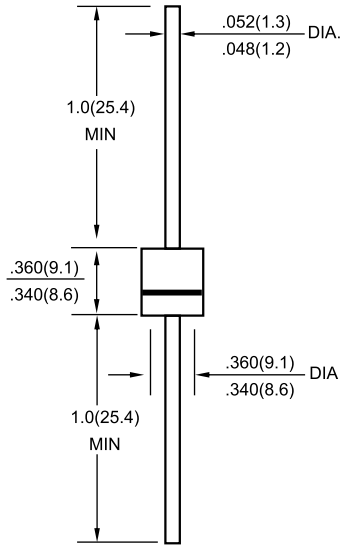
# 5KP Series

TVS Transient Voltage Suppressor

POWER DISSIPATION - **5000** Watts

**R-6**




**Dimensions in inches and (millimeters)**

## Features

- ✧ Glass passivated chip
- ✧ low leakage
- ✧ Uni and bidirectional unit
- ✧ Excellent clamping capability
- ✧ Plastic material has UL recognition 94V-0
- ✧ Fast response time

## Mechanical Data

- ✧ Case : Molded Plastic
- ✧ Marking : Unidirectional -type number and cathode band
  Bidirectional-type number only

## Maximum Ratings and Electrical Characteristics

Rating at 25℃ ambient temperature unless otherwise specified.

Single phase, half wave ,60Hz, resistive or inductive load.

For capacitive load, derate current by 20%

| CHARACTERISTICS | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Peak Power Dissipation at $T_A$=25℃ TP=1ms (NOTE1) | $P_{PK}$ | Minimum 5000 | WATTS |
| Peak Forward Surge Current 8.3ms Single Half Sine-Wave Super Imposed on Rated Load (JEDEC Method) | $I_{FSM}$ | 500 | AMPS |
| Steady State Power Dissipation at $T_L$=75℃ Lead Lengths 0.375"(9.5mm),See Fig. 4 | $P_{M(AV)}$ | 8.0 | WATTS |
| Maximum Instantaneous Forward Voltage at 100A for Unidirectional Devices Only (NOTE2) | $V_F$ | See NOTE 3 | VOLTS |
| Operating Temperature Range | $T_J$ | -55 to + 150 | ℃ |
| Storage Temperature Range | $T_{STG}$ | -55 to + 175 | ℃ |

NOTES:1. Non-repetitive current pulse ,per Fig. 5 and derated above $T_A$=25℃ per Fig. 1 .

2. 8.3ms single half-wave duty cycle=4 pulses per minutes maximum (uni-directional units only).

3. $V_F$=3.5V on 5KP5.0 thru 5KP100A devices and $V_F$=5.0V on 5KP110 thru 5KP180 devices.

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# 5KP Series

TVS Transient Voltage Suppressor

## Electrical Characteristics($T_A$=25℃ unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage $V_{BR}$ @$I_T$ | | | Maximum Reverse Leakage $I_R$ @$V_{RWM}$ (uA) | Working Peak Reverse Voltage $V_{RWM}$ (V) | Maximum Reverse Surge Current $I_{PP}$ (A) | Maximum Clamping Voltage $V_C$ @$I_{PP}$ (V) |
|---|---|---|---|---|---|---|---|---|
| | | Min (V) | Max (V) | $I_T$ (mA) | | | | |
| 5KP5.0 | 5KP5.0C | 6.40 | 7.30 | 50 | 5000 | 5 | 520.83 | 9.6 |
| 5KP5.0A | 5KP5.0CA | 6.40 | 7.00 | 50 | 5000 | 5 | 543.48 | 9.2 |
| 5KP6.0 | 5KP6.0C | 6.67 | 8.15 | 50 | 5000 | 6 | 438.60 | 11.4 |
| 5KP6.0A | 5KP6.0CA | 6.67 | 7.37 | 50 | 5000 | 6 | 485.44 | 10.3 |
| 5KP6.5 | 5KP6.5C | 7.22 | 8.82 | 50 | 2000 | 7 | 406.50 | 12.3 |
| 5KP6.5A | 5KP6.5CA | 7.22 | 7.98 | 50 | 2000 | 7 | 446.43 | 11.2 |
| 5KP7.0 | 5KP7.0C | 7.78 | 9.51 | 50 | 1000 | 7 | 375.94 | 13.3 |
| 5KP7.0A | 5KP7.0CA | 7.78 | 8.60 | 50 | 1000 | 7 | 416.67 | 12.0 |
| 5KP7.5 | 5KP7.5C | 8.33 | 10.2 | 5 | 250 | 8 | 349.65 | 14.3 |
| 5KP7.5A | 5KP7.5CA | 8.33 | 9.21 | 5 | 250 | 8 | 387.60 | 12.9 |
| 5KP8.0 | 5KP8.0C | 8.89 | 10.9 | 5 | 150 | 8 | 333.33 | 15.0 |
| 5KP8.0A | 5KP8.0CA | 8.89 | 9.83 | 5 | 150 | 8 | 367.65 | 13.6 |
| 5KP8.5 | 5KP8.5C | 9.44 | 11.5 | 5 | 50 | 9 | 314.47 | 15.9 |
| 5KP8.5A | 5KP8.5CA | 9.44 | 10.4 | 5 | 50 | 9 | 347.22 | 14.4 |
| 5KP9.0 | 5KP9.0C | 10.00 | 12.2 | 5 | 20 | 9 | 295.86 | 16.9 |
| 5KP9.0A | 5KP9.0CA | 10.00 | 11.1 | 5 | 20 | 9 | 324.68 | 15.4 |
| 5KP10 | 5KP10C | 11.10 | 13.6 | 5 | 15 | 10 | 265.96 | 18.8 |
| 5KP10A | 5KP10CA | 11.10 | 12.3 | 5 | 15 | 10 | 294.12 | 17.0 |
| 5KP11 | 5KP11C | 12.20 | 14.9 | 5 | 2 | 11 | 248.76 | 20.1 |
| 5KP11A | 5KP11CA | 12.20 | 13.5 | 5 | 2 | 11 | 274.73 | 18.2 |
| 5KP12 | 5KP12C | 13.30 | 16.3 | 5 | 2 | 12 | 227.27 | 22.0 |
| 5KP12A | 5KP12CA | 13.30 | 14.7 | 5 | 2 | 12 | 251.26 | 19.9 |
| 5KP13 | 5KP13C | 14.40 | 17.6 | 5 | 2 | 13 | 210.08 | 23.8 |
| 5KP13A | 5KP13CA | 14.40 | 15.9 | 5 | 2 | 13 | 232.56 | 21.5 |
| 5KP14 | 5KP14C | 15.60 | 19.1 | 5 | 2 | 14 | 193.80 | 25.8 |
| 5KP14A | 5KP14CA | 15.60 | 17.2 | 5 | 2 | 14 | 215.52 | 23.2 |
| 5KP15 | 5KP15C | 16.70 | 20.4 | 5 | 2 | 15 | 185.87 | 26.9 |
| 5KP15A | 5KP15CA | 16.70 | 18.5 | 5 | 2 | 15 | 204.92 | 24.4 |
| 5KP16 | 5KP16C | 17.80 | 21.8 | 5 | 2 | 16 | 173.61 | 28.8 |
| 5KP16A | 5KP16CA | 17.80 | 19.7 | 5 | 2 | 16 | 192.31 | 26.0 |
| 5KP17 | 5KP17C | 18.90 | 23.1 | 5 | 2 | 17 | 163.93 | 30.5 |
| 5KP17A | 5KP17CA | 18.90 | 20.9 | 5 | 2 | 17 | 181.16 | 27.6 |
| 5KP18 | 5KP18C | 20.00 | 24.4 | 5 | 2 | 18 | 155.28 | 32.2 |
| 5KP18A | 5KP18CA | 20.00 | 22.1 | 5 | 2 | 18 | 171.23 | 29.2 |
| 5KP19 | 5KP19C | 21.13 | 25.8 | 5 | 2 | 19 | 147.02 | 34.0 |
| 5KP19A | 5KP19CA | 21.10 | 23.3 | 5 | 2 | 19 | 162.44 | 30.8 |
| 5KP20 | 5KP20C | 22.20 | 27.1 | 5 | 2 | 20 | 139.66 | 35.8 |
| 5KP20A | 5KP20CA | 22.20 | 24.5 | 5 | 2 | 20 | 154.32 | 32.4 |
| 5KP22 | 5KP22C | 24.40 | 29.8 | 5 | 2 | 22 | 126.90 | 39.4 |
| 5KP22A | 5KP22CA | 24.40 | 26.9 | 5 | 2 | 22 | 140.85 | 35.5 |
| 5KP24 | 5KP24C | 26.70 | 32.6 | 5 | 2 | 24 | 116.28 | 43.0 |
| 5KP24A | 5KP24CA | 26.70 | 29.5 | 5 | 2 | 24 | 128.53 | 38.9 |
| 5KP26 | 5KP26C | 28.90 | 35.3 | 5 | 2 | 26 | 107.30 | 46.6 |
| 5KP26A | 5KP26CA | 28.90 | 31.9 | 5 | 2 | 26 | 118.76 | 42.1 |
| 5KP28 | 5KP28C | 31.10 | 38.0 | 5 | 2 | 28 | 100.00 | 50.0 |
| 5KP28A | 5KP28CA | 31.10 | 34.4 | 5 | 2 | 28 | 110.13 | 45.4 |
| 5KP30 | 5KP30C | 33.30 | 40.7 | 5 | 2 | 30 | 93.46 | 53.5 |
| 5KP30A | 5KP30CA | 33.30 | 36.8 | 5 | 2 | 30 | 103.31 | 48.4 |
| 5KP33 | 5KP33C | 36.70 | 44.9 | 5 | 2 | 33 | 84.75 | 59.0 |
| 5KP33A | 5KP33CA | 36.70 | 40.6 | 5 | 2 | 33 | 93.81 | 53.3 |
| 5KP36 | 5KP36C | 40.00 | 48.9 | 5 | 2 | 36 | 77.76 | 64.3 |
| 5KP36A | 5KP36CA | 40.00 | 44.2 | 5 | 2 | 36 | 86.06 | 58.1 |
| 5KP40 | 5KP40C | 44.40 | 54.3 | 5 | 2 | 40 | 70.03 | 71.4 |
| 5KP40A | 5KP40CA | 44.40 | 49.1 | 5 | 2 | 40 | 77.52 | 64.5 |

