

Product Summary (@ $T_A = +25^\circ\text{C}$)

| V_{RRM} (V) | I_o (A) | V_F (V) | I_R (μA) |
|---------------|-----------|-----------|-------------------------|
| 1,000 | 3 | 1.8 | 10 |

Description

3.0A Surface Mount Glass Passivated Rectifier in SMC package offers high current capability and ultra-fast recovery time for high efficiency. Designed with glass passivated die construction for high reliability, this device is ideal for applications such as:

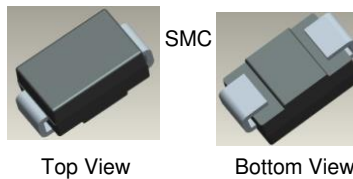
- Power Supplies
- Lighting Ballasts

Features and Benefits

- Glass Passivated Die Construction
- High Current Capability
- Ultra-Fast Recovery Time for High Efficiency
- Maximum Operating Junction Temperature of $+175^\circ\text{C}$
- **Lead Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SMC
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Lead-Free Plating (Matte Tin Finish).
Solderable per MIL-STD-202, Method 208 (E3)
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.21 grams (Approximate)



Top View

Bottom View

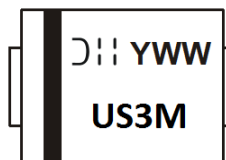
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|------|-------------------|
| US3M-13 | SMC | 3,000/Tape & Reel |

- 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.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SMC



US3M = Product Type Marking Code
 DII = Manufacturer's Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 4 for 2014)
 WW = Week Code 01 to 53

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitance load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|--------------|-------|------|
| Peak Repetitive Reverse Voltage | V_{RRM} | 1,000 | V |
| Working Peak Reverse Voltage | V_{RWM} | | |
| DC Blocking Voltage | V_R | | |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 700 | V |
| Average Rectified Output Current @ $T_T = +75^\circ\text{C}$ | I_O | 3.0 | A |
| Non-Repetitive Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I_{FSM} | 120 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Typical Thermal Resistance, Junction to Terminal (Note 7) | $R_{\theta JT}$ | 26 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +175 | $^\circ\text{C}$ |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------------|-------------|-------|-----------|-----------|---------------|---|
| Reverse Breakdown Voltage (Note 5) | $V_{(BR)R}$ | 1,000 | — | — | V | $I_R = 10\mu\text{A}$ |
| Forward Voltage | V_F | — | 1.5 | 1.8 | V | $I_F = 3.0\text{A}$ |
| Leakage Current (Note 5) | I_R | — | 2.2 14 | 10 500 | μA | $V_R = 1,000\text{V}, T_A = +25^\circ\text{C}$ $V_R = 1,000\text{V}, T_A = +125^\circ\text{C}$ |
| Reverse Recovery Time | t_{rr} | — | 70 | 85 | ns | $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$ |
| Total Capacitance | C_T | — | 25 | — | pF | $V_R = 4\text{V}, f = 1.0\text{MHz}$ |

- Notes:
5. Short duration pulse test used to minimize self-heating effect.
 6. Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.15" x 0.26" copper pads.
 7. Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.56" x 0.73" copper pads.

