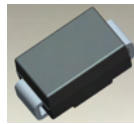


## Features

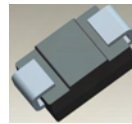
- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Surge Overload Rating to 30A Peak
- Ideally Suited for Automated Assembly
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony) (Note 2)**

## Mechanical Data

- Case: SMA
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish) Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band or Cathode Notch
- Weight: 0.064 grams (approximate)



Top View



Bottom View

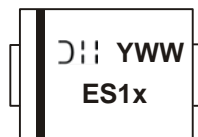
## Ordering Information (Note 3)

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). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes.
  2. Product manufactured with Data Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  3. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



ES1x = Product type marking code, ex. ES1A  
 D = 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<sub>A</sub> = 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	V <sub>RRM</sub>						
Working Peak Reverse Voltage	V <sub>RWM</sub>	50	100	150	200	400	V
DC Blocking Voltage (Note 5)	V <sub>R</sub>						
RMS Reverse Voltage	V <sub>R(RMS)</sub>	35	70	105	140	280	V
Average Rectified Output Current @ T <sub>T</sub> = 110°C	I <sub>O</sub>	1.0					A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	30					A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Terminal (Note 4)	R <sub>θJT</sub>	25	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	ES1A	ES1B	ES1C	ES1D	ES1G	Unit
Maximum Forward Voltage Drop @ I <sub>F</sub> = 0.6A @ I <sub>F</sub> = 1.0A	V <sub>FM</sub>	0.90 0.92				— 1.25	V
Peak Reverse Current at Rated DC Blocking Voltage (Note 5)	I <sub>RM</sub>	5.0 200					μA
Maximum Reverse Recovery Time (Note 6)	t <sub>rr</sub>	25					ns
Typical Total Capacitance (Note 7)	C <sub>T</sub>	20					pF

- Notes:
- Unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pad as heat sink.
  - Short duration pulse test used to minimize self-heating effect.
  - Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>rr</sub> = 0.25A. See figure 5.
  - Measured at 1.0MHz and applied reverse voltage of 4.0V DC.

