



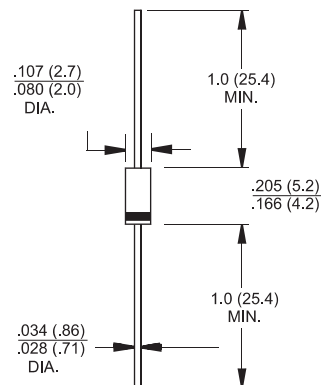
### Features

- ✧ 400W surge capability at 10 x 100us waveform, duty cycle: 0.01%
- ✧ Excellent clamping capability
- ✧ Low zener impedance
- ✧ Fast response time: Typically less than 1.0ps from 0 volts to VBR for unidirectional and 5.0 ns for bidirectional
- ✧ Typical  $I_R$  less than 1 uA above 10V
- ✧ High temperature soldering guaranteed: 260°C / 10 seconds / .375", (9.5mm) lead length / 5lbs., (2.3kg) tension

### Mechanical Data

- ✧ Case: Molded plastic
- ✧ Polarity: Color band denotes cathode except bipolar

### DO-41



Dimensions in inches and (millimeters)

### 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                                                                                                 | Symbol         | Value        | Units |
|-------------------------------------------------------------------------------------------------------------|----------------|--------------|-------|
| Peak Power Dissipation at $T_A=25^{\circ}\text{C}$ , $T_p=1\text{ms}$ (Note 1)                              | $P_{PK}$       | Minimum 400  | Watts |
| Steady State Power Dissipation at $T_L=75^{\circ}\text{C}$ Lead Lengths .375", 9.5mm (Note 2)               | $P_D$          | 1.0          | Watts |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) (Note 3) | $I_{FSM}$      | 40           | Amps  |
| Maximum Instantaneous Forward Voltage at 25.0A for Unidirectional Only (Note 4)                             | $V_F$          | 3.5 / 5.0    | Volts |
| Operating and Storage Temperature Range                                                                     | $T_J, T_{STG}$ | -55 to + 150 | °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 x 1.6" (40 x 40 mm) Per Fig. 4.
  3. 8.3ms Single Half Sine-wave or Equivalent Square Wave, Duty Cycle=4 Pulses Per Minutes Maximum.
  4.  $V_F=3.5\text{V}$  for Devices of  $V_{BR} \leq 200\text{V}$  and  $V_F=6.5\text{V}$  Max. for Devices  $V_{BR}>200\text{V}$

Devices for Bipolar Applications

1. For Bidirectional Use C or CA Suffix for Types P4KE6.8 thru Types P4KE440.
2. Electrical Characteristics Apply in Both Directions.



