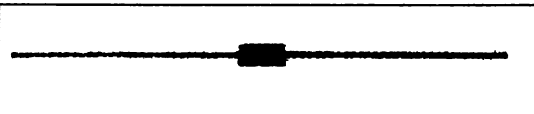




P4KE SERIES TRANSIENT VOLTAGE SUPPRESSORS DIODE



FEATURES

- * Plastic package has underwriters laboratory flammability classifications 94V-0
- * 400W surge capability at 1ms
- * Excellent clamping capability
- * Low zener impedance
- * Fast response time: typically less than 1.0ps from 0 volts to BV min
- * Typical I_R less than $1\mu A$ above 10V

MECHANICAL DATA

- * Case: Molded plastic
- * Terminals: Axial leads, solderable per MIL - STD - 202, Method 208
- * Polarity: Color band denotes cathode Bidirectional not Mark.
- * Weight: 0.012 ounce (0.3 grams)

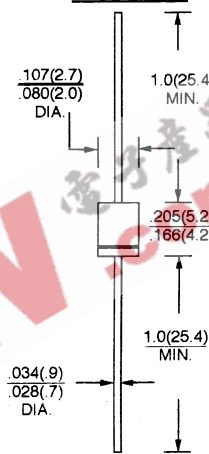
DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P4KE6.8 thru types P4KE400
Electrical characteristics apply in both directions

VOLTAGE RANGE

6.8 to 400 Volts
400 Watts Peak Power

DO-41



Dimensions in inches and (millimeters)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%

| TYPE NUMBER | SYMBOLS | VALUE | UNITS |
|-------------------------------------------------------------------------------------------------------------|-----------------|-------------|-------|
| Peak Power Dissipation at $T_A = 25^\circ C$, $T_P = 1ms$ (Note 1) | P_{PPM} | Minimum 400 | Watt |
| Steady State Power Dissipation at $T_L = 75^\circ C$ Lead Lengths .375", 9.5mm (Note 2) | P_D | 1.0 | Watt |
| Peak Forward surge Current, 8.3 ms single half Sine-Wave Superimposed on Rated Load (JEDEC method) (Note 3) | I_{FSM} | 40.0 | Amp |
| Maximum instantaneous forward voltage at 25A for unidirectional Only (Note 4) | V_F | 3.5/5.0 | Volt |
| Operating and Storage Temperature Range | T_j T_{STG} | -65 to +150 | °C |

- NOTE: (1) Non-repetitive current pulse per Fig. 3 and derated above $T_A = 25^\circ C$ per Fig. 2.
(2) Mounted on Copper Pad area $1.6 \times 1.6"$ ($40 \times 40mm$) Per Fig 5.
(3) 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per Minutes maximum.
(4) $V_F = 3.5V$ Max for Devices $V(BR) \leq 200V$ and $V_F = 5.0V$ for Devices $V(BR) > 200V$.



RATINGS AND CHARACTERISTIC CURVES (P4KE SERIES)

FIGURE 1 - PEAK PULSE POWER RATING CURVE

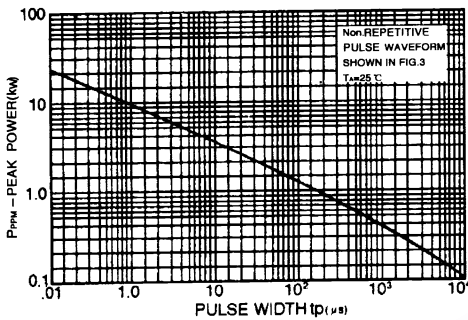


FIGURE 2 - PULSE DERATING CURVE

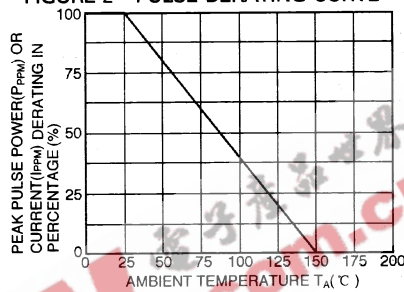


FIGURE 3 - PULSE WAVEFORM

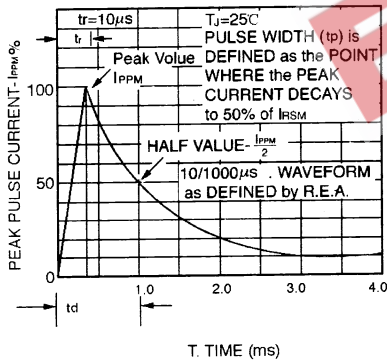


FIGURE 5 - STEADY STATE POWER DERATING CURVE

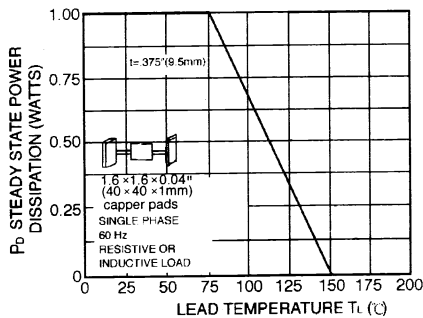


FIGURE 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

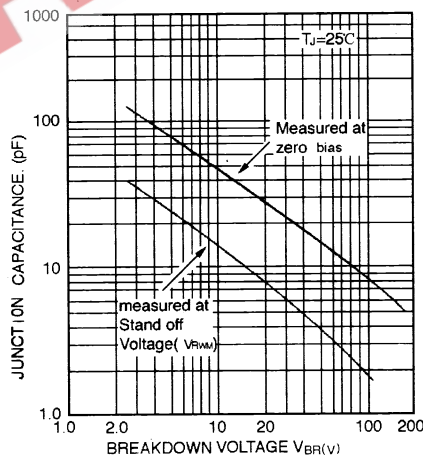
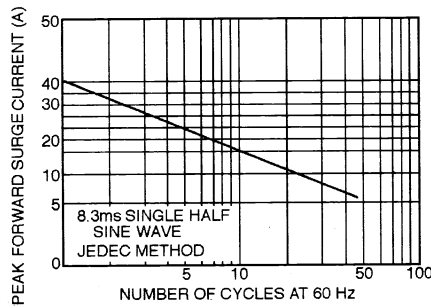


FIGURE 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT - UNIDIRECTIONAL ONLY



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

| Device | Nominal Voltage (Volts) | Breakdown Voltage | | I_T (mA) | stand-off Voltage V_{WM} (Volts) | Maximum Reverse Leakage @ V_{WM} I_D (μA) (NOTE 3) | Maximum Reverse Surge Current I_{PPM} (NOTE 2) (Amps) | Maximum Reverse Voltage @ I_{PPM} (Clamping Voltage) V_C (Volts) | Maximum Temperature Coefficient of $V(BR)$ ($\%/^\circ\text{C}$) |
|----------|-------------------------|--------------------------|------|------------|------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------|
| | | $V(BR)$ (Volts) (Note 1) | | | | | | | |
| | | Min | Max | | | | | | |
| P4KE6.8 | 6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 38 | 10.8 | 0.057 |
| P4KE6.8A | 6.8 | 6.46 | 7.14 | 10 | 5.80 | 1000 | 40 | 10.5 | 0.057 |
| P4KE7.5 | 7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 36 | 11.7 | 0.061 |
| P4KE7.5A | 7.5 | 7.13 | 7.88 | 10 | 6.40 | 500 | 37 | 11.3 | 0.061 |
| P4KE8.2 | 8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 33 | 12.5 | 0.065 |
| P4KE8.2A | 8.2 | 7.79 | 8.61 | 10 | 7.02 | 200 | 35 | 12.1 | 0.065 |
| P4KE9.1 | 9.1 | 8.19 | 10.0 | 10 | 7.37 | 50 | 30 | 13.8 | 0.068 |
| P4KE9.1A | 9.1 | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 31 | 13.4 | 0.068 |
| P4KE10 | 10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 28 | 15.0 | 0.073 |
| P4KE10A | 10 | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 29 | 14.5 | 0.073 |
| P4KE11 | 11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 26 | 16.2 | 0.075 |
| P4KE11A | 11 | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 27 | 15.6 | 0.075 |
| P4KE12 | 12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 24 | 17.3 | 0.076 |
| P4KE12A | 12 | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 25 | 16.7 | 0.078 |
| P4KE13 | 13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 22 | 19.0 | 0.081 |
| P4KE13A | 13 | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 23 | 18.2 | 0.081 |
| P4KE15 | 15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 19 | 22.0 | 0.084 |
| P4KE15A | 15 | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 20 | 21.2 | 0.084 |
| P4KE16 | 16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 18 | 23.5 | 0.086 |
| P4KE16A | 16 | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 19 | 22.5 | 0.086 |
| P4KE18 | 18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 16 | 26.5 | 0.088 |
| P4KE18A | 18 | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 17 | 25.2 | 0.088 |
| P4KE20 | 20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 14 | 29.1 | 0.090 |
| P4KE20A | 20 | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 15 | 27.7 | 0.090 |
| P4KE22 | 22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 13 | 31.9 | 0.092 |
| P4KE22A | 22 | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 14 | 30.6 | 0.092 |
| P4KE24 | 24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 12 | 34.7 | 0.094 |
| P4KE24A | 24 | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 13 | 33.2 | 0.094 |
| P4KE27 | 27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 11 | 39.1 | 0.096 |
| P4KE27A | 27 | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 11.2 | 37.5 | 0.096 |
| P4KE30 | 30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 10 | 43.5 | 0.097 |
| P4KE30A | 30 | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 10 | 41.4 | 0.097 |
| P4KE33 | 33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 9 | 47.7 | 0.098 |
| P4KE33A | 33 | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 9 | 45.7 | 0.098 |
| P4KE36 | 36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 8 | 52.0 | 0.099 |
| P4KE36A | 36 | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.4 | 49.9 | 0.099 |
| P4KE39 | 39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.4 | 56.4 | 0.100 |
| P4KE39A | 39 | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.8 | 53.9 | 0.100 |
| P4KE43 | 43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.8 | 61.9 | 0.101 |
| P4KE43A | 43 | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 7.1 | 59.3 | 0.101 |
| P4KE47 | 47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 6.2 | 67.8 | 0.101 |
| P4KE47A | 47 | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.4 | 64.8 | 0.101 |

| Device | Nominal Voltage (Volts) | Breakdown Voltage | | @ I _T (mA) | stand - off Voltage V _{WM} (Volts) | Maximum Reverse Leakage @ V _{WM} I _D (μA) (NOTE 3) | Maximum Reverse Surge Current I _{PPM} (NOTE 2) (Amps) | Maximum Reverse Voltage @ I _{PPM} (Clamping Voltage) V _C (Volts) | Maximum Temperature Coefficient of V _(BR) (%/°C) |
|----------|-------------------------|------------------------------------|-------|-----------------------|---------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------|
| | | V _(BR) (Volts) (Note 1) | | | | | | | |
| | | Min | Max | | | | | | |
| P4KE51 | 51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.7 | 73.5 | 0.102 |
| P4KE51A | 51 | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 6.0 | 70.1 | 0.102 |
| P4KE56 | 56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.2 | 80.5 | 0.103 |
| P4KE56A | 56 | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.4 | 77.0 | 0.103 |
| P4KE62 | 62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.7 | 89.0 | 0.104 |
| P4KE62A | 62 | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 5.0 | 85.0 | 0.104 |
| P4KE68 | 68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.2 | 96.0 | 0.104 |
| P4KE68A | 68 | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.5 | 92.0 | 0.104 |
| P4KE75 | 75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.8 | 108.0 | 0.105 |
| 5P4KE75A | 75 | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 4.0 | 103.0 | 0.105 |
| P4KE82 | 82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.5 | 118.0 | 0.105 |
| P4KE82A | 82 | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.7 | 113.0 | 0.105 |
| P4KE91 | 91 | 81.9 | 100.0 | 1.0 | 73.7 | 5.0 | 3.2 | 131.8 | 0.106 |
| P4KE91A | 91 | 86.5 | 95.50 | 1.0 | 77.8 | 5.0 | 3.3 | 125.0 | 0.106 |
| P4KE100 | 100 | 90.0 | 110.0 | 1.0 | 81.0 | 5.0 | 2.9 | 144.0 | 0.106 |
| P4KE100A | 100 | 95.0 | 105.0 | 1.0 | 85.5 | 5.0 | 3.0 | 137.0 | 0.106 |
| P4KE110 | 110 | 99.0 | 121.0 | 1.0 | 89.2 | 5.0 | 2.6 | 158.0 | 0.107 |
| P4KE110A | 110 | 105.0 | 116.0 | 1.0 | 94.0 | 5.0 | 2.7 | 152.0 | 0.107 |
| P4KE120 | 120 | 108.0 | 132.0 | 1.0 | 97.2 | 5.0 | 2.4 | 173.0 | 0.107 |
| P4KE120A | 120 | 114.0 | 126.0 | 1.0 | 102.0 | 5.0 | 2.5 | 165.0 | 0.107 |
| P4KE130 | 130 | 117.0 | 143.0 | 1.0 | 105.0 | 5.0 | 2.2 | 187.0 | 0.107 |
| P4KE130A | 130 | 124.0 | 137.0 | 1.0 | 111.0 | 5.0 | 2.3 | 179.0 | 0.107 |
| P4KE150 | 150 | 135.0 | 165.0 | 1.0 | 121.0 | 5.0 | 1.9 | 215.0 | 0.108 |
| P4KE150A | 150 | 143.0 | 158.0 | 1.0 | 128.0 | 5.0 | 2.0 | 207.0 | 0.108 |
| P4KE160 | 160 | 144.0 | 176.0 | 1.0 | 130.0 | 5.0 | 1.8 | 230.0 | 0.108 |
| P4KE160A | 160 | 152.0 | 168.0 | 1.0 | 136.0 | 5.0 | 1.9 | 219.0 | 0.108 |
| P4KE170 | 170 | 153.0 | 187.0 | 1.0 | 138.0 | 5.0 | 1.7 | 244.0 | 0.108 |
| P4KE170A | 170 | 162.0 | 179.0 | 1.0 | 145.0 | 5.0 | 1.8 | 234.0 | 0.108 |
| P4KE180 | 180 | 162.0 | 198.0 | 1.0 | 146.0 | 5.0 | 1.6 | 258.0 | 0.108 |
| P4KE180A | 180 | 171.0 | 189.0 | 1.0 | 154.0 | 5.0 | 1.7 | 246.0 | 0.108 |
| P4KE200 | 200 | 180.0 | 220.0 | 1.0 | 162.0 | 5.0 | 1.4 | 287.0 | 0.108 |
| P4KE200A | 200 | 190.0 | 210.0 | 1.0 | 171.0 | 5.0 | 1.51 | 274.0 | 0.108 |
| P4KE220 | 220 | 198.0 | 242.0 | 1.0 | 175.0 | 5.0 | 1.2 | 344.0 | 0.108 |
| P4KE220A | 220 | 209.0 | 231.0 | 1.0 | 185.0 | 5.0 | 1.3 | 328.0 | 0.108 |
| P4KE250 | 250 | 225.0 | 275.0 | 1.0 | 202.0 | 5.0 | 1.1 | 360.0 | 0.110 |
| P4KE250A | 250 | 237.0 | 263.0 | 1.0 | 214.0 | 5.0 | 1.2 | 344.0 | 0.110 |
| P4KE300 | 300 | 270.0 | 330.3 | 1.0 | 243.0 | 5.0 | 0.97 | 430.0 | 0.110 |
| P4KE300A | 300 | 285.0 | 315.0 | 1.0 | 256.0 | 5.0 | 1.0 | 414.0 | 0.110 |
| P4KE350 | 350 | 315.0 | 385.0 | 1.0 | 284.0 | 5.0 | 0.83 | 504.0 | 0.110 |
| P4KE350A | 350 | 332.0 | 368.0 | 1.0 | 300.0 | 5.0 | 0.87 | 482.0 | 0.110 |
| P4KE400 | 400 | 360.0 | 440.0 | 1.0 | 324.0 | 5.0 | 0.73 | 574.0 | 0.110 |
| P4KE400A | 400 | 380.0 | 420.0 | 1.0 | 342.0 | 5.0 | 0.76 | 548.0 | 0.110 |

NOTES:

1. V_(BR) Measured after I_T applied for 300us. I_T = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derate per Figure 2.
3. For Bipolar types having V_{WM} of 10 volts and less, the I_D limit is doubled.