

|   |                |
|---|----------------|
|  | <b>E480232</b> |
|---|----------------|

### Features

- For Surface Mount Application in Order to Optimize Board Space
- Fast Response Time: Typical Less Than 1.0ps From 0 Volts to  $V_{BR}$  Minimum
- Low Inductance
- Low Profile Package
- Excellent Clamping Capability
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note2) ("P" Suffix Designates Compliant. See Ordering Information)
- For Bidirectional Devices Add "C" To The Suffix of The Part Number: i.e.SMCJ1.5KE6.8CA for 5% Tolerance

### Mechanical Data

- Polarity: Color Band Denotes Positive End( Cathode) Except Bi-directional Types
- Maximum Soldering Temperature: 260 °C for 10 Seconds
- Terminals: Solderable Per MIL-STD-750, Method 2026

### Maximum Ratings

- Operating Junction Temperature Range: -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Typical Thermal Resistance: 15°C/W Junction to Lead
- Typical Thermal Resistance: 75°C/W Junction to Ambient

### Electrical Characteristics @ 25°C Unless Otherwise Specified

|  |           |               |          |
|--|-----------|---------------|----------|
| Peak Pulse Power Surge Current on 10/1000µs Waveform                         | $I_{PP}$  | See the Table | Note 3   |
| Peak Pulse Power Dissipation   | $P_{PP}$  | 1500W(Min)    | Note 3,4 |
| Peak Forward Surge Current, 8.3 ms single half sine-wave unidirectional only | $I_{FSM}$ | 200A          |          |

#### Note:

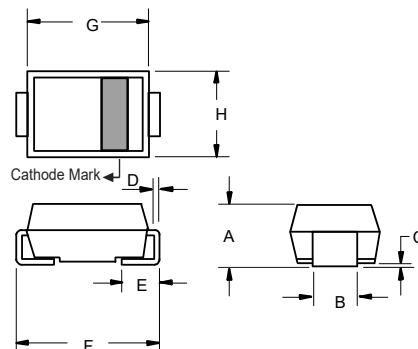
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.
3. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.4.
4. Mounted on 8.0mm<sup>2</sup> copper pads to each terminal.

#### Pin Configuration:



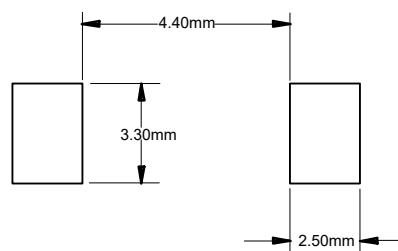
## 1500 Watt TVS 6.8 to 550 Volts

### SMC (DO-214AB) (LEAD FRAME)



| DIM | INCHES |       | MM    |       | NOTE |
|-----|--------|-------|-------|-------|------|
|     | MIN    | MAX   | MIN   | MAX   |      |
| A   | 0.079  | 0.103 | 2.00  | 2.62  |      |
| B   | 0.108  | 0.128 | 2.75  | 3.25  |      |
| C   | 0.002  | 0.008 | 0.051 | 0.203 |      |
| D   | 0.006  | 0.012 | 0.152 | 0.305 |      |
| E   | 0.030  | 0.060 | 0.76  | 1.52  |      |
| F   | 0.305  | 0.320 | 7.75  | 8.13  |      |
| G   | 0.260  | 0.280 | 6.60  | 7.11  |      |
| H   | 0.220  | 0.245 | 5.59  | 6.22  |      |

