

# MBRA320T3G

## Surface Mount Schottky Power Rectifier SMA Power Surface Mount Package

Employing the Schottky Barrier principle in a large area metal-to-silicon power diode. State of the art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity diodes in surface mount applications where compact size and weight are critical to the system.

### Features

- Small Compact Surface Mountable Package with J-Bent Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop
- Guardring for Stress Protection
- Pb-Free Package is Available

### Mechanical Characteristics:

- Case: Epoxy, Molded
- 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
- Shipped in 12 mm tape, 5000 units per 13 inch reel
- Polarity: Cathode Lead Indicated by Polarity Band
- ESD Ratings: Machine Model = C  
Human Body Model = 3B
- Device Meets MSL 1 Requirements

### MAXIMUM RATINGS

| Rating                                                                                                         | Symbol                          | Value       | Unit             |
|----------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                         | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 20          | V                |
| Average Rectified Forward Current<br>(At Rated $V_R$ , $T_J = 100^\circ\text{C}$ )                             | $I_O$                           | 3.0         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 80          | A                |
| Storage Temperature                                                                                            | $T_{stg}$                       | -65 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature                                                                                 | $T_J$                           | -65 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change<br>(Rated $V_R$ , $T_J = 25^\circ\text{C}$ )                                            | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |

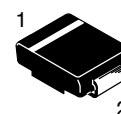
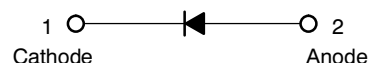
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



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## SCHOTTKY BARRIER RECTIFIER 3.0 AMPERES 20 VOLTS



**SMA  
CASE 403D  
PLASTIC**

### MARKING DIAGRAM



A32 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

### ORDERING INFORMATION

| Device     | Package          | Shipping†        |
|------------|------------------|------------------|
| MBRA320T3G | SMA<br>(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.

# MBRA320T3G

## THERMAL CHARACTERISTICS

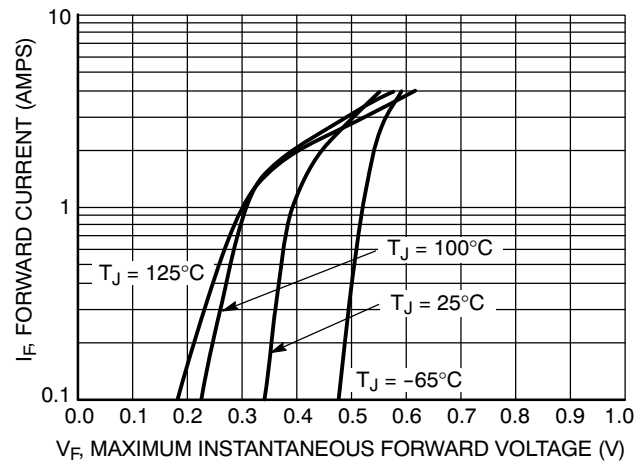
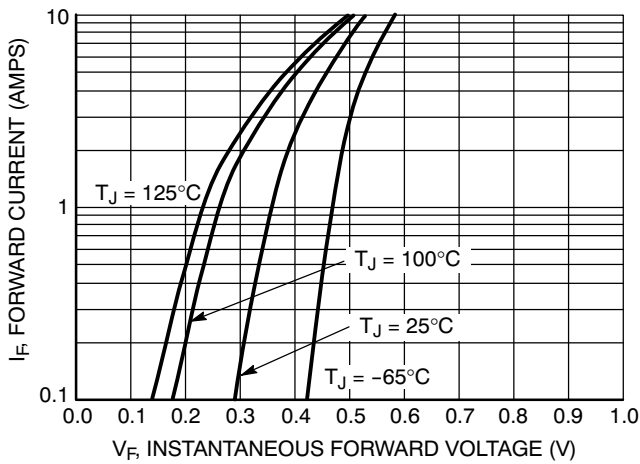
| Characteristic                                    | Symbol          | Value | Unit                        |
|---------------------------------------------------|-----------------|-------|-----------------------------|
| Thermal Resistance - Junction-to-Lead (Note 1)    | $R_{\theta JL}$ | 15    | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance - Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 80    | $^{\circ}\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

