

For Bipolar Transistors and Discrete MOSFETs please check the Power Management Chapter, pages 189-239.

For RF Consumer Products please find following tables in the RF Products Chapter from page 252 onwards:

- RF PIN diodes
- RF Bandswitch diodes
- RF Varicap diodes
- MMIC Amplifiers and Mixers
- RF Wideband Transistors
- RF J-FETs
- RF FETs

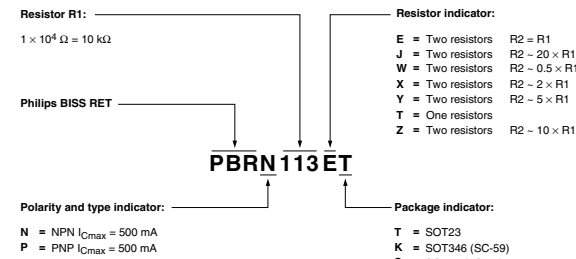
BISS RETs

BISS RETs

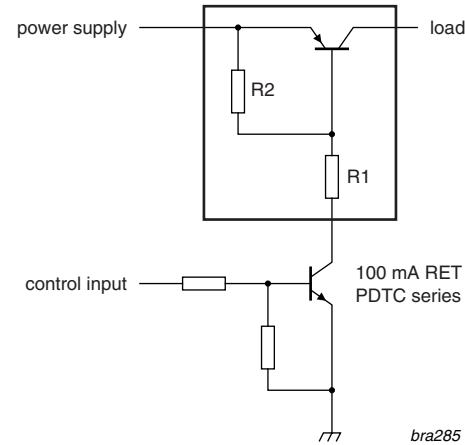
types in **bold red italic underlined** represent products in development

Polarity	(I _C) = mA	(V _{CEO}) = V		(R1) kΩ	(R2) kΩ	SOT346 (SC-59) 250 mW	SOT23 250 mW	SOT54 (TO-92) 500 mW
P _{tot} max.								
NPN	800	50	R1 = R2	1	1	<i>PBRN113EK</i>	<i>PBRN113ET</i>	<i>PBRN113ES</i>
NPN	800	50	R1 = R2	2.2	2.2	<i>PBRN123EK</i>	<i>PBRN123ET</i>	<i>PBRN123ES</i>
NPN	800	50	R1 <> R2	1	10	<i>PBRN113ZK</i>	<i>PBRN113ZT</i>	<i>PBRN113ZS</i>
NPN	800	50	R1 <> R2	2.2	10	<i>PBRN123YK</i>	<i>PBRN123YT</i>	<i>PBRN123YS</i>
PNP	800	50	R1 = R2	1	1	<i>PBRP113EK</i>	<i>PBRP113ET</i>	<i>PBRP113ES</i>
PNP	800	50	R1 = R2	2.2	2.2	<i>PBRP123EK</i>	<i>PBRP123ET</i>	<i>PBRP123ES</i>
PNP	800	50	R1 <> R2	1	10	<i>PBRP113ZK</i>	<i>PBRP113ZT</i>	<i>PBRP113ZS</i>
PNP	800	50	R1 <> R2	2.2	10	<i>PBRP123YK</i>	<i>PBRP123YT</i>	<i>PBRP123YS</i>

800 mA BISS RET coding



BISS RET loadswitch



Features

BISS RETs

- 800 mA collector current capability
- + / - 10 % resistor tolerance
- Low collector-emitter saturation voltage V_{CEsat}

LOADSWITCHES

(I _C) = mA	(V _{CEO}) = V	(V _{CEsat}) = mV	(R) kΩ	SOT363 (SC-88) 300 mW	SOT666 300 mW
P _{tot} max.					
100	50	200	22/47	PUMF11	
100	50	200	22/47	PUMF12	
500	12	250	10/10		PEMF21

Loadswitches

BISS LOADSWITCHES

types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

(I _C) = mA	(V _{CEO}) = V	(V _{CEsat}) = mV	(R1) kΩ	(R2) kΩ	SOT457 (SC-74) 600 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
P _{tot} max.							
500	15	250	1	1		PBLS1500Y	PBLS1500V
500	15	250	2.2	2.2		PBLS1501Y	PBLS1501V
500	15	250	4.7	4.7		PBLS1502Y	PBLS1502V
500	15	250	10	10		PBLS1503Y	PBLS1503V
500	15	250	22	22		PBLS1504Y	PBLS1504V
500	40	145	2.2	2.2		PBLS4001Y	PBLS4001V
500	40	145	4.7	4.7		PBLS4002Y	PBLS4002V
500	40	145	10	10		PBLS4003Y	PBLS4003V
500	40	145	22	22		PBLS4004Y	PBLS4004V
500	40	145	47	47		PBLS4005Y	PBLS4005V
1000	20	190	1	1	<i>PBLS2000D</i>		
1000	20	190	2.2	2.2	<i>PBLS2001D</i>		
1000	20	190	4.7	4.7	<i>PBLS2002D</i>		
1000	20	190	10	10	<i>PBLS2003D</i>		
1000	20	190	22	22	<i>PBLS2004D</i>		
1000	40	250	2.2	2.2	<i>PBLS4001D</i>		
1000	40	250	4.7	4.7	<i>PBLS4002D</i>		
1000	40	250	10	10	<i>PBLS4003D</i>		
1000	40	250	22	22	<i>PBLS4004D</i>		
1000	40	250	47	47	<i>PBLS4005D</i>		
1000	60	250	1	1	<i>PBLS6000D</i>		
1000	60	250	2.2	2.2	<i>PBLS6001D</i>		
1000	60	250	4.7	4.7	<i>PBLS6002D</i>		
1000	60	250	10	10	<i>PBLS6003D</i>		
1000	60	250	22	22	<i>PBLS6004D</i>		



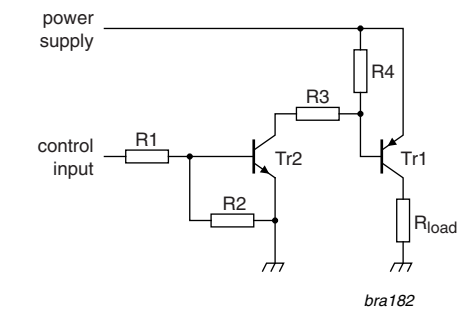
Related literature

BISS Loadswitches PBLS-series
Automotive small-signal solutions

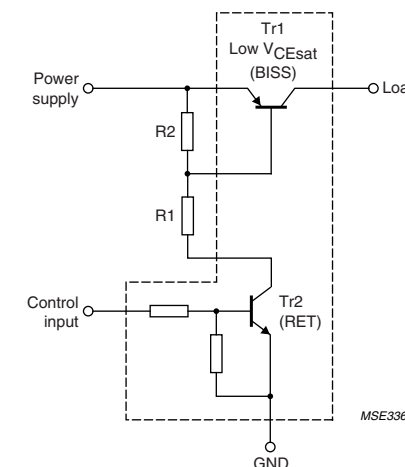
Order code

9397 750 12512
9397 750 14063

High side switch



BISS Loadswitch



Features

BISS Loadswitches

- Low V_{CEsat} (BISS) transistor and RET in one package
- Low "threshold" voltage (<1V) compared to MOSFET
- Low drive power required
- Best-in-class performance for loadswitches
- Space-saving solution offering reduced component count and sourcing effort

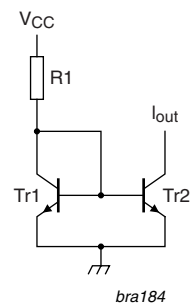
Matched pairs

MATCHED PAIRS

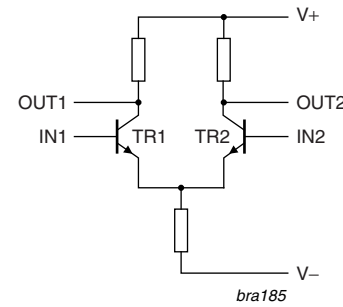
types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	Δ h _{FE} %	Δ V _{BE} mV	SOT143B 250 mW	SOT457 (SC-74) 600 mW	SOT353 (SC-88A) 300 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
NPN	100	30	110	800	n.a.	n.a.	BCV61/A/B/C				
NPN	100	45	200	450	10	2	BCVM61B	BCM847DS		BCM847BS	
NPN	100	45	200	450	5	2		PMP4501D	PMP4501G	PMP4501Y	PMP4501V
NPN	100	45	200	450	2	2		PMP4201D	PMP4201G	PMP4201Y	PMP4201V
PNP	100	30	110	800	n.a.	n.a.	BCV62/A/B/C				
PNP	100	45	200	450	10	2	BCVM62B	BCM857DS		BCM857BS	
PNP	100	45	200	450	5	2		PMP5501D	PMP5501G	PMP5501Y	PMP5501V
PNP	100	45	200	450	2	2		PMP5201D	PMP5201G	PMP5201Y	PMP5201V

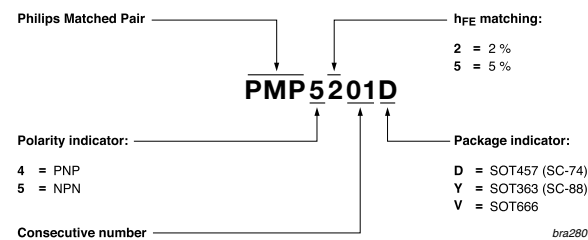
NPN current mirror



Differential amplifier



Matched pair coding



Features

Matched pairs

- Current gain matching 10/5/2 %
- Base-emitter voltage matching 2 mV
- Standard double transistor and application optimised pin out available

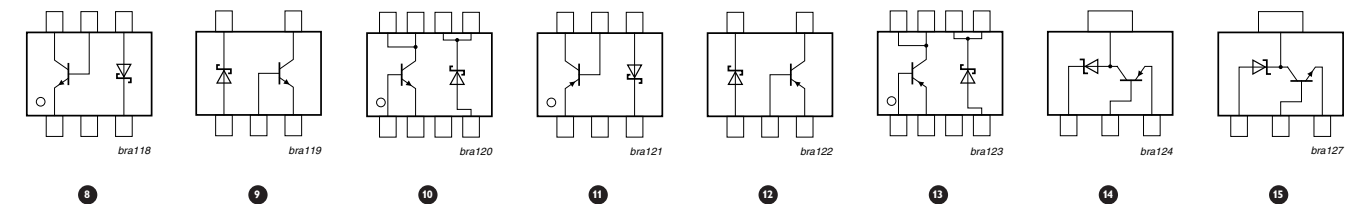
Schottky diodes/Transistor modules

Complex discretos

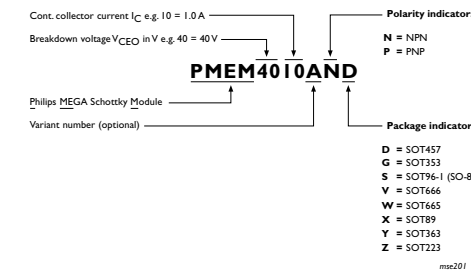
MEGA SCHOTTKY DIODES/BISS TRANSISTOR MODULES

types in **bold red italic underlined** represent products in development

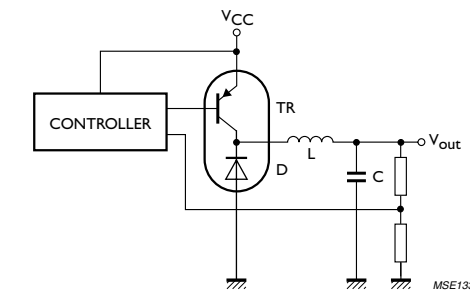
						Package	SOT96-1 (SO8)	SOT457 (SC-74)	SOT353 (SC-88A)	SOT223
						Size	4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.1 x 1.25 x 0.95	6.5 x 3.5 x 1.65
						Configuration	NPN	NPN	NPN	NPN
Transistor			Schottky rectifier							
I _C max. (A)	V _{CEO} max. (V)	V _{CEsat} max. (mV)	I _F max. (A)	V _R max. (V)	V _F max. (mV)	10	8	9	15	
0.2	40	300	1	40	500				PZTM1101	
0.5	15	250	0.5	20	390				PMEM1505NG	
1.0	40	210	1	20	550			PMEM4010ND		
2.0	40	400	1	20	550			PMEM4020ND		
2.0	40	400	1	40	640			PMEM4020AND		
3.0	40	370	1	40	500	PMEM4030NS				
						Configuration	PNP	PNP	PNP	PNP
0.2	40	350	1	40	500				PZTM1102	
0.5	15	250	0.5	20	390				PMEM1505PG	
1.0	40	410	1	20	550			PMEM4010PD		
2.0	40	530	1	20	550			PMEM4020PD		
2.0	40	530	1	40	640			PMEM4020APD		
3.0	40	390	1	40	500	PMEM4030PS				



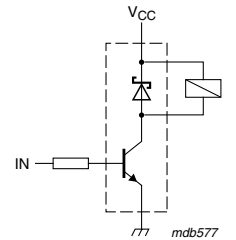
MEGA Schottky modules part numbering



Step down DC/DC converter



Inductive load driver



Related literature

Title
Low V_F (MEGA) Schottky rectifier portfolio

Order code
9397 750 13277

Features

- Schottky diodes/BISS transistor modules**
- Combination of low V_F (MEGA) Schottky rectifier and low V_{CEsat} (BISS) transistor in one package
- Low forward voltage drop
- Low saturation voltage

Why choose Philips Semiconductors?

Schottky diodes/BISS transistor modules

- Less component count
- Board space reduction
- Higher efficiency
- Higher power density
- Cost reduction potential

TERMINATORS/FILTERS

Description	Configuration	Operating voltage	R1 (Ω)	R2 (Ω)	R3 (Ω)	C1 (pF)	SOT23
Clock Terminator		0V ..5V	45 ..55	45 ..55	41.7 ..51	120 ..180	PSSI3120CA

LOW V_F (MEGA) SCHOTTKY RECTIFIERS

types in **bold red italic underlined** represent products in development

I_F max. (A)	V_R max. (V)	V_F max. (mV)	SOT457 (SC-74) 2.9 x 1.5 x 1.0	SOD123F 2.6 x 1.6 x 1.1	SOD323F (SC-90) 1.7 x 1.25 x 0.7	SOT666 1.6 x 1.2 x 0.6	SOD523 (SC-79) 1.2 x 0.8 x 0.6	SOD882 1.0 x 0.6 x 0.5
0.2	30	480					PMEG3002AEB	PMEG3002AEL
0.2	40	600						PMEG4002EL
0.5	20	390		<i>PMEG2005EH</i>	<i>PMEG2005EJ</i>	PMEG2005AEV		
0.5	20	440						PMEG2005AEL
0.5	20	480					PMEG2005EB	
0.5	20	500						PMEG2005EL
0.5	30	430		<i>PMEG3005EH</i>	<i>PMEG3005EJ</i>	PMEG3005AEV		
0.5	40	470		<i>PMEG4005EH</i>	<i>PMEG4005EJ</i>	PMEG4005AEV		
1.0	20	500		<i>PMEG2010EH</i>	PMEG2010EJ	PMEG2010BEV		
1.0	20	550			<i>PMEG2010AEJ</i>	PMEG2010EV		
1.0	20	620					PMEG2010AEB	
1.0	30	560		<i>PMEG3010EH</i>	PMEG3010EJ	PMEG3010BEV		
1.0	40	640		<i>PMEG4010EH</i>	PMEG4010EJ	PMEG4010BEV		
1.0	60	650	PMEG6010AED					
1.5	20	660			<i>PMEG2015EJ</i>	PMEG2015EV		
1.5	30	500			<i>PMEG3015EJ</i>	PMEG3015EV		
1.5	40	550						
1.5	60	570						
2.0	10	460		<i>PMEG1020EH</i>	PMEG1020EJ	PMEG1020EV		
2.0	20	525		<i>PMEG2020EH</i>	PMEG2020EJ			

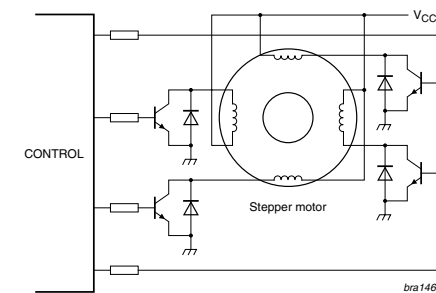


Related literature

Title
Low V_F (MEGA) Schottky rectifier portfolio
Automotive small-signal solutions
SOT88x package platform

Order code
9397 750 13277
9397 750 14063
9397 750 11753

Stepper motor driver



MEGA Schottky diodes part numbering

MEGA Schottky Rectifier part numbering

Cont. forward current e.g. 10 = 1.0 A
Max. reverse voltage in V e.g. 20 V

PMEG2010AEV

Philips MEGA Schottky Diode
Variant number (optional)

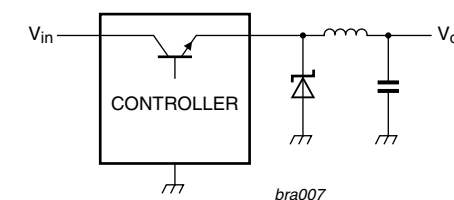
Internal configuration:
E = single
A = CA
C = CC
S = series
P = double, parallel
R = triple, anti-parallel
V = triple
Z = 2 x CA
Y = 2 x CC
X = 2 x series
W = CA and CC

Package indicator:
A = SOD323
B = SOD523
D = SOT457
H = SOD123F
J = SOD323F
L = SOD882
T = SOT23
V = SOT666

Features

- Low V_F (MEGA) Schottky rectifiers**
- Low forward voltage drop
 - High forward current capability
 - Low power dissipation
 - Integrated guard ring for stress protection
 - Replacement of standard SMA rectifier with smaller package

Step down converter



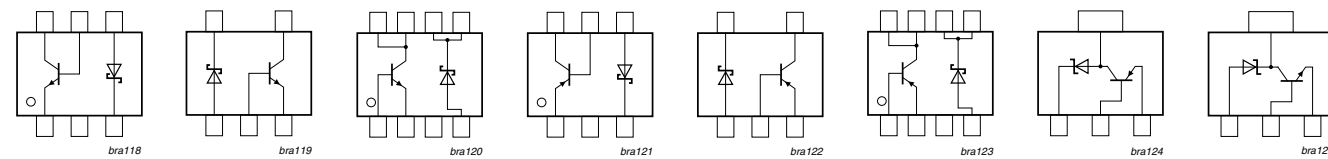
Why choose Philips Semiconductors?

- Low V_F (MEGA) Schottky rectifiers**
- Higher efficiency
 - Higher power density
 - Board space reduction
 - Cost reduction potential

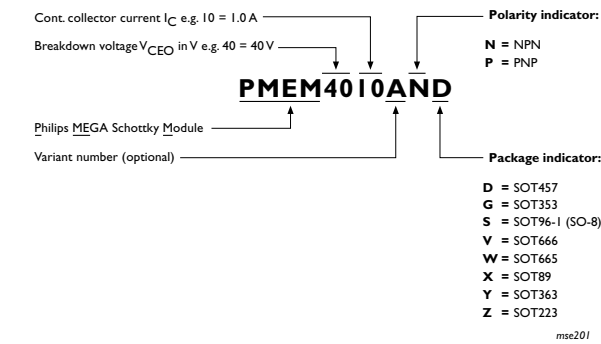
MEGA SCHOTTKY DIODES/BISS TRANSISTOR MODULES

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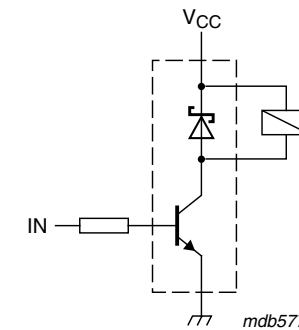
		Package	SOT96-1 (SO8)	SOT457 (SC-74)	SOT353 (SC-88A)	SOT223	
		Size	4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.1 x 1.25 x 0.95	6.5 x 3.5 x 1.65	
		Configuration	NPN	NPN	NPN	NPN	
		Configuration					
Transistor		Schottky rectifier					
I_C max. (A)	V_{CEO} max. (V)	V_{CEsat} max. (mV)	I_F max. (A)	V_R max. (V)	V_F max. (mV)		
0.2	40	300	1	40	500	PZTM1101	
0.5	15	250	0.5	20	390		
1.0	40	210	1	20	550	PMEM4010ND	
2.0	40	400	1	20	550	PMEM4020ND	
2.0	40	400	1	40	640	PMEM4020AND	
3.0	40	370	1	40	500	<i>PMEM4030NS</i>	
		Configuration	PNP	PNP	PNP	PNP	
0.2	40	350	1	40	500	PZTM1102	
0.5	15	250	0.5	20	390	PMEM1505PG	
1.0	40	410	1	20	550	PMEM4010PD	
2.0	40	530	1	20	550	PMEM4020PD	
2.0	40	530	1	40	640	PMEM4020APD	
3.0	40	390	1	40	500	<i>PMEM4030PS</i>	



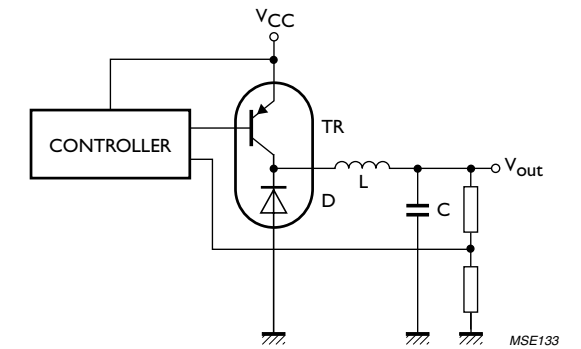
MEGA Schottky modules part numbering



Inductive load driver



Step down DC/DC converter



Features

- Schottky diodes/BISS transistor modules**
- Combination of low V_F (MEGA) Schottky rectifier and low V_{CEsat} (BISS) transistor in one package
- Low forward voltage drop
- Low saturation voltage

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Related literature

Title
Low V_F (MEGA) Schottky rectifier portfolio

Order code
9397 750 13277

GENERAL PURPOSE SCHOTTKY DIODES

V_R max. (V)	I_F max. (mA)	V_F max. (mV)	C_D max. (pF)	Package Size (mm)	SOD80C (MiniMelf) Surface mounted glass 3.5 x 1.5 x 1.5	SOD68 (DO-34) Leaded glass 3.04 x 1.6 x 0.55	SOT346 (SC-59) Plastic SMD 2.9 x 1.5 x 1.15	SOT23 Plastic SMD 2.9 x 1.3 x 1.0	SOT143B Plastic SMD 2.9 x 1.3 x 1.0	SOD110 Ceramic SMD 2.0 x 1.25 x 1.6	SOT323 (SC-70) Plastic SMD 2.0 x 1.25 x 0.95	SOT363 (SC-88) Plastic SMD 2.0 x 1.25 x 0.95	SOD323 (SC-76) Plastic SMD 1.7 x 1.25 x 0.95	SOT416 (SC-75) Plastic SMD 1.6 x 0.8 x 0.75	SOT666 Plastic flat lead SMD 1.6 x 1.2 x 0.6	SOD523 (SC-79) Plastic flat lead SMD 1.2 x 0.8 x 0.6	SOD882 SOT883 Leadless 1.0 x 0.6 x 0.5
20	1000	350 @ $I_F = 100$ mA	25 @ $V_R = 5$ V	single									BAT760		BAT960		
30	200	260 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	single				BAT754									
30	200	260 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual series				BAT754S									
30	200	260 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual c.c.				BAT754C									
30	200	260 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual c.a.				BAT754A									
30	200	260 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	triple isolated								BAT754L					
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	single	BAS85	BAT85	1PS59SB10	BAT54		BAT254	BAT54W 1PS70SB10		1PS76SB10			1PS79SB10	BAT54L
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual series			1PS59SB14	BAT54S			BAT54SW 1PS70SB14						
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual c.c.			1PS59SB15	BAT54C			BAT54CW 1PS70SB15				BAT54CV		BAT54CM
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual c.a.			1PS59SB16	BAT54A			BAT54AW 1PS70SB16						
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	dual isolated					BAT74				BAT74S			BAT74V	
30	200	320 @ $I_F = 1$ mA	10 @ $V_R = 1$ V	triple isolated												BAT54VV	
40	30	410 @ $I_F = 1$ mA	1.6 @ $V_R = 1$ V	single	BAS81	BAT81											
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	single				BAS40			BAS40W 1PS70SB40		1PS76SB40			1PS79SB40	BAS40L
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	dual series				BAS40-04			BAS40-04W 1PS70SB44						
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	dual c.c.				BAS40-05			BAS40-05W 1PS70SB45			1PS75SB45	BAS40-05V		
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	dual c.a.				BAS40-06			BAS40-06W 1PS70SB46						
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	dual isolated					BAS40-07							BAS40-07V	
40	120	380 @ $I_F = 1$ mA	5 @ $V_R = 0$ V	quad c.c./c.c.									1PS88SB48				
40	200	410 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	single												1PS79SB31	PMEG3002AEL
40	200	420 @ $I_F = 100$ mA	50 @ $V_R = 0$ V	single			1PS59SB21	BAT721							1PS76SB21		
40	200	420 @ $I_F = 100$ mA	50 @ $V_R = 0$ V	dual series				BAT721S									
40	200	420 @ $I_F = 100$ mA	50 @ $V_R = 0$ V	dual c.c.				BAT721C									
40	200	420 @ $I_F = 100$ mA	50 @ $V_R = 0$ V	dual c.a.				BAT721A									
40	200	500 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	single												1PS79SB30	PMEG4002EL
40	200	550 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	single							BAT854W						
40	200	550 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	dual series							BAT854SW						
40	200	550 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	dual c.c.							BAT854CW						
40	200	550 @ $I_F = 100$ mA	20 @ $V_R = 1$ V	dual c.a.							BAT854AW						

GENERAL PURPOSE SCHOTTKY DIODES

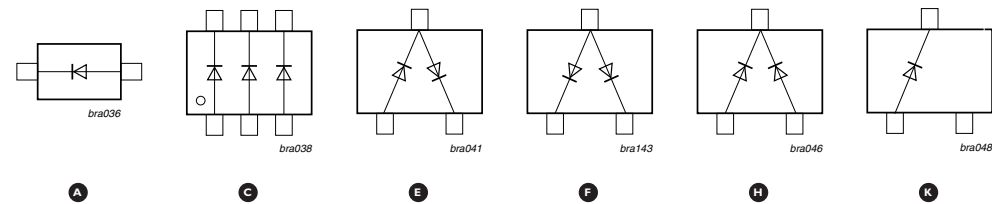
V _R max. (V)	I _R @ V _R max. [μA]	V _F max. (mV)	C _D max. (pF)	Package	SOD80C (MiniMelf) Surface mounted glass 3.5 x 1.5 x 1.5	SOD68 (DO-34) Leaded glass 3.04 x 1.6 x 0.55	SOT346 (SC-59) Plastic SMD 2.9 x 1.5 x 1.15	SOT23 Plastic SMD 2.9 x 1.3 x 1.0	SOT143B Plastic SMD 2.9 x 1.3 x 1.0	SOD110 Ceramic SMD 2.0 x 1.25 x 1.6	SOT323 (SC-70) Plastic SMD 2.0 x 1.25 x 0.95	SOT363 (SC-88) Plastic SMD 2.0 x 1.25 x 0.95	SOD323 (SC-76) Plastic SMD 1.7 x 1.25 x 0.95	SOT416 (SC-75) Plastic SMD 1.6 x 0.8 x 0.75	SOT666 Plastic flat lead SMD 1.6 x 1.2 x 0.6	SOD523 (SC-79) Plastic flat lead SMD 1.2 x 0.8 x 0.6	SOD882 SOT883 Leadless 1.0 x 0.6 x 0.5
				Size (mm)													
40	500	550 @ I _F = 500 mA	90 @ V _R = 0V	single			1PS59SB20	BAT720			1PS70SB20						
50	30	410 @ I _F = 1 mA	1.6 @ V _R = 1V	single	BAS82	BAT82											
50	200	380 @ I _F = 1 mA	8 @ V _R = 1V	single	BAS86	BAT86											
60	30	410 @ I _F = 1 mA	1.6 @ V _R = 1V	single	BAS83	BAT83											
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	single				BAS70			BAS70V		1PS76SB70			1PS79SB70	BAS70L
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	dual series				BAS70-04			BAS70-04W						
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	dual c.c.				BAS70-05			BAS70-05W						
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	dual c.a.				BAS70-06			BAS70-06W						
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	dual isolated					BAS70-07			BAS70-07S			BAS70-07V		
70	70	410 @ I _F = 1 mA	2 @ V _R = 0V	triple isolated											BAS70VV		

Note:
c.a.= common anode
c.c.= common cathode

LOW CAPACITANCE SCHOTTKY DIODES

V _R max. (V)	I _F max. (mA)	V _F max. (mV) @ I _F = 1 mA	C _D max. (pF) @ V _R = 0 V	SOT23	SOT363 (SC-88)	SOT323 (SC-70)	SOD323 (SC-76)	SOT666	SOD523 (SC-79)	SOD882
				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 0.6	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
4	30	450 @ I _F = 1 mA	1	BAT17 K			1PS76SB17 A	1PS66SB17 C	1PS79SB17 A	
4	30	450 @ I _F = 1 mA	1	PMBD353 PMBD354 E						
5	20	250 @ I _F = 1 mA	0.5					1PS66SB63 C	1PS79SB63 A	1PS10SB63 A
15	30	340 @ I _F = 1 mA	1		1PS88SB82 C	1PS70SB82 K		1PS66SB82 C		1PS10SB82 A
15	30	340 @ I _F = 1 mA	1			1PS70SB84 E				
15	30	340 @ I _F = 1 mA	1			1PS70SB85 H				
15	30	340 @ I _F = 1 mA	1			1PS70SB86 F				
40	20	800 @ I _F = 2 mA	0.6				1PS76SB62 A	1PS66SB62 C	1PS79SB62 A	1PS10SB62 A

