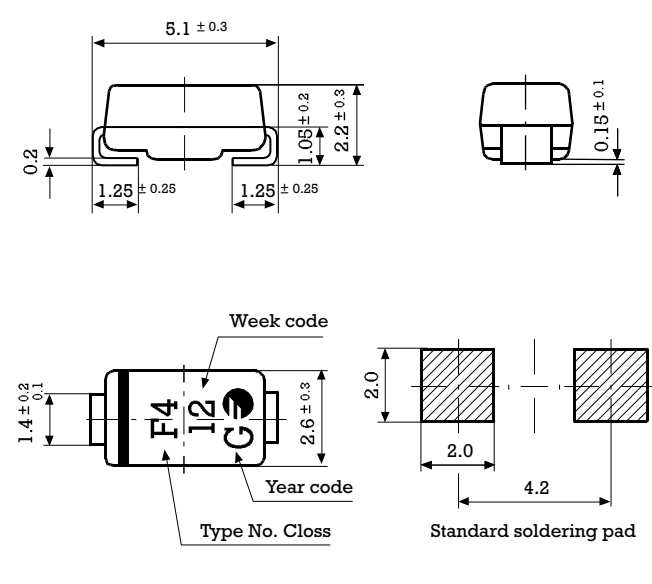


## 400 W Unidirectional and Bidirectional Surface Mounted Transient Voltage Suppressor Diodes

|                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dimensions in mm.</b></p>  <p><b>CASE:</b><br/>SMA/DO-214AC</p> <p>Week code<br/>F4<br/>12<br/>G</p> <p>Year code<br/>2</p> <p>Type No. Closs</p> <p>Standard soldering pad</p> | <p><b>Voltage</b><br/>6.8 to 220 V</p> <p><b>Power</b><br/>400 W/ms</p> <p><b>HYPERECTIFIER®</b></p> <ul style="list-style-type: none"> <li>• Glass passivated junction</li> <li>• Typical <math>I_{RM}</math> less than <math>1\mu A</math> above 10V</li> <li>• Response time typically &lt; 1ns.</li> <li>• The plastic material carries UL 94 V-0</li> <li>• Low profile package</li> <li>• Easy pick and place</li> <li>• High temperature soldering 260 °C 10 sec</li> </ul> <p><b>MECHANICAL DATA</b><br/>         Terminals: Solder plated, solderable per IEC 68-2-20.<br/>         Standard Packaging: 4 mm. tape (EIA-RS-481).<br/>         Weight: 0.064 g.</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Maximum Ratings and Electrical Characteristics at 25 °C

|                 |                                                                     |                  |
|-----------------|---------------------------------------------------------------------|------------------|
| $P_{PPM}$       | Peak Pulse Power Dissipation with 10/1000 $\mu s$ exponential pulse | 400 W            |
| $I_{FSM}$       | Peak Forward Surge Current 8.3 ms.<br>(Jedec Method) (Note 1)       | 40 A             |
| $V_F$           | Max. forward voltage drop at $I_F = 50 A$<br>(Note 1)               | 3.5 V            |
| $T_J - T_{STG}$ | Operating Junction and Storage Temperature Range                    | - 65 to + 175 °C |