|                                                                                                       |       |                             |       |
|-------------------------------------------------------------------------------------------------------|-------|-----------------------------|-------|
| Maximum Instantaneous Forward Voltage (Note 2) ( $I_F = 3.0 \text{ A}$ , $T_J = 25^{\circ}\text{C}$ ) | $V_F$ | 0.50                        | Volts |
| Maximum Instantaneous Reverse Current (Note 2) ( $V_R = 20 \text{ V}$ )                               | $I_R$ | $T_J = 25^{\circ}\text{C}$  | mA    |
|                                                                                                       |       | 2.0                         |       |
|                                                                                                       |       | $T_J = 100^{\circ}\text{C}$ | 20    |

1. Mounted on 2" Square PC Board with 1" Square Total Pad Size, PC Board FR4.
2. Pulse Test: Pulse Width = 300 s, Duty Cycle  $\leq 2.0\%$ .

## TYPICAL CHARACTERISTICS



# MBRA320T3G

## TYPICAL CHARACTERISTICS

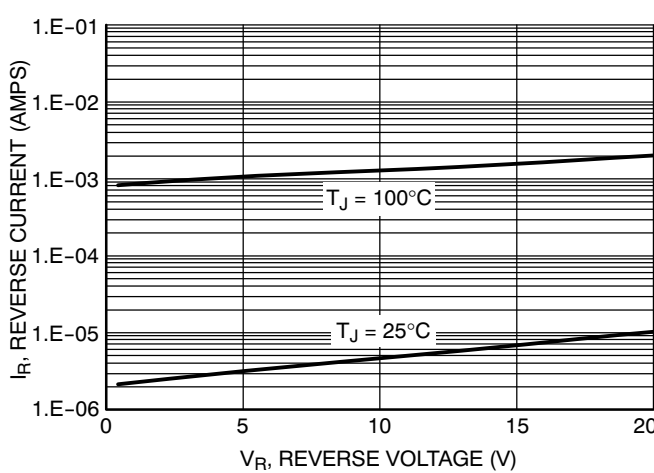


Figure 3. Typical Reverse Current

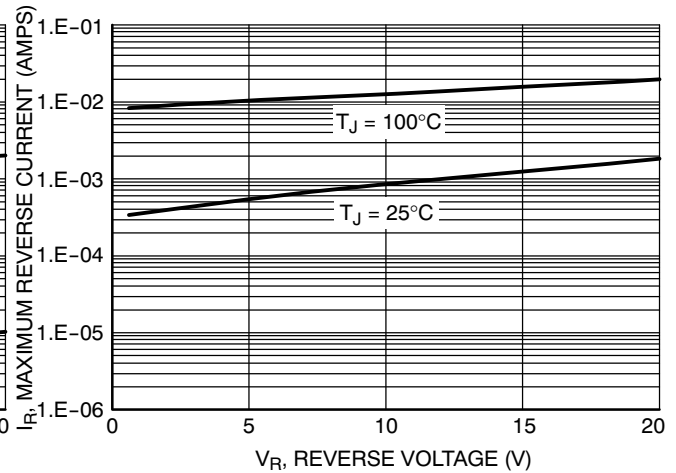


Figure 4. Maximum Reverse Current

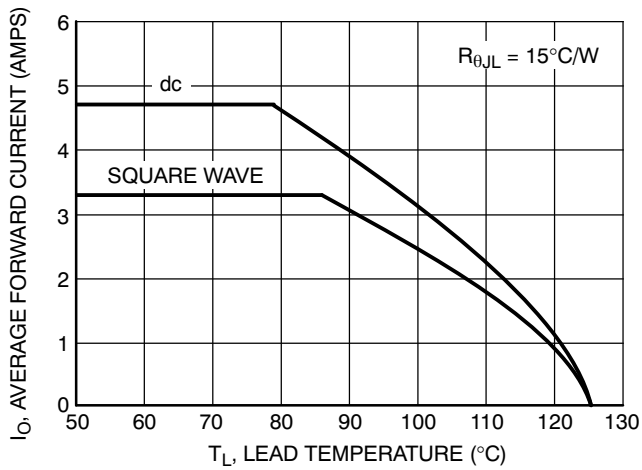


Figure 5. Current Derating

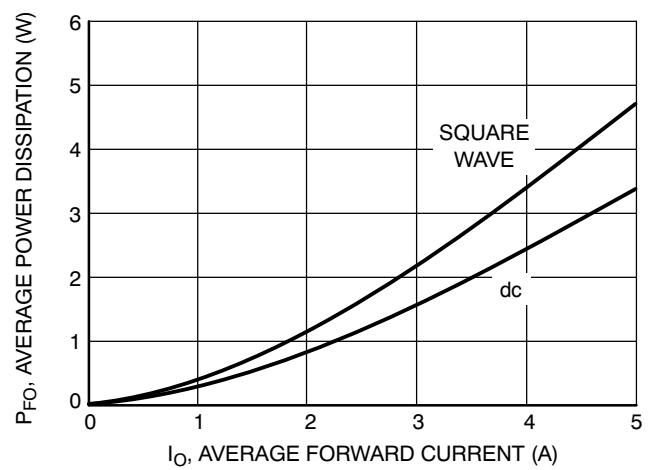


Figure 6. Forward Power Dissipation

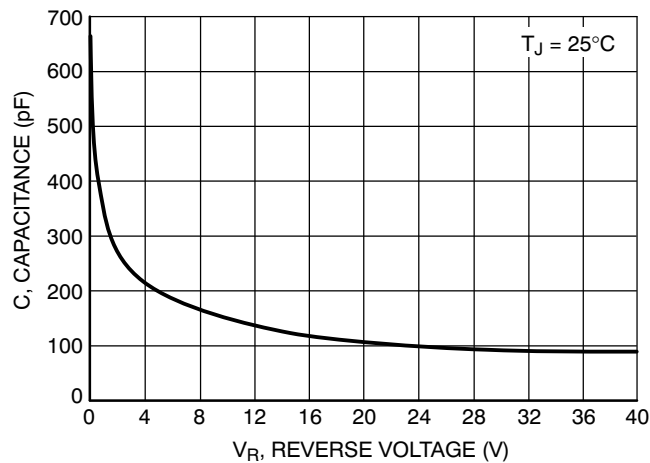


Figure 7. Typical Capacitance

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## TYPICAL CHARACTERISTICS

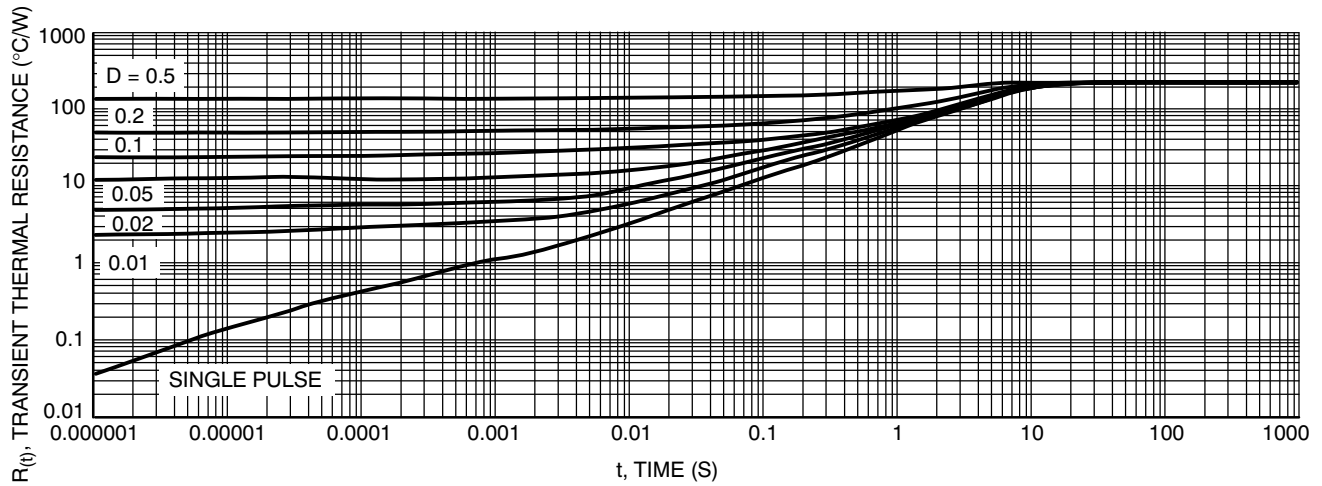


Figure 8. Thermal Response, Junction-to-Ambient (min pad)

