



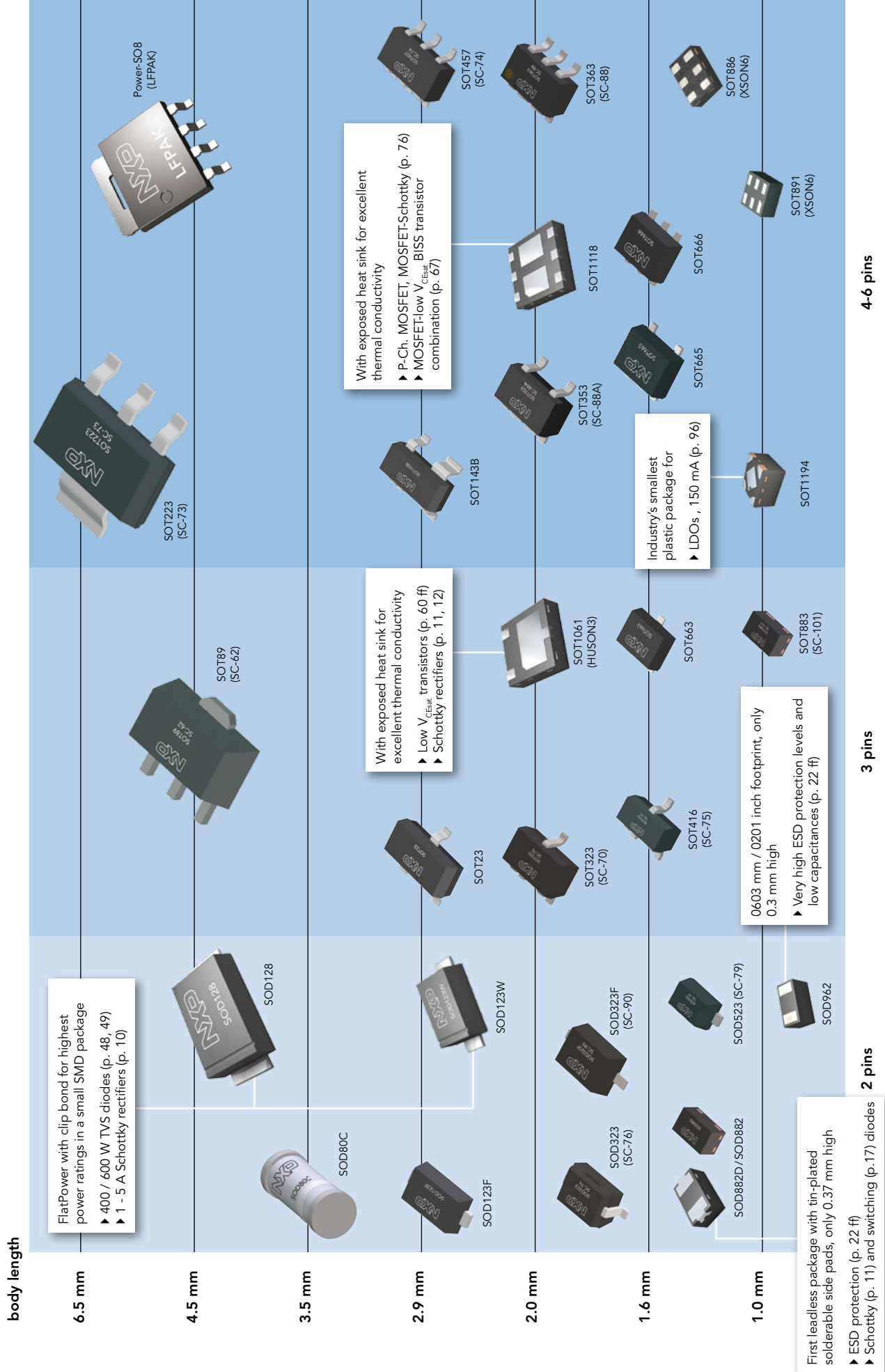
Discrete Semiconductors Selection Guide 2011

Diodes, protection and signal conditioning devices,
bipolar transistors, MOSFETs, thyristors



Discrete Semiconductors packages – portfolio and highlights

Small SMD packages with 2 - 6 pins



The first leadless package with solderable side pads

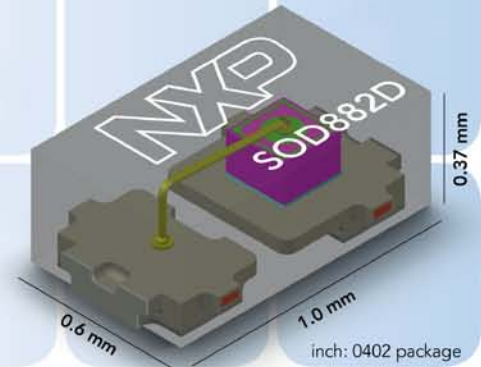
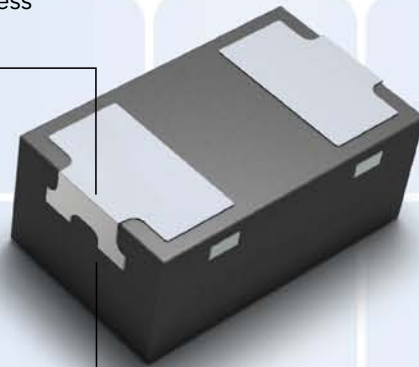
Solderable (Tin-plated) exposed side pads

- ▶ Easy visible inspection of solder pads
- ▶ Very high mechanical robustness
- ▶ Post-soldering stability

Full thermal, electrical, mounting and footprint compatibility to leadless 1006 mm packages (inch: 0402)
▶ **Height only 0.37 mm**

Built for a range of functions

- ▶ Protection, Switching and Schottky diodes
- ▶ **Ideal for small and thin devices**



Get ready to improve your ultra-flat PCB design with our SOD882D package.

<http://standardproducts.nxp.com>



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Support tools

Check the NXP Standard Products Portal www.standardproducts.nxp.com

Your first stop for NXP's wide range of diodes, bipolar transistors, MOSFETs, thyristors and ESD protection products. The gateway focuses on:

- Product and application information
- Recently launched products
- News items and related documents
- Design hints, with simple solutions to some of today's common design challenges, incl. energy efficiency, integration, packaging, and protection



Direct links to popular design support tools and items:

Datasheets

http://standardproducts.nxp.com/all_datasheets

Find cross references of industry type numbers and download X-Reference offline tool

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Application notes

http://standardproducts.nxp.com/all_appnotes

Sales literature

http://standardproducts.nxp.com/all_literature

Selection Guide (download pdf file)

http://www.nxp.com/discrete_selection_guide

Models and test data

<http://www.nxp.com/models>

Technical support portal

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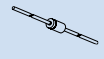


FAQ (Frequently Asked Questions) Discretes

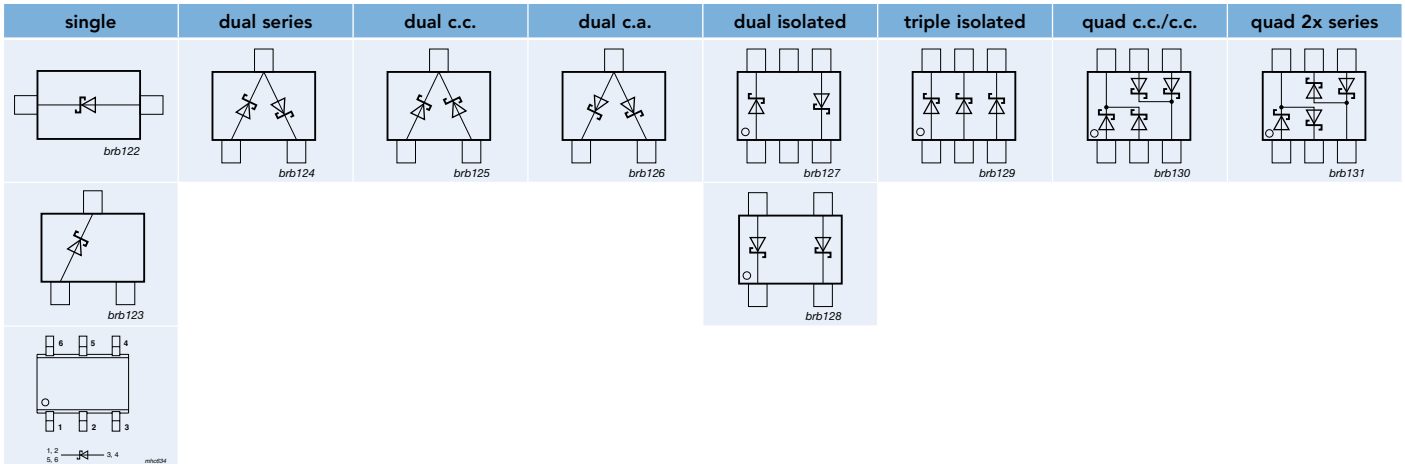
http://www.nxp.com/faq_discretes

Direct support needed? Find complete contact information to your regional NXP sales offices and distributors






<http://www.nxp.com/profile/sales>

General purpose Schottky diodes ≤ 250 mA

I_F max (mA)	V_F max (V)	V_F max (mV)	@ I_F (mA)	I_R max (μA)	@ V_R (V)	Package	SOD80C (MiniMelf)	SOD68 (DO-34)	SOT23	SOT143B	
											
							Size (mm)	3.5 x 1.5 x 1.5	3.04 x 1.6 x 0.55	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0
							P_{tot} (mW)	300	500	250	250
70	70	750	10	0.1	50	single			BAS70		
						dual series			BAS70-04		
						dual c.c.			BAS70-05		
						dual c.a.			BAS70-06		
						dual isolated				BAS70-07	
						triple isolated					
120	40	370	1	0.5	30	quad 2x series					
						single					
						single			BAS40		
						dual series			BAS40-04		
						dual c.c.			BAS40-05		
		dual c.a.			BAS40-06						
		dual isolated				BAS40-07					
		quad c.c./c.c.									
		quad 2x series									
		200	30	300	10	30	10	single			
single									BAT754		
dual series					BAT754S						
dual c.c.					BAT754C						
dual c.a.					BAT754A						
triple isolated											
single	BAS85			BAT85	BAT54						
dual series					BAT54S						
dual c.c.					BAT54C						
dual c.a.					BAT54A						
dual isolated					BAT74						
triple isolated											
quad c.c./c.c.											
quad 2x series											
single											
single											
40	300		10	15	30	single			BAT721		
						dual series			BAT721S		
						dual c.c.			BAT721C		
						dual c.a.			BAT721A		
	single										
	single										
	dual series										
	dual c.c.										
dual c.a.											
50	450	10	5	40	single	BAS86	BAT86				
					single						
250	100	850	250	4	75	single					
						single					






















Medium power low V_F Schottky rectifiers single ≥ 200 mA

I_F max (A)	V_R max (V)	V_F max (mV) @ I_F max	I_R max (mA) @ V_R max	Package	SOD128	SOT457 (SC-74)	SOT23	SOD123W	SOD123F	
										
				Size (mm)	3.8 x 2.5 x 1.0	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.7 x 1.0	2.6 x 1.6 x 1.1	
				P_{tot} (mW) @ 1 cm ²	1050	540	420	950	830	
Optimization										
0.2	30	480	0.04	low V_F						
	40	600	0.01	low I_R						
	60	600	0.1	low V_F						
0.5	20	390	0.2	low V_F			PMEG2005ET		PMEG2005EH	
		440	1.5	low V_F						
		480	0.01	low I_R						
	30	500	0.03	low I_R						
		430	0.15	low V_F			PMEG3005ET		PMEG3005EH	
		500	0.5	low V_F						
40	470	0.1	low V_F			PMEG4005ET		PMEG4005EH		
	550	0.1	low V_F			BAT720				
1.0	20	340	1	low V_F				PMEG2010ER		
		375	1.9	low V_F						
		430	0.2	low V_F			PMEG2010AET		PMEG2010AEH	
		450	0.05	low I_R				PMEG2010BER		
		500	0.2	low V_F			PMEG2010ET		PMEG2010EH	
		550	0.07	low I_R						
	30	450	1.0	low V_F			1PS74SB23			
		360	1.5	low V_F	PMEG3010EP			PMEG3010ER		
		450	0.05	low I_R	PMEG3010BEP			PMEG3010BER		
		520	0.05	low I_R					PMEG3010CEH	
		560	0.15	low V_F			PMEG3010ET		PMEG3010EH	
		680	0.5	low V_F						
	40	490	0.05	low V_F	PMEG4010EP			PMEG4010ER		
		640	0.1	low V_F			PMEG4010ET		PMEG4010EH	
		570	0.05	low I_R					PMEG4010CEH	
60	530	0.06	low V_F	PMEG6010EP			PMEG6010ER			
	650	0.35	low V_F			PMEG6010AED				
	660	0.05	low I_R					PMEG6010CEH		
1.5	20	660	0.07	low I_R				PMEG2015EH		
	30	550	1.0	low V_F				PMEG3015EH		
2.0	10	460	3.0	low V_F					PMEG1020EH	
		420	1.9	low V_F						
	20	525	0.2	low V_F					PMEG2020EH	
		360	3.0	low V_F	PMEG3020EP					
		420	1.5	low V_F	PMEG3020CEP			PMEG3020ER		
		450	0.1	low I_R	PMEG3020BEP					
		470	2.5	low V_F						
		520	0.05	low I_R	PMEG3020DEP			PMEG3020BER		
	30	620	1.0	low V_F					PMEG3020EH	
		490	0.1	low V_F	PMEG4020EP			PMEG4020ER		
		535	0.1	low V_F						
		530	0.15	low V_F	PMEG6020EP			PMEG6020ER		
60	575	0.25	low V_F							
3.0	10	530	3.0	low V_F					PMEG1030EH	
	30	360	5.0	low V_F	PMEG3030EP					
		450	0.15	low I_R	PMEG3030BEP					
	40	490	0.2	low V_F	PMEG4030EP					
		540	0.1	low I_R				PMEG4030ER		
60	530	0.2	low V_F	PMEG6030EP						
5.0	30	360	8.0	low V_F	PMEG3050EP					
		450	0.25	low I_R	PMEG3050BEP					
	40	490	0.3	low V_F	PMEG4050EP					

Medium power low V_F Schottky rectifiers dual ≥ 200 mA

types in **bold** represent new products

I_F max (A)	V_R max (V)	V_F max (mV) @ I_F max	I_R max (mA) @ V_R max	Optimization	Package	SOT223 (SC-73)	SOT23	SOT1061	SOT666
									
						Size (mm)	6.5 x 3.5 x 1.65	2.9 x 1.3 x 1.0	2.0 x 2.0 x 0.65
P_{tot} (mW)	1500	250	1000	300					
0.2	30	480	0.03	low V_F	dual isolated 				PMEG3002TV
	60	600	0.1	low V_F					PMEG6002TV
0.5	20	390	0.2	low V_F	dual c.c. 			PMEG2005CT	
	30	430	0.15	low V_F				PMEG3005CT	
	40	470	0.1	low V_F				PMEG4005CT	
1.0	25	450	1.0	low V_F	dual series 	BAT120S			
				low V_F	dual c.c. 	BAT120C			
				low V_F	dual c.a. 	BAT120A			
	40	500	0.05	low V_F	dual c.c. 				PMEG4010CPA
				low V_F	dual c.c. 				PMEG6010CPA
	60	650	0.35	low V_F	dual series 	BAT160S			
				low V_F	dual c.c. 	BAT160C			
				low V_F	dual c.a. 	BAT160A			
	2.0	20	420	1.0	low V_F	dual c.c. 			
30		440	2.0	low V_F	dual c.c. 				PMEG3020CPA

In the Spotlight

Medium power single and dual Schottky rectifiers in SOT1061

Small (2 x 2 x 0.65 mm) leadless medium power package SOT1061

Exposed heat sink for excellent thermal and electrical performance ($P_{tot} > 1$ W)

High forward-current capability (I_F up to 2 A) with low forward voltage drop


































High reverse voltage (V_R up to 60 V)

AEC-Q101 qualified



General purpose Zener diodes

types in **bold** represent new products

I_f max (mA)	P_{ZSM} (W)	V_z nom (V)	V_z tolerance	Note	Configuration	Series	Package	Size (mm)	P_{tot} (mW)
500	-	3.3~24	C	Eur	single 	1N47xxA series		4.8 x 2.6 x 0.81	1000
	60	3.6~75				BZV85 series			
250	-	2.4~36	about 2%	special	single 	NZX series		4.25 x 1.85 x 0.56	400
	40	2.4~75	B, C	Eur		BZX79 series			
400	40	2.4~75	C	Eur	single 	BZV90 series		6.5 x 3.5 x 1.65	1500
250	40	2.4~75	C	Eur	single 	BZV49 series		4.5 x 2.5 x 1.5	1000
250	40	2.4~75	B, C	Eur	single 	BZV55 series		3.5 x 1.5 x 1.5	300
200	40	2.4~75	B, C	Eur	dual c.a. 	BZB84 series		2.9 x 1.3 x 1.0	250
250	30		A, B, C		Ave	single 			
		0.2 V	Ave	dual c.a. 		PLVA600A series			
250	-	3.0~30	about 2.5%	special	single 	NZH series		2.6 x 1.6 x 1.1	830
	40	2.4~75	B, C	Eur		BZT52H series			
200	40	2.7~24	B2	Jap	dual isolated 	PZUxDB2 series		2.0 x 1.25 x 0.95	300
200	40	2.4~15	C	Eur	dual c.a. 	BZB784 series		2.0 x 1.25 x 0.95	350
200	30	100	C	Eur	back-to-back 	BZB100A		1.7 x 1.25 x 0.95	300
	40	2.4~36	B2	Jap	single 	PDZ-B series			
250	40	2.4~75	B, C	Eur		BZX384 series			
200	40	2.4~36	B, B1, B2, B3	Jap		PZUxBA series			
200	60	100	C	Eur	single 	BZB100A		1.7 x 1.25 x 0.7	550
200	40	2.4~36	B, B1, B2, B3	Jap		PZUxB series			
250	40	2.4~75	B, C	Eur		BZX84J series			
200	40	2.4~15	C	Eur	dual c.a. 	BZB984 series		1.6 x 1.2 x 0.55	350
200	40	2.4~75	B, C	Eur	single 	BZX585 series		1.2 x 0.8 x 0.6	300
200	40	2.4~75	B, C	Eur	single 	BZX884 series		1.0 x 0.6 x 0.5	250
		2.4~36	B, B2	Jap		PZUxBL series			
250	180	5.6	C	Eur	single 	TDZ5V6J		1.7 x 1.25 x 0.7	500

Notes:

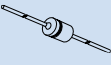
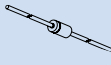






















Jap: B selection: app. 5% V_z tolerance, B1, B2, B3 selections: app. 2% V_z tolerance in sequential intervals

Eur: A selection: app. 1% V_z tolerance, B selection: app. 2% V_z tolerance, C selection: app. 5% V_z tolerance; the selections are in overlapping intervals



























Ave: low voltage avalanche regulator diodes

dual c.a.: dual common anode

General purpose switching diodes $\leq 100V$









V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA)	@ V_R (V)	t_{rr} max (ns)	Package	SOD27 (DO-35)	SOD68 (DO-34)	SOD80C (MiniMelf)	SOT23	SOT143B	SOD123F				
																
							Size (mm)	4.25 x 1.85 x 0.56	3.04 x 1.6 x 0.55	3.5 x 1.5 x 1.5	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1			
							P_{tot} (mW)	500	500	500	250	250	830			
50	1	50	100	50	4					BAL74						
										BAV74						
70	1	50	1000	70	4					BAL99						
75	1	10	25	20	4			1N4531								
		50	1000	75	4						BAS28					
		100	5000	75	4				BAS32L							
90	1	50	500	80	4					BAW56						
																
																
100	1	10	25	20	4		1N4148									
		50	500	80	4							BAS16H				
											BAS16					
																
																
														BAV70		
																
														BAV99		
																

General purpose switching diodes > 100V

V_R max (V)	V_F max (V)	I_F (mA)	I_R max (mA)	V_R (V)	t_r max (ns)	 Package Size (mm) P_{tot} (mW)	SOD27 (DO-35)	SOD80C (MiniMelf)	SOT457 (SC-74)	SOT23	SOT143B	SOD123F	SOT323 (SC-70)	SOT363 (SC-88)	SOD323 (SC-76)	SOD323F (SC-90)	SOD523 (SC-79)				
																					
150	1	100	100	150	50	 BAV20															
≥ 200	1	100	100	200	50	 BAV21		BAV103				BAS21H			BAS321						
						 BAS21				BAS21			BAS21W								
						 BAV23							BAV23								
						 BAV23A							BAV23A			BAS21AW					
						 BAV23C								BAV23C							
						 BAV23S									BAV23S		BAS21SW				
						 BAS21VD											BAS21VD				
						 BAS21J												BAS21J	BAS521		
						 BAS101													BAS101		
						 BAS101S														BAS101S	
300	1.1	100	150	250	50	 BAW101															
						 BAW101S															
						 BAW101S															





Ultrafast recovery power diodes

types in **bold** represent new products

V_{RRM} (V)	I_{FAV} (A)	V_F (typ) @ 150C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT226 (I ² PAK)	SOT404 (D ² PAK)	SOT428 (DPAK)
												
100	8	0.8	8	20	BYW29E-100							
	2 x 10	0.72	8	20			BYV32E-100					
150	2 x 0.75	0.5	0.5	10					BYV40E-150			
	8	0.8	8	20	BYW29E-150							
	2 x 10	0.72	8	20			BYV32E-150					
200	2 x 15	0.78	15	20			BYV42E-150					
	8	0.8	8	20	BYW29E-200	BYW29EX-200						BYW29ED-200
	2 x 5	0.8	5	15			BYQ28E-200	BYQ28X-200				BYQ28ED-200
	14	0.83	14	20	BYV79E-200							
	2 x 8	0.84	8	20			BYQ30E-200					
	2 x 10	0.72	8	20			BYV32E-200			BYV32G-200	BYV32EB-200	
300	2 x 15	0.78	15	20			BYV42E-200			BYV42G-200	BYV42EB-200	
	2 x 5	0.95	5	50			BYT28-300					
400	9	0.9	8	50	BYV29-400							
	2 x 10	0.87	10	50			BYV34-400					
500	9	0.9	8	50	BYV29-500	BYV29X-500					BYV29B-500	
	2 x 5	0.95	5	50			BYT28-500					
	15	0.9	15	50	BYT79-500							
	2 x 10	0.87	10	50			BYV34-500					
600	2 x 15	0.95	15	50			BYV44-500					
	5	0.97	5	50		BYV25X-600				BYV25G-600		BYV25D-600
	8	1.07	8	60	BYR29-600	BYR29X-600						
	9	0.97	8	50	BYV29-600	BYV29X-600				BYV29G-600	BYV29B-600	
	15	1	15	50	BYT79-600	BYT79X-600						
	2 x 10	0.92	10	50			BYV34-600	BYV34X-600		BYV34G-600		
	5	1.1	5	17.5		BYV25FX-600	BYV25F-600				BYV25FB-600	BYV25FD-600
	9	1.25	8	17.5		BYV29FX-600	BYV29F-600				BYV29FB-600	BYV29FD-600
800	2 x 10	1.3	10	20			BYV410-600	BYV410X-600				
	8	1.07	8	60	BYR29-800	BYR29X-800						


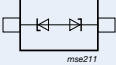
Hyperfast power diodes

types in **bold** represent new products

V_{RRM} (V)	I_{FAV} (A)	V_F (typ) @ 150C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOT78 (TO220AB)	SOT404 (D ² PAK)
								
600	5	1.4	5	19	BYC5-600	BYC5X-600		BYC5B-600
	8	1.4	8	19	BYC8-600	BYC8X-600		BYC8B-600
	8	1.4	8	19	BYC8D-600	BYC8DX-600		
	8	2	8	12.5		BYC58X-600		
	10	1.4	10	19	BYC10-600	BYC10X-600		BYC10B-600
	2 x 5	1.4	5	19			BYC10-600CT	
	15	1.4	15	19	BYC15-600	BYC15X-600		
	20	1.4	20	19	BYC20-600	BYC20X-600		

