

MBRAF1540T3G

Surface Mount Schottky Power Rectifier

This device employs 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 protection diodes in surface mount applications where compact size and weight are critical to the system.

Features

- Low Profile Package for Space Constrained Applications
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- 150°C Operating Junction Temperature
- Guard-Ring for Stress Protection
- These are Pb-Free and Halide-Free Devices

Mechanical Characteristics

- Case: Epoxy, Molded, Epoxy Meets UL 94, V-0
- Weight: 95 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
- Cathode Polarity Band
- Device Meets MSL 1 Requirements
- ESD Ratings: Machine Model = C
Human Body Model = 3B

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 40 | V |
| Average Rectified Forward Current (At Rated V_R , $T_C = 100^\circ\text{C}$) | I_O | 1.5 | A |
| Peak Repetitive Forward Current (At Rated V_R , Square Wave, 100 kHz, $T_C = 130^\circ\text{C}$) | I_{FRM} | 3.0 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I_{FSM} | 40 | A |
| Storage/Operating Case Temperature | T_{stg}, T_C | -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 |

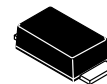
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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



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SCHOTTKY BARRIER RECTIFIER 1.5 AMPERE 40 VOLTS



SMA-FL
CASE 403AA
STYLE 6

MARKING DIAGRAM



RAE = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|---------------------|--------------------|
| MBRAF1540T3G | SMA-FL (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.

MBRAF1540T3G

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------|-----------------------------|
| Thermal Resistance, Junction-to-Lead (Note 1) | $R_{\theta JL}$ | 25 | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 90 | |

1. 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Value | | Unit |
|--|--------|-----------------------------------|------------------------------------|------|
| | | $T_J = 25^{\circ}\text{C}$ | $T_J = 125^{\circ}\text{C}$ | |
| Maximum Instantaneous Forward Voltage (Note 2) see Figure 2 ($i_F = 1.5\text{ A}$) ($i_F = 3.0\text{ A}$) | v_F | 0.46 | 0.39 | V |
| | | 0.54 | 0.54 | |
| Maximum Instantaneous Reverse Current (Note 2) see Figure 4 ($V_R = 40\text{ V}$) ($V_R = 20\text{ V}$) | I_R | $T_J = 25^{\circ}\text{C}$ 0.8 | $T_J = 100^{\circ}\text{C}$ 5.7 | mA |
| | | 0.1 | 1.6 | |

