Release//21

ET Products Services

- NEW ASIC & FPGA Development Systems
- Board to Board Interconnects
- Custom, Semi-Custom (Built to Order)
- Emulator Tools & Adapters
- Field Configurable Adapters & Cables
- Interconnects
- NEW Lab & Rework Accessories
- Logic Analyzer/Scope Adapters
- Programming Adapters
- Prototyping Adapters, Boards & Extenders
- NEW Sockets: Test & Burn-ins, Production
- Test Clips & Oscilloscope Probes
- NEW Wireless Products

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Overview

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- Spending hours sourcing the correct socket/adapter for your project
- Engineers and technicians in different labs searching for the same lab tool and issuing separate purchase requisitions
- Spending time expediting orders or trying to find the quickest delivery
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- Solving multiple problems related to chip obsolescence

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- 125,000 insertion cycles
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- Rush delivery – 5, 7, 10 and 15 days

Specifications

Mechanical

Mechanical Life: 125,000 cycles

Pitch:	.50/.65mm	.8mm	1–1.27mm
Full Travel:	0.43mm	0.50mm	0.70mm
Contact Force:	26 gf	26 gf	19 gf

Electrical

Bandwidth @-1dB	15 GHz	18 GHz	23 GHz
Contact Resistance:	<35m Ohm	<30m Ohm	<16m Ohm
Current (free air):	2.9 amp	3.0 amp	4 amp
Self Inductance:	0.88nH	0.95nH	0.93nH
Capacitance:	0.097 pF	0.284 pF	0.19 pF

Operating Temperature

-55 degrees C to +130 degrees C

Materials

Stamped Contact: BeCu, Au Plate

Spring: SS, Au Plate

Ordering Information

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- Accommodates BGA, LGA, QFN and custom packages
- Easy Screw & Easy Knob retention systems are
- interchangeable and sold together upon request
- Custom retention covers available
- 125,000 insertion cycles
- RoHS compliant
- Rush delivery – 5, 7, 10 and 15 days

Specifications

Mechanical

Mechanical Life: 125,000 cycles

Pitch:	.50/.65mm	.8mm	1–1.27mm
Full Travel:	0.43mm	0.50mm	0.70mm
Contact Force:	26 gf	26 gf	19 gf

Electrical

Bandwidth @-1dB	15 GHz	18 GHz	23 GHz
Contact Resistance:	<35m Ohm	<30m Ohm	<16m Ohm
Current (free air):	2.9 amp	3.0 amp	4 amp
Self Inductance:	0.88nH	0.95nH	0.93nH
Capacitance:	0.097 pF	0.284 pF	0.19 pF

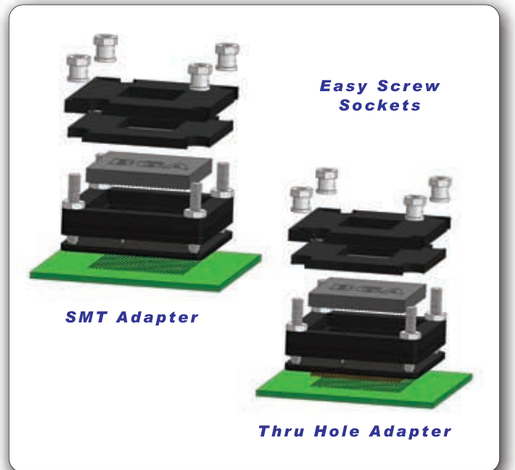
Operating Temperature

-55 degrees C to +130 degrees C

Materials

Stamped Contact: BeCu, Au Plate

Spring: SS, Au Plate



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High Speed up to 10 GHz
Test & Development Sockets

ET 3300 series
Elastomer

A cost effective, compression mount, elastomeric contact socket line for a wide range of applications.

Features & Benefits

- Up to 10 GHz bandwidth
- 60,000 insertion cycles
- Compression mount to PCB
- Elastomeric contacts
- Accepts any pitch down to 0.1mm
- Package size up to 45mm x 45mm
- Accommodates BGA, LGA, QFN and custom packages
- Easy Screw & Easy Knob retention systems are interchangeable and sold together upon request
- Custom retention covers available
- Rush delivery – 5, 7, 10 and 15 days
- Easy assembly

Specifications

Mechanical

Mechanical Life: 60,000 cycles

Minimum Pitch:..... 0.1mm

Elastomer Thickness:..... 0.5mm

Electrical

Bandwidth @-1dB:..... 10 GHz

Contact Resistance:..... 400 milliohms

Current (free air):..... 0.05 A/wire

Self Inductance:..... 0.26 nH

Capacitance:..... 0.03 pF

Insulation Resistance @ 500V DC:..... 1000 milliohms

Breakdown Voltage @60 Hz:..... 500 VDC

Operating Temperature

-35 degrees C to +100 degrees C

Socket Materials

Elastomeric pad

Ordering Information

http://www.emulation.com/et3300

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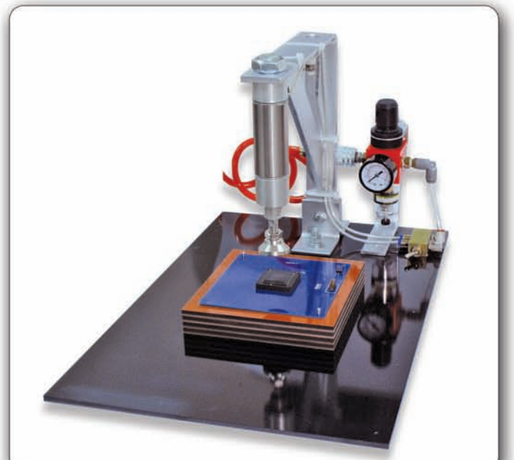
Features & Benefits

- Reconfigurable for different chip packages and PCBs
- No soldering, tooling holes or epoxy required
- Perfect for limited x and y clearance around chip package
- Suited for medium volume testing
- Up to 23 GHz bandwidth
- Applications include: failure analysis, software debug, automated test and programming
- Accepts any pitch to down to 0.1mm
- Pogo pins or elastomeric contacts
- Accommodates BGA, LGA, QFN and custom packages
- Extra sockets and accessories sold separately
- ASAP rush service available



Specifications

Mechanical

Mechanical Life: 125,000 cycles

Pitch:	.50/.65mm	.8mm	1–1.27mm
Full Travel:	0.43mm	0.50mm	0.70mm
Contact Force:	26 gf	26 gf	19 gf

Electrical

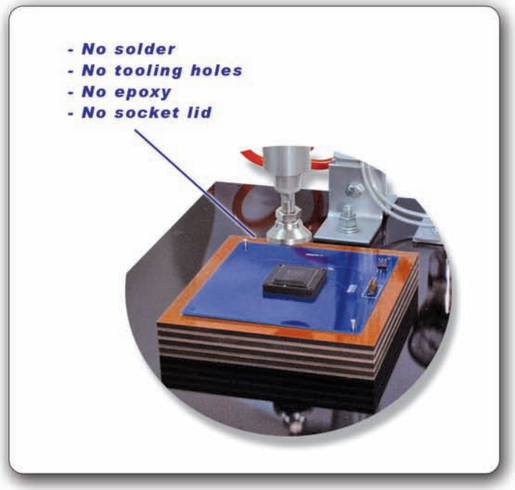
Bandwidth @-1dB	15 GHz	18 GHz	23 GHz
Contact Resistance:	<35m Ohm	<30m Ohm	<16m Ohm
Current (free air):	2.9 amp	3.0 amp	4 amp
Self Inductance:	0.88nH	0.95nH	0.93nH
Capacitance:	0.097 pF	0.284 pF	0.19 pF

Operating Temperature

-55 degrees C to +130 degrees C

Materials

Gold plated contacts or elastomeric pad



Ordering Information

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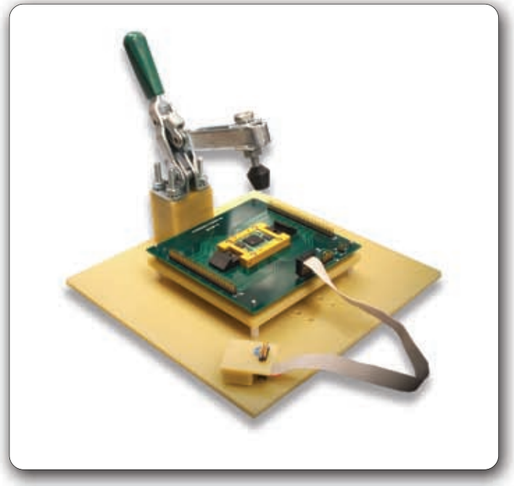
High Performance
Custom Test Fixtures

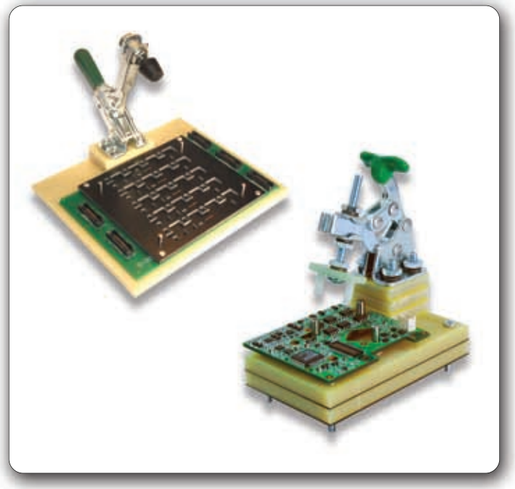
ET 5100 series

Emulation Technology has developed an innovative custom fixture product line using high-speed interconnect to create single or multi-site test applications.
Your circuit board design can be incorporated or we can design a new target circuit board for multiple packages to save time and money.

Features & Benefits

- Customized to meet your test needs
- Single or multi-site test applications
- Toggle clamp or air cylinder retention system
- Designed to be operator independent
- No soldering required
- Up to 23 GHz bandwidth
- Accepts any pitch down to 0.1mm
- Pogo pins or elastomeric contacts
- 125,000 insertion cycles per socket
- Accommodates BGA, LGA, QFN and custom packages
- ASAP rush service available





Specifications

Mechanical

Mechanical Life: 125,000 cycles

Pitch:	.50/.65mm	.8mm	1–1.27mm
Full Travel:	0.43mm	0.50mm	0.70mm
Contact Force:	26 gf	26 gf	19 gf

Electrical

Bandwidth @-1dB	15 GHz	18 GHz	23 GHz
Contact Resistance:	<35m Ohm	<30m Ohm	<16m Ohm
Current (free air):	2.9 amp	3.0 amp	4 amp
Self Inductance:	0.88nH	0.95nH	0.93nH
Capacitance:	0.097 pF	0.284 pF	0.19 pF

Operating Temperature

-55 degrees C to +130 degrees C

Materials

Gold plated contacts or elastomeric pad

Ordering Information

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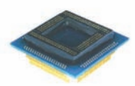

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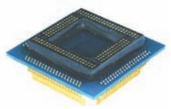

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Chip Package Reference Guide

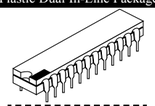
Our technical and sales staff is always ready to offer their expertise. You can facilitate the process by:

- Answering the following questions before you contact us
- Have your package outline drawing available for reference and ready to email in .pdf format
- Please reference our package code tables on the following pages

1) What is your chip package? _____
2) What is the pin count of your package? _____
3) Who manufactures your IC? _____
4) What is your application? _____

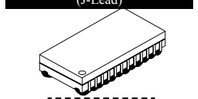
Plastic Packages

PDIP
(Plastic Dual In-Line Package)



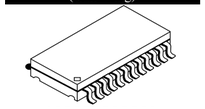
Send package drawing

SOJ
(Small Outline Package)
(J-Lead)



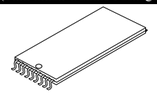
See table #3
on page 4

SOP
(Small Outline Package)
(Gull-Wing)



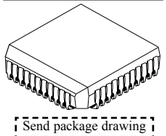
See table #1
on page 4

TSOP
(Thin Small Outline Package)



See tables 4 & 5
on page 4

PLCC
(Plastic Leaded Chip Carrier)



Send package drawing

PQFP/TQFP
(Thin Quad Flatpack)

(JEDEC)

See table #9
on page 6

MILITARY
(Quad Flatpack)

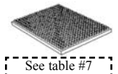
(EIAJ)

Send package drawing

MLF/QFN
(Multi Lead Frame)
(Quad Flat No Lead)

See table #6
on page 5

BGA
(Ball Grid Array)

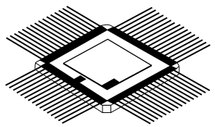


See table #7
on page 5

HOW TO CHOOSE THE RIGHT SOLUTION

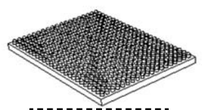
Ceramic Packages

CQFP
(Ceramic Quad Flatpack)



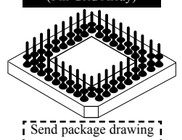
Send package drawing

BGA
(Ball Grid Array)



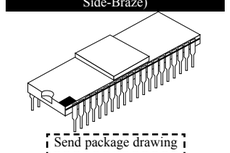
Send package drawing

PGA
(Pin Grid Array)



Send package drawing

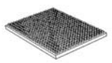
C-DIP
(Ceramic Dual In-Line Package; Side-Braze)



Send package drawing

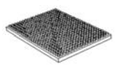
HOW TO CHOOSE THE RIGHT SOCKET & ADAPTER

ChipScale BGA Packages



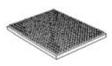
1.00 mm

Send package drawing



.80 mm

Send package drawing

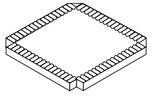


.75 mm

Send package drawing

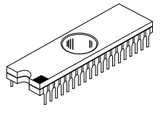
Lead Chip Carrier Packages

LCC
(Bottom View)



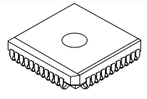
Send package drawing

CERDIP
(Ceramic Dual In-Line Package; UV Window)



Send package drawing

JLCC CERQUAD
(Ceramic Quadpack)



Send package drawing

FOOTPRINTS

Table #1

Small Outline Packages (SOP)				
Body Size		Pitch		Package Code
mm	in	mm	in	
3.90	.155	1.27	.0500	**SO01**
5.30	.208	1.27	.0500	**SO02**
5.60	.220	1.27	.0500	**SO11**
7.50	.295	1.27	.0500	**SO03**
7.62	.300	1.02	.0400	**SO12**
8.40	.337	1.27	.0500	**SO04**
8.89	.350	1.27	.0500	**SO05**
10.16	.400	1.27	.0500	**SO13**
10.70	.421	1.27	.0500	**SO08**
11.20	.440	1.27	.0500	**SO06**
11.40	.449	1.27	.0500	**SO10**
13.20	.519	1.27	.0500	**SO09**
12.59	.496	1.27	.0500	**SO14**
12.00	.472	0.80	.0315	**SO07**

Table #2

Shrink Small Outline Packages (SSOP) Thin Shrink Outline Packages (TSSOP)					
Body Size		Pitch		*SSOP	**TSSOP
mm	in	mm	in	Pakage Code	Pakage Code
3.00	.118	0.500	.0197	**N/A**	**ST35**
3.00	.118	0.650	.0256	**N/A**	**ST36**
3.80	.150	0.635	.0250	**SS01**	**N/A**
3.90	.154	0.400	.0157	**SS02**	**N/A**
3.90	.154	0.635	.0250	**SS12**	**N/A**
4.40	.173	0.400	.0157	**SS23**	**ST23**
4.40	.173	0.500	.0197	**SS13**	**ST13**
4.40	.173	0.650	.0256	**SS03**	**ST03**
5.30	.209	0.400	.0157	**SS24**	**ST24**
5.30	.209	0.500	.0197	**SS14**	**ST14**
5.30	.209	0.650	.0256	**SS04**	**ST04**
5.30	.209	0.650	.0256	**SS34**	**N/A**
6.10	.240	0.400	.0157	**SS25**	**ST25**
6.10	.240	0.500	.0197	**SS15**	**ST15**
6.10	.240	0.650	.0256	**SS05**	**ST05**
7.62	.300	0.635	.0250	**SS06**	**N/A**
7.62	.300	0.650	.0256	**SS26**	**N/A**
8.00	.315	0.500	.0256	**SS15**	**N/A**
8.00	.315	0.400	.0157	**SS27**	**ST27**
8.00	.315	0.500	.0197	**SS17**	**ST17**
8.00	.315	0.650	.0256	**SS07**	**ST07**
9.90	.390	0.500	.0315	**SS18**	**N/A**
9.90	.390	1.000	.0394	**SS08**	**N/A**
11.00	.433	0.800	.0315	**SS36**	**N/A**
12.00	.472	0.800	.0315	**SS11**	**N/A**
13.30	.524	0.800	.0315	**SS09**	**N/A**
7.62	.300	0.800	.0315	**SS16**	**N/A**

***SSOP maximum body height = 2.00mm**
****TSSOP maximum body height = 1.20mm**

Table #3

Small Outline with J-lead (SOJ)				
Body Size		Pitch		Package Code
mm	in	mm	in	
7.62	.300	1.27	.0500	**SJ01**
8.38	.330	1.27	.0500	**SJ02**
8.89	.350	1.27	.0500	**SJ03**
10.15	.400	0.80	.0315	**SJ05**
10.15	.400	1.27	.0500	**SJ04**
12.00	.472	0.80	.0315	**SJ06**
12.70	.500	1.27	.0500	**SJ07**

Table #4

Thin Small Outline Packages (TSOP)				
Body Size		Pitch		Package
mm	in	mm	in	Code
11.80	.465	0.550	.0217	**TS05**
12.40	.488	0.500	.0197	**TS04**
14.40	.567	0.500	.0197	**TS03**
16.40	.646	0.500	.0197	**TS02**
18.40	.724	0.500	.0197	**TS01**

Table #5

Thin Small Outline Packages (TSOP TYPE II)				
Body Size		Pitch		Package
mm	in	mm	in	Code
7.62	.300	1.27	.0500	**T203**
10.16	.400	0.50	.0197	**T232**
10.16	.400	0.65	.0256	**T222**
10.16	.400	0.80	.0315	**T212**
10.16	.400	1.27	.0500	**T202**
10.16	.400	1.16	.0456	**T242**
12.70	.500	0.65	.0256	**T221**
12.70	.500	0.80	.0315	**T211**
12.70	.500	1.27	.0500	**T201**

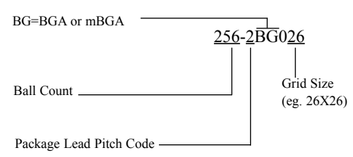
FOOTPRINTS

Table #6

QUAD FINE PITCH (QFN) Also Known As: MLF, LPCC, BCC, QFN					
Pin Count	**Body Size mm**	**Pitch mm**	**Pad Layout**	**Package Code**	**Test & B/I Socket**
8	6X5	1.27	4-0	ML08	S-MLF-00-008-A
8	6X8	1.27	4-0	ML40	S-MLF-00-008-D
8	3X2	0.50	4-0	ML09	S-MLF-00-008-B
8	3X3	0.50	4-0	ML10	S-MLF-00-008-C
10	3X2	0.50	4-1	ML11	S-MLF-00-010-A
10	3X3	0.50	5-0	ML12	S-MLF-00-010-B
12	3X3	0.50	3-3	ML13	S-MLF-00-012-A
16	5X5	0.80	4-4	ML01	S-MLF-00-016-A
16	4X4	0.65	4-4	ML16	S-MLF-00-016-B
16	3X3	0.50	5-3	ML14	S-MLF-00-016-C
16	3X3	0.50	4-4	ML15	S-MLF-00-016-D
16	5X5	0.50	8-0	ML17	S-MLF-00-016-E
20	5X5	0.65	5-5	ML02	S-MLF-00-020-A
20	5.2X4.2	0.65	5-5	ML18	S-MLF-00-020-B
20	4X4	0.50	5-5	ML19	S-MLF-00-020-C
24	4.5X3.5	0.50	3-9	ML20	S-MLF-00-024-A
24	4X4	0.50	6-6	ML21	S-MLF-00-024-B
28	5X5	0.50	7-7	ML03	S-MLF-00-028-A
28	6X6	0.65	7-7	ML38	S-MLF-00-028-C
28	7X7	0.80	7-7	ML36	S-MLF-00-028-B
32	5X5	0.50	8-8	ML04	S-MLF-00-032-A
32	6X6	0.50	8-8	ML22	S-MLF-00-032-B
32	7X7	0.65	8-8	ML23	S-MLF-00-032-C
32	8X8	0.80	8-8	ML24	S-MLF-00-032-D
32	9X9	0.90	8-8	ML25	S-MLF-00-032-E
34	14X9.7	1.27	8-9	ML26	S-MLF-00-034-A
36	6X6	0.50	9-9	ML27	S-MLF-00-036-A
40	6X6	0.50	10-10	ML28	S-MLF-00-040-A
44	7X7	0.50	11-11	ML05	S-MLF-00-044-A
44	7X7	0.50	12-10	ML29	S-MLF-00-044-B
44	8X8	0.65	11-11	ML37	S-MLF-00-044-D
44	9X9	0.65	11-11	ML30	S-MLF-00-044-C
48	7X7	0.50	11-13	ML31	S-MLF-00-048-B
48	7X7	0.50	12-12	ML06	S-MLF-00-048-A
52	8X8	0.50	13-13	ML32	S-MLF-00-052-A
56	8X8	0.50	14-14	ML33	S-MLF-00-056-A
64	9X9	0.50	16-16	ML34	S-MLF-00-064-A
68	10X10	0.50	17-17	ML35	S-MLF-00-068-A
84	12X12	0.50	21-21	ML39	S-MLF-00-084-A

Table #7 **Ball Grid Array (BGA)**

Ordering Information Example



Code	PITCH	Code	PITCH	Code	PITCH
1	1.50mm	4	0.75mm	7	2.50mm
2	1.27mm	5	0.50mm	8	2.54mm
3	1.00mm	6	0.80mm	9	0.65mm

Table #8

ATMEL PACKAGES					
Pin	**Body Size**		**Pitch**		**Code**
Count	**mm**	**in**	**mm**	**in**	
8	8.00	.315	1.27	.0500	**8-LAP1**
8	4.90	.193	0.65	.0256	**8-MAP1**
8	6.40	.252	0.65	0.026	**8-TAP1**

INFORMATION NEEDED FOR ORDERING

1) What is your chip package?

(Please refer to the following package drawings and corresponding Package Coding charts to determine your chip package type.)

2) What is the pin count of your package?
3) Who manufactures your IC?
4) What is your application?

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FOOTPRINTS

Table #9

PIN COUNT LEAD PITCH (mm)	QFP FOOTPRINT CODE (mm)	BODY SIZE (mm)	TIP-2-TIP (mm)
32	QF59	7.00 sq.	10.90
	QF59		10.20
.8mm	QF59C		9.60
	QF59D		9.00
44	QF16	10.00 sq.	13.90
.8mm	QF16C		12.60
44	QF24	14.00 sq.	17.60
.5mm			
44	QF52	13.00 sq.	16.71
.5mm			
48	QF50A	7.00 sq.	10.90
	QF50B		10.20
.5mm	QF50C		9.60
	QF50		9.00
48	QF54	12.00 sq.	15.90
	QF54		15.20
.8mm	QF54C		14.60
	QF54D		14.00
52	QF37	14.00 sq.	17.90
	QF37		17.20
1.0mm	QF37C		16.60
	QF37D		16.00
52	QF39	10.00 sq.	13.90
	QF39		13.20
.65mm	QF39C		12.60
	QF39D		12.00
56	QF53	14.00 x 10.00	17.90 / 13.90
	QF53		17.20 / 13.20
.8mm	QF53C		16.60 / 12.60
	QF53D		16.00 / 12.00
56	QF58	10.00 sq.	13.90
	QF58		13.20
.65mm	QF58C		12.60
	QF58D		12.00
60	QF18	14.00 sq.	17.90
.8mm			
64	QF09	20.00 x 14.00	23.90 / 17.90
	QF09		23.20 / 17.20
1.0mm	QF09C		22.60 / 16.60
	QF09D		22.00 / 16.00
64	QF34	12.00 sq.	15.90
	QF34		15.20
.65mm	QF34C		14.60
	QF34D		14.00
64	QF64	10.00 sq.	13.90
	QF64		13.20
.5mm	QF64C		12.60
	QF64D		12.00
68	QF23	.700" sq.	.680"
.025"			

PIN COUNT LEAD PITCH (mm)	QFP FOOTPRINT CODE (mm)	BODY SIZE (mm)	TIP-2-TIP (mm)
74	QF46	20.00 sq.	23.90
	QF46		23.20
1.0mm	QF46C		22.60
	QF46D		22.00
80	QF14A	14.00 sq.	17.90
.65mm	QF14C		16.60
	QF14		16.00
80	QF47	12.00 sq.	15.90
	QF47		15.20
.5mm	QF47C		14.60
84	QF02	.800" sq.	.780"
.025"			
94	QF32	20.00 sq.	23.90
.8mm	QF32D		22.00
100	QF01	.900" sq.	.880"
.025"			
100	QF06	20.00 x 14.00	23.90 / 17.90
	QF06		23.20 / 17.20
.65mm	QF06C		22.60 / 16.60
	QF06D		22.00 / 16.00
100	QF49A	14.00 sq.	17.90
	QF49B		17.20
.5mm	QF49C		16.60
	QF49		16.00
100	QF55	.960" sq.	1.150"
.025"			
112	QF36	20.00 sq.	23.90
	QF36		23.20
.65mm	QF36C		2.60
	QF36D		22.00
120	QF05	28.00 sq.	31.90
	QF05		31.20
.8mm	QF05C		30.60
	QF05D		30.00
120	QF56A	14.00 sq	17.90
	QF56B		17.20
.4mm	QF56C		16.60
	QF56		16.00
120	QF70A	16.00 sq.	19.90
	QF70B		19.22
.5mm	QF70C		18.60
	QF70D		18.00

Table #9 (cont.)

PIN COUNT LEAD PITCH (mm)	QFP FOOTPRINT CODE (mm)	BODY SIZE (mm)	TIP-2-TIP (mm)
128 .4mm	QF57	14.00 sq.	16.00
128	QF13	28.00 sq.	31.90
	QF13		31.20
.8mm	QF13C		30.60
	QF13D		30.00
	QF13E		31.46
128	QF51A	20.00 x 14.00	23.90 / 17.90
	QF51B		23.20 / 17.20
.5mm	QF51		22.60 / 16.60
	QF51D		22.00 / 16.00
128 .5mm	QF26	20.00 sq.	23.90
128 .5mm	QF53	20.00 sq.	22.00
132 .025"	QF03	1.100" sq.	1.080"
144	QF10	28.00 sq.	31.90
	QF10		31.20
.65mm	QF10C		30.60
	QF10D		30.00
144	QF63A	20.00 sq.	23.90
	QF63B		23.20
.5mm	QF63C		22.60
	QF63		22.00
160	QF07	28.00 sq.	31.90
	QF07		31.20
.65mm	QF07C		30.60
	QF07D		30.00
160	QF48A	24.00 sq.	27.90
	QF48B		27.20
.5mm	QF48C		26.60
	QF48		26.00
164 .025"	QF04	1.300" sq.	1.280"
172 .025"	QF12	1.150" sq.	1.610"
176	QF19A	20.00 sq.	23.90
	QF19B		23.20
.4mm	QF19C		22.60
	QF19		22.00

PIN COUNT LEAD PITCH (mm)	QFP FOOTPRINT CODE (mm)	BODY SIZE (mm)	TIP-2-TIP (mm)
176	QF67A	24.00 sq.	27.90
	QF67B		27.20
.5mm	QF67C		26.60
	QF67		26.00
184	QF31	32.00 sq.	35.90
	QF31		35.20
.65mm	QF31C		34.60
	QF31D		34.00
196 .025"	QF15	1.500" sq.	1.480"
196	QF18	1.356" sq.	1.650"
208	QF21A	28.00 sq.	31.90
	QF21D		30.00
232	QF41	40.00 sq.	43.90
.65mm	QF41C		42.60
	QF41D		42.00
240	QF22	40.00 sq.	43.90
	QF22		43.20
.65mm	QF22C		42.60
	QF22D		42.00
240	QF62A	32.00 sq.	35.90
	QF62B		35.20
.5mm	QF62		34.60
	QF62D		34.00
256 .5mm	QF17	31.50 sq.	43.43
256	QF38A	40.00 x 28.00	43.90 / 31.90
	QF38B		43.20 / 31.20
.5mm	QF38C		42.60 / 30.60
	QF38D		42.00 / 30.00
256 .51mm	QF42	37.34 sq.	49.20
256 .020"	QF68	1.460" sq.	1.790"
256	QF70	28.00 sq.	31.90
			31.20
.4mm			30.60
			30.00
304	QF61A	40.00 sq.	43.90
	QF61B		43.20
.5mm	QF61		42.60
	QF61D		42.00
352 .5mm	QF71	48.26 sq.	54.61

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ET Web links and reference product links accompany each catalog section to help you find the right product.

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- *Detailed drawings*

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Sincerely,

Joe Bagliere

Joe Bagliere, President

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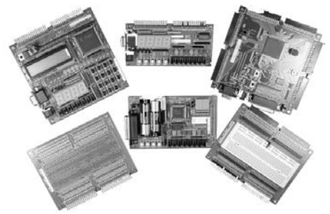
- provide product availability

ASIC&FPGA DEVELOPMENT SYSTEMS

Our new ASIC and FPGA Development Systems aid electrical and computer engineers of all levels in gaining new skills or advancing new designs.

- Ideal for engineers needing an easy and rapid-prototyping environment capable of hosting complex digital systems
- Easily transition an electrical design to an electronic design
- Great tool for users looking to upgrade skills in designing with CPLD's and FPGA's



See our complete ASIC & FPGA Development Systems listing online: **www.1800adapter.com/091**

Development System Quick Guide

Easily identify the right sytem by:

1) FPGA device
2) Number of FPGA devices
3) FPGA application

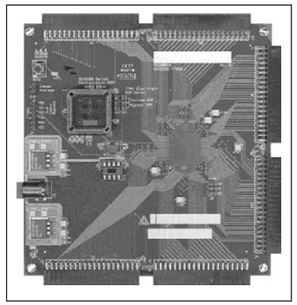
Once you have identified the device, the number of devices and the application, follow the line up to the corresponding catalog page to learn more about the product.

	ET-D2FT System Board	ET-D2SB System Board	ET-DIO4 Digital I/O Board	ET-DIO5 Digital I/O Board	ET-DBB1 Xilinx Add-on Board	ET-DWR1 Wire Wrap Board	ET-DNET Ethernet Module	ET-DUSB Connectivity Module	ET-JTAG Programming Cable	ET-AIO1 Learning Board	ET-XCRP Learning Board	ET3000K10S Emulation System	ET3000K10M Emulation System	ET5000K10S Emulation System	ET5000K10 Emulation System	ET6000KS Emulation System	ET-EP1S10 Development System	ET-EP1S25 Development System	ET-EP1C20F324C7 Dev. System	ET-EP1C3T100C7 Learning Board
Catalog Page	**10**	**10**	**11**	**11**	**12**	**12**	**13**	**13**	**13**	**14**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**20**	**21**	**21**
FPGA Device Type																				
Altera Cyclone EP1C20F324C7																			X	
Altera Cyclone EP1C3T100C7																				X
Altera Stratix (672-pin) EP1S10																	X	X		
Altera Stratix EP1S80 GPGA														X	X					
Xilinx VirtexII FPGA													X			X				
Xilinx XC2S200-E-200 FPGA	X	X																		
Xilinx XCR3064 CPLD											X									
Xilinx XCR3128 CPLD				X																
Number of FPGA Devices																				
Multiple													X		X					
Single	X	X		X							X	X		X		X	X	X	X	X
FPGA Application																				
Add Analog to Digital Converter										X										
Add Ethernet Connection to System Board Design							X													
Add New Designs & Capabilities			X	X	X	X		X												
Add USB Connector to System Board Design								X												
Build Custom ASICS																	X	X		
Build Custom Microcontroller Cores																	X	X		
Design & Implement Digital Circuits	X	X																X	X	X
Embedded Core Design	X	X																		
Facilitate Device Programming									X											
Learn Digital Design Techniques			X	X							X									
Prototyping Logic & Memory Designs												X	X	X	X	X	X	X	X	X

ASIC DEVELOPMENT - XILINX SYSTEM BOARDS

ET-D2FT SYSTEM BOARD

The ET-D2FT FPGA-based development board provides an inexpensive and expandable platform on which to design and implement digital circuits of all kinds. The ET-D2FT features a Xilinx Spartan 2E-300 FPGA in an FT256 package, proving plenty of gates and I/O's for even the most challenging embedded designs. The ET-D2FT is the prefect platform for working with embedded processors such as Xilinx's MicroBlaze or other cores available from a variety of sites. The board is fully compatible with Xilinx's free WebPack software, and it ships with a power supply and programming cable, so designs can be implemented immediately without any further costs. It can easily mate with several expansion boards (see below), so more complex designs can easily be completed.



ET-D2FT

APPLICATIONS

- Embedded-core processor design (e.g., Xilinx MicroBlaze)
- General digital systems and controllers
- Application specific DSP solutions

FEATURES & BENEFITS

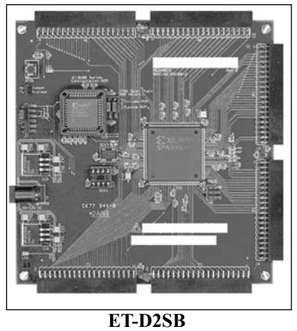
- A Xilinx XC2S200E-300 FPGA with 300,000 gates and 350+MHz operation
- 190 available user I/Os
- A socket for a JTAG-programmable 18V02 Flash ROM
- Dual on-board 1.5A power regulators (1.8V core and 3.3V I/O)
- A surface-mount 50MHz oscillator and a socket for a second oscillator
- A JTAG programming port and programming cable
- A status LED and pushbutton for basic I/O
- Six 40-pin expansion connectors that allow easy connection to all available I/Os

P/N: **ET-D2FT**

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ET-D2SB SYSTEM BOARD

The ET-D2SB FPGA-based development board provides a very low cost and expandable platform on which to design and implement digital circuits of all kinds. The ET-D2SB features a Xilinx Spartan 2E-200 FPGA in a PQ208 package - enough gates and I/O's to implement a wide range of digital circuits. The ET-D2SB provides the perfect platform for developing controllers or other general-purpose circuits with minimum effort. When combined with our other peripheral boards, complex systems can be readily constructed. The ET-D2SB is fully compatible with the free WebPack software from Xilinx, and it ships with a power supply and programming cable so designs can be implemented immediately without any further costs.



ET-D2SB

APPLICATIONS

- Embedded-core processor design (e.g., Xilinx MicroBlaze)
- General digital systems and controllers
- Application specific DSP solutions

FEATURES & BENEFITS

- A Xilinx XC2S200E-200 FPGA with 200,000 gates and 200+MHz operation
- 143 available user I/O's
- A socket for a JTAG-programmable 18V02 Flash ROM
- Dual on-board 1.5A power regulators (1.8V core and 3.3V I/O)
- A surface-mount 50MHz oscillator and a socket for a second oscillator
- A JTAG programming port and programming cable
- A status LED and pushbutton for basic I/O
- Six 40-pin expansion connectors that allow easy connection to all available I/Os

P/N: ET-D2SB

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
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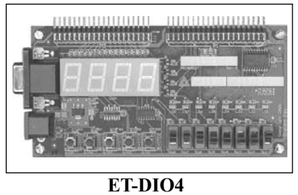
NEW!



ET-DIO4

- Ideal for engineers needing an easy and rapid-prototyping environment capable of hosting complex digital systems
- Great tool for users looking to upgrade skills in designing with CPLD's and FPGA's

ET-DIO4 DIGITAL I/0 BOARD

The ET-DIO4 Digital I/O board provides a simple and inexpensive ready-made source for several useful I/O devices and ports. It can be used with the D2SB or D2FT boards to provide a convenient source of I/O devices that are useful in the design and debug of digital circuits. All I/O devices are directly mapped to I/O pins on the system FPGA, so it is very quick and easy to use.

APPLICATIONS

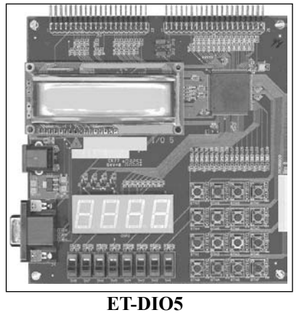
- Any circuit where common I/O devices are needed
- Easily transition an electrical design to an electronic design

FEATURES & BENEFITS

- A 4-digit seven segment display
- 8 individual LEDs
- 4 debounced pushbuttons
- 8 slide switches
- 3-bit VGA port
- PS/2 mouse or keyboard port

P/N: ET-DIO4

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**



ET-DIO5

- Ideal for engineers needing an easy and rapid-prototyping environment capable of hosting complex digital systems
- Great tool for users looking to upgrade skills in designing with CPLD's and FPGA's

ET-DIO5 DIGITAL I/0 BOARD

The ET-DIO5 Digital I/O board provides a ready-made source for many of the most common I/O devices and ports found in digital systems. It can be used with the D2SB or D2FT boards to create a platform that can host a wide range of projects. Because it contains a large CPLD to coordinate the various on-board I/O devices, it can also be used to partition designs across the CPLD and an FPGA on an attached system board. Using the DIO5, designs such as a full-function calculator, a complete computer, a simple video game controller, or countless other systems can readily be created.

APPLICATIONS

- Any circuit where common I/O devices are needed
- Easily transition an electrical design to an electronic design

FEATURES & BENEFITS

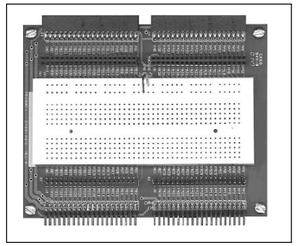
- An XCR3128 CPLD for I/O device and system bus control (the CPLD is automatically inserted in the JTAG scan chain when the DIO5 is attached to any system board)
- A 16x2 character LCD
- A 4-digit seven segment display
- 16 individual LEDs in three different colors
- A 16 button keypad
- 8 slide switches
- 3-bit VGA port
- PS/2 mouse or keyboard port

P/N: ET-DIO5

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ASIC DEVELOPMENT - XILINX ADD-ON BOARDS

XILINX ADD-ON BOARDS
This add-on board provide an easy way to add new designs and capabilities to ET system boards. Both boards offer connections to system Vdd and GND signals as well as easy access to all system board signals. Both boards pass all signals through from one side of the board to the other, so that the boards can be inserted between a system board and an I/O board. For larger custom designs, multiple wirewrap or breadboards can be connected in series. Both boards offer two additional connection points for each signal, so that every signal is available for prototype circuit connections and/or test and measurement equipment connection.



ET-DBB1

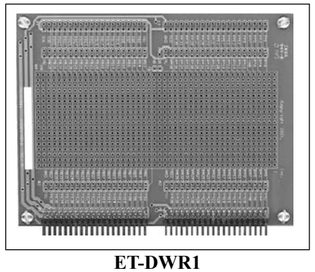
APPLICATIONS
- Ideal platform for engineers who want to learn digital design techniques using modern technologies.

FEATURES & BENEFITS
- A large 500 tie-point breadboard with separate pre-connected power/GND tracks or a 540-hole wirewrap area
- Test point connections on every signal
- Prototype/wirewrap connections on every signal
- 8 slide switches
- Compatibility with all other ET Development boards

P/N: ET-DBB1

For a complete list of product specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ET-DWR1 WIRE WRAP BOARD
The ET Digital I/O Board 1 (DIO2) provides a ready-made source for many of the most common I/O devices and ports found in digital systems. The ET-DIO2 board can be used with any system board to create a platform that can host a wide range of projects. For example, the ET-DIO2 board can be used with an ET-D2 board to create a full-function calculator, a complete computer, video game, as well as countless other circuits and systems. If a given project requires circuits or devices that are not on the ET-DIO2, an ET breadboard or wirewrap board can be inserted between a system. board and ET-DIO2 board. The DIO2 board uses a Xilinx 95108 CPLD to create a system bus between the system board and I/O devices, as well as to manage several of the I/O devices. The CPLD can be reprogrammed by the user to customize the board for particular needs.



ET-DWR1

APPLICATIONS
- Ideal platform for engineers who want to learn digital design techniques using modern technologies.

FEATURES & BENEFITS
- Large wire wrap area with system Vdd and GND connections
- All connections passed through board and to prototyping/test point connectors

P/N: ET-DWR1

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

EMULATION TECHNOLOGY RECOMMENDS

Wire Wrap Tools

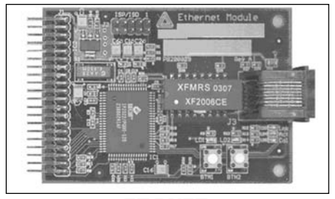
Hand-operated wrapping guns use interchangeable bits and sleeves. Tools can provide up to 10 revolutions per squeeze of the trigger, and accomodate wire sizes from 22-32 AWG. The plastic gun (ET-WG-350L, shown) offers the advantage of light weight, and the aluminum gun (ET-WG-350) provides greater durability. Both guns are used for production line and field service use in the electronics and telecommunications industries.

Web Link: www.1800adapter.com/058

NEW!

ET-DNET ETHERNET MODULE

The ET-DNET Ethernet module provides a ready-made 10/100Mb Ethernet port that can be used to add Ethernet connectivity to any system board. When attached to a system board, the Ethernet port can be used to configure any FPGAs and CPLDs that are present, and it can also be used for general data transfers. The ET-DNET is based on the Ubicom "all in one" Ethernet IC, which provides a simple, inexpensive, and well-documented Ethernet connectivity solution. The ET-DNET module comes with drivers and various application programs, so that it can be used to quickly develop web-connected applications.



ET-DNET

APPLICATIONS

• Any circuit where Ethernet connectivity is needed

FEATURES & BENEFITS

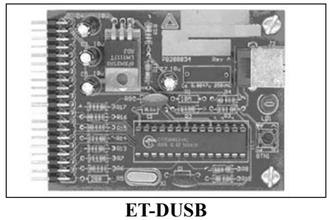
• A 10/100Mb front end (up to 30Mb/sec transfers)
• Status indicator LEDs
• Easy connection to system boards using predefined bus protocol
• Up to 6 modules can be used with ET-D2FT board

P/N: ET-DNET

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ET-DUSB USB 1.1 MODULE

The ET-DUSB USB 1.1 module provides a ready-made USB port that can be used to add USB connectivity to any system board. When attached to a system board, the USB port can be used to configure any FPGAs and CPLDs that are present, and it can also be used for general data transfers. The ET-DUSB is based on a Cypress CY7C64013 USB IC, which provides a simple, inexpensive, and well-documented USB connectivity solution. The USB chip is flash-based, so its firmware can easily be modified (using Cypress tools which must be purchased separately). The ET-USB module comes with drivers and various application programs, so that it can be used to quickly develop USB-connected applications.



ET-DUSB

APPLICATIONS

• Any circuit where USB connectivity is needed

FEATURES & BENEFITS

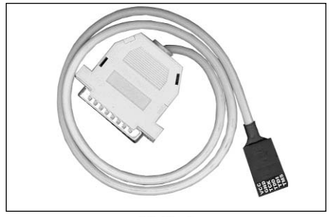
• A USB 1.1 front end (up to 12Mb/sec data transfers)
• Status indicator LED
• Easy connection to system boards using predefined bus protocol
• Up to 6 modules can be used with ET-D2FT board

P/N: ET-DUSB

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ET-JTAG Programming Cable

The ET-JTAG3 cable is the least expensive, widest voltage range programming cable available for any Xilinx device. It can be used to program any Xilinx device from any PC, and it can work with system voltages from 5.5VDC down to 1.65VDC. The cable attaches to the parallel port of a PC, and to a standard 100-mil spaced 6-pin header connector on the system board. The cable is auto-detected by all versions of Xilinx software, and it can be used without having to leave the Xilinx CAD envoriment.



ET-JTAG

FEATURES & BENEFITS

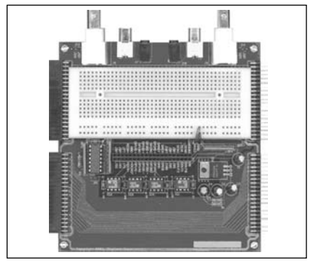
• Compatible with all versions of Xilinx software
• Auto-detected from with Xilinx CAD tools
• Compatible with system voltages from 5.5 to 1.65 volts
• 5 feet long

P/N: ET-JTAG

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/147**

ASIC DEVELOPMENT - XILINX CPLD LEARNING BOARDS

ET-AIO1 ANALOG I/O BOARD
The ET-AIO1 board provides a simple means to add analog-to-digital and digital-to-analog converters to any system board. The ET-AIO1 includes an 8-bit, 1MS ADC and an 8-bit, 1MS DAC from Analog Devices. Also included are two dual op-amps and an integral breadboard so that filter and gain circuits can easily be constructed. All analog components use an on-board 5VDC voltage source. All unused I/O signals are passed through the ET-AIO1 board so that it can be placed between a system board and other peripheral boards. The ET-AIO1 also contains several useful signal connectors, including BNC, RCA, and 1/8" audio so that connections to outside devices can easily be made.



ET-AIO1

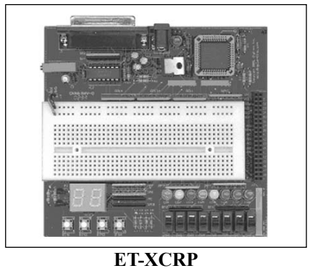
APPLICATIONS
• Any circuit requiring low to medium speed analog I/O

FEATURES & BENEFITS
• An 8-bit, 1MS AD7303 analog-to-digital converter from Analog Devices
• An 8-bit, 1MS AD7823 digital-to-analog converter from Analog Devices
• Two AD8532 dual op-amps from Analog Devices, each with 250mA rail-to-rail drive and 3MHz bandwidth
• Integral solderless breadboard area for easy construction of analog circuits
• BNC, RCA, and 1/8" audio connectors (two each) for routing analog signals off

P/N: ET-AIO1

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ET-XCR PLUS LEARNING BOARD
This CPLD-based development board provides a platform that can be used to implement digital circuits of all kinds, from complex combinational logic to sequential machines and controllers. The "all-in-one" XCRP board features a 64 macrocell, 1600 gate Xilinx CoolRunner CPLD and several useful I/O devices. The ET-XCRP can run on 2 AA batteries or a wall-plug power supply (included). It works seamlessly with Xilinx's free WebPack tools, and it ships with a programming cable, so designs can be completed anywhere a PC exists with no additional costs. The ET-XCRP provides an ideal platform for engineers who want to learn digital design techniques using modern technologies.

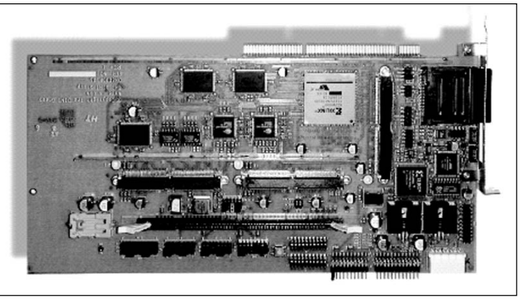


ET-XCRP

FEATURES & BENEFITS
• 64 macrocell, 1600 gates Xilinx XCR3064 CPLD with non-volatile, indefinite storage of CPLD designs
• Can be used with the included power supply, or run more than 60hrs on 2 AA cells (typical)
• User-settable oscillator (0.5Hz to 4KHz range)
• JTAG programming using a standard parallel cable (included)
• Two high-bright seven segment displays
• Four debounced buttons
• Eight slide switches
• Eight LEDs in three colors (red, green, and yellow)
• An integral solderless breadboard so that expansion circuits can be constructed right on the XCRP board
• 40-pin expansion connector
• Ideal platform for engineers who want to learn digital design techniques using modern technologies.

P/N: ET-XCRP

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**



ET3000K10S

The ET3000K10S is a complete logic emulation system that enables ASIC or IP designers a vehicle to prototype logic and memory designs for a fraction of the cost of existing solutions. The ET3000K10S can be hosted in 32/64-bit PCI/PCIX slot, or can be used stand-alone. A ET3000K10S can emulate up to 500,000 gates of logic as measured by LSI. The ET3000K10S achieves high gate density and allows for fast target clock frequencies by utilizing Xilinx's VirtexII family for logic and memory.

Ordering Information Example

Product Code ——— ET3K10S-04-4-1
- ET3K10S-04-4-1 — Number of Chips
- ET3K10S-04-4-1 — Speed Grade (options: 4,5,6)
- ET3K10S-04-4-1 — Number of Gates per FPGA (options: 4=4M, 5=5M, 6=6M, 7=7M, 8=8M)
- ET3K10S-04-4-1 — Product Family: S= Single Chip System, M= Multi Chip System

ASIC Prototyping Engine Xilinx Virtex II Single Chip

ET PART#	# of Gates (Million)	ET PART#	# of Gates (Million)	ET PART#	# of Gates (Million)
ET3K10S-04-4-1	4	ET3K10S-06-4-1	6	ET3K10S-06-6-1	6
ET3K10S-04-5-1	4	ET3K10S-06-5-1	6	ET3K10S-08-5-1	8
ET3K10S-04-6-1	4	ET3K10S-08-4-1	8		

TECHNICAL SPECIFICATIONS

- Single FPGA Virtex II
- 32/64-bit, +3.3V, PCI/PCIX-based PWB with one Xilinx VirtexII™ FPGA's (FF1152 BGA)
- Initial availability: 2V6000/2V8000/2V4000
- Flexible, abundant and configurable embedded memory:
  - Up to 331 Kb dual-port SelectRAM (assuming XC2V6000)
  - Plus up to 135 Kb Distributed RAM (assuming XC2V6000)
- Fast/Easy FPGA configuration via standard SmartMedia FLASH card
- Microprocessor controlled RS232 port for configuration/operational status and control
- Fastest possible configuration using SelectMap
- Sanity checking programs for bit files eases configuration hassles
- 5A on-board linear regulator for +3.3V and +1.5V
  - Standalone operation via separate power connector
  - +3.3V not needed on backplane
- 6 low skew clocks distributed to FPGA and test connectors:
  - 2 CY7B993/4 RoboClockII PLL's
  - 2 socketed oscillators
  - PCI Clock
  - 1 dividable clock via CPLD
- Direct Support for Synplicity's Certify TDM interconnect multiplexing
- Robust observation/debug with 450+ connections for logic analyzer observability or for pattern generator stimulus
- Status LED's
- User designed daughter PWB for custom circuitry and interfaces
- HW locking mechanisms for IP protection via CPLD
- Hosted in a 66/100/133 MHz PCI/PCIX slot or standalone
- Four external memories included:
  - 3 512K x 36 Pipeline/Flowthrough SSRAM
  - 512 Mbyte SDRAM DIMM (upgradeable to 8 GB)

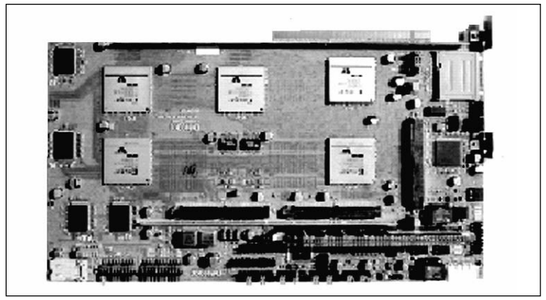
For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ASIC DEVELOPMENT - XILINX VIRTEX II™ MULTI CHIP

TECHNICAL SPECIFICATIONS

- 32/64-bit, +3.3V, PCI/PCI-X based PWB
  - Available in configurations with two to five VirtexII™ FPGAs (FF1152 BGA)
  - Available with: 2V4000/2V6000/2V8000
  - Four 512Kx36 SSRAMS
  - One 72-Bit SDRAM DIMM (product ships with a 1 Gbyte SDRAM DIMM(PC133)
  - Tightly interconnected FPGA's facilitate the partitioning process
- Flexible, abundant and configurable embedded memory in FPGA's:
  - Up to 1620 Kbytes dual-port Block SelectRAM (assuming 5 2V6000)
  - Up to 660 Kbytes Distributed SelectRAM (assuming 5 2V6000)
- 10A on-board switching regulator for both +3.3V and +1.5V (Only requires +5V power).
- Stand alone operation via separate power connector
- Status LED's provide instant status and operational feedback
- 2 CY7B993/4 RoboClock II PLLs
- 2 3807 Clock Drivers
- Fast/Easy FPGA configuration via standard SmartMedia FLASH card:
  - Microprocessor controlled (ATmega 128L)
  - RS232 port for configuration and/or operational status and control
  - Fastest possible configuration using SelectMap
  - Five 2V6000s configure in under 5 seconds.
  - Sanity checking programs for bit files simplify the configuration process.
- 5 low skew clocks distributed to all FPGAs and headers (from up to 8 possible sources)
  - 2 socketed oscillators
  - PCI clock
  - 1 clock dividable via CPLD
  - 4 external clocks via ribbon cable(may be differential!)
- Robust observation/debug with 400+ connections for logic analyzer observability and pattern generator stimulus.
- Custom daughter PWB headers for application-specific circuitry and interfaces.
- Full support for chipscope & Indentify™

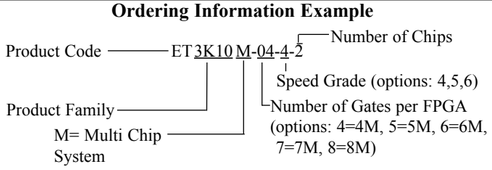
For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**



ET3000K10M

The ET3000K10M is a complete logic emulation system that enables ASIC or IP designers a vehicle to prototype logic and memory designs for a fraction of the cost of existing solutions. The ET3000K10M can be either hosted in 32/64-bit PCI/PCIX slot, or used in a stand alone environment. A single ET3000K10 configured with five 2V6000's can emulate up to 3 million gates of logic as measured by LSI. The ET3000K10M achieves high gate density and allows for fast target clock frequencies by utilizing up to five FPGA's from Xilinx's VirtexII family for logic and memory. High I/O-count, 1152-pin, flip-chip BGA packages are employed providing for abundant, fixed interconnect between FPGA's. A total of 400+ test pins are provided on the top of the PWB for logic analyzer-based debugging, or for pattern generator stimulus. Custom daughter cards can be mounted to these connectors as a means to interface the ET3000K10M to application-specific circuits. A reference 32-bit PCI target design and test bench are provided (in Verilog and VHDL) at no additional cost.

Ordering Information Example



ASIC Prototyping Engine Xilinx Virtex II Multi Chip

ET PART#	# of Gates (Million)	ET PART#	# of Gates (Million)	ET PART#	# of Gates (Million)
ET3K10M-04-4-2	8	ET3K10M-04-6-5	20	ET3K10M-08-4-4	32
ET3K10M-04-4-3	12	ET3K10M-06-4-2	12	ET3K10M-08-4-5	40
ET3K10M-04-4-4	16	ET3K10M-06-4-3	18	ET3K10M-06-6-2	12
ET3K10M-04-4-5	20	ET3K10M-06-4-4	24	ET3K10M-06-6-3	18
ET3K10M-04-5-2	8	ET3K10M-06-4-5	30	ET3K10M-06-6-4	24
ET3K10M-04-5-3	12	ET3K10M-06-5-2	12	ET3K10M-06-6-5	30
ET3K10M-04-5-4	16	ET3K10M-06-5-3	18	ET3K10M-08-5-2	16
ET3K10M-04-5-5	20	ET3K10M-06-5-4	24	ET3K10M-08-5-3	24
ET3K10M-04-6-2	8	ET3K10M-06-5-5	30	ET3K10M-08-5-4	32
ET3K10M-04-6-3	12	ET3K10M-08-4-2	16	ET3K10M-08-5-5	40
ET3K10M-04-6-4	16	ET3K10M-08-4-3	24		

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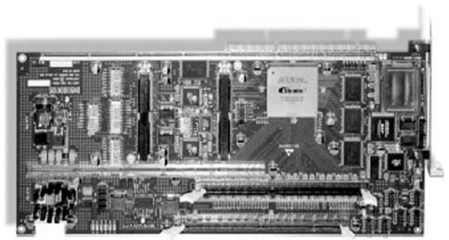
ALTERA STRATIX™ SINGLE CHIP - ASIC DEVELOPMENT

NEW!



ET5000K10S

The ET5000K10S is a complete logic emulation system that enables ASIC or IP designers to prototype logic and memory designs for a fraction of the cost of other solutions. The ET5000K10S can be hosted in 32/64-bit PCI/PCIX slot, or can be used stand alone. A ET5000K10S can emulate up to 600,000 gates of logic as measured by LSI. The ET5000K10S achieves high gate density and allows for fast target clock frequencies by utilizing Altera's Stratix family of FPGA's for logic and memory. A high I/O count, 1508-pin BGA package is employed allowing for a host of features including test signals and external memory. A total of 242 signals are provided on the top of the PWB for logic analyzer-based debugging, or for pattern generator stimulus. Custom daughter cards can be mounted to these connectors as a means of interfacing the ET5000K10S to application-specific circuits. A reference 32-bit PCI target design and test bench is provided (in Verilog/VHDL) at no additional cost.

Ordering Information Example

Product Code ——— ET5K10S-04-4-1

- ET5K10S-04-4-1 — Number of Chips
- ET5K10S-04-4-1 — Speed Grade (options: 4, 5, 6)
- ET5K10S-04-4-1 — Number of Flip Flops (4=40,000 8=80,000)
- ET5K10S-04-4-1 — Product Family
- ET5K10S-04-4-1 — S= Single Chip System, M= Multi Chip System

ASIC Prototyping Engine Altera Stratix Multi Chip

ET PART#	FLIP FLOP COUNT (K)	ET PART#	FLIP FLOP COUNT (K)	ET PART#	FLIP FLOP COUNT (K)
ET5K10S-04-6-1	40	ET5K10S-06-6-1	60	ET5K10S-08-6-1	80
ET5K10S-04-7-1	40	ET5K10S-06-7-1	60	ET5K10S-08-7-1	80

TECHNICAL SPECIFICATIONS

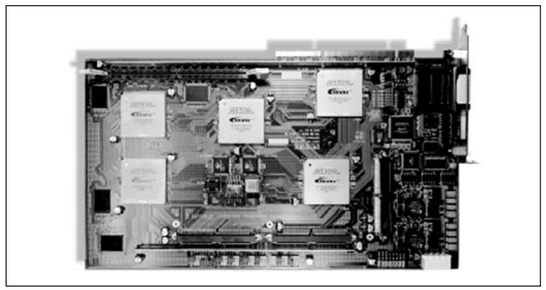
- 32/64-bit, +3.3V, PCI/PCIX-based PWB
- Single Stratix FPGA in BGA1508
  -1S40, 1S60, 1S80
- Four external 512k x 36 SSRAM's
- One 72-bit SDRAM DIMM
  - Enough addressing for up to 1 GB x 72
  - Shipped standard with a 512MB SDRAM DIMM PC 133
- Two 200-pin high-speed connectors for awesome signal integrity
- 5A onboard linear regulator for +1.5V
- 5A onboard switching regulator for +2.5V and Vtt
- 10A switching regulator for +3.3V
- Stand alone operation via separate power connector
  - +3.3V not needed on backplane
- 324 signals for observation/debug
- 6 low skew clocks distributed to FPGA's and test connector:
  - 2 CY7B994 RoboClockII PLL's for the best clock distribution
  - 1 FCT3805 low-skew clock driver (non-PLL)
  - 2 user-selectable socketed oscillators
  - PCI/PCI-X clock
  - 1 dividable clock via CPLD
- Reference materials included (FREE)
  - 32-bit target PCI design (Verilog/VHDL)
  - 32-bit master/target OpenCore PCI (Verilog)
  - SDRAM controller (Verilog/VHDL)
  - DDR SDRAM controller (Verilog/VHDL)
  - SSRAM controller
  - DOS-based utilities
  - Board test
  - PCI Drivers (with C code)
- Windows XP, ME, 2000, 98, NT
- LINUX
- Solaris
- Full support for embedded logic analyzers
  -SignalTap
  -Identify™ (Bridges2Silicon)

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ASIC DEVELOPMENT SYSTEMS - ALTERA STRATIX MULTI CHIP

TECHNICAL SPECIFICATIONS

- 32/64 bit, +3.3V PCI/PCI-X-based PWB
- Available in configurations with two to five Stratix™ EP1S80 FPGAs (1508BGA)
- Four external 512k x 36 SSRAMs
  - Pipeline, flowthrough or ZBT
  - Supports up to 2M X 36 SSRAMs
- One external 72-bit SDRAM DIMM
  - Ships standard with a 512 MB SDRAM DIMM (PC133)
  - Supports up to 8 GB SDRAM DIMM
- Tightly interconnected FPGAs facilitate the partitioning process.
- Status LEDs provide instant status and operational feedback.
- Flexible, abundant and configurable embedded memory in FPGAs:
  - 4.6 MB dual-port ESB RAM blocks (assuming five 1S80s)
- Two CY7B993/4 RoboclockII PLLs
- Two FCT3807 Clock Drivers (non-PLL)
- +10 A switching regulator for both +3.3V and +1.5V (only requires +5 V power)
- Stand alone operation via separate power connector
- Fast/Easy FPGA configuration via standard SmartMedia FLASH card
  - Microprocessor controlled (ATmega128L)
  - RS232 port for configuration/operational status and control
  - Fastest possible configuration using parallel bus
  - Five EP1S80s configure in less than 5 seconds
  - Sanity checking programs for bit files simplify the configuration process
- 5 low skew clocks distributed to all FPGAs and headers (from up to 8 possible sources)
  - 2 user-selectable socketed oscillators
  - PCI/PCI-X clock
  - 1 dividable clock via CPLD
  - 4 external clocks via ribbon cable (may be differential!)
- Robust observation/debug with 485+ connections for logic analyzer observability and pattern generator stimulus.
- Custom daughter PWB headers for application-specific circuitry and interfaces.
- Full support for SignalTap and Identify™



ET5000K10M

The ET5000K10M is a complete logic emulation system that enables ASIC or IP designers to prototype logic and memory designs for a fraction of the cost of other solutions. The ET5000K10M is also applicable to algorithmic acceleration and reconfigurable computing. The ET5000K10M can be hosted in a 32/64 bit PCI / PCI - X slot, or can be used stand alone. A single ET5000K10 configured with five 1S80s can emulate up to 3–4 million gates of logic as measured by LSI (not including memories, multipliers, and DSP functions). The ET5000K10M achieves high gate density and allows for fast memory. High I / O count, 1508-pin, flip-chip BGA packages are employed providing for abundant, fixed interconnect between the FPGA s. A total of 485 test pins are provided on the top of the PWB for logic analyzer-based debugging or for pattern generator stimulus. Custom daughter cards can be mounted to these connectors as a means of interfacing the ET5000K10 to application-specific circuits. A reference 32-bit PCI target design and test bench is provided (in Verilog/ VHDL) at no additional cost.

Ordering Information Example

Product Code — ET 5K10 M-04-4-2
- Number of Chips
- Speed Grade (options: 4, 5, 6)
- Number of Flip Flops (4=40,000 8=80,000)
- Product Family: S= Single Chip System, M= Multi Chip System

ASIC Prototyping Engine Altera Stratix Multi Chip

ET PART#	FLIP FLOP COUNT (K)	ET PART#	FLIP FLOP COUNT (K)	ET PART#	FLIP FLOP COUNT (K)
ET5K10M-08-6-2	160	ET5K10M-08-6-5	400	ET5K10M-08-7-4	320
ET5K10M-08-6-3	240	ET5K10M-08-7-2	160	ET5K10M-08-7-5	400
ET5K10M-08-6-4	320	ET5K10M-08-7-3	240		

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
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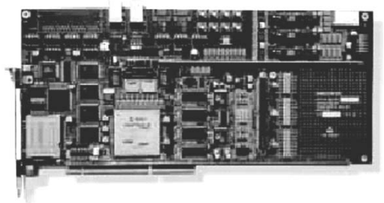
XILINX VIRTEX II SINGLE CHIP - ASIC DEVELOPMENT SYSTEMS

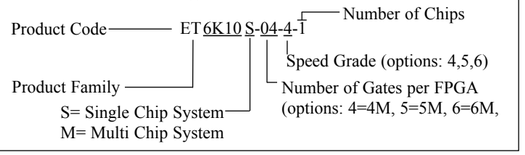
NEW!



ET6000K10S

The ET6000K10S is a complete logic emulation system that enables ASIC or IP designers to prototype logic, memory, and embedded systems designs for a fraction of the cost of other solutions. The ET6000K10S can be hosted in 32/64-bit PCI/PCIX slot, or can be used standalone. A ET6000K10S can emulate up to 600,000 gates of logic as measured by LSI. In addition, the VirtexII Pro FPGA contains two 300MHz+ 405 PowerPC microprocessors, 328-556 18x18 multipliers, and more than 438 Kbytes of block RAM memory. Ten serial RocketI/O ports are provided on the top of the circuit board and can support a variety of serial communication protocols at speeds up to 3.125 GB/s, with 10 GB/s to follow. The ET6000K10S is designed for performance – all external memories run at a frequency of at least 133MHz and the FPGA internal speed is limited only by the logic within. A high I/O count, 1704-pin BGA package is employed allowing for a host of external interface features including test signals, four SSRAM's, four DDR SDRAM's, and two FLASH's. A total of 162 signals are provided via a 200-pin connector on the top of the PWB for logic analyzer-based debugging or for pattern generator stimulus. Custom daughter cards can be mounted to this connector to interface the ET6000K10S to application-specific circuits. A reference 32-bit PCI target design and test bench is provided (in Verilog/VHDL) at no additional cost.

Ordering Information Example



ASIC Prototyping Engine Xilinx Virtex II Single Chip

ET PART#	# of Gates (Million)	ET PART#	# of Gates (Million)
ET6K10S-7-5-1	7	ET6K10S-7-6-1	7

TECHNICAL SPECIFICATIONS (cont.)

- Boatloads of reference stuff included (FREE)
  - 32-bit target PCI design (Verilog/VHDL)
  - 32-bit master/target OpenCore PCI (Verilog)
  - SDRAM controller (Verilog/VHDL)
  - DDR SDRAM controller (Verilog/VHDL)
  - PowerPC 'Hello World'
  - UARTs, DOS-based utilities, PCI Drivers (with C code)
  - Board test(s)
  - Windows XP, ME, 2000, 98, NT LINUX, Solaris

TECHNICAL SPECIFICATIONS

- 32/64-bit, +3.3V, PCI/PCIX-based PWB
- Single VirtexII-Pro FPGA in FF1704
  - 2vp70, 2vp100, 2vp125
- Four external independent SSRAM's
  - 512k/1M/2M x 36
  - pipeline or flowthrough
  - ZBT or non-ZBT
- Four independent DDR SDRAM banks
  - 4 banks 32M/64M x 16
- Two independent external FLASH memories
  - 8M/16M x 16
- 10 High Speed serial ports
  - 1 10GigE Fiber (4 MGT's)
  - 2 HSSDC2 - Infiniband (2 MGT's)
  - 2 SATA (2 MGT's)
  - 2 SMA (2 MGT's)
- One 200-pin high-speed connector
  - custom daughter cards
  - observation daughter cards
- 5A onboard linear regulator for +1.5V
  - +1.5V @ Switcher Module
  - +2.5V @ 10A Switcher Module
  - Embedded 300+ MHz Harvard Architecture
  - Hardware Multiply/Divide Unit
  - Thirty-Two 32-bit General Purpose Registers
  - 16 KB 2-Way Set-Associative Instruction Cache
  - 16 KB 2-Way Set-Associative Data Cache
  - Memory Management Unit (MMU)
  - Timer Facilities
  - One dedicated external JTAG connectors for uP trace/debug
- RS232 ports for PowerPC processor visibility
  - 2 Tx/Rx, 2 Tx only
- Stand alone operation via separate power connector
  - +3.3V not needed on backplane
- Fast/Easy FPGA configuration via standard SmartMedia FLASH card
- 2vp70 configures in 1 second
  - Sanity checking programs for bit files eases configuration hassles connector:
  - 2 CY7B994 RoboClockII PLL's for the best clock distribution
  - 1 FCT3805 low-skew clock driver (non PLL)
  - 2 user-selectable socketed oscillators
  - PCI/PCI-X clock
  - 1 dividable clock via CPLD
- Full support for embedded logic analyzers
  - ChipScope, ChipScope PRO
  - Identify™ from Synplicity
- 162 signals for observation/debug

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

ASIC DEVELOPMENT SYSTEMS - ALTERA STRATIX SINGLE CHIP SYSTEM

The Stratix SmartPack is a specialized device for advanced engineers--those who are interested in building custom ASICs (application specific integrated circuits) or even their own microcontroller cores. The Stratix is a large scale FPGA (field programmable gate array). This SmartPack is based on the EP1S10-6. The SmartPack comes with Altera's Quartus II Web Edition software which supports the EP1S10.

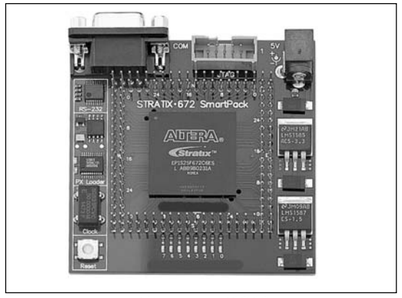
The Stratix SmartPacks are a great fit for your ASIC development projects. Based on the new Stratix chip from Altera, the Stratix chip has scalable RAMs, DSP blocks, and PLLs, all meshed in an enhanced logic fabric. And it's FAST - built in a 0.13m all-copper process, the RAMs are rated for 300MHz operation. The PLLs will step up nominal input frequencies to 400+ MHz.

FEATURES & BENEFITS
- Stratix (672-pin) EP1S10 device
- Power supplies
- Loader/non-volatile booter
- Clock; 128 I/Os; Filtering for all 6 PLLs; Reset button & 8 LEDs
- Comes with Altera's Quartus II Web Edition Software which supports the EP1S10.

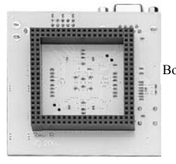
For the latest Altera Quartus Software, please visit the ET Web site.

P/N: ET-EP1S10

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: www.1800adapter.com/091



P/N: ET-EP1S10



Bottom view of ET-EP1S10

- Whether you're curious about FPGAs and are ready to jump in, or logic/ASIC development is your focus, why not employ the Stratix as a state-of-the-art test bed for your designs?

The Stratix SmartPack is a specialized device for advanced engineers -- those who are interested in building custom ASICs (application specific integrated circuits) or even their own microcontroller cores.

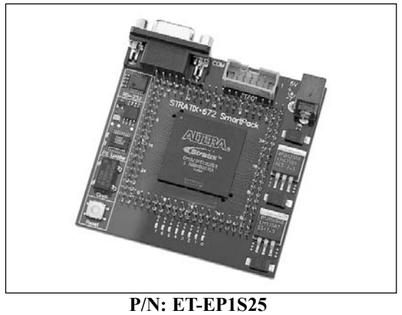
The Stratix is a large scale FPGA (field programmable gate array). This Smart Pack is based on the EP1S25-6.

The EP1S25 device requires Quartus II Full Edition from Altera (must be purchased separately).

FEATURES & BENEFITS
- Stratix (672-pin) EP1S10 device
- Power supplies
- Loader/non-volatile booter
- Clock; 128 I/Os; Filtering for all 6 PLLs; Reset button & 8 LEDs
- Comes with Altera's Quartus II Web Edition Software which supports the EP1S10.

P/N: ET-EP1S25

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

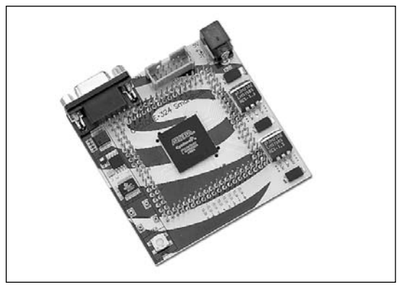


P/N: ET-EP1S25

- The Stratix SmartPack provides all necessary support circuitry and a proven connection to the 672-pin Stratix device, saving you valuable engineering time and money.

ALTERA CYCLONE SINGLE CHIP - ASIC DEVELOPMENT SYSTEMS

NEW!



P/N: ET-EP1C20F324C7

• The Cyclone is similar to the Stratix, but lacks the 512kb RAMs and DSP blocks.

These Cyclone development tools have been designed to give engineers the opportunity to explore the features of the new Altera Cyclone device family. The Cyclone SmartPack provides you with everything necessary to begin development with the Cyclone FPGA. The SmartPack neatly presents the Cyclone device with all required support circuitry, plus a simple serial port loader.

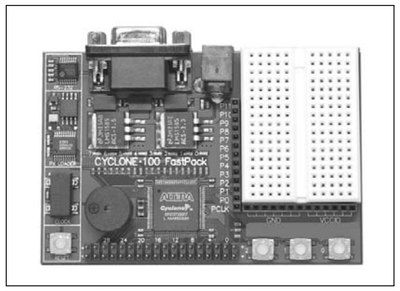
FEATURES & BENEFITS

- Cyclone EP1C20F324C7 device (20k LE's and 64 x 4kb internal RAMs.)
- Voltage regulators and power jack
- Clock socket with 50 MHz oscillator
- DB9 serial port with Txb & Rx (loader overrides during configuration)
- 8 LEDs
- Reset button
- Serial Cable
- 5VDC power supply
- Loader software
- Quartus II Web Edition Design Software
- .100" headers with 128 I/O's, VCCIO, and GND
- Serial loader with 8Mbit boot flash

P/N: ET-EP1C20F324C7

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

For the latest Altera Quartus Software, please visit the ET Web site.



P/N: ET-EP1C3T100C7

• The Cyclone Family may be programmed in AHDL, Verilog, or VHDL.

The Cyclone FastPack is based on the EP1C3T100C7 device.

FEATURES & BENEFITS

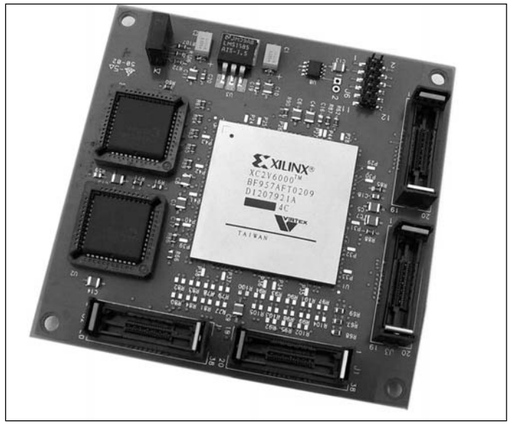
- Cyclone EP1C3T100C7 device
- Voltage regulators and power jack
- Clock socket with 50MHz oscillator
- Reset button
- 8 LEDs
- 3 Pushbuttons
- Piezo speaker
- DB9 serial port with Tx & Rx (loader overrides during configuration)
- Breadboard with 12 I/O's, clock input, VCCIO, and GND .100" header with 32 I/O's, VCCIO, and GND
- Serial loader with 8Mbit boot flash
- Serial Cable
- 5VDC Power Supply
- Loader software
- Quartus II Web Edition Design software

P/N: ET-EP1C3T100C7

For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/091**

For the latest Altera Quartus Software, please visit the ET Web site.

ASIC DEVELOPMENT SYSTEM MODULES



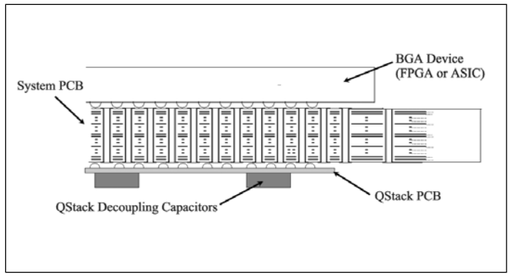
HOW TO BUY
Visit our Web site to request a quotation:
Web Link: www.emulation.com/technical

For additional information on ASIC Emulation Modules including specs, pricing and delivery, see:
Web Link: **www.1800adapter.com/063**

ASIC EMULATION MODULES

Convert an FPGA and associated components to the footprint of your ASIC

- Reduces time-to-market by allowing customer to develop and test hardware and software while waiting for ASIC to arrive
- Allows use of the same motherboard for FPGA development and ASIC production
- Reduces risk of having to re-spin ASIC
- Is generally centered around high gate-count FPGA or existing/pre-production ASIC. May also include memory, voltage regulation, passives, and connectors for test equipment
- HiLo is a key enabling technology for most ASIC Emulation Module projects. HiLo allows pinned module to plug into HiLo socket soldered to BGA footprint. Final ASIC can be pinned and plugged into same HiLo socket - no need for separate motherboards. (See HiLo listing on page 142.)



Q STACK MODULES

QStack BGA Power Delivery Modules allow you to take advantage of often unused board space directly opposite a BGA device on a PCB.

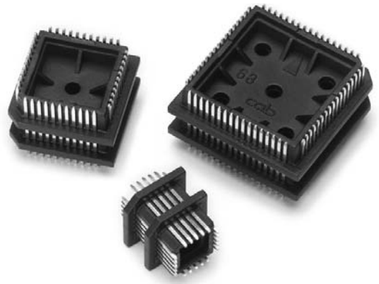
- A Q Stack module is a small PCB with decoupling capacitors on one side, and solder balls on the other side
- Q Stack eliminates or reduces the need to add decoupling capacitors around the perimeter of your ASIC or FPGA, thus freeing up valuable board space
- Q Stack shortens the power delivery path which reduces inductance and improves power delivery performance

HOW TO BUY
Visit our Web site to request a quotation:
Web Link: www.emulation.com/technical

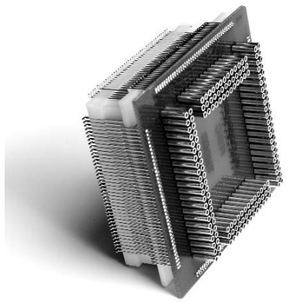
For additional information on Q Stack Modules including specs, pricing and delivery, see:
Web Link: **www.1800adapter.com/064**

BOARD TO BOARD INTERCONNECTS

WHAT ARE BOARD TO BOARD INTERCONNECTS?



ET offers a variety of molded PLCC plugs, designed to provide a connection between your daughterboard and your PLCC production socket or SMT pads.



PQFP/TQPF SMT BASES (pg. 26, 27, 28)

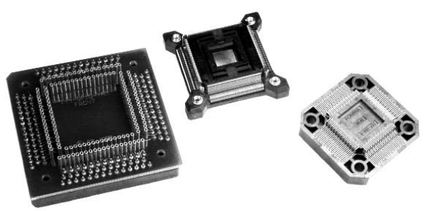
HIGH-SPEED BOARD TO BOARD INTERCONNECT (pg. 28)
Using Ultra Mini Pogo Pins or Solder Balls for applications up to 14.6GHz.

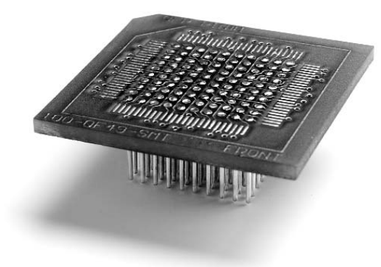
INTERCONNECT	PAGE
Custom Cable Assemblies	31
ET Interconnect System	30
PLCC Plugs	24
Pogo Pin-Based Interconnect	28
PQFP/TQFP Bases with Cable for Posts	29
PQFP/TQFP Surface Mount Bases	26, 27, 28
SMT PQFP Emulator Plugs	25

ET provides board to board interconnect solutions for the following package styles:

TQFP • PQFP • SOIC • SSOP •
TSOP • TSSOP • FLT • BGA • QFN/MLF

EMULATION INTERCONNECT SYSTEM (pg. 30)



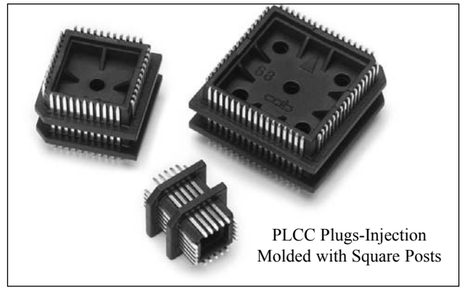


EMULATOR PLUGS FOR SURFACE MOUNT TQFP/ PQFP PRODUCTION SOCKETS (pg. 25)

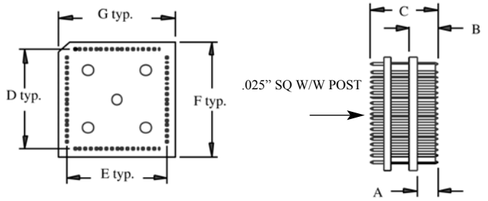
BOARD TO BOARD INTERCONNECTS - PLCC PLUGS

FEATURES & BENEFITS

- A variety of high quality, injection molded PLCC plugs, designed to provide a connection between your printed circuit board and your PLCC production socket
- Created for the designer who wishes to mate a daughter board with a motherboard
- ET will design and build to order your daughter card.
- Send us your schematic today



PLCC Plugs-Injection Molded with Square Posts



PLCC Plugs - Male to Through Hole, Square Posts		
Pin count	**ET Part #**	**Drawing #**
20	BC4-20-SPACER-G	F4030
28	BC4-28-SPACER-G	F4029
32	BC4-32-SPACER-G	F4028
32	BC4-32-SPACER-G-LONG	F6804
44	BC4-44-SPACER-G	F4027
44	BC4-44-SPACER-G-LONG-1	F6699
52	BC4-52-SPACER-G	F4026
68	BC4-68-SPACER-G	F4017
84	BC4-84-SPACER-G	F4025

PLCC Plugs - Right-Angled Surface Mount End		
Pin Count	**ET Part #**	**Drawing #**
20	BC4-20-SPACER-L	F6314
28	BC4-28-SPACER-L	F6315
32	BC4-32-SPACER-L	F6316
44	BC4-44-SPACER-L	F6317
52	BC4-52-SPACER-L	F6318
68	BC4-68-SPACER-L	F6319
84	BC4-84-SPACER-L	F6320

PLCC Plugs - Male to Male Each End		
Pin Count	**ET Part #**	**Drawing #**
20	BC4-20-SPACER-M	F6327
28	BC4-28-SPACER-M	F6326
32	BC4-32-SPACER-M	F6325
44	BC4-44-SPACER-M	F6324
52	BC4-52-SPACER-M	F6323
68	BC4-68-SPACER-M	F6322
84	BC4-84-SPACER-M	F6321

PLCC Plugs - Machined Round Pins End		
Pin Count	**ET Part #**	**Drawing #**
20	BC4-20-SPACER-R	F6307
28	BC4-28-SPACER-R	F6308
32	BC4-32-SPACER-R	F6309
44	BC4-44-SPACER-R	F6310
52	BC4-52-SPACER-R	F6311
68	BC4-68-SPACER-R	F6312
84	BC4-84-SPACER-R	F6313

PLCC Plugs - Small Outline Straight Pins for Butt Soldering Ends		
Pin Count	**ET Part #**	**Drawing #**
20	BC4-20-SPACER-S	F6588
28	BC4-28-SPACER-S	F6588
32	BC4-32-SPACER-S	F6588
44	BC4-44-SPACER-S	F6588
52	BC4-52-SPACER-S	F6588
68	BC4-68-SPACER-S	F6588
84	BC4-84-SPACER-S	F6588

Try our **PLCC Socketable Bug Katchers**

PLCC Bug Katchers make it easy to attach test leads to socketed ICs in PLCC packages

Web Link: www.1800adapter.com/119

For a complete list of specifications, pricing and delivery information for these adapters, please see
Web Link: www.1800adapter.com/025

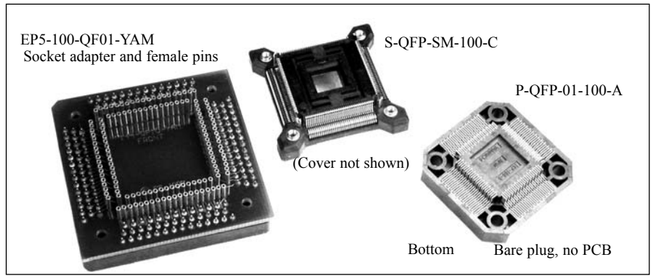
PLCC Extraction Tool

- Use this to extract PLCC packages from their production sockets
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, 84, and 100 pin counts

Web Link: www.1800adapter.com/053

P/N-290N-SUN

SMT PQFP/TQFP EMULATOR PLUGS - BOARD TO BOARD INTERCONNECTS



Ordering Information Example

Product Code ——— EP (5)-080-QF14-A YAM — YAM = Yamaichi Socket Mount
Male Plug: 5 = Socket Plug
Pin Count
A = A Socket Version
PQFP/TQFP Package Footprint (Footprint Section)

SMT PQFP/TQFP EMULATOR PLUGS

Footprint Code	ET Part #	Drawing #
XXX-QFXX (Sample)	*Surface Mount Production Socket*	*SKTXXX*
	Socket Adapter and Female Pin	*FXXXX*
	PQFP Plug	*SKTXXX*
100-QF01	S-QFP-SM-100-C	SKT429
	EP5-100-QF01-YAM	F3783
	P-QFP-01-100-A	SKT548
100-QF06	S-QFP-SM-100-D	SKT503
	EP5-100-QF06-YAM	F2165
	P-QFP-06-100-A	SKT152
160-QF07	S-QFP-SM-160-A	SKT432
	EP5-160-QF07-YAM	F2129
	P-QFP-07-160-A	SKT153
80-QF08-A	S-QFP-SM-080-A	SKT424
	EP5-080-QF08-YAM-A	F2232
	P-QFP-08-080-A	SKT154
80-QF08-B	S-QFP-SM-080-C	SKT426
	EP5-080-QF08-YAM-B	F2233
	P-QFP-08-080-B	SKT155
80-QF14	S-QFP-SM-080-B	SKT425
	EP5-080-QF14-YAM	F2177
	P-QFP-14-080-A	SKT156
64-QF29	S-QFP-SM-064-B	SKT501
	EP5-064-QF29-YAM	SKT1791
	P-QFP-29-064-A	SKT157
100-QF49	S-QFP-SM-100-B	SKT428
	EP5-100-QF49-YAM	F2541
	P-QFP-49-100-A	SKT159
144-QF10	S-QFP-SM-144-B	SKT536
	EP5-144-QF10-YAM	F5015
	P-QFP-07-160-A	SKT153
144-QF63	S-QFP-SM-144-A	SKT535
	EP5-144-QF63-YAM	F5397
	P-QFP-63-144-A	SKT912

EMULATOR PLUGS FOR SMT PQFP/TQFP PRODUCTION SOCKETS

FEATURES & BENEFITS

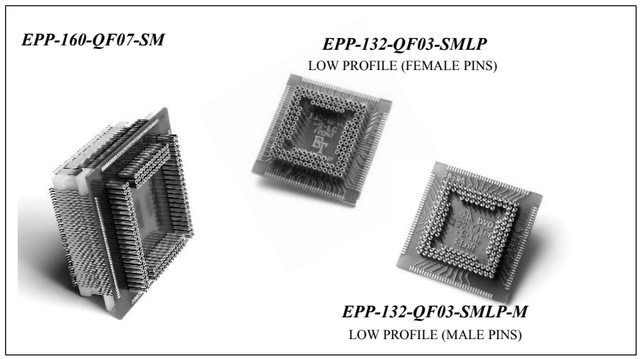
- Perfect for boards designed with Yamaichi Production Sockets or socket footprints!
- Allow access to the lead of a Yamaichi PQFP/TQFP Surface-Mount Production Socket for connecting to:
  - Emulator Pods,
  - Logic Analyzers/Scopes, or
  - Custom pods and cables
- Plug/Adapter/Socket assembly is compact
- Top female pins are compatible with PQFP/TQFP Target Chip Adapters and PQFP/TQFP Emulator Pods
- Socket Adapter, Plug, and Yamaichi Production Socket may each be ordered individually as required

HOW TO ORDER

1) Determine the pin count and footprint of your device (see Footprint Section).
2) Select the corresponding Footprint Code in the Yamaichi PQFP/TQFP Plug column of the table.
3) Select the corresponding socket, plug base, or plug only that you need.

For a complete list of specifications, pricing and delivery information for these adapters, please see
Web Link: www.1800adapter.com/025

BOARD TO BOARD INTERCONNECTS - PQFP/TQFP SURFACE MOUNT BASES



Ordering Information Example

EP P-160-QF07-SM (LP)

- Product Code
- Target Surface Mount Pads
- Pin Count
- PQFP/TQFP Package Footprint (See Footprint Section)
- SM = Small Base or LP = Low Profile
- (M) = Male Pins

LOW PROFILE, HAND SOLDERABLE, REFLOW PROCESS

- Low profile, vertical clearance 0.2", not reusable
- Lead pitch as low as 0.40mm
- Manufacturing tolerances +/- 0.002
- Hand solderable

HIGH QUALITY TEFLON®& FR4 SURFACE MOUNT BASES

- SMT bases can be made for any SMT leaded package
- These SMT bases are the highest quality in the industry
- The base material used is TEFLON. These units will withstand ALL soldering methods without deforming or melting--including hand soldering
- Precision machining ensures accurate pitch, size, and other physical characteristics. Tolerances: +/- 0.001"
- Sturdy and reusable
- Vertical clearance = 0.5"

HOW TO ORDER

Determine the footprint of your device (see Footprint Section), such as QF14, and find the EPP part with the same footprint.

PQFP/TQFP SURFACE MOUNT BASES

Pin Count	Lead Pitch (mm)	Tip-to-Tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
32	0.80	9.0	Female	EPP-032-QF59D-SM	F5768
44	0.80	12.0	Female	EPP-044-QF16D-SM	F4319
44	0.80	12.0	Male	EPP-044-QF16D-SM-M	F5815
44	0.80	13.2 to 13.9	Female	EPP-044-QF16-SM	F1067
44	0.80	16.7	Female	EPP-044-QF52-SM	F1643
48	0.50	9.0	Female	EPP-048-QF50D-SM	F5807
52	1.00	17.2 to 17.9	Female	EPP-052-QF37-SM	F1642
52	0.65	12.0	Female	EPP-052-QF39D-SM	F4574
52	0.65	13.2 to 13.9	Female	EPP-052-QF39-SM	F1632
64	1.00	23.2 to 23.9	Female	EPP-064-QF09-SM	F1286
64	0.80	17.2	Low Profile Male	EPP-064-QF29B-SMLP-M	F5771
64	0.80	17.2	Low Profile Female	EPP-064-QF29B-SMLP	F5408
64	0.80	22.0	Female	EPP-064-QF29D-SM	F1328
64	0.80	17.2 to 17.9	Female	EPP-064-QF29-SM	F1196
64	0.80	17.2 to 17.9	Male	EPP-064-QF29-SM-M	F5987
64	0.50	15.2 to 15.9	Female	EPP-064-QF64C/D-SM	F1153

For a complete list of specifications, pricing and delivery information for these adapters, please see: **Web Link: www.1800adapter.com/024**

PQFP/TQFP SURFACE MOUNT BASES - BOARD TO BOARD INTERCONNECTS

PQFP/TQFP SURFACE MOUNT BASES (cont.)					
Pin Count	Lead Pitch (mm)	Tip-to-Tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
64	0.50	15.2 to 15.9	Male	EPP-064-QF64-SM-M	F5766
80	0.80	23.2 to 23.9	Female	EPP-080-QF08-SM	F1368
80	0.65	17.9	Female	EPP-080-QF14A-SM	F1199
80	0.65	16.0	Female	EPP-080-QF14D-SM	F3886
80	0.65	16.0	Low Profile Female	EPP-080-QF14-SMLP	F4049
80	0.50	15.2 to 15.9	Female	EPP-080-QF47-SM	F2007
100	0.25"	.880"	Female	EPP-100-QF01-SM	F1713
100	0.65	23.2	Female	EPP-100-QF06B-SM	F3856
100	0.65	22.0	Female	EPP-100-QF06D-SM	F6134
100	0.65	23.2 to 23.9	Female	EPP-100-QF06-SM	F4337
100	0.65	23.2 to 23.9	Low Profile Female	EPP-100-QF06-SMLP	F4047
100	0.65	23.2 to 23.9	Low Profile Male	EPP-100-QF06-SMLP-M	F6152
100	0.50	16.0	Low Profile Female	EPP-100-QF49D-SMLP	F5053
100	0.50	16.0	Low Profile Male	EPP-100-QF49D-SMLP-M	F2934
100	0.50	16.0	Female	EPP-100-QF49-SM	F1634
112	0.65	22.0	Female	EPP-112-QF36D-SM	F5755
112	0.65	23.2 to 23.9	Female	EPP-112-QF36-SM	F1639
120	0.80	31.2 to 31.9	Female	EPP-120-QF05-SM	F1307
120	0.40	17.9	Female	EPP-120-QF56-SM	F5482
120	0.50	18.0 to 18.6	Female	EPP-120-QF70-C/D-SM	F4335
128	0.80	31.2 to 31.9	Female	EPP-128-QF13-SM	F1204
128	0.80	31.2 to 31.9	Low Profile Female	EPP-128-QF13-SMLP	F4099
128	0.50	23.9	Female	EPP-128-QF26-SM	F5618
128	0.50	23.9	Female	EPP-128-QF51A-SM	F5411
128	0.50	22.6	Female	EPP-128-QF51-SM	F2216
128	0.50	22.0	Female	EPP-128-QF53-SM	F5616
128	0.40	16.0	Low Profile Female	EPP-128-QF57-SMLP	F6145
132	0.25"	1.080"	Female	EPP-132-QF03-SM	F1640
132	0.25"	1.080"	Low Profile Female	EPP-132-QF03-SMLP	F3959
132	0.25"	1.080"	Low Profile Male	EPP-132-QF03-SMLP-M	F4100
144	0.65	31.2 to 31.9	Female	EPP-144-QF10-SM	F1360
144	0.50	22.6	Female	EPP-144-QF63C-SM	F6042
144	0.50	22.0	Female	EPP-144-QF63-SM	F1631
160	0.65	30.6	Female	EPP-160-QF07C-SM	F5908
160	0.65	31.2 to 31.9	Female	EPP-160-QF07-SM	F1556
160	0.65	31.2 to 31.9	Low Profile Female	EPP-160-QF07-SMLP	F4045
160	0.65	31.2 to 31.9	Low Profile Male	EPP-160-QF07-SMLP-M	F4101
160	0.50	26.0	Female	EPP-160-QF48-SM	F1641
164	0.25"	1.280"	Female	EPP-164-QF04-SM	F3639
172	0.25"	1.150"	Female	EPP-172-QF12-SM	F1362
176	0.50	26.0	Female	EPP-176-QF67-SM	F1109
184	0.65	35.2 to35.9	Female	EPP-184-QF31-SM	F5658
196	.025"	1.480"	Female	EPP-196-QF15-SM	F4313
196	.025"	1.650"	Female	EPP-196-QF18-SM	F5753

For a complete list of specifications, pricing and delivery information for these adapters, please see:
Web Link: www.1800adapter.com/024

BOARD TO BOARD INTERCONNECTS - SURFACE MOUNT BASES

PQFP/TQFP SURFACE MOUNT BASES (cont.)

QFP Surface Mount Package Adapter Bases - TOP

Pin Count	Lead Pitch (mm)	Tip-to-Tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
208	0.50	30.0	Female	EPP-208-QF21D-SM	F4580
208	0.50	30.6	Female	EPP-208-QF21-SM	F1225
208	0.50	30.6	Low Profile Female	EPP-208-QF21-SMLP	F4042
240	0.65	34.6	Female	EPP-240-QF62-SM	F1793
240	0.65	34.6	Low Profile Female	EPP-240-QF62-SMLP	F4041
256	0.50	31.5	Female	EPP-256-QF17-SM	F5567
304	0.50	42.6	Female	EPP-304-QF61-SM	F2189
352	0.50	54.6	Low Profile Female	EPP-352-QF71-SMLP	F5421

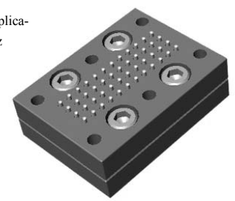
SOIC, SSOP, TSOP, and TSSOP SURFACE MOUNT BASES

Pin Count	Lead Pitch (mm)	Body Width Dimension (mm)	Adapter Top Pin Top	ET Part #	Drawing #
20	1.27	3.90	Male	EPP-020-SO01-SM-M	F5813
20	1.27	7.50	Male	EPP-020-SO03-SM-M	F6200
28	1.27	7.50	Female	EPP-028-SO03-SM	S1746
44	1.27	13.20	Female	EPP-044-SO09-SM	F1620
48	0.64	7.62	Female	EPP-048-SS06-SM	F5867
48	0.50	6.10	Female	EPP-048-ST15-SM	F5754
48	0.50	18.40	Female	EPP-048-TS01-SM	F5407
56	0.64	7.62	Female	EPP-056-SS06-SM	F5467
56	0.80	13.30	Female	EPP-056-SS09-SM	F4735
56	0.50	6.10	Female	EPP-056-ST15-SM	F4736

For a complete list of specifications, pricing and delivery information for these adapters, please see:
Web Link: www.1800adapter.com/024

POGO PIN-BASED BOARD TO BOARD INTERCONNECT STANDARD & BUILT TO ORDER

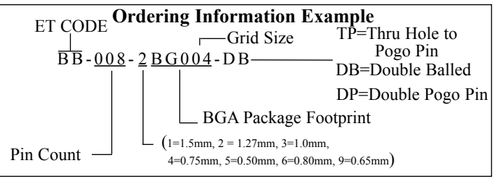
Built for high speed applications 1GHz to 14.6GHz



FEATURES & BENEFITS

- Pins can be reconfigured to a new footprint with the same pitch and grid
- Built for high speed applications 1GHz to 14.6GHz
- Long life (500,000 cycles)
- Used with test applications & prototype
- As a custom application, it can interface as a connector on a current board

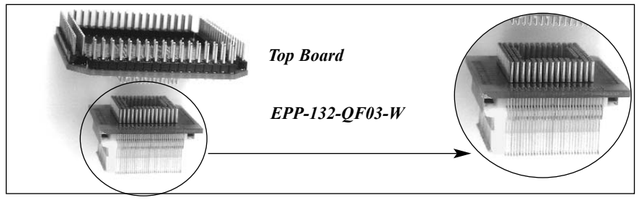
Ordering Information Example



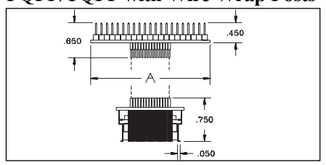
Pin Count	Lead Pitch (mm)	Footprint Code	ET Part #	Drawing #
8	1.27	2BG004	BB-008-2BG004-DB	F7078
224	0.50	5BG018	BB-224-5BG018-DB	F7079
324	0.80	6BG018	BB-324-6BG018-DB	F7080
324	1.00	3BG018	BB-324-3BG018-DB	F7081
324	1.27	2BG018	BB-324-2BG018-DB	F7082

For a complete list of specifications, pricing and delivery information for the Board to Board Interconnect, please see:
Web Link: www.1800adapter.com/065

PQFP/TQFP BASES, W/ CABLE OR POSTS - BOARD TO BOARD INTERCONNECTS



PQFP/TQFP with Wire Wrap Posts



Ordering Information Example

Pin Count
Product Code — EP P-100-QF06-*
P = Surface Mountable Plug
Male Plug

NW = No Wire Wrap Posts
W = Wire Wrap Posts
12/18 = Cable Length (inches)
Male Plug Footprint (see Footprint Section)

HOW TO ORDER

1) Locate the part number with the correct number of pins for the emulator pod.
2) Select wire-wrap posts and cable length.
3) Verify top and bottom footprints (see Footprint Section).
4) Customs available upon request.

