

Features

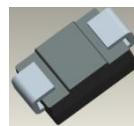
- Glass Passivated Die Construction
- Super-Fast Recovery Time for High Efficiency
- Surge Overload Rating to 30A Peak
- Ideally Suited for Automated Assembly
- **Lead Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free "Green" Device (Note 3)**

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 **63**
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.064 grams (Approximate)



Top View



Bottom View

Ordering Information (Note 4)

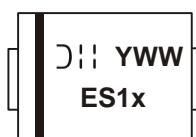
Part Number	Case	Packaging
ES1x-13-F	SMA	5000/Tape & Reel

* 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
 DII = 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 (@ $T_A = +25^\circ\text{C}$, 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	V_{RRM}						
Working Peak Reverse Voltage	V_{RWM}	50	100	150	200	400	V
DC Blocking Voltage (Note 6)	V_R						
RMS Reverse Voltage	$V_{R(\text{RMS})}$	35	70	105	140	280	V
Average Rectified Output Current @ $T_T = +110^\circ\text{C}$	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_{JT}	25	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	ES1A	ES1B	ES1C	ES1D	ES1G	Unit	
Minimum Reverse Breakdown Voltage (Note 6)	$I_R = 5\mu\text{A}$	$V_{(\text{BR})R}$	50	100	150	200	400	V
Maximum Forward Voltage Drop	$I_F = 0.6\text{A}$ $I_F = 1.0\text{A}$	V_{FM}		0.90 0.92		— 1.25	V	
Peak Reverse Current at Rated DC Blocking Voltage (Note 6)	$T_A = +25^\circ\text{C}$ $T_A = +125^\circ\text{C}$	I_{RR}		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 mm² (0.013 mm thick) copper pad as heat sink.
6. Short duration pulse test used to minimize self-heating effect.
7. Measured with $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{RR} = 0.25\text{A}$. See figure 5.
8. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.

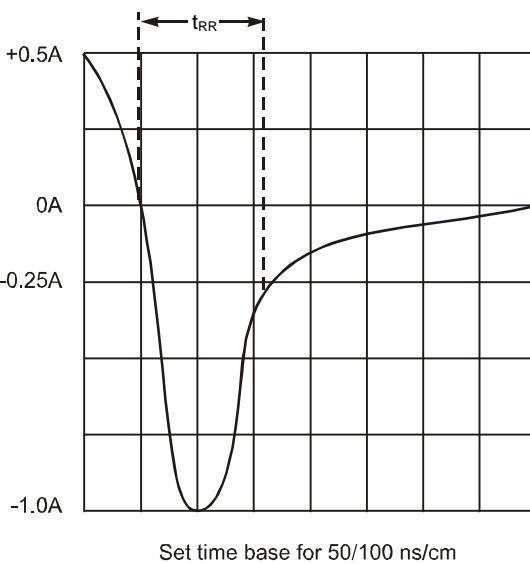
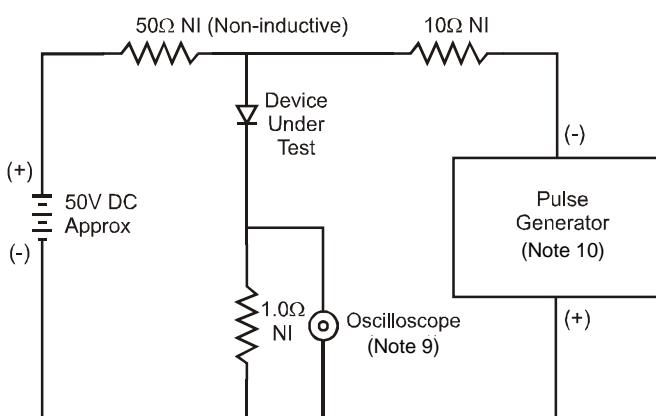
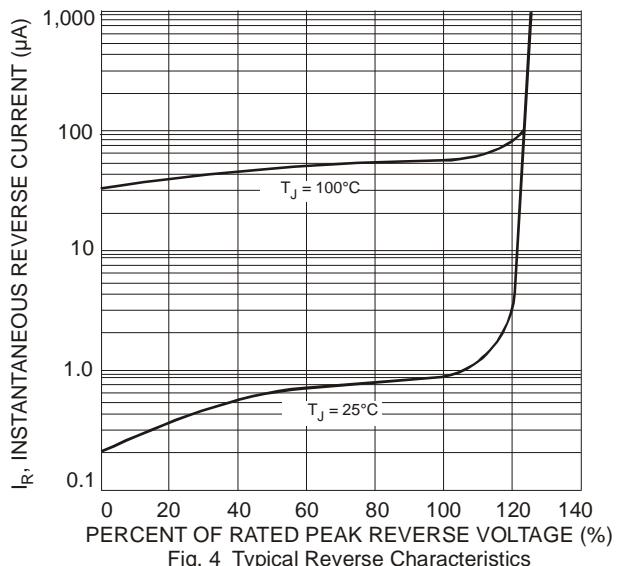
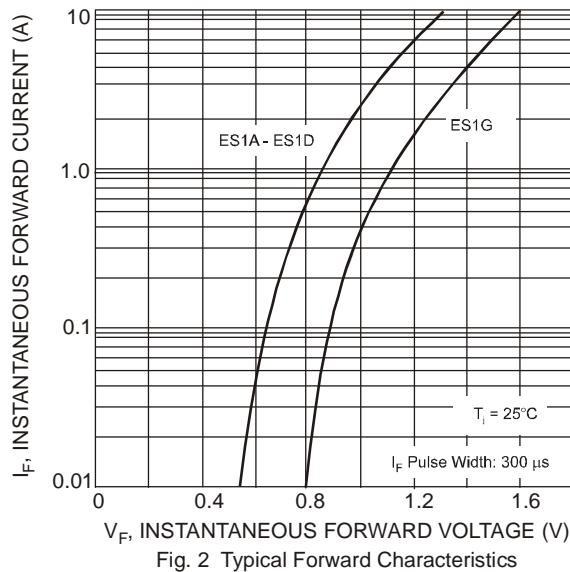
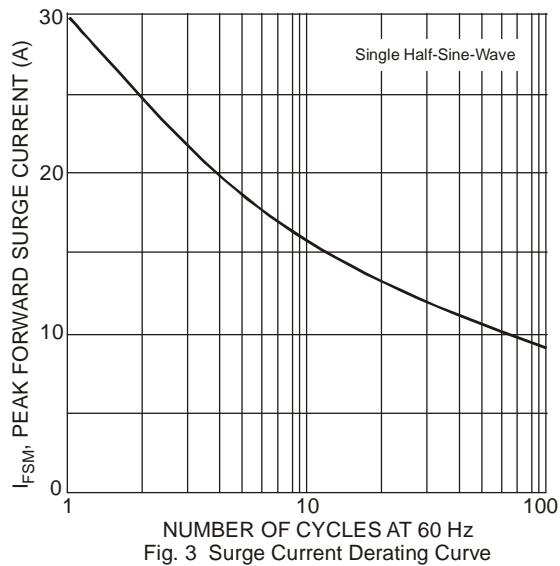
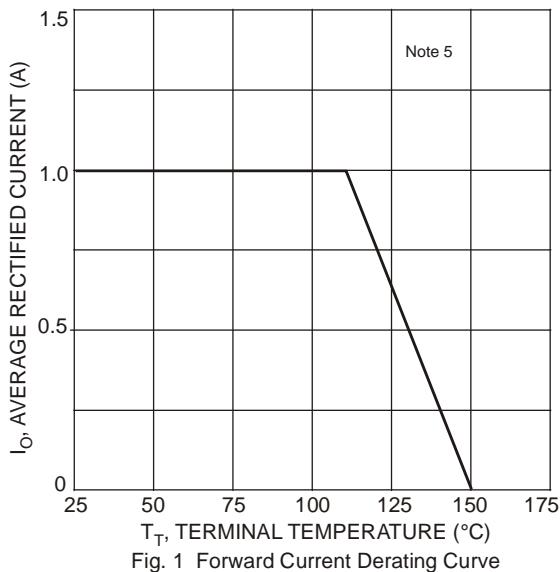
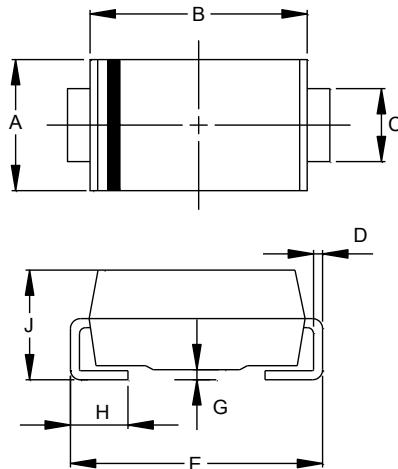


Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

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

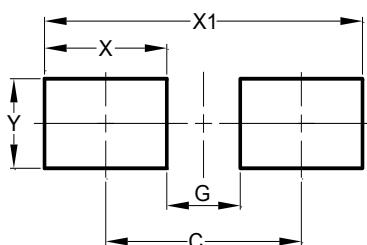


SMA		
Dim	Min	Max
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40

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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