



Certificate Number: Q10561

Certificate Number: E17276

P4KE SERIES

V_{BR} : 6.8 - 440 Volts
P_{PK} : 400 Watts

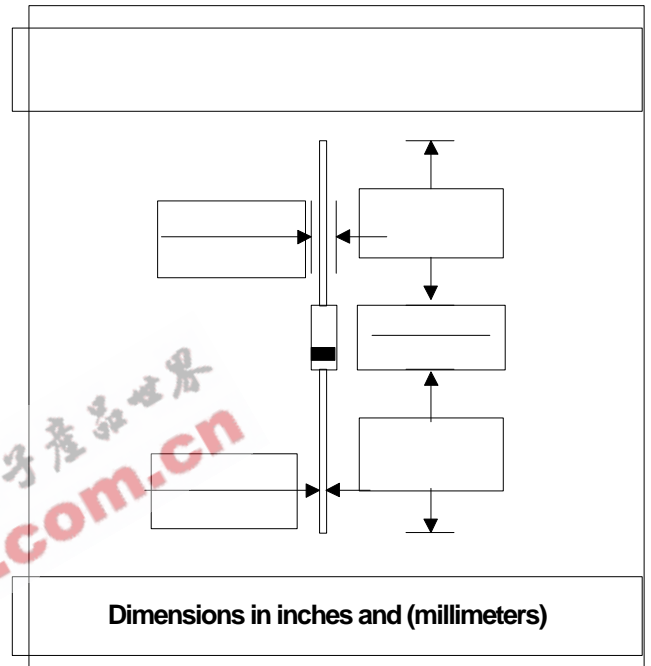
FEATURES :

- * 400W surge capability at 1ms
- * Excellent clamping capability
- * Low zener impedance
- * Fast response time : typically less than 1.0 ps from 0 volt to V_{BR(min.)}
- * Typical I_R less than 1 A above 10V

MECHANICAL DATA

- * Case : DO-41 Molded plastic
- * Epoxy : UL94V-O rate flame retardant
- * Lead : Axial lead solderable per MIL-STD-202, method 208 guaranteed
- * Polarity : Color band denotes cathode end except Bipolar.
- * Mounting position : Any
- * Weight : 0.339 gram

TRANSIENT VOLTAGE SUPPRESSOR



DEVICES FOR BIPOLAR APPLICATIONS

For bi-directional use C or CA Suffix
Electrical characteristics apply in both directions

MAXIMUM RATINGS

| | | | |
|---|-----------------------------------|---------------|-------|
| Peak Power Dissipation at T _a = 25 °C, T _p =1ms (Note1) | P _{PK} | Minimum 400 | Watts |
| Steady State Power Dissipation at T _L = 75 °C Lead Lengths 0.375", (9.5mm) (Note2) | P _D | 1.0 | Watt |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note3) | I _{FSM} | 40 | Amps. |
| Operating and Storage Temperature Range | T _J , T _{STG} | - 65 to + 175 | °C |

Note :



