General Applications Selection Guide 2009

Diodes, transistors and integrated discretes
Excellence in portfolio and performance

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founded by
PHILIPS

NXP founded by Philips

Dark Green – NXP's transfer to halogen-free products

Why Dark Green?

We as NXP are deeply committed to developing eco-friendly products and integrating environmental safety aspects in all manufacturing processes. For our packaging technology this meant a shift to lead-free and halogen-free "Dark Green", years ahead of upcoming legislation. 2008 we have taken concerted action to transfer all remaining packages to "Dark Green".

What is Dark Green?

- Dark Green products are **fully RoHS compliant** with the European Union directive 2002/95/EC.
- Dark Green products **ban the use of halogens and antimony** in the material, which is used as flame retardant in the mold compound.
- Dark Green products conform to following requirements:

Substances	Limit
a) Antimony oxides (Sb_2O_3, Sb_2O_5)	< 900 ppm
b) Brominated flame retardents	< 900 ppm
Total amount of a) and b)	< 1500 ppm

Which packages are Dark Green now?

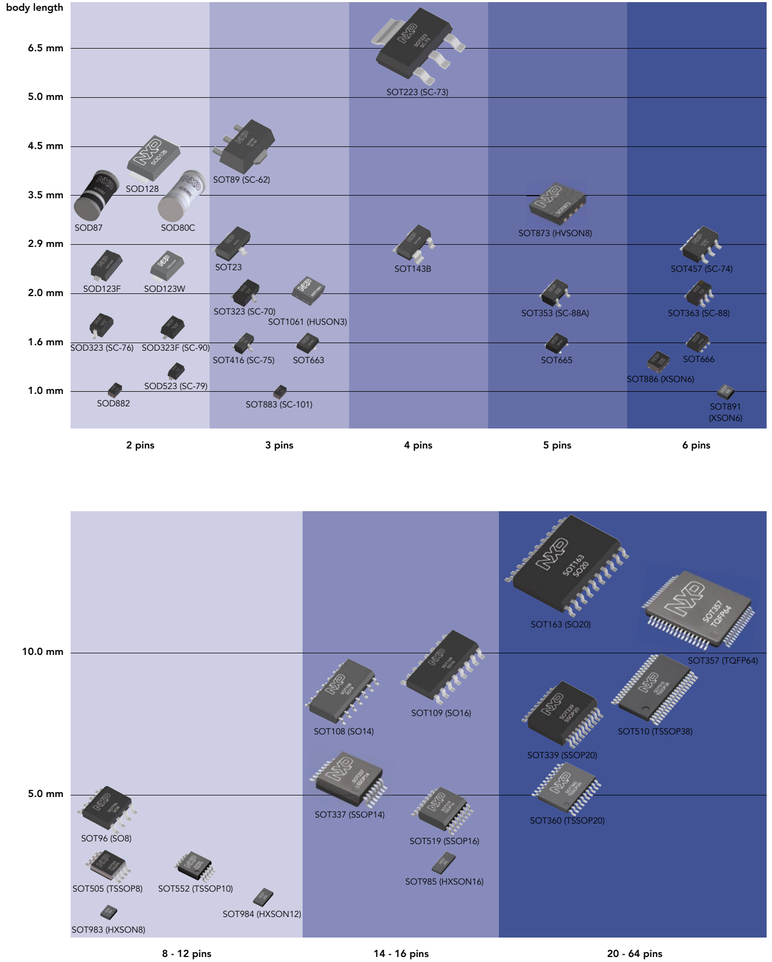
All NXP small-signal discrete SMD plastic packages on the market and in development are Dark Green.
Exception is SOT89 that will be transferred to Dark Green as last plastic package of NXP GA.

What does Dark Green mean for you?

You receive a product that has been produced according to strict environmental protection targets and does not contain hazardous substances. At the same time, there will be **no changes on any product parameter** and the products will be qualified to tight **automotive standard AEC-Q101.**

Please see reverse side for package overview

General application products – packages



General application products – support tools

To help you achieve the best, most efficient design-ins with our products, we offer a wide variety of support tools. Available for both internal and external customers, all the tools can be found on the NXP Semiconductors website, or via the marketing group.

Application notes
Comprehensive application information:
http://www.nxp.com/all_appnotes

Datasheets
Details on all released products and product families, available for download as pdf files:
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Selection Guide – offline version
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Spice models
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http://www.nxp.com/models/

X-reference tool
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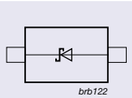
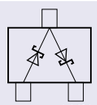
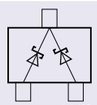
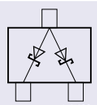
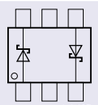
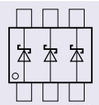
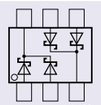
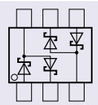
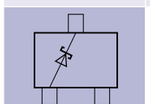
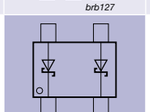
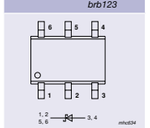
http://www.nxp.com/search/advanced

For further design-in support (e. g. demo boards) please contact your local sales office.

Schottky barrier diodes

General purpose Schottky diodes ≤ 200 mA

I_F max (mA)	V_R max (V)	V_F max (mV)	@ I_F (mA)	I_R max (µA)	@ V_R (V)	Package	SOD80C (MiniMelf)	SOD68 (DO-34)	SOT23		SOT143B	SOD123F	SOT323 (SC-70)	SOT363 (SC-88)	SOD323F (SC-90)	SOD323 (SC-76)	SOT666	SOT416 (SC-75)	SOD523 (SC-79)	SOD882/ SOT883 (SC-101)
						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	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.7 x 1.25 x 0.95	1.6 x 1.2 x 0.55	1.6 x 0.8 x 0.77	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
						P_{tot} (mW)	300	500	250		250	830	250	300	550	400	300	150	500	250
70	70	750	10	0.1	50	single			BAS70			BAS70H	BAS70W			1PS76SB70			1PS79SB70	BAS70L
						dual series			BAS70-04				BAS70-04W							
						dual c.c.			BAS70-05				BAS70-05W							
						dual c.a.			BAS70-06				BAS70-06W							
						dual isolated					BAS70-07			BAS70-07S			BAS70-07V			
						triple isolated											BAS70VV			
						quad 2x series								BAS70XY						
120	40	370	1	0.5	30	single										RB751V40			RB751S40	RB751CS40
		500	10	1	30	single			BAS40			BAS40H	BAS40W			1PS76SB40			1PS79SB40	BAS40L
						dual series			BAS40-04				BAS40-04W							
						dual c.c.			BAS40-05				BAS40-05W					1PS75SB45		
						dual c.a.			BAS40-06				BAS40-06W							
						dual isolated					BAS40-07						BAS40-07V			
						quad c.c./c.c.								1PS88SB48			BAS40-05V			
						quad 2x series								BAS40XY						
200	30	340	10	2	25	single			BAT754											
						dual series			BAT754S											
						dual c.c.			BAT754C											
						dual c.a.			BAT754A											
						triple isolated								BAT754L						
		400	10	2	25	single	BAS85	BAT85	BAT54			BAT54H	BAT54W		BAT54J	1PS76SB10			1PS79SB10	BAT54L
						dual series			BAT54S				BAT54SW							
						dual c.c.			BAT54C				BAT54CW							BAT54CM
						dual c.a.			BAT54A				BAT54AW							
						dual isolated					BAT74			BAT74S			BAT74V			
						triple isolated											BAT54VV			
						quad c.c./c.c.											BAT54CV			
						quad 2x series								BAT54XY						
		300	10	30	10	single													1PS79SB31	PMEG3002AEL
200	40	300	10	15	30	single			BAT721							1PS76SB21				
						dual series			BAT721S											
						dual c.c.			BAT721C											
						dual c.a.			BAT721A											
		360	10	0.5	25	single													1PS79SB30	PMEG4002EL
		420	30	0.5	25	single							BAT854W							
						dual series							BAT854SW							
						dual c.c.							BAT854CW							
						dual c.a.							BAT854AW							
200	50	450	10	5	40	single	BAS86	BAT86												

single	dual series	dual c.c.	dual c.a.	dual isolated	triple isolated	quad c.c./c.c.	quad 2x series
 brb122	 brb124	 brb125	 brb126	 brb127	 brb129	 brb130	 brb131
 brb123				 brb128			
							

Schottky barrier diodes

Medium power Schottky diodes single ≥ 200 mA

types in **bold blue** 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	Package	SOD128	SOD87 (Melf)	SOT457 (SC-74)	SOT23	SOD123W	SOD123F	SOT1061	SOT323 (SC-70)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
				Size (mm)	3.8 x 2.5 x 1.0	3.5 x 2.05 x 2.05	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	2 x 2 x 0.65	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
				P_{tot} (mW) @ 1 cm²	1050	1000	540	420	950	830	1000	250	570	830	570	450	250
				Optimization													
0.2	30	480	0.04	low V_F										**PMEG3002EJ**		PMEG3002AEB	PMEG3002AEL
	40	600	0.04	low I_R										**PMEG4002EJ**		PMEG4002EB	PMEG4002EL
	60	600	0.1	low V_F										**PMEG6002EJ**		PMEG6002EB	
0.5	20	390	0.2	low V_F				PMEG2005ET		PMEG2005EH			PMEG2005AEA	PMEG2005EJ	PMEG2005AEV		
		440	1.5	low V_F													PMEG2005AEL
		480	0.03	low I_R												PMEG2005EB	
		500	0.03	low I_R													PMEG2005EL
	30	430	0.15	low V_F				PMEG3005ET		PMEG3005EH			PMEG3005AEA	PMEG3005EJ	PMEG3005AEV		
		500	0.5	low V_F												PMEG3005EB	PMEG3005EL
	40	470	0.1	low V_F				PMEG4005ET		PMEG4005EH			PMEG4005AEA	PMEG4005EJ	PMEG4005AEV		
		550	0.1	low V_F				BAT720				1PS70SB20					
1.0	20	340	1	low V_F					**PMEG2010ER**								
		375	1.9	low V_F							**PMEG2010EPA**						
		430	0.2	low V_F				PMEG2010AET		PMEG2010AEH							
		450	0.05	low I_R					**PMEG2010BER**								
			1.0	low V_F		PRLL5817											
		500	0.2	low V_F				PMEG2010ET		PMEG2010EH			PMEG2010BEA	PMEG2010EJ	PMEG2010BEV		
		550	0.05	low I_R									PMEG2010EA BAT760	PMEG2010AEJ	PMEG2010EV BAT960		
		620	1.5	low V_F												PMEG2010AEB	
	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				PMEG3010CEJ			
		550	1	low V_F		PRLL5818											
		560	0.15	low V_F				PMEG3010ET		PMEG3010EH			PMEG3010BEA	PMEG3010EJ	PMEG3010BEV		
		680	0.5	low V_F												PMEG3010EB	
	40	490	0.05	low V_F	**PMEG4010EP**				**PMEG4010ER**								
		600	1.0	low V_F		PRLL5819											
		640	0.1	low V_F				PMEG4010ET		PMEG4010EH			PMEG4010BEA	PMEG4010EJ	PMEG4010BEV		
		570	0.05	low I_R						PMEG4010CEH				PMEG4010CEJ			
	60	530	0.05	low V_F	**PMEG6010EP**				**PMEG6010ER**								
		650	0.35	low V_F			PMEG6010AED										
		660	0.05	low I_R						PMEG6010CEH				PMEG6010CEJ			
1.5	20	660	0.2	low I_R						PMEG2015EH			PMEG2015EA	PMEG2015EJ	PMEG2015EV		
	30	550	1.0	low V_F						PMEG3015EH				PMEG3015EJ	PMEG3015EV		
2.0	10	460	3.0	low V_F						PMEG1020EH			PMEG1020EA	PMEG1020EJ	PMEG1020EV		
	20	525	0.2	low V_F						PMEG2020EH			PMEG2020AEA	PMEG2020EJ			
	30	370	7.0	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							**PMEG3020EPA**						
		520	0.05	low I_R	**PMEG3020DEP**				**PMEG3020BER**								
		620	1.0	low V_F						PMEG3020EH				PMEG3020EJ			
	40	490	0.1	low V_F	**PMEG4020EP**				**PMEG4020ER**								
		535	0.1	low V_F							**PMEG4020EPA**						
	60	530	0.2	low V_F	**PMEG6020EP**				**PMEG6020ER**								
		575	0.25	low V_F							**PMEG6020EPA**						
3.0	10	530	3.0	low V_F						PMEG1030EH				PMEG1030EJ			
	30	370	10.5	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	0.3	low V_F	**PMEG6030EP**												
5.0	30	370	17	low V_F	**PMEG3050EP**												
		450	0.5	low I_R	**PMEG3050BEP**												
	40	490	0.3	low V_F	**PMEG4050EP**												

Medium power Schottky diodes dual ≥ 200 mA

types in **bold blue** 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	SOT666
					Size (mm)	6.5 x 3.5 x 1.65	2.9 x 1.3 x 1.0	1.6 x 1.2 x 0.55
					P_{tot} (mW)	1500	250	300
0.2	30	480	0.05	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		
	60	650	0.35	low V_F	dual series	BAT160S		
				low V_F	dual c.c.	BAT160C		
				low V_F	dual c.a.	BAT160A		

Low capacitance Schottky diodes

I_F max (mA)	V_R max (V)	V_F max (mV) @ I_F (mA)	C_d max (pF) @ V_R = 0 V	Package	SOT23	SOT323 (SC-70)	SOT363 (SC-88)	SOD323 (SC-76)	SOT666	SOD523 (SC-79)	SOD882
				Size (mm)	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
				P_{tot} (mW)	250	250	300	400	300	500	250
30	4	450	1	1	single	BAT17			1PS76SB17		1PS79SB17	
					triple isolated					1PS66SB17		
					dual series	PMBD353 PMBD354 [1]						
30	15	340	1	1	single		1PS70SB82					1PS10SB82
					triple isolated			1PS88SB82		1PS66SB82		
					dual series		1PS70SB84					
					dual c.c.		1PS70SB85					
					dual c.a.		1PS70SB86					

[1] diodes have matched capacitance

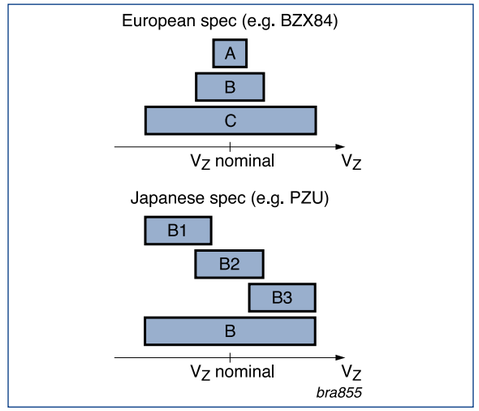
General purpose Zener diodes

types in **bold blue** 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	SOD66 (DO-41)	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**	SOD27 (DO-35)	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	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1500
250	40	2.4~75	C	Eur	single	BZV49 series	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1000
250	40	2.4~75	B, C	Eur	single	BZV55 series	SOD80C (MiniMelf)	3.5 x 1.5 x 1.5	300
200	40	2.4~75	B, C	Eur	dual c.a.	**BZB84 series**	SOT23	2.9 x 1.3 x 1.0	250
			A, B, C		single	BZX84 series			
250	30	5~6.8	0.2 V	Ave		PLVA600A series			
			0.2 V	Ave	dual c.a.	PLVA2600A series			
250	40	2.4~75	C	Eur	single	BZT52H series	SOD123F	2.6 x 1.6 x 1.1	830
200	40	2.7~24	B2	Jap	dual isolated	**PZUxDB2 series**	SOT353 (SC-88A)	2.0 x 1.25 x 0.95	300
200	40	2.4~15	C	Eur	dual c.a.	BZB784 series	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350
200	30	100	C	Eur	back-to-back	**BZB100A**	SOD323 (SC-76)	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			
		2.4~36	B, B1, B2, B3	Jap		**PZUxBA series**			
200	60	100	C	Eur	single	BZX100A	SOD323F (SC-90)	1.7 x 1.25 x 0.7	550
250	40	2.4~36	B, B1, B2, B3	Jap		PZUxB series			
		2.4~75	B, C	Eur		BZX84J series			
200	40	2.4~15	C	Eur	dual c.a.	BZB984 series	SOT663	1.6 x 1.2 x 0.55	350
200	40	2.4~75	B, C	Eur	single	BZX585 series	SOD523 (SC-79)	1.2 x 0.8 x 0.6	300
200	40	2.4~75	B, C	Eur	single	BZX884 series	SOD882	1.0 x 0.6 x 0.5	250
		2.4~36	B, B2	Jap		**PZUxBL series**			

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

Differences in Zener specification



PZU-series in SOD323F, Japanese spec

y =	B-series	B1-series	B2-series	B3-series
	± 5 %	± 2 %	± 2 %	± 2 %
	V_z (V)	V_z (V)	V_z (V)	V_z (V)
PZU2.4y	2.3 - 2.6	-	-	-
PZU2.7y	2.5 - 2.9	2.5 - 2.75	2.65 - 2.9	-
PZU3.0y	2.8 - 3.2	2.8 - 3.05	2.95 - 3.2	-
PZU3.3y	3.1 - 3.5	3.1 - 3.35	3.25 - 3.5	-
PZU3.6y	3.4 - 3.8	3.4 - 3.65	3.55 - 3.8	-
PZU3.9y	3.7 - 4.1	3.7 - 3.97	3.87 - 4.1	-
PZU4.3y	4.01 - 4.48	4.01 - 4.21	4.15 - 4.34	4.28 - 4.48
PZU4.7y	4.42 - 4.9	4.42 - 4.61	4.55 - 4.75	4.69 - 4.9
PZU5.1y	4.84 - 5.37	4.84 - 5.04	4.98 - 5.2	5.14 - 5.37
PZU5.6y	5.31 - 5.92	5.31 - 5.55	5.49 - 5.73	5.67 - 5.92
PZU6.2y	5.86 - 6.53	5.86 - 6.12	6.06 - 6.33	6.26 - 6.53
PZU6.8y	6.47 - 7.14	6.47 - 6.73	6.65 - 6.93	6.86 - 7.14
PZU7.5y	7.06 - 7.84	7.06 - 7.36	7.28 - 7.6	7.52 - 7.84
PZU8.2y	7.76 - 8.64	7.76 - 8.1	8.02 - 8.36	8.28 - 8.64
PZU9.1y	8.56 - 9.55	8.56 - 8.93	8.85 - 9.23	9.15 - 9.55
PZU10y	9.45 - 10.55	9.45 - 9.87	9.77 - 10.21	10.11 - 10.55
PZU11y	10.44 - 11.56	10.44 - 10.88	10.76 - 11.22	11.1 - 11.56
PZU12y	11.42 - 12.6	11.42 - 11.9	11.74 - 12.24	12.08 - 12.6
PZU13y	12.47 - 13.96	12.47 - 13.03	12.91 - 13.49	13.37 - 13.96
PZU14y	-	-	13.7 - 14.3	-
PZU15y	13.84 - 15.52	13.84 - 14.46	14.34 - 14.98	14.85 - 15.52
PZU16y	15.37 - 17.09	15.37 - 16.01	15.85 - 16.51	16.35 - 17.09
PZU18y	16.94 - 19.03	16.94 - 17.7	17.56 - 18.35	18.21 - 19.03
PZU20y	18.86 - 21.08	18.86 - 19.7	19.52 - 20.39	20.21 - 21.08
PZU22y	20.88 - 23.17	20.88 - 21.77	21.54 - 22.47	22.23 - 23.17
PZU24y	22.93 - 25.57	22.93 - 23.96	23.72 - 24.78	24.54 - 25.57
PZU27y	25.1 - 28.9	-	-	-
PZU30y	28 - 32	-	-	-
PZU33y	31 - 35	-	-	-
PZU36y	34 - 38	-	-	-

BZX-series, European spec

y =	C-series	B-series	A-series
	± 5 %	± 2 %	± 1 %
	V_z (V)	V_z (V)	V_z (V)
BZX84-y2V4	2.2 - 2.6	2.35 - 2.45	2.37 - 2.43
BZX84-y2V7	2.5 - 2.9	2.65 - 2.75	2.67 - 2.73
BZX84-y3V0	2.8 - 3.2	2.94 - 3.06	2.97 - 3.03
BZX84-y3V3	3.1 - 3.5	3.23 - 3.37	3.26 - 3.34
BZX84-y3V6	3.4 - 3.8	3.53 - 3.67	3.56 - 3.64
BZX84-y3V9	3.7 - 4.1	3.82 - 3.98	3.86 - 3.94
BZX84-y4V3	4 - 4.6	4.21 - 4.39	4.25 - 4.35
BZX84-y4V7	4.4 - 5	4.61 - 4.79	4.65 - 4.75
BZX84-y5V1	4.8 - 5.4	5 - 5.2	5.04 - 5.16
BZX84-y5V6	5.2 - 6	5.49 - 5.71	5.54 - 5.66
BZX84-y6V2	5.8 - 6.6	6.08 - 6.32	6.13 - 6.27
BZX84-y6V8	6.4 - 7.2	6.66 - 6.94	6.73 - 6.87
BZX84-y7V5	7 - 7.9	7.35 - 7.65	7.42 - 7.58
BZX84-y8V2	7.7 - 8.7	8.04 - 8.36	8.11 - 8.29
BZX84-y9V1	8.5 - 9.6	8.92 - 9.28	9 - 9.2
BZX84-y10	9.4 - 10.6	9.8 - 10.2	9.9 - 10.1
BZX84-y11	10.4 - 11.6	10.8 - 11.2	10.8 - 11.11
BZX84-y12	11.4 - 12.7	11.8 - 12.2	11.88 - 12.12
BZX84-y13	12.4 - 14.1	12.7 - 13.3	12.87 - 13.13
BZX84-y15	13.8 - 15.6	14.7 - 15.3	14.85 - 15.15
BZX84-y16	15.3 - 17.1	15.7 - 16.3	-
BZX84-y18	16.8 - 19.1	17.6 - 18.4	-
BZX84-y20	18.8 - 21.2	19.6 - 20.4	19.8 - 20.2
BZX84-y22	20.8 - 23.3	21.6 - 22.4	-
BZX84-y24	22.8 - 25.6	23.5 - 24.5	-
BZX84-y27	25.1 - 28.9	26.5 - 27.5	26.73 - 27.27
BZX84-y30	28 - 32	29.4 - 30.6	-
BZX84-y33	31 - 35	32.3 - 33.7	-
BZX84-y36	34 - 38	35.3 - 36.7	35.64 - 36.36
BZX84-y39	37 - 41	38.2 - 39.8	38.61 - 39.39
BZX84-y43	40 - 46	42.1 - 43.9	42.57 - 43.43
BZX84-y47	44 - 50	46.1 - 47.9	-
BZX84-y51	48 - 54	50 - 52	50.49 - 51.51
BZX84-y56	52 - 60	54.9 - 57.1	-
BZX84-y62	58 - 66	60.8 - 63.2	-
BZX84-y68	64 - 72	66.6 - 69.4	-
BZX84-y75	70 - 79	73.5 - 76.5	74.25 - 75.75