Standard ESD protection devices

types in **bold** represent new products









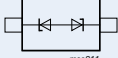






Number of protected lines		V_{RWM} (V)	C_{line} typ (pF)	C_{line} max (pF)	$P_{PP}^{(1)}$ max (W)	ESD rating ⁽²⁾ max (kV)	I_r max (μA) @ V_{RWM}	Configuration	Type	Package	Size (mm)			
Unidirectional	Bidirectional													
1	0	3.3	207	300	150	30	2		PESD3V3S1UL	SOD882	1.0 x 0.6 x 0.5			
		5	152	200	150	30	1		PESD5V0S1UL					
		12	38	75	150	30	0.05		PESD12VS1UL					
		15	32	70	150	30	0.05		PESD15VS1UL					
		24	23	50	150	23	0.05		PESD24VS1UL					
		5	152	200	150	30	1		PESD5V0S1ULD					
		12	38	75	150	30	0.05		PESD12VS1ULD					
		15	32	70	150	30	0.05		PESD15VS1ULD					
		24	23	50	150	23	0.05		PESD24VS1ULD					
		3.3	207	300	330	30	2		PESD3V3S1UB	SOD523 (SC-79)	1.2 x 0.8 x 0.6			
		5	152	200	260	30	1		PESD5V0S1UB					
		12	38	75	180	30	0.05		PESD12VS1UB					
		15	32	70	160	30	0.05		PESD15VS1UB					
		24	23	50	160	23	0.05		PESD24VS1UB					
		5	480	530	890	30	4		PESD5V0S1UA	SOD323 (SC-76)	1.7 x 1.25 x 0.95			
		12	160	180	600	30	0.1		PESD12VS1UA					
		24	23	50	160	23	0.05		PESD24VS1UA					
		5	480	530	890	30	4		PESD5V0S1UJ	SOD323F (SC-90)	1.7 x 1.25 x 0.7			
		12	160	180	600	30	0.1		PESD12VS1UJ					
		2.5	229	300	260	30	6		PESD5Z2.5	SOD523 (SC-79)	1.2 x 0.8 x 0.6			
		3.3	172	200	260	30	0.05		PESD5Z3.3					
		5	89	150	180	30	0.05		PESD5Z5.0					
		6	78	150	180	30	0.01		PESD5Z6.0					
		7	69	150	180	30	0.01		PESD5Z7.0					
		12	35	75	200	30	0.01		PESD5Z12					
		5	68	75	150	30	1		PESD9X5.0L			SOD882	1.0 x 0.6 x 0.5	
		7	62	70	150	30	1		PESD9X7.0L					
		0	1	5	35	45	130		30	0.1		PESD5V0S1BL	SOD882D	1.0 x 0.6 x 0.37
				5	35	45	130		30	0.1		PESD5V0S1BLD		
				5	35	45	130		30	0.1		PESD5V0S1BB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
5	35			45	130	30	0.1	PESD5V0S1BA	SOD323 (SC-76)	1.7 x 1.25 x 0.95				
5.5	35			45	100	30	0.1	PESD5V0S1BSF	SOD962	0.6 x 0.3 x 0.3				

⁽¹⁾ 8/20 μs surge pulse acc. to IEC 61000-4-5

⁽²⁾ acc. to IEC 61000-4-2 (contact discharge)

Low capacitance ESD protection devices

types in **bold** represent new products

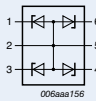
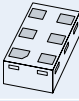
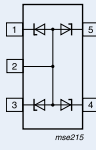











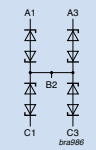
Number of protected lines		V_{RWM} (V)	C_{line} typ (pF)	C_{line} max (pF)	$P_{PP}^{(1)}$ max (W)	ESD rating ^[2] max (kV)	I_R max (μA) @ V_{RWM}	Configuration	Type	Package	Size (mm)
Unidirectional	Bidirectional										
1	0	3.3	34	40	45	30	0.3		PESD3V3L1UL	SOD882	1.0 x 0.6 x 0.5
		5	25	30	42	26	0.1		PESD5V0L1UL		
		5	25	30	42	26	0.1		PESD5V0L1ULD	SOD882D 	1.0 x 0.6 x 0.37
		3.3	34	40	45	30	0.3		PESD3V3L1UB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
		5	25	30	42	26	0.1		PESD5V0L1UB		
		3.3	34	40	45	30	0.3		PESD3V3L1UA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
		5	25	30	42	26	0.1		PESD5V0L1UA		
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UL	SOD882 	1.0 x 0.6 x 0.5
		5	2	2.6	-	9	0.1		PESD5V0U1UL		
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
		5	2	2.6	-	9	0.1		PESD5V0U1UB		
		3.3	2.6	3.1	-	9	0.1 (@ 3 V)		PESD3V3U1UA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
		5	2	2.6	-	9	0.1		PESD5V0U1UA		
		0	1	3.3	101	-	500		30	2	
5	75			-	500	30	1	PESD5V0L1BA			
12	19			-	200	30	0.05	PESD12VL1BA			
15	16			-	200	30	0.05	PESD15VL1BA			
24	11			-	200	23	0.05	PESD24VL1BA			
5.5	12			15.4	35	30	0.1	PESD5V0L1BSF	SOD962 	0.6 x 0.3 x 0.3	
5	11			13	45	30	0.01	PESD5V0V1BL	SOD882 	1.0 x 0.6 x 0.5	
5	11			13	45	30	0.01	PESD5V0V1BLD	SOD882D 	1.0 x 0.6 x 0.37	
5	11			13	45	30	0.01	PESD5V0V1BB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6	
5	11			13	45	30	0.01	PESD5V0V1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95	
5.5	3.5			4.5	8	15	0.1	PESD5V0V1BSF	SOD962 	0.6 x 0.3 x 0.3	
15	8			10	-	15	0.1	IP4302CX2/A	CSP2	0.7 x 0.52 x 0.40	

^[1] 8/20 μs surge pulse acc. to IEC 61000-4-5

^[2] acc. to IEC 61000-4-2 (contact discharge)

Low capacitance ESD protection devices

types in **bold** represent new products

Number of protected lines		V_{RWM} (V)	C_{line} typ (pF)	C_{line} max (pF)	$P_{PP}^{(1)}$ max (W)	ESD rating ^[2] max (kV)	I_r max (μ A) @ V_{RWM}	Configuration	Type	Package	Size (mm)		
Unidirectional	Bidirectional												
3	0	5.5	3	4	-	15	0.1	-	IP4059CX5/LF	CSP5, staggered compressed	1.34 x 0.96 x 0.65		
4	3	3.3	22	28	30	20	0.3		PESD3V3L4UF	SOT886 (XSON6)		1.45 x 1.0 x 0.5	
		5	16	19	30	20	0.025		PESD5V0L4UF				
		3.3	22	28	30	20	0.3		PESD3V3L4UW	SOT665		1.6 x 1.2 x 0.55	
		5	16	19	30	20	0.025		PESD5V0L4UW				
		3.3	22	28	30	20	0.3		PESD3V3L4UG	SOT353 (SC-88A)		2.0 x 1.25 x 0.95	
		5	16	19	30	20	0.025		PESD5V0L4UG				
		3.3	13	17	25	10	1		PESD3V3V4UK	SOT891 (XSON6)		1.0 x 1.0 x 0.5	
		5	12	15	25	15	0.3		PESD5V0V4UK				
		9	6.5	10	28	8	0.1		PESD3V3V4UK	SOT886 (XSON6)		1.45 x 1.0 x 0.5	
		3.3	15	18	16	12	0.3		PESD3V3V4UF				
		5	12	15	16	12	0.025	PESD5V0V4UF					
		3.3	15	18	16	12	0.3		PESD3V3V4UW	SOT665		1.6 x 1.2 x 0.55	
		5	12	15	16	12	0.025		PESD5V0V4UW				
		3.3	15	18	16	12	0.3		PESD3V3V4UG	SOT353 (SC-88A)		2.0 x 1.25 x 0.95	
		5	12	15	16	12	0.025		PESD5V0V4UG				
		5.5	18	20	-	15	0.1	-	-	IP4142CX5/LF	5 ball CSP, staggered compressed	1.28 x 0.91 x 0.65	
		0	4	5.5	18	20	-	15	0.1		IP4343CX5/LF	5 ball CSP	1.06 x 0.76 x 0.61
				5.5	18	20	-	15	0.1		IP4043CX5/LF	5 ball CSP	1.12 x 1.12 x 0.65

^[1] 8/20 μ s surge pulse acc. to IEC 61000-4-5

^[2] acc. to IEC 61000-4-2 (contact discharge)

ESD protection for very high-speed interfaces (< 2 pF)

ESD protection for very high-speed interfaces (< 2 pF)

types in **bold** represent new products

Number of protected lines		V_{RWM} (V)	C_{lim} typ (pF)	C_{lim} max (pF)	ESD rating ⁽¹⁾ max (kV)	Configuration	Type	Package	Size (mm)		
Unidirectional	Bidirectional										
1	0	5	1.55	1.75	15		PESD5V0X1ULD	SOD882D 	1.0 x 0.6 x 0.37		
		5	0.95	1.15	8		PESD5V0X1UALD				
		5	0.95	1.15	8		PESD5V0X1UB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6		
		5	1.55	1.75	15		PESD5V0X1UAB				
			16	0.83	0.98	8	PESD16VX1UL	SOD882 	1.0 x 0.6 x 0.5		
			5.5	1	1.5	8		PRTR5V0U1T	SOT23 	2.9 x 1.3 x 1.0	
			80	0.6	0.75	30		NUP1301	SOT323 	2.0 x 1.25 x 0.95	
			80	0.6	0.75	30		NUP1301U			
0	1	5.5	0.4	0.55	10		PESD5V0F1BL	SOD882 	1.0 x 0.6 x 0.5		
		16	0.5	0.65	8		PESD16VF1BL				
		3.3	1.3	1.6	9		PESD3V3X1BL				
		5	0.9	1.3	9		PESD5V0X1BL				
		5.5	0.25	0.3	28		PESD5V0F1BSF	SOD962 	0.6 x 0.3 x 0.3		
2	1	5	0.9	1.3	9		PESD5V0X1BQ	SOT663 	1.6 x 1.2 x 0.55		
		5	0.9	1.3	9		PESD5V0X1BT	SOT23 	2.9 x 1.3 x 1.0		
	0	1	5.5	1	1.5	8		PRTR5V0U2X	SOT143B 	2.9 x 1.3 x 1.0	
			5.5	1.8	-	12		PRTR5V0U2AX			
		0	0	5.5	1	1.5	8		PRTR5V0U2K	SOT891 (XSON6) 	1.0 x 1.0 x 0.5
				5.5	1	1.5	8		PRTR5V0U2D	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
				5.5	1	1.5	8		PRTR5V0U2F	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
				5.5	1	1.5	8				

⁽¹⁾ acc. to IEC 61000-4-2 (contact discharge)

ESD protection for very high-speed interfaces (< 2 pF)

ESD protection for very high-speed interfaces (< 2 pF)

types in **bold** represent new products

Number of protected lines		V_{RWM} (V)	C_{limb} typ (pF)	C_{limb} max (pF)	ESD rating ⁽¹⁾ max (kV)	Configuration	Type	Package	Size (mm)
Unidirectional	Bidirectional								
4	0	5.5	1	-	8		PRTR5V0U4D	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		5.5	1	-	8		PRTR5V0U4Y	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
		5.5	0.8	-	12		IP4285CZ9-TBB	SOT1178 (XSON9) 	1.0 x 2.1 x 0.5
		5.5	0.7	-	8		IP4280CZ10	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		5.5	0.6	-	8		IP4283CZ10-TBA	SOT1165 (XSON10) 	1.0 x 2.5 x 0.5
		5.5	0.6	-	8		IP4283CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		5.5	0.6	-	8		IP4283CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		5.5	0.5	-	8		IP4284CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		5.5	0.5	-	8		IP4284CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		5.5	0.6	-	8		IP4286CZ6-TBF	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
		5.5	0.6	-	8		IP4286CZ6-TTY	SOT363 (SC-88) 	2.0 x 1.25 x 0.95

⁽¹⁾ acc. to IEC 61000-4-2 (contact discharge)

Audio interfaces

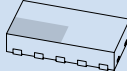
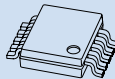
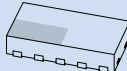
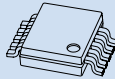





types in **bold** represent new products

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed (MHz)	Remark	Type	Package	Size (mm)
		R_{line}	C_{line} (pF)					
Audio	2	0.9 Ω	290	-	Low-ohmic speaker (< ~8 Ω)	IP4047CX6/LF	6 ball CSP	1.56 x 1.01 x 0.65
		10 Ω	200	-	Low-ohmic speaker (> ~8 Ω)	IP4048CX5/LF	5 ball CSP	0.91 x 1.28 x 0.65
		68 Ω	110	-	Single-ended or differential microphone	IP4049CX5/LF	6 ball CSP	1.56 x 1.03 x 0.65
		470 Ω	35	-	Single-ended or differential microphone	IP4055CX6/LF		1.16 x 0.76 x 0.65
		470 Ω	20	-	Single-ended or differential microphone	IP4355CX6/LF	8 ball CSP	1.67 x 1.67 x 0.65
		50 Ω / 2.2 k Ω	2000	-	Single-ended to quasi-differential microphone channel with integrated biasing network	IP5002CX8/LF	6 ball CSP	1.60 x 1.15 x 0.65
		0.25 Ω , 3 nH	-	-	Inductive, low-ohmic differential channel LC filter	IP3047CX6	5 ball CSP	1.51 x 1.15 x 0.65
		0.25 Ω , 3 nH	-	-	Inductive, low-ohmic differential channel LC filter	IP3048CX5	20 ball CSP	1.91 x 2.52 x 0.65
	6	40 Ω / 1450 Ω / 10 Ω	50 / 20 / 200	-	Fully integrated audio interface protection for differential microphone and differential speaker, including EMI filtering and pull up resistors	IP4027CX20/LF	20 ball CSP	1.91 x 2.52 x 0.65

ESD protection acc. to IEC 61000-4-2 (level 4)

Video interfaces

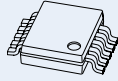
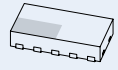
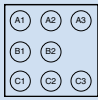
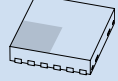
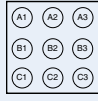


types in **bold** represent new products

Baseband interface	Number of protected lines	C_{line} (pF)	Remark	Type	Package	Size (mm)
Display port	4	0.6	ESD protection for ultra high-speed interfaces	IP4283CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		0.6	ESD protection for ultra high-speed interfaces	IP4283CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		0.5	ESD protection for ultra high-speed interfaces	IP4284CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		0.5	ESD protection for ultra high-speed interfaces	IP4284CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		0.5	ESD protection for ultra high-speed interfaces	IP4292CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		0.8	ESD protection for ultra high-speed interfaces	IP4285CZ9-TBB	SOT1178 (XSON9) 	1.0 x 2.1 x 0.5
		0.6	ESD protection for ultra high-speed interfaces	IP4286CZ6-TBF	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
			ESD protection for ultra high-speed interfaces	IP4286CZ6-TTY	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
	11	0.7	ESD protection for display port	IP4790CZ38	SOT510 (TSSOP38) 	9.7 x 4.4 x 1.1

ESD protection acc. to IEC 61000-4-2 (level 4)

Video interfaces

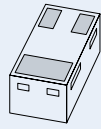
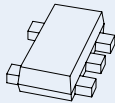
types in **bold** represent new products

Baseband interface	Number of protected lines	Buffer	Level shifter	C _{line} (pF)	Resistor (Ω)	Remark	Type	Package	Size (mm)
HDMI	4	-	-	0.5	-	ESD protection for ultra high-speed interfaces	IP4284CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		-	-	0.5	-	ESD protection for ultra high-speed interfaces	IP4292CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
	5	-	-	10	1.75 k, 100 k	HDMI, DDC, CEC, hot plug ESD protection and biasing	IP4310CX8/P	8 ball CSP 	1.16 x 1.16 x 0.61
		yes	yes	-	internal	Fully integrated solution for HDMI low-speed signals, buffer and level shifter for DDC, CEC, HP	IP4791CZ12	SOT1156 	2.5 x 2.1 x 0.5
	8	-	-	1.3	-	HDMI, TMDS line ESD protection	IP4309CX9	9 ball CSP 	1.16 x 1.16 x 0.61
	12	-	yes	0.7	-	ESD protection and level shifting for a complete HDMI port	IP4776CZ38		9.7 x 4.4 x 1.1
		yes	yes	0.7	-	ESD protection, DDC buffering, noise reduction and hot plug application for a complete HDMI source port	IP4777CZ38		
		yes	yes	0.7	-	ESD protection, DDC buffering, noise reduction and hot plug application for a complete HDMI sink port	IP4778CZ38		
	13	yes	yes	100 Ω differential impedance	internal	Fully integrated HDMI solution with current limiter, buffer and level shifter for DDC, CEC, HP	IP4786CZ32	SOT617 	5.0 x 5.0 x 1.0
	LVDS	2	-	-	30	10	EMI filter with ESD protection for MIPI or MDDI	IP3348CX5	CSP5, staggered compressed
4		-	-	30	10	EMI filter with ESD protection for MIPI or MDDI	IP3348CX10	CSP10, staggered compressed	1.56 x 1.06 x 0.61
6		-	-	30	10	EMI filter with ESD protection for MIPI or MDDI	IP3348CX15	CSP15, staggered compressed	2.36 x 1.06 x 0.61
8		-	-	30	10	EMI filter with ESD protection for MIPI or MDDI	IP3348CX20	CSP20, staggered compressed	3.16 x 1.06 x 0.61

ESD protection acc. to IEC 61000-4-2 (level 4)

Multichannel EMI filters, ESD protection for LCD and camera

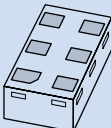
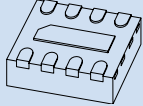
types in **bold** represent new products

Baseband interface	Number of protected lines	Line small-signal equivalents			Digital interface clock speed (MHz)	Insertion Loss S ₂₁ ~ -3 dB (MHz)	Type	Package	Size (mm)
		R _{line} (Ω)	C _{line} (pF)	L _{line} (nH)					
LCD display, camera, keypad	1	75	36	-	~50	155	IP4307CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
		20	40	-	~50	153	PEMI1QFN/CT		1.0 x 0.6 x 0.5
		20	36	-	~55	170	PEMI1QFN/CR		
		20	32	-	~60	185	PEMI1QFN/CP		
		20	28	-	~70	218	PEMI1QFN/CM		
		20	23	-	~90	264	PEMI1QFN/CK		
		20	19	-	~105	317	PEMI1QFN/CG		
		20	15	-	~130	397	PEMI1QFN/CE		
		45	40	-	~50	145	PEMI1QFN/HT		
		45	36	-	~55	161	PEMI1QFN/HR		
		45	32	-	~60	175	PEMI1QFN/HP		
		45	28	-	~70	206	PEMI1QFN/HM		
		45	23	-	~80	249	PEMI1QFN/HK		
		45	19	-	~100	300	PEMI1QFN/HG		
		45	15	-	~125	376	PEMI1QFN/HE		
		65	40	-	~45	139	PEMI1QFN/LT		
		65	36	-	~50	155	PEMI1QFN/LR		
		65	32	-	~55	168	PEMI1QFN/LP		
		65	28	-	~65	197	PEMI1QFN/LM		
		65	23	-	~80	239	PEMI1QFN/LK		
		65	19	-	~95	288	PEMI1QFN/LG		
		65	15	-	~120	361	PEMI1QFN/LE		
		100	40	-	~45	131	PEMI1QFN/RT		
		100	36	-	~50	145	PEMI1QFN/RR		
		100	32	-	~55	159	PEMI1QFN/RP		
		100	28	-	~60	187	PEMI1QFN/RM		
		100	30	-	~65	200	IP4256CZ3-M		
		100	23	-	~75	227	PEMI1QFN/RK		
		100	19	-	~90	272	PEMI1QFN/RG		
		100	15	-	~115	343	PEMI1QFN/RE		
	200	40	-	~40	119	PEMI1QFN/WT			
	200	36	-	~45	132	PEMI1QFN/WR			
	200	32	-	~50	143	PEMI1QFN/WP			
	200	28	-	~55	169	PEMI1QFN/WM			
	200	23	-	~70	205	PEMI1QFN/WK			
	200	19	-	~80	247	PEMI1QFN/WG			
200	15	-	~105	311	PEMI1QFN/WE				
2	10	35	15	~115	350	IP3348CX5	5 ball CSP	0.76 x 1.06 x 0.61	
	18	65	40	~60	175	IP3088CX5		0.96 x 1.28 x 0.65	
	100	45	35	~50	150	IP3053CX5			
	20	40	-	~50	153	PEMI2STD/CT		1.6 x 1.2 x 0.5	
	20	36	-	~55	170	PEMI2STD/CR			
	20	32	-	~60	185	PEMI2STD/CP			
20	28	-	~70	218	PEMI2STD/CM				

ESD protection acc. to IEC 61000-4-2 (level 4)

Multichannel EMI filters, ESD protection for LCD and camera

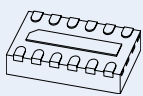
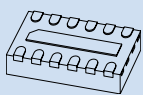
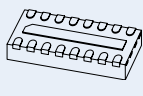
types in **bold** represent new products

Baseband interface	Number of protected lines	Line small-signal equivalents			Digital interface clock speed (MHz)	Insertion Loss S21 ~ -3 dB (MHz)	Type	Package	Size (mm)
		R _{line} (Ω)	C _{line} (pF)	L _{line} (nH)					
LCD display, camera, keypad	2	45	23	-	~80	249	PEMI2QFN/HK	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
		45	19	-	~100	300	PEMI2QFN/HG		
		45	15	-	~125	376	PEMI2QFN/HE		
		65	40	-	~45	139	PEMI2QFN/LT		
		65	36	-	~50	155	PEMI2QFN/LR		
		65	32	-	~55	168	PEMI2QFN/LP		
		65	28	-	~65	197	PEMI2QFN/LM		
		65	23	-	~80	239	PEMI2QFN/LK		
		65	19	-	~95	288	PEMI2QFN/LG		
		65	15	-	~120	361	PEMI2QFN/LE		
		100	40	-	~45	131	PEMI2QFN/RT		
		100	36	-	~50	145	PEMI2QFN/RR		
		100	32	-	~55	159	PEMI2QFN/RP		
		100	30	-	~65	200	IP4256CZ6-F		
		100	28	-	~60	187	PEMI2QFN/RM		
		100	23	-	~75	227	PEMI2QFN/RK		
		100	19	-	~90	272	PEMI2QFN/RG		
		100	15	-	~115	343	PEMI2QFN/RE		
		200	40	-	~40	119	PEMI2QFN/WT		
		200	36	-	~45	132	PEMI2QFN/WR		
	200	32	-	~50	143	PEMI2QFN/WP			
	200	28	-	~55	169	PEMI2QFN/WM			
	200	23	-	~70	205	PEMI2QFN/WK			
	200	19	-	~80	247	PEMI2QFN/WG			
	200	15	-	~105	311	PEMI2QFN/WE			
	10	35	15	~115	350	IP3348CX10	10 ball CSP	1.56 x 1.06 x 0.61	
	18	65	40	~60	175	IP3088CX10		1.96 x 1.28 x 0.65	
	100	54	-	~30	98	PEMI4CSP/RW		1.56 x 1.06 x 0.61	
	100	45	35	~20	150	IP3053CX10		1.96 x 1.28 x 0.65	
	100	41	-	~40	125	PEMI4CSP/RT		1.56 x 1.06 x 0.61	
	20	40	-	~50	153	PEMI4QFN/CT	SOT1157 (8 pin QFN) 	1.7 x 1.2 x 0.5	
	20	36	-	~55	170	PEMI4QFN/CR			
	20	32	-	~60	185	PEMI4QFN/CP			
	20	28	-	~70	218	PEMI4QFN/CM			
	20	23	-	~90	264	PEMI4QFN/CK			
	20	19	-	~105	317	PEMI4QFN/CG			
20	15	-	~130	397	PEMI4QFN/CE				
45	40	-	~50	145	PEMI4QFN/HT				
45	36	-	~55	161	PEMI4QFN/HR				
45	32	-	~60	175	PEMI4QFN/HP				
45	28	-	~70	206	PEMI4QFN/HM				
45	23	-	~80	249	PEMI4QFN/HK				
45	19	-	~100	300	PEMI4QFN/HG				