BOARD TO BOARD INTERCONNECTS

PQFP/TQFP ADAPTER BASES WITH 18" CABLE

Pin Count	Lead Pitch (mm)	Tip-to-Tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
44	0.80	13.2 to 13.9	SMT Foot with 18" Cable	EPP-044-QF16-18	F1306
64	0.80	17.2 to 17.9	SMT Foot with 18" Cable	EPP-064-QF29-18 *	F2558
80	0.80	23.2 to 23.9	SMT Foot with 18" Cable	EPP-080-QF08-18	F2562
100	0.65	23.2 to 23.9	SMT Foot with 18" Cable	EPP-100-QF06-18	F1928
160	0.65	31.2 to 31.9	SMT Foot with 18" Cable	EPP-160-QF07-18	F4579
240	0.50	34.60	SMT Foot with 18" Cable	EPP-240-QF62-18 *	F4581

* Surface Mount Footprint Available on Top Board

PQFP/TQFP BASES WITH BLANK HOLES OR WIRE WRAP POSTS

Pin Count	Lead Pitch (mm)	Tip-to-tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
44	0.80	12.00	Wire Wrap Posts	EPP-044-QF16D-W	F5564
44	0.80	13.2 to 13.9	Wire Wrap Posts	EPP-044-QF16-W	F2022
52	1.00	17.2 to 17.9	Wire Wrap Posts	EPP-052-QF37-W	F4170
64	1.00	23.2 to 23.9	Wire Wrap Posts	EPP-064-QF09-W	F1920
64	0.80	22.00	Wire Wrap Posts	EPP-064-QF29D-W	F5816
64	0.80	17.2 to 17.9	Wire Wrap Posts	EPP-064-QF29-W *	F4108
64	0.50	15.2 to 15.9	Wire Wrap Posts	EPP-064-QF64-W	F1735
80	0.80	23.2 to 23.9	Blank Holes, No Wire Wrap Posts	EPP-080-QF08-NW	F2563
80	0.80	23.2 to 23.9	Wire Wrap Posts	EPP-080-QF08-W	F1198
80	0.65	17.90	Wire Wrap Posts	EPP-080-QF14A-W	F4191
80	0.50	15.2 to 15.9	Wire Wrap Posts	EPP-080-QF47-W *	F1932
100	0.25"	.880"	Wire Wrap Posts	EPP-100-QF01-W	F1275
100	23.2 to 23.9	23.2 to 23.9	Blank Holes, No Wire Wrap Posts	EPP-100-QF06-NW *	F3978
100	23.2 to 23.9	23.2 to 23.9	Wire Wrap Posts	EPP-100-QF06-W	F1285
100	0.50	16.00	Wire Wrap Posts	EPP-100-QF49-W *	F1880
112	0.65	22.00	Wire Wrap Posts	EPP-112-QF36D-W	F1648
112	0.65	23.2 to 23.9	Wire Wrap Posts	EPP-112-QF36-W	F4474
128	0.80	31.2 to 31.9	Wire Wrap Posts	EPP-128-QF13-W	F3963

* Surface Mount Footprint Available on Top Board

For a complete list of specifications, pricing and delivery information for these adapters, please see
Web Link: www.1800adapter.com/022

BOARD TO BOARD INTERCONNECTS - PQFP/TQFP INTERCONNECT SYSTEM

PQFP/TQFP ADAPTER BASES WITH BLANK HOLES OR WIRE WRAP POSTS (cont.)

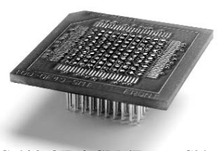
Pin Count	Lead Pitch (mm)	Tip-to-Tip Dimension (mm)	Adapter Top Pin Type	ET PART #	Drawing #
128	0.50mm	23.9mm	Wire Wrap Posts	EPP-128-QF51A-W	F6109
128	0.50mm	22.6mm	Wire Wrap Posts	EPP-128-QF51-W	F6110
128	0.50mm	22.0mm	Wire Wrap Posts	EPP-128-QF53-W	F5566
132	0.25"	1.080"	Blank Holes, No Wire Wrap Posts	EPP-132-QF03-NW	F2677
132	0.25"	1.080"	Wire Wrap Posts	EPP-132-QF03-W	F1288
144	0.65mm	31.9mm	Wire Wrap Posts	EPP-144-QF10-W	F1429
144	0.50mm	22.0mm	Wire Wrap Posts	EPP-144-QF63-W	F1736
160	0.65mm	31.9mm	Blank Holes, No Wire Wrap Posts	EPP-160-QF07-NW	F2566
160	0.65mm	31.9mm	Wire Wrap Posts	EPP-160-QF07-W *	F1575
160	0.50mm	26.0mm	Wire Wrap Posts	EPP-160-QF48-W	F5686
208	0.50mm	30.6mm	Wire Wrap Posts	EPP-208-QF21-W *	F1995
240	0.65mm	34.6mm	Wire Wrap Posts	EPP-240-QF62-W *	F2035
304	0.50mm	42.6mm	Wire Wrap Posts	EPP-304-QF61-W	F4583

* Surface Mount Footprint Available on Top Board

PQFP/TQFP INTERCONNECT SYSTEM

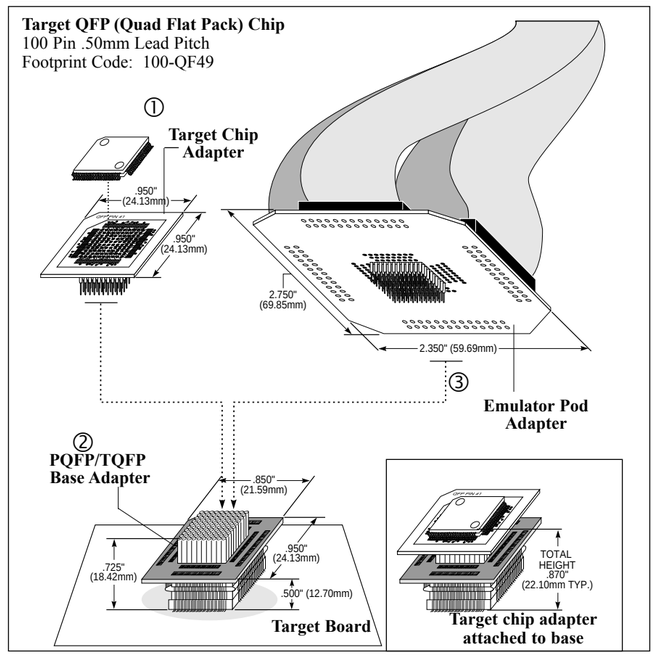
Emulation Technology now offers a time-saving Interconnect System for your TQFP/ PQFP packages. This interconnect system is specifically designed for use in the emulation/ debug/ development environment.

Just surface mount the PQFP/TQFP base adapter to your target board. Once the base is in place, you are free to plug in your emulator pod adapter or target chip adapter.



EPS-100-QF49-SM (Target Chip Adapter)

ET Part #	Drawing #
(1) Target Chip Adapter	
EPS-080-QF14-SM	F5517
EPS-080-QF47-SM	F4584
EPS-100-QF01-SM	F4585
EPS-100-QF06-SM	F4183
EPS-100-QF49-SM	F3901
EPS-132-QF03-SM	F4307
EPS-144-QF10-SM	F4276
EPS-144-QF63-SM	F5005
EPS-176-QF67-SM	F5568
(2) QFP Base Adapter	
EPP-080-QF14A-SM	F1199
EPP-080-QF47-SM	F2007
EPP-100-QF01-SM	F1713
EPP-100-QF06-SM	F4337
EPP-100-QF49-SM	F1634
EPP-132-QF03-SM	F1640
EPP-144-QF10-SM	F1360
EPP-144-QF63-SM	F1631
EPP-176-QF67-SM	F1109
(3) Emulator Pod Adapter	
AX5-080-QF47/14-18	F7075
AX5-100-QF06-18	F7076
AX5-100-QF49-18	F7077



CUSTOM CABLE ASSEMBLIES - BOARD TO BOARD

Date: _____

To: ET Technical Sales Department

From: _____

Co: _____

Tel: _____

Fax: _____

# of Pages: _____

EC-M-068-PCC1-F-068-PGA1-08
EC-M-068-PCC1-F-068-PCC1-24

FEATURES

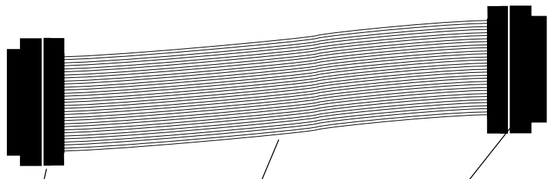
- A socket extender acts like an extension cord for your target socket; it connects your emulator pod to your target socket in a tight card cage
- Socket extenders are available for most packages types and configurations including PQFP, PGA, LCC, and PLCC pods
- Socket extenders can be male to male, male to female, or female to female

PREP WORKSHEET FOR WEB OR FAX

Use this prep worksheet to help you prepare answers for our online quotation form. Be prepared to provide the information where the blank lines are found. *If you prefer, you may complete this worksheet and fax it to 408-982-0664.*

1) Visit the ET Web site and complete the online form at:
   www.emulation.com/technical
2) Using the information on this worksheet, complete all required fields on the online form
3) Attach package drawings in .pdf format

ET's technical support group will contact you promptly with confirmation.



END ONE

Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

Cable Length
(in inches) _____

END TWO

Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

*Consult factory for length and width dimensions of male and female pods.

Important:
I need _____ units, delivered in _____ days.

Custom Assemblies are Non-Cancelable, Non-Returnable Items

- Please check the part description above, carefully, against your application.
- Due to the fact that these are custom parts, they are non-returnable.

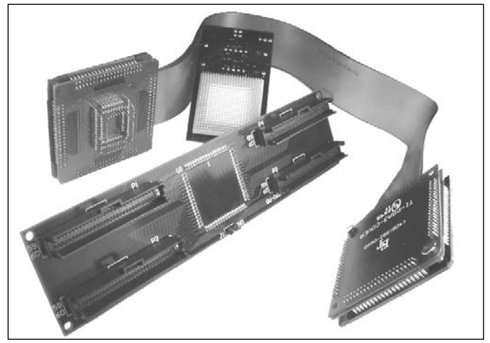
NOTES

CUSTOM, SEMI-CUSTOM (BUILT TO ORDER)

From Short-Term Prototypes to High Volume Manufacturing ET can now provide it all.

Emulation Technology is excited to launch the expansion of our design and manufacturing capabilities. The dedicated and talented staff at ET is now ready, eager and able to deliver problem-solving engineering for both low and high volume assembly.

Drawing on over 20 years of experience, we work closely with all of our customers to determine their unique packaging and electrical project requirements, and then design products to those specifications.



CUSTOM ADAPTERS

From highly sophisticated daughter board modules to simple one piece adapters, Emulation Technology can do it all:

- Mirror chip orientation
- Add or delete specific connections
- Add power/ground planes and decoupling capacitors
- Add peripheral components
- Enhance replaceability
- Designs offer up to 32 layers, with multiple grounds and multiple voltages
- Check plots produced in 5 days or less
- For test applications, ET offers reliable mechanisms for interfacing fine-pitch packages to standard test & burn-in sockets
- For production applications, ET offers solutions that eliminate the need for costly board redesigns

CUSTOM APPLICATION	PAGE
Chip on Board	36
Chip-Specific Cost Reduction Adapters	37
Cost Reduction Modules	35
Custom Order Process	34
Flex Circuit Assemblies	35
Footprint Conversion	36
Quotation Worksheet	38

Information Required for Quotations:

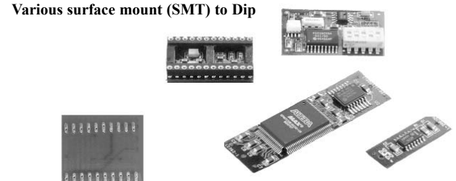
- mechanical package drawings
- dimensional requirements
- pin connection diagrams or net list

Also, please identify any equipment and/or components to be used with the adapter, and any special needs you would like incorporated into the adapter design, such as component assembly on your adapter.

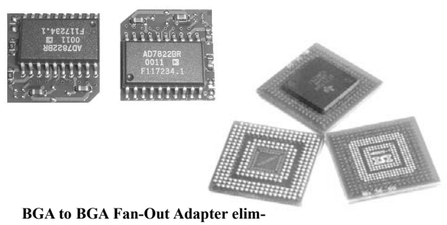
For more infomation, please see:
Web Link: www.1800.adapter.com/AA1

Custom, Semi-Custom and Built to Order Examples

Various surface mount (SMT) to Dip



SOIC to SOIC Adapter



BGA to BGA Fan-Out Adapter eliminated microvias on motherboard

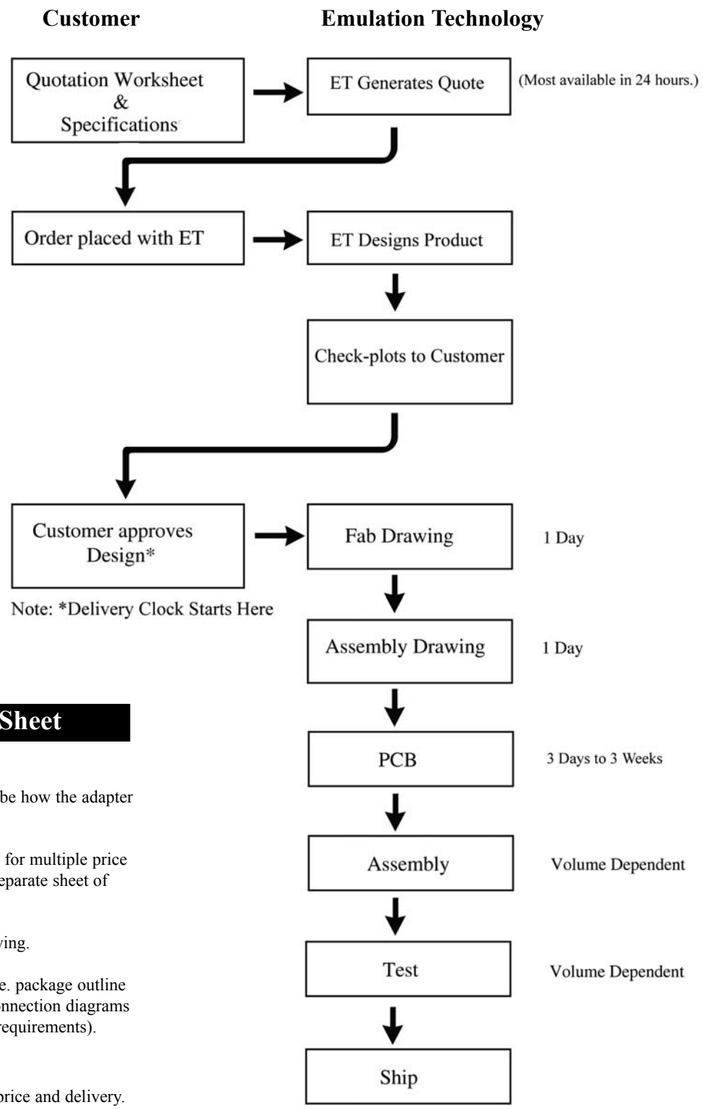
CUSTOM - ORDER PROCESS

Custom Order Process

In addition to the thousands of adapters we provide for surface-mount packages, we can also design and build converters to your specifications.

- Custom BGA, PQFP, PGA, LCC, SOJ, SOIC, PLCC, and DIP adapters
- Custom socket converters
- Custom emulator pods and pod converters and more
- Up to 32 layers, multiple grounds, multiple voltages
- Protel® Advanced PCB design system used for all PC Board designs
- Check plots produced in 5 days or less

Basic Flow ET Custom Design Process



Quotation Work Sheet

You need to:

- Indicate your application and describe how the adapter will be used.
- Attach information on requirements for multiple price breaks and delivery schedule on a separate sheet of paper.
- Provide a specific and detailed drawing.
- Attach all drawing requirements, (i.e. package outline drawings for top and bottom, pin connection diagrams or net list and adapter dimensional requirements).

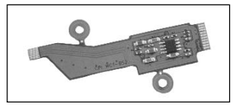
ET will:

- Deliver a quote with part number, price and delivery.

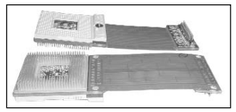
FLEX CIRCUIT, COST REDUCTION MODULES - CUSTOM

FLEX CIRCUIT ASSEMBLIES

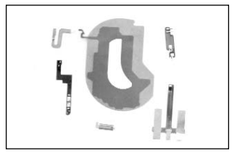
Design-to-production flexible circuit solutions



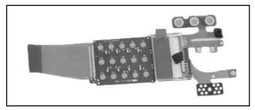
SMT on Flex



Rigid Flex with
Micro-PGA
Pin Field and Socket



Pacemaker Application



SMT on Flex

FEATURES & BENEFITS

- Flexible circuit technology is used in discrete packages for improved circuit density.
- Through the use of a unique assembly processes, ET can reduce the size and cost of complex circuitry.

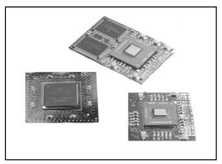
All common flex construction methods are available:

- Assembly of through-hole, surface mount and bare die components
- Polyimide, Polyester, and Teflon base materials
- Adhesive and adhesiveless system
- Copper and aluminum conductors
- 3 mil trace line and space standard; designs down to 1mil line and space
- Single or double sided
- Single or double access
- Multi-layer flex applications
- Static and dynamic flex applications
- Miniature flex assembly

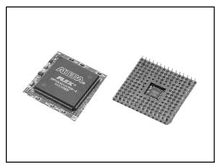
For more infomation, please see:
Web Link: www.1800adapter.com/AA4

COST REDUCTION MODULES

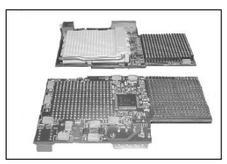
Designed into new products to isolate high performance components from the motherboard



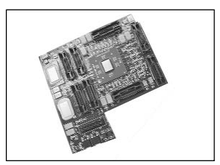
Microprocessor Modules



FPGA and PROM as ASIC
Replacement



Multi-Component Module



Microprocessor/Memory
Development Module

FEATURES & BENEFITS

- I/O for ET Few Chip Modules can be BGA, PGA, microPGA (50 mil center), or lead frame

Modules offer the following design/cost benefits:

- Minimization of trace length between high performance components
- Elimination of microvias on motherboard
- Reduction of layer count on motherboard
- Selective population on a common motherboard
- Isolation of high-performance components from motherboard
- Pre-tested modules for high-cost components
- As packages change, ET can redesign the module, to avoid requiring customers to re-qualify the motherboard
- ET can also incorporate an on-board voltage regulator to accommodate different chip voltages

For more infomation, please see:
Web Link: www.1800adapter.com/AA5

CUSTOM - FOOTPRINT CONVERSION ADAPTERS/ CHIP ON BOARD/ ON FLEX

FOOTPRINT CONVERSION ADAPTERS

FEATURES & BENEFITS

- Designed to convert one semiconductor package form factor to another.
- Adapters will allow the use of a newer or more available component package type - avoiding costly redesign or requalifying of the existing motherboard.
- ET can supply bare adapters ready for assembly, assemble your consigned components, or purchase all components - providing a complete turn-key assembly.
- We can also design and manufacture an adapter to meet your critical specifications.
- ET can ship adapters in packaging compatible with pick and place equipment.
- Adapters are available for QFPs with 0.4mm lead spacing, BGAs with 0.5mm lead spacing, and passive devices as small as 0201.
- Power and ground planes and discrete components can be added as needed.

APPLICATION EXAMPLES

- SOIC to SOIC Adapter
- BGA & passives to QFP
- BGA to BGA fan-out adapter eliminated microvias on motherboard

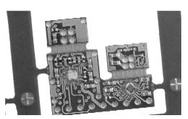
Manufacturer	Chip	Top Pin Count	Bottom Pin Count	Top Lead Pitch (mm)	Bottom Lead Pitch (mm)	ET Part #	Drawing #
Generic	Wired 1 to 1	QFP-100	QFP-100	0.50	0.65	CR-100Q49S-100Q6-SM-LP	F6983
Generic	Wired 1 to 1	QFP-100	QFP-100	0.65	0.50	CR-100QF06S-100QF49DS-SM-LP	F7086
XILINX	XC3000	PLCC-84	PGA-84	1.27	2.54	CR-PCC5-84PGA1-XC3000	F6655
Generic	Wired 1 to 1	DIP.3	SO-3.9	2.54	1.27	CR-14DIP.3-14SO01S-GENERIC	F7065
Generic	Wired 1 to 1	SOIC-3.9	SOIC-10.16	1.27	1.27	CR-16SO01S-16SO13S-SM-LP	F7087
Generic	Wired 1 to 1	SOIC-7.5	DIP.3	1.27	2.54	CR-28SO03S-28DIP.3-GEN	F1303

For more infomation on Footprint Conversion Adapters, see:
Web Link: www.1800adapter.com/AA2

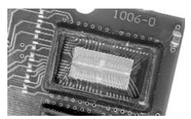
CHIP ON BOARD / CHIP ON FLEX

FEATURES & BENEFITS

- In addition to conventional electronics assembly, we now offer wire-bonding and flip-chip technology for chip on board and chip on flex applications.
- Utilizing bare die will ensure cost savings while effectively reducing the size of your next generation products.
- Offers a design solution that assembles bare die (wire bond or flip chip) to a printed circuit board or flexible circuit



Chip on Thin Board



Chip on Rigid Flex

ET's broad bare die capabilities include:

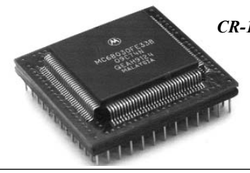
- Bare die on any substrate - FR4, thin board, flex, rigid, flex, exotic materials
- Die Attach
- Gold wire bonding; gold or aluminum wedge bonding
- Encapsulation, glob-top or dam and fill
- Flip chip
- Underfill

For more infomation on Chip on Board/ Flex, please see:
Web Link: www.1800adapter.com/AA3

CHIP-SPECIFIC COST REDUCTION ADAPTERS

FEATURES & BENEFITS

- Cost savings and availability advantages of PQFP SMT packages versus chip manufacturer PGAs
- Avoid board re-design
- Convert fine-pitch surface-mount packages to PGA footprints--footprint compatibility with existing packages
- The adapter package for a specific chip can plug into the same footprint as the PGA package supplied directly from the chip manufacturer
- Provide complete masking of the PQFP attach surface: only the SMT pads are exposed
- Tight tolerance molded-in pins



CR-132QF03-PGA3-68030

For more information about Cost Reduction Adapters, pricing and delivery information, see:

Web Link: www.1800adapter.com/008

Ordering Information Example

Product Code — CR-132QF03-PGA3-68020-20 — Chip Part Number / Clock Speed

Top SMT Pad Footprint — Bottom PGA Footprint

(-AMP-0000) for Replacement Converter

SMT Attach Pads - Hot air leveled solder, .0001" min. thickness.

PGA Pins - Ni/Au plated Phosphor Bronze; .018" diameter.

RATING: 125° C max. continuous use

APPLICATION SPECIFIC COST REDUCTION ADAPTERS

Manufacturer	Chip	QFP Pin Count	PGA Pin Count	Lead Pitch (mm)	QFP Pins/ Side	ET Part #	Drawing #
AMD	386DXL	132	132	0.635	33 X 33	CR-132QF03-PGA8-386DXL	F1752
LSI LOGIC	L64230/L6	144	142	0.65	36 X 36	CR-144QF10-PGA4-L64230/L6	F5100
MOTOROLA	56001	132	88	0.635	33 X 33	CR-132QF03-PGA3-56001	F1756
MOTOROLA	56002	312	132	0.635	33 X 33	CR-132QF03-PGA3-56002	F1751
MOTOROLA	68030/68EC030	132	132	0.635	33 X 33	CR-132QF03-PGA3-68030/EC030	F1760
MOTOROLA	68040	184	179	0.65	46 X 46	CR-184QF31-PGA11-68040	F3748
MOTOROLA	68302	132	132	0.635	33 X 33	CR-132QF03-PGA3-68302	F1761
MOTOROLA	68332	132	132	0.635	33 X 33	CR-132QF03-PGA3-68332	F3747
MOTOROLA	68340	144	145	0.65	36 X 36	CR-144QF10-PGA4-68340	F1762
MOTOROLA	68340	144	145	0.50	36 X 36	CR-144QF63-PGA4-68340	F4262
MOTOROLA	68360	240	241	0.50	60 X 60	CR-240QF62-PGA11-68360	F3811
XILINX	XC4005	208	156	0.50	52 X 52	CR-208QF21-PGA9-XC4005	F4745
XILINX	XC95108	100	64	0.50	25 X 25	CR-100Q49D-PGA2-XC95108	F6129
XILINX	XC3042	144	132	0.50	36 X 36	CR-144QF63D-132P9-XC3042	F6653
XILINX	XC3046	160	132	0.65	40 X 40	CR-160QF07B-132P9-XC3046	F6654
XILINX	XC401	208	175	0.50	52 X 52	CR-208QF21CS-P9-XC401	F6829
Generic Cost Reduction Adapters							
Generic	Multi-Purpose	80	----	0.80	16 X 24	CR-80QF08-PGA3-GENERIC	F7083
Generic	Multi-Purpose	100	----	0.65	20 x 30	CR-100QF06-PGA3-GENERIC	F5413
Generic	Multi-Purpose	128	----	0.80	32 X 32	CR-128QF13-PGA4-GENERIC	F1029
Generic	Multi-Purpose	132	----	0.635	33 X 33	CR-132QF03-PGA3-GENERIC	F5726
Generic	Multi-Purpose	144	----	0.65	36 X 36	CR-144QF10-PGA4-GENERIC	F1762
Generic	Multi-Purpose	160	----	0.65	40 X 40	CR-160QF07-PGA4-GENERIC	F4263
Generic	Multi-Purpose	208	----	0.50	52 X 52	CR-208QF21-PGA10-GENERIC	F5441
Generic	Multi-Purpose	304	----	0.50	76 X 76	CR-304QF61-PGA12-GENERIC	F3812
AMP Replacement Converter							
Generic	Multi-Purpose	132	----	0.635	----	CR-132QF03-AMP-0000	F5089
Footprint Correction Adapters							
Manufacturer	Chip	Top Pin Count	Bottom Pin Count	Top Lead Pitch (mm)	Bottom Lead Pitch (mm)	ET Part #	Drawing #
Generic	Multi-Purpose	QFP-100	QFP-100	0.50	0.65	CR-100Q49S-100Q6-SM-LP	F6983
Generic	Multi-Purpose	QFP-100	QFP-100	0.65	0.50	CR-100QF06S-100QF49DS-SM-LP	F7084
XILINX	XC3000	PLCC-84	PGA-84	1.27	2.54	CR-PCC5-84PGA1-XC3000	F6655
Generic	Multi-Purpose	DIP.3	SO-3.9	2.54	1.27	CR-14DIP.3-14SO01S-GENERIC	F7065
Generic	Multi-Purpose	SOIC-3.9	SOIC-10.16	1.27	1.27	CR-16SO01S-16SO13S-SM-LP	F7085

CUSTOM ADAPTERS QUOTATION WORKSHEET

Date: _____
To: ET Technical Sales Department
From: _____
Co: _____
Tel: _____
Fax: _____
# of Pages: _____

PREP WORKSHEET FOR WEB OR FAX

Use this prep worksheet to help you prepare answers for our online quotation form. Be prepared to provide the information where the blank lines are found. *If you prefer, you may complete this worksheet and fax it to 408-982-0664.*

1) Visit the ET Web site and complete the online form at:
www.emulation.com/technical
2) Using the information on this worksheet, complete all required fields on the online form
3) Attach package drawings in .pdf format

ET's technical support group will contact you promptly with confirmation.

Describe your application:

_____

_____

_____

Side View Drawing: (Identify Each Component)

Drawing Requirements
Please Attach All:

Package Outline Drawings for Top ☐

Package Outline Drawings for Bottom ☐

Pin Connection Diagram ☐

Adapter Dimensional Requirements ☐

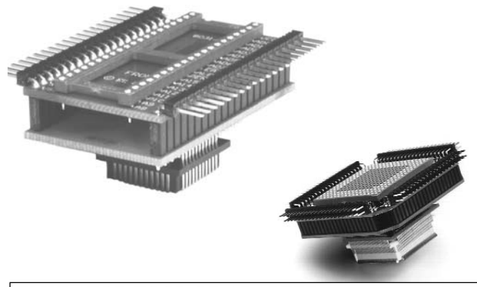
List of Components to Attach to Board ☐

During development, my chip will operate at _____ speed

Custom, semi-custom or built to order, you choose. Call us today.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

EMULATOR TOOLS & ADAPTERS

These development tools provide users with an interface between their device and an in-circuit emulator. As such, they support users throughout the design process. ET also offers a large line of grabbers, handling tools, test probes, insertion/extraction tools, and cost reduction adapters as accessories for your in-circuit emulator.



EMULATOR TOOL OR ADAPTER	PAGE
Clip-on - PLCC	46
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Emulator Pod Extenders Web Prep. Form	55
Emulator Pods - Compact Size - PLCC	53
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FEATURES & BENEFITS

- Provides electrical and mechanical conversion from an emulator pod's package type to an alternate IC package type.
- Many designs are also useful as carrier adapters for use with logic analyzers, oscilloscopes, and other test equipment.
- Some models are available in two-piece designs for easy removal and replacement. Extra bases may be purchased separately for use with multiple boards.
- Most adapters offer test point arrays that will accept industry standard test connectors. These adapters usually offer pin labeling to identify signals.
- Some adapters offer flip signal option: Signal names change direction from clockwise to counterclockwise, top to bottom.
- Adapters are available for emulating either device-specific or generic packages.
- Device-Specific Adapters allow emulation of specific devices from these manufacturers: Actel, AMD, Analog Devices, Hitachi, IDT, Intel, Microchip, Motorola, NEC, Philips, Siemens, Texas Instruments, Toshiba, Zilog and more!
- Call for custom emulator solutions

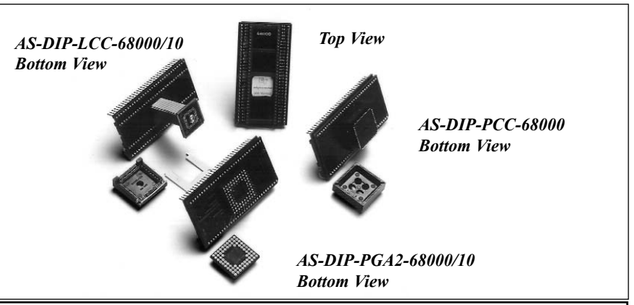
Information Required for Ordering:

1) Emulator Pod
   - Package Manufacturer Part Number
   - Package outline drawing
2) IC package to be emulated
   - Manufacturer Part Number
   - Package outline drawing
3) Required Features
   - Test Leads
   - Extra Adapter Bases
   - Flip Signal
   - Conversion to Socket Footprint (vs. IC Footprint)

Emulated Package	Target System	Package Type
BGA	Surface-Mount:	**QFP**
DIP	Socketable:	**PGA, PLCC**
	Surface-Mount:	**SSOP, QFP**
PGA	Socketable:	**QFP, PGA, DIP**
SDIP, PLCC	Surface-Mount:	**SSOP, QFP**
PLCC	Socketable:	**QFP, PGA,DIP**
SDIP, PLCC	Surface-Mount:	**QFP, PLCC**
QFP	Socketable:	**QFP, PGA**
	Surface-Mount:	**BGA, QFP**
SDIP*	Socketable:	**PLCC**
	Surface-Mount:	**QFP**
TSOP	Surface-Mount:	**QFP**

For a complete listing of emulator tools & adapters, pricing and delivery information, please see:
www.1800adapter.com/093

EMULATOR ADAPTERS - DEVICE-SPECIFIC - SOCKETABLE



Ordering Information Example

Product Code — AS-PGA-QF03T-68302
- T = For Textool Socket
- Y = For Yamaichi Socket
- IC to be Emulated
- Footprint Target Socket
- Emulator Pod Female Receptacle

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

HOW TO ORDER

Identify the following characteristics to determine the Emulation Technology part number.

1) The manufacturer and IC to be emulated (i.e. Motorola 68000/10).
2) Package type of the emulator pod.
3) Package type of the target socket.
4) Verify top and bottom footprints (see Footprint Section).

Emulator Pod → Target Socket

Icons identify your emulator pod and target socket.

Motorola

DIP → PGA

Description #	Document #
AS-DIP-PGA2-68000/10	F2230
AS-DIP-PGA2-68000/10LN	F2432

LN = Low Noise Version with ground plane and no test points. (PGA2 = 10 X 10)

DIP → PLCC

AS-DIP-PCC-68000/10	F1234
AS-DIP68K-PCC-68EC000	F1155
AS-DIP-PCC-68HC11	F1982
AS-DIP-PCC-68008	F2290

(Note: Used with 48 pin or 52 pin emulator pod)

AS-DIP-PCC-6809	F2289

PGA → DIP

AS-PGA2-DIP-68000/10	F2474
AS-PGA2-DIP-68000/10LN	F1805

LN = Low Noise Version with ground plane and no test points.

PGA → PLCC

AS-PGA2-PCC1-68000/10	F1079
AS-PGA268K-PCC-68EC000	F1737

PGA → PGA

AS-114P3-100P3-68EC020	F1712
AS-100P3-114P3-68EC020	F2421

PGA → QFP

AS-PGA-QF03T-68030	F1040
AS-PGA-QF03T-68302	F1041
AS-PGA4-QF10Y-68340	F4550
AS-PGA4-QF63Y-68340	F5024
AS-114P3-QF06Y-68EC020-NTP	F2192
AS-PGA3-QF63Y-68302	F5554

Zilog

DIP → PLCC

Description #	Document #
AS-DIP-PCC-Z80	F2058
AS-DIP-PCC-Z86C21	F4547

Motorola

PLCC → QFP

AS-PCC5-QF14Y-68HC11K4	F1969

PLCC → DIP

Description #	Document #
AS-PCC-DIP-68000/10	F2465
AS-PCC-DIP-68HC11	F1385
AS-PCC-DIP-68008	F2229

(Note: Used with 48 pin or 52 pin DIP target board)

PLCC → PGA

AS-PCC-PGA2-68000/10	F2070
AS-PCC1S-PGA2-MC68440	F1687

PLCC → PLCC

AS-PCC68K-PCC-68EC000	F1097
AS-PCC68EC-PCC1-68HC000/68000	F2470

Hitachi

SHRINK DIP → PLCC

AS-SDIP-PCC-64180	F1023
AS-SDIP-PCC-6301/701	F1024

PLCC → SHRINK DIP

AS-PCC-SDIP-64180	F2467

PLCC → QFP

AS-PCC5-QF47Y-H8534	F4559

PGA → SHRINK DIP

AS-PGA-SDIP-64180	F2472

Intel

PLCC → PLCC

AS-PCC1-PCC4-N80C196KB/198	F1278
AS-PCC1-PCC5-80186EB	F1298

PGA → LCC

AP3-68-PGA (Used with Intel 80186/80286)	F2374

AMD

PGA → PQFP

Description #	Document #
AS-PGA8-QF03T-386DXL	F1400

Microchip

DIP → PLCC

Description #	Document #
AS-DIP-PCC-PIC16C74/64/65	F3939
AS-DIP-PCC-PIC17C42/43/44	F3970

Wired 1 to 1

PLCC → QFP

Description #	Document #
AS-PCC3-QF16S-GEN	F1377
AS-PCC3-QF16DS-GEN	F3949
AS-PCC5-QF02S-GEN	F4327

QFP → QFP

AS-QF08S-QF08S-GEN	F4498
AS-QF09S-QF09S-GEN	F5004
AS-QF10S-QF63Y-GEN	F5078

Intel

DIP → PLCC

Description #	Document #
AS-DIP-PCC-8031/51	F3789
AS-DIP-PCC-8031/51VP	F3789
AS-DIP-PCC-8031/51Z	F1520
AS-DIP-PCC-8086/88	F3790

LCC → PLCC

AP4-68-LCC (Used with Intel 80186/80286)	F1077

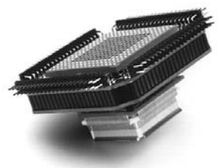
PGA → PLCC

AP4-68-PGA (Used with Intel 80186/80286)	F1124
AP4-68-PGA1-FLIP* (Used with Intel MCS96)	F1838

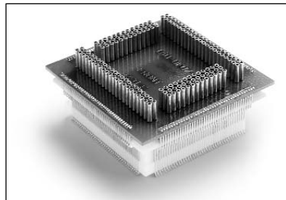
PLCC → DIP

AS-PCC-DIP-8031/51	F1137

DEVICE-SPECIFIC - SURFACE MOUNTABLE - EMULATOR ADAPTERS



AS-PGA-QF03S-68302



EPP-160-QF07-SM

HOW TO ORDER

Determine the following characteristics to identify the ET part number.

1) Chip manufacturer for the IC to be emulated. (i.e. Motorola 68000/10).
2) Package type of the emulator pod.
3) Package type of the target socket.
4) Verify top and bottom footprints (see package coding system).

HOW TO ORDER REPLACEMENT BASES

1) Find the QFXXS in your original part number (i.e. your PQFP package footprint number).
2) Turn to the package coding system to locate complete ordering information.

Ordering Information Example

Footprint Type (See Footprint Section)

Product Code ——— AS-PGA-QF29*S-68020 ——— IC to be Emulated

Emulator Pod Female Receptacle ——— Surface Mount Pad Footprint

Emulator Pod → Target Socket **Icons identify your emulator pod and target socket.**

Analog Devices

PGA → PQFP SMT Pads

Description #	Document #
AS-PGA-QF01S-ADSP2111	F3389
AS-PGA1-QF14S-ADSP2101	F1572

Hitachi

PLCC → PQFP SMT Pads

Description #	Document #
AS-PCC5-QF14S-H8532/34/36	F1018
AS-PCC5-QF14S-H8330/37	F1140
AS-PCC5-QF47S-H8534	F3880

PGA → PQFP SMT Pads

AS-PGA3-QF14S-H8532/34/36	F2209

DIP → PQFP SMT Pads

AS-DIP1-QF09S-63X03RF	F2228

SDIP → PQFP SMT Pads

AS-SDIP-QF29S-H8/320	F2097
AS-SDIP1-QF09S-63X03Y	F2094

Note: No Test Points

Zilog

DIP → PQFP SMT Pads

Description #	Document #
AS-DIP1-QF16S-Z80	F4285
AS-DIP1-QF16S-Z86	F5312

PLCC → PQFP SMT Pads

AS-PCC1-QF08S-Z180	F4549

NEC

PGA → PQFP SMT Pads

Description #	Document #
AS-PGA8-QF05S-V53	F1251

PLCC → PQFP SMT Pads

AS-PCC5-QF32S-V25	F1843
AS-PCC1-QF08S-V40	F1852

Motorola

PLCC → PQFP SMT Pads

Description #	Document #
AS-PCC1-QF14S-68HC11F1	F3960
AS-PCC1-QF14DS-68HC11F1	F1424
AS-PCC1-QF14DS-68HC11KA4	F4158
AS-PCC1-QF29S-68EC000	F2111
AS-PCC1-QF29S-68HC11KA4/KA2	F4001
AS-PCC4-QF29S-68HC05B6	F4555
AS-PCC4-QF29S-68HC11/711E9/A8	F1922
AS-PCC4-QF29DS-68HC11/711E9/A8	F4277
AS-PCC5-QF14S-68HC11K4	F1064

PGA → PQFP SMT Pads

AS-PGA-QF03S-56001	F1034
AS-PGA-QF03S-68020	F1035
AS-PGA-QF03S-68030	F1036
AS-PGA-QF03S-68302	F1854
AS-PGA-QF03S-68332	F2099
AS-PGA1-QF14DS-68HC11F1	F4552
AS-PGA3-QF14S-68HC11K4	F2476
AS-PGA3-QF14S-68HC12	F5049
AS-PGA3-QF49S-68LC302	F3853
AS-PGA3/68302-QF49S-68LC302	F3937
(For use with 68LC302 emulator)	
AS-PGA3-QF63S-68302	F2257
AS-PGA4-QF10S-68340	F1394
AS-PGA4-QF63S-68EN302	F4326
AS-PGA4-QF63S-68PM302	F4165
AS-PGA4-QF63S-68331	F4308
AS-PGA4-QF63S-68340	F2080
AS-PGA8-QF07S-68336-TP	F4305
AS-PGA11-QF31S-68EC040/LC040	F2133
AS-PGA11-QF62S-68060-HIS	F4262
AS-PGA11-QF62S-68360/EN360	F1940
AS-PGA11-QF62S-68360/EN360-HIS	F3882
AS-100P3-QF06S-68EC020-NTP	F2422
AS-114P3-QF06S-68EC020-NTP	F1468

PGA → QFP

AS-PGA-QF63DS-68302	F5475
AS-PGA3-QF63S-68302-NTP	F5480

PQFP → PQFP SMT Pads

AS-QF03A-QF63S-68332-0	F2482
AS-QF03T-QF63S-68HC16Z1	F4086

DIP → PQFP SMT Pads

AS-DIP-QF16S-68HC05/705C8FB	F1214
AS-DIP-QF16S-4044G	F5614

SDIP → PQFP SMT Pads

AS-SDIP-QF29S-68HC05F6FU	F4286

Intel

PLCC → PQFP SMT Pads

AS-PCC1-QF08S-80186/88(XL)	F1172
AS-PCC1-QF08S-80186/88EA	F1870
AS-PCC1-QF08S-80/83C196KB/KC/KD	F1733
AS-PCC1-QF34S-87C196KM	F4556
AS-PCC1-QF47S-80186/88(XL)(EA)	F1937
AS-PCC5-QF08S-80186EB/88	F1671
AS-PCC5-QF47S-80186/88EB	F2275

PGA → PQFP SMT Pads

AS-INTELICE-QF06S-80C186EC	F4288
AS-PGA8-QF03S-80386DXL-NTP	F2256
AS-PGA8-QF03S-80960JX	F3887
AS-PGA8-QF03S-80960KA/KB	F1434
AS-PGA8-QF03SLP-80960KA/KB	F4548
AS-PGA10-QF15S-486SX/DX	F2473
AS-PGA10-QF67S-486GX	F4197
AS-PGA10-QF67S-486SX	F4072
AS-PGA10-QF15S-80960CA/CF	F1191
AS-PGA10-QF21S-486SX/DX	F2021
AS-PGA10-QF21S-80960HX	F4328

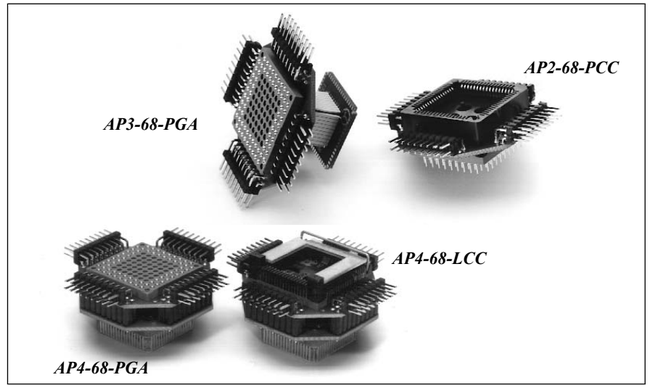
DIP → PQFP SMT Pads

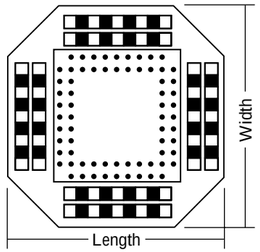
AS-DIP-QF16DS-8031/51	F5184
AS-DIP-QF16S-8031/51	F1051

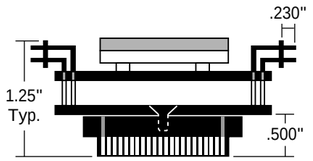
For a complete listing of emulator adapters and additional information, see:

Web Link:**www.1800adapter.com/093**

EMULATOR ADAPTERS - WIRED 1-TO-1 - SOCKETABLE - PLCC, LCC, PGA







Note: Drawing applies to pods with PLCC target socket.

Ordering Information Example

Product Code — AP 4-68-PGA-ST-(FLIP*)

Male Plug: 1=DIP, 2=PGA, 3=LCC, 4=PLCC

Target Socket and Emulator Pod Pin Count

Female Emulation Pod Receptacle

ST = Straight Test Points
NT = No Test Points
MM = Male to Male Plug
LP = Low Profile

Emulator Pod → **Target Socket** **Icons identify your emulator pod and target socket.**

PGA → PLCC

Description #	Document #
AP4-28-PGA	F2383
AP4-32-PGA	F2385
AP4-44-PGA	F2388
AP4-52-PGA	F1049
AP4-68-PGA	F1124
AP4-68-PGA-LP	F4256
AP4-68-PGA-NT	F1382
AP4-68-PGA-ST	F2391
AP4-68-PGA1-FLIP* (NT)	F2392
AP4-84-PGA	F1697
AP4-84-PGA-NT	F1765
AP4-84-PGA-ST	F2394

PGA → LCC

AP3-68-PGA	F2374

PLCC → PLCC

AP4-20-PCC-ST	F2380
AP4-28-PCC	F2382
AP4-28-PCC-ST	F1899
AP4-32-PCC	F2384
AP4-44-PCC	F1780
AP4-44-PCC-MM	F4532
AP4-44-PCC-ST	F1779
AP4-52-PCC-MM	F1925
AP4-52-PCC-NT	F1445
AP4-52-PCC	F2034
AP4-68-PCC	F1443
AP4-68-PCC-MM	F2389
AP4-68-PCC-NT	F2390
AP4-68-PCC-ST	F2235
AP4-84-PCC	F1091
AP4-84-PCC-MM	F1797
AP4-84-PCC-ST	F2234

PLCC → PGA

Description #	Document #
AP2-44-PCC	F1732
AP2-68-PCC	F1518
AP2-68-PCC1-FLIP*	F2362
AP2-84-PCC	F2076

PLCC → LCC

AP3-68-PCC	F2372

LCC → PLCC

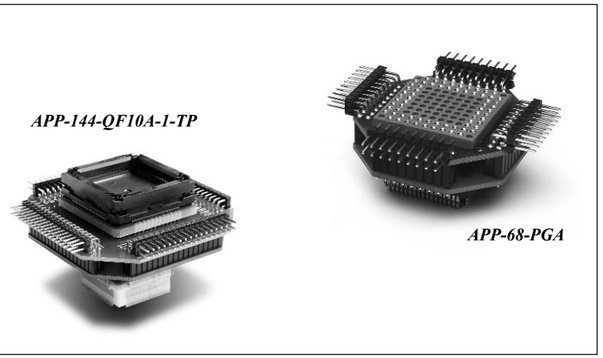
AP4-32-LCC	F1958
AP4-68-LCC	F1077
AP4-84-LCC5C (For JEDEC Type C)	F2028

HOW TO ORDER

1) Find your emulator pod and target socket package type combination in the table on this page. (i.e. emulator pod: PGA; target socket: PLCC).
2) Locate the part number with the correct number of pins for the emulator pod and target socket (i.e. AP4-20-PGA is the right part for 20-pin emulator pods and target sockets).
3) All parts are wired 1-to-1, top to bottom, except flip adapters. On flip adapters, signals names change direction from clockwise to counterclockwise, top to bottom.

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

WIRED 1-TO-1 - SURFACE MOUNTABLE - PLCC, PQFP/TQFP - EMULATOR ADAPTERS



HOW TO ORDER

1) Find your emulator pod and target socket package type combination in the table on this page. (i.e. emulator pods: PGA; target socket: SMT).
2) Locate the part number with the correct number of pins for the emulator pod and target socket (i.e. APP-44-PGA is the right part for 44-pin emulator pods and target sockets).
3) All parts are wired 1-to-1, top to bottom.

Ordering Information Example

AP P-100-QF01A-(0)-(NTP)

- Product Code
- Target SMT Pads
- Pin Count
- Emulation Pod Receptacle Footprint
- A=AMP, T=TEXTOOL, Z=ZIF
- 0 = w/out Production Socket; 1 = with Production Socket; 2 = with Burn-in Socket
- (NTP) = No Test Points; (TP) = with Test Points

Emulator Pod | Target Socket — **Icons identify your emulator pod and target socket.**

PLCC → PLCC SMT Pads

Description #	Document #
APP-32-PCC	F2416
APP-44-PCC	F2253
APP-52-PCC	F1454
APP-68-PCC	F2419
APP-84-PCC	F2077

Note: Bottom pins emulate the PLCC package.

PQFP Production Socket Footprint → QFP SMT Pads

Description #	Document #
APP-132-QF03A-0-NTP	F2411
APP-132-QF03T-0-TP	F2412
APP-144-QF10A-0-TP	F1604

PQFP ZIF Socket → QFP SMT Pads

Description #	Document #
APP-100-QF49Z-NTP	F4451

TSOP ZIF Socket → QFP SMT Pads

Description #	Document #
APP-032-TS01Z-2	F5069
APP-048-TS01Z-WELS	F4536

PGA Production Socket → PLCC SMT Pads

Description #	Document #
APP-44-PGA	F1658
APP-68-PGA	F1403
APP-84-PGA	F2224

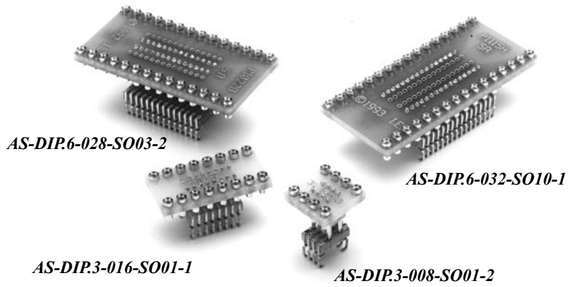
Note: Bottom pins emulate the PLCC package.

PQFP Production Socket → QFP SMT Pads

Description #	Document #
APP-100-QF01T-1-NTP (Used with Sophia emulator)	F2410
APP-100-QF01A-1-TP	F4537
APP-132-QF03A-1-TP	F1175
APP-132-QF03T-1-TP	F2413
APP-144-QF10A-1-TP	F1678

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

EMULATOR ADAPTERS - SURFACE MOUNTABLE - DIP TO SMT



AS-DIP.6-028-SO03-2

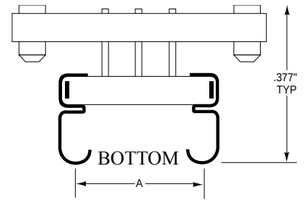
AS-DIP.6-032-SO10-1

AS-DIP.3-016-SO01-1

AS-DIP.3-008-SO01-2

DIP TO TSSOP, SOP, & SOIC SMT PACKAGE CONVERTERS

These adapters enable you to adapt 6 to 32-pin DIPs to SOIC-type footprints. These devices have a two-piece construction: a top DIP assembly with interconnects to a SOIC surface-mountable assembly that is soldered to the target PC board and then, the top assembly is plugged onto it.



SOIC Lead Pitch = 0.05"

Ordering Information Example

Product Code — AS-DIP.6-040-SO11-1(2) — 1 = 1 piece SOIC, 2 = 2 piece SOIC
Female Top Socket
Dip Width
Pin Count (Top & Bottom)
Footprint Code (See Footprint Section)

FEMALE DIP ➡ SOIC, TSSOP, SSOP SMT

Pin Count	DIP Width (inches)	Bottom SMT Lead Pitch (mm)	Bottom SMT Body Width (mm)	ET PART #	Drawing#
6	0.300	1.27	0.155	AS-DIP.3-006-SO01-2	F5014
8	0.300	1.27	0.155	AS-DIP.3-008-SO01-1	F2435
8	0.300	1.27	0.155	AS-DIP.3-008-SO01-2	F2434
14	0.300	1.27	0.155	AS-DIP.3-014-SO01-2	F2436
16	0.300	1.27	0.155	AS-DIP.3-016-SO01-1	F2438
16	0.300	1.27	0.155	AS-DIP.3-016-SO01-2	F5014
16	0.300	1.27	0.300	AS-DIP.3-016-SO03-1	F2110
16	0.300	1.27	0.300	AS-DIP.3-016-SO03-2	F5014
16	0.300	0.65	0.173	AS-DIP.3-016-ST03-1	F6651
18	0.300	1.27	0.155	AS-DIP.3-018-SO01-2	F5014
18	0.300	1.27	0.300	AS-DIP.3-018-SO03-2	F1219
20	0.300	1.27	0.155	AS-DIP.3-020-SO01-1	F5014
20	0.300	1.27	0.155	AS-DIP.3-020-SO01-2	F2442
20	0.300	1.27	0.208	AS-DIP.3-020-SO02-2	F5843
20	0.300	1.27	0.300	AS-DIP.3-020-SO03-1	F2252
20	0.300	1.27	0.300	AS-DIP.3-020-SO03-2	F2443
20	0.300	0.65	0.173	AS-DIP.3-020-ST03-1	F6345
20	0.600	1.27	0.300	AS-DIP.6-020-SO03-1	F5014
20	0.600	1.27	0.300	AS-DIP.6-020-SO03-2	F5014
24	0.300	1.27	0.300	AS-DIP.3-024-SO03-1	F2449
24	0.300	1.27	0.300	AS-DIP.3-024-SO03-2	F5014
24	0.300	0.65	0.173	AS-DIP.3-024-ST03-1	F7194
24	0.600	1.27	0.300	AS-DIP.6-024-SO03-1	F2451
24	0.600	1.27	0.300	AS-DIP.6-024-SO03-2	F2452
24	0.600	1.27	0.421	AS-DIP.6-024-SO08-1	F5014
24	0.600	1.27	0.421	AS-DIP.6-024-SO08-2	F2447
28	0.600	1.27	0.300	AS-DIP.6-028-SO03-1	F1408
28	0.600	1.27	0.300	AS-DIP.6-028-SO03-2	F2249
28	0.600	1.27	0.300	AS-DIP.6-028-SO03-OFFSET	F7195
28	0.300	1.27	0.300	AS-DIP.3/.6-SOIC.3S-GENERICZ	F1960
28	0.600	1.27	0.421	AS-DIP.6-028-SO08-1	F1176
28	0.600	1.27	0.421	AS-DIP28.6Z-028-SO08-1	F3306
28	0.600	0.65	0.209	AS-DIP.6-028-SS34-1	F5527
28	0.400	1.27	0.350	AS-SDP.4-028-SO05-2	F2086
28	0.300	1.27	0.300	AS-DIP.3-028-ST03-1	F2086
32	0.600	1.27	0.300	AS-DIP.6-032-SO03-1	F2458
32	0.600	1.27	0.300	AS-DIP.6-032-SO03-2	F5014
32	0.600	1.27	0.421	AS-DIP.6-032-SO08-1	F5777
32	0.600	1.27	0.449	AS-DIP.6-032-SO10-1	F2456
32	0.600	1.27	0.449	AS-DIP.6-032-SO10-2	F2455
40	0.600	1.02	0.300	AS-40DIP.6-40SO12-VSOP	F7196

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

FEATURES

- Adapters can be used for prototyping SMT boards with DIP devices
- Provide interconnects to SMT patterns for testing
- Constructed with gold-plated machined pin contacts for high reliability
- Add a programming adapter with maching screw pins and turn your suface mount pins to a ZIF socket

HOW TO ORDER

1) Locate the part number with the correct number of pins for the emulator pod and target socket.

2) All parts are wired 1-to-1, top to bottom.

Try our **New Soldering Iron Systems**
Temperature controlled, compact soldering systems with additional tips. (ESTD-SAFE version also)
Web Link: **www.1800adapter.com/150**

Try our **Chip Quik® SMD Removal Kit**
Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.
Web Link: **www.1800adapter.com/046**

DIP TO TSOP & MLF - SURFACE MOUNTABLE - EMULATOR ADAPTERS

AS-DIP48.6-048-TS01S-1

Ordering Information

Female Top Socket — Dip Width (.600")
Product Code — AS-DIP48.6-048-TS01S-1 — 1 = 1 piece
Pin Count (Top)
Pin Count (Bottom)
Footprint Code (See Footprint Section)

FEMALE DIP ➡ QFN/MLF TSOP SMT

Pin Count	TOP Socket Package Width (Inches)	Bottom Package Code Lead Pitch (mm)	Bottom SMT Package Code	Bottom SMT Body Width (Inches)	ET PART #	Drawing#
20	0.600	0.65	20-ML02	N/A	AS-DIP20.6-20ML02S-GEN	F6259
28	0.600	0.55	28-TS05	11.80	AS-DIP28.6Z-028-TS05S-1-S	F1044
28	0.600	0.50	28-ML03	N/A	AS-DIP28.6-28ML03S-GEN	F6260
32	0.600	0.50	32-TS01	18.40	AS-DIP32.6-032-TS01S-1-AT27C080	F4459

DIP TO QFN/MLF, TSOP PACKAGE CONVERTERS

These adapters enable you to adapt 6 to 32-pin DIPs to TSOP-type footprints. These devices have a two-piece construction: a top DIP assembly with interconnects to a TSOP surface-mountable assembly that is soldered to the target PC board and then, the top assembly is plugged onto it.

FEATURES

- Adapters can be used for prototyping SMT boards with DIP devices
- Provide interconnects to SMT patterns for testing
- Constructed with gold-plated machined pin contacts for high reliability

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

APP-044-T202Z

Ordering Information Example

Product Code — AP P-048-TS01Z-(2)-(NTP) — (NTP) = No Test Points, (TP) = with Test Points
Target SMT Pads
Pin Count
Emulation Pod Receptacle Footprint
0 = w/out Production Socket
1 = with Production Socket
2 = with Burn-in Socket
Z = ZIF Socket

QFP, SOIC, TSSOP, SSOP ZIF ➡ QFP, SOIC, TSSOP, SSOP SMT

Pin Count	Bottom SMT Width (mm)	Lead Pitch (mm)	Package Type	ET Part #	Drawing#
16	0.635	3.90	SSOP	APP-016-SS12Z-2-TP	F5931
28	1.27	7.62	SOIC	APP-028-SO03Z-2-NTP	F4347
30	0.80	11.00	SSOP	APP-030-SS36Z-2	F6156
32	1.27	10.16	TSOPII	APP-032-T202Z-2	F6286
32	0.50	18.40	TSOP	APP-032-TS01Z-2	F5069
40	0.50	18.40	TSOP	APP-040-TS01Z-2	F2420
44	0.80	10.16	TSOPII	APP-044-T212Z-2	F2098
48	0.50	18.40	TSOP	APP-048-TS01Z-2	F4339
50	0.80	10.16	TSOPII	APP-050-T212Z-2	F5736
54	0.80	10.16	TSOPII	APP-054-T212Z-2	F1031
56	0.50	18.40	TSOP	APP-056-TS01Z-2	F1662
64	0.80	12.00	TSOP	APP-064-SS11Z-2-TP	F5944
86	0.50	10.16	TSOPII	APP-086-T232Z-2	F6229
100	0.50	ZIF	QFP	APP-100-QF49Z-NTP	F4451
132	0.635	AMP	QFP	APP-132-QF0A-0-NTP	F2411
132	0.635	AMP	QFP	APP-132-QF03A-1-TP	F1175
144	0.650	AMP	QFP	APP-144-QF10A-1-TP	F1678

QFP, SOIC, TSSOP, SSOP ZIF TO TSOP PACKAGE CONVERTERS

These adapters enable you to convert a surface mount pad footprint to a test socket.

HOW TO ORDER

1) Locate the part number with the correct number of pins for the emulator pod and target socket.
2) All parts are wired 1-to-1, top to bottom.

Try our **New Soldering Iron Systems**
Temperature controlled, compact soldering systems with additional solder tips. (ESTD-SAFE version also)
Web Link: **www.1800adapter.com/150**

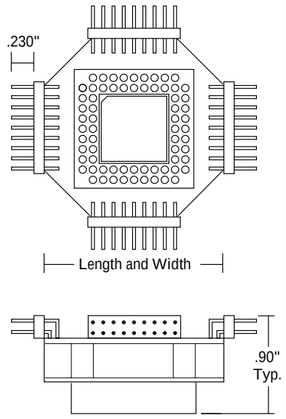
Try our **Chip Quik® SMD Removal Kit**
Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.
Web Link: **www.1800adapter.com/046**

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/093**

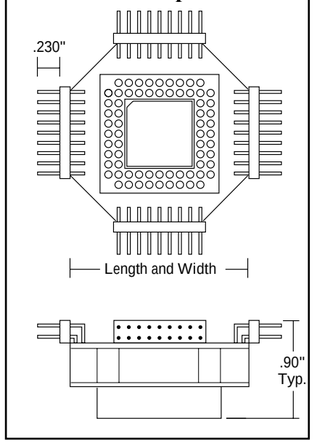
EMULATOR ADAPTERS - CLIP-ON - PLCC

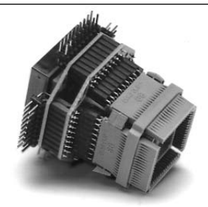
CAUTION:
In most applications, user must disable (tri-state) the soldered-in PLCC device before connecting the emulator to the device.

Wired 1-to-1



Device-Specific





AC4-68-PCC

Wired 1-to-1 Ordering Information Example

Product Code: AC 4-84-PGA-(NC)
- PLCC Code
- Pin Count
- (NC) = No Clip — Can be sold without Test Clip
- Emulator Pod Female Receptacle

Device-Specific Ordering Information Example

Product Code: AC-PGA2-PCC-68000/10-(NC)
- Emulator Pod Female Receptacle
- PLCC Pkg.
- (LP) = Low Profile
- (NC) = No Clip
- IC to be Emulated

Emulator Pod → Target Socket

Icons identify your emulator pod and target socket.

Wired 1-to-1

PGA → PLCC

Description #	Document #
AC4-68-PGA	F2060
AC4-84-PGA	F2343

PLCC → PLCC

AC4-32-PCC	F1703
AC4-44-PCC	F2149
AC4-52-PCC	F2329
AC4-68-PCC	F1393
AC4-84-PCC	F2341

Device-Specific

Motorola

PGA → PLCC

Description #	Document #
AC-PGA2-PCC-68000/10-NC	F2318

DIP → PLCC

AC-DIP-PCC-68000/10	F1665
AC-DIP-PCC-68000/10-NC	F2300

Device-Specific

Intel

DIP → PLCC

Description #	Document #
AC-DIP-PCC-8031/51(-NC)	F2304
AC-DIP-PCC-8086/88	F1363

PGA → PLCC

AC4-68-PGA1-8051GB	F4331
AC-PGA-PCC-80186/88	F1310
AC-PGA1-PCC5-80186EB	F2293

PLCC → PLCC

AC-PCC1-PCC1-80186/88(-LP)	F4068

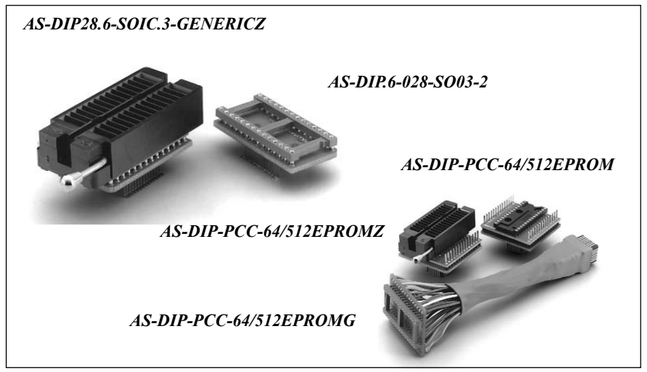
Hewlett Packard

PGA → QFP

Description #	Document #
AC-144P7-QF01-HP	F4520
AC-144P7-QF03-HP	F4316

For a complete list of Clip On Device Specific Adapters, please see:
Web Link: **www.1800adapter.com/093**

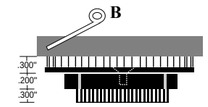
SOIC & PLCC - PAL/EPROM EMULATOR ADAPTERS



DRAWING A

AS-DIP.6-SO08-1

DRAWING B



AS-DIP-PCC-64/512EPROMZ

Ordering Information Example

Product Code ——— AS-DIP-SOIC-1MEG/EPROM(G) (Z)
- EPROM Size
- (Z) = ZIF Socket
- (G) = Optional Gang Version

DIP Device Female Receptacle
Male Plug
GENERIC = 1-to-1

Emulator Pod → Target Socket **Icons identify your emulator pod and target socket.**

EPROM - Surface Mountable

Memory Size: 64K through 512K

DIP 28 → SOIC SMT Pads

Description #	Document #
AS-DIP28.6-SOIC.3-GENERICZ	31960

Note: SOIC Package width = 7.62mm (.300")

DIP 28 → PLCC SMT Pads

Description #	Document #
AS-DIP-PCCS-512EPROM	32204

DIP 28 → LCC SMT Pads

Description #	Document #
AS-DIP-LCC-64/512EPROM	31600
AS-DIP-LCC-64/512EPROMZ	31601

Memory Size: 1MB through 4MB

DIP 32 → SOIC SMT Pads

Description #	Document #
AS-DIP32.6-SOIC.4-GENERIC	31145

Note: SOIC package width = 10.2mm (.400")

Description #	Document #
AS-DIP32.6-SOIC.4-GENERICZ	31086

Note: SOIC package width = 10.2mm (.400")

SDIP 28 → SOIC SMT Pads

Description #	Document #
AS-SDP.4-028-SO05-2	32086

EPROM - Socketable

Memory Size: 64K through 512K

DIP 28 → PLCC 32

Description #	Document #
AS-DIP-PCC-64/512EPROM	31152
AS-DIP-PCC-64/512EPROMZ	31178

GANG VERSION

AS-DIP-PCC-64/512EPROMG	31207

Note: 5 3/4" Long Typical.

AS-DIP-PCC-64/512EPROMGZ	32427

Note: 5 3/4" Long Typical.

Memory Size: 1MB through 4MB

DIP 32 → PLCC 32

Description #	Document #
AS-DIP-PCC-1MEG/EPROM	31855
AS-DIP-PCC-1MEG/EPROMZ	31455
AS-DIP-PCC-1MEG/EPROMG	31666
AS-DIP-PCC-1MEG/EPROMGZ	31667
AS-DIP-PCC-27C4096	31519

PAL - PLCC Wired 1-to-1

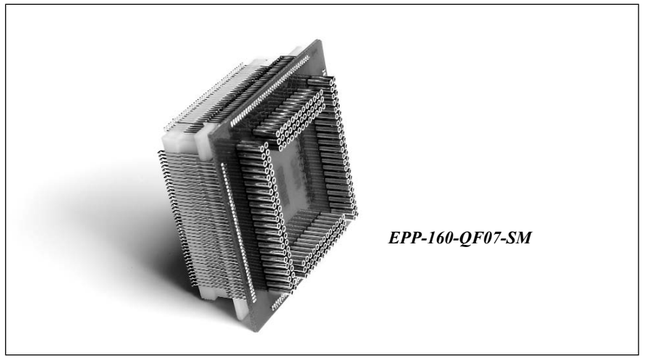
Description #	Document #	
AS-DIP28-PCC6-GENRC	33851	**Note:** Wired 1-to-1

FEATURES

- Emulate your 28 and 32-pin SOIC or PLCC devices with a standard DIP device
- Test new EPROM code quickly and easily
- Convert SOIC surface mount pads, or a PLCC socket on a printed circuit board, to a zero-insertion force DIP socket
- Used with industry-standard EPROMs: 8Kx8 and 64Kx8 (2764, 27128, 27256, 27512 and 1-4 MB)

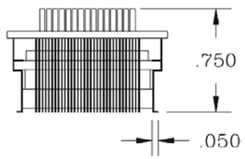
For a complete listing of SOIC, PLCC PAL/EPROM emulator adapters and additional information, please see:
Web Link: **www.1800adapter.com/029**

EMULATOR ADAPTERS - SMT REPLACEMENT BASES, PQFP/TQFP



EPP-160-QF07-SM

PQFP/TQFP Replacement Base



Standard Dimensions

Ordering Information Example

Product Code — EP P-160-QF07-SM — SM = Small Base
Target Surface Mount Pads — QFP Package Footprint (see Footprint Section)
Pin Count

Chip Package → Target Socket **Icons identify your chip package and target socket.**

SMT Replacement Bases

QFP → Surface Mount Pad

Description	Document #
EPP-044-QF16-SM	F1067
EPP-044-QF16D-SM	F4319
EPP-044-QF24-SM	F3983
EPP-044-QF52-SM	F1643
EPP-052-QF37-SM	F1642
EPP-052-QF39-SM	F1632
EPP-052-QF39D-SM	F4574
EPP-064-QF09-SM	F1286
EPP-064-QF29-SM	F1196
EPP-064-QF29D-SM	F1328
EPP-064-QF64-SM	F1153
EPP-080-QF08-SM	F1368
EPP-080-QF14A-SM	F1199
EPP-080-QF14D-SM	F3886
EPP-080-QF47-SM	F2007
EPP-094-QF32-SM	F1357
EPP-100-QF01-SM	F1713
EPP-100-QF06-SM	F4337
EPP-100-QF06B-SM	F3856
EPP-100-QF49-SM	F1634
EPP-120-QF70C/D-SM	F4335

QFP → Surface Mount Pad

Description	Document #
EPP-128-QF13-SM	F1204
EPP-128-QF51A-SM	F5411
EPP-128-QF13-LG	F4225
EPP-128-QF51-SM	F2216
EPP-128-QF53-SM	F5616
EPP-132-QF03-SM	F1640
EPP-144-QF10-SM	F1360
EPP-144-QF63-SM	F1631
EPP-160-QF07-SM	F1556
EPP-164-QF04-SM	F3639
EPP-172-QF12-SM	F1362
EPP-176-QF67-SM	F1109
EPP-184-QF31-SM	F5658
EPP-196-QF15-SM	F4313
EPP-208-QF21-SM	F1225
EPP-208-QF21D-SM	F4580
EPP-240-QF62-SM	F1793
EPP-256-QF17-SM	F5567
EPP-256-QF38-SM	F4582
EPP-256-QF42-SM	F4413
EPP-304-QF61-SM	F2189

SSOP → Surface Mount Pad

EPP-056-SS06-SM	F5464
EPP-056-SS09-SM	F4735
EPP-056-SS15-SM	F4736

HIGH QUALITY (SMT) REPLACEMENT BASES

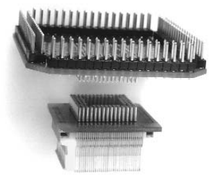
- These replacement bases are the highest quality in the industry.
- The base material used is TEFLON®. These units will withstand ALL soldering methods without deforming or melting--including hand soldering.
- Precision machining ensures accurate pitch, size, and other physical characteristics. Tolerances: +/- 0.001"
- Vertical clearance = 0.5"

HOW TO ORDER

1) Determine the footprint of your device (see Footprint Section), such as QF16, and find the ET part with the same footprint.

For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/023**

PQFP/TQFP - SURFACE MOUNTABLE - EMULATOR PODS



Top Board w/ wire wrap posts on .001" spacing

EPP-132-QF03-W Replacement Base

Ordering Information Example

Pin Count
Product Code
Male Plug
P = Surface Mountable Plug

EP P-100-QF06-*

NW = No Wire Wrap Posts
W = Wire Wrap Posts
12/18 = Cable Length (inches)

Male Plug Footprint (see Footprint Section)

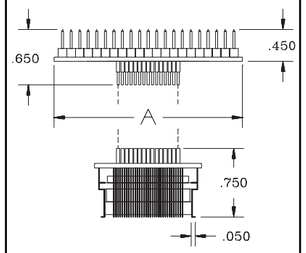
PQFP/TQFP

Description	Document #	Surface Mount Footprint Available on Top Board
EPP-044-QF16D-W	F5564	NO
EPP-044-QF16-W	F2022	NO
EPP-044-QF16-18	F1306	NO
EPP-052-QF37-W	F4170	NO
EPP-064-QF09-W	F1920	NO
EPP-064-QF64-W	F1735	NO
EPP-064-QF29-18	F2558	YES
EPP-064-QF29-W	F4108	YES
EPP-080-QF08-NW	F2563	NO
EPP-080-QF08-W	F1198	NO
EPP-080-QF08-18	F2562	NO
EPP-080-QF47-W	F1932	YES
EPP-100-QF01-W	F1275	NO
EPP-100-QF06-W	F1285	NO
EPP-100-QF06B-W	F4577	NO
EPP-100-QF06-NW	F3978	YES

PQFP/TQFP

Description	Document #	Surface Mount Footprint Available on Top Board
EPP-100-QF06-18	F1928	NO
EPP-100-QF49-W	F1880	YES
EPP-112-QF36-W	F4474	YES
EPP-128-QF13-W	F3963	NO
EPP-128-QF53-W	F5566	NO
EPP-132-QF03-W	F1228	NO
EPP-144-QF10-W	F1429	NO
EPP-144-QF63-W	F1736	NO
EPP-160-QF07-NW	F2566	NO
EPP-160-QF07-18	F4579	NO
EPP-160-QF07-W	F1575	YES
EPP-208-QF21-W	F1995	YES
EPP-240-QF62-W	F2035	YES
EPP-240-QF62-18	F4581	YES

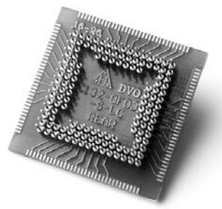
PQFP/TQFP w/ Wire Wrap Posts



HOW TO ORDER

1) Locate the part number with the correct number of pins for the emulator pod.
2) Select wire-wrap posts and cable length.
3) Verify top and bottom footprints (see Footprint Section).

EPP-132-QF03-SMLP



EPP-132-QF03-SMLP-M

Ordering Information Example

Product Code
Male Plug
P = Surface Mountable Plug

EP P-132-QF03-SMLP-M

SMLP=Small Base LowProfile
M = Male pins on top
Male Plug Footprint (see Footprint Section)
Pin Count

PQFP

Female Pins on Top	Document #
EPP-064-QF29B-SMLP	F5408
EPP-080-QF14-SMLP	F4049
EPP-100-QF06-SMLP	F4047
EPP-128-QF13-SMLP	F4099
EPP-132-QF03-SMLP	F3959
EPP-160-QF07-SMLP	F4045
EPP-208-QF21-SMLP	F4042
EPP-240-QF62-SMLP	F4041
EPP-352-QF71-SMLP	F5421

Male Pins on Top	Document #
EPP-132-QF03-SMLP-M	F4100
EPP-160-QF07-SMLP-M	F4101

LOW PROFILE, HAND SOLDERABLE, REFLOW PROCESS PQFP

- Low profile, vertical clearance 0.2", not reusable
- PCB material is FR4
- Manufacturing tolerances +/- 0.002
- Requires high precision soldering techniques (precision solder mask)
- Hand solderable

HOW TO ORDER

1) Determine the footprint of your device (see Footprint Section), such as QF14, and find the EPP part with the same footprint.

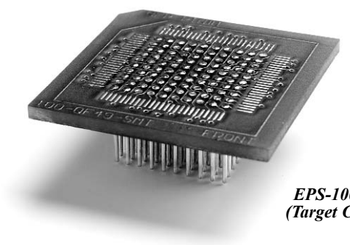
For a complete listing of emulator adapters pricing and delivery information, see:
Web Link: **www.1800adapter.com/023**

EMULATOR PODS - SURFACE MOUNTABLE - PQFP/TQFP

EMULATION INTERCONNECT SYSTEM

Emulation Technology, Inc. now offers a time-saving Interconnect System for your fine pitch PQFP/TQFP packages. This interconnect system is specifically designed for use in the emulation/debug/development environment.

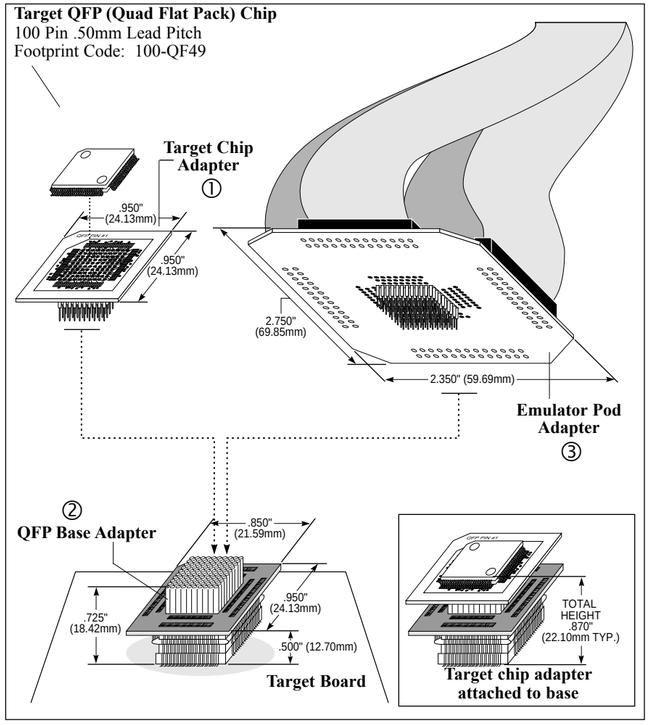
Just surface mount the PQFP/TQFP base adapter to your target board. Once the base is in place, you are free to plug in your emulator pod adapter or target chip adapter.



EPS-100-QF49-SM
(Target Chip Adapter)

① Target Chip Adapter		② QFP Base Adapter		③ Emulator Pod Adapter
Description	**Document #**	**Description**	**Document #**	
EPS-080-QF14-SM	F5517	EPP-080-QF14A-SM	F1199	AX5-080-QF47/14-18
EPS-080-QF47-SM	F4584	EPP-080-QF47-SM	F2007	
EPS-100-QF01-SM	F4585	EPP-100-QF01-SM	F1713	
EPS-100-QF06-SM	F4183	EPP-100-QF06-SM	F4337	AX5-100-QF06-18
EPS-100-QF49-SM	F3901	EPP-100-QF49-SM	F1634	AX5-100-QF49-18
EPS-132-QF03-SM	F4307	EPP-132-QF03-SM	F1640	
EPS-144-QF10-SM	F4276	EPP-144-QF10-SM	F1360	
EPS-144-QF63-SM	F5005	EPP-144-QF63-SM	F1631	
EPS-176-QF67-SM	F5568	EPP-176-QF67-SM	F1109	

Target QFP (Quad Flat Pack) Chip
100 Pin .50mm Lead Pitch
Footprint Code: 100-QF49



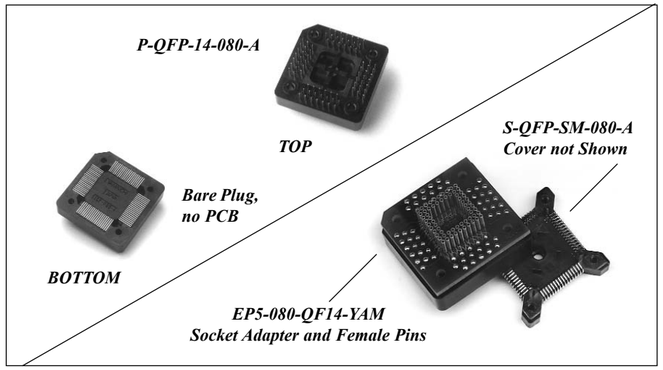
HOW TO ORDER

1) Determine the pin count and footprint of your device (see Footprint Section).
2) If you do not find an ET compatible part number for your device, call the factory or your local distributor for assistance.

For a complete listing of emulator adapters pricing and delivery information, see:

Web Link: **www.1800adapter.com/093**

YAMAICHI - SURFACE MOUNTABLE - EMULATOR PODS



EMULATOR PLUGS FOR SURFACE MOUNT PQFP PRODUCTION SOCKETS

- Allows emulation using Yamaichi production sockets
- Small and compact
- Adapters allow you to plug in the following:

  Emulator adapters
  - Logic analyzer/scope adapters
  - Your own custom pod or cable

Ordering Information Example

Product Code ——— EP (5)-080-QF14-A YAM — YAM = Yamaichi Socket Mount
Male Plug: 5 = Socket Plug
Pin Count
A = A Socket Version
PQFP Package Footprint (Footprint Section)

HOW TO ORDER

1) Determine the pin count and footprint of your device (see Footprint Section).
2) Select the corresponding Footprint Code in the Yamaichi PQFP Plug column of the table.
3) Select the corresponding socket, plug base, or plug only that you need.

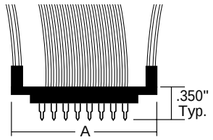
Footprints (see Footprint Section)	Surface Mount Production Sockets		Socket Adapter and Female Pins		Yamaichi PQFP Plugs	
Footprint Code	Part #	Drawing #	Part #	Drawing #	Part #	Drawing #
100-QF01	S-QFP-SM-100-C	SKT429	EP5-100-QF01-YAM	F3783	P-QFP-01-100-A	SKT548
100-QF06	S-QFP-SM-100-D	SKT503	EP5-100-QF06-YAM	F2165	P-QFP-06-100-A	SKT152
160-QF07	S-QFP-SM-160-A	SKT432	EP5-160-QF07-YAM	F2129	P-QFP-07-160-A	SKT153
80-QF08-A	S-QFP-SM-080-A	SKT424	EP5-080-QF08-YAM-A	F2232	P-QFP-08-080-A	SKT154
80-QF08-B	S-QFP-SM-080-C	SKT426	EP5-080-QF08-YAM-B	F2233	P-QFP-08-080-B	SKT155
80-QF14	S-QFP-SM-080-B	SKT425	EP5-080-QF14-YAM	F2177	P-QFP-14-080-A	SKT156
64-QF29	S-QFP-SM-064-B	SKT501	EP5-064-QF29-YAM	F1791	P-QFP-29-064-A	SKT157
112-QF36	S-QFP-SM-112-A	SKT341	EP5-112-QF36-YAM	F1341	P-QFP-36-112-C	SKT158
100-QF49	S-QFP-SM-100-B	SKT428	EP5-100-QF49-YAM	F2541	P-QFP-49-100-A	SKT159
144-QF10	S-QFP-SM-144-B	SKT536	EP5-144-QF10-YAM	F5015	P-QFP-07-160-A	SKT153
144-QF63	S-QFP-SM-144-A	SKT535	EP5-144-QF63-YAM	F5397	P-QFP-63-144-A	SKT912

For a complete listing of emulator adapters pricing and delivery information, see:

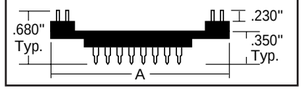
Web Link: **www.1800adapter.com/025**

EMULATOR PODS - PGA, LCC & PLCC

PGA with Cable



PGA with Wire Wrap Posts



PGA

10 X 10	Document #	Dim. A
EP2-068-PGA2-18	F1090	1.70" SQ.
11 X 11		
EP2-068-PGA1-12	F2489	1.80" SQ.
14 X 14		
EP2-196-PGA8-18	F2509	2.40" SQ.

- Emulator pods can be wired directly to test equipment or emulators where access to a PGA or PQFP socket is required
- Available with male 0.025" square wirewrap posts or 12"or 18" cables
- Now available for soldering to PQFP SMT pads on a PC board, allows you to lay out your PC board with PQFP pads and still access your PC board with test equipment

For a complete listing of PGA emulator adapters, and additional information see:

Web Link: **www.1800adapter.com/027**

PGA Ordering Information Example

Pin Count
Product Code
Male Plug: 5 = Socket Plug — EP 5-100-PGA2-*
Male Plug Footprint (see Footprint Section)

- NW = No Wire Wrap Posts
- W = Wire Wrap Posts
- 12/18/36 = Cable Length (inches)
- SM = Small Base

Socket Type: A = AMP, T = TEXTOOL

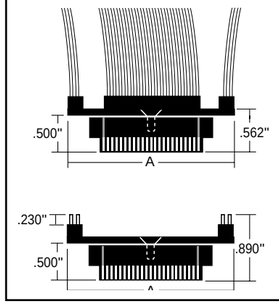
Ordering Information Example

Pin Count
Product Code — EP 4-44-PCC3-*
Male Plug

- NW = No Wire Wrap Post
- W = Wire Wrap Post
- 12/18 = Cable Length (inches)

Male Plug Footprint (see Footprint Section)

PLCC with Cable



LCC

Description	Document #	DIM. A
EP3-32-LCC7-12 (18)	F1818	1.20" SQ.
EP3-44-LCC3-12 (18)	F1819	.65" SQ.
EP3-68-LCC2-12	F1825	.95" SQ.
EP3-68-LCC2-18	F1826	.95" SQ.

PLCC

Description	Document #	DIM. A
EP4-20-PCC2-W	F1114	.95" SQ.
EP4-20-PCC2-18	F1613	.95" SQ.
EP4-28-PCC6-W	F1115	1.35" SQ.
EP4-28-PCC6-18	F1614	1.35" SQ.
EP4-32-PCC7-W	F1555	1.2" SQ.
EP4-32-PCC7-12	F2524	1.2" SQ.
EP4-32-PCC7-18	F1113	1.2" SQ.
EP4-44-PCC3-NW	F2527	1.45" SQ.
EP4-44-PCC3-W	F1193	1.45" SQ.
EP4-44-PCC3-12	F2526	1.45" SQ.
EP4-44-PCC3-18	F1615	1.45" SQ.
EP4-52-PCC4-W	F1448	1.55" SQ.
EP4-52-PCC4-12	F2528	1.55" SQ.
EP4-52-PCC4-18	F1616	1.55" SQ.

PLCC

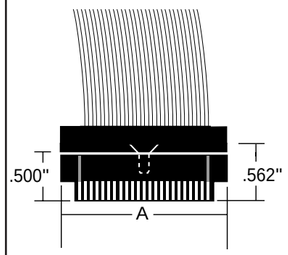
Description	Document #	DIM. A
EP4-68-PCC1-NW	F1065	1.75" SQ.
EP4-68-PCC1-W	F1132	1.75" SQ.
EP4-68-PCC1-12	F2532	1.75" SQ.
EP4-68-PCC1-18	F1617	1.75" SQ.
EP4-84-PCC5-NW	F1119	1.95"SQ.

For a complete listing of LCC & PLCC emulator adapters , please see:

Web Link: **www.1800adapter.com/025**

COMPACT SIZE - PLCC - EMULATOR PODS

PLCC with Cable



PLCC Ordering Information Example

Product Code — EP 4-052-PCC4-18-NB — ET Internal Use
Male Plug — Cable Length (inches)
Pin Count — Package Footprint (see Footprint Section)

FEATURES

- Emulator pods can be wired directly to test equipment or emulators where access to a PLCC socket is required in a confined space
- Available with 12", 18", and 32" cables
- Adapter can be used to connect a daughter board

HOW TO ORDER

1) Determine the footprint of your device (see Footprint Section).
2) Select cable length 12" or 18"
3) Select the corresponding ET part # from the table.

Customs available upon request.

For a complete listing of PLCC emulator adapters, and additional information see:

Web Link: **www.1800adapter.com/028**

PLCC			PLCC		
Description	**Document #**	**DIM. A**	**Description**	**Document #**	**DIM. A**
EP4-020-PCC2-18-NB	F2515	.50"	EP4-068-PCC1-32-NB	F1924	1.10"
EP4-028-PCC6-18-NB	F1335	.60"	EP4-084-PCC5-12-NB	F2519	1.30"
EP4-032-PCC7-12-NB	F1481	.60" X .70"	EP4-084-PCC5-18-NB	F2168	1.30"
EP4-032-PCC7-18-NB	F2126	.60" X .70"			
EP4-044-PCC3-12-NB	F2516	.80"			
EP4-044-PCC3-18-NB	F2127	.80"			
EP4-068-PCC1-12-NB	F2518	1.10"			
EP4-068-PCC1-18-NB	F1037	1.10"			

PLCC Vacuum Insertion Tool

- Use this tool to easily insert PLCC packages into their sockets.
- Inserters works on PLCC packages with pin counts 28 to 84
- Conductive plastic material is an active grounding device against static charging

PLCC Extraction Tool

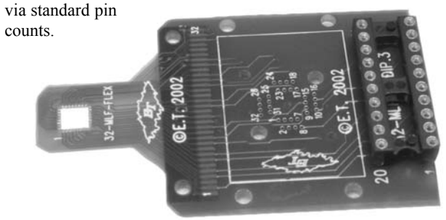
- Use this to extract PLCC packages from their production sockets
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, 84, and 100 pin counts

P/N-290N-SUN

Try our PLCC Tools. Learn more about these tools and others by visiting:
Web Link: www.1800adapter.com/053

EMULATOR ADAPTERS - MLF/QFN

Easily connects to an in-circuit emulator via standard pin counts.



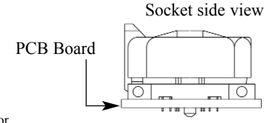
This emulator can quickly be transformed for programming and logic analysis.

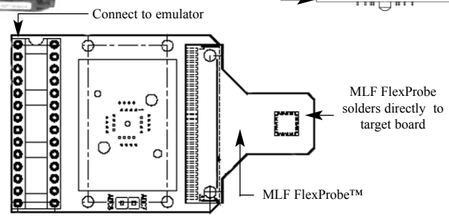
EMULATE. ANALYZE. PROGRAM.

Ordering Information Example

DIP Width (.3=.300", .6=.600")
Female Top Socket — Device to be emulated
Product Code — AS-DIP28.3-32 ML04S-MEGA8
Pin Count — Footprint Code

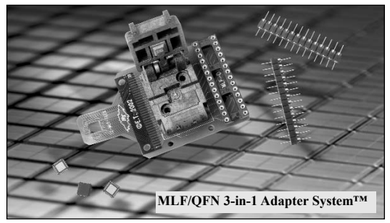
For a complete list of adapter specifications, pricing and delivery information, please see: Web Link: **www.1800adapter.com/060**





MLF/QFN 3-in-1 Adapter System™

The QFN/MLF 3-in-1 Adapter System™ ensures quick and easy configuring and interfacing to an in-circuit emulator, device programmer, logic analyzer or oscilloscope. The first of its kind, this 3-in-1system provides the solution for test and design engineers needing QFN (Quad Flat Non-leaded) or MLF (Micro Lead Frame) signal access. This system supports the ATMEL® ATtiny26, ATtiny28, ATmega8, ATmega16 and ATmega32 8-bit AVR® Microcontrollers.


MLF/QFN 3-in-1 Adapter System™

FEATURES & BENEFITS

- Reduces cost of ownership by 50-66% by eliminating the need for three separate adapters
- Change chip packages rapidly
- Flexible target interconnect minimizes physical strain on target pads
- Excellent for in-circuit or out of circuit programming
- Monitor signals - Logic Analysis
- Quick interface In-Circuit Emulator
- Compact design ensures signal integrity

MLF/QFN LOGIC ANALYZER ADAPTER (ONLY) PART NUMBERS — **Logic Analyzer Adapter Only**

Top DIP Pin Count	Top DIP Width (Inches)	BottomSMT SMT Pin Count	Bottom SMT Lead Pitch (mm)	Body Size	Footprint Code	ET Part #	Drawing #
28	0.300	32	0.50	5X5	32-ML04	AS-DIP28.3-32ML04S-MEGA8	F6658
20	0.300	32	0.50	5X5	32-ML04	AS-DIP20.3-32ML04S-TINY26	F6659
40	0.600	44	0.50	7X7	44-ML05	AS-DIP40.6-44ML05S-MEGA16/32	F6660
40	0.600	44	0.50	7X7	44-ML05	AS-DIP40.6-44ML05S-MEGA162	F6661

MLF/QFN 3-IN-1 ADAPTER SYSTEM PART NUMBERS — **Complete 3-in-1 Adapter System**

Pin Count	Pin Map	SMT Lead Pitch (mm)	Body Size	Footprint Code	ET Part #	Drawing #
32	ATMEL MEGA 8	0.50	5X5	32-ML04	BCP-032-ML04Z-MEGA8-3IN1	F6730
32	ATMEL TINY 26	0.50	5X5	32-ML04	BCP-032-ML04Z-TINY26-3IN1	F6727
44	MEGA16/32, 8535	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA16/32-3IN1	F6728
44	MEGA 162, 8515	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA162-3IN1	F6729

Complete 3-in-1 Adapter System:
- Logic Analyzer Adapter
- Program Adapter
- Emulator Adapter

EMULATOR POD EXTENDERS

Date: _____

To: ET Technical Sales Department

From: _____

Co: _____

Tel: _____

Fax: _____

# of Pages: _____

EC-M-068-PCC1-F-068-PGA1-08
EC-M-068-PCC1-F-068-PCC1-24

FEATURES

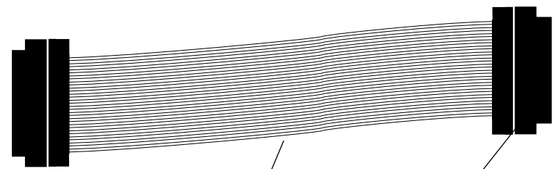
- A socket extender acts like an extension cord for your target socket; it connects your emulator pod to your target socket in a tight card cage
- Socket extenders are available for most packages types and configurations including PQFP, PGA, LCC, and PLCC pods
- Socket extenders can be male to male, male to female, or female to female

PREP WORKSHEET FOR WEB OR FAX

Use this prep worksheet to help you prepare answers for our online quotation form. Be prepared to provide the information where the blank lines are found. *If you prefer, you may complete this worksheet and fax it to 408-982-0664.*

1) Visit the ET Web site and complete the online form at:
www.emulation.com/technical
2) Using the information on this worksheet, complete all required fields on the online form
3) Attach package drawings in .pdf format

ET's technical support group will contact you promptly with confirmation.



END ONE

Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

Cable Length
(in inches) _____

END TWO

Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

*Consult factory for length and width dimensions of male and female pods.

Important:
I need _____ units, delivered in _____ days.

Custom Assemblies are Non-Cancelable, Non-Returnable Items

- Please check the part description above, carefully, against your application.
- Due to the fact that these are custom parts, they are non-returnable.

NOTES

FIELD-CONFIGURABLE ADAPTERS & CABLES

ALL PURPOSE ADAPTERS, CABLES & EXTENDERS... pg 58

You wire wrap the top PCB to the bottom PCB after you receive the adapter.

- Complete line of male/female sockets for DIP, LCC, PLCC, PQFP, and PGA packages
- Wire-wrappable Convert-A-Socket converts any type of socket to any different type of socket regardless of pin count
- Eliminates weeks of waiting or paying for NRE or minimum order charges just to have a special board made
- Wire wrap your converter yourself for total pin-to-pin flexibility

PROGRAMMING ADAPTERS.... pg 60

- For programming PROMs, PLDs, EPROMs, EEPROMs, and PALs.
- Designed to fit all types of programmers
- You wire the connections between the outer and inner posts yourself according to your own pin configurations.
- Complete line of male/female sockets for DIP, LCC, PLCC, PQFP, and PGA packages
- The inner posts are connected to the DIP plug (on the bottom). The outer posts are connected to the PLCC socket (on top)
- Wire-wrappable Convert-A-Socket converts any type of socket to any different type of socket regardless of pin count
- Eliminates weeks of waiting or paying for NRE or minimum order charges just to have a special board made
- Wire wrap your converter yourself for total pin-to-pin flexibility

EMULATOR ADAPTERS..... pg 60

Connect any pin of your DIP to any pin of your PLCC and you are ready to emulate.

- Pin numbering is provided for easy wire-wrapping.
- A socket extender acts like an extension cord for your target socket; it connects your emulator pod to your target socket in a tight card cage
- Socket extenders are available for most packages types and configurations including PQFP, PGA, LCC, and PLCC pods
- Socket extenders can be male to male, male to female, or female to female

Why you need a field configurable adapter

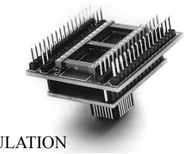
We know that no two designs are the same, and know that we can configure any adapter you can imagine. Our 20 years of adapter design experience and over 10,000 parts in inventory ensure that you we will meet your needs.

USE ET ALL PURPOSE ADAPTERS FOR:

- Emulation
- Logic Analysis
- Programming
- Debug
- IC Testing
- Best for low quantities (1 or 2)
- Quick Solution: 3-10 days delivery
- No minimum order required and
- No non-recurring engineering (NRE) charges

CIRCUIT FIX & CHIP TESTING

PROGRAMMING



EMULATION

FIELD CONFIGURABLE - ALL PURPOSE ADAPTERS

Date: _____

To: _____

From: ET Technical Sales Dept.

Co: _____

Tel: _____

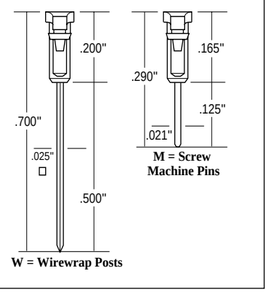
Fax: _____

# of Pages: _____

FEATURES

- Complete line of male/female sockets for DIP, LCC, PLCC, PQFP, and PGA packages
- Wire-wrappable Convert-A-Socket converts any type of socket to any different type of socket regardless of pin count
- Eliminates weeks of waiting or paying for NRE or minimum order charges just to have a special board made
- Wire wrap your converter yourself for total pin-to-pin flexibility

Figure 1



Non-Cancelable Non-Returnable Item

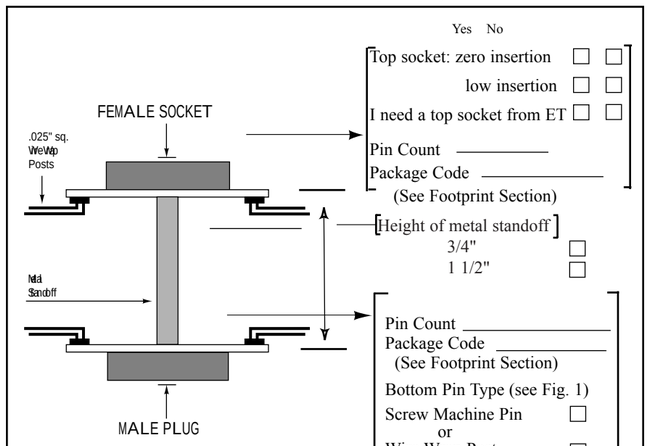
- Please carefully check the part description above against your application.
- Due to the fact that these are custom parts, they are non-cancelable and non-returnable.

PREP WORKSHEET FOR WEB OR FAX

Use this prep worksheet to help you prepare answers for our online quotation form. Be prepared to provide the information where the blank lines are found. *If you prefer, you may complete this worksheet and fax it to 408-982-0664.*

1) Visit the ET Web site and complete the online form at:
   www.emulation.com/technical
2) Using the information on this worksheet, complete all required fields on the online form
3) Attach package drawings in .pdf format

ET's technical support group will contact you promptly with confirmation.



Yes No

Top socket: zero insertion ☐ ☐
low insertion ☐ ☐
I need a top socket from ET ☐ ☐
Pin Count _____
Package Code _____
(See Footprint Section)

Height of metal standoff
3/4" ☐
1 1/2" ☐

Pin Count _____
Package Code _____
(See Footprint Section)

Bottom Pin Type (see Fig. 1)
Screw Machine Pin ☐
or
Wire Wrap Post ☐
or
Surface Mount ☐
or
PLCC Plug ☐
or
Socket Plug (QFP Only) ☐
Amp
Textool ☐

Important:
I need _____ units,
delivered in _____ days.

Check here if you are using an AMP Low Profile socket ☐

ET Marketing Use Only:

CS – ☐ - ☐☐☐☐☐☐☐☐☐ - ☐☐☐☐☐☐☐☐ - ☐ - ☐ - ☐ - W W

- 1=Socket Included / 0=Socket NOT Included
- Top Socket Types: Z = ZIF*, L = LIF**
- Bottom Pin Type: W=Wire wrap post; M= Screw Machine pins; S = SMT (A=Amp, T=Textool)
- Chip Package
- Product Code
- Target Socket
- Target Socket Pin Count

ET Quote:
Quantity: _____ Price: _____ Delivery: _____

*ZIF = Zero Insertion Force
**LIF = Low Insertion Force

QUOTE NUMBER _____

CABLE & EXTENDERS BUILD TO ORDER - FIELD CONFIGURABLE

Date: _____
To: ET Technical Sales Department
From: _____
Co: _____
Tel: _____
Fax: _____
# of Pages: _____

EC-M-068-PCC1-F-068-PGA1-08
EC-M-068-PCC1-F-068-PCC1-24

FEATURES

- A socket extender acts like an extension cord for your target socket; it connects your emulator pod to your target socket in a tight card cage
- Socket extenders are available for most packages types and configurations including PQFP, PGA, LCC, and PLCC pods
- Socket extenders can be male to male, male to female, or female to female

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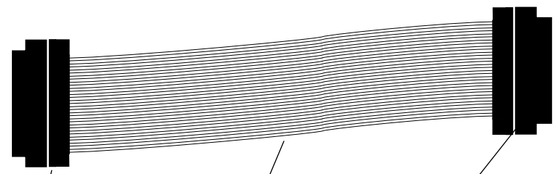

END ONE
Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

Cable Length
(in inches) _____

END TWO
Pin Count _____
*Male ☐ Female ☐
Footprint _____
(See Footprint Section)

*Consult factory for length and width dimensions of male and female pods.

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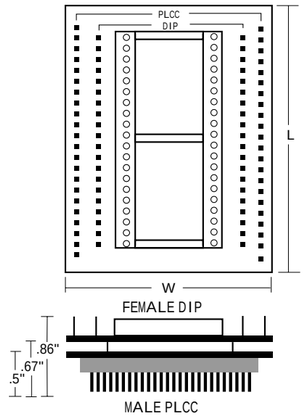
NOTES

FIELD CONFIGURABLE - EMULATOR & PROGRAMMING ADAPTERS

EMULATOR PODS

Connect any pin of your DIP to any pin of your PLCC and you're ready to emulate. Pin numbering is provided for easy wire wrapping.



Ordering Information Example

DIP Device
Female Receptacle
Product Code
Male Plug

AS-DIP-PCC-28 28 G Z

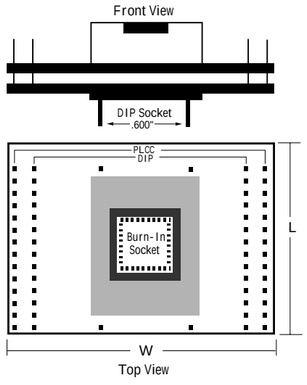
Top Pin Count
Bottom Pin Count
Z = DIP socket is Zero Insertion Force
Generic

Emulator Adapters

Description		ET Part #	Dimensions		Document #
FEMALE	MALE		L	X W	
28-pin DIP	28-pin PLCC	AS-DIP-PCC-2828G	1.6"	1.65"	F2014
28-pin ZIF DIP	28-pin PLCC	AS-DIP-PCC-2828GZ	1.6"	1.65"	F3058
28-pin DIP	32-pin PLCC	AS-DIP-PCC-2832G	1.8"	1.6"	F3059
28-pin ZIF DIP	32-pin PLCC	AS-DIP-PCC-2832GZ	1.8"	1.65"	F3060
32-pin DIP	32-pin PLCC	AS-DIP-PCC-3232G	1.8"	1.6"	F1136
32-pin ZIF DIP	32-pin PLCC	AS-DIP-PCC-3232GZ	1.8"	1.6"	F3061
40-pin DIP	44-pin PLCC	AS-DIP-PCC-4044G	2.5"	2.0"	F3062
40-pin DIP	44-pin PLCC	AS-DIP-PCC-4044G-(GANG)	2.5"	2.0"	F4749
64-pin DIP	68 pin PLCC	AS DIP-PCC-6468G	3.65"	1.95"	F2136
64-pin Shrink DIP	68-pin PLCC	AS-SDIP-PCC-6468G	3.65"	1.95"	F1022
		SURFACE MOUNT			
40-pin DIP	44-pin QFP	AS-DIP-QF16S-4044G	2.55"	1.95"	F3883

PROGRAMMING ADAPTERS

- You wire the connections between the outer and inner posts yourself, according to your own pin configurations.
- The inner posts are connected to the DIP plug (on the bottom). The outer posts are connected to the PLCC socket (on top).



Programming Adapters

Description		ET Part #	Dimensions		Document #
FEMALE	MALE		L	x W	
44-pin PLCC	40-pin DIP	AS-44-40-00P-6TEX	2.3"	2.9"	F1270
44-pin LCC	40-pin DIP	AS-44-40-00L-6	2.3"	2.9"	F3237

ULTRA MINI POGO PINS

Need custom POGO PINS fast? Now available and in stock from ET.

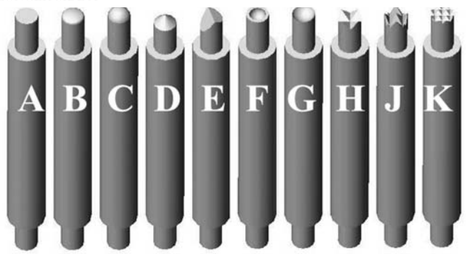
Request a quote today.

Pin Grid Pitch	0.5mm	0.8mm or 0.75mm	1.00mm	1.27mm	2.54mm
Typical Mechanical Specifications					
Full Travel (mm) (Spring stroke)	0.5	0.8	1	1	2
Min. pre-loaded spring force (N) 20%	0.03	0.05	0.06	0.08	0.1
Min. spring force on travel (N) 20%	0.3	0.5	0.6	0.8	1
Min. Life (cycles)	1KK	1KK	1KK	1KK	1KK
Typical Electrical Specifications					
Max. Continuity resistance (mOhm)	100	50	50	50	50
Max. pin-pin Capacitance (pF)	0.5	0.3	0.2	0.2	0.2
Max. top-bottom Reactance (nH)	1	0.5	0.6	0.7	0.8
Typical Material Specifications					
Plunger	**Brass / Ni(2-4um) / Au(0.7-0.9um) Plate**				
Shell	**Brass / Ni(2-4um) / Au(0.7-0.9um) Plate**				
Spring	**SUS / Cu / Au Plate**				

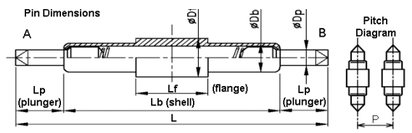
Lead Pitch Range	Plunger A	Plunger B	Length (mm)	ET Part #	Drawing #
0.50mm-1.27mm	E	H	2.00	POGO-PIN-2.00-1	SKT1762
0.50mm-1.27mm	E	H	2.55	POGO-PIN-2.55-1	SKT1769
0.50mm-1.27mm	E	H	3.20	POGO-PIN-3.20-1	SKT1766
0.80mm-1.27mm	E	H	3.30	POGO-PIN-3.30-1	SKT1766
0.65mm-1.27mm	E	H	5.70	POGO-PIN-5.70-1	SKT1768
0.80mm-1.27mm	E	H	3.00	POGO-PIN-3.00-1	SKT1770
1.00mm-1.27mm	H	H	5.80	POGO-PIN-5.80-1	SKT1767
1.00mm-1.27mm	H	H	4.30	POGO-PIN-4.30-1	SKT1771
2.54mm	B	J	12.80	POGO-PIN-12.8-1	SKT1619
0.80mm-1.27mm	E	H	5.58	POGO-PIN-5.58-1	SKT1476
0.50mm-1.27mm	E	H	5.67	POGO-PIN-5.67-1	SKT1477
1.27mm	H	H	5.95	POGO-PIN-5.95-1	SKT1785

PLUNGER STYLES

PLUNGER SIDE A



PLUNGER SIDE B



Try our **Magnetic Pickup Tool...***to assist you in working with pogo pins. This tool telescopes, has a magnetic tip capable of picking up 1.5 pounds. The perfect tool for your lab.*

Web Link: www.1800adapter.com/051

Try our **Magnifyer Tools...***to assist you in working with pogo pins or attaching a probe to a signal. Our magnifying visor will keep both hands free while our 2" magnifier provides 5X magnification.*

Web Link: www.1800adapter.com/054

Custom pogo pins are available with a delivery of two weeks and no NRE. Contact us via our Web site for a quotation or call us today. **www.emulation.com/technical**

For a complete list of pogo pins, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/017**

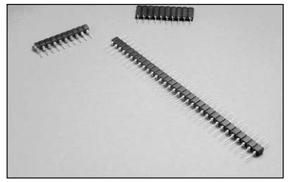
INTERCONNECTS - WIRING ACCESSORIES

HEADERS

Description	PER STRIP	TOTAL LENGTH	TOTAL WIDTH	END A LENGTH	END B LENGTH	END A DIAMETER	END B DIAMETER	Part #
HEADER - FEMALE	32	.290"	.100"	N/A	.120"	N/A	.020"	HEADER-FEM-32
HEADER - FEMALE	36	.395"	.100"	N/A	.120"	N/A	.023"	T36-118F275SlR
HEADER - MALE	32	.475"	.100"	.165"	.150"	.018"	.018"	HEADER-MALE-32

Try our **New Soldering Iron Systems**
Temperature controlled, compact soldering systems with additional soldering tips. (ESTD-SAFE version also)
Web Link: **www.1800adapter.com/150**

For a complete list of Headers, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/084**

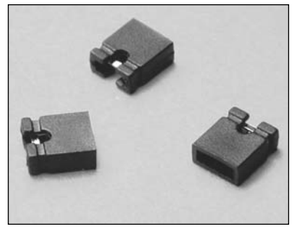


JUMPER SHUNTS

Description	PER STRIP	TOTAL LENGTH	TOTAL WIDTH	Part #
JUMPER-SHUNT	1EA	.238"	.200 x .100	JUMPER-SHUNT

Try our **New Soldering Iron Systems**
Temperature controlled, compact soldering systems with additional soldering tips. (ESTD-SAFE version also)
Web Link: **www.1800adapter.com/150**

For a complete list of Jumper Shunts, pricing and delivery information, please see:
Web Link: www.1800adapter.com/082

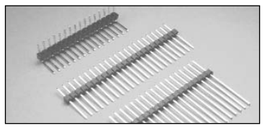


WIRE WRAP POSTS - .025" SQ Diameter

Description	Per Strip	Total Length	Total Width	End A Length	End B Length	ET Part #	Drawing #
RIGHT ANGLE -SINGLE STRIP	36	N/A	.100"sq.	.325"	.225"	T36-230M285R1WG	PN1004
RIGHT ANGLE -DUAL STRIP	36	N/A	.100"sq.	.325"	.225"	T36-230M285R2WG	PN1018
RIGHT ANGLE -SINGLE STRIP	36	N/A	.100"sq.	.790"	.230"	T36-230M790R1WG	PN1031
RIGHT ANGLE -DUAL STRIP	36	N/A	.100"sq.	.790"	.230"	T36-230M790R2WG	PN1032
STRAIGHT -SINGLE STRIP	36	.630"	.100"sq.	.230"	.300"	T36-300M230SlWG	PN1009
SINGLE PINS	1EA	.634"	.025"sq.	N/A	N/A	WWPINS-.634	PN1063
STRIP	36	.430"	.100"sq.	.100"	.230"	WWPOST-36-AS	PN1060
STRIP	36	.525"	.100"sq.	.200"	.325"	WWPOST-36-AS-II	PN1001
STRIP	36	1.230"	.100"sq.	.320"	.810"	WWPOST-36-BC4	PN1013
STRIP	36	.725"	.100"sq.	.225"	.400"	WWPOST-36-PGA	PN1003
STRIP	40	.100"	.100"sq.	.100"	.400"	WWPOST-40-AS-3M	PN1010
STRIP	40	.450"	.100"sq.	.120"	.230"	WWPOST-40-PGA	PN1002
SINGLE PINS	1EA	.500"	.012"sq.	.500"	.080"	WWPOST-SMT-.012	PN1053
SINGLE PINS	1EA	.480"	.025"sq.	.480"	.125"	WWPOST-SMT-.025	PN1036

(All Wire Wrap Posts are .025" square diameter)

For a complete list of wire wrap posts, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/081**



PRINTED CIRCUIT PINS & CONNECTORS - INTERCONNECTS

MALE, FEMALE & MALE TO FEMALE PRINTED CIRCUIT CONNECTORS

Description	PER STRIP	TOTAL LENGTH	TAIL LENGTH	TAIL DIAMETER	FEMALE DIAMETER	FEMALE HOLE DIAMETER	ET Part #
MALE TO FEMALE	1EA	.297"	.124"	.020"	.072"	.043"	PINS1
FEMALE ONLY	1EA	.146"	N/A	N/A	.053"	.053"	PINS1-FEM
MALE ONLY	1EA	.297"	.124"	.020"	N/A	N/A	PINS1-MALE
MALE TO FEMALE	1EA	.355"	.180"	.018"	.038"	.031"	PINS2
MALE TO FEMALE	1EA	.300"	.127"	.020"	.072"	.053"	PINS5

Drawings available upon request.

MALE TO MALE PINS

Description	PER STRIP	TOTAL LENGTH	END A LENGTH	END B LENGTH	END A DIAMETER	END B DIAMETER	ET Part #
PINS - MALE TO MALE	1EA	.250"	.077"	.157"	.039"	.018"	T01-125M170S1RG
PINS - MALE TO MALE	1EA	.410"	.150"	.150"	.039"	.018"	T01-150M150S1RG

Drawings available upon request.

For a complete list of pins, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/080**

CONNECTORS

DESCRIPTION	PIN COUNT	ET PART #	LENGTH
MALE CABLE & CONNECTOR	10 PIN	CON-WC-10-18	18"
MALE CONNECTOR SINGLE ROW	12 PIN	CON-NC-12	N/A
FEMALE SINGLE ROW CABLE CONNECTOR	12 PIN	CON-C-12-1-F	N/A
MALE CABLE & CONNECTOR	14 PIN	CON-WC-14-18	18"
MALE CONNECTOR SINGLE ROW	14 PIN	CON-NC-14	N/A
FEMALE SINGLE ROW CABLE CONNECTOR	16 PIN	CON-C-16-1-F	N/A
MALE CABLE & CONNECTOR	17 PIN	CON-WC-17-18	18"
MALE CONNECTOR SINGLE ROW	18 PIN	CON-NC-18	N/A
MALE CONNECTOR DUAL ROW	20 PIN	CON-P-20-2-M	N/A
FEMALE SINGLE ROW CABLE CONNECTOR	20 PIN	CON-NC-20	N/A
MALE CABLE & CONNECTOR	22 PIN	CON-WC-22-18	18"
MALE CONNECTOR SINGLE ROW	22 PIN	CON-NC-22	N/A
FEMALE TO FEMALE CONNECTOR	24 PIN	CON-WC-24-5-FF	N/A
MALE CONNECTOR SINGLE ROW	24 PIN	CON-NC-24	N/A
MALE CABLE & CONNECTOR	26 PIN	CON-WC-26-18	18"
MALE CABLE & CONNECTOR	26 PIN	CON-WC-26-18	18"
FEMALE TO FEMALE CONNECTOR	26 PIN	CON-WC-26-4-FF	N/A
MALE CONNECTOR SINGLE ROW	26 PIN	CON-NC-26	N/A
MALE CONNECTOR SINGLE ROW	32 PIN	CON-NC-32	N/A
MALE CABLE & CONNECTOR	34 PIN	CON-WC-34-18	18"
VERTICAL 2X17 CARD CONNECTOR	34 PIN	CON-P-34-2-F	N/A
MICTOR FEMALE CONNECTOR	38 PIN	CON-MICTOR-FEM-38-SMT	N/A
MALE CONNECTOR	52 PIN	CON-NC-52	N/A
MALE CONNECTOR DUAL ROW	60 PIN	CON-P-60-2-M	N/A
FEMALE CONNECTOR DUAL ROW	60 PIN	CON-P-60-2-F	N/A
RIBBON CABLE & CONNECTOR	64 PIN	CON-WC-64-18	18"
MALE CONNECTOR DUAL ROW	64 PIN	CON-NC-64	N/A

Drawings available upon request.

For a complete list of connectors, specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/083

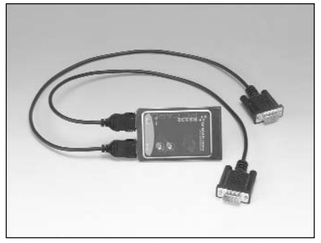
LAB & REWORK ACCESSORIES

SOLDERING SYSTEMS

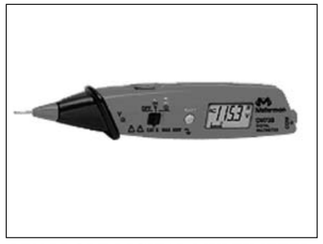
BGA REBALLING TRAINING KIT

HANDHELD TEST TOOLS

VACUUM SYSTEMS



PCMCIA RS232 CONVERTER CARDS



PEN PROBE DIGITAL MULTIMETER

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LAB & REWORK ACCESSORIES - MULTIMETER TEST TOOLS

Meterman™ is a line of more than 60 test and measurement products designed electronic and electrical technicians and engineers installing, building, troubleshooting, servicing or maintaining electronics. The Meterman line includes everything from rugged digital multimeters to basic and specialty testers for electrical and electronics testing. Component testers and specialty test tools are the right match for electronics troubleshooting.

MM-FG2C BENCHTOP MULTIMETER

- 3MHz function generator
- Easy push-button selection for power, range and waveform
- Square, triangle, sine wave and TTL/CMOS outputs
- Duty cycle and DC offset control VCF input
- Includes test cables and spare fuses Range: 0.3 Hz to 3 MHz, ± 5
- % of fullscale Main Output: >20 Vp-p open circuit, >10 Vp-p into 50 W load DC Offset Control: -10 V to +10 V(open)/-5 V to +5 V (50 W load) Duty Cycle: 80 % : 20 % : 80 % Cont. Variable VCF Input: (0 V to ±10 V) ±1 V input for 100:1 ratio Input Impedance: 10 kW ±10 %
- Note: Also available in 220 V version as MM-FG2CE

MM-FG2C

MM-SF10
Brush Probe

Exclusive patented technology provides the fastest and easiest method of finding shorts and tracing circuits on PCBs.

- Brush probe quickly pinpoints area of shorts and traces circuits in assembled printed circuits, multi-conductor cables, mass terminations systems, backplanes, connectors and IC sockets
- Low-test voltage protects sensitive circuitry and eliminates false continuity indications
- Many applications in depot service benches, production quality control and production engineering

MM-DM73B
Pen Probe Style Digital Multimeter

Designed for convenient, one-hand operation, the MM-DM73B pen-style meter is an ideal choice for measurements in tight spots. The MM-DM73B comes with a plug-in test lead, spare tip and battery. Protective case is an available option.

- Resistance to 34 MW
- 3400 count digital display plus analog bargraph
- Autoranging
- Data Hold™
- Continuity Test with Beeper
- Auto-off for Extended Battery Life
- UL, 3111-1 approved and meets EN61010-1

MM-IR610
Infrared Thermometer

The Meterman MM-IR610 is a portable, easy-to-use, compact-sized, digital infrared thermometer for measuring temperature in °C and °F. The MM-IR610 utilizes non-contact technology for measuring surface temperatures from a distance. The MM-IR610 brings the high technology of infrared temperature measurement into a value-priced thermometer.

- Laser pointer for accurate targeting
- Measures to 500°F (260°C), front panel switchable
- Narrow 10:1 field of view measures 1" at 10" distance
- Fixed emissivity at 0.95
- Certified to meet CE EN60825 Class II for Laser safety

For a complete list of multimeter tools, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/156**

HANDHELD COMPONENT TESTERS

P/N: MM-CR50

P/N: MM-LCR55

MM-CR50
Sort, match, QC inspect, and verify components, check circuits with this full range capacitance and resistance meter.

- Dual zero adjustment ports to null strays and test leads
- Special "Low Ohms" range
- Oversized, read-at-a-glance display
- Premium test leads with alligator clips

MM-LCR55
The ultimate component checker measures inductance, capacitance, resistance, transistors, diodes and microwave diodes.

- Plug-in test slots and test leads
- Oversized, read-at-a-glance display
- Data hold and max hold
- Auto-off

P/N: MM-37XR

True RMS digital multimeter with component and logic test

MM-37XR HANDHELD MULTIMETER
For electronics, the MM-37XR is a high-resolution, true RMS meter for troubleshooting electronic circuits at the bench or on the job site. The 37XR features capacitance, inductance, frequency, logic test, peak hold, dBm and backlight.

- Autoranging 10,000 count with 0.1% accuracy for the most accurate measurements
- LCR component test functions - inductance, capacitance and resistance
- Bright blue backlight for dim work environments
- CAT II 1000 V, CAT III 600 V and UL listed
- Magne-Grip™ holster with magnetic hanging strap frees both hands for work
- Min/Max, Avg, Rel and Data Hold
- Includes heavy-duty test leads with threaded alligator clips, manual, spare fuse and 9V battery

P/N: MM-37XR

P/N: MM-38XR

True RMS digital multimeter with optical PC interface

Includes heavy-duty test leads, threaded alligator clips, temperature adapter, type K thermocouple, manual, spare fuse and 9 V battery.

MM-38XR HANDHELD MULTIMETER
For Engineers designing and troubleshooting industrial automation and control systems, the MM-38XR delivers the highest safety rating available - CAT IV 600 V and CAT III 1000 V. The features include temperature, capacitance, frequency, 4-20mA loop current percentage, backlight and PC interface. With the addition of 38SW software and RS232 cable, the MM-38XR can be used for real-time data acquisition using any industry standard Windows® PC.

- 10,000-count with high 0.25 % accuracy
- Bright blue backlight for dim environments
- Duty cycle, capacitance and frequency
- Magne-Grip™ holster with magnetic hanging strap frees both hands for work
- 4-20 mA loop current with % readout
- Temperature to 2372°F/1300°C type K thermocouple included
- True RMS AC + DC coupled for accurate ripple measurements

P/N: MM-38XR

For a complete list of multimeter tools, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/156**

LAB & REWORK ACCESSORIES - SOLDERING IRON SYSTEMS

TEMPERATURE CONTROLLED SOLDERING SYSTEM

This soldering iron system includes the only iron to use switching technology allowing the closest possible monitoring of small temperature variations. This compact soldering system with its modern style takes up little space on the workbench. It is stackable so that two or more control bases and/or iron holders can be attached together where two different soldering tips and soldering iron temperatures can be maintained and used for one single job. Control base and the iron holder can be separated if needed.

Contact Specifications	
Input Voltage	200-240V~50Hz
Input Voltage	60W
Output Voltage	24V
Temperature Adjusting Range (C)	200 degrees C to 480 degrees C
Temperature Adjusting Range (F)	392 F-896 degrees F
Dimension (Base/Holder)	60(L)X110(W)X130(H)(46/90)mm
Weight (w/o Cord Assembly)	<1Kg

FEATURES & BENEFITS

- •Rapid heat up and recovery
- • Maintains constant set temperature; locking ability
- • Will maintain temperature under varying thermal loads, thus reducing dwell time. Critical for safe SMD rework
- • Set temperature without changing tip
- • Easy to use and comfortable
- • Compact enough to stack one station on top of another
- • Ideal for seperate solder desolder stations
- • Compact design takes up little space
- • Rugged contruction for field use
- • Various tips available for special applications

ETCS-2010 SOLDERING SYSTEM

Description	ET Part #
Temperature Controlled Soldering Iron	ETCS-2010
Replacement Soldering Iron (only)	ETCS-900
Replacement Soldering Iron Tip (only)	ETIP-018

ETCS-2015 SOLDERING SYSTEM (ESD-SAFE)

Description	ET Part #
Temperature Controlled Soldering Iron	ETCS-2015
Replacement Soldering Iron (only)	ETCS-901
Replacement Soldering Iron Tip (only)	ETIP-018

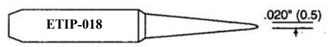
ADDITIONAL REPLACEMENT TIPS

Description	ET Part #
Soldering Iron Tip	ETIP-001
Soldering Iron Tip	ETIP-002
Soldering Iron Tip	ETIP-003
Soldering Iron Tip	ETIP-004
Soldering Iron Tip	ETIP-005
Soldering Iron Tip	ETIP-006
Soldering Iron Tip	ETIP-007

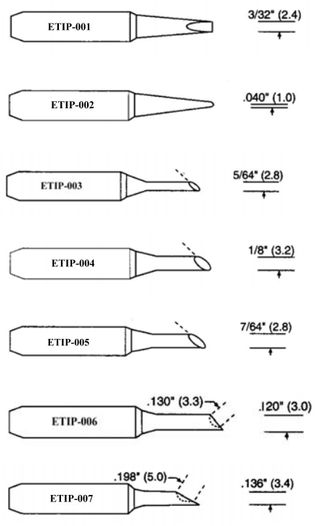
For a complete list of soldering iron tools along with specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/155**

P/N: ETCS-2010
or
P/N: ETCS-2015 (ESD-SAFE)

These soldering systems are stackable and compact saving you valuable lab space.



ETCS-2010 and ETCS-2015 come standard with soldering iron and a medium point soldering tip shown above. The special replacement tips below are available to meet your needs.



NEW!

P/N: ETCS-600

PORTABLE (PEN-SIZE) SOLDERING IRON

When connected to the power source, the fuzzy control circuit is activated.It enters into a standby mode keeping the soldering tip at the pre-soldering temperature of just below 392 F (200 C), thus making soldering work extremely efficient, Preventing oxidation of tips, therefore achieving much longer service life of the tips.

- Comes with one 1.5mm conical tip, a tip cap that makes storing convenient and a tip removal tool. A wide variety of tips are available for different applications.

P/N: ETCS-700

BATTERY POWERED SOLDERING IRON

Powered by 3AA size Alkaline batteries (included), there are no cords to get in your way. This soldering iron provides precision soldering capability for field or lab work when a power supply is not readily available.

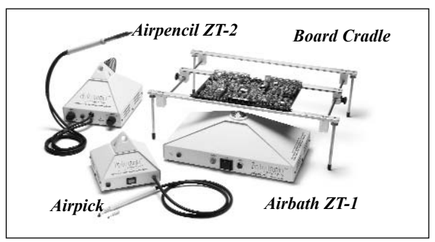
- Comes with one 1.5mm conical tip, a tip cap that makes storing convenient and a tip removal tool. A wide variety of tips are available for different applications.

DESOLDERING PUMPS

ESD-SAFE SOLDER SUCKER
- Molded from non-conductive material
- High efficiency and durable construction
- Self-cleaning tip
- Length: 13" / 330mm
- Weight: 3.5 oz. / 99 g

ESD-SAFE SINGLE HAND SOLDER SUCKER
- High quality
- Designed for single-handed operation
- Aluminum barrel for easy cleaning, self-cleaning tip
- Length: 8.5" / 216mm
- Weight: 1.5 oz. / 43 g

P/N: ET-SS350



ET Part#	Description
ET-ZT-1-120	Airbath ZT-1, analog preheater
ET-ZT-2-120	Airpencil ZT-2, air pencil
ET-ZT-3-120	Airpick, vacuum pick and place
ET-ZT-4-120	Fume Extractor *(not pictured)*
ET-ABC-1	Adjustable Board Cradle (10" x 18")
ET-ABC-2	Adjustable Board Cradle (20" x 18")

AIRBATH SOLDERING AND DESOLDERING EQUIPMENT

- By preheating PCB assemblies during low-volume or prototyping and rework jobs, the Airbath eliminates PCB warpage, lifted pads and IC degradation
- Provides a non-contact, safe method of soldering thermally sensitive semiconductors and delicate ceramic chips
- Its pinpointed air stream quickly reflows fine-pitched devices without touching the leads or pad
- An all-purpose handling system for miniature surface mount devices and small components
- The Adjustable Board Cradles provide a sturdy open frame table top fixture, for printed boards. The board cable holds and locks PCB's from 1/32" to 1/8"

For a complete list of soldering & desoldering tools, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/155**

LAB & REWORK ACCESSORIES - DESOLDERING KITS & ACCESSORIES

CHIP QUIK®
SURFACE MOUNT DEVICE REMOVAL KIT

This kit is designed to assist engineers in removing SMDs. The Chip Quik method surpasses all others regarding time and money. This method requires no expensive removal equipment or potentially damaging heating guns.

DESCRIPTION

Chip Quik is a specially formulated alloy in wire form designed to melt at the low temperature of 136 degrees F, 58 degrees C. It eliminates the potential for damage to the circuit, adjacent components, and the device itself. This method requires no expensive removal equipment or potentially damaging heating guns. The removal process is suprisingly easy. Liquid flux and a soldering iron are used to melt the Chip Quik low temperature alloy that is specially formulated to stay molten long enough to react with existing solder. The SMT device can then be easily removed with a vacuum pen.

FEATURES

- Quickly remove surface mounted devices (SMDs) without expensive rework equipment
- Removes QFPs, PLCCs, SOICs and others SMD chip components under 300 degrees F
- Prevents damage to the PC board, adjacent components, and the device itself
- Complete removal in four easy steps
- Easy clean-up
- Easy instructions provided

P/N: CQ123E
Starter Kit

P/N: CQ08E Alloy

P/N: CQ291E Flux

P/N: CQ2000E
Deluxe SMD Removal Kit

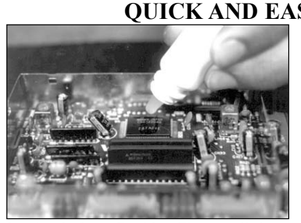
SMD Deluxe Solder/ Desolder Rework Kit (P/N: CQ2000E) Contains:

- Chip Quik removal alloy
- Solder paste
- Solder
- Chip Quik paste flux
- Liquid flux remover cleaner
- Probe kit
- Solder wick
- Handi Vac
- Acid brush
- Precision tweezers
- Cleaning wipers
- Swabs
- Alcohol pads
- Chip Quik SMD removal & clean up instructions

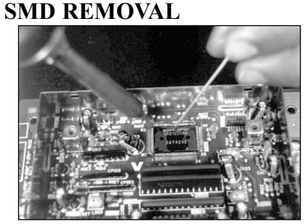
SMD REMOVAL ALLOY & ACCESSORIES

Part #	Description
Alloy (4 ft. cut into 6.5" lengths)	CQ08E
Alloy (16 ft. cut into 6.5" lengths)	CQ16E
Alloy (32 ft. cut into 6.5" lengths)	CQ32E
Alloy, No Lead (4 ft. cut into 6.5" lengths)	CQ08ENL
Alloy, No Lead (16 ft. cut into 6.5" lengths)	CQ16ENL
Alloy, No Lead (32 ft. cut into 6.5" lengths)	CQ32ENL
Flux, No Clean (10cc syringe)	CQ291E
SMD Removal Kit (Includes Flux & Alloy)	CQ123E

QUICK AND EASY SMD REMOVAL

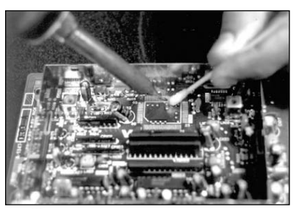


1. Apply Low Residue Flux to all the leads on the SMD you're removing



2. With a soldering iron, melt ChipQuik low temperature alloy

3. Easily lift device off the board with a vacuum pen



4. Thoroughly clean site and solder new device to PCB

Try our **Temperature Controlled Soldering** *System for optimal SMD removal.*
Web Link: www.1800adapter.com/155

For a complete list of SMD removal tools and specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/046**

0.80mm LEAD PITCH BGA PREFORMS

Ball Count	Package Size (mm)	BGA Grid Size	Ball Size (mm)	Ball Material	Fixture Part #	Preform Part #	Drawing #
100	10.00	12 X 12	0.50	64/37	ET-43-022	ET-41-498	SKT1861
144	12.00	12 X 12	0.45	63/37	ET-43-023	ET-47-016	SKT1753
196	12.00	14 X 14	0.50	63/37	ET-43-023	ET-41-301	SKT1862

1.00mm LEAD PITCH BGA PREFORMS

Ball Count	Package Size (mm)	BGA Grid Size	Ball Size (mm)	Ball Material	Fixture Part #	Preform Part #	Drawing #
81	10.00	9 X 9	0.45	64/37	ET-43-022	ET-41-440	SKT1863
256	17.00	16 X 16	0.45	63/37	ET-43-025	ET-41-035	SKT1864
484	27.00	26 X 26	0.50	63/37	ET-43-003	ET-41-317	SKT1866
484	23.00	22 X 22	0.60	63/37	ET-43-002	ET-41-414	SKT1867
820	37.50	36 X 36	0.60	63/37	ET-43-014	ET-41-129	SKT1754
836	42.50	41 X 41	0.63	63/37	ET-43-015	ET-41-240	SKT1800

1.27mm LEAD PITCH BGA PREFORMS

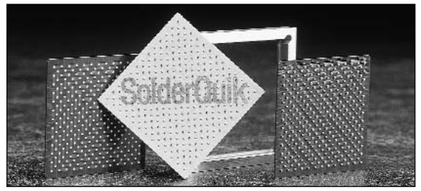
Ball Count	Package Size (mm)	BGA Grid Size	Ball Size (mm)	Ball Material	Fixture Part #	Preform Part #	Drawing#
272	27.00	20 X 20	0.76	64/37	ET-43-003	ET-41-560	SKT1869
304	30.00	23 X 23	0.76	63/37	ET-43-100	ET-41-063	SKT1870
304	31.00	23 X 23	0.76	63/37	ET-43-004	ET-41-676	SKT1871
324	27.00	20 X 20	0.76	64/37	ET-43-003	ET-41-516	SKT1872
352	35.00	26 X 26	0.76	64/37	ET-43-005	ET-41-596	SKT1873
360	25.00	19 X 19	0.76	63/37	ET-43-009	ET-41-762	SKT1874
361	25.00	19 X 19	0.76	64/37	ET-43-009	ET-41-545	SKT1875
400	27.00	20 X 20	0.76	64/37	ET-43-003	ET-41-523	SKT1876
420	35.00	26 X 26	0.76	63/37	ET-43-005	ET-41-622	SKT1877
456	35.00	26 X 26	0.76	64/37	ET-43-005	ET-41-544	SKT1878
480	37.50	29 X 29	0.76	64/37	ET-43-014	ET-41-611	SKT1879
575	31.00	24 X 24	0.76	63/37	ET-43-004	ET-41-058	SKT1880
596	40.00	30 X 30	0.76	63/37	ET-43-006	ET-41-565	SKT1881
600	45.00	35 X 35	0.76	64/37	ET-43-011	ET-41-591	SKT1882
665	40.00	31 x 31	0.76	63/37	ET-43-006	ET-41-313	SKT1883
676	35.00	26 X 26	0.76	63/37	ET-43-005	ET-41-680	SKT1884

Sold in packages of 25.

SOLDERQUIK™ BALL GRID ARRAY PREFORMS

SolderQuick preforms provide the most cost effective solution for reattaching solder spheres to Ball Grid Array (BGA) components. Whether prototyping, testing, or reworking, one can now easily ball or reball BGA components using SolderQuik BGA Preforms.

SolderQuik BGA consists of individual solder ball preforms held in a grid array by a water soluble paper/polymer holder. SolderQuik BGA Preforms are available in any standard or custom patterns, and solder ball diameters.



- Removes the need for stencils or special tools
- No more fumbling around with loose balls or hassling with washing flux from stencils
- Choose from the existing list of preforms, or send us your requirements
- Others available upon request

For additional information, specifications,pricing and delivery information, please see:
Web Link: **www.1800adapter.com/043**

BGA REBALLING TRAINING KIT

It's Fast. It's Easy. The Starter Kit will get you reballing today using SolderQuik Preforms.

Starter Kit includes:
- Quick reference guide
- Flux syringe
- Comprehensive manual
- Dispensing bottle for DI water
- Cleaning tray
- ESD cleaning brush
- Desoldering braid
- Conductive mat
- IPA wipes
- Acid brushes

NOTE: 1 package of 25 Preforms and fixtures are sold with each training kit.

Customer should send package outline drawing with order.

P/N: ET-43-200

For additional information, specifications,pricing and delivery information, please see:
Web Link: **www.1800adapter.com/047**

MAGNIFYING GLASSES

P/N: MAG 5X
- 2-inch magnifier with 5X aspheric lens provides sharpness needed when working with very small tools

P/N: MAG-EYES
- Magnifying headset leaves hands free for working
- Comes with 2 lenses of different magnfication (2.5 and 4.0 Diopter)
- Adjustable lens arms
- Lightweight and padded for comfort

MAG-EYES

MAG5X

For additional information, specifications,pricing and delivery information, please see:
Web Link: **www.1800adapter.com/054**

LAB & REWORK ACCESSORIES - VACUUM SYSTEMS AND TOOLS

SMD GENERAL PURPOSE VACUUM

A general purpose vacuum handling tool that plugs directly into the 110 VAC. This compact unit will handle most of the surface mount components used in industry today. The long life diaphragm vacuum pump generates six inches of mercury. The unit connects to ground automatically with a three wire power cord. This vacuum comes complete with the following features:

- Whisper-quiet operation
- 4 feet of straight vacuum hose
- 4 feet of coiled vacuum hose
- A set of seven vacuum tips
- A vacuum pick-up handle
- Rubber no-skid feet
- Produces vacuum of over six inches of mercury
- Optional side mounted handle holder

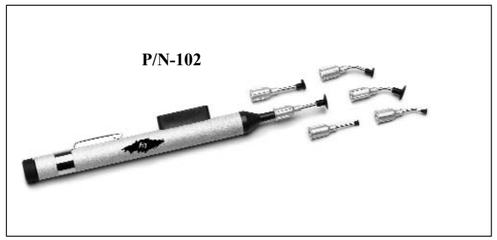
P/N-103

SMD Vacuum System	**P/N-103**
Replacement probe/ cup kit:	**P/N-103-PROBES**

VACUUM PEN (Side Plunger)

The P/N-102 vacuum pen comes with both straight and angled suction attachments for easier chip handling.

- Eliminates need to touch fragile QFP and SOIC packages
- Few mechanical parts; will last for years
- Vacuum is built in
- Comes with 6 tips: 3-straight, 3-angled



P/N-102

Vacuum Pen w/ cups	**P/N-102**
Replacement Cups: 2 Small, 2 Medium, 2 Large	**P/N-102-CUPS**

VACUUM PEN (End Plunger)

This hand-held vacuum pen with suction handle allows you to easily pick up fine pitch devices. Simply screw on one of the three cup sizes provided, place the pen over the device and depress plunger, then release the plunger to create a vacuum.

- Eliminates need to touch fragile packages
- Few mechanical parts; will last for years
- Comes with 3 cups

P/N-100

Vacuum Pen w/ cups	**P/N-100**
Replacement Cups: 1 Small, 1 Medium, 1 Large	**P/N-100-CUPS**

For a complete list of vacuum tools and specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/086**

NOTE: These tools are handling tools only, not to be used with force. Components should be handled with vacuum pick to ensure that coplanarity of leads is maintained.

PCMCIA TO RS232 & RS422/485 CONVERTERS - LAB & REWORK ACCESSORIES

NEW!

P/N: ET-PM-010
(2 RS232 SERIAL PORTS)

P/N: ET-PM-020
(1 RS232 SERIAL PORTS)

Specifications	
Ports	1 or 2 RS232
UART	16950
Line Drivers	1Mbit per second
Baud Rates	Up to 921,600
Data Bits	5, 6, 7 or 8
Stop Bits	1 or 2
Parity	odd, even, none, mark or space
Power Requirements	210mA @5V, 20mA@12V
Power on	-60mA
Normal Operation	-150mA
Max Consumption	-200mA
Size	PCMCIA Type II

As prices drop and performances rise, portable laptop PC's are enabling more and more users to consider taking their PC into the field where testing, measurement or process control is required. Our range of PCMCIA cards allow you to use your notebook PC's a genuine desktop replacement.

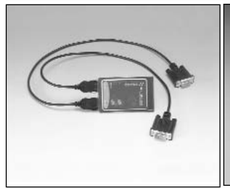
PCMCIA to RS232 CONVERTER CARDS
These cards provide users with on or two independent RS232 serial ports. The megabaud data transfer rates and the 128 byte deep FIFOS, coupled with 1 Mbit/s line drivers deliver uncompromising performance on your desktop PC. Being mobile no longer limits your options.

FEATURES

- Massive 128 byte transmit and receive FIFO on each port
- PCMCIA Bus--fully plug & play auto configuring interrupt and address
- Sample Programs, Test & Terminal software--all with source code
- Plug & Play compatible

P/N : ET-PM-010

P/N : ET-PM-020



P/N: ET-PM-121
(2 RS422/485 SERIAL PORTS)

P/N: ET-PM-120
(1 RS422/485 SERIAL PORTS)

Specifications	
Ports	1 or 2 RS422 / RS485 Standard
UART	16950
Line Drivers	1Mbit per second
Baud Rates	Up to 921,600
Data Bits	5, 6, 7 or 8
Stop Bits	1 or 2
Parity	odd, even, none, mark or space
Power Requirements	210mA @5V, 20mA@12V
Power on	-60mA
Normal Operation	-150mA
Max Consumption	-200mA
Size	PCMCIA Type II

Portable laptop PC's are enabling users to take their PC into the field where testing, measurement or process control is required. But what if you are needing a RS422/485 serial port? Add one or two ports with one of the Bluetooth cards below.

PCMCIA to RS422/485 CONVERTER CARDS
These cards provides users with one or two RS422/458 serial ports. The megabaud data transfer rates and the 128 byte deep FIFOS, coupled with 1 Mbit/s line drivers deliver uncompromising performance on your desktop PC. Being mobile no longer limits your options.

FEATURES

- Massive 128 byte transmit and receive FIFO on each port
- PCMCIA Bus--fully plug & play auto configuring interrupt and address
- Sample Programs, Test & Terminal software--all with source code
- Plug & Play compatible
- Configurable as full or half duplex

P/N : ET-PM-121

P/N : ET-PM-120

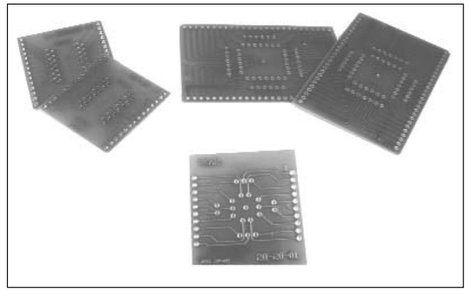
For a complete list of PCMCIA card products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/154**

LAB & REWORK ACCESSORIES - TEST FIXTURE RECEPTACLE BOARDS

- Burn-In Socket footprints are hard to work with when developing test boards. Test Fixture Adapter Boards accept these sockets, and convert their leads to fit common .100" grid boards. The Adapter Board's pins may then be soldered or wire wrapped.

FEATURES & BENEFITS

- Hundreds of boards available. Call us with your socket part number
- Provide a low-cost alternative to creating a special test board.
- May be ordered with a matching burn-in socket included.
- Adapter Boards are available for sockets from these manufacturers and others: 3M/Textool, Enplas,Yamaichi.
- Others available upon request.
- Custom designs available. Call ET today.



TEST FIXTURE RECEPTACLE BOARDS

Convert Various Socket Footprints to .100" Grid Footprints

Popular Socket Packages:

SOIC< DIP, DIP< DIP, PLCC<DIP

DIP			
ET Receptacle Part #	Corresponding Mfgr.'s Socket Part #	Corresponding ET Socket Part #	View PDF
14-28-300/600	TEXTOOL 228-3345	S-DIP-00-028-AZ	SKT064
40-600	TEXTOOL 240-3346	S-DIP-00-040-AZ	SKT069

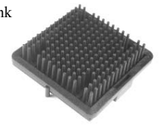
PLCC			
ET Receptacle Part #	Corresponding Mfgr.'s Socket Part #	Corresponding ET Socket Part #	Drawing #
20-20-01	TEXTOOL 220-5573	S-PCC-00-020-A	SKT075
28-28-01	TEXTOOL 228-5523	S-PCC-00-028-A	SKT078
32-28-01	YAMAICHI IC51-0324-453	S-PCC-00-032-C	SKT082
44-40-XX	TEXTOOL 244-5292	S-PCC-00-044-A	SKT085
52-52-01	TEXTOOL 252-5904	S-PCC-00-052-A	SKT088
IC-51-28	YAMAICHI IC51-0284-399	S-PCC-00-028-B	SKT079
IC-51-44	YAMAICHI IC51-0444-400	S-PCC-00-044-B	SKT086
IC-51-52	YAMAICHI IC51-0524-411	S-PCC-00-052-B	SKT089
IC-51-68	YAMAICHI IC51-0684-390	S-PCC-00-068-B	SKT091
IC-51-84	YAMAICHI IC51-0844-401	S-PCC-00-084-B	SKT093

SOIC			
ET Receptacle Part #	Corresponding Mfgr.'s Socket Part #	Corresponding ET Socket Part #	Drawing #
16-16-01S	TEXTOOL 216-6337	S-SOL-00-016-A	SKT459
16-16-R1S	TEXTOOL 216-7383	S-SOR-00-016-C	SKT459
AG-28-28-01/03S	ENPLAS FP28-1.27-06/07	S-SOL-00-028-A/B	SKT463
28-28-02S	YAMAICHI IC51-0282-277	S-SOL-00-028-B	SKT464

For a complete list of receptacle boards' specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/013**

BGA HEAT SINKS - LAB & REWORK ACCESSORIES

Snap-on BGA Heat Sink



Up-to-date heat sink drawings are available for reference on the ET Web site:
www.1800adapter.com/009

FEATURES AND BENEFITS

Easily Installed
- Snaps on and self aligns; no special board modifications
- Maintains constant pressure on chip with tension mounted clip
- Saves Labor - complete assembly as shown in instructions

Eliminates complex assemblies
- No epoxy
- No screw devices that loosen
- No special tools needed

Omnidirectional air flow to maximize heat dissipation
- "Round Pin" Heat sinks
- Outperform Crosscuts and Plate Fin Heat sinks in most applications
- Lightweight

- Custom Heat sinks are available for any application. Call today.

Part Number	Chip Pkg.	Heatsink Height	Fits Chip Height *	Thermal Resistance C/Watt		
H-2103-01-9007-05-A	21mm	.30 in (7.62 mm)	1.83 (+/- 0.3) mm	29.6	18.4	14.1
H-2103-02-9007-05-A	21mm	.30 in (7.62 mm)	1.33 (+/- 0.3) mm	29.6	18.4	14.1
H-2105-01-9007-05-A	21mm	.50 in (12.7 mm)	1.83 (+/- 0.3) mm	11.9	7.3	5.5
H-2105-02-9007-05-A	21mm	.50 in (12.7 mm)	1.33 (+/- 0.3) mm	11.9	7.3	5.5
H-2303-03-9017-05-A	23mm	.30 in (7.62 mm)	2.88 (+/- 0.16) mm	20.1	12	8.9
H-2303-04-9017-05-A	23mm	.30 in (7.62 mm)	2.38 (+/- 0.26) mm	20.1	12	8.9
H-2305-03-9017-05-A	23mm	.50 in (12.7 mm)	2.88 (+/- 0.16) mm	9.1	5.5	4.1
H-2305-04-9017-05-A	23mm	.50 in (12.7 mm)	2.38 (+/- 0.26) mm	9.1	5.5	4.1
H-2503-01-9031-05-A	25mm	.30 in (7.62 mm)	1.83 (+/- 0.3) mm	16.5	9.9	7.4
H-2503-02-9031-05-A	25mm	.30 in (7.62 mm)	1.33 (+/- 0.3) mm	16.5	9.9	7.4
H-2505-01-9031-05-A	25mm	.50 in (12.7 mm)	1.83 (+/- 0.3) mm	7.4	4.4	3.3
H-2505-02-9031-05-A	25mm	.50 in (12.7 mm)	1.33 (+/- 0.3) mm	7.4	4.4	3.3
H-2703-05-9000-05-A	27mm	.30 in (7.62 mm)	1.855 (+/- 0.285) mm	15.5	9.1	6.8
H-2703-06-9005-05-A	27mm	.30 in (7.62 mm)	1.355 (+/- 0.335) mm	15.5	9.1	6.8
H-2705-05-9005-05-A	27mm	.50 in (12.7 mm)	1.855 (+/- 0.285) mm	7	4.2	3.1
H-2705-06-9005-05-A	27mm	.50 in (12.7 mm)	1.355 (+/- 0.335) mm	7	4.2	3.1
H-3503-07-9038-05-A	35mm	.30 in (7.62 mm)	1.88 (+/- 0.26) mm	8.6	5	3.7
H-3503-08-9038-05-A	35mm	.30 in (7.62 mm)	1.38 (+/- 0.26) mm	8.6	5	3.7
H-3505-07-9038-05-A	35mm	.50 in (12.7 mm)	1.88 (+/- 0.26) mm	4.6	2.7	2
H-3505-08-9038-05-A	35mm	.50 in (12.7 mm)	1.38 (+/- 0.26) mm	4.6	2.7	2
H-3753-07-9015-05-A	37.5mm	.30 in (7.62 mm)	1.88 (+/- 0.26) mm	7.5	4.3	3.1
H-3753-08-9015-05-A	37.5mm	.30 in (7.62 mm)	1.38 (+/- 0.26) mm	7.5	4.3	3.1
H-3755-07-9015-05-A	37.5mm	.50 in (12.7 mm)	1.88 (+/- 0.26) mm	4.2	2.5	1.8
H-3755-08-9015-05-A	37.5mm	.50 in (12.7 mm)	1.38 (+/- 0.26) mm	4.2	2.5	1.8
H-4003-07-9040-05-A	40mm	.30 in (7.62 mm)	1.88 (+/- 0.26) mm	7.1	4.1	3
H-4003-08-9040-05-A	40mm	.30 in (7.62 mm)	1.38 (+/- 0.26) mm	7.1	4.1	3
H-4005-07-9040-05-A	40mm	.50 in (12.7 mm)	1.88 (+/- 0.26) mm	3.6	2.1	1.5
H-4005-08-9040-05-A	40mm	.50 in (12.7 mm)	1.38 (+/- 0.26) mm	3.6	2.1	1.5
H-4253-09-9020-05-A	42.5mm	.30 in (7.62 mm)	3.105 (+/- 0.26) mm	5.6	3.2	2.3
H-4253-10-9020-05-A	42.5mm	.30 in (7.62 mm)	2.605 (+/- 0.26) mm	5.6	3.2	2.3
H-4255-09-9020-05-A	42.5mm	.50 in (12.7 mm)	3.105 (+/- 0.26) mm	3.4	2.1	1.6
H-4255-10-9020-05-A	42.5mm	.50 in (12.7 mm)	2.605 (+/- 0.285) mm	3.4	2.1	1.6
H-4503-07-9016-05-A	45mm	.30 in (7.62 mm)	1.88 (+/- 0.26) mm	5.6	3.1	2.3
H-4503-08-9016-05-A	45mm	.30 in (7.62 mm)	1.38 (+/- 0.26) mm	5.6	3.1	2.3
H-4505-07-9016-05-A	45mm	.50 in (12.7 mm)	1.88 (+/- 0.26) mm	2.8	1.6	1.2
H-4505-08-9016-05-A	45mm	.50 in (12.7 mm)	1.38 (+/- 0.26) mm	2.8	1.6	1.2

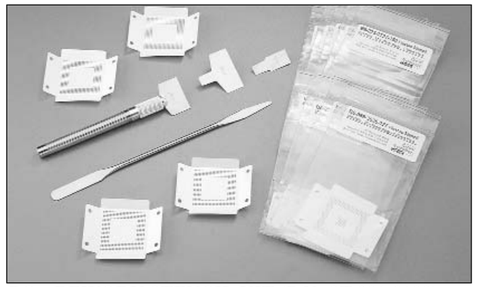
Some heat sinks are supplied with Chometrics T710 Thermal Tape.

For a complete list BGA heat sink specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/009**

LAB & REWORK ACCESSORIES - BGA REWORK STENCILS

FEATURES & BENEFITS

- These stencils are a major improvement over the current metal stencil standard
- Residue-free adhesive backing means these stencils are self-sticking--say goodbye to tape and fixturing forever!
- Many more sizes available upon request. Call us with your package drawing
- The Kit includes 20 different sizes of BGA rework stencils, a spatula handle and three sizes of spatula blades



BGA REWORK STENCIL KIT (P/N: ST-201-3120)

SQUEEGEE HANDLE (P/N: ET-SQUGHANDLE)
SQUEEGEE BLADE 27MM (P/N: ET-SQUG-27MM)
ET SPATULA (P/N: ET-SPATULA)

SPECIFICATIONS

Material: Anti-static Polymer Film
Adhesive: Residue-Free

* Max dimensions include allowance for .005" thick thermal pad

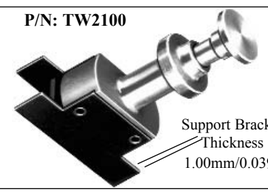
Ball Count	Grid Size & Ball Pattern	Thickness (in)	Thickness (mm)	Hole Diam. (in)	Hole Diam. (mm)	Component Body	ET Part #
1.00mm (.039") Lead Pitch							
196	16 x 16, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	15 mm x 15 mm	ST-196-3BG014-4
256	18 x 18, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	17 mm x 17 mm	ST-256-3BG016-4
324	22 x 22, P4-Row, +6 x 6 center	.004"	(0.102 mm)	.020"	(0.508 mm)	19 mm x 19 mm	ST-324-3BG018-4
324	22 x 22, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	23 mm x 23 mm	ST-324-3BG022-4
484	26 x 26, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	23 mm x 23 mm	ST-484-3BG022-4
672	26 x 26, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	27 mm x 27 mm	ST-672-3BG026-4
676	26 x 26, Full Array	.004"	(0.102 mm)	.020"	(0.508 mm)	27 mm x 27 mm	ST-676-3BG026-4
1.27mm (.050") Lead Pitch							
119	7 x 17, Full Array	.006"	(0.152 mm)	.025"	(0.635 mm)	14 mm x 22 mm	ST-119-2BG07X12-6
208	17 x 17, P4-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	23 mm x 23 mm	ST-208-2BG017-4
256	16 x 16, Full Array	.008"	(0.203 mm)	.032"	(0.813 mm)	21 mm x 21 mm	ST-256-2BG016-8
256	20 x 20, P4-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	27 mm x 27 mm	ST-256-2BG020-6
272	20 x 20, P4-Row, +4 x 4 center	.006"	(0.152 mm)	.025"	(0.635 mm)	27 mm x 27 mm	ST-272-2BG020-6
292	20 x 20, P4-Row, +6 x 6 center	.006"	(0.152 mm)	.025"	(0.635 mm)	27 mm x 27 mm	ST-292-2BG020-6
304	16 x 19, Full Array	.008"	(0.203 mm)	.032"	(0.813 mm)	21 mm x 25 mm	ST-304-2BG16X19-8
352	26 x 26, P4-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	35 mm x 35 mm	ST-352-2BG026-6

For a complete list of BGA rework stencil specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/019**

DIP INSERTION TOOLS / REWORK STENCILS - LAB & REWORK ACCESSORIES

Ball Count	Grid Size & Ball Pattern	Thickness (in)	Thickness (mm)	Hole Diam. (in)	Hole Diam. (mm)	Component Body	Description
1.27mm (.050") Lead Pitch							
357	19 x 19, Full Array	.006"	(0.152 mm)	.025"	(0.635 mm)	25 mm x 25 mm	ST-357-2BG019-6
361	19 x 19, Full Array	.008"	(0.203 mm)	.032"	(0.813 mm)	25 mm x 25 mm	ST-361-2BG019-8
388	26 x 26, P4-Row, +6 x 6 center	.006"	(0.152 mm)	.025"	(0.635 mm)	35 mm x 35 mm	ST-388-2BG026-6
420	26 x 26, P5-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	35 mm x 35 mm	ST-420-2BG026-6
432	31 x 31, P4-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	40 mm x 40 mm	ST-432-2BG031-4
560	33 x 33, P5-Row	.006"	(0.152 mm)	.025"	(0.635 mm)	42.5 mm x 42.5 mm	ST-560-2BG033-6
624	25 x 25, Full Array	.008"	(0.203 mm)	.032"	(0.813 mm)	32.5 mm x 32.5 mm	ST-624-2BG025-8
625	25 x 25, Full Array	.008"	(0.203 mm)	.032"	(0.813 mm)	32.5 mm x 32.5 mm	ST-625-2BG025-8
1.50mm (.059") Lead Pitch							
225	15 x 15, Full Array	.006"	(0.152 mm)	.025"	(0.635 mm)	27 mm x 27 mm	ST-225-1BG015-6

P/N: TW2100



DIP INSERTION TOOLS

- For precision insertion of DIP ICs into sockets, circuit boards and other plug and socket couplings
- Available for 8-pin to 64-pin DIP ICs
- All metal design with grounding facility against static charge
- Pressure device ensures precise handling and parallel insertion without twisting

SERIES TW2100 INSERTION TOOLS

Part #	Used for	Contact Row Spacing
TW2100-16	16 pins	7.62mm/0.3"
TW2100-20	20 pins	7.62mm/0.3"
TW2100-24/3	24 pins	7.62mm/0.3"
TW2100-24/6	24-28 pins	15.24mm/0.6"
TW2100-40	40-48 pins	15.24mm/0.6"

For a complete list of BGA rework stencil specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/054**

DIP EXTRACTION TOOLS

- For use with 14-pin to 64-pin DIP ICs
- Ideal for assembly and disassembly of densely-packed circuit boards **(P/N: TW2020)**
- The spindle enables the lifting apparatus to extract ICs from holders, PCBs, and other plug and socket devices parallel and without twisting **(P/N: TW2000)**

SERIES TW2000/020 EXTRACTION TOOLS

Part #	Used for	Contact Row Spacing
TW2000-14/20	14-20 pins	7.62mm/0.3"
TW2000-24	24-28 pins	15.24mm/0.6"
TW2000-40	40 pins	15.24mm/0.6"
TW2020-14/16	14-16 pins	7.62mm/0.3"
TW2020-18/20	18-20 pins	7.62mm/0.3"
TW2020-24/28	24-28 pins	15.24mm/0.6"
TW2020-40	40 pins	15.24mm/0.6"

For a complete list of BGA rework stencil specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/054**

LAB & REWORK ACCESSORIES - INSERTION/EXTRACTION TOOLS - PLCC

PLCC HIGH PERFORMANCE EXTRACTION TOOLS

- For use with PLCC sockets with diagonal extracting slits and pin counts from 20 to 84*
- Smooth extracting procedure. The lifting apparatus allows for controlled chip extraction since the jaws retract squarely from the center
- Counter pressure from the device prevents the chip from tilting during extraction
- Slim construction allows for use on high density boards

* **Note:** With small PLCC's the adjusting screw has to be removed since no counter pressure is necessary

APPLICATION:
The two steel grip arms fit into the socket's 1.4mm slits, and catch the chip from underneath at the free corners. The tool supports itself on the edges of the socket. When the side arms are squeezed, the lifting apparatus slowly pulls up the arms, releasing the chip.

P/N: TW2200-PLCC

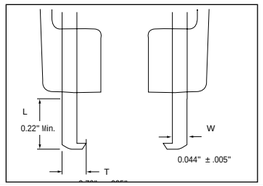
For PLCC tool specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/051**

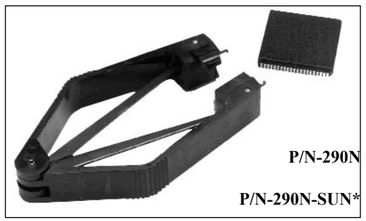
PLCC EXTRACTION TOOL

- Use this to extract PLCC packages from their production sockets
- Utilizes the two corners of a production socket available for extracting a PLCC
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, and 84

*Note: Fits AMP PLCC sockets
**Note: Fits NEC PLCC sockets.

Part #
P/N-290N
P/N-290N-SUN*
P/N-290N-NEC**





P/N-290N

P/N-290N-SUN*

For PLCC tool specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/051**

PLCC VACUUM INSERTION TOOL

- Use this tool to easily insert PLCC packages into their sockets
- Inserter works on PLCC packages with pin counts from 28 to 84
- Conductive plastic material is an active grounding device against static charging

Part #
TW2250-28/44
TW2250-68/84

P/N: TW2250-68/84

P/N: TW2250-28/44

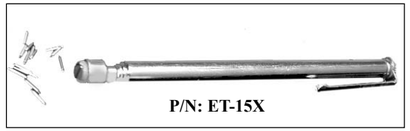
For PLCC tool specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/051**

MAGNETIC HANDLING TOOLS

Pocket Telescopic Magnetic Retrieval Tool

- Powerful enough to pick up ferrous metal objects weighing 1 1/2 lbs.
- Extends to 25 9/16 "
- Closes to 5 7/8 "
- Ideal for working with pogo pins and printed circuit board pins!
- Chrome plated

P/N: ET-15X

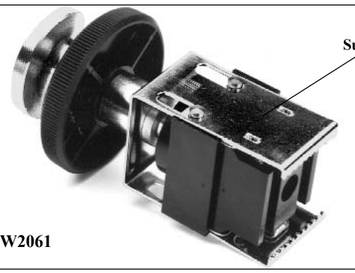


P/N: ET-15X

For information on additional insertion and extraction tools, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/051**

Get the job done right. ET's test, lab and rework accessories ensure success.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

LAB & REWORK ACCESSORIES - INSERTION/EXTRACTION TOOLS - HGA/PGA



P/N: TW2061

APPLICATION:

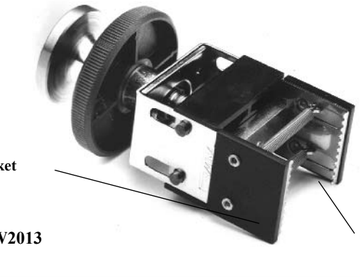
1. The spindle disk is used to adjust the pressure block until it makes contact.
2. The tool is spread open until the gripper plates can hook under the PGA socket.
3. The knurled disk is turned counter-clockwise until the pressure block has pressed the chip down absolutely flat and parallel into the socket, the tool is spread, and removed.

PGA SINGLE-GRID SIZE INSERTION TOOLS

- For inserting multi-pole HGA/PGA devices into sockets with precision contacts
- Ensures even pressure is applied to the top of the PGA device, preventing tilting and pin damage

SERIES TW2060 INSERTION TOOLS

Part # Size	PGA Grid	PGA Package Length
TW2060	10 X 10	26.67mm/1.050"
TW2061	11 X 11	29.21mm/1.150"
TW2062	12 X 12	31.75mm/1.250"
TW2063	13 X 13	34.29mm/1.350"
TW2065	15 X 15	39.37mm/1.550"
TW2066	16 X 16	41.91mm/1.650"
TW2067	17 X 17	44.45mm/1.750"
TW2068	18 X 18	46.99mm/1.850"



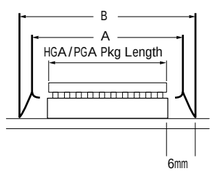
P/N: TW2013

HGA/PGA SINGLE-GRID SIZE EXTRACTION TOOLS

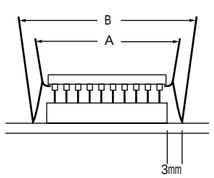
- For use with PGA devices
- Smooth extracting procedure. The lifting apparatus allows for controlled chip extraction since the jaws retract squarely from the center
- Counter pressure from the device prevents the chip from tilting during extraction
- Plastic sides prevent scratching or damage to wiring even with intense downward pressure

SERIES TW2010 EXTRACTION TOOLS

Part #	PGA Grid Size	HGA/PGA Package Length	Dimension A		Dimension B	
			Released	Spread	Released	Spread
TW2010	10 X 10	26.67mm/1.050"	.842"	1.039"	1.291"	1.488"
TW2011	11 X 11	29.21mm/1.150"	.940"	1.137"	1.389"	1.586"
TW2012	12 X 12	31.75mm/1.250"	1.043"	1.240"	1.492"	1.688"
TW2013	13 X 13	34.29mm/1.350"	1.141"	1.338"	1.590"	1.787"
TW2014	14 X 14	36.83mm/1.450"	1.240"	1.437"	1.688"	1.885"
TW2015	15 X 15	39.37mm/1.550"	1.342"	1.539"	1.791"	1.988"
TW2016	16 X 16	41.91mm/1.650"	1.444"	1.648"	1.893"	2.090"
TW2017	17 X 17	44.45mm/1.750"	1.539"	1.736"	1.988"	2.185"
TW2018	18 X 18	46.99mm/1.850"	1.641"	1.838"	2.090"	2.287"



1. Spread the tool open and push it down over the HGA/PGA device.



2. Turn the knurled disk clockwise; the lifting mechanism slowly extracts the chip from the socket.

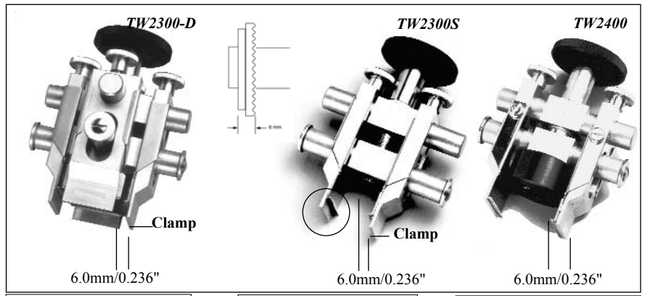
HOW TO ORDER

1) Decide whether you need an insertion or extraction tool.
2) Find your grid size (8X8, 9X9, etc.) in the appropriate tool table.
3) Locate the correct part # and use it to order.

LAB & REWORK ACCESSORIES - INSERTION/EXTRACTION TOOLS - PGA/HGA

HGA/PGA MULTI-GRID SIZE EXTRACTION TOOL

- Extracts Pin-Grid-Array (PGA) devices measuring 10 X 10 to 15 X 15 and 16 X 16 to 22 X 22 and HGA devices measuring 31X31 to 43X43 from sockets with high extraction force
- Two grip claws hug the socket from underneath on both sides
- Solid aluminium crossbars, 18mm thick, allow even load distribution during extraction
- Lifting range of about 15mm allows extraction of PGA devices with attached disk heat sinks



P/N: TW2300-D	TW2300S	TW2400
16 X 16 to 22 X 22	10 X 10 to 15 X 15	16 X 16 to 22 X 22

HGA/PGA MULTI-GRID SIZE EXTRACTION TOOLS

Adjustable extraction for both low and high profile socketed PGAs.
These extractors combine all of the features and benefits of previous designs in an adjustable tool. The 1050 series can be easily changed from a low profile setting with a simple screw adjustment.

Available in four sizes, covering an operating range of 1" to 3", the 1050 series adds flexibility to fast, safe, reliable PGA extraction. For those operations that involve variable extraction requirements the 1050 series provides the ideal solution.

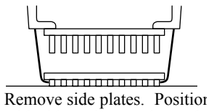
* H = heavy duty stainless steel.
Note: .100" clearance required between adjacent Pin Grid Arrays.

P/N 1060-AH
(Both Insertion and Extraction.)

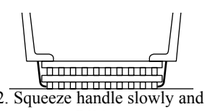
P/N 1050AH
(Extraction Only.)

Part #	PGA Range (.100 center)	Part #	PGA Range (.100 center)
P/N-1060	10 X 10 to 14 X 14	P/N-1050-AH*	15 X 15 to 19 X 19
P/N-1060-AH*	15 X 15 to 19 X 19	P/N-1050-BH*	20 X 20 to 24 X 24
P/N-1060-BH*	20 X 20 to 24 X 24		

HGA/PGA INSERTION

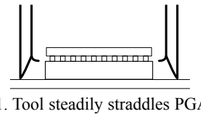


1. Remove side plates. Position tool with side springs under socket.

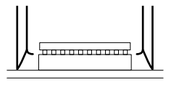


2. Squeeze handle slowly and firmly to insert PGA.

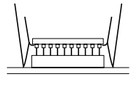
HGA/PGA EXTRACTION



1. Tool steadily straddles PGA.

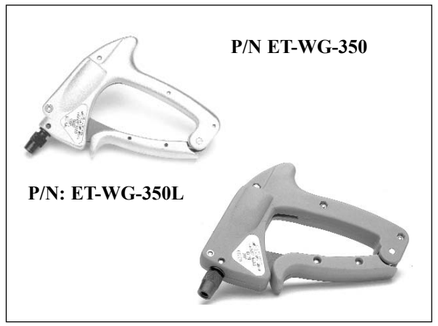


2. Squeeze of handle produces firm grip of PGA. Tool remains steady on base.



3. Continued squeeze action . . .**without pulling** . . . *lifts* PGA from board.

LAB & REWORK ACCESSORIES - WIRE WRAP GUNS, BITS, SLEEVES & WIRE



WIRE WRAP TOOL FOR PROTOTYPE ADAPTERS

FEATURES & BENEFITS

- Hand-operated wrapping guns use interchangeable bits and sleeves.
- Cushion grips and interchangeable blades, 22-24 and 24-26 AWG are included.
- Tools can provide up to 10 revolutions per squeeze of the trigger, and accommodate wire sizes from 22-32 AWG.
- Both guns are used for production line and field service within the electronics and telecommunications industries.

ET-WG-350L (plastic gun) has the advantage of being lightweight, while **ET-WG-350** (aluminum gun) offers great durability.

QUICK-WRAP BITS

TOP: ET-BW-2224
BOTTOM: ET-BW-3032

QUICK-WRAP BITS

Description	Wire Guage	Hole Diameter	Hole Depth
ET-BW-2224	22-24	.075	.807
ET-BW-2600	26	.075	1.000
ET-BW-3O32	30-32	.040	.750

QUICK-WRAP SLEEVES

Description	Wire Guage	Hole Diameter	Hole Depth
ET-SW-2224	22-24	.075	.807
ET-SW-2600	26	.075	1.000
ET-SW-3O32	30-32	.040	.750

QUICK-WRAP BITS & SLEEVES 5" LONG

Description	Wire Guage	Hole Diameter	Hole Depth
ETBW-24005	22-24	.075	.750
ET-SW-24265	24-26	.075	.750

WIRE

Wire Gauge	Wire Length (ft.)	Wire Color: Blue	Black	White	Red	Yellow	ET Part#
24	100	X					ET-R24B-0100
24	100		X				ET-R24BLK-0100
24	100			X			ET-R24W-0100
24	100					X	ET-R24Y-0100
26	100	X					ET-R26B-0100
26	100		X				ET-R26BLK-0100
26	100				X		ET-R26R-0100
26	100					X	ET-R26Y-0100
28	100	X					ET-R28B-0100
28	100		X				ET-R28BLK-0100
28	100				X		ET-R28R-0100
28	100			X			R28W-0100
28	100					X	R28Y-0100
30	50	X					ET-R30B-0050
30	100	X					ET-R30B-0100
30	100		X				ET-R30BLK-0100
30	1000		X				ET-R30BLK1000
30	50				X		ET-R-30R-0050
30	100				X		ET-R30R-0100
30	1000				X		ET-R30R-1000
30	DISPENSER						ET-R-30-TRI
30	50			X			ET-R-30W-0050
30	100			X			ET-R30W-0100
30	1000			X			ET-R30W-1000
30	50					X	ET-R-30Y-0050
30	100					X	ET-R30Y-0100
30	1000					X	ET-R30Y-1000

For a complete list of wire wrapping tools along with specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/058**

LAB & REWORK ACCESSORIES - FLUX REMOVER, JTAG PROGRAM CABLE

FLUX REMOVER NO CLEAN BRUSHLESS SYSTEM

FEATURES & BENEFITS

- Dries fast and leaves no residue
- Removes encrusted flux from hard-to-reach areas
- Brush applies solvent exactly where you need it
- Solvent flow flushes brush clean
- A new brush is supplied with every easy-grip can

P/N: ET-FLUXO

Cleans three ways:
1. Spot clean economically with the brush
2. Flush under SMDs with the extension tube
3. Clean large areas with the spray nozzle

- Great for post-solder operations
- Printed circuit boards
- Thru-hole and SMT devices

ET-JTAG Programming Cable

The ET-JTAG3 cable is the least expensive, widest voltage range programming cable available for any Xilinx device. It can be used to program any Xilinx device from any PC, and it can work with system voltages from 5.5VDC down to 1.65VDC. The cable attaches to the parallel port of a PC, and to a standard 100-mil spaced 6-pin header connector on the system board. The cable is auto-detected by all versions of Xilinx software, and it can be used without having to leave the Xilinx CAD envoriment.

ET-JTAG

FEATURES & BENEFITS
- Compatible with all versions of Xilinx software
- Auto-detected from with Xilinx CAD tools
- Compatible with system voltages from 5.5 to 1.65 volts
- 5 feet long

P/N: ET-JTAG

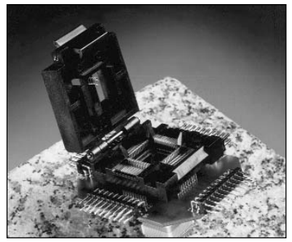
For a complete list of ASIC Development Systems specs, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/147**

Get the job done right. ET's test, lab and rework accessories ensure success.
Tel: **1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

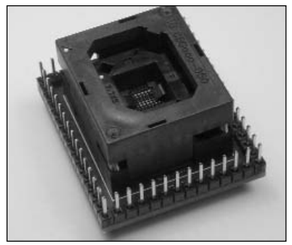
LOGIC ANALYZER/SCOPE ADAPTERS

With the introduction of our first "Bug Katcher™" in 1983, ET has built a quality line of logic analyzer probe adapters that include popular package styles such as BGA, SSOP, TSOP, PQFP/TQFP, HGA, PGA, DIP, SDIP and PLCC.

Logic analyzer/scope adapters are for use with all types of logic analyzers and oscilloscopes, and surface mount bases, when you are debugging your circuits. In this section you will find Bug Katchers and Surface Mount Bases.



PQFP/TQFP Logic Analyzer Adapter

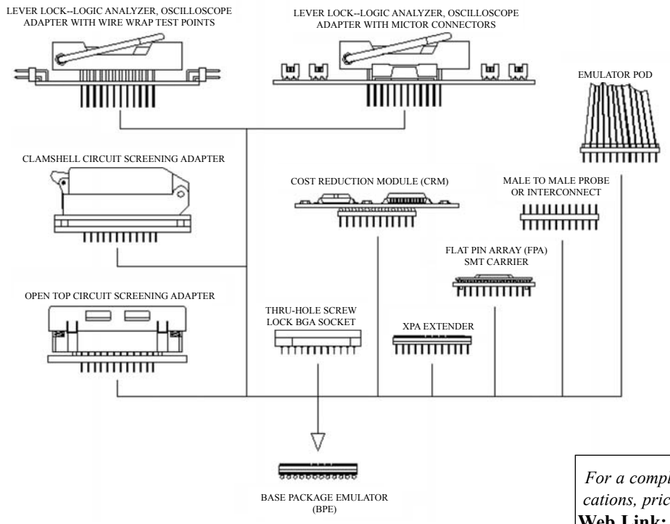


BGA 0.75mm pitch "Bug Katcher"

FEATURES & BENEFITS

- Low profile, less than 1" high
- Gold-plated wire wrap posts
- Test points provide quick connection of test cable assemblies, test probes, or wire wraps
- Available in Generic or Device-Specific models
- Some models are available in two-piece designs for easy removal and replacement
- Provide complete signal access between the target printed circuit board and the IC package during in-circuit testing and debugging
- Eliminate the need for noisy cables, reducing capacitance and inductance in your test setup
- Used by hardware and software design engineers developing, debugging, programming, qualifying or testing

Bug Katchers extend the leads and labels the signals of socketed and surface mount ICs so it's easy to attach test leads to them. These adapters fit between your IC and its socket or SMT pads, and accept leads from logic analyzers and oscilloscopes. Packages accommodated include: BGA, CSP, PQFP, DIP, and MLF/QFN.



PACKAGE STYLE	PAGE
BGA	84, 85, 86
CSP	87
DIP	97
MICTOR	93
MLF / QFN	91
PGA	94, 95, 96
PLCC	92
PQFP	88, 89, 90

HOW TO FIND YOUR SOLUTION

1. Provide us with your package outline drawing.
2. Choose style for top socket (open top, test & burn-in, screw lock, etc.)
3. How will you be connecting the adapter to the board? SMT, thru-hole or plug?

For a complete list of logic analyzer adapter specifications, pricing and delivery information, please see:
Web Link: www.emulation.com/catalog/#logic

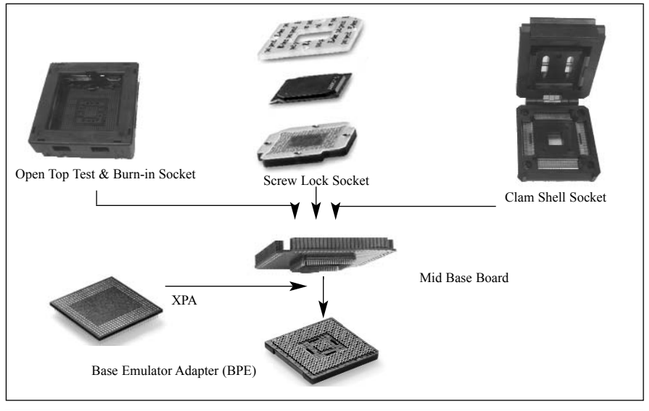
LOGIC ANALYZER/SCOPE ADAPTERS - BGA

REPLACEMENT SMT BASES PROMOTE MULTIPLE BOARD TESTING

- Solder the Bug Katcher to the BGA pads on your PC board, then insert your BGA chip into the socket on the Bug Katcher
- Leads extend from your socketed chip to the edge of the Bug Katcher. You can easily attach test leads to these pins
- JEDEC standard sizes
- BGA emulator block on the bottom circuit board eliminates the need for noisy cables and reduces the capacitance and inductance in your test set-up
- Custom devices are available upon request

HOW TO ORDER

1) Locate your chip package in the package coding section.
2) Identify your package by pin count, lead pitch, and package length and width.



Ordering Information

Lead Count
Lead pitch (1=1.5mm, 2 = 1.27mm, 3=1.0mm, 4=.75mm, 5=.50mm, 6=.80mm)
Product Code — BCP-0256-2BG020Z-0000-1-BL
Device Template
BL=Balls
1=With Socket, 0=Without Socket
Probing System
Footprint Code
Package Type
Z=Zero Insertion Force (ZIF), SL=Screw Lock

0.80mm Lead Pitch

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
144	13X13	Test & Burn-in	Generic	6BG013	BCP-0144-6BG013Z-0000-1-BL	F5964
180	14X14	Production	Generic	6BG014	BCP-0180-6BG014P-0000-1-BL	F6990
208	17X17	Surface Mount Pads	Generic	6BG017	BCP-0208-6BG017S-0000-1-BL	F2752
384	22X22	Surface Mount Pads	Generic	6BG022	BCP-0384-6BG022S-TS320C6202	F5851

1.00mm Lead Pitch

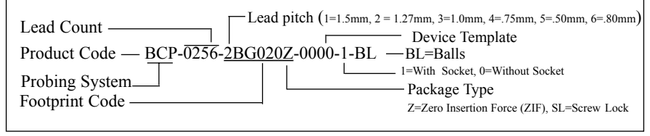
Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
144	12X12	Test & Burn-in	Generic	3BG012	BCP-0144-3BG012Z-0000-1-BL	F4814
144	12X12	Test & Burn-in	Generic	3BG012	BCP-0144-3BG012Z/A-0000-1-BL	F5070
156	14X14	Test & Burn-in	Generic	3BG014	BCP-0156-3BG014Z-0000-1-BL	F5067
160	14X14	Test & Burn-in	Generic	3BG014	BCP-0160-3BG014Z-0000-1-BL	F5992
160	13X13	MICTOR	Generic	3BG013	BCP-0160-3BG013-MCF5249-MIC-BL	F6595
196	14X14	Test & Burn-in	Generic	3BG014	BCP-0196-3BG014Z-0000-1-BL	F5372
256	16X16	Test & Burn-in	Generic	3BG016	BCP-0256-3BG016Z-0000-1-BL	F5848
388	26X26	Test & Burn-in	Generic	2BG026	BCP-0388-3BG026Z-MPC563-1-BL	F6498
388	26X26	Production	Generic	2BG026	BCP-0388-3BG026P-HNS-1-BL	F6737
388	26X26	Production	Generic	2BG026	BCP-0388-3BG026P-0000-1-BL	F6791

Try our **BGA Emulator Solution**
Converts ET Screw Lock SMT or Thru-hole sockets into an emulator pod receptacle for JTAG or similar testing.
Web Link: www.1800adapter.com/127

For a complete list of logic analyzer specifications, pricing and delivery information, see
Web Link:www.1800adapter.com/035

BGA - LOGIC ANALYZER/SCOPE ADAPTERS

Ordering Information



For a complete list of product specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/035

1.27mm Lead Pitch (cont.)

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
119	7X17	Test & Burn-in	Generic	2BG7X17	BCP-0119-2BG7X17Z-0000-1-BL-SPL	F5522
192	17X17	Test & Burn-in	Generic	2BG017	BCP-0192-2BG017Z-0000-1-BL	F6665
208	17X17	Test & Burn-in	Generic	2BG017	BCP-0208-2BG017Z-0000-0-BL	F5109
208	17X17	Test & Burn-in	Generic	2BG017	BCP-0208-2BG017Z-0000-1-BL	F5111
225	15X15	Test & Burn-in	Generic	2BG015	BCP-0225-2BG015Z-0000-1-BL	F6285
233	17X17	Test & Burn-in	Generic	2BG017	BCP-0233-2BG017Z-0000-1-BL	F5948
255	16X16	Test & Burn-in	Generic	2BG016	BCP-0255-2BG016Z-0000-1-BL	F5117
255	16X16	Test & Burn-in	Generic	2BG016	BCP-0255-2BG016Z-MPC603-1-BL	F5142
255	16X16	Test & Burn-in	Generic	2BG016	BCP-0255-2BG016Z-MPC604-1-BL	F5146
256	16X16	Test & Burn-in	Agilent	2BG016	BCP-0256-2BG016Z-MPC603/6-HP-BL	F5029
256	16X16	Test & Burn-in	Tektronix	2BG016	BCP-0256-2BG016Z-603E-1-BL-TEK	F6032
256	16X16	Test & Burn-in	Generic	2BG016	BCP-0256-2BG016Z-MPC603-0-BL	F5140
256	16X16	Test & Burn-in	Generic	2BG016	BCP-0256-2BG016Z/A-MPC604-0-BL	F5144
256	16X16	Test & Burn-in	Generic	2BG016	BCP-0256-2BG016Z-MPC801	F5154
256	20X20	Test & Burn-in	Generic	2BG020	BCP-0256-2BG020Z-0000-1-BL	F5121
256	20X20	Test & Burn-in	Generic	2BG020	BCP-0256-2BG020Z-7750-1-BL	F6281
256	23X23	Test & Burn-in	Generic	2BG023	BCP-0256-2BG023Z-0000-1-BL-SPL	F1548
256	23X23	Test & Burn-in	Generic	2BG023	BCP-0256-2BG023Z-0000-1-BL-SPL	F5518
272	20X20	Production	Agilent	2BG020	BCP-0272-2BG020P-MPC555-1-BL-MIC	F7025
272	20X20	Surface Mount Pads	Generic	2BG020	BCP-0272-2BG020S-0000-1-BL	F5648
272	20X20	Test & Burn-in	Generic	2BG020	BCP-0272-2BG020Z-0000-1-BL	F5380
272	21X21	Test & Burn-in	Generic	2BG021	BCP-0272-2BG021Z-0000-1-BL	F5101
280	19X19	Production	Generic	6BG019	BCP-0280-6BG019P-0000-1-BL	F6692
292	20X20	Test & Burn-in	Generic	2BG020	BCP-0292-2BG020Z-0000-1-BL	F5593
304	23X23	Test & Burn-in	Generic	2BG023	BCP-0304-2BG023Z-0000-1-BL	F5684
304	16X19	Test & Burn-in	Generic	2BG016X19	BCP-0304-2BG016X19Z-0000-1-BL	F5124
316	20X20	Test & Burn-in	Generic	2BG020	BCP-0316-2BG020Z-0000-1-BL	F5951
324	20X20	Test & Burn-in	Generic	2BG020	BCP-0324-2BG020Z-82430HX-1-BL	F5182
324	20X20	Test & Burn-in	Generic	2BG020	BCP-0324-2BG020Z-0000-1-BL	F5473
329	23X23	Test & Burn-in	Generic	2BG023	BCP-0329-2BG023Z-0000-1-BL	F7026
352	26X26	Surface Mount Pads	Agilent	2BG026	BCP-0352-2BG026S-I960RD-HP-1-BL	F5596
352	26X26	Surface Mount Pads	Tektronix	2BG026	BCP-0352-2BG026S-I960RP-TEK-0-BL	F5351
352	26X26	Test & Burn-in	Tektronix	2BG026	BCP-0352-2BG026Z-I960RP-TEK-1-BL	F5012
352	26X26	Surface Mount Pads	Generic	2BG026	BCP-0352-2BG026S-0000-1-BL	F5850
352	26X26	Test & Burn-in	Generic	2BG026	BCP-0352-2BG026Z-0000-1A1-BL	F5597
352	26X26	Test & Burn-in	Generic	2BG026	BCP-0352-2BG026Z-0000-1-BL	F4797
352	26X26	Production	Tektronix	2BG026	BCP-0352-2BG026-TMX320-TEK-1-BL	F5057
352	26X26	Test & Burn-in	Generic	2BG026	BCP-0352-2BG026Z-I960RP-0-BL	F5188
352	26X26	Test & Burn-in	Generic	2BG026	BCP-0352-2BG026Z-I960RP-1-BL	F5187
356	26X26	Test & Burn-in	Generic	2BG026	BCP-0356-2BG026Z-0000-1-BL	F5369
357	19X19	Surface Mount Pads	Tektronix	2BG019	BCP-0357-2BG019S-MPC860-TEK-FLEX	F7027
357	19X19	Test & Burn-in	Tektronix	2BG019	BCP-0357-2B19Z-MPC860-1-TEK-BL	F5017
357	19X19	Test & Burn-in	Tektronix	2BG019	BCP-0357-2BG019Z-MPC860-1-TEK-BL	F5018
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-MPC860-0-TEK-BL	F5509
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-0000-0-BL	F5126
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-0000-1-BL	F4361
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-MPC821-1-BL	F5200
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-MPC860-0-BL	F5202

Try our **BGA Emulator Solution**
Converts ET screw-lock SMT or Thru-hole sockets into an emulator pod receptacle for JTAG or similar testing.
Web Link: www.1800adapter.com/127

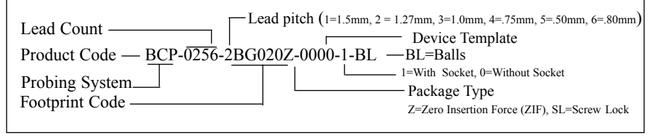
For a complete list of logic analyzer specifications, pricing and delivery information, see
Web Link:www.1800adapter.com/035

LOGIC ANALYZER/SCOPE ADAPTERS - BGA

For a complete list of product specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/035

Ordering Information



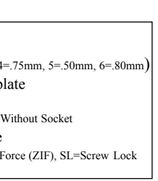
1.27mm Lead Pitch (cont.)

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
357	19X19	Test & Burn-in	Generic	2BG019	BCP-0357-2BG019Z-MPC860-1-BL	F5204
357	19X19	Production	Generic	2BG019	BCP-0357-2BG019P-MPC860-1-HP-BL	F5510
361	19X19	Test & Burn-in	Generic	2BG019	BCP-0361-2BG019Z-0000-0-BL	F5127
361	19X19	Test & Burn-in	Generic	2BG019	BCP-0361-2BG019Z-0000-1-BL	F5129
388	26X26	Test & Burn-in	Generic	2BG026	BCP-0388-2BG026Z-0000-1-BL	F3727
388	26X26	Test & Burn-in	Generic	2BG026	BCP-0388-2BG026Z-0000-1-HP	F5599
420	26X26	Test & Burn-in	Generic	2BG026	BCP-0420-2BG026Z-0000-1-BL	F5499
432	26X26	Test & Burn-in	Generic	2BG026	BCP-0432-2BG026Z-0000-0-BL	F4321
432	26X26	Test & Burn-in	Generic	2BG026	BCP-0432-2BG026Z-0000-1-BL	F5954
432	31X31	Production	Generic	2BG031	BCP-0432-2BG031P-0000-1-BL	F6062
452	26X26	Test & Burn-in	Generic	2BG026	BCP-0452-2BG026Z-TMS320C6-TEK	F5375
456	26X26	Test & Burn-in	Generic	2BG026	BCP-0456-2BG026Z-0000-0-BL	F5926
456	26X26	Test & Burn-in	Generic	2BG026	BCP-0456-2BG026Z-0000-1-BL	F5956
480	26X26	Test & Burn-in	Generic	2BG026	BCP-0480-2BG026Z-0000-0-BL	F5764
480	26X26	Test & Burn-in	Generic	2BG026	BCP-0480-2BG026Z-0000-1-BL	F5765
480	26X26	Test & Burn-in	Generic	2BG026	BCP-0480-2BG026Z-0000-1-BL	F5765
480	29X29	Surface Mount Pads	Generic	2BG029	BCP-0480-2BG029S-MPC8260-0-HP	F6420
480	29X29	Surface Mount Pads	Generic	2BG029	BCP-0480-2BG029S-MPC8260-1-HP	F5808
480	29X29	Surface Mount Pads	Generic	2BG029	BCP-0480-2BG029S-MPC8260-1-BL-TEK	F5906
484	22X22	Surface Mount Pads	Generic	3BG022	BCP-0484-3BG022S-0000-1-BL	F6187
484	26X26	Test & Burn-in	Generic	3BG026	BCP-0484-3BG026Z-0000-1-BL	F7028
520	26X26	Production	Generic	2BG026	BCP-0520-2BG026P-0000-1-BL	F6288
528	30X30	Production	Generic	2BG030	BCP-0528-2BG030P-0000-1-BL	F6166
560	33X33	Production	Generic	2BG033	BCP-0560-2BG033P-0000-1-ET	F5389
560	33X33	Production	Generic	2BG033	BCP-0560-2BG033P-0000-1-BL	F2940
576	30X30	Test & Burn-in	Generic	2BG030	BCP-0576-2BG030Z-0000-1-BL	F6006
600	35X35	Production	Generic	2BG035	BCP-0600-2BG035P-0000-1-BL	F5457

UNDERSTANDING THE DIFFERENCE IN SOCKET STYLES

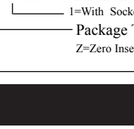
Choosing the correct adapter socket for your application is easy. The primary differences between the socket types have much to do with what your application is and how often you will be swapping out the device under test.

Screw Lock Sockets are often used for production purposes. The device is secured in place via a frame that is screwed down. Because of this, these sockets are for users who will not be swapping out the device frequently. Available in SMT and Thru-hole versions.



Screw Lock Socket

Open Top Sockets allow the user to actuate the socket and drop the device into it with relative ease. This socket is a good choice for users who have a known good board and will be swapping out multiple devices. Thru-hole only.



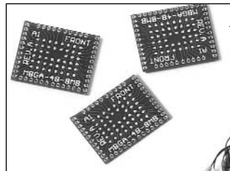
Open Top Socket

ZIF/LIF Sockets are considered “low” (Low Insertion Force) or “zero” (Zero Insertion Force) in terms of how much insertion force is required to secure the DUT. ZIF and LIF sockets have a lever that actuates the mechanism securing the device. This socket choice is ideal for swapping multiple devices. Available in thru-hole only.

ZIF Socket

For a complete list of logic analyzer specifications, pricing and delivery information, see
Web Link: www.1800adapter.com/035

CHIP SCALE - LOGIC ANALYZER/SCOPE ADAPTERS



BCP-040-4BG6X8S-GT28F008S3

Reference Web link below for attachment instructions.

FP-2S90-10

Attach specially designed MicroGripper™ to SAT to bring out signals for testing.

Ordering Information

Lead Count — Lead pitch (1=1.5mm, 2 = 1.27mm, 3=1.0mm, 4=.75mm, 5=.50mm, 6=.80mm)

Product Code — BCP-040-4BG6X8S-GT28F008S3 — Package Type

Probing System — Device

Footprint Code

CHIP SCALE
SIGNAL ACCESS TOOL (SAT)
Solder between your chip and target PCB.

The first solution for designers needing to solder between your chip and target PCB. These tools streamline access to signals on soldered down Micro BGA and ChipScale packages. The Signal Access Tool (SAT) routes all test points out around the perimeter of the package.

- Use solder flux or paste and standard rework station
- Attach SAT to target PCB and subject to reflow
- Attach Micro BGA or Chip Scale package to top of SAT and repeat reflow process

0.50mm Lead Pitch

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
40	4X10	Surface Mount Pads	Generic	5BG4X10	BCP-040-5BG4X10S-0000-BL	F6570

0.65mm Lead Pitch

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
137	11X15	Surface Mount Pads	Generic	9BG11X15	BCP-137-9BG11X15S-0000A	F6815
137	11X15	Surface Mount Pads	Generic	9BG11X15	BCP-137-9BG11X15S-0000B	F6814

0.75mm Lead Pitch

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
40	5X8	Surface Mount Pads	Generic	4BG5X8	BCP-040-4BG5X8S-GT28F008S3	F5355
48	6X8	Surface Mount Pads	Generic	4BG6X8	BCP-048-4BG6X8S-GT28F800B3	F5095
48	6X8	Surface Mount Pads	Generic	4BG6X8	BCP-048-4BG6X8S-GT28F160B3	F5097
48	6X8	Surface Mount Pads	Generic	4BG6X8	BCP-048-4BG6X8S-GT28F320B3/C3	F5796
48	6X8	Surface Mount Pads	Generic	4BG6X8	BCP-048-4BG6X8S-CSP-SAT-GEN	F6005
56	7X8	Surface Mount Pads	Generic	4BG7X8	BCP-056-4BG7X8S-0000A	F6591
56	7X8	Test & Burn-in	Generic	4BG7X8	BCP-056-4BG7X8Z-0000A	F6668
56	7X8	Surface Mount Pads	Generic	4BG7X8	BCP-056-4BG7X8S-0000B	F6812
56	9X8	Surface Mount Pads	Generic	4BG9X8	BCP-056-4BG9X8S-GT28F640J5	F5096
60	9X10	Surface Mount Pads	Generic	4BG9X10	BCP-060-4BG9X10S-0000A	F6643
63	7X9	Surface Mount Pads	Generic	4BG7X9	BCP-063-4BG7X9S-0000A	F6644

0.80mm Lead Pitch

68	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-068-6BG8X12S-0000A	F6645
72	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-072-6BG8X12S-16MB-CSP-SAT	F5797
72	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-072-6BG8X12S-32MB-CSP-SAT	F5798
72	8X12	Test & Burn-in	Generic	6BG8X12	BCP-072-6BG8X12Z-0000-1-BL	F6854
88	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-088-6BG8X12S-0000A	F6646
88	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-088-6BG8X12S-0000B	F6647
88	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-088-6BG8X12S-0000C	F6648
88	8X12	Surface Mount Pads	Generic	6BG8X12	BCP-088-6BG8X12S-0000D	F6813
96	8X14	Surface Mount Pads	Generic	6BG8X14	BCP-096-6BG8X14S-0000A	F6649

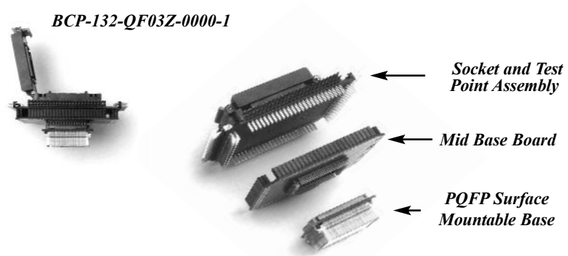
1.00mm Lead Pitch

Pin Count	Grid Size	Socket Type	Pin Map	Footprint Code	ET Part #	Drawing #
64	8X8	Surface Mount Pads	Generic	3BG008	BCP-064-3BG008S-EASYBGA-CSP-SAT-KIT	F5608
64	8X8	Surface Mount Pads	Generic	3BG008	BCP-064-3BG008S-EASYBGA-CSP-SAT	F5799

For a complete list of Chip Scale Signal Access Tools, pricing and delivery information, see
Web Link: www.emulation.com/chipscale

LOGIC ANALYZER/SCOPE ADAPTERS - PQFP/TQFP

- PQFP Bug Katchers make it easy to attach test leads to socketed ICs in PQFP packages
- Accommodate PQFP packages with 84, 100, and 132 pins
- Available for 3M/TEXTOOL or Yamaichi production sockets
- JEDEC standard sizes
- Fit between your IC and socket
- Unique PQFP emulator block on bottom circuit board eliminates the need for noisy cables and reduces capacitance and inductance in your test set-up
- Available with replacement SMT bases for multiple board testing
- Custom adapters available



Ordering Information Example

Product Code — BC P-132-QF03Z-0000-1 (A1) — Pin Numbering

Pin Count — 132

PQFP Package (see Footprint Section) — QF03

ET's socket version — Z

(Optional) A1 = with Burn-in Socket; No number = Production Socket

T = 3M/TEXTOOL Production Socket, Z = ZIF Socket

HOW TO ORDER: 1) Locate your chip package in the package coding section; 2) Identify your package by pin count, lead pitch, and package length and width.

