PINGWEI ENTERPRISE

# P4KE SERIES

## TRANSIENT VOLTAGE SUPPRESSOR DIODES

Voltage Range
6.8 to 400 Vots
400 Watts Peak Power

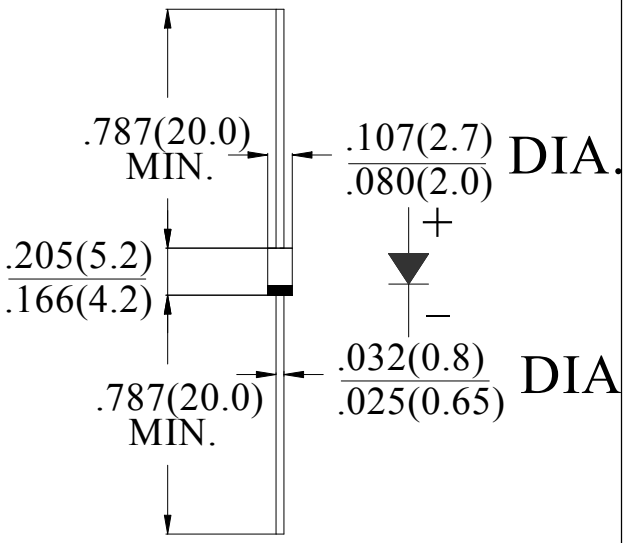
## FEATURE

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 400W surge capability at10×100us waveform,Duty cycle:0.01%
- Excellent clamping capability
- Low zener impedance
- Fast response time：Typically less then 1.0ps from 0 volts to VBR for unidirectional and 5.0ns for bidirectional
- Typical IR less then 1 μA above 10V
- High temperature soldering guaranteed: 260℃/10 seconds /.375"lead length / 5lbs tension

## MECHANICAL DATA

- Terminal: Plated axial leads solderable per MIL-STD 202E, method 208C
- Case: Molded with UL-94 Class V-0 recognized Flame Retardant Epoxy
- Polarity: color band denotes cathode except bipolar

**DO-41**




Dimensions in inches and (millimeters)

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise stated.
Single-phase, half-wave, 60HZ, resistive or inductive load.
For capacotive load,derate current by 20%

| Type Number | SYMBOL | Value | units |
|---|---|---|---|
| Peak Power Dissipation at Ta=25℃,Tp=1ms (note 1) | $P_{PPM}$ | Minimum 400 | Watts |
| Steady State Power Dissipation .375"lead length at $T_L$=50℃(note 2) | $P_D$ | 1.0 | Watts |
| Peak Forward Surge Current 8.3ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) (note 3) | $I_{FSM}$ | 40 | Amps |
| Storage Temperature | $T_{STG}$ | -55 to +150 | ℃ |
| Operating Junction Temperature | $T_J$ | -55 to +125 | ℃ |

**Note:**

1. Non-repetitive Current Pulse Per Fig.3 and Derated above Ta=25℃ Per Fig.2 .
2. Mounted on Copper Pad Area of 1.6×1.6″ (40×40mm)Per Fig.5 .
3. 8.3ms Single Half Sine-wave or Equivalent Square Wave,Duty Cycle=4 Pulses Per Minutes Maximum.

**Devices for Bipolar Applications**

1. For Bidirectional Use C or CA Suffix for Types P4KE6.8 thru Types P4KE400.
2. Electrical Characteristics Apply in Both Directions.

## ELECTRICAL CHARACTERISTICS(TA=25℃ unless otherwise noted)

| Device | Nominal | Breakdown | Test | Stand- | Maximum | Maximum | Maximum | Maximum |
|---|---|---|---|---|---|---|---|---|