NZX-series in SOD27

	V_z (V)		V_z (V)		V_z (V)
NZX2V4A	2.3 - 2.5	NZX6V2D	6.1 - 6.4	NZX14B	13.5 - 14
NZX2V4B	2.4 - 2.6	NZX6V2E	6.3 - 6.6	NZX14C	13.8 - 14.3
NZX2V7A	2.5 - 2.7	NZX6V8A	6.4 - 6.7	NZX15A	14.1 - 14.7
NZX2V7B	2.6 - 2.8	NZX6V8B	6.6 - 6.9	NZX15B	14.5 - 15.1
NZX2V7C	2.7 - 2.9	NZX6V8C	6.7 - 7	NZX15C	14.9 - 15.5
NZX3V0A	2.8 - 3	NZX6V8D	6.9 - 7.2	NZX15X	14.35 - 15.09
NZX3V0B	2.9 - 3.1	NZX7V5A	7 - 7.3	NZX16A	15.3 - 15.9
NZX3V0C	3 - 3.2	NZX7V5B	7.2 - 7.6	NZX16B	15.7 - 16.5
NZX3V3A	3.1 - 3.3	NZX7V5C	7.3 - 7.7	NZX16C	16.3 - 17.1
NZX3V3B	3.2 - 3.4	NZX7V5D	7.5 - 7.9	NZX18A	16.9 - 17.7
NZX3V3C	3.3 - 3.5	NZX7V5X	7.07 - 7.45	NZX18B	17.5 - 18.3
NZX3V6A	3.4 - 3.6	NZX8V2A	7.7 - 8.1	NZX18C	18.1 - 19
NZX3V6B	3.5 - 3.7	NZX8V2B	7.9 - 8.3	NZX20A	18.8 - 19.7
NZX3V6C	3.6 - 3.8	NZX8V2C	8.1 - 8.5	NZX20B	19.5 - 20.4
NZX3V9A	3.7 - 3.9	NZX8V2D	8.3 - 8.7	NZX20C	20.2 - 21.2
NZX3V9B	3.8 - 4	NZX9V1A	8.5 - 8.9	NZX22A	20.9 - 21.9
NZX3V9C	3.9 - 4.1	NZX9V1B	8.7 - 9.1	NZX22B	21.6 - 22.6
NZX4V3A	4 - 4.2	NZX9V1C	8.9 - 9.3	NZX22C	22.3 - 23.3
NZX4V3B	4.1 - 4.3	NZX9V1D	9.1 - 9.5	NZX24A	22.9 - 24
NZX4V3C	4.2 - 4.4	NZX9V1E	9.3 - 9.7	NZX24B	23.6 - 24.7
NZX4V3D	4.3 - 4.5	NZX10A	9.5 - 9.9	NZX24C	24.3 - 25.5
NZX4V7A	4.4 - 4.6	NZX10B	9.7 - 10.1	NZX24X	22.61 - 23.77
NZX4V7B	4.5 - 4.7	NZX10C	9.9 - 10.3	NZX27A	25.2 - 26.6
NZX4V7C	4.6 - 4.8	NZX10D	10.2 - 10.6	NZX27B	26.2 - 27.6
NZX4V7D	4.7 - 4.9	NZX11A	10.4 - 10.8	NZX27C	27.2 - 28.6
NZX5V1A	4.8 - 5	NZX11B	10.7 - 11.3	NZX27X	26.99 - 28.39
NZX5V1B	4.9 - 5.1	NZX11C	10.9 - 11.3	NZX30A	28.2 - 29.6
NZX5V1C	5 - 5.2	NZX11D	11.1 - 11.6	NZX30B	29.2 - 30.6
NZX5V1D	5.1 - 5.3	NZX12A	11.4 - 11.9	NZX30C	30.2 - 31.6
NZX5V6A	5.2 - 5.5	NZX12B	11.6 - 12.1	NZX30X	29.02 - 30.51
NZX5V6B	5.3 - 5.6	NZX12C	11.9 - 12.4	NZX33A	31.2 - 32.6
NZX5V6C	5.4 - 5.7	NZX12D	12.2 - 12.7	NZX33B	32.2 - 33.6
NZX5V6D	5.5 - 5.8	NZX12X	11.44 - 12.03	NZX33C	33.2 - 34.5
NZX5V6E	5.6 - 5.9	NZX13A	12.4 - 12.9	NZX36A	34.2 - 35.7
NZX6V2A	5.7 - 6	NZX13B	12.6 - 13.1	NZX36B	35.3 - 36.8
NZX6V2B	5.8 - 6.1	NZX13C	12.9 - 13.4	NZX36C	36.4 - 38
NZX6V2C	6 - 6.3	NZX14A	13.2 - 13.7	NZX36X	35.36 - 37.19

Switching diodes

General purpose switching diodes ≤ 100 V

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	SOT323 (SC-70)	SOT363 (SC-88)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOT416 (SC-75)	SOD523 (SC-79)	SOD882	SOT883 (SC-101)
						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	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.6 x 0.8 x 0.77	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5	1.0 x 0.6 x 0.5
						P_{tot} (mW)	500	500	500	250		250	830	200	300	400	550	180	170	500	250	250
50	1	50	100	50	4					BAL74												
70	1	50	1000	70	4					BAL99												
75	1	10	25	20	4			1N4531														
	1	50	1000	75	4							BAS28										
	1	100	5000	75	4				BAS32L													
90	1	50	500	80	4					BAW56				BAW56W					BAW56T			BAW56M
															BAW56S							
															BAV756S							
100	1	10	25	20	4		1N4148															
	1	50	500	80	4								BAS16H			BAS316	BAS16J					
										BAS16				BAS16W					BAS16T			
																				BAS516	BAS16L	
															BAS16VY			BAS16VV				
										BAV70				BAV70W					BAV70T			BAV70M
															BAV70S							
										BAV99				BAV99W								
															BAV99S							

General purpose switching diodes > 100 V

types in **bold blue** represent new products

V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA)	@ V_R (V)	t_r max (ns)	Package	SOD27 (DO-35)	SOD80C (MiniMelf)	SOT457 (SC-74)	SOT23	SOT323 (SC-70)	SOT143B	SOD123F	SOT363 (SC-88)	SOD323 (SC-76)	SOD323F (SC-90)	SOD523 (SC-79)
						Size (mm)	4.25 x 1.85 x 0.56	3.5 x 1.5 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	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.2 x 0.8 x 0.6
						P_{tot} (mW)	500	300	500	250	350	250	830	300	400	550	500
150	1	100	100	200	50	bra036	BAV20										
200	1	100	100	200	50	bra038	BAV21	BAV103					BAS21H		BAS321		
						bra008				BAS21	**BAS21W**						
						bra007						BAV23					
						bra002				**BAV23A**	**BAS21AW**						
						bra008				**BAV23C**							
						bra038				BAV23S	**BAS21SW**						
						bra038			BAS21VD								
300	1.1	100	150	250	50	bra036										BAS21J	BAS521
						bra008				BAS101							
						bra001				BAS101S							
						bra007						BAW101					
						bra042								BAW101S			

Controlled avalanche switching diodes

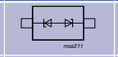
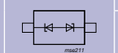
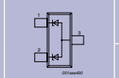
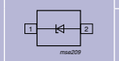
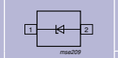
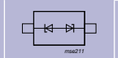
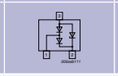
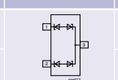
V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA) @ V_R max	I_{FSM} max (A)	I_{FRM} max (mA)	C_d max (pF)	t_r max (ns)	Package	SOT23	SOT143B
								Size (mm)	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0
								P_{tot} (mW)	250	250
60	1	200	100	9	600	2.5	6	bra007		BAS56
90	1	200	100	10	600	35	50	bra048	BAS29	
								bra001	BAS31	
								bra002	BAS35	

Low leakage current switching diodes

V_R max (V)	V_F max (V)	@ I_F (mA)	I_R max (nA) @ V_R max	t_{rr} max (µs)	Package	SOD80C (MiniMelf)	SOD68 (DO-34)	SOT23	SOD123F	SOT323 (SC-70)	SOD323 (SC-76)	SOD523 (SC-79)
					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	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.2 x 0.8 x 0.6
					P_{tot} (mW)	300	500	250	830	250	400	500
75	1	10	5	3	bra036			BAS116	BAS116H		BAS416	BAS716
					bra041			BAV199		BAV199W		
					bra143			BAW156				
					bra046			BAV170				
125	1	100	1	1.5 typ	bra036	BAS45AL	BAS45A					

ESD protection diodes for high-speed data rates

types in **bold blue** represent new products

Number of protected lines	C_{line} typ (pF)	V_{RWM} (V)	ESD rating [1] max (kV)	I_R max (µA) @ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
1	0.4	5	8	0.1 @ 5		**PESD5V0F1BL**	SOD882 	1.0 x 0.6 x 0.5
	0.9	5	9	0.1 @ 5		PESD5V0X1BL		
						PESD5V0X1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
						**PESD5V0X1BQ**	SOT663 	1.6 x 1.2 x 0.55
						PESD5V0X1BT	SOT23 	2.9 x 1.3 x 1.0
	1.3	3.3	9	0.1 @ 3		**PESD3V3X1BL**	SOD882 	1.0 x 0.6 x 0.5
						PESD3V3X1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
	2	5	9	0.1 @ 5		**PESD5V0U1UL**	SOD882 	1.0 x 0.6 x 0.5
						PESD5V0U1UB	SOD523 	1.2 x 0.8 x 0.6
						PESD5V0U1UA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
						PESD3V3U1UA		
	2.6	3.3	9	0.1 @ 3		**PESD3V3U1UB**	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
						PESD3V3U1UL	SOD882 	1.0 x 0.6 x 0.5
	2.9	5	10	0.1 @ 5		PESD5V0U1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
						PESD5V0U1BB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
						PESD5V0U1BL	SOD882 	1.0 x 0.6 x 0.5
	1	5.5	8	0.1 @ 3 [2]		**PRTR5V0U1T**	SOT23 	2.9 x 1.3 x 1.0
2	0.9	5	9	0.1 @ 5		**PESD5V0X2BT**		
	2.9	5	10	0.1 @ 5		**PESD5V0U2BT**		
						PESD5V0U2BM	SOT883 	1.0 x 0.6 x 0.5
	1	5.5	8	0.1 @ 3 [2]		PRTR5V0U2X	SOT143B 	2.9 x 1.3 x 1.0
	1.8		12			PRTR5V0U2AX		

ESD protection diodes for high-speed data rates

types in **bold blue** represent new products

Number of protected lines	C_{line} typ (pF)	V_{RWM} (V)	ESD rating [1] max (kV)	I_R max (µA) @ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
2	1	5.5	8	0.1 @ 5 [2]		**PRTR5V0U2D**	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
						PRTR5V0U2F	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
						PRTR5V0U2K	SOT891 	1.0 x 1.0 x 0.5
4	1	5.5	8	0.1 @ 3		PRTR5V0U4Y	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
						PRTR5V0U4D	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
	2.9	5	10	0.1 @ 5		PESD5V0U4BF	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
						PESD5V0U4BW	SOT665 	1.6 x 1.2 x 0.55
5						PESD5V0U5BF	SOT886 (XSON6)	1.45 x 1.0 x 0.5
						PESD5V0U5BV	SOT666	1.6 x 1.2 x 0.55
6	1	5.5	8	0.1 @ 3 [2]		PRTR5V0U6S	SOT96 (SO8)	4.9 x 3.9 x 1.75
						PRTR5V0U6AS		
8	1	5.5	8	0.1 @ 3 [2]		PRTR5V0U8S	SOT552 (TSSOP10)	3.0 x 3.0 x 1.1

[1] acc. to IEC 61000-4-2 (contact discharge)
[2] Value is specified at V_R (V)

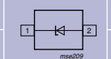
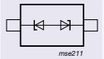
ESD protection diodes for automotive applications

Number of protected lines bidirectional	C_{line} typ (pF)	V_{RWM} (V)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	I_R max (µA) @ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
1	13	15 (diode 1) 24 (diode 2)	160	23	0.05 @ 15 (diode 1) 24 (diode 2)		PESD1LIN	SOD323 (SC-76)	1.7 x 1.25 x 0.95
2	11	24	200	23	0.05 @ 24		PESD1CAN	SOT23	2.9 x 1.3 x 1.0
	25	24	230	30	0.01 @ 24		PESD2CAN		
	11 [3]	24	200	23	0.05 @ 24		PESD1FLEX		

[1] 8/20 µs surge pulse acc. to IEC 61000-4-5 [2] acc. to IEC 61000-4-2 (contact discharge) [3] f = 5 MHz; V_R = 0 V

ESD protection diodes for general purpose interfaces

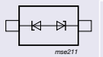
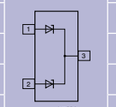
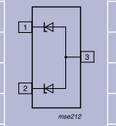
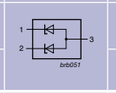
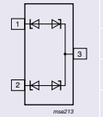
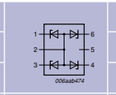
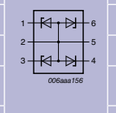
types in **bold blue** represent new products

Number of protected lines uni-	bi-	C_{line} typ (pF)	V_{RWM} (V)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	I_R max (µA)	@ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
1		200	3.3	150	30	2	3.3		PESD3V3S1UL	SOD882 	1.0 x 0.6 x 0.5
		150	5	150	30	1	5		PESD5V0S1UL		
		38	12	150	30	0.05	12		PESD12VS1UL		
		34	3.3	45	30	0.3	3.3		**PESD3V3L1UL**		
		32	15	150	30	0.05	15		PESD15VS1UL		
		25	5	42	30	0.1	5		**PESD5V0L1UL**		
		23	24	150	23	0.05	24		PESD24VS1UL		
		207	3.3	330	30	2	3.3		PESD3V3S1UB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
		152	5	260	30	1	5		PESD5V0S1UB		
		38	12	180	30	0.05	12		PESD12VS1UB		
		32	15	160	30	0.05	15		PESD15VS1UB		
		23	24	160	23	0.05	24		PESD24VS1UB		
		229	2.5	260	30	6	2.5		PESD5Z2.5		
		172	3.3	260	30	0.05	3.3		PESD5Z3.3		
		89	5	180	30	0.05	5		PESD5Z5.0		
		78	6	180	30	0.01	6		PESD5Z6.0		
		69	7	180	30	0.01	7		PESD5Z7.0		
		35	12	200	30	0.01	12		PESD5Z12		
		34	3.3	45	30	0.3	3.3		**PESD3V3L1UB**		
		25	5	42	30	0.1	5		**PESD5V0L1UB**		
		480	5	890	30	4	5		**PESD5V0S1UA**	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
		160	12	600	30	0.1	12		**PESD12VS1UA**		
		34	3.3	45	30	0.3	3.3		**PESD3V3L1UA**		
		25	5	42	30	0.1	5		**PESD5V0L1UA**		
		480	5	890	30	4	5		**PESD5V0S1UJ**	SOD323F (SC-90) 	1.7 x 1.25 x 0.7
		160	12	600	30	0.1	12		**PESD12VS1UJ**		
	1	35	5	120	30	0.1	5		PESD5V0S1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
									PESD5V0S1BB	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
									PESD5V0S1BL	SOD882 	1.0 x 0.6 x 0.5
		101	3.3	500	30	2	3.3		PESD3V3L1BA	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
		75	5	500	30	1	5		PESD5V0L1BA		
		19	12	200	30	0.05	12		PESD12VL1BA		
		16	15	200	30	0.05	15		PESD15VL1BA		
		11	24	200	23	0.05	24		PESD24VL1BA		

[1] 8/20 µs surge pulse acc. to IEC 61000-4-5 [2] acc. to IEC 61000-4-2 (contact discharge)

ESD protection diodes for general purpose interfaces

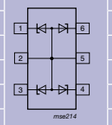
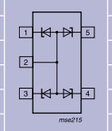
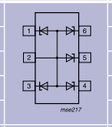
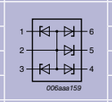
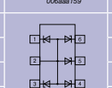
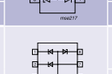
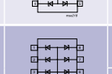
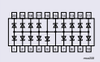
types in **bold blue** represent new products

Number of protected lines uni-	bi-	C_{line} typ (pF)	V_{RWM} (V)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	I_R max (µA)	@ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
	1	12	5	50	25	0.1	5		**PESD5V0V1BA**	SOD323 (SC-76) 	1.7 x 1.25 x 0.95
									PESD5V0V1BL	SOD523 (SC-79) 	1.2 x 0.8 x 0.6
									PESD5V0V1BB	SOD882 	1.0 x 0.6 x 0.5
2	1	207	3.3	330	30	2	3.3		PESD3V3S2UAT	SOT23 	2.9 x 1.3 x 1.0
		152	5	260	30	1	5		PESD5V0S2UAT		
		38	12	180	30	0.05	12		PESD12VS2UAT		
		32	15	160	30	0.05	15		PESD15VS2UAT		
		23	24	160	23	0.05	24		PESD24VS2UAT		
		207	3.3	330	30	2	3.3		PESD3V3S2UT		
		152	5.25	260	30	1	5.25		PESD5V2S2UT		
		38	12	180	30	1	12		PESD12VS2UT		
		32	15	160	30	1	15		PESD15VS2UT		
		23	24	160	23	1	24		PESD24VS2UT		
		200	3.3	150	30	3	3.3		PESD3V3S2UQ	SOT663 	1.6 x 1.2 x 0.55
		150	5	150	30	0.3	5		PESD5V0S2UQ		
		38	12	150	30	0.03	12		PESD12VS2UQ		
		32	15	150	30	0.05	15		PESD15VS2UQ		
		23	24	150	23	0.05	24		PESD24VS2UQ		
		38	5	70	30	0.09	4		**PESD5V0L2UU**	SOT323 (SC-70) 	2 x 1.25 x 0.95
		34	6	60	30	0.018	4.3		**PESD6V0L2UU**		
		22	3.3	30	15	0.3	3.3		PESD3V3L2UM	SOT883 (SC-101) 	1.0 x 0.6 x 0.5
		16	5	30	15	0.025	5		PESD5V0L2UM		
	2	35	5	120	30	0.1	5		PESD5V0S2BT	SOT23 	2.9 x 1.3 x 1.0
		101	3.3	350	30	2	3.3		PESD3V3L2BT		
		75	5	350	30	1	5		PESD5V0L2BT		
		19	12	200	30	0.05	12		PESD12VL2BT		
		16	15	200	30	0.05	15		PESD15VL2BT		
		11	24	200	23	0.05	24		PESD24VL2BT		
4	3	13	3.3	14	10	2	3.3		**PESD3V3V4UK**	SOT891 	1.0 x 1.0 x 0.5
		12	5	20	10	1	5		**PESD5V0V4UK**		
		6.5	9	25	10	0.5	9		**PESD9V3V4UK**		
		22	3.3	30	20	0.3	3.3		PESD3V3L4UF	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
		16	5	30	20	0.025	5		PESD5V0L4UF		
		15	3.3	16	10	0.3	3.3		PESD3V3V4UF		
		12	5	16	10	0.025	5		PESD5V0V4UF		
		215	3.3	200	30	0.8	3.3		PESD3V3S4UF		
		165	5	200	30	0.2	5		PESD5V0S4UF		

[1] 8/20 µs surge pulse acc. to IEC 61000-4-5 [2] acc. to IEC 61000-4-2 (contact discharge)

ESD protection diodes for general purpose interfaces

types in **bold blue** represent new products

Number of protected lines uni-	bi-directional	C_{line} typ (pF)	V_{RWM} (V)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	I_R @ max (µA)	V_{RWM} (V)	Configuration	Type	Package	Size (mm)
4	3	200	3	-	8	2	3		BZA456A	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		165	4	-	8	0.7	4		BZA462A		
		37	14	-	8	0.075	14		BZA418A		
		37	15	-	8	0.1	15		BZA420A		
		215	3.3	200	30	0.8	3.3		PESD3V3S4UD		
		165	5	200	30	0.2	5		PESD5V0S4UD		
		73	12	200	30	0.01	12		PESD12VS4UD		
		60	15	200	30	0.01	15		PESD15VS4UD		
		45	24	200	23	0.01	24		PESD24VS4UD		
		200	3	-	8	2	3		BZA856A	SOT353 (SC-88A) 	2.0 x 1.25 x 0.95
		165	4	-	8	0.7	4		BZA862A		
		145	4.3	-	8	0.2	4.3		BZA868A		
		37	15	-	8	0.01	15		BZA820A		
		107	3	-	8	1	3		BZA856AL		
		90	4	-	8	0.5	4		BZA862AL		
		78	4.3	-	8	0.01	4.3		BZA868AL		
		22	3.3	30	20	0.3	3.3		PESD3V3L4UG		
		16	5	30	20	0.025	5		PESD5V0L4UG		
		15	3.3	16	10	0.3	3.3		PESD3V3V4UG		
		12	5	16	10	0.025	5		PESD5V0V4UG		
		107	3	-	8	1	3		BZA956A	SOT665 	1.6 x 1.2 x 0.55
		90	4	-	8	0.5	4		BZA962A		
		78	4.3	-	8	0.01	4.3		BZA968A		
		22	3.3	30	20	0.3	3.3		PESD3V3L4UW		
		16	5	30	20	0.025	5		PESD5V0L4UW		
		15	3.3	16	10	0.3	3.3		PESD3V3V4UW		
		12	5	16	10	0.025	5		PESD5V0V4UW		
	4	48	5	-	15	0.01	5		BZA408B	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
5	4	215	3.3	200	30	0.8	3.3		PESD3V3S5UD	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		165	5	200	30	0.2	5		PESD5V0S5UD		
		73	12	200	30	0.01	12		PESD12VS5UD		
		60	15	200	30	0.01	15		PESD15VS5UD		
		45	24	200	23	0.01	24		PESD24VS5UD		
		22	3.3	25	20	0.2	3.3		**PESD3V3L5UK**	SOT891 	1.0 x 1.0 x 0.5
		16	5	25	20	0.1	5		**PESD5V0L5UK**		
		22	3.3	30	20	0.2	3.3		PESD3V3L5UF	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
		16	5	30	20	0.1	5		PESD5V0L5UF		
		22	3.3	25	20	0.3	3.3		PESD3V3L5UY	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
		16	5	25	20	0.025	5		PESD5V0L5UY		
		22	3.3	25	20	0.3	3.3		PESD3V3L5UV	SOT666 	1.6 x 1.2 x 0.55
		16	5	25	20	0.025	5		PESD5V0L5UV		
6	5	16	5	35	20	0.025	5		PESD5V0L6US	SOT96 (SO8) 	4.9 x 3.9 x 1.75
									PESD5V0L6UAS	SOT505 (TSSOP8) 	3.0 x 3.0 x 1.1
	7	7	5	35	20	0.025	5		PESD5V0L7BS	SOT96 (SO8) 	4.9 x 3.9 x 1.75
									PESD5V0L7BAS	SOT505 (TSSOP8) 	3.0 x 3.0 x 1.1
18	17	100	5.2	100	8	1	5.2		BZA100	SOT163 (SO20) 	12.8 x 7.5 x 2.65
									PESD5V2S18U	SOT339 (SSOP20) 	7.2 x 5.3 x 2.0

[1] 8/20 µs surge pulse acc. to IEC 61000-4-5
[2] acc. to IEC 61000-4-2 (contact discharge)

