

Exceptional choice in ... Discrete semiconductors

Playing an essential role in every application, our complete discrete semiconductors portfolio contains innovative, highly integrated power components including transistors, diodes and triacs; a vast selection of small-signal products and discrete sensors; and advanced RF devices for base station and broadcast applications. We are continually expanding our offering, introducing new products and packages which continue to push back the boundaries of reliability and performance.

One of Philips Semiconductors' strengths in discrete semiconductors is our power portfolio, backed by a world-renowned reputation for quality that meets even stringent automotive requirements. Proven, state-of-the-art smart power technologies ensure our extensive range of MOSFETs, fast switching bipolar transistors, power diodes, and triacs and thyristors match your power needs in a myriad of applications. With sophisticated design processes, along with excellence in manufacturing, supply chain logistics and support, Philips Semiconductors' commitment continually enhancing and expanding our offering delivers outstanding price / performance power solutions.

One of the broadest and deepest portfolios of small-signal discretes enables Philips Semiconductors to service many diverse markets. Continually innovating in what can often be seen as a static market with advances such as low V_{CEsat} (BISS) transistors and large Schottky diodes, Philips is also actively driving the integration of passive and active components into a single package with developments including RETs (Resistor Equipped Transistors). This is strengthened by our growing range of magnetoresistive and temperature sensors as well as being recognized for many of the major advances in package options – including the development of surface mount technology. Committed to delivering highest quality products at the lowest cost-of-ownership in the industry, this extensive portfolio is supported by world-class service and logistics.

Recognized globally as a leading supplier of RF discretes, Philips Semiconductors offers one of the broadest portfolios, coupled with high volume manufacturing capability and our unrivalled understanding of RF. Setting the performance standards for others follow, based on our world-leading RF design, process and packaging technologies, ensures your benefit from proven, leading-edge products. Delivering products dedicated to specific applications, we are committed to supplying you with next-generation solutions which meet tomorrow's market needs - today.



Discretes

BANDSWITCHING DIODES

Type number	Package	V _R max [V]	C _D typ. [pF]	I _F max [mA]	R _D @ I _F =3 mA AND F=200 MHz max (Ohm)	R _D @ I _F =2 mA AND F=100 MHz max (Ohm)	R _D @ I _F =5 mA AND F=200 MHz max (Ohm)	R _D @ I _F =3 mA AND F=100 MHz max (Ohm)	Application keys
BA278	SOD523 (I-IGIA, UFP)	35	1.2@V _R =6V AND F=1MHz max	100	-	0.7	-	-	152
BA591	SOD323 (UMD2, I-IEIA, URP)	35	0.9@V _R =3V AND F=1MHz max	100	0.7	-	-	0.7	152
BA792	SOD110	35	1.1@V _R =3V AND F=1to100MHz max	100	0.7	-	-	-	152
BA891	SOD523 (I-IGIA, UFP)	35	0.9@V _R =3V AND F=1MHz max	100	0.7	-	-	0.7	152
BAT18	SOT23 (SST3)	35	1.0@V _R =20V AND F=1MHz max	100	-	-	0.7	-	152
BA277	SOD523 (I-IGIA, UFP)	35	1.2@V _R =6V AND F=1MHz max	100	-	0.7	-	-	152
BA277-01	SOD723	35	1.2@V _R =6V AND F=1MHz max	100	-	0.7	-	-	152



Related literature

Title	Order code
Small-Signal Field-effect Transistors and Diodes (databook)	939775006017
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
PIN diodes designed for RF applications up to 3 GHz	939775008008
RF PIN Diode Replacement Card	939775008573



Applications key

Consumer
152 : Standard TV

Why choose Philips Semiconductors?

...PIN Diodes and Bandswitch Diodes

* Our portfolio offers unrivalled performance in a wide variety of RF applications.

Benefits

- * Volume delivery
- * Short leadtimes
- * Low series inductance
- * Low insertion loss
- * Low capacitance
- * High reverse isolation

ULTRA LOW V_F (MEGA) SCHOTTKY DIODES

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

V _R max [V]	I _{F(AV)} max [mA]	I _{FSM} max [A]	V _F max [mV]	C _D @max. [pF]	Configuration	SOT23	SOT457 (SC-74)	SOD323 (SC-76)	SOT666	SOD523 (ISC79)	SOD882
10	2000	9000	350 @I _F = 1000 mA	45 @V _R =5V	single			PMEG1020EA	PMEG1020EV		
20	500	6000	480 @I _F = 500 mA	30 @V _R =1V	single					PMEG2005EB	PMEG2005EL
20	500	10000	390 @I _F = 500 mA	80 @V _R =1V	single			PMEG2005AEA	PMEG2005AEV		
20	1000	5000	550 @I _F = 1000 mA	25 @V _R =1V	single			PMEG2010EA			
20	1000	8000	550 @I _F = 1000 mA	25 @V _R =1V	single				PMEG2010EV		
20	700		290 @I _F = 100 mA	30 @V _R =1V	single						PMEG2007EL
20	1000		290 @I _F = 100 mA	30 @V _R =1V	single					PMEG2010AEB	
20	1000	10000	500 @I _F = 1000 mA	80 @V _R =1V	single			PMEG2010BEA			
20	1500	10000	660 @I _F = 1000 mA	25 @V _R =1V	single			PMEG2015EA	PMEG2015EV		
20	2000		430 @I _F = 1000 mA	50 @V _R =1V	single			PMEG2020AEA			
30	200	1000	400 @I _F = 100 mA	25 @V _R =1V	single					PMEG3002AEB	PMEG3002AEL
30	500	10000	430 @I _F = 500 mA	70 @V _R =1V	single			PMEG3005AEA	PMEG3005AEV		
30	1000	10000	560 @I _F = 1000 mA	70 @V _R =1V	single			PMEG3010BEA			
30	1500				single	PMEG3015ET					
40	200	1000	500 @I _F = 500 mA	20 @V _R =1V	single						PMEG4002EL
40	500	10000	460 @I _F = 500 mA	50 @V _R =1V	single			PMEG4005AEA	PMEG4005AEV		
40	1000	10000	640 @I _F = 1000 mA	50 @V _R =1V	single			PMEG4010BEA			
40	1500				single	PMEG4015ET					
60	1000		650 @I _F = 1000 mA	60 @V _R =1V	single			PMEG6010AED			
60	1500				single	PMEG6015ET					

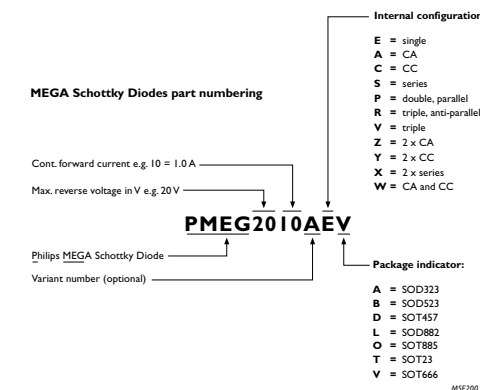
Note: For MEGA Schottky Modules please go to page 6.33



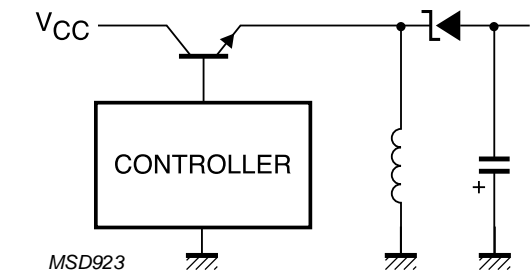
Related literature

Title	Order code
MEGA Schottky diodes	939775010821

MEGA Schottky Diodes part numbering



Inverting DC/DC converter



DAMPER AND MODULATOR DIODES

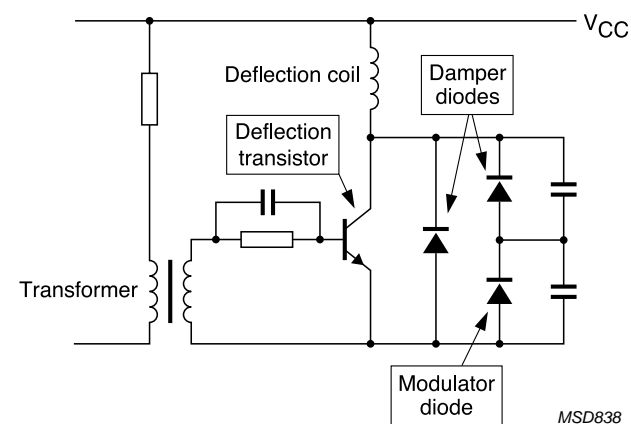
t_{rr} [ns]	V_{RRM} [V]	$I_O (AV)$ [A]	I_{FRM} [A]	@ I_F [A]	V_F [V]	SOD57	SOD64	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	Application Keys
1000	1650	-	8	3	1.60	BY448				13 18 125 152
500	1500	-	10	5	1.45		BY328 BY328/20			13 125 126 152
1000	1650	-	10	5	1.50		BY228 BY228/20 BY228/21 BY228/24 BY228/33 BY228/40			13 125 152
1000	1700	-	10	5	1.50		BY278/20			125 152
-	1500/600	8	16	-	-			BYM359X-1500		126
-	1500	10	16	-	-			BY329X-1500 BY329X-1500S	BY329-1500S	17 19 125 126 152
-	1500	10	60	-	-			BY359X-1500 BY359X-1500S	BY359-1500	17 23 125 126 152
-	1500	10	100	-	-			BY459X-1500 BY459X-1500S	BY459-1500	16 23 24 125 126 152
250	1500	-	8	4	1.95		BY428			13 126



Applications key

- Computing
 - 126 : CRT Monitors
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- Monitor
 - 18 : 14"Monitor
 - 19 : 14"-15"Monitor
 - 23 : 17"Monitor
 - 24 : 17"-19"Monitor
- TV
 - 13 : Colour TV
 - 16 : High Definition TV (HDTV)
 - 17 : Improved Definition TV (IDTV)

Damper and modulator diodes



Why choose Philips Semiconductors?

- ... Damper and modulator diodes
 - * Complete range of high voltage damper diodes ranging from 500 to 1700 V.
 - * Low loss, low V_f and fast switching characteristics ideally for all TV and Monitor applications.
 - * Full range of industry standard packages.
 - * Fully compatible with Philips Semiconductors Range of Deflection Transistors.
 - * The BYM range offers dual damper/modulator diode combinations, simplifying circuit layout and reducing component count.

GENERAL PURPOSE PIN DIODES

types in **bold red** represent new products

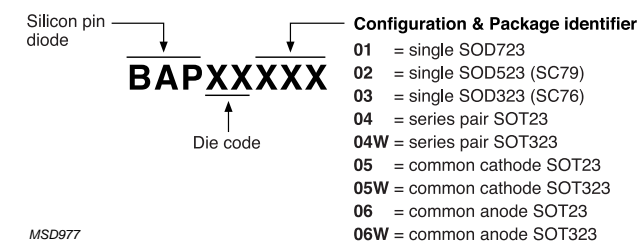
Type number	Package	V _R max (V)	Configuration	C _D typ. (pF)	I _F max (mA)	R _D @ I _F =0.5 mA AND F=100 MHz max (Ohm)	R _D @ I _F =10 mA AND F=100 MHz max (Ohm)	t _L @ I _F =10 mA AND I _R =6 mA
BAP1321-01	SOD723	60	Single	0.25@V _R =20V AND F=1MHz max	100	3.4	1.2	-
BAP1321-02	SOD523 (I-IGIA, UFP)	60	S	0.32@V _R =20V AND F=1MHz max	100	5	1.8	-
BAP1321-03	SOT323 (UMT3, CMPAK)	100	Single	0.27@V _R =5V AND F=1MHz max 0.36@V _R =0V AND F=1MHz max 0.30@V _R =20V AND F=1MHz max 0.36@NOTE3	100	3.5	1.2	-
BAP1321-04	SOT23 (SST3)	100	Series	0.27@V _R =5V AND F=1MHz max 0.36@V _R =0V AND F=1MHz max 0.30@V _R =20V AND F=1MHz max 0.36@NOTE3	100	3.5	1.2	-
BAP27-01	SOD723	20	S	-	50	2.5	0.95	-
BAP50-02	SOD523 (I-IGIA, UFP)	50	Single	0.3@V _R =5V AND F=1MHz max 0.45@V _R =0V AND F=1MHz max 0.22@V _R =20V AND F=1MHz max 0.45@NOTE3	50	25	3	1.04
BAP50-03	SOD323 (UMD2, I-IEIA, URP)	30	S	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP50-04	SOT23 (SST3)	50	Series	0.3@V _R =5V AND F=1MHz max 0.45@V _R =0V AND F=1MHz max 0.25@V _R =20V AND F=1MHz max 0.45@NOTE3	50	25	3	1.04
BAP50-04W	SOT323 (UMT3, CMPAK)	50	Series	0.3@V _R =5V AND F=1MHz max 0.45@V _R =0V AND F=1MHz max 0.25@V _R =20V AND F=1MHz max 0.45@NOTE3	50	25	3	1.04
BAP50-05	SOT23 (SST3)	50	CC	0.3@V _R =5V AND F=1MHz max 0.45@V _R =0V AND F=1MHz max 0.25@V _R =20V AND F=1MHz max 0.45@NOTE3	50	25	3	1.04
BAP50-05W	SOT323 (UMT3, CMPAK)	50	Common cathode	0.3@V _R =5V AND F=1MHz max 0.45@V _R =0V AND F=1MHz max 0.25@V _R =20V AND F=1MHz max 0.45@NOTE3	50	25	3	1.04
BAP51-01	SOD723	50	Single	0.2@V _R =5V AND F=1MHz max 0.4@V _R =0V AND F=1MHz max 0.16@V _R =20V AND F=1MHz max	60	5.5	1.5	0.55
BAP51-02	SOD523 (I-IGIA, UFP)	50	Single	0.2@V _R =5V AND F=1MHz max 0.4@V _R =0V AND F=1MHz max 0.16@V _R =20V AND F=1MHz max	60	5.5	1.5	0.55
BAP51-03	SOD323 (UMD2, I-IEIA, URP)	50	Single	0.2@V _R =5V AND F=1MHz max 0.4@V _R =0V AND F=1MHz max 0.16@V _R =20V AND F=1MHz max 0.4@NOTE3	60	5.5	1.5	0.55
BAP51-04W	SOT323 (UMT3, CMPAK)	50	Series	0.2@V _R =5V AND F=1MHz max 0.4@V _R =0V AND F=1MHz max 0.16@V _R =20V AND F=1MHz max 0.4@NOTE3	60	5.5	1.5	0.55
BAP51-05W	SOT323 (UMT3, CMPAK)	60	CC	0.35@V _R =5V AND F=1MHz max	60	9	2.5	-
BAP63-01	SOD723	50	Single	0.25@V _R =20V AND F=1MHz max	100	2.5	1.17	-
BAP63-02	SOD523 (I-IGIA, UFP)	175	Single	0.23@V _R =20V AND F=1MHz max	100	20	2	-
BAP63-03	SOD323 (UMD2, I-IEIA, URP)	175	Single	0.27@V _R =5V AND F=1MHz max	100	20	2	1.55
BAP63-05W	SOT323 (UMT3, CMPAK)	50	CC	0.35@V _R =20V AND F=1MHz max	100	3.5	1.8	-
BAP64-02	SOD523 (I-IGIA, UFP)	175	Single	0.27@V _R =5V AND F=1MHz max 0.52@V _R =0V AND F=1MHz max 0.23@V _R =20V AND F=1MHz max 0.52@NOTE3	100	20	2	1.55
BAP64-03	SOD323 (UMD2, I-IEIA, URP)	175	Single	0.27@V _R =5V AND F=1MHz max 0.52@V _R =0V AND F=1MHz max 0.23@V _R =20V AND F=1MHz max 0.52@NOTE3	100	20	2	1.55
BAP64-04	SOT23 (SST3)	175	Series	0.27@V _R =5V AND F=1MHz max 0.52@V _R =0V AND F=1MHz max 0.23@V _R =20V AND F=1MHz max 0.52@NOTE3	100	20	2	1.55
BAP64-04W	SOT323 (UMT3, CMPAK)	200	SS	0.35@V _R =20V AND F=1MHz max	100	40	3.8	-
BAP64-05	SOT23 (SST3)	175	CC	0.27@V _R =5V AND F=1MHz max 0.52@V _R =0V AND F=1MHz max 0.23@V _R =20V AND F=1MHz max 0.52@NOTE3	100	20	2	1.55
BAP64-05W	SOT323 (UMT3, CMPAK)	30	CC	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP64-06	SOT23 (SST3)	175	CA	0.27@V _R =5V AND F=1MHz max 0.52@V _R =0V AND F=1MHz max 0.23@V _R =20V AND F=1MHz max	100	20	2	1.55

GENERAL PURPOSE PIN DIODES

Type number	Package	V _R max (V)	Configuration	C _D typ. (pF)	I _F max (mA)	R _D @ I _F =0.5 mA AND F=100 MHz max (Ohm)	R _D @ I _F =10 mA AND F=100 MHz max (Ohm)	t _L @ I _F =10 mA AND I _R =6 mA
BAP64-06W	SOT323 (UMT3, CMPAK)	100	CA	0.35@V _R =20V AND F=1MHz max	100	40	3.8	-
BAP65-01	SOD723	30	S	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP65-02	SOD523 (I-IGIA, UFP)	30	S	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP65-03	SOD323 (UMD2, I-IEIA, URP)	30	S	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP65-05	SOT23 (SST3)	30	CC	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP65-05W	SOT323	30	CC	0.7@V _R =5V AND F=1MHz max	100	-	0.9	-
BAP70-02	SOD523 (I-IGIA, UFP)	70	Single	0.25@V _R =20V AND F=1MHz max	100	-	7	-
BAP70-03	SOD323 (UMD2, I-IEIA, URP)	70	Single	0.25@V _R =20V AND F=1MHz max	100	-	7	-

AM PIN DIODES

RF pin diode part numbering



Charge carrier life time [us]	Diode capacitance [pF]	100 kHz diode series resistance [M Ohm]	1 MHz diode series resistance [k Ohm]	V _F [V]	@ I _F [A]	SOD81	SOD106 (SMA, PMOS)	Application Keys
25	5	12	250	1.1	0.1	BAQ800	BAQ806	105 119 120



Applications key

- Automotive
- 105 : Automotive
- 119 : Car infotainment
- 120 : Car radio/CD/tape systems



Related literature

Title	Order code
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146

Why choose Philips Semiconductors?

- ...PIN Diodes and Bandswitch Diodes**
- * Our portfolio offers unrivalled performance in a wide variety of RF applications.
- Benefits**
- * Volume delivery
 - * Short leadtimes
 - * Low series inductance
 - * Low insertion loss
 - * Low capacitance
 - * High reverse isolation

Why choose Philips Semiconductors?

- ...SOD106 diodes**
- Where added functionality or an SMB package is required, Philips Semiconductors offers the SOD106 range (BYG series). These SOD106 rectifiers are the same size as the SMA package but with SMB ratings, thus offering a smaller, cost-effective alternative
- Features and benefits**
- * High carrier life time gives low distortion of AM signals
 - * Large forward resistance change over current range gives large AGC range
 - * Can be used with an active AM antenna (50/75 Ohm) for increased AGC range
 - * Surface mount package helps in miniaturisation of circuit
 - * Low leakage current for optimum sensitivity

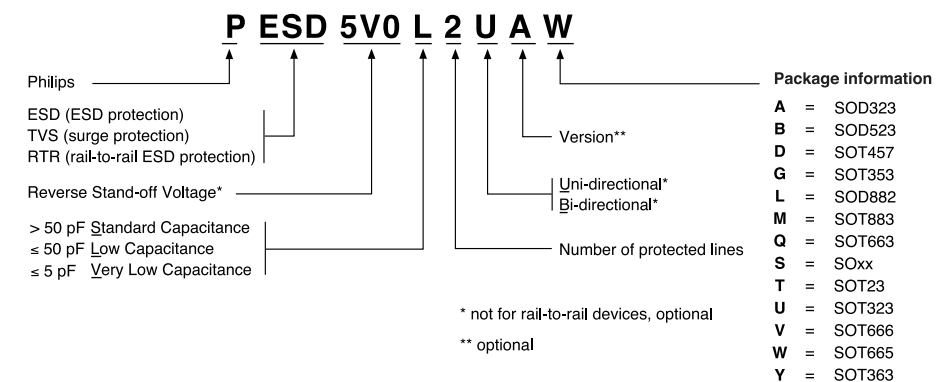
ESD PROTECTION DEVICES /TRANSIENT VOLTAGE SUPPRESSORS (TVS)

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

Number of protected lines Uni-/Bi-directional		I _{RM} (I _R) max [μA]	V _{RWM} (V _R) [V]	V _Z typ [μA]	I _Z [V]	C max [pF]	C typ. [pF]	P _{ZSM} * max [W]	Configuration	2-pin		3-pin		5-pin	
Uni-	Bi-									SOD323 (SC-76)	SOD523 (SC-79)	SOD882	SOT23	SOT663	SOT883 (SC-101)
1				2.4 - 75	5					BZX384 PDZ	BZX8585	BZX884			
1				2.4 - 75	5								BZX84		
	1	0.1	5			55		20		PESD5V0S1BA	PESD5V0S1BB				
2	1	1	5.25	6.8	1	200							PESD5V2S2UT PESD12VS2UT PESD15VS2UT PESD24VS2UT	PESD5V0S2UQ PESD12VS2UQ PESD15VS2UQ PESD24VS2UQ	
2	1	0.5	3.3	5.6	1	19	16	6							PESD3V3L2UM PESD5V0L2UM
2	1	0.05	5	6.8	1	19	16	6							
	2	0.1	5			55		20					PESD5V0S2BT		
4	3	2	3	5.6	1	240		24							BZA856A BZA862A BZA868A BZA820A
4	3	0.7	4	6.2	1	200		24							
4	3	0.2	4.3	6.8	1	180		24							
4	3	0.1	15	20	1	50		17							
4	3	1	3	5.6	1	125		16							BZA856AL BZA862AL BZA868AL
4	3	0.5	4	6.2	1	105		15							BZA956A BZA962A
4	3	0.1	4.3	6.8	1	90		14							BZA968A
4	3	0.2	3	5.6	1	28	22	6							BZA856AVL PESD3V3L4UG BZA862AVL BZA868AVL
4	3	0.5	3.3	5.6	1	28	22	6							BZA956AVL PESD3V3L4UW
4	3	0.1	4	6.2	1	22	18	6							BZA962AVL BZA968AVL
4	3	0.02	4.3	6.8	1	19	16	6							PESD5V0L4UG PESD12VL4UG PESD15VL4UG PESD24VL4UG
4	3	0.05	5	6.8	1	19	16	6							PESD5V0L4UW PESD12VL4UW PESD15VL4UW PESD24VL4UW
4	3		12				6								
4	3		15				5								
4	3		24				3								

* square pulse; tp = 1ms

Protection Devices part numbering



MSE202

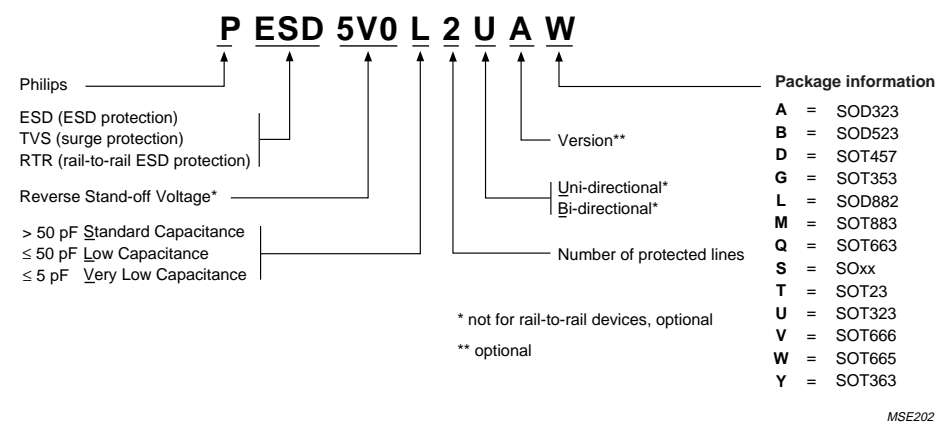
ESD PROTECTION DEVICES /TRANSIENT VOLTAGE SUPPRESSORS (TVS)

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

Number of protected lines		I _{RM} (I _R) max [μA]	V _{RWM} (V _R) [V]	V _Z typ [μA]	I _Z [V]	C max [pF]	C typ. [pF]	P _{ZSM} * [W]	Configuration						
Uni-directional	Bi-directional									SOT457 (SC-74)	6-pin SOT363 (SC-88)	SOT666	8-pin		20-pin
										SOT96-1 (SO8)	SOT505-1 (TSSOP8)	SOT163 (SO20)	SOT339-1 (SSOP20)		
4	3	2	3	5.6	1	240		24		BZA456A					
4	3	0.7	4	6.2	1	200		24		BZA462A					
4	3	0.075	14	18	1	48		19.6		BZA418A					
4	3	0.1	15	20	1	48		19.6		BZA420A					
	4	0.1	5			75		20		BZA408B					
5	4		3.3												
5	4		5					22							
5	4		12					16							
5	4		15					6							
5	4		24					5							
6	5	0.05	5	6.8	1	19	16	6							
6	5	0.05	5	6.8	1	19	16	6							
	7	0.05	5	6.8	1	19	16	6							
	7	0.05	5	6.8	1	19	16	6							
18	17	2	5.25	6.8	5	120		27.5						BZA100	PESD5V2S18U

* square pulse; tp = 1ms

Protection Devices part numbering



FAST RECOVERY

@ I _F [A]	t _{rr} [ns]	V _{RRM} [V]	V _F [V]	I _O (AV) / I _F (AV) [A]	SOD124	SOD57	SOD64	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOD106 (SMA, PMOS)	SOD87 (LLDL)	Application Keys
-	135	200	-	8				BY229X-200				13 17 104 126
-	135	600	-	8				BY229X-600	BY229-600			13 17 104 125 126 152
-	135	800	-	8				BY229X-800				13 17 104 126
-	135	1000	-	8					BY329-1000			17 19 104 125 152
-	135	1200	-	8				BY329X-1200	BY329-1200			17 19 104 125 126 152
-	250	1400	-	1.5								44 45 104
-	300	2000	-	0.8							BYD47-20	44 45 104
1	100	600	1.35	1.8		BYV36C						44 104
1	150	1000	1.45	1.8		BYV36E						44 104
1	250	50	1.3	1	RS1A							104
1	250	100	1.3	1	RS1B							104
1	250	200	1.2	1.9						BYG60D		104
1	250	200	1.3	1	RS1D							104
1	250	200	-	1.6								
1	250	200	1.3	1.6							BYD37D	104
1	250	400	1.2	1.9						BYG60G		104
1	250	400	1.3	1	RS1G							104
1	250	400	-	1.6								
1	250	400	1.3	1.6							BYD37G	104
1	250	600	1.2	1.9						BYG60J		44 45 104
1	250	600	1.3	1	RS1J							44 45 104
1	250	600	1.3	1.3								
1	250	600	1.3	1.6							BYD37J	44 45 104
1	250	1400	1.45	1.8		BYV36G						44 104
1	300	800	1.2	1.9						BYG60K		44 45 104
1	300	800	1.3	1	RS1K							44 45 104
1	300	800	1.3	1.6							BYD37K	
1	300	1000	1.2	1.9						BYG60M		44 45 104
1	300	1000	1.3	1	RS1M							44 45 104
1	300	1000	-	1.6								
1	300	1000	1.3	1.6							BYD37M	44 45 104
1	500	1400	1.3	1.3								44 45 104 125 126 152
2	300	2000	2.4	1.2		BYV98						104
3	100	600	1.60	3.5								44 104
3	150	800	1.78	3.5				BYM36C BYM36C/20 BYM36C/24 BYM36C/40 BYM36D BYM36D/24				
3	150	1000	1.78	3.5				BYM36E BYM36E/40				44 104
3	250	200	1.60	2		BYV95A						104 125 126 152
3	250	400	1.60	2		BYV95B						104 125 126 152
3	250	600	1.60	2		BYV95C						44 45 104 125 126 152
3	250	1400	1.57	3.5				BYM36G				44 104
3	300	1000	1.60	2		BYV96E						44 45 104 125 126 152
3	500	1400	1.65	2		BYV97G						44 104
5	250	200	1.50	3.7				BYW95A BYW95A/30				104 125 126 152
5	250	400	1.50	3.7				BYW95B BYW95B/20 BYW95B/33				104 125 126 152
5	250	600	1.50	3.7				BYW95C BYW95C/20 BYW95C/24 BYW95C/40				44 104 125 126 152
5	300	800	1.50	3.7				BYW96D				125 126 152
5	300	1000	1.50	3.7				BYW96E BYW96E/20 BYW96E/40				44 104 125 126 152
5	500	1400	1.45	3.7				BYW97G				44 104

For application keys see next page.

GENERAL PURPOSE

@ I _F [A]	t _{rr} [ns]	V _F [V]	V _{RRM} max [V]	I _O (AV) / I _F (AV) [A]	V _{RRM} [V]	SOD124	SOD64	SOD57	SOD106 (SMA, PMOS)	SOD87 (LLDL)	Application Keys
1	-	1	200	2	-			1N5059			104 125 152
1	-	1	400	2	-			1N5060			104 125 152
1	-	1	600	2	-			1N5061 BYW54			104 125 152
1	-	1	800	2	-			1N5062 BYW55			104 125 152
1	-	1	1000	2	-			BYW56			104 125 152
1	-	1.05	-	1.4	200					BYD17D	104
1	-	1.05	-	1.4	400					BYD17G	104
1	-	1.05	-	1.4	600					BYD17J	104
1	-	1.05	-	1.4	800					BYD17K	104
1	-	1.05	-	1.4	1000					BYD17M	104
1	-	1.1	-	1.6	50					PRLL4001	104
1	-	1.1	-	1.6	100					PRLL4002	104
1	1000	1.1	-	1	50	S1A					104
1	1000	1.1	-	1	100	S1B					104
1	1000	1.1	-	1	200	S1D					104
1	1000	1.1	-	1	400	S1G					104
1	1000	1.1	-	1	600	S1J					104
1	1000	1.1	-	1	800	S1K					104
1	1000	1.1	-	1	1000	S1M					104
1	2000	1	-	2.1	200				BYG50D		
1	2000	1	-	2.1	400				BYG50G		
1	2000	1	-	2.1	600				BYG50J		
1	2000	1	-	2.1	800				BYG50K		
1	2000	1	-	2.1	1000				BYG50M		
1	3000	1	-	1.8	1250			BY527			104
2	-	1.5	-	1.2	1600			BYX10G			104
3	-	1.15	-	3.6	400		BYM56B				104
3	-	1.15	-	3.6	600		BYM56C BYM56C/20 BYM56C/21				104
3	-	1.15	-	3.6	800		BYM56D				104
3	-	1.15	-	3.6	1000		BYM56E BYM56E/20				104

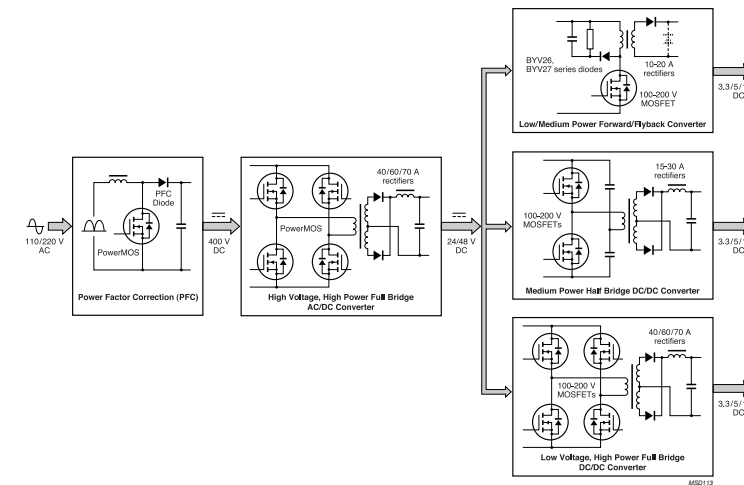
Applications key

- Computing
 - 126 : CRT Monitors
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- General Purpose
 - 104 : General
- Lighting
 - 44 : HF electronic ballast
 - 45 : Compact fluorescent lamp (CFL)
- Monitor
 - 19 : 14"-15" Monitor
- TV
 - 13 : Colour TV
 - 17 : Improved Definition TV (IDTV)

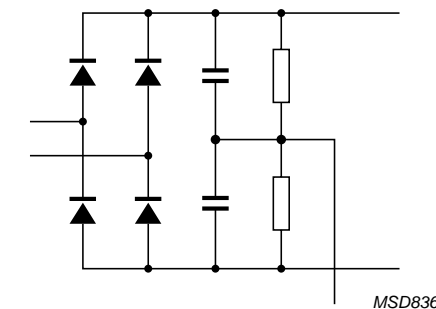
Related literature

Title	Order code
Ultrafast epitaxial diodes for Power Factor Correction (application note)	939775003097
Power in Lighting (folder)	939775005312
Power in Home Appliances (brochure)	939775005986
Power & Battery Management Semiconductors (folder)	939775006394
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
SOD87 hermetically sealed, surface-mount glass package for rectifiers and voltage regulators	939775009634

Telecomms Power Chain



Bridge Rectification



Why choose Philips Semiconductors?

... SOD106 diodes
 Where added functionality or an SMB package is required, Philips Semiconductors offers the SOD106 range (BYG series). These SOD106 rectifiers are the same size as the SMA package but with SMB ratings, thus offering a smaller, cost-effective alternative to SMB.

- ... SOD87
- * Better Current/Power Capability than SMA - Can be used in a wider range of applications with higher current/power than a standard 1A SMA
 - * Smaller than SMA equivalents - Aids miniaturisation of board space requirements, key to most SMD applications
- Features and benefits over plastic devices**
- * Device Hermetically sealed - No moisture ingress. Better than plastic equivalents
 - * Good Avalanche Energy Absorption - This benefit overcomes problems caused by noisy lines in various circuitry such as input rectification
 - * Glass Package - Reduced risk of diode thermal runaway, due to a higher maximum operating temperature of the device compared to plastic equivalents

HIGH VOLTAGE

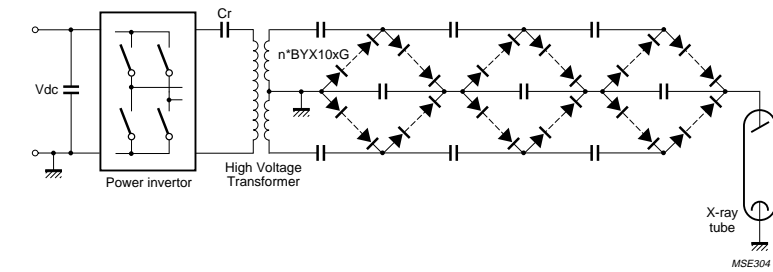
@ I _F [A]	V _F [V]	t _{rr} [ns]	V _{RRM} max [V]	V _{RWM} [kV]	I _{F(AV)} [mA]	V _{RRM} [V]	SOD61	SOD83A	SOD88A	SOD57	SOD107	SOD125A	SOD118A	SOD119	Application Keys
-	-	50	-	4.5	340	5000			BYX108G						107 125 152
-	-	50	-	9	225	10000			BYX104G						107 125 152
-	-	60	5000	-	20	4000	BY8104								104 125 126 152
-	-	60	8000	-	10	6000	BY8106								104 125 126 152
-	-	60	10000	-	5	8000	BY8108								104 125 126 152
-	-	60	12000	-	5	10000	BY8110								104 125 126 152
-	-	60	14000	-	5	12000	BY8112								104 125 126 152
-	-	60	17000	-	5	14000	BY8114								104 125 126 152
-	-	60	19000	-	3	16000	BY8116								104 125 126 152
-	-	75	-	4	20	5000	BY715								104 125 152
-	-	75	-	5	20	6000	BY716								104 125 152
-	-	75	-	9	4	10000	BY717								104 125 152
-	-	75	-	10	4	12000	BY718								104 125 152
-	-	75	-	12	4	14000	BY719								104 125 152
-	-	75	-	14	3	17000	BY720								104 125 152
-	-	75	-	16	3	19000	BY721								104 125 152
-	-	75	-	18	3	22000	BY722								125 152
-	-	75	-	20	3	24000	BY723								125 152
-	-	75	-	24	3	30000	BY724								125 152
-	-	100	5000	-	20	4000	BY8004 BY8404								104 125 126 152
-	-	100	8000	-	10	6000	BY8406 BY8006								104 125 126 152
-	-	100	10000	-	5	8000	BY8408 BY8008								104 125 126 152
-	-	100	12000	-	5	10000	BY8410 BY8010								104 125 126 152
-	-	100	14000	-	5	12000	BY8412 BY8012								104 125 126 152
-	-	100	17000	-	5	14000	BY8014 BY8414								104 125 126 152
-	-	100	19000	-	3	16000	BY8416 BY8016								104 125 126 152
-	-	100	22000	-	3	18000	BY8418								125 126 152
-	-	100	24000	-	3	20000	BY8420								125 126 152
-	-	100	30000	-	3	24000	BY8424								125 126 152
-	-	175	-	4.5	480	5000			BYX107G						107 125 152
-	-	175	-	9	310	10000			BYX103G						107 125 152
-	-	200 *	-	1.5	85	1800	BY584								104 125 152
-	-	200 *	-	2	85	2200	BY505								104 125 152
-	-	300	-	2	50	2200	BY614								104 125 152
-	-	350	-	4.5	575	5000			BYX106G						107 125 152
-	-	350	-	6	550	7500		BYX90G							107 125 152
-	-	350	-	9	360	10000			BYX102G						107 125 152
-	-	600	-	4.5	650	5000			BYX105G						107 125 152
-	-	600	-	9	400	10000			BYX101G						107 125 152

* = typical

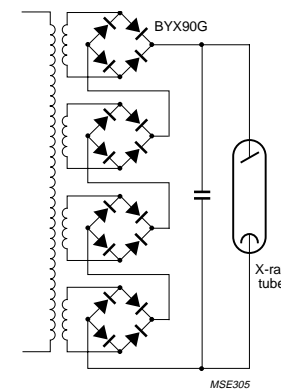
HIGH VOLTAGE

@ I _F [A]	V _F [V]	t _{rr} [ns]	V _{RRM max} [V]	V _{RWM} [kV]	I _{F(AV)} [mA]	V _{RRM} [V]	SOD61	SOD83A	SOD88A	SOD57	SOD107	SOD125A	SOD118A	SOD119	Application Keys
0.01	3.5	5000	-	2	50	2000	BYX132G					BYX132GPL	BYX132GPS	BYX132GL	105 114 117 125 132 133 143 152
0.01	5.25	5000	-	3	50	3000	BYX133G						BYX133GPS	BYX133GL	105 114 117 125 132 133 143 152
0.01	7	5000	-	4	50	4000	BYX134G				BYX134GP	BYX134GPL	BYX134GPS	BYX134GL	105 114 117 125 132 133 143 152
0.01	8.75	5000	-	5	50	5000	BYX135G				BYX135GP	BYX135GPL	BYX135GPS	BYX135GL	105 114 117 125 132 133 143 152
0.25	5	5000	-	3	100	3000			BYX120G						105 114 117 125 132 133 143 152
0.1	2.5	-	-	-	-	2400				BYX119G					

High voltage Multiplier (cascade) using the BYX10xG series



Serial bridges using the BYX90G



Applications key

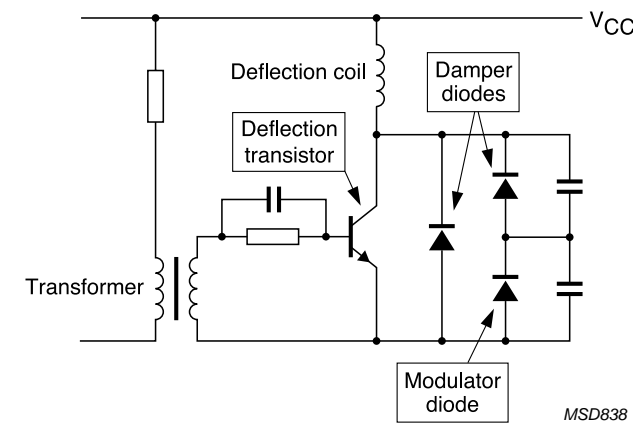
- Automotive
 - 105 : Automotive
 - 114 : Access and immobilization
 - 117 : Body electronics
 - 132 : In vehicle networking
 - 133 : In vehicle power
 - 143 : Passenger restraint systems
- Computing
 - 126 : CRT Monitors
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- General Purpose
 - 104 : General
- Medical
 - 107 : Medical



Related literature

Title	Order code
SKN002, Pre-spark blocking diode BYX120G (factsheet)	939775000261
Custom-made Stacks (leaflet)	939775006549
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146

Damper and modulator diodes



Why choose Philips Semiconductors?

