

# BAT54CL

## Dual Common Cathode Schottky Barrier Diodes

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) @  $I_F = 10 \text{ mA}$
- 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                          |
| Forward Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_F$           | 225<br>1.8  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance (Note 1)<br>Junction-to-Ambient (Note 2)                                | $R_{\theta JA}$ | 508<br>311  | $^\circ\text{C}/\text{W}$  |
| Forward Current (DC)   | $I_F$           | 200 Max     | mA                         |
| Non-Repetitive Peak Forward Current<br>$t_p < 10 \text{ msec}$                             | $I_{FSM}$       | 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.

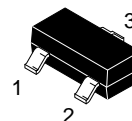
1. FR-4 @ Minimum Pad.
2. FR-4 @ 1.0 x 1.0 inch Pad.



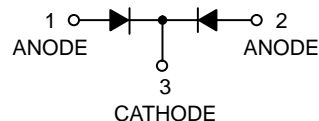
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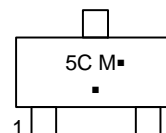
### 30 VOLT DUAL COMMON CATHODE SCHOTTKY BARRIER DIODES



SOT-23  
CASE 318  
STYLE 9



### MARKING DIAGRAM



5C = Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing location.

### ORDERING INFORMATION

| Device      | Package             | Shipping†               |
|-------------|---------------------|-------------------------|
| BAT54CLT1G  | SOT-23<br>(Pb-Free) | 3,000 /<br>Tape & Reel  |
| SBAT54CLT1G | SOT-23<br>(Pb-Free) | 3,000 /<br>Tape & Reel  |
| BAT54CLT3G  | SOT-23<br>(Pb-Free) | 10,000 /<br>Tape & Reel |

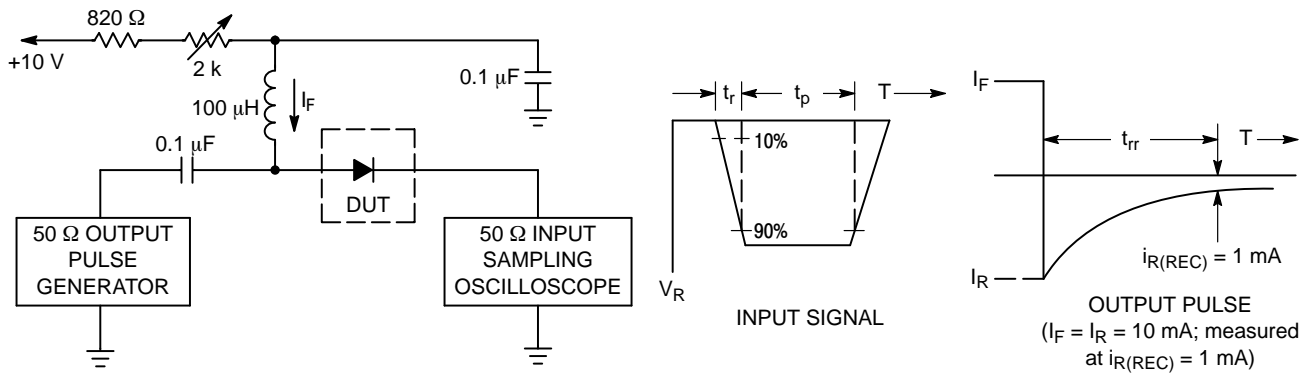
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

| 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                                  | $\mu\text{A}$ |
| 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>( $I_F = 100 \text{ mA}$ ) | $V_F$       | -   | 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>( $I_F = I_R = 10 \text{ mAdc}$ , $I_{R(\text{REC})} = 1.0 \text{ mAdc}$ , Figure 1)   | $t_{rr}$    | -   | -                                    | 5.0                                  | ns            |

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 k $\Omega$  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

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## TYPICAL CHARACTERISTICS

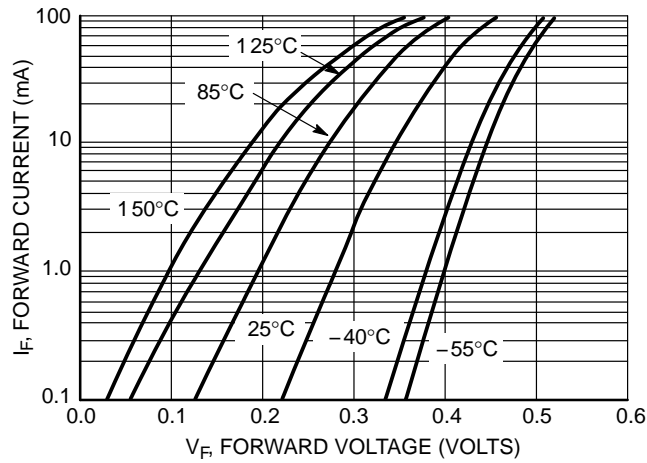


Figure 2. Forward Voltage

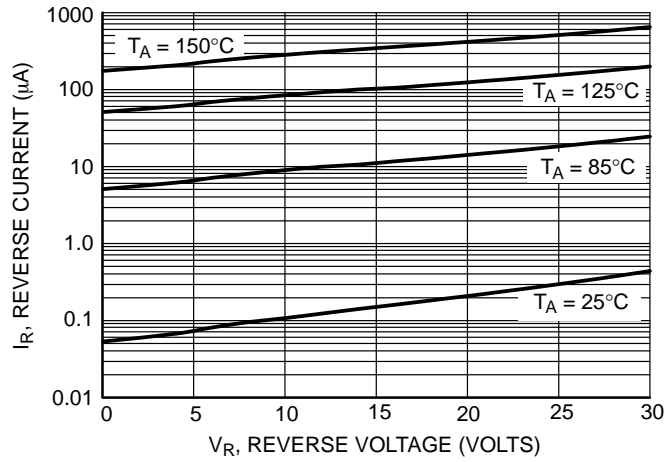


Figure 3. Leakage Current

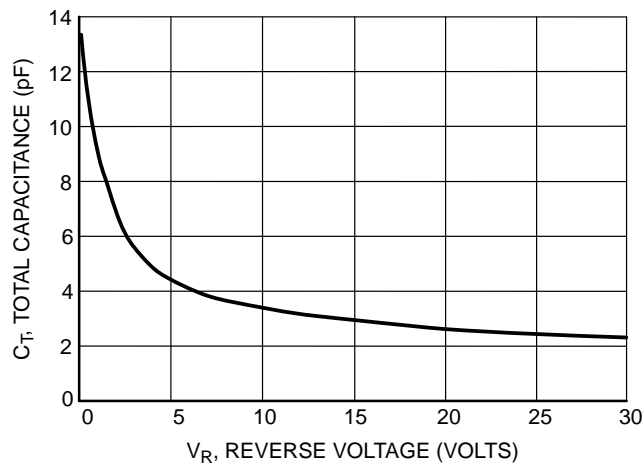
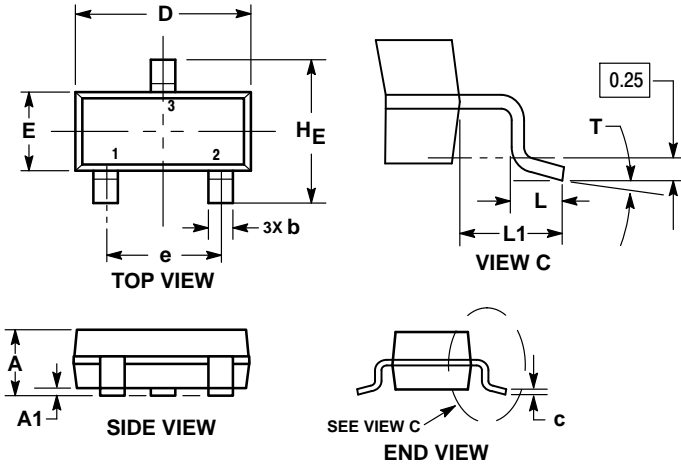


Figure 4. Total Capacitance

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## PACKAGE DIMENSIONS

SOT-23 (TO-236)  
CASE 318-08  
ISSUE AS



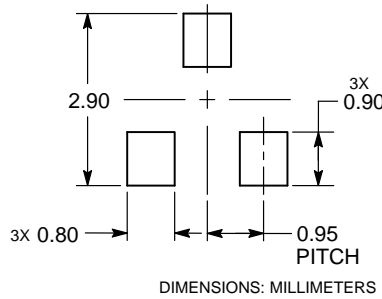
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE 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  | 0.039 | 0.044 |
| A1  | 0.01        | 0.06 | 0.10 | 0.000  | 0.002 | 0.004 |
| b   | 0.37        | 0.44 | 0.50 | 0.015  | 0.017 | 0.020 |
| c   | 0.08        | 0.14 | 0.20 | 0.003  | 0.006 | 0.008 |
| 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 | 0.080 |
| L   | 0.30        | 0.43 | 0.55 | 0.012  | 0.017 | 0.022 |
| L1  | 0.35        | 0.54 | 0.69 | 0.014  | 0.021 | 0.027 |
| HE  | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |
| T   | 0°          | —    | 10°  | 0°     | —     | 10°   |

STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

### RECOMMENDED 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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