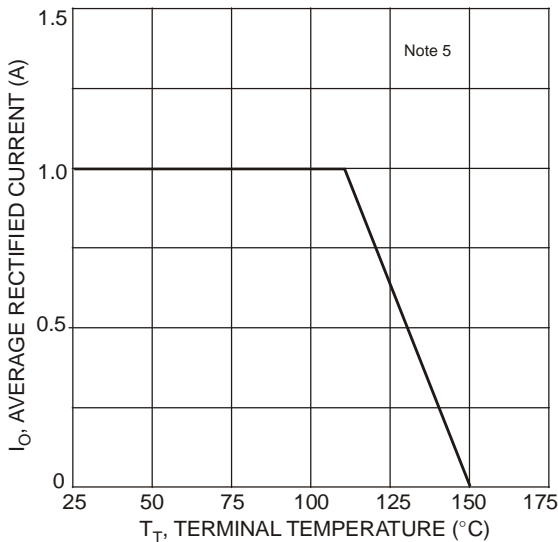


Fig. 1 Forward Current Derating Curve

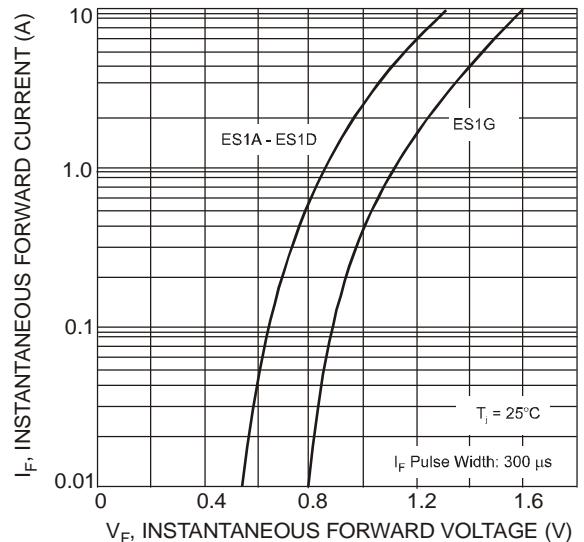


Fig. 2 Typical Forward Characteristics

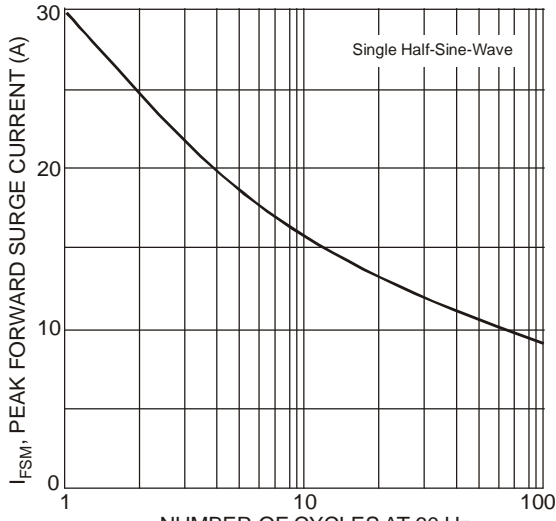


Fig. 3 Surge Current Derating Curve

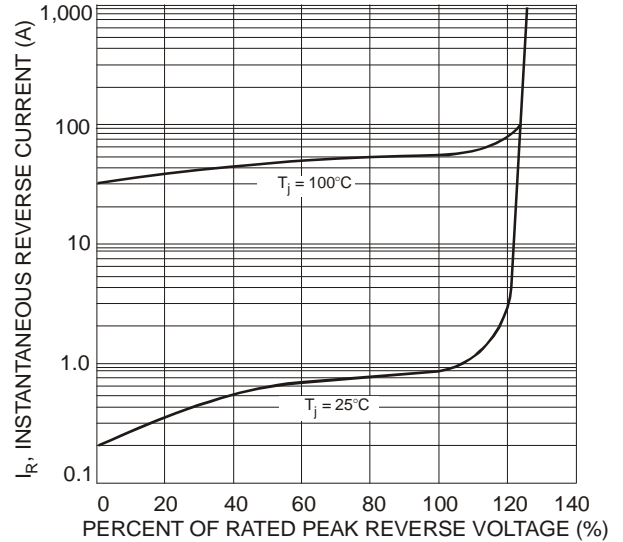
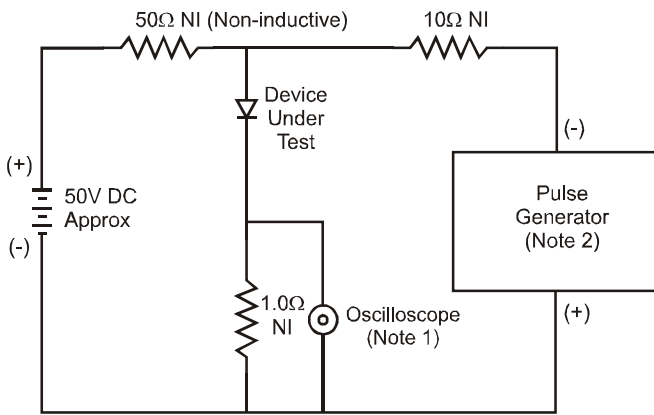
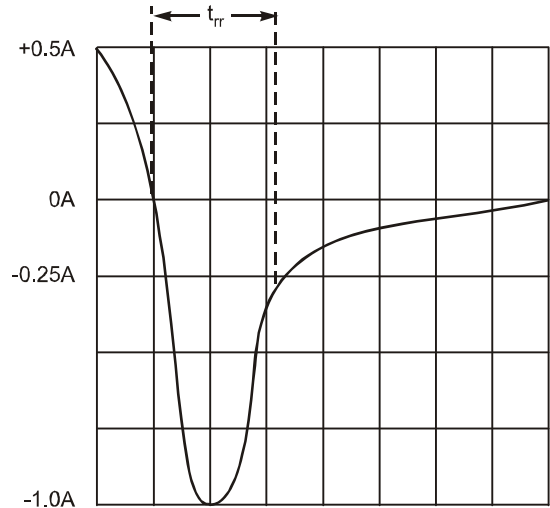


Fig. 4 Typical Reverse Characteristics



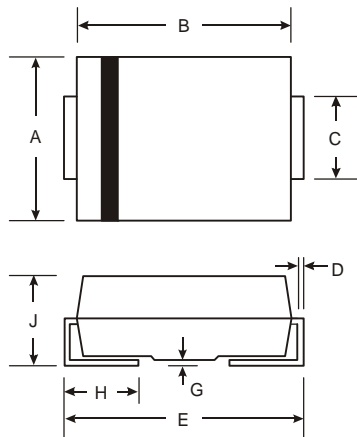
- Notes:  
 1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.  
 2. Rise Time = 10ns max. Input Impedance = 50Ω.



Set time base for 50/100 ns/cm

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

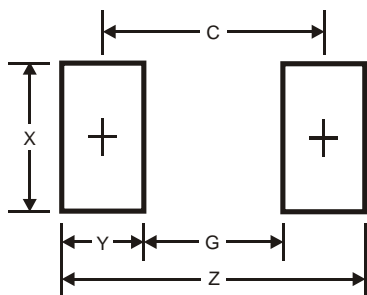
**Package Outline Dimensions**



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	2.01	2.30

All Dimensions in mm

## Suggested Pad Layout



Dimensions	Value (in mm)
Z	6.5
G	1.5
X	1.7
Y	2.5
C	4.0

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