

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 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
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.

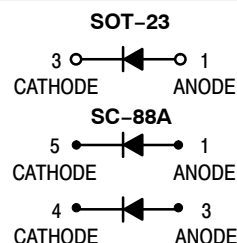
1. Mounted on FR-5 Board = 1.0 x 0.75 x 0.062 in.



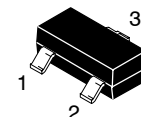
ON Semiconductor®

<http://onsemi.com>

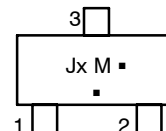
HIGH VOLTAGE SWITCHING DIODE



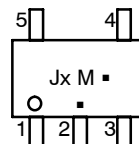
MARKING DIAGRAMS



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 1.8	mW 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 2.4	mW 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 3.0	$^\circ\text{C}/\text{W}$ 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) BAS19 ($V_R = 150$ Vdc) BAS20 ($V_R = 200$ Vdc) BAS21 ($V_R = 100$ Vdc, $T_J = 150^\circ\text{C}$) BAS19 ($V_R = 150$ Vdc, $T_J = 150^\circ\text{C}$) BAS20 ($V_R = 200$ Vdc, $T_J = 150^\circ\text{C}$) BAS21	I_R	– – – – – –	0.1 0.1 0.1 100 100 100	μAdc
Reverse Breakdown Voltage ($I_{BR} = 100$ μAdc) BAS19 ($I_{BR} = 100$ μAdc) BAS20 ($I_{BR} = 100$ μAdc) BAS21	$V_{(BR)}$	120 200 250	– – –	Vdc
Forward Voltage ($I_F = 100$ mAdc) ($I_F = 200$ mAdc)	V_F	– –	1.0 1.25	Vdc
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