...High Voltage Rectifiers for medical equipment

Features and benefits

- * High operating junction temperatures in combination with glass passivation giving excellent stability and reliability
- * Controlled avalanche feature make the rectifiers capable of absorbing reverse energy
- * Small package outline reduces required space on circuit board
- * Full glass package suitable for immersing in e.g. oil
- * Hermetic seal, no absorption of moisture from surrounding oil

...Pre-spark-blocking diode for distributorless ignition systems

Features and benefits

- * High operating junction temperatures, up to 200°C, which can handle easily the high operating ambient temperatures under the hood
- * Excellent stability due to glass passivation giving a high reliability, fulfilling requirements of automotive applications
- * Hermetic seal enables use in an aggressive environment
- * Controlled avalanche properties preventing component failure when e.g. circuit is disconnected from spark plug

HYPERFAST RECOVERY

V _{RRM} [V]	V _{RRM max} [V]	t _{rr} [ns]	V _F [V]	@ I _F [A]	I _{O (AV)} / I _{F (AV)} [A]	SOD57	SOD64	SOD106 (SMA, PMOS)	SOD87 (LLDL)	Application Keys
-	600	15	2.7	1	1	BYV99				32 34 44 46
-	600	15	3.60	3	1.8		BYM99			32 33 34 44
100	-	10	0.96	1	1.7				BYD1100	35 40
100	-	12.5	0.98	2	2.3	BYV2100		BYG85B		40
100	-	15	0.98	3.5	4.2		BYV4100			34



Related literature

Title

Order code

SKN003, BYV2100 - The Ultrafast Alternative (factsheet)	939775000344
SKN004, converter diodes for PFC	939775000597
Ultrafast epitaxial diodes for Power Factor Correction (application note)	939775003097
FS046, An Electronic Ballast: Base Drive Optimisation (factsheet)	939775003653
Power in Lighting (folder)	939775005312
Power & Battery Management Semiconductors (folder)	939775006394
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146



Applications key

Lighting

44 : HF electronic ballast

Power Supply

32 : Primary side voltage clamp for isolated power supply units

33 : Low power; power factor correction

34 : Medium/high power; power factor correction

35 : Output rectifiers for low wattage power supplies

40 : Low power chargers and laptop power supply units

46 : Low power; power factor correction

Why choose Philips Semiconductors?

Benefits of Hyperfast Recovery Diodes

- * 600V Hyperfast diodes are optimised for power factor correction (PFC) circuits. They feature:
- * fast reverse recovery (trr) of typically 19 ns.
- * max forward Vf.
- * 100V Hyperfast diodes are optimised for low power battery chargers.

...SOD106 diodes

Where added functionality or an SMB package is required, Philips Semiconductors offers the SOD106 range (BYG series). These SOD106 rectifiers are the same size as the SMA package but with SMB ratings, thus offering a smaller, cost-effective alternative to SMB.

...SOD87

- * Better Current/Power Capability than SMA - Can be used in a wider range of applications with higher current/power than a standard 1A SMA
- * Smaller than SMA equivalents - Aids miniaturisation of board space requirements, key to most SMD applications

Features and benefits over plastic devices

- * Device Hermetically sealed - No moisture ingress. Better than plastic equivalents
- * Good Avalanche Energy Absorption - This benefit overcomes problems caused by noisy lines in various circuitry such as input rectification
- * Glass Package - Reduced risk of diode thermal runaway, due to a higher maximum operating temperature of the device compared to plastic equivalents

LOW LOSS ULTRAFAST RECOVERY

t_{rr} [ns]	@ I_F [A]	V_{RRM} [V]	I_O (AV) / I_F (AV) [A]	V_F [V]	SOD124	SOD64	SOD57	SOD106 (SMA, PMOS)	SOD87 (LLDL)	Application Keys
25	1	50	1	1.1	ES1A					35
25	1	50	1.9	0.98					BYD77A	35
25	1	50	2.4	0.93				BYG80A		35
25	1	100	1	1.1	ES1B					35
25	1	100	1.9	0.98					BYD77B	35
25	1	100	2.4	0.93				BYG80B		35
25	1	150	1	1.1	ES1C					35
25	1	150	1.9	0.98					BYD77C	35 126
25	1	150	2.4	0.93				BYG80C		35
25	1	200	1	1.1	ES1D					35
25	1	200	1.9	0.93					BYD127	35
25	1	200	1.9	0.98					BYD77D	35 126
25	1	200	2.4	0.93				BYG80D		35
25	2	50	2.4	0.98				BYV27-50		125 126 152
25	2	100	2.4	0.98				BYV27-100		35 125 126 152
25	2	150	2.4	0.98				BYV27-150		35 125 126 152
25	2	200	2.4	0.98				BYV27-200		35 125 126 152
25	3.5	50	4.5	1.02				BYV28-50		125 126 152
25	3.5	100	4.5	1.02				BYV28-100		35 125 126 152
25	3.5	150	4.5	1.02				BYV28-150		35 125 126 152
25	3.5	200	4.5	1.02				BYV28-200 BYV28-200/20 BYV28-200/24		35 125 126 152
50	1	50	1	1.1	US1A					35
50	1	100	1	1.1	US1B					35
50	1	200	1	1.1	US1D					35
50	1	400	1	1.1	US1G					32 46
50	1	400	1.7	1.05					BYD147	35 44
50	1	400	1.9	1.05					BYD77G	32 35 126
50	1	400	2.4	0.98				BYG80G		32
50	1	600	1	1.4	US1J					32 44 45 46
50	1	600	1.6	1.25					BYD167	44 46
50	1	600	2.4	1.2				BYG80J		32 35 44
50	2	400	2.4	1.05				BYV27-400		32 35 125 126 152
50	2	600	2.4	1.2				BYV160		32 44 46
50	2	600	2.4	1.25				BYV27-600		44 46 125 126 152
50	3.5	400	4.5	1.05				BYV28-400 BYV28-400/20 BYV28-400/24 BYV28-400/40		32 46 125 126 152
50	3.5	600	4.5	1.25				BYV28-600		44 46 125 126 152



Applications key

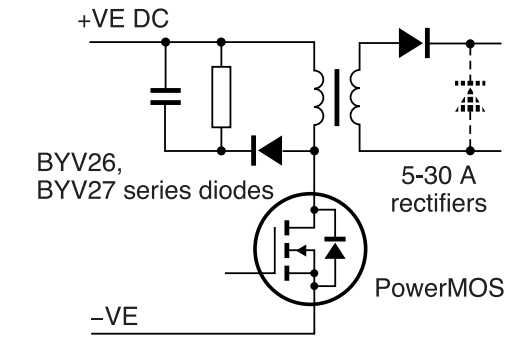
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- Lighting
 - 44 : HF electronic ballast
 - 45 : Compact fluorescent lamp (CFL)
- Monitor
 - 22 : 15"-17"Monitor
- Power Supply
 - 32 : Primary side voltage clamp for isolated power supply units
 - 34 : Medium/high power, power factor correction
 - 35 : Output rectifiers for low wattage power supplies
 - 36 : Output rectifiers for medium power telecom supplies
 - 37 : Output rectifiers for high power telecoms supplies
 - 46 : Low power, power factor correction



Related literature

Title	Order code
FS046, An Electronic Ballast: Base Drive Optimisation (factsheet)	939775003653
Power in Lighting (folder)	939775005312
FS080, High-quality, glass-passivated diodes (glass bead) - BYV27-200 (factsheet)	939775006323
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
SOD87 hermetically sealed, surface-mount glass package for rectifiers and voltage regulators	939775009634

Battery Charger, Computer Power Supply (Forward/Flyback Converter)



MSD115

Why choose Philips Semiconductors?

...SOD106 diodes
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...SOD87
* Better Current/Power Capability than SMA
- Can be used in a wider range of applications with higher current/power than a standard 1A SMA
* Smaller than SMA equivalents
- Aids miniaturisation of board space requirements, key to most SMD applications

Features and benefits over plastic devices
* Device Hermetically sealed
- No moisture ingress. Better than plastic equivalents
* Good Avalanche Energy Absorption
- This benefit overcomes problems caused by noisy lines in various circuitry such as input rectification
* Glass Package
- Reduced risk of diode thermal runaway, due to a higher maximum operating temperature of the device compared to plastic equivalents

ULTRAFAST RECOVERY

Single/dual	V _{RRM} [V]	t _{rr} [ns]	@ I _F [A]	I _O (AV) / I _F (AV) [A]	V _F [V]	SOD57	SOD64	SOD124		SOT186A (3 lead TO-220F)	SOD59 (TO-220AC)	SOD113 (TO-220F)	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT428 (SC-63, D-PAK)	SOD106 (SMA, PMOS)	SOD87 (LLDL)	SOT404 (D ² -PAK)	Application Keys	
-	100	15	3.5	4.2	0.98		BYV4100/20													
-	200	30	1	1	3.6			BYG26D												35
-	200	30	1	1.5	2.50	BYV26A														46 125 152
-	200	30	1	1.5	3.6											BYG70D				46
-	200	30	2	2.8	2.65		BYM26A													35 125 152
-	400	30	1	1	3.6			BYG26G										BYD57G		32 44 45 46
-	400	30	1	1.5	2.5	BYV26B														32 46 125 152
-	400	30	1	1.5	3.6											BYG70G				32 46
-	400	30	2	2.8	2.65		BYM26B													35 125 152
-	600	30	1	1	3.6			BYG26J										BYD57J		32 44 45 46
-	600	30	1	1.5	2.5	BYV26C														32 44 125 152
-	600	30	1	1.5	3.6											BYG70J				32 44 46
-	600	30	2	2.8	2.65		BYM26C BYM26C/20 BYM26C/24													32 44 46 125 152
-	800	75	1	1	3.6													BYD57K		32 46
-	800	75	1	1.5	2.5	BYV26D														32 125 152
-	800	75	2	2.8	2.65		BYM26D													32 46 125 152
-	1000	75	1	1	3.6													BYD57M		32 46
-	1000	75	1	1.5	2.5	BYV26E														32 125 152
-	1000	75	2	2.8	2.65		BYM26E													46 125 152
-	1400	150	1	1	2.3													BYD57V		32 46
-	1400	150	1	1.5	2.15	BYV26G														32 125 152
-	1400	150	2	2.8	2.30		BYM26G													46 125 152
SINGLE	150	25	8	8	0.895						BYW29E-150									36
SINGLE	200	25	8	8	0.895					BYW29EX-200	BYW29E-200				BYW29ED-200					36
SINGLE	200	30	14	14	0.9						BYV79E-200									36
SINGLE	400	60	8	9	1.03						BYV29-400									36
SINGLE	500	-	8	9	1.03							BYV29X-500								22 36
SINGLE	500	60	8	9	1.03						BYV29-500									22 36
SINGLE	500	60	15	14	1.05						BYT79-500									36
SINGLE	600	19	1.85	8	8									BYC8-600						34
SINGLE	600	19	5	5	1.75									BYC5-600				BYC5B-600		34 44
SINGLE	600	19	8	8	1.85													BYC8B-600		34
SINGLE	600	19	10	10	1.8									BYC10-600				BYC10B-600		34
SINGLE	600	75	8	8	1.5						BYR29-600									36
SINGLE	800	75	8	8	1.5						BYR29-800									36
DUAL (2 x15A)	150	28	15	30	0.85									BYV42E-150						37
DUAL (2 x15A)	200	28	15	30	0.82								BYV72EW-200							37
DUAL (2 x15A)	200	28	15	30	0.85									BYV42E-200				BYV42EB-200		37
DUAL (2 x15A)	400	60	15	30	1.12								BYV74W-400							37
DUAL (2 x15A)	500	60	15	30	1.12									BYV44-500						37
DUAL (2 x 8A)	200	25	8	16	0.95									BYQ30E-200						36
DUAL (2 x 5A)	200	25	5	10	0.895									BYQ28E-200						36
DUAL (2 x 5A)	300	60	5	10	1.05									BYT28-300						36
DUAL (2 x 5A)	500	60	5	10	1.05									BYT28-500						37
DUAL (2 x 20A)	200	40	20	40	0.85								BYQ40EW-200							37
DUAL (2 x 10A)	150	25	8	20	0.85									BYV32E-150						36
DUAL (2 x 10A)	200	25	8	20	0.85									BYV32E-200				BYV32EB-200		36

ULTRAFAST RECOVERY

Single/dual	V _{RRM} [V]	t _{rr} [ns]	@ I _F [A]	I _O (AV) / I _F (AV) [A]	V _F [V]	SOD57	SOD64	SOD124		SOT186A (3 lead TO-220F)	SOD59 (TO-220AC)	SOD113 (TO-220F)	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT428 (SC-63, D-PAK)	SOD106 (SMA, PMOS)	SOD87 (LLDL)	SOT404 (D ² -PAK)	Application Keys	
DUAL (2 x 10A)	400	60	10	20	1.05									BYV34-400						36
DUAL (2 x 10A)	500	60	10	20	1.05									BYV34-500						36



Applications key

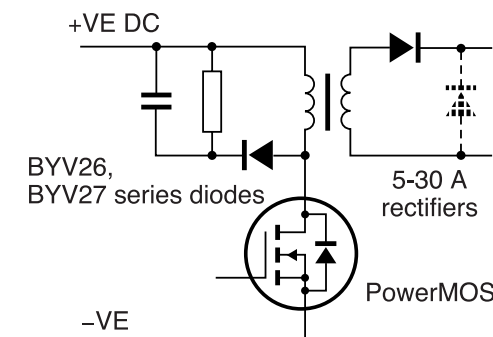
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- Lighting
 - 44 : HF electronic ballast
 - 45 : Compact fluorescent lamp (CFL)
- Monitor
 - 22 : 15"-17"Monitor
- Power Supply
 - 32 : Primary side voltage clamp for isolated power supply units
 - 34 : Medium/high power, power factor correction
 - 35 : Output rectifiers for low wattage power supplies
 - 36 : Output rectifiers for medium power telecom supplies
 - 37 : Output rectifiers for high power telecoms supplies
 - 46 : Low power, power factor correction



Related literature

Title	Order code
FS046, An Electronic Ballast: Base Drive Optimisation (factsheet)	939775003653
Power in Lighting (folder)	939775005312
FS080, High-quality, glass-passivated diodes (glass bead) - BYV27-200 (factsheet)	939775006323
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
SOD87 hermetically sealed, surface-mount glass package for rectifiers and voltage regulators	939775009634

Battery Charger, Computer Power Supply (Forward/Flyback Converter)



MSD115

Why choose Philips Semiconductors?

- ...SOD106 diodes**
Where added functionality or an SMB package is required, Philips Semiconductors offers the SOD106 range (BYG series). These SOD106 rectifiers are the same size as the SMA package but with SMB ratings, thus offering a smaller, cost-effective alternative to SMB.
- ...SOD87**
* Better Current/Power Capability than SMA - Can be used in a wider range of applications with higher current/power than a standard 1A SMA
* Smaller than SMA equivalents - Aids miniaturisation of board space requirements, key to most SMD applications
- Features and benefits over plastic devices**
* Device Hermetically sealed - No moisture ingress. Better than plastic equivalents
* Good Avalanche Energy Absorption - This benefit overcomes problems caused by noisy lines in various circuitry such as input rectification
* Glass Package - Reduced risk of diode thermal runaway, due to a higher maximum operating temperature of the device compared to plastic equivalents

RIPPLE BLOCKING DIODES

V_{RRM} [V]	t_{rr} [ns]	V_F [V]	@ I_F [A]	$I_O (AV) / I_F (AV)$ [A]	SOD57	SOD64	SOD87 (LLDL)	Application Keys
300	150	2.15	1	1.5	BYQ63			125 152
300	150	2.3	1	1			BYD67	
300	150	2.3	2	2.7		BYM63		125 152



Applications key

Consumer
125 : Consumer Multimedia
152 : Standard TV



Related literature

Title	Order code
SKN001, Ripple blocking diodes BYD63 and BYM63 (fact-sheet)	939775000157
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146

MEGA SCHOTTKY DIODES/BISS TRANSISTOR MODULES

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

Diode			Transistor			Configuration	SOT457 (SC-74)	SOT96 (SO-8)
V_R [V]	I_F [A]	V_F [mV]	I_C [A]	V_{CEO} [V]	V_{CEsat} [mV]			
20	1	550 @ $I_F=1A$	-1	-40	-310mV @ $I_C = -1A$	pnp Trans.+Diode	PMEM4010PD	
20	1	550 @ $I_F=1A$	1	40	210mV @ $I_C = 1A$	npn Trans.+Diode	PMEM4010ND	
20	1	550 @ $I_F=1A$	-2	-40	-280mV @ $I_C = -1A$	pnp Trans.+Diode	PMEM4020PD	
20	1	550 @ $I_F=1A$	2	40	190mV @ $I_C = 1A$	npn Trans.+Diode	PMEM4020ND	
40	1	500 @ $I_F=1A$	-3	-40	-390mV @ $I_C = -3A$	pnp Trans.+Diode		<i>PMEM4030PS</i>
40	1	500 @ $I_F=1A$	3	40	370mV @ $I_C = 3A$	npn Trans.+Diode		<i>PMEM4030NS</i>
40	1.5	-	-5	-40	-	pnp Trans.+Diode		<i>PMEM4050PS</i>
40	1.5	-	5	40	-	npn Trans.+Diode		<i>PMEM4050NS</i>

Note: For Mega Schottky Diodes please go to page 6.5

SCHOTTKY DIODE/TRANSISTOR MODULES

Diode			Transistor			Configuration	SOT223 (SC-73)
V_R [V]	I_F [A]	V_F [mV]	I_C [A]	V_{CEO} [V]	V_{CEsat} [mV]		
40	1000	500 @ $I_F=1A$	-0.2	-40	-300mV @ $I_C = -0.05A$	pnp Trans.+Diode	PZTM1102
40	1000	500 @ $I_F=1A$	0.2	40	300mV @ $I_C = -0.05A$	npn Trans.+Diode	PZTM1101

Note: For Mega Schottky Diodes please go to page 6.5

Why choose Philips Semiconductors?

Ripple Blocking Diodes

- * Glass passivated for excellent stability under all conditions.
- * Fast rectifier with guaranteed minimum turn-on time for absorbing forward current transients and oscillations.

...SOD87

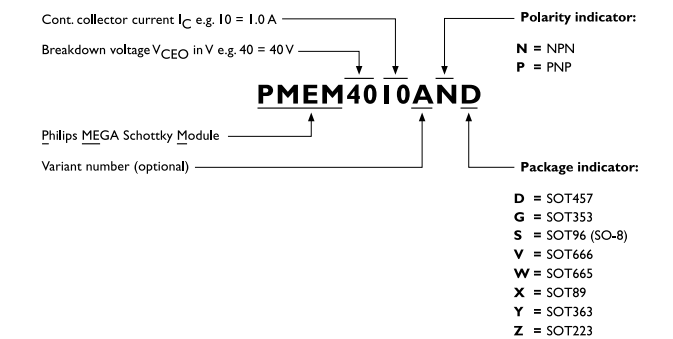
- * even smaller package than SMA
- * better current handling capability than SMA (1.5 A SOD87 vs 1 A SMA)



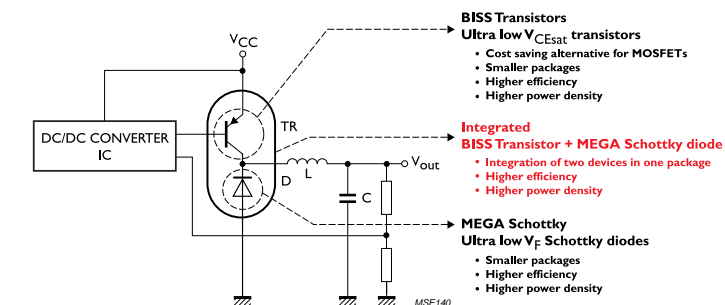
Related literature

Title	Order code
MEGA Schottky diodes	939775010821

MEGA Schottky Modules part numbering



Step down DC/DC converter



GENERAL PURPOSE SCHOTTKY DIODES

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

V _R max [V]	I _{F(AV)} max [mA]	V _F max [mV]	C _D @max. [pF]	Configuration	SOD68 (DO-34)	SOD80C (MiniMelf)	SOT23	SOT346 (SC-59)	SOT143B	SOD323 (SC-76)	SOD110	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT490 (SC-89)	SOT666	SOD523 (SC-79)	SOD882	SOT883 (SC-101)
20	1000	350@I _F =100mA	25@V _R =5V	single						BAT760						BAT960			
30	200	260@I _F =1mA	10@V _R =1V	single			BAT754												
30	200	260@I _F =1mA	10@V _R =1V	dual series			BAT754S												
30	200	260@I _F =1mA	10@V _R =1V	dual c.c.			BAT754C												
30	200	260@I _F =1mA	10@V _R =1V	dual c.a.			BAT754A												
30	200	260@I _F =1mA	10@V _R =1V	triple isolated									BAT754L						
30	200	320@I _F =1mA	10@V _R =1V	single	BAT85	BAS85	BAT54	1PS59SB10		1PS76SB10	BAT254	1PS70SB10 BAT54W					1PS79SB10	BAT54L	
30	200	320@I _F =1mA	10@V _R =1V	dual series			BAT54S	1PS59SB14				1PS70SB14 BAT54SW			1PS89SB14				
30	200	320@I _F =1mA	10@V _R =1V	dual c.c.			BAT54C	1PS59SB15				1PS70SB15 BAT54CW			1PS89SB15	BAT54CV			BAT54CM
30	200	320@I _F =1mA	10@V _R =1V	dual c.a.			BAT54A	1PS59SB16				1PS70SB16 BAT54AW			1PS89SB16				
30	200	320@I _F =1mA	10@V _R =1V	dual isolated					BAT74				BAT74S			BAT74V			
40	30	410@I _F =1mA	1.6@V _R =1V	single	BAT81	BAS81													
40	120	380@I _F =1mA	5@V _R =0V	single			BAS40			1PS76SB40	BAS240	1PS70SB40 BAS40W					1PS79SB40	BAS40L	
40	120	380@I _F =1mA	5@V _R =0V	dual series			BAS40-04					1PS70SB44 BAS40-04W							
40	120	380@I _F =1mA	5@V _R =0V	dual c.c.			BAS40-05					1PS70SB45 BAS40-05W		1PS75SB45		BAS40-05V			
40	120	380@I _F =1mA	5@V _R =0V	dual c.a.			BAS40-06					1PS70SB46 BAS40-06W							
40	120	380@I _F =1mA	5@V _R =0V	dual isolated					BAS40-07							BAS40-07V			
40	120	380@I _F =1mA	5@V _R =0V	quad c.c./c.c.									1PS88SB48						
40	200	410@I _F =100mA	20@V _R =1V	single													1PS79SB31	PMEG3002AEL	
40	200	420@I _F =100mA	50@V _R =0V	single			BAT721	1PS59SB21		1PS76SB21									
40	200	420@I _F =100mA	50@V _R =0V	dual series			BAT721S												
40	200	420@I _F =100mA	50@V _R =0V	dual c.c.			BAT721C												
40	200	420@I _F =100mA	50@V _R =0V	dual c.a.			BAT721A												
40	200	500@I _F =100mA	20@V _R =1V	single													1PS79SB30	PMEG4002AEL	
40	200	550@I _F =100mA	20@V _R =1V	single								BAT854W							
40	200	550@I _F =100mA	20@V _R =1V	dual series								BAT854SW							
40	200	550@I _F =100mA	20@V _R =1V	dual c.c.								BAT854CW							
40	200	550@I _F =100mA	20@V _R =1V	dual c.a.								BAT854AW							
40	500	550@I _F =500mA	90@V _R =0V	single			BAT720	1PS59SB20				1PS70SB20							
50	30	410@I _F =1mA	1.6@V _R =1V	single	BAT82	BAS82													
50	200	380@I _F =1mA	8@V _R =1V	single	BAT86	BAS86													
60	30	410@I _F =1mA	1.6@V _R =1V	single	BAT83	BAS83													
70	70	410@I _F =1mA	2@V _R =0V	single			BAS70			1PS76SB70	BAS270	BAS70W			1PS89SB74		1PS79SB70	BAS70L	
70	70	410@I _F =1mA	2@V _R =0V	dual series			BAS70-04					BAS70-04W							
70	70	410@I _F =1mA	2@V _R =0V	dual c.c.			BAS70-05					BAS70-05W							
70	70	410@I _F =1mA	2@V _R =0V	dual c.a.			BAS70-06					BAS70-06W							
70	70	410@I _F =1mA	2@V _R =0V	dual isolated					BAS70-07				BAS70-07S			BAS70-07V			

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

LOW CAPACITANCE, HIGH FREQUENCY SCHOTTKY DIODES

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

V _R max [V]	I _{F(AV)} max [mA]	V _F max [mV]	C _{D@max.} [pF]	Configuration	SOT23	SOD323 (SC-76)	SOT323 (SC-70)	SOT363 (SC-88)	SOD523 (SC-79)	SOD882
4	30	450@I _F =1mA	1@V _R =0	single	BAT17	1PS76SB17			<u>1PS79SB17</u>	
4	30	450@I _F =1mA	1@V _R =0	dual series	PMBD353 PMBD354 (matched Cap.)					
5	20	250@I _F =1mA	0.5 typ.@V _R =0	single					<u>1PS79SB63</u>	<u>1PS10SB63</u>
15	30	340@I _F =1mA	1@V _R =0	single			1PS70SB82			
15	30	340@I _F =1mA	1@V _R =0	dual series			1PS70SB84			
15	30	340@I _F =1mA	1@V _R =0	dual c.c.			1PS70SB85			
15	30	340@I _F =1mA	1@V _R =0	dual c.a.			1PS70SB86			
15	30	340@I _F =1mA	1@V _R =0	triple isolated				1PS88SB82		
40	20	800@I _F =2mA	0.6@V _R =0	single		1PS76SB62			1PS79SB62	<u>1PS10SB62</u>

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

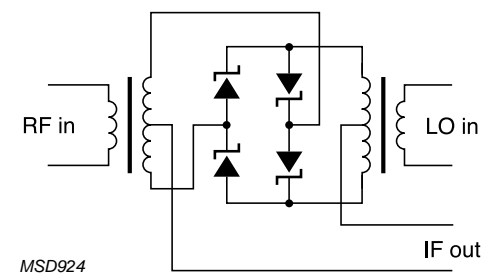
MEDIUM POWER SCHOTTKY DIODES

types in **bold red** represent new products

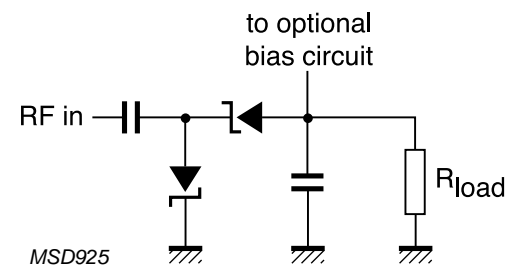
V _{RRM} max [V]	I _{F(AV)} max [mA]	I _{FSM} max [A]	V _F max [mV]	C _{D@max.} [pF]	Configuration	SOD87 (Melf)	SOT223 (SC-73)	SOT457 (SC-74)
20	1000	25	450@I _F =1A	70@V _R =4V typ	single	PRLL5817		
20	1000	25	450@I _F =1A	100@V _R =4V typ.	single			<u>1PS74SB23</u>
25	1000	10	450@I _F =1A	100@V _R =4V	dual series		BAT120S	
25	1000	10	450@I _F =1A	100@V _R =4V	dual c.c.		BAT120C	
25	1000	10	450@I _F =1A	100@V _R =4V	dual c.a.		BAT120A	
30	1000	25	550@I _F =1A	50@V _R =4V typ	single	PRLL5818		
40	1000	27	500@I _F =1A	80@V _R =4V	single			<u>1PS74SB43</u>
40	1000	10	500@I _F =1A	80@V _R =4V	dual series		BAT140S	
40	1000	10	500@I _F =1A	80@V _R =4V	dual c.c.		BAT140C	
40	1000	10	500@I _F =1A	80@V _R =4V	dual c.a.		BAT140A	
40	1000	25	600@I _F =1A	50@V _R =4V typ	single	PRLL5819		
60	1000	10	650@I _F =1A	60@V _R =4V	dual series		BAT160S	
60	1000	10	650@I _F =1A	60@V _R =4V	dual c.c.		BAT160C	
60	1000	10	650@I _F =1A	60@V _R =4V	dual c.a.		BAT160A	

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

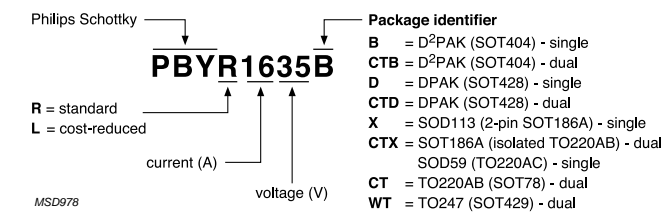
Diode Ring Mixer



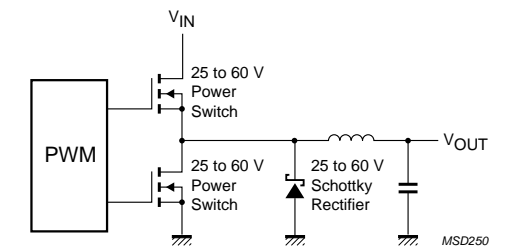
RF detector and voltage doubler



Schottky diode part numbering



Synchronous step down converter



Applications key

- Communication
- 115 : Analog cordless
 - 123 : CDMA
 - 128 : DECT Digital cordless
 - 153 : Standard wired telephony
 - 154 : Wired and analog-cordless telephony
 - 155 : Wireless communications

Related literature

Title	Order code
Power & Battery Management Semiconductors (folder)	939775006394
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
Schottky diodes Selction guide	939775009967

Why choose Philips Semiconductors?

- * Special 25V technology for low voltage supplies
- * Lowest forward drop of any rectifier gives lower losses
- * Full range of LEADED and surface mount packages
- * Guaranteed repetitive ruggedness, typically 1A repetition reverse surge capability

POWER SCHOTTKYS (RECTIFIERS)

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

V _{RRM} [V]	@ I _F [A]	Single/dual	I _O (AV) / I _F (AV) [A]	V _F [V]	SOT429 (TO-247)	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOD59 (TO-220AC)	SOT223 (SC-73)	SOT226 (I ² PAK)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	Application Keys
4.5	20	DUAL (2 x 20A)	40	600	PBYR4045WT								38 125 152
20	12.5	DUAL (2 x 12.5A)	25	430			PBYL2520CT						41 125 152
25	5	DUAL (2 x 5A)	10	540								BYV116B-25	52 125 152
25	7.5	DUAL (2 x 7.5A)	15	420								PBYL1525CTB	41 125 152
25	10	SINGLE	10	410							PBYR1025D		52 125 152
25	12.5	DUAL (2 x 12.5A)	25	430								PBYL2525CTB	41 125 152
25	15	DUAL (2 x 15A)	30	430			PBYL3025CT						39 125 152
25	16	SINGLE	16	460				PBYL1625					41 125 152
25	20	SINGLE	20	430								PBYL2025B	41 125 152
40	7.5	DUAL (2 x 7.5A)	15	570		PBYR1540CTX							41 125 152
40	10	SINGLE	10	570			PBYR1040						40 125 152
40	10	DUAL (2 x 10A)	20	570								PBYR2040CTB	41 125 152
40	20	DUAL (2 x 20A)	40	600	PBYR4040WT								38 125 152
45	1	DUAL (2 x 1A)	2	450					PBYR245CT				40 125 152
45	7.5	SINGLE	7.5	570			PBYR745						40 125 152
45	7.5	DUAL (2 x 7.5A)	15	570			PBYR1545CT						41 125 152
45	10	SINGLE	10	570			PBYR1045						40 125 152
45	10	DUAL (2 x 10A)	20	570			PBYR2045CT						41 125 152
45	16	SINGLE	16	570			PBYR1645					PBYR1645B	41 125 152
45	20	DUAL (2 x 15A)	30	600	PBYR3045WT								39 125 152
45	20	DUAL (2 x 15A)	30	620			PBYR2545CT					PBYR2545CTB	39 125 152
45	20	DUAL (2 x 15A)	30	620						<i>PBYR2545CTE</i>			
45	30	DUAL (2 x 30A)	60	600	PBYR6045WT								38 125 152
100	10	SINGLE	10	700			PBYR10100						40 125 152
100	10	DUAL (2 x 10A)	20	700			PBYR20100CT					PBYR20100CTB	41 125 152
100	15	DUAL (2 x 15A)	30	700	PBYR30100WT								39 125 152



Applications key

Communication

- 115 : Analog cordless
- 123 : CDMA
- 128 : DECT Digital cordless
- 153 : Standard wired telephony
- 154 : Wired and analog-cordless telephony
- 155 : Wireless communications



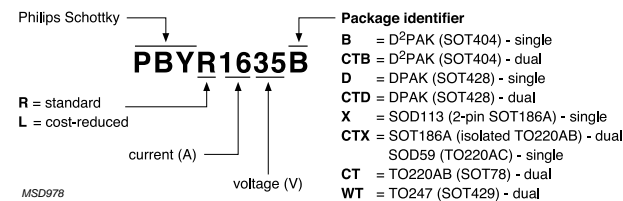
Related literature

Title

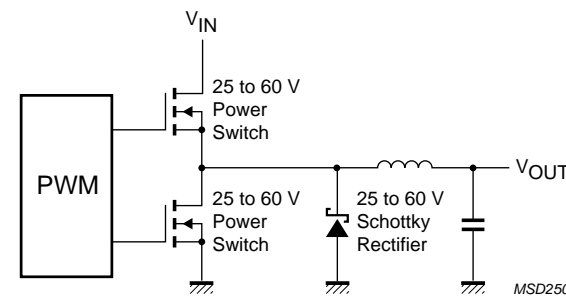
- | | |
|--|--------------|
| Power & Battery Management Semiconductors (folder) | 939775006394 |
| Philips Comprehensive Product Catalog (CD-ROM set) | 939775011146 |

Order code

Schottky diode part numbering



Synchronous step down converter



Why choose Philips Semiconductors?

- * Special 25V technology for low voltage supplies
- * Lowest forward drop of any rectifier gives lower losses
- * Full range of LEADED and surface mount packages
- * Guaranteed repetitive ruggedness, typically 1A repetition reverse surge capability

GENERAL PURPOSE SWITCHING DIODES

types in **bold red** represent new products

V _R max [V]	I _{F(AV)} max [mA]	I _{FSM} max [A]	I _{FRM} [mA]	V _F max [mV]	C _D @max. [pF]	t _{rr} max [ns]	Configuration	SOD27 (DO-35)	SOD68 (DO-34)	SOD80C (MiniMelf)	SOT23	SOT346 (SC-59)	SOT143B	SOT457 (SC-74)	SOD323 (SC-76)	SOD110	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT490 (SC-89)	SOD523 (SC-79)	SOD882	
50	200	4	450	880 @I _F =50mA	2	4	single			PMLL4153													
50	215	4	450	1000 @I _F =100mA	1.5	4	dual c.c.				BAV74												
50	215	4	500	1000 @I _F =50mA	2	4	single				BAL74												
60	200	9	600	1000 @I _F =200mA	2.5	6	dual isolated						BAS56										
70	175	4	500	1000 @I _F =50mA	1.5	4	dual c.c.											BAV70W					
70	215	4	450	1000 @I _F =50mA	1.5	4	dual c.c.				BAV70 PMBD6100												
70	215	4	500	1000 @I _F =50mA	1.5	4	single				BAL99 PMBD914 PMBD6050												
75	75	4	225	1000 @I _F =10mA	4	4	single	1N914B															
75	150	4	500	1000 @I _F =50mA	1.5	4	single											BAL99W					
75	150	4	500	1000 @I _F =50mA	1.5	4	dual series											BAV99W					
75	150	4	500	1000 @I _F =50mA	1.5	4	dual c.c.														BAV70T		
75	150	4	500	1000 @I _F =50mA	2	4	dual c.a.											BAW56W		BAW56T			
75	155	4	500	1000 @I _F =50mA	1.5	4	single														BAS16T		
75	175	4	500	1000 @I _F =50mA	1.5	4	single											BAL74W BAS16W					
75	200	4	450	930 @I _F =100mA	2	4	single			BAS32L													
75	200	4	450	1000 @I _F =50mA	1.5	4	triple isolated														BAS16VY		
75	200	4	450	1000 @I _F =10mA	4	4	single	1N4148	1N4531	PMLL4148L													
75	200	4	450	1000 @I _F =100mA	2	4	single	BAW62															
75	200	4	450	1000 @I _F =100mA	4	4	single	1N4448		PMLL4448													
75	200	4.5	450	855 @I _F =10mA	1.5	4	quad series															BAV99S	
75	215	4	450	1000 @I _F =50mA	1.5	4	dual series				BAV99												
75	215	4	450	1000 @I _F =50mA	2	4	dual c.a.				BAW56												
75	215	4	500	1000 @I _F =50mA	1.5	4	single				BAS16												
75	215	4	500	1000 @I _F =50mA	1.5	4	dual isolated						BAS28										
75	250	4	450	1000 @I _F =50mA	1.5	4	quad c.c./c.c.															BAV70S	
75	250	4	450	1000 @I _F =50mA	2	4	quad c.a./c.c.															BAV756S	

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

GENERAL PURPOSE SWITCHING DIODES

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

V _R max [V]	I _{F(AV)} max [mA]	I _{FSM} max [A]	I _{FRM} [mA]	V _F max [mV] @I _F =50mA	C _D @max. [pF]	t _{rr} max [ns]	Configuration	SOD27 (DO-35)	SOD68 (DO-34)	SOD80C (MiniMelf)	SOT23	SOT346 (SC-59)	SOT143B	SOT457 (SC-74)	SOD323 (SC-76)	SOD110	SOT323 (SC-70)	SOT363 (SC-88)	SOT416 (SC-75)	SOT490 (SC-89)	SOD523 (SC-79)	SOD882					
75	250	4	450	1000	2	4	quad c.a./c.a.																BAW565				
75	250	4	500	1000	1	4	single															BAS516	BAS16L				
75	250	4	500	1000	1.5	4	single								BAS316	BAS216											
80	200	4	500	1000	1.5	4	dual series										1PS302				1PS89SS04						
80	200	4	500	1000	1.5	4	dual c.c.															1PS89SS05					
80	200	4	500	1000	2	4	dual c.a.										1PS300					1PS89SS06					
80	215	4	500	1000	1.5	4	single					1PS193															
80	215	4	500	1000	1.5	4	dual series					1PS226															
80	215	4	500	1000	1.5	4	dual c.c.					1PS184															
80	215	4	500	1000	2	4	dual c.a.					1PS181															
80	250	4	500	1000	1.5	4	dual c.c.																1PS301				
100	215	4	450	1000	1.5	4	dual series																	PMBD7000			
100	200	9	625	1000	5	50	single																	BAS19			
150	200	9	625	1000	5	50	single																	BAS20			
150	250	9	625	1000	5	50	single	BAV20		BAV102																	
200	200	9	625	1000	5	50	single																		BAS21		
200	225	9	625	1000	5	50	dual series																		BAV23S		
200	225	9	625	1000	5	50	single																		BAV23		
200	250	9	625	1000	2	50	single																		BAS321		
200	250	9	625	1000	5	50	single	BAV21		BAV103																	
200	300	20	1000	1000	2	50	single																		BAS221		
200	200	16	1000	1000	5	50	triple isolated																		BAS21VD		
300	250	4.5	1000	1100	5	50	single																		BAS521		
300	250	4.5	625	1100	2	50	dual series																			BAW101	
																											BAW101S

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

CONTROLLED AVALANCHE SWITCHING DIODES

V _R max [V]	I _{F(AV)} max [mA]	I _{FSM} max [A]	I _{FRM} [mA]	V _F max [mV] @I _F =200mA	C _D @max. [pF]	t _{rr} max [ns]	Configuration	SOT23
90	250	10	500	1000@I _F =200mA	35	50	single	BAS29
90	250	10	500	1000@I _F =200mA	35	50	dual series	BAS31
90	250	10	500	1000@I _F =200mA	35	50	dual c.a.	BAS35

