



# PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

**P6KE6.8 THRU P6KE440CA(GPP)**

**Breakdown Voltage 6.8 to 440 Volts**

**P6KE6.8J THRU P6KE440CAJ(OPEN JUNCTION)**

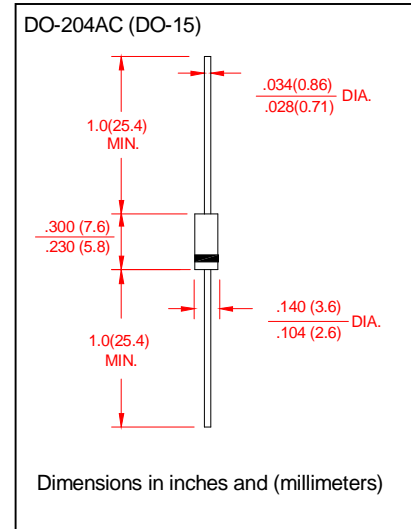
**Peak Pulse Power 600 Watts**

## FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- Glass passivated or silastic guard junction (open junction)
- 600W peak pulse power capability with a 10/1000  $\mu$  s 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 unidirectional and 5.0ns for bidirectional types
- Typical  $I_D$  less than 1.0  $\mu$  A above 10V
- High temperature soldering guaranteed: 265°C/10 seconds, 0.375" (9.5mm) lead length, 51bs.(2.3kg) tension

## MECHANICAL DATA

- Cass: JEDEC DO-204AC, molded plastic body over passivated junction
- Terminals: Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color bands denotes positive end (cathode) except for bidirectional types
- Mounting position: any
- Weight: 0.015 ounces, 0.4 gram



## DEVICES FOR BIDIRECTIONAL APPLICATIONS

- For bidirectional use C or CA Suffix for types P6KE6.8 thru P6K440 (e.g. P6KE6.8C, P6KE440CA). Electrical Characteristics apply in both directions.
- Suffix A denotes  $\pm 5\%$  tolerance device, No suffix A denotes  $\pm 10\%$  tolerance device

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

- Ratings at 25°C ambient temperature unless otherwise specified

| Ratings   | Symbols        | Value       | Unit             |
|---|----------------|-------------|------------------|
| Peak Pulse power dissipation with a 10/1000 $\mu$ s waveform(NOTE1,FIG.1)                                 | PPPM           | Minimum 400 | Watts            |
| Peak Pulse current with a 10/1000 $\mu$ s waveform (NOTE1,FIG.3)  | IPPM           | See Table 1 | Watt             |
| Steady Stage Power Dissipation at $T_L=75^\circ\text{C}$<br>Lead lengths 0.375"(9.5)(Note2)               | $P_{M(AV)}$    | 5.0         | Amps             |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (Note3) | $I_{FSM}$      | 100.0       | Amps             |
| Maximum instantaneous forward voltage at 50.0A for unidirectional only (NOTE 4)                           | $V_F$          | 3.5/5.0     | Volts            |
| Operating Junction and Storage Temperature Range  | $T_J, T_{STG}$ | 50 to +150  | $^\circ\text{C}$ |

### Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2
2. Mounted on copper pad area of 1.6 $\times$ 1.6"(40 $\times$ 40mm) per Fig 5.
3. Measured at 8.3ms single half sine-wave or equivalent square wave duty cycle = 4 pulses per minutes maximum.
4.  $V_F=3.0$  Volts max. for devices of  $V_{(BR)} \leq 200\text{V}$ , and  $V_F=5.0\text{V}$  for devices of  $V_{(BR)} \geq 200\text{V}$



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**Electrical Characteristic at (T<sub>A</sub> =25°C unless otherwise noted)**

| Device Type | Breakdown Voltage at Test Current I <sub>r</sub> |       |                     | Stand-off Voltage<br>V <sub>WM</sub> | Maximum Reverse Leakage at V <sub>WM</sub><br>I <sub>D</sub> ( μ A) | Maximum Peak Pulse Current<br>I <sub>PPM</sub> (A) | Maximum Clamping Voltage at I <sub>PPM</sub><br>V <sub>c</sub> (V) | Maximum Temperature Coefficient of V <sub>BR</sub><br>X <sub>vz</sub> (% °C) |
|-------------|--|-------|---------------------|--------------------------------------|---|--|--|--|
|             | MIN  | MAX   |                     |                                      |   |  |  |  |
|             | V <sub>BR</sub> (V)                              |       | I <sub>r</sub> (mA) |                                      |   |  |  |  |
|             | Note 1   |       |                     |                                      |   |  |  |  |
| P6KE6.8/J   | 6.12   | 7.48  | 10                  | 5.5                                  | 1000  | 55.6   | 10.8   | 0.067  |
| P6KE6.8A/J  | 6.45   | 7.14  | 10                  | 5.8                                  | 1000  | 57.1   | 10.5   | 0.057  |
| P6KE7.5/J   | 6.75   | 8.25  | 10                  | 6.05                                 | 500   | 51.3   | 11.7   | 0.061  |
| P6KE7.5A/J  | 7.13   | 7.88  | 10                  | 6.4                                  | 500   | 53.1   | 11.3   | 0.061  |
| P6KE8.2/J   | 7.38   | 9.02  | 10                  | 6.63                                 | 200   | 48.0   | 12.5   | 0.065  |
| P6KE8.2A/J  | 7.79   | 8.61  | 10                  | 7.02                                 | 200   | 49.6   | 12.1   | 0.065  |
| P6KE9.1/J   | 8.19   | 10    | 1                   | 7.37                                 | 50  | 43.6   | 13.8   | 0.068  |
| P6KE9.1A/J  | 8.65   | 9.55  | 1                   | 7.78                                 | 50  | 44.8   | 13.4   | 0.068  |
| P6KE10/J    | 9  | 11    | 1                   | 8.1                                  | 10  | 40.0   | 15   | 0.073  |
| P6KE10A/J   | 9.5  | 10.5  | 1                   | 8.55                                 | 10  | 41.4   | 14.5   | 0.073  |
| P6KE11/J    | 9.9  | 12.1  | 1                   | 8.92                                 | 5   | 37   | 16.2   | 0.075  |
| P6KE11A/J   | 10.5   | 11.6  | 1                   | 9.4                                  | 5   | 38.5   | 15.6   | 0.075  |
| P6KE12/J    | 10.8   | 13.2  | 1                   | 9.72                                 | 5   | 34.7   | 17.3   | 0.078  |
| P6KE12A/J   | 11.4   | 12.6  | 1                   | 10.2                                 | 5   | 35.9   | 16.7   | 0.078  |
| P6KE13/J    | 11.7   | 14.3  | 1                   | 10.5                                 | 5   | 31.6   | 19   | 0.061  |
| P6KE13A/J   | 12.4   | 13.7  | 1                   | 11.1                                 | 5   | 33.0   | 18.2   | 0.081  |
| P6KE15/J    | 13.5   | 16.5  | 1                   | 12.1                                 | 5   | 27.3   | 22   | 0.084  |
| P6KE15A/J   | 14.3   | 15.8  | 1                   | 12.8                                 | 5   | 28.3   | 21.2   | 0.084  |
| P6KE16/J    | 14.4   | 17.6  | 1                   | 12.9                                 | 5   | 25.5   | 23.5   | 0.086  |
