

## Electrical Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Device type | Breakdown voltage<br>$V_{(BR)}$<br>(Volts) <sup>(1)</sup> |      | Test<br>current<br>at $I_T$<br>(mA) | Stand-off<br>voltage<br>$V_{WM}$<br>(Volts) | Maximum<br>reverse<br>leakage<br>at $V_{WM}$<br>$I_D^{(2)}$<br>( $\mu$ A) | Maximum<br>peak pulse<br>current<br>$I_{PPM}^{(2)}$<br>(A) | Maximum<br>clamping<br>voltage at<br>$I_{PPM}$<br>$V_C$ (Volts) | Maximum<br>temperature<br>coefficient<br>of $V_{(BR)}$<br>(% / °C) |
|-------------|-----------------------------------------------------------|------|-------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------|
|             | Min.                                                      | Max. |                                     |                                             |                                                                           |                                                            |                                                                 |                                                                    |
| 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      | 9.00                                                      | 11.0 | 1.0                                 | 8.10                                        | 10                                                                        | 40.0                                                       | 15.0                                                            | 0.073                                                              |
| P6KE10A     | 9.50                                                      | 10.5 | 1.0                                 | 8.55                                        | 10                                                                        | 41.4                                                       | 14.5                                                            | 0.073                                                              |
| P6KE11      | 9.90                                                      | 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                                                            | 0.076                                                              |
| 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                                        | 1.0                                                                       | 27.3                                                       | 22.0                                                            | 0.084                                                              |
| P6KE15A     | 14.3                                                      | 15.8 | 1.0                                 | 12.8                                        | 1.0                                                                       | 28.3                                                       | 21.2                                                            | 0.084                                                              |
| P6KE16      | 14.4                                                      | 17.6 | 1.0                                 | 12.9                                        | 1.0                                                                       | 25.5                                                       | 23.5                                                            | 0.086                                                              |
| P6KE16A     | 15.2                                                      | 16.8 | 1.0                                 | 13.6                                        | 1.0                                                                       | 26.7                                                       | 22.5                                                            | 0.086                                                              |
| P6KE18      | 16.2                                                      | 19.8 | 1.0                                 | 14.5                                        | 1.0                                                                       | 22.6                                                       | 26.5                                                            | 0.088                                                              |
| P6KE18A     | 17.1                                                      | 18.9 | 1.0                                 | 15.3                                        | 1.0                                                                       | 23.8                                                       | 25.2                                                            | 0.088                                                              |
| P6KE20      | 18.0                                                      | 22.0 | 1.0                                 | 16.2                                        | 1.0                                                                       | 20.6                                                       | 29.1                                                            | 0.090                                                              |
| P6KE20A     | 19.0                                                      | 21.0 | 1.0                                 | 17.1                                        | 1.0                                                                       | 21.7                                                       | 27.7                                                            | 0.090                                                              |
| P6KE22      | 19.8                                                      | 24.2 | 1.0                                 | 17.8                                        | 1.0                                                                       | 18.8                                                       | 31.9                                                            | 0.092                                                              |
| P6KE22A     | 20.9                                                      | 23.1 | 1.0                                 | 18.8                                        | 1.0                                                                       | 19.6                                                       | 30.6                                                            | 0.092                                                              |
| P6KE24      | 21.6                                                      | 26.4 | 1.0                                 | 19.4                                        | 1.0                                                                       | 17.3                                                       | 34.7                                                            | 0.094                                                              |
| P6KE24A     | 22.8                                                      | 25.2 | 1.0                                 | 20.5                                        | 1.0                                                                       | 18.1                                                       | 33.2                                                            | 0.094                                                              |
| P6KE27      | 24.3                                                      | 29.7 | 1.0                                 | 21.8                                        | 1.0                                                                       | 15.3                                                       | 39.1                                                            | 0.096                                                              |
| P6KE27A     | 25.7                                                      | 28.4 | 1.0                                 | 23.1                                        | 1.0                                                                       | 16.0                                                       | 37.5                                                            | 0.096                                                              |
| P6KE30      | 27.0                                                      | 33.0 | 1.0                                 | 24.3                                        | 1.0                                                                       | 13.8                                                       | 43.5                                                            | 0.097                                                              |
| P6KE30A     | 28.5                                                      | 31.5 | 1.0                                 | 25.6                                        | 1.0                                                                       | 14.5                                                       | 41.4                                                            | 0.097                                                              |
| P6KE33      | 29.7                                                      | 36.3 | 1.0                                 | 26.8                                        | 1.0                                                                       | 12.6                                                       | 47.7                                                            | 0.098                                                              |
| P6KE33A     | 31.4                                                      | 34.7 | 1.0                                 | 28.2                                        | 1.0                                                                       | 13.1                                                       | 45.7                                                            | 0.098                                                              |
| P6KE36      | 32.4                                                      | 39.6 | 1.0                                 | 29.1                                        | 1.0                                                                       | 11.5                                                       | 52.0                                                            | 0.099                                                              |
| P6KE36A     | 34.2                                                      | 37.8 | 1.0                                 | 30.8                                        | 1.0                                                                       | 12.0                                                       | 49.9                                                            | 0.099                                                              |
| P6KE39      | 35.1                                                      | 42.9 | 1.0                                 | 31.6                                        | 1.0                                                                       | 10.6                                                       | 56.4                                                            | 0.100                                                              |
| P6KE39A     | 37.1                                                      | 41.0 | 1.0                                 | 33.3                                        | 1.0                                                                       | 11.1                                                       | 53.9                                                            | 0.100                                                              |
| P6KE43      | 38.7                                                      | 47.3 | 1.0                                 | 34.8                                        | 1.0                                                                       | 9.7                                                        | 61.9                                                            | 0.101                                                              |
| P6KE43A     | 40.9                                                      | 45.2 | 1.0                                 | 36.8                                        | 1.0                                                                       | 10.1                                                       | 59.3                                                            | 0.101                                                              |
| P6KE47      | 42.3                                                      | 51.7 | 1.0                                 | 38.1                                        | 1.0                                                                       | 8.8                                                        | 67.8                                                            | 0.101                                                              |
| P6KE47A     | 44.7                                                      | 49.4 | 1.0                                 | 40.2                                        | 1.0                                                                       | 9.3                                                        | 64.8                                                            | 0.101                                                              |
| P6KE51      | 45.9                                                      | 56.1 | 1.0                                 | 41.3                                        | 1.0                                                                       | 8.2                                                        | 73.5                                                            | 0.102                                                              |
| P6KE51A     | 48.5                                                      | 53.6 | 1.0                                 | 43.6                                        | 1.0                                                                       | 8.6                                                        | 70.1                                                            | 0.102                                                              |
| P6KE56      | 50.4                                                      | 61.6 | 1.0                                 | 45.4                                        | 1.0                                                                       | 7.5                                                        | 80.5                                                            | 0.103                                                              |
| P6KE56A     | 53.2                                                      | 58.8 | 1.0                                 | 47.8                                        | 1.0                                                                       | 7.8                                                        | 77.0                                                            | 0.103                                                              |

