

# Surface Mount Schottky Power Rectifier

Plastic SOD-123 Package

**MBR0520LT1G,  
SBR80520LT1G,  
MBR0520LT3G,  
SBR80520LT3G**

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

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

\*\* 8 mm Tape, 7" Reel

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

<sup>†</sup>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.

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

# 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 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.

## THERMAL CHARACTERISTICS

| Characteristic                                   | 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   | $^\circ\text{C/W}$ |

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

## ELECTRICAL CHARACTERISTICS

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

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

# MBR0520LT1G, SBR80520LT1G, MBR0520LT3G, SBR80520LT3G

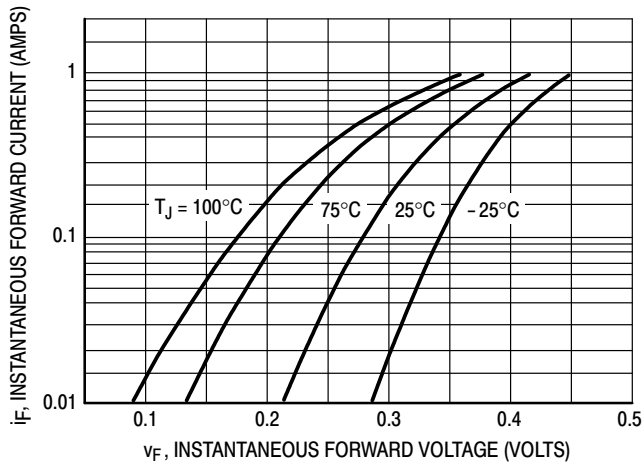


Figure 1. Typical Forward Voltage

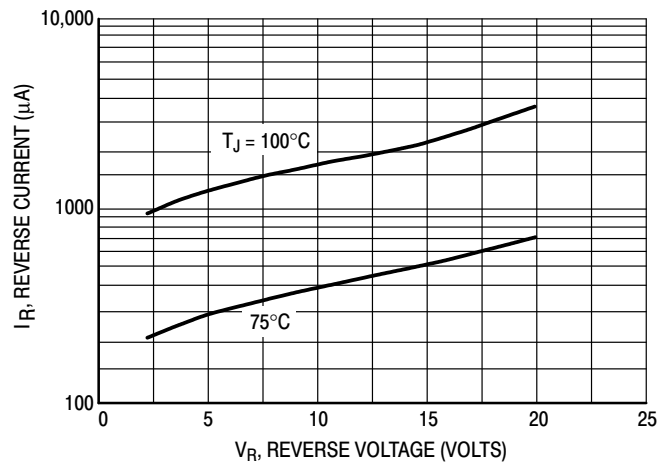


Figure 2. Typical Reverse Current

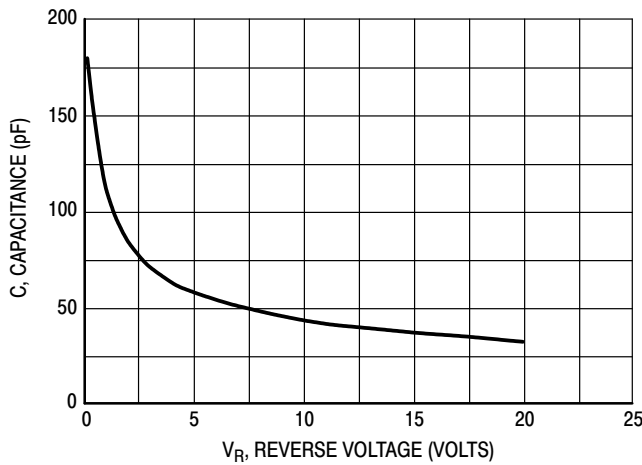


Figure 3. Typical Capacitance

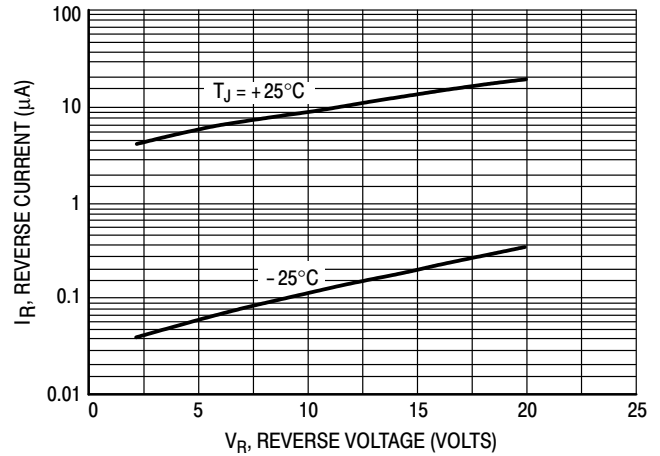


Figure 4. Typical Reverse Current

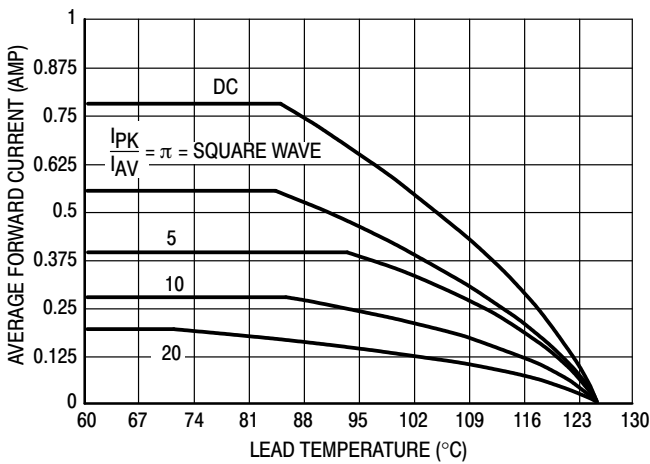


Figure 5. Current Derating (Lead)

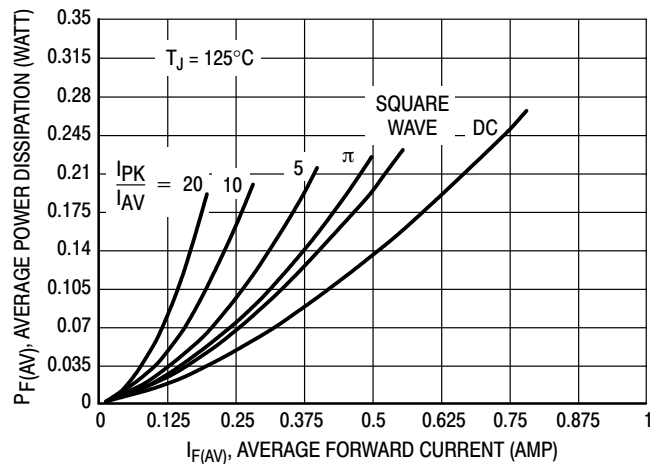


Figure 6. Power Dissipation


**SOD-123 2-LEAD, 1.60x2.69x1.16**  
CASE 425  
ISSUE H

