

## SMBJP6KE6.8(C)A THRU SMBJP6KE550(C)A

### Features

- Halogen free available upon request by adding suffix "-HF"
- For surface mount applications in order to optimize board space
- Available in both unidirectional and bidirectional construction and suffix "C" designates bidirectional type
- Lead Free Finish/Rohs Compliant (Note1) ("P" Suffix designates Compliant. See ordering information)
- Fast response time: typical less than 1.0ps from 0 volts to  $V_{BR}$  minimum
- Low inductance
- Excellent clamping capability
- UL Recognized File # E331408

### Mechanical Data

- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Terminals: solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes positive end (cathode) except Bidirectional
- Maximum soldering temperature: 260°C for 10 seconds

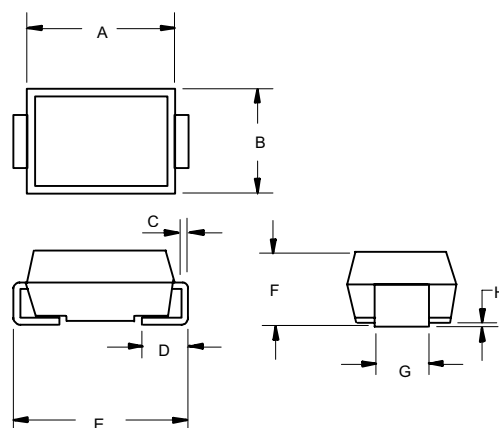
### Maximum Ratings @ 25°C Unless Otherwise Specified

|                                          |                          |                  |          |
|------------------------------------------|--------------------------|------------------|----------|
| Peak Pulse Current on 10/1000us waveform | $I_{PP}$                 | See Table 1      | Note: 2  |
| Peak Pulse Power Dissipation             | $P_{PP}$                 | 600W             | Note: 2, |
| Operation And Storage Temperature Range  | $T_J, T_{STG}$           | -55°C to +175°C  |          |
| Thermal Resistance                       | $R_{thJC}$<br>$R_{thJL}$ | 25°C/W<br>20°C/W |          |

- NOTES: 1. High Temperature Solder Exemptions Applied, see EU Directive Annex 7.
2. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2.

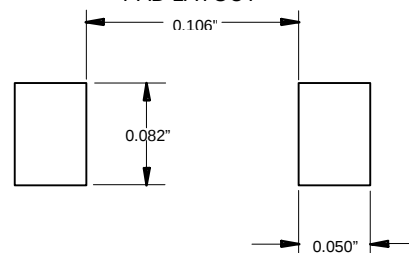
## Transient Voltage Suppressor 6.8 to 550 Volts 600 Watt

### DO-214AA (SMBJ) (LEAD FRAME)



| DIMENSIONS |        |      |      |       |      |
|------------|--------|------|------|-------|------|
| DIM        | INCHES |      | MM   |       | NOTE |
|            | MIN    | MAX  | MIN  | MAX   |      |
| A          | .160   | .185 | 4.06 | 4.70  |      |
| B          | .130   | .155 | 3.30 | 3.94  |      |
| C          | .006   | .012 | 0.15 | 0.31  |      |
| D          | .030   | .060 | 0.76 | 1.52  |      |
| E          | .200   | .220 | 5.08 | 5.59  |      |
| F          | .079   | .096 | 2.00 | 2.44  |      |
| G          | .075   | .087 | 1.91 | 2.21  |      |
| H          | .002   | .008 | 0.05 | 0.203 |      |

