



## 5KP SERIES

**V<sub>BR</sub> : 5.0 - 180 Volts**  
**P<sub>PK</sub> : 5000 Watts**

### FEATURES :

- \* 5000W Peak Pulse Power
- \* Excellent clamping capability
- \* Low incremental surge resistance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V

### MECHANICAL DATA

- \* Case : Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
- \* Polarity : Cathode polarity band
- \* Mounting position : Any
- \* Weight : 2.73 grams

### DEVICES FOR BIPOLAR APPLICATIONS

For Bi-directional use C or CA Suffix  
Electrical characteristics apply in both directions

### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

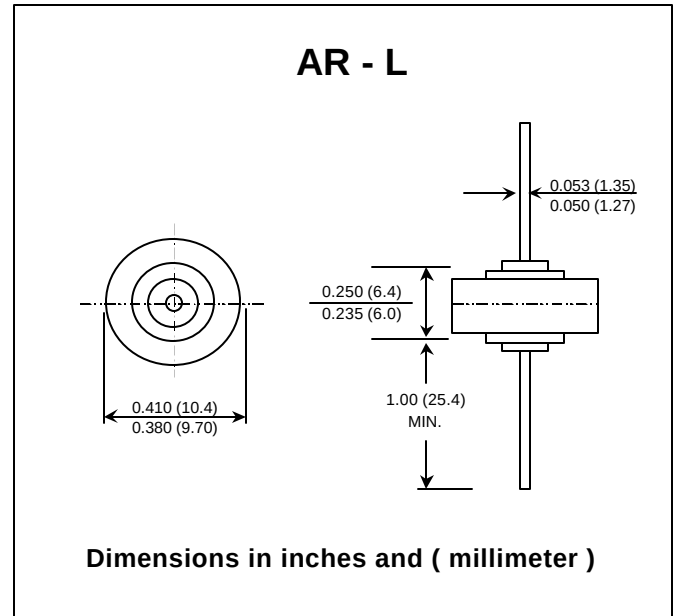
| Rating                                                                                                           | Symbol                            | Value         | Unit  |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------|-------|
| Peak Pulse Power Dissipation at tp = 1ms<br>(Note 1, Fig. 4)                                                     | P <sub>PK</sub>                   | Minimum 5000  | Watts |
| Steady State Power Dissipation at T <sub>L</sub> = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2)                | P <sub>D</sub>                    | 8.0           | Watts |
| Peak Forward Surge Current, 8.3ms Single Half<br>Sine-Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | I <sub>FSM</sub>                  | 400           | Amps. |
| Operating and Storage Temperature Range                                                                          | T <sub>J</sub> , T <sub>STG</sub> | - 55 to + 150 | °C    |

### Note :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on Copper Leaf area of 0.79 in<sup>2</sup> (20mm<sup>2</sup>).
- (3) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum.

