

# Schottky Barrier Diodes

## BAT54XV2

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 V (Typ) @  $I_F = 10$  mA
- 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    |

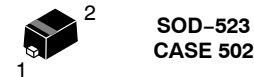
### THERMAL CHARACTERISTICS

| Characteristic                                                                                               | Symbol          | Max        | Unit                       |
|--------------------------------------------------------------------------------------------------------------|-----------------|------------|----------------------------|
| Total Device Dissipation FR-5 Board,<br>(Note 1) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 200<br>2.0 | mW<br>mW/ $^\circ\text{C}$ |
| Forward Current (DC)                                                                                         | $I_F$           | 200 Max    | mA                         |
| Non-Repetitive Peak Forward<br>Current, $t_p < 10$ msec                                                      | $I_{FSM}$       | 600        | mA                         |
| Repetitive Peak Forward Current<br>Pulse Wave = 1 sec, Duty Cycle = 66%                                      | $I_{FRM}$       | 300        | mA                         |
| Thermal Resistance,<br>Junction-to-Ambient                                                                   | $R_{\theta JA}$ | 635        | $^\circ\text{C}/\text{W}$  |
| Junction and Storage Temperature                                                                             | $T_J, T_{stg}$  | -55 to 125 | $^\circ\text{C}$           |

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-4 Minimum Pad.

## 30 VOLT SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES



### MARKING DIAGRAM



JV = Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation may vary depending upon manufacturing location.

### ORDERING INFORMATION

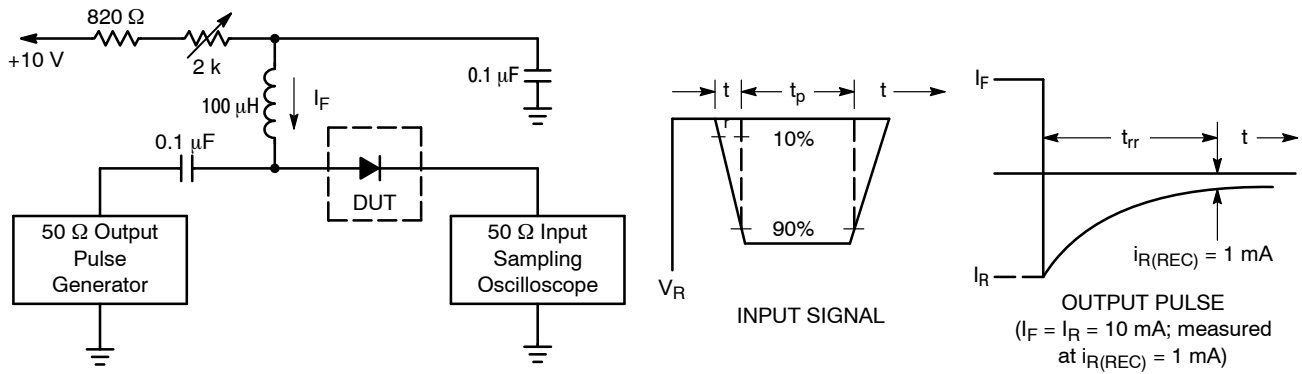
| Device       | Package              | Shipping†             |
|--------------|----------------------|-----------------------|
| BAT54XV2T1G  | SOD-523<br>(Pb-Free) | 3000 / Tape &<br>Reel |
| BAT54XV2T5G  | SOD-523<br>(Pb-Free) | 8000 / Tape &<br>Reel |
| SBAT54XV2T1G | SOD-523<br>(Pb-Free) | 3000 / Tape &<br>Reel |
| SBAT54XV2T5G | SOD-523<br>(Pb-Free) | 8000 / Tape &<br>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.