### SUGGESTED SOLDER PAD LAYOUT



# SMBJP6KE6.8(C)A THRU SMBJP6KE550(C)A

## ELECTRICAL CHARACTERISTICS @25°C

| MCC<br>PART NUMBER | REVERSE<br>STAND-OFF<br>VOLTAGE<br>$V_{WM}$<br>(VOLTS) | BREAKDOWN VOLTAGE<br>$V_{(BR)}$ @ $I_T$<br>(VOLTS) |        |            | MAXIMUM<br>CLAMPING<br>VOLTAGE @<br>$I_{PP}$<br>(VOLTS) | PEAK PULSE<br>CURRENT<br>$I_{PP}$<br>(AMPS) | MAXIMUM<br>REVERSE<br>LEAKAGE<br>@ $V_{WM}$<br>$I_D$<br>( $\mu A$ ) | MARKING<br>CODE |
|--------------------|--------------------------------------------------------|----------------------------------------------------|--------|------------|---------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------|-----------------|
|                    |                                                        | MIN                                                | MAX    | $I_T$ (mA) |                                                         |                                             |                                                                     |                 |
| SMBJP6KE6.8A       | 5.80                                                   | 6.45                                               | 7.14   | 10         | 10.5                                                    | 58.1                                        | 1000                                                                | 6V8A            |
| SMBJP6KE7.5A       | 6.40                                                   | 7.13                                               | 7.88   | 10         | 11.3                                                    | 54.0                                        | 500                                                                 | 7V5A            |
| SMBJP6KE8.2A       | 7.02                                                   | 7.79                                               | 8.61   | 10         | 12.1                                                    | 50.4                                        | 200                                                                 | 8V2A            |
| SMBJP6KE9.1A       | 7.78                                                   | 8.65                                               | 9.55   | 1          | 13.4                                                    | 45.5                                        | 50                                                                  | 9V1A            |
| SMBJP6KE10A        | 8.55                                                   | 9.50                                               | 10.50  | 1          | 14.5                                                    | 42.1                                        | 10                                                                  | 10A             |
| SMBJP6KE11A        | 9.40                                                   | 10.50                                              | 11.60  | 1          | 15.6                                                    | 39.1                                        | 5                                                                   | 11A             |
| SMBJP6KE12A        | 10.20                                                  | 11.40                                              | 12.60  | 1          | 16.7                                                    | 36.5                                        | 5                                                                   | 12A             |
| SMBJP6KE13A        | 11.10                                                  | 12.40                                              | 13.70  | 1          | 18.2                                                    | 33.5                                        | 1                                                                   | 13A             |
| SMBJP6KE15A        | 12.80                                                  | 14.30                                              | 15.80  | 1          | 21.2                                                    | 28.8                                        | 1                                                                   | 15A             |
| SMBJP6KE16A        | 13.60                                                  | 15.20                                              | 16.80  | 1          | 22.5                                                    | 27.1                                        | 1                                                                   | 16A             |
| SMBJP6KE18A        | 15.30                                                  | 17.10                                              | 18.90  | 1          | 25.5                                                    | 24.2                                        | 1                                                                   | 18A             |
| SMBJP6KE20A        | 17.10                                                  | 19.00                                              | 21.00  | 1          | 27.7                                                    | 22.0                                        | 1                                                                   | 20A             |
| SMBJP6KE22A        | 18.80                                                  | 20.90                                              | 23.10  | 1          | 30.6                                                    | 19.9                                        | 1                                                                   | 22A             |
| SMBJP6KE24A        | 20.50                                                  | 22.80                                              | 25.20  | 1          | 33.2                                                    | 18.4                                        | 1                                                                   | 24A             |
