

## FEATURES

- | Low Profile Package
- | Ideal For Automated Placement
- | Glass Passivated Chip Junction
- | High Forward Surge Capability
- | Super Fast Reverse Recovery Time



SOD-123FL



Schematic Symbol

## MECHANICAL DATA

- | Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- | Polarity: Cathode line denotes the cathode end

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MAXIMUM RATINGS AND CHARACTERISTICS (T<sub>A</sub>=25°C)

| Parameter                                                                                          |                       | Symbol            | ES2000<br>FL | ES2001<br>FL | ES2015<br>FL | ES2002<br>FL | ES2003<br>FL | ES2004<br>FL | ES2005<br>FL | ES2006<br>FL | ES2008<br>FL | Unit             |
|----------------------------------------------------------------------------------------------------|-----------------------|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| Marking                                                                                            |                       |                   | ES2A         | ES2B         | ES2C         | ES2D         | ES2F         | ES2G         | ES2H         | ES2J         | ES2K         |                  |
| Maximum Repetitive Peak Reverse Voltage                                                            |                       | V <sub>RRM</sub>  | 50           | 100          | 150          | 200          | 300          | 400          | 500          | 600          | 800          | V                |
| Maximum RMS Voltage                                                                                |                       | V <sub>RMS</sub>  | 35           | 70           | 105          | 140          | 210          | 280          | 350          | 420          | 560          |                  |
| Maximum DC Blocking Voltage                                                                        |                       | V <sub>DC</sub>   | 50           | 100          | 150          | 200          | 300          | 400          | 500          | 600          | 800          |                  |
| Average Rectified Output Current<br>@60Hz Sine Wave, Resistance Load, TL (Fig.1)                   |                       | I <sub>O</sub>    | 2.0          |              |              |              |              |              |              |              |              | A                |
| Forward Surge Current (Non-Repetitive)<br>@60Hz Half-Sine Wave,1 cycle, T <sub>J</sub> =25°C       |                       | I <sub>FSM</sub>  | 50           |              |              |              |              |              |              |              |              |                  |
| Forward Surge Current (Non-Repetitive)<br>@1ms, Square Wave, 1 Cycle, T <sub>J</sub> =25°C         |                       | I <sub>FSM</sub>  | 100          |              |              |              |              |              |              |              |              |                  |
| Maximum Instantaneous Forward Voltage<br>@I <sub>FM</sub> =2A                                      |                       | V <sub>F</sub>    | 1.0          |              |              |              | 1.3          |              | 1.7          |              | 2.2          | V                |
| Maximum DC Reverse Current<br>at Rated DC Blocking Voltage                                         | T <sub>J</sub> =25°C  | I <sub>R</sub>    | 5.0          |              |              |              |              |              |              |              |              | μA               |
|                                                                                                    | T <sub>J</sub> =125°C |                   | 100          |              |              |              |              |              |              |              |              |                  |
| Typical Thermal Resistance <sup>(1)</sup>                                                          |                       | R <sub>θJ-A</sub> | 90           |              |              |              |              |              |              |              |              | °C/W             |
|                                                                                                    |                       | R <sub>θJ-L</sub> | 30           |              |              |              |              |              |              |              |              |                  |
| Current Squared Time @1ms≤t≤8.3ms T <sub>J</sub> =25°C                                             |                       | I <sup>2</sup> t  | 10.375       |              |              |              |              |              |              |              |              | A <sup>2</sup> s |
| Typical Junction Capacitance Measured At 1MHz<br>And Applied Reverse Voltage Of 4.0 V.D.C          |                       | C <sub>J</sub>    | 30           |              |              |              | 16           |              | 12           |              |              | pF               |
| Operating Junction Temperature Range                                                               |                       | T <sub>J</sub>    | -55 to +150  |              |              |              |              |              |              |              |              | °C               |
| Storage Temperature Range                                                                          |                       | T <sub>STG</sub>  | -55 to +150  |              |              |              |              |              |              |              |              |                  |
| Maximum Reverse Recovery<br>Time I <sub>F</sub> =0.5A, I <sub>r</sub> =1.0A, I <sub>r</sub> =0.25A |                       | t <sub>rr</sub>   | 35           |              |              |              |              |              |              |              |              |                  |

Note: (1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

# CHARACTERISTIC CURVES

Fig. 1-  $I_o$ - $T_L$  Curve

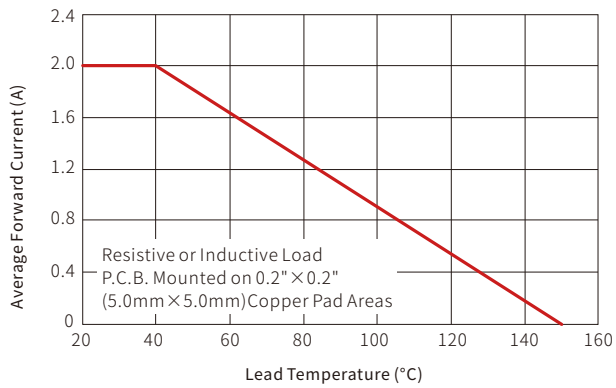


Fig. 2-Surge Forward Current Capability

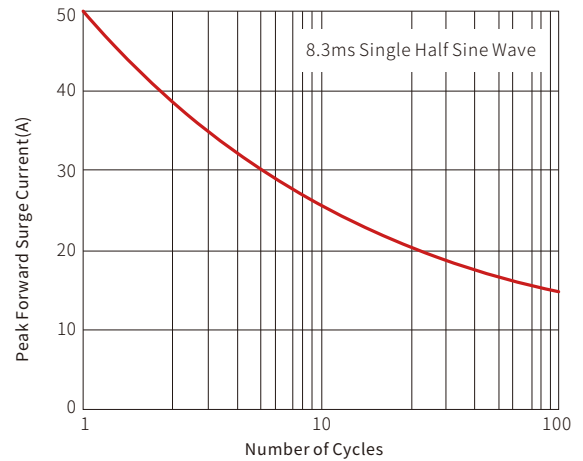


Fig. 3-Typical Forward Voltage

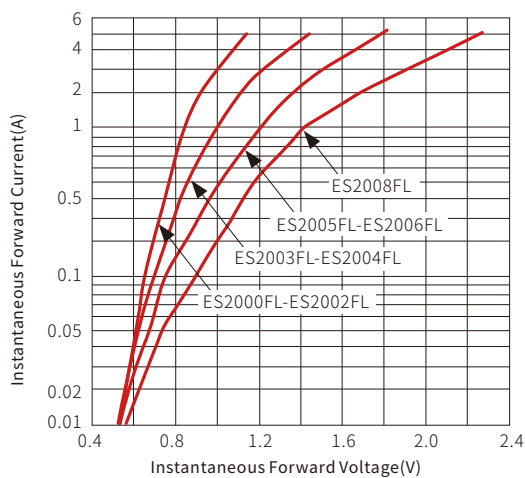


Fig. 4-Typical Reverse Characteristics

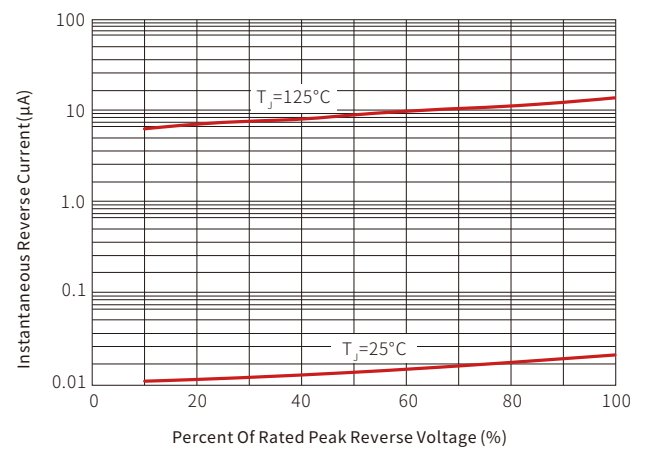
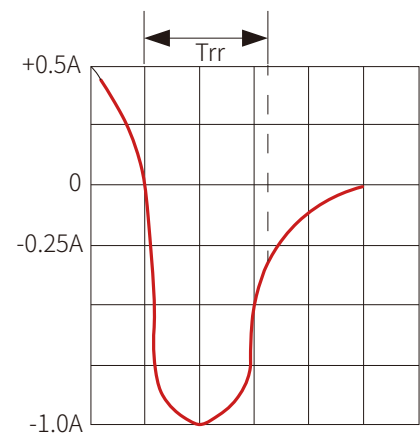
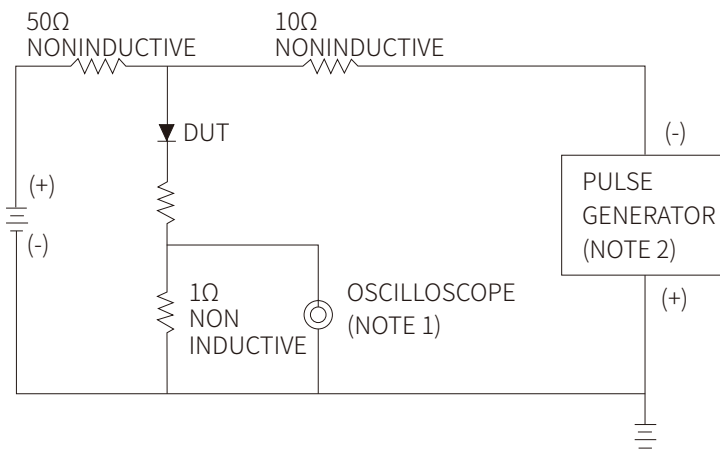