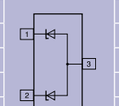
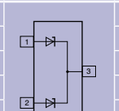
TVS diodes, 400 W

types in **bold blue** represent new products

Power (W) (10/1000 µs waveform)	V_{RWM} (V)	I_{RM} typ. (µA) @ V_{RWM}	I_{RM} max (µA) @ V_{RWM}	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)	Type	Package	Size (mm)	P_{tot} (mW)
350	3.3	5	600	5.2	5.6	6	10	8	43.8	**PTVS3V3S1UR**	SOD123W 	2.6 x 1.7 x 1.0	900
400	5	5	400	6.4	6.7	7	10	9.2	43.5	**PTVS5V0S1UR**			
	6	5	400	6.67	7.02	7.37	10	10.3	38.8	**PTVS6V0S1UR**			
	6.5	5	250	7.22	7.6	7.98	10	11.2	35.7	**PTVS6V5S1UR**			
	7	3	100	7.78	8.2	8.6	10	12	33.3	**PTVS7V0S1UR**			
	7.5	0.2	50	8.33	8.77	9.21	1	12.9	31.0	**PTVS7V5S1UR**			
	8	0.03	25	8.89	9.36	9.83	1	13.6	29.4	**PTVS8V0S1UR**			
	8.5	0.01	10	9.44	9.92	10.4	1	14.4	27.8	**PTVS8V5S1UR**			
	9	0.005	5	10	10.55	11.1	1	15.4	26.0	**PTVS9V0S1UR**			
	10	0.005	2.5	11.1	11.7	12.3	1	17	23.5	**PTVS10VS1UR**			
	11	0.005	2.5	12.2	12.85	13.5	1	18.2	22.0	**PTVS11VS1UR**			
	12	0.005	2.5	13.3	14	14.7	1	19.9	20.1	**PTVS12VS1UR**			
	13	0.001	0.1	14.4	15.15	15.9	1	21.5	18.6	**PTVS13VS1UR**			
	14	0.001	0.1	15.6	16.4	17.2	1	23.2	17.2	**PTVS14VS1UR**			
	15	0.001	0.1	16.7	17.6	18.5	1	24.4	16.4	**PTVS15VS1UR**			
	16	0.001	0.1	17.8	18.75	19.7	1	26	15.4	**PTVS16VS1UR**			
	17	0.001	0.1	18.9	19.9	20.9	1	27.6	14.5	**PTVS17VS1UR**			
	18	0.001	0.1	20	21	22.1	1	29.2	13.7	**PTVS18VS1UR**			
	20	0.001	0.1	22.2	23.35	24.5	1	32.4	12.3	**PTVS20VS1UR**			
	22	0.001	0.1	24.4	25.6	26.9	1	35.5	11.3	**PTVS22VS1UR**			
	24	0.001	0.1	26.7	28.1	29.5	1	38.9	10.3	**PTVS24VS1UR**			
	26	0.001	0.1	28.9	30.4	31.9	1	42.1	9.5	**PTVS26VS1UR**			
	28	0.001	0.1	31.1	32.8	34.4	1	45.4	8.8	**PTVS28VS1UR**			
	30	0.001	0.1	33.3	35.1	36.8	1	48.4	8.3	**PTVS30VS1UR**			
	33	0.001	0.1	36.7	38.7	40.6	1	53.3	7.5	**PTVS33VS1UR**			
	36	0.001	0.1	40	42.1	44.2	1	58.1	6.9	**PTVS36VS1UR**			
	40	0.001	0.1	44.4	46.8	49.1	1	64.5	6.2	**PTVS40VS1UR**			
	43	0.001	0.1	47.8	50.3	52.8	1	69.4	5.8	**PTVS43VS1UR**			
	45	0.001	0.1	50	52.65	55.3	1	72.7	5.5	**PTVS45VS1UR**			
	48	0.001	0.1	53.3	56.1	58.9	1	77.4	5.2	**PTVS48VS1UR**			
	51	0.001	0.1	56.7	59.7	62.7	1	82.4	4.9	**PTVS51VS1UR**			
	54	0.001	0.1	60	63.15	66.3	1	87.1	4.6	**PTVS54VS1UR**			
	58	0.001	0.1	64.4	67.8	71.2	1	93.6	4.3	**PTVS58VS1UR**			
	60	0.001	0.1	66.7	70.2	73.7	1	96.8	4.1	**PTVS60VS1UR**			
	64	0.001	0.1	71.1	74.85	78.6	1	103	3.9	**PTVS64VS1UR**			

TVS diodes, 24 W / 40 W

types in **bold blue** represent new products

Number of protected lines uni-	bi-directional	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	ESD rating [3] max (kV)	I_{RM} max (µA)	@ V_{RWM} (V)	Configuration	Type	Package	Size (mm)
2	1	210	24	16	30	5	3		**MMBZ5V6AL**	SOT23 	2.9 x 1.3 x 1.0
		170	24	16	30	0.5	3		**MMBZ6V2AL**		
		150	24	16	30	0.5	4.5		**MMBZ6V8AL**		
		160	24	16	30	0.3	6		**MMBZ9V1AL**		
		135	24	16	30	0.3	6.5		**MMBZ10VAL**		
		110	40	16	30	0.2	8.5		MMBZ12VAL		
		85	40	16	30	0.05	12		MMBZ15VAL		
		70	40	16	30	0.05	14.5		MMBZ18VAL		
		62	40	16	30	0.05	17		MMBZ20VAL		
		48	40	16	30	0.05	22		MMBZ27VAL		
		42	40	16	30	0.05	26		MMBZ33VAL		
2	1	110	40	16	30	0.2	8.5		MMBZ12VDL		
		85	40	16	30	0.1	12		MMBZ15VDL		
		70	40	16	30	0.05	14.5		MMBZ18VCL		
		62	40	16	30	0.05	17		MMBZ20VCL		
		48	40	16	30	0.05	22		MMBZ27VCL		
		42	40	16	30	0.05	26		MMBZ33VCL		

[1] 10/1000 µs acc. to IEC 61643-321
[2] MIL-STD-883 (Human Body Model)
[3] IEC61000-4-2

MOSFETs

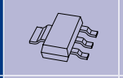
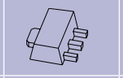
Small-signal MOSFETs single (N-channel) < 100 V

Package												SOT223 (SC-73)	TSOP6 SOT457 (SC-74)	SOT23	SOT363 (SC-88)	SOT323 (SC-70)	SOT416 (SC-75)	SOT883 (SC-101)
Size (mm)												6.5 x 3.5 x 1.65	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.0 x 1.25x 0.95	2.0 x 1.25x 0.95	1.6 x 0.8 x 0.77	1.0 x 0.6 x 0.5
P_{tot} (mW)												1700	600	250	300	200	150	250
V_{DS} (V)	**V_{GS} (V)**	**V_{GS} (th) min (V)**	**V_{GS} (th) max (V)**	**t_{on} typ (ns)**	**t_{off} typ (ns)**	**Q_G typ (nC)**	**ESD protection**	**R_{DSon} typ (mΩ) @V_{GS} =**										
								10 V	**4.5 V**	**2.5 V**	**1.8 V**							
12	8	0.4	-	23	67	10.1	-	-	28	-	39		PMN28UN					
20	8	2	4	23	71	10.6	-	-	23	-	37		PMN23UN					
		0.4	-	23	71	10.6	-	-	27	-	39		PMN27UN					
		0.45	-	20	66	7.4	-	-	30	-	44			PMV30UN [1]				
		0.65	-	35	84	5.4	-	-	56	77	-			PMV56XN [1]				
		0.65	-	35	84	5.4	-	-	56	77	-			SI2302DS				
		0.4	-	6.5	65	-	-	-	140	-	240			BSH105				
		0.45	0.95	14.5	23.5	0.89	-	-	250	-	420							PMZ250UN
		0.45	1	14.5	23.5	-	-	-	280	-	460					PMF280UN		
		0.45	1	14.5	23.5	0.89	-	-	280	-	460						PMR280UN	
	12	0.5	1.5	25	37	5.8	-	-	31	44	-			PMV31XN [1]				
		0.5	1.5	16	17	0.72	-	-	270	440	-							PMZ270XN
		0.5	1.5	16	17	-	-	-	290	460	-					PMF290XN		
		0.5	1.5	16	17	0.72	-	-	290	460	-						PMR290XN	
	15	1	2	24	35	13.1	-	28	34	-	-		PMN34LN					
		1	2	24	35	13.1	-	55	70	-	-		PMN55LN					
30	8	0.45	-	22	60	9.9	-	-	38	-	54		PMN34UN					
		0.45	-	18	50	9.3	-	-	40	-	55			PMV40UN [1]				
		0.45	0.95	11.5	22.5	0.89	-	-	390	-	550							PMZ390UN
		0.45	1	11.5	22.5	-	-	-	400	-	580					PMF400UN		
		0.4	-	6	27	-	-	-	**400** [2]	-	**600** [2]			BSH103				
		0.45	1	11.5	22.5	0.89	-	-	400	-	580						PMR400UN	
	12	0.5	1.5	16	19.5	0.65	-	-	350	520	-							PMZ350XN
		0.5	1.5	16	19.5	-	-	-	370	550	-				PMG370XN			
		0.35	-	16	19.5	-	-	-	370	550	-					PMF370XN		
		0.5	1.5	16	19.5	0.65	-	-	370	550	-						PMR370XN	
	15	1	2	12	27	13.8	-	32	40	-	-		PMN40LN					
	20	1	2	33	44	6.1	-	31	38	-	-		PMN38EN					
		1	2	33	44	6.1	-	32	42	-	-		PMN45EN					
		1	2	12	21.5	9.4	-	35	45	-	-			PMV45EN [1]				
		1	2	8.4	17.8	8.8	-	40	49	-	-		PMN49EN					
		1	2	12	23.5	9.4	-	47	60	-	-			PMV60EN [1]				
		1.5	-	12	23.5	4.6	-	74	117	-	-			PMV117EN				
		1	2.8	14	36	-	-	80	120	-	-	BSP100						
		1.5	-	11.5	31	4.6	-	**117** [2]	**190** [2]	-	-			SI2304DS				
		1	2,8	18	44	24	-	20	30	-	-			BSP030				
		1	2	11	41	6,4	-	77	102	-	-	BSH108						
50	20	0.4	1.8	2	5	-	-	8000	-	18000	-			BSN20				
55	13	1	2	-	-	-	yes	-	30	-	-	PHT11N06LT						
		1	2	-	-	-	yes	-	65	-	-	PHT8N06LT						
		1	2	-	-	-	yes	-	120	-	-	PHT6N06LT						
		2	4	-	-	-	yes	120	-	-	-	PHT6N06T						
60	15	1	-	3	9	-	yes	2800	3800	-	-					PMF3800SN		
		1	-	3	9	-	yes	2800	3800	-	-			2N7002K				
	20	1	-	6	7.2	-	-	780	1100	-	-					PMF780SN		
		1	3	6	7.2	1.05	-	780	1100	-	-						PMR780SN	
		1	3	6	7.2	1.05	-	760	1100	-	-							PMZ760SN
		0.8	3	-	-	-	-	2500	-	-	-			PMBF170				
	30	1	2.5	2.5	11	0.69	-	780	1200	-	-			2N7002E				
		1	2.5	2.5	11	0.69	-	780	1200	-	-			2N7002F				
		1	2.5	2.5	11	-	-	2800	3800	-	-			2N7002				

[1] enhanced thermal capability
[2] max values

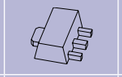
MOSFETs

Small-signal MOSFETs single (N-channel) ≥ 100 V

Package													SOT223 (SC-73)	SOT89 (SC-62)	SOT873	SOT23
																
Size (mm)													6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	3.3 x 3.3 x 0.85	2.9 x 1.3 x 1.0
P_{tot} (mW)													1700	1300	1500	250
V_{DS} (V)	**V_{GS} (V)**	**V_{GS} (th) min (V)**	**V_{GS} (th) max (V)**	**t_{on} typ (ns)**	**t_{off} typ (ns)**	**Q_G typ (nC)**	**ESD protection**	**R_{DSon} typ (mΩ) @V_{GS} =**								
								10 V	**4.5 V**	**2.5 V**	**1.8 V**					
100	16	1	2	14	73	-	-	-	200	-	-		PHT4NQ10LT			
	20	1	-	3	12	-	-	-	5000	-	-					BST82
	20	1	2.8	3	12	-	-	3500	-	-	-					BSS123
	20	2	4	21	31	-	-	200	-	-	-		PHT4NQ10T			
	20	2	4	-		-	-	57	-	-	-		PHT6NQ10T			
	30	2	4	10.5	12.5	7	-	213	-	-	-					PMV213SN [1]
200	20	0.4	2	10	45	-	-	1700	-	3000	-		BSP122			
	20	0.8	2.8	6	49	-	-	1600	-	-	-			BSS87		
	20	2	4	18	26	13.3	-	250	-	-	-				PML260SN	
220	20	2	4	20.8	24.3	13.2	-	320	-	-	-				PML340SN	
240	20	0.8	2	6	47	-	-	2800	-	**7500** [2]	-		BSP89			
250	20	0.8	2	6	47	-	-	2800	-	-	-		BSP126			
300	20	0.8	2	6	46	-	-	3700	-	4800	-		BSP130			

[1] enhanced thermal capability
[2] max values

Small-signal MOSFETs single (P-channel)

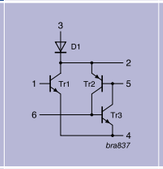
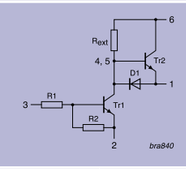
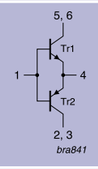
Package													SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	SOT23
																
Size (mm)													6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0
P_{tot} (mW)													1700	1300	600	250
V_{DS} (V)	**V_{GS} (V)**	**V_{GS} (th) min (V)**	**V_{GS} (th) max (V)**	**t_{on} typ (ns)**	**t_{off} typ (ns)**	**Q_G typ (nC)**	**ESD protection**	**R_{DSon} typ (mΩ) @V_{GS} =**								
								10 V	**4.5 V**	**2.5 V**	**1.8 V**					
12	8	0.4	-	6.5	65	-	-	-	80	-	140				BSH207	
	8	0.4	-	6.5	65	-	-	-	180	-	420					BSH205 [1]
20	12	0.55	0.95	16	117	10	-	-	48	65	-				PMN50XP	
	12	0.55	0.95	28	101	7.6	-	-	65	90	-					PMV65XP [1]
30	8	0.4	-	6.5	65	-	-	-	660	-	1100					BSH203
	20	1	2.8	20	50	-	-	220	330	-	-		BSP250			
	20	1	-	6.5	65	-	-	630	890	-	-					BSH202
50	20	0.8	2	3	7	-	-	6000	-	-	-					BSS84
60	20	1	-	6.5	65	-	-	2100	2700	-	-					BSH201
200	20	0.8	2.8	5	20	-	-	10000	-	-	-		BSP220			
240	20	0.8	2.8	5	20	-	-	10000	-	-	-			BSS192		
250	20	0.8	2.8	5	10	-	-	10000	-	-	-		BSP225			
300	20	1.95	2.8	5	15	-	-	**17000** [2]	-	-	-		BSP230			

[1] enhanced thermal capability
[2] max values

Small-signal MOSFETs double

Package											SOT363 (SC-88)
Size (mm)											2.0 x 1.25x 0.95
P_{tot} (mW)											300
V_{DS} (V)	V_{GS} (V)	V_{GS} (th) min (V)	V_{GS} (th) max (V)	t_{on} typ (ns)	t_{off} typ (ns)	Q_G typ (nC)	R_{DSon} typ (mΩ) @V_{GS} =				
							10 V	4.5 V	2.5 V	1.8 V	
20	8	0.45	1	14.5	23.5	0	-	280	-	460	PMGD280UN
	12	0.5	1.5	16	17	0.72	-	290	460	-	PMGD290XN
30	8	0.45	1	11.5	22.5	0.89	-	400	-	580	PMGD400UN
	12	0.5	1.5	17	19.5	0.65	-	370	550	-	PMGD370XN
	15	0.8	1.5	17	22	0.35	-	1800	2900	-	PMGD8000LN
60	20	1	-	6	7.2	1.05	780	1100	-	-	PMGD780SN

MOSFET driver

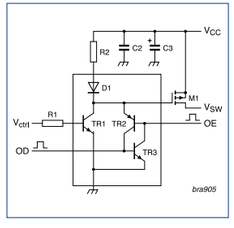
Package			SOT457 (SC-74)			
Size (mm)			2.9 x 1.5 x 1.0			
P_{tot} (mW)			400			580
Configuration						
Contains	I_C (A)	I_{CM} (A)		R1 = R2 (kΩ)		
General purpose transistors	0.1	0.2	PMD9050D	-	PMD9010D	BCV65 (SOT143B)
				2.2	PMD9001D	
				4.7	PMD9002D	
				10	PMD9003D	
Switching transistors - reduced storage time	0.6	1.0		-		PMD2001D
Low V_{CEsat} (BISS) transistors - Low V_{CEsat}, high h_{FE} and I_C	1.0	2.0		-		PMD3001D

Key features
- Four different configurations
- Types available with standard, switching and low V_{CEsat} (BISS) transistors
- Small footprint packages

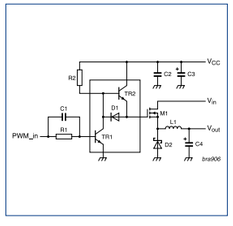
Key benefits
- Reduced component count
- Smaller end products

Key applications
- MOSFET driver
- Bipolar power transistor driver
- Push-pull driver

MOSFET driver with hardware output disable function



High-side MOSFET driver with level shifter function



Single transistors

types in **bold blue** 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
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	f_T min (MHz)				
NPN	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			
		100	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			
			500	1250	100	PMBT6429	PMST6429		
	50	100	90 - 290	260 - 460	100 - 150	2PD601ART **2PD601ARL** **2PD601ASL**	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	
	45	500	100 - 250	250 - 600	100	BC817 / -16 / -25 / -40	BC817W / -16W / -25W / -40W		
			100 - 160	400 - 600	100	BCX19			
	50	500	85 - 170	170 - 340	140 - 180	**2PD602AQL** **2PD602ARL** **2PD602ASL**	2PD1820A / R / S		
	60	500	50	-	100		PMSTA05		
	80	500	100	-	100	PMBTA06	PMSTA06		
PNP	30	100	125 - 220	500 - 800	100	BC858B	BC858W		
	32	100	120 - 215	260 - 500	100	BCW29 / 30			
		100	180 - 380	310 - 630	100	BCW61B / C / D			
	40	100	120 - 270	270 - 560	100				2PA1774QM / RM / SM
	45	100	160 - 290	260 - 460	60 - 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
	50	100	200	400	100				
	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	
	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			
	50	500	85 - 170	170 - 340	100 - 140	**2PB710ARL** **2PB710ASL**	2PB1219AQ / R / S		
	60	500	100	-	50		PMSTA55		
	80	500	100	-	50	PMBTA56	PMSTA56		

Double transistors

Package						SOT457 (SC-74)	SOT363 (SC-88)	SOT666
Size (mm)						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)						600	300	300
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	f_T min (MHz)			
NPN	40	100	120	450	100		PUMX1	PEMX1
	45	100	200	450	100		BC847BS	BC847BV
	65	100	110	450	100		BC846S	
	50	150	120	560	100		PUMX2	
	45	500	160	400	80	BC817DS		
PNP	40	100	120	450	100	PIMT1	PUMT1	PEMT1
	45	100	200	450	100		BC857BS	BC857BV
	65	100	110	450	100		BC856S	
	45	500	160	400	80	BC807DS		
NPN/PNP	40	100	120	450	100		PUMZ1	PEMZ1
	45	100	200	450	100		BC847BPN	BC847BVN
	50	100	120	560	100	PIMZ2	PUMZ2	
	12	500	200	-	250/100			PEMZ7
	45	500	160	400	100/80	BC817DPN		

Single and double switching transistors

types in **bold blue** represent new products

Package							SOT223 (SC-73)	SOT89 (SC-62)	SOT23	SOT323 (SC-70)	SOT363 (SC-88)	SOT666	SOT883 (SC-101)
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	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55	1.0 x 0.6 x 0.5
P_{tot} (mW)							1700	1300	250	200	300	300	250
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	f_T min (MHz)	t_{off} (ns)							
NPN	12	100	40	120	400	20			BSV52				
	40	100	100	300	180	1200			PMBS3904	PMSS3904			
					300	250		PXT2222A					
	15	200	40	120	500	20			PMBT2369	PMST2369			
	40	200	100	300	300	250			MMBT3904		PMBT3904YS	PMBT3904VS	PMBT3904M
									PMBT3904	PMST3904			
	30	600	100	300	250	250			PMBT2222	PMST2222			
	40	600	100	300	250	250	PZT4401	PXT4401	PMBT4401	PMST4401			
					300	250			MMBT2222A				
							PZT2222A		PMBT2222A	PMST2222A			
	40	800	100	300	300	250			BSR14				
PNP	40	100	100	300	150	700			PMBS3906	PMSS3906			
	40	200	100	300	250	300			MMBT3906		PMBT3906YS	PMBT3906VS	PMBT3906M
									PMBT3906	PMST3906			
	40	600	100	300	200	350	PZT4403	PXT4403	PMBT4403	PMST4403			
						365			PMBT2907				
	60	600	100	300	200	300				PMST2907A			
						365			BSR16				
							PZT2907A	PXT2907A	PMBT2907A				
NPN/PNP	40	200	100	300	300/250	250/300					PMBT3946YPN	PMBT3946VPN	

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		

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 typ (MHz)			
NPN	30	500	10000	125			PMBTA13
			20000	125	PZTA14	PXTA14	PMBTA14
				220		BCV29	BCV27
	45	1000	2000	200	BSP50	BST50	
	60	500	10000	220		BCV49	BCV47
		1000	2000	200	BSP51	BST51	
	80	1000	2000	200	BSP52	BST52	
PNP	30	500	20000	125			PMBTA64
				220		BCV28	BCV26
	45	1000	2000	200	BSP60	BST60	
	60	500	10000	220		BCV48	BCV46
		1000	2000	200	BSP61	BST61	
	80	1000	2000	200	BSP62	BST62	

Matched pair transistors

types in **bold blue** represent new products

Package							SOT143B	SOT457 (SC-74)	SOT353 (SC-88A)	SOT363 (SC-88)		SOT666	
Size (mm)							2.9 x 1.3 x 1.0	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95		1.6 x 1.2 x 0.55	
P_{tot} (mW)							250	380	300	300		300	
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	h_{FE1}/h_{FE2}	$V_{BE1} - V_{BE2}$ (mV)							
NPN	30	100	110	800	0.7 [1]	n.a.	BCV61/A/B/C [1]						
	45	100	200	450	0.9 [1]	2	BCM61B [1]	BCM847DS		BCM847BS		BCM847BV	
					0.95	2			PMP4501G		PMP4501Y		PMP4501V
					0.98	2			PMP4201G		PMP4201Y		PMP4201V
	Configuration						bra129	sma307	bra219	sma307	bra217	sma307	bra217
PNP	30	100	100	800	0.7 [1]	n.a.	BCV62/A/B/C [1]						
	45	100	200	450	0.9 [1]	2	BCM62B [1]	BCM857DS		BCM857BS		BCM857BV	
					0.95	2			PMP5501G		PMP5501Y		PMP5501V
					0.98	2			PMP5201G		PMP5201Y		PMP5201V
	65	100	200	450	0.9	2		**BCM856DS**		**BCM856BS**			
	Configuration						bra126	bra306	bra219	bra306	bra189	bra306	bra189

[1] I_{C1}/I_{E2}

Key features

- Current gain matching to 10 %, 5 % or 2 %
- Base-emitter voltage matching to 2 mV
- Choice of standard double transistor pinout or application-optimized pinout
- Common-emitter configuration for 5-pin type
- Range of small, very small and ultra small packages

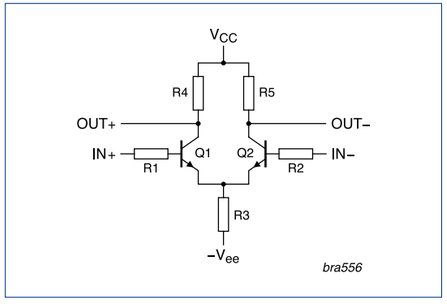
Key benefits

- Improved performance of current mirror and differential amplifier circuits
- Drop-in replacement for standard double transistors (BCM series)
- Simplified board layout (PMP series)
- Eliminates the need for costly additional trimming