ESD protection acc. to IEC 61000-4-2 (level 4)

Multichannel EMI filters, ESD protection for LCD and camera




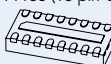
types in **bold** represent new products

Baseband interface	Number of protected lines	Line small-signal equivalents			Digital interface clock speed (MHz)	Insertion Loss S21 ~ -3 dB (MHz)	Type	Package	Size (mm)
		R _{line} (Ω)	C _{line} (pF)	L _{line} (nH)					
LCD display, camera, keypad	6	45	36	-	~55	161	PEMI6QFN/HR	SOT1158 (12 pin QFN) 	2.5 x 1.2 x 0.5
		45	32	-	~60	175	PEMI6QFN/HP		
		45	28	-	~70	206	PEMI6QFN/HM		
		45	23	-	~80	249	PEMI6QFN/HK		
		45	19	-	~100	300	PEMI6QFN/HG		
		45	15	-	~125	376	PEMI6QFN/HE		
		65	40	-	~45	139	PEMI6QFN/LT		
		65	36	-	~50	155	PEMI6QFN/LR		
		65	32	-	~55	168	PEMI6QFN/LP		
		65	28	-	~65	197	PEMI6QFN/LM		
		65	23	-	~80	239	PEMI6QFN/LK		
		65	19	-	~95	288	PEMI6QFN/LG		
		65	15	-	~120	361	PEMI6QFN/LE		
		100	40	-	~45	131	PEMI6QFN/RT		
		100	36	-	~50	145	PEMI6QFN/RR		
		100	32	-	~55	159	PEMI6QFN/RP		
		100	28	-	~60	187	PEMI6QFN/RM		
		100	23	-	~75	227	PEMI6QFN/RK		
		100	19	-	~90	272	PEMI6QFN/RG		
		100	15	-	~115	343	PEMI6QFN/RE		
		200	40	-	~40	119	PEMI6QFN/WT		
		200	36	-	~45	132	PEMI6QFN WR		
		200	32	-	~50	143	PEMI6QFN/WP		
		200	28	-	~55	169	PEMI6QFN/WM		
	200	23	-	~70	205	PEMI6QFN/WK			
	200	19	-	~80	247	PEMI6QFN/WG			
	200	15	-	~105	311	PEMI6QFN/WE			
	15	50	18	~50	145	IP3254CZ12-6-TTL	SOT1167 (12 pin QFN) 	2.5 x 1.35 x 0.5	
	15	43	12	~60	175	IP3253CZ12-6-TTL			
	40	18	-	~100	300	IP4252CZ12-6-TTL			
	100	45	-	~40	130	IP4254CZ12-6-TTL			
	100	15	-	~110	330	IP4251CZ12-6-TTL			
	200	45	-	~35	110	IP4253CZ12-6-TTL			
	7	70	25	-	~75	220	IP4337CX18/LF	18 ball CSP	1.96 x 1.61 x 0.61
	125	25	60	~60	180	IP3337CX18/LF	2.06 x 1.66 x 0.61		
	8	10	35	15	~115	350	IP3348CX20	20 ball CSP	3.16 x 1.06 x 0.61
18		65	40	~60	175	IP3088CX20	3.96 x 1.28 x 0.65		
100		54	-	~30	98	PEMI8CSP/RW	3.16 x 1.06 x 0.61		
100		50	-	~40	120	IP4088CX20/LF	3.91 x 1.28 x 0.65		
100		45	35	~20	150	IP3053CX20	3.96 x 1.28 x 0.65		
100		41	-	~40	125	PEMI8CSP/RT	3.16 x 1.06 x 0.61		
20		40	-	~50	153	PEMI8QFN/CT	SOT1159 (16 pin QFN) 	3.3 x 1.2 x 0.5	
20		36	-	~55	170	PEMI8QFN/CR			
20		32	-	~60	185	PEMI8QFN/CP			
20		28	-	~70	218	PEMI8QFN/CM			
20		23	-	~90	264	PEMI8QFN/CK			
20		19	-	~105	317	PEMI8QFN/CG			
20	15	-	~130	397	PEMI8QFN/CE				

ESD protection acc. to IEC 61000-4-2 (level 4)

SD-, SIM-card and MMC

types in **bold** represent new products


Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed (MHz)	Remark	Type	Package	Size (mm)	
		R_{line}	C_{line} (pF)						
SIM card	3 + 2	47 Ω / 100 Ω	10	~20	Integrated low capacitance SIM-card passive filter array & USB ESD protection	IP4365CX11	11 ball CSP	1.16 x 1.56 x 0.61	
	3	47 Ω / 100 Ω	40	~12	Integrated SIM-card EMI filter and ESD protection	IP4044CX8/LF	8 ball CSP	1.46 x 1.49 x 0.65	
		47 Ω / 100 Ω	20	~20	Integrated SIM-card EMI filter and ESD protection	IP4064CX8/LF/P		1.41 x 1.41 x 0.65	
		47 Ω / 100 Ω	20	~20	Smaller size, integrated SIM-card EMI filter and ESD protection	IP4364CX8/LF/P		1.16 x 1.16 x 0.61	
		47 Ω / 100 Ω	10	~20	Smaller size, low capacitance integrated SIM-card EMI filter and ESD protection	IP4366CX8/P			
		47 Ω / 100 Ω	40	~12	Integrated SIM-card EMI filter and ESD protection	IP4264CZ8-40-TTL	SOT1166 (8 pin QFN)	1.7 x 1.35 x 0.5	
		47 Ω / 100 Ω	20	~20	Integrated SIM-card EMI filter and ESD protection	IP4264CZ8-20-TTL			
		47 Ω / 100 Ω	10	~20	Integrated SIM-card EMI filter and ESD protection	IP4264CZ8-10-TTL			
		-	-	1	~240	Quad channel low capacitance ESD protection	IP4221CZ6-S	SOT886 (XSON6)	
SD-card / MMC	4	47 Ω / 13 k Ω / 56 k Ω	25	~30	MMC ESD protection, pull-up resistors	IP4051CX11/LF	11 ball CSP	1.44 x 1.96 x 0.65	
		50 Ω / 75 k Ω / 7 k Ω	18	~50	High-speed MMC ESD protection, pull-up resistors	IP4060CX16/LF	16 ball CSP	1.96 x 1.97 x 0.65	
	6	40 Ω	12	>52	(Mini) SD card/trans flash ESD protection, EMI filter	IP4252CZ12-6-TTL	SOT1167 (12 pin QFN)		2.5 x 1.35 x 0.5
	6 + 2	40 Ω	12	>52	(Mini) SD card/trans flash ESD protection, EMI filter	IP4252CZ16-8-TTL	SOT1168 (16 pin QFN)		3.3 x 1.35 x 0.5
	7	40 Ω / 50 k Ω / 25 k Ω	18	~20	(Mini) SD/trans flash card ESD protection, EMI filter, pull-up resistors	IP4052CX20/LF	20 ball CSP	2.54 x 1.96 x 0.65	
		-	5	~24	Memory stick PRO ESD protection	IP4067CX9/LF	9 ball CSP	1.46 x 1.52 x 0.65	
	6 (+3)	15 Ω / 50 k Ω / 15 k Ω	8	>52	Very low capacitance, low channel resistance (mini) SD card/trans flash ESD protection EMI filter, pull-up resistor	IP4350CX24/LF	24 ball CSP	1.95 x 2.11 x 0.61	
		40 Ω / 50 k Ω / 15 k Ω	20	>52	(Mini) SD card/trans flash ESD protection, EMI filter, pull-up resistor	IP4352CX24/LF		2.02 x 2.01 x 0.61	
		-	-	>52	(Mini) SD/SDIO memory card level shifter, can be combined with IP4352CX24/LF	IP4852CX25/LF	25 ball CSP	2.01 x 2.01 x 0.61	
		40 Ω / 50 k Ω / 15 k Ω	-	>52	(Mini) SD/SDIO memory card level shifter, and voltage regular, incl. ESD and EMI filter	IP4853CX24/P	24 ball CSP		

ESD protection acc. to IEC 61000-4-2 (level 4)

Please find more ESD protection diodes for ultra high-speed interfaces on pages 28 - 31

Battery and charger protection


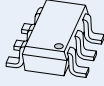

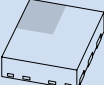
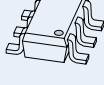



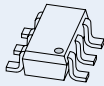
types in **bold** represent new products

Baseband interface	Number of protected lines	C_{line} (pF)	Diode voltage	Remark	Type	Package	Size (mm)	
Battery & charger protection	1	180	Breakdown 16 V	Power diode	IP4085CX4	4 ball CSP	0.91 x 0.91 x 0.65	
		450	Breakdown 7 V	Power diode	IP4385CX4			
		160	Breakdown 16 V	Power diode	IP4386CX4			
		290	Breakdown 10 V	Power diode	IP4387CX4			
		160	$V_{RWM} = 12$ V	Power diode with 2 A integrated fuse	IP4389CX4		0.76 x 0.76 x 0.61	
		160	$V_{RWM} = 12$ V	Power diode	PESD12VS1UJ	SOD323F (SC-90)		1.7 x 1.25 x 0.7
		160	$V_{RWM} = 12$ V	Power diode	PESD12VS1UA	SOD323 (SC-76)		1.7 x 1.25 x 0.95
		480	$V_{RWM} = 5$ V	Power diode	PESD5V0S1UJ	SOD323F (SC-90)		1.7 x 1.25 x 0.7
		480	$V_{RWM} = 5$ V	Power diode	PESD5V0S1UA	SOD323 (SC-76)		1.7 x 1.25 x 0.95

ESD protection acc. to IEC 61000-4-2 (level 4)

USB, SATA, LAN

types in **bold** represent new products

Baseband interface	Number of protected lines	R_{line}	C_{line} (pF)	Remark	Type	Package	Size (mm)
USB2.0 (Plastic package)	2	-	1	ESD protection for up to 2 ultra high-speed datalines	PRTR5V0U2K	SOT891 (XSON6) 	1.0 x 1.0 x 0.5
		-	1	ESD protection for up to 2 ultra high-speed datalines	PRTR5V0U2D	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		-	1	ESD protection for up to 2 ultra high-speed datalines	PRTR5V0U2F	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
	3 + 1	-	0.8	USB protection for USB OTG with 5.5 V Vbat protection	PUSBM5V5X4-TL	SOT1189 (HXSON6) 	1.6 x 1.6 x 0.5
		-	0.8	USB protection for USB OTG with 12 V Vbat protection	PUSBM12VX4-TL		
		-	0.8	USB protection for USB OTG with 15 V Vbat protection	PUSBM15VX4-TL		
		-	0.8	USB protection for USB OTG with 27 V Vbat protection	PUSBM27VX4-TL		
	4	-	1	Dual ESD protection for USB2.0 high-speed, SD-card, SIM card	IP4220CZ6	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
			1	Dual ESD protection for USB2.0 high-speed, SD-card, SIM card	PRTR5V0U4D		
			1	Dual ESP protection for USB2.0 high-speed, SD-card, SIM card	PRTR5V0U4Y	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
		-	1	ESD protection for USB2.0 high-speed, SD-card, SIM card	IP4221CZ6-S	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
			1	ESD protection for USB2.0 high-speed, SD-card, SIM card	IP4221CZ6-XS	SOT891 (XSON6) 	1.0 x 1.0 x 0.5
			1	3	>15 kV IEC contact ESD protection with pi-filter	IP4225CZ10	SOT457 (SC-74) 

ESD protection acc. to IEC 61000-4-2 (level 4)

USB, SATA, LAN

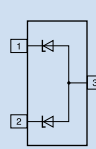
types in **bold** represent new products

Baseband interface	Number of protected lines	R_{line}	C_{line} (pF)	Remark	Type	Package	Size (mm)
Display port	4	-	0.6	ESD protection for ultra high-speed interfaces	IP4286CZ6-TTY	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
	11	-	0.7	ESD protection	IP4790CZ38	SOT510 (TSSOP38) 	9.7 x 4.4 x 1.1
SATA	2	-	0.7	ESD protection for ultra high-speed interfaces	IP4282CZ6	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
		-	0.6	ESD protection for ultra high-speed interfaces	IP4286CZ6-TBF	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
		-	0.6	ESD protection for ultra high-speed interfaces	IP4286CZ6-TTY		
	4	-	0.6	ESD protection for ultra high-speed interfaces	IP4283CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		-	0.6	ESD protection for ultra high-speed interfaces	IP4283CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		-	0.5	ESD protection for ultra high-speed interfaces	IP4284CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		-	0.5	ESD protection for ultra high-speed interfaces	IP4284CZ10-TT	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		-	0.8	ESD protection for ultra high-speed interfaces	IP4285CZ9-TBB	SOT1178 (XSON9) 	1.0 x 2.5 x 0.1
		-	0.5	ESD protection for ultra high-speed interfaces	IP4292CZ10-TBR	SOT1176 (XSON10) 	1.0 x 2.5 x 0.5
		-	0.5	ESD protection for ultra high-speed interfaces			

ESD protection acc. to IEC 61000-4-2 (level 4)

TVS diodes

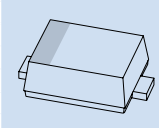
TVS diodes, 24 W/40 W

Power (W) (10/1000 μ s waveform) ^[1]	V_{RWM} (V)	$V_{BR\ min}$ (V) @ I_R	$V_{BR\ typ}$ (V) @ I_R	$V_{BR\ max}$ (V) @ I_R	I_R (mA)	ESD rating ^[2] max (kV)	C_{line} typ (pF)	$V_{CL\ max}$ (V) @ I_{PP}	I_{PP} (A)	$I_{RM\ max}$ (μ A) @ V_{RWM}	Configuration	Type	Package	Size (mm)
24	3	5.32	5.6	5.88	20	30	210	8	3	5		MMBZ5V6AL	SOT23	2.9 x 1.3 x 1.0
	3	5.89	6.2	6.51	1	30	175	8.7	2.76	0.2		MMBZ6V2AL		
	4.5	6.48	6.8	7.14	1	30	150	9.6	2.5	0.3		MMBZ6V8AL		
	6	8.65	9.1	9.56	1	30	155	14	1.7	0.1		MMBZ9V1AL		
	6.5	9.5	10	10.5	1	30	130	14.2	1.7	0.02		MMBZ10VAL		
40	8.5	11.4	12	12.6	1	30	110	17	2.35	0.005		MMBZ12VAL		
	12	14.25	15	15.75	1	30	85	21	1.9	0.005		MMBZ15VAL		
	14.5	17.1	18	18.9	1	30	70	25	1.6	0.005		MMBZ18VAL		
	17	19	20	21	1	30	65	28	1.4	0.005		MMBZ20VAL		
	22	25.65	27	28.35	1	30	48	40	1	0.005		MMBZ27VAL		
	26	31.35	33	34.65	1	30	45	46	0.87	0.005		MMBZ33VAL		
	8.5	11.4	12	12.6	1	30	110	17	2.35	0.005		MMBZ12VDL		
	12.8	14.3	15	15.8	1	30	85	21.2	1.9	0.005		MMBZ15VDL		
	14.5	17.1	18	18.9	1	30	70	25	1.6	0.005		MMBZ18VCL		
	17	19	20	21	1	30	65	28	1.4	0.005		MMBZ20VCL		
	22	25.65	27	28.35	1	30	48	38	1	0.005	MMBZ27VCL			
	26	31.35	33	34.65	1	30	45	46	0.87	0.005	MMBZ33VCL			

^[1] acc. to IEC 61643-321

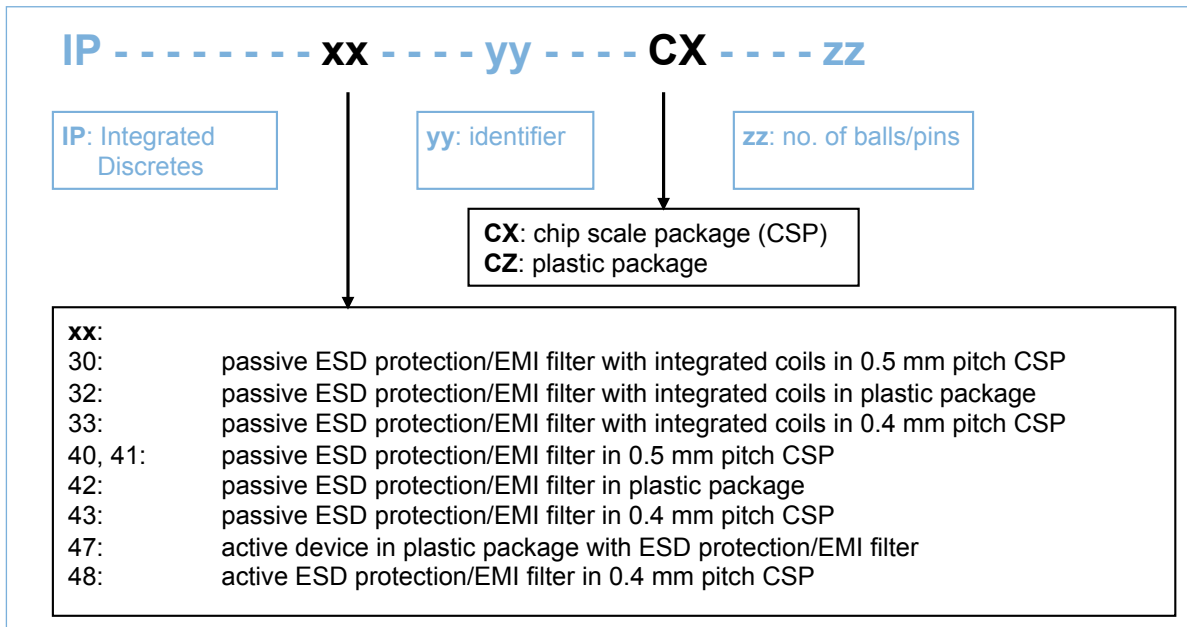
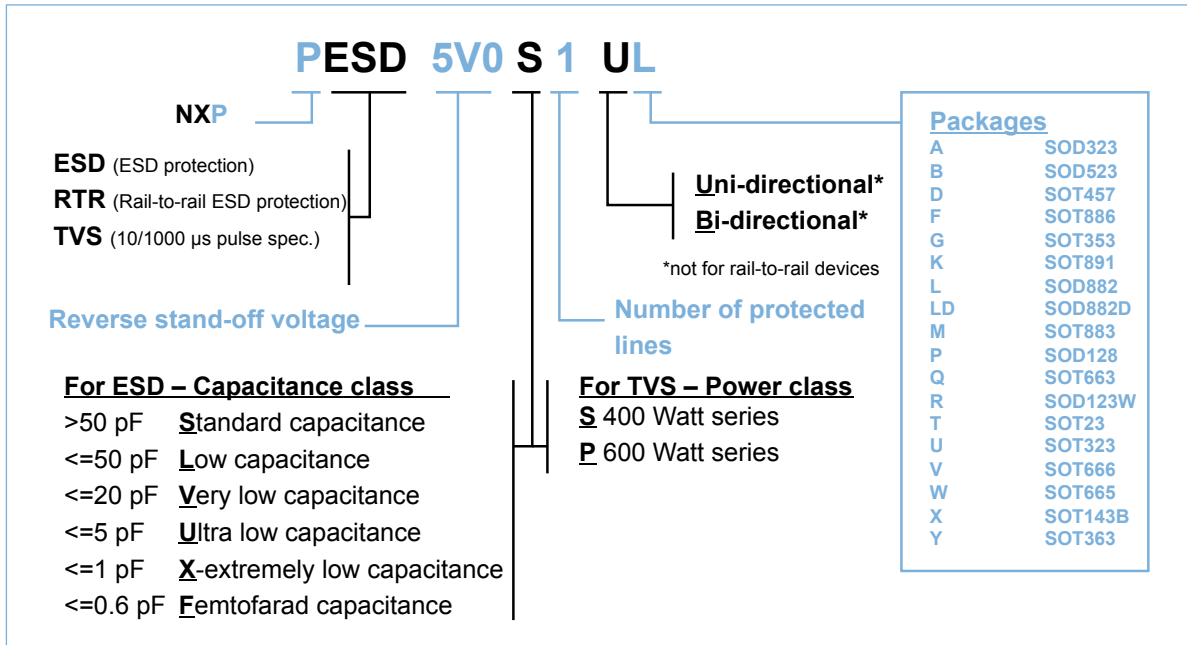
^[2] acc. to IEC 61000-4-2 (contact discharge)

TVS diodes, 400 W

Power (W) (10/1000 μ s waveform) ^[1]	V_{RWM} (V)	$V_{BR\ min}$ (V) @ I_R	$V_{BR\ typ}$ (V) @ I_R	$V_{BR\ max}$ (V) @ I_R	I_R (mA)	$V_{CL\ max}$ (V) @ I_{PP}	I_{PP} (A)	$I_{RM\ typ}$ (μ A) @ V_{RWM}	$I_{RM\ max}$ (μ A) @ V_{RWM}	Type	Package	Size (mm)
350	3.5	5.20	5.60	6.00	10	8.0	43.8	5	600	PTVS3V3S1UR		2.6 x 1.7 x 1.0
	5.0	6.40	6.70	7.00	10	9.2	43.5	5	400	PTVS5V0S1UR		
	6.0	6.67	7.02	7.37	10	10.3	38.8	5	400	PTVS6V0S1UR		
	6.5	7.22	7.60	7.98	10	11.2	35.7	5	250	PTVS6V5S1UR		
	7.0	7.78	8.20	8.60	10	12.0	33.3	3	100	PTVS7V0S1UR		
	7.5	8.33	8.77	9.21	1	12.9	31.0	0.2	50	PTVS7V5S1UR		
	8.0	8.89	9.36	9.83	1	13.6	29.4	0.03	25	PTVS8V0S1UR		
	8.5	9.44	9.92	10.40	1	14.4	27.8	0.01	10	PTVS8V5S1UR		
	9.0	10.00	10.55	11.10	1	15.4	26.0	0.005	5	PTVS9V0S1UR		
	10	11.10	11.70	12.30	1	17.0	23.5	0.005	2.5	PTVS10VS1UR		
	11	12.20	12.85	13.50	1	18.2	22.0	0.005	2.5	PTVS11VS1UR		
	12	13.30	14.00	14.70	1	19.9	20.1	0.005	2.5	PTVS12VS1UR		
	13	14.40	15.15	15.90	1	21.5	18.6	0.001	0.1	PTVS13VS1UR		
	14	15.60	16.40	17.20	1	23.2	17.2	0.001	0.1	PTVS14VS1UR		
	15	16.70	17.60	18.50	1	24.4	16.4	0.001	0.1	PTVS15VS1UR		
	16	17.80	18.75	19.70	1	26.0	15.4	0.001	0.1	PTVS16VS1UR		
	17	18.90	19.90	20.90	1	27.6	14.5	0.001	0.1	PTVS17VS1UR		
400	18	20.00	21.00	22.10	1	29.2	13.7	0.001	0.1	PTVS18VS1UR		
	20	22.20	23.35	24.50	1	32.4	12.3	0.001	0.1	PTVS20VS1UR		
	22	24.40	25.60	26.90	1	35.5	11.3	0.001	0.1	PTVS22VS1UR		
	24	26.70	28.10	29.50	1	38.9	10.3	0.001	0.1	PTVS24VS1UR		
	26	28.90	30.40	31.90	1	42.1	9.5	0.001	0.1	PTVS26VS1UR		
	28	31.10	32.80	34.40	1	45.4	8.8	0.001	0.1	PTVS28VS1UR		
	30	33.30	35.10	36.80	1	48.4	8.3	0.001	0.1	PTVS30VS1UR		
	33	36.70	38.70	40.60	1	53.3	7.5	0.001	0.1	PTVS33VS1UR		
	36	40.00	42.10	44.20	1	58.1	6.9	0.001	0.1	PTVS36VS1UR		
	40	44.40	46.80	49.10	1	64.5	6.2	0.001	0.1	PTVS40VS1UR		
	43	47.80	50.30	52.80	1	69.4	5.8	0.001	0.1	PTVS43VS1UR		
	45	50.00	52.65	55.30	1	72.7	5.5	0.001	0.1	PTVS45VS1UR		
	48	53.30	56.10	58.90	1	77.4	5.2	0.001	0.1	PTVS48VS1UR		
	51	56.70	59.70	62.70	1	82.4	4.9	0.001	0.1	PTVS51VS1UR		
	54	60.00	63.15	66.30	1	87.1	4.6	0.001	0.1	PTVS54VS1UR		
	58	64.40	67.80	71.20	1	93.6	4.3	0.001	0.1	PTVS58VS1UR		
	60	66.70	70.20	73.70	1	96.8	4.1	0.001	0.1	PTVS60VS1UR		
	64	71.10	74.85	78.60	1	103.0	3.9	0.001	0.1	PTVS64VS1UR		