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ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE | Breakdown Voltage @ It (Note 1) | | Working Peak Reverse Voltage VRWM | Maximum Reverse Leakage @ VRWM IR (A) | Maximum Reverse Current IRSM (A) | Maximum Clamping Voltage @ IRSM VRSM (V) | Maximum Temperature Co-efficient of VBR (% / °C) | |
|----------|--------------------------------------|------|--|---|--|--|--|------------|
| | VBR (V) | | | | | | | It (mA) |
| | Min. | Max. | (V) | | | | | |
| P4KE6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 38.0 | 10.8 | 0.057 |
| P4KE6.8A | 6.45 | 7.14 | 10 | 5.80 | 1000 | 40.0 | 10.5 | 0.057 |
| P4KE7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 36.0 | 11.7 | 0.061 |
| P4KE7.5A | 7.13 | 7.88 | 10 | 6.40 | 500 | 37.0 | 11.3 | 0.061 |
| P4KE8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 33.0 | 12.5 | 0.065 |
| P4KE8.2A | 7.79 | 8.61 | 10 | 7.02 | 200 | 35.0 | 12.1 | 0.065 |
| P4KE9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 30.0 | 13.8 | 0.068 |
| P4KE9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 31.0 | 13.4 | 0.068 |
| P4KE10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 28.0 | 15.0 | 0.073 |
| P4KE10A | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 29.0 | 14.5 | 0.073 |
| P4KE11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 26.0 | 16.2 | 0.075 |
| P4KE11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 27.0 | 15.6 | 0.075 |
| P4KE12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 24.0 | 17.3 | 0.078 |
| P4KE12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 25.0 | 16.7 | 0.078 |
| P4KE13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 22.0 | 19.0 | 0.081 |
| P4KE13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 23.0 | 18.2 | 0.081 |
| P4KE15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 19.0 | 22.0 | 0.084 |
| P4KE15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 20.0 | 21.2 | 0.084 |
| P4KE16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 18.0 | 23.5 | 0.086 |
| P4KE16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 19.0 | 22.5 | 0.086 |
| P4KE17 | 15.3 | 18.7 | 1.0 | 13.7 | 5.0 | 17.0 | 25.0 | 0.087 |
| P4KE17A | 16.2 | 17.9 | 1.0 | 14.5 | 5.0 | 18.0 | 24.0 | 0.087 |
| P4KE18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 16.0 | 26.5 | 0.088 |
| P4KE18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 17.0 | 25.5 | 0.088 |
| P4KE20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 14.0 | 29.1 | 0.090 |
| P4KE20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 15.0 | 27.7 | 0.090 |
| P4KE22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 13.0 | 31.9 | 0.092 |
| P4KE22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 14.0 | 30.6 | 0.092 |
| P4KE24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 12.0 | 34.7 | 0.094 |
| P4KE24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 13.0 | 33.2 | 0.094 |
| P4KE27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 11.0 | 39.1 | 0.096 |
| P4KE27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 11.2 | 37.5 | 0.096 |
| P4KE30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 10.0 | 43.5 | 0.097 |
| P4KE30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 10.0 | 41.4 | 0.097 |
| P4KE33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 9.0 | 47.7 | 0.098 |
| P4KE33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 9.0 | 45.7 | 0.098 |
| P4KE36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 8.0 | 52.0 | 0.099 |
| P4KE36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.4 | 49.9 | 0.099 |
| P4KE39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.4 | 56.4 | 0.100 |
| P4KE39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.8 | 53.9 | 0.100 |
| P4KE43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.8 | 61.9 | 0.101 |
| P4KE43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 7.1 | 59.3 | 0.101 |
| P4KE47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 6.2 | 67.8 | 0.101 |
| P4KE47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.5 | 64.8 | 0.101 |
| P4KE51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.7 | 73.5 | 0.102 |
| P4KE51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 6.0 | 70.1 | 0.102 |
| P4KE56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.2 | 80.5 | 0.103 |
| P4KE56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.5 | 77.0 | 0.103 |