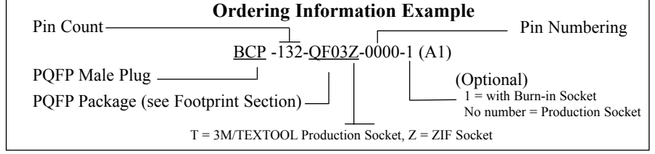
PQFP/TQFP

Pin Count	Tip-to-Tip Size	Footprint Code	Pin Map	Socket Type	ET Part #	Drawing #
32	9X9	32-QF59D	Generic	ZIF	BCP-032-QF59DZ-0000-1	F1032
32	7X7	32-QF60D	Generic	ZIF	BCP-032-QF60DZ-0000-1	F7029
44	13.9X13.9	044-QF16	8031/51	ZIF	BCP-044-QF16Z-8031/51-1	F3531
44	13.9X13.9	044-QF16	Generic	ZIF	BCP-044-QF16Z-0000-1	F1577
44	13.2X132	044-QF16	Generic	ZIF	BCP-044-QF16Z-0000-1	F1577
44	12X12	044-QF16	Generic	ZIF	BCP-044-QF16DZ-0000-1	F4298
48	9X9	048-QF50D	Generic	ZIF	BCP-048-QF50DZ-0000-1	F5006
52	17.2X17.2	52-QF37B	Generic	ZIF	BCP-052-QF37Z-0000-1	F1253
52	13.9X13.9	052-QF39	Generic	ZIF	BCP-052-QF39Z-0000-1	F1962
52	13.2X13.2	052-QF39	Generic	ZIF	BCP-052-QF39Z-0000-1A1	F5349
52	12X12	052-QF39	Generic	ZIF	BCP-052-QF39DZ-0000-1	F6830
64	23.6X17.6	064-QF09	Generic	ZIF	BCP-064-QF09Z-0000-1	F1187
64	23.2X17.2	064-QF09	Generic	ZIF	BCP-064-QF09Z-0000-1A3	F4691
64	17.2X.17.2	064-QF09	Generic	ZIF	BCP-064-QF29Z-0000-1	F1221
64	17.2X.17.2	064-QF09	Generic	ZIF	BCP-064-QF29DZ-0000-1-ST	F5534
64	17.2X.17.2	064-QF29	Generic	ZIF	BC5Y-064-QF29Z-0000-1	F3966
64	16X16	064-QF29	Generic	ZIF	BCP-064-QF29DZ-0000-1D-ST	F5456
64	15.9X15.9	064-QF34	Generic	ZIF	BCP-064-QF34Z-0000-1	F2002
64	12X12	064-QF34	Generic	ZIF	BCP-064-QF64Z-0000-1	F2280
80	23.9X17.9	080-QF08	Generic	ZIF	BCP-080-QF08Z-0000-1	F1300
80	23.9X17.9	080-QF08	Generic	ZIF	BCP-080-QF08Z-0000-1-YAM	F3933
80	17.2X17.2	080-QF14	Generic	ZIF	BCP-080-QF14Z-0000-1	F1321
80	16X16	080-QF14D	Generic	ZIF	BCP-080-QF14DZ-0000-1	F4284
80	14X14	080-QF47	Generic	ZIF	BCP-080-QF47Z-0000-1	F1740
84	.800"X.650"	084-QF02	Generic	ZIF	BCP-084-QF02Z-0000-1	F1578
100	.900"X.750"	100-QF01	Generic	LIF	BCP-100-QF01A-0000	F3532
100	.900"X.750"	100-QF01	Generic	LIF	BCP-100-QF01T-0000	F1081
100	.900"X.750"	100-QF01	Generic	ZIF	BCP-100-QF01Z-0000-1	F1723
100	.900"X.750"	100-QF01	Generic	LIF	BC5T-100-QF01T-0000	F1050
100	.900"X.750"	100-QF01	Generic	ZIF	BC5T-100-QF01Z-0000	F3521
100	.900"X.750"	100-QF01A	386SX	LIF	BCP-100-QF01A-386SX	F1047
100	23.9X17.9	100-QF01	386SX	LIF	BCP-100-QF01T-386SX	F1466
100	23.9X17.9	100-QF01	386SX	LIF	BC5T-100-QF01T-386SX	F3519

For a complete list of PQFP logic analyzer specifications, pricing and delivery information, please see:
Web Link: www.emulation.com/catalog/#logic

PQFP/TQFP - LOGIC ANALYZER/SCOPE ADAPTERS

Ordering Information Example



For a complete list of product specifications, pricing and delivery information, please see

Web Link:
www.emulation.com/catalog/#logic

PQFP/TQFP (cont.)

Pin Count	Tip-to-Tip Size	Footprint Code	Pin Map	Socket Type	ET Part #	Drawing #
100	23.9X17.9	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1	F1265
100	23.2X17.2	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1-A	F2299
100	23.2X17.2	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1A1	F2299
100	23.2X17.2	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1A2	F4465
100	23.2X17.2	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1A3	F4689
100	22X22	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1A5	F5344
100	23.9X17.2	100-QF06Z	Generic	ZIF	BCP-100-QF06Z-0000-1-YAM	F4090
100	25.9X25.2	100-QF11	Generic	ZIF	BCP-100-QF11Z-0000-1	F1237
100	16X16	100-QF49	Generic	LIF	BCP-100-QF49P-0000-1	F6974
100	16X16	100-QF49	Generic	ZIF	BCP-100-QF49Z-0000-1	F1338
100	16X16	100-QF49	Generic	ZIF	BC5Y-100-QF49Z-0000	F4011
100	16.6-16.9	100-QF49C	Generic	ZIF	BCP-100-QF49CZ-0000-1	F5963
112	23.2X23.2	112-QF36	Generic	ZIF	BCP-112-QF36Z-0000-1	F1573
112	23.2X232	112-QF36	56156	ZIF	BCP-112-QF36Z-56156-1	F1710
112	22X22	112-QF36D	Generic	ZIF	BCP-112-QF36DZ-0000-1	F6635
120	31.9X31.9	120-QF05	Generic	ZIF	BCP-120-QF05Z-0000-1	F1302
120	31.2X31.2	120-QF05	Generic	ZIF	BCP-120-QF05Z-0000-1A1	F5856
128	16X16	128-QF57D	Generic	ZIF	BCP-128-QF57DZ-0000-1-LP	F6192
128	31.2	128-QF13	Generic	ZIF	BCP-128-QF13Z-0000-1A1	F4692
128	23.9X23.9	128-QF51A	Generic	ZIF	BCP-128-QF51AZ-0000-0-C2-ST	F6513
128	22X16	128-QF51	Generic	ZIF	BCP-128-QF51Z-0000-1	F3538
128	23.2X23.2	128-QF51	Generic	ZIF	BCP-128-QF51Z-0000-1-C1	F4463
128	23.2X23.2	128-QF51	Generic	ZIF	BCP-128-QF51Z-0000-1-C1ST	F5857
128	23.9X23.9	128-QF51A	Generic	ZIF	BCP-128-QF51AZ-0000-1-C2	F5065
128	22X22	128-QF63	Generic	ZIF	BCP-128-QF63Z-0000-1-SPL	F4701
132	1.10"X1.10"	132-QF03A	68302	LIF	BC2-132-QF03A-68302	F1112
132	1.10"X1.10"	132-QF03A	Generic	LIF	BCP-132-QF03A-0000	F1949
132	1.10"X1.10"	132-QF03	Generic	LIF	BCP-132-QF03T-0000	F3540
132	1.10"X1.10"	132-QF03	Generic	ZIF	BCP-132-QF03Z-0000-1	F1084
132	1.10"X1.10"	132-QF03	Generic	LIF	BC5T-132-QF03T-0000	F1167
132	1.10"X1.10"	132-QF03	Generic	ZIF	BC5T-132-QF03Z-0000	F1898
132	1.10"X1.10"	132-QF03	68020	LIF	BCP-132-QF03T-68020	F3541
132	1.10"X1.10"	132-QF03	68020	LIF	BC5T-132-QF03T-68020	F3523
132	1.10"X1.10"	132-QF03	68030	LIF	BCP-132-QF03T-68030	F3542
132	1.10"X1.10"	132-QF03	68030	LIF	BC5T-132-QF03T-68030	F3524
132	1.10"X1.10"	132-QF03A	68302	LIF	BCP-132-QF03A-68302	F1076
132	1.10"X1.10"	132-QF03	68302	LIF	BC5T-132-QF03T-68302	F3525
132	1.10"X1.10"	132-QF03	68332	LIF	BCP-132-QF03A-68332	F2079
132	1.10"X1.10"	132-QF03	68332	LIF	BC5T-132-QF03T-68332	F1274
132	1.10"X1.10"	132-QF03A	56001	LIF	BCP-132-QF03A-56001	F1102
132	1.10"X1.10"	132-QF03	56001	LIF	BC5T-132-QF03T-56001	F3522
144	31.2X31.2	144-QF10	Generic	ZIF	BCP-144-QF10Z-0000-1	F1129
144	31.2X31.2	144-QF63	Generic	ZIF	BCP-144-QF63Z-0000-1	F1685
144	22X22	144-QF63	Generic	ZIF	BCP-144-QF63Z-0000-1C	F4702
144	22X22	144-QF63	Generic	LIF	BCP-144-QF63Z-0000-1E1	F4702
160	31.9X31.9	160-QF07	Generic	LIF	BCP-160-QF07Z-0000-1	F1085
160	31.9X31.9	160-QF07	Generic	LIF	BCP-160-QF07Z-0000-1A2	F4690
160	31.2X31.2	160-QF07	Generic	LIF	BCP-160-QF07Z-0000-1A1	F3548
160	31.9X31.9	160-QF07	Generic	LIF	BCP-160-QF07Z-0000-1-YAM	F3872
160	31.2X31.2	160-QF07	Generic	LIF	BCP-160-QF07Z-0000-1A1-ST	F5345
160	26X26	160-QF48	Generic	LIF	BCP-160-QF48Z-0000-1	F4698
164	1.300"X1.300"	164-QF04	Generic	LIF	BCP-164-QF04T-0000	F1388
164	1.300"X1.300"	164-QF04A	Generic	LIF	BCP-164-QF04A-0000	F3549
168	31.9X31.9,31.2X31.2	168-QF25	Generic	ZIF	BCP-168-QF25Z-0000-1	F1488
172	1.610"X1.610"	172-QF12	Generic	ZIF	BCP-172-QF12Z-0000-1	F1000
176	22X22	176-QF19	Generic	ZIF	BCP-176-QF19Z-0000-1	F3552
176	26X26	176-QF19	Generic	ZIF	BCP-176-QF67Z-0000-1	F1158

For a complete list of logic analyzer adapters, pricing and delivery information, please see:
Web Link: **www.emulation.com/catalog/#logic**

LOGIC ANALYZER/SCOPE ADAPTERS - PQFP/TQFP

For a complete list of product specifications, pricing and delivery information, please see

Web Link:
www.emulation.com/catalog/#logic

Ordering Information Example

Pin Count — BCP-132-QF03Z-0000-1 (A1) — Pin Numbering

PQFP Male Plug

PQFP Package (see Footprint Section)

(Optional)
1 = with Burn-in Socket
No number = Production Socket

T = 3M/TEXTOOL Production Socket, Z = ZIF Socket

PQFP/TQFP (cont.)

Pin Count	Tip-to-Tip Size	Footprint Code	Pin Map	Socket Type	ET Part #	Drawing #
176	26X26	176-QF19	Generic	LIF	BCP-176-QF67S-0000-1	F5044
184	35.9X35.9,35.2X35.2	184-QF31	Generic	ZIF	BCP-184-QF31Z-0000-1	F1986
196	1.48"X1.48"	196-QF15	Generic	ZIF	BCP-196-QF15Z-0000-1	F1513
208	30.6X30.6	208-QF21	Generic	ZIF	BCP-208-QF21Z-0000-1M	F3934
208	31.2X31.2	208-QF21	Generic	ZIF	BCP-208-QF21Z-0000-1B	F4693
208	30.6X30.6	208-QF21	Generic	ZIF	BCP-208-QF21Z-0000-1M	F4694
208	30.6X30.6	208-QF21	Generic	ZIF	BCP-208-QF21Z-0000-1-VP	F1864
208	30.6X30.6	208-QF21	Generic	ZIF	BCP-208-QF21Z-0000-1A1-NT	F5858
208	30.6X30.6	208-QF21C	Generic	ZIF	BCP-208-QF21CZ-0000-1-VP	F3553
208	30.6X30.6	208-QF21C	Generic	ZIF	BCP-208-QF21CZ-0000-1B3	F4695
208	30.6X30.6	208-QF21C	Generic	ZIF	BCP-208-QF21CZ-0000-1-B5	F5348
208	30.6X30.6	208-QF21C	Generic	ZIF	BCP-208-QF21Z-0000-1D	F4696
208	31.2X31.2	208-QF21C	Generic	ZIF	BCP-208-QF21Z-0000-1-NTP	F3791
208	30X30	208-QF21C	Generic	ZIF	BCP-208-QF21Z-0000-1-B7	F6105
240	34.6X34.6	240-QF62	Generic	ZIF	BCP-240-QF62Z-0000-1	F1913
256	31.50X31.50	256-QF68	Generic	ZIF	BCP-256-QF68Z-0000-1	F5043
304	42.6X42.6	304-QF61	Generic	ZIF	BCP-304-QF61Z-0000-1	F2169
304	42.6X42.6	304-QF61	Generic	ZIF	BCP-304-QF61Z-0000-1-NTP	F4699
1689	31.9X31.2	168-QF25A	Generi	ZIF	BCP-168-QF25Z-0000-0	F3550
1689	31.9X31.2	168-QF25A	Generi	ZIF	BCP-168-QF25Z-0000-0	F3550

Try our **PQFP GRIPPERS**
Used with PQFP packages up to 0.5mm lead pitch with a logic analyzer or oscilliscopes. Max frequency is 100MHz.
Web Link: www.1800adapter.com/071

Try our **OSCILLOSCOPE PROBE KIT**
Used with PQFP packages 0.8mm to 0.3mm lead pitch with standard oscilloscopes. Probe tips plug into dual-lead adapter.
Web Link: www.1800adapter.com/072

For a complete list of logic analyzer adapters, pricing and delivery information, please see:
www.emulation.com/catalog/#logic

EMULATION TECHNOLOGY RECOMMENDS:
Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling systems.

Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.

P/N-101

P/N-102

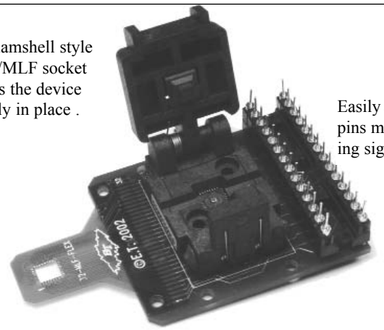
- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

These ESD-safe units feature a silver aluminum body and non-marking static dissipative black rubber vacuum cups. The pens' vacuum is generated by pressing and releasing the vacuum push button.

For a complete list of vacuum specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/118

MLF/QFN - LOGIC ANALYZER/SCOPE ADAPTERS NEW!



EMULATE. **ANALYZE.** PROGRAM.

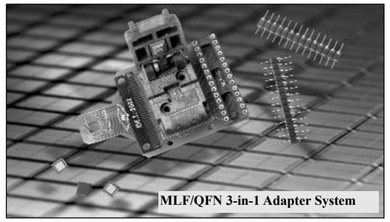
Ordering Information Example

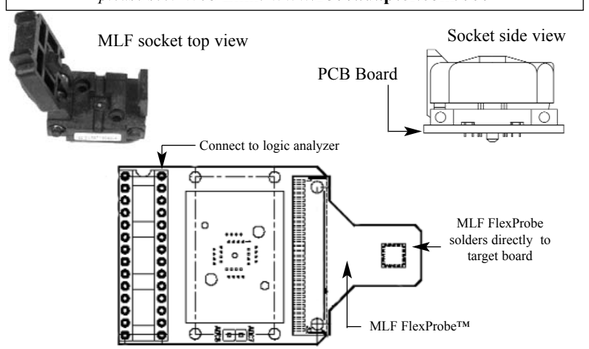
Lead pitch (1=1.5mm, 2 = 1.27mm, 3=1.0mm, 4=.75mm, 5=.50mm, 6=.80mm)
Pin Count
Device
Product Code —— BCP-032-ML04Z-MEGA8
Package to be Programmed: __
Z = ZIF
ML= MICRO LEAD FRAME

For a complete list of adapter specifications, pricing and delivery information, please see: Web Link: **www.1800adapter.com/060**

MLF/QFN 3-in-1 Adapter System™

The QFN/MLF 3-in-1 Adapter Systemensures quick and easy configuring and interfacing to an in-circuit emulator, device programmer, logic analyzer or oscilloscope. The first of its kind, this 3-in-1system provides the solution for test and design engineers needing QFN (Quad Flat Non-leaded) or MLF (Micro Lead Frame) signal access. This system supports the ATMEL® ATtiny26, ATtiny28, ATmega8, ATmega16 and ATmega32 8-bit AVR® Microcontrollers.


MLF/QFN 3-in-1 Adapter System



FEATURES & BENEFITS

- Reduces cost of ownership by 50-66% by eliminating the need for three separate adapters
- Change chip packages rapidly
- Flexible target interconnect minimizes physical strain on target pads
- Excellent for in-circuit or out of circuit programming
- Monitor signals - Logic Analysis
- Quick interface In-Circuit Emulator
- Compact design ensures signal integrity

MLF/QFN LOGIC ANALYZER ADAPTER (ONLY) PART NUMBERS

Logic Analyzer Adapter Only

Pin Count	Pin Map	SMT Lead Pitch (mm)	Body Size	Footprint Code	ET Part #	Drawing #
32	ATMEL MEGA 8	0.50	5X5	32-ML04	BCP-032-ML04Z-MEGA8-1	F6663
32	ATMEL TINY 26	0.50	5X5	32-ML04	BCP-032-ML04Z-TINY26-1	F6724
44	MEGA16/32, 8535	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA16/32-1	F6725
44	MEGA 162, 8515	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA162-1	F6726

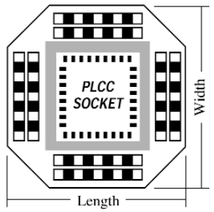
MLF/QFN 3-IN-1 ADAPTER SYSTEM PART NUMBERS

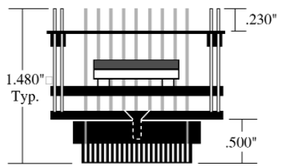
Complete 3-in-1 Adapter System

- Logic Analyzer Adapter
- Program Adapter
- Emulator Adapter

Pin Count	Pin Map	SMT Lead Pitch (mm)	Body Size	Footprint Code	ET Part #	Drawing #
32	ATMEL MEGA 8	0.50	5X5	32-ML04	BCP-032-ML04Z-MEGA8-3IN1	F6730
32	ATMEL TINY 26	0.50	5X5	32-ML04	BCP-032-ML04Z-TINY26-3IN1	F6727
44	MEGA16/32, 8535	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA16/32-3IN1	F6728
44	MEGA 162, 8515	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA162-3IN1	F6729

LOGIC ANALYZER/SCOPE ADAPTERS - PLCC





- PLCC Bug Katchers make it easy to attach test leads to socketed ICs in PLCC packages
- Accommodate PLCC packages with 20, 28, 32, 44, 52, 68, and 84 pins
- Device template eliminates pin identification problems by labeling each test point
- Fits between your IC and socket
- Unique PLCC emulator block on bottom circuit board eliminates the need for noisy cables and reduces capacitance and inductance in your test set-up
- Custom adapters available

HOW TO ORDER

1) Check to see if your chip package and target socket icon is shown in the Device-Specific section (right column of table).
2) If your part is not listed under the appropriate icon, find your chip package and target socket in the Pin-Numbered section (left column of table).
3) Find the pin count that corresponds to your chip package (see Ordering Information Example).

Try our **PLCC INSERTION TOOLS**

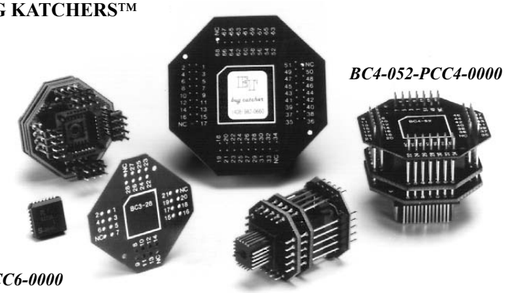
Use this vacuum tool to easily insert PLCC packages into their sockets. Inserter works on pin counts 28 to 84.

Web Link: www.1800adapter.com/053

For a complete list of logic analyzer adapters, pricing and delivery information, please see:

Web Link: www.emulation.com/catalog/#logic

PLCC BUG KATCHERS™



BC4-052-PCC4-0000

BC4-028-PCC6-0000

BC4-020-PCC2-0000

Ordering Information Example

Pin Count — Device Template

Product Code — BC 4-068-PCC1-0000

PLCC Male Plug

Chip Pkg Footprint Socket (see Footprint Section)

Chip Package → **Target Socket** **Icons identify your chip package and target socket.**

Pin-Numbered Template

PLCC → **PLCC**

BC4-20-PCC2-0000	Document # F1594
BC4-28-PCC6-0000	Document # F1595
BC4-32-PCC7-0000	Document # F1596
BC4-44-PCC3-0000	Document # F1597
BC4-52-PCC4-0000	Document # F1599
BC4-68-PCC1-0000	Document # F1610
BC4-84-PCC5-0000	Document # F4535

PGA → **PLCC**

BC4-028-PGA0-0000	Document # F3495
BC4-044-PGA5-0000	Document # F1309
BC4-052-PGA6-0000	Document # F3500
BC4-068-PGA1-0000	Document # F1611

PLCC Extraction Tool

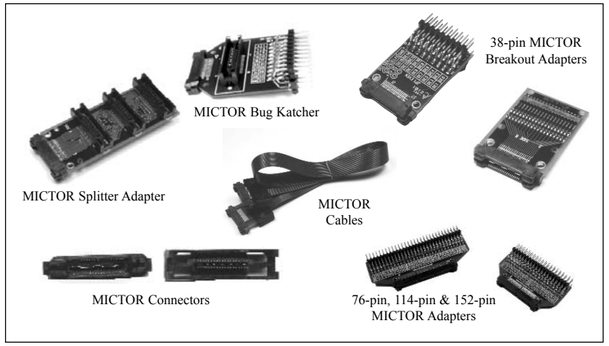
- Use this to extract PLCC packages from their production sockets
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, 84, and 100 pin counts

P/N-290N-SUN

Web Link: www.1800adapter.com/053

MICTOR™ - LOGIC ANALYZER/SCOPE ADAPTERS

NEW!



ET's new MICTOR breakout boards are created for users needing a high-speed, reliable, low cost solution for testing surface mount and BGA packages which can be difficult to probe directly. In addition, these adapters can bridge the gap between older PCB designs using stake headers and newer PCB designs using MICTOR connectors.

High-speed, reliable, low cost testing for testing surface mount and BGA packages.

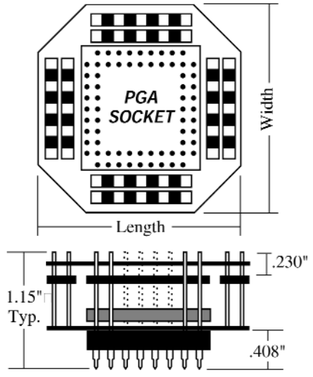
- Designed for 50-ohm systems
- Redundant interfaces on mated contacts
- MICTOR connector housings are polarized for correct mating

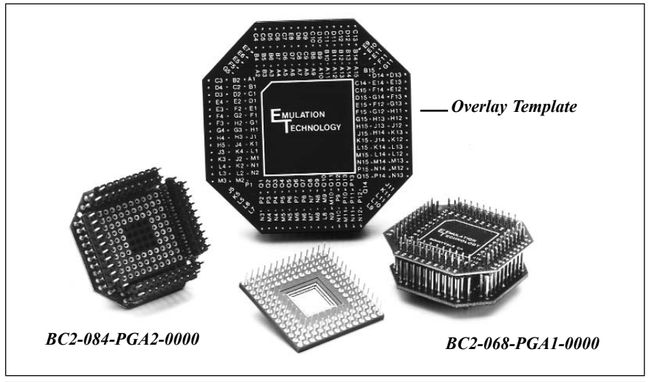
Pin Count	ET Part #	Product Description	Mates With Connector # (See Note 1.)	Drawing #
38	MIC-38-BREAKOUT	MICTOR Breakout to 38 position MICTOR Male Plug w/ Digital signals brought out to accessible headers	2-767004-2, 767054-1, 767044-1	F6716
38	MIC-38-BREAKOUT-FEMALE	MICTOR Breakout to 38 position MICTOR Female Plug w/ Digital signals brought out to accessible headers	767055	F7049
38	MIC-38-CABLE-MF	MICTOR Cable, 38 position, Male to Female,18" Length	Recept. Mates w/ 2-767004-2 Plug Mates w/ 2-767004-2, 767054-1, 767044-1	F6777
38	MIC-38-CABLE-MM	MICTOR Cable, 38 position, Male to Male,18" Length	2-767004-2, 767054-1, 767044-1	F6776
38	MIC-38-SMTPADS	MICTOR BreakOut to 38 position MICTOR Male Plug w/ Digital signals brought out to surface mount pads	2-767004-2, 767054-1, 767044-1	F6690
38	MIC-38-SPLITTER	MICTOR Splitter consists of one 38 position MICTOR Plug & Three 38 position MICTOR Female Receptacles	3 Female Receptacles mate w/ 767006-1 1 Male Plug mates w/ 2-767004-2 or 767044-1	F6778
38	MIC-38-CABLE-MM-6	MICTOR Cable, 38 position, Male to Male, 6" Length	2-767004-2, 767054-1, 767044-1	F7050
38	CON-MICTOR-FEM-38-SMT	MICTOR Female Connector Only -38 Position	2-767004-2	F1416
38	CON-MICTOR-MALE-38-SMT	MICTOR Connector Male Only - 38 Position	767007-8	F6718
38	CON-MICTOR-SHROUD-38	Shroud used w/ CON-MICTOR-FEM-38-SMT	2-767004-2	F6719
38	BCM-038-MICTOR-0000	MICTOR Bug Katcher Adapter	2-767004-2, 767054-1, 767044-1	F7293
76	MIC-76-BREAKOUT	MICTOR BreakOut to 76 position MICTOR Male Plug w/ Digital signals brought out to accessible headers	2-767004-3	F6741
114	MIC-114-BREAKOUT	MICTOR BreakOut to 114 position MICTOR Male Plug w/ Digital signals brought out to accessible headers	2-767004-4	F6740
114	CON-MICTOR-FEM-114-SMT	MICTOR Connector Female Only - 114 Position	2-767004-4	F6787
152	MIC-152-BREAKOUT-MALE	MICTOR BreakOut to 152 position MICTOR Male Plug w/ Digital signals brought out to accessible headers	767044-4	F7022
152	MIC-152-BREAKOUT-FEMALE	MICTOR BreakOut to 152 position MICTOR Female Plug w/ Digital signals brought out to accessible headers	767006-4	F7046

Note 1. Mating Connectors are sold by Tyco / AMP and Emulation Technology, Inc.

For a complete list of MICTOR adapter specifications, pricing and delivery information, see:
Web Link:www.1800adapter.com/062

LOGIC ANALYZER/SCOPE ADAPTERS - PGA





- PGA Bug Katchers make it easy to attach test leads to socketed ICs in PGA packages
- Accommodate PGA packages with 44 to 396 pins
- Support Motorola, Intel and other popular processors
- Device template makes pin identification easy by labeling each test point
- Fits between your IC and socket
- Test points for each pin are located on the perimeter of each Bug Katcher for quick connection of wire wraps, test probes, or interfacing cable assemblies
- PGA Bug Katchers eliminate the need for noisy cables, and reduces capacitance and inductance in your test set-up
- Custom adapters available

HOW TO ORDER

1) Match pin count to corresponding chip package (see ordering information example).

2) Choose pin map and socket type and match them to ET part #.

3) Verify footprint in the Package Coding SystemSection of this catalog.

Ordering Information Example

Pin Count
Product Code — BC 2-068-PGA1-0000Z — Device Template; Optional ZIF* Chip Pkg Socket (*ZIF = ZIF)
PGA Male Plug — Chip Pkg Socket (see Footprint Section)

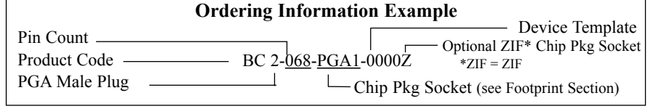
PGA

Pin Count	Footprint Code	Pin Map	Top Socket Type	ET Part #	Drawing #
28	28-PGA0	Generic	LIF	BC4-28-PGA0-0000	F3495
44	044-PGA5	Generic	LIF	BC2-044-PGA5-0000	F1489
44	044-PGA5	Generic	LIF	BC4-44-PGA5-0000	F1309
52	52-PGA6	Generic	LIF	BC4-52-PGA6-0000	F3500
56	056-PGA6	Generic	LIF	BC2-056-PGA6-0000	F1490
60	060-PGA5	Generic	LIF	BC2-060-PGA5-0000	F3309
64	064-PGA5	Generic	LIF	BC2-064-PGA5-0000	F3310
68	068-PGA1	Generic	LIF	BC2-068-PGA1-0000	F1458
68	068-PGA1	Generic	ZIF	BC2-068-PGA1-0000Z	F3318
68	068-PGA1	80186/88	LIF	BC2-068-PGA1-80186/88	F3319
68	068-PGA1	80286	LIF	BC2-068-PGA1-80286	F3320
68	068-PGA2	Generic	LIF	BC2-068-PGA2-0000	F1459
68	068-PGA2	Generic	ZIF	BC2-068-PGA2-0000Z	F3321
68	068-PGA2	68000/10	LIF	BC2-068-PGA2-68000/10	F3322
68	068-PGA2	Generic	LIF	BC2-068-PGA2-68881	F3323
68	68-PGA1	Generic	LIF	BC4-68-PGA1-0000	F1611
68	68-PGA1	FLIPMCS96	LIF	BC4-68-PGA1-FLIPMCS96	F3509
68	68-PGA1	80186/88	LIF	BC4-68-PGA1-80186/88	F3507
69	069-PGA1	Generic	LIF	BC2-069-PGA1-0000	F3324
72	072-PGA1	Generic	LIF	BC2-072-PGA1-0000	F3325
72	072-PGA1	Generic	LIF	BC2-072-PGA1-0000Z	F3326
80	080-PGA7	Generic	LIF	BC2-080-PGA7-0000	F1491
84	084-PGA1	Generic	LIF	BC2-084-PGA1-0000	F1583
84	084-PGA1	Generic	ZIF	BC2-084-PGA1-0000Z	F3328
84	084-PGA2	Generic	LIF	BC2-084-PGA2-0000	F1460
84	084-PGA7	Generic	LIF	BC2-084-PGA7-0000	F1492
84	84-PGA3	Generic	LIF	BC4-84-PGA3-0000	F1612
85	085-PGA1	Generic	LIF	BC2-085-PGA1-0000	F3329
85	085-PGA1	Generic	ZIF	BC2-085-PGA1-0000Z	F3330
85	085-PGA3	Generic	LIF	BC2-085-PGA3-0000	F3331
88	088-PGA3	Generic	LIF	BC2-088-PGA3-0000	F1461
88	088-PGA3	Generic	ZIF	BC2-088-PGA3-0000Z	F3332
88	088B-PGA3	56001	LIF	BC2-088B-PGA3-56001	F3334
96	096-PGA1	Generic	LIF	BC2-096-PGA1-0000	F3335
96	096-PGA1	Generic	ZIF	BC2-096-PGA1-0000Z	F3336
100	100-PGA3	Generic	LIF	BC2-100-PGA3-0000	F3338

For a complete list of logic analyzer adapters, pricing and delivery information, please see:
Web Link: www.emulation.com/catalog/#logic

PGA - LOGIC ANALYZER/SCOPE ADAPTERS

Ordering Information Example



For a complete list of product specifications, pricing and delivery information, please see

Web Link:
www.emulation.com/catalog/#logic

PGA (cont.)

Pin Count	Footprint Code	Pin Map	Top Socket Type	ET Part #	Drawing #
100	144-PGA4	Generic	LIF	BC2-144-PGA4-0000	F1477
101	101-PGA3	Generic	LIF	BC2-101-PGA3-0000	F1462
101	101-PGA3	Generic	ZIF	BC2-101-PGA3-0000Z	F2066
101	101-PGA3	56001	LIF	BC2-101-PGA3-ADSP2100	F3342
104	104-PGA4	Generic	ZIF	BC2-104-PGA4-0000Z	F3345
108	108-PGA7	Generic	LIF	BC2-108-PGA7-0000	F1495
112	112-PGA1	Generic	LIF	BC2-112-PGA1-0000	F3346
112	112-PGA1	Generic	ZIF	BC2-112-PGA1-0000Z	F3347
112	112-PGA9	Generic	LIF	BC2-112-PGA9-0000	F1507
112	112-PGA9	Generic	ZIF	BC2-112-PGA9-0000Z	F3348
114	114-PGA3	Generic	LIF	BC2-114-PGA3-0000	F1463
114	114-PGA3	Generic	ZIF	BC2-114-PGA3-0000Z	F3349
114	114-PGA3	68020	LIF	BC2-114-PGA3-68020	F3350
114	114-PGA3	68020	ZIF	BC2-114-PGA3-68020Z	F3351
114	114-PGA3	Generic	ZIF	BC2-114-PGA8-0000Z	F3353
116	116-PGA1	Generic	LIF	BC2-116-PGA1-0000	F3354
116	116-PGA1	Generic	ZIF	BC2-116-PGA1-0000Z	F3355
120	120-PGA3	Generic	LIF	BC2-120-PGA3-0000	F1464
120	120-PGA3	Generic	ZIF	BC2-120-PGA3-0000Z	F3357
120	120-PGA3	68020	LIF	BC2-120-PGA3-68020	F3358
120	120-PGA3	68020	ZIF	BC2-120-PGA3-68020Z	F3359
120	120-PGA10	Generic	LIF	BC2-120-PGA10-0000	F1508
120	120-PGA10	Generic	ZIF	BC2-120-PGA10-0000Z	F3356
121	121-PGA1	Generic	LIF	BC2-121-PGA1-0000	F3360
121	121-PGA1	Generic	ZIF	BC2-121-PGA1-0000Z	F3361
121	121-PGA3	Generic	LIF	BC2-121-PGA3-0000	F3362
121	121-PGA3	Generic	ZIF	BC2-121-PGA3-0000Z	F3363
125	125-PGA3	Generic	LIF	BC2-125-PGA3-0000	F3364
125	125-PGA3	Generic	ZIF	BC2-125-PGA3-0000Z	F3365
128	128-PGA3	Generic	LIF	BC2-128-PGA3-0000	F1471
128	128-PGA3	Generic	ZIF	BC2-128-PGA3-0000Z	F3368
128	128-PGA3	68030	LIF	BC2-128-PGA3-68030	F3369
128	128-PGA3	68030	ZIF	BC2-128-PGA3-68030Z	F3370
128	100C-PGA3	Generic	ZIF	BC2-100C-PGA3-0000Z	F6273
132	132-PGA3	68851	LIF	BC2-132-PGA3-68851	F3373
132	132-PGA3	Generic	LIF	BC2-132-PGA3-0000	F1472
132	132-PGA3	68302	LIF	BC2-132-PGA3-68302	F3371
132	132-PGA3	68302	ZIF	BC2-132-PGA3-68302Z	F3372
132	132-PGA8	Generic	LIF	BC2-132-PGA8-0000	F1496
132	132-PGA8	Generic	LIF	BC2-132-PGA8-0000Z	F3374
132	132-PGA8	80386	LIF	BC2-132-PGA8-80386	F3375
132	132-PGA8	80960KB	LIF	BC2-132-PGA8-80960KB	F3377
132	132-PGA8	80960KB	ZIF	BC2-132-PGA8-80960KBZ	F3378
132	132-PGA8	80386	ZIF	BC2-132-PGA8-80386Z	F3376
133	133-PGA3	Generic	LIF	BC2-133-PGA3-0000	F3379
133	133-PGA3	Generic	LIF	BC2-133B-PGA3-0000	F3381
133	133-PGA3	Generic	ZIF	BC2-133B-PGA3-0000Z	F3382
133	133-PGA3	Generic	ZIF	BC2-133-PGA3-0000Z	F3380
135	135-PGA8	Generic	LIF	BC2-135-PGA8-0000	F3383
135	135-PGA8	Generic	ZIF	BC2-135-PGA8-0000Z	F3384
136	136-PGA12	Generic	LIF	BC2-136-PGA12-0000	F1532
136	136-PGA12	Generic	ZIF	BC2-136-PGA12-0000Z	F3385
144	144-PGA3	Generic	LIF	BC2-144-PGA3-0000	F1465
144	144-PGA3	Generic	ZIF	BC2-144-PGA3-0000Z	F3387
144	104-PGA4	Generic	LIF	BC2-104-PGA4-0000	F3344
144	144-PGA4	R3000	LIF	BC2-144-PGA4-R3000Z	F3390
144	145-PGA4	AM29030	LIF	BC2-145-PGA4-AM29030	F3391
144	144-PGA4	Generic	LIF	BC2-144-PGA4-0000Z	F3388
144	144-PGA13	Generic	LIF	BC2-144-PGA13-0000	F1536
144	144-PGA13	Generic	ZIF	BC2-144-PGA13-0000Z	F3386

PGA (cont.)

Pin Count	Footprint Code	Pin Map	Top Socket Type	ET Part #	Drawing #
145	145-PGA4	Generic	LIF	BC2-145-PGA4-0000	F1478
145	145-PGA4	Generic	ZIF	BC2-145-PGA4-0000Z	F1730
145	149-PGA4	Generic	LIF	BC2-149-PGA4-0000	F3392
145	145-PGA4	AM29030Z	ZIF	BC2-145-PGA4-AM29030Z	F1731
149	144-PGA4	R3000	LIF	BC2-144-PGA4-R3000	F3389
156	156-PGA9	Generic	LIF	BC2-156-PGA9-0000	F1509
156	156-PGA9	Generic	ZIF	BC2-156-PGA9-0000Z	F3393
160	160-PGA3	Generic	LIF	BC2-160-PGA3-0000	F1479
160	160-PGA3	Generic	LIF	BC2-160-PGA3-0000-RA	F4680
160	160-PGA3	Generic	ZIF	BC2-160-PGA3-0000Z	F3394
160	160-PGA4	Generic	LIF	BC2-160-PGA4-0000	F3395
160	160-PGA4	Generic	ZIF	BC2-160-PGA4-0000Z	F1734
160	160-PGA8	Generic	LIF	BC2-160-PGA8-0000	F3396
160	160-PGA8	Generic	ZIF	BC2-160-PGA8-0000Z	F3397
168	168-PGA3	Generic	LIF	BC2-168-PGA3-0000	F3400
168	168-PGA3	Generic	ZIF	BC2-168-PGA3-0000Z	F3401
168	168-PGA10	Generic	LIF	BC2-168-PGA10-0000	F1510
168	168-PGA10	80860	LIF	BC2-168-PGA10-80860	F3398
168	168-PGA10	80960C	LIF	BC2-168-PGA10-80960CA/CF	F2092
168	168-PGA10	80960C	ZIF	BC2-168-PGA10-80960CA/CFZ	F3399
168	168-PGA10	486SX/DX	LIF	BC2-168-PGA10-486SX/DX	F1263
168	168-PGA10	486SX/DX	ZIF	BC2-168-PGA10-486SX/DXZ	F1264
168	168-PGA10	Generic	ZIF	BC2-168-PGA10-0000Z	F2088
168	168-PGA10	80486	LIF	BC2-168-PGA10-80486	F1845
169	169-PGA3	Generic	LIF	BC2-169-PGA3-0000	F3404
169	169-PGA3	Generic	ZIF	BC2-169-PGA3-0000Z	F3405
169	169-PGA10	Generic	LIF	BC2-169-PGA10-0000	F3402
169	169-PGA10	Generic	ZIF	BC2-169-PGA10-0000Z	F3403
169	169-PGA10	80486	ZIF	BC2-169-PGA10-80486Z	F7036
175	175-PGA4	Generic	LIF	BC2-175-PGA4-0000	F3230
175	175-PGA4	Generic	ZIF	BC2-175-PGA4-0000Z	F3408
175	175A-PGA9	32532	LIF	BC2-175A-PGA9-32532	F3411
175	175B-PGA9	Generic	LIF	BC2-175B-PGA9-0000	F2153
175	175B-PGA9	Generic	ZIF	BC2-175B-PGA9-0000Z	F2155
175	175A-PGA9	Generic	LIF	BC2-175A-PGA9-0000	F3409
175	175-PGA10	Generic	ZIF	BC2-175A-PGA9-0000Z	F3410
175	175-PGA10	Generic	LIF	BC2-175-PGA10-0000	F3406
175	175-PGA10	Generic	ZIF	BC2-175-PGA10-0000Z	F3407
176	176-PGA4	Generic	LIF	BC2-176-PGA4-0000	F1486
176	176-PGA4	Generic	ZIF	BC2-176-PGA4-0000Z	F2065
176	176-PGA4	Generic	ZIF	BC2-176-PGA4-0000Z-RA	F7037
176	176A-PGA9	Generic	LIF	BC2-176A-PGA9-0000	F3412
176	176B-PGA9	Generic	LIF	BC2-176B-PGA9-0000	F3414
176	176B-PGA9	Generic	ZIF	BC2-176B-PGA9-0000Z	F3415
176	176A-PGA9	Generic	ZIF	BC2-176A-PGA9-0000Z	F3413
177	177-PGA4	Generic	LIF	BC2-177-PGA4-0000	F1487
179	179-PGA4	Generic	ZIF	BC2-179-PGA4-0000Z	F2038
179	179-PGA4	Generic	LIF	BC2-179-PGA4-0000	F3418
179	179-PGA8	Generic	LIF	BC2-179-PGA8-0000	F3419
179	179-PGA8	Generic	ZIF	BC2-179-PGA8-0000Z	F3420
179	179-PGA11	68040	LIF	BC2-179-PGA11-68040	F3416
179	179-PGA11	68040	LIF	BC2-179-PGA11-68040-RA	F3416
179	179-PGA11	68040	ZIF	BC2-179-PGA11-68040Z	F3417
180	180A-PGA4	Generic	LIF	BC2-180A-PGA4-0000	F1497
180	180B-PGA4	Generic	LIF	BC2-180B-PGA4-0000	F1498
180	180-PGA11	Generic	LIF	BC2-180-PGA11-0000	F1529
180	180-PGA11	Generic	ZIF	BC2-180-PGA11-0000Z	F2223
181	181-PGA4	Generic	LIF	BC2-181-PGA4-0000	F1499
181	181-PGA4	Generic	ZIF	BC2-181-PGA4-0000Z	F3422
181	181B-PGA10	MC88100	LIF	BC2-181B-PGA10-MC88100	F3426

LOGIC ANALYZER/SCOPE ADAPTERS - PGA

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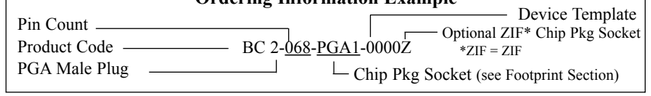
Web Link: www.emulation.com/catalog/#logic

Ordering Information Example



PGA (cont.)

Pin Count	Footprint Code	Pin Map	Top Socket Type	ET Part #	Drawing #
181	181B-PGA10	Generic	LIF	BC2-181B-PGA10-0000	F3425
181	181A-PGA10	Generic	LIF	BC2-181A-PGA10-0000	F3423
181	181A-PGA10	Generic	ZIF	BC2-181A-PGA10-0000Z	F3424
184	184-PGA8	Generic	LIF	BC2-184-PGA8-0000	F3427
184	184-PGA8	Generic	ZIF	BC2-184-PGA8-0000Z	F3428
191	191-PGA11	Generic	LIF	BC2-191-PGA11-0000	F2105
191	191-PGA11	Generic	ZIF	BC2-191-PGA11-0000Z	F3429
192	192-PGA9	Generic	LIF	BC2-192-PGA9-0000	F3433
192	192-PGA9	Generic	ZIF	BC2-192-PGA9-0000Z	F1279
192	192-PGA10	Generic	LIF	BC2-192-PGA10-0000	F3430
192	192-PGA10	Generic	ZIF	BC2-192-PGA10-0000Z	F3431
192	192-PGA12	Generic	LIF	BC2-192-PGA12-0000	F1533
192	192-PGA12	Generic	ZIF	BC2-192-PGA12-0000Z	F3432
196	196-PGA8	Generic	LIF	BC2-196-PGA8-0000	F3434
200	200-PGA4	Generic	LIF	BC2-200-PGA4-0000	F1500
200	200-PGA4	Generic	ZIF	BC2-200-PGA4-0000Z	F3435
204	204-PGA13	Generic	LIF	BC2-204-PGA13-0000	F1537
204	204-PGA13	Generic	ZIF	BC2-204-PGA13-0000Z	F3436
205	205-PGA4	Generic	LIF	BC2-205-PGA4-0000	F3437
206	206-PGA11	Generic	LIF	BC2-206-PGA11-0000	F4685
206	206-PGA11	68060	LIF	BC2-206-PGA11-68060	F4217
207	207-PGA10	Generic	LIF	BC2-207-PGA10-0000	F3438
207	207-PGA10	CY7C601	LIF	BC2-207-PGA10-CY7C601	F3440
207	207-PGA10	CY7C601	ZIF	BC2-207-PGA10-CY7C601Z	F3441
207	207-PGA10	Generic	ZIF	BC2-207-PGA10-0000Z	F3439
209	209-PGA10	Generic	LIF	BC2-209-PGA10-0000	F1511
209	209-PGA10	Generic	ZIF	BC2-209-PGA10-0000Z	F3442
216	216-PGA4	Generic	LIF	BC2-216-PGA4-0000	F3443
216	216-PGA4	Generic	ZIF	BC2-216-PGA4-0000Z	F3444
220	220-PGA9	Generic	LIF	BC2-220-PGA9-0000	F3445
220	220-PGA9	Generic	ZIF	BC2-220-PGA9-0000Z	F3446
223	223-PGA11	Generic	LIF	BC2-223-PGA11-0000	F3447
223	223-PGA11	Generic	ZIF	BC2-223-PGA11-0000Z	F3448
223	223B-PGA11	DSP96002	LIF	BC2-223B-PGA11-DSP96002	F1649
223	223B-PGA11	DSP96002	ZIF	BC2-223B-PGA11-DSP96002Z	F3451
223	223-PGA11	ADSP21000	LIF	BC2-223-PGA11-ADSP21000	F4682
223	223-PGA11	ADSP21000	ZIF	BC2-223-PGA11-ADSP21000Z	F4683
223	223-PGA11	Generic	ZIF	BC2-223B-PGA11-0000Z	F7038
223	223-PGA13	Generic	LIF	BC2-223-PGA13-0000	F3449

PGA (cont.)

Pin Count	Footprint Code	Pin Map	Top Socket Type	ET Part #	Drawing #
223	223-PGA13	Generic	ZIF	BC2-223-PGA13-0000Z	F3450
224	224-PGA4	Generic	LIF	BC2-224-PGA4-0000	F3453
224	224-PGA4	Generic	ZIF	BC2-224-PGA4-0000Z	F3454
224	224-PGA11	Generic	LIF	BC2-224-PGA11-0000	F1530
224	224-PGA11	Generic	LIF	BC2-224-PGA11-0000-RA	F7039
224	224-PGA11	Generic	ZIF	BC2-224-PGA11-0000Z	F3452
225	225-PGA4	Generic	LIF	BC2-225-PGA4-0000	F3459
225	225-PGA4	Generic	ZIF	BC2-225-PGA4-0000Z	F3460
225	225-PGA10	Generic	LIF	BC2-225-PGA10-0000	F1512
225	225-PGA10	Generic	ZIF	BC2-225-PGA10-0000Z	F3455
225	225-PGA10	Generic	LIF	BC2-225-PGA11-0000	F3458
225	225-PGA10	Generic	ZIF	BC2-225-PGA11-0000Z	F1138
232	232-PGA10	Generic	LIF	BC2-232-PGA10-0000	F2056
232	232-PGA10	Generic	ZIF	BC2-232-PGA10-0000Z	F3461
240	240-PGA10	Generic	LIF	BC2-240-PGA10-0000	F3462
240	240-PGA10	Generic	ZIF	BC2-240-PGA10-0000Z	F3463
240	240-PGA12	Generic	LIF	BC2-240-PGA12-0000	F1534
240	240-PGA12	Generic	ZIF	BC2-240-PGA12-0000Z	F3464
241	241-PGA11	68360	LIF	BC2-241-PGA11-68360	F1149
241	241-PGA11	68360	LIF	BC2-241-PGA11-68360-SPL	F7040
241	241-PGA11	Generic	LIF	BC2-241-PGA11-0000	F5847
241	241-PGA11	68360	ZIF	BC2-241-PGA11-68360Z	F1157
241	241-PGA11	68360	ZIF	BC2-241-PGA11-68360Z-RA	F4684
243	243-PGA12	Generic	LIF	BC2-243-PGA12-0000	F3465
243	243-PGA12	CY7C604	LIF	BC2-243-PGA12-CY7C604	F3467
243	243-PGA12	CY7C604	ZIF	BC2-243-PGA12-CY7C604Z	F3468
256	256-PGA13	Generic	LIF	BC2-256-PGA13-0000	F1538
256	256-PGA13	Generic	ZIF	BC2-256-PGA13-0000Z	F3469
257	256-PGA13	Generic	LIF	BC2-257-PGA13-0000	F1539
257	256-PGA13	Generic	ZIF	BC2-257-PGA13-0000Z	F3470
260	260-PGA11	Generic	LIF	BC2-260-PGA11-0000	F1531
260	260-PGA11	Generic	LIF	BC2-260-PGA11-0000-RA	F7041
260	260-PGA11	Generic	ZIF	BC2-260-PGA11-0000Z	F3471
262	262-PGA12	Generic	LIF	BC2-262-PGA12-0000	F1241
262	262-PGA12	Generic	ZIF	BC2-262-PGA12-0000Z	F3472
273	273-PGA14	Generic	LIF	BC2-273-PGA14-0000	F1714
273	273-PGA14	Generic	ZIF	BC2-273-PGA14-0000Z	F1715
273	273-PGA14	PENTIUM	LIF	BC2-273-PGA14-PENTIUM	F1441
273	273-PGA14	PENTIUM	ZIF	BC2-273-PGA14-PENTIUMZ	F2020
280	280-PGA12	Generic	LIF	BC2-280-PGA12-0000	F1535
280	280-PGA12	Generic	ZIF	BC2-280-PGA12-0000Z	F3473
281	281-PGA11	Generic	LIF	BC2-281-PGA11-0000	F1521
281	281-PGA11	Generic	ZIF	BC2-281-PGA11-0000Z	F3474
281	281-PGA12	Generic	LIF	BC2-281-PGA12-0000	F2041
281	281-PGA12	Generic	ZIF	BC2-281-PGA12-0000Z	F2042
289	289-PGA10	JPL-HP	LIF	BC2-289-PGA10-JPL-HP	F6695
289	289-PGA10	Generic	LIF	BC2-289-PGA10-0000	F3475
289	289-PGA10	Generic	ZIF	BC2-289-PGA10-0000Z	F3476
299	299-PGA13	Generic	LIF	BC2-299-PGA13-0000	F3477
299	299-PGA13	Generic	ZIF	BC2-299-PGA13-0000Z	F3478
300	300-PGA13	Generic	LIF	BC2-300-PGA13-0000	F1540
300	300-PGA13	Generic	ZIF	BC2-300-PGA13-0000Z	F3479
301	301-PGA13	Generic	LIF	BC2-301-PGA13-0000	F1547
301	301-PGA13	Generic	ZIF	BC2-301-PGA13-0000Z	F3480
319	319-PGA14	Generic	LIF	BC2-319-PGA14-0000	F3481
319	319-PGA14	Generic	ZIF	BC2-319-PGA14-0000Z	F3850
383	383-PGA15	Generic	LIF	BC2-383-PGA15-0000	F3482
383	383-PGA15	Generic	ZIF	BC2-383-PGA15-0000Z	F1943
441	441-PGA14	Generic	LIF	BC2-441-PGA14-0000	F5077

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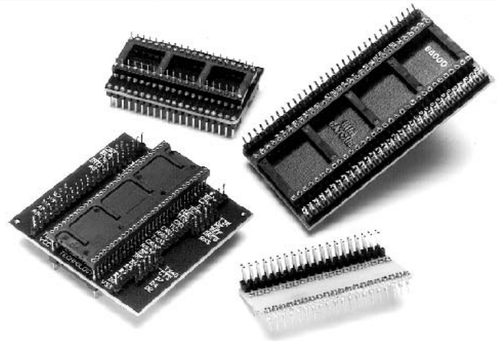
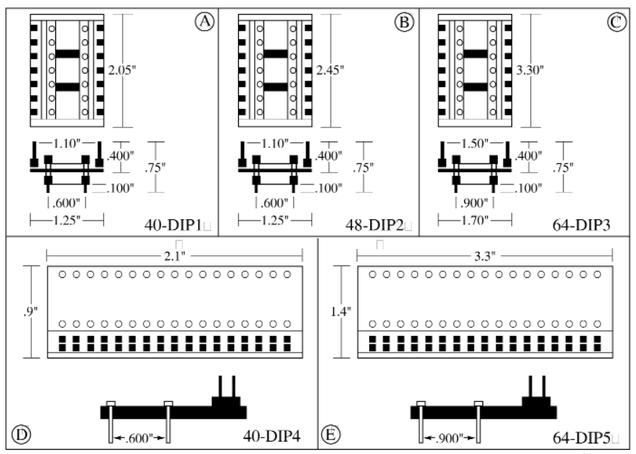
DIP - LOGIC ANALYZER/SCOPE ADAPTERS



Ordering Information Example

Pin Count — Device Pin Numbering
Product Code — BC 1-040-DIP-0000Z — Optional ZIF* Chip Pkg Socket
DIP Male Plug — *Zero Insertion Force
Chip Pkg. Footprint Socket (see drawings below)



- DIP Bug Katchers make it easy to attach test leads to socketed ICs in DIP packages
- Accommodates DIP packages with 28, 32, 40, 48, and 64 pins
- Fits between your IC and socket
- Low profile: .75" high (conventional test clips are 1.5" high)
- Accepts logic analyzer and emulator simultaneously
- Fully-labeled with mnemonics or generic pin numbers
- Custom adapters available

HOW TO ORDER

1) Check to see if your chip package and target socket icons are shown in the Device-Specific section (right column of table).
2) If your part is not listed in the Device-Specific section under the appropriate icon, find your chip package and target socket in the Pin-Numbered section (on the left side of these tables).
3) Find the pin count that corresponds to your chip package (see Ordering Information Example).

DIP

Pin Count	DIP Width	Pin Map	Socket Type	ET Part #	Drawing #
28	.600"	Generic	Low Insertion Force	BC1-028-DIP6-0000	F1581
32	.600"	Generic	Low Insertion Force	BC1-032-DIP7-0000	F1580
40	.600"	Generic	Low Insertion Force	BC1-040-DIP1-0000	F1544
40	.600"	Generic	Low Insertion Force	BC1-040-DIP4-0000	F3300
40	.600"	Generic	Zero Insertion Force	BC1-040-DIP1-0000Z	F3289
40	.600"	8031/51	Low Insertion Force	BC1-040-DIP1-8031/51	F3290
40	.600"	Z80	Low Insertion Force	BC1-040-DIP1-Z80	F3299
48	.600"	Generic	Low Insertion Force	BC1-048-DIP2-0000	F1545
64	.600"	Generic	Low Insertion Force	BC1-064-DIP3-0000	F1546
64	.600"	Generic	Low Insertion Force	BC1-064-DIP3-68000	F1936
64	.750"	64180	Low Insertion Force	BC1-064-SDIP-64180	F2221

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PROGRAMMING ADAPTERS

Adapt-A-Socket® Programming Adapters allow you to use any programmer designed for a DIP socket to program BGA, PLCC, SOJ, PGA, PQFP, TSOP, SSOP, and Flatpack devices. You can program, PLDs, PALs, EPROMs, EEPROMs, and Flash Memory. These adapters are designed to fit all types of programmers and are easy to use. To program, you simply insert an Adapt-A-Socket between the programmer's DIP socket and the circuit to be programmed.

FEATURES & BENEFITS

- Allow devices in non-DIP or non-standard DIP packages to fit the .300" or .600" DIP sockets (all types of programmers)
- Test points are provided for each signal in most adapters
- Other optional features: Bypass capacitor between VCC & GND, gang-ability, specific socket manufacturer, machine screw pin termination, & reverse pinout

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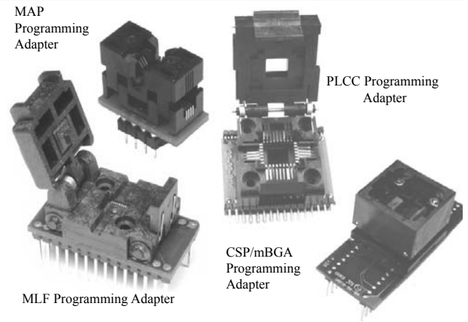

PACKAGE STYLE	PAGE
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FIELD CONFIGURABLE	109
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PLCC	106, 107
PQFP/TQFP	102, 103
SOIC	104
SSOP, SDI, SOT, MMCARD	105
TSOP	101

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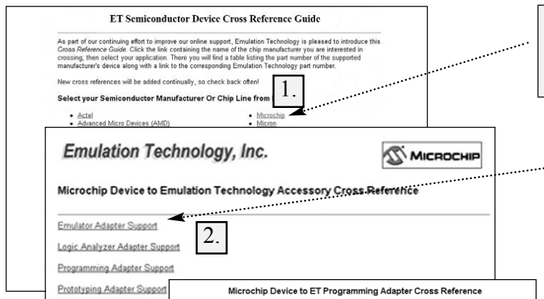
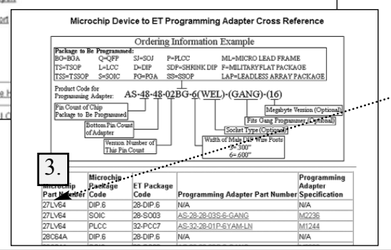
CROSS REFERENCE BY SEMICONDUCTOR MANUFACTURER





1. From the Cross Reference Index Page, click through to manufacturer's reference page via their hyperlink

2. Find Adapter Type

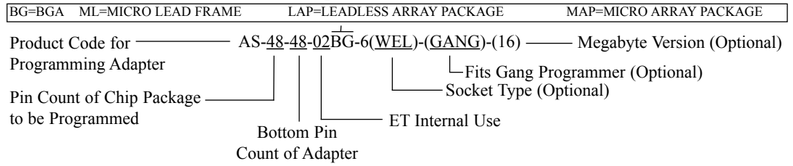
3. Match Manufacturer Part Number in listing with ET Package Code

If you cannot find your manufacturer in the Cross Reference Guide, please contact our technical support group via email at:
www.emulation.com/technical

PROGRAMMING ADAPTERS - BGA/ MAP/LAP/TAP/MLF

Ordering Information Example

BG=BGA ML=MICRO LEAD FRAME LAP=LEADLESS ARRAY PACKAGE MAP=MICRO ARRAY PACKAGE



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

BGA

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Size (mm)	Grid Size	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
34	32	0.50	4X6	9X6	SST39VF010/020/040	32-5BG9X6	AS-34-32-01BG-6	F7005
40	40	0.75	7.43x5.69	5X8	GT28F008/016/S3/S5/SC	40-4BG5X8	AS-40-40-01BG-6YAM-8/16	M4229
48	48	0.80	6X8	6x8	INTEL	48-6BG6X8	AS-48-32-01BG-6	F7006
48	48	0.75	9.25X7.13	6X8	INTELGT28F016B3)	48-4BG6X8	AS-48-40-01BG-6YAM-16	F4334
48	48	0.75	7.48X5.74	6X8	GT28F004/008B3	48-4BG6X8	AS-48-40-01BG-6YAM-8	M5699
48	48	0.75	7.9X6.5	6X8	GT28F016C3/A16B3	48-4BG6X8	AS-48-40-02BG-6TI-16	M5902
48	48	0.75	9.8X7.6	6X8	GT28F0323XA/C3XA	48-4BG6X8	AS-48-40-02BG-6TI-32	M5523
48	48	0.75	9.8X7.6	6X8	GT28F160B3	48-4BG6X8	AS-48-44-01BG-6YAM-16	M4226
48	48	0.75	7.9X6.5	6X8	GT28F800B3/400B3	48-4BG6X8	AS-48-44-01BG-6YAM-8	M5497
48	48	0.75	7.286X10.85	6X8	GT28F160CXA/B3XA	48-4BG6X8	AS-48-48-01BG-6TI-16	M5448
48	48	0.75	7.3X10.85	6X8	GT28F320C3XA/B3XA	48-4BG6X8	AS-48-48-01BG-6TI-32	M5630
48	48	0.50	4X6	11X6	39XF800A/160A/320A/6401	48-5BG11X6	AS-48-48-01BG-6	F7007
48	48	0.80	8X9	6X8	AMD 29LV160BB/BT	48-6BG6X8	AS-48-48-02BG-6WEL-GANG-16	M5505
48	48	0.75	8X9	6X8	FUJ 29DL163TD	48-4BG6X8	AS-48-48-03BG-6WEL-GANG-16	M5893
48	48	0.80	6X8	6X8	SST 39VF160	48-6BG6X8	AS-48-48-04BG-6	M6007
48	48	0.80	8X10	6X8	SST 39VF100	48-6BG6X8	AS-48-48-05BG-6	M6256
48	48	0.80	8X9	6X8	29LV160BB/BT	48-6BG6X8	AS-48-48-06BG-6WEL-GANG-16	F6526
48	48	0.80	6X8	6X8	SST 39VF200A	48-6BG6X8	AS-48-48-07BG-6	F7008
56	40	0.75	7.7X16.4	9x8	INTEL G28F640J5	56-4BG9X8	AS-56-40-01BG-6YAM-64	M4637
56	48	0.75	7.7X16.4	9X8	GT28F640J5	56-4BG9X8	AS-56-48-01BG-6YAM-64	M4638
56	48	0.75	8X10.24	6X10	GT28F160F3/800F3	59-4BG6X10	AS-56-48-02BG-6TI	M5442
56	48	0.80	8X10	8X8	SST 34HF163X/64X	56-6BG8X8	AS-56-48-036BG-6	F6270
63	48	0.80	8X14	8X12	AMD 29LV033C/DL322C/3C	63-6BG8X12	AS-63-48-01BG-6WEL-GANG	M5631
64	48	1.00	10X13	8X8	RC28F16(32,64)0C3XA(C)	64-3BG008	AS-64-48-01EBG-6TI	F5861
64	48	1.00	10X13	8X8	RC28F320J3A	64-3BG008	AS-64-48-02EBG-6TI	M5862
64	48	1.00	10X13	8X8	RC28F160F3	64-3BG008	AS-64-48-03EBG-6TI	F2938

LAP/MLF

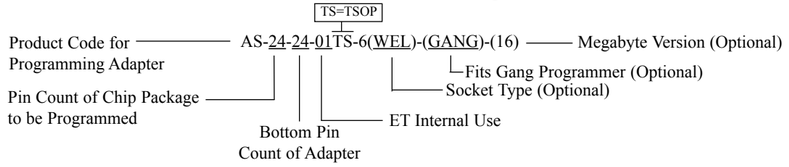
Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Size (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
8	8	1.27	5.10X8.10	WIRED 1TO1	08-LAP1	AS-08-08-01LAP-3	M6488
8	8	1.27	5.84X4.93	WIRED 1TO1	08-LAP2	AS-08-08-02LAP-3	F6696
8	8	1.27	5.99X5.99	WIRED 1TO1	08-LAP2	AS-08-08-03LAP-3	F6827
8	8	1.27	8.00X6.00	WIRED 1TO1	08-LAP2	AS-08-08-03LAP-3	F6978
8	8	1.27	5X6	WIRED 1TO1	08-ML08	AS-08-08-01ML-3	M6611
8	20	1.27	6X8	ATMEL AT45DB161B	08-LAP4	AS-08-20-01ML-3	F6980
20	20	0.65	5X5	WIRED 1TO1	20-ML02	AS-20-20-01ML-6	F6257
28	28	0.50	5.00X5.00	WIRED 1TO1	28-ML03	AS-28-28-01ML-6	F6258
28	28	0.65	6.00X6.00	PIC16F87XA	28-ML38	AS-28-28-02ML-6	F6712
32	20	0.50	5X5	AT TINY26	32-ML04	AS-32-20-01ML-3	F6772
32	28	0.50	5X5	ATMEGA8, ATTINY28L/V	32-ML04	AS-32-28-01ML-3	F6332
32	28	0.50	5X5	ATTINY28	32-ML04	AS-32-28-01ML-6	F6356
32	40	0.50	5X5	FOR AT90VC8544	32-ML04	AS-32-40-01ML-6	F6666
44	40	0.50	7X7	ATMEL MEGA 16/32 & 8535	44-ML05	AS-44-40-01ML-6	F6842
44	40	0.50	7X7	ATMEL MEGA 162 & 8515	44-ML05	AS-44-40-02ML-6	F6843
44	40	0.50	7X7	8031/51 PINOUT	44-ML05	AS-44-40-03ML-6	F6774
44	40	0.50	7X7	AT MEGA16/32/323/8535	44-ML05	AS-44-40-04ML-6	F6773

MAP/TAP

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Size (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
8	8	0.65	3X4.9	WIRED 1TO1	08-MAP01	AS-08-08-01MAP-3	M6698
8	8	0.65	8.4X3.65	WIRED 1TO1	08-LAP2	AS-08-08-01TAP-3	F7047

TSOP - PROGRAMMING ADAPTERS

Ordering Information Example

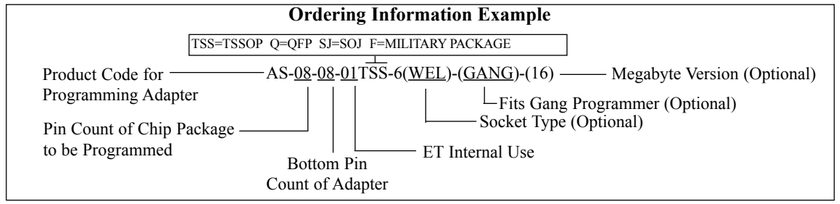


For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

TSOP

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
24	24	0.65	4.4X7.8	Wired 1 TO 1	024-ST03	AS-24-24-01TSS-6-GANG	M6023
28	28	0.55	11.8	Wired 1 TO 1	028-TS05	AS-28-28-01TS-6YAM-GANG-S	M1133
32	24	0.50	18.4	PIC28C16A	032-TS01	AS-32-24-01TS-6YAM-GANG-S	M4024
32	28	0.50	18.4	27C256	032-TS01	AS-32-28-01TS-6YAM-GANG-S	M2281
32	28	0.50	18.4	27C64/256/512	032-TS01	AS-32-28-02TS-6ENP-GANG-S	F1777
32	28	0.50	12.4	X28(H)C64	032-TS04	AS-32-28-04TS-6ENP-GANG-S	M2152
32	28	0.50	18.4	X28(H)C64	032-TS01	AS-32-28-05TS-6YAM-GANG-S	M3841
32	32	0.50	18.4	F28F010	032-TS01	AS-32-32-01TS-6ENP-GANG-R	M1705
32	32	0.50	18.4	AT49BV020	032-TS01	AS-32-32-01TS-6ENP-GANG-S	M1856
32	32	0.50	18.4	OPEN TOP	032-TS01	AS-32-32-01TS-6YAM-GANG-R	M1794
32	32	0.50	18.4	OPEN TOP	032-TS01	AS-32-32-01TS-6YAM-GANG-S	M2119
32	32	0.50	12.4	HIT29C101T15	032-TS04	AS-32-32-03TS-6ENP-GANG-S	M2115
32	32	0.50	18.4	CLAMSHL	032-TS01	AS-32-32-04TS-6YAM-GANG-S	M4224
32	32	0.50	18.4	F28F020	032-TS01	AS-32-32-05TS-6ENP-GANG-S	M5056
32	32	0.50	18.4	N/A	032-TS01	AS-32-32-06TS-6WEL-GANG-S	F7011
40	32	0.50	12.4	AT27LV040/27C040	040-TS01	AS-40-32-01TS-6YAM-S	M1876
40	32	0.50	12.4	MITSU27C201VP	040-TS04	AS-40-32-02TS-6YAM-R	M4302
40	32	0.50	12.4	MITSU27C201VP	040-TS04	AS-40-32-02TS-6YAM-S	M1366
40	32	0.50	18.4	NEC27C4001GZ	040-TS01	AS-40-32-03TS-6YAM-S	M1367
40	40	0.50	18.4	28F008/16SA/SAL/SC	040-TS01	AS-40-40-01TS-6YAM-GANG-R	F1208
40	40	0.50	18.4	28F008/16SA/SAL/SC	040-TS01	AS-40-40-01TS-6YAM-GANG-S	M1209
40	40	0.50	18.4	E28F002/4/8/BX/BL/BV	040-TS01	AS-40-40-02TS-6YAM-GANG-S	M1308
40	40	0.50	12.4	M5M28F102/27202RV	040-TS04	AS-40-40-03TS-6YAM-GANG-R	M2000
40	40	0.50	12.4	M5M28F102P	040-TS04	AS-40-40-03TS-6YAM-GANG-S	M3831
40	40	0.50	18.4	AT27LV4096	040-TS01	AS-40-40-04TS-6YAM-GANG-S	M3964
44	44	0.80	10.16	Wired 1 TO 1	044-TS12	AS-44-44-01TS2-6ENP-S	M5841
48	40	0.50	18.4	E28F200/400CR/CV	048-TS01	AS-48-40-01TS-6WEL-S	M3269
48	40	0.50	18.4	E28F200/400CR/CV	048-TS01	AS-48-40-01TS-6WEL-S	F5902
48	40	0.50	18.4	E28F200/400/800CR/CV	048-TS01	AS-48-40-02TS-6WEL-S	M3270
48	40	0.50	18.4	MBM29F080/016	048-TS01	AS-48-40-03TS-6WEL-S	M4633
48	42	0.50	16.4	MBM29F080/016	048-TS02	AS-48-42-01TS-6YAM-S	M2147
48	42	0.50	18.4	AMD/FUJ29F016	048-TS01	AS-48-42-02TS-6WEL-S	M3884
48	44	0.50	18.4	E28F200/400/800CV/E/B5	048-TS01	AS-48-44-01TS-6WEL-S	M3272
48	44	0.50	18.4	AMD29LV800B	048-TS01	AS-48-44-01TS-6WEL-R	M5340
48	44	0.50	18.4	AMD/FUJ 29F400AB/T	048-TS01	AS-48-44-02TS-6WEL-S	M3897
48	44	0.50	18.4	AMD/FUJ 29LV400	048-TS01	AS-48-44-03TS-6WEL-S	M3913
48	44	0.50	18.4	MBM29F200/400/800	048-TS01	AS-48-44-04TS-6WEL-S	M4303
48	44	0.50	18.4	TE28F160/400/800B3	048-TS01	AS-48-44-05TS-6YAM-S	M4227
48	44	0.50	18.4	DATA I/O SPRINT ONLY	048-TS01	AS-48-44-06TS-6YAM-S	M6087
48	48	0.50	18.4	AMD 29F400	048-TS01	AS-48-48-01TS-6WEL-S	M3813
48	48	0.50	18.4	AMD29F016 (12,37)(35,36)	048-TS01	AS-48-48-02TS-6WEL-S	M3895
48	48	0.50	18.4	29X/F100/200/400T/B/CX/EC/FC	048-TS01	AS-48-48-03TS-6YAM-S	M3955
48	48	0.50	18.4	TE28F320/160/800C3XA/B3XA	048-TS01	AS-48-48-04TS-6YAM-S	M5091
48	48	0.50	18.4	Wired 1 TO 1	048-TS01	AS-48-48-05TS-6WEL-S	M5504
48	48	0.50	18.4	Wired 1 TO 1	048-TS01	AS-48-48-05TS-6WEL-S-MS	F7009
48	48	0.50	18.4	CHIPMASTER AM29F400	048-TS01	AS-48-48-06TS-6WEL-S	M6295
56	40	0.50	18.4	E28F200/400BV/BX/BL	056-TS01	AS-56-40-01TS-6YAM-GANG-S	M1785
56	40	0.50	18.4	E28F200/400BX/BL/BV	056-TS01	AS-56-40-02TS-6YAM-GANG-S	M1784
56	40	0.50	18.4	E28F016XS/320J5/160S3	056-TS01	AS-56-40-04TS-6YAM-S	M3276
56	40	0.50	18.4	E28F016XD	056-TS01	AS-56-40-04TS-6YAM-S	M3277
56	44	0.50	18.4	E28F200/400BX/BV/BL	056-TS01	AS-56-44-01TS-6YAM-GANG-S	M1709
56	44	0.50	18.4	E28F016SA/SV	056-TS01	AS-56-44-02TS-6YAM-GANG-S	M2043
56	44	0.50	18.4	E28F016/SV	056-TS01	AS-56-44-03TS-6YAM-GANG-S	M2158
56	48	0.50	18.4	E28F016SA/SV,DD28F032SA	056-TS01	AS-56-48-01TS-6YAM-S	M2160
56	48	0.50	18.4	E28F016XS/320J5,TE28F160S3/S5	056-TS01	AS-56-48-02TS-6YAM-S	M3278
56	48	0.50	18.4	TE28F160/800F3	056-TS01	AS-56-48-03TS-6YAM-S	M5515
56	56	0.50	18.4	Wired 1 TO 1	056-TS01	AS-56-56-01TS-6YAM	F7010

PROGRAMMING ADAPTERS - TSSOP/SOJ/FLATPACK/PQFP/TQFP



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

TSSOP

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
8	8	0.65	4.40	WIRED 1-1	08-ST03	AS-08-08-01ST-3	M4607
8	8	0.65	4.40	MICROCHP 24AA64/LC64/C64	08-ST03	AS-08-08-02ST-3	M5300
8	8	0.65	4.40	MICROCHIP HCS362	08-ST03	AS-08-08-03ST-3	M5503
8	8	0.65	3.00	MICRCHIP 24AA52	08-ST36	AS-08-08-04ST-3	M6969
20	20	0.65	4.40	WIRED 1-1	20-ST03	AS-20-20-01TSS-6YAM	M4619
20	20	0.65	4.40	27LV520	20-ST03	AS-20-20-02TSS-6YAM	M5382
28	28	0.65	4.40	Philips	28-ST03	AS-28-28-01TSS-6ENP-GANG	F6511
56	40	0.50	18.4	DD28F032/16SA/SV	TS01	AS-56-40-03TS-6YAM-GANG-S	M2087

SOJ

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
20	20	1.27	.300"	WIRED 1TO1	20-SJ01	AS-20-20-01SJ-3	M3089
20	20	1.27	.300"	WIRED 1TO1	20-SJ01	AS-20-20-01SJ-6	M1476
24	24	1.27	.300"	WIRED 1TO1	24-SJ01	AS-24-24-01SJ-6	M3094
26	26	1.27	.300"	WIRED 1TO1	26-SJ01	AS-26-26-01SJ-3	M3103
26	26	1.27	.300"	WIRED 1TO1	26-SJ01	AS-26-26-01SJ-6	M2208
28	28	1.27	.300"	WIRED 1TO1	28-SJ01	AS-28-28-01SJ-3	M3180
28	28	1.27	.300"	WIRED 1TO1	28-SJ01	AS-28-28-01SJ-6	M2199
28	28	1.27	.300"	WIRED 1TO1	28-SJ01	AS-28-28-03SJ-3	M2240

MILITARY STANDARD FLATPACK

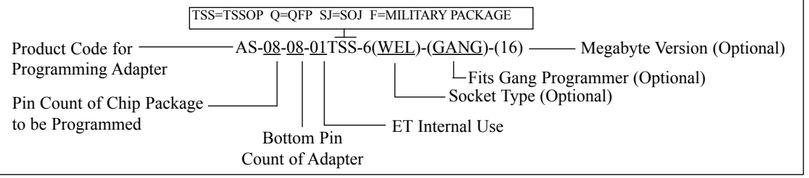
Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Dimensions Inches	Carrier Dimensions Inches	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
16	16	0.50	.280"X.420"	3/4 X 1	Wired 1TO1	16-FL01	AS-16-16-01F-3	M3067
16	16	0.50	.280"X.420"	3/4 X 1	Wired 1TO1	16-FL01	AS-16-16-01F-6	M3068
20	20	0.50	.300"X.520"	3/4 X 1	Wired 1TO1	20-FL02	AS-20-20-01F-3	M3085
24	24	0.50	.400"X.620"	1 1/4 X 1 1/4	Wired 1TO1	24-FL04	AS-24-24-02F-3	M3095
24	24	0.50	.400"X.620"	1 1/4 X 1 1/4	Wired 1TO1	24-FL04	AS-24-24-02F-6	M3096
28	28	0.50	.380"X.740"	1 1/4 X 1 1/4	Wired 1TO1	28-FL03	AS-28-28-01F-3	M3176
28	28	0.50	.380"X.740"	1 1/4 X 1 1/4	Wired 1TO1	28-FL03	AS-28-28-01F-6	M2116
32	32	1.27	N/A	1 1/4 X1 1/4	Wired 1TO1	32-FL07	AS-32-32-01F-6	M2148

PQFP/TQFP

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
32	8	0.80	9.0	EPC1441,1064/E	32-QF59D	AS-032-08-01Q-3ENP	M5450
32	28	0.80	9.0	AT90S/LS2333/4433/MG8	32-QF59D	AS-032-28-01Q-3ENP	M5801
32	28	0.80	9.0	AT90S/LS2333/443	32-QF59D	AS-032-28-01Q-3ENP-MS	M5801
44	28	0.80	12.0	IPLSI 1016/E,2032	44-QF16D	AS-44-28-01Q-3	M4815
44	28	0.80	12.0	IPLSI 1016/E,2032	44-QF16D	AS-44-28-01Q-6	M2197
44	28	0.80	12.0	MACH111/210/211/215	44-QF16D	AS-044-28-01Q-6ENP-SP	M4168
44	28	0.80	12.0	MACH110 ONLY!!!	44-QF16D	AS-44-28-01TQ-6ENP	M3878
44	28	0.80	12.0	ISP1016/E,2032/V/LV,2064	44-QF16D	AS-44-28-02Q-6	M4273
44	40	0.80	13.9/13.2	8031/51	44-QF16A/B	AS-044-40-01Q-6ENP	M2272
44	40	0.80	12.6	8031/51	44-QF16C	AS-44-40-01Q-6ENP-2.4	M3915
44	40	0.80	12.0	8051	44-QF16D	AS-44-40-01TQ-6ENP-2.0	M6261

PQFP/TQFP - PROGRAMMING ADAPTERS

Ordering Information Example



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

PQFP/TQFP (cont.)

Pin Count	Pin Count of Adapter	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
44	40	0.80	13.9	68HC705C8	44-QF16A	AS-44-40-02Q-6	M2082
44	40	0.80	13.2	68HC705C8	44-QF16B	AS-44-40-02Q-6	M2082
44	40	0.80	12.0	8051	44-QF16D	AS-44-40-02TQ-6ENP-2.0	M6735
44	40	0.80	13.0	PIC16C64/74	44-QF16B	AS-44-40-03Q-6YAM	M2157
44	40	0.80	12.0	PIC16C64/74/661	44-QF16D	AS-044-40-03TQ-6YAM	M5074
44	40	0.80	13.0	PIC17C42/43/44	44-QF16B	AS-044-40-04Q-6	M3248
44	40	0.80	12.0	17C42(A),44,17CR42,43	QF16D	AS-044-40-04TQ-6YAM	F5927
44	40	0.80	13.9/13.2	EPM7032	44-QF16A/B	AS-044-40-05Q-6	M3843
44	40	0.80	13.9/13.2	PSD311	44-QF16A/B	AS-044-40-06Q-6YAM	M5330
44	40	0.80	12.6	AT90(L)S4434,S8535,MEGA163L	44-QF16C	AS-44-40-07Q-6ENP-2.4	M5805
44	44	0.80	12.0	CY7C371	44-QF16D	AS-044-44-01Q-6	M4087
44	28	0.80	12.0	ISPLSI 2032/LV	44-QF16D	AS-048-28-01Q-6	M4267
52	40	1.00	17.2	PD301/02/03/11/12/13	52-QF37B	AS-052-40-01Q-6ENP	M1249
64	20	0.80	17.2	UPD75P036GC	64-QF29B	AS-064-20-01Q-6ENP	M3864
64	40	0.80	16.0	68HC705C9	64-QF29D	AS-064-40-02Q-6ENP	M4009
64	48	0.80	17.2	68HC711L6/E9	64-QF29B	AS-64-48-01Q-6ENP	M3825
64	48	0.80	17.2	68HC705/B16/B32/X16/BP32/X32	64-QF29B	AS-064-48-02Q-6ENP	M3826
64	48	1.00	23.2/17.2	PD75108F/112F/116F	64QF09B	AS-064-48-03Q-6	M5842
80	28	0.80	23.9/17.9	4074639FS,404638/39FS	80-QF08A	AS-080-28-01Q-6	M4301
100	28	0.50	16.0	IPLSI 1032/2096	100-QF49D	AS-100-28-01Q-6YAM	M1874
100	28	0.65	17.2/23.2	MACH 231SP/445	100-QF06A	AS-100-28-03Q-6	M2171
100	28	0.65	17.2/23.2	MACH 231SP/445	100-QF06B	AS-100-28-03Q-6	M2171
100	28	0.50	16.0	ISP2064V,2128V	100-QF49D	AS-100-28-04Q-6	M4304
100	28	0.50	16.0	ISPLSI 1024	100-QF49D	AS-100-28-05Q-6	M5001
100	28	0.50	16.0	PLSI/ISPLSI 1032/2064/E	100-QF49D	AS-100-28-06Q-6	M5048
100	32	0.50	16.0	HD647343F16	100-QF49D	AS-100-32-01Q-6YAM	M4094
120	28	0.80	31.2	IPLSI 1048	120-QF05B	AS-120-28-01Q-6YAM	M2173
128	28	0.80	31.2	IPLSI 1048/E,2096	128-QF13B	AS-128-28-01Q-6YAM	M2081
128	28	0.80	31.2	ISPLSI 2096V	128-QF13B	AS-128-28-02Q-6	M4274
128	28	0.40	16.0	ISPLSI1048C/E,2096	128-QF27	AS-128-28-03Q-6YAM	M4367
132	28	0.635	27.9	IFX780,EPX780	132-QF03	AS-132-28-01Q-6	M1972
144	28	0.65	31.2	MACH 355	144-QF10B	AS-144-28-01Q-6	M3066
160	28	0.65	31.2	IPLSI2128/3256	160-QF07B	AS-160-28-01Q-6	M1453
160	28	0.65	31.2	IPLSI 3256	160-QF07B	AS-160-28-02Q-6	M4610
160	28	0.65	31.2	ISPLSI/PLSI 2128V	160-QF07B	AS-160-28-03Q-6	M4611
160	48	0.65	31.2	CY7C375	160-QF07B	AS-160-48-01Q-6ENP	M3865
176	28	0.50	26.0	IPLSI 2128	176-QF67D	AS-176-28-01Q-6NEP	M3327
176	28	0.50	26.0	ISPLSI 2128V	176-QF67D	AS-176-28-02Q-6	M4266
176	28	0.50	26.0	ISPGDX120	176-QF67D	AS-176-28-03Q-6	M5050
176	48	0.50	26.0	CY7C375	176-QF67D	AS-176-48-01Q-6ENP	M4032
208	28	0.50	30.6	MACH 465	208-QF21C	AS-208-28-02Q-6	F2218
208	28	0.50	31.2	ISPLSI3160,ISPGDS160	208-QF21B	AS-208-28-04MQ-6ENP	M4270
208	28	0.50	30.6	AMD MACH 256	208-QF21C	AS-208-28-04Q-6YAM	M4621
208	28	0.50	30.6	ISPLSI 2096V	208-QF21C	AS-208-28-05Q-6	M4622
240	28	0.50	34.6	ISPLSI 2096V	240-QF62C	AS-240-28-01Q-6ENP	M4487
304	28	0.50	42.6	ISPLSI 3256E	304-QF61C	AS-304-28-01Q-6YAM	M4265

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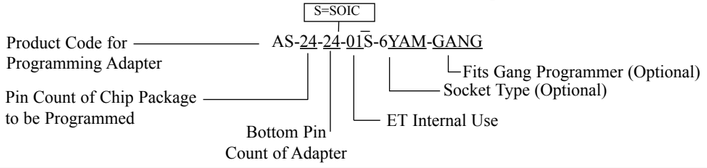
PROGRAMMING ADAPTERS - SOIC

Ordering Information Example



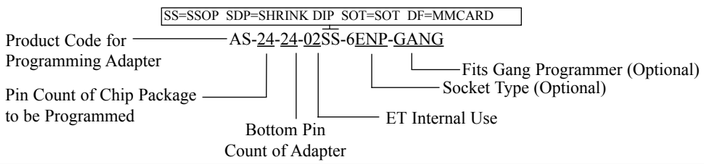
For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

SOIC

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width mm	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
8	8	1.27	3.9	WIRED 1 TO 1	08-SO01	AS-08-08-01S-3	M1229
8	8	1.27	5.28	WIRED 1TO1	08-SO02	AS-08-08-03S-3YAM	M4272
8	8	1.27	5.28	93LC46/56/66B	08-SS02	AS-08-08-02S-3	M4460
14	8	1.27	3.9	MCHIP 93LC46/56/66B	14-SO01	AS-14-08-R1S-3	M4089
16	16	1.27	7.62	WIRED 1TO1	16-SO03	AS-16-16-02S-3	M2045
16	16	1.27	7.62	WIRED 1TO1	16-SO03	AS-16-16-02S-6	M2140
16	16	1.27	3.9	MS-CY3079	16-SO01	AS-16-16-04S-3-MS-CY3079	M5247
16	16	1.27	3.9	MS-CY3079-OT	16-SS01	AS-16-16-04S-3-MS-CY3079-OT	M2704
16	16	1.27	3.9	WIRED 1TO1	16-SO01	AS-16-16-R1S-3	M1803
16	16	1.27	3.9	WIRED 1TO1	16-SO01	AS-16-16-R1S-6	M2137
18	18	1.27	7.62	WIRED 1TO1	18-SO03	AS-18-18-01S-3-GANG	M1990
20	20	1.27	7.62	WIRED 1TO1	20-SO03	AS-20-20-01S-3-GANG	M6264
20	20	1.27	7.62	WIRED 1TO1	20-SO03	AS-20-20-01S-6-GANG	M6263
20	20	1.27	5.6	WIRED 1TO1	20-SO02	AS-20-20-02S-3	M1205
20	20	1.27	5.6	WIRED 1TO1	20-SO02	AS-20-20-02S-6	M2145
24	24	1.27	8.55	WIRED 1TO1	24-SO04	AS-24-24-01S-3	M3093
24	24	1.27	8.55	WIRED 1TO1	24-SO04	AS-24-24-01S-6-GANG	M2242
24	24	1.27	7.62	WIRED 1TO1	24-SO03	AS-24-24-02S-3-GANG	M5689
24	24	1.27	7.62	WIRED 1TO1	24-SO03	AS-24-24-02S-6-GANG	M1195
28	28	1.27	8.55	WIRED 1TO1	28-SO04	AS-28-28-01S-3-GANG	M3179
28	28	1.27	8.55	WIRED 1TO1	28-SO04	AS-28-28-01S-6-GANG	M1057
28	28	1.27	8.89	WIRED 1TO1	28-SO05	AS-28-28-02S-3	M3181
28	28	1.27	8.89	WIRED 1TO1	28-SO05	AS-28-28-02S-6	M2063
28	28	1.27	7.62	WIRED 1TO1	28-SO03	AS-28-28-03S-3-GANG	M2241
28	28	1.27	7.62	WIRED 1TO1	28-SO03	AS-28-28-03S-6-GANG	M2236
28	28	1.27	8.56	WIRED 1TO1	28-SO04	AS-28-28-04S-6-GANG	M4628
28	28	1.27	7.62	68HC705J2	28-SO03	AS-28-28-06S-3-GANG	M4629
28	28	1.27	7.62	68HC705J2	28-SO03	AS-28-28-06S-6-GANG	M4630
32	28	1.27	11.4	WIRED 1TO1	32-SO10	AS-32-32-01S-3	M3225
32	32	1.27	11.4	WIRED 1TO1	32-SO10	AS-32-32-01S-6	M1882
32	32	1.27	10.7	WIRED 1TO1	32-SO08	AS-32-32-02S-6-GANG	M1977
40	40	1.27	11.2	WIRED 1TO1	40-SO06/10	AS-40-40-01S-6YAM	M1991
40	40	1.27	11.2	WIRED 1TO1	40-SO10	AS-40-40-02S-6YAM	M2078
40	40	1.27	10.7	27C4000FEMALE	40-SO08	AS-40-40-03S-6YAM	M2103
40	40	1.27	11.2	TC5XXX00FEMALE	40-SO06/10	AS-40-40-04S-6YAM	M1202
40	40	1.27	10.7	WIRED 1TO1	40-SO08	AS-40-40-05S-6YAM	M1068
40	40	0.50	18.4	AT29C1024	40-TS01	AS-40-40-05TS-6YAM-GANG-S	M4813
40	40	0.50	12.4	28C1024	40-TS04	AS-40-40-06TS-6YAM-GANG-S	M4461
40	40	0.50	12.4	AT49F1025	40-TS04	AS-40-40-07TS-6YAM-GANG-S	M4271
40	40	0.50	18.4	E28F004/008	40-TS01	AS-40-40-08TS-6YAM-S	M5026
40	40	0.50	18.4	FU28F/LV002/4/8/16/80ST	40-TS01	AS-40-40-09TS-6WEL-S	M5075
40	40	0.50	18.4	WIRED 1TO1	40-TS01	AS-40-40-10TS-6WEL-S	M5840
44	40	1.27	13.2	PA28F200	44-SO09	AS-44-40-01S-6YAM-GANG	M1247
44	40	1.27	13.2	PA28F204	44-SO09	AS-44-40-03S-6YAM-GANG	M1638
44	40	1.27	13.2	PA28F200	44-SO09	AS-44-40-04S-6YAM	M1783
44	40	1.27	13.2	28F002/200/400/800	44-SO09	AS-44-40-05S-6YAM	M1782
44	40	1.27	13.2	AMD	44-SO09	AS-44-40-06S-6YAM	M3863
44	40	1.27	13.18	FUJI	44-SO09	AS-44-40-07S-6YAM	M4818
44	42	1.27	13.2	WIRED 1TO1	44-SO09	AS-44-42-01S-6YAM-GANG	M1935
44	42	1.27	13.18	WIRED 1TO1	44-SO09	AS-44-42-02S-6YAM	M2159
44	44	1.27	13.2	28F002/200/400/800, BV, BX, B5	44-SO09	AS-44-44-01S-6YAM-GANG	M1414
44	44	1.27	13.2	WIRED 1TO1	44-SO09	AS-44-44-02S-6YAM	M3844
44	44	1.27	13.2	AM29F200/400/800BX	44-SO09	AS-44-44-03S-6YAM	M4006

SSOP/SDIP/SOT/MMCARD - PROGRAMMING ADAPTERS

Ordering Information Example



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

SSOP

Pin Count	Pin Count of Adapter	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
8	8	0.65	3.00	WIRED 1TO1	08-ST36	AS-08-08-04ST-3	F6969
16	16	0.65	5.30	WIRED 1TO1	16-SS34	AS-16-16-01SS-6ENP-GANG	M5778
16	16	0.65	5.30	WIRED 1TO1	16-SS34	AS-16-16-01SS-6ENP-GANG-LONG	F7013
20	18	0.65	5.30	PIC16C54/20/61/22	20-SS34	AS-20-18-01SS-3YAM	M1879
20	18	0.65	5.30	PIC16C54/20/21/22	20-SS34	AS-20-18-01SS-6YAM	M4616
20	18	0.65	4.40	WIRED 1TO1	20-SS34	AS-20-20-01SS-3	M2109
20	20	0.65	5.30	WIRED 1TO1	20-SS34	AS-20-20-01SS-6	M4618
20	20	0.635	300.80	WIRED 1TO1	20-SS01	AS-20-20-02SS-3	M3664
20	20	0.635	300.80	WIRED 1TO1	20-SS01	AS-20-20-02SS-6	M5445
20	20	0.65	4.40	WIRED 1TO1	20-SS03	AS-20-20-03SS-6	M5445
24	24	0.65	4.40	WIRED 1TO1	20-SS03	AS-24-24-01SS-6-GANG	M5704
24	24	0.635	3.90	CY3070,3071,3075	24-SS12	AS-24-24-02SS-6WEL-S	M5105
28	28	0.65	5.30	PIC16C55/57	28-SS34	AS-28-28-01SS-6ENP-GANG	M3820
28	28	0.65	5.30	WIRED 1TO1	28-SS34	AS-28-28-02SS-6ENP-GANG	M3862
40	40	0.65	6.10	WIRED 1TO1	40-SS05	AS-40-40-01SS-6YAM	M5068
48	48	0.635	7.62	WIRED 1TO1	48-SS06	AS-48-48-01SS-6-GANG	M5493
56	4	0.80	13.3	DA28F016SA/SV	56-SS09	AS-56-40-01SS-6TI	M3792
56	40	0.80	13.3	DA28F016XS	56-SS09	AS-56-40-02SS-6TI	M4058
56	44	0.80	13.3	DA28F016SA/SV	56-SS09	AS-56-44-01SS-6TI	M3793
56	44	0.80	13.3	DA28F016SA/SV	56-SS09	AS-56-44-02SS-6TI	M3794
56	48	0.80	13.3	DA28F016SA/SV	56-SS09	AS-56-48-01SS-6TI	M3807
56	48	0.80	13.3	DA28F016SA/SV	56-SS09	AS-56-48-02SS-6TI	M4059
56	48	0.80	13.3	28F160F3 & 28F800F3	56-SS09	AS-56-48-03SS-6TI	M5306
56	56	0.80	13.3	WIRED 1TO1	56-SS09	AS-56-56-01SS-6-YAM	M5307

SDIP

Pin Count	Pin Count of Adapter	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	ET Part#	Drawing #
56	48	.070"	16.51X47.79mm	MC68HC05B6	AS-56-48-01SDIP-6	M5519

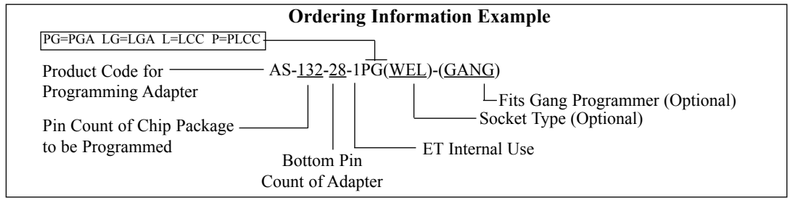
SOT

Pin Count	Pin Count of Adapter	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	ET Part#	Drawing #
6	6	0.95mm	1.62	WIRED 1TO1	AS-06-06-01SOT23-3	F6573
6	8	0.95mm	1.62	NC=4,5	AS-06-08-01SOT23-6	M5649
6	8	0.95mm	1.62	MICROCHIP 24AA01/24LC01B	AS-06-08-02SOT23-6	F6996

MMCARD

Pin Count	Pin Count of Adapter	Lead Pitch (mm)	Body Width (mm)	Chip Manufacturer	ET Part#	Drawing #
7	28	20.50	24X32	ATMEL AT45DB161B	AS-07-28-01DF-6	F6982

