

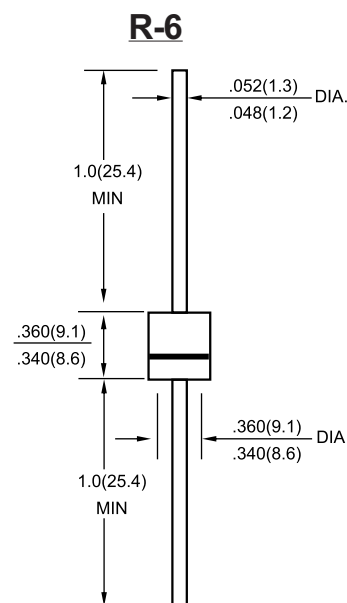


## Features

- ✧ Glass passivated chip
- ✧ low leakage
- ✧ Uni and bidirectional unit
- ✧ Excellent clamping capability
- ✧ Plastic material has UL recognition 94V-0
- ✧ Fast response time

## Mechanical Data

- ✧ Case : Molded Plastic
- ✧ Marking : Unidirectional -type number and cathode band  
Bidirectional-type number only



Dimensions in inches and (millimeters)

## Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Single phase, half wave ,60Hz, resistive or inductive load.

For capacitive load, derate current by 20%

| CHARACTERISTICS                                                                                         | SYMBOL      | VALUE        | UNIT               |
|---------------------------------------------------------------------------------------------------------|-------------|--------------|--------------------|
| Peak Power Dissipation at $T_A=25^{\circ}\text{C}$<br>TP=1ms (NOTE1)                                    | $P_{PK}$    | Minimum 5000 | WATTS              |
| Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave<br>Super Imposed on Rated Load (JEDEC Method) | $I_{FSM}$   | 500          | AMPS               |
| Steady State Power Dissipation at $T_L=75^{\circ}\text{C}$<br>Lead Lengths 0.375"(9.5mm), See Fig. 4    | $P_{M(AV)}$ | 8.0          | WATTS              |
| Maximum Instantaneous Forward Voltage<br>at 100A for Unidirectional Devices Only (NOTE2)                | $V_F$       | See NOTE 3   | VOLTS              |
| Operating Temperature Range                                                                             | $T_J$       | -55 to + 150 | $^{\circ}\text{C}$ |
| Storage Temperature Range                                                                               | $T_{STG}$   | -55 to + 175 | $^{\circ}\text{C}$ |

NOTES:1. Non-repetitive current pulse ,per Fig. 5 and derated above  $T_A=25^{\circ}\text{C}$  per Fig. 1 .

2. 8.3ms single half-wave duty cycle=4 pulses per minutes maximum (uni-directional units only).

3.  $V_F=3.5\text{V}$  on 5KP5.0 thru 5KP100A devices and  $V_F=5.0\text{V}$  on 5KP110 thru 5KP180 devices.

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

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage $V_{BR}$ @ $I_T$ |         |            | Maximum<br>Reverse<br>Leakage $I_R$<br>@ $V_{RWM}$<br>( $\mu\text{A}$ ) | Working<br>Peak Reverse<br>Voltage<br>$V_{RWM}$<br>(V) | Maximum<br>Reverse<br>Surge<br>Current $I_{PP}$<br>(A) | Maximum<br>Clamping<br>Voltage $V_C$<br>@ $I_{PP}$<br>(V) |
|----------------------|---------------------|------------------------------------|---------|------------|-------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|
|                      |                     | Min (V)                            | Max (V) | $I_T$ (mA) |                                                                         |                                                        |                                                        |                                                           |
| 5KP5.0               | 5KP5.0C             | 6.40                               | 7.30    | 50         | 5000                                                                    | 5                                                      | 520.83                                                 | 9.6                                                       |
| 5KP5.0A              | 5KP5.0CA            | 6.40                               | 7.00    | 50         | 5000                                                                    | 5                                                      | 543.48                                                 | 9.2                                                       |
| 5KP6.0               | 5KP6.0C             | 6.67                               | 8.15    | 50         | 5000                                                                    | 6                                                      | 438.60                                                 | 11.4                                                      |
| 5KP6.0A              | 5KP6.0CA            | 6.67                               | 7.37    | 50         | 5000                                                                    | 6                                                      | 485.44                                                 | 10.3                                                      |
| 5KP6.5               | 5KP6.5C             | 7.22                               | 8.82    | 50         | 2000                                                                    | 7                                                      | 406.50                                                 | 12.3                                                      |
| 5KP6.5A              | 5KP6.5CA            | 7.22                               | 7.98    | 50         | 2000                                                                    | 7                                                      | 446.43                                                 | 11.2                                                      |
| 5KP7.0               | 5KP7.0C             | 7.78                               | 9.51    | 50         | 1000                                                                    | 7                                                      | 375.94                                                 | 13.3                                                      |
| 5KP7.0A              | 5KP7.0CA            | 7.78                               | 8.60    | 50         | 1000                                                                    | 7                                                      | 416.67                                                 | 12.0                                                      |
| 5KP7.5               | 5KP7.5C             | 8.33                               | 10.2    | 5          | 250                                                                     | 8                                                      | 349.65                                                 | 14.3                                                      |
| 5KP7.5A              | 5KP7.5CA            | 8.33                               | 9.21    | 5          | 250                                                                     | 8                                                      | 387.60                                                 | 12.9                                                      |
| 5KP8.0               | 5KP8.0C             | 8.89                               | 10.9    | 5          | 150                                                                     | 8                                                      | 333.33                                                 | 15.0                                                      |
| 5KP8.0A              | 5KP8.0CA            | 8.89                               | 9.83    | 5          | 150                                                                     | 8                                                      | 367.65                                                 | 13.6                                                      |
| 5KP8.5               | 5KP8.5C             | 9.44                               | 11.5    | 5          | 50                                                                      | 9                                                      | 314.47                                                 | 15.9                                                      |
| 5KP8.5A              | 5KP8.5CA            | 9.44                               | 10.4    | 5          | 50                                                                      | 9                                                      | 347.22                                                 | 14.4                                                      |
| 5KP9.0               | 5KP9.0C             | 10.00                              | 12.2    | 5          | 20                                                                      | 9                                                      | 295.86                                                 | 16.9                                                      |
| 5KP9.0A              | 5KP9.0CA            | 10.00                              | 11.1    | 5          | 20                                                                      | 9                                                      | 324.68                                                 | 15.4                                                      |
| 5KP10                | 5KP10C              | 11.10                              | 13.6    | 5          | 15                                                                      | 10                                                     | 265.96                                                 | 18.8                                                      |
| 5KP10A               | 5KP10CA             | 11.10                              | 12.3    | 5          | 15                                                                      | 10                                                     | 294.12                                                 | 17.0                                                      |
| 5KP11                | 5KP11C              | 12.20                              | 14.9    | 5          | 2                                                                       | 11                                                     | 248.76                                                 | 20.1                                                      |
| 5KP11A               | 5KP11CA             | 12.20                              | 13.5    | 5          | 2                                                                       | 11                                                     | 274.73                                                 | 18.2                                                      |
| 5KP12                | 5KP12C              | 13.30                              | 16.3    | 5          | 2                                                                       | 12                                                     | 227.27                                                 | 22.0                                                      |
| 5KP12A               | 5KP12CA             | 13.30                              | 14.7    | 5          | 2                                                                       | 12                                                     | 251.26                                                 | 19.9                                                      |
| 5KP13                | 5KP13C              | 14.40                              | 17.6    | 5          | 2                                                                       | 13                                                     | 210.08                                                 | 23.8                                                      |
| 5KP13A               | 5KP13CA             | 14.40                              | 15.9    | 5          | 2                                                                       | 13                                                     | 232.56                                                 | 21.5                                                      |
| 5KP14                | 5KP14C              | 15.60                              | 19.1    | 5          | 2                                                                       | 14                                                     | 193.80                                                 | 25.8                                                      |
| 5KP14A               | 5KP14CA             | 15.60                              | 17.2    | 5          | 2                                                                       | 14                                                     | 215.52                                                 | 23.2                                                      |
