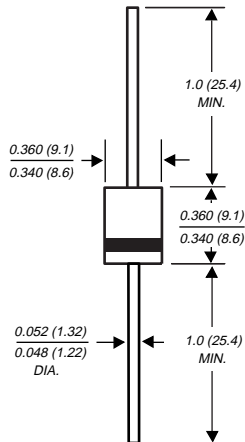


5KP5.0 THRU 5KP110A

TRANSZORB™ TRANSIENT VOLTAGE SUPPRESSOR
Stand-off Voltage - 5.0 to 110 Volts Peak Pulse Power - 5000 Watts

Case Style P600

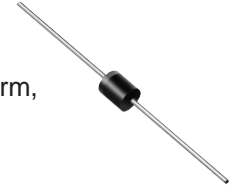


Dimensions in inches and (millimeters)

Available in uni-directional only

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ 5000W peak pulse power capability with a 10/1000 μ s waveform, repetition rate (duty cycle): 0.05%
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to $V_{(BR)}$
- ◆ Devices with $V_{(BR)} > 10V$ I_D are typically I_D less than 1.0 μ A
- ◆ High temperature soldering guaranteed: 265°C/10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3 kg) tension



MECHANICAL DATA

Case: Molded plastic body over glass passivated junction

Terminals: Solder plated axial leads, solderable per MIL-STD-750, Method 2026

Polarity: The color band denotes the cathode, which is positive with respect to the anode under normal TVS operation

Mounting Position: Any

Weight: 0.07 ounce, 2.1 grams

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| | SYMBOL | VALUE | UNITS |
|--|------------------|--------------|-------|
| Peak pulse power dissipation with a 10/1000 μ s waveform (NOTE 1, FIG. 1) | PPPM | Minimum 5000 | Watts |
| Peak pulse current with a 10/1000 μ s waveform (NOTE 1) | I _{PPM} | 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 junction and storage temperature range | T_J, T_{STG} | -55 to +175 | °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

ELECTRICAL CHARACTERISTICS at (T_A=25°C unless otherwise noted) TABLE 1

| Device Type | Breakdown Voltage V _(BR) (Volts) (NOTE 1) | | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage at V _{WM} I _D (μA) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _C (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|------|--|--|--|--|---|---|
| | MIN | MAX | | | | | | |
| 5KP5.0 | 6.40 | 7.30 | 50 | 5.0 | 2000 | 521 | 9.6 | 0.057 |
| 5KP5.0A | 6.40 | 7.00 | 50 | 5.0 | 2000 | 543 | 9.2 | 0.057 |
| 5KP6.0 | 6.67 | 8.15 | 50 | 6.0 | 5000 | 439 | 11.4 | 0.061 |
| 5KP6.0A | 6.67 | 7.37 | 50 | 6.0 | 5000 | 485 | 10.3 | 0.061 |
| 5KP6.5 | 7.22 | 8.82 | 50 | 6.5 | 2000 | 407 | 12.3 | 0.065 |
| 5KP6.5A | 7.22 | 7.98 | 50 | 6.5 | 2000 | 446 | 11.2 | 0.065 |
| 5KP7.0 | 7.78 | 9.51 | 50 | 7.0 | 1000 | 376 | 13.3 | 0.068 |
| 5KP7.0A | 7.78 | 8.60 | 50 | 7.0 | 1000 | 417 | 12.0 | 0.068 |
| 5KP7.5 | 8.33 | 10.2 | 5.0 | 7.5 | 250 | 350 | 14.3 | 0.073 |
| 5KP7.5A | 8.33 | 9.21 | 5.0 | 7.5 | 250 | 388 | 12.9 | 0.073 |
| 5KP8.0 | 8.89 | 10.9 | 5.0 | 8.0 | 150 | 333 | 15.0 | 0.075 |
| 5KP8.0A | 8.89 | 9.83 | 5.0 | 8.0 | 150 | 368 | 13.6 | 0.075 |
| 5KP8.5 | 9.44 | 11.5 | 5.0 | 8.5 | 50.0 | 314 | 15.9 | 0.078 |
| 5KP8.5A | 9.44 | 10.4 | 5.0 | 8.5 | 50.0 | 347 | 14.4 | 0.078 |
| 5KP9.0 | 10.0 | 12.2 | 5.0 | 9.0 | 20.0 | 296 | 16.9 | 0.081 |
| 5KP9.0A | 10.0 | 11.1 | 5.0 | 9.0 | 20.0 | 325 | 15.4 | 0.081 |
| 5KP10 | 11.1 | 13.6 | 5.0 | 10.0 | 15.0 | 266 | 18.8 | 0.084 |
| 5KP10A | 11.1 | 12.3 | 5.0 | 10.0 | 15.0 | 294 | 17.0 | 0.084 |
| 5KP11 | 12.2 | 14.9 | 5.0 | 11.0 | 10.0 | 249 | 20.1 | 0.086 |
| 5KP11A | 12.2 | 13.5 | 5.0 | 11.0 | 10.0 | 275 | 18.2 | 0.086 |
| 5KP12 | 13.3 | 16.3 | 5.0 | 12.0 | 10.0 | 227 | 22.0 | 0.088 |
| 5KP12A | 13.3 | 14.7 | 5.0 | 12.0 | 10.0 | 251 | 19.9 | 0.088 |
| 5KP13 | 14.4 | 17.6 | 5.0 | 13.0 | 10.0 | 210 | 23.8 | 0.090 |
| 5KP13A | 14.4 | 15.9 | 5.0 | 13.0 | 10.0 | 233 | 21.5 | 0.090 |
| 5KP14 | 15.6 | 19.1 | 5.0 | 14.0 | 10.0 | 194 | 25.8 | 0.092 |
| 5KP14A | 15.6 | 17.2 | 5.0 | 14.0 | 10.0 | 216 | 23.2 | 0.092 |
| 5KP15 | 16.7 | 20.4 | 5.0 | 15.0 | 10.0 | 186 | 26.9 | 0.094 |
| 5KP15A | 16.7 | 18.5 | 5.0 | 15.0 | 10.0 | 205 | 24.4 | 0.094 |
| 5KP16 | 17.8 | 21.8 | 5.0 | 16.0 | 10.0 | 174 | 28.8 | 0.096 |
| 5KP16A | 17.8 | 19.7 | 5.0 | 16.0 | 10.0 | 192 | 26.0 | 0.096 |
| 5KP17 | 18.9 | 23.1 | 5.0 | 17.0 | 10.0 | 164 | 30.5 | 0.097 |
| 5KP17A | 18.9 | 20.9 | 5.0 | 17.0 | 10.0 | 181 | 27.6 | 0.097 |
| 5KP18 | 20.0 | 24.4 | 5.0 | 18.0 | 10.0 | 155 | 32.2 | 0.098 |
| 5KP18A | 20.0 | 22.1 | 5.0 | 18.0 | 10.0 | 171 | 29.2 | 0.098 |
| 5KP20 | 22.2 | 27.1 | 5.0 | 20.0 | 10.0 | 140 | 35.8 | 0.099 |
| 5KP20A | 22.2 | 24.5 | 5.0 | 20.0 | 10.0 | 154 | 32.4 | 0.099 |
| 5KP22 | 24.4 | 29.8 | 5.0 | 22.0 | 10.0 | 127 | 39.4 | 0.100 |
| 5KP22A | 24.4 | 26.9 | 5.0 | 22.0 | 10.0 | 141 | 35.5 | 0.100 |
| 5KP24 | 26.7 | 32.6 | 5.0 | 24.0 | 10.0 | 116 | 43.0 | 0.101 |
| 5KP24A | 26.7 | 29.5 | 5.0 | 24.0 | 10.0 | 129 | 38.9 | 0.101 |
| 5KP26 | 28.9 | 35.3 | 5.0 | 26.0 | 10.0 | 107 | 46.6 | 0.101 |
| 5KP26A | 28.9 | 31.9 | 5.0 | 26.0 | 10.0 | 119 | 42.1 | 0.101 |
| 5KP28 | 31.1 | 38.0 | 5.0 | 28.0 | 10.0 | 100 | 50.1 | 0.102 |
| 5KP28A | 31.1 | 34.4 | 5.0 | 28.0 | 10.0 | 110 | 45.4 | 0.102 |
| 5KP30 | 33.3 | 40.7 | 5.0 | 30.0 | 10.0 | 93.5 | 53.5 | 0.103 |
| 5KP30A | 33.3 | 36.8 | 5.0 | 30.0 | 10.0 | 103 | 48.4 | 0.103 |

ELECTRICAL CHARACTERISTICS at (T_A=25°C unless otherwise noted) TABLE 1 (Cont'd)

| Device Type | Breakdown Voltage V _(BR) (Volts) (NOTE 1) | | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage at V _{WM} I _D (μA) | Maximum Peak Pulse Current I _{PPM} (NOTE 2) (Amps) | Maximum Clamping Voltage at I _{PPM} V _c (Volts) | Maximum Temperature Coefficient of V _(BR) (% / °C) |
|-------------|--|-------|--|--|--|--|---|---|
| | MIN | MAX | | | | | | |
| 5KP33 | 36.7 | 44.9 | 5.0 | 33.0 | 10.0 | 84.7 | 59.0 | 0.104 |
| 5KP33A | 36.7 | 40.6 | 5.0 | 33.0 | 10.0 | 93.8 | 53.3 | 0.104 |
| 5KP36 | 40.0 | 48.9 | 5.0 | 36.0 | 10.0 | 77.8 | 64.3 | 0.104 |
| 5KP36A | 40.0 | 44.2 | 5.0 | 36.0 | 10.0 | 86.1 | 58.1 | 0.104 |
| 5KP40 | 44.4 | 54.3 | 5.0 | 40.0 | 10.0 | 70.0 | 71.4 | 0.105 |
| 5KP40A | 44.4 | 49.1 | 5.0 | 40.0 | 10.0 | 77.5 | 64.5 | 0.105 |
| 5KP43 | 47.8 | 58.4 | 5.0 | 43.0 | 10.0 | 65.2 | 76.7 | 0.105 |
| 5KP43A | 47.8 | 52.8 | 5.0 | 43.0 | 10.0 | 72.0 | 69.4 | 0.105 |
| 5KP45 | 50.0 | 61.1 | 5.0 | 45.0 | 10.0 | 62.3 | 80.3 | 0.106 |
| 5KP45A | 50.0 | 55.3 | 5.0 | 45.0 | 10.0 | 68.8 | 72.7 | 0.106 |
| 5KP48 | 53.3 | 65.2 | 5.0 | 48.0 | 10.0 | 58.5 | 85.5 | 0.106 |
| 5KP48A | 53.3 | 58.9 | 5.0 | 48.0 | 10.0 | 64.6 | 77.4 | 0.106 |
| 5KP51 | 56.1 | 69.3 | 5.0 | 51.0 | 10.0 | 54.9 | 91.1 | 0.107 |
| 5KP51A | 56.7 | 62.7 | 5.0 | 51.0 | 10.0 | 60.7 | 82.4 | 0.107 |
| 5KP54 | 60.0 | 73.3 | 5.0 | 54.0 | 10.0 | 51.9 | 96.3 | 0.107 |
| 5KP54A | 60.0 | 66.3 | 5.0 | 54.0 | 10.0 | 57.4 | 87.1 | 0.107 |
| 5KP58 | 64.4 | 78.7 | 5.0 | 58.0 | 10.0 | 48.5 | 103 | 0.107 |
| 5KP58A | 64.4 | 71.2 | 5.0 | 58.0 | 10.0 | 53.4 | 94 | 0.107 |
| 5KP60 | 66.7 | 81.5 | 5.0 | 60.0 | 10.0 | 46.7 | 107 | 0.108 |
| 5KP60A | 66.7 | 73.7 | 5.0 | 60.0 | 10.0 | 51.7 | 97 | 0.108 |
| 5KP64 | 71.1 | 96.9 | 5.0 | 64.0 | 10.0 | 43.9 | 114 | 0.108 |
| 5KP64A | 71.1 | 78.6 | 5.0 | 64.0 | 10.0 | 48.5 | 103 | 0.108 |
| 5KP70 | 77.6 | 95.1 | 5.0 | 70.0 | 10.0 | 40.0 | 125 | 0.108 |
| 5KP70A | 77.8 | 86.0 | 5.0 | 70.0 | 10.0 | 44.2 | 113 | 0.108 |
| 5KP75 | 83.3 | 102 | 5.0 | 75.0 | 10.0 | 37.3 | 134 | 0.108 |
| 5KP75A | 83.3 | 92.1 | 5.0 | 75.0 | 10.0 | 41.3 | 121 | 0.108 |
| 5KP78 | 86.7 | 106.0 | 5.0 | 78.0 | 10.0 | 36.0 | 139 | 0.108 |
| 5KP78A | 86.7 | 95.8 | 5.0 | 78.0 | 10.0 | 39.7 | 126 | 0.108 |
| 5KP85 | 94.4 | 115 | 5.0 | 85.0 | 10.0 | 33.1 | 151 | 0.108 |
| 5KP85A | 94.4 | 104 | 5.0 | 85.0 | 10.0 | 36.5 | 137 | 0.110 |
| 5KP90 | 100 | 122 | 5.0 | 90.0 | 10.0 | 31.3 | 160 | 0.110 |
| 5KP90A | 100 | 111 | 5.0 | 90.0 | 10.0 | 34.2 | 146 | 0.110 |
| 5KP100 | 111 | 136 | 5.0 | 100 | 10.0 | 27.9 | 179 | 0.110 |
| 5KP100A | 111 | 123 | 5.0 | 100 | 10.0 | 30.9 | 162 | 0.110 |
| 5KP110 | 122 | 149 | 5.0 | 110 | 10.0 | 25.5 | 196 | 0.112 |
| 5KP110A | 122 | 135 | 5.0 | 110 | 10.0 | 28.2 | 177 | 0.112 |

NOTES:

- (1) V_(BR) measured after I_T applied for 300μs I_T=square wave pulse or equivalent
- (2) Surge current waveform per Fig. 3 and derate per Fig. 2
- (3) All items and symbols are consistent with ANSI/IEEE C62.35

APPLICATION

The 5KP series of high power transient voltage suppressors were designed to be used on the output of switching power supplies. These devices may be used to replace crowbar circuits. Both the 5 and 10 percent voltage tolerances are referenced to the power supply output voltage level.

They are able to withstand high levels of peak current while allowing a circuit breaker to trip or a fuse blow before shorting. This will enable the user to reset the breaker or replace the fuse and continue operation. For this type operation, it is recommended that a sufficient mounting surface be used for dissipating the heat generated by the Transient Voltage Suppressor during the transient or over-voltage condition.

Transient Voltage Suppressors are Silicon PN Junction devices designed for absorption of high voltage transients associated with power disturbances, switching and induced lighting effects. This series is available from 5.0 volts thru 110 volts.



RATINGS AND CHARACTERISTIC CURVES 5KP5.0 THRU 5KP110A

FIG. 1 - PEAK PULSE POWER RATING CURVE

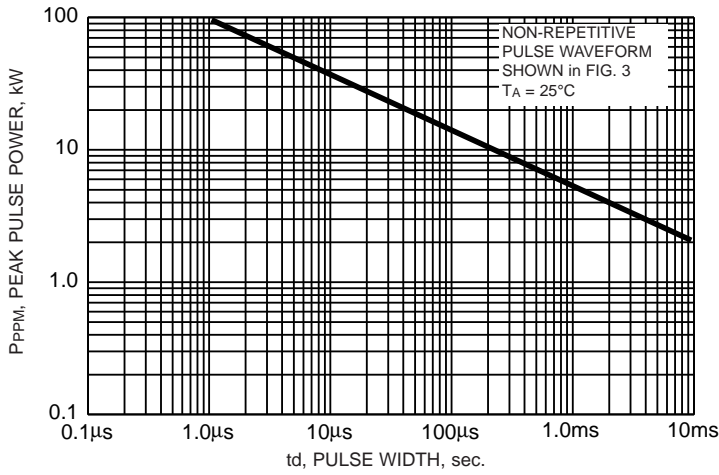


FIG. 2 - PULSE DERATING CURVE

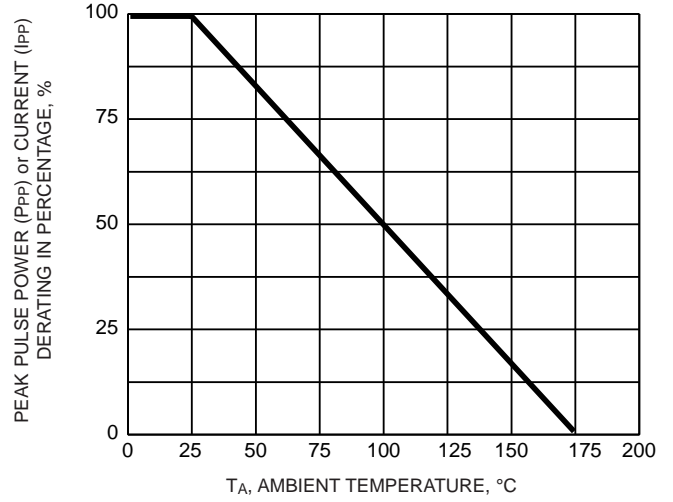


FIG. 3 - PULSE WAVEFORM

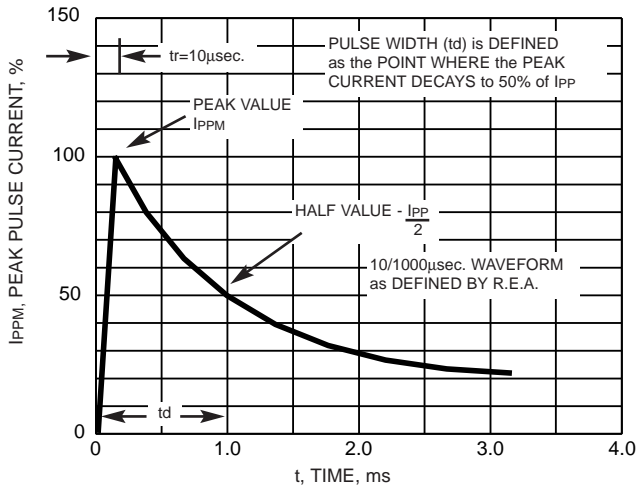


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

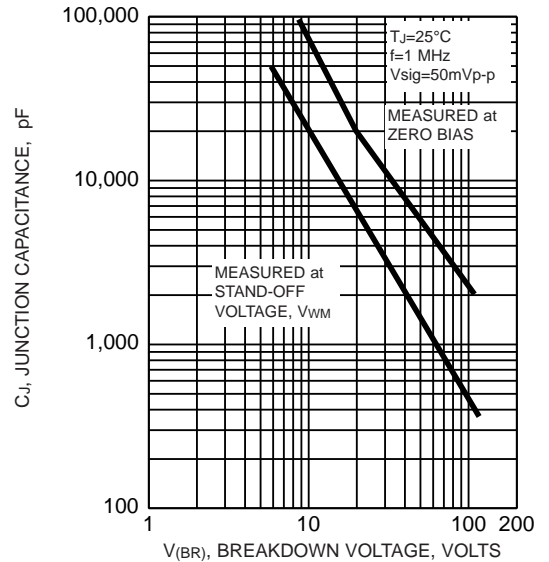


FIG. 5 - STEADY STATE POWER DERATING CURVE

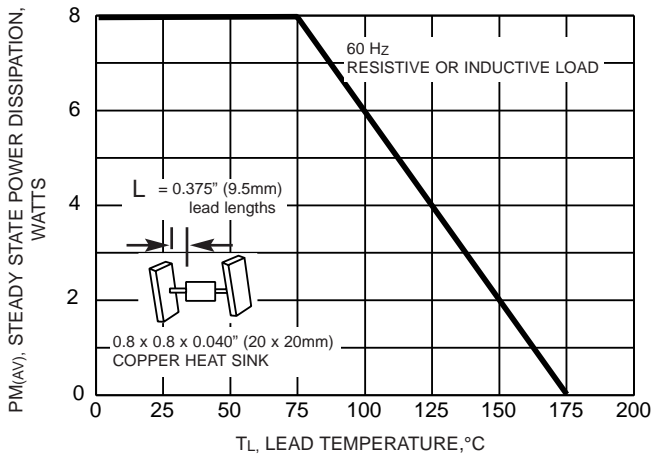
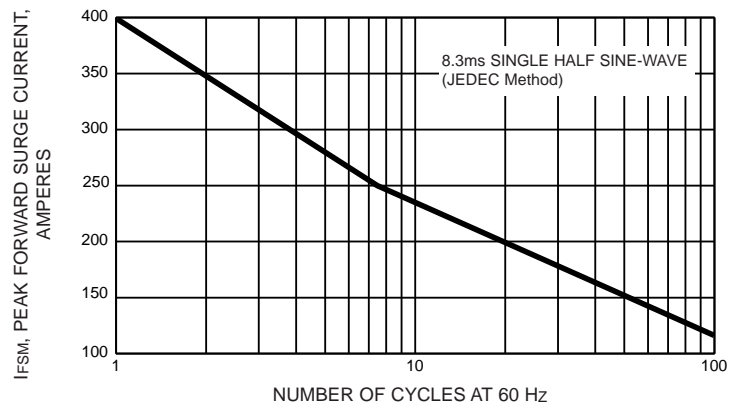


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



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Datasheets for electronics components.