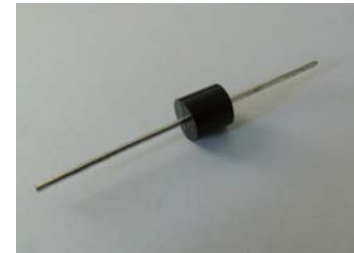


DESCRIPTION:

The 5KP series of high current uni/bi-directional transient suppressors are designed for A.C. line protection and high power DC bus clamping applications. These devices offer uni/bi-directional port protection from 5.0 volts to 250 volts. They provide a clamping voltage lower than the avalanche voltage. Therefore, any voltage rise due to increased current conduction is contained to a minimum, providing the best possible protection level. They can also be connected in series and/or parallel to create very high capacity protection solutions.



Bi-directional



Uni-directional

Symbol

FEATURES:

- ✧ Low zener impedance.
- ✧ Excellent clamping capability.
- ✧ JEDEC R-6/P-600 Molded Plastic.
- ✧ Repetition rate (duty cycle): 0.01%.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering: 260°C/10s at terminals.
- ✧ Glass passivated chip junction in R-6/P600 package.
- ✧ 5000W Peak Pulse power capability at 10×1000μs waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, RH=45%-75%, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|----------------|----------------|------|
| Peak pulse power dissipation on 10/1000μs waveform | P_{PP} | 5000 | W |
| Peak pulse current of on 10/1000μs waveform | I_{PP} | See next table | A |
| Steady state power dissipation at $T_L=75^\circ\text{C}$ | $P_{M(AV)}$ | 8 | W |
| Operating junction and Storage temperature range | T_{STG}, T_J | -55 to +150 | °C |
| Peak forward surge current, 8.3ms single half sine-wave | I_{FSM} | 400 | A |

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$)

| Part Number | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\text{①}}$ |
|-------------|----------|-------|---------------|--------------|--------|-------|--------------|---------------------|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| 5KP5.0A | 5KP5.0CA | 5.0 | 150 | 6.40 | 7.00 | 10 | 9.2 | 544.0 |
| 5KP6.0A | 5KP6.0CA | 6.0 | 100 | 6.67 | 7.37 | 10 | 10.3 | 486.0 |
| 5KP6.5A | 5KP6.5CA | 6.5 | 50 | 7.22 | 7.98 | 10 | 11.2 | 448.0 |
| 5KP7.0A | 5KP7.0CA | 7.0 | 20 | 7.78 | 8.60 | 10 | 12.0 | 417.0 |
| 5KP7.5A | 5KP7.5CA | 7.5 | 10 | 8.33 | 9.21 | 1 | 12.9 | 388.0 |
| 5KP8.0A | 5KP8.0CA | 8.0 | 10 | 8.89 | 9.83 | 1 | 13.6 | 367.0 |
| 5KP8.5A | 5KP8.5CA | 8.5 | 10 | 9.44 | 10.40 | 1 | 14.4 | 347.0 |
| 5KP9.0A | 5KP9.0CA | 9.0 | 10 | 10.00 | 11.10 | 1 | 15.4 | 325.0 |
| 5KP10A | 5KP10CA | 10.0 | 5 | 11.10 | 12.30 | 1 | 17.0 | 294.0 |
| 5KP11A | 5KP11CA | 11.0 | 5 | 12.20 | 13.50 | 1 | 18.2 | 275.0 |
| 5KP12A | 5KP12CA | 12.0 | 2 | 13.30 | 14.70 | 1 | 19.9 | 252.0 |
| 5KP13A | 5KP13CA | 13.0 | 2 | 14.40 | 15.90 | 1 | 21.5 | 233.0 |
| 5KP14A | 5KP14CA | 14.0 | 1 | 15.60 | 17.20 | 1 | 23.2 | 216.0 |
| 5KP15A | 5KP15CA | 15.0 | 1 | 16.70 | 18.50 | 1 | 24.4 | 205.0 |
| 5KP16A | 5KP16CA | 16.0 | 1 | 17.80 | 19.70 | 1 | 26.0 | 193.0 |
| 5KP17A | 5KP17CA | 17.0 | 1 | 18.90 | 20.90 | 1 | 27.6 | 181.0 |
| 5KP18A | 5KP18CA | 18.0 | 1 | 20.00 | 22.10 | 1 | 29.2 | 172.0 |
| 5KP20A | 5KP20CA | 20.0 | 1 | 22.20 | 24.50 | 1 | 32.4 | 155.0 |
| 5KP22A | 5KP22CA | 22.0 | 1 | 24.40 | 26.90 | 1 | 35.5 | 141.0 |
| 5KP24A | 5KP24CA | 24.0 | 1 | 26.70 | 29.50 | 1 | 38.9 | 129.0 |
| 5KP26A | 5KP26CA | 26.0 | 1 | 28.90 | 31.90 | 1 | 42.1 | 119.0 |
| 5KP28A | 5KP28CA | 28.0 | 1 | 31.10 | 34.40 | 1 | 45.4 | 110.0 |
| 5KP30A | 5KP30CA | 30.0 | 1 | 33.30 | 36.80 | 1 | 48.4 | 103.0 |
| 5KP33A | 5KP33CA | 33.0 | 1 | 36.70 | 40.60 | 1 | 53.3 | 93.9 |
| 5KP36A | 5KP36CA | 36.0 | 1 | 40.00 | 44.20 | 1 | 58.1 | 86.1 |
| 5KP40A | 5KP40CA | 40.0 | 1 | 44.40 | 49.10 | 1 | 64.5 | 77.6 |
| 5KP43A | 5KP43CA | 43.0 | 1 | 47.80 | 52.80 | 1 | 69.4 | 72.1 |
| 5KP45A | 5KP45CA | 45.0 | 1 | 50.00 | 55.30 | 1 | 72.7 | 68.8 |
| 5KP48A | 5KP48CA | 48.0 | 1 | 53.30 | 58.90 | 1 | 77.4 | 64.7 |
| 5KP51A | 5KP51CA | 51.0 | 1 | 56.70 | 62.70 | 1 | 82.4 | 60.7 |

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, continued)

| Part Number | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\textcircled{1}}$ |
|-------------|----------|-------|---------------|--------------|--------|-------|--------------|----------------------------|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| 5KP54A | 5KP54CA | 54.0 | 1 | 60.00 | 66.30 | 1 | 87.1 | 57.5 |
| 5KP58A | 5KP58CA | 58.0 | 1 | 64.40 | 71.20 | 1 | 93.6 | 53.5 |
| 5KP60A | 5KP60CA | 60.0 | 1 | 66.70 | 73.70 | 1 | 96.8 | 51.7 |
| 5KP64A | 5KP64CA | 64.0 | 1 | 71.10 | 78.60 | 1 | 103.0 | 48.6 |
| 5KP70A | 5KP70CA | 70.0 | 1 | 77.80 | 86.00 | 1 | 113.0 | 44.3 |
| 5KP75A | 5KP75CA | 75.0 | 1 | 83.30 | 92.10 | 1 | 121.0 | 41.4 |
| 5KP78A | 5KP78CA | 78.0 | 1 | 86.70 | 95.80 | 1 | 126.0 | 39.7 |
| 5KP85A | 5KP85CA | 85.0 | 1 | 94.40 | 104.0 | 1 | 137.0 | 36.5 |
| 5KP90A | 5KP90CA | 90.0 | 1 | 100.0 | 111.0 | 1 | 146.0 | 34.3 |
| 5KP100A | 5KP100CA | 100.0 | 1 | 111.0 | 123.0 | 1 | 162.0 | 30.9 |
| 5KP110A | 5KP110CA | 110.0 | 1 | 122.0 | 135.0 | 1 | 177.0 | 28.3 |
| 5KP120A | 5KP120CA | 120.0 | 1 | 133.0 | 147.0 | 1 | 193.0 | 26.0 |
| 5KP130A | 5KP130CA | 130.0 | 1 | 144.0 | 159.0 | 1 | 209.0 | 24.0 |
| 5KP150A | 5KP150CA | 150.0 | 1 | 167.0 | 185.0 | 1 | 243.0 | 20.6 |
| 5KP160A | 5KP160CA | 160.0 | 1 | 178.0 | 197.0 | 1 | 259.0 | 19.3 |
| 5KP170A | 5KP170CA | 170.0 | 1 | 189.0 | 209.0 | 1 | 275.0 | 18.2 |
| 5KP180A | 5KP180CA | 180.0 | 1 | 200.0 | 221.0 | 1 | 292.0 | 17.5 |
| 5KP190A | 5KP190CA | 190.0 | 1 | 211.0 | 233.0 | 1 | 310.0 | 16.5 |
| 5KP200A | 5KP200CA | 200.0 | 1 | 224.0 | 247.0 | 1 | 329.2 | 15.5 |
| 5KP210A | 5KP210CA | 210.0 | 1 | 237.0 | 263.0 | 1 | 349.5 | 14.6 |
| 5KP220A | 5KP220CA | 220.0 | 1 | 246.0 | 272.0 | 1 | 371.1 | 13.7 |
| 5KP250A | 5KP250CA | 250.0 | 1 | 277.0 | 306.0 | 1 | 425.0 | 12.0 |

$\textcircled{1}$ Surge waveform: 10/1000 μs

V_R : Stand-off Voltage -- Maximum voltage that can be applied V_{BR} :
Breakdown Voltage

V_C : Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp} I_R :
Reverse Leakage Current

RATINGS AND V-I CHARACTERISTICS CURVES ($T_A=25^\circ\text{C}$, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

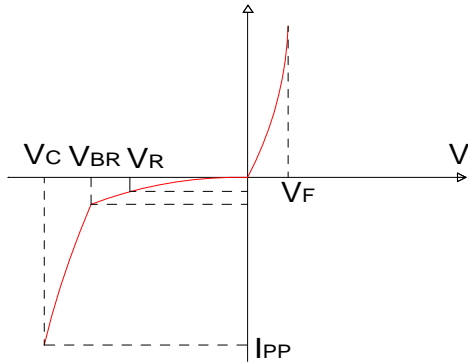


FIG.2:V- I curve characteristics (Bi-directional)

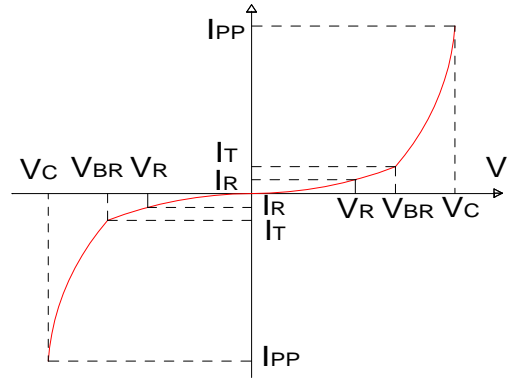


FIG.3: Pulse waveform

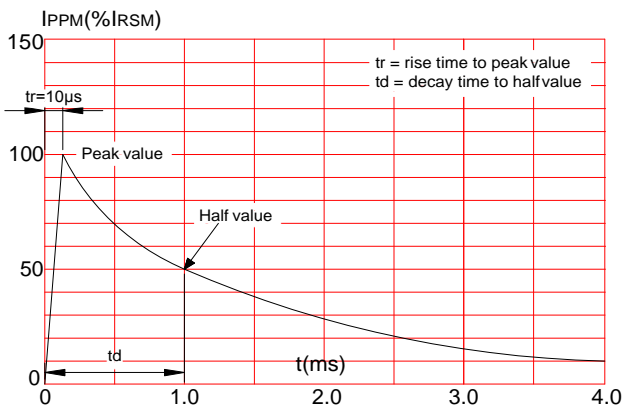
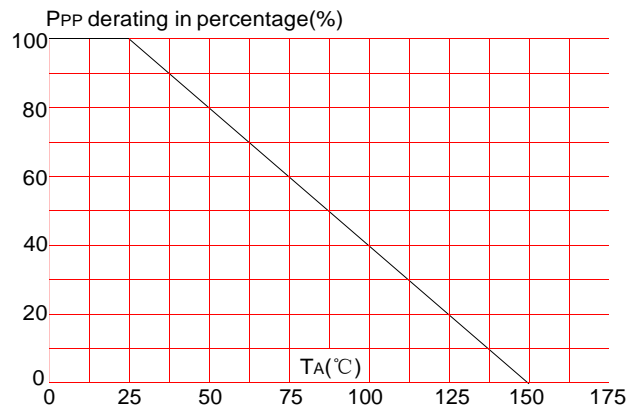
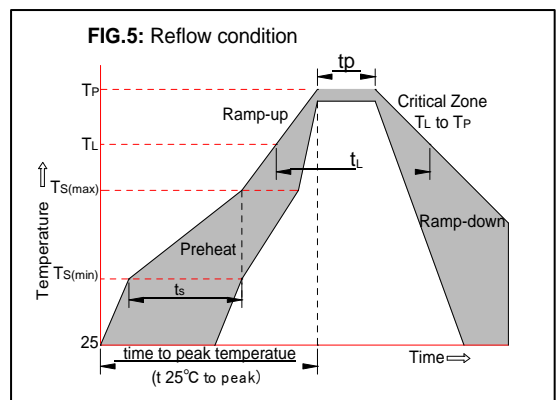


FIG.4: Pulse derating curve

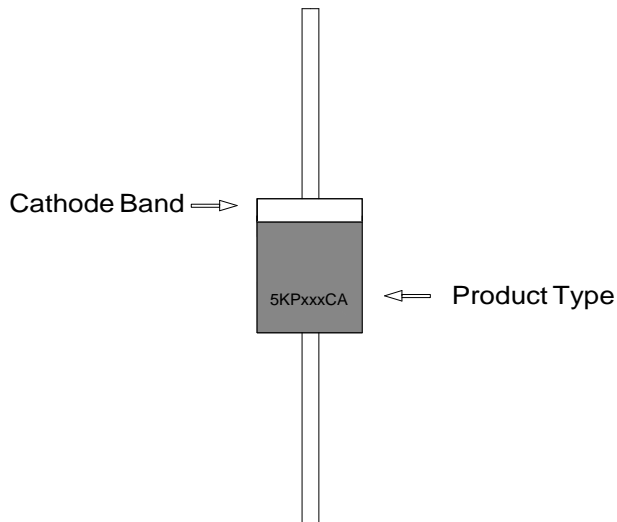


SOLDERING PARAMETERS

| | | |
|---|------------------------------------|------------------------------|
| Reflow Condition | | Pb-Free assembly (see FIG.5) |
| Pre Heat | -Temperature Min ($T_{s(\min)}$) | +150°C |
| | -Temperature Max($T_{s(\max)}$) | +200°C |
| | -Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(\max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L)(Liquid us) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_P) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_P) | | 8 min. Max |
| Do not exceed | | +260°C |

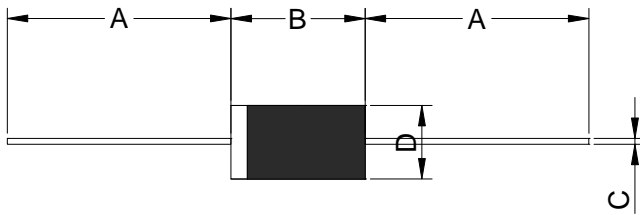


MARKING & ORDERING INFORMATION



5KP XX C A
 (1) (2) (3) (4)
 (1) Series: 5000 watts series
 (2) Reverse Stand-off Voltage
 (3) Bi-directional
 (4) 5% V_{BR} Voltage tolerance

PACKAGE MECHANICAL DATA



| Ref. | Dimensions | | | |
|------|------------|-------|-------------|------|
| | Inches | | Millimeters | |
| | Min. | Max. | Min. | Max. |
| A | 1.000 | - | 25.40 | - |
| B | 0.339 | 0.370 | 8.60 | 9.40 |
| C | 0.048 | 0.052 | 1.20 | 1.40 |
| D | 0.340 | 0.360 | 8.60 | 9.10 |