

# BAT54T1

Preferred Device

## 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 Volts (Typ) @  $I_F = 10 \text{ mAdc}$
- Pb-Free Package is Available

### 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 $25^\circ\text{C}$	$P_F$	400 3.2	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Case	$R_{\theta JL}$	174	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	492	$^\circ\text{C/W}$
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	$^\circ\text{C}$

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. FR-5 =  $1.0 \times 0.75 \times 0.062 \text{ in.}$



ON Semiconductor®

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### 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†
BAT54T1	SOD-123	3000 / Tape & Reel
BAT54T1G	SOD-123 (Pb-Free)	3000 / Tape & Reel

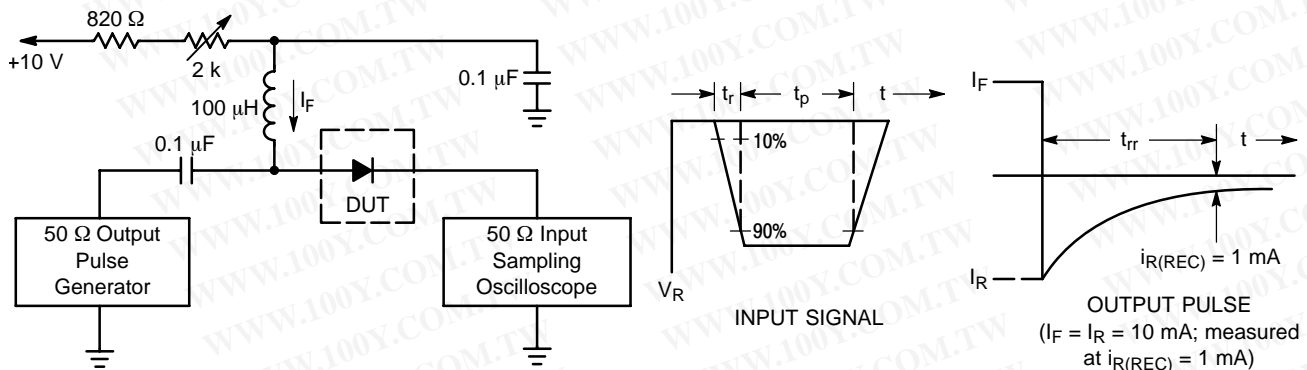
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

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## 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	$\mu\text{A}_{dc}$
Forward Voltage ( $I_F = 0.1\ \text{mA}_{dc}$ )	$V_F$	–	0.22	0.24	V <sub>dc</sub>
Forward Voltage ( $I_F = 30\ \text{mA}_{dc}$ )	$V_F$	–	0.41	0.5	V <sub>dc</sub>
Forward Voltage ( $I_F = 100\ \text{mA}_{dc}$ )	$V_F$	–	0.52	0.8	V <sub>dc</sub>
Reverse Recovery Time ( $I_F = I_R = 10\ \text{mA}_{dc}$ , $I_{R(REC)} = 1.0\ \text{mA}_{dc}$ , Figure 1)	$t_{rr}$	–	–	5.0	ns
Forward Voltage ( $I_F = 1.0\ \text{mA}_{dc}$ )	$V_F$	–	0.29	0.32	V <sub>dc</sub>
Forward Voltage ( $I_F = 10\ \text{mA}_{dc}$ )	$V_F$	–	0.35	0.40	V <sub>dc</sub>
Forward Current (DC)	$I_F$	–	–	200	mA <sub>dc</sub>
Repetitive Peak Forward Current	$I_{FRM}$	–	–	300	mA <sub>dc</sub>
Non-Repetitive Peak Forward Current ( $t < 1.0\ \text{s}$ )	$I_{FSM}$	–	–	600	mA <sub>dc</sub>



- 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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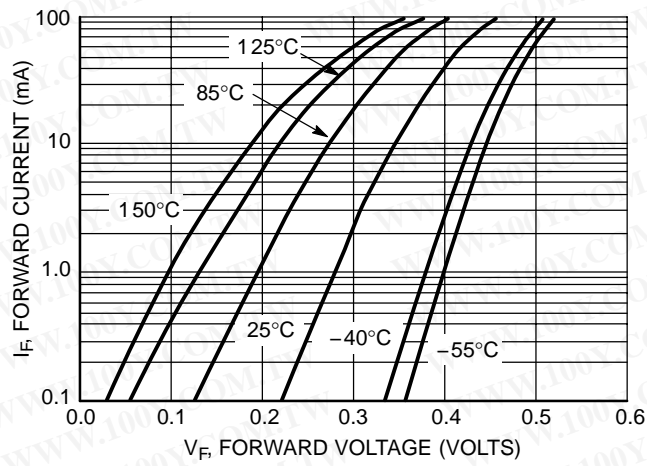


