

## Features

- For Surface Mount Applications
- Excellent Clamping Capability
- High Temp Soldering: 260°C / 10 Seconds at Terminals
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note 2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV (Contact)

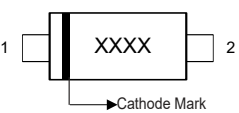
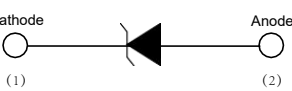
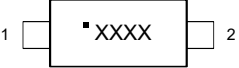
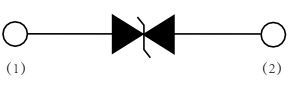
## Maximum Ratings

| Parameter  | Symbol    | Value          | Unit |
|--|-----------|----------------|------|
| Peak Pulse Power Surge Current with a 10/1000µs Waveform (Note 3)  | $I_{PPM}$ | See Next Table | A    |
| Peak Pulse Power Dissipation (Note 3)                              | $P_{PPM}$ | 400            | W    |
| Power Dissipation on Infinite Heatsink at $T_L = 50^\circ\text{C}$ | $P_D$     | 1              | W    |
| Peak Forward Surge Current Unidirectional Only (Note 4)            | $I_{FSM}$ | 40             | A    |

### 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  $T_A = 25^\circ\text{C}$  per Fig.4.
4. 8.3ms, single half sine wave duty cycle = 4 pulses per Minutes maximum.

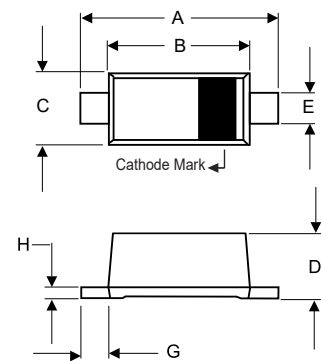
## Internal Structure

| Description     | Simplified outline  | Graphic symbol  |
|-----------------|---|---|
| Uni-directional |  |  |
| Bi-directional  |  |  |

XXXX = Marking code

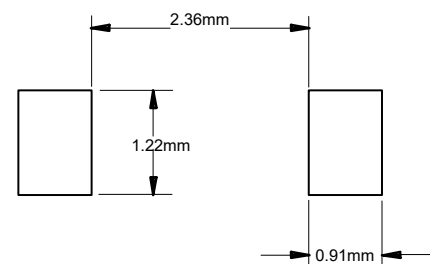
# 400Watt TVS 5.0 to 100 Volts

## SOD-123FL



| DIM | INCHES |       | MM   |      | NOTE |
|-----|--------|-------|------|------|------|
|     | MIN    | MAX   | MIN  | MAX  |      |
| A   | 0.130  | 0.152 | 3.30 | 3.85 |      |
| B   | 0.100  | 0.122 | 2.55 | 3.10 |      |
| C   | 0.055  | 0.075 | 1.40 | 1.90 |      |
| D   | 0.035  | 0.053 | 0.90 | 1.35 |      |
| E   | 0.020  | 0.041 | 0.50 | 1.05 |      |
| G   | 0.010  | ----  | 0.25 | ---- |      |
| H   | ----   | 0.010 | ---- | 0.25 |      |

## SUGGESTED SOLDER PAD LAYOUT



## Thermal Characteristics

| Parameter                                      | Symbol          | Value       | Unit |
|--|-----------------|-------------|------|
| Operating Junction Temperature Range           | $T_J$           | -55 to +150 | °C   |
| Storage Temperature Range                      | $T_{STG}$       | -55 to +150 | °C   |
| Typical Thermal Resistance Junction to Lead    | $R_{\theta JL}$ | 100         | °C/W |
| Typical Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 220         | °C/W |

Note:

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

| MCC Part Number |           | Working Peak Reverse Voltage<br>VRWM(V) | Breakdown Voltage VBR @IT |         |         | Maximum Clamping Voltage @IPP<br>VC(V) | Maximum Reverse Surge Current<br>IPP(A) | Maximum Reverse Leakage @VRWM<br>IR(μA) | Device Marking Code |       |
|-----------------|-----------|---|---------------------------|---------|---------|--|---|---|---------------------|-------|
| (Uni)           | (Bi)      |   | Min (V)                   | Max (V) | IT (mA) |  |   |   | 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

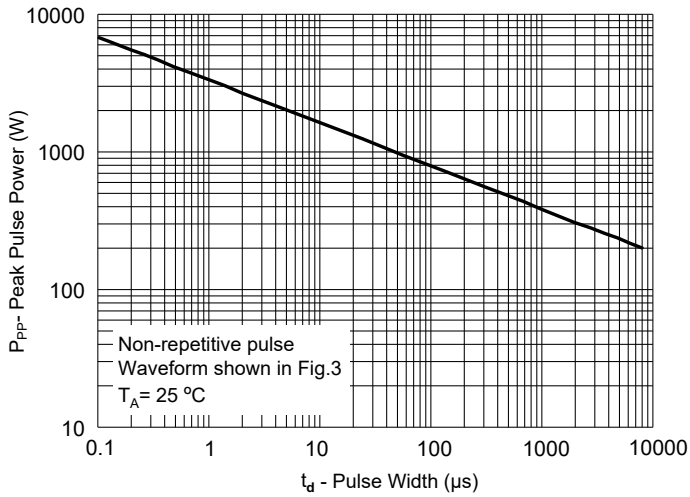


Fig. 2 - Typical Junction Capacitance

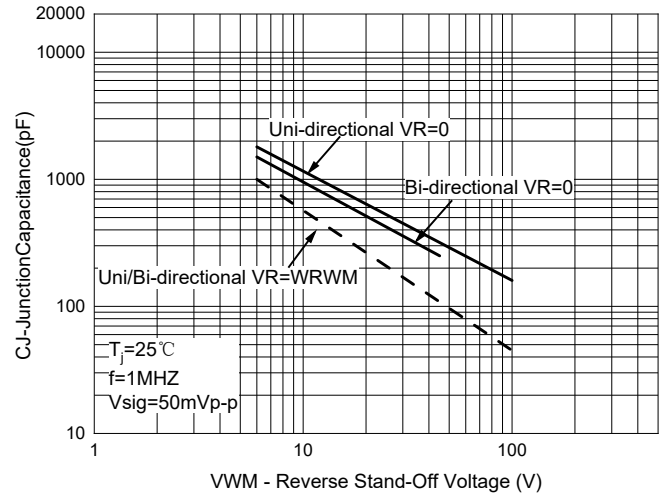


Fig. 3 - Pulse Waveform

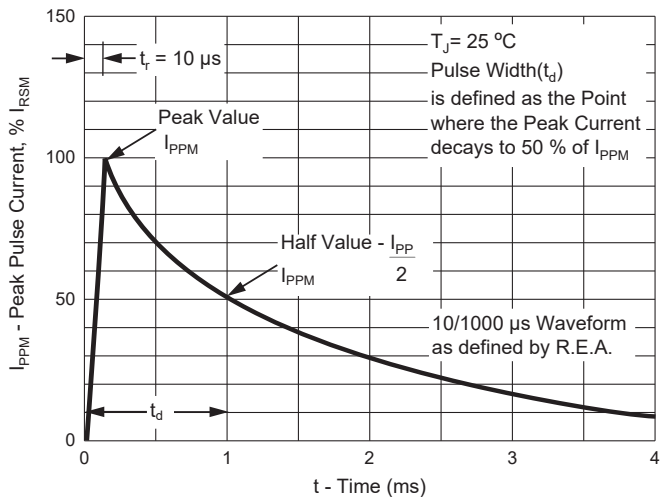
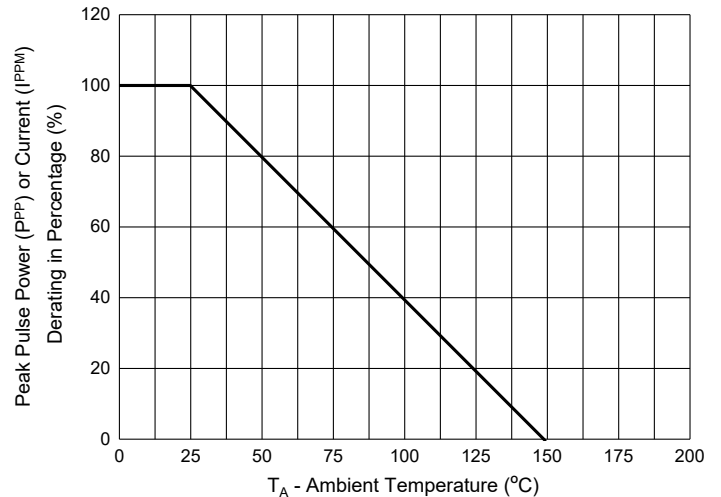


Fig. 4 - Pulse Derating Curve



## Ordering Information

| Device          | Packing                |
|-----------------|------------------------|
| Part Number-TP  | Tape&Reel:2.5Kpcs/Reel |
| Part Number-13P | Tape&Reel:10Kpcs/Reel  |

For packaging details, go to our website at <https://www.mccsemi.com/pdf/productpackaging/SOD-123FL%20Package.pdf>

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