| 5KP15                | 5KP15C              | 16.70                              | 20.4    | 5          | 2                                                                       | 15                                                     | 185.87                                                 | 26.9                                                      |
| 5KP15A               | 5KP15CA             | 16.70                              | 18.5    | 5          | 2                                                                       | 15                                                     | 204.92                                                 | 24.4                                                      |
| 5KP16                | 5KP16C              | 17.80                              | 21.8    | 5          | 2                                                                       | 16                                                     | 173.61                                                 | 28.8                                                      |
| 5KP16A               | 5KP16CA             | 17.80                              | 19.7    | 5          | 2                                                                       | 16                                                     | 192.31                                                 | 26.0                                                      |
| 5KP17                | 5KP17C              | 18.90                              | 23.1    | 5          | 2                                                                       | 17                                                     | 163.93                                                 | 30.5                                                      |
| 5KP17A               | 5KP17CA             | 18.90                              | 20.9    | 5          | 2                                                                       | 17                                                     | 181.16                                                 | 27.6                                                      |
| 5KP18                | 5KP18C              | 20.00                              | 24.4    | 5          | 2                                                                       | 18                                                     | 155.28                                                 | 32.2                                                      |
| 5KP18A               | 5KP18CA             | 20.00                              | 22.1    | 5          | 2                                                                       | 18                                                     | 171.23                                                 | 29.2                                                      |
| 5KP19                | 5KP19C              | 21.13                              | 25.8    | 5          | 2                                                                       | 19                                                     | 147.02                                                 | 34.0                                                      |
| 5KP19A               | 5KP19CA             | 21.10                              | 23.3    | 5          | 2                                                                       | 19                                                     | 162.44                                                 | 30.8                                                      |
| 5KP20                | 5KP20C              | 22.20                              | 27.1    | 5          | 2                                                                       | 20                                                     | 139.66                                                 | 35.8                                                      |
| 5KP20A               | 5KP20CA             | 22.20                              | 24.5    | 5          | 2                                                                       | 20                                                     | 154.32                                                 | 32.4                                                      |
| 5KP22                | 5KP22C              | 24.40                              | 29.8    | 5          | 2                                                                       | 22                                                     | 126.90                                                 | 39.4                                                      |
| 5KP22A               | 5KP22CA             | 24.40                              | 26.9    | 5          | 2                                                                       | 22                                                     | 140.85                                                 | 35.5                                                      |
| 5KP24                | 5KP24C              | 26.70                              | 32.6    | 5          | 2                                                                       | 24                                                     | 116.28                                                 | 43.0                                                      |
| 5KP24A               | 5KP24CA             | 26.70                              | 29.5    | 5          | 2                                                                       | 24                                                     | 128.53                                                 | 38.9                                                      |
| 5KP26                | 5KP26C              | 28.90                              | 35.3    | 5          | 2                                                                       | 26                                                     | 107.30                                                 | 46.6                                                      |
| 5KP26A               | 5KP26CA             | 28.90                              | 31.9    | 5          | 2                                                                       | 26                                                     | 118.76                                                 | 42.1                                                      |
| 5KP28                | 5KP28C              | 31.10                              | 38.0    | 5          | 2                                                                       | 28                                                     | 100.00                                                 | 50.0                                                      |
| 5KP28A               | 5KP28CA             | 31.10                              | 34.4    | 5          | 2                                                                       | 28                                                     | 110.13                                                 | 45.4                                                      |
| 5KP30                | 5KP30C              | 33.30                              | 40.7    | 5          | 2                                                                       | 30                                                     | 93.46                                                  | 53.5                                                      |
| 5KP30A               | 5KP30CA             | 33.30                              | 36.8    | 5          | 2                                                                       | 30                                                     | 103.31                                                 | 48.4                                                      |
| 5KP33                | 5KP33C              | 36.70                              | 44.9    | 5          | 2                                                                       | 33                                                     | 84.75                                                  | 59.0                                                      |
| 5KP33A               | 5KP33CA             | 36.70                              | 40.6    | 5          | 2                                                                       | 33                                                     | 93.81                                                  | 53.3                                                      |
| 5KP36                | 5KP36C              | 40.00                              | 48.9    | 5          | 2                                                                       | 36                                                     | 77.76                                                  | 64.3                                                      |
| 5KP36A               | 5KP36CA             | 40.00                              | 44.2    | 5          | 2                                                                       | 36                                                     | 86.06                                                  | 58.1                                                      |
| 5KP40                | 5KP40C              | 44.40                              | 54.3    | 5          | 2                                                                       | 40                                                     | 70.03                                                  | 71.4                                                      |
| 5KP40A               | 5KP40CA             | 44.40                              | 49.1    | 5          | 2                                                                       | 40                                                     | 77.52                                                  | 64.5                                                      |

