



# THE DATASHEET OF SMF70A-TP



**Features**

- Uni and Bi-directional Type Available (Suffix "C" means Bi-directional)
- Surface Mount
- Low Clamping Voltage
- Small, High Thermal Efficiency
- 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)

**Maximum Ratings**

- Operating Junction Temperature Range: -65°C to +175°C
- Storage Temperature Range: -65°C to +175°C
- Typical Thermal Resistance: 26°C/W Junction to Lead
- Typical Thermal Resistance: 300°C/W Junction to Ambient

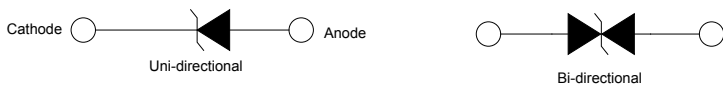
**Electrical Characteristics @ 25°C Unless Otherwise Specified**

|  |                  |                |   |
|--|------------------|----------------|---|
| Peak Pulse Power Dissipation with a 10/1000µs Waveform   | P <sub>PP</sub>  | 200W           | - |
| ESD Voltage(HBM)   | V <sub>ESD</sub> | >16KV          | - |
| IEC61000-4-2(ESD)  | Air Contact      | ±30KV<br>±30KV | - |
| Peak forward surge current, 8.3 ms single half sine-wave | I <sub>FSM</sub> | 30A            | - |

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

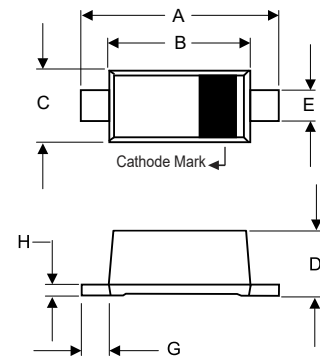
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.

Pin Configuration:



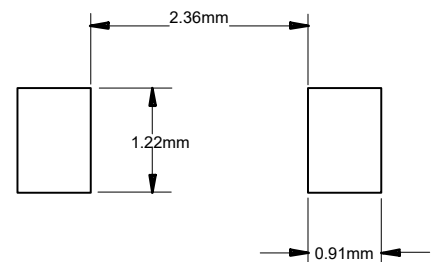
**200 Watt TVS  
5.0 to 170 Volts**

**SOD-123FL**



| DIM | DIMENSIONS |       |      |      | NOTE |
|-----|------------|-------|------|------|------|
|     | INCHES     |       | MM   |      |      |
|     | 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**