LOW LEAKAGE CURRENT SWITCHING DIODES

V_R max [V]	$I_F(AV)$ max [mA]	I_{FSM} max [A]	V_F max [mV]	I_R max [nA]	$C_D@max.$ [pF]	t_{rr} max [ns]		Configuration	SOD68 (DO-34)	SOD80C (MiniMelf)	SOT23	SOT323 (SC-70)	SOD323 (SC-76)	SOD523 (SC-79)
75	135	4	1@ $I_F=10mA$	5@ V_R max.	2	3		dual series				BAV199W		
75	160	4	1@ $I_F=10mA$	5@ V_R max.	2	3		dual series			BAV199			
75	160	4	1@ $I_F=10mA$	5@ V_R max.	3	3		dual c.a.			BAW156			
75	215	4	1@ $I_F=10mA$	5@ V_R max.	2	3		single			BAS116		BAS416	BAS716*
75	215	4	1@ $I_F=10mA$	5@ V_R max.	2	3		dual c.c.			BAV170			
125	250	4	1@ $I_F=100mA$	1@ V_R max.	4	1.5typ.		single	BAS45A	BAS45AL				

Note:

c.a. = common anode

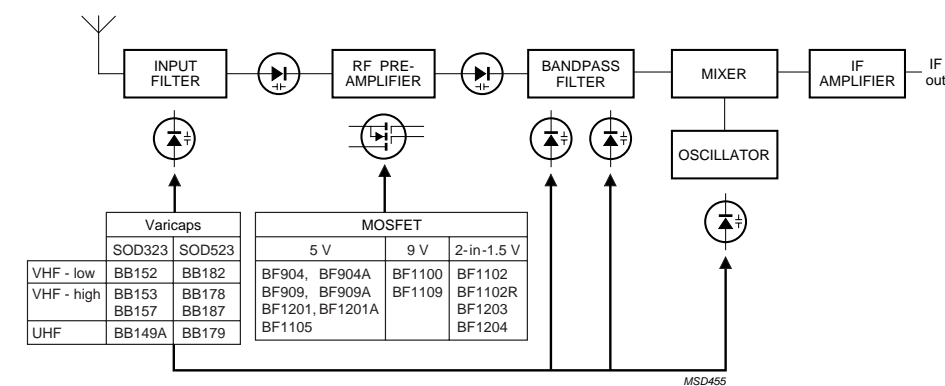
c.c. = common cathode

VARICAP DIODES

Type number	Package	C _D @max. (pF)	C _D min. (pF)	C _D ratio (pF)	R _S max	Matched sets (%)	Capacitance ratio	R _S typ	Application Keys
BB131	SOD323 (UMD2, I-IEIA, URP)	1.055@V _R =28V	0.7@V _R =28V	14	3	-	-	-	123 155
BB132	SOD323 (UMD2, I-IEIA, URP)	2.75@V _R =28V	2.3@V _R =28V	26	2	1	-	-	123 155
BB133	SOD323 (UMD2, I-IEIA, URP)	2.75@V _R =28V	2.2@V _R =28V	16	0.9	0.7	-	-	123 155
BB134	SOD323 (UMD2, I-IEIA, URP)	2.1@V _R =28V	1.7@V _R =28V	10	0.75	0.5	-	-	123 155
BB135	SOD323 (UMD2, I-IEIA, URP)	2.1@V _R =28V	1.7@V _R =28V	10	0.75	-	-	-	105 119 120
BB141	SOD523 (I-IGIA, UFP)	2.55@V _R =4V 4.5@V _R =1V	2.22@V _R =4V 3.9@V _R =1V	-	-	-	1.76@typ.	0.4	123 155
BB142	SOD523 (I-IGIA, UFP)	2.35@V _R =4V 4.9@V _R =1V	1.85@V _R =4V 4@V _R =1V	-	-	-	2.2@typ.	0.5	123 155
BB143	SOD523 (I-IGIA, UFP)	2.55@V _R =4V 5.75@V _R =1V	2.05@V _R =4V 4.75@V _R =1V	-	-	-	2.35@typ.	0.5	123 155
BB145	SOD523 (I-IGIA, UFP)	3.25@V _R =4V 7.4@V _R =1V	2.75@V _R =4V 6.4@V _R =1V	-	-	-	2@typ.	0.6	123 155
BB145B	SOD523 (I-IGIA, UFP)	2.95@V _R =4V 7.4@V _R =1V	2.55@V _R =4V 6.4@V _R =1V	-	-	-	2.2@min.	0.6	123 155
BB145B-01	SOD723	2.95@V _R =4V 7.2@V _R =1V	2.55@V _R =4V 6.4@V _R =1V	-	-	-	2.2@min.	0.6	123 155
BB145C	SOD523 (I-IGIA, UFP)	3.25@V _R =4V 7.4@V _R =1V	2.75@V _R =4V 6.4@V _R =1V	-	-	-	2@typ.	0.6	123 155
BB147	SOD323 (UMD2, I-IEIA, URP)	2.8@V _R =28V	2.4@V _R =28V	40	2.8	2	-	-	125 152
BB148	SOD323 (UMD2, I-IEIA, URP)	2.75@V _R =28V	2.4@V _R =28V	15@1-28V	0.9	1	-	-	125 152
BB149	SOD323 (UMD2, I-IEIA, URP)	2.25@V _R =28V	1.9@V _R =28V	9@1-28V	0.75	1	-	-	125 152
BB149A	SOD323 (UMD2, I-IEIA, URP)	2.22@V _R =28V	1.95@V _R =28V	9.7@1-28V	0.75	2	-	-	125 152
BB151	SOD323 (UMD2, I-IEIA, URP)	17@V _R =1V	15.4@V _R =1V	-	-	-	1.8@typ.	0.4	123 155
BB152	SOD323 (UMD2, I-IEIA, URP)	2.89@V _R =28V	2.48@V _R =28V	20.6@1-28V (min)	1.2	2	-	-	125 152
BB153	SOD323 (UMD2, I-IEIA, URP)	2.75@V _R =28V	2.36@V _R =28V	13.5@1-28V (min)	0.8	2	-	-	125 152
BB155	SOD323 (UMD2, I-IEIA, URP)	26.7@V _R =2.82V 49.8@V _R =0.34V	24.55@V _R =2.82V 45.2@V _R =0.34V	-	-	-	-	0.35	123 155
BB156	SOD323 (UMD2, I-IEIA, URP)	9.6@V _R =4V 17.6@V _R =1V	7.6@V _R =4V 14.4@V _R =1V	-	-	-	1.86@typ.	0.4	123 155 105 119 120
BB157	SOD323 (UMD2, I-IEIA, URP)	2.92@V _R =25V	2.57@V _R =25V	11@2-25V (min)	0.75	2	-	-	125 152
BB158	SOD323 (UMD2, I-IEIA, URP)	2.75@V _R =28V	2.4@V _R =28V	15@1-28V	0.9	-	-	-	125 152
BB159	SOD323 (UMD2, I-IEIA, URP)	2.25@V _R =28V	1.9@V _R =28V	9@1-28V	0.75	-	-	-	125 152
BB164	SOD323 (UMD2, I-IEIA, URP)	3.4@V _R =28V	2.9@V _R =28V	19.5@1-28V (min)	1.4	2	-	-	125 152
BB178	SOD523 (I-IGIA, UFP)	2.75@V _R =28V	2.36@V _R =28V	13.5@1-28V (min)	0.8	2	-	-	125 152
BB179	SOD523 (I-IGIA, UFP)	2.22@V _R =28V	1.95@V _R =28V	9.7@1-28V	0.75	2	-	-	125 152
BB179B	SOD523 (I-IGIA, UFP)	2.25@V _R =28V	1.9@V _R =28V	9.2@1-28V	0.75	2	-	-	125 152

Type number	Package	C _D @max. (pF)	C _D min. (pF)	C _D ratio (pF)	R _S max	Matched sets (%)	Capacitance ratio	R _S typ	Application Keys
BB181	SOD523 (I-IGIA, UFP)	1.055@V _R =28V	0.7@V _R =28V	14	3	-	-	-	125 152
BB182	SOD523 (I-IGIA, UFP)	2.89@V _R =28V	2.48@V _R =28V	20.6@1-28V (min)	1.2	2	-	-	125 152
BB187	SOD523 (I-IGIA, UFP)	2.92 @ V _R =25V	2.57@V _R =25V	11@2-25V	0.75	2	-	-	125 152
BB200	SOT23 (SST3)	14.8@V _R =4.5V 74.2@V _R =1V	12@V _R =4.5V 65.8@V _R =1V	-	-	-	5@1 - 4.5V	0.43	105 119 120
BB201	SOT223 (SC-73)	29.7@V _R =7.5V 102@V _R =1V	25.5@V _R =7.5V 89@V _R =1V	-	-	-	3.1@1 - 7.5V	0.3	105 119 120
BB202	SOD523 (I-IGIA, UFP)	11.2@V _R =3.2V 33.5@V _R =0.2V	7.2@V _R =3.2V 28.2@V _R =0.2V	-	-	-	2.5@0.2 - 2.3	0.35	105 119 120 123 155
BB804	SOT23 (SST3)	-	26@V _R =8V	-	-	-	1.7@2 - 8	0.2	105 119 120
BBY31	SOT23 (SST3)	2@V _R =28V	1.6@V _R =28V	8.3@1-28V	1.2	-	-	-	125 152
BBY39	SOT23 (SST3)	2@V _R =28V	1.6@V _R =28V	8.3@1-28V	1.2	-	-	-	125 152
BBY40	SOT23 (SST3)	6@V _R =28V	4.3@V _R =28V	5.5@3-25V	0.7	-	-	-	125 152
BBY42	SOT23 (SST3)	3@V _R =28V	2.4@V _R =28V	14@1-28V	1	-	-	-	125 152
BBY62	SOT143B	2@V _R =28V	1.6@V _R =28V	8.3@1-28V	1.2	-	-	-	125 152

TV/VCR/DVD tuning application diagram



Applications key

- Automotive**
 - 105 : Automotive
 - 119 : Car infotainment
 - 120 : Car radio/CD/tape systems
- Consumer**
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- Communication**
 - 123 : CDMA
 - 155 : Wireless Communications

Why choose Philips Semiconductors?

- Varicaps**
 - * Our broad portfolio offers high volume and flexibility at high performance.
- Benefits**
 - * Volume delivery
 - * Short leadtimes
 - * Direct matching process
 - * Small tolerances



Related literature

Title	Order code
Discrete Semiconductors Packages (brochure)	939775005011
Small-Signal Field-effect Transistors and Diodes (databook)	939775006017
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146

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

GENERAL PURPOSE ZENER DIODES

$I_F(AV)$ max [mA]	P_{tot} [mW]	P_{ZSM} [W]	V_Z nom [V]	V_Z tol [%]	Configuration	SOD27 (DO-35)	SOD66 (DO-41)	SOD80C (MiniMelf)	SOT23	SOT346 (SC-59)	SOD323 (SC-76)	SOD110	SOT323 (SC-70)	SOD523 (SC-79)	SOT663	SOD882	SOT223 (SC-73)	SOT89 (SC-62)
200	220	-	2.4~15	appr. 3	dual c.a.					PZM-NA series								
200	250	40@Tj=25°C and tp max.=0.1ms (W)	2.4~75	appr. 1 appr. 2 appr.5	single				BZX84-series									
200	300	40@Tj=25°C and tp max.=0.1ms (W)	2.4~75	appr. 2 appr.5	single					BZX384 series	BZX284 series							
200	250	-	2.4~75	appr. 2 appr.5	single											BZX884 series*		
200	300	-	2.4~75	appr. 2 appr.5	single									BZX585 series*				
200	350	40@Tj=25°C and tp max.=0.1ms (W)	2.7~15	appr.5	dual c.a.								BZB784 series					
200	350	40@Tj=25°C and tp max.=0.1ms (W)	4.7~6.8	appr.5	dual c.a.											BZB984 series		
200	400		2.4~36	appr.2	single						PDZ-B series							
250	300	40@Tj=55°C and tp max.=8.3ms (W)	3.3~33	appr.5	single				PMBZ52xxB series									
250	300		2.4~36	appr. 3; appr. 5	single					PZM-N series								
250	400	40@Tj=25°C and tp max.=0.1ms (W)	2.4~75	appr. 2 appr.5	single	BZX79 series		BZV55 series										
250	1000	40	2.4~75	appr.5	dual													BZV49 series
400	1500	40	2.4~75	appr.5	single												BZV90 series	
500	1000		3.3~24	appr. 5	single		1N47xxA series											
500	1000	60@Tj=25°C and tp max.=0.1ms (W)	3.6~75	appr. 5	single		BZV85 series											

Note:
c.a. = common anode

* = range from 15V to 75V under development, others released

AVALANCHE REGULATOR DIODES

$I_F(AV)$ max [mA]	P_{ZSM} [W]	P_{tot} [mW]	V_Z nom [V]	Tolerance +/- %	Configuration	SOT23
250	30@Tj=150°C and tp max.=0.1ms (W)	250	5~6.8	+0.2V	single	PLVA600A series
250	30@Tj=150°C and tp max.=0.1ms (W)	250	5~6.8	+0.2V	dual c.a.	PLVA2600A series

TERMINATIONS/FILTERS

Description	Configuration	Operating Voltage	R1 / Ohm	R2 / Ohm	R3 / Ohm	C1 / pF	SOT23
Clock Terminator		0V ... 5V	45 .. 55	45 .. 55	41.7 .. 51	120 .. 180	PSSI3120CA

LOW VOLTAGE STABISTORS

V_R max [V]	$I_F(AV)$ max [mA]	$C_D@max.$ [pF]	$V_F @ I_F = 5$ mA min [mV]	$V_F @ I_F = 5$ mA max [mV]	S_F [mV/K]	r_{dif} [Ohm]	SOT23 (SST3)
5	200	2	725	805	-1.8	120@IF=0.5mA	BAS17

ZENBLOCK DIODES

Zener working voltage [V]	TVS stand-off voltage [V]	@ I _Z [mA]	V _R [V]	Total power dissipation [mW]	TVS-peak power-rating [W]	SOD124	SOD87 (LLDL)	Application Keys
68~200	56~160	5~10	600	1500	100		BZD142W series	43
68~200	56~160	5~10	600	1800	150	BZG142 series		43
160	130	5	600	1800	150	BZG142-160		

ZENER POWER DIODES AND TRANSIENT VOLTAGE SUPPRESSORS

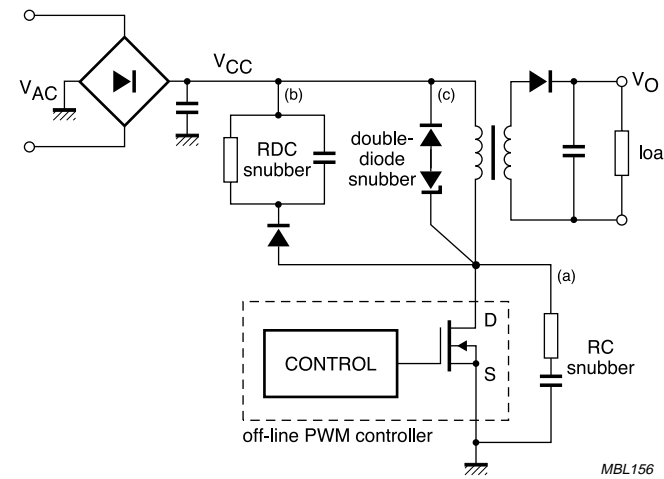
TVS peak power rating [W]	Zener total power rating	Zener working voltage [V]	TVS stand-off voltage [V]	SOD64	SOD57	SOD124	SOD106 (SMA, PMOS)	SOD87 (LLDL)	Application Keys
-	2.5W	10~270	-			BZG01 series			54 55 56
-	3W	10~270	8.2~200				BZG03 series		54 55 56
150	1.7W to 2.3W	5.6~510	6.2~430					BZD27 series	54 55 56
150	1.7W to 2.3W	12~270	10~220						54 55 56
300	-	10~240	8.2~220				BZG04 series		54 55 56
300	3.25W	7.5~270	6.2~430		BZT03 series				54 55 56
400	-	-	26				PSMA26A		55 56
500	6.00W	12~270	10~220	BZW03 series					54 55 56

Applications key
Power Supply
43 : Snubber diode

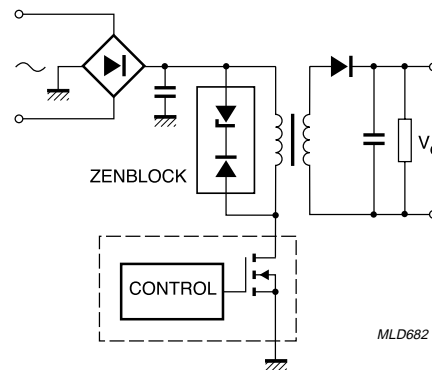
Related literature
Title
ZenBlock™ - Zener with integrated blocking diode
Zenblock™ - Zener with integrated blocking diode (leaflet)
Philips Comprehensive Product Catalog (CD-ROM set)

Order code
939775006903
939775007017
939775011146

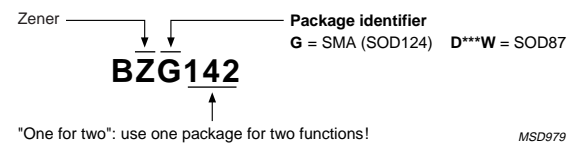
Flyback converters showing various snubber topologies



Zenblock in a flyback converter



Zenblock™ part numbering



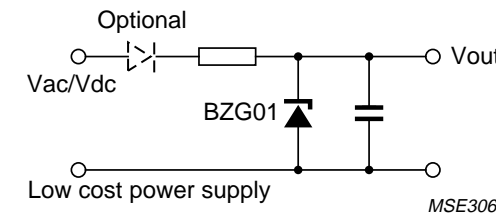
Why choose Philips Semiconductors?

- ZenBlock**
- * Zener & Blocking function in one package, means fewer components, leading to a reduction in space used on circuit boards
 - * Benefits of ZenBlock over RCD or RC snubber
 - Lowered EMI by reducing the drain clamp circuit length & area
 - Optimal clamp performance at all loads
 - Higher efficiency at low loads
 - * Excellent stability due to glass passivation technology

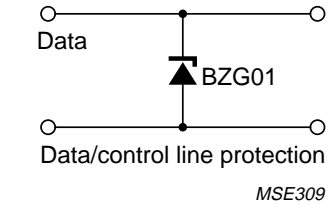
Applications key
General Purpose
54 : Voltage regulation
55 : Voltage clamping
56 : Surge protection

Related literature
Title
SOD87 hermetically sealed, surface-mount glass package for rectifiers and voltage regulators
Order code
939775009634

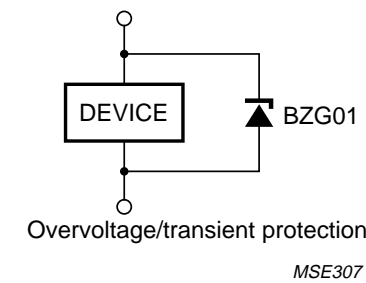
BZG01 Zener/TVS for general applications



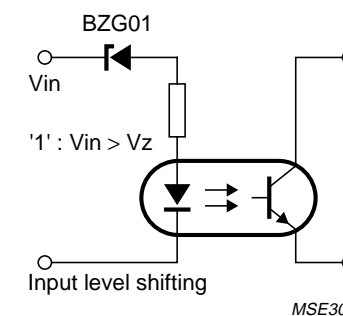
BZG01 Zener/TVS for general applications



BZG01 Zener/TVS for general applications



BZG01 Zener/TVS for general applications



Why choose Philips Semiconductors?

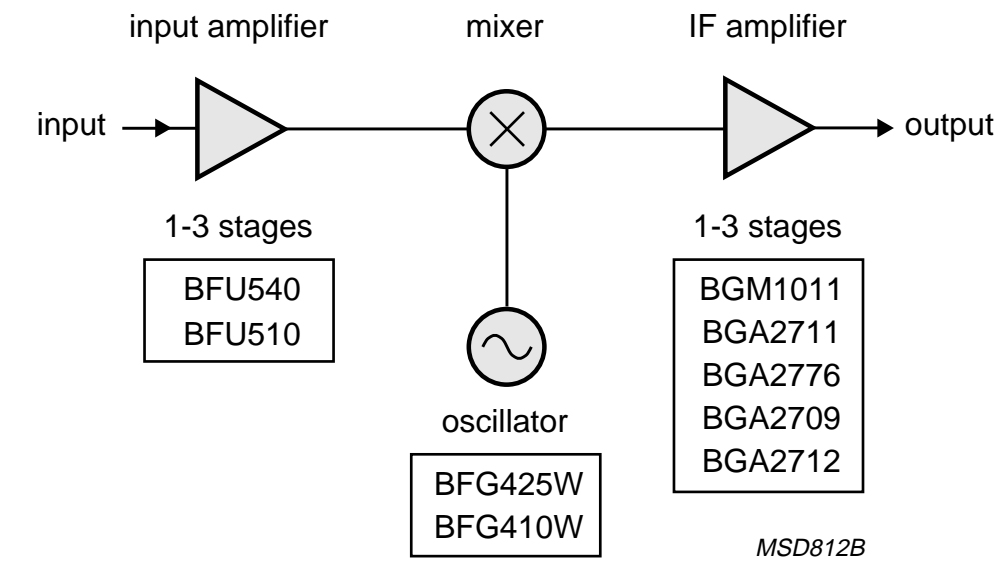
- ...SOD87**
- * Better Current/Power Capability than SMA - Can be used in a wider range of applications with higher current/power than a standard 1A SMA
 - * Smaller than SMA equivalents - Aids miniaturisation of board space requirements, key to most SMD applications
- Features and benefits over plastic devices**
- * Device Hermetically sealed - No moisture ingress. Better than plastic equivalents
 - * Good Avalanche Energy Absorption - This benefit overcomes problems caused by noisy lines in various circuitry such as input rectification
 - * Glass Package - Reduced risk of diode thermal runaway, due to a higher maximum operating temperature of the device compared to plastic equivalents

MMIC AMPLIFIERS AND MIXERS

types in **bold red** represent new products

Type number	Package	Remarks	V _s (V)	I _s (mA)	NF (dB)	Gain (dB)	@ (GHz)	Input intercept point (IP3) (dBm)
BGA2001	SOT343R (CMPAK-4)	LNA	2.5	4	1.5	19	2	-
BGA2003	SOT343R (CMPAK-4)	Linear LNA	2.5	10	1.9	19	2	5
BGA2011	SOT363 (UMT6)	LNA	3	15	1.5	-	8	-
BGA2012	SOT363 (UMT6)	LNA	3	7	-	11.6	2.6	-
BGA2022	SOT363 (UMT6)	Linear Mixer	3	51	9	5	0.88	-
BGA2031/1	SOT363 (UMT6)	2 Stage Variable Gain Linear Amplifier	3	51	-	23	1.9	-
BGA2709	SOT363 (UMT6)	General Purpose Wideband Amplifier	5	23.5	4	2.7	1	-
BGA2711	SOT363 (UMT6)	General Purpose Wideband Amplifier	5	12	4.7	12.9	1	-
BGA2712	SOT363 (UMT6)	General Purpose Wideband Amplifier	5	12.5	3.9	21.3	1	-
BGA2748	SOT363 (UMT6)	General Purpose Wideband Amplifier	3	5.7	1.8	21.3	1	-
BGA2771	SOT363 (UMT6)	General Purpose Wideband Amplifier	3	33	4.4	21	1	-
BGA2776	SOT363 (UMT6)	General Purpose Wideband Amplifier	5	23.8	4.7	22.8	1	-

Satellite dish LNB application diagram



Related literature

Title	Order code
Discrete Semiconductors Packages (brochure)	939775005011
RF Wideband Transistors and MMIC's (databook)	939775006311
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
Optimized MMIC Gain Blocks	939775007976

Why choose Philips Semiconductors?

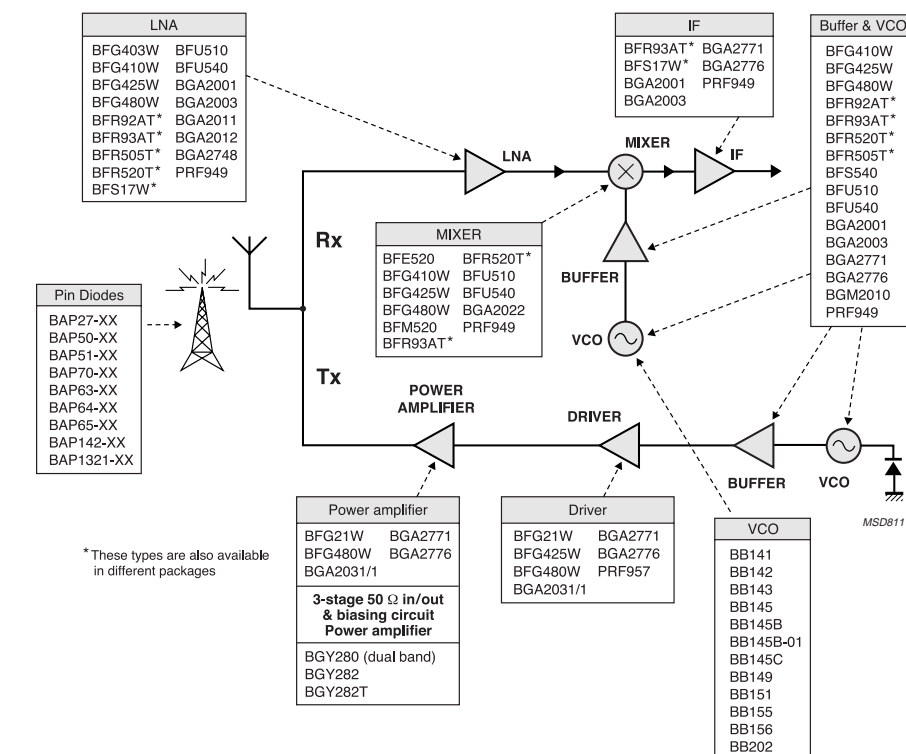
... MMICs

- * Our broad MMIC portfolio offers highest price performance at highest reliability.

Benefits

- * Volume delivery
- * Short leadtimes
- * Reduced RF component count
- * Easy circuit design-in and rapid product development
- * Short time-to-market
- * Reduced board size

Generic cell phone front-end application diagram



*These types are also available in different packages

MAGNETIC FIELD SENSORS

Type number	Package	Supply voltage (V)	Sensitivity (mV/V / kA/m)	Field range (kA/m)	Bridge resistance (k Ohm)	Operating temperature (Cel)	Application Keys
KMZ10A	SOT195	5	16	-0.5~0.5	0.8~1.6	-40~150	104 105 134
KMZ10B	SOT195	5~12	4	-2.0~2.0	1.6~2.6	-40~150	104 105 134
KMZ10C	SOT195	5	1.5	-7.5~7.5	1.0~1.8	-40~150	104 105 134
KMZ51	SOT96 (SO8)	5	12~16	-0.2~0.2	1.0~2.6	-40~125	104 134 145
KMZ52	SOT109 (SO16)	6~8	12~16	-0.2~0.2	1.0~2.6	-40~125	105 119 134

ROTATIONAL SPEED MEASUREMENT

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

Type number	Package	Supply voltage (V)	Airgap (mm)	Target wheel	Operating temperature (Cel)	Output type	Magnetized ferrite magnet (mm)	Remarks	Application Keys
KMI15/1	SOT453	5.5~16	2.5	Passive Ferromagnetic	-40~85	Digital Current	8.0 x 8.0 x 4.5	-	105 117 134
KMI15/2	SOT453	5.5~16	2	Magnetized	-40~85	Digital Current	3.8 x 2.0 x 0.8	-	105 117 134
KMI15/4	SOT453	5.5~16	2.5	Passive Ferromagnetic	-40~85	Digital Current	5.5 x 5.5 x 3.0	-	105 117 134
KMI16/1	SOT477	4.5~16.5	2.5	Passive Ferromagnetic	-40~150	Open Collector	8.0 x 8.0 x 4.5	-	77 105 117
KMI18/2	SOT477	4.5~16.5	2.5	Magnetized	-40~150	Open Collector	3.8 x 2.0 x 0.8	Shielded Sensor => EMC improved	77 105 117
KMI18/4	SOT477	4.5~16.5	2	Passive Ferromagnetic	-40~150	Open Collector	5.5 x 5.5 x 3.0	Shielded Sensor => EMC improved	77 105 117
KMI20/1	SOT453	0~18	3.5	Passive Ferromagnetic	-40~85	Digital Current	8.0 x 8.0 x 4.5	Extended Airgap	105 117 134
KMI20/2	SOT453	0~18	3.5	Magnetized	-40~85	Digital Current	3.8 x 2.0 x 0.8	Extended Airgap	105 117 134
KMI20/4	SOT453	0~18	3.5	Passive Ferromagnetic	-40~85	Digital Current	5.5 x 5.5 x 3.0	Extended Airgap	105 117 134
<i>KMI22/1</i>	SOT477	0~18	3.5	Passive Ferromagnetic	-40~85	Digital Current	8.0 x 8.0 x 4.5	Extended Airgap, direction Recognition, digital Protocol	105 117 134
<i>KMI22/2</i>	SOT477	0~18	3.5	Magnetized	-40~85	Digital Current	3.8 x 2.0 x 0.8	Extended Airgap, direction Recognition, digital Protocol	105 117 134
<i>KMI22/4</i>	SOT477	0~18	3.5	Passive Ferromagnetic	-40~85	Digital Current	5.5 x 5.5 x 3.0	Extended Airgap, direction Recognition, digital Protocol	105 117 134

ANGULAR MEASUREMENT AND SIGNAL CONDITIONING ICs

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

Type number	Package	Description	Supply voltage (V)	Angle range (DEG)	Output voltage (V)	Output type	Operating temperature (Cel)	Application Keys
<i>KMA200</i>	SOT637	Angular measurement system	4.5~5.5	180	-	4 analog linear / 2 digital	-40~125	74 105 119 134
KMZ41	SOT96 (SO8)	Magnetic field sensor	5.0~9	180	-	sine / cosine	-40~150	74 105 119 134
KMZ43T	SOT96 (SO8)	Magnetic field sensor	5.0~9	180	-	sine / cosine	-40~150	74 105 119 134
UZZ9000	SOT137 (SO24)	Signal conditioning unit	4.5~5.5	180	-	analog linear	-40~150	74 105 119 134
UZZ9001	SOT137 (SO24)	Signal conditioning unit	4.5~5.5	180	-	digital	-40~150	74 105 119 134

TEMPERATURE SENSORS

Type number	Package	R25 (Ohm)	R100 (Ohm)	Tolerance +/- %	Operating temperature (Cel)	Application Keys
KTY81-1 / KTY81-2	SOD70	1000 / 2000		+/- 1%~+/- 5%	-55~150	105 117 133
KTY82-1 / KTY82-2	SOT23	1000 / 2000		+/- 1%~+/- 5%	-55~150	105 117 133
KTY83-1	SOD68 (DO-34)	1000		+/- 1%~+/- 5%	-55~175	105 117 133
KTY84-1	SOD68 (DO-34)		1000	+/- 3%~+/- 5%	-40~300	105 117 133



Applications key

Automotive

- 74 : Electronic Power Assisted Steering (EPAS)
- 77 : Motor
- 105 : Automotive
- 117 : Body electronics
- 119 : Car infotainment
- 133 : In vehicle power
- 134 : Industrial and Home Appliances

General Purpose

- 104 : General

Consumer

- 145 : PC-TV



Related literature

Title

- Magneto-resistive Sensors, the attractive choice
- Rotational Speed Sensors, running ahead of the field
- MR sensors cover all the angles
- Silicon temperature sensors

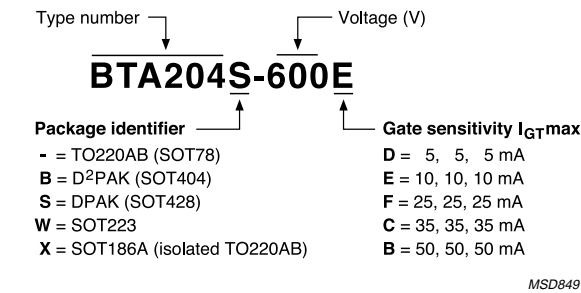
Order code

- 939775003655
- 939775003656
- 939775005985
- 939775007515

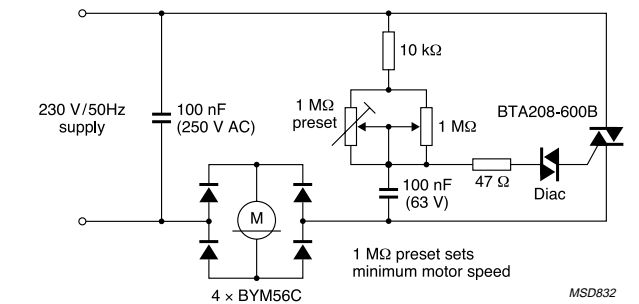
3-QUADRANT TRIACS (HIGH COMMUTATION)

V _{DRM} [V]	I _{GT} [mA]	I _T (R _{MS}) [A]	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT428 (SC-63, D-PAK)	Application Keys
600	5	1				BTA204VW-600D		134
600	5	4	BTA204X-600D	BTA204-600D			BTA204S-600D	134
600	5	8	BTA208X-600D	BTA208-600D			BTA208S-600D	134
600	5	12	BTA212X-600D	BTA212-600D	BTA212B-600D			134
600	5	16	BTA216X-600D	BTA216-600D	BTA216B-600D			134
600	10	1				BTA204VW-600E		134
600	10	4	BTA204X-600E	BTA204-600E			BTA204S-600E	134
600	10	8	BTA208X-600E	BTA208-600E			BTA208S-600E	134
600	10	12	BTA212X-600E	BTA212-600E	BTA212B-600E			134
600	10	16	BTA216X-600E	BTA216-600E	BTA216B-600E			134
600	25	1				BTA204VW-600F		134
600	25	4	BTA204X-600F	BTA204-600F			BTA204S-600F	134
600	25	8	BTA208X-600F	BTA208-600F			BTA208S-600F	134
600	25	12	BTA212X-600F	BTA212-600F	BTA212B-600F			134
600	25	16	BTA216X-600F	BTA216-600F	BTA216B-600F			134
600	35	1				BTA204VW-600C		134
600	35	4	BTA204X-600C	BTA204-600C			BTA204S-600C	134
600	50	1				BTA204VW-600B		134
600	50	4	BTA204X-600B	BTA204-600B			BTA204S-600B	134
600	50	8	BTA208X-600B	BTA208-600B			BTA208S-600B	134
600	50	12	BTA212X-600B	BTA212-600B	BTA212B-600B			134
600	50	16	BTA216X-600B	BTA216-600B	BTA216B-600B			134
600	50	25		BTA225-600B	BTA225B-600B			134
800	10	4		BTA204-800E				134
800	10	8	BTA208X-800E					134
800	10	12	BTA212X-800E					134
800	50	8	BTA208X-800B	BTA208-800B			BTA208S-800B	134
800	50	12	BTA212X-800B	BTA212-800B	BTA212B-800B			134
800	50	16	BTA216X-800B	BTA216-800B	BTA216B-800B			134
800	50	25		BTA225-800B	BTA225B-800B			134
1000	50	8	BTA208X-1000B					134

Three-quadrant triacs
Philips part numbering system



Motor Speed Controller



Applications key
Industrial/standard/distribution
134 : Industrial and Home Appliances

Related literature

Title	Order code
Three quadrant triacs bring major benefits to OEMs	939775006518
Three-quadrant triacs: Simplifying the design of power-control circuitry for non-resistive loads	939775006551
51LPC Microcontrollers & three-quadrant triacs: Simplifying the design of power control applications	939775008054
Surface Mounted Triacs and Thyristors	939775002622
Thyristors & Triacs - Ten Golden Rules for Success in your Application	939775000812
Philips 51LPC Microcontrollers & Triacs easily connected FS013/14	939775007826
	939775006504

Why choose Philips Semiconductors?

- Benefits**
- * Wide range of triacs meets the needs of the general industrial and home appliance O.E.M.
 - * The most comprehensive, first choice range of three-quadrant triacs offers enhanced immunity to loss of control and satisfies the needs of the vast majority of triac applications.
 - * Three-quadrant triacs do not require RC snubber networks or dIcom/dt-limiting inductors, making power control circuitry more compact, cheaper to assemble and reducing the overall bill of materials.
 - * Three-quadrant triacs offer improved circuit reliability as they are less prone to false triggering from mains transients.
 - * Logic level and sensitive gate triacs can be driven directly by logic IC's and microcontrollers. They provide simple plug-in, high surge replacements for existing industry parts.
 - * Patented planar technologies have been optimised for stable voltage blocking at elevated temperatures, yielding long term reliability in the application.
 - * All devices are rated for the abnormal false trigger condition (Max safe dIT/dt specified).
 - * The availability of three surface mount packages helps in streamlining PCB assembly and reducing costs.

4-QUADRANT TRIACS

types in **bold red** represent new products

V _{DRM} [V]	I _{GT} [mA]	I _T (R _{MS}) [A]	SOT54B	SOT82	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT54 (SPT, E-1)	Application Keys
400	5	0.6								MAC97A6	44 111
400	35	25				MAC223A6					
600	3	1	Z0103MA						Z0103MN	BT131-600	
600	5	0.6								MAC97A8	44 111
600	5	1	Z0107MA						BT134W-600D Z0107MN		
600	5	4		BT134-600D	BT136X-600D	BT136-600D	BT136S-600D				
600	5	8			BT137X-600D	BT137-600D	BT137S-600D				
600	10	1	Z0109MA						BT134W-600E Z0109MN		
600	10	4		BT134-600E	BT136X-600E	BT136-600E	BT136S-600E	BT136B-600E			
600	10	8			BT137X-600E	BT137-600E	BT137S-600E	BT137B-600E			
600	10	12			BT138X-600E	BT138-600E		BT138B-600E			
600	10	16			BT139X-600E	BT139-600E		BT139B-600E			
600	25	4			BT136X-600F		BT136S-600F				
600	25	8			BT137X-600F		BT137S-600F	BT137B-600F			
600	25	12			BT138X-600F			BT138B-600F			
600	25	16			BT139X-600F			BT139B-600F			
600	35	1			MAC223A8X						
600	35	1							BT134W-600		
600	35	1							BT134W-600		
600	35	8			BT137X-600		BT137S-600				
600	35	12			BT138X-600			BT138B-600			
600	35	16			BT139X-600			BT139B-600			
600	35	25					BTA140-600				
600	35	25					MAC223A8				
800	3	1	Z0103NA						Z0103NN		
800	5	1	Z0107NA						Z0107NN		
800	10	1	Z0109NA Z0109NN								
800	10	4		BT134-800E	BT136X-800E	BT136-800E	BT136S-800E	BT136B-800E			
800	10	8			BT137X-800E	BT137-800E	BT137S-800E	BT137B-800E			
800	10	12			BT138X-800E	BT138-800E		BT138B-800E			
800	10	16				BT139-800E		BT139B-800E			
800	25	4					BT136S-800F				
800	25	8					BT137S-800F	BT137B-800F			
800	25	12			BT138X-800F						
800	25	16						BT139B-800F			
800	35	1							BT134W-800		

V _{DRM} [V]	I _{GT} [mA]	I _T (R _{MS}) [A]	SOT54B	SOT82	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT54 (SPT, E-1)	Application Keys
800	35	4			BT136X-800		BT136S-800				
800	35	8			BT137X-800		BT137S-800	BT137B-800			
800	35	12			BT138X-800						
800	35	16			BT139X-800			BT139B-800			
800	35	25					BTA140-800				

Applications key

Home Appliances
111 : Home appliances

Lighting
44 : HF electronic ballast

**Four-quadrant triacs
Philips part numbering system**

Type number → Voltage (V)

BT137X-600D

Package identifier → Gate sensitivity I_{GT}max

- = TO220AB (SOT78)
B = D²PAK (SOT404)
S = DPAK (SOT428)
W = SOT223
X = SOT186A (isolated TO220AB)
 BT131, BT132D use TO92 package
 BT134 uses SOT82 package

D = 5, 5, 5, 10 mA
 E = 10, 10, 10, 25 mA
 F = 25, 25, 25, 70 mA
 - = 35, 35, 35, 70 mA
 B = 50, 50, 50, 100 mA

MSD850

Why choose Philips Semiconductors?

Benefits

- * Wide range of thyristors meets the needs of the general industrial and home appliance O.E.M.
- * Large selection of four-quadrant triacs, suits applications where the load is predominantly resistive or where 4th quadrant triggering (T₂-) is required.
- * Logic level and sensitive gate triacs can be driven directly by logic IC's and microcontrollers. They provide simple plug-in, high surge replacements for existing industry parts.
- * Patented planar technologies have been optimised for stable voltage blocking at elevated temperatures, yielding long term reliability in the application.
- * All devices are rated for the abnormal false trigger condition (Max safe dI_T/dt specified).
- * The availability of three surface mount packages helps in streamlining PCB assembly and reducing costs.

Thyristors (SCRs), triacs and trigger devices

THYRISTORS

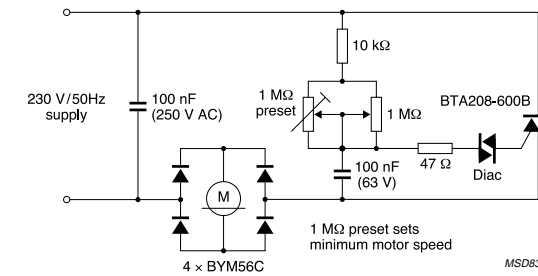
I_{GT} [mA]	V_{DRM} [V]	$I_T (R_{MS})$ [A]	SOT82	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT404 (D ² -PAK)	SOT428 (SC-63, D-PAK)	SOT223 (SC-73)	SOT54 (SPT, E-1)
-	400	0.8							EC103D1
0.2 (min 0.02)	500	0.8							BT168E
0.2 (min 0.02)	600	0.8							BT168G
0.2 (min 0.02)	600	1.0						BT168GW	
0.2	200	0.8							BT149B BT169B
-	200	0.8						MCR08BT1	
0.2	400	0.8							BT149D BT169D
0.2	400	4	BT148-400R						
0.2	500	4	BT148-500R		BT150-500R				
0.2	500	8		BT258X-500R	BT258-500R				
0.2	600	0.8							BT149G BT169G
0.2	600	1						BT148W-600R	
0.2	600	4	BT148-600R				BT150S-600R		
0.2	600	8		BT258X-600R	BT258-600R				
0.2	800	8		BT258X-800R	BT258-800R		BT258S-800R		
15	500	9		BT151X-500R					
15	500	12			BT151-500R		BT151S-500R		
15	600	8					BT300S-600R		
15	650	9		BT151X-650R					
15	650	12					BTH151S-650R		
15	650	12			BT151-650R		BT151S-650R		
15	800	9			BT151-800R				
15	800	12		BT151X-800R			BT151S-800R		
32	450	20		BT152X-400R	BT152-400R	BT152B-400R			
32	650	20		BT152X-600R	BT152-600R	BT152B-600R			
32	800	20		BT152X-800R	BT152-800R	BT152B-800R			
35	800	25			BT145-800R				

DIACS

I_{FRM} [A]	V_{BO} [V]	I_{BO} [μA]	SOD27 (DO-35, SC-40)
2	28 to 36	50	BR100/03

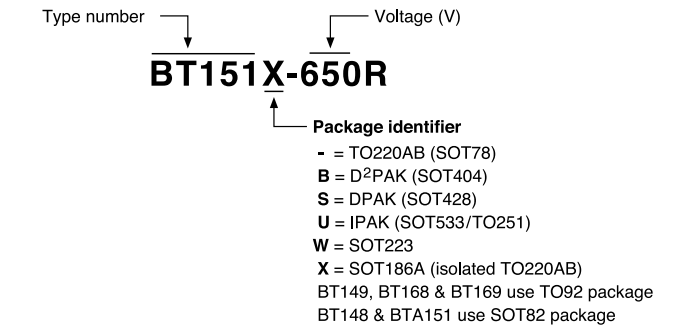
Thyristors (SCRs), triacs and trigger devices

Motor Speed Controller



SCRs

Philips part numbering system



Why choose Philips Semiconductors?

Benefits

- * Wide range of thyristors meets the needs of the general industrial and home appliance O.E.M.
- * Comprehensive thyristor (SCR) selection suits D.C. ignition and half wave A.C control applications in the home, on the move and in industry.
- * Patented planar technologies have been optimised for stable voltage blocking at elevated temperatures, yielding long term reliability in the application.
- * The availability of three surface mount packages helps in streamlining PCB assembly and reducing costs.

Note: BTH151S has a high repetitive surge specification which makes it suitable for applications where high inrush currents or stall currents are likely to occur on a repetitive basis.

DEFLECTION

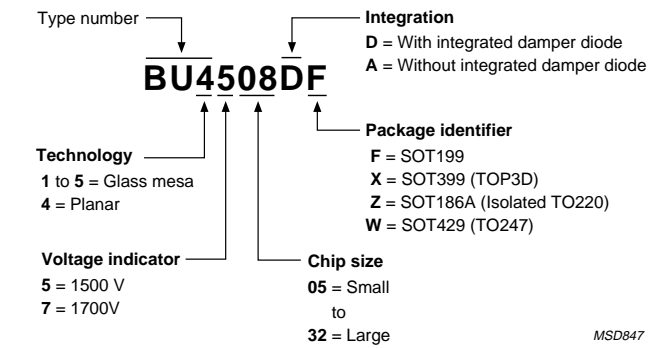
Integrated damper diode	CRTV frequency [KHz]	V _{CESM} [V]	Monitor frequency [KHz]	I _{C (SAT)} [A]	t _{f(max)} [μs]	SOT429 (TO-247)	SOT199 (3-lead TO-247F)	SOT186A (3 lead TO-220F)	SOT399 (TOP-3D)	Application Keys
yes	16	1500	-	3	0.4		BU4506DF	BU4506DZ	BU4506DX	126
yes	16	1500	-	4.5	1	BU508DW	BU508DF			125 152
yes	16	1500	56	4	0.4				BU4507DX	126
yes	16	1500	64	4.5	0.6		BU2508DF	BU1508DX		125 126 152
yes	16	1500	64	5	0.4		BU4508DF	BU4508DZ	BU4508DX	126
yes	16	1500	-	5	0.5		BU2506DF		BU2506DX	
yes	16	1500	-	8	0.5				BU2507DX	
yes	16	1700	-	5.5	0.9				BU2720DX	125 126 152
yes	16	1700	-	7	0.8				BU2725DX	125 126 152
no	16	1000	-	3	0.3			BUT11APX		
no	16	1200	-	2	0.3			BUT11APX-1200		
no	16	1500	-	3	0.45		BU4506AF	BU4506AZ	BU4506AX	126
no	16	1500	-	4.5	1	BU508AW	BU508AF			125 152
no	16	1500	56	4	0.45				BU4507AX	126
no	16	1500	56	4	0.5			BU1507AX		
no	16	1500	64	4.5	0.6		BU2508AF			
no	16	1500	64	5	0.48		BU4508AF		BU4508AX	126
no	16	1500	64	6	0.5		BU4515AF		BU4515AX	126
no	16	1500	64	7	0.4		BU4522AF		BU4522AX	
no	16	1500	70	9	0.55				BU4525AX	126
no	16	1500	-	9	0.4				BU2515DX	
no	16	1500	-	10	0.25				BU2522AX	
no	16	1500	-	10	0.5				BU2520AX	
no	16	1500	-	10	0.5				BU2520DX	
no	16	1500	-	11	0.3				BU2523AX	
no	16	1500	-	12	0.35				BU2525AX	
no	16	1500	-	12	0.2				BU2527AX	
no	16	1500	-	12	0.2				BU2527DX	
no	16	1500	-	12	0.35	BU2525AW				
no	16	1500	-	16	0.1	BU2532AW				
no	16	1500	-	16	0.25	BU2530AW				
no	16	1500	-	12	0.2		BU2527AF			
no	16	1500	-	12	0.35		BU2525AF			
no	16	1500	-	11	0.3		BU2523AF			
no	16	1500	-	10	0.5		BU2520DF			
no	16	1500	-	10	0.5		BU2520AF			
no	16	1500	-	10	0.25		BU2522AF			
no	16	1700	-	4	0.52		BU2708AF			125 126 152
no	32	1500	90	10	0.4	BU4530AW				126



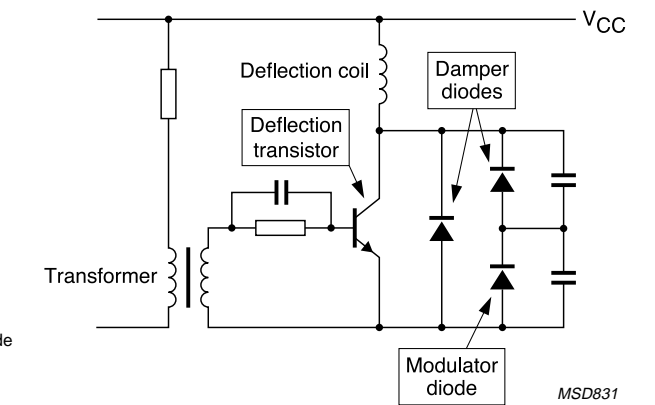
Applications key

- Computing
 - 126 : CRT Monitors
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV

Deflection transistor part numbering



Deflection circuit



Why choose Philips Semiconductors?

Deflection

- * Complete portfolio of industry benchmark deflection transistors for all CTV and Monitor applications.
- * Proven glass mesa process utilised to produce very good switching characteristics.
- * Improved emitter design enhances ruggedness in the BU45 series.
- * Optimised for low loss in applications from 1000 to 1700 V.
- * Full range of industry standard packages offered with or without integrated damper diodes.

LIGHTING

V _{CESM} [V]	I _C (DC) [A]	I _C (SAT) [A]	t _{f(max)} [µs]	SOT82	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT404 (D ² -PAK)	SOT54 (SPT, E-1)	Application Keys
700	1	0.5	0.05					BUJ100 BUJ100B	45
700	4	2	0.16			PHE13005			44
700	4	3	0.033			BUJ103A			44 45
700	8	4	0.045			BUJ105A	BUJ105AB		44
700	8	5	0.04			PHE13007			44
700	10	6	0.05			BUJ106A			44
700	12	6	0.15			PHE13009			44
800	0.5	-	0.28	BUX86P					44
850	6	4	0.088			BUJ204A			44
1000	0.5	-	0.28	BUX87P					44
1000	2	1	0.4			BUX85			44
1000	5	2.5	0.8			BUT11A BUT11AI			44 126
1000	5	2.5	-0.8		BUT11AX				44 126
1000	5	3	0.145			BUJ303A			44
1000	6	4	0.8			BUT18A			44 126
1000	8	5	0.8			BUJ12AI			44
1050	5	3	0.2			BUJ303B			44
1200	6	2	0.17		BUJ403BX		BUJ403A BUJ403B		44



Applications key

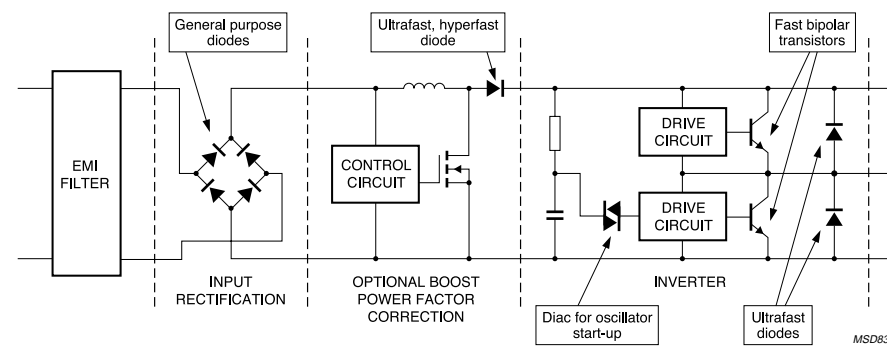
- Computing
 - 126 : CRT Monitors
- Lighting
 - 44 : HF electronic ballast
 - 45 : Compact fluorescent lamp (CFL)



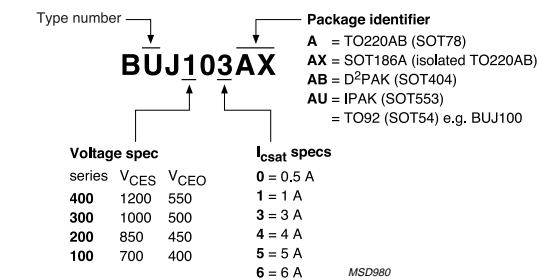
Related literature

Title	Order code
FS046, An Electronic Ballast: Base Drive Optimisation (factsheet)	939775003653
Power in Lighting (folder)	939775005312
Philips BUJ100 transistor in TO92 suits all Compact Fluorescent Lamp powers (application note)	939775007909

Electronic lighting ballast



BUJ part numbering



Why choose Philips Semiconductors?

... BUJ range of Bipolar Transistors

Benefits

- * Wide choice of current ratings and packages meets all self-oscillating ballast requirements
- * Planar passivation technology offers stable voltage blocking at elevated temperature for longterm reliability and long life
- * Transistor design optimised for the lowest power dissipation in lighting ballasts
- * Very fast, smooth turn-off performance yields the lowest switching dissipation
- * Very low V_{CESAT} yields low ON-state losses
- * Very fast turn-off is maintained, even when base is driven hard to minimise ON-state losses
- * BUJ100 in TO92 is suitable for all Compact Fluorescent Lamps and ballasts up to at least 26 W @ 230 V AC
- * Tightly-controlled gain makes selection and gain banding unnecessary
- * Flat gain characteristic over a wide range of IC guarantees correct operation under all conditions

DARLINGTON TRANSISTORS

I _C [mA]	V _{CE} [V]	hFE min [V]	f _T min. [MHz]	Polarity	SOT54	SOT223	SOT89	SOT23
					Leaded		SMD	
					Ptot max. 500-800 mW	Ptot max. 1250 mW	Ptot max. 1300 mW	Ptot max. 250 mW
500	30	5000	125	NPN				
500	30	10000	125	PNP	MPSA64			
500	30	10000	125	NPN	MPSA14	PZTA14		
500	30	20000	125	NPN			PXTA14	
500	30	20000	220 typ.	PNP			BCV28	
500	30	20000	220 typ.	NPN			BCV29	
500	30	30000	220 typ.	PNP	BC516			BST60
500	30	30000	220 typ.	NPN	BC517			BST50
500	60	10000	220 typ.	PNP			BCV48	BST61
500	60	10000	220 typ.	NPN			BCV49	BST51
500	55	2000	155	NPN	BC618			BCV48
1.000	45	1000	220 typ.	NPN	BC875			BCV49
1.000	45	2000	220 typ.	PNP		BSP60	BST60	BST62
1.000	45	2000	220 typ.	NPN		BSP50	BST50	BST52
1.000	60	2000	220 typ.	NPN		BSP51	BST51	
1.000	60	2000	220 typ.	PNP		BSP61	BST61	
1.000	80	2000	220 typ.	NPN	BSR52	BSP52	BST52	
1.000	80	2000	220 typ.	PNP	BSR62	BSP62	BST62	
1.000	80	1000	220 typ.	NPN	BC879			

LOW NOISE TRANSISTORS

I _C [mA]	V _{CEO} [V]	hFE min	hFE max	f _T min. [MHz]	Polarity	SOT54/TO-92	SOT23	SOT323/SC-70
						Leaded	SMD	
						Ptot max. 830 mW	Ptot max. 250 mW	Ptot max. 200 mW
100	30	200	450	100	NPN	JC548B	BC849B	BC849BW
100	30	220	475	100	PNP	JC558B	BC859B	BC859BW
100	30	420	800	100	PNP	BC559C	BC859C	BC859CW
100	30	420	800	100	NPN	BC549C	BC849C	BC849CW
100	30	200	450	100	NPN		BC850B	BC850BW
100	30	220	475	100	PNP		BC860B	BC860BW
100	30	420	800	100	PNP		BC860C	BC860CW
100	30	420	800	100	NPN	BC550C	BC850C	BC850CW

MEDIUM FREQUENCY TRANSISTORS

I _C [mA]	V _{CEO} [V]	hFE min	hFE max	f _T min. [MHz]	Polarity	SOT54/TO-92	SOT23	SOT323/SC-70
						Leaded	SMD	
						Ptot max. 300-500 mW	Ptot max. 250 mW	Ptot max. 200 mW
25	20	40	85	275	NPN		BFS20	BFS20W
25	25	38	-	500 typ.	NPN	BF199		
25	30	25	50	400	PNP		BF824	BF824W
25	30	25	-	450 typ.	PNP	BF324		
25	40	50	-	325 typ.	PNP		BF550	
25	40	50	-	350	PNP	BF450		
25	40	67	220	150	NPN	BF240		
25	40	67	222	380 typ.	NPN		BF840	
30	20	65	225	260 typ.	NPN		BFS19	
100	15	20	-	490	NPN	BF370	BF570	

SINGLE GENERAL PURPOSE

types in **bold red** represent new products

I _C [mA]	V _{CE0} [V]	hFE min [V]	hFE max [V]	f _T min [MHz]	Polarity	SOT54 / TO-92	SOT223 / SC-73	SOT89 / SC-62	SOT23	SOT346 / SC-59	SOT323 / SC-70	SOT416 / SC-75	SOT490 / SC-89	SOT883 / SC-101	
						Leaded	SMD			SMD					Leadless
						Ptot max. 500-850 mW	Ptot max. 1370 mW	Ptot max. 1350 mW	Ptot max. 250 mW	Ptot max. 250 mW	Ptot max. 200 mW	Ptot max. 150 mW	Ptot max. 250 mW	Ptot max. 230 mW	
100	25	450	-	100	NPN						PMST5089				
100	30	350	-	100	NPN						PMST5088				
100	32	110 - 420	220 - 800	100	NPN				BCW31 / 32 / 33						
100	32	120 - 215	260 - 500	100	PNP				BCW29 / 30						
100	32	180 - 380	310 - 630	100	NPN				BCW60B / C / D						
100	32	180 - 380	310 - 630	100	PNP				BCW61B / C / D						
100	32	200	450	100	NPN				BCF32						
100	40	100	300	180	NPN				PMBS3904						
100	40	100	300	150	PNP				PMBS3906						
100	45	200	450	100	NPN	PSS9014C									
100	45	100	300	100	PNP	PSS9015B									
100	40..50	120 - 270	270 - 560	100	NPN						2PC4081Q / R / S	2PC4617Q / R / S	2PC4617QJ / RJ / SJ	2PC4617QM / RM / SM	
100	40..50	120 - 270	270 - 560	100	PNP						2PA1576Q / R / S	2PA1774Q / R / S	2PA1774QJ / RJ / SJ	2PA1774QM / RM / SM	
100	45	110 - 200	220 - 450	100	NPN				BCW71 / 72						
100	45	120 - 215	260 - 500	100	PNP				BCW69 / 70						
100	45	110 - 420	220 - 800	100	NPN	BC547 / A / B / C			BC847 / A / B / C		BC847W / AW / BW / CW	BC847AT / BT / CT	BC847AF / BF / CF	BC847AM / BM / CM	
100	45	125 - 420	250 - 800	100	PNP	BC557 / A / B / C			BC857 / A / B / C		BC857W / AW / BW / CW	BC857AT / BT / CT	BC857AF / BF / CF	BC857AM / BM / CM	
100	45	120 - 380	220 - 630	100	NPN				BCX70G / H / J / K						
100	45	120 - 380	220 - 630	100	NPN				BCX71H / J / K						
100	45	500	1250	100	PNP				PMBT6429		PMST6429				
100	50	160 - 290	260 - 460	60 - 80	PNP					2PB709AQ / R / S	2PB709AQW / RW / SW				
100	50	160 - 290	260 - 460	100 - 140	NPN					2PD601AQ / R / S	2PD601AQW / RW / SW				
100	50	200	400	150	NPN	2PC945P									
100	50	200	400	100	PNP	2PA733 / P									
100	50	250	650	100	NPN				PMBT6428		PMST6428				
100	60	110 - 200	220 - 450	100	NPN				BCV71 / 72						
100	60	120	260	100	PNP				BCW89						
100	65	110 - 200	220 - 450	100	NPN	BC546A / B			BC846 / A / B		BC846W / AW / BW	BC846AT / BT			
100	65	200	450	100	NPN	JC546B									
100	65	125 - 200	250 - 475	typ. 150	PNP	BC556 / A / B			BC856 / A / B		BC856W / AW / BW	BC856AT / BT			
100	65	220	475	100	PNP	JC556B									
150	50	120 - 350	240 - 700	80	NPN	2PC1815Y / GR / BL									
150	50	120 - 200	240 - 400	80	PNP	2PA1015Y / GR									
500	20	112 - 144	166 - 202	-	NPN	PSS9012G / H									
500	20	112 - 144	166 - 202	-	PNP	PSS9012G / H									
500	25	100	600	80	PNP				BCX18						
500	45	100 - 250	250 - 600	100	NPN	BC337 / -16 / -25 / -40			BC817 / -16 / -25 / -40		BC817W / -16W / -25W / -40W				
500	45	100 - 250	250 - 600	80	PNP	BC327 / -16 / -25 / -40			BC807 / -16 / -25 / -40		BC807W / -16W / -25W / -40W				
500	45	160	400	80	PNP	JC327-25									
500	45	160	400	100	NPN	JC337-25									
500	45	100	600	100	NPN				BCX19						
500	45	100	600	80	PNP				BCX17						
500	50	85 - 170	170 - 340	140 - 180	NPN					2PD602AQ / R / S	2PD1820AQ / R / S				
500	50	85 - 170	170 - 340	100 - 140	PNP					2PB710AQ / R / S	2PB1219AQ / R / S				
500	60	50	-	100	NPN						PMSTA05				
500	60	50	-	50	PNP						PMSTA55				
500	80	100	-	100	NPN	MPSA06			PMBTA06		PMSTA06				
500	80	100	-	50	PNP	MPSA56			PMBTA56		PMSTA56				
1.000	20	85	375	40	NPN	BC368	BCP68 / -25	BC868 / -25							
1.000	20	100 - 160	250 - 375	40	PNP	BC369 / -16 / -25	BCP69 / -16 / -25	BC869 / -16 / -25							
1.000	45	100	160 - 250	100	NPN	BC635 / -16	BCP54 / -10 / -16	BCX54 / -10 / -16							
1.000	45	63 - 100	160 - 250	typ. 115	PNP	BC636 / -10 / -16	BCP51 / -10 / -16	BCX51 / -10 / -16							
1.000	60	63 - 100	160 - 250	typ. 115	NPN	BC637 / -16	BCP55 / -10 / -16	BCX55 / -10 / -16							
1.000	60	63 - 100	160 - 250	100	PNP	BC638 / -16	BCP52 / -10 / -16	BCX52 / -10 / -16							
1.000	60	100	300	100	NPN		BSP41	BSR40 / 41							
1.000	60	100	300	100	PNP		BSP31	BSR30 / 31							
1.000	80	63 - 100	160 - 250	100	NPN	BC639 / -10 / -16	BCP56 / -10 / -16	BCX56 / -10 / -16							
1.000	80	63 - 100	160 - 250	typ. 15	PNP	BC640 / -16	BCP53 / -10 / -16	BCX53 / -10 / -16							
1.000	80	100	300	100	NPN		BSP43	BSR42 / 43							
1.000	80	40 - 100	120 - 300	100	PNP		BSP32 / 33	BSR33							

SINGLE GENERAL PURPOSE

types in **bold red** represent new products

I _C [mA]	V _{CEO} [V]	hFE min [V]	f _T min. [MHz]	Polarity	SOT54 / TO-92	SOT223 / SC-73	SOT89 / SC-62	SOT23	SOT346 / SC-59	SOT323 / SC-70	SOT416 / SC-75	SOT490 / SC-89	SOT883 / SC-101
					Leaded	SMD		SMD		SMD		Leadless	
					Ptot max. 500-850 mW	Ptot max. 1370 mW	Ptot max. 1350 mW	Ptot max. 250 mW	Ptot max. 250 mW	Ptot max. 200 mW	Ptot max. 150 mW	Ptot max. 250 mW	Ptot max. 230 mW
1500	25	120 - 160	200 - 300	NPN	PSS8050C / D								
1500	25	120 - 160	200 - 300	PNP	PSS8550C / D								
3000	45	40		NPN		BDP31							
3000	45	40		PNP		BDP32							
5000	10	180		PNP		BDL32	BCV28						
5000	10	200		NPN		BDL31	BCV29						

DOUBLE GENERAL PURPOSE TRANSISTORS

types in **bold red** represent new products

I _C [mA]	V _{CEO} [V]	hFE min	hFE max	f _T min. [MHz]	Polarity	SOT457/TO-74	SOT363/SC-88	SOT666
						SMD		
						Ptot max. 380 mW	Ptot max. 300 mW	Ptot max. 300 mW
100	40	120	-	100	2x PNP	PIMT1	PUMT1	PEMT1
100	40	120	-	100	NPN/PNP		PUMZ1	PEMZ1
100	40	120	-	100	2x NPN		PUMX1	PEMX1
100	45	200	450	100	2x PNP		BC857BS	BC857BV
100	45	200	450	100	NPN/PNP		BC847BPN	BC847BVN
100	45	200	450	100	2x NPN		BC847BS	BC847BV
100	65	110	-	100	2x NPN		BC846S	
100	65	110	-	100	2x PNP		BC856S	
500	12	200	-	100	NPN/PNP			PEMZ7
500	45	160	400	80	2x PNP	BC807DS		
500	45	160	400	80	NPN/PNP	BC817DPN		
500	45	160	400	100	2x NPN	BC817DS		

HIGH VOLTAGE TRANSISTORS

V _{CEO} [V]	I _C [mA]	hFE min	hFE max	f _T min. [MHz]	Polarity	SOT54 / TO-92		SOT223 / SC-73	SOT89 / SC-62	SOT23	SOT323 / SC-70
						Leaded		SMD			
						Ptot max. 500-830 mW		Ptot max. 1250 mW	Ptot max. 1300 mW	Ptot max. 250 mW	Ptot max. 200 mW
80	100	20	80	60	NPN					BSS64	
100	100	30	-	50	PNP					BSS63	
100	100	150	-	150	PNP	BFV421					
100	100	150	-	150	NPN	BFV420					
120	300	40	180	100	PNP					BSR20	
140	300	60	250	100	NPN					BSR19	
140	300	60	250	100	NPN	2N5550				PMBT5550	PMST5550
150	300	60	240	100	PNP	2N5401				BSR20A	PMST5401
150	300	60	240	100	PNP	2N5401				PMBT5401	
160	300	80	250	100	NPN					BSR19A	
160	300	80	250	100	NPN	2N5551				PMBT5551	PMST5551
200	200	30	150	15	PNP			BST15			
250	100	40	-	70	NPN		BSP20				
250	100	50	-	60	PNP	BF423	BF723	BF623	BF823		
						BF423L					
250	100	50	-	60	NPN	BF422	BF722	BF622	BF822		
250	100	50	-	70	NPN	BF483					
250	100	40	-	70	NPN			BST40			
300	200	30	120	15	PNP		BSP16				
300	50	50	-	60	PNP	BF421		BF621	BF821		
						BF421L					
300	50	50	-	60	NPN	BF420	BF720	BF620	BF820	BF820W	
						BF420L					
300	100	50	-	70	NPN	BF485					
300	100	40	-	50	PNP	MPSA92	PZTA92	PXTA92	MMBTA92	PMSTA92	
									PMBTA92		
300	100	40	-	50	NPN	MPSA42	PZTA42	PXTA42	MMBTA42	PMSTA42	
									PMBTA42		
300	200	30	120	15	PNP			BST16			
350	100	40	-	70	NPN	BSP19					
350	100	50	-	70	PNP	BF488					
350	100	50	-	70	NPN	BF487					
350	100	40	-	70	NPN			BST39			
400	300	50	200	20	NPN	MPSA44	PZTA44				

DOUBLE HIGH VOLTAGE TRANSISTORS

V _{CEO} [V]	I _C [mA]	hFE min	hFE max	f _T min [MHz]	Polarity	SOT457 / SC-74
350	200	50	50	50	NPN / PNP	BF485PN



Related literature

Title
BF485PN: Dual surface mount transistor

Order code
939775008177

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

I_C [mA]	I_{CM} / I_{CRP} [mA]	V_{CEO} [V]	V_{CEsat} [V]					hFE min	hFE max	f_T min	Polarity		SOT54 / TO-92	SOT223 / SC-73	SOT89 / SC-62	SOT457 / SC-74	SOT23	SOT323 / SC-70	SOT363 / SC-88	SOT416 / SC-75	SOT490 / SC-89	SOT666	SOT883 / SC-101		
			$I_C=500\text{mA} /$ $I_B=50\text{mA}$	$I_C=1\text{ A} /$ $I_B=100\text{ mA}$	$I_C=2\text{ A} /$ $I_B=200\text{ mA}$	$I_C=3\text{ A} /$ $I_B=300\text{ mA}$	$I_C=5\text{ A} /$ $I_B=500\text{ mA}$						Leaded	SMD										Leadless	
													Ptot max. 830 mW	Ptot max. 2000 mW	Ptot max. 1300 mW	Ptot max. 750 mW	Ptot max. 480 mW	Ptot max. 350 mW	Ptot max. 430 mW	Ptot max. 150 mW	Ptot max. 250 mW	Ptot max. 300 mW	Ptot max. 250 mW		
500	1.000	15	< 250 mV					200		250	PNP												PBSS3515M		
500	1.000	15	< 250 mV					200		250	NPN												PBSS2515F	PBSS2515M	
500	1.000	40	< 250 mV					200		250	PNP												PBSS3540F	PBSS3540M	
500	1.000	40	< 250 mV					200		250	NPN												PBSS2540F	PBSS2540M	
1.000	2.000	20	< 125 mV	< 250 mV				300		100	PNP												PBSS5120T		
1.000	2.000	20	< 110 mV	< 250 mV				350		100	NPN												PBSS4120T		
1.000	2.000	30	< 110 mV					350		100	PNP												PBSS5130T		
1.000	2.000	30	< 120 mV	< 270 mV				350		100	NPN												PBSS4130T		
1.000	2.000	40	< 250 mV	< 500 mV				300	800	150	PNP												PMMT591A		
1.000	2.000	40	< 250 mV	< 500 mV				300	900	150	NPN												PMMT491A		
1.000	2.000	40	< 250 mV	< 500 mV				300	800	150	PNP	PBSS5140S			PBSS5140D	PBSS5140T	PBSS5140U								
1.000	2.000	40	< 250 mV	< 500 mV				300	900	150	NPN	PBSS4140S				PBSS4140T	PBSS4140U								
1.000	2.000	40	< 170 mV	< 310 mV				300	800	150	PNP													PBSS5140V	
1.000	2.000	40	< 110 mV	< 190 mV				300	900	150	NPN													PBSS4140V	
1.000	2.000	60	< 175 mV	< 330 mV							PNP												PBSS5160T	PBSS5160U	
1.000	2.000	60	< 140 mV	< 250 mV							NPN												PBSS4160T	PBSS4160U	
1.000	2.000	100									PNP	PBSS9110S	PBSS9110Z	PBSS9110X	PBSS9110D	PBSS9110T				PBSS9110Y					
1.000	2.000	100									NPN	PBSS8110S	PBSS8110Z	PBSS8110X	PBSS8110D	PBSS8110T				PBSS8110Y					
2.000	3.000	20	< 80 mV	< 225 mV				225		100	PNP														
2.000	3.000	30	< 110 mV	< 225 mV				300		100	PNP														
2.000	3.000	30	< 100 mV	< 180 mV				350		100	PNP														
1.800	3.000	40	< 145 mV	< 250 mV	< 530 mV			300	800	150	PNP														PBSS5240V
2.000	3.000	40	< 100 mV	< 190 mV	< 400 mV			300	900	150	NPN														PBSS4240V
2.000	3.000	40	< 110 mV		< 350 mV			300	100		PNP						PBSS5240T							PBSS5240Y	
2.000	3.000	40	< 100 mV		< 320 mV			300	100		NPN						PBSS4240T							PBSS4240Y	
2.000	3.000	50									PNP						PBSS5250T								
2.000	3.000	20	< 70 mV		< 210 mV	< 300 mV		220		100	PNP				PBSS5320X	PBSS5320D	PBSS5320T								
2.000	3.000	20	< 70 mV		< 210 mV	< 310 mV		220		100	NPN				PBSS4320X		PBSS4320T								
2.000	3.000	30	< 70 mV			< 320 mV					PNP				PBSS5330X										
2.000	3.000	30	< 60 mV			< 300 mV					NPN				PBSS4330X										
2.000	3.000	50			< 270 mV	< 390 mV		200		100	PNP				PBSS5350X		PBSS5350T								
2.000	3.000	50			< 260 mV	< 370 mV		300		100	NPN				PBSS4350X		PBSS4350T								
3.000	5.000	50	< 100 mV		< 300 mV			200		100	PNP	PBSS5350S	PBSS5350Z			PBSS5350D									
3.000	5.000	50	< 90 mV		< 290 mV			200		100	NPN	PBSS4350S	PBSS4350Z			PBSS4350D									
4.000		80									PNP				PBSS4480X										
4.000		80									NPN				PBSS4480X										
5.000	10.000	20									PNP				PBSS5520X										
5.000	10.000	20									NPN				PBSS4520X										
5.000	10.000	40			< 160 mV		< 375 mV	250		60	PNP				PBSS5540Z	PBSS5540X									
5.000	10.000	40			< 150 mV		< 355 mV	300		70	NPN				PBSS4540Z	PBSS4540X									



Related literature

Title

Breakthrough In Small- Signal Transistors (BISS)

Order code

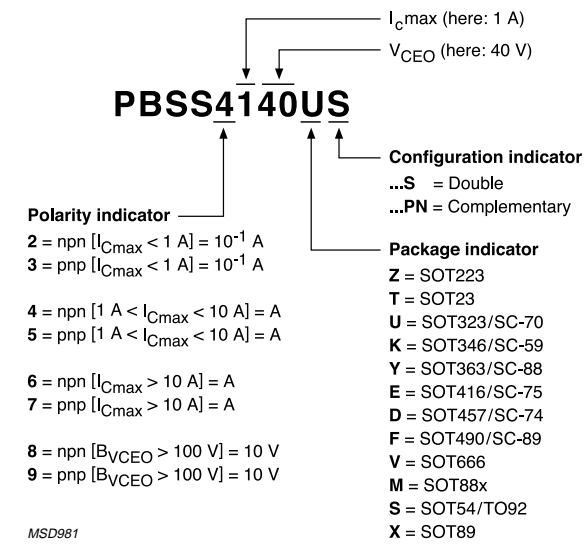
939775011275

DOUBLE BISS TRANSISTORS

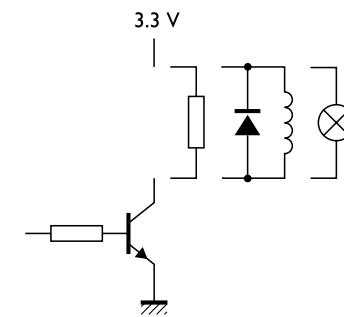
types in **bold red** represent new products

I_C [mA]	I_{CM} / I_{CRP} [mA]	V_{CEO} [V]	V_{CEsat} [V]					hFE min	hFE max	f_T min	Polarity	SOT457 / SC-74	SOT363 / SC-88	SOT666
			$I_C=500\text{mA} / I_B=50\text{mA}$	$I_C=1\text{A} / I_B=100\text{mA}$	$I_C=2\text{A} / I_B=200\text{mA}$	$I_C=3\text{A} / I_B=300\text{mA}$	$I_C=5\text{A} / I_B=500\text{mA}$					Ptot max. 750 mW	Ptot max. 430 mW	Ptot max. 300 mW
500	1.000	15	< 250 mV					200		250	2 x PNP			PBSS3515VS
500	1.000	15	< 250 mV					200		250	NPN / PNP		PBSS2515YPN	PBSS2515VFN
500	1.000	15	< 250 mV					200		250	2 x NPN			PBSS2515VS
1.000	2.000	40	< 250 mV	< 500 mV				300	800	150	NPN / PNP	PBSS4140DPN		
1.500	2.000	40	< 100 mV	< 200 mV	< 400 mV			300	800	150	NPN / PNP	PBSS4240DPN		

Breakthrough In Small Signal (BISS) part numbering



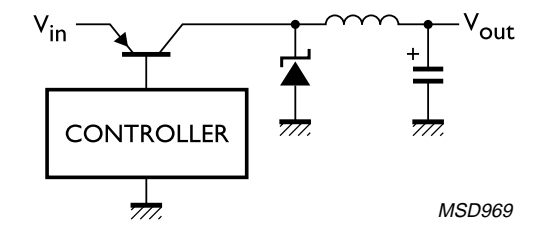
Peripheral driver example circuit



Peripheral driver example circuit

MSD968

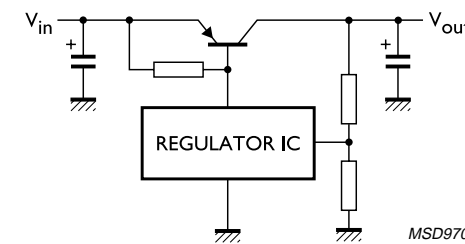
DC/DC converter example circuit



DC/DC converter example circuit

MSD969

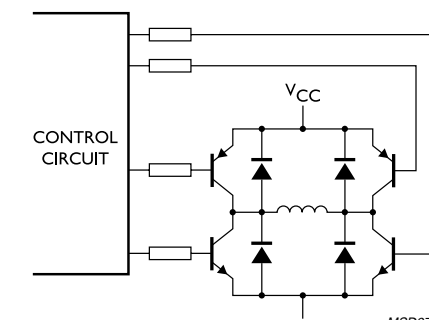
Linear voltage regulation (LDO) example circuit



Linear voltage regulation (LDO) example circuit

MSD970

Fullbridge driver example circuit



MSD971

30V HPA TRENCHMOS

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

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7E2R7-30B	SOT226 (TO-220)	30	Single N-channel	75	2.7@10V	29	0.5
BUK7207-30B	SOT428 (SC-63, D-PAK)	30	Single N-channel	75	7@10V	10	0.95
BUK7507-30B	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	7@10V	10	1
BUK752R7-30B	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	2.7@10V	29	0.5
BUK7607-30B	SOT404 (D ² -PAK)	30	Single N-channel	75	7@10V	10	1
BUK762R7-30B	SOT404 (D ² -PAK)	30	Single N-channel	75	2.7@10V	29	0.5
BUK9E04-30B	SOT226 (TO-220)	30	Single N-channel	75	3@10V 4@5V 4.4@4.5V	25	0.59
BUK9207-30B	SOT428 (SC-63, D-PAK)	30	Single N-channel	75	5@10V 7@5V 9@4.5V	13	0.95
BUK9507-30B	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	6.0@10V 7.0@5V 9.0@4.5V	12	1
BUK952R8-30B	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	2.4@10V 2.8@5V 3@4.5V	35	0.5
BUK9607-30B	SOT404 (D ² -PAK)	30	Single N-channel	75	6.0@10V 7.0@5V 9.0@4.5V	12	1
BUK962R8-30B	SOT404 (D ² -PAK)	30	Single N-channel	75	2.4@10V 2.8@5V 3@4.5V	35	0.5

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

40V HPA TRENCHMOS

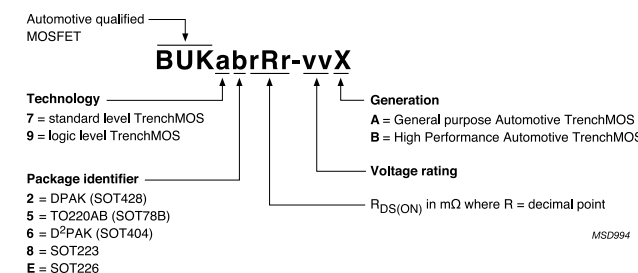
Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7208-40B	SOT428 (SC-63, D-PAK)	40	Single N-channel	75	8@10V	11	0.95
BUK7508-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	8@10V	11.5	1
BUK753R1-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	3.1@10V	29	0.5
BUK754R3-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	4.3@10V	22	0.59
BUK755R2-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	5.2@10V	16	0.74
BUK7608-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	8@10V	11.5	1
BUK763R1-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	3.1@10V	29	0.5
BUK764R3-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	4.3@10V	22	0.59
BUK765R2-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	5.2@10V	16	0.74
BUK9E3R2-40B	SOT226 (TO-220)	40	Single N-channel	75	2.8@10V 3.2@5V 3.5@4.5V	37	0.5
BUK9209-40B	SOT428 (SC-63, D-PAK)	40	Single N-channel	75	7@10V 9@5V 10@4.5V	13	0.95
BUK9506-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	5.0@10V 6.0@5V 8.0@4.5V	20	0.74
BUK9509-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	8.0@10V 9.0@5V 11.0@4.5V	15	1
BUK953R2-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	2.8@10V 3.2@5V 3.5@4.5V	37	0.5
BUK954R4-40B	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	4.0@10V 4.4@5V 4.8@4.5V	24	0.59
BUK9606-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	5.0@10V 6.0@5V 8.0@4.5V	20	0.74
BUK9609-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	8.0@10V 9.0@5V 11.0@4.5V	15	1
BUK963R2-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	2.8@10V 3.2@5V 3.5@4.5V	37	0.5
BUK964R4-40B	SOT404 (D ² -PAK)	40	Single N-channel	75	4.0@10V 4.4@5V 4.8@4.5V	24	0.59



Related literature

Title	Order code
In Vehicle Power Brochure	939775010255
What if! Automotive competency (brochure)	939775006353
High Performance MOSFETs for Automotive Systems	939775011136
AN10273_1 Power MOSFET Single-Shot and Repetitive	AN10273_1
Avalanche Ruggedness Rating	

Automotive TrenchMOS part numbering



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- * Excellent thermal performance eases route to SMD packages

55 V HPA TRENCHMOS

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

Type number	Package	V _{DS} max(V)	Configuration	I _D DC(A)	R _{DS(on)} (mOhm)	Q _{gd} (typ)(nC)	Thermal Resistance(K/W)
BUK7E06-55B	SOT226 (TO-220)	55	Single N-channel	75	6@10V	19	0.59
BUK7E11-55B	SOT226 (TO-220)	55	Single N-channel	75	11@10V	12	1
BUK7212-55B	SOT428 (SC-63, D-PAK)	55	Single N-channel	75	12@10V	12	0.95
BUK7506-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	6@10V	14	0.64
BUK7507-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	7@10V	13	0.74
BUK7511-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	11@10V	12	1
BUK754R0-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	4@10V	25	0.5
BUK7606-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	6@10V	14	0.64
BUK7607-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	7@10V	13	0.74
BUK7611-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	11@10V	12	1
BUK764R0-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	4@10V	25	0.5
BUK9212-55B	SOT428 (SC-63, D-PAK)	55	Single N-channel	75	10@10V 12@5V 13@4.5V	13	0.95
BUK9506-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	5.4@10V 6.0@5V 6.4@4.5V	22	0.64
BUK9508-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	7.0@10V 8.0@5V 10.0@4.5V	18	0.74
BUK9512-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	11.0@10V 12.0@5V 14.0@4.5V	13	1
BUK954R2-55B	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	3.7@10V 4.2@5V 4.4@4.5V	37	0.5
BUK9606-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	5.4@10V 6.0@5V 6.4@4.5V	22	0.64
BUK9608-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	7.0@10V 8.0@5V 10.0@4.5V	18	0.74
BUK9612-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	11.0@10V 12.0@5V 14.0@4.5V	13	1
BUK964R2-55B	SOT404 (D ² -PAK)	55	Single N-channel	75	3.7@10V 4.2@5V 4.4@4.5V	37	0.5
BUK9E06-55B	SOT226 (TO-220)	55	Single N-channel	75	5.4@10V 6.0@5V 6.4@4.5V	22	0.64

75 V HPA TRENCHMOS

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

Type number	Package	V _{DS} max(V)	Configuration	I _D DC(A)	R _{DS(on)} (mOhm)	Q _{gd} (typ)(nC)	Thermal Resistance(K/W)
BUK7214-75B	SOT428 (SC-63, D-PAK)	75	Single N-channel	73	14@10V	15	0.95
BUK9217-75B	SOT428 (SC-63, D-PAK)	75	Single N-channel	66	15@10V 17@5V 19@4.5V	13	0.95
BUK7506-75B	SOT78 (TO-220AB, SC-46)	75	Single N-channel	75	6@10V	28	0.5
BUK7606-75B	SOT404 (D ² -PAK)	75	Single N-channel	75	6@10V	28	0.5
BUK7513-75B	SOT78 (TO-220AB, SC-46)	75	Single N-channel	60	13@10V	15	1
BUK7613-75B	SOT404 (D ² -PAK)	75	Single N-channel	60	13@10V	15	1
BUK9506-75B	SOT78 (TO-220AB, SC-46)	75	Single N-channel	75	5.5@10V 6.1@5V 6.6@4.5V	37	0.5
BUK9606-75B	SOT404 (D ² -PAK)	75	Single N-channel	75	5.5@10V 6.1@5V 6.6@4.5V	37	0.5
BUK9516-75B	SOT78 (TO-220AB, SC-46)	75	Single N-channel	60	14@10V 16@5V 20@4.5V	13	1
BUK9616-75B	SOT404 (D ² -PAK)	75	Single N-channel	60	14@10V 16@5V 20@4.5V	13	1

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

100 V HPA TRENCHMOS

Type number	Package	V _{DS} max(V)	Configuration	I _D DC(A)	R _{DS(on)} (mOhm)	Q _{gd} (typ)(nC)	Thermal Resistance(K/W)
BUK7227-100B	SOT428 (SC-63, D-PAK)	100	Single N-channel	47	27@10V	13	0.95
BUK7510-100B	SOT78 (TO-220AB, SC-46)	100	Single N-channel	75	10@10V	22	0.5
BUK7526-100B	SOT78 (TO-220AB, SC-46)	100	Single N-channel	40	26@10V	13	1
BUK7610-100B	SOT404 (D ² -PAK)	100	Single N-channel	75	10@10V	22	0.5
BUK7626-100B	SOT404 (D ² -PAK)	100	Single N-channel	40	26@10V	13	1
BUK9230-100B	SOT428 (SC-63, D-PAK)	100	Single N-channel	45	28@10V 30@5V 33@4.5V	11	0.95
BUK9510-100B	SOT78 (TO-220AB, SC-46)	100	Single N-channel	75	9.7@10V 10@5V 11@4.5V	32	0.5
BUK9529-100B	SOT78 (TO-220AB, SC-46)	100	Single N-channel	46	27@10V 29@5V 32@4.5V	13	0.95
BUK9610-100B	SOT404 (D ² -PAK)	100	Single N-channel	75	9.7@10V 10@5V 11@4.5V	32	0.5
BUK9629-100B	SOT404 (D ² -PAK)	100	Single N-channel	46	27@10V 29@5V 32@4.5V	13	0.95

55 V GPA TRENCHMOS

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7215-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	55	15@10V	19	1.3
BUK72150-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	11	150@10V	2.7	4.2
BUK7219-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	55	19@10V	19	1.3
BUK7222-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	48	22@10V	14	1.5
BUK7225-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	43	25@10V	13	1.6
BUK7230-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	38	30@10V	10	1.7
BUK7237-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	32	37@10V	9	1.9
BUK7277-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	18	77@10V	5	2.9
BUK7506-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	6.3@10V	53	0.5
BUK7508-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	8@10V	35	0.59
BUK7509-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	9@10V	25	0.71
BUK7511-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	11@10V	26	0.9
BUK7514-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	73	14@10V	21	0.9
BUK75150-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	11	150@10V	2.7	4.1
BUK7516-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	65	16@10V	19	1.1
BUK7520-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	54	20@10V	14	1.2
BUK7524-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	47	24@10V	13	1.4
BUK7528-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	42	28@10V	10	1.5
BUK7535-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	35	35@10V	9	1.7
BUK7575-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	20	75@10V	5	2.4
BUK7606-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	6.3@10V	53	0.5
BUK7608-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	8@10V	35	0.59
BUK7609-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	9@10V	25	0.71
BUK7611-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	11@10V	26	0.9
BUK7614-55A	SOT404 (D ² -PAK)	55	Single N-channel	73	14@10V	21	0.9
BUK76150-55A	SOT404 (D ² -PAK)	55	Single N-channel	11	150@10V	2.7	4.1
BUK7616-55A	SOT404 (D ² -PAK)	55	Single N-channel	65	16@10V	19	1.1
BUK7620-55A	SOT404 (D ² -PAK)	55	Single N-channel	54	20@10V	14	1.2
BUK7624-55A	SOT404 (D ² -PAK)	55	Single N-channel	47	24@10V	13	1.4
BUK7628-55A	SOT404 (D ² -PAK)	55	Single N-channel	42	28@10V	10	1.5
BUK7635-55A	SOT404 (D ² -PAK)	55	Single N-channel	35	35@10V	9	1.7
BUK7675-55A	SOT404 (D ² -PAK)	55	Single N-channel	20	75@10V	5	2.4
BUK78150-55A	SOT223 (SC-73)	55	Single N-channel	5.5	150@10V	2.7	15
BUK9215-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	55	13@10V 15@5V 16@4.5V	20	1.3
BUK92150-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	11	137@10V 150@5V 161@4.5V	2.6	4.1
BUK9219-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	55	17@10V 19@5V 20@4.5V	19	1.3
BUK9222-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	48	20@10V 22@5V 24@4.5V	16	1.5
BUK9225-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	43	22@10V 25@5V 27@4.5V	14	1.6
BUK9230-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	38	27@10V 30@5V 33@4.5V	11	1.7
BUK9237-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	32	33@10V 37@5V 38@4.5V	9	1.9

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK9245-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	28	40@10V 45@5V 50@4.5V	6	2.1
BUK9277-55A	SOT428 (SC-63, D-PAK)	55	Single N-channel	18	69@10V 77@5V 86@4.5V	4.6	2.9
BUK9506-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	5.8@10V 6.3@5V 6.7@4.5V	50	0.5
BUK9508-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	7.5@10V 8@5V 8.5@4.5V	43	0.59
BUK9509-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	8@10V 9@5V 10@4.5V	29	0.71
BUK9510-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	9@10V 10@5V 11@4.5V	28	0.75
BUK9511-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	10@10V 11@5V 12@4.5V	30	0.9
BUK9514-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	73	13@10V 14@5V 15@4.5V	25	1
BUK95150-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	13	137@10V 150@5V 161@4.5V	2.6	2.8
BUK9516-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	66	15@10V 16@5V 17@4.5V	19	1.1
BUK9518-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	61	16@10V 18@5V 19@4.5V	14	1.1
BUK9520-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	54	18@10V 20@5V 21@4.5V	16	1.2
BUK9524-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	46	22@10V 24@5V 26@4.5V	14	1.4
BUK9528-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	42	25@10V 28@5V 30@4.5V	11	1.5
BUK9535-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	34	32@10V 35@5V 38@4.5V	9	1.8
BUK9575-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	20	68@10V 75@5V 81@4.5V	4.6	2.4
BUK9606-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	5.8@10V 6.3@5V 6.7@4.5V	50	0.5
BUK9608-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	7.5@10V 8@5V 8.5@4.5V	43	0.59
BUK9609-55A	SOT78 (TO-220AB, SC-46)	55	Single N-channel	75	8@10V 9@5V 10@4.5V	29	0.71
BUK9610-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	9@10V 10@5V 11@4.5V	28	0.75
BUK9611-55A	SOT404 (D ² -PAK)	55	Single N-channel	75	10@10V 11@5V 12@4.5V	30	0.9
BUK9614-55A	SOT404 (D ² -PAK)	55	Single N-channel	73	13@10V 14@5V 15@4.5V	25	1
BUK96150-55A	SOT404 (D ² -PAK)	55	Single N-channel	13	137@10V 150@5V 161@4.5V	2.6	2.8
BUK9616-55A	SOT404 (D ² -PAK)	55	Single N-channel	66	15@10V 16@5V 17@4.5V	19	1.1
BUK9618-55A	SOT404 (D ² -PAK)	55	Single N-channel	61	16@10V 18@5V 19@4.5V	14	1.1
BUK9620-55A	SOT404 (D ² -PAK)	55	Single N-channel	54	18@10V 20@5V 21@4.5V	16	1.2
BUK9624-55A	SOT404 (D ² -PAK)	55	Single N-channel	46	22@10V 24@5V 26@4.5V	14	1.4
BUK9628-55A	SOT404 (D ² -PAK)	55	Single N-channel	42	25@10V 28@5V 30@4.5V	11	1.5
BUK9635-55A	SOT404 (D ² -PAK)	55	Single N-channel	34	32@10V 35@5V 38@4.5V	9	1.8
BUK9675-55A	SOT404 (D ² -PAK)	55	Single N-channel	20	68@10V 75@5V 81@4.5V	4.6	2.4
BUK98150-55A	SOT223 (SC-73)	55	Single N-channel	5	137@10V 150@5V 161@4.5V	2.8	15
BUK9832-55A	SOT223 (SC-73)	55	Single N-channel	12	29@10V 32@5V 36@4.5V	11	15
BUK9880-55A	SOT223 (SC-73)	55	Single N-channel	7	73@10V 80@5V 89@4.5V	4.6	15
BUK9E06-55A	SOT226 (TO-220)	55	Single N-channel	75	5.8@10V 6.3@5V 6.7@4.5V	50	0.5

30 V GPA TRENCHMOS

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7505-30A	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	5@10V	48	0.65
BUK7605-30A	SOT404 (D ² -PAK)	30	Single N-channel	75	5@10V	48	0.65
BUK9213-30A	SOT428 (SC-63, D-PAK)	30	Single N-channel	55	11@10V 13@5V 14@4.5V	18	1.0
BUK9214-30A	SOT428 (SC-63, D-PAK)	30	Single N-channel	63	12@10V 14@5V 15@4.5V	12	1.4
BUK9505-30A	SOT78 (TO-220AB, SC-46)	30	Single N-channel	75	4.6@10V 5@5V 5.4@4.5V	50	0.65
BUK9605-30A	SOT404 (D ² -PAK)	30	Single N-channel	75	4.6@10V 5@5V 5.4@4.5V	50	0.65

40 V GPA TRENCHMOS

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7504-40A	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	4.5@10V	50	0.5
BUK7604-40A	SOT404 (D ² -PAK)	40	Single N-channel	75	4.5@10V	50	0.5
BUK7E04-40A	SOT226 (TO-220)	40	Single N-channel	75	4.5@10V	50	0.5
BUK9504-40A	SOT78 (TO-220AB, SC-46)	40	Single N-channel	75	4@10V 4.4@5V 5.9@4.5V	56	0.5
BUK9E04-40A	SOT226 (TO-220)	40	Single N-channel	75	4@10V 4.4@5V 5.9@4.5V	56	0.5
BUK9604-40A	SOT404 (D ² -PAK)	40	Single N-channel	75	4@10V 4.4@5V 5.9@4.5V	56	0.5

75 V GPA TRENCHMOS

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7226-75A	SOT428 (SC-63, D-PAK)	75	Single N-channel	45	26@10V	17	1.3
BUK7509-75A	SOT78 (TO-220AB, SC-46)	75	Single N-channel	75	9@10V	48	0.65
BUK7523-75A	SOT78 (TO-220AB, SC-46)	75	Single N-channel	53	23@10V	17	1.1
BUK7609-75A	SOT404 (D ² -PAK)	75	Single N-channel	75	9@10V	48	0.65
BUK7623-75A	SOT404 (D ² -PAK)	75	Single N-channel	53	23@10V	17	1.1
BUK9226-75A	SOT428 (SC-63, D-PAK)	75	Single N-channel	45	24@10V 26@5V 29@4.5V	17	1.3
BUK9509-75A	SOT78 (TO-220AB, SC-46)	75	Single N-channel	75	8.5@10V 9@5V 9.9@4.5V	54	0.65
BUK9523-75A	SOT78 (TO-220AB, SC-46)	75	Single N-channel	53	22@10V 23@5V 26@4.5V	17	1.1
BUK9609-75A	SOT404 (D ² -PAK)	75	Single N-channel	75	8.5@10V 9@5V 9.9@4.5V	54	0.65
BUK9623-75A	SOT404 (D ² -PAK)	75	Single N-channel	53	22@10V 23@5V 26@4.5V	17	1.1

100 V GPA TRENCHMOS

Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK7240-100A	SOT428 (SC-63, D-PAK)	100	Single N-channel	34	40@10V	17	1.3
BUK7275-100A	SOT428 (SC-63, D-PAK)	100	Single N-channel	21.7	75@10V	9	1.7
BUK7515-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	75	15@10V	44	0.65
BUK7520-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	63	20@10V	33	0.75
BUK7528-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	47	28@10V	36	0.9
BUK7535-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	41	35@10V	21	1
BUK7540-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	37	40@10V	17	1.1
BUK7560-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	26	60@10V	11	1.4
BUK7575-100A	SOT404 (D ² -PAK)	100	Single N-channel	23	75@10V	9	1.5
BUK7615-100A	SOT404 (D ² -PAK)	100	Single N-channel	75	15@10V	44	0.65
BUK7620-100A	SOT404 (D ² -PAK)	100	Single N-channel	63	20@10V	33	0.75
BUK7628-100A	SOT404 (D ² -PAK)	100	Single N-channel	47	28@10V	36	0.9
BUK7635-100A	SOT404 (D ² -PAK)	100	Single N-channel	41	35@10V	21	1
BUK7640-100A	SOT404 (D ² -PAK)	100	Single N-channel	37	40@10V	17	1.1
BUK7660-100A	SOT404 (D ² -PAK)	100	Single N-channel	26	60@10V	11	1.4
BUK7675-100A	SOT404 (D ² -PAK)	100	Single N-channel	23	75@10V	9	1.5
BUK9240-100A	SOT428 (SC-63, D-PAK)	100	Single N-channel	33	39@10V 40@5V 44@4.5V	20	1.3
BUK9275-100A	SOT428 (SC-63, D-PAK)	100	Single N-channel	21	72@10V 75@5V 84@4.5V	10	1.7
BUK9515-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	75	14@10V 15@5V 16@4.5V	44	0.65
BUK95180-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	11	173@10V 180@5V 200@4.5V	3.7	2.8
BUK9520-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	63	19@10V 20@5V 22@4.5V	40	0.75
BUK9528-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	49	27@10V 28@5V 31@4.5V	24	0.9
BUK9535-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	41	34@10V 35@5V 39@4.5V	23	1
BUK9540-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	39	39@10V 40@5V 43@4.5V	20	0.95
BUK9560-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	26	58@10V 60@5V 67@4.5V	13	1.4
BUK9575-100A	SOT78 (TO-220AB, SC-46)	100	Single N-channel	23	72@10V 75@5V 84@4.5V	10	1.5
BUK9615-100A	SOT404 (D ² -PAK)	100	Single N-channel	75	14@10V 15@5V 16@4.5V	44	0.65
BUK96180-100A	SOT404 (D ² -PAK)	100	Single N-channel	11	173@10V 180@5V 200@4.5V	3.7	2.8
BUK9620-100A	SOT404 (D ² -PAK)	100	Single N-channel	63	19@10V 20@5V 22@4.5V	40	0.75
BUK9628-100A	SOT404 (D ² -PAK)	100	Single N-channel	49	27@10V 28@5V 31@4.5V	24	0.9
BUK9635-100A	SOT404 (D ² -PAK)	100	Single N-channel	41	34@10V 35@5V 39@4.5V	23	1

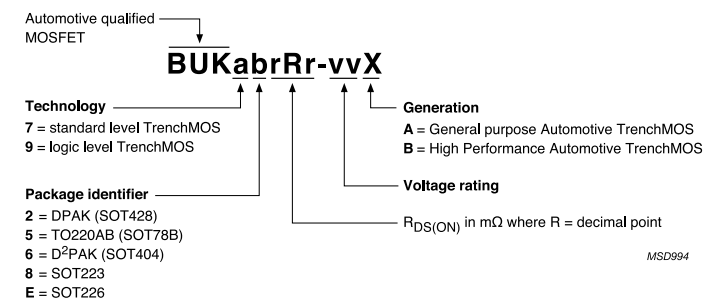
Type number	Package	V _{DSmax} (V)	Configuration	I _{D DC} (A)	R _{DS(on)} (mOhm)	Q _{gd} (typ) (nC)	Thermal Resistance (K/W)
BUK9640-100A	SOT404 (D ² -PAK)	100	Single N-channel	39	39@10V 40@5V 43@4.5V	20	0.95
BUK9660-100A	SOT404 (D ² -PAK)	100	Single N-channel	26	58@10V 60@5V 67@4.5V	13	1.4
BUK9675-100A	SOT404 (D ² -PAK)	100	Single N-channel	23	72@10V 75@5V 84@4.5V	10	1.5
BUK98180-100A	SOT223 (SC-73)	100	Single N-channel	4.6	173@10V 180@5V 201@4.5V	3.7	15
BUK9875-100A	SOT223 (SC-73)	100	Single N-channel	7	72@10V 75@5V 84@4.5V	10	15



Related literature

Title	Order code
In Vehicle Power Brochure	939775010255
What if! Automotive competency (brochure)	939775006353
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

Automotive TrenchMOS part numbering



Why choose Philips Semiconductors?

...Automotive MOSFETs

- * Leading edge TrenchMOS technology used for all devices, giving outstanding performance
- * Wide variety of operating voltages, R_{DS(ON)} values, drain current ratings, power handling and package types – allows you more flexibility
- * Extended TrenchMOS range suitable for a wider variety of applications
- * True Logic Level and Standard Level devices available – lets YOU choose!
- * Continued package and process developments mean smaller and smaller packages
- * Excellent thermal performance eases route to SMD packages

MOSFET with protection features - TrenchPLUS

34 V TRENCHPLUS

types in **bold red** represent new products

Type number	Package	V _{DSmax} (V)	Configuration	I _D DC (A)	R _{DS(on)} (mOhm)	Thermal Resistance (K/W)	Temperature sensor	Current sensor
BUK7L11-34ARC	SOT78C	34	Single N-channel	75	11@10V	0.87	no	no
BUK7L06-34ARC	SOT78C	34	Single N-channel	75	6@10V	0.6	no	no

40 V TRENCHPLUS

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

Type number	Package	V _{DSmax} (V)	Configuration	I _D DC (A)	R _{DS(on)} (mOhm)	Thermal Resistance (K/W)	Temperature sensor	Current sensor
BUK7105-40ATE	SOT426 (D ² -PAK)	40	Single N-channel	75	5@10V	0.55	yes	no
BUK7105-40AIE	SOT426 (D ² -PAK)	40	Single N-channel	75	5@10V	0.55	no	yes
BUK7107-40ATC	SOT426 (D ² -PAK)	40	Single N-channel	75	7@10V	0.55	yes	no
BUK7108-40AIE	SOT426 (D ² -PAK)	40	Single N-channel	75	8@10V	0.68	no	yes
BUK7905-40ATE	SOT263B (5-lead TO-220)	40	Single N-channel	75	5@10V	0.55	yes	no
BUK7905-40AIE	SOT263B (5-lead TO-220)	40	Single N-channel	75	5@10V	0.55	no	yes
BUK7907-40ATC	SOT263B (5-lead TO-220)	40	Single N-channel	75	7@10V	0.55	yes	no
BUK7908-40AIE	SOT263B (5-lead TO-220)	40	Single N-channel	75	8@10V	0.68	no	yes
BUK7C06-40AITE	SOT427 (D ² -PAK)	40	Single N-channel	75	6.2@10V	0.55	yes	yes
BUK9107-40ATC	SOT426 (D ² -PAK)	40	Single N-channel	75	6.2@10V 7@5V	0.55	yes	no
BUK9907-40ATC	SOT263B (5-lead TO-220)	40	Single N-channel	75	6.2@10V 7@5V	0.55	yes	no

55 V TRENCHPLUS

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

Type number	Package	V _{DSmax} (V)	Configuration	I _D DC (A)	R _{DS(on)} (mOhm)	Thermal Resistance (K/W)	Temperature sensor	Current sensor
BUK7C08-55AITE	SOT427 (D ² -PAK)	55	Single N-channel	75	8@10V	0.55	yes	yes
BUK7107-55AIE	SOT426 (D ² -PAK)	55	Single N-channel	75	7@10V	0.55	no	yes
BUK7107-55ATE	SOT426 (D ² -PAK)	55	Single N-channel	75	7@10V	0.55	yes	no
BUK7907-55AIE	SOT263B (5-lead TO-220)	55	Single N-channel	75	7@10V	0.55	no	yes
BUK7907-55ATE	SOT263B (5-lead TO-220)	55	Single N-channel	75	7@10V	0.55	yes	no
BUK9107-55ATE	SOT426 (D ² -PAK)	55	Single N-channel	75	6.2@10V 7@5V	0.55	yes	no
BUK9907-55ATE	SOT263B (5-lead TO-220)	55	Single N-channel	75	6.2@10V 7@5V	0.55	yes	no

75 V TRENCHPLUS

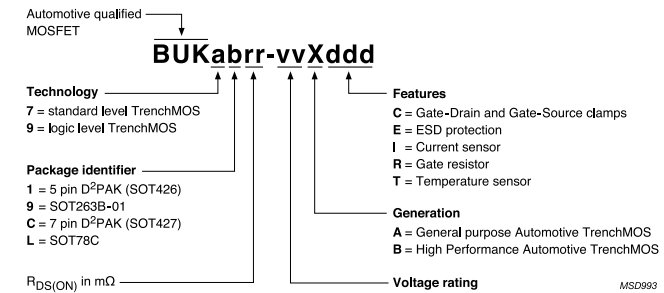
Type number	Package	V _{DSmax} (V)	Configuration	I _D DC (A)	R _{DS(on)} (mOhm)	Thermal Resistance (K/W)	Temperature sensor	Current sensor
BUK7C10-75AITE	SOT427 (D ² -PAK)	75	Single N-channel	75	10@10V	0.55	yes	yes
BUK7109-75AIE	SOT426 (D ² -PAK)	75	Single N-channel	75	9@10V	0.55	no	yes
BUK7109-75ATE	SOT426 (D ² -PAK)	75	Single N-channel	75	9@10V	0.55	yes	no
BUK7909-75AIE	SOT263B (5-lead TO-220)	75	Single N-channel	75	9@10V	0.55	no	yes
BUK7909-75ATE	SOT263B (5-lead TO-220)	75	Single N-channel	75	9@10V	0.55	yes	no



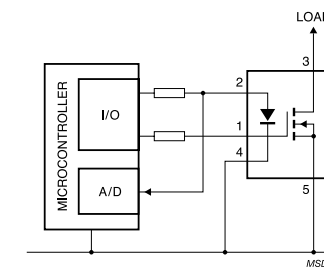
Related literature

Title	Order code
In Vehicle Power Brochure	939775010255
What if! Automotive competency (brochure)	939775006353
AN10137 Temperature Sensing using TrenchPLUS devices	AN10137
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

Automotive TrenchPLUS part numbering



Automotive TrenchPLUS Application diagram



Why choose Philips Semiconductors?

...Automotive TrenchPLUS MOSFETs

- * TrenchPLUS provides semi-protected power solutions at lower cost than full SMART power devices
- * Philips TrenchMOS™ technology offers integrated components on to standard MOSFETs with very low R_{DS(ON)} and low cost protection features
- * TrenchPLUS enables application specific optimised power driving solutions

HIGH-SIDE SWITCH

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

Type number	Package	V _{DSmax} (V)	Configuration	R _{DS(on)} (mOhm)	Operating voltage (VDC)	Channel resistance (mOhms)	Protection current (A)	Nominal current (A)	Application Keys
BUK2C14-50SLDA	SOT427 (D ² -PAK)	50	Single High side TOPFET	14	6~35	1 x 14	74	25	
BUK2M90-50SYDD	SO20	50	Quad High side TOPFET	90	6~35	4 x 90	12	3,7	
BUK2M60-50SYEB	SO20	50	Dual High side TOPFET	60	6~35	2 x 60	20	4,6	
BUK2M38-50SYEB	SO20	50	Dual High side TOPFET	38	6~35	2 x 38	20	5,7	
BUK2M30-50SYEB	SO20	50	Dual High side TOPFET	30	6~35	2 x 30	20	6,5	
BUK2M30-50SMXB	SO20	50	Dual High side TOPFET*	30	6~35	2 x 30	20	6,5	
BUK2M30-50SMYB	SO20	50	Dual High side TOPFET*	30	6~35	2 x 30	20	6,5	
BUK202-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	
BUK204-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	100	6~35	1 x 100	33	4	
BUK205-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	60	6~35	1 x 60	40	6	
BUK208-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	100	6~35	1 x 100	18	4	79 105 114 117 132 133 143
BUK209-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	60	6~35	1 x 60	30	6	
BUK210-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	
BUK210-50YT	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	
BUK2109-50SYAA	SOT426 (D ² -PAK)	50	Single High side TOPFET	8	6~35	1 x 9	70	TBD	
BUK2109-50SYBA	SOT426 (D ² -PAK)	50	Single High side TOPFET	8	6~35	1 x 9	52.5	TBD	
BUK2109-50SYCA	SOT426 (D ² -PAK)	50	Single High side TOPFET	8	6~35	1 x 9	30	TBD	
BUK211-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	20	6~35	1 x 20	65	18	
BUK211-50YT	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	20	6~35	1 x 20	15	3	
BUK2114-50SYTS	SOT426 (D ² -PAK)	50	Single High side TOPFET	14	6~35	1 x 14	15	3	
BUK212-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	14	6~35	1 x 14	74	25	
BUK212-50YT	SOT263B-01	50	Single High side TOPFET	14	6~35	1 x 14	15	3	
BUK213-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	100	6~35	1 x 100	18	4	79 105 114 117 132 133 143
BUK2138-50SYAA	SOT426 (D ² -PAK)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	
BUK214-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	60	6~35	1 x 60	30	6	
BUK215-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	84 105 114 117 132 133 143
BUK215-50YT	SOT426 (D ² -PAK)	50	Single High side TOPFET	38	6~35	1 x 38	45	9	84 105 114 117 132 133 143
BUK216-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	20	6~35	1 x 20	65	18	
BUK216-50YT	SOT426 (D ² -PAK)	50	Single High side TOPFET	20	6~35	1 x 20	15	3	
BUK217-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	14	6~35	1 x 14	74	25	
BUK217-50YT	SOT426 (D ² -PAK)	50	Single High side TOPFET	14	6~35	1 x 14	15	3	
BUK218-50DC	SOT427 (D ² -PAK)	50	Dual High side TOPFET	40	6~35	2 x 40	30	8	84
BUK218-50DY	SOT427 (D ² -PAK)	50	Dual High side TOPFET	40	6~35	2 x 40	30	8	84 105 114 117 132 133 143
BUK219-50Y	SOT263B-01 (5-lead TO-220)	50	Single High side TOPFET	180	6~35	1 x 180	9	2	82 83 105 114 117 132 133 143
BUK220-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	180	6~35	1 x 180	9	2	82 83 105 114 117 132 133 143

*4'with current sense'

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

Type number	Package	V _{DSmax} (V)	Configuration	R _{DS(on)} (mOhm)	Operating voltage (VDC)	Channel resistance (mOhms)	Protection current (A)	Nominal current (A)	Application Keys
BUK221-50DY	SOT427 (D ² -PAK)	50	Dual High side TOPFET	90	6~35	2 x 90	12	3,6	
BUK222-50MX*	SOT427 (D ² -PAK)	50	Single High side TOPFET	30	6~35	1 x 30	50	11	
BUK221-50DY	SOT427 (D ² -PAK)	50	Single High side TOPFET	30	6~35	1 x 30	50	11	
BUK223-50Y	SOT263B-01 (5-lead (option) TO-220)	50	Single High side TOPFET	30	6~35	1 x 30	55	12	
BUK224-50Y	SOT426 (D ² -PAK)	50	Single High side TOPFET	30	6~35	1 x 30	55	12	
BUK2909-50SYAA	SOT263B-01	50	Single High side TOPFET	8	6~35	1 x 9	70	TBD	
BUK2909-50SYBA	SOT263B-01	50	Single High side TOPFET	8	6~35	1 x 9	52.5	TBD	
BUK2909-50SYCA	SOT263B-01	50	Single High side TOPFET	8	6~35	1 x 9	30	TBD	
BUK2914-50SYTS	SOT263B-01	50	Single High side TOPFET	14	6~35	1 x 14	15	3	



Applications key

Automotive

- 79 : Protected Motor Switch
- 82 : Relay Driver
- 83 : Solenoid Driver
- 84 : Lamp Driver
- 105 : Automotive
- 114 : Access and immobilization
- 117 : Body electronics
- 132 : In vehicle networking
- 133 : In vehicle power
- 143 : Passenger restraint systems

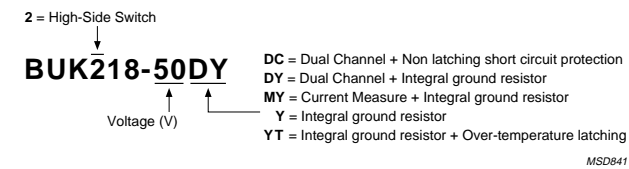


Related literature

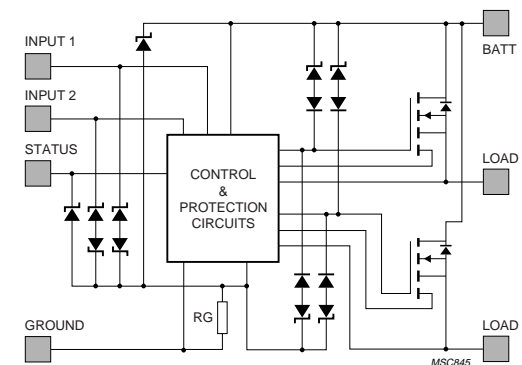
Title

Title	Order code
What if! Automotive competency (brochure)	939775006353
In Vehicle Power Brochure	939775010255
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

High Side Switch part numbering



TOPFET block diagram



Why choose Philips Semiconductors?

...Automotive TOPFETs

- * Real low R_{DS(ON)} protected Power MOSFETs.
- * Protected against overload, overvoltage and shorted lead.
- * No additional design-in effort required than with a standard MOSFET.
- * High side switch - monolithic level shifter, protection circuits and power MOSFET are all on one chip.
- * Very low current drain in off state.
- * Can be directly interfaced to a microcontroller.
- * New TOPFET2 range now uses Philips' field-proven TrenchMOS technology which extends the range further and facilitates cost-reductions making possible top-of-the-range features on lower-end vehicles.

GENERAL FEATURES - TYPES BUK100-116

	Low side 3 pin	Low side 5 pin	High side single
Over-voltage clamping	●	●	●
Drain-Source (Battery-Load) clamps for output device	●	●	●
Additional clamps for Battery-Ground	●		
Reverse Battery-Ground capability with integral ground resistor			●
Separate inductive load ring-off clamping			●
Over-temperature protection	●	●	●
Allows full operation to at least 150°C	●	●	●
Latched over-temperature protection	●	●	○
Auto re-start over-temperature protection with 10°C hysteresis			○
Current limiting			●
Active current limit with low temperature coefficient			●
Low value current limit			
High value latched current trip			
Short circuit protection	●	●	●
Thermal based S/C latched protection	●	●	●
Thermal based S/C protection with auto restart			
Voltage based latched S/C protection with turn on delay			●
Voltage based S/C reporting with delay - Status indication only			
ESD protection	●	●	●
2kV HBM capability on all pins	●	●	●
ESD clamp diodes rated for continuous clamping	●	●	●
CMOS logic compatibility	●	●	●
High value RIG for easy drive	●		
Lower value RIG for faster switching	○		
Fast switching with very low RIG		●	
Diagnostic reporting via Flag / Status		●	●
ON-state low load current detection with hysteresis			●
OFF-state open load detection		●	
OFF-state open load detection has integral current source		●	
Low OFF-state currents	●	●	●
Low OFF state leakage current in output device	●	●	●
Very low OFF state quiescent current Battery-Ground			●
Vertical Power TrenchMOS	●	●	●
N channel, logic level	●	●	●
Very low noise charge pumping			●
Open Ground protection - output remains OFF			●

Note: ● = standard feature
 Note: ○ = option (metal mask determined for various variants)

GENERAL FEATURES - TYPES BUK117 ONWARDS

	Low side 3 pin	Low side 5 pin	High side single	High side dual
Over-voltage clamping	●	●	●	●
Drain-Source (Battery-Load) clamps for output device	●	●	●	●
Additional clamps for Battery-Ground			●	●
Reverse Battery-Ground capability with integral ground resistor			●	●
Separate inductive load ring-off clamping			●	●
Over-temperature protection	●	●	●	●
Allows full operation to at least 150°C	●	●	●	●
Latched over-temperature protection	●	●	○	○
Auto re-start over-temperature protection with 10°C hysteresis	○	○		
Current limiting	●	●	●	●
Active current limit with low temperature coefficient	●	●	●	●
Low value current limit			○	○
High value latched current trip			○	○
Short circuit protection	●	●	●	●
Thermal based S/C latched protection	●	●	●	●
Thermal based S/C protection with auto restart				○
Voltage based latched S/C protection with turn on delay			●	
Voltage based S/C reporting with delay - Status indication only			○	
ESD protection	●	●	●	●
2kV HBM capability on all pins	●	●	●	●
ESD clamp diodes rated for continuous clamping	●	●	●	●
CMOS logic compatibility	●	●	●	●
High value RIG for easy drive	●			
Lower value RIG for faster switching	○			
Fast switching with very low RIG		●		
Diagnostic reporting via Flag / Status		●	●	●
ON-state low load current detection with hysteresis			●	○
OFF-state open load detection		●		●
OFF-state open load detection has integral current source		●		
Low OFF-state currents	●	●	●	●
Low OFF state leakage current in output device	●	●	●	●
Very low OFF state quiescent current Battery-Ground			●	●
Vertical Power TrenchMOS	●	●	●	●
N channel, logic level	●	●	●	●
Very low noise charge pumping			●	●
Open Ground protection - output remains OFF			●	●

● = standard feature
 ○ = option (metal mask determined for various variants)

LOW-SIDE SWITCH

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

Type number	Package	V _{DSmax} (V)	@ V _{IS} (V)	I _D (A)	Configuration	R _{DS(on)} (mOhm)		Number of pins	Operating voltage (VDC)	Channel resistance (mOhms)	Protection current (A)	Nominal current (A)	Application Keys
BUK100-50GL	SOT78 (TO-220AB, SC-46)	50	5	13.5	Single Low side TOPFET	125		3	-	-	-	-	79 105 114 117 132 133 143
BUK101-50GL	SOT78 (TO-220AB, SC-46)	50	5	26	Single Low side TOPFET	60		3	-	-	-	-	
BUK101-50GS	SOT78 (TO-220AB, SC-46)	50	10	29	Single Low side TOPFET	50		3	-	-	-	-	
BUK107-50DL	SOT223 (SC-73)	50	5	0.7	Single Low side TOPFET	200		3	-	-	-	-	82 84 105 114 117 132 133 143
BUK108-50DL	SOT404 (D ² -PAK)	50	5	13.5	Single Low side TOPFET	125		3	-	-	-	-	79 105 114 117 132 133 143
BUK109-50DL	SOT404 (D ² -PAK)	50	5	26	Single Low side TOPFET	60		3	-	-	-	-	83 105 114 117 132 133 143
BUK110-50GL	SOT404 (D ² -PAK)	50	5	43	Single Low side TOPFET	35		3	-	-	-	-	84 105 114 117 132 133 143
<i>BUK1110-50SLAA</i>	SOT426 (D ² -PAK)	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	70	TBD	
<i>BUK1110-50SLBA</i>	SOT426 (D ² -PAK)	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	52,5	TBD	
<i>BUK1110-50SLCA</i>	SOT426 (D ² -PAK)	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	30	TBD	
BUK114-50L	SOT426 (D ² -PAK)	50	5	15	Single Low side TOPFET	125		5	-	-	-	-	79 105 114 117 132 133 143
BUK116-50L	SOT426 (D ² -PAK)	50	5	50	Single Low side TOPFET	35		5	-	-	-	-	84 105 114 117 132 133 143
BUK117-50DL	SOT78B (TO-220AB, SC-46)	50	-	-	Single Low side TOPFET	100		3	6~35	1 x 100	12	3.5	79 105 114 117 132 133 143
BUK118-50DL	SOT78B (TO-220AB, SC-46)	50	-	-	Single Low side TOPFET	50		3	6~35	1 x 50	24	7	83 105 114 117 132 133 143
BUK119-50DL	SOT78B (TO-220AB, SC-46)	50	-	-	Single Low side TOPFET	28		3	6~35	1 x 28	43	12	84 105 114 117 132 133 143
BUK124-50L	SOT263B-01	50	-	-	Single Low side TOPFET	28		5	6~35	1 x 28	44	13	
<i>BUK120-50DL</i>	SOT78 (TO-220AB, SC-46)	50	-	-	Single Low side TOPFET	20		3	6~35	1 x 20	60	TBD	
BUK125-50L	SOT263B-01	50	-	-	Single Low side TOPFET	20		5	6~35	1 x 20	62	18	
BUK127-50DL	SOT223 (SC-73)	50	-	-	Single Low side TOPFET	200		3	6~35	1 x 200	1.3	0.7	82 84 105 114 117 132 133 143
BUK127-50GT	SOT223 (SC-73)	50	-	-	Single Low side TOPFET	200		3	6~35	1 x 200	6	0.7	
BUK128-50DL	SOT404 (D ² -PAK)	50	-	-	Single Low side TOPFET	100		3	6~35	1 x 100	12	3.5	79 105 114 117 132 133 143
BUK129-50DL	SOT404 (D ² -PAK)	50	-	-	Single Low side TOPFET	50		3	6~35	1 x 50	24	7	83 105 114 117 132 133 143
BUK130-50DL	SOT404 (D ² -PAK)	50	-	-	Single Low side TOPFET	28		3	6~35	1 x 28	43	12	84 105 114 117 132 133 143
<i>BUK131-50DL</i>	SOT404 (D ² -PAK)	50	-	-	Single Low side TOPFET	20		3	6~35	1 x 20	60	TBD	
BUK135-50L	SOT426 (D ² -PAK)	50	-	-	Single Low side TOPFET	28		5	6~35	1 x 28	44	13	
BUK136-50L	SOT426 (D ² -PAK)	50	-	-	Single Low side TOPFET	20		5	6~35	1 x 20	62	18	
BUK138-50DL	SOT428 (SC-63, D-PAK)	50	-	-	Single Low side TOPFET	100		3	6~35	1 x 100	12	3.5	79 105 114 117 132 133 143
BUK139-50DL	SOT428 (SC-63, D-PAK)	50	-	-	Single Low side TOPFET	50		3	6~35	1 x 50	24	7	84 105 114 117 132 133 143
BUK148-50DL	SOT226 (TO-220)	50	-	-	Single Low side TOPFET	100		3	6~35	1 x 100	12	3.5	79
BUK149-50DL	SOT226 (TO-220)	50	-	-	Single Low side TOPFET	50		3	6~35	1 x 50	24	7	83
BUK150-50DL	SOT226 (TO-220)	50	-	-	Single Low side TOPFET	28		3	6~35	1 x 28	43	12	84
<i>BUK1910-50SLAA</i>	SOT263B-01	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	70	TBD	
<i>BUK1910-50SLBA</i>	SOT263B-01	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	52,5	TBD	
<i>BUK1910-50SLCA</i>	SOT263B-01	50	-	-	Single Low side TOPFET	10		5	6~35	1 x 10	30	TBD	
<i>BUK1M200-50SGTD</i>	SO20	50	-	-	Quad Low side TOPFET	200		20	6~35	4 x 200	6	0,7	
<i>BUK1M200-50SDLD</i>	SO20	50	-	-	Quad Low side TOPFET	200		20	6~35	4 x 200	1,3	0,7	



