

## 400W Transient Voltage Suppressor

### Features

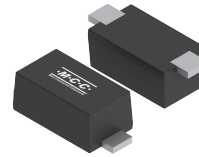
- Ideal for surface mount applications
- Excellent clamping capability
- Available in uni-directional and bi-directional
- Epoxy meets UL 94 V-0 flammability rating

### Applications

- Over voltage protection
- Surge protection

### Mechanical Data

- Package: SOD123-FL
- Moisture Sensitivity Level 1, per J-STD-020
- Halogen Free. "Green" Device <sup>(Note1)</sup>
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant <sup>(Note2)</sup> ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Weight: 0.018g (approximate)



SOD123-FL



### Body Marking and Pin Layout

| Description     | Simplified Outline | Graphic Symbol |
|-----------------|--------------------|----------------|
| Uni-directional |                    |                |
| Bi-directional  |                    |                |

XXXX = Marking code

### Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

| Parameter                                                                    | Symbol           | Rating         | Unit |
|------------------------------------------------------------------------------|------------------|----------------|------|
| Peak Pulse Power Surge Current with a 10/1000μs Waveform <sup>(Note 3)</sup> | I <sub>PPM</sub> | Refer to table | A    |
| Peak Pulse Power Dissipation <sup>(Note 3)</sup>                             | P <sub>PPM</sub> | 400            | W    |
| Power Dissipation on Infinite Heatsink                                       | P <sub>D</sub>   | 1              | W    |
| Peak Forward Surge Current (Unidirectional Only) <sup>(Note3)</sup>          | I <sub>FSM</sub> | 40             | A    |
| Operating Junction Temperature Range                                         | T <sub>J</sub>   | -55 to +150    | °C   |
| Storage Temperature Range                                                    | T <sub>STG</sub> | -55 to +150    | °C   |

- Note:
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.
  3. Non-repetitive current pulse per Fig.3 and derated above T<sub>A</sub>= 25 °C per Fig.4
  4. Measured on 8.3ms single half sinewave or equivalent square wave, duty cycle = 4 pulses per minute maximum

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Thermal characteristics (T<sub>A</sub>=25°C unless otherwise specified)

| Parameter                                                       | Symbol               | Rating | Unit |
|-----------------------------------------------------------------|----------------------|--------|------|
| Thermal Resistance from Junction to Ambient <sup>(Note 4)</sup> | Rth <sub>(j-a)</sub> | 220    | °C/W |
| Thermal Resistance from Junction to Lead                        | Rth <sub>(j-L)</sub> | 100    | °C/W |

Note:

4. Mounted on 0.31x0.35"(8.0x9.0mm) copper pads to each terminal.

Ordering Information

| Product Name     | Packing info |
|------------------|--------------|
| Product name-TP  | 2.5Kpcs/reel |
| Product name-13P | 10Kpcs/reel  |

For packaging details, visit our website at <https://www.mccsemi.com/Package/List>

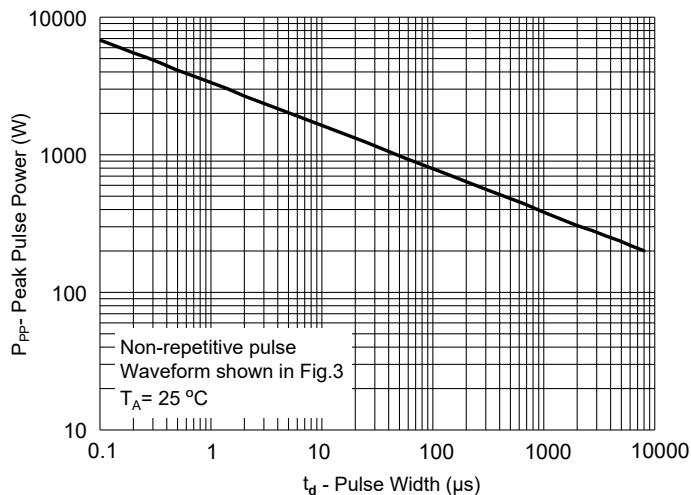
400W Transient Voltage Suppressor

Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

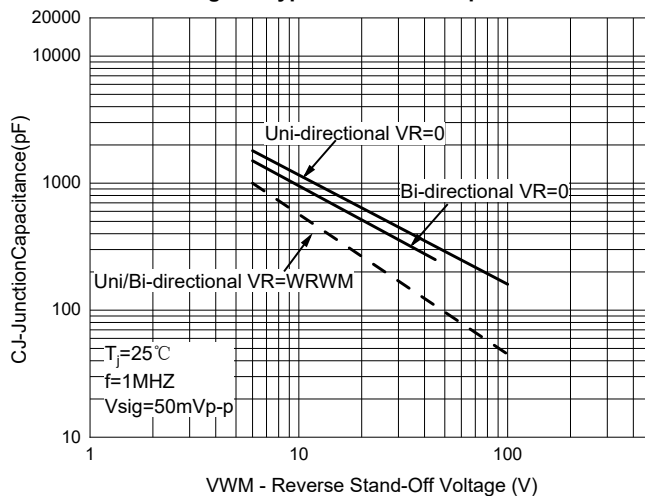
| MCC<br>Part Number |           | Working<br>Peak<br>Reverse<br>Voltage | Breakdown Voltage VBR @IT |         |         | Maximum<br>Clamping<br>Voltage<br>@IPP | Maximum<br>Reverse<br>Surge<br>Current | Maximum<br>Reverse<br>Leakage<br>@VRWM | Device<br>Marking Code |       |
|--------------------|-----------|---------------------------------------|---------------------------|---------|---------|----------------------------------------|----------------------------------------|----------------------------------------|------------------------|-------|
| (Uni)              | (Bi)      | VRWM(V)                               | Min (V)                   | Max (V) | IT (mA) | VC(V)                                  | IPP(A)                                 | IR(μA)                                 | Uni                    | Bi    |
| SM4F5.0A           | SM4F5.0CA | 5                                     | 6.4                       | 7       | 10      | 9.2                                    | 43.5                                   | 400                                    | F5.0                   | F5.0C |
| SM4F6.0A           | SM4F6.0CA | 6.0                                   | 6.67                      | 7.37    | 10      | 10.3                                   | 38.8                                   | 400                                    | F6.0                   | F6.0C |
| SM4F6.5A           | SM4F6.5CA | 6.5                                   | 7.22                      | 7.98    | 10      | 11.2                                   | 35.7                                   | 400                                    | F6.5                   | F6.5C |
| SM4F7.0A           | SM4F7.0CA | 7.0                                   | 7.78                      | 8.60    | 10      | 12.0                                   | 33.3                                   | 200                                    | F7.0                   | F7.0C |
| SM4F7.5A           | SM4F7.5CA | 7.5                                   | 8.33                      | 9.21    | 1       | 12.9                                   | 31                                     | 100                                    | F7.5                   | F7.5C |
| SM4F8.0A           | SM4F8.0CA | 8.0                                   | 8.89                      | 9.83    | 1       | 13.6                                   | 29.4                                   | 50                                     | F8.0                   | F8.0C |
| SM4F8.5A           | SM4F8.5CA | 8.5                                   | 9.44                      | 10.40   | 1       | 14.4                                   | 27.7                                   | 20                                     | F8.5                   | F8.5C |
| SM4F9.0A           | SM4F9.0CA | 9.0                                   | 10.00                     | 11.10   | 1       | 15.4                                   | 26                                     | 10                                     | F9.0                   | F9.0C |
| SM4F10A            | SM4F10CA  | 10.0                                  | 11.10                     | 12.30   | 1       | 17.0                                   | 23.5                                   | 5                                      | F10                    | F10C  |
| SM4F11A            | SM4F11CA  | 11.0                                  | 12.20                     | 13.50   | 1       | 18.2                                   | 21.98                                  | 1                                      | F11                    | F11C  |
| SM4F12A            | SM4F12CA  | 12.0                                  | 13.30                     | 14.70   | 1       | 19.9                                   | 20.1                                   | 1                                      | F12                    | F12C  |
| SM4F13A            | SM4F13CA  | 13.0                                  | 14.40                     | 15.90   | 1       | 21.5                                   | 18.6                                   | 1                                      | F13                    | F13C  |
| SM4F14A            | SM4F14CA  | 14.0                                  | 15.60                     | 17.20   | 1       | 23.2                                   | 17.24                                  | 1                                      | F14                    | F14C  |
| SM4F15A            | SM4F15CA  | 15.0                                  | 16.70                     | 18.50   | 1       | 24.4                                   | 16.39                                  | 1                                      | F15                    | F15C  |
| SM4F16A            | SM4F16CA  | 16.0                                  | 17.80                     | 19.70   | 1       | 26.0                                   | 15.38                                  | 1                                      | F16                    | F16C  |
| SM4F17A            | SM4F17CA  | 17.0                                  | 18.90                     | 20.90   | 1       | 27.6                                   | 14.49                                  | 1                                      | F17                    | F17C  |
| SM4F18A            | SM4F18CA  | 18.0                                  | 20.00                     | 22.10   | 1       | 29.2                                   | 13.7                                   | 1                                      | F18                    | F18C  |
| SM4F19A            | SM4F19CA  | 19.0                                  | 21.10                     | 23.30   | 1       | 30.8                                   | 13                                     | 1                                      | F19                    | F19C  |
| SM4F20A            | SM4F20CA  | 20.0                                  | 22.20                     | 24.50   | 1       | 32.4                                   | 12.35                                  | 1                                      | F20                    | F20C  |