Note 1: Only for Unidirectional

| Type           |              | Maximum Reverse Leakage Current<br>$I_{RM}$ at $V_{RM}$ |      | (1) Breakdown Voltage<br>$V_{BR}$ at $I_R$<br>(V) |      |      |      | Max. Clamping Voltage<br>$V_{CL}$ at $I_{PP}$<br>max. 1ms. Expo. |      |
|----------------|--------------|---------------------------------------------------------|------|---------------------------------------------------|------|------|------|------------------------------------------------------------------|------|
| Unidirectional | Marking Code | ( $\mu A$ )                                             | (V)  | Min.                                              | Nom. | Max. | (mA) | (V)                                                              | (A)  |
| P4SMA6V8       | AD           | 1000                                                    | 5.50 | 6.12                                              | 6.8  | 7.48 | 10   | 10.8                                                             | 38   |
| P4SMA6V8A      | AE           | 1000                                                    | 5.80 | 6.45                                              | 6.8  | 7.14 | 10   | 10.5                                                             | 40   |
| P4SMA7V5       | AF           | 500                                                     | 6.05 | 6.75                                              | 7.5  | 8.25 | 10   | 11.7                                                             | 36   |
| P4SMA7V5A      | AG           | 500                                                     | 6.40 | 7.13                                              | 7.5  | 7.88 | 10   | 11.3                                                             | 37   |
| P4SMA8V2       | AH           | 200                                                     | 6.63 | 7.38                                              | 8.2  | 9.02 | 10   | 12.5                                                             | 33   |
| P4SMA8V2A      | AK           | 200                                                     | 7.02 | 7.79                                              | 8.2  | 8.61 | 10   | 12.1                                                             | 35   |
| P4SMA9V1       | AL           | 50                                                      | 7.37 | 8.19                                              | 9.1  | 10.0 | 1    | 13.8                                                             | 30   |
| P4SMA9V1A      | AM           | 50                                                      | 7.78 | 8.65                                              | 9.1  | 9.55 | 1    | 13.4                                                             | 31   |
| P4SMA10        | AN           | 10                                                      | 8.10 | 9.00                                              | 10   | 11.0 | 1    | 15.0                                                             | 28   |
| P4SMA10A       | AP           | 10                                                      | 8.55 | 9.50                                              | 10   | 10.5 | 1    | 14.5                                                             | 29   |
| P4SMA11        | AQ           | 5                                                       | 8.92 | 9.90                                              | 11   | 12.1 | 1    | 16.2                                                             | 26   |
| P4SMA11A       | AR           | 5                                                       | 9.40 | 10.5                                              | 11   | 11.6 | 1    | 15.6                                                             | 27   |
| P4SMA12        | AS           | 5                                                       | 9.72 | 10.8                                              | 12   | 13.2 | 1    | 17.3                                                             | 24   |
| P4SMA12A       | AT           | 5                                                       | 10.2 | 11.4                                              | 12   | 12.6 | 1    | 16.7                                                             | 25   |
| P4SMA13        | AU           | 5                                                       | 10.5 | 11.7                                              | 13   | 14.3 | 1    | 19.0                                                             | 22   |
| P4SMA13A       | AV           | 5                                                       | 11.1 | 12.4                                              | 13   | 13.7 | 1    | 18.2                                                             | 23   |
| P4SMA15        | AW           | 5                                                       | 12.1 | 13.5                                              | 15   | 16.5 | 1    | 22.0                                                             | 19   |
| P4SMA15A       | AX           | 5                                                       | 12.8 | 14.3                                              | 15   | 15.8 | 1    | 21.2                                                             | 20   |
| P4SMA16        | AY           | 5                                                       | 12.9 | 14.4                                              | 16   | 17.6 | 1    | 23.5                                                             | 18   |
| P4SMA16A       | AZ           | 5                                                       | 13.6 | 15.2                                              | 16   | 16.8 | 1    | 22.5                                                             | 19   |
| P4SMA18        | BD           | 5                                                       | 14.5 | 16.2                                              | 18   | 19.8 | 1    | 26.5                                                             | 16   |
| P4SMA18A       | BE           | 5                                                       | 15.3 | 17.1                                              | 18   | 18.9 | 1    | 25.5                                                             | 17   |
| P4SMA20        | BF           | 5                                                       | 16.2 | 18.0                                              | 20   | 22.0 | 1    | 29.1                                                             | 14   |
| P4SMA20A       | BG           | 5                                                       | 17.1 | 19.0                                              | 20   | 21.0 | 1    | 27.7                                                             | 15   |
| P4SMA22        | BH           | 5                                                       | 17.8 | 19.8                                              | 22   | 24.2 | 1    | 31.9                                                             | 13   |
| P4SMA22A       | BK           | 5                                                       | 18.8 | 20.9                                              | 22   | 23.1 | 1    | 30.6                                                             | 14   |
| P4SMA24        | BL           | 5                                                       | 19.4 | 21.6                                              | 24   | 26.4 | 1    | 34.7                                                             | 12   |
| P4SMA24A       | BM           | 5                                                       | 20.5 | 22.8                                              | 24   | 25.2 | 1    | 33.2                                                             | 13   |
| P4SMA27        | BN           | 5                                                       | 21.8 | 24.3                                              | 27   | 29.7 | 1    | 39.1                                                             | 11   |
| P4SMA27A       | BP           | 5                                                       | 23.1 | 25.7                                              | 27   | 28.4 | 1    | 37.5                                                             | 11.2 |
| P4SMA30        | BQ           | 5                                                       | 24.3 | 27.0                                              | 30   | 33.0 | 1    | 43.5                                                             | 10   |
| P4SMA30A       | BR           | 5                                                       | 25.6 | 28.5                                              | 30   | 31.5 | 1    | 41.4                                                             | 10   |
| P4SMA33        | BS           | 5                                                       | 26.8 | 29.7                                              | 33   | 36.3 | 1    | 47.7                                                             | 9    |
| P4SMA33A       | BT           | 5                                                       | 28.2 | 31.4                                              | 33   | 34.7 | 1    | 45.7                                                             | 9    |
| P4SMA36        | BU           | 5                                                       | 29.1 | 32.4                                              | 36   | 39.6 | 1    | 52.0                                                             | 8    |
| P4SMA36A       | BV           | 5                                                       | 30.8 | 34.2                                              | 36   | 37.8 | 1    | 49.9                                                             | 8.4  |
| P4SMA39        | BW           | 5                                                       | 31.6 | 35.1                                              | 39   | 42.9 | 1    | 56.4                                                             | 7.4  |
| P4SMA39A       | BX           | 5                                                       | 33.3 | 37.1                                              | 39   | 41.0 | 1    | 53.9                                                             | 7.8  |