PROGRAMMING ADAPTERS - PGA, LGA, LCC, PLCC



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

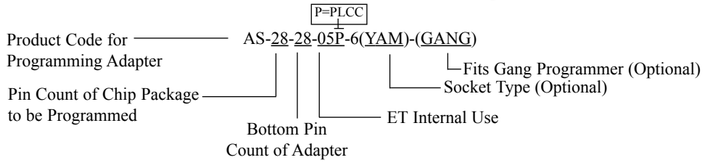
PLCC

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
20	16	1.27	.356"	N/C=1,6,11,16	20-PCC2	AS-20-16-01P-3TEX	M1889
20	16	1.27	.356"	N/C=1,6,11,16	20-PCC2	AS-20-16-01P-6TEX	M1890
20	20	1.27	.356"	WIRED 1TO1	20-PCC2	AS-20-20-01P-3TEX	M1904
20	20	1.27	.356"	WIRED 1TO1	20-PCC2	AS-20-20-01P-3YAM	M1541
20	20	1.27	.356"	WIRED 1TO1	20-PCC2	AS-20-20-01P-6TEX	M1905
20	20	1.27	.356"	WIRED 1TO1	20-PCC2	AS-20-20-01P-6YAM	M1903
28	24	1.27	.454"	N/C= 1,10,15,21	28-PCC6	AS-28-24-02P-3TEX	M3128
28	24	1.27	.454"	N/C=1,10,15,21	28-PCC6	AS-28-24-02P-3YAM	M3129
28	24	1.27	.454"	N/C=1,10,15,21	28-PCC6	AS-28-24-02P-6TEX	M3130
28	24	1.27	.454"	N/C=1,10,15,21	28-PCC6	AS-28-24-02P-6YAM	M1567
28	24	1.27	.454"	N/C=5,8,11,19,NL PKG	28-PCC6	AS-28-24-04P-6YAM	M3140
28	24	1.27	.454"	N/C=1,8,15,22 FN PKG	28-PCC6	AS-28-24-05P-3YAM	M1543
28	24	1.27	.454"	N/C=1,8,15,22 FN PKG	28-PCC6	AS-28-24-05P-6YAM	M3144
28	24	1.27	.454"	N/C=5,11,19,25	28-PCC6	AS-28-24-06P-6TEX	M3148
28	24	1.27	.454"	NC=11,19(14,15)(1,28)	28-PCC6	AS-28-24-07P-6YAM	M3154
28	24	1.27	.454"	N/C=5,11,15,19	28-PCC6	AS-28-24-09P-6YAM	M3166
28	24	1.27	.454"	N/C=5,10,21,22	28-PCC6	AS-28-24-13P-3YAM	M3172
28	24	1.27	.454"	N/C=5,10,21,22	28-PCC6	AS-28-24-13P-6YAM	M3173
28	28	1.27	.454"	WIRED 1TO1	28-PCC6	AS-28-28-01P-3TEX	M2016
28	28	1.27	.454"	WIRED 1TO1	28-PCC6	AS-28-28-01P-3YAM	M2015
28	28	1.27	.454"	WIRED 1TO1	28-PCC6	AS-28-28-01P-6TEX	M2017
28	28	1.27	.454"	WIRED 1TO1	28-PCC6	AS-28-28-01P-6YAM	M1184
28	28	1.27	.454"	90 DEGREE ROTATION	28-PCC6	AS-28-28-05P-6YAM	M1015
32	24	1.27	.450"X.550"	NC=1,2,3,12,17,26,27,30	32-PCC7	AS-32-24-05P-3YAM	M2274
32	24	1.27	.450"X.550"	NC=1,2,3,12,17,26,27,30	32-PCC7	AS-32-24-05P-6YAM	M3203
32	28	1.27	.450"X.550"	N/C=1,12,17,26	32-PCC7	AS-32-28-01P-3YAM-LN	M3208
32	28	1.27	.450"X.550"	N/C=1,12,17,26	32-PCC7	AS-32-28-01P-6YAM-GANG-LN	M1384
32	28	1.27	.450"X.550"	N/C=1,12,17,26	32-PCC7	AS-32-28-01P-6YAM-LN	M1244
32	28	1.27	.450"X.550"	N/C=11,15,18,23	32-PCC7	AS-32-28-02P-6TEX	M3213
32	32	1.27	.450"X.550"	WIRED 1TO1	32-PCC7	AS-32-32-01P-3YAM-LN	M3088
32	32	1.27	.450"X.550"	WIRED 1TO1	32-PCC7	AS-32-32-01P-6YAM-GANG-LN	M1269
32	32	1.27	.450"X.550"	WIRED 1TO1	32-PCC7	AS-32-32-01P-6YAM-LN	M1677
44	28	1.27	0.654"	MACH110/111/210/215	44-PCC3	AS-44-28-01P-3YAM	M1111
44	28	1.27	0.654"	MACH110/111/210/215	44-PCC3	AS-44-28-01P-6YAM	M1831
44	28	1.27	0.654"	IPLSI 1016/2032	44-PCC3	AS-44-28-03P-6YAM	M2093
44	40	1.27	0.654"	NC=17,39(22,23)(1,44)	44-PCC3	AS-44-40-03P-6YAM	M1742
44	40	1.27	0.654"	N/C=1,17,22,39	44-PCC3	AS-44-40-04P-6YAM	M3247
44	40	1.27	0.654"	N/C=1,12,23,34 (8051)	44-PCC3	AS-44-40-07P-6TEX	M2151
44	40	1.27	0.654"	NC=1,12,23,34(8051)	44-PCC3	AS-44-40-07P-6YAM-GANG	M1988
44	40	1.27	0.654"	N/C=1,12,23,34 (8051)	44-PCC3	AS-44-40-07P-6YAM	M3255
44	40	1.27	0.654"	N/C=1,13,23,33	44-PCC3	AS-44-40-08P-6YAM	M1312
44	40	1.27	0.654"	NC=40,41,42(1,12,23,34)	44-PCC3	AS-44-40-09P-6YAM	F4343
44	40	1.27	0.654"	ATV2500	44-PCC3	AS-44-40-13P-6YAM-LN	M1260
44	40	1.27	0.654"	PSD301/2/11/12/13	44-PCC3	AS-44-40-14P-6YAMIC120	M3266
44	40	1.27	0.654"	PSD301/2/3/11/12/13	44-PCC3	AS-44-40-14P-6YAMIC51	M1801
44	40	1.27	0.654"	PSD301/2/3/11/12/13	BPPROG ONLY	AS-44-40-15P-6YAM	M3267
44	40	1.27	0.654"	PIC16C54/64/74/77/F87	44-PCC3	AS-44-40-17P-6YAM	M2150
44	40	1.27	0.654"	CY7C259	44-PCC3	AS-44-40-18P-6YAM	M1117
44	40	1.27	0.654"	CY7C270	44-PCC3	AS-44-40-19P-6YAM	M1160
44	40	1.27	0.654"	68HC711D3	44-PCC3	AS-44-40-20P-6YAM	M3821
44	40	1.27	0.654"	68HC705C4/C8	44-PCC3	AS-44-40-21P-6YAM	M3822
44	40	1.27	0.654"	68HC705C9/D9	44-PCC3	AS-44-40-22P-6YAM	M3279
44	40	1.27	0.654"	PIC17C42	44-PCC3	AS-44-40-28P-6YAM	M3979
44	40	1.27	0.654"	AT90(L)S4434,S8535,MEGA163L	44-PCC3	AS-44-40-29P-6YAM-GANG	M5804
44	44	1.27	0.654"	WIRED 1TO1	44-PCC3	AS-44-44-01P-6YAM	M3988
44	40	1.27	0.654"	N/C=6,7,28,39	44-PCC3	AS-44-40-01P-6TEX	M3238
44	40	1.27	0.654"	NC=17,39(22,23)(1,44)	44-PCC3	AS-44-40-03P-6TEX	M3243
44	44	1.27	0.654"	CY7C371	44-PCC3	AS-44-44-03P-6YAM	M3845

Jumpstart your search with ET's cross reference guide: www.emulation.com/catalog/cross
***Tel:* 1-800-ADAPTER (800-232-7837) or (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

PLCC - PROGRAMMING ADAPTERS

Ordering Information Example



For a complete list of program adapter specifications, pricing and delivery information, see **Web Link:www.1800adapter.com/067**

PLCC

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
44	48	1.27	0.654"	CY7C343,EPM5064	44-PCC3	AS-44-48-01P-6YAM	M9452
52	48	1.27	0.654"	68HC705B5/B6/B16	44-PCC3	AS-52-48-01P-6YAM	M3823
52	48	1.27	0.654"	68HC711E9/E20	44-PCC3	AS-52-48-02P-6YAM	M3824
52	52	1.27	.753"X.754"	WIRED 1TO1	52-PCC4	AS-52-52-01P-6TEX	M3275
68	28	1.27	0.954"	IPLSI 1024/E	68-PCC1	AS-68-28-03P-3YAM	M4640
68	28	1.27	0954"	IPLSI 1024/E\	68-PCC1	AS-68-28-03P-6YAM	M3280
68	40	1.27	0.954"	USER CONFIG. WIRE WRAP	68-PCC1	AS-68-40-00P-6YAM	M6193
68	40	1.27	0.954"	PML2552	68-PCC1	AS-68-40-04P-6YAM	M3283
68	40	1.27	0.954"	87C196KB/KC/KD	68-PCC1	AS-68-40-06P-6YAM	M1698
68	48	1.27	0.954"	EP1800	68-PCC1	AS-68-48-01P-6YAM	M1965
68	48	1.27	0.954"	CY7C342,EPM5128	68-PCC1	AS-68-48-02P-6YAM	M3785
68	48	1.27	0.954"	68HC(7)11F1/L6	68-PCC1	AS-68-48-03P-6YAM	M3827
68	48	1.27	0.954"	68HC(7)11KA2/KA4	68-PCC1	AS-68-48-04P-6YAM	M3828
84	28	1.27	1.153"	MACH130/131/230/231/435	84-PCC5	AS-84-28-01P-3YAM	M3285
84	28	1.27	1.153"	MACH130/131/230/231/435	84-PCC5	AS-84-28-01P-6YAM	M1701
84	28	1.27	1.153"	IPLSI 1032/E,2064	84-PCC5	AS-84-28-02P-6YAM	M3287
84	28	1.27	1.153"	ISP2064V,2128V	84-PCC5	AS-84-28-05P-6YAM	M4268
84	28	1.27	1.153"	H8/532	84-PCC5	AS-84-28-06P-6YAM	F6675
84	32	1.27	1.153"	H8/536	84-PCC5	AS-84-32-01P-6YAM	F7015
84	40	1.27	1.153"	PML2652	84-PCC5	AS-84-40-01P-6YAM	M1426
84	48	1.27	1.153"	CY7C346,EPM5130	84-PCC5	AS-84-48-01P-6YAM	M3786
84	48	1.27	1.153"	CY7C341,EPM5192	84-PCC5	AS-84-48-02P-6YAM	M3787
84	48	1.27	1.153"	68HC(7)11K4	84-PCC5	AS-84-48-03P-6YAM	M3829
100	52	1.27	.753"X.754"	WIRED 1TO1	52-PCC4	AS-52-52-01P-6TEX-MS	M3143

PGA

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width mm	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
44	40	.100"	.850" SQR	PSD301/02/03/11/12/13	44-PGA8X8	AS-044-40-12PG-6	M1835
68	40	.100"	.850" SQR	EP-1800	68-PGA1	AS-044-40-12PG-6	M1271
132	28	.100"	N/A	ISPLSI 1048C/E, 2096	132-PGA8	AS-132-28-01PG-6	M1875

LGA

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width mm	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
48	48	0.50	4X6	39XF800A/160A/320A/6401	5LG11X6	AS-48-48-01LG-6	F7014

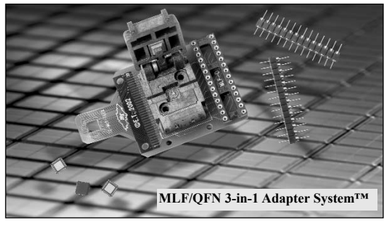
LCC

Pin Count	Pin Count of Adapter	Lead Pitch mm	Body Width	Chip Manufacturer	Footprint Code	ET Part#	Drawing #
20	20	1.27	.350"	WIRED 1TO1	20-LCC1	AS-20-20-01L-3	M3086
20	20	1.27	.350"	WIRED 1TO1	20-LCC1	AS-20-20-01L-6	M3087
28	24	1.27	.450"	N/C=4,11,18,25	28-LCC6	AS-28-24-01L-6	M3123
28	24	1.27	.450"	N/C-1,10,15,21	28-LCC6	AS-28-24-02L-3	M3126
28	24	1.27	.450"	N/C= 1,10,15,21	28-LCC6	AS-28-24-02L-6	M3127
28	24	1.27	.450"	N/C= 1,10,15,21	28-LCC6	AS-28-24-03L-6	M3132
28	24	1.27	.450"	N/C= 1,8,15,22	28-LCC6	AS-28-24-05L-3	M3141
28	24	1.27	.450"	N/C= 1,8,15,22	28-LCC6	AS-28-24-05L-6	M1605
28	28	1.27	.450"	WIRED 1TO1	28-LCC6	AS-28-28-01L-3	M3178
28	28	1.27	.450"	WIRED 1TO1	28-LCC6	AS-28-28-01L-6	M1931
32	28	1.27	13.97x11.43	N/C=1,12,17,26	32-LCC7	AS-32-28-01L-6	M1161
32	32	1.27	13.97x11.43	WIRED 1TO1	32-LCC7	AS-32-32-01L-6	M2244
44	40	1.27	0.650"	N/C= 1,12,23,34	44-LCC3	AS-44-40-07L-6	M3254
44	40	1.27	0.650"	N/C=1,13,23,33	44-LCC3	AS-44-40-08L-6	M3256
44	40	1.27	0.650"	ATV2500 ONLY	44-LCC3	AS-44-40-13L-6YAM-LN	M3265
52	52	1.27	.750"	WIRED 1TO1	52-LCC4	AS-52-52-01L-6	M3274

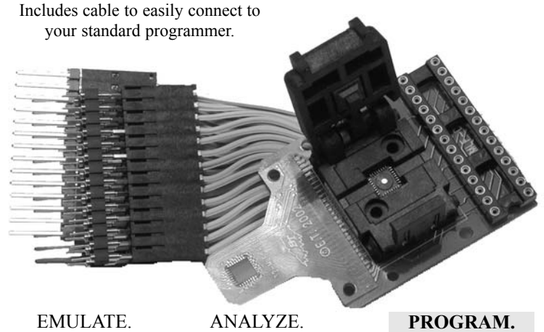
PROGRAMMING ADAPTERS - MLF/QFN

MLF/QFN 3-in-1 Adapter System™

The QFN/MLF 3-in-1 Adapter System™ ensures quick and easy configuring and interfacing to an in-circuit emulator, device programmer, logic analyzer or oscilloscope. The first of its kind, this 3-in-1system provides the solution for test and design engineers needing QFN (Quad Flat Non-leaded) or MLF (Micro Lead Frame) signal access. This system supports the ATMEL® ATtiny26, ATtiny28, ATmega8, ATmega16 and ATmega32 8-bit AVR® Microcontrollers.


MLF/QFN 3-in-1 Adapter System™

Includes cable to easily connect to your standard programmer.



EMULATE. ANALYZE. **PROGRAM.**

Ordering Information Example

Lead pitch (1=1.5mm, 2 = 1.27mm, 3=1.0mm, 4=.75mm, 5=.50mm, 6=.80mm)

Pin Count of device to be programmed — Product Code — Bottom Pin Count of Adapter

AS-08-08-01ML-3

Version # of Pin — Package to be Programmed: ML= MICRO LEAD FRAME, LAP=LAP, TAP=TAP — Width of Male DIP Wire Posts 3=.300" 6=.600"

For a complete list of adapter specifications, pricing and delivery information, please see: Web Link: **www.1800adapter.com/060**

FEATURES & BENEFITS

- Reduces cost of ownership by 50-66% by eliminating the need for three separate adapters
- Change chip packages rapidly
- Flexible target interconnect minimizes physical strain on target pads
- Excellent for in-circuit or out of circuit programming
- Monitor signals - Logic Analysis
- Quick interface In-Circuit Emulator
- Compact design ensures signal integrity

Programming Adapter Only — **MLF/QFN PROGRAMMING ADAPTER (ONLY) PART NUMBERS**

Pin Count	DIP Pin Count	Lead Pitch (mm)	Body Size	Footprint Code	Chip Manufacturer and Notes	ET Part #	Drawing #
8	8	1.27	6X5	08-ML08	WIRED 1 TO 1	AS-08-08-01ML-3	M6611
8	8	1.27	8X5	08-LAP1	WIRED 1 TO 1	AS-08-08-01LAP-3	M6488
8	8	0.65	4.9sq.	08-MAP1	WIRED 1 TO 1 (Load Dead Bug)	AS-08-08-01MAP-3	M6698
8	8	0.65	6.4sq.	08-TAP1	WIRED 1 TO 1	AS-08-08-01TAP-3	F7047
8	8	1.27	5.99X4.93	08-LAP2	WIRED 1 TO 1	AS-08-08-02LAP-3	F6696
8	8	1.27	5.99sq.	08LAP3	WIRED 1 TO 1	AS-08-08-03LAP-3	F6827
8	8	1.27	8X6	08LAP4	WIRED 1 TO 1	AS-08-08-04LAP-3	F6978
8	20	1.27	8X6	08-ML40	ATMEL AT45DB161B	AS-08-20-01ML-3	F6980
8	20	1.27	8X6	08-ML40	ATMEL AT45DB161B	AS-08-20-01ML-6	F7018
20	20	0.65	5X5	20-ML02	WIRED 1 TO 1	AS-20-20-01ML-6	F6257
28	28	0.50	5X5	28-ML03	WIRED 1 TO 1	AS-28-28-01ML-6	F6258
28	28	0.65	6X6	28-ML38	4Pin Off Rotation (See Drawing)	AS-28-28-02ML-6	F6712
32	28	0.50	5X5	32-ML04	ATMEL MEGA 8	AS-32-28-01ML-3	M6332
32	28	0.50	5X5	32-ML04	ATMEL MEGA 8	AS-32-28-01ML-6	M6356
32	20	0.50	5X5	32-ML04	ATMEL TINY 26	AS-32-20-01ML-3	F6772
44	40	0.50	7X7	44-ML05	MEGA16/32, 8535	AS-44-40-01ML-6	F6842
44	40	0.50	7X7	44-ML05	MEGA 162, 8515	AS-44-40-02ML-6	F6843
44	40	0.50	7X7	44-ML05	8031/51	AS-44-40-03ML-6	F6774

Complete 3-in-1 Adapter System — **MLF/QFN 3-in-1 ADAPTER SYSTEM PART NUMBERS**

- Logic Analyzer Adapter
- Program Adapter
- Emulator Adapter

Pin Count	Pin Map	SMT Lead Pitch (mm)	Body Size	Footprint Code	ET Part #	Drawing #
32	ATMEL MEGA 8	0.50	5X5	32-ML04	BCP-032-ML04Z-MEGA8-3IN1	F6730
32	ATMEL TINY 26	0.50	5X5	32-ML04	BCP-032-ML04Z-TINY26-3IN1	F6727
44	MEGA16/32, 8535	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA16/32-3IN1	F6728
44	MEGA 162, 8515	0.50	7X7	44-ML05	BCP-044-ML05Z-MEGA162-3IN1	F6729

Date: _____

To: _____

From: ET Technical Sales Dept.

Co: _____

Tel: _____

Fax: _____

# of Pages: _____

FEATURES

- Complete line of male/female sockets for DIP, LCC, PLCC, PQFP, and PGA packages
- Wire-wrappable Convert-A-Socket converts any type of socket to any different type of socket regardless of pin count
- Eliminates weeks of waiting or paying for NRE or minimum order charges just to have a special board made
- Wire wrap your converter yourself for total pin-to-pin flexibility

Figure 1

PREP WORKSHEET FOR WEB OR FAX

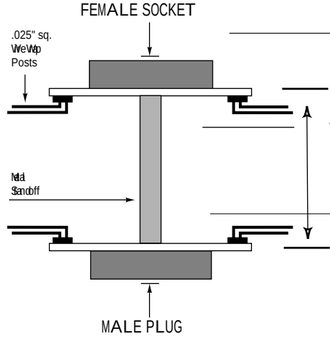
Use this prep worksheet to help you prepare answers for our online quotation form. Be prepared to provide the information where the blank lines are found. *If you prefer, you may complete this worksheet and fax it to 408-982-0664.*

1) Visit the ET Web site and complete the online form at:
www.emulation.com/technical

2) Using the information on this worksheet, complete all required fields on the online form

3) Attach package drawings in .pdf format

ET's technical support group will contact you promptly with confirmation.



Yes No

Top socket: zero insertion ☐ ☐
low insertion ☐ ☐
I need a top socket from ET ☐ ☐

Pin Count _____
Package Code _____
(See Footprint Section)

Height of metal standoff
3/4" ☐
1 1/2" ☐

Pin Count _____
Package Code _____
(See Footprint Section)

Bottom Pin Type (see Fig. 1)
Screw Machine Pin ☐
or
Wire Wrap Post ☐
or
Surface Mount ☐
or
PLCC Plug ☐
or
Socket Plug (QFP Only) ☐
Amp
Textool ☐

Important:
I need _____ units,
delivered in _____ days.

Check here if you are using an AMP Low Profile socket ☐

Non-Cancelable, Non-Returnable Item

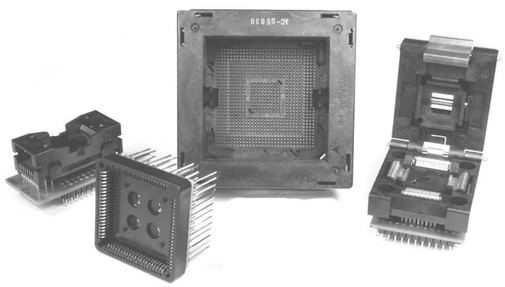
- Please carefully check the part description above against your application.
- Due to the fact that these are custom parts, they are non-cancelable and non-returnable.

PROTOTYPING ADAPTERS, EXTENDERS & PROTOTYPING BOARDS

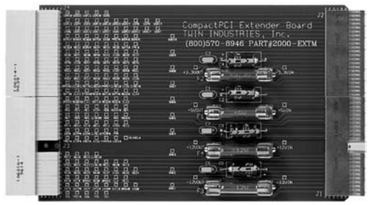
With thousands of adapter designs available in the most popular package styles, ET is sure to have the adapter you need. ET has been providing off-the-shelf and custom adapter solutions for design and test engineers for over 20 years. ET can provide you with the adapter you need to keep your project on schedule and completed on time and on budget.

FEATURES & BENEFITS

- Top Interface options: SMT Lands, Solder tail Pin Receptacles, Socket Receptacle, Production Socket, and ZIF Socket
- Adapters terminate in Wire Wrap Posts or Solder tail Pins
- Pins and sockets are plated 10µ" Gold over 100µ" Nickel
- Pins conform to MIL-C-45204
- Special adapters are available to fit high-density prototyping panels
- Custom designs are available upon request
- Extenders support both 32 & 64-bit transfers



IC Prototyping Adapters
Convert IC Package Footprints to Fit Standard Prototyping Panel Footprints

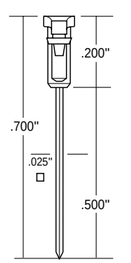


CompactPCI Extender

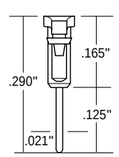
Wire Wrap Post or Machine Screw?

M - Machine screw version Adapt-A-Boards are used on prototyping boards that have wire wrap posts already installed on the back side of the prototyping board. The pins on the back of these Adapt-A-Boards plug directly into these posts.

W - Wire-wrappable Adapt-A-Boards are used in prototyping boards that have holes with nothing in them. The wire-wrap posts go through the holes and can then be wire-wrapped on the back side of the board.



W = Wirewrap Posts



M = Screw Machine Pins

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See our complete Prototyping Boards, Extenders & PCBs listing online by visiting: **www.1800adapter.com/004**

Prototyping Adapters

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See our complete prototyping adapters listing online by visiting: **www.1800adapter.com/004**

PROTOTYPING ADAPTERS - BGA UNIVERSAL PROTOTYPING BOARDS

BGA Universal Prototyping Boards make it easy to adapt standard or high-density prototyping boards to a variety of BGA packages.

FEATURES & BENEFITS

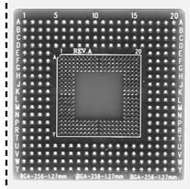
- Mountable 0.8mm, 1.0mm, 1.27mm lead pitch BGA/CSP up to 484 pin on 22X22/max
- Able to check all pins at outside holes, printed pin numbers for easy signal location
- Outer holes pitch: 2.54mm
- Solder resist treatment to prevent solder bridge
- Jumper pads available on two sides for custom wiring and additional circuitry
- 0.75mm, & 0.50mm lead pitch boards available upon request

HOW TO ORDER

Please provide the following:

- IC Package Information: Manufacturer & Part Number, Pin Count, and/or Package Outline Drawing
- Prototyping Panel Type
- Determine Top Chip Interface Type: SMT Lands, Solder Tail Pin Receptacles, Production Socket, Zero Insertion Force Socket
- Determine Bottom Terminal Options: Wire Wrap Posts or Solder Tail Pin
- Adapter Application
- Quantity and Delivery Requirements

EMULATION TECHNOLOGY RECOMMENDS



BGA 256 Adapter

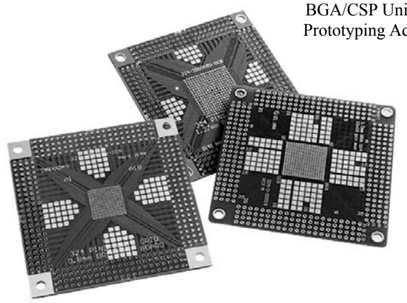
Users needing a BGA Surface Mount Adapter can also consider our adapters designed specifically for BGA 256 components. All pads break out to dedicated plated through holes. 1.00mm and 1.27mm lead pitch are available.

Web Link: www.1800adapter.com/001

Try our **Chip Quik® SMD Removal Kit**
Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.

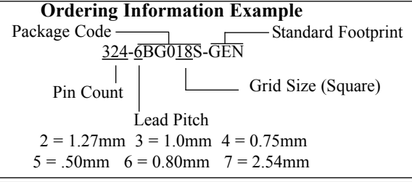
Web Link: www.1800adapter.com/046

For a complete list of prototyping adapter specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/001**



BGA/CSP Universal Prototyping Adapters

Ordering Information Example



Material Specifications	
Package	0.8mm, 1.00mm, 1.27mm Lead Pitch
Material	Glass Epoxy (FR4)
Board Thickness	1.60mm
Copper Plate	Outside:18mm, inside: 35mm
Plating	Gold Flash
Pin Number	Top side silk print, pin map available
Maximum Current	0.15 A per line

KIT INCLUDES:

- Wire Wrap Post or Screw Machine Pin (available below)
- Prototyping Board
- Pin Map
- 3/4" Standoff (available below)
- Other patterns & sizes available upon request

BGA / CSP

Pin Count	Lead Pitch	BGA Grid Size	Maximum .1" Grid Size	Description	Drawing#
324	0.80mm	SMT 18X18	29X29	324-6BG018S-GEN	F5939
324	1.00mm	SMT 18X18	29X29	324-3BG018S-GEN	F5938
324	1.27mm	SMT 18X18	29X29	324-2BG018S-GEN	F5937
484	1.00mm	SMT 22X22	41X41	484-3BG022S-GEN	F6977
484	0.80mm	SMT 22X22	41X41	484-6BG022S-GEN	F7052
676	1.00mm	SMT 26X26	26X26	676-3BG026S-GEN	F7092
900	1.00mm	SMT 30X30	40X40	900-3BG030S-GEN	F7020

Part #	Document	Description	Qty.
WWPost-40-PGA	PN1002	Wire Wrap Post - .025# Sq. Post	40 Per Strip
Header-Male-32	PN1039	Machine Screw Pin .018" Diameter	32 Per Strip
SPACER	F5784	3/4" Metal Standoff	1 Per

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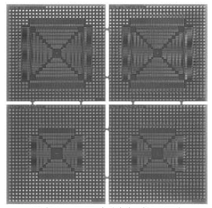
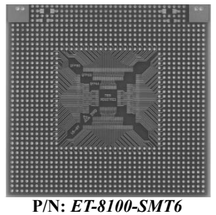
PLCC
SMT adapters extend the signals of the following packages to plated through holes on a 100 mil grid: PLCC package's 20, 28, 44, 64 and 84 pin packages and socket families. Ground plane on solder side. (1 EACH)
Board Size: 6.0" X 6.0"
Pad to Pad Spacing: 50 mil



P/N: *ET-8100-SMT3*

PQFP/TQFP
SMT Adapter for QFP 44, 100 & 160

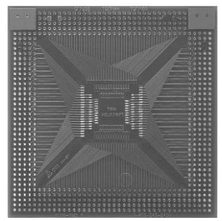
Pad to Pad Spacing: 25 mil



P/N: *ET-8100-SMT6*

PQFP/TQFP
SMT Adapter for QFP 240 & 208, QFP 144, 128 & 100

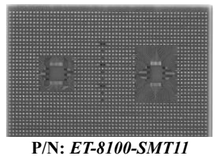
Pad to Pad Spacing: 20 mil



P/N: *ET-8100-SMT7*

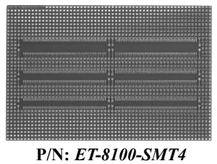
PQFP/TQFP
SMT Adapters for 80 pin QFP packages. 0.50mm Pitch. FR4 Material, Ground plane on rear side.

Board Size: 6.0" X 4.0"



P/N: *ET-8100-SMT11*

SOIC
SMT adapters extend the signals of the following packages to plated through holes on a 100 mil grid: SOIC medium, wide, metric and plastic mini-flat packages. Ground plane on solder side.
Board Size: 6.0" X 4.0"



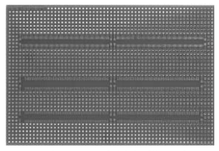
P/N: *ET-8100-SMT4*

SMT Prototyping Adapter PCBs

FEATURES & BENEFITS
- Access all signals via plated 2.54mm (.100") through-holes, which are numbered for easy signal location. A pin map is included
- Eliminates the need to design-in additional signal access pins/test points
- Also prevents time-consuming board revisions
- Most designs accept several pitch sizes and multiple ICs See our web site or call ET for detailed layout drawings
- Optional Wire Wrap Post Strips allow mounting on standard Prototyping Panels or universal PCBs
- Solder-resistant treatment helps prevent solder bridging

Popular Package Styles - *Call for those not shown*:

SOIC	1.27mm, 0.80mm, 0.635mm, 0.65mm, 0.50mm, & 0.40mm pitches
QFP	1.00mm, 0.80mm, 0.635mm, 0.65mm, 0.50mm pitches
PLCC	.50" pitch
TSOP	0.550mm & 0.50mm pitches
TSOPII	1.27mm, 1.16mm, 0.80mm, 0.65mm & 0.50mm pitches
MLF	0.80mm, 0.65mm & 0.50mm pitches

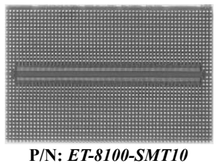


P/N: *ET-8100-SMT8*

SOIC
SMT Adapter for SOIC Medium, Metric (50 mil Spacing) & Tiny (25 mil Spacing)

P/N: *ET-8100-SMT9*

TSOP
SMT Adapter for TSOP 40, 48 & 56 (20 mil Spacing), PSOP 44 (50 mil Spacing) & SSOP 56 (30 mil Spacing)



P/N: *ET-8100-SMT10*

TSSOP
SMT Adapters for TSSOP packages. 0.50mm Pitch. FR4 Material, Ground plane on rear side. Board Size: 6.0"x4.0"

For a complete list of prototyping adapter specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/002**

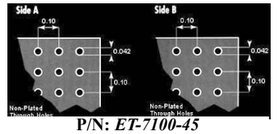
PROTOTYPING ADAPTER - PROTOTYPING PANELS / EXTENDERS

PROTOTYPING PANELS

.100" Breadboards / Prototyping Panels

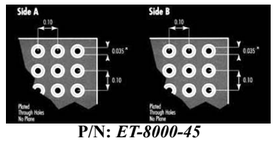
- Available with plated or non-plated thru-holes
- Popular thru-hole sizes: .035", .042", & .062"
- Available with 0, 1, or 2 ground/power planes

Protoboard featuring a 0.1" X 0.1" grid of non-plated through holes. *Board Size:* 4.0" X 5.0"



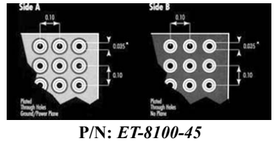
P/N: *ET-7100-45*

Protoboard featuring a 0.1" X 0.1" grid of non-plated through holes, no plane. *Board Size:* 4.0" X 5.0"



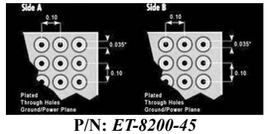
P/N: *ET-8000-45*

Protoboard featuring a 0.1" X 0.1" grid of non-plated through holes, no plane. *Board Size:* 4.0" X 5.0"



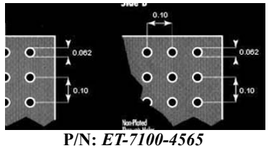
P/N: *ET-8100-45*

Protoboard featuring a 0.1" X 0.1" grid of plated through holes, two planes. *Board Size:* 4.0" X 5.0"



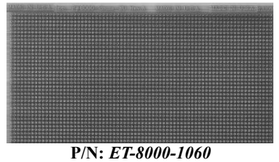
P/N: *ET-8200-45*

Protoboard featuring a 0.1' x 0." grid of non-plated .062" through holes. *Board Size:* 4.5"



P/N: *ET-7100-4565*

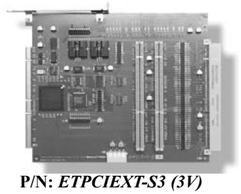
Protoboard featuring a 2mm x 2mm grid of plated through holes, no plane. Board Size: 100mm x 160mm.



P/N: *ET-8000-1060*

For a complete list of prototyping panels, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/003**

EXTENDER CARDS



P/N: *ETPCIEXT-S3 (3V)*
P/N: *ETPCIEXT-S5 (5V)*

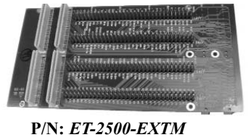
These extender cards are designed to aid in the debug and test of PCI-based circuit boards. This is an active extender card; an Intel® 21154 PCI to PCI bridge is used to isolate the primary PCI bus from the three secondary PCI bus slots. Since primary and secondary busses are electrically isolated, a much cleaner electrical signaling environment exists, and a single host slot can be expanded to contain up to three plug-in PCI cards. The primary PCI frequency can range from 0 to 66.66 MHz. The secondary PCI frequency is configurable to be the primary frequency or one half the primary frequency. DIP switches are provided to force the primary or secondary buses to 33MHz.

This extender is available in two versions to cover all your voltage-conversion needs:
•3.3V or 5V to 5V signal conversion.
•3.3V or 5V to 3.3V signal conversion.

P/N: *ET-3300-EXTM*

PCMCIA Extender Card with Iinternal VCC and Ground

- Multi-layer design (4), internal VCC and Ground Planes
- Clearly marked signals for easy probing, grouped for use with multiprobe analyzers
- The ET-3300-EXTM extends the unit under test out of the system for easy access
- The ET-3300-EXTM extends the life of your system by absorbing the wear and tear of multiple insertion environment



P/N: *ET-2500-EXTM*

Passive PMC Extender Card

Designed for testing PMC cards on host system or test fixture. J/P 1-4 connectors installed. Labelled 0.1" headers for all signals, allowing analysis with probe or logic analyzer. Keyed for 3.3 and 5 volts. Mounting holes included to allow secure attachment to single board computers.

For a complete list of extender cards, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/132**

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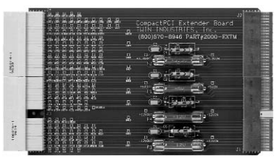
COMPACTPCI EXTENDERS-PROTOTYPING ADAPTER



P/N: *ET-2000-EXTM*

3U CompactPCI extender supoorts both 32 and 64 Bit transfers. Multi-layer design with full ground and power planes. All power rails fused with standard 3AG fuses.

- 3U CompactPCI extender supports both 32 and 64 bit transfers
- Multi-layer design with full ground and power planes
- Fuses easily removed for current measurements
- All signals labeled for easy scope probing
- All power rails fully de-coupled with both .1uF and 47uF capacitors
- Connectors support full shielding to maintain full CompactPCI compliance

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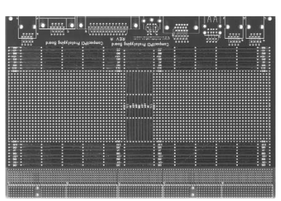
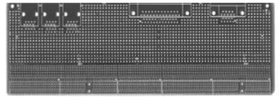


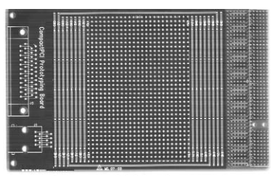
P/N: *ET-2000-100-EXTM*

CompactPCI prototyping board. 6U form factor with connector mounting areas for J1-5 CompactPCI connectors, RJ45, VGA, USB, PS/2, DB25, and DB9 connectors. Every connector pin has dedicated plated through hole for headers or wire soldering. Bus bars for all voltages and ground. Uncommitted area of 0.1" x 0.1" plated through holes.



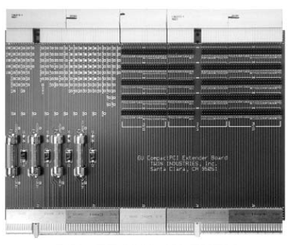
P/N: *ET-2000-80-EXTM*

6U, 80mm CompactPCI Rear I/O Protoboard. Locations for all CompactPCI pressfit connectors and other commonly used connectors. Bus bars and non-committed prototyping holes on 0.1" x 0.1" grid. Mulit-layer PCB, FR4 material.



P/N: *ET-2000-50-EXTM*

3U CompactPCI Protoboard. Locations for all CompactPCI pressfit connectors and other commonly used connectors. Bus bars and non-committed prototyping holes on 0.1" x 0.1" grid. Mulit-layer PCB, FR4 material.



P/N: *ET-2000-6U-EXTM*

6UCompactPCI extender supports both 32 and 64 Bit transfers. Multi-layer design with full ground and power planes.

- 6U CompactPCI extender supports both 32 and 64 bit transfers
- Multi-layer design with full ground and power planes
- All power rails fused with standard 3AG fuses
- Fuses easily removed for current measurements
- All signals labeled fore easy scope probing
- All power rails fully decoupled with both .1uF and 47uF capacitors
- Connectors support full shielding to maintain full CompactPCI compliance
- Direct connect interface for logic analyzer

For a complete list of prototyping adapters, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

PROTOTYPING ADAPTER - COMPACTPCI EXTENDERS & PCI CONNECTORS

The ET PCI Test Connector offers the user an accuarate and reliable way to test their PCI cards. With over 10,000 reliable cycles, it eliminates the need to constantly replace your PCI Connectors. The Test Connector assemply plugs directly into the PCI connector in the test bed and is actuated by a lever for easy loading and unloading of cards. Available with (PCIZIF120-A) or without (PCIZIF120-C)adapter cards to mate with standard PCI Connectors or a .062" PC board.

FEATURES & BENEFITS

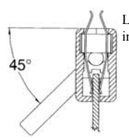
- 10,000 plus cycles
- Mates to 32 Bit 3.3 and 5.0 volt standard PCI connectors
- Available with or without adapter cards to mate with standard PCI Connectors or a .062 PC board
- Custom adapter cards available upon request
- Straddle mount design allows the connector to be terminated to a test designer's own adapter card
- The lever-actuated design allows for quick and easy loading and unloading of PCI cards
- Reduces tester downtime for increased production flow
- Minimal rotation of 40 degrees of the cam accommodates the full open and closed position of the contact

P/N: *PCI-ZIF120-ADAPTER*
(Adapter & Connector)

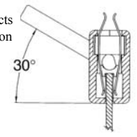
P/N: *PCI-ZIF120-CONNECTOR*
(Connector Only)

Electrical Specifications	
Contact Resistance	20 mOhms (max)
Dielectric withstanding voltage	1000 VAC (min)
Insulation Resitance	>1 X 10 12th ohms @ 500VDC
Current Rating	1.0 AMP per contact (continuous)
Mechanical Specifications	
Contact Material	Copper alloy
Number of contacts	120
Normal Force	75 grams minimum per contact
Actuation force	1 in/ob of torque
Dielectric material	Glass filled liquid crystal polymer (black)
Environmental	
Material	UL rated 94 V-O
Temperature rating	-40 degrees C to +150 degrees C

Lever w/ contacts in open position



Lever w/ contacts in closed position



3U CompactPCI to 64 bit PCI passive adapter.

P/N: *ET-2000-64PCI*

3U CompactPCI to 64 bit PCI passive adapter with full size PCI bracket for additional support of Unit Under Test (UUT).

P/N: *ET-2002-64PCI*

For a complete list of prototyping adapters, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

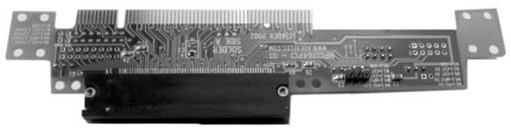
ET has thousands of adapter designs available in the most popular package styles.
***Tel:* 1-800-ADAPTER (800-232-7837) or (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

PCI BUS EXTENDER CARD CONNECTORS - PROTOTYPING ADAPTER

PN: ET-101913-003

64 Bit 5V PCI Connector mounted to PCI Bus Extender Card.

PN: ET-102639-001



mini PCI Connector mounted to Intel PCI Bus Extender Card.*

* mini PCI Connectors can be mounted for other manufacturers' PCI Bus Extender Cards/

Contact Specifications	
Self Inductance	5.2nh < 500 MHZ
Mutual Inductance	< .75 db @ 1 GHz
Ground Capacitance	< .87 pf
Mutual Capacitance	< .71 pf
Current	3 Amp Continuous
Height	13 mm (0.79")
Force	20-30 g/contact
Typical Life	20-50K insertions
Composition and Plating Specifications	
Contact Base Material	Beryllium copper with ~ 150 µ in electroless NI and ~35-50 µ in hard alloy AU
Housing and Frame Specifications	
Material	30% Glass filled Torlon 5030, Ultem 2300, LCP

The specifications for these cards is preliminary. Performance will vary based on application and compliance requirements.

DESIGNED AS A DROP IN REPLACEMENT FOR STANDARD EXTENDER CARDS

These LIF Edge Cards are standardized, low-cost, high insertion count designs that provide an alternative to customized, high-priced, long-lead-time connectors, or low cost short insertion life commercial connectors with high insertion forces. These contacting systems are available for a wide range of standard package sizes and I/O counts and provide significant benefits to the user.

These Edge Cards are specifically designed for PCI devices with the following characteristics:

- Low Insertion Force
- Long Mechanical Life
- Straddle Mount
- Solder attach or Solder-less versions
- Replaceable Keys

Mounting these LIF (Low Insertion Force) connectors to PCI Bus Extender Cards enables them to be plugged directly into a standard commercial PCI connector.

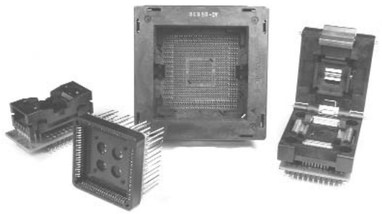
FEATURES & BENEFITS

- Pre-designed footprints for standard-dimensioned packages shorten manufacturing lead times
- The standard designs reduce costs associated with custom engineering
- Connectors are quickly and easily changed
- Cost effective solution for development, debugging, test qualification or evaluation
- Topside decoupling pockets allow close decoupling, reducing ground bounce and overshoot
- Solderless or solder down, SMT inserts can easily and rapidly be changed reducing costs associated with board and device work
- Available for in 3V or 5V
- 32-bit PCI available

NOTE: 2 piece minimum order required for both PCI extender cards.

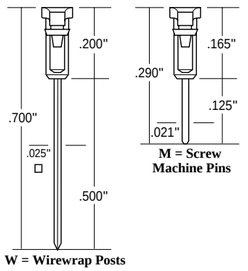
For a additonal information, specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

PROTOTYPING ADAPTERS - FULLY ASSEMBLED & TESTED



Ordering Information Example

Pin Count
Product Code
Chip Pkg Socket Footprint
Top Socket Configurations CQFP & PQFP only:
S = SMT Pads
P = Production
Z = ZIF Socket
Prototyping PC Board Configurations (see below)
AB-120-QF05 (Z)-P10-M-(1)
Optional:
1 = Socket Included
0 = Socket Not Included
Bottom Male Pin Type:
M = Screw Machine Pin
W = Wire Wrap Post



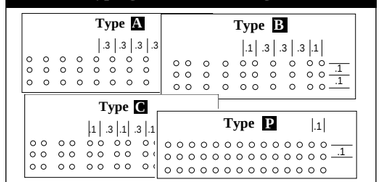
W = Wirewrap Posts

M = Screw Machine Pins

M - Machine screw version Adapt-A-Boards are used on prototyping boards that have wire wrap posts already installed on the back side of the prototyping board. The pins on the back of these Adapt-A-Boards plug directly into these posts.

W - Wire-wrappable Adapt-A-Boards are used in prototyping boards that have holes with nothing in them. The wire-wrap posts go through the holes and can then be wire-wrapped on the back side of the board.

Prototyping PC Board Configurations



P5= PGA 8X8	P10= PGA 17X17	P19= PGA 26X26
P6= PGA 9X9	P11= PGA 18X18	P20= PGA 27x27
P2= PGA 10X10	P12= PGA 19X19	P21= PGA 28X28
P1= PGA 11X11	P13= PGA 20X20	P22= PGA 29x29
P7= PGA 12X12	P14= PGA 21X21	P23= PGA 30X30
P3= PGA 13X13	P15= PGA 22X22	P24= PGA 31X31
P8= PGA 14X14	P16= PGA 23X23	P25= PGA 32X32
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

Adapt-A-Boards make it easy to adapt standard or high-density prototyping boards to a variety of packages including BGA, PLCC,PGA, PQFP, SOIC and more...

FEATURES & BENEFITS

- Bottom configurations adapt to wire wraps or screw machine pins
- Over 300 varieties available
- Pins conform to MIL-C-45204
- Pins and sockets are gold plated; 10 u gold over 100 u nickel
- Available in standard sizes or custom designs.

HOW TO ORDER

1) Determine your board configuration using the diagrams on this page (type A, B, C, or P)
2) Determine if you need a machine screw pins (M) or wire wrap (W) post version (see Bottom Male Pin Types below)
3) Determine your IC package type and locate it on the following pages
4) Determine your pin count

EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling sytems.

Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.

- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

For a complete list of vacuum specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/086

For a complete list of prototyping adapters, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

ET has thousands of adapter designs available in the most popular package styles.
***Tel:* 1-800-ADAPTER (800-232-7837) or (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

FULLY ASSEMBLED & TESTED - PROTOTYPING ADAPTERS

Ordering Information Example

Pin Count
Product Code — AB-120-QF05 (Z)-P10-M-(1)
Chip Pkg Socket Footprint
Top Socket Configurations
CQFP & PQFP only:
S = SMT Pads
P = Production
Z = ZIF Socket

Prototyping PC Board Configurations (see below)

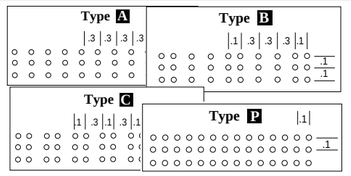
Optional:
1 = Socket Included
0 = Socket Not Included

Bottom Male Pin Type:
M = Screw Machine Pin
W = Wire Wrap Post

For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

Prototyping PC Board Configurations



P5= PGA 8X8	P10= PGA 17X17	P19= PGA 26X26
P6= PGA 9X9	P11= PGA 18X18	P20= PGA 27x27
P2= PGA 10X10	P12= PGA 19X19	P21= PGA 28X28
P1= PGA 11X11	P13= PGA 20X20	P22= PGA 29x29
P7= PGA 12X12	P14= PGA 21X21	P23= PGA 30X30
P3= PGA 13X13	P15= PGA 22X22	P24= PGA 31X31
P8= PGA 14X14	P16= PGA 23X23	P25= PGA 32X32
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

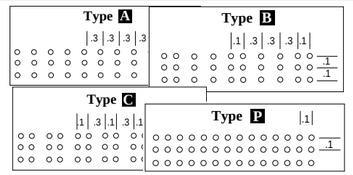
BGA / CSP

Pin Count	Lead Pitch (mm)	Adapter Top Female Config.	Adapter Bottom Male Config.	Pin Type	ET Part #	Drawing #
40	0.75	Surface Mount	P5	Screw Machine	AB-040-4BG5X8S-P5-M	F5362
40	0.75	Surface Mount	P5	Wire Wrap	AB-040-4BG5X8S-P5-W	F5363
48	0.75	Surface Mount	P5	Screw Machine	AB-048-4BG6X8S-P5-M	F5353
48	0.75	Surface Mount	P5	Wire Wrap	AB-048-4BG6X8S-P5-W	F5364
56	0.75	Surface Mount	P5	Screw Machine	AB-056-4BG9X8S-P5-M	F5360
56	0.75	Surface Mount	P5	Wire Wrap	AB-056-4BG9X8S-P5-W	F5361
60	0.75	Zero Insertion Socket	A	Screw Machine	AB-060-4BG11X8Z-A-M	F3057
60	0.75	Zero Insertion Socket	A	Wire Wrap	AB-060-4BG11X8Z-A-W	F2676
144	0.80	Zero Insertion Socket	P25	Screw Machine	AB-144-6BG013Z-P25-M-1	F6758
144	0.80	Zero Insertion Socket	P25	Wire Wrap	AB-144-6BG013Z-P25-W-1	F6755
168	1.27	Zero Insertion Socket	P3	Screw Machine	AB-0168-2BG016Z-P3-M-1	F4755
196	1.00	Surface Mount	P13	Screw Machine	AB-0196-3BG014S-P13-M	F6803
223	1.00	Surface Mount	P11	Screw Machine	AB-0223-3BG018S-P11-M	F6845
223	1.00	Zero Insertion Socket	P11	Screw Machine	AB-0223-3BG018Z-P11-M-1	F6706
256	1.27	Surface Mount	P9	Screw Machine	AB-0256-2BG016S-P9-M	F5318
256	1.27	Zero Insertion Socket	P9	Screw Machine	AB-0256-2BG016Z-P9-M-1	F5810
256	1.27	Zero Insertion Socket	P9	Wire Wrap	AB-0256-2BG016Z-P9-W-1	F6179
256	1.27	Production Socket	P9	Screw Machine	AB-0256-2BG020P-P9-M-1	F4222
256	1.27	Production Socket	P9	Wire Wrap	AB-0256-2BG020P-P9-W-1	F4415
256	1.27	Surface Mount	P9	Screw Machine	AB-0256-2BG020S-P9-M	F4439
256	1.27	Zero Insertion Socket	P9	Screw Machine	AB-0256-2BG020Z-P9-M-1	F4222
256	1.27	Zero Insertion Socket	P9	Wire Wrap	AB-0256-2BG020Z-P9-W-1	F4415
256	1.00	Zero Insertion Socket	P13	Screw Machine	AB-0256-3BG016Z-P13-M-1	F5342
256	1.00	Zero Insertion Socket	P13	Wire Wrap	AB-0256-3BG016Z-P13-W-1	F6847
272	1.27	Zero Insertion Socket	P10	Screw Machine	AB-0272-2BG020Z-P10-M-1	F5032
304	1.27	Production Socket	P11	Screw Machine	AB-0304-2BG023P-P11-M-1	F5064
304	1.27	Zero Insertion Socket	P11	Wire Wrap	AB-0304-2BG023Z-P11-W-1	F6244
352	1.27	Zero Insertion Socket	P19	Screw Machine	AB-0352-2BG026Z-P19-M-1	F5547
357	1.27	Production Socket	P13	Screw Machine	AB-0357-2BG019P-P13-M-1	F5446
361	1.27	Zero Insertion Socket	P12	Screw Machine	AB-0361-2BG019Z-P12-M-1	F5028
388	1.27	Production Socket	P14	Screw Machine	AB-0388-2BG026P-P14-M-1	F5158
400	1.27	Zero Insertion Socket	P13	Screw Machine	AB-0400-2BG020Z-P13-M-1	F5103
432	1.27	Zero Insertion Socket	P14	Screw Machine	AB-0432-2BG031Z-P14-M-1	35708
441	1.27	Zero Insertion Socket	P14	Screw Machine	AB-0441-2BG027Z-P14-M-1	F4448
456	1.27	Production Socket	P15	Screw Machine	AB-0456-2BG026P-P15-M-1	F6018
456	1.27	Production Socket	P15	Wire Wrap	AB-0456-2BG026P-P15-W-1	F4504
456	1.27	Zero Insertion Socket	P15	Wire Wrap	AB-0456-2BG026Z-P15-W-1	F6709
560	1.27	Zero Insertion Socket	P42	Screw Machine	AB-0560-2BG033Z-P42-M-1	F6296
600	1.27	Zero Insertion Socket	P20	Screw Machine	AB-0600-2BG035Z-P20-M-1	F5478
600	1.27	Zero Insertion Socket	P20	Wire Wrap	AB-0600-2BG035Z-P20-W-1	F5477
625	1.27	Zero Insertion Socket	P18	Screw Machine	AB-0625-2BG025Z-P18-M-1	F5324
652	1.27	Zero Insertion Socket	P50	Screw Machine	AB-0652-2BG035Z-P50-M-1	F6354
652	1.27	Zero Insertion Socket	P50	Wire Wrap	AB-0652-2BG035Z-P50-W-1	F6355
672	1.00	Production Socket	P21	Screw Machine	AB-0672-3BG026P-P21-M-1	F5511

For a complete list of prototyping adapters, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

PROTOTYPING ADAPTERS - FULLY ASSEMBLED & TESTED

Prototyping PC Board Configurations



P5= PGA 8X8	P10= PGA 17X17	P19= PGA 26X26
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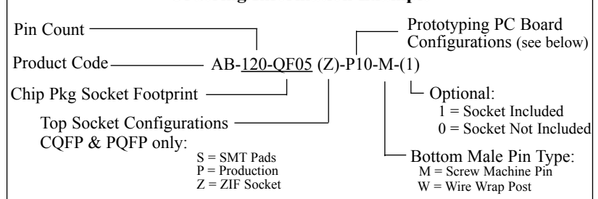
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

Ordering Information Example



For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

PQFP/TQFP

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	Bottom Configuration Type	Adapter Bottom Male Configuration	ET Part #	Drawing #
32	0.80	9.00	Zero Insertion Socket	Screw Machine	Q16	A	AB-032-QF59DZ-A-M	F4000
32	0.80	9.00	Zero Insertion Socket	Wire Wrap	Q16	A	AB-032-QF59DZ-A-W	F6017
44	0.80	12.00 - 13.90	Surface Mount	Wire Wrap	Q16	A & B	AB-044-QF16S-A/B-W	F2691
44	0.80	12.00 - 13.90	Surface Mount	Screw Machine	Q16	C	AB-044-QF16S-C-M	F2692
44	0.80	12.00 - 13.90	Surface Mount	Wire Wrap	Q16	C	AB-044-QF16S-C-W	F2693
44	0.80	12.00 - 13.90	Surface Mount	Screw Machine	Q16	8X8 PGA Grid	AB-044-QF16S-P5-M	F2694
44	0.80	12.00- 13.90	Surface Mount	Wire Wrap	Q16	8X8 PGA Grid	AB-044-QF16S-P5-W	F2695
44	0.80	13.20 -13.90	Zero Insertion Socket	Screw Machine	Q16A/B	8X8 PGA Grid	AB-044-QF16A/BZ-P5-M-1	F2700
44	0.80	13.20 - 13.90	Zero Insertion Socket	Wire Wrap	Q16A/B	8X8 PGA Grid	AB-044-QF16A/BZ-P5-W-1	F2701
44	0.80	12.00 - 13.90	Surface Mount	Screw Machine	Q16	A & B	AB-044-QF16S-A/B-M	F2690
44	0.80	13.20	Zero Insertion Socket	Screw Machine	Q16B	A	AB-044-QF16BZ-A-M-1	F2697
44	0.80	13.20	Zero Insertion Socket	Wire Wrap	Q16B	A	AB-044-QF16BZ-A-W-1	F2699
44	0.80	12.60	Zero Insertion Socket	Screw Machine	Q16C	11X11 PGA Grid	AB-044-QF16CZ-P1-M-1	F4418
44	0.80	12.60	Zero Insertion Socket	Wire Wrap	Q16C	11X11 PGA Grid	AB-044-QF16CZ-P1-W-1	F4420
44	0.80	12.60	Zero Insertion Socket	Wire Wrap	Q16C	11X11 PGA Grid	AB-044-QF16CZ-P1-W-1	F4420
44	0.80	12.00	Zero Insertion Socket	Screw Machine	Q16D	8X8 PGA Grid	AB-044-QF16DZ-P5-M-1	F5793
44	0.80	12.00	Zero Insertion Socket	Wire Wrap	Q16D	8X8 PGA Grid	AB-044-QF16DZ-P5-W-1	F59F4
48	0.50	9.00 - 10.90	Surface Mount	Screw Machine	Q50	C	AB-048-QF50S-C-M	F4188
48	0.50	9.00 - 10.90	Surface Mount	Wire Wrap	Q50	C	AB-048-QF50S-C-W	F4505
48	0.50	9.00	Zero Insertion Socket	Screw Machine	50D	C	AB-048-QF50DZ-C-M-1	F5060
48	0.50	9.00	Zero Insertion Socket	Wire Wrap	50D	C	AB-048-QF50DZ-C-W-1	F5061
52	0.65	12.00 - 13.90	Surface Mount	Screw Machine	Q39	9X9 PGA Grid	AB-052-QF39S-P6-M	F1484
52	0.65	12.00 - 13.90	Surface Mount	Wire Wrap	Q39	9X9 PGA Grid	AB-052-QF39S-P6-W	F1483
52	0.65	13.90	Zero Insertion Socket	Screw Machine	Q39A	9X9 PGA Grid	AB-052-QF39AZ-P6-M-1	F4511
52	0.65	13.90	Zero Insertion Socket	Wire Wrap	Q39A	9X9 PGA Grid	AB-052-QF39AZ-P6-W-1	F2725
52	0.65	13.20	Zero Insertion Socket	Screw Machine	Q39B	9X9 PGA Grid	AB-052-QF39BZ-P6-M-1	F5541
52	0.65	13.20	Zero Insertion Socket	Wire Wrap	Q39B	9X9 PGA Grid	AB-052-QF39BZ-P6-W-1	F5542
52	0.65	12.00	Zero Insertion Socket	Screw Machine	Q39D	9X9 PGA Grid	AB-052-QF39DZ-P6-M-1	F4189
52	1.00	16.00 - 17.90	Surface Mount	Screw Machine	Q37	9X9 PGA Grid	AB-052-QF37S-P6-M	F2722
52	1.00	16.00 - 17.90	Surface Mount	Wire Wrap	Q37	9X9 PGA Grid	AB-052-QF37S-P6-W	F2723
52	1.00	16.00	Zero Insertion Socket	Screw Machine	Q37D	10X10 PGA Grid	AB-052-QF37DZ-P2-M-1	F5714
64	0.50	12.00 - 13.90	Surface Mount	Screw Machine	Q64	A	AB-064-QF64S-A-M	F5F13
64	0.50	12.00 - 13.90	Surface Mount	Wire Wrap	Q64	A	AB-064-QF64S-A-W	F6095
64	0.50	23.20/17.20	Surface Mount	Wire Wrap	Q9B	15X15 PGA Grid	AB-064-QF09BZ-P4-W-1	F6918
64	0.50	12.00	Zero Insertion Socket	Screw Machine	64D	A	AB-064-QF64DZ-A-M-1	F2748
64	0.50	12.00	Zero Insertion Socket	Wire Wrap	64D	A	AB-064-QF64DZ-A-W-1	F4422
64	0.50	23.20/17.20	Zero Insertion Socket	Screw Machine	Q9B	15X15 PGA Grid	AB-064-QF09BZ-P4-M-1	F2746
64	0.80	16.00 - 17.90	Surface Mount	Screw Machine	Q29	A	AB-064-QF29S-A-M	F3858
64	0.80	16.00 - 17.90	Surface Mount	Wire Wrap	Q29	A	AB-064-QF29S-A-W	F4513
64	0.80	16.00 - 17.90	Surface Mount	Screw Machine	Q29	B	AB-064-QF29S-B-M	F3929
64	0.80	16.00 - 17.90	Surface Mount	Wire Wrap	Q29	B	AB-064-QF29S-B-W	F4514
64	0.80	17.20	Zero Insertion Socket	Screw Machine	Q29B	C	AB-064-QF29BZ-C-M-1	F2747
64	0.80	17.20	Zero Insertion Socket	Wire Wrap	Q29B	C	AB-064-QF29BZ-C-W-1	F4159
64	0.80	16.00	Zero Insertion Socket	Screw Machine	Q29D	C	AB-064-QF29DZ-C-M-1	F4093
64	0.80	16.00	Zero Insertion Socket	Wire Wrap	Q29D	C	AB-064-QF29DZ-C-W-1	F1722
64	1.00	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q9A/B	15X15 PGA Grid	AB-064-QF09A/BZ-P4-M-1	F1726
64	1.00	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Wire Wrap	Q9A/B	15X15 PGA Grid	AB-064-QF09A/BZ-P4-W-1	F1727
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q9	A & B	AB-064-QF09S-A/B-M	F2740
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q9	A & B	AB-064-QF09S-A/B-W	F2741
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q9	C	AB-064-QF09S-C-M	F2742

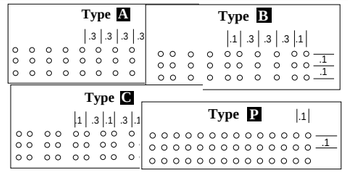
Ordering Information Example

Pin Count
Product Code — AB-120-QF05 (Z)-P10-M-(1)
Chip Pkg Socket Footprint
Top Socket Configurations CQFP & PQFP only:
S = SMT Pads
P = Production
Z = ZIF Socket
Prototyping PC Board Configurations (see below)
Optional:
1 = Socket Included
0 = Socket Not Included
Bottom Male Pin Type:
M = Screw Machine Pin
W = Wire Wrap Post

For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

Prototyping PC Board Configurations



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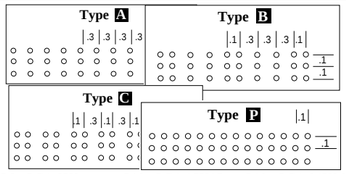
P2= PGA 10X10	P12= PGA 19X19	P21= PGA 28X28
P1= PGA 11X11	P13= PGA 20X20	P22= PGA 29x29
P7= PGA 12X12	P14= PGA 21X21	P23= PGA 30X30
P3= PGA 13X13	P15= PGA 22X22	P24= PGA 31X31
P8= PGA 14X14	P16= PGA 23X23	P25= PGA 32X32
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

PQFP/TQFP (cont.)

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	Bottom Configuration Type	Adapter Bottom Male Configuration	ET Part #	Drawing #
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q9	C	AB-064-QF09S-C-M	F2742
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q9	C	AB-064-QF09S-C-W	F2743
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q9	12X12 PGA Grid	AB-064-QF09S-P7-M	F2744
64	1.00	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q9	12X12 PGA Grid	AB-064-QF09S-P7-W	F2745
80	0.50	14.00 - 15.90	Surface Mount	Screw Machine	Q47	11X11 PGA Grid	AB-080-QF47S-P1-M	F1813
80	0.50	14.00	Surface Mount	Screw Machine	Q47D	13X13 PGA Grid	AB-080-QF47DZ-P3-M-1	F4190
80	0.50	14.00	Surface Mount	Wire Wrap	Q47D	13X13 PGA Grid	AB-080-QF47DZ-P3-W-1	F5941
80	0.50	14.00 - 15.90	Surface Mount	Wire Wrap	Q47S	11X11 PGA Grid	AB-080-QF47S-P1-W	F1814
80	0.65	16.00 - 17.90	Surface Mount	Screw Machine	Q14	11X11 PGA Grid	AB-080-QF14S-P1-M	F2782
80	0.65	16.00 - 17.90	Surface Mount	Wire Wrap	Q14	11X11 PGA Grid	AB-080-QF14S-P1-W	F2783
80	0.65	17.20	Surface Mount	Screw Machine	Q14B	C	AB-080-QF14BZ-C-M-1	F1330
80	0.65	17.20	Surface Mount	Wire Wrap	Q14B	C	AB-080-QF14BZ-C-W-1	F2785
80	0.65	17.20	Surface Mount	Screw Machine	Q14B	13X13 PGA Grid	AB-080-QF14BZ-P3-M-1	F5555
80	0.65	17.20	Surface Mount	Wire Wrap	Q14B	13X13 PGA Grid	AB-080-QF14BZ-P3-W-1	F6094
80	0.65	16.00	Surface Mount	Screw Machine	Q14D	12X12 PGA Grid	AB-080-QF14DZ-P7-M-1	F4282
80	0.65	16.00	Surface Mount	Wire Wrap	Q14D	12X12 PGA Grid	AB-080-QF14DZ-P7-W-1	F5627
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q8	A	AB-080-QF08S-A-M	F2773
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q8	A	AB-080-QF08S-A-W	F2774
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q8	B	AB-080-QF08S-B-M	F2775
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q8	C	AB-080-QF08S-C-M	F2777
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q8	14X14 PGA Grid	AB-080-QF08S-P8-M	F2779
80	0.80	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q8	14X14 PGA Grid	AB-080-QF08S-P8-W	F2780
80	0.80	23.90/17.90	Zero Insertion Socket	Screw Machine	8A	15X15 PGA Grid	AB-080-QF08AZ-P4-M-1	F1230
80	0.80	23.90/17.90	Zero Insertion Socket	Wire Wrap	8A	15X15 PGA Grid	AB-080-QF08AZ-P4-W-1	F1231
100	0.50	16.00 - 17.90	Surface Mount	Screw Machine	Q49	13X13 PGA Grid	AB-100-QF49S-P3-M	F1815
100	0.50	16.00 - 17.90	Surface Mount	Wire Wrap	Q49	13X13 PGA Grid	AB-100-QF49S-P3-W	F1816
100	0.50	16.00	Zero Insertion Socket	Screw Machine	49D	17X17 PGA Grid	AB-100-QF49DZ-P10-M-1	F4295
100	0.50	16.00	Zero Insertion Socket	Wire Wrap	49D	17X17 PGA Grid	AB-100-QF49DZ-P10-W-1	F6919
100	0.50	16.00	Zero Insertion Socket	Screw Machine	49D	13X13 PGA Grid	AB-100-QF49DZ-P3-M-1	F2271
100	0.50	16.00	Zero Insertion Socket	Wire Wrap	49D	13X13 PGA Grid	AB-100-QF49DZ-P3-W-1	F2878
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q6	A	AB-100-QF06S-A-M	F2855
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q6	A	AB-100-QF06S-A-W	F2856
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q6	B	AB-100-QF06S-B-M	F2857
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q6	B	AB-100-QF06S-B-W	F2858
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q6	C	AB-100-QF06S-C-M	F2859
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q6	C	AB-100-QF06S-C-W	F2860
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q6	14X14 PGA Grid	AB-100-QF06S-P8-M	F2861
100	0.65	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q6	14X14 PGA Grid	AB-100-QF06S-P8-W	F2862
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q6A/B	A & B	AB-100-QF06A/BZ-A-M-1	F2863
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q6A/B	A & B	AB-100-QF06A/BZ-A-W-1	F2865
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q6A/B	A & B	AB-100-QF06A/BZ-C-M-1	F2868
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Wire Wrap	Q6A/B	A & B	AB-100-QF06A/BZ-C-W-1	F2870
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q6A/B	14X14 PGA Grid	AB-100-QF06A/BZ-P8-M-1	F1789
100	0.65	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Wire Wrap	Q6A/B	14X14 PGA Grid	AB-100-QF06A/BZ-P8-W-1	F2873
100	0.65	22.00/16.00	Zero Insertion Socket	Screw Machine	Q6D	14X14 PGA Grid	AB-100-QF06DZ-P8-M-1	F4423
100	0.65	22.00/16.00	Zero Insertion Socket	Wire Wrap	Q6D	14X14 PGA Grid	AB-100-QF06DZ-P8-W-1	F6159
100	.025"	.880"	Surface Mount	Screw Machine	Q1	15X15 PGA Grid	AB-100-QF01S-P4-M	F1240
112	0.65	23.20	Zero Insertion Socket	Wire Wrap	Q36B	15X15 PGA Grid	AB-112-QF36BZ-P4-W-1	F2052

PROTOTYPING ADAPTERS - FULLY ASSEMBLED & TESTED

Prototyping PC Board Configurations



P5= PGA 8X8
P6= PGA 9X9
P2= PGA 10X10
P1= PGA 11X11
P7= PGA 12X12
P3= PGA 13X13
P8= PGA 14X14
P4= PGA 15X15
P9= PGA 16X16
P10= PGA 17X17
P11= PGA 18X18
P12= PGA 19X19
P13= PGA 20X20
P14= PGA 21X21
P15= PGA 22X22
P16= PGA 23X23
P17= PGA 24X24
P18= PGA 25X25
P19= PGA 26X26
P20= PGA 27x27
P21= PGA 28X28
P22= PGA 29x29
P23= PGA 30X30
P24= PGA 31X31
P25= PGA 32X32
P26= PGA 33x33
P27= PGA 34x34

Ordering Information Example

AB-120-QF05 (Z)-P10-M-(1)

- Pin Count
- Product Code
- Chip Pkg Socket Footprint
- Top Socket Configurations CQFP & PQFP only: S = SMT Pads, P = Production, Z = ZIF Socket
- Prototyping PC Board Configurations (see below)
- Optional: I = Socket Included, 0 = Socket Not Included
- Bottom Male Pin Type: M = Screw Machine Pin, W = Wire Wrap Post

For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

PQFP/TQFP (cont.)

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	Bottom Configuration Type	Adapter Bottom Male Configuration	ET Part #	Drawing #
112	0.65	22.00	Zero Insertion Socket	Screw Machine	Q36D	15X15 PGA Grid	AB-112-QF36DZ-P4-M-0	F6361
112	0.65	22.00	Zero Insertion Socket	Screw Machine	Q36D	15X15 PGA Grid	AB-112-QF36DZ-P4-M-1	F6362
120	0.80	30.00 - 31.90	Surface Mount	Screw Machine	Q5	15X15 PGA Grid	AB-120-QF05S-P4-M	F2891
120	0.80	30.00 - 31.90	Surface Mount	Wire Wrap	Q5	15X15 PGA Grid	AB-120-QF05S-P4-W	F2892
120	0.80	16.00 - 17.90	Surface Mount	Screw Machine	Q56	12X12 PGA Grid	AB-120-QF56S-P7-M	F6026
120	0.80	16.00 - 17.90	Surface Mount	Wire Wrap	Q56	12X12 PGA Grid	AB-120-QF56S-P7-W	F6096
120	0.80	17.90	Zero Insertion Socket	Screw Machine	Q5A	17X17 PGA Grid	AB-120-QF05AZ-P10-M-1	F1696
120	0.80	17.90	Zero Insertion Socket	Wire Wrap	Q5A	17X17 PGA Grid	AB-120-QF05AZ-P10-W-1	F2895
128	0.40	16.00	Zero Insertion Socket	Screw Machine	Q57	24X24 PGA Grid	AB-128-QF57DZ-P17-M-0	F6849
128	0.50	22.00/16.00 - 23.90/17.90	Surface Mount	Screw Machine	Q51	13X13 PGA Grid	AB-128-QF51S-P3-M	F4427
128	0.50	22.00/16.00 - 23.90/17.90	Surface Mount	Wire Wrap	Q51	13X13 PGA Grid	AB-128-QF51S-P3-W	F5066
128	0.50	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Screw Machine	Q51A/B	18X18 PGA Grid	AB-128-QF51A/BZ-P11-M-1	F2916
128	0.50	23.20/17.20 - 23.90/17.90	Zero Insertion Socket	Wire Wrap	Q51A/B	18X18 PGA Grid	AB-128-QF51A/BZ-P11-W-1	F4428
128	0.50	23.20/17.20	Zero Insertion Socket	Screw Machine	Q51B	18X18 PGA Grid	AB-128-QF51BZ-P18-M-1	F5543
128	0.50	22.00/16.00	Zero Insertion Socket	Screw Machine	Q51D	18X18 PGA Grid	AB-128-QF51DZ-P18-M-1	F5930
128	0.50	22.00/16.00	Zero Insertion Socket	Wire Wrap	Q51D	18X18 PGA Grid	AB-128-QF51DZ-P18-W-1	F4078
128	0.50	16.00	Zero Insertion Socket	Screw Machine	Q57D	24X24 PGA Grid	AB-128-QF57DZ-P17-M-1	F6620
128	0.50	16.00	Zero Insertion Socket	Wire Wrap	Q57D	24X24 PGA Grid	AB-128-QF57DZ-P17-W-1	F6619
128	0.80	31.46 - 31.90	Surface Mount	Screw Machine	Q13	A	AB-128-QF13S-A-M	F2902
128	0.80	31.46 - 31.90	Surface Mount	Wire Wrap	Q13	A	AB-128-QF13S-A-W	F2903
128	0.80	31.46 - 31.90	Surface Mount	Screw Machine	Q13	15X15 PGA Grid	AB-128-QF13S-P4-M	F2906
128	0.80	31.46 - 31.90	Surface Mount	Wire Wrap	Q13	15X15 PGA Grid	AB-128-QF13S-P4-W	F2907
128	0.80	31.90	Zero Insertion Socket	Screw Machine	Q13A	17X17 PGA Grid	AB-128-QF13AZ-P10-M-1	F2909
128	0.80	31.90	Zero Insertion Socket	Wire Wrap	Q13A	17X17 PGA Grid	AB-128-QF13AZ-P10-W-1	F2911
128	0.80	31.90	Zero Insertion Socket	Screw Machine	Q13A	19X19 PGA Grid	AB-128-QF13AZ-P12-M-1	F2913
128	0.80	31.90	Zero Insertion Socket	Wire Wrap	Q13A	19X19 PGA Grid	AB-128-QF13AZ-P12-W-1	F2915
128	0.80	31.20	Zero Insertion Socket	Wire Wrap	Q13B	17X17 PGA Grid	AB-128-QF13BZ-P10-W-1	F4426
132	.025"	1.080"	Surface Mount	Screw Machine	Q3	17X17 PGA Grid	AB-132-QF03S-P10-M	F1121
132	.025"	1.080"	Surface Mount	Wire Wrap	Q3	17X17 PGA Grid	AB-132-QF03S-P10-W	F2923
132	.025"	1.080"	Zero Insertion Socket	Screw Machine	Q3	18X18 PGA Grid	AB-132-QF03Z-P11-M-1	F1317
132	.025"	1.080"	Zero Insertion Socket	Wire Wrap	Q3	18X18 PGA Grid	AB-132-QF03Z-P11-W-1	F1318
132	.025"	1.080"	Production Socket	Screw Machine	Q3A	A	AB-132-QF03A-A-M	F2921
132	.025"	1.080"	Production Socket	Wire Wrap	Q3A	A	AB-132-QF03A-A-W	F2922
132	.025"	1.080"	Production Socket	Screw Machine	Q3A	C	AB-132-QF03A-C-M	F3797
132	.025"	1.080"	Production Socket	Wire Wrap	Q3A	C	AB-132-QF03A-C-W	F3798
144	0.50	22.00 - 23.90	Surface Mount	Screw Machine	Q63	19X19 PGA Grid	AB-144-QF63S-P12H-M	F1945
144	0.50	22.00 - 23.90	Surface Mount	Wire Wrap	Q63	19X19 PGA Grid	AB-144-QF63S-P12H-W	F1946
144	0.50	22.00 - 23.90	Surface Mount	Screw Machine	Q63	16X16 PGA Grid	AB-144-QF63S-P9-M	F2170
144	0.50	22.00 - 23.90	Surface Mount	Wire Wrap	Q63	16X16 PGA Grid	AB-144-QF63S-P9-W	F2187
144	0.50	22.00	Zero Insertion Socket	Screw Machine	Q63D	17X17 PGA Grid	AB-144-QF63DZ-P10-M-1	F2096
144	0.50	22.00	Zero Insertion Socket	Screw Machine	Q63D	17X17 PGA Grid	AB-144-QF63DZ-P10-M-1	F4430
144	0.50	22.00	Zero Insertion Socket	Wire Wrap	Q63D	17X17 PGA Grid	AB-144-QF63DZ-P10-W-1	F2958
144	0.65	30.00 - 31.90	Surface Mount	Screw Machine	Q10	17X17 PGA Grid	AB-144-QF10S-P10-M	F2946
144	0.65	30.00 - 31.90	Surface Mount	Wire Wrap	Q10	17X17 PGA Grid	AB-144-QF10S-P10-W	F2947
144	0.65	31.20	Zero Insertion Socket	Screw Machine	Q10B	A	AB-144-QF10BZ-A-M-1	F2949
144	0.65	31.20	Zero Insertion Socket	Wire Wrap	Q10B	A	AB-144-QF10BZ-A-W-1	F2951
144	0.65	31.20	Zero Insertion Socket	Screw Machine	Q10B	19X19 PGA Grid	AB-144-QF10BZ-P12-M-1	F1796

ET has thousands of adapter designs available in the most popular package styles.
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FULLY ASSEMBLED & TESTED - PROTOTYPING ADAPTERS

Ordering Information Example

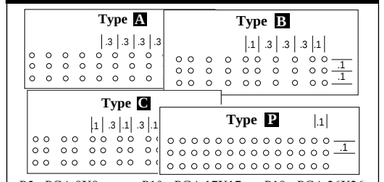
Pin Count
Product Code — AB-120-QF05 (Z)-P10-M-(1)
Chip Pkg Socket Footprint
Top Socket Configurations CQFP & PQFP only:
S = SMT Pads
P = Production
Z = ZIF Socket

Prototyping PC Board Configurations (see below)
Optional:
1 = Socket Included
0 = Socket Not Included
Bottom Male Pin Type:
M = Screw Machine Pin
W = Wire Wrap Post

For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

Prototyping PC Board Configurations



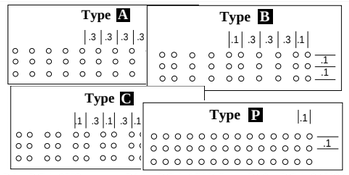
P5= PGA 8X8
P6= PGA 9X9
P2= PGA 10X10
P1= PGA 11X11
P7= PGA 12X12
P3= PGA 13X13
P8= PGA 14X14
P4= PGA 15X15
P9= PGA 16X16
P10= PGA 17X17
P11= PGA 18X18
P12= PGA 19X19
P13= PGA 20X20
P14= PGA 21X21
P15= PGA 22X22
P16= PGA 23X23
P17= PGA 24X24
P18= PGA 25X25
P19= PGA 26X26
P20= PGA 27x27
P21= PGA 28X28
P22= PGA 29x29
P23= PGA 30X30
P24= PGA 31X31
P25= PGA 32X32
P26= PGA 33x33
P27= PGA 34x34

PQFP/TQFP (cont.)

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	Bottom Configuration Type	Adapter Bottom Male Configuration	ET Part #	Drawing #
144	0.65	31.20	Zero Insertion Socket	Wire Wrap	Q10B	19X19 PGA Grid	AB-144-QF10BZ-P12-W-1	F2956
144	0.65	31.20	Zero Insertion Socket	Wire Wrap	Q10B	19X19 PGA Grid	AB-144-QF10BZ-P12-W-1	F4429
160	0.50	26.00 - 27.90	Surface Mount	Screw Machine	Q48	C	AB-160-QF48S-C-M	F4431
160	0.50	26.00 - 27.90	Surface Mount	Wire Wrap	Q48	C	AB-160-QF48S-C-W	F4432
160	0.50	26.00 - 27.90	Surface Mount	Screw Machine	Q48	19X19 PGA Grid	AB-160-QF48S-P12-M	F1718
160	0.50	26.00 - 27.90	Surface Mount	Wire Wrap	Q48	19X19 PGA Grid	AB-160-QF48S-P12-W	F1717
160	0.65	30.00 - 31.90	Surface Mount	Screw Machine	Q7	A	AB-160-QF07S-A-M	F2966
160	0.65	30.00 - 31.90	Surface Mount	Wire Wrap	Q7	A	AB-160-QF07S-A-W	F2967
160	0.65	30.00 - 31.90	Surface Mount	Screw Machine	Q7	C	AB-160-QF07S-C-M	F2968
160	0.65	30.00 - 31.90	Surface Mount	Wire Wrap	Q7	C	AB-160-QF07S-C-W	F2969
160	0.65	30.00 - 31.90	Surface Mount	Screw Machine	Q7	17X17 PGA Grid	AB-160-QF07S-P10-M	F2970
160	0.65	30.00 - 31.90	Surface Mount	Wire Wrap	Q7	17X17 PGA Grid	AB-160-QF07S-P10-W	F2971
160	0.65	30.00 - 31.90	Surface Mount	Screw Machine	Q7	19X19 PGA Grid	AB-160-QF07S-P12-M	F1918
160	0.65	30.00 - 31.90	Surface Mount	Wire Wrap	Q7	19X19 PGA Grid	AB-160-QF07S-P12-W	F1919
160	0.65	31.90	Zero Insertion Socket	Screw Machine	Q7A	19X19 PGA Grid	AB-160-QF07AZ-P12-M-1	F1074
160	0.65	31.90	Zero Insertion Socket	Wire Wrap	Q7A	19X19 PGA Grid	AB-160-QF07AZ-P12-W-1	F2976
160	0.65	31.20	Zero Insertion Socket	Wire Wrap	Q7B	19X19 PGA Grid	AB-160-QF07BZ-P12-W-1	F6222
160	0.65	30.00 - 31.90	Production Socket	Wire Wrap	Q7	A	AB-160-QF07P-A-W-1	F6855
172	.025"	1.150" sq	Zero Insertion Socket	Screw Machine	Q12	23X23 PGA Grid	AB-172-QF12Z-P16-M-1	F1075
172	.025"	1.150" sq	Zero Insertion Socket	Wire Wrap	Q12	23X23 PGA Grid	AB-172-QF12Z-P16-W-1	F2999
176	0.40	22.00 - 23.90	Surface Mount	Screw Machine	Q19	16X16 PGA Grid	AB-176-QF19S-P9-M	F60F0
176	0.40	22.00	Zero Insertion Socket	Screw Machine	Q19D	16X16 PGA Grid	AB-176-QF19DZ-P14-M-1	F3007
176	0.40	22.00	Zero Insertion Socket	Wire Wrap	Q19D	16X16 PGA Grid	AB-176-QF19DZ-P14-W-1	F3009
176	0.50	26.00 - 27.90	Surface Mount	Screw Machine	Q67	17X17 PGA Grid	AB-176-QF67S-P10-M	F2031
176	0.50	26.00 - 27.90	Surface Mount	Wire Wrap	Q67	17X17 PGA Grid	AB-176-QF67S-P10-W	F2032
176	0.50	26.00	Zero Insertion Socket	Screw Machine	Q67D	A	AB-176-QF67DZ-A-M-1	F3010
176	0.50	26.00	Zero Insertion Socket	Wire Wrap	Q67D	A	AB-176-QF67DZ-A-W-1	F4753
176	0.50	26.00	Zero Insertion Socket	Screw Machine	Q67D	17X17 PGA Grid	AB-176-QF67DZ-P10-M-1	F2004
176	0.50	26.00	Zero Insertion Socket	Wire Wrap	Q67D	17X17 PGA Grid	AB-176-QF67DZ-P10-W-1	F2006
196	.025"	1.480"	Surface Mount	Screw Machine	Q15	20X20 PGA Grid	AB-196-QF15S-P13-M	F1391
196	.025"	1.480"	Surface Mount	Wire Wrap	Q15	20X20 PGA Grid	AB-196-QF15S-P13-W	F3015
196	.025"	1.480"	Zero Insertion Socket	Screw Machine	Q15	20X20 PGA Grid	AB-196-QF15Z-P13-M-1	F1350
196	.025"	1.480"	Zero Insertion Socket	Wire Wrap	Q15	20X20 PGA Grid	AB-196-QF15Z-P13-W-1	F3017
208	0.50	30.00 - 31.90	Surface Mount	Screw Machine	Q21	A	AB-208-QF21S-A-M	F3022
208	0.50	30.00 - 31.90	Surface Mount	Wire Wrap	Q21	A	AB-208-QF21S-A-W	F3023
208	0.50	30.00 - 31.90	Surface Mount	Screw Machine	Q21	C	AB-208-QF21S-C-M	F5661
208	0.50	30.00 - 31.90	Surface Mount	Wire Wrap	Q21	C	AB-208-QF21S-C-W	F3025
208	0.50	30.00 - 31.90	Surface Mount	Screw Machine	Q21	17X17 PGA Grid	AB-208-QF21S-P10-M	F2303
208	0.50	30.00 - 31.90	Surface Mount	Wire Wrap	Q21	17X17 PGA Grid	AB-208-QF21S-P10-W	F6446
208	0.50	30.00 - 31.90	Surface Mount	Screw Machine	Q21	18X18 PGA Grid	AB-208-QF21S-P11-M	F3026
208	0.50	30.00 - 31.90	Surface Mount	Wire Wrap	Q21	18X18 PGA Grid	AB-208-QF21S-P11-W	F3027
208	0.50	30.00 - 31.90	Surface Mount	Screw Machine	Q21	20X20 PGA Grid	AB-208-QF21S-P13-M	F2071
208	0.50	30.00 - 31.90	Surface Mount	Wire Wrap	Q21	20X20 PGA Grid	AB-208-QF21S-P13-W	F3028
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21	20X20 PGA Grid	AB-208-QF21ZYAM-P13-M-1-B7	F6359
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21B	21X21PGA Grid	AB-208-QF21BZENP-P14-M-1	F2125
208	0.50	30.00 - 31.90	Zero Insertion Socket	Wire Wrap	Q21B	21X21PGA Grid	AB-208-QF21BZENP-P14-W-1	F3030
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21B	C	AB-208-QF21BZYAM-C-M-1	F3951
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21B	20X20 PGA Grid	AB-208-QF21BZYAM-P13-M-1	F1451
208	0.50	30.00 - 31.90	Zero Insertion Socket	Wire Wrap	Q21B	20X20 PGA Grid	AB-208-QF21BZYAM-P13-W-1	F3032

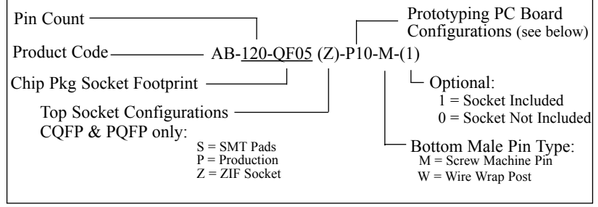
PROTOTYPING ADAPTERS - FULLY ASSEMBLED & TESTED

Prototyping PC Board Configurations



P5= PGA 8X8	P10= PGA 17X17	P19= PGA 26X26
P6= PGA 9X9	P11= PGA 18X18	P20= PGA 27x27
P2= PGA 10X10	P12= PGA 19X19	P21= PGA 28X28
P1= PGA 11X11	P13= PGA 20X20	P22= PGA 29x29
P7= PGA 12X12	P14= PGA 21X21	P23= PGA 30X30
P3= PGA 13X13	P15= PGA 22X22	P24= PGA 31X31
P8= PGA 14X14	P16= PGA 23X23	P25= PGA 32X32
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

Ordering Information Example



For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

PQFP/TQFP (cont.)

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	Bottom Configuration Type	Adapter Bottom Male Configuration	ET Part #	Drawing#
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21C	20X20 PGA Grid	AB-208-QF21CZ-P13-M-1	F4436
208	0.50	30.00 - 31.90	Zero Insertion Socket	Screw Machine	Q21C	21X21PGA Grid	AB-208-QF21CZ-P14-M-1	F1473
208	0.50	30.00 - 31.90	Zero Insertion Socket	Wire Wrap	Q21C	21X21PGA Grid	AB-208-QF21CZ-P14-W-1	F6090
216	0.40	26.00	Surface Mount	Screw Machine	Q65	16X16 PGA Grid	AB-216-QF65S-P9-M	F6034
240	0.50	34.00 - 35.90	Surface Mount	Screw Machine	Q62	20X20 PGA Grid	AB-240-QF62S-P13-M	F1515
240	0.50	34.00 - 35.90	Surface Mount	Wire Wrap	Q62	20X20 PGA Grid	AB-240-QF62S-P13-W	F4438
240	0.50	34.60	Zero Insertion Socket	Screw Machine	Q62C	C	AB-240-QF62CZ-C-M-1	F3042
240	0.50	34.60	Zero Insertion Socket	Wire Wrap	Q62C	C	AB-240-QF62CZ-C-W-1	F4767
240	0.50	34.60	Zero Insertion Socket	Screw Machine	Q62C	18X18 PGA Grid	AB-240-QF62CZ-P11-M-1	F5837
240	0.50	34.60	Zero Insertion Socket	Wire Wrap	Q62C	20X20 PGA Grid	AB-240-QF62CZ-P13-W-1	F2298
304	0.50	42.60	Zero Insertion Socket	Screw Machine	Q61C	21X21PGA Grid	AB-304-QF61CZ-P14-M-1	F3931
304	0.50	42.60	Zero Insertion Socket	Screw Machine	Q61C	27x27 PGA GRID	AB-304-QF61CZ-P20-M-1	F3994

DIP

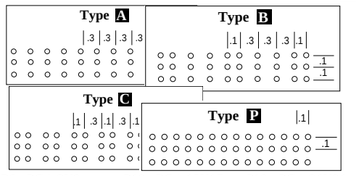
Pin Count	Package Specs (width/inches)	Adapter Top Female Config.	Adapter Bottom Male Config. (inches)	Bottom Pin Type	Description	Drawing#
20	.300 DIP	Production Socket	.600 DIP	Screw Machine	AB-020-300FEM-600MALE-M	F5536
20	.600 DIP	Production Socket	.300 DIP	Screw Machine	AB-020-600FEM-300MALE-M	F2603
20	.600 DIP	Production Socket	.300 DIP	Wire Wrap	AB-020-600FEM-300MALE-W	F2604
20	.600 DIP	Production Socket	.400 DIP	Screw Machine	AB-020-600FEM-400MALE-M	F4186
20	.600 DIP	Production Socket	.400 DIP	Wire Wrap	AB-020-600FEM-400MALE-W	F4435
24	.300 DIP	Production Socket	.600 DIP	Screw Machine	AB-024-300FEM-600MALE-M	F2619
24	.600 DIP	Production Socket	.300 DIP	Screw Machine	AB-024-600FEM-300MALE-M	F2625
24	.600 DIP	Production Socket	.300 DIP	Wire Wrap	AB-024-600FEM-300MALE-W	F2626
28	.300 DIP	Production Socket	.600 DIP	Screw Machine	AB-028-300FEM-600MALE-M	F2634
28	.300 DIP	Production Socket	.600 DIP	Wire Wrap	AB-028-300FEM-600MALE-W	F2635
28	.300 DIP	Production Socket	.600 DIP	Screw Machine	AB-028-400FEM-600MALE-M	F2636
28	.300 DIP	Production Socket	.600 DIP	Wire Wrap	AB-028-400FEM-600MALE-W	F2637
28	.600 DIP	Production Socket	.300 DIP	Screw Machine	AB-028-600FEM-300MALE-M	F2638
28	.600 DIP	Production Socket	.300 DIP	Wire Wrap	AB-028-600FEM-300MALE-W	F2639
28	.600 DIP	Production Socket	.400 DIP	Screw Machine	AB-028-600FEM-400MALE-M	F2640
28	.600 DIP	Production Socket	.400 DIP	Wire Wrap	AB-028-600FEM-400MALE-W	F2641
32	.400 DIP	Production Socket	.600 DIP	Screw Machine	AB-032-400FEM-600MALE-M	F1062
32	.600 DIP	Production Socket	.300 DIP	Screw Machine	AB-032-600FEM-300MALE-M	F2659
40	.600 DIP	Production Socket	.300 DIP	Screw Machine	AB-040-600FEM-300MALE-M	F2669
40	.600 DIP	Production Socket	.300 DIP	Wire Wrap	AB-040-600FEM-300MALE-W	F2670

SDIP

Pin Count	Package Specs (width/inches)	Adapter Top Female Config.	Adapter Bottom Male Config.	Bottom Pin Type	Description	Drawing#
28	.750 SDIP	Production Socket	Type B & C	Screw Machine	AB-028/030-SDIP-B/C-M,	F2656
28	.750 SDIP	Production Socket	Type B & C	Wire Wrap	AB-028/030-SDIP-B/C-W,	F2657
40	.750 SDIP	Production Socket	Type B & C	Screw Machine	AB-040/042-SDIP-B/C-M,	F2672
40	.750 SDIP	Production Socket	Type B & C	Wire Wrap	AB-040/042-SDIP-B/C-W,	F2673
48	.750 SDIP	Production Socket	Type A & B	Screw Machine	AB-048/052-SDIP-A/B-M,	F2702
56	.650 SDIP	Production Socket	Type C	Screw Machine	AB-056-SDIP-C-M	F6624
56	.650 SDIP	Production Socket	Type C	Wire Wrap	AB-056-SDIP-C-W	F6623
64	.750 SDIP	Production Socket	Type A & B	Screw Machine	AB-064-SDIP-A/B-M,	F2749
64	.750 SDIP	Production Socket	Type A & B	Wire Wrap	AB-064-SDIP-A/B-W,	F2750

FULLY ASSEMBLED & TESTED -PROTOTYPING ADAPTERS

Prototyping PC Board Configurations



P5= PGA 8X8
P6= PGA 9X9
P2= PGA 10X10
P1= PGA 11X11
P7= PGA 12X12
P3= PGA 13X13
P8= PGA 14X14
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P9= PGA 16X16

P10= PGA 17X17
P11= PGA 18X18
P12= PGA 19X19
P13= PGA 20X20
P14= PGA 21X21
P15= PGA 22X22
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P17= PGA 24X24
P18= PGA 25X25

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P21= PGA 28X28
P22= PGA 29x29
P23= PGA 30X30
P24= PGA 31X31
P25= PGA 32X32
P26= PGA 33x33
P27= PGA 34x34

Ordering Information Example

Pin Count
Product Code — AB-120-QF05 (Z)-P10-M-(1)
Chip Pkg Socket Footprint
Top Socket Configurations
CQFP & PQFP only:
S = SMT Pads
P = Production
Z = ZIF Socket

Prototyping PC Board Configurations (see below)
Optional:
1 = Socket Included
0 = Socket Not Included
Bottom Male Pin Type:
M = Screw Machine Pin
W = Wire Wrap Post

For a complete list of prototyping adapter specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/004

SOIC/SSOP

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Adapter Bottom Male Configuration	Bottom Pin Type	ET Part #	Drawing #
8	1.27	3.90	Surface Mount	.300" DIP	Screw Machine	AB-008-SO01S-A-M	F6748
8	0.65	3.00	Zero Insertion Socket	.300" DIP	Screw Machine	AB-008-ST36Z-A-M-1	F6515
20	0.65	4.4 to 8.00	Surface Mount	.300" DIP	Screw Machine	AB-020-ST03S-A-M	F6045
20	0.65	4.4 to 8.00	Surface Mount	.300" DIP	Wire Wrap	AB-020-ST03S-A-W	F6044
20	0.50	3.00 to 9.90	Surface Mount	.300" DIP	Screw Machine	AB-020-ST35S-A-M	F6038
20	0.50	3.00 to 9.90	Surface Mount	.300" DIP	Wire Wrap	AB-020-ST35S-A-W	F5157
24	0.65	4.40	Surface Mount	.300" DIP	Screw Machine	AB-024-SO03S-A-M	F6607
24	1.00	9.90	Surface Mount	C	Screw Machine	AB-024-SS08S-C-M	F2629
28	1.27	3.90	Surface Mount	A	Screw Machine	AB-028-SO01S-A-M	F6091
28	1.27	3.90	Surface Mount	A	Wire Wrap	AB-028-SO01S-A-W	F6092
28	0.635	3.80 to 7.62	Surface Mount	A	Screw Machine	AB-028-SS01S-A-M	F6035
28	0.635	3.80 to 7.62	Surface Mount	A	Wire Wrap	AB-028-SS01S-A-W	F3035
28	0.635	7.62	Zero Insertion Socket	P7	Screw Machine	AB-028-SS06Z-P7-M-1	F1088
28	0.635	7.62	Zero Insertion Socket	P7	Wire Wrap	AB-028-SS06Z-P7-W-1	F5080
28	0.65	5.30	Surface Mount	.300" DIP	Screw Machine	AB-028-SS34S-300-M	F6165
28	0.65	5.30	Surface Mount	.300" DIP	Wire Wrap	AB-028-SS34S-300-W	F6164
28	0.65	5.30	Surface Mount	.600" DIP	Screw Machine	AB-028-SS34S-600-M	F6160
28	0.65	5.30	Surface Mount	.600" DIP	Wire Wrap	AB-028-SS34S-600-W	F6131
36	0.80	7.62	Zero Insertion Socket	A	Screw Machine	AB-036-SS16Z-A-M-1	F6508
44	1.27	13.20	Surface Mount	A	Screw Machine	AB-044-SO09PS-A-M	F6009
44	1.27	13.20	Surface Mount	A	Wire Wrap	AB-044-SO09PS-A-W	F6013
44	1.27	13.20	Surface Mount	A	Screw Machine	AB-044-SO09S-A-M	F2602
44	1.27	13.20	Surface Mount	A	Wire Wrap	AB-044-SO09S-A-W	F5148
44	1.27	13.20	Surface Mount	C	Screw Machine	AB-044-SO09S-C-M	F4291
44	1.27	13.20	Surface Mount	C	Wire Wrap	AB-044-SO09S-C-W	F6093
48	0.635	7.62	Zero Insertion Socket	P1	Screw Machine	AB-048-SS06Z-P1-M-1	F5829
48	0.635	7.62	Zero Insertion Socket	P1	Wire Wrap	AB-048-SS06Z-P1-W-1	F5830
48	0.50	6.10 to 8.00	Surface Mount	A	Screw Machine	AB-048-SS15S-A-M	F5309
48	0.50	6.10 to 8.00	Surface Mount	A	Wire Wrap	AB-048-SS15S-A-W	F4421
48	0.50	6.10 to 8.00	Zero Insertion Socket	C	Screw Machine	AB-048-SS15Z-C-M-1	F5009
56	0.635	7.62	Zero Insertion Socket	P1	Screw Machine	AB-056-SS06Z-P1-M-1	F2217
56	0.635	7.62	Zero Insertion Socket	P1	Wire Wrap	AB-056-SS06Z-P1-W-1	F3723
56	0.50	6.10	Surface Mount	A	Screw Machine	AB-056-SS15S-A-M	F5062
56	0.50	6.10	Surface Mount	A	Wire Wrap	AB-056-SS15S-A-W	F6097

Try our **Quick Probe Test Fixture**

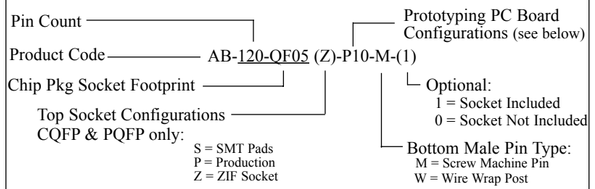
Designed to quickly connect a test instrument, such as an oscilloscope, to a variety of SMDs including PLCC, SOIC, QFP, and VIAS or test point holes.

Web Link: www.1800adapter.com/quickprobe

For a complete list of product specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/004**

PROTOTYPING ADAPTERS - FULLY ASSEMBLED & TESTED

Ordering Information Example



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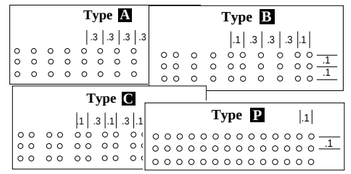
Web Link: www.1800adapter.com/004

Prototyping PC Board Configurations



P5= PGA 8X8	P10= PGA 17X17	P19= PGA 26X26
P6= PGA 9X9	P11= PGA 18X18	P20= PGA 27x27
P2= PGA 10X10	P12= PGA 19X19	P21= PGA 28X28
P1= PGA 11X11	P13= PGA 20X20	P22= PGA 29x29
P7= PGA 12X12	P14= PGA 21X21	P23= PGA 30X30
P3= PGA 13X13	P15= PGA 22X22	P24= PGA 31X31
P8= PGA 14X14	P16= PGA 23X23	P25= PGA 32X32
P4= PGA 15X15	P17= PGA 24X24	P26= PGA 33x33
P9= PGA 16X16	P18= PGA 25X25	P27= PGA 34x34

TSOP, TSOP II

Pin Count	Lead Pitch (mm)	Package Specs Width (inches)	Adapter Top Female Configuration	Adapter Bottom Male Configuration	Bottom Pin Type	ET Part #	Drawing #
32	0.50	18.40	Surface Mount	P2	Screw Machine	AB-032-TS01S-P2-M	F4405
32	0.50	18.40	Surface Mount	P2	Wire Wrap	AB-032-TS01S-P2-W	F5710
40	0.50	18.40	Production Socket	A	Screw Machine	AB-040-TS01PS-A-M	F6010
40	0.50	18.40	Production Socket	A	Wire Wrap	AB-040-TS01PS-A-W	F6014
44	0.50	18.40	Surface Mount	P2	Screw Machine	AB-044-TS01S-P2-M	F4406
48	0.50	18.40	Production Socket	.600" DIP	Screw Machine	AB-048-TS01PS-A-M	F6011
48	0.50	18.40	Production Socket	.600" DIP	Wire Wrap	AB-048-TS01PS-A-W	F6015
48	0.50	18.40	Surface Mount	P2	Screw Machine	AB-048-TS01S-P2-M	F4407
48	0.50	18.40	Surface Mount	P2	Wire Wrap	AB-048-TS01S-P2-W	F5831
48	0.50	18.40	Zero Insertion Socket	P5	Screw Machine	AB-048-TS01Z-P5-M-1	F4492
48	0.50	18.40	Zero Insertion Socket	P5	Wire Wrap	AB-048-TS01Z-P5-W-1	F5833
50	0.80	10.16	Zero Insertion Socket	P1	Screw Machine	AB-050-T212Z-P1-M-1	F4306
54	0.80	10.16	Zero Insertion Socket	P9	Screw Machine	AB-054-T212Z-P9-M-1	F4408
54	0.80	10.16	Zero Insertion Socket	P9	Wire Wrap	AB-054-T212Z-P9-W-1	F5311
56	0.50	18.40	Production Socket	A	Screw Machine	AB-056-TS01PS-A-M	F6012
56	0.50	18.40	Production Socket	A	Wire Wrap	AB-056-TS01PS-A-W	F6016
56	0.50	18.40	Production Socket	P2	Screw Machine	AB-056-TS01PS-P2-M-1	F5928
56	0.50	18.40	Production Socket	P2	Wire Wrap	AB-056-TS01PS-P2-W-1	F5910
56	0.50	18.40	Surface Mount	P2	Screw Machine	AB-056-TS01S-P2-M	F4409
56	0.50	18.40	Surface Mount	P2	Wire Wrap	AB-056-TS01S-P2-W	F4493
86	0.50	10.16	Zero Insertion Socket	P4	Screw Machine	AB-086-T232Z-P4-M-1	F6747

PLCC

Pin Count	Lead Pitch (mm)	Tip-to-Tip mm (sq.)	Adapter Top Female Configuration	Bottom Pin Type	ET Part #	Drawing #
84	0.50	PLCC	Zero Insertion Socket	Screw Machine	AB-084-PCC5Z-P12-M-1	F2800
84	0.50	PLCC	Zero Insertion Socket	Wire Wrap	AB-084-PCC5Z-P12-W-1	F2802
84	0.50	PLCC	Production Socket	Screw Machine	AB-084-PCC5-A-M	F2793
84	0.50	PLCC	Production Socket	Wire Wrap	AB-084-PCC5-A-W	F2794
84	0.50	PLCC	Production Socket	Screw Machine	AB-084-PCC5-B-M	F2795
84	0.50	PLCC	Production Socket	Screw Machine	AB-084-PCC5-C-M	F2797
84	0.50	PLCC	Production Socket	Wire Wrap	AB-084-PCC5-C-W	F2798

Try our **PLCC Vacuum Insertion Tool**

Use this tool to easily insert PLCC packages into their sockets.

Inserter works on PLCC packages with pin counts 28 to 84.

Web Link: www.1800adapter.com/053

For a complete list of prototyping adapters, pricing and delivery information, please see:

Web Link: **www.1800adapter.com/004**

ET has thousands of adapter designs available in the most popular package styles.

***Tel:* 1-800-ADAPTER (800-232-7837) or (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

WIRE WRAP TOOL FOR PROTOTYPE ADAPTERS

FEATURES & BENEFITS

- Hand-operated wrapping guns use interchangeable bits and sleeves.
- Cushion grips and interchangeable blades, 22-24 and 24-26 AWG are included.
- Tools can provide up to 10 revolutions per squeeze of the trigger, and accommodate wire sizes from 22-32 AWG.
- Both guns are used for production line and field service within the electronics and telecommunications industries.

QUICK-WRAP BITS

TOP: ET-BW-2224
BOTTOM: ET-BW-3032

QUICK-WRAP BITS

Description	Wire Guage	Hole Diameter	Hole Depth
ET-BW-2224	22-24	.075	.807
ET-BW-2600	26	.075	1.000

QUICK-WRAP SLEEVES

Description	Wire Guage	Hole Diameter	Hole Depth
ET-SW-2224	22-24	.075	.807
ET-SW-2600	26	.075	1.000

QUICK-WRAP BITS & SLEEVES 5" LONG

Description	Wire Guage	Hole Diameter	Hole Depth
ETBW-24005	22-24	.075	.750
ET-SW-24265		24-26	.075

WIRE

Wire Gauge	Wire Length (ft.)	Wire Color: Blue	Black	White	Red	Yellow	ET Part#
24	100	X					ET-R24B-0100
24	100		X				ET-R24BLK-0100
24	100			X			ET-R24W-0100
24	100					X	ET-R24Y-0100
26	100	X					ET-R26B-0100
26	100		X				ET-R26BLK-0100
26	100				X		ET-R26R-0100
26	100					X	ET-R26Y-0100
28	100	X					ET-R28B-0100
28	100		X				ET-R28BLK-0100
28	100				X		ET-R28R-0100
28	100			X			R28W-0100
28	100					X	R28Y-0100
30	50	X					ET-R30B-0050
30	100	X					ET-R30B-0100
30	100		X				ET-R30BLK-0100
30	1000		X				ET-R30BLK1000
30	50				X		ET-R-30R-0050
30	100				X		ET-R30R-0100
30	1000				X		ET-R30R-1000
30	DISPENSER						ET-R-30-TRI
30	50			X			ET-R-30W-0050
30	100			X			ET-R30W-0100
30	1000			X			ET-R30W-1000
30	50					X	ET-R-30Y-0050
30	100					X	ET-R30Y-0100
30	1000					X	ET-R30Y-1000

For a complete list of wire wrapping tools along with specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/058**

TEST & BURN-IN, PRODUCTION, PROTOTYPING SOCKETS AND RECEPTACLES

ET is proud to carry several thousand different sockets to meet your unique applications. When you're looking for a socket solution, ET is your one-stop shop providing you with the resources to quickly and accurately find the right socket to meet your needs. Whether you are looking for an off-the-shelf solution or a custom design, our technical staff can assist you.

How to Choose The Right Socket

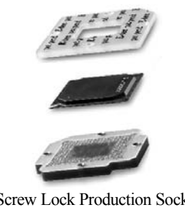
Finding the right socket for your project is easy. Gathering the following key characteristics will assist you in finding the correct ET part number:

1. Pin count
2. Chip size
3. Grid size
4. Socket style (Burn-in, Surface Mount)
5. Bandwidth of chip

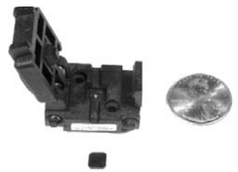
When you are ready to order, please provide the following:

1. Chip manufacturer, part number, and package outline drawing
2. Socket style: Production, Test & Burn-in, SMT or Thru Hole
3. Quantity and delivery requirements

See our complete socket listing online: **www.1800adapter.com/049**



BGA Screw Lock Production Sockets
Page 130



QFN/MLF ZIF Sockets
Page 149

CUSTOMS: Custom Configurations Available	SOCKET TYPES: Test & Burn-in (ZIF)	SOCKET TYPES: Production	SOCKET TYPES: Prototyping	CONTACT TYPES: Dual Beam	CONTACT TYPES: Pogo Pin / Spring Probe	CONTACT TYPES: Elastomer	SOCKET SPEED: < 1 GHz	SOCKET SPEED: Up to 3 GHz	SOCKET SPEED: Up to 14 GHz	SOCKET SPEED: Up to 40 GHz	SOCKET SOLUTIONS	Catalog Page
											BGA (Ball Grid Array) Sockets	
X		X	X		X			X			BGA SMT & Thru-hole Development up to 3 GHz	130-133
X	X	X			X			X			BGA SMT & Thru-hole Knob Lock	134
X		X			X			X			BGA SMT & Thru-hole ZIF Lock up to 3 GHz	135
X	X	X	X		X				X		BGA Custom High Speed 4.6 to 14 GHz BGA Sockets	136
X				X		X				X	BGA High Performance up to 40 GHz	137
X		X	X	X					X		BGA (BPE) Base Package Emulators	138, 139
X		X	X	X					X		BGA (FPA) Flat Pin Array	140, 141
X		X	X	X					X		BGA (XPA) Extender	142
X	X	X	X					X			BGA Chip Screening Socket System	143
X		X	X	X					X		HiLo Flexible Interconnect System up to 9.3 GHz	144, 145
X	X		X	X							Micro-BGA & BGA Sockets—Test & Burn-In	146-148
											non-BGA Sockets	
X	X		X	X	X		X				QFN/MLF, MAP, TAP, LAP Sockets	149
X	X	X	X	X			X				TSOP/TSSOP, SOJ, SOIC	150
X	X	X	X	X			X				SSO/DIP/SDIP	151
X	X		X	X			X				PQFP/TQFP Sockets—Test & Burn-in/ SMT	154, 155
X	X		X	X			X				PGA Test & Burn-in	156, 157
X	X		X		X		X				PLCC Chip Screening Socket System	143
X	X		X	X			X				PGA & HGA Test & Burn-in	157
	X		X	X			X				PLCC Sockets—Burn-in/Production	158
											Socket Receptacles	24, 25
X	X	X	X	X							Socket Receptacles	152, 153

SOCKETS - BGA SMT AND THRU-HOLE DEVELOPMENT UP TO 3 GHz

SCREW LOCK SOCKETS

These sockets can be either surface mount or thru-hole mount to your target PCB - for ease of chip insertion and removal utilizing a screw lock lid.

FEATURES & BENEFITS

- Available for ceramic, plastic BGA and land grid array (LGA)
- Screw lock compression type socket guarantees contact continuity even under the highest shock and vibration
- Thru-hole version eliminates surface mount soldering problems
- Easily exchange and replace chips with no desoldering required
- Utilizes solder paste or solder flux and industry standard rework stations
- Prevents time-consuming board revisions
- Customs available upon request

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

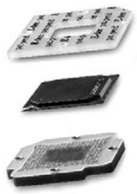
BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

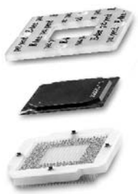
GRID SIZES

- 8X8 through 40X40

NOTE: Manufacturer's chip package drawing required with each order.



SMT Screw Lock Socket



Thru-Hole Screw Lock Socket

Electrical Specifications	
Bandwidth	Up to 3GHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Breakdown Voltage at 60Hz	500 V min.
Mechanical Specifications	
Contact Life	10,000 cycles minimum
Retention System Life	10,000 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.
Max Torque for Retention Screws	7cN per meter, or 10 oz.per inch
Materials	
Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu
Operating Temperature	
Temperature Range	-55 degrees C to + 130 degrees C

EMULATION TECHNOLOGY RECOMMENDS:

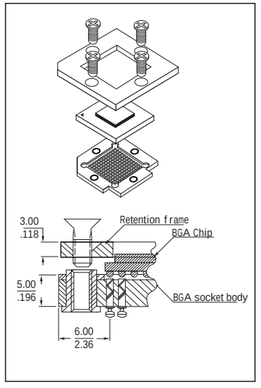
Try our **BGA Screw Lock Torque Screwdriver**
Pre-set torque screwdriver ensures correct tightening of retention frames. Ideal accessory for BGA Screw Lock Socket users.
Web Link: www/1800adapter.com/120

Try our **BGA Solder Stencils**
Residue-free adhesive backing means these stencils are self-sticking …so you can say goodbye to tape and fixturing forever!
Web Link: www.1800adapter.com/019

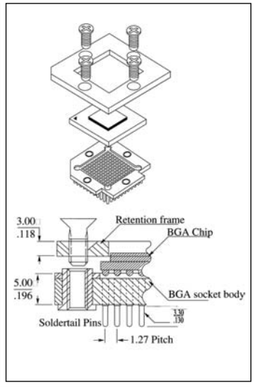
Try our **BGA Emulator Solution**
Converts ET screw-lock SMT or Thru-hole sockets into an emulator pod receptacle for JTAG or similar testing. Test. Emulate. Connect.
Web Link: www.1800adapter.com/127

For a complete list of socket specifications, pricing and delivery information, please see:
BGA Sockets: **www.1800adapter.com/048**

SMT STANDARD STYLE



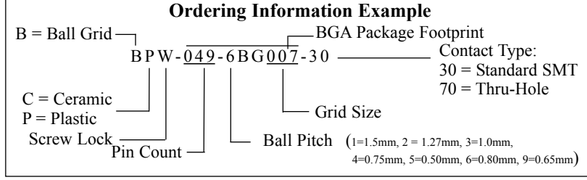
THRU-HOLE STYLE



Don't be confused. Thru-hole, Surface Mount? BGA High Performance? Call ET today.
Tel: **1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz - SOCKETS

Ordering Information Example



SCREW LOCK SOCKETS

For a complete list of socket specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/048

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
225	27	15X15	Surface Mount	BPW-225-1BG015-30	SKT1120
225	27	15X15	Thru Hole	BPW-225-1BG015-70	SKT1123

1.27mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
16	15.8X11.0	8X8	Surface Mount	BPW-016-2BG008-30	SKT1177
119	14X22	7X17	Surface Mount	BPW-119-2BG7X17-30	SKT846
119	14X22	7X17	Thru-hole	BPW-119-2BG7X17-70	SKT846
120	11X17	10X16	Surface Mount	BPW-120-3BG10X16-30	SKT1256
120	11X17	10X16	Thru-hole	BPW-120-3BG10X16-70	SKT1256
144	13X13	12X12	Surface Mount	BPW-144-3BG012-30	SKT1119
144	13X13	12X12	Thru-hole	BPW-144-3BG012-70	SKT1119
153	14X22	17X17	Surface Mount	BPW-153-2BG9X17-30	SKT1189
153	14X22	17X17	Thru-hole	BPW-153-2BG9X17-70	SKT1189
208	23X23	17X17	Surface Mount	BPW-208-2BG017-30	SKT992
208	23X23	17X17	Thru-hole	BPW-208-2BG017-70	SKT992
217	23X23	17X17	Surface Mount	BPW-217-2BG017-30	SKT996
217	23X23	17X17	Thru-hole	BPW-217-2BG017-70	SKT996
225	20X20	15X15	Surface Mount	BPW-225-2BG015-30	SKT1269
225	20X20	15X15	Thru-hole	BPW-225-2BG015-70	SKT1269
225	27X27	15X15	Surface Mount	BPW-225-1BG015-30	SKT1120
225	27X27	15X15	Thru-hole	BPW-225-1BG015-70	SKT1120
241	35X35	17X17	Thru-hole	BPW-241-2BG017-70	SKT952
241	23X23	17X17	Surface Mount	BPW-241-2BG017-30	SKT1343
249	23X23	17X17	Surface Mount	BPW-249-2BG017-30	SKT1273
249	23X23	17X17	Thru-hole	BPW-249-2BG017-70	SKT1273
255	23X23	16X16	Surface Mount	BPW-256-2BG016-30	SKT1066
256	23X23	16X16	Thru-hole	BPW-256-2BG016-70	SKT1066
256	27X27	20X20	Surface Mount	BPW-256-2BG020-30	SKT814
256	27X27	20X20	Thru-hole	BPW-256-2BG020-70	SKT814
256	31X31	23X23	Surface Mount	BPW-256-2BG023-30	SKT036
256	31X31	23X23	Thru-hole	BPW-256-2BG023-70	SKT036
272	27X27	20X20	Surface Mount	BPW-272-2BG020-30	SKT818
272	27X27	20X20	Thru-hole	BPW-272-2BG020-70	SKT818
272	29X29	21X21	Surface Mount	BPW-272-2BG021-30	SKT1027
272	29X29	21X21	Thru-hole	BPW-272-2BG021-70	SKT1027
289	23X23	17X17	Surface Mount	BPW-289-2BG017-30-P	SKT1512
292	27X27	20X20	Surface Mount	BPW-292-2BG020-30	SKT753
292	27X27	20X20	Thru-hole	BPW-292-2BG020-70	SKT753
308	27X27	20X20	Surface Mount	BPW-308-2BG020-30	SKT1191
308	27X27	20X20	Thru-hole	BPW-308-2BG020-70	SKT1191
316	27X27	20X20	Surface Mount	BPW-316-2BG020-30	SKT1192
316	27X27	20X20	Thru-hole	BPW-316-2BG020-70	SKT1192
324	27X27	24X24	Surface Mount	BPW-324-2BG020-30	SKT821
324	27X27	20X20	Thru-hole	BPW-324-2BG020-70	SKT821
328	27X27	20X20	Surface Mount	BPW-328-2BG020-30	SKT1327
328	27X27	20X20	Surface Mount	BPW-328-2BG020-30A	SKT1328
328	27X27	20X20	Thru-hole	BPW-328-2BG020-70	SKT1327
328	27X27	20X20	Thru-hole	BPW-328-2BG020-70A	SKT1328
329	30X30	23X23	Surface Mount	BPW-329-2BG023-30	SKT1160
329	30X30	23X23	Thru-hole	BPW-329-2BG023-70	SKT1160
336	27X27	20X20	Surface Mount	BPW-336-2BG020-30	SKT1000
336	27X27	20X20	Thru-hole	BPW-336-2BG020-70	SKT1000
348	27X27	20X20	Surface Mount	BPW-348-2BG020-30	SKT1001
348	27X27	20X20	Thru-hole	BPW-348-2BG020-70	SKT1001
352	35X35	26X26	Surface Mount	BPW-352-2BG026-30	SKT772
352	35X35	26X26	Thru-hole	BPW-352-2BG026-70	SKT772
356	27X27	20X20	Surface Mount	BPW-356-2BG020-30	SKT1176
356	27X27	20X20	Thru-hole	BPW-356-2BG020-70	SKT1176
356	35X35	26X26	Surface Mount	BPW-356-2BG026-30	SKT933

NOTE: Manufacturer's chip package drawing required with each order.

1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
356	35X35	26X26	Thru-hole	BPW-356-2BG026-70	SKT933
360	31X31	23X23	Surface Mount	BPW-360-2BG023-30	SKT759
360	31X31	23X23	Thru-hole	BPW-360-2BG023-70	SKT759
380	31X31	24X24	Surface Mount	BPW-380-2BG024-30	SKT1324
380	31X31	24X24	Thru-hole	BPW-380-2BG024-70	SKT1324
384	37.5X37.5	28X28	Thru-hole	BPW-384-2BG028-70	SKT1618
388	35X35	26X26	Surface Mount	BPW-388-2BG026-30	SKT817
388	35X35	26X26	Thru-hole	BPW-388-2BG026-70	SKT817
409	31X31	23X23	Surface Mount	BPW-409-2BG023-30	SKT1029
409	31X31	23X23	Thru-hole	BPW-409-2BG023-70	SKT1029
416	31X31	30X30	Surface Mount	BPW-416-2BG030-30	SKT1134
416	31X31	30X30	Thru-hole	BPW-416-2BG030-70	SKT1134
420	35X35	26X26	Surface Mount	BPW-420-2BG026-30	SKT1002
420	35X35	26X26	Thru-hole	BPW-420-2BG026-70	SKT1002
421	31X31	23X23	Surface Mount	BPW-421-2BG023-30	SKT951
421	31X31	23X23	Thru-hole	BPW-421-2BG023-70	SKT951
432	40X40	31X31	Surface Mount	BPW-432-2BG031-30	SKT934
432	40X40	31X31	Thru-hole	BPW-432-2BG031-70	SKT934
480	37.5X37.5	29X29	Surface Mount	BPW-480-2BG029-30	SKT947
480	37.5X37.5	29X29	Thru-hole	BPW-480-2BG029-70	SKT947
484	30X30	22X29	Surface Mount	BPW-484-2BG022-30	SKT1274
484	30X30	22X29	Thru-hole	BPW-484-2BG022-70	SKT1274
492	35X35	26X26	Surface Mount	BPW-492-2BG026-30	SKT1005
492	35X35	26X26	Thru-hole	BPW-492-2BG026-70	SKT1005
500	40X40	30X30	Surface Mount	BPW-500-2BG030-30	SKT869
500	40X40	30X30	Thru-hole	BPW-500-2BG030-70	SKT869
516	35X35	26X26	Surface Mount	BPW-516-2BG026-30	SKT1300
516	35X35	26X26	Thru-hole	BPW-516-2BG026-70	SKT1300
520	35X35	26X26	Surface Mount	BPW-520-2BG026-30	SKT1276
520	35X35	26X26	Thru-hole	BPW-520-2BG026-70	SKT1276
528	40X40	30X30	Surface Mount	BPW-528-2BG030-30	SKT1149
528	40X40	30X30	Thru-hole	BPW-528-2BG030-70	SKT1149
548	40X40	26X26	Surface Mount	BPW-548-2BG026-30	SKT1071
548	40X40	26X26	Thru-hole	BPW-548-2BG026-70	SKT1071
560	42.5X42.5	33X33	Surface Mount	BPW-560-2BG033-30	SKT781
560	42.5X42.5	33X33	Thru-hole	BPW-560-2BG033-70	SKT781
564	40X40	30X30	Surface Mount	BPW-564-2BG030-30	SKT1562
564	40X40	30X30	Thru-hole	BPW-564-2BG030-70	SKT1562
576	40X40	30X30	Surface Mount	BPW-576-2BG030-30	SKT1030
576	40X40	30X30	Thru-hole	BPW-576-2BG030-70	SKT1030
596	40X40	30X30	Surface Mount	BPW-596-2BG030-30	SKT1199
596	40X40	30X30	Thru-hole	BPW-596-2BG030-70	SKT1199
600	45X45	35X35	Surface Mount	BPW-600-2BG035-30	SKT806
600	45X45	35X35	Thru-hole	BPW-600-2BG035-70	SKT806
600	45X45	35X35	Surface Mount	BPW-600-2BG035B-30	SKT1553
600	45X45	35X35	Thru-hole	BPW-600-2BG035B-70	SKT1553
652	45X45	35X35	Surface Mount	BPW-652-2BG035-30	SKT949
652	45X45	35X35	Thru-hole	BPW-652-2BG035-70	SKT949
652	45X45	35X35	Surface Mount	BPW-652-2BG035B-30	SKT1351
652	45X45	35X35	Thru-hole	BPW-652-2BG035B-70	SKT1351
728	35X35	27X27	Surface Mount	BPW-728-2BG027-30	SKT1436
728	35X35	27X27	Thru-hole	BPW-728-2BG027-70	SKT1436
841	37.5X37.5	29X29	Surface Mount	BPW-841-2BG029-30	SKT1427
841	37.5X37.5	29X29	Thru-hole	BPW-841-2BG029-70	SKT1427
957	40X40	31X31	Surface Mount	BPW-957-2BG031-30	SKT1411
957	40X40	31X31	Thru-hole	BPW-957-2BG031-70	SKT1411
1444	40X40	38X38	Surface Mount	BPW-1444-2BG038-30	SKT1146
1444	40X40	38X38	Thru-hole	BPW-1444-2BG038-70	SKT1146

Call us (1-800-ADAPTER) or visit this link to request an immediate custom socket quotation:
Web Link: www.1800adapter.com/128

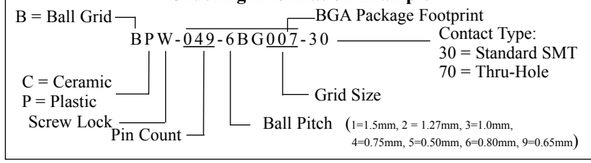
SOCKETS - BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz

SCREW LOCK SOCKETS

For a complete list of socket specifications, pricing and delivery information, please see:

Web Link:
www.1800adapter.com/048

Ordering Information Example



1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
560	42.5X42.5	33X33	Surface Mount	BPW-560-2BG033-30	SKT781
560	42.5X42.5	33X33	Thru-hole	BPW-560-2BG033-70	SKT781
564	40X40	30X30	Surface Mount	BPW-564-2BG030-30	SKT1562
564	40X40	30X30	Thru-hole	BPW-564-2BG030-70	SKT1562
576	40X40	30X30	Surface Mount	BPW-576-2BG030-30	SKT1030
576	40X40	30X30	Thru-hole	BPW-576-2BG030-70	SKT1030
596	40X40	30X30	Surface Mount	BPW-596-2BG030-30	SKT1199
596	40X40	30X30	Thru-hole	BPW-596-2BG030-70	SKT1199
600	45X45	35X35	Surface Mount	BPW-600-2BG035-30	SKT806
600	45X45	35X35	Thru-hole	BPW-600-2BG035-70	SKT806
600	45X45	35X35	Surface Mount	BPW-600-2BG035B-30	SKT1553
600	45X45	35X35	Thru-hole	BPW-600-2BG035B-70	SKT1553
652	45X45	35X35	Surface Mount	BPW-652-2BG035-30	SKT949
652	45X45	35X35	Thru-hole	BPW-652-2BG035-70	SKT949
652	45X45	35X35	Surface Mount	BPW-652-2BG035B-30	SKT1351
652	45X45	35X35	Thru-hole	BPW-652-2BG035B-70	SKT1351
728	35X35	27X27	Surface Mount	BPW-728-2BG027-30	SKT1436
728	35X35	27X27	Thru-hole	BPW-728-2BG027-70	SKT1436
841	37.5X37.5	29X29	Surface Mount	BPW-841-2BG029-30	SKT1427
841	37.5X37.5	29X29	Thru-hole	BPW-841-2BG029-70	SKT1427
957	40X40	31X31	Surface Mount	BPW-957-2BG031-30	SKT1411
957	40X40	31X31	Thru-hole	BPW-957-2BG031-70	SKT1411
1444	40X40	38X38	Surface Mount	BPW-1444-2BG038-30	SKT1146
1444	40X40	38X38	Thru-hole	BPW-1444-2BG038-70	SKT1146

1.00mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
64	10X13	8X8	Surface Mount	BUW-064-3BG008-30	SKT1214
64	10x13	8X8	Thru Hole	BPW-064-3BG008-70	SKT1214
74	12X12	11X11	Surface Mount	BPW-074-3BG011-30	SKT1480
80	13x10	10X10	Surface Mount	BUW-080-3BG010-30	SKT1470
100	12X12	10X10	Surface Mount	BPW-100-3BG010-30	SKT1118
100	12X12	10X10	Thru Hole	BPW-100-3BG010-70	SKT1118
120	40X40	10X16	Thru Hole	BPW-120-3BG10X16-70	SKT1528
160	15X15	14X14	Surface Mount	BPW-160-3BG014-30	SKT1065
160	15X15	14X14	Thru Hole	BPW-160-3BG014-70	SKT1065
169	15X15	13X13	Raised SM	BPW-169-3BG013-29	SKT1454
196	15X15	14X14	Surface Mount	BPW-196-3BG014-30	SKT1347
196	15X15	14X14	Thru Hole	BPW-196-3BG014-70	SKT1347
208	17X17	16X16	Surface Mount	BPW-208-3BG016-30	SKT993
208	17X17	16X16	Thru Hole	BPW-208-3BG016-70	SKT993
256	17X17	16X16	Surface Mount	BPW-256-3BG016-30	SKT844
256	17X17	16X16	Thru Hole	BPW-256-3BG016-70	SKT844
289	19X19	17X17	Surface Mount	BPW-289-3BG017-30	SKT1153
289	19X19	17X17	Thru Hole	BPW-289-3BG017-70	SK1153
321	19X19	18X18	Surface Mount	BPW-321-3BG018-30	SKT1456
324	19X19	18X18	Raised SM	BUW-324-3BG018-29	SKT1457
324	19X19	18X18	Surface Mount	BUW-324-3BG018-30	SKT1457
324	23X23	22X22	Surface Mount	BPW-324-3BG022-30	SKT1180
324	23X23	22X22	Thru Hole	BPW-324-3BG022-70	SKT1180
352	27X27	26X26	Surface Mount	BPW-352-3BG026-30	SKT1194
352	27X27	26X26	Thru Hole	BPW-352-3BG026-70	SKT1194
372	27X27	26X26	Surface Mount	BPW-388-3BG026-30	SKT1165
372	35X35	34X34	Surface Mount	BPW-372-3BG034-30	SKT1342
372	35X35	34X34	Thru Hole	BPW-372-3BG034-70	SKT1342
388	27X27	26X26	Thru Hole	BPW-388-3BG026-70	SKT1165
416	31X31	30X30	Surface Mount	BPW-416-3BG030-30	SKT1197
416	31X31	30X30	Thru Hole	BPW-416-3BG030-70	SKT1197
456	23X23	22X22	Surface Mount	BPW-456-3BG022-30	SKT1724
456	23X23	22X22	Thru Hole	BPW-456-3BG022-70	SKT1724

1.00mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
456	27X27	26X26	Surface Mount	BPW-456-3BG026-30	SKT1616
456	27X27	26X26	Surface Mount	BPW-456-3BG026-30H	SKT1621
456	27X27	26X26	Thru Hole	BPW-456-3BG026-70	SKT1616
480	35X35	34X34	Surface Mount	BPW-480-3BG034-30	SKT848
480	35X35	34X34	Thru Hole	BPW-480-3BG034-70	SKT848
484	23X23	22X22	Surface Mount	BPW-484-3BG022-30	SKT1128
484	23X23	22X22	Thru Hole	BPW-484-3BG022-70	SKT1128
484	27X27	26X26	Surface Mount	BPW-484-3BG026-30	SKT1124
484	27X27	26X26	Thru Hole	BPW-484-3BG026-70	SKT1124
603	31X31	30X30	Thru Hole	BPW-603-3BG030-70	SKT1600
648	35X35	33X33	Surface Mount	BPW-648-3BG033-30	SKT1293
648	35X35	33X33	Thru Hole	BPW-648-3BG033-70	SKT1293
672	27X27	26X26	Surface Mount	BPW-672-3BG026-30	SKT1129
672	27X27	26X26	Thru Hole	BPW-672-3BG026-70	SKT1129
676	27X27	26X26	Surface Mount	BPW-676-3BG026-30	SKT1201
676	27X27	26X26	Thru Hole	BPW-676-3BG026-70	SKT1201
680	35X35	34X34	Surface Mount	BPW-680-3BG034-30	SKT1723
680	35X35	34X34	Thru Hole	BPW-680-3BG034-70	SKT1723
680	40X40	39X39	Surface Mount	BPW-680-3BG039-30	SKT1426
696	40X40	38X38	Surface Mount	BPW-696-3BG038-30	SKT1420
788	35X35	34X34	Surface Mount	BPW-788-3BG034-30	SKT1498
788	35X35	34X34	Thru Hole	BPW-788-3BG034-70	SKT1498
792	14X14	39X39	Thru Hole	BPW-792-3BG039-70	SKT1200
792	40X40	39X39	Surface Mount	BPW-792-3BG039-30	SKT1200
896	31X31	30X30	Surface Mount	BPW-896-3BG030-30	SKT1601
896	31X31	30X30	Thru Hole	BPW-896-3BG030-70	SKT1601
900	31X31	30X30	Surface Mount	BPW-900-3BG030-30	SKT1561
900	31X31	30X30	Thru Hole	BPW-900-3BG030-70	SKT1561
956	40X40	38X38	Surface Mount	BPW-956-3BG038-30	SKT1379
1020	33X33	32X32	Surface Mount	BPW-1020-3BG032-30	SKT1223
1020	33X33	32X32	Thru Hole	BPW-1020-3BG032-70	SKT1223
1152	35X35	34X34	Surface Mount	BPW-1152-3BG034-30	SKT1312
1152	35X35	34X34	Thru Hole	BPW-1152-3BG034-70	SKT1312
1156	35X35	34X34	Surface Mount	BPW-1156-3BG034-30	SKT1218
1156	35X35	34X34	Thru Hole	BPW-1156-3BG034-70	SKT1218
1517	40X40	39X39	Surface Mount	BPW-1517-3BG039-30	SKT1313
1517	40X40	39X39	Thru Hole	BPW-1517-3BG039-70	SKT1313

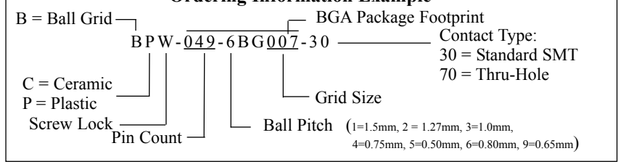
0.80mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
49	7X7	7X7	Surface Mount	BPW-049-6BG007-30	SKT1154
49	7X7	7X7	Thru Hole	BPW-049-6BG007-70	SKT1154
63	11X12	8X12	Surface Mount	BUW-063-6BG8X12-30	SKT1729
64	8X8	8X8	Thru Hole	BPW-064-6BG008-YY	SKT1746
74	8X8	9X9	Surface Mount	BPW-074-6BG009-30	SKT1150
74	8X8	9X9	Thru Hole	BPW-074-6BG009-70	SKT1150
81	8X8	9X9	Thru Hole	BPW-081-6BG009-70	SKT1258
81	8X8	9X9	Surface Mount	BUW-081-6BG009-30	SKT1258
100	10.1X10.1	10X10	Surface Mount	BPW-100-6BG010-30	SKT1126
100	10.1X10.1	10X10	Thru Hole	BPW-100-6BG010-70	SKT1126
100	11X11	10X10	Surface Mount	BPW-100-6BG011-30	SKT1271
100	11X11	11X11	Thru Hole	BPW-100-6BG011-70	SKT1271
100	13.54X13.54	12X12	Surface Mount	BPW-100-6BG012-30	SKT1187
100	13.54X13.54	12X12	Thru Hole	BPW-100-6BG012-70	SKT1187
121	10X10	11X11	Surface Mount	BPW-121-6BG011-30	SKT1277
121	10X10	11X11	Thru Hole	BPW-121-6BG011-70	SKT1277
132	15X15	14X14	Surface Mount	BPW-132-6BG014-30	SKT1349
132	15X15	14X14	Surface Mount	BPW-132-6BG014-30-3	SKT1366
132	15X15	14X14	Thru Hole	BPW-132-6BG014-70	SKT1349
144	11X11	12X12	Surface Mount	BPW-144-6BG012-30	SKT1181

NOTE: Manufacturer's chip package drawing required with each order.

BGA SMT & THRU-HOLE DEVELOPMENT UP TO 3 GHz - SOCKETS

Ordering Information Example



SCREW LOCK SOCKETS

For a complete list of socket specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/048

0.80mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
144	12X12	13X13	Surface Mount	BPW-144-6BG013-30	SKT990
144	12X12	13X13	Thru Hole	BPW-144-6BG013-70	SKT990
144	13X13	13X13	Thru Hole	BPW-144-6BG013B-70	SKT1311
160	12X12	14X14	Thru Hole	BPW-160-6BG014-70	SKT1311
168	12.1X12.1	14X14	Surface Mount	BPW-168-6BG014-30	SKT1278
168	12.1X12.1	14X14	Thru Hole	BPW-168-6BG014-70	SKT1278
168	14X14	12X12	Thru Hole	BUW-168-6BG014-YY	SKT1747
180	12X12	14X14	Surface Mount	BPW-180-6BG014-30	SKT1386
180	12X12	14X14	Thru Hole	BPW-180-6BG014-70	SKT1386
192	16X16	16X16	Surface Mount	BPW-192-6BG016-30	SKT1279
192	16X16	16X16	Thru Hole	BPW-192-6BG016-70	SKT1279
196	12X12	14X14	Surface Mount	BPW-196-6BG014-30	SKT991
196	12X12	14X14	Thru Hole	BPW-196-6BG014-70	SKT991
208	15X15	17X17	Surface Mount	BPW-208-6BG017-30	SKT995
208	15X15	17X17	Thru Hole	BPW-208-6BG017-70	SKT995
228	12X12	22X22	Thru Hole	BPW-228-5BG022-YY	SKT1760
249	16X16	17X17	Surface Mount	BPW-249-6BG017-30	SKT1272
249	16X16	17X17	Thru Hole	BPW-249-6BG017-70	SKT1272
256	15X15	17X17	Surface Mount	BPW-256-6BG017-30	SKT1511
256	15X15	17X17	Thru Hole	BPW-256-6BG017-70	SKT1511
257	16X16	19X19	Surface Mount	BPW-257-6BG019-30	SKT1560
280	16X16	19X19	Surface Mount	BPW-280-6BG019-30	SKT1280
280	16X16	19X19	Thru Hole	BPW-280-6BG019-70	SKT1280

0.75mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
46	7.00X7.30	6X8	Thru Hole	BUW-046-4BG6X8-YY	SKT1761

0.50mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
144		13X13	Surface Mount	BPW-144-8BG013B-30	SKT1713

0.40mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
96	6x6	14X14	Surface Mount	BPW-096-5BG014-30	SKT1713

NOTE: Manufacturer's chip package drawing required with each order.

EMULATION TECHNOLOGY RECOMMENDS:

ET's ultra-modern, high tech design torque limiting screwdriver ensures correct tightening of retention frames used with our BGA Screw Lock Sockets, BGA Socket Emulator Adapter and Bluetooth 104 001 Socket & Adapter Systems. (Part # ET-TORQ-7CN)

- Safely tighten retention socket frames
- Safeguard expensive devices
- Screwdriver preset to 0.7 oz. in.

For pricing and delivery information see:

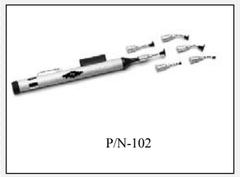
Web Link: www.1800adapter.com/118

EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling systems.

Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.



- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

These ESD-safe units feature a silver aluminum body and non-marking static dissipative black rubber vacuum cups. The pens' vacuum is generated by pressing and releasing the vacuum push button.

For a complete list of vacuum specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/086

EMULATION TECHNOLOGY RECOMMENDS:

Try our **BGA Solder Stencils**

Residue-free adhesive backing means these stencils are self-sticking …so you can say goodbye to tape and fixturing forever!

Web Link: www.1800adapter.com/019

Try our **SolderQuik™ BGA Preform**

Allows for easy and inexpensive testing of new BGA package designs. Use it for testing, rework and prototyping BGA packages.

Web Link: www.1800adapter.com/043

For a complete list of BGA socket specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/048

SOCKETS - BGA SMT AND THRU-HOLE KNOB LOCK UP TO 3 GHz

KNOB LOCK SOCKETS

ET's zero insertion force sockets provide quick, accurate and safe closure for user's DUT. Simply place the chip into the socket, which is automatically guided into the correct position, and secure by hand with the knob lock.

FEATURES & BENEFITS

- Provides for quick insertion and extraction of packages during the chip screening process
- Available for ceramic, plastic BGA and land grid array (LGA)
- Knob Lock Socket guarantees contact continuity
- Knob Lock compression type socket avoids soldering socket to PCB
- Easily exchange and replace chips with no desoldering required
- Utilizes solder paste or solder flux, industry standard rework stations and a two-step reflow process
- Rapid new design capabilities
- Customs available for Column Grid Arrays

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

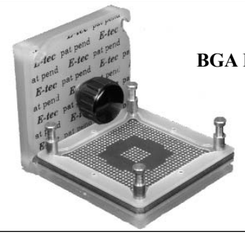
BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

GRID SIZES

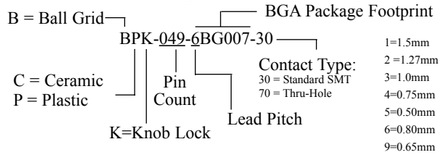
- 8X8 through 40X40

NOTE: Manufacturer's chip package drawing required with each order.



BGA Knob Lock Socket

Ordering Information Example

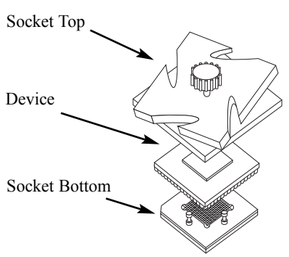


Electrical Specifications	
Bandwidth	Up to 3 GHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Breakdown Voltage at 60Hz	500V min.
Mechanical Specifications	
Contact Life	10,000 cycles minimum
Retention System Life	10,000 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.
Max Torque for Retention Screws	7cN per meter, or 10 oz.per inch
Materials	
Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu
Operating Temperature	
Temperature Range	-55 degrees C to +130 degrees C
Max Temperature Duration	220 degrees C for 10 sec.

1.27mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
352	31.75x31.75	26X26	Surface Mount	BPK-352-2BG026-30	SKT1133
388	35x35	26X26	Surface Mount	BPK-388-2BG026-30	SKT1716
409	31x31	23X23	Surface Mount	BPK-409-2BG023-30	SKT1587
432	31x31	31X31	Thru Hole	BPK-432-2BG031-70	SKT1778
456	35x35	26X26	Surface Mount	BPK-456-2BG026-30	SKT1732
456	35x35	26X26	Thru Hole	BPK-456-2BG026-70	SKT1732
474	35x35	25X25	Surface Mount	BCK-474-2BG025-30	SKT1779
474	35x35	25X25	Thru Hole	BCK-474-2BG025-70	SKT1780
675	27X27	26X26	Surface Mount	BPK-675-3BG026-30	SKT1782

Contact force is only generated when closing the chip retention feature, which then applies force of less than 40 grams (1.4 oz.) per contact which protects your device from damage.



Try our **BGA Solder Stencils**

Residue-free adhesive backing means these stencils are self-sticking …so you can say goodbye to tape and fixturing forever!

Web Link: www.1800adapter.com/019

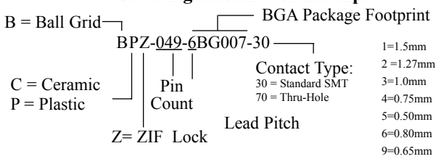
For a complete list of Knob Lock Socket specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/101

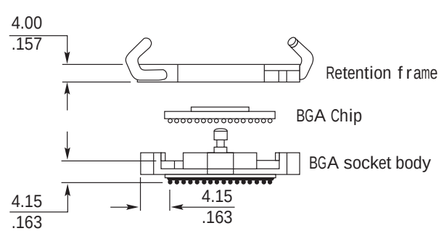
BGA SMT AND THRU-HOLE ZIF LOCK UP TO 3 GHz - SOCKETS

BGA ZIF Lock Socket

Ordering Information Example



Electrical Specifications	
Bandwidth	Up to 3 GHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Breakdown Voltage at 60Hz	500V min.
Mechanical Specifications	
Contact Life	10,000 cycles minimum
Retention System Life	10,000 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.
Materials	
Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu
Operating Temperature	
Temperature Range	-55 degrees C to +130 degrees C
Max Temperature Duration	220 degrees C for 10 sec.



NOTE: Manufacturer's chip package drawing required with each order.

ZIF LOCK SOCKETS

With the zero insertion force socket (ZIF), users simply place the DUT into the socket which is automatically guided into the correct position. Contact force is only generated when closing the chip retention feature, which then applies force of less than 40 grams (1.4 oz.) per contact which protects your device from damage.

FEATURES & BENEFITS

- Available for ceramic, plastic BGA and land grid array (LGA)
- ZIF Lock Socket guarantees contact continuity even under the highest shock and vibration
- Avoid having to solder socket to PCB
- Easily exchange and replace chips with no desoldering required
- Utilizes solder paste or solder flux and industry standard rework stations
- Prevents time-consuming board revisions
- Rapid new design applications
- Customs available upon request

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

BALL PITCH

- BGA (1.27mm)

GRID SIZES

- 16X16 to 26X26 (only)

1.27mm Pitch Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	Socket Style	ET Part #	Drawing #
233		17X17	Thru Hole	BPZ-233-2BG017-70	SKT971
256		20X20	Surface Mount	BPZ-256-2BG020-30	SKT941
256		20X20	Thru Hole	BPZ-256-2BG020-70	SKT940
272		20X20	Surface Mount	BPZ-256-2BG020-70	SKT938
272		20X20	Surface Mount	BPZ-272-2BG020-30	SKT1074
316	27x27	20X20	Thru Hole	BPZ-272-2BG020-70	SKT1463
352		26X26	Surface Mount	BPZ-316-2BG020-30	SKT1322
352		26X26	Thru Hole	BPZ-352-2BG026-70	SKT1322
352	35x35	26X26	Thru Hole	BPZ-352-2BG026L-70	SKT1466
357		19X19	Surface Mount	BPZ-357-2BG019-30	SKT1032
357		19X19	Thru Hole	BPZ-357-2BG019-70	SKT1032
372	27x27	20X20	Surface Mount	BPZ-372-2BG020-30	SKT1432
388		26X26	Surface Mount	BPZ-388-2BG026-30	SKT1033
388		26X26	Thru Hole	BPZ-388-2BG026-70	SKT1033
456		26X26	Surface Mount	BPZ-456-2BG026-30	SKT1777
568	35x35	26X26	Surface Mount	BPZ-568-2BG026-30	SKT1433

For a complete list of ZIF Lock Socket specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/102

SOCKETS - BGA CUSTOM HIGH SPEED 4.6 GHz to 14 GHz

COMPRESSION SOCKETS, POGO-PIN BASED

ET's custom high speed test sockets are available for any package on the market. The Clam Shell style with a floating package nest and floating lid ensures reliability. The sockets can also be designed to fit an automated handler or BGA solder footprint. These sockets are spring probe based and exhibit very high mechanical and electrical performance. We have ultra high performance spring probes available that will reach bandwidths of 4.6 to 14 GHz.

FEATURES & BENEFITS

- Precision micro-probe contacts display ideal electrical characteristics such as low inductance, resistance, and capacitance
- Custom designed and manufactured for any standard or non-standard package, for which an off the shelf socket does not exist, or the existing socket is not suitable for the user specifications
- Mount surface on chip (SOC) test fixtures using double-ended pogo pin technology
- Sockets are designed for long life of up to 5,000 insertions
- All socket contacts are individually replaceable in field, making repairs quick, easy and cost-effective
- Can be repopulated to accommodate different footprints

APPLICATIONS

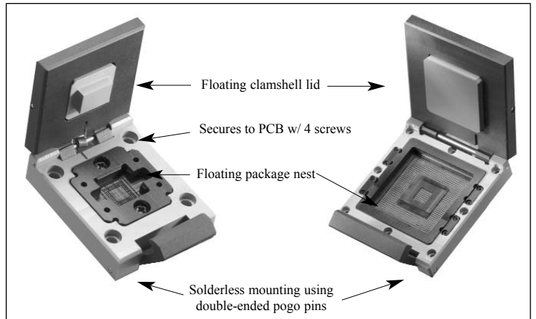
- Development
- Debug
  - Hand Test
- Programming / Test
  - Qualification
  - Production

BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

GRID SIZES

- 8X8 through 40X40



Ordering Information Example

Socket Type — Internal Use
Product Code — S-BGA-20-292-A
Grid Size — Pin Count

Electrical Specifications	
Bandwidth	4.6Ghz to 14GHz depending on contact
Contact Resistance	<50m Ohms
Insulation Resitance 500V DC	>1000m Ohms
Current Rating	varies from 1A to 2 ~3A
Mechanical Specifications	
Individual Contact Force	Standard 18g/contact, can be changed
Contact Life	500,000 insertions
Heat Sink	Can be customized into the lid
Materials	
Insulator	Torlon 4203, Ultem 1000
Contact	Spring probes
Operating Temperature	
Temperature Range	Room temp to 150 degrees C

Information Required for Ordering:

- Package outline drawing needed, including pin counts, ball pitch & grid layout

Sample Part #: S-BGA-16-292-A

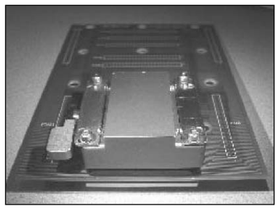
NOTE: Manufacturer's chip package drawing required with each order.

Looking for a custom Adapter or PCB?
We also design custom adapters & PCBs for your unique test application. Info:
Web Link: www.1800adapter.com/forms

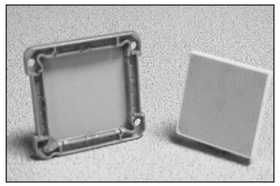
Call us (1-800-ADAPTER) or check out this link to request an immediate customsocket quotation:
Web Link: www.1800adapter.com/050

BGA HIGH SPEED UP TO 40 GHz - SOCKETS

NEW!



New technology is driving the need for high performance test sockets.



ET's 40 GHz High Performance Socket is designed for the high speed testing environment.

Ordering Information Example

CON=Contactor or Pin Count — HSP-900-3BG031-PF — Internal Use

HSP = High Speed Socket; 900 = Package Code; 3 = Lead Pitch; BG031 = Grid Size

Material Electrical Specifications	
Bandwidth	40 GHz min.
Inductance	0.0232 pF
Contact Resistance	< 25m ohms @ < 40 grams/contact
Insulation Resitance 500V DC	1000m ohm @ 1.27mm pitch
Signal to Ground Resistance	Zo = 55 ohms
Insulation Resistence 500V DC	1000m ohm @ 1.00mm pitch
Votage Breakdown (DWV)	1000V min. @ 1.00mm pitch
Current Rating	2.5A/pin @ 1.00mm pitch
Material Reliability Specifications	
Individual Contact Force	40-50 grams/contact
Durability	500,000 minimum
Materials	
Contact	Anisotropically conductive polymer fabric with multiple conductive elements
Operating Temperature	
Temperature Range	-55 degrees C to +150 degrees C

Information Required for Ordering:

- Package outline drawing needed, including pin counts, ball pitch & grid layout

Sample Part #: S-BGA-16-292-A

NOTE: Manufacturer's chip package drawing required with each order.

CUSTOM 40 GHz ZIF SOCKETS

ET's high performance sockets allow the user to test, debug or program any BGA or MicroBGA accommodating lead pitches as small as 0.40mm and as large as 5.00mm. These sockets are designed for outstanding electrical performance at high speeds.

FEATURES & BENEFITS

- Anisotropically conductive polymer fabric with multiple conductive elements per interface for outstanding electrical performance
- Electrical performance tested to 40 GHz
- Self-registering, compliant material eliminates a whole level of tolerance stack-up and makes implementation easy
- Reduces costs/labor; no need for precision alignment of contacts
- Robust, durable interface material that is extremely stable
- Ideal for high-density, high reliability interconnections with capabilities to 0.1mm interfaces
- Excellent alternative for testing fine-pitch chip packages and bare boards with surface-mount pads
- Allows for non-planar interconnections; easily cut or molded to accommodate varying dimensional sizes and geometric configurations

APPLICATIONS

- High Speed Test and Development
- High Speed Test & Burn-in
- Production Sockets
- Board to Board Connectors
- Cable to Board Connectors

BALL PITCH

- BGA (1.27mm through 5.0mm)
- mBGA (1.50mm, 1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm, 0.40mm)

Looking for a custom PCB? Request an immediate custom quotation online for a prompt response:
Web Link: www.1800adapter.com/forms

For a complete list of High Performance Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/133

SOCKETS - BGA (BPE)BASE PACKAGE EMULATORS

LOW COST SOCKET SYSTEM

ET's Base Package Emulators (BPE) are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These BPEs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These BPE sockets are an integral part of ET's BGA Socketing System.

FEATURES & BENEFITS

- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Customs available upon request

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

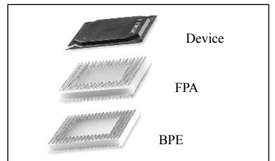
BALL PITCH

- 1.27mm, 1.00mm, 0.80mm

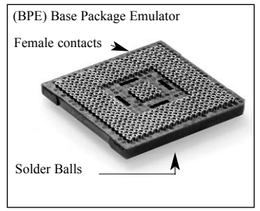
GRID SIZES

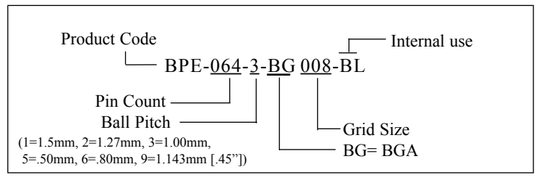
- 6X8 through 44X44

NOTE: Manufacturer's chip package drawing required with each order.

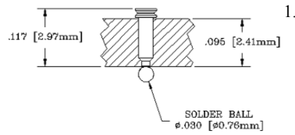


ET BGA Socket System





Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contacts	Beryllium Copper; Copper Alloy (C17200), ASTTM-B-194
Plating	Gold over nickel
Body Material	Molded or FR4
Solder Ball	63Sn/37Pb, Eutectic, 183 degrees C
Temperature Life	
U.L. Rated 94V-0	-60 degrees C to 260 degrees C



1.27mm Lead Pitch

BPE

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	0.80	6X8	BPE-0048-6BG6X8-BL	F1082
49	0.80	7X7	BPE-049-6BG007-BL	F1098
64	1.00	8X8	BPE-0064-3BG008-BL	F6681
66	0.80	8X12	BPE-066-6BG8X12-BL	F6852
80	0.80	10X10	BPE-080-6BG010-BL	F6723
100	0.80	10X10	BPE-0100-6BG010-BL	F6414
100	0.80	11X11	BPE-0100-6BG011-BL	F6366
100	1.00	10X10	BPE-0100-3BG010-BL	F6055
108	1.00	12X12	BPE-0108-3BG012-BL	F6870
119	1.27	7X17	BPE-0119-2BG7X17-BL	F6369
121	0.80	11X11	BPE-121-6BG011-BL	F6871
128	0.80	12X12	BPE-128-6BG012-BL	F6872
144	0.80	12X12	BPE-0144-6BG012-BL	F6808
144	0.80	13X13	BPE-0144-6BG013-BL	F5935
144	1.00	12X12	BPE-0144-3BG012-BL	F3483
156	1.00	14X14	BPE-0156-3BG014-BL	F5367
160	0.80	14X14	BPE-0160-6BG014-BL	F1353
160	1.00	14X14	BPE-0160-3BG014-BL	F5557
176	0.80	15X15	BPE-0176-6BG015-BL	F6626
180	0.80	14X14	BPE-0180-6BG014-BL	SKT1394
196	1.00	14X14	BPE-0196-3BG014-BL	F5383
196	1.00	16X16	BPE-0196-3BG016-BL	F5982
208	0.80	17X17	BPE-0208-6BG017-BL	F5695
208	1.00	16X16	BPE-0208-3BG016-BL	F5983
208	1.27	17X17	BPE-0208-2BG017-BL	F6370

Emulation Technology Recommends:

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Try our **Flat Pin Array (FPA) Sockets...**
to solve your BGA probing needs. Our FPA sockets are an integral part of our BGA Socket & Probing System
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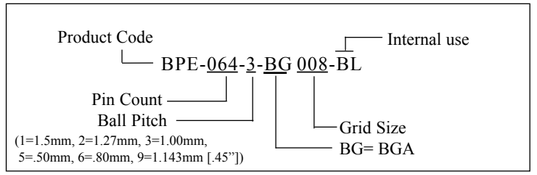
Try our **Chip Quik® SMD Removal Kit**
Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.
Web Link: www.1800adapter.com/046

For a complete list of BPE Ssocket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/123

BGA (BPE)BASE PACKAGE EMULATORS - SOCKETS



For a complete list of BPE Socket specifications, pricing and delivery information,please see:

Web Link:
www.1800adapter.com/123

BPE (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
217	1.27	17X17	BPE-0217-2BG017-BL	F6371
225	1.27	15X15	BPE-0225-2BG015-BL	F6373
225	1.50	15X15	BPE-0225-1BG015-BL	F6372
233	1.27	17X17	BPE-0233-2BG017-BL	F6374
233	1.27	17X17	BPE-0233-2BG017-BL-1	F6862
233	1.27	17X17	BPE-0233-2BG017-BL-HL	F6817
241	1.27	17X17	BPE-0241-2BG017-BL	F6375
244	1.27	16X16	BPE-0244-2BG016-BL	F6873
255	1.27	16X16	BPE-0255-2BG016-BL	F6376
255	1.27	21X21	BPE-0255-2BG021-BL	F4472
256	0.80	20X20	BPE-0256-6BG020-BL	F6744
256	1.00	16X16	BPE-0256-3BG016-BL	F6060
256	1.27	16X16	BPE-0256-2BG016-BL	F6377
256	1.27	20X20	BPE-0256-2BG020-BL	F6063
256	1.27	23X23	BPE-0256-2BG023-BL	F6378
259	1.00	18X18	BPE-0259-3BG018-BL	F6754
272	1.27	20X20	BPE-0272-2BG020-BL	F3487
272	1.27	21X21	BPE-0272-2BG021-BL	F6379
280	0.80	19X19	BPE-0280-6BG019-BL	F6247
281	0.80	19X19	BPE-0281-6BG019-BL	F5984
288	0.80	19X19	BPE-0288-6BG019-BL	F6820
292	1.27	20X20	BPE-0292-2BG020-BL	F6381
300	1.00	20X20	BPE-0300-3BG020-BL	F6874
304	1.27	23X23	BPE-0304-2BG023-BL	F6382
304	1.27	16X19	BPE-0304-2BG16X19-BL	F4472
313	1.27	25X25	BPE-0313-2BG025-BL	F6952
316	1.27	20X20	BPE-0316-2BG020-BL	F6386
316	1.27	24X24	BPE-0320-2BG024-BL	F6387
324	1.00	18X18	BPE-0324-3BG018-BL	F6066
324	1.00	22X22	BPE-0324-3BG022-BL	F5985
324	1.27	20X20	BPE-0324-2BG020-BL	F6388
329	1.27	23X23	BPE-0329-2BG023-BL	F6875
342	1.27	24X24	BPE-0342-2BG024-BL	F4472
352	1.27	26X26	BPE-0352-2BG026-BL	F6084
352	1.27	31X31	BPE-0352-2BG031-BL	F4472
356	1.27	26X26	BPE-0356-2BG026-BL	F6069
357	1.27	19X19	BPE-0357-2BG019-BL	F6953
360	1.27	19X19	BPE-0360-2BG019-BL	F6390
360	1.27	23X23	BPE-0360-2BG023-BL	F6391
361	1.27	19X19	BPE-0361-2BG019-BL	F6392
361	1.27	25X25	BPE-0361-2BG025-BL	F4472
368	1.27	26X26	BPE-0368-2BG026-BL	F6393
372	1.27	20X20	BPE-0372-2BG020-BL	F6394

NOTE: Manufacturer's chip package drawing required with each order.

BPE (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
379	1.27	24X24	BPE-0379-2BG024-BL	F4472
387	1.27	26X26	BPE-0387-2BG026-BL	F6395
388	1.00	26X26	BPE-0388-3BG026-BL	F6397
388	1.27	26X26	BPE-0388-2BG026-BL	F3492
400	1.27	20X20	BPE-0400-2BG020-BL	F6396
413	1.00	23X23	BPE-0413-3BG023-BL	F6157
420	1.27	26X26	BPE-0420-2BG026-BL	F6398
421	1.27	23X23	BPE-0421-2BG023-BL	F6399
432	1.27	15X15	BPE-0432-2BG015-BL	F4472
432	1.27	24X24	BPE-0432-2BG024-BL	F6401
432	1.27	31X31	BPE-0432-2BG031-BL	F6155
452	1.27	26X26	BPE-0452-2BG026-BL	F6571
456	1.00	22X22	BPE-0456-3BG023-BL	F6826
456	1.00	26X26	BPE-0456-3BG026-BL	F6876
456	1.27	26X26	BPE-0456-2BG026-BL	F6249
460	1.27	28X28	BPE-0460-2BG028-BL	F6877
472	1.27	22X22	BPE-0472-2BG022-BL	F6402
474	1.27	19X25	BPE-0474-2BG19X25-BL	F6878
479	1.27	29X29	BPE-0479-2BG029-BL	F4472
480	1.27	26X26	BPE-0480-2BG026-BL	F6403
480	1.27	29X29	BPE-0480-2BG029-BL	F6404
483	1.27	22X22	BPE-0483-2BG022-BL	F6368
484	1.00	22X22	BPE-0484-3BG022-BL	F6072
484	1.00	26X26	BPE-0484-3BG026-BL	F6405
492	1.27	26X26	BPE-0492-2BG026-BL	F6049
500	1.27	30X30	BPE-0500-2BG030-BL	F6406
503	1.27	29X29	BPE-0503-2BG029-BL	F5513
505	1.27	26X26	BPE-0505-2BG026-BL	F5521
510	1.27	26X26	BPE-0510-2BG026-BL	F6407
516	1.27	26X26	BPE-0516-2BG026-BL	F6248
520	1.27	26X26	BPE-0520-2BG026-BL	F6954
528	1.27	30X30	BPE-0528-2BG030-BL	F6143
552	1.00	24X24	BPE-0552-3BG024-HL	F6672
560	1.27	33X33	BPE-0560-2BG033-BL	F6408
568	1.27	26X26	BPE-0568-2BG026-BL	F6673
575	1.27	24X24	BPE-0575-2BG024-BL	F6415
576	1.27	30X30	BPE-0576-2BG030-BL	F6409
596	1.27	30X30	BPE-0596-2BG030-BL	F6410
600	1.27	31X31	BPE-0600-2BG031-BL	F6879
600	1.27	35X35	BPE-0600-2BG035-BL	F6075
600	1.27	35X35	BPE-0600-2BG035-HL	F6631
608	1.00	30X30	BPE-0608-3BG030-BL	F6745
625	1.27	25X25	BPE-0625-2BG025-BL	F6412
652	1.27	35X35	BPE-0652-2BG035-BL	F6078
655	1.27	34X34	BPE-0655-2BG034-BL	F6413
672	1.00	26X26	BPE-0672-3BG026-BL	F6081
676	1.00	26X26	BPE-0676-3BG026-BL	F6880
680	1.00	39X39	BPE-0680-3BG039-BL	F5863
724	1.27	27X27	BPE-0724-2BG027-BL	F6194
728	1.27	27X27	BPE-0728-2BG027-BL	F6194
729	1.27	27X27	BPE-0729-2BG027-BL	F6881
783	1.00	28X28	BPE-0783-3BG028-BL	F6835
788	1.00	34X34	BPE-0788-3BG034-HL	F6882
820	1.00	34X34	BPE-0820-3BG034-BL	F6883
869	1.00	9X10	BPE-0086-9BG9X10-BL	F1033
896	1.00	30X30	BPE-0896-3BG030-BL	F6884
957	1.27	31X31	BPE-0957-2BG031-BL	F6416
1020	1.00	32X32	BPE-1020-3BG032-HL	F6885
1152	1.00	34X34	BPE-1152-3BG034-BL	F6886
1156	1.00	34X34	BPE-1156-3BG034-BL	F6227
1156	1.00	34X34	BPE-1156-3BG034-B1	F6887
1497	1.00	39X39	BPE-1497-3BG039-HL	F6888
1936	1.00	44X44	BPE-1936-3BG044-BL	F6858

Emulation Technology Recommends:

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to solve your BGA probing needs. Our FPA sockets are an integral part of our BGA Socket & Probing System
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Try our **HiLo Flexible Interconnect System**
New connector design incorporates the highs, the lows, and the application flexibility your BGA design demands.
Web Link: www.1800adapter.com/124

For a complete list of BPE Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/123

SOCKETS - BGA (FPA) FLAT PIN ARRAY

ET's Flat Pin Array (FPA) sockets are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These FPAs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These FPAs sockets are an integral part of ET's BGA Socketing System.

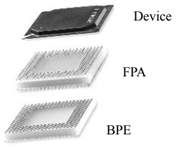
FEATURES & BENEFITS
- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Solder your BGA chip to the FPA for multiple insertions into a surface mount BPE
- Customs available upon request

APPLICATIONS
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

BALL PITCH
- 1.27mm, 1.00mm, 0.80mm

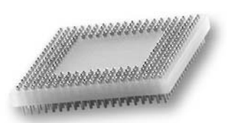
GRID SIZES
- 6X8 through 44X44

NOTE: Manufacturer's chip package drawing required with each order.



ET BGA Socket System

(FPA) Flat Pin Array with solder balls

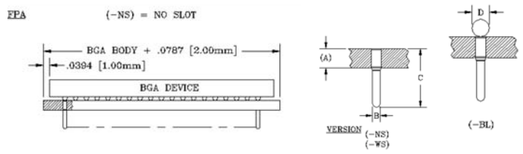


(FPA) Flat Pin Array

Ordering Information Example

Product Code: FPA-304-2BG16X19-NS
- 304 — Pin Count
- 2 — Ball Pitch (1=1.5mm, 2=1.27mm, 3=1.00mm, 5=.50mm, 6=.80mm, 9=1.143mm [.45"])
- BG=BGA
- 16X19 — Grid Size
- NS = No Slot; WS= With Slot)
- (BL = SMT Balls on Top Side

Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contacts	Beryllium Copper; Copper Alloy (C17200), ASTTM-B-194
Plating	G-Gold over nickel
Body Material	M-Molded PPS (high-temp, glass-filled thermoplastic)
Solder Ball	63Sn/37Pb, Eutectic, 183 degrees C
Temperature Life	
U.L. Rated 94V-0	-60 degrees C to 260 degrees C



FPA

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	0.80	6X8	FPA-048-6BG6X8-NS	F4292
49	0.80	7X7	FPA-049-6BG007-BL	F6098
49	0.80	7X7	FPA-049-6BG007-NS	F6099
64	1.00	8X8	FPA-064-3-008-BL	F6889
64	1.00	8X8	FPA-064-3BG008-NS	F6680
66	0.80	8X12	FPA-066-6BG8X12-BL	F6721
66	0.80	8X12	FPA-066-6BG8X12-NS	F6890
80	0.80	10X10	FPA-080-6BG010-BL	F6722
100	0.80	10X10	FPA-100-6BG010-BL	F6891
100	0.80	10X10	FPA-100-6BG010-NS	F6079
100	1.00	10X10	FPA-100-3BG010-BL	F6056
100	1.00	10X10	FPA-100-3BG010-WS	F6057
121	0.80	11X11	FPA-121-6BG011-NS	F6892
128	0.80	12X12	FPA-128-6BG012-NS	F6893
144	0.80	13X13	FPA-144-6BG013-BL	F5988
144	0.80	12X12	FPA-144-6BG012-NS	F6867
144	1.00	12X12	FPA-144-3BG012-BL	F6070
144	1.00	12X12	FPA-144-3BG012-WS	F3484
156	1.00	14X14	FPA-156-3BG014-BL	F5989
160	0.80	14X14	FPA-160-6BG014-BL	F6972
160	1.00	14X14	FPA-160-3BG014-BL	F5821
160	1.00	14X14	FPA-160-3BG014-NS	F5569

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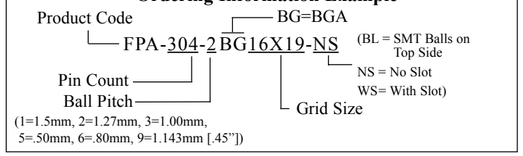
Try our **HiLo Flexible Interconnect System**
New connector design incorporates the highs, the lows, and the application flexibility your BGA design demands.
Web Link: www.1800adapter.com/124

For a complete list of FPA Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/122

BGA (FPA) FLAT PIN ARRAY - SOCKETS

Ordering Information Example



For a complete list of FPA Socket specifictions, pricing and delivery information, please see:

Web Link: www.1800adapter.com/122

FPA (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
176	0.80	15X15	FPA-176-6BG015-BL	F66F0
176	0.80	15X15	FPA-176-6BG015-NS	F6627
180	0.80	14X14	FPA-180-6BG014-BL	F6894
180	0.80	14X14	FPA-180-6BG014-NS	F6895
196	1.00	14X14	FPA-196-3BG014-BL	F5990
196	1.00	16X16	FPA-196-3BG016-BL	F5822
196	1.00	14X14	FPA-196-3BG014-NS	F5F41
196	1.00	14X14	FPA-196-3BG014-WS	F5245
208	0.80	17X17	FPA-208-6BG017-BL	F6689
208	1.00	16X16	FPA-208-3BG016-BL	F5823
208	1.00	16X16	FPA-208-3BG016-WS	F6071
225	1.27	15X15	FPA-225-2BG015-NS	F4471
225	1.27	15X15	FPA-225-2BG015-WS	F4471
225	1.50	15X15	FPA-225-1BG015-BL	F6058
225	1.50	15X15	FPA-225-1BG015-WS	F6059
233	1.27	17X17	FPA-233-2BG017-BL	F6955
233	1.27	17X17	FPA-233-2BG017-HL	F6896
233	1.27	17X17	FPA-233-2BG017-WS	F6956
233	1.27	17X17	FPA-233-2BG017-BL-1	F6869
241	1.27	17X17	FPA-241-2BG023-NS	F4471
256	0.80	20X20	FPA-256-6BG020-NS	F6742
256	1.00	16X16	FPA-256-3BG016-BL	F5825
256	1.00	16X16	FPA-256-3BG016-NS	F6061
256	1.27	20X20	FPA-256-2BG020-BL	F6065
256	1.27	16X16	FPA-256-2BG016-NS	F4471
256	1.27	16X16	FPA-256-2BG016-WS	F6602
256	1.27	20X20	FPA-256-2BG020-NS	F4471
256	1.27	20X20	FPA-256-2BG020-WS	F6065
272	1.27	20X20	FPA-272-2BG020-BL	F3488
272	1.27	20X20	FPA-272-2BG020-NS	F4471
272	1.27	20X20	FPA-272-2BG020-WS	F3490
280	0.80	19X19	FPA-280-6BG019-BL	F6250
280	0.80	19X19	FPA-280-6BG019-NS	F6250
281	0.80	19X19	FPA-281-6BG019-BL	F6212
281	0.80	19X19	FPA-281-6BG019-NS	F6897
292	1.27	20X20	FPA-292-2BG020-BL	F6789
292	1.27	20X20	FPA-292-2BG020-NS	F6790
304	1.27	23X23	FPA-304-2BG023-BL	F6970
304	1.27	29X29	FPA-304-2BG029-BL	F6971
304	1.27	23X23	FPA-304-2BG023-NS	F6898
304	1.27	16X19	FPA-304-2BG16X19-NS	F4471
304	1.27	16X19	FPA-304-2BG16X19-WS	F4471
313	1.27	25X25	FPA-313-2BG025-NS	F6899
320	1.27	24X24	FPA-320-2BG024-BL	F607F
320	1.27	24X24	FPA-320-2BG024-WS	F6900
324	1.00	18X18	FPA-324-3BG018-BL	F6067
324	1.00	22X22	FPA-324-3BG022-BL	F5993
324	1.00	18X18	FPA-324-3BG018-WS	F6068
324	1.00	22X22	FPA-324-3BG022-WS	F4471
324	1.27	20X20	FPA-324-2BG020-WS	F4471
329	1.27	23X23	FPA-329-2BG023-NS	F6694
352	1.27	26X26	FPA-352-2BG026-BL	F6008
352	1.27	26X26	FPA-352-2BG026-NS	F4471
352	1.27	26X26	FPA-352-2BG026-WS	F6085
356	1.27	26X26	FPA-356-2BG026-BL	F6901
356	1.27	26X26	FPA-356-2BG026-NS	F4471
356	1.27	26X26	FPA-356-2BG026-WS	F6071
357	1.27	19X19	FPA-357-2BG019-NS	F4471
357	1.27	19X19	FPA-357-2BG019-WS	F6581
361	1.27	19X19	FPA-361-2BG019-NS	F6512
372	1.27	20X20	FPA-372-2BG020-NS	F4471
388	1.00	26X26	FPA-388-3BG026-BL	F6809
388	1.00	26X26	FPA-388-3BG026-NS	F648F

NOTE: Manufacturer's chip package drawing required with each order.

FPA (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
388	1.00	26X26	FPA-388-3BG026-WS	F6482
388	1.00	26X26	FPA-388-3BG026-ISI	F6902
388	1.27	26X26	FPA-388-2BG026-BL	F3494
388	1.27	26X26	FPA-388-2BG026-NS	F6577
388	1.27	26X26	FPA-388-2BG026-WS	F6046
400	1.27	20X20	FPA-400-2BG020-NS	F4471
405	1.27	31X31	FPA-405-2BG031X25-BL	F6903
416	1.00	26X26	FPA-416-3BG026-WS	F6353
421	1.27	21X21	FPA-421-2BG021-NS	F6904
421	1.27	23X23	FPA-421-2BG023-NS	F4471
432	1.27	31X31	FPA-432-2BG031-BL	F6905
432	1.27	31X31	FPA-432-2BG031-NS	F6142
432	1.27	31X31	FPA-432-2BG031-WS	F6048
441	1.27	21X21	FPA-441-2BG021-NS	F4471
441	1.27	21X21	FPA-441-2BG021-WS	F4471
452	1.27	26X26	FPA-452-2BG026-NS	F4471
452	1.27	26X26	FPA-452-2BG026-WS	F4471
456	1.00	22X22	FPA-456-3BG022-BL	F6825
456	1.00	26X26	FPA-456-3BG026-BL	F6906
456	1.00	22X22	FPA-456-3BG022-NS	F6824
456	1.00	26X26	FPA-456-3BG026-WS	F6907
456	1.27	26X26	FPA-456-2BG026-BL	F6F46
456	1.27	26X26	FPA-456-2BG026-NS	F6252
456	1.27	26X26	FPA-456-2BG026-WS	F4471
465	1.27	27X27	FPA-465-2BG027-NS	F6908
472	1.27	22X22	FPA-472-2BG022-BL	F5994
472	1.27	22X22	FPA-472-2BG022-NS	F4471
480	1.27	29X29	FPA-480-2BG029-BL	F6601
480	1.27	26X26	FPA-480-2BG026-NS	F6909
480	1.27	29X29	FPA-480-2BG029-NS	F4471
484	1.00	22X22	FPA-484-3BG022-BL	F6957
484	1.00	22X22	FPA-484-3BG022-NS	F6198
484	1.00	22X22	FPA-484-3BG022-WS	F6074
484	1.00	26X26	FPA-484-3BG026-WS	F6910
484	1.00	26X26	FPA-484-3BG026-ISI	F6613
484	1.00	26X26	FPA-484-3BG026-ISI	F6911
492	1.27	26X26	FPA-492-2BG026-BL	F6076
492	1.27	26X26	FPA-492-2BG026-NS	F4471
492	1.27	26X26	FPA-492-2BG026-WS	F6050
516	1.27	26X26	FPA-516-2BG026-BL	F6254
516	1.27	26X26	FPA-516-2BG026-NS	F6251
528	1.27	30X30	FPA-528-2BG030-NS	F6144
529	1.27	23X23	FPA-529-2BG023-WS	F4471
552	1.00	24X24	FPA-552-3BG024-HL	F6912
560	1.27	33X33	FPA-560-2BG033-NS	F4471
560	1.27	33X33	FPA-560-2BG033-WS	F4471
561	1.27	33X33	FPA-560-2BG033-BL	F6610
576	1.27	24X24	FPA-576-2BG024-NS	F4471
576	1.27	24X24	FPA-576-2BG024-WS	F4471
596	1.27	30X30	FPA-596-2BG030-BL	F6913
600	1.27	35X35	FPA-600-2BG035-BL	F6076
600	1.27	35X35	FPA-600-2BG035-WS	F6077
600	1.27	35X35	FPA-600-2BG035-HL	F6632
829	1.27	23X23	FPA-529-2BG023-NS	F4471
1020	1.00	32X32	FPA-1020-3BG032-HL	F6914
1152	1.00	34X34	FPA-1152-3BG034-WS	F6915
1156	1.00	34X34	FPA-1156-3BG034-WS	F6226
1497	1.00	39X39	FPA-1497-3BG039-HL	F6916
1497	1.00	39X39	FPA-1497-3BG039-HL-BL	F6917

For a complete list of FPA Socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/122**

SOCKETS - BGA (XPA) EXTENDER

ET's Extender (XPA) sockets are a reliable, cost-effective alternative to soldering BGA devices directly to the PCB. These XPAs enable a BGA device to be plugged into a socket matching the BGAs device. The design provides results that are equivalent to direct PCB attach. These XPA sockets are an integral part of ET's BGA Adapter System.

FEATURES & BENEFITS
- Very low inductance
- Protects valuable PC boards and subjects device to lower thermal stress
- Same footprint as BGA device
- Compact & easy to integrate into designs
- Solder your BGA chip to the XPA for multiple insertions into a surface mount BPE (page 7)

APPLICATIONS
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

Ball PITCH
- 1.27mm, 1.00mm, 0.80mm

GRID SIZES
- 6X8 through 44X44

(XPA) BGA Extender

XPAs are an integral part of ET's BGA Socket System. The XPA can be soldered to ET's Base Package Emulator for multiple insertions.

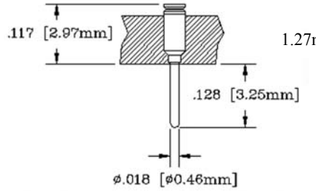
Gold-plated extended pins provide secure connection and low inductance.

Ordering Information EXample

Product Code (Extender) — XPA-0361-2BG019

- 361 = Pin Count
- 2 = Ball Pitch (1=1.5mm, 2=1.27mm, 3=1.00mm, 5=.50mm, 6=.80mm, 9=1.143mm [.45"])
- BG = BGA
- 019 = Grid Size

Materials	
Insulator Material	Glass Filled Polyester and Glass Epoxy
Flamable Rating	UL 94V-0
Plating	G-Gold over nickel
Operating Temperature	
Glass Epoxy	-76 degrees F to +284 degrees F
Plastic	-65 degrees C to +125 degrees C
Pin Material	
Brass Pin	10 micro inches of gold over 100 micro inches of Nickel



XPA

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
48	1.00	6X8	XPA-048-3BG6X8	F5501
64	1.27	10X10	XPA-064-2BG010	F6677
144	1.27	12X12	XPA-0144-2BG012	F5045
160	0.80	14X14	XPA-0160-6BG014	F6965
160	1.00	14X14	XPA-0160-3BG014	F5995
160	1.27	13X15	XPA-0160-2BG13X15	F6966
176	0.80	15X15	XPA-0176-6BG015	F6958
196	0.80	14X14	XPA-0196-6BG014	F5573
217	1.27	17X17	XPA-0217-2BG017	F5045
255	1.27	16X16	XPA-0255-2BG016	F5045
256	1.00	16X16	XPA-0256-3BG016	F5579
256	1.27	16X16	XPA-0256-2BG016	F5045
256	1.27	20X20	XPA-0256-2BG020	F5045
256	1.27	21X21	XPA-0256-2BG021	F5045
272	1.27	20X20	XPA-0272-2BG020	F5045
292	1.27	20X20	XPA-0292-2BG020	F5045
303	1.27	23X23	XPA-0303-2BG023	F5045
304	1.27	23X23	XPA-0304-2BG023	F5045
313	1.27	25X25	XPA-0313-2BG025	F5045
324	1.00	18X18	XPA-0324-3BG018	F6959
324	1.00	22X22	XPA-0324-3BG022	F5996
336	1.27	20X20	XPA-0336-2BG020	F5045
352	1.27	26X26	XPA-0352-2BG026	F5045
352	1.27	26X26	XPA-0352-2BG026-A	F6583
356	1.27	26X26	XPA-0356-2BG026	F5045
357	1.27	19X19	XPA-0357-2BG019	F5045

For a complete list of XPA Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/121

XPA (cont.)

Pin Count	Ball Pitch (mm)	Grid Size	ET Part #	Drawing #
361	1.27	19X19	XPA-0361-2BG019	F5045
384	1.27	28X28	XPA-0384-2BG028	F6960
388	1.00	26X26	XPA-0388-3BG026	F6622
388	1.27	26X26	XPA-0388-2BG026	F5045
420	1.27	26X26	XPA-0420-2BG026	F5045
452	1.27	26X26	XPA-0452-2BG026	F5045
456	1.00	26X26	XPA-0456-3BG026	F5961
456	1.27	26X26	XPA-0456-2BG026	F5045
460	1.27	28X28	XPA-0460-2BG028	F5962
478	1.27	26X26	XPA-0478-2BG026-P4**	F6967
478	1.27	26X26	XPA-0478-2BG026-P4-L***	F6968
480	1.27	26X26	XPA-0480-2BG026	F5045
480	1.27	29X29	XPA-0480-2BG029	F6188
492	1.27	26X26	XPA-0492-2BG026	F5045
560	1.27	33X33	XPA-0560-2BG033	F6656
576	1.27	30X30	XPA-0576-2BG030	F5045
596	1.27	30X30	XPA-0596-2BG030	F5045
600	1.27	35X35	XPA-0600-2BG035	F5045
652	1.27	35X35	XPA-0652-2BG035	F6819
655	1.27	34X34	XPA-0655-2BG034	F5045
680	1.00	39X39	XPA-0680-3BG039	F5860
728	1.27	27X27	XPA-0728-2BG027	F6810
820	1.00	34X34	XPA-0820-3BG034	F5963

** Pentium 4 .125 IN LENGTH *** Pentium 4 .250 IN LENGTH

Don't be confused. Thru-hole, Surface Mount? BGA High Performance? Call ET today.
Tel: **1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *FaX:* (408) 982-0664**

BGA, LCC & PLCC - CHIP SCREENING ADAPTERS

CONVERT ANY KNOWN GOOD PCB TO A TEST FIXTURE FOR CHIP SCREENING OR FAILURE ANALYSIS

This system ensures complete screening capabilities for sorting marginal or non-functional BGA circuits. The BGA System is built upon ET's BPE (Base Package Emulator) which accommodates thru-hole accessories via its top while the bottom is soldered to the PCBs BGA footprint, taking the place of the chip.

The Socket and Probing System is used by hardware, software, design and test engineers who have a need to screen a particular chip package. This can also be used to develop, debug, program, qualify or test BGA devices.

1.00mm Lead Pitch

Ball Count	BGA Grid Size	Ball Pitch (mm)	DESCRIPTION	DRAWING
223	18X18	1.00	ZR-MBGA-223-3-018-1	F6799
1936	44X44	1.00	ZR-MBGA-1936-3-044-1	F7201

1.27mm Lead Pitch

Ball Count	BGA Grid Size	Ball Pitch (mm)	DESCRIPTION	DRAWING
244	16X16	1.27	ZR-BGA-244-2-016-1	F6792
256	20X20	1.27	ZR-BGA-256-2-020-1	F6793
272	20X20	1.27	ZR-BGA-272-2-020-1	F6794
324	20X20	1.27	ZR-BGA-324-2-020-1	F6795
352	26X26	1.27	ZR-BGA-352-2-026-1	F6797
388	26X26	1.27	ZR-BGA-388-2-026-1	F6664
432	31X31	1.27	ZR-BGA-432-2-031-1	F6798
624	25X25	1.27	ZR-BGA-624-2-025-1	F6796

BGA CHIP SCREENING

- Allow for quick screening with a known good PC board
- Prevents time-consuming board revisions
- Easy installation
- Easily removable
- Socket options are available for low profile (minimal clearance) needs
- Allows for rapid, new design capabilities
- Requires no extra tooling holes or extra space on the target PCB

CS2-084-PCC5-M-Z-1

LCC & PLCC Ordering Information Example

CS-2-068-PCC1-M-Z-1

- Target Socket
- Product Code
- Target Socket Pin Count
- Bottom Pin Type (see Figure 1) — W=PLCC Block, M=Screw Machine Pins, S=Surface Mountable
- Chip Pkg Socket Footprint (see Footprint Section)
- 1 = Socket Included
- Top Socket Type: Z = Zero Insertion Force

Target Socket → Chip Package

Icons identify your target socket and chip package.

ET Part #

PLCC → PLCC

CS-2-028-PCC6-M-Z-1
Document # F3749
CS-2-044-PCC3-M-Z-1
Document # F3750
CS-2-044-PCC3-W-Z-1
Document # F1800
CS-2-052-PCC4-M-Z-1
Document # F3752
CS-2-052-PCC4-W-Z-1
Document # F2123
CS-2-068-PCC1-M-Z-1
Document # F3755
CS-2-068-PCC1-W-Z-1
Document # F3756
CS-2-084-PCC5-M-Z-1
Document # F3759
CS-2-084-PCC5-W-Z-1
Document # F3761

PGA → LCC

CS-2-068-LCC2-M-Z-1
Document # F3754
CS-2-084-LCC5-M-Z-1
Document # F3758

ET Part #

PLCC → PLCC

CS-4-028-PCC6-M-Z-1
Document # F3749
CS-4-044-PCC3-M-Z-1
Document # F3750
CS-4-044-PCC3-W-Z-1
Document # F1800
CS-4-052-PCC4-M-Z-1
Document # F3752
CS-4-052-PCC4-W-Z-1
Document # F2123
CS-4-068-PCC1-M-Z-1
Document # F3755
CS-4-068-PCC1-W-Z-1
Document # F3756
CS-4-084-PCC5-M-Z-1
Document # F3759
CS-4-084-PCC5-W-Z-1
Document # F3761

- Pre-wired, one-to-one, Convert-A-Sockets convert a production socket to a test/burn-in socket and vice-versa
- Socket footprints are in-line for production sockets and staggered for burn-in sockets, Convert-A-Sockets eliminates this incompatibility
- Complete line of male/female sockets for LCC, PLCC, and PGA packages
- Makes it possible to perform repeated insertions using a zero insertion force socket on a printed circuit board equipped with a production socket
- Low-cost alternative to creating a special board for simple drop and test procedures
- Pre-assigned wiring for convenience

For a complete list of specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/133

SOCKETS - BGA HiLo FLEXIBLE INTERCONNECT SYSTEM UP TO 9.3 GHz

This all new connector design can be used as a BGA production socket or a board to board connector system. The connectors unique design incorporates the highs, the lows, and the application flexibility the industry requires.

FEATURES & BENEFITS

HIGHS
- High Density: 1mm pitch and above
- High Speed: 1 dB cut-off measured at 9.3 GHz
- High Reliability: Proven dual-beam gold plated beryllium copper contacts
- High I/O: Can be supplied with over 2000 I/O
- High Speed Assembly: Pick and place compatible

LOWS
- Low Profile: Socket height approximately 2mm
- Low Cost: Less than $0.02 per mated pair in volume
- Low Insertion Force: Less than 1 oz. per contact
- Low Tooling Cost

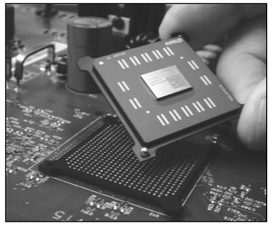
Quick Delivery:
- Prototype quantities shipped in 2 weeks

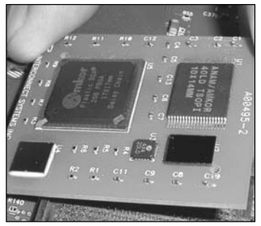
Any Footprint:
- Not limited to standard arrays or geometries

CTE Compliant:
- Designed to accommodate thermal mismatch

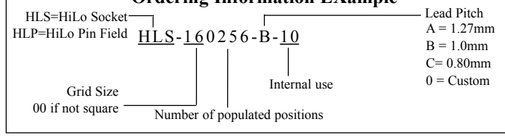
APPLICATIONS
- BGA production socket
- Board to board connector
- Module interconnect
- Flex circuit connector
- Any creative use

NOTE: Manufacturer's chip package drawing required with each order.





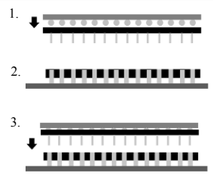
Ordering Information EXample

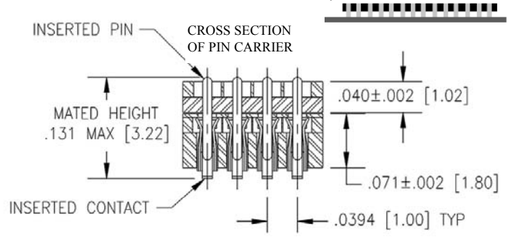


Electrical Specifications	
Bandwidth	9.3 GHz
Contact Resistance	Less than 12 milliohms--Includes bulk Socket Resistence
Insulation Resitance 500V DC	Greater than 50,000 M Ohms
Current Rating	1 Amp per contact
Mechanical Specifications	
Individual Contact Force	1 oz per contact
Heat Sink	N/A
Materials	
Insulator	FR4 Epoxy Resin
Terminal	Pin Material: Phosphor Bronze
Contact	Socket Contact BeCu
Operating Temperature	
Temperature Range	0 to 105 degrees C

3 Easy Steps:

Step 1: Reflow BGA to HiLo pin field to create a 'micro-PGA' package
Step 2: Solder HiLo socket to motherboard
Step 3: Insert pinned FPGA into socket





CROSS SECTION OF SOCKET CARRIER

The drawing depicts a typical stack-up for a mated pair (pin field and socket). These dimensions can be changed to fit a specific application. Pin length can be shortened or lengthened to decrease or increase mated height.

Emulation Technology Recommends:

Try our **Multi-Grid Size EXtraction Tool**
Safely extract HGA & PGA devices.
Safely remove your HiLo socket using this quality tool.
Web Link: www.1800adapter.com/056

Try our **BGA Solder Stencils**
Residue-free adhesive backing means these stencils are self-sticking …so you can say goodbye to tape and fixturing forever!
Web Link: www.1800adapter.com/019

For a complete list of HiLo socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/124

BGA HiLo FLEXIBLE INTERCONNECT SYSTEM UP TO 9.3 GHz - SOCKETS

Xilinx

Xilinx Part #	Pin Count	Array Size	Lead Pitch (mm)	Body Size (mm)	Socket Part #	Socket Drawing	HiLo Pin Field	HiLo Drawing
BG255	225	15X15	1.50	27.00	HLS-150225-0-10	F7093	HLP-150225-0-10	F7094
FG256	256	16X16	1.00	17.00	HLS-160256-B-10	F7095	HLP-160256-B-10	F7096
BG256	256	20X20	1.27	27.00	HLS-200272-A-10	F7097	HLP-200272-A-10	F7098
FG324	324	22X22	1.00	23.00	HLS-220324-B-00	F7099	HLP-220324-B-00	F7100
BG352	352	26X26	1.27	35.00	HLS-250352-A-10	F7101	HLP-250352-A-10	F7102
BG388	388	26X26	1.27	35.00	HLS-260388-A-10	F7103	HLP-260388-A-10	F7104
BG432	432	31X31	1.27	40.00	HLS-310432-A-10	F7105	HLP-310432-A-10	F7106
FG456	456	22X22	1.00	23.00	HLS-220456-B-10	F7107	HLP-220456-B-10	F7108
BG492	492	26X26	1.27	35.00	HLS-260492-A-10	F7109	HLP-260492-A-10	F7110
FG556	556	30X30	1.00	31.00	HLS-300556-B-10	F7111	HLP-300556-B-10	F7112
BG560	560	33X33	1.27	42.50	HLS-330560-A-10	F7113	HLP-330560-A-10	F7114
BG575	575	24X24	1.27	31.00	HLS-240575-A-10	F7115	HLP-240575-A-10	F7116
FF672	672	26X26	1.00	27.00	HLS-260672-B-10	F7117	HLP-260672-B-10	F7118
FG676	676	26X26	1.00	27.00	HLS-260676-B-10	F7119	HLP-260676-B-10	F7120
FG680	680	39X39	1.00	40.00	HLS-390680-B-10	F7121	HLP-390680-B-10	F7122
BG728	728	27X27	1.27	35.00	HLS-270728-A-10	F7123	HLP270728-A-10	F7124
FG860	860	42X42	1.00	42.50	HLS-420860-B-10	F7125	HLP-420860-B-10	F7126
FF896	896	30X30	1.00	31.00	HLS-300896-B-10	F7127	HLP-300896-B-10	F7128
FG900	900	30X30	1.00	31.00	HLS-300900-B-10	F7129	HLP-300900-B-10	F7130
BF957	957	31X31	1.27	40.00	HLS-310957-A-10	F7131	HLP-310957-A-10	F7132
FF1148	1148	34X34	1.00	35.00	HLS-341148-B-10	F7133	HLP-341148-B-10	F7134
FF1152	1152	34X34	1.00	35.00	HLS-341152-B-10	F7135	HLP-341152-B-10	F7136
FG1156	1156	34X34	1.00	35.00	HLS-341156-B-10	F7137	HLP-341156-B-10	F7138

Altera

Pin Count	Array Size	Lead Pitch (mm)	Body Size (mm)	Socket Part #	Socket Drawing	HiLo Pin Field	HiLo Drawing
100	10X10	1.00	11.00	HLS-100100-B-00	F7145	HLP-100100-B-00	F7146
144	12X12	1.00	13.00	HLS-120144-B-00	F7147	HLP-120144-B-00	F7148
256	20X20	1.27	27.00	HLS-200256-A-10	F7149	HLP-200256-A-10	F7150
256	16X16	1.27	17.00	HLS-160256-A-10	F7151	HLP-160256-A-10	F7152
256	16X16	1.27	17.00	HLS-160256-A-10	F7153	HLP-160256-A-10	F7154
324	18X18	1.00	19.00	HLS-180324-B-00	F7155	HLP-180324-B-00	F7156
356	26X26	1.27	35.00	HLS-260356-A-10	F7157	HLP-260356-A-10	F7158
484	22X22	1.00	23.00	HLS-220484-B-00	F7159	HLP-220484-B-00	F7160
600	35X35	1.27	45.10	HLS-350600-A-10	F7161	HLP-350600-A-10	F7162
652	35X35	1.27	45.00	HLS-350652-A-10	F7163	HLP-350652-A-10	F7164
672	26X26	1.00	27.00	HLS-260672-B-00	F7165	HLP-260676-B-00	F7166
672	26X26	1.27	35.00	HLS-260672-A-10	F7167	HLP-260672-A-10	F7168
724	27X27	1.27	35.00	HLS-270724-A-10	F7169	HLP-270724-A-10	F7170
780	28X28	1.00	29.00	HLS-280780-B-00	F7171	HLP-280780-B-00	F7172
956	31X31	1.27	40.00	HLS-310956-A-10	F7173	HLP-310956-A10	F7174

Actel

Pin Count	Array Size	Lead Pitch (mm)	Body Size (mm)	Socket Part #	Socket Drawing	HiLo Pin Field	HiLo Drawing
272	20X20	1.27	20.00	HLS-200272-A-11	F7179	HLP-200272-A-11	F7180
313	25X25	1.27	35.00	HLS-250313-A-10	F7181	HLP-250313-A-10	F7182
329	23X23	1.27	31.00	HLS-230329-A-10	F7183	HLP-230329-A-10	F7184
456	26X26	1.27	35.00	HLS-260456-A-10	F7185	HLP-260456-A-10	F7186
729	27X27	1.27	35.00	HLS-270729-A-10	F7187	HLP-270729-A-10	F7188

SOCKETS - BGA TEST & BURN-IN

These sockets can either surface mount or thru-hole mount to your target PCB. They provide easy chip insertion and utilize a screw lock lid for safe closure.