## Electrical Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Device type | Breakdown voltage<br>$V_{(BR)}^{(1)}$<br>(Volts) |       | Test<br>current<br>at $I_T$<br>(mA) | Stand-off<br>voltage<br>$V_{WM}$<br>(Volts) | Maximum<br>reverse<br>leakage<br>at $V_{WM}$<br>$I_{VR}$ <sup>(3)</sup><br>( $\mu$ A) | Maximum<br>peak pulse<br>current<br>$I_{PPM}^{(2)}$<br>(A) | Maximum<br>clamping<br>voltage at<br>$I_{PPM}$<br>$V_C$ (Volts) | Maximum<br>temperature<br>coefficient<br>of $V_{(BR)}$<br>(% / °C) |
|-------------|--------------------------------------------------|-------|-------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------|
|             | Min.                                             | Max.  |                                     |                                             |                                                                                       |                                                            |                                                                 |                                                                    |
| P6KE62      | 55.8                                             | 68.2  | 1.0                                 | 50.2                                        | 1.0                                                                                   | 6.7                                                        | 89.0                                                            | 0.104                                                              |
| P6KE62A     | 58.9                                             | 65.1  | 1.0                                 | 53.0                                        | 1.0                                                                                   | 7.1                                                        | 85.0                                                            | 0.104                                                              |
| P6KE68      | 61.2                                             | 74.8  | 1.0                                 | 55.1                                        | 1.0                                                                                   | 6.1                                                        | 98.0                                                            | 0.104                                                              |
| P6KE68A     | 64.6                                             | 71.4  | 1.0                                 | 58.1                                        | 1.0                                                                                   | 6.5                                                        | 92.0                                                            | 0.104                                                              |
| P6KE75      | 67.5                                             | 82.5  | 1.0                                 | 60.7                                        | 1.0                                                                                   | 5.6                                                        | 108                                                             | 0.105                                                              |
| P6KE75A     | 71.3                                             | 78.8  | 1.0                                 | 64.1                                        | 1.0                                                                                   | 5.8                                                        | 103                                                             | 0.105                                                              |
| P6KE82      | 73.8                                             | 90.2  | 1.0                                 | 66.4                                        | 1.0                                                                                   | 5.1                                                        | 118                                                             | 0.105                                                              |
| P6KE82A     | 77.9                                             | 86.1  | 1.0                                 | 70.1                                        | 1.0                                                                                   | 5.3                                                        | 113                                                             | 0.105                                                              |
| P6KE91      | 81.9                                             | 100   | 1.0                                 | 73.7                                        | 1.0                                                                                   | 4.6                                                        | 131                                                             | 0.106                                                              |
| P6KE91A     | 86.5                                             | 95.5  | 1.0                                 | 77.8                                        | 1.0                                                                                   | 4.8                                                        | 125                                                             | 0.106                                                              |
| P6KE100     | 90.0                                             | 110   | 1.0                                 | 81.0                                        | 1.0                                                                                   | 4.2                                                        | 144                                                             | 0.106                                                              |
| P6KE100A    | 95.0                                             | 105   | 1.0                                 | 85.5                                        | 1.0                                                                                   | 4.4                                                        | 137                                                             | 0.106                                                              |
| P6KE110     | 99.0                                             | 121   | 1.0                                 | 89.2                                        | 1.0                                                                                   | 3.8                                                        | 158                                                             | 0.107                                                              |
| P6KE110A    | 105                                              | 116   | 1.0                                 | 94.0                                        | 1.0                                                                                   | 3.9                                                        | 152                                                             | 0.107                                                              |
| P6KE120     | 108                                              | 132   | 1.0                                 | 97.2                                        | 1.0                                                                                   | 3.5                                                        | 173                                                             | 0.107                                                              |
| P6KE120A    | 114                                              | 126   | 1.0                                 | 102                                         | 1.0                                                                                   | 3.6                                                        | 165                                                             | 0.107                                                              |
| P6KE130     | 117                                              | 143   | 1.0                                 | 105                                         | 1.0                                                                                   | 3.2                                                        | 187                                                             | 0.107                                                              |
| P6KE130A    | 124                                              | 137   | 1.0                                 | 111                                         | 1.0                                                                                   | 3.4                                                        | 179                                                             | 0.107                                                              |
| P6KE150     | 135                                              | 165   | 1.0                                 | 121                                         | 1.0                                                                                   | 2.8                                                        | 215                                                             | 0.108                                                              |
| P6KE150A    | 143                                              | 158   | 1.0                                 | 128                                         | 1.0                                                                                   | 2.9                                                        | 207                                                             | 0.108                                                              |
| P6KE160     | 144                                              | 176   | 1.0                                 | 130                                         | 1.0                                                                                   | 2.6                                                        | 230                                                             | 0.108                                                              |
| P6KE160A    | 152                                              | 168   | 1.0                                 | 136                                         | 1.0                                                                                   | 2.7                                                        | 219                                                             | 0.108                                                              |
| P6KE170     | 153                                              | 187   | 1.0                                 | 138                                         | 1.0                                                                                   | 2.5                                                        | 244                                                             | 0.108                                                              |
| P6KE170A    | 162                                              | 179   | 1.0                                 | 145                                         | 1.0                                                                                   | 2.6                                                        | 234                                                             | 0.108                                                              |
| P6KE180     | 162                                              | 198   | 1.0                                 | 146                                         | 1.0                                                                                   | 2.3                                                        | 258                                                             | 0.108                                                              |
| P6KE180A    | 171                                              | 189   | 1.0                                 | 154                                         | 1.0                                                                                   | 2.4                                                        | 246                                                             | 0.108                                                              |
| P6KE200     | 180                                              | 220   | 1.0                                 | 162                                         | 1.0                                                                                   | 2.1                                                        | 287                                                             | 0.108                                                              |
| P6KE200A    | 190                                              | 210   | 1.0                                 | 171                                         | 1.0                                                                                   | 2.2                                                        | 274                                                             | 0.108                                                              |
| P6KE220     | 198                                              | 242   | 1.0                                 | 175                                         | 1.0                                                                                   | 1.7                                                        | 344                                                             | 0.108                                                              |
| P6KE220A    | 209                                              | 231   | 1.0                                 | 185                                         | 1.0                                                                                   | 1.8                                                        | 328                                                             | 0.108                                                              |
| P6KE250     | 225                                              | 275   | 1.0                                 | 202                                         | 1.0                                                                                   | 1.7                                                        | 360                                                             | 0.110                                                              |
| P6KE250A    | 237                                              | 263   | 1.0                                 | 214                                         | 1.0                                                                                   | 1.7                                                        | 344                                                             | 0.110                                                              |
| P6KE300     | 270                                              | 330   | 1.0                                 | 243                                         | 1.0                                                                                   | 1.4                                                        | 430                                                             | 0.110                                                              |
| P6KE300A    | 285                                              | 315   | 1.0                                 | 256                                         | 1.0                                                                                   | 1.4                                                        | 414                                                             | 0.110                                                              |
| P6KE350     | 315                                              | 385   | 1.0                                 | 284                                         | 1.0                                                                                   | 1.2                                                        | 504                                                             | 0.110                                                              |
| P6KE350A    | 333                                              | 368   | 1.0                                 | 300                                         | 1.0                                                                                   | 1.2                                                        | 482                                                             | 0.110                                                              |
| P6KE400     | 360                                              | 440   | 1.0                                 | 324                                         | 1.0                                                                                   | 1.0                                                        | 574                                                             | 0.110                                                              |
| P6KE400A    | 380                                              | 420   | 1.0                                 | 342                                         | 1.0                                                                                   | 1.1                                                        | 548                                                             | 0.110                                                              |
| P6KE440     | 396                                              | 484   | 1.0                                 | 356                                         | 1.0                                                                                   | 0.95                                                       | 631                                                             | 0.110                                                              |
| P6KE440A    | 418                                              | 462   | 1.0                                 | 376                                         | 1.0                                                                                   | 1.0                                                        | 602                                                             | 0.110                                                              |
| P6KE480A    | 456                                              | 504   | 1.0                                 | 408                                         | 1.0                                                                                   | 0.9                                                        | 658                                                             | 0.110                                                              |
| P6KE510A    | 485                                              | 535   | 1.0                                 | 434                                         | 1.0                                                                                   | 0.9                                                        | 698                                                             | 0.110                                                              |
| P6KE530A    | 503.5                                            | 556.5 | 1.0                                 | 450                                         | 1.0                                                                                   | 0.8                                                        | 725                                                             | 0.110                                                              |
| P6KE540A    | 513                                              | 567   | 1.0                                 | 459                                         | 1.0                                                                                   | 0.8                                                        | 740                                                             | 0.110                                                              |
| P6KE550A    | 522.5                                            | 577.5 | 1.0                                 | 467                                         | 1.0                                                                                   | 0.8                                                        | 760                                                             | 0.110                                                              |

- Notes:**
1.  $V_{(BR)}$  measured after  $I_T$  applied for 300 $\mu$ s,  $I_T$ =square wave pulse or equivalent
  2. Surge current waveform per Fig. 3 and derate per Fig. 2
  3. For bidirectional types with  $V_{WM}$  of 10 volts and less, the  $I_{VR}$  limit is doubled
  4. All terms and symbols are consistent with ANSI/IEEE C62.35
  5. For parts without A, the  $V_{BR}$  is +10%

### Description:

This P6KE TVS series is a low cost commercial product for use in applications where large voltage transients can permanently damage voltage-sensitive components.

The P6KE series device types are designed in a small package size where power and space is a consideration. They are characterized by their high surge capability, extremely fast response time, and low impedance, (Ron). Because of the unpredictable nature of transients, and the variation of the impedance with respect to these transients, impedance, per se, is not specified as a parametric value. However, a minimum voltage at low current conditions (BV) and a maximum clamping voltage (Vc) at a maximum peak pulse current is specified.

In some instances, the thermal effect (see Vc Clamping Voltage) may be responsible for 50% to 70%. of the observed voltage differential when subjected to high current pulses for several duty cycles, thus making a maximum impedance specification insignificant.

In case of a severe current overload or abnormal transient beyond the maximum ratings, the Transient Voltage Suppressor will initially fail 'short' thus tripping the system's circuit breaker or fuse while protecting the entire circuit. Curves depicting clamping voltage vs. various current pulses are available from the factory.

Extended power curves vs. pulse time are also available.

## RATINGS AND CHARACTERISTIC CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

