3.0A SURFACE MOUNT ULTRA-FAST RECTIFIER

Product Summary (@T_A = +25°C)

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

Features and Benefits

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

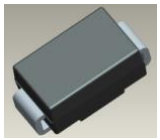
Description

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

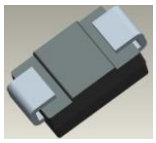
Mechanical Data

- 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

SMC



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

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Maximum Ratings (@T_A = +25°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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	1,000	V
RMS Reverse Voltage	$V_{R(RMS)}$	700	V
Average Rectified Output Current @ T_T = +75°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	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	°C

Electrical Characteristics (@T_A = +25°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=10μA
Forward Voltage	V_F	—	1.5	1.8	V	I_F = 3.0A
Leakage Current (Note 5)	I_R	— —	2.2 14	10 500	μA	V_R =1,000V, T_A = +25°C V_R =1,000V, T_A = +125°C
Reverse Recovery Time	t_{rr}	—	70	85	ns	I_F = 0.5A, I_R = 1.0A, I_{rr} = 0.25A
Total Capacitance	C_T	—	25	—	pF	V_R = 4V, f =1.0MHz

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.

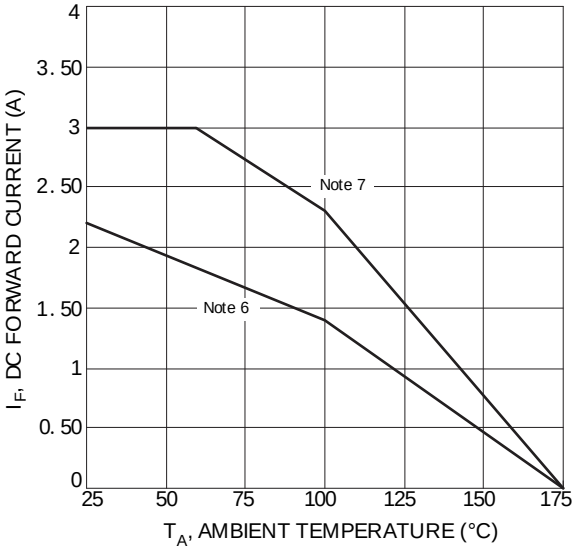


Figure 1 DC Forward Current Derating

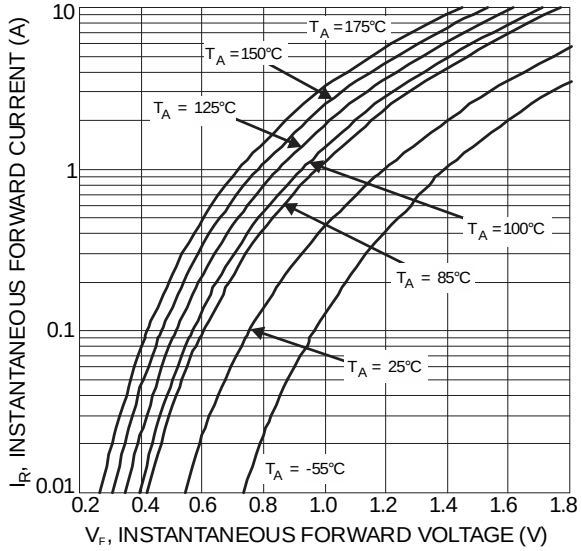


Figure 2 Typical Reverse Characteristics

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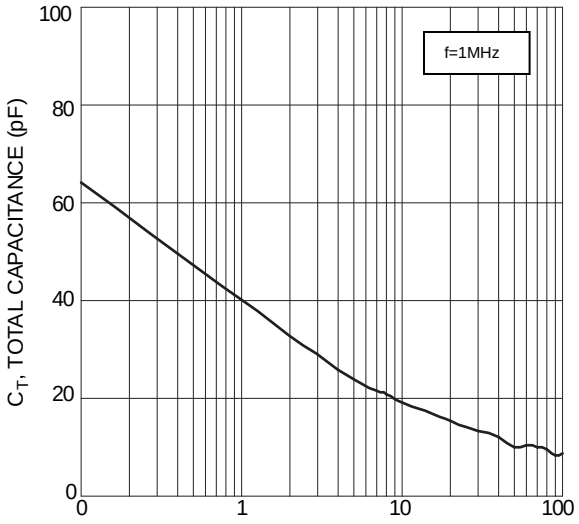


Figure 3 Total Capacitance vs. Reverse Voltage

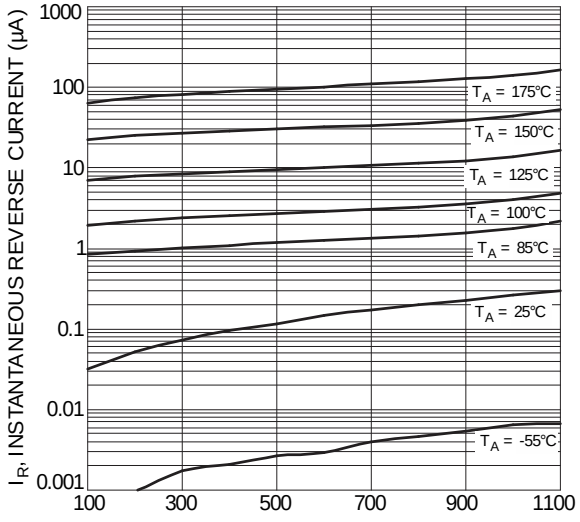
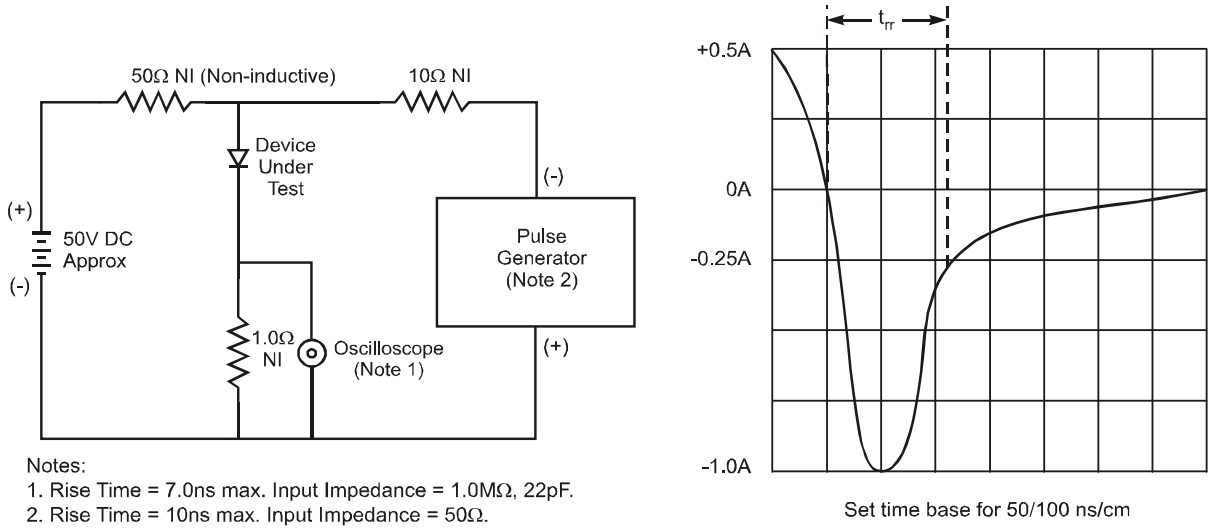


Figure 4 Typical Reverse Characteristics



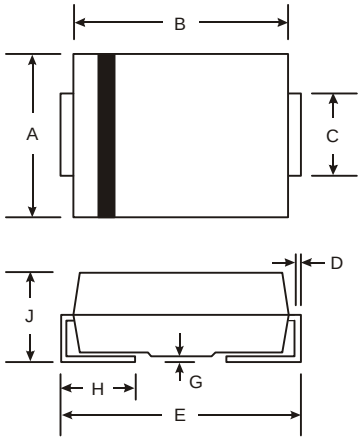
Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
2. Rise Time = 10ns max. Input Impedance = 50Ω.

Figure 5 Reverse Recovery Time Characteristic and Test Circuit

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Package Outline Dimensions

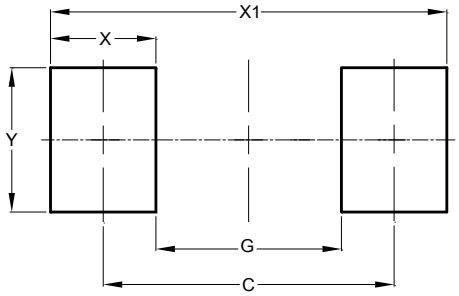
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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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