



P4KE6.8 THRU P4KE440CA

TRANSIENT VOLTAGE SUPPRESSOR

BREAKDOWN VOLTAGE: 6.8-440V

PEAK PULSE POWER: 400W

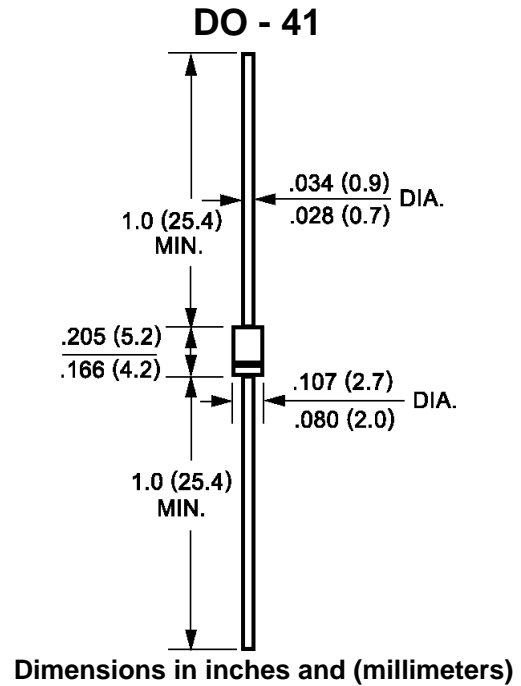
TECHNICAL
SPECIFICATION

FEATURES

- 400W peak pulse power capability
- Excellent clamping capability
- Low incremental surge resistance
- Fast response time:
typically less than 1.0ps from 0V to V_{BR}
for unidirectional and 5.0nS for bidirectional types.
- High temperature soldering guaranteed:
265°C/10S/9.5mm lead length at 5 lbs tension

MECHANICAL DATA

- Terminal: Plated axial leads solderable per MIL-STD 202E, method 208C
- Case: Molded with UL-94 Class V-O recognized flame retardant epoxy
- Polarity: Color band denotes cathode except for unidirectional types.
- Mounting position: Any



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

(Ratings at 25°C ambient temperature unless otherwise specified)

| RATINGS | SYMBOL | VALUE | UNITS |
|---|-----------------------------------|--------------|-------|
| Peak power dissipation (Note 1) | P _{ppm} | Minimum 400 | W |
| Peak pulse reverse current (Note 1) | I _{ppm} | See Table | A |
| Steady state power dissipation (Note 2) | P _{m(av)} | 1.0 | W |
| Peak forward surge current (Note 3) | I _{FSM} | 40 | A |
| Maximum instantaneous forward voltage at 50A for unidirectional only (Note 4) | V _F | 3.5/6.5 | V |
| Operating junction and storage temperature range | T _{STG} , T _J | -55 to + 175 | °C |

Notes:

1. 10/1000μS waveform non-repetitive current pulse, and derated above T_a=25°C
2. T_I=75°C, lead length 9.5mm, Mounted on copper pad area of (40x40mm)
3. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
4. V_F=3.5V max. for devices of V_(BR) ≤ 200V, and V_F=5.0V max. for devices of V_(BR) >200V

DEVICES FOR BIDIRECTIONAL APPLICATIONS

1. Suffix 'A' denotes 5% tolerance device, no suffix 'A' denotes 10% tolerance device.
2. For bidirectional use 'C' or 'CA' suffix for types P4KE7.5 thru types P4KE440A (e.g. P4KE7.5C, P4KE440CA), for unidirectional don't use 'C' suffix after types.
3. For bidirectional devices having V_{WM} of 10 volts and less, the I_D limit is doubled.
4. Electrical characteristics apply in both directions.

ELECTRICAL CHARACTERISTICS

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

| Device Type | Breakdown Voltage $V_{(BR)}$ (Volts) (NOTE 1) | | Test Current I_T (mA) | Stand-off Voltage V_{WM} (Volts) | Maximum Reverse Leakage at $V_{WM} I_D$ (μA) (NOTE 3) | Maximum Peak Pulse Reverse Current I_{ppm} (Amps) (NOTE 2) | Maximum Clamping Voltage at $I_{ppm} V_C$ (Volts) | Maximum Temperature Coefficient of $V_{(BR)}$ ($\%/^{\circ}\text{C}$) |
|-------------|---|------|-------------------------|------------------------------------|--|--|---|---|
| | MIN | MAX | | | | | | |
| *P4KE6.8 | 6.12 | 7.48 | 10.0 | 5.50 | 1000.0 | 38.0 | 10.8 | 0.057 |
| *P4KE6.8A | 6.45 | 7.14 | 10.0 | 5.80 | 1000.0 | 40.0 | 10.5 | 0.057 |
| P4KE7.5 | 6.75 | 8.25 | 10.0 | 6.05 | 500.0 | 36.0 | 11.7 | 0.061 |
| P4KE7.5A | 7.13 | 7.88 | 10.0 | 6.40 | 500.0 | 37.0 | 11.3 | 0.061 |
| P4KE8.2 | 7.38 | 9.02 | 10.0 | 6.63 | 200.0 | 33.0 | 12.5 | 0.065 |
| P4KE8.2A | 7.79 | 8.61 | 10.0 | 7.02 | 200.0 | 35.0 | 12.1 | 0.065 |
| P4KE9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50.0 | 30.0 | 13.8 | 0.068 |
| P4KE9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50.0 | 31.0 | 13.4 | 0.068 |
| P4KE10 | 9.00 | 11.0 | 1.0 | 8.10 | 10.0 | 28.0 | 15.0 | 0.073 |
| P4KE10A | 9.50 | 10.5 | 1.0 | 8.55 | 10.0 | 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 |
| 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 | 25.2 | 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 | 5.0 | 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 |

