

TRANSIENT VOLTAGE SUPPRESSOR

BREAKDOWN VOLTAGE: 6.8 --- 550 V
PEAK PULSE POWER: 1500 W

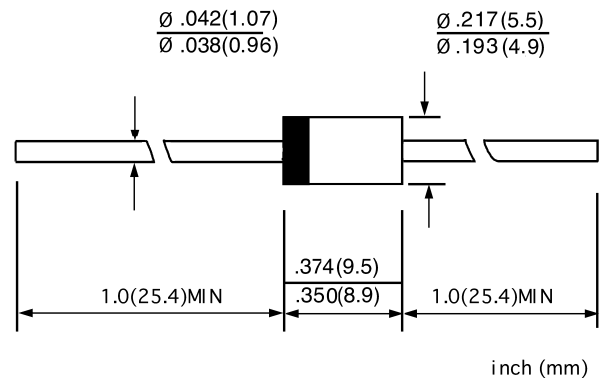
FEATURES

- ◇ Plastic package has underwriters laboratory flammability classification 94V-0
- ◇ Glass passivated junction
- ◇ 1500W peak pulse power capability with a 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- ◇ Excellent clamping capability
- ◇ Low incremental surge resistance
- ◇ Fast response time: typically less than 1.0ps from 0 Volts to $V_{(BR)}$ for uni-directional and 5.0ns for bi-directional types
- ◇ For devices with $V_{(BR)} \geq 10V$, I_D are typically less than 5.0µA
- ◇ High temperature soldering guaranteed: 265 °C / 10 seconds, 0.375"(9.5mm) lead length, 5lbs. (2.3kg) tension

MECHANICAL DATA

- ◇ Case: JEDEC DO-201AE, molded plastic
- ◇ Polarity: color band denotes positive end (cathode) except for bidirectional
- ◇ Weight: 0.032 ounces, 0.9 grams
- ◇ Mounting position: any

DO-201AE



DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bi-directional use C or CA suffix for types 1.5KE 6.8 thru types 1.5KE 550 (e.g. 1.5KE 6.8CA, 1.5KE 550CA).
 Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| | SYMBOL | VALUE | UNIT |
|---|----------------|--------------|------|
| Peak power dissipation with a 10/1000µs waveform (NOTE 1, FIG.1) | P_{PPM} | Minimum 1500 | W |
| Peak pulse current with a 10/1000µs waveform (NOTE 1) | I_{PPM} | SEE TABLE 1 | A |
| Steady state power dissipation at $T_L=75^\circ\text{C}$ Lead lengths 0.375"(9.5mm) (NOTE 2) | $P_{M(AV)}$ | 6.5 | W |
| Peak forward surge current, 8.3ms single half Sine-wave superimposed on rated load (JEDEC Method) (NOTE 3) | I_{FSM} | 200.0 | A |
| Maximum instantaneous forward voltage at 100.0A for unidirectional only (NOTE 4) | V_F | 3.5/5.0 | V |
| Operating junction and storage temperature range | T_J, T_{STG} | -50---+175 | °C |

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

(2) Mounted on copper pad area of 1.6" x 1.6" (40 x 40mm²) 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 $V_{(BR)} \leq 200V$, and $V_F=5.0$ Volt max. for devices of $V_{(BR)} > 200V$

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ELECTRICAL CHARACTERISTICS at(T_A=25 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 Pead Pulse I _{PPM} (NOTE2) (A) | Maximum Clamping Voltage at I _{PPM} V _C (V) | Maximum Temperature Coefficient of V _(BR) (%/) |
|-------------|--|------|-------------------------------------|---------------------------------------|---|---|---|--|
| | MIN | MAX | | | | | | |
| 1.5KE 6.8 | 6.12 | 7.48 | 10.0 | 5.50 | 1000 | 139 | 10.8 | 0.057 |
| 1.5KE 6.8A | 6.45 | 7.14 | 10.0 | 5.80 | 1000 | 143 | 10.5 | 0.057 |
| 1.5KE 7.5 | 6.75 | 8.25 | 10.0 | 6.05 | 500 | 128 | 11.7 | 0.061 |
| 1.5KE 7.5A | 7.13 | 7.88 | 10.0 | 6.40 | 500 | 133 | 11.3 | 0.061 |
| 1.5KE 8.2 | 7.38 | 9.02 | 10.0 | 6.63 | 200 | 120 | 12.5 | 0.065 |
| 1.5KE 8.2A | 7.79 | 8.61 | 10.0 | 7.02 | 200 | 124 | 12.1 | 0.065 |
| 1.5KE 9.1 | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 109 | 13.8 | 0.068 |
| 1.5KE 9.1A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 112 | 13.4 | 0.068 |
| 1.5KE 10 | 9.0 | 11.0 | 1.0 | 8.10 | 10 | 100 | 15.0 | 0.073 |
| 1.5KE 10A | 9.5 | 10.5 | 1.0 | 8.55 | 10 | 103 | 14.5 | 0.073 |
| 1.5KE 11 | 9.9 | 12.1 | 1.0 | 8.92 | 5.0 | 92.6 | 16.2 | 0.075 |
| 1.5KE 11A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 96.2 | 15.6 | 0.075 |
| 1.5KE 12 | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 86.7 | 17.3 | 0.076 |
| 1.5KE 12A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 89.8 | 16.7 | 0.078 |
| 1.5KE 13 | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 78.9 | 19.0 | 0.081 |
| 1.5KE 13A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 82.4 | 18.2 | 0.081 |
| 1.5KE 15 | 13.5 | 16.5 | 1.0 | 12.1 | 5.0 | 68.2 | 22.0 | 0.084 |
| 1.5KE 15A | 14.3 | 15.8 | 1.0 | 12.8 | 5.0 | 70.8 | 21.2 | 0.084 |
| 1.5KE 16 | 14.4 | 17.6 | 1.0 | 12.9 | 5.0 | 63.8 | 23.5 | 0.086 |
| 1.5KE 16A | 15.2 | 16.8 | 1.0 | 13.6 | 5.0 | 66.7 | 22.5 | 0.086 |
| 1.5KE 18 | 16.2 | 19.8 | 1.0 | 14.5 | 5.0 | 56.6 | 26.5 | 0.088 |
| 1.5KE 18A | 17.1 | 18.9 | 1.0 | 15.3 | 5.0 | 59.5 | 25.2 | 0.089 |
| 1.5KE 20 | 18.0 | 22.0 | 1.0 | 16.2 | 5.0 | 51.5 | 29.1 | 0.090 |
| 1.5KE 20A | 19.0 | 21.0 | 1.0 | 17.1 | 5.0 | 54.2 | 27.7 | 0.090 |
| 1.5KE 22 | 19.8 | 24.2 | 1.0 | 17.8 | 5.0 | 47.0 | 31.9 | 0.092 |
| 1.5KE 22A | 20.9 | 23.1 | 1.0 | 18.8 | 5.0 | 49.0 | 30.6 | 0.092 |
| 1.5KE 24 | 21.6 | 26.4 | 1.0 | 19.4 | 5.0 | 43.2 | 34.7 | 0.094 |
| 1.5KE 24A | 22.8 | 25.2 | 1.0 | 20.5 | 5.0 | 45.2 | 33.2 | 0.094 |
| 1.5KE 27 | 24.3 | 29.7 | 1.0 | 21.8 | 5.0 | 38.4 | 39.1 | 0.096 |
| 1.5KE 27A | 25.7 | 28.4 | 1.0 | 23.1 | 5.0 | 40.0 | 37.5 | 0.096 |
| 1.5KE 30 | 27.0 | 33.0 | 1.0 | 24.3 | 5.0 | 34.5 | 43.5 | 0.097 |
| 1.5KE 30A | 28.5 | 31.5 | 1.0 | 25.6 | 5.0 | 36.2 | 41.4 | 0.097 |
| 1.5KE 33 | 29.7 | 36.3 | 1.0 | 26.8 | 5.0 | 31.4 | 47.7 | 0.098 |
| 1.5KE 33A | 31.4 | 34.7 | 1.0 | 28.2 | 5.0 | 32.8 | 45.7 | 0.098 |
| 1.5KE 36 | 32.4 | 39.6 | 1.0 | 29.1 | 5.0 | 28.8 | 52.0 | 0.099 |
| 1.5KE 36A | 34.2 | 37.8 | 1.0 | 30.8 | 5.0 | 30.1 | 49.9 | 0.099 |
| 1.5KE 39 | 35.1 | 42.9 | 1.0 | 31.6 | 5.0 | 26.6 | 56.4 | 0.100 |
| 1.5KE 39A | 37.1 | 41.0 | 1.0 | 33.3 | 5.0 | 27.8 | 53.9 | 0.100 |
| 1.5KE 43 | 38.7 | 47.3 | 1.0 | 34.8 | 5.0 | 24.2 | 61.9 | 0.101 |
| 1.5KE 43A | 40.9 | 45.2 | 1.0 | 36.8 | 5.0 | 25.3 | 59.3 | 0.101 |
| 1.5KE 47 | 42.3 | 51.7 | 1.0 | 38.1 | 5.0 | 22.1 | 67.8 | 0.101 |
| 1.5KE 47A | 44.7 | 49.4 | 1.0 | 40.2 | 5.0 | 23.1 | 64.8 | 0.101 |
| 1.5KE 51 | 45.9 | 56.1 | 1.0 | 41.3 | 5.0 | 20.4 | 73.5 | 0.102 |
| 1.5KE 51A | 48.5 | 53.6 | 1.0 | 43.6 | 5.0 | 21.4 | 70.1 | 0.102 |
| 1.5KE 56 | 50.4 | 61.8 | 1.0 | 45.4 | 5.0 | 18.6 | 80.5 | 0.103 |
| 1.5KE 56A | 53.2 | 58.8 | 1.0 | 47.8 | 5.0 | 19.5 | 77.0 | 0.103 |
| 1.5KE 62 | 55.8 | 68.2 | 1.0 | 50.2 | 5.0 | 16.9 | 89 | 0.104 |
| 1.5KE 62A | 58.9 | 65.1 | 1.0 | 53.0 | 5.0 | 17.6 | 85 | 0.104 |
| 1.5KE 68 | 61.2 | 74.8 | 1.0 | 55.1 | 5.0 | 15.3 | 98 | 0.104 |
| 1.5KE 68A | 64.6 | 71.4 | 1.0 | 58.1 | 5.0 | 16.3 | 92 | 0.104 |

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ELECTRICAL CHARACTERISTICS at $T_A=25$ unless otherwise noted) TABLE 1(Cont' d)

| 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 Pead Pulse I_{PPM} (NOTE2) (A) | Maximum Clamping Voltage at I_{PPM} $V_C(V)$ | Maximum Temperature Coefficient of $V_{(BR)}$ (%/) |
|-------------|---|------|----------------------------|-------------------------------|--|--|--|---|
| | MIN | MAX | | | | | | |
| 1.5KE 75 | 67.5 | 82.5 | 1.0 | 60.7 | 5.0 | 13.9 | 109 | 0.105 |
| 1.5KE 75A | 71.3 | 78.8 | 1.0 | 64.1 | 5.0 | 14.6 | 104 | 0.105 |
| 1.5KE 82 | 73.8 | 90.2 | 1.0 | 66.4 | 5.0 | 12.7 | 118 | 0.105 |
| 1.5KE 82A | 77.9 | 86.1 | 1.0 | 70.1 | 5.0 | 13.3 | 113 | 0.105 |
| 1.5KE 91 | 81.9 | 100 | 1.0 | 73.7 | 5.0 | 11.5 | 131 | 0.106 |
| 1.5KE 91A | 86.5 | 95.5 | 1.0 | 77.8 | 5.0 | 12.0 | 125 | 0.106 |
| 1.5KE 100 | 90.0 | 110 | 1.0 | 81.0 | 5.0 | 10.4 | 144 | 0.106 |
| 1.5KE 100A | 95.0 | 105 | 1.0 | 85.5 | 5.0 | 10.9 | 137 | 0.106 |
| 1.5KE 110 | 99.0 | 121 | 1.0 | 89.2 | 5.0 | 9.5 | 158 | 0.107 |
| 1.5KE 110A | 106 | 116 | 1.0 | 94.0 | 5.0 | 9.9 | 152 | 0.107 |
| 1.5KE 120 | 108 | 132 | 1.0 | 97.2 | 5.0 | 8.7 | 173 | 0.107 |
| 1.5KE 120A | 114 | 126 | 1.0 | 102 | 5.0 | 9.1 | 165 | 0.107 |
| 1.5KE 130 | 117 | 143 | 1.0 | 106 | 5.0 | 8.0 | 187 | 0.107 |
| 1.5KE 130A | 124 | 137 | 1.0 | 111 | 5.0 | 8.4 | 179 | 0.107 |
| 1.5KE 150 | 136 | 165 | 1.0 | 121 | 5.0 | 7.0 | 215 | 0.108 |
| 1.5KE 150A | 143 | 158 | 1.0 | 128 | 5.0 | 7.2 | 207 | 0.106 |
| 1.5KE 160 | 144 | 176 | 1.0 | 130 | 5.0 | 6.5 | 230 | 0.106 |
| 1.5KE 160A | 152 | 168 | 1.0 | 136 | 5.0 | 6.8 | 219 | 0.108 |
| 1.5KE 170 | 153 | 167 | 1.0 | 138 | 5.0 | 6.1 | 244 | 0.108 |
| 1.5KE 170A | 162 | 179 | 1.0 | 145 | 5.0 | 6.4 | 234 | 0.108 |
| 1.5KE 180 | 162 | 198 | 1.0 | 146 | 5.0 | 5.8 | 258 | 0.108 |
| 1.5KE 180A | 171 | 189 | 1.0 | 154 | 5.0 | 6.1 | 246 | 0.108 |
| 1.5KE 200 | 180 | 220 | 1.0 | 162 | 5.0 | 5.2 | 287 | 0.108 |
| 1.5KE 200A | 190 | 210 | 1.0 | 171 | 5.0 | 5.5 | 274 | 0.108 |
| 1.5KE 220 | 196 | 242 | 1.0 | 175 | 5.0 | 4.4 | 344 | 0.108 |
| 1.5KE 220A | 209 | 231 | 1.0 | 185 | 5.0 | 4.6 | 328 | 0.108 |
| 1.5KE 250 | 225 | 275 | 1.0 | 202 | 5.0 | 4.2 | 360 | 0.110 |
| 1.5KE 250A | 237 | 263 | 1.0 | 214 | 5.0 | 4.4 | 344 | 0.110 |
| 1.5KE 300 | 270 | 330 | 1.0 | 243 | 5.0 | 3.5 | 430 | 0.110 |
| 1.5KE 300A | 285 | 315 | 1.0 | 256 | 5.0 | 3.6 | 414 | 0.110 |
| 1.5KE 350 | 315 | 385 | 1.0 | 284 | 5.0 | 3.0 | 504 | 0.110 |
| 1.5KE 350A | 333 | 368 | 1.0 | 300 | 5.0 | 3.1 | 482 | 0.110 |
| 1.5KE 400 | 360 | 440 | 1.0 | 324 | 5.0 | 2.6 | 574 | 0.110 |
| 1.5KE 400A | 380 | 420 | 1.0 | 342 | 5.0 | 2.7 | 548 | 0.110 |
| 1.5KE 440 | 396 | 484 | 1.0 | 356 | 5.0 | 2.4 | 631 | 0.110 |
| 1.5KE 440A | 418 | 462 | 1.0 | 376 | 5.0 | 2.5 | 602 | 0.110 |
| 1.5KE 480 | 432 | 528 | 1.0 | 389 | 5.0 | 2.19 | 686 | 0.110 |
| 1.5KE 480A | 456 | 504 | 1.0 | 408 | 5.0 | 2.28 | 658 | 0.110 |
| 1.5KE 510 | 459 | 561 | 1.0 | 413 | 5.0 | 2.06 | 729 | 0.110 |
| 1.5KE 510A | 485 | 535 | 1.0 | 434 | 5.0 | 2.15 | 698 | 0.110 |
| 1.5KE 540 | 486 | 594 | 1.0 | 437 | 5.0 | 1.94 | 772 | 0.110 |
| 1.5KE 540A | 513 | 567 | 1.0 | 459 | 5.0 | 2.03 | 740 | 0.110 |
| 1.5KE 550 | 495 | 605 | 1.0 | 470 | 5.0 | 1.91 | 786 | 0.110 |
| 1.5KE 550A | 522 | 577 | 1.0 | 467 | 5.0 | 2.00 | 760 | 0.110 |

NOTE:(1) Pulse test:tp 50ms

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

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FIG.1 – PEAK PULSE POWER RATING CURVE

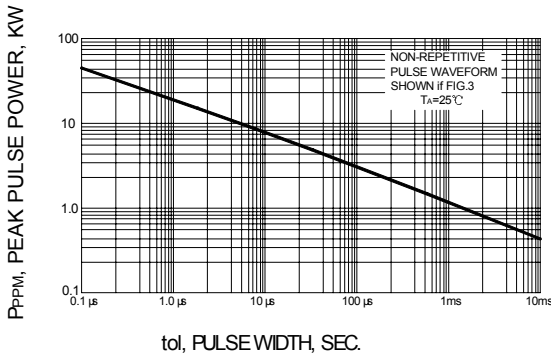


FIG.3 – PULSE WAVEFORM

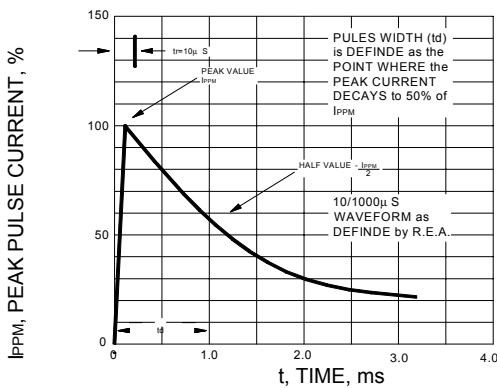


FIG.5 – STEADY STATE POWER DERATING CURVE

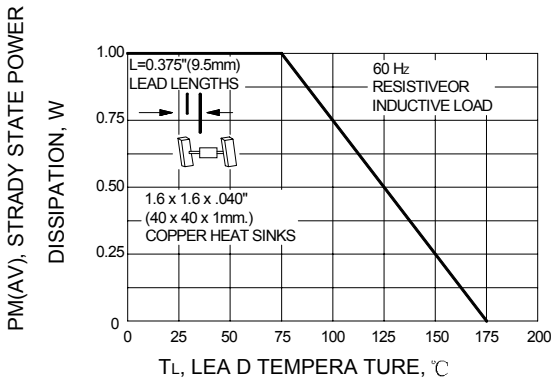


FIG.7 – TYPICAL REVERSE LEAKAGE CHARACTERISTICS

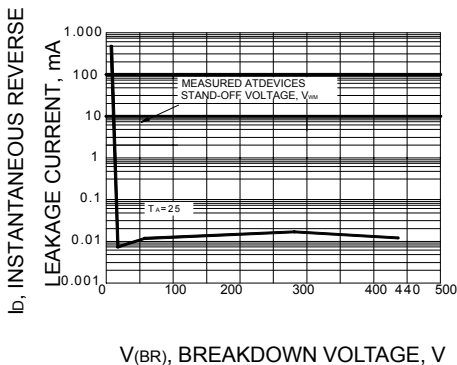


FIG.2 – PULSE DERATING CURVE

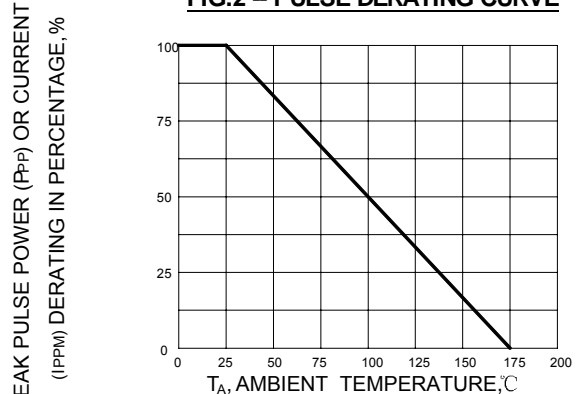


FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

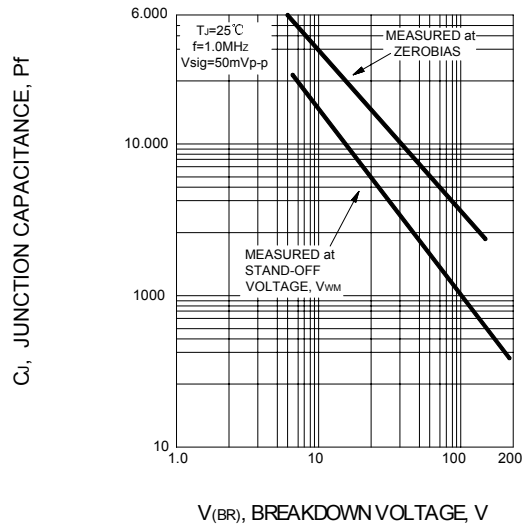


FIG.6 – MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