#### Suggested Solder Pad Layout



## Electrical Characteristics @ 25°C Unless Otherwise Specified

| MCC<br>Part Number | Reverse<br>Stand-Off<br>Voltage | Breakdown Voltage<br>$V_{BR}(V)$ |        | Test<br>Current | Max.<br>Clamping Voltage<br>@ $I_{PP}$ | Peak<br>Pulse<br>Current | Reverse<br>Leakage<br>Current<br>@ $V_{WM}$ | Marking Code |
|--------------------|---------------------------------|----------------------------------|--------|-----------------|--|--------------------------|---|--------------|
|                    |                                 | Min                              | Max    |                 |  |                          |   |              |
| Uni-directional    | $V_{WM}(V)$                     |                                  |        | $I_T(mA)$       | $V_C(V)$                               | $I_{PP}(A)$              | $I_D(\mu A)$                                |              |
| SMCJ1.5KE6.8A      | 5.80                            | 6.45                             | 7.14   | 10              | 10.5                                   | 144.8                    | 1000  | 6V8A         |
| SMCJ1.5KE7.5A      | 6.40                            | 7.13                             | 7.88   | 10              | 11.3                                   | 134.5                    | 500   | 7V5A         |
| SMCJ1.5KE8.2A      | 7.02                            | 7.79                             | 8.61   | 10              | 12.1                                   | 125.6                    | 200   | 8V2A         |
| SMCJ1.5KE9.1A      | 7.78                            | 8.65                             | 9.55   | 1               | 13.4                                   | 113.4                    | 50  | 9V1A         |
| SMCJ1.5KE10A       | 8.55                            | 9.50                             | 10.50  | 1               | 14.5                                   | 104.8                    | 10  | 10A          |
| SMCJ1.5KE11A       | 9.40                            | 10.50                            | 11.60  | 1               | 15.6                                   | 97.4                     | 5   | 11A          |
| SMCJ1.5KE12A       | 10.20                           | 11.40                            | 12.60  | 1               | 16.7                                   | 91.0                     | 5   | 12A          |
| SMCJ1.5KE13A       | 11.10                           | 12.40                            | 13.70  | 1               | 18.2                                   | 83.5                     | 5   | 13A          |
| SMCJ1.5KE15A       | 12.80                           | 14.30                            | 15.80  | 1               | 21.2                                   | 71.7                     | 5   | 15A          |
| SMCJ1.5KE16A       | 13.60                           | 15.20                            | 16.80  | 1               | 22.5                                   | 67.6                     | 5   | 16A          |
| SMCJ1.5KE18A       | 15.30                           | 17.10                            | 18.90  | 1               | 25.5                                   | 60.3                     | 5   | 18A          |
| SMCJ1.5KE20A       | 17.10                           | 19.00                            | 21.00  | 1               | 27.7                                   | 54.9                     | 5   | 20A          |
| SMCJ1.5KE22A       | 18.80                           | 20.90                            | 23.10  | 1               | 30.6                                   | 49.7                     | 5   | 22A          |
| SMCJ1.5KE24A       | 20.50                           | 22.80                            | 25.20  | 1               | 33.2                                   | 45.8                     | 5   | 24A          |
| SMCJ1.5KE27A       | 23.10                           | 25.70                            | 28.40  | 1               | 37.5                                   | 40.5                     | 5   | 27A          |
| SMCJ1.5KE30A       | 25.60                           | 28.50                            | 31.50  | 1               | 41.4                                   | 36.7                     | 5   | 30A          |
| SMCJ1.5KE33A       | 28.20                           | 31.40                            | 34.70  | 1               | 45.7                                   | 33.3                     | 5   | 33A          |
| SMCJ1.5KE36A       | 30.80                           | 34.20                            | 37.80  | 1               | 49.9                                   | 30.5                     | 5   | 36A          |
| SMCJ1.5KE39A       | 33.30                           | 37.10                            | 41.00  | 1               | 53.9                                   | 28.2                     | 5   | 39A          |
| SMCJ1.5KE43A       | 36.80                           | 40.90                            | 45.20  | 1               | 59.3                                   | 25.6                     | 5   | 43A          |
| SMCJ1.5KE47A       | 40.20                           | 44.70                            | 49.40  | 1               | 64.8                                   | 23.5                     | 5   | 47A          |
| SMCJ1.5KE51A       | 43.60                           | 48.50                            | 53.60  | 1               | 70.1                                   | 21.7                     | 5   | 51A          |
| SMCJ1.5KE56A       | 47.80                           | 53.20                            | 58.80  | 1               | 77.0                                   | 19.7                     | 5   | 56A          |
| SMCJ1.5KE62A       | 53.00                           | 58.90                            | 65.10  | 1               | 85.0                                   | 17.9                     | 5   | 62A          |
| SMCJ1.5KE68A       | 58.10                           | 64.60                            | 71.40  | 1               | 92.0                                   | 16.5                     | 5   | 68A          |
| SMCJ1.5KE75A       | 64.10                           | 71.30                            | 78.80  | 1               | 103.0                                  | 14.8                     | 5   | 75A          |
| SMCJ1.5KE82A       | 70.10                           | 77.90                            | 86.10  | 1               | 113.0                                  | 13.5                     | 5   | 82A          |
| SMCJ1.5KE91A       | 77.80                           | 86.50                            | 95.50  | 1               | 125.0                                  | 12.2                     | 5   | 91A          |
| SMCJ1.5KE100A      | 85.50                           | 95.00                            | 105.00 | 1               | 137.0                                  | 11.1                     | 5   | 100A         |
| SMCJ1.5KE110A      | 94.00                           | 105.00                           | 116.00 | 1               | 152.0                                  | 10.0                     | 5   | 110A         |
| SMCJ1.5KE120A      | 102.00                          | 114.00                           | 126.00 | 1               | 165.0                                  | 9.2                      | 5   | 120A         |
| SMCJ1.5KE130A      | 111.00                          | 124.00                           | 137.00 | 1               | 179.0                                  | 8.5                      | 5   | 130A         |
| SMCJ1.5KE150A      | 128.00                          | 143.00                           | 158.00 | 1               | 207.0                                  | 7.3                      | 5   | 150A         |
| SMCJ1.5KE160A      | 136.00                          | 152.00                           | 168.00 | 1               | 219.0                                  | 6.9                      | 5   | 160A         |
| SMCJ1.5KE170A      | 145.00                          | 162.00                           | 179.00 | 1               | 234.0                                  | 6.5                      | 5   | 170A         |
| SMCJ1.5KE180A      | 154.00                          | 171.00                           | 189.00 | 1               | 246.0                                  | 6.2                      | 5   | 180A         |
| SMCJ1.5KE200A      | 171.00                          | 190.00                           | 210.00 | 1               | 274.0                                  | 5.5                      | 5   | 200A         |
| SMCJ1.5KE220A      | 185.00                          | 209.00                           | 231.00 | 1               | 328.0                                  | 4.6                      | 5   | 220A         |
| SMCJ1.5KE250A      | 214.00                          | 237.00                           | 263.00 | 1               | 344.0                                  | 4.4                      | 5   | 250A         |
| SMCJ1.5KE300A      | 256.00                          | 285.00                           | 315.00 | 1               | 414.0                                  | 3.7                      | 5   | 300A         |
| SMCJ1.5KE350A      | 300.00                          | 332.00                           | 368.00 | 1               | 482.0                                  | 3.2                      | 5   | 350A         |
| SMCJ1.5KE400A      | 342.00                          | 380.00                           | 420.00 | 1               | 548.0                                  | 2.8                      | 5   | 400A         |
| SMCJ1.5KE440A      | 376.00                          | 418.00                           | 462.00 | 1               | 602.0                                  | 2.5                      | 5   | 440A         |
| SMCJ1.5KE480A      | 408.00                          | 456.00                           | 504.00 | 1               | 658.0                                  | 2.3                      | 5   | 480A         |
| SMCJ1.5KE510A      | 434.00                          | 485.00                           | 535.00 | 1               | 698.0                                  | 2.1                      | 5   | 510A         |
| SMCJ1.5KE530A      | 477.00                          | 503.50                           | 556.50 | 1               | 725.0                                  | 2.1                      | 5   | 530A         |
| SMCJ1.5KE540A      | 459.00                          | 513.00                           | 567.00 | 1               | 740.0                                  | 2.0                      | 5   | 540A         |
| SMCJ1.5KE550A      | 495.00                          | 522.50                           | 577.50 | 1               | 760.0                                  | 2.0                      | 5   | 550A         |

1. For Bi-directional type having  $V_{WM}$  of 10 volts and less, the  $I_R$  limit is double.  
 2. The available parts are "A" type only, the parts without A ( $V_{BR}$  is  $\pm 10\%$ ) is not available.

**Electrical Characteristics @ 25°C Unless Otherwise Specified**

| MCC Part Number | Reverse Stand-Off Voltage | Breakdown Voltage $V_{BR}(V)$ |        | Test Current | Max. Clamping Voltage @ $I_{PP}$ | Peak Pulse Current | Reverse Leakage Current @ $V_{WM}$ | Marking Code |
|-----------------|---------------------------|-------------------------------|--------|--------------|----------------------------------|--------------------|------------------------------------|--------------|
|                 |                           | Min                           | Max    |              |                                  |                    |                                    |              |
| Bi-directional  | $V_{WM}(V)$               |                               |        | $I_T(mA)$    | $V_C(V)$                         | $I_{PP}(A)$        | $I_D(\mu A)$                       |              |
| SMCJ1.5KE6.8CA  | 5.80                      | 6.45                          | 7.14   | 10           | 10.5                             | 144.8              | 1000                               | 6V8C         |
| SMCJ1.5KE7.5CA  | 6.40                      | 7.13                          | 7.88   | 10           | 11.3                             | 134.5              | 500                                | 7V5C         |
| SMCJ1.5KE8.2CA  | 7.02                      | 7.79                          | 8.61   | 10           | 12.1                             | 125.6              | 200                                | 8V2C         |
| SMCJ1.5KE9.1CA  | 7.78                      | 8.65                          | 9.55   | 1            | 13.4                             | 113.4              | 50                                 | 9V1C         |
| SMCJ1.5KE10CA   | 8.55                      | 9.50                          | 10.50  | 1            | 14.5                             | 104.8              | 10                                 | 10C          |
| SMCJ1.5KE11CA   | 9.40                      | 10.50                         | 11.60  | 1            | 15.6                             | 97.4               | 5                                  | 11C          |
| SMCJ1.5KE12CA   | 10.20                     | 11.40                         | 12.60  | 1            | 16.7                             | 91.0               | 5                                  | 12C          |
| SMCJ1.5KE13CA   | 11.10                     | 12.40                         | 13.70  | 1            | 18.2                             | 83.5               | 5                                  | 13C          |
| SMCJ1.5KE15CA   | 12.80                     | 14.30                         | 15.80  | 1            | 21.2                             | 71.7               | 5                                  | 15C          |
| SMCJ1.5KE16CA   | 13.60                     | 15.20                         | 16.80  | 1            | 22.5                             | 67.6               | 5                                  | 16C          |
| SMCJ1.5KE18CA   | 15.30                     | 17.10                         | 18.90  | 1            | 25.5                             | 60.3               | 5                                  | 18C          |
| SMCJ1.5KE20CA   | 17.10                     | 19.00                         | 21.00  | 1            | 27.7                             | 54.9               | 5                                  | 20C          |
| SMCJ1.5KE22CA   | 18.80                     | 20.90                         | 23.10  | 1            | 30.6                             | 49.7               | 5                                  | 22C          |
| SMCJ1.5KE24CA   | 20.50                     | 22.80                         | 25.20  | 1            | 33.2                             | 45.8               | 5                                  | 24C          |
| SMCJ1.5KE27CA   | 23.10                     | 25.70                         | 28.40  | 1            | 37.5                             | 40.5               | 5                                  | 27C          |
| SMCJ1.5KE30CA   | 25.60                     | 28.50                         | 31.50  | 1            | 41.4                             | 36.7               | 5                                  | 30C          |
| SMCJ1.5KE33CA   | 28.20                     | 31.40                         | 34.70  | 1            | 45.7                             | 33.3               | 5                                  | 33C          |
| SMCJ1.5KE36CA   | 30.80                     | 34.20                         | 37.80  | 1            | 49.9                             | 30.5               | 5                                  | 36C          |
| SMCJ1.5KE39CA   | 33.30                     | 37.10                         | 41.00  | 1            | 53.9                             | 28.2               | 5                                  | 39C          |
| SMCJ1.5KE43CA   | 36.80                     | 40.90                         | 45.20  | 1            | 59.3                             | 25.6               | 5                                  | 43C          |
| SMCJ1.5KE47CA   | 40.20                     | 44.70                         | 49.40  | 1            | 64.8                             | 23.5               | 5                                  | 47C          |
