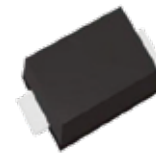
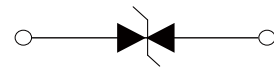


## FEATURES

- | Low profile package
- | Ideal for automated placement
- | 200 Watt peak pulse power capability with a 10/1000µs waveform
- | For surface mounted applications to optimize board space
- | Excellent clamping capability
- | Very fast response time
- | Low incremental surge resistance
- | Meet AEC-Q101 Requirements



SOD-123FL



Schematic Symbol

## APPLICATIONS

- | Power supply protection
- | Automotive application
- | Industrial application
- | Power management

## APPROVALS

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

## MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

| Parameter                                                  | Symbol    | Value | Unit  |
|------------------------------------------------------------|-----------|-------|-------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (Note1) | $P_{PPM}$ | 200   | Watts |
| Steady State Power Dissipation at $T_A=50^{\circ}\text{C}$ | $P_D$     | 1.0   | Watts |

**Notes :** 1. Non-repetitive current pulse,  $T_A=25^{\circ}\text{C}$ .

2. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum

## THERMAL CONSIDERATIONS

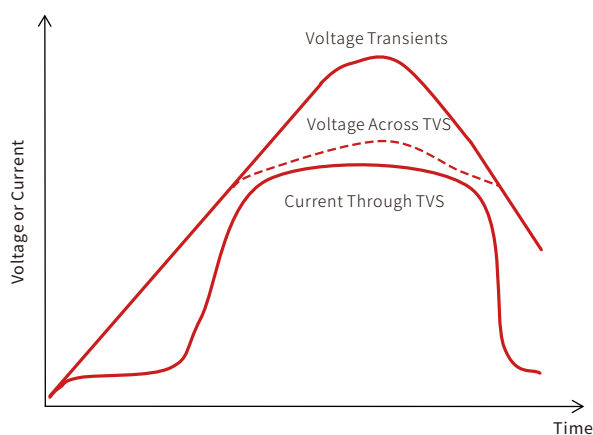
| Parameter                              | Symbol          | Value       | Unit                        |
|----------------------------------------|-----------------|-------------|-----------------------------|
| Operating junction Temperature         | $T_J$           | -55 to +150 | $^{\circ}\text{C}$          |
| Storage Temperature Range              | $T_S$           | -55 to +150 | $^{\circ}\text{C}$          |
| Junction to Ambient on Printed circuit | $R_{\theta JA}$ | 220         | $^{\circ}\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

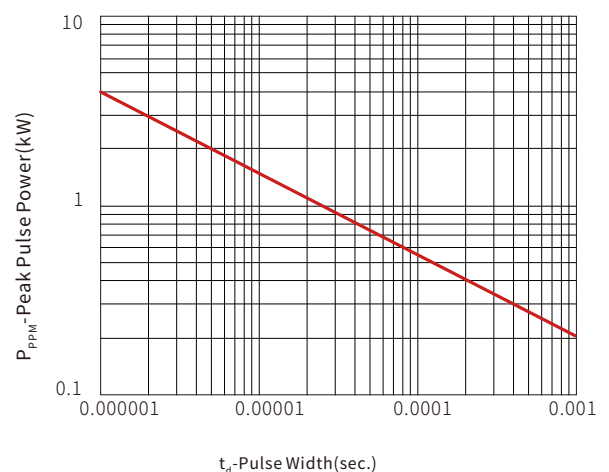
| Part Number | Device Marking Code | Reverse Stand-off Voltage | Breakdown Voltage Min.@ $I_T$ | Breakdown Voltage Max.@ $I_T$ | Test Current | Maximum Clamping Voltage @ $I_{PP}$ | Maximum Peak Pulse Current | Maximum Reverse Leakage @ $V_{RWM}$ |
|-------------|---------------------|---------------------------|-------------------------------|-------------------------------|--------------|-------------------------------------|----------------------------|-------------------------------------|
|             |                     | $V_{RWM}$ (V)             | $V_{BR}$ (V)                  | $V_{BR}$ (V)                  | $I_T$ (mA)   | $V_C$ (V)                           | $I_{PP}$ (A)               | $I_R$ ( $\mu$ A)                    |
| TPSVF20B28  | HG                  | 28.0                      | 31.1                          | 34.4                          | 1.0          | 45.4                                | 4.4                        | 1.0                                 |

