

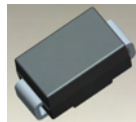
## 1.0A SURFACE MOUNT SUPER-FAST RECTIFIER

### Features

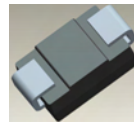
- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Surge Overload Rating to 30A Peak
- Ideally Suited for Automated Assembly
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony) (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

### 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 (e3)
- Polarity: Cathode Band or Cathode Notch
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.064 grams (approximate)



Top View



Bottom View

### 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 5)	$V_R$						
RMS Reverse Voltage	$V_{R(RMS)}$	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)	$R_{\theta JT}$	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
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 @ $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage (Note 6) @ $T_A = 125^\circ\text{C}$	$I_{RM}$	5.0 200					$\mu\text{A}$
Maximum Reverse Recovery Time (Note 3)	$t_{rr}$	25					ns
Typical Total Capacitance (Note 4)	$C_T$	10					pF

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html).
  2. Product manufactured with Data Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  3. Measured with  $I_F = 0.5\text{A}$ ,  $I_R = 1.0\text{A}$ ,  $I_{rr} = 0.25\text{A}$ . See figure 5.
  4. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
  5. Unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pad as heat sink.
  6. Short duration pulse test used to minimize self-heating effect.

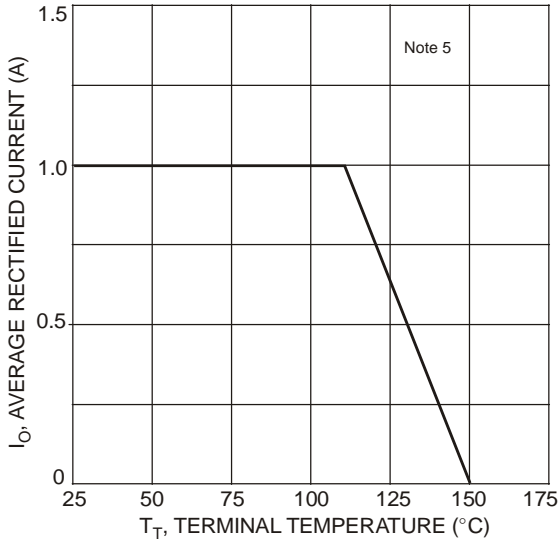


Fig. 1 Forward Current Derating Curve

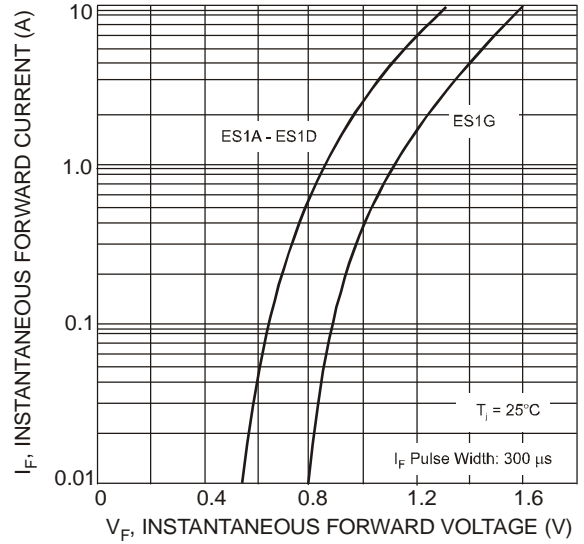


Fig. 2 Typical Forward Characteristics

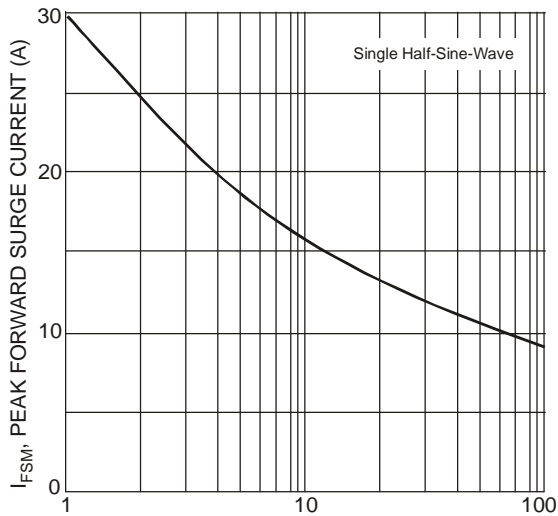


Fig. 3 Surge Current Derating Curve

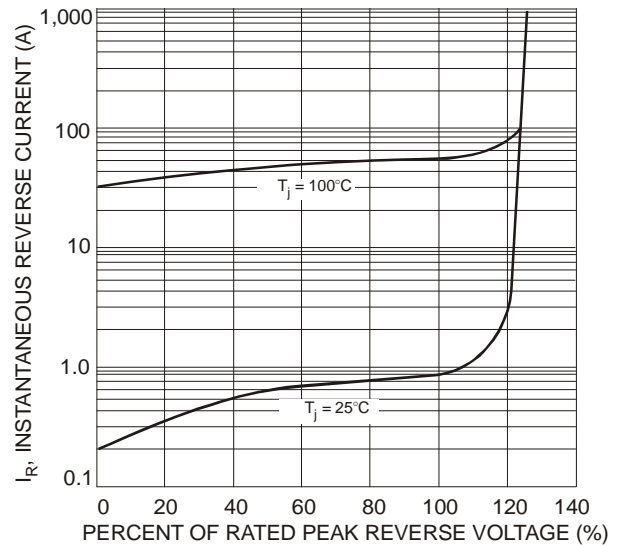
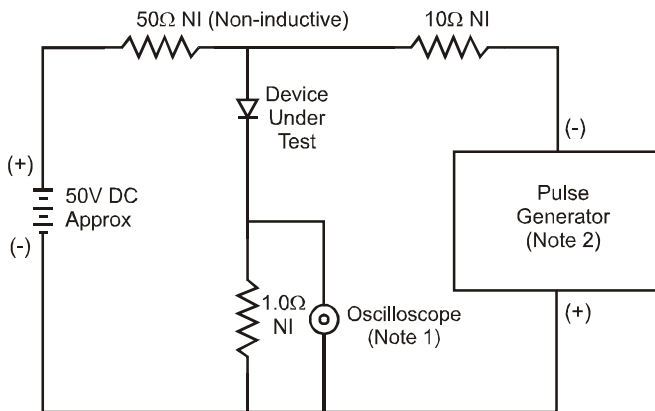
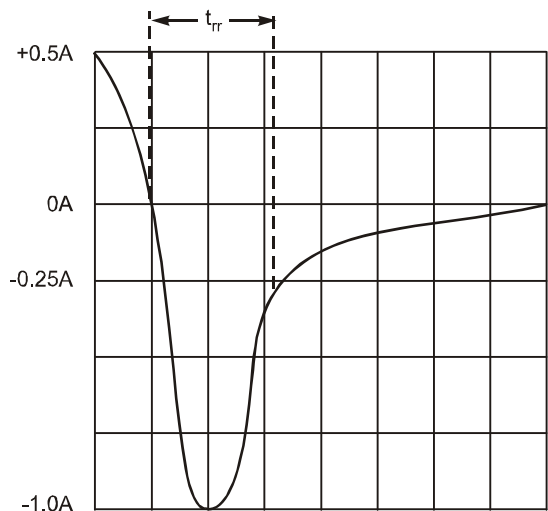


Fig. 4 Typical Reverse Characteristics



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

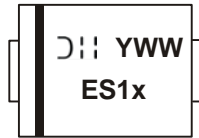
### Ordering Information (Note 7)

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

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

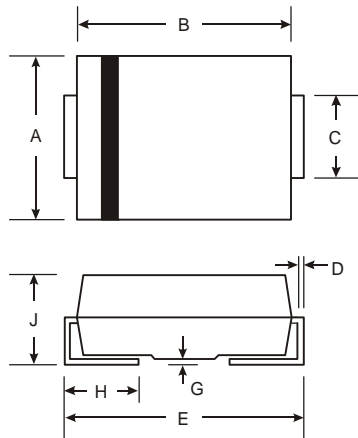
Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



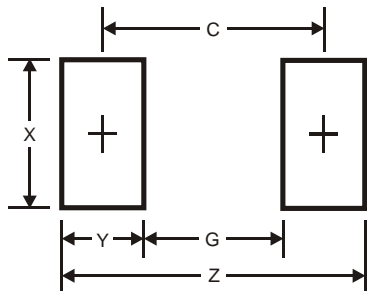
ES1x = Product type marking code, ex. ES1A  
 DII = Manufacturer's code marking  
 YWW = Date code marking  
 Y = Last digit of year (ex: 2 for 2002)  
 WW = Week code 01 to 52

### Package Outline Dimensions



SMA		
Dim	Min	Max
<b>A</b>	2.29	2.92
<b>B</b>	4.00	4.60
<b>C</b>	1.27	1.63
<b>D</b>	0.15	0.31
<b>E</b>	4.80	5.59
<b>G</b>	0.05	0.20
<b>H</b>	0.76	1.52
<b>J</b>	2.01	2.30
<b>All Dimensions in mm</b>		

### Suggested Pad Layout



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

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