(1) Tested with pulses.

Pulse test:  $t_p \leq 50$  ms;  $\delta < 2\%$

| Type           |              | Maximum Reverse Leakage Current<br>$I_{RM}$ at $V_{RM}$ |      | (1) Breakdown Voltage<br>$V_{BR}$ at $I_R$<br>(V) |      |      |      | Max. Clamping Voltage<br>$V_{CL}$ at $I_{PP}$<br>max. 1 ms. Expo. |      |
|----------------|--------------|---------------------------------------------------------|------|---------------------------------------------------|------|------|------|-------------------------------------------------------------------|------|
| Unidirectional | Marking Code | ( $\mu A$ )                                             | (V)  | Min.                                              | Nom. | Max. | (mA) | (V)                                                               | (A)  |
| P4SMA43        | BY           | 5                                                       | 34.8 | 38.7                                              | 43   | 47.3 | 1    | 61.9                                                              | 6.8  |
| P4SMA43A       | BZ           | 5                                                       | 36.8 | 40.9                                              | 43   | 45.2 | 1    | 59.3                                                              | 7.1  |
| P4SMA47        | CD           | 5                                                       | 38.1 | 42.3                                              | 47   | 51.7 | 1    | 67.8                                                              | 6.2  |
| P4SMA47A       | CE           | 5                                                       | 40.2 | 44.7                                              | 47   | 49.4 | 1    | 64.8                                                              | 5.0  |
| P4SMA51        | CF           | 5                                                       | 41.3 | 45.9                                              | 51   | 56.1 | 1    | 73.5                                                              | 5.7  |
| P4SMA51A       | CG           | 5                                                       | 43.6 | 48.5                                              | 51   | 53.6 | 1    | 70.1                                                              | 6.0  |
| P4SMA56        | CH           | 5                                                       | 45.4 | 50.4                                              | 56   | 61.6 | 1    | 80.5                                                              | 5.2  |
| P4SMA56A       | CK           | 5                                                       | 47.8 | 53.2                                              | 56   | 58.8 | 1    | 77.0                                                              | 5.5  |
| P4SMA62        | CL           | 5                                                       | 50.2 | 55.8                                              | 62   | 68.2 | 1    | 89.0                                                              | 4.7  |
| P4SMA62A       | CM           | 5                                                       | 53.0 | 58.9                                              | 62   | 65.1 | 1    | 85.0                                                              | 5.0  |
| P4SMA68        | CN           | 5                                                       | 55.1 | 61.2                                              | 68   | 74.8 | 1    | 98.0                                                              | 4.3  |
| P4SMA68A       | CP           | 5                                                       | 58.1 | 64.6                                              | 68   | 71.4 | 1    | 92.0                                                              | 4.6  |
| P4SMA75        | CQ           | 5                                                       | 60.7 | 67.5                                              | 75   | 82.5 | 1    | 108                                                               | 3.9  |
| P4SMA75A       | CR           | 5                                                       | 64.1 | 71.3                                              | 75   | 78.8 | 1    | 103                                                               | 4.1  |
| P4SMA82        | CS           | 5                                                       | 66.4 | 73.8                                              | 82   | 90.2 | 1    | 118                                                               | 3.6  |
| P4SMA82A       | CT           | 5                                                       | 70.1 | 77.9                                              | 82   | 86.1 | 1    | 113                                                               | 3.7  |
| P4SMA91        | CU           | 5                                                       | 73.7 | 81.9                                              | 91   | 100  | 1    | 131                                                               | 3.2  |
| P4SMA91A       | CV           | 5                                                       | 77.8 | 86.5                                              | 91   | 95.5 | 1    | 125                                                               | 3.4  |
| P4SMA100       | CW           | 5                                                       | 81.0 | 90.0                                              | 100  | 110  | 1    | 144                                                               | 2.9  |
| P4SMA100A      | CX           | 5                                                       | 85.5 | 95.0                                              | 100  | 105  | 1    | 137                                                               | 3.1  |
| P4SMA110       | CY           | 5                                                       | 89.2 | 99.0                                              | 110  | 121  | 1    | 158                                                               | 2.7  |
| P4SMA110A      | CZ           | 5                                                       | 94.0 | 105                                               | 110  | 116  | 1    | 152                                                               | 2.8  |
| P4SMA120       | DD           | 5                                                       | 97.2 | 108                                               | 120  | 132  | 1    | 173                                                               | 2.4  |
| P4SMA120A      | DE           | 5                                                       | 102  | 114                                               | 120  | 126  | 1    | 165                                                               | 2.5  |
| P4SMA130       | DF           | 5                                                       | 105  | 117                                               | 130  | 143  | 1    | 187                                                               | 2.2  |
| P4SMA130A      | DG           | 5                                                       | 111  | 124                                               | 130  | 137  | 1    | 179                                                               | 2.3  |
| P4SMA150       | DH           | 5                                                       | 121  | 135                                               | 150  | 165  | 1    | 215                                                               | 2.0  |
| P4SMA150A      | DL           | 5                                                       | 128  | 143                                               | 150  | 158  | 1    | 207                                                               | 2.0  |
| P4SMA160       | DM           | 5                                                       | 130  | 144                                               | 160  | 176  | 1    | 230                                                               | 1.8  |
| P4SMA160A      | DN           | 5                                                       | 136  | 152                                               | 160  | 168  | 1    | 219                                                               | 1.9  |
| P4SMA170       | DP           | 5                                                       | 138  | 153                                               | 170  | 187  | 1    | 244                                                               | 1.7  |
| P4SMA170A      | DQ           | 5                                                       | 145  | 162                                               | 170  | 179  | 1    | 234                                                               | 1.8  |
| P4SMA180       | DR           | 5                                                       | 146  | 162                                               | 180  | 198  | 1    | 258                                                               | 1.6  |
| P4SMA180A      | DS           | 5                                                       | 154  | 171                                               | 180  | 189  | 1    | 246                                                               | 1.7  |
| P4SMA200       | DT           | 5                                                       | 162  | 180                                               | 200  | 220  | 1    | 287                                                               | 1.5  |
| P4SMA200A      | DU           | 5                                                       | 171  | 190                                               | 200  | 210  | 1    | 274                                                               | 1.53 |
| P4SMA220       | DV           | 5                                                       | 175  | 198                                               | 220  | 242  | 1    | 344                                                               | 1.16 |
| P4SMA220A      | DX           | 5                                                       | 185  | 209                                               | 220  | 231  | 1    | 328                                                               | 1.22 |

(1) Tested with pulses.