# P4KE SERIES

## 400 Watts Transient Voltage Suppressor Diodes

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

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub> |         |                     | Maximum<br>Reverse<br>Leakage I <sub>R</sub><br>@V <sub>RWM</sub><br>(uA) | Working<br>Peak Reverse<br>Voltage<br>V <sub>RWM</sub><br>(V) | Maximum<br>Reverse<br>Surge<br>Current I <sub>PP</sub><br>(A) | Maximum<br>Clamping<br>Voltage V <sub>C</sub><br>@I <sub>PP</sub><br>(V) |
|----------------------|---------------------|---------------------------------------------------|---------|---------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
|                      |                     | Min (V)                                           | Max (V) | I <sub>T</sub> (mA) |                                                                           |                                                               |                                                               |                                                                          |
| P4KE6.8              | P4KE6.8C            | 6.12                                              | 7.48    | 10                  | 1000                                                                      | 5.5                                                           | 37.04                                                         | 10.8                                                                     |
| P4KE6.8A             | P4KE6.8CA           | 6.46                                              | 7.14    | 10                  | 1000                                                                      | 5.8                                                           | 38.10                                                         | 10.5                                                                     |
| P4KE7.5              | P4KE7.5C            | 6.75                                              | 8.25    | 10                  | 500                                                                       | 6.1                                                           | 34.19                                                         | 11.7                                                                     |
| P4KE7.5A             | P4KE7.5CA           | 7.13                                              | 7.88    | 10                  | 500                                                                       | 6.4                                                           | 35.40                                                         | 11.3                                                                     |
| P4KE8.2              | P4KE8.2C            | 7.38                                              | 9.02    | 10                  | 200                                                                       | 6.6                                                           | 32.00                                                         | 12.5                                                                     |
| P4KE8.2A             | P4KE8.2CA           | 7.79                                              | 8.61    | 10                  | 200                                                                       | 7.0                                                           | 33.06                                                         | 12.1                                                                     |
| P4KE9.1              | P4KE9.1C            | 8.19                                              | 10.01   | 1                   | 50                                                                        | 7.4                                                           | 28.99                                                         | 13.8                                                                     |
| P4KE9.1A             | P4KE9.1CA           | 8.65                                              | 9.56    | 1                   | 50                                                                        | 7.8                                                           | 29.85                                                         | 13.4                                                                     |
| P4KE10               | P4KE10C             | 9.00                                              | 11.00   | 1                   | 10                                                                        | 8.1                                                           | 26.67                                                         | 15.0                                                                     |
| P4KE10A              | P4KE10CA            | 9.50                                              | 10.50   | 1                   | 10                                                                        | 8.6                                                           | 27.59                                                         | 14.5                                                                     |
| P4KE11               | P4KE11C             | 9.90                                              | 12.10   | 1                   | 5                                                                         | 8.9                                                           | 24.69                                                         | 16.2                                                                     |
| P4KE11A              | P4KE11CA            | 10.45                                             | 11.55   | 1                   | 5                                                                         | 9.4                                                           | 25.64                                                         | 15.6                                                                     |
| P4KE12               | P4KE12C             | 10.80                                             | 13.20   | 1                   | 5                                                                         | 9.7                                                           | 23.12                                                         | 17.3                                                                     |
| P4KE12A              | P4KE12CA            | 11.40                                             | 12.60   | 1                   | 5                                                                         | 10.2                                                          | 23.95                                                         | 16.7                                                                     |
| P4KE13               | P4KE13C             | 11.70                                             | 14.30   | 1                   | 1                                                                         | 10.5                                                          | 21.05                                                         | 19.0                                                                     |
| P4KE13A              | P4KE13CA            | 12.35                                             | 13.65   | 1                   | 1                                                                         | 11.1                                                          | 21.98                                                         | 18.2                                                                     |
| P4KE15               | P4KE15C             | 13.50                                             | 16.50   | 1                   | 1                                                                         | 12.1                                                          | 18.18                                                         | 22.0                                                                     |
| P4KE15A              | P4KE15CA            | 14.25                                             | 15.75   | 1                   | 1                                                                         | 12.8                                                          | 18.87                                                         | 21.2                                                                     |
| P4KE16               | P4KE16C             | 14.40                                             | 17.60   | 1                   | 1                                                                         | 12.9                                                          | 17.02                                                         | 23.5                                                                     |
| P4KE16A              | P4KE16CA            | 15.20                                             | 16.80   | 1                   | 1                                                                         | 13.6                                                          | 17.78                                                         | 22.5                                                                     |
| P4KE18               | P4KE18C             | 16.20                                             | 19.80   | 1                   | 1                                                                         | 14.5                                                          | 15.09                                                         | 26.5                                                                     |
| P4KE18A              | P4KE18CA            | 17.10                                             | 18.90   | 1                   | 1                                                                         | 15.3                                                          | 15.87                                                         | 25.2                                                                     |