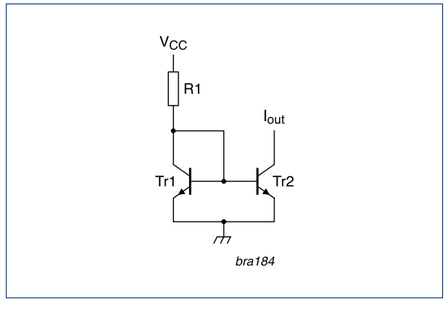
Key applications

- Current mirrors
- Differential and instrumentation amplifiers
- Logarithmic amplifiers
- Comparators

Differential amplifier



Current mirror



Medium frequency 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)	h_{FE} min	h_{FE} max	f_T typ (MHz)		
NPN	15	100	40	-	500	BF570	
	20	25	40	85	> 275	BFS20	BFS20W
		30	65	225	260	BFS19	
	40	25	67	220	380	BF840	
PNP	30	25	25	50	250	BF824	BF824W
	40	25	50	-	> 325	BF550	

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)

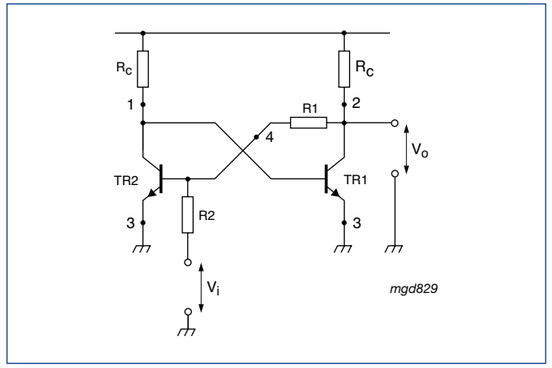
Key benefits

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

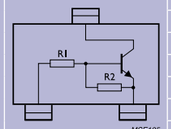
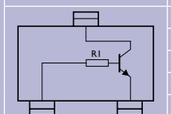
Key applications

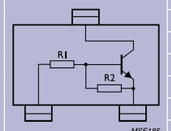
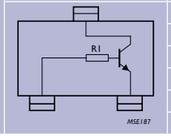
- General purpose switching and amplification
- Schmitt trigger applications

Schmitt trigger



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

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

RETs 100 mA double

Package					SOT457 (SC-74)		SOT363 (SC-88)			SOT666		
Size (mm)					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)					600		300					
V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	NPN/NPN	NPN/PNP	NPN/NPN	NPN/PNP	PNP/PNP	NPN/NPN	NPN/PNP	PNP/PNP
50	100	R1 = R2	2.2	2.2			PUMH20	PUMD20	PUMB20	PEMH20	PEMD20	PEMB20
			4.7	4.7			PUMH15	PUMD15	PUMB15	PEMH15	PEMD15	PEMB15
			10	10		PIMD3	PUMH11	PUMD3	PUMB11	PEMH11	PEMD3	PEMB11
			22	22		PIMD2	PUMH1	PUMD2	PUMB1	PEMH1	PEMD2	PEMB1
			47	47			PUMH2	PUMD12	PUMB2	PEMH2	PEMD12	PEMB2
			100	100			PUMH24	PUMD24	PUMB24	PEMH24	PEMD24	PEMB24
		R1 ≠ R2	2.2	47			PUMH10	PUMD10	PUMB10	PEMH10	PEMD10	PEMB10
			4.7	10			PUMH18	PUMD18	PUMB18	PEMH18	PEMD18	PEMB18
			4.7	47			PUMH13	PUMD13	PUMB13	PEMH13	PEMD13	PEMB13
			10	47	PIMH9		PUMH9	PUMD9	PUMB9	PEMH9	PEMD9	PEMB9
			22	47			PUMH16	PUMD16	PUMB16	PEMH16	PEMD16	PEMB16
			47	22			PUMH17	PUMD17	PUMB17	PEMH17	PEMD17	PEMB17
			47/2.2	47/47				PUMD48			PEMD48	
		Only R1	2.2	-			PUMH30	PUMD30	PUMB30	PEMH30	PEMD30	PEMB30
			4.7	-			PUMH7	PUMD6	PUMB3	PEMH7	PEMD6	PEMB3
			10	-			PUMH4	PUMD4	PUMB4	PEMH4	PEMD4	PEMB4
			22	-			PUMH19	PUMD19	PUMB19	PEMH19	PEMD19	PEMB19
			47	-			PUMH14	PUMD14	PUMB14	PEMH14	PEMD14	PEMB14

RETs 500 mA

Package					SOT457 (SC-74)	SOT23	
Size (mm)					2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	
P_{tot} (mW)					600	250	
V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	2 x NPN	NPN	PNP
50	500	R1 = R2	1.0	1.0		PDTD113ET	PDTB113ET
			2.2	2.2		PDTD123ET	PDTB123ET
		R1 ≠ R2	1.0	10	**PIMN31**	PDTD113ZT	PDTB113ZT
			2.2	10		PDTD123YT	PDTB123YT
		Only R1	2.2	-		PDTD123TT	PDTB123TT

Low V_{CEsat} (BISS) RETs

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

Low V_{CEsat} (BISS) transistors single NPN

types in **bold blue** represent new products

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-62)		SOT23	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT666	SOT883 (SC-101)	SOT1061
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	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.6 x 1.2 x 0.55	1.0 x 0.6 x 0.5	2.0 x 2.0 x 0.65
P_{tot} (mW)											1700	1650	750		480	350	430	250	500	250	1650
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 = 0.5A; I_B = 0.05A	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	270/440	1	2	33	20	265	6	0.3											**PBSS4612PA**
15	0.5	1.0	200/325	0.01	2	360	-	250	0.5	0.05										PBSS2515M	
	0.5	1.0	200/425	0.01	2	300	200	250	0.5	0.05								PBSS2515E			
20	1.0	3.0	350/470	0.1	2	220	110 [2]	250	1	0.05					PBSS4120T						
	2.0	4.0	220/410	0.5	2	140	70	350	2	0.2									PBSS4220V		
	2.0	5.0	220/330	0.1	2	80	45	310	3	0.3					PBSS4320T						
	3.0	5.0	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								
	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	270/435	1	2	33	20	265	6	0.3											**PBSS4620PA**
30	1.0	3.0	300/450	0.5	2	240	120 [2]	270	1	0.05					PBSS4130T						
	2.0	3.0	300/450	0.5	2	120	70	320	2	0.2					PBSS4230T						
	3.0	5.0	300/490	0.5	2	80	45 [1]	300	3	0.3		PBSS4330X									
	5.1	10.2	300/480	0.5	2	30 [1]	20	220	5.1	0.255		PBSS303NX									
	5.5	11.0	300/480	0.5	2	31 [1]	20	240	5.5	0.275	PBSS303NZ										
	6.0	7.0	270/440	1	2	35	24	265	6	0.3											**PBSS4630PA**
40	0.5	1.0	200/550	0.01	2	380	200 [2]	250	0.5	0.05										PBSS2540M	
	0.5	1.0	200/350	0.01	2	380	190	250	0.5	0.05								PBSS2540E			
	1.0	3.0	300/ -	0.5	5	150	70	440	2	0.2									PBSS4140V		
	1.0	2.0	300/440	0.5	5	240	130	500	1	0.1						PBSS4140U					
	1.0	2.0	300/510	0.5	5	230	120	500	1	0.1					PMMT491A						
	1.0	2.0	300/420	0.5	5	150	130	500	1	0.1					PBSS4140T						
	2.0	3.0	300/400	0.5	5	150	70	400	2	0.2									PBSS4240V		
	2.0	3.0	350/470	0.1	2	120	70	320	2	0.2							PBSS4240Y				
	2.0	3.0	300/450	0.5	2	120	70	320	2	0.2					PBSS4240T						
	4.0	15.0	300/520	0.5	2	55	35	300	4	0.4			PBSS302ND								
	4.0	10.0	300/500	0.5	2	40	21	355	5	0.5		PBSS4540X									
	5.0	10.0	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					PBSS4350T						
	2.0	5.0	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								
	3.0	5.0	300/460	0.5	2	75	50	370	3	0.3		PBSS4350X									
	3.0	5.0	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									PBSS4160V		
	1.0	2.0	200/420	0.5	5	230	120	280	1	0.1						PBSS4160U					
	1.0	2.0	200/350	0.5	5	200	110	250	1	0.1					PBSS4160T						
	3.0	6.0	345/570	0.5	2	65	40	260	3	0.3			PBSS303ND								
	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	260/420	1	2	34	21	275	6	0.3											**PBSS4560PA**
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	250/400	1	2	40	25	295	5.6	0.28											**PBSS4580PA**
100	1.0	3.0	150/400	0.25	10	160	80	200	1	0.1							PBSS8110Y				
	1.0	3.0	150/300	0.25	10	165	70	200	1	0.1					PBSS8110T						
	1.0	3.0	150/290	0.25	10	160	75	200	1	0.1			PBSS8110D								
	1.0	3.0	150/290	0.25	10	165	73	200	1	0.1		PBSS8110X									
	1.0	3.0	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	150/230	1	2	48	28	325	5.2	0.26											**PBSS8510PA**

[1] I_C/I_B = 20
[2] V_{CEsat} (max)

Low V_{CEsat} (BISS) transistors single PNP

types in **bold blue** represent new products

Package											SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-62)		SOT23	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT666	SOT883 (SC-101)	SOT1061
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	2.0 x 1.25 x 0.95	1.6 x 0.8 x 0.77	1.6 x 1.2 x 0.55	1.0 x 0.6 x 0.5	2.0 x 2.0 x 0.65
P_{tot} (mW)											1700	1650	750		480	350	430	250	500	250	1650
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 = 0.5A; I_B = 0.05A	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	200/320	1	2	32	20	280	6	0.3											**PBSS5612PA**
15	0.5	1.0	200/260	0.01	2	300	150	250	0.5	0.05										PBSS3515M	
	0.5	1.0	200/325	0.01	2	300	150	250	0.5	0.05								PBSS3515E			
20	1.0	2.0	300/450	0.1	2	250	125 [2]	250	1	0.05					PBSS5120T						
	2.0	4.0	220/440	0.1	2	140	75	390	2	0.2									PBSS5220V		
	2.0	3.0	225/ -	0.5	2	115	80 [2]	225	2	0.2					PBSS5220T						
	2.0	5.0	220/420	0.5	2	75	50	210	2	0.2					PBSS5320T						
	3.0	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									
	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	200/335	1	2	35	23	300	6	0.3											**PBSS5620PA**
30	1.0	3.0	260/350	0.5	2	220	110	225	1	0.05					PBSS5130T						
	2.0	3.0	300/450	0.1	2	160	70	350	2	0.2					PBSS5230T						
	3.0	5.0	200/380	0.5	2	80	50	320	3	0.3		PBSS5330X									
	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	1	2	37	24	315	6	0.3											**PBSS5630PA**
40	0.5	1.0	200/380	0.01	2	440	220	350	0.5	0.05										PBSS3540M	
	0.5	1.0	200/380	0.01	2	440	230	350	0.5	0.05								PBSS3540E			
	1.0	2.0	300/ -	0.1	5	200	120	310	1	0.1									PBSS5140V		
	1.0	2.0	300/520	0.1	5	230	130	500	1	0.1						PBSS5140U					
	1.0	2.0	300/800	0.1	5	250	130	500	1	0.1					PMMT591A						
	1.0	2.0	300/510	0.1	5	230	130	500	1	0.1					PBSS5140T						
	1.8	3.0	300/450	0.1	5	185	100	530	2	0.2									PBSS5240V		
	2.0	3.0	300/ -	0.1	2	200	110 [2]	350	2	0.2							PBSS5240Y				
	2.0	3.0	300/450	0.1	2	150	70	350	2	0.2					PBSS5240T						
	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									
	5.0	10.0	250/350	0.5	2	55	40 [1]	160	2	0.2	PBSS5540Z										
50	2.0	3.0	200/ -	0.5	2	150	90 [2]	300	2	0.1					PBSS5250T						
	2.0	5.0	200/360	0.5	2	90	55	270	2	0.2					PBSS5350T						
	2.0	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								
	3.0	5.0	200/375	0.5	2	120	70	390	3	0.3		PBSS5350X									
	3.0	5.0	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									PBSS5160V		
	1.0	2.0	150/250	0.5	5	255	135	340	1	0.1						PBSS5160U					
	1.0	2.0	150/250	0.5	5	220	120	330	1	0.1					PBSS5160T						
	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	1	2	52	31	375	5	0.25											**PBSS5560PA**
80	3.0	5.0	155/225	0.5	2	71	55	290	3	0.3			PBSS304PD								
	4.0	10.0	200/300	0.5	2	50	35	380	5	0.5		PBSS5480X									
	4.0	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										
	4.5	5.0	170/265	1	2	63	35	420	4.5	0.225											**PBSS5580PA**
100	1.0	3.0	150/ -	0.25	5	170	93	320	1	0.1							PBSS9110Y				
	1.0	3.0	150/350	0.5	5	170	95	320	1	0.1					PBSS9110T						
	1.0	3.0	150/350	0.5	5	170	100	320	1	0.1			PBSS9110D								
	1.0	3.0	150/350	0.5	5	170	90	320	1	0.1		PBSS9110X									
	1.0	3.0	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								
	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										
	3.0	4.0	170/275	1	2	95	43	400	3.0	0.15											**PBSS9410PA**

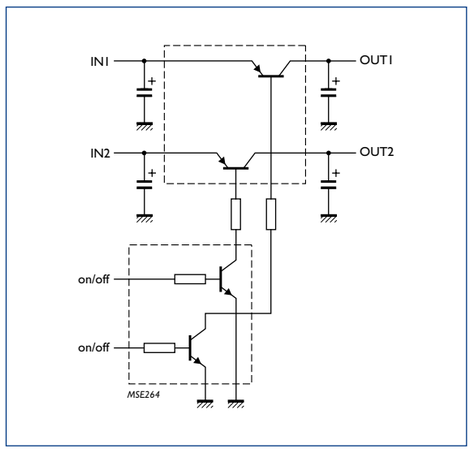
[1] I_C/I_B = 20
[2] V_{CEsat} (max)

Low V_{CEsat} (BISS) transistors double

Package										SOT96 (SO8)	SOT457 (SC-62)	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 [4]	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 = 0.5A; I_B = 0.05A	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
	0.5	2 x PNP	200	0.01	2	170 [1]	250	0.5	0.05				PBSS3515VS
	0.5	NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05				PBSS2515VPN
	0.5	NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05			PBSS2515YPN	
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			
	2.7	2 x PNP	200	0.5	2	60	370	2.7	0.27	PBSS5350SS			
	2.7	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		
	1.0	2 x PNP	150	0.5	5	120	330	1	0.1		PBSS5160DS		
	1.0	NPN/PNP	200/150	0.5	5	115/120	250/330	1	0.1		PBSS4160DPN		

[1] I_C/I_B = 20

Dual load switch using double RETs and double BISS transistors



Low V_{CEsat} (BISS) loadswitches

types in **bold blue** represent new products

Package				SOT96 (SO8)	SOT457 (SC-62)	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)				1500 [1]	600 [1]	300 [2]	300 [2]
V_{CEO} (V)	I_C (A)	V_{CEsat} typ (mV); I_C = 0.5A; I_B = 0.05A	R1, R2 (kΩ)				
15	0.5	250	2.2			PBLS1501Y	PBLS1501V
			4.7			PBLS1502Y	PBLS1502V
			10			PBLS1503Y	PBLS1503V
			22			PBLS1504Y	PBLS1504V
20	1	150	2.2		PBLS2001D		
			4.7		PBLS2002D		
			10		PBLS2003D		
			22		PBLS2004D		
20	1.6	70	2.2		**PBLS2021D**		
			4.7		**PBLS2022D**		
			10		**PBLS2023D**		
			22		**PBLS2024D**		
20	3	75	2.2	PBLS2001S			
			4.7	PBLS2002S			
			10	PBLS2003S			
40	1	170	2.2		PBLS4001D		
			4.7		PBLS4002D		
			10		PBLS4003D		
			22		PBLS4004D		
			47		PBLS4005D		
60	1	180	2.2		PBLS6001D		
			4.7		PBLS6002D		
			10		PBLS6003D		
			22		PBLS6004D		
			47		PBLS6005D		
60	1.3	100	2.2		**PBLS6021D**		
			4.7		**PBLS6022D**		
			10		**PBLS6023D**		
			22		**PBLS6024D**		

[1] Device mounted on a ceramic PCB, Al_2O_3, standard footprint
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint

Key features

- Low V_{CEsat} (BISS) transistor and resistor-equipped transistor (RET) in one package
- Low saturation voltage
- Low 'threshold' voltage (< 1 V) compared to MOSFET
- Low drive power required
- Range of small, very small and ultra small packages

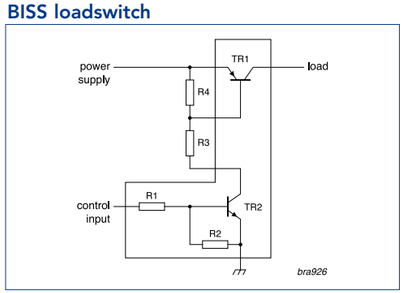
Key benefits

- Smaller end products
- Reduced component count
- Less sourcing effort
- Fewer solder points increase reliability
- Cost reduction
- More efficient, cooler running systems

Key applications

- Supply line switch
- Battery charger
- High-side switch for LEDs, drivers and backlights
- Portable equipment

BISS loadswitch



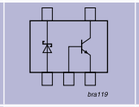
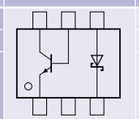
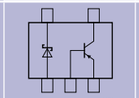
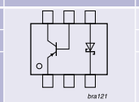
High voltage low V_{CEsat} (BISS) transistors

types in **bold blue** represent new products

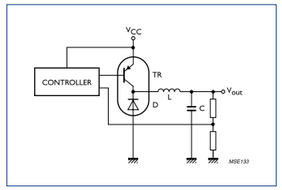
Package				SOT223 (SC-73) 	SOT89 (SC-62) 	SOT23 
Size (mm)				6.5 x 3.5 x 1.65	4.5 x 2.5 x 1.5	2.9 x 1.3 x 1.0
P_{tot} (mW)				1700	1300	250
Polarity	**V_{CESM}[1] (V)**	**V_{CEO} (V)**	**I_C (A)**			
NPN	-	150	1	PBHV8115Z	**PBHV8115X**	PBHV8115T
	500	400	0.5	PBHV8540Z	**PBHV8540X**	PBHV8540T
PNP	-	150	1	PBHV9115Z	**PBHV9115X**	PBHV9115T
	500	400	0.25	PBHV9040Z	**PBHV9040X**	PBHV9040T

[1] Collector-emitter peak voltage

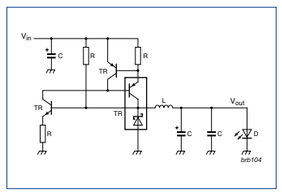
Low V_{CEsat} modules – Schottky diode / (BISS) transistor module

Package							Configuration	SOT457 (SC-74) 	SOT353 (SC-88A)
Size (mm)								2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95
P_{tot} (mW)								500	250
Transistor			**Schottky rectifier**						
V_{CEO} max (V)	**I_C max (A)**	**V_{CEsat} max (mV)**	**I_F max (A)**	**V_R max (V)**	**V_F max (V)**				
15	0.5	250	0.5	20	390	 bra119			PMEM1505NG
40	1.0	210	1	20	550	 bra118		PMEM4010ND	
	2.0	400	1	20	550			PMEM4020ND	
				40	640			PMEM4020AND	
15	0.5	250	0.5	20	390	 bra122			PMEM1505PG
40	1.0	410	1	20	550	 bra121		PMEM4010PD	
	2.0	530	1	20	550			PMEM4020PD	
					640			PMEM4020APD	

Step-down DC/DC converter



Power LED driver



Key features

- Combination of low V_F (MEGA) Schottky rectifier and low V_{CEsat} (BISS) transistor in one package
- High forward current capability
- Low power dissipation

Key applications

- DC/DC conversion
- Inductive load driver
- Push-pull driver

Key benefits

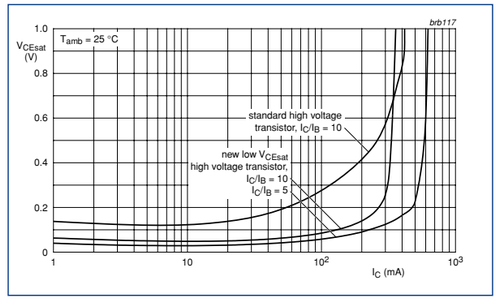
- Reduced component count
- Space savings of up to 32 %
- Higher efficiency
- Higher power density
- Cost reduction potential
- Simplified circuit design

Low V_{CEsat} (BISS) RETs

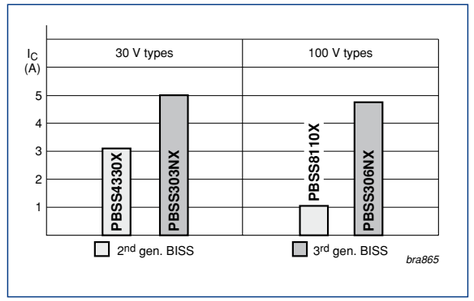
Package						SOT23 
Size (mm)						2.9 x 1.3 x 1.0
P_{tot} (mW)						250
Polarity	**V_{CEO} (V)**	**I_C (mA)**		**R1 (kΩ)**	**R2 (kΩ)**	
NPN	40	600	R1 = R2	1	1	PBRN113ET
				2.2	2.2	PBRN123ET
			R1 ≠ R2	1	10	PBRN113ZT
				2.2	10	PBRN123YT
PNP	40	600	R1 = R2	1	1	PBRP113ET
				2.2	2.2	PBRP123ET
			R1 ≠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

Advantages of low V_{CEsat} (BISS) technology

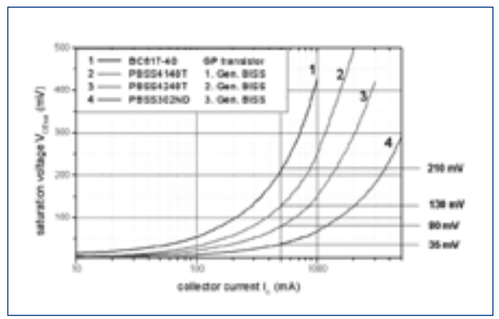
High voltage low V_{CEsat} (BISS)
V_{CEsat} improvement leads to higher I_C capability



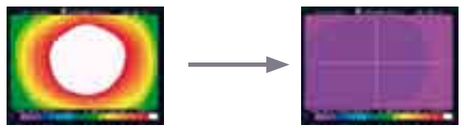
Improved collector current capabilities



Saturation voltage:
General purpose versus low V_{CEsat} (BISS) transistors (NPN in SOT23/SOT457)



65 % heat reduction by BISS transistors



General purpose transistor T_{case} = 110°C

3rd generation BISS transistor T_{case} = 40°C

Temperature profile of device surface (T_{case}). Comparison of a general purpose transistor and a 3rd generation BISS transistor.

