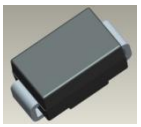
1.0A SURFACE MOUNT SUPER-FAST RECTIFIER

Features

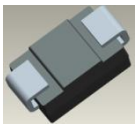
- Glass Passivated Die Construction
- Super-Fast Recovery Time for High Efficiency
- Surge Overload Rating to 30A Peak
- Ideally Suited for Automated Assembly
- **Lead Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free "Green" Device (Note 3)**

Mechanical Data

- Case: SMA
- Case Material: Molded Plastic. 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 (e3)
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.064 grams (Approximate)



Top View



Bottom View

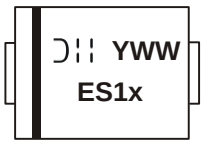
Ordering Information (Note 4)

Part Number	Case	Packaging
ES1x-13-F	SMA	5000/Tape & Reel

* x = Device type, e.g. ES1A-13-F

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



ES1x = Product type marking code, ex. ES1A
= Manufacturer's code marking
YWW = Date code marking
Y = Last digit of year (ex: 2 for 2002)
WW = Week code (01 to 53)

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	ES1A	ES1B	ES1C	ES1D	ES1G	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage (Note 6)	V_{RRM} V_{RWM} V_R	50	100	150	200	400	V
RMS Reverse Voltage	$V_{R(RMS)}$	35	70	105	140	280	V
Average Rectified Output Current @ T_T = +110°C	I_O	1.0					A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	30					A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Terminal (Note 5)	$R_{\theta JT}$	25	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	ES1A	ES1B	ES1C	ES1D	ES1G	Unit
Minimum Reverse Breakdown Voltage (Note 6)	I_R = 5µA	$V_{(BR)R}$	50	100	150	200	400	V
Maximum Forward Voltage Drop	I_F = 0.6A I_F = 1.0A	V_{FM}	0.90 0.92				— 1.25	V
Peak Reverse Current at Rated DC Blocking Voltage (Note 6)	T_A = +25°C T_A = +125°C	I_{RM}	5.0 200					µA
Maximum Reverse Recovery Time (Note 7)		t_{RR}	25					ns
Typical Total Capacitance (Note 8)		C_T	20					pF

Notes:
5. Unit mounted on PC board with 5.0 mm^2 (0.013 mm thick) copper pad as heat sink.
6. Short duration pulse test used to minimize self-heating effect.
7. Measured with I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A. See figure 5.
8. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.

