

400W Surface Mount Transient Voltage Suppressor

Features

- Stand-off voltage from 5.0 to 170 volts
- 400W Peak Pulse Power capability on 10/1000 μ s waveform repetition rate(duty cycle): 0.01%
- Ideal for ESD protection of data lines in accordance with IEC 1000-4-2 (IEC801-2)
- Ideal for EFT protection of data lines in accordance with IEC 1000-4-4 (IEC801-4)
- Fast response time: typically less than 1.0ps from 0v to VBR
- Low incremental surge resistance, excellent clamping capability
- Typical IR less than 1 μ A above 10V
- High temperature soldering guaranteed:
250°C/10 seconds at terminals
- This series is UL recognized under component index. File number E315008
- RoHS Compliant

SMA



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

| Symbol | Description | Value | Unit | Conditions |
|--------------------------------------|--|-------------|------|--|
| V_{WM} | Stand-Off Voltage | 5.0 to 170 | V | |
| PPPM | Peak Pulse Power Dissipation on 10/1000 μ s waveform | Minimum 400 | W | Non-repetitive current pulse |
| IPPM | Peak Pulse current on 10/1000 μ s waveform | See Table | A | Non-repetitive current pulse |
| PM(AV) | Steady State Power Dissipation | 1.0 | W | At TL(Lead Temperature)=75°C (Note 1) |
| IFSM | Peak Forward Surge Current | 40.0 | A | 8.3ms single half sine-wave superimposed on rated load (uni-direction only), TL=75°C |
| V_F | Maximum Instantaneous Forward Voltage | 3.5 | V | 8.3ms single half sine-wave (uni-direction only), TL=75°C |
| T_J,T_{STG} | Operating Junction and Storage Temperature Range | -55 to 150 | ° C | |

Note: (1) Mounted on copper pad area of 0.2" x 0.2" (5.0mmx5.0mm).

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SMAJ5.0A~170CA

Mechanical Data

| | |
|---------------------------|---|
| Case: | JEDEC DO-214AC molded plastic |
| Epoxy: | Meets UL 94V-0 flammability rating |
| Terminals: | Plated axial leads, solderable per MIL-STD-750, Method 2026 |
| Polarity: | Cathode indicated by color band |
| Mounting position: | Any |
| Weight: | 0.002 ounces, 0.064 gram |

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

| P/N (note1) | | Device Marking Code | | Stand-Off Voltage | Breakdown Voltage @ Test Current | | | Max. Clamping Voltage @ IPPM | Max. Peak Pulse Current | Max. Reverse Leakage Current @ V_{WM} |
|-------------|-----------|---------------------|----|-------------------|----------------------------------|------|------------|------------------------------|-------------------------|---|
| | | | | | V_{BR} | | I_T (mA) | | | |
| Uni-Polar | Bi-Polar | Uni | Bi | V_{WM} (V) | Min. | Max. | | V_C (V) | IPPM (A) | I_D (μ A) (note2) |
| SMAJ5.0A | SMAJ5.0CA | AE | WE | 5.0 | 6.4 | 7.08 | 10 | 9.2 | 43.5 | 800/1600 |
| SMAJ6.0A | SMAJ6.0CA | AG | WG | 6.0 | 6.67 | 7.37 | | 10.3 | 38.8 | 800/1600 |
| SMAJ6.5A | SMAJ6.5CA | AK | WK | 6.5 | 7.22 | 7.98 | | 11.2 | 35.7 | 500/1000 |
| SMAJ7.0A | SMAJ7.0CA | AM | WM | 7.0 | 7.78 | 8.6 | | 12.0 | 33.3 | 200/400 |
| SMAJ7.5A | SMAJ7.5CA | AP | WP | 7.5 | 8.33 | 9.21 | 1.0 | 12.9 | 31.0 | 100/200 |
| SMAJ8.0A | SMAJ8.0CA | AR | WR | 8.0 | 8.89 | 9.83 | | 13.6 | 29.4 | 50/100 |
| SMAJ8.5A | SMAJ8.5CA | AT | WT | 8.5 | 9.44 | 10.4 | | 14.4 | 27.8 | 10/20 |
| SMAJ9.0A | SMAJ9.0CA | AV | WV | 9.0 | 10.0 | 11.1 | | 15.4 | 26.0 | 5/10 |
| SMAJ10A | SMAJ10CA | AX | WX | 10 | 11.1 | 12.3 | 1.0 | 17.0 | 23.5 | 1/2 |
| SMAJ11A | SMAJ11CA | AZ | WZ | 11 | 12.2 | 13.5 | 1.0 | 18.2 | 22.0 | 1.0 |
| SMAJ12A | SMAJ12CA | BE | XE | 12 | 13.3 | 14.7 | | 19.9 | 20.1 | |
| SMAJ13A | SMAJ13CA | BG | XG | 13 | 14.4 | 15.9 | | 21.5 | 18.6 | |
| SMAJ14A | SMAJ14CA | BK | XK | 14 | 15.6 | 17.2 | 1.0 | 23.2 | 17.2 | 1.0 |
| SMAJ15A | SMAJ15CA | BM | XM | 15 | 16.7 | 18.5 | | 24.4 | 16.4 | |
| SMAJ16A | SMAJ16CA | BP | XP | 16 | 17.8 | 19.7 | | 26.0 | 15.4 | |
| SMAJ17A | SMAJ17CA | BR | XR | 17 | 18.9 | 20.9 | | 27.6 | 14.5 | |

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SMAJ5.0A~170CA

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| P/N | | Device Marking Code | | Stand-Off Voltage | Breakdown Voltage @ Test Current | | | Max. Clamping Voltage @ IPPM | Max. Peak Pulse Current | Max. Reverse Leakage Current @ V_{WM} |
|-----------|----------|---------------------|----|-------------------|----------------------------------|------|------------|------------------------------|-------------------------|---|
| | | | | | V_{BR} | | I_T (mA) | | | |
| Uni-Polar | Bi-Polar | Uni | Bi | V_{WM} (V) | Min. | Max. | | V_C (V) | IPPM (A) | I_D (μ A) |
| SMAJ18A | SMAJ18CA | BT | XT | 18 | 20.0 | 22.1 | 1.0 | 29.2 | 13.7 | 1.0 |
| SMAJ20A | SMAJ20CA | BV | XV | 20 | 22.2 | 24.5 | | 32.4 | 12.3 | |
| SMAJ22A | SMAJ22CA | BX | XX | 22 | 24.4 | 26.9 | | 35.5 | 11.3 | |
| SMAJ24A | SMAJ24CA | BZ | XZ | 24 | 26.7 | 29.5 | | 38.9 | 10.3 | |
| SMAJ26A | SMAJ26CA | CE | YE | 26 | 28.9 | 31.9 | 1.0 | 42.1 | 9.5 | 1.0 |
| SMAJ28A | SMAJ28CA | CG | YG | 28 | 31.1 | 34.4 | | 45.4 | 8.8 | |
| SMAJ30A | SMAJ30CA | CK | YK | 30 | 33.3 | 36.8 | | 48.4 | 8.3 | |
| SMAJ33A | SMAJ33CA | CM | YM | 33 | 36.7 | 40.6 | | 53.3 | 7.5 | |
| SMAJ36A | SMAJ36CA | CP | YP | 36 | 40.0 | 44.2 | 1.0 | 58.1 | 6.9 | 1.0 |
| SMAJ40A | SMAJ40CA | CR | YR | 40 | 44.4 | 49.1 | | 64.5 | 6.2 | |
| SMAJ43A | SMAJ43CA | CT | YT | 43 | 47.8 | 52.8 | | 69.4 | 5.8 | |
| SMAJ45A | SMAJ45CA | CV | YV | 45 | 50.0 | 55.3 | | 72.7 | 5.5 | |
| SMAJ48A | SMAJ48CA | CX | YX | 48 | 53.3 | 58.9 | 1.0 | 77.4 | 5.2 | 1.0 |
| SMAJ51A | SMAJ51CA | CZ | YZ | 51 | 56.7 | 62.7 | | 82.4 | 4.9 | |
| SMAJ54A | SMAJ54CA | RE | ZE | 54 | 60.0 | 66.3 | | 87.1 | 4.6 | |
| SMAJ58A | SMAJ58CA | RG | ZG | 58 | 64.4 | 71.2 | | 93.6 | 4.3 | |
| SMAJ60A | SMAJ60CA | RK | ZK | 60 | 66.7 | 73.7 | 1.0 | 96.8 | 4.1 | 1.0 |
| SMAJ64A | SMAJ64CA | RM | ZM | 64 | 71.1 | 78.6 | | 103.0 | 3.9 | |
| SMAJ70A | SMAJ70CA | RP | ZP | 70 | 77.8 | 86.0 | | 113.0 | 3.5 | |
| SMAJ75A | SMAJ75CA | RR | ZR | 75 | 83.3 | 92.1 | | 121.0 | 3.3 | |
| SMAJ78A | SMAJ78CA | RT | ZT | 78 | 86.7 | 95.8 | 1.0 | 126.0 | 3.2 | 1.0 |
| SMAJ85A | SMAJ85CA | RV | ZV | 85 | 94.4 | 104 | | 137.0 | 2.9 | |
| SMAJ90A | SMAJ90CA | RX | ZX | 90 | 100 | 111 | | 146.0 | 2.7 | |

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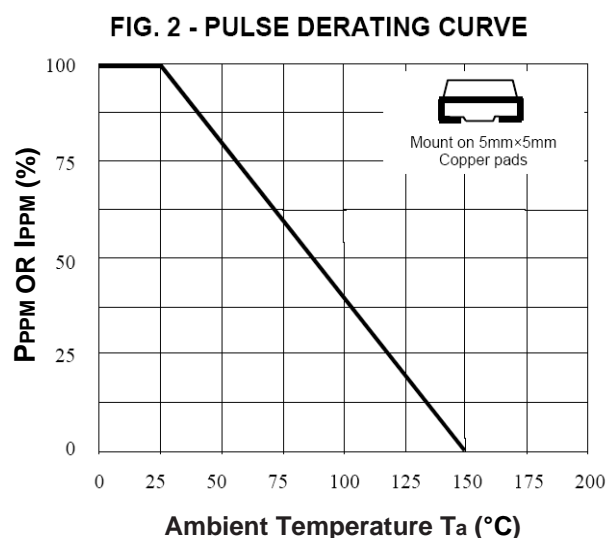
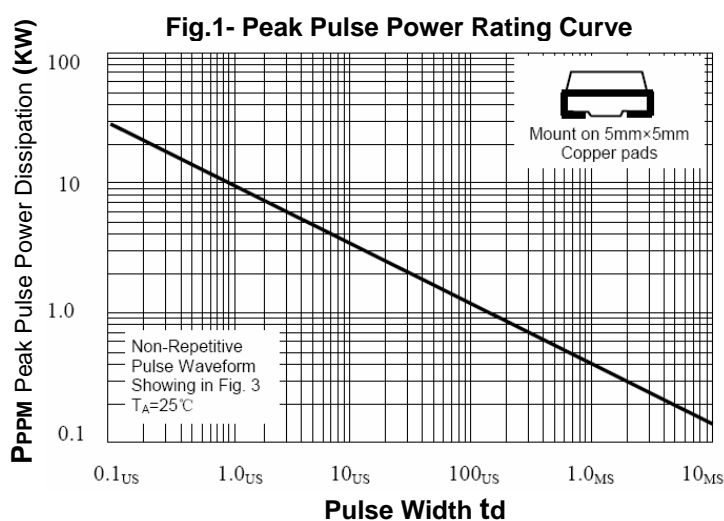
SMAJ5.0A~170CA

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

| P/N | | Device Marking Code | | Stand-Off Voltage | Breakdown Voltage @ Test Curr. | | | Max. Clamping Vltg. @ IPPM | Max. Peak Pulse Current | Max. Reverse Leakage Current @ V_{WM} |
|-----------|-----------|---------------------|----|-------------------|--------------------------------|------|------------|----------------------------|-------------------------|---|
| | | | | | V_{BR} | | I_T (mA) | | | |
| Uni-Polar | Bi-Polar | Uni | Bi | V_{WM} (V) | Min. | Max. | | V_C (V) | IPP (A) | I_D (μ A) |
| SMAJ100A | SMAJ100CA | RZ | ZZ | 100 | 111 | 123 | 1.0 | 162.0 | 2.5 | 1.0 |
| SMAJ110A | SMAJ110CA | SE | VE | 110 | 122 | 135 | | 177.0 | 2.3 | |
| SMAJ120A | SMAJ120CA | SG | VG | 120 | 133 | 147 | | 193.0 | 2.1 | |
| SMAJ130A | SMAJ130CA | SK | VK | 130 | 144 | 159 | | 209.0 | 1.9 | |
| SMAJ150A | SMAJ150CA | SM | VM | 150 | 167 | 185 | 1.0 | 243.0 | 1.6 | 1.0 |
| SMAJ160A | SMAJ160CA | SP | VP | 160 | 178 | 197 | | 259.0 | 1.5 | |
| SMAJ170A | SMAJ170CA | SR | VR | 170 | 189 | 209 | | 275.0 | 1.4 | |

- Note:** 1. For parts with suffix A, the V_{BR} is +/- 5%.
 2. For Bi-directional type having V_{WM} of 10V or less, the I_D limit is double.

Typical Characteristics Curves



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SMAJ5.0A~170CA

Fig.3- Pulse Waveform

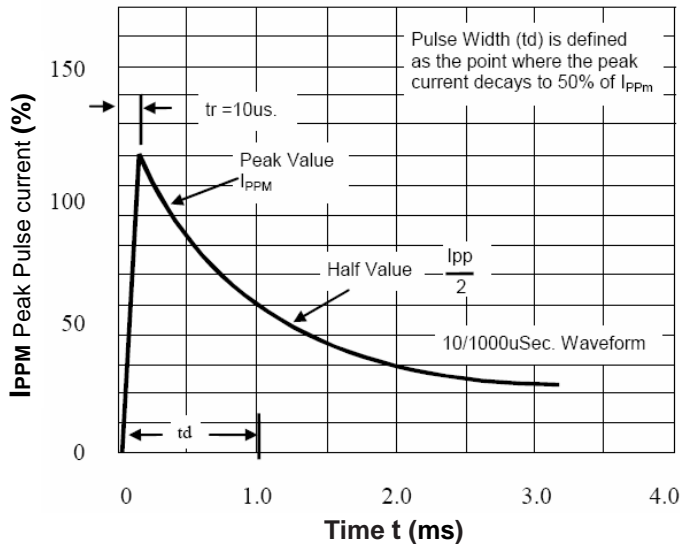


Fig.4- Max. Non-Repetitive Forward Surge Current Uni-directional only

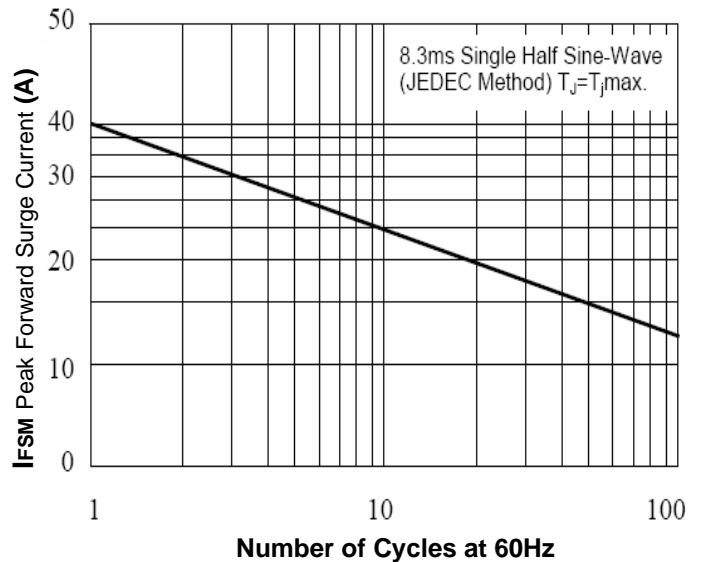


Fig.5- Steady State Power Derating Curve

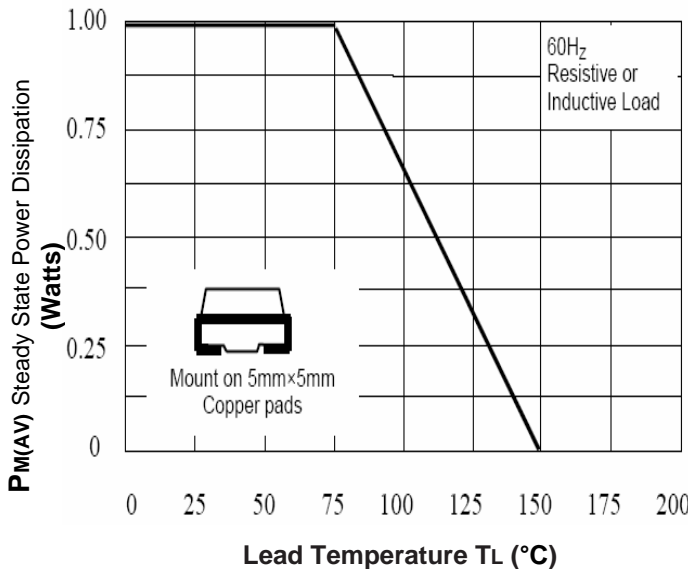
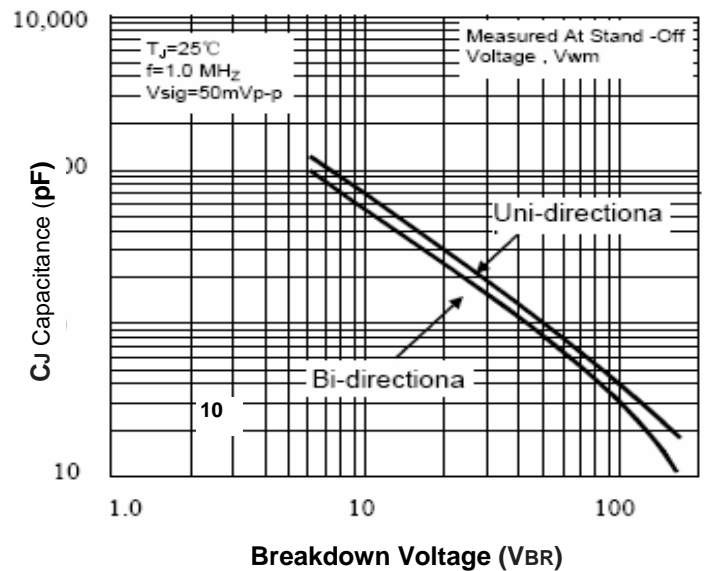


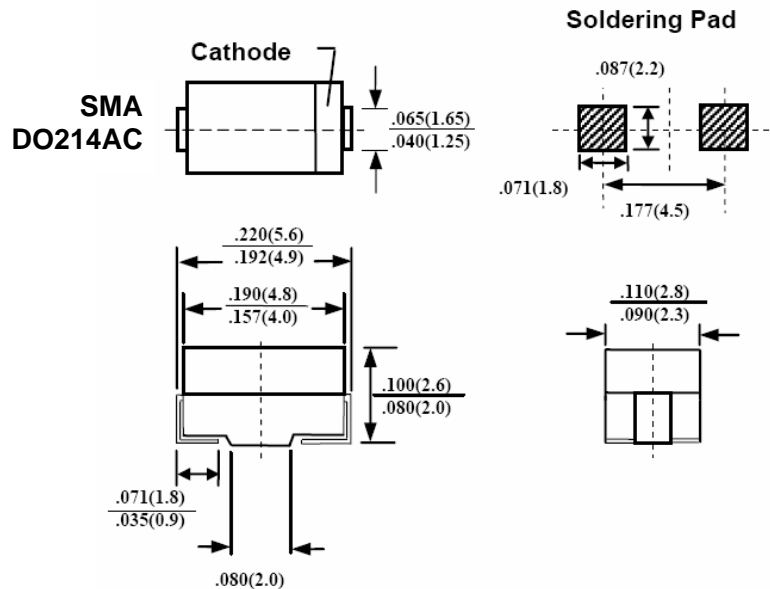
Fig.6- Capacitance



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Dimensions



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