

# MBR0520LT1G, SBR80520LT1G, MBR0520LT3G, SBR80520LT3G

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
- AEC-Q101 Qualified and PPAP Capable
- SBR8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

#### Mechanical Characteristics

- 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
- ESD Ratings:
  - ◆ Human Body Model = 3B
  - ◆ Machine Model = C

\*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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<http://onsemi.com>

### 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†                   |
|--------------|----------------------|-----------------------------|
| MBR0520LT1G  | SOD-123<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| SBR80520LT1G | SOD-123<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| MBR0520LT3G  | SOD-123<br>(Pb-Free) | 10,000 /<br>Tape & Reel *** |
| SBR80520LT3G | SOD-123<br>(Pb-Free) | 10,000 /<br>Tape & Reel *** |

\*\* 8 mm Tape, 7" Reel

\*\*\* 8 mm Tape, 13" 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.

# MBR0520LT1G, SBR80520LT1G, MBR0520LT3G, SBR80520LT3G

## MAXIMUM RATINGS

| Rating  | Symbol                          | Value           | Unit             |
|---|---------------------------------|-----------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 20              | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_L = 90^\circ\text{C}$ )                              | $I_{F(AV)}$                     | 0.5             | A                |
| Non-Repetitive Peak Surge Current<br>(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:<br>Machine Model = C<br>Human Body Model = 3B  |                                 | > 400<br>> 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

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

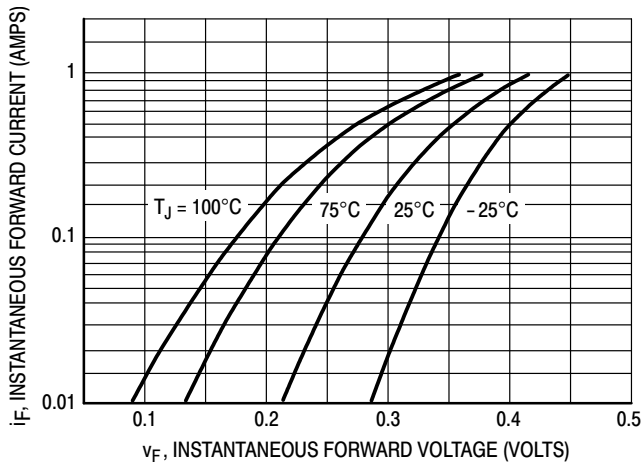
1. 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

## ELECTRICAL CHARACTERISTICS

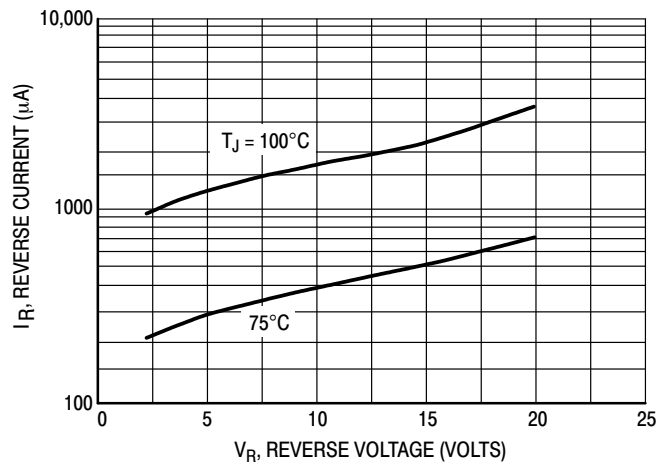
| Characteristic   | Symbol | Value                    |                           | Unit |
|--|--------|--------------------------|---------------------------|------|
|  |        | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ |      |
| Maximum Instantaneous Forward Voltage (Note 2)<br><br>( $i_F = 0.1$ Amps)<br>( $i_F = 0.5$ Amps)   | $V_F$  | 0.300                    | 0.220                     | V    |
|  |        | 0.385                    | 0.330                     |      |
| Maximum Instantaneous Reverse Current (Note 2)<br><br>( $V_R = 10$ V)<br>(Rated DC Voltage = 20 V) | $I_R$  | 75 $\mu\text{A}$         | 5 mA                      | mA   |
|  |        | 250 $\mu\text{A}$        | 8 mA                      |      |

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

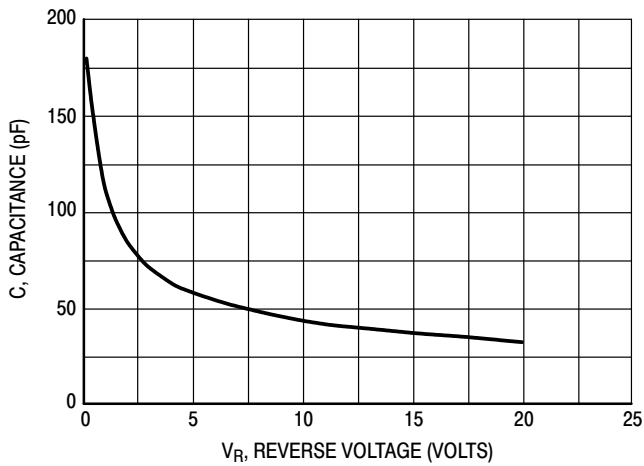
**MBR0520LT1G, SBR80520LT1G, MBR0520LT3G, SBR80520LT3G**



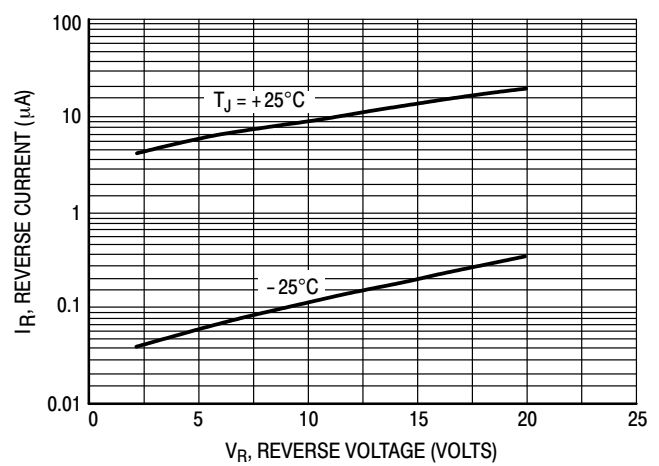
**Figure 1. Typical Forward Voltage**



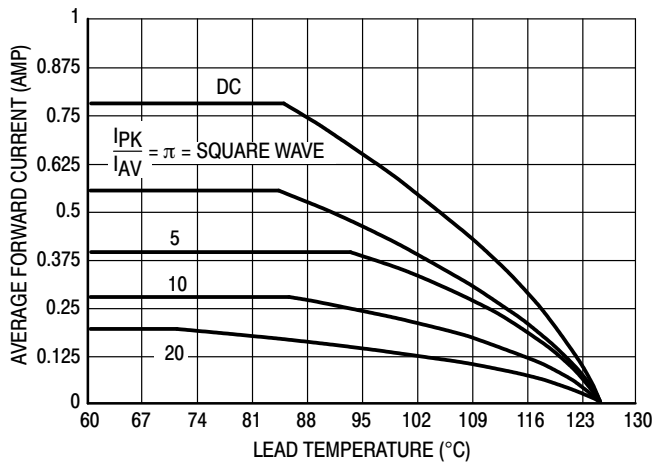
**Figure 2. Typical Reverse Current**



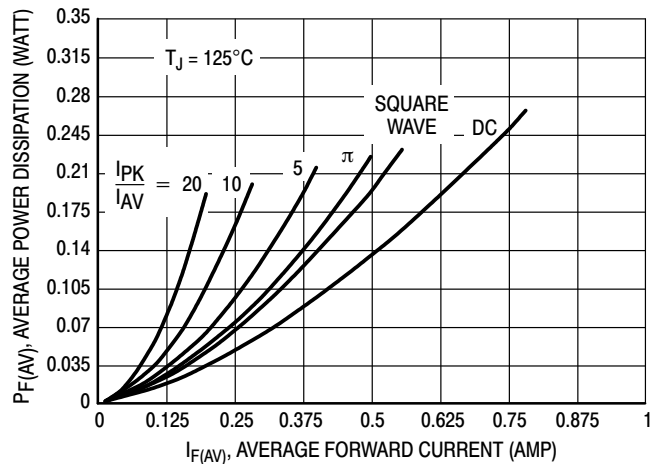
**Figure 3. Typical Capacitance**



**Figure 4. Typical Reverse Current**



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



**Figure 6. Power Dissipation**

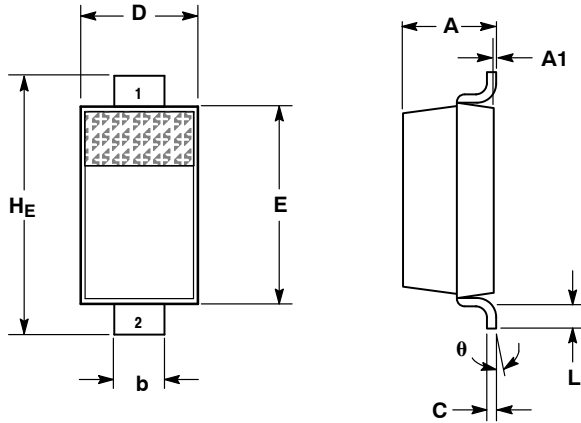
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



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

DATE 07 OCT 2009

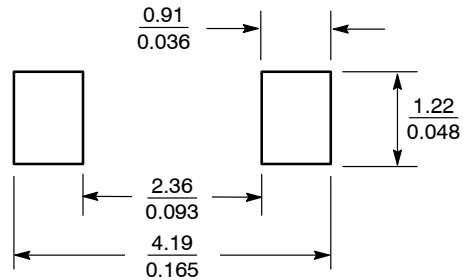
SCALE 5:1



- 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 |
| HE  | 3.56        | 3.68 | 3.86 | 0.140  | 0.145 | 0.152 |
| L   | 0.25        | ---  | ---  | 0.010  | ---   | ---   |
| θ   | 0°          | ---  | 10°  | 0°     | ---   | 10°   |

### RECOMMENDED SOLDERING FOOTPRINT\*



SCALE 10:1 (mm/inches)

### GENERIC MARKING DIAGRAM\*



- XXX = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLE 1:  
PIN 1. CATHODE  
2. ANODE

|                         |                    |  |
|-------------------------|--------------------|--|
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| <b>DESCRIPTION:</b>     | <b>SOD-123</b>     | <b>PAGE 1 OF 1</b>   |

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