Pulse test:  $t_p \leq 50 \text{ ms}$ ;  $\delta < 2\%$

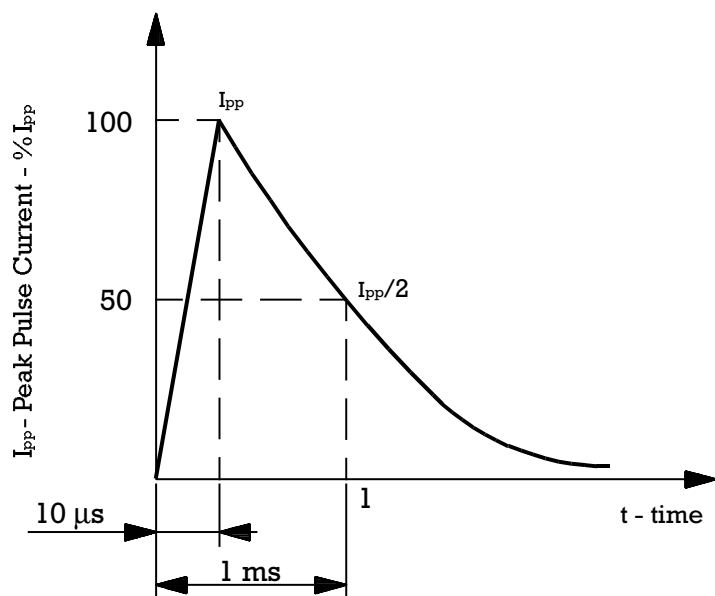
| Type          |              | Maximum Reverse Leakage Current |             | (1) Breakdown Voltage |          |          |       | Max. Clamping Voltage |             |
|---------------|--------------|---------------------------------|-------------|-----------------------|----------|----------|-------|-----------------------|-------------|
|               |              | $I_{RM}$                        | at $V_{RM}$ | $V_{BR}$              | at $I_R$ | $V_{BR}$ | $I_R$ | $V_{CL}$              | at $I_{PP}$ |
| Bidirectional | Marking Code | ( $\mu A$ )                     | (V)         | Min.                  | Nom.     | Max.     | (mA)  | (V)                   | (A)         |
| P4SMA6V8C     | RA           | 1000                            | 5.50        | 6.12                  | 6.8      | 7.48     | 10    | 10.8                  | 38          |
| P4SMA7V5C     | RC           | 500                             | 6.05        | 6.75                  | 7.5      | 8.25     | 10    | 11.7                  | 36          |
| P4SMA8V2C     | RE           | 200                             | 6.63        | 7.38                  | 8.2      | 9.02     | 10    | 12.5                  | 33          |
| P4SMA9V1C     | RG           | 50                              | 7.37        | 8.19                  | 9.1      | 10.0     | 1     | 13.8                  | 30          |
| P4SMA10C      | RI           | 10                              | 8.10        | 9.00                  | 10       | 11.0     | 1     | 15.0                  | 28          |
| P4SMA11C      | RK           | 5                               | 8.92        | 9.90                  | 11       | 12.1     | 1     | 16.2                  | 26          |
| P4SMA12C      | RM           | 5                               | 9.72        | 10.8                  | 12       | 13.2     | 1     | 17.3                  | 24          |
| P4SMA13C      | RO           | 5                               | 10.5        | 11.7                  | 13       | 14.3     | 1     | 19.0                  | 22          |
| P4SMA15C      | RR           | 5                               | 12.1        | 13.5                  | 15       | 16.5     | 1     | 22.0                  | 19          |
| P4SMA16C      | RT           | 5                               | 12.9        | 14.4                  | 16       | 17.6     | 1     | 23.5                  | 18          |
| P4SMA18C      | RV           | 5                               | 14.5        | 16.2                  | 18       | 19.8     | 1     | 26.5                  | 16          |
| P4SMA20C      | RX           | 5                               | 16.2        | 18.0                  | 20       | 22.0     | 1     | 29.1                  | 14          |
| P4SMA22C      | RZ           | 5                               | 17.8        | 19.8                  | 22       | 24.2     | 1     | 31.9                  | 13          |
| P4SMA24C      | SB           | 5                               | 19.4        | 21.6                  | 24       | 26.4     | 1     | 34.7                  | 12          |
| P4SMA27C      | SD           | 5                               | 21.8        | 24.3                  | 27       | 29.7     | 1     | 39.1                  | 11          |
| P4SMA30C      | SF           | 5                               | 24.3        | 27.0                  | 30       | 33.0     | 1     | 43.5                  | 10          |
| P4SMA33C      | SH           | 5                               | 26.8        | 29.7                  | 33       | 36.3     | 1     | 47.7                  | 9           |
| P4SMA36C      | SJ           | 5                               | 29.1        | 32.4                  | 36       | 39.6     | 1     | 52.0                  | 8           |
| P4SMA39C      | SL           | 5                               | 31.6        | 35.1                  | 39       | 42.9     | 1     | 56.4                  | 7.4         |
| P4SMA43C      | SN           | 5                               | 34.8        | 38.7                  | 43       | 47.3     | 1     | 61.9                  | 6.8         |
| P4SMA47C      | SP           | 5                               | 38.1        | 42.3                  | 47       | 51.7     | 1     | 67.8                  | 6.2         |
| P4SMA51C      | SS           | 5                               | 41.3        | 45.9                  | 51       | 56.1     | 1     | 73.5                  | 5.7         |
| P4SMA56C      | ST           | 5                               | 45.4        | 50.4                  | 56       | 61.6     | 1     | 80.5                  | 5.2         |
| P4SMA62C      | SU           | 5                               | 50.2        | 55.8                  | 62       | 68.2     | 1     | 89.0                  | 4.7         |
| P4SMA68C      | SW           | 5                               | 55.1        | 61.2                  | 68       | 74.8     | 1     | 98.0                  | 4.3         |
| P4SMA75C      | SY           | 5                               | 60.7        | 67.5                  | 75       | 82.5     | 1     | 108                   | 3.9         |
| P4SMA82C      | WA           | 5                               | 66.4        | 73.8                  | 82       | 90.2     | 1     | 118                   | 3.6         |
| P4SMA91C      | WC           | 5                               | 73.7        | 81.9                  | 91       | 100      | 1     | 131                   | 3.2         |
| P4SMA100C     | WE           | 5                               | 81.0        | 90.0                  | 100      | 110      | 1     | 144                   | 2.9         |
| P4SMA110C     | WG           | 5                               | 89.2        | 99.0                  | 110      | 121      | 1     | 158                   | 2.7         |
| P4SMA120C     | WI           | 5                               | 97.2        | 108                   | 120      | 132      | 1     | 173                   | 2.4         |
| P4SMA130C     | WK           | 5                               | 105         | 117                   | 130      | 143      | 1     | 187                   | 2.2         |
| P4SMA150C     | WM           | 5                               | 121         | 135                   | 150      | 165      | 1     | 215                   | 2.0         |
| P4SMA160C     | WO           | 5                               | 130         | 144                   | 160      | 176      | 1     | 230                   | 1.8         |
| P4SMA170C     | WR           | 5                               | 138         | 153                   | 170      | 187      | 1     | 244                   | 1.7         |
| P4SMA180C     | WT           | 5                               | 146         | 162                   | 180      | 198      | 1     | 258                   | 1.6         |
| P4SMA200C     | WV           | 5                               | 162         | 180                   | 200      | 220      | 1     | 287                   | 1.5         |
| P4SMA220C     | WX           | 5                               | 175         | 198                   | 220      | 242      | 1     | 344                   | 1.16        |

(1) Tested with pulses.

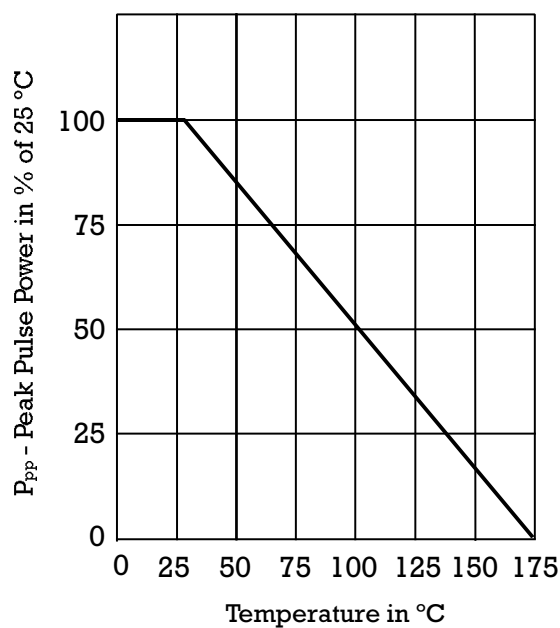
Pulse test:  $t_p \leq 50$  ms;  $\delta < 2\%$

## Rating And Characteristic Curves

DERATING CURVE



Pulse wave form 10/1000



PEAK PULSE POWER RATING CURVE