Medium power low V_{CEsat} (BISS) transistors NPN

Package												SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-62)
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
Polarity	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 = 0.5A; I_B = 0.05A	V_{CEsat} max (mV)	@ I_C (A)	@ I_B (A)			
NPN	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		
	20	3.0	5.0	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
		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		
	30	3.0	5.0	300/490	0.5	2	80	45 [1]	300	3	0.3		PBSS4330X	
		5.1	10.2	300/480	0.5	2	30 [1]	20	220	5.1	0.255		PBSS303NX	
		5.5	11.0	300/480	0.5	2	31 [1]	20	240	5.5	0.275	PBSS303NZ		
	40	4.0	15.0	300/520	0.5	2	55	35	300	4	0.4			PBSS302ND
		4.0	10.0	300/500	0.5	2	40	21	355	5	0.5		PBSS4540X	
		5.0	10.0	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			
		2.0	5.0	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
		3.0	5.0	300/460	0.5	2	75	50	370	3	0.3		PBSS4350X	
		3.0	5.0	200/280	0.5	2	110	60 [1]	290	2	0.2	PBSS4350Z		
	60	3.0	6.0	345/570	0.5	2	65	40	260	3	0.3			PBSS303ND
		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		
	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		
	100	1.0	3.0	150/290	0.25	10	160	75	200	1	0.1			PBSS8110D
		1.0	3.0	150/290	0.25	10	165	73	200	1	0.1		PBSS8110X	
		1.0	3.0	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		

[1] I_C/I_B = 20
[2] V_{CEsat} (max)

Medium power low V_{CEsat} (BISS) transistors PNP

Package												SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-62)
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
Polarity	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 = 0.5A; I_B = 0.05A	V_{CEsat} max (mV)	@ I_C (A)	@ I_B (A)			
PNP	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		
	20	3.0	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	
		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		
	30	3.0	5.0	200/380	0.5	2	80	50	320	3	0.3		PBSS5330X	
		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		
	40	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	
		5.0	10.0	250/350	0.5	2	55	40 [1]	160	2	0.2	PBSS5540Z		
	50	2.0	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
		3.0	5.0	200/375	0.5	2	120	70	390	3	0.3		PBSS5350X	
		3.0	5.0	200/300	0.5	2	120	70	300	2	0.2	PBSS5350Z		
	60	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		
	80	3.0	5.0	155/225	0.5	2	71	55	290	3	0.3			PBSS304PD
		4.0	10.0	200/300	0.5	2	50	35	380	5	0.5		PBSS5480X	
		4.0	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	150/350	0.5	5	170	100	320	1	0.1			PBSS9110D
		1.0	3.0	150/350	0.5	5	170	90	320	1	0.1		PBSS9110X	
		1.0	3.0	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
		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		

[1] I_C/I_B = 20
[2] V_{CEsat} (max)

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

Voltage regulator IC

types in **bold blue** represent new products

Package				SOT23
Size (mm)				2.9 x 1.3 x 1.0
P_{tot} (mW)				480
V_{KA} (V)	I_k (A)	V_{ref}	T_{amb}	
36	150	2%	0 to 70°C	**TL431CDBZR**
			-40 to 85°C	**TL431IDBZR**
			-40 to 125°C	**TL431QDBZR** **TL431SDT** [1]
		1%	0 to 70°C	**TL431ACDBZR**
			-40 to 85°C	**TL431AIDBZR**
			-40 to 125°C	**TL431AQDBZR** **TL431ASDT** [1]

[1] optimized for use with dedicated capacitive load

Discrete voltage regulators

Package					SOT223 (SC-73)	SOT457 (SC-74)
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)	V_{CEO} (V)	I_c (A)	h_{FE} min		
	@ I_z = 5 mA			@ 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
- Output power dissipation capability: 1300 mW in SOT223 and 380 mW in SOT457
- SMD plastic packages

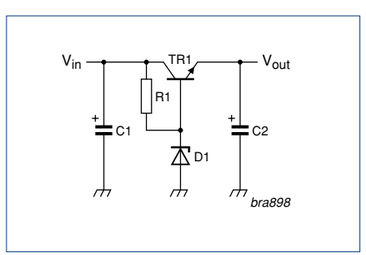
Key benefits

- Component count reduction
- Board space reduction
- Improved reliability

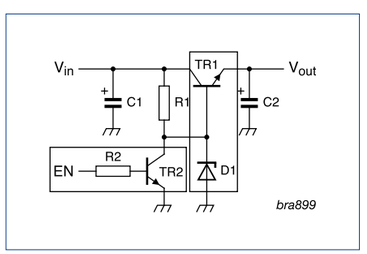
Key applications

- Linear voltage regulation

Standard voltage regulator. PVR-series already include TR1 and D1, internally connected



A resistor-equipped transistor (RET) adds an output enable function



Constant current source

Package	SOT353 (SC-88A)						
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)	$\Delta I_{out}/I_{out}$ typ (%)	$\Delta I_{out}/(I_{out} * \Delta T_{amb})_{typ}$ (%/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

- Single-chip constant current source
- Output current set by an external resistor
- Very small footprint package

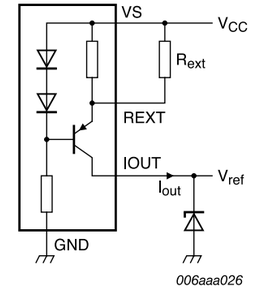
Key benefits

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

Key applications

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

Voltage reference



Audio solutions

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	-	high-ohmic speaker (> ~8 Ω)	IP4048CX5/LF	5 ball CSP	0.91 x 1.28 x 0.65
		15 Ω	5000	-	high-ohmic speaker (> ~8 Ω)	IP5311CX5/LF	5 ball CSP	0.80 x 1.16 x 0.61
		68 Ω	110	-	single-ended or differential microphone	IP4049CX5/LF	5 ball CSP	0.91 x 1.28 x 0.65
		470 Ω	35	-	single-ended or differential microphone	IP4055CX6/LF	6 ball CSP	1.56 x 1.03 x 0.65
		470 Ω	35	-	single-ended or differential microphone	IP4355CX6/LF	6 ball CSP	1.16 x 0.76 x 0.65
		50 Ω / 2200 Ω	2000	-	single-ended to quasi-differential microphone channel with integrated biasing network	IP5002CX8/LF	8 ball CSP	1.67 x 1.67 x 0.65
		50 Ω	4000	-	differential microphone filter with integrated biasing network for ΣΔ ADC converters	IP5006CX11/LF	11 ball CSP	1.41 x 1.91 x 0.65
		5 Ω / 20 Ω / 1.5 kΩ	9450	-	differential microphone filter with integrated biasing network for ΣΔ including coupling capacitors	IP5020CX16/LF	16 ball CSP	2.01 x 1.91 x 0.65
	4	10 kΩ	5000	-	dual differential speaker	IP5040CX11/LF	11 ball CSP	1.41 x 2.01 x 0.65
	5	15 Ω / 95 Ω	65 / 33	-	single-ended microphone and high-ohmic speaker (> ~8 Ω) with integrated 2 kohm pull-up resistor	IP4363CX10/LF	10 ball CSP	0.76 x 1.96 x 0.61
	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	IP4025CX20/LF	20 ball CSP	1.98 x 2.53 x 0.65
		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
		50 Ω / 10 Ω	50 / 100 / 1000	-	fully integrated audio interface protection for differential microphone and differential speaker, including EMI filtering and pull up resistors	IP4125CX20/LF	20 ball CSP	2.00 x 2.66 x 0.65
	8	0.8 Ω / 30 Ω / 200 Ω	20 / 50 / 150	~20	fully integrated audio interface protection including EMI filtering for microphone and speaker, and additional 4-channel EMI filter	IP4110CX20/LF	20 ball CSP	1.91 x 2.47 x 0.65

MMC, SD & SIM cards solutions

types in **bold blue** 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	1	47 Ω / 100 Ω	10	~20	Integrated low capacitance SIM-Card & USB passive filter array with ESD protection	**IP4365CX11**	11 ball CSP	1.16 x 1.56 x 0.61
	3	47 Ω / 100 Ω	40	~12	EMI filter, ESD protection	IP4044CX8/LF	8 ball CSP	1.46 x 1.49 x 0.65
		47 Ω / 100 Ω	20	~20	EMI filter, ESD protection	IP4064CX8/LF/S	8 ball CSP	1.41 x 1.41 x 0.65
		47 Ω / 100 Ω	20	~20	EMI filter, ESD protection, extremely small size	IP4364CX8/LF	8 ball CSP	1.16 x 1.16 x 0.61
		47 Ω / 100 Ω	10	~20	Integrated low capacitance SIM-Card passive filter array with ESD protection	**IP4366CX8/LF**	8 ball CSP	1.21 x 1.21 x 0.66
		47 Ω / 100 Ω	40	~12	EMI filter, ESD protection	IP4264CZ8-40	8 pin QFN 	1.7 x 1.35 x 0.5
		47 Ω / 100 Ω	20	~20	EMI filter, ESD protection	IP4264CZ8-20	8 pin QFN 	1.7 x 1.35 x 0.5
		-	1	~240	ESD protection	IP4221CZ6-S	SOT886 (XSON6) 	1.45 x 1.0 x 0.5

MMC, SD & SIM cards solutions

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)					
Memory cards	4	47 Ω / 13 kΩ / 56 kΩ	25	~30	MMC ESD protection, pull-up resistors	IP4051CX11/LF	11 ball CSP	1.44 x 1.96 x 0.65
		50 Ω / 75 kΩ / 7 kΩ	18	~50	high-speed MMC ESD protection, pull-up resistors	IP4060CX16/LF	16 ball CSP	1.96 x 1.97 x 0.65
	7	40 Ω / 50 kΩ / 25 kΩ	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
	9	15 Ω / 50 kΩ / 15 kΩ	8	> 52	(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 kΩ / 15 kΩ	20	> 52	(mini) SD card/trans flash ESD protection, EMI filter, pull-up resistor	IP4352CX24/LF	24 ball CSP	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 kΩ / 15 kΩ	-	> 52	(mini) SD/SDIO memory card level shifter and voltage regulator, incl. ESD and EMI filter	IP4853CX24/LF	24 ball CSP	2.01 x 2.01 x 0.61

USB 2.0 & USB 1.1 solutions

types in **bold blue** 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)					
USB (CSP Package)	1	47 Ω / 100 Ω	10	~20	Integrated low capacitance SIM-Card & USB passive filter array with ESD protection	**IP4365CX11**	11 ball CSP	1.16 x 1.56 x 0.61
	2	33 Ω / 1.3 kΩ	30	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection, pull-up resistors and impedance matching	IP4056CX8/LF	8 ball CSP	1.27 x 1.83 x 0.65
		33 Ω / 1.3 kΩ / 10 kΩ	30	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection, pull-up resistors and impedance matching	IP4057CX10/LF	10 ball CSP	1.56 x 1.91 x 0.65
		33 Ω / 1.3 kΩ / 17 kΩ / 15 kΩ	27	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection, pull-up resistors and impedance matching	IP4065CX11/LF	11 ball CSP	1.47 x 1.97 x 0.65
		33 Ω / 1.5 kΩ	35	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection, pull-up resistors and impedance matching on NXP ISP110x, ISP130x, ISP136x	IP4058CX8/LF	8 ball CSP	0.91 x 1.91 x 0.65
		17 Ω / 1.5 kΩ	35	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection, pull-up resistors and impedance matching on NXP ISP110x, ISP130x, ISP136x	IP4158CX8/LF	8 ball CSP	0.91 x 1.91 x 0.65
		33 Ω	35	~5.5	fully integrated USB2.0 low / full-speed interface with EMI filter, ESD protection and impedance matching on NXP ISP1110	IP4078CX6/LF	6 ball CSP	0.91 x 1.41 x 0.65
		-	1.3	~1 GHz	USB2.0 high-speed ESD protection on NXP ISP1504/01 HS transceiver	IP4359CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
	3	-	3	~240	USB2.0 high-speed ESD protection on NXP ISP176x and ISP1504	IP4059CX5/LF	5 ball CSP	0.96 x 1.34 x 0.65
		-	1.3	5.5	USB2.0 high-speed ESD protection on NXP ISP176x and ISP1504	**IP4358CX6/LF**	6 ball CSP	0.76 x 1.16 x 0.41

Interface	Number of protected lines	Buffer	Level shifter	C_{line} (pF)	Resistor (Ω)	Remark	Type	Package	Size (mm)
USB (Plastic Package)	3	-	1.0	~240	-	USB2.0 high-speed ESD protection on NXP ISP1504/01 HS transceiver	IP4221CZ6-S	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
	4	-	-	1	-	ESD protection	IP4220CZ6	SOT457 (SC-74) 	2.9 x 1.5 x 1.0

USB 2.0 & USB 1.1 solutions

types in **bold blue** represent new products

Interface	Number of protected lines	Buffer	Level shifter	C_{line} (pF)	Resistor (Ω)	Remark	Type	Package	Size (mm)
USB (Plastic Package)	4	-	-	1	-	Dual USB 2.0, ESD protection	IP4220CZ6	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		-	-	1	-	ESD protection, as IP4220CZ6 but different bonding	PRTR5V0U4AD	SOT457 (SC-74) 	2.9 x 1.5 x 1.1
		-	-	1	-	ESD protection, as IP4220CZ6 but different pagckage	PRTR5V0U4Y	SOT363 (SC-88) 	2.0 x 1.25 x 0.95
		-	-	1	-	USB 2.0 high- speed, SD-Card, SIM card	IP4221CZ6-S	SOT886 (XSON6) 	1.0 x 1.0 x 0.5
		-	-	1	-	USB 2.0 high- speed, SD-Card, SIM card	IP4221CZ6-XS	SOT891 (XSON6) 	2.9 x 1.5 x 1.0
		-	-	1.5	0.9	2-channel common mode filter with integrated ESD protection	**IP3219CZ6**	SOT1082-1 (VSON6U) 	2.3 x 3.5 x 0.85
		-	-	3	1	>15kv contact ESD protection with pi-filter	IP4225CZ10	SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		2	-	0.9	-	ESD protection	**IP4242CZ6**	SOT886 (XSON6) 	1.45 x 1.0 x 0.5

Multichannel, battery, generic ESD & special diode solutions

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)					
Reverse battery	1	-	240	-	overvoltage and reverse battery protection	IP4085CX4/LF	4 ball CSP	0.91 x 0.91 x 0.65
		-	450	-	overvoltage and reverse battery protection	IP4385CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
		-	220	-	overvoltage and reverse battery protection	IP4386CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
		-	290	-	overvoltage and reverse battery protection	IP4387CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
Multi-channel filters e.g.: Bottom connector LCD display Camera interface Keypad connector	1	75 Ω	36	~40	EMI filter, ESD protection with common ground	IP4307CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
		100 Ω	30	~40	EMI filter, ESD protection	IP4256CZ3-M	SOT883 	1 x 0.6 x 0.5
	2	100 Ω	30	~40	EMI filter, ESD protection	IP4256CZ5-W	SOT665 	1.6 x 1.2 x 0.5
		100 Ω	30	~40	EMI filter, ESD protection	IP4256CZ6-F	SOT886 	1.0 x 1.0 x 0.5

Multichannel, battery, generic ESD & special diode solutions

types in **bold blue** 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)					
Multi-channel filters e.g.: Bottom connector LCD display Camera interface Keypad connector	4	100 Ω	15	~50	EMI filter, ESD protection	IP4251CZ8-4	8 pin QFN 	1.7 x 1.35 x 0.5
		40 Ω	18	~70	EMI filter, ESD protection	IP4252CZ8-4	8 pin QFN 	1.7 x 1.35 x 0.5
		100 Ω	45	~30	EMI filter, ESD protection	IP4254CZ8-4	8 pin QFN 	1.7 x 1.35 x 0.5
		200 Ω	45	~30	EMI filter, ESD protection	IP4253CZ8-4	8 pin QFN 	1.7 x 1.35 x 0.5
		100 Ω	60	~20	EMI filter, ESD protection plus 4x ESD	IP4054CX15/LF	15 ball CSP	2.96 x 1.32 x 0.65
	6	100 Ω	15	~50	EMI filter, ESD protection	IP4251CZ12-6	12 pin QFN 	2.5 x 1.35 x 0.5
		40 Ω	18	~70	EMI filter, ESD protection	IP4252CZ12-6	12 pin QFN 	2.5 x 1.35 x 0.5
		100 Ω	45	~30	EMI filter, ESD protection	IP4254CZ12-6	12 pin QFN 	2.5 x 1.35 x 0.5
		200 Ω	45	~30	EMI filter, ESD protection	IP4253CZ12-6	12 pin QFN 	2.5 x 1.35 x 0.5
		100 Ω	60	~20	EMI filter, ESD protection	IP4053CX15/LF	15 ball CSP	2.96 x 1.32 x 0.65
		100 Ω	30	~40	EMI filter, ESD protection	IP4153CX15/LF	15 ball CSP	2.91 x 1.28 x 0.65
		100 Ω	60	~20	EMI filter, ESD protection	**IP4353CX15/LF**	15 ball CSP	2.38 x 1.05 x 0.61
	7	70 Ω	25	~40	EMI filter, ESD protection, extremely small size	IP4337CX18/LF/E	18 ball CSP	1.96 x 1.61 x 0.61
		125 Ω	25	~60	60 nH coils RLC filter	IP3337CX18/LF	18 ball CSP	2.11 x 1.81 x 0.61
	8	100 Ω	15	~50	EMI filter, ESD protection	IP4251CZ16-8	16 pin QFN 	3.3 x 1.35 x 0.5
		40 Ω	18	~70	EMI filter, ESD protection	IP4252CZ16-8	16 pin QFN 	3.3 x 1.35 x 0.5
		100 Ω	45	~30	EMI filter, ESD protection	IP4254CZ16-8	16 pin QFN 	3.3 x 1.35 x 0.5
		200 Ω	45	~30	EMI filter, ESD protection	IP4253CZ16-8	16 pin QFN 	3.3 x 1.35 x 0.5
		100 Ω	50	~25	EMI filter, ESD protection	IP4088CX20/LF	20 ball CSP	3.91 x 1.28 x 0.65

Multichannel, battery, generic ESD & special diode solutions

types in **bold blue** represent new products

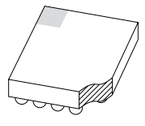
Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed (MHz)	Remark	Type	Package	Size (mm)
		R_{line}	C_{line} (pF)					
Multi-channel filters e.g.: Bottom connector LCD display Camera interface Keypad connector	7	125 Ω	25 / 60 [1]	200	EMI filter, ESD protection	**IP3337CX18/LF**	18 ball CSP	2.06 x 1.66 x 0.61
	10	80 Ω	40	~30	EMI filter, ESD protection	IP4032CX25/LF	25 ball CSP	2.41 x 2.41 x 0.65
		80 Ω	40	~30	EMI filter, ESD protection (higher tolerances as IP4032CX25/LF)	IP4033CX25/LF	25 ball CSP	2.41 x 2.41 x 0.65
		84 Ω	14	~40	EMI filter, ESD protection	IP4040CX25/LF	25 ball CSP	2.41 x 2.46 x 0.65
		200 Ω	50	~20	EMI filter, ESD protection	IP4041CX25/LF/S	25 ball CSP	2.41 x 2.41 x 0.65
		1 kΩ	50	< 1	EMI filter, ESD protection	IP4035CX24/LF	24 ball CSP	2.46 x 2.44 x 0.65
		200 Ω	50	~20	EMI filter, ESD protection, extremely small size	IP4341CX25/LF	25 ball CSP	2.01 x 2.01 x 0.61
		70 Ω	25	~40	EMI filter, ESD protection, extremely small size	IP4338CX24/LF	24 ball CSP	1.96 x 2.01 x 0.61
		125 Ω	25	~60	60 nH coils RLC filter	IP3338CX24/LF	24 ball CSP	2.11 x 2.21 x 0.61
		125 Ω	25 / 60 [1]	200	EMI filter, ESD protection	IP3338CX24/LF	24 ball CSP	2.11 x 2.11 x 0.61
Generic ESD protection	1	-	10	~40	1x back-to-back diode with one common ground, extremely small size	IP4302CX2/LF	2 ball CSP	0.52 x 0.7 x 0.61
	2	-	10	~40	2x back-to-back diode with one common ground, extremely small size	IP4303CX4/LF	4 ball CSP	0.76 x 0.76 x 0.61
		-	0.6	-	16V Ultra low capacitance ESD protection in 4 mm pitch	**IP4361CX4/LF**	4 ball CSP	0.76 x 0.76 x 0.61
	4	-	30	~30	4x single diode with one common ground	IP4042CX5/LF	5 ball CSP	0.91 x 1.28 x 0.65
		-	14	~40	4x single diode with one common ground	IP4142CX5/LF	5 ball CSP	0.91 x 1.28 x 0.65
		-	15	Breakdown: min. 5.5V	Quad diode array with ESD protection	**IP4332CX5/LF**	5 ball CSP	0.76 x 1.06 x 0.61
		-	16	~40	4x back-to-back diode with one common ground	IP4043CX5/LF	5 ball CSP	1.12 x 1.12 x 0.65
		-	16	~40	4x back-to-back diode with one common ground, extremely small size	IP4343CX5/LF	5 ball CSP	0.93 x 0.93 x 0.61

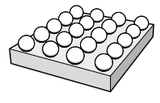
[1] second value is L_{Line} (nH)

			C_{line} (pF)	Diode Voltage	Remark	Type	Package	Size (mm)
Special Diode	1	-	65	Breakdown: min. 20V Forward: 0.25 - 0.5V	Schottky Power Diode in WLCSP	IP4306CX2/LF	2 ball CSP	0.49 x 0.67 x 0.38
	2	-	19	Breakdown: min. 15V Forward: 0.25 - 0.45V	1x back-to-back diode with integrated dual Schottky diode array incl. ESD protection	IP4305CX4/LF	4 ball CSP	0.96 x 0.96 x 0.61

NXP Wafer-Level Chip Scale Package (WL-CSP)

- Smallest possible solution for ESD and EMI circuits, saving maximum of space
- Lowest parasitic inductance to GND contact, ensures best performance
- High mechanical robustness





HDMI, DVI, DP, VGA, IEEE1394, LAN & LVDS solutions

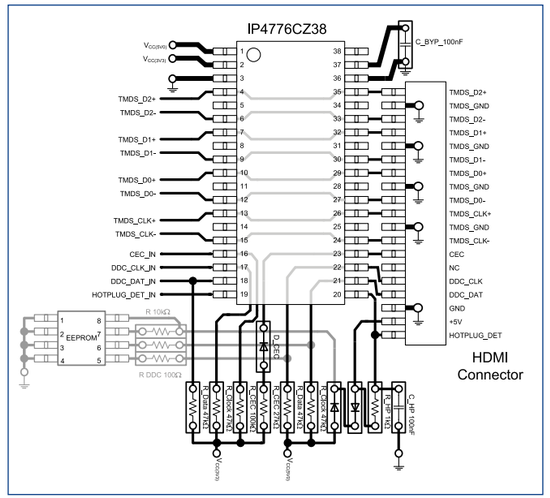
types in **bold blue** represent new products