^[1] 10/1000 μ s acc. to IEC 61643-321





Protection and signal conditioning nomenclature



General purpose bipolar transistors





Single transistors NPN

types in **bold** represent new products



Package					SOT23	SOT323 (SC-70)	SOT416 (SC-75)	SOT883 (SC-101)
								
Size (mm)					2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.0 x 0.6 x 0.5
P _{tot} (mW)					250	200	150	250
V _{CEO} (V)	I _C (mA)	h _{FE} min	h _{FE} max	f _T min (MHz)				
25	100	450	1200	100		PMST5089		
30	100	110 - 200	450 - 800	100	BC848B	BC848W		
		350	900	100		PMST5088		
32	100	110 - 420	220 - 800	100	BCW31 / 32 / 33			
		180 - 380	310 - 630	250	BCW60B / C / D			
40	100	120 - 270	270 - 560	100				2PC4617QM / RM
45	100	110 - 420	220 - 800	100	BC847 / A / B / C	BC847W / AW / BW / CW	BC847T / AT / BT / CT	BC847AM / BM / CM
		120 - 380	220 - 630	100	BCX70G / H / J / K			
		110 - 200	220 - 450	100	BCW71 / 72			
50	100	210 - 290	340 - 460	100 - 150	PMBT6429 2PD601ART 2PD601ARL 2PD601ASL	PMST6429 2PD601ARW / SW		
		250	650	100	PMBT6428	PMST6428		
60	100	110 - 200	220 - 450	100	BCV71 / 72			
65	100	110 - 200	220 - 450	100	BC846 / A / B	BC846W / AW / BW	BC846T / AT / BT	
80	100	20	80	60	BSS64			
50	150	120 - 270	270 - 560	100		2PC4081Q / R / S	2PC4617Q / R	
	200	210	340	100	2PD601BRL			
		290	460	100	2PD601BSL			
45	500	100 - 250	250 - 600	100	BC817 / -16 / -25 / -40	BC817W / -16W / -25W / -40W		
		100	600	100	BCX19 2PD602AQL 2PD602ARL 2PD602ASL	2PD1820AR / S		
60	500	50	-	100		PMSTA05		

Single transistors PNP

types in **bold** represent new products






Package					SOT23	SOT323 (SC-70)	SOT416 (SC-75)	SOT883 (SC-101)
								
Size (mm)					2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.0 x 0.6 x 0.5
P _{tot} (mW)					250	200	150	250
V _{CEO} (V)	I _C (mA)	h _{FE} min	h _{FE} max	f _T min (MHz)				
80	500	100	-	100	PMBTA06	PMSTA06		
30	100	125 - 220	500 - 800	100	BC858B	BC858W		
		120 - 215	260 - 500	100	BCW29 / 30			
32	100	180 - 380	310 - 630	100	BCW61B / C / D			
		120 - 270	270 - 560	100				2PA1774QM / RM / SM
45	100	210 - 290	340 - 460	70 - 80	2PB709ART 2PB709ARL 2PB709ASL	2PB709ARW / SW		
		180 - 380	310 - 630	100	BCX71H / J / K			
		120 - 215	260 - 500	100	BCW69 / 70			
		125 - 420	250 - 800	100	BC857 / A / B / C	BC857W / AW / BW / CW	BC857T / AT / BT / CT	BC857AM / BM / CM
60	100	120	260	150	BCW89			
65	100	125 - 200	250 - 475	100	BC856 / A / B	BC856W / AW / BW	BC856T / AT / BT	
100	100	30	-	50	BSS63			
50	150	120 - 270	270 - 560	100		2PA1576Q / R / S	2PA1774Q / R / S	
	200	210	340	100	2PD601BRL			
		290	460	100	2PD601BSL			
25	500	100	600	80	BCX18			
45	500	100 - 250	250 - 600	80	BC807 / -16 / -25 / -40	BC807W / -16W / -25W / -40W		
		100	600	80	BCX17 2PB710ARL 2PB710ASL	2PB1219AQ / R / S		
60	500	100	-	50		PMSTA55		
80	500	100	-	50	PMBTA56	PMSTA56		

Medium power general purpose transistors

Package						SOT223 (SC-73)	SOT89 (SC-62)
							
Size (mm)						6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5
P _{tot} (mW)						1700	1300
Polarity	V _{CEO} (V)	I _C (mA)	h _{FE} min	h _{FE} max	f _T min (MHz)		
NPN	20	1000	85 - 160	375	40	BCP68 / -25	BC868 / -25
	45	1000	63 - 100	160 - 250	100	BCP54 / -10 / -16	BCX54 / -10 / -16
	60	1000	63 - 100	160 - 250	100	BCP55 / -10 / -16	BCX55 / -10 / -16
			100	300	100	BSP41	BSR41
	80	1000	63 - 100	160 - 250	100	BCP56 / -10 / -16	BCX56 / -10 / -16
			40 - 100	120 - 300	100	BSP43	BSR42 / 43
PNP	20	1000	85 - 160	250 - 375	40	BCP69 / -16 / -25	BC869 / -16 / -25
	45	1000	63 - 100	160 - 250	115 ¹⁾ - 145 ¹⁾	BCP51 / -10 / -16	BCX51 / -10 / -16
	60	1000	63 - 100	160 - 250	100	BCP52 / -10 / -16	BCX52 / -10 / -16
			40 - 100	120 - 300	100	BSP31	BSR30 / 31
	80	1000	63 - 100	160 - 250	115 ¹⁾ - 145 ¹⁾	BCP53 / -10 / -16	BCX53 / -10 / -16
			40 - 100	120 - 300	100	BSP32 / 33	BSR33



¹⁾ typical value

High voltage transistors




Package						SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	SOT23	SOT323 (SC-70)
										
Size (mm)						6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95
P _{tot} (mW)						1700	1300	600	250	200
Polarity	V _{CEO} (V)	I _C (mA)	h _{FE} min	h _{FE} max	f _T min (MHz)					
NPN	80	100	20	-	60				BSS64	
	140	100	60	250	100				PMBT5550	PMST5550
	160	300	80	250	100				PMBT5551/BSR19A	PMST5551
	250	100	50	-	60	BF722	BF622		BF822	
	300	100	50	-	60	BF720	BF620		BF820	BF820W
			40	-	50	PZTA42	PXTA42		PMBTA42	PMSTA42
	350	100	40	-	70	BSP19	BST39			
400	300	50	200	20	PZTA44			PMBTA44		
PNP	100	100	30	-	50				BSS63	
	250	100	50	-	60	BF723				
			50	-	60		BF623		BF823	
	300	100	50	-	60		BF621		BF821	
			40	-	50	PZTA92	PXTA92		PMBTA92	PMSTA92
2 x NPN	300	100	40	-	50				PMBTA42DS	

For high voltage transistors with increased performance please refer to our high voltage low V_{CEsat} (BISS) transistor portfolio on page 66.


Low noise transistors

Package							SOT23	SOT323 (SC-70)
								
Size (mm)							2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95
P _{tot} (mW)							250	200
Polarity	V _{CEO} (V)	I _C (mA)	NF max (dB)	h _{FE} min	h _{FE} max	f _T min (MHz)		
NPN	30	100	4	200	450	100	BC849B	BC849BW
				420	800	100	BC849C	BC849CW
	45	100	4	200	450	100	BC850B	BC850BW
				420	800	100	BC850C	BC850CW
PNP	30	100	4	220	475	100	BC859B	BC859BW
				420	800	100	BC859C	BC859CW
	45	100	4	220	475	100	BC860B	BC860BW
				420	800	100	BC860C	BC860CW

Darlington transistors

Package					SOT223 (SC-73)	SOT89 (SC-62)	SOT23		
									
Size (mm)					6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.3 x 1.0		
P _{tot} (mW)					1700	1300	250		
Polarity	V _{CEO} (V)	I _C (mA)	h _{FE} min	f _T min (MHz)					
NPN	30	500	10000	125			PMBTA13		
			20000	125	PZTA14	PXTA14	PMBTA14		
	45	1000	10000	2000	200			BCV29	
				2000	200	BSP50	BST50		
				2000	200			BCV49	BCV47
				2000	200				
60	1000	1000	2000	200	BSP51	BST51			
			2000	200	BSP52	BST52			
PNP	30	500	20000	125			PMBTA64		
			20000	125			BCV28	BCV26	
	45	1000	10000	2000	200	BSP60	BST60		
				2000	200			BCV48	BCV46
				2000	200				
				2000	200	BSP61	BST61		
60	1000	1000	2000	200	BSP62	BST62			
			2000	200					

Schmitt trigger

Package							SOT143B
							
Size (mm)							2.9 x 1.3 x 1.0
P _{tot} (mW)							250
Polarity	V _{CEO} (V) TR1	V _{CEO} (V) TR2	I _C (mA)	h _{FE} min	h _{FE} max	V _{CEsat} typ (mV)	
NPN	30	6	100	110	800	250	BCV63 / B
PNP	30	6	100	220	475	250	BCV64B

Key features

- ▶ Low current (max. 100 mA)
- ▶ Low voltage (max. 30 and 6 V)

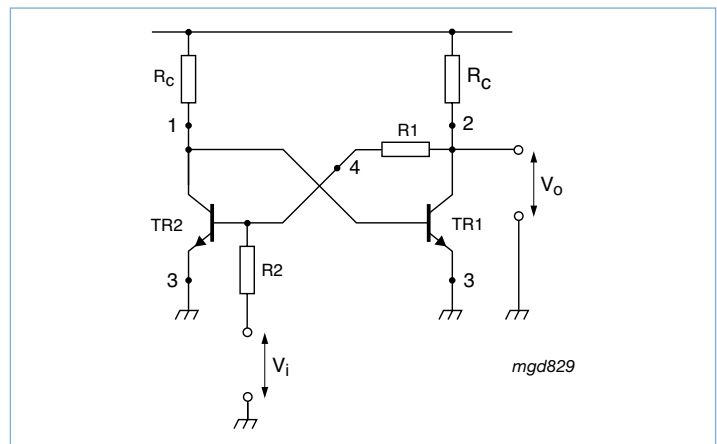
Key benefits

- ▶ Reduced component count and pick-and-place costs
- ▶ Smaller designs

Key applications



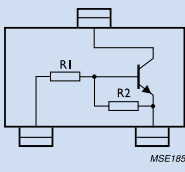
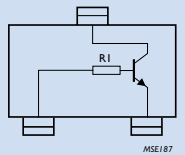
- ▶ General purpose switching and amplification
- ▶ Schmitt trigger applications



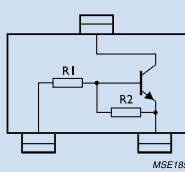
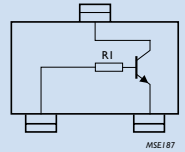
Schmitt trigger






Resistor-equipped transistors (RETs)

RETs 100 mA single




Package					SOT23		SOT323 (SC-70)		
									
Size (mm)					2.9 x 1.3 x 1.0		2.0 x 1.25 x 0.95		
P _{tot} (mW)					250		200		
V _{CEO} (V)	I _c (mA)	Configuration	R1 (kΩ)	R2 (kΩ)	NPN	PNP	NPN	PNP	
50	100		1	1			PDTA113ET		PDTA113EU
			2.2	2.2	PDTC123ET	PDTA123ET	PDTC123EU	PDTA123EU	
			4.7	4.7	PDTC143ET	PDTA143ET	PDTC143EU	PDTA143EU	
			10	10	PDTC114ET	PDTA114ET	PDTC114EU	PDTA114EU	
			22	22	PDTC124ET	PDTA124ET	PDTC124EU	PDTA124EU	
			47	47	PDTC144ET	PDTA144ET	PDTC144EU	PDTA144EU	
			100	100	PDTC115ET	PDTA115ET	PDTC115EU	PDTA115EU	
			1	10		PDTA113ZT		PDTA113ZU	
			2.2	10	PDTC123YT	PDTA123YT	PDTC123YU	PDTA123YU	
			2.2	47	PDTC123JT	PDTA123JT	PDTC123JU	PDTA123JU	
		4.7	10	PDTC143XT	PDTA143XT	PDTC143XU	PDTA143XU		
		4.7	47	PDTC143ZT	PDTA143ZT	PDTC143ZU	PDTA143ZU		
		10	47	PDTC114YT	PDTA114YT	PDTC114YU	PDTA114YU		
		22	47	PDTC124XT	PDTA124XT	PDTC124XU	PDTA124XU		
		47	10	PDTC144VT	PDTA144VT	PDTC144VU	PDTA144VU		
		47	22	PDTC144WT	PDTA144WT	PDTC144WU	PDTA144WU		
		2.2	-	PDTC123TT	PDTA123TT	PDTC123TU	PDTA123TU		
		4.7	-	PDTC143TT	PDTA143TT	PDTC143TU	PDTA143TU		
		10	-	PDTC114TT	PDTA114TT	PDTC114TU	PDTA114TU		
		22	-	PDTC124TT	PDTA124TT	PDTC124TU	PDTA124TU		
47	-	PDTC144TT	PDTA144TT	PDTC144TU	PDTA144TU				
100	-	PDTC115TT	PDTA115TT	PDTC115TU	PDTA115TU				
			2.2	-	PDTC123TE	PDTA123TE	PDTC123TE	PDTA123TE	
			4.7	-	PDTC143TE	PDTA143TE	PDTC143TE	PDTA143TE	
			10	-	PDTC114TE	PDTA114TE	PDTC114TE	PDTA114TE	
			22	-	PDTC124TE	PDTA124TE	PDTC124TE	PDTA124TE	
			47	-	PDTC144TE	PDTA144TE	PDTC144TE	PDTA144TE	
			100	-	PDTC115TE	PDTA115TE	PDTC115TE	PDTA115TE	

Package					SOT416 (SC-75)		SOT883 (SC-101)		
									
Size (mm)					1.6 x 0.8 x 0.77		1.0 x 0.6 x 0.5		
P _{tot} (mW)					150		250		
V _{CEO} (V)	I _c (mA)	Configuration	R1 (kΩ)	R2 (kΩ)	NPN	PNP	NPN	PNP	
50	100		1	1			PDTA113EE		PDTA113EM
			2.2	2.2	PDTC123EE	PDTA123EE	PDTC123EM	PDTA123EM	
			4.7	4.7	PDTC143EE	PDTA143EE	PDTC143EM	PDTA143EM	
			10	10	PDTC114EE	PDTA114EE	PDTC114EM	PDTA114EM	
			22	22	PDTC124EE	PDTA124EE	PDTC124EM	PDTA124EM	
			47	47	PDTC144EE	PDTA144EE	PDTC144EM	PDTA144EM	
			100	100	PDTC115EE	PDTA115EE	PDTC115EM	PDTA115EM	
			1	10		PDTA113ZE		PDTA113ZM	
			2.2	10	PDTC123YE	PDTA123YE	PDTC123YM	PDTA123YM	
			2.2	47	PDTC123JE	PDTA123JE	PDTC123JM	PDTA123JM	
		4.7	10	PDTC143XE	PDTA143XE	PDTC143XM	PDTA143XM		
		4.7	47	PDTC143ZE	PDTA143ZE	PDTC143ZM	PDTA143ZM		
		10	47	PDTC114YE	PDTA114YE	PDTC114YM	PDTA114YM		
		22	47	PDTC124XE	PDTA124XE	PDTC124XM	PDTA124XM		
		47	10	PDTC144VE	PDTA144VE	PDTC144VM	PDTA144VM		
		47	22	PDTC144WE	PDTA144WE	PDTC144WM	PDTA144WM		
		2.2	-	PDTC123TE	PDTA123TE	PDTC123TM	PDTA123TM		
		4.7	-	PDTC143TE	PDTA143TE	PDTC143TM	PDTA143TM		
		10	-	PDTC114TE	PDTA114TE	PDTC114TM	PDTA114TM		
		22	-	PDTC124TE	PDTA124TE	PDTC124TM	PDTA124TM		
47	-	PDTC144TE	PDTA144TE	PDTC144TM	PDTA144TM				
100	-	PDTC115TE	PDTA115TE	PDTC115TM	PDTA115TM				
			2.2	-	PDTC123TE	PDTA123TE	PDTC123TE	PDTA123TE	
			4.7	-	PDTC143TE	PDTA143TE	PDTC143TE	PDTA143TE	
			10	-	PDTC114TE	PDTA114TE	PDTC114TE	PDTA114TE	
			22	-	PDTC124TE	PDTA124TE	PDTC124TE	PDTA124TE	
			47	-	PDTC144TE	PDTA144TE	PDTC144TE	PDTA144TE	
			100	-	PDTC115TE	PDTA115TE	PDTC115TE	PDTA115TE	

Low V_{CEsat} (BISS) transistors single NPN

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	
														
Size (mm)											6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0	
P _{tot} (mW)											1700	1650	750	
V _{CEO} (V)	I _C (A)	I _{CM} (A)	h _{FE} min/typ	@ I _C (A)	@ V _{CE} (V)	R _{CEsat} typ (mΩ); I _C /I _B = 10	V _{CEsat} typ (mV); I _C = 0.5 A; I _B = 0.05 A	V _{CEsat} max (mV)	@ I _C (A)	@ I _B (A)				
12	5.3	10.6	300/530	0.5	2	27 ¹⁾	18	200	5.3	0.265			PBSS301NX	
	5.8	11.6	300/530	0.5	2	29 ¹⁾	18	235	5.8	0.29	PBSS301NZ			
	6.0	7.0	280/440	0.5	2	33 ¹⁾	20	275	6	0.3				
15	0.5	1.0	200/325	0.01	2	360	-	250	0.5	0.05				
			200/425	0.01	2	300	200	250	0.5	0.05				
20	1.0	3.0	350/470	0.1	2	220	110 ²⁾	250	1	0.05				
			220/410	0.5	2	140	70	350	2	0.2				
	2.0	5.0	220/330	0.1	2	80	45	310	3	0.3				
			220/390	0.5	2	85	40	310	3	0.3			PBSS4320X	
	4.0	15.0	300/450	0.5	2	50	30	280	4	0.4			PBSS301ND	
	4.3	8.0	300/550	0.5	2	36	21	220	4	0.2				
	5.0	10.0	300/450	0.5	2	32	35	220	5	0.5			PBSS4520X	
	5.3	10.6	300/570	0.5	2	27 ¹⁾	20	200	5.3	0.265			PBSS302NX	
	5.8	10.2	300/570	0.5	2	30 ¹⁾	20	250	5.8	0.29	PBSS302NZ			
	6.0	7.0	280/440	0.5	2	33 ¹⁾	20	275	6	0.3				
7.0	15.0	300/550	0.5	2	19	12	210	7	0.35			PBSS4021NX		
8.0	20.0	300/550	0.5	2	14	9	170	8	0.4	PBSS4021NZ				
30	1.0	3.0	300/450	0.5	2	240	120 ²⁾	270	1	0.05				
			300/450	0.5	2	120	70	320	2	0.2				
	2.6	5.0	300/500	0.5	2	76	80	320	3	0.3				
			300/490	0.5	2	80	45	300	3	0.3			PBSS4330X	
	3.0	5.0	300/465	0.5	2	75	40	300	3	0.3				
	3.5	6.0	300/500	0.5	2	50	70	300	4	0.4				PBSS4032ND ³⁾
	4.7	10.0	300/500	0.5	2	45	57	250	4	0.4			PBSS4032NX ³⁾	
	5.1	10.2	300/480	0.5	2	30 ¹⁾	20	220	5.1	0.255			PBSS303NX	
	5.4	10.0	300/500	0.5	2	45	57	340	4.9	0.27	PBSS4032NZ ³⁾			
	5.5	11.0	300/480	0.5	2	31 ¹⁾	20	240	5.5	0.275	PBSS303NZ			
6.0	7.0	280/450	0.5	2	35 ¹⁾	21	275	6	0.3					
40	0.5	1.0	200/550	0.01	2	380	200 ²⁾	250	0.5	0.05				
			200/350	0.01	2	380	190	250	0.5	0.05				
	3.0	-	300/-	0.5	5	150	70	440	2	0.2				
			300/440	0.5	5	240	130	500	1	0.1				
	1.0	2.0	300/510	0.5	5	230	120	500	1	0.1				
			300/420	0.5	5	150	130	500	1	0.1				
	3.0	4.0	300/400	0.5	5	150	70	400	2	0.2				
			350/470	0.1	2	120	70	320	2	0.2				
	4.0	15.0	300/450	0.5	2	120	70	320	2	0.2				
			300/520	0.5	2	55	35	300	4	0.4				PBSS302ND
5.0	10.0	300/500	0.5	2	40	21	355	5	0.5				PBSS4540X	
		300/500	0.5	2	42	25	355	5	0.5	PBSS4540Z				
50	2.0	5.0	300/495	0.5	2	100	60	260	2	0.2				
			300/-	0.5	2	160	90 ²⁾	320	2	0.2			PBSS4250X	
	3.0	5.0	200/280	0.5	2	110	65	290	2	0.2				PBSS4350D
			300/460	0.5	2	75	50	370	3	0.3			PBSS4350X	
200/280	0.5	2	110	60 ¹⁾	290	2	0.2	PBSS4350Z						
60	1.0	2.0	200/400	0.5	5	200	110	250	1	0.1				
			200/420	0.5	5	230	120	280	1	0.1				
	200/350	0.5	5	200	110	250	1	0.1						
	3.0	6.0	345/570	0.5	2	65	40	260	3	0.3				PBSS303ND
	3.8	8.0	300/500	0.5	2	46	29	200	3	0.3				
	4.7	9.4	300/520	0.5	2	37 ¹⁾	25	245	4.7	0.235			PBSS304NX	
	5.2	10.4	300/520	0.5	2	39 ¹⁾	25	280	5.2	0.26	PBSS304NZ			
	6.0	7.0	280/440	0.5	2	34 ¹⁾	22	290	6	0.3				
6.2	15.0	300/500	0.5	2	25	17	230	6	0.3			PBSS4041NX		
7.0	15.0	300/500	0.5	2	17.5	13	195	7	0.35	PBSS4041NZ				
80	3.0	6.0	240/360	0.5	2	67	40	255	3	0.3				PBSS304ND
	4.0	10.0	250/400	0.5	2	43 ¹⁾	25	230	4	0.2			PBSS4480X	
	4.6	9.2	300/470	0.5	2	37 ¹⁾	25	240	4.6	0.23			PBSS305NX	
	5.1	10.2	300/470	0.5	2	38 ¹⁾	25	270	5.1	0.255	PBSS305NZ			
	5.6	7.0	270/425	0.5	2	40 ¹⁾	25	320	5.6	0.28				
100	1.0	3.0	150/400	0.25	10	160	80	200	1	0.1				
			150/300	0.25	10	165	70	200	1	0.1				
			150/290	0.25	10	160	75	200	1	0.1				PBSS8110D
			150/290	0.25	10	165	73	200	1	0.1			PBSS8110X	
			150/290	0.25	10	160	73	200	1	0.1	PBSS8110Z			
	3.0	4.0	170/275	0.5	2	72	45	360	4	0.4				PBSS305ND
	4.5	9.0	200/330	0.5	2	38 ¹⁾	27	245	4.5	0.225			PBSS306NX	
5.1	10.2	200/330	0.5	2	43 ¹⁾	27	300	5.1	0.255	PBSS306NZ				
5.2	6.0	180/285	0.5	2	48 ¹⁾	30	340	5.2	0.26					

Low V_{CEsat} (BISS) transistors single PNP

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	
														
Size (mm)											6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0	
P _{tot} (mW)											1700	1650	750	
V _{CEO} (V)	I _C (A)	I _{CM} (A)	h _{FE} min/typ	@ I _C (V)	@ V _{CE} (V)	R _{CEsat} typ (mΩ); I _C /I _B = 10	V _{CEsat} typ (mV); I _C = 0.5 A; I _B = 0.05 A	V _{CEsat} max (mV)	@ I _C (A)	@ I _B (A)				
12	5.3	10.6	250/400	0.5	2	28 ¹⁾	20	210	5.3	0.265			PBSS301PX	
	5.7	11.4	250/400	0.5	2	30 ¹⁾	20	245	5.7	0.285	PBSS301PZ			
	6.0	7.0	220/335	0.5	2	33 ¹⁾	20	300	6	0.3				
15	0.5	1.0	200/260	0.01	2	300	150	250	0.5	0.05				
	0.5	1.0	200/325	0.01	2	300	150	250	0.5	0.05				
20	1.0	2.0	300/450	0.1	2	250	125 ²⁾	250	1	0.05				
	2.0	4.0	220/440	0.1	2	140	75	390	2	0.2				
		3.0	225/ -	0.5	2	115	80 ²⁾	225	2	0.2				
	3.0	5.0	220/420	0.5	2	75	50	210	2	0.2				
		5.0	200/ -	0.5	2	85	80 ²⁾	400	3	0.3			PBSS5320D	
	3.0	5.0	220/450	0.5	2	90	50	300	3	0.3			PBSS5320X	
	3.5	8.0	250/400	0.5	2	55	35	375	4	0.2				
	4.0	15.0	250/400	0.5	2	50	35	280	4	0.4			PBSS301PD	
	5.0	10.0	300/430	0.5	2	34	45	270	5	0.5			PBSS5520X	
	5.1	10.2	250/370	0.5	2	32 ¹⁾	25	230	5.1	0.255			PBSS302PX	
	5.5	11.0	250/370	0.5	2	34 ¹⁾	25	265	5.5	0.275	PBSS302PZ			
	6.0	7.0	230/345	0.5	2	39 ¹⁾	25	350	6	0.3				
6.2	15.0	250/400	0.5	2	23	18	240	6	0.3			PBSS4021PX		
6.6	20.0	250/400	0.5	2	22	16	240	7	0.35	PBSS4021PZ				
30	1.0	3.0	260/350	0.5	2	220	110	225	1	0.05				
	2.0	3.0	300/450	0.1	2	160	70	350	2	0.2				
	2.4	5.0	200/320	0.5	2	110	95	330	2	0.2				
	2.7	5.0	200/350	0.5	2	88	87	395	3	0.3			PBSS4032PD ³⁾	
	3.0	5.0	200/380	0.5	2	80	50	320	3	0.3			PBSS5330X	
	3.0	5.0	200/320	0.5	2	75	45	320	3	0.3				
	4.2	10.0	200/350	0.5	2	58	70	345	4	0.4			PBSS4032PX ³⁾	
	4.4	10.0	200/350	0.5	2	58	70	400	4	0.2	PBSS4032PZ ³⁾			
	5.1	10.2	250/400	0.5	2	32 ¹⁾	25	230	5.1	0.255			PBSS303PX	
	5.3	10.6	250/400	0.5	2	35 ¹⁾	25	265	5.3	0.265	PBSS303PZ			
	6.0	7.0	200/335	0.5	2	39 ¹⁾	25	350	6	0.3				
40	0.5	1.0	200/380	0.01	2	440	220	350	0.5	0.05				
	1.0	2.0	200/380	0.01	2	440	230	350	0.5	0.05				
			300/ -	0.1	5	200	120	310	1	0.1				
			300/520	0.1	5	230	130	500	1	0.1				
	1.0	2.0	300/800	0.1	5	250	130	500	1	0.1				
			300/510	0.1	5	230	130	500	1	0.1				
	1.8	3.0	300/450	0.1	5	185	100	530	2	0.2				
	2.0	3.0	300/ -	0.1	2	200	110 ²⁾	350	2	0.2				
			300/450	0.1	2	150	70	350	2	0.2				
	4.0	15.0	200/310	0.5	2	55	46	300	4	0.4			PBSS302PD	
	4.0	10.0	250/370	0.5	2	45	33	375	5	0.5			PBSS5540X	
10.0		250/350	0.5	2	55	40 ¹⁾	160	2	0.2	PBSS5540Z				
50	3.0	200/ -	0.5	2	150	90 ²⁾	300	2	0.1					
	2.0	5.0	200/360	0.5	2	90	55	270	2	0.2				
		5.0	200/ -	0.5	2	160	90 ²⁾	320	2	0.2			PBSS5250X	
	3.0	5.0	200/300	0.5	2	120	70	300	2	0.2			PBSS5350D	
			200/375	0.5	2	120	70	390	3	0.3			PBSS5350X	
200/300	0.5	2	120	70	300	2	0.2			PBSS5350Z				
60	1.0	2.0	150/250	0.5	5	220	120	330	1	0.1				
	1.0	2.0	150/250	0.5	5	255	135	340	1	0.1				
			150/250	0.5	5	220	120	330	1	0.1				
	2.7	8.0	200/300	0.5	2	80	49	360	3	0.3				
	3.0	6.0	180/265	0.5	2	70	55	290	3	0.3			PBSS303PD	
	4.2	8.4	200/295	0.5	2	53 ¹⁾	35	310	4.2	0.21			PBSS304PX	
	4.5	9.0	200/295	0.5	2	59 ¹⁾	35	375	4.5	0.225	PBSS304PZ			
	5.0	6.0	170/260	0.5	2	35 ¹⁾	35	450	5	0.25				
15.0		200/300	0.5	2	40	30	300	5	0.5			PBSS4041PX		
5.7	15.0	200/300	0.5	2	29	22	285	6	0.3	PBSS4041PZ				
80	3.0	5.0	155/225	0.5	2	71	55	290	3	0.3			PBSS304PD	
	4.0	5.0	180/265	0.5	2	65 ¹⁾	40	420	4	0.2				
		10.0	200/300	0.5	2	50	35	380	5	0.5			PBSS5480X	
	8.0	200/280	0.5	2	43	36	240	4	0.4			PBSS305PX		
4.5	9.0	200/280	0.5	2	69 ¹⁾	36	450	4.5	0.225	PBSS305PZ				
100	1.0	3.0	150/ -	0.25	5	170	93	320	1	0.1				
			150/350	0.5	5	170	95	320	1	0.1				
			150/350	0.5	5	170	100	320	1	0.1			PBSS9110D	
			150/350	0.5	5	170	90	320	1	0.1			PBSS9110X	
			150/ -	0.5	5	170	90	320	1	0.1			PBSS9110Z	
	2.0	3.0	175/275	0.5	2	88	65	250	2	0.2			PBSS305PD	
	2.7	4.0	180/295	0.5	2	110 ¹⁾	45	450	2.7	0.135				
	3.7	7.4	200/300	0.5	2	52	45	300	4	0.4			PBSS306PX	
4.1	8.2	200/300	0.5	5	57	45	325	4.1	0.41	PBSS306PZ				

In the Spotlight

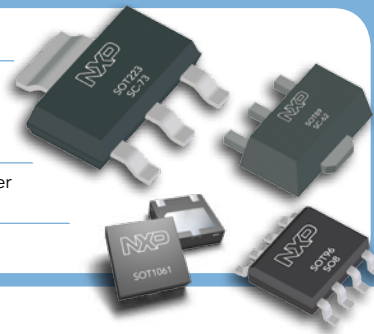
New low V_{CEsat} (BISS) transistors

Industry's first combination of reduced switching times (down to 125 ns) with minimized saturation voltage (below 50 mV)

Voltage range from 12 V to 100 V

Flexible package options, from standard SMD to brand new medium power leadless package SOT1061 (2 x 2 x 0.65 mm)

Benchmark for reduced on-state-resistance



Low V_{CEsat} (BISS) double transistors

Package										SOT96 (SO8)	SOT457 (SC-74)	SOT363 (SC-88)	SOT666
Size (mm)										4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55
P _{tot} (mW)										2000 ²⁾	750	430	500
V _{CEO} (V)	I _C (A)	Polarity	h _{FE min}	@ I _C (A)	@ V _{CE} (V)	V _{CEsat typ} (mV); I _C = 0.5 A; I _B = 0.05 A	V _{CEsat max} (mV)	@ I _C (A)	@ I _B (A)				
15	0.5	2 x NPN	200	0.01	2	170 ¹⁾	250	0.5	0.05				PBSS2515VS
		2 x PNP	200	0.01	2	170 ¹⁾	250	0.5	0.05				PBSS3515VS
		NPN/PNP	200	0.01	2	170 ¹⁾	250	0.5	0.05				PBSS2515VPN
		NPN/PNP	200	0.01	2	170 ¹⁾	250	0.5	0.05			PBSS2515YPN	
20	7.5	NPN/NPN	300	0.5	2	15	150	4	0.2	PBSS4021SN			
	6.3	PNP/PNP	250	0.5	2	24	225	4	0.2	PBSS4021SP			
	7.5 / 6.3	NPN/PNP	300/250	0.5	2	15/24	150/225	4	0.2	PBSS4021SPN			
30	5.7	NPN/NPN	300	0.5	2	57	250	4	0.4	PBSS4032SN ³⁾			
	4.8	PNP/PNP	200	0.5	2	70	390	4	0.4	PBSS4032SP ³⁾			
	5.7 / 4.8	NPN/PNP	300/200	0.5	2	57/70	250/390	4	0.4	PBSS4032SPN ³⁾			
40	1.0	NPN/PNP	300/250	0.5	5	130/150	500	1	0.1		PBSS4140DPN		
	2.0	NPN/PNP	300/250	0.5	5	80/100	400/530	2	0.2		PBSS4240DPN		
50	2.7	2 x NPN	300	0.5	2	50	340	2.7	0.27	PBSS4350SS			
		2 x PNP	200	0.5	2	60	370	2.7	0.27	PBSS5350SS			
		NPN/PNP	300/200	0.5	2	50/60	340/370	2.7	0.27	PBSS4350SPN			
60	1.0	2 x NPN	200	0.5	5	115	250	1	0.1		PBSS4160DS		
		2 x PNP	150	0.5	5	120	330	1	0.1		PBSS5160DS		
		NPN/PNP	200/150	0.5	5	115/120	250/330	1	0.1		PBSS4160DPN		
	6.7	NPN/NPN	300	0.5	2	20	190	4	0.2	PBSS4041SN			
	5.9	PNP/PNP	200	0.5	2	35	330	4	0.2	PBSS4041SP			
	6.7 / 5.9	NPN/PNP	300/200	0.5	2	20/35	190/330	4	0.2	PBSS4041SPN			

¹⁾ I_C/I_B=20

²⁾ Device mounted on a ceramic PCB, Al₂O₃, standard footprint.

³⁾ Optimized for high speed switching

Low V_{CEsat} (BISS) transistors

High voltage low V_{CEsat} (BISS) transistors

types in **bold** represent new products


Package				SOT223 (SC-73)	SOT89 (SC-62)	SOT23
Size (mm)				6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.3 x 1.0
P _{tot} (mW)				1700	1300	250
Polarity	$V_{CESM}^{1)}$	V_{CEO} (V)	I_c (A)			
NPN	-	150	1	PBHV8115Z		PBHV8115T
			2	PBHV8215Z		
	500	180	1			PBHV8118T
		400	0.5	PBHV8540Z		PBHV8540T
		500	1	PBHV8140Z		
PNP	-	150	1	PBHV9115Z	PBHV9115X	PMBTA45
			2	PBHV9215Z		PBHV9115T
	500	400	0.25	PBHV9040Z		PBHV9040T
			0.5	PBHV9540Z		
		500	0.15			PBHV9050T
			0.25	PBHV9050Z		

¹⁾ Collector-emitter peak voltage

In the Spotlight

High voltage low V_{CEsat} (BISS) transistors in SOT223 & SOT23

- Voltage V_{CEO} up to 500 V
- Current I_c up to 1 A (continuous), 2 A (peak)
- V_{CEsat} down to 33 mV at $I_B = 20$ mA
- AEC-Q101 qualified








Low V_{CEsat} (BISS) RETs

Package					SOT23	
Size (mm)					2.9 x 1.3 x 1.0	
P _{tot} (mW)					250	
V_{CEO} (V)	I_c (mA)		R1 (kΩ)	R2 (kΩ)	NPN	PNP
40	600	R1 = R2	1	1	PBRN113ET	PBRP113ET
			2.2	2.2	PBRN123ET	PBRP123ET
		R1 ≠ R2	1	10	PBRN113ZT	PBRP113ZT
			2.2	10	PBRN123YT	PBRP123YT

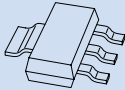
High voltage bipolar transistors for lighting, SMPS and industrial applications

types in **bold** represent new products

V_{CESM} (V)	$I_{C(DC)}$ (max) (A)	25 °C ind. t_f (typ) (ns)	@ I_C (A)	h_{FE} (typ)	@ I_C (A)	SOT54 (TO92)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT404 (D ² PAK)	SOT428 (DPAK)
										
700	1	80	1	7.5	0.8	BUJ100LR				
	1	80	1	7.5	0.8	PHE13003A				
	1	50	1	14	0.75	BUJ100				
	1.5	100	0.5	9	1	PHE13003C				
	1.5	100	0.5	9	1	PHD13003C ¹⁾				
	4	30	2	12.5	3		BUJ103A	BUJ103AX		BUJ103AD
	4	30	2	12.5	3					BUJD103AD ¹⁾
	4	100	2	17	2		PHE13005	PHE13005X		
	4	100	2	17	2		PHD13005 ¹⁾			
	8	20	5	11	4		BUJ105A		BUJ105AB	BUJ105AD
	8	20	5	11	4					BUJD105AD ¹⁾
	8	40	5	9	5		PHE13007			
	10	20	5	11	6		BUJ106A			
	12	100	5	6 min - 30 max	8		PHE13009			
850	4	30	2	12.5	3		BUJD203A¹⁾	BUJD203AX¹⁾		BUJD203AD¹⁾
1000	5	145	2.5	12	3		BUJ303A	BUJ303AX		BUJ303AD
1050	4	520	2	41	0.8		BUJ302A	BUJ302AX		BUJ302AD
	5	200	2.5	10.5	3		BUJ303B			
1200	6	170	2.5	15.5	3		BUJ403A			

¹⁾ Integrated freewheeling diode

Small-signal MOSFETs single (N-channel) < 50V

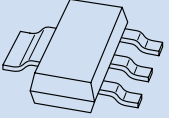
													SOT223 (SC-73)				
Package																	
Size (mm)														6.5 x 3.5 x 1.65			
P _{tot} (mW)													1700				
V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th) min} (V)	V _{GS(th) max} (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	R _{DS(on)} typ (mΩ) @ V _{GS} =								
									10 V	4.5 V	2.5 V	1.8 V					
12	8	5.7	0.4	-	23	67	10.1	-	-	28	-	39					
20	8	tbd	tbd	tbd	tbd	tbd	tbd	-	-	16	tbd	tbd					
		6.3	2	4	23	71	10.6	-	-	23	-	37					
		5.7	0.4	-	23	71	10.6	-	-	27	-	39					
		tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	-	28	tbd	tbd				
		5.7	0.45	-	20	66	7.4	-	-	30	-	44					
		3.76	0.65	-	35	84	5.4	-	-	56	77	-					
		2.5	0.65	-	35	84	5.4	-	-	56	77	-					
		1.05	0.4	-	6.5	65	-	-	-	140	-	240					
	12	12	2.28	0.45	0.95	14.5	23.5	0.89	-	-	250	-	420				
			1	0.45	1	14.5	23.5	0.89	-	-	280	-	460				
			tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	-	30	tbd	-			
			5.9	0.5	1.5	25	37	5.8	-	-	31	44	-				
	15	15	2.15	0.5	1.5	16	17	0.72	-	-	270	440	-				
			1	0.5	1.5	16	17	0.72	-	-	290	460	-				
	30	8	5.7	1	2	24	35	13.1	-	28	34	-	-				
			4.1	1	2	24	35	13.1	-	55	70	-	-				
4.9			0.45	-	22	60	9.9	-	-	38	-	54					
4.9			0.45	-	18	50	9.3	-	-	40	-	55					
12		12	1.78	0.45	0.95	11.5	22.5	0.89	-	-	390	-	550				
			0.85	0.4	-	6	27	-	-	-	400 ²⁾	-	600 ²⁾				
			0.8	0.45	1	11.5	22.5	0.89	-	-	400	-	580				
			tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	-	20	tbd	-			
20		12	tbd	tbd	tbd	tbd	tbd	tbd	-	-	250	tbd	-				
			1.87	0.5	1.5	16	19.5	0.65	-	-	350	520	-				
			0.87	0.35	-	16	19.5	-	-	-	370	550	-				
			0.9	0.5	-	16	19.5	0.65	-	-	370	550	-				
		15	15	5.4	1	2	12	27	13.8	-	32	40	-	-			
				tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	tbd	15	tbd	-		
				tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	tbd	18	tbd	-		
				10	1	2.8	18	44	24	-	20	30	-	-	BSP030		
20	20	tbd	tbd	tbd	tbd	tbd	tbd	-	tbd	31	tbd	-					
		tbd	tbd	tbd	tbd	tbd	tbd	tbd	-	tbd	35	tbd	-				
		5.4	1	2	33	44	6.1	-	31	38	-	-					
		5.2	1	2	33	44	6.1	-	32	42	-	-					
	20	20	5.4	1	2	12	21.5	9.4	-	35	45	-	-				
			4.6	1	2	8.4	17.8	8.8	-	40	49	-	-				
			4.7	1	2	12	23.5	9.4	-	47	60	-	-				
			1.9	1	2	11	41	6.4	-	77	102	-	-				
20	20	2.5	1.5	-	12	23.5	4.6	-	74	117	-	-					
		6	1	2.8	14	36	-	-	80	120	-	-	BSP100				
20	20	1.7	1.5	-	11.5	31	4.6	-	117 ²⁾	190 ²⁾	-	-					

¹⁾ Enhanced thermal capability

²⁾ Max values

* Products to be released in 2011. For new product information, please check <http://standardproducts.nxp.com/mosfets>

Small-signal MOSFETs single (N-channel) $\geq 50V$

Package													SOT223 (SC-73)
													
Size (mm)													6.5 x 3.5 x 1.65
P _{tot} (mW)													1700
V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th) min} (V)	V _{GS(th) max} (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	R _{DSon} typ (mΩ) @ V _{GS} =				
									10 V	4.5 V	2.5 V	1.8 V	
50	20	0.1	0.4	1.8	2	5	-	-	2800	3800 ³⁾	-	-	
55	8	0.3	0.4	1.3	4	11	1	-	-	2300	2400	3100	
	10	0.335	0.4	1.3	4	11	1	-	-	2300	2400	3100	
	13	2.5	2	4	-	-	-	2	2	120	-	-	-
3.5		1	2	-	-	-	2	2	-	65	-	-	PHT8N06LT
2.5		1	2	-	-	-	2	2	-	120	-	-	PHT6N06LT
60	15	0.26	1	3.3	3	9	-	1	2800	3800	-	-	
	20	0.25	0.8	3	-	-	-	-	2500	-	-	-	
		0.36	0.9	1.5	5	13	0.72	-	900	1000	-	-	
		1.22	1	3	6	7.2	1.05	-	760	1100	-	-	
		0.57	1	-	6	7.2	-	-	780	1100	-	-	
		0.55	1	3	6	7.2	1.05	-	780	1100	-	-	
		0.3	1	2.5	7	15	0.6	-	1000	1300	-	-	
		0.3	1	2.5	11	19	0.5	2	1000	1300	-	-	
	0.3	1	2.5	16	60	1.09	3	1100	1300	-	-		
	30	0.34	1	-	3	9	-	1	2800	3800	-	-	
0.385		1	2.5	2.5	11	0.69	-	780	1200	-	-		
0.475		1	2.5	2.5	11	0.69	-	780	1200	-	-		
100	0.3	1	2.5	2.5	11	-	-	2800	3800	-	-		
	16	3.5	1	2	14	73	-	-	-	200	-	-	PHT4NQ10LT
	20	3	2	4	-	-	-	-	57	-	-	-	PHT6NQ10T
		3.5	2	4	21	31	7.4	-	200	-	-	-	PHT4NQ10T
		0.85	2	4	19	13	4.6	-	400	-	-	-	
		0.15	1	2.8	3	12	-	-	3500	-	-	-	
		0.19	1	-	3	12	-	-	-	5000	-	-	
0.52	1	-	3	12	-	-	-	5000	-	-	BSP110		
30	1.9	2	4	10.5	12.5	7	-	213	-	-	-		
200	0.4	0.8	2.8	6	49	-	-	1600	-	-	-		
	0.55	0.4	2	10	45	-	-	1700	-	3000	-	BSP122	
240	20	0.375	0.8	2	6	47	-	-	2800	7500 ³⁾	-	-	BSP89
250	20	0.35	0.8	2	6	47	-	-	2800	-	-	-	BSP126
300	20	0.35	0.8	2	6	46	-	-	3700	-	4800	-	BSP130

¹⁾ Enhanced thermal capability

²⁾ Max values

³⁾ @ V_{gs} = 5 V

Small-signal MOSFETs dual (N-channel)

Package													
Size (mm)													
P _{tot} (mW)													
V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th)} min (V)	V _{GS(th)} max (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	R _{DSon} typ (mΩ) @ V _{GS} =				
									10 V	4.5 V	2.5 V	1.8 V	
20	8	0.87	0.45	1	14.5	23.5	-	-	-	280	-	460	-
	12	0.86	0.5	1.5	16	17	0.72	-	-	290	460	-	-
30	8	0.71	0.45	1	11.5	22.5	0.89	-	-	400	-	580	-
	12	0.74	0.5	1.5	17	19.5	0.65	-	-	370	550	-	-
	15	0.125	0.8	1.5	17	22	0.35	-	-	1800	2900	-	-
60	20	0.49	1	-	6	7.2	1.05	-	-	780	1100	-	-
		0.36	0.9	1.5	5	13	0.72	-	-	900	1000	-	-
		0.3	1	2.5	7	15	0.6	-	-	1000	1300	-	-
		0.3	1	2.5	11	19	0.5	2	-	1000	1300	-	-

Small-signal MOSFETs single (P-channel)

Package													
Size (mm)													
P _{tot} (mW)													
V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th)} min (V)	V _{GS(th)} max (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	R _{DSon} typ (mΩ) @ V _{GS} =				
									10 V	4.5 V	2.5 V	1.8 V	
12	8	1.52	0.4	-	6.5	65	-	-	-	80	-	140	-
		0.75	0.4	-	6.5	65	-	-	-	180	-	420	-
20	8	tbd	tbd	tbd	tbd	tbd	tbd	-	-	-	21	tbd	tbd
		tbd	tbd	tbd	tbd	tbd	tbd	-	-	-	27	tbd	tbd
		2	0.5	1.1	7	50	6	-	-	-	100	-	-
		4.8	0.55	0.95	16	117	10	-	-	-	48	65	-
	12	3.5	0.75	1.25	24	84	8.5	-	-	-	48	71	-
		3.9	0.55	0.95	28	101	7.6	-	-	-	65	90	-
		3.5	0.75	1.25	tbd	tbd	tbd	-	-	-	85	tbd	tbd
		3.5	0.75	1.25	tbd	tbd	tbd	-	-	-	170	tbd	tbd
30	8	0.47	0.4	-	6.5	65	-	-	-	660	-	1100	
	20	3	1	2.8	20	50	-	-	220	330	-	-	
		0.52	1	-	6.5	65	-	-	630	890	-	-	
50	20	0.2	tbd	tbd	tbd	tbd	tbd	1	5300	6000	-	-	
		0.13	0.8	2	3	7	-	-	6000	-	-	-	
60	20	0.3	1	-	6.5	65	-	-	2100	2700	-	-	
200	20	0.225	0.8	2.8	5	20	-	-	10000	-	-	-	
240	20	0.2	0.8	2.8	5	20	-	-	10000	-	-	-	
250	20	0.225	0.8	2.8	5	10	-	-	10000	-	-	-	
300	20	0.21	1.95	2.8	5	15	-	-	17000 ²⁾	-	-	-	


