

SMAJ 5.0 ~ 170A

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

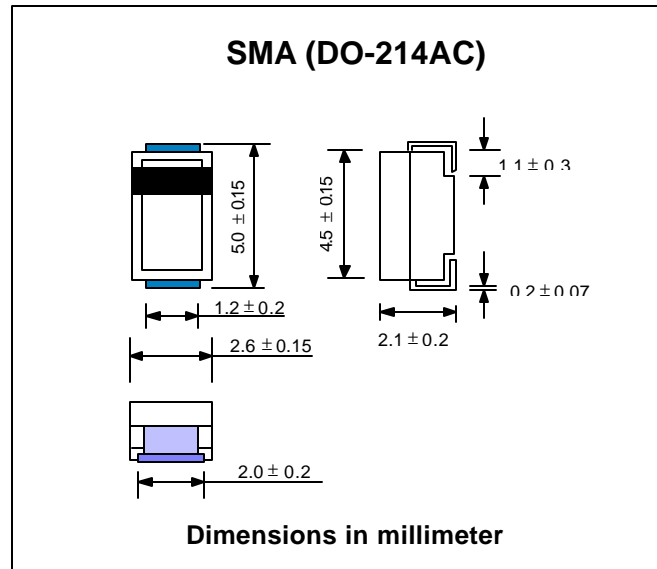
V_{BR} : 6.8 - 200 Volts
P_{PK} : 400 Watts

FEATURES :

- * 400W surge capability at 1ms
- * Excellent clamping capability
- * Low zener impedance
- * Fast response time : typically less than 1.0 ps from 0 volt to V_{BR(min.)}
- * Typical I_R less than 1µA above 10V

MECHANICAL DATA

- * Case : SMA Molded plastic
- * Epoxy : UL94V-O rate flame retardant
- * Lead : Lead Formed for Surface Mount
- * Polarity : Color band denotes cathode end except Bipolar.
- * Mounting position : Any
- * Weight : 0.064 grams



MAXIMUM RATINGS

Rating at Ta = 25 °C ambient temperature unless otherwise specified.

| Rating | Symbol | Value | Units |
|---|-----------------------------------|---------------|-------|
| Peak Pulse Power Dissipation (Note1,2,5) Fig. 4 | PPPM | Minimum 400 | Watts |
| Peak Forward Surge Current per Fig. 5 (Note 3) | I _{FSM} | 40 | Amps |
| Peak Pulse Current on 10/1000µs waveform (Note 1, Fig. 1) | I _{PPM} | See Table | Amps |
| Steady State Power Dissipation (Note 4) | P _{M(AV)} | 1.0 | Watt |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | - 55 to + 150 | °C |

Notes :

- (1) Non-repetitive Current pulse, per Fig. 3 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on 5.0mm² (0.013mm) copper pads to each terminal.
- (3) 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.
- (4) Lead temperature at T_L=75°C
- (5) Peak pulse power waveform is 10/1000µs.



ELECTRICAL CHARACTERISTICS

Rating at Ta = 25 °C ambient temperature unless otherwise specified

| TYPE | Marking Code | Breakdown Voltage @ Ir (Note 1) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ VWM | Maximum Peak Impulse Surge Current (Note 1) | Maximum Clamping Voltage @ IPPM (Note 1) |
|----------|--------------|------------------------------------|------|------|------------------------------------|--|--|---|
| | | VBR (V) | | Ir | | | | |
| | | Min. | Max. | (mA) | VWM (V) | ID (µA) | IPPM (A) | Vc (V) |
| SMAJ5.0 | S06H | 6.40 | 7.3 | 10 | 5.0 | 800 | 41.6 | 9.6 |
| SMAJ5.0A | S56H | 6.40 | 7.0 | 10 | 5.0 | 800 | 43.5 | 9.2 |
| SMAJ6.0 | S07A | 6.67 | 8.15 | 10 | 6.0 | 800 | 35.1 | 11.4 |
| SMAJ6.0A | S57A | 6.67 | 7.37 | 10 | 6.0 | 800 | 38.8 | 10.3 |
| SMAJ6.5 | S07G | 7.22 | 8.82 | 10 | 6.5 | 500 | 32.5 | 12.3 |
| SMAJ6.5A | S57G | 7.22 | 7.98 | 10 | 6.5 | 500 | 35.7 | 11.2 |
| SMAJ7.0 | S08C | 7.78 | 9.51 | 10 | 7.0 | 200 | 30.1 | 13.3 |
| SMAJ7.0A | S58C | 7.78 | 8.6 | 10 | 7.0 | 200 | 33.3 | 12.0 |
| SMAJ7.5 | S08I | 8.33 | 10.3 | 1.0 | 7.5 | 100 | 28.0 | 14.3 |
| SMAJ7.5A | S58I | 8.33 | 9.21 | 1.0 | 7.5 | 100 | 31.0 | 12.9 |
| SMAJ8.0 | S09B | 8.89 | 10.9 | 1.0 | 8.0 | 50 | 26.5 | 15.0 |
| SMAJ8.0A | S59B | 8.89 | 9.83 | 1.0 | 8.0 | 50 | 29.4 | 13.6 |
| SMAJ8.5 | S010 | 9.44 | 11.5 | 1.0 | 8.5 | 10 | 25.1 | 15.9 |
| SMAJ8.5A | S510 | 9.44 | 10.4 | 1.0 | 8.5 | 10 | 27.7 | 14.4 |
| SMAJ9.0 | S011 | 10.0 | 12.2 | 1.0 | 9.0 | 5.0 | 23.6 | 16.9 |
| SMAJ9.0A | S511 | 10.0 | 11.1 | 1.0 | 9.0 | 5.0 | 26.0 | 15.4 |
| SMAJ10 | S012 | 11.1 | 13.6 | 1.0 | 10 | 5.0 | 21.2 | 18.8 |
| SMAJ10A | S512 | 11.1 | 12.3 | 1.0 | 10 | 5.0 | 23.5 | 17.0 |
| SMAJ11 | S013 | 12.2 | 14.9 | 1.0 | 11 | 5.0 | 20.0 | 20.1 |
| SMAJ11A | S513 | 12.2 | 13.5 | 1.0 | 11 | 5.0 | 22.0 | 18.2 |
| SMAJ12 | S014 | 13.3 | 16.3 | 1.0 | 12 | 5.0 | 18.1 | 22.0 |
| SMAJ12A | S514 | 13.3 | 14.7 | 1.0 | 12 | 5.0 | 20.1 | 19.9 |
| SMAJ13 | S015 | 14.4 | 17.6 | 1.0 | 13 | 5.0 | 16.8 | 23.8 |
| SMAJ13A | S515 | 14.4 | 15.9 | 1.0 | 13 | 5.0 | 18.6 | 21.5 |
| SMAJ14 | S016 | 15.6 | 19.1 | 1.0 | 14 | 5.0 | 15.5 | 25.8 |
| SMAJ14A | S516 | 15.6 | 17.2 | 1.0 | 14 | 5.0 | 17.2 | 23.2 |
| SMAJ15 | S018 | 16.7 | 20.4 | 1.0 | 15 | 5.0 | 14.8 | 26.9 |
| SMAJ15A | S518 | 16.7 | 18.5 | 1.0 | 15 | 5.0 | 16.4 | 24.4 |
| SMAJ16 | S019 | 17.8 | 21.8 | 1.0 | 16 | 5.0 | 13.8 | 28.8 |
| SMAJ16A | S519 | 17.8 | 19.7 | 1.0 | 16 | 5.0 | 15.3 | 26.0 |
| SMAJ17 | S020 | 18.9 | 23.1 | 1.0 | 17 | 5.0 | 13.1 | 30.5 |
| SMAJ17A | S520 | 18.9 | 20.9 | 1.0 | 17 | 5.0 | 14.5 | 27.6 |
| SMAJ18 | S021 | 20.0 | 24.4 | 1.0 | 18 | 5.0 | 12.4 | 32.2 |
| SMAJ18A | S521 | 20.0 | 22.1 | 1.0 | 18 | 5.0 | 13.7 | 29.2 |
| SMAJ20 | S023 | 22.2 | 27.1 | 1.0 | 20 | 5.0 | 11.1 | 35.8 |
| SMAJ20A | S523 | 22.2 | 24.5 | 1.0 | 20 | 5.0 | 12.3 | 32.4 |
| SMAJ22 | S026 | 24.4 | 29.8 | 1.0 | 22 | 5.0 | 10.1 | 39.4 |
| SMAJ22A | S526 | 24.4 | 26.9 | 1.0 | 22 | 5.0 | 11.2 | 35.5 |
| SMAJ24 | S028 | 26.7 | 32.6 | 1.0 | 24 | 5.0 | 9.3 | 43.0 |
| SMAJ24A | S528 | 26.7 | 29.5 | 1.0 | 24 | 5.0 | 10.3 | 38.9 |
| SMAJ26 | S030 | 28.9 | 35.3 | 1.0 | 26 | 5.0 | 8.6 | 46.6 |
| SMAJ26A | S530 | 28.9 | 31.9 | 1.0 | 26 | 5.0 | 9.5 | 42.1 |
| SMAJ28 | S033 | 31.1 | 38.0 | 1.0 | 28 | 5.0 | 8.0 | 60.0 |
| SMAJ28A | S533 | 31.1 | 34.4 | 1.0 | 28 | 5.0 | 8.8 | 45.4 |
| SMAJ30 | S035 | 33.3 | 40.7 | 1.0 | 30 | 5.0 | 7.5 | 53.5 |
| SMAJ30A | S535 | 33.3 | 36.8 | 1.0 | 30 | 5.0 | 8.3 | 48.4 |

ELECTRICAL CHARACTERISTICS

Rating at $T_a = 25^\circ\text{C}$ ambient temperature unless otherwise specified

| TYPE | Marking Code | Breakdown Voltage @ I_r (Note 1) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V_{WM} | Maximum Peak Impulse Surge Current (Note 1) | Maximum Clamping Voltage @ I_{PPM} (Note 1) |
|----------|--------------|---------------------------------------|-------|-------|------------------------------------|---|--|--|
| | | V_{BR} (V) | | I_T | | | | |
| | | Min. | Max. | (mA) | V_{WM} (V) | I_D (μA) | I_{PPM} (A) | V_C (V) |
| SMAJ33 | S039 | 36.7 | 44.9 | 1.0 | 33 | 5.0 | 6.8 | 59.0 |
| SMAJ33A | S539 | 36.7 | 40.6 | 1.0 | 33 | 5.0 | 7.5 | 53.3 |
| SMAJ36 | S042 | 40.0 | 48.9 | 1.0 | 36 | 5.0 | 6.2 | 64.3 |
| SMAJ36A | S542 | 40.0 | 44.2 | 1.0 | 36 | 5.0 | 6.9 | 58.1 |
| SMAJ40 | S047 | 44.4 | 54.3 | 1.0 | 40 | 5.0 | 5.6 | 71.4 |
| SMAJ40A | S547 | 44.4 | 49.1 | 1.0 | 40 | 5.0 | 6.2 | 64.5 |
| SMAJ43 | S050 | 47.8 | 58.4 | 1.0 | 43 | 5.0 | 5.2 | 76.7 |
| SMAJ43A | S550 | 47.8 | 52.8 | 1.0 | 43 | 5.0 | 5.7 | 69.4 |
| SMAJ45 | S053 | 50.0 | 61.1 | 1.0 | 45 | 5.0 | 5.0 | 80.3 |
| SMAJ45A | S553 | 50.0 | 55.3 | 1.0 | 45 | 5.0 | 5.5 | 72.7 |
| SMAJ48 | S056 | 53.3 | 65.1 | 1.0 | 48 | 5.0 | 4.7 | 85.5 |
| SMAJ48A | S556 | 53.3 | 58.9 | 1.0 | 48 | 5.0 | 5.2 | 77.4 |
| SMAJ51 | S060 | 56.7 | 69.3 | 1.0 | 51 | 5.0 | 4.4 | 91.1 |
| SMAJ51A | S560 | 56.7 | 62.7 | 1.0 | 51 | 5.0 | 4.9 | 82.4 |
| SMAJ54 | S063 | 60.0 | 73.3 | 1.0 | 54 | 5.0 | 4.2 | 96.3 |
| SMAJ54A | S563 | 60.0 | 66.3 | 1.0 | 54 | 5.0 | 4.6 | 87.1 |
| SMAJ58 | S068 | 64.4 | 78.7 | 1.0 | 58 | 5.0 | 3.9 | 103.0 |
| SMAJ58A | S568 | 64.4 | 71.2 | 1.0 | 58 | 5.0 | 4.3 | 93.6 |
| SMAJ60 | S071 | 66.7 | 81.5 | 1.0 | 60 | 5.0 | 3.7 | 107 |
| SMAJ60A | S571 | 66.7 | 73.7 | 1.0 | 60 | 5.0 | 4.1 | 96.8 |
| SMAJ64 | S075 | 71.1 | 86.4 | 1.0 | 64 | 5.0 | 3.5 | 114 |
| SMAJ64A | S575 | 71.1 | 78.6 | 1.0 | 64 | 5.0 | 3.9 | 103 |
| SMAJ70 | S082 | 77.8 | 95.1 | 1.0 | 70 | 5.0 | 3.2 | 125 |
| SMAJ70A | S582 | 77.8 | 86 | 1.0 | 70 | 5.0 | 3.5 | 113 |
| SMAJ75 | S088 | 83.3 | 102 | 1.0 | 75 | 5.0 | 3.0 | 134 |
| SMAJ75A | S588 | 83.3 | 92.1 | 1.0 | 75 | 5.0 | 3.3 | 121 |
| SMAJ78 | S091 | 86.7 | 106 | 1.0 | 78 | 5.0 | 2.9 | 139 |
| SMAJ78A | S591 | 86.7 | 95.8 | 1.0 | 78 | 5.0 | 2.2 | 126 |
| SMAJ85 | S099 | 94.4 | 115 | 1.0 | 85 | 5.0 | 2.6 | 151 |
| SMAJ85A | S599 | 94.4 | 104 | 1.0 | 85 | 5.0 | 2.9 | 137 |
| SMAJ90 | S0B1 | 100 | 122 | 1.0 | 90 | 5.0 | 2.5 | 160 |
| SMAJ90A | S5B1 | 100 | 111 | 1.0 | 90 | 5.0 | 2.7 | 146 |
| SMAJ100 | S0B2 | 111 | 136.0 | 1.0 | 100 | 5.0 | 2.2 | 179 |
| SMAJ100A | S5B2 | 111 | 123.0 | 1.0 | 100 | 5.0 | 2.5 | 162 |
| SMAJ110 | S0B3 | 122 | 149 | 1.0 | 110 | 5.0 | 2.0 | 196 |
| SMAJ110A | S5B3 | 122 | 135 | 1.0 | 110 | 5.0 | 2.3 | 177 |
| SMAJ120 | S0B4 | 133 | 163.0 | 1.0 | 120 | 5.0 | 1.9 | 214 |
| SMAJ120A | S5B4 | 133 | 147.0 | 1.0 | 120 | 5.0 | 2.0 | 193 |
| SMAJ130 | S0B5 | 144 | 176 | 1.0 | 130 | 5.0 | 1.7 | 231 |
| SMAJ130A | S5B5 | 144 | 159 | 1.0 | 130 | 5.0 | 1.9 | 209 |
| SMAJ150 | S0B8 | 167 | 204 | 1.0 | 150 | 5.0 | 1.5 | 268 |
| SMAJ150A | S5B8 | 167 | 185 | 1.0 | 150 | 5.0 | 1.6 | 243 |
| SMAJ160 | S0B9 | 178 | 218.0 | 1.0 | 160 | 5.0 | 1.4 | 287 |
| SMAJ160A | S5B9 | 178 | 197.0 | 1.0 | 160 | 5.0 | 1.5 | 259 |
| SMAJ170 | S0D0 | 189 | 231 | 1.0 | 170 | 5.0 | 1.3 | 304 |
| SMAJ170A | S5D0 | 189 | 209 | 1.0 | 170 | 5.0 | 1.4 | 275 |

Note:

(1) Peak pulse power waveform is 10/1000 μs .

RATING AND CHARACTERISTIC CURVES (SMAJ5.0 - SMAJ170A)

FIG.1 - PULSE DERATING CURVE

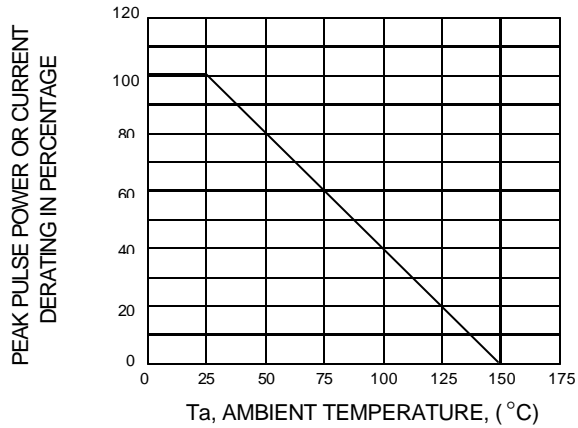


FIG.2 - TYPICAL JUNCTION CAPACITANCE

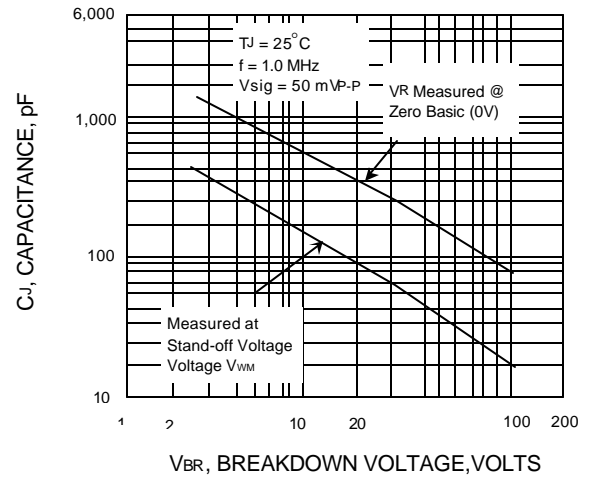


FIG.3 - PULSE WAVEFORM

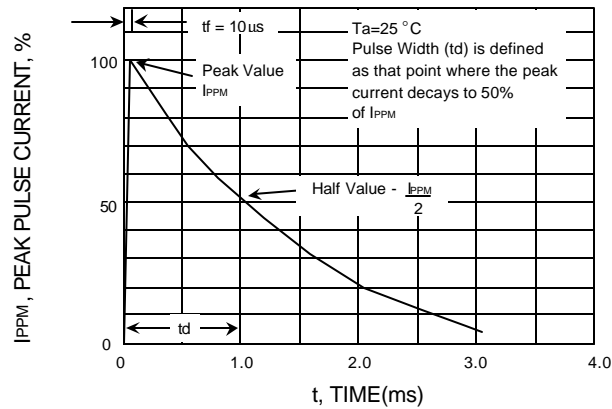


FIG.4 - PEAK PULSE POWER RATING CURVE

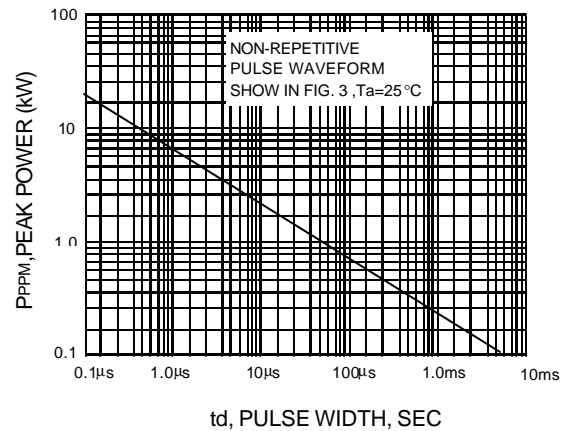


FIG.5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