Interface	Number of protected lines	Buffer	Level shifter	C_{line} (pF)	Resistor (Ω)	Remark	Type	Package	Size (mm)
VGA	7	yes	yes	5	55	H&V sync buffer, DDC level shifter	IP4770 CZ16	SOT519 (SSOP16)	4.9 x 3.9 x 1.73
		yes	yes	5	65	H&V sync buffer, DDC level shifter	IP4771 CZ16		
		yes	yes	5	10	H&V sync buffer, DDC level shifter	IP4772 CZ16		
		yes	no	4	10	VGA receivers, H&V sync buffer	IP4773CZ14	SOT337 (SSOP14)	6.2 x 5.3 x 2
		yes	no	4	10	VGA receivers, H sync buffer	**IP4774CZ14**		
		no	yes	4	1.3 - 2.4	VGA receivers, DDC level shifter	**IP4769CZ14**	SOT402-1 (TSSOP14)	5.0 x 4.4 x 1.1
Display Port	2	-	-	0.5	1.3 - 2.4	ESD protection for High Speed Interfaces	**IP4285CZ6**	SOT886 (XSON6)	1.45 x 1.0 x 0.5
								SOT457 (SC-74)	2.9 x 1.5 x 1.0
								SOT363 (SC-88)	2.0 x 1.25 x 1.0
	4	-	-	0.6	-	ESD protection for Ultra High Speed Interfaces	IP4283CZ10-TB	SOT1059 (XSON10U)	1 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
		-	-	0.6	1.3 - 2.4	ESD protection for High Speed Interfaces	**IP4286CZ6**	SOT886 (XSON6)	1.45 x 1.0 x 0.5
								SOT457 (SC-74)	2.9 x 1.5 x 1.0
								SOT363 (SC-88)	2.0 x 1.25 x 1.0
	11	-	-	0.7	-	ESD protection	IP4790CZ38	SOT510 (TSSOP38)	9.7 x 4.4 x 1.1
IEEE1394	4	-	-	5	55	ESD protection and termination for IEEE1394	IP4224CZ6	SOT457(SC-74)	2.9 x 1.5 x 1.0
LAN	4	-	-	1	-	Ethernet ESD protection	IP4220CZ6	SOT457 (SC-74)	2.9 x 1.5 x 1.0
		-	-	1	-	Ethernet line surge ESD protection	**IP4233CZ6**	SOT363 (SC-88)	2.0 x 1.25 x 1.0
LVDS	10	-	-	5	100	100Ω termination	IP4263CZ14	SOT108(SO14)	8.65 x 3.9 x 1.75

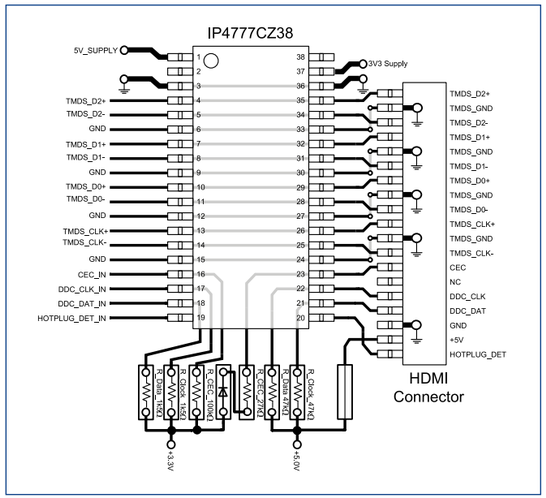
HDMI, DVI, DP, VGA, IEEE1394, LAN & LVDS solutions

Interface	Number of protected lines	Buffer	Level shifter	C_{line} (pF)	Resistor (Ω)	Remark	Type	Package	Size (mm)
HDMI	2	-	-	0.5	1.3 - 2.4	ESD protection for High Speed Interfaces	**IP4285CZ6**	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
								SOT457 (SC-74) 	2.9 x 1.5 x 1.0
								SOT363 (SC-88) 	2.0 x 1.25 x 1.0
	4	-	-	0.6	1.3 - 2.4	ESD protection for High Speed Interfaces	**IP4286CZ6**	SOT886 (XSON6) 	1.45 x 1.0 x 0.5
								SOT457 (SC-74) 	2.9 x 1.5 x 1.0
		-	-	1	-	ESD protection	PRTR5V0U4D	SOT457(SC-74) 	2.0 x 1.25 x 0.95
		-	-	1	-	ESD protection	PRTR5V0U4Y	SOT363(SC-88) 	3.0 x 3.0 x 1.1
		-	-	0.7	-	ESD protection	IP4280CZ10	SOT552 (TSSOP10) 	
		-	-	0.7	-	ESD protection for Ultra High Speed Interfaces	IP4281CZ10	SOT1059 (XSON10U) 	1 x 2.5 x 0.5
		-	-	0.6	-	ESD protection for Ultra High Speed Interfaces	IP4283CZ10-TB	SOT1059 (XSON10U) 	1 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
	12	2	-	0.7	-	ESD protection for Ultra High Speed Interfaces	IP4282CZ6	SOT886(XSON6) 	1.45 x 1.0 x 0.5
		-	-	1	-	ESD protection	PRTR5V0U8S	SOT552 (TSSOP10) 	3.0 x 3.0 x 1.1
		yes	yes	0.7	-	level shifter, ESD protection	IP4776CZ38	SOT510 (TSSOP38) 	9.7 x 4.4 x 1.1
		yes	yes	0.7	-	for HDMI sinks- I²C buffer, level shifter, ESD protection, back drive protection, CEC buffer	IP4778CZ38		
		-	yes	0.7	-	for HDMI sources- I²C buffer, level shifter, ESD protection, CEC buffer	IP4777CZ38		
		yes	yes	0.7	-	HDMI and DVI 3-to-1 switch which includes ESD protection, TMDS, equalizer, TMDS driver, DDC slew rate accelerator and level shifting	IP4779CZ64	SOT357 	10 x 10 x 1

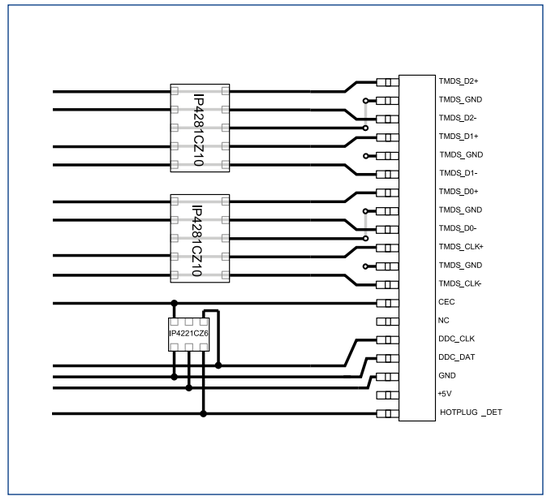
IP4776CZ38 HDMI Receiver



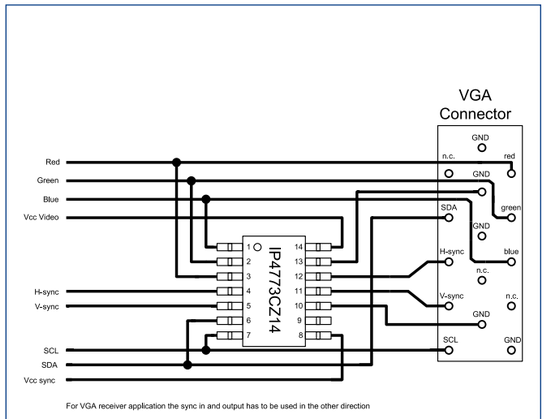
IP4777CZ38 HDMI Transmitter



IP4281CZ10 HDMI Transmitter/Receiver



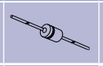
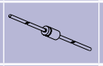
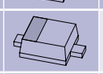
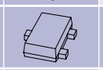
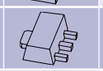
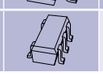
IP4773CZ14 VGA Solution



For VGA receiver application the sync in and output has to be used in the other direction

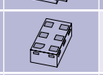
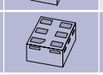
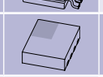
Package cross reference

types in **bold blue** represent new products

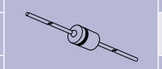
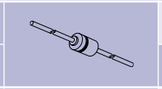
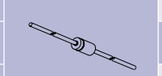
NXP	Industry standard names	Size (l x w x h)	Pins / leads	P_{tot} (mW)	Package	Competitor synonyms						
						Rohm	Toshiba	ON Semi	Renesas	Infineon	Diodes Inc	KEC
SOD27	DO-35	4.25 x 1.85 x 0.56	2	500		GSD			DO-35		DO-35	
SOD66	DO-41	4.8 x 2.6 x 0.81	2	1300		GSR	DO-41				DO-41	
SOD68	DO-34	3.04 x 1.6 x 0.55	2	500		MSD						
SOD80C	MiniMelf	3.5 x 1.5 x 1.5	2	300		LLDS			LLD			
SOD87	Melf	3.5 x 2.05 x 2.05	2	1000								
SOD123F	-	2.6 x 1.6 x 1.1	2	830		PMDU	S-Flat	SOD-123-FL			PowerDI123	SMF
SOD123W	-	2.6 x 1.7 x 1.0	2	900			S-Flat	SOD-123-FL			PowerDI123	
SOD128	-	3.8 x 2.6 x 1.0	2	1000		PMDT	M-Flat					
SOD323	SC-76	1.7 x 1.25 x 0.95	2	400			USC	SOD-323	URP	SOD323	SOD-323	USC
SOD323F	SC-90	1.7 x 1.25 x 0.7	2	830		UMD2	US-Flat				PowerDI323	
SOD523	SC-79	1.2 x 0.8 x 0.6	2	500		EMD2	ESC/TESC	SOD-523	UFP	SC79		ESC
SOD882	-	1.0 x 0.6 x 0.5	2	250						TSLP-2	DFN1006-2	
SOT1061	HUSON3	2.0 x 2.0 x 0.65	3	1300				WDFN3				
SOT23	-	2.9 x 1.3 x 1.0	3	250		SSD3/SST3		SOT-23		SOT23	SOT-23	SOT-23
SOT323	SC-70	2.0 x 1.25 x 0.95	3	200		UMD3/UMT3	USM	SC-70	CMAK/CM-PAK	SOT323	SOT-323	USM
SOT416	SC-75	1.6 x 0.8 x 0.77	3	150		EMD3/EMT3	SSM	SC-75	SMPAK	SC75		
SOT663	-	1.6 x 1.2 x 0.55	3	300								
SOT883	SC-101	1.0 x 0.6 x 0.5	3	250			SS CSP2			TSLP-3-1	DFN1006-3	
SOT89	SC-62	4.5 x 2.5 x 1.5	3	1300		MPT3	PW-Mini	SOT-89	UPAK (SOT89)	SOT89		SOT-89
SOT143B	-	2.9 x 1.3 x 1.0	4	250			CP4		MPAK-4R	SOT143	SOT-143	
SOT223	SC-73	6.5 x 3.5 x 1.65	4	1700				SOT-223		SOT223	SOT-223	SOT-223
SOT353	SC-88A	2.0 x 1.25 x 0.95	5	300		UMD5/UMT5	USV	SC-88A	CMPAK-5(T)			USV

Package cross reference

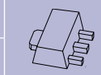
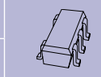
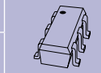
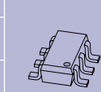
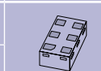
types in **bold blue** represent new products

NXP	Industry standard names	Size (l x w x h)	Pins / leads	P_{tot} (mW)	Package	Competitor synonyms						
						Rohm	Toshiba	ON Semi	Renesas	Infineon	Diodes Inc	KEC
SOT665	-	1.6 x 1.2 x 0.55	5	300		EMD5/EMT5	ESV	SOT-553	VSON-5			TESV
SOT1082	VSON6U	2.3 x 3.5 x 0.85	6	-								
SOT363	SC-88	2.0 x 1.25 x 0.95	6	300		UMD6/UMT6	US6	SC-88	CMPAK-6	SOT363	SOT-363	US6
SOT457	SC-74	2.9 x 1.5 x 1.0	6	750		SMD6/SMT6	SM6	SC-74	TSOP-6	SC74		TSOP6
SOT666	-	1.6 x 1.2 x 0.55	6	300		EMD6/EMT6	ES6	SOT-563	SMFPAK-6	SOT666		TES6
SOT886	XSON6	1.45 x 1.0 x 0.5	6	250								
SOT891	XSON6	1.0 x 1.0 x 0.5	6	-			CS6					
SOT505	TSSOP8	3.0 x 3.0 x 1.1	8	-				TSSOP-8				TSSOP8
SOT873	HVSON8	3.3 x 3.3 x 0.85	8	1500								
SOT96	SO8	4.9 x 3.9 x 1.75	8	1500		SOP8	FM8	SOIC-8 NB	SOP-8			FLP-8
SOT983	HXSON8	1.7 x 1.35 x 0.5	8	-						TSSOP38		
SOT552	TSSOP10	3.0 x 3.0 x 1.1	10	-				Micro10		TSSOP10		
SOT984	HXSON12	2.5 x 1.35 x 0.5	12	-								
SOT108	SO14	8.65 x 3.9 x 1.75	14	-		SOP14				DSO14		
SOT402	TSSOP14	5.0 x 4.4 x 1.1	14	-								
SOT109	SO16	9.9 x 3.9 x 1.75	16	-		SOP16		SOIC-16		DSO16		FLP-16
SOT519	SSOP16	4.9 x 3.9 x 1.73	16	-								
SOT985	HXSON16	3.3 x 1.35 x 0.5	16	-				Micro10		TSSOP10		
SOT163	SO20	12.8 x 7.5 x 2.65	20	1250								
SOT360	TSSOP20	6.5 x 4.4 x 1.1	20	-				TSSOP20		TSSOP20		
SOT510	TSSOP38	9.7 x 4.4 x 1.1	38	-						TSSOP38		
SOT357	TQFP64	10 x 10 x 1	64	-								

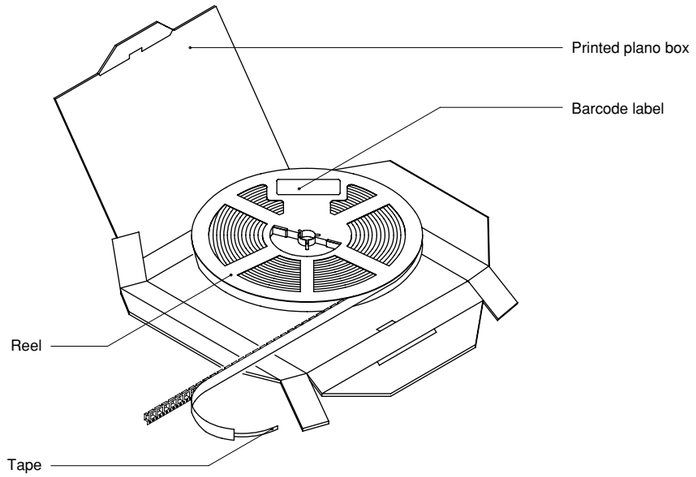
types in **bold blue** represent new products

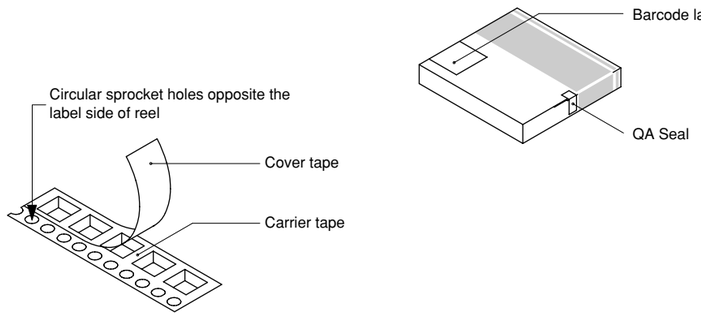
Package	Packing method and tape dimension	Reel dimension (d x w)	Package	Packing quantity						
				2000	2500	3000	4000	5000	8000	10000
SOD27	26 mm tape ammo pack, axial			-	-	-	-	-143	-	-
	52 mm tape ammo pack, axial			-	-	-	-	-	-	-133
	52 mm reel pack, axial			-	-	-	-	-	-	-113
SOD66	52 mm tape ammo pack, axial			-	-	-	-	-	-	-133
	52 mm reel pack, axial			-	-	-	-	-	-	-113
SOD68	26 mm tape ammo pack, axial			-	-	-	-	-143	-	-
	52 mm reel pack, axial			-	-	-	-	-	-	-113
	52 mm tape ammo pack, axial			-	-	-	-	-	-	-133
SOD80C	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-115	-	-	-	-	-
	4 mm pitch, 8 mm tape and reel	330 x 8 mm		-	-	-	-	-	-	-135
SOD87	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-115	-	-	-	-	-	-
	4 mm pitch, 8 mm tape and reel	330 x 8 mm		-	-	-	-	-	-135	-
SOD123F	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
SOD123W	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
SOD128	4 mm pitch, 12 mm tape and reel	180 x 12 mm		-	-	-115	-	-	-	-
SOD323	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm		-	-	-	-	-	-	-135
SOD323F	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
SOD523	2 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-	-	-	-315	-
	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm		-	-	-	-	-	-	-135
SOD882	2 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-	-	-	-	-315
SOT1061	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
SOT23	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-215	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm		-	-	-	-	-	-	-235
SOT323	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm		-	-		-	-	-	-135
SOT416	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm		-	-	-	-	-	-	-135
SOT663	4 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-	-115	-	-	-
SOT883	2 mm pitch, 8 mm tape and reel	180 x 8 mm		-	-	-	-	-	-	-315

types in **bold blue** represent new products

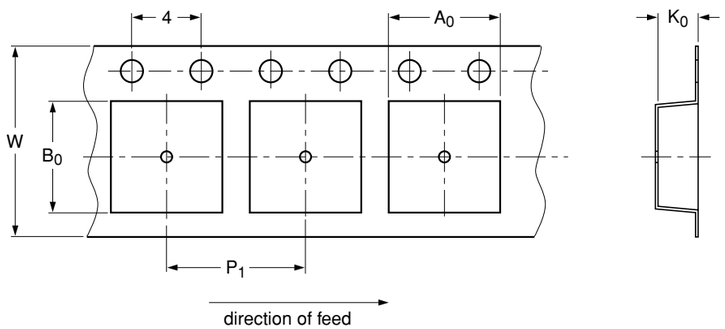
Package	Packing method and tape dimension	Reel dimension (d x w)	Taping	Package	Packing quantity							
					1000	1400	2500	3000	4000	5000	8000	10000
SOT89	8 mm pitch, 12 mm tape and reel	180 x 12 mm	T1		-115	-	-	-	-	-	-	-
	8 mm pitch, 12 mm tape and reel	330 x 12 mm	T1		-	-	-	-	-135	-	-	-
	8 mm pitch, 12 mm tape and reel	180 x 12 mm	T3		-146	-	-	-	-	-	-	-
	8 mm pitch, 12 mm tape and reel	180 x 12 mm	T4		-147	-	-	-	-	-	-	-
SOT143B	4 mm pitch, 8 mm tape and reel	180 x 8 mm			-	-	-	-215	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm			-	-	-	-	-	-	-	-235
SOT223	8 mm pitch, 12 mm tape and reel	180 x 12 mm			-115	-	-	-	-	-	-	-
	8 mm pitch, 12 mm tape and reel	330 x 12 mm			-	-	-	-	-135	-	-	-
SOT353	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T1		-	-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T1		-	-	-	-	-	-	-	-135
	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T2		-	-	-	-125	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T2		-	-	-	-	-	-	-	-165
SOT665	2 mm pitch, 8 mm tape and reel	180 x 8 mm			-	-	-	-	-	-	-315	-
	4 mm pitch, 8 mm tape and reel	180 x 8 mm			-	-	-	-	-115	-	-	-
	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T1		-	-	-	-115	-	-	-	-
SOT363	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T1		-	-	-	-	-	-	-	-135
	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T2		-	-	-	-125	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T2		-	-	-	-	-	-	-	-165
SOT457	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T1		-	-	-	-115	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T1		-	-	-	-	-	-	-	-135
	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T2		-	-	-	-125	-	-	-	-
	4 mm pitch, 8 mm tape and reel	286 x 8 mm	T2		-	-	-	-	-	-	-	-165
SOT666	2 mm pitch, 8 mm tape and reel	180 x 8 mm			-	-	-	-	-	-	-315	-
	4 mm pitch, 8 mm tape and reel	180 x 8 mm			-	-	-	-	-115	-	-	-
SOT886	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T1		-	-	-	-	-	-115	-	-
	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T4		-	-	-	-	-	-132	-	-
SOT891	4 mm pitch, 8 mm tape and reel	180 x 8 mm	T4		-	-	-	-	-	-132	-	-
SOT505	8 mm pitch, 12 mm tape and reel	330 x 12 mm			-	-	-118	-	-	-	-	-
SOT873	8 mm pitch, 12 mm tape and reel	180 x 12 mm			-	-118	-	-	-	-	-	-
SOT96	8 mm pitch, 12 mm tape and reel	180 x 12 mm			-115	-	-	-	-	-	-	-
	8 mm pitch, 12 mm tape and reel	330 x 12 mm			-	-	-118	-	-	-	-	-

Tape and reel pack for SMD packages





Carrier tape - tape and reel

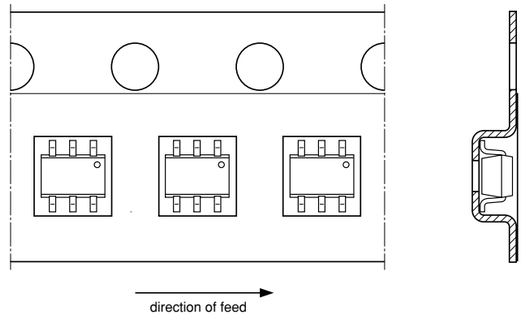


P1 = pitch (see table packing methods)
W = tape width (see table packing methods)

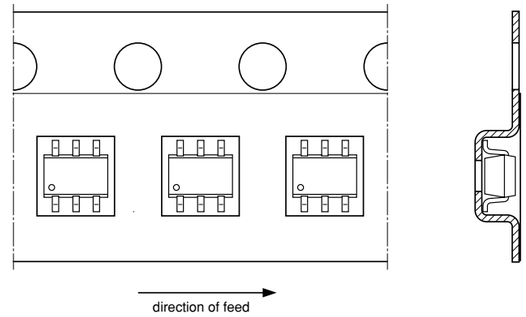
Compartment width (A_0), length (B_0) and depth (K_0) depending on package