2. Pulse Test: Pulse Width $\leq 250\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

MBRAF1540T3G

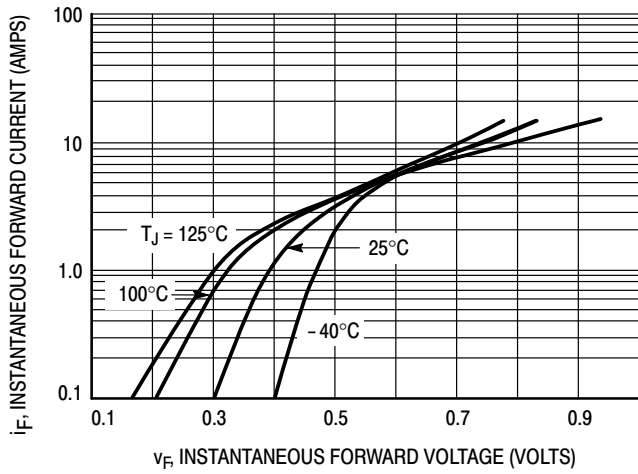


Figure 1. Typical Forward Voltage

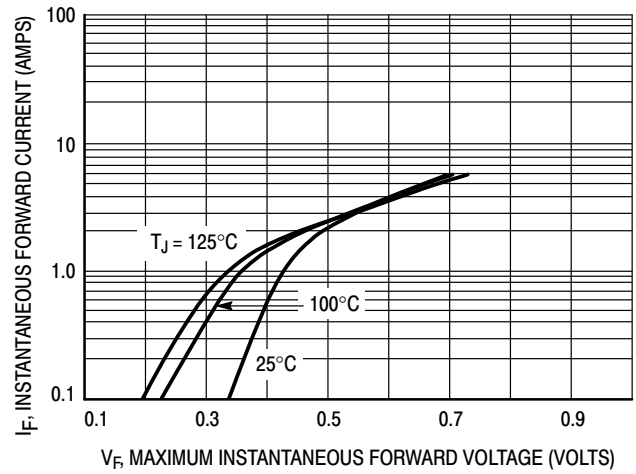


Figure 2. Maximum Forward Voltage

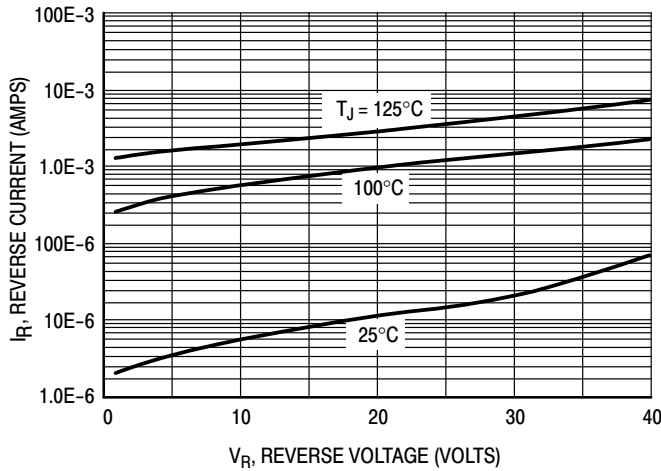


Figure 3. Typical Reverse Current

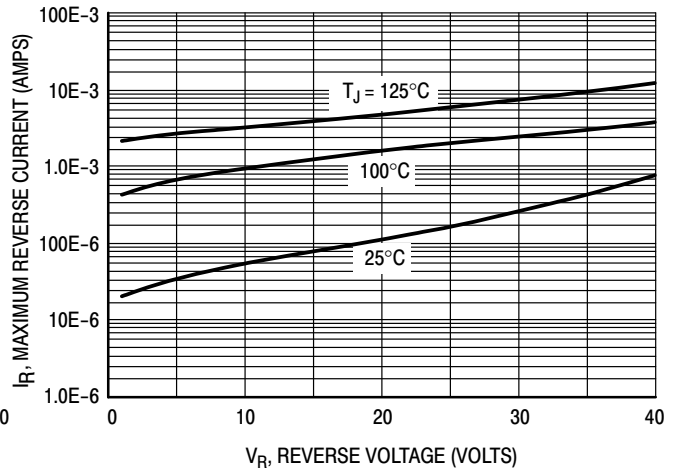


Figure 4. Maximum Reverse Current

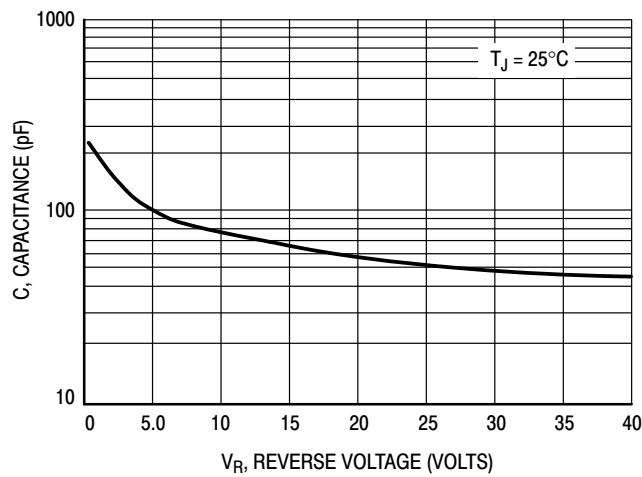


Figure 5. Capacitance

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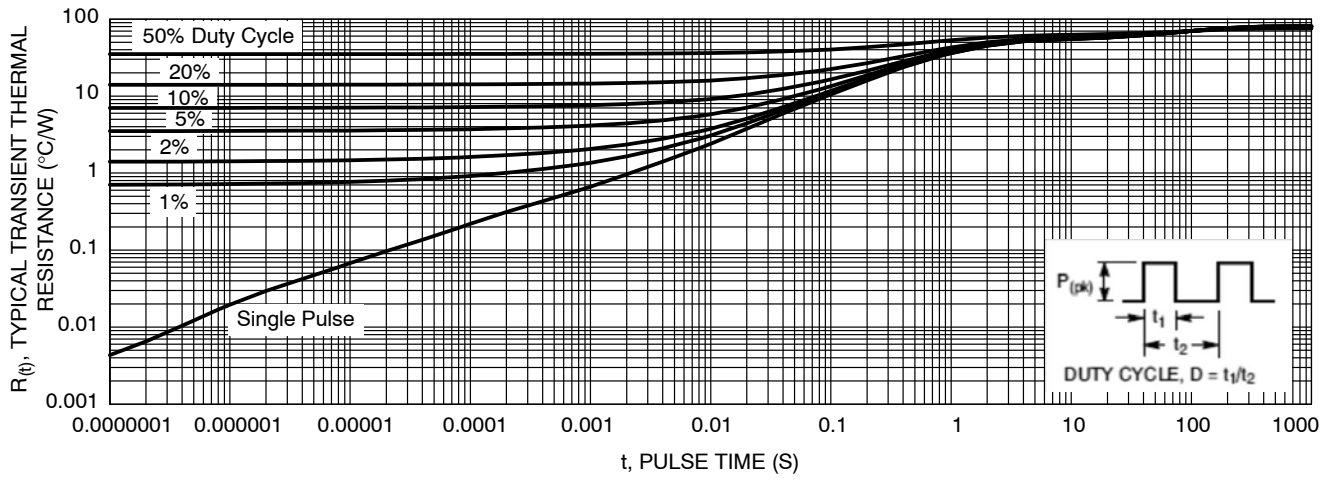
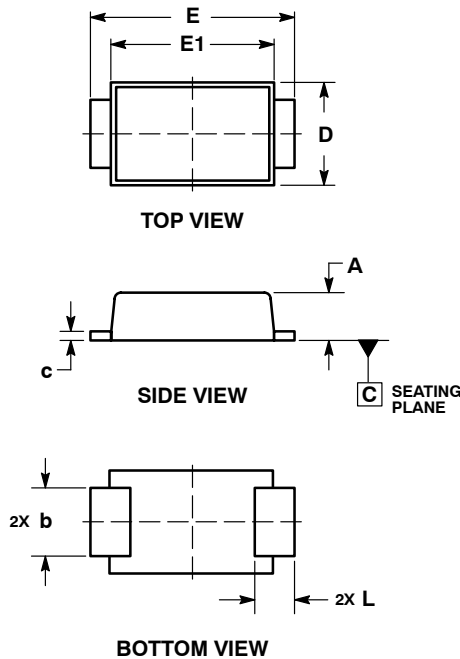


Figure 6. Typical Transient Thermal Response, Junction-to-Ambient

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PACKAGE DIMENSIONS

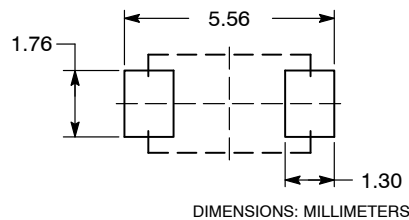
SMA-FL
CASE 403AA
ISSUE O




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.

| MILLIMETERS | | |
|-------------|------|------|
| DIM | MIN | MAX |
| A | 0.90 | 1.10 |
| b | 1.25 | 1.65 |
| c | 0.15 | 0.30 |
| D | 2.40 | 2.80 |
| E | 4.80 | 5.40 |
| E1 | 4.00 | 4.60 |
| L | 0.70 | 1.10 |

RECOMMENDED SOLDER 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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