FEATURES & BENEFITS

- BGA Test Sockets are available in all pitches (1.27mm, 1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)
- Precision micro-probe contacts display ideal electrical characteristics such as low inductance, resistance, and capacitance
- Sockets are completely customizable and designed for up to 500k insertions
- All socket contacts are individually replaceable in the field, which makes repairs quick, easy and cost-effective
- Sockets can also be manufactured with etched or stamped contacts for high volume burn-in or test applications

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

BALL PITCH

- BGA (1.27mm)
- mBGA (1.00mm, 0.80mm, 0.75mm, 0.65mm, 0.50mm)

GRID SIZES

- 8X8 through 40X40

1.27mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
119	14X22	7X17	S-BGA-7X17-119-A1	SKT731
120	11X17	10X16	S-BGA-10-120-A	SKT1270
121	15X15	11X11	S-BGA-11-121-A	SKT734
121	15X15	11X11	S-BGA-11-121-A1	SKT735
144	13X13	12X12	S-BGA-12-144-A1	SKT1157
144	27X27	12X12	S-BGA-12-144-A	SKT736
144	27X27	20X20	S-BGA-20-144-A	SKT745
153	14X22	9X17	S-BGA-9X17-153-A	SKT1346
168	23X23	17X17	S-BGA-17-168-A	SKT740
192	23X23	17X17	S-BGA-17-192-A	SKT1566
204	27X27	20X20	S-BGA-20-204-A	SKT746
204	27X27	20X20	S-BGA-20-204-A1	SKT747
208	23X23	17X17	S-BGA-17-208-A	SKT537
208	23X23	17X17	S-BGA-17-208-B	SKT1034
208	23X23	17X17	S-BGA-17-208-C	SKT1373
225	23X23	15X15	S-BGA-15-225-B	SKT1474
225	27X27	15X15	S-BGA-15-225-A	SKT161

For a complete list of socket specifications, pricing and delivery information, please see:

(BGA) Web Link: www.1800adapter.com/100

(mBGA) Web Link: www.1800adapter.com/107

Open Top Style

Lever Lock Style

Ordering Information EXample

Socket Type — Version
Product Code — S-BGA-20-272-A
Grid Size — Pin Count

1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
244	22X22	16X16	S-BGA-16-244-A	SKT1506
255	21X21	16X16	S-BGA-16-255-A	SKT738
256	21X21	16X16	S-BGA-16-256-A	SKT739
256	21X21	16X16	S-BGA-16-256-D	SKT1503
256	23X23	16X16	S-BGA-16-256-B	SKT762
256	27X27	20X20	S-BGA-20-256-A	SKT1038
256	27X27	20X20	S-BGA-20-256-A1	SKT820
256	27X27	20X20	S-BGA-20-256-B	SKT748
256	27X27	20X20	S-BGA-20-256-C	SKT533
256	35X35	26X26	S-BGA-26-256-A	SKT769
272	27X27	20X20	S-BGA-20-272-A	SKT802
272	27X27	20X20	S-BGA-20-272-A1	SKT751
272	31X31	21X21	S-BGA-21-272-A	SKT703
289	23X23	17X17	S-BGA-17-289-A	SKT1288
303	21X25	19X19	S-BGA-19-303-A	SKT741
304	35X35	23X23	S-BGA-23-304-A	SKT758
316	27X27	20X20	S-BGA-20-316-A	SKT754
316	27X27	20X20	S-BGA-20-316-A1	SKT1036
324	27X27	20X20	S-BGA-20-324-A	SKT755
336	27X27	20X20	S-BGA-20-336-A	SKT1555
340	35X35	26X26	S-BGA-26-340-A	SKT770
352	35X35	26X26	S-BGA-26-352-A	SKT634
352	35X35	26X26	S-BGA-26-352-A1	SKT771
352	35X35	26X26	S-BGA-26-352-B	SKT528
356	35X35	26X26	S-BGA-26-356-A	SKT773
357	25X25	19X19	S-BGA-19-357-A	SKT636
361	24.7X24.7	19X19	S-BGA-19-361-A	SKT631
361	25X25	19X19	S-BGA-19-361-A1	SKT743
361	25X25	19X19	S-BGA-19-361-A2	SKT744
368	35X35	26X26	S-BGA-26-368-A	SKT1361
372	27X27	20X20	S-BGA-20-372-A	SKT1167
388	35X35	26X26	S-BGA-26-388-A	SKT704
400	27X27	20X20	S-BGA-20-400-A	SKT1372
416	35X35	27X27	S-BGA-27-416-A	SKT780
420	35X35	26X26	S-BGA-26-420-A	SKT879
420	35X35	26X26	S-BGA-26-420-A1	SKT733
432	31X31	24X24	S-BGA-24-432-A	SKT760
432	40X40	31X31	S-BGA-31-432-A	SKT637
432	40X40	31X31	S-BGA-31-432-A1	SKT543
436	35X35	26X26	S-BGA-26-436-A	SKT774
452	35X35	26X26	S-BGA-26-452-A	SKT775

NOTE: Manufacturer's chip package drawing required with each order.

BGA TEST & BURN-IN - SOCKETS

Ordering Information EXample

For a complete list of socket specifications, pricing and delivery information, please see:

BGA Sockets:
www.1800adapter.com/100

mBGA Sockets:
www.1800adapter.com/107

1.27mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
456	35X35	26X26	S-BGA-26-456-A	SKT776
456	35X35	26X26	S-BGA-26-456-B	SKT1340
475	25X32	19X19	S-BGA-19X25-475-A	SKT826
480	35X35	26X26	S-BGA-26-480-A	SKT777
492	35X35	26X26	S-BGA-26-492-A	SKT942
495	40X40	29X29	S-BGA-29-495-A	SKT830
503	40X40	29X29	S-BGA-29-503-A	SKT1008
540	42.5X42.5	32X32	S-BGA-32-540-A	SKT1531
544	35X35	26X26	S-BGA-26-544-A	SKT1719
552	37.5X37.5	37X37	S-BGA-37-552-A	SKT632
560	45X45	33X33	S-BGA-33-560-A	SKT953
576	40X40	30X30	S-BGA-30-576-A	SKT037
600	45X45	35X35	S-BGA-35-600-A	SKT810
600	45X45	35X35	S-BGA-35-600-B	SKT1330
600	45X45	35X35	S-BGA-35-600-C	SKT1546
625	32.3X32.3	25X25	S-BGA-25-625-A	SKT1007
625	32.5X32.5	25X25	S-BGA-25-625-B	SKT966
652	45X45	35X35	S-BGA-35-652-A	SKT1142
672	35X35	26X26	S-BGA-26-672-A	SKT143
729	35X35	27X27	S-BGA-27-729-A	SKT1686
841	29X29	29X29	S-BGA-29-841-A	SKT1430
961	33X33	31X31	S-BGA-31-961-A	SKT763
961	33X33	31X31	S-BGA-31-961-B	SKT1691
2292	27X27	20X20	S-BGA-20-292-A	SKT752

1.00mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
20	5X5	6X6	S-MBGA-06-020-A	SKT1206
40	5.74X7.48	5X8	S-MBGA-5X8-40-A	SKT710
48	10X11	6X8	S-MBGA-6X8-48-M	SKT1575
48	10X12	6X8	S-MBGA-6X8-48-K	SKT1316
48	6X8	6X8	S-MBGA-6X8-48-N	SKT1717
48	6X8	6X8	S-MBGA-6X8-48-G	SKT1207
48	6X8	6X8	S-MBGA-6X8-48-H	SKT1255
48	6X8	6X8	S-MBGA-6X8-48-J	SKT1306
48	6X9	6X8	S-MBGA-6X8-48-E1	SKT1500
48	7.28X10.85	6X8	S-MBGA-6X8-48-C	SKT1017
48	7.3X10.85	6X8	S-MBGA-6X8-48-D	SKT1208
48	7.9X6.5	6X8	S-MBGA-6X8-48-B	SKT1016
48	7X12	6X8	S-MBGA-6X8-48-L	SKT285
48	7X7	7X7	S-MBGA-07-048-A	SKT1715
48	7X7	7X7	S-MBGA-07-048-B	SKT1714
48	8.9X7.95	6X8	S-MBGA-6X8-48-E2	SKT1018
48	8X9	6X8	S-MBGA-6X8-48-F	SKT1209
48	8X9	6X8	S-MBGA-6X8-48-A	SKT1656
48	8X9	6X8	S-MBGA-6X8-48-E	SKT963
48	9.8X7.6	6X8	S-MBGA-6X8-48-A	SKT725
52	11X11	9X9	S-MBGA-09-052-A	SKT1210
56	10X12	8X8	S-MBGA-8X8-56-B	SKT1318
56	10X8	8X8	S-MBGA-8X8-56-A	SKT1320
56	7.7X16.4	9X8	S-MBGA-9X8-056-A	SKT1019
56	7.7X9	7X8	S-MBGA-7X8-56-A	SKT1504
63	8X14	12X8	S-MBGA-12X8-063-A	SKT1211
64	10X12	8X8	S-MBGA-8X8-64-A	SKT1317
64	8X8	8X8	S-MBGA-08-064-A	SKT1012
64	8X8	8X8	S-MBGA-08-064-A1	SKT1013
66	12X8	8X12	S-MBGA-8X12-66-A	SKT1495
72	10X8	8X12	S-MBGA-8X12-72-A	SKT1056
72	12X8	8X12	S-MBGA-8X12-72-A1	SKT1057
72	14X8	8X12	S-MBGA-8X12-72-A2	SKT1058
80	12X9	10X14	S-MBGA-10X14-080-A	SKT1382
80	9X9	10X10	S-MBGA-10-080-A	SKT1375
84	6X6	10X10	S-MBGA-10-084-A	SKT1542

1.00mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
100	10X10	10X10	S-MBGA-10-100-B	SKT1156
100	11X11	10X10	S-MBGA-10-100-A	SKT1438
120	11X17	10X16	S-MBGA-10-120-A	SKT1270
121	10X10	11X11	S-MBGA-11-121-A	SKT1499
121	10X10	11X11	S-MBGA-11-121-B	SKT1549
128	10X10	12X12	S-MBGA-12-128-B	SKT1526
128	11X11	12X12	S-MBGA-12-128-A	SKT1414
144	10X10	12X12	S-MBGA-12-144-C	SKT173
144	13X13	12X12	S-MBGA-12-144-B	SKT1015
144	13X13	13X13	S-MBGA-13-144-A	SKT1075
144	13X13	12X12	S-MBGA-13-144-A1	SKT1157
144	15X15	12X12	S-MBGA-12-144-A	SKT1014
156	15X15	14X14	S-MBGA-14-156-A	SKT936
160	15X15	14X14	S-MBGA-14-160-A	SKT1076
169	13X13	13X13	S-MBGA-13-169-A	SKT1439
196	15X15	14X14	S-MBGA-14-196-A	SKT1037
196	17X17	16X16	S-MBGA-16-196-A	SKT785
208	15X15	17X17	S-MBGA-17-208-A	SKT1513
208	15X15	17X17	S-MBGA-17-208-A	SKT1692
208	17X17	16X16	S-MBGA-16-208-A	SKT827
208	23X23	16X16	S-MBGA-16-208-A1	SKT1212
256	15X15	17X17	S-MBGA-17-256-A	SKT1492
256	17X17	16X16	S-MBGA-16-256-A	SKT786
256	17X17	16X16	S-MBGA-16-256-B	SKT809
280	16X16	19X19	S-MBGA-19-280-A	SKT842
288	19X19	22X22	S-MBGA-22-288-A	SKT1253
324	19X19	18X18	S-MBGA-18-324-A	SKT1440
324	23X23	22X22	S-MBGA-22-324-A	SKT1514
329	31X31	34X34	S-MBGA-23-329-A	SKT1213
456	32X32	22X22	S-MBGA-22-456-A	SKT1652
484	23X23	22X22	S-MBGA-22-484-A	SKT1688
484	27X27	26X26	S-MBGA-26-484-A	SKT1687
672	40X40	34X34	S-MBGA-34-672-A	SKT1077
676	27X27	26X26	S-MBGA-26-676-A	SKT1611
724	50X50	34X34	S-MBGA-34-724-A	SKT1461
896	31X31	30X30	S-MBGA-30-896-A	SKT1689
932	39X39	39X39	S-MBGA-39-932-A	SKT1654
961	33X33	31X31	S-MBGA-31-961-A	SKT763
1152	35X35	34X34	S-MBGA-34-1152-A	SKT1493
1152	35X35	34X34	S-MBGA-34-1152-B	SKT1494

0.80mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
20	5X5	6X6	S-MBGA-06-020-A	SKT1206
48	6X8	6X8	S-MBGA-6X8-48-G	SKT1207
48	6X8	6X8	S-MBGA-6X8-48-H	SKT1255
48	6X8	6X8	S-MBGA-6X8-48-J	SKT1306
48	6X9	6X8	S-MBGA-6X8-48-E1	SKT1500
48	7X7	7X7	S-MBGA-07-048-A	SKT1715
48	7X7	7X7	S-MBGA-07-048-B	SKT1714
48	8.9X7.95	6X8	S-MBGA-6X8-48-E2	SKT1018
48	8X9	6X8	S-MBGA-6X8-48-A	SKT1656
48	8X9	6X8	S-MBGA-6X8-48-E	SKT963
52	11X11	9X9	S-MBGA-09-052-A	SKT1210
56	10X12	8X8	S-MBGA-8X8-56-B	SKT1318
56	10X8	8X8	S-MBGA-8X8-56-A	SKT1320
63	8X14	12X8	S-MBGA-12X8-063-A	SKT1211

For a complete list of socket specifications, pricing and delivery information, please see:

(BGA) Web Link: www.1800adapter.com/100
(mBGA) Web Link: www.1800adapter.com/107

SOCKETS - BGA, TEST & BURN-IN

For a complete list of socket specifications, pricing and delivery information, please see:

BGA Sockets:
www.1800adapter.com/100

mBGA Sockets:
www.1800adapter.com/107

0.80mm Ball Pitch (cont.)

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
64	10X12	8X8	S-MBGA-8X8-64-A	SKT1317
64	8X8	8X8	S-MBGA-08-064-A	SKT1012
64	8X8	8X8	S-MBGA-08-064-A1	SKT1013
66	12X8	8X12	S-MBGA-8X12-66-A	SKT1495
72	10X8	8X12	S-MBGA-8X12-72-A	SKT1056
72	12X8	8X12	S-MBGA-8X12-72-A1	SKT1057
72	14X8	8X12	S-MBGA-8X12-72-A2	SKT1058
80	12X9	10X14	S-MBGA-10X14-080-A	SKT1382
80	9X9	10X10	S-MBGA-10-080-A	SKT1375
88	10X8	12X8	S-MBGA-8X12-88-A	SKT1757
100	10X10	10X10	S-MBGA-10-100-B	SKT1156
121	10X10	11X11	S-MBGA-11-121-A	SKT1499
121	10X10	11X11	S-MBGA-11-121-B	SKT1549
128	10X10	12X12	S-MBGA-12-128-B	SKT1526
128	11X11	12X12	S-MBGA-12-128-A	SKT1414
144	10X10	12X12	S-MBGA-12-144-C	SKT173
144	13X13	13X13	S-MBGA-13-144-A	SKT1075
169	13X13	13X13	S-MBGA-13-169-A	SKT1439
208	15X15	17X17	S-MBGA-17-208-A	SKT1513
208	15X15	17X17	S-MBGA-17-208-A	SKT1692
256	15X15	17X17	S-MBGA-17-256-A	SKT1492
280	16X16	19X19	S-MBGA-19-280-A	SKT842
288	19X19	22X22	S-MBGA-22-288-A	SKT1253

0.75mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
40	5.74X7.48	5X8	S-MBGA-5X8-40-A	SKT710
48	7.28X10.85	6X8	S-MBGA-6X8-48-C	SKT1017
48	7.3X10.85	6X8	S-MBGA-6X8-48-D	SKT1208
48	7.9X6.5	6X8	S-MBGA-6X8-48-B	SKT1016
48	7X12	6X8	S-MBGA-6X8-48-L	SKT285
48	8X9	6X8	S-MBGA-6X8-48-F	SKT1209
48	9.8X7.6	6X8	S-MBGA-6X8-48-A	SKT725
56	7.7X16.4	9X8	S-MBGA-9X8-056-A	SKT1019
56	7.7X9	7X8	S-MBGA-7X8-56-A	SKT1504

0.65mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
84	6X6	10X10	S-MBGA-10-084-A	SKT1542
96	6X6	11X11	S-MBGA-11-096-A	SKT1475

NOTE: Manufacturer's chip package drawing required with each order.

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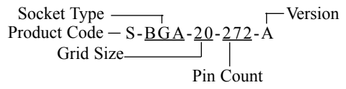
Web Link: www.1800adapter.com/forms

For a complete list of socket specifications, pricing and delivery information, please see:

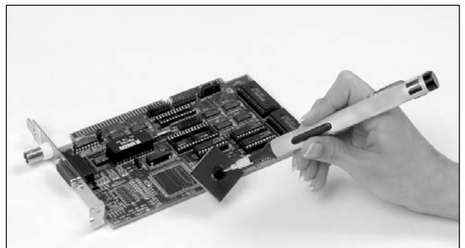
(BGA) Web Link: www.1800adapter.com/100
(mBGA) Web Link: www.1800adapter.com/107

Ordering Information EXample



0.50mm Ball Pitch

Pin Count	Chip Size (mm)	Grid Size	ET Part #	Drawing #
96	6X6	11X11	S-MBGA-11-096-A	SKT1475



Handle your expensive ICs safely using ET's Vacuum Pen (P/N-102).

EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum Handling Systems.

Vacuum Pens

ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.

P/N-100

P/N-102

- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

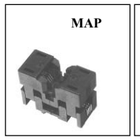
These ESD-safe units feature a silver aluminum body and non-marking static dissipative black rubber vacuum cups. The pens' vacuum is generated by pressing and releasing the vacuum push button.

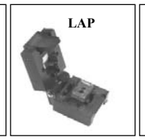
For a complete list of vacuum specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/086

Don't be confused. Thru-hole, Surface Mount? BGA High Performance? Call ET today.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *FaX:* (408) 982-0664**

QFN/MLF/MAP/LAP/TAP - SOCKETS





Ordering Information Example

Product Code — S-MLF-00-008-B — Version
Pin Count
Grid Size
Package Style

Electrical Specifications	
Bandwidth	<1 GHz (inductance 3.2nH)
Contact Bulk Resistance	25m ohms
Insulation Resitance	1 x 10(11th) ohms
Current Rating	1A ~75C temp. rise
Mechanical Specifications	
Individual Contact Force	25-40 grams
Cycle Life	5,000
Heat Sink	Brass center pin included as standard. Larger copper center pin available upon special request for additional heat sinking.
Materials	
Insulator	Polyphenylene Sulfide (PPS)
Terminal	N/A
Contact	Beryllium Copper with gold plating
Operating Temperature	
Temperature Range	-50C to +150C

QFN/MLF MAP LAP TAP

Pin Count	Lead Pitch	Chip Size (mm)	Pad Layout	ET Part #	Drawing #
8	0.50	3X2	4-0	S-MLF-00-008-B	SKT261
8	0.50	3X3	4-0	S-MLF-00-008-C	SKT264
8	0.65	4.93X3	4-0	S-MAP-00-008-A	SKT1471
8	0.65	6.4X3.65	4-0	S-TAP-00-008-A	SKT1472
8	1.27	5.99X4.93	4-0	S-LAP-00-008-B	SKT173
8	1.27	5.99X5.99	4-0	S-LAP-00-008-C	SKT287
8	1.27	6X5	4-0	S-MLF-00-008-A	SKT1483
8	1.27	8X5	4-0	S-LAP-00-008-A	SKT1455
10	0.50	3X2	4-1	S-MLF-00-010-A	SKT265
10	0.50	3X3	4-0	S-MLF-00-010-B	SKT1524
12	0.50	3X3	4-0	S-MLF-00-012-A	SKT268
16	0.50	3X3	5-0	S-MLF-00-016-C	SKT270
16	0.50	3X3	4-4	S-MLF-00-016-D	SKT1613
16	0.50	5X5	8-0	S-MLF-00-016-E	SKT277
16	0.65	4X4	4-0	S-MLF-00-016-B	SKT1444
16	0.80	5X5	4-0	S-MLF-00-016-A	SKT1309
20	0.50	4X4	5-5	S-MLF-00-020-C	SKT283
20	0.65	5.2X4.2	5-5	S-MLF-00-020-B	SKT282
20	0.65	5X5	5-5	S-MLF-00-020-A	SKT1307
24	0.50	4.5X3.5	3-9	S-MLF-00-024-A	SKT1557
24	0.50	4X4	6-6	S-MLF-00-024-B	SKT1558
28	0.50	5X5	7-7	S-MLF-00-028-A	SKT1308
28	0.65	6X6	7-7	S-MLF-00-028-C	SKT1592
28	0.65	6X6	7-7	S-MLF-00-028-D	SKT1576
28	0.80	7X7	7-7	S-MLF-00-028-B	SKT1497

These sockets offer a modular design in a small outline with very low inductance. ET has sockets for 8 to 100 lead devices with pitches of 0.40 mm, 0.50 mm, 0.65 mm and 0.80 mm to support this rapidly growing market.

FEATURES & BENEFITS
- Very low inductance
- Center ground pin
- Small outline
- Modular design
- Compact & easy to integrate into designs

APPLICATIONS
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

LEAD PITCH
- 0.80mm, 0.75mm, 0.65mm, 0.50mm, 0.40mm

GRID SIZES
- 8X8 through 40X40

QFN/MLF MAP LAP TAP (cont.)

Pin Count	Lead Pitch	Chip Size (mm)	Pad Layout	ET Part #	Drawing #
32	0.50	5X5	8-8	S-MLF-00-032-A	SKT1310
32	0.50	6X6	8-8	S-MLF-00-032-B	SKT1624
32	0.65	7X7	8-8	S-MLF-00-032-C	SKT1559
32	0.80	8X8	8-8	S-MLF-00-032-D	SKT258
32	0.90	9X9	8-8	S-MLF-00-032-E	SKT256
34	1.27	14X9.7	8-9	S-MLF-00-034-A	SKT251
36	0.50	6X6	9-9	S-MLF-00-036-A	SKT238
40	0.50	6X6	10-10	S-MLF-00-040-A	SKT1541
44	0.50	7X7	11-11	S-MLF-00-044-A	SKT1544
44	0.50	7X7	12-10	S-MLF-00-044-B	SKT255
44	0.65	9X9	11-11	S-MLF-00-044-C	SKT252
48	0.50	7X7	12-12	S-MLF-00-048-A	SKT1421
48	0.50	7X7	11-13	S-MLF-00-048-B	SKT219
52	0.50	8X8	13-13	S-MLF-00-052-A	SKT1413
56	0.50	8X8	14-14	S-MLF-00-056-A	SKT1527
56	0.50	8X8	14-14	S-MLF-00-056-A1	SKT218
64	0.50	9X9	16-16	S-MLF-00-064-A	SKT1496
68	0.50	10X10	17-17	S-MLF-00-068-A	SKT216

NOTE: Manufacturer's chip package drawing required with each order.

Emulation Technology Recommends:

Try our manually operated **Vacuum Pens**
to easily lift ICs without damaging your device.
Web Link: www.1800adapter.com/118

Try our **3-in-1 Adapter System**
Emulate, Program, Analyze QFN/MLF with one adapter!
Web Link: www.1800adapter.com/060

For a complete list of QFN/MLF Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/044

SOCKETS - TSOP/TSSOP/SOJ/SOIC

TSOP/TSSOP BURN IN & SMT PRODUCTION

Pin Count	Lead Pitch (mm)	Package Width (mm)	ET Part #	Drawing #
8	0.65	4.40	S-TSS-00-008-A	SKT1055
14	0.65	4.39	S-TSSO-00-014-A	SKT1752
20	0.65	4.40	S-TSSO-00-020-A	SKT987
20	0.65	4.40	S-TSO-00-020-B	SKT788
24	1.27	7.62	S-TSO-00-024-A	SKT1364
28	0.50	11.8	S-TSO-00-028-A	SKT049
32	0.50	11.8	S-TSO-00-032-G	SKT1666
32	0.50	12.4	S-TSO-00-032-B	SKT051
32	0.50	18.4	S-TSO-00-032-A	SKT050
32	0.50	18.4	S-TSO-00-032-D	SKT107
32	0.50	18.4	S-TSO-00-032-E	SKT591
32	0.50	18.4	S-TSO-SM-032-A1*	SKT1162
32	1.27	10.16	S-TSO-00-032-F	SKT1283
40	0.50	12.4	S-TSO-00-040-B	SKT496
40	0.50	18.4	S-TSO-00-040-A	SKT053
40	0.50	18.4	S-TSO-00-040-C	SKT1238
40	0.50	18.4	S-TSO-00-040-D	SKT1239
40	0.50	12.4	S-TSO-SM-040-B	SKT1244
40	0.50	18.40	S-TSO-SM-040-A	SKT518
40	0.50	18.40	S-TSO-SM-040-A1*	SKT1508
40	0.65	6.10	S-TSS-00-040-A	SKT1245
44	0.80	10.43	S-TSO-00-044-C	SKT845
44	0.80	10.16	S-TSO-00-044-B	SKT1139
44	0.80	10.16	S-TSO-00-044-D	SKT1240
48	0.50	16.4	S-TSO-00-048-A	SKT497
48	0.50	18.40	S-TSO-00-048-B	SKT498
48	0.50	18.40	S-TSO-00-048-D	SKT1469
48	0.50	18.4	S-TSO-00-048-B1	SKT723
48	0.50	18.4	S-TSO-00-048-C	SKT511
48	0.50	18.4	S-TSO-SM-048-A	SKT1111
48	0.50	18.4	S-TSO-SM-048-A1*	SKT1247
50	0.80	10.16	S-TSO-00-050-A	SKT1241
50	0.80	10.16	S-TSO-00-050-B	SKT1242
54	0.80	10.16	S-TSO-00-054-A	SKT839
54	0.80	10.16	S-TSO-00-054-B	SKT1243
54	0.80	10.16	S-TSO-00-054-C	SKT1445
56	0.50	18.4	S-TSO-00-056-A	SKT054

*Available in Tape/Reel

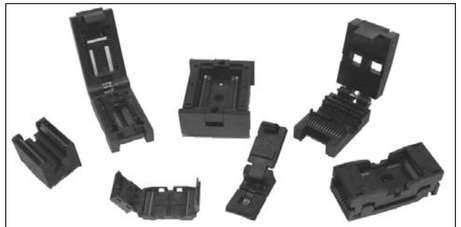
For a complete list of TSOP & TSSOP Socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/113**

SOJ TEST & BURN-IN & SMT PRODUCTION

Pin Count	Lead Pitch (mm)	Chip Size (mm)	ET Part #	Drawing #
20	1.27	7.62	S-SOJ-00-020-A	SKT450
24	1.27	7.62	S-SOJ-00-024-A	SKT451
26	1.27	7.62	S-SOJ-00-026-A	SKT114
26	1.27	7.62	S-SOJ-00-026-C	SKT453
26	1.27	4.62	S-SOJ-SM-026-A	SKT112
28	1.27	10.16	S-SOJ-00-028-A	SKT454
28	1.27	7.62	S-SOJ-00-028-B	SKT455
28	1.27	10.15	S-SOJ-SM-028-A	SKT1251
28	1.27	8.89	S-SOJ-SM-028-B	SKT112
32	1.27	10.16	S-SOJ-00-032-A	SKT457
32	1.27	7.62	S-SOJ-00-032-B	SKT458
32	1.27	10.15	S-SOJ-SM-032-A	SKT1251
32	1.27	10.15	S-SOJ-SM-032-B	SKT112
40	1.27	10.16	S-SOJ-00-040-A	SKT580
40	1.27	10.15	S-SOJ-SM-040-A	SKT1251
44	1.27	10.16	S-SOJ-00-044-A	SKT724

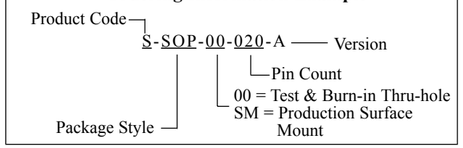
For a complete list of SOJ Socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/115**

NOTE: Manufacturer's chip package drawing required with each order.



Buy in quantity and save on these high quality sockets!

Ordering Information Example



SOIC TEST & BURN-IN & SMT PRODUCTION

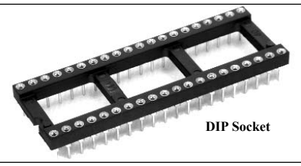
Count	Pitch (mm)	Width (mm)	ET Part #	Drawing #
8	1.27	5.30	S-SOP-00-008-B	SKT890
8	1.27	3.90	S-SOR-00-008-A	SKT525
16	1.27	3.90	S-SOR-00-016-A	SKT475
16	1.27	3.90	S-SOR-00-016-B	SKT476
16	1.27	3.90	S-SOR-00-016-C	SKT532
16	1.27	3.90	S-SOR-00-016-D	SKT1235
16	1.27	7.50	S-SOL-00-016-B	SKT460
16	1.27	5.30	S-SOL-00-016-C	SKT1054
16	1.27	5.30	S-SOL-00-016-D	SKT1093
20	1.27	5.60	S-SOR-00-020-A	SKT586
20	1.27	7.50	S-SOR-00-020-B	SKT984
24	1.27	5.60	S-SOP-00-024-A	SKT727
24	1.27	8.40	S-SOL-00-024-A	SKT462
28	1.27	11.40	S-SOP-SM-028-B	SKT1268
28	1.27	7.50	S-SOP-SM-028-C	SKT585
28	1.27	7.50	S-SOR-00-028-A	SKT113
28	1.27	7.90-8.2	S-SOR-00-028-B	SKT1236
28	1.27	7.50	S-SOR-00-028-D	SKT478
28	1.27	8.40	S-SOL-00-028-A	SKT463
28	1.27	8.89	S-SOL-00-028-B	SKT464
28	1.27	8.40	S-SOL-00-028-D	SKT583
28	1.27	8.40	S-SOL-SM-028-A	SKT1233
32	1.27	13.30	S-SOP-SM-032-A	SKT983
32	1.27	11.40	S-SOL-00-032-A	SKT465
32	1.27	10.16	S-SOL-00-032-B	SKT1172
32	1.27	10.70	S-SOL-00-032-C	SKT466
40	1.27	11.60	S-SOP-00-040-A	SKT891
40	1.27	11.20	S-SOR-00-040-A	SKT479
40	1.27	10.70	S-SOR-00-040-B	SKT106
44	1.27	13.20	S-SOP-00-044-A	SKT1094
44	1.27	13.30	S-SOP-SM-044-A	SKT516
44	1.27	12.60	S-SOP-SM-044-B	SKT1602
44	1.27	12.60	S-SOP-SM-044-C	SKT1488
44	1.27	13.20	S-SOR-00-044-B	SKT480
44	1.27	13.20	S-SOR-00-044-C	SKT481
44	1.27	12.60	S-SOR-00-044-D	SKT1489

For a complete list of SOIC Socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/117**

SSO/DIP/SDIP TEST & BURN-IN SOCKETS - SOCKETS

SOL Socket

SSO Socket



DIP Socket

Ordering Information Example

Product Code — S-TSO-00-020-A(Z) — Version (Z=ZIF)

- Pin Count: 020
- 00 = Test & Burn-in Thru-hole; SM = Production Surface Mount
- Package Style: TSO

SOJ TEST & BURN-IN & SMT PRODUCTION

Count	Pitch (mm)	Width (mm)	ET Part #	Drawing #
8	0.65	3.00	S-SSO-00-008-A	SKT1393
10	0.50	3.00	S-SSO-00-010-A	SKT1590
16	0.65	4.40	S-SSO-00-016-A	SKT488
16	0.635	3.90	S-SSO-00-016-B	SKT985
16	0.65	5.30	S-SSO-00-016-C	SKT986
20	0.65	4.40	S-SSO-00-020-A	SKT489
20	0.65	5.30	S-SSO-00-020-B	SKT490
20	.025	30.80	S-SSO-00-020-C	SKT1096
20	0.65	4.40	S-SSO-00-020-E	SKT1665
24	0.65	5.30	S-SSO-00-024-A	SKT491
24	0.635	3.90	S-SSO-00-024-B	SKT1222
24	0.65	4.40	S-SSO-00-024-C	SKT1163
28	0.65	5.30	S-SSO-00-028-A	SKT492
28	0.65	5.40	S-SSO-00-028-B	SKT118
28	0.635	7.62	S-SSO-00-028-D	SKT959
28	0.65	4.40	S-SSO-00-028-E	SKT1458
30	0.50	4.40	S-SSO-00-030-A	SKT711
30	0.80	11.00	S-SSO-00-030-B	SKT1237
32	0.65	7.62	S-SSO-00-032-A	SKT1491
32	0.65	6.10	S-SSO-00-032-B	SKT1516
34	1.02	7.62	S-SSO-00-034-A	SKT588
36	0.80	0.80	S-SSO-00-036-A	SKT960
44	0.80	0.80	S-SSO-00-044-A	SKT917
48	0.635	7.62	S-SSO-00-048-B	SKT589
54	0.80	10.16	S-SSO-00-054-A	SKT961
56	0.635	7.62	S-SSO-00-056-A	SKT494
56	0.635	7.62	S-SSO-00-056-B	SKT495
56	0.80	13.30	S-SSO-00-056-C	SKT514
56	0.50	6.10	S-SSO-00-056-D	SKT713
56	0.635	7.62	S-SSO-00-056-E	SKT590
56	0.80	13.30	S-SSO-00-056-F	SKT789
64	0.80	12.00	S-SSO-00-064-A	SKT1682
56	0.80	13.30	S-SSO-SM-056-A	SKT517

DIP

Pin Count	Package Width	Socket Application	ET Part #	Drawing #
8	.300"	Production	S-DIP-00-008-A	SKT055
8	.300"	Burn-in	S-DIP-00-008-AZ	SKT527
14	.300"	Burn-in	S-DIP-00-014-A	SKT056
14	.300"	Burn-in	S-DIP-00-014-AZ	SKT110
16	.300"	Production	S-DIP-00-016-A	SKT057
16	.300"	Burn-in	S-DIP-00-016-BZ	SKT555
16	.300"	Burn-in	S-DIP-00-016-AZ	SKT1159
20	.300"	Burn-in	S-DIP-00-020-AZ	SKT059
20	.300"	Production	S-DIP-00-020-B	SKT1639
20	.300"	Production	S-DIP-00-020-A	SKT058
24	.300"	Burn-in	S-DIP-00-024-D	SKT1610
24	.400"	Burn-in	S-DIP-SM-024-A	SKT1645
24	.600"	Production	S-DIP-00-024-A	SKT060
24	.600"	Burn-in	S-DIP-00-024-AZ	SKT061
28	.300"	Burn-in	S-DIP-00-028-BZ	SKT065
28	.300"	Production	S-DIP-00-028-C	SKT968
28	.600"	Production	S-DIP-00-028-A	SKT062
28	.600"	Burn-in	S-DIP-00-028-AZ	SKT064
28	.600"	Development	S-DIP-00-028-AW	SKT063
32	600"	Burn-in	S-DIP-00-032-AZ	SKT067
32	.600"	Burn-in	S-DIP-00-032-A	SKT066
32	.600"	Development	S-DIP-00-032-AW	SKT1640
40	.600"	Production	S-DIP-00-040-A	SKT068
40	.600"	Burn-in	S-DIP-00-040-AZ	SKT069
40	.600"	Development	S-DIP-00-040-AW	SKT1641
44	.600"	Burn-in	S-DIP-00-044-A	SKT1642
44	.600"	Development	S-DIP-00-044-AW	SKT1643
48	.600"	Production	S-DIP-00-048-A	SKT070
48	.600"	Burn-in	S-DIP-00-048-AZ	SKT071
48	.600"	Development	S-DIP-00-048-AW	SKT1644
64	.900"	Production	S-DIP-00-064-A	SKT072
64	.900"	Burn-in	S-DIP-00-064-AZ	SKT073

SHRINK DIP

Pin Count	Lead Pitch (mm)	Grid Size	Package Width (mm)	ET Part #	Drawing #
28	1.76	14X2	10.16X23.11	S-SDP-00-028-A	SKT1231
40	1.78	20X2	15.24X33.78	S-SDP-00-040-A	SKT1095
42	1.78	21X2	15.24X35.56	S-SDP-00-042-A	SKT436
42	1.77	21X2	15.24X35.60	S-SDP-00-042-AZ	SKT437
56	1.77	28X2	16.51X47.79	S-SDP-00-056-A	SKT438

NOTE: Manufacturer's chip package drawing required with each order.

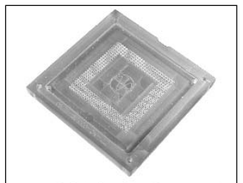
Emulation Technology Recommends:

Try our **DIP Insertion & Extraction Tools**
Insertion tool ensures precise handling and parallel insertion without twisting. For use with PCBs and sockets.
Web Link: www.1800adapter.com/057

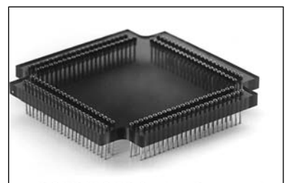
Try our **Chip Quik® SMD Removal Kit**
Speeds up SMD removal without requiring expensive equipment or risking the use of heat guns.
Web Link: www.1800adapter.com/046

For a complete list of socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/049**

SOCKET RECEPTACLES - SOCKETS



BGA Socket Receptacle



PQFP/TQFP Socket Receptacle

Ordering Information Example

Product Code ——— SR-QFP-00-208-A ——— Internal Use

Chip Package Type

Grid Size (when applicable)

Pin Count

0 = no socket
1 = socket

Materials	
Terminals	Brass; copper alloy (C36000) ASTM-B-16
Contact Material	Beryllium Copper
Shell Plating	200 micro meters gold over 50 micro meters nickel
Contact Plating	30 micro meters gold over 50 micro meters nickel
Operating Temperature	
Operating Temperature	-50 degrees C to 140 degrees C

Receptacles are used in conjunction with your test burn-in and/or production sockets as an interface between the board and the socket. ET's receptacles are available for the most popular package styles including: DIP, PGA, PLCC, LCC, BGA, SOJ, SOIC, SOP, SSOP, VFP, TQFP, TAB, MLF, HGA, QFP, and MBGA.

FEATURES & BENEFITS

- Eliminate the need for soldering your sockets directly onto the board and facilitate a plug-in media for ease of socket replacement without damage to the PCB
- Can be custom manufactured for any given socket header or contactor. We provide a wide variety of female contacts (standard fine pitch wire wrap) that can optimize matability for any given male contact.
- Provide ultra low insertion force contacts for direct insertion of any PGA (Pin Grid Array) IC package
- Feature ultherm as the standard substrate material which combines high temperature capabilities with great rigidity and electrical properties.

If you do not find the receptacle you are needing or your desired package is not noted in the catalog please contact us for a quotation or to request more information on ordering receptacles

APPLICATIONS

- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

LEAD PITCH

- 1.27mm 1.00mm 0.80mm

GRID SIZES

- 6X8 through 44X44

BGA

Pin Count	Lead Pitch (mm)	Chip Size (mm)	Grid Size (mm)	Description	Corresponding ET Socket #	Drawing #
48	0.75	7X7	7X7	SR-MBGA-07-048-A	S-MBG-07-048-A	SKT1552
72	0.80	8X10	8X12	SR-MBG-8X12-072-A	S-MBG-8X12-72A	SSKT1773
208	1.27	23X23	17X17	SR-BGA-17-208-C	S-BGA-17-208-C	SKT1370
244	1.27	22X22	16X16	SR-BGA-16-244-A	S-BGA-16-244-A	SKT1774
256	1.00	17X17	16X16	SR-MBGA-16-256-A	S-MBG-16-256-A	SKT1522
256	1.27	27X27	20X20	SR-BGA-20-256-A	S-BGA-20-256-A	SKT1781
272	1.27	27X27	20X20	SR-BGA-20-272-A	S-BGA-20-272-A	SKT1547
272	1.27	31X31	21X21	SR-BGA-21-272-A	S-BGA-21-272-A	SKT791
292	1.27	27X27	20X20	SR-BGA-20-292-A	S-BGA-20-292-A	SKT975
304	1.27	27X27	20X20	SR-BGA-20-324-A	S-BGA-20-324-A	SKT976
304	1.27	35X35	23X23	SR-BGA-23-304-A	S-BGA-23-304-A	SKT792
316	1.27	27X27	20X20	SR-BGA-20-316-A	S-BGA-20-316-A	SKT1548
336	1.27	27X27	20X20	SR-BGA-20-336-A	S-BGA-20-336-A	SKT1556
352	1.27	35X35	26X26	SR-BGA-26-352-A	S-BGA-26-352-A	SKT720
356	1.27	35X35	26X26	SR-BGA-26-356-A	S-BGA-26-356-A	SKT978
368	1.27	35X35	26X26	SR-BGA-26-368-A	S-BGA-26-368-A	SKT1362
388	1.27	35X35	26X26	SR-BGA-26-388-A	S-BGA-26-388-A	SKT721
400	1.27	27X27	20X20	SR-BGA-20-400-A	S-BGA-20-400-A	SKT977
432	1.27	40X40	31X31	SR-BGA-31-432-A	S-BGA-31-432-A	SKT1083
456	1.27	35X35	26X26	SR-BGA-26-456-A	S-BGA-26-456-A	SKT1082
480	1.27	35X35	26X26	SR-BGA-26-480-A	S-BGA-26-480-A	SKT979
492	1.27	35X35	26X26	SR-BGA-26-492-A	S-BGA-26-492-A	SKT943
560	1.27	45X45	33X33	SR-BGA-33-560-A	S-BGA-33-560-A	SKT980
576	1.27	40X40	30X30	SR-BGA-30-576-A	S-BGA-30-576-A	SKT895
600	1.27	45X45	35X35	SR-BGA-35-600-A	S-BGA-35-600-A	SKT1523
600	1.27	45X45	35X35	SR-BGA-35-600-B	S-BGA-35-600-B	SKT1329
625	1.27	32.3X32.3	25X25	SR-BGA-25-626-A	S-BGA-25-625-A	SKT793
676	1.27	35X35	26X26	SR-BGA-26-676-A	S-BGA-26-676-A	SKT1408
1936	1.00	45X45	44X44	SR-MBGA-44-1936-A	S-MBG-44-1936A	SKT1775

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Web Link: www.1800adapter.com/forms

For a complete list of BGA Socket Receptacle specifications, pricing and delivery information, see:
Web Link: **www.1800adapter.com/125**

SOCKET RECEPTACLES - SOCKETS

Ordering Information Example

Product Code ——— SR-QFP-00-160-A——— Version

Chip Package Type

Grid Size (when applicable)

Pin Count

For a complete list of socket specifications, pricing and delivery information, please see

Web Link: www.1800adapter.com/126

MLF

Pin Count	Lead Pitch	Package Width (mm)	Pad Layout	ET Part #	Drawing #
32	0.50	5X5	8-8	SR-MLF-00-032-A	SKT1310
36	0.50	6X6	9-9	SR-MLF-00-036-A	SKT238

PQFP/TQFP

Pin Count	Lead Pitch (mm)	Body Size (mm)	Tip-to-Tip (mm)	Description	Corresponding ET Socket #	Drawing #
48	0.50	7X7	9X9	SR-QFP-00-048-A	S-QFP-00-048-A	SKT1084
64	1.00	20X14	23.9X17.9	SR-QFP-00-064-A	S-QFP-00-064-A	SKT1085
80	0.50	12X12	14X14	SR-QFP-00-080-G2	S-QFP-00-080-G2	SKT1776
80	0.65	14X14	17.2X17.2	SR-QFP-00-080-A	S-QFP-00-080-A	SKT981
80	0.65	14X14	17.2X17.2	SR-QFP-00-080-H	S-QFP-00-080-H	SKT1452
100	0.65	20X14	23.9X17.9	SR-QFP-00-100-A	S-QFP-00-100-A	SKT596
120	0.80	28X28	31.9X31.9	SR-QFP-00-120-A	S-QFP-00-120-A	SKT1087
128	0.80	28X28	31.9X31.9	SR-QFP-00-128-A	S-QFP-00-128-A	SKT1088
128	0.50	20X14	23.2X17.2	SR-QFP-00-128-C1	S-QFP-00-128-C1	SKT1596
160	0.65	28X28	31.9X31.9	SR-QFP-00-160-A	S-QFP-00-160-A	SKT1089
176	0.50	24X24	26X26	SR-QFP-00-176-A	S-QFP-00-176-A	SKT1024
176	0.40	20X20	22X22	SR-QFP-00-176-B	S-QFP-00-176-C	SKT1406
208	0.50	28X28	Metal Pkg	SR-QFP-00-208-A	S-QFP-00-208-B4	SKT618

TSSOP/TSSO

Pin Count	Lead Pitch (mm)	Body Size (mm)	Description	Corresponding ET Socket #	Drawing #
14	0.65	4.40 mm	SR-TSSO-00-014-A	S-TSSO-00-020-A	SKT1751
20	0.65	4.40 mm	SR-TSSO-00-020-A	S-TSS-00-020-A	SKT1730

NOTE: Manufacturer's chip package drawing required with each order.

Emulation Technology Recommends:

Ultra Mini Pogo Pins

Design the perfect interface with our custom or stock ultra-miniature pogo pins!

- BGA, CSP, MicroBGA, and cell phone battery pins are all available
- Our pogo pins can be built to your specification

For a complete list of pogo pins along with specifications, pricing and delivery information, please see:

Web Link: www.1800adapter.com/017

For a complete list of QFP Socket Receptacle specifications pricing and delivery information see:
Web Link: **www.1800adapter.com/126**

SOCKETS - PQFP/TQFP TEST & BURN-IN / SMT

ET's broad range of PQFP/TQFP sockets are available in Test & Burn-in and SMT in a variety grid and body sizes and styles. Our technical staff can assist you in finding the best PQFP/TQFP socket match for your application whether you are doing test & burn-in, development or production work.

FEATURES & BENEFITS
- Tolerances
- Durability
- Small outline
- Quality
- Use of floating bases and parallel clamps

APPLICATIONS
- Test & Burn-in
- Development
- Debug
  - Hand Test
- Programming/Test
  - Qualification
  - Production

LEAD PITCH
- 1.00mm, 0.80mm, 0.65mm, 0.635mm, 0.50mm

NOTE: Manufacturer's chip package drawing required with each order.

HOW TO CHOOSE THE RIGHT SOCKET

Finding the right socket for your project is easy. Gathering the following key characteristics will assist you in finding the correct ET part number:

1. Pin count
2. Lead pitch
3. Body size
4. Tip-to-Tip measurement

When you are ordering, provide the following:

1. Manufacturer part number and package outline drawing
2. Socket style: Production, Test & Burn-in or Male to Male
3. Quantity and delivery requirements
4. Socket application

Emulation Technology Recommends:

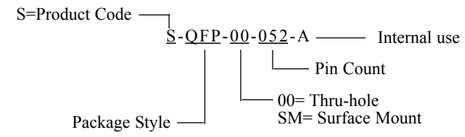
Try our **BGA Rework Stencils**
Residue-free adhesive backing means these stencils are self-sticking
…so you can say goodbye to tape and fiXturing forever!
Web Link: www.1800adapter.com/019

For a complete list of QFP Test & Burn-In Socket specifications, pricing and delivery information, please see:
Web Link: **www.1800adapter.com/106**

Test & Burn-in QFP Socket

Surface Mount QFP Socket

Ordering Information Example



Electrical Specifications	
Current Rating	1 A max.
Contact Resistance	Less than 200m ohms (initial)
Insulation Resistance	500m ohms min. at 500V DC (0.80mm)
Mechanical Specifications	
Individual Contact Force	20-40g (typical)
Replaceable Anisotropic Conductive Pad Life	250,000 to 1,000,000
Materials	
Insulation Housing	PES, Torlon
Contacts	Plunger BeCu, Barrel PB
Terminal	BeCu
Operating Temperature	
Temperature Range	-55 degrees C to 100 degrees C

EMULATION TECHNOLOGY RECOMMENDS:

Safely handle your fine-pitch devices with a product from Emulation Technology's Vacuum handling systems.

P/N-100

Vacuum Pens

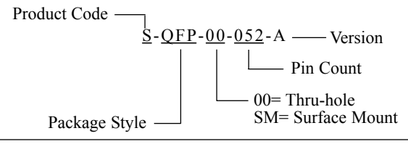
ET's vacuum pens are hand-held, manually operated handling tools that allow you to lift and move fine pitch devices.

- Easily lift ICs without damaging device
- Eliminates need to touch fragile packages
- Built-in vacuum
- All pens come with tips

For a complete list of vacuum specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/086

PQFP/TQFP TEST & BURN-IN / SMT - SOCKETS

Ordering Information Example



For a complete list of QFP Test & Burn-In Socket specifications, pricing and delivery information, please see

Web Link:
www.1800adapter.com/106

SMT

Pin Count	Lead Pitch (mm)	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
44	0.80	10X10	12.00 & 12.65	S-QFP-SM-044-A	SKT722
44	0.80	10X10	12.00 & 12.65	S-QFP-SM-044-A1	SKT1518
64	0.50	10X10	12X12	S-QFP-SM-064-C	SKT1422
64	0.50	10X10	12X12	S-QFP-SM-064-D	SKT1597
64	0.80	14X10	17.2X17.2	S-QFP-SM-064-B	SKT501
64	0.80	14X14	17.2X17.2	S-QFP-SM-064-B1	SKT1662
64	1.00	12X14	24.80X18.85	S-QFP-SM-064-A	SKT500
80	0.50	12X12	14X14	S-QFP-SM-080-E	SKT832
80	0.65	14X14	17.2X17.2	S-QFP-SM-080-B	SKT425
80	0.65	14X14	16X16	S-QFP-SM-080-B1	SKT840
80	0.80	14X20	23.2-23.9	S-QFP-SM-080-A	SKT424
80	0.80	14X20	23.2X23.2	S-QFP-SM-080-C	SKT426
100	0.50	25X4	14X14	S-QFP-SM-100-B	SKT428
100	0.50	25X4	14X14	S-QFP-SM-100-B2	SKT1473
100	0.50	14X14	16X16	S-QFP-SM-100-E	SKT1369
100	0.65	14X20	23.20-23.90	S-QFP-SM-100-A	SKT499
100	0.65	14X20	23.2X23.2	S-QFP-SM-100-D	SKT503
128	0.50	14X20	16X22	S-QFP-SM-128-A	SKT836
132	0.635	27.9X27.9	27.9X27.9	S-QFP-SM-132-A	SKT431
144	0.50	20X20	22X22	S-QFP-SM-144-A	SKT535
144	0.50	20X20	22X22	S-QFP-SM-144-A1	SKT578
144	0.65	28X28	31.9X31.9	S-QFP-SM-144-B	SKT536
160	0.65	28X28	31.9X31.9	S-QFP-SM-160-A	SKT432
176	0.50	24X24	26X26	S-QFP-SM-176-D	SKT835
208	0.50	28X28	30.6X30.6	S-QFP-SM-208-A	SKT434
208	0.50	28X28	30.6X30.6	S-QFP-SM-208-A1	SKT1168
240	0.50	32X32	34.6X34.6	S-QFP-SM-240-A	SKT540
256	0.50	40X28	42.6/30.60	S-QFP-SM-256-A	SKT639

TEST & BURN-IN

0.65mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
52	10X10	13.9X13.9	S-QFP-00-052-A	SKT003
52	10X10	13.2X13.2	S-QFP-00-052-A1	SKT808
52	10X10	12X12	S-QFP-00-052-D	SKT572
52	10X10	12X12	S-QFP-00-052-F	SKT1614
64	14X14	17.2X17.2	S-QFP-00-064-F	SKT1022
64	12X12	14.6X14.6	S-QFP-00-064-H	SKT423
80	14X14	17.2X17.2	S-QFP-00-080-A	SKT005
80	14X14	16X16	S-QFP-00-080-F	SKT409
80	14X14	17.2X17.2	S-QFP-00-080-H	SKT1451
100	14X22	17.2/17.9 23.2/23.9	S-QFP-00-100-A	SKT007
100	14X20	17.2X23.2	S-QFP-00-100-A1	SKT410
100	14X20	16X22	S-QFP-00-100-A5	SKT573
112	20X20	23.2X23.2	S-QFP-00-112-A	SKT027
112	20X20	22X22	S-QFP-00-112-B	SKT1377
112	20X20	22X22	S-QFP-00-112-D	SKT1520
100	14X20	17.20X23.20	S-QFP-00-100-A2	SKT1706
144	26X26	31.2X31.2	S-QFP-00-144-B	SKT012
144	28X28	31.2X31.2	S-QFP-00-144-B1	SKT1705
144	28X28	31.2-31.9	S-QFP-00-144-D	SKT038
160	28X28	31.9X31.9	S-QFP-00-160-A	SKT013
160	28X28	31.2X31.2	S-QFP-00-160-A1	SKT800
160	28X28	31.9X31.9	S-QFP-00-160-A2	SKT013
160	28X28	31.20X31.90	S-QFP-00-160-B	SKT014
160	28X28	31.2X31.2	S-QFP-00-160-C	SKT1419

NOTE: Manufacturer's chip package drawing required with each order.

TEST & BURN-IN

0.635mm / .025" Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
100	22.9X22.9	22.9X22.9	S-QFP-00-100-B	SKT024
100	.900"	.880"	S-QFP-00-100-D	SKT008
132	24.13X24.13	27.94X27.94	S-QFP-00-132-E	SKT035
132	24.13	1.080"	S-QFP-00-132-A	SKT031
132	24.13	1.080"	S-QFP-00-132-B	SKT032
132	24.13	1.080"	S-QFP-00-132-C	SKT033
132	1.100"	1.080"	S-QFP-00-132-D	SKT034
164	1.300"	1.280"	S-QFP-00-164-C	SKT041
172	1.150"	1.610"	S-QFP-00-172-A	SKT043
196	34.39X34.39	38.1X38.1	S-QFP-00-196-B	SKT016

0.50mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
32	5X5	7X7	S-QFP-00-032-B	SKT1006
48	7X7	9X9	S-QFP-00-048-A	SKT002
48	7X7	9X9	S-QFP-00-048-B	SKT1460
64	10X10	12X12	S-QFP-00-064-C	SKT116
64	10X10	13.2X13.2	S-QFP-00-064-E	SKT541
80	12X12	14X14	S-QFP-00-080-D	SKT021
80	12X12	14X14	S-QFP-00-080-G2	SKT1598
100	14X14	16X16	S-QFP-00-100-G	SKT010
100	14X14	16X16	S-QFP-00-100-H	SKT574
100	14X14	16.6/16.9	S-QFP-00-100-L	SKT1659
120	14X14	17.9X17.9	S-QFP-00-120-C	SKT412
128	20X14	22X16	S-QFP-00-128-C	SKT544
128	20X14	23.2X17.2	S-QFP-00-128-C1	SKT831
144	20X20	22X22	S-QFP-00-144-E	SKT039
144	20X20	22X22	S-QFP-00-144-E1	SKT576
144	20X20	22X20	S-QFP-00-144-E2	SKT1660
160	24X24	26X26	S-QFP-00-160-F	SKT1287
176	24X24	26X26	S-QFP-00-176-A	SKT052
176	44X4	24X24	S-QFP-00-176-B	SKT513
208	28X28	31.2X31.2	S-QFP-00-208-A	SKT017
208	28X28	30.6X30.6	S-QFP-00-208-A1	SKT508
208	28X28	31.2X31.2	S-QFP-00-208-B	SKT046
208	28X28	30.6X30.6	S-QFP-00-208-B3	SKT047
208	28X28	31.9X31.9	S-QFP-00-208-B4	SKT504
208	28X28	30X30	S-QFP-00-208-B5	SKT1661
208	28X28	30X30	S-QFP-00-208-B7	SKT841
240	32X32	34.6X34.6	S-QFP-00-240-B	SKT048
240	32X32	34.6X34.6	S-QFP-00-240-C	SKT1339
304	40X40	42.6X42.6	S-QFP-00-304-A	SKT119

0.4mm Lead Pitch

Pin Count	Chip Size (mm)	Tip to Tip (mm)	ET Part #	Drawing #
128	14X14	16X16	S-QFP-00-128-E	SKT1285
176	20X20	22X22	S-QFP-00-176-C	SKT420
176	20X20	22X22	S-QFP-00-176-E	SKT1182

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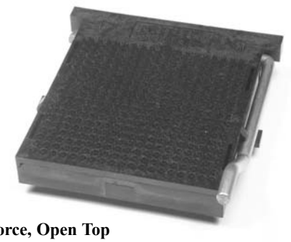
SOCKETS - PGA TEST & BURN-IN SOCKETS

PGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
20	5X5	S-PGA-05-020-A	SKT202
28	6X6	S-PGA-06-028-A	SKT204
30	6X6	S-PGA-06-030-A	SKT213
30	6X6	S-PGA-06-030-AZ	SKT214
32	7X7	S-PGA-07-032-A	SKT206
44	8X8	S-PGA-08-044-A	SKT208
44	8X8	S-PGA-08-044-AW	SKT209
44	8X8	S-PGA-08-044-AZ	SKT210
48	8X8	S-PGA-08-048-A	SKT212
52	9X9	S-PGA-09-052-A	SKT211
68	10X10	S-PGA-10-068-A	SKT215
68	10X10	S-PGA-10-068-AZ	SKT105
68	11X11	S-PGA-11-068-A	SKT220
68	11X11	S-PGA-11-068-AW	SKT221
68	11X11	S-PGA-11-068-AZ	SKT222
69	11X11	S-PGA-11-069-A	SKT223
69	11X11	S-PGA-11-069-AZ	SKT224
81	12X12	S-PGA-12-081-A	SKT239
84	10X10	S-PGA-10-084-A	SKT217
84	11X11	S-PGA-11-084-A	SKT523
84	11X11	S-PGA-11-084-AW	SKT225
84	13X13	S-PGA-13-084-A	SKT245
84	13X13	S-PGA-13-084-AW	SKT246
85	11X11	S-PGA-11-085-A	SKT226
85	11X11	S-PGA-11-085-AW	SKT227
85	11X11	S-PGA-11-085-AZ	SKT228
88	13X13	S-PGA-13-088-A	SKT160
88	13X13	S-PGA-13-088-AZ	SKT249
88	13X13	S-PGA-13-088-B	SKT250
96	11X11	S-PGA-11-096-A	SKT230
96	11X11	S-PGA-11-096-AZ	SKT231
100	12X12	S-PGA-12-100-A	SKT559
100	13X13	S-PGA-13-100-A	SKT253
100	13X13	S-PGA-13-100-B	SKT254
101	13X13	S-PGA-13-101-A	SKT257
108	12X12	S-PGA-12-108-A	SKT240
108	12X12	S-PGA-12-108-AW	SKT241
108	12X12	S-PGA-12-108-AZ	SKT242
112	11X11	S-PGA-11-112-A	SKT232
112	11X11	S-PGA-11-112-AZ	SKT233
114	13X13	S-PGA-13-114-A	SKT260
114	13X13	S-PGA-13-114-AZ	SKT262
116	11X11	S-PGA-11-116-A	SKT234
120	13X13	S-PGA-13-120-A	SKT263
120	17X17	S-PGA-17-120-A	SKT334
121	11X11	S-PGA-11-121-A	SKT235
121	11X11	S-PGA-11-121-AW	SKT1698
121	11X11	S-PGA-11-121-AZ	SKT237
121	13X13	S-PGA-13-121-A	SKT266
121	13X13	S-PGA-13-121-AZ	SKT267
128	13X13	S-PGA-13-128-A	SKT269
128	13X13	S-PGA-13-128-AZ	SKT271
132	13X13	S-PGA-13-132-A	SKT272
132	13X13	S-PGA-13-132-AZ	SKT274
132	14X14	S-PGA-14-132-A	SKT284
132	14X14	S-PGA-14-132-AZ	SKT286
133	13X13	S-PGA-13-133-A	SKT275
133	13X13	S-PGA-13-133-B	SKT560
144	12X12	S-PGA-12-144-A	SKT243
144	12X12	S-PGA-12-144-AZ	SKT244
144	12X12	S-PGA-12-144-B	SKT248
144	13X13	S-PGA-13-144-A	SKT276
144	13X13	S-PGA-13-144-AZ	SKT278
144	15X15	S-PGA-15-144-A	SKT296
145	15X15	S-PGA-15-145-A	SKT297
145	15X15	S-PGA-15-145-SM	SKT1384
156	16X16	S-PGA-16-156-A	SKT318
156	16X16	S-PGA-16-156-AZ	SKT320
160	13X13	S-PGA-13-160-A	SKT279
160	15X15	S-PGA-15-160-A	SKT302
160	15X15	S-PGA-15-160-AZ	SKT304
160	15X15	S-PGA-15-160-B	SKT1078

PGA Test & Burn-in Socket



Zero Insertion Force, Open Top

Ordering Information EXample

Product Code — Production Socket

S-PGA-13-020-A(Z) Optional:

Socket Type — (Z)= Burn-in Socket
(W)=Wire Wrap Posts

Socket Male Pattern

Pin Count — Note: No (Z) = Prod. Socket

PGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
168	17X17	S-PGA-17-168-A	SKT335
168	17X17	S-PGA-17-168-AS	SKT958
168	17X17	S-PGA-17-168-AZ	SKT336
168	17X17	S-PGA-17-168-BS	SKT1615
169	13X13	S-PGA-13-169-A	SKT280
175	16X16	S-PGA-16-175-A	SKT321
175	16X16	S-PGA-16-175-B	SKT324
175	16X16	S-PGA-16-175-BW	SKT325
175	16X16	S-PGA-16-175-BZ	SKT326
176	15X15	S-PGA-15-176-A	SKT521
176	15X15	S-PGA-15-176-AW	SKT303
176	15X15	S-PGA-15-176-AZ	SKT522
176	16X16	S-PGA-16-176-A	SKT327
176	16X16	S-PGA-16-176-AZ	SKT328
179	18X18	S-PGA-18-179-A	SKT360
179	18X18	S-PGA-18-179-AZ	SKT361
179	18X18	S-PGA-18-179-SM	SKT1669
180	18X18	S-PGA-18-180-A	SKT362
180	18X18	S-PGA-18-191-A	SKT1680
181	15X15	S-PGA-15-181-A	SKT310
181	15X15	S-PGA-15-181-AW	SKT311
191	18X18	S-PGA-18-191-AZ	SKT365
192	16X16	S-PGA-16-192-AZ	SKT331
192	17X17	S-PGA-17-192-A	SKT342
192	17X17	S-PGA-17-192-AZ	SKT343
196	14X14	S-PGA-14-196-A	SKT293
200	15X15	S-PGA-15-200-A	SKT313
200	15X15	S-PGA-15-200-AZ	SKT314
206	18X18	S-PGA-18-206-A	SKT1670
207	17X17	S-PGA-17-207-AZ	SKT344
208	17X17	S-PGA-17-208-A	SKT345
209	17X17	S-PGA-17-209-A	SKT347
209	17X17	S-PGA-17-209-AZ	SKT349

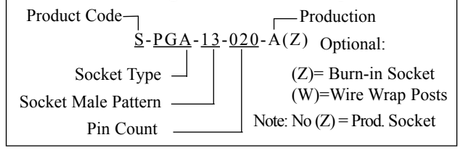
NOTE: Manufacturer's chip package drawing required with each order.

Call us (1-800-ADAPTER) or check out this link
to request an immediate custom quotation:
Web Link: **www.1800adapter.com/forms**

For a complete list of PGA Test & Burn-In Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/131

Don't be confused. Thru-hole, Surface Mount? BGA High Performance? Call ET today.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

Ordering Information Example



PGA TEST & BURN-IN (cont.)

Pin Count	Grid Pattern	ET Part #	Drawing #
220	16X16	S-PGA-16-220-A	SKT332
223	18X18	S-PGA-18-223-A	SKT366
223	18X18	S-PGA-18-223-AW	SKT367
223	18X18	S-PGA-18-223-AZ	SKT368
223	18X18	S-PGA-18-223B-B	SKT369
224	18X18	S-PGA-18-224-A	SKT370
224	18X18	S-PGA-18-224-AZ	SKT371
225	15X15	S-PGA-15-225-A	SKT316
225	15X15	S-PGA-15-225-AZ	SKT317
225	18X18	S-PGA-18-225-A	SKT372
225	15X15	S-PGA-15-225-AZ	SKT317
225	18X18	S-PGA-18-225-A	SKT372
225	18X18	S-PGA-18-225-AW	SKT566
232	17X17	S-PGA-17-232-A	SKT352
240	17X17	S-PGA-17-240-A	SKT353
240	17X17	S-PGA-17-240-AW	SKT354
240	17X17	S-PGA-17-240-AZ	SKT355
240	19X19	S-PGA-19-240-A	SKT384
240	20X20	S-PGA-20-240-AW	SKT889
241	18X18	S-PGA-18-241-A	SKT374
241	18X18	S-PGA-18-241-AZ	SKT375
244	19X19	S-PGA-19-244-A	SKT386
256	16X16	S-PGA-16-256-A	SKT1667
256	16X16	S-PGA-16-256-AW	SKT1668
256	20X20	S-PGA-20-256-A	SKT396
256	20X20	S-PGA-20-256-AW	SKT399
256	20X20	S-PGA-20-256-AZ	SKT397
257	19X19	S-PGA-19-257-A	SKT388
260	18X18	S-PGA-18-260-A	SKT376
271	21X21	S-PGA-21-271-A	SKT1673
273	21X21	S-PGA-21-273-A	SKT1079
280	19X19	S-PGA-19-280-A	SKT390
280	19X19	S-PGA-19-280-AW	SKT569
280	19X19	S-PGA-19-280-AZ	SKT391
288	18X18	S-PGA-18-288-AZ	SKT1671
289	17X17	S-PGA-17-289-A	SKT356
289	17X17	S-PGA-17-289-AW	SKT357
289	17X17	S-PGA-17-289-AZ	SKT358
300	20X20	S-PGA-20-300-A	SKT398
300	20X20	S-PGA-20-300-AW	SKT1672
300	20X20	S-PGA-20-300-AZ	SKT400
315	18X18	S-PGA-18-315-A	SKT568
319	21X21	S-PGA-21-319-A	SKT1586
324	18X18	S-PGA-18-324-AZ	SKT379
350	21X21	S-PGA-21-350-AZ	SKT1681
361	19X19	S-PGA-19-361-A	SKT1113
361	19X19	S-PGA-19-361-AZ	SKT392
400	20X20	S-PGA-20-400-A	SKT401
400	20X20	S-PGA-20-400-AW	SKT819
431	24X24	S-PGA-24-431-A	SKT1674
456	22X22	S-PGA-22-456-AW	SKT1583
625	25X25	S-PGA-25-625-A	SKT1675
625	25X25	S-PGA-25-625-AZ	SKT1676
625	25X25	S-PGA-25-625-BZ	SKT1677

NOTE: Manufacturer's chip package drawing required with each order.

Call us (1-800-ADAPTER) or check out this link
to request an immediate custom quotation:
Web Link: www.1800adapter.com/forms

HGA TEST & BURN-IN

Pin Count	Grid Pattern	ET Part #	Drawing #
141	19X19	S-HGA-19-141-A	SKT545
141	19X19	S-HGA-19-141-AL	SKT1010
296	37X37	S-HGA-37-296-A	SKT170
296	37X37	S-HGA-37-296-A1	SKT171
296	37X37	S-HGA-37-296-AL	SKT184
296	37X37	S-HGA-37-296-AZ	SKT545
320	37X37	S-HGA-37-320-PN	SKT1584
321	37X37	S-HGA-37-321-AL	SKT1331
325	35X35	S-HGA-35-325-A	SKT169
325	35X35	S-HGA-35-325-AZ	SKT1651
365	33X33	S-HGA-33-365-A	SKT552
365	33X33	S-HGA-33-365-AL	SKT1650
370	37X37	S-HGA-37-370-A	SKT1011
370	37X37	S-HGA-37-370-AL	SKT183
370	37X37	S-HGA-37-370-AZ	SKT838
387	47X47	S-HGA-47-387-AZ	SKT553
391	35X35	S-HGA-35-391-A	SKT520
403	37X37	S-HGA-37-403-A	SKT546
403	37X37	S-HGA-37-403-AL	SKT1484
403	37X37	S-HGA-37-403-AZ	SKT547
411	39X39	S-HGA-39-411-A	SKT708
411	39X39	S-HGA-39-411-AZ	SKT1374
423	39X39	S-HGA-39-423-A	SKT1290
429	37X37	S-HGA-37-429-A	SKT784
429	37X37	S-HGA-37-429-AL	SKT179
447	39X39	S-HGA-39-447-A	SKT548
447	39X39	S-HGA-39-447-AL	SKT549
463	37X37	S-HGA-37-463-A	SKT530
463	37X37	S-HGA-37-463-AL	SKT531
503	43X43	S-HGA-43-503-A	SKT534
503	43X43	S-HGA-43-503-AL	SKT550
503	43X43	S-HGA-43-503-AZ	SKT551
559	43X43	S-HGA-43-559-A	SKT709
655	47X47	S-HGA-47-655-AZ	SKT939
761	39X39	S-HGA-39-761-AZ	SKT177

FLATPACK TEST & BURN-IN

Pin Count	Carrier Size (mm)	ET Part #	Drawing #
14	75X1 CRR	S-FLT-00-014-A	SKT162
16	CONSULT FACTORY	S-FLT-00-016-A	SKT163
24	1.25X1.25	S-FLT-00-024-A	SKT164
24	1.25X1.25	S-FLT-00-024-B	SKT165
28	1.25X1.25	S-FLT-00-028-A	SKT168
28	1.25X1.25	S-FLT-00-028-B	SKT1646
32	CONSULT FACTORY	S-FLT-00-032-A	SKT1647
44	2.75X2.75	S-FLT-00-044-A	SKT1648
44	2.75X2.75	S-FLT-00-044-B	SKT1649
84	CONSULT FACTORY	S-FLT-00-084-A	SKT167
160	CONSULT FACTORY	S-FLT-00-160-A	SKT166
176	CONSULT FACTORY	S-FLT-00-176-A	SKT1391
176	CONSULT FACTORY	S-FLT-00-178-A	SKT750
256	CONSULT FACTORY	S-FLT-00-256-A	SKT1521

LCC TEST & BURN-IN

Pin Count	ET Part #	Drawing #
8	S-LCC-00-008-A	SKT1385
20	S-LCC-00-020-A	SKT172
28	S-LCC-00-028-A	SKT175
32	S-LCC-00-032-A	SKT176
32	S-LCC-00-032-E	SKT1515
32	S-LCC-07-032-A	SKT185
32	S-LCC-SM-032-A	SKT192
32	S-LCC-SM-032-B	SKT193
44	S-LCC-00-044-A	SKT180
48	S-LCC-00-048-B	SKT181
52	S-LCC-00-052-A	SKT182
68	S-LCC-11-068-A	SKT188
68	S-LCC-SM-068-A	SKT1164
84	S-LCC-13-084-C	SKT191

SOCKETS - PLCC BURN-IN/ PRODUCTION/ THRU-HOLE & SMT

PLCC BURN-IN TEST

Pin Count	ET Part #	Drawing #
20	S-PCC-00-020-A	SKT075
20	S-PCC-00-020-B	SKT076
28	S-PCC-00-028-A	SKT078
28	S-PCC-00-028-B	SKT079
28	S-PCC-00-028-C	SKT196
32	S-PCC-00-032-A	SKT080
32	S-PCC-00-032-C	SKT082
32	S-PCC-00-032-D	SKT083
32	S-PCC-00-032-K	SKT084
44	S-PCC-00-044-A	SKT085
44	S-PCC-00-044-B	SKT086
44	S-PCC-00-044-C	SKT197
44	S-PCC-00-044-D	SKT087
52	S-PCC-00-052-A	SKT088
52	S-PCC-00-052-B	SKT089
68	S-PCC-00-068-B	SKT091
68	S-PCC-00-068-C	SKT199
84	S-PCC-00-084-B	SKT093
84	S-PCC-00-084-C	SKT094

For a complete list of PLCC Test & Burn-In Socket specifications, pricing and delivery information, see:
Web Link: www.1800adapter.com/108

PRODUCTION THRU-HOLE

Pin Count	ET Part #	Drawing #
20	S-PCC-05-020-A	SKT095
28	S-PCC-06-028-A	SKT096
32	S-PCC-07-032-A	SKT097
44	S-PCC-08-044-A	SKT098
52	S-PCC-09-052-A	SKT099
68	S-PCC-11-068-A	SKT100
84	S-PCC-13-084-A	SKT102

For a complete list of PLCC Thru-Hole Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/109

PRODUCTION SMT

Pin Count	ET Part #	Drawing #
20	S-SMT-05-020-B	SKT1200
20	S-SMT-05-020-A	SKT443
28	S-SMT-07-028-A	SKT444
32	S-SMT-09-032-A	SKT445
44	S-SMT-11-044-A	SKT446
52	S-SMT-13-052-A	SKT447
68	S-SMT-17-068-A	SKT448
84	S-SMT-21-084-A	SKT449

For a complete list of PLCC Production Socket specifications, pricing and delivery information, please see:
Web Link: www.1800adapter.com/110

NOTE: Manufacturer's chip package drawing required with each order.

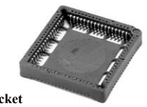
Emulation Technology Recommends:

Try our **PLCC Daughterboard Plugs**
Designed to provide a connection betweenyour printed circuit board and your PLCC production socket

Web Link: www.emulation.com/plccplugs

Try our **PLCC Socketable Bug Katchers**
PLCC Bug Katchers make it easy to attach test leads to socketed ICs in PLCC packages

Web Link: www.1800adapter.com/119



SMT Socket

Thru-Hole Socket

PLCC Socket with Cover

Ordering Information Example

S=Product Code — S-PCC-00-020-A — Socket Version
Pin Count
00 = Test & Burn-in Thru-hole
SM = Prod. Surface Mount
Package Style

PLCC Extraction Tool

- Use this to extract PLCC packages from their production sockets
- Prevents bending or breaking of adjacent leads
- Puller works on PLCC packages with 20, 28, 32, 44, 52, 68, 84, and 100 pin counts

P/N-290N-SUN

Web Link: www.1800adapter.com/053

PLCC Vacuum Insertion Tool

- Use this tool to easily insert PLCC packages into their sockets.
- Inserters works on PLCC packages with pin counts 28 to 84
- Conductive plastic material is an active grounding device against static charging

TW2250-68/84

TW2250-28/44

Web Link: www.1800adapter.com/053

Vacuum Pen

- Eliminates need to touch fragile QFP and SOIC packages
- Few mechanical parts, will last for years
- Vacuum is built in
- Comes with 3 straight tips and 3 angled tips

P/N-100

P/N-102

Web Link: www.1800adapter.com/086

Don't be confused. Thru-hole, Surface Mount? BGA High Performance? Call ET today.
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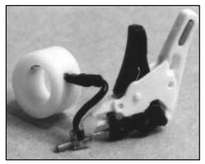
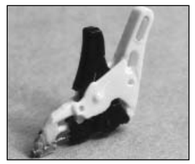
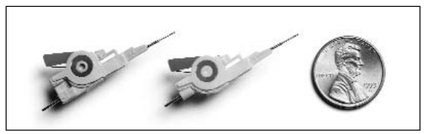
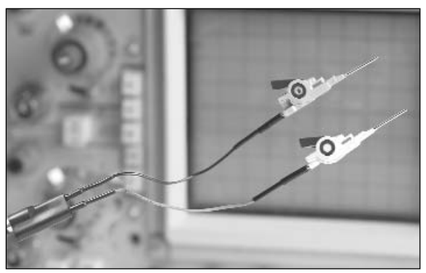
TEST CLIPS & OSCILLOSCOPE PROBES

Emulation Technology test adapters and Oscilloscope probes are designed especially for testing dual-in-line IC packages on high-density PC boards . Many of the test clips and probes are specifically designed for ultra-dense packaged chips located adjacent to each other. As chip packages shrink the ability to test becomes increasingly challenging. Test clips and probes can readily assist the user looking for a cost-effective means of testing signals at the chip level.









FEATURES & BENEFITS

- Allow Access to Board-Mounted IC Signals
- Allow hands-free testing and debugging of ICs soldered onto PCBs
- Clips either piggy-back or clip onto IC packages. Many models also lock onto the device's body for a secure connection
- Test points provide quick connection of test cable assemblies, test probes, or wire wraps. Most models provide signal labeling
- Some designs allow a "known good" device to be soldered onto the Clip. Target system diagnostics may then be run while the board-mounted device is disabled
- Many designs may also be used as emulator adapters
- Several styles are available

	Popular Test Clip Styles
SSOP	Locking feature; Test Point spacing: .050" or .100".
TSOP	Elastomeric Connectors instead of pins; Low-profile; Connector styles: Male-to-Male, Flex, and Rigid.
SOIC/SOJ/QFP	EIAJ: Standard & Locking versions; JEDEC: Locking; Optional Flex or Rigid connector.
DIP	Standard & High-Density versions.
PLCC	Quad Clip: With optional Extender Cables; Low-Profile: With straight or 90º test leads.

Custom Solutions are avilable. Call us today.

Information Required for Ordering:

1) IC Package information: Manufacturer, Part Number and package outline drawing

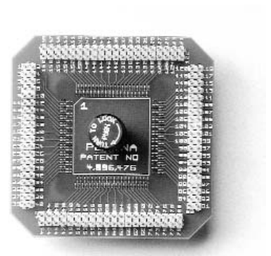
2) Clearance: Distance between IC & other components

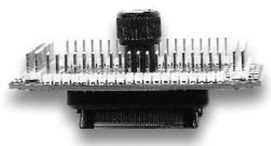
3) Preferred features: Locking Clip, Test Lead or Connector style Test Lead Pitch, etc.

Test Clips & Oscilloscope Probes	**Page**
Deluxe Probe Kits	**175, 176**
DIP Test Clips	**167**
Flying Test Leads	**164**
MicroGrippers High Speed to 5 GHz	**172**
MicroGrippers High Speed to 5—10 GHz	**173**
MicroGrippers, 1—100MHz	**170, 171**
PLCC Test Clip Cables	**163**
PLCC Test Clips	**163**
Probe Fixture, Adjustable	**176**
QFP Friction Lock Test Clips	**162**
PQFP/TQFP JEDEC Locking Test Clips	**161**
PQFP/TQFP Locking Test Clips	**160**
SMD Grabbers	**168, 169**
SMD Test Probes	**174, 175**
SMD Tweezer Clips	**175**
SOIC Test Clips	**164**
SSOP Test Clips	**165**

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/040

LOCKING TEST CLIPS - EIAJ





CLIP-080-QF14-B-L

Ordering Information Example

Pin Count — Clip Type
Product Code — CLIP-160-QF07-A-L — Locking Test Clip
QFP Footprint (see Footprint Section)

LOCKING TEST CLIPS
EIAJ TYPE

This ET PQFP Clip® is specifically designed for testing EIAJ metric Plastic Quad Flatpack (PQFP) surface mounted ICs. It piggybacks onto a soldered-in PQFP, and converts the PQFP leads to standard .1" test points, for easy attachment of test instruments.

As an option, on most ET PQFP Test Clips you can solder a known "good" PQFP device to the top of the PQFP clip, disable the device at board level, and then run your target system diagnostics.

In addition, the PQFP clip can be used to convert a PQFP to any other IC package type for easy emulation.

METRIC PQFP/TQFP TEST CLIPS

Pin Count	Package Shape	Lead Pitch in./mm	Body Size (+/- .4mm)	Critical Dimensions (+/- .1mm)	Drawing#	Part Number
80	RECT.	.0315/.80	14X20	16.3X22.3	F4145	CLIP-080-QF08-A-L
80	RECT.	.0315/.80	14X20	15.6X21.6	F4146	CLIP-080-QF08-B-L
100	RECT.	.0256/.65	14X20	16.3X22.3	F5031	CLIP-100-QF06-A-L
100	RECT.	.0256/.65	14X20	15.6X21.6	F4149	CLIP-100-QF06-B-L
144	SQ.	.019/.50	20X20	21.4 SQ.	F4671	CLIP-144-QF63-D-L
160	SQ.	.0256/.65	28X28	30.3 SQ.	F4150	CLIP-160-QF07-A-L
160	SQ.	.0256/.65	28X28	29.6 SQ.	F4151	CLIP-160-QF07-B-L
176	SQ.	.0196/.50	24X24	25.0 SQ.	F4672	CLIP-176-QF67-D-L
208	SQ.	.0196/.50	28X28	29.6 SQ.	F4152	CLIP-208-QF21-C-L
240	SQ.	.0196/.50	32X32	33.6 SQ.	F4822	CLIP-240-QF62-C-L
304	SQ.	.0196/.50	40X40	41.6 SQ.	F5244	CLIP-304-QF61-C-L

Try our **SOIC Flying Test Leads**. *Female. Plugs onto .025" wire wrap post; maintains 1/10" spacing.*
Web Link: www.1800adapter.com/089

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/040

HOW TO ORDER

Use the tables on these pages to select your test clip, based on the package drawing for your chip.

1) Select pin count.

2) Select lead pitch and body size.

3) Verify the footprint in the Footprint Section.

Test at the chip scale level with confidence using ET's test clips and oscilloscope accessories.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

LOCKING QFP TEST CLIPS
JEDEC TYPE

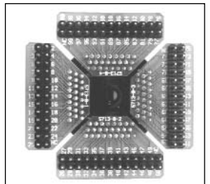
Now you can test your PQFP devices—even while they're soldered to a PC board! The ET PQFP Clip® is specifically designed to allow testing of surface mounted JEDEC plastic or ceramic Quad Flat Packs. It piggybacks onto a soldered-in PQFP, and converts the PQFP leads to standard .1" test points, for easy attachment of test instruments.

The special "locking" feature ensures positive electrical interconnection while providing a solid mechanical connection in either the vertical or horizontal plane. The mechanism locks to the body of the IC, avoiding damage to the leads.

CONTACTS: Selectively gold plated Beryllium Copper.
INSULATION: Liquid crystal polymer and Nylon, black.
RATING: 250 VRMS Max., 1 Amp Max., +110° C (+230°F) Max.

CLIP-132-QF03-2

CLIP-132-QF03-0



CLIP-100-QF01-1

Ordering Information Example

Pin Count — Product Code — CLIP-132-QF03-1
Clip Type (see table, below)
QFP Footprint (see Footprint Section)

JEDEC = Joint Electronic Device Engineering Council

HOW TO ORDER

Use the tables on these pages to select your test clip, based on the package drawing for your chip.

1) Select pin count.
2) Select lead pitch and body size.
3) Verify the footprint in the Footprint Section.

JEDEC QFP TEST CLIPS

Pin Count	Lead Pitch in./mm	Body Size	Package/ Footprint Drawing #	Part Number	Drawing #
100	.025/.635	.750" SQ.	100-QF01	CLIP-100-QF01-0	F3718
100	.025/.635	.750" SQ.	100-QF01	CLIP-100-QF01-1	F2067
100	.025/.635	.750" SQ.	100-QF01	CLIP-100-QF01-2	F1447
132	.025/.635	.950" SQ.	132-QF03	CLIP-132-QF03-0	F3833
132	.025/.635	.950" SQ.	132-QF03	CLIP-132-QF03-1	F1795
132	.025/.635	.950" SQ.	132-QF03	CLIP-132-QF03-2	F1648

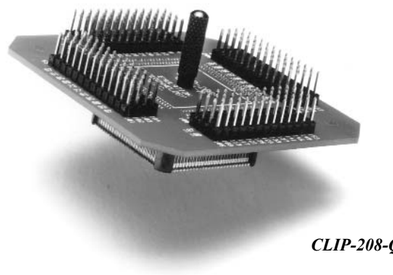
Note: (1) PQFP Only

Clip Type

Type	Top Circuit Board	Height	Test Points
-0	None	1.7" Typ.	.075" Stagger
-1	4-Piece Assembly	1.9" Typ.	.100" In-Line
-2	1-Piece with Flex Cable	1.9" Typ.	.100" In-Line

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

TEST CLIPS - EIAJ



CLIP-208-QF21-C

Ordering Information Example

Pin Count — CLIP-080-QF08-B(C)
- Pin Count: 080
- Product Code: QF08
- Clip Version (see Table below, at right): B(C)
- Clip for Ceramic Package
- QFP Footprint (see Footprint Section): QF08

EIAJ = Electronic Industry Association of Japan

METRIC QFP TEST CLIPS

Pin Count	Package Shape	Lead Pitch in./mm	Body Size (+/- .4mm)	Critical Dimensions (+/- .1mm)	Part Number	Drawing #
44	SQ.	0.80	10X10	12.3 SQ.	CLIP-044-QF16-A	F1446
44	SQ.	0.80	10X10	11.6 SQ.	CLIP-044-QF16-B	F1832
64	RECT.	1.00	14X20	16.6X22.3	CLIP-064-QF09-A	F1670
64	RECT.	1.00	14X20	15.6X21.6	CLIP-064-QF09-B	F1672
64	SQ.	0.80	14X14	16.3 SQ.	CLIP-064-QF29-A	F3712
64	SQ.	0.80	14X14	15.6 SQ.	CLIP-064-QF29-B	F3713
80	RECT.	0.80	14X20	16.3X22.3	CLIP-080-QF08-A	F1628
80	RECT.	0.80	14X20	15.6X21.6	CLIP-080-QF08-B	F1339
80	SQ.	0.65	14X14	16.3 SQ.	CLIP-080-QF14-A	F2175
80	SQ.	0.65	14X14	15.6 SQ.	CLIP-080-QF14-B	F2176
80	SQ.	0.50	12X12	N/A	CLIP-080-QF47-2	F6625
100	RECT.	0.65	14X20	16.3X22.3	CLIP-100-QF06-A	F1629
100	RECT.	0.65	14X20	15.6X21.6	CLIP-100-QF06-B	F1340
100	RECT.	0.65	14X20	14.8X20.8	CLIP-100-QF06-2	F5677
112	SQ.	0.65	20X20	22.3 SQ.	CLIP-112-QF36-B/C	F3721
120	SQ.	0.80	28X28	30.3 SQ.	CLIP-120-QF05-A	F1608
120	SQ.	0.80	28X28	29.6 SQ.	CLIP-120-QF05-B	F1609
128	SQ.	0.80	28X28	30.3 SQ.	CLIP-128-QF13-A	F1192
128	SQ.	0.80	28X28	29.6 SQ.	CLIP-128-QF13-B	F1342
144	SQ.	0.65	28X28	30.3 SQ.	CLIP-144-QF10-A	F1606
144	SQ.	0.65	28X28	29.6 SQ.	CLIP-144-QF10-B	F1607
144	SQ.	0.65	28X28	29.6 SQ.	CLIP-144-QF10-BC	F1807
160	SQ.	0.65	28X28	30.3 SQ.	CLIP-160-QF07-A	F5237
160	SQ.	0.65	28X28	29.6 SQ.	CLIP-160-QF07-B	F3722
168	SQ.	0.65	28X28	29.6 SQ.	CLIP-168-QF25-B	F1344
208	SQ.	0.50	28X28	30.3 SQ.	CLIP-208-QF21-2	F5875
208	SQ.	0.50	28X28	29.6 SQ.	CLIP-208-QF21-C	F1415
240	SQ.	0.50	32X32	33.6 SQ.	CLIP-240-QF62-C	F2164
240	SQ.	0.50	32X32	33.6 SQ.	CLIP-240-QF62-CM	F1297
240	SQ.	0.50	32X32	33.6 SQ.	CLIP-240-QF62-2	F1716
304	SQ.	0.50	40X40	41.6 SQ.	CLIP-304-QF61-C	F3729

For a complete SOIC Flying Test Leads listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/089

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/040

QFP TEST CLIPS

EIAJ TYPE

This ET PQFP Clip® is specifically designed for testing EIAJ or JEDEC metric Plastic Quad Flatpack (PQFP) surface mounted ICs. It piggybacks onto a soldered-in PQFP, and converts the PQFP leads to standard .1" test points, for easy attachment of test instruments.

As an option, on most ET PQFP Test Clips you can solder a known "good" PQFP device to the top of the PQFP clip, disable the device at board level, and then run your target system diagnostics.

In addition, the PQFP clip can be used to convert a PQFP to any other IC package type for easy emulation.

CONTACTS: 0.30mm (.010") Sq. pins, Beryllium Copper, gold plated.
INSULATION: Liquid crystal polymer. Vectra A-130, black.
RATING: 250 VRMS Max., 5 Amps, +110°C (+230°F) Max.

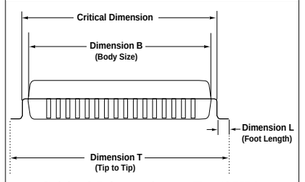
HOW TO ORDER

1) Select pin count.
2) Select lead pitch and body size. Tolerance on body size is +/- .4mm.
3) Calculate critical dimension. **Tolerance on Critical Dimension is +/-.1mm.** See example below.

Clip Version

Type	Tip to Tip Dimension (T)
-A	Body size + 3.9mm
-B	Body size + 3.2mm
-C	Body size + 2.6mm
-D	Body size + 2.0mm

Calculating your Critical Dimension



Critical Dimension = T - (2XL)

Test at the chip scale level with confidence using ET's test clips and oscilloscope accessories.
Tel: **1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

PLCC QUAD CLIP™

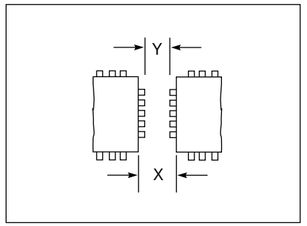
QUAD CLIP™ is designed for Plastic Leaded Chip Carriers (PLCC) with "J" leads. Latches on diagonal sides allow the adapter to be positively held in place providing hands free testing.

UPPER CONTACTS: .635mm (.025") Sq. pins. Phosphor Bronze, gold plated.

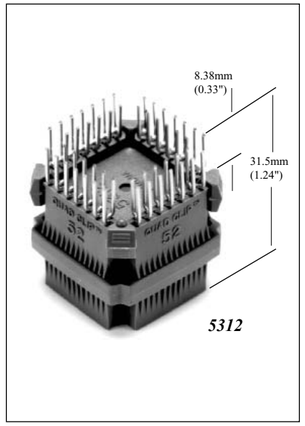
INSULATION: Glass-filled nylon, gray.

CONTACT: Beryllium Copper, gold plated.

RATING: 500 VRMS; 1 Amp; +102°C (+216°F) Max.



	X Min.	Y Min.
Single Chip Testing	3.05mm (.120")	2.79mm (.110")
Adjacent Testing	8.26mm (.325")	7.24mm (.285")

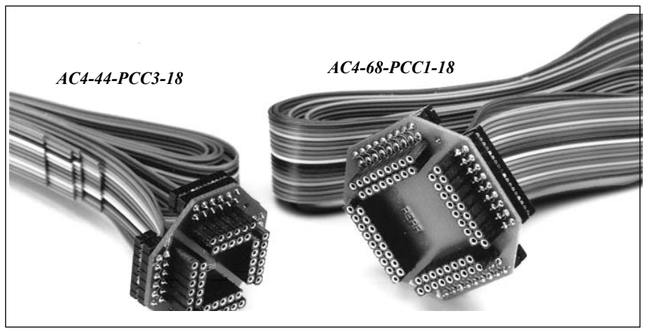


5312

Pin Count	Pins per Side	Pitch	Part #
20	5X5	.050"	5279
28	7X7	.050"	5280
32	7X9	.050"	5733
44	11X11	.050"	5281
52	13X13	.050"	5312
68	17X17	.050"	5401
84	21X21	.050"	5402

PLCC TEST CLIP CABLE ATTACHMENTS

- Clip extenders work with the PLCC QUAD Clips above.



Pin Count	Dimensions	Part #	Drawing #
32	1.250X1.350	AC4-32-PCC7-18	F5378
44	1.45" SQ.	AC4-44-PCC3-18	F3703
52	1.55" SQ.	AC4-52-PCC4-18	F3704
68	1.75" SQ.	AC4-68-PCC1-18	F3705
84	1.95" SQ.	AC4-84-PCC5-18	F3706

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

TEST CLIPS - SOIC / FLYING TEST LEADS

FEMALE TO FEMALE

Part #	Length	Quantity
03-3103	76 mm (3.0")	10/pkg
03-3104	101.5 mm (4.0")	10/pkg
03-3106	152.4 mm (6.0")	10/pkg
03-3110	254 mm (10.0")	10/pkg
03-3112	305 mm (12.0")	10/pkg

FEMALE TO MALE

Part #	Length	Quantity
04-3103	76 mm (3.0")	10/pkg
04-3104	101.5 mm (4.0")	10/pkg
04-3106	152.4 mm (6.0")	10/pkg
04-3110	254 mm (10.0")	10/pkg
04-3112	305 mm (12.0")	10/pkg
04-3136	915 mm (36.0")	10/pkg

FEMALE TO FEMALE

WIRE: 26 AWG, 19X38 t.c., polyvinyl insulation.
1ST END: Female. Plugs onto .025" wire wrap post; maintains 1/10" spacing.
2ND END: Female.
RATING: Operating Voltage: 500 VRMS Max.; +50^{O} (+122^{O}F)

FEMALE TO MALE

WIRE: 26 AWG, 19X38 t.c., polyvinyl insulation.
1ST END: Female. Plugs onto .025" wire wrap post; maintains 1/10" spacing.
2ND END: Male.
RATING: Operating Voltage: 500 VRMS Max.; +50^{O} (+122^{O}F)

For a complete SOIC Flying Test Leads listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/089

FEMALE TO FEMALE

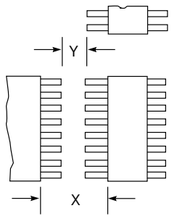
CLOSE UP OF FEMALE TEST LEAD END

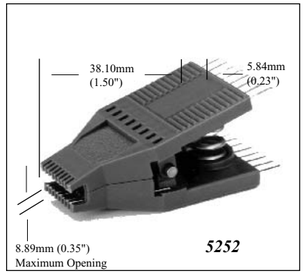
FEMALE TO MALE NOT SHOWN.

SOIC CLIP™

This test clip is designed specifically for testing Small Outline Integrated Circuits (SOIC). The SOIC Clip™ assures a positive connection and provides hands-free testing convenience.

- 0.64mm (.025") square access pins on upper end permits either individual pin testing or the use of 2.54mm (.100") spaced connectors. Lead pitch is .050".
- Molded barrier between each contact allows connections to be made on live boards without accidental shorting of adjacent contacts





INSULATION: Glass-filled nylon, blue.

CONTACT: Beryllium Copper, gold plated.

RATING: 500 VRMS; 1 Amp; +102^{O}C (+216^{O}F) Max.

	X Min.	Y Min.
Single Chip Testing	4.06mm (.160")	1.52mm (.060")
Narrow Body (Adjacent)	15.24mm (.600")	12.70mm (.500")
Wide Body (Adjacent)	8.51mm (.335")	5.97mm (.235")

Pin Count	Part #
8	5250
14	5251
16	5252
20	5253
24	5254
28	5437
32	6107
40	6108
44	6109

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

SSOP TEST CLIPS

These test clips provide you with an easy means to connect your instrument to the fine pitch plastic SSOP chip leads.
SSOP test clips are perfect for emulation, field service testing, and failure analysis.

The locking mechanism holds the clip to the device by gripping the chip body at the ends of the package. Each contact is individually cantelevered to assure positive contact, regardless of coplanarity. The top interface connects with high density IDC cable connectors.

MATERIAL:

Upper Contacts - .018 sq. pins, Phospor Bronze, gold plated, 30 microinches Max

Lower Contacts - Beryllium Copper, gold plated. Handle, Aluminum alloy, black anodized

INSULATION: Body, Ultem and nylon.

CONDUCTOR: Beryllium Copper, gold plated. Insulation, Kapton

RATING: 250 VRMS; 1 Amp; +110°C (+230°F) Max.