* diodes have matched capacitance



MEDIUM POWER SCHOTTKY DIODES

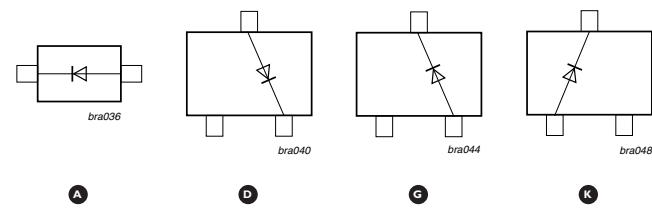
V _{RRM} max. (V)	I _F max. (mA)	I _{FSM} max. (A)	V _F max. (mV) @ I _F = 1 A	C _D max. (pF)	Package Size (mm) P _{tot} (mW)	SOT223 (SC-73)	SOD87 (Melf)	SOT457 (SC-74)
						6.5 x 3.5 x 1.65 1500	3.5 x 2.05 x 2.05 1000	2.9 x 1.5 x 1.0 500
20	1000	25	450	70 @ V _R = 4 V typ.	single		PRLL5817	
20	1000	25	450	100 @ V _R = 4 V typ.	single			1PS74SB23
25	1000	10	450	100 @ V _R = 4 V	dual series	BAT120S		
25	1000	10	450	100 @ V _R = 4 V	dual c.c.	BAT120C		
25	1000	10	450	100 @ V _R = 4 V	dual c.a.	BAT120A		
-30	1000	25	550	50 @ V _R = 4 V typ.	single		PRLL5818	
40	1000	27	500	80 @ V _R = 4 V	single			1PS74SB43
40	1000	10	500	80 @ V _R = 4 V	dual series	BAT140S		
40	1000	10	500	80 @ V _R = 4 V	dual c.c.	BAT140C		
40	1000	10	500	80 @ V _R = 4 V	dual c.a.	BAT140A		
40	1000	25	600	50 @ V _R = 4 V typ.	single		PRLL5819	
60	1000	10	650	60 @ V _R = 4 V	dual series	BAT160S		
60	1000	10	650	60 @ V _R = 4 V	dual c.c.	BAT160C		
60	1000	10	650	60 @ V _R = 4 V	dual c.a.	BAT160A		

Note:
c.a.= common anode
c.c.= common cathode

GENERAL PURPOSE SINGLE SWITCHING DIODES

types in ***bold red italic underlined*** represent products in development

V_R max. (V)	t_{rr} max. (ns)	Package	SOD27 (DO-35) Leaded glass	SOD80C (MiniMelf) Surface mounted glass	SOD68 (DO-34) Leaded glass	SOT346 (SC-59) Plastic SMD	SOT23 Plastic SMD		SOD123F Plastic flat lead SMD	SOD110 Ceramic SMD	SOT323 (SC-70) Plastic SMD	SOD323 (SC-76) Plastic SMD	SOT416 (SC-75) Plastic SMD	SOD523 (SC-79) Plastic flat lead SMD	SOD882 Lead less SMD
		Size (mm) P_{tot} (mW)	4.25 x 1.85 x 0.56 500	3.5 x 1.5 x 1.5 300	3.04 x 1.6 x 0.55 500	2.9 x 1.5 x 1.15 250	2.9 x 1.3 x 1.0 250		2.6 x 1.6 x 1.1 900	2.0 x 1.25 x 1.6 300	2.0 x 1.25 x 0.95 250	1.7 x 1.25 x 0.95 400	1.6 x 0.8 x 0.75 150	1.2 x 0.8 x 0.6 500	1.0 x 0.6 x 0.5 250
100	4	A	1N4148 BAW62	BAS32L PMLL4148L	1N4531				<i>BAS16H</i>	BAS216		BAS316		BAS516	BAS16L
100	4	K				1PS193	BAS16				BAS16W		BAS16T		
100		G					BAL74								
100	4	D					BAL99								
200	50	A	BAV21	BAV103					<i>BAS21H</i>			BAS321			
200	50	K					BAS21								
300	50	A												BAS521	



Related literature

Title

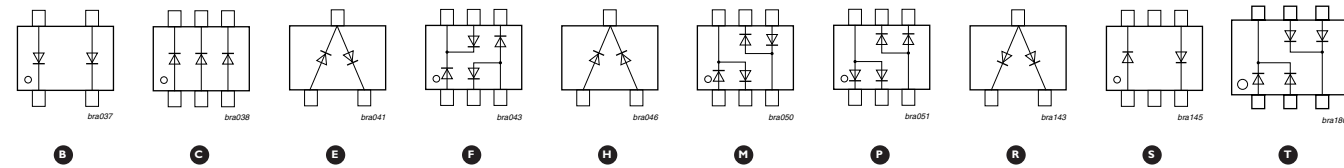
Switching diodes portfolio
SOT88x package platform

Order code

9397 750 13921
9397 750 11753

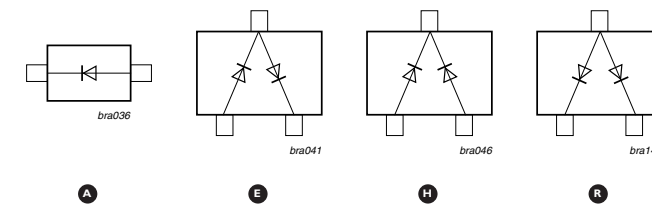
GENERAL PURPOSE DOUBLE/MULTIPLE SWITCHING DIODES

V_R max. (V)	t_{rr} max. (ns)	Package	SOT346 (SC-59) Plastic SMD	SOT457 (SC-74) Plastic SMD	SOT23 Plastic SMD	SOT143B Plastic SMD	SOT323 (SC-70) Plastic SMD	SOT363 (SC-88) Plastic SMD	SOT666 Plastic flat lead SMD	SOT416 (SC-75) Plastic SMD
		Size (mm)	2.9 x 1.5 x 1.15	2.9 x 1.5 x 1.0	2.9 x 1.3 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 1.2 x 0.6	1.6 x 0.8 x 0.75
		P_{tot} (mW)	250	500	250	250	250	300	300	150
100	4	E	1PS226		BAV99		BAV99V			
100	4	H	1PS184		BAV70		BAV70W			BAV70T
100	4	R	1PS181		BAW56		BAW56W			BAW56T
100	4	B				BAS28				
100	4	C					BAS16VY	BAS16VV		
100	4	M					BAV99S			
100	4	T					BAV70S			
100	4	P					BAW56S			
100	4	F					BAW756S			
200	50	E			BAV23S					
200	50	B				BAV23				
200	50	C		BAS21VD						
300	50	B				BAW101				
300	50	S						BAW101S		



LOW LEAKAGE CURRENT SWITCHING DIODES

V_R max. (V)	V_F max. (V)	I_R max. (nA)	t_{rr} max. (ns)	Package	SOD80C (MiniMelf) Surface mounted glass	SOD68 (DO-34) Leaded glass	SOT23 Plastic SMD	SOT323 (SC-70) Plastic SMD	SOD323 (SC-76) Plastic SMD	SOD523 (SC-79) Plastic flat lead SMD
				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	2.0 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	250	400	500
100	1 @ $I_F = 10$ mA	5 @ V_R max.	3	A			BAS116		BAS416	BAS716
100	1 @ $I_F = 10$ mA	5 @ V_R max.	3	E			BAV199	BAV199W		
100	1 @ $I_F = 10$ mA	5 @ V_R max.	3	R			BAW156			
100	1 @ $I_F = 10$ mA	5 @ V_R max.	3	H			BAV170			
125	1 @ $I_F = 10$ mA	1 @ V_R max.	1.5 typ.	A	BAS45AL	BAS45A				



Related literature

Switching diodes portfolio
SOT88x package platform

Order code

9397 750 13921
9397 750 11753

Related literature

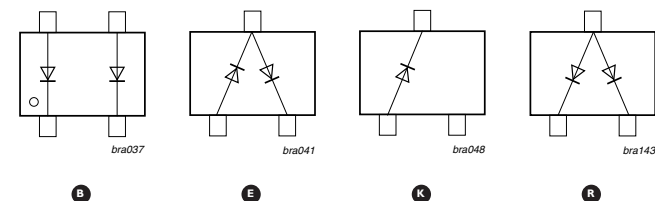
Switching diodes portfolio
SOT88x package platform

Order code

9397 750 13921
9397 750 11753

CONTROLLED AVALANCHE SWITCHING DIODES

V_R max. (V)	I_{FSM} max. (A)	I_{FRM} max. (mA)	C_D max. (pF)	t_{rr} max. (ns)	Package	SOT23 Plastic SMD	SOT143B Plastic SMD
					Size (mm)	2.9 x 1.3 x 1.0	2.9 x 1.3 x 1.0
					P_{tot} (mW)	250	250
60	9	600	2.5	6	B		BAS56
90	10	600	35	50	K	BAS29	
90	10	600	35	50	E	BAS31	
90	10	600	35	50	R	BAS35	



ESD PROTECTION DIODES FOR 1 TO 2 LINES

Number of lines	Uni-directional	Bi-directional	I_{RM} max. (μA)	@	V_{RWM} (V)	C typ. (pF)	P_{pp} * max. (W)	ESD rating** (kV)	Configuration	Type	Package
1			2		3.3	207	330	30		PESD3V3S1UB	SOD523 (SC-79)
1			1		5.0	152	260	30		PESD5V0S1UB	SOD523 (SC-79)
1			0.05		12	38	180	30		PESD12VS1UB	SOD523 (SC-79)
1			0.05		15	32	160	30		PESD15VS1UB	SOD523 (SC-79)
1			0.05		24	23	160	23		PESD24VS1UB	SOD523 (SC-79)
	1		0.1		5.0	35	120	30		PESD5V0S1BA	SOD323 (SC-76)
	1		0.1		5.0	35	120	30		PESD5V0S1BB	SOD523 (SC-79)
	1		0.1		5.0	35	120	30		PESD5V0S1BL	SOD882
	1		2		3.3	101	500	30		PESD3V3L1BA	SOD323 (SC-76)
	1		1		5.0	75	500	30		PESD5V0L1BA	SOD323 (SC-76)
	1		0.05		12	19	200	30		PESD12VL1BA	SOD323 (SC-76)
	1		0.05		15	16	200	30		PESD15VL1BA	SOD323 (SC-76)
	1		0.05		24	11	200	23		PESD24VL1BA	SOD323 (SC-76)
	1		0.05	0.05	15 (diode 1) 24 (diode 2)	13	160	23		PESD1LIN	SOD323 (SC-76)
1			2		3.3	1	330	30		PESD3V3U1UT	SOT23
1			1		5.0	1	260	30		PESD5V0U1UT	SOT23
1			0.05		12	1	180	30		PESD12VU1UT	SOT23
1			0.05		15	1	160	30		PESD15VU1UT	SOT23
1			0.05		24	1	160	23		PESD24VU1UT	SOT23

ESD PROTECTION DIODES FOR 1 TO 2 LINES

Number of lines	Uni-directional	Bi-directional	I_{RM} max. (μA)	@	V_{RWM} (V)	C typ. (pF)	P_{pp} * max. (W)	ESD rating** (kV)	Configuration	Type	Package	
2		1	2		3.3	207	330	30		PESD3V3S2UAT	SOT23	
2		1	1		5.0	152	260	30		PESD5V0S2UAT	SOT23	
2		1	0.05		12	38	180	30		PESD12VS2UAT	SOT23	
2		1	0.05		15	32	160	30		PESD15VS2UAT	SOT23	
2		1	0.05		24	23	160	23		PESD24VS2UAT	SOT23	
	2		2		3.3	207	330	30		PESD3V3S2UT	SOT23	
	2		1		5.25	152	260	30		PESD5V2S2UT	SOT23	
	2		1		12	38	180	30		PESD12VS2UT	SOT23	
	2		1		15	32	160	30		PESD15VS2UT	SOT23	
	2		1		24	23	160	23		PESD24VS2UT	SOT23	
	2		1		3	3.3	200	150		30	PESD3V3S2UQ	SOT663
	2		0.3		5.0	150	150	30		PESD5V0S2UQ	SOT663	
	2		0.03		12	38	150	30		PESD12VS2UQ	SOT663	
	2		0.05		15	32	150	30		PESD15VS2UQ	SOT663	
	2		0.05		24	23	150	23		PESD24VS2UQ	SOT663	
	2		0.3		3.3	22	30	15		PESD3V3L2UM	SOT883 (SC-101)	
	2		0.025		5.0	16	30	15		PESD5V0L2UM	SOT883 (SC-101)	
	2		0.1		5.0	35	120	30		PESD5V0S2BT	SOT23	
	2		2		3.3	101	500	30		PESD3V3L2BT	SOT23	
	2		1		5.0	75	500	30		PESD5V0L2BT	SOT23	
	2		0.05		12	19	200	30		PESD12VL2BT	SOT23	
	2		0.05		15	16	200	30		PESD15VL2BT	SOT23	
	2		0.05		24	11	200	23		PESD24VL2BT	SOT23	
	2		0.05		24	11	200	23		PESD1CAN	SOT23	

*8/20 μs surge pulse acc. to IEC61000-4-5
 **acc. to IEC61000-4-2 (contact discharge)

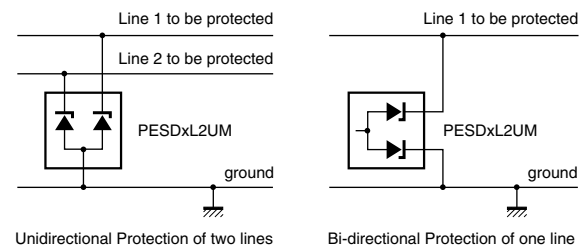
Related literature

- EDS protection diodes
- Automotive small-signal solutions
- SOT88x package platform

Order code

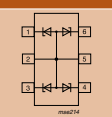



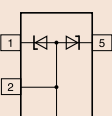
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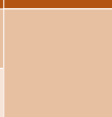
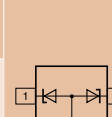
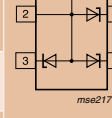