### 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  $V_R$  of 10 volts and under, the  $I_R$  limit is double

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

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage $V_{BR}$ @ $I_T$ |         |            | Maximum<br>Reverse<br>Leakage $I_R$<br>@ $V_{RWM}$<br>( $\mu\text{A}$ ) | Working<br>Peak Reverse<br>Voltage<br>$V_{RWM}$<br>(V) | Maximum<br>Reverse<br>Surge<br>Current $I_{PP}$<br>(A) | Maximum<br>Clamping<br>Voltage $V_C$<br>@ $I_{PP}$<br>(V) |
|----------------------|---------------------|------------------------------------|---------|------------|-------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|
|                      |                     | Min (V)                            | Max (V) | $I_T$ (mA) |                                                                         |                                                        |                                                        |                                                           |
| 5KP43                | 5KP43C              | 47.80                              | 58.4    | 5          | 2                                                                       | 43                                                     | 65.19                                                  | 76.7                                                      |
| 5KP43A               | 5KP43CA             | 47.80                              | 52.8    | 5          | 2                                                                       | 43                                                     | 72.05                                                  | 69.4                                                      |
| 5KP45                | 5KP45C              | 50.00                              | 61.1    | 5          | 2                                                                       | 45                                                     | 62.27                                                  | 80.3                                                      |
| 5KP45A               | 5KP45CA             | 50.00                              | 55.3    | 5          | 2                                                                       | 45                                                     | 68.78                                                  | 72.7                                                      |
| 5KP48                | 5KP48C              | 53.30                              | 65.1    | 5          | 2                                                                       | 48                                                     | 58.48                                                  | 85.5                                                      |
| 5KP48A               | 5KP48CA             | 53.30                              | 58.9    | 5          | 2                                                                       | 48                                                     | 64.60                                                  | 77.4                                                      |
| 5KP51                | 5KP51C              | 56.70                              | 69.3    | 5          | 2                                                                       | 51                                                     | 54.88                                                  | 91.1                                                      |
| 5KP51A               | 5KP51CA             | 56.70                              | 62.7    | 5          | 2                                                                       | 51                                                     | 60.68                                                  | 82.4                                                      |
| 5KP54                | 5KP54C              | 60.00                              | 73.3    | 5          | 2                                                                       | 54                                                     | 51.92                                                  | 96.3                                                      |
| 5KP54A               | 5KP54CA             | 60.00                              | 66.3    | 5          | 2                                                                       | 54                                                     | 57.41                                                  | 87.1                                                      |
| 5KP58                | 5KP58C              | 64.40                              | 78.7    | 5          | 2                                                                       | 58                                                     | 48.54                                                  | 103.0                                                     |
| 5KP58A               | 5KP58CA             | 64.40                              | 71.2    | 5          | 2                                                                       | 58                                                     | 53.42                                                  | 93.6                                                      |
| 5KP60                | 5KP60C              | 66.70                              | 81.5    | 5          | 2                                                                       | 60                                                     | 46.73                                                  | 107.0                                                     |
| 5KP60A               | 5KP60CA             | 66.70                              | 73.7    | 5          | 2                                                                       | 60                                                     | 51.65                                                  | 96.8                                                      |
| 5KP64                | 5KP64C              | 71.10                              | 86.9    | 5          | 2                                                                       | 64                                                     | 43.86                                                  | 114.0                                                     |
| 5KP64A               | 5KP64CA             | 71.10                              | 78.6    | 5          | 2                                                                       | 64                                                     | 48.54                                                  | 103.0                                                     |
| 5KP70                | 5KP70C              | 77.80                              | 95.1    | 5          | 2                                                                       | 70                                                     | 40.00                                                  | 125.0                                                     |
| 5KP70A               | 5KP70CA             | 77.80                              | 86.0    | 5          | 2                                                                       | 70                                                     | 44.25                                                  | 113.0                                                     |
| 5KP75                | 5KP75C              | 83.30                              | 102     | 5          | 2                                                                       | 75                                                     | 37.31                                                  | 134.0                                                     |
| 5KP75A               | 5KP75CA             | 83.30                              | 92.1    | 5          | 2                                                                       | 75                                                     | 41.32                                                  | 121.0                                                     |
| 5KP78                | 5KP78C              | 86.70                              | 106.0   | 5          | 2                                                                       | 78                                                     | 35.97                                                  | 139.0                                                     |
| 5KP78A               | 5KP78CA             | 86.70                              | 95.8    | 5          | 2                                                                       | 78                                                     | 39.68                                                  | 126.0                                                     |
| 5KP80                | 5KP80C              | 88.96                              | 108.8   | 5          | 2                                                                       | 80                                                     | 34.92                                                  | 143.2                                                     |
| 5KP80A               | 5KP80CA             | 88.80                              | 97.6    | 5          | 2                                                                       | 80                                                     | 38.58                                                  | 129.6                                                     |
| 5KP85                | 5KP85C              | 94.40                              | 115.0   | 5          | 2                                                                       | 85                                                     | 33.11                                                  | 151.0                                                     |
| 5KP85A               | 5KP85CA             | 94.40                              | 104.0   | 5          | 2                                                                       | 85                                                     | 36.50                                                  | 137.0                                                     |
| 5KP90                | 5KP90C              | 100.00                             | 122.0   | 5          | 2                                                                       | 90                                                     | 31.25                                                  | 160.0                                                     |
| 5KP90A               | 5KP90CA             | 100.00                             | 111.0   | 5          | 2                                                                       | 90                                                     | 34.25                                                  | 146.0                                                     |
| 5KP100               | 5KP100C             | 111.00                             | 136.0   | 5          | 2                                                                       | 100                                                    | 27.93                                                  | 179.0                                                     |
| 5KP100A              | 5KP100CA            | 111.00                             | 123.0   | 5          | 2                                                                       | 100                                                    | 30.86                                                  | 162.0                                                     |
| 5KP110               | 5KP110C             | 122.00                             | 149.0   | 5          | 2                                                                       | 110                                                    | 25.51                                                  | 196.0                                                     |
| 5KP110A              | 5KP110CA            | 122.00                             | 135.0   | 5          | 2                                                                       | 110                                                    | 28.25                                                  | 177.0                                                     |
| 5KP120               | 5KP120C             | 133.00                             | 163.0   | 5          | 2                                                                       | 120                                                    | 23.36                                                  | 214.0                                                     |
| 5KP120A              | 5KP120CA            | 133.00                             | 147.0   | 5          | 2                                                                       | 120                                                    | 25.91                                                  | 193.0                                                     |
| 5KP130               | 5KP130C             | 144.00                             | 176.0   | 5          | 2                                                                       | 130                                                    | 21.65                                                  | 231.0                                                     |
| 5KP130A              | 5KP130CA            | 144.00                             | 159.0   | 5          | 2                                                                       | 130                                                    | 23.92                                                  | 209.0                                                     |
| 5KP140               | 5KP140C             | 155.68                             | 190.4   | 5          | 2                                                                       | 140                                                    | 19.95                                                  | 250.6                                                     |
| 5KP140A              | 5KP140CA            | 155.00                             | 171.0   | 5          | 2                                                                       | 140                                                    | 22.05                                                  | 226.8                                                     |
| 5KP150               | 5KP150C             | 167.00                             | 204.0   | 5          | 2                                                                       | 150                                                    | 18.66                                                  | 268.0                                                     |
| 5KP150A              | 5KP150CA            | 167.00                             | 185.0   | 5          | 2                                                                       | 150                                                    | 20.58                                                  | 243.0                                                     |
| 5KP160               | 5KP160C             | 178.00                             | 218.0   | 5          | 2                                                                       | 160                                                    | 17.42                                                  | 287.0                                                     |
| 5KP160A              | 5KP160CA            | 178.00                             | 197.0   | 5          | 2                                                                       | 160                                                    | 19.31                                                  | 259.0                                                     |
| 5KP170               | 5KP170C             | 189.00                             | 231.0   | 5          | 2                                                                       | 170                                                    | 16.45                                                  | 304.0                                                     |
| 5KP170A              | 5KP170CA            | 189.00                             | 209.0   | 5          | 2                                                                       | 170                                                    | 18.18                                                  | 275.0                                                     |
| 5KP180               | 5KP180C             | 200.16                             | 244.8   | 5          | 2                                                                       | 180                                                    | 15.52                                                  | 322.2                                                     |
| 5KP180A              | 5KP180CA            | 200.00                             | 220.0   | 5          | 2                                                                       | 180                                                    | 17.15                                                  | 291.6                                                     |
| 5KP190               | 5KP190C             | 211.28                             | 258.4   | 5          | 2                                                                       | 190                                                    | 14.70                                                  | 340.1                                                     |
| 5KP190A              | 5KP190CA            | 211.00                             | 232.0   | 5          | 2                                                                       | 190                                                    | 16.24                                                  | 307.8                                                     |
| 5KP200A              | 5KP200CA            | 224.00                             | 247.0   | 5          | 2                                                                       | 200                                                    | 15.43                                                  | 324.0                                                     |
| 5KP210A              | 5KP210CA            | 233.00                             | 258.0   | 5          | 2                                                                       | 210                                                    | 42.10                                                  | 349.5                                                     |
| 5KP220A              | 5KP220CA            | 246.00                             | 272.0   | 5          | 2                                                                       | 220                                                    | 50.00                                                  | 356.0                                                     |
| 5KP250A              | 5KP250CA            | 279.00                             | 309.0   | 5          | 2                                                                       | 250                                                    | 45.40                                                  | 405.0                                                     |
| 5KP300A              | 5KP300CA            | 335.00                             | 371.0   | 5          | 2                                                                       | 300                                                    | 53.50                                                  | 486.0                                                     |
| 5KP350A              | 5KP350CA            | 391.00                             | 432.0   | 5          | 2                                                                       | 350                                                    | 48.40                                                  | 567.0                                                     |
| 5KP400A              | 5KP400CA            | 447.00                             | 494.0   | 5          | 2                                                                       | 400                                                    | 7.72                                                   | 648.0                                                     |
| 5KP440A              | 5KP440CA            | 492.00                             | 543.0   | 5          | 2                                                                       | 440                                                    | 7.01                                                   | 713.0                                                     |

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

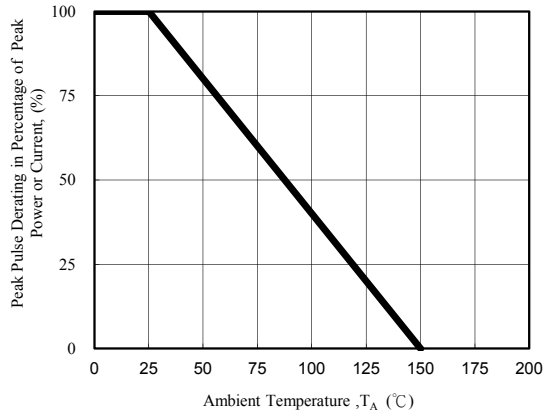


Fig. 1 - Pulse Derating Curve

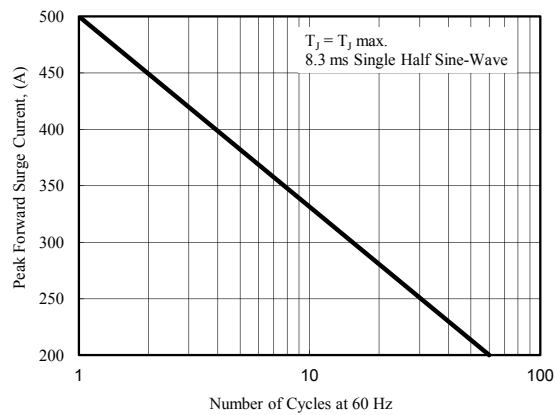


Fig. 2 - Maximum Non-Repetitive Surge Current

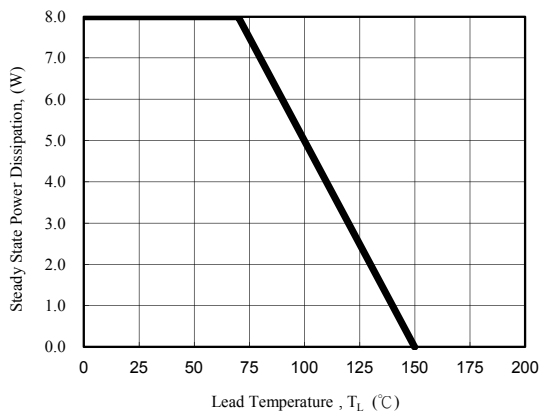


Fig. 3 - Steady State Power Derating Curve

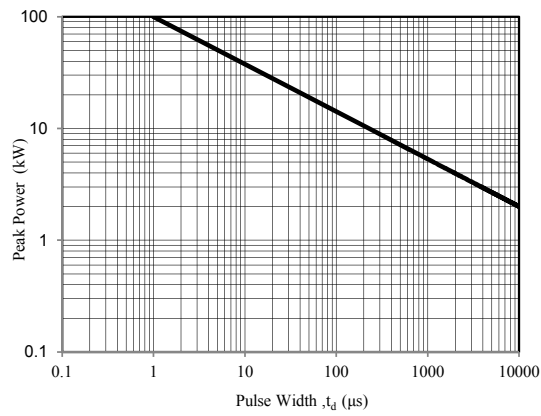


Fig. 4 - Peak Pulse Power Rating Curve

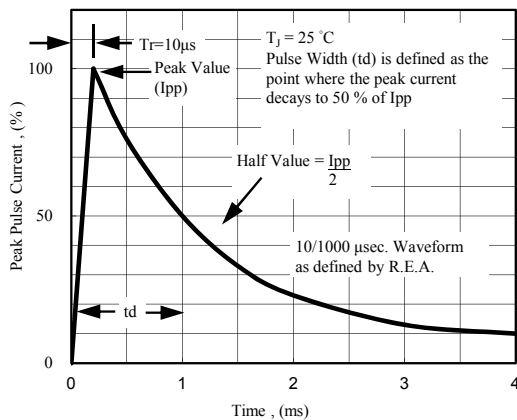


Fig. 5 - Pulse Waveform

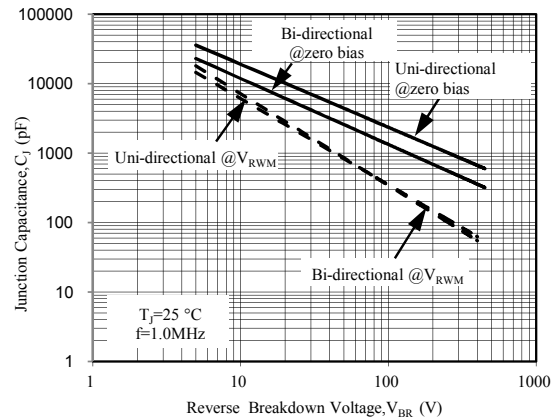


Fig. 6 - Typical Junction Capacitance