FFC / FPC / CIC Connectors

November 2003

FFC / FPC / CIC Connectors



Introduction

Created in 1989, FCI - an Areva Group company - rapidly secured its place among the world's top three manufacturers of connectors and interconnect systems.

With a turnover of 1.56 billion Euros (1.47 billion dollars) in 2002, FCI currently operates in 29 countries where it covers the following markets : communications, data, consumer, automotive and electrical power interconnect.

The company employs about 14 000 staff worldwide.

For more information: www.fciconnect.com

Selection Innovation Reliability **Economy**



Circuitry and cable Flexible Printed Circuit (FPC) Flexible Flat Cable (FFC) Conductive Ink Circuitry (CIC)



Low profile body heights Permit low PCB clearance



Upper or lower contact orientation Provides design flexibility







Cable Lock alignment system Ensures proper alignment during mating and prevents unintentional cable release



Gas Tight High pressure (GTH) contact system Provides highly-reliable contact performance







Embossed Tape-and-Reel packaging Supports automated PCB assembly process



Contents

0.30 mm spacing	page
62789 Series	6

0.50 mm spacing

62674 Series	
62684 Series	
SFV Series	

1.00 mm spacing

SFW Series	
HFW Series	
SLW Series	
HLW Series	

2.54 mm spacing

DUFLEX Series	
CLINCHER Series	

GENERAL

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FFC / FPC / CIC Connectors



Product Chart



FFC / FPC / CIC Connectors









Features

- Available in 27, 33, 39, 45, 51, 57, 67 positions
- Right angle
- Excellent cable retention with small size slider



PC Board pattern (component side)

Benefits

- Low profile of 2.00 mm
- Flip-Top cover rotates back 100 degrees for easy cable positioning.
- Staggered PCB layout enables space savings and easy soldering.
- The Zero Insertion Force (ZIF) connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.

Technical Data





0.30 mm Spacing for FPC

Ordering Data

Series 62789 - Positions 1100

Number of contacts 27, 33, 39, 45, 51, 57, 67 (for other number of positions, please contact FCI)

Packaging

Tape and reel : 3000 pcs.

Dimensions



Circuitry Type For Recommended Circuitry type see page 27

Technical Support / Drawings / Specifications / www.fciconnect.com

The most flexible solution





0.50 mm Spacing for FFC / FPC

Features

- Available in 8, 12, 16, 20, 23, 24, 25, 30, 33 positions
- Straight
- Excellent cable retention with small size slider
- Cable lock option



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Zero Insertion Force (ZIF) connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.
- The slider ensures maximum cable retention with a minimum size.
- Fork shaped contacts mean stable and low contact resistance.
- The cable lock option provides cable strain relief as well as full retention of cable.

Technical Data

PC Board pattern (component side)





0.50 mm Spacing for FFC / FPC

Ordering Data



Dimensions	
A = 0.50 x total number of positions $+ 4.50$	±0.20
B = $0.50 \times \text{total number of positions} + 3.90$	±0.20
C = 0.50 x total number of positions - 0.50	±0.10
D (with cable lock) = $0.50 \times \text{total number of positions} - 0.40$	±0.10
D (without cable lock) = $0.50 \times \text{total number of positions} + 0.7$	70 ±0.10

Circuitry Type For Recommended Circuitry type see page 27





0.50 mm Spacing for FPC / FPC

Features

- Available in 32, 34, 36, 40, 43, 45, 50 positions
- Right angle
- Excellent cable retention with small size slider



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Zero Insertion Force (ZIF) connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.
- The slider ensures maximum cable retention with a minimum size.
- Fork shaped contacts mean stable and low contact resistance.

Technical Data

Material

- Housing: Glass filled thermoplastic, UL94V-0, Beige
- Slider : Glass filled thermoplastic, UL94V-0, Black
- Contact : Phosphor Bronze, Tin alloy plated

PC Board pattern (component side)





62684 series - ZIF / SMT

0.50 mm Spacing for FPC / FPC

Ordering Data



Dimensions



Circuitry Type For Recommended Circuitry type see page 28





0.50 mm Spacing for FFC / FPC

Features

- Available in 4 to 35 positions
- Right angle
- Cable lock option
- Top and bottom contacts
- Excellent cable retention with small size slider



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Zero Insertion Force (ZIF) connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.
- The slider ensures maximum cable retention with a minimum size.
- The cable lock option provides cable strain relief as well as full retention of cable.
- Fork shaped contacts mean stable and low contact resistance.
- Product variations cover a broad range of applications.

Technical Data

Material

 Housing :
 Polyamide Resin, glass reinforced, UL94V-0, Black

 Slider
 :
 PPS Resin, glass reinforced, UL94V-0, Brown (with cable-lock : Black)

 Contact
 :
 Phosphor Bronze, Tin alloy plated



PC Board pattern (component side)



SFV series - ZIF / SMT

0.50 mm Spacing for FFC / FPC

Ordering Data

Series	SFV	20	R -	• 1	ST	E1		
	-	-			-			
Number of conta	acts 4 to 3	35					Packaging	tape-and-reel : 3000 pcs.
Terminal type F	R = side entr	У						
							PCB mountin	ig ST = SMT type
Cable type 1	= FPC/FF	C downs	ide cont	act				

2 = FPC/FFC upside contact

3 = FPC (with cable-lock) downside contact

4 = FPC (with cable-lock) upside contact

Dimensions



Circuitry Type For Recommended Circuitry type see page 28 and 29





Features

- Available in 4 to 30 positions (right angle) and 4 to 32 positions (straight)
- Top and Bbottom contacts
- Cable lock option
- Optional mounting devices (straight)
- Excellent cable retention with small size slider



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Zero Insertion Force (ZIF) connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.
- The slider ensures maximum cable retention with a minimum size.
- The cable lock option provides cable strain relief as well as full retention of cable.
- Fork shaped contacts mean stable and low contact resistance.
- Product variations cover a broad range of application.
- Optional mounting devices provide PCB hold-down and strain relief for SMT tails, highly desirable for lower positions.

Technical Data

PC Board pattern (component side)





SFW series - ZIF / SMT

1.00 mm Spacing for FFC / FPC / CIC

Ordering Data

Series	5	SFW	20	R	-	1	ST	•	E1.	Р	Packaging
										Righ	t angle tape-and-reel 2000 pcs
Number of co	ntact	s 4 to 3	0							Strai	ght <tape-and-reel 1000="" pcs<="" td=""></tape-and-reel>
Terminal type	R =	Right ang	gle								PCB mounting
S = Straight				ST = SMT type					SMT type		
									ST	M =	SMT with mounting device (top entry only)
Cable type	1 =	FPC/FFC	C downs	side co	ntact					5 =	CIC downside contact
	2 =	FPC/FFC) upside	e conta	ict					6 =	CIC upside contact
	3 =	FPC (with cable-lock) down			down	side contact 7 = CIC (with cable-lock) d				CIC (with cable-lock) downside contact	
	4 =	FPC (wit	h cable	-lock) ι	upsid	e co	ntact			8 =	CIC (with cable-lock) upside contact
	(cab	le types 1,	3, 4, 5,	7, 8 fc	or sid	e en	try onl	y)			

Dimensions



Circuitry Type For Recommended Circuitry type see page 29 and 30

15





Features

- Available in 4 to 30 positions (right angle) and 4 to 33 positions (straight)
- Top and bottom contacts
- Optional mounting devices (straight)



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Low Insertion Force (LIF) contacts positioning provides a reliable and easy mating operation.
- Fork shaped contacts mean stable and low contact resistance.
- Optional mounting devices provide PCB hold-down and strain relief for SMT tails, highly desirable for lower positions.





HFW series - LIF / SMT

1.00 mm Spacing for FFC / FPC / CIC

Ordering Data



2 = FPC/FFC upside contact (Right angle)

Dimensions



Circuitry Type For Recommended Circuitry type see page 30



Features

- Available in 4 to 30 positions
- Right angle or vertical type
- Excellent cable retention with small size slider
- Kinked solder tails available



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Zero Insertion Force connection allows an increased number of mating cycles with minimal wear.
- The ZIF pre-holding process provides a stable and reliable mating operation.
- The slider ensures maximum cable retention with a minimum size.
- Fork shaped contacts mean stable and low contact resistance.
- Kinked solder tails provide added PCB retention.
- Product variations cover a broad range of applications.

Technical Data

Material

Housing : Nylon, glass reinforced, UL94V-0, Black Slider : Nylon, glass reinforced, UL94V-0, Black (For CIC : Milky-White) Contact : Phosphor Bronze, Tin alloy plated



THICKNESS : 0.8~16

PC Board pattern (component side)



Ordering Data



Dimensions



Circuitry Type For Recommended Circuitry type see page 31



Features

- Available in 4 to 32 positions
- Right angle and vertical type
- Kinked solder tails available



Benefits

- The Gas-Tight, High pressure (GTH) contact system ensures a low cost connection with reliability equal to gold plating.
- The Low Insertion Force (LIF) contacts positioning provides a reliable and easy mating operation.
- Fork shaped contacts mean stable and low contact resistance.
- Kinked solder tails provide added PCB retention.

Technical Data

PC Board pattern (component side)

Material

Housing : PBT, glass reinforced, UL94V-0, Black

Contact : Phosphor Bronze, Tin alloy plated



THICKNESS : 1.2~1.6



Ordering Data



Dimensions



Circuitry Type For Recommended Circuitry type see page 31





Features

- Available in 2 to 36 positions per row
- Single or double row
- Gold or tin plated option
- Gas tight
- Highly reliable Insulation Displacement Contact (IDC) termination technique
- Low-cost connection system
- Versatility
- Long-life contacts
- Mates with 0.62 mm square or round pins as short as 5 mm
- Dedicated application equipment



Benefits

- Ideal for large-volume users.
- Mass-termination reduces overall applied costs and time.
- Contacts fitting all housing styles ensures versatility and minimizes stock values.

Technical Data

Material

Housing : Thermoplastic Polyester, glass reinforced, UL94V-0, Blue

Contact : Phosphor Bronze, Gold-duplex or Tin alloy plated

	Cable specification
Specification:	IPC Standard FC-220C. Cables type A or B
Thickness:	0.305 ±0.025 mm(0.012±0.0001 inch) incl. insulation
Insulation material:	Mylar, Kapton or Nomex (polyester/polyamide)
Conductor Thickness:	0.076 ±0.013 mm (0.003±0.0005 inch), 305 gr/m ²
	0.127 ±0.013 mm (0.005±0.0005 inch), 610 gr/m ²
Conductor width:	1.57 ± 0.07 mm (0.062±0.003 inch)
Conductor pitch:	2.54 ±0.05 mm (0.100±0.002 inch)
Thickness for	
non standard cable:	0.11 - 0.35 mm (0.004 - 0.013 inch)
Mating pin:	0.64 mm square (0.025 inch), min. 5.00 mm(0.196 inch) length
Cable specification and	application data sheet TA 338 and TA 333 on request





Ordering Data



Dimensions

Contact



Housing



Single row



Double row



Technical Support / Drawings / Specifications / www.fciconnect.com

Dimensions in mm

The most flexible solution





Features

- Available in 2 to 32 positions
- Gas-Tight, High pressure (GTH)
- Gold and tin plated option
- Pre-assembled
- Snap-shut
- Long-life contacts
- Mates with 0.62 mm square or round pins
- Dedicated application equipment



Benefits

- Pre-assembled connectors reduce overall applied costs and ensure full contact protection.
- Snap-shut allows a single connection operation and therefore increases assembly speed.

Technical Data

Material

- Housing : Polypropylene, glass reinforced, UL94V-0, Blue
- Contact : brass, Gold or Tin alloy plated

	Cable specification
Specification:	IPC Standard FC-220C. Cables type A or B
Thickness:	0.305 ±0.025 mm(0.012±0.0001 inch) incl. insulation
Insulation material:	Mylar, Kapton or Nomex (polyester/polyamide)
Conductor Thickness:	0.076 ±0.013 mm (0.003±0.0005 inch), 305 gr/m ²
	0.127 ±0.013 mm (0.005±0.0005 inch), 610 gr/m ²
Conductor width:	1.57 ± 0.07 mm (0.062±0.003 inch)
Conductor pitch:	2.54 ±0.05 mm (0.100±0.002 inch)
Thickness for	
non standard cable:	0.11 - 0.35 mm (0.004 - 0.013 inch)
Mating pin:	0.64 mm square (0.025 inch), min. 5.00 mm(0.196 inch) length
Cable specification and	application data sheet TA 264, TA 371 and TA 372 on request



- 2.54 (0.100 inc

2.54 (n-1)

2.54 (n-1) +7.37

Gol	d p	lated	Tin	pla	ted
code	р	ositions	code	р	ositions
63	=	2 pos.	02	=	2 pos.
62	=	3 pos.	03	=	3 pos.
33	=	4 pos.	04	=	4 pos.
34	=	5 pos.	05	=	5 pos.
35	=	6 pos.	06	=	6 pos.
36	=	7 pos.	07	=	7 pos.
37	=	8 pos.	08	=	8 pos.
38	=	9 pos.	09	=	9 pos.
39	=	10 pos.	10	=	10 pos.
40	=	11 pos.	11	=	11 pos.
41	=	12 pos.	12	=	12 pos.
42	=	13 pos.	13	=	13 pos.
43	=	14 pos.	14	=	14 pos.
44	=	15 pos.	15	=	15 pos.
45	=	16 pos.	16	=	16 pos.
46	=	17 pos.	17	=	17 pos.
47	=	18 pos.	18	=	18 pos.
48	=	19 pos.	19	=	19 pos.
49	=	20 pos.	20	=	20 pos.
50	=	21 pos.	21	=	21 pos.
51	=	22 pos.	22	=	22 pos.
52	=	23 pos.	23	=	23 pos.
53	=	24 pos.	24	=	24 pos.
54	=	25 pos.	25	=	25 pos.
55	=	26 pos.	26	=	26 pos.
56	=	27 pos.	27	=	27 pos.
57	=	28 pos.	28	=	28 pos.
58	=	29 pos.	29	=	29 pos.
59	=	30 pos.	30	=	30 pos.
60	=	31 pos.	31	=	31 pos.
61	=	32 pos.	32	=	32 pos.
66	=	34 pos.	64	=	34 pos.

_____ 2.54 (n-1) 0.100 (n-1)inch

2.54 (n-1) +7.37

Gol	d p	lated	k	· ·	Γin	pla	ted	
code	ро	ositi	coo	le	р	ositi	ons	
34	=	2	pos.	02	2	=	2	pos.
35	=	3	pos.	03	3	=	3	pos.
36	=	4	pos.	04	1	=	4	pos.
37	=	5	pos.	05	5	=	5	pos.
38	=	6	pos.	06	3	=	6	pos.
39	=	7	pos.	07	7	=	7	pos.
40	=	8	pos.	08	3	=	8	pos.
41	=	9	pos.	09	9	=	9	pos.
42	=	10	pos.	10)	=	10	pos.
43	=	11	pos.	11		=	11	pos.
44	=	12	pos.	12	2	=	12	pos.
45	=	13	pos.	13	3	=	13	pos.
46	=	14	pos.	14	1	=	14	pos.
47	=	15	pos.	15	5	=	15	pos.
48	=	16	pos.	16	6	=	16	pos.
49	=	17	pos.	17	7	=	17	pos.
50	=	18	pos.	18	3	=	18	pos.
51	=	19	pos.	19)	=	19	pos.
52	=	20	pos.	20)	=	20	pos.
53	=	21	pos.	2		=	21	pos.
54	=	22	pos.	22	2	=	22	pos.
55	=	23	pos.	23	3	=	23	pos.
56	=	24	pos.	24	1	=	24	pos.
57	=	25	pos.	25	5	=	25	pos.
58	=	26	pos.	26	3	=	26	pos.
59	=	27	pos.	27	7	=	27	pos.
60	=	28	pos.	28	3	=	28	pos.
61	=	29	pos.	29	9	=	29	pos.
62	=	30	pos.	30)	=	30	pos.
63	=	31	pos.	3-		=	31	pos.
64	=	32	pos.	32	2	=	32	pos.

15.49

Dimensions in mm



Bill of Material Flexible Printed Circuit (FPC)						
1	Base Film	Polyamide or Polyester or Equivalent				
2	Conductor	Copper Foil (Solder Plated 1 µm min.)				
3	Overlay	Polyamide or Polyester or Equivalent				
4	Supporting Tape	Polyamide or Polyester or Equivalent				
Flexible Flexible Cable (FFC)						
Number	Description	Material				
1	Insulation	Flame Resistant Polyester or Equivalent				
(2)	Conductor	Copper Foil (Tin or Solder Plated 1 µm min.)				
\sim						

Conductive Ink Circuit (CIC)

Number	Description	Material		
1	Base Film	Polyester or Equivalent		
2	Conductor	Carbon Paste over Silver Paste		
3	Overlay	Polyamide or Polyester or Equivalent		
4	Supporting Tape	Polyamide or Polyester or Equivalent		