**UPDATE : SEPTEMBER 6, 2001**

## TRANSIENT VOLTAGE SUPPRESSOR





## ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE    | Breakdown Voltage @ $I_T$<br>( Note 1 ) |      |       | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse Leakage<br>@ $V_{RM}$ | Maximum<br>Peak Pulse<br>Current (Note2) | Maximum<br>Clamping<br>Voltage @ $I_{PPM}$ | Maximum<br>Voltage<br>Temperature<br>Variation of<br>$V_{BR}$ (mV/°C) |
|---------|-----------------------------------------|------|-------|---------------------------------|------------------------------------------|------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------|
|         | $V_{BR}$ (V)                            |      | $I_T$ | $V_{RWM}$                       | $I_R$                                    | $I_{PPM}$                                | $V_C$                                      |                                                                       |
|         | Min.                                    | Max. | (mA)  | (V)                             | ( $\mu A$ )                              | (A)                                      | (V)                                        |                                                                       |
| 5KP5.0  | 6.40                                    | 7.30 | 50    | 5.0                             | 5000                                     | 520                                      | 9.60                                       | 4.0                                                                   |
| 5KP5.0A | 6.40                                    | 7.00 | 50    | 5.0                             | 5000                                     | 543                                      | 9.20                                       | 4.0                                                                   |
| 5KP6.0  | 6.67                                    | 8.15 | 50    | 6.0                             | 5000                                     | 439                                      | 11.4                                       | 4.0                                                                   |
| 5KP6.0A | 6.67                                    | 7.37 | 50    | 6.0                             | 5000                                     | 485                                      | 10.3                                       | 4.0                                                                   |
| 5KP6.5  | 7.22                                    | 8.82 | 50    | 6.5                             | 2000                                     | 407                                      | 12.3                                       | 4.0                                                                   |
| 5KP6.5A | 7.22                                    | 7.98 | 50    | 6.5                             | 2000                                     | 447                                      | 11.2                                       | 4.0                                                                   |
| 5KP7.0  | 7.78                                    | 9.51 | 5.0   | 7.0                             | 1000                                     | 378                                      | 13.3                                       | 5.0                                                                   |
| 5KP7.0A | 7.78                                    | 8.60 | 5.0   | 7.0                             | 1000                                     | 417                                      | 12.0                                       | 5.0                                                                   |
| 5KP7.5  | 8.33                                    | 10.2 | 5.0   | 7.5                             | 250                                      | 350                                      | 14.3                                       | 6.0                                                                   |
| 5KP7.5A | 8.33                                    | 9.21 | 5.0   | 7.5                             | 250                                      | 388                                      | 12.9                                       | 6.0                                                                   |
| 5KP8.0  | 8.89                                    | 10.9 | 5.0   | 8.0                             | 150                                      | 333                                      | 15.0                                       | 6.0                                                                   |
| 5KP8.0A | 8.89                                    | 9.83 | 5.0   | 8.0                             | 150                                      | 367                                      | 13.6                                       | 6.0                                                                   |
| 5KP8.5  | 9.44                                    | 11.5 | 5.0   | 8.5                             | 50                                       | 314                                      | 15.9                                       | 7.0                                                                   |
| 5KP8.5A | 9.44                                    | 10.4 | 5.0   | 8.5                             | 50                                       | 347                                      | 14.4                                       | 7.0                                                                   |
| 5KP9.0  | 10.0                                    | 12.2 | 5.0   | 9.0                             | 20                                       | 295                                      | 16.9                                       | 8.0                                                                   |
| 5KP9.0A | 10.0                                    | 11.1 | 5.0   | 9.0                             | 20                                       | 325                                      | 15.4                                       | 8.0                                                                   |
| 5KP10   | 11.1                                    | 13.6 | 5.0   | 10                              | 15                                       | 266                                      | 18.8                                       | 9.0                                                                   |
| 5KP10A  | 11.1                                    | 12.3 | 5.0   | 10                              | 15                                       | 294                                      | 17.0                                       | 9.0                                                                   |
| 5KP11   | 12.2                                    | 14.9 | 5.0   | 11                              | 10                                       | 249                                      | 20.1                                       | 10                                                                    |
| 5KP11A  | 12.2                                    | 13.5 | 5.0   | 11                              | 10                                       | 274                                      | 18.2                                       | 10                                                                    |
| 5KP12   | 13.3                                    | 16.3 | 5.0   | 12                              | 10                                       | 227                                      | 22.0                                       | 11                                                                    |
| 5KP12A  | 13.3                                    | 14.7 | 5.0   | 12                              | 10                                       | 251                                      | 19.9                                       | 11                                                                    |
| 5KP13   | 14.4                                    | 17.6 | 5.0   | 13                              | 10                                       | 210                                      | 23.8                                       | 12                                                                    |
| 5KP13A  | 14.4                                    | 15.9 | 5.0   | 13                              | 10                                       | 232                                      | 21.5                                       | 12                                                                    |
| 5KP14   | 15.6                                    | 19.1 | 5.0   | 14                              | 10                                       | 194                                      | 25.8                                       | 13                                                                    |
| 5KP14A  | 15.6                                    | 17.2 | 5.0   | 14                              | 10                                       | 215                                      | 23.2                                       | 13                                                                    |
| 5KP15   | 16.7                                    | 20.4 | 5.0   | 15                              | 10                                       | 188                                      | 26.9                                       | 15                                                                    |
| 5KP15A  | 16.7                                    | 18.5 | 5.0   | 15                              | 10                                       | 206                                      | 24.4                                       | 15                                                                    |
| 5KP16   | 17.8                                    | 21.8 | 5.0   | 16                              | 10                                       | 176                                      | 28.8                                       | 18                                                                    |
| 5KP16A  | 17.8                                    | 19.7 | 5.0   | 16                              | 10                                       | 192                                      | 26.0                                       | 16                                                                    |
| 5KP17   | 18.9                                    | 23.1 | 5.0   | 17                              | 10                                       | 164                                      | 30.5                                       | 19                                                                    |
| 5KP17A  | 18.9                                    | 20.9 | 5.0   | 17                              | 10                                       | 181                                      | 27.6                                       | 18                                                                    |
| 5KP18   | 20.0                                    | 24.4 | 5.0   | 18                              | 10                                       | 155                                      | 32.2                                       | 20                                                                    |
| 5KP18A  | 20.0                                    | 22.1 | 5.0   | 18                              | 10                                       | 172                                      | 29.2                                       | 19                                                                    |
| 5KP20   | 22.2                                    | 27.1 | 5.0   | 20                              | 10                                       | 139                                      | 35.8                                       | 24                                                                    |
| 5KP20A  | 22.2                                    | 24.5 | 5.0   | 20                              | 10                                       | 154                                      | 32.4                                       | 22                                                                    |
| 5KP22   | 24.4                                    | 29.8 | 5.0   | 22                              | 10                                       | 127                                      | 39.4                                       | 27                                                                    |
| 5KP22A  | 24.4                                    | 26.9 | 5.0   | 22                              | 10                                       | 141                                      | 35.5                                       | 24                                                                    |
| 5KP24   | 26.7                                    | 32.6 | 5.0   | 24                              | 10                                       | 116                                      | 43.0                                       | 30                                                                    |
| 5KP24A  | 26.7                                    | 29.5 | 5.0   | 24                              | 10                                       | 128                                      | 38.9                                       | 27                                                                    |
| 5KP26   | 28.9                                    | 35.3 | 5.0   | 26                              | 10                                       | 107                                      | 46.6                                       | 33                                                                    |
| 5KP26A  | 28.9                                    | 31.9 | 5.0   | 26                              | 10                                       | 119                                      | 42.1                                       | 29                                                                    |
| 5KP28   | 31.1                                    | 38.0 | 5.0   | 28                              | 10                                       | 99                                       | 50.1                                       | 34                                                                    |
| 5KP28A  | 31.1                                    | 34.4 | 5.0   | 28                              | 10                                       | 110                                      | 45.4                                       | 30                                                                    |
| 5KP30   | 33.3                                    | 40.7 | 5.0   | 30                              | 10                                       | 93                                       | 53.5                                       | 38                                                                    |
| 5KP30A  | 33.3                                    | 36.8 | 5.0   | 30                              | 10                                       | 103                                      | 48.4                                       | 35                                                                    |
| 5KP33   | 36.7                                    | 44.9 | 5.0   | 33                              | 10                                       | 85                                       | 59.0                                       | 41                                                                    |
| 5KP33A  | 36.7                                    | 40.6 | 5.0   | 33                              | 10                                       | 94                                       | 53.3                                       | 38                                                                    |

## ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE   | Breakdown Voltage @ I <sub>r</sub><br>( Note 1 ) |      |                        | Reverse<br>Stand off<br>Voltage<br>V <sub>RWM</sub><br>(V) | Maximum<br>Reverse Leakage<br>@ V <sub>RM</sub><br>I <sub>R</sub><br>(μA) | Maximum<br>Peak Pulse<br>Current (Note2)<br>I <sub>PPM</sub><br>(A) | Maximum<br>Clamping<br>Voltage @ I <sub>PPM</sub><br>V <sub>C</sub><br>(V) | Maximum<br>Voltage<br>Temperature<br>Variation of<br>V <sub>BR</sub> (mV/°C) |
|--------|--------------------------------------------------|------|------------------------|------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------|
|        | V <sub>BR</sub> (V)                              |      | I <sub>r</sub><br>(mA) |                                                            |                                                                           |                                                                     |                                                                            |                                                                              |
|        | Min.                                             | Max. |                        |                                                            |                                                                           |                                                                     |                                                                            |                                                                              |
| 5KP36  | 40.0                                             | 48.9 | 5.0                    | 36                                                         | 10                                                                        | 78                                                                  | 64.3                                                                       | 45                                                                           |
| 5KP36A | 40.0                                             | 44.2 | 5.0                    | 36                                                         | 10                                                                        | 86                                                                  | 58.1                                                                       | 40                                                                           |
| 5KP40  | 44.4                                             | 54.3 | 5.0                    | 40                                                         | 10                                                                        | 70                                                                  | 71.4                                                                       | 50                                                                           |
| 5KP40A | 44.4                                             | 49.1 | 5.0                    | 40                                                         | 10                                                                        | 78                                                                  | 64.5                                                                       | 45                                                                           |
| 5KP43  | 47.8                                             | 58.4 | 5.0                    | 43                                                         | 10                                                                        | 65                                                                  | 76.7                                                                       | 54                                                                           |
| 5KP43A | 47.8                                             | 52.8 | 5.0                    | 43                                                         | 10                                                                        | 72                                                                  | 69.4                                                                       | 49                                                                           |
| 5KP45  | 50.0                                             | 61.1 | 5.0                    | 45                                                         | 10                                                                        | 62                                                                  | 80.3                                                                       | 57                                                                           |
| 5KP45A | 50.0                                             | 55.3 | 5.0                    | 45                                                         | 10                                                                        | 69                                                                  | 72.7                                                                       | 51                                                                           |
| 5KP48  | 53.3                                             | 65.2 | 5.0                    | 48                                                         | 10                                                                        | 58                                                                  | 85.5                                                                       | 62                                                                           |
| 5KP48A | 53.3                                             | 58.9 | 5.0                    | 48                                                         | 10                                                                        | 65                                                                  | 77.4                                                                       | 55                                                                           |
| 5KP51  | 56.7                                             | 69.3 | 5.0                    | 51                                                         | 10                                                                        | 55                                                                  | 91.1                                                                       | 65                                                                           |
| 5KP51A | 56.7                                             | 62.7 | 5.0                    | 51                                                         | 10                                                                        | 61                                                                  | 82.4                                                                       | 60                                                                           |
| 5KP54  | 60.0                                             | 73.3 | 5.0                    | 54                                                         | 10                                                                        | 52                                                                  | 96.3                                                                       | 70                                                                           |
| 5KP54A | 60.0                                             | 66.3 | 5.0                    | 54                                                         | 10                                                                        | 57                                                                  | 87.1                                                                       | 64                                                                           |
| 5KP58  | 64.4                                             | 78.7 | 5.0                    | 58                                                         | 10                                                                        | 49                                                                  | 103                                                                        | 77                                                                           |
| 5KP58A | 64.4                                             | 71.2 | 5.0                    | 58                                                         | 10                                                                        | 53                                                                  | 94                                                                         | 69                                                                           |
| 5KP60  | 66.7                                             | 81.5 | 5.0                    | 60                                                         | 10                                                                        | 47                                                                  | 107                                                                        | 79                                                                           |
| 5KP60A | 66.7                                             | 73.7 | 5.0                    | 60                                                         | 10                                                                        | 52                                                                  | 97                                                                         | 70                                                                           |
| 5KP64  | 71.1                                             | 96.9 | 5.0                    | 64                                                         | 10                                                                        | 44                                                                  | 114                                                                        | 85                                                                           |
| 5KP64A | 71.1                                             | 78.6 | 5.0                    | 64                                                         | 10                                                                        | 49                                                                  | 103                                                                        | 75                                                                           |
| 5KP70  | 77.6                                             | 95.1 | 5.0                    | 70                                                         | 10                                                                        | 40                                                                  | 125                                                                        | 93                                                                           |
| 5KP70A | 77.6                                             | 86.0 | 5.0                    | 70                                                         | 10                                                                        | 44                                                                  | 113                                                                        | 84                                                                           |
| 5KP75  | 83.3                                             | 102  | 5.0                    | 75                                                         | 10                                                                        | 37                                                                  | 134                                                                        | 100                                                                          |
| 5KP75A | 83.3                                             | 92.1 | 5.0                    | 75                                                         | 10                                                                        | 41                                                                  | 121                                                                        | 90                                                                           |
| 5KP78  | 86.7                                             | 106  | 5.0                    | 78                                                         | 10                                                                        | 36                                                                  | 139                                                                        | 104                                                                          |
| 5KP78A | 86.7                                             | 95.8 | 5.0                    | 78                                                         | 10                                                                        | 40                                                                  | 126                                                                        | 94                                                                           |
| 5KP85  | 94.4                                             | 115  | 5.0                    | 85                                                         | 10                                                                        | 33                                                                  | 151                                                                        | 113                                                                          |
| 5KP85A | 94.4                                             | 104  | 5.0                    | 85                                                         | 10                                                                        | 36                                                                  | 137                                                                        | 102                                                                          |
| 5KP90  | 100                                              | 122  | 5.0                    | 90                                                         | 10                                                                        | 31                                                                  | 160                                                                        | 120                                                                          |
| 5KP90A | 100                                              | 111  | 5.0                    | 100                                                        | 10                                                                        | 34                                                                  | 146                                                                        | 109                                                                          |
| 5KP100 | 111                                              | 136  | 5.0                    | 100                                                        | 10                                                                        | 28                                                                  | 179                                                                        | 134                                                                          |
| 5KP110 | 122                                              | 149  | 5.0                    | 110                                                        | 10                                                                        | 26                                                                  | 196                                                                        | 147                                                                          |
| 5KP120 | 133                                              | 163  | 5.0                    | 120                                                        | 10                                                                        | 23                                                                  | 215                                                                        | 158                                                                          |
| 5KP150 | 166                                              | 204  | 5.0                    | 150                                                        | 10                                                                        | 19                                                                  | 268                                                                        | 200                                                                          |
| 5KP180 | 200                                              | 244  | 5.0                    | 180                                                        | 10                                                                        | 15                                                                  | 320                                                                        | 240                                                                          |

### Note:

- ( 1 )  $V_{BR}$  measured after  $I_r$  applied for 300  $\mu$ s.,  $I_r$  = square wave pulse or equivalent.
- ( 2 ) Surge Current waveform per Fig. 3 and Derate per Fig. 2
- ( 3 )  $V_F$  = 3.5 Volts max. for devices of  $V_R$  < 100 V, and  $V_F$  = 5 Volts max. for devices of  $V_R$  > 100 V.
- ( 4 ) For Bi-directional devices having  $V_R$  of 10 Volts and under the  $I_R$  limit is doubled.

## RATING AND CHARACTERISTIC CURVES ( 5KP SERIES )

FIG.1 - PULSE DERATING CURVE

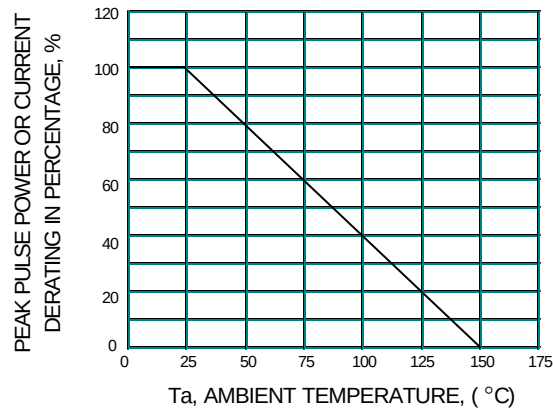


FIG.2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

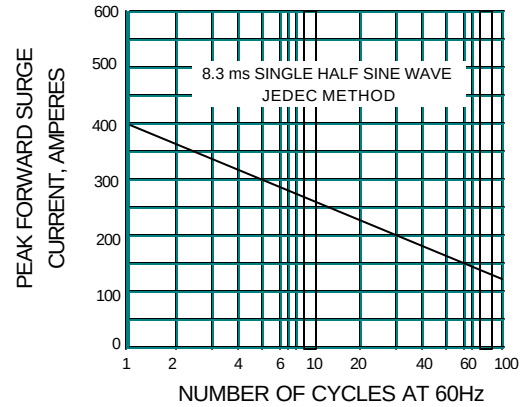


FIG.3 - STEADY STATE POWER DERATING

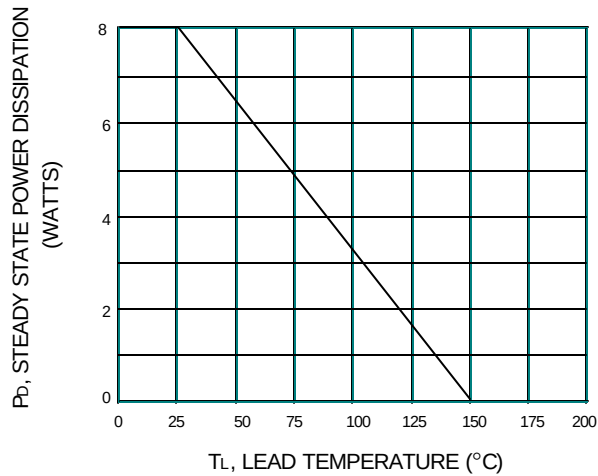


FIG.4 - PEAK PULSE POWER RATING CURVE

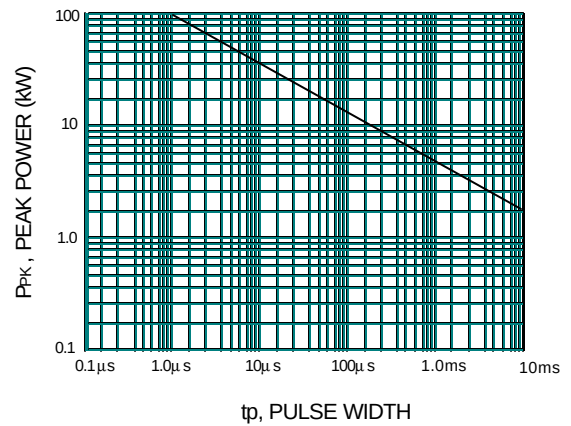
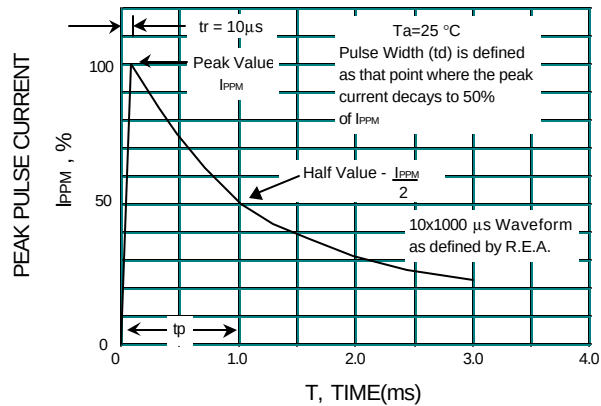


FIG.5 - PULSE WAVEFORM



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