# **Surface Mount Schottky Power Rectifier**

# Plastic SOD-123 Package

This device uses the Schottky Barrier principle with a large area metal—to—silicon power diode. Ideally suited for low voltage, high frequency rectification or as free wheeling and polarity protection diodes in surface mount applications where compact size and weight are critical to the system. This package also provides an easy to work with alternative to leadless 34 package style. Because of its small size, it is ideal for use in portable and battery powered products such as cellular and cordless phones, chargers, notebook computers, printers, PDAs and PCMCIA cards. Typical applications are AC—DC and DC—DC converters, reverse battery protection, and "Oring" of multiple supply voltages and any other application where performance and size are critical.

#### **Features**

- Guardring for Stress Protection
- Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0
- Package Designed for Optimal Automated Board Assembly
- ESD Ratings: Machine Model, C Human Body Model, 3B
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

#### **Mechanical Characteristics**

- Reel Options: MBR230LSFT1G = 3,000 per 7 in reel/8 mm tape
- Device Marking: L3N
- Polarity Designator: Cathode Band
- Weight: 11.7 mg (approximately)
- Case: Epoxy, Molded
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



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http://onsemi.com

# SCHOTTKY BARRIER RECTIFIER 2.0 AMPERES, 30 VOLTS



SOD-123FL CASE 498

#### MARKING DIAGRAM



L3N = Specific Device Code

M = Date Code ■ Pb–Free Package

(Note: Microdot may be in either location)

#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MBR230LSFT1G	SOD-123FL (Pb-Free)	3000/Tape & Reel
NRVB230LSFT1G	SOD-123FL (Pb-Free)	3000/Tape & Reel

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

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	30	V
Average Rectified Forward Current (At Rated V <sub>R</sub> , T <sub>L</sub> = 105°C)	I <sub>O</sub>	2.0	А
Peak Repetitive Forward Current (At Rated V <sub>R</sub> , Square Wave, 100 kHz, T <sub>L</sub> = 95°C)	I <sub>FRM</sub>	4.0	А
Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	40	А
Storage Temperature	T <sub>stg</sub>	-55 to 150	°C
Operating Junction Temperature	TJ	-55 to 125	°C
Voltage Rate of Change (Rated V <sub>R</sub> , T <sub>J</sub> = 25°C)	dv/dt	10,000	V/μs

#### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Lead (Note 1)	R <sub>til</sub>	26	°C/W
Thermal Resistance, Junction–to–Lead (Note 2)	R <sub>til</sub>	21	
Thermal Resistance, Junction-to-Ambient (Note 1)	R <sub>tia</sub>	325	
Thermal Resistance, Junction-to-Ambient (Note 2)	R <sub>tja</sub>	82	

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.

- Mounted with minimum recommended pad size, PC Board FR4.
   Mounted with 1 in. copper pad (Cu area 700 mm²).

#### **ELECTRICAL CHARACTERISTICS**

Maximum Instantaneous Forward Voltage (Note 3)	V <sub>F</sub>	T <sub>J</sub> = 25°C	$T_J = 25^{\circ}C$ $T_J = 100^{\circ}C$	
$(I_F = 1.0 \text{ A})$ $(I_F = 2.0 \text{ A})$		0.38 0.43	0.30 0.37	
Maximum Instantaneous Reverse Current (Note 3)	I <sub>R</sub>	T <sub>J</sub> = 25°C	T <sub>J</sub> = 100°C	mA
(V <sub>R</sub> = 30 V)		1.0	25	

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. 3. Pulse Test: Pulse Width  $\leq$  250  $\mu$ s, Duty Cycle  $\leq$  2%.

#### **TYPICAL CHARACTERISTICS**

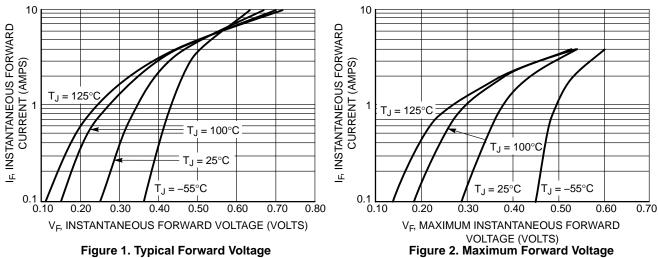
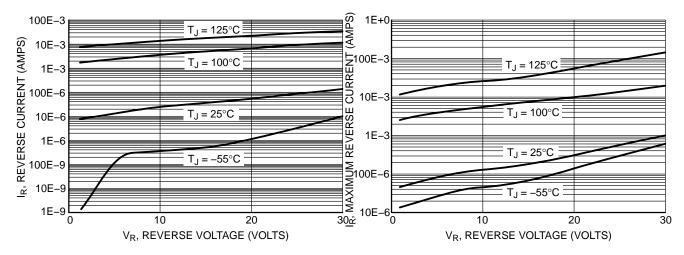