| P4KE20               | P4KE20C             | 18.00                                             | 22.00   | 1                   | 1                                                                         | 16.2                                                          | 13.75                                                         | 29.1                                                                     |
| P4KE20A              | P4KE20CA            | 19.00                                             | 21.00   | 1                   | 1                                                                         | 17.1                                                          | 14.44                                                         | 27.7                                                                     |
| P4KE22               | P4KE22C             | 19.80                                             | 24.20   | 1                   | 1                                                                         | 17.8                                                          | 12.54                                                         | 31.9                                                                     |
| P4KE22A              | P4KE22CA            | 20.90                                             | 23.10   | 1                   | 1                                                                         | 18.8                                                          | 13.07                                                         | 30.6                                                                     |
| P4KE24               | P4KE24C             | 21.60                                             | 26.40   | 1                   | 1                                                                         | 19.4                                                          | 11.53                                                         | 34.7                                                                     |
| P4KE24A              | P4KE24CA            | 22.80                                             | 25.20   | 1                   | 1                                                                         | 20.5                                                          | 12.05                                                         | 33.2                                                                     |
| P4KE27               | P4KE27C             | 24.30                                             | 29.70   | 1                   | 1                                                                         | 21.8                                                          | 10.23                                                         | 39.1                                                                     |
| P4KE27A              | P4KE27CA            | 25.65                                             | 28.35   | 1                   | 1                                                                         | 23.1                                                          | 10.67                                                         | 37.5                                                                     |
| P4KE30               | P4KE30C             | 27.00                                             | 33.00   | 1                   | 1                                                                         | 24.3                                                          | 9.20                                                          | 43.5                                                                     |
| P4KE30A              | P4KE30CA            | 28.50                                             | 31.50   | 1                   | 1                                                                         | 25.6                                                          | 9.66                                                          | 41.4                                                                     |
| P4KE33               | P4KE33C             | 29.70                                             | 36.30   | 1                   | 1                                                                         | 26.8                                                          | 8.39                                                          | 47.7                                                                     |
| P4KE33A              | P4KE33CA            | 31.35                                             | 34.65   | 1                   | 1                                                                         | 28.2                                                          | 8.75                                                          | 45.7                                                                     |
| P4KE36               | P4KE36C             | 32.40                                             | 39.60   | 1                   | 1                                                                         | 29.1                                                          | 7.69                                                          | 52.0                                                                     |
| P4KE36A              | P4KE36CA            | 34.20                                             | 37.80   | 1                   | 1                                                                         | 30.8                                                          | 8.02                                                          | 49.9                                                                     |
| P4KE39               | P4KE39C             | 35.10                                             | 42.90   | 1                   | 1                                                                         | 31.6                                                          | 7.09                                                          | 56.4                                                                     |
| P4KE39A              | P4KE39CA            | 37.05                                             | 40.95   | 1                   | 1                                                                         | 33.3                                                          | 7.42                                                          | 53.9                                                                     |
| P4KE43               | P4KE43C             | 38.70                                             | 47.30   | 1                   | 1                                                                         | 34.8                                                          | 6.46                                                          | 61.9                                                                     |
| P4KE43A              | P4KE43CA            | 40.85                                             | 45.15   | 1                   | 1                                                                         | 36.8                                                          | 6.75                                                          | 59.3                                                                     |
| P4KE47               | P4KE47C             | 42.30                                             | 51.70   | 1                   | 1                                                                         | 38.1                                                          | 5.90                                                          | 67.8                                                                     |
| P4KE47A              | P4KE47CA            | 44.65                                             | 49.35   | 1                   | 1                                                                         | 40.2                                                          | 6.17                                                          | 64.8                                                                     |
| P4KE51               | P4KE51C             | 45.90                                             | 56.10   | 1                   | 1                                                                         | 41.3                                                          | 5.44                                                          | 73.5                                                                     |
| P4KE51A              | P4KE51CA            | 48.45                                             | 53.55   | 1                   | 1                                                                         | 43.6                                                          | 5.71                                                          | 70.1                                                                     |
| P4KE56               | P4KE56C             | 50.40                                             | 61.60   | 1                   | 1                                                                         | 45.4                                                          | 4.97                                                          | 80.5                                                                     |
| P4KE56A              | P4KE56CA            | 53.20                                             | 58.80   | 1                   | 1                                                                         | 47.8                                                          | 5.19                                                          | 77.0                                                                     |

#### Note:

1. Suffix 'A ' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA ' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V<sub>R</sub> of 10 volts and under, the I<sub>R</sub> limit is double



P4KE SERIES

400 Watts Transient Voltage Suppressor Diodes

Electrical Characteristics(T<sub>A</sub>=25℃ unless otherwise noted)

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub> |         |                     | Maximum<br>Reverse<br>Leakage I <sub>R</sub><br>@V <sub>RWM</sub><br>(uA) | Working<br>Peak Reverse<br>Voltage<br>V <sub>RWM</sub><br>(V) | Maximum<br>Reverse<br>Surge<br>Current I <sub>PP</sub><br>(A) | Maximum<br>Clamping<br>Voltage V <sub>C</sub><br>@I <sub>PP</sub><br>(V) |
|----------------------|---------------------|---------------------------------------------------|---------|---------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
|                      |                     | Min (V)                                           | Max (V) | I <sub>T</sub> (mA) |                                                                           |                                                               |                                                               |                                                                          |
| P4KE62               | P4KE62C             | 55.80                                             | 68.20   | 1                   | 1                                                                         | 50.2                                                          | 4.49                                                          | 89.0                                                                     |
| P4KE62A              | P4KE62CA            | 58.90                                             | 65.10   | 1                   | 1                                                                         | 53.0                                                          | 4.71                                                          | 85.0                                                                     |
| P4KE68               | P4KE68C             | 61.20                                             | 74.80   | 1                   | 1                                                                         | 55.1                                                          | 4.08                                                          | 98.0                                                                     |
| P4KE68A              | P4KE68CA            | 64.60                                             | 71.40   | 1                   | 1                                                                         | 58.1                                                          | 4.35                                                          | 92.0                                                                     |
| P4KE75               | P4KE75C             | 67.50                                             | 82.50   | 1                   | 1                                                                         | 60.7                                                          | 3.70                                                          | 108.0                                                                    |
| P4KE75A              | P4KE75CA            | 71.25                                             | 78.75   | 1                   | 1                                                                         | 64.1                                                          | 3.88                                                          | 103.0                                                                    |
| P4KE82               | P4KE82C             | 73.80                                             | 90.20   | 1                   | 1                                                                         | 66.4                                                          | 3.39                                                          | 118.0                                                                    |
| P4KE82A              | P4KE82CA            | 77.90                                             | 86.10   | 1                   | 1                                                                         | 70.1                                                          | 3.54                                                          | 113.0                                                                    |
| P4KE91               | P4KE91C             | 81.90                                             | 100.10  | 1                   | 1                                                                         | 73.7                                                          | 3.05                                                          | 131.0                                                                    |
| P4KE91A              | P4KE91CA            | 86.45                                             | 95.55   | 1                   | 1                                                                         | 77.8                                                          | 3.20                                                          | 125.0                                                                    |
| P4KE100              | P4KE100C            | 90.00                                             | 110.00  | 1                   | 1                                                                         | 81.0                                                          | 2.78                                                          | 144.0                                                                    |
| P4KE100A             | P4KE100CA           | 95.00                                             | 105.00  | 1                   | 1                                                                         | 85.5                                                          | 2.92                                                          | 137.0                                                                    |
| P4KE110              | P4KE110C            | 99.00                                             | 121.00  | 1                   | 1                                                                         | 89.2                                                          | 2.53                                                          | 158.0                                                                    |
| P4KE110A             | P4KE110CA           | 104.50                                            | 115.50  | 1                   | 1                                                                         | 94.0                                                          | 2.63                                                          | 152.0                                                                    |
| P4KE120              | P4KE120C            | 108.00                                            | 132.00  | 1                   | 1                                                                         | 97.2                                                          | 2.31                                                          | 173.0                                                                    |
| P4KE120A             | P4KE120CA           | 114.00                                            | 126.00  | 1                   | 1                                                                         | 102.0                                                         | 2.42                                                          | 165.0                                                                    |
| P4KE130              | P4KE130C            | 117.00                                            | 143.00  | 1                   | 1                                                                         | 105.0                                                         | 2.14                                                          | 187.0                                                                    |
| P4KE130A             | P4KE130CA           | 123.50                                            | 136.50  | 1                   | 1                                                                         | 111.0                                                         | 2.23                                                          | 179.0                                                                    |
| P4KE150              | P4KE150C            | 135.00                                            | 165.00  | 1                   | 1                                                                         | 121.0                                                         | 1.86                                                          | 215.0                                                                    |
| P4KE150A             | P4KE150CA           | 142.50                                            | 157.50  | 1                   | 1                                                                         | 128.0                                                         | 1.93                                                          | 207.0                                                                    |
| P4KE160              | P4KE160C            | 144.00                                            | 176.00  | 1                   | 1                                                                         | 130.0                                                         | 1.74                                                          | 230.0                                                                    |
| P4KE160A             | P4KE160CA           | 152.00                                            | 168.00  | 1                   | 1                                                                         | 136.0                                                         | 1.83                                                          | 219.0                                                                    |
| P4KE170              | P4KE170C            | 153.00                                            | 187.00  | 1                   | 1                                                                         | 138.0                                                         | 1.64                                                          | 244.0                                                                    |
| P4KE170A             | P4KE170CA           | 161.50                                            | 178.50  | 1                   | 1                                                                         | 145.0                                                         | 1.71                                                          | 234.0                                                                    |
| P4KE180              | P4KE180C            | 162.00                                            | 198.00  | 1                   | 1                                                                         | 146.0                                                         | 1.55                                                          | 258.0                                                                    |
| P4KE180A             | P4KE180CA           | 171.00                                            | 189.00  | 1                   | 1                                                                         | 154.0                                                         | 1.63                                                          | 246.0                                                                    |
| P4KE200              | P4KE200C            | 180.00                                            | 220.00  | 1                   | 1                                                                         | 162.0                                                         | 1.39                                                          | 287.0                                                                    |
| P4KE200A             | P4KE200CA           | 190.00                                            | 210.00  | 1                   | 1                                                                         | 171.0                                                         | 1.46                                                          | 274.0                                                                    |
| P4KE220              | P4KE220C            | 198.00                                            | 242.00  | 1                   | 1                                                                         | 175.0                                                         | 1.16                                                          | 344.0                                                                    |
| P4KE220A             | P4KE220CA           | 209.00                                            | 231.00  | 1                   | 1                                                                         | 185.0                                                         | 1.22                                                          | 328.0                                                                    |
| P4KE250              | P4KE250C            | 225.00                                            | 275.00  | 1                   | 1                                                                         | 202.0                                                         | 1.11                                                          | 360.0                                                                    |
| P4KE250A             | P4KE250CA           | 237.50                                            | 262.50  | 1                   | 1                                                                         | 214.0                                                         | 1.16                                                          | 344.0                                                                    |
