

MBR130T1, MBR130T3

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.

Features

- Guardring for Stress Protection
- Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Package Designed for Optimal Automated Board Assembly
- ESD Ratings: Machine Model, C;
Human Body Model, 3
- Pb-Free Packages are Available

Mechanical Characteristics

- Reel Options: MBR130T1 = 3,000 per 7 in reel/8 mm tape
MBR130T3 = 10,000 per 13 in reel/8 mm tape
- Device Marking: S3
- 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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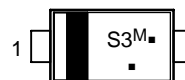
<http://onsemi.com>

SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES 30 VOLTS



SOD-123
CASE 425
STYLE 1

MARKING DIAGRAM



S3 = Specific Device Code
M = Date Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|-----------|----------------------|--------------------|
| MBR130T1 | SOD-123 | 3000/Tape & Reel |
| MBR130T1G | SOD-123 (Pb-Free) | 3000/Tape & Reel |
| MBR130T3 | SOD-123 | 10,000/Tape & Reel |
| MBR130T3G | 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 Specification Brochure, BRD8011/D.

MBR130T1, MBR130T3

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 (Rated V_R) $T_L = 65^\circ\text{C}$ | $I_{F(AV)}$ | 1.0 | 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 +125 | $^\circ\text{C}$ |
| Operating Junction Temperature | T_J | -65 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 1000 | V/ μs |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------|---------------------------|
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 230 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Lead (Note 1) | $R_{\theta JL}$ | 108 | $^\circ\text{C}/\text{W}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

- FR-4 or FR-5 = 3.5 × 1.5 inches using a 1 inch Cu pad.

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Typ | Max | Unit |
|---|--------|----------------|-------------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 2) ($I_F = 0.1\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 0.7\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 1.0\text{ A}$, $T_J = 25^\circ\text{C}$) | V_F | - - 0.47 | 0.35 0.45 - | V |
| Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, $T_C = 25^\circ\text{C}$) ($V_R = 5\text{ V}$, $T_C = 25^\circ\text{C}$) | I_R | | 60 10 | μA |

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

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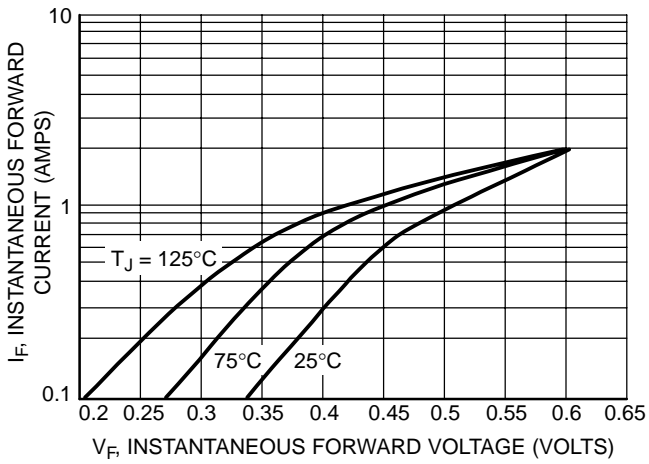


Figure 1. Maximum Forward Voltage

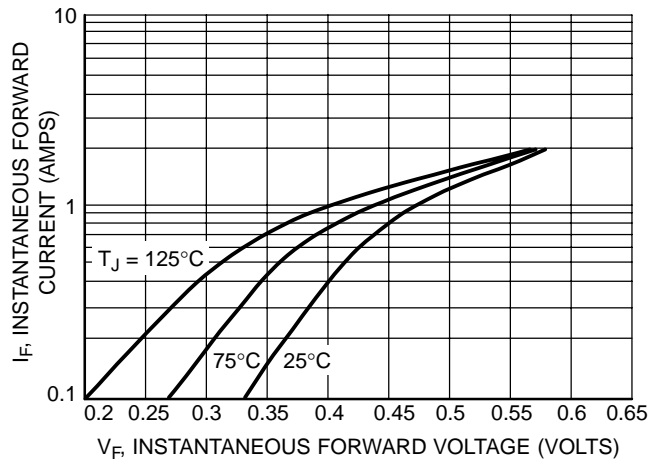


Figure 2. Typical Forward Voltage

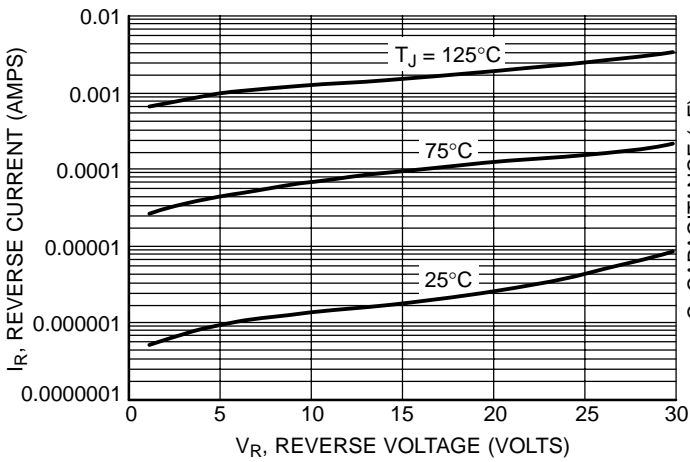


Figure 3. Typical Reverse Current

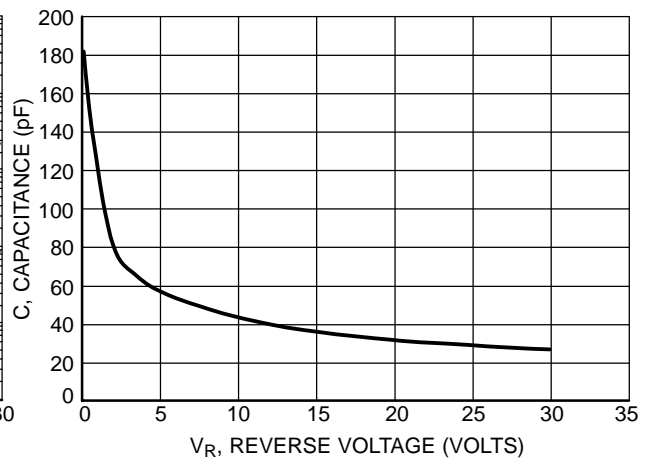


Figure 4. Typical Capacitance

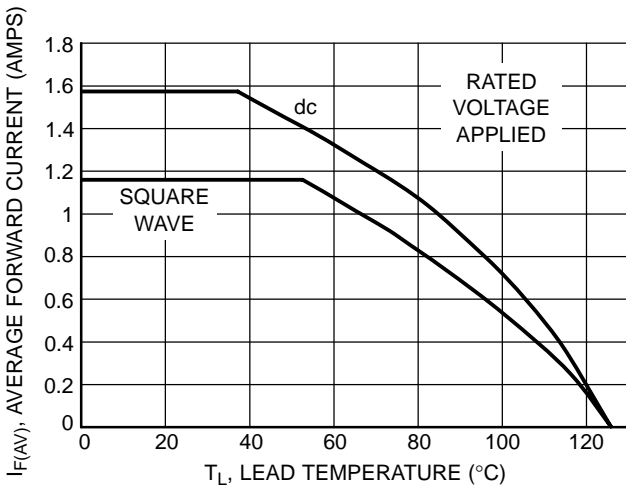


Figure 5. Current Derating, Lead, $R_{\theta JL} = 108^\circ\text{C/W}$

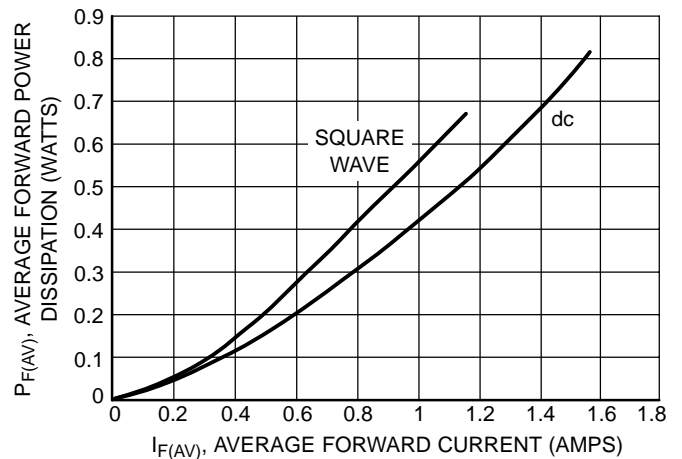
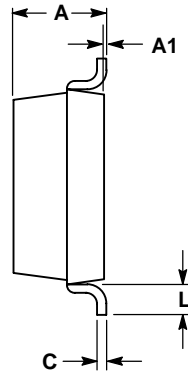
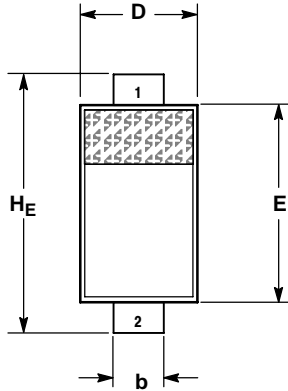


Figure 6. Forward Power Dissipation

MBR130T1, MBR130T3

PACKAGE DIMENSIONS

SOD-123
CASE 425-04
ISSUE E



NOTES:

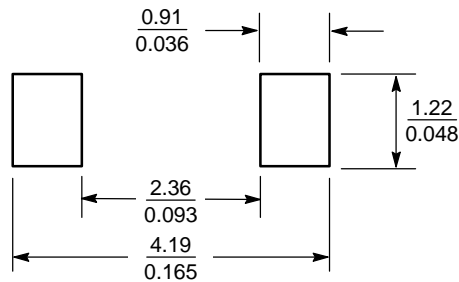
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| 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 |
| HE | 3.56 | 3.68 | 3.86 | 0.140 | 0.145 | 0.152 |
| L | 0.25 | --- | --- | 0.010 | --- | --- |

STYLE 1:


- PIN 1. CATHODE
- 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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