| SM4F22A            | SM4F22CA  | 22.0                                  | 24.40                     | 26.90   | 1       | 35.5                                   | 11.27                                  | 1                                      | F22                    | F22C  |
| SM4F24A            | SM4F24CA  | 24.0                                  | 26.70                     | 29.50   | 1       | 38.9                                   | 10.28                                  | 1                                      | F24                    | F24C  |
| SM4F26A            | SM4F26CA  | 26.0                                  | 28.90                     | 31.90   | 1       | 42.1                                   | 9.5                                    | 1                                      | F26                    | F26C  |
| SM4F28A            | SM4F28CA  | 28.0                                  | 31.10                     | 34.40   | 1       | 45.4                                   | 8.81                                   | 1                                      | F28                    | F28C  |
| SM4F30A            | SM4F30CA  | 30.0                                  | 33.30                     | 36.80   | 1       | 48.4                                   | 8.26                                   | 1                                      | F30                    | F30C  |
| SM4F33A            | SM4F33CA  | 33.0                                  | 36.70                     | 40.60   | 1       | 53.3                                   | 7.5                                    | 1                                      | F33                    | F33C  |
| SM4F36A            | SM4F36CA  | 36.0                                  | 40.00                     | 44.20   | 1       | 58.1                                   | 6.88                                   | 1                                      | F36                    | F36C  |
| SM4F40A            | SM4F40CA  | 40.0                                  | 44.40                     | 49.10   | 1       | 64.5                                   | 6.2                                    | 1                                      | F40                    | F40C  |
| SM4F43A            | SM4F43CA  | 43.0                                  | 47.80                     | 52.80   | 1       | 69.4                                   | 5.7                                    | 1                                      | F43                    | F43C  |
| SM4F45A            | SM4F45CA  | 45.0                                  | 50.00                     | 55.30   | 1       | 72.7                                   | 5.5                                    | 1                                      | F45                    | F45C  |
| SM4F48A            | -         | 48.0                                  | 53.30                     | 58.90   | 1       | 77.4                                   | 5.2                                    | 1                                      | F48                    | -     |
| SM4F51A            | -         | 51.0                                  | 56.70                     | 62.70   | 1       | 82.4                                   | 4.9                                    | 1                                      | F51                    | -     |
| SM4F54A            | -         | 54.0                                  | 60.00                     | 66.30   | 1       | 87.1                                   | 4.6                                    | 1                                      | F54                    | -     |
| SM4F58A            | -         | 58.0                                  | 64.40                     | 71.20   | 1       | 93.6                                   | 4.3                                    | 1                                      | F58                    | -     |
| SM4F60A            | -         | 60.0                                  | 66.70                     | 73.70   | 1       | 96.8                                   | 4.1                                    | 1                                      | F60                    | -     |
| SM4F64A            | -         | 64.0                                  | 71.10                     | 78.60   | 1       | 103.0                                  | 3.9                                    | 1                                      | F64                    | -     |
| SM4F70A            | -         | 70.0                                  | 77.80                     | 86.00   | 1       | 113.0                                  | 3.5                                    | 1                                      | F70                    | -     |
| SM4F75A            | -         | 75.0                                  | 83.30                     | 92.10   | 1       | 121.0                                  | 3.3                                    | 1                                      | F75                    | -     |
| SM4F78A            | -         | 78.0                                  | 86.70                     | 95.80   | 1       | 126.0                                  | 2.2                                    | 1                                      | F78                    | -     |
| SM4F85A            | -         | 85.0                                  | 94.40                     | 104.00  | 1       | 137.0                                  | 2.9                                    | 1                                      | F85                    | -     |
| SM4F90A            | -         | 90.0                                  | 100.00                    | 111.00  | 1       | 146.0                                  | 2.74                                   | 1                                      | F90                    | -     |
| SM4F100A           | -         | 100.0                                 | 111.00                    | 123.00  | 1       | 162.0                                  | 2.46                                   | 1                                      | F100                   | -     |