Electrical Characteristics @ 25°C Unless Otherwise Specified

| MCC Part Number | Reverse Stand-Off Voltage | Breakdown Voltage $V_{BR}(V)$ |      | Test Current | Max. Clamping Voltage @ $I_{PP}$ | Max. Peak Pulse Current | Max. Reverse Leakage Current @ $V_{WM}$ | Marking Code |
|-----------------|---------------------------|-------------------------------|------|--------------|----------------------------------|-------------------------|---|--------------|
|                 | $V_{WM}(V)$               | Min                           | Max  | $I_T(mA)$    | $V_C(V)$                         | $I_{PP}(A)$             | $I_D(\mu A)$                            |              |
| SMF5.0A         | 5.0                       | 6.4                           | 7.0  | 10           | 9.2                              | 21.7                    | 400                                     | 5.0A         |
| SMF6.0A         | 6.0                       | 6.67                          | 7.37 | 10           | 10.3                             | 19.4                    | 400                                     | 6.0A         |
| SMF6.5A         | 6.5                       | 7.22                          | 7.98 | 10           | 11.2                             | 17.9                    | 250                                     | 6.5A         |
| SMF7.0A         | 7.0                       | 7.78                          | 8.6  | 10           | 12                               | 16.7                    | 100                                     | 7.0A         |
| SMF7.5A         | 7.5                       | 8.33                          | 9.21 | 1.0          | 12.9                             | 15.5                    | 50                                      | 7.5A         |
| SMF8.0A         | 8.0                       | 8.89                          | 9.83 | 1.0          | 13.6                             | 14.7                    | 25                                      | 8.0A         |
| SMF8.5A         | 8.5                       | 9.44                          | 10.4 | 1.0          | 14.4                             | 13.9                    | 10                                      | 8.5A         |
| SMF9.0A         | 9.0                       | 10                            | 11.1 | 1.0          | 15.4                             | 13                      | 5.0                                     | 9.0A         |
| SMF10A          | 10                        | 11.1                          | 12.3 | 1.0          | 17                               | 11.8                    | 2.5                                     | 10A          |
| SMF11A          | 11                        | 12.2                          | 13.5 | 1.0          | 18.2                             | 11                      | 2.5                                     | 11A          |
| SMF12A          | 12                        | 13.3                          | 14.7 | 1.0          | 19.9                             | 10.1                    | 2.5                                     | 12A          |
| SMF13A          | 13                        | 14.4                          | 15.9 | 1.0          | 21.5                             | 9.3                     | 1.0                                     | 13A          |
| SMF14A          | 14                        | 15.6                          | 17.2 | 1.0          | 23.2                             | 8.6                     | 1.0                                     | 14A          |
| SMF15A          | 15                        | 16.7                          | 18.5 | 1.0          | 24.4                             | 8.2                     | 1.0                                     | 15A          |
| SMF16A          | 16                        | 17.8                          | 19.7 | 1.0          | 26                               | 7.7                     | 1.0                                     | 16A          |
| SMF17A          | 17                        | 18.9                          | 20.9 | 1.0          | 27.6                             | 7.2                     | 1.0                                     | 17A          |
| SMF18A          | 18                        | 20                            | 22.1 | 1.0          | 29.2                             | 6.8                     | 1.0                                     | 18A          |
| SMF20A          | 20                        | 22.2                          | 24.5 | 1.0          | 32.4                             | 6.2                     | 1.0                                     | 20A          |
| SMF22A          | 22                        | 24.4                          | 26.9 | 1.0          | 35.5                             | 5.6                     | 1.0                                     | 22A          |
| SMF24A          | 24                        | 26.7                          | 29.5 | 1.0          | 38.9                             | 5.1                     | 1.0                                     | 24A          |
| SMF26A          | 26                        | 28.9                          | 31.9 | 1.0          | 42.1                             | 4.8                     | 1.0                                     | 26A          |
| SMF28A          | 28                        | 31.1                          | 34.4 | 1.0          | 45.4                             | 4.4                     | 1.0                                     | 28A          |
| SMF30A          | 30                        | 33.3                          | 36.8 | 1.0          | 48.4                             | 4.1                     | 1.0                                     | 30A          |
| SMF33A          | 33                        | 36.7                          | 40.6 | 1.0          | 53.3                             | 3.8                     | 1.0                                     | 33A          |
| SMF36A          | 36                        | 40                            | 44.2 | 1.0          | 58.1                             | 3.4                     | 1.0                                     | 36A          |
| SMF40A          | 40                        | 44.4                          | 49.1 | 1.0          | 64.5                             | 3.1                     | 1.0                                     | 40A          |
| SMF43A          | 43                        | 47.8                          | 52.8 | 1.0          | 69.4                             | 2.9                     | 1.0                                     | 43A          |
| SMF45A          | 45                        | 50                            | 55.3 | 1.0          | 72.7                             | 2.8                     | 1.0                                     | 45A          |
| SMF48A          | 48                        | 53.3                          | 58.9 | 1.0          | 77.4                             | 2.6                     | 1.0                                     | 48A          |
| SMF51A          | 51                        | 56.7                          | 62.7 | 1.0          | 82.4                             | 2.4                     | 1.0                                     | 51A          |
| SMF54A          | 54                        | 60                            | 66.3 | 1.0          | 87.1                             | 2.3                     | 1.0                                     | 54A          |
| SMF58A          | 58                        | 64.4                          | 71.2 | 1.0          | 93.6                             | 2.1                     | 1.0                                     | 58A          |
| SMF60A          | 60                        | 66.7                          | 73.7 | 1.0          | 96.8                             | 1.8                     | 1.0                                     | 60A          |
| SMF64A          | 64                        | 71.1                          | 78.6 | 1.0          | 103                              | 1.7                     | 1.0                                     | 64A          |
| SMF70A          | 70                        | 77.8                          | 86   | 1.0          | 113                              | 1.5                     | 1.0                                     | 70A          |
| SMF75A          | 75                        | 83.3                          | 92.1 | 1.0          | 121                              | 1.4                     | 1.0                                     | 75A          |
| SMF78A          | 78                        | 86.7                          | 95.8 | 1.0          | 126                              | 1.4                     | 1.0                                     | 78A          |
| SMF85A          | 85                        | 94.4                          | 104  | 1.0          | 137                              | 1.3                     | 1.0                                     | 85A          |
| SMF90A          | 90                        | 100                           | 111  | 1.0          | 146                              | 1.2                     | 1.0                                     | 90A          |
| SMF100A         | 100                       | 111                           | 123  | 1.0          | 162                              | 1.1                     | 1.0                                     | 100          |
| SMF110A         | 110                       | 122                           | 135  | 1.0          | 177                              | 1.0                     | 1.0                                     | 110          |
| SMF120A         | 120                       | 133                           | 147  | 1.0          | 193                              | 0.9                     | 1.0                                     | 120          |
| SMF130A         | 130                       | 144                           | 159  | 1.0          | 209                              | 0.8                     | 1.0                                     | 130          |
| SMF150A         | 150                       | 167                           | 185  | 1.0          | 243                              | 0.7                     | 1.0                                     | 150          |
| SMF160A         | 160                       | 178                           | 197  | 1.0          | 259                              | 0.7                     | 1.0                                     | 160          |
| SMF170A         | 170                       | 189                           | 209  | 1.0          | 275                              | 0.6                     | 1.0                                     | 170          |

