

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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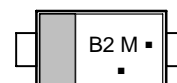
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SCHOTTKY BARRIER RECTIFIER 0.5 AMPERES, 20 VOLTS



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/ μs |
| 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 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance; Junction-to-Lead | $R_{\theta JL}$ | 150 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS

| | | | | |
|--|-------|---------------------------------------|---------------------------|----|
| 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 | |

- 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.
- Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

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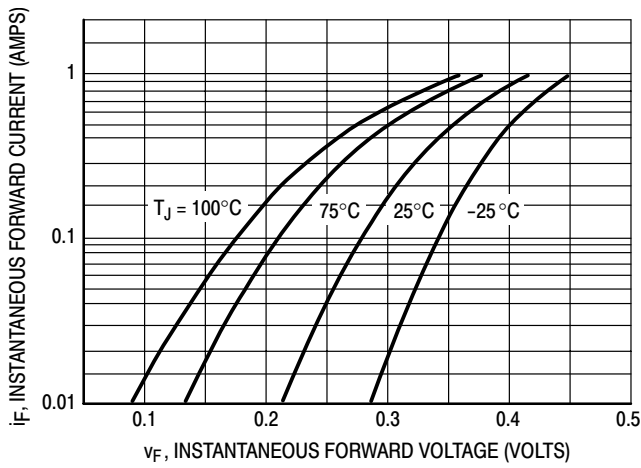


Figure 1. Typical Forward Voltage

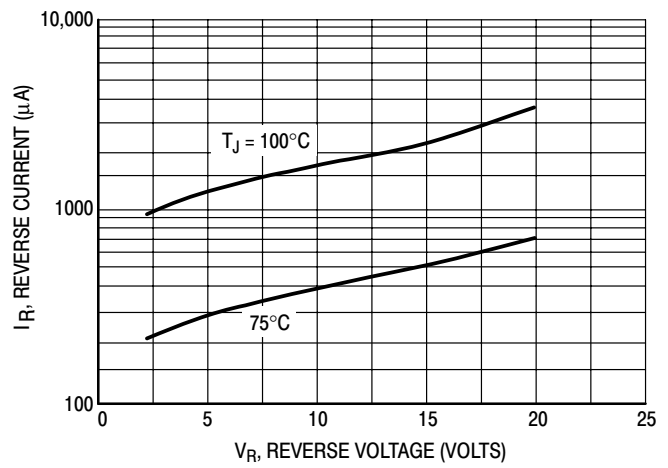


Figure 2. Typical Reverse Current

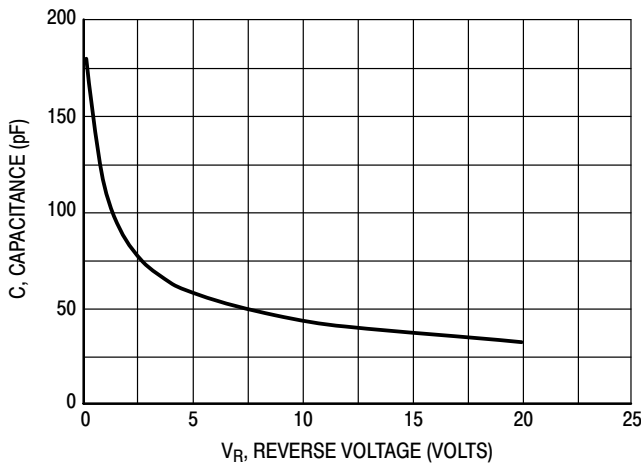


Figure 3. Typical Capacitance

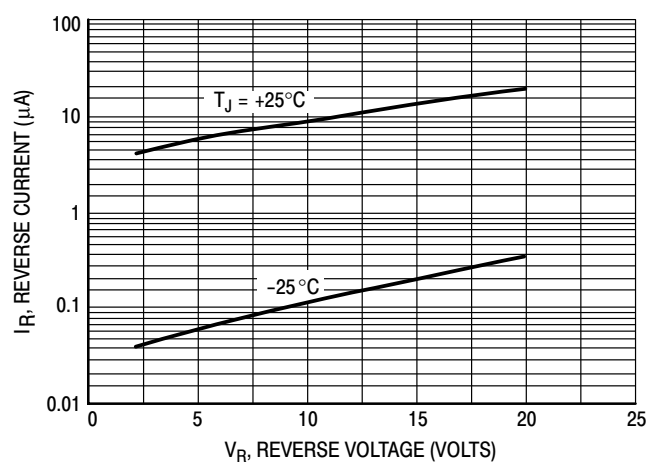


Figure 4. Typical Reverse Current

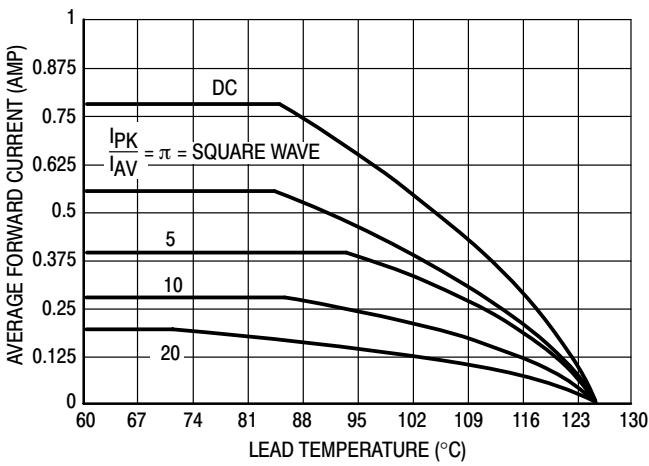


Figure 5. Current Derating (Lead)

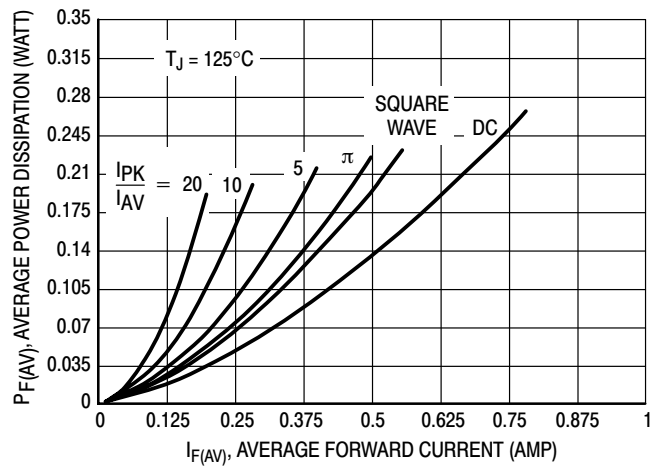
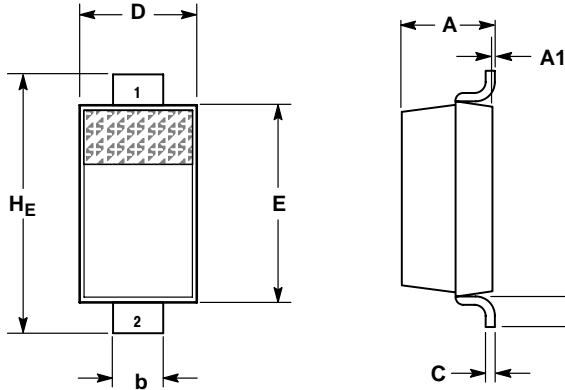


Figure 6. Power Dissipation

MBR0520LT1, MBR0520LT3

PACKAGE DIMENSIONS

SOD-123
CASE 425-04
ISSUE E

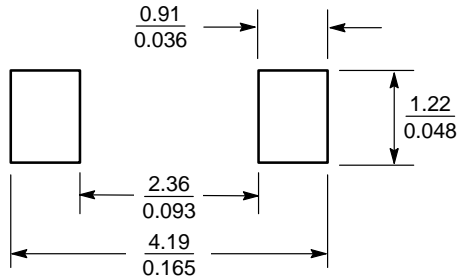


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| 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 _E | 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 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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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