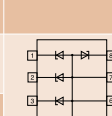
ESD connection diagram



MSE344

ESD PROTECTION DIODES FOR 4 TO 18 LINES

Number of lines Uni-directional	Bi-directional	I _{RM} max. (μA) @ V _{RWM} (V)	C typ. (pF)	P _{pp} * max. (W)	ESD rating** (kV)	Configuration	Type	Package	
4	3	2	3	200	8		BZA456A	SOT457 (SC-74)	
4	3	0.7	4	165	8		BZA462A	SOT457 (SC-74)	
4	3	0.075	14	37	8		BZA418A	SOT457 (SC-74)	
4	3	0.1	15	37	8		BZA420A	SOT457 (SC-74)	
4	3	2	3	200	8		BZA856A	SOT353 (SC-88A)	
4	3	0.7	4	165	8		BZA862A	SOT353 (SC-88A)	
4	3	0.2	4.3	145	8		BZA868A	SOT353 (SC-88A)	
4	3	0.1	15	37	8		BZA820A	SOT353 (SC-88A)	
4	3	1	3	107	8		BZA856AL	SOT353 (SC-88A)	
4	3	0.5	4	90	8		BZA862AL	SOT353 (SC-88A)	
4	3	0.1	4.3	78	8		BZA868AL	SOT353 (SC-88A)	
4	3	0.3	3.3	22	30			PESD3V3L4UG	SOT353 (SC-88A)
4	3	0.025	5.0	16	30			PESD5V0L4UG	SOT353 (SC-88A)
4	3	0.3	3.3	15	16			PESD3V3V4UG	SOT353 (SC-88A)
4	3	0.025	5.0	12	16			PESD5V0V4UG	SOT353 (SC-88A)
4	3	1	3	107	8			BZA956A	SOT665
4	3	0.5	4	90	8	BZA962A		SOT665	
4	3	0.1	4.3	78	8	BZA968A		SOT665	
4	3	0.3	3.3	22	30	PESD3V3L4UW		SOT665	
4	3	0.025	5.0	16	30	PESD5V0L4UW		SOT665	
4	3	0.3	3.3	15	16	PESD3V3V4UW		SOT665	
4	3	0.025	5.0	12	16	PESD5V0V4UW		SOT665	
4	3	0.1	3.3	30	15			IP4042CX5/LF	WLCSP
4	3	0.1	3.3	30	15				
4	4	0.1	5.0	48	15		BZA408B	SOT457 (SC-74)	
4	4	0.1	5.0	16	8		IP4043CX5/LF	WLCSP	

Number of lines Uni-directional	Bi-directional	I _{RM} max. (μA) @ V _{RWM} (V)	C typ. (pF)	P _{pp} * max. (W)	ESD rating** (kV)	Configuration	Type	Package	
5	4	2.2	3.3	215	30		PESD3V3S5UD	SOT457 (SC-74)	
5	4	0.15	5.0	158	30		PESD5V0S5UD	SOT457 (SC-74)	
5	4	0.01	12	73	30		PESD12V5S5UD	SOT457 (SC-74)	
5	4	0.01	15	61	30		PESD15V5S5UD	SOT457 (SC-74)	
5	4	0.01	24	45	30		PESD24V5S5UD	SOT457 (SC-74)	
5	4	0.3	3.3	22	25		PESD3V3L5UY	SOT363 (SC-88)	
5	4	0.025	5.0	16	25		PESD5V0L5UY	SOT363 (SC-88)	
5	4	0.3	3.3	22	25		PESD3V3L5UV	SOT666	
5	4	0.025	5.0	16	25		PESD5V0L5UV	SOT666	
6	5	0.025	5.0	16	35			PESD5V0L6US	SOT96-1 (SO8)
6	5	0.025	5.0	16	35			PESD5V0L6UAS	SOT505-1 (TSSOP8)
	7	0.025	5.0	7	35			PESD5V0L7BS	SOT96-1 (SO8)
	7	0.025	5.0	7	35	PESD5V0L7BAS		SOT505-1 (TSSOP8)	
16	15	0.1	3	15	15		IP4080CX20	WLCSP	
18	17	1	5.2	100	8		BZA100	SOT163 (SO20)	
18	17	1	5.2	100	8		PESD5V2S18U	SOT339-1 (SSOP20)	

*8/20μs surge pulse acc. to IEC61000-4-5
 **acc. to IEC61000-4-2 (contact discharge)



Related literature

Title
 EDS protection diodes
 Automotive small-signal solutions
 SOT88x package platform

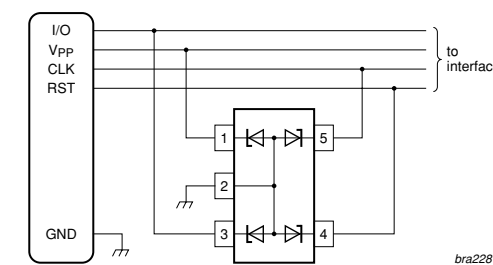
Order code

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 9397 750 14063
 9397 750 11753

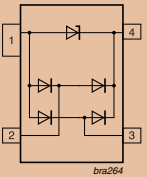
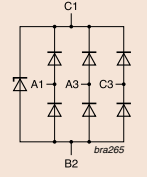
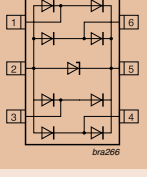
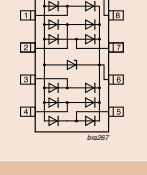
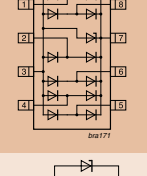
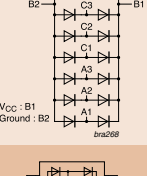
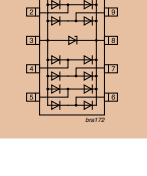
Features

ESD protection diodes
 Excellent ESD clamping behaviour
 Superior size / performance ratio
 IEC61000-4-2, level 4 compatible (8 kV contact, 15 kV air discharge)

Mobile phone SIMcard protection with PESD5VOL4UW



RAIL-TO-RAIL DIODES

Number of protected data lines	I _{RM} max. (μA)	@ V _{RWM} (V)	C _{line} typ. [pF]	ESD rating** max. [kV]	Configuration	Type	Package
2	0.1	3	1	8		PRTR5V0U2X	SOT143
3	0.1	3	4	8		IP4059CX5/LF	WLCSP
4	0.1	3	1	8		PRTR5V0U4D	SOT457 (SC-74)
6	0.1	3	1	8		PRTR5V0U6S	SOT96-1 (SO8)
6	0.1	3	1	8		PRTR5V0U6AS	SOT96-1 (SO8)
7	0.1	3	4	8		IP4067CX9	WLCSP
8	0.1	3	1	8		PRTR5V0U8S	SOT522-1 (TSSOP10)

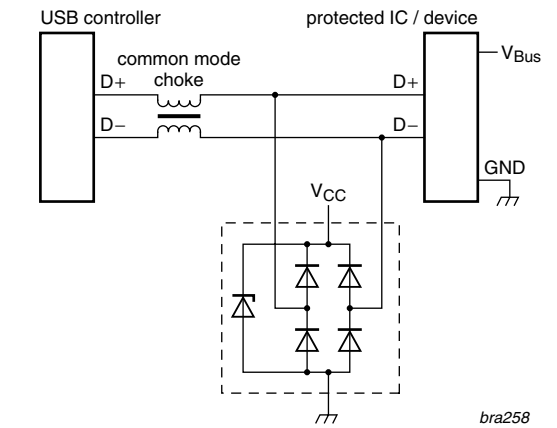


Related literature

Title
 EDS protection diodes
 Automotive small-signal solutions
 SOT88x package platform

USB2.0 protection with PRTR5V0U2X

Order code
 9397 750 12521
 9397 750 14063
 9397 750 11753



Features

- ESD protection diodes**
- Excellent ESD clamping behaviour
- Superior size / performance ratio
- IEC61000-4-2, level 4 compatible (8 kV contact)
- Ultra low capacitance 1 pF

Why choose Philips Semiconductors?

- ESD protection diodes**
- Sensitive applications are protected from the destructive effects of Electrostatic discharge (ESD) according to international industrial standards
- Highly reliable protection devices featuring excellent ESD protection performance
- Ultra-small SMD plastic packages delivering PCB space savings

GENERAL PURPOSE ZENER DIODES

I _F max. (mA)	P _{ZSM} (W)	V _Z nom. (V)	V _Z tolerance	Note	Package	SOT223 (SC-73)	SOD66 (DO-41)	SOT89 (SC-62)	SOD27 (DO-35)	SOD80C (MiniMelf)	SOT346 (SC-59)	SOT23	SOD110	SOT323 (SC-70)	SOD323 (SC-76)	SOD523 (SC-79)	SOT663	SOD882	
						Plastic SMD	Leaded glass	Plastic flat lead SMD	Leaded glass		Surface mounted glass	Plastic SMD	Plastic SMD	Ceramic SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic flat lead SMD	Leadless
						Size (mm)	6.5 x 3.5 x 1.65	4.8 x 2.6 x 0.81	4.5 x 2.5 x 1.5		4.25 x 1.85 x 0.56	3.5 x 1.5 x 1.5	2.9 x 1.3 x 1.0	2.9 x 1.5 x 1.15	2.0 x 1.25 x 1.6	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.2 x 0.8 x 0.6	1.6 x 1.2 x 0.6
P _{tot} (mW)	1500	1000	1000	400	300	220	250	300	350	300	300	350	250						
200	-	2.4~15	B, B2	1	dual c.a.						PZM-NA series								
200	40	2.4~75	A, B, C	2	single							BZX84-series							
200	40	2.4~75	B, C	2	single								BZX284 series		BZX384 series	BZX585 series			BZX884 series
200	40	2.4~15	C	2	dual c.a.									BZB784 series					BZB984 series
200	-	2.4~36	B	2	single										PDZ-B series				
250	-	2.4~36	B, B1, B2, B3	1	single						PZM-N series								
250	40	2.4~75	B, C	2	single				BZX79 series	BZV55 series									
250	40	2.4~75	C	2	single			BZV49 series											
400	40	2.4~75	C	2	single	BZV90 series													
500	-	3.3~24	C	2	single		1N47xxA series												
500	60	3.6~75	C	2	single		BZV85 series												

Note:
 1. B: app. 5%, B1, B2, B3: app. 2%; sequential intervals
 2. A: app. 1%, B: app. 2%, C: app. 5%; overlapping intervals
 c.a.= common anode
 c.c.= common cathode

AVALANCHE REGULATOR DIODES

I _F max. (mA)	P _{ZSM} (W)	V _Z nom. (V)	V _Z tolerance	Configuration	P _{tot} (mW)	SOT23
250	30	5 ~ 6.8	+/- 0.2 V	single	250	PLVA600A series
250	30	5 ~ 6.8	+/- 0.2 V	dual c.a.	250	PLVA2600A series

Note:
 c.a.= common anode

Darlington transistors

DARLINGTON TRANSISTORS

Polarity	(I _C) = mA	(V _{CES}) = V	h _{FE} min.	(f _T min.) = MHz	SOT223 (SC-73)	SOT89 (SC-62)	SOT23	SOT54 (TO-92)
P _{tot} max.					1.250 mW	1.300 mW	250 mW	850 mW
NPN	500	30	5000	125			PMBTA13	
NPN	500	30	10000	125	PZTA14	PXTA14	PMBTA14	MPSA14
NPN	500	30	20000	220 typ.		BCV29	BCV27	
NPN	500	30	30000	220 typ.				BC517
NPN	500	45	2000	200 typ.	BSP50	BST50		
NPN	500	55	2000	155				BC618
NPN	500	60	2000	200 typ.	BSP51	BST51		
NPN	500	60	10000	220 typ.		BCV49	BCV47	
NPN	500	80	2000	200 typ.	BSP52	BST52		
NPN	1000	45	1000	200 typ.				BC875
NPN	1000	80	1000	200 typ.				BC879
NPN	1000	80	2000	200 typ.				BSR52
PNP	500	30	10000	125			PMBTA64	MPSA64
PNP	500	30	20000	220 typ.		BCV28	BCV26	
PNP	500	30	30000	220 typ.				BC516
PNP	500	45	2000	200 typ.	BSP60	BST60		
PNP	500	60	2000	200 typ.	BSP61	BST61		
PNP	500	60	10000	220 typ.		BCV48	BCV46	
PNP	500	80	2000	200 typ.	BSP62	BST62		
PNP	1000	80	2000	200 typ.				BSR62



Related literature

Title	Order code
Philips' medium power transistors in SOT89 (SC-62) and 9397 750 13922 SOT223 (SC-73)	

SINGLE GENERAL PURPOSE TRANSISTORS

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	(f _T min.) = MHz	SOT223 (SC-73) 1.250 mW	SOT89 (SC-62) 1.300 mW	SOT23 250 mW	SOT346 (SC-59) 250 mW	SOT323 (SC-70) 200 mW	SOT416 (SC-75) 150 mW	SOT883 (SC-101) 250 mW	SOT54 (TO-92) 850 mW
P _{tot} max.													
NPN	100	25	450		100					PMST5089			
NPN	100	30	350		100					PMST5088			
NPN	100	30	110 - 200	450 - 800	100			BC848B		BC848V			
NPN	100	32	110	800	100			BCW31 / 32 / 33					
NPN	100	40	120 - 270	270 - 560	100					2PC4081Q / R / S	2PC4617Q / R / S	2PC4617QM / RM / SM	
NPN	100	45	200	450	100								PSS9014C
NPN	100	45	110 - 420	220 - 800	100			BC847 / A / B / C		BC847W / AW / BW / CW	BC847AT / BT / CT	BC847AM / BM / CM	BC547 / A / B / C
NPN	100	45	500	1250	100			PMBT6429		PMST6429			
NPN	100	45	160 - 290	260 - 460	100 - 140				2PD601AQ / R / S	2PD601AQW / RW / SW			
NPN	100	50	200	400	150								2PC945P
NPN	100	65	110 - 200	220 - 450	100			BC846 / A / B		BC846W / AW / BW	BC846AT / BT		BC546A / B
NPN	100	80	20	80	60			BSS64					
NPN	150	50	120 - 350	240 - 700	80								2PC1815Y / GR / BL
NPN	500	20	112 - 144	166 - 202									PSS9013G / H
NPN	500	45	100 - 250	250 - 600	100			BC817 / -16 / -25 / -40		BC817W / -16W / -25W / -40W			BC337 / -16 / -25 / -40
NPN	500	45	160	400	80								JC337-25
NPN	500	50	100	600	100			BCX19					
NPN	500	50	85 - 170	170 - 340	140 - 180				2PD602AQ / R / S	2PD1820AQ / R / S			
NPN	500	60	50		100					PMSTA05			
NPN	500	80	100		100			PMBTA06		PMSTA06			MPSA06
NPN	1000	20	85	375	40	BCP68 / -25		BC868 / -25					BC368
NPN	1000	45	100	160 - 250	100	BCP54 / -10 / -16		BCX54 / -10 / -16					BC635 / -16
NPN	1000	60	63 - 100	160 - 250	typ. 115	BCP55 / -10 / -16		BCX55 / -10 / -16					BC637 / -16
NPN	1000	60	100	300	100	BSP41		BSR40 / 41					
NPN	1000	80	63 - 100	160 - 250	100	BCP56 / -10 / -16		BCX56 / -10 / -16					BC639 / -10 / -16
NPN	1000	80	100	300	100	BSP43		BSR42 / 43					
NPN	1500	25	120 - 160	200-300	100								PSS8050C / D
PNP	100	30	125 - 220	500 - 800	100			BC858B		BC858W			
PNP	100	32	120	500	100			BCW29 / 30					
PNP	100	40	120 - 270	270 - 560	100					2PA1576Q / R / S	2PA1774Q / R / S	2PA1774QM / RM / SM	
PNP	100	45	100	300	100								PSS9015B
PNP	100	45	125 - 420	250 - 800	100			BC857 / A / B / C		BC857W / AW / BW / CW	BC857AT / BT / CT	BC857AM / BM / CM	BC557 / A / B / C
PNP	100	50	200	400	100								2PA733 P
PNP	100	50	160 - 290	260 - 460	60 - 80				2PB709AQ / R / S	2PB709AQW / RW / SW			
PNP	100	65	125 - 200	250 - 475	typ. 150			BC856 / A / B		BC856W / AW / BW	BC856AT / BT		BC556 / A / B
PNP	100	100	30		typ. 85			BSS63					
PNP	150	50	120 - 200	240 - 400	80								2PA1015Y / GR
PNP	500	20	112 - 144	166 - 202									PSS9012G / H
PNP	500	20	100	600	80			BCX18					
PNP	500	45	100 - 250	250 - 600	80			BC807 / -16 / -25 / -40		BC807W / -16W / -25W / -40W			BC327 / -16 / -25 / -40
PNP	500	45	160	400	80								JC327-25
PNP	500	45	100	600	80			BCX17					
PNP	500	50	85 - 170	170 - 340	100 - 140				2PB710AQ / R / S	2PB1219AQ / R / S			
PNP	500	60	50		50					PMSTA55			
PNP	500	80	100		50			PMBTA56		PMSTA56			MPSA56
PNP	1000	20	100 - 160	250 - 375	40	BCP69 / -16 / -25		BC869 / -16 / -25					BC369 / -16 / -25
PNP	1000	45	63 - 100	160 - 250	typ. 115	BCP51 / -10 / -16		BCX51 / -10 / -16					BC636 / -10 / -16
PNP	1000	60	63 - 100	160 - 250	100	BCP52 / -10 / -16		BCX52 / -10 / -16					BC638 / -16
PNP	1000	60	100	300	100	BSP31		BSR30 / 31					
PNP	1000	80	63 - 100	160 - 250	typ. 115	BCP53 / -10 / -16		BCX53 / -10 / -16					BC640 / -16
PNP	1000	80	40 - 100	120 - 300	100	BSP32 / 33		BSR33					
PNP	1500	25	120 - 160	200-300	100								PSS8550C / D



