

# MBRS120T3G, SBR8120T3G

Preferred Device

## 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

- Small Compact Surface Mountable Package with J-Bend Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop (0.55 Volts Max @ 1.0 A,  $T_J = 25^\circ\text{C}$ )
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guard-Ring for Stress Protection
- ESD Ratings:
  - ♦ Human Body Model = 3B (> 16000 V)
  - ♦ Machine Model = C (> 400 V)
- AEC-Q101 Qualified and PPAP Capable
- SBR8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 95 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Max. for 10 Seconds
- Cathode Polarity Band



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## SCHOTTKY BARRIER RECTIFIER 1.0 AMPERE, 20 VOLTS



SMB  
CASE 403A

### MARKING DIAGRAM



B12 = 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†              |
|------------|------------------|------------------------|
| MBRS120T3G | SMB<br>(Pb-Free) | 2,500 /<br>Tape & Reel |
| SBR8120T3G | SMB<br>(Pb-Free) | 2,500 /<br>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.

**Preferred** devices are recommended choices for future use and best overall value.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MBRS120T3G, SBRS8120T3G

## 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>( $T_L = 115^\circ\text{C}$ )                                          | $I_{F(AV)}$                     | 1.0         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 40          | A                |
| Operating Junction Temperature                                                                              | $T_J$                           | -65 to +125 | $^\circ\text{C}$ |

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.

## THERMAL CHARACTERISTICS

| Characteristic                                                       | Symbol          | Value | Unit               |
|----------------------------------------------------------------------|-----------------|-------|--------------------|
| Thermal Resistance, Junction-to-Lead<br>( $T_L = 25^\circ\text{C}$ ) | $R_{\theta JL}$ | 12    | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                    | Symbol | Value     | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )                                             | $V_F$  | 0.6       | V    |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 100^\circ\text{C}$ ) | $i_R$  | 1.0<br>10 | mA   |

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

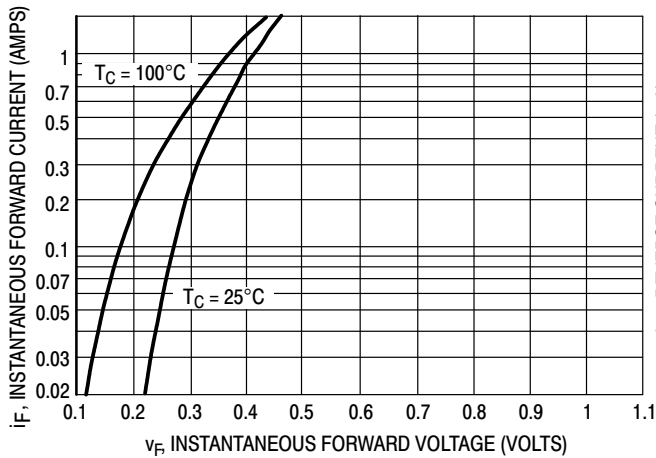


Figure 1. Typical Forward Voltage

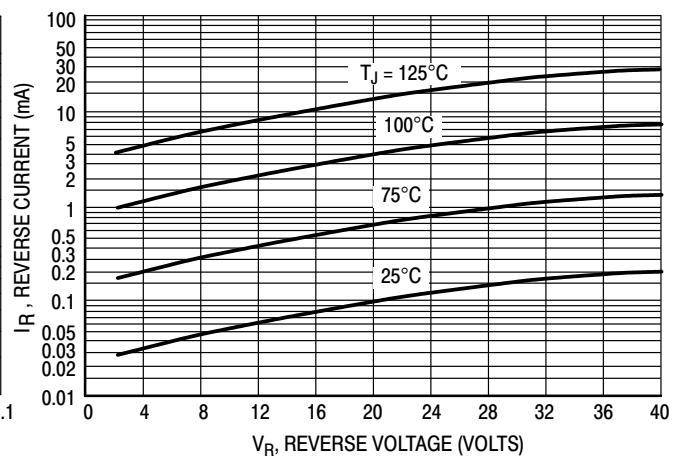


Figure 2. Typical Reverse Current

## MBRS120T3G, SBRS8120T3G

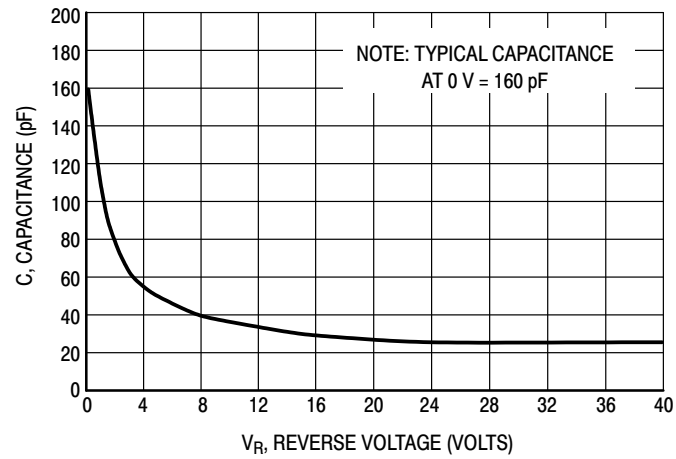


Figure 3. Typical Capacitance

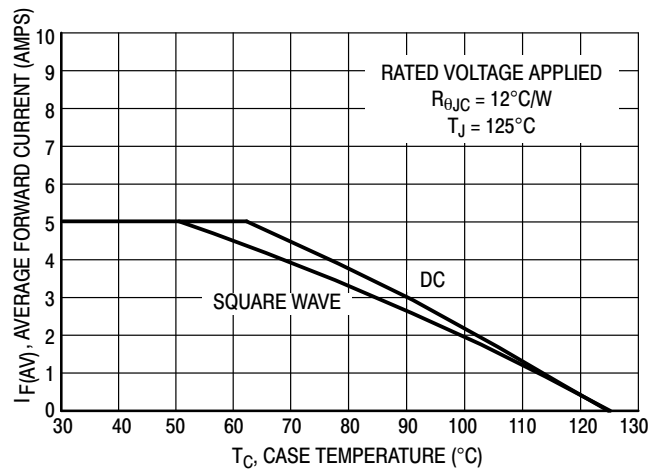


Figure 4. Current Derating (Case)

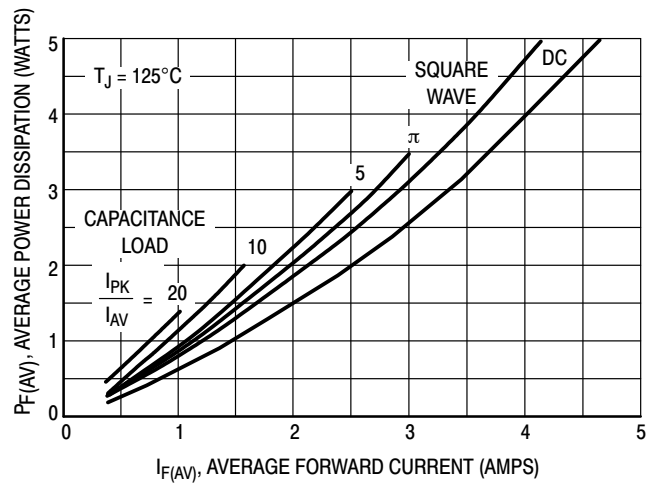
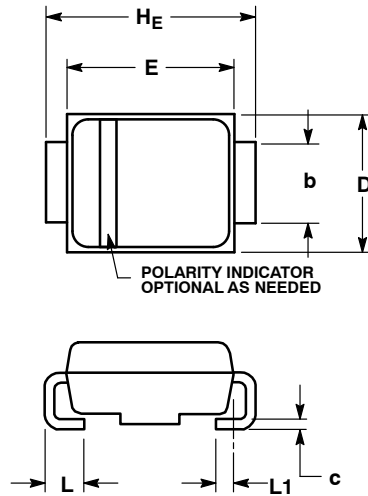


Figure 5. Power Dissipation

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## PACKAGE DIMENSIONS

### SMB CASE 403A-03 ISSUE H

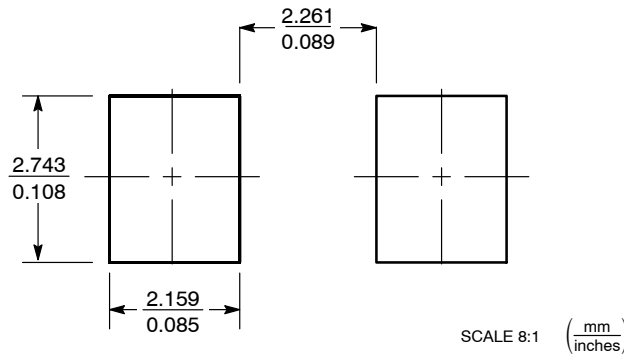


#### NOTES:

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

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.90        | 2.20 | 2.28 | 0.075     | 0.087 | 0.090 |
| A1  | 0.05        | 0.10 | 0.19 | 0.002     | 0.004 | 0.007 |
| b   | 1.96        | 2.03 | 2.20 | 0.077     | 0.080 | 0.087 |
| c   | 0.15        | 0.23 | 0.31 | 0.006     | 0.009 | 0.012 |
| D   | 3.30        | 3.56 | 3.95 | 0.130     | 0.140 | 0.156 |
| E   | 4.06        | 4.32 | 4.60 | 0.160     | 0.170 | 0.181 |
| HE  | 5.21        | 5.44 | 5.60 | 0.205     | 0.214 | 0.220 |
| L   | 0.76        | 1.02 | 1.60 | 0.030     | 0.040 | 0.063 |
| L1  | 0.51 REF    |      |      | 0.020 REF |       |       |

### 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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