

# Surface Mount Schottky Power Rectifier Plastic SOD-123 Package

**MBR0520LT1**  
**MBR0520LT3**

Motorola Preferred Devices

**SCHOTTKY BARRIER  
RECTIFIER  
0.5 AMPERES  
20 VOLTS**



**CASE 425-04, Style 1  
SOD-123**

The Schottky Power Rectifier employs the Schottky Barrier principle with a barrier metal that produces optimal forward voltage drop-reverse current tradeoff. 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 provides an alternative to the leadless 34 MELF style package. These state-of-the-art devices have the following features:

- Guardring for Stress Protection
- Very Low Forward Voltage (0.38 V Max @ 0.5 A, 25°C)
- 125°C Operating Junction Temperature
- Epoxy Meets UL94, VO at 1/8"
- Package Designed for Optimal Automated Board Assembly

### Mechanical Characteristics

- Reel Options: MBR0520LT1 = 3,000 per 7" reel/8 mm tape.  
MBR0520LT3 = 10,000 per 13" reel/8 mm tape.
- Device Marking: B2
- 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

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	20	Volts
Average Rectified Forward Current (Rated $V_R$ ) $T_L = 90^\circ\text{C}$	$I_F(AV)$	0.5	Amps
Non-repetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	5.5	Amps
Storage Temperature	$T_{stg}$	-65 to +125	°C
Operating Junction Temperature	$T_J$	-65 to +125	°C
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	1000	V/ $\mu\text{s}$

### THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Ambient (1)	$R_{\theta JA}$	340	°C/W
Thermal Resistance — Junction to Lead	$R_{\theta JL}$	150	°C/W

### ELECTRICAL CHARACTERISTICS

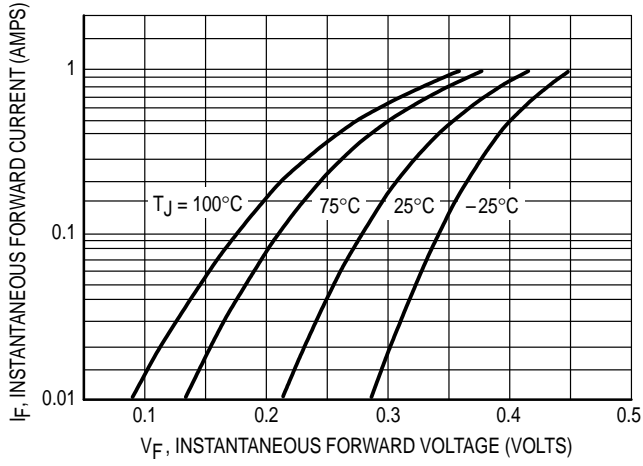
Maximum Instantaneous Forward Voltage (2) ( $i_F = 0.1$ Amps) ( $i_F = 0.5$ Amps)	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	Volts
		0.300 0.385	0.220 0.330	
Maximum Instantaneous Reverse Current (2) ( $V_R = 10$ V) (Rated dc Voltage = 20 V)	$I_R$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	mA
		75 $\mu\text{A}$ 250 $\mu\text{A}$	5 mA 8 mA	

(1) FR-4 or FR-5 = 3.5 x 1.5 inches using the Motorola minimum recommended footprint.

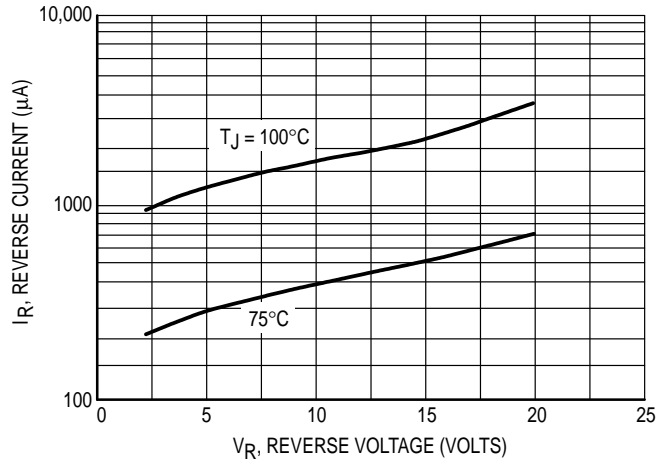
(2) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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

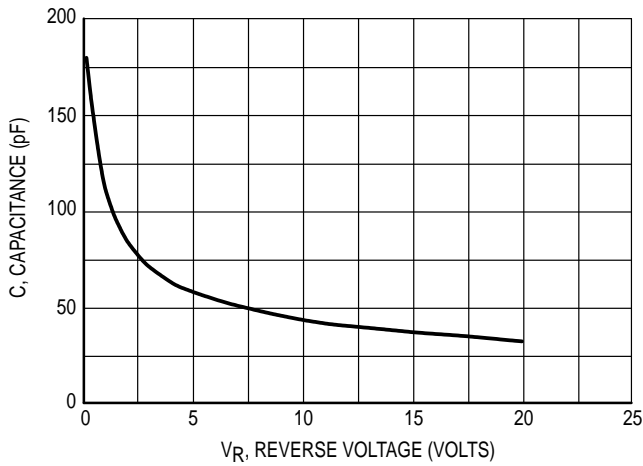
**MBR0520LT1**



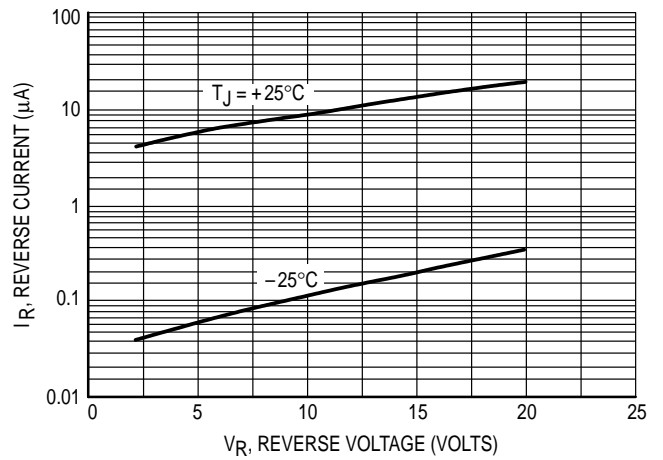
**Figure 1. Typical Forward Voltage**



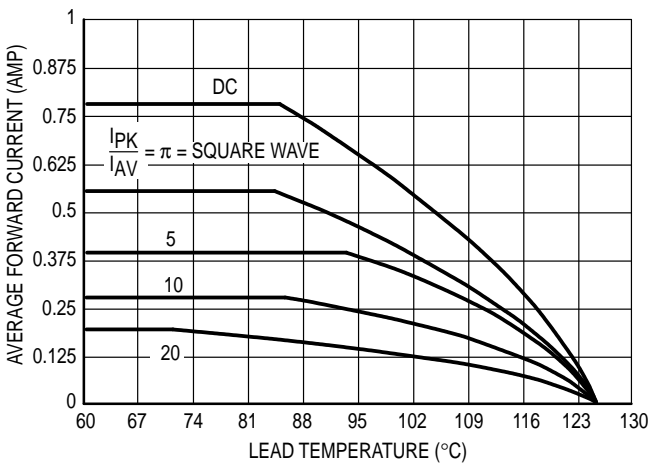
**Figure 2. Typical Reverse Current**



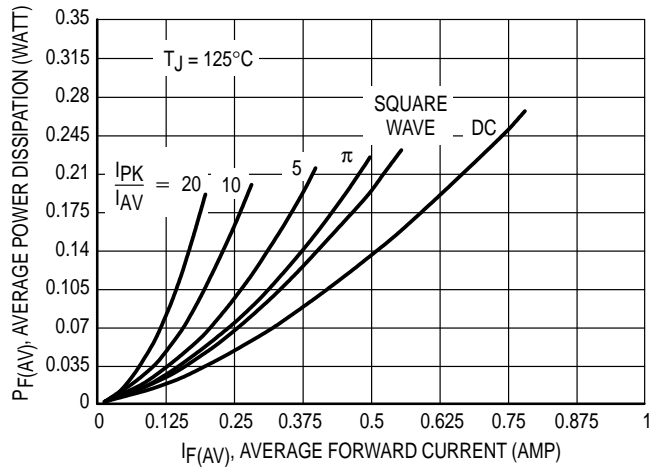
**Figure 3. Typical Capacitance**



**Figure 4. Typical Reverse Current**

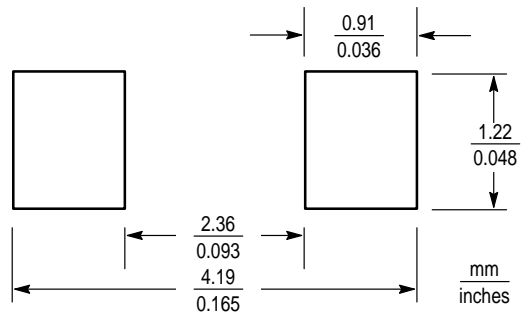


**Figure 5. Current Derating (Lead)**



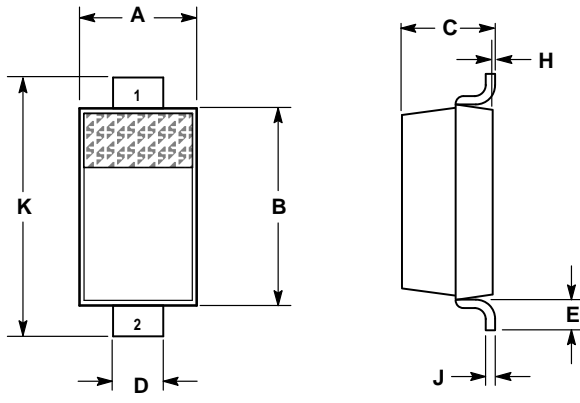
**Figure 6. Power Dissipation**

RECOMMENDED FOOTPRINT FOR SOD-123



SOD-123

**PACKAGE DIMENSIONS**




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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.055	0.071	1.40	1.80
B	0.100	0.112	2.55	2.85
C	0.037	0.053	0.95	1.35
D	0.020	0.028	0.50	0.70
E	0.004	—	0.25	—
H	0.000	0.004	0.00	0.10
J	—	0.006	—	0.15
K	0.140	0.152	3.55	3.85

STYLE 1:  
 PIN 1. CATHODE  
 2. ANODE

**CASE 425-04  
 ISSUE C  
 SOD-123**

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