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BAS19LT1G, BAS20LT1G, BAS21LT1G

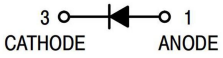
High Voltage Switching Diode

Features

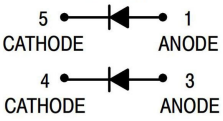
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant
- S and NSV Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable

HIGH VOLTAGE SWITCHING DIODE

SOT−23



SC−88A



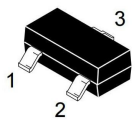
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Continuous Reverse Voltage BAS19 BAS20 BAS21	V_R	 120 200 250	Vdc
Repetitive Peak Reverse Voltage BAS19 BAS20 BAS21	V_{RRM}	 120 200 250	Vdc
Continuous Forward Current	I_F	200	mAdc
Peak Forward Surge Current (1/2 Cycle, Sine Wave, 60 Hz)	I_{FSM}	2	A
Repetitive Peak Forward Current (Pulse Train: T_{ON} = 1 s, T_{OFF} = 0.5 s)	I_{FRM}	0.6	A
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C
Power Dissipation (Note 1)	P_D	385	mW
Electrostatic Discharge	ESD	HM < 500 MM < 400	V V

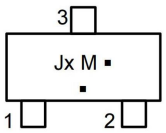
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Mounted on FR−5 Board = 1.0 x 0.75 x 0.062 in.

MARKING DIAGRAMS



SOT−23 (TO−236)



x = P, R, or S
P = BAS19L
R = BAS20L
S = BAS21L = Date Code

▪ = Pb−Free Package
(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon the manufacturing location.

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BAS19L, BAS20L, BAS21L, BAS21DW5

THERMAL CHARACTERISTICS (SOT−23)

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR−5 Board (Note 2) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance Junction−to−Ambient (SOT−23)	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate (Note 3) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance Junction−to−Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS (SC−88A)

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 4)	P_D	385	mW
Thermal Resistance − Junction−to−Ambient Derate Above 25°C	$R_{\theta JA}$	328 3.0	°C/W mW/°C
Maximum Junction Temperature	T_{Jmax}	150	°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

2. FR−5 = 1.0 × 0.75 × 0.062 in.
3. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.
4. Mounted on FR−5 Board = 1.0 x 0.75 x 0.062 in.

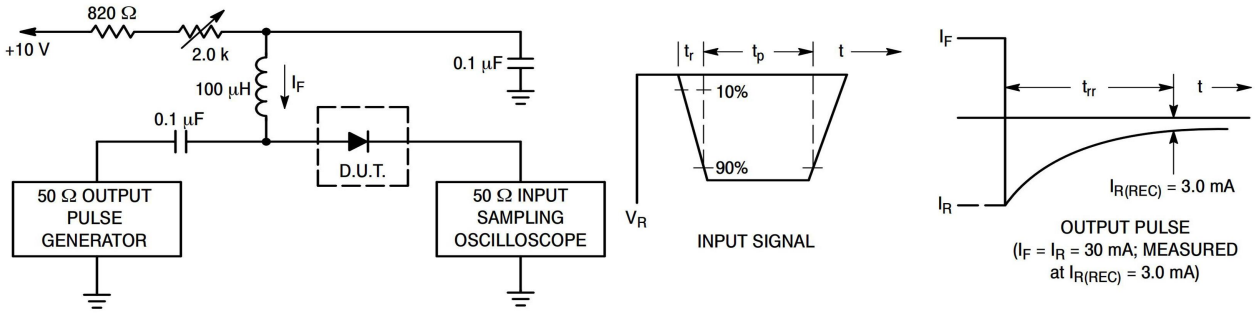
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
Reverse Voltage Leakage Current		I_R			μAdc
(V_R = 100 Vdc)	BAS19		−	0.1	
(V_R = 150 Vdc)	BAS20		−	0.1	
(V_R = 200 Vdc)	BAS21		−	0.1	
(V_R = 100 Vdc, T_J = 150°C)	BAS19		−	100	
(V_R = 150 Vdc, T_J = 150°C)	BAS20		−	100	
(V_R = 200 Vdc, T_J = 150°C)	BAS21		−	100	
Reverse Breakdown Voltage		$V_{(BR)}$			Vdc
(I_{BR} = 100 μAdc)	BAS19		120	−	
(I_{BR} = 100 μAdc)	BAS20		200	−	
(I_{BR} = 100 μAdc)	BAS21		250	−	
Forward Voltage		V_F			Vdc
(I_F = 100 mAdc)			−	1.0	
(I_F = 200 mAdc)			−	1.25	
Diode Capacitance (V_R = 0, f = 1.0 MHz)		C_D	−	5.0	pF
Reverse Recovery Time (I_F = I_R = 30 mAdc, $I_{R(REC)}$ = 3.0 mAdc, R_L = 100)		t_{rr}	−	50	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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BAS19L, BAS20L, BAS21L, BAS21DW5



Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current (I_F) of 30 mA.
2. Input pulse is adjusted so $I_{R(peak)}$ is equal to 30 mA.
3. $t_p \gg t_{rr}$

Figure 1. Recovery Time Equivalent Test Circuit

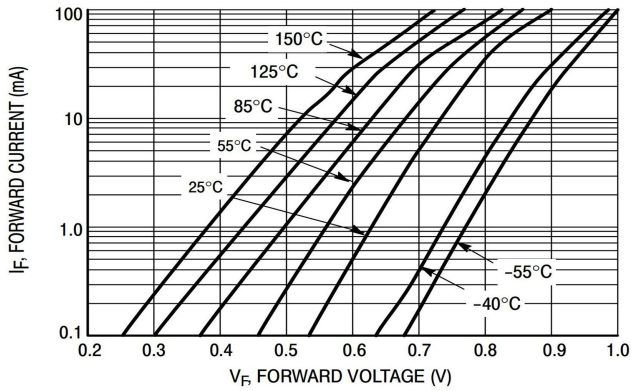


Figure 2. V_F vs. I_F

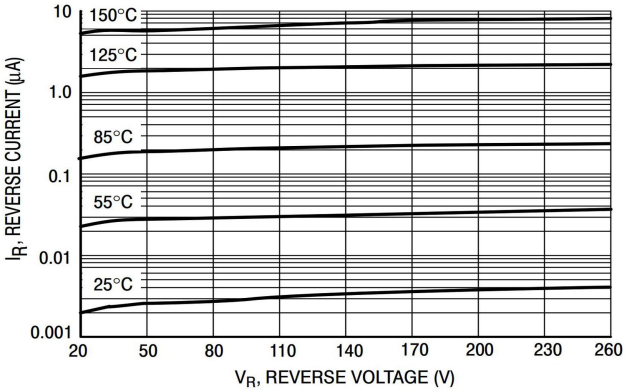


Figure 3. I_R vs. V_R

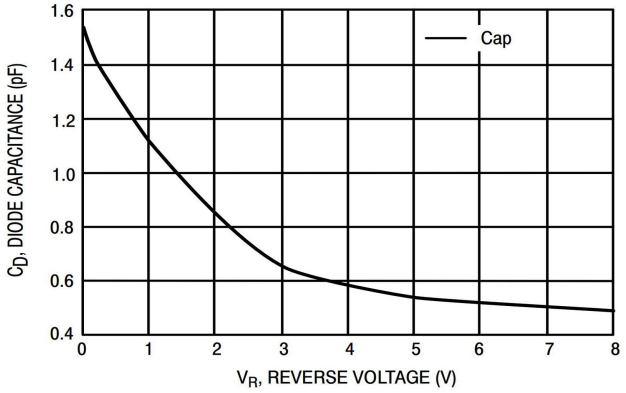


Figure 4. Capacitance

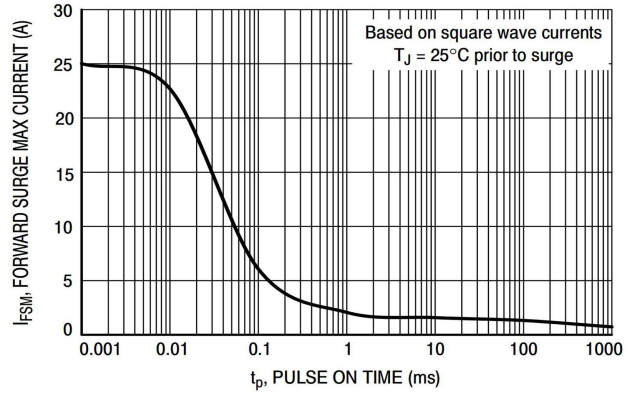


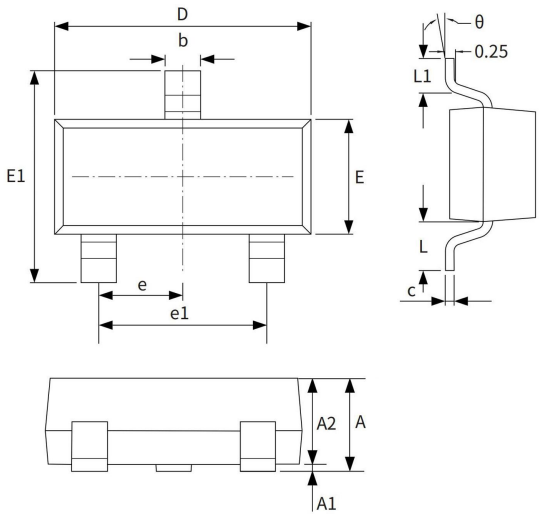
Figure 5. Forward Surge Current

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Ordering Information

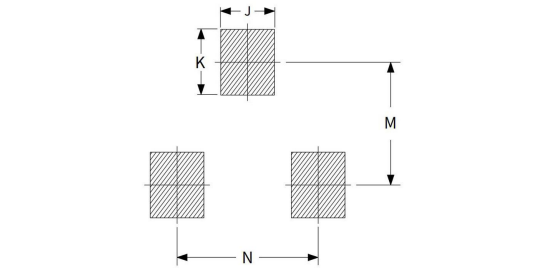
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7''

Package Outline Dimensions (SOT-23)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077