

MBRA120ET3G

Surface Mount Schottky Power Rectifier SMA Power Surface Mount Package

Employing the Schottky Barrier principle in a metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

Features

- Compact Package with J-Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over-Voltage Protection
- Optimized for Low Leakage Current
- These Devices are Pb-Free and are RoHS Compliant

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL94, V_O at 1/8"
- Weight: 70 mg (approximately)
- 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
- Polarity: Polarity Band Indicates Cathode Lead
- Available in 12 mm Tape, 5000 Units per 13 inch Reel
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (>400 V)
Human Body Model, 3B (>8000 V)
- Marking: B1E2

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 (At Rated V_R , $T_C = 125^\circ\text{C}$) | I_O | 1.0 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I_{FSM} | 40 | A |
| Storage Temperature | T_{stg} | -55 to +150 | °C |
| Operating Junction Temperature | T_J | -55 to +150 | °C |
| Voltage Rate of Change (Rated V_R , $T_J = 25^\circ\text{C}$) | dv/dt | 10,000 | V/ μs |

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.



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SCHOTTKY BARRIER RECTIFIER 1 AMPERE 20 VOLTS

MARKING DIAGRAM



SMA
CASE 403D



A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|------------------|--------------------|
| MBRA120ET3G | SMA (Pb-Free) | 5000 / 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.

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THERMAL CHARACTERISTICS

| Characteristic | Symbol | 5 mm x 5 mm (Note 2) | 1 Inch x 1/2 inch (Note 3) | Unit |
|------------------------------------------|-----------------|-------------------------|-------------------------------|---------------|
| Thermal Resistance – Junction-to-Lead | $R_{\theta JL}$ | 34 | 20 | $^{\circ}C/W$ |
| Thermal Resistance – Junction-to-Ambient | $R_{\theta JA}$ | 138 | 77 | |

ELECTRICAL CHARACTERISTICS

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------|-------|---------------------|----------------------|---------|
| Maximum Instantaneous Forward Voltage (Note 1), See Figure 2 ($I_F = 0.1$ A) ($I_F = 1.0$ A) ($I_F = 2.0$ A) | V_F | $T_J = 25^{\circ}C$ | $T_J = 100^{\circ}C$ | V |
| | | 0.455 | 0.360 | |
| | | 0.530 | 0.455 | |
| Maximum Instantaneous Reverse Current, See Figure 4 ($V_R = 20$ V) ($V_R = 10$ V) ($V_R = 5.0$ V) | I_R | $T_J = 25^{\circ}C$ | $T_J = 100^{\circ}C$ | μA |
| | | 10 | 1600 | |
| | | 1.0 | 500 | |
| | | 0.5 | 300 | |

1. Pulse Test: Pulse Width ≤ 250 μs , Duty Cycle $\leq 2\%$.
2. Mounted on a Pad Size of 5 mm x 5 mm, PC Board FR4 (2 pads).
3. Mounted on a Pad Size of 1 inch x 1/2 inch, PC Board FR4 (2 pads).

