

# BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

Preferred Devices

## High Voltage Switching Diode

Device Marking:

- BAS19LT1 = JP
- BAS20LT1 = JR
- BAS21LT1 = JS
- BAS21DW5T1 = JS

### Features

- Pb-Free Packages are Available

### 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	$I_{FM(surge)}$	625	mAdc
Maximum Junction Temperature	$T_{Jmax}$	150	°C
Power Dissipation (Note 4)	$P_D$	385	mW

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

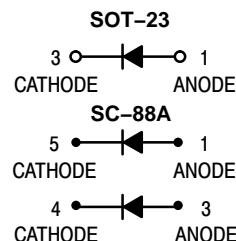
1. Mounted on FR-5 Board = 1.0 x 0.75 x 0.062 in.



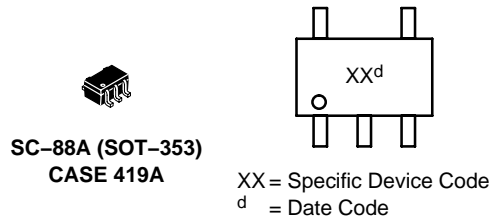
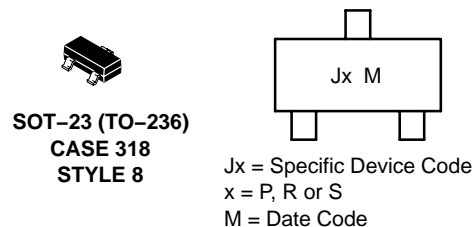
ON Semiconductor®

<http://onsemi.com>

## HIGH VOLTAGE SWITCHING DIODE



### MARKING DIAGRAMS



### 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 $25^\circ\text{C}$	$P_D$	225	mW
		1.8	mW/ $^\circ\text{C}$
Thermal Resistance Junction-to-Ambient (SOT-23)	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate (Note 3) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300	mW
		2.4	mW/ $^\circ\text{C}$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
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 $25^\circ\text{C}$	$R_{\theta JA}$	328	$^\circ\text{C/W}$
		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 × 0.75 × 0.062 in.

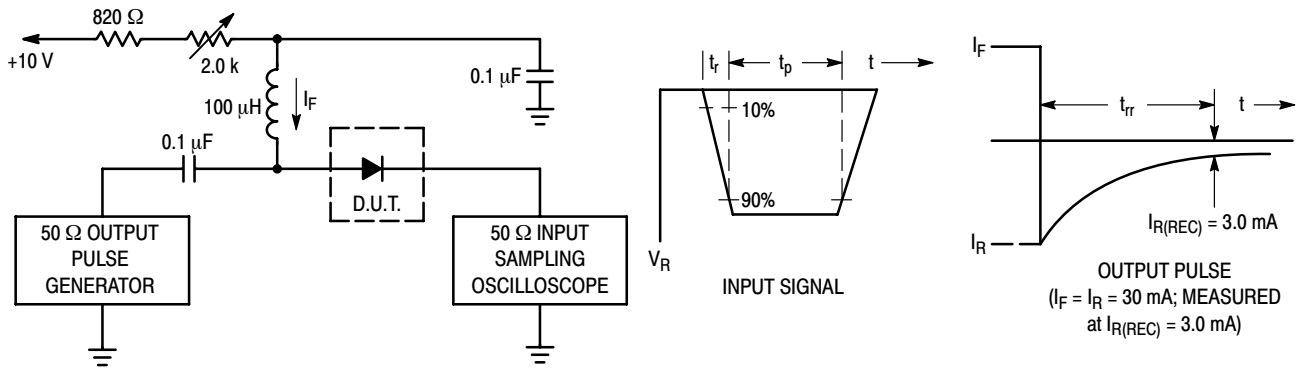
3. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.

