

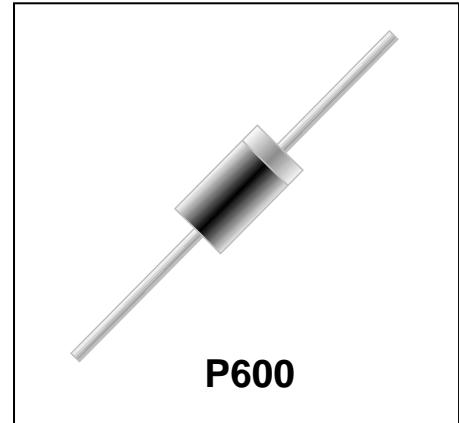


5KPxx(C)A

Power Transient Voltage Suppressor

Features

- 5000 watts Peak Pulse Power (10/1000 μ s)
- Unidirectional and Bidirectional Protection
- Fast Response Time :Typically < 1ns
- Excellent Clamping Capability
- Glass Passivated Junction
- Low incremental surge resistance
- Plastic package has Underwriters Laboratory Flammability classification 94V-0
- High temperature soldering guaranteed:260°C /10 seconds/.375",(.9.5mm) lead length/5lbs.,(2.3kg) tension



Mechanical Characteristics

- JEDEC P600 molded plastic
- Polarity: Color band denoted cathode except Bipolar
- Marking : Marking Code
- Mounting Position: Any
- RoHS &UL497B Compliant

Applications

- I/O Interfaces
- Power lines
- Automotive and Telecommunication
- Signal lines of sensor units for consumer
- Industrial Electronics
- Computer

| Absolute Maximum Rating | | | |
|---|-----------------|--------------------------------|--------------|
| Rating | Symbol | Value | Units |
| Peak Pulse Power ($t_p = 10/1000\mu s$) (see Note1&2) | P_{PPM} | 5000 | W |
| Peak pulse current (10/1000 μ s) (see Note2) | I_{PPM} | See Electrical Characteristics | A |
| Peak Forward surge current (see Note3&4) | I_{FSM} | 400 | A |
| Power Dissipation on infinite heat sink $T_L = 50^\circ C$ (Fig5) | P_D | 8.0 | W |
| Operating Junction Temperature range | T_J | -55 to + 175 | $^\circ C$ |
| Typical Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 8.0 | $^\circ C/W$ |

Note1: Peak Pulse Power Rating as Pulse Width , per Fig1.

Note2: Peak Pulse Power or Current Derated above $T_A=25^\circ C$ Per Fig. 2 and Non-Repetitive Current Pulse, Per Fig.3.

Note3: 8.3ms Single Half Sine Wave or Equivalent Square Wave

Note4: Maximum Forward Surge Current only for Unidirectional Device per Fig6.