**Note:**

1. Suffix 'A ' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C 'or ' CA ' after part number to specify Bi-directional devices
3. For Bi-Directional devices having $V_R$ of 10 volts and under, the $I_R$ limit is double

# 5KP Series

TVS Transient Voltage Suppressor

**Electrical Characteristics($T_A$=25℃ unless otherwise noted)**

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage $V_{BR}$ @$I_T$ | | | Maximum Reverse Leakage $I_R$ @$V_{RWM}$ (uA) | Working Peak Reverse Voltage $V_{RWM}$ (V) | Maximum Reverse Surge Current $I_{PP}$ (A) | Maximum Clamping Voltage $V_C$ @$I_{PP}$ (V) |
|---|---|---|---|---|---|---|---|---|
| | | Min (V) | Max (V) | $I_T$ (mA) | | | | |
| 5KP43 | 5KP43C | 47.80 | 58.4 | 5 | 2 | 43 | 65.19 | 76.7 |
| 5KP43A | 5KP43CA | 47.80 | 52.8 | 5 | 2 | 43 | 72.05 | 69.4 |
| 5KP45 | 5KP45C | 50.00 | 61.1 | 5 | 2 | 45 | 62.27 | 80.3 |
| 5KP45A | 5KP45CA | 50.00 | 55.3 | 5 | 2 | 45 | 68.78 | 72.7 |
| 5KP48 | 5KP48C | 53.30 | 65.1 | 5 | 2 | 48 | 58.48 | 85.5 |
| 5KP48A | 5KP48CA | 53.30 | 58.9 | 5 | 2 | 48 | 64.60 | 77.4 |
| 5KP51 | 5KP51C | 56.70 | 69.3 | 5 | 2 | 51 | 54.88 | 91.1 |
| 5KP51A | 5KP51CA | 56.70 | 62.7 | 5 | 2 | 51 | 60.68 | 82.4 |
| 5KP54 | 5KP54C | 60.00 | 73.3 | 5 | 2 | 54 | 51.92 | 96.3 |
| 5KP54A | 5KP54CA | 60.00 | 66.3 | 5 | 2 | 54 | 57.41 | 87.1 |
| 5KP58 | 5KP58C | 64.40 | 78.7 | 5 | 2 | 58 | 48.54 | 103.0 |
| 5KP58A | 5KP58CA | 64.40 | 71.2 | 5 | 2 | 58 | 53.42 | 93.6 |
| 5KP60 | 5KP60C | 66.70 | 81.5 | 5 | 2 | 60 | 46.73 | 107.0 |
| 5KP60A | 5KP60CA | 66.70 | 73.7 | 5 | 2 | 60 | 51.65 | 96.8 |
| 5KP64 | 5KP64C | 71.10 | 86.9 | 5 | 2 | 64 | 43.86 | 114.0 |
| 5KP64A | 5KP64CA | 71.10 | 78.6 | 5 | 2 | 64 | 48.54 | 103.0 |
| 5KP70 | 5KP70C | 77.80 | 95.1 | 5 | 2 | 70 | 40.00 | 125.0 |
| 5KP70A | 5KP70CA | 77.80 | 86.0 | 5 | 2 | 70 | 44.25 | 113.0 |
| 5KP75 | 5KP75C | 83.30 | 102 | 5 | 2 | 75 | 37.31 | 134.0 |
| 5KP75A | 5KP75CA | 83.30 | 92.1 | 5 | 2 | 75 | 41.32 | 121.0 |
| 5KP78 | 5KP78C | 86.70 | 106.0 | 5 | 2 | 78 | 35.97 | 139.0 |
| 5KP78A | 5KP78CA | 86.70 | 95.8 | 5 | 2 | 78 | 39.68 | 126.0 |
| 5KP80 | 5KP80C | 88.96 | 108.8 | 5 | 2 | 80 | 34.92 | 143.2 |
| 5KP80A | 5KP80CA | 88.80 | 97.6 | 5 | 2 | 80 | 38.58 | 129.6 |
| 5KP85 | 5KP85C | 94.40 | 115.0 | 5 | 2 | 85 | 33.11 | 151.0 |
| 5KP85A | 5KP85CA | 94.40 | 104.0 | 5 | 2 | 85 | 36.50 | 137.0 |
| 5KP90 | 5KP90C | 100.00 | 122.0 | 5 | 2 | 90 | 31.25 | 160.0 |
| 5KP90A | 5KP90CA | 100.00 | 111.0 | 5 | 2 | 90 | 34.25 | 146.0 |
| 5KP100 | 5KP100C | 111.00 | 136.0 | 5 | 2 | 100 | 27.93 | 179.0 |
| 5KP100A | 5KP100CA | 111.00 | 123.0 | 5 | 2 | 100 | 30.86 | 162.0 |
| 5KP110 | 5KP110C | 122.00 | 149.0 | 5 | 2 | 110 | 25.51 | 196.0 |
| 5KP110A | 5KP110CA | 122.00 | 135.0 | 5 | 2 | 110 | 28.25 | 177.0 |
| 5KP120 | 5KP120C | 133.00 | 163.0 | 5 | 2 | 120 | 23.36 | 214.0 |
| 5KP120A | 5KP120CA | 133.00 | 147.0 | 5 | 2 | 120 | 25.91 | 193.0 |
| 5KP130 | 5KP130C | 144.00 | 176.0 | 5 | 2 | 130 | 21.65 | 231.0 |
| 5KP130A | 5KP130CA | 144.00 | 159.0 | 5 | 2 | 130 | 23.92 | 209.0 |
| 5KP140 | 5KP140C | 155.68 | 190.4 | 5 | 2 | 140 | 19.95 | 250.6 |
| 5KP140A | 5KP140CA | 155.00 | 171.0 | 5 | 2 | 140 | 22.05 | 226.8 |
| 5KP150 | 5KP150C | 167.00 | 204.0 | 5 | 2 | 150 | 18.66 | 268.0 |
| 5KP150A | 5KP150CA | 167.00 | 185.0 | 5 | 2 | 150 | 20.58 | 243.0 |
| 5KP160 | 5KP160C | 178.00 | 218.0 | 5 | 2 | 160 | 17.42 | 287.0 |
| 5KP160A | 5KP160CA | 178.00 | 197.0 | 5 | 2 | 160 | 19.31 | 259.0 |
| 5KP170 | 5KP170C | 189.00 | 231.0 | 5 | 2 | 170 | 16.45 | 304.0 |
| 5KP170A | 5KP170CA | 189.00 | 209.0 | 5 | 2 | 170 | 18.18 | 275.0 |
| 5KP180 | 5KP180C | 200.16 | 244.8 | 5 | 2 | 180 | 15.52 | 322.2 |
| 5KP180A | 5KP180CA | 200.00 | 220.0 | 5 | 2 | 180 | 17.15 | 291.6 |
| 5KP190 | 5KP190C | 211.28 | 258.4 | 5 | 2 | 190 | 14.70 | 340.1 |
| 5KP190A | 5KP190CA | 211.00 | 232.0 | 5 | 2 | 190 | 16.24 | 307.8 |
| 5KP200A | 5KP200CA | 224.00 | 247.0 | 5 | 2 | 200 | 15.43 | 324.0 |
| 5KP210A | 5KP210CA | 233.00 | 258.0 | 5 | 2 | 210 | 42.10 | 349.5 |
| 5KP220A | 5KP220CA | 246.00 | 272.0 | 5 | 2 | 220 | 50.00 | 356.0 |
| 5KP250A | 5KP250CA | 279.00 | 309.0 | 5 | 2 | 250 | 45.40 | 405.0 |
| 5KP300A | 5KP300CA | 335.00 | 371.0 | 5 | 2 | 300 | 53.50 | 486.0 |
| 5KP350A | 5KP350CA | 391.00 | 432.0 | 5 | 2 | 350 | 48.40 | 567.0 |
| 5KP400A | 5KP400CA | 447.00 | 494.0 | 5 | 2 | 400 | 7.72 | 648.0 |
| 5KP440A | 5KP440CA | 492.00 | 543.0 | 5 | 2 | 440 | 7.01 | 713.0 |

