

# MRA4003T3 Series

## Surface Mount Standard Recovery Power Rectifier

### SMA Power Surface Mount Package

Features construction with glass passivation. Ideally suited for surface mounted Automotive application.

- Compact Package with J-Bend Leads Ideal for Automated Handling
- Stable, High Temperature, Glass Passivated Junction

#### Mechanical Characteristics

- Case: Molded Epoxy  
Epoxy meets UL 94 V-0 @ 0.125 in
- Weight: 70 mg (Approximately)
- Finish: All External Surfaces are Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 seconds in Solder Bath
- Polarity: Band in Plastic Body Indicates Cathode Lead
- Marking: MRA4003T3 = R13  
MRA4004T3 = R14  
MRA4005T1 = R15  
MRA4005T3 = R15  
MRA4006T3 = R16  
MRA4007T3 = R17

#### ORDERING INFORMATION

| Device     | Package          | Shipping†        |
|------------|------------------|------------------|
| MRA4003T3  | SMA              | 5000/Tape & Reel |
| MRA4003T3G | SMA<br>(Pb-Free) | 5000/Tape & Reel |
| MRA4004T3  | SMA              | 5000/Tape & Reel |
| MRA4004T3G | SMA<br>(Pb-Free) | 5000/Tape & Reel |
| MRA4005T1  | SMA              | 1500/Tape & Reel |
| MRA4005T3  | SMA              | 5000/Tape & Reel |
| MRA4006T3  | SMA              | 5000/Tape & Reel |
| MRA4007T3  | SMA              | 5000/Tape & Reel |
| MRA4007T3G | 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 Specifications Brochure, BRD8011/D.

#### MAXIMUM RATINGS

Please See the Table on the Following Page



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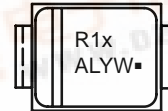
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STANDARD RECOVERY  
RECTIFIERS  
1.0 AMPERES  
300-1000 VOLTS



CASE 403D  
SMA  
PLASTIC

#### MARKING DIAGRAM



R1x = Specific Device Code  
A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week  
▪ = Pb-Free Package



# MRA4003T3 Series

## MAXIMUM RATINGS

| Rating  | Symbol                          | Value      |           |                         |           |           | Unit             |
|---|---------------------------------|------------|-----------|-------------------------|-----------|-----------|------------------|
|   |                                 | MRA4003T3  | MRA4004T3 | MRA4005T1,<br>MRA4005T3 | MRA4006T3 | MRA4007T3 |                  |
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                          | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 300        | 400       | 600                     | 800       | 1000      | Volts            |
| Avg. Rectified Forward Current<br>(At Rated $V_R$ , $T_L = 150^\circ\text{C}$ )                                 | $I_O$                           | 1          |           |                         |           |           | Amp              |
| Peak Repetitive Forward Current<br>(At Rated $V_R$ , Square Wave,<br>20 kHz, $T_L = 150^\circ\text{C}$ )        | $I_{FRM}$                       | 2          |           |                         |           |           | Amps             |
| Non-Repetitive Peak Surge Current<br>(Surge applied at rated load conditions,<br>halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 30         |           |                         |           |           | Amps             |
| Storage/Operating Case Temperature  | $T_{stg}$ , $T_C$               | -55 to 150 |           |                         |           |           | $^\circ\text{C}$ |
| Operating Junction Temperature  | $T_J$                           | -55 to 175 |           |                         |           |           | $^\circ\text{C}$ |

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.

## THERMAL CHARACTERISTICS

| Characteristic                                   | Symbol          | Value | Unit                      |
|--|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Lead (Note 1)    | $R_{\theta JL}$ | 16.2  | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 88.3  | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic   | Symbol | Value                    |                           | Unit          |
|--|--------|--------------------------|---------------------------|---------------|
|  |        | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ |               |
| Maximum Instantaneous Forward Voltage (Note 3)<br>( $I_F = 1\text{ A}$ )<br>( $I_F = 2\text{ A}$ ) | $V_F$  | 1.1<br>1.18              | 1.04<br>1.12              | Volts         |
| Maximum Instantaneous Reverse Current (at rated DC voltage)  | $I_R$  | 10                       | 50                        | $\mu\text{A}$ |

1. Minimum Pad Size
2. 1 inch Pad Size
3. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

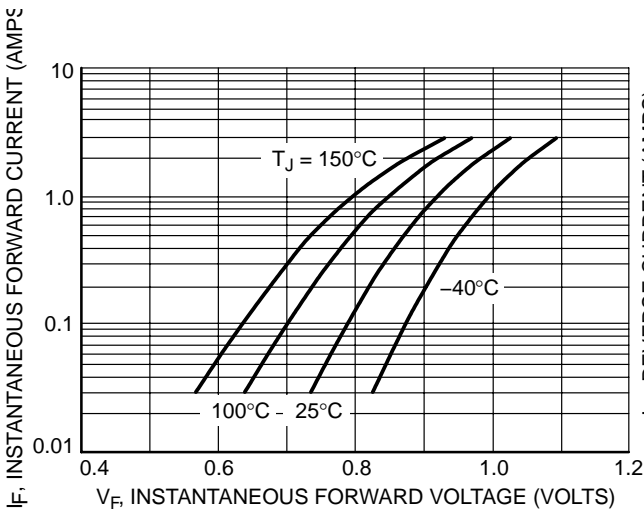


Figure 1. Typical Forward Voltage

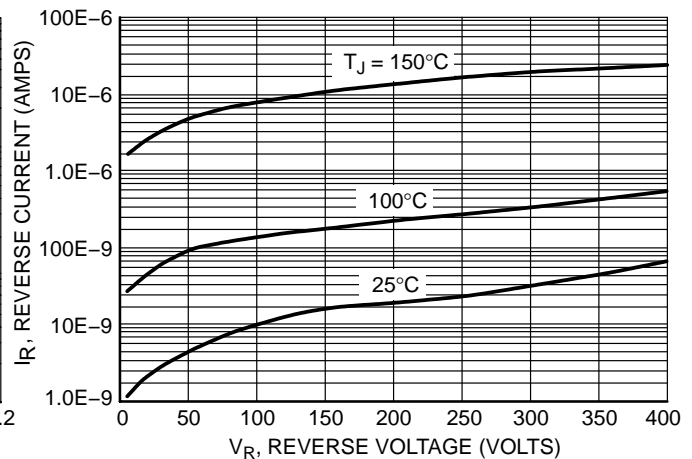


Figure 2. Typical Reverse Current

# MRA4003T3 Series

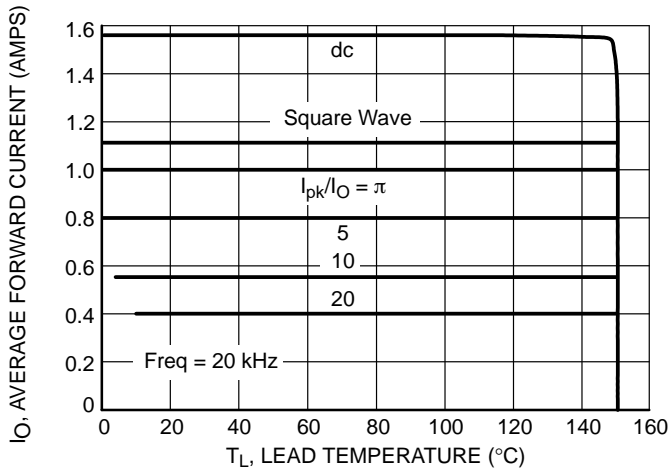


Figure 3. Current Derating per Leg

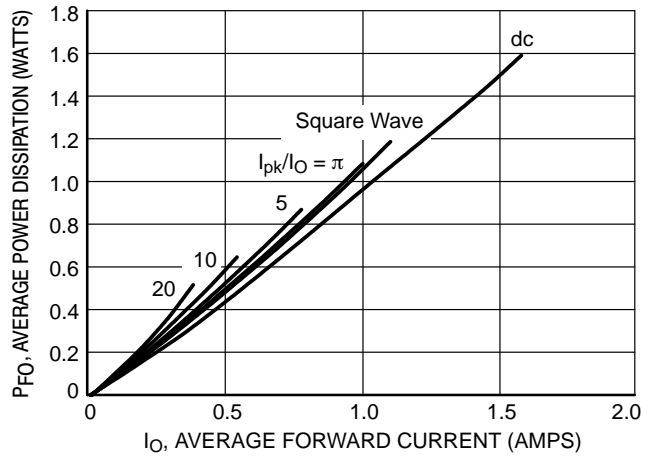


Figure 4. Forward Power Dissipation per Leg

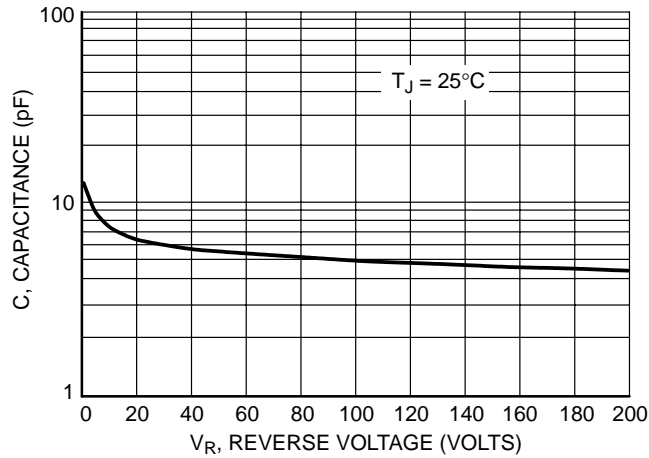


Figure 5. Capacitance

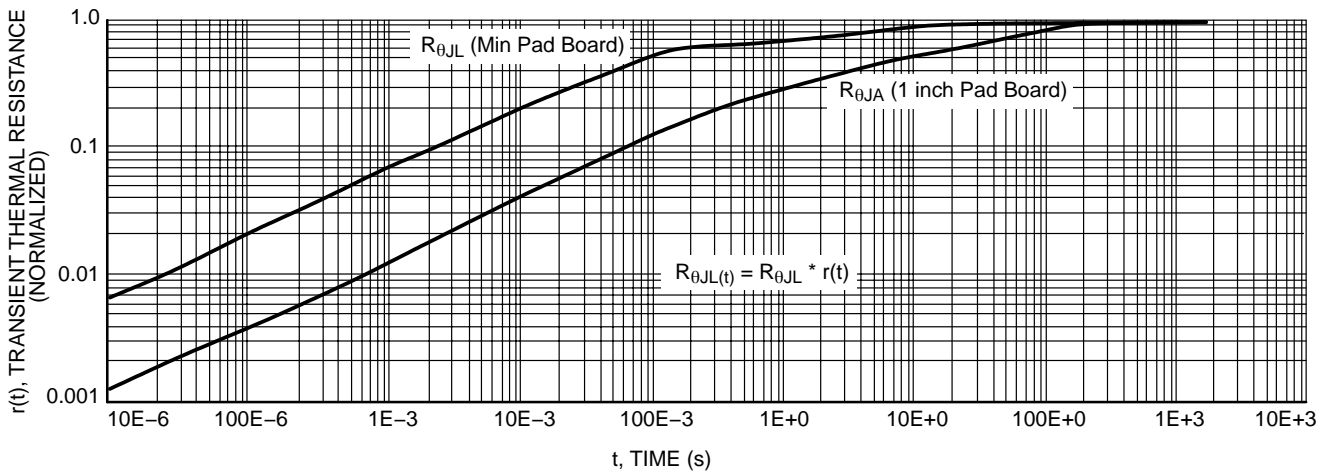
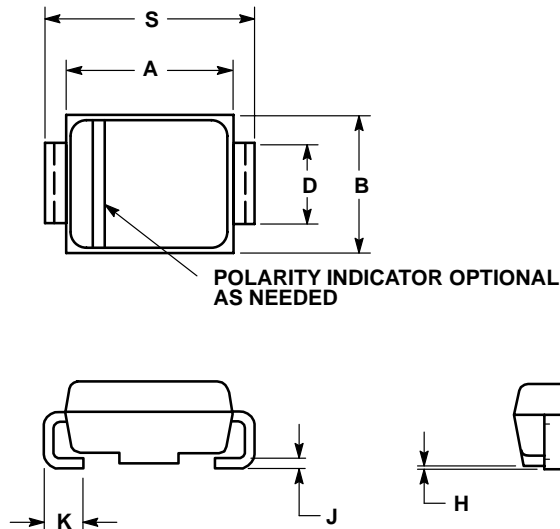


Figure 6. Thermal Response

# MRA4003T3 Series


## PACKAGE DIMENSIONS

**SMA**  
**PLASTIC PACKAGE**  
**CASE 403D-02**  
**ISSUE A**



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

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.160  | 0.180 | 4.06        | 4.57 |
| B   | 0.090  | 0.115 | 2.29        | 2.92 |
| C   | 0.075  | 0.095 | 1.91        | 2.41 |
| D   | 0.050  | 0.064 | 1.27        | 1.63 |
| H   | 0.002  | 0.006 | 0.05        | 0.15 |
| J   | 0.006  | 0.016 | 0.15        | 0.41 |
| K   | 0.030  | 0.060 | 0.76        | 1.52 |
| S   | 0.190  | 0.220 | 4.83        | 5.59 |

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