Electrical Characteristics

| Part Number | | Reverse Stand off Voltage V_{RWM} (V) | Breakdown Voltage V_{BR} (Volts)@ I_T | | Test Current I_T (mA) | Maximum Clamping Voltage $V_C@I_{PP}$ (V) | Maximum Peak Pulse Current I_{PP} (A) | Maximum Reverse Leakage $I_R@V_{RWM}$ (μ A) |
|-------------|----------|---|--|-------|-------------------------------|---|---|--|
| UNI-POLAR | BI-POLAR | | MIN | MAX | | | | |
| 5KP5.0A | 5KP5.0CA | 5.0 | 6.40 | 7.00 | 50 | 9.2 | 554.3 | 5000 |
| 5KP6.0A | 5KP6.0CA | 6.0 | 6.67 | 7.37 | 50 | 10.3 | 495.1 | 5000 |
| 5KP6.5A | 5KP6.5CA | 6.5 | 7.22 | 7.98 | 50 | 11.2 | 455.4 | 2000 |
| 5KP7.0A | 5KP7.0CA | 7.0 | 7.78 | 8.60 | 50 | 12.0 | 425.0 | 1000 |
| 5KP7.5A | 5KP7.5CA | 7.5 | 8.33 | 9.21 | 5 | 12.9 | 395.3 | 250 |
| 5KP8.0A | 5KP8.0CA | 8.0 | 8.89 | 9.83 | 5 | 13.6 | 375.0 | 150 |
| 5KP8.5A | 5KP8.5CA | 8.5 | 9.44 | 10.40 | 5 | 14.4 | 354.2 | 50 |
| 5KP9.0A | 5KP9.0CA | 9.0 | 10.00 | 11.10 | 5 | 15.4 | 331.2 | 20 |
| 5KP10A | 5KP10CA | 10.0 | 11.10 | 12.30 | 5 | 17.0 | 300.0 | 15 |
| 5KP11A | 5KP11CA | 11.0 | 12.20 | 13.50 | 5 | 18.2 | 280.2 | 2 |
| 5KP12A | 5KP12CA | 12.0 | 13.30 | 14.70 | 5 | 19.9 | 256.3 | 2 |
| 5KP13A | 5KP13CA | 13.0 | 14.40 | 15.90 | 5 | 21.5 | 237.2 | 2 |
| 5KP14A | 5KP14CA | 14.0 | 15.60 | 17.20 | 5 | 23.2 | 219.8 | 2 |
| 5KP15A | 5KP15CA | 15.0 | 16.70 | 18.50 | 5 | 24.4 | 209.0 | 2 |
| 5KP16A | 5KP16CA | 16.0 | 17.80 | 19.70 | 5 | 26.0 | 196.2 | 2 |
| 5KP17A | 5KP17CA | 17.0 | 18.90 | 20.90 | 5 | 27.6 | 184.8 | 2 |
| 5KP18A | 5KP18CA | 18.0 | 20.00 | 22.10 | 5 | 29.2 | 174.7 | 2 |
| 5KP20A | 5KP20CA | 20.0 | 22.20 | 24.50 | 5 | 32.4 | 157.4 | 2 |
| 5KP22A | 5KP22CA | 22.0 | 24.00 | 26.90 | 5 | 35.5 | 143.7 | 2 |
| 5KP24A | 5KP24CA | 24.0 | 26.70 | 29.50 | 5 | 38.9 | 131.1 | 2 |
| 5KP26A | 5KP26CA | 26.0 | 28.90 | 31.90 | 5 | 42.1 | 121.1 | 2 |
| 5KP28A | 5KP28CA | 28.0 | 31.10 | 34.40 | 5 | 45.4 | 112.3 | 2 |
| 5KP30A | 5KP30CA | 30.0 | 33.30 | 36.80 | 5 | 48.4 | 105.4 | 2 |
| 5KP33A | 5KP33CA | 33.0 | 36.70 | 40.60 | 5 | 53.3 | 95.7 | 2 |
| 5KP36A | 5KP36CA | 36.0 | 40.00 | 44.20 | 5 | 58.1 | 87.8 | 2 |
| 5KP40A | 5KP40CA | 40.0 | 44.40 | 49.10 | 5 | 64.5 | 79.1 | 2 |
| 5KP43A | 5KP43CA | 43.0 | 47.80 | 52.80 | 5 | 69.4 | 73.5 | 2 |
| 5KP45A | 5KP45CA | 45.0 | 50.00 | 55.30 | 5 | 72.7 | 70.2 | 2 |
| 5KP48A | 5KP48CA | 48.0 | 53.30 | 58.90 | 5 | 77.4 | 65.9 | 2 |
| 5KP51A | 5KP51CA | 51.0 | 56.70 | 62.70 | 5 | 82.4 | 61.9 | 2 |
| 5KP54A | 5KP54CA | 54.0 | 60.00 | 66.30 | 5 | 87.1 | 58.6 | 2 |
| 5KP58A | 5KP58CA | 58.0 | 64.40 | 71.20 | 5 | 93.6 | 54.5 | 2 |
| 5KP60A | 5KP60CA | 60.0 | 66.70 | 73.70 | 5 | 96.8 | 52.7 | 2 |

Electrical Characteristics (Cont.)

| Part Number | | Reverse Stand off Voltage V_{RWM} (V) | Breakdown Voltage V_{BR} (Volts)@ I_T | | 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_{RWM} (μ A) |
|-------------|----------|---|--|--------|-------------------------------|---|---|--|
| UNI-POLAR | BI-POLAR | | MIN | MAX | | | | |
| 5KP64A | 5KP64CA | 64.0 | 71.10 | 78.60 | 5 | 103.0 | 49.5 | 2 |
| 5KP70A | 5KP70CA | 70.0 | 77.80 | 86.00 | 5 | 113.0 | 45.1 | 2 |
| 5KP75A | 5KP75CA | 75.0 | 83.30 | 92.10 | 5 | 121.0 | 42.1 | 2 |
| 5KP78A | 5KP78CA | 78.0 | 86.70 | 95.80 | 5 | 126.0 | 40.5 | 2 |
| 5KP85A | 5KP85CA | 85.0 | 94.40 | 104.00 | 5 | 137.0 | 37.2 | 2 |
| 5KP90A | 5KP90CA | 90.0 | 100.00 | 111.00 | 5 | 146.0 | 34.9 | 2 |
| 5KP100A | 5KP100CA | 100.0 | 110.00 | 123.00 | 5 | 162.0 | 31.5 | 2 |
| 5KP110A | 5KP110CA | 110.0 | 122.00 | 135.00 | 5 | 177.0 | 28.8 | 2 |
| 5KP120A | 5KP120CA | 120.0 | 133.00 | 147.00 | 5 | 193.0 | 26.4 | 2 |
| 5KP130A | 5KP130CA | 130.0 | 144.00 | 159.00 | 5 | 209.0 | 24.4 | 2 |
| 5KP150A | 5KP150CA | 150.0 | 167.00 | 185.00 | 5 | 243.0 | 21.0 | 2 |
| 5KP160A | 5KP160CA | 160.0 | 178.00 | 197.00 | 5 | 259.0 | 19.7 | 2 |
| 5KP170A | 5KP170CA | 170.0 | 189.00 | 209.00 | 5 | 275.0 | 18.5 | 2 |
| 5KP180A | 5KP180CA | 180.0 | 200.00 | 221.00 | 5 | 292.0 | 17.5 | 2 |
| 5KP190A | 5KP190CA | 190.0 | 211.00 | 233.00 | 5 | 310.0 | 16.5 | 2 |
| 5KP200A | 5KP200CA | 200.0 | 222.00 | 246.00 | 5 | 329.2 | 15.5 | 2 |
| 5KP210A | 5KP210CA | 210.0 | 233.00 | 258.00 | 5 | 349.5 | 14.6 | 2 |
| 5KP220A | 5KP220CA | 220.0 | 244.00 | 270.00 | 5 | 371.1 | 13.7 | 2 |
| 5KP250A | 5KP250CA | 250.0 | 277.00 | 306.00 | 5 | 425.0 | 12.0 | 2 |

For bidirectional type V_R 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.

Typical Characteristics

Figure 1. Peak Pulse Power Rating Curve

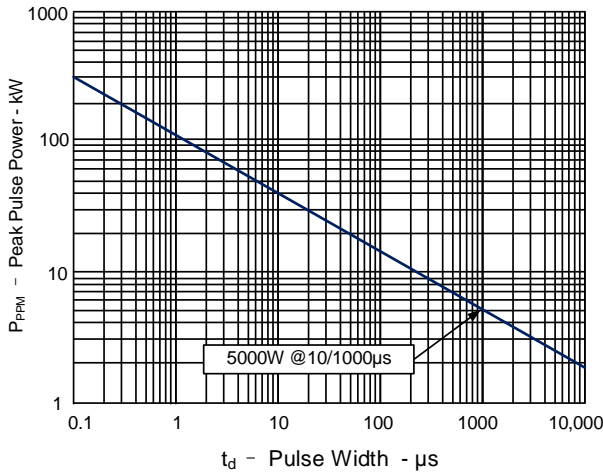


Figure 2. Pulse Derating Curve

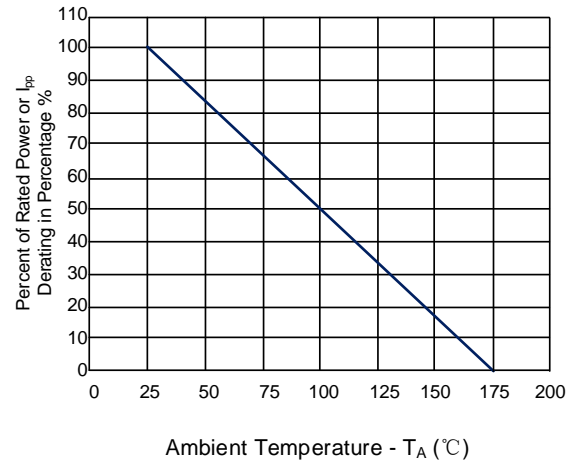


Figure 3. Pulse Waveform

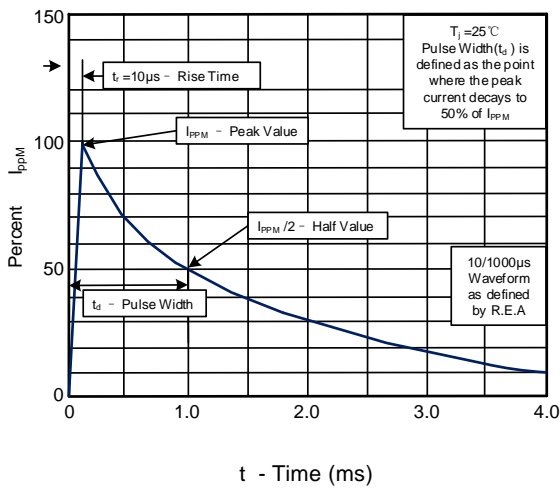


Figure 4: Typical Junction Capacitance

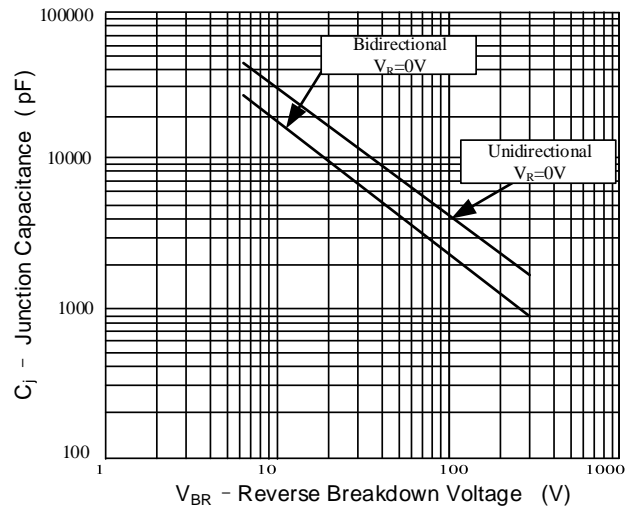


Figure 5. Steady State Power Dissipation Derating Curve

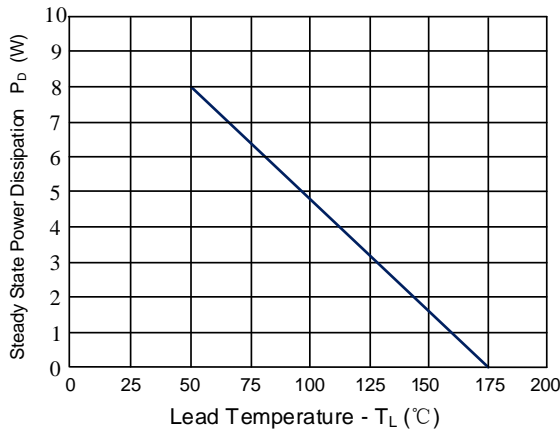
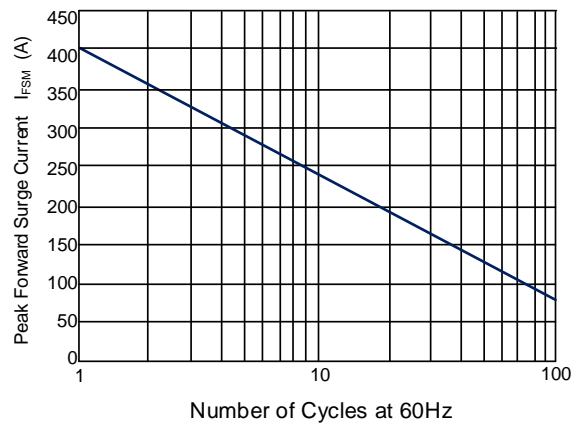
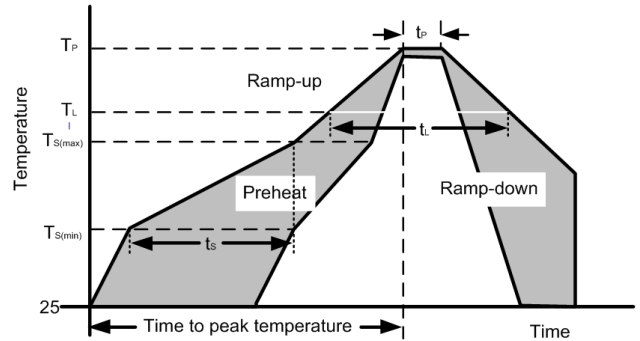


Figure 6. Maximum Non-Repetitive Forward Surge Current Only Unidirectional



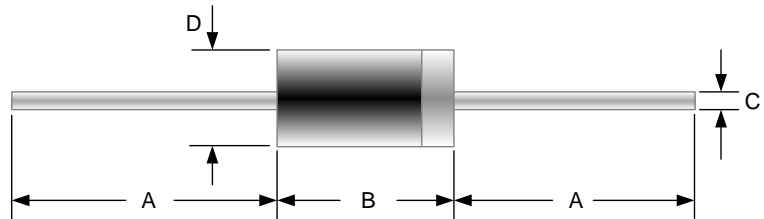
Recommended Soldering Parameters

| Condition | | |
|--|----------------------------------|-------------------------|
| Pre-Heat | Temperature min ($T_{s(min)}$) | 150°C |
| | Temperature max ($T_{s(max)}$) | 200°C |
| | Time (min to max) (t_s) | 60-190 s |
| Average ramp up rate (Liquidus Temp) (T_L) to peak | | 3°C/s max |
| Ts(max) to TL - Ramp-up Rate | | 3°C/s max |
| Reflow | Temperature (T_L) (Liquidus) | 217°C |
| | Temperature (t_L) | 60-150 s |
| Peak Temperature (T_P) | | 260 ^{+0/-5} °C |
| Time within actual peak Temperature (t_p) | | 20-40 s |
| Ramp-down Rate | | 5°C/s max |
| Time 25°C to peak Temperature (T_P) | | 8 minutes max |
| Do not exceed | | 260°C |

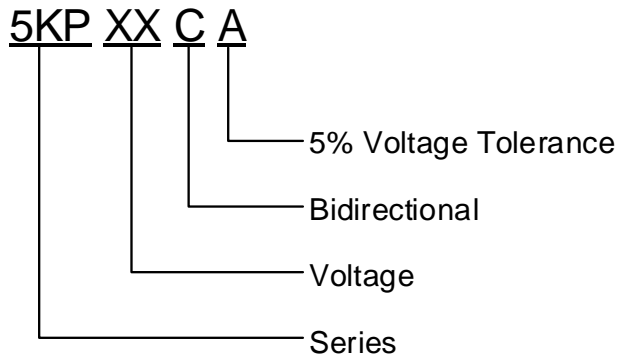


Outline Drawing - P600

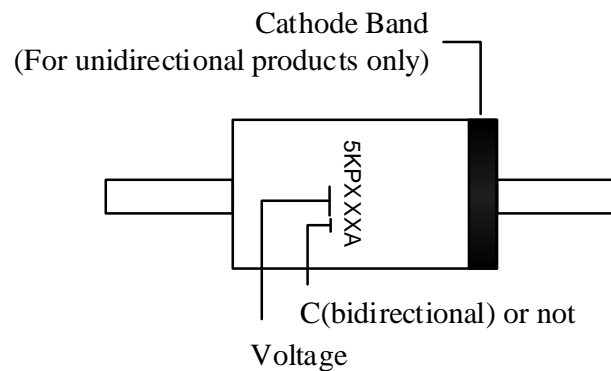
| Ref.(mm) | Millimeters | |
|----------|-------------|------|
| | Min. | Max. |
| A | 25.40 | - |
| B | 8.60 | 9.10 |
| C | 1.22 | 1.32 |
| D | 8.60 | 9.10 |



Part Numbering System



Part Marking System



Package Information

| Package Type | Description | Quantity (pcs) |
|--------------|-------------|----------------|
| P-600 | Tape & Box | 300 |

CONTACT INFORMATION

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The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

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