

**GPP TRANSIENT VOLTAGE SUPPRESSOR**  
**5000 WATT PEAK POWER 8.0 WATTS STEADY STATE**

**FEATURES**

- \* Plastic package has underwriters laboratory
- \* Glass passivated chip construction
- \* 5000 watt surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time

Ratings at 25 °C ambient temperature unless otherwise specified.

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25 °C ambient temperature unless otherwise specified.

Single phase, half wave, 60 Hz, resistive or inductive load,

For capacitive load, derate current by 20%.



**R-6**



Dimensions in inches and (millimeters)

**DEVICES FOR BIPOLAR APPLICATIONS**

For Bidirectional use C or CA suffix for types 5KP5.0 thru 5KP110

Electrical characteristics apply in both direction

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

| RATINGS                                                                                                     | SYMBOL         | VALUE        | UNITS            |
|-------------------------------------------------------------------------------------------------------------|----------------|--------------|------------------|
| Peak Pulse Power Dissipation with a 10/1000uS waveform (Note 1, FIG.1)                                      | PPPM           | Minimum 5000 | Watts            |
| Peak Pulse Current with a 10/1000uS waveform (Note 1, Fig. 3)                                               | IPPM           | SEE TABLE 1  | Amps             |
| Steady State Power Dissipation at $T_L = 75^\circ\text{C}$ lead lengths 0.375" (9.5mm) (Note 2)             | $P_{M(AV)}$    | 8.0          | Watts            |
| Peak Forward Surge Current, 8.3ms single half sine wave-superimposed on rated load( JEDEC METHOD ) (Note 3) | $I_{FSM}$      | 400          | Amps             |
| Instantaneous Forward Voltage at 100A, (Note 3)                                                             | $V_F$          | 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 copper pad area of 0.8 X 0.8" ( 20 X 20mm ) per Fig. 5

3. Measured on 8.3mS single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

2002-12

# RATING AND CHARACTERISTIC CURVES ( 5KP5.0 THRU 5KP110CA )

FIG. 1 - PEAK PULSE POWER RATING CURVE



FIG. 2 - PULSE DERATING CURVE



FIG. 3 - PULSE WAVEFORM



FIG. 4 - TYPICAL JUNCTION CAPACITANCE



FIG. 5 - STEADY STATE POWER DERATING CURVE



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



# TRANSIENT VOLTAGE SUPPRESSORS

5000W SERIES TVS DIODES / R-6 ( CASE 12 ) 5000W

| TYPE    | Breakdown Voltage          |      |                         | Reverse Stand off Voltage<br>V <sub>WM</sub><br>(Volts) | Maximum Reverse Leakage at V <sub>WM</sub><br>I <sub>D</sub> (uA) | Maximum Peak Pulse Current<br>I <sub>PPM</sub><br>(Amps) | Maximum Clamping Voltage at I <sub>PPM</sub><br>V <sub>C</sub> (Volts) |
|---------|----------------------------|------|-------------------------|---------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------|
|         | V <sub>BR</sub><br>(Volts) |      | @I <sub>T</sub><br>(mA) |                                                         |                                                                   |                                                          |                                                                        |
|         | MIN.                       | MAX. |                         |                                                         |                                                                   |                                                          |                                                                        |
| 5KP5.0  | 6.40                       | 7.30 | 50                      | 5.0                                                     | 2000                                                              | 521                                                      | 9.6                                                                    |
| 5KP5.0A | 6.40                       | 7.00 | 50                      | 5.0                                                     | 2000                                                              | 543                                                      | 9.2                                                                    |
| 5KP6.0  | 6.67                       | 8.15 | 50                      | 6.0                                                     | 5000                                                              | 439                                                      | 11.4                                                                   |
| 5KP6.0A | 6.67                       | 7.37 | 50                      | 6.0                                                     | 5000                                                              | 485                                                      | 10.3                                                                   |
| 5KP6.5  | 7.22                       | 8.82 | 50                      | 6.5                                                     | 2000                                                              | 407                                                      | 12.3                                                                   |
| 5KP6.5A | 7.22                       | 7.98 | 50                      | 6.5                                                     | 2000                                                              | 446                                                      | 11.2                                                                   |
| 5KP7.0  | 7.78                       | 9.51 | 50                      | 7.0                                                     | 1000                                                              | 376                                                      | 13.3                                                                   |
| 5KP7.0A | 7.78                       | 8.60 | 50                      | 7.0                                                     | 1000                                                              | 417                                                      | 12.0                                                                   |
| 5KP7.5  | 8.33                       | 10.2 | 5.0                     | 7.5                                                     | 250                                                               | 350                                                      | 14.3                                                                   |
| 5KP7.5A | 8.33                       | 9.21 | 5.0                     | 7.5                                                     | 250                                                               | 388                                                      | 12.9                                                                   |
| 5KP8.0  | 8.89                       | 10.9 | 5.0                     | 8.0                                                     | 150                                                               | 333                                                      | 15.0                                                                   |
| 5KP8.0A | 8.89                       | 9.83 | 5.0                     | 8.0                                                     | 150                                                               | 368                                                      | 13.6                                                                   |
| 5KP8.5  | 9.44                       | 11.5 | 5.0                     | 8.5                                                     | 50                                                                | 314                                                      | 15.9                                                                   |
| 5KP8.5A | 9.44                       | 10.4 | 5.0                     | 8.5                                                     | 50                                                                | 347                                                      | 14.4                                                                   |
| 5KP9.0  | 10.0                       | 12.2 | 5.0                     | 9.0                                                     | 20                                                                | 296                                                      | 16.9                                                                   |
| 5KP9.0A | 10.0                       | 11.1 | 5.0                     | 9.0                                                     | 20                                                                | 325                                                      | 15.4                                                                   |
| 5KP10   | 11.1                       | 13.6 | 5.0                     | 10.0                                                    | 15                                                                | 266                                                      | 18.8                                                                   |
| 5KP10A  | 11.1                       | 12.3 | 5.0                     | 10.0                                                    | 15                                                                | 294                                                      | 17.0                                                                   |
| 5KP11   | 12.2                       | 14.9 | 5.0                     | 11.0                                                    | 10                                                                | 249                                                      | 20.1                                                                   |
| 5KP11A  | 12.2                       | 13.5 | 5.0                     | 11.0                                                    | 10                                                                | 275                                                      | 18.2                                                                   |
| 5KP12   | 13.3                       | 16.3 | 5.0                     | 12.0                                                    | 10                                                                | 227                                                      | 22.0                                                                   |
| 5KP12A  | 13.3                       | 14.7 | 5.0                     | 12.0                                                    | 10                                                                | 251                                                      | 19.9                                                                   |
| 5KP13   | 14.4                       | 17.6 | 5.0                     | 13.0                                                    | 10                                                                | 210                                                      | 23.8                                                                   |
| 5KP13A  | 14.4                       | 15.9 | 5.0                     | 13.0                                                    | 10                                                                | 233                                                      | 21.5                                                                   |
| 5KP14   | 15.6                       | 19.1 | 5.0                     | 14.0                                                    | 10                                                                | 194                                                      | 25.8                                                                   |
| 5KP14A  | 15.6                       | 17.2 | 5.0                     | 14.0                                                    | 10                                                                | 216                                                      | 23.2                                                                   |
| 5KP15   | 16.7                       | 20.4 | 5.0                     | 15.0                                                    | 10                                                                | 186                                                      | 26.9                                                                   |
| 5KP15A  | 16.7                       | 18.5 | 5.0                     | 15.0                                                    | 10                                                                | 205                                                      | 24.4                                                                   |
| 5KP16   | 17.8                       | 21.8 | 5.0                     | 16.0                                                    | 10                                                                | 174                                                      | 28.8                                                                   |
| 5KP16A  | 17.8                       | 19.7 | 5.0                     | 16.0                                                    | 10                                                                | 192                                                      | 26.0                                                                   |
| 5KP17   | 18.9                       | 23.1 | 5.0                     | 17.0                                                    | 10                                                                | 164                                                      | 30.5                                                                   |
| 5KP17A  | 18.9                       | 20.9 | 5.0                     | 17.0                                                    | 10                                                                | 181                                                      | 27.6                                                                   |
| 5KP18   | 20.0                       | 24.4 | 5.0                     | 18.0                                                    | 10                                                                | 155                                                      | 32.2                                                                   |
| 5KP18A  | 20.0                       | 22.1 | 5.0                     | 18.0                                                    | 10                                                                | 171                                                      | 29.2                                                                   |
| 5KP20   | 22.2                       | 27.1 | 5.0                     | 20.0                                                    | 10                                                                | 140                                                      | 35.8                                                                   |
| 5KP20A  | 22.2                       | 24.5 | 5.0                     | 20.0                                                    | 10                                                                | 154                                                      | 32.4                                                                   |
| 5KP22   | 24.4                       | 29.8 | 5.0                     | 22.0                                                    | 10                                                                | 127                                                      | 39.4                                                                   |
| 5KP22A  | 24.4                       | 26.9 | 5.0                     | 22.0                                                    | 10                                                                | 141                                                      | 35.5                                                                   |
| 5KP24   | 26.7                       | 32.6 | 5.0                     | 24.0                                                    | 10                                                                | 116                                                      | 43.0                                                                   |
| 5KP24A  | 26.7                       | 29.5 | 5.0                     | 24.0                                                    | 10                                                                | 129                                                      | 38.9                                                                   |
| 5KP26   | 28.9                       | 35.3 | 5.0                     | 26.0                                                    | 10                                                                | 107                                                      | 46.6                                                                   |
| 5KP26A  | 28.9                       | 31.9 | 5.0                     | 26.0                                                    | 10                                                                | 119                                                      | 42.1                                                                   |
| 5KP28   | 31.1                       | 38.0 | 5.0                     | 28.0                                                    | 10                                                                | 100                                                      | 50.1                                                                   |
| 5KP28A  | 31.1                       | 34.4 | 5.0                     | 28.0                                                    | 10                                                                | 110                                                      | 45.4                                                                   |
| 5KP30   | 33.3                       | 40.7 | 5.0                     | 30.0                                                    | 10                                                                | 93.5                                                     | 53.5                                                                   |
| 5KP30A  | 33.3                       | 36.8 | 5.0                     | 30.0                                                    | 10                                                                | 103                                                      | 48.4                                                                   |

# TRANSIENT VOLTAGE SUPPRESSORS

5000W SERIES TVS DIODES / R-6 ( CASE 12 ) 5000W

| TYPE    | Breakdown Voltage |      |              | Reverse Stand off Voltage $V_{WM}$ (Volts) | Maximum Reverse Leakage at $V_{WM}$ $I_D(\mu A)$ | Maximum Peak Pulse Current $I_{PPM}$ (Amps) | Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts) |
|---------|-------------------|------|--------------|--------------------------------------------|--------------------------------------------------|---------------------------------------------|-----------------------------------------------------|
|         | $V_{BR}$ (Volts)  |      | @ $I_T$ (mA) |                                            |                                                  |                                             |                                                     |
|         | MIN.              | MAX. |              |                                            |                                                  |                                             |                                                     |
| 5KP33   | 36.7              | 44.9 | 5.0          | 33.0                                       | 10                                               | 84.7                                        | 59.0                                                |
| 5KP33A  | 36.7              | 40.6 | 5.0          | 33.0                                       | 10                                               | 93.8                                        | 53.3                                                |
| 5KP36   | 40.0              | 48.9 | 5.0          | 36.0                                       | 10                                               | 77.8                                        | 64.3                                                |
| 5KP36A  | 40.0              | 44.2 | 5.0          | 36.0                                       | 10                                               | 86.1                                        | 58.1                                                |
| 5KP40   | 44.4              | 54.3 | 5.0          | 40.0                                       | 10                                               | 70.0                                        | 71.4                                                |
| 5KP40A  | 44.4              | 49.1 | 5.0          | 40.0                                       | 10                                               | 77.5                                        | 64.5                                                |
| 5KP43   | 47.8              | 58.4 | 5.0          | 43.0                                       | 10                                               | 65.2                                        | 76.7                                                |
| 5KP43A  | 47.8              | 52.8 | 5.0          | 43.0                                       | 10                                               | 72.0                                        | 69.4                                                |
| 5KP45   | 50.0              | 61.1 | 5.0          | 45.0                                       | 10                                               | 62.3                                        | 80.3                                                |
| 5KP45A  | 50.0              | 55.3 | 5.0          | 45.0                                       | 10                                               | 68.8                                        | 72.7                                                |
| 5KP48   | 53.3              | 65.2 | 5.0          | 48.0                                       | 10                                               | 58.5                                        | 85.5                                                |
| 5KP48A  | 53.3              | 58.9 | 5.0          | 48.0                                       | 10                                               | 64.6                                        | 77.4                                                |
| 5KP51   | 56.7              | 69.3 | 5.0          | 51.0                                       | 10                                               | 54.9                                        | 91.1                                                |
| 5KP51A  | 56.7              | 62.7 | 5.0          | 51.0                                       | 10                                               | 60.7                                        | 82.4                                                |
| 5KP54   | 60.0              | 73.3 | 5.0          | 54.0                                       | 10                                               | 51.9                                        | 96.3                                                |
| 5KP54A  | 60.0              | 66.3 | 5.0          | 54.0                                       | 10                                               | 57.4                                        | 87.1                                                |
| 5KP58   | 64.4              | 78.7 | 5.0          | 58.0                                       | 10                                               | 48.5                                        | 103                                                 |
| 5KP58A  | 64.4              | 71.2 | 5.0          | 58.0                                       | 10                                               | 53.4                                        | 94                                                  |
| 5KP60   | 66.7              | 81.5 | 5.0          | 60.0                                       | 10                                               | 46.7                                        | 107                                                 |
| 5KP60A  | 66.7              | 73.7 | 5.0          | 60.0                                       | 10                                               | 51.7                                        | 97                                                  |
| 5KP64   | 71.1              | 96.9 | 5.0          | 64.0                                       | 10                                               | 43.9                                        | 114                                                 |
| 5KP64A  | 71.1              | 78.6 | 5.0          | 64.0                                       | 10                                               | 48.5                                        | 103                                                 |
| 5KP70   | 77.8              | 95.1 | 5.0          | 70.0                                       | 10                                               | 40.0                                        | 125                                                 |
| 5KP70A  | 77.8              | 86.0 | 5.0          | 70.0                                       | 10                                               | 44.2                                        | 113                                                 |
| 5KP75   | 83.3              | 102  | 5.0          | 75.0                                       | 10                                               | 37.3                                        | 134                                                 |
| 5KP75A  | 83.3              | 92.1 | 5.0          | 75.0                                       | 10                                               | 41.3                                        | 121                                                 |
| 5KP78   | 86.7              | 106  | 5.0          | 78.0                                       | 10                                               | 36.0                                        | 139                                                 |
| 5KP78A  | 86.7              | 95.8 | 5.0          | 78.0                                       | 10                                               | 39.7                                        | 126                                                 |
| 5KP85   | 94.4              | 115  | 5.0          | 85.0                                       | 10                                               | 33.1                                        | 151                                                 |
| 5KP85A  | 94.4              | 104  | 5.0          | 85.0                                       | 10                                               | 36.5                                        | 137                                                 |
| 5KP90   | 100               | 122  | 5.0          | 90.0                                       | 10                                               | 31.3                                        | 160                                                 |
| 5KP90A  | 100               | 111  | 5.0          | 90.0                                       | 10                                               | 34.2                                        | 146                                                 |
| 5KP100  | 111               | 136  | 5.0          | 100                                        | 10                                               | 27.9                                        | 179                                                 |
| 5KP100A | 111               | 123  | 5.0          | 100                                        | 10                                               | 30.9                                        | 162                                                 |
| 5KP110  | 122               | 149  | 5.0          | 110                                        | 10                                               | 25.5                                        | 196                                                 |
| 5KP110A | 122               | 135  | 5.0          | 110                                        | 10                                               | 28.2                                        | 177                                                 |

- Notes :
1.  $V_{BR}$  measured after  $I_T$  applied for 300ms.  $I_T$  = square pulse or equivalent.
  2. All devices UL listed under file# E211196.

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