

## P6KE SERIES

**V<sub>BR</sub> : 6.8 - 600 Volts**

**P<sub>PK</sub> : 600 Watts**

### FEATURES :

- \* Glass passivated junction chip
- \* 600W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V
- \* Moisture Sensitivity Level 1 (Unlimited)
- \* **Pb / RoHS Free**

### MECHANICAL DATA :

- \* Case : DO-15 Molded plastic
- \* Epoxy : UL94V-0 rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.4 gram

### DEVICES FOR BIPOLAR APPLICATIONS

For Bi-directional use C or CA Suffix

Electrical characteristics apply in both directions

### MAXIMUM RATINGS

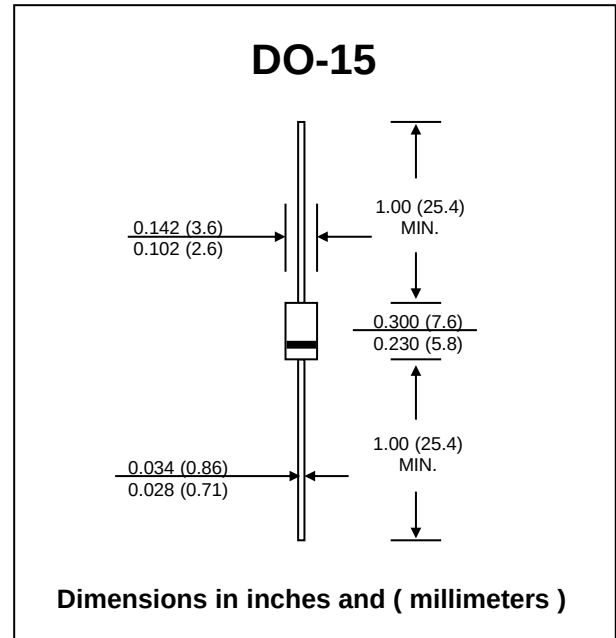
Rating at 25 °C ambient temperature unless otherwise specified.

| Rating                                                                                            | Symbol                            | Value         | Unit |
|---------------------------------------------------------------------------------------------------|-----------------------------------|---------------|------|
| Peak Power Dissipation at Ta = 25 °C, Tp=1ms (Note1)                                              | P <sub>PK</sub>                   | 600           | W    |
| Steady State Power Dissipation at T <sub>L</sub> = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2) | P <sub>D</sub>                    | 5.0           | W    |
| Typical thermal resistance junction to lead (Note 3)                                              | R <sub>θJL</sub>                  | 20.0          | °C/W |
| Typical thermal resistance junction to ambient (Note 3)                                           | R <sub>θJA</sub>                  | 75.0          | °C/W |
| Operating and Storage Temperature Range                                                           | T <sub>J</sub> , T <sub>STG</sub> | - 65 to + 175 | °C   |

### Notes :

- (1) Non-repetitive Current pulse, per Fig. 2 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on Copper Leaf area of 1.57 in<sup>2</sup> (40mm<sup>2</sup>).
- (3) Thermal resistance from junction to ambient at 0.375" (9.6 mm) lead length, PCB mounted