| | | Voltage (volts) | Voltage VBR (volts)(note1) | | Current @IT (mA) | Off Voltage VWM (volts) | Reverse Leakage At VWM ID(μA) | Peak Pulse Current IPPM (note2)(Amps) | Clamping Voltage at IPPM VC(Volts) | Temperature Coefficient Of VBR(%/℃) |
|---|---|---|---|---|---|---|---|---|---|---|
| UNI | BI | | Min | Max | | | | | | |
| P4KE6.8 | P4KE6.8C | 6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 38 | 10.8 | 0.057 |
| P4KE6.8A | P4KE6.8CA | 6.8 | 6.46 | 7.14 | 10 | 5.80 | 1000 | 40 | 10.5 | 0.057 |
| P4KE7.5 | P4KE7.5C | 7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 35 | 11.7 | 0.061 |
| P4KE7.5A | P4KE7.5CA | 7.5 | 7.13 | 7.88 | 10 | 6.4 | 500 | 37 | 11.3 | 0.061 |
| P4KE8.2 | P4KE8.2C | 8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 33 | 12.5 | 0.065 |
| P4KE8.2A | P4KE8.2CA | 8.2 | 7.79 | 8.61 | 10 | 7.02 | 200 | 34 | 12.1 | 0.065 |
| P4KE9.1 | P4KE9.1C | 9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 30 | 13.8 | 0.068 |
| P4KE9.1A | P4KE9.1CA | 9.1 | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 31 | 13.4 | 0.068 |
| P4KE10 | P4KE10C | 10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 28 | 15.0 | 0.073 |
| P4KE10A | P4KE10CA | 10 | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 29 | 14.5 | 0.073 |
| P4KE11 | P4KE11C | 11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 26 | 16.2 | 0.075 |
| P4KE11A | P4KE11CA | 11 | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 27 | 15.6 | 0.075 |
| P4KE12 | P4KE12C | 12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 24 | 17.3 | 0.078 |
| P4KE12A | P4KE12CA | 12 | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 25 | 16.7 | 0.078 |
| P4KE13 | P4KE13C | 13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 22 | 19.0 | 0.081 |
| P4KE13A | P4KE13CA | 13 | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 23 | 18.2 | 0.081 |
| P4KE15 | P4KE15C | 15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 19 | 22.0 | 0.084 |
| P4KE15A | P4KE15CA | 15 | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 20 | 21.2 | 0.084 |
| P4KE16 | P4KE16C | 16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 17.8 | 23.5 | 0.086 |
| P4KE16A | P4KE16CA | 16 | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 18.6 | 22.5 | 0.086 |
| P4KE18 | P4KE18C | 18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 16 | 26.5 | 0.088 |
| P4KE18A | P4KE18CA | 18 | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 16.5 | 25.2 | 0.088 |
| P4KE20 | P4KE20C | 20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 14 | 29.1 | 0.090 |
| P4KE20A | P4KE20CA | 20 | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 15 | 27.7 | 0.090 |
| P4KE22 | P4KE22C | 22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 13 | 31.9 | 0.092 |
| P4KE22A | P4KE22CA | 22 | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 13.7 | 30.6 | 0.092 |
| P4KE24 | P4KE24C | 24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 12 | 34.7 | 0.094 |
| P4KE24A | P4KE24CA | 24 | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 12.6 | 33.2 | 0.094 |
| P4KE27 | P4KE27C | 27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 10.7 | 39.1 | 0.096 |
| P4KE27A | P4KE27CA | 27 | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 11.0 | 37.5 | 0.096 |
| P4KE30 | P4KE30C | 30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 9.6 | 43.5 | 0.097 |
| P4KE30A | P4KE30CA | 30 | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 10 | 41.4 | 0.097 |
| P4KE33 | P4KE33C | 33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 8.8 | 47.7 | 0.098 |
| P4KE33A | P4KE33CA | 33 | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 9.0 | 45.7 | 0.098 |
| P4KE36 | P4KE36C | 36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 8.0 | 52 | 0.099 |
| P4KE36A | P4KE36CA | 36 | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.4 | 49.9 | 0.099 |
| P4KE39 | P4KE39C | 39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.4 | 56.4 | 0.100 |
| P4KE39A | P4KE39CA | 39 | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.7 | 53.9 | 0.100 |
| P4KE43 | P4KE43C | 43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.7 | 61.9 | 0.101 |
| P4KE43A | P4KE43CA | 43 | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 7.0 | 59.3 | 0.101 |
| P4KE47 | P4KE47C | 47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 6.2 | 67.8 | 0.101 |
| P4KE47A | P4KE47CA | 47 | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.4 | 64.8 | 0.101 |
| P4KE51 | P4KE51C | 51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.7 | 73.5 | 0.102 |
| P4KE51A | P4KE51CA | 51 | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 6.0 | 70.1 | 0.102 |
| P4KE56 | P4KE56C | 56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.2 | 80.5 | 0.103 |
| P4KE56A | P4KE56CA | 56 | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.4 | 77 | 0.103 |
| P4KE62 | P4KE62C | 62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.7 | 89 | 0.104 |
| P4KE62A | P4KE62CA | 62 | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 5.0 | 85 | 0.104 |
| Device | | Nominal Voltage (volts) | Breakdown Voltage VBR (volts)(note1) | | Test Current @IT | Stand-Off Voltage | Maximum Reverse Leakage | Maximum Peak Pulse Current IPPM | Maximum Clamping Voltage at | Maximum Temperature Coefficient |
| | | | Min | Max | | | | | | |

| UNI | BI | | | | (mA) | VWM (volts) | At VWM ID(μA) | (note2)(Amps) | IPPM VC(Volts) | Of VBR(%/℃) |
|---|---|---|---|---|---|---|---|---|---|---|
| P4KE68 | P4KE68C | 68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.2 | 98 | 0.104 |
| P4KE68A | P4KE68CA | 68 | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.5 | 92 | 0.104 |
| P4KE75 | P4KE75C | 75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.8 | 108 | 0.105 |
| P4KE75A | P4KE75CA | 75 | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 4.0 | 103 | 0.105 |
| P4KE82 | P4KE82C | 82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.5 | 118 | 0.105 |
| P4KE82A | P4KE82CA | 82 | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.7 | 113 | 0.105 |
| P4KE91 | P4KE91C | 91 | 81.9 | 100.0 | 1.0 | 73.7 | 5.0 | 3.2 | 131 | 0.106 |
| P4KE91A | P4KE91CA | 91 | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.3 | 125 | 0.106 |
| P4KE100 | P4KE100C | 100 | 90.0 | 110.0 | 1.0 | 81.0 | 5.0 | 2.9 | 144 | 0.106 |
| P4KE100A | P4KE100CA | 100 | 95.0 | 105.0 | 1.0 | 85.5 | 5.0 | 3.0 | 137 | 0.106 |
| P4KE110 | P4KE110C | 110 | 99.0 | 121.0 | 1.0 | 89.2 | 5.0 | 2.6 | 158 | 0.107 |
| P4KE110A | P4KE110CA | 110 | 105.0 | 116.0 | 1.0 | 94.0 | 5.0 | 2.7 | 152 | 0.107 |
| P4KE120 | P4KE120C | 120 | 108.0 | 132.0 | 1.0 | 97.2 | 5.0 | 2.4 | 173 | 0.107 |
| P4KE120A | P4KE120CA | 120 | 114.0 | 126.0 | 1.0 | 102.0 | 5.0 | 2.5 | 165 | 0.107 |
| P4KE130 | P4KE130C | 130 | 117.0 | 143.0 | 1.0 | 105.0 | 5.0 | 2.2 | 187 | 0.107 |
| P4KE130A | P4KE130CA | 130 | 124.0 | 137.0 | 1.0 | 111.0 | 5.0 | 2.3 | 179 | 0.107 |
| P4KE150 | P4KE150C | 150 | 135.0 | 165.0 | 1.0 | 121.0 | 5.0 | 1.9 | 215 | 0.108 |
