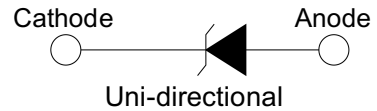
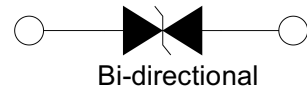
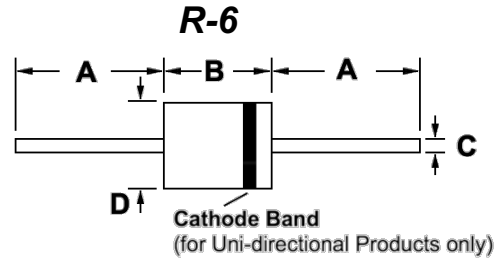




# 3000W Axial Leaded Transient Voltage Suppressors

## Features

- Peak power dissipation 3000W @10 x 1000 us Pulse
- Low profile package.
- Excellent clamping capability.
- Glass passivated junction.
- Fast response time: typically less than 1ps from 0 Volts to BV min
- Typical  $I_R$  less than 2uA when  $V_{BR}$  min above 12V.
- IEC 61000-4-2 ESD 30KV(Air), 30KV(Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Halogen free and RoHS compliant
- Lead-free finish



## Mechanical Characteristics

- CASE: R-6 Molded Plastic
- Mounting Position: Any
- Polarity: by cathode band denotes uni-directional device, none cathode band denotes bi-directional device.
- Terminal: Solder plated

| REF. | DIMENSIONS  |      |        |       |
|------|-------------|------|--------|-------|
|      | Millimeters |      | Inches |       |
|      | Min.        | Max. | Min.   | Max.  |
| A    | 25.4        | ---  | 1.000  | ---   |
| B    | 8.6         | 9.5  | 0.34   | 0.375 |
| C    | 1.2         | 1.3  | 0.048  | 0.052 |
| D    | 8.6         | 9.5  | 0.340  | 0.375 |

## Maximum Ratings and Characteristics @ 25°C Ambient Temperature (unless otherwise noted)

| Parameter   | Symbol    | Value       | Units            |
|---|-----------|-------------|------------------|
| Peak Pulse Power Dissipation on 10/1000 us Waveform (Note 1, FIG.1) | $P_{PPM}$ | Min 3000    | W                |
| Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$   | $P_D$     | 7.0         | W                |
| Peak Pulse Current of on 10/1000us Waveform (Note 1, FIG.3)         | $I_{PPM}$ | See Table 1 | A                |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave (Note 2)    | $I_{FSM}$ | 300         | A                |
| Operating Junction Temperature Range                                | $T_J$     | -55 to 150  | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$ | -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. Measured on 8.3ms single half sine-wave, or equivalent square wave, for Unidirectional device only.

## Electrical Specification (T<sub>A</sub>=25@25°C unless otherwise specified)

| Type Number |          | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I <sub>T</sub> | Breakdown Voltage Max. @ I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RMW</sub> |
|-------------|----------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni)       | (Bi)     | V <sub>RMW</sub> (V)      | V <sub>BR MIN</sub> (V)                | V <sub>BR MAX</sub> (V)                 | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> ( $\mu$ A)         |
| 3KP5.0A     | 3KP5.0CA | 5.0                       | 6.40                                   | 7.00                                    | 50                  | 9.2                                       | 326.1               | 5000                              |
| 3KP6.0A     | 3KP6.0CA | 6.0                       | 6.67                                   | 7.37                                    | 50                  | 10.3                                      | 291.3               | 5000                              |
| 3KP6.5A     | 3KP6.5CA | 6.5                       | 7.22                                   | 7.98                                    | 50                  | 11.2                                      | 267.9               | 2000                              |
| 3KP7.0A     | 3KP7.0CA | 7.0                       | 7.78                                   | 8.60                                    | 50                  | 12.0                                      | 250.0               | 1000                              |
| 3KP7.5A     | 3KP7.5CA | 7.5                       | 8.33                                   | 9.21                                    | 5                   | 12.9                                      | 232.6               | 250                               |
| 3KP8.0A     | 3KP8.0CA | 8.0                       | 8.89                                   | 9.83                                    | 5                   | 13.6                                      | 220.6               | 150                               |
| 3KP8.5A     | 3KP8.5CA | 8.5                       | 9.44                                   | 10.40                                   | 5                   | 14.4                                      | 208.3               | 50                                |
| 3KP9.0A     | 3KP9.0CA | 9.0                       | 10.00                                  | 11.10                                   | 5                   | 15.4                                      | 194.8               | 20                                |
| 3KP10A      | 3KP10CA  | 10.0                      | 11.10                                  | 12.30                                   | 5                   | 17.0                                      | 176.5               | 15                                |
| 3KP11A      | 3KP11CA  | 11.0                      | 12.20                                  | 13.50                                   | 5                   | 18.2                                      | 164.8               | 2                                 |
| 3KP12A      | 3KP12CA  | 12.0                      | 13.30                                  | 14.70                                   | 5                   | 19.9                                      | 150.8               | 2                                 |
| 3KP13A      | 3KP13CA  | 13.0                      | 14.40                                  | 15.90                                   | 5                   | 21.5                                      | 139.5               | 2                                 |
| 3KP14A      | 3KP14CA  | 14.0                      | 15.60                                  | 17.20                                   | 5                   | 23.2                                      | 129.3               | 2                                 |
| 3KP15A      | 3KP15CA  | 15.0                      | 16.70                                  | 18.50                                   | 5                   | 24.4                                      | 123.0               | 2                                 |
| 3KP16A      | 3KP16CA  | 16.0                      | 17.80                                  | 19.70                                   | 5                   | 26.0                                      | 115.4               | 2                                 |
| 3KP17A      | 3KP17CA  | 17.0                      | 18.90                                  | 20.90                                   | 5                   | 27.6                                      | 108.7               | 2                                 |
| 3KP18A      | 3KP18CA  | 18.0                      | 20.00                                  | 22.10                                   | 5                   | 29.2                                      | 102.7               | 2                                 |
| 3KP20A      | 3KP20CA  | 20.0                      | 22.20                                  | 24.50                                   | 5                   | 32.4                                      | 92.6                | 2                                 |
| 3KP22A      | 3KP22CA  | 22.0                      | 24.40                                  | 26.90                                   | 5                   | 35.5                                      | 84.5                | 2                                 |
| 3KP24A      | 3KP24CA  | 24.0                      | 26.70                                  | 29.50                                   | 5                   | 38.9                                      | 77.1                | 2                                 |
| 3KP26A      | 3KP26CA  | 26.0                      | 28.90                                  | 31.90                                   | 5                   | 42.1                                      | 71.3                | 2                                 |
| 3KP28A      | 3KP28CA  | 28.0                      | 31.10                                  | 34.40                                   | 5                   | 45.4                                      | 66.1                | 2                                 |
| 3KP30A      | 3KP30CA  | 30.0                      | 33.30                                  | 36.80                                   | 5                   | 48.4                                      | 62.0                | 2                                 |
| 3KP33A      | 3KP33CA  | 33.0                      | 36.70                                  | 40.60                                   | 5                   | 53.3                                      | 56.3                | 2                                 |
| 3KP36A      | 3KP36CA  | 36.0                      | 40.00                                  | 44.20                                   | 5                   | 58.1                                      | 51.6                | 2                                 |
| 3KP40A      | 3KP40CA  | 40.0                      | 44.40                                  | 49.10                                   | 5                   | 64.5                                      | 46.5                | 2                                 |
| 3KP43A      | 3KP43CA  | 43.0                      | 47.80                                  | 52.80                                   | 5                   | 69.4                                      | 43.2                | 2                                 |
| 3KP45A      | 3KP45CA  | 45.0                      | 50.00                                  | 55.30                                   | 5                   | 72.7                                      | 41.3                | 2                                 |
| 3KP48A      | 3KP48CA  | 48.0                      | 53.30                                  | 58.90                                   | 5                   | 77.4                                      | 38.8                | 2                                 |
| 3KP51A      | 3KP51CA  | 51.0                      | 56.70                                  | 62.70                                   | 5                   | 82.4                                      | 36.4                | 2                                 |
| 3KP54A      | 3KP54CA  | 54.0                      | 60.00                                  | 66.30                                   | 5                   | 87.1                                      | 34.4                | 2                                 |
| 3KP58A      | 3KP58CA  | 58.0                      | 64.40                                  | 71.20                                   | 5                   | 93.6                                      | 32.1                | 2                                 |
| 3KP60A      | 3KP60CA  | 60.0                      | 66.70                                  | 73.70                                   | 5                   | 96.8                                      | 31.0                | 2                                 |
| 3KP64A      | 3KP64CA  | 64.0                      | 71.10                                  | 78.60                                   | 5                   | 103.0                                     | 29.1                | 2                                 |
| 3KP70A      | 3KP70CA  | 70.0                      | 77.80                                  | 86.00                                   | 5                   | 113.0                                     | 26.5                | 2                                 |
| 3KP75A      | 3KP75CA  | 75.0                      | 83.30                                  | 92.10                                   | 5                   | 121.0                                     | 24.8                | 2                                 |

※ For Bi-directional type having V<sub>RMW</sub> of 10 Volts and less, the I<sub>R</sub> limit is double.

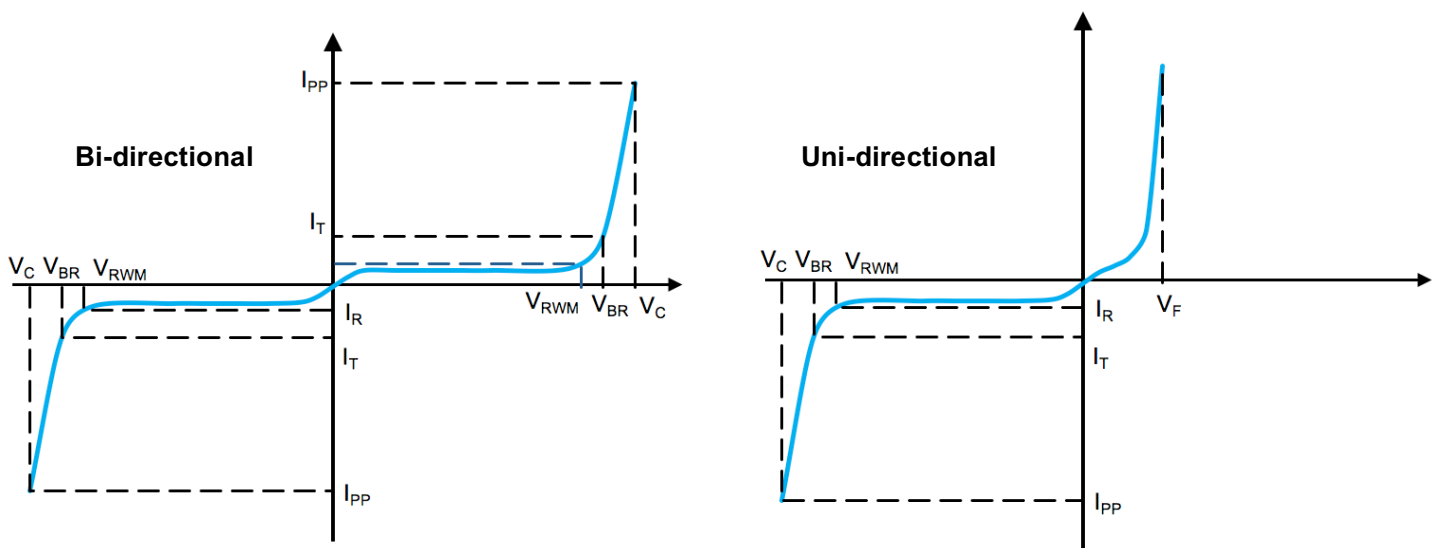
※ For parts without A, the V<sub>BR</sub> is  $\pm$  10% and V<sub>C</sub> is 5% higher than with A parts.

| Type Number |          | Reverse Stand-Off Voltage | Breakdown Voltage Min. @ $I_T$ | Breakdown Voltage Max. @ $I_T$ | Test Current | Maximum Clamping Voltage @ $I_{PP}$ | Peak Pulse Current | Reverse Leakage @ $V_{RWM}$ |
|-------------|----------|---------------------------|--------------------------------|--------------------------------|--------------|-------------------------------------|--------------------|-----------------------------|
| (Uni)       | (Bi)     | $V_{RWM}(V)$              | $V_{BR MIN}(V)$                | $V_{BR MAX}(V)$                | $I_T (mA)$   | $V_C(V)$                            | $I_{PP}(A)$        | $I_R(\mu A)$                |
| 3KP78A      | 3KP78CA  | 78.0                      | 86.70                          | 95.80                          | 5            | 126.0                               | 23.8               | 2                           |
| 3KP85A      | 3KP85CA  | 85.0                      | 94.40                          | 104.00                         | 5            | 137.0                               | 21.9               | 2                           |
| 3KP90A      | 3KP90CA  | 90.0                      | 100.00                         | 111.00                         | 5            | 146.0                               | 20.5               | 2                           |
| 3KP100A     | 3KP100CA | 100.0                     | 111.00                         | 123.00                         | 5            | 162.0                               | 18.5               | 2                           |
| 3KP110A     | 3KP110CA | 110.0                     | 122.00                         | 135.00                         | 5            | 177.0                               | 16.9               | 2                           |
| 3KP120A     | 3KP120CA | 120.0                     | 133.00                         | 147.00                         | 5            | 193.0                               | 15.5               | 2                           |
| 3KP130A     | 3KP130CA | 130.0                     | 144.00                         | 159.00                         | 5            | 209.0                               | 14.4               | 2                           |
| 3KP150A     | 3KP150CA | 150.0                     | 167.00                         | 185.00                         | 5            | 243.0                               | 12.3               | 2                           |
| 3KP160A     | 3KP160CA | 160.0                     | 178.00                         | 197.00                         | 5            | 259.0                               | 11.6               | 2                           |
| 3KP170A     | 3KP170CA | 170.0                     | 189.00                         | 209.00                         | 5            | 275.0                               | 10.9               | 2                           |
| 3KP180A     | 3KP180CA | 180.0                     | 200.00                         | 221.00                         | 5            | 289.0                               | 10.4               | 2                           |
| 3KP190A     | 3KP190CA | 190.0                     | 211.00                         | 233.00                         | 5            | 310.0                               | 9.7                | 2                           |
| 3KP200A     | 3KP200CA | 200.0                     | 222.00                         | 246.00                         | 5            | 329.2                               | 9.1                | 2                           |
| 3KP210A     | 3KP210CA | 210.0                     | 233.00                         | 258.00                         | 5            | 349.5                               | 8.6                | 2                           |
| 3KP220A     | 3KP220CA | 220.0                     | 244.00                         | 270.00                         | 5            | 371.1                               | 8.1                | 2                           |

※ For Bi-directional type having  $V_{RWM}$  of 10 Volts and less, the  $I_R$  limit is double.

※ For parts without A, the  $V_{BR}$  is  $\pm 10\%$  and  $V_C$  is 5% higher than with A parts.

## I-V Curve Characteristics



$P_{PPM}$  **Peak Pulse Power Dissipation** - Max power dissipation

$V_{RWM}$  **Reverse Stand-off Voltage** - Maximum voltage that can be applied to TVS without operation

$V_{BR}$  **Breakdown Voltage** – Maximum voltage that flows through the TVS at a specified current ( $I_T$ )

$V_C$  **Clamping Voltage** – Peak voltage measured across the TVS at a specified  $I_{PPM}$  (peak impulse current)

$I_R$  **Reverse Leakage Current** – Current measured at  $V_R$

$V_F$  **Forward Voltage Drop for Uni-directional**

## Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise noted)

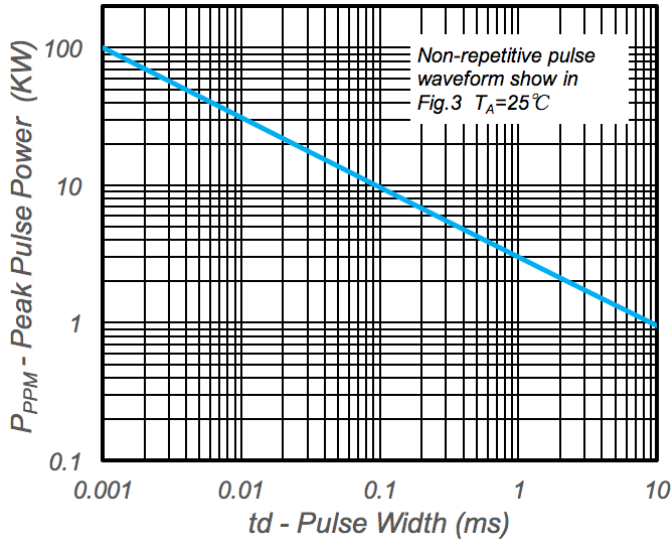


Fig.1 - Peak Pulse Power Rating

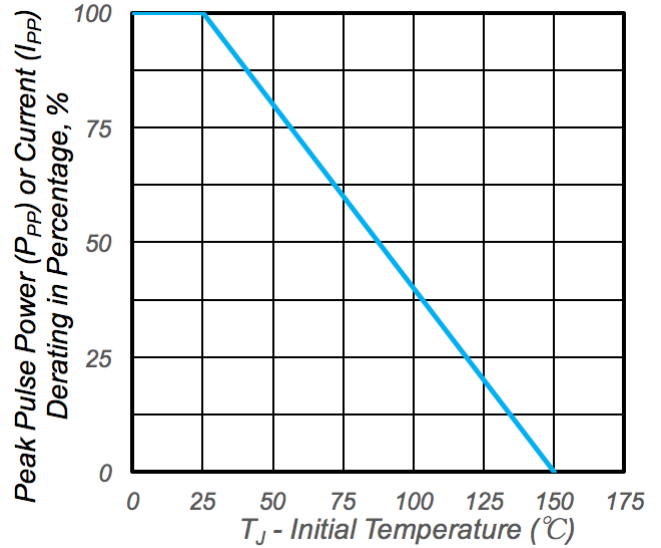


Fig.2 - Pulse Derating Curve

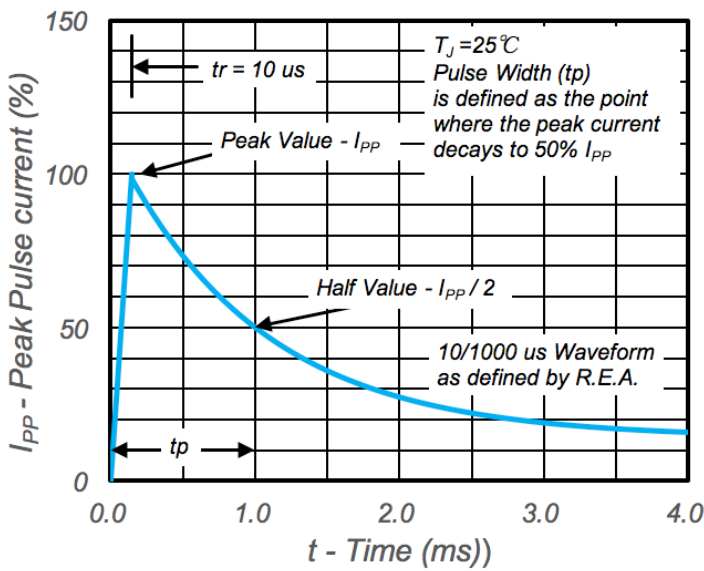


Fig.3 - Pulse Waveform

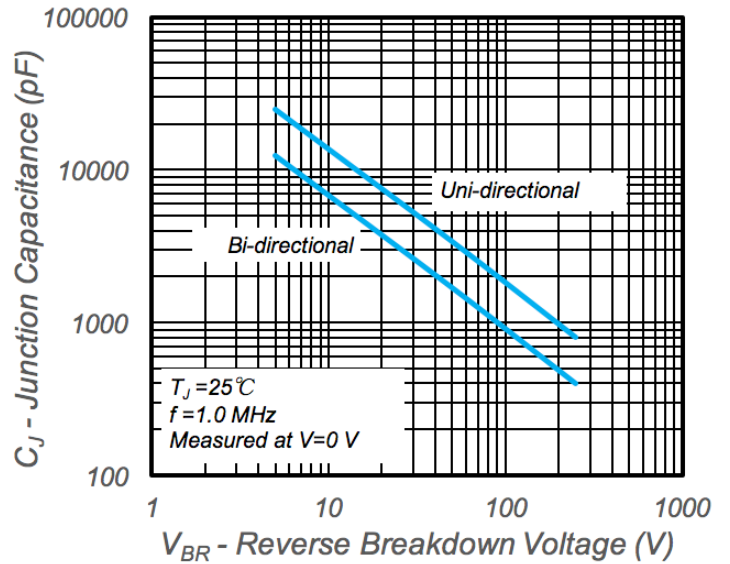


Fig.4 - Typical Junction Capacitance