## Curve Characteristics

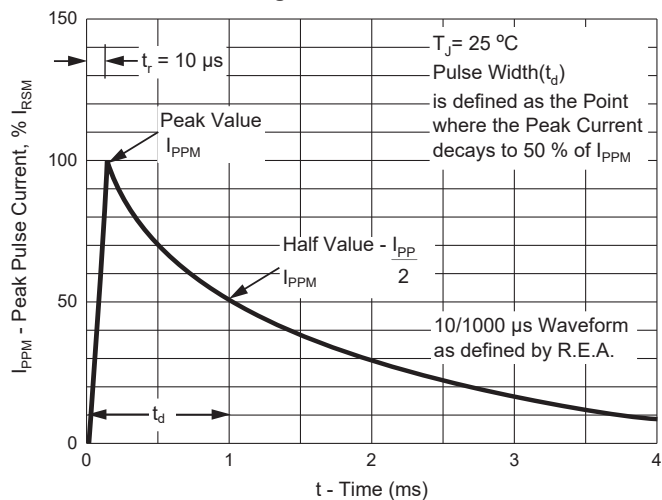
**Fig. 1 - Peak Pulse Power Rating Curve**



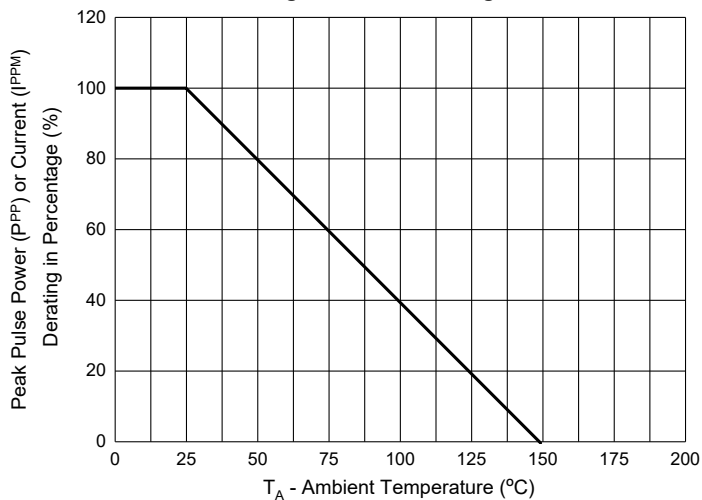
**Fig. 2 - Typical Junction Capacitance**



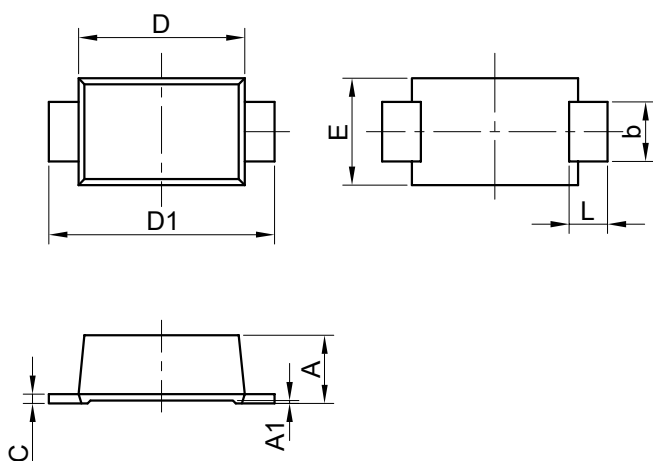
**Fig. 3 - Pulse Waveform**



**Fig. 4 - Pulse Derating Curve**

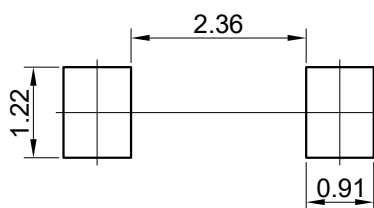


## Package Outline



| DIM | INCH  |       | MM   |      | NOTE |
|-----|-------|-------|------|------|------|
|     | MIN   | MAX   | MIN  | MAX  |      |
| A   | 0.035 | 0.048 | 0.90 | 1.20 |      |
| A1  | 0.000 | 0.004 | 0.00 | 0.10 |      |
| b   | 0.031 | 0.044 | 0.80 | 1.10 |      |
| c   | 0.004 | 0.010 | 0.10 | 0.25 |      |
| D   | 0.100 | 0.122 | 2.55 | 3.10 |      |
| D1  | 0.137 | 0.154 | 3.50 | 3.90 |      |
| E   | 0.055 | 0.075 | 1.40 | 1.90 |      |
| L   | 0.015 | 0.036 | 0.40 | 0.90 |      |

## Suggested Pad Layout



### Notes:

1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please reference document IPC-7351A.

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