

**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 surage capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time

**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 TFMAJ5.0 thru TFMAJ170

Electrical characteristics apply in both direction

MAXIMUM RATINGS (At TA = 25°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 ) | I <sub>PPM</sub>                  | SEE TABLE 1  | Amps  |
| Steady State Power Dissipation (Note 3)                        | P <sub>M(AV)</sub>                | 1.0          | Watts |
| Peak Forward Surge Current per Fig.5 (Note 3)                  | I <sub>FSM</sub>                  | 40           | Amps  |
| Maximum Instantaneous Forward Voltage at 25A (Note 4)          | V <sub>F</sub>                    | 3.5          | Volts |
| Operating and Storage Temperature Range                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to + 150 | °C    |

- NOTES :
1. Non-repetitive current pulse, per Fig.3 and derated above TA = 25°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 TL = 25°C
  4. Measured on 8.3mS single half sine-wave duty cycle = 4 pules per minute maximum.
  5. Peak pulse power waveform is 10/1000uS.

# RATING AND CHARACTERISTIC CURVES ( TFMAJ5.0 THRU TFMAJ170CA )

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(uA) | 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                                  | 5.0                                   | 19.9                                   | 20.1  |
| SMAJ11A              | TFMAJ11A          | 12.2              | 13.5 | 1.0      | 11.0                                  | 5.0                                   | 22.0                                   | 18.2  |
| SMAJ12               | TFMAJ12           | 13.3              | 16.3 | 1.0      | 12.0                                  | 5.0                                   | 18.2                                   | 22.0  |
| SMAJ12A              | TFMAJ12A          | 13.3              | 14.7 | 1.0      | 12.0                                  | 5.0                                   | 20.1                                   | 19.9  |
| SMAJ13               | TFMAJ13           | 14.4              | 17.6 | 1.0      | 13.0                                  | 5.0                                   | 16.8                                   | 23.8  |
| SMAJ13A              | TFMAJ13A          | 14.4              | 15.9 | 1.0      | 13.0                                  | 5.0                                   | 18.6                                   | 21.5  |
| SMAJ14               | TFMAJ14           | 15.6              | 19.1 | 1.0      | 14.0                                  | 5.0                                   | 15.5                                   | 25.8  |
| SMAJ14A              | TFMAJ14A          | 15.6              | 17.2 | 1.0      | 14.0                                  | 5.0                                   | 17.2                                   | 23.2  |
| SMAJ15               | TFMAJ15           | 16.7              | 20.4 | 1.0      | 15.0                                  | 5.0                                   | 14.9                                   | 26.9  |
| SMAJ15A              | TFMAJ15A          | 16.7              | 18.5 | 1.0      | 15.0                                  | 5.0                                   | 16.4                                   | 24.4  |
| SMAJ16               | TFMAJ16           | 17.8              | 21.8 | 1.0      | 16.0                                  | 5.0                                   | 13.9                                   | 28.8  |
| SMAJ16A              | TFMAJ16A          | 17.8              | 19.7 | 1.0      | 16.0                                  | 5.0                                   | 15.4                                   | 26.0  |
| SMAJ17               | TFMAJ17           | 18.9              | 23.1 | 1.0      | 17.0                                  | 5.0                                   | 13.1                                   | 30.5  |
| SMAJ17A              | TFMAJ17A          | 18.9              | 20.9 | 1.0      | 17.0                                  | 5.0                                   | 14.5                                   | 27.6  |
| SMAJ18               | TFMAJ18           | 20.0              | 24.4 | 1.0      | 18.0                                  | 5.0                                   | 12.4                                   | 32.2  |
| SMAJ18A              | TFMAJ18A          | 20.0              | 22.1 | 1.0      | 18.0                                  | 5.0                                   | 13.7                                   | 29.2  |
| SMAJ20               | TFMAJ20           | 22.2              | 27.1 | 1.0      | 20.0                                  | 5.0                                   | 11.2                                   | 35.8  |
| SMAJ20A              | TFMAJ20A          | 22.2              | 24.5 | 1.0      | 20.0                                  | 5.0                                   | 12.3                                   | 32.4  |
| SMAJ22               | TFMAJ22           | 24.4              | 29.8 | 1.0      | 22.0                                  | 5.0                                   | 10.2                                   | 39.4  |
| SMAJ22A              | TFMAJ22A          | 24.4              | 26.9 | 1.0      | 22.0                                  | 5.0                                   | 11.3                                   | 35.5  |
| SMAJ24               | TFMAJ24           | 26.7              | 32.6 | 1.0      | 24.0                                  | 5.0                                   | 9.3                                    | 43.0  |
| SMAJ24A              | TFMAJ24A          | 26.7              | 29.5 | 1.0      | 24.0                                  | 5.0                                   | 10.3                                   | 38.9  |
| SMAJ26               | TFMAJ26           | 28.9              | 35.3 | 1.0      | 26.0                                  | 5.0                                   | 8.6                                    | 46.6  |
| SMAJ26A              | TFMAJ26A          | 28.9              | 31.9 | 1.0      | 26.0                                  | 5.0                                   | 9.5                                    | 42.1  |
| SMAJ28               | TFMAJ28           | 31.1              | 38.0 | 1.0      | 28.0                                  | 5.0                                   | 8.0                                    | 50.0  |
| SMAJ28A              | TFMAJ28A          | 31.1              | 34.4 | 1.0      | 28.0                                  | 5.0                                   | 8.8                                    | 45.4  |
| SMAJ30               | TFMAJ30           | 33.3              | 40.7 | 1.0      | 30.0                                  | 5.0                                   | 7.5                                    | 53.5  |
| SMAJ30A              | TFMAJ30A          | 33.3              | 36.8 | 1.0      | 30.0                                  | 5.0                                   | 8.3                                    | 48.4  |
| SMAJ33               | TFMAJ33           | 36.7              | 44.9 | 1.0      | 33.0                                  | 5.0                                   | 6.8                                    | 59.0  |
| SMAJ33A              | TFMAJ33A          | 36.7              | 40.6 | 1.0      | 33.0                                  | 5.0                                   | 7.5                                    | 53.3  |
| SMAJ36               | TFMAJ36           | 40.0              | 48.9 | 1.0      | 36.0                                  | 5.0                                   | 6.2                                    | 64.3  |
| SMAJ36A              | TFMAJ36A          | 40.0              | 44.2 | 1.0      | 36.0                                  | 5.0                                   | 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 V <sub>WM</sub> (Volts) | Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (uA) | Maximum Peak Pulse Current IPPM (Amps) | Maximum Clamping Voltage at IPPM V <sub>C</sub> (Volts) |
|----------------------|-------------------|-------------------------|------|----------------------|---|--|--|---|
|                      |                   | V <sub>BR</sub> (Volts) |      | @I <sub>T</sub> (mA) |   |  |  |   |
|                      |                   | MIN.                    | MAX. |                      |   |  |  |   |
| SMAJ40               | TFMAJ40           | 44.4                    | 54.3 | 1.0                  | 40  | 5.0  | 5.6                                    | 71.4  |
| SMAJ40A              | TFMAJ40A          | 44.4                    | 49.1 | 1.0                  | 40  | 5.0  | 6.2                                    | 64.5  |
| SMAJ43               | TFMAJ43           | 47.8                    | 58.4 | 1.0                  | 43  | 5.0  | 5.2                                    | 76.7  |
| SMAJ43A              | TFMAJ43A          | 47.8                    | 52.8 | 1.0                  | 43  | 5.0  | 5.8                                    | 69.4  |
| SMAJ45               | TFMAJ45           | 50.0                    | 61.1 | 1.0                  | 45  | 5.0  | 5.0                                    | 80.3  |
| SMAJ45A              | TFMAJ45A          | 50.0                    | 55.3 | 1.0                  | 45  | 5.0  | 5.5                                    | 72.7  |
| SMAJ48               | TFMAJ48           | 53.3                    | 65.1 | 1.0                  | 48  | 5.0  | 4.7                                    | 85.5  |
| SMAJ48A              | TFMAJ48A          | 53.3                    | 58.9 | 1.0                  | 48  | 5.0  | 5.2                                    | 77.4  |
| SMAJ51               | TFMAJ51           | 56.7                    | 69.3 | 1.0                  | 51  | 5.0  | 4.4                                    | 91.1  |
| SMAJ51A              | TFMAJ51A          | 56.7                    | 62.7 | 1.0                  | 51  | 5.0  | 4.9                                    | 82.4  |
| SMAJ54               | TFMAJ54           | 60.0                    | 73.3 | 1.0                  | 54  | 5.0  | 4.2                                    | 96.3  |
| SMAJ54A              | TFMAJ54A          | 60.0                    | 66.3 | 1.0                  | 54  | 5.0  | 4.6                                    | 87.1  |
| SMAJ58               | TFMAJ58           | 64.4                    | 78.7 | 1.0                  | 58  | 5.0  | 3.9                                    | 103   |
| SMAJ58A              | TFMAJ58A          | 64.4                    | 71.2 | 1.0                  | 58  | 5.0  | 4.3                                    | 93.6  |
| SMAJ60               | TFMAJ60           | 66.7                    | 81.5 | 1.0                  | 60  | 5.0  | 3.7                                    | 107   |
| SMAJ60A              | TFMAJ60A          | 66.7                    | 73.7 | 1.0                  | 60  | 5.0  | 4.1                                    | 96.8  |
| SMAJ64               | TFMAJ64           | 71.1                    | 86.9 | 1.0                  | 64  | 5.0  | 3.5                                    | 114   |
| SMAJ64A              | TFMAJ64A          | 71.1                    | 78.6 | 1.0                  | 64  | 5.0  | 3.9                                    | 103   |
| SMAJ70               | TFMAJ70           | 77.8                    | 95.1 | 1.0                  | 70  | 5.0  | 3.2                                    | 125   |
| SMAJ70A              | TFMAJ70A          | 77.8                    | 86.0 | 1.0                  | 70  | 5.0  | 3.5                                    | 113   |
| SMAJ75               | TFMAJ75           | 83.3                    | 102  | 1.0                  | 75  | 5.0  | 3.0                                    | 134   |
| SMAJ75A              | TFMAJ75A          | 83.3                    | 92.1 | 1.0                  | 75  | 5.0  | 3.3                                    | 121   |
| SMAJ78               | TFMAJ78           | 86.7                    | 106  | 1.0                  | 78  | 5.0  | 2.9                                    | 139   |
| SMAJ78A              | TFMAJ78A          | 86.7                    | 95.8 | 1.0                  | 78  | 5.0  | 3.2                                    | 126   |
| SMAJ85               | TFMAJ85           | 94.4                    | 115  | 1.0                  | 85  | 5.0  | 2.0                                    | 151   |
| SMAJ85A              | TFMAJ85A          | 94.4                    | 104  | 1.0                  | 85  | 5.0  | 2.2                                    | 137   |
| SMAJ90               | TFMAJ90           | 100                     | 122  | 1.0                  | 90  | 5.0  | 1.9                                    | 160   |
| SMAJ90A              | TFMAJ90A          | 100                     | 111  | 1.0                  | 90  | 5.0  | 2.1                                    | 146   |
| SMAJ100              | TFMAJ100          | 111                     | 136  | 1.0                  | 100   | 5.0  | 1.7                                    | 179   |
| SMAJ100A             | TFMAJ100A         | 111                     | 123  | 1.0                  | 100   | 5.0  | 1.9                                    | 162   |
| SMAJ110              | TFMAJ110          | 122                     | 149  | 1.0                  | 110   | 5.0  | 1.5                                    | 196   |
| SMAJ110A             | TFMAJ110A         | 122                     | 135  | 1.0                  | 110   | 5.0  | 1.7                                    | 177   |
| SMAJ120              | TFMAJ120          | 133                     | 163  | 1.0                  | 120   | 5.0  | 1.4                                    | 214   |
| SMAJ120A             | TFMAJ120A         | 133                     | 147  | 1.0                  | 120   | 5.0  | 1.6                                    | 193   |
| SMAJ130              | TFMAJ130          | 144                     | 176  | 1.0                  | 130   | 5.0  | 1.3                                    | 231   |
| SMAJ130A             | TFMAJ130A         | 144                     | 159  | 1.0                  | 130   | 5.0  | 1.4                                    | 209   |
| SMAJ150              | TFMAJ150          | 167                     | 204  | 1.0                  | 150   | 5.0  | 1.1                                    | 268   |
| SMAJ150A             | TFMAJ150A         | 167                     | 185  | 1.0                  | 150   | 5.0  | 1.2                                    | 243   |
| SMAJ160              | TFMAJ160          | 178                     | 218  | 1.0                  | 160   | 5.0  | 1.0                                    | 287   |
| SMAJ160A             | TFMAJ160A         | 178                     | 197  | 1.0                  | 160   | 5.0  | 1.2                                    | 259   |
| SMAJ170              | TFMAJ170          | 189                     | 231  | 1.0                  | 170   | 5.0  | 0.99                                   | 304   |
| SMAJ170A             | TFMAJ170A         | 189                     | 209  | 1.0                  | 170   | 5.0  | 1.09                                   | 275   |

- Notes :
1. V<sub>BR</sub> measured after I<sub>T</sub> applied for 300ms. I<sub>T</sub> = square pulse or equivalent.
  2. For bidirectional use C or CA suffixs for all types (ex. SMAJ5.0C,SMAJ170CA) electrical characteristics apply in both directions.
  3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled.

## Mounting Pad Layout



Dimensions in inches and (millimeters)