## Ratings and Characteristics Curves ($T_A$=25℃ unless otherwise noted)

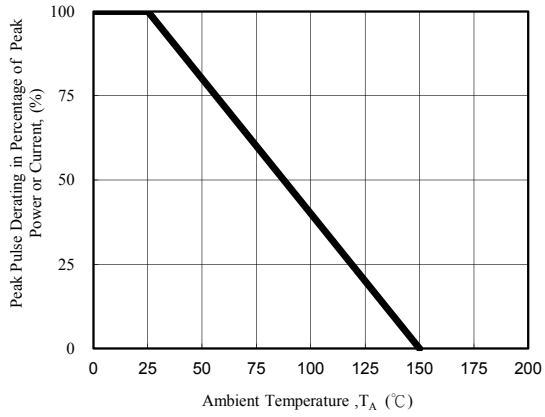


Fig. 1 - Pulse Derating Curve

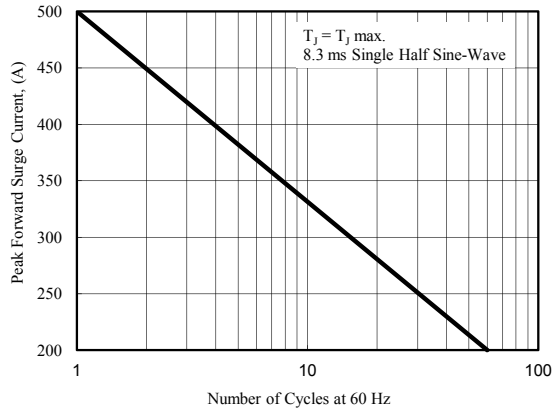


Fig. 2 - Maximum Non-Repetitive Surge Current

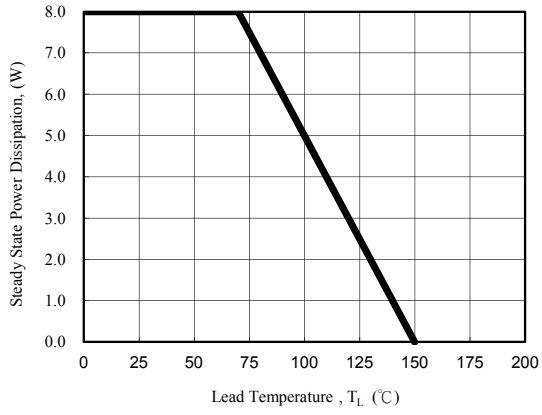


Fig. 3 - Steady State Power Derating Curve

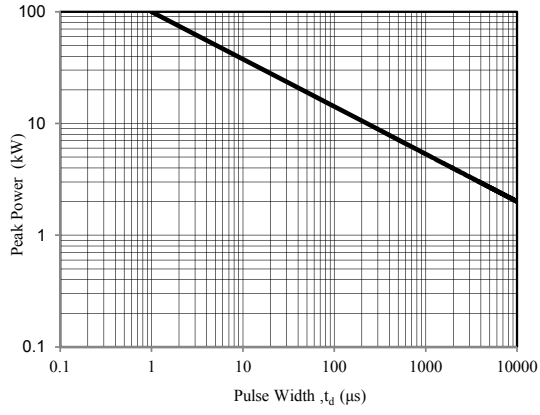


Fig. 4 - Peak Pulse Power Rating Curve

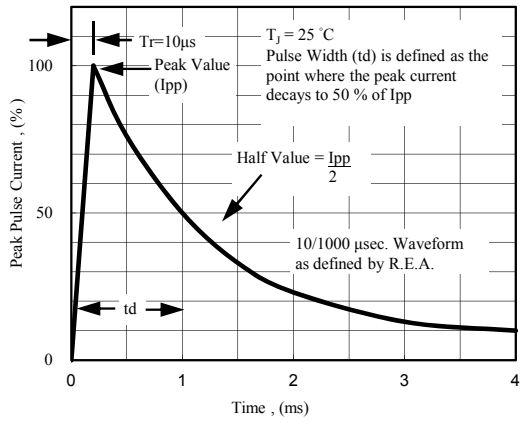


Fig. 5 - Pulse Waveform

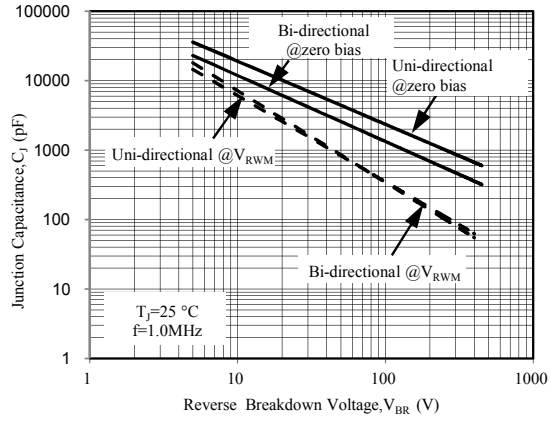


Fig. 6 - Typical Junction Capacitance