| P4KE150A | P4KE150CA | 150 | 143.0 | 158.0 | 1.0 | 128.0 | 5.0 | 2.0 | 207 | 0.108 |
| P4KE160 | P4KE160C | 160 | 144.0 | 176.0 | 1.0 | 130.0 | 5.0 | 1.8 | 230 | 0.108 |
| P4KE160A | P4KE160CA | 160 | 152.0 | 168.0 | 1.0 | 136.0 | 5.0 | 1.9 | 219 | 0.108 |
| P4KE170 | P4KE170C | 170 | 153.0 | 187.0 | 1.0 | 138.0 | 5.0 | 1.7 | 244 | 0.108 |
| P4KE170A | P4KE170CA | 170 | 162.0 | 179.0 | 1.0 | 145.0 | 5.0 | 1.8 | 234 | 0.108 |
| P4KE180 | P4KE180C | 180 | 162.0 | 198.0 | 1.0 | 146.0 | 5.0 | 1.6 | 258 | 0.108 |
| P4KE180A | P4KE180CA | 180 | 171.0 | 189.0 | 1.0 | 154.0 | 5.0 | 1.7 | 246 | 0.108 |
| P4KE200 | P4KE200C | 200 | 180.0 | 220.0 | 1.0 | 162.0 | 5.0 | 1.4 | 287 | 0.108 |
| P4KE200A | P4KE200CA | 200 | 190.0 | 210.0 | 1.0 | 171.0 | 5.0 | 1.51 | 274 | 0.108 |
| P4KE220 | P4KE220C | 220 | 198.0 | 242.0 | 1.0 | 175.0 | 5.0 | 1.2 | 344 | 0.108 |
| P4KE220A | P4KE220CA | 220 | 209.0 | 231.0 | 1.0 | 185.0 | 5.0 | 1.3 | 328 | 0.108 |
| P4KE250 | P4KE250C | 250 | 225.0 | 275.0 | 1.0 | 202.0 | 5.0 | 1.1 | 360 | 0.110 |
| P4KE250A | P4KE250CA | 250 | 237.0 | 263.0 | 1.0 | 214.0 | 5.0 | 1.2 | 344 | 0.110 |
| P4KE300 | P4KE300C | 300 | 270.0 | 330.0 | 1.0 | 243.0 | 5.0 | 0.97 | 430 | 0.110 |
| P4KE300A | P4KE300CA | 300 | 285.0 | 315.0 | 1.0 | 256.0 | 5.0 | 1.0 | 414 | 0.110 |
| P4KE350 | P4KE350C | 350 | 315.0 | 385.0 | 1.0 | 284.0 | 5.0 | 0.83 | 504 | 0.110 |
| P4KE350A | P4KE350CA | 350 | 332.0 | 368.0 | 1.0 | 300.0 | 5.0 | 0.87 | 482 | 0.110 |
| P4KE400 | P4KE400C | 400 | 360.0 | 440.0 | 1.0 | 324.0 | 5.0 | 0.73 | 574 | 0.110 |
| P4KE400A | P4KE400CA | 400 | 380.0 | 420.0 | 1.0 | 342.0 | 5.0 | 0.76 | 548 | 0.110 |

**Note:**

1. VBR measured afert IT applied for 300us,IT=square wave pulse or equivalent.
2. Surge cuttent waveform per Figure 3 and derate per Figure 2.
3. For bipolar types having VWM of 10 volts and under,the ID limit is doubled.
4. All terms and symbols are consistent with ANSI/IEEE C62.35.

## RATING AND CHARACTERISTIC CURVES (P4KE6.8 THRU P4KE400CA)

FIG.1-PEAK PULSE POWER RATING CURVE

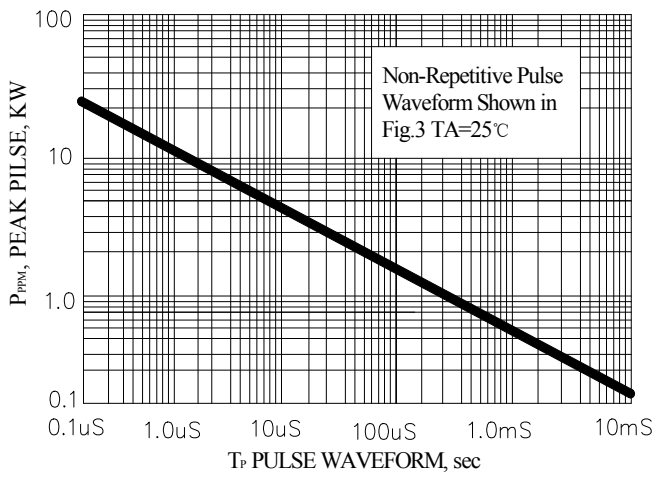



FIG.2-PULSE DERATING CURVE

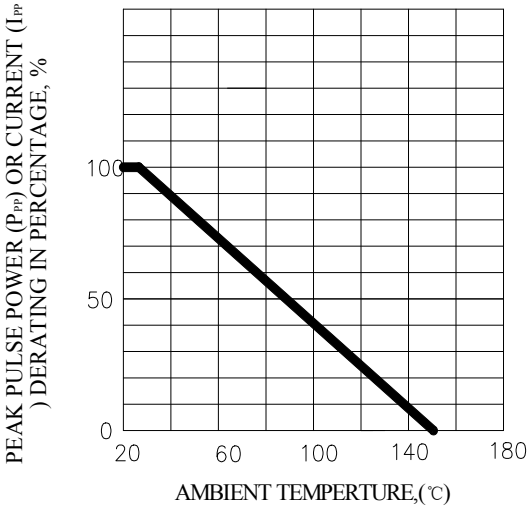



FIG.3-PULSE WAVEFORM

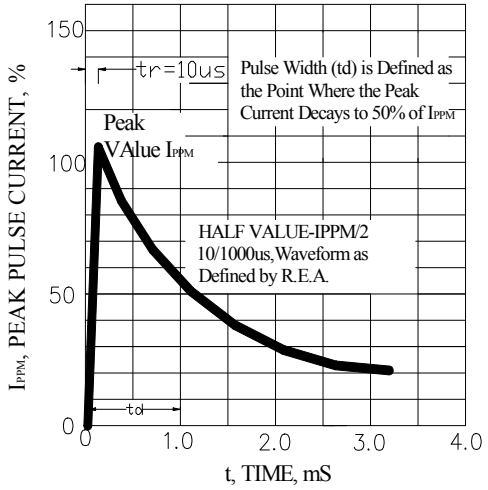



FIG.4- TYPICAL JUNCTION CAPACITANCE

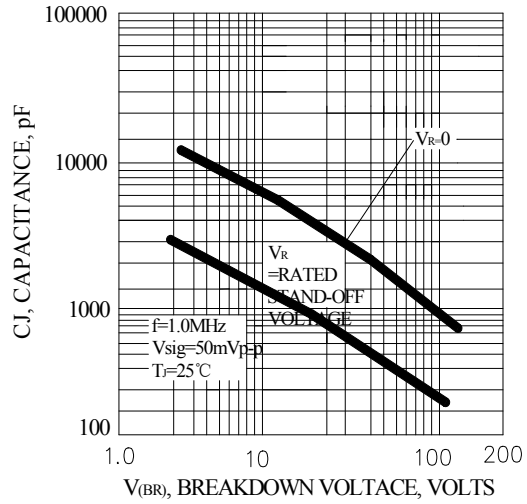



FIG.5- STEADY STATE POWER DERATING CURVE

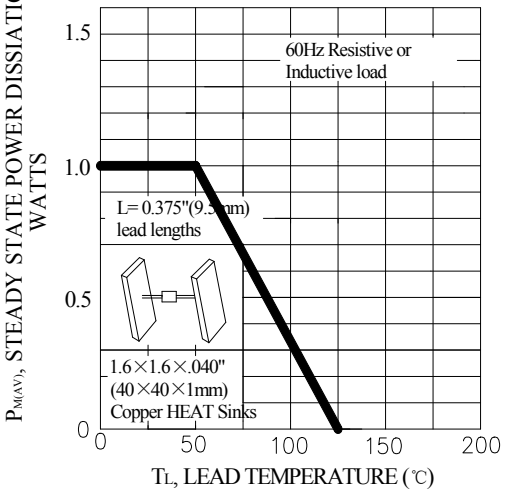



FIG.6- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL