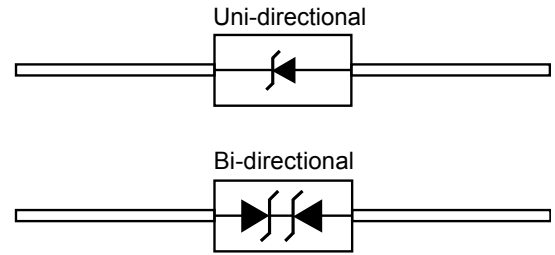


## 5000 Watt Axial Leaded Transient Voltage Suppressor

### Description

The 5KP Series are designed specifically to protect sensitive electronics equipment from voltage transients induced by lightning and other transient voltage events.

These devices are ideal for the protection of I/O interfaces, Vcc bus and other vulnerable circuits used in automotive, industrial and consumer electronic applications.



### Feature

- RoHS compliant
- 5.0 to 190 Volts
- Glass passivated chip junction
- Uni-directional and Bi-directional
- 5000W peak pulse power capability on 10/1000 $\mu$ s waveform
- Excellent clamping capability
- Repetition rate (duty cycle): 0.05%
- Low incremental surge resistance
- Fast response time: typically less than 1.0ps from 0 Volts to  $V_R$

### Absolute maximum rating@25°C

| Parameter   | Symbol         | Value       | Unit             |
|---|----------------|-------------|------------------|
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform(Note 1, FIG. 1)                                    | $P_{PPM}$      | Min 5000    | W                |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform (Note 1, FIG. 3)  | $I_{PPM}$      | See Table 1 | A                |
| Steady State Power Dissipation at $T_L=75^\circ\text{C}$ , Lead lengths .375",                              | $P_{M(AV)}$    | 8           | W                |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3) | $I_{FSM}$      | 400         | A                |
| Operating junction and Storage  | $T_J, T_{STG}$ | -55 to +175 | $^\circ\text{C}$ |

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 0.8x0.8"(20x20mm) per Fig.5.
3. 8.3 ms single half sine-wave, or equivalent square wave, Duty cycle= 4 pulses per minutes maximum.

## Electrical characteristics

| Part Number (Uni) | Part Number (Bi) | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR} @ I_T$ (V) |       | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C @ I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R @ V_R$ ( $\mu$ A) |
|-------------------|------------------|-------------------------------------|--------------------------------------|-------|-------------------------|---|---|--|
|                   |                  |                                     | MIN                                  | MAX   |                         |   |   |  |
| 5KP5.0A           | 5KP5.0CA         | 5.0                                 | 6.4                                  | 7.25  | 10                      | 9.2   | 543.5                                   | 1000   |
| 5KP6.0A           | 5KP6.0CA         | 6.0                                 | 6.67                                 | 7.67  | 10                      | 10.3  | 485.4                                   | 1000   |
| 5KP6.5A           | 5KP6.5CA         | 6.5                                 | 7.22                                 | 8.30  | 10                      | 11.2  | 446.4                                   | 500  |
| 5KP7.0A           | 5KP7.0CA         | 7.0                                 | 7.78                                 | 8.95  | 10                      | 12.0  | 416.7                                   | 200  |
| 5KP7.5A           | 5KP7.5CA         | 7.5                                 | 8.33                                 | 9.58  | 1.0                     | 12.9  | 387.6                                   | 50   |
| 5KP8.0A           | 5KP8.0CA         | 8.0                                 | 8.89                                 | 10.23 | 1.0                     | 13.6  | 367.6                                   | 10   |
| 5KP8.5A           | 5KP8.5CA         | 8.5                                 | 9.44                                 | 10.82 | 1.0                     | 14.4  | 347.2                                   | 5  |
| 5KP9.0A           | 5KP9.0CA         | 9.0                                 | 10.00                                | 11.50 | 1.0                     | 15.4  | 324.7                                   | 5  |
| 5KP10A            | 5KP10CA          | 10.0                                | 11.10                                | 12.80 | 1.0                     | 17.0  | 294.1                                   | 5  |
| 5KP11A            | 5KP11CA          | 11.0                                | 12.20                                | 14.00 | 1.0                     | 18.2  | 274.7                                   | 5  |
| 5KP12A            | 5KP12CA          | 12.0                                | 13.30                                | 15.30 | 1.0                     | 19.9  | 251.3                                   | 5  |
| 5KP13A            | 5KP13CA          | 13.0                                | 14.40                                | 16.50 | 1.0                     | 21.5  | 232.6                                   | 5  |
| 5KP14A            | 5KP14CA          | 14.0                                | 15.60                                | 17.90 | 1.0                     | 23.2  | 215.5                                   | 5  |
| 5KP15A            | 5KP15CA          | 15.0                                | 16.70                                | 19.20 | 1.0                     | 24.4  | 204.9                                   | 5  |
| 5KP16A            | 5KP16CA          | 16.0                                | 17.80                                | 20.50 | 1.0                     | 26.0  | 192.3                                   | 5  |
| 5KP17A            | 5KP17CA          | 17.0                                | 18.90                                | 21.70 | 1.0                     | 27.6  | 181.2                                   | 5  |
| 5KP18A            | 5KP18CA          | 18.0                                | 20.00                                | 23.30 | 1.0                     | 29.2  | 171.2                                   | 5  |
| 5KP20A            | 5KP20CA          | 20.0                                | 22.20                                | 25.50 | 1.0                     | 32.4  | 154.3                                   | 5  |
| 5KP22A            | 5KP22CA          | 22.0                                | 24.40                                | 28.00 | 1.0                     | 35.5  | 140.8                                   | 5  |
| 5KP24A            | 5KP24CA          | 24.0                                | 26.70                                | 30.70 | 1.0                     | 38.9  | 128.5                                   | 5  |
| 5KP26A            | 5KP26CA          | 26.0                                | 28.9                                 | 33.20 | 1.0                     | 42.1  | 118.8                                   | 5  |
| 5KP28A            | 5KP28CA          | 28.0                                | 31.1                                 | 35.80 | 1.0                     | 45.4  | 110.1                                   | 5  |
| 5KP30A            | 5KP30CA          | 30.0                                | 33.30                                | 38.30 | 1.0                     | 48.4  | 103.3                                   | 5  |
| 5KP33A            | 5KP33CA          | 33.0                                | 36.70                                | 42.20 | 1.0                     | 53.3  | 93.9                                    | 5  |
| 5KP36A            | 5KP36CA          | 36.0                                | 40.00                                | 46.00 | 1.0                     | 58.1  | 86.1                                    | 5  |
| 5KP40A            | 5KP40CA          | 40.0                                | 44.40                                | 51.10 | 1.0                     | 64.5  | 77.5                                    | 5  |
| 5KP43A            | 5KP43CA          | 43.0                                | 47.80                                | 54.90 | 1.0                     | 69.4  | 72.0                                    | 5  |
| 5KP45A            | 5KP45CA          | 45.0                                | 50.00                                | 57.50 | 1.0                     | 72.7  | 68.8                                    | 5  |

| Part Number (Uni) | Part Number (Bi) | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR} @ I_T$ (V) |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C @ I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R @ V_R$ ( $\mu$ A) |
|-------------------|------------------|-------------------------------------|--------------------------------------|--------|-------------------------|---|---|--|
|                   |                  |                                     | MIN                                  | MAX    |                         |   |   |  |
| 5KP48A            | 5KP48CA          | 48.0                                | 53.30                                | 61.30  | 1.0                     | 77.4  | 64.6                                    | 5  |
| 5KP51A            | 5KP51CA          | 51.0                                | 56.70                                | 65.20  | 1.0                     | 82.4  | 60.7                                    | 5  |
| 5KP54A            | 5KP54CA          | 54.0                                | 60.00                                | 69.10  | 1.0                     | 87.1  | 57.4                                    | 5  |
| 5KP58A            | 5KP58CA          | 58.0                                | 64.40                                | 74.10  | 1.0                     | 93.6  | 53.4                                    | 5  |
| 5KP60A            | 5KP60CA          | 60.0                                | 66.70                                | 76.70  | 1.0                     | 96.8  | 51.7                                    | 5  |
| 5KP64A            | 5KP64CA          | 64.0                                | 71.10                                | 81.80  | 1.0                     | 103.0                                       | 48.5                                    | 5  |
| 5KP70A            | 5KP70CA          | 70.0                                | 77.80                                | 89.50  | 1.0                     | 113.0                                       | 44.2                                    | 5  |
| 5KP75A            | 5KP75CA          | 75.0                                | 83.00                                | 95.80  | 1.0                     | 121.0                                       | 41.3                                    | 5  |
| 5KP78A            | 5KP78CA          | 78.0                                | 86.00                                | 99.70  | 1.0                     | 126.0                                       | 39.7                                    | 5  |
| 5KP85A            | 5KP85CA          | 85.0                                | 94.00                                | 108.20 | 1.0                     | 137.0                                       | 36.5                                    | 5  |
| 5KP90A            | 5KP90CA          | 90.0                                | 100.00                               | 115.50 | 1.0                     | 146.0                                       | 34.2                                    | 5  |
| 5KP100A           | 5KP100CA         | 100.0                               | 111.00                               | 128.00 | 1.0                     | 162.0                                       | 30.9                                    | 5  |
| 5KP110A           | 5KP110CA         | 110.0                               | 122.00                               | 140.50 | 1.0                     | 177.0                                       | 28.2                                    | 5  |
| 5KP120A           | 5KP120CA         | 120.0                               | 133.00                               | 153.00 | 1.0                     | 193.0                                       | 25.9                                    | 5  |
| 5KP130A           | 5KP130CA         | 130.0                               | 144.00                               | 165.50 | 1.0                     | 209.0                                       | 23.9                                    | 5  |
| 5KP150A           | 5KP150CA         | 150.0                               | 167.00                               | 192.50 | 1.0                     | 243.0                                       | 20.6                                    | 5  |
| 5KP160A           | 5KP160CA         | 160.0                               | 178.00                               | 205.00 | 1.0                     | 259.0                                       | 19.3                                    | 5  |
| 5KP170A           | 5KP170CA         | 170.0                               | 189.0                                | 217.50 | 1.0                     | 275.0                                       | 18.2                                    | 5  |
| 5KP180A           | 5KP180CA         | 180.0                               | 200.0                                | 230.40 | 1.0                     | 290.0                                       | 17.2                                    | 5  |
| 5KP190A           | 5KP190CA         | 190.0                               | 211.00                               | 243.20 | 1.0                     | 306.0                                       | 16.3                                    | 5  |

For bidirectional type having  $V_R$  of 30 volts and less, the  $I_R$  limit is double.

For parts without A, the  $V_{BR}$  is  $\pm 10\%$

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

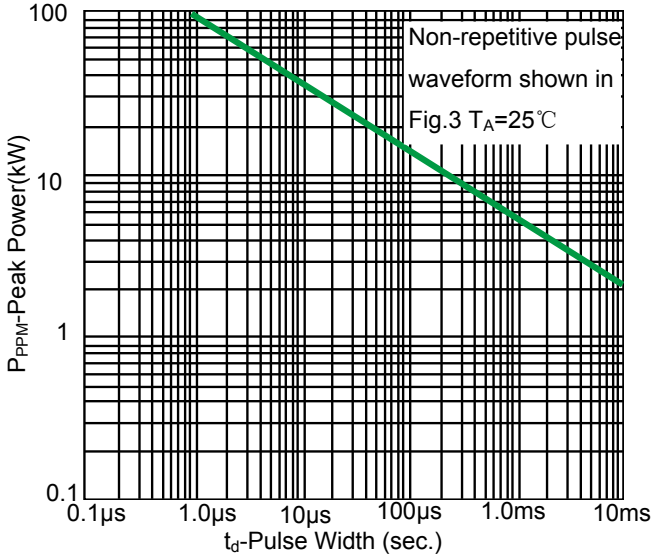


Figure 1-Peak Pulse Power Rating Curve

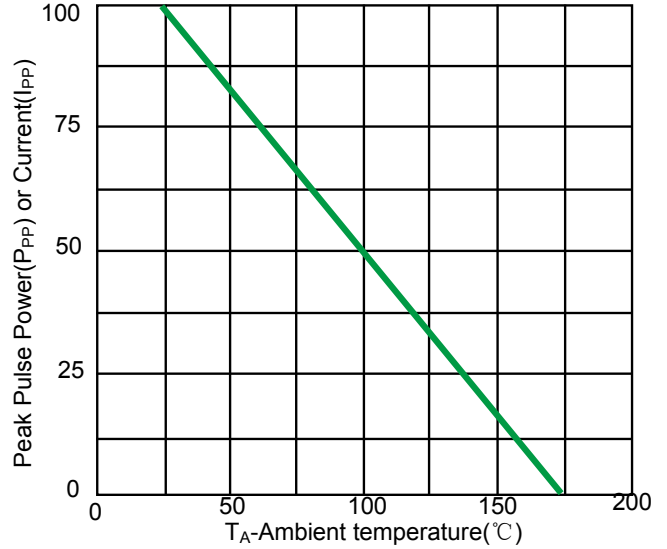


Figure 2-Pulse Derating Curve

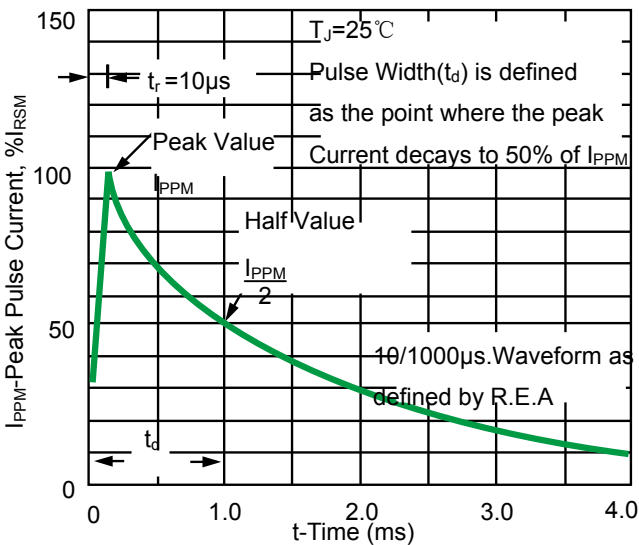


Figure 3-Pulse Waveform

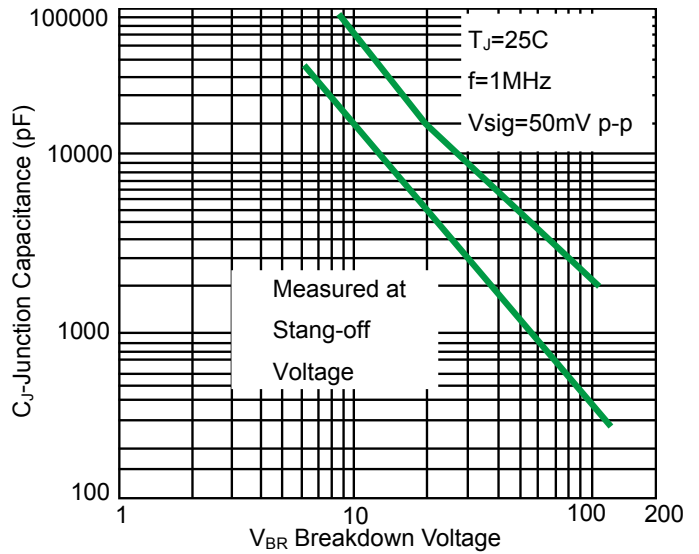


Figure 4-Typical Junction Capacitance

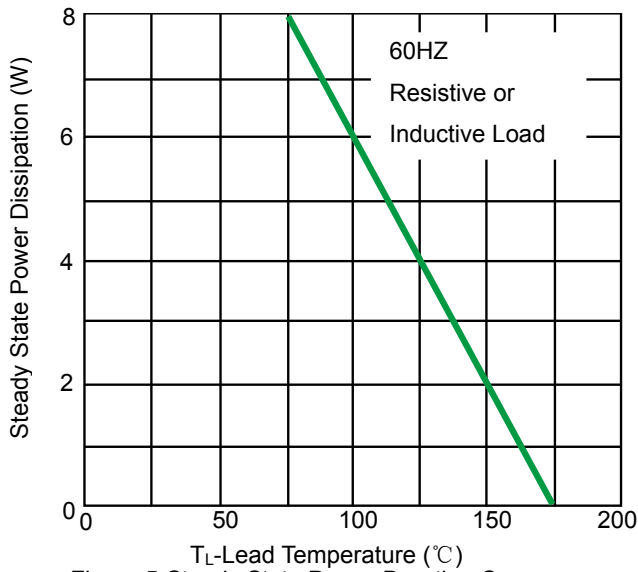


Figure 5-Steady State Power Derating Curve

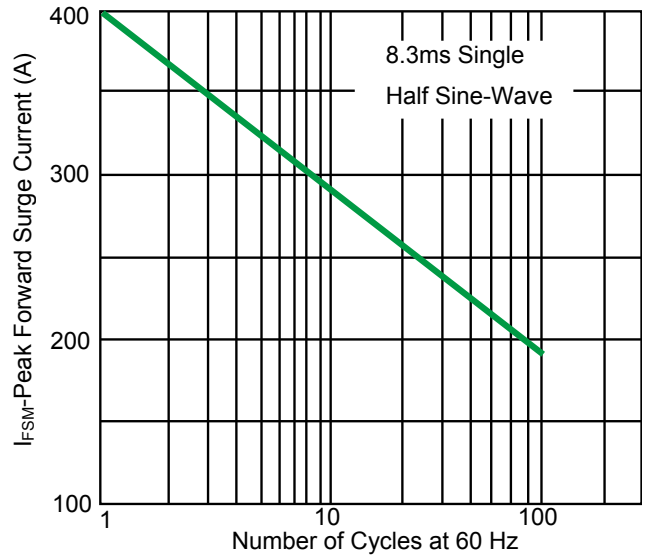
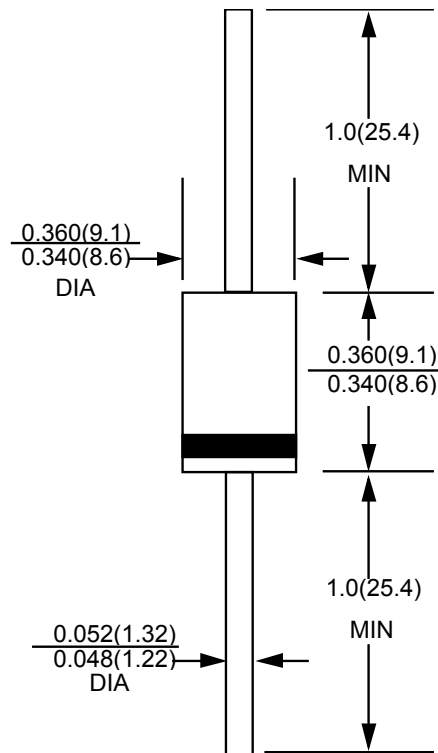



Figure 6-Maximum Non-Repetitive Forward Surge Current

Product dimension (R-6)



Dimensions in inches and (millimeters)


**IMPORTANT NOTICE**

 and **Prisemi**<sup>®</sup> are registered trademarks of **Prisemi Electronics Co., Ltd (Prisemi)** ,Prisemi reserves the right to make changes without further notice to any products herein. Prisemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Prisemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in Prisemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. Prisemi does not convey any license under its patent rights nor the rights of others. The products listed in this document are designed to be used with ordinary electronic equipment or devices, Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

Website: <http://www.prisemi.com>

For additional information, please contact your local Sales Representative.

©Copyright 2009, Prisemi Electronics

 **Prisemi**<sup>®</sup> is a registered trademark of Prisemi Electronics.

All rights are reserved.