



Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors



Reverse Voltage 5.0 - 170 Volts

Power Dissipation - 400 Watts

Features

- For surface mounted applications in order to optimize board space
- Low profile space
- Glass passivated chip
- Typical I_R less than 1 μA above 10V
- Fast response time: typically less than 1.0ns for Uni-direction, less than 5.0ns for Bi-direction, from 0 Volts to BV min

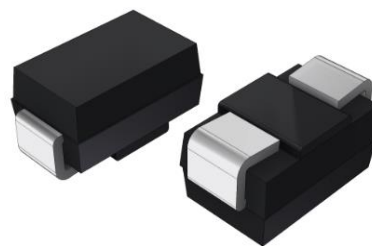
Mechanical Data

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

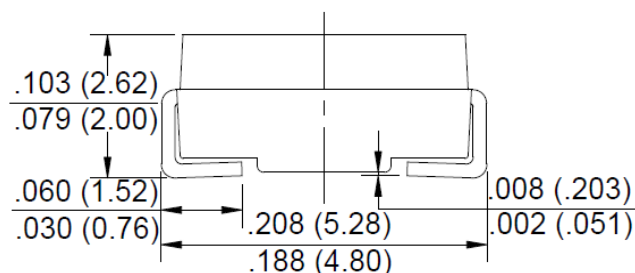
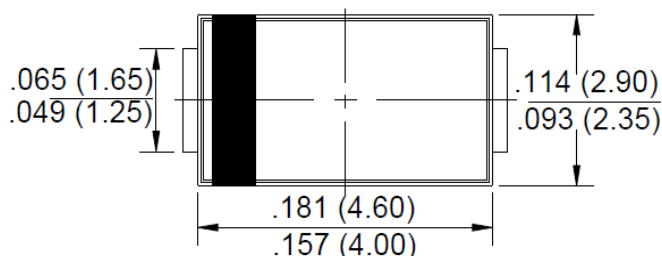
Applications

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

SMA



RoHS COMPLIANT



Package Outline Dimensions in Inches (Millimeters)

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 Power Dissipation at $T_A=25^\circ C$ $T_P=1ms$ (Note 1) | P_{PK} | 400 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave, Superimposed on Rated Load (JEDEC Method) | I_{FSM} | 40 | A |
| Steady State Power Dissipation at $T_L=75^\circ C$ | $P_{M(AV)}$ | 1.0 | W |
| Maximum Instantaneous Forward Voltage at 35A for Unidirectional Devices Only (Note 2) | V_F | 3.5 | V |
| Operating Junction Temperature Range | T_J | -55 to + 150 | $^\circ C$ |
| Storage Temperature Range | T_{STG} | -55 to + 150 | $^\circ C$ |

Notes: 1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ C$ per Fig. 1.