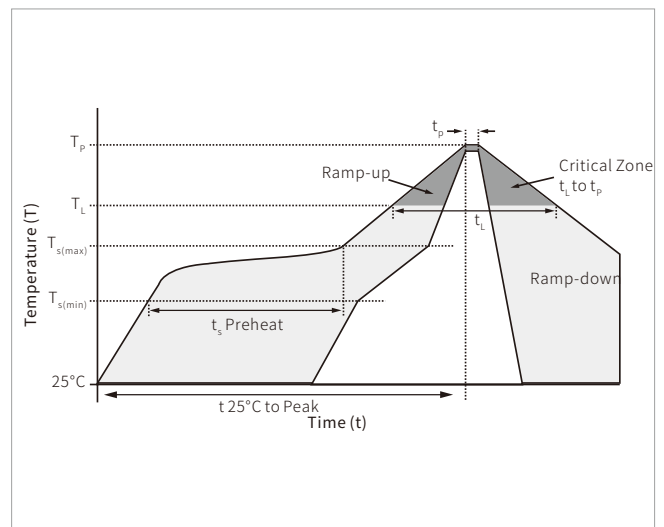
Fig. 5-Diagram Of Circuit And Testing Wave Form Of Reverse Recovery Time



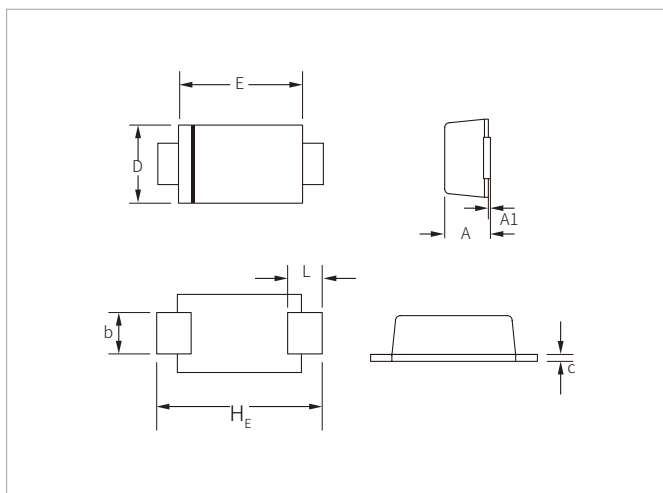
NOTES : 1. Rise Time = 7 ns max., Input Impedance = 1 megaohm, 22 pF  
 2. Rise time = 10 ns max., Source Impedance = 50Ω

## SOLDERING PARAMETERS

| Reflow Condition                                      |                                  | Lead-free assembly |
|-------------------------------------------------------|----------------------------------|--------------------|
| Pre Heat                                              | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|                                                       | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                       | Time (min to max) ( $t_s$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3°C/second max     |
| Reflow                                                | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                       | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                            |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                  | 20 – 40 seconds    |
| Ramp-down Rate                                        |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )               |                                  | 8 minutes max.     |
| Do not exceed                                         |                                  | 260°C              |

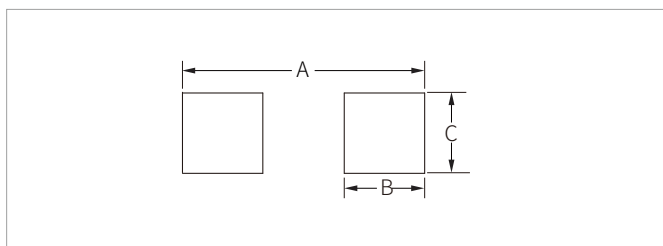


## SOD-123FL PACKAGE INFORMATION



| Ref.           | Millimeters |      | Inches |       |
|----------------|-------------|------|--------|-------|
|                | Min.        | Max. | Min.   | Max.  |
| A              | 0.95        | 1.45 | 0.037  | 0.057 |
| A1             | 0.00        | 0.10 | 0.000  | 0.004 |
| b              | 0.70        | 1.20 | 0.028  | 0.047 |
| c              | 0.05        | 0.30 | 0.002  | 0.012 |
| D              | 1.50        | 2.00 | 0.059  | 0.079 |
| E              | 2.50        | 3.10 | 0.098  | 0.122 |
| L              | 0.35        | 0.90 | 0.014  | 0.035 |
| H <sub>E</sub> | 3.40        | 3.90 | 0.134  | 0.154 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters | Inches |
|------|-------------|--------|
| A    | 4.20        | 0.165  |
| B    | 1.50        | 0.059  |
| C    | 1.20        | 0.047  |

## ORDERING INFORMATION

| Part Number   | Component Package | QTY/Reel | Reel Size |
|---------------|-------------------|----------|-----------|
| ES2000-2008FL | SOD-123FL         | 3000PCS  | 7"        |

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