

# BAT54W

## Schottky Barrier Diode

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
- Extremely Low Forward Voltage – 0.35 V (Typ) @  $I_F = 10$  mAdc
- NSV 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<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_F$     | 200<br>1.6  | mW<br>mW/ $^\circ\text{C}$ |
| Forward Current (DC)                                                                       | $I_F$     | 200 Max     | mA                         |
| Non-Repetitive Peak Forward Current,<br>$t_p < 10$ msec                                    | $I_{FSM}$ | 600         | mA                         |
| Repetitive Peak Forward Current<br>Pulse Wave = 1 sec,<br>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.

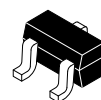
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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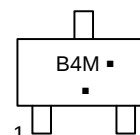
## 30 VOLT SCHOTTKY BARRIER DETECTOR AND SWITCHING DIODE



SOT-323  
CASE 419  
STYLE 2



### MARKING DIAGRAM



B4 = 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

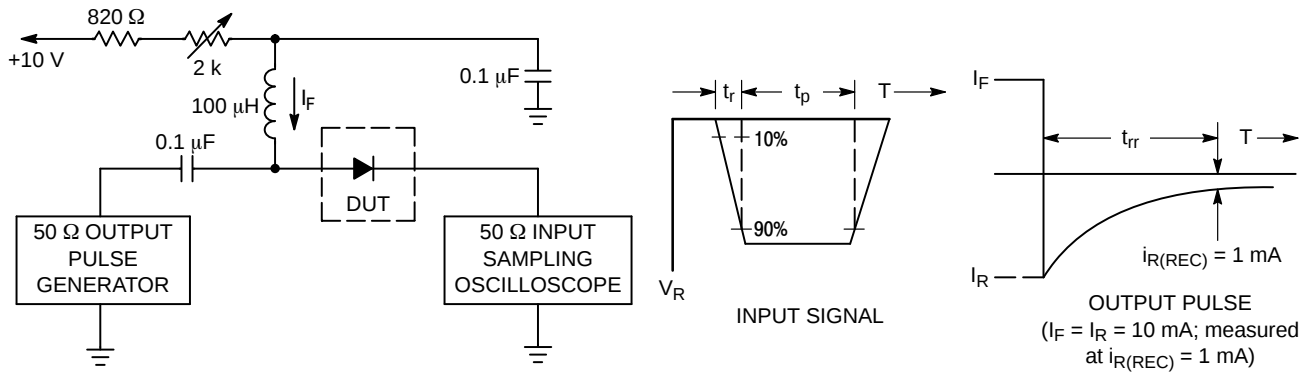
| Device       | Package              | Shipping†              |
|--------------|----------------------|------------------------|
| BAT54WT1G    | SOT-323<br>(Pb-Free) | 3,000 /<br>Tape & Reel |
| NSVBAT54WT1G | SOT-323<br>(Pb-Free) | 3,000 /<br>Tape & Reel |

†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.

# BAT54W

## 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>( $V_R = 25\ \text{V}$ )                                                                                                                         | $I_R$       | –                     | 0.5                                  | 2.0                                  | $\mu\text{A}_{dc}$ |
| 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>0.29<br>0.35<br>0.41<br>0.52 | 0.24<br>0.32<br>0.40<br>0.50<br>0.80 | V                  |
| Reverse Recovery Time<br>( $I_F = I_R = 10\ \text{mA}$ , $I_{R(REC)} = 1.0\ \text{mA}$ , 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**

# BAT54W

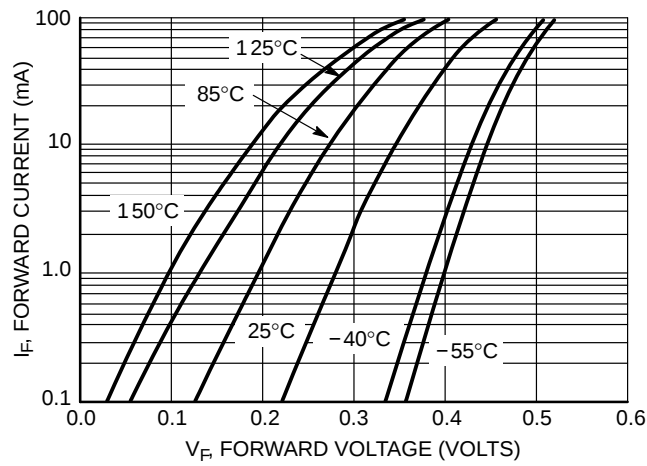


Figure 2. Forward Voltage

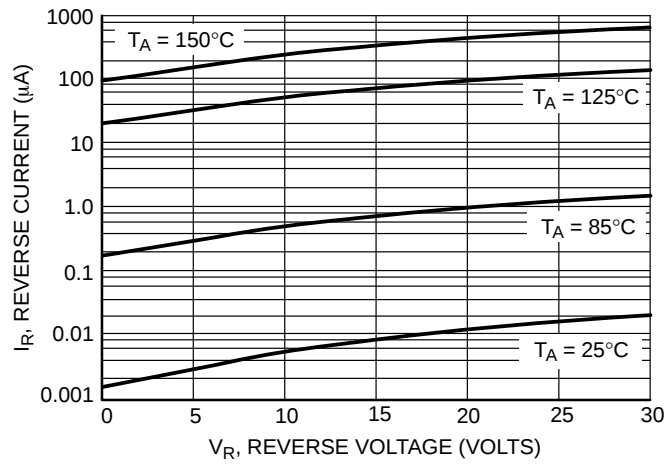


Figure 3. Leakage Current

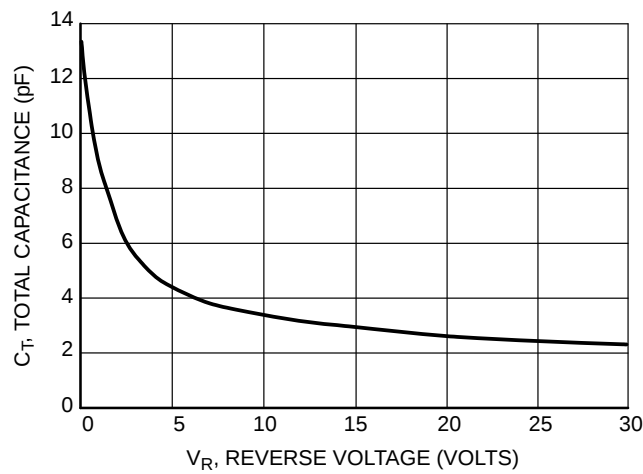
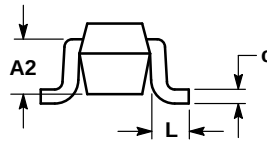
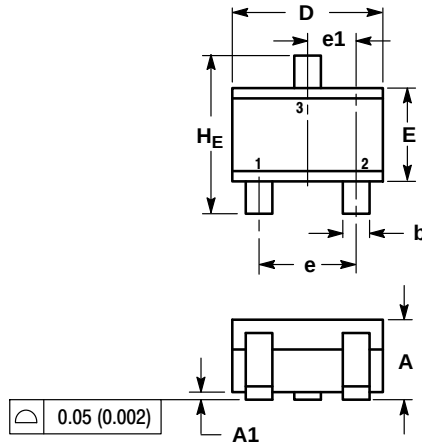


Figure 4. Total Capacitance

# BAT54W

## PACKAGE DIMENSIONS

### SOT-323 (SC-70) CASE 419-04 ISSUE N

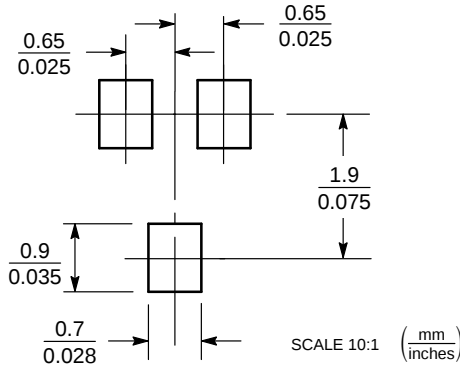


NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 0.80        | 0.90 | 1.00 | 0.032     | 0.035 | 0.040 |
| A1  | 0.00        | 0.05 | 0.10 | 0.000     | 0.002 | 0.004 |
| A2  | 0.70 REF    |      |      | 0.028 REF |       |       |
| b   | 0.30        | 0.35 | 0.40 | 0.012     | 0.014 | 0.016 |
| c   | 0.10        | 0.18 | 0.25 | 0.004     | 0.007 | 0.010 |
| D   | 1.80        | 2.10 | 2.20 | 0.071     | 0.083 | 0.087 |
| E   | 1.15        | 1.24 | 1.35 | 0.045     | 0.049 | 0.053 |
| e   | 1.20        | 1.30 | 1.40 | 0.047     | 0.051 | 0.055 |
| e1  | 0.65 BSC    |      |      | 0.026 BSC |       |       |
| L   | 0.20        | 0.38 | 0.56 | 0.008     | 0.015 | 0.022 |
| HE  | 2.00        | 2.10 | 2.40 | 0.079     | 0.083 | 0.095 |

STYLE 2:  
PIN 1. ANODE  
2. N.C.  
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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