

Schottky Barrier Diodes

BAT54T1G, SBAT54T1G

These Schottky barrier diodes are designed for high speed switching applications, circuit protection, and voltage clamping. Extremely low forward voltage reduces conduction loss. Miniature surface mount package is excellent for hand held and portable applications where space is limited.

Features

- Extremely Fast Switching Speed
- Low Forward Voltage – 0.35 Volts (Typ) @ $I_F = 10 \text{ mAdc}$
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

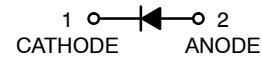
MAXIMUM RATINGS ($T_J = 125^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---|-----------------|-------------|----------------------------|
| Reverse Voltage | V_R | 30 | V |
| Forward Power Dissipation, FR-5 Board (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_F | 400 4.0 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JL}$ | 174 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 492 | $^\circ\text{C}/\text{W}$ |
| Forward Current (DC) | I_F | 200 Max | mA |
| Non-Repetitive Peak Forward Current $t_p < 10 \text{ msec}$ | I_{FSM} | 600 | mA |
| Repetitive Peak Forward Current Pulse Wave = 1 sec, Duty Cycle = 66% | I_{FRM} | 300 | mA |
| Junction Temperature | T_J | -55 to 125 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-5 = 1.0 x 0.75 x 0.062 in.

30 VOLT SCHOTTKY BARRIER DETECTOR AND SWITCHING DIODES



SOD-123
CASE 425
STYLE 1

MARKING DIAGRAM



SB = Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------|----------------------|-----------------------|
| BAT54T1G | SOD-123 (Pb-Free) | 3000 / Tape & Reel |
| SBAT54T1G | SOD-123 (Pb-Free) | 3000 / Tape & Reel |

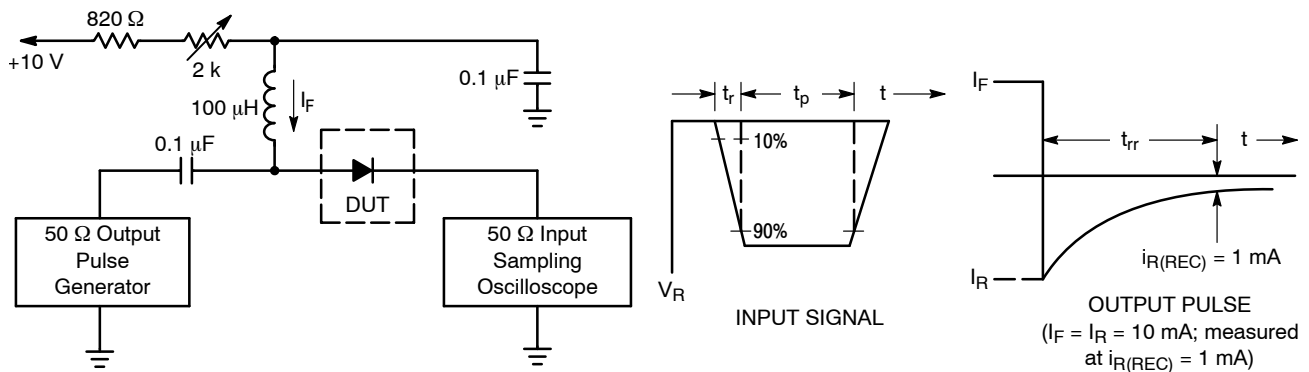
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

BAT54T1G, SBAT54T1G

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|-------------|-----|------|------|-----------------|
| Reverse Breakdown Voltage ($I_R = 10 \mu\text{A}$) | $V_{(BR)R}$ | 30 | - | - | V |
| Total Capacitance ($V_R = 1.0 \text{ V}$, $f = 1.0 \text{ MHz}$) | C_T | - | 7.6 | 10 | pF |
| Reverse Leakage ($V_R = 25 \text{ V}$) | I_R | - | 0.5 | 2.0 | μAdc |
| Forward Voltage ($I_F = 0.1 \text{ mAdc}$) | V_F | - | 0.22 | 0.24 | Vdc |
| Forward Voltage ($I_F = 30 \text{ mAdc}$) | V_F | - | 0.41 | 0.5 | Vdc |
| Forward Voltage ($I_F = 100 \text{ mAdc}$) | V_F | - | 0.52 | 0.8 | Vdc |
| Reverse Recovery Time ($I_F = I_R = 10 \text{ mAdc}$, $I_{R(\text{REC})} = 1.0 \text{ mAdc}$, Figure 1) | t_{rr} | - | - | 5.0 | ns |
| Forward Voltage ($I_F = 1.0 \text{ mAdc}$) | V_F | - | 0.29 | 0.32 | Vdc |
| Forward Voltage ($I_F = 10 \text{ mAdc}$) | V_F | - | 0.35 | 0.40 | Vdc |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current (I_F) of 10 mA.
 2. Input pulse is adjusted so $I_{R(\text{peak})}$ is equal to 10 mA.
 3. $t_p \gg t_{rr}$

Figure 1. Recovery Time Equivalent Test Circuit

BAT54T1G, SBAT54T1G

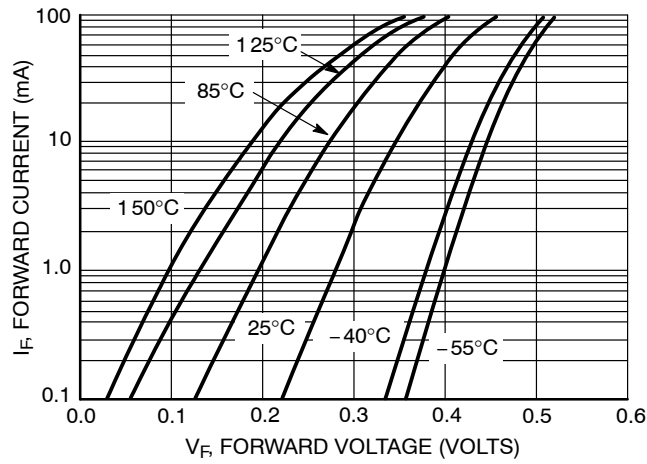


Figure 2. Forward Voltage

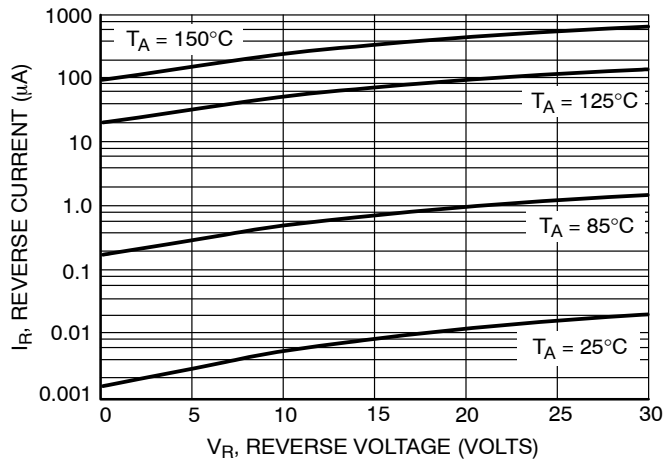


Figure 3. Leakage Current

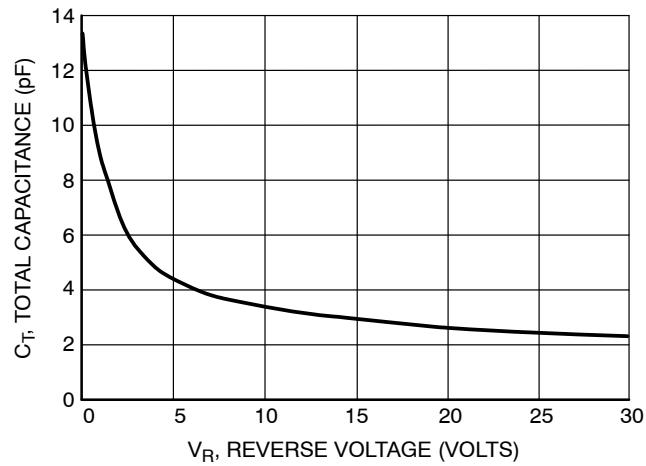
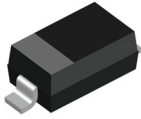


Figure 4. Total Capacitance

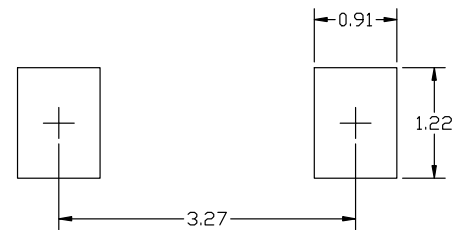
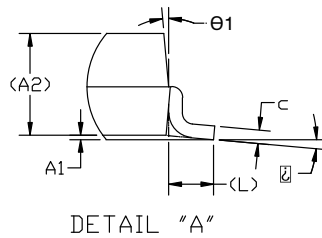
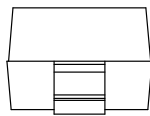
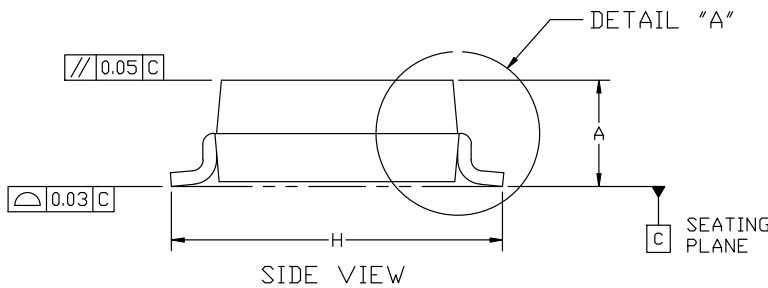
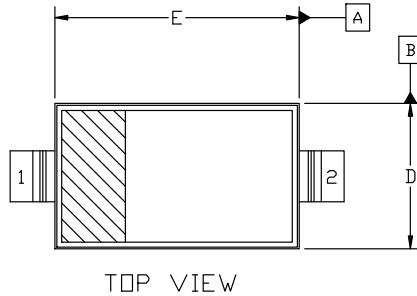
MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



SOD-123 2L 1.60x2.69x1.16
CASE 425
ISSUE H

DATE 29 FEB 2024



NOTES:

1. DIMENSION AND TOLERANCING PER ASME Y14.5M, 2018
2. CONTROLLING DIMENSION: MILLIMETERS

| DIM | MILLIMETER | | |
|-----|------------|------|------|
| | MIN. | NOM. | MAX. |
| A | 0.94 | 1.17 | 1.35 |
| A1 | 0.00 | 0.05 | 0.10 |
| A2 | 1.16 REF. | | |
| b | 0.51 | 0.61 | 0.71 |
| c | - | - | 0.15 |
| D | 1.40 | 1.60 | 1.80 |
| E | 2.54 | 2.69 | 2.84 |
| H | 3.56 | 3.68 | 3.86 |
| L | 0.25 REF. | | |
| ∠ | 0° | | 10° |
| θ1 | 0° | | 10° |

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:
PIN 1. CATHODE
2. ANODE

| | | |
|-------------------------|----------------------------------|--|
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| DESCRIPTION: | SOD-123 2L 1.60x2.69x1.16 | PAGE 1 OF 1 |

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