BAS19L, NSVBAS19L, BAS20L, SBAS20L, BAS21L, SBAS21L, BAS21DW5, SBAS21DW5

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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Continuous Reverse Voltage BAS19, NSVBAS19 BAS20, SBAS20 BAS21, SBAS21	V_R	120 200 250	Vdc
Repetitive Peak Reverse Voltage BAS19, NSVBAS19 BAS20, SBAS20 BAS21, SBAS21	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	V
		MM < 400	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.
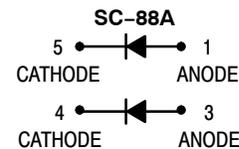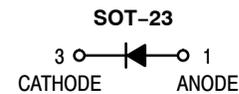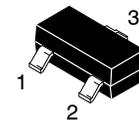1. Mounted on FR−5 Board = 1.0 x 0.75 x 0.062 in.

ON Semiconductor®

HIGH VOLTAGE SWITCHING DIODE

SOT−23

3 ○—◁|—○ 1
CATHODE   ANODE

SC−88A

5 ●—◁|—● 1
CATHODE   ANODE

4 ●—|▷—● 3
CATHODE   ANODE

MARKING DIAGRAMS

SOT−23 (TO−236)
CASE 318
STYLE 8

Jx M ▪
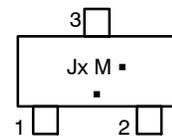
SC−88A (SOT−353)
CASE 419A

Jx M ▪
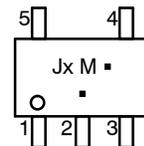
x	= P, R, or S
P	= BAS19L, NSVBAS19L
R	= BAS20L, SBAS20L
S	= BAS21L, SBAS21L or BAS21DW5, SBAS21DW5
M	= Date Code
▪	= Pb−Free Package

(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.

November, 2012 − Rev. 15

BAS19L, NSVBAS19L, BAS20L, SBAS20L, BAS21L, SBAS21L, BAS21DW5, SBAS21DW5

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 (V_R = 100 Vdc) (V_R = 150 Vdc) (V_R = 200 Vdc) (V_R = 100 Vdc, T_J = 150°C) (V_R = 150 Vdc, T_J = 150°C) (V_R = 200 Vdc, T_J = 150°C)	 BAS19, NSVBAS19 BAS20, SBAS20 BAS21, SBAS21 BAS19 BAS20, SBAS20 BAS21, SBAS21	I_R	 − − − − − −	 0.1 0.1 0.1 100 100 100	μAdc
Reverse Breakdown Voltage (I_{BR} = 100 μAdc) (I_{BR} = 100 μAdc) (I_{BR} = 100 μAdc)	 BAS19, NSVBAS19 BAS20, SBAS20 BAS21, SBAS21	$V_{(BR)}$	 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
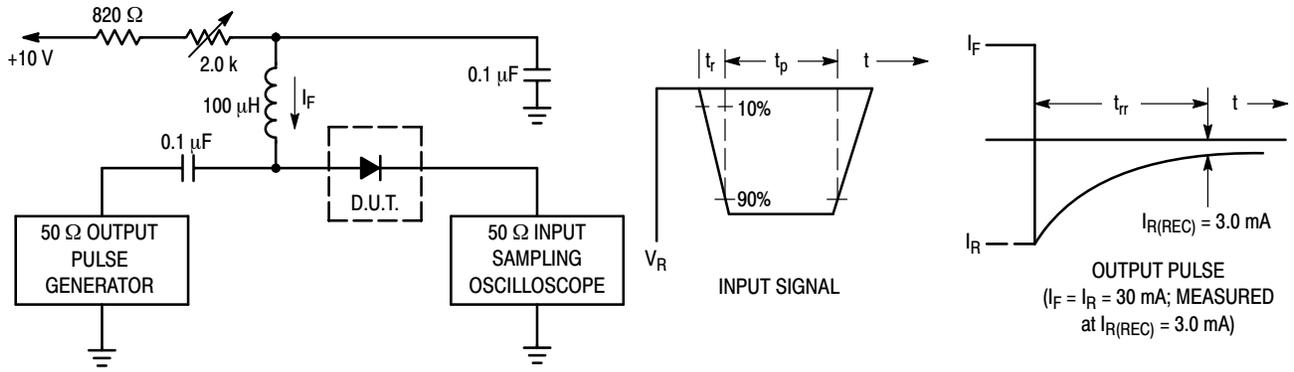
Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current (I_F) of 30 mA.
2. Input pulse is adjusted so $I_{R(peak)}$ is equal to 30 mA.
3. $t_p \gg t_{rr}$
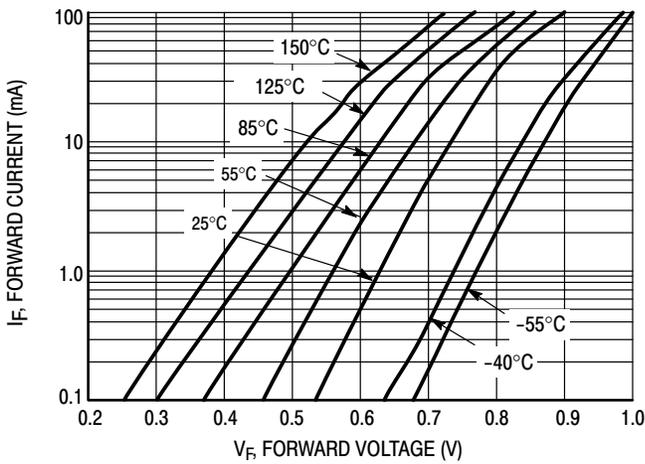
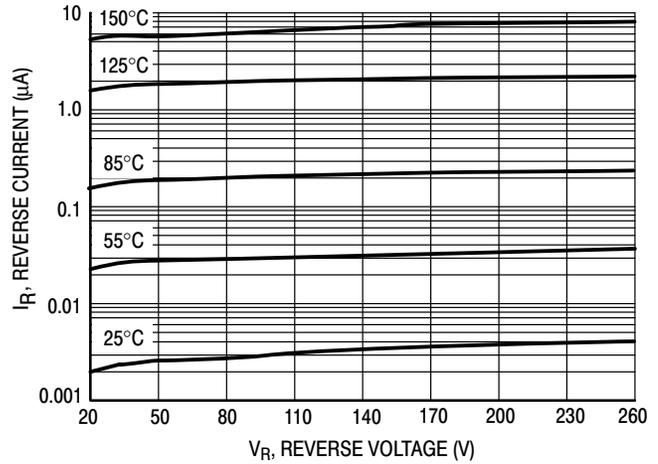**Figure 1. Recovery Time Equivalent Test Circuit**

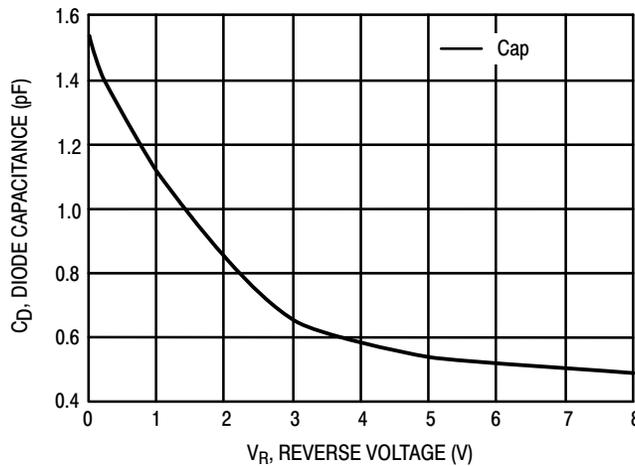**Figure 2. V_F vs. I_F**

Figure 3. I_R vs. V_R

Figure 4. Capacitance

BAS19L, NSVBAS19L, BAS20L, SBAS20L, BAS21L, SBAS21L, BAS21DW5, SBAS21DW5

ORDERING INFORMATION

| Device	Package	Shipping†
BAS19LT1G	SOT−23 (Pb−Free)	3000 / Tape & Reel
BAS19LT3G	SOT−23 (Pb−Free)	10000 / Tape & Reel
NSVBAS19LT1G*	SOT−23 (Pb−Free)	3000 / Tape & Reel
BAS20LT1G	SOT−23 (Pb−Free)	3000 / Tape & Reel
BAS20LT3G	SOT−23 (Pb−Free)	10000 / Tape & Reel
SBAS20LT1G*	SOT−23 (Pb−Free)	3000 / Tape & Reel
BAS21LT1G	SOT−23 (Pb−Free)	3000 / Tape & Reel
SBAS21LT1G*	SOT−23 (Pb−Free)	3000 / Tape & Reel
BAS21LT3G	SOT−23 (Pb−Free)	10000 / Tape & Reel
SBAS21LT3G*	SOT−23 (Pb−Free)	10000 / Tape & Reel
BAS21DW5T1G	SC−88A (Pb−Free)	3000 / Tape & Reel
SBAS21DW5T1G*	SC−88A (Pb−Free)	3000 / Tape & Reel
SBAS21DW5T3G*	SC−88A (Pb−Free)	10000 / 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.

*S and NSV Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable.

BAS19L, NSVBAS19L, BAS20L, SBAS20L, BAS21L, SBAS21L, BAS21DW5, SBAS21DW5

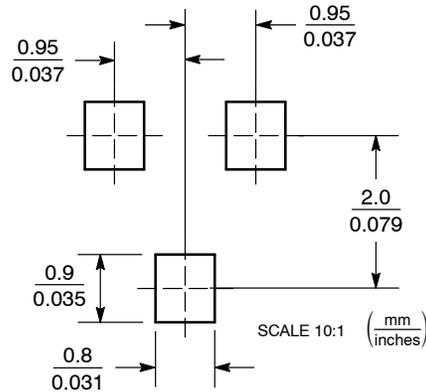### PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AP
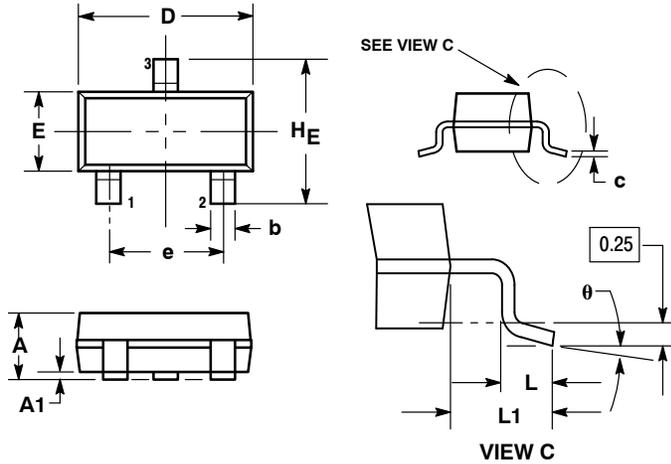
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

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
H_E	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	−−−	10°	0°	−−−	10°

STYLE 8:
PIN 1. ANODE
    2. NO CONNECTION
    3. CATHODE

SOLDERING FOOTPRINT*

$\frac{0.95}{0.037}$

$\frac{0.95}{0.037}$

$\frac{2.0}{0.079}$

$\frac{0.9}{0.035}$

$\frac{0.8}{0.031}$
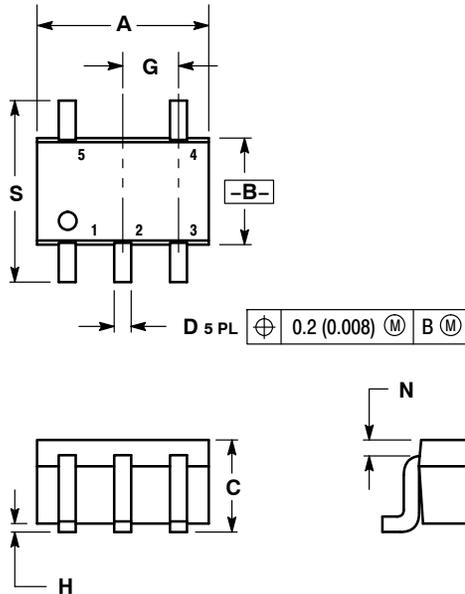
SCALE 10:1 $\left(\frac{mm}{inches}\right)$

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

BAS19L, NSVBAS19L, BAS20L, SBAS20L, BAS21L, SBAS21L, BAS21DW5, SBAS21DW5

PACKAGE DIMENSIONS

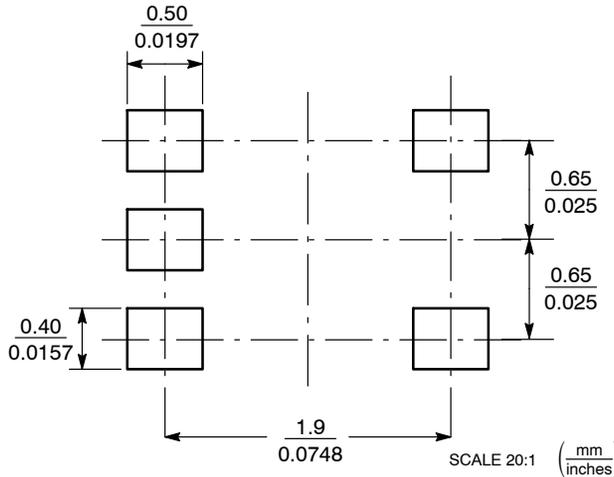### SC−88A (SC−70−5/SOT−353)
CASE 419A−02
ISSUE K

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

D 5 PL ⊕ 0.2 (0.008) Ⓜ B Ⓜ

SOLDERING FOOTPRINT*

$\frac{0.50}{0.0197}$

$\frac{0.65}{0.025}$

$\frac{0.65}{0.025}$

$\frac{0.40}{0.0157}$

$\frac{1.9}{0.0748}$

SCALE 20:1 $\left(\frac{mm}{inches}\right)$

*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/D

Mouser Electronics

Authorized Distributor

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