

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

Product Summary

| V_{RRM} (V) | I_o (A) | V_F (MAX) (V) @ +25°C | I_R (MAX) (mA) @ +25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 100 | 3 | 0.85 | 0.5 |

Description

The MBR3100 is a high voltage Schottky rectifier suited for switch mode power supplies and other power converters. This device is intended for use in medium voltage operation, and particularly, in high frequency circuits where low switching losses and low noise are required.

The MBR3100 is available in standard DO-214AC and DO-27 packages.

Applications

- Power Supply-Output Rectification
- Power Management
- Instrumentation

Features

- Low Forward Voltage: 0.85V at +25°C
- High Surge Current Capacity
- Operating Junction Temperature: +150°C
- 3A Total
- Guard-Ring for Stress Protection
- DO-214AC and DO-27
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Available in "Green" Packages: DO-214AC and DO-27
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
 - **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: DO-214AC, DO-27
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^{Ⓔ3}
- Weight (Approximately): 1.9Grams



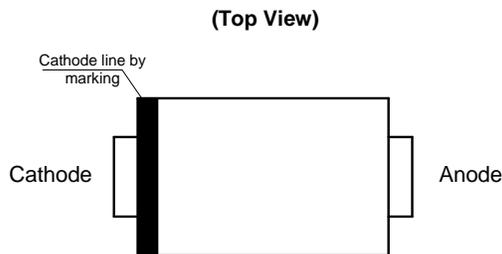
DO-214AC



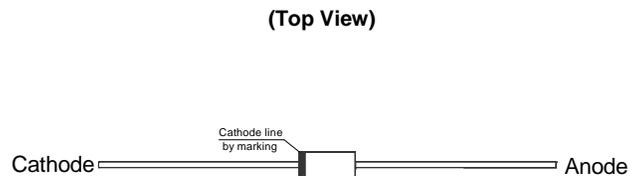
DO-27

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Pin Assignments

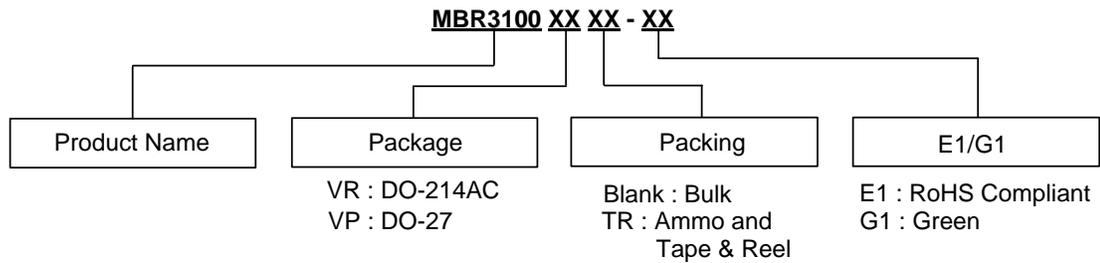


DO-214AC



DO-27

Ordering Information (Note 4)



Note 4: Diodes Inc's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

| | Package | Part Number | Marking ID | Packing |
|--------------------------|----------|----------------|------------|-------------------------|
| | DO-214AC | MBR3100VRTR-E1 | 3100VE | 7500 Pieces/Tape & Reel |
| | | MBR3100VRTR-G1 | 3100VR | 7500 Pieces/Tape & Reel |
| | DO-27 | MBR3100VP-E1 | 3100VP | 500 Pieces/Bulk |
| | | MBR3100VP-G1 | 3100VG | 500 Pieces/Bulk |
| | | MBR3100VPTR-E1 | 3100VP | 500 Pieces/Ammo |
| | | MBR3100VPTR-G1 | 3100VG | 500 Pieces/Ammo |

Marking Information

(1) DO-214AC

(Top View)



First Line: Logo and Date Code
 Y: Year
 WW: Work Week of Molding
 A: Assembly House Code
 Second Line: Marking ID
 (See Ordering Information)

Marking Information (Cont.)

(2) DO-27

(Top View)



First Line: Logo and Date Code
 Y: Year
 WW: Work Week of Molding
 A: Assembly House Code
 Second Line: Marking ID
 (See Ordering Information)

Maximum Ratings (Note 5)

| Characteristic | Symbol | Rating | Unit |
|----------------------------------------------------------------------------------------------------------|-------------|-------------|------------------|
| Peak Repetitive Reverse Voltage | V_{RRM} | 100 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| Average Rectified Forward Current (Rated V_R , $T_C = +141^\circ\text{C}$) | $I_{F(AV)}$ | 3 | A |
| Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 60Hz) | I_{FSM} | 80 | A |
| Operating Junction Temperature Range (Note 6) | T_J | -65 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10000 | V/ μs |
| ESD (Machine Model = C) | – | 400 | V |
| ESD (Human Body Model = 3B) | – | 8000 | V |

- Notes:
- Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.
 - The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_D/dT_J < 1/\theta_{JA}$.

Thermal Characteristics

| Characteristic | Symbol | Rating | | Unit |
|---------------------------------------------------|--------------------------|----------|----|------|
| Thermal Resistance (Junction to Lead) (Note 7) | R θ _{JL} | DO-214AC | 20 | °C/W |
| | | DO-27 | 5 | |
| Thermal Resistance (Junction to Ambient) (Note 7) | R θ _{JA} | DO-214AC | 70 | |
| | | DO-27 | 35 | |

Note 7: Device mounted on heat sink, with minimum recommended pad layout per <http://www.diodes.com>

Electrical Characteristics

| Characteristic | Symbol | Rating | Unit | Test Condition |
|-----------------------------------------------------|----------------------|--------|------|----------------------------------------------|
| Maximum Instantaneous Forward Voltage Drop (Note 8) | V _F (MAX) | 0.85 | V | I _F = 3A, T _C = +25°C |
| | | 0.7 | | I _F = 3A, T _C = +125°C |
| Maximum Instantaneous Reverse Current (Note 8) | I _R (MAX) | 0.5 | mA | Rated DC Voltage, T _C = +25°C |
| | | 2.0 | | Rated DC Voltage, T _C = +125°C |

Note 8: Short duration pulse test used to minimize self-heating effect, Pulse Test: Pulse Width = 300µs, Duty Cycle ≤ 2.0%.