# BAT54XV2

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

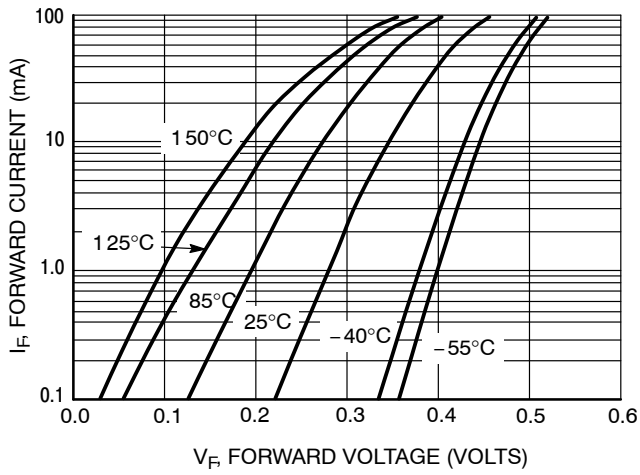
| Characteristic                                                                                                                                                      | Symbol      | Min                   | Typ                                  | Max                                  | Unit          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------|--------------------------------------|--------------------------------------|---------------|
| Reverse Breakdown Voltage<br>( $I_R = 10\ \mu\text{A}$ )                                                                                                            | $V_{(BR)R}$ | 30                    | –                                    | –                                    | V             |
| Total Capacitance<br>( $V_R = 1.0\ \text{V}$ , $f = 1.0\ \text{MHz}$ )                                                                                              | $C_T$       | –                     | 7.6                                  | 10                                   | pF            |
| Reverse Leakage<br>( $V_R = 25\ \text{V}$ )                                                                                                                         | $I_R$       | –                     | 0.3                                  | 2.0                                  | $\mu\text{A}$ |
| Forward Voltage<br>( $I_F = 0.1\ \text{mA}$ )<br>( $I_F = 1.0\ \text{mA}$ )<br>( $I_F = 10\ \text{mA}$ )<br>( $I_F = 30\ \text{mA}$ )<br>( $I_F = 100\ \text{mA}$ ) | $V_F$       | –<br>–<br>–<br>–<br>– | 0.22<br>0.28<br>0.35<br>0.39<br>0.46 | 0.24<br>0.32<br>0.40<br>0.50<br>0.80 | V             |
| Reverse Recovery Time<br>( $I_F = I_R = 10\ \text{mA}$ , $I_{R(\text{REC})} = 1.0\ \text{mA}$ ) Figure 1                                                            | $t_{rr}$    | –                     | –                                    | 5.0                                  | ns            |



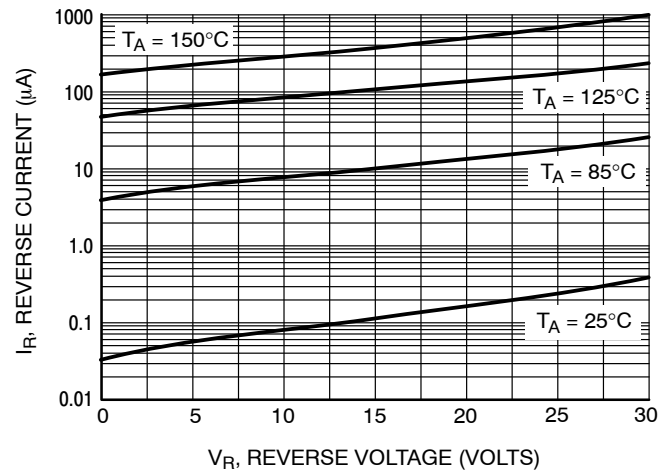
- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current ( $I_F$ ) of 10 mA.  
2. Input pulse is adjusted so  $I_{R(\text{peak})}$  is equal to 10 mA.  
3.  $t_p \gg t_{rr}$

Figure 1. Recovery Time Equivalent Test Circuit

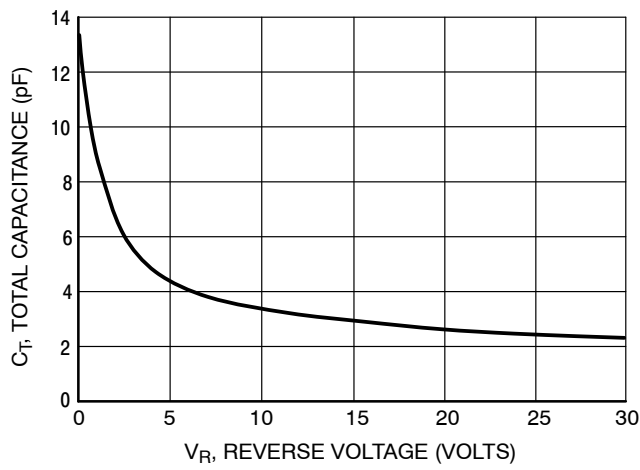
# BAT54XV2



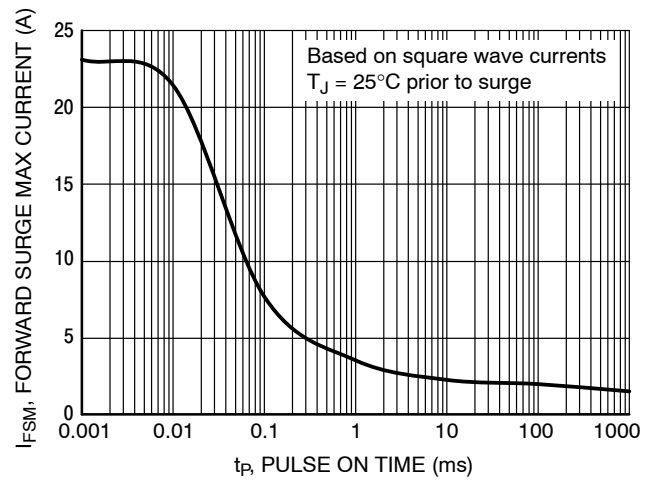
**Figure 2. Forward Voltage**



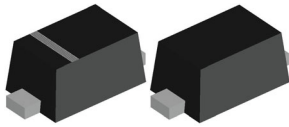
**Figure 3. Leakage Current**



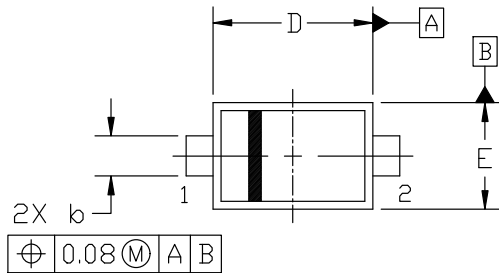
**Figure 4. Total Capacitance**



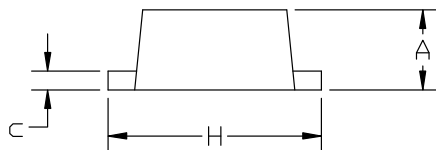
**Figure 5. Forward Surge Current**


**SOD-523 1.20x0.80x0.60**  
**CASE 502**  
**ISSUE F**

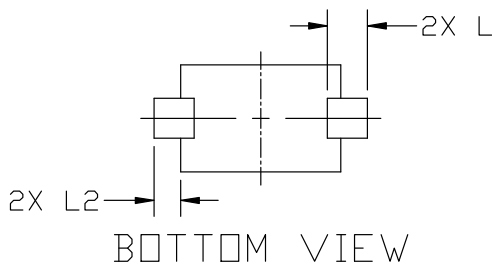
DATE 08 FEB 2024



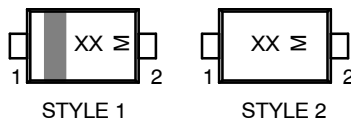
TOP VIEW



SIDE VIEW



BOTTOM VIEW

**GENERIC**  
**MARKING DIAGRAM\***

XX = Specific Device Code  
M Date Code

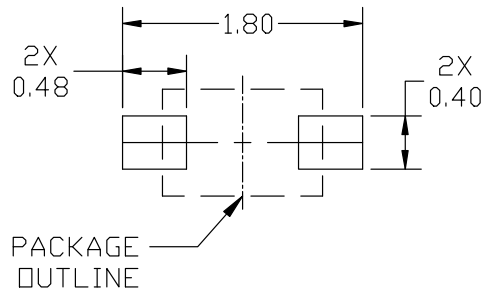
\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

STYLE 1: PIN 1: CATHODE (POLARITY BAND)  
2: ANODE  
STYLE 2: NO POLARITY

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH, 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 |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 0.50        | 0.60 | 0.70 |
| b   | 0.25        | 0.30 | 0.35 |
| c   | 0.07        | 0.14 | 0.20 |
| D   | 1.10        | 1.20 | 1.30 |
| E   | 0.70        | 0.80 | 0.90 |
| H   | 1.50        | 1.60 | 1.70 |
| L   | 0.30 REF    |      |      |
| L2  | 0.15        | 0.20 | 0.25 |


**RECOMMENDED MOUNTING**  
**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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| <b>DESCRIPTION:</b>     | <b>SOD-523 1.20x0.80x0.60</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

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