

SMF5.0A~SMF170CA

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE 5 to 170 Volt **POWER** 200 Watt

SOD-123FL

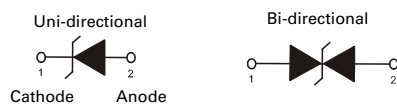
Unit:mm

FEATURES

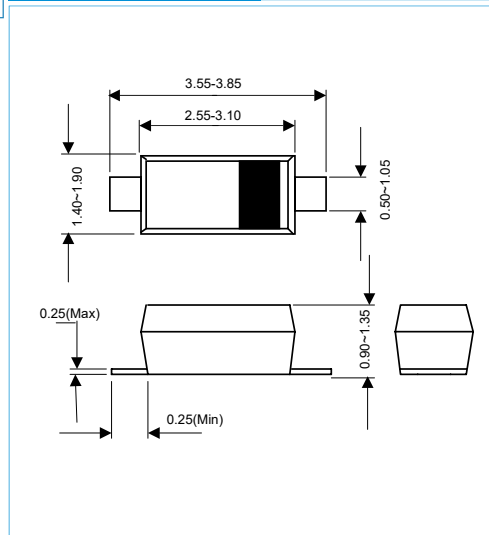
- For surface mounted applications in order to optimize board space.
- Ultra Thin Profile Package for Space Constrained Utilization
- Package suitable for Automated Handling
- Low inductance
- High temperature soldering : 260OC/10 seconds at terminals
- ESD IEC-61000-4-2 Air + 30kV, Contact + 30kV
- Lead free in compliance with EU RoHS 2.0

MECHANICAL DATA

- Case Material: Molded Plastic.
- UL Flammability Classification Rating 94V-0
- Polarity: Color band denotes cathode end



For Uni-directional use A Suffix for types SMF5.0A thru types SMF170A.
For Bi-directional use CA Suffix for types SMF5.0CA thru types SMF170CA.



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| Rating | Symbol | Value | Units |
|---|-----------------|-------------|-----------------------------|
| Peak Pulse Power Dissipation on $T_A = 25^\circ\text{C}$ (Notes 1,2,5, Fig.1) | P_{PP} | 200 | Watts |
| Steady State Power Dissipation | $P_{M(AV)}$ | 1.0 | W |
| Peak Forward Surge Current per Fig.5 (Notes 3) | I_{FSM} | 20 | Amps |
| Peak Pulse Current on $t_p=10/1000\mu\text{s}$ waveform (Notes 1)Fig.2 | I_{PPM} | see Table 1 | Amps |
| Typical Thermal Resistance Junction to Air (Notes 2) | $R_{\theta JA}$ | 180 | $^\circ\text{C} / \text{W}$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

NOTES :

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
2. Mounted on 5mm² copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle = 4 pulses per minutes maximum.
4. Lead temperature at 75°C = T_L .
5. Peak pulse power waveform is 10/1000 μs .
6. A transient suppressor is selected according to the working peak reverse voltage (V_{RWM}), which should be equal to or greater than the DC or continuous peak operating voltage level.

SMF5.0A~SMF170CA

ELECTRICAL CHARACTERISTICS @25°C

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

SMF5.0A~SMF170CA

ELECTRICAL CHARACTERISTICS @25°C

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

SMF5.0A~SMF170CA

Electrical Characteristics

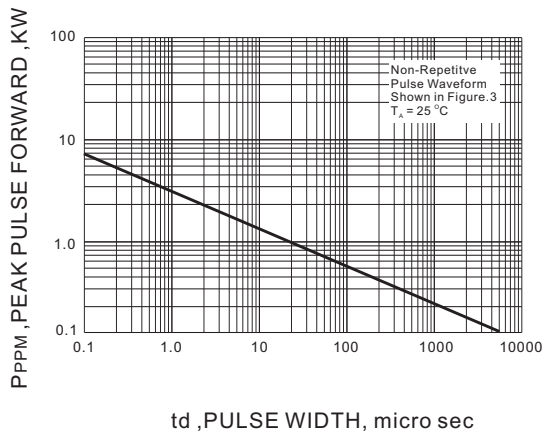


Fig.1 PEAK PULSE POWER RATING CURVE

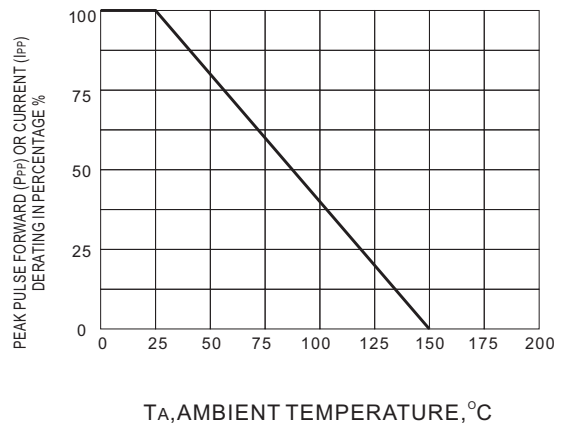


Fig.2 DERATING CURVE

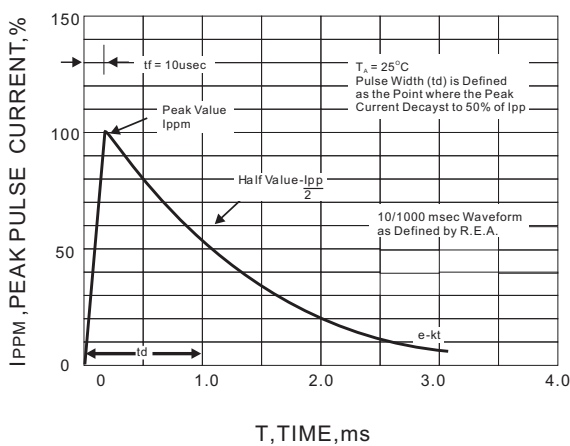


Fig.3 PULSE WAVEFORM

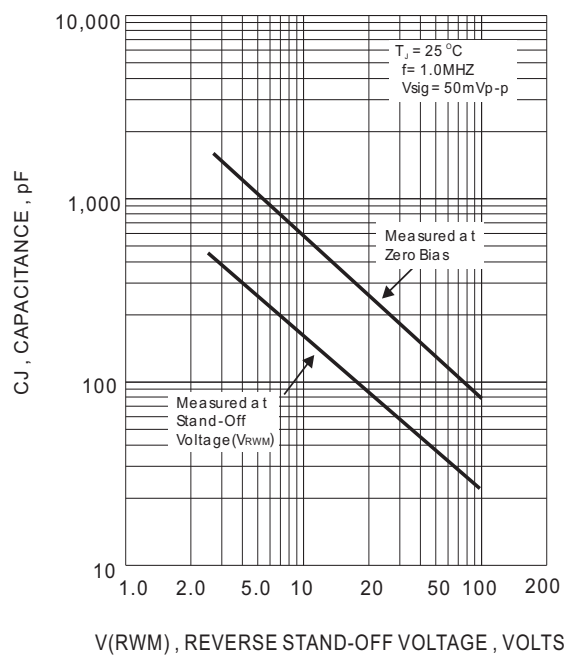


Fig.4 TYPICAL JUNCTION CAPACITANCE

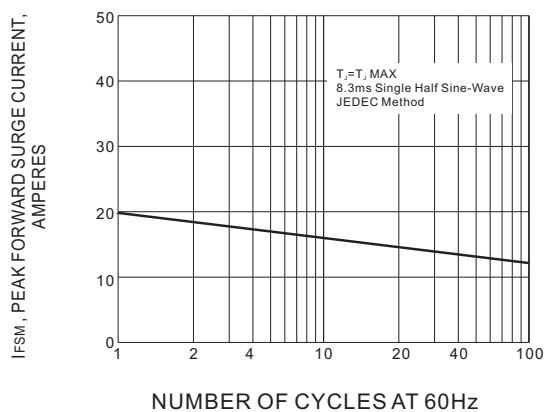


Fig.5 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

SMF5.0A~SMF170CA

ORDER INFORMATION

- Packing information

| Part Number | Case | Reel Size | QUANTITY |
|------------------|-----------|-----------|----------|
| SMF5.0A~SMF170CA | SOD-123FL | 7 Inch | 2500 |