4. Mounted on FR-5 Board = 1.0 × 0.75 × 0.062 in.

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

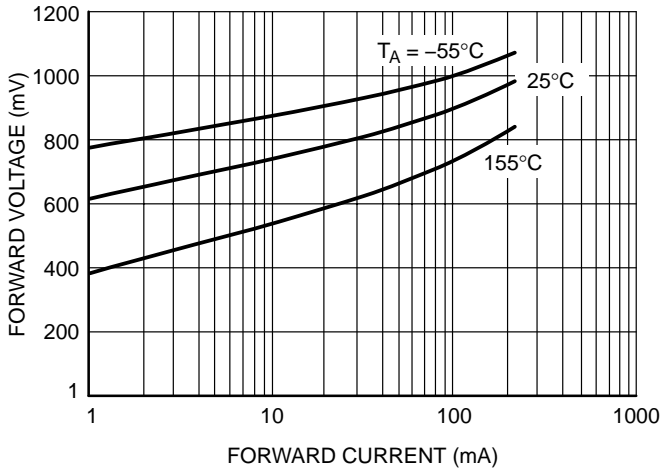
Characteristic	Symbol	Min	Max	Unit	
Reverse Voltage Leakage Current ( $V_R = 100\text{ Vdc}$ ) ( $V_R = 150\text{ Vdc}$ ) ( $V_R = 200\text{ Vdc}$ ) ( $V_R = 100\text{ Vdc}, T_J = 150^\circ\text{C}$ ) ( $V_R = 150\text{ Vdc}, T_J = 150^\circ\text{C}$ ) ( $V_R = 200\text{ Vdc}, T_J = 150^\circ\text{C}$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

# BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

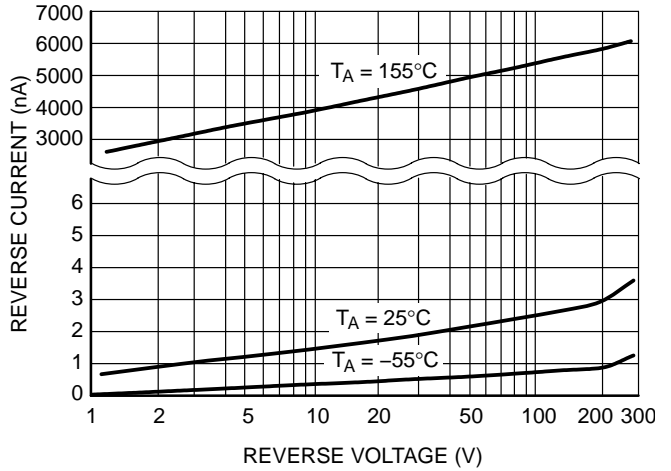


- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current ( $I_F$ ) of 30 mA.  
 2. Input pulse is adjusted so  $I_{R(\text{peak})}$  is equal to 30 mA.  
 3.  $t_p \gg t_{rr}$

**Figure 1. Recovery Time Equivalent Test Circuit**



**Figure 2. Forward Voltage**



**Figure 3. Reverse Leakage**

# BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

## ORDERING INFORMATION

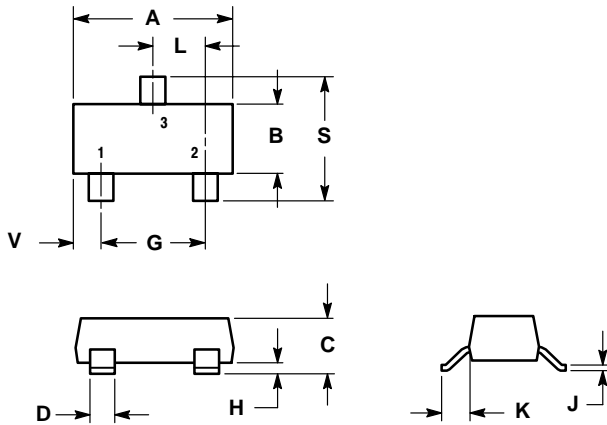
Device	Package	Shipping†
BAS19LT1	SOT-23	3000 Tape/Reel
BAS19LT1G	SOT-23 (Pb-Free)	
BAS19LT3	SOT-23	10000 Tape/Reel
BAS19LT3G	SOT-23 (Pb-Free)	
BAS20LT1	SOT-23	3000 Tape/Reel
BAS20LT1G	SOT-23 (Pb-Free)	
BAS21LT1	SOT-23	3000 Tape/Reel
BAS21LT1G	SOT-23 (Pb-Free)	
BAS21LT3	SOT-23	10000 Tape/Reel
BAS21LT3G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

