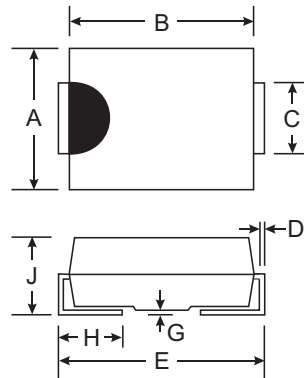


### Features

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Surge Overload Rating to 50A Peak
- Ideally Suited for Automated Assembly
- Lead Free Finish/RoHS Compliant (Note 4)**

### Mechanical Data

- Case: SMA/SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- 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
- SMA Weight: 0.064 grams (approximate)
- SMB Weight: 0.093 grams (approximate)



| Dim                  | SMA  |      | SMB  |      |
|----------------------|------|------|------|------|
|                      | Min  | Max  | Min  | Max  |
| A                    | 2.29 | 2.92 | 3.30 | 3.94 |
| B                    | 4.00 | 4.60 | 4.06 | 4.57 |
| C                    | 1.27 | 1.63 | 1.96 | 2.21 |
| D                    | 0.15 | 0.31 | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 | 5.00 | 5.59 |
| G                    | 0.10 | 0.20 | 0.10 | 0.20 |
| H                    | 0.76 | 1.52 | 0.76 | 1.52 |
| J                    | 2.01 | 2.30 | 2.00 | 2.40 |
| All Dimensions in mm |      |      |      |      |

AA, BA, CA, DA Suffix Designates SMA Package  
 A, B, C, D, Suffix Designates SMB Package

### Maximum Ratings and Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.  
 For capacitive load, derate current by 20%.

| Characteristic                                                                                                       | Symbol                          | ES2A/A      | ES2B/A | ES2C/A | ES2D/A | Unit               |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|--------|--------|--------|--------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage (Note 5)                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50          | 100    | 150    | 200    | V                  |
| RMS Reverse Voltage                                                                                                  | $V_{R(RMS)}$                    | 35          | 70     | 105    | 140    | V                  |
| Average Rectified Output Current @ $T_T = 110^\circ\text{C}$                                                         | $I_O$                           | 2.0         |        |        |        | A                  |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single half sine-wave Superimposed on Rated Load                  | $I_{FSM}$                       | 50          |        |        |        | A                  |
| Forward Voltage @ $I_F = 2.0\text{A}$                                                                                | $V_{FM}$                        | 0.92        |        |        |        | V                  |
| Peak Reverse Current @ $T_A = 25^\circ\text{C}$<br>at Rated DC Blocking Voltage (Note 5) @ $T_A = 125^\circ\text{C}$ | $I_{RM}$                        | 5.0<br>350  |        |        |        | A                  |
| Reverse Recovery Time (Note 3)                                                                                       | $t_{rr}$                        | 25          |        |        |        | ns                 |
| Typical Total Capacitance (Note 2)                                                                                   | $C_T$                           | 25          |        |        |        | pF                 |
| Typical Thermal Resistance, Junction to Terminal (Note 1)                                                            | $R_{JT}$                        | 20          |        |        |        | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                                                                              | $T_J, T_{STG}$                  | -55 to +150 |        |        |        | $^\circ\text{C}$   |

- Notes:
- Unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pads as heat sink.
  - Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
  - Measured with  $I_F = 0.5\text{A}$ ,  $I_R = 1.0\text{A}$ ,  $t_{rr} = 0.25\text{A}$ . See Figure 5.
  - RoHS revision 13.2.2003. Glass and high temperature solder exemptions applied, see *EU Directive Annex Notes 5 and 7*.
  - Short duration pulse test used to minimize self-heating effect.