| SMCJ1.5KE51CA   | 43.60                     | 48.50                         | 53.60  | 1            | 70.1                             | 21.7               | 5                                  | 51C          |
| SMCJ1.5KE56CA   | 47.80                     | 53.20                         | 58.80  | 1            | 77.0                             | 19.7               | 5                                  | 56C          |
| SMCJ1.5KE62CA   | 53.00                     | 58.90                         | 65.10  | 1            | 85.0                             | 17.9               | 5                                  | 62C          |
| SMCJ1.5KE68CA   | 58.10                     | 64.60                         | 71.40  | 1            | 92.0                             | 16.5               | 5                                  | 68C          |
| SMCJ1.5KE75CA   | 64.10                     | 71.30                         | 78.80  | 1            | 103.0                            | 14.8               | 5                                  | 75C          |
| SMCJ1.5KE82CA   | 70.10                     | 77.90                         | 86.10  | 1            | 113.0                            | 13.5               | 5                                  | 82C          |
| SMCJ1.5KE91CA   | 77.80                     | 86.50                         | 95.50  | 1            | 125.0                            | 12.2               | 5                                  | 91C          |
| SMCJ1.5KE100CA  | 85.50                     | 95.00                         | 105.00 | 1            | 137.0                            | 11.1               | 5                                  | 100C         |
| SMCJ1.5KE110CA  | 94.00                     | 105.00                        | 116.00 | 1            | 152.0                            | 10.0               | 5                                  | 110C         |
| SMCJ1.5KE120CA  | 102.00                    | 114.00                        | 126.00 | 1            | 165.0                            | 9.2                | 5                                  | 120C         |
| SMCJ1.5KE130CA  | 111.00                    | 124.00                        | 137.00 | 1            | 179.0                            | 8.5                | 5                                  | 130C         |
| SMCJ1.5KE150CA  | 128.00                    | 143.00                        | 158.00 | 1            | 207.0                            | 7.3                | 5                                  | 150C         |
| SMCJ1.5KE160CA  | 136.00                    | 152.00                        | 168.00 | 1            | 219.0                            | 6.9                | 5                                  | 160C         |
| SMCJ1.5KE170CA  | 145.00                    | 162.00                        | 179.00 | 1            | 234.0                            | 6.5                | 5                                  | 170C         |
| SMCJ1.5KE180CA  | 154.00                    | 171.00                        | 189.00 | 1            | 246.0                            | 6.2                | 5                                  | 180C         |
| SMCJ1.5KE200CA  | 171.00                    | 190.00                        | 210.00 | 1            | 274.0                            | 5.5                | 5                                  | 200C         |
| SMCJ1.5KE220CA  | 185.00                    | 209.00                        | 231.00 | 1            | 328.0                            | 4.6                | 5                                  | 220C         |
| SMCJ1.5KE250CA  | 214.00                    | 237.00                        | 263.00 | 1            | 344.0                            | 4.4                | 5                                  | 250C         |
| SMCJ1.5KE300CA  | 256.00                    | 285.00                        | 315.00 | 1            | 414.0                            | 3.7                | 5                                  | 300C         |
| SMCJ1.5KE350CA  | 300.00                    | 332.00                        | 368.00 | 1            | 482.0                            | 3.2                | 5                                  | 350C         |
| SMCJ1.5KE400CA  | 342.00                    | 380.00                        | 420.00 | 1            | 548.0                            | 2.8                | 5                                  | 400C         |
| SMCJ1.5KE440CA  | 376.00                    | 418.00                        | 462.00 | 1            | 602.0                            | 2.5                | 5                                  | 440C         |
| SMCJ1.5KE480CA  | 408.00                    | 456.00                        | 504.00 | 1            | 658.0                            | 2.3                | 5                                  | 480C         |
| SMCJ1.5KE510CA  | 434.00                    | 485.00                        | 535.00 | 1            | 698.0                            | 2.1                | 5                                  | 510C         |
| SMCJ1.5KE530CA  | 477.00                    | 503.50                        | 556.50 | 1            | 725.0                            | 2.1                | 5                                  | 530C         |
| SMCJ1.5KE540CA  | 459.00                    | 513.00                        | 567.00 | 1            | 740.0                            | 2.0                | 5                                  | 540C         |
| SMCJ1.5KE550CA  | 495.00                    | 522.50                        | 577.50 | 1            | 760.0                            | 2.0                | 5                                  | 550C         |

1. For Bi-directional type having  $V_{WM}$  of 10 volts and less, the  $I_R$  limit is double.  
2. The available parts are "A" type only, the parts without A ( $V_{BR}$  is  $\pm 10\%$ ) is not available.

**Curve Characteristics**

Fig. 1 - Peak Pulse Power Rating Curve

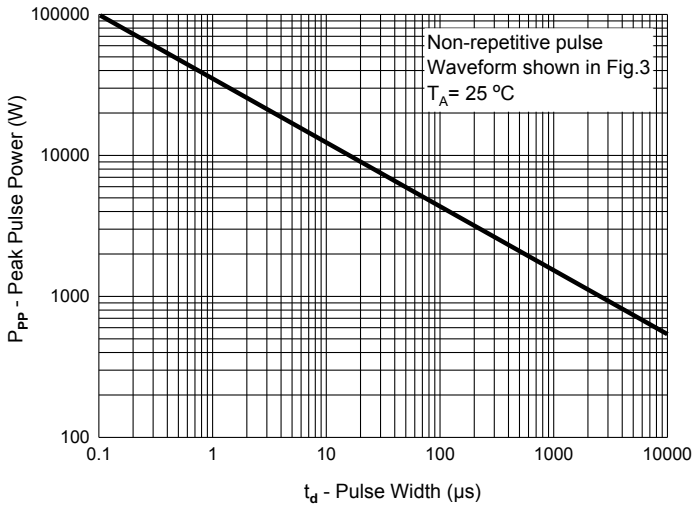


Fig. 2 - Typical Junction Capacitance

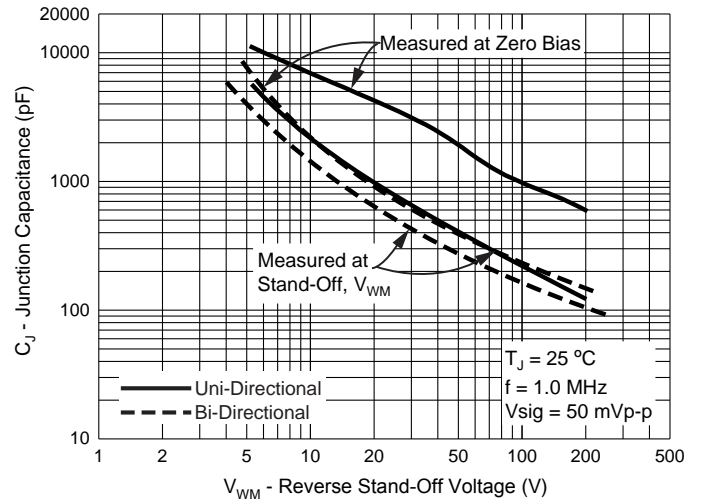


Fig. 3 - Pulse Waveform

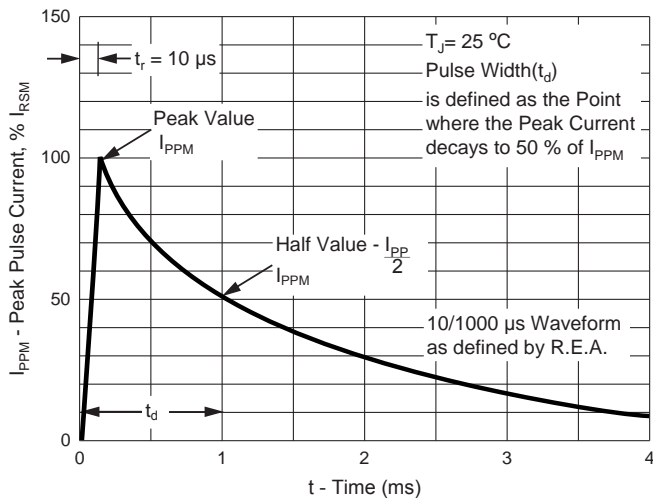


Fig. 4 - Pulse Derating Curve

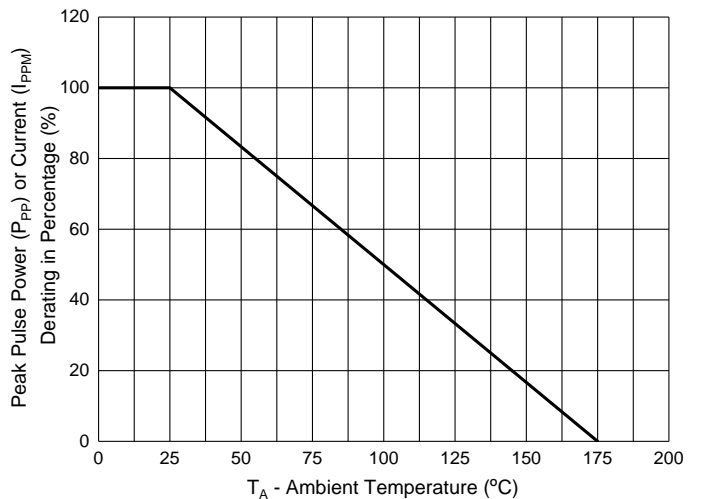
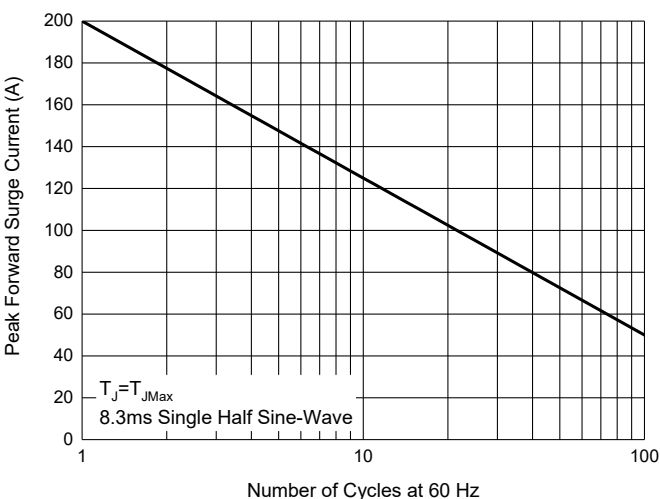


Fig. 5 - Maximum Non-Repetitive Surge Current



## Ordering Information

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

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