Electrical Characteristics @ 25°C Unless Otherwise Specified

| MCC Part Number | Reverse Stand-Off Voltage | Breakdown Voltage $V_{BR}(V)$ |      | Test Current | Max. Clamping Voltage @ $I_{PP}$ | Max. Peak Pulse Current | Max. Reverse Leakage Current @ $V_{WM}$ | Marking Code |
|-----------------|---------------------------|-------------------------------|------|--------------|----------------------------------|-------------------------|---|--------------|
|                 | $V_{WM}(V)$               | Min                           | Max  | $I_T(mA)$    | $V_C(V)$                         | $I_{PP}(A)$             | $I_D(\mu A)$                            |              |
| SMF5.0CA        | 5.0                       | 6.4                           | 7.0  | 10           | 9.2                              | 21.7                    | 400                                     | 5.0CA        |
| SMF6.0CA        | 6.0                       | 6.67                          | 7.37 | 10           | 10.3                             | 19.4                    | 400                                     | 6.0CA        |
| SMF6.5CA        | 6.5                       | 7.22                          | 7.98 | 10           | 11.2                             | 17.9                    | 250                                     | 6.5CA        |
| SMF7.0CA        | 7.0                       | 7.78                          | 8.6  | 10           | 12                               | 16.7                    | 100                                     | 7.0CA        |
| SMF7.5CA        | 7.5                       | 8.33                          | 9.21 | 1.0          | 12.9                             | 15.5                    | 50                                      | 7.5CA        |
| SMF8.0CA        | 8.0                       | 8.89                          | 9.83 | 1.0          | 13.6                             | 14.7                    | 25                                      | 8.0CA        |
| SMF8.5CA        | 8.5                       | 9.44                          | 10.4 | 1.0          | 14.4                             | 13.9                    | 10                                      | 8.5CA        |
| SMF9.0CA        | 9.0                       | 10                            | 11.1 | 1.0          | 15.4                             | 13                      | 5.0                                     | 9.0CA        |
| SMF10CA         | 10                        | 11.1                          | 12.3 | 1.0          | 17                               | 11.8                    | 2.5                                     | 10CA         |
| SMF11CA         | 11                        | 12.2                          | 13.5 | 1.0          | 18.2                             | 11                      | 2.5                                     | 11CA         |
| SMF12CA         | 12                        | 13.3                          | 14.7 | 1.0          | 19.9                             | 10.1                    | 2.5                                     | 12CA         |
| SMF13CA         | 13                        | 14.4                          | 15.9 | 1.0          | 21.5                             | 9.3                     | 1.0                                     | 13CA         |
| SMF14CA         | 14                        | 15.6                          | 17.2 | 1.0          | 23.2                             | 8.6                     | 1.0                                     | 14CA         |
| SMF15CA         | 15                        | 16.7                          | 18.5 | 1.0          | 24.4                             | 8.2                     | 1.0                                     | 15CA         |
| SMF16CA         | 16                        | 17.8                          | 19.7 | 1.0          | 26                               | 7.7                     | 1.0                                     | 16CA         |
| SMF17CA         | 17                        | 18.9                          | 20.9 | 1.0          | 27.6                             | 7.2                     | 1.0                                     | 17CA         |
| SMF18CA         | 18                        | 20                            | 22.1 | 1.0          | 29.2                             | 6.8                     | 1.0                                     | 18CA         |
| SMF20CA         | 20                        | 22.2                          | 24.5 | 1.0          | 32.4                             | 6.2                     | 1.0                                     | 20CA         |
| SMF22CA         | 22                        | 24.4                          | 26.9 | 1.0          | 35.5                             | 5.6                     | 1.0                                     | 22CA         |
| SMF24CA         | 24                        | 26.7                          | 29.5 | 1.0          | 38.9                             | 5.1                     | 1.0                                     | 24CA         |
| SMF26CA         | 26                        | 28.9                          | 31.9 | 1.0          | 42.1                             | 4.8                     | 1.0                                     | 26CA         |
| SMF28CA         | 28                        | 31.1                          | 34.4 | 1.0          | 45.4                             | 4.4                     | 1.0                                     | 28CA         |