Figure 1. Typical Forward Voltage



**Figure 3. Typical Reverse Current** 

Figure 4. Maximum Reverse Current

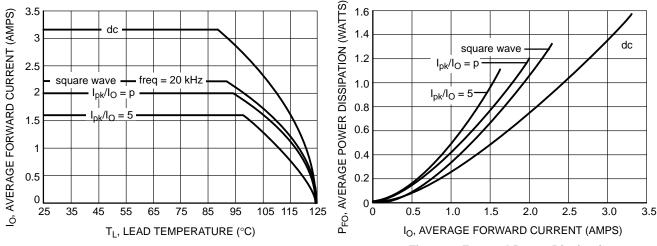
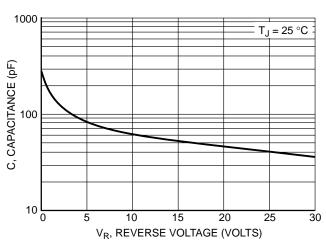


Figure 5. Current Derating

Figure 6. Forward Power Dissipation

#### **TYPICAL CHARACTERISTICS**



 $T_{\rm J}, \, {\rm DERATED} \, {\rm OPERATING} \, {\rm TEMPERATURE} \, (^{\circ}{\rm C})$ 125 R<sub>θJA</sub> = 25.6 °C/W 120 115 110 R<sub>θJA</sub> = 130 °C/W 105 100 95 90  $R_{\theta JA}$  = 235 °C/W 85 80  $R_{\theta JA} = 324.9 \, ^{\circ}\text{C/W}$ 75 70  $R_{\theta JA} = 400 \, ^{\circ}\text{C/W}$ 65 <mark>L</mark> 10 12 V<sub>R</sub>, DC REVERSE VOLTAGE (VOLTS)

Figure 7. Capacitance

Figure 8. Typical Operating Temperature Derating

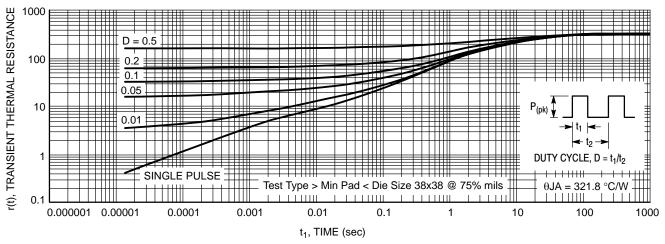
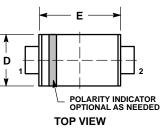
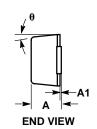


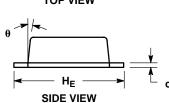
Figure 9. Thermal Response

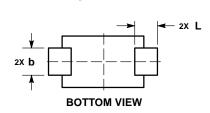
#### PACKAGE DIMENSIONS

#### SOD-123LF **CASE 498** ISSUE D







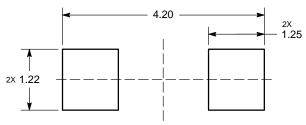


- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
   CONTROLLING DIMENSION: MILLIMETER.

- DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH.
  DIMENSIONS D AND J ARE TO BE MEASURED ON FLAT SECTION OF THE LEAD: BETWEEN 0.10 AND 0.25 MM FROM THE LEAD TIP.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	0.90	0.95	0.98	0.035	0.037	0.039
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.70	0.90	1.10	0.028	0.035	0.043
С	0.10	0.15	0.20	0.004	0.006	0.008
D	1.50	1.65	1.80	0.059	0.065	0.071
E	2.50	2.70	2.90	0.098	0.106	0.114
L	0.55	0.75	0.95	0.022	0.030	0.037
HE	3.40	3.60	3.80	0.134	0.142	0.150
θ	0°	_	8°	0°	-	8°

#### RECOMMENDED **SOLDERING FOOTPRINT\***



**DIMENSIONS: MILLIMETERS** 

\*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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