



Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors

Reverse Voltage 5.0 - 170 Volts

Power Dissipation - 200 Watts

Features

- For surface mounted applications in order to optimize board space
- Low profile space
- Glass passivated chip
- Low inductance
- Very fast response time
- Typical ID less than 1μA at VWM

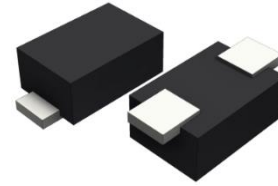
Mechanical Data

- Case: SOD-123FL molded plastic
 - Polarity: Color band denotes cathode
- Note: Products with logo  or  are made by HY Electronic (Cayman) Limited.

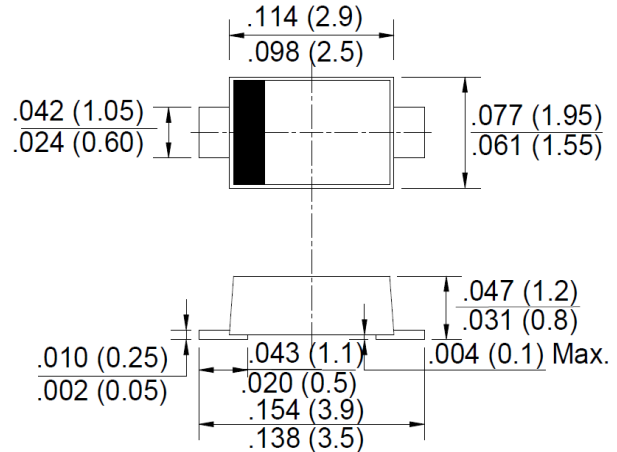
Applications

- Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET.

SOD-123FL



RoHS COMPLIANT



Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

| Characteristics | Symbol | Value | Unit |
|---|------------------|----------------|------|
| Peak Pulse Power Dissipation with a 10/1000μs Waveform (See Fig. 1) | P _{PPM} | 200 | W |
| Peak Forward Surge Current 8.3ms Single Half Sine-Wave | I _{FSM} | 20 | A |
| Peak Pulse Current with a Waveform (See Fig. 3 , Single Pulse) | I _{PPM} | See Next Table | A |
| Typical Thermal Resistance Junction to Ambient (Note1) | R _{θJA} | 120.0 | °C/W |
| Typical Thermal Resistance Junction to Lead (Note1) | R _{θJL} | 30.0 | °C/W |
| Junction Temperature Range | T _J | -55 to + 150 | °C |
| Storage Temperature Range | T _{STG} | -55 to + 150 | °C |

Notes: 1. Mounted on P.C.B. with 0.036 x 0.06" (0.9 x 1.5mm) copper pad areas.

2. 8.3ms single half sine-wave duty cycle= 4 pulses per minutes maximum (uni-directional units only)

3. The typical data above is for reference only .



Fig. 1 - Pulse Rating Curve

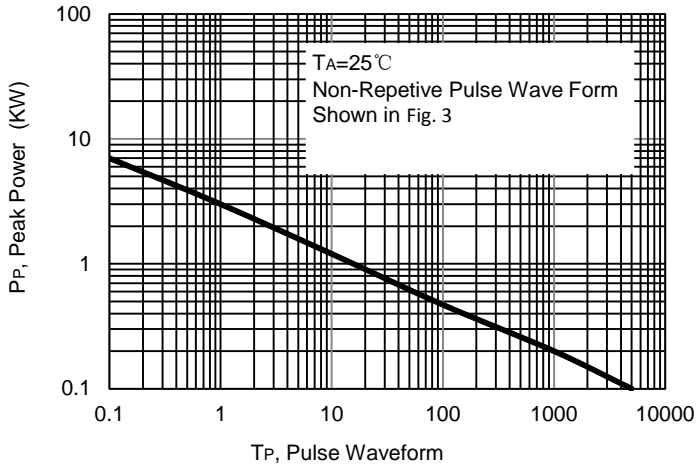


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

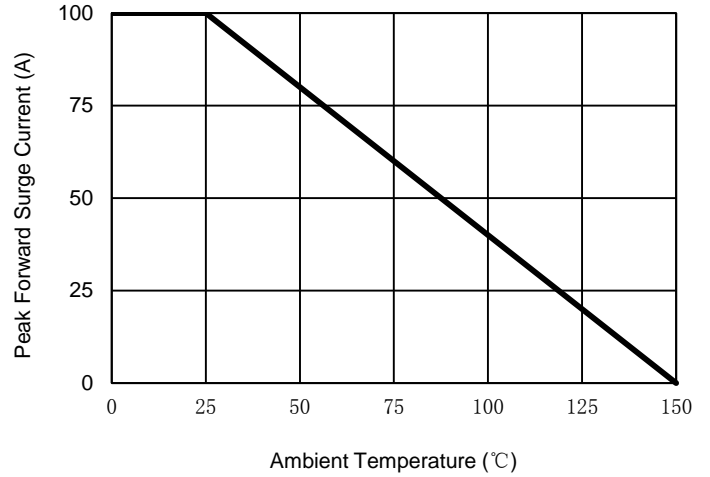


Fig. 3 - Pulse Waveform

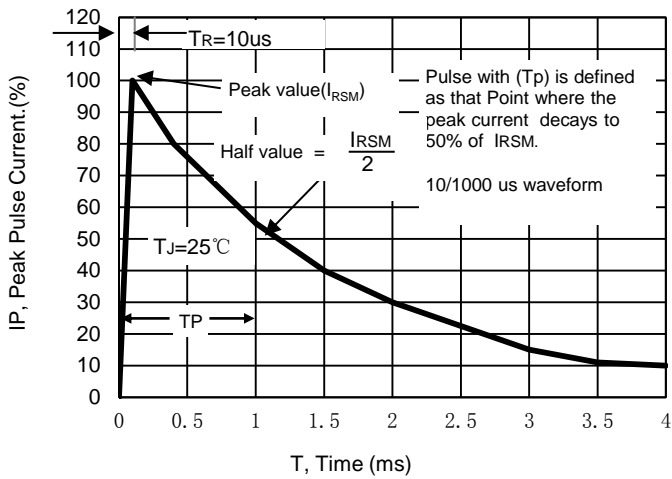


Fig.4- Typical Junction Capacitance

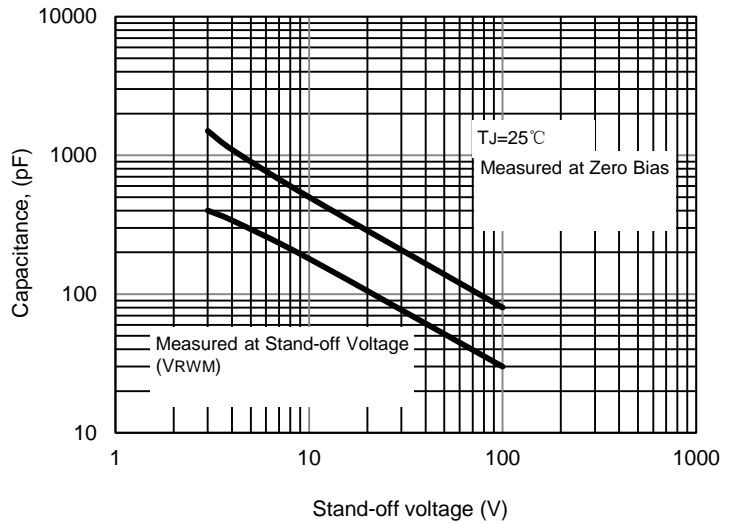
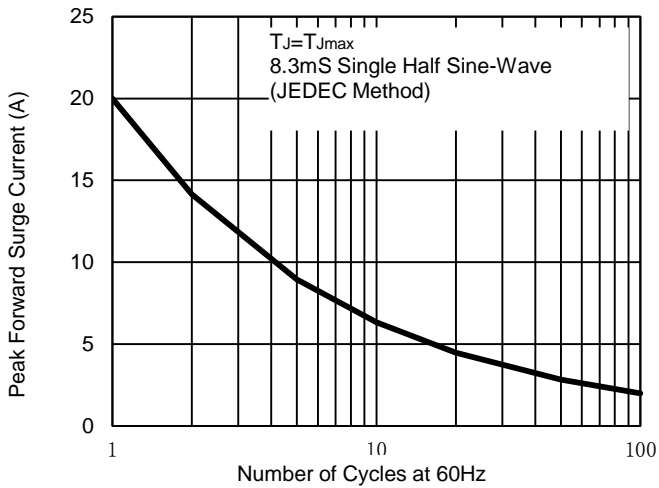


Fig. 2 - Maximum Non-Repetitive Surge Current



The curve above is for reference only.



| Part number with C donoteo Bi-Directional (Note 5) | Marking Code | | Breakdown Voltage at I_T^2 $V_{(BR)}$ (V) | | Test Current | Stand-off Voltage | Maximum Reverse Leakage at $V_{WM}^{(4)}$ | Maximum Peak Pulse Surge Current ⁽³⁾ | Maximum Clamping Voltage at IPPM |
|--|--------------|----|---|-------|--------------|-------------------|---|---|----------------------------------|
| | Uni | Bi | Min | Max | | | | | |
| SMF5.0 (C)A | KE | AE | 6.40 | 7.00 | 10 | 5.0 | 400 | 21.70 | 9.2 |
| SMF6.0 (C)A | KG | AG | 6.67 | 7.37 | 10 | 6.0 | 400 | 19.40 | 10.3 |
| SMF6.5 (C)A | KK | AK | 7.22 | 7.98 | 10 | 6.5 | 250 | 17.90 | 11.2 |
| SMF7.0 (C)A | KM | AM | 7.78 | 8.60 | 10 | 7.0 | 100 | 16.70 | 12.0 |
| SMF7.5 (C)A | KP | AP | 8.33 | 9.21 | 1.0 | 7.5 | 50 | 15.50 | 12.9 |
| SMF8.0 (C)A | KR | AR | 8.89 | 9.83 | 1.0 | 8.0 | 25 | 14.70 | 13.6 |
| SMF8.5 (C)A | KT | AT | 9.44 | 10.40 | 1.0 | 8.5 | 10 | 13.90 | 14.4 |
| SMF9.0 (C)A | KV | AV | 10.00 | 11.10 | 1.0 | 9.0 | 5.0 | 13.00 | 15.4 |
| SMF10 (C)A | KX | AX | 11.10 | 12.30 | 1.0 | 10 | 2.5 | 11.80 | 17.0 |
| SMF11 (C)A | KZ | AZ | 12.20 | 13.50 | 1.0 | 11 | 2.5 | 11.00 | 18.2 |
| SMF12 (C)A | LE | BE | 13.30 | 14.70 | 1.0 | 12 | 2.5 | 10.10 | 19.9 |
| SMF13 (C)A | LG | BG | 14.40 | 15.90 | 1.0 | 13 | 1.0 | 9.30 | 21.5 |
| SMF14 (C)A | LK | BK | 15.60 | 17.20 | 1.0 | 14 | 1.0 | 8.60 | 23.2 |
| SMF15 (C)A | LM | BM | 16.70 | 18.50 | 1.0 | 15 | 1.0 | 8.20 | 24.4 |
| SMF16 (C)A | LP | BP | 17.80 | 19.70 | 1.0 | 16 | 1.0 | 7.70 | 17.0 |
| SMF17 (C)A | LR | BR | 18.90 | 20.90 | 1.0 | 17 | 1.0 | 7.20 | 27.6 |
| SMF18 (C)A | LT | BT | 20.00 | 22.10 | 1.0 | 18 | 1.0 | 6.80 | 29.2 |
| SMF20 (C)A | LV | BV | 22.20 | 24.50 | 1.0 | 20 | 1.0 | 6.20 | 32.4 |
| SMF22 (C)A | LX | BX | 24.40 | 26.90 | 1.0 | 22 | 1.0 | 5.60 | 35.5 |
| SMF24 (C)A | LZ | BZ | 26.70 | 29.50 | 1.0 | 24 | 1.0 | 5.10 | 38.9 |
| SMF26 (C)A | ME | CE | 28.90 | 31.90 | 1.0 | 26 | 1.0 | 4.80 | 42.1 |
| SMF28 (C)A | MG | CG | 31.10 | 34.40 | 1.0 | 28 | 1.0 | 4.40 | 45.4 |
| SMF30 (C)A | MK | CK | 33.30 | 36.80 | 1.0 | 30 | 1.0 | 4.10 | 48.4 |
| SMF33 (C)A | MM | CM | 36.70 | 40.60 | 1.0 | 33 | 1.0 | 3.80 | 53.30 |
| SMF36 (C)A | MP | CP | 40.00 | 44.20 | 1.0 | 36 | 1.0 | 3.40 | 58.10 |
| SMF40 (C)A | MR | CR | 44.40 | 49.10 | 1.0 | 40 | 1.0 | 3.10 | 64.50 |
| SMF43 (C)A | MT | CT | 47.80 | 52.80 | 1.0 | 43 | 1.0 | 2.90 | 69.40 |
| SMF45 (C)A | MV | CV | 50.00 | 55.30 | 1.0 | 45 | 1.0 | 2.80 | 72.70 |
| SMF48 (C)A | MX | CX | 53.30 | 58.90 | 1.0 | 48 | 1.0 | 2.60 | 77.40 |
| SMF51 (C)A | MZ | CZ | 56.70 | 62.70 | 1.0 | 51 | 1.0 | 2.40 | 82.40 |
| SMF54 (C)A | NE | DE | 60.00 | 66.30 | 1.0 | 54 | 1.0 | 2.30 | 87.10 |
| SMF58 (C)A | NG | DG | 64.40 | 71.20 | 1.0 | 58 | 1.0 | 2.20 | 93.60 |
| SMF60 (C)A | NK | DK | 66.70 | 73.70 | 1.0 | 60 | 1.0 | 2.10 | 96.80 |
| SMF64 (C)A | NM | DM | 71.10 | 78.60 | 1.0 | 64 | 1.0 | 2.00 | 103.00 |
| SMF70 (C)A | NP | DP | 77.80 | 86.00 | 1.0 | 70 | 1.0 | 1.80 | 113.00 |
| SMF75 (C)A | NR | DR | 83.30 | 92.10 | 1.0 | 75 | 1.0 | 1.70 | 121.00 |
| SMF78 (C)A | NT | DT | 86.70 | 95.80 | 1.0 | 78 | 1.0 | 1.60 | 126.00 |
| SMF85 (C)A | NV | DV | 94.40 | 104.0 | 1.0 | 85 | 1.0 | 1.50 | 137.00 |
| SMF90 (C)A | NX | DX | 100.0 | 111.0 | 1.0 | 90 | 1.0 | 1.40 | 146.00 |
| SMF100 (C)A | NZ | DZ | 111.0 | 123.0 | 1.0 | 100 | 1.0 | 1.30 | 162.00 |
| SMF110 (C)A | PE | EE | 122.0 | 135.0 | 1.0 | 110 | 1.0 | 1.20 | 177.00 |
| SMF120 (C)A | PG | EG | 133.0 | 147.0 | 1.0 | 120 | 1.0 | 1.00 | 193.00 |
| SMF130 (C)A | PK | EK | 144.0 | 159.0 | 1.0 | 130 | 1.0 | 1.00 | 209.00 |
| SMF150 (C)A | PM | EM | 167.0 | 185.0 | 1.0 | 150 | 1.0 | 0.80 | 243.00 |
| SMF160 (C)A | PP | EP | 178.0 | 197.0 | 1.0 | 160 | 1.0 | 0.80 | 259.00 |
| SMF170 (C)A | PR | ER | 189.0 | 209.0 | 1.0 | 170 | 1.0 | 0.70 | 275.00 |

Notes: 1. Ir Pulse test : $T_p \cong 50ms$.

2. Surge current waveform 10 / 1000 μ S.

3. For bi-directional types with V_{WM} of 10 V and less, the I_D limit is doubled

4. $V_F = 3.5$ V at $I_F = 25$ A (uni-directional only). $V_F = 3.5$ V at $I_F = 25$ A

5. Suffix C denotes Bi-directional device.

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