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ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE | Breakdown Voltage @ I_t (Note 1) | | I_t | Working Peak Reverse Voltage V_{RWM} | Maximum Reverse Leakage @ V_{RWM} I_R (A) | Maximum Reverse Current I_{RSM} (A) | Maximum Clamping Voltage @ I_{RSM} V_{RSM} (V) | Maximum Temperature Co-efficient of V_{BR} (% / °C) |
|----------|---|------|-------|---|---|---|--|---|
| | V_{BR} (V) | | | | | | | |
| | Min. | Max. | (mA) | (V) | (A) | (A) | (V) | (% / °C) |
| P4KE62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 4.7 | 89.0 | 0.104 |
| P4KE62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 5.0 | 85.0 | 0.104 |
| P4KE68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.3 | 98.0 | 0.104 |
| P4KE68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.6 | 92.0 | 0.104 |
| P4KE75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.9 | 108 | 0.105 |
| P4KE75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 4.1 | 103 | 0.105 |
| P4KE82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.6 | 118 | 0.105 |
| P4KE82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.7 | 113 | 0.105 |
| P4KE91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 3.2 | 131 | 0.106 |
| P4KE91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.4 | 125 | 0.106 |
| P4KE100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 2.9 | 144 | 0.106 |
| P4KE100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 3.1 | 137 | 0.106 |
| P4KE110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 2.7 | 158 | 0.107 |
| P4KE110A | 105 | 116 | 1.0 | 94.0 | 5.0 | 2.8 | 152 | 0.107 |
| P4KE120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 2.4 | 173 | 0.107 |
| P4KE120A | 114 | 126 | 1.0 | 102 | 5.0 | 2.5 | 165 | 0.107 |
| P4KE130 | 117 | 143 | 1.0 | 105 | 5.0 | 2.2 | 187 | 0.107 |
| P4KE130A | 124 | 137 | 1.0 | 111 | 5.0 | 2.3 | 179 | 0.107 |
| P4KE150 | 135 | 165 | 1.0 | 121 | 5.0 | 2.0 | 215 | 0.108 |
| P4KE150A | 143 | 158 | 1.0 | 128 | 5.0 | 2.0 | 207 | 0.108 |
| P4KE160 | 144 | 176 | 1.0 | 130 | 5.0 | 1.8 | 230 | 0.108 |
| P4KE160A | 152 | 168 | 1.0 | 136 | 5.0 | 1.9 | 219 | 0.108 |
| P4KE170 | 153 | 187 | 1.0 | 138 | 5.0 | 1.7 | 244 | 0.108 |
| P4KE170A | 162 | 179 | 1.0 | 145 | 5.0 | 1.8 | 234 | 0.108 |
| P4KE180 | 162 | 198 | 1.0 | 146 | 5.0 | 1.6 | 258 | 0.108 |
| P4KE180A | 171 | 189 | 1.0 | 154 | 5.0 | 1.7 | 246 | 0.108 |
| P4KE200 | 180 | 220 | 1.0 | 162 | 5.0 | 1.5 | 287 | 0.108 |
| P4KE200A | 190 | 210 | 1.0 | 171 | 5.0 | 1.53 | 274 | 0.108 |
| P4KE220 | 198 | 242 | 1.0 | 175 | 5.0 | 1.16 | 344 | 0.108 |
| P4KE220A | 209 | 231 | 1.0 | 185 | 5.0 | 1.22 | 328 | 0.108 |
| P4KE250 | 225 | 275 | 1.0 | 202 | 5.0 | 1.11 | 360 | 0.110 |
| P4KE250A | 237 | 263 | 1.0 | 214 | 5.0 | 1.16 | 344 | 0.110 |
| P4KE300 | 270 | 330 | 1.0 | 243 | 5.0 | 0.93 | 430 | 0.110 |
| P4KE300A | 285 | 315 | 1.0 | 256 | 5.0 | 0.97 | 414 | 0.110 |
| P4KE350 | 315 | 385 | 1.0 | 284 | 5.0 | 0.79 | 504 | 0.110 |
| P4KE350A | 332 | 368 | 1.0 | 300 | 5.0 | 0.83 | 482 | 0.110 |
| P4KE400 | 360 | 440 | 1.0 | 324 | 5.0 | 0.70 | 574 | 0.110 |
| P4KE400A | 380 | 420 | 1.0 | 342 | 5.0 | 0.73 | 548 | 0.110 |
| P4KE440 | 396 | 484 | 1.0 | 356 | 5.0 | 0.95 | 631 | 0.110 |
| P4KE440A | 418 | 462 | 1.0 | 376 | 5.0 | 1.00 | 602 | 0.110 |

- (1) V_{BR} measured after I_t applied for 300 s., I_t = square wave pulse or equivalent.
- (2) $V_F = 3.5 V_{max.}$, $I_F = 25$ Amps. (6.8 Volts thru 91 Volts)
 $V_F = 5.0 V_{max.}$, $I_F = 25$ Amps. (100 Volts thru 440 Volts) per 1/2 square or equivalent sine wave.
 $PW = 8.3$ ms, duty cycle = 4 pulses per minute maximum.
- (3) For Bipolar types having V_R of 10 Volts and under, the I_R limit is doubled.