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

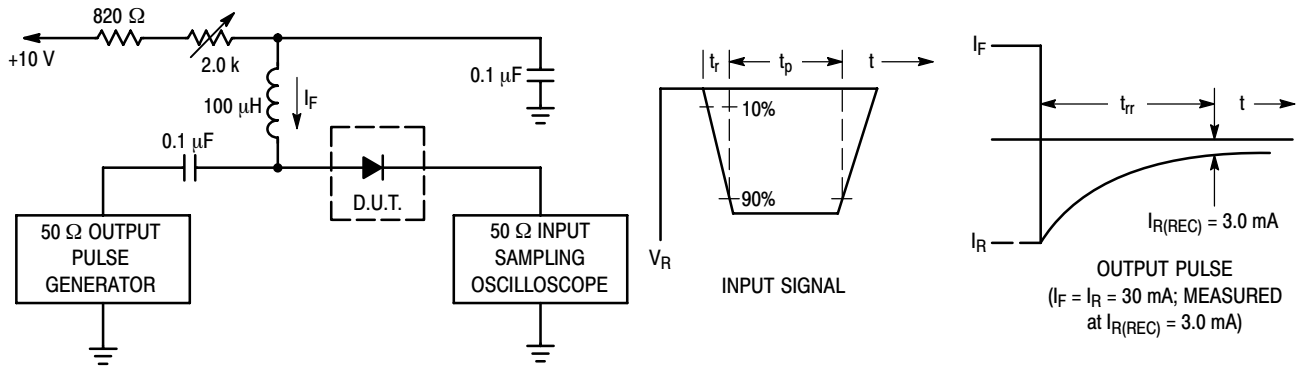


Figure 1. Recovery Time Equivalent Test Circuit

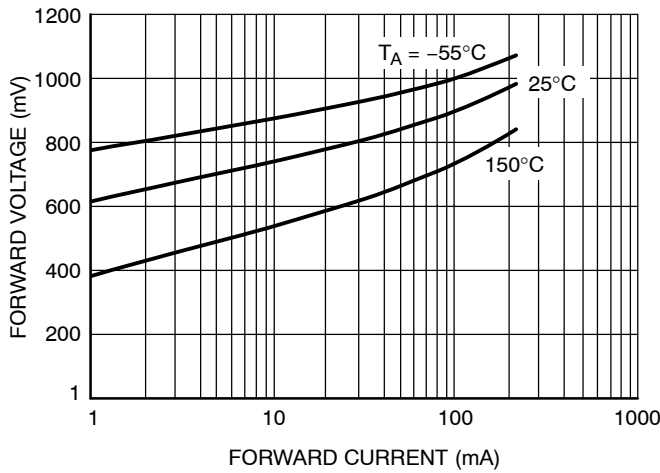


Figure 2. Forward Voltage

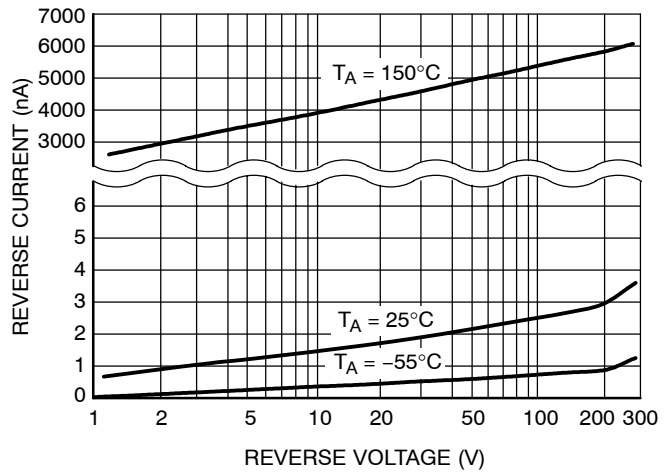


Figure 3. Reverse Leakage

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

ORDERING INFORMATION

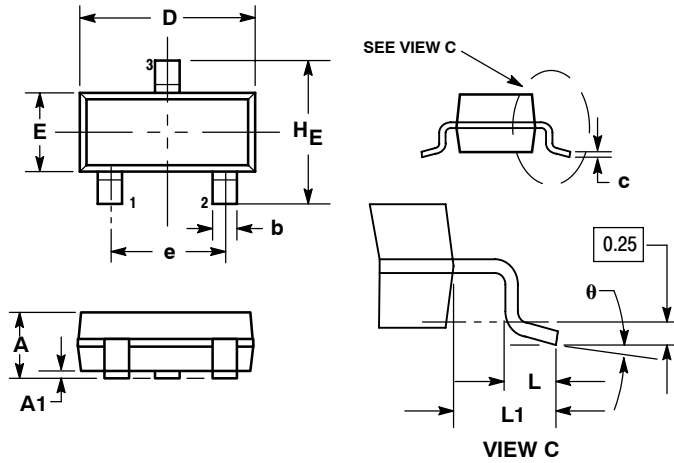
Device	Package	Shipping [†]
BAS19LT1	SOT-23	3000 / Tape & Reel
BAS19LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BAS19LT3	SOT-23	10000 / Tape & Reel
BAS19LT3G	SOT-23 (Pb-Free)	10000 / Tape & Reel
BAS20LT1	SOT-23	3000 / Tape & Reel
BAS20LT1G	SOT-23 (Pb-Free)	3000 / Tape & Reel
BAS21LT1	SOT-23	3000 / Tape & 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:

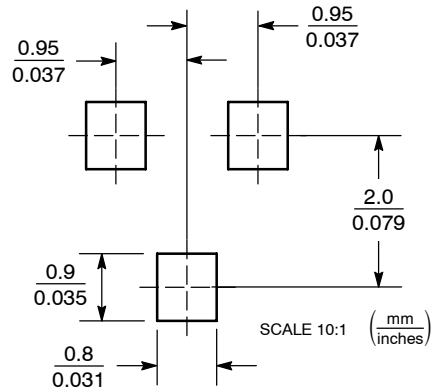
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

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:

- PIN 1: ANODE
- NO CONNECTION
- CATHODE

SOLDERING FOOTPRINT*

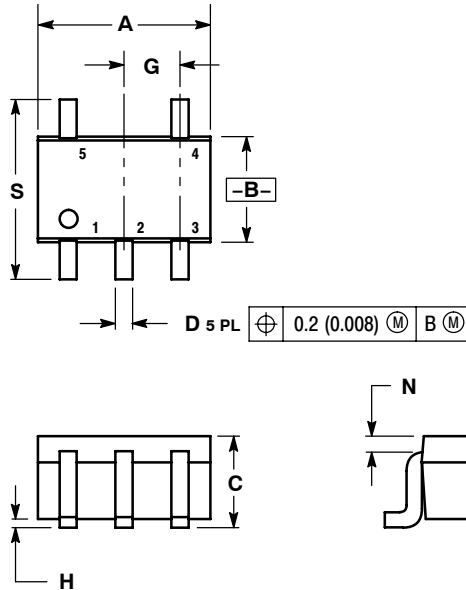


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

PACKAGE DIMENSIONS

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

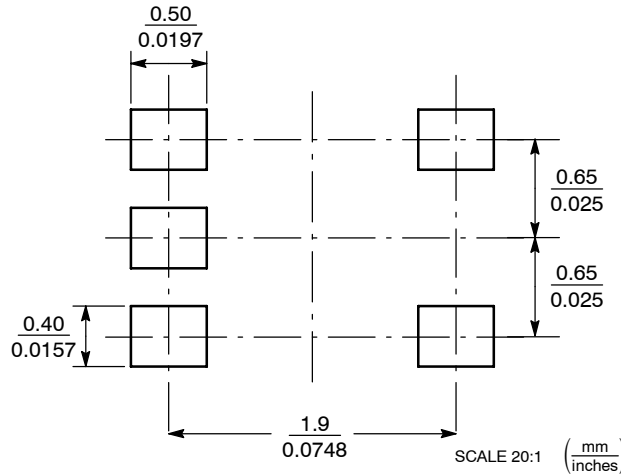


NOTES:

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.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative