



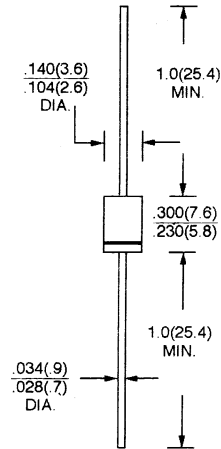
# P6KE SERIES

## TRANSIENT VOLTAGE SUPPRESSORS DIODE

### VOLTAGE RANGE

6.8 to 400 Volts  
400 Watts Peak Power

### DO-15



Dimensions in inches and (millimeters)

### FEATURES

- \* Plastic package has underwriters laboratory flammability classifications 94V-0
- \* 600W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time: typically less than 1.0ps from 0 volts to BV min
- \* Typical IR less than 1 $\mu$ A above 10V

### MECHANICAL DATA

- \* Case: Molded plastic
- \* Terminals: Axial leads, solderable per MIL - STD - 202, Method 208
- \* Polarity: Color band denotes cathode Bidirectional not mark.
- \* Weight: 0.34 ounce (0.3 grams)

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified.  
Single phase, half wave, 60 Hz, resistive or inductive load.  
For capacitive load, derate current by 20%

| TYPE NUMBER   | SYMBOLS        | VALUE       | UNITS            |
|---|----------------|-------------|------------------|
| Peak Power Dissipation at $T_A = 25^\circ\text{C}$ , $T_P = 1\text{ms}$ (Note 1)                            | $P_{PPM}$      | Minimum 600 | Watt             |
| Steady State Power Dissipation at $T_L = 75^\circ\text{C}$<br>Lead Lengths: .375", 9.5mm (Note 2)           | $P_D$          | 5.0         | Watt             |
| Peak Forward surge Current, 8.3 ms single half Sine-Wave Superimposed on Rated Load (JEDEC method) (Note 3) | $I_{FSM}$      | 100.0       | Amp              |
| Maximum instantaneous forward voltage at 50A for unidirectional only. (Note 4)                              | $V_F$          | 3.5/5.0     | Volt             |
| Operating and Storage Temperature Range   | $T_J, T_{STG}$ | -65 to +150 | $^\circ\text{C}$ |

#### NOTE:

- (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 1.6 x 1.6" (40 x 40mm) Per fig 5.
- (3) 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per Minutes maximum.
- (4)  $V_F = 3.5\text{V}$  Max. for Devices of  $V_{(BR)} \leq 200\text{V}$  and  $V_F = 5.0\text{V}$  Max. for Devices  $V_{BR} > 200\text{V}$ .

#### DEVICES FOR BIPOLAR APPLICATIONS

- (1) For Bidirectional use C or CA Suffix for types P6KE6.8 thru types P6KE400
- (2) Electrical characteristics apply in both directions

## RATINGS AND CHARACTERISTIC CURVES (P6KE SERIES)

FIGURE 1 – PEAK PULSE POWER RATING CURVE

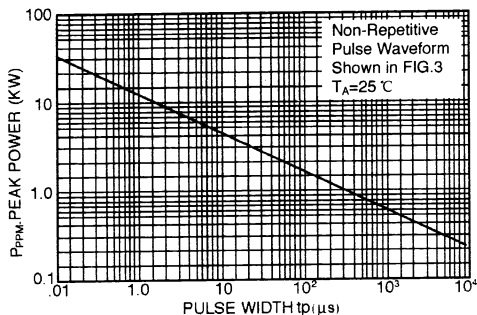


FIGURE 2 – PULSE DERATING CURVE

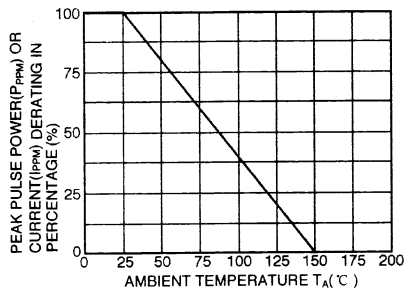


FIGURE 3 – PULSE WAVEFORM

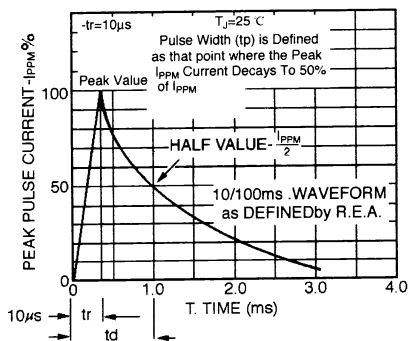


FIGURE 4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

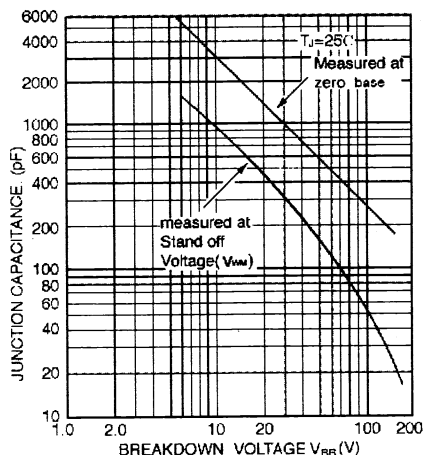


FIGURE 5 – STEADY STATE POWER DERATING CURVE

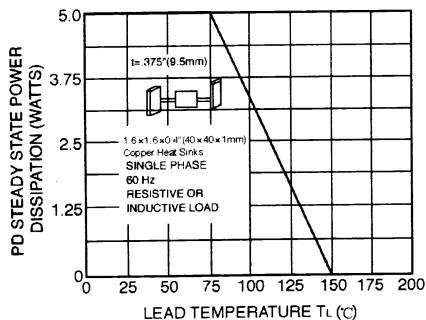
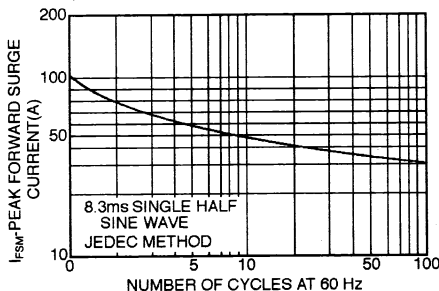


FIGURE 6 – MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT – UNIDIRECTIONAL ONLY



# ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Device   | Nominal Voltage (Volts) | Breakdown Voltage  |      | I <sub>T</sub> (mA) | stand - off Voltage V <sub>WM</sub> (V) (Volts) | Maximum Reverse Leakage @ V <sub>WM</sub> I <sub>D</sub> ( $\mu$ A) | Maximum Reverse Surge Current I <sub>PPM</sub> (NOTE2) (A) | Maximum Reverse Voltage @ I <sub>PPM</sub> (Clamping Voltage) V <sub>C</sub> (V) | Maximum Temperature Coefficient of V(BR) (%/°C) |
|----------|-------------------------|--------------------|------|---------------------|---|---|--|--|---|
|          |                         | V(BR) (V) (Note 1) |      |                     |   |   |  |  |   |
|          |                         | Min                | Max  |                     |   |   |  |  |   |
| P6KE6.8  | 6.8                     | 6.12               | 7.48 | 10                  | 5.50  | 1000  | 56   | 10.8   | 0.057   |
| P6KE6.8A | 6.8                     | 6.45               | 7.14 | 10                  | 5.80  | 1000  | 57   | 10.5   | 0.057   |
| P6KE7.5  | 7.5                     | 6.75               | 8.25 | 1.0                 | 6.05  | 500   | 51   | 11.7   | 0.061   |
| P6KE7.5A | 7.5                     | 7.13               | 7.88 | 1.0                 | 6.40  | 500   | 53   | 11.3   | 0.061   |
| P6KE8.2  | 8.2                     | 7.38               | 9.02 | 1.0                 | 6.63  | 200   | 48   | 12.5   | 0.065   |
| P6KE8.2A | 8.2                     | 7.79               | 8.61 | 1.0                 | 7.02  | 200   | 50   | 12.1   | 0.065   |
| P6KE9.1  | 9.1                     | 8.19               | 10.0 | 1.0                 | 7.37  | 50  | 44   | 13.8   | 0.068   |
| P6KE9.1A | 9.1                     | 8.65               | 9.55 | 1.0                 | 7.78  | 50  | 45   | 13.4   | 0.068   |
| P6KE10   | 10                      | 9.00               | 11.0 | 1.0                 | 8.10  | 10  | 40   | 15.0   | 0.073   |
| P6KE10A  | 10                      | 9.50               | 10.5 | 1.0                 | 8.55  | 10  | 41   | 14.5   | 0.073   |
| P6KE11   | 11                      | 9.90               | 12.1 | 1.0                 | 8.92  | 5.0   | 37   | 16.2   | 0.075   |
| P6KE11A  | 11                      | 10.5               | 11.6 | 1.0                 | 9.40  | 5.0   | 38   | 15.6   | 0.075   |
| P6KE12   | 12                      | 10.8               | 13.2 | 1.0                 | 9.72  | 5.0   | 35   | 17.3   | 0.076   |
| P6KE12A  | 12                      | 11.4               | 12.6 | 1.0                 | 10.2  | 5.0   | 36   | 16.7   | 0.078   |
| P6KE13   | 13                      | 11.7               | 14.3 | 1.0                 | 10.5  | 5.0   | 32   | 19.0   | 0.081   |
| P6KE13A  | 13                      | 12.4               | 13.7 | 1.0                 | 11.1  | 5.0   | 33   | 18.2   | 0.081   |
| P6KE15   | 15                      | 13.5               | 16.5 | 1.0                 | 12.1  | 5.0   | 27   | 22.0   | 0.084   |
| P6KE15A  | 15                      | 14.3               | 15.8 | 1.0                 | 12.8  | 5.0   | 28   | 21.2   | 0.084   |
| P6KE16   | 16                      | 14.4               | 17.6 | 1.0                 | 12.9  | 5.0   | 26   | 23.5   | 0.086   |
| P6KE16A  | 16                      | 15.2               | 16.8 | 1.0                 | 13.6  | 5.0   | 27   | 22.5   | 0.086   |
| P6KE18   | 18                      | 16.2               | 19.8 | 1.0                 | 14.5  | 5.0   | 23   | 26.5   | 0.088   |
| P6KE18A  | 18                      | 17.1               | 18.9 | 1.0                 | 15.3  | 5.0   | 24   | 25.2   | 0.088   |
| P6KE20   | 20                      | 18.0               | 22.0 | 1.0                 | 16.2  | 5.0   | 21   | 29.1   | 0.090   |
| P6KE20A  | 20                      | 19.0               | 21.0 | 1.0                 | 17.1  | 5.0   | 22   | 27.7   | 0.090   |
| P6KE22   | 22                      | 19.8               | 24.2 | 1.0                 | 17.8  | 5.0   | 19   | 31.9   | 0.092   |
| P6KE22A  | 22                      | 20.9               | 23.1 | 1.0                 | 18.8  | 5.0   | 20   | 30.6   | 0.092   |
| P6KE24   | 24                      | 21.6               | 26.4 | 1.0                 | 19.4  | 5.0   | 17   | 34.7   | 0.094   |
| P6KE24A  | 24                      | 22.8               | 25.2 | 1.0                 | 20.5  | 5.0   | 18   | 33.2   | 0.094   |
| P6KE27   | 27                      | 24.3               | 29.7 | 1.0                 | 21.8  | 5.0   | 15   | 39.1   | 0.096   |
| P6KE27A  | 27                      | 25.7               | 28.4 | 1.0                 | 23.1  | 5.0   | 16   | 37.5   | 0.096   |
| P6KE30   | 30                      | 27.0               | 33.0 | 1.0                 | 24.3  | 5.0   | 14   | 43.5   | 0.097   |
| P6KE30A  | 30                      | 28.5               | 31.5 | 1.0                 | 25.6  | 5.0   | 14.4   | 41.4   | 0.097   |
| P6KE33   | 33                      | 29.7               | 36.3 | 1.0                 | 26.8  | 5.0   | 12.6   | 47.7   | 0.098   |
| P6KE33A  | 33                      | 31.4               | 34.7 | 1.0                 | 28.2  | 5.0   | 13.2   | 45.7   | 0.098   |
| P6KE36   | 36                      | 32.4               | 39.6 | 1.0                 | 29.1  | 5.0   | 11.6   | 52.0   | 0.099   |
| P6KE36A  | 36                      | 34.2               | 37.8 | 1.0                 | 30.8  | 5.0   | 12   | 49.9   | 0.099   |
| P6KE39   | 39                      | 35.1               | 42.9 | 1.0                 | 31.6  | 5.0   | 10.6   | 56.4   | 0.100   |
| P6KE39A  | 39                      | 37.1               | 41.0 | 1.0                 | 33.3  | 5.0   | 11.2   | 53.9   | 0.100   |
| P6KE43   | 43                      | 38.7               | 47.3 | 1.0                 | 34.8  | 5.0   | 9.6  | 61.9   | 0.101   |
| P6KE43A  | 43                      | 40.9               | 45.2 | 1.0                 | 36.8  | 5.0   | 10.1   | 59.3   | 0.101   |
| P6KE47   | 47                      | 42.3               | 51.7 | 1.0                 | 38.1  | 5.0   | 8.9  | 67.8   | 0.101   |
| P6KE47A  | 47                      | 44.7               | 49.4 | 1.0                 | 40.2  | 5.0   | 9.3  | 64.8   | 0.101   |
| P6KE51   | 51                      | 45.9               | 56.1 | 1.0                 | 41.3  | 5.0   | 8.2  | 73.5   | 0.102   |

| Device   | Nominal Voltage (Volts) | Breakdown Voltage     |       | $I_T$ (mA) | stand - off Voltage $V_{WM}$ (V) (Volts) | Maximum Reverse Leakage @ $V_{WM}$ $I_D$ ( $\mu$ A) | Maximum Reverse Surge Current IPPM (NOTE2) (A) | Maximum Reverse Voltage @ IPPM (Clamping Voltage) $V_C$ (V) | Maximum Temperature Coefficient of $V_{BR}$ (%/°C) |
|----------|-------------------------|-----------------------|-------|------------|--|---|--|---|--|
|          |                         | $V_{BR}$ (V) (Note 1) |       |            |  |   |  |   |  |
|          |                         | Min                   | Max   |            |  |   |  |   |  |
| P6KE51A  | 51                      | 48.5                  | 53.6  | 1.0        | 43.6                                     | 5.0   | 8.6  | 70.1  | 0.102  |
| P6KE56   | 56                      | 50.4                  | 61.6  | 1.0        | 45.4                                     | 5.0   | 7.4  | 80.5  | 0.103  |
| P6KE56A  | 56                      | 53.2                  | 58.8  | 1.0        | 47.8                                     | 5.0   | 7.8  | 77.0  | 0.103  |
| P6KE62   | 62                      | 55.8                  | 68.2  | 1.0        | 50.2                                     | 5.0   | 6.8  | 89.0  | 0.104  |
| P6KE62A  | 62                      | 58.9                  | 65.1  | 1.0        | 53.0                                     | 5.0   | 7.1  | 85.0  | 0.104  |
| P6KE68   | 68                      | 61.2                  | 74.8  | 1.0        | 55.1                                     | 5.0   | 6.1  | 96.0  | 0.104  |
| P6KE68A  | 68                      | 64.6                  | 71.4  | 1.0        | 58.1                                     | 5.0   | 6.5  | 92.0  | 0.104  |
| P6KE75   | 75                      | 67.5                  | 82.5  | 1.0        | 60.7                                     | 5.0   | 5.5  | 108.0   | 0.105  |
| 5P6KE75A | 75                      | 71.3                  | 78.8  | 1.0        | 64.1                                     | 5.0   | 5.8  | 103.0   | 0.105  |
| P6KE82   | 82                      | 73.8                  | 90.2  | 1.0        | 66.4                                     | 5.0   | 5.1  | 118.0   | 0.105  |
| P6KE82A  | 82                      | 77.9                  | 86.1  | 1.0        | 70.1                                     | 5.0   | 5.3  | 113.0   | 0.105  |
| P6KE91   | 91                      | 81.9                  | 100.0 | 1.0        | 73.7                                     | 5.0   | 4.8  | 131.8   | 0.106  |
| P6KE91A  | 91                      | 86.5                  | 95.50 | 1.0        | 77.8                                     | 5.0   | 4.2  | 125.0   | 0.106  |
| P6KE100  | 100                     | 90.0                  | 110.0 | 1.0        | 81.0                                     | 5.0   | 4.8  | 144.0   | 0.106  |
| P6KE100A | 100                     | 95.0                  | 105.0 | 1.0        | 85.5                                     | 5.0   | 4.4  | 137.0   | 0.106  |
| P6KE110  | 110                     | 99.0                  | 121.0 | 1.0        | 89.2                                     | 5.0   | 3.8  | 158.0   | 0.107  |
| P6KE110A | 110                     | 105.0                 | 116.0 | 1.0        | 94.0                                     | 5.0   | 4.0  | 152.0   | 0.107  |
| P6KE120  | 120                     | 108.0                 | 132.0 | 1.0        | 97.2                                     | 5.0   | 3.5  | 173.0   | 0.107  |
| P6KE120A | 120                     | 114.0                 | 126.0 | 1.0        | 102.0                                    | 5.0   | 3.6  | 165.0   | 0.107  |
| P6KE130  | 130                     | 117.0                 | 143.0 | 1.0        | 105.0                                    | 5.0   | 3.2  | 187.0   | 0.107  |
| P6KE130A | 130                     | 124.0                 | 137.0 | 1.0        | 111.0                                    | 5.0   | 3.3  | 179.0   | 0.107  |
| P6KE150  | 150                     | 135.0                 | 165.0 | 1.0        | 121.0                                    | 5.0   | 2.8  | 215.0   | 0.108  |
| P6KE150A | 150                     | 143.0                 | 158.0 | 1.0        | 128.0                                    | 5.0   | 2.9  | 207.0   | 0.108  |
| P6KE160  | 160                     | 144.0                 | 176.0 | 1.0        | 130.0                                    | 5.0   | 2.6  | 230.0   | 0.108  |
| P6KE160A | 160                     | 152.0                 | 168.0 | 1.0        | 136.0                                    | 5.0   | 2.7  | 219.9   | 0.108  |
| P6KE170  | 170                     | 153.0                 | 187.0 | 1.0        | 138.0                                    | 5.0   | 2.5  | 244.0   | 0.108  |
| P6KE170A | 170                     | 162.0                 | 179.0 | 1.0        | 145.0                                    | 5.0   | 2.6  | 234.0   | 0.108  |
| P6KE180  | 180                     | 162.0                 | 198.0 | 1.0        | 146.0                                    | 5.0   | 2.3  | 258.0   | 0.108  |
| P6KE180A | 180                     | 171.0                 | 189.0 | 1.0        | 154.0                                    | 5.0   | 2.4  | 246.0   | 0.108  |
| P6KE200  | 200                     | 180.0                 | 220.0 | 1.0        | 162.0                                    | 5.0   | 2.1  | 287.0   | 0.108  |
| P6KE200A | 200                     | 190.0                 | 210.0 | 1.0        | 171.0                                    | 5.0   | 2.2  | 274.0   | 0.108  |
| P6KE220  | 220                     | 198.0                 | 242.0 | 1.0        | 175.0                                    | 5.0   | 1.7  | 344.0   | 0.109  |
| P6KE220A | 220                     | 209.0                 | 231.0 | 1.0        | 185.0                                    | 5.0   | 1.8  | 328.0   | 0.109  |
| P6KE250  | 250                     | 225.0                 | 275.0 | 1.0        | 202.0                                    | 5.0   | 1.6  | 360.0   | 0.109  |
| P6KE250A | 250                     | 237.0                 | 263.0 | 1.0        | 214.0                                    | 5.0   | 1.7  | 344.0   | 0.109  |
| P6KE300  | 300                     | 270.0                 | 330.3 | 1.0        | 243.0                                    | 5.0   | 1.4  | 430.0   | 0.109  |
| P6KE300A | 300                     | 285.0                 | 315.0 | 1.0        | 256.0                                    | 5.0   | 1.45   | 414.0   | 0.109  |
| P6KE350  | 350                     | 315.0                 | 385.0 | 1.0        | 284.0                                    | 5.0   | 1.2  | 504.0   | 0.110  |
| P6KE350A | 350                     | 332.0                 | 368.0 | 1.0        | 300.0                                    | 5.0   | 1.25   | 482.0   | 0.110  |
| P6KE400  | 400                     | 360.0                 | 440.0 | 1.0        | 324.0                                    | 5.0   | 1.05   | 574.0   | 0.111  |
| P6KE400A | 400                     | 380.0                 | 420.0 | 1.0        | 342.0                                    | 5.0   | 1.09   | 548.0   | 0.111  |

NOTES:

1.  $V_{BR}$  Measured after  $I_T$  applied for 300us.  $I_T$  = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derate per Figure 2.
3. For Bipolar types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled.