

## TRANSIENT VOLTAGE SUPPRESSOR

**BREAKDOWN VOLTAGE: 6.8 --- 440 V**  
**PEAK PULSE POWER: 600 W**

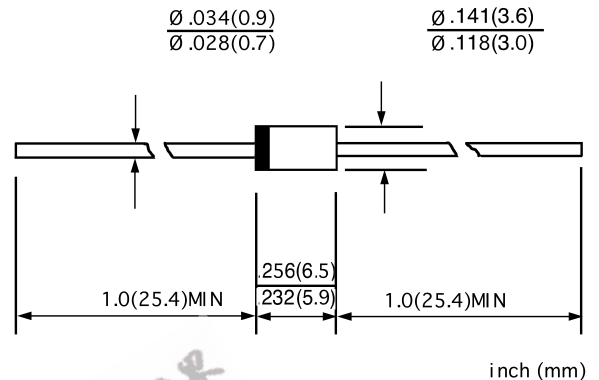
### FEATURES

- ◇ Plastic package has underwriters laboratory flammability classification 94V-0
- ◇ Glass passivated junction
- ◇ 600W 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
- ◇ Typical  $I_D$  less than 1 µA above 10V
- ◇ High temperature soldering guaranteed: 265 °C / 10 seconds, 0.375"(9.5mm) lead length, 5lbs. (2.3kg) tension

### MECHANICAL DATA

- ◇ Case: JEDEC DO-15, 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: 0.015 ounces, 0.39 grams
- ◇ Mounting position: any

### DO-15



### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bi-directional use C or CA suffix for types P6KE 6.8 thru types P6KE 440 (e.g. P6KE 6.8CA, P6KE 440CA).  
 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 600 | W    |
| Peak pulse current with a 10/1000µs waveform (NOTE 1)   | $I_{PPM}$      | See table 1 | A    |
| Steady state power dissipation at $T_L=75^\circ\text{C}$<br>Lead lengths 0.375"(9.5mm) (NOTE 2)               | $P_{M(AV)}$    | 5.0         | W    |
| Peak forward surge current, 8.3ms single half<br>Sine-wave superimposed on rated load (JEDEC Method) (NOTE 3) | $I_{FSM}$      | 100.0       | A    |
| Maximum Instantaneous forward voltage at 50A 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 40mm<sup>2</sup>) 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  $V_{(BR)} > 220V$

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**ELECTRICAL CHARACTERISTICS** (at  $T_A=25$  unless otherwise noted)

TABLE1

| Type     | $V_{(BR)}$ |      | $@I_T$ | $V_{WM}$ | $I_{DM}$  | $I_{PPM}$ | $V_C$      | $\alpha V_{(BR)}$ |
|----------|------------|------|--------|----------|-----------|-----------|------------|-------------------|
|          | V          |      |        |          | $@V_{WM}$ |           | $@I_{PPM}$ |                   |
|          | Min        | Max  | mA     | V        | $\mu A$   | A         | V          | %/                |
| P6KE6.8  | 6.12       | 7.48 | 10     | 5.50     | 1000      | 55.6      | 10.8       | 0.057             |
| P6KE6.8A | 6.45       | 7.14 | 10     | 5.80     | 1000      | 57.1      | 10.5       | 0.057             |
| P6KE7.5  | 6.75       | 8.25 | 10     | 6.05     | 500       | 51.3      | 11.7       | 0.061             |
| P6KE7.5A | 7.13       | 7.88 | 10     | 6.40     | 500       | 53.1      | 11.3       | 0.061             |
| P6KE8.2  | 7.38       | 9.02 | 10     | 6.63     | 200       | 48.0      | 12.5       | 0.065             |
| P6KE8.2A | 7.79       | 8.61 | 10     | 7.02     | 200       | 49.6      | 12.1       | 0.065             |
| P6KE9.1  | 8.19       | 10.0 | 1.0    | 7.37     | 50        | 43.5      | 13.8       | 0.068             |
| P6KE9.1A | 8.65       | 9.55 | 1.0    | 7.78     | 50        | 44.8      | 13.4       | 0.068             |
| P6KE10   | 9.0        | 11.0 | 1.0    | 8.10     | 10        | 40.0      | 15.0       | 0.073             |
| P6KE10A  | 9.5        | 10.5 | 1.0    | 8.55     | 10        | 41.4      | 14.5       | 0.073             |
| P6KE11   | 9.9        | 12.1 | 1.0    | 8.92     | 5.0       | 37.0      | 16.2       | 0.075             |
| P6KE11A  | 10.5       | 11.6 | 1.0    | 9.40     | 5.0       | 38.5      | 15.6       | 0.075             |
| P6KE12   | 10.8       | 13.2 | 1.0    | 9.72     | 5.0       | 34.7      | 17.3       | 0.078             |
| P6KE12A  | 11.4       | 12.6 | 1.0    | 10.2     | 5.0       | 35.9      | 16.7       | 0.078             |
| P6KE13   | 11.7       | 14.3 | 1.0    | 10.5     | 5.0       | 31.6      | 19.0       | 0.081             |
| P6KE13A  | 12.4       | 13.7 | 1.0    | 11.1     | 5.0       | 33.0      | 18.2       | 0.081             |
| P6KE15   | 13.5       | 16.5 | 1.0    | 12.1     | 5.0       | 27.3      | 22.0       | 0.084             |
| P6KE15A  | 14.3       | 15.8 | 1.0    | 12.8     | 5.0       | 28.3      | 21.2       | 0.084             |
| P6KE16   | 14.4       | 17.6 | 1.0    | 12.9     | 5.0       | 25.5      | 23.6       | 0.086             |
| P6KE16A  | 15.2       | 16.8 | 1.0    | 13.6     | 5.0       | 26.7      | 22.5       | 0.086             |
| P6KE18   | 16.2       | 19.8 | 1.0    | 14.5     | 5.0       | 22.6      | 26.5       | 0.088             |
| P6KE18A  | 17.1       | 18.9 | 1.0    | 15.3     | 5.0       | 23.8      | 25.2       | 0.088             |
| P6KE20   | 18.0       | 22.0 | 1.0    | 16.2     | 5.0       | 20.6      | 29.1       | 0.090             |
| P6KE20A  | 19.0       | 21.0 | 1.0    | 17.1     | 5.0       | 21.7      | 27.7       | 0.090             |
| P6KE22   | 19.8       | 24.2 | 1.0    | 17.8     | 5.0       | 18.8      | 31.9       | 0.092             |
| P6KE22A  | 20.9       | 23.1 | 1.0    | 18.8     | 5.0       | 19.6      | 30.6       | 0.092             |
| P6KE24   | 21.6       | 26.4 | 1.0    | 19.4     | 5.0       | 17.3      | 34.7       | 0.094             |
| P6KE24A  | 22.8       | 25.2 | 1.0    | 20.5     | 5.0       | 18.1      | 33.2       | 0.094             |
| P6KE27   | 24.3       | 29.7 | 1.0    | 21.8     | 5.0       | 15.3      | 39.1       | 0.096             |
| P6KE27A  | 25.7       | 28.4 | 1.0    | 23.1     | 5.0       | 16.0      | 37.5       | 0.096             |
| P6KE30   | 27.0       | 33.0 | 1.0    | 24.3     | 5.0       | 13.8      | 43.5       | 0.097             |
| P6KE30A  | 28.5       | 31.5 | 1.0    | 25.6     | 5.0       | 14.5      | 41.4       | 0.097             |
| P6KE33   | 29.7       | 36.3 | 1.0    | 26.8     | 5.0       | 12.6      | 47.7       | 0.098             |
| P6KE33A  | 31.4       | 34.7 | 1.0    | 28.2     | 5.0       | 13.1      | 45.7       | 0.098             |
| P6KE36   | 32.4       | 39.6 | 1.0    | 29.1     | 5.0       | 11.5      | 52.0       | 0.099             |
| P6KE36A  | 34.2       | 37.8 | 1.0    | 30.8     | 5.0       | 12.0      | 49.9       | 0.099             |
| P6KE39   | 35.1       | 42.9 | 1.0    | 31.6     | 5.0       | 10.6      | 56.4       | 0.100             |
| P6KE39A  | 37.1       | 41.0 | 1.0    | 33.3     | 5.0       | 11.1      | 53.9       | 0.100             |
| P6KE43   | 38.7       | 47.3 | 1.0    | 34.8     | 5.0       | 9.7       | 61.9       | 0.101             |
| P6KE43A  | 40.9       | 45.2 | 1.0    | 36.8     | 5.0       | 10.1      | 59.3       | 0.101             |
| P6KE47   | 42.3       | 51.7 | 1.0    | 38.1     | 5.0       | 8.8       | 67.8       | 0.101             |
| P6KE47A  | 44.7       | 49.4 | 1.0    | 40.2     | 5.0       | 9.3       | 64.8       | 0.101             |
| P6KE51   | 45.9       | 56.1 | 1.0    | 41.3     | 5.0       | 8.2       | 73.5       | 0.102             |
| P6KE51A  | 48.5       | 53.6 | 1.0    | 43.6     | 5.0       | 8.6       | 70.1       | 0.102             |
| P6KE56   | 50.4       | 61.6 | 1.0    | 45.4     | 5.0       | 7.5       | 80.5       | 0.103             |
| P6KE56A  | 53.2       | 58.8 | 1.0    | 47.8     | 5.0       | 7.8       | 77.0       | 0.103             |

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**ELECTRICAL CHARACTERISTICS** (at  $T_A=25$  unless otherwise noted)

TABLE1(Cont'd)

| Type     | $V_{(BR)}$ (Note 1) |      | $I_T$ | $V_{WM}$ | $I_{DM}$ (Note 3) | $I_{PPM}$<br>(Note 2) | $V_C$       | $\alpha V_{(BR)}$ |
|----------|---------------------|------|-------|----------|-------------------|-----------------------|-------------|-------------------|
|          | V                   |      |       |          | @ $V_{WM}$        |                       | @ $I_{PPM}$ |                   |
|          | Min                 | Max  | mA    | V        | $\mu A$           | A                     | V           | %/                |
| P6KE62   | 55.8                | 68.2 | 1.0   | 50.2     | 5.0               | 6.7                   | 89.0        | 0.104             |
| P6KE62A  | 58.9                | 65.1 | 1.0   | 53.0     | 5.0               | 7.1                   | 85.0        | 0.104             |
| P6KE68   | 61.2                | 74.8 | 1.0   | 55.1     | 5.0               | 6.1                   | 98.0        | 0.104             |
| P6KE68A  | 64.6                | 71.4 | 1.0   | 58.1     | 5.0               | 6.5                   | 92.0        | 0.104             |
| P6KE75   | 67.5                | 82.5 | 1.0   | 60.7     | 5.0               | 5.6                   | 108         | 0.105             |
| P6KE75A  | 71.3                | 78.8 | 1.0   | 64.1     | 5.0               | 5.8                   | 103         | 0.105             |
| P6KE82   | 73.8                | 90.2 | 1.0   | 66.4     | 5.0               | 5.1                   | 118         | 0.105             |
| P6KE82A  | 77.9                | 86.1 | 1.0   | 70.1     | 5.0               | 5.3                   | 113         | 0.105             |
| P6KE91   | 81.9                | 100  | 1.0   | 73.7     | 5.0               | 4.6                   | 131         | 0.106             |
| P6KE91A  | 86.5                | 95.5 | 1.0   | 77.8     | 5.0               | 4.8                   | 125         | 0.106             |
| P6KE100  | 90.0                | 110  | 1.0   | 81.0     | 5.0               | 4.2                   | 144         | 0.106             |
| P6KE100A | 95.0                | 105  | 1.0   | 85.5     | 5.0               | 4.4                   | 137         | 0.106             |
| P6KE110  | 99.0                | 121  | 1.0   | 89.2     | 5.0               | 3.8                   | 158         | 0.107             |
| P6KE110A | 105                 | 116  | 1.0   | 94.0     | 5.0               | 3.9                   | 152         | 0.107             |
| P6KE120  | 108                 | 132  | 1.0   | 97.2     | 5.0               | 3.5                   | 173         | 0.107             |
| P6KE120A | 114                 | 126  | 1.0   | 102      | 5.0               | 3.6                   | 165         | 0.107             |
| P6KE130  | 117                 | 143  | 1.0   | 105      | 5.0               | 3.2                   | 187         | 0.107             |
| P6KE130A | 124                 | 137  | 1.0   | 111      | 5.0               | 3.6                   | 179         | 0.107             |
| P6KE150  | 135                 | 165  | 1.0   | 121      | 5.0               | 2.8                   | 215         | 0.108             |
| P6KE150A | 143                 | 158  | 1.0   | 128      | 5.0               | 2.9                   | 207         | 0.108             |
| P6KE160  | 144                 | 176  | 1.0   | 130      | 5.0               | 2.6                   | 230         | 0.108             |
| P6KE160A | 152                 | 168  | 1.0   | 136      | 5.0               | 2.7                   | 219         | 0.108             |
| P6KE170  | 153                 | 187  | 1.0   | 138      | 5.0               | 2.5                   | 244         | 0.108             |
| P6KE170A | 162                 | 179  | 1.0   | 145      | 5.0               | 2.6                   | 234         | 0.108             |
| P6KE180  | 162                 | 198  | 1.0   | 146      | 5.0               | 2.3                   | 258         | 0.108             |
| P6KE180A | 171                 | 189  | 1.0   | 154      | 5.0               | 2.4                   | 246         | 0.108             |
| P6KE200  | 180                 | 220  | 1.0   | 162      | 5.0               | 2.1                   | 287         | 0.108             |
| P6KE200A | 190                 | 210  | 1.0   | 171      | 5.0               | 2.2                   | 274         | 0.108             |
| P6KE220  | 198                 | 242  | 1.0   | 175      | 5.0               | 1.7                   | 344         | 0.108             |
| P6KE220A | 209                 | 231  | 1.0   | 185      | 5.0               | 1.8                   | 328         | 0.108             |
| P6KE250  | 225                 | 275  | 1.0   | 202      | 5.0               | 1.7                   | 360         | 0.110             |
| P6KE250A | 237                 | 263  | 1.0   | 214      | 5.0               | 1.7                   | 344         | 0.110             |
| P6KE300  | 270                 | 330  | 1.0   | 243      | 5.0               | 1.4                   | 430         | 0.110             |
| P6KE300A | 285                 | 315  | 1.0   | 256      | 5.0               | 1.4                   | 414         | 0.110             |
| P6KE350  | 315                 | 385  | 1.0   | 284      | 5.0               | 1.2                   | 504         | 0.110             |
| P6KE350A | 332                 | 368  | 1.0   | 300      | 5.0               | 1.2                   | 482         | 0.110             |
| P6KE400  | 360                 | 440  | 1.0   | 324      | 5.0               | 1.0                   | 574         | 0.110             |
| P6KE400A | 380                 | 420  | 1.0   | 342      | 5.0               | 1.1                   | 548         | 0.110             |
| P6KE440  | 396                 | 484  | 1.0   | 356      | 5.0               | 0.95                  | 631         | 0.110             |
| P6KE440A | 418                 | 462  | 1.0   | 376      | 5.0               | 1.0                   | 602         | 0.110             |

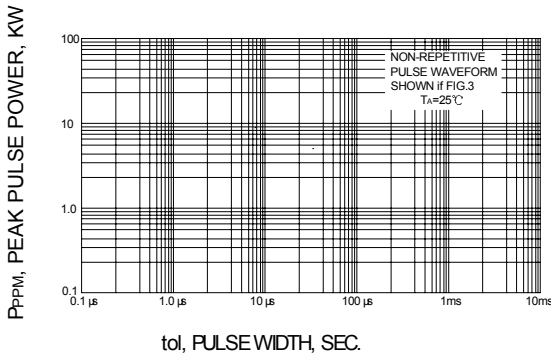
Notes:(1) $V_{(BR)}$  measured after  $I_T$  applied for 300 $\mu s$ ,  $I_T$ =square wave pulse or equivalent

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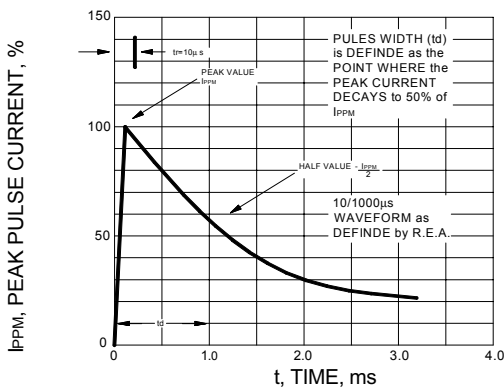
(2) Surge current waveform per Fig. 3 and derated Fig. 2

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

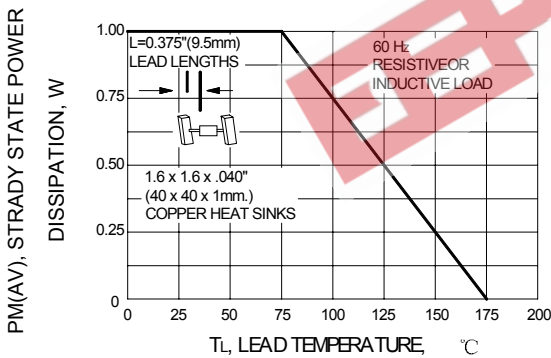
**FIG.1 – PEAK PULSE POWER RATING CURVE**



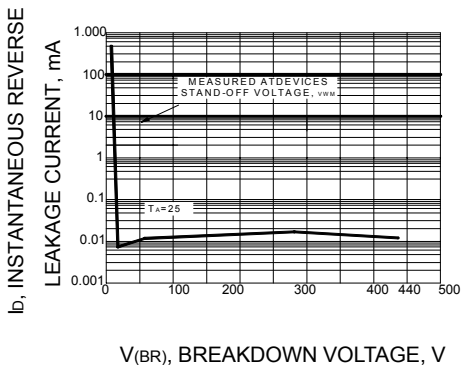
**FIG.3 – PULSE WAVEFORM**



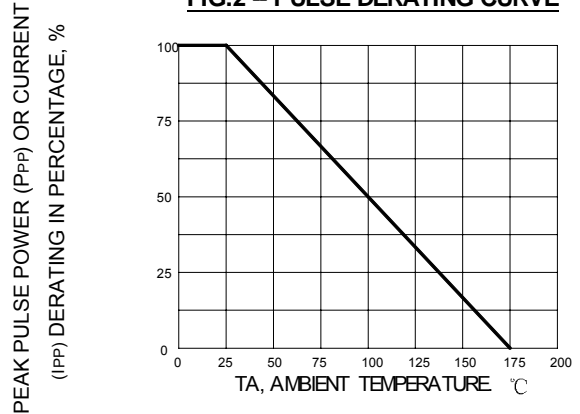
**FIG.5 – STEADY STATE POWER DERATING CURVE**



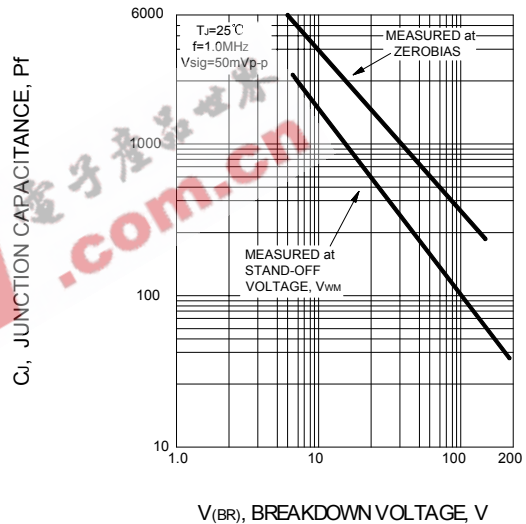
**FIG.7 – TYPICAL REVERSE LEAKAGE CHARACTERISTICS**



**FIG.2 – PULSE DERATING CURVE**



**FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL**



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