¹⁾ Enhanced thermal capability

²⁾ Max values

* Products to be released in 2011. For new product information, please check <http://standardproducts.nxp.com/mosfets>




Small-signal MOSFET – Schottky combination

types in **bold** represent new products

Package														SOT1118		
																
Size (mm)														2.0 x 2.0 x 0.65		
P _{tot} (mW)														1250		
Configuration	V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th) min} (V)	V _{GS(th) max} (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	I _F (A)	V _R (V)	V _F typ. (mA)	R _{DSon} typ (mΩ) @ V _{GS} =			
													4.5 V	2.5 V	1.8 V	
single + schottky	20	8	3.3	0.5	1.5	15	92	4.5	1	2	30	455	58	72	100	PMFPB6545UP
			3.3	0.5	1.5	15	92	4.5	1	2.2	30	325	58	72	100	PMFPB6532UP

Small-signal MOSFETs dual (P-channel)

types in **bold** represent new products


Package														SOT363 (SC-88)	SOT666 (SC-88)	SOT1118
																
Size (mm)														2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55	2.0 x 2.0 x 0.65
P _{tot} (mW)														300	300	1250
V _{DS} (V)	V _{GS} (V)	I _D (A)	V _{GS(th) min} (V)	V _{GS(th) max} (V)	t _{on} typ (ns)	t _{off} typ (ns)	Q _G typ (nC)	ESD protection (kV)	R _{DSon} typ (mΩ) @ V _{GS} =							
									10 V	4.5 V	2.5 V	1.8 V				
20	8	3.3	0.5	1.5	15	92	4.5	1	-	58	72	100				PMDPB65UP
50	20	0.2	tbd	tbd	tbd	tbd	tbd	1	5300	6000	-	-	BSS84AKS*	BSS84AKV*		

* Products to be released in 2011. For new product information, please check <http://standardproducts.nxp.com/mosfets>

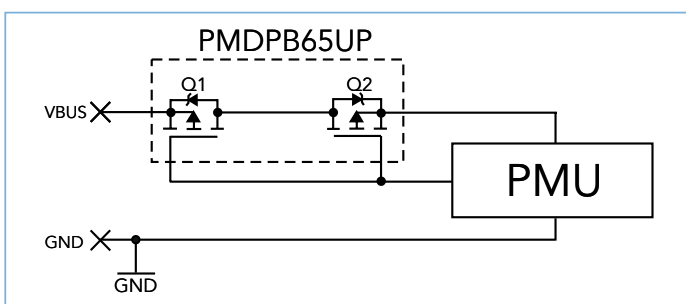
In the Spotlight

Dual P-channel ESD protected MOSFET in small 0.65 mm flat, 2 x 2 mm leadless package (PMDPB65UP)

- ESD protected MOSFET of >1 kV HBM
- Very low R_{DSon} of <70 mΩ at V_{GS} = 4.5 V
- 1.8 V R_{DSon} rating for operation at low voltage gate drive levels
- Best-in-class thermal performance due to extra heatsink
- Smallest 2 x 2 mm leadless package dual P-channel; 0.65 mm package height

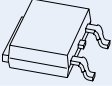
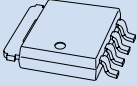

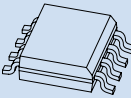
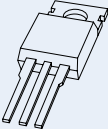


USB OTG Vbus protection



30V N-channel MOSFETs

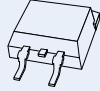
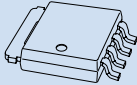

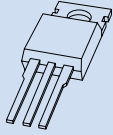
types in **bold** represent new products

Package	Typenumber	V_{DS} [max] (V)	R_{Dson} [max] @ $V_{GS} = 10$ V (m Ω)	R_{Dson} [max] @ $V_{GS} = 4.5$ V (m Ω)	I_D [max] (A)	$Q_{g(tot)}$ [typ] (nC)	
DPAK (SOT428)		PHD71NQ03LT	30	10	-	75	13.2
		PHD36N03LT	30	17	22	43.4	18.5
Power-SO8 (LPAK)		PSMN1R0-30YLC	30	1.15	1.4	100	50
		PSMN1R3-30YL	30	1.3	1.95	100	46.6
		PSMN1R5-30YL	30	1.5	1.9	100	36.2
		PSMN1R7-30YL	30	1.7	2.1	100	36.2
		PSMN2R0-30YL	30	2	2.63	100	30
		PSMN2R5-30YL	30	2.4	3.16	100	27
		PSMN3R0-30YL	30	3	4.04	100	21
		PSMN3R5-30YL	30	3.5	4.61	100	19
		PSMN4R0-30YL	30	4	5.25	100	17.6
		PSMN4R5-30YLC	30	4.8	6.1	84	9.6
		PSMN5R0-30YL	30	5	6.7	91	14.1
		PSMN6R0-30YL	30	6	7.87	79	11
		PSMN7R0-30YL	30	7	9.1	76	10
		PSMN9R0-30YL	30	8	11.03	61	8.7
QFN3333 (SOT873-1)		PSMN3R5-30LL	30	3.6	5.6	40	18
		PSMN3R8-30LL	30	3.7	5.8	40	38
		PSMN5R8-30LL	30	5.8	8	40	24
		PSMN9R0-30LL	30	9	13	21	20.6
		PSMN013-30LL	30	13	19	21	12.2
		PSMN017-30LL	30	17	25	15	10
SO8 (SOT96-1)		PHK12NQ03LT	30	-	14	11.8	-
		PSMN3R2-30KL	30	3.5	3.8	30	70.3
		PHK31NQ03LT	30	4.4	-	30.4	-
		PSMN005-30K	30	5.5	8	-	34
		PHK28NQ03LT	30	6.5	7.7	23.7	30.3
		PHK18NQ03LT	30	8.9	-	20.3	-
		SI4410DY	30	13.5	20	10	21.5
		PHK13N03LT	30	20	26	13.8	10.7
		PHKD13N03LT	30	20	26	10.4	10.7
		PHN203	30	30	55	6.3	14.6
		PHN210T	30	100	200	3.4	-
TO-220AB (SOT78)		PSMN1R6-30PL	30	1.7	2.1	100	101
		PSMN1R8-30PL	30	1.8	2.3	100	83
		PSMN2R0-30PL	30	2.1	2.8	100	55
		PSMN2R7-30PL	30	2.7	3.6	100	32
		PSMN3R4-30PL	30	3.4	4.1	100	31
		PSMN4R3-30PL	30	4.3	6.2	100	19
		PHP36N03LT	30	17	22	43.4	18.5
		PSMN022-30PL	30	22	34	30	4.4

For the most up to date product information, please visit <http://standardproducts.nxp.com/mosfets>

60V - 80V N-channel MOSFETs

types in **bold** represent new products

Package	Typenumber	V_{DS} [max] (V)	$R_{DS(on)}$ [max] @ $V_{GS} = 10$ V (m Ω)	I_D [max] (A)	$Q_{g(tot)}$ [typ] (nC)	
D ² PAK (SOT404)		PSMN004-60B	60	3.6	75	168
		PHB32N06LT	60	37	34	17
		PHB29N08T	75	-	27	19
		PSMN005-75B	75	5	75	165
		PSMN008-75B	75	8.5	75	122.8
		PHB110NQ08T	75	9	75	113.1
Power-SO8 (LFPACK)		PSMN5R5-60YS	60	5.2	100	56
		PSMN7R0-60YS	60	6.4	89	45
		PSMN8R5-60YS	60	8	76	39
		PSMN012-60YS	60	11.1	59	28.4
		PSMN017-60YS	60	15.7	44	20
		PSMN030-60YS	60	24.7	29	13
		PSMN8R2-80YS	80	8.5	82	55
		PSMN011-80YS	80	11	67	45
		PSMN013-80YS	80	12.9	60	37
		PSMN018-80YS	80	18	45	26
		PSMN026-80YS	80	27.5	34	20
QFN3333 (SOT873-1)		PSMN014-60LS	60	14	40	19.6
		PSMN023-80LS	80	23	34	21
TO-220AB (SOT78)		PSMN3R0-60PS	60	3	100	130
		PSMN4R6-60PS	60	4.6	100	70.8
		PSMN7R6-60PS	60	7.8	92	38.7
		PSMN015-60PS	60	14.8	50	20.9
		PHP29N08T	75	-	27	19
		PSMN008-75P	75	8.5	75	122.8
		PHP79NQ08LT	75	16	73	30
		PSMN4R4-80PS	80	4.1	100	112
		PSMN5R0-80PS	80	4.7	100	87
		PSMN6R5-80PS	80	6.9	100	71
		PSMN8R7-80PS	80	8.7	90	52
		PSMN012-80PS	80	11	74	36
		PSMN017-80PS	80	17	50	26
		PSMN050-80PS	80	46	22	9

For the most up to date product information, please visit <http://standardproducts.nxp.com/mosfets>

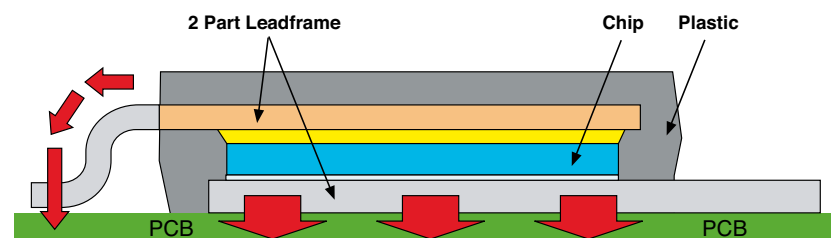
150V - 300V N-channel MOSFETs

Package	Typenumber	V_{DS} [max] (V)	$R_{DS(on)}$ [max] @ $V_{GS} = 10$ V (m Ω)	I_D [max] (A)	$Q_{g(total)}$ [typ] (nC)
D ² PAK (SOT404)	PSMN030-150B	150	30	55.5	-
	PSMN035-150B	150	35	50	79
	PHB45NQ15T	150	42	45.1	32
	PSMN057-200B	200	57	39	-
	PSMN070-200B	200	70	35	-
	PHB33NQ20T	200	77	32.7	32.2
	PHB20NQ20T	200	130	20	-
DPAK (SOT428)	PSMN063-150D	150	63	29	55
	PSMN130-200D	200	130	20	-
	PHD9NQ20T	200	400	8.7	-
Power-SO8 (LFAK)	PSMN059-150Y	150	59	43	-
	PSMN102-200Y	200	102	21.5	-
QFN3333 (SOT873-1)	PML260SN	200	294	8.8	13.3
	PML340SN	220	386	7.3	13.2
SO8 (SOT96-1)	PHK5NQ15T	150	75	5	29
	PSMN085-150K	150	85	-	40
	PSMN165-200K	200	165	-	40
TO-220AB (SOT78)	PSMN030-150P	150	30	55.5	-
	PSMN035-150P	150	35	50	79
	PHP30NQ15T	150	63	29	55
	PHP28NQ15T	150	65	28.5	24
	PSMN057-200P	200	57	39	-
	PSMN070-200P	200	70	35	-
	PHP33NQ20T	200	77	32.7	32.2
	PHP20NQ20T	200	130	20	-
	PHP9NQ20T	200	400	8.7	-

For the most up to date product information, please visit <http://standardproducts.nxp.com/mosfets>

Power-SO8 (LFAK) Design









- ▶ Low Thermal resistance
- ▶ Low Electrical resistance
- ▶ Low Inductance



4-Quadrant Triacs

4-Quadrant Triacs

types in **bold** represent new products








$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT54 (TO92)	SOT78 (TO220AB)	SOT78D (internally insulated TO220AB)	SOT82	SOT186A (isolated TO220AB)	SOT223	SOT404 (D ² PAK)	SOT428 (DPAK)
										
0.6	400	5/5/5/7	MAC97A6							
	600	5/5/5/7	MAC97A8							
	400 / 600	5/5/5/7	BT1306-D							
0.8	400 / 600	5/5/5/7	BT1308-D					BT1308W-D		
	600	5/5/5/7	Z00607MA							
1	600	3/3/3/7						BT131W		
	600 / 800	3/3/3/7	BT131							
	600 / 800	5/5/5/7	BT131-D							
	600 / 800	10/10/10/10	BT131-E							
	600 / 800	3/3/3/5	Z0103MA/NA					Z0103MN/NN		
	600 / 800	5/5/5/7	Z0107MA/NA					Z0107MN/NN		
	600 / 800	10/10/10/10	Z0109MA/NA					Z0109MN/NN		
	600 / 800	3/3/3/5	Z0103MA0/NA0**					Z0103MN0/NN0**		
	600 / 800	5/5/5/7	Z0107MA0/NA0**					Z0107MN0/NN0**		
	600 / 800	10/10/10/10	Z0109MA0/NA0**					Z0109MN0/NN0**		
600	5/5/5/10	BT132-D*								
4	600	D/E/-/G				BT134				
	800	E/-				BT134				
	600	D/-		BT136			BT136X			BT136S
	600	F					BT136X			BT136S
	600 / 800	E		BT136			BT136X		BT136B	BT136S
	800	F								BT136S
	800	-					BT136X			BT136S
6	600	F/-/G					BT236X			
	800	-/G					BT236X			
8	600	D/-/G		BT137			BT137X			BT137S
	600	E		BT137			BT137X		BT137B	BT137S
	600	F					BT137X		BT137B	BT137S
	800	E		BT137			BT137X			BT137S
	800	F							BT137B	BT137S
	800	-		BT137			BT137X		BT137B	
	800	G							BT137B	BT137S
12	600	D		BT138			BT138X			
	600	-/G		BT138			BT138X		BT138B	
	600	F					BT138X		BT138B	
	600 / 800	E		BT138	BT138Y		BT138X		BT138B	
	800	F					BT138X			
	800	-		BT138			BT138X			
	800	G		BT138						

* Large chip / high I_{TSM}

** Enhanced immunity to false triggering

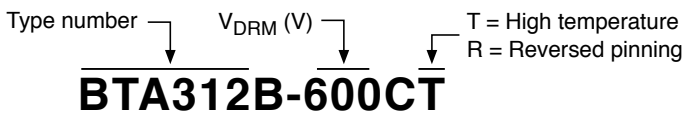
3-Quadrant Triacs

types in **bold** represent new products

$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT54 (TO92)	SOT78 (TO220AB)	SOT78D (internally insulated TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT404 (D ² PAK)	SOT428 (DPAK)
									
0.8	600 / 800	D/E	BTA2008						
1	600 / 800	B/E/ER	BTA201						
	600 / 800	E					BTA201W		
2	600 / 800	D/E				BTA202X			
4	600	B/C/D/E/F		BTA204		BTA204X			BTA204S
	800	B/C/E		BTA204		BTA204X			BTA204S
	1000	C				BTA204X			BTA204S
8	600	B/D/E/F		BTA208		BTA208X			BTA208S
	800	B/E		BTA208		BTA208X			BTA208S
	800	F		BTA208		BTA208X			BTA208S
	1000	B				BTA208X			
	1000	C				BTA208X		BTA208B	
	1000	5 min - 35 max				BTA208X-1000C0			
12	600	D		BTA312		BTA312X		BTA312B	
	600	CT		BTA312				BTA312B	
	600 / 800	B/C/E		BTA312		BTA312X		BTA312B	
	600 / 800	C			BTA312Y				
	800	ET		BTA312				BTA312B	
	600 / 800	B/C			BTA412Y				
16	600	BT/D		BTA316					
	600 / 800	B/C/E		BTA316		BTA316X		BTA316B	
	600 / 800	ET		BTA316					
	800	10 min - 50 max				BTA316X-800B0			
	600 / 800	B/C			BTA416Y				
25	600	BT		BTA225					
	600 / 800	B		BTA225				BTA225B	

* Large chip / high I_{TSM}
T: high T_{max} 150 °C

3-Quadrant Triacs part numbering



- Package identifier**
- = TO220AB (SOT78)
 - B** = D²PAK (SOT404)
 - S** = DPAK (SOT428)
 - W** = SOT223
 - X** = SOT186A (isolated TO220AB)
 - Y** = SOT78D (internally insulated TO220)
 - BTA2008, BTA201 use TO92 (SOT54) package
- Gate sensitivity I_{GTmax}**
- D** = 5, 5, 5 mA
 - E** = 10, 10, 10 mA
 - F** = 25, 25, 25 mA
 - C** = 35, 35, 35 mA
 - C0** = I_{GT} 5-35 mA
 - B** = 50, 50, 50 mA
- MSD849


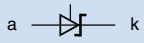

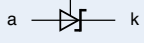
Adjustable shunt voltage regulator TL431

types in **bold** represent new products

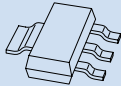
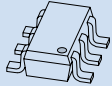


Package				SOT23	
Size (mm)				2.9 x 1.3 x 1.0	
P _{tot} (mW)				580	
Pinning configuration				Normal pinning*	Mirrored pinning*
V _{KA} (V)	I _K (mA)	V _{ref}	T _{amb} (°C)		
36	100	2%	0 to 70	TL431CDBZR ¹⁾	
			-40 to 85	TL431IDBZR ¹⁾	
			-40 to 125	TL431QDBZR ¹⁾	
				TL431FDT²⁾	TL431MFDT²⁾
			TL431SDT ³⁾	TL431MSDT ³⁾	
			1%	0 to 70	TL431ACDBZR ¹⁾
		-40 to 85		TL431AIDBZR ¹⁾	
		-40 to 125		TL431AQDBZR ¹⁾	
			TL431AFDT²⁾	TL431AMFDT²⁾	
		TL431ASDT ³⁾	TL431AMSDT ³⁾		
		0.5%	0 to 70	TL431BCDBZR ¹⁾	
			-40 to 85	TL431BIDBZR ¹⁾	
-40 to 125	TL431BQDBZR ¹⁾				
	TL431BFDT²⁾	TL431BMFDT²⁾			
TL431BSDT ³⁾	TL431BMSDT ³⁾				

¹⁾ Offers enhanced stability area and very low load capacity requirement²⁾ Offers higher ElectroMagnetic Interference (EMI) ruggedness, e.g. for Switch Mode Power Supply³⁾ Is designed for standard requirements and linear applications

* Normal pinning vs. mirrored pinning for TL431

	Pin	Symbol	Description	Simplified outline	Grafic symbol
Normal pinning	1	k	cathode		REF a  k
	2	REF	reference		
	3	a	anode		
Mirrored pinning	1	REF	reference		REF a  k
	2	k	cathode		
	3	a	anode		

Discrete voltage regulator

					SOT223 (SC-73)	SOT457 (SC-74)
Package						
Size (mm)					6.5 x 3.5 x 1.65	2.9 x 1.5 x 1.0
P _{tot} (mW)					1300	380
Zener diode		Transistor				
V _{out} (V)	V _Z min - V _Z max (V) @ I _Z = 5 mA	V _{CEO} (V)	I _C (A)	h _{FE} min @ I _C = 100 mA		
2.5	3.23 - 3.37	45	0.1	160	PVR100AZ-B2V5	PVR100AD-B2V5
3.0	3.53 - 3.67	45	0.1	160	PVR100AZ-B3V0	PVR100AD-B3V0
3.3	3.82 - 3.98	45	0.1	160	PVR100AZ-B3V3	PVR100AD-B3V3
5.0	5.49 - 5.71	45	0.1	160	PVR100AZ-B5V0	PVR100AD-B5V0
12.3	12.7 - 13.3	45	0.1	160	PVR100AZ-B12V	PVR100AD-B12V

Key features

- ▶ A bipolar transistor and an integrated Zener diode, internally connected to build a voltage regulator
- ▶ Output voltage options V_{out}: 2.5 V, 3 V, 3.3 V, 5 V and 12 V

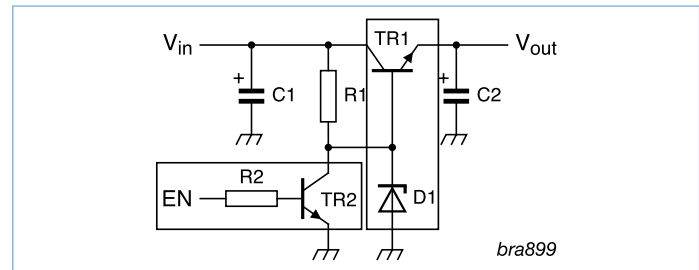
Key benefits

- ▶ Component count reduction
- ▶ Board space reduction
- ▶ Improved reliability


Key applications

- ▶ Linear voltage regulation

Discrete voltage regulator. PVR-series already include TR1 and D1, internally connected to build a voltage regulator. A resistor-equipped transistor (RET) adds an output enable function.



Constant current source

SOT353 (SC-88A)							
Package							
Size (mm)	2.0 x 1.25 x 0.95						
P _{tot} (mW)	335						
Type	PSSI2021SAY						
Description	maximum supply voltage	maximum supply current	typical stabilized output current	minimum stabilized output current	maximum stabilized output current	typical load stability of stabilized output current	typical output current change over ambient temperature
Parameter	V _S max (V)	I _S max (mA)	I _{out} typ (µA)	I _{out} min (mA)	I _{out} max (mA)	ΔI _{out} /I _{out} typ (%)	ΔI _{out} /I _{out} (ΔT _{amb}) ^{typ} (%/K)
Condition		@ V _S = 12 V; I _{out} = 15 µA; V _{out} = 1 V to 10 V	@ V _S = 12 V; V _{out} = 1 V to 10 V; R _{ext} = open			@ V _S = 12 V; V _{out} = 1 V to 10 V	@ V _S = 12 V; V _{out} = 1 V; T _{amb} = -55 °C to 150 °C
Value	75	2.2	15	0.015	50	0.5	0.15

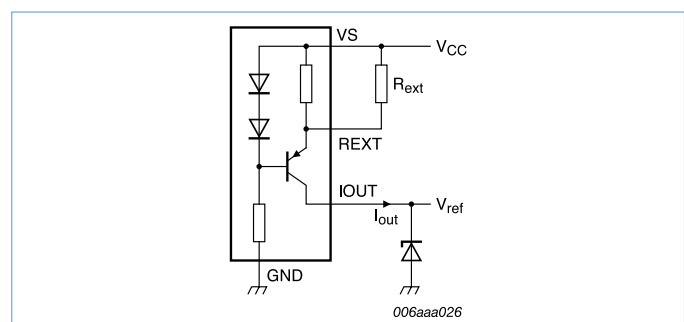
Key features and benefits

- ▶ Single-chip constant current source with reduced component count
- ▶ Output current set by an external resistor
- ▶ Very small footprint package for smaller designs

Key applications


- ▶ Constant current LED driver
- ▶ Generic constant current source
- ▶ Active bias control for audio amplifiers

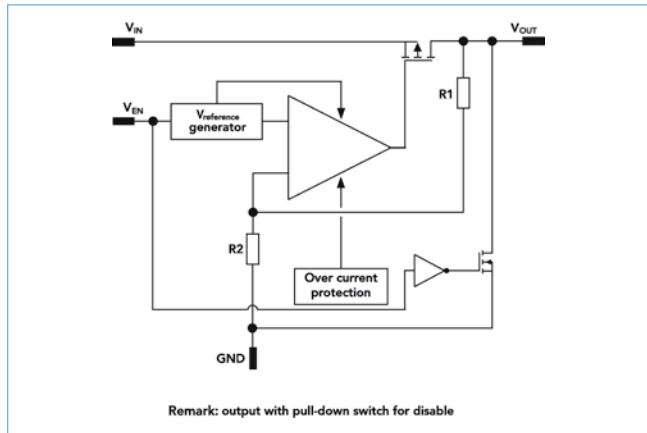
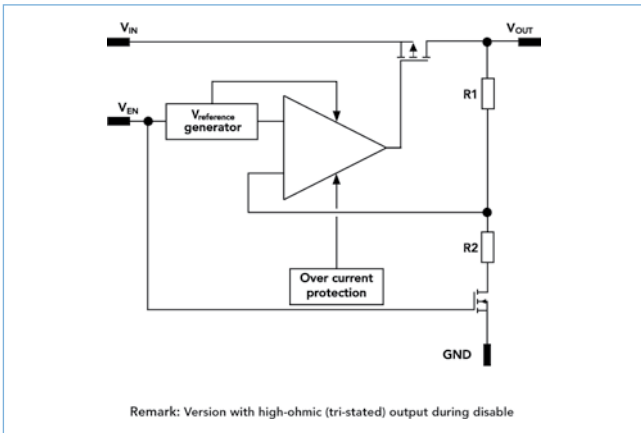
Voltage reference



LD6805 Ultra low-dropout voltage regulators – 150 mA

types in **bold** represent new products

Package							SOT1194	
								
Size (mm)							1.0 x 1.0 x 0.55	
P _{tot} @ °C							400	
V _{in} (V)	I _{out} typ (mA)	Quiescent current (µA)	V _{out} drop @ 150 mA (mV)	output noise µVrms (typ)	PSRR @ 1 kHz dB	Output voltage (V)	V _{OUT,nom}	
							LD6805K/vvH High ohmic output stage	LD6805K/vvP Pull down output stage
2.3 - 5.5	150	35	250	50	75	1.2	LD6805K/12H	LD6805K/12P
						1.4	LD6805K/14H	LD6805K/14P
						1.6	LD6805K/16H	LD6805K/16P
						1.7	LD6805K/17H	LD6805K/17P
						1.8	LD6805K/18H	LD6805K/18P
						2.2	LD6805K/22H	LD6805K/22P
						2.3	LD6805K/23H	LD6805K/23P
						2.5	LD6805K/25H	LD6805K/25P
						2.8	LD6805K/28H	LD6805K/28P
						2.9	LD6805K/29H	LD6805K/29P
						3.0	LD6805K/30H	LD6805K/30P
						3.3	LD6805K/33H	LD6805K/33P
						3.6	LD6805K/36H	LD6805K/36P



Key features

- ▶ High power supply ripple rejection (PSRR)
- ▶ Ultra low-dropout voltage and low noise
- ▶ Very small package size





























Key benefits

- ▶ No additional noise bypass capacitor needed
- ▶ Very low-dropout voltage for extended battery usage
- ▶ Lower power dissipation






















Key applications

- ▶ Mobile phone handsets, cordless telephones, personal digital devices (applications requiring component miniaturization)

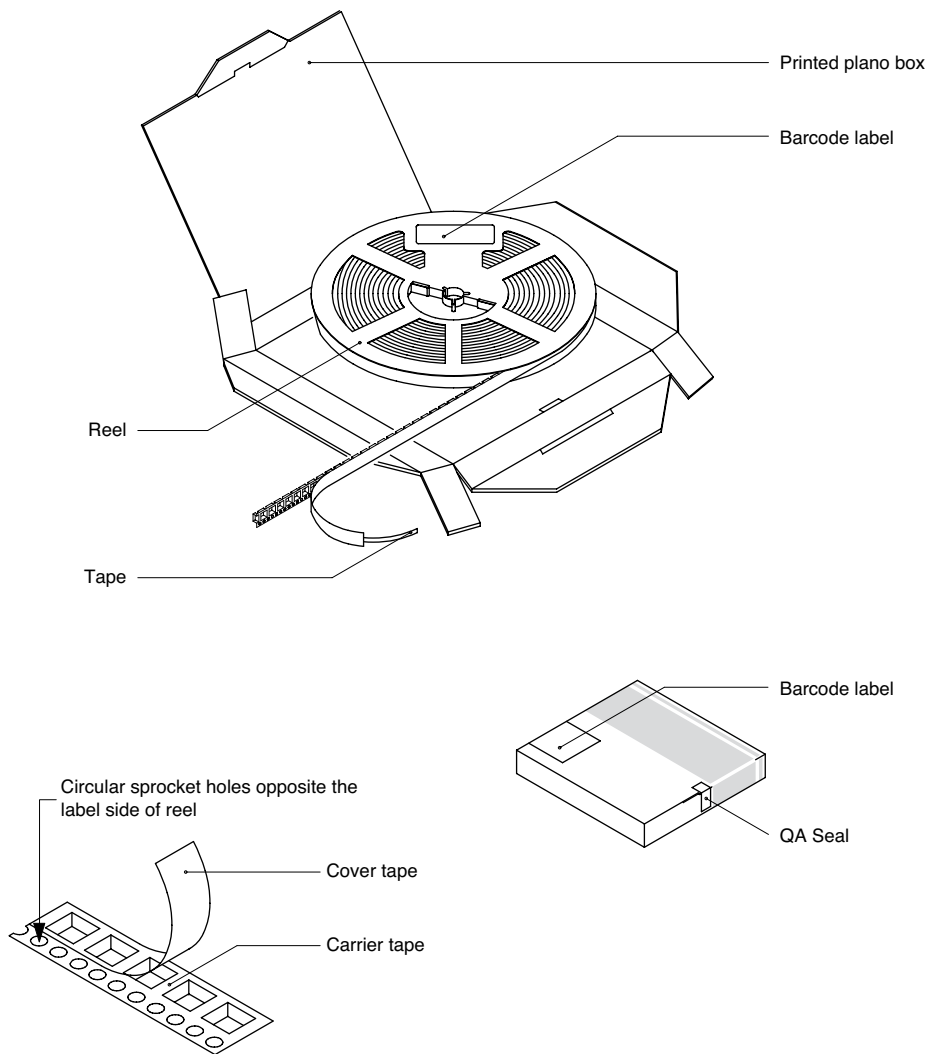
Package cross reference

Pins / leads	NXP	Industry standard names	Size (l x w x h) (mm)	P _{tot} (mW)	Package	Competitor synonyms								
						Rohm	Toshiba	ON Semi	Renesas	Infineon	Diodes Inc	KEC	Vishay	Semtech
2	SOD27	DO-35	4.25 x 1.85 x 0.56	500		GSD			DO-35		DO-35		DO-204AH	
	SOD66	DO-41	4.8 x 2.6 x 0.81	1300		GSR	DO-41				DO-41		DO-204AL	
	SOD68	DO-34	3.04 x 1.6 x 0.55	500		MSD								
	SOD80C	MiniMelf	3.5 x 1.5 x 1.5	300		LLDS			LLD		MiniMELF		MiniMELF	
	SOD123F	-	2.6 x 1.6 x 1.1	830		PMDU	S-Flat	SOD-123-FL			PowerDI123	SMF		
	SOD123W	-	2.6 x 1.7 x 1.0	900			S-Flat	SOD-123-FL			PowerDI123			
	SOD128	-	3.8 x 2.5 x 1.0	1000		PMDT	M-Flat							
	SOD323	SC-76	1.7 x 1.25 x 0.95	400			USC	SOD-323	URP	SOD323	SOD-323	USC	SOD323	
	SOD323F	SC-90	1.7 x 1.25 x 0.7	830		UMD2	US-Flat				PowerDI323			
	SOD523	SC-79	1.2 x 0.8 x 0.6	500		EMD2	ESC/TESC	SOD-523	UFP	SC79		ESC	SOD523	
	SOD882	-	1.0 x 0.6 x 0.5	250			CTS2			TSLP-2	DFN1006-2			
	SOD882D	-	1.0 x 0.6 x 0.37	250						TSLP-2-7	DFN1006H4-2			
3	SOT1061	HUSON3	2.0 x 2.0 x 0.65	1300				WDFN3			DFN2020-3		PowerPAK SC706L	
	SOT23	-	2.9 x 1.3 x 1.0	250		SSD3/SST3		SOT-23		SOT23	SOT-23	SOT-23	SOT23	
	SOT323	SC-70	2.0 x 1.25 x 0.95	200		UMD3/UMT3	USM	SC-70	CMAK/CM-PAK	SOT323	SOT-323	USM	SC-70 3 leads	
	SOT416	SC-75	1.6 x 0.8 x 0.77	150		EMD3/EMT3	SSM	SC-75	SMPAK	SC75			SC-75A	
	SOT883	SC-101	1.0 x 0.6 x 0.5	250			SS CSP2			TSLP-3-1	DFN1006-3			
	SOT89	SC-62	4.5 x 2.5 x 1.5	1300		MPT3	PW-Mini	SOT-89	UPAK (SOT89)	SOT89		SOT-89		
4	SOT143B	-	2.9 x 1.3 x 1.0	250			CP4		MPAK-4R	SOT143	SOT-143			
	SOT223	SC-73	6.5 x 3.5 x 1.65	1700				SOT-223		SOT223	SOT-223	SOT-223	SOT223	
5	SOT353	SC-88A	2.0 x 1.25 x 0.95	300		UMD5/UMT5	USV	SC-88A	CMPAK-5(T)			USV	SOT353	
	SOT665	-	1.6 x 1.2 x 0.55	300		EMD5/EMT5	ESV	SOT-553	VSON-5			TESV		
6	SOT363	SC-88	2.0 x 1.25 x 0.95	300		UMD6/UMT6	US6	SC-88	CMPAK-6	SOT363	SOT-363	US6	SOT363	
	SOT457	SC-74	2.9 x 1.5 x 1.0	750		SMD6/SMT6	SM6	SC-74	TSOP-6	SC74		TSOP6	TSOP-6	
	SOT666	-	1.6 x 1.2 x 0.55	300		EMD6/EMT6	ES6	SOT-563	SMFPAK-6	SOT666	SOT563	TES6	SC89-6lead	
	SOT1118	-	2.0 x 2.0 x 0.65	1300				6 Lead DFN			DFN2020B-6			
	SOT886	XSON6	1.45 x 1.0 x 0.5	250										SLP1510N6
	SOT891	XSON6	1.0 x 1.0 x 0.5	-				CS6						

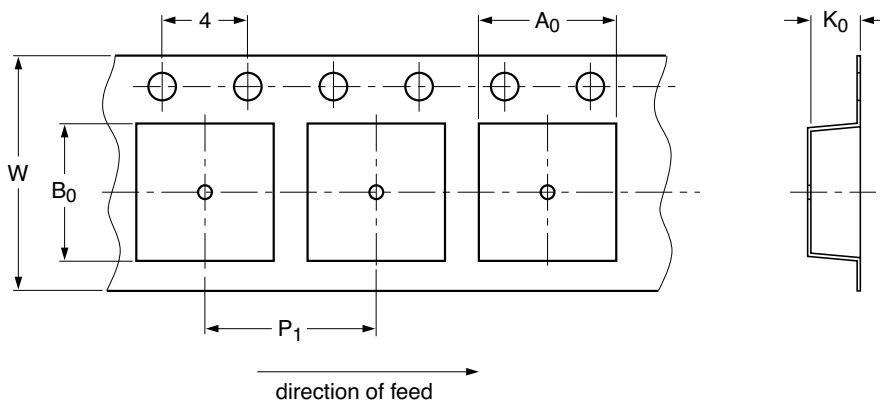
Packing methods SMD

Pins / leads	Package	Packing method and tape dimension	Reel dimension (d x w) (mm)	Taping	Package	Packing quantity and ordering code (12 NC ending)								
						800	1000	2500	3000	4000	8000	9000	10000	
2	SOD80C	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-115	-	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	330 x 8	-		-	-	-	-	-	-	-	-135	
	SOD123F	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
	SOD123W	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
	SOD128	4 mm pitch, 12 mm tape and reel	180 x 12	-		-	-	-	-115	-	-	-	-	
	SOD323	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-135	
	SOD323F	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
	SOD523	2 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-	-	-315	-	-
		4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-	-135
	SOD882	2 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-	-	-	-315	
	SOD882D	2 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-	-	-	-315	
	SOD962	2 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-	-	-	-315	-
3	SOT23	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-215	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-235	
	SOT89	8 mm pitch, 12 mm tape and reel	180 x 12	T1		-	-115	-	-	-	-	-	-	
		8 mm pitch, 12 mm tape and reel	330 x 12	T1		-	-	-	-	-135	-	-	-	
		8 mm pitch, 12 mm tape and reel	180 x 12	T3		-	-146	-	-	-	-	-	-	
		8 mm pitch, 12 mm tape and reel	180 x 12	T4		-	-147	-	-	-	-	-	-	
	SOT323	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-135	
	SOT404	16 mm pitch, 24 mm tape and reel	330 x 24	-		-118	-	-	-	-	-	-	-	
	SOT416	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-135	
	SOT428	8 mm pitch, 16 mm tape and reel	330 x 16	-		-	-	-118	-	-	-	-	-	
	SOT663	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-115	-	-	-	
	SOT883	2 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-	-	-	-	-315	
SOT1061	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-115	-	-	-	-		
4	SOT143B	4 mm pitch, 8 mm tape and reel	180 x 8	-		-	-	-	-215	-	-	-	-	
		4 mm pitch, 8 mm tape and reel	286 x 8	-		-	-	-	-	-	-	-	-235	
	SOT223	8 mm pitch, 12 mm tape and reel	180 x 12	-		-	-115	-	-	-	-	-	-	
		8 mm pitch, 12 mm tape and reel	330 x 12	-		-	-	-	-	-135	-	-	-	

Tape and reel pack for SMD packages



Carrier tape - tape and reel

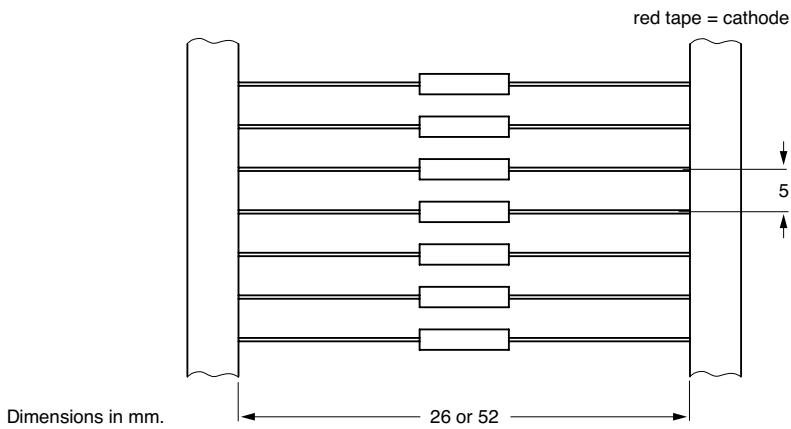
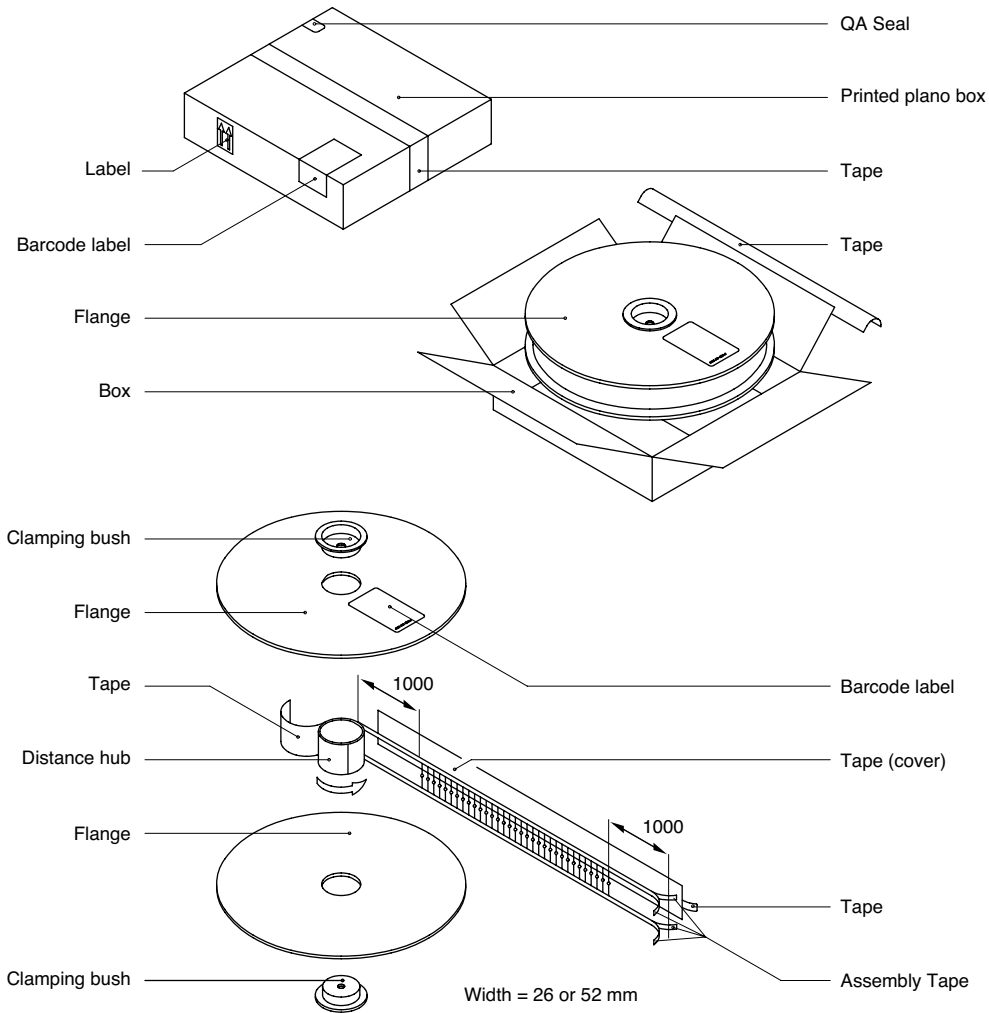


P_1 = pitch (see table packing methods)

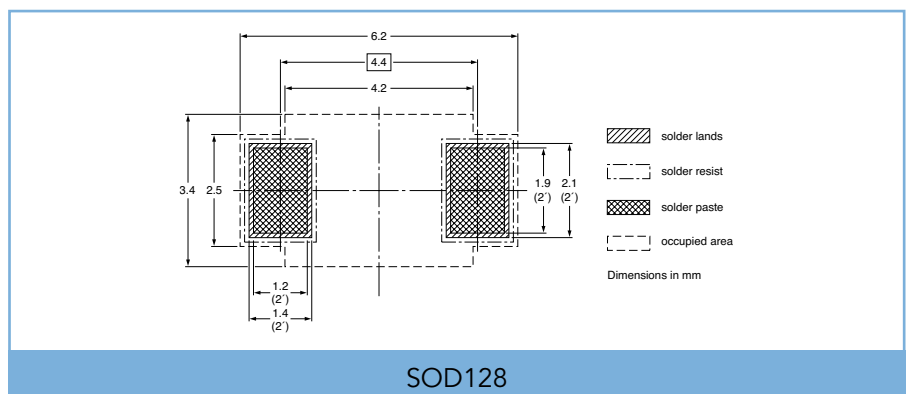
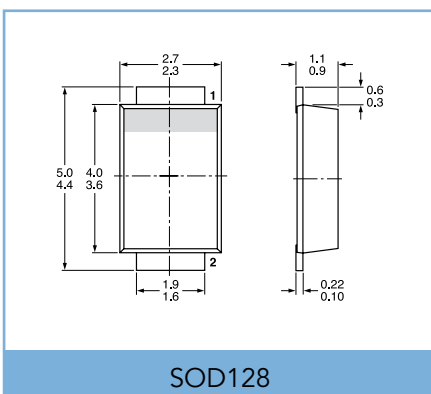
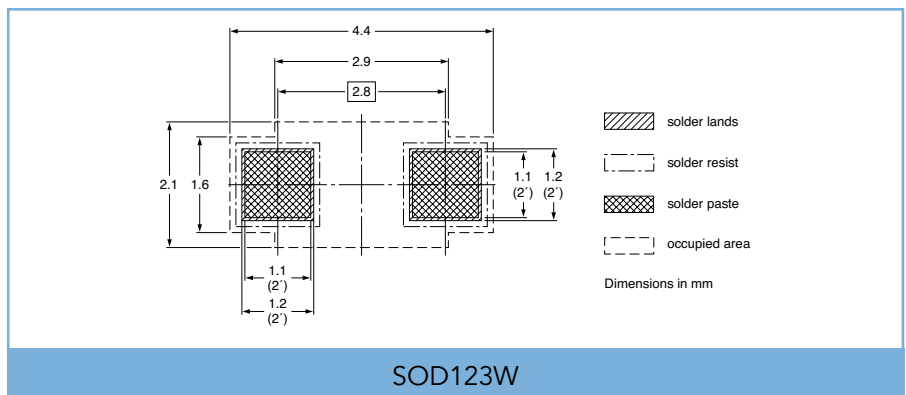
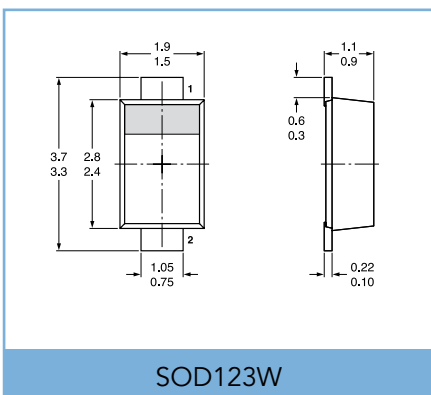
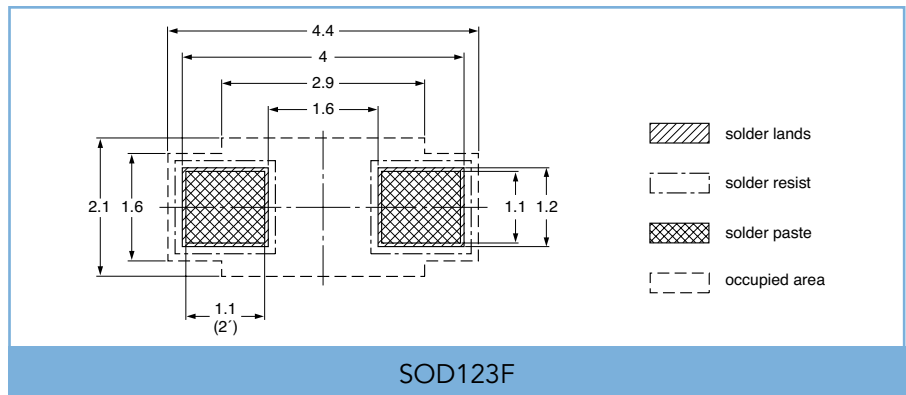
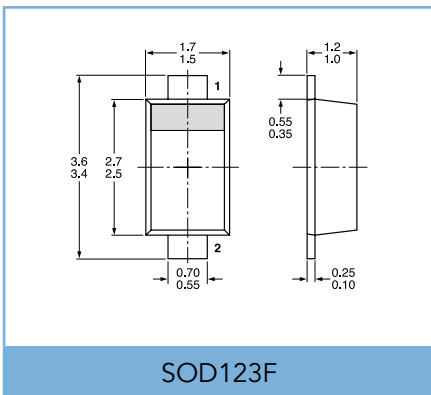
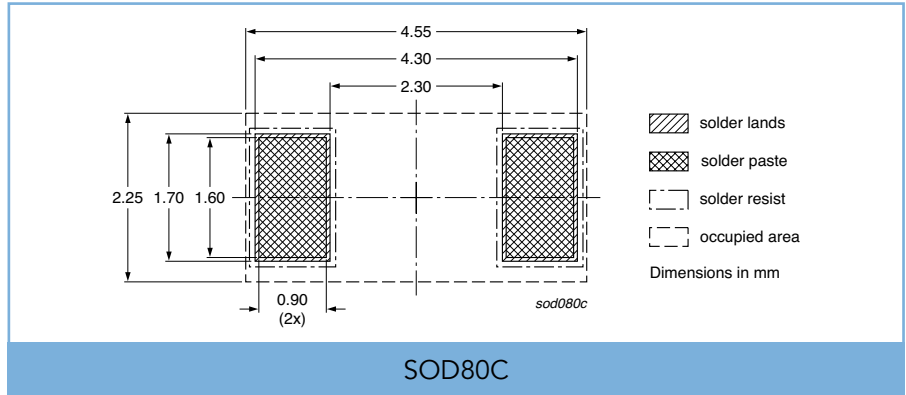
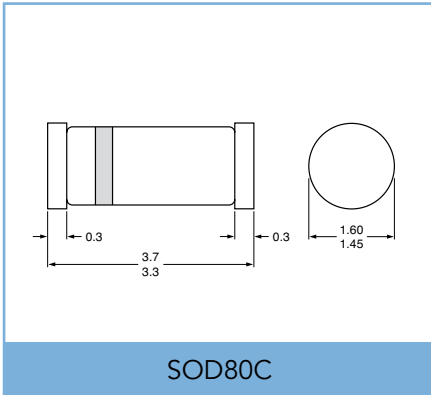
W = tape width (see table packing methods)

