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
- Optimized for Very Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Package Designed for Optimal Automated Board Assembly
- ESD Ratings: Machine Model, C; Human Body Model, 3B
- Pb-Free Packages are Available

Mechanical Characteristics

- Reel Options: MBR120VLSFT1 = 3,000 per 7" reel/8 mm tape MBR120VLSFT3 = 10,000 per 13" reel/8 mm tape
- Device Marking: L2V
- Polarity Designator: Cathode Band
- Weight: 11.7 mg (approximately)
- Case: Epoxy, Molded
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



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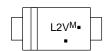
http://onsemi.com

SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES 20 VOLTS



SOD-123FL CASE 498 PLASTIC

MARKING DIAGRAM



L2V = Specific Device Code

M = Date Code

= Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping [†]		
MBR120VLSFT1	SOD-123FL	3000/Tape & Reel		
MBR120VLSFT1G	SOD-123FL (Pb-Free)	3000/Tape & Reel		
MBR120VLSFT3	SOD-123FL	10000/Tape & Reel		
MBR120VLSFT3G	SOD-123FL (Pb-Free)	10000/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.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V _{RRM} V _{RWM} V _R	20	V	
Average Rectified Forward Current (Rated V_R) $T_L = 119^{\circ}C$	I _{F(AV)}	1.0	А	
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions, Halfwave, Single Phase, 60 Hz)	I _{FSM}	45	А	
Storage Temperature Range	T _{stg}	-65 to +125	°C	
Operating Junction Temperature	TJ	-65 to +125	°C	
Voltage Rate of Change (Rated V _R)	dv/dt	1000	V/μs	

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.

THERMAL CHARACTERISTICS

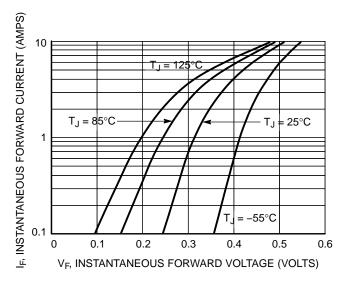
Characteristic	Symbol	Value	Unit
Thermal Resistance – Junction–to–Lead (Note 1)	R _{til}	26	°C/W
Thermal Resistance – Junction–to–Lead (Note 2)	R _{til}	21	
Thermal Resistance – Junction–to–Ambient (Note 1)	R _{tja}	325	
Thermal Resistance – Junction–to–Ambient (Note 2)	R _{tja}	82	

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

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	T _J = 25°C	$T_J = 85^{\circ}C$	Unit
Maximum Instantaneous Forward Voltage (Note 3)	V_{F}			V
$(I_F = 0.1 \text{ A})$		0.275	0.205	
$(I_F = 0.5 \text{ A})$		0.315	0.270	
$(I_F = 1.0 \text{ A})$		0.340	0.300	
Maximum Instantaneous Reverse Current (Note 3)	I _R			mA
(Rated DC Voltage)		0.60	15	

^{3.} Pulse Test: Pulse Width = 300 μ s, Duty Cycle \leq 2%.



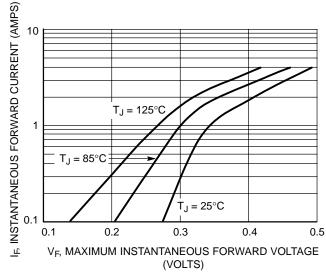


Figure 1. Typical Forward Voltage

Figure 2. Maximum Forward Voltage

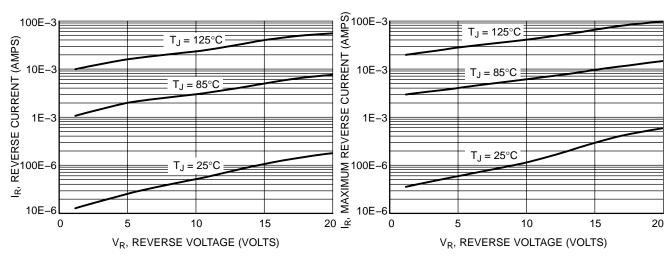
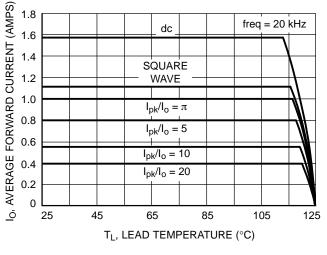


Figure 3. Typical Reverse Current

Figure 4. Maximum Reverse Current





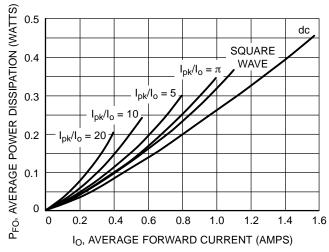


Figure 6. Forward Power Dissipation

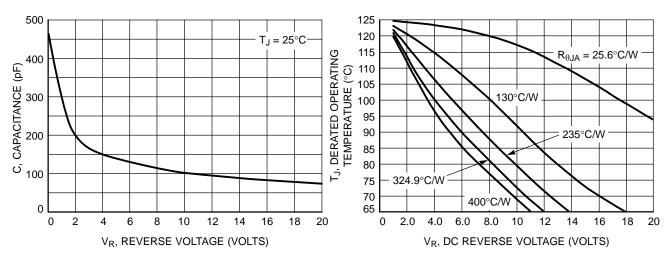


Figure 7. Capacitance

Figure 8. Typical Operating Temperature Derating*

* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of T_J therefore must include forward and reverse power effects. The allowable operating T_J may be calculated from the equation: $T_J = T_{Jmax} - r(t)(Pf + Pr)$ where

r(t) = thermal impedance under given conditions,

Pf = forward power dissipation, and

Pr = reverse power dissipation

This graph displays the derated allowable T_J due to reverse bias under DC conditions only and is calculated as $T_J = T_{Jmax} - r(t)Pr$, where r(t) = Rthja. For other power applications further calculations must be performed.

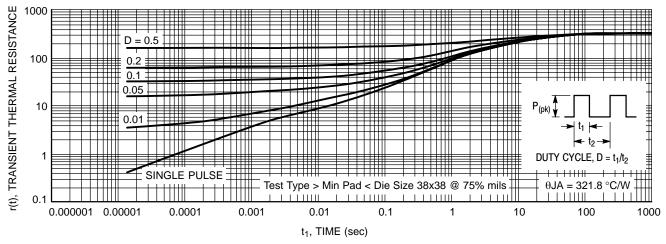
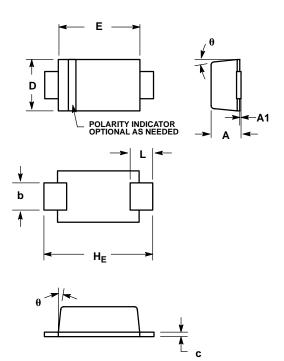


Figure 9. Thermal Response

PACKAGE DIMENSIONS

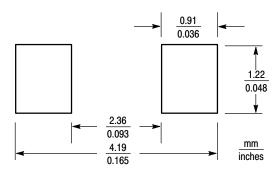
SOD-123LF CASE 498-01 **ISSUE A**



- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,
- 1. DIMENSIONING AND TOLLIFORMAND.
 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH.
 4. 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	1.00	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°

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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