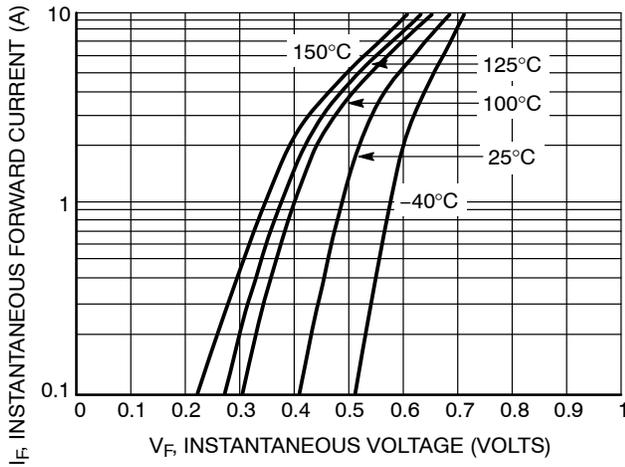


Figure 1. Typical Forward Voltage

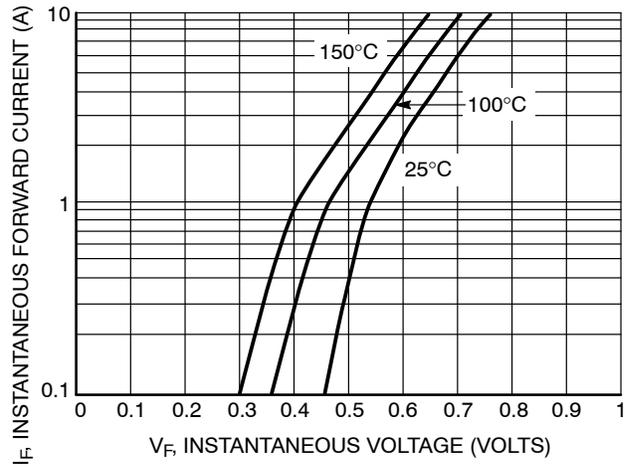


Figure 2. Maximum Forward Voltage

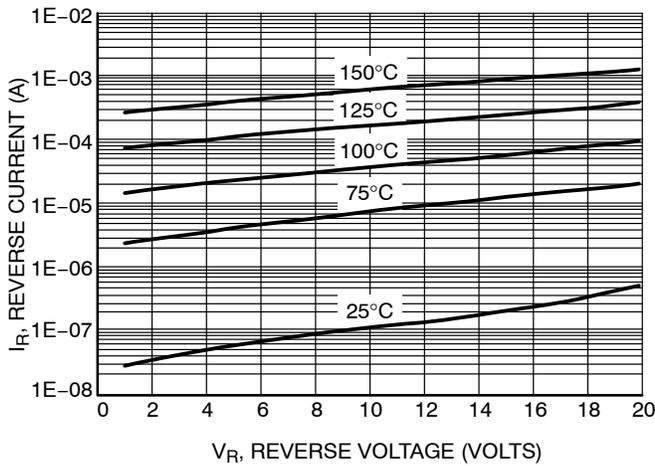


Figure 3. Typical Reverse Current

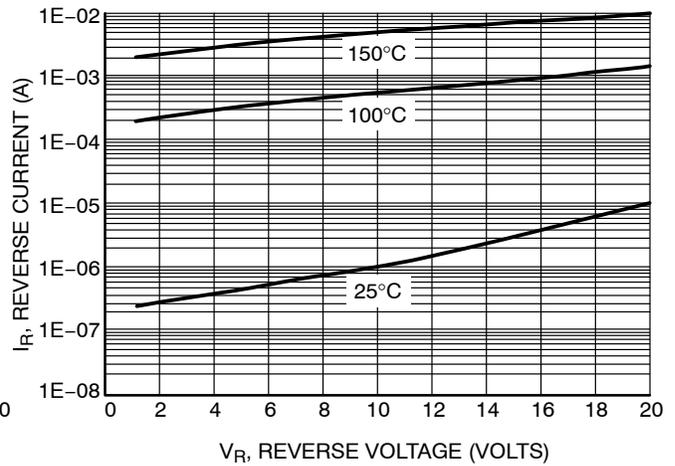


Figure 4. Maximum Reverse Current

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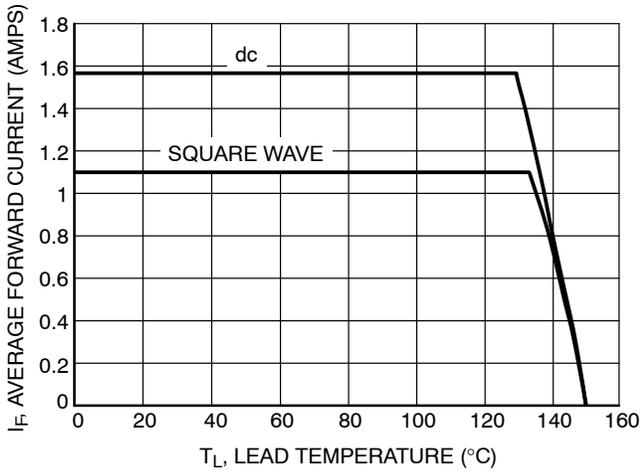