Related literature

Title

Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)

Order code

9397 750 13922

General purpose transistors

DOUBLE GENERAL PURPOSE TRANSISTORS

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	(f _T min.) = MHz	SOT457 (SC-74) 600 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
P _{tot} max.								
NPN	100	40	120	450	100		PUMX1	PEMX1
NPN	100	45	200	450	100		BC847BS	BC847BV
NPN	100	65	110	450	100		BC846S	
NPN	500	45	160	400	80	BC817DS		
PNP	100	40	120	450	100	PIMT1	PUMT1	PEMT1
PNP	100	45	200	450	100		BC857BS	BC857BV
PNP	100	65	110	450	100		BC856S	
PNP	500	45	160	400	80	BC807DS		
NPN/PNP	100	40	120	450	100		PUMZ1	PEMZ1
NPN/PNP	100	45	200	450	100		BC847BPN	BC847BVN
NPN/PNP	100	65	110	450	100	PIMZ2	PUMZ2	
NPN/PNP	500	12	200		100			PEMZ7
NPN/PNP	500	45	160	400	80	BC817DPN		



Related literature

Title

Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)

Order code

9397 750 13922

High voltage transistors

HIGH VOLTAGE TRANSISTORS

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	(f _T min.) = MHz	SOT223 (SC-73) Single 1.250 mW	SOT89 (SC-62) Single 1.300 mW	SOT23 Single 250 mW	SOT323 (SC-70) Single 200 mW	SOT54 (TO-92) Single 830 mW	SOT457 (SC-74) Double 600 mW
P _{tot} max.											
NPN	100	100	150		150					BFV420	
NPN	100	140	60	250	100			PMBT5550	PMST5550	2N5550	
NPN	100	160	80	250	100			PMBT5551	PMST5551	2N5551	
NPN	100	250	50		60	BF722					
NPN	100	250	50		60		BF622	BF822		BF422	
NPN	100	300	50		60	BF720	BF620	BF820	BF820W	BF420	
NPN	200	300	40		50			MMBTA42			
NPN	300	300	40		50	PZTA42	PXTA42	PMBTA42	PMSTA42	MPSA42	
NPN	300	400	50	200	20	PZTA44				MPSA44	
PNP	100	100	30		50			BSS63			
PNP	100	100	150		150					BFV421	
PNP	100	150	60	240	100			PMBT5401	PMST5401	2N5401	
PNP	100	250	50		60	BF723					
PNP	100	250	50		60		BF623	BF823		BF423	
PNP	100	300	50		60		BF621	BF821		BF421	
PNP	100	300	40		50			MMBTA92			
PNP	300	300	40		50	PZTA92	PXTA92	PMBTA92	PMSTA92	MPSA92	
NPN/PNP	300	350	50		50						BF485PN



Related literature

Title

Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)

Order code

9397 750 13922

Low noise transistors

LOW NOISE TRANSISTORS

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	(f _T min.) = MHz	SOT23 250 mW	SOT323 (SC-70) 200 mW	SOT54 (TO-92) 850 mW
P _{tot} max.								
PNP	100	30	220	475	100	BC859B	BC859BW	
PNP	100	30	420	800	100	BC859C	BC859CW	BC559C
PNP	100	45	220	475	100	BC860B	BC860BW	
PNP	100	45	420	800	100	BC860C	BC860CW	
NPN	100	30	200	450	100	BC849B	BC849BW	
NPN	100	30	420	800	100	BC849C	BC849CW	BC549C
NPN	100	45	200	450	100	BC850B	BC850BW	
NPN	100	45	420	800	100	BC850C	BC850CW	BC550C



Related literature

Title

Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)

Order code

9397 750 13922

SINGLE BISS TRANSISTORS < 3A

types in **bold red italic underlined** represent products in development

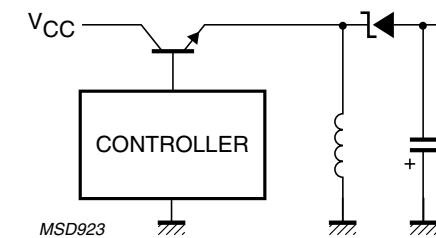
Polarity	$I_C = A$	$V_{CEO} = V$	SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	SOT23	SOT346 (SC-59)	SOT323 (SC-70)		SOT363 (SC-88)	SOT416 (SC-75)	SOT666	SOT883 (SC-101)	SOT54 (TO-92)	$(R_{CEsat}) = m\Omega$	$(V_{CEsat}) = mV$ $I_C/I_B = 10$ $I_C = 500 mA$	$(V_{CEsat}) = mV$ $I_C/I_B = 10$ max. I_C
$P_{tot} max.$			2.000 mW	1.300 mW	750 mW	480 mW	250 mW	350 mW		430 mW	150 mW	300 mW	250 mW	830 mW			
NPN	0.5	15									<i>PBSS2515E</i>		PBSS2515M		< 500	< 250	
NPN	0.5	40									<i>PBSS2540E</i>		PBSS2540M		< 500	< 250	
NPN	1.0	20				PBSS4120T									< 200	< 110	< 250
NPN	1.0	30				PBSS4130T									< 220	< 120	< 270
NPN	1.0	40										PBSS4140V			< 190	< 110	< 190
NPN	1.0	40				PMMT491A										< 300	< 500
NPN	1.0	40				PBSS4140T		PBSS4140U						PBSS4140S	< 500	< 250	< 500
NPN	1.0	60				PBSS4160T	<i>PBSS4160K</i>	<i>PBSS4160U</i>					<i>PBSS4160V</i>		< 250	< 140	< 250
NPN	1.0	100	PBSS8110Z	<i>PBSS8110X</i>	PBSS8110D	PBSS8110T				PBSS8110Y				PBSS8110S/AS	< 200	< 120	< 200
NPN	2.0	20															
NPN	2.0	20				PBSS4320T									< 105	< 70	< 310
NPN	2.0	30				PBSS4230T									< 200	< 100	< 320
NPN	2.0	40										PBSS4240V			< 190	< 100	< 400
NPN	2.0	40				PBSS4240T				PBSS4240Y					< 200	< 100	< 320
NPN	2.0	50		PBSS4250X											< 160	< 90	< 320
NPN	2.0	50				PBSS4350T									< 130	< 80	< 370
NPN	3.0	20		PBSS4320X											< 105	< 70	< 310
NPN	3.0	30		PBSS4330X											< 100	< 60	< 300
NPN	3.0	50		PBSS4350X											< 130	< 80	< 370
NPN	3.0	50	PBSS4350Z		PBSS4350D									PBSS4350S	< 145	< 90	
PNP	0.5	15														< 500	< 250
PNP	0.5	40														< 700	< 350
PNP	1.0	20				PBSS5120T									< 250	< 125	< 250
PNP	1.0	30				PBSS5130T									< 220	< 110	
PNP	1.0	40										PBSS5140V			< 340	< 170	< 310
PNP	1.0	40				PMMT591A										< 350	< 500
PNP	1.0	40				PBSS5140T		PBSS5140U						PBSS5140S	< 500	< 250	< 500
PNP	1.0	60				PBSS5160T	<i>PBSS5160K</i>	<i>PBSS5160U</i>							< 330	< 175	< 330
PNP	1.0	100	PBSS9110Z	<i>PBSS9110X</i>	<i>PBSS9110D</i>	PBSS9110T				PBSS9110Y				PBSS9110S/AS	< 320	< 180	< 320
PNP	2.0	20															
PNP	2.0	20				PBSS5220T									< 113	< 80	< 225
PNP	2.0	20				PBSS5320T									< 105	< 70	< 300
PNP	2.0	30				PBSS5230T									< 220	< 110	< 350
PNP	2.0	40										PBSS5240V			< 250	< 145	< 530
PNP	2.0	40				PBSS5240T				PBSS5240Y					< 220	< 110	< 350
PNP	2.0	50				PBSS5250T									< 150	< 90	< 300
PNP	2.0	50				PBSS5350T									< 135	< 90	< 390
PNP	2.0	50		PBSS5250X											< 160	< 90	< 320
PNP	3.0	20		PBSS5320X											< 105	< 70	< 300
PNP	3.0	20			PBSS5320D										< 133	< 80	< 400
PNP	3.0	30		PBSS5330X											< 107	< 70	< 320
PNP	3.0	50		PBSS5350X											< 135	< 90	< 390
PNP	3.0	50	PBSS5350Z		PBSS5350D									PBSS5350S	< 150	< 100	



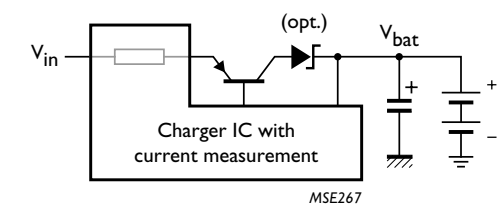
Related literature

Title	Order code
Philips low V_{CEsat} (BISS) transistor portfolio	9397 750 13067
Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)	9397 750 13922
Automotive small-signal solutions	9397 750 14063
SOT88x package platform	9397 750 11753

DC/DC converter



Battery charger



Low V_{CEsat} (BISS) transistors

SINGLE BISS TRANSISTORS > 3 A

Polarity	$I_C = A$	$V_{CEO} = V$	SOT223 (SC-73)	SOT89 (SC-62)	SOT457 (SC-74)	$(R_{CEsat}) = m\Omega$	$(V_{CEsat}) = mV$	$(V_{CEsat}) = mV$
							$I_C/I_B = 10$ $I_C = 500 mA$	$I_C/I_B = 10$ max. I_C
			2.000 mW	1.300 mW	750 mW			
NPN	4.0	20			<i>PBSS4420D</i>	< 50	< 50	< 200
NPN	4.0	40			<i>PBSS4440D</i>	< 75	< 50	< 300
NPN	4.0	40		PBSS4540X		< 71		< 290
NPN	4.0	80		<i>PBSS4480X</i>		< 54	< 40	< 216
NPN	5.0	20		<i>PBSS4520X</i>		< 44	< 50	< 220
NPN	5.0	40	PBSS4540Z			< 71		< 355
PNP	4.0	20			<i>PBSS5420D</i>	< 50	< 60	< 200
PNP	4.0	40			<i>PBSS5440D</i>	< 75	< 60	< 300
PNP	4.0	40		<i>PBSS5540X</i>		< 80		< 375
PNP	4.0	80		<i>PBSS5480X</i>		< 75	< 55	< 300
PNP	5.0	20		<i>PBSS5520X</i>		< 44	< 50	< 220
PNP	5.0	40	PBSS5540Z			< 80	< 80	< 375

types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

Low V_{CEsat} (BISS) transistors

DOUBLE BISS TRANSISTORS

Polarity	$I_C = A$	$V_{CEO} = V$	SOT457 (SC-74)	SOT363 (SC-88)	SOT666	$(R_{CEsat}) = m\Omega$	$(V_{CEsat}) = mV$	$(V_{CEsat}) = mV$
							$I_C/I_B = 10$ $I_C = 500 mA$	$I_C/I_B = 10$ max. I_C
			750 mW	430 mW	300 mW			
NPN	0.5	15			PBSS2515VS	< 500	< 250	< 250
NPN	1.0	60	<i>PBSS4160DS</i>					
PNP	0.5	15			PBSS3515VS	< 500	< 250	< 250
PNP	1.0	60	<i>PBSS5160DS</i>					
NPN/PNP	0.5	15		PBSS2515YPN	PBSS2515VPPN	< 500	< 250	< 250
NPN/PNP	1.0	40	PBSS4140DPN				< 250	< 500
NPN/PNP	1.0	60	<i>PBSS4160DPN</i>					
NPN/PNP	2.0	40	PBSS4240DPN			< 200/260	< 100/145	< 400/530

types in **bold red italic underlined** represent products in development

Related literature



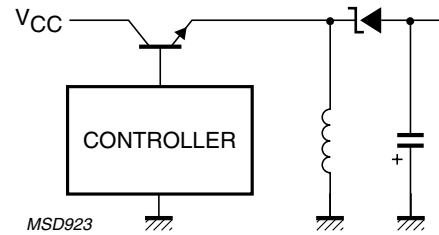
Related literature

- Title**
- Philips low V_{CEsat} (BISS) transistor portfolio
 - Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)
 - Automotive small-signal solutions
 - SOT88x package platform

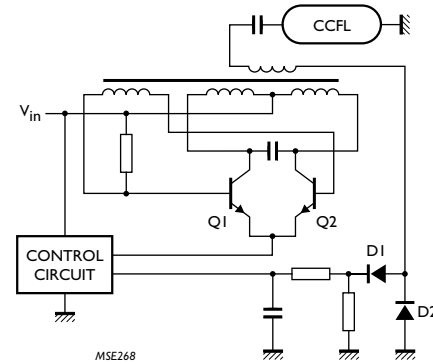
Order code

- 9397 750 13067
- 9397 750 13922
- 9397 750 14063
- 9397 750 11753

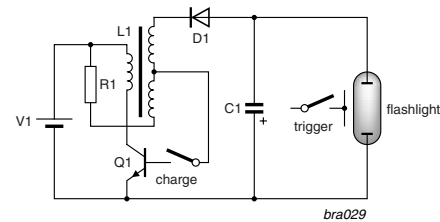
DC/DC converter



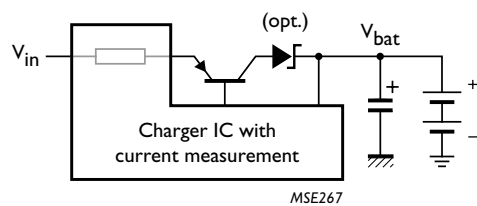
Backlight inverter for TFT display



Flashlight



Battery charger



Features

- Low V_{CEsat} (BISS) transistors**
- Extensive range of BISS transistors
- Low collector-emitter saturation voltage V_{CEsat}
- Up to 5 A collector current capability I_C
- Up to 10 A peak collector current I_{CM}
- High performance / boardspace ratio

Why choose Philips Semiconductors?

