

TRANSIENT VOLTAGE SUPPRESSOR

BREAKDOWN VOLTAGE: 6.8 — 440 V
PEAK PULSE POWER: 400 W

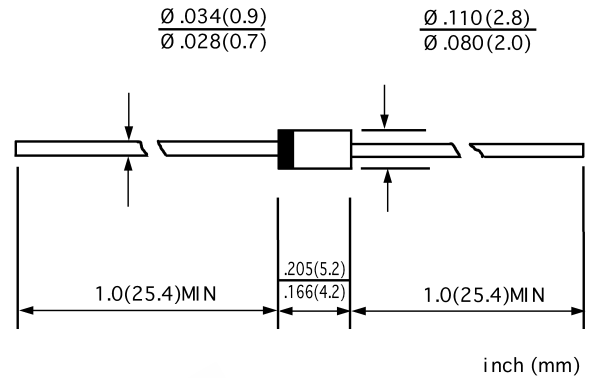
FEATURES

- ◇ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◇ Glass passivated junction
- ◇ 400W peak pulse power capability with a 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- ◇ Excellent clamping capability
- ◇ Fast response time: typically less than 1.0ps from 0 Volts to $V_{(BR)}$ for uni-directional and 5.0ns for bi-directional types
- ◇ Devices with $V_{(BR)} \geq 10V_{ID}$ are typically I_D less than 1.0 μ A
- ◇ High temperature soldering guaranteed: 265 $^{\circ}$ C / 10 seconds, 0.375"(9.5mm) lead length, 5 lbs. (2.3kg) tension

MECHANICAL DATA

- ◇ Case: JEDEC DO-41, molded plastic body over passivated junction
- ◇ Terminals: Axial leads, solderable per MIL-STD-750, method 2026
- ◇ Polarity: For uni-directional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- ◇ Weight: 0.012 ounces, 0.34 grams
- ◇ Mounting position: Any

DO - 41



DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bi-directional use C or CA suffix for types P4KE 7.5 thru types P4KE 440 (e.g. P4KE 7.5CA, P4KE 440CA).
 Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

| | SYMBOL | VALUE | UNIT |
|---|----------------|-------------|--------------|
| Peak Power Dissipation with a 10/1000 μ s waveform (NOTE 1, FIG. 1) | P_{PPM} | Minimum 400 | W |
| Peak Pulse Current with a 10/1000 μ s waveform (NOTE 1) | I_{PPM} | See table 1 | A |
| Steady State Power Dissipation at $T_L=75^{\circ}$ C Lead Lengths 0.375"(9.5mm) (NOTE 2) | $P_{M(AV)}$ | 1.0 | W |
| Peak Forward Surge Current, 8.3ms Single half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3) | I_{FSM} | 40.0 | A |
| Maximum Instantaneous Forward Voltage at 25A for unidirectional only (NOTE 4) | V_F | 3.5/5.0 | V |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -50—+175 | $^{\circ}$ C |

NOTES: (1) Non-repetitive current pulses, per Fig. 3 and derated above $T_A=25^{\circ}$ C per Fig. 2

(2) Mounted on copper pad area of 1.6" x 1.6" (40 x 40mm 2) per Fig. 5

(3) Measured of 8.3ms single half sine-wave or square wave, duty cycle=4 pulses per minute maximum

(4) $V_F=3.5$ Volt max. for devices of $V_{(BR)} \leq 220V$, and $V_F=5.0$ Volt max. for devices of $V_{(BR)} > 220V$

www.galaxycn.com

ELECTRICAL CHARACTERISTICS at(T_A=25 °C unless otherwise noted)