| P6KE16A/J   | 15.2   | 16.8  | 1                   | 13.6                                 | 5   | 26.7   | 22.5   | 0.086  |
| P6KE18/J    | 16.2   | 19.8  | 1                   | 14.5                                 | 5   | 22.6   | 26.5   | 0.088  |
| P6KE18A/J   | 17.1   | 18.9  | 1                   | 15.3                                 | 5   | 23.8   | 25.2   | 0.088  |
| P6KE20/J    | 18   | 22    | 1                   | 16.2                                 | 5   | 20.6   | 29.1   | 0.09   |
| P6KE20A/J   | 19   | 21    | 1                   | 17.1                                 | 5   | 21.7   | 27.7   | 0.09   |
| P6KE22/J    | 19.8   | 24.2  | 1                   | 17.8                                 | 5   | 18.8   | 31.9   | 0.092  |
| P6KE22A/J   | 20.9   | 23.1  | 1                   | 18.8                                 | 5   | 19.6   | 30.6   | 0.092  |
| P6KE24/J    | 21.6   | 26.4  | 1                   | 19.4                                 | 5   | 17.6   | 34.7   | 0.094  |
| P6KE24A/J   | 22.8   | 25.2  | 1                   | 20.5                                 | 5   | 18.1   | 33.2   | 0.094  |
| P6KE27/J    | 24.3   | 29.37 | 1                   | 21.8                                 | 5   | 15.3   | 39.1   | 0.096  |
| P6KE27A/J   | 25.7   | 28.4  | 1                   | 23.1                                 | 5   | 16.0   | 37.5   | 0.096  |
| P6KE30/J    | 27   | 33    | 1                   | 24.3                                 | 5   | 13.8   | 43.5   | 0.097  |
| P6KE30A/J   | 28.5   | 31.5  | 1                   | 25.6                                 | 5   | 14.5   | 41.4   | 0.097  |
| P6KE33/J    | 29.7   | 36.3  | 1                   | 26.8                                 | 5   | 12.6   | 47.7   | 0.098  |
| P6KE33A/J   | 31.4   | 34.7  | 1                   | 28.2                                 | 5   | 13.1   | 45.7   | 0.098  |
| P6KE36/J    | 32.4   | 39.6  | 1                   | 29.1                                 | 5   | 11.5   | 52   | 0.099  |
| P6KE36A/J   | 34.2   | 37.8  | 1                   | 30.8                                 | 5   | 12.0   | 49.9   | 0.099  |
| P6KE39/J    | 35.1   | 42.9  | 1                   | 31.6                                 | 5   | 10.6   | 56.4   | 0.1  |
| P6KE39A/J   | 37.1   | 41    | 1                   | 33.3                                 | 5   | 11.1   | 53.9   | 0.1  |
| P6KE43/J    | 38.7   | 47.3  | 1                   | 34.8                                 | 5   | 9.7  | 61.9   | 0.101  |
| P6KE43A/J   | 40.9   | 45.2  | 1                   | 36.8                                 | 5   | 10.1   | 59.3   | 0.101  |
| P6KE47/J    | 42.3   | 51.7  | 1                   | 38.1                                 | 5   | 8.8  | 67.8   | 0.101  |
| P6KE47A/J   | 44.7   | 49.4  | 1                   | 40.2                                 | 5   | 9.3  | 64.8   | 0.101  |
| P6KE51/J    | 45.9   | 56.1  | 1                   | 41.3                                 | 5   | 8.2  | 73.5   | 0.102  |
| P6KE51A/J   | 48.5   | 53.6  | 1                   | 43.6                                 | 5   | 8.6  | 70.1   | 0.102  |
| P6KE56/J    | 50.4   | 61.6  | 1                   | 45.4                                 | 5   | 7.5  | 80.5   | 0.103  |
| P6KE56A/J   | 53.2   | 58.8  | 1                   | 47.8                                 | 5   | 7.8  | 77   | 0.103  |
| P6KE62/J    | 55.8   | 68.2  | 1                   | 50.2                                 | 5   | 6.7  | 89   | 0.104  |



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|-------------|--|------|---------------------|--------------------------------------|---|--|--|---|
|             | MIN  | MAX  |                     |                                      |   |  |  |   |
|             | V <sub>BR</sub> (V)                              |      | I <sub>r</sub> (mA) |                                      |   |  |  |   |
|             | Note 1   |      |                     |                                      |   |  |  |   |
| P6KE62A/J   | 58.9   | 65.1 | 1                   | 53                                   | 5   | 7.1  | 85   | 0.104   |
| P6KE68/J    | 61.2   | 74.8 | 1                   | 55.1                                 | 5   | 6.1  | 98   | 0.104   |
| P6KE68A/J   | 64.6   | 71.4 | 1                   | 58.1                                 | 5   | 6.5  | 92   | 0.104   |
| P6KE75/J    | 67.5   | 82.5 | 1                   | 60.7                                 | 5   | 5.6  | 108  | 0.105   |
| P6KE75A/J   | 71.3   | 78.8 | 1                   | 64.1                                 | 5   | 5.8  | 103  | 0.105   |
| P6KE82/J    | 73.8   | 90.2 | 1                   | 66.4                                 | 5   | 5.1  | 116  | 0.105   |
| P6KE82A/J   | 77.9   | 86.1 | 1                   | 70.1                                 | 5   | 5.3  | 113  | 0.105   |
| P6KE91/J    | 81.9   | 100  | 1                   | 73.7                                 | 5   | 4.6  | 131  | 0.106   |
| P6KE91A/J   | 86.5   | 85.5 | 1                   | 77.8                                 | 5   | 4.8  | 125  | 0.106   |
| P6KE100/J   | 90   | 110  | 1                   | 81                                   | 5   | 4.2  | 144  | 0.106   |
| P6KE100A/J  | 95   | 105  | 1                   | 85.5                                 | 5   | 4.4  | 137  | 0.106   |
| P6KE110/J   | 99   | 121  | 1                   | 89.2                                 | 5   | 3.8  | 158  | 0.107   |
| P6KE110A/J  | 105  | 116  | 1                   | 94                                   | 5   | 3.9  | 152  | 0.107   |
| P6KE120/J   | 108  | 132  | 1                   | 97.2                                 | 5   | 3.5  | 173  | 0.107   |
| P6KE120A/J  | 114  | 126  | 1                   | 102                                  | 5   | 3.6  | 165  | 0.107   |
| P6KE130/J   | 117  | 143  | 1                   | 105                                  | 5   | 3.2  | 187  | 0.107   |
| P6KE130A/J  | 124  | 137  | 1                   | 111                                  | 5   | 3.4  | 179  | 0.107   |
| P6KE150/J   | 135  | 165  | 1                   | 121                                  | 5   | 2.8  | 215  | 0.108   |
| P6KE150A/J  | 143  | 158  | 1                   | 128                                  | 5   | 2.9  | 207  | 0.108   |
| P6KE160/J   | 144  | 176  | 1                   | 130                                  | 5   | 2.6  | 230  | 0.108   |
| P6KE160A/J  | 152  | 168  | 1                   | 136                                  | 5   | 2.7  | 219  | 0.108   |
| P6KE170/J   | 153  | 187  | 1                   | 138                                  | 5   | 2.5  | 244  | 0.108   |
| P6KE170A/J  | 162  | 179  | 1                   | 145                                  | 5   | 2.6  | 234  | 0.108   |
| P6KE180/J   | 162  | 198  | 1                   | 146                                  | 5   | 2.3  | 258  | 0.108   |
| P6KE180A/J  | 171  | 189  | 1                   | 154                                  | 5   | 2.4  | 246  | 0.108   |
| P6KE200/J   | 180  | 220  | 1                   | 162                                  | 5   | 2.1  | 287  | 0.108   |
| P6KE200A/J  | 190  | 210  | 1                   | 171                                  | 5   | 2.2  | 274  | 0.108   |
| P6KE220/J   | 198  | 242  | 1                   | 175                                  | 5   | 1.7  | 344  | 0.108   |
| P6KE220A/J  | /209   | 231  | 1                   | 185                                  | 5   | 1.8  | 328  | 0.108   |
| P6KE250/J   | 225  | 275  | 1                   | 202                                  | 5   | 1.7  | 360  | 0.11  |
| P6KE250A/J  | 237  | 263  | 1                   | 214                                  | 5   | 1.7  | 344  | 0.11  |
| P6KE300/J   | 270  | 330  | 1                   | 243                                  | 5   | 1.4  | 430  | 0.11  |
| P6KE300A/J  | 285  | 315  | 1                   | 256                                  | 5   | 1.4  | 414  | 0.11  |
| P6KE350/J   | 315  | 385  | 1                   | 284                                  | 5   | 1.2  | 504  | 0.11  |
| P6KE350A/J  | 332  | 368  | 1                   | 300                                  | 5   | 1.2  | 482  | 0.11  |
| P6KE400/J   | 360  | 440  | 1                   | 324                                  | 5   | 1.0  | 571  | 0.11  |
| P6KE400A/J  | 380  | 420  | 1                   | 342                                  | 5   | 1.1  | 548  | 0.11  |
| P6KE440/J   | 396  | 484  | 1                   | 356                                  | 5   | 0.95   | 631  | 0.11  |
| P6KE440A/J  | 418  | 462  | 1                   | 376                                  | 5   | 1.0  | 602  | 0.11  |

**Notes:**

- (1) V<sub>BR</sub> measured after I<sub>r</sub> applied for 300ms I<sub>r</sub> =square wave pulse or equivalent
- (2) Surge current waveform per Figure 3 and derate per Fig.2
- (3) For bidirectional type having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled



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## RATING AND CHARACTERISTIC CURVES P6KE6.8/J THRU P6KE440CA/J

FIG.1- PEAK PULSE POWER RATING CURVE

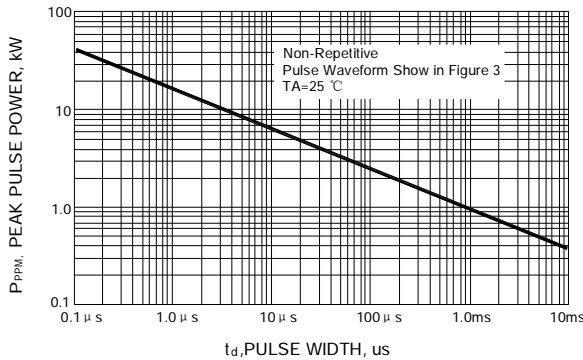


FIG.2- PULSE DERATING CURVE

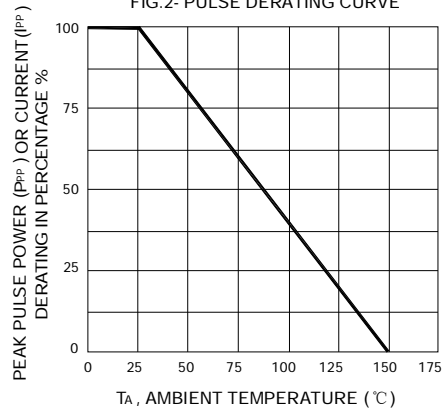


FIG.3- PULSE WAVEFORM

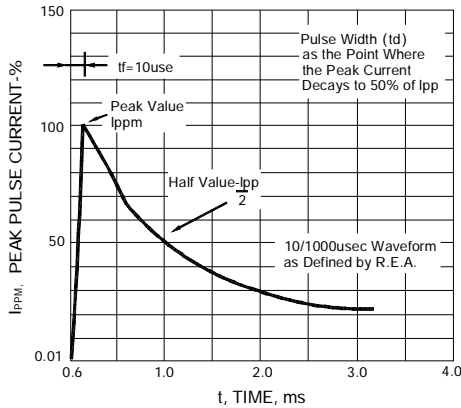


FIG.4- STEADY STATE POWER DERATING CURVE

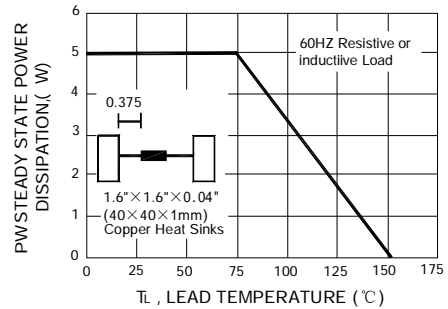


FIG.5- TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

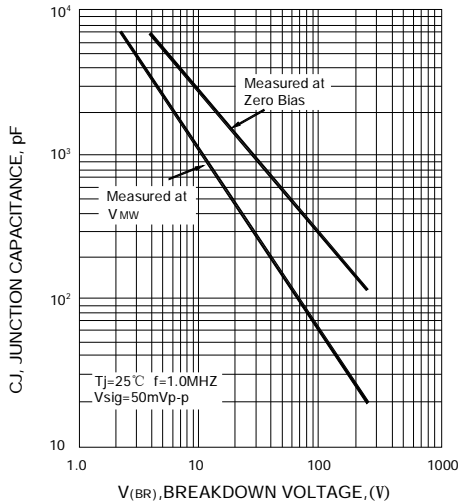


FIG.6- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