RATING AND CHARACTERISTIC CURVES (P4KE SERIES)

FIG.1 - PULSE DERATING CURVE

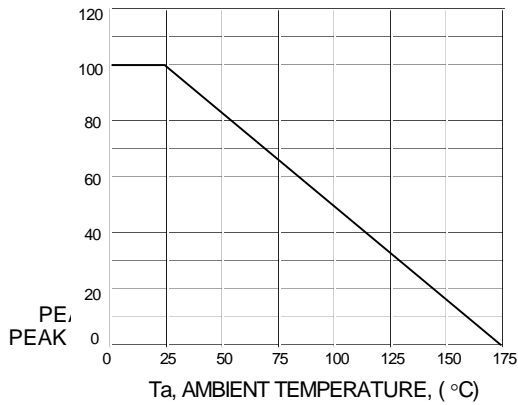


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

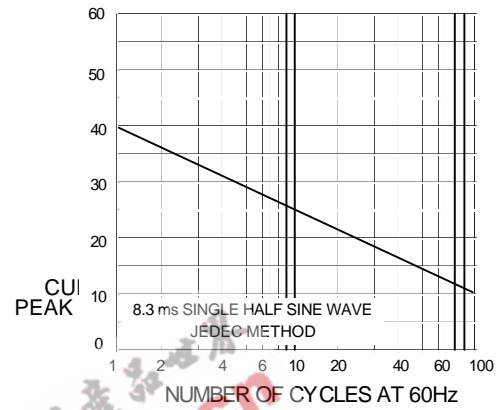


FIG.3 - STEADY STATE POWER DERATING

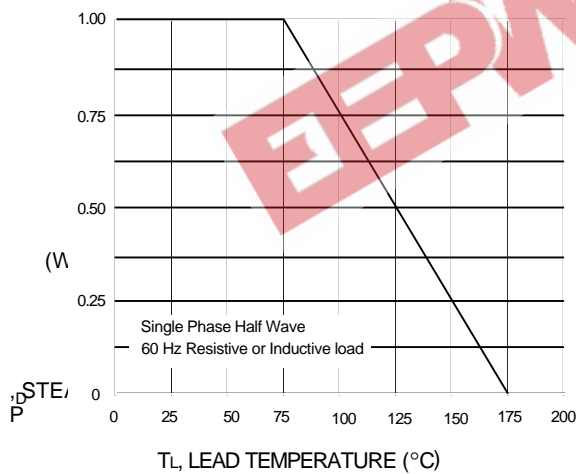


FIG.4 - PULSE RATING CURVE

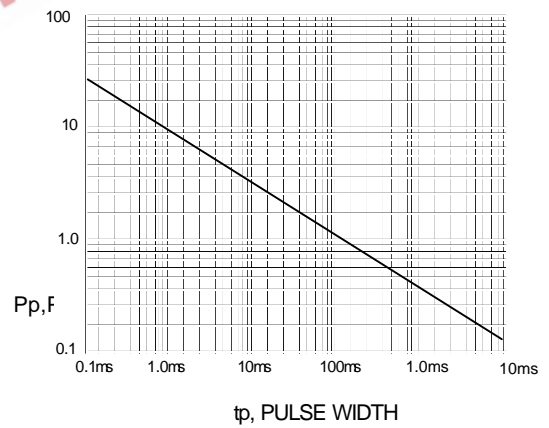


FIG.5 - PULSE WAVEFORM

