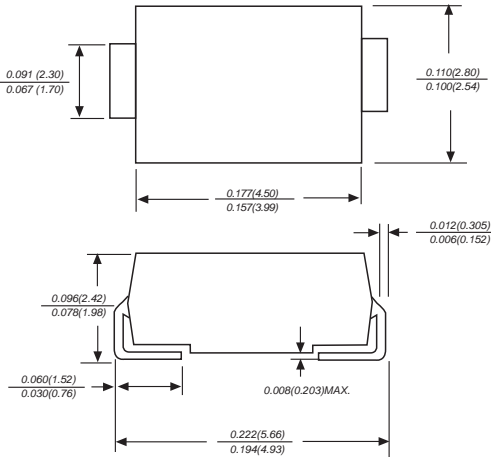


SMAJ5.0 THRU SMAJ170CA

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Stand-off Voltage: 5.0-170 Volts Peak pulse power: 300 Watts

DO-214AC



Dimensions in inches and (millimeters)

FEATURE

- ◆ Optimized for LAN protection applications
- ◆ 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 IEC1000-4-4(IEC801-2)
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ 300w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0v to $V_{(BR)}$ min
- ◆ High temperature soldering guaranteed: 250°C/10S at terminals

MECHANICAL DATA

Case: JEDEC DO-214AC molded plastic body over passivated chip

Terminals: Solder plated, solderable per MIL-STD 750, method 2026

Polarity: Color band denotes cathode except for bidirectional types

Mounting Position: Any

Weight: 0.003 ounce, 0.093 grams

DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use suffix C or CA for types SMAJ5.0 thru SMAJ170 (e.g. SMAJ5.0C, SMAJ170CA)
Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| | SYMBOLS | VALUE | UNITS |
|--|-----------------------------------|--------------|-------|
| Peak pulse power dissipation with a 10/1000μs wavetorm(NOTE 1,2,5,FIG.1) | P _{PPM} | Minimum 300 | Watts |
| Peak forward surge current (Note 4) | I _{FSM} | 40.0 | Amps |
| Peak pulse current with a 10/1000μs waveform(NOTE 1) | I _{PPM} | See Table 1 | Amps |
| Steady state power dissipation (Note 3) | P _{M(AV)} | 1.0 | Watts |
| Maximum instantaneous forward voltage at 25A(Note 4) | V _F | 3.5 | Volts |
| Operating junction and storage temperature range | T _{STG} , T _J | -55 to + 150 | °C |

- Notes:**
1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig.2
 2. Mounted on 5.0mm² copper pads to each terminal
 3. Lead temperature at T_L=75°C per Fig.5
 4. Measured on 8.3ms single half sine-wave. For uni-directional devices only.
 5. Peak pulse power waveform is 10/1000μs

ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Device | Device Marking Code | | Working Peak Reverse Voltage V _{WM} (Volts) | Breakdown Voltage V _(BR) (Volts) at I _T | | Test Current I _T (mA) | Maximum Clamping Voltage at I _{PPM} V _C (Volts)(NOTE5) | Maximum Peak Pulse Reverse Current I _{PPM} (NOTE5) (Amps) | Maximum Reverse Leakage a V _{WM} I _D (μA) |
|----------|---------------------|----|--|---|------|----------------------------------|--|--|---|
| | UNI | BI | | MIN | MAX | | | | |
| SMAJ5.0 | AD | WD | 5.0 | 6.40 | 7.81 | 10 | 9.6 | 31.3 | 800 |
| SMAJ5.0A | AE | WE | 5.0 | 6.40 | 7.08 | 10 | 9.2 | 32.6 | 800 |
| SMAJ6.0 | AF | WF | 6.0 | 6.67 | 8.15 | 10 | 11.4 | 26.3 | 800 |
| SMAJ6.0A | AG | WG | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 29.1 | 800 |
| SMAJ6.5 | AH | WH | 6.5 | 7.22 | 8.82 | 10 | 12.3 | 24.4 | 500 |
| SMAJ6.5A | AK | WK | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 26.8 | 500 |
| SMAJ7.0 | AL | WL | 7.0 | 7.78 | 9.51 | 10 | 13.3 | 22.6 | 200 |
| SMAJ7.0A | AM | WM | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 25.0 | 200 |
| SMAJ7.5 | AN | WN | 7.5 | 8.33 | 10.3 | 1.0 | 14.3 | 21.0 | 100 |
| SMAJ7.5A | AP | WP | 7.5 | 8.33 | 9.21 | 1.0 | 12.9 | 23.3 | 100 |
| SMAJ8.0 | AQ | WQ | 8.0 | 8.89 | 10.9 | 1.0 | 15.0 | 20.0 | 50.0 |
| SMAJ8.0A | AR | WR | 8.0 | 8.89 | 9.83 | 1.0 | 13.6 | 22.1 | 50.0 |
| SMAJ8.5 | AS | WS | 8.5 | 9.44 | 11.5 | 1.0 | 15.9 | 18.9 | 10.0 |
| SMAJ8.5A | AT | WT | 8.5 | 9.44 | 10.4 | 1.0 | 14.4 | 20.8 | 10.0 |
| SMAJ9.0 | AU | WU | 9.0 | 10.0 | 12.2 | 1.0 | 16.9 | 17.8 | 5.0 |
| SMAJ9.0A | AV | WV | 9.0 | 10.0 | 11.1 | 1.0 | 15.4 | 19.5 | 5.0 |
| SMAJ10 | AW | WV | 10.00 | 11.1 | 13.6 | 1.0 | 18.8 | 16.0 | 5.0 |
| SMAJ10A | AX | WX | 10.00 | 11.1 | 12.3 | 1.0 | 17.0 | 17.6 | 5.0 |
| SMAJ11 | AY | WY | 11.00 | 12.2 | 14.9 | 1.0 | 20.1 | 14.9 | 5.0 |
| SMAJ11A | AZ | WZ | 11.00 | 12.2 | 13.5 | 1.0 | 18.2 | 16.5 | 5.0 |
| SMAJ12 | BD | XD | 12.00 | 13.3 | 16.3 | 1.0 | 22.0 | 13.6 | 5.0 |
| SMAJ12A | BE | XE | 12.00 | 13.3 | 14.7 | 1.0 | 19.9 | 15.1 | 5.0 |
| SMAJ13 | BF | XF | 13.00 | 14.4 | 17.6 | 1.0 | 23.8 | 12.6 | 5.0 |
| SMAJ13A | BG | XG | 13.00 | 14.4 | 15.9 | 1.0 | 21.5 | 14.0 | 5.0 |
| SMAJ14 | BH | XH | 14.00 | 15.6 | 19.1 | 1.0 | 25.8 | 11.6 | 5.0 |
| SMAJ14A | BK | XK | 14.00 | 15.6 | 17.2 | 1.0 | 23.2 | 12.9 | 5.0 |
| SMAJ15 | BL | XL | 15.00 | 16.7 | 20.4 | 1.0 | 26.9 | 11.2 | 5.0 |
| SMAJ15A | BM | XM | 15.00 | 16.7 | 18.5 | 1.0 | 24.4 | 12.3 | 5.0 |
| SMAJ16 | BN | XN | 16.00 | 17.8 | 21.8 | 1.0 | 28.8 | 10.4 | 5.0 |
| SMAJ16A | BP | XP | 16.00 | 17.8 | 19.7 | 1.0 | 26.0 | 11.5 | 5.0 |
| SMAJ17 | BQ | XQ | 17.00 | 18.9 | 23.1 | 1.0 | 30.5 | 9.8 | 5.0 |
| SMAJ17A | BR | XR | 17.00 | 18.9 | 20.9 | 1.0 | 27.6 | 10.9 | 5.0 |
| SMAJ18 | BS | XS | 18.00 | 20.0 | 24.4 | 1.0 | 32.2 | 9.3 | 5.0 |
| SMAJ18A | BT | XT | 18.00 | 20.0 | 22.1 | 1.0 | 29.2 | 10.3 | 5.0 |
| SMAJ20 | BU | XU | 20.00 | 22.2 | 27.1 | 1.0 | 35.8 | 8.4 | 5.0 |
| SMAJ20A | BV | XV | 20.00 | 22.2 | 24.5 | 1.0 | 32.4 | 9.3 | 5.0 |
| SMAJ22 | BW | XW | 22.00 | 24.4 | 29.8 | 1.0 | 39.4 | 7.6 | 5.0 |
| SMAJ22A | BX | XX | 22.00 | 24.4 | 26.9 | 1.0 | 35.5 | 8.5 | 5.0 |
| SMAJ24 | BY | XY | 24.00 | 26.7 | 32.6 | 1.0 | 43.0 | 7.0 | 5.0 |
| SMAJ24A | BZ | XZ | 24.00 | 26.7 | 29.5 | 1.0 | 38.9 | 7.7 | 5.0 |
| SMAJ26 | CD | YD | 26.00 | 28.9 | 35.3 | 1.0 | 46.6 | 6.4 | 5.0 |
| SMAJ26A | CE | YE | 26.00 | 28.9 | 31.9 | 1.0 | 42.1 | 7.1 | 5.0 |
| SMAJ28 | CF | YF | 28.00 | 31.1 | 38.0 | 1.0 | 50.0 | 6.0 | 5.0 |
| SMAJ28A | CG | YG | 28.00 | 31.1 | 34.4 | 1.0 | 45.4 | 6.6 | 5.0 |
| SMAJ30 | CH | YH | 30.00 | 33.3 | 40.7 | 1.0 | 53.5 | 5.6 | 5.0 |
| SMAJ30A | CK | YK | 30.00 | 33.3 | 36.8 | 1.0 | 48.4 | 6.2 | 5.0 |

ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Device | Device Marking Code | | Working Peak Reverse Voltage V _{WM} (Volts) | Breakdown Voltage V _(BR) (Volts) at I _r | | Test Current I _r (mA) | Maximum Clamping Voltage at I _{PPM} V _c (Volts)(NOTE5) | Maximum Peak Pulse Reverse Current I _{PPM} (NOTE5) (Amps) | Maximum Reverse Leakage a V _{WM} I _D (μ A) |
|----------|---------------------|----|---|---|------|-------------------------------------|--|---|--|
| | UNI | BI | | MIN | MAX | | | | |
| SMAJ33 | CL | YL | 33.00 | 36.7 | 44.9 | 1.0 | 59.0 | 5.1 | 5.0 |
| SMAJ33A | CM | YM | 33.00 | 36.7 | 40.6 | 1.0 | 53.3 | 5.6 | 5.0 |
| SMAJ36 | CN | YN | 36.00 | 40.0 | 48.9 | 1.0 | 64.3 | 4.7 | 5.0 |
| SMAJ36A | CP | YP | 36.00 | 40.0 | 44.2 | 1.0 | 58.1 | 5.2 | 5.0 |
| SMAJ40 | CQ | YQ | 40.00 | 44.4 | 54.3 | 1.0 | 71.4 | 4.2 | 5.0 |
| SMAJ40A | CR | YR | 40.00 | 44.4 | 49.1 | 1.0 | 64.5 | 4.7 | 5.0 |
| SMAJ43 | CS | YS | 43.00 | 47.8 | 58.4 | 1.0 | 76.7 | 3.9 | 5.0 |
| SMAJ43A | CT | YT | 43.00 | 47.8 | 52.8 | 1.0 | 69.4 | 4.3 | 5.0 |
| SMAJ45 | CU | YU | 45.00 | 50.0 | 61.1 | 1.0 | 80.3 | 3.7 | 5.0 |
| SMAJ45A | CV | YV | 45.00 | 50.0 | 55.3 | 1.0 | 72.7 | 4.1 | 5.0 |
| SMAJ48 | CW | YW | 48.00 | 53.3 | 65.1 | 1.0 | 85.5 | 3.5 | 5.0 |
| SMAJ48A | CX | YX | 48.00 | 53.3 | 58.9 | 1.0 | 77.4 | 3.9 | 5.0 |
| SMAJ51 | CY | YY | 51.00 | 56.7 | 69.3 | 1.0 | 91.1 | 3.3 | 5.0 |
| SMAJ51A | CZ | YZ | 51.00 | 56.7 | 62.7 | 1.0 | 82.4 | 3.6 | 5.0 |
| SMAJ54 | RD | ZD | 54.00 | 60.0 | 73.3 | 1.0 | 96.3 | 3.1 | 5.0 |
| SMAJ54A | RE | ZE | 54.00 | 60.0 | 66.3 | 1.0 | 87.1 | 3.4 | 5.0 |
| SMAJ58 | RF | ZF | 58.00 | 64.4 | 78.7 | 1.0 | 103.0 | 2.9 | 5.0 |
| SMAJ58A | RG | ZG | 58.00 | 64.4 | 71.2 | 1.0 | 93.6 | 3.2 | 5.0 |
| SMAJ60 | RH | ZH | 60.00 | 66.7 | 81.5 | 1.0 | 107.0 | 2.8 | 5.0 |
| SMAJ60A | RK | ZK | 60.00 | 66.7 | 73.7 | 1.0 | 96.8 | 3.1 | 5.0 |
| SMAJ64 | RL | ZL | 64.00 | 71.1 | 86.4 | 1.0 | 114.0 | 2.6 | 5.0 |
| SMAJ64A | RM | ZM | 64.00 | 71.1 | 78.6 | 1.0 | 103.0 | 2.9 | 5.0 |
| SMAJ70 | RN | ZN | 70.00 | 77.8 | 95.1 | 1.0 | 125 | 2.4 | 5.0 |
| SMAJ70A | RP | ZP | 70.00 | 77.8 | 86.0 | 1.0 | 113 | 2.7 | 5.0 |
| SMAJ75 | RQ | ZQ | 75.00 | 83.3 | 102 | 1.0 | 134 | 2.2 | 5.0 |
| SMAJ75A | RR | ZR | 75.00 | 83.3 | 92.1 | 1.0 | 121 | 2.5 | 5.0 |
| SMAJ78 | RS | ZS | 78.00 | 86.7 | 106 | 1.0 | 139 | 2.2 | 5.0 |
| SMAJ78A | RT | ZT | 78.00 | 86.7 | 95.8 | 1.0 | 126 | 2.4 | 5.0 |
| SMAJ85 | RU | ZU | 85.00 | 94.4 | 115 | 1.0 | 151 | 2.0 | 5.0 |
| SMAJ85A | RV | ZV | 85.00 | 94.4 | 104 | 1.0 | 137 | 2.2 | 5.0 |
| SMAJ90 | RW | ZW | 90.00 | 100 | 122 | 1.0 | 160 | 1.9 | 5.0 |
| SMAJ90A | RX | ZX | 90.00 | 100 | 111 | 1.0 | 146 | 2.1 | 5.0 |
| SMAJ100 | RY | ZY | 100.00 | 111 | 136 | 1.0 | 179 | 1.7 | 5.0 |
| SMAJ100A | RZ | ZZ | 100.00 | 111 | 123 | 1.0 | 162 | 1.9 | 5.0 |
| SMAJ110 | SD | VD | 110.00 | 122 | 149 | 1.0 | 196 | 1.5 | 5.0 |
| SMAJ110A | SE | VE | 110.00 | 122 | 135 | 1.0 | 177 | 1.7 | 5.0 |
| SMAJ120 | SF | VF | 120.00 | 133 | 163 | 1.0 | 214 | 1.4 | 5.0 |
| SMAJ120A | SG | VG | 120.00 | 133 | 147 | 1.0 | 193 | 1.6 | 5.0 |
| SMAJ130 | SH | VH | 130.00 | 144 | 176 | 1.0 | 231 | 1.3 | 5.0 |
| SMAJ130A | SK | VK | 130.00 | 144 | 159 | 1.0 | 209 | 1.4 | 5.0 |
| SMAJ150 | SL | VL | 150.00 | 167 | 204 | 1.0 | 268 | 1.1 | 5.0 |
| SMAJ150A | SM | VM | 150.00 | 167 | 185 | 1.0 | 243 | 1.2 | 5.0 |
| SMAJ160 | SN | VN | 160.00 | 178 | 218 | 1.0 | 287 | 1.0 | 5.0 |
| SMAJ160A | SP | VP | 160.00 | 178 | 197 | 1.0 | 259 | 1.2 | 5.0 |
| SMAJ170 | SQ | VQ | 170.00 | 189 | 231 | 1.0 | 304 | 0.99 | 5.0 |
| SMAJ170A | SR | VR | 170.00 | 189 | 209 | 1.0 | 275 | 1.09 | 5.0 |

NOTES:

1. V_(BR) measured after I_r applied for 300 μ s, I_r=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35
5. Peak pulse power waveform is 10/1000 μ s

RATINGS AND CHARACTERISTIC CURVES SMAJ5.0 THUR SMAJ170CA

FIG. 1-PEAK PULSE POWER RATING CURVE

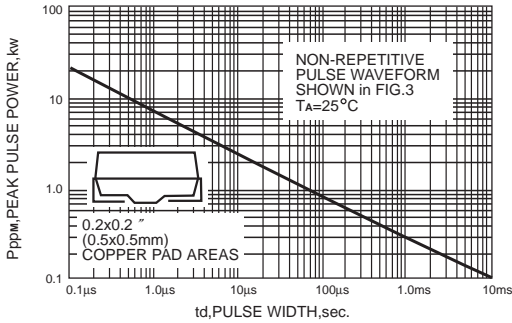


FIG. 2-PULSE DERATING CURVE

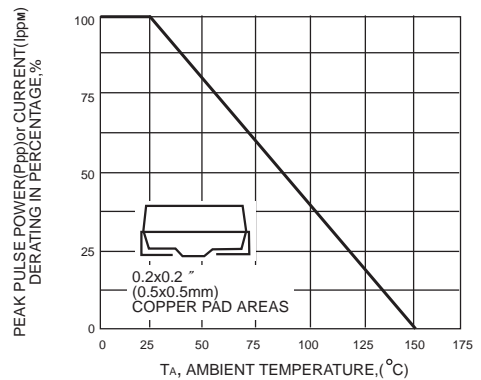


FIG.3-PULSE WAVEFORM

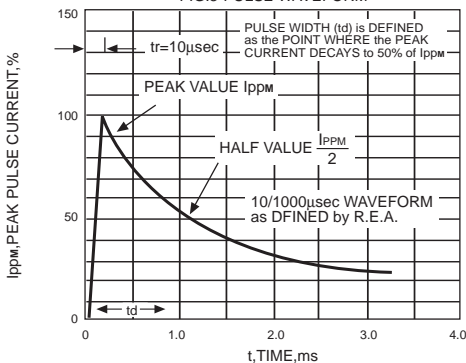


FIG. 4-TYPICAL JUNCTIONAL CAPACITANCE UNIDIRECTIONAL

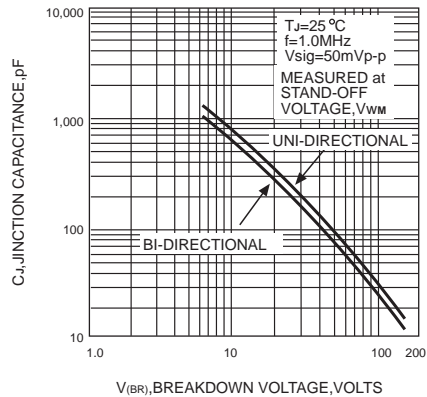


FIG.5-STEADY STATE POWER DERATING CURVE

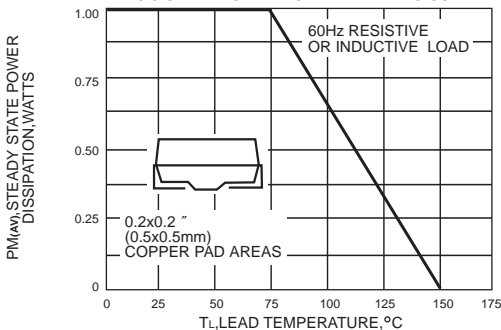


FIG.6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

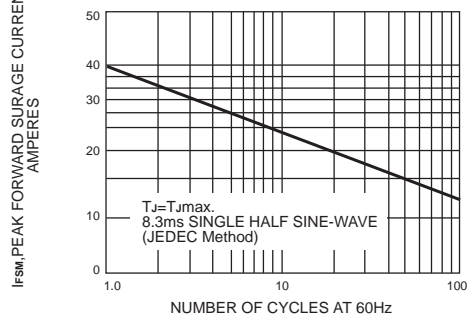


FIG.7-TYPICAL RESPONSE TO 8KV POSITIVE GOING ESD PULSE PER IEC1000-4-2(IEC801-2)