## TRANSIENT VOLTAGE SUPPRESSOR



## ELECTRICAL CHARACTERISTICS (Rating at 25 °C ambient temperature unless otherwise specified.)

| Type No. | Breakdown Voltage @ It<br>( Note 1 ) |      |      | Working Peak<br>Reverse<br>Voltage | Maximum<br>Reverse Leakage<br>@ VRWM | Maximum<br>Reverse<br>Current | Maximum<br>Clamping<br>Voltage @ IRSM | Maximum<br>Temperature<br>Co-efficient<br>of VBR<br>of VBR |      |      |      |      |
|----------|--------------------------------------|------|------|------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|------------------------------------------------------------|------|------|------|------|
|          | VBR (V)                              |      | It   |                                    |                                      |                               |                                       |                                                            | VRWM | IR   | IRSM | VRSM |
|          | Min.                                 | Max. | (mA) |                                    |                                      |                               |                                       |                                                            | (V)  | (μA) | (A)  | (V)  |
| P6KE6.8  | 6.12                                 | 7.48 | 10   | 5.50                               | 1000                                 | 55.5                          | 10.8                                  | 0.057                                                      |      |      |      |      |
| P6KE6.8A | 6.45                                 | 7.14 | 10   | 5.80                               | 1000                                 | 57.0                          | 10.5                                  | 0.057                                                      |      |      |      |      |
| P6KE7.5  | 6.75                                 | 8.25 | 10   | 6.05                               | 500                                  | 51.0                          | 11.7                                  | 0.061                                                      |      |      |      |      |
| P6KE7.5A | 7.13                                 | 7.88 | 10   | 6.40                               | 500                                  | 53.0                          | 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                                  | 50.0                          | 12.1                                  | 0.065                                                      |      |      |      |      |
| P6KE8.5  | 7.65                                 | 9.35 | 10   | 6.89                               | 200                                  | 46.0                          | 13.0                                  | 0.067                                                      |      |      |      |      |
| P6KE8.5A | 8.08                                 | 8.93 | 10   | 7.27                               | 200                                  | 47.0                          | 12.7                                  | 0.067                                                      |      |      |      |      |
| P6KE9.1  | 8.19                                 | 10.0 | 1.0  | 7.37                               | 150                                  | 44.0                          | 13.8                                  | 0.068                                                      |      |      |      |      |
| P6KE9.1A | 8.65                                 | 9.55 | 1.0  | 7.78                               | 150                                  | 45.0                          | 13.4                                  | 0.068                                                      |      |      |      |      |
| P6KE10   | 9.00                                 | 11.0 | 1.0  | 8.10                               | 150                                  | 40.0                          | 15.0                                  | 0.073                                                      |      |      |      |      |
| P6KE10A  | 9.50                                 | 10.5 | 1.0  | 8.55                               | 150                                  | 41.0                          | 14.5                                  | 0.073                                                      |      |      |      |      |
| P6KE11   | 9.90                                 | 12.1 | 1.0  | 8.92                               | 150                                  | 37.0                          | 16.2                                  | 0.075                                                      |      |      |      |      |
| P6KE11A  | 10.5                                 | 11.6 | 1.0  | 9.40                               | 150                                  | 38.0                          | 15.6                                  | 0.075                                                      |      |      |      |      |
| P6KE12   | 10.8                                 | 13.2 | 1.0  | 9.72                               | 5.0                                  | 35.0                          | 17.3                                  | 0.078                                                      |      |      |      |      |
| P6KE12A  | 11.4                                 | 12.6 | 1.0  | 10.2                               | 5.0                                  | 36.0                          | 16.7                                  | 0.078                                                      |      |      |      |      |
| P6KE13   | 11.7                                 | 14.3 | 1.0  | 10.5                               | 5.0                                  | 32.0                          | 19.0                                  | 0.081                                                      |      |      |      |      |
| P6KE13A  | 12.4                                 | 13.7 | 1.0  | 11.1                               | 5.0                                  | 33.0                          | 18.2                                  | 0.081                                                      |      |      |      |      |
| P6KE15   | 13.5                                 | 16.5 | 1.0  | 12.1                               | 5.0                                  | 27.0                          | 22.0                                  | 0.084                                                      |      |      |      |      |
| P6KE15A  | 14.3                                 | 15.8 | 1.0  | 12.8                               | 5.0                                  | 28.0                          | 21.2                                  | 0.084                                                      |      |      |      |      |
| P6KE16   | 14.4                                 | 17.6 | 1.0  | 12.9                               | 5.0                                  | 26.0                          | 23.5                                  | 0.086                                                      |      |      |      |      |
| P6KE16A  | 15.2                                 | 16.8 | 1.0  | 13.6                               | 5.0                                  | 27.0                          | 22.5                                  | 0.086                                                      |      |      |      |      |
| P6KE18   | 16.2                                 | 19.8 | 1.0  | 14.5                               | 5.0                                  | 23.0                          | 26.5                                  | 0.088                                                      |      |      |      |      |
| P6KE18A  | 17.1                                 | 18.9 | 1.0  | 15.3                               | 5.0                                  | 24.0                          | 25.2                                  | 0.088                                                      |      |      |      |      |
| P6KE20   | 18.0                                 | 22.0 | 1.0  | 16.2                               | 5.0                                  | 21.0                          | 29.1                                  | 0.090                                                      |      |      |      |      |
| P6KE20A  | 19.0                                 | 21.0 | 1.0  | 17.1                               | 5.0                                  | 22.0                          | 27.7                                  | 0.090                                                      |      |      |      |      |
| P6KE22   | 19.8                                 | 24.2 | 1.0  | 17.8                               | 5.0                                  | 19.0                          | 31.9                                  | 0.092                                                      |      |      |      |      |
| P6KE22A  | 20.9                                 | 23.1 | 1.0  | 18.8                               | 5.0                                  | 20.0                          | 30.6                                  | 0.092                                                      |      |      |      |      |
| P6KE24   | 21.6                                 | 26.4 | 1.0  | 19.4                               | 5.0                                  | 17.0                          | 34.7                                  | 0.094                                                      |      |      |      |      |
| P6KE24A  | 22.8                                 | 25.2 | 1.0  | 20.5                               | 5.0                                  | 18.0                          | 33.2                                  | 0.094                                                      |      |      |      |      |
| P6KE27   | 24.3                                 | 29.7 | 1.0  | 21.8                               | 5.0                                  | 15.0                          | 39.1                                  | 0.096                                                      |      |      |      |      |
| P6KE27A  | 25.7                                 | 28.4 | 1.0  | 23.1                               | 5.0                                  | 16.0                          | 37.5                                  | 0.096                                                      |      |      |      |      |
| P6KE28   | 25.2                                 | 30.8 | 1.0  | 22.7                               | 5.0                                  | 15.0                          | 40                                    | 0.096                                                      |      |      |      |      |
| P6KE28A  | 26.6                                 | 29.4 | 1.0  | 23.9                               | 5.0                                  | 15.5                          | 38.7                                  | 0.096                                                      |      |      |      |      |
| P6KE30   | 27.0                                 | 33.0 | 1.0  | 24.3                               | 5.0                                  | 14.0                          | 43.5                                  | 0.097                                                      |      |      |      |      |
| P6KE30A  | 28.5                                 | 31.5 | 1.0  | 25.6                               | 5.0                                  | 14.4                          | 41.4                                  | 0.097                                                      |      |      |      |      |
| P6KE33   | 29.7                                 | 36.3 | 1.0  | 26.8                               | 5.0                                  | 12.6                          | 47.7                                  | 0.098                                                      |      |      |      |      |
| P6KE33A  | 31.4                                 | 34.7 | 1.0  | 28.2                               | 5.0                                  | 13.2                          | 45.7                                  | 0.098                                                      |      |      |      |      |
| P6KE36   | 32.4                                 | 39.6 | 1.0  | 29.1                               | 5.0                                  | 11.6                          | 52.0                                  | 0.099                                                      |      |      |      |      |
| P6KE36A  | 34.2                                 | 37.8 | 1.0  | 30.8                               | 5.0                                  | 12.0                          | 49.9                                  | 0.099                                                      |      |      |      |      |
| P6KE39   | 35.1                                 | 42.9 | 1.0  | 31.6                               | 5.0                                  | 10.6                          | 56.4                                  | 0.100                                                      |      |      |      |      |
| P6KE39A  | 37.1                                 | 41.0 | 1.0  | 33.3                               | 5.0                                  | 11.2                          | 53.9                                  | 0.100                                                      |      |      |      |      |
| P6KE43   | 38.7                                 | 47.3 | 1.0  | 34.8                               | 5.0                                  | 9.6                           | 61.9                                  | 0.101                                                      |      |      |      |      |
| P6KE43A  | 40.9                                 | 45.2 | 1.0  | 36.8                               | 5.0                                  | 10.1                          | 59.3                                  | 0.101                                                      |      |      |      |      |
| P6KE47   | 42.3                                 | 51.7 | 1.0  | 38.1                               | 5.0                                  | 8.9                           | 67.8                                  | 0.101                                                      |      |      |      |      |
| P6KE47A  | 44.7                                 | 49.4 | 1.0  | 40.2                               | 5.0                                  | 9.3                           | 64.8                                  | 0.101                                                      |      |      |      |      |
| P6KE51   | 45.9                                 | 56.1 | 1.0  | 41.3                               | 5.0                                  | 8.2                           | 73.5                                  | 0.102                                                      |      |      |      |      |
| P6KE51A  | 48.5                                 | 53.6 | 1.0  | 43.6                               | 5.0                                  | 8.6                           | 70.1                                  | 0.102                                                      |      |      |      |      |
| P6KE56   | 50.4                                 | 61.6 | 1.0  | 45.4                               | 5.0                                  | 7.4                           | 80.5                                  | 0.103                                                      |      |      |      |      |
| P6KE56A  | 53.2                                 | 58.8 | 1.0  | 47.8                               | 5.0                                  | 7.8                           | 77.0                                  | 0.103                                                      |      |      |      |      |
| P6KE62   | 55.8                                 | 68.2 | 1.0  | 50.2                               | 5.0                                  | 6.8                           | 89.0                                  | 0.104                                                      |      |      |      |      |
| P6KE62A  | 58.9                                 | 65.1 | 1.0  | 53.0                               | 5.0                                  | 7.1                           | 85.0                                  | 0.104                                                      |      |      |      |      |
| P6KE68   | 61.2                                 | 74.8 | 1.0  | 55.1                               | 5.0                                  | 6.1                           | 98.0                                  | 0.104                                                      |      |      |      |      |
| P6KE68A  | 64.6                                 | 71.4 | 1.0  | 58.1                               | 5.0                                  | 6.5                           | 92.0                                  | 0.104                                                      |      |      |      |      |

## ELECTRICAL CHARACTERISTICS (Rating at 25 °C ambient temperature unless otherwise specified.)

| Type No. | Breakdown Voltage @ It<br>( Note 1 ) |       |      | Working Peak<br>Reverse<br>Voltage | Maximum<br>Reverse Leakage<br>@ VRWM | Maximum<br>Reverse<br>Current | Maximum<br>Clamping<br>Voltage @ IRSM | Maximum<br>Temperature<br>Co-efficient<br>of VBR<br>of VBR |
|----------|--------------------------------------|-------|------|------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|------------------------------------------------------------|
|          | VBR (V)                              |       | It   |                                    |                                      |                               |                                       |                                                            |
|          | Min.                                 | Max.  | (mA) |                                    |                                      |                               |                                       |                                                            |
| P6KE75   | 67.5                                 | 82.5  | 1.0  | 60.7                               | 5.0                                  | 5.5                           | 108                                   | 0.105                                                      |
| P6KE75A  | 71.3                                 | 78.8  | 1.0  | 64.1                               | 5.0                                  | 5.8                           | 103                                   | 0.105                                                      |
| P6KE82   | 73.8                                 | 90.2  | 1.0  | 66.4                               | 5.0                                  | 5.1                           | 118                                   | 0.105                                                      |
| P6KE82A  | 77.9                                 | 86.1  | 1.0  | 70.1                               | 5.0                                  | 5.3                           | 113                                   | 0.105                                                      |
| P6KE91   | 81.9                                 | 100.0 | 1.0  | 73.7                               | 5.0                                  | 4.5                           | 131                                   | 0.106                                                      |
| P6KE91A  | 86.5                                 | 95.5  | 1.0  | 77.8                               | 5.0                                  | 4.8                           | 125                                   | 0.106                                                      |
| P6KE100  | 90.0                                 | 110.0 | 1.0  | 81.0                               | 5.0                                  | 4.2                           | 144                                   | 0.106                                                      |
| P6KE100A | 95.0                                 | 105.0 | 1.0  | 85.5                               | 5.0                                  | 4.4                           | 137                                   | 0.106                                                      |
| P6KE110  | 99.0                                 | 121.0 | 1.0  | 89.2                               | 5.0                                  | 3.8                           | 158                                   | 0.107                                                      |
| P6KE110A | 105.0                                | 116.0 | 1.0  | 94.0                               | 5.0                                  | 4.0                           | 152                                   | 0.107                                                      |
| P6KE120  | 108.0                                | 132.0 | 1.0  | 97.2                               | 5.0                                  | 3.5                           | 173                                   | 0.107                                                      |
| P6KE120A | 114.0                                | 126.0 | 1.0  | 102                                | 5.0                                  | 3.6                           | 165                                   | 0.107                                                      |
| P6KE130  | 117.0                                | 143.0 | 1.0  | 106                                | 5.0                                  | 3.2                           | 187                                   | 0.107                                                      |
| P6KE130A | 124.0                                | 137.0 | 1.0  | 111                                | 5.0                                  | 3.3                           | 179                                   | 0.107                                                      |
| P6KE150  | 135.0                                | 165.0 | 1.0  | 121                                | 5.0                                  | 2.8                           | 215                                   | 0.108                                                      |
| P6KE150A | 143.0                                | 158.0 | 1.0  | 128                                | 5.0                                  | 2.9                           | 207                                   | 0.108                                                      |
| P6KE160  | 144.0                                | 176.0 | 1.0  | 130                                | 5.0                                  | 2.6                           | 230                                   | 0.108                                                      |
| P6KE160A | 152.0                                | 168.0 | 1.0  | 136                                | 5.0                                  | 2.7                           | 219                                   | 0.108                                                      |
| P6KE170  | 153.0                                | 187.0 | 1.0  | 138                                | 5.0                                  | 2.5                           | 244                                   | 0.108                                                      |
| P6KE170A | 162.0                                | 179.0 | 1.0  | 145                                | 5.0                                  | 2.6                           | 234                                   | 0.108                                                      |
| P6KE180  | 162.0                                | 198.0 | 1.0  | 146                                | 5.0                                  | 2.3                           | 258                                   | 0.108                                                      |
| P6KE180A | 171.0                                | 189.0 | 1.0  | 154                                | 5.0                                  | 2.4                           | 246                                   | 0.108                                                      |
| P6KE200  | 180.0                                | 220.0 | 1.0  | 162                                | 5.0                                  | 2.1                           | 287                                   | 0.108                                                      |