- Low V_{CEsat} (BISS) transistors**
- Leading technology
- Broad portfolio of more than 80 devices
- First-to-market for smallest SOT666 package
- Leading technology in medium power SOT89 (SC-62)

Bipolar small-signal transistors



Related literature

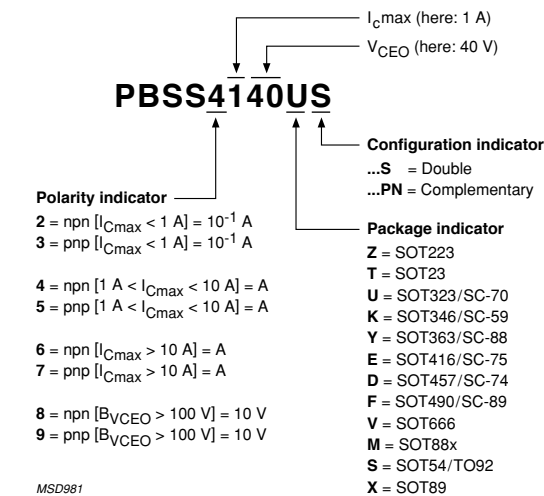
- Title**
- Philips low V_{CEsat} (BISS) transistor portfolio

Order code

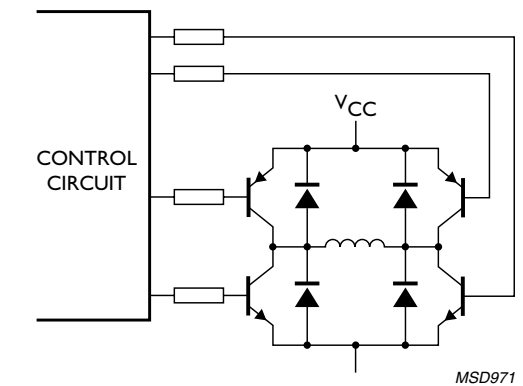
- 9397 750 13067

BISS part numbering

Breakthrough In Small Signal (BISS) part numbering



Fullbridge driver circuit



Why choose Philips Semiconductors?

- Low V_{CEsat} (BISS) transistors**
- Cost reduction potential
- Low R_{CEsat} values
- High current gain h_{FE} , even at high I_C
- Reduces heat generation of applications
- Low collector-emitter saturation voltage V_{CEsat}

Loadswitches

BISS LOADSWITCHES

types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

(I _C) = mA	(V _{CEO}) = V	(V _{CEsat}) = mV	(R1) kΩ	(R2) kΩ	SOT457 (SC-74) 600 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
500	15	250	1	1		PBLS1500Y	PBLS1500V
500	15	250	2.2	2.2		PBLS1501Y	PBLS1501V
500	15	250	4.7	4.7		PBLS1502Y	PBLS1502V
500	15	250	10	10		PBLS1503Y	PBLS1503V
500	15	250	22	22		PBLS1504Y	PBLS1504V
500	40	145	2.2	2.2		PBLS4001Y	PBLS4001V
500	40	145	4.7	4.7		PBLS4002Y	PBLS4002V
500	40	145	10	10		PBLS4003Y	PBLS4003V
500	40	145	22	22		PBLS4004Y	PBLS4004V
500	40	145	47	47		PBLS4005Y	PBLS4005V
1000	20	190	1	1	<i>PBLS2000D</i>		
1000	20	190	2.2	2.2	<i>PBLS2001D</i>		
1000	20	190	4.7	4.7	<i>PBLS2002D</i>		
1000	20	190	10	10	<i>PBLS2003D</i>		
1000	20	190	22	22	<i>PBLS2004D</i>		
1000	40	250	2.2	2.2	<i>PBLS4001D</i>		
1000	40	250	4.7	4.7	<i>PBLS4002D</i>		
1000	40	250	10	10	<i>PBLS4003D</i>		
1000	40	250	22	22	<i>PBLS4004D</i>		
1000	40	250	47	47	<i>PBLS4005D</i>		
1000	60	250	1	1	<i>PBLS6000D</i>		
1000	60	250	2.2	2.2	<i>PBLS6001D</i>		
1000	60	250	4.7	4.7	<i>PBLS6002D</i>		
1000	60	250	10	10	<i>PBLS6003D</i>		
1000	60	250	22	22	<i>PBLS6004D</i>		

BISS RETs

BISS RETS

types in **bold red italic underlined** represent products in development

Polarity	(I _C) = mA	(V _{CEO}) = V	(R1) kΩ	(R2) kΩ	SOT346 (SC-59) 250 mW	SOT23 250 mW	SOT54 (TO-92) 500 mW	
NPN	800	50	R1 = R2	1	1	<i>PBRN113EK</i>	<i>PBRN113ET</i>	<i>PBRN113ES</i>
NPN	800	50	R1 = R2	2.2	2.2	<i>PBRN123EK</i>	<i>PBRN123ET</i>	<i>PBRN123ES</i>
NPN	800	50	R1 <> R2	1	10	<i>PBRN113ZK</i>	<i>PBRN113ZT</i>	<i>PBRN113ZS</i>
NPN	800	50	R1 <> R2	2.2	10	<i>PBRN123YK</i>	<i>PBRN123YT</i>	<i>PBRN123YS</i>
PNP	800	50	R1 = R2	1	1	<i>PBRP113EK</i>	<i>PBRP113ET</i>	<i>PBRP113ES</i>
PNP	800	50	R1 = R2	2.2	2.2	<i>PBRP123EK</i>	<i>PBRP123ET</i>	<i>PBRP123ES</i>
PNP	800	50	R1 <> R2	1	10	<i>PBRP113ZK</i>	<i>PBRP113ZT</i>	<i>PBRP113ZS</i>
PNP	800	50	R1 <> R2	2.2	10	<i>PBRP123YK</i>	<i>PBRP123YT</i>	<i>PBRP123YS</i>

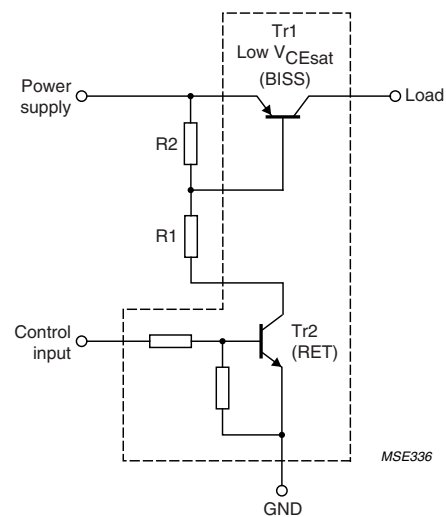


Related literature

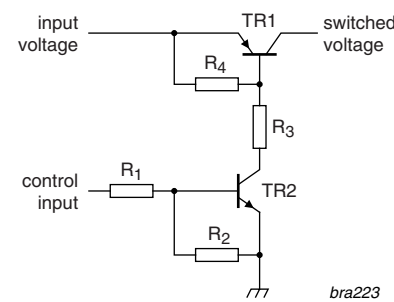
BISS Loadswitches PBLs-series
Automotive small-signal solutions

Order code
9397 750 12512
9397 750 14063

BISS Loadswitch



Supply line switch

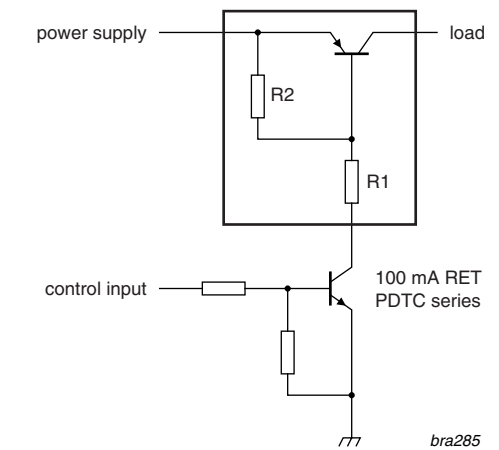
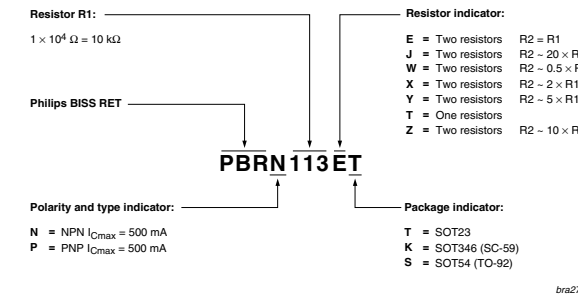


Features

- BISS Loadswitches**
- Low V_{CEsat} (BISS) transistor and RET in one package
- Low "threshold" voltage (<1V) compared to MOSFET
- Low drive power required
- Best-in-class performance for loadswitches
- Space-saving solution offering reduced component count and sourcing effort

BISS RET loadswitch

800 mA BISS RET coding



Features

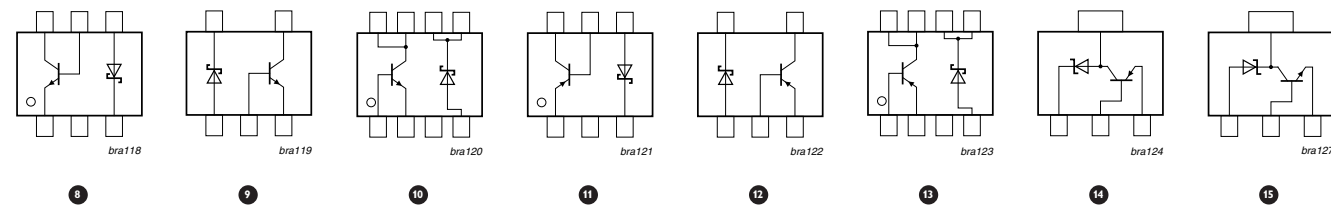
- BISS RETs**
- 800 mA collector current capability
- + / - 10 % resistor tolerance
- Low collector-emitter saturation voltage V_{CEsat}

Schottky diodes/Transistor modules

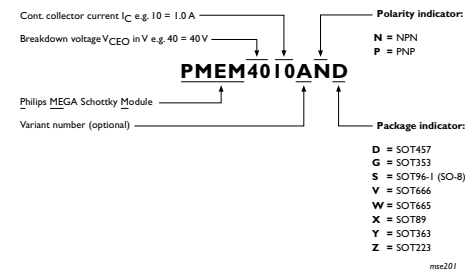
MEGA SCHOTTKY DIODES/BISS TRANSISTOR MODULES

types in **bold red italic underlined** represent products in development

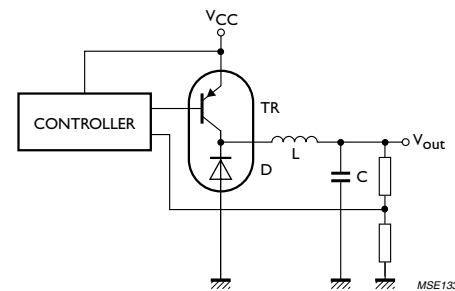
Transistor		Schottky rectifier				Package	SOT96-1 (SO8)	SOT457 (SC-74)	SOT353 (SC-88A)	SOT223
Size		Configuration				Size	4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.1 x 1.25 x 0.95	6.5 x 3.5 x 1.65
Configuration		Configuration				Configuration	NPN	NPN	NPN	NPN
I_C max. (A)	V_{CEO} max. (V)	V_{CEsat} max. (mV)	I_F max. (A)	V_R max. (V)	V_F max. (mV)		10	8	9	15
0.2	40	300	1	40	500					PZTM1101
0.5	15	250	0.5	20	390					PMEM1505NG
1.0	40	210	1	20	550					PMEM4010ND
2.0	40	400	1	20	550					PMEM4020ND
2.0	40	400	1	40	640					PMEM4020AND
3.0	40	370	1	40	500					<i>PMEM4030NS</i>
Configuration		Configuration				Configuration	PNP	PNP	PNP	PNP
0.2	40	350	1	40	500		13	11	12	14
0.5	15	250	0.5	20	390					PMEM1505PG
1.0	40	410	1	20	550					PMEM4010PD
2.0	40	530	1	20	550					PMEM4020PD
2.0	40	530	1	40	640					PMEM4020APD
3.0	40	390	1	40	500					<i>PMEM4030PS</i>



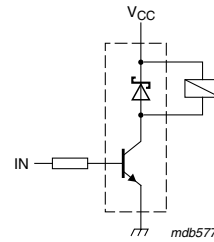
MEGA Schottky modules part numbering



Step down DC/DC converter



Inductive load driver



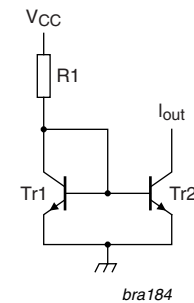
Matched pairs

MATCHED PAIRS

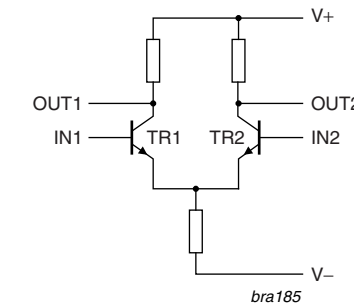
types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

Polarity	$(I_C) = \text{mA}$	$(V_{CEO}) = \text{V}$	$h_{FE} \text{ min.}$	$h_{FE} \text{ max.}$	$\Delta h_{FE} \%$	$\Delta V_{BE} \text{ mV}$	SOT143B 250 mW	SOT457 (SC-74) 600 mW	SOT353 (SC-88A) 300 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
NPN	100	30	110	800	n.a.	n.a.	BCV61/A/B/C				
NPN	100	45	200	450	10	2	<i>BCVM61B</i>	<i>BCM847DS</i>		<i>BCM847BS</i>	
NPN	100	45	200	450	5	2		<i>PMP4501D</i>	<i>PMP4501G</i>	<i>PMP4501Y</i>	<i>PMP4501V</i>
NPN	100	45	200	450	2	2		<i>PMP4201D</i>	<i>PMP4201G</i>	<i>PMP4201Y</i>	<i>PMP4201V</i>
PNP	100	30	110	800	n.a.	n.a.	BCV62/A/B/C				
PNP	100	45	200	450	10	2	<i>BCVM62B</i>	<i>BCM857DS</i>		<i>BCM857BS</i>	
PNP	100	45	200	450	5	2		<i>PMP5501D</i>	<i>PMP5501G</i>	<i>PMP5501Y</i>	<i>PMP5501V</i>
PNP	100	45	200	450	2	2		<i>PMP5201D</i>	<i>PMP5201G</i>	<i>PMP5201Y</i>	<i>PMP5201V</i>

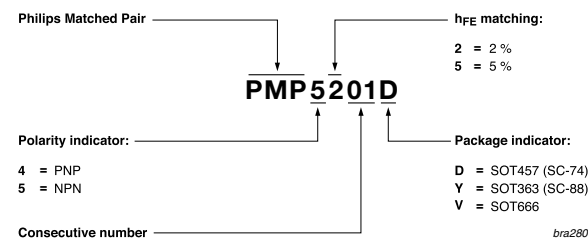
NPN current mirror



Differential amplifier



Matched pair coding



Features

- Matched pairs**
- Current gain matching 10/5/2 %
- Base-emitter voltage matching 2 mV
- Standard double transistor and application optimised pin out available

Medium frequency transistors

MEDIUM FREQUENCY TRANSISTORS

Polarity	$(I_C) = \text{mA}$	$(V_{CEO}) = \text{V}$	$h_{FE} \text{ min.}$	$h_{FE} \text{ max.}$	$(f_T \text{ min.}) = \text{MHz}$	SOT23 250 mW	SOT323 (SC-70) 200 mW	SOT54 (TO-92) 500 mW
NPN	25	20	40	85	275	BFS20	BFS20W	
NPN	25	25	38		typ. 550			BF199
NPN	25	40	67	220	150			BF240
NPN	25	40	67	222	typ. 380	BF840		
NPN	30	20	65	225	typ. 260	BFS19		
NPN	100	15	40		490	BF570		BF370
PNP	25	30	25	50	400	BF824	BF824W	
PNP	25	30	25		typ. 450			BF324
PNP	25	40	50		typ. 325	BF550		
PNP	25	40	50		350			BF450



Related literature

Title
Low V_F (MEGA) Schottky rectifier portfolio

Order code
9397 750 13277

Features

- Schottky diodes/BISS transistor modules**
- Combination of low V_F (MEGA) Schottky rectifier and low V_{CEsat} (BISS) transistor in one package
- Low forward voltage drop
- Low saturation voltage

Why choose Philips Semiconductors?

Schottky diodes/BISS transistor modules

- Less component count
- Board space reduction
- Higher efficiency
- Higher power density
- Cost reduction potential

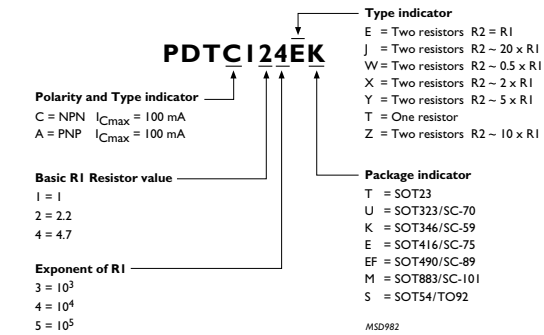
SINGLE RETS 100 mA

types in **bold red** represent new products

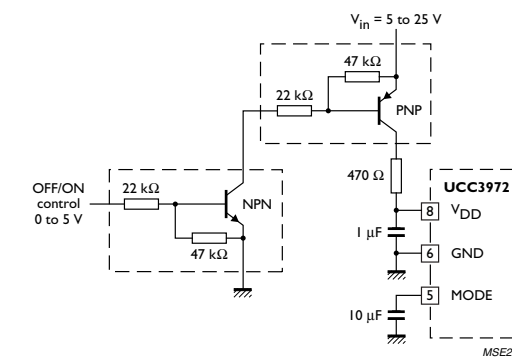
Polarity	(I _C) = mA	(V _{CEO}) = V	(R1) kΩ	(R2) kΩ	SOT346 (SC-59) 250 mW	SOT23 250 mW	SOT323 (SC-70) 200 mW	SOT416 (SC-75) 150 mW	SOT883 (SC-101) 250 mW	SOT54 (TO-92) 500 mW	
NPN	100	50	R1 = R2	1	1	PDTC113EK	PDTC113ET	PDTC113EU	PDTC113EE	PDTC113EM	PDTC113ES
NPN	100	50	R1 = R2	2.2	2.2	PDTC123EK	PDTC123ET	PDTC123EU	PDTC123EE	PDTC123EM	PDTC123ES
NPN	100	50	R1 = R2	4.7	4.7	PDTC143EK	PDTC143ET	PDTC143EU	PDTC143EE	PDTC143EM	PDTC143ES
NPN	100	50	R1 = R2	10	10	PDTC114EK	PDTC114ET	PDTC114EU	PDTC114EE	PDTC114EM	PDTC114ES
NPN	100	50	R1 = R2	22	22	PDTC124EK	PDTC124ET	PDTC124EU	PDTC124EE	PDTC124EM	PDTC124ES
NPN	100	50	R1 = R2	47	47	PDTC144EK	PDTC144ET	PDTC144EU	PDTC144EE	PDTC144EM	PDTC144ES
NPN	100	50	R1 = R2	100	100	PDTC115EK	PDTC115ET	PDTC115EU	PDTC115EE	PDTC115EM	PDTC115ES
NPN	100	50	R1 <> R2	1	10	PDTC113ZK	PDTC113ZT	PDTC113ZU	PDTC113ZE	PDTC113ZM	PDTC113ZS
NPN	100	50	R1 <> R2	2.2	10	PDTC123YK	PDTC123YT	PDTC123YU	PDTC123YE	PDTC123YM	PDTC123YS
NPN	100	50	R1 <> R2	2.2	47	PDTC123JK	PDTC123JT	PDTC123JU	PDTC123JE	PDTC123JM	PDTC123JS
NPN	100	50	R1 <> R2	4.7	10	PDTC143XK	PDTC143XT	PDTC143XU	PDTC143XE	PDTC143XM	PDTC143XS
NPN	100	50	R1 <> R2	4.7	47	PDTC143ZK	PDTC143ZT	PDTC143ZU	PDTC143ZE	PDTC143ZM	PDTC143ZS
NPN	100	50	R1 <> R2	10	47	PDTC114YK	PDTC114YT	PDTC114YU	PDTC114YE	PDTC114YM	PDTC114YS
NPN	100	50	R1 <> R2	22	47	PDTC124XK	PDTC124XT	PDTC124XU	PDTC124XE	PDTC124XM	PDTC124XS
NPN	100	50	R1 <> R2	47	10	PDTC144VK	PDTC144VT	PDTC144VU	PDTC144VE	PDTC144VM	PDTC144VS
NPN	100	50	R1 <> R2	47	22	PDTC144WK	PDTC144WT	PDTC144WU	PDTC144WE	PDTC144WM	PDTC144WS
NPN	100	50	Only R1	4.7	-	PDTC143TK	PDTC143TT	PDTC143TU	PDTC143TE	PDTC143TM	PDTC143TS
NPN	100	50	Only R1	10	-	PDTC114TK	PDTC114TT	PDTC114TU	PDTC114TE	PDTC114TM	PDTC114TS
NPN	100	50	Only R1	22	-	PDTC124TK	PDTC124TT	PDTC124TU	PDTC124TE	PDTC124TM	PDTC124TS
NPN	100	50	Only R1	47	-	PDTC144TK	PDTC144TT	PDTC144TU	PDTC144TE	PDTC144TM	PDTC144TS
NPN	100	50	Only R1	100	-	PDTC115TK	PDTC115TT	PDTC115TU	PDTC115TE	PDTC115TM	PDTC115TS
PNP	100	50	R1 = R2	1	1	PDTA113EK	PDTA113ET	PDTA113EU	PDTA113EE	PDTA113EM	PDTA113ES
PNP	100	50	R1 = R2	2.2	2.2	PDTA123EK	PDTA123ET	PDTA123EU	PDTA123EE	PDTA123EM	PDTA123ES
PNP	100	50	R1 = R2	4.7	4.7	PDTA143EK	PDTA143ET	PDTA143EU	PDTA143EE	PDTA143EM	PDTA143ES
PNP	100	50	R1 = R2	10	10	PDTA114EK	PDTA114ET	PDTA114EU	PDTA114EE	PDTA114EM	PDTA114ES
PNP	100	50	R1 = R2	22	22	PDTA124EK	PDTA124ET	PDTA124EU	PDTA124EE	PDTA124EM	PDTA124ES
PNP	100	50	R1 = R2	47	47	PDTA144EK	PDTA144ET	PDTA144EU	PDTA144EE	PDTA144EM	PDTA144ES
PNP	100	50	R1 = R2	100	100	PDTA115EK	PDTA115ET	PDTA115EU	PDTA115EE	PDTA115EM	PDTA115ES
PNP	100	50	R1 <> R2	1	10	PDTA113ZK	PDTA113ZT	PDTA113ZU	PDTA113ZE	PDTA113ZM	PDTA113ZS
PNP	100	50	R1 <> R2	2.2	10	PDTA123YK	PDTA123YT	PDTA123YU	PDTA123YE	PDTA123YM	PDTA123YS
PNP	100	50	R1 <> R2	2.2	47	PDTA123JK	PDTA123JT	PDTA123JU	PDTA123JE	PDTA123JM	PDTA123JS
PNP	100	50	R1 <> R2	4.7	10	PDTA143XK	PDTA143XT	PDTA143XU	PDTA143XE	PDTA143XM	PDTA143XS
PNP	100	50	R1 <> R2	4.7	47	PDTA143ZK	PDTA143ZT	PDTA143ZU	PDTA143ZE	PDTA143ZM	PDTA143ZS
PNP	100	50	R1 <> R2	10	47	PDTA114YK	PDTA114YT	PDTA114YU	PDTA114YE	PDTA114YM	PDTA114YS
PNP	100	50	R1 <> R2	22	47	PDTA124XK	PDTA124XT	PDTA124XU	PDTA124XE	PDTA124XM	PDTA124XS
PNP	100	50	R1 <> R2	47	10	PDTA144VK	PDTA144VT	PDTA144VU	PDTA144VE	PDTA144VM	PDTA144VS
PNP	100	50	R1 <> R2	47	22	PDTA144WK	PDTA144WT	PDTA144WU	PDTA144WE	PDTA144WM	PDTA144WS
PNP	100	50	Only R1	4.7	-	PDTA143TK	PDTA143TT	PDTA143TU	PDTA143TE	PDTA143TM	PDTA143TS
PNP	100	50	Only R1	10	-	PDTA114TK	PDTA114TT	PDTA114TU	PDTA114TE	PDTA114TM	PDTA114TS
PNP	100	50	Only R1	22	-	PDTA124TK	PDTA124TT	PDTA124TU	PDTA124TE	PDTA124TM	PDTA124TS
PNP	100	50	Only R1	47	-	PDTA144TK	PDTA144TT	PDTA144TU	PDTA144TE	PDTA144TM	PDTA144TS
PNP	100	50	Only R1	100	-	PDTA115TK	PDTA115TT	PDTA115TU	PDTA115TE	PDTA115TM	PDTA115TS

Single RET part numbering

Resistor-Equipped-Transistors part numbering



RETs can be used to control IC inputs



Features

Resistor-equipped transistors (RETs)

- Extensive range of 400 products
- Single and dual RETs with large choice of resistor combinations
- Broad range of SMD and leaded package options

Why choose Philips Semiconductors?

Resistor-equipped transistors (RETs)

- Increased end product reliability
- Lower handling and inventory costs
- Simplified circuit design
- Reduced board space requirements
- Shorter assembly times
- Reduced pick-and-place efforts



Related literature

Title	Order code
Philips' Resistor-equipped transistor (RET) portfolio	9397 750 12514
Automotive small-signal solutions	9397 750 14063
SOT88x package platform	9397 750 11753

Order code

9397 750 12514
9397 750 14063
9397 750 11753

Resistor-equipped transistors (RETs)

Bipolar small-signal transistors

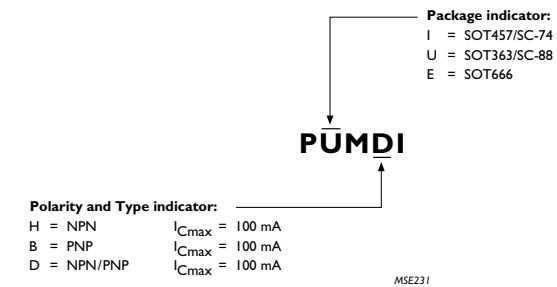
DOUBLE RETS 100 mA

types in **bold red** represent new products
types in **bold red italic underlined** represent products in development

