

Small Signal Discretes

Small signal devices are semiconductor components found in almost every electronic circuit. They are used in a variety of applications such as radio, television, logic circuits, computing, control and automation, handling "small signals" with short duration, low power and high frequencies. Current market demand for portable digital communications, signal processing equipment and other handheld multimedia creates a necessity for miniaturized electronic components, to enable slim and small designs, but without compromising in functionality and performance.

Diotec offers a wide range of small signal components including high-speed Switching Diodes, Zener Diodes, ESD Diodes, Voltage Regulators, Bipolar Transistors and MOSFETs. Package sizes are 0603, 1608, SOT-23, SOT-323, SOT-363, SOT-26, SOD-523, (Power) SOD-323, SOD-123(F/FL), SOD-106 and SOD-80C. With the exemption of the last two packages, all of these are totally free of lead (Pb), with other words fully RoHS compliant without any exemption.

Some highlights of our Small signal discrete components:

Small Signal diodes

- Switching, Schottky & Zener diodes
- Ultra-low profile SMD packages
- Several internal pin configurations such as single diode, common cathode, common anode, series connections and bridge configuration

ESD Protection diodes

- Switching, Schottky & Zener diode
- Ultra-low profile & miniaturized leadless packages
- Lower C_j value components for better signal integrity

Shunt Regulators

- Switching, Schottky & Zener diode
- Ultra-low profile & miniaturized leadless packages

Bipolar Transistors

- Standard NPN and PNP bipolar transistors
- Digital transistors integrated with Resistors for space and cost saving
- Ultra-low profile & miniaturized leadless packages.
- Matched pair bipolar transistor for improved performance in amplifier circuits

MOSFETs

- Low R_{DS(on)}
- Gate protection
- Ultra-low profile & lead less QFN packages for space saving and higher thermal performance

Linear Voltage Regulators:

- Standard, Low Dropout voltage & Low Quiescent current regulators
- High power density
- Thermal overload and short circuit protection

Features

Epitaxial planar diodes
Fast switching
Low forward voltage
Low junction capacitance
Small to ultra-small packages
Very high to Ultra high frequency applications
Lead free & fully ROHS compliant
Available in AEC-Q101 grade

Applications

Signal processing
Switching devices
Logic circuits
Clipper and clamper circuits
Voltage and current regulation
High frequency rectification
Controls and drives

ESD Protection Diodes

Part no	Package	Configuration	P _{PPM} [W]	V _{RRM} [V]	V _{BR Min} [V]	C _j [pF]	IEC61000-4-2 (contact)
ESD0521Z	0201	Bidirectional	100 W	5.0 V	6.0 V	0.5 pF	± 17 kV
ESD0541Z		Bidirectional	25 W	5.0 V	6.0 V	6.5 pF	± 17 kV
ESD03B3Z *)		Bidirectional	170 W	3.3 V	3.7 V	30 pF	± 30 kV
ESD01B5Z *)		Bidirectional	75 W	1.5 V	4.0 V	0.55pF	± 18 kV
ESD9BL0521P	SOD-882	Bidirectional	100 W	5.0 V	6.0 V	0.5 pF	± 8 kV
ESD9BL0522P		Bidirectional	80 W	5.0 V	6.0 V	0.4 pF	± 15 kV
ESD9L1P8 *)		Unidirectional	80 W	1.8 V	2.2 V	30 pF	± 30 kV
ESD9L36P *)		Unidirectional	200 W	36 V	38 V	18 F	± 30 kV
ESD5Z3V3	SOD-523	Unidirectional	134 W	3.3 V	5.0 V	105 pF	± 16 kV
ESD5Z5V0		Unidirectional	148 W	5.0 V	6.2 V	80 pF	± 16 kV
ESD5Z6V0		Unidirectional	154 W	6.0 V	6.8 V	70 pF	± 16 kV
ESD5Z12		Unidirectional	204 W	12 V	14.1 V	55 pF	± 16 kV
ESD5Z24		Unidirectional	300 W	24 V	25.5 V	25 pF	± 25 kV
ESD3V3WT *)		Unidirectional	40 W	3.3 V	2.8 V ¹⁾	30 pF	± 20 kV
ESD3Z5V0	SOD-323F	Unidirectional	350 W	5.0 V	6.0 V	350 pF	± 30 kV (air)
ESD3Z12		Unidirectional	350 W	12 V	13.3 V	150 pF	± 30 kV (air)
ESD3B5V0WS	SOD-323	Bidirectional	350 W	5.0 V	6.0 V	200 pF	± 30 kV
ESD3B12WS		Bidirectional	350 W	12 V	13.3 V	100 pF	± 30 kV
ESD3B15WS		Bidirectional	350 W	15 V	16.7 V	75 pF	± 30 kV
ESD3B24WS		Bidirectional	350 W	24 V	26.7 V	50 pF	± 30 kV
ESD3V3CA	SOT-23	Common Anode	200 W	3.3 V	4.5 V	600 pF	± 16 kV
ESD5V0CA		Common Anode	200 W	5.0 V	6.0 V	400 pF	± 16 kV
ESD24CA		Common Anode	200 W	24 V	26.7 V	63 pF	± 16 kV
ESD36CA		Common Anode	200 W	12 V	40 V	60 pF	± 16 kV
ESDB3V3C		Bidirectional	350 W	3.3 V	5.8 V	101 pF	± 30kV
ESDB5V0C		Bidirectional	350 W	5.0 V	7.0 V	75 pF	± 30kV
ESDB12C		Bidirectional	200 W	12 V	14.2 V	19 pF	± 30kV
ESDB15C		Bidirectional	200 W	15 V	17.1 V	16 pF	± 30kV
ESDB24C		Bidirectional	200 W	24 V	25.4 V	11 pF	± 23kV

*) under development

1) Snap-back Voltage

Package Internal configuration

0201, SOD-882, SOD-523, SOD-323F & SOD-323

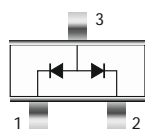


Unidirectional

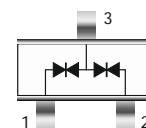


Bidirectional

SOT-23



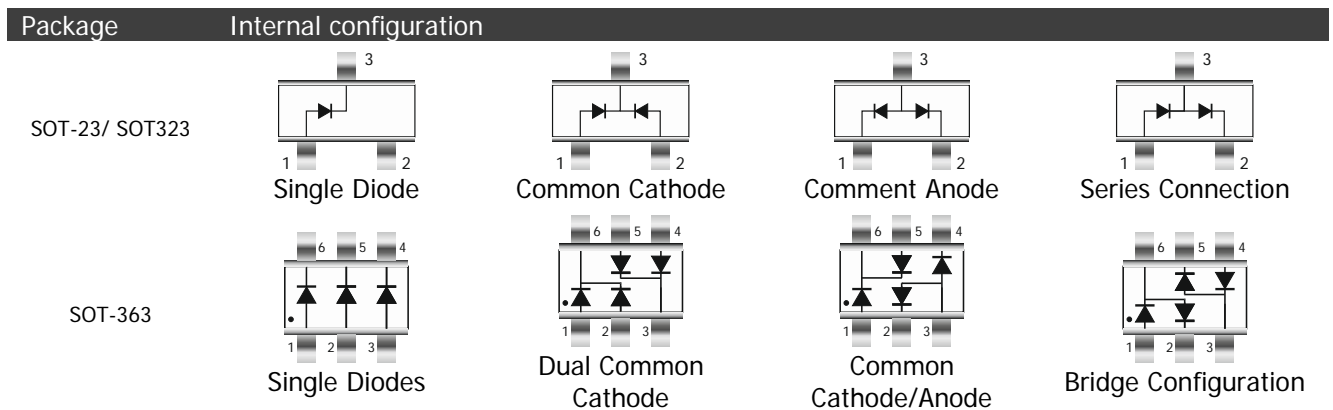
Common Anode



Bidirectional

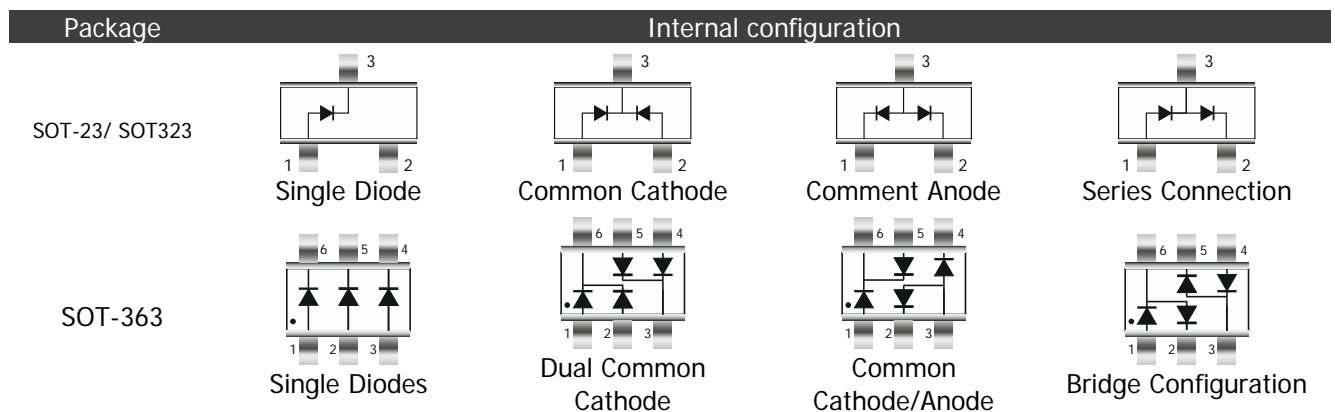
Small Signal Switching Diodes

Part no	Package	Internal configuration	I _{FAV}	V _{RRM}	P _{tot}	
1N4148W	SOD-123F 	Single diode	150 mA	100 V	400 mW	
1N4448W		Single diode	150 mA	100 V	400 mW	
MCL4148	Micro-Melf (~SOD-106) 	Single diode	150 mA	100 V	500 mW	
MCL4448		Single diode	150 mA	100 V	500 mW	
1N4148WS	SOD-323F 	Single diode	150 mA	100 V	200 mW	
1N4448WS		Single diode	150 mA	100 V	200 mW	
1SS5004WS		Single diode	225 mA	400 V	350 mW	
BAS316WS		Single diode	250 mA	100 V	200 mW	
BAV19WS		Single diode	200 mA	120 V	200 mW	
BAV20WS		Single diode	200 mA	200 V	200 mW	
BAV21WS		Single diode	200 mA	250 V	200 mW	
1N4148WT		SOD-523 	Single diode	125 mA	100 V	150 mW
BAS216WT			Single diode	250 mA	85 V	150 mW
BAS16	Single diode		215 mA	85 V	350 mW	
BAW56	Common Anode		215 mA	85 V	350 mW	
BAV99	Series connection		215 mA	85 V	350 mW	
BAV199	Series connection		215 mA	85 V	350 mW	
BAV99L	Series connection		215 mA	100 V	250 mW	
BAV70	Common Cathode		215 mA	100 V	250 mW	
BAS19	Single diode		200 mA	120 V	250 mW	
BAS20	Single diode		200 mA	200 V	250 mW	
BAS21	Single diode	200 mA	250 V	250 mW		
BAS31	SOT-23 	Series Connection	200 mA	120 V	350 mW	
BAS35		Common Anode	200 mA	120 V	350 mW	
BAV23I		Single diode	225 mA	250 V	250 mW	
BAV23CA		Common Anode	225 mA	250 V	250 mW	
BAV23CC		Common Cathode	225 mA	250 V	250 mW	
BAV23SE		Series Connection	225 mA	250 V	250 mW	
BAS21W		SOT-323 	Single diode	200 mA	250 V	250 mW
BAS16W			Single diode	150 mA	85 V	200 mW
BAV70W			Common Cathode	175 mA	85 V	200 mW
BAW56W			Common Anode	150 mA	85 V	200 mW
BAV99W	Series Connection		125 mA	85 V	200 mW	
BAV199W	Series Connection		140 mA	85 V	200 mW	
BAS16DW	SOT-363 		Single diodes	150 mA	75 V	200 mW
BAV70DW			Common Cathode	150 mA	75 V	200 mW
BAV756DW		Common Cathode/Anode	150 mA	75 V	200 mW	
MMBD4448SDW		Bridge Configuration	150 mA	75 V	200 mW	







Small Signal Schottky Diodes

Part no	Package	Internal configuration	I _{FAV}	V _{RRM}	P _{tot}
BAT46W	SOD-123F	Single diode	150 mA	100 V	200 mW
SD101AW		Single diode	15 mA	60 V	400 mW
SD101BW		Single diode	15 mA	50 V	400 mW
SD101CW		Single diode	15 mA	40 V	400 mW
SD103AW		Single diode	350 mA	40 V	400 mW
SD103BW		Single diode	350 mA	30 V	400 mW
SD103CW		Single diode	350 mA	20 V	400 mW
MCL103B	Micro-Melf (~SOD-106)	Single diode	350 mA	30 V	400 mW
MCL103C		Single diode	350 mA	20 V	400 mW
BAT46WS	SOD-323F	Single diode	150 mA	100 V	230 mW
BAT54WS		Single diode	200 mA	30 V	230 mW
SDB13HS	Power SOD-323	Single diode	1.0 A	30 V	600 mW
SDB14HS		Single diode	1.0 A	40 V	600 mW
SDB160WS		Single diode	1.0 A	60 V	600 mW
BAS70E	SOD-523	Single diode	70 mA	70 V	150 mW
BAS70-04E		Series Connection	70 mA	70 V	150 mW
BAS70-05E		Common Cathode	70 mA	70 V	150 mW
BAS70-06E		Common Anode	70 mA	70 V	150 mW
BAS40	SOT-23	Single diode	200 mA	40 V	310 mW
BAS40-04		Series Connection	200 mA	40 V	310 mW
BAS40-05		Common Cathode	200 mA	40 V	310 mW
BAS40-06		Common Anode	200 mA	40 V	310 mW
BAT54		Single diode	200 mA	30 V	290 mW
BAT54A		Common Anode	200 mA	30 V	290 mW
BAT54C		Common Cathode	200 mA	30 V	290 mW
BAT54S		Series Connection	200 mA	30 V	290 mW
BAS70		Single diode	70 mA	70 V	200 mW
BAS70-04		Series Connection	70 mA	70 V	200 mW
BAS70-05	Common Cathode	70 mA	70 V	200 mW	
BAS70-06	Common Anode	70 mA	70 V	200 mW	
BAS70W	SOT-323	Single diode	70 mA	70 V	200 mW
BAS70-04W		Series Connection	70 mA	70 V	200 mW
BAS70-05W		Common Cathode	70 mA	70 V	200 mW
BAS70-06W		Common Anode	70 mA	70 V	200 mW
BAT54W		Single diode	200 mA	30 V	200 mW
BAT54SW		Series Connection	200 mA	30 V	200 mW
BAT54CW		Common Cathode	200 mA	30 V	200 mW
BAT54AW	Common Anode	200 mA	30 V	200 mW	



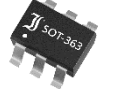


Small Signal Bipolar transistors


Part no	Package	Polarity	I _{C Max}	V _{CEO}	P _{tot}	h _{FE}
BC846BP	SOT-883	NPN	200 mA	65 V	150 mW	200 ... 450
BC847BP		NPN	200 mA	45 V	150 mW	200 ... 450
BC848BP		NPN	200 mA	30 V	150 mW	200 ... 450
BC817-16		NPN	1A	45 V	310 mW	100 ... 250
BC817-25		NPN	1A	45 V	310 mW	160 ... 400
BC817-40		NPN	1A	45 V	310 mW	250 ... 630
BC818-16		NPN	1A	25 V	310 mW	100 ... 250
BC818-25		NPN	1A	25 V	310 mW	160 ... 400
BC818-40		NPN	1A	25 V	310 mW	250 ... 630
BC846A		NPN	200 mA	65 V	250 mW	Typ. 90
BC846B		NPN	200 mA	65 V	250 mW	Typ. 150
BC846C		NPN	200 mA	65 V	250 mW	Typ. 270
BC847A		NPN	200 mA	45 V	250 mW	Typ. 90
BC847B		NPN	200 mA	45 V	250 mW	Typ. 150
BC847C		NPN	200 mA	45 V	250 mW	Typ. 270
BC848A		NPN	200 mA	30 V	250 mW	Typ. 90
BC848B		NPN	200 mA	30 V	250 mW	Typ. 150
BC848C		NPN	200 mA	30 V	250 mW	Typ. 270
BC849A		NPN	200 mA	30 V	250 mW	Typ. 90
BC849B		NPN	200 mA	30 V	250 mW	Typ. 150
BC849C		NPN	200 mA	30 V	250 mW	Typ. 270
BC850A	NPN	200 mA	45 V	250 mW	Typ. 90	
BC850B	NPN	200 mA	45 V	250 mW	Typ. 150	
BC850C	NPN	200 mA	45 V	250 mW	Typ. 270	
MMBTA06		NPN	500 mA ^{DC}	80 V	250 mW	100 (min)
MMBTA42		NPN	500 mA ^{DC}	300 V	250 mW	40 (max)
MMBTA44		NPN	500 mA ^{DC}	400 V	250 mW	40 (max)
MMBT2222A		NPN	800 mA	40 V	250 mW	100 ... 300
MMBT3904		NPN	200 mA ^{DC}	40 V	350 mW	100 ... 300
MMBT4401		NPN	600 mA ^{DC}	40 V	300 mW	Typ. 200
MMBT5551		NPN	600 mA ^{DC}	160 V	250 mW	80 ... 150
BC846AW		NPN	200 mA	65 V	200 mW	110 ... 220
BC846BW		NPN	200 mA	65 V	200 mW	200 ... 450
BC846CW		NPN	200 mA	65 V	200 mW	420 ... 800
BC847AW		NPN	200 mA	45 V	200 mW	110 ... 220
BC847BW		NPN	200 mA	45 V	200 mW	200 ... 450
BC847CW	NPN	200 mA	45 V	200 mW	420 ... 800	
BC848AW	NPN	200 mA	30 V	200 mW	110 ... 220	
BC848BW	NPN	200 mA	30 V	200 mW	200 ... 450	
BC848CW	NPN	200 mA	30 V	200 mW	420 ... 800	
BC849AW	NPN	200 mA	30 V	200 mW	110 ... 220	
BC849BW	NPN	200 mA	30 V	200 mW	200 ... 450	
BC849CW	NPN	200 mA	30 V	200 mW	420 ... 800	