| P6KE200A | 190.0                                | 210.0 | 1.0  | 171                                | 5.0                                  | 2.2                           | 274                                   | 0.108                                                      |
| P6KE220  | 198.0                                | 242.0 | 1.0  | 175                                | 5.0                                  | 1.75                          | 344                                   | 0.108                                                      |
| P6KE220A | 209.0                                | 231.0 | 1.0  | 185                                | 5.0                                  | 1.83                          | 328                                   | 0.108                                                      |
| P6KE250  | 225.0                                | 275.0 | 1.0  | 202                                | 5.0                                  | 1.67                          | 360                                   | 0.110                                                      |
| P6KE250A | 237.0                                | 263.0 | 1.0  | 214                                | 5.0                                  | 1.75                          | 344                                   | 0.110                                                      |
| P6KE300  | 270.0                                | 330.0 | 1.0  | 243                                | 5.0                                  | 1.40                          | 430                                   | 0.110                                                      |
| P6KE300A | 285.0                                | 315.0 | 1.0  | 256                                | 5.0                                  | 1.45                          | 414                                   | 0.110                                                      |
| P6KE320  | 288.0                                | 352.0 | 1.0  | 259                                | 5.0                                  | 1.31                          | 460                                   | 0.110                                                      |
| P6KE320A | 303.0                                | 337.0 | 1.0  | 272                                | 5.0                                  | 1.35                          | 445                                   | 0.110                                                      |
| P6KE350  | 315.0                                | 385.0 | 1.0  | 284                                | 5.0                                  | 1.20                          | 504                                   | 0.110                                                      |
| P6KE350A | 332.0                                | 368.0 | 1.0  | 300                                | 5.0                                  | 1.25                          | 482                                   | 0.110                                                      |
| P6KE400  | 360.0                                | 440.0 | 1.0  | 324                                | 5.0                                  | 1.05                          | 574                                   | 0.110                                                      |
| P6KE400A | 380.0                                | 420.0 | 1.0  | 342                                | 5.0                                  | 1.10                          | 548                                   | 0.110                                                      |
| P6KE440  | 396.0                                | 484.0 | 1.0  | 356                                | 5.0                                  | 0.95                          | 631                                   | 0.110                                                      |
| P6KE440A | 418.0                                | 462.0 | 1.0  | 376                                | 5.0                                  | 1.00                          | 602                                   | 0.110                                                      |
| P6KE480  | 432.0                                | 528.0 | 1.0  | 389                                | 5.0                                  | 0.88                          | 686                                   | 0.110                                                      |
| P6KE480A | 456.0                                | 504.0 | 1.0  | 408                                | 5.0                                  | 0.90                          | 658                                   | 0.110                                                      |
| P6KE510  | 459.0                                | 561.0 | 1.0  | 413                                | 5.0                                  | 0.82                          | 729                                   | 0.110                                                      |
| P6KE510A | 485.0                                | 535.0 | 1.0  | 434                                | 5.0                                  | 0.86                          | 698                                   | 0.110                                                      |
| P6KE530  | 477.0                                | 583.0 | 1.0  | 457                                | 5.0                                  | 0.76                          | 798                                   | 0.110                                                      |
| P6KE530A | 503.5                                | 556.5 | 1.0  | 477                                | 5.0                                  | 0.80                          | 725                                   | 0.110                                                      |
| P6KE540  | 486.0                                | 594.0 | 1.0  | 437                                | 5.0                                  | 0.78                          | 772                                   | 0.110                                                      |
| P6KE540A | 513.0                                | 567.0 | 1.0  | 459                                | 5.0                                  | 0.81                          | 740                                   | 0.110                                                      |
| P6KE550  | 495.0                                | 605.0 | 1.0  | 470                                | 5.0                                  | 0.76                          | 836                                   | 0.110                                                      |
| P6KE550A | 522.5                                | 577.5 | 1.0  | 495                                | 5.0                                  | 0.80                          | 760                                   | 0.110                                                      |
| P6KE600  | 540.0                                | 660.0 | 1.0  | 490                                | 5.0                                  | 0.71                          | 911                                   | 0.110                                                      |
| P6KE600A | 570.0                                | 630.0 | 1.0  | 512                                | 5.0                                  | 0.75                          | 828                                   | 0.110                                                      |

Notes : ( 1 ) VBR measured after It applied for 300 μs., It = square wave pulse or equivalent.

( 2 ) For Bipolar types moving VR of 10 Volts and under, the IR limit is doubled.

( 3 ) "6KE" will be omitted in marking on the diode.

## RATING AND CHARACTERISTIC CURVES ( P6KE SERIES )

FIG.1 - PULSE DERATING CURVE

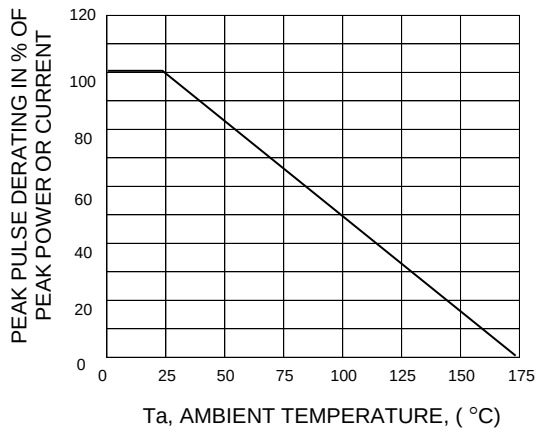


FIG. 2 - TYPICAL JUNCTION CAPACITANCE  
UNI-DIRECTIONAL

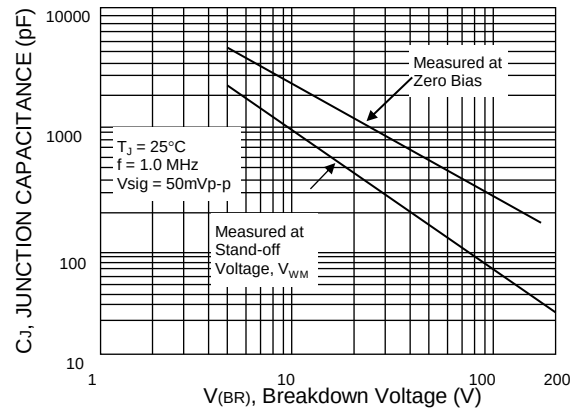


FIG.3 - STEADY STATE POWER DERATING

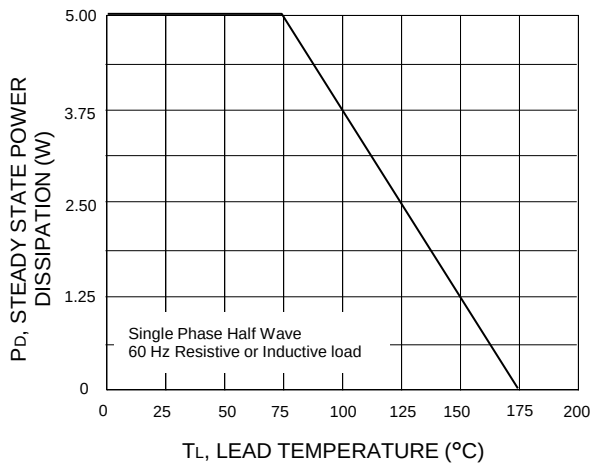


FIG.4 - PULSE RATING CURVE

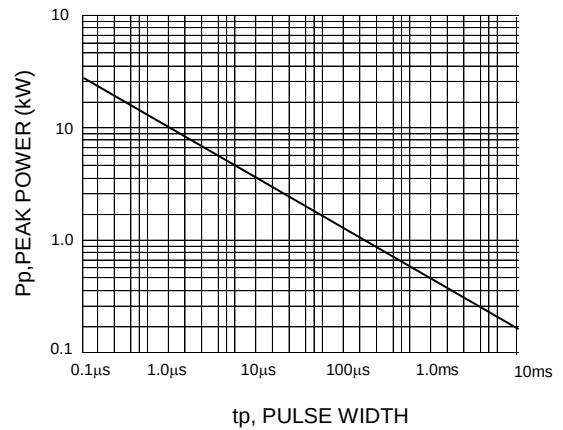


FIG.5 - PULSE WAVEFORM

