

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

Preferred Devices

High Voltage Switching Diode

Features

- Pb-Free Packages are Available

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Continuous Reverse Voltage	V_R	120 200 250	Vdc
Repetitive Peak Reverse Voltage	V_{RRM}	120 200 250	Vdc
Continuous Forward Current	I_F	200	mAdc
Peak Forward Surge Current	$I_{FM(surge)}$	625	mAdc
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 Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

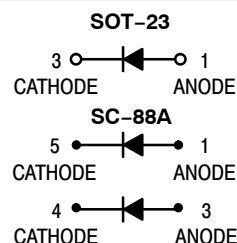
1. Mounted on FR-5 Board = 1.0 x 0.75 x 0.062 in.



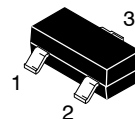
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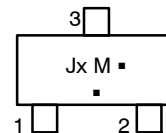
HIGH VOLTAGE SWITCHING DIODE



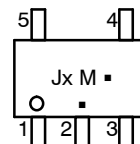
MARKING DIAGRAMS



SOT-23 (TO-236)
CASE 318
STYLE 8



SC-88A (SOT-353)
CASE 419A



- x = P, R, or S
- P = BAS19LT1
- R = BAS20LT1
- S = BAS21LT1 or BAS21DW5T1
- M = 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.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

Thermal Characteristics (SOT-23)

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

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	$^\circ\text{C}/\text{W}$
		3.0	mW/ $^\circ\text{C}$
Maximum Junction Temperature	T_{Jmax}	150	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

2. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

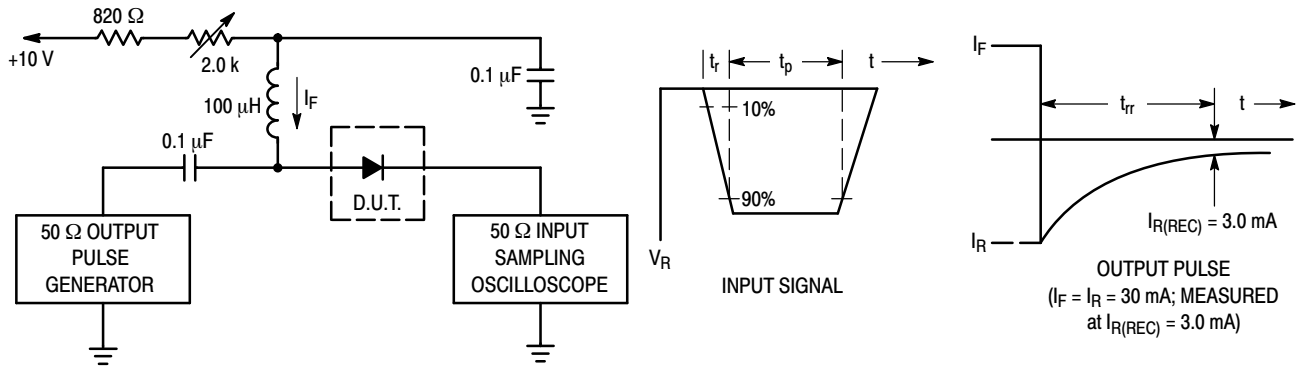
3. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.

