

Working Voltage: 5.0 to 350 V
Peak Pulse Power: 200 W

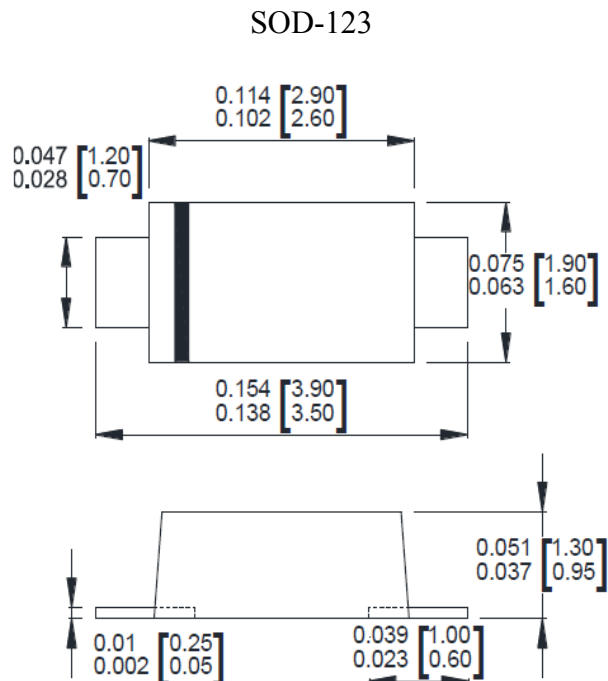
Surface Mount Transient Voltage Suppressors

Features

- Glass passivated chip
- 200 W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- RoHS compliant

Mechanical Data

- Case: Molded plastic
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any



Maximum Ratings($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | UNIT |
|---|----------------|----------------|------------------|
| Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾ | P_{PP} | 200 | W |
| Peak power dissipation with a 8/20 μ s waveform ⁽¹⁾ | P_{PP} | 1000 | W |
| Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾ | I_{PP} | See Next Table | A |
| Power dissipation on infinite heatsink at $T_L = 75^\circ\text{C}$ | P_D | 0.4 | W |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾ | I_{FSM} | 20 | A |
| Maximum instantaneous forward voltage at 25 A for unidirectional only | V_F | 3.5 | V |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to +150 | $^\circ\text{C}$ |

Note:

(1)Non-repetitive current pulse per Fig.5 and derated above $T_A=25^\circ\text{C}$ per Fig.1

(2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum



Ratings and Characteristics Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

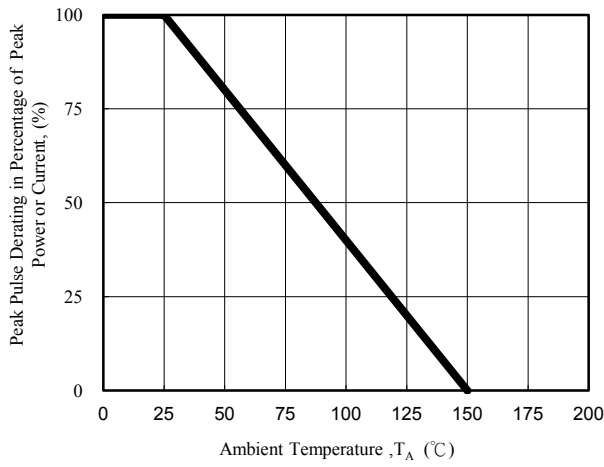


Fig. 1 - Pulse Derating Curve

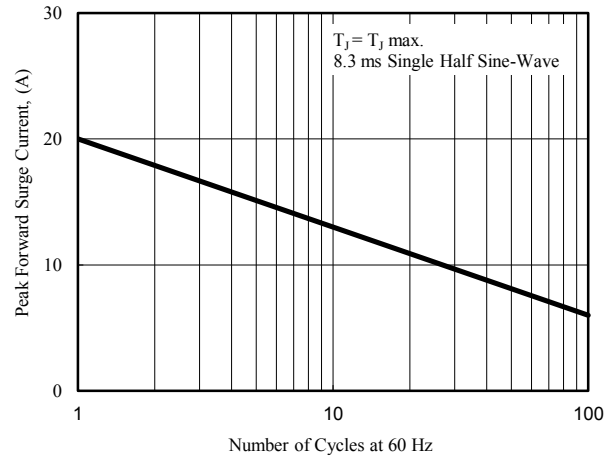


Fig. 2 - Maximum Non-Repetitive Surge Current

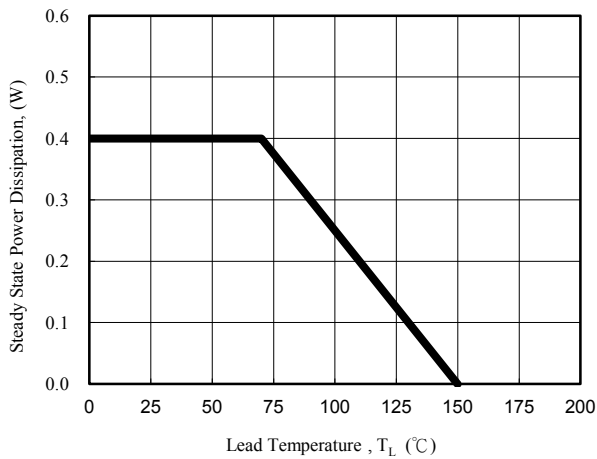


Fig. 3 - Steady State Power Derating Curve

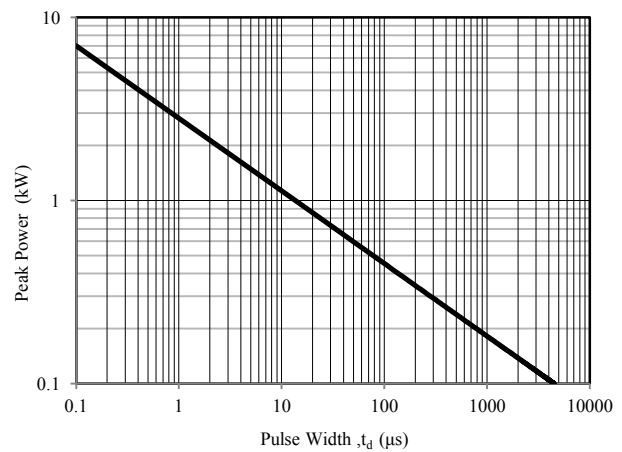


Fig. 4 - Peak Pulse Power Rating Curve

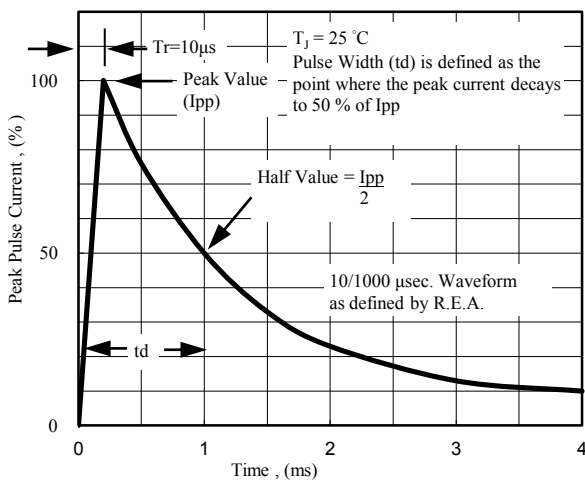


Fig. 5 - Pulse Waveform

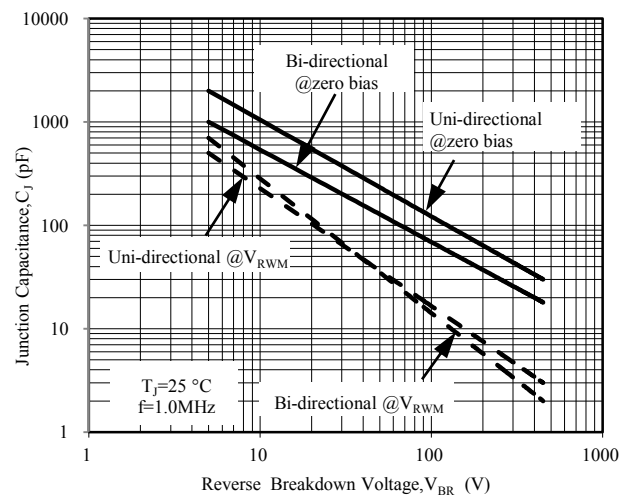


Fig. 6 - Typical Junction Capacitance



Electrical Characteristics($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Device Marking Code | | Breakdown Voltage V_{BR} @ I_T | | | Maximum Reverse Leakage I_R @ V_{RWM} (μA) | Working Peak Reverse Voltage V_{RWM} (V) | Maximum Reverse Surge Current I_{PP} (A) | Maximum Clamping Voltage V_C @ I_{PP} (V) |
|-------------------|------------------|---------------------|----|------------------------------------|---------|------------|---|--|--|---|
| | | Uni | Bi | Min (V) | Max (V) | I_T (mA) | | | | |
| SMF5.0A | SMF5.0CA | FE | KE | 6.40 | 7.00 | 10 | 400 | 5.0 | 21.74 | 9.2 |
| SMF6.0A | SMF6.0CA | FG | KG | 6.67 | 7.37 | 10 | 400 | 6.0 | 19.42 | 10.3 |
| SMF6.5A | SMF6.5CA | FK | KK | 7.22 | 7.98 | 10 | 250 | 6.5 | 17.86 | 11.2 |
| SMF7.0A | SMF7.0CA | FM | KM | 7.78 | 8.60 | 10 | 100 | 7.0 | 16.67 | 12.0 |
| SMF7.5A | SMF7.5CA | FP | KP | 8.33 | 9.21 | 1 | 50 | 7.5 | 15.50 | 12.9 |
| SMF8.0A | SMF8.0CA | FR | KR | 8.89 | 9.83 | 1 | 25 | 8.0 | 14.71 | 13.6 |
| SMF8.5A | SMF8.5CA | FT | KT | 9.44 | 10.40 | 1 | 10 | 8.5 | 13.89 | 14.4 |
| SMF9.0A | SMF9.0CA | FV | KV | 10.00 | 11.10 | 1 | 5 | 9.0 | 12.99 | 15.4 |
| SMF10A | SMF10CA | FX | KX | 11.10 | 12.30 | 1 | 2.5 | 10.0 | 11.76 | 17.0 |
| SMF11A | SMF11CA | FZ | KZ | 12.20 | 13.50 | 1 | 2.5 | 11.0 | 10.99 | 18.2 |
| SMF12A | SMF12CA | HE | LE | 13.30 | 14.70 | 1 | 2.5 | 12.0 | 10.05 | 19.9 |
| SMF13A | SMF13CA | HG | LG | 14.40 | 15.90 | 1 | 1 | 13.0 | 9.30 | 21.5 |
| SMF14A | SMF14CA | HK | LK | 15.60 | 17.20 | 1 | 1 | 14.0 | 8.62 | 23.2 |
| SMF15A | SMF15CA | HM | LM | 16.70 | 18.50 | 1 | 1 | 15.0 | 8.20 | 24.4 |
| SMF16A | SMF16CA | HP | LP | 17.80 | 19.70 | 1 | 1 | 16.0 | 7.69 | 26.0 |
| SMF17A | SMF17CA | HR | LR | 18.90 | 20.90 | 1 | 1 | 17.0 | 7.25 | 27.6 |
| SMF18A | SMF18CA | HT | LT | 20.00 | 22.10 | 1 | 1 | 18.0 | 6.85 | 29.2 |
| SMF19A | SMF19CA | HB | LB | 21.10 | 23.30 | 1 | 1 | 19.0 | 6.54 | 30.6 |
| SMF20A | SMF20CA | HV | LV | 22.20 | 24.50 | 1 | 1 | 20.0 | 6.17 | 32.4 |
| SMF22A | SMF22CA | HX | LX | 24.40 | 26.90 | 1 | 1 | 22.0 | 5.63 | 35.5 |
| SMF24A | SMF24CA | HZ | LZ | 26.70 | 29.50 | 1 | 1 | 24.0 | 5.14 | 38.9 |
| SMF26A | SMF26CA | JE | ME | 28.90 | 31.90 | 1 | 1 | 26.0 | 4.75 | 42.1 |
| SMF28A | SMF28CA | JG | MG | 31.10 | 34.40 | 1 | 1 | 28.0 | 4.41 | 45.4 |
| SMF30A | SMF30CA | JK | MK | 33.30 | 36.80 | 1 | 1 | 30.0 | 4.13 | 48.4 |
| SMF33A | SMF33CA | JM | MM | 36.70 | 40.60 | 1 | 1 | 33.0 | 3.75 | 53.3 |
| SMF36A | SMF36CA | JP | MP | 40.00 | 44.20 | 1 | 1 | 36.0 | 3.44 | 58.1 |
| SMF40A | SMF40CA | JR | MR | 44.40 | 49.10 | 1 | 1 | 40.0 | 3.10 | 64.5 |
| SMF43A | SMF43CA | JT | MT | 47.80 | 52.80 | 1 | 1 | 43.0 | 2.88 | 69.4 |
| SMF45A | SMF45CA | JV | MV | 50.00 | 55.30 | 1 | 1 | 45.0 | 2.75 | 72.7 |
| SMF48A | SMF48CA | JX | MX | 53.30 | 58.90 | 1 | 1 | 48.0 | 2.58 | 77.4 |
| SMF51A | SMF51CA | JZ | MZ | 56.70 | 62.70 | 1 | 1 | 51.0 | 2.43 | 82.4 |
| SMF54A | SMF54CA | XE | NE | 60.00 | 66.30 | 1 | 1 | 54.0 | 2.30 | 87.1 |
| SMF58A | SMF58CA | XG | NG | 64.40 | 71.20 | 1 | 1 | 58.0 | 2.14 | 93.6 |
| SMF60A | SMF60CA | XK | NK | 66.70 | 73.70 | 1 | 1 | 60.0 | 2.07 | 96.8 |
| SMF64A | SMF64CA | XM | NM | 71.10 | 78.60 | 1 | 1 | 64.0 | 1.94 | 103.0 |