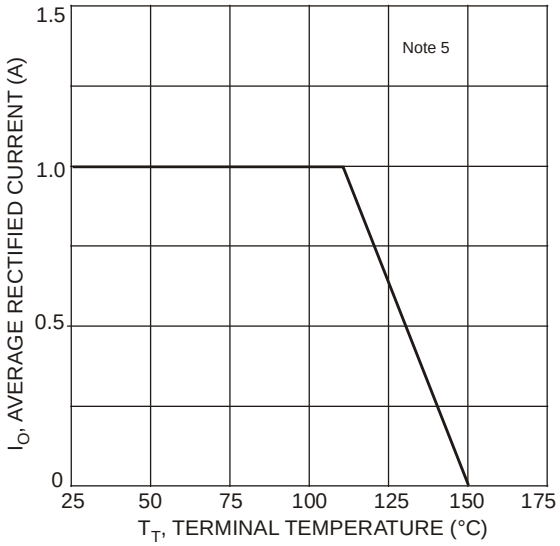


Fig. 1 Forward Current Derating Curve

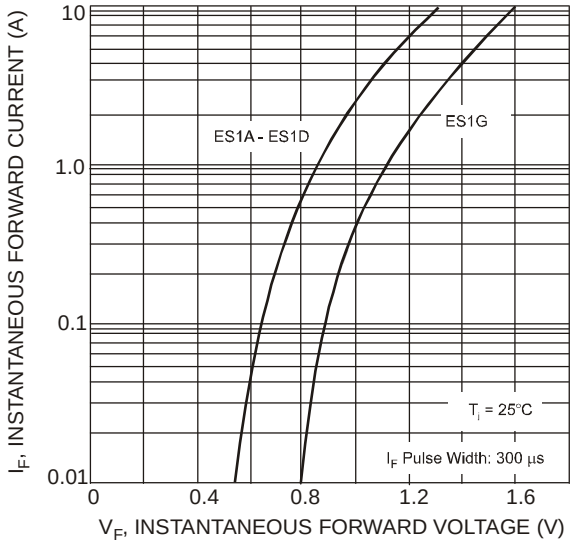


Fig. 2 Typical Forward Characteristics

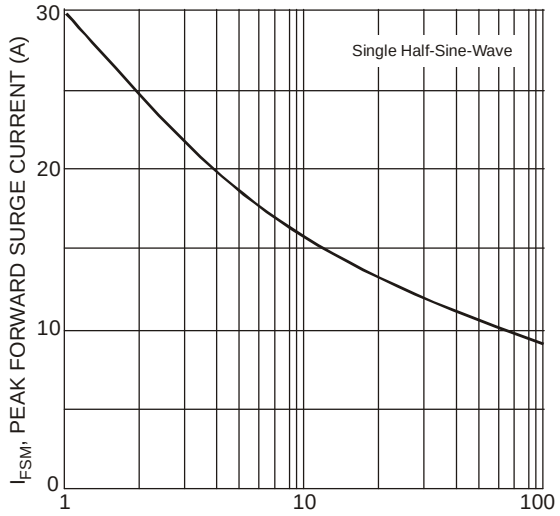


Fig. 3 Surge Current Derating Curve

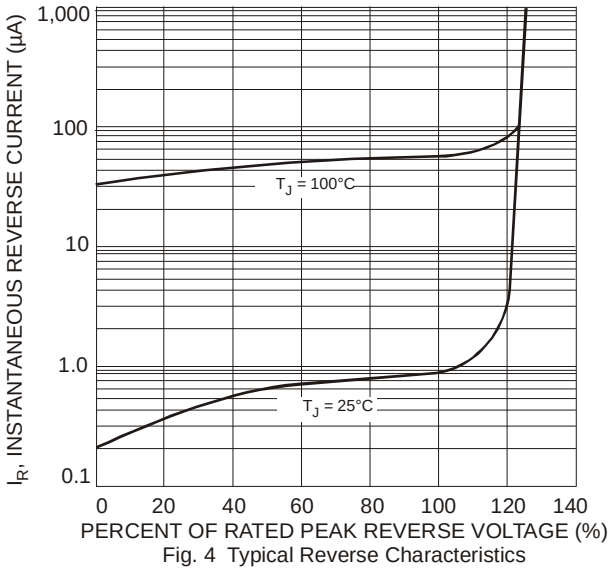
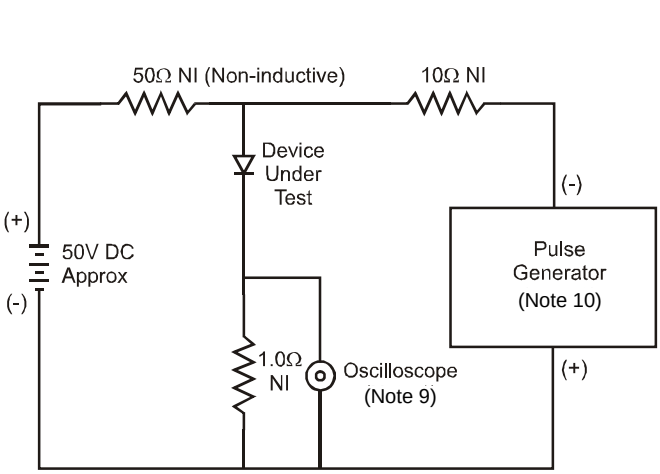
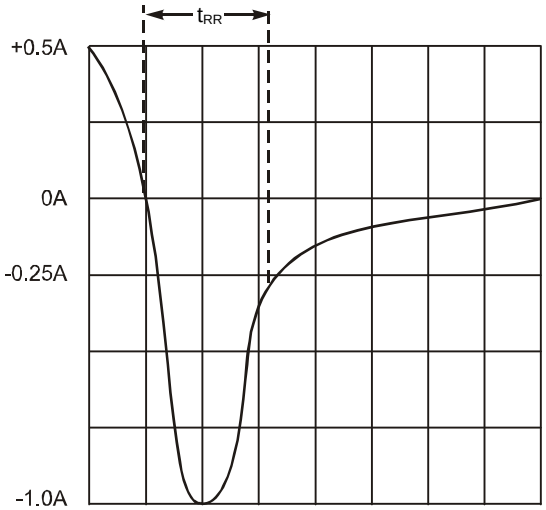


Fig. 4 Typical Reverse Characteristics





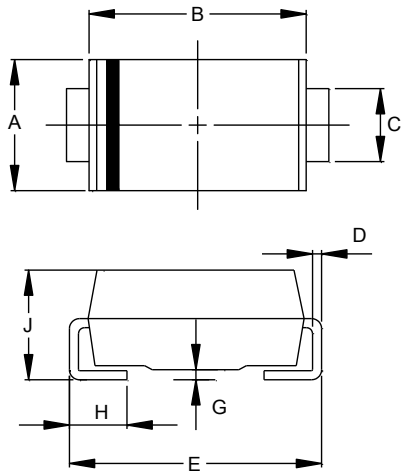
Set time base for 50/100 ns/cm

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

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

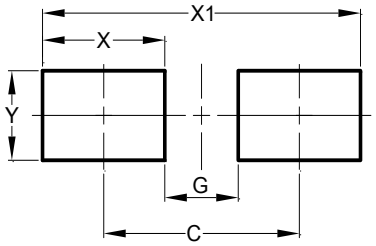
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SMA		
Dim	**Min**	**Max**
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
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	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

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