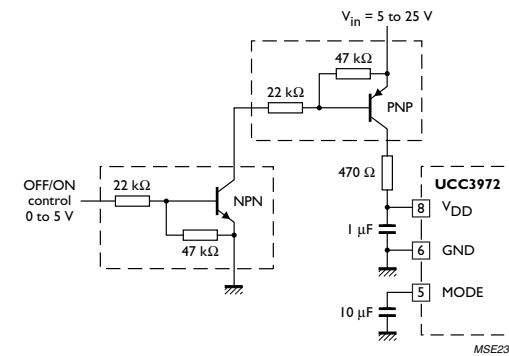
Polarity	(I _C) = mA	(V _{CE0}) = V	(R1) kΩ	(R2) kΩ	SOT457 (SC-74) 600 mW	SOT363 (SC-88) 300 mW	SOT666 300 mW
P _{tot} max.							
NPN	100	50	R1 = R2	2.2	2.2		PEMH20
NPN	100	50	R1 = R2	4.7	4.7		PEMH15
NPN	100	50	R1 = R2	10	10		PEMH11
NPN	100	50	R1 = R2	22	22		PEMH1
NPN	100	50	R1 = R2	47	47		PEMH2
NPN	100	50	R1 = R2	100	100		PUMH24
NPN	100	50	R1 <> R2	2.2	47		PEMH10
NPN	100	50	R1 <> R2	4.7	10		PEMH18
NPN	100	50	R1 <> R2	4.7	47		PEMH13
NPN	100	50	R1 <> R2	10	47	PIMH9	PEMH9
NPN	100	50	R1 <> R2	22	47		PEMH16
NPN	100	50	R1 <> R2	47	22		PEMH17
NPN	100	50	Only R1	4.7	-		PEMH7
NPN	100	50	Only R1	10	-		PEMH4
NPN	100	50	Only R1	22	-		PEMH19
NPN	100	50	Only R1	47	-		PEMH14
PNP	100	50	R1 = R2	2.2	2.2		PEMB20
PNP	100	50	R1 = R2	4.7	4.7		PEMB15
PNP	100	50	R1 = R2	10	10		PEMB11
PNP	100	50	R1 = R2	22	22		PEMB1
PNP	100	50	R1 = R2	47	47		PEMB2
PNP	100	50	R1 = R2	100	100		PEMB24
PNP	100	50	R1 <> R2	2.2	47		PEMB10
PNP	100	50	R1 <> R2	4.7	10		PEMB18
PNP	100	50	R1 <> R2	4.7	47		PEMB13
PNP	100	50	R1 <> R2	10	47		PEMB9
PNP	100	50	R1 <> R2	22	47		PEMB16
PNP	100	50	R1 <> R2	47	22		PEMB17
PNP	100	50	Only R1	4.7	-		PEMB3
PNP	100	50	Only R1	10	-		PEMB4
PNP	100	50	Only R1	22	-		PEMB19
PNP	100	50	Only R1	47	-		PEMB14
NPN/PNP	100	50	R1 = R2	2.2	2.2		PEMD20
NPN/PNP	100	50	R1 = R2	4.7	4.7		PEMD15
NPN/PNP	100	50	R1 = R2	10	10	PIMD3	PEMD3
NPN/PNP	100	50	R1 = R2	22	22	PIMD2	PEMD2
NPN/PNP	100	50	R1 = R2	47	47		PEMD12
NPN/PNP	100	50	R1 = R2	100	100		PEMD24
NPN/PNP	100	50	R1 <> R2	2.2	47		PEMD10
NPN/PNP	100	50	R1 <> R2	4.7	10		PEMD18
NPN/PNP	100	50	R1 <> R2	4.7	47		PEMD13
NPN/PNP	100	50	R1 <> R2	10	47		PEMD9
NPN/PNP	100	50	R1 <> R2	22	47		PEMD16
NPN/PNP	100	50	R1 <> R2	47	22		PEMD17
NPN/PNP	100	50	R1 <> R2	47/2.2	47/2.2		PEMD48
NPN/PNP	100	50	Only R1	4.7	-		PEMD6
NPN/PNP	100	50	Only R1	10	-		PEMD4
NPN/PNP	100	50	Only R1	22	-		PEMD19
NPN/PNP	100	50	Only R1	47	-		PEMD14

Double RET part numbering

Double Resistor-Equipped Transistors part numbering



RETs can be used to control IC inputs



Features

Resistor-equipped transistors (RETs)

- Extensive range of 400 products
- Single and dual RETs with large choice of resistor combinations
- Broad range of SMD and leaded package options

Why choose Philips Semiconductors?

Resistor-equipped transistors (RETs)

- Increased end product reliability
- Lower handling and inventory costs
- Simplified circuit design
- Reduced board space requirements
- Shorter assembly times
- Reduced pick-and-place efforts

Resistor-equipped transistors (RETs)

SINGLE RETS 500 mA

types in **bold red italic underlined** represent products in development

Polarity	(I _C) = mA	(V _{CEO}) = V	(R1) kΩ	(R2) kΩ	SOT346 (SC-59) 250 mW	SOT23 250 mW	SOT54 (TO-92) 500 mW	
NPN	500	50	R1 = R2	1	1	<i><u>PDTD113EK</u></i>	<i><u>PDTD113ET</u></i>	<i><u>PDTD113ES</u></i>
NPN	500	50	R1 = R2	2.2	2.2	<i><u>PDTD123EK</u></i>	<i><u>PDTD123ET</u></i>	<i><u>PDTD123ES</u></i>
NPN	500	50	R1 <> R2	1	10	<i><u>PDTD113ZK</u></i>	<i><u>PDTD113ZT</u></i>	<i><u>PDTD113ZS</u></i>
NPN	500	50	R1 <> R2	2.2	10	<i><u>PDTD123YK</u></i>	<i><u>PDTD123YT</u></i>	<i><u>PDTD123YS</u></i>
PNP	500	50	R1 = R2	1	1	<i><u>PDTB113EK</u></i>	<i><u>PDTB113ET</u></i>	<i><u>PDTB113ES</u></i>
PNP	500	50	R1 = R2	2.2	2.2	<i><u>PDTB123EK</u></i>	<i><u>PDTB123ET</u></i>	<i><u>PDTB123ES</u></i>
PNP	500	50	R1 <> R2	1	10	<i><u>PDTB113ZK</u></i>	<i><u>PDTB113ZT</u></i>	<i><u>PDTB113ZS</u></i>
PNP	500	50	R1 <> R2	2.2	10	<i><u>PDTB123YK</u></i>	<i><u>PDTB123YT</u></i>	<i><u>PDTB123YS</u></i>



Related literature

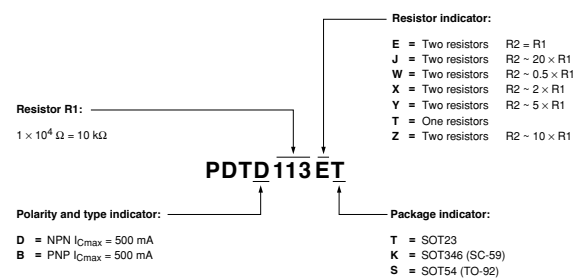
Title

Automotive small-signal solutions

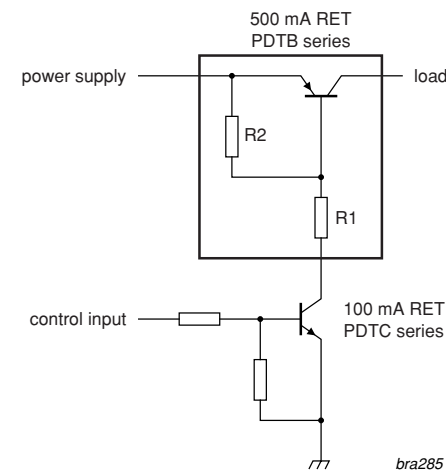
Order code

9397 750 14063

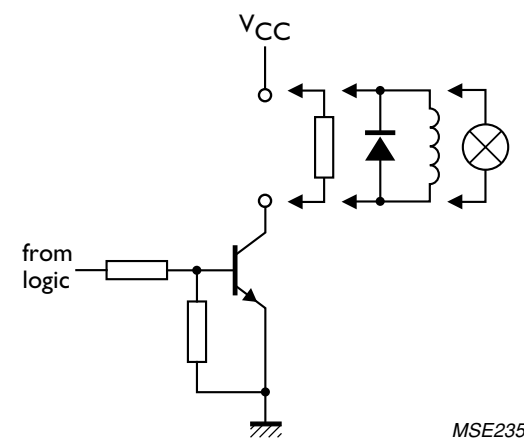
500 mA RET coding



RET loadswitch



RETs to switch loads up to 500 mA



Switching transistors

Bipolar small-signal transistors

SWITCHING TRANSISTORS

Polarity	(I _C) = mA	(V _{CEO}) = V	h _{FE} min.	h _{FE} max.	(f _T min.) = (t _{off}) = ns	SOT223 (SC-73) Single 1.250 mW	SOT89 (SC-62) Single 1.300 mW	SOT23 Single 250 mW	SOT323 (SC-70) Single 200 mW	SOT54 (TO-92) Single 500 mW	SOT457 (SC-74) Double 600 mW
NPN	100	12	40	120	400			BSV52			
NPN	100	40	100	300	180			PMBS3904	PMSS3904	MPS3904	
NPN	200	15	40	120	500					PN2369A	
NPN	200	15	40	120	500			PMBT2369	PMST2369	PH2369	
NPN	200	40	100	300	300			MMBT3904			
NPN	200	40	100	300	300	PZT3904		PMBT3904	PMST3904	2N3904	PMBT3904D
NPN	600	30	100	300	250			PMBT2222	PMST2222		
NPN	600	40	100	300	250			PMBT4401	PMST4401	2N4401	
NPN	600	40	100	300	250			MMBT2222A			
NPN	600	40	100	300	250	PZT2222A	PXT2222A	PMBT2222A	PMST2222A	PN2222A	
PNP	100	40	100	300	150			PMBS3906	PMSS3906	MPS3906	
PNP	200	40	100	300	250			MMBT3906			
PNP	200	40	100	300	250			PZT3906		PMST3906	2N3906
PNP	600	40	100	300	200			PMBT2907			
PNP	600	40	100	300	200			PZT4403	PXT4403	PMBT4403	PMST4403
PNP	600	40	100	300	200			PZT2907A	PXT2907A	PMBT2907A	PMST2907A
PNP	600	40	100	300	200					PN2907A	



Related literature

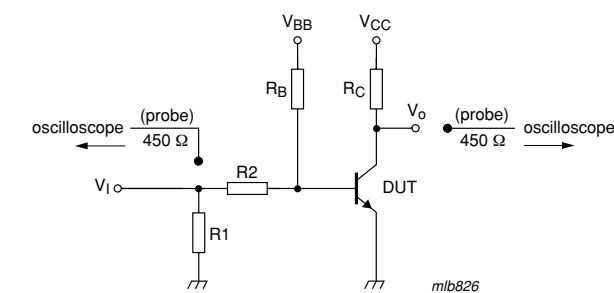
Title

Philips' medium power transistors in SOT89 (SC-62) and SOT223 (SC-73)

Order code

9397 750 13922

Switching times test circuit



ANGULAR MEASUREMENT

Type number	Package	Description	Supply voltage (V)	Angle range (DEG)	Output type	Operating temperature (°C)
KMZ41	SOT96 (SO8)	Magnetic field sensor	5.0 ~ 9	180	sine / cosine	-40 ~ 150
KMZ43T	SOT96 (SO8)	Magnetic field sensor	5.0 ~ 9	180	sine / cosine	-40 ~ 150
UZZ9000	SOT137 (SO24)	Signal conditioning unit	4.5 ~ 5.5	180	analog linear	-40 ~ 150
UZZ9001	SOT137 (SO24)	Signal conditioning unit	4.5 ~ 5.5	180	digital	-40 ~ 150
X3T-KMZ43T	bare die	Magnetic field sensor	5.0 ~ 9.0	180	sine / cosine	-40 ~ 150
KMA200	SOT637	Magnetic field sensor	4.5 ~ 5.5	180	analog / digital	-40 ~ 160



Related literature

Title
Magnetoresistive angle sensors

Order code
9397 750 14132

Features

Magnetoresistive angle sensors

- Contactless angular measurement up to 180 °C
- Measurement independent of magnetic drift caused by life time and temperature changes
- Operation independent of mechanical tolerances and shifts of the magnet caused by thermal stress
- High temperature range
- Automotive qualification
- Highly flexible solutions that measure any automotive angle effectively
- Fully stable operation over long life-cycle

Magnetic field sensors

MAGNETIC FIELD SENSORS

Type number	Package	Supply voltage (V) (typ)	Sensitivity (mV/V / kA/m) (typ)	Filed range (kA/m)	Bridge resistance (Ω)	Operating temperature (°C)
KMZ10B	SOT195	5 ~12	4	-0.2 ~ 2.0	1.6 ~ 2.6	-40 ~ 150
KMZ10C	SOT195	5	1.5	-7.5 ~ 7.5	1.0 ~ 1.8	-40 ~ 150
KMZ51	SOT96 (SO8)	5	12 ~ 16	-0.2 ~ 2.0	1.0 ~ 2.6	-40 ~ 125
KMZ52	SOT109 (SO16)	6 ~ 8	12 ~ 16	-0.2 ~ 2.0	1.0 ~ 2.6	-40 ~ 125

Features

Magnetic field sensors

- High sensitivity and high reliability
- Low offset voltage
- Contactless and therefore wear-free measurement / detection
- Wide operating frequency range (0 Hz to 1 MHz)
- High operating temperatures (up to 125 °C peak)
- Long operating life, high stability and ruggedness

ROTATIONAL SPEED MEASUREMENT

Type number	Package	Supply voltage (V)	Airgap (mm)	Target wheel	Operating temperature (°C)	Output type	Magnetized ferrite magnet (mm)
KMI15/1	SOT453	5 ~ 16	0.9 ~ 2.9	Passive ferromagnetic	-40 ~ 85	Digital current	8.0 x 8.0 x 4.5
KMI15/2	SOT453	5 ~ 16	0.5 ~ 2.7	Magnetized	-40 ~ 85	Digital current	3.8 x 2.0 x 0.8
KMI15/4	SOT453	5 ~ 16	0.5 ~ 2.3	Passive ferromagnetic	-40 ~ 85	Digital current	5.5 x 5.5 x 3.0
KMI16/1	SOT477	5 ~ 16	0.9 ~ 2.9	Passive ferromagnetic	-40 ~ 150	Open collector	8.0 x 8.0 x 4.5
KMI18/2	SOT477	5 ~ 16	0.5 ~ 2.7	Magnetized	-40 ~ 150	Open collector	3.8 x 2.0 x 0.8
KMI18/4	SOT477	5 ~ 16	0.5 ~ 2.3	Passive ferromagnetic	-40 ~ 150	Open collector	5.5 x 5.5 x 3.0
KMI20/1	SOT453	5 ~ 16	0.9 ~ 3.5*	Passive ferromagnetic	-40 ~ 85	Digital current	8.0 x 8.0 x 4.5
KMI20/2	SOT453	5 ~ 16	0.5 ~ 3.2*	Magnetized	-40 ~ 85	Digital current	3.8 x 2.0 x 0.8
KMI20/4	SOT453	5 ~ 16	0.5 ~ 2.8*	Passive ferromagnetic	-40 ~ 85	Digital current	5.5 x 5.5 x 3.0

* + 1 mm dynamic reserve



Related literature

Title
Rotational speed sensors

Order code
9397 750 14138

Features

Rotational speed sensors

- Wide airgap between sensor and target
- Speed detection down to 0 Hz
- Very low jitter
- Wide frequency range
- Insensitive to vibrations
- Temperature range - 40 to + 150 °C
- Prepared for injection moulding

Temperature sensors

TEMPERATURE SENSORS

Type number	Package	R25 (Ω)	R100 (Ω)	Tolerance +/- %	Operating temperature (°C)
KTY81-1 KTY81-2	SOD70	1000 2000		+/- 1% ~ +/- 5%	-55 ~150
KTY82-1 KTY82-2	SOT23	1000 2000		+/- 1% ~ +/- 5%	-55 ~150
KTY83-1 KTY84-1	SOD68 (DO-34) SOD68 (DO-34)	1000	1000	+/- 1% ~ +/- 5% +/- 3% ~ +/- 5%	-55 ~175 -40 ~ 300



Related literature

Title
KTY silicon temperature sensors

Order code
9397 750 14133

Features

KTY silicon temperature sensors

- High accuracy and reliability
- Long term stability
- Positive temperature coefficient - fail-safe behaviour
- Virtually linear characteristics