| SMBJP6KE27A        | 23.10                                                  | 25.70                                              | 28.40  | 1          | 37.5                                                    | 16.3                                        | 1                                                                   | 27A             |
| SMBJP6KE30A        | 25.60                                                  | 28.50                                              | 31.50  | 1          | 41.4                                                    | 14.7                                        | 1                                                                   | 30A             |
| SMBJP6KE33A        | 28.20                                                  | 31.40                                              | 34.70  | 1          | 45.7                                                    | 13.3                                        | 1                                                                   | 33A             |
| SMBJP6KE36A        | 30.80                                                  | 34.20                                              | 37.80  | 1          | 49.9                                                    | 12.2                                        | 1                                                                   | 36A             |
| SMBJP6KE39A        | 33.30                                                  | 37.10                                              | 41.00  | 1          | 53.9                                                    | 11.3                                        | 1                                                                   | 39A             |
| SMBJP6KE43A        | 36.80                                                  | 40.90                                              | 45.20  | 1          | 59.3                                                    | 10.3                                        | 1                                                                   | 43A             |
| SMBJP6KE47A        | 40.20                                                  | 44.70                                              | 49.40  | 1          | 64.8                                                    | 9.4                                         | 1                                                                   | 47A             |
| SMBJP6KE51A        | 43.60                                                  | 48.50                                              | 53.60  | 1          | 70.1                                                    | 8.7                                         | 1                                                                   | 51A             |
| SMBJP6KE56A        | 47.80                                                  | 53.20                                              | 58.80  | 1          | 77.0                                                    | 7.9                                         | 1                                                                   | 56A             |
| SMBJP6KE62A        | 53.00                                                  | 58.90                                              | 65.10  | 1          | 85.0                                                    | 7.2                                         | 1                                                                   | 62A             |
| SMBJP6KE68A        | 58.10                                                  | 64.60                                              | 71.40  | 1          | 92.0                                                    | 6.6                                         | 1                                                                   | 68A             |
| SMBJP6KE75A        | 64.10                                                  | 71.30                                              | 78.80  | 1          | 103.0                                                   | 5.9                                         | 1                                                                   | 75A             |
| SMBJP6KE82A        | 70.10                                                  | 77.90                                              | 86.10  | 1          | 113.0                                                   | 5.4                                         | 1                                                                   | 82A             |
| SMBJP6KE91A        | 77.80                                                  | 86.50                                              | 95.50  | 1          | 125.0                                                   | 4.9                                         | 1                                                                   | 91A             |
| SMBJP6KE100A       | 85.50                                                  | 95.00                                              | 105.00 | 1          | 137.0                                                   | 4.5                                         | 1                                                                   | 100A            |
| SMBJP6KE110A       | 94.00                                                  | 105.00                                             | 116.00 | 1          | 152.0                                                   | 4.0                                         | 1                                                                   | 110A            |
| SMBJP6KE120A       | 102.00                                                 | 114.00                                             | 126.00 | 1          | 165.0                                                   | 3.7                                         | 1                                                                   | 120A            |
| SMBJP6KE130A       | 111.00                                                 | 124.00                                             | 137.00 | 1          | 179.0                                                   | 3.4                                         | 1                                                                   | 130A            |
| SMBJP6KE150A       | 128.00                                                 | 143.00                                             | 158.00 | 1          | 207.0                                                   | 2.9                                         | 1                                                                   | 150A            |
| SMBJP6KE160A       | 136.00                                                 | 152.00                                             | 168.00 | 1          | 219.0                                                   | 2.8                                         | 1                                                                   | 160A            |
| SMBJP6KE170A       | 145.00                                                 | 162.00                                             | 179.00 | 1          | 234.0                                                   | 2.6                                         | 1                                                                   | 170A            |
| SMBJP6KE180A       | 154.00                                                 | 171.00                                             | 189.00 | 1          | 246.0                                                   | 2.5                                         | 1                                                                   | 180A            |
| SMBJP6KE200A       | 171.00                                                 | 190.00                                             | 210.00 | 1          | 274.0                                                   | 2.2                                         | 1                                                                   | 200A            |
| SMBJP6KE220A       | 185.00                                                 | 209.00                                             | 231.00 | 1          | 328.0                                                   | 1.9                                         | 1                                                                   | 220A            |
| SMBJP6KE250A       | 214.00                                                 | 237.00                                             | 263.00 | 1          | 344.0                                                   | 1.9                                         | 1                                                                   | 250A            |
| SMBJP6KE300A       | 256.00                                                 | 285.00                                             | 315.00 | 1          | 414.0                                                   | 1.5                                         | 1                                                                   | 300A            |
| SMBJP6KE350A       | 300.00                                                 | 332.00                                             | 368.00 | 1          | 482.0                                                   | 1.3                                         | 1                                                                   | 350A            |
| SMBJP6KE400A       | 342.00                                                 | 380.00                                             | 420.00 | 1          | 548.0                                                   | 1.1                                         | 1                                                                   | 400A            |
| SMBJP6KE440A       | 376.00                                                 | 418.00                                             | 462.00 | 1          | 602.0                                                   | 1.0                                         | 1                                                                   | 440A            |
| SMBJP6KE480A       | 408.00                                                 | 456.00                                             | 504.00 | 1          | 658.0                                                   | 0.9                                         | 1                                                                   | 480A            |
| SMBJP6KE510A       | 434.00                                                 | 485.00                                             | 535.00 | 1          | 698.0                                                   | 0.9                                         | 1                                                                   | 510A            |
| SMBJP6KE530A       | 477.00                                                 | 503.50                                             | 556.50 | 1          | 725.0                                                   | 0.8                                         | 1                                                                   | 530A            |
| SMBJP6KE540A       | 459.00                                                 | 513.00                                             | 567.00 | 1          | 740.0                                                   | 0.8                                         | 1                                                                   | 540A            |
| SMBJP6KE550A       | 495.00                                                 | 522.50                                             | 577.50 | 1          | 760.0                                                   | 0.8                                         | 1                                                                   | 550A            |

For bi-directional type having  $V_{TWM}$  of 10 volts and less, the  $I_R$  limit is double.

The available parts are "A" type only, the parts without A ( $V_{BR}$  is  $\pm 10\%$ ) is not available.

# SMBJP6KE6.8(C)A THRU SMBJP6KE550(C)A

## ELECTRICAL CHARACTERISTICS @25°C

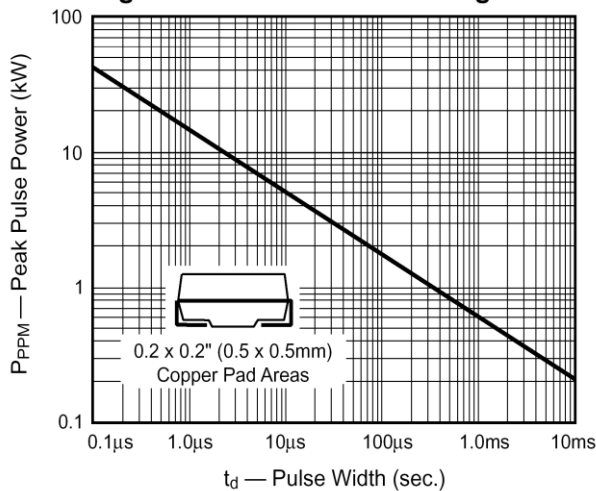
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|--------------------|--------------------------------------------------------|----------------------------------------------------|--------|------------|---------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------|-----------------|
|                    |                                                        | MIN                                                | MAX    | $I_T$ (mA) |                                                         |                                             |                                                                     |                 |
| SMBJP6KE6.8CA      | 5.80                                                   | 6.45                                               | 7.14   | 10         | 10.5                                                    | 58.1                                        | 1000                                                                | 6V8C            |
| SMBJP6KE7.5CA      | 6.40                                                   | 7.13                                               | 7.88   | 10         | 11.3                                                    | 54.0                                        | 500                                                                 | 7V5C            |
| SMBJP6KE8.2CA      | 7.02                                                   | 7.79                                               | 8.61   | 10         | 12.1                                                    | 50.4                                        | 200                                                                 | 8V2C            |
| SMBJP6KE9.1CA      | 7.78                                                   | 8.65                                               | 9.55   | 1          | 13.4                                                    | 45.5                                        | 50                                                                  | 9V1C            |
| SMBJP6KE10CA       | 8.55                                                   | 9.50                                               | 10.50  | 1          | 14.5                                                    | 42.1                                        | 10                                                                  | 10C             |
| SMBJP6KE11CA       | 9.40                                                   | 10.50                                              | 11.60  | 1          | 15.6                                                    | 39.1                                        | 5                                                                   | 11C             |
| SMBJP6KE12CA       | 10.20                                                  | 11.40                                              | 12.60  | 1          | 16.7                                                    | 36.5                                        | 5                                                                   | 12C             |
| SMBJP6KE13CA       | 11.10                                                  | 12.40                                              | 13.70  | 1          | 18.2                                                    | 33.5                                        | 5                                                                   | 13C             |
| SMBJP6KE15CA       | 12.80                                                  | 14.30                                              | 15.80  | 1          | 21.2                                                    | 28.8                                        | 5                                                                   | 15C             |
| SMBJP6KE16CA       | 13.60                                                  | 15.20                                              | 16.80  | 1          | 22.5                                                    | 27.1                                        | 5                                                                   | 16C             |
| SMBJP6KE18CA       | 15.30                                                  | 17.10                                              | 18.90  | 1          | 25.5                                                    | 24.2                                        | 5                                                                   | 18C             |
| SMBJP6KE20CA       | 17.10                                                  | 19.00                                              | 21.00  | 1          | 27.7                                                    | 22.0                                        | 5                                                                   | 20C             |
| SMBJP6KE22CA       | 18.80                                                  | 20.90                                              | 23.10  | 1          | 30.6                                                    | 19.9                                        | 5                                                                   | 22C             |
| SMBJP6KE24CA       | 20.50                                                  | 22.80                                              | 25.20  | 1          | 33.2                                                    | 18.4                                        | 5                                                                   | 24C             |
| SMBJP6KE27CA       | 23.10                                                  | 25.70                                              | 28.40  | 1          | 37.5                                                    | 16.3                                        | 5                                                                   | 27C             |
| SMBJP6KE30CA       | 25.60                                                  | 28.50                                              | 31.50  | 1          | 41.4                                                    | 14.7                                        | 5                                                                   | 30C             |
| SMBJP6KE33CA       | 28.20                                                  | 31.40                                              | 34.70  | 1          | 45.7                                                    | 13.3                                        | 5                                                                   | 33C             |
| SMBJP6KE36CA       | 30.80                                                  | 34.20                                              | 37.80  | 1          | 49.9                                                    | 12.2                                        | 5                                                                   | 36C             |
| SMBJP6KE39CA       | 33.30                                                  | 37.10                                              | 41.00  | 1          | 53.9                                                    | 11.3                                        | 5                                                                   | 39C             |
| SMBJP6KE43CA       | 36.80                                                  | 40.90                                              | 45.20  | 1          | 59.3                                                    | 10.3                                        | 5                                                                   | 43C             |
| SMBJP6KE47CA       | 40.20                                                  | 44.70                                              | 49.40  | 1          | 64.8                                                    | 9.4                                         | 5                                                                   | 47C             |
| SMBJP6KE51CA       | 43.60                                                  | 48.50                                              | 53.60  | 1          | 70.1                                                    | 8.7                                         | 5                                                                   | 51C             |
| SMBJP6KE56CA       | 47.80                                                  | 53.20                                              | 58.80  | 1          | 77.0                                                    | 7.9                                         | 5                                                                   | 56C             |
| SMBJP6KE62CA       | 53.00                                                  | 58.90                                              | 65.10  | 1          | 85.0                                                    | 7.2                                         | 5                                                                   | 62C             |
| SMBJP6KE68CA       | 58.10                                                  | 64.60                                              | 71.40  | 1          | 92.0                                                    | 6.6                                         | 5                                                                   | 68C             |
| SMBJP6KE75CA       | 64.10                                                  | 71.30                                              | 78.80  | 1          | 103.0                                                   | 5.9                                         | 5                                                                   | 75C             |
| SMBJP6KE82CA       | 70.10                                                  | 77.90                                              | 86.10  | 1          | 113.0                                                   | 5.4                                         | 5                                                                   | 82C             |
| SMBJP6KE91CA       | 77.80                                                  | 86.50                                              | 95.50  | 1          | 125.0                                                   | 4.9                                         | 5                                                                   | 91C             |
| SMBJP6KE100CA      | 85.50                                                  | 95.00                                              | 105.00 | 1          | 137.0                                                   | 4.5                                         | 5                                                                   | 100C            |
| SMBJP6KE110CA      | 94.00                                                  | 105.00                                             | 116.00 | 1          | 152.0                                                   | 4.0                                         | 5                                                                   | 110C            |
| SMBJP6KE120CA      | 102.00                                                 | 114.00                                             | 126.00 | 1          | 165.0                                                   | 3.7                                         | 5                                                                   | 120C            |
| SMBJP6KE130CA      | 111.00                                                 | 124.00                                             | 137.00 | 1          | 179.0                                                   | 3.4                                         | 5                                                                   | 130C            |
| SMBJP6KE150CA      | 128.00                                                 | 143.00                                             | 158.00 | 1          | 207.0                                                   | 2.9                                         | 5                                                                   | 150C            |
| SMBJP6KE160CA      | 136.00                                                 | 152.00                                             | 168.00 | 1          | 219.0                                                   | 2.8                                         | 5                                                                   | 160C            |
| SMBJP6KE170CA      | 145.00                                                 | 162.00                                             | 179.00 | 1          | 234.0                                                   | 2.6                                         | 5                                                                   | 170C            |
| SMBJP6KE180CA      | 154.00                                                 | 171.00                                             | 189.00 | 1          | 246.0                                                   | 2.5                                         | 5                                                                   | 180C            |
| SMBJP6KE200CA      | 171.00                                                 | 190.00                                             | 210.00 | 1          | 274.0                                                   | 2.2                                         | 5                                                                   | 200C            |
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| SMBJP6KE400CA      | 342.00                                                 | 380.00                                             | 420.00 | 1          | 548.0                                                   | 1.1                                         | 5                                                                   | 400C            |
| SMBJP6KE440CA      | 376.00                                                 | 418.00                                             | 462.00 | 1          | 602.0                                                   | 1.0                                         | 5                                                                   | 440C            |
| SMBJP6KE480CA      | 408.00                                                 | 456.00                                             | 504.00 | 1          | 658.0                                                   | 0.9                                         | 5                                                                   | 480C            |
| SMBJP6KE510CA      | 434.00                                                 | 485.00                                             | 535.00 | 1          | 698.0                                                   | 0.9                                         | 5                                                                   | 510C            |
| SMBJP6KE530CA      | 477.00                                                 | 503.50                                             | 556.50 | 1          | 725.0                                                   | 0.8                                         | 5                                                                   | 530C            |
| SMBJP6KE540CA      | 459.00                                                 | 513.00                                             | 567.00 | 1          | 740.0                                                   | 0.8                                         | 5                                                                   | 540C            |
| SMBJP6KE550CA      | 495.00                                                 | 522.50                                             | 577.50 | 1          | 760.0                                                   | 0.8                                         | 5                                                                   | 550C            |

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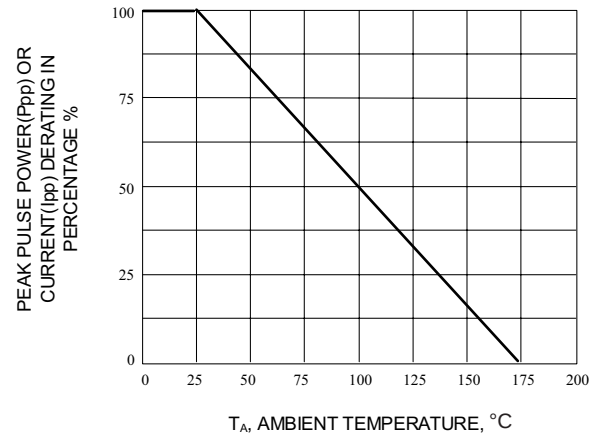
# SMBJP6KE6.8(C)A THRU SMBJP6KE550(C)A

## RATINGS AND CHARACTERISTIC CURVES

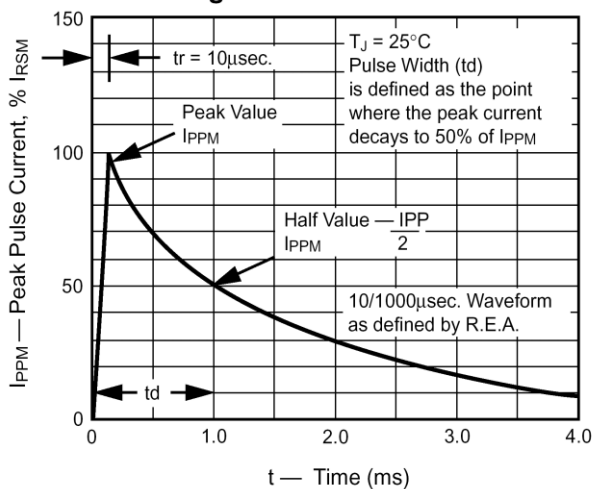
**Fig. 1 – Peak Pulse Power Rating Curve**



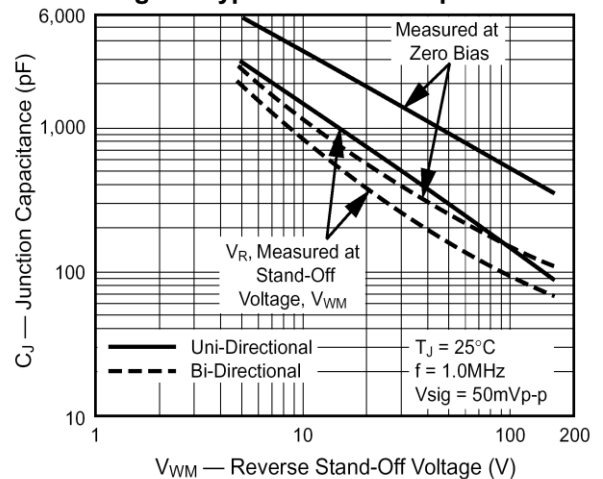
**Fig. 2-PULSE RATING CURVE**



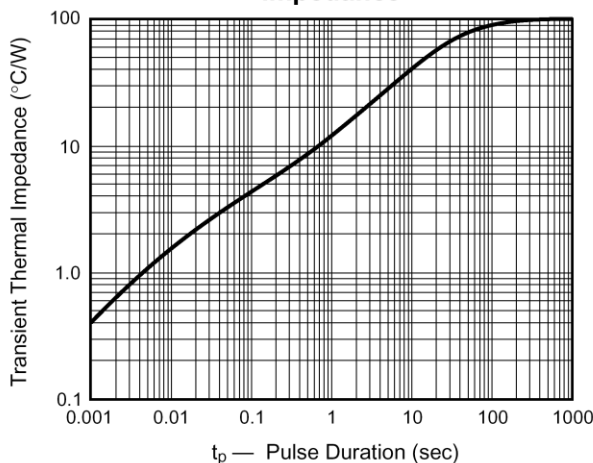
**Fig. 3 – Pulse Waveform**



**Fig. 4 – Typical Junction Capacitance**



**Fig. 5 – Typical Transient Thermal Impedance**



## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

### \*\*\*IMPORTANT NOTICE\*\*\*

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