Product orientation (tape and reel pack) T1-T4

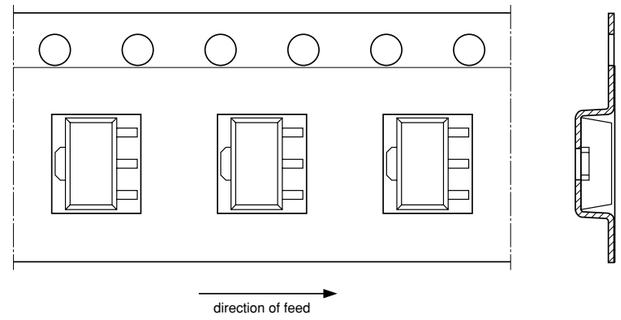
T1 taping



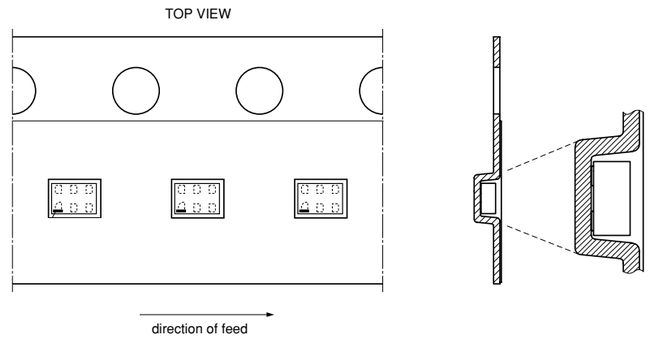
T2 taping



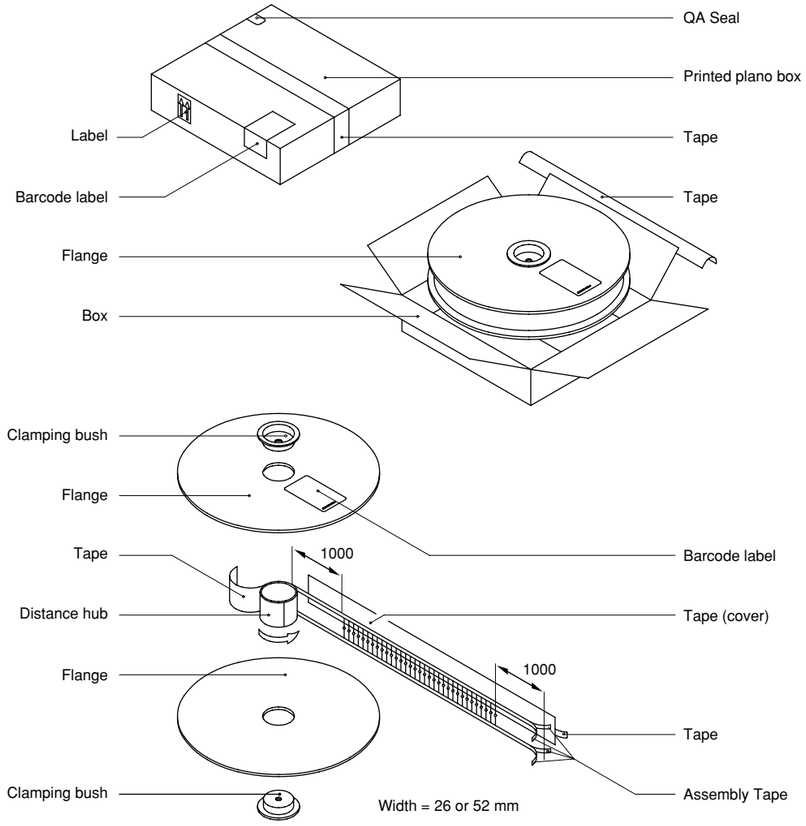
T3 taping

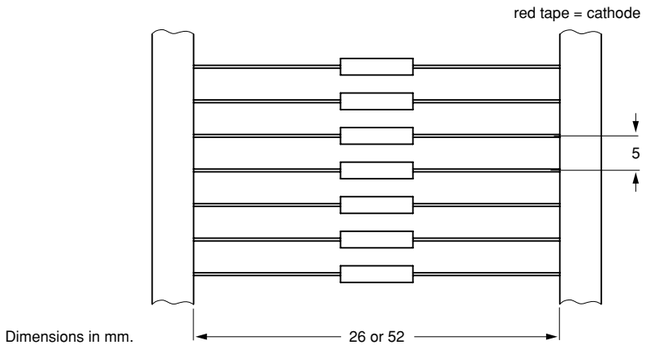


T4 taping

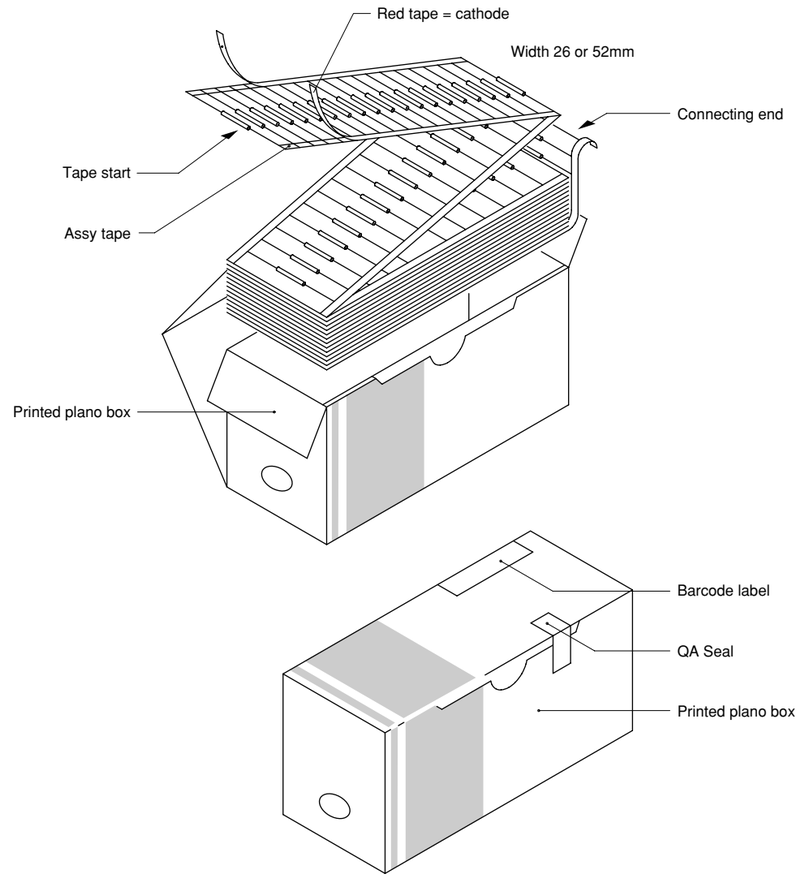


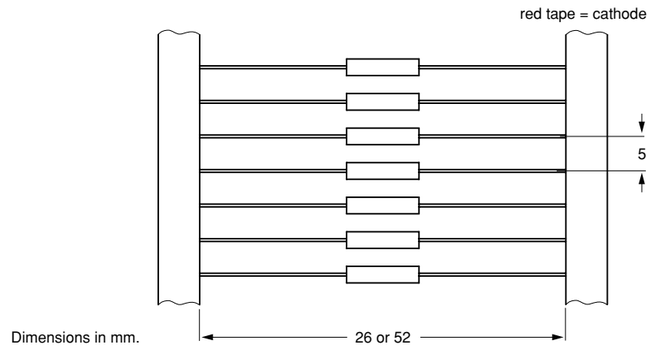
Reel pack axial tape for glass diodes



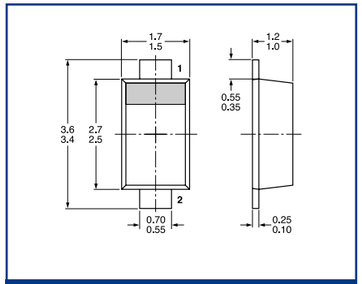


Ammo pack axial tape for glass diodes

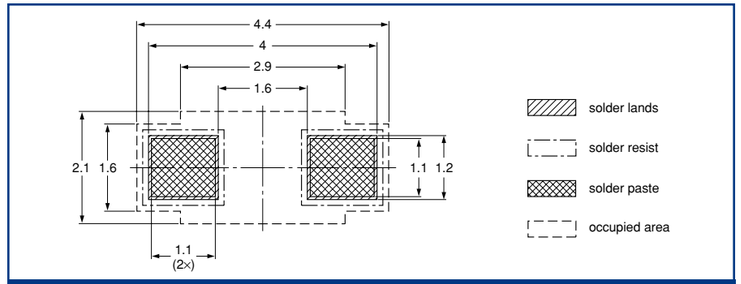




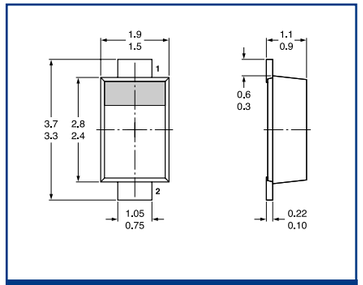
2-Pin SMD Packages



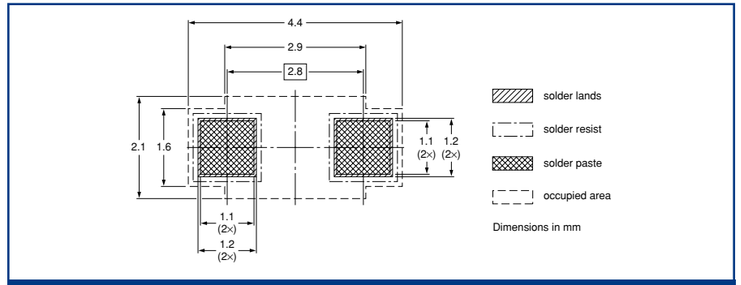
SOD123F



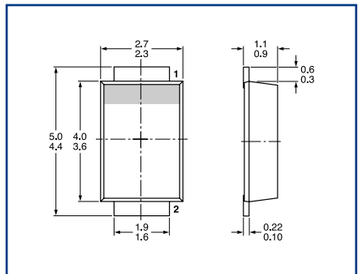
SOD123F



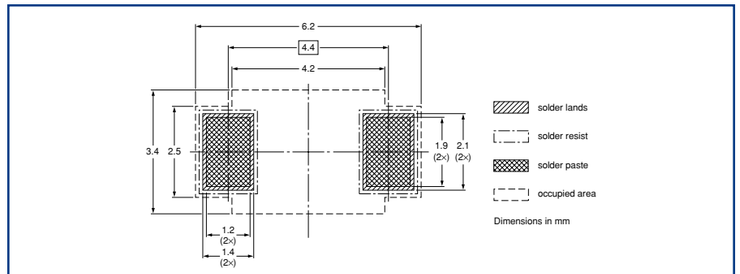
SOD123W



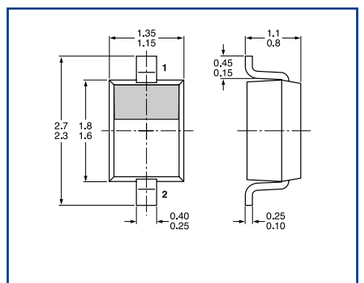
SOD123W



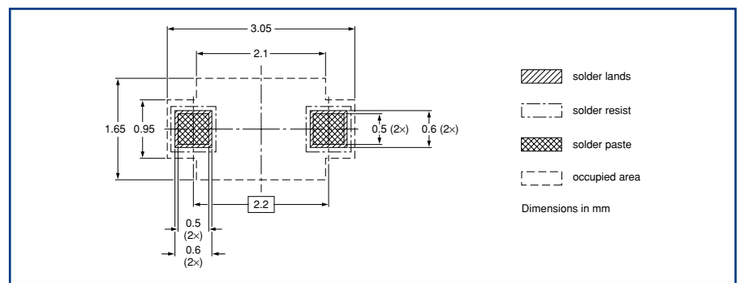
SOD128



SOD128

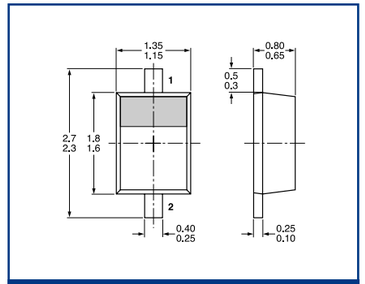


SOD323 (SC-76)

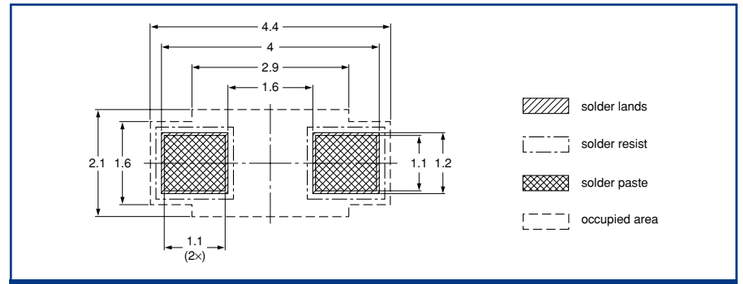


SOD323 (SC-76)

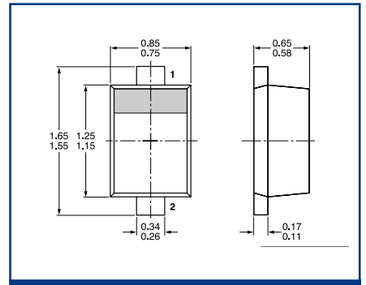
Dimensions in mm



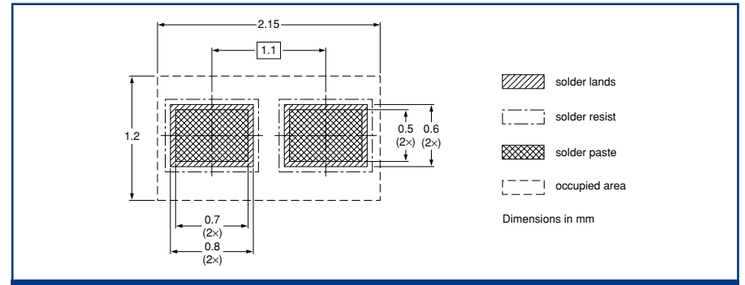
SOD323F (SC-90)



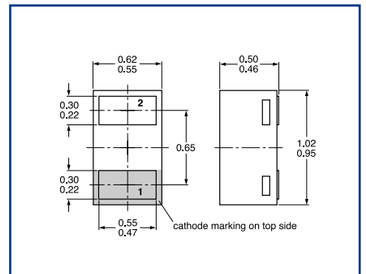
SOD323F (SC-90)



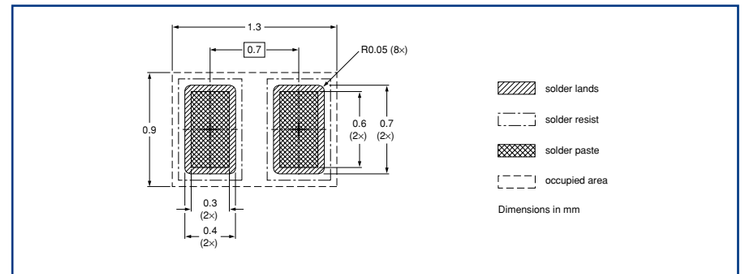
SOD523 (SC-79)



SOD523 (SC-79)

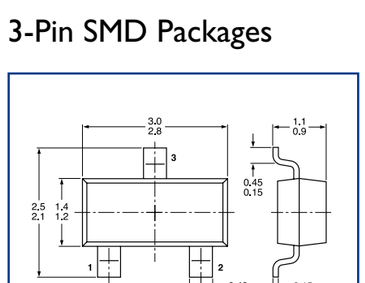


SOD882

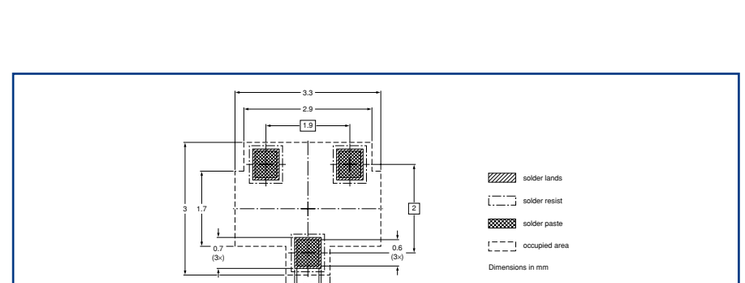


SOD882

3-Pin SMD Packages

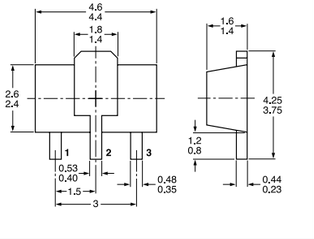


SOT23

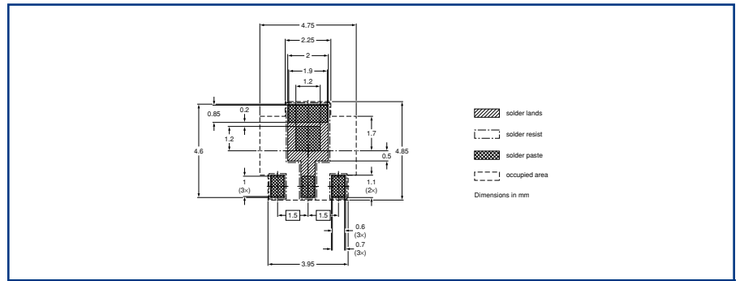


SOT23

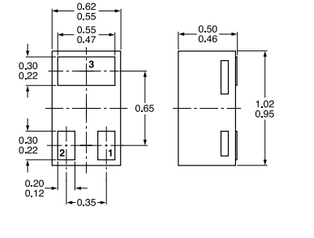
Dimensions in mm



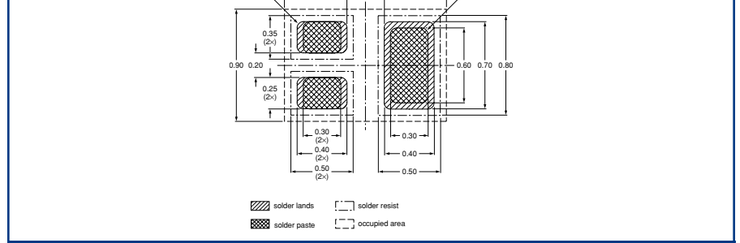
SOT89 (SC-62)



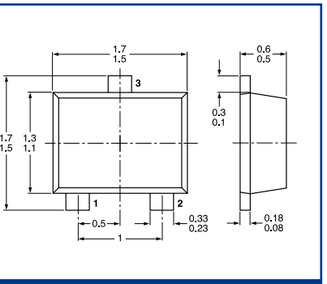
SOT89 (SC-62)



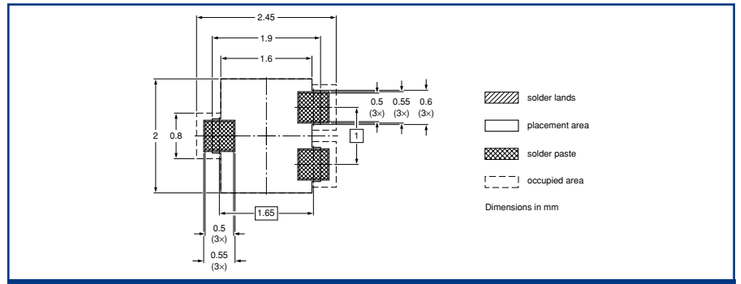
SOT883 (SC-101)



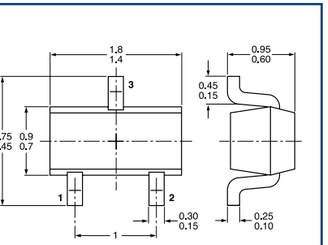
SOT883 (SC-101)



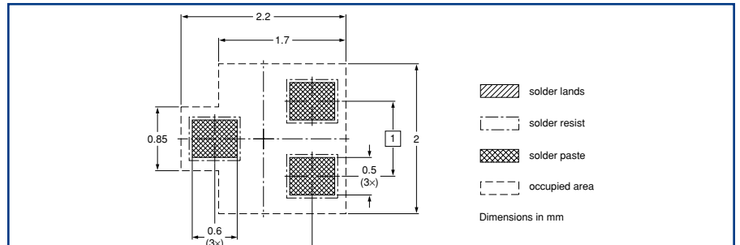
SOT663



SOT663

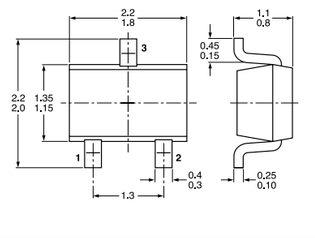


SOT416 (SC-75)

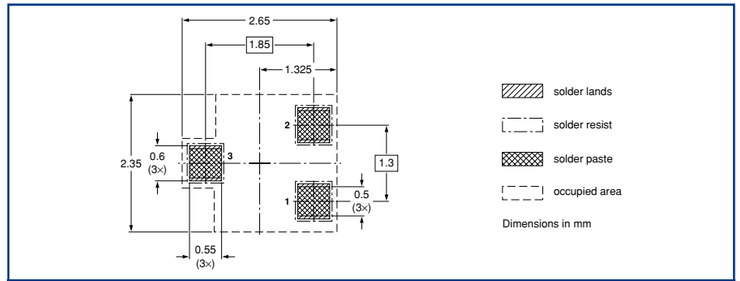


SOT416 (SC-75)

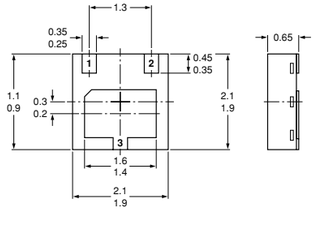
Dimensions in mm



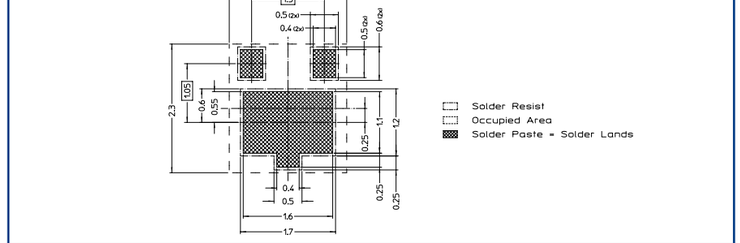
SOT323 (SC-70)



SOT323 (SC-70)

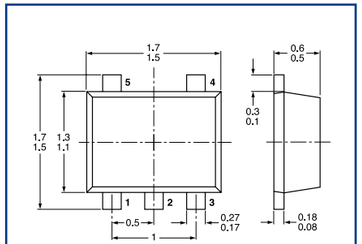


SOT1061

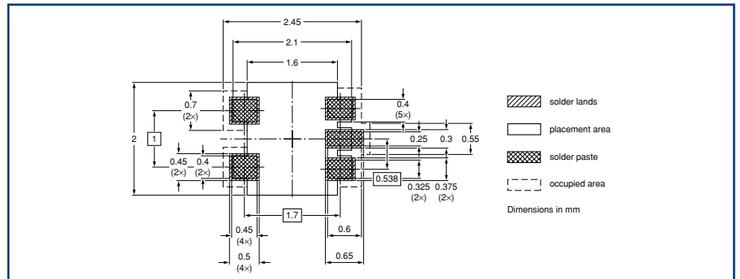


SOT1061

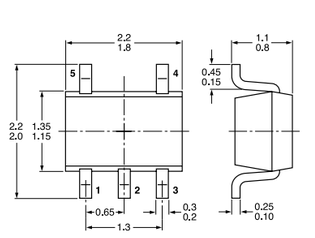
4-/5-Pin SMD Packages



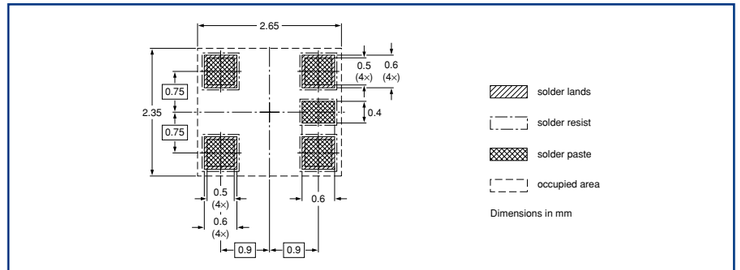
SOT665



SOT665

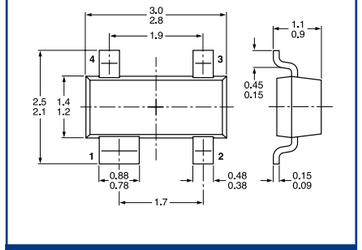


SOT353 (SC-88A)

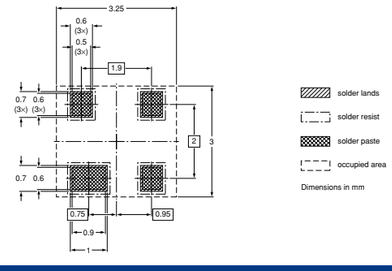


SOT353 (SC-88A)

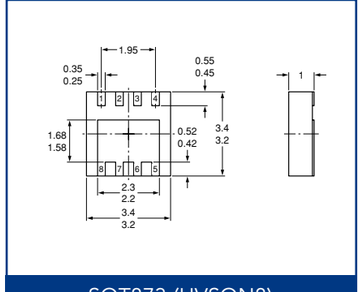
Dimensions in mm



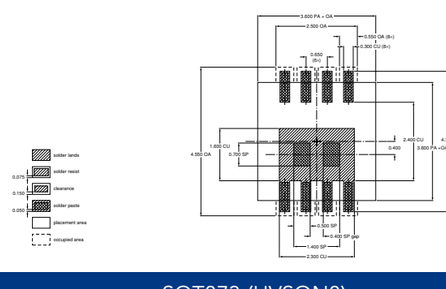
SOT143B



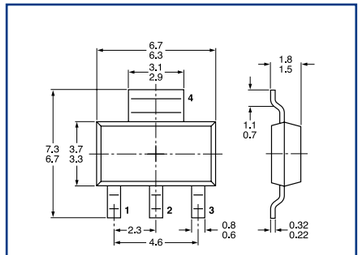
SOT143B



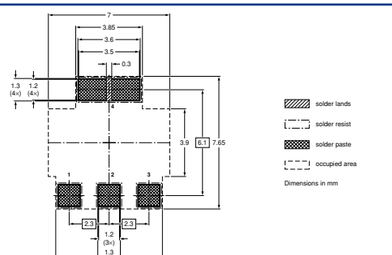
SOT873 (HVSON8)



SOT873 (HVSON8)

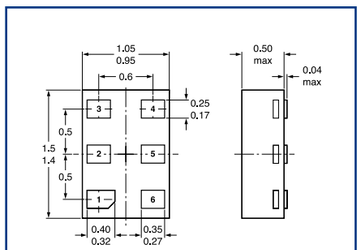


SOT223 (SC-73)

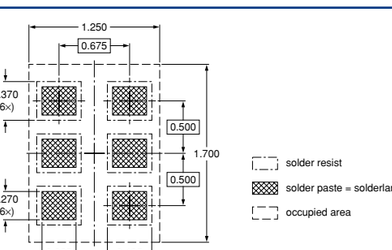


SOT223 (SC-73)

6-Pin SMD Packages

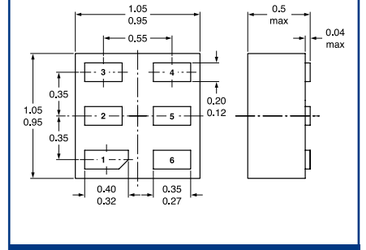


SOT886 (XSON6)

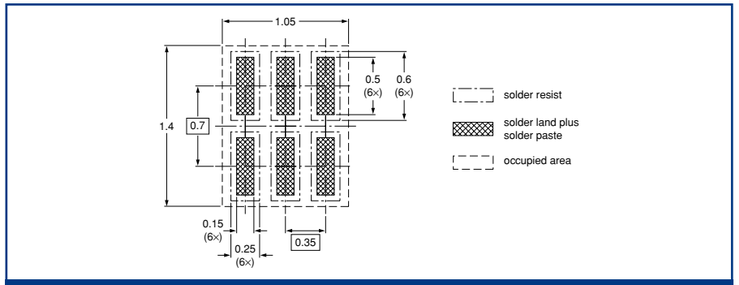


SOT886 (XSON6)

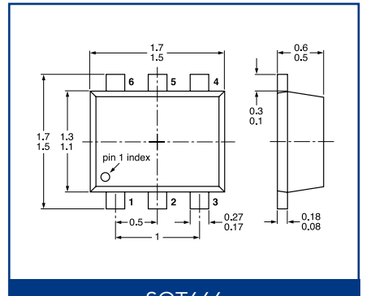
Dimensions in mm



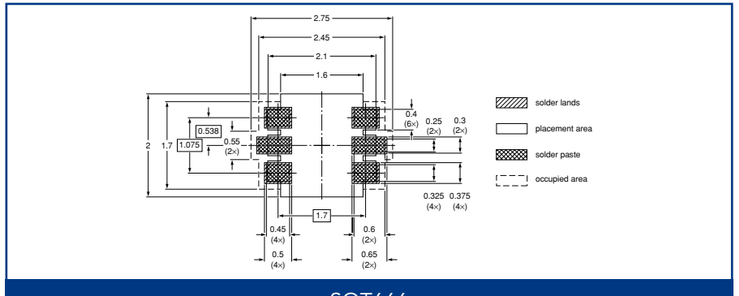
SOT891 (XSON6)



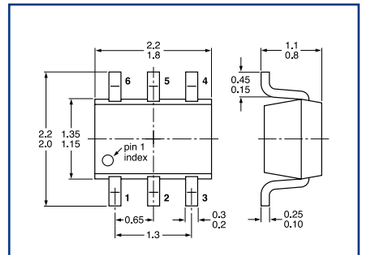
SOT891 (XSON6)



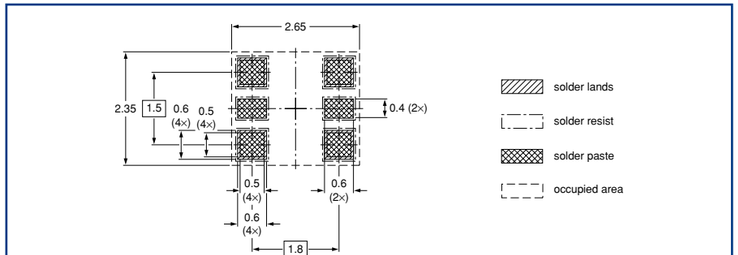
SOT666



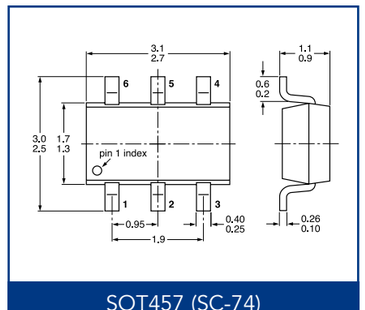
SOT666



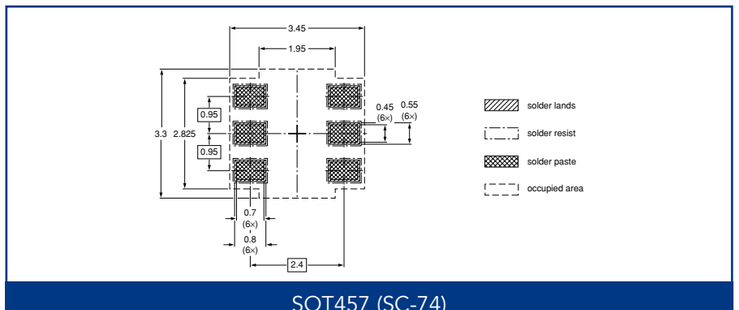
SOT363 (SC-88)



SOT363 (SC-88)



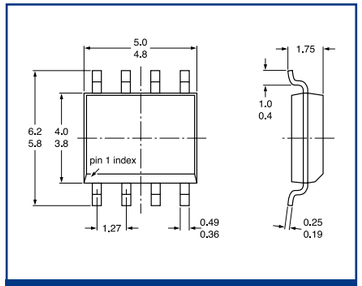
SOT457 (SC-74)



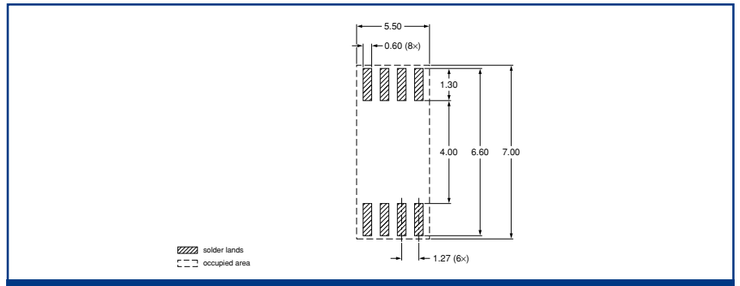
SOT457 (SC-74)

Dimensions in mm

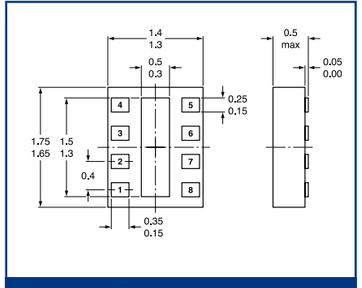
Multi-Pin SMD Packages



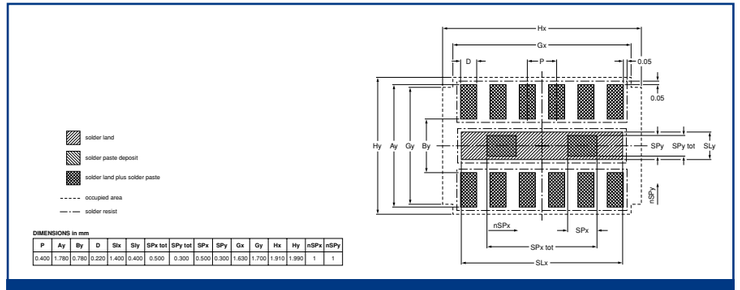
SOT96 (SO8)



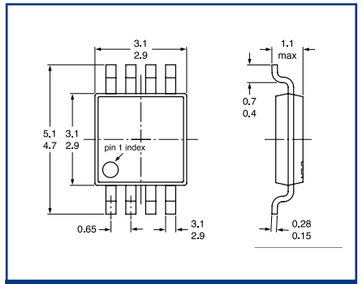
SOT96 (SO8)



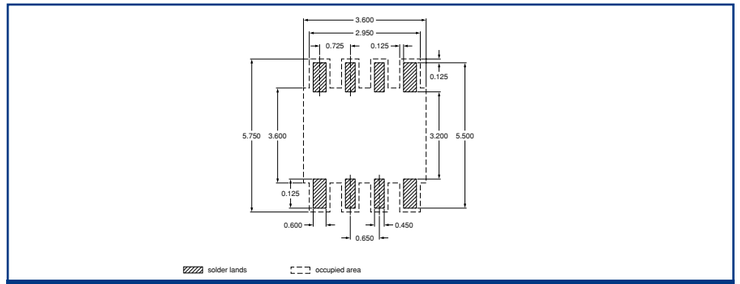
SOT983 (HXSON8)



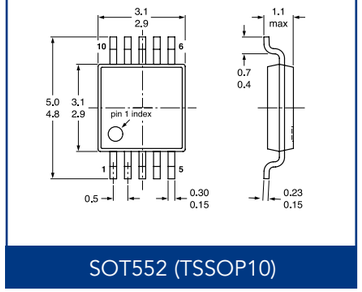
SOT983 (HXSON8)



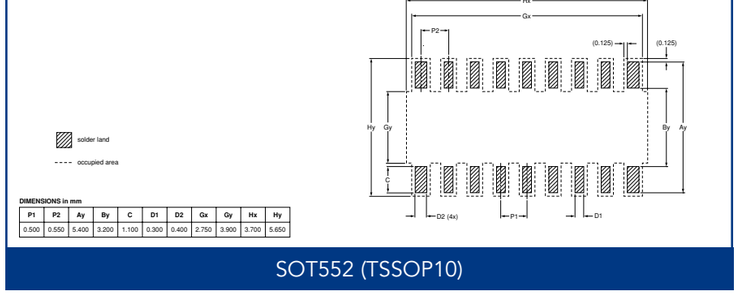
SOT505 (TSSOP8)



SOT505 (TSSOP8)

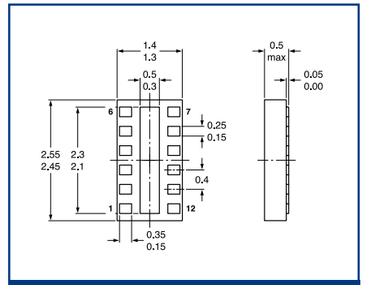


SOT552 (TSSOP10)

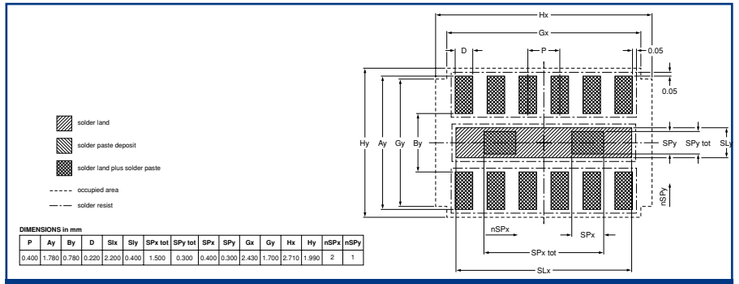


SOT552 (TSSOP10)

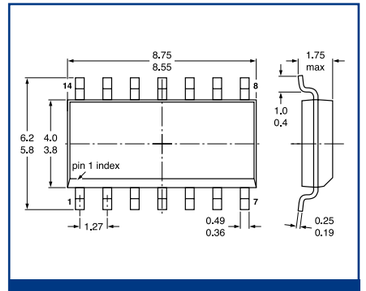
Dimensions in mm



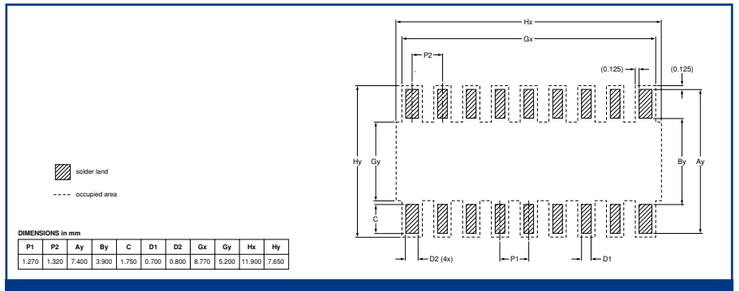
SOT984 (HXSON12)



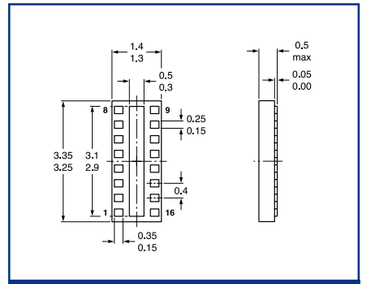
SOT984 (HXSON12)



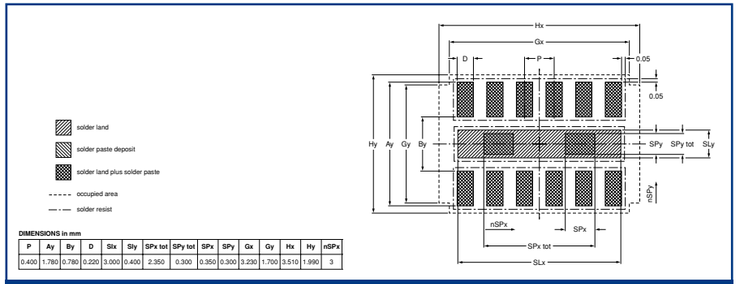
SOT108 (SO14)



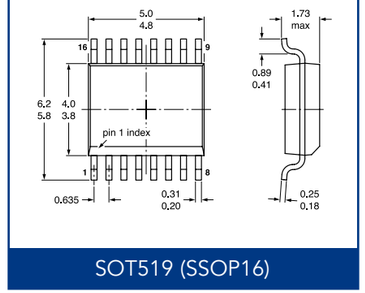
SOT108 (SO14)



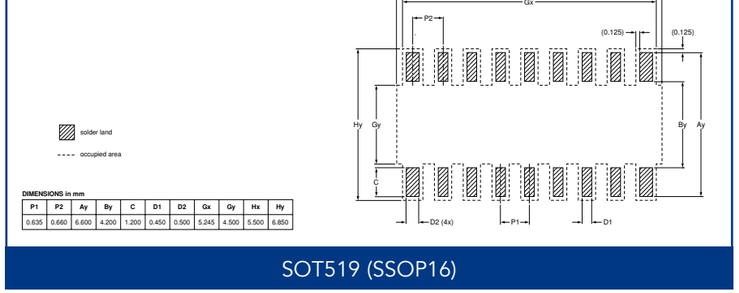
SOT985 (HXSON16)



SOT985 (HXSON16)

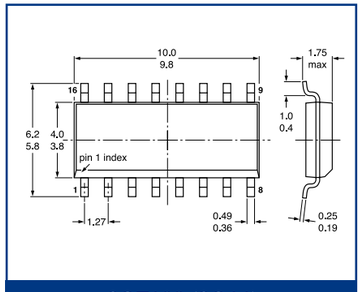


SOT519 (SSOP16)

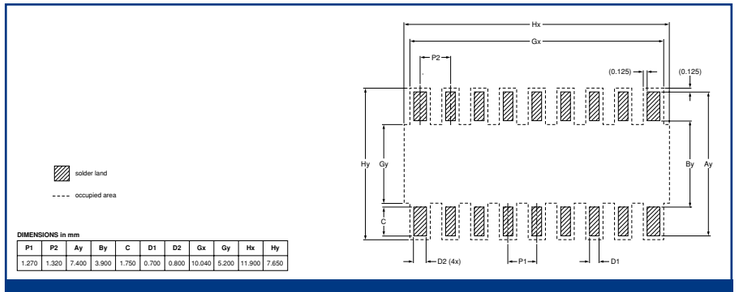


SOT519 (SSOP16)

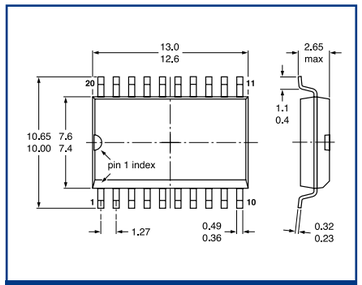
Dimensions in mm



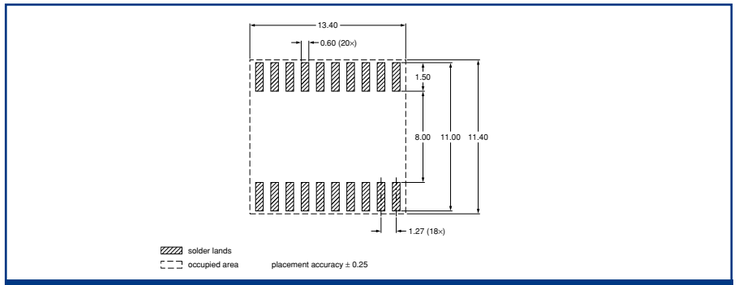
SOT109 (SO16)



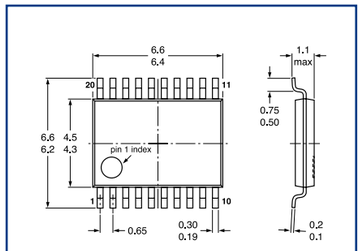
SOT109 (SO16)



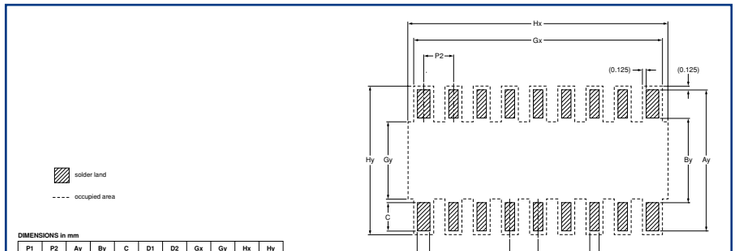
SOT163 (SO20)



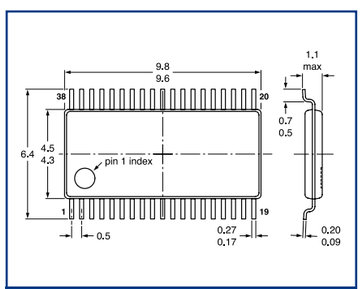
SOT163 (SO20)



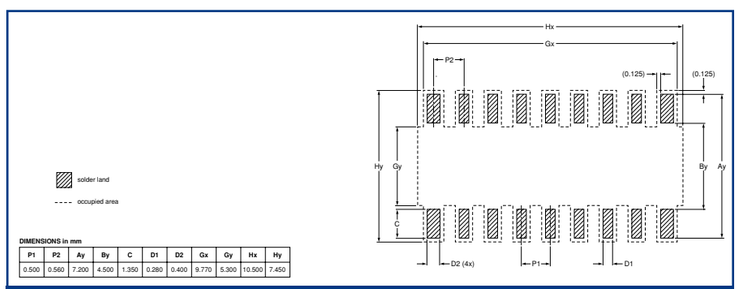
SOT360 (TSSOP20)



SOT360 (TSSOP20)



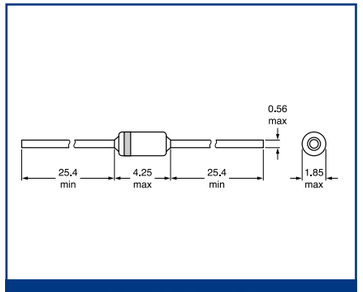
SOT510 (TSSOP38)



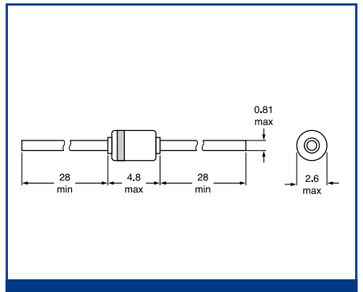
SOT510 (TSSOP38)

Dimensions in mm

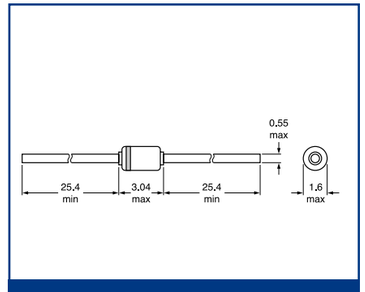
Glass diodes



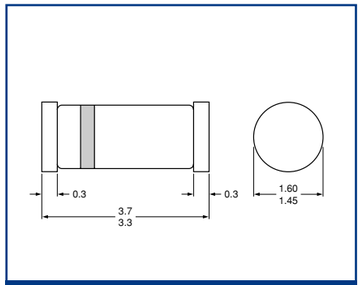
SOD27 (DO-35)



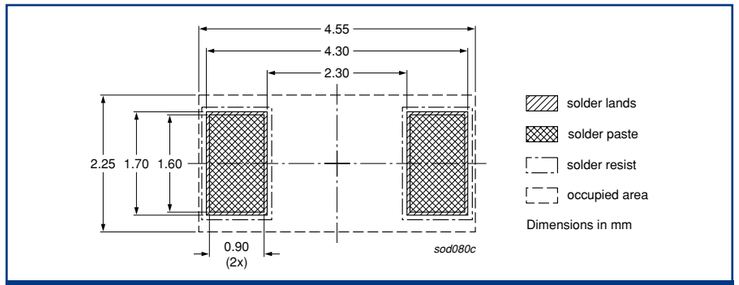
SOD66 (DO-41)



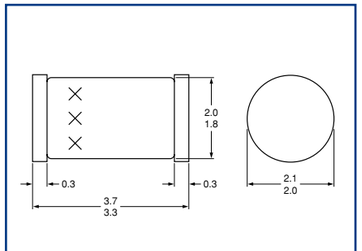
SOD68 (DO-34)



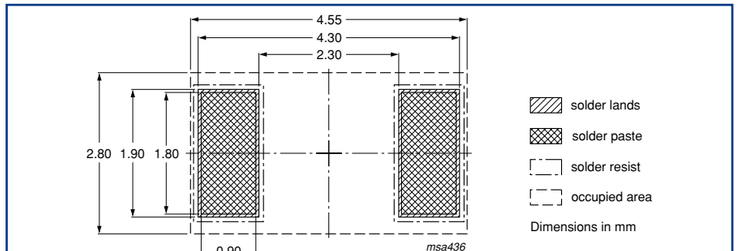
SOD80C



SOD80C



SOD87



SOD87

Dimensions in mm

Notes