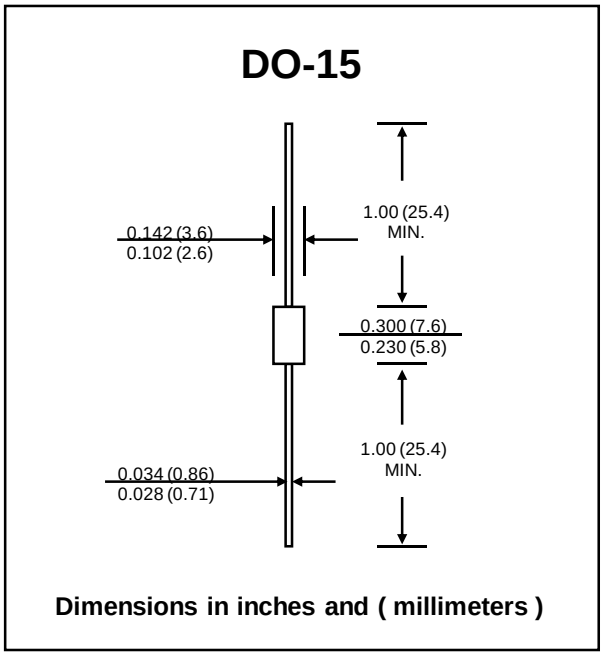
# P6KExxC SERIES

## BI-DIRECTIONAL TRANSIENT VOLTAGE SUPPRESSOR

**$V_{BR}$ : 6.8 - 600 Volts**

**$P_{PK}$ : 600 Watts**




### FEATURES :

* Glass passivated jungtion chip
* 600W surge capability at 1ms
* Excellent clamping capability
* Low zener impedance
* Fast response time : typically less then 1.0 ps from 0 volt to $V_{BR(min.)}$
* Typical $I_R$ less then 1μA above 10V
* Pb / RoHS Free

### MECHANICAL DATA :

* Case : DO-15 Molded plastic
* Epoxy : UL94V-0 rate flame retardant
* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
* Mounting position : Any
* Weight : 0.4 gram

### DEVICES FOR UNIPOLAR APPLICATIONS

For uni-directional without "C"
Electrical characteristics apply in both directions

### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Peak Power Dissipation at Ta = 25 °C, Tp=1ms (Note1) | $P_{PK}$ | Minimum 600 | W |
| Steady State Power Dissipation at $T_L$ = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2) | $P_D$ | 5.0 | W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | - 65 to + 175 | °C |

**Notes :**

(1) Non-repetitive Current pulse, per Fig. 2 and derated above Ta = 25 °C per Fig. 1

(2) Mounted on Copper Leaf area of 1.57 $in^2$ (40$mm^2$).

## ELECTRICAL CHARACTERISTICS ( Rating at 25 °C ambient temperature unless otherwise specified. )

| Type No. | Breakdown Voltage @ It ( Note 1 ) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ $V_{RWM}$ | Maximum Reverse Current | Maximum Clamping Voltage @ $I_{RSM}$ | Maximum Temperature Co-efficient of $V_{BR}$ |
|---|---|---|---|---|---|---|---|---|
| | $V_{BR}$ (V) | | It | $V_{RWM}$ | $I_R$ | $I_{RSM}$ | $V_{RSM}$ | |
| | Min. | Max. | (mA) | (V) | (μA) | (A) | (V) | (% / °C) |
| **P6KE6.8C** | 6.12 | 7.48 | 10 | 5.50 | 2000 | 55.5 | 10.8 | 0.057 |
| **P6KE6.8CA** | 6.45 | 7.14 | 10 | 5.80 | 2000 | 57.0 | 10.5 | 0.057 |
| **P6KE7.5C** | 6.75 | 8.25 | 10 | 6.05 | 1000 | 51.0 | 11.7 | 0.061 |
| **P6KE7.5CA** | 7.13 | 7.88 | 10 | 6.40 | 1000 | 53.0 | 11.3 | 0.061 |
| **P6KE8.2C** | 7.38 | 9.02 | 10 | 6.63 | 400 | 48.0 | 12.5 | 0.065 |
| **P6KE8.2CA** | 7.79 | 8.61 | 10 | 7.02 | 400 | 50.0 | 12.1 | 0.065 |
| **P6KE9.1C** | 8.19 | 10.0 | 1.0 | 7.37 | 300 | 44.0 | 13.8 | 0.068 |
| **P6KE9.1CA** | 8.65 | 9.55 | 1.0 | 7.78 | 300 | 45.0 | 13.4 | 0.068 |
| **P6KE10C** | 9.00 | 11.0 | 1.0 | 8.10 | 300 | 40.0 | 15.0 | 0.073 |
| **P6KE10CA** | 9.50 | 10.5 | 1.0 | 8.55 | 300 | 41.0 | 14.5 | 0.073 |
| **P6KE11C** | 9.90 | 12.1 | 1.0 | 8.92 | 150 | 37.0 | 16.2 | 0.075 |
| **P6KE11CA** | 10.5 | 11.6 | 1.0 | 9.40 | 150 | 38.0 | 15.6 | 0.075 |
| **P6KE12C** | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 35.0 | 17.3 | 0.078 |
| **P6KE12CA** | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 36.0 | 16.7 | 0.078 |
| **P6KE13C** | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 32.0 | 19.0 | 0.081 |
| **P6KE13CA** | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 33.0 | 18.2 | 0.081 |
| **P6KE15C** | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 27.0 | 22.0 | 0.084 |
| **P6KE15CA** | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 28.0 | 21.2 | 0.084 |
| **P6KE16C** | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 26.0 | 23.5 | 0.086 |
| **P6KE16CA** | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 27.0 | 22.5 | 0.086 |
| **P6KE18C** | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 23.0 | 26.5 | 0.088 |
| **P6KE18CA** | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 24.0 | 25.2 | 0.088 |
| **P6KE20C** | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 21.0 | 29.1 | 0.090 |
| **P6KE20CA** | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 22.0 | 27.7 | 0.090 |
| **P6KE22C** | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 19.0 | 31.9 | 0.092 |
| **P6KE22CA** | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 20.0 | 30.6 | 0.092 |
| **P6KE24C** | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 17.0 | 34.7 | 0.094 |
| **P6KE24CA** | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 18.0 | 33.2 | 0.094 |
| **P6KE27C** | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 15.0 | 39.1 | 0.096 |
| **P6KE27CA** | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 16.0 | 37.5 | 0.096 |
| **P6KE30C** | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 14.0 | 43.5 | 0.097 |
| **P6KE30CA** | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 14.4 | 41.4 | 0.097 |
| **P6KE33C** | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 12.6 | 47.7 | 0.098 |
| **P6KE33CA** | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 13.2 | 45.7 | 0.098 |
| **P6KE36C** | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 11.6 | 52.0 | 0.099 |
| **P6KE36CA** | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 12.0 | 49.9 | 0.099 |
| **P6KE39C** | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 10.6 | 56.4 | 0.100 |
| **P6KE39CA** | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 11.2 | 53.9 | 0.100 |
| **P6KE43C** | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 9.6 | 61.9 | 0.101 |
| **P6KE43CA** | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 10.1 | 59.3 | 0.101 |
| **P6KE47C** | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 8.9 | 67.8 | 0.101 |
| **P6KE47CA** | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 9.3 | 64.8 | 0.101 |
| **P6KE51C** | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 8.2 | 73.5 | 0.102 |
| **P6KE51CA** | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 8.6 | 70.1 | 0.102 |
| **P6KE56C** | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 7.4 | 80.5 | 0.103 |
| **P6KE56CA** | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 7.8 | 77.0 | 0.103 |
| **P6KE62C** | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 6.8 | 89.0 | 0.104 |
| **P6KE62CA** | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 7.1 | 85.0 | 0.104 |
| **P6KE68C** | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 6.1 | 98.0 | 0.104 |
| **P6KE68CA** | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 6.5 | 92.0 | 0.104 |
| **P6KE70C** | 63.0 | 77.0 | 1.0 | 56.7 | 5.0 | 6.0 | 100 | 0.104 |
| **P6KE70CA** | 66.5 | 73.5 | 1.0 | 59.8 | 5.0 | 6.2 | 96.7 | 0.104 |

# ELECTRICAL CHARACTERISTICS ( Rating at 25 °C ambient temperature unless otherwise specified. )

| Type No. | Breakdown Voltage @ It ( Note 1 ) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ $V_{RWM}$ | Maximum Reverse Current | Maximum Clamping Voltage @ $I_{RSM}$ | Maximum Temperature Co-efficient of $V_{BR}$ |
|---|---|---|---|---|---|---|---|---|
| | $V_{BR}$ (V) | | It | $V_{RWM}$ | $I_R$ | $I_{RSM}$ | $V_{RSM}$ | |
| | Min. | Max. | (mA) | (V) | (μA) | (A) | (V) | (% / °C) |
| **P6KE75C** | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 5.5 | 108 | 0.105 |
| **P6KE75CA** | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 5.8 | 103 | 0.105 |
| **P6KE82C** | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 5.1 | 118 | 0.105 |
| **P6KE82CA** | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 5.3 | 113 | 0.105 |
| **P6KE91C** | 81.9 | 100.0 | 1.0 | 73.7 | 5.0 | 4.5 | 131 | 0.106 |
| **P6KE91CA** | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 4.8 | 125 | 0.106 |
| **P6KE100C** | 90.0 | 110.0 | 1.0 | 81.0 | 5.0 | 4.2 | 144 | 0.106 |
| **P6KE100CA** | 95.0 | 105.0 | 1.0 | 85.5 | 5.0 | 4.4 | 137 | 0.106 |
| **P6KE110C** | 99.0 | 121.0 | 1.0 | 89.2 | 5.0 | 3.8 | 158 | 0.107 |
| **P6KE110CA** | 105.0 | 116.0 | 1.0 | 94.0 | 5.0 | 4.0 | 152 | 0.107 |
| **P6KE120C** | 108.0 | 132.0 | 1.0 | 97.2 | 5.0 | 3.5 | 173 | 0.107 |
| **P6KE120CA** | 114.0 | 126.0 | 1.0 | 102 | 5.0 | 3.6 | 165 | 0.107 |
| **P6KE130C** | 117.0 | 143.0 | 1.0 | 106 | 5.0 | 3.2 | 187 | 0.107 |
| **P6KE130CA** | 124.0 | 137.0 | 1.0 | 111 | 5.0 | 3.3 | 179 | 0.107 |
| **P6KE150C** | 135.0 | 165.0 | 1.0 | 121 | 5.0 | 2.8 | 215 | 0.108 |
| **P6KE150CA** | 143.0 | 158.0 | 1.0 | 128 | 5.0 | 2.9 | 207 | 0.108 |
| **P6KE160C** | 144.0 | 176.0 | 1.0 | 130 | 5.0 | 2.6 | 230 | 0.108 |
| **P6KE160CA** | 152.0 | 168.0 | 1.0 | 136 | 5.0 | 2.7 | 219 | 0.108 |
| **P6KE170C** | 153.0 | 187.0 | 1.0 | 138 | 5.0 | 2.5 | 244 | 0.108 |
| **P6KE170CA** | 162.0 | 179.0 | 1.0 | 145 | 5.0 | 2.6 | 234 | 0.108 |
| **P6KE180C** | 162.0 | 198.0 | 1.0 | 146 | 5.0 | 2.3 | 258 | 0.108 |
| **P6KE180CA** | 171.0 | 189.0 | 1.0 | 154 | 5.0 | 2.4 | 246 | 0.108 |
| **P6KE200C** | 180.0 | 220.0 | 1.0 | 162 | 5.0 | 2.1 | 287 | 0.108 |
| **P6KE200CA** | 190.0 | 210.0 | 1.0 | 171 | 5.0 | 2.2 | 274 | 0.108 |
| **P6KE220C** | 198.0 | 242.0 | 1.0 | 175 | 5.0 | 1.75 | 344 | 0.108 |
| **P6KE220CA** | 209.0 | 231.0 | 1.0 | 185 | 5.0 | 1.83 | 328 | 0.108 |
| **P6KE250C** | 225.0 | 275.0 | 1.0 | 202 | 5.0 | 1.67 | 360 | 0.110 |
| **P6KE250CA** | 237.0 | 263.0 | 1.0 | 214 | 5.0 | 1.75 | 344 | 0.110 |
| **P6KE300C** | 270.0 | 330.0 | 1.0 | 243 | 5.0 | 1.40 | 430 | 0.110 |
| **P6KE300CA** | 285.0 | 315.0 | 1.0 | 256 | 5.0 | 1.45 | 414 | 0.110 |
| **P6KE320C** | 288.0 | 352.0 | 1.0 | 259 | 5.0 | 1.31 | 460 | 0.110 |
| **P6KE320CA** | 303.0 | 337.0 | 1.0 | 272 | 5.0 | 1.35 | 445 | 0.110 |
| **P6KE350C** | 315.0 | 385.0 | 1.0 | 284 | 5.0 | 1.20 | 504 | 0.110 |
| **P6KE350CA** | 332.0 | 368.0 | 1.0 | 300 | 5.0 | 1.25 | 482 | 0.110 |
| **P6KE400C** | 360.0 | 440.0 | 1.0 | 324 | 5.0 | 1.05 | 574 | 0.110 |
| **P6KE400CA** | 380.0 | 420.0 | 1.0 | 342 | 5.0 | 1.10 | 548 | 0.110 |
| **P6KE440C** | 396.0 | 484.0 | 1.0 | 356 | 5.0 | 0.95 | 631 | 0.110 |
| **P6KE440CA** | 418.0 | 462.0 | 1.0 | 376 | 5.0 | 1.00 | 602 | 0.110 |
| **P6KE480C** | 432.0 | 528.0 | 1.0 | 389 | 5.0 | 0.88 | 686 | 0.110 |
| **P6KE480CA** | 456.0 | 504.0 | 1.0 | 408 | 5.0 | 0.90 | 658 | 0.110 |
| **P6KE510C** | 459.0 | 561.0 | 1.0 | 413 | 5.0 | 0.82 | 729 | 0.110 |
| **P6KE510CA** | 485.0 | 535.0 | 1.0 | 434 | 5.0 | 0.86 | 698 | 0.110 |
| **P6KE530C** | 477.0 | 583.0 | 1.0 | 457 | 5.0 | 0.76 | 798 | 0.110 |
| **P6KE530CA** | 503.5 | 556.5 | 1.0 | 477 | 5.0 | 0.80 | 725 | 0.110 |
| **P6KE540C** | 486.0 | 594.0 | 1.0 | 437 | 5.0 | 0.78 | 772 | 0.110 |
| **P6KE540CA** | 513.0 | 567.0 | 1.0 | 459 | 5.0 | 0.81 | 740 | 0.110 |
| **P6KE550C** | 495.0 | 605.0 | 1.0 | 470 | 5.0 | 0.76 | 836 | 0.110 |
| **P6KE550CA** | 522.5 | 577.5 | 1.0 | 495 | 5.0 | 0.80 | 760 | 0.110 |
| **P6KE600C** | 540.0 | 660.0 | 1.0 | 490 | 5.0 | 0.71 | 911 | 0.110 |
| **P6KE600CA** | 570.0 | 630.0 | 1.0 | 512 | 5.0 | 0.75 | 828 | 0.110 |

**Notes :** ( 1 ) $V_{BR}$ measured after It applied for 300 μs., It = square wave pulse or equivalent.

( 2 ) "6KE" will be omitted in marking on the diode.

## RATING AND CHARACTERISTIC CURVES ( P6KExxC SERIES )

**FIG.1 - PULSE DERATING CURVE**

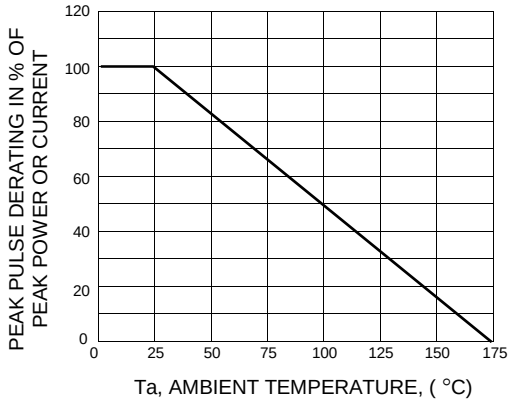



**FIG.2 - PULSE WAVEFORM**

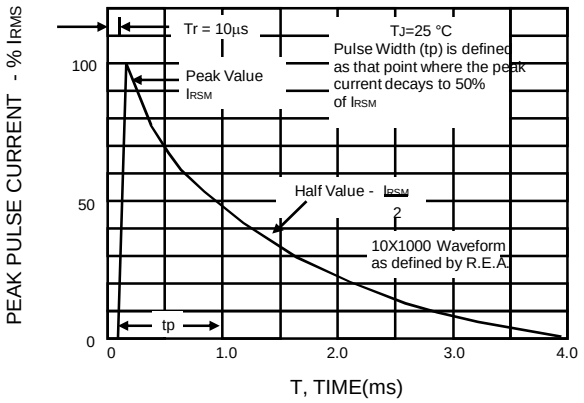



**FIG.3 - STEADY STATE POWER DERATING**

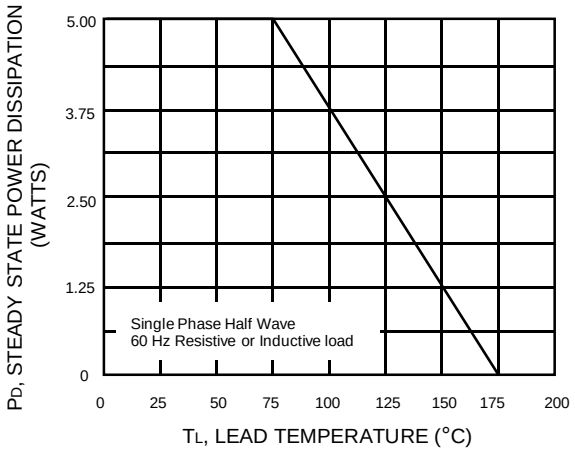



**FIG.4 - PULSE RATING CURVE**