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



Fig. 1 - Maximum Non-Repetitive Peak Forward Surge Current

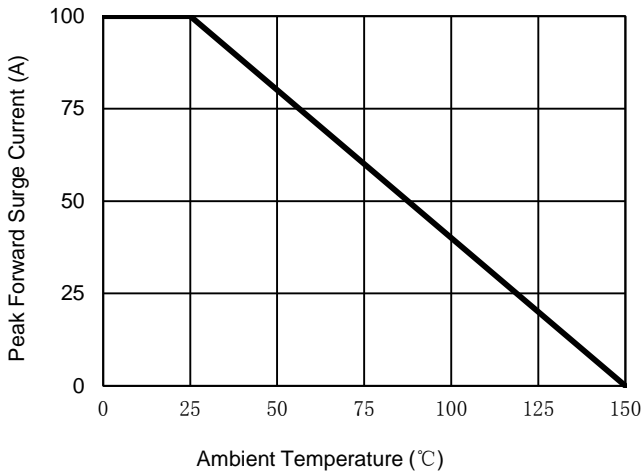


Fig. 2 - Maximum Non-Repetitive Surge Current

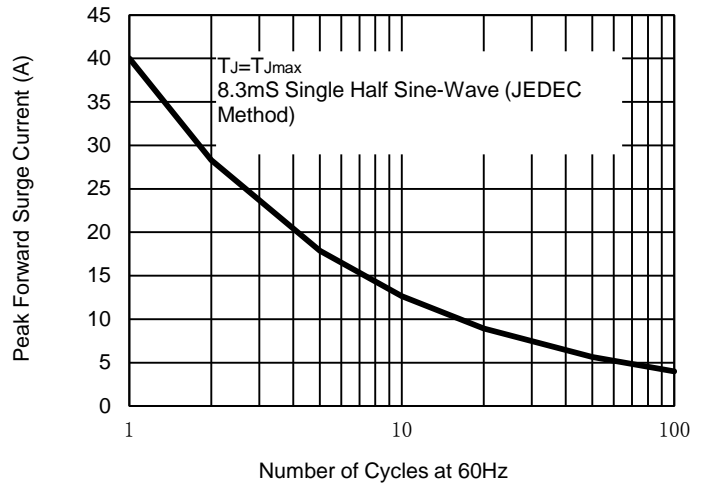


Fig. 3 - Pulse Waveform

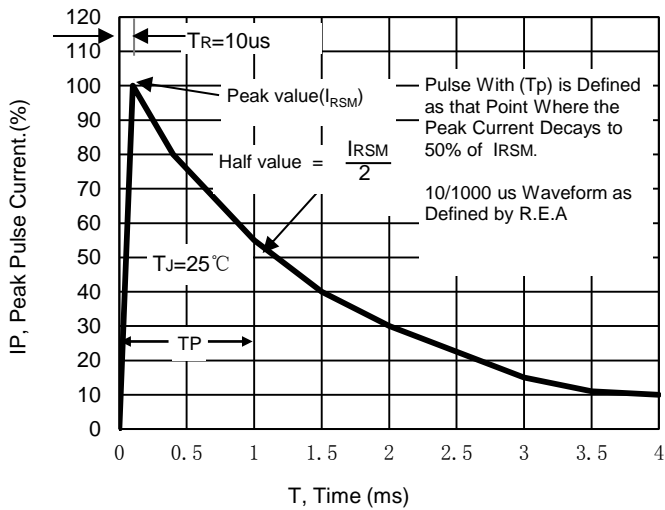


Fig. 5 - Pulse Rating Curve

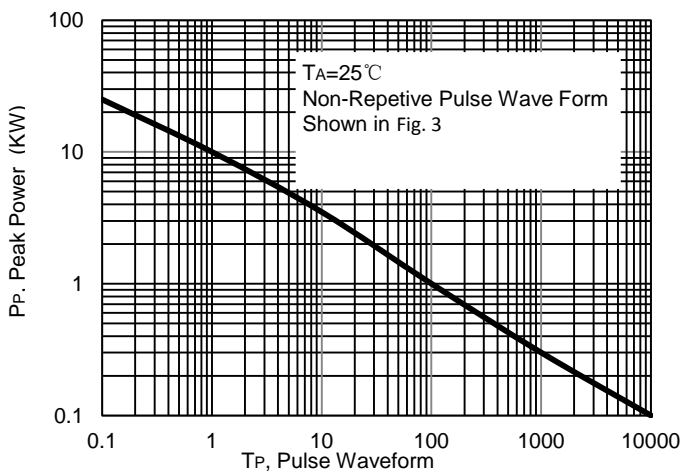


Fig. 4- Typical Junction Capacitance

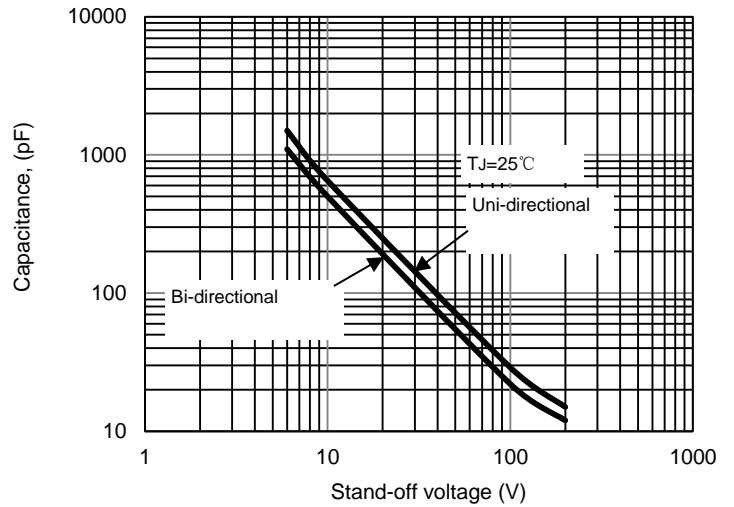
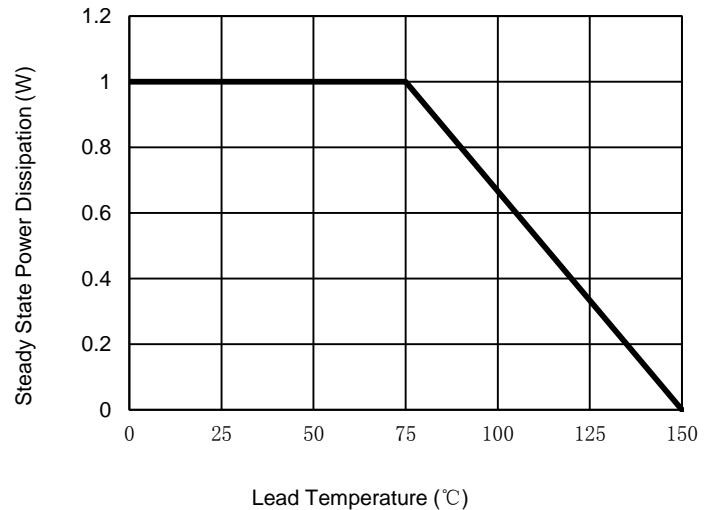


Fig. 6 - Steady State Power Derating Curve



The curve above is for reference only.



SMAJ SERIES

| Device Uni-directional | Device Bi-directional | Working Peak Reverse Voltage VRWM (volts) | Breakdown Voltage VBR Volts | | | Maximum Clamping Voltage at IPPM Vc (V) | Maximum Peak Pulse Surge Current ⁽³⁾ IPPM (A) | Maximum Reverse Leakage at VRWM IR (µA) |
|---------------------------|--------------------------|---|-----------------------------------|--------|----------|--|---|--|
| | | | Min(V) | Max(V) | @ IT(mA) | | | |
| SMAJ5.0A | SMAJ5.0CA | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 43.5 | 800/1600 |
| SMAJ6.0A | SMAJ6.0CA | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 38.8 | 800/1600 |
| SMAJ6.5A | SMAJ6.5CA | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 35.7 | 500/1000 |
| SMAJ7.0A | SMAJ7.0CA | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 33.3 | 200/400 |
| SMAJ7.5A | SMAJ7.5CA | 7.5 | 8.33 | 9.21 | 1.0 | 12.9 | 31.0 | 100/200 |
| SMAJ8.0A | SMAJ8.0CA | 8.0 | 8.89 | 9.83 | 1.0 | 13.6 | 29.4 | 50/100 |
| SMAJ8.5A | SMAJ8.5CA | 8.5 | 9.44 | 10.40 | 1.0 | 14.4 | 27.7 | 10/20 |
| SMAJ9.0A | SMAJ9.0CA | 9.0 | 10.00 | 11.10 | 1.0 | 15.4 | 26.0 | 5/10 |
| SMAJ10A | SMAJ10CA | 10.0 | 11.10 | 12.30 | 1.0 | 17.0 | 23.5 | 5/10 |
| SMAJ11A | SMAJ11CA | 11.0 | 12.20 | 13.50 | 1.0 | 18.2 | 22.0 | 5.0 |
| SMAJ12A | SMAJ12CA | 12.0 | 13.30 | 14.70 | 1.0 | 19.9 | 20.1 | 5.0 |
| SMAJ13A | SMAJ13CA | 13.0 | 14.40 | 15.90 | 1.0 | 21.5 | 18.6 | 5.0 |
| SMAJ14A | SMAJ14CA | 14.0 | 15.60 | 17.20 | 1.0 | 23.2 | 17.2 | 5.0 |
| SMAJ15A | SMAJ15CA | 15.0 | 16.70 | 18.50 | 1.0 | 24.4 | 16.4 | 5.0 |
| SMAJ16A | SMAJ16CA | 16.0 | 17.80 | 19.70 | 1.0 | 26.0 | 15.3 | 5.0 |
| SMAJ17A | SMAJ17CA | 17.0 | 18.90 | 20.90 | 1.0 | 27.6 | 14.5 | 5.0 |
| SMAJ18A | SMAJ18CA | 18.0 | 20.00 | 22.10 | 1.0 | 29.2 | 13.7 | 5.0 |
| SMAJ20A | SMAJ20CA | 20.0 | 22.20 | 24.50 | 1.0 | 32.4 | 12.3 | 5.0 |
| SMAJ22A | SMAJ22CA | 22.0 | 24.40 | 26.90 | 1.0 | 35.5 | 11.2 | 5.0 |
| SMAJ24A | SMAJ24CA | 24.0 | 26.70 | 29.50 | 1.0 | 38.9 | 10.3 | 5.0 |
| SMAJ26A | SMAJ26CA | 26.0 | 28.90 | 31.90 | 1.0 | 42.1 | 9.5 | 5.0 |
| SMAJ28A | SMAJ28CA | 28.0 | 31.10 | 34.40 | 1.0 | 45.4 | 8.8 | 5.0 |
| SMAJ30A | SMAJ30CA | 30.0 | 33.30 | 36.80 | 1.0 | 48.4 | 8.3 | 5.0 |
| SMAJ33A | SMAJ33CA | 33.0 | 36.70 | 40.60 | 1.0 | 53.3 | 7.5 | 5.0 |
| SMAJ36A | SMAJ36CA | 36.0 | 40.0 | 44.2 | 1.0 | 58.1 | 6.9 | 5.0 |
| SMAJ40A | SMAJ40CA | 40.0 | 44.4 | 49.1 | 1.0 | 64.5 | 6.2 | 5.0 |
| SMAJ43A | SMAJ43CA | 43.0 | 47.8 | 52.8 | 1.0 | 69.4 | 5.7 | 5.0 |
| SMAJ45A | SMAJ45CA | 45.0 | 50.0 | 55.3 | 1.0 | 72.7 | 5.5 | 5.0 |
| SMAJ48A | SMAJ48CA | 48.0 | 53.3 | 58.9 | 1.0 | 77.4 | 5.2 | 5.0 |
| SMAJ51A | SMAJ51CA | 51.0 | 56.7 | 62.7 | 1.0 | 82.4 | 4.9 | 5.0 |
| SMAJ54A | SMAJ54CA | 54.0 | 60.0 | 66.3 | 1.0 | 87.1 | 4.6 | 5.0 |
| SMAJ58A | SMAJ58CA | 58.0 | 64.4 | 71.2 | 1.0 | 93.6 | 4.3 | 5.0 |
| SMAJ60A | SMAJ60CA | 60.0 | 66.7 | 73.7 | 1.0 | 96.8 | 4.1 | 5.0 |
| SMAJ64A | SMAJ64CA | 64.0 | 71.1 | 78.6 | 1.0 | 103.0 | 3.9 | 5.0 |
| SMAJ70A | SMAJ70CA | 70.0 | 77.8 | 86.0 | 1.0 | 113.0 | 3.5 | 5.0 |
| SMAJ75A | SMAJ75CA | 75.0 | 83.3 | 92.1 | 1.0 | 121.0 | 3.3 | 5.0 |
| SMAJ78A | SMAJ78CA | 78.0 | 86.7 | 95.8 | 1.0 | 126.0 | 3.2 | 5.0 |
| SMAJ85A | SMAJ85CA | 85.0 | 94.4 | 104.0 | 1.0 | 137.0 | 2.9 | 5.0 |
| SMAJ90A | SMAJ90CA | 90.0 | 100.0 | 111.0 | 1.0 | 146.0 | 2.7 | 5.0 |
| SMAJ100A | SMAJ100CA | 100.0 | 111.0 | 123.0 | 1.0 | 162.0 | 2.5 | 5.0 |
| SMAJ110A | SMAJ110CA | 110.0 | 122.0 | 135.0 | 1.0 | 177.0 | 2.3 | 5.0 |
| SMAJ120A | SMAJ120CA | 120.0 | 133.0 | 147.0 | 1.0 | 193.0 | 2.0 | 5.0 |
| SMAJ130A | SMAJ130CA | 130.0 | 144.0 | 159.0 | 1.0 | 209.0 | 1.9 | 5.0 |
| SMAJ150A | SMAJ150CA | 150.0 | 167.0 | 185.0 | 1.0 | 243.0 | 1.6 | 5.0 |
| SMAJ160A | SMAJ160CA | 160.0 | 178.0 | 197.0 | 1.0 | 259.0 | 1.5 | 5.0 |
| SMAJ170A | SMAJ170CA | 170.0 | 189.0 | 209.0 | 1.0 | 275.0 | 1.4 | 5.0 |

Notes: 1. For bidirectional use CA suffix for types SMAJ5.0CA thru types SMAJ170CA
 2. Electrical characteristics apply in both directions.



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