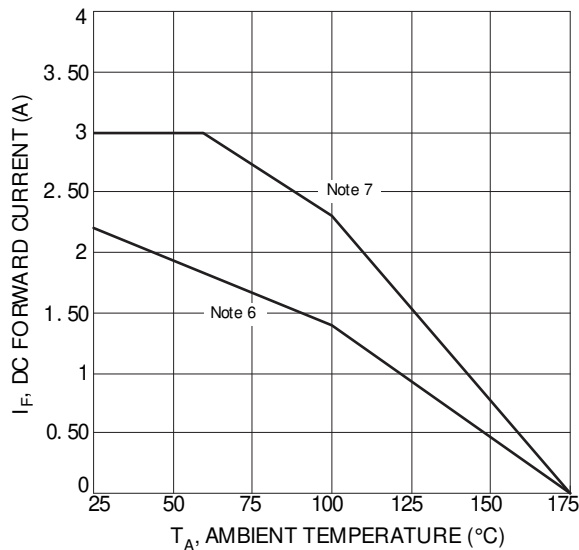


Figure 1 DC Forward Current Derating

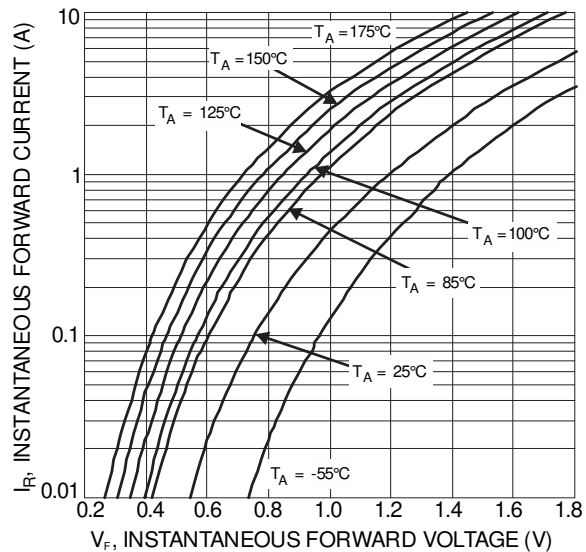


Figure 2 Typical Reverse Characteristics

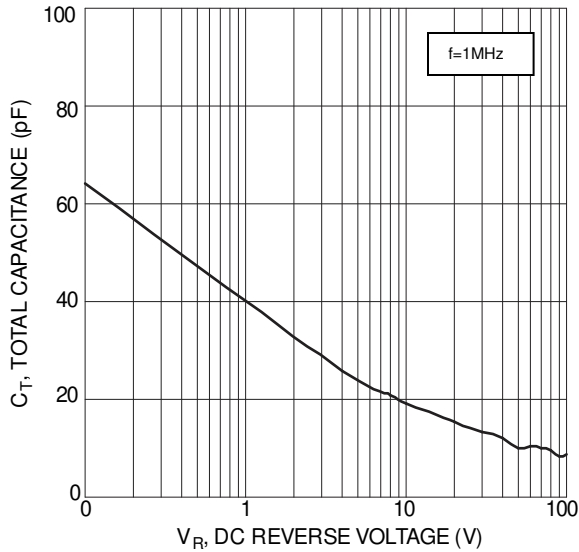


Figure 3 Total Capacitance vs. Reverse Voltage

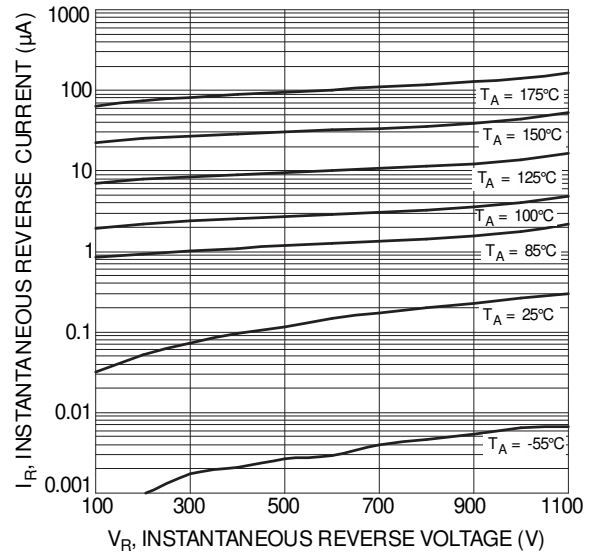
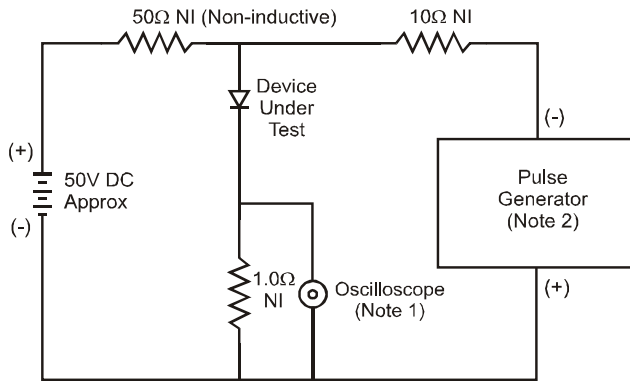
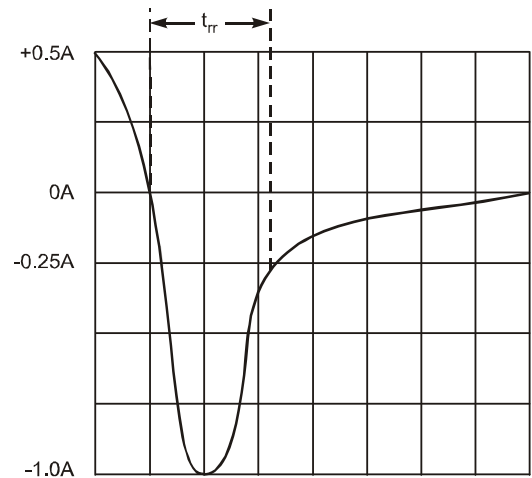


Figure 4 Typical Reverse Characteristics



- Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
 2. Rise Time = 10ns max. Input Impedance = 50Ω.

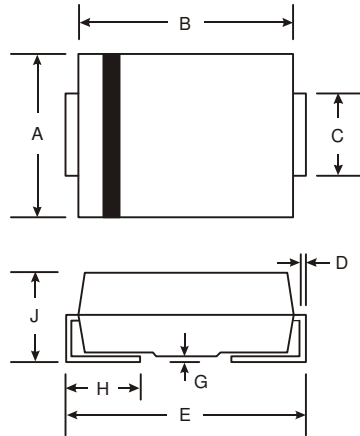


Set time base for 50/100 ns/cm

Figure 5 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

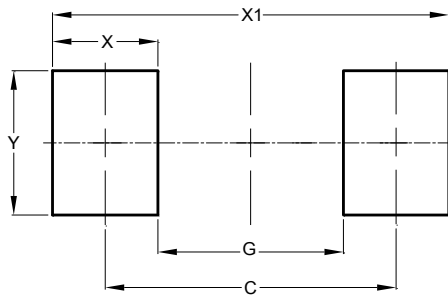
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SMC | | |
|----------------------|------|------|
| Dim | Min | Max |
| A | 5.59 | 6.22 |
| B | 6.60 | 7.11 |
| C | 2.75 | 3.18 |
| D | 0.15 | 0.31 |
| E | 7.75 | 8.13 |
| G | 0.10 | 0.20 |
| H | 0.76 | 1.52 |
| J | 2.00 | 2.50 |
| All Dimensions in mm | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 6.90 |
| G | 4.40 |
| X | 2.50 |
| X1 | 9.40 |
| Y | 3.30 |

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