FPC for 62789 Series



FPC for 62674 Series



FFC for 62674 Series



FPC cable lock for 62674 Series



) = for circled number description, please see page 26



FFC for 62684 Series



FFC for SFV Series



) = for circled number description, please see page 26

FPC for 62684 Series



FPC for SFV Series





FPC cable lock for SFV Series

FFC cable lock for SFW Series



FFC for SFW Series



FPC for SFW Series



) = for circled number description, please see page 26



Technical Support / Drawings / Specifications: www.fciconnect.com

The most flexible solution



FPC cable lock for SFW Series



FFC for HFW straight Series



FPC for HFW RA Series



) = for circled number description, please see page 26



The most flexible solution

MM

ŝ

FPC for HFW straight Series



FFC for SLW Series



FPC for SLW Series



FPC for HLW Series



= for circled number description, please see page 26

Technical Support / Drawings / Specifications: www.fciconnect.com

The most flexible solution

FFC for HLW Series

RECOMMENDED CABLE (FFC) n : NO. OF CONDUCTORS 1×(⊓+1)±0.1 1 ±0.15 1×(n−1)±0.07 1 ±0 15 0.3±005 1±0.05 0.7 ±0.03 2 MIN 9 T) I I I I I 11111111 I II II II II 0.5 REF THUT ппп 3 цијијији цијијт



Performance characteristics

Spacing	0.30 mm	0.50 mm	1.00 mm	2.54 mm
Circuitry	FPC	FFC / FPC	FFC / F	PC / CIC
Series	62789	62674 62684 SFV	SFW HFW SLW HLW	DUFLEX CLINCHER
Electrical				
Current Rating	0.5A	0.5A	1A	2A
Rated Voltage (AC/DC)	50V	50V	100V	500V
Contact Resistance (initial)	$30m\Omega$ max.	$30m\Omega$ max.	$30 \text{m}\Omega$ max.	$30 \mathrm{m}\Omega$ max.
Insulation Resistance	100M Ω min.	100M Ω min.	500MΩ min.	5000MΩ min.
Dielectic withstanding Voltage	AC 200VAC 2	200V AC 500V	V AC 1000V	
Mechanical				
Durability		Contact resistance	ce : 50m Ω max.	
Cycle	20	20	20 30 20 30	30
Vibration		per JIS C 0040	No discontinuity greater than	1µ second
Environmental				
Salt Spray		per JIS C 0023	Contact Resistance 50m	2 max.
Damp Heat		per JIS C 0022	Contact Resistance 50mΩ max.	
(steady state)			Insulation Resistance 100mΩ min.	
Change of Temperature		per JIS C 0025	Contact Resistance 50mΩ max.	
Operating temperature Range			-55°C to +85°C	



Series at a glance

Series	Pitch	Cable Type	ZIF / LIF	Soldering	Number of Positions
	0.00	500	715	0. J.T.	
62789	0.30 mm	FPC	ZIF	SMT	27,33,39,45,51,57
62674	0.50 mm	FFC/FPC	ZIF	SMT	12,20,24,25,30
62684	0.50 mm	FFC/FPC	ZIF	SMT	32,34,40,45,50
SFV	0.50 mm	FFC/FPC	ZIF	SMT	4 to 35
SFR	0 80 mm	FEC/EPC/CIC	7IF	SMT	4 to 30
HFR	0.80 mm	FFC/FPC/CIC	LIF	SMT	4 to 30
	••••			•••••	
SFW	1.00 mm	FFC/FPC/CIC	ZIF	SMT	4 to 30
HFW	1.00 mm	FFC/FPC/CIC	LIF	SMT	4 to 30
SLW	1.00 mm	FFC/FPC/CIC	ZIF	DIP	4 to 30
HLW	1.00 mm	FFC/FPC/CIC	LIF	DIP	4 to 32
SED	1 25 mm	FEC/EPC/CIC	ZIE	SMT	162126
SID	1.25 mm	FFC/FPC/CIC	ZII 7IF	DIP	4,0,21,20 4 to 40
SLP	1.25 mm	FFC/FPC/CIC	ZIF	DIP	4 to 20
SLEM	1.25 mm	FFC/FPC	ZIF	DIP	4 to 30
HLEM	1.25 mm	FFC/FPC/CIC	LIF	DIP	3 to 40
Clincher	2.54 mm	FFC/FPC/CIC	-	-	2 to 32
Duflex	2.54 mm	FFC/FPC/CIC	-	-	2 to 72



Notes



Notes

AREVA, the world leader in nuclear power and connectors, is present in more than 30 countries.

The group's employees provide customers with a full range of products and services for electricity generation and develop connector products and interconnect systems mainly for the communications, data and automotive markets.

AREVA brings expertise and technologies for better living to meet the challenges of the 21st century: generalized access to energy and information, preservation of the planet, and responsible stewardship of resources for future generations.

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