FEATURES

- Interfaces with high density SSOP chip leads
- Locking feature insures positive retention on the chip in either vertical or horizontal position
- Label on top of clip provides a guide for pin numbering
- Gold plated contacts for the chip leads and the connector pins assure noise free connection

Note: Will not work on .110" or thicker IC

CLIP-048-SS06-1

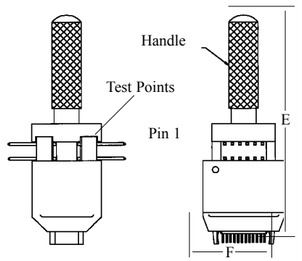
CLIP-048-SS06-0

Ordering Information Example

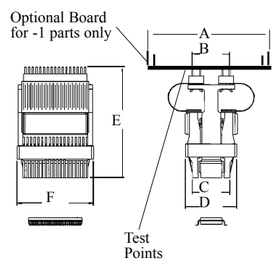
Pin Count
Product Code — CLIP-048-SS06-1 — Clip Version:
SSOP Footprint (see Footprint Section)

-0 = .05" Test Point Spacing
-1 = .1" Test Point Spacing

20/24 PIN



48/56 PIN



48/56 SSOP Test Clip Dimensions

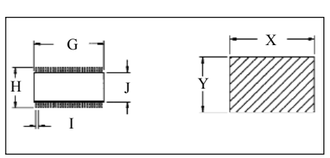
Part #	Document #	A	B	C	D	E	F
CLIP-048-SS06-0	F2013	1.15	.500	.506	.695	1.50	.835
CLIP-048-SS06-1	F2012	1.15	.500	.506	.695	1.50	.835
CLIP-048-SS15-2	Consult Drawing						
CLIP-056-SS06-0	F2011	1.15	.500	.506	.695	1.50	1.02
CLIP-056-SS06-1	F2008	1.15	.500	.506	.695	1.50	1.02

48/56 SSOP Dimensions/Required Board Space

Package Type	G	H	I	J	X	Y
48-SS06	.625"	.420"	.025"	.300"	.720"	.570"
56-SS06	.725"	.420"	.025"	.300"	.870"	.570"

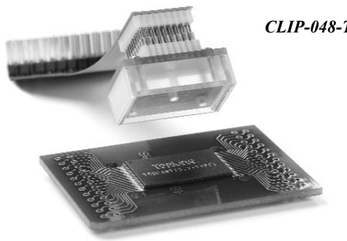
20/24 SSOP Test Clip Dimensions/Required Board Space

Part #	Document #	Pin Ct	E	F	I	J	X	Y
CLIP-020/24-SS12-1	F3708	20/24	1.54"	.54"	.025"	.154"	.540"	.530"
CLIP-020-SS04-1	F3707	20	1.54"	.54"	.065"	.209"	.370"	.310"
CLIP-024-SS04-1	F3709	24	1.54"	.54"	.065"	.209"	.400"	.310"



For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

TEST CLIPS - TSOP



CLIP-048-TS01-FLEX

Ordering Information Example

TSOP Footprint
Pin Count
Product Code — **CLIP-048-TS01 (-MALE, -FLEX, -RIGID, -KIT)**
TSOP Clip (includes base and male socket)
TSOP Clip and all TPC options
TSOP Clip and Flex TPC
TSOP Clip and Rigid TPC
Test Point Connector (TPC) options

TSOP CLIP WITH MALE SOCKET

Part #	Document #	Lead Pitch	Body Size	Footprint Code
CLIP-028-TS05-MALE	F4235	.55mm	11.8mm	028-TS05
CLIP-032-TS01-MALE	F4234	.50mm	18.4mm	032-TS01
CLIP-032-TS04-MALE	F4234	.50mm	12.4mm	032-TS04
CLIP-040-TS01-MALE	F4233	.50mm	18.4mm	040-TS01
CLIP-048-TS01-MALE	F4232	.50mm	18.4mm	048-TS01
CLIP-048-TS02-MALE	F4236	.50mm	16.4mm	048-TS02
CLIP-056-TS01-MALE	F4231	.50mm	18.4mm	056-TS01

TSOP CLIP WITH FLEX TEST POINT CONNECTOR

Part #	Document #	Lead Pitch	Body Size	Footprint Code
CLIP-028-TS05-FLEX	F4243	.55mm	11.8mm	028-TS05
CLIP-032-TS01-FLEX	F4242	.50mm	18.4mm	032-TS01
CLIP-032-TS04-FLEX	F4242	.50mm	12.4mm	032-TS04
CLIP-040-TS01-FLEX	F4241	.50mm	18.4mm	040-TS01
CLIP-048-TS01-FLEX	F4240	.50mm	18.4mm	048-TS01
CLIP-048-TS02-FLEX	F4244	.50mm	16.4mm	048-TS02
CLIP-056-TS01-FLEX	F4239	.50mm	18.4mm	056-TS01

TSOP CLIP WITH RIGID TEST POINT CONNECTOR

Part #	Document #	Lead Pitch	Body Size	Footprint Code
CLIP-028-TS05-RIGID	F4251	.55mm	11.8mm	028-TS05
CLIP-032-TS01-RIGID	F4250	.50mm	18.4mm	032-TS01
CLIP-032-TS04-RIGID	F4254	.50mm	12.4mm	032-TS04
CLIP-040-TS01-RIGID	F4249	.50mm	18.4mm	040-TS01
CLIP-048-TS01-RIGID	F4248	.50mm	18.4mm	048-TS01
CLIP-048-TS02-RIGID	F4252	.50mm	16.4mm	048-TS02
CLIP-056-TS01-RIGID	F4247	.50mm	18.4mm	056-TS01

TSOP CLIP KIT (Includes all of the Above)

Part #	Document #	Lead Pitch	Body Size	Footprint Code
CLIP-028-TS05-KIT	N/A	.55mm	11.8mm	028-TS05
CLIP-032-TS01-KIT	N/A	.50mm	18.4mm	032-TS01
CLIP-032-TS04-KIT	N/A	.50mm	12.4mm	032-TS04
CLIP-040-TS01-KIT	N/A	.50mm	18.4mm	040-TS01
CLIP-048-TS01-KIT	N/A	.50mm	18.4mm	048-TS01
CLIP-048-TS02-KIT	N/A	.50mm	16.4mm	048-TS02
CLIP-056-TS01-KIT	N/A	.50mm	18.4mm	056-TS01

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/040

TSOP TEST CLIPS

This is the first clip-on solution specifically designed for testing Thin Small Outline Packages (TSOPs). Its low-profile design and use of directionally conductive elastomeric connectors make it ideal for probing units up to .030" apart and with a lead pitch of 0.50mm to 0.55mm.

MATERIAL:
Body: Vespel Æ
Pins: 10µ" Gold over 100µ" Nickel
Posts: 10µ" Gold over 50µ" Nickel

OPERATING CHARACTERISTICS:
Elastomer Base:
250 milliohms
Flex Test Point Connector:
150 milliohms
Rigid Test Point Connector:
350 milliohms

HOW TO ORDER

1) Select pin count.
2) Determine lead pitch and body size. Tolerance on body size is +/- .4mm.
3) Verify the correct footprint (See footprint section in catalog).

Test at the chip scale level with confidence using ET's test clips and oscilloscope accessories.
***Tel:* 1-800-ADAPTER (800-232-7837) or *Tel:* (408) 982-0660 *Web*: www.1800adapter.com *Fax:* (408) 982-0664**

DIP CLIP™

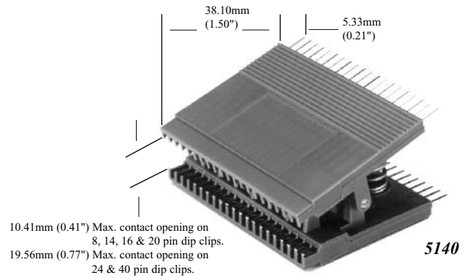
Emulation Technology test adapters are designed especially for testing dual-in-line IC packages on high-density PC boards. The DIP CLIP™ test adapter has many built-in features that assure a positive electrical connection while providing hands-free testing.

The high density DIP CLIP™ test adapters are used for ultra-dense packaged chips located adjacent to each other on 2.54mm (.100") spacing.

MATERIAL: Contact, tarnish resistant Nickel, Silver or Gold plated Beryllium Copper. Stainless steel hinge pin and spring.

INSULATION: Glass filled nylon, blue.

RATING: 500 VRMS; 1 Amp; +102°C (+126°F) Max.

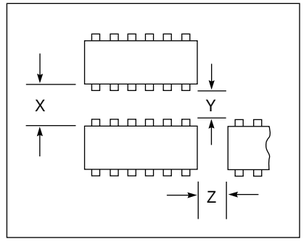


Part #	No. of Pins	Contact Material	Type
5108	8	Gold Plated Beryllium Copper	Standard
5208	8	Gold Plated Beryllium Copper	High Density
5014	14	Spring Tempered Nickel Silver	Standard
5114	14	Spring Tempered Nickel Silver	High Density
5214	14	Gold Plated Beryllium Copper	Standard
5314	14	Gold Plated Beryllium Copper	High Density
3916A	16	Spring Tempered Nickel Silver	Standard
4236A	16	Spring Tempered Nickel Silver	High Density
5116	16	Gold Plated Beryllium Copper	Standard
5216	16	Gold Plated Beryllium Copper	High Density
5120	20	Gold Plated Beryllium Copper	Standard
5220	20	Gold Plated Beryllium Copper	High Density
4124A	24	Spring Tempered Nickel Silver	Standard*
4324A	24	Spring Tempered Nickel Silver	High Density*
5124	24	Gold Plated Beryllium Copper	Standard*
5224	24	Gold Plated Beryllium Copper	High Density*
4140A	40	Spring Tempered Nickel Silver	Standard*
4340A	40	Spring Tempered Nickel Silver	High Density*
5140	40	Gold Plated Beryllium Copper	Standard*
5240	40	Gold Plated Beryllium Copper	High Density*

***For .600 MIL DIP Only.**

FEATURES

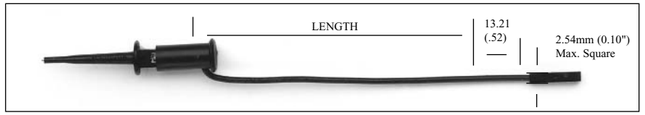
- Contacts 1.02 mm (.040") wide on lower end are serrated for good electrical connection
- 0.64mm (.025")X0.71mm (.028") square serrated test points on upper end will accept wire wraps or mini test clips
- Molded barrier between each contact allows connections to be made on live boards without accidental shorting of adjacent contacts



	X Min.	Y Min.	Z Min.
Single Chip Testing Standard	3.30mm (.130")	1.91mm (.075")	1.02mm (.040")
Single Chip Testing High Density	2.67mm (.105")	1.27mm (.050")	1.02mm (.040")
Adjacent	7.62mm (.300")	5.72mm (.225")	2.03mm (.080")

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

SMD GRABBERS®

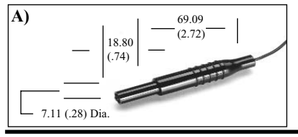


0.64mm (.025") Sq. Pin Receptacle End: Gold plated Phosphor Bronze. ABS insulation.

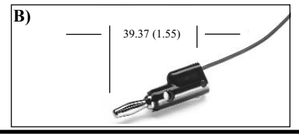
Part #	2nd End	Length
5302-12-*	Stacking Banana Plug	304.8mm (12.0")
5302-24-*	Stacking Banana Plug	609.6mm (24.0")
5302-36-*	Stacking Banana Plug	914.4mm (36.0")
5412-12-*	.064 mm Sq. Pin Receptacle	304.8mm (12.0")
5412-24-*	.064 mm Sq. Pin Receptacle	609.6mm (24.0")
5412-36-*	.064 mm Sq. Pin Receptacle	914.4mm (36.0")

***STD COLORS:** -0 Black, -2 Red.

A)



B)



SMD GRABBER TEST CLIP TO VARIOUS ENDS

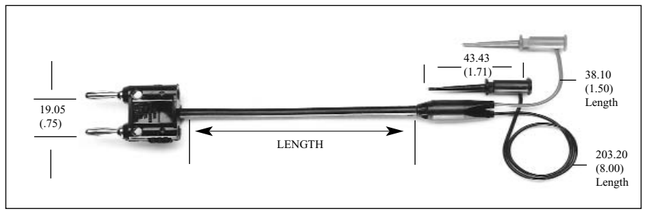
1ST END: SMD Grabber Test Clip. Contact, selectively gold plated stainless steel. Insulation; glass filled nylon.

WIRE: 22 AWG, 26x36 t.c., PVC insulated, 1.63mm (.064") O.D.

RATING: 1000 WVDC; 0.5 Amps; +50°C (+122°F) Max.

A) Sheathed Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Nylon insulation.

B) Stacking Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Polypropylene insulation.



Double Banana Plug End: Nickel plated Brass body. Beryllium Copper spring. Black polyethylene insulation. Rating: 1000WVDC; 0.5 Amp; +55°C (+131°F) Max.

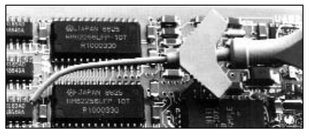
Part #	2nd End	Length
5304-K-24	BNC Male	609.6mm(24.0")
✈ 5304-K-36	BNC Male	914.4mm(36.0")
5411-C-36	Dbl. Banana Plug	914.4mm(36.0")
5411-C-60	Dbl. Banana Plug	1524.0mm(60.0")

SMD GRABBER TEST CLIPS TO VARIOUS ENDS

1ST END: SMD Grabber Test Clips. Contact, selectively gold plated stainless steel. Insulation; glass filled nylon. One black, one red.

CABLE: Sheilded coax., RG 174/U, 2.54mm (.100) and RG58C/U, 4.95mm (.195) O.D. Y-Mold insulation, PVC, black.

BNC Male End: Brass body, tarnish resistant plated. Brass center contact, gold plated. Nominal impedance: 50 Ohms. Boot, PVC, black. Rating: 500 VRMS Max.; +50°C (+122°F) Max.



Part #
SMG50

SMT GRABBER VALUE PACK

- Includes 20 SMT Grabber Clips.

Specifications: Grabbers
Elect. Connector Point: 2 (0.025" connections)
Resistance: 12-30 millions
Dimensions: Shaft: 0.05" O.D.
Length: 2.30"
Weight: 1.0 grams
Wire: .011".
Leads: N/A

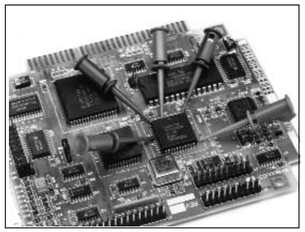
SMT GRABBER CLIPS WITH FLEXIBLE TIP

The flexible tip sleeve allows for bending up to a 35 degree angle to accommodate for hard-to-reach circuit locations.

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

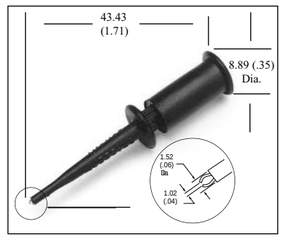
TEST CLIPS - SMD GRABBER®

The SMD Grabber Test Clip is especially suited for testing surface mounted packages on centers as small as 0.76mm (.030"). Pincer-like contacts grasp individual legs of SMDs such as those in SOIC, SOJ, PLCC packages. Its circular design and small size have been developed for easy use and handling.



MATERIAL: Contact, stainless steel.
FINISH: Selectively gold plated on tip.
INSULATION: Glass filled nylon.
RATING: 1000 WVDC; 0.5 Amp; +102°C (+216°F) Max.

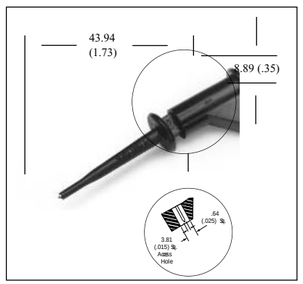
SMD GRABBER TEST CLIP, DO-IT-YOURSELF



Part #
5243-*

***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

SMD GRABBER TEST CLIP, with 0.64mm (.025") SQ. PIN



Part #
5360-*

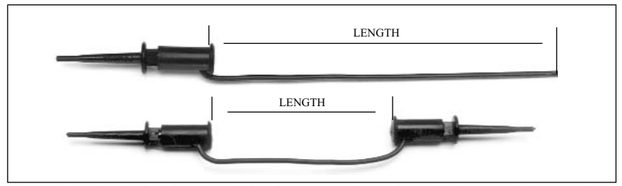
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

1ST END: Contact, stainless steel, selectively gold plated.
INSULATION: Glass filled nylon.
2ND END: Square pin, phospor bronze, gold plated.
RATING: 1000 WVDC; 0.5 Amps; +102°C (+216°F) Max.

SMD GRABBER TEST CLIP, ONE and TWO ENDS

Part #	Length	Ends
5303-36-*	914.4mm (36.0")	1
5301-06-*	152.4mm (6.0")	2
5301-12-*	304.8mm (12.0")	2
5301-24-*	609.6mm (24.0")	2
5301-36-*	914.4mm (36.0")	2

***STD COLORS:** -0 Black, -2 Red

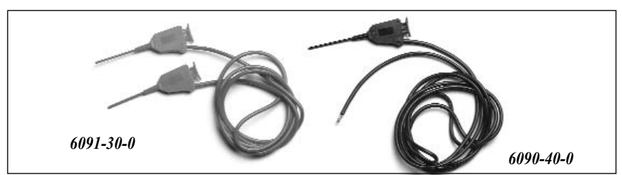


1ST END: SMD Grabber Test Clip. Contact, selectively gold plated stainless steel. Insulation; glass filled nylon.
WIRE: 22 AWG, 26x36 t.c., PVC insulated, 1.63mm (.064") O.D.
2ND END: One end only - none. Two ends - same as first end.
RATING: 1000 WVDC; 0.5 Amps; +102°C (+216°F) Max.

ULTRA-THIN GRABBER TEST CLIP, ONE and TWO ENDS

These test clips are especially designed for testing today's fine-pitched, surface mount devices. This ultra-thin body contour combined with a 1.2mm/0.5" shaft maximizes the users' ability to stack the clips tightly onto fine-pitched devices with up to 50 mils spacing. The shaft flexes (up to 36°) for easy access from different angles.

Part #
6090-40-0 (Black) One end only
6090-40-2 (Red) One end only
6091-30-0 One each end
6091-30-2 One each end



WIRE: Silicone insulated, 2mm (.08") O.D. Overall length of 54mm/2.13"
2ND END: One end only - none. Two ends - same as first end.
TEMP: -20° to 80° C.

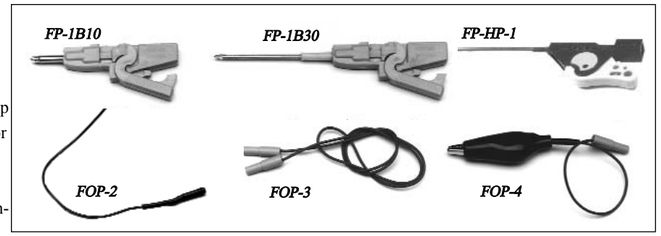
For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

PQFP MICROGRIPPERS™

MicroGripper 0.8mm to 0.5mm Lead Pitch (3 Side by Side - Maximum)

- Used to monitor signal on SMT packages up to 0.5mm lead pitch with a logic analyzer or oscilloscopes
- 3 adjacent SMT leads (max.) for testing
- Board under test must be inactive when connecting clips
- Maximum frequency is 100MHz
- Contact resistance is 10 Ω

PART NUMBERS: **FP-1B10**
FP-1B30
FOP-2, FOP-3, FOP-4



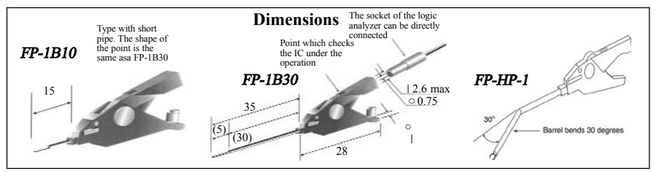
Part	Document	Description	Qty.
FP-1B10	F3855	Gripper, 10mm long tip	ea.
FP-1B30	F3855	Gripper, 30mm long tip	ea.
FOP-2*	F3855	Jumper lead, 200mm long, female to female	ea.
FOP-3*	F3855	Jumper lead, 300mm long, female to female	ea.
FOP-4*	F3855	Jumper lead, 100mm long, alligator clip at opposite end	ea.
FP-HP-1	F3855	Gripper, 2.54mm to 0.8mm, (See Below)	10/pkg.

* Necessary if using an oscilloscope.

MicroGripper 2.54mm to 0.8mm Lead Pitch

- Includes 10 multi-colored Grippers
- Barrel bends 30 degrees for hard to reach signal probing

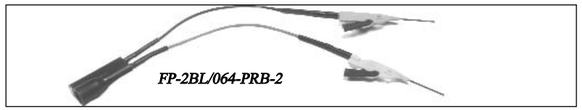
PART NUMBER: **FP-HP-1**



MicroGripper Oscilloscope Probe Adapter Kit 1.25mm to 0.2mm Lead Pitch

- Monitor signals of QFP and SOIC packages to 0.2mm lead pitch with standard oscilliscopes
- Plug your probe tip into dual-lead adapter, then connect Grippers to female test leads (see drawing below)
- Probe kits contain 4 MicroGrippers, 2 Scope Adapters

5.2mm Diam. Probe Adapter (Alone)
P/N: ETPF/064 Drawing#: F5720
7.2mm Diam. Probe Adapter (Alone)
P/N: FP-GR-P1 Drawing#: F6088



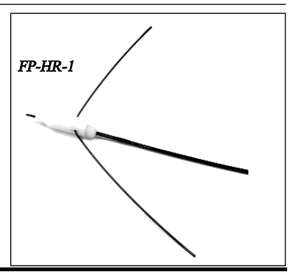
Probe Tip Diameter	Lead Pitch Range	ET Part #	Drawing #
5.2mm	1.25mm to 0.3mm SHORT VERSION	FP2B/064-PRB-2	F2317
5.2mm	1.25mm to 0.3mm LONG VERSION	FP2BL/064-PRB-2	F2317
5.2mm	0.5mm to 0.2mm	FP2S/064-PRB-2	F5732
7.2mm	1.25mm to 0.3mm SHORT VERSION	FP2B/GRP1-PRB-2	F2317
7.2mm	1.25mm to 0.3mm LONG VERSION	FP2BL/GRP1-PRB-2	F2317
7.2mm	0.5mm to 0.2mm	FP2S/GRP1-PRB-2	F5732

For complete specifications including a manufacturer cross reference, please visit our Web site.

High Temperature MicroGripper 1.25mm to 0.3mm Lead Pitch

- New temperature rated MicroGrippers
- Test from -55° C to +250° C
- Two temperature Range options available
- Contact Resistance 10mΩ

P/N: **FP-HR-1:** -55° C to +250° C MicroGripper
P/N: **FP-HRG-1** ; -20° C to +150° C MicroGripper



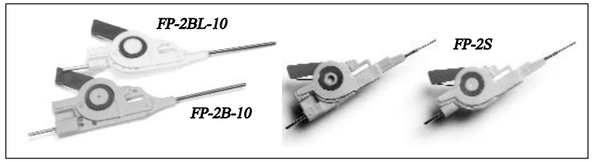
For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

POFP MICROGRIPPERS™

MicroGripper™
1.25mm to 0.2mm Lead Pitch
(Unlimited - Side by Side)

- Used with SMT packages down to 0.3mm lead pitch
- Thin clip body width allows many lead grippers to be mounted side by side for simultaneous testing
- Bandwidth (3dB> 100MHz)
- Packaged 10 per box

MATERIAL: Steel wire or stainless steel, Nickel plated
FINISH: Plastic: ABS
RATING 500 WVDC



Part	Description	Qty	Document
FP-2BL-10	Gripper, short/no cords, 1.25 to 0.3mm	10/pkg.	F3217
FP-2B-10	Gripper, 0.8mm	10/pkg.	N/A
FP-2CL-10*	Gripper, long w/cords, 1.25 to 0.3mm*	10/pkg.	N/A
FP-2C-10*	Gripper, short w/cords, 1.25 to 0.3mm*	10/pkg.	N/A
FP-2S-10:	Gripper, long w/cords, 0.5 to 0.2mm	10/pkg.	N/A
FOP-1:	Jumpers/Male to Female, 0.5 to 0.2mm	10/pkg.	N/A

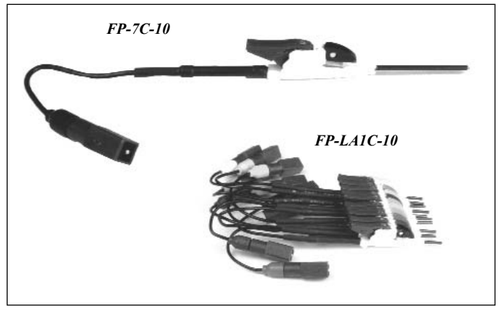
* With colored jumpers

Improved version has a Teflon™ coated tip and 40% more distance when spring is extended.

Micro Gripper™
1.25mm to 0.3mm Lead Pitch
(Unlimited - Side by Side)

- New low profile MicroGrippers
- Conductor resistence for ET P/N: FP-7CL=2m ∩ max
- Conductor resistence for ET P/N: FP-LA1=40m ∩ max
- Flexible stand wires included with each package of 10

FP-7C-10: Gripper short /10 per package with cord
FP-7CL-10: Gripper long/10 per package with cord
FP-LA1C-10: Gripper long/10 per package with cord

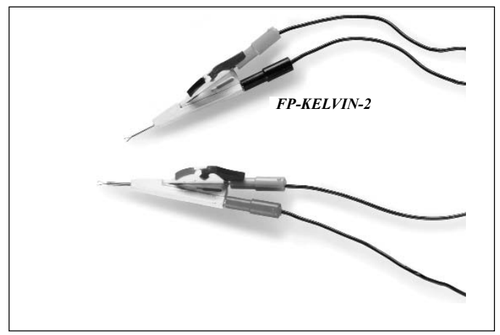


MicroGripper™ Kelvin True Measure
1.25mm to 0.3mm Lead Pitch

- Used with SMT packages down to 0.3mm lead pitch
- Thin clip body width allows many lead grippers to be mounted side by side for simultaneous testing
- Maximum frequency is 100MHz

FEATURES & BENEFITS

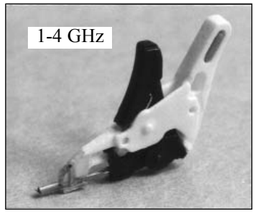
· Four wire measurement using the Kelvin probe reduces the voltage drop in test leads that cause measurement inaccuracies
· Excellent for resistance measurement below 2W
· Double probe tines are ideal for testing surface mount and small leaded components
· Probe tips and spade lugs are gold plated Beryllium Copper for low contact resistance
· Compatible with Agilent, Keithley, Textronix and most 4 wire test instruments with screw connections for binding posts
· Extremely small 7mm body height for tight testing areas
· Flexible stand wires included with each package



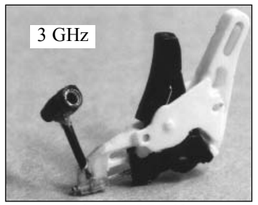
FP-KELVIN-2: Gripper short 2 per package with cord

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

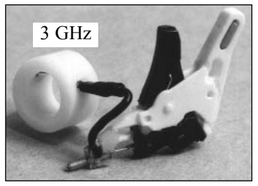
MICROGRIPPERS™ - HIGH SPEED 1 TO 5 GHZ



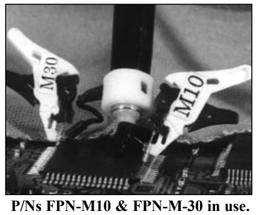
P/N: FPN-SM-105F-1



P/N: FPN-M-10



P/N: FPN-M-30



P/Ns FPN-M10 & FPN-M-30 in use.

Now you can accomplish high frequency signal measurement in the GHz band using an oscilloscope.

Test accessories with long conductors used together with circuits that output high-speed signals can degrade the signal fidelity and add noise. This is why we created the ideal microgripper for high-speed signal measurement.

FEATURES & BENEFITS

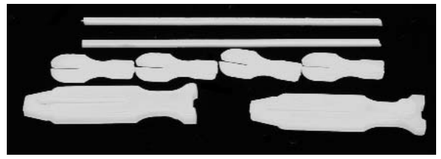
- The Noise Free Micro Gripper attaches directly to the socket tip of the differential probe
- You can connect in parallel by 0.2mm pitch between center of QFP and center of IC terminal
- Available for 1 GHz, 3 GHz, 5 GHz & 10 GHz
- Available in 2.54mm to 0.2mm lead pitches

YOU MUST USE TWEEZERS WHEN YOU USE THIS CLIP

Lead Pitch Range	Lever Color	Barrel Length	Cord Length	Cord Diameter	Conductor Resistance	Capac-itance	Male Pin Diam.	Female Skt Diam.	Drawing Number	ET Part #
(mm)		(mm)	(mm)	(mm)	(Milliohm)	(pF)	(mm)	(mm)		
1 GHz										
0.2 to 0.5	Red	3.00	5.00	0.75	0.5	0.5		0.65-0.80	F7061	FPN-S-15
0.2 to 0.5	Red	3.00	10.00	0.75	0.8	1.0		4.80	F7061	FPN-S-25
0.5 to 1.0	Blue	3.00	5.00	0.75	0.5	0.5		0.65-0.80	F7061	FPN-M-15
0.5 to 1.0	Blue	3.00	10.00	0.75	1.5	2.0		4.80	F7061	FPN-M-20
0.5 to 1.0	Blue	3.00	10.00	0.75	0.8	1.0		4.80	F7061	FPN-M-25
0.8 to 2.54	Green	3.00	5.00	0.75	0.5	0.5		0.65-0.80	F7061	FPN-L-15
0.8 to 2.54	Green	3.00	10.00	0.75	0.8	1.0		4.80	F7061	FPN-L-25
3 GHz										
0.2 to 0.5	Red	1.50	3.00	0.75	0.3	0.3		0.65-0.80	F7062	FPN-S-10
0.2 to 0.5	Red	3.00	10.00	4.80	0.8	1.0		4.80	F7062	FPN-S-30
0.5 to 1.0	Blue	1.50	3.00	0.75	0.3	0.3		0.65-0.80	F7062	FPN-M-10
0.5 to 1.0	Blue	3.00	10.00	4.80	0.8	1.0		4.80	F7062	FPN-M-30
0.8 to 2.54	Green	1.50	3.00	0.75	0.3	0.3		0.65-0.80	F7062	FPN-L-10
0.8 to 2.54	Green	3.00	10.00	4.80	0.8	1.0		4.80	F7062	FPN-L-30

All high speed Microgrippers are sold in pairs. Minimum order is 2 units. The 1—4 GHz Microgrippers come with accessories kit (FPN-T-55, shown below).

HIGH SPEED MICROGRIPPER ACCESSORIES KIT



P/N: FPN-T-55

Try our **SolderQuik™ BGA Preform**
Allows for easy and inexpensive testing of new BGA package designs. Use it for testing, rework and prototyping BGA packages.
Web Link: www.1800adapter.com/043

For a complete list of high-speed microgripper specifications, pricing and delivery information, see:
Web Link: www.1800adapter.com/105

HIGH SPEED 5 TO 10 GHZ - MICROGRIPPERS™

NEW!

Now you can accomplish high frequency signal measurement in the GHz band using an oscilloscope.

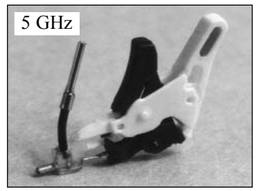
Test accessories with long conductors used together with circuits that output high-speed signals can degrade the signal fidelity and add noise. This is why we created the ideal microgripper for high-speed signal measurement.

FEATURES & BENEFITS

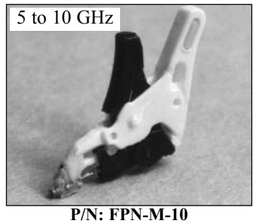
- The Noise Free Microgripper attaches directly to the socket tip of the differential probe
- You can connect in parallel by 0.2mm pitch between center of QFP and center of IC terminal
- Available for 1 GHz, 3 GHz, 5 GHz & 10 GHz
- Available in 2.54mm to 0.2mm lead pitches.

YOU MUST USE TWEEZERS WHEN YOU USE THIS CLIP

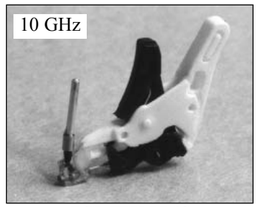
Lead Pitch Range	Lever Color	Barrel Length	Cord Length	Cord Diameter	Conductor Resistance	Capac-itance	Male Pin Diam.	Female Skt Diam.	Drawing Number	ET Part #
(mm)		(mm)	(mm)	(mm)	(Milliohm)	(pF)	(mm)	(mm)		
5 GHz										
0.2 to 0.5	Red	1.50	3.00	0.75	0.3	0.3	0.68		F7063	FPN-S-1
0.2 to 0.5	Red	3.00	5.00	0.75	0.5	0.5	0.68		F7063	FPN-S-2
0.5 to 1.0	Blue	1.50	3.00	0.75	0.3	0.3	0.68		F7063	FPN-M-1
0.5 to 1.0	Blue	3.00	5.00	0.75	0.5	0.5	0.68		F7063	FPN-M-2
0.8 to 2.54	Green	1.50	3.00	0.75	0.3	0.3	0.68		F7063	FPN-L-1
0.8 to 2.54	Green	3.00	5.00	0.75	0.5	0.5	0.68		F7063	FPN-L-2
10 GHz										
0.2 to 0.5	Red	0.50	2.00	0.75	0.2	0.2	0.68		F7064	FPN-SS-1
0.5 to 1.0	Blue	0.50	2.00	0.75	0.2	0.2	0.68		F7064	FPN-SM-1
0.8 to 2.54	Green	0.50	2.00	0.75	0.2	0.2	0.68		F7064	FPN-SL-1



P/N FPN-M-2



P/N: FPN-M-10



P/N: FPN-M-10

All high speed Microgrippers are sold in pairs. Minimum order is 2 units. The 5—10 GHz Microgrippers come with accessories kit, Part number FPN-T-55 Pictured on page 172.)

HIGH SPEED MICROGRIPPER TWEEZERS

P/N: FPN-T-55

P/N: FPN-T-56

Try our **SolderQuik™ BGA Preform**

Allows for easy and inexpensive testing of new BGA package designs. Use it for testing, rework and prototyping BGA packages.

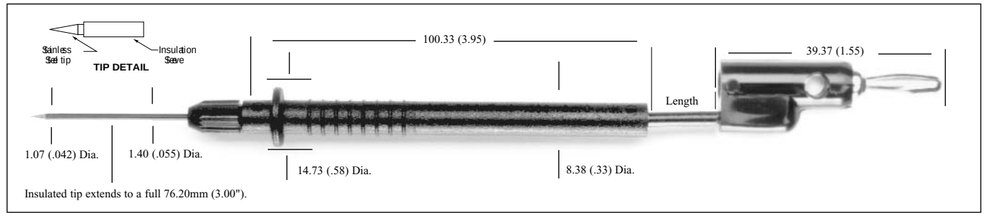
Web Link: www.1800adapter.com/043

For a complete list of high-speed microgripper specifications, pricing and delivery information, see:

Web Link: www/1800adapter.com/105

SMD TEST PROBES

EXTENDABLE TIP PROBE TO VARIOUS ENDS



Stacking Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Insulation; polypropylene. Two pieces: Black and Red.

1ST END: Extendable Probe. Collet, brass. Insulation; nylon. Tip; stainless steel. Insulation; Kynar. Chuck nut, nylon.
WIRE: 18 AWG, 65X36 t.c., PVC insulated, 3.66mm (.144") O.D.
RATING: 1500 V AC/DC; 3 Amps; +55^{O}C (+131^{O}F) Max.

Part #	2nd End	Length
5952	Stacking Banana Plug	1219.2mm (48.0")

SMD MICROTIP™ TEST PROBE

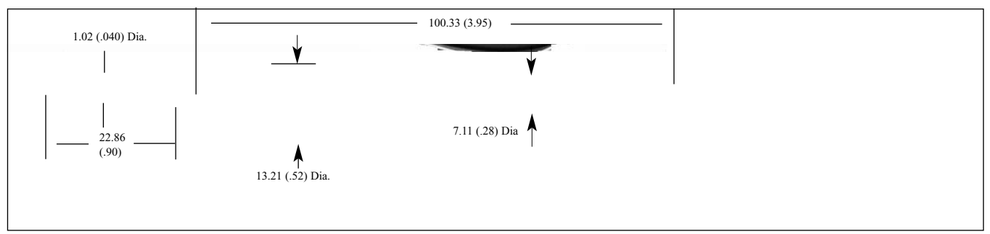
SMD MICROTIP™

The Microtip is specially designed to probe SMD contacts. It features a stainless steel needle point tip that is flexible to help prevent damage to the SMD lands The microtip is curved to aid probing of hard to reach areas.

Part #	Length
5144-48-*	1219.2mm (48.0")

***STD COLORS:** -0 Black, -2 Red.

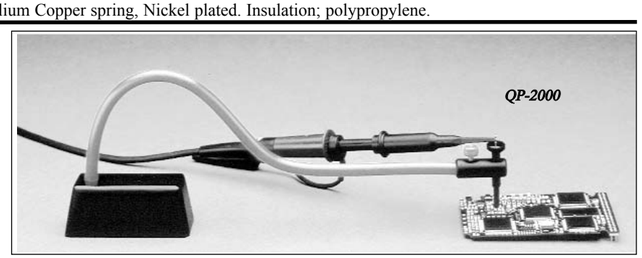
1ST END: SMD Microtips Test Probe. Chuck, brass, Nickel plated. Replaceable microtip, stainless steel. Insulation; nylon.
WIRE: 20 AWG, 41X36 t.c., PVC insulated, 2.21mm (.087") O.D.
RATING: 1200 V AC/DC; 5 Amps; +55^{O}C (+131^{O}F) Max.



Stacking Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Insulation; polypropylene.

QUICK PROBE TEST FIXTURE

This probe is designed to provide quick and easy SMD probing. It's simple design quickly connects a test instrument, such as an oscilloscope, to a variety of SMDs including PLCC, SOIC, QFP, and VIAS or test point holes.



Part #	Document #
QP-2000	F1011

- Heavy base and flexible shaft make positioning to a test point a simple process.
- Adjustment features enable precise positioning to adjacent test points, even on very fine pitches.

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/040

SMD TEST PROBES & TWEEZERS

PROBE SET AND REPLACEMENT TIPS

The precise probe set is ideal for making measurements not easily accessible. The right-angle sheathed banana plug provides easy connecton to hand-held digital instruments. The plugs fit most Fluke, Tektronix, Hewlett-Packard and Wavetek meters.

Right-Angle Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Insulation; polypropylene, one black and one red.

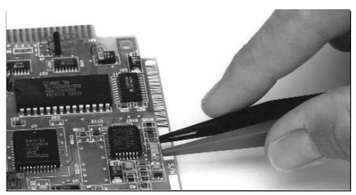
INSULATION: Nylon 6 fire retardant, UL94 VO, or fire retadant polypropylene.

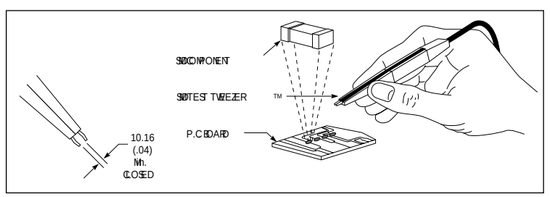
WIRE: 24 AWG, stranding 45X 40 tinned copper, silicon rubber .089 (2,26 mm) O.D.

Part #	Description
6341	Probe set with 5 sets of replacement tips
6354	5 replacement tips

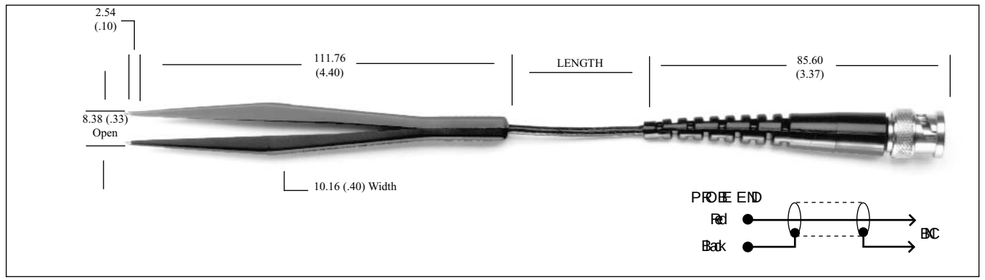
SMD TWEEZER CLIPS

The tweezer clip is specifically designed for testing Surface Mounted Devices (SMD). The durable tips assure a positive electrical connection. The tweezer gives rapid and convenient testing.

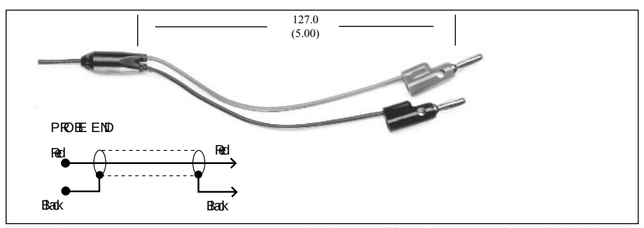




SMD TEST TWEEZER™ TO VARIOUS ENDS



BNC Male End: Brass body, tarnish resistant plated. Center contact, brass gold plated. Boot; PVC, black.



Single Stacking Banana Plug End: Brass body, Beryllium Copper spring, Nickel plated. Insulation; polypropylene, one black and one red.

1ST END: SMD Test Tweezer. Tips, Beryllium Copper, gold plated. Insulation; glass filled nylon, black and red.

CABLE: Shielded coaxial, RG174/U, 2.54mm (.100") O.D.

RATING: 400 WRMS; 3 Amps; +50°C (+122°F) Max.

Part #	Length
5142-K-48	1219.2mm (48.0")
5143-K-48	1219.2mm (48.0")

For a complete test clip listing, pricing and delivery information, please see
Web Link: www.1800adapter.com/040

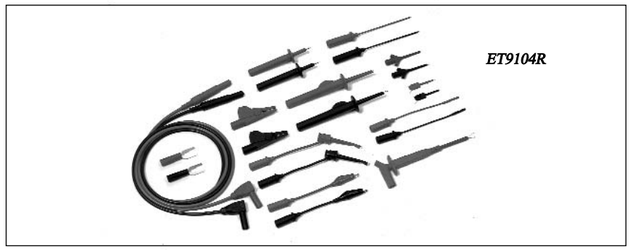
PROBE TEST FIXTURE/PROBE KITS

DELUXE PROBE KIT

This ET9104R Probe Kit is a modular package that includes two leads, two probes, 2 sprung hook probes, 2 alligator clips, two spade lugs, and a pouch.

FEATURES

- Silicone leads
- Burn resistant
- Goldleaf contacts
- 18 gauge (440 strands)



ET9104R

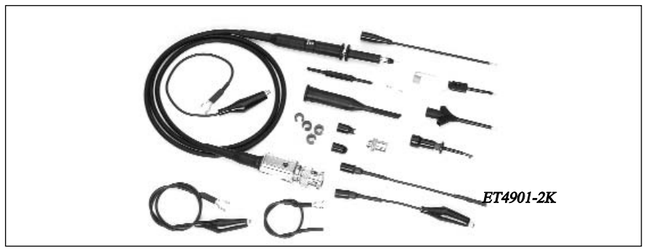
Part #
ET9104-R

DELUXE PROBE KIT

This DELUXE Probe Kit includes the probe, a storage pouch and 17 accessories, plus a set of snap-on channel identification markers (various colors). You can master the most difficult servicing or design problems by simply connecting the correct accessories to the probe.

FEATURES

- 18-piece kit
- Low resistance gold contacts
- Switchable readout actuator option



ET4901-2K

PART #	ATTEN.	LENGTH FT.	LENGTH M.	BW-MHz AT-3DB	RISE TIME ns	LOADING pF	LOADING Ù
ET4901-2K	SWITCHED 1X/R/10X	5.0	1.5	10/150	35/2.40	57/115	1/10
ET4903-2K	FIXED 1X	5.0	1.5	30	11.6	40	1
ET4904-2K	FIXED 10X	5.0	1.5	150	2.4	15	10
ET4905-2K	FIXED 10X	5.0	1.5	250	1.4	12	10
ET4910-2K	FIXED 100X	5.0	1.5	200	1.7	3.5	10
ET4906-2K	FIXED 10X	5.0	1.5	300	1.16	11	10

SMD TEST PROBES

Designed to provide high performance, reliable SMD testing.

Each of the test probes features a sharp, spring-loaded tip to assist users needing to test within an SMD environment where space is limited and the test points are difficult to reach.

- Spring contact minimizes pressure on DUT and prevents slippage on the board surface
- Laser trimmed hybrid circuitry improves accuracy and reliability
- Reed relay switch with a shielded X10 position prevents accidental operation
- Fast rise times
- True frequency response

ET Part #	Application	Characteristics	Drawing #
ET-PMV511	Timing & voltage high impedance measurements	10 Mohms, 15 pF bandwidths to 500 MHz	F6779
ET-PMM501	Low mass, general purpose, high impedance measurements	10 Mohms, 10 pF	F6780
ET-PMMZ511	Low-mass, low impedance measurements	450 to 950 ohms, 1.5 pF	F6781
ET-PHV641-L	Probing high power discrete components	66 Mohms, 3pF 100:1 for measurements to 2 kV	F6782
ET-PHV4002-3	Switching power supply, power transmission	1000:1 divider for measurements to 30 kV	F6783
ET-PMTG321	General purpose for work bench or field service	10 Mohms, 15 pF or 1 Mohm, 50 pF	F6784

For a complete test clip listing, pricing and delivery information, please see: **Web Link: www.1800adapter.com/040**

WIRELESS PRODUCTS

The Bluetooth™ products that we provide directly aid users in the lab and in the field in creating a simpler, wireless network for gathering data and analysis. These new Bluetooth products are based on CSR's (Cambridge Silicon Radio) pioneer silicon design.

FEATURES & BENEFITS

- Intuitive user interface
- Highly configurable software
- Ability to set up user accounts for Bluetooth shared folders allows secure password access only to your files
- Integrated with Windows Explorer, easy to use
- PCMCIA cards provide higher power output translating into longer transmission distances
- Excellent data throughput-- fast access to information/data

One of the most exciting aspects of Bluetooth is that a single product can be used for many purposes, whether connecting to the Internet via an access point, or sending files to a friend.

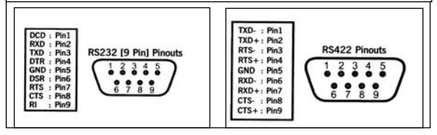
What is RS232? RS422? RS485?

RS232 is the best-known industry standard providing asynchronous serial communication using +/-12 Volt logic levels over distances up to 100 feet, at speeds up to 921,600 Baud.

RS422 allows one transmitter and up to 10 receivers with data transmission rates up to 10 Megabits per second for distances up to 40 feet and up to 100 Kilobits per second for distances up to 4000 feet.

RS485, based on the RS422 standard allows up to 32 driver/recievers pairs on a party line data bus. While only one of these should be transmitting data at any time, the rest can all simultaneously listen to the data. Handshaking is performed by a software protocol. Two twisted pairs form a full duplex system.

RS232 & RS422
SERIAL PORT STANDARD PINOUT DIAGRAMS



For a complete list of Bluetooth products, specifications, pricing and delivery information, please see:
www.1800adapter.com/152

WIRELESS PRODUCTS **Page**

Add a RS232 serial port(s) to your computer.....186

Add a RS422/485 serial port(s) to your computer.....186

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Working with a legacy device but want wireless (via Bluetooth).....182, 183

WIRELESS PRODUCTS - CF BLUETOOTH™ CARD W/CF-PCMCIA ADAPTER

COMPACTFLASH BLUETOOTH CARD w/CF- PCMCIA -ADAPTER
Want to wirelessly synchronize your Pocket PC? Use our Bluetooth CompactFlash Card. You can also use it to exchange phone numbers and address book details, or dial the Internet with your Bluetooth phone - taking advantage of fast GPRS or 3G connections.

Works with any laptop, desktop, tablet or Pocket PC with a Type I or Type II CompactFlash slot. Product is supplied with a CF - PCMCIA Adapter, which converts the CompactFlash card into a Type II PCMCIA Card.

FEATURES

- Type 1 CompactFlash Card with extended back
- Hardware and software certified Bluetooth 1.1
- Worldwide approvals include CE, FCC, METL (UL), Telec
- 721 kbit/s maximum actual data transfer rate
- Plug & Play compatible
- Class 1, 16dBm
- Typical open field range 100m+ (300ft+)
- Bluetooth profiles supported: SPP, DUN, FTP, OPP, FAX, LAN (all PC) - SPP, DUN, FTP, OPP, LAN (Pocket PC)
- Product is supplied with a CF - PCMCIA Adapter, providing functionality for laptops and tablet PCs

Specifications	
Power Requirements	3.3 or 5VDC
Power on	- 90mA
Normal Operation	- 150mA (Typical)
Max Consumption	- 180mA
Adapter Size	85.6mm x 54mm x 5mm
UART	BB16CF950+
Adapter Weight	21g
CF Card Weight	14g
Operating Systems	Window XP
	Windows 2000
	Windows ME
	Windows 98 SE
	Pocket PC2000
	Pocket PC2002

P/N : ET-BL-752

For a complete list of Wireless products, see:
Web Link: www.1800adapter.com/153

BB16CF950+ ASIC

The new BB16CF950+ ASIC is perfect for third party vendors looking for a cost effective means to build boards for a CompactFlash Type I/II BlueCore designs from PDAs and cellular phones to laptops and point-of-sale terminals.

FEATURES

The BB16CF950+ is a UART (Universal Asynchronous Receiver-Transmitter) with a host interface suitable for direct connection to a CompactFlash or 16-bit PC Card bus. Once installed and configured by the host OS it provides:

- an eight-byte programming interface which may be configured to be identical to that of the TL16C750 UART from Texas Instruments
- ability to be configured to fit the requirements of RS232, RS422/485, or Bluetooth applications

For specs & detailed technical data, along with inquries regarding the BB16CF950+ see:
Web Link: www.emulation.com/technical

CompactFlash Bluetooth Card with the BB16CF950+ ASIC (upper right).

A key component of the CompactFlash reference design is the new CompactFlash interface ASIC, the BB16CF950+, that shrinks the active parts count of BluetoothCF and PCMCIA cards to two chips, enabling glueless interface (no extra components needed) to both CompactFlash/16 bit PCMCIA bus and CSR's BlueCore Bluetooth chips which power 70% of the world's Bluetooth designs.

BLUETOOTH™ USB ADAPTERS - WIRELESS PRODUCTS

Specifications	
Standard	Bluetooth Version 1.1
Chipset	CSR Bluecore 02
I/O Interface	USB 1.1
Radio Output	Class 1
Range	100 Meters
Modulation	GFSK
Spread Spectrum	FHSS
Frequency Band	2.4-2.4835GHz ISM Band
OS Support	Win 98SE, ME, 2000, XP
LED Indication	Power/Activity
Antenna	Integrated
Sensitivity	~ < 0.1% BER at -80Db
Power Supply	DC 5V (via USB Port)
Operation Temperature	0-55 degrees celcius

USB BLUETOOTH ADAPTER

This USB Adapter allows a personal computer with a USB port to communicate with other Bluetooth devices.

Plug our Bluetooth USB Adapter into your laptop or desktop PC and set up an ad-hoc network within a matter of seconds, allowing you to exchange information.

FEATURES

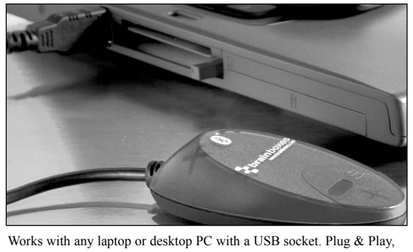
- Includes Bluetooth software (WidComm) for Microsoft Windows 98/ME/2K/XP
- Worldwide approvals include CE, FCC, METL (UL)
- Class 1 Bluetooth device
- Bluetooth profiles supported: SPP, DUN, FTP, OPP, FAX, LAN, Audio, Headset, PAN, HCRP
- Integrated Antenna

P/N : ET-RNUSB

USB BLUETOOTH ADAPTER

This USB Adapter allows a personal computer with a USB port to communicate with other Bluetooth devices. It is based on the Cambridge Silicon Radio BC02 chip. The antenna for the board is built into the PCB.

Plug our Bluetooth USB Adapter into your laptop or desktop PC and set up an ad-hoc network within a matter of seconds, allowing you to exchange information.



Works with any laptop or desktop PC with a USB socket. Plug & Play,

Specifications	
Power Requirements	Powered via USB Cable
USB Compliancy	USB 1.1
Bluetooth Qualification	Bluetooth 1.1

This product connects to the PC via a 75cm cable (supplied) - allows positioning for optimal radio performance.

FEATURES

- Compatible with Microsoft Windows XP Bluetooth software
- Worldwide approvals include CE, FCC, METL (UL)
- 721 kbit/s maximum actual data transfer rate
- Class 2 Bluetooth device, 4dBm
- Typical open field range 50m (150ft)
- Bluetooth profiles supported: SPP, DUN, FTP, OPP, FAX, LAN
- Integrated Antenna
- This product has on board flash, making it user upgradeable to the lastest Bluetooth specification.

P/N : ET-BL-554

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/152**

WIRELESS PRODUCTS - RS232 BLUETOOTH™ ADAPTER, EVALUATION BOARD

RS232 BLUETOOTH ADAPTER

This RS232 Adapter allows a personal computer with an RS232 port to communicate with other Bluetooth devices. It is based on the Cambridge Silicon Radio BC02 chip, allowing communications at the full Bluetooth data rates. The antenna for the board is built into the PCB.

FEATURES

- Supplied with RS232 cable
- Hardware and software certified Bluetooth 1.1
- Worldwide approvals include CE. (FCC tested)
- 115.2 kbit/s maximum actual data transfer rate
- Class 1, 14dBm
- Typical open field range 100m+ (300ft+)
- Slimline power adapter supplied

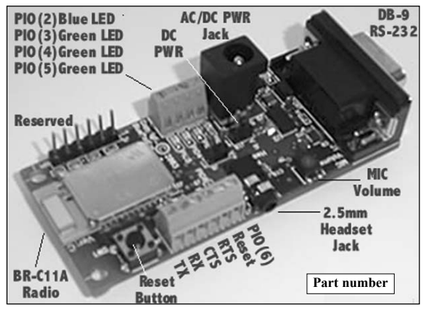
Specifications	
Max Measured Current	120mA
Power Requirements	External Power adapters supplied (200mA @5V)
Baud Rates	115,200
Data Bits	8
Stop Bits	1 or 2
Parity	None
Size	3.8cm x 7.8cm
Weight	68g
Bluetooth Profile	SPP, DUN, FTP, OPP, FAX, LAN
Software Systems	Windows XP
	Windows 2000
	Windows ME
	Windows 98 SE

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/153**

P/N : ET-BL-510

BLUETOOTH EVALUATION BOARD

Build Bluetooth into your equipment.



FEATURES

- Audio CODEC, head jack, head phones, volume control
- RS232 (DB-9) and TTL (screw posts) interfaces
- Includes integrated software stack and profiles
- Embedded Bluetooth stack profiles included (requires no host MCU stack): BCSP, SPP, DUN, LAN, GAP SDP, RFCOMM and L2CAP protocols
- Dedicated voice channel
- ATDS & ATDM type modem commands via UART or over the air RF configuration
- 13 bit linear CODEC
- Programmable input output (I/O)
- Reset button
- LED status indicators

Specifications	
Baud Rates	1200bps up to 921.6kbps
Classification	Class 1
Connection	DB-9 male (DCE) and TTL
Bluetooth Profile	BCSP, SPP, DUN, LAN, GAP SDP, RFCOMM and L2CAP

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, see:
Web Link: **www.1800adapter.com/153**

P/N : ET-RN-EVAL-C11A

BLUETOOTH™ ACCESS POINT & USB PRINT ADAPTER - WIRELESS PRODUCTS

NEW!

View from back of unit

BLUELINE: BLUETOOTH™ ACCESS POINTS

The BlueLine is an intelligent and compact Bluetooth to Ethernet Access Point. It is all that is required to provide multiple Bluetooth users with LAN access and print services.

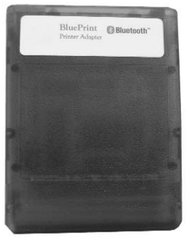
FEATURES & BENEFITS

- Effortlessly connects Bluetooth enabled laptops, PDA's, and others to LANs and the Internet
- Complete solution with all hardware and software
- Support for USB connected local printers
- Intelligent features include routing, authentication, zero configuration install
- Includes LAN printing! (Ethernet or WiFi to USB direct print server)
- Profiles supported: SPP, DUN, LAP, PAN

Specifications	
Standard	Bluetooth Version 1.1
Chipset	CSR Bluecore 02
I/O Interface	USB 1.1
Connector	RJ45 10/100 with link, serial: DB9, High Speed UART
Radio Output	Class 1
Range	100 Meters
OS Support	Win 98SE, ME, 2000, XP
LED Indication	Power/Activity
Antenna	Integrated

P/N : ET-RN-1000

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/152**



ET-RNPS

View from back of unit

Use your USB printer via Bluetooth wireless technology Simply connect the Adapter to your USB printer, and you can start printing from your devices enabled with Bluetooth technology. The Adapter works without the labor of a software configuration, and enables reliable, efficient Bluetooth communication between your computing devices—without cables or physical connectors.

FEATURES & BENEFITS

- Adds Bluetooth connection capability to your USB printer
- Works with any Bluetooth client supporting SPP or HCRP profiles
- Installs easily, with minimal client software configuration with most parallel printers via inexpensive Centronics to USB converter cables, such as Belkin FT005
- Flash upgrade over Bluetooth ensures future compatibility

Specifications	
Standard	Bluetooth Version 1.1
I/O Interface	USB 1.1
Radio Output	High Power Class 1, 20db TX
Range	100 Meters
OS Support	Win 98SE, ME, 2000, XP
LED Indication	Power/Activity
Antenna	Integrated

P/N : ET-RNPS

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/152**

WIRELESS PRODUCTS - RS232 BLUETOOTH™ CONVERTERS / ADAPTERS

RS232 BLUETOOTH CONVERTER

Enable your legacy device or PC to benefit from Bluetooth wireless technology with our RS232 Bluetooth products.

The true cable replacement. This Bluetooth Converter can be plugged onto *any* RS232 device (e.g. printers, oscilloscopes, etc.). Combining this product with *any* Brainboxes product means that you can replace all of the RS232 cables with a wireless network.

FEATURES

- Supplied with RS232 cable
- Hardware and software certified Bluetooth 1.1
- Worldwide approvals include CE. (FCC tested)
- 115.2 kbit/s maximum actual data transfer rate
- Class 1, 14dBm
- Typical open field range 100m+ (300ft+)
- Slimline power adapter supplied
- Battery powered converter available (P/N: ET-BL-521-BAT)

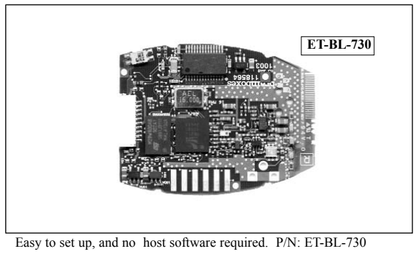
Specifications	
Max Measured Current	120mA
Power Requirements	External Power adapters supplied (200mA @5V)
Baud Rates	All std. RS232 baud rates plus bespoke settings 244-1.38Mbaud
Data Bits	8
Stop Bits	1 or 2
Parity	None, Even, Odd
Size	3.8cm x 7.8cm
Weight	68g
Bluetooth Profile	SPP

P/N : ET-BL-521

P/N : ET-BL-521-BAT ⟷ Looking for a battery operated converter?

RS232 BLUETOOTH CONVERTER MODULE

Build Bluetooth into your equipment. This RS232 Bluetooth Converter is the uncased electronics for the ET-BL-521 used as a build it in Bluetooth module. Ideal for Bluetooth enabling 'dumb' RS232 devices such as printers/scanners etc. It is based on fully tested Bluetooth silicon, allowing communications at the full Bluetooth data rates. The antenna for the board is built into the PCB.



Easy to set up, and no host software required. P/N: ET-BL-730

FEATURES

- Easy set up and configuration using bulletin board style menu
- Baud rates from 244baud to 1.38Mbaud
- 3 wire operation
- Secure: Requires bonding/pairing
- Can be configured as a 'pair'offering TRUE cable replacement
- It has a simple to use 'bulletin-board' style configuration menu meaning its settings can be changed from any Operating System without the need for a specific configuration application.

Specifications	
Max Measured Current	120mA
Recommended Power Supply	200mA @ 5V
Baud rates	115k2 baud (configurable)
Data Bits	8
Stop Bits	1
Parity	None
Size	46.8mm x 36.025mm
Connector Type	JST 10 Way Housing

For a complete list of Bluetooth converter products, data sheets, manuals, drivers, support, and pricing, see:
Web Link: **www.1800adapter.com/153**

P/N : ET-BL-730

BLUETOOTH™ SENSOR INTERFACE, SERIAL ADAPTER - WIRELESS PRODUCTS

NEW!

ET-RN-400S

Specifications	
Classification	Class 1, 20dB TX
Size	1.6" X2.4" X 0.9"
Connection	4 Pin terminal block , RJ45
Bluetooth Profile	SPP
Data Capture	
Input Voltage	0 -5VDC
Resolution	16 bit (0.01 millivolt)
Channels	1 to 8, programmable
Capture rate	7.2Khtz
Max. Transfer rate	800Htz
Power	
Input Voltage	5VDC-12VDC
Current, connected	75ma
Current, idle	5ma

BlueSentry™ BLUETOOTH SENSOR INTERFACE

BlueSentry-AD data acquisition and control modules contain an 8 channel 16 bit AtoD converter, sampling analog signals and converting to a Bluetooth enabled digital data stream. The module also has two general purpose digital outputs that can be controlled over the same bluetooth link using simple output commands.

FEATURES

- Data acquisition and control module
- Class I Bluetooth radio for long-range operation.
- Sleep mode (4ma) while still discovererable/connectable external trigger activation
- Up to 1khz data rates (binary mode, 1 channel)
- Selectable 1 to 8 channels of sampling
- Selectable data capture rates, from 1Hz to 1Khz.

ET P/N : ET-RN-400S

The RJ45 connection provides developers and engineers with options beyond simple DB-9 connection.

ET-RN-200P

Specifications	
Baud Rates	9600, 19.2k, 38.4k, 57.6k, 115,200, 232,400 kbps.
Classification	Class 1, 20dB TX
Data Bits	8
Stop Bits	1 or 2
Parity	Even, Odd , None
Size	1.6" X2.4" X 0.9"
Connection	DB-9 and RJ45
Bluetooth Profile	SPP
Power	
Input Voltage	5VDC-12VDC
Current, connected	75ma
Current, idle	5-25ma

BluePort™ BLUETOOTH SERIAL ADAPTER

BluePort is a highly compact Bluetooth serial adapter which enables wireless connections to any legacy serial port. The BluePort has three ways to attach to the RS232 port of the host device or peripheral.

FEATURES

- Supports bi-directional RS-232 signaling at up to 115.2Kpbs.
- BluePort uses standard Bluetooth Serial Port profile
- Compatible with all clients running under Windows, Palm, PocketPC, and other platforms
- Connect directly using DB-9 connector and via RJ45, allowing custom cables to be easily made.
- Wiring into a 4 pin terminal block with screw down posts (TX,RX,GND, and Power)
- Two ways to utilize
  - Direct to Bluetooth client
  - Access Point mode

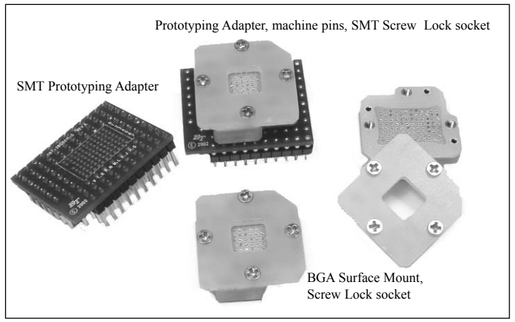
P/N : ET-RN-200P

For a complete list of wireless products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/152**

WIRELESS PRODUCTS - BLUETOOTH SOCKETS & ADAPTERS

ERICSSON ROK 104 0001

These sockets and prototyping adapters are designed to support the Ericsson Bluetooth ROK 104 001 MCM. The second-generation module has a footprint 70% smaller than the original ROK101 device and is used in products like PDA's and cell phones.



FEATURES & BENEFITS

- Special surface mount (SMT) footprint provide easy mounting to printed circuit boards
- Eliminates damage to valuable PCB's
- Promotes easy insertion and removal of the Bluetooth modules for development, debug, upgrade, replacement and repair
- The Bluetooth MCM Prototyping Adapters' provide developers with options beyond surface mounting, and allow the adapter to be plugged into standard prototyping boards
- Socket available in surface mount or through-hole style
- Available with machine pins or wire wrap posts

Electrical Specifications	
Bandwidth	Up to 400 MHz
Lead Inductance	< 2 nH
Contact Resistance	< 100m ohms
Insulation Resistance	100m ohms if 0.50 to 0.80mm pitch
	500m ohms 1.00mm pitch upwards
Current Rating	500 mA max.
Capacitance	<1 pF
Inductance	<2 nH
Breakdown Voltage at 60Hz	500 V min.
Mechanical Specifications	
Contact Life	10,000 cycles minimum
Retention System Life	100 cycles minimum
Solderability (Method 208)	Exceeds MIL-STD-202
Individual Contact Force	40 grams max.
Max Torque for Retention Screws	7cN per meter, or 10 oz.per inch
Materials	
Insulator	Glass epoxy FR4
Terminal	Brass
Contact	BeCu
Operating Temperature	
Temperature Range	-55 degrees C to +130 degrees C

EMULATION TECHNOLOGY RECOMMENDS:

ET's ultra-modern, high tech design torque limiting screwdriver ensures correct tightening of retention frames used with our BGA Screw Lock Sockets, BGA Socket Emulator Adapter and Bluetooth 104 001 Socket & Adapter Systems.

(Part # ET-TORQ-7CN)

- Safely tighten retention socket frames
- Safeguard expensive devices
- Screwdriver preset to 0.7 oz. in.

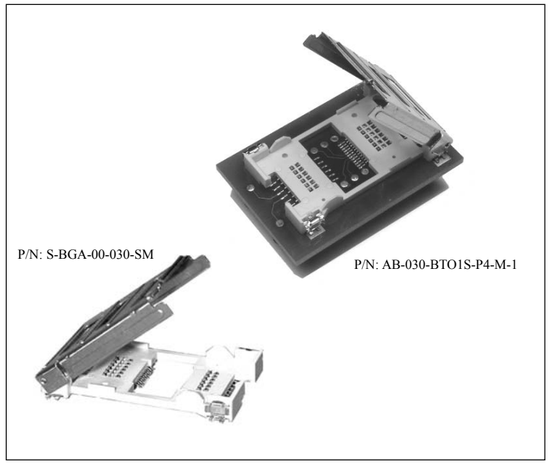
For pricing and delivery information see:

www.1800adapter.com/120

BLUETOOTH ROK 104 001 MCM SOCKETS & ADAPTERS

ET Part #	Description	Pin Style	Socket Style	Drawing #
AB-087-2BG11X8P-PO1-M-1	Prototyping adapter	Machine pins	SMT screw-lock socket	F6703
AB-087-2BG11X8P-PO1-W-1	Prototyping adapter	Wire-wrap pins	SMT screw-lock socket	F6704
S-LPW-087-2BG11X8-30	BGA socket	N/A	SMT screw-lock	SKT1565
S-LPW-087-2BG11X8-70	BGA socket	N/A	Thru-hole, screw-lock socket	SKT1564
AB-087-2BG11X8S-PO1-M-1	SMT prototyping adapter	Machine pins		F6701
AB-087-2BG11X8S-PO1-W-1	SMT prototyping adapter	Wire-wrap pins		F6702
ST-087-2BG11X8-8	Board stencil	N/A	Surface-mount socket	

For a complete list of Bluetooth production sockets & adapters, data sheets, manuals, support, and pricing, please see:
Web Link: **www.1800adapter.com/034**



Electrical Specifications	
Rated Voltage/Current	AC 115 V, 1.5A
Contact Resistance	≤ 30m ohm, MIL-STD 1344A Method 3002.1
Insulation Resistance	≥ 22m ohm @ 500 V DC, MIL-STD 202F Method 302
Dielectric Strength	Applied AC 500V for 1 min. 1mA between adjacent terminal or ground. No Arcing or Breakdown, MIL-STD 202 Method 301
Mechanical Specifications	
Terminal Retention	> 1.5Kg to 2.3Kg
Insertion Force	≤ 0.8Kg to 1.6Kg
Extraction Force	≥ 0.5Kg to 0.8Kg
Materials	
Insulation	LCP, UL Rated 94V-0, Color: White
Terminals	Phosphor Bronze
Board Clip	Phosphor Bronze
Plating	Selective Gold/Tin over Nickel
Contact Area	30u" min. Gold
Solder Area	100u" min. Tin over 30u"min. Nickel
Metal Shell	100u" min. Nickel
Operating Temperature	
	-40 degrees C TO 105 degrees C

ERICSSON ROK 101 007 SOCKET

ET's Bluetooth MCM Production Sockets' special surface mount footprints provide easy mounting to PCBs; and allows for easy insertion and removal of module for upgrade replacement or repair.

FEATURES & BENEFITS

- Designed to fit Ericsson ROK 101 007 Module
- Eliminates damage to valuable PCBs
- Perfect for high volume production applications and prototypes
- Uses a special surface mount footprint for easy mounting to your printed circuit board
- Eliminates damage to valuable PCBs
- Promotes easy insertion and removal of the Bluetooth modules for development debug upgrade replacement and repair

APPLICATIONS

- Prototyping
- Mass production
- Future upgrades
- Device stability
- Allocation issues
- Development
  - Debug
  - Handtest
- Test
- Qualification

For a complete list of Bluetooth sockets & adapters, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/034**

LAB & REWORK ACCESSORIES - PCMCIA TO RS232 & RS422/485

As prices drop and performances rise, portable laptop PC's are enabling more and more users to consider taking their PC into the field where testing, measurement or process control is required. Our range of PCMCIA cards allow you to use your notebook PC's a genuine desktop replacement.

P/N: ET-PM-010
(2 RS232 SERIAL PORTS)

P/N: ET-PM-020
(1 RS232 SERIAL PORT)

PCMCIA to RS232 CONVERTER CARDS

These cards provide users with on or two independent RS232 serial ports. The megabaud data transfer rates and the 128 byte deep FIFOS, coupled with 1 Mbit/s line drivers deliver uncompromising performance on your desktop PC. Being mobile no longer limits your options.

FEATURES

- Massive 128 byte transmit and receive FIFO on each port
- PCMCIA Bus--fully plug & play auto configuring interrupt and address
- Sample Programs, Test & Terminal software--all with source code

Specifications	
Ports	1 or 2 RS232
UART	16950
Line Drivers	1Mbit per second
Baud Rates	Up to 921,600
Data Bits	5, 6, 7 or 8
Stop Bits	1 or 2
Parity	odd, even, none, mark or space
Power Requirements	210mA @5V, 20mA@12V
Power on	-60mA
Normal Operation	-150mA
Max Consumption	-200mA
Size	PCMCIA Type II

P/N : ET-PM-010
P/N : ET-PM-020

Portable laptop PC's are enabling users to take their PC into the field where testing, measurement or process control is required. But what if you are needing a RS422/458 serial port? Add one or two ports with one of the Bluetooth cards below.

P/N: ET-PM-121
(2 RS422/458 SERIAL PORTS)

P/N: ET-PM-120
(1 RS422/458 SERIAL PORT)

PCMCIA to RS422/485 CONVERTER CARDS

These cards provides users with one or two RS422/485 serial ports. The megabaud data transfer rates and the 128 byte deep FIFOS, coupled with 1 Mbit/s line drivers deliver uncompromising performance on your desktop PC. Being mobile no longer limits your options.

FEATURES

- Massive 128 byte transmit and receive FIFO on each port
- PCMCIA Bus--fully plug & play auto configuring interrupt and address
- Sample Programs, Test & Terminal software--all with source code
- Configurable as full or half duplex
- Hardware autogating for guaranteed no data loss in cheaper half-duplex cabling systems
- Zener diodes provide transient spike protection

Specifications	
Ports	1 or 2 RS422 / RS485 Standard
UART	16950
Line Drivers	1Mbit per second
Baud Rates	Up to 921,600
Data Bits	5, 6, 7 or 8
Stop Bits	1 or 2
Parity	odd, even, none, mark or space
Power Requirements	210mA @5V, 20mA@12V
Power on	-60mA
Normal Operation	-150mA
Max Consumption	-200mA
Size	PCMCIA Type II

For a complete list of PCMCIA card products, data sheets, manuals, drivers, support, and pricing, please see:
Web Link: **www.1800adapter.com/154**

P/N : ET-PM-121
P/N : ET-PM-120

Ruggedised versions of these adapters (identical to the adapters on this page except the cable can't be removed from the card) are available:

P/N : ET-PM-143 (1 RS232 SERIAL PORTS)
P/N : ET-PM-132 (2 RS232 SERIAL PORTS)
P/N : ET-PM-154 (1 RS422/458 SERIAL PORT)

GENERAL SPECIFICATIONS

SOCKETS

- LCC, PLCC, SOIC, FLAT PACK

Body Material: Ryton (TYP)

Contact Material: BeCu

Contact Plating: 30 Microinches of Gold over Nickel

- PGA
  Low insertion force-- average insertion force less than 2 ounces per contact (measured with a .018 diameter pin).

PC BOARD ASSEMBLY

Body Material: FR4

Contact Material: BeCu

Contact Plating: 30 Microinches of Gold over Nickel

ELECTRICAL

Contact Resistance: 25 MilliOHMs per Contact MAX.

Insulation Resistance: 20 MegOHMs MIN. @50 VDC

Capacitance: 2.0-15.0 Pico-Farads between any pair of isolated contacts.

TEST POINT SPECIFICATIONS

Insulator Material: Glass-filled nylon black, UL94V-0

Contact Material: Phosphor Bronze

Current Rating: 1 Amp

Voltage Rating: 300 VRMS

Dielectric Withstanding Voltage: 500 VRMS

Insulation Resistance: >1,000 MegOHMs

Temperature Rating: -55^{o}C to +125^{o}C

NOTE: Specifications apply to Emulator Pods and Adapters, Logic Analyzer/Scope Adapters, Programming Adapters, Field Programmable Adapters, and Prototyping Adapters. Every effort has been made by ET to furnish accurate and reliable information in this catalog. However, since both device manufacturers and ET reserve the right to improve device specifications, such changes may result in this catalog being in error.

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TSOP Programming Adapters 101
TSOP Prototyping Adapters 126
TSOP Sockets 150

ET Worldwide Distributors

COUNTRY	DISTRIBUTOR	PHONE	E-MAIL ADDRESS
AUSTRALIA	Emulation Technology, Inc.	408-982-0660	sales@emulation.com
AUSTRIA	tecBiT GmbH	43-2682-67561	support@tecbit.com
BELGIUM	Logic Technology Microtron NV.	31-77-307-84 38 32-15-292929	info@logic.nl www.microtron.be
CANADA	E.G. Lomas Limited	800-347-0647	lomas@videotron.ca
CHINA	Wuxi Knight Technology Co., Ltd Xuanji S & T Inc.	86 510 5115408 86-10-82883933 ext.686	knight@wst.net.cn sales@watertek.com
DENMARK	Nohau Corporation	45-4346-6393	sales@nohau.dk
FINLAND	Etra-Dielectric Oy	3589-369-966	dielectric@etra.fi
FRANCE	VLSI Solutions	33-01-69-41-16-92	fe@vlsi-solutions.com
GERMANY	Synatron GmbH	49-(0)811-6-00-05-23	emulation@synatron.de
HONG KONG	Twin Star Trading	852-2-341-4282	twinstar@hk.super.net
HUNGARY	Chip CAD Electronics Ltd.	36-1-399-42-90	www.chipcad.hu
INDIA	MiniATE Systems Pvt. Ltd.	0-9810006661	info@miniate.com
IRELAND	Trio-Tech International	353-1-2800395	rcullin@iol.ie
ISRAEL	STG Int'l Ltd.	972-3-696-5231	davidb@stggroup.co.il
ITALY	Veratim	39-015-2522636	info@veratim.it
JAPAN	Micron, Inc. Sunhayato Corp.	81-3-3317-9911 81-3-3986-0403	hiro@micron.co.jp adapter@sunhayato.co.jp
KOREA	Inhwa Company Ltd. VAS Corporation	82-2-703-7231 82-2-704-7111	inhwa@inhwa.com wpark@vas.co.kr
LUXEMBOURG	Comtest Instrumentation B.V.	31-40-2908830	sales@comtest.nl
MALAYSIA	Daqcon	0116045085057	ganga_daqcon@hotmail.com
MEXICO	AG Electronica	(052)5-21-10-17	agmatriz@mpsnet.com
NETHERLANDS	Comtest Instrumentation B.V. Logic Technology	31-40-2908830 31-77-307-84 38	sales@comtest.nl info@logic.nl
NEW ZEALAND	Emulation Technology, Inc.	408-982-0660	sales@emulation.com
NORWAY	Hans H. Schive A/S	47-66-760 500	4mgve.mobraathen@Shieve.no
PORTUGAL	Dec.Medida S.A.	351-214-724-900	geral@decmed.pt
RUSSIA	Inline Group Ltd.	795-765-0616	mer@inlinegroup.ru
SINGAPORE	Trio-Tech Int'l. PTE Ltd.	65-354-9705	isabellachang@triotech.com.sg
SOUTH AFRICA	Channels Measurement Services (PTY) Ltd.	27-11-254-8440	george@channels.co.za
SPAIN	Instrumatic Española S.A.	34-1-555-8112	instrumatic@instrumatic.es
SWEDEN	Martinsson Elektronik AB Nohau Elektronik AB Pelcon Electronics AB	46-8-744-0300 46-40-59 22 00 46-8-5064 98 70	ulf.eweman@martinssonelektronik.se info@nohau.se ola@pelcon.se
SWITZERLAND	Dantronic Group E-Tec Interconnect Ltd.	41-01-931-22-33 41-21-781-08-10	assaf@dantronic.ch oscar@e-tec.ch
TAIWAN	Allreach Enterprise Co., LTD. Prospect Technology Corporation	886-2-227-21-5819 886-2-2721-9533	allreach@ms3.hinet.net jack_yang@prospect.com.tw
UNITED KINGDOM	Jacarem Ltd. Nohau UK Ltd.	44 (0) 1494 791 336 44-1962-733140	sales@jacarem.co.uk www.nohau.co.uk

Release//21

ET Products Services

- NEW: ASIC & FPGA Development Systems
- Board to Board Interconnects
- Custom, Semi-Custom (Built to Order)
- Emulator Tools & Adapters
- Field Configurable Adapters & Cables
- Interconnects
- NEW: Lab & Rework Accessories
- Logic Analyzer/Scope Adapters
- Programming Adapters
- Prototyping Adapters, Boards & Extenders
- NEW: Sockets: Test & Burn-ins, Production
- Test Clips & Oscilloscope Probes
- NEW: Wireless Products

EMULATION TECHNOLOGY, INC.

Subsidiary of Interconnect Systems, Inc.

ET Development Lab Management Services

Overview

Fact: This year engineers will have half the time and half the budget to complete twice the number of projects.

ET can help you meet these challenges head on.

Are you facing some of these situations on a regular basis?

- Searching through multiple vendor catalogs, calling vendors and emailing to source a development accessory
- Valuable time spent today trying to find an accessory part number that you purchased a few months ago
- Spending hours sourcing the correct socket/adapter for your project
- Engineers and technicians in different labs searching for the same lab tool and issuing separate purchase requisitions
- Spending time expediting orders or trying to find the quickest delivery
- A large number of small transactions all with minimum orders
- Solving multiple problems related to chip obsolescence

Introducing Emulation Technology's newest solution...

If you answered yes to any of the above statements, ET can help you can meet these challenges and regain control by reducing your costs and speeding your product to market. Free up your internal resources so you can better focus on current objectives. With 20 years of industry experience and access to the widest range of development lab products and services, ET has a solution for you.

ET will manage your development purchases, and product/ service needs by designing a unique package to help you better communicate with your team and do your job, hassle free.

ET's new Development Lab Management Services provide a one-stop solution (below) delivered in a way that best fits your company:

Services & Solutions

- Project Level Services
  - Custom Internet Store
  - Information Center by Project
  - Application / Reference Center
- Fulfillment & Distribution Services
- Order Management Services
- Reporting Services
- Procurement Analysis Services

Delivery that fits your company

- ET-served, password-protected extranet Web site
- Emailed reports & analysis
- Hard copy reports & analysis
- Faxed reports & analysis

EMULATION TECHNOLOGY, INC.

How to find out more

Call or e-mail us today for a quick needs assessment:
408-982-0660 x224, labservices@emulation.com

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Emulation Technology, Inc.

DESIGN. CONNECT. DELIVER. **www.emulation.com**

New Full-Line Product Catalog: Release//21

Release//21 includes a number of new products in the wireless, ASIC development and high-speed chip level testing categories. The 188-page catalog makes it easy to find products and critical information quickly:

- Alphabetized table of contents; index by device style
- Product specific URL listings that link to specs, drawings, and pricing
- Easy to use tables and guides for up-to-date part numbers
- Contact information for ET's worldwide distributors

Release//21 combined with ET's Web site provide engineers with the means to easily source the product they need and purchase it online.

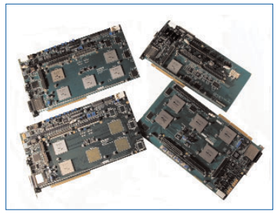
Order online: www.emulation.com/021

ASAP! 5, 7, or 10-Day Service For BGA Sockets

ASAP
SERVICE
BGA SOCKETS
5, 7, or 10-DAY

Four to five weeks is a long time to wait for a socket given the accelerated design schedules that exist in today's market place. Customers will receive their sockets 85% faster than the industry standard with ET's ASAP Delivery service, which means the project can be completed on time, and that's critical in today's market. ASAP Service is deal for: (Call ET today: 1-800-232-7837)

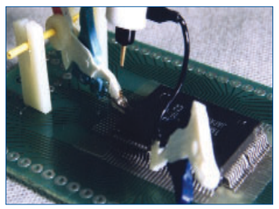
- Development/Bring Up Boards
- Debug (hand test) and Programming/ Test
- Qualification and Production



Save up to 50% on Designs w/High Performance ASIC & FPGA Systems

Escalating costs associated with ASICS (sometimes as high as $2M) and lead times for spinning ASIC masks pushing six months or more have become common place, ET's ASIC & FPGA Development Systems are a time-saving, cost-effective solution for engineers. These products were created to assist ASIC or IP design engineers prototyping logic, memory, and embedded system designs.

Web information: www.emulation.com/091



Low-Noise, High Speed MicroGrippers

Our new High Speed Microgrippers provide access to SMT packages down to 0.2mm lead pitch allowing for high frequency signal measurement in the GHz band using an oscilloscope. They are available in 2.54mm to 0.2mm lead pitches in bandwidths of 1 GHz, 3 GHz, 5 GHz, 10 GHz. Each Microgripper attaches directly to the socket tip of the differential probe ensuring signal fidelity and no noise.

Web information: www.emulation.com/105

Bluetooth Solutions For The Lab

The Bluetooth products that we provide directly aid users in the lab and in the field in creating a simpler, wireless network for gathering data for analysis. One popular example is the RS232 Bluetooth Module which allows users to easily add Bluetooth to any device with no software modifications required.Simple to set up and use. It allows you to easily test your application before embedding the device.

Whether you are needing to add a RS232 serial port, add Bluetooth serial interface to sensor outputs, or set up a wireless connection with your laptop via CompactFlash or USB we have a wireless solution.

Web information: www.emulation.com/152

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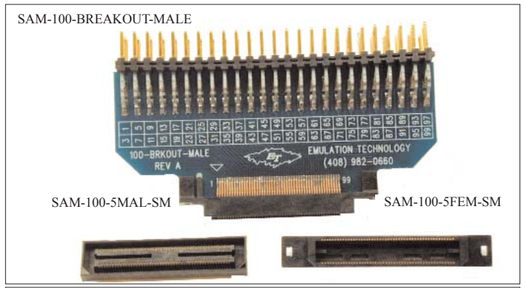
www.emulation.com • et@emulation.com • 1-800-232-7837

SAMTEC® - LOGIC ANALYZER/SCOPE ADAPTERS



Ordering Information Example

Product Code — SAM-100-BREAKOUT-MALE
Pin Count of Connector — 100
MALE= Male Headers
PADS= Solder Pads

Samtec Micro Socket Connector Specificatons	
Insulator Material	Liquid Crystal Polymer
Contact Material	Phosphor Bronze
Current Rating	1.25A @ 80 degrees ambient & 5mm Stack Height
Operating Temp Range	-65 degrees C up to 125 degrees C
Votage Rating	125 VAC mated with BTH & 5mm Stack Height
Plating	Au over 50µ" (1,27µm) Ni

SUPPORTS AGILENT PROBE MODELS

- E5378A (single ended signals)
- E5379A (differential signals)
- E5385A (universal probe)
- E5381A (differential)
- E5382A (single-ended) flying lead probe set.

SAMTEC PROBING ADAPTERS

ET's newest probing adapter supports the Agilent differential and single ended probes with 100-pin Samtec 0.50mm pitch connectors. The new adapter permits designers easy access, debug and probing ability for fine-pitch individual and hard to reach signals in high-speed electronic designs.

HOW THE ADAPTER WORKS

This adapter supports the Agilent differential and single ended probes. The user simply unplugs the differential probe from his test setup and plugs in the ET breakout adapter. The breakout adapters are available with stake pins or with surface mount pads. Surface mount pads are sometimes preferred for signal rerouting and customization in the lab during product development. On the bottom side the adapter mates with the Samtec connector ASP-65067-01 that is soldered to the target board.

FEATURES & BENEFITS

· The Samtec connector user can also probe individual signals on his target board with an oscilloscope or other signal monitoring instruments.

· Available with 100-pin signal access via .025" square stake pins spaced on .100" pitch or Surface Mount Pads.

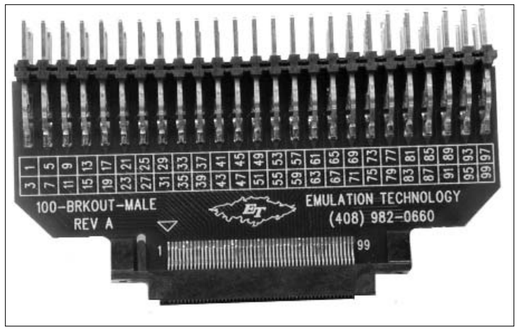
· Adapters' socket mate requires no ground plane leads providing PCB routing flexibility.

· Each signal pin number is silk-screened on the probe adapter for easy signal identification.

Part Number	Corresponding Samtec P/N	Description	Drawing
SAM-100-BREAKOUT-MALE	BTH-050-01-L-D-A	Male Samtec to 100 test points for Aglient 1670A	F7256
SAM-100-SMTPADS	BTH-050-01-L-D-A	Plugs into Female connector w/SMT pads	F7285
CON-100-5MAL-SM	BTH-050-01-L-D-A	100-pin Male Connector; mounts on PCB	F7371
CON-100-5FEM-SM	ASP-65067-01 BSH	100-Pin Female Connector; mounts on PCB	F7370
BCM-100-SAMTEC-0000	BTH-050-01-L-D-A	Bug Katcher	F7297
SAM-100-CABLE-MM-6	ASP-65067-01 BTH	6" 100-Pin male to male SMT cable	F7369
SAM-100-CABLE-MF-6	ASP-65067-01 BSH	6" 100-Pin male to female SMT cable	F7367
SAM-100-CABLE-FF-6	ASP-65067-01 BSH	6" 100-Pin female to female SMT cable	F7365
SAM-100-CABLE-MM-18	ASP-65067-01 BTH	18" 100-Pin male to male SMT cable	F7366
SAM-100-CABLE-MF-18	ASP-65067-01 BSH & BTH-050-01-L-D-A	18" 100-Pin male to female SMT cable	F7368
SAM-100-CABLE-FF-18	ASP-65067-01 BSH & BTH-050-01-L-D-A	18" 100-Pin female to female SMT cable	F7364

For a complete list of SAMTEC adapter specifications, pricing and delivery information, see:
Web Link:www.1800adapter.com/159

SAMTEC® - LOGIC ANALYZER/SCOPE ADAPTERS NEW!



Samtec Micro Socket Connector Specificatons	
Insulator Material	Liquid Crystal Polymer
Contact Material	Phosphor Bronze
Current Rating	1.25A @ 80 degrees ambient & 5mm Stack Height
Operating Temp Range	-65 degrees C up to 125 degrees C
Votage Rating	125 VAC mated with BTH & 5mm Stack Height
Plating	Au over 50µ" (1,27µm) Ni

ET P/N	Samtec P/N	Description
SAM-100BREAKMAL	N/A	Adapter w/ signals to stake headers
SAM-100-SMTPADS	N/A	Adapter w/ signals to SMT pads
CON-100-5MAL-SM	BTH-050-01-L-D-A	100-pin Male Connector
CON-100-5FEM-SM	ASP-65067-01 BSH	100-Pin Female Connector

SAMTEC PROBING ADAPTERS

ET's newest probing adapter supports the Agilent differential and single ended probes with 100-pin Samtec 0.50mm pitch connectors. The new adapter permits designers easy access, debug and probing ability for fine-pitch individual and hard to reach signals in high-speed electronic designs.

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SUPPORTS AGILENT PROBE MODELS

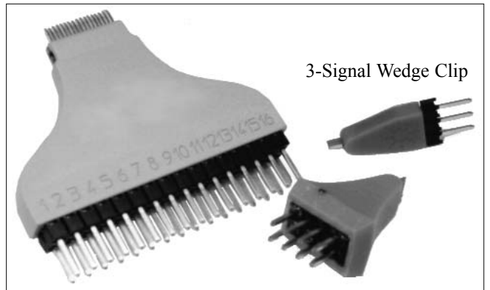
- E5378A (single ended signals)
- E5379A (differential signals)
- E5385A (universal probe)
- E5381A (differential)
- E5382A (single-ended) flying lead probe set.

For a complete list of SAMTEC adapter specifications, pricing and delivery information, see:
Web Link:www.1800adapter.com/159

TEST CLIPS - WEDGE CLIPS - 0.50 & 0.65mm PITCH PACKAGES

WEDGE CLIP- 0.50MM & 0.65MM SSOP,TSOP,TSSOP,TQFP

Wedge Clip technology ensures reliable probing of 3, 8 or 16 signals on 0.5mm or 0.65mm pitch signals. The clip alleviates the frustration of accidentally shorting IC pins together; the electrical or mechanical problems associated with soldering, and/or holding multiple probes while using your scope. The clip is excellent for those times when a standard test clip doesn't exist or you only need to access a few pins. No "keep out" area is required surrounding the device as the wedge clip probe is inserted between the leads of the device. The side of each wedge clip contact connects with each package leg as it is inserted. An insulated core electrically isolates the sides of each signal probe ensuring electrical reliability.



Ordering Information Example

Product Code — CLIPW-003-050-1 — IC Lead Spacing 050=0.5mm, 065=0.65mm
Signal Count — 003
Number of Wedges [per package] — 1

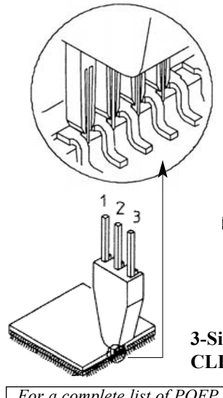
FEATURES & BENEFITS

- Accommodates SSOP, TSOP, TSSOP, TQFP packages, all pin counts
- Easy connection to surface mount ICs
- Available in 3 models: 3, 8 and 16-signal access
- Safe, with no chance of shorting
- Mechanically non-invasive contact
- No soldering required
- No "keep out" area required around device

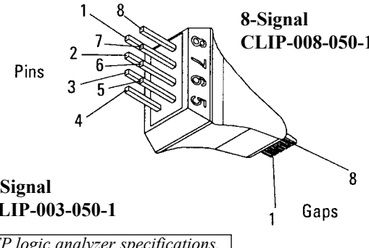
Electrical Specifications	
Operating Voltage	<40 V (dc + peak ac)
Operating Current	0.5 A maximum
Capacitance Between Contacts	4.3 pF at 1 MHz
Self-Inductance	37 nH at 1 MHz
Contact Resistance	< 0.1 Ohm

WEDGE CLIP

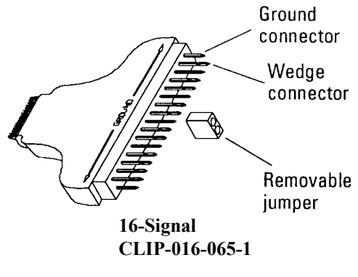
ET Part	Lead Pitch (mm)	Signal Count	Wedge Count per Package
CLIP-003-050-1	0.5	3	1
CLIP-008-050-1	0.5	8	1
CLIP-016-050-1	0.5	16	1
CLIP-003-065-1	0.65	3	1
CLIP-008-065-1	0.65	8	1
CLIP-016-065-1	0.65	16	1



3-Signal
CLIP-003-050-1



8-Signal
CLIP-008-050-1



16-Signal
CLIP-016-065-1

For a complete list of PQFP logic analyzer specifications, pricing and delivery information, please see:
Web Link: www.emulation.com/040

PROTOTYPING ADAPTERS - 6-Pin SOT23 DEVELOPMENT ACCESSORIES

PROGRAMMING, PROTOTYPING AND TESTING SUPPORT FOR THE 6-PIN SOT-23, THE WORLD'S SMALLEST DEVICE PACKAGE

ET's support includes sockets, receptacles and adapters to accommodate the ultra-small form factor of the new 8-bit, 6-pin Flash devices housed in SOT-23 packages. The packaged device measures about one-eighth of an inch by one-sixteenth of an inch.

- **Zero Insertion Force (ZIF) Socket** allows users to remove the SOT-23 packaged device, and re-insert into the development board without soldering.
- **SOT Socket Receptacle** allows the ZIF socket to be easily removed and replaced.
- **Programming/Prototyping Adapter** with wire wrap male pins or screw machine male pins provide for easy and reliable conversion of programmers and prototyping PCBs so your design can be verified and tested quickly.
- **SOT Emulation Adapter** extends development capabilities and converts the SOT target footprint to an 8-pin Female DIP for easy hookup to a DIP Emulator Pod.

Socket

S-SOT-00-006-A

Prototyping Adapter

AB-006-SOT1S-DIP.3-M

Emulation Adapter

AS-DIP.3-008-06SOT23S-1

Socket Receptacle

SR-SOT-00-006-A

DIP Socket

S-DIP-00-008-A

Programming & Prototyping Adapter

AS-06-06-01SOT23-3

Vacuum Pen

P/N-102-A

This hand-held vacuum pen comes with special micro-tip to pick up fine pitch devices and easily lift ICs without damaging the device.

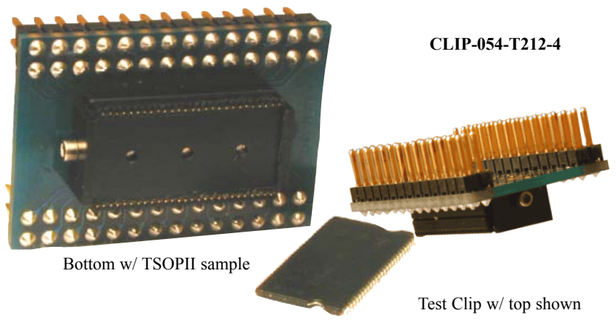
SMT Adapter

APP-006-SOT23Z-2

For a complete list of socket and adapter specifications, pricing and delivery information, please see:
Web Link: www.emulation.com/160

Part Number	Package Style	Description	Price	Drawing #
S-SOT-00-006-A	SOT	Socket	$47.00	SKT1314
SR-SOT-00-006-A	SOT	Receptacle	$26.00	SKT2047
AS-06-06-01SOT23-3	SOT	Wired 1to1 Programming & Prototyping with Wire Wrap Male Pins	$79.00	F6573
AS-06-06-01SOT23-3-MS	SOT	Wired 1to1 Programming & Prototyping with Screw Machine Pins	$79.00	F7324
AS-06-08-04SOT23-6	SOT	Programming Adapter	$79.00	F7310
AS-06-08-04SOT23-6-MS	SOT	Programming Adapter with Machine Screws	$79.00	F7311
S-DIP-00-008-A	DIP	Socket	$3.00	SKT055
AB-006-SOT1S-DIP.3-M	DIP	Prototyping Adapter With Machine Screw Pins	$15.00	F7308
AB-006-SOT1S-DIP.3-W	DIP	Prototyping Adapter With Wire Wrap Pins	$15.00	F7309
AS-DIP.6-008-06SOT23S-1	DIP	Emulation Adapter w/ .600 DIP	$75.00	F7325
AS-DIP.3-008-06SOT23S-2	DIP	Emulation Adapter w/.300 DIP	$75.00	F7312
APP-006-SOT23Z-2	SOT	SMT Adapter with ZIF socket on top, Wired 1to1	$75.00	F7322
P/N-102-A	SOT	Vacuum pen with small tip for 6-SOT23	$75.00	F7313

TEST CLIPS - TSOPII



CLIP-054-T212-4

Bottom w/ TSOPII sample

Test Clip w/ top shown

Ordering Information Example

Pin Count — ET Internal Code

Product Code — **CLIP-054-T212-4)**

TSOPII Clip (includes base and male socket) — ET Internal Style Code

Electrical Specifications	
Current Rating	0.5A Continuous
Probe Resistence	Less than 50mohm
Inductance	1.47nH ~4.0nH @ 30MHZ to 3.8 GHz
Bandwidth	6 GHz @ -0.26dB (Dielectric Material: ULTEM1000)
Propagation Delay	50 ps (Dielectric Material: ULTEM1000)
Mechanical Specifications	
Spring Force	1.06oz (30.0 g) @ 0.0295 inch (0.75mm)
Top Plunger Travel	0.0158 (0.40)
Bottom Plunger Travel	0.0138 (0.35)
Full Travel	0.0315 (0.80mm)
Material	Hardened BeCu / Gold Plated Barrel - Phospher Bronze / Gold Plated Spring - Music Wire /Gold Plated

TSOPII CLIP

Pin Count	Part #	Drawing #	Lead Pitch (mm)	Body Size (mm)
54	CLIP-054-T212-4	F7380	0.80	10.16
66	CLIP-066-T212-4	F7398	0.80	10.16
86	CLIP-086-T212-4	F7399	0.80	10.16
56	CLIP-056-SS15-4	F7400	0.50	6.10
66	CLIP-066-SS15-4	F7401	0.50	6.10
86	CLIP-086-SS15-4	F7402	0.50	6.10

For a complete test clip listing, pricing and delivery information, please see:
Web Link: www.1800adapter.com/161

TSOPII TEST CLIPS

The QUAD-4 Clip™ is designed to clip over (piggy-back) surface mounted DDR SDRAM memories in the Thin Small Outline (TSOPII) package style, in pin counts of 54, 66, and 86 and lead pitches of 0.80mm to 0.50mm.

FEATURES & BENEFITS

- The clip's unique spring probe design ensures an excellent electrical connection.
- Users can access individual or multiple signals when used with a logic analyzer, oscilloscope, or other test equipment.
- Silkscreened numbers on PCB aide users in matching Wire Wrap Posts to hardware contact.
- Spring probe (pogo pin) design promotes low maintenance, long life of clip.
- The clip has a low profile and is ideal for near zero keep-out area required target boards.

APPLICATIONS

- Development
- Debug
  -Hand Test
- Programming/Test
  -Qualification
  -Production

LEAD PITCH

- 0.80mm to 0.50mm

BODY SIZES

- Customizable to meet device size

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