Applications key

Automotive

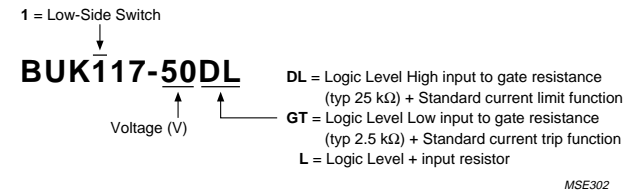
- 79 : Protected Motor Switch
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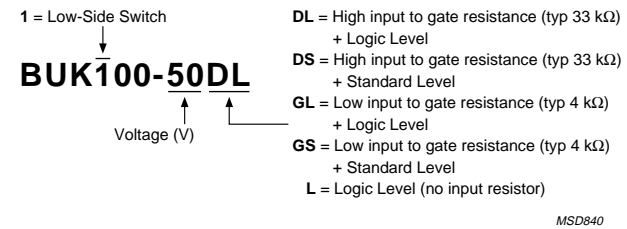
Related literature

Title	Order code
TOPFETs - driving forward in protected PowerMOS (folder)	939775003985
What if! Automotive competency (brochure)	939775006353
In Vehicle Power Brochure	939775010255
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

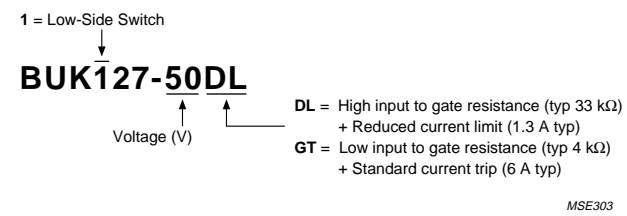
Low Side Switch part numbering (types BUK117 - BUK150 only)



Low Side Switch part numbering (types BUK100 - BUK116 only)



Topfet BUK127 (exception) part numbering



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...Automotive MOSFETs

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12 - 300 V P-CHANNEL MOSFETS

types in **bold red** represent new products

Configuration	Q _{gd} (typ) [nC]	V _{DSmax} [V]	R _{DS(on)} [mOhm]	I _D DC [A]	SOT89 (MPT3, UPAK)	SOT96-1 (SO8)	SOT223 (SC-73)	SOT457 (TSOP6, SMT6, SSOT6)	SOT23 (SST3)	SOT54 (SPT, E-1)	Application Keys
Single P-channel	-	30	250@10V 400@4.5V	3			BSP250				63 68 71 104
Single P-channel	-	50	10000@10V	0.13					BSS84		67 68 104
Single P-channel	-	200	12000@10V	0.225			BSP220				67 68 104
Single P-channel	-	240	12000@10V	0.2	BSS192						
Single P-channel	-	250	15000@10V	0.2						BSP254A	68 69 72 104
Single P-channel	-	250	15000@10V	0.225			BSP225				68 69 72 104
Single P-channel	-	300	17000@10V	0.17						BSP304A	
Single P-channel	-	300	17000@10V	0.210			BSP230				68 69 72 104
Single P-channel	0.25	30	900@4.5V 1100@2.5V	0.47					BSH203		71 104
Single P-channel	0.4	60	2500@10V 3750@4.5V	0.3					BSH201		
Single P-channel	0.5	30	900@10V 1350@4.5V	0.52					BSH202		
Single P-channel	1	12	400@4.5V 500@2.5V	0.75					BSH205		
Single P-channel	2	12	120@4.5V 150@2.5V	1.52				BSH207			63
Single P-channel	-	16	150@2.5V	2		PHK04P02T					
Dual P-channel	-	30	250@10V	2 x 2.5		PHP225					



Applications key

Communication

- 67 : Line switching protection
- 68 : Power conversion
- 69 : Telecoms DC-DC converters
- 70 : Synchronous rectifiers in telecom converters
- 71 : Power (battery) management
- 72 : Line card switching

General Purpose

- 104 : General

PC Peripherals

- 63 : 3.5" disk drive, CD, hard disk drive

Why choose Philips Semiconductors?

Benefits

- * Volume delivery
- * Short leadtimes
- * 200 - 300V devices niche product, no competitors,

12 - 50 V N-CHANNEL MOSFETS

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

Configuration	V _{DSmax} [V]	I _{D DC} [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT457 (TSOP6, SMT6, SSOT6)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT669 (LFPACK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT226 (I ² PAK)	SOT533 (I-PAK)	SOT530 (TSSOP8)
Single N-channel	12	5.7	2.1	34@4.5V 40@2.5V 56@1.8V			PMN28UN									
Single N-channel	20	32	13.2	5@4.5V 5.7@2.5V 8.2@1.8V				PSMN006-20K								
Single N-channel	20	5.7	2.1	34@4.5V 40@2.5V 56@1.8V			PMN27UN									
Single N-channel	20	4.1	-	34@10V 40@4.5V			PMN34LN									
Single N-channel	20	4.1	-	65@10V 82@4.5V			PMN55LN									
Dual N-channel	20	2.5	-	28.5@4.5V 20.5@2.5V 18.5@1.8V												PMWD15UN
Dual N-channel	20	2.5	-	19@4.5V 22@2.5V 30@1.8V												PMWD16UN
Dual N-channel	20	2.5	-	30@4.5V 35@2.5V 40@1.8V												PMWD26UN
Single N-channel	20	1.05	1.4	200@4.5V 250@2.5V												
Single N-channel	20	-	-	2.5@4.5V 3.2@2.5V						PH2520U						
Single N-channel	20	-	-	2.9@10V 5.8@4.5V						PH2920						
Single N-channel	20	-	-	2.5@10V 3.1@4.5V						PH3120L						
Single N-channel	20	2.5	1.6	85@4.5V 115@2.5V												PMV56XN
Single N-channel	20	-	-	31@4.5V 45@2.5V												PMV31XN
Single N-channel	20	38	-	21@5V 33@2.5V												<i>PHB38N02LT</i>
Single N-channel	20	38	-	21@5V 33@2.5V					<i>PHD38N02LT</i>							
Single N-channel	25	40	8	21@10V 24@5V												PHP45N03LTA
Single N-channel	25	55	7	14@10V 18@5V												PHP55N03LTA
Single N-channel	25	66	3.6	12@10V 16@5V												PHB66NQ03LT
Single N-channel	25	66	3.6	12@10V 16@5V												PHP66NQ03LT
Single N-channel	25	75	4.2	9@10V 13.5@5V												PHP78NQ03LT
Single N-channel	25	75	7.3	6@10V												PHP108NQ03LT
Single N-channel	25	75	8.4	4.95@10V 7.5@5V												PHD96NQ03LT
Single N-channel	25	75	8.4	4.95@10V 7.5@5V												PHP96NQ03LT
Single N-channel	25	75	8.4	9@10V 12@5V												PHP83N03LT

12 - 50 V N-CHANNEL MOSFETS

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

Configuration	V _{DS} max [V]	I _D DC [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT457 (TSOP6, SMT6, SSOT6)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT669 (LFPACK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT226 (I ² PAK)	SOT533 (I-PAK)	SOT530 (TSSOP8)
Single N-channel	25	75	15	5.9@10V 7.3@5V		PHP98N03LT										
Single N-channel	25	75	16	7@10V 9@5V		PHP95N03LT										
Single N-channel	25	75	60	2.2@10V 2.45@5V		PSMN002-25P										
Single N-channel	25	75	60	2.2@10V 2.45@5V							PSMN002-25B					
Single N-channel	25	100	113	3.2@10V 3.5@5V 4@4.5V	PSMN003-25W											
Single N-channel	25	40	8	21@10V 24@5V					PHD45N03LTA							
Single N-channel	25	55	7	14@10V 18@5V					PHD55N03LTA							
Single N-channel	25	66	3.6	12@10V 16@5V					PHD66NQ03LT							
Single N-channel	25	72	12.5	9@10V 12@5V					PHD83N03LT							
Single N-channel	25	75	4.2	9@10V 13.5@5V					PHD78NQ03LT							
Single N-channel	25	75	7.3	6@10V					PHD108NQ03LT							
Single N-channel	25	75	15	5.9@10V 7.3@5V					PHD98N03LT							
Single N-channel	25	75	16	7@10V 9@5V												
Single N-channel	25	75	32	5.8@10V 7.5@5V					PSMN005-25D							
Single N-channel	25	40	8	21@10V 24@5V							PHB45N03LTA					
Single N-channel	25	55	7	14@10V 18@5V							PHB55N03LTA					
Single N-channel	25	64	7	12@10V 18@5V							PHB64N03LT					
Single N-channel	25	75	4.2	9@10V 13.5@5V							PHB78NQ03LT					
Single N-channel	25	75	7.3	6@10V							PHB108NQ03LT					
Single N-channel	25	75	8.4	4.95@10V 7.5@5V							PHB96NQ03LT					
Single N-channel	25	75	12.5	9@10V 12@5V							PHB83N03LT					
Single N-channel	25	75	14.5	4@10V 5@5V					<i><u>PHD152NQ03LT</u></i>							
Single N-channel	25	75	14.5	4@10V 5@5V		PHP152NQ03LT										
Single N-channel	25	75	14.5	4@10V 5@5V							PHB152NQ03LT					
Single N-channel	25	75	15	5.9@10V 7.3@5V							PHB98N03LT					
Single N-channel	25	75	16	6@10V 9@5V												
Single N-channel	25	75	16	7@10V 9@5V							PHB95N03LT					

12 - 50 V N-CHANNEL MOSFETS

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

Configuration	V _{DS} max [V]	I _D DC [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT457 (TSOP6, SMT6, SSOT6)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT669 (LFPAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT226 (I ² PAK)	SOT533 (I-PAK)	SOT530 (TSSOP8)
Single N-channel	25	75	12.5	9@10V 12@5V												
Single N-channel	25	75	16	7@10V 9@5V												
Single N-channel	30	7	5	30@10V 40@5V 50@4.5V				SI9410DY								
Single N-channel	30	9	6	18@10V 28@4.5V				SI4416DY								
Single N-channel	30	9	7.5	18.5@10V 33@4.5V				SI4800								
Single N-channel	30	10	7	13.5@10V 20@4.5V				SI4410DY								
Single N-channel	30	12	4.4	8.9@10V 11@4.5V				PHK12NQ03LT PI4884								
Single N-channel	30	12.5	11.5	9@10V 13@4.5V				SI4420DY								
Single N-channel	30	20	14	5.5@10V 8@4.5V				PSMN005-30K								
Single N-channel	30	68.9	3.2	13@10V 17.7@5V		PHP63NQ03LT										
Single N-channel	30	75	4.6	10@10V 15.2@5V		PHP71NQ03LT										
Single N-channel	30	75	5	8@10V 10@5V		PHP82NQ03LT										
Single N-channel	30	75	8	5.5@10V 7@5V		PHP101NQ03LT										
Single N-channel	30	-	-	8.2@10V 15.3@4.5V						PH8230						
Single N-channel	30	-	-	8.2@10V 12@4.5V						<i>PH8230E</i>						
Single N-channel	30	-	-	7@10V 9.1@4.5V						<i>PH7030L</i>						
Single N-channel	30	-	-	5.3@10V 7.8@4.5V						<i>PH5330E</i>						
Single N-channel	30	50	8	5.3@10V 10@4.5V						PH5330						
Single N-channel	30	50	14	3.7@10V 7.3@4.5V						PH3230						
Single N-channel	30	-	-	3.2@10V 6.3@4.5V						PH3230S						
Single N-channel	30	-	-	3.8@10V 4.8@4.5V						<i>PH3830L</i>						
Single N-channel	30	-	-	4.5@10V 5.9@4.5V						<i>PH4530L</i>						
Single N-channel	30	4.2	-	46@4.5V 54@2.5V 77@1.8V			PMN34UN									
Single N-channel	30	5	-	38@10V 45@4.5V			PMN40LN									

12 - 50 V N-CHANNEL MOSFETS

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

Configuration	V _{DS} max [V]	I _D DC [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT457 (TSOP6, SMT6, SSOT6)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT669 (LFPAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT226 (I ² PAK)	SOT533 (I-PAK)	SOT530 (TSSOP8)
Single N-channel	30	5.2	2.35	40@10V 50@4.5V			PMN45EN									
Single N-channel	30	16	-	100@10V					<i>PHD16N03T</i>							
Single N-channel	30	10.5	-	130@10V 150@5V					PHD11N03LT							
Single N-channel	30	20	5.7	50@10V 56@5V					PHD24N03LT							
Single N-channel	30	68.9	3.2	13@10V 17.7@5V					PHD63NQ03LT							
Single N-channel	30	75	4.6	10@10V 15.2@5V					PHD71NQ03LT							
Single N-channel	30	75	5	8@10V 10@5V					PHD82NQ03LT							
Single N-channel	30	75	8	5.5@10V 7@5V					PHD101NQ03LT							
Single N-channel	30	36	-	22@10V					<i>PHD36N03LT</i>							
Single N-channel	30	68.9	3.2	13@10V 17.7@5V										PHB63NQ03LT		
Single N-channel	30	75	4.6	10@10V 15.2@5V										PHB71NQ03LT		
Single N-channel	30	75	5	8@10V 10@5V										PHB82NQ03LT		
Single N-channel	30	75	8	5.5@10V 7@5V										PHB101NQ03LT		
Single N-channel	30	75	56	5@10V										PHB160N03T		
Single N-channel	30	68.9	3.2	13@10V 17.7@5V												<i>PHU63NQ03LT</i>
Single N-channel	30	75	4.6	10@10V 15.2@5V												<i>PHU71NQ03LT</i>
Single N-channel	30	75	5	8@10V 10@5V												<i>PHU82NQ03LT</i>
Single N-channel	30	75	8	5.5@10V 7@5V												PHU101NQ03LT
Single N-channel	30	28	-	6.5@10V 7.7@4.5V					PHK28NQ03LT							
Single N-channel	30	13	-	21@5V 33@2.5V					PHK13N03LT							
Single N-channel	30	0.85	0.67	400@4.5V 500@2.5V												BSH103
Single N-channel	30	1.7	1.35	117@10V 190@4.5V												PMV117EN
Single N-channel	30	-	-	35@10V 45@4.5V												PMV45EN
Single N-channel	30	-	-	47@10V 60@4.5V												PMV60EN
Single N-channel	30	1.9	1.3	120@10V 140@5V												BSH108

12 - 50 V N-CHANNEL MOSFETS

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

Configuration	V _{DS} max [V]	I _D DC [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT457 (TSOP6, SMT6, SSOT6)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT669 (LFPACK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT226 (I ² PAK)	SOT533 (I-PAK)	SOT530 (TSSOP8)
Dual N-channel	30	2.5	-	21.5@4.5V 23.5@2.5V 35@1.8V												PMWD18UN
Dual N-channel	30	2.5	-	23@4.5V 26@2.5V 35@1.8V												PMWD19UN
Dual N-channel	30	2.5	-	33@4.5V 30@2.5V 40@1.8V												PMWD30UN
Single N-channel	30	6	0.7	100@10V 200@4.5V								BSP100				
Single N-channel	35	40	-	14@10V												
Single N-channel	36	75	39	4@10V 5@5V 5.4@4.5V							PSMN004-36B					
Single N-channel	40	-	-	4.8@10V 6@7V						<i>PH4840S</i>						
Single N-channel	40	24	-	7.7@10V 9.2@4.5V				<i>PHK24NQ04LT</i>								
Single N-channel	50	0.173	-	15000@10V 20000@5V									BSN20			
Single N-channel	55	17	-	70@10V		IRFZ24N										
Single N-channel	55	30	11	35@10V 46@5V		IRLZ34N										
Single N-channel	55	49	-	22@10V		IRFZ44N										
Single N-channel	55	64	-	16@10V		IRFZ48N										
Single N-channel	55	49	-	22@10V							IRFZ44NS					



Applications key

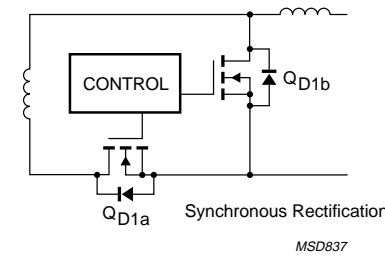
- Communication
- 66 : Mobile phone and laptop power management
 - 70 : Synchronous rectifiers in telecom converters
 - 109 : Telecom
- General Purpose
- 104 : General
- Motherboard
- 48 : Laptop DC-DC converters
 - 49 : Desktop PC & server- DC-DC converters
 - 110 : Motherboard
- PC Peripherals
- 63 : 3.5" disk drive, CD, hard disk drive
 - 108 : PC Peripherals



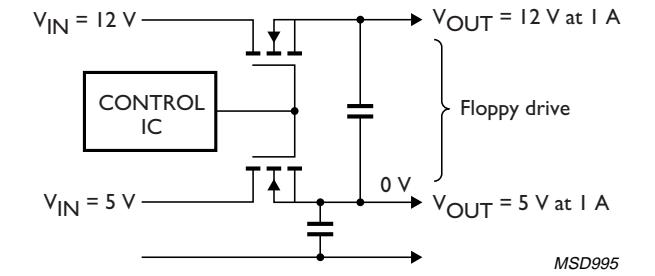
Related literature

Title	Order code
SiliconMAX™: ultralow $R_{DS(on)}$ MOSFETs to 200V (leaflet)	939775005724
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146
μ TrenchMOS - a new dimension in power	939775010248
Powerful solutions for DC/DC conversion	939775010455
Cool Solutions for DC/DC Conversion	939775010247
Power MOSFET Selection Guide 2002/2003	938775010214
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

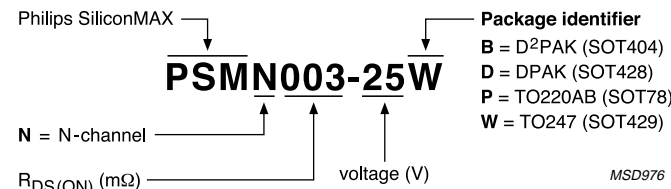
Synchronous Rectification



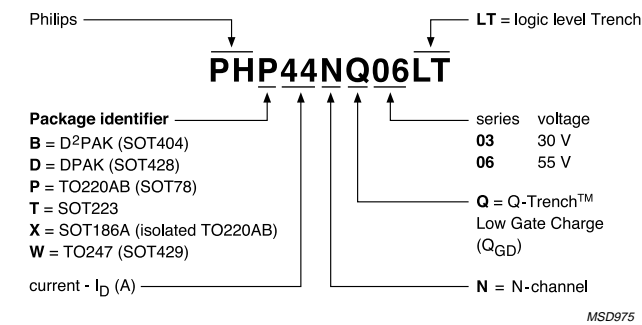
Hard drive load switch



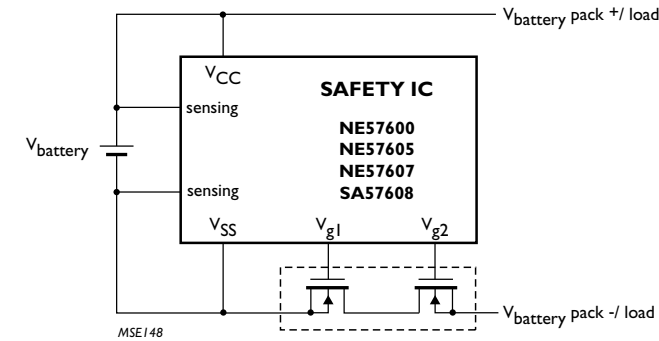
SiliconMAX part numbering



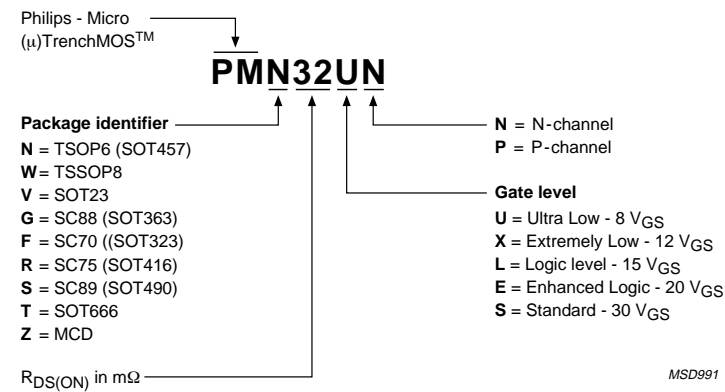
TrenchMOS - PH types part numbering



Li-Ion Battery Protection



μ TrenchMOSTM part numbering



Why choose Philips Semiconductors?

μ TrenchMOS™

* As a technology leader, Philips continues to develop new power devices delivering essential solutions for today's rapidly moving market. μ TrenchMOS is a new product portfolio exploiting Philips' core competencies in both innovative Trench technology and package miniaturization. These small devices help designers meet the demanding requirements of motor, load and switching circuits in compact, portable and battery operated appliances.

Benefits

- * Small Footprint Packages - space saving
- * Low $R_{DS(ON)}$ - reduced power dissipation for cooler running applications

55 - 60 V N-CHANNEL MOSFETS

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

Configuration	V _{DSmax} [V]	I _{D DC} [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT223 (SC-73)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT23 (SST3)	SOT54 (SPT, E-1)	Application Keys
Single N-channel	55	19	5.4	70@10V 75@5V			PHP21N06LT						50 111
Single N-channel	55	20.3	6	75@10V			PHP20N06T						104
Single N-channel	55	54	11.5	20@10V			PHP54N06T						104
Single N-channel	55	75	29	8@10V			PHP112N06T						104
Single N-channel	55	75	52	5.8@10V 6.3@5V 6.7@4.5V			PSMN005-55P						70
Single N-channel	55	100	106	4.2@10V 4.5@5V 5@4.5V	PSMN004-55V								70
Single N-channel	55	18	6	77@10V					PHD20N06T				104
Single N-channel	55	19	5.4	70@10V 75@5V					PHD21N06LT				50 111
Single N-channel	55	37	11	32@10V 35@5V					PHD37N06LT				
Single N-channel	55	75	28	10.5@10V 12@5V 13@4.5V					PSMN010-55D				70
Single N-channel	55	10.3	3	130@10V 150@5V						PHB11N06LT			104
Single N-channel	55	19	5.4	70@10V 75@5V						PHB21N06LT			50 111
Single N-channel	55	20.3	6	75@10V						PHB20N06T			104
Single N-channel	55	75	52	5.8@10V 6.3@5V 6.7@4.5V						PSMN005-55B			70
Single N-channel	55	0.335	0.5	4000@4.5V 5000@2.5V							BSH111		104
Single N-channel	55	5.5	2.5	150@5V					PHT6N06LT				
Single N-channel	55	7.5	5	80@5V					PHT8N06LT				50 111
Single N-channel	55	10.7	10	40@5V					PHT11N06LT				
Single N-channel	60	10.3	3.2	150@10V			PHP3055E						104 125 152
Single N-channel	60	34	8.5	37@10V 40@5V			PHP32N06LT						104
Single N-channel	60	52	11.5	22@10V			PHP52N06T						112
Single N-channel	60	73	19	14@10V			PHP73N06T						112
Single N-channel	60	75	26	12@10V			PHP83N06T						112
Single N-channel	60	0.3	-	5000@10V 5300@4.5V								2N7000	104
Single N-channel	60	10.3	3.2	150@10V					PHD3055E				104 125 152
Single N-channel	60	34	8.5	37@10V 40@5V						PHB32N06LT			104
Single N-channel	60	73	19	14@10V						PHB73N06T			104
Single N-channel	60	0.3	-	5000@10V 5300@4.5V							2N7002 BSH112 PMBF170		104

55 - 60 V N-CHANNEL MOSFETS

Configuration	V _{DSmax} [V]	I _{D DC} [A]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	SOT429 (TO-247)	SOT186A (3 lead TO-220F)	SOT78 (TO-220AB, SC-46)	SOT223 (SC-73)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT23 (SST3)	SOT54 (SPT, E-1)	Application Keys
Single N-channel	60	0.385	-	3000@10V 400@4.5V								2N7002E	
Single N-channel	60	0.475	-	2000@10V 400@4.5V								2N7002F	
Single N-channel	55	11	-	7.5@10V		PHX20N06T							
Single N-channel	60	75	-	3.6@10V			PSMN004-60P						
Single N-channel	60	75	-	3.6@10V						PSMN004-60B			



Applications key

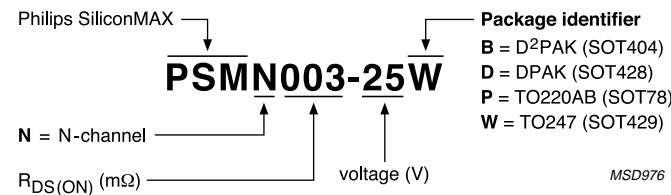
- Communication
 - 70 : Synchronous rectifiers in telecom converters
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV
- General Purpose
 - 104 : General
 - 112 : UPS
- Home Appliances
 - 111 : Home appliances
- Motherboard
 - 50 : Desktop PC linear regulators



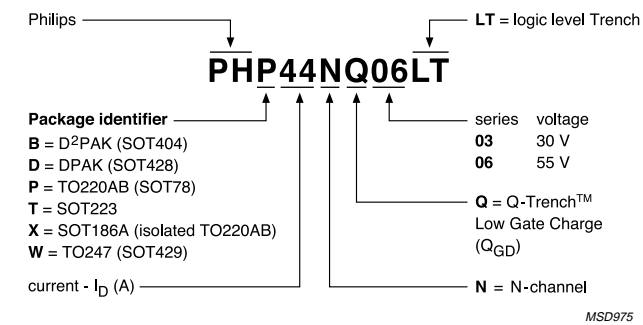
Related literature

Title	Order code
SiliconMAX™: ultralow R _{DS(on)} MOSFETs to 200V (leaflet)	939775005724
Philips Comprehensive Product Catalog (CD-ROM set) AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	939775011146 AN10273_1

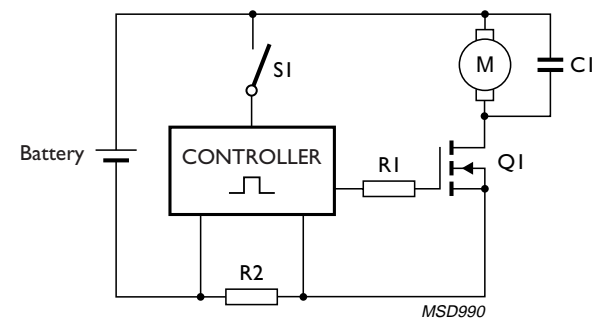
SiliconMAX part numbering



TrenchMOS - PH types part numbering



Low Power Motor control



Why choose Philips Semiconductors?

Benefits

- * Volume delivery
- * Short leadtimes
- * 200 - 300V devices niche product, no competitors,

75 - 300 V N-CHANNEL MOSFETS

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

Configuration	V _{DS} max [V]	Q _{gd} (typ) [nC]	R _{DS(on)} [mOhm]	I _D DC [A]	SOT186A (3 lead TO-220F)	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT533 (I-PAK)	SOT54 (SPT, E-1)	SOT685 (QLPAK)	SOT669 (LFPK)
Single N-channel	75	50	5\leq10V	75			PSMN005-75P			PSMN005-75B						
Single N-channel	75	9	50\leq11V	27			PHP29N08T									
Single N-channel	75	50	8.5\leq10V	75			PSMN008-75P									
Single N-channel	75	9	50\leq11V	27						PHB29N08T						
Single N-channel	75	50	8.5\leq10V	75						PSMN008-75B						
Single N-channel	100	44	8.8\leq10V	75			PSMN009-100P			PSMN009-100B						
Single N-channel	100	44	8.8\leq10V	75												
Single N-channel	100	18	20\leq10V	30											PHM30NQ10T	
Single N-channel	100	10	20\leq10V	30												PHN20100S
Single N-channel	100	8	70\leq10V	4				PHK4NQ10T								
Single N-channel	100	11	50\leq10V	5				PHK5NQ10T								
Single N-channel	100	16	38\leq10V	6.3				PSMN038-100K								
Single N-channel	100	10	30\leq10V	25											PHM25NQ10T	
Single N-channel	100	10.1	30\leq10V	11.5				PHK12NQ10T								
Single N-channel	100	29 max	77\leq10V	23			IRF540									
Single N-channel	100	29 max	110\leq10V	17			IRF530N									
Single N-channel	100	8	90\leq10V	18			PHP18NQ10T									
Single N-channel	100	10	70\leq10V	23			PHP23NQ10T									
Single N-channel	100	12	50\leq10V	28			PHP27NQ10T									
Single N-channel	100	18	40\leq10V	35			PHP34NQ10T									
Single N-channel	100	21	28\leq10V	47			PHP47NQ10T									
Single N-channel	100	25	25\leq10V	47			PHP45NQ10T									
Single N-channel	100	50	15\leq10V	75			PSMN015-100P									
Single N-channel	100	unspecified	10000\leq5V	0.19										BST72A		
Single N-channel	100	5.3	180\leq10V	10.9									PHU11NQ10T			
Single N-channel	100	25	25\leq10V	47			PHW45NQ10T									
Single N-channel	100	50	15\leq10V	80			PHW80NQ10T									
Single N-channel	100	91	9\leq10V	100												
Single N-channel	100	8	90\leq10V	18					PHD18NQ10T							
Single N-channel	100	10	70\leq10V	23					PHD23NQ10T							
Single N-channel	100	12	50\leq10V	28					PHD27NQ10T							
Single N-channel	100	18	40\leq10V	35					PHD34NQ10T							
Single N-channel	100	25	25\leq10V	47					PSMN025-100D							
Single N-channel	100	unspecified	77\leq10V	23												
Single N-channel	100	8	90\leq10V	18						PHB18NQ10T						
Single N-channel	100	10	70\leq10V	23						PHB23NQ10T						
Single N-channel	100	12	50\leq10V	28						PHB27NQ10T						
Single N-channel	100	18	40\leq10V	35						PHB34NQ10T						
Single N-channel	100	21	28\leq10V	47						PHB47NQ10T						
Single N-channel	100	25	25\leq10V	47						PHB45NQ10T						
Single N-channel	100	2.5	250\leq10V	1.2								PMV213SN				
Single N-channel	100	50	15\leq10V	75						PSMN015-100B						
Single N-channel	100	unspecified	6000\leq10V	0.15									BSS123			
Single N-channel	100	unspecified	10000\leq5V	0.19									BST82			
Single N-channel	100	2.1	500\leq10V	0.85									BSH114			
Single N-channel	100	unspecified	10000\leq5V	0.52									BSP110			
Single N-channel	100	3.3	250\leq10V	3.5									PHT4NQ10T			
Single N-channel	100	3.6	250\leq5V	3.5									PHT4NQ10LT			
Single N-channel	100	8.2	90\leq10V	6.5									PHT6NQ10T			
Single N-channel	100	10	70\leq10V	13			PHX23NQ10LT	PHX23NQ10T								
Single N-channel	100	unspecified	430\leq10V	2									PHT2NQ10T			
Single N-channel	110	50	15\leq10V	75			PSMN015-110P									
Single N-channel	150	9.9	75\leq10V	5.5				PHK5NQ15T								
Single N-channel	150	12	85\leq10V	4.1				PSMN085-150K								
Single N-channel	150	14.9	55\leq10V	21											PHM21NQ15T	
Single N-channel	150	11.5	60\leq10V	18												PH60150S
Single N-channel	150	8	200\leq10V	12.5			PHP12NQ15T									
Single N-channel	150	20	63\leq10V	29			PHP30NQ15T									
Single N-channel	150	20	90\leq10V	23			PHP23NQ15T									
Single N-channel	150	33	35\leq10V	50			PSMN035-150P									
Single N-channel	150	38	30\leq10V	55.5			PSMN030-150P									
Single N-channel	150	33	35\leq10V	50			PHW50NQ15T									
Single N-channel	150	91	20\leq10V	73												

75 - 300 V N-CHANNEL MOSFETS

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

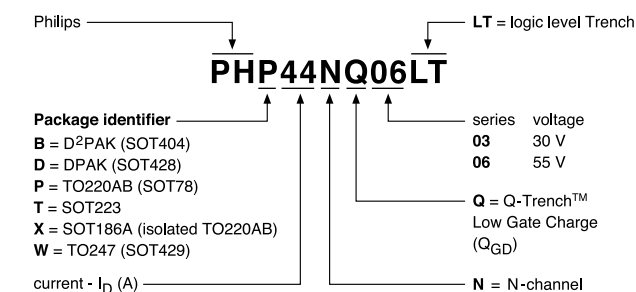
Configuration	V _{DS} max [V]	Q _{gd} (typ) [nC]	R _{DS(on)} [mΩ]	I _D DC [A]	SOT186A (3 lead TO-220F)	SOT429 (TO-247)	SOT78 (TO-220AB, SC-46)	SOT96-1 (SO8)	SOT428 (SC-63, D-PAK)	SOT404 (D ² -PAK)	SOT223 (SC-73)	SOT23 (SST3)	SOT533 (I-PAK)	SOT54 (SPT, E-1)	SOT685 (QLPAK)	SOT669 (LFPK)	
Single N-channel	150	10	75\leq10V	18													<i>PHM18NQ15T</i>
Single N-channel	150	8	200\leq10V	12.5					PHD12NQ15T								
Single N-channel	150	20	63\leq10V	29					PSMN063-150D								
Single N-channel	150	8	200\leq10V	12.5						PHB12NQ15T							
Single N-channel	150	20	63\leq10V	29						PHB30NQ15T							
Single N-channel	150	20	90\leq10V	23						PHB23NQ15T							
Single N-channel	150	33	35\leq10V	50						PSMN035-150B							
Single N-channel	150	38	30\leq10V	55.5						PSMN030-150B							
Single N-channel	200	10	130\leq10V	4				PHK4NQ20T									
Single N-channel	200	12	165\leq10V	2.9				PSMN165-200K									
Single N-channel	200	11.2	85\leq10V	15												<i>PHM15NQ20T</i>	
Single N-channel	200	11.5	102\leq10V	12													<i>PH102200S</i>
Single N-channel	200	10.1	130\leq10V	12												<i>PHM12NQ20T</i>	
Single N-channel	200	35 max	180\leq10V	16				IRF640									
Single N-channel	200	21 max	400\leq10V	9				IRF630									
Single N-channel	200	12	400\leq10V	8.7				PHP9NQ20T									
Single N-channel	200	13.3	230\leq10V	14				PHP14NQ20T									
Single N-channel	200	22	130\leq10V	20				PHP20NQ20T									
Single N-channel	200	22	180\leq10V	16				PHP18NQ20T									
Single N-channel	200	28	70\leq10V	35				PSMN070-200P									
Single N-channel	200	37	57\leq10V	39				PSMN057-200P									
Single N-channel	200		unspecified	0.3													BS108
Single N-channel	200	28	70\leq10V	35		PHW35NQ20T											
Single N-channel	200	73	40\leq10V	50													
Single N-channel	200	4	800\leq10V	4.8					IRFR220								
Single N-channel	200	12	400\leq10V	8.7					PHD9NQ20T								
Single N-channel	200	22	130\leq10V	20					PSMN130-200D								
Single N-channel	200		180\leq10V	16													
Single N-channel	200		400\leq10V	9													
Single N-channel	200	12	400\leq10V	8.7						PHB9NQ20T							
Single N-channel	200	13.3	230\leq10V	14						PHB14NQ20T							
Single N-channel	200	22	130\leq10V	20						PHB20NQ20T							
Single N-channel	200	22	180\leq10V	16						PHB18NQ20T							
Single N-channel	200	28	70\leq10V	35						PSMN070-200B							
Single N-channel	200	37	57\leq10V	39						PSMN057-200B							
Single N-channel	200		2500\leq10V	0.55							BSP122						
Single N-channel	200	12	400\leq10V	5.2		PHX9NQ20T											
Single N-channel	200	13.3	230\leq10V	7.6		PHX14NQ20T											
Single N-channel	200	22	180\leq10V	8.2		PHX18NQ20T											
Single N-channel	200	10	230\leq10V	14					PHD14NQ20T								
Single N-channel	200	10	230\leq10V	14						PHB14NQ20T							
Single N-channel	240		5000\leq10V 7500\leq4.5V	0.375							BSP89						
Single N-channel	250		7000\leq10V	0.3													BSN254A
Single N-channel	250		7000\leq10V	0.35													BSP126
Single N-channel	300		8000\leq10V	0.25													BSN304
Single N-channel	300		8000\leq10V	0.3													BSP130
Dual N-channel	100	8	90\leq10V	2.2				PHKD3NQ10T									



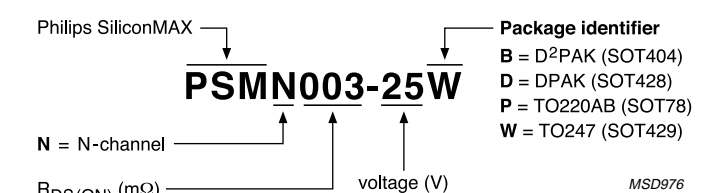
Related literature

Title	Order code
SiliconMAX™: ultralow R _{DS(on)} MOSFETs to 200V (leaflet)	939775005724
Philips Comprehensive Product Portfolio (CD-ROM set)	939775011146
High performance MOSFET's for DC-DC conversion	939775008939
Powerful solutions for DC/DC conversion	939775010455
Cool Solutions for DC/DC Conversion	939775010247
Power MOSFET Selection Guide 2002/2003	938775010214
AN10273_1 Power MOSFET Single-Shot and Repetitive Avalanche Ruggedness Rating	AN10273_1

TrenchMOS - PH types part numbering



SiliconMAX part numbering



MULTI-CHIP 25 - 300V MOSFETS

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

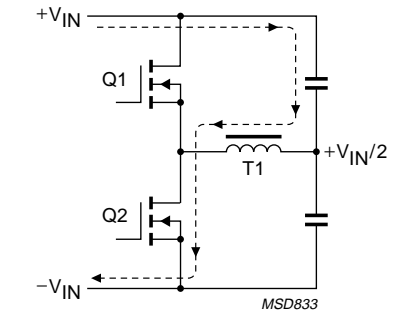
V _{DSmax} [V]	Configuration	I _{D DC} [A]	R _{DS(on)} [mΩ]	Q _{gd} (typ) [nC]	SOT137 (SO24)	SOT96-1 (SO8)	Application Keys
20	Dual N-channel	6	20@5V 45@4.5V	10		PHKD6N02LT	66
25	N-channel + schottky array	5.5	35@10V 55@4.5V	5.2	PHN603S		63
25	Dual N-channel	6.3	30@10V 55@4.5V	6.1		PHN203	63 71
30	Dual P-channel	2.3	250@10V 400@4.5V	-		PHP225	63 68 71 104
30	Dual N-channel	3.4	100@10V 200@4.5V	-		PHN210	
30	Dual N-channel	3.4	100@10V 200@4.5V	0.7		PHN210T	63 66 68 71 104
30	Dual N-channel	5	50@10V 80@4.5V	3		SI9936DY	104 108 109 110
30	Complementary Pair	3.5	100@10V 200@4.5V	2.5		PHC21025	63 68 71 104
100	Dual N-channel	2.2	90@10V	8		PHKD3NQ10T	68 69
300	Complementary Pair	0.34	8000@10V	-		PHC2300	67
25	Dual N-channel	7	<i><u>22@10V30@4.5V</u></i>	-		<i><u>PHKD7N03LT</u></i>	



Applications key

- Communication
 - 66 : Mobile phone and laptop power management
 - 67 : Line switching protection
 - 68 : Power conversion
 - 69 : Telecoms DC-DC converters
 - 70 : Synchronous rectifiers in telecom converters
 - 71 : Power (battery) management
 - 109 : Telecom
- General Purpose
 - 104 : General
- Motherboard
 - 110 : Motherboard
- PC Peripherals
 - 63 : 3.5" disk drive, CD, hard disk drive
 - 108 : PC Peripherals

HALF BRIDGE CONVERTER Q2 CONDUCTION CYCLE



Why choose Philips Semiconductors?

