

**SURFACE MOUNT GPP
GPP TRANSIENT VOLTAGE SUPPRESSOR
400 WATT PEAK POWER 1.0 WATT STEADY STATE**

FEATURES

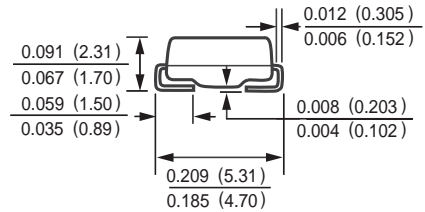
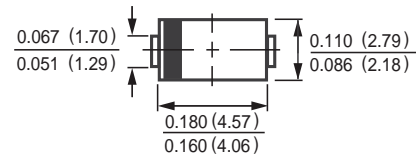
- * Plastic package has underwriters laboratory
- * Glass passivated chip construction
- * 400 watt surge capability at 1ms
- * Excellent clamping capability
- * Low zener impedance
- * Fast response time
- * P/N suffix V means AEC-Q101 qualified, e.g:SMAJ5.0V
- * P/N suffix V means Halogen-free

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified.



DO-214AC



Dimensions in inches and (millimeters)

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA suffix for types SMAJ5.0 thru SMAJ440

Electrical characteristics apply in both direction

MAXIMUM RATINGS (At $T_A = 25^\circ\text{C}$ unless otherwise noted)

| RATINGS | SYMBOL | VALUE | UNITS |
|--|----------------|--------------|------------------------|
| Peak Power Dissipation with a 10/1000uS (Note 1,2,5 Fig.1) | PPPM | Minimum 400 | Watts |
| Peak Pulse Current with a 10/1000uS waveform (Note 1, Fig.2) | IPPM | SEE TABLE 1 | Amps |
| Steady State Power Dissipation (Note 3) | $P_{M(AV)}$ | 1.0 | Watts |
| Peak Forward Surge Current per Fig.5 (Note 4) | I_{FSM} | 40 | Amps |
| Typical Current Squared Time | i^2t | 6.64 | A^2Sec |
| Maximum Instantaneous Forward Voltage at 25A (Note 5) | V_F | 3.5 | Volts |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to + 150 | $^\circ\text{C}$ |

- NOTES : 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A = 25^\circ\text{C}$ per Fig.2.
 2. Mounted on 0.2 X 0.2" (5.0 X 5.0mm) copper pad to each terminal.
 3. Lead temperature at $T_L = 25^\circ\text{C}$
 4. Measured on 8.3mS single half sine-wave duty cycle = 4 pulses per minute maximum.
 5. Peak pulse power waveform is 10/1000uS.

RATING AND CHARACTERISTIC CURVES (SMAJ5.0 THRU SMAJ440CA)

FIG. 1 - PEAK PULSE POWER RATING CURVE



FIG. 2 - PULSE DERATING CURVE



FIG. 3 - PULSE WAVEFORM



FIG. 4 - TYPICAL JUNCTION CAPACITANCE



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



TRANSIENT VOLTAGE SUPPRESSORS

400W SERIES TVS DIODES/DO-214AC (CASE 2) 400W

| Rectron Industry No. | Rectron House No. | Breakdown Voltage | | | Reverse Stand off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM ID(μA) | Maximum Peak Pulse Current IPPM (Amps) | Maximum Clamping Voltage at IPPM VC (Volts) |
|----------------------|-------------------|-------------------|------|----------|---------------------------------------|---------------------------------------|--|---|
| | | VBR (Volts) | | @IT (mA) | | | | |
| | | MIN. | MAX. | | | | | |
| SMAJ5.0 | TFMAJ5.0 | 6.40 | 7.82 | 10 | 5.0 | 800.0 | 41.7 | 9.6 |
| SMAJ5.0A | TFMAJ5.0A | 6.40 | 7.07 | 10 | 5.0 | 800.0 | 43.5 | 9.2 |
| SMAJ6.0 | TFMAJ6.0 | 6.67 | 8.15 | 10 | 6.0 | 800.0 | 35.1 | 11.4 |
| SMAJ6.0A | TFMAJ6.0A | 6.67 | 7.37 | 10 | 6.0 | 800.0 | 38.8 | 10.3 |
| SMAJ6.5 | TFMAJ6.5 | 7.22 | 8.82 | 10 | 6.5 | 500.0 | 32.5 | 12.3 |
| SMAJ6.5A | TFMAJ6.5A | 7.22 | 7.98 | 10 | 6.5 | 500.0 | 35.7 | 11.2 |
| SMAJ7.0 | TFMAJ7.0 | 7.78 | 9.51 | 10 | 7.0 | 200.0 | 30.1 | 13.3 |
| SMAJ7.0A | TFMAJ7.0A | 7.78 | 8.60 | 10 | 7.0 | 200.0 | 33.3 | 12.0 |
| SMAJ7.5 | TFMAJ7.5 | 8.33 | 10.2 | 1.0 | 7.5 | 100.0 | 28.0 | 14.3 |
| SMAJ7.5A | TFMAJ7.5A | 8.33 | 9.21 | 1.0 | 7.5 | 100.0 | 31.0 | 12.9 |
| SMAJ8.0 | TFMAJ8.0 | 8.89 | 10.9 | 1.0 | 8.0 | 50.0 | 26.7 | 15.0 |
| SMAJ8.0A | TFMAJ8.0A | 8.89 | 9.83 | 1.0 | 8.0 | 50.0 | 29.4 | 13.6 |
| SMAJ8.5 | TFMAJ8.5 | 9.44 | 11.5 | 1.0 | 8.5 | 10.0 | 25.2 | 15.9 |
| SMAJ8.5A | TFMAJ8.5A | 9.44 | 10.4 | 1.0 | 8.5 | 10.0 | 27.8 | 14.4 |
| SMAJ9.0 | TFMAJ9.0 | 10.0 | 12.2 | 1.0 | 9.0 | 5.0 | 23.7 | 16.9 |
| SMAJ9.0A | TFMAJ9.0A | 10.0 | 11.1 | 1.0 | 9.0 | 5.0 | 26.0 | 15.4 |
| SMAJ10 | TFMAJ10 | 11.1 | 13.6 | 1.0 | 10.0 | 5.0 | 21.3 | 18.8 |
| SMAJ10A | TFMAJ10A | 11.1 | 12.3 | 1.0 | 10.0 | 5.0 | 23.5 | 17.0 |
| SMAJ11 | TFMAJ11 | 12.2 | 14.9 | 1.0 | 11.0 | 1.0 | 19.9 | 20.1 |
| SMAJ11A | TFMAJ11A | 12.2 | 13.5 | 1.0 | 11.0 | 1.0 | 22.0 | 18.2 |
| SMAJ12 | TFMAJ12 | 13.3 | 16.3 | 1.0 | 12.0 | 1.0 | 18.2 | 22.0 |
| SMAJ12A | TFMAJ12A | 13.3 | 14.7 | 1.0 | 12.0 | 1.0 | 20.1 | 19.9 |
| SMAJ13 | TFMAJ13 | 14.4 | 17.6 | 1.0 | 13.0 | 1.0 | 16.8 | 23.8 |
| SMAJ13A | TFMAJ13A | 14.4 | 15.9 | 1.0 | 13.0 | 1.0 | 18.6 | 21.5 |
| SMAJ14 | TFMAJ14 | 15.6 | 19.1 | 1.0 | 14.0 | 1.0 | 15.5 | 25.8 |
| SMAJ14A | TFMAJ14A | 15.6 | 17.2 | 1.0 | 14.0 | 1.0 | 17.2 | 23.2 |
| SMAJ15 | TFMAJ15 | 16.7 | 20.4 | 1.0 | 15.0 | 1.0 | 14.9 | 26.9 |
| SMAJ15A | TFMAJ15A | 16.7 | 18.5 | 1.0 | 15.0 | 1.0 | 16.4 | 24.4 |
| SMAJ16 | TFMAJ16 | 17.8 | 21.8 | 1.0 | 16.0 | 1.0 | 13.9 | 28.8 |
| SMAJ16A | TFMAJ16A | 17.8 | 19.7 | 1.0 | 16.0 | 1.0 | 15.4 | 26.0 |
| SMAJ17 | TFMAJ17 | 18.9 | 23.1 | 1.0 | 17.0 | 1.0 | 13.1 | 30.5 |
| SMAJ17A | TFMAJ17A | 18.9 | 20.9 | 1.0 | 17.0 | 1.0 | 14.5 | 27.6 |
| SMAJ18 | TFMAJ18 | 20.0 | 24.4 | 1.0 | 18.0 | 1.0 | 12.4 | 32.2 |
| SMAJ18A | TFMAJ18A | 20.0 | 22.1 | 1.0 | 18.0 | 1.0 | 13.7 | 29.2 |
| SMAJ20 | TFMAJ20 | 22.2 | 27.1 | 1.0 | 20.0 | 1.0 | 11.2 | 35.8 |
| SMAJ20A | TFMAJ20A | 22.2 | 24.5 | 1.0 | 20.0 | 1.0 | 12.3 | 32.4 |
| SMAJ22 | TFMAJ22 | 24.4 | 29.8 | 1.0 | 22.0 | 1.0 | 10.2 | 39.4 |
| SMAJ22A | TFMAJ22A | 24.4 | 26.9 | 1.0 | 22.0 | 1.0 | 11.3 | 35.5 |
| SMAJ24 | TFMAJ24 | 26.7 | 32.6 | 1.0 | 24.0 | 1.0 | 9.3 | 43.0 |
| SMAJ24A | TFMAJ24A | 26.7 | 29.5 | 1.0 | 24.0 | 1.0 | 10.3 | 38.9 |
| SMAJ26 | TFMAJ26 | 28.9 | 35.3 | 1.0 | 26.0 | 1.0 | 8.6 | 46.6 |
| SMAJ26A | TFMAJ26A | 28.9 | 31.9 | 1.0 | 26.0 | 1.0 | 9.5 | 42.1 |
| SMAJ28 | TFMAJ28 | 31.1 | 38.0 | 1.0 | 28.0 | 1.0 | 8.0 | 50.0 |
| SMAJ28A | TFMAJ28A | 31.1 | 34.4 | 1.0 | 28.0 | 1.0 | 8.8 | 45.4 |
| SMAJ30 | TFMAJ30 | 33.3 | 40.7 | 1.0 | 30.0 | 1.0 | 7.5 | 53.5 |
| SMAJ30A | TFMAJ30A | 33.3 | 36.8 | 1.0 | 30.0 | 1.0 | 8.3 | 48.4 |
| SMAJ33 | TFMAJ33 | 36.7 | 44.9 | 1.0 | 33.0 | 1.0 | 6.8 | 59.0 |
| SMAJ33A | TFMAJ33A | 36.7 | 40.6 | 1.0 | 33.0 | 1.0 | 7.5 | 53.3 |
| SMAJ36 | TFMAJ36 | 40.0 | 48.9 | 1.0 | 36.0 | 1.0 | 6.2 | 64.3 |
| SMAJ36A | TFMAJ36A | 40.0 | 44.2 | 1.0 | 36.0 | 1.0 | 6.9 | 58.1 |

TRANSIENT VOLTAGE SUPPRESSORS

400W SERIES TVS DIODES/DO-214AC (CASE 2) 400W

| Rectron Industry No. | Rectron House No. | Breakdown Voltage | | | Reverse Stand off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM ID(uA) | Maximum Peak Pulse Current IPPM (Amps) | Maximum Clamping Voltage at IPPM VC (Volts) |
|----------------------|-------------------|-------------------|-------|----------|---------------------------------------|---------------------------------------|--|---|
| | | VBR (Volts) | | @IT (mA) | | | | |
| | | MIN. | MAX. | | | | | |
| SMAJ40 | TFMAJ40 | 44.4 | 54.3 | 1.0 | 40 | 1.0 | 5.6 | 71.4 |
| SMAJ40A | TFMAJ40A | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 6.2 | 64.5 |
| SMAJ43 | TFMAJ43 | 47.8 | 58.4 | 1.0 | 43 | 1.0 | 5.2 | 76.7 |
| SMAJ43A | TFMAJ43A | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 5.8 | 69.4 |
| SMAJ45 | TFMAJ45 | 50.0 | 61.1 | 1.0 | 45 | 1.0 | 5.0 | 80.3 |
| SMAJ45A | TFMAJ45A | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 5.5 | 72.7 |
| SMAJ48 | TFMAJ48 | 53.3 | 65.1 | 1.0 | 48 | 1.0 | 4.7 | 85.5 |
| SMAJ48A | TFMAJ48A | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 5.2 | 77.4 |
| SMAJ51 | TFMAJ51 | 56.7 | 69.3 | 1.0 | 51 | 1.0 | 4.4 | 91.1 |
| SMAJ51A | TFMAJ51A | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 4.9 | 82.4 |
| SMAJ54 | TFMAJ54 | 60.0 | 73.3 | 1.0 | 54 | 1.0 | 4.2 | 96.3 |
| SMAJ54A | TFMAJ54A | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 4.6 | 87.1 |
| SMAJ58 | TFMAJ58 | 64.4 | 78.7 | 1.0 | 58 | 1.0 | 3.9 | 103 |
| SMAJ58A | TFMAJ58A | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 4.3 | 93.6 |
| SMAJ60 | TFMAJ60 | 66.7 | 81.5 | 1.0 | 60 | 1.0 | 3.7 | 107 |
| SMAJ60A | TFMAJ60A | 66.7 | 73.7 | 1.0 | 60 | 1.0 | 4.1 | 96.8 |
| SMAJ64 | TFMAJ64 | 71.1 | 86.9 | 1.0 | 64 | 1.0 | 3.5 | 114 |
| SMAJ64A | TFMAJ64A | 71.1 | 78.6 | 1.0 | 64 | 1.0 | 3.9 | 103 |
| SMAJ70 | TFMAJ70 | 77.8 | 95.1 | 1.0 | 70 | 1.0 | 3.2 | 125 |
| SMAJ70A | TFMAJ70A | 77.8 | 86.0 | 1.0 | 70 | 1.0 | 3.5 | 113 |
| SMAJ75 | TFMAJ75 | 83.3 | 102 | 1.0 | 75 | 1.0 | 3.0 | 134 |
| SMAJ75A | TFMAJ75A | 83.3 | 92.1 | 1.0 | 75 | 1.0 | 3.3 | 121 |
| SMAJ78 | TFMAJ78 | 86.7 | 106 | 1.0 | 78 | 1.0 | 2.9 | 139 |
| SMAJ78A | TFMAJ78A | 86.7 | 95.8 | 1.0 | 78 | 1.0 | 3.2 | 126 |
| SMAJ85 | TFMAJ85 | 94.4 | 115 | 1.0 | 85 | 1.0 | 2.0 | 151 |
| SMAJ85A | TFMAJ85A | 94.4 | 104 | 1.0 | 85 | 1.0 | 2.2 | 137 |
| SMAJ90 | TFMAJ90 | 100 | 122 | 1.0 | 90 | 1.0 | 1.9 | 160 |
| SMAJ90A | TFMAJ90A | 100 | 111 | 1.0 | 90 | 1.0 | 2.1 | 146 |
| SMAJ100 | TFMAJ100 | 111 | 136 | 1.0 | 100 | 1.0 | 1.7 | 179 |
| SMAJ100A | TFMAJ100A | 111 | 123 | 1.0 | 100 | 1.0 | 1.9 | 162 |
| SMAJ110 | TFMAJ110 | 122 | 149 | 1.0 | 110 | 1.0 | 1.5 | 196 |
| SMAJ110A | TFMAJ110A | 122 | 135 | 1.0 | 110 | 1.0 | 1.7 | 177 |
| SMAJ120 | TFMAJ120 | 133 | 163 | 1.0 | 120 | 1.0 | 1.4 | 214 |
| SMAJ120A | TFMAJ120A | 133 | 147 | 1.0 | 120 | 1.0 | 1.6 | 193 |
| SMAJ130 | TFMAJ130 | 144 | 176 | 1.0 | 130 | 1.0 | 1.3 | 231 |
| SMAJ130A | TFMAJ130A | 144 | 159 | 1.0 | 130 | 1.0 | 1.4 | 209 |
| SMAJ150 | TFMAJ150 | 167 | 204 | 1.0 | 150 | 1.0 | 1.1 | 268 |
| SMAJ150A | TFMAJ150A | 167 | 185 | 1.0 | 150 | 1.0 | 1.2 | 243 |
| SMAJ160 | TFMAJ160 | 178 | 218 | 1.0 | 160 | 1.0 | 1.0 | 287 |
| SMAJ160A | TFMAJ160A | 178 | 197 | 1.0 | 160 | 1.0 | 1.2 | 259 |
| SMAJ170 | TFMAJ170 | 189 | 231 | 1.0 | 170 | 1.0 | 0.99 | 304 |
| SMAJ170A | TFMAJ170A | 189 | 209 | 1.0 | 170 | 1.0 | 1.09 | 275 |
| SMAJ180 | TFMAJ180 | 200.16 | 244.8 | 1.0 | 180 | 1.0 | 1.24 | 322.2 |
| SMAJ180A | TFMAJ180A | 200 | 220 | 1.0 | 180 | 1.0 | 1.37 | 291.6 |
| SMAJ190 | TFMAJ190 | 211.28 | 258.4 | 1.0 | 190 | 1.0 | 1.18 | 340.1 |
| SMAJ190A | TFMAJ190A | 211 | 232 | 1.0 | 190 | 1.0 | 1.3 | 307.8 |
| SMAJ200A | TFMAJ200A | 224 | 247 | 1.0 | 200 | 1.0 | 1.23 | 324 |
| SMAJ220A | TFMAJ220A | 246 | 272 | 1.0 | 220 | 1.0 | 1.12 | 356 |
| SMAJ250A | TFMAJ250A | 279 | 309 | 1.0 | 250 | 1.0 | 0.99 | 405 |
| SMAJ300A | TFMAJ300A | 335 | 371 | 1.0 | 300 | 1.0 | 0.82 | 486 |
| SMAJ350A | TFMAJ350A | 391 | 432 | 1.0 | 350 | 1.0 | 0.71 | 567 |
| SMAJ400A | TFMAJ400A | 447 | 494 | 1.0 | 400 | 1.0 | 0.62 | 648 |
| SMAJ440A | TFMAJ440A | 492 | 543 | 1.0 | 440 | 1.0 | 0.56 | 713 |

- Notes :
1. V_{BR} measured after I_T applied for 300ms. I_T = square pulse or equivalent.
 2. For bidirectional use C or CA suffixes for all types (ex. SMAJ5.0C, SMAJ440CA) electrical characteristics apply in both directions.
 3. For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled.

Mounting Pad Layout



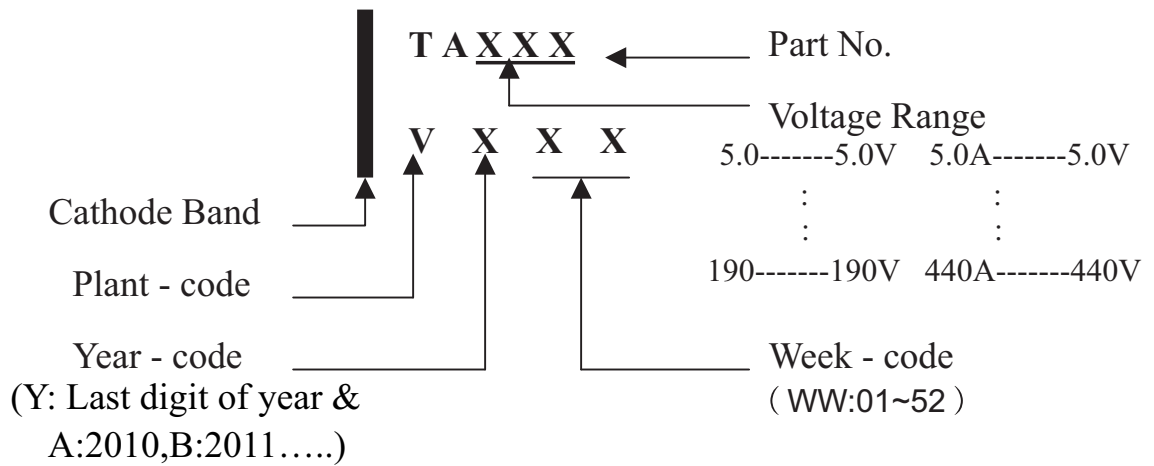
Dimensions in inches and (millimeters)

1. Internal Circuit



2. Marking on the body

SMAJxx/SMAJxxA



SMAJxxCA



PACKAGING OF DIODE AND BRIDGE RECTIFIERS

REEL PACK

| PACKAGE | PACKING CODE | EA PER REEL | EA PER INNER BOX | COMPONENT SPACE (mm) | TAPE SPACE (mm) | REEL DIA (mm) | CARTON SIZE (mm) | EA PER CARTON | GROSS WEIGHT(Kg) |
|---------|--------------|-------------|------------------|----------------------|-----------------|---------------|------------------|---------------|------------------|
| SMA | -W | 7,500 | 15,000 | --- | --- | 330 | 360*355*360 | 120,000 | 15.2 |

| PACKAGE | PACKING CODE | EA PER REEL | EA PER INNER BOX | COMPONENT SPACE (mm) | TAPE SPACE (mm) | REEL DIA (mm) | CARTON SIZE (mm) | EA PER CARTON | GROSS WEIGHT(Kg) |
|---------|--------------|-------------|------------------|----------------------|-----------------|---------------|------------------|---------------|------------------|
| SMA | -T | 2,000 | 8,000 | --- | --- | 178 | 390*205*310 | 64,000 | 7.8 |