| SMF30CA         | 30                        | 33.3                          | 36.8 | 1.0          | 48.4                             | 4.1                     | 1.0                                     | 30CA         |
| SMF33CA         | 33                        | 36.7                          | 40.6 | 1.0          | 53.3                             | 3.8                     | 1.0                                     | 33CA         |
| SMF36CA         | 36                        | 40                            | 44.2 | 1.0          | 58.1                             | 3.4                     | 1.0                                     | 36CA         |
| SMF40CA         | 40                        | 44.4                          | 49.1 | 1.0          | 64.5                             | 3.1                     | 1.0                                     | 40CA         |
| SMF43CA         | 43                        | 47.8                          | 52.8 | 1.0          | 69.4                             | 2.9                     | 1.0                                     | 43CA         |
| SMF45CA         | 45                        | 50                            | 55.3 | 1.0          | 72.7                             | 2.8                     | 1.0                                     | 45CA         |
| SMF48CA         | 48                        | 53.3                          | 58.9 | 1.0          | 77.4                             | 2.6                     | 1.0                                     | 48CA         |
| SMF51CA         | 51                        | 56.7                          | 62.7 | 1.0          | 82.4                             | 2.4                     | 1.0                                     | 51CA         |
| SMF54CA         | 54                        | 60                            | 66.3 | 1.0          | 87.1                             | 2.3                     | 1.0                                     | 54CA         |
| SMF58CA         | 58                        | 64.4                          | 71.2 | 1.0          | 93.6                             | 2.1                     | 1.0                                     | 58CA         |
| SMF60CA         | 60                        | 66.7                          | 73.7 | 1.0          | 96.8                             | 1.8                     | 1.0                                     | 60CA         |
| SMF64CA         | 64                        | 71.1                          | 78.6 | 1.0          | 103                              | 1.7                     | 1.0                                     | 64CA         |
| SMF70CA         | 70                        | 77.8                          | 86   | 1.0          | 113                              | 1.5                     | 1.0                                     | 70CA         |
| SMF75CA         | 75                        | 83.3                          | 92.1 | 1.0          | 121                              | 1.4                     | 1.0                                     | 75CA         |
| SMF78CA         | 78                        | 86.7                          | 95.8 | 1.0          | 126                              | 1.4                     | 1.0                                     | 78CA         |
| SMF85CA         | 85                        | 94.4                          | 104  | 1.0          | 137                              | 1.3                     | 1.0                                     | 85CA         |
| SMF90CA         | 90                        | 100                           | 111  | 1.0          | 146                              | 1.2                     | 1.0                                     | 90CA         |
| SMF100CA        | 100                       | 111                           | 123  | 1.0          | 162                              | 1.1                     | 1.0                                     | 100C         |
| SMF110CA        | 110                       | 122                           | 135  | 1.0          | 177                              | 1.0                     | 1.0                                     | 110C         |
| SMF120CA        | 120                       | 133                           | 147  | 1.0          | 193                              | 0.9                     | 1.0                                     | 120C         |
| SMF130CA        | 130                       | 144                           | 159  | 1.0          | 209                              | 0.8                     | 1.0                                     | 130C         |
| SMF150CA        | 150                       | 167                           | 185  | 1.0          | 243                              | 0.7                     | 1.0                                     | 150C         |
| SMF160CA        | 160                       | 178                           | 197  | 1.0          | 259                              | 0.7                     | 1.0                                     | 160C         |
| SMF170CA        | 170                       | 189                           | 209  | 1.0          | 275                              | 0.6                     | 1.0                                     | 170C         |

**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 |

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