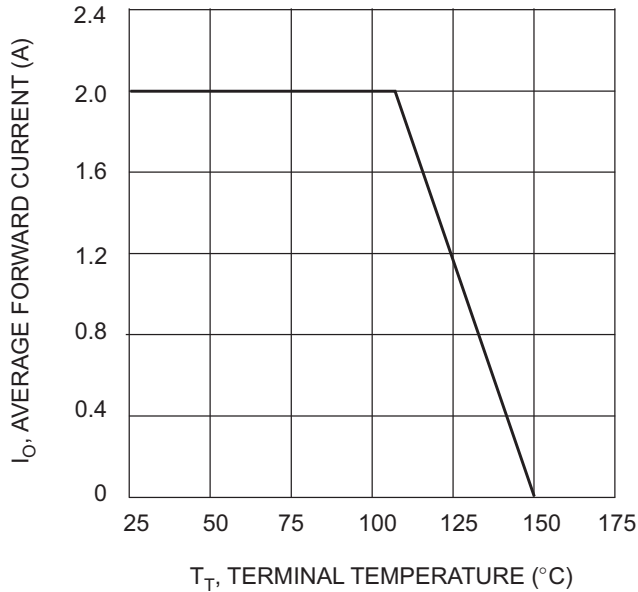


Fig. 1 Forward Current Derating Curve

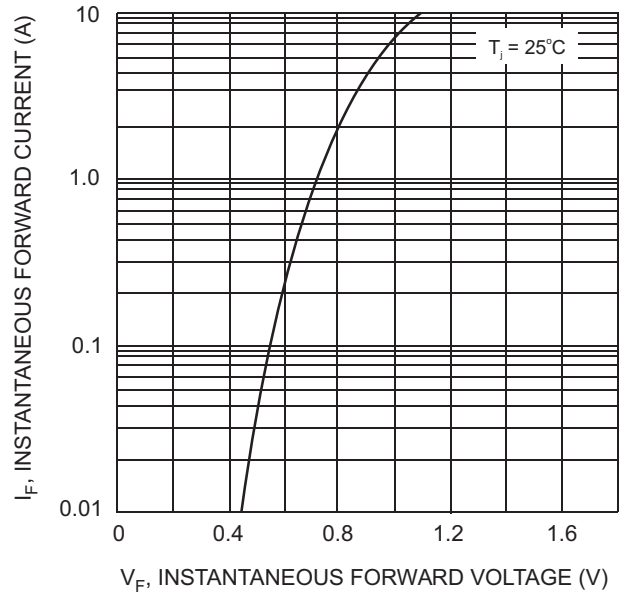


Fig. 2 Typical Forward Characteristics

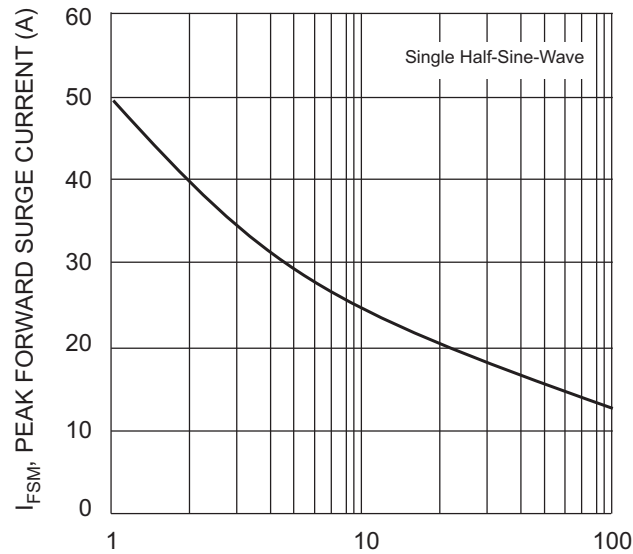


Fig. 3 Surge Current Derating Curve

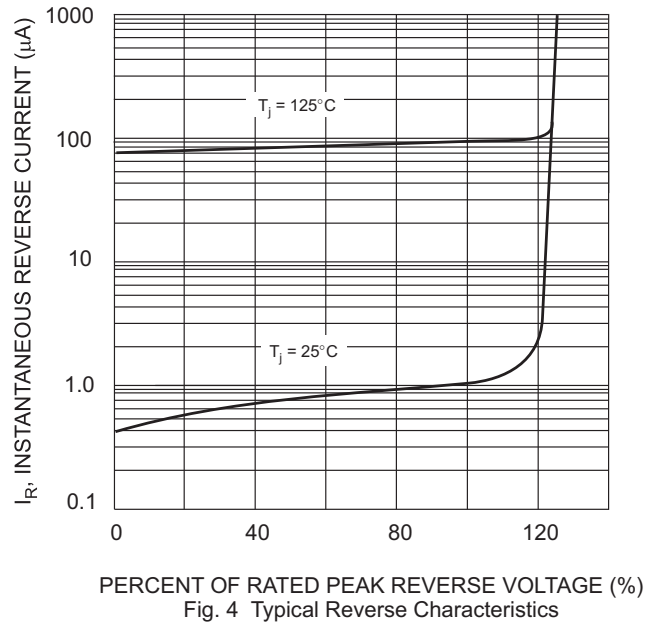
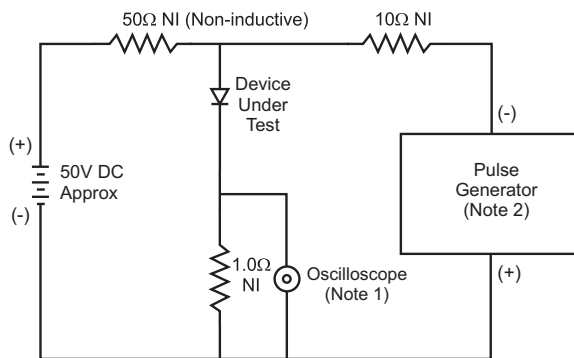


Fig. 4 Typical Reverse Characteristics



- Notes:  
1. Rise Time = 7.0ns max. Input Impedance = 1.0M $\Omega$ , 22pF.  
2. Rise Time = 10ns max. Input Impedance = 50 $\Omega$ .

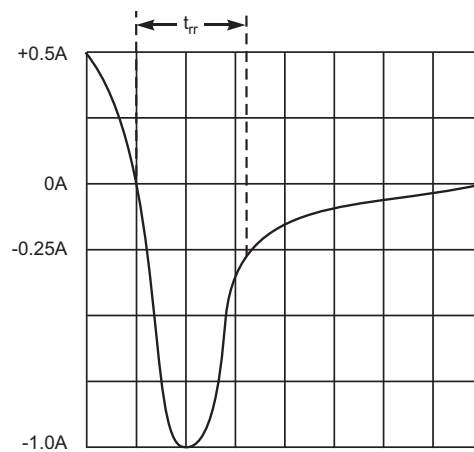


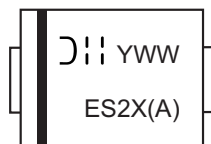
Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

**Ordering Information** (Note 6)

| Device                  | Packaging  | Shipping                             |
|-------------------------|------------|--------------------------------------|
| ES2xA-13-F<br>ES2x-13-F | SMA<br>SMB | 5000/Tape & Reel<br>3000/Tape & Reel |

\* x = Device type, e.g. ES2BA-13-F (SMA package); ES2A-13-F (SMB package).

Notes: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**

ES2XA = Product type marking code, ex: ES2BA (SMA package)

ES2X = Product type marking code, ex: ES2A (SMB package)

D||| = Manufacturers' code marking

YWW = Date code marking

Y = Last digit of year ex: 2 for 2002

WW = Week code 01 to 52

**IMPORTANT NOTICE**

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

**LIFE SUPPORT**

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.