

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† |
|--------------|----------------------|-----------------------------|
| 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

†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 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/ μs |
| ESD Ratings: Machine Model = C Human Body Model = 3B | | > 400 > 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) ($i_F = 0.1$ Amps) ($i_F = 0.5$ Amps) | 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 μA 250 μA | 5 mA 8 mA | |

2. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

MBR0520LT1G, SBR80520LT1G, MBR0520LT3G, SBR80520LT3G

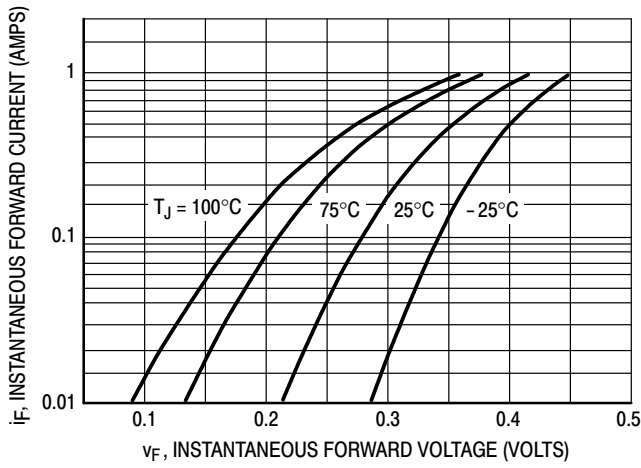


Figure 1. Typical Forward Voltage

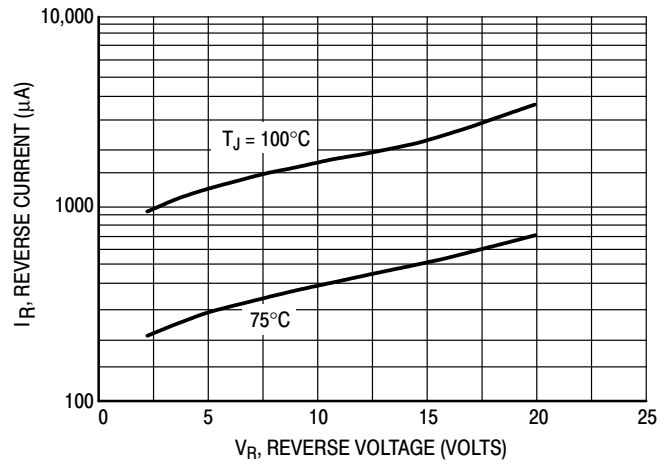


Figure 2. Typical Reverse Current

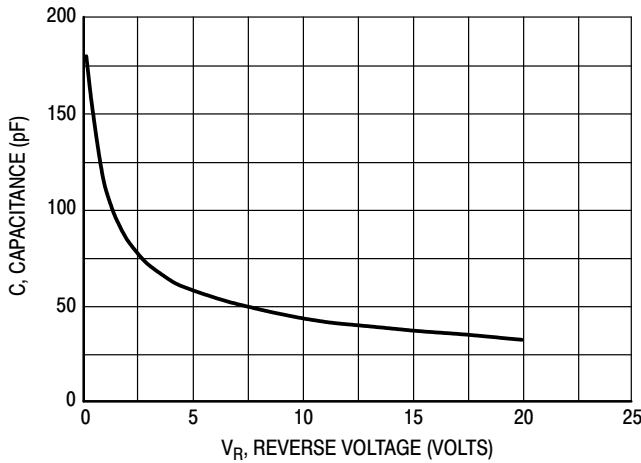


Figure 3. Typical Capacitance

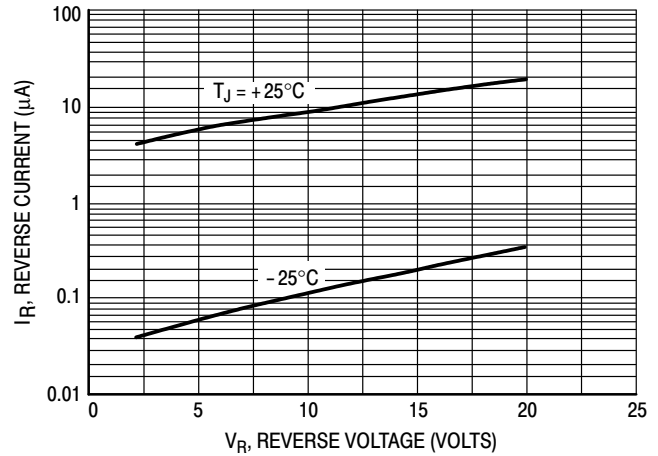


Figure 4. Typical Reverse Current

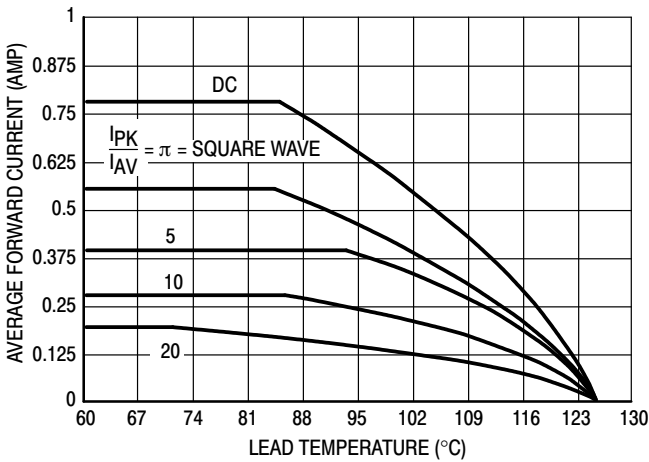


Figure 5. Current Derating (Lead)

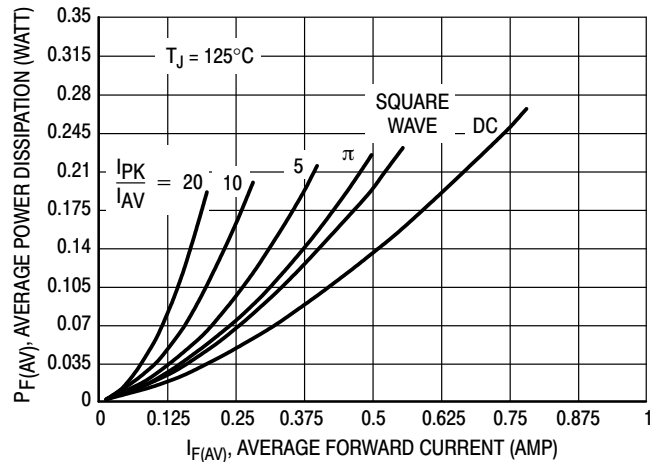
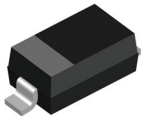
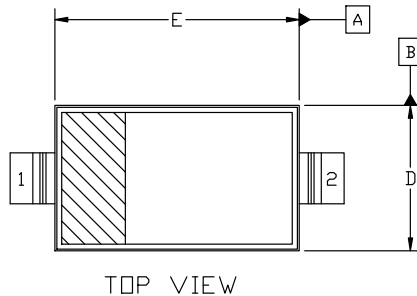


Figure 6. Power Dissipation

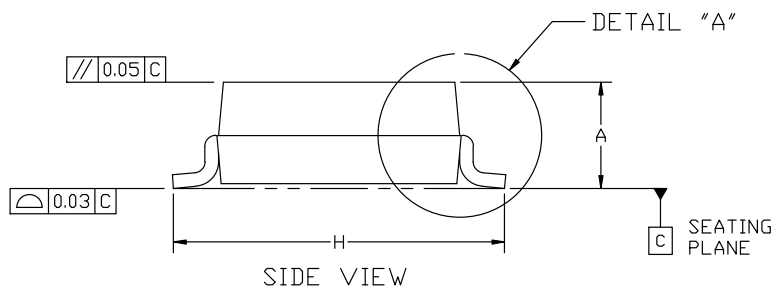


SOD-123 2-LEAD, 1.60x2.69x1.16
CASE 425
ISSUE H

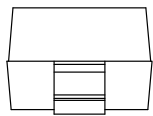
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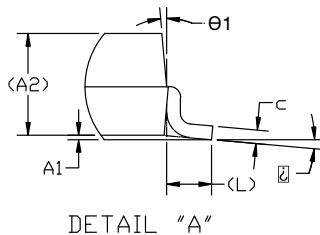
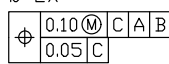
TOP VIEW



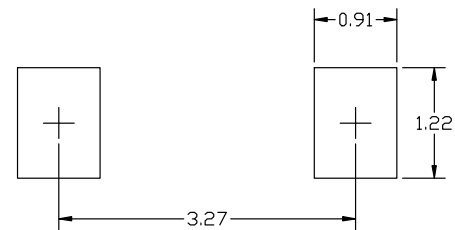
SIDE VIEW



END VIEW



DETAIL "A"



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.

NOTES:

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

| DIM | MILLIMETER | | |
|-----|------------|------|------|
| | MIN. | NDM. | 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

| | | |
|------------------|--------------------------------|--|
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| DESCRIPTION: | SOD-123 2-LEAD, 1.60x2.69x1.16 | PAGE 1 OF 1 |

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