Figure 2. Forward Voltage

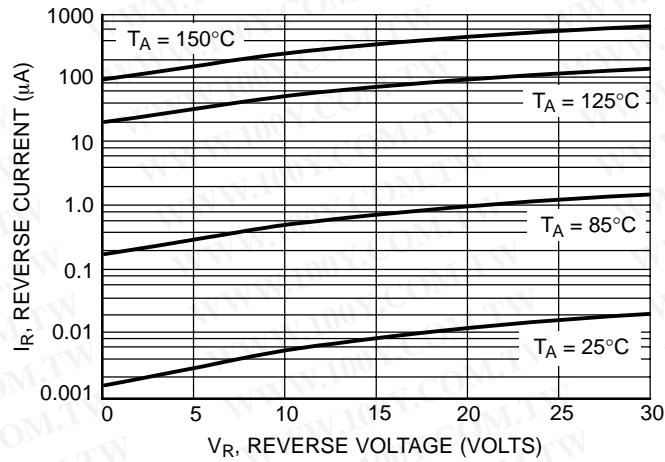


Figure 3. Leakage Current

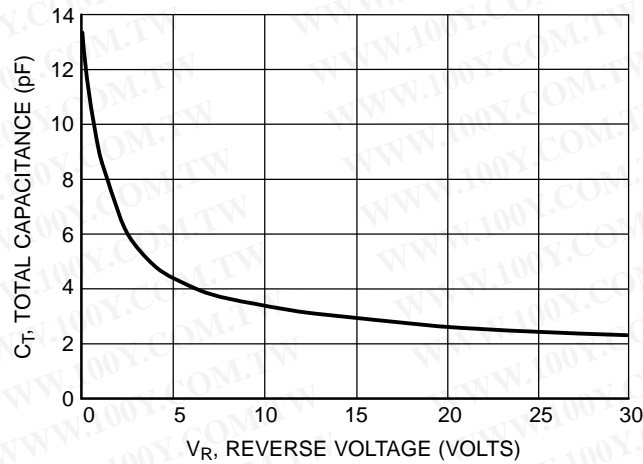
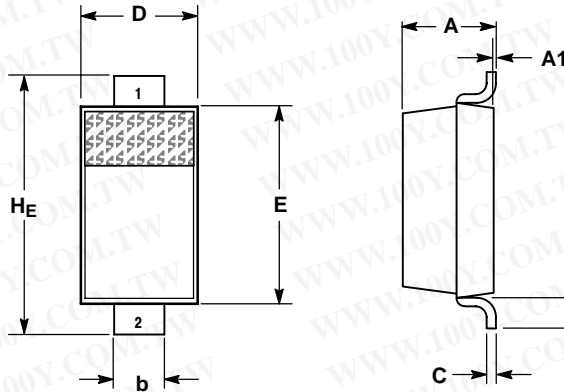


Figure 4. Total Capacitance

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## PACKAGE DIMENSIONS

SOD-123  
PLASTIC PACKAGE  
CASE 425-04  
ISSUE E

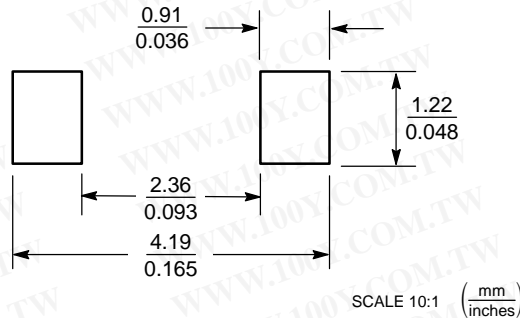


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.


DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.94	1.17	1.35	0.037	0.046	0.053
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.51	0.61	0.71	0.020	0.024	0.028
c	---	---	0.15	---	---	0.006
D	1.40	1.60	1.80	0.055	0.063	0.071
E	2.54	2.69	2.84	0.100	0.106	0.112
H_E	3.56	3.68	3.86	0.140	0.145	0.152
L	0.25	---	---	0.010	---	---

STYLE 1:  
PIN 1. CATHODE  
2. ANODE

## 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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