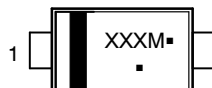
DATE 29 FEB 2024



## NOTES:

1. DIMENSION AND TOLERANCING PER ASME Y14.5M, 2018
2. CONTROLLING DIMENSION: MILLIMETERS

| DIM | MILLIMETER |      |      |
|-----|------------|------|------|
|     | MIN.       | NOM. | MAX. |
| A   | 0.94       | 1.17 | 1.35 |
| A1  | 0.00       | 0.05 | 0.10 |
| A2  | 1.16 REF.  |      |      |
| b   | 0.51       | 0.61 | 0.71 |
| c   | —          | —    | 0.15 |
| D   | 1.40       | 1.60 | 1.80 |
| E   | 2.54       | 2.69 | 2.84 |
| H   | 3.56       | 3.68 | 3.86 |
| L   | 0.25 REF.  |      |      |
| ⌀   | 0°         |      | 10°  |
| θ1  | 0°         |      | 10°  |

**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.

STYLE 1:  
PIN 1. CATHODE  
2. ANODE

**RECOMMENDED MOUNTING FOOTPRINT**

\*For additional information on or Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference manual SOLDERM/D.

|                         |                                       |                                                                                                                                                                                  |
|-------------------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DOCUMENT NUMBER:</b> | <b>98ASB42927B</b>                    | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>DESCRIPTION:</b>     | <b>SOD-123 2-LEAD, 1.60x2.69x1.16</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at  
[www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)