## CHARACTERISTIC CURVES

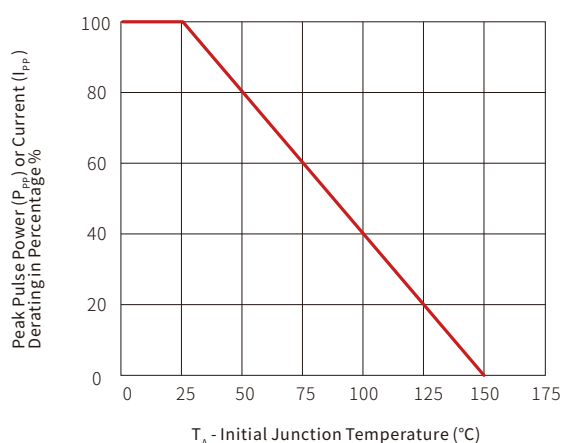
TVS Transients Clamping Waveform



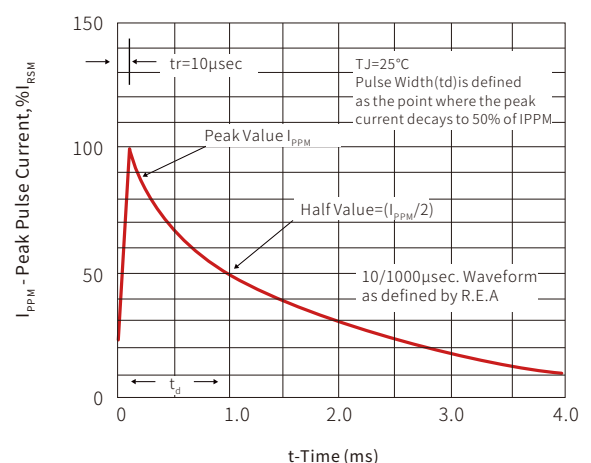
Peak Pulse Power Rating Curve



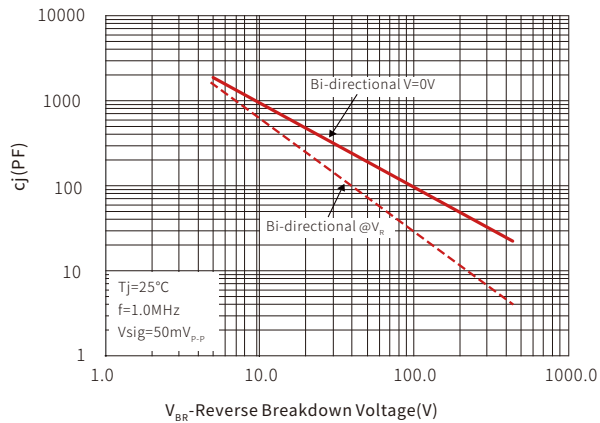
Pulse Derating Curve



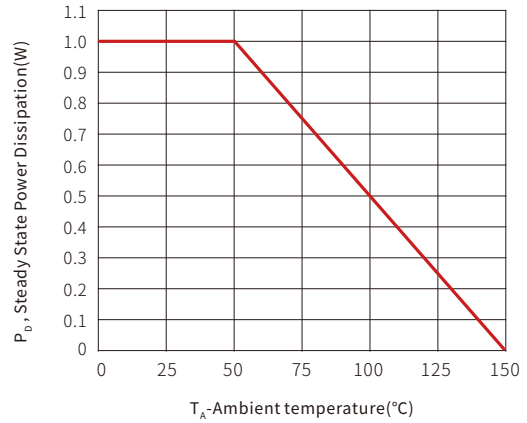
Pulse Waveform



Typical Junction Capacitance

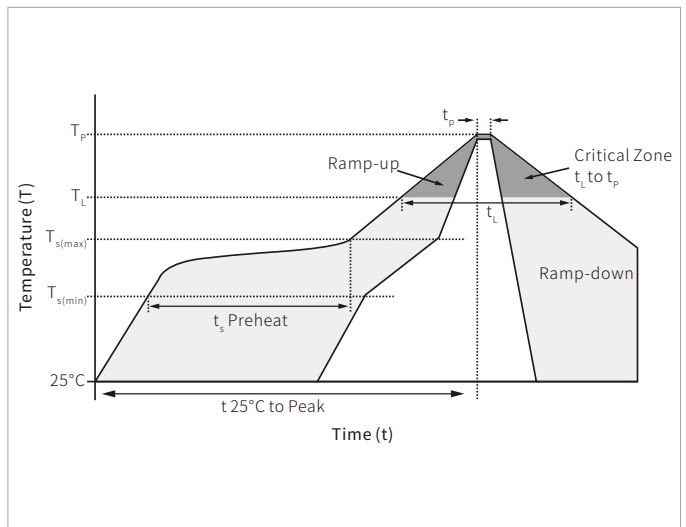


Steady State Power Dissipation Derating Curve

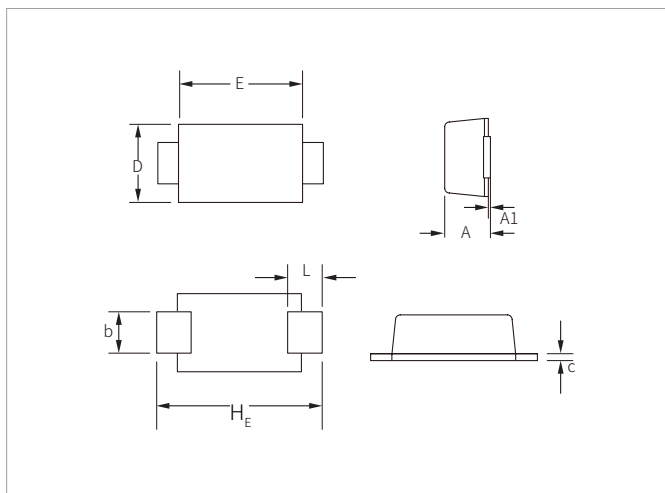


## SOLDERING PARAMETERS

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

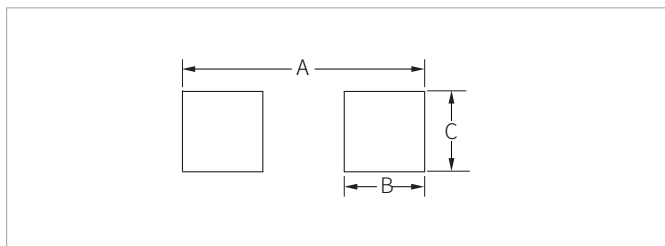


## SOD-123FL PACKAGE INFORMATION



| 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 |
|-------------|-------------------|----------|-----------|
| TPSVF20B28  | SOD-123FL         | 3000PCS  | 7"        |

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