...SiliconMAX

- * For applications, where R_{DS(ON)} is the key factor
- * Lower R_{DS(ON)} for the same size Mosfet package, reduced gate charge (QGD) but not optimised - see Q Trench below
- * Smaller package can replace larger package for same R_{DS(ON)} value and/or reduced component count
- * Comprehensive range of D²PAK, DPAK, TO220, TO247 AND SO8 package options
- * Replacement of through-hole mounting power packages with surface mount devices
- * Reduced heat-sinking requirement

...Q Trench

- * Lower QGD for a given R_{DS(ON)}
- * Optimised for high speed, lower switching loss performance
- * Runs cooler at higher frequencies
- * Lower system loss and higher performance

Benefits

- * Volume delivery
- * Short leadtimes
- * 200 - 300V devices niche product, no competitors,

PIP3XXX HIGH SIDE

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

Type number	Package	V _{DSmax} (V)	Configuration	R _{DS(on)} (mOhm)	Operating voltage (VDC)	Channel resistance (mOhms)	Protection current (A)	Nominal current (A)
PIP3201-A	SOT263B-01 (5-lead (option) TO-220)	50	Single High Side Topfet	38	6~35	1 x 38	45	9
PIP3202-DC	SOT427 (D ² -PAK)	50	Dual High Side Topfet	40	6~35	2 x 40	30	8
PIP3203-A	SOT263B-01 (5-lead (option) TO-220)	50	Single High Side Topfet	100	6~35	1 x 100	18	3.6
<i>PIP3205-A</i>	SOT263B-01 (5-lead (option) TO-220)	50	Single High Side Topfet	14	6~35	1 x 14	15	10
PIP3206-R	SOT426 (D ² -PAK)	50	Single High Side Topfet	14	6~35	1 x 14	15	10
PIP3207-DC	SOT427 (D ² -PAK)	50	Dual High Side Topfet	40	6~35	2 x 40	30	8
PIP3208-A	SOT263 (5-lead TO-220)	50	Single High Side Topfet	180	6~35	1 x 180	9	2
PIP3209-R	SOT426 (D ² -PAK)	50	Single High Side Topfet	180	6~35	1 x 180	9	2
PIP3210-R	SOT426 (D ² -PAK)	50	Single High Side Topfet	38	6~35	1 x 38	45	9
PIP3211-R	SOT426 (D ² -PAK)	50	Single High Side Topfet	38	6~35	1 x 38	45	9
<i>PIP3212-A</i>	SOT263B-01 (5-lead (option) TO-220)	50	Single High Side Topfet	20	6~35	1 x 20	65	18
PIP3213-R	SOT426 (D ² -PAK)	50	Single High Side Topfet	20	6~35	1 x 20	65	18

PIP3XXX LOW SIDE

types in **bold red** represent new products

Type number	Package	V _{DSmax} (V)	Configuration	R _{DS(on)} (mOhm)	Operating voltage (VDC)	Channel resistance (mOhms)	Protection current (A)	Nominal current (A)
PIP3101-A	SOT263	50	Single Low Side Topfet	28	6~35	1 x 28	44	12
PIP3102-R	SOT426 (D ² -PAK)	50	Single Low Side Topfet	28	6~35	1 x 28	44	12
PIP3103-T	SOT223 (SC-73)	50	Single Low Side Topfet	200	6~35	1 x 200	1.3	0.7
PIP3104-P	SOT78B	50	Single Low Side Topfet	100	6~35	1 x 100	12	3.5
PIP3105-P	SOT78 (TO-220AB, SC-46)	50	Single Low Side Topfet	50	6~35	1 x 50	24	7
PIP3106-D	SOT428 (SC-63, D-PAK)	50	Single Low Side Topfet	100	6~35	1 x 100	12	3.5
PIP3107-D	SOT428 (SC-63, D-PAK)	50	Single Low Side Topfet	50	6~35	1 x 50	24	7
PIP3115-B	SOT404 (D ² -PAK)	50	Single Low Side Topfet	100	6~35	1 x 100	12	3.5
PIP3117-B	SOT404 (D ² -PAK)	50	Single Low Side Topfet	50	6~35	1 x 50	24	7
PIP3118-B	SOT404 (D ² -PAK)	50	Single Low Side Topfet	28	6~35	1 x 28	43	12
PIP3119-P	SOT78 (TO-220AB, SC-46)	50	Single Low Side Topfet	28	6~35	1 x 28	43	12
PIP3121-A	SOT263	50	Single Low Side Topfet	20	6~35	1 x 20	62	17.5
PIP3122-R	SOT426 (D ² -PAK)	50	Single Low Side Topfet	20	6~35	1 x 20	62	17.5

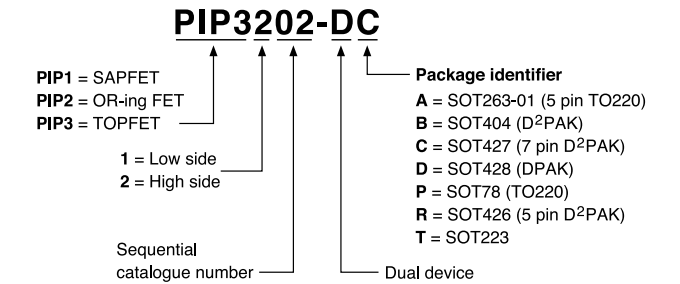


Related literature

Title
PIP3 TOFETs for industrial automation AN01048
Power MOSFET Selection Guide 2002/2003

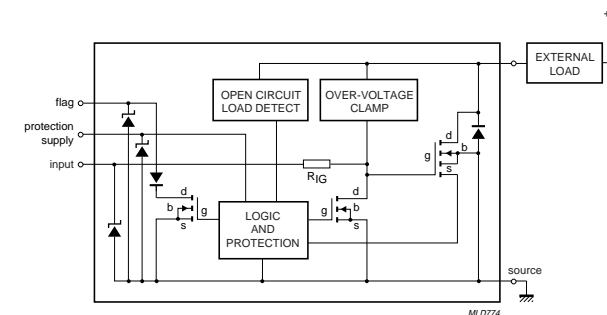
Order code
939775009069
938775010214

PIP part numbering

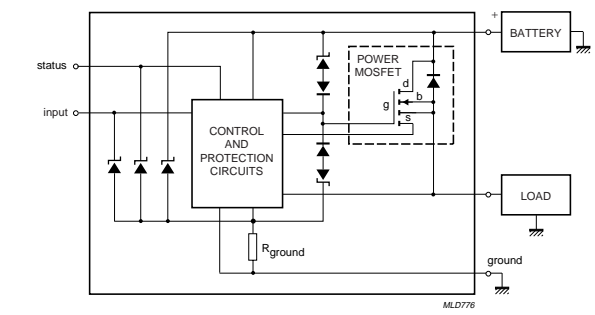


MSD844

PIP3XXX HIGH SIDE



PIP3XXX LOW SIDE



Why choose Philips Semiconductors?

...Philips Intelligent Power

- * Protection against Over Current, Over Temperature, Over Voltage and ESD.
- * Reduced costs through lower PCB 'real estate' requirement.
- * Quicker time to market by simplified design.
- * Lower component counts giving lower assembly costs.
- * No external ground resistor requirement.
- * Self protection against transients and supply polarity reversal.
- * Excellent EMC performance.

DOUBLE RESISTOR EQUIPPED TRANSISTORS

R1	R2	V _{CEO} [V]	I _C min [mA]	hFE min	hFE max	Polarity	SOT457/SC-74	SOT363/SC-88	SOT666
							600 mW	SMD 300 mW	300 mW
2.2	2.2	50	100	-	-	2 x PNP		PUMH20	
2.2	2.2	50	100	-	-	2 x NPN		PUMB20	
4.7	4.7	50	100	-	-	2 x NPN		PUMH15	
4.7	4.7	50	100	-	-	NPN/PNP		PUMD15	
4.7	4.7	50	100	-	-	2 x PNP		PUMB15	
10	10	50	100	100	600	2 x NPN		PUMH11	PEMH11
10	10	50	100	30	-	NPN/PNP		PUMD3	PEMD3
10	10	50	100	30	-	2 x PNP		PUMB11	PEMB11
22	22	50	100	56	-	2 x NPN		PUMH1	PEMH1
22	22	50	100	56	-	NPN/PNP	PIMD2	PUMD2	PEMD2
22	22	50	100	60	-	2 x PNP		PUMB1	PEMB1
47	47	50	100	68	80	2 x NPN		PUMH2	PEMH2
47	47	50	100	68	80	NPN/PNP		PUMD12	PEMD12
47	47	50	100	68	80	2 x PNP		PUMB2	PEMB2
100	100	50	100	-	-	2 x NPN		PUMH24	
2.2	47	50	100	100		2 x NPN		PUMH10	PEMH10
2.2	47	50	100	100		NPN/PNP		PUMD10	PEMD10
2.2	47	50	100	100		2 x PNP		PUMB10	PEMB10
4.7	10	50	100	-	-	2 x NPN		PUMH18	
4.7	10	50	100	-	-	2 x PNP		PUMB18	
4.7	47	50	100	100	-	2 x NPN		PUMH13	PEMH13
4.7	47	50	100	100	-	NPN/PNP		PUMD13	PEMD13
4.7	47	50	100	100	-	2 x PNP		PUMB13	PEMB13
10	47	50	100	100	-	2 x NPN	PIMH9	PUMH9	PEMH9
10	47	50	100	100	-	NPN/PNP		PUMD9	PEMD9
10	47	50	100	100	-	2 x PNP		PUMB9	PEMB9
22	47	50	100	-	-	2 x NPN		PUMH16	
22	47	50	100	-	-	NPN/PNP		PUMD16	
22	47	50	100	-	-	2 x PNP		PUMB16	
47	22	50	100	-	-	2 x NPN		PUMH17	
47	22	50	100	-	-	NPN/PNP		PUMD17	
47	22	50	100	-	-	2 x PNP		PUMB17	
4.7	-	50	100	-	-	2 x NPN		PUMH7	PEMH7
4.7	-	50	100	100	600	NPN/PNP		PUMD6	PEMD6
4.7	-	50	100	100	600	2 x PNP		PUMB3	PEMB3
10	-	50	100	100	600	2 x NPN		PUMH4	PEMH4
10	-	50	100	100	600	NPN/PNP		PUMD4	PEMD4
10	-	50	100	100	600	2 x PNP		PUMB4	PEMB4
22	-	50	100	-	-	2 x NPN		PUMH19	
47	-	50	100	-	-	2 x NPN		PUMH14	
47 / 2.2	47 / 47	50	100	-	-	NPN/PNP		PUMD48	PEMD48

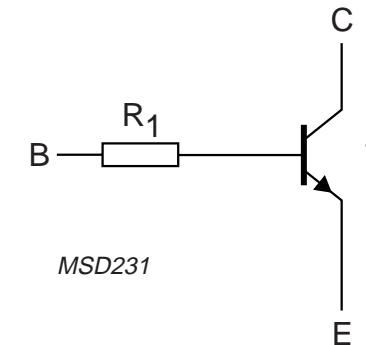


Related literature

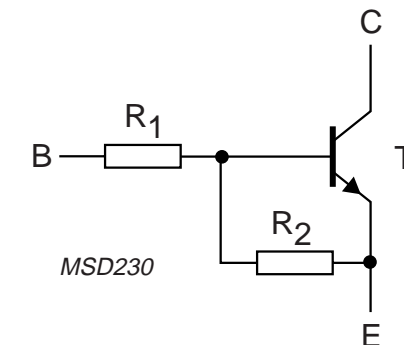
Title
Resistor-Equipped transistors (RETs), Family overview and selection guide

Order code
939775011248

Bias arrangement for one transistor

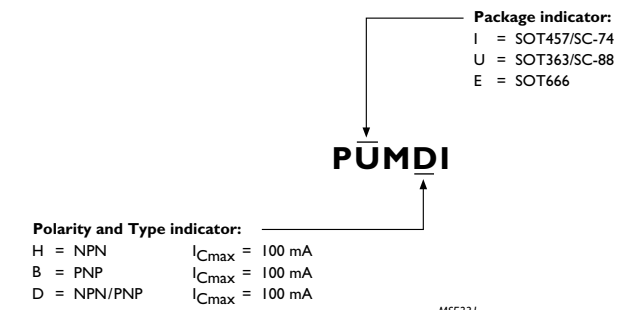


Bias arrangement for two transistors



Double Resistor-Equipped-Transistors part numbering

Double Resistor-Equipped Transistors part numbering



SINGLE RESISTOR EQUIPPED TRANSISTORS

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

R1	R2	V _{CEO} max [V]	I _C [mA]	hFE min	hFE max	Polarity	SOT346 / SC-59	SOT23	SOT323 / SC-70	SOT416 / SC-75	SOT490 / SC-89	SOT883 / SC-101	SOT54 / TO-92
							250 mW	250 mW	SMD 200 mW	150 mW	250 mW	250 mW	Leaded 500 mW
2.2	2.2	50	100	30	> 30	NPN	PDTC123EK	PDTC123ET	PDTC123EU	<i>PDTC123EE</i>	<i>PDTC123EE</i>	<i>PDTC123EM</i>	PDTC123ES
2.2	2.2	50	100	30	> 30	PNP	PDTA123EK	PDTA123ET	PDTA123EU	<i>PDTA123EE</i>	<i>PDTA123EEF</i>	<i>PDTA123EM</i>	PDTA123ES
4.7	4.7	50	100	20	> 20	NPN	PDTC143EK	PDTC143ET	PDTC143EU	PDTC143EE	PDTC143EEF	PDTC143EM	PDTC143ES
4.7	4.7	50	100	20	> 20	PNP	PDTA143EK	PDTA143ET	PDTA143EU	PDTA143EE	<i>PDTA143EEF</i>	PDTA143EM	PDTA143ES
10	10	50	100	30	> 30	NPN	PDTC114EK	PDTC114ET	PDTC114EU	PDTC114EE	PDTC114EEF	PDTC114EM	PDTC114ES
10	10	50	100	30	> 30	PNP	PDTA114EK	PDTA114ET	PDTA114EU	PDTA114EE	PDTA114EEF	PDTA114EM	PDTA114ES
22	22	50	100	56	> 56	NPN	PDTC124EK	PDTC124ET	PDTC124EU	PDTC124EE	PDTC124EEF	PDTC124EM	PDTC124ES
22	22	50	100	60	> 60	PNP	PDTA124EK	PDTA124ET	PDTA124EU	PDTA124EE	PDTA124EEF	PDTA124EM	PDTA124ES
47	47	50	100	68	> 68	NPN	PDTC144EK	PDTC144ET	PDTC144EU	PDTC144EE	PDTC144EEF	PDTC144EM	PDTC144ES
47	47	50	100	68	> 68	PNP	PDTA144EK	PDTA144ET	PDTA144EU	PDTA144EE	PDTA144EEF	PDTA144EM	PDTA144ES
100	100	50	100	80	> 80	NPN	PDTC115EK	<i>PDTC115ET</i>	PDTC115EU	PDTC115EE	PDTC115EEF	PDTC115EM	<i>PDTC115ES</i>
100	100	50	100	80	> 80	PNP	<i>PDTA115EK</i>	<i>PDTA115ET</i>	<i>PDTA115EU</i>	<i>PDTA115EE</i>	<i>PDTA115EEF</i>	<i>PDTA115EM</i>	<i>PDTA115ES</i>
2.2	47	50	100	100	> 100	NPN	PDTC123JK	PDTC123JT	PDTC123JU	PDTC123JE	PDTC123JEF	PDTC123JM	PDTC123JS
2.2	47	50	100	100	> 100	PNP	PDTA123JK	PDTA123JT	PDTA123JU	PDTA123JE	PDTA123JEF	PDTA123JM	PDTA123JS
4.7	10	50	100	50	> 50	NPN	PDTC143XK	PDTC143XT	PDTC143XU	PDTC143XE	<i>PDTC143XEF</i>	PDTC143XM	PDTC143XS
4.7	10	50	100	50	> 50	PNP	PDTA143XK	PDTA143XT	PDTA143XU	PDTA143XE	PDTA143XEF	PDTA143XM	PDTA143XS
4.7	47	50	100	100	> 100	NPN	PDTC143ZK	PDTC143ZT	PDTC143ZU	<i>PDTC143ZE</i>	<i>PDTC143ZEF</i>	PDTC143ZM	PDTC143ZS
4.7	47	50	100	100	> 100	PNP	PDTA143ZK	PDTA143ZT	PDTA143ZU	<i>PDTA143ZE</i>	<i>PDTA143ZEF</i>	PDTA143ZM	PDTA143ZS
10	47	50	100	100	> 100	NPN	PDTC114YK	PDTC114YT	PDTC114YU	PDTC114YE	<i>PDTC114YEF</i>	PDTC114YM	PDTC114YS
10	47	50	100	100	> 100	PNP	PDTA114YK	PDTA114YT	PDTA114YU	<i>PDTA114YE</i>	PDTA114YEF	PDTA114YM	PDTA114YS
22	47	50	100	80	> 80	NPN	PDTC124XK	PDTC124XT	PDTC124XU	PDTC124XE	PDTC124XEF	PDTC124XM	PDTC124XS
22	47	50	100	80	> 80	PNP	PDTA124XK	PDTA124XT	PDTA124XU	PDTA124XE	PDTA124XEF	PDTA124XM	PDTA124XS
47	22	50	100	60	> 60	NPN	PDTC144WK	PDTC144WT	PDTC144WU	<i>PDTC144WE</i>	PDTC144WEF	PDTC144WM	PDTC144WS
47	22	50	100	60	> 60	PNP	PDTA144WK	PDTA144WT	PDTA144WU	<i>PDTA144WE</i>	<i>PDTA144WEF</i>	<i>PDTA144WM</i>	PDTA144WS
4.7	-	50	100	100	600	NPN	PDTC143TK	PDTC143TT	PDTC143TU	<i>PDTC143TE</i>	PDTC143TEF	PDTC143TM	PDTC143TS
4.7	-	50	100	100	600	PNP	PDTA143TK	PDTA143TT	PDTA143TU	<i>PDTA143TE</i>	PDTA143TEF	PDTA143TM	PDTA143TS
10	-	50	100	100	600	NPN	PDTC114TK	PDTC114TT	PDTC114TU	PDTC114TE	<i>PDTC114TEF</i>	PDTC114TM	PDTC114TS
10	-	50	100	100	600	PNP	PDTA114TK	PDTA114TT	PDTA114TU	PDTA114TE	<i>PDTA114TEF</i>	PDTA114TM	PDTA114TS
22	-	50	100	100	600	NPN	PDTC124TK	PDTC124TT	PDTC124TU	<i>PDTC124TE</i>	PDTC124TEF	PDTC124TM	PDTC124TS
22	-	50	100	100	600	PNP	PDTA124TK	PDTA124TT	PDTA124TU	<i>PDTA124TE</i>	<i>PDTA124TEF</i>	<i>PDTA124TM</i>	PDTA124TS
47	-	50	100	100	unspecified	NPN	PDTC144TK	PDTC144TT	PDTC144TU	PDTC144TE	PDTC144TEF	PDTC144TM	PDTC144TS
47	-	50	100	100	unspecified	PNP	PDTA144TK	PDTA144TT	PDTA144TU	<i>PDTA144TE</i>	<i>PDTA144TEF</i>	<i>PDTA144TM</i>	PDTA144TS



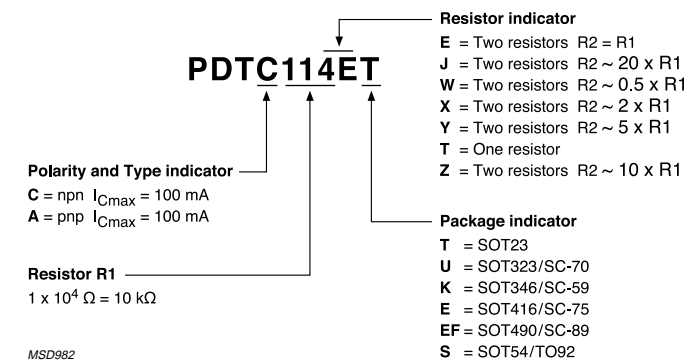
Related literature

Title
Resistor-Equipped transistors (RETs), Family overview and selection guide

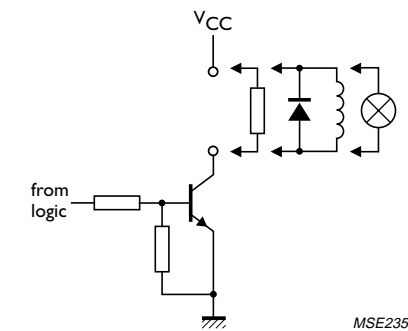
Order code

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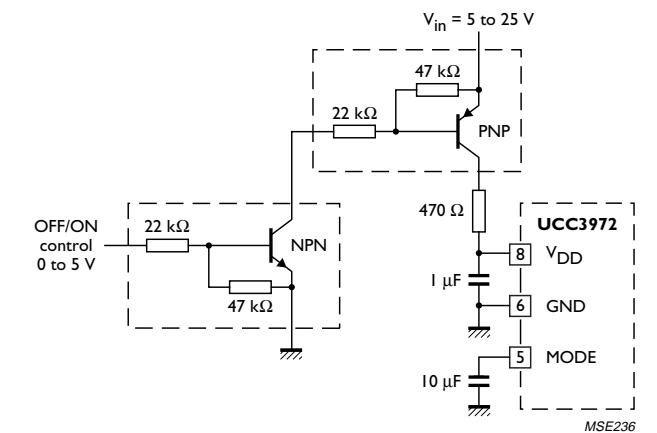
Single Resistor-Equipped-Transistors part numbering



RETs can be used to switch small loads



RETs can be used to control IC inputs



VDMOS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLF145	SOT123A	HFVDMOS RF POWER Transistor	27	Broadcast and HF Communication transmitters	40	30	0 - 28	28
BLF147	SOT121B	VHFVDMOS RF POWER Transistor	18	Broadcast and VHF Communication transmitters	70	150	28 - 108	28
BLF175	SOT123A	VHFVDMOS RF POWER Transistor	20	Broadcast and VHF Communication transmitters	65	30	28 - 108	50
BLF177	SOT121B	VHFVDMOS RF POWER Transistor	19	Broadcast and VHF Communication transmitters	70	150	28 - 108	50
BLF202	SOT409A	VHFVDMOS RF POWER Transistor	13	Broadcast and VHF Communication transmitters	55	2	175	12.5
BLF242	SOT123A	VHFVDMOS RF POWER Transistor	16	Broadcast and VHF Communication transmitters	60	5	175	28
BLF244	SOT123A	VHFVDMOS RF POWER Transistor	17	Broadcast and VHF Communication transmitters	65	15	175	28
BLF245	SOT123A	VHFVDMOS RF POWER Transistor	15.5	Broadcast and VHF Communication transmitters	65	30	175	28
BLF245B	SOT279A	VHFVDMOS RF POWER Transistor	18	Broadcast and VHF Communication transmitters	65	30	175	28
BLF246	SOT121B	VHFVDMOS RF POWER Transistor	18	Broadcast and VHF Communication transmitters	65	80	108	28
BLF246B	SOT161A	VHFVDMOS RF POWER Transistor	19	Broadcast and VHF Communication transmitters	65	60	175	28
BLF248	SOT262A1	VHFVDMOS RF POWER Transistor	13	Broadcast and VHF Communication transmitters	67	300	225	28
BLF278	SOT262A1	VHFVDMOS RF POWER Transistor	16	Broadcast and VHF Communication transmitters	55	250	225	50
BLF346	SOT119A	VHFVDMOS RF POWER Transistor	16.5	Broadcast and VHF Communication transmitters	-	30	225	28
BLF368	SOT262A1	VHFVDMOS RF POWER Transistor	13.5	Broadcast and VHF Communication transmitters	62	300	225	32
BLF404	SOT409A	UHFVDMOS RF POWER Transistor	11.5	Broadcast, PMR and UHF Communication transmitters	55	4	500	12.5
BLF521	SOT172D	UHFVDMOS RF POWER Transistor	13	Broadcast, PMR and UHF Communication transmitters	60	2	500	12.5
BLF542	SOT171A	UHFVDMOS RF POWER Transistor	16.5	Broadcast, PMR and UHF Communication transmitters	60	5	500	28
BLF544	SOT171A	UHFVDMOS RF POWER Transistor	14	Broadcast, PMR and UHF Communication transmitters	60	20	500 - 960	28
BLF546	SOT268A	UHFVDMOS RF POWER Transistor	13	Broadcast, PMR and UHF Communication transmitters	60	80	500	28
BLF548	SOT262A2	UHFVDMOS RF POWER Transistor	11	Broadcast, PMR and UHF Communication transmitters	55	150	500	28

BIPOLAR

Type number	Package	Description	Power gain (dB)	Application	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLV57	SOT161A	UHF Bipolar RF POWER Transistor	6.5	TV and UHF Communication transmitters	38	860	25
BLW33	SOT122A	UHF Bipolar RF POWER Transistor	10.5	TV and UHF Communication transmitters	1.15	860	25
BLW34	SOT122A	UHF Bipolar RF POWER Transistor	10.2	TV and UHF Communication transmitters	2.15	860	25

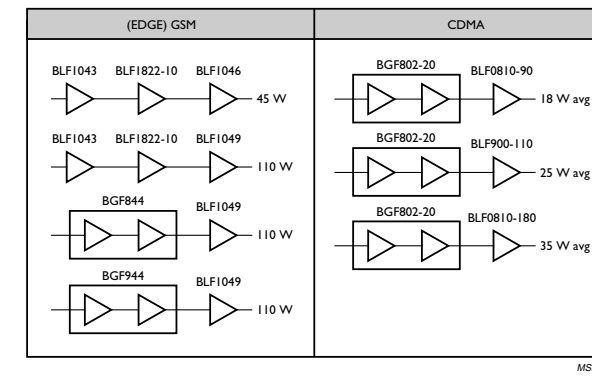
LDMOS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLF647	SOT540A (LDMOST)	UHF LDMOS RF POWER Transistor	16	Broadcast, Military and UHF Communication transmitters	55	150	0 - 600	32
BLF861A	SOT540A (LDMOST)	UHF LDMOS RF POWER Transistor	15	TV and UHF Communication transmitters	55	150	470 - 860	32

1.0 GHZ LDMOS TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLF0810-180	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	15.6	CDMA	35@2-Tone 26@CDMA	140 (2-Tone) / 32 (avg CDMA)	800 - 1000	28
BLF0810-90	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	16	CDMA	35@2-Tone 26@CDMA	60 (2-Tone) / 20 (avg CDMA)	800 - 1000	27
BLF1043	SOT538A	UHF LDMOS RF POWER Transistor	18.5	GSM, Broadcast and UHF Communication transmitters	40@2-Tone	10 (2-Tone)	0 - 960	26
BLF1046	SOT467C (LDMOST)	UHF LDMOS RF POWER Transistor	17	UHF Communication transmitters	40@2-Tone	45 (2-Tone)	0 - 960	26
BLF1049	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	17	EDGE	49@CW-min 25@EDGE	100 (CW) / 45 (avg EDGE)	800 - 1000	28

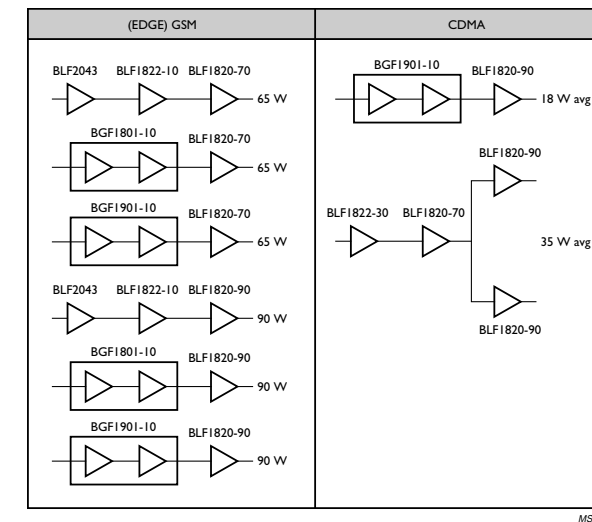
Basestations lineups 1 GHz



1.8 - 2.0 GHZ LDMOS TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLF1820-70	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	12	GSM, EDGE, CDMA	30@CW-min	65 (CW)	1800 - 2000	26
BLF1820-90	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	12	GSM, EDGE, CDMA	30@CW-min	90 (CW)	1800 - 2000	26
BLF1822-10	SOT467C (LDMOST)	Basestation LDMOS RF POWER Transistor	>11	W-CDMA, CDMA and Broadcast drivers	30@CW-min	10 (CW)	0 - 2200	26
BLF2043	SOT538A	UHF LDMOS RF POWER Transistor	12.5	EDGE, GSM, Broadcast and UHF Communication transmitters	36.5@2-Tone	10 (2-Tone)	0 - 2000	26
BLF2043F	SOT467C (LDMOST)	UHF LDMOS RF POWER Transistor	>11	EDGE, GSM, Broadcast and UHF Communication transmitters	30@2-Tone-min	10 (2-Tone)	0 - 2200	26
BLF2045	SOT467C (LDMOST)	UHF LDMOS RF POWER Transistor	>10	GSM, Broadcast and UHF Communication transmitters	30@2-Tone-min	30 (2-Tone)	1800 - 2200	26

Basestations lineups 2 GHz

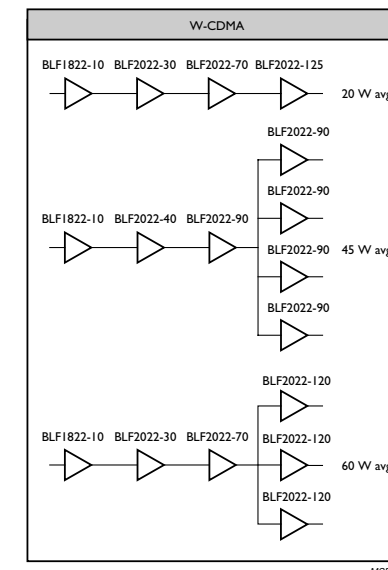


2.0 - 2.2 GHZ LDMOS TRANSISTORS

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

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Frequency (MHz)	Operating voltage (VDC)
BLF2022-120	SOT539A (LDMOST)	Basestation LDMOS RF POWER Transistor	12	W-CDMA	32@CW 20@W-CDMA	120 (CW) / 20 (avg W-CDMA)	2000 - 2200	28
<i>BLF2022-125</i>	SOT634A	Basestation LDMOS RF POWER Transistor	12	W-CDMA	32@CW 19@W-CDMA	125 (CW) / 20 (avg W-CDMA)	2000 - 2200	28
BLF2022-30	SOT608A	Basestation LDMOS RF POWER Transistor	12.5	W-CDMA	30@CW-min 20@W-CDMA	30 (CW) / 4 (avg W-CDMA)	2000 - 2200	28
BLF2022-70	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	13	W-CDMA	30@CW-min 20@W-CDMA	65 (CW) / 10 (avg W-CDMA)	2000 - 2200	28
BLF2022-90	SOT502A (LDMOST)	Basestation LDMOS RF POWER Transistor	13.2	W-CDMA	35.7@CW 20@W-CDMA	90 (CW) / 15 (avg W-CDMA)	2000 - 2200	28

Basestations lineups 2.2 GHz



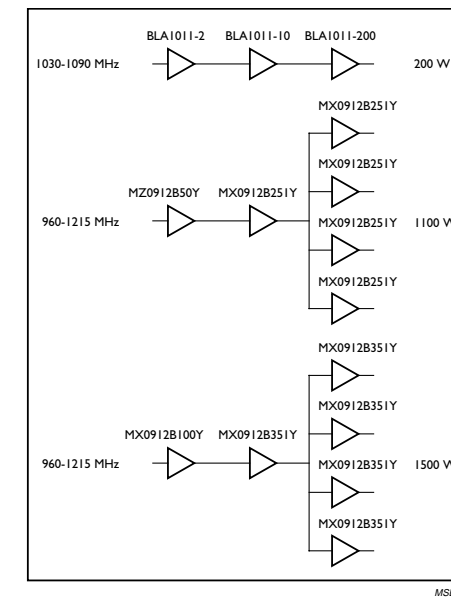
AVIONICS BIPOLAR TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Pulse width (us)	Frequency (MHz)	Operating voltage (VDC)	Duty cycle (%)
MX0912B100Y	SOT439A	Avionics Bipolar RF POWER Transistor	7.5	Avionics - TACAN, JTIDS, DME	45	115	10	960 - 1215	50	10
MX0912B251Y	SOT439A	Avionics Bipolar RF POWER Transistor	7.5	Avionics - TACAN, JTIDS, DME	45	275	10	960 - 1215	50	10
MX0912B351Y	SOT439A	Avionics Bipolar RF POWER Transistor	7.5	Avionics - TACAN, JTIDS, DME	45	375	10	960 - 1215	50	10
MZ0912B100Y	SOT439A	Avionics Bipolar RF POWER Transistor	7.5	Avionics - TACAN, JTIDS, DME	45	115	10	960 - 1215	50	10
MZ0912B50Y	SOT443A	Avionics Bipolar RF POWER Transistor	8	Avionics - TACAN, JTIDS, DME	45	60	10	960 - 1215	50	10

AVIONICS LDMOS TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Pulse width (us)	Frequency (MHz)	Operating voltage (VDC)	Duty cycle (%)
BLA1011-10	SOT467C (LDMOST)	Avionics LDMOS RF POWER Transistor	18	Avionics - TCAS, IFF, Mod-S	50	10	50	1030 - 1090	36	1
BLA1011-2	SOT538A	Avionics LDMOS RF POWER Transistor	18	Avionics - TCAS, IFF, Mod-S	50	2	50	1030 - 1090	36	1
BLA1011-200	SOT502A (LDMOST)	Avionics LDMOS RF POWER Transistor	15	Avionics - TCAS, IFF, Mod-S	50	200	50	1030 - 1090	36	1

Microwave lineups for Avionics



MSE277

L-BAND BIPOLAR TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Pulse width (us)	Frequency (MHz)	Operating voltage (VDC)	Duty cycle (%)
RX1214B300Y	SOT439A	L-Band Radar Bipolar RF POWER Transistor	8	L-band Radar	40	320	150	1200 - 1400	50	5
RX1214B350Y	SOT439A	L-Band Radar Bipolar RF POWER Transistor	8	L-band Radar	45	380	130	1200 - 1400	50	6
RZ1214B35Y	SOT443A	L-Band Radar Bipolar RF POWER Transistor	8	L-band Radar	35	40	150	1200 - 1400	50	5
RZ1214B65Y	SOT443A	L-Band Radar Bipolar RF POWER Transistor	8	L-band Radar	40	80	150	1200 - 1400	50	5

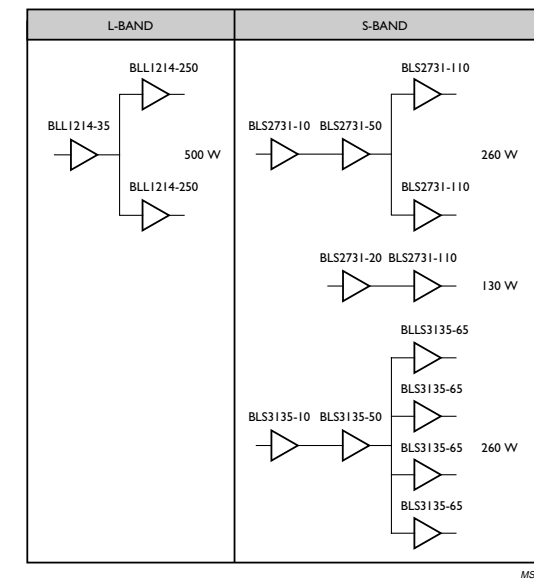
L-BAND LDMOS TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Pulse width (us)	Frequency (MHz)	Operating voltage (VDC)	Duty cycle (%)
BLL1214-250	SOT502A (LDMOST)	L-Band Radar LDMOS RF POWER Transistor	13	L-band Radar	50	250	100	1200 - 1400	36	10
BLL1214-35	SOT467C (LDMOST)	L-Band Radar LDMOS RF POWER Transistor	14	L-band Radar	45	35	100	1200 - 1400	36	10

S-BAND BIPOLAR TRANSISTORS

Type number	Package	Description	Power gain (dB)	Application	Efficiency (%)	Load power (W)	Pulse width (us)	Frequency (MHz)	Operating voltage (VDC)	Duty cycle (%)
BLS2731-10	SOT445C	S-Band Radar Bipolar RF POWER Transistor	10	S-band Radar	45	12.5	100	2700 - 3100	40	10
BLS2731-110	SOT423A	S-Band Radar Bipolar RF POWER Transistor	8	S-band Radar	40	110	100	2700 - 3100	40	10
BLS2731-20	SOT445C	S-Band Radar Bipolar RF POWER Transistor	10	S-band Radar	40	25	100	2700 - 3100	40	10
BLS2731-50	SOT422A	S-Band Radar Bipolar RF POWER Transistor	9	S-band Radar	40	60	100	2700 - 3100	40	10
BLS3135-10	SOT445C	S-Band Radar Bipolar RF POWER Transistor	9	S-band Radar	40	10	100	3100 - 3500	40	10
BLS3135-20	SOT422A	S-Band Radar Bipolar RF POWER Transistor	8	S-band Radar	40	20	100	3100 - 3500	40	10
BLS3135-50	SOT422A	S-Band Radar Bipolar RF POWER Transistor	8	S-band Radar	40	50	100	3100 - 3500	40	10
BLS3135-65	SOT422A	S-Band Radar Bipolar RF POWER Transistor	8	S-band Radar	40	65	100	3100 - 3500	40	10

Microwave lineups for radar



MSE276

TRANSISTOR WIDEBAND NPN UP TO 3.5 GHz

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	GUM @ f1 (dB)	GUM @ f2 (dB)	@ f1	@ f2
BF547	SOT23 (SST3)	-	50	-	NPN	300	1.2	100	20	-	100	-
BF547W	SOT323 (UMT3, CMPAK)	-	50	-	NPN	300	1.2	100	20	-	100	-
BF747	SOT23 (SST3)	-	50	-	NPN	300	1.2	100	20	-	100	-
BFG16A	SOT223 (SC-73)	-	150	-	NPN	1000	1.5	500	10	-	500	-
BFQ17	SOT89 (MPT3, UPAK)	-	150	-	NPN	1000	1.5	200	16	6.5	200	800
BFR53	SOT23 (SST3)	-	50	5@f1	NPN	250	2	500	-	10.5	500	800
BFS17	SOT23 (SST3)	-	25	4.5@f1	NPN	300	1	500	-	-	500	-
BFS17A	SOT23 (SST3)	10	25	2.5@f1 25@250 MHz 25@250 MHz	NPN	300	2.8	800	13.5	-	800	-
BFS17W	SOT323 (UMT3, CMPAK)	3-8	50	2.5@f1 25@250 MHz 25@250 MHz	NPN	300	1.6	500	-	-	500	-
BFT25	SOT23 (SST3)	-	6.5	3.8@f1	NPN	30	2.3	500	18	12	500	800
MPSH10	SOT54 (SPT, E-1)	-	40	-	NPN	1000	0.65	-	-	-	-	-
PMBTH10	SOT23 (SST3)	-	40	-	NPN	400	0.65	-	-	-	-	-

TRANSISTOR WIDEBAND NPN UP TO 6 GHz

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	P _L (W)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	GUM @ f1 (dB)	GUM @ f2 (dB)	@ f1	@ f2
BFG35	SOT223 (SC-73)	10	150	-	-	NPN	1000	4	500	15	11	500	800
BFG92A/X	SOT143B	-	25	3@f2 2@f1	-	NPN	400	5	1000	16	11	1000	2000
BFG93A	SOT143B	-	35	2.3@f2 1.7@f1	-	NPN	300	6	1000	16	10	1000	2000
BFG93A/X	SOT143B	-	35	2.3@f2 1.7@f1	-	NPN	300	6	1000	16	10	1000	2000
BFG94	SOT223 (SC-73)	10	60	3@f2 2.7@f1	21.5	NPN	700	6	500	-	13.5	500	1000
BFG97	SOT223 (SC-73)	10	100	-	-	NPN	1000	5.5	500	16	12	500	800
BFQ136	SOT122A	15	600	-	-	NPN	9000	4	800	12.5	-	800	-
BFQ18A	SOT89 (MPT3, UPAK)	-	150	-	-	NPN	1000	4	-	-	-	-	-
BFQ19	SOT89 (MPT3, UPAK)	-	100	3.3@f1	-	NPN	1000	5.5	500	11.5	7.5	500	800
BFQ34/01	SOT122A	15	150	8@f1	26	NPN	2700	4	500	16.3	-	500	-
BFQ68	SOT122A	15	300	-	28	NPN	4500	4	800	13	-	800	-
BFR106	SOT23 (SST3)	9	100	3.5@f1	-	NPN	500	5	800	11.5	-	800	-
BFR92	SOT23 (SST3)	10	25	2.4@f1	-	NPN	300	5	500	18	-	500	-
BFR92A	SOT23 (SST3)	10	25	3@f2 2.1@f1 2.1@900MHz	-	NPN	300	5	1000	14	8	1000	2000
BFR92AT	SOT416 (EMT3, SMPAK)	-	25	2@f1	-	NPN	150	5	-	14	8	1000	2000
BFR92AV	SOT323 (UMT3, CMPAK)	3-10	25	3@f2 2@f1 2.1@900MHz	-	NPN	300	5	1000	14	8	1000	2000
BFR93	SOT23 (SST3)	-	35	1.9@f1	-	NPN	300	5	500	16.5	-	500	2000
BFR93A	SOT23 (SST3)	8	35	3@f2 1.9@f1 1.9@900MHz	-	NPN	300	6	1000	13	7	1000	2000
BFR93AR	SOT23 (SST3)	8	35	3@f2 1.9@f1 1.9@900MHz	-	NPN	300	6	1000	13	7	1000	2000
BFR93AT	SOT416 (EMT3, SMPAK)	-	35	1.5@f1	-	NPN	150	5	-	13	8	1000	2000
BFR93AV	SOT323 (UMT3, CMPAK)	3-10	35	2.1@f2 1.5@f1 1.9@900MHz	-	NPN	300	5	1000	13	8	1000	-

TRANSISTOR WIDEBAND NPN UP TO 8 GHZ

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	GUM @ f1 (dB)	GUM @ f2 (dB)	@ f1	@ f2
BFG135	SOT223 (SC-73)	10	150	-	NPN	1000	7	500	16	12	500	800
BFG198	SOT223 (SC-73)	8	100	-	NPN	1000	8	500	18	15	500	800
BFG591	SOT223 (SC-73)	-	200	-	NPN	2000	7	900	13	7.5	900	2000
BFG67	SOT143B	-	50	-	NPN	380	8	1000	17	10	-	-
BFG67/X	SOT143R (SC-61B)	-	50	2.5@f2 1.7@f1	NPN	380	8	1000	17	10	1000	2000
BFG67/XR	SOT143R (SC-61B)	-	50	-	NPN	380	8	1000	17	10	-	-
BFQ135	SOT172A2	18	150	-	NPN	2700	6.5	500	17	13.5	500	800
BFQ67	SOT23 (SST3)	-	50	2.7@f2 1.7@f1	NPN	300	8	1000	14	8	1000	2000
BFQ67W	SOT323 (UMT3, CMPAK)	-	50	2.7@f2 2@f1	NPN	300	8	1000	13	8	1000	2000
PBR941	SOT23 (SST3)	-	50	2@f2 1.4@f1	NPN	360	8	-	15	9.5	1000	2000
PBR951	SOT23 (SST3)	-	100	2@f2 1.3@f1	NPN	365	8	-	14	8	1000	2000

TRANSISTOR WIDEBAND NPN UP TO 10 GHZ

types in **bold red** represent new products

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Load power (W)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	GUM @ f1 (dB)	GUM @ f2 (dB)	@ f1	@ f2
BFC505	SOT353 (UMT5)	3	18	3.5@f2 1.8@f1	-	NPN	500	7.3	900	-	-	900	2000
BFC520	SOT353 (UMT5)	3	70	1.3@f1	-	NPN	1000	7	900	-	-	900	-
BFES05	SOT353 (UMT5)	-	18	1.9@f2 1.2@f1	-	NPN	500	9	900	-	-	900	2000
BFES20	SOT353 (UMT5)	-	70	1.9@f2 1.1@f1	-	NPN	1000	9	900	-	-	900	2000
BFG10	SOT143B	-	250	-	-	NPN	250	-	1900	7	-	1900	-
BFG10/X	SOT143B	-	250	-	-	NPN	250	-	1900	7	-	1900	-
BFG10W/X	SOT343N	-	-	-	28 dBm	-	-	-	-	-	-	-	-
BFG11	SOT143B	-	500	-	-	NPN	400	-	1900	5	-	1900	-
BFG11/X	SOT143B	-	500	-	-	NPN	400	-	1900	5	-	1900	-
BFG11W/X	SOT343N	-	-	-	26 dBm	-	-	-	-	-	-	-	-
BFG25A/X	SOT143B	-	6.5	1.8@f1	-	NPN	32	5	1000	18	-	1000	-
BFG25AW/X	SOT343N	-	6.5	2@f1	-	NPN	500	5	1000	16	8	1000	2000
BFG505	SOT143B	6	18	1.9@f2 1.6@f1	-	NPN	150	9	900	20	13	900	2000
BFG505/X	SOT143B	6	18	1.9@f2 1.6@f1	-	NPN	150	9	900	20	13	900	2000
BFG505W/X	SOT343N	6	18	1.9@f2 1.6@f1	-	NPN	500	9	900	19	12	900	2000
BFG520	SOT143B	6	70	1.9@f2 1.6@f1	-	NPN	300	9	900	19	13	900	2000
BFG520/X	SOT143B	6	70	1.9@f2 1.6@f1	-	NPN	300	9	900	19	13	900	2000
BFG520/XR	SOT143B	6	70	-	-	NPN	300	9	900	19	13	-	-
BFG520W	SOT343N	6	70	1.85@f2 1.6@f1 1.9@1.9GHz 1.2@900MHz	-	NPN	500	9	900	17	11	900	2000
BFG520W/X	SOT343N	6	70	1.85@f2 1.6@f1	-	NPN	500	9	900	17	11	900	2000
BFG540	SOT143B	8	120	2.1@f2 1.9@f1	-	NPN	500	9	900	18	11	900	2000
BFG540/X	SOT143B	8	120	2.1@f2 1.9@f1	-	NPN	500	9	900	18	11	900	2000

TRANSISTOR WIDEBAND NPN UP TO 10 GHZ

types in **bold red** represent new products

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Load power (W)	Polarity		P _{tot} (mW)	f _T (GHz)	@ f (MHz)	GUM @ f1 (dB)	GUM @ f2 (dB)	@ f1	@ f2
BFG540/XR	SOT143R (SC-61B)	8	120	-	-	NPN		500	9	900	18	11	-	-
BFG540W	SOT343N	-	-	-	18 dBm			-	-	-	-	-	-	-
BFG540W/X	SOT343N	8	120	2.1@f2 1.9@f1	-	NPN		500	9	900	16	10	900	2000
BFG540W/XR	SOT343N	8	120	-	-	NPN		500	9	900	16	10	-	-
BFG541	SOT223 (SC-73)	8	120	2.1@f2 1.9@f1	-	NPN		650	9	900	15	9	900	2000
BFG590	SOT143B	-	200	-	-	NPN		400	5	900	13	7.5	900	2000
BFG590/X	SOT143B	-	200	-	-	NPN		400	5	900	13	7.5	900	2000
BFG590W	SOT343N	5	200	-	-	NPN		500	5	900	13	7.5	900	2000
BFM505	SOT363 (UMT6)	3-12	18	1.9@f2 1.4@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		500	9	900	17	10	900	2000
BFM520	SOT363 (UMT6)	3-12	70	1.9@f2 1.7@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		1000	9	900	15	9	900	2000
BFQ540	SOT89 (MPT3, UPAK)	8	120	1.9@f1	-	NPN		1200	9	900	-	-	900	-
BFQ591	SOT89 (MPT3, UPAK)	-	-	-	-	NPN		2000	7	900	-	-	2000	-
BFR505	SOT23 (SST3)	6	18	1.9@f2 1.6@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		150	9	900	17	10	900	2000
BFR505T	SOT416 (EMT3, SMPAK)	-	18	1.2@f1	-	NPN		150	9	-	17	-	900	-
BFR520	SOT23 (SST3)	6	70	1.9@f2 1.6@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		300	9	900	15	9	900	2000
BFR520T	SOT416 (EMT3, SMPAK)	-	70	1.9@f2 1.6@f1	-	NPN		150	9	-	15	9	900	2000
BFR540	SOT23 (SST3)	8	120	2.1@f2 1.9@f1	-	NPN		480	9	900	14	7	900	2000
BFS25A	SOT323 (UMT3, CMPAK)	-	6.5	1.8@f1	-	NPN		32	5	1000	13	-	1000	-
BFSS505	SOT323 (UMT3, CMPAK)	6	18	1.9@f2 1.6@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		150	9	900	17	10	900	2000
BFSS520	SOT323 (UMT3, CMPAK)	6	70	1.9@f2 1.6@f1 1.9@1.9GHz 1.2@900MHz	-	NPN		300	9	900	15	9	900	2000
BFSS540	SOT323 (UMT3, CMPAK)	8	120	2.1@f2 1.9@f1	-	NPN		500	9	900	14	8	900	2000
BFT25A	SOT23 (SST3)	-	6.5	1.8@f1	-	NPN		32	5	1000	15	-	1000	-
PRF947	SOT323 (UMT3, CMPAK)	-	50	2.1@f2 1.5@f1	-	NPN		250	8.5	-	16	10	1000	2000
PRF949	SOT416 (EMT3, SMPAK)	-	50	1.5@f1	-	NPN		150	9	-	16	-	1000	-
PRF957	SOT323 (UMT3, CMPAK)	-	100	1.8@f2 1.3@f1	-	NPN		270	8.5	-	15	9.2	1000	2000

TRANSISTOR WIDEBAND NPN UP TO 25 GHZ

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Load power (W)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	Gain @ 900 Mhz (dB)	Gain @ 1.9 GHz (dB)	@ f1	@ f2	Power gain (dB)	Efficiency % min
BFG21W	SOT343R (CMPAK-4)	3.6	200	-	0.4		600	18	700	-	-	-	-	11	50
BFG403W	SOT343R (CMPAK-4)	1	3.6	1.6@f2 1@f1 1.6@1.9GHz 1@900MHz	-	NPN	16	17	900	20	22	900	2000	-	-
BFG410W	SOT343R (CMPAK-4)	2	12	1.2@f2 0.9@f1 0.9@1.9GHz 1.2@900MHz	-	NPN	54	22	900	21	29	900	2000	-	-
BFG425W	SOT343R (CMPAK-4)	2	30	1.2@f2 0.8@f1 0.8@1.9GHz 1.2@900MHz	-	NPN	135	25	900	20	28	900	2000	-	-
BFG480W	SOT343R (CMPAK-4)	2	250	1.8@f2 1.2@f1	-	NPN	360	21	-	-	16	900	2000	-	-

TRANSISTOR WIDEBAND NPN UP TO 45 GHZ

types in **bold red** represent new products

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Polarity	P _{tot} (mW)	f _T (GHz)	Gain @ 1.9 GHz (dB)	@ f1	@ f2
BFU510	SOT343R (CMPAK-4)	2	250	1.8@f2 1.2@f1	NPN	360	21	16	900	2000
BFU540	SOT343R (CMPAK-4)	2	250	1.8@f2 1.2@f1	NPN	360	21	16	900	2000

TRANSISTOR WIDEBAND PNP UP TO 3.5 GHZ

Type number	Package	V _{CE} (V)	I _C (A)	Polarity	P _{tot} (mW)	f _T (GHz)
BSR12	SOT23 (SST3)	10	100	PNP	250	1.5
PMBT3640	SOT23 (SST3)	5	80	PNP	350	0.5
PMBTH81	SOT23 (SST3)	10	40	PNP	400	0.6

TRANSISTOR WIDEBAND PNP UP TO 6 GHz

Type number	Package	V _{CE} (V)	I _C (A)	Noise figure (dB)	Polarity	P _{tot} (mW)	f _T (GHz)	@ f (MHz)	G _{UM} @ f1 (dB)	G _{UM} @ f2 (dB)	@ f1	@ f2
BFG31	SOT223 (SC-73)	10	100	-	PNP	1000	5	500	16	12	500	800
BFQ149	SOT89 (MPT3, UPAK)	-	100	3.75@f1	PNP	1000	5	500	12	-	500	-
BFT92	SOT23 (SST3)	10	25	2.5@f1	PNP	300	5	500	18	-	500	-
BFT92W	SOT323 (UMT3, CMPAK)	-	35	3@f2 2.5@f1	PNP	300	5	500	17	11	500	1000
BFT93	SOT23 (SST3)	5	35	2.4@f1	PNP	300	5	500	16.5	-	500	-
BFT93W	SOT323 (UMT3, CMPAK)	-	50	3@f2 2.4@f1	PNP	300	5	500	15.5	10	500	1000

TRANSISTORS FOR 900 MHz PORTABLE EQUIPMENT

Type number	Package	Load power (W)	Power gain (dB)	Efficiency % min	Efficiency % typ	Frequency (MHz)	telecom system	Thermal Resistance (K/W)
BLT70	SOT223 (SC-73)	0.6	6	60		900	analog cellular	39
BLT80	SOT223 (SC-73)	0.8	6	60	67	900	analog cellular	22
BLT81	SOT223 (SC-73)	1.2	6	60	70	900	analog cellular	32



Related literature

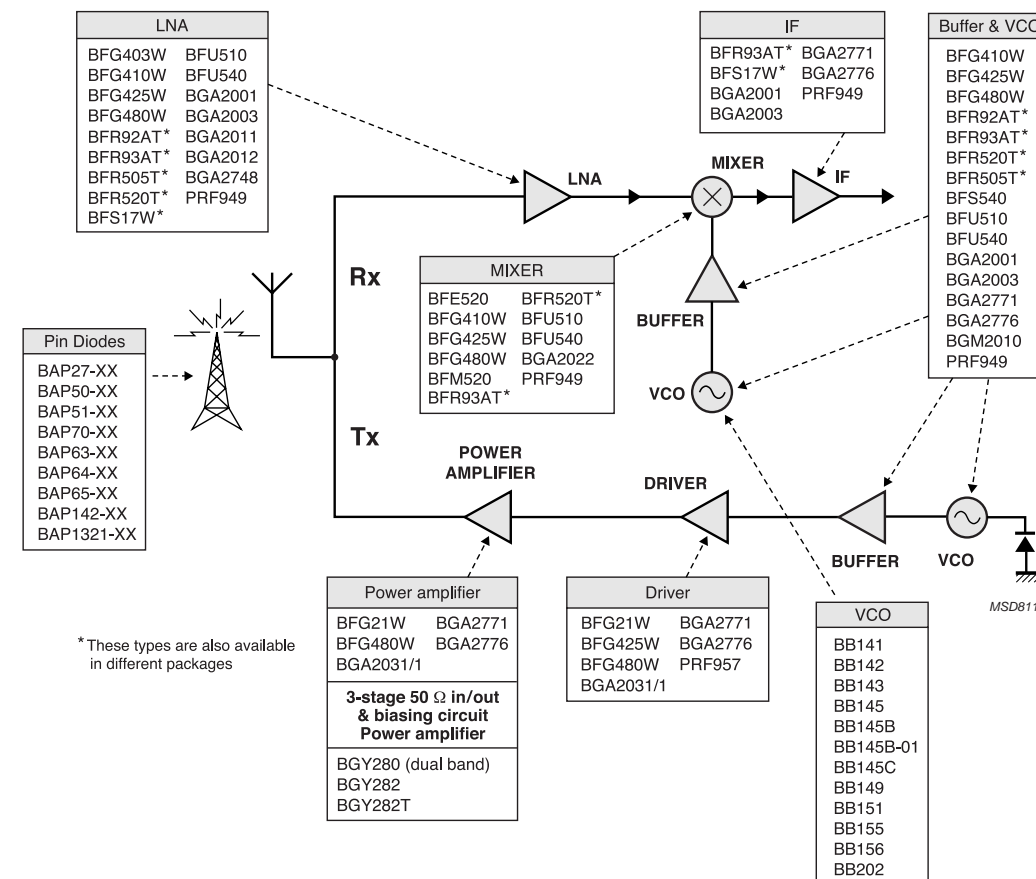
Title

- Discrete Semiconductors Packages (brochure)
- RF Wideband Transistors and MMIC's (databook)
- Philips Comprehensive Product Catalog (CD-ROM set)
- RF Wideband Transistors and MMICs for Wireless

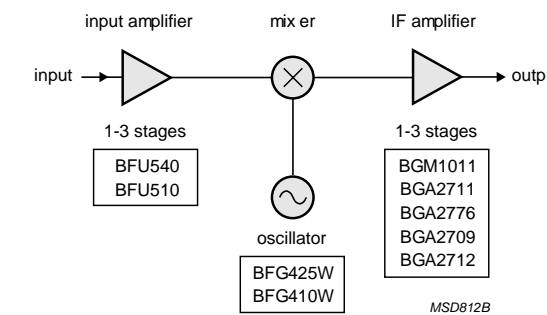
Order code

- 939775005011
- 939775006311
- 939775011146
- 939775008634

Generic cell phone front-end application diagram



Satellite dish LNB application diagram



Why choose Philips Semiconductors?

- ...Wideband transistors**
- * Our broad wideband transistor portfolio offers highest price performance at highest reliability.
- Benefits**
- * Volume delivery
- * Short leadtimes
- * Broad portfolio
- * Smallest packages

N-CHANNEL DUAL GATE MOSFETS

Type number	Package	Remarks	V _{DS} max (V)	I _D (A)	Noise figure (dB)	-V(P)GS MAX (V)	Y _{FS} (ms)	CIS TYP (pF)	I _{DSS} (mA)	Note	I _{DSS} (mA)	COS (pf)	Application Keys
BF1100	SOT143B	VHF and UHF	14	30	2@800MHz	1	24	2.2	1.4	Partly internal bias	8 to 13	1.4	125 152
BF1100R	SOT143R (SC-61B)	VHF and UHF	14	30	2@800MHz	1	24	2.2	1.4	Partly internal bias	8 to 13	1.4	125 152
BF1100WR	SOT343R (CMPAK-4)	VHF and UHF	14	30	2@800MHz	1	24	2.2	1.4	Partly internal bias	8 to 13	1.4	125 152
BF1101	SOT143B	VHF and UHF	7	30	1.7@800MHz	1	25	2.2	-	Partly internal bias	8 to 16	1.2	125 152
BF1101R	SOT143R (SC-61B)	VHF and UHF	7	30	1.7@800MHz	1	25	2.2	-	Partly internal bias	8 to 16	1.2	125 152
BF1101WR	SOT343R (CMPAK-4)	VHF and UHF	7	30	1.7@800MHz	1	25	2.2	-	Partly internal bias	8 to 16	1.2	125 152
BF1102	SOT363 (UMT6)	-	7	40	2@800MHz	1	36	2.8	-	Partly internal bias	12 to 20	1.6	125 152
BF1102R	SOT363 (UMT6)	-	7	40	2@800MHz	1	36	2.8	-	Partly internal bias	12 to 20	1.6	125 152
BF1105	SOT143B	VHF and UHF	7	30	1.7@800MHz	1.2	25	2.2	-	Fully internal bias	8 to 16	1.2	125 152
BF1105R	SOT143B	VHF and UHF	7	30	1.7@800MHz	1.2	25	2.2	-	Fully internal bias	8 to 16	1.2	125 152
BF1105WR	SOT143B	VHF and UHF	7	30	1.7@800MHz	1.2	25	2.2	-	Fully internal bias	8 to 16	1.2	125 152
BF1109	SOT143B	VHF and UHF	11	30	1.5@800MHz	1	24	2.2	-	Fully internal bias	8 to 16	1.3	125 152
BF1109R	SOT143B	VHF and UHF	11	30	1.5@800MHz	1	24	2.2	-	Fully internal bias	8 to 16	1.3	125 152
BF1109WR	SOT143B	VHF and UHF	11	30	1.5@800MHz	1	24	2.2	-	Fully internal bias	8 to 16	1.3	125 152
BF1201	SOT143B	VHF and UHF	10	30	1.9@800MHz	1	23	2.6	-	Partly internal bias	11 to 19	0.9	125 152
BF1201R	SOT143R (SC-61B)	VHF and UHF	10	30	1.9@800MHz	1	23	2.6	-	Partly internal bias	11 to 19	0.9	125 152
BF1201WR	SOT343R (CMPAK-4)	VHF and UHF	10	30	1.9@800MHz	1	23	2.6	-	Partly internal bias	11 to 19	0.9	125 152
BF1202	SOT143B	VHF and UHF	10	30	1.1@800MHz	1	25	1.7	-	Partly internal bias	8 to 16	0.85	125 152
BF1202R	SOT143R (SC-61B)	VHF and UHF	10	30	1.1@800MHz	1	25	1.7	-	Partly internal bias	8 to 16	0.85	125 152
BF1202WR	SOT343R (CMPAK-4)	VHF and UHF	10	30	1.1@800MHz	1	25	1.7	-	Partly internal bias	8 to 16	0.85	125 152
BF1203	SOT363 (UMT6)	VHF and UHF	10	30	1.9@800MHz	1	23	2.6	-	Partly internal bias	11 to 19	0.9	125 152
BF1203/MA	SOT363	VHF and UHF	10	30	1.8@800MHz	1.2	23	2.6	-	Partly internal bias	11 to 19	0.9	125 152
BF1204	SOT363 (UMT6)	VHF and UHF	10	30	1.1@800MHz	1	25	1.7	-	Partly internal bias	8 to 16	0.85	125 152
BF904	SOT143B	VHF and UHF	7	30	2@800MHz	1	22	2.2	1.3	With external bias	8 to 13	1.3	125 152
BF904R	SOT143R (SC-61B)	VHF and UHF	7	30	2@800MHz	1	22	2.2	1.3	With external bias	8 to 13	1.3	125 152
BF904WR	SOT343R (CMPAK-4)	VHF and UHF	7	30	2@800MHz	1	22	2.2	1.3	With external bias	8 to 13	1.3	125 152
BF908	SOT143B	VHF and UHF	12	40	1.5@800MHz	2	36	3.1	1.7	With external bias	3 to 27	1.7	105 119 120 125 152
BF908R	SOT143R (SC-61B)	VHF and UHF	12	40	1.5@800MHz	2	36	3.1	1.7	With external bias	3 to 27	1.7	105 119 120 125 152
BF908WR	SOT343R (CMPAK-4)	VHF and UHF	12	40	1.5@800MHz	2	36	3.1	1.7	With external bias	3 to 27	1.7	105 119 120 125 152
BF909	SOT143B	VHF and UHF	7	40	2@800MHz	1	36	3.6	2.3	With external bias	12 to 20	2.3	125 152
BF909R	SOT143R (SC-61B)	VHF and UHF	7	40	2@800MHz	1	36	3.6	2.3	With external bias	12 to 20	2.3	125 152
BF909WR	SOT343R (CMPAK-4)	VHF and UHF	7	40	2@800MHz	1	36	3.6	2.3	With external bias	12 to 20	2.3	125 152
BF991	SOT143B	VHF	20	20	0.7@800MHz	2.5	10	2.1	1.1	With external bias	4 to 25	1.1	125 152
BF992	SOT143B	VHF	20	40	1.2@800MHz	1.3	20	4	2	With external bias	-	2	125 152
BF994S	SOT143B	VHF	20	30	1@800MHz	2	15	2.5	1	With external bias	4 to 20	1	125 152
BF996S	SOT143B	UHF	20	30	1.8@800MHz	2.5	15	2.3	0.8	With external bias	4 to 20	0.8	125 152
BF998	SOT143R (SC-61B)	VHF and UHF	12	30	1@800MHz	2	21	2.1	1.05	With external bias	2 to 18	1.05	105 119 120 125 152
BF998R	SOT143R (SC-61B)	VHF and UHF	12	30	1@800MHz	2	21	2.1	1.05	With external bias	2 to 18	1.05	105 119 120 125 152
BF998WR	SOT343R (CMPAK-4)	VHF and UHF	12	30	1@800MHz	2	22	2.1	1.05	With external bias	2 to 18	1.05	105 119 120 125 152



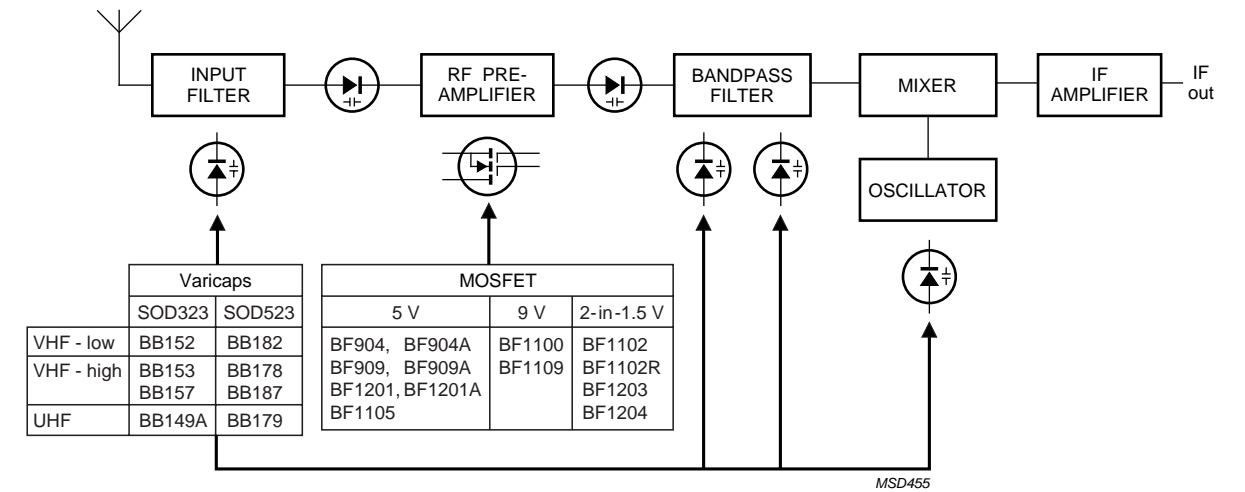
Applications key

- Automotive
 - 105 : Automotive
 - 119 : Car infotainment
 - 120 : Car radio/CD/tape systems
- Consumer
 - 125 : Consumer Multimedia
 - 152 : Standard TV

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS

Type number	Package	V _{DSmax} (V)	Kind	-V(P)GS (V)	Y _{FS} (ms)	CRS (pF)	I _G (mA)	I _{DSS} (mA)	Application Keys
BF245A	SOT54 (SPT, E-1)	30	DC, LF and HF amplifiers	<8	3 to 6.5	1.1	10	2 to 6.5	156
BF245B	SOT54 (SPT, E-1)	30	DC, LF and HF amplifiers	<8	3 to 6.5	1.1	10	6 to 15	156
BF245C	SOT54 (SPT, E-1)	30	DC, LF and HF amplifiers	<8	3 to 6.5	1.1	10	12 to 25	156
BF510	SOT23 (SST3)	20	RF stages FM portables, car radios, main radios and mixer stages	typ. 0.8	2.5	0.4	10	0.7 to 3	61 105 119 120
BF511	SOT23 (SST3)	20	RF stages FM portables, car radios, main radios and mixer stages	typ. 1.5	4	0.4	10	2.5 to 7	61 105 119 120
BF512	SOT23 (SST3)	20	RF stages FM portables, car radios, main radios and mixer stages	typ. 2.2	6	0.4	10	6 to 12	61 105 119 120
BF513	SOT23 (SST3)	20	RF stages FM portables, car radios, main radios and mixer stages	typ. 3	7	0.4	10	10 to 18	61 105 119 120
BF545A	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.4 to 7.5	3 to 6.5	0.8	10	2 to 6.5	156
BF545B	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.4 to 7.5	3 to 6.5	0.8	10	6 to 15	156
BF545C	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.4 to 7.5	3 to 6.5	0.8	10	12 to 25	156
BF556A	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.5 to 7.5	4.5	0.8	10	3 to 7	156
BF556B	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.5 to 7.5	4.5	0.8	10	6 to 13	156
BF556C	SOT23 (SST3)	30	DC, LF and HF amplifiers	0.5 to 7.5	0.5	0.8	10	11 to 18	156
BF861A	SOT23 (SST3)	25	Preamplifiers for AM tuners in car radios	0.2 to 1.0	12	2.1	10	2 to 6.5	105 119 120
BF861B	SOT23 (SST3)	25	Preamplifiers for AM tuners in car radios	0.5 to 1.5	16	2.1	10	6 to 15	105 119 120
BF861C	SOT23 (SST3)	25	Preamplifiers for AM tuners in car radios	0.8 to 2.0	20	2.1	10	12 to 25	105 119 120
BF862	SOT23 (SST3)	25	Preamplifiers for AM tuners in car radios	20	35	1.9	10	10 to 25	105 119 120
BFR30	SOT23 (SST3)	25	Low level general purpose amplifiers	<5	1 to 4	1.5	5	4 to 10	156
BFR31	SOT23 (SST3)	25	Low level general purpose amplifiers	<2.5	1.5 to 4.5	1.5	5	1 to 5	156
BFT46	SOT23 (SST3)	25	General purpose amplifiers	<1.2	<1	1.5	5	0.2 to 1.5	156
PMBFJ308	SOT23 (SST3)	25	AM input stages UHF/VHF amplifiers	1 to 6.5	<10	1.3	50	12 to 60	105 119 120
PMBFJ309	SOT23 (SST3)	25	AM input stages UHF/VHF amplifiers	1 to 4	<10	1.3	50	12 to 30	105 119 120
PMBFJ310	SOT23 (SST3)	25	AM input stages UHF/VHF amplifiers	2 to 6.5	<10	1.3	50	24 to 60	105 119 120

TV/VCR/DVD tuning application diagram



Applications key

- Automotive
 - 105 : Automotive
 - 119 : Car infotainment
 - 120 : Car radio/CD/tape systems
- Car radio
 - 61 : low noise amplifier
- General purpose
 - 156 : RF amplifiers



Related literature

Title	Order code
Discrete Semiconductors Packages (brochure)	939775005011
Small-Signal Field-effect Transistors and Diodes (databook)	939775006017
Philips Comprehensive Product Catalog (CD-ROM set)	939775011146

Why choose Philips Semiconductors?

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- * Our broad portfolio offers high flexibility in biasing circuitry with the lowest total cost of ownership.
- Benefits
- * Volume delivery
 - * Short leadtimes
 - * Broad portfolio
 - * Fet's for tuner applications with optimised performance
 - * 2 in 1 Fet's for tuner applications
 - * Smallest packages

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS FOR SWITCHING

Type number	Package	V _{DSmax} (V)	-V(P)GS (V)	CRS (pF)	t _{on} (ns)	t _{off} (ns)	I _{DSS} (mA)	I _{DSS} (mA)	V(P)GS (V)	V(P)GS (V)	R _{DS(on)} (Ohm)	t _{off} (ns)	I _G (mA)	I _{DSS} (mA)	Application Keys
BSR56	SOT23 (SST3)	40	4 to 10	5		25	50		4	10	25		50	50	157
BSR57	SOT23 (SST3)	40	2 to 6	5		50	20	100	2	6	40		50	20 to 100	156 157
BSR58	SOT23 (SST3)	40	0.8 to 4	5		100	8	80	0.8	4	60		50	8 to 80	156 157
J108	SOT54 (SPT, E-1)	25	3 to 10	15	typ. 4		80		3	10	8	6	50	80	156 157
J109	SOT54 (SPT, E-1)	25	2 to 6	15	typ. 4		40		2	6	12	6	50	40	156 157
J110	SOT54 (SPT, E-1)	25	0.5 to 4	15	typ. 4		10		0.5	4	18	6	50	10	157
J111	SOT54 (SPT, E-1)	40	3 to 10	typ. 3	typ. 13		20		3	10	30	35	50	20	157
J112	SOT54 (SPT, E-1)	40	1 to 5	typ. 3	typ. 13		5		1	5	50	35	50	5	157
J113	SOT54 (SPT, E-1)	40	0.5 to 3	typ. 3	typ. 13		2		0.5	3	100	35	50	2	157
PMBF4391	SOT23 (SST3)	40	4 to 10	3.5	15	20	50	150	4	10	30		50	50 to 150	157
PMBF4392	SOT23 (SST3)	40	2 to 5	3.5	15	35	25	75	2	5	60		50	25 to 75	157
PMBF4393	SOT23 (SST3)	40	0.5 to 3	3.5	15	50	5	30	0.5	3	100		50	5 to 30	157
PMBFJ108	SOT23 (SST3)	25	3 to 10	15	typ. 4		80		3	10	8	6	50	80	157
PMBFJ109	SOT23 (SST3)	25	2 to 6	15	typ. 4		40		2	6	12	6	50	40	157
PMBFJ110	SOT23 (SST3)	25	0.5 to 4	15	typ. 4		10		0.5	4	18	6	50	10	157
PMBFJ111	SOT23 (SST3)	40	3 to 10	typ. 3	typ. 13		20		3	10	30	35	50	20	157
PMBFJ112	SOT23 (SST3)	40	1 to 5	typ. 3	typ. 13		5		1	5	50	35	50	5	157
PMBFJ113	SOT23 (SST3)	40	0.5 to 3	typ. 3	typ. 13		2		0.5	3	100	35	50	2	157
PN4392	SOT54 (SPT, E-1)	40	2 to 5	5	15	35	25		2	5	60		50	25	157
PN4393	SOT54 (SPT, E-1)	40	0.5 to 3	5	15	50	5		0.5	3	100		50	5	157

P-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS FOR SWITCHING

Type number	Package	V _{DSmax} (V)	-V(P)GS MAX (V)	-V(P)GS (V)	CRS (pF)	t _{on} (ns)	t _{off} (ns)	I _{DSS} (mA)	I _{DSS} (mA)	R _{DS(on)} (Ohm)	-V(P)GS MIN (V)	CRS TYP (pF)	t _{on} (ns)	t _{off} (ns)	I _G (mA)	I _{DSS} (mA)	I _G	Application Keys
J174	SOT54 (SPT, E-1)	30	10	5 to 10	4	7	15	20	135	85	5	4	7	15	50	20 to 135	50	157
J175	SOT54 (SPT, E-1)	30	6	3 to 6	4	15	30	7	70	125	3	4	15	30	50	7 to 70	50	157
J176	SOT54 (SPT, E-1)	30	4	1 to 4	4	35	35	2	35	250	1	4	35	35	50	2 to 35	50	157
J177	SOT54 (SPT, E-1)	30	2.25	0.8 to 2.25	4	45	45	1.5	20	300	0.8	4	45	45	50	1.5 to 20	50	157
PMBFJ174	SOT23 (SST3)	30	10	5 to 10	4	7	15	20	135	85	5	4	7	15	50	20 to 135	50	157
PMBFJ175	SOT23 (SST3)	30	6	3 to 6	4	15	30	7	70	125	3	4	15	30	50	7 to 70	50	157
PMBFJ176	SOT23 (SST3)	30	4	1 to 4	4	35	35	2	35	250	1	4	35	35	50	2 to 35	50	157
PMBFJ177	SOT23 (SST3)	30	2.25	0.8 to 2.25	4	45	45	1.5	20	300	0.8	4	45	45	50	1.5 to 20	50	157

N-CHANNEL, SINGLE GATE MOSFETS FOR SWITCHING

Type number	Package	V _{DSmax} (V)	I _D (A)	V(P)GS (V)	V(P)GS (V)	Mode	R _{DS(on)} (Ohm)	C _{RSS} (pF)	t _{on} /t _{off} (ns)	I _{GSS} max (nA)	V _{SG} max (V)	S _{21(on)} (dB)	S _{21(off)} (dB)	[S _{21(On)}] ₂ max	[S _{21(Off)}] ₂ min	Application Keys
BF1107	SOT23 (SST3)	3	10			depl.	20			100	7	2.5	30	-2.5	-30	157
BF1108	SOT143B	3	10			depl.	20			100	7	3	30	-3	-30	157
BF1108R	SOT143R (SC-61B)	3	10			depl.	20			100	7	3	30	-3	-30	157
BSD22	SOT143B	20	50		2	depl.	30	0.6	1/5							157
BSS83	SOT143B	10	50	0.1	2	enh.	45	0.6	1/5							157



Applications key

- Automotive
 105 : Automotive
 119 : Car infotainment
 120 : Car radio/CD/tape systems
 General purpose
 156 : RF amplifier
 157 : RF switch



Related literature

- Title
 Discrete Semiconductors Packages (brochure) 939775005011
 Small-Signal Field-effect Transistors and Diodes (databook) 939775006017
 Philips Comprehensive Product Catalog (CD-ROM set) 939775011146

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 * Smallest packages

Switching transistors

SINGLE SWITCHING TRANSISTORS

I _C max [mA]	V _{CEO} max [V]	hFE min	hFE max	f _T min [MHz]	t _{off} [ns]	Polarity	SOT54 / TO-92	SOT223 / SC-73	SOT89 / SC-62	SOT23	SOT323 / SC-70	
							Leaded	SMD				
							Ptot max. 500 mW	Ptot max. 1150 mW	Ptot max. 1300 mW	Ptot max. 250 mW	Ptot max. 200 mW	
100	12	40	120	400	20	NPN				BSV52		
100	40	100	300	150	700	PNP				PMBS3906	PMSS3906	
100	40	100	300	180	1200	NPN				PMBS3904	PMSS3904	
100	40	100	300	150	690	PNP	MPS3906					
100	40	100	300	180	990	NPN	MPS3904					
100	40	100	300	250	300	PNP				BSR18A		
100	40	100	300	300	240	NPN				BSR17A		
100	40	100	300	250	300	PNP	2N3906	PZT3906	PXT3906	PMBT3906	PMST3906	
100	40	100	300	300	240	NPN	2N3904	PZT3904	PXT3904	PMBT3904	PMST3904	
200	40	100	300	250	300	PNP				MMBT3906		
200	40	100	300	300	240	NPN				MMBT3904		
200	15	40	120	500	20	NPN	PH2369			PMBT2369	PMST2369	
600	15	40	120	500	30	NPN	PN2369A					
600	30	100	300	250	250	NPN				PMBT2222	PMST2222	
600	40	100	300	200	365	PNP				BSR15		
600	40	75	75	300	250	NPN						
600	40	100	300	200	350	PNP		PZT4403	PXT4403	PMBT4403	PMST4403	
600	40	100	300	200	365	PNP				PMBT2907		
600	40	100	300	250	250	NPN	2N4401	PZT4401	PXT4401	PMBT4401		
600	40	100	300	250	250	NPN					PMST4401	
600	40	100	300	300	250	NPN	PN2222A PH2222A	PZT2222A	PXT2222A	MMBT2222A PMBT2222A	PMST2222A	
600	40	100	300	250	250	NPN						
600	60	100	300	200	365	PNP				BSR16		
600	60	100	300	200	365	PNP	PH2907A PN2907A	PZT2907A	PXT2907A	PMBT2907A	PMST2907A	
800	30	100	300	250	250	NPN				BSR13		
800	40	100	300	300	250	NPN				BSR14		

DOUBLE SWITCHING TRANSISTOR

I _C max [mA]	V _{CEO} max [V]	hFE min	hFE max	f _T min [MHz]	t _{off} [ns]	Polarity	SOT457 / SC-74
100	40	100	300	300	24	dual NBN	PMBT3904D