4. Mounted on FR-5 Board = $1.0 \times 0.75 \times 0.062$ in.

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1



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

Figure 1. Recovery Time Equivalent Test Circuit

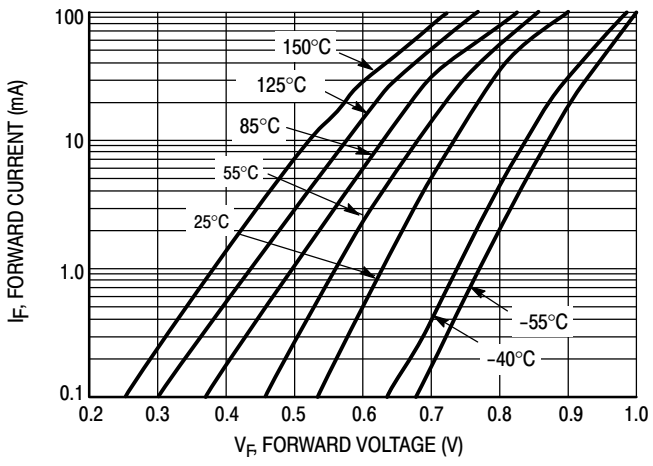


Figure 2. V_F vs. I_F

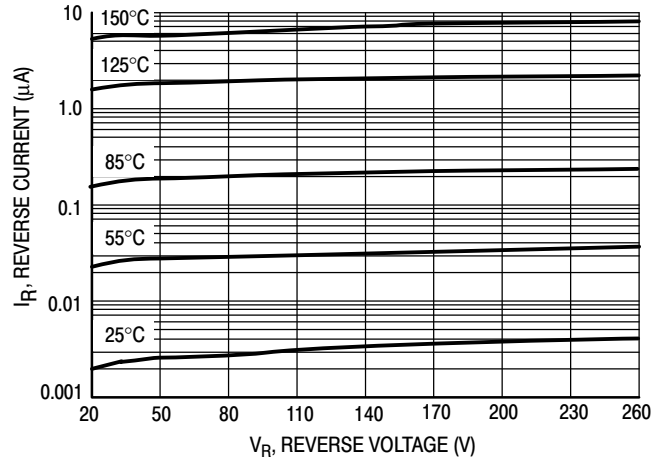


Figure 3. I_R vs. V_R

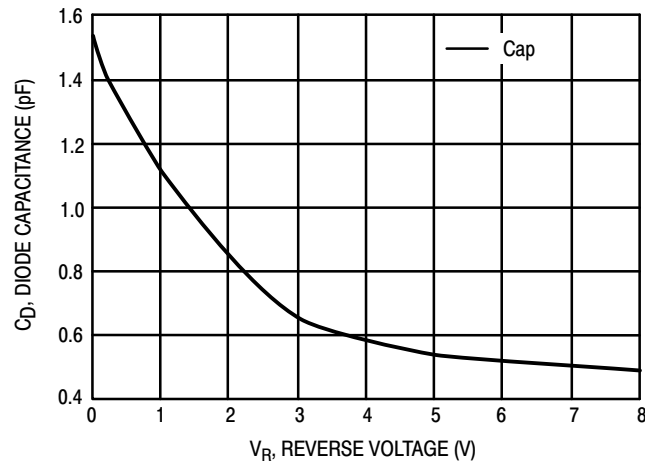


Figure 4. Capacitance

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

ORDERING INFORMATION

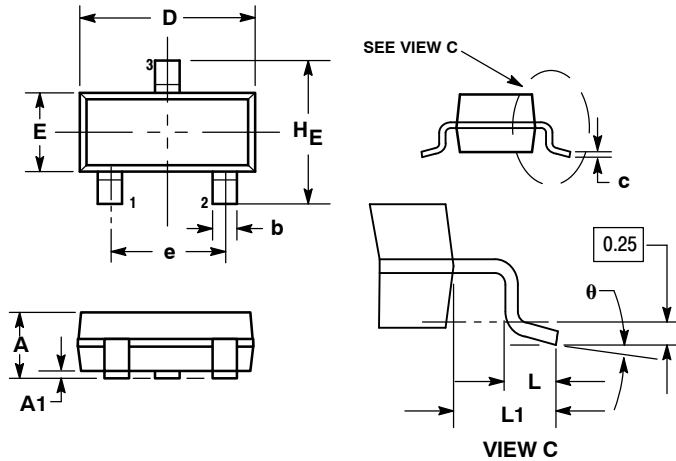
Device	Package	Shipping†
BAS19LT1	SOT-23	3000 / Tape & Reel
BAS19LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BAS19LT3	SOT-23	10000 / Tape & Reel
BAS19LT3G	SOT-23 (Pb-Free)	10000 / Tape & Reel
BAS20LT1	SOT-23	3000 / Tape & Reel
BAS20LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BAS21LT1	SOT-23	3000 / Tape & Reel
BAS21LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BAS21LT3	SOT-23	10000 / Tape & Reel
BAS21LT3G	SOT-23 (Pb-Free)	10000 / Tape & Reel
BAS21DW5T1	SC-88A	3000 / Tape & Reel
BAS21DW5T1G	SC-88A (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318-08
ISSUE AN



NOTES:

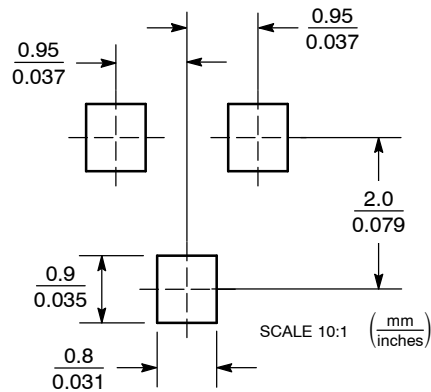
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 8:

1. ANODE
2. NO CONNECTION
3. CATHODE

SOLDERING FOOTPRINT*

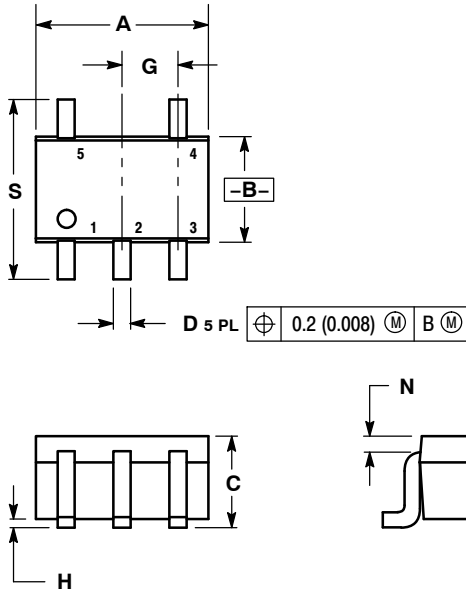


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

PACKAGE DIMENSIONS

SC-88A, SOT-353, SC-70
CASE 419A-02
ISSUE J

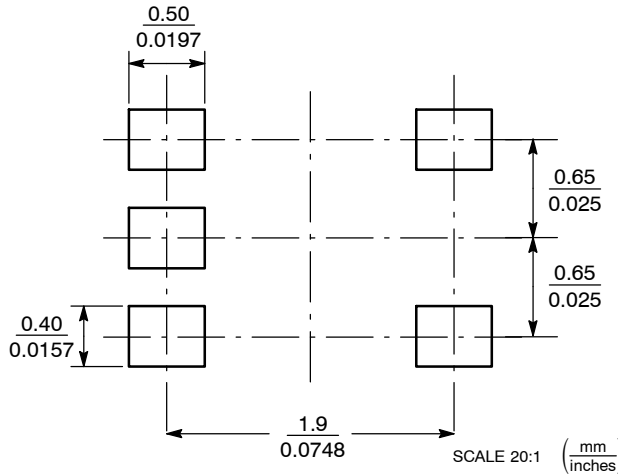


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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