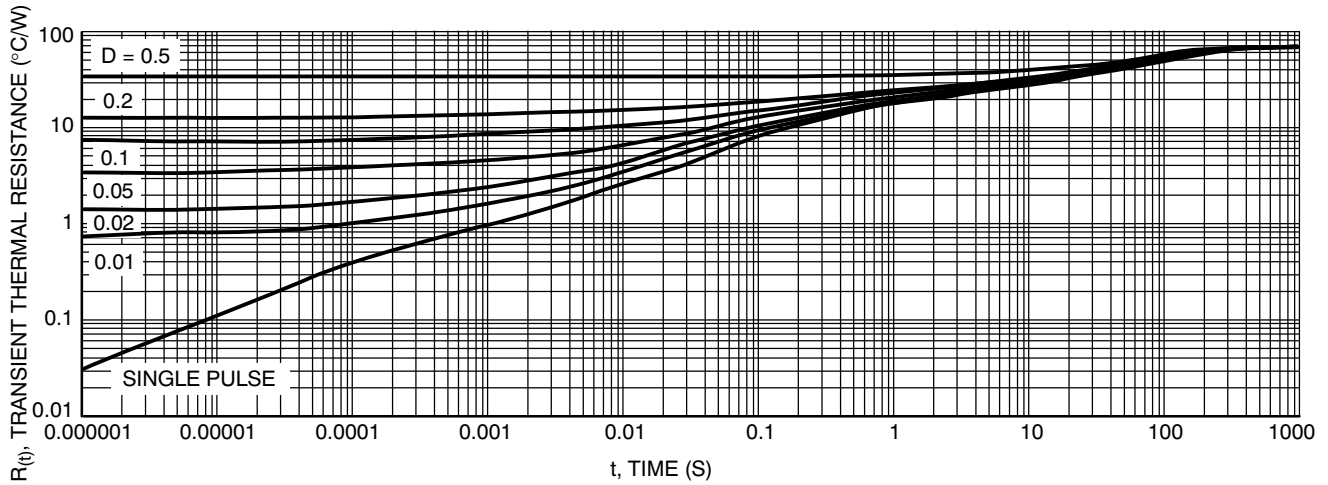
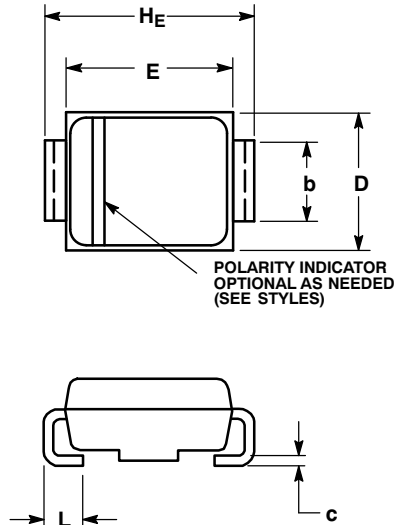


Figure 9. Thermal Response, Junction to Ambient (1 inch pad)

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## PACKAGE DIMENSIONS

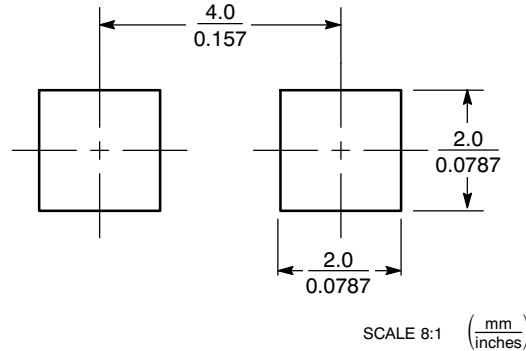
### SMA CASE 403D-02 ISSUE C



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 403D-01 OBSOLETE, NEW STANDARD IS 403D-02.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 1.91        | 2.16 | 2.41 | 0.075  | 0.085 | 0.095 |
| A1  | 0.05        | 0.10 | 0.15 | 0.002  | 0.004 | 0.006 |
| 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\*



\*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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