Figure 5. Current Derating

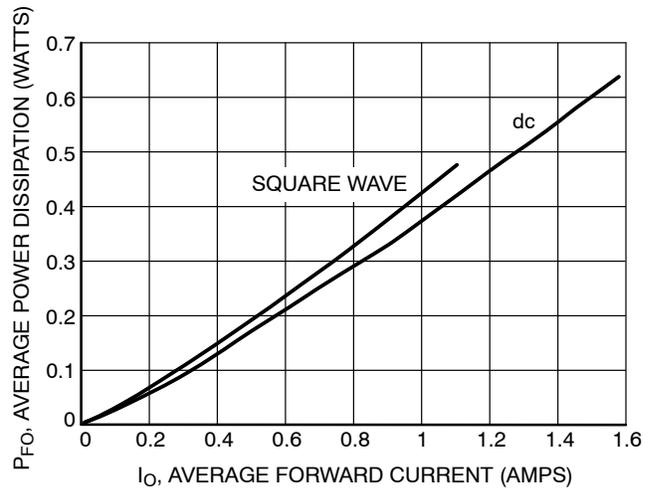


Figure 6. Forward Power Dissipation

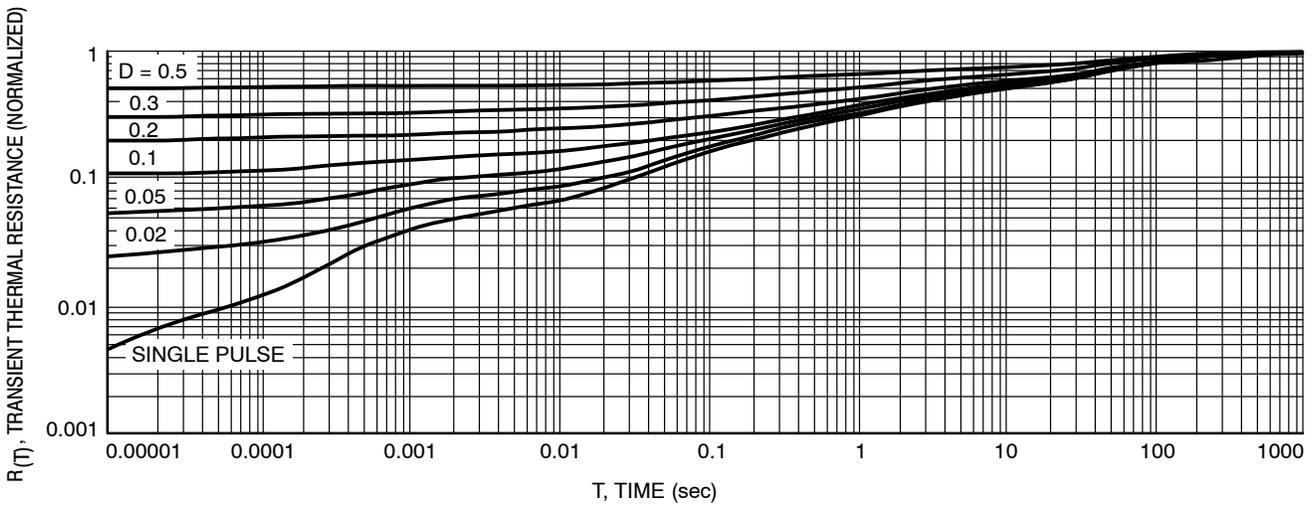


Figure 7. Thermal Resistance

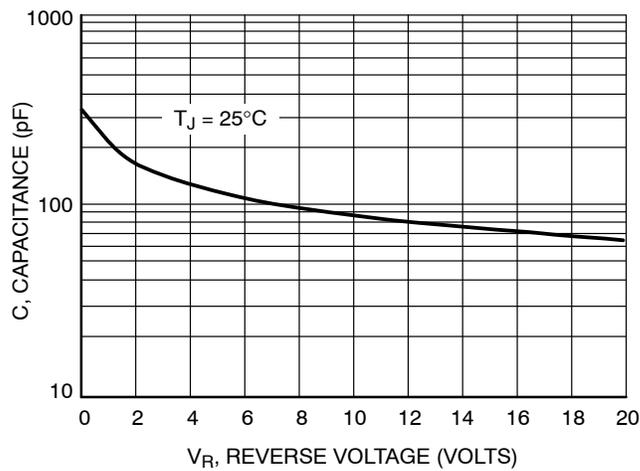
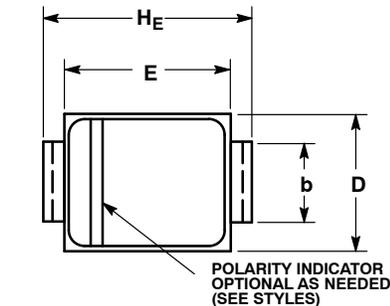


Figure 8. Typical Junction Capacitance

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PACKAGE DIMENSIONS

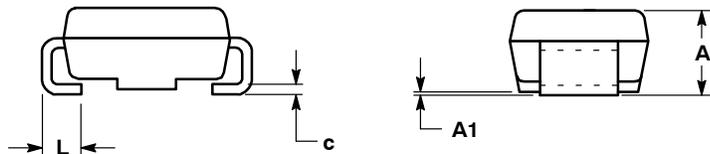
SMA
CASE 403D-02
ISSUE G



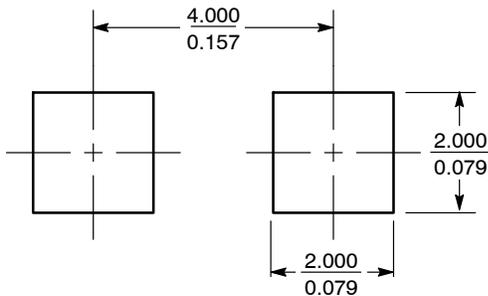
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.97 | 2.10 | 2.20 | 0.078 | 0.083 | 0.087 |
| A1 | 0.05 | 0.10 | 0.20 | 0.002 | 0.004 | 0.008 |
| b | 1.27 | 1.45 | 1.63 | 0.050 | 0.057 | 0.064 |
| c | 0.15 | 0.28 | 0.41 | 0.006 | 0.011 | 0.016 |
| D | 2.29 | 2.60 | 2.92 | 0.090 | 0.103 | 0.115 |
| E | 4.06 | 4.32 | 4.57 | 0.160 | 0.170 | 0.180 |
| HE | 4.83 | 5.21 | 5.59 | 0.190 | 0.205 | 0.220 |
| L | 0.76 | 1.14 | 1.52 | 0.030 | 0.045 | 0.060 |



SOLDERING FOOTPRINT*



SCALE 8:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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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