

# MBR0520LT1, MBR0520LT3

Preferred Devices

## Surface Mount Schottky Power Rectifier

### Plastic SOD-123 Package

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:

#### 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 UL 94 V-0 @ 0.125 in
- Package Designed for Optimal Automated Board Assembly
- Pb-Free Packages are Available

#### Mechanical Characteristics

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



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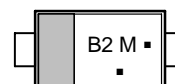
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### SCHOTTKY BARRIER RECTIFIER 0.5 AMPERES, 20 VOLTS



SOD-123  
CASE 425  
STYLE 1

#### MARKING DIAGRAM



B2 = Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
MBR0520LT1	SOD-123	3000/Tape & Reel
MBR0520LT1G	SOD-123 (Pb-Free)	3000/Tape & Reel
MBR0520LT3	SOD-123	10,000/Tape & Reel
MBR0520LT3G	SOD-123 (Pb-Free)	10,000/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.

# MBR0520LT1, MBR0520LT3

## 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 $V_R$ , $T_L = 90^\circ\text{C}$ )	$I_{F(AV)}$	0.5	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	5.5	A
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-65 to +125	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	1000	V/ $\mu\text{s}$
ESD Ratings:	Machine Model = C Human Body Model = 3B	> 400 > 8000	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance; Junction-to-Ambient (Note 1)	$R_{\theta JA}$	206	$^\circ\text{C/W}$
Thermal Resistance; Junction-to-Lead	$R_{\theta JL}$	150	$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 2) ( $i_F = 0.1$ Ams) ( $i_F = 0.5$ Ams)	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	V
		0.300 0.385	0.220 0.330	
Maximum Instantaneous Reverse Current (Note 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 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.
- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# MBR0520LT1, MBR0520LT3

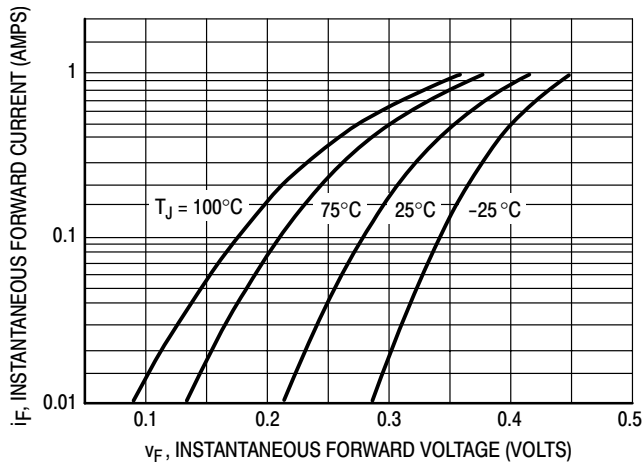


Figure 1. Typical Forward Voltage

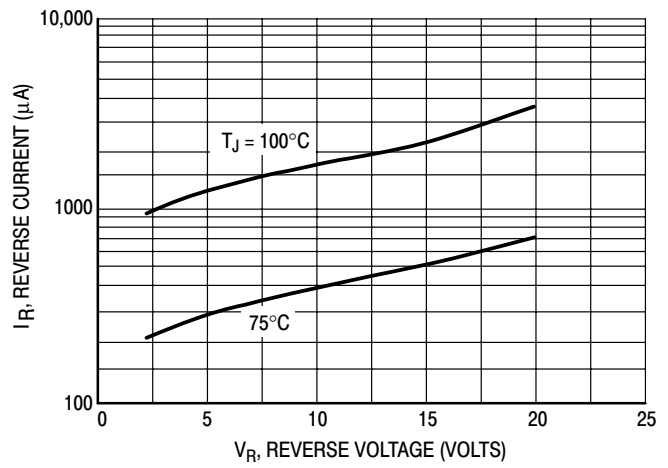


Figure 2. Typical Reverse Current

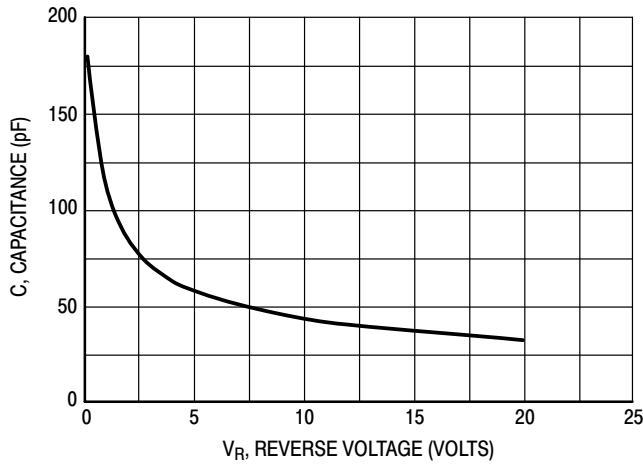


Figure 3. Typical Capacitance

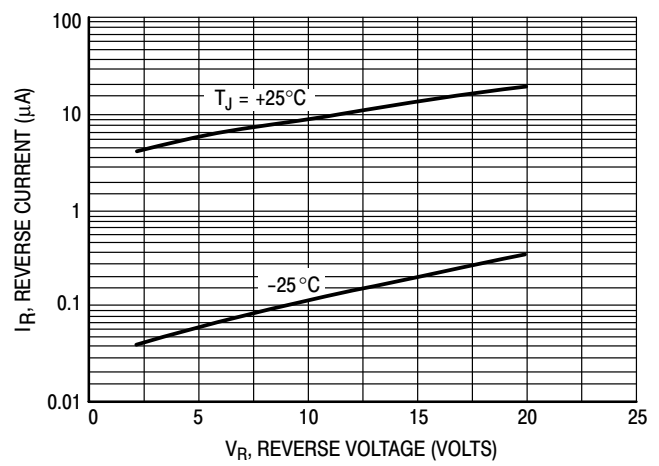


Figure 4. Typical Reverse Current

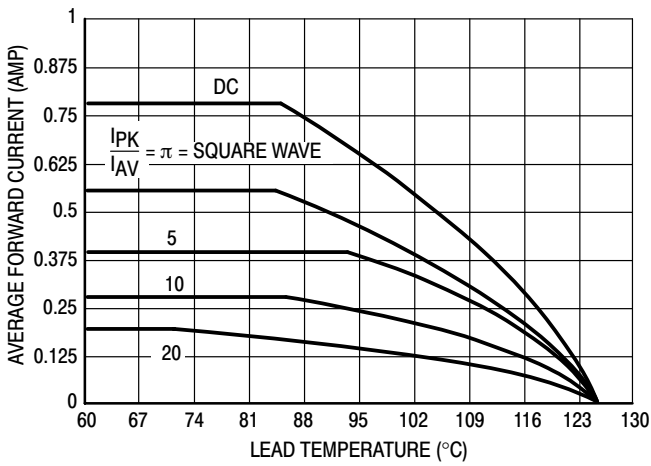


Figure 5. Current Derating (Lead)

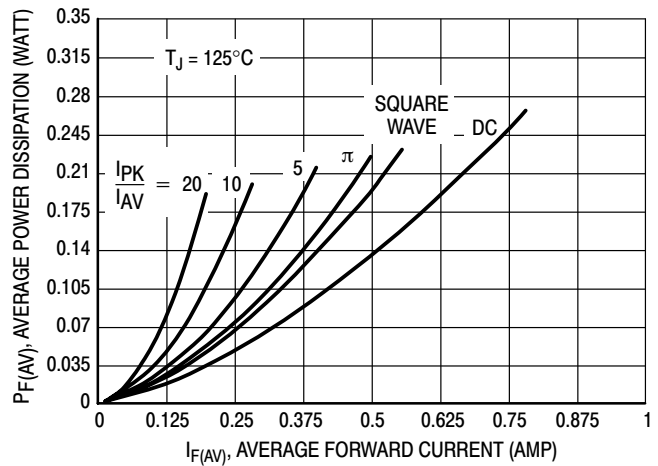
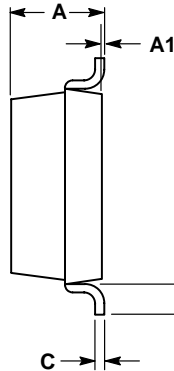
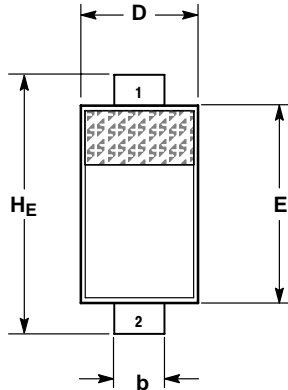


Figure 6. Power Dissipation

# MBR0520LT1, MBR0520LT3

## PACKAGE DIMENSIONS

SOD-123  
CASE 425-04  
ISSUE E

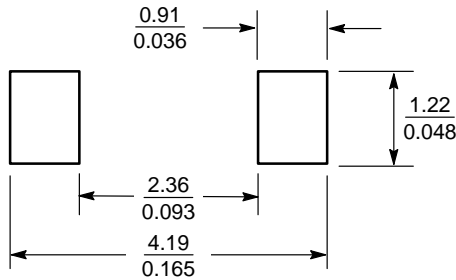


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

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 <sub>E</sub>	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\*



SCALE 10:1 (  $\frac{\text{mm}}{\text{inches}}$  )

\*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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