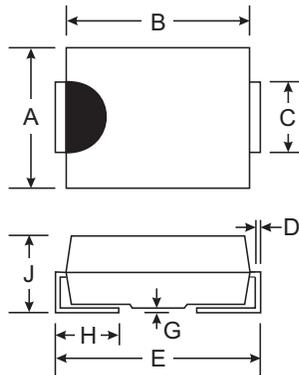


### Features

- Glass Passivated Die Construction
- Super-Fast Recovery Time For High Efficiency
- Low Forward Voltage Drop and High Current Capability
- Surge Overload Rating to 50A Peak
- Ideally Suited for Automated Assembly
- **Lead Free Finish/RoHS Complaint (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
- Polarity: Cathode Band or Cathode Notch
- Mounting Position: Any
- Marking: Type Number
- SMA Weight: 0.064 grams (approx.)
- SMB Weight: 0.093 grams (approx.)



| 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 |
| <b>All Dimensions in mm</b> |      |      |      |      |

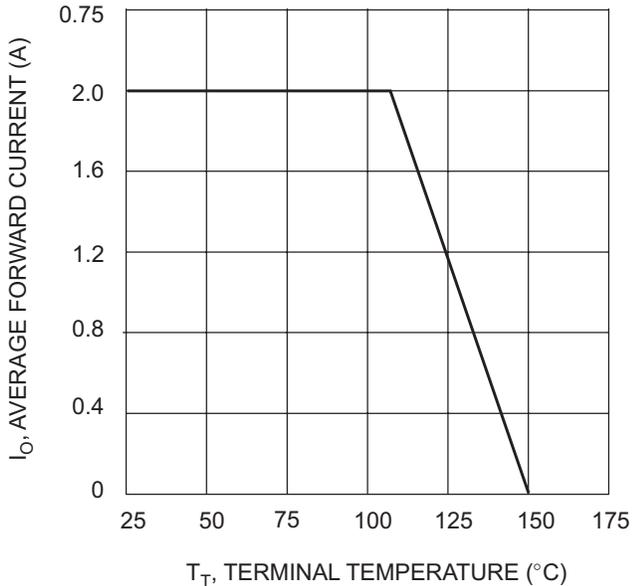
AA, BA, CA, DA Suffix Designates SMA Package  
A, B, C, D, Suffix Designates SMB Package

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

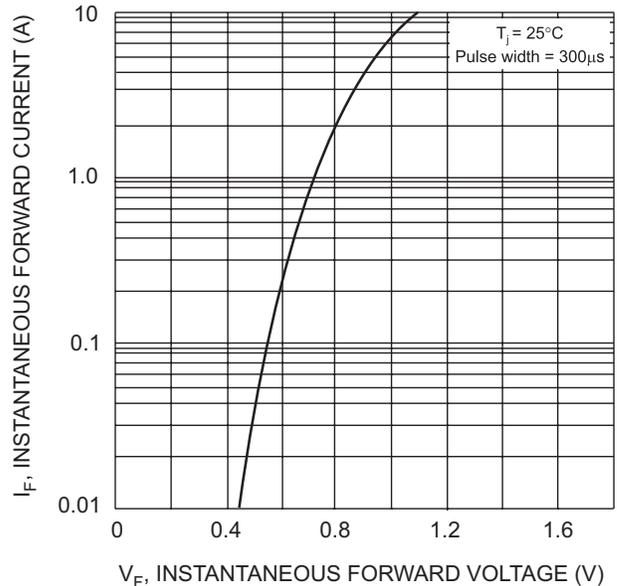
Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| Characteristic  | Symbol   | ES2A/A      | ES2B/A | ES2C/A | ES2D/A | Unit |
|---|--|-------------|--------|--------|--------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                                | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 50          | 100    | 150    | 200    | V    |
| RMS Reverse Voltage   | V <sub>R(RMS)</sub>                                    | 35          | 70     | 105    | 140    | V    |
| Average Rectified Output Current @ T <sub>T</sub> = 110°C   | I <sub>O</sub>   | 2.0         |        |        |        | A    |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single half sine-wave Superimposed on Rated Load<br>(JEDEC Method) | I <sub>FSM</sub>                                       | 50          |        |        |        | A    |
| Forward Voltage @ I <sub>F</sub> = 2.0A   | V <sub>FM</sub>  | 0.92        |        |        |        | V    |
| Peak Reverse Current @ T <sub>A</sub> = 25°C<br>at Rated DC Blocking Voltage @ T <sub>A</sub> = 125°C                 | I <sub>RM</sub>  | 5.0<br>350  |        |        |        | μA   |
| Reverse Recovery Time (Note 3)  | t <sub>rr</sub>  | 25          |        |        |        | ns   |
| Typical Junction Capacitance (Note 2)   | C <sub>j</sub>   | 25          |        |        |        | pF   |
| Typical Thermal Resistance, Junction to Terminal (Note 1)   | R <sub>θJT</sub>                                       | 20          |        |        |        | °C/W |
| Operating and Storage Temperature Range   | T <sub>j</sub> , T <sub>STG</sub>                      | -55 to +150 |        |        |        | °C   |

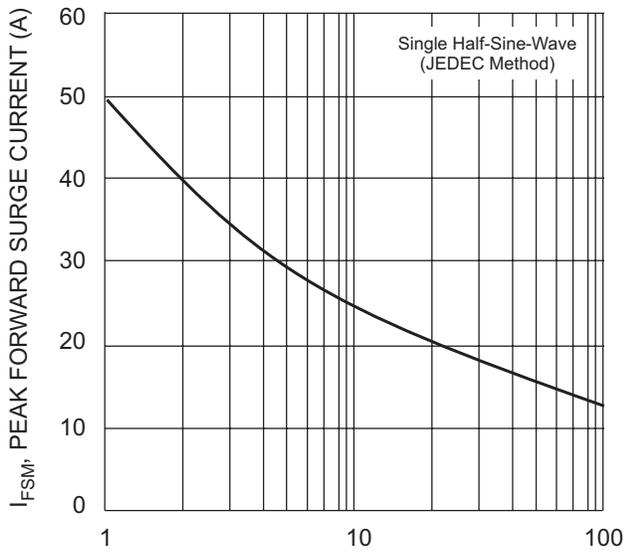
- Notes:
1. Unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pads as heat sink.
  2. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
  3. Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>rr</sub> = 0.25A. See Figure 5.
  4. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.



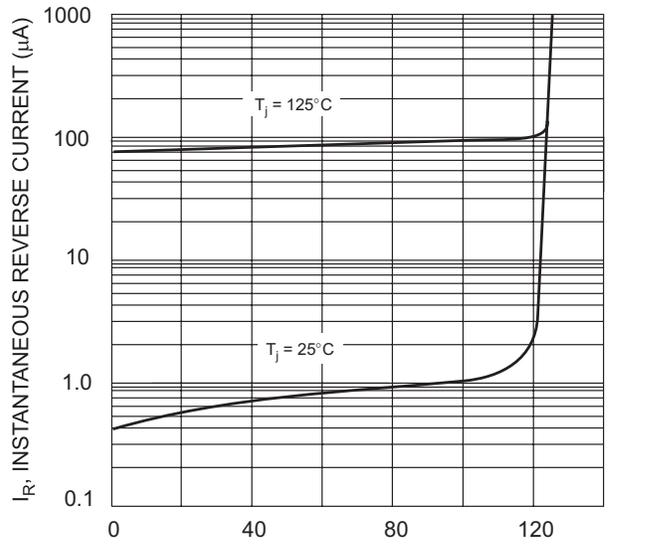
$T_T$ , TERMINAL TEMPERATURE (°C)  
Fig. 1 Forward Current Derating Curve



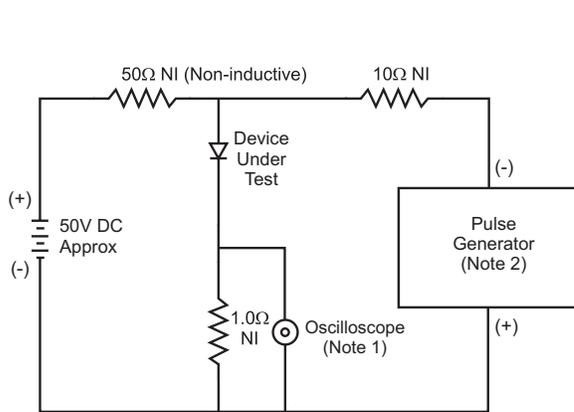
$V_F$ , INSTANTANEOUS FORWARD VOLTAGE (V)  
Fig. 2 Typical Forward Characteristics



NUMBER OF CYCLES AT 60Hz  
Fig. 3 Surge Current Derating Curve



PERCENT OF RATED PEAK REVERSE VOLTAGE (%)  
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 $\Omega$ .

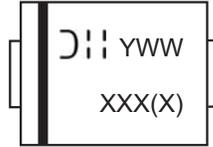
Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

**Ordering Information** (Note 5)

| 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: 5. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.



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

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