TABLE 1

| Device type | Breakdown voltage V _(BR) (V)(NOTE1) | | Test current at I _T (mA) | Stand-off voltage V _{WM} (V) | Maximum reverse leakage at V _{WM} I _D (NOTE3)(μA) | Maximum peak pulse I _{PPM} (NOTE2) (A) | Maximum clamping voltage at I _{PPM} V _C (V) | Maximum temperature coefficient of V _(BR) (%/°C) |
|-------------|--|------|-------------------------------------|---------------------------------------|---|---|---|---|
| | Min | Max | | | | | | |
| P4KE 6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 37.0 | 10.8 | 0.057 |
| P4KE 6.8A | 6.45 | 7.14 | 10 | 5.80 | 1000 | 38.1 | 10.5 | 0.057 |
| P4KE 7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 34.2 | 11.7 | 0.061 |
| P4KE 7.5A | 7.13 | 7.88 | 10 | 6.40 | 500 | 35.4 | 11.3 | 0.061 |
| P4KE 8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 32.0 | 12.5 | 0.065 |
| P4KE 8.2A | 7.79 | 8.61 | 10 | 7.02 | 200 | 33.1 | 12.1 | 0.065 |
| P4KE 9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 29.0 | 13.8 | 0.068 |
| P4KE 9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 29.9 | 13.4 | 0.068 |
| P4KE 10 | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 26.7 | 15.0 | 0.073 |
| P4KE 10A | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 27.6 | 14.5 | 0.073 |
| P4KE 11 | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 24.7 | 16.2 | 0.075 |
| P4KE 11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 25.6 | 15.6 | 0.075 |
| P4KE 12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 23.1 | 17.3 | 0.076 |
| P4KE 12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 24.0 | 16.7 | 0.078 |
| P4KE 13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 21.1 | 19.0 | 0.081 |
| P4KE 13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 22.0 | 18.2 | 0.081 |
| P4KE 15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 18.2 | 22.0 | 0.084 |
| P4KE 15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 18.9 | 21.2 | 0.084 |
| P4KE 16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 17.0 | 23.5 | 0.086 |
| P4KE 16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 17.8 | 22.5 | 0.086 |
| P4KE 18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 15.1 | 26.5 | 0.088 |
| P4KE 18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 15.9 | 25.2 | 0.088 |
| P4KE 20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 13.7 | 29.1 | 0.090 |
| P4KE 20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 14.4 | 27.7 | 0.090 |
| P4KE 22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 12.5 | 31.9 | 0.092 |
| P4KE 22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 13.1 | 30.6 | 0.092 |
| P4KE 24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 11.5 | 34.7 | 0.094 |
| P4KE 24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 12.0 | 33.2 | 0.094 |
| P4KE 27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 10.2 | 39.1 | 0.096 |
| P4KE 27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 10.7 | 37.5 | 0.096 |
| P4KE 30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 9.2 | 43.5 | 0.097 |
| P4KE 30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 9.7 | 41.4 | 0.097 |
| P4KE 33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 8.4 | 47.7 | 0.098 |
| P4KE 33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 8.8 | 45.7 | 0.098 |
| P4KE 36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 7.7 | 52.0 | 0.099 |
| P4KE 36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 8.0 | 49.9 | 0.099 |
| P4KE 39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 7.1 | 56.4 | 0.100 |
| P4KE 39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 7.4 | 53.9 | 0.100 |
| P4KE 43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 6.5 | 61.9 | 0.101 |
| P4KE 43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 6.7 | 59.3 | 0.101 |
| P4KE 47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 5.9 | 67.8 | 0.101 |
| P4KE 47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 6.2 | 64.8 | 0.101 |
| P4KE 51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 5.4 | 73.5 | 0.102 |
| P4KE 51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 5.7 | 70.1 | 0.102 |
| P4KE 56 | 50.4 | 61.6 | 1.0 | 45.4 | 5.0 | 5.0 | 80.5 | 0.103 |
| P4KE 56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 5.2 | 77.0 | 0.103 |

www.galaxycn.com

ELECTRICAL CHARACTERISTICS at(T_A=25 °C unless otherwise noted)

TABLE 1(Cont' d)

| Device type | Breakdown voltage V _(BR) (V) _(NOTE1) | | Test current at I _r (mA) | Stand-off voltage V _{WM} (V) | Maximum reverse leakage at V _{WM} I _D (NOTE3)(μA) | Maximum peak pulse I _{PPM} (NOTE2) (A) | Maximum damping voltage at I _{PPM} V _C (V) | Maximum temperature coefficient of V _(BR) (%/°C) |
|-------------|--|------|-------------------------------------|---------------------------------------|---|---|--|---|
| | Min | Max | | | | | | |
| P4KE 62 | 55.8 | 68.8 | 1.0 | 50.2 | 5.0 | 4.5 | 89.0 | 0.104 |
| P4KE 62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 4.7 | 85.0 | 0.104 |
| P4KE 68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 4.1 | 98.0 | 0.104 |
| P4KE 68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 4.3 | 92.0 | 0.104 |
| P4KE 75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 3.7 | 108 | 0.105 |
| P4KE 75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 3.9 | 103 | 0.105 |
| P4KE 82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 3.4 | 118 | 0.105 |
| P4KE 82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 3.5 | 113 | 0.105 |
| P4KE 91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 3.1 | 131 | 0.106 |
| P4KE 91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 3.2 | 125 | 0.106 |
| P4KE 100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 2.8 | 144 | 0.106 |
| P4KE 100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 2.9 | 137 | 0.106 |
| P4KE 110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 2.5 | 158 | 0.107 |
| P4KE 110A | 105 | 116 | 1.0 | 94.0 | 5.0 | 2.6 | 152 | 0.107 |
| P4KE 120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 2.3 | 173 | 0.107 |
| P4KE 120A | 114 | 126 | 1.0 | 102 | 5.0 | 2.4 | 165 | 0.107 |
| P4KE 130 | 117 | 143 | 1.0 | 105 | 5.0 | 2.1 | 187 | 0.107 |
| P4KE 130A | 124 | 137 | 1.0 | 111 | 5.0 | 2.2 | 179 | 0.107 |
| P4KE 150 | 135 | 165 | 1.0 | 121 | 5.0 | 1.9 | 215 | 0.108 |
| P4KE 150A | 143 | 158 | 1.0 | 128 | 5.0 | 1.9 | 207 | 0.108 |
| P4KE 160 | 144 | 176 | 1.0 | 130 | 5.0 | 1.7 | 230 | 0.108 |
| P4KE 160A | 152 | 168 | 1.0 | 136 | 5.0 | 1.8 | 219 | 0.108 |
| P4KE 170 | 153 | 187 | 1.0 | 138 | 5.0 | 1.6 | 244 | 0.108 |
| P4KE 170A | 162 | 179 | 1.0 | 145 | 5.0 | 1.7 | 234 | 0.108 |
| P4KE 180 | 162 | 198 | 1.0 | 146 | 5.0 | 1.6 | 258 | 0.108 |
| P4KE 180A | 171 | 189 | 1.0 | 154 | 5.0 | 1.6 | 246 | 0.108 |
| P4KE 200 | 180 | 220 | 1.0 | 162 | 5.0 | 1.4 | 287 | 0.108 |
| P4KE 200A | 190 | 210 | 1.0 | 171 | 5.0 | 1.5 | 274 | 0.108 |
| P4KE 220 | 198 | 242 | 1.0 | 175 | 5.0 | 1.2 | 344 | 0.108 |
| P4KE 220A | 209 | 231 | 1.0 | 185 | 5.0 | 1.2 | 328 | 0.108 |
| P4KE 250 | 225 | 275 | 1.0 | 202 | 5.0 | 1.1 | 360 | 0.110 |
| P4KE 250A | 237 | 267 | 1.0 | 214 | 5.0 | 1.2 | 344 | 0.110 |
| P4KE 300 | 270 | 330 | 1.0 | 243 | 5.0 | 0.93 | 430 | 0.110 |
| P4KE 300A | 285 | 315 | 1.0 | 256 | 5.0 | 1.0 | 414 | 0.110 |
| P4KE 350 | 315 | 385 | 1.0 | 284 | 5.0 | 0.79 | 504 | 0.110 |
| P4KE 350A | 332 | 368 | 1.0 | 300 | 5.0 | 0.83 | 482 | 0.110 |
| P4KE 400 | 360 | 440 | 1.0 | 324 | 5.0 | 0.70 | 574 | 0.110 |
| P4KE 400A | 380 | 420 | 1.0 | 342 | 5.0 | 0.73 | 548 | 0.110 |
| P4KE 440 | 396 | 484 | 1.0 | 356 | 5.0 | 0.63 | 631 | 0.110 |
| P4KE 440A | 418 | 462 | 1.0 | 376 | 5.0 | 0.66 | 602 | 0.110 |

NOTE: (1) V_(BR) measured after I_r applied for 300 μs, I_r=square wave pulse or equivalent

www.galaxycn.com

(2) Surge current waveform per Fig. 3 and derated Fig. 2

(3) For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled

(4) All terms and symbols are consistent with ANSI/IEEE C62.35

FIG.1 – PEAK PULSE POWER RATING CURVE

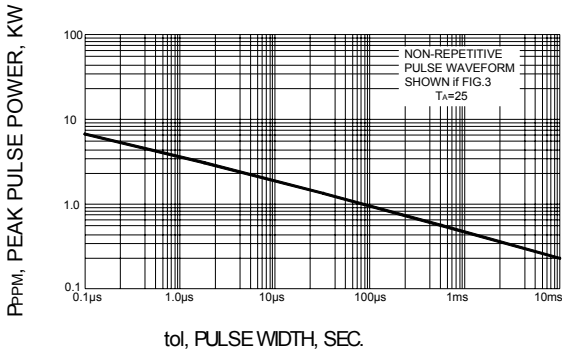


FIG.3 – PULSE WAVEFORM

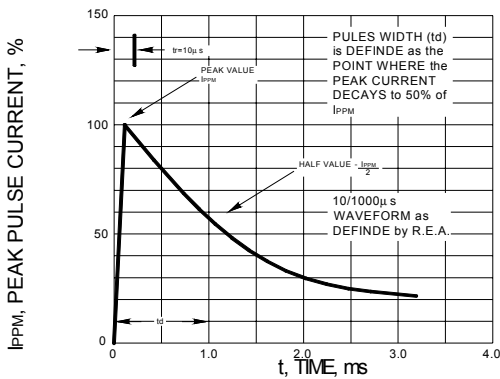


FIG.5 – STEADY STATE POWER DERATING CURVE

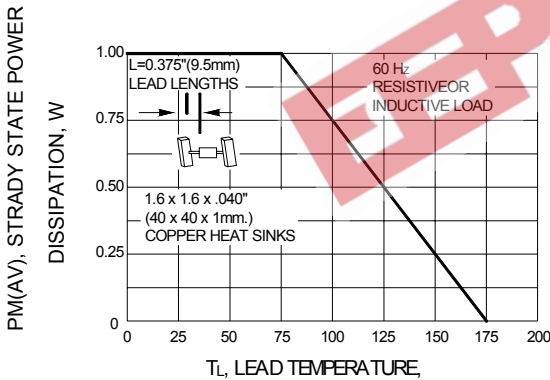


FIG.7 – TYPICAL REVERSE LEAKAGE CHARACTERISTICS

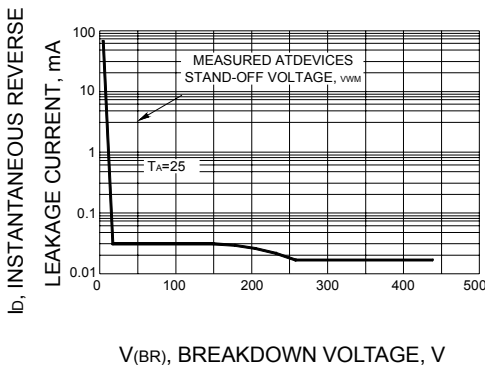


FIG.2 – PULSE DERATING CURVE

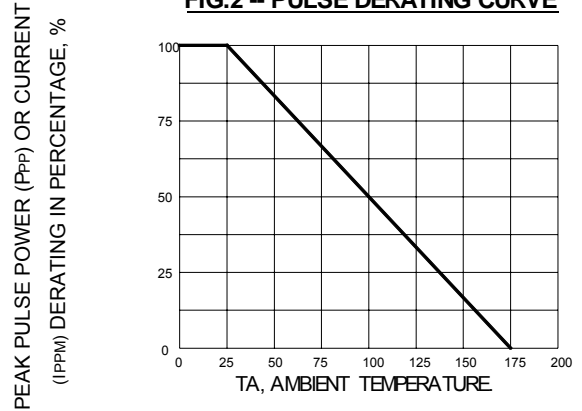


FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

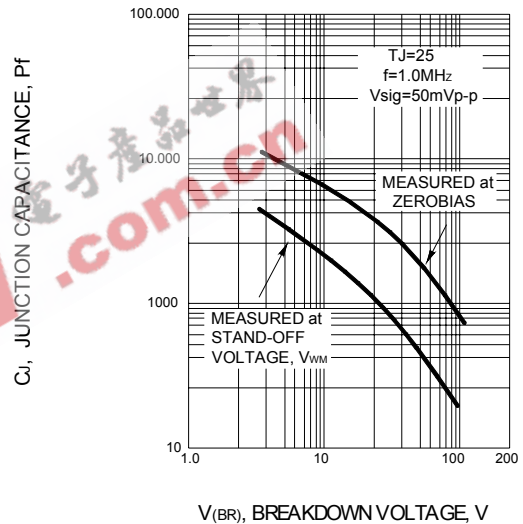


FIG.6 – MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

