



E480232

## Features

- For Surface Mount Application in Order to Optimize Board Space
- Built-in Strain Relief
- Glass Passivated Junction
- Plastic Package Has Underwrites Laboratory Flammability
- Temperature Coefficient, Typical Value is 0.1%
- Fast Response Time: Typical Less than 1ps from 0V to BV Min
- Typical  $I_D$  Less than 1 $\mu$ A Above 10V
- High Temperature Soldering: 260°C/10 Seconds at Terminals
- 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)

## Mechanical Data

- Polarity: Color Band Denotes Positive End( Cathode) Except Bi-directional Types(Note4)
- IEC-61000-4-