Compartment width (A_0), length (B_0) and depth (K_0) depending on package

Reel pack axial tape for glass diodes

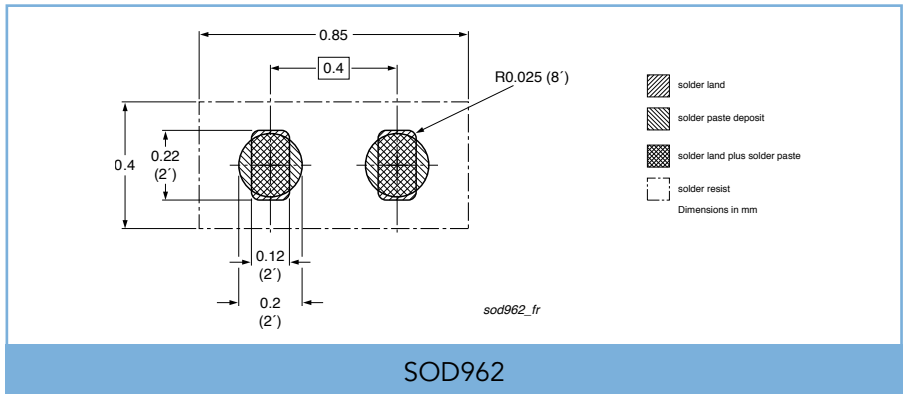
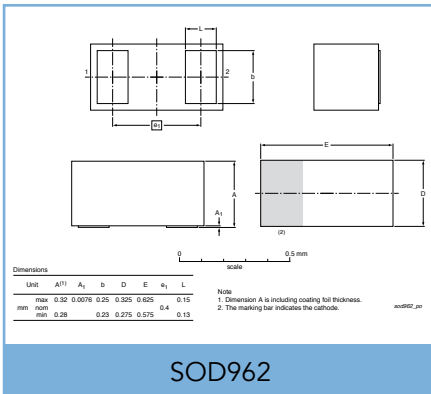
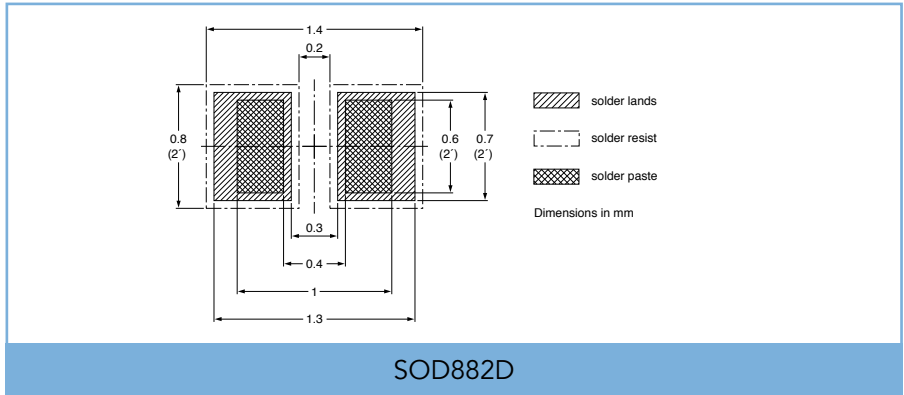
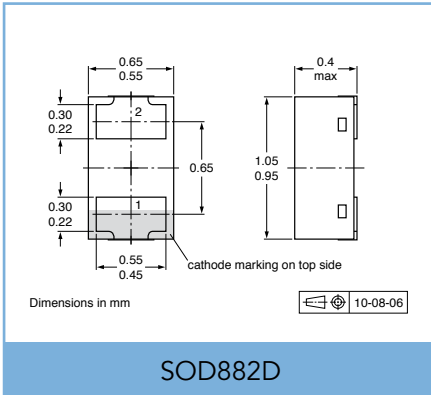


2-Pin SMD Packages

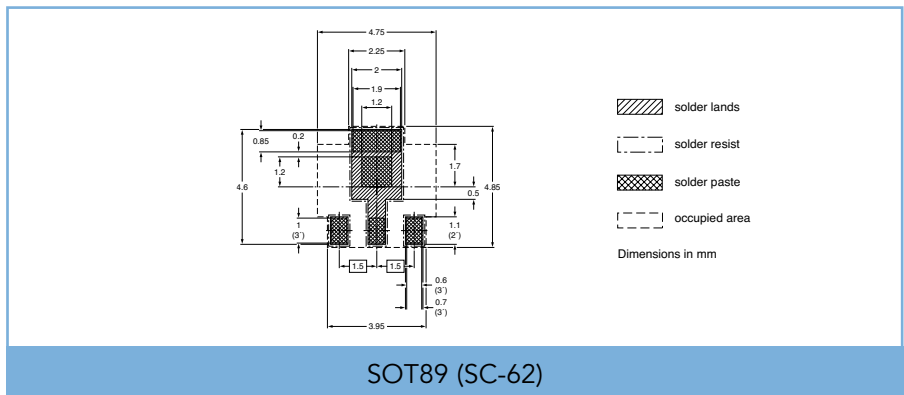
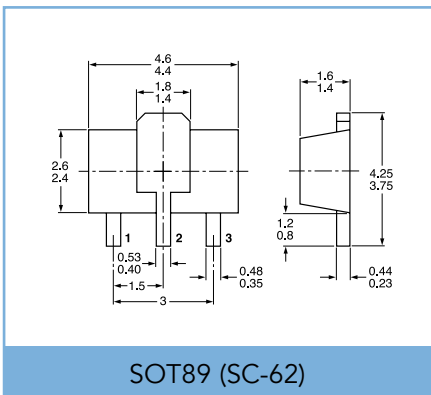
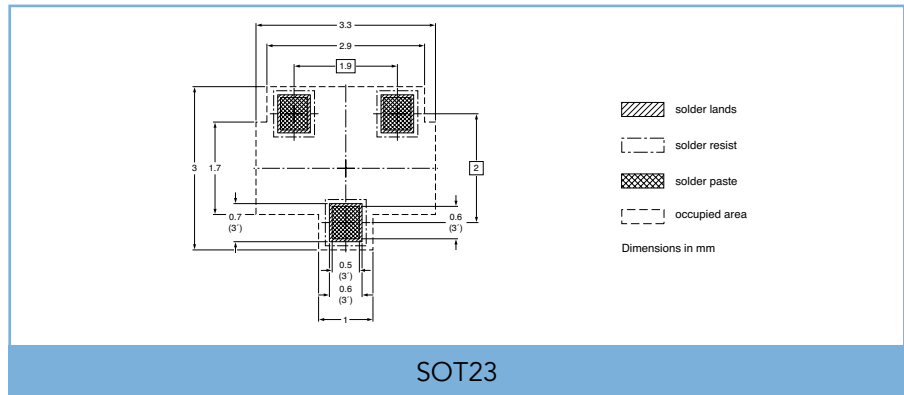
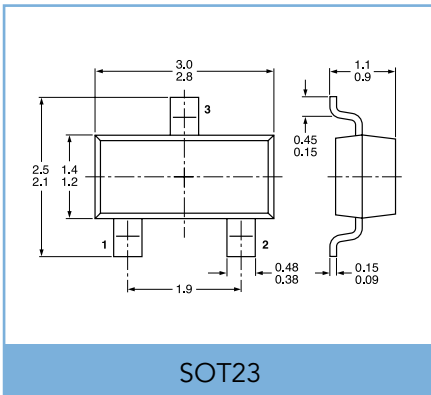


Dimensions in mm

Minimized outline drawings and reflow soldering footprint

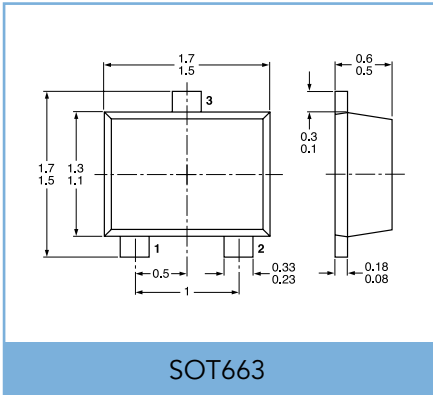


3-Pin SMD Packages

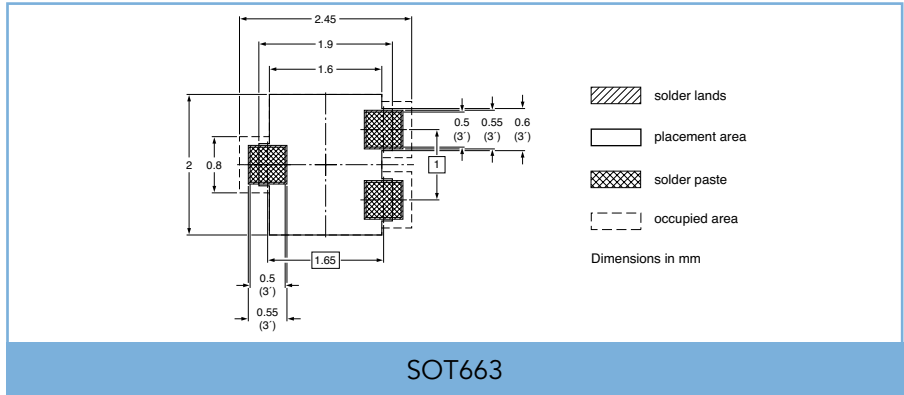


Dimensions in mm

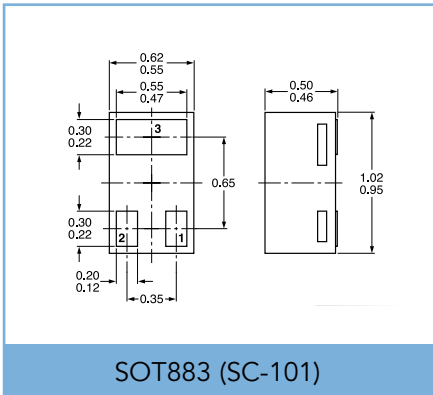
Minimized outline drawings and reflow soldering footprint



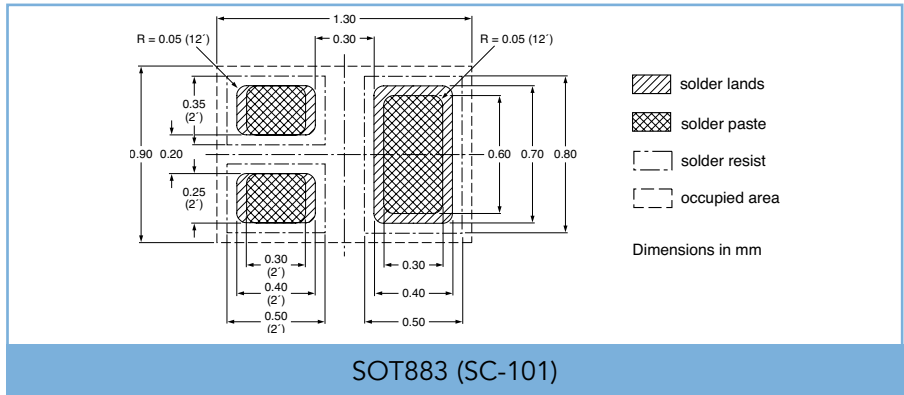
SOT663



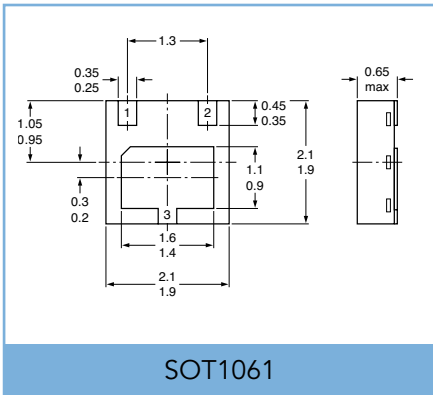
SOT663



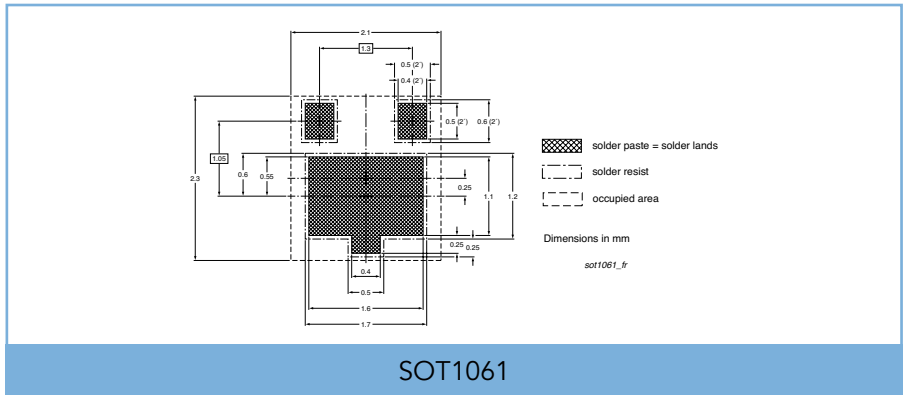
SOT883 (SC-101)



SOT883 (SC-101)

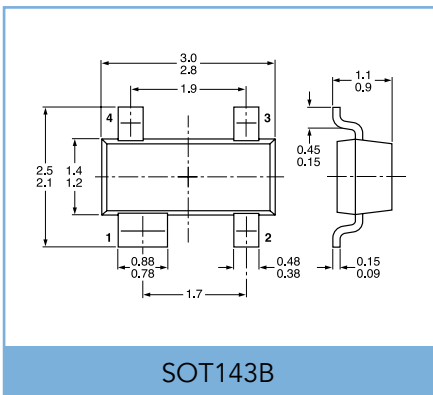


SOT1061

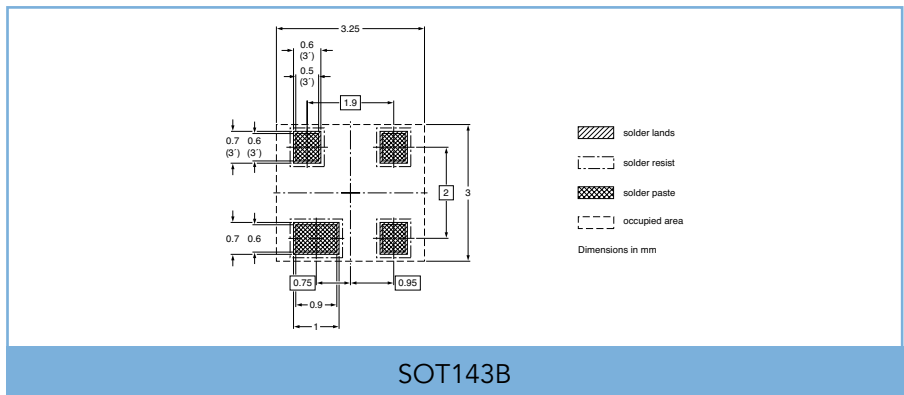


SOT1061

4-/5-Pin SMD Packages



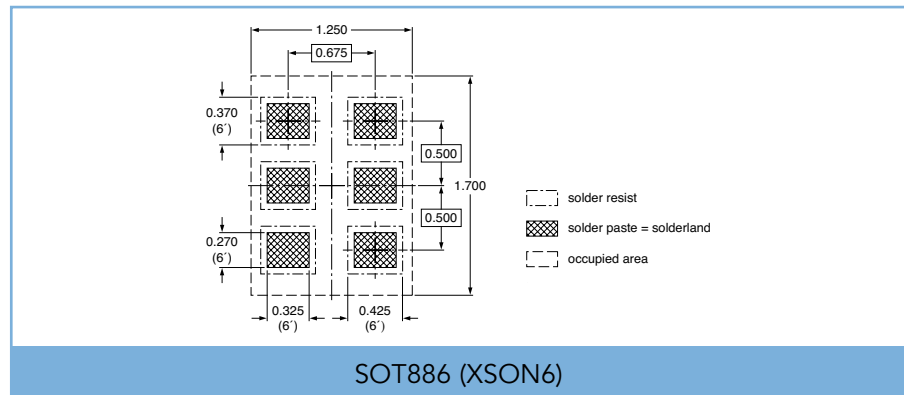
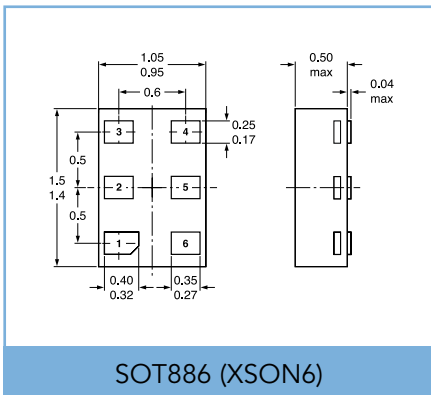
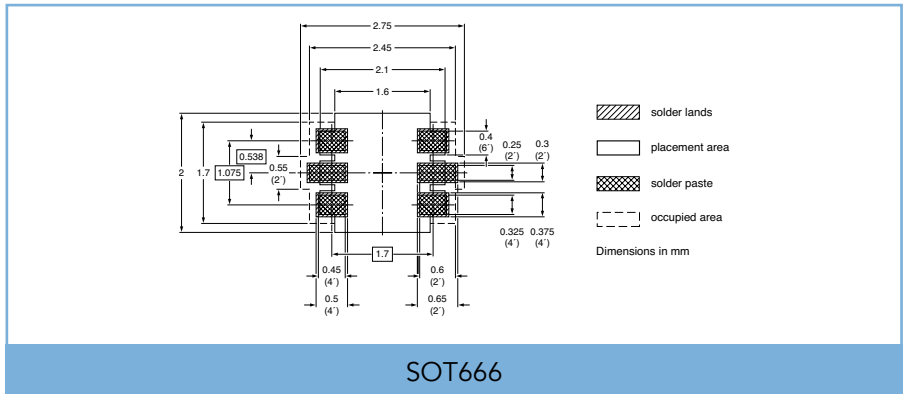
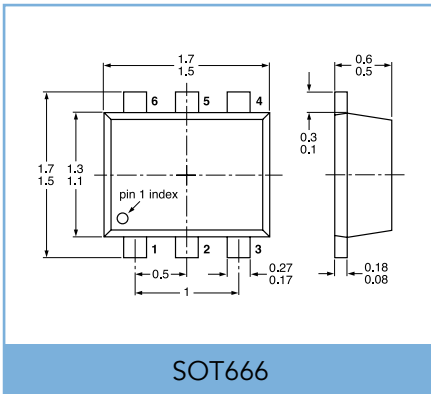
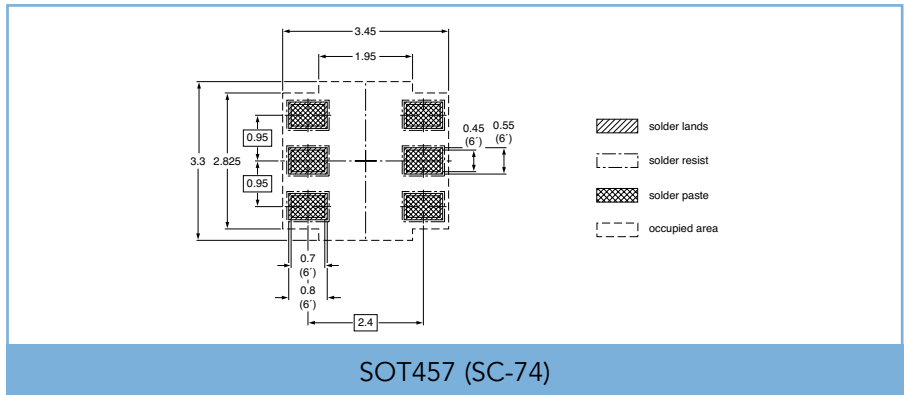
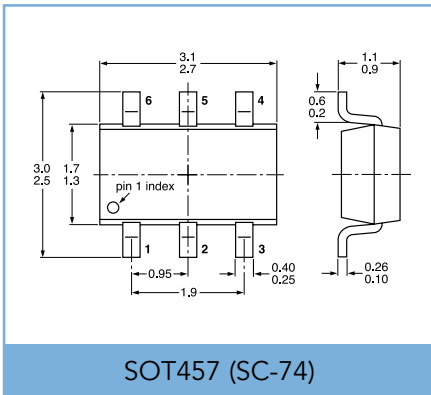
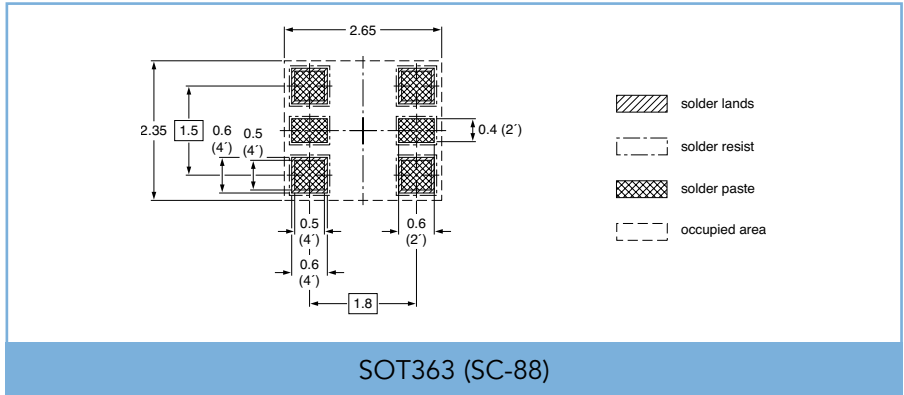
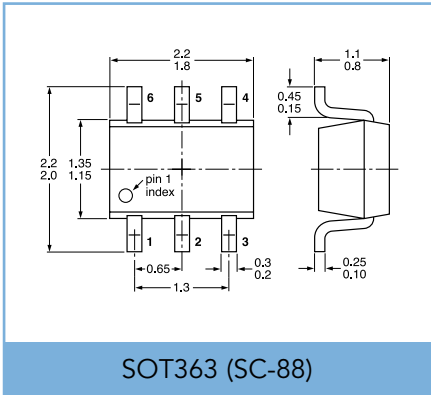
SOT143B



SOT143B

Dimensions in mm

6-Pin SMD Packages



Dimensions in mm

DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾ max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note
1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

SOT54

DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b	b ₁ ⁽²⁾	b ₂ ⁽²⁾	c	D	D ₁	E	e	L	L ₁ ⁽¹⁾	L ₂ ⁽¹⁾ max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.6 1.0	1.3 1.0	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

Notes
1. Lead shoulder designs may vary.
2. Dimension includes excess dambar.

SOT78

DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b	b ₁	b ₂	c	D	D ₁ ref.	E	e	L	L ₁ ref.	p	Q	q	w
mm	4.7 4.3	1.40 1.25	0.9 0.6	1.4 1.1	1.72 1.32	0.6 0.4	16.0 15.2	6.5	10.3 9.7	2.54	14.0 12.8	3.0	3.7 3.5	2.6 2.2	3.0 2.7	0.2

SOT78D

DIMENSIONS (mm are the original dimensions)

UNIT	A	b	c	D	E	e	e ₁	L	L ₁ ⁽¹⁾ max.	P	Q	q	w
mm	2.8 2.3	0.88 0.65	0.58 0.47	11.1 10.5	7.8 7.2	2.29	4.58	16.5 15.3	2.54	3.1 2.5	1.5 0.9	3.9 3.5	0.254

Note
1. Terminal dimensions within this zone are uncontrolled to allow for body and terminal irregularities.

SOT82

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