

SMF5.0A~SMF220A-HAF

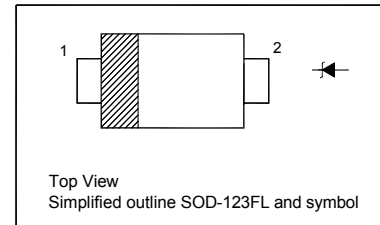
Surface Mount Transient Voltage Suppressors

Features

- Halogen and Antimony Free(HAF), RoHS compliant

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | Cathode |
| 2 | Anode |



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|-----------------|---------------|---------------------------|
| Peak Pulse Power Dissipation (PW-10/1000 us) ¹⁾ | P_{PPM} | 200 | W |
| Peak Forward Surge Current ²⁾ | I_{FSM} | 20 | A |
| Thermal Resistance | $R_{\theta JA}$ | 325 | $^\circ\text{C}/\text{W}$ |
| Operating Junction and Storage Temperature Range | T_j, T_{stg} | - 55 to + 150 | $^\circ\text{C}$ |

¹⁾ Non-repetitive current pulse at $T_a = 25^\circ\text{C}$, per waveform of Figure 1. Mounted on 5.0 mm² copper pads to each terminal.

²⁾ Peak Forward Surge Current 8.3 ms Single Half Sine -Wave, or equivalent square wave, duty cycle = 4 pulses per minutes maximum.

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Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified) $V_F = 1.25\text{ V Max.}$ at $I_F = 200\text{ mA}$

| Type | Marking Code | Stand-off Voltage V_{WM} (V) | Breakdown Voltage | | Test Current I_T (mA) | Maximum Reverse Leakage I_R (μA) at V_{WM} | Maximum Clamping Voltage V_C (V) at I_{PPM} | Maximum Peak Pulse Current I_{PPM} (A) |
|---------|--------------|--------------------------------|----------------------------|----------------------------|-------------------------|---|---|--|
| | | | V_{BR} (V) Min. at I_T | V_{BR} (V) Max. at I_T | | | | |
| SMF5.0A | .TA1 | 5 | 6.4 | 7 | 10 | 400 | 9.2 | 21.7 |
| SMF6.0A | .TB1 | 6 | 6.7 | 7.4 | 10 | 400 | 10.3 | 19.4 |
| SMF6.5A | .TC1 | 6.5 | 7.2 | 8 | 10 | 250 | 11.2 | 17.9 |
| SMF7.0A | .TD1 | 7 | 7.8 | 8.6 | 10 | 100 | 12 | 16.7 |
| SMF7.5A | .TE1 | 7.5 | 8.3 | 9.2 | 1 | 50 | 12.9 | 15.5 |
| SMF8.0A | .TF1 | 8 | 8.9 | 9.8 | 1 | 25 | 13.6 | 14.7 |
| SMF8.5A | .TG1 | 8.5 | 9.4 | 10.4 | 1 | 10 | 14.4 | 13.9 |
| SMF9.0A | .TH1 | 9 | 10 | 11.1 | 1 | 5 | 15.4 | 13 |
| SMF10A | .TJ1 | 10 | 11.1 | 12.3 | 1 | 2.5 | 17 | 11.8 |
| SMF11A | .TK1 | 11 | 12.2 | 13.5 | 1 | 2.5 | 18.2 | 11 |
| SMF12A | .TL1 | 12 | 13.3 | 14.7 | 1 | 2.5 | 19.9 | 10.1 |
| SMF13A | .TM1 | 13 | 14.4 | 15.9 | 1 | 1 | 21.5 | 9.3 |
| SMF14A | .TN1 | 14 | 15.6 | 17.2 | 1 | 1 | 23.2 | 8.6 |
| SMF15A | .TP1 | 15 | 16.7 | 18.5 | 1 | 1 | 24.4 | 8.2 |
| SMF16A | .TQ1 | 16 | 17.8 | 19.7 | 1 | 1 | 26 | 7.7 |
| SMF17A | .TR1 | 17 | 18.9 | 20.9 | 1 | 1 | 27.6 | 7.2 |
| SMF18A | .TS1 | 18 | 20 | 22.1 | 1 | 1 | 29.2 | 6.8 |
| SMF20A | .TT1 | 20 | 22.2 | 24.5 | 1 | 1 | 32.4 | 6.2 |
| SMF22A | .TU1 | 22 | 24.4 | 26.9 | 1 | 1 | 35.5 | 5.6 |
| SMF24A | .TV1 | 24 | 26.7 | 29.5 | 1 | 1 | 38.9 | 5.1 |
| SMF26A | .TW1 | 26 | 28.9 | 31.9 | 1 | 1 | 42.1 | 4.8 |
| SMF28A | .TX1 | 28 | 31.1 | 34.4 | 1 | 1 | 45.4 | 4.4 |
| SMF30A | .TY1 | 30 | 33.3 | 36.8 | 1 | 1 | 48.4 | 4.1 |
| SMF33A | .TZ1 | 33 | 36.7 | 40.6 | 1 | 1 | 53.3 | 3.8 |
| SMF36A | .UA1 | 36 | 40 | 44.2 | 1 | 1 | 58.1 | 3.4 |
| SMF40A | .UB1 | 40 | 44.4 | 49.1 | 1 | 1 | 64.5 | 3.1 |
| SMF43A | .UC1 | 43 | 47.8 | 52.8 | 1 | 1 | 69.4 | 2.9 |
| SMF45A | .UD1 | 45 | 50 | 55.3 | 1 | 1 | 72.7 | 2.8 |
| SMF48A | .UE1 | 48 | 53.3 | 58.9 | 1 | 1 | 77.4 | 2.6 |
| SMF51A | .UF1 | 51 | 56.7 | 62.7 | 1 | 1 | 82.4 | 2.4 |
| SMF54A | .UG1 | 54 | 60 | 66.3 | 1 | 1 | 87.1 | 2.3 |
| SMF58A | .UH1 | 58 | 64.4 | 71.2 | 1 | 1 | 93.6 | 2.1 |
| SMF60A | .UJ1 | 60 | 66.7 | 73.7 | 1 | 1 | 96.8 | 1.8 |
| SMF64A | .UK1 | 64 | 71.1 | 78.6 | 1 | 1 | 103 | 1.7 |
| SMF70A | .UL1 | 70 | 77.8 | 86 | 1 | 1 | 113 | 1.5 |
| SMF75A | .UM1 | 75 | 83.3 | 92.1 | 1 | 1 | 121 | 1.4 |
| SMF78A | .UN1 | 78 | 86.7 | 95.8 | 1 | 1 | 126 | 1.4 |
| SMF85A | .UP1 | 85 | 94.4 | 104 | 1 | 1 | 137 | 1.3 |

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Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified) $V_F = 1.25\text{ V Max. at } I_F = 200\text{ mA}$

| Type | Marking Code | Stand-off Voltage V_{WM} (V) | Breakdown Voltage | | Test Current I_T (mA) | Maximum Reverse Leakage I_R (μA) at V_{WM} | Maximum Clamping Voltage V_C (V) at I_{PPM} | Maximum Peak Pulse Current I_{PPM} (A) |
|---------|--------------|--------------------------------|----------------------------|----------------------------|-------------------------|---|---|--|
| | | | V_{BR} (V) Min. at I_T | V_{BR} (V) Max. at I_T | | | | |
| SMF90A | .UQ1 | 90 | 100 | 111 | 1 | 1 | 146 | 1.2 |
| SMF100A | .UR1 | 100 | 111 | 123 | 1 | 1 | 162 | 1.1 |
| SMF110A | .US1 | 110 | 122 | 135 | 1 | 1 | 177 | 1 |
| SMF120A | .UT1 | 120 | 133 | 147 | 1 | 1 | 193 | 0.9 |
| SMF130A | .UU1 | 130 | 144 | 159 | 1 | 1 | 209 | 0.8 |
| SMF150A | .UV1 | 150 | 167 | 185 | 1 | 1 | 243 | 0.7 |
| SMF160A | .UW1 | 160 | 178 | 197 | 1 | 1 | 259 | 0.7 |
| SMF170A | .UX1 | 170 | 189 | 209 | 1 | 1 | 275 | 0.6 |
| SMF175A | .UY1 | 175 | 198 | 214 | 1 | 1 | 284 | 0.6 |
| SMF180A | .UZ1 | 180 | 201 | 222 | 1 | 1 | 292 | 0.5 |
| SMF190A | .VA1 | 190 | 211 | 232 | 1 | 1 | 308 | 0.5 |
| SMF200A | .VB1 | 200 | 224 | 247 | 1 | 1 | 324 | 0.5 |
| SMF220A | .VC1 | 220 | 246 | 272 | 1 | 1 | 356 | 0.5 |

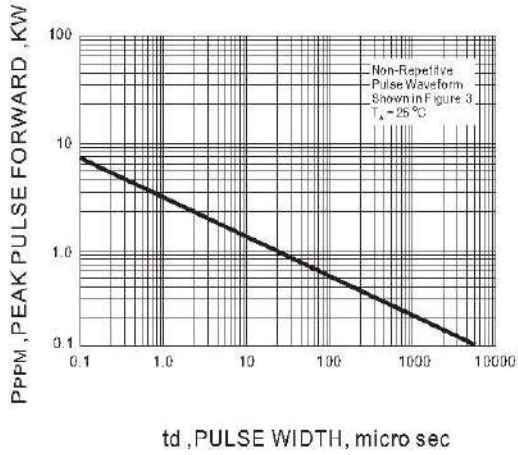


Fig.1 Peak pulse power rating curve

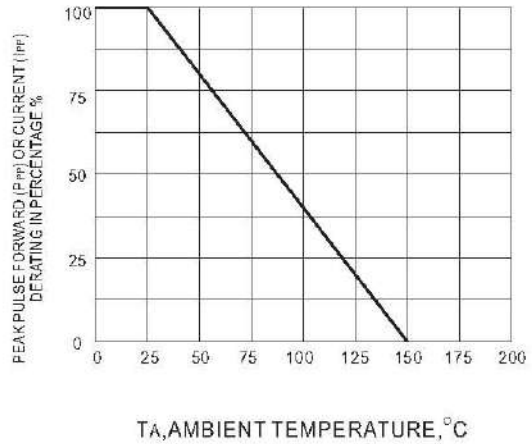


Fig.2 Derating curve

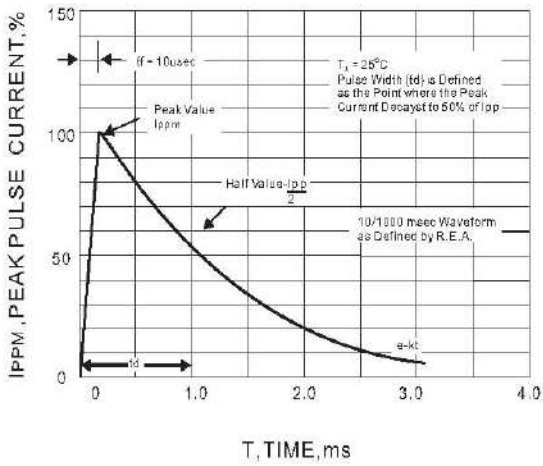


Fig.3 Pulse waveform