†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 318-09  
ISSUE AH



NOTES:

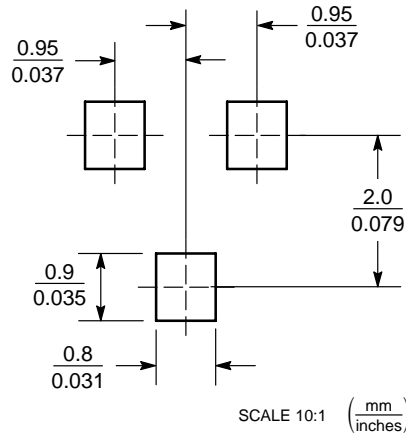
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01, -02, AND -06 OBSOLETE, NEW STANDARD 318-09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0385	0.0498	0.99	1.26
D	0.0140	0.0200	0.36	0.50
G	0.0670	0.0826	1.70	2.10
H	0.0040	0.0098	0.10	0.25
J	0.0034	0.0070	0.085	0.177
K	0.0180	0.0236	0.45	0.60
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.0984	2.10	2.50
V	0.0177	0.0236	0.45	0.60

STYLE 8:

1. ANODE
2. NO CONNECTION
3. CATHODE

### SOLDERING FOOTPRINT\*

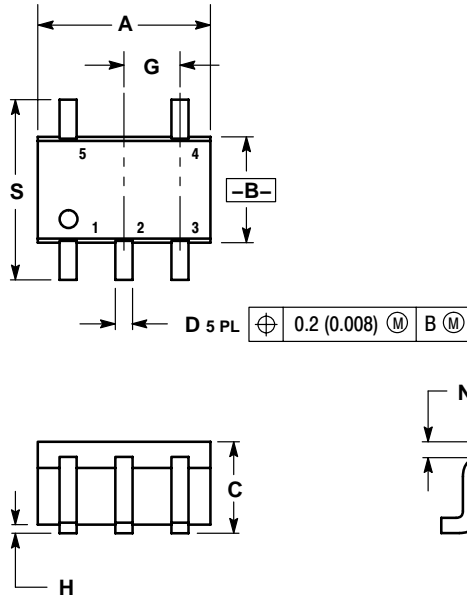


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

## PACKAGE DIMENSIONS

### SC-88A (SOT-353) CASE 419A-02 ISSUE G

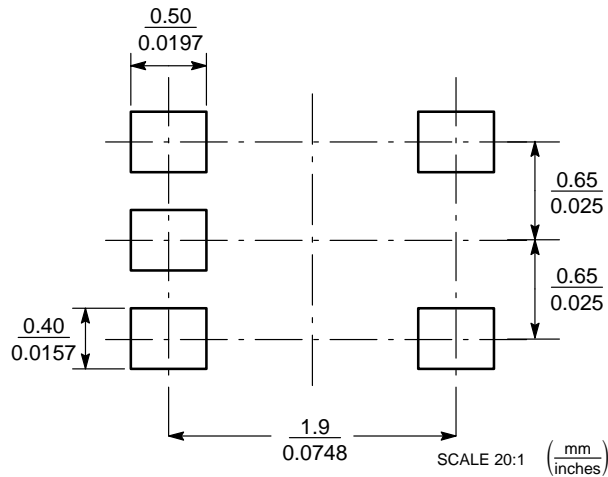


#### NOTES:

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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