| P4KE300              | P4KE300C            | 270.00                                            | 330.00  | 1                   | 1                                                                         | 243.0                                                         | 0.93                                                          | 430.0                                                                    |
| P4KE300A             | P4KE300CA           | 285.00                                            | 315.00  | 1                   | 1                                                                         | 256.0                                                         | 0.97                                                          | 414.0                                                                    |
| P4KE350              | P4KE350C            | 315.00                                            | 385.00  | 1                   | 1                                                                         | 284.2                                                         | 0.79                                                          | 504.0                                                                    |
| P4KE350A             | P4KE350CA           | 332.50                                            | 367.50  | 1                   | 1                                                                         | 299.3                                                         | 0.83                                                          | 482.0                                                                    |
| P4KE380              | P4KE380C            | 342.00                                            | 418.00  | 1                   | 1                                                                         | 308.6                                                         | 0.73                                                          | 547.2                                                                    |
| P4KE380A             | P4KE380CA           | 361.00                                            | 399.00  | 1                   | 1                                                                         | 324.9                                                         | 0.76                                                          | 524.4                                                                    |
| P4KE400              | P4KE400C            | 360.00                                            | 440.00  | 1                   | 1                                                                         | 324.8                                                         | 0.69                                                          | 576.0                                                                    |
| P4KE400A             | P4KE400CA           | 380.00                                            | 420.00  | 1                   | 1                                                                         | 342.0                                                         | 0.72                                                          | 552.0                                                                    |
| P4KE440              | P4KE440C            | 396.00                                            | 484.00  | 1                   | 1                                                                         | 357.3                                                         | 0.63                                                          | 633.6                                                                    |
| P4KE440A             | P4KE440CA           | 418.00                                            | 462.00  | 1                   | 1                                                                         | 376.2                                                         | 0.66                                                          | 607.2                                                                    |
| P4KE500              | P4KE500C            | 450.00                                            | 550.00  | 1                   | 1                                                                         | 406.0                                                         | 0.56                                                          | 720.0                                                                    |
| P4KE500A             | P4KE500CA           | 475.00                                            | 525.00  | 1                   | 1                                                                         | 427.5                                                         | 0.58                                                          | 690.0                                                                    |
| P4KE520              | P4KE520C            | 468.00                                            | 572.00  | 1                   | 1                                                                         | 422.2                                                         | 0.53                                                          | 748.8                                                                    |
| P4KE520A             | P4KE520CA           | 494.00                                            | 546.00  | 1                   | 1                                                                         | 444.6                                                         | 0.56                                                          | 717.6                                                                    |
| P4KE550              | P4KE550C            | 495.00                                            | 605.00  | 1                   | 1                                                                         | 446.6                                                         | 0.51                                                          | 792.0                                                                    |
| P4KE550A             | P4KE550CA           | 522.50                                            | 577.50  | 1                   | 1                                                                         | 470.3                                                         | 0.53                                                          | 759.0                                                                    |
| P4KE600              | P4KE600C            | 540.00                                            | 660.00  | 1                   | 1                                                                         | 487.2                                                         | 0.46                                                          | 864.0                                                                    |
| P4KE600A             | P4KE600CA           | 570.00                                            | 630.00  | 1                   | 1                                                                         | 513.0                                                         | 0.48                                                          | 828.0                                                                    |



# P4KE SERIES

## 400 Watts Transient Voltage Suppressor Diodes

### Ratings and Characteristics Curves ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

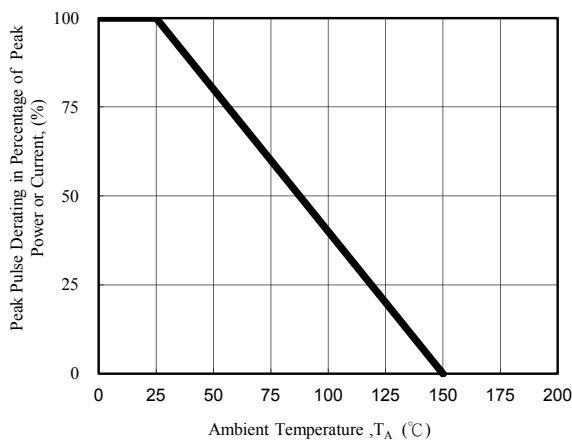


Fig. 1 - Pulse Derating Curve

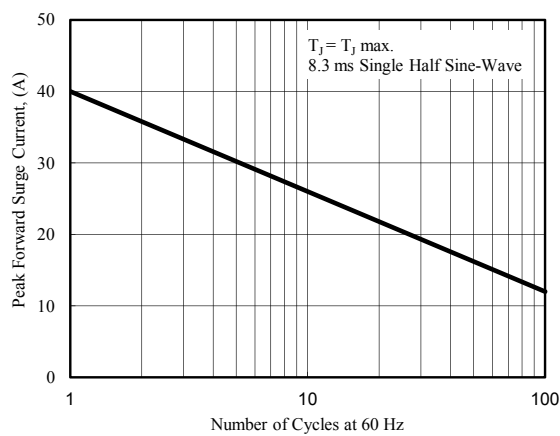


Fig. 2 - Maximum Non-Repetitive Surge Current

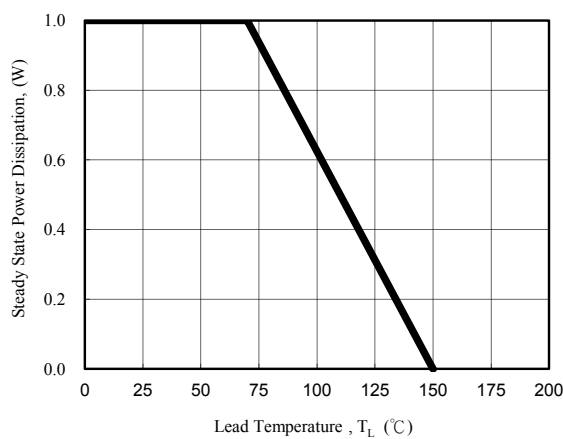


Fig. 3 - Steady State Power Derating Curve

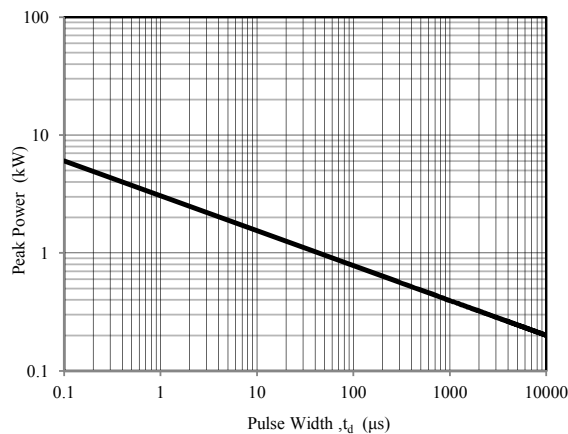


Fig. 4 - Peak Pulse Power Rating Curve

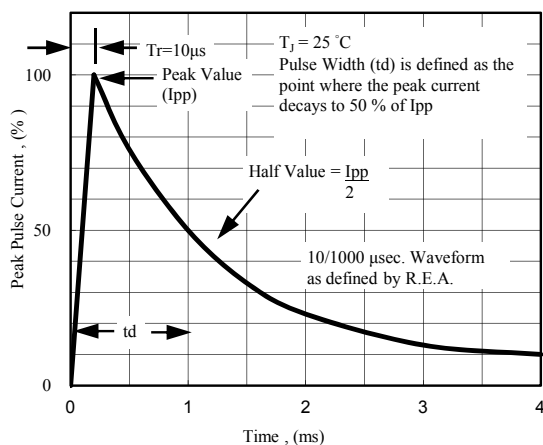


Fig. 5 - Pulse Waveform

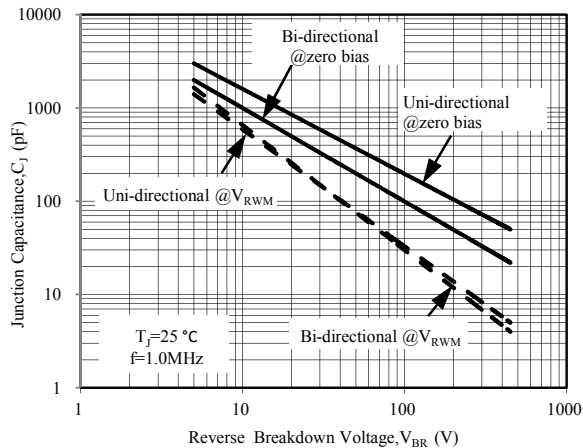


Fig. 6 - Typical Junction Capacitance