

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.

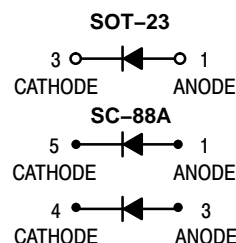
1. Mounted on FR-5 Board = 1.0 x 0.75 x 0.062 in.



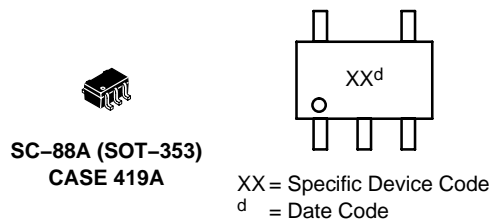
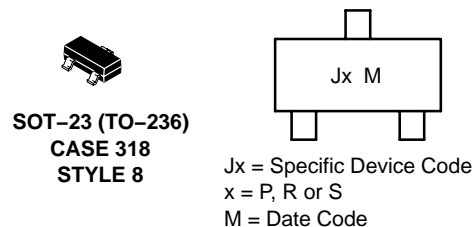
ON Semiconductor®

<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°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°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°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.

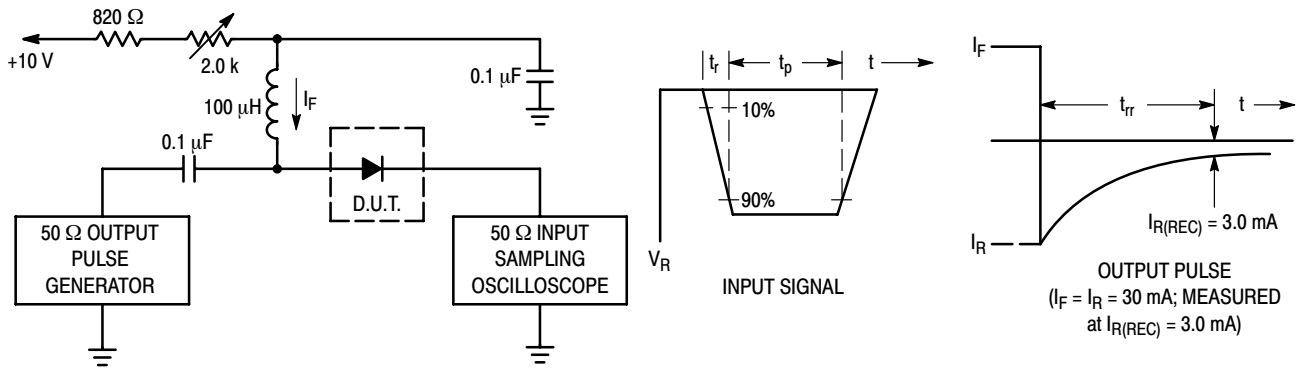
3. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.

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 | μAdc |
| | | BAS20 | – | 0.1 | |
| | | BAS21 | – | 0.1 | |
| | | BAS19 | – | 100 | |
| | | BAS20 | – | 100 | |
| | | BAS21 | – | 100 | |
| Reverse Breakdown Voltage ($I_{BR} = 100\ \mu\text{Adc}$) ($I_{BR} = 100\ \mu\text{Adc}$) ($I_{BR} = 100\ \mu\text{Adc}$) | $V_{(BR)}$ | BAS19 | 120 | – | Vdc |
| | | BAS20 | 200 | – | |
| | | BAS21 | 250 | – | |
| Forward Voltage ($I_F = 100\text{ mAdc}$) ($I_F = 200\text{ mAdc}$) | 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 ($I_F = I_R = 30\text{ mAdc}, I_{R(REC)} = 3.0\text{ mAdc}, R_L = 100$) | 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

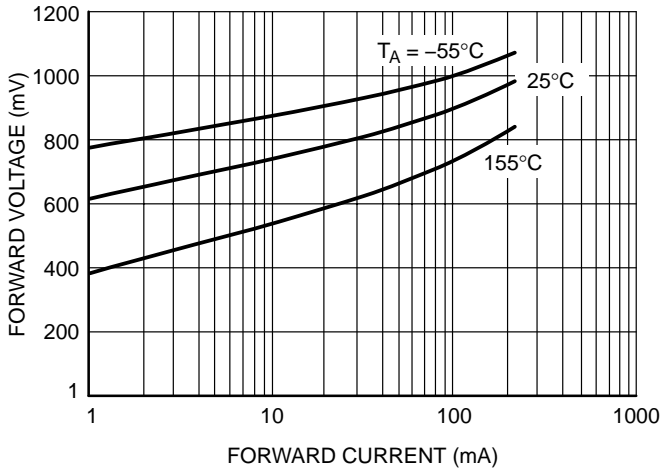


Figure 2. Forward Voltage

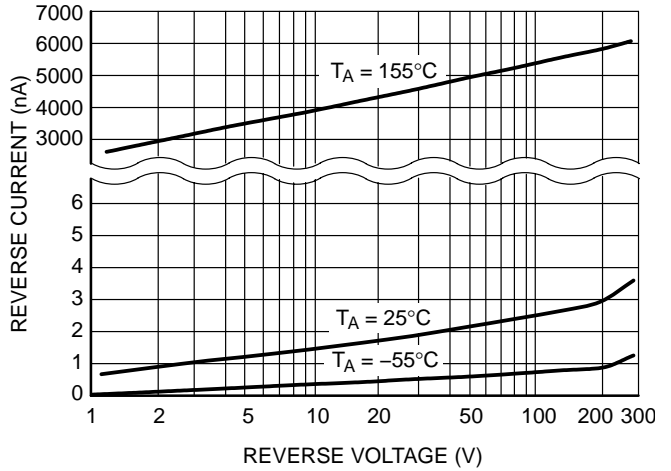


Figure 3. Reverse Leakage

BAS19LT1, BAS20LT1, BAS21LT1, BAS21DW5T1

ORDERING INFORMATION

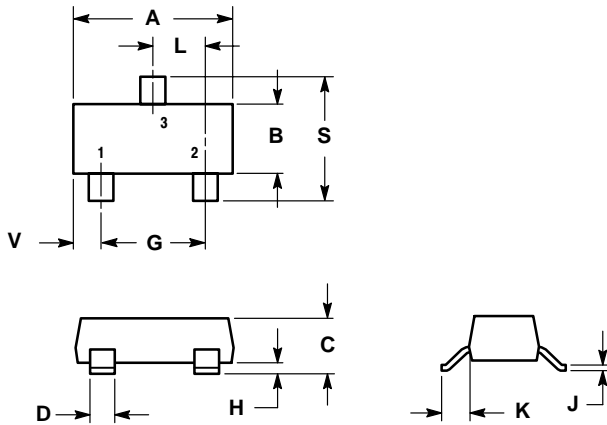
| Device | Package | Shipping† |
|-------------|---------------------|-----------------|
| BAS19LT1 | SOT-23 | 3000 Tape/Reel |
| BAS19LT1G | SOT-23 (Pb-Free) | |
| BAS19LT3 | SOT-23 | 10000 Tape/Reel |
| BAS19LT3G | SOT-23 (Pb-Free) | |
| BAS20LT1 | SOT-23 | 3000 Tape/Reel |
| BAS20LT1G | SOT-23 (Pb-Free)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

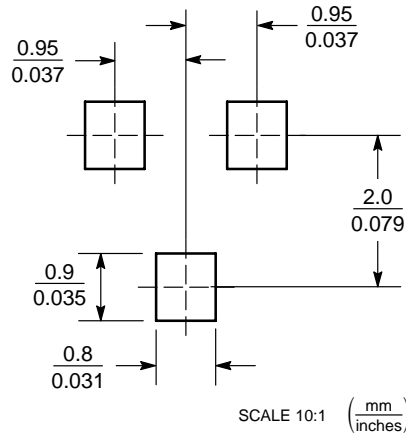
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01, -02, AND -06 OBSOLETE, NEW STANDARD 318-09.

| 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*

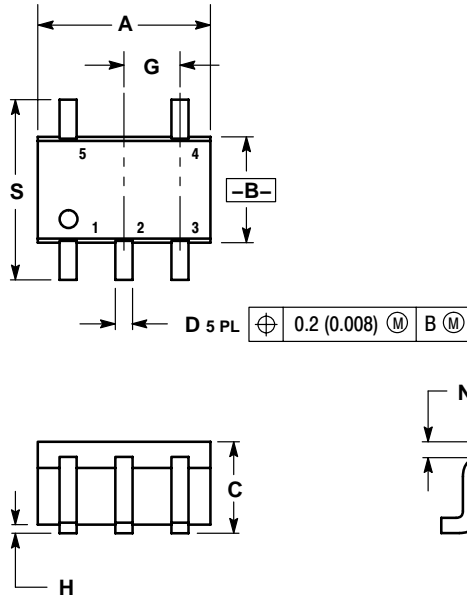


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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PACKAGE DIMENSIONS

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

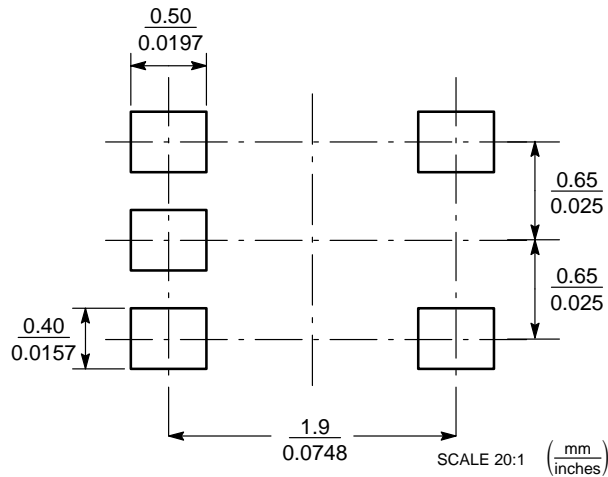


NOTES:

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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