* Not available as bidirectional devices

ELECTRICAL CHARACTERISTICS

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

| Device Type | Breakdown Voltage $V_{(BR)}$ (Volts) (NOTE 1) | | Test Current I_T (mA) | Stand-off Voltage V_{WM} (Volts) | Maximum Reverse Leakage at V_{WM} I_D (μA) (NOTE 3) | Maximum Peak Pulse Reverse Current I_{ppm} (Amps) (NOTE 2) | Maximum Clamping Voltage at I_{ppm} V_C (Volts) | Maximum Temperature Coefficient of $V_{(BR)}$ ($\%/^{\circ}\text{C}$) |
|-------------|---|------|-------------------------|------------------------------------|--|--|---|---|
| | MIN | MAX | | | | | | |
| 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 | 0.105 |
| P4KE75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 4.1 | 103.0 | 0.105 |
| P4KE82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.6 | 118.0 | 0.105 |
| P4KE82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.7 | 113.0 | 0.105 |
| P4KE91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 3.2 | 131.0 | 0.106 |
| P4KE91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.4 | 125.0 | 0.106 |
| P4KE100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 2.9 | 144.0 | 0.106 |
| P4KE100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 3.1 | 137.0 | 0.106 |
| P4KE110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 2.7 | 158.0 | 0.107 |
| P4KE110A | 105 | 116 | 1.0 | 94.0 | 5.0 | 2.8 | 152.0 | 0.107 |
| P4KE120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 2.4 | 173.0 | 0.107 |
| P4KE120A | 114 | 126 | 1.0 | 102 | 5.0 | 2.5 | 165.0 | 0.107 |
| P4KE130 | 117 | 143 | 1.0 | 105 | 5.0 | 2.2 | 187.0 | 0.107 |
| P4KE130A | 124 | 137 | 1.0 | 111 | 5.0 | 2.3 | 179.0 | 0.107 |
| P4KE150 | 135 | 165 | 1.0 | 121 | 5.0 | 2.0 | 215.0 | 0.108 |
| P4KE150A | 143 | 158 | 1.0 | 128 | 5.0 | 2.0 | 207.0 | 0.108 |
| P4KE160 | 144 | 176 | 1.0 | 130 | 5.0 | 1.8 | 230.0 | 0.108 |
| P4KE160A | 152 | 168 | 1.0 | 136 | 5.0 | 1.9 | 219.0 | 0.108 |
| P4KE170 | 153 | 187 | 1.0 | 138 | 5.0 | 1.7 | 244.0 | 0.108 |
| P4KE170A | 162 | 179 | 1.0 | 145 | 5.0 | 1.8 | 234.0 | 0.108 |
| P4KE180 | 162 | 198 | 1.0 | 146 | 5.0 | 1.6 | 258.0 | 0.108 |
| P4KE180A | 171 | 189 | 1.0 | 154 | 5.0 | 1.7 | 246.0 | 0.108 |
| P4KE200 | 180 | 220 | 1.0 | 162 | 5.0 | 1.5 | 287.0 | 0.108 |
| P4KE200A | 190 | 210 | 1.0 | 171 | 5.0 | 1.53 | 274.0 | 0.108 |
| P4KE220 | 198 | 242 | 1.0 | 175 | 5.0 | 1.16 | 344.0 | 0.108 |
| P4KE220A | 209 | 231 | 1.0 | 185 | 5.0 | 1.22 | 328.0 | 0.108 |
| P4KE250 | 225 | 275 | 1.0 | 202 | 5.0 | 1.11 | 360.0 | 0.110 |
| P4KE250A | 237 | 263 | 1.0 | 214 | 5.0 | 1.16 | 344.0 | 0.110 |
| P4KE300 | 270 | 330 | 1.0 | 243 | 5.0 | 0.93 | 430.0 | 0.110 |
| P4KE300A | 285 | 315 | 1.0 | 256 | 5.0 | 0.97 | 414.0 | 0.110 |
| P4KE350 | 315 | 385 | 1.0 | 284 | 5.0 | 0.79 | 504.0 | 0.110 |
| P4KE350A | 332 | 368 | 1.0 | 300 | 5.0 | 0.83 | 482.0 | 0.110 |
| P4KE400 | 360 | 440 | 1.0 | 324 | 5.0 | 0.70 | 574.0 | 0.110 |
| P4KE400A | 380 | 420 | 1.0 | 342 | 5.0 | 0.73 | 548.0 | 0.110 |
| P4KE440 | 396 | 484 | 1.0 | 356 | 5.0 | 0.66 | 631.0 | 0.110 |
| P4KE440A | 418 | 462 | 1.0 | 376 | 5.0 | 0.69 | 602.0 | 0.110 |

NOTES:

1. $V_{(BR)}$ measured after I_T applied for 300 μs , I_T =square wave pulse or equivalent
2. Surge current waveform and derated
3. For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled