# **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<sub>J</sub> = 125°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, (Note 1) T <sub>A</sub> = 25°C	P <sub>D</sub>	200	mW
Derate above 25°C		1.57	mW/°C
Forward Current (DC)	lF	200 Max	mA
Non–Repetitive Peak Forward Current, t <sub>p</sub> < 10 msec	I <sub>FSM</sub>	600	mA
Repetitive Peak Forward Current Pulse Wave = 1 sec, Duty Cycle = 66%	I <sub>FRM</sub>	300	mA
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	635	°C/W
Junction and Storage Temperature	T <sub>J</sub> , T <sub>stg</sub>	-55 to 125	°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.



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# 30 VOLT SILICON HOT-CARRIER DETECTOR AND SWITCHING DIODES





SOD-523 CASE 502

## **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.

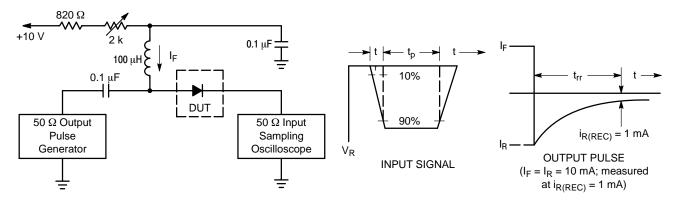
# ORDERING INFORMATION

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

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

Characteristic	Symbol	Min	Тур	Max	Unit
Reverse Breakdown Voltage (I <sub>R</sub> = 10 μA)	V <sub>(BR)R</sub>	30	-	-	V
Total Capacitance (V <sub>R</sub> = 1.0 V, f = 1.0 MHz)	C <sub>T</sub>	-	7.6	10	pF
Reverse Leakage (V <sub>R</sub> = 25 V)	I <sub>R</sub>	-	0.3	2.0	μΑ
Forward Voltage (I <sub>F</sub> = 0.1 mA) (I <sub>F</sub> = 1.0 mA) (I <sub>F</sub> = 10 mA) (I <sub>F</sub> = 30 mA) (I <sub>F</sub> = 100 mA)	V <sub>F</sub>	- - - -	0.22 0.28 0.35 0.39 0.46	0.24 0.32 0.40 0.50 0.80	V
Reverse Recovery Time (I <sub>F</sub> = I <sub>R</sub> = 10 mA, $I_{R(REC)}$ = 1.0 mA) Figure 1	t <sub>rr</sub>	-	-	5.0	ns



Notes: 1. A 2.0 k $\Omega$  variable resistor adjusted for a Forward Current (I<sub>F</sub>) of 10 mA.

- 2. Input pulse is adjusted so  $I_{R(peak)}$  is equal to 10 mA.
- 3.  $t_p \gg t_{rr}$

Figure 1. Recovery Time Equivalent Test Circuit

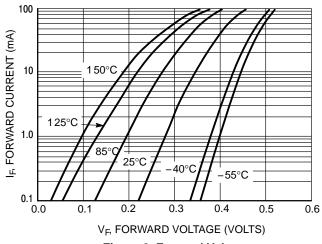


Figure 2. Forward Voltage

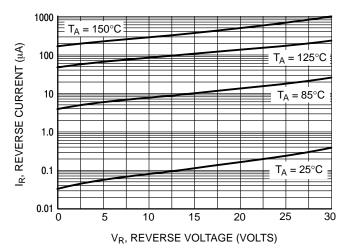


Figure 3. Leakage Current

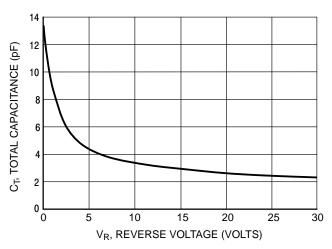


Figure 4. Total Capacitance

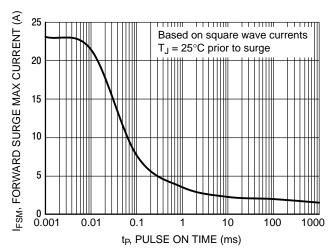
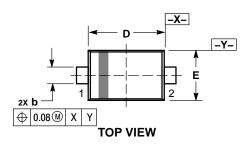
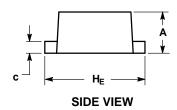


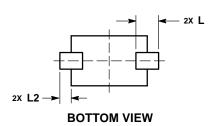
Figure 5. Forward Surge Current

## PACKAGE DIMENSIONS

SOD-523 **CASE 502** ISSUE E





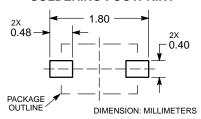


### NOTES

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994. CONTROLLING DIMENSION: MILLIMETERS. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS			
DIM	MIN	NOM	MAX	
Α	0.50	0.60	0.70	
b	0.25	0.30	0.35	
С	0.07	0.14	0.20	
D	1.10	1.20	1.30	
E	0.70	0.80	0.90	
HE	1.50	1.60	1.70	
L	0.30 REF			
L2	0.15	0.20	0.25	

# 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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