| SMF70A | SMF70CA | XP | NP | 77.80 | 86.00 | 1 | 1 | 70.0 | 1.77 | 113.0 |
| SMF75A | SMF75CA | XR | NR | 83.30 | 92.10 | 1 | 1 | 75.0 | 1.65 | 121.0 |
| SMF78A | SMF78CA | XT | NT | 86.70 | 95.80 | 1 | 1 | 78.0 | 1.59 | 126.0 |
| SMF80A | SMF80CA | XB | NB | 88.80 | 97.60 | 1 | 1 | 80.0 | 1.55 | 129.0 |
| SMF85A | SMF85CA | XV | NV | 94.40 | 104.00 | 1 | 1 | 85.0 | 1.46 | 137.0 |
| SMF90A | SMF90CA | XX | NX | 100.00 | 111.00 | 1 | 1 | 90.0 | 1.37 | 146.0 |
| SMF100A | SMF100CA | XZ | NZ | 111.00 | 123.00 | 1 | 1 | 100.0 | 1.23 | 162.0 |
| SMF110A | SMF110CA | TE | PE | 122.00 | 135.00 | 1 | 1 | 110.0 | 1.13 | 177.0 |
| SMF120A | SMF120CA | TG | PG | 133.00 | 147.00 | 1 | 1 | 120.0 | 1.04 | 193.0 |
| SMF130A | SMF130CA | TK | PK | 144.00 | 159.00 | 1 | 1 | 130.0 | 0.96 | 209.0 |
| SMF140A | SMF140CA | TB | PB | 155.00 | 171.00 | 1 | 1 | 140.0 | 0.89 | 224.0 |
| SMF150A | SMF150CA | TM | PM | 167.00 | 185.00 | 1 | 1 | 150.0 | 0.82 | 243.0 |
| SMF160A | SMF160CA | TP | PP | 178.00 | 197.00 | 1 | 1 | 160.0 | 0.77 | 259.0 |
| SMF170A | SMF170CA | TR | PR | 189.00 | 209.00 | 1 | 1 | 170.0 | 0.73 | 275.0 |
| SMF180A | SMF180CA | TT | PT | 200.00 | 220.00 | 1 | 1 | 180.0 | 0.68 | 292.0 |
| SMF190A | SMF190CA | TV | PV | 211.00 | 232.00 | 1 | 1 | 190.0 | 0.65 | 308.0 |
| SMF200A | SMF200CA | TX | PX | 224.00 | 247.00 | 1 | 1 | 200.0 | 0.62 | 324.0 |
| SMF220A | SMF220CA | TZ | PZ | 246.00 | 272.00 | 1 | 1 | 220.0 | 0.56 | 356.0 |
| SMF250A | | YE | | 279.00 | 309.00 | 1 | 1 | 250.0 | 0.50 | 405.0 |
| SMF300A | | YG | | 335.00 | 371.00 | 1 | 1 | 300.0 | 0.41 | 486.0 |
| SMF350A | | YK | | 391.00 | 432.00 | 1 | 1 | 350.0 | 0.36 | 567.0 |

Note:

1. The available parts are "A" type only, the parts without A (V_{BR} is $\pm 10\%$) is not available
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V_R of 10 volts and under, the I_R limit is double

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