Part no	Package	Polarity	$I_{C\ Max}$	V_{CEO}	P_{tot}	h_{FE}
BC807-16	 SOT-23	PNP	- 800 mA	- 50 V	310 mW	100 ... 250
BC807-25		PNP	- 800 mA	- 50 V	310 mW	160 ... 400
BC807-40		PNP	- 800 mA	- 50 V	310 mW	250 ... 630
BC808-16		PNP	- 800 mA	- 30 V	310 mW	100 ... 250
BC808-25		PNP	- 800 mA	- 30 V	310 mW	160 ... 400
BC808-40		PNP	- 800 mA	- 30 V	310 mW	250 ... 630
BC845A		PNP	- 200 mA	- 65 V	250 mW	Typ. 90
BC856B		PNP	- 200 mA	- 65 V	250 mW	Typ. 150
BC856C		PNP	- 200 mA	- 65 V	250 mW	Typ. 270
BC857A		PNP	- 200 mA	- 45 V	250 mW	Typ. 90
BC857B		PNP	- 200 mA	- 45 V	250 mW	Typ. 150
BC857C		PNP	- 200 mA	- 45 V	250 mW	Typ. 270
BC858A		PNP	- 200 mA	- 30 V	250 mW	Typ. 90
BC858B		PNP	- 200 mA	- 30 V	250 mW	Typ. 150
BC858C		PNP	- 200 mA	- 30 V	250 mW	Typ. 270
BC859A		PNP	- 200 mA	- 30 V	250 mW	Typ. 90
BC859B		PNP	- 200 mA	- 30 V	250 mW	Typ. 150
BC859C		PNP	- 200 mA	- 30 V	250 mW	Typ. 270
BC860A		PNP	- 200 mA	- 45 V	250 mW	Typ. 90
BC860B		PNP	- 200 mA	- 45 V	250 mW	Typ. 150
BC860C	PNP	- 200 mA	- 45 V	250 mW	Typ. 270	
BC807W-16	 SOT-323	PNP	- 500 mA	- 50 V	200 mW	100 ... 250
BC807W-25		PNP	- 500 mA	- 50 V	200 mW	160 ... 400
BC807W-40		PNP	- 500 mA	- 50 V	200 mW	250 ... 600
BC808W-16		PNP	- 500 mA	- 30 V	200 mW	100 ... 250
BC808W-25		PNP	- 500 mA	- 30 V	200 mW	160 ... 400
BC808W-40		PNP	- 500 mA	- 30 V	200 mW	250 ... 600

Small Signal MOSFETs

Part no	Package	Polarity	I_{DM}	V_{DS}	P_{tot}	$R_{thDS(on)}$	
MMFTN20	 SOT-23	N	300 mA	50 V	300 mW	15 Ω	
MMFTN123		N	680 mA	100 V	360 mW	6 Ω	
MMFTN138		N	880 mA	50 V	360 mW	3.5 Ω	
MMFTN170		N	800 mA	60 V	300 mW	5 Ω	
MMBT7002K		N	300 mA	60 V	350 mW	3 Ω	
MMNFTN3402		N	15 A	30 V	1000 mW	55 m Ω	
MMFTN6001		N	440 mA	60 V	530 mW	2 Ω	
2N7002		N	1200 mA	60 V	350 mW	5 Ω	
2N7002A		N	1200 mA	60 V	350 mW	2 Ω	
MMFTP3401		P	3000 mA	30 V	1000 mW	0.1 Ω	
MMFTP84		P	520 mA	60 V	250 mW	10 Ω	
2N7002W		 SOT-323	N	800 mA	60 V	200 mW	13.5 Ω
MMFTN3018W			N	400 mA	60 V	200 mW	8 Ω
MMFTN7002DW	 SOT-363	N	800 mA	60 V	200 mW	7.5 Ω	

Shunt Regulators

Part no	Package	Configuration	I_K	V_{KA}	V_{REF}	P_{Tot}
MMTL431A	 SOT-23	Standard	1 ... 100 mA	37 V	2.495 V	330 mW
MMTL431AR		Reverse	1 ... 100 mA	37 V	2.495 V	330 mW
MMTV4041		Standard	0.1 ... 20 mA	-	1.240 V	330 mW
MMTV431A		Standard	0.1 ... 20 mA	20 V	1.240 V	330 mW

Linear Voltage Regulators

Part no	Package	Configuration	I_o	V_{OUT}	$V_{IN Max}$	Tolerance
DI78L Series	SO-8, SOT-89 & TO-92	Positive	100 mA	3.3 ... 24V	30 ... 40 V	5 %
DI79L Series	SO-8, SOT-89 & TO-92	Negative	100 mA	-5.0 ... -24V	-20 ... 39 V	5 %
DI78M05UAB	SOT-89	Positive	500 mA	5.0 V	35 V	5 %
DI6026 Series	SOT-23	Positive	60 ... 200mA	1.8 ... 3.6 V	7.0 V	1%

Disclaimer

This application note describes device proposals and shall not be considered as assured and proven solution for any circuit. No warranty or guarantee, expressed or implied is made regarding the capacity, performance or suitability of any device, circuit etc.