

MBR230LSFT1

Surface Mount Schottky Power Rectifier

Plastic SOD-123 Package

This device uses the Schottky Barrier principle with a large area metal-to-silicon power diode. 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 also provides an easy to work with alternative to leadless 34 package style. Because of its small size, it is ideal for use in portable and battery powered products such as cellular and cordless phones, chargers, notebook computers, printers, PDAs and PCMCIA cards. Typical applications are AC-DC and DC-DC converters, reverse battery protection, and “Oring” of multiple supply voltages and any other application where performance and size are critical.

Features

- Guardring for Stress Protection
- Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0
- Package Designed for Optimal Automated Board Assembly
- ESD Ratings: Machine Model, C
Human Body Model, 3B
- This is a Pb-Free Device

Mechanical Characteristics

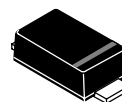
- Reel Options: MBR230LSFT1 = 3,000 per 7 in reel/8 mm tape
- Device Marking: L3N
- Polarity Designator: Cathode Band
- Weight: 11.7 mg (approximately)
- Case: Epoxy, Molded
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



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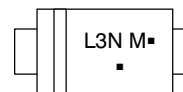
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SCHOTTKY BARRIER RECTIFIER 2.0 AMPERES, 30 VOLTS



SOD-123FL
CASE 498
PLASTIC

MARKING DIAGRAM



L3N = Specific Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|------------------------|------------------|
| MBR230LSFT1G | SOD-123FL (Pb-Free) | 3000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

MBR230LSFT1

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---------------------------------|------------|------------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 30 | V |
| Average Rectified Forward Current (At Rated V_R , $T_L = 105^\circ\text{C}$) | I_O | 2.0 | A |
| Peak Repetitive Forward Current (At Rated V_R , Square Wave, 100 kHz, $T_L = 95^\circ\text{C}$) | I_{FRM} | 4.0 | A |
| Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60 Hz) | I_{FSM} | 40 | A |
| Storage Temperature | T_{stg} | -55 to 150 | $^\circ\text{C}$ |
| Operating Junction Temperature | T_J | -55 to 125 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R , $T_J = 25^\circ\text{C}$) | dv/dt | 10,000 | $\text{V}/\mu\text{s}$ |

THERMAL CHARACTERISTICS

| | | | |
|--|-----------|-----|---------------------------|
| Thermal Resistance, Junction-to-Lead (Note 1) | R_{tjl} | 26 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Lead (Note 2) | R_{tjl} | 21 | |
| Thermal Resistance, Junction-to-Ambient (Note 1) | R_{tja} | 325 | |
| Thermal Resistance, Junction-to-Ambient (Note 2) | R_{tja} | 82 | |

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.

- Mounted with minimum recommended pad size, PC Board FR4.
- Mounted with 1 in. copper pad (Cu area 700 mm²).

ELECTRICAL CHARACTERISTICS

| | | | | |
|--|-------|--------------------------|---------------------------|----|
| Maximum Instantaneous Forward Voltage (Note 3) ($I_F = 1.0 \text{ A}$) ($I_F = 2.0 \text{ A}$) | V_F | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ | V |
| | | 0.38 0.43 | 0.30 0.37 | |
| Maximum Instantaneous Reverse Current (Note 3) ($V_R = 30 \text{ V}$) | I_R | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ | mA |
| | | 1.0 | 25 | |

- Pulse Test: Pulse Width $\leq 250 \mu\text{s}$, Duty Cycle $\leq 2\%$.

MBR230LSFT1

TYPICAL CHARACTERISTICS

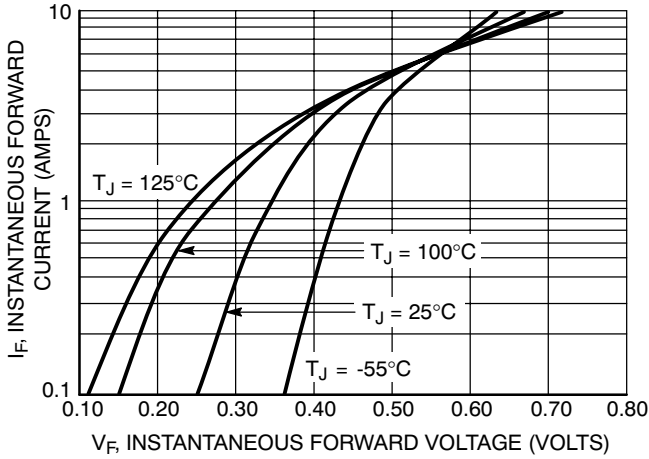


Figure 1. Typical Forward Voltage

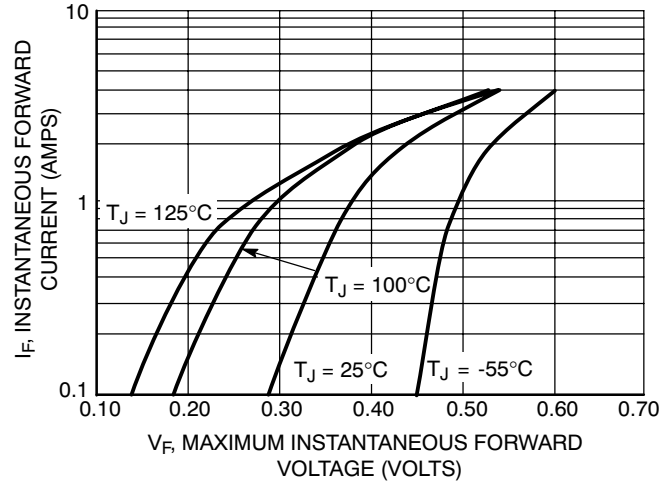


Figure 2. Maximum Forward Voltage

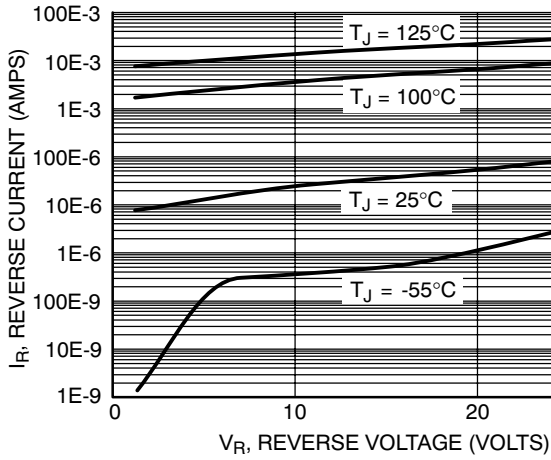


Figure 3. Typical Reverse Current

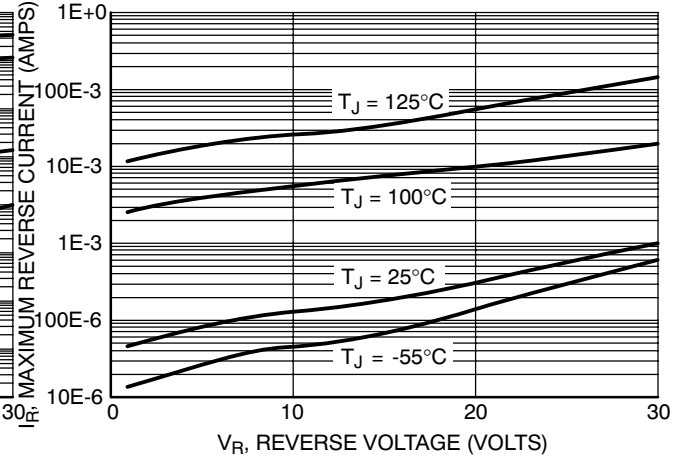


Figure 4. Maximum Reverse Current

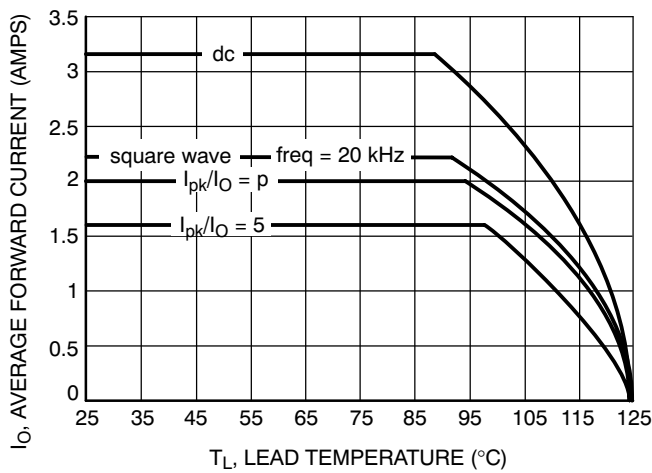


Figure 5. Current Derating

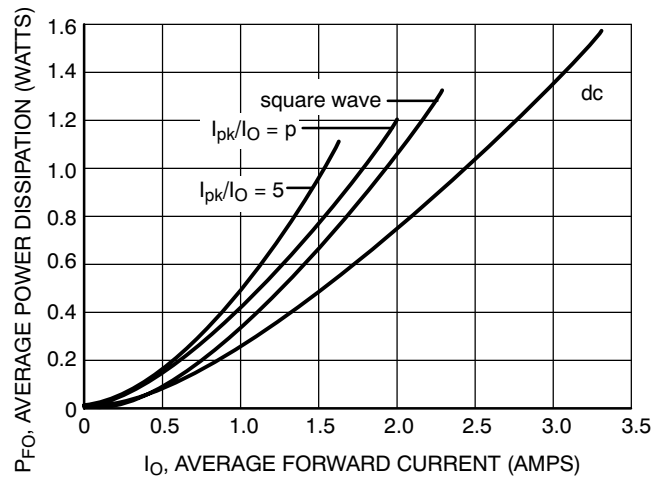


Figure 6. Forward Power Dissipation

MBR230LSFT1

TYPICAL CHARACTERISTICS

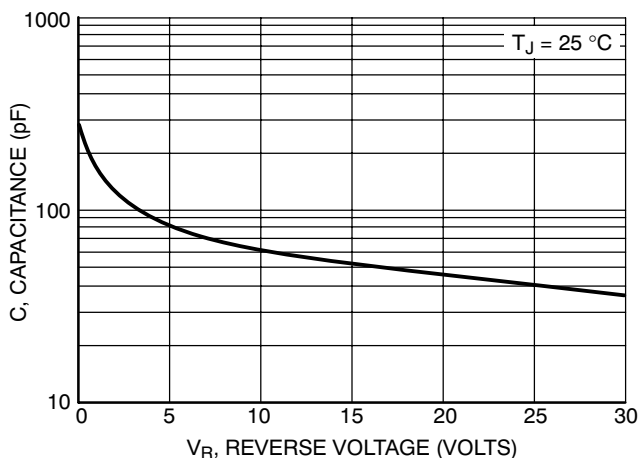


Figure 7. Capacitance

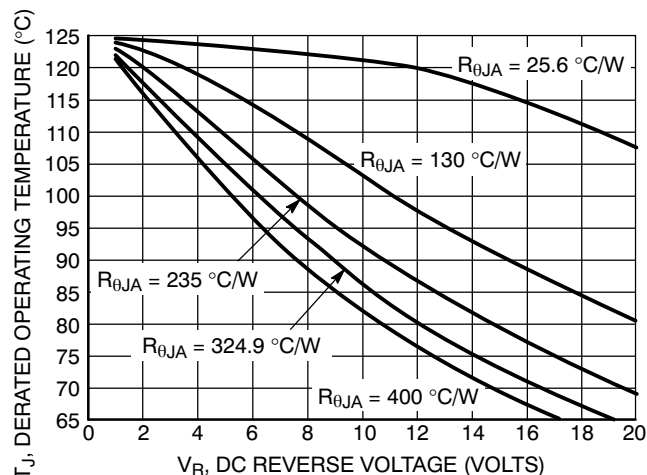


Figure 8. Typical Operating Temperature Derating

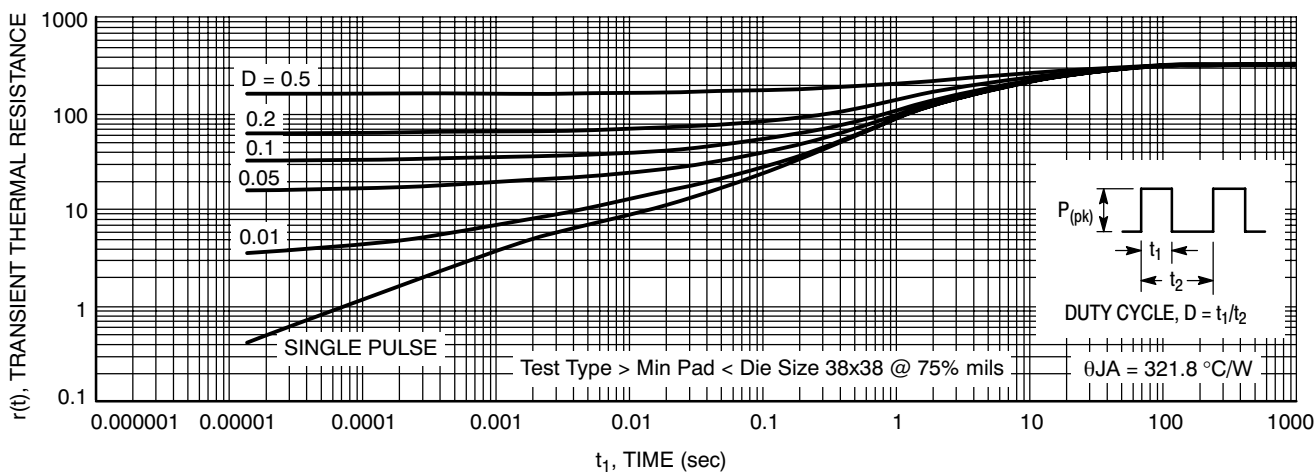
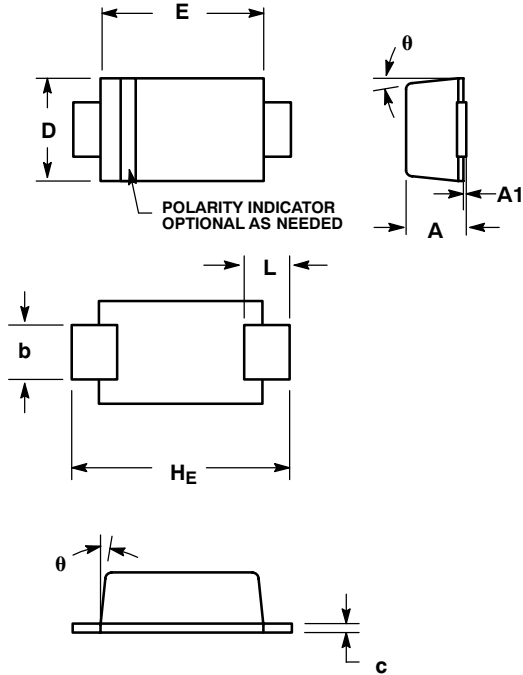


Figure 9. Thermal Response

MBR230LSFT1

PACKAGE DIMENSIONS

SOD-123LF
CASE 498-01
ISSUE A

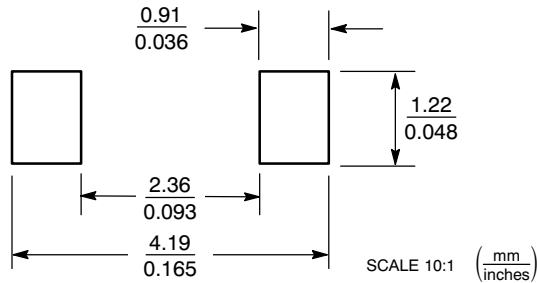


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH.
4. DIMENSIONS D AND J ARE TO BE MEASURED ON FLAT SECTION OF THE LEAD: BETWEEN 0.10 AND 0.25 MM FROM THE LEAD TIP.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.90 | 0.95 | 1.00 | 0.035 | 0.037 | 0.039 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| b | 0.70 | 0.90 | 1.10 | 0.028 | 0.035 | 0.043 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 1.50 | 1.65 | 1.80 | 0.059 | 0.065 | 0.071 |
| E | 2.50 | 2.70 | 2.90 | 0.098 | 0.106 | 0.114 |
| L | 0.55 | 0.75 | 0.95 | 0.022 | 0.030 | 0.037 |
| HE | 3.40 | 3.60 | 3.80 | 0.134 | 0.142 | 0.150 |
| θ | 0° | - | 8° | 0° | - | 8° |

SOLDERING FOOTPRINT*



*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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