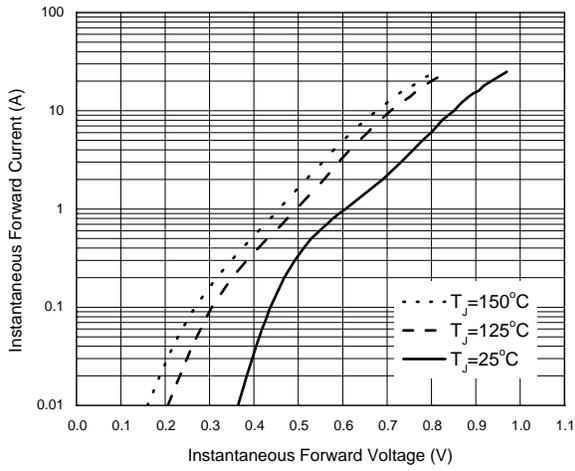


Figure 1. Typical Forward Characteristics

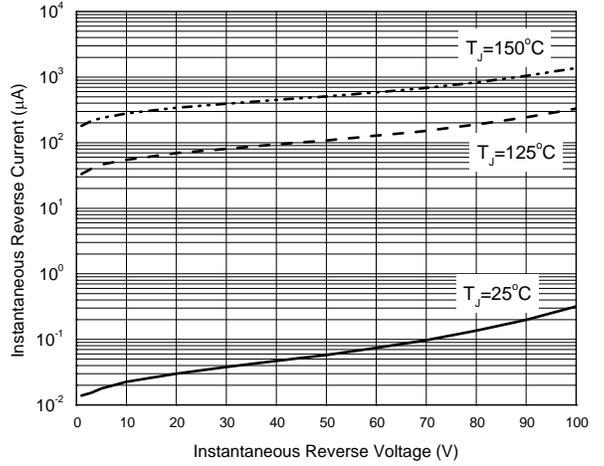


Figure 2. Typical Reverse Characteristics

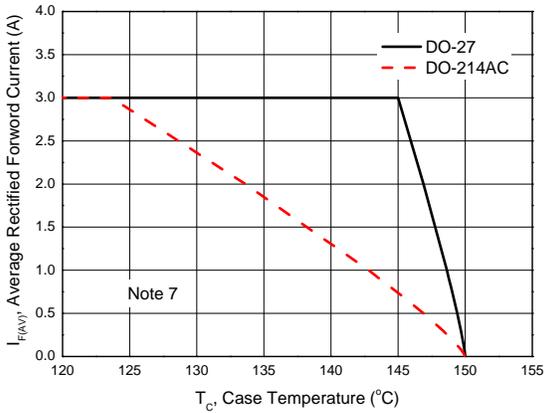


Figure 3. Average Rectified Forward Current vs. Case Temperature

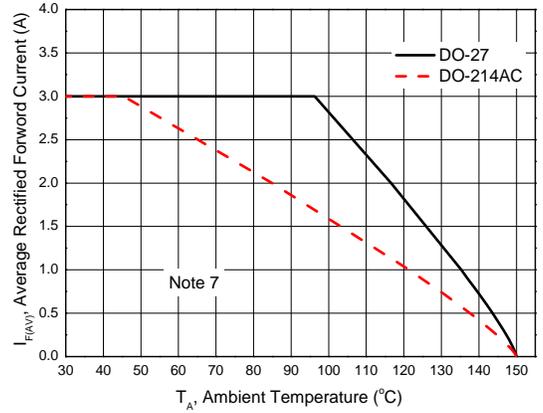
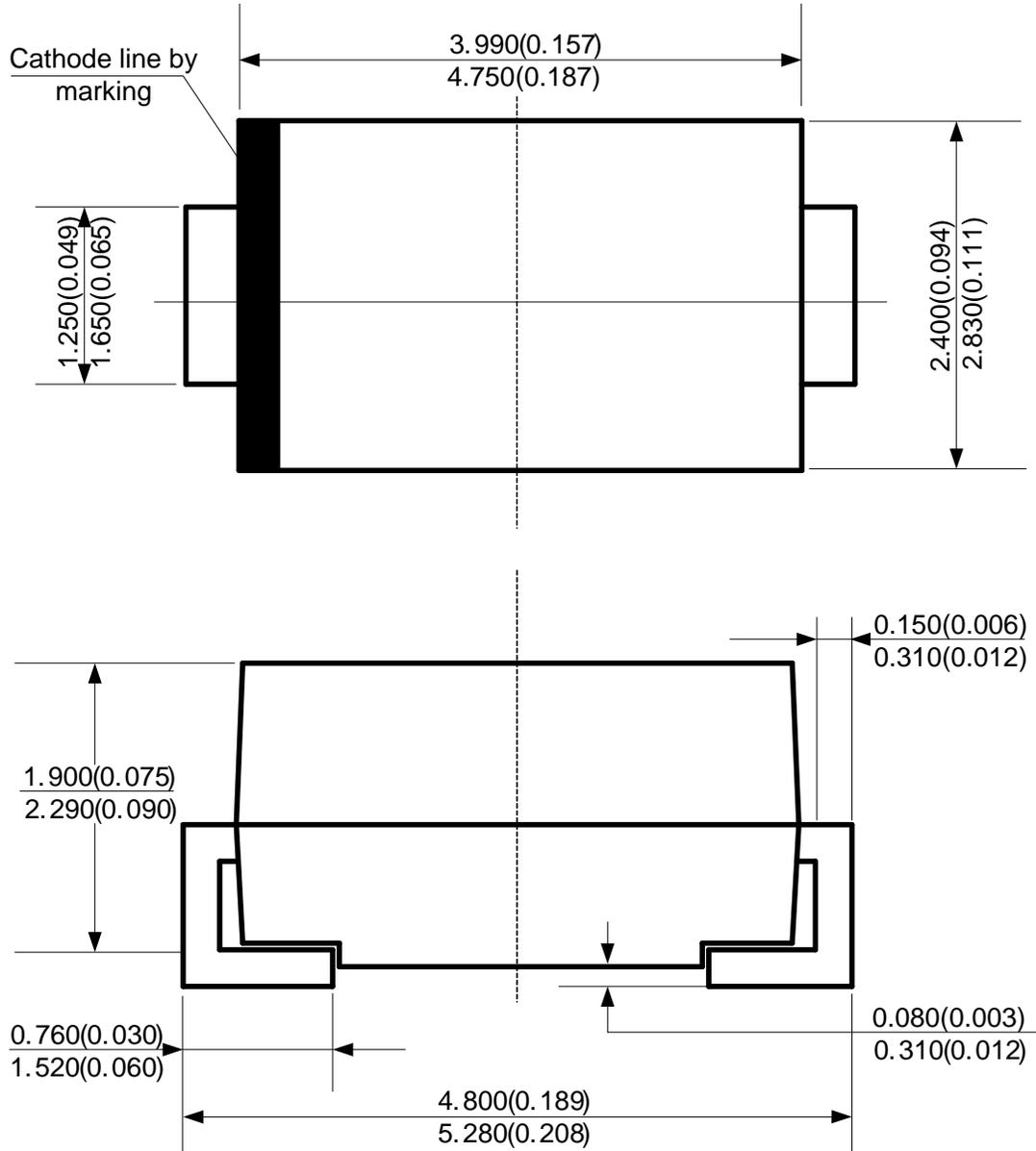


Figure 4. Average Rectified Forward Current vs. Ambient Temperature

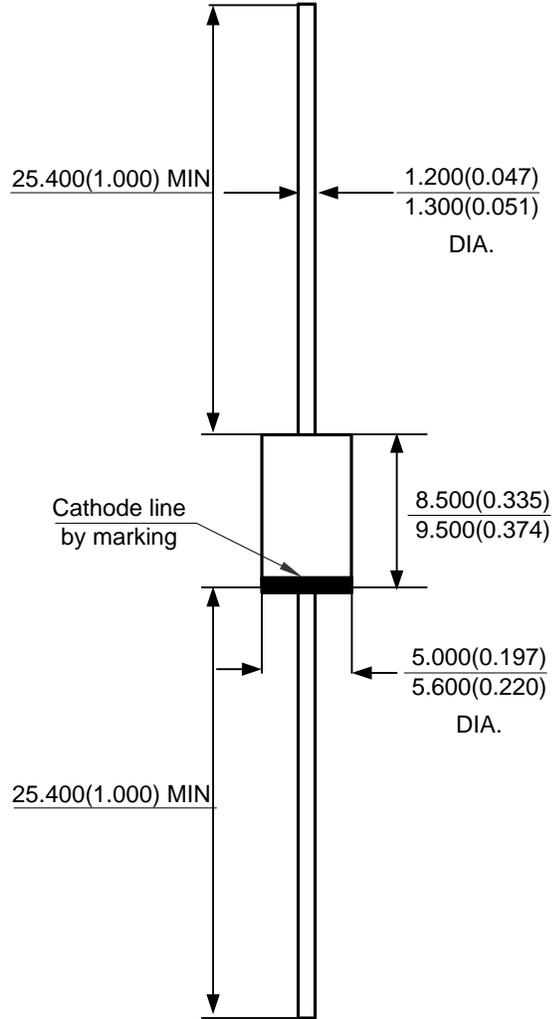
Package Outline Dimensions (All dimensions in mm(inch).)

(1) Package Type: DO-214AC



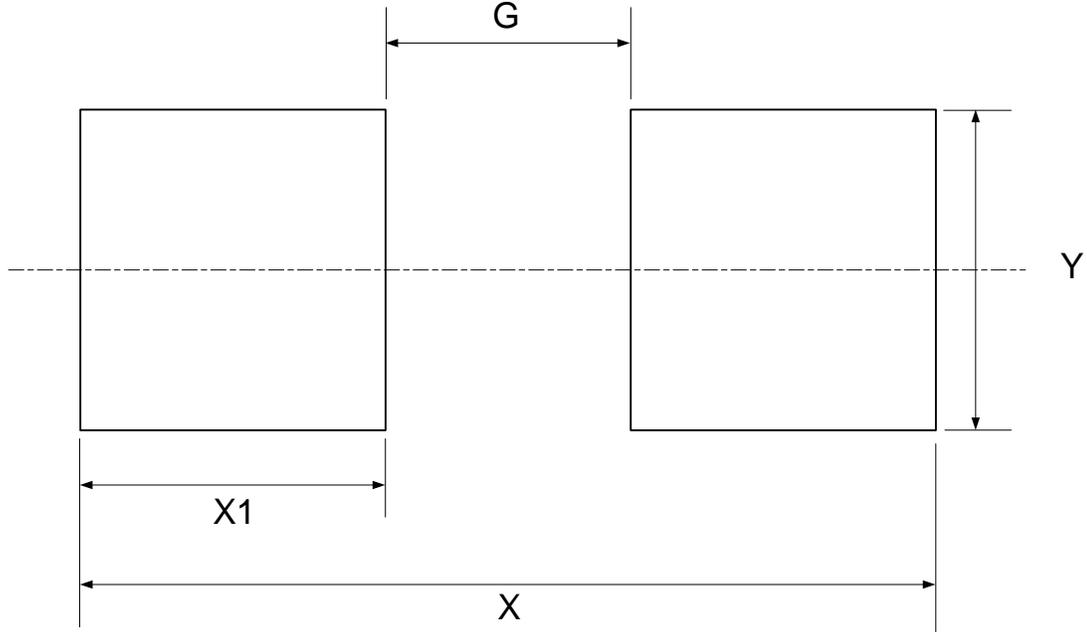
Package Outline Dimensions (Cont. All dimensions in mm(inch).)

(2) Package Type: DO-27



Suggested Pad Layout

(1) Package Type: DO-214AC



| Dimensions | Y (mm)/(inch) | X1 (mm)/(inch) | G (mm)/(inch) | X (mm)/(inch) |
|------------|------------------|-------------------|------------------|------------------|
| Value | 2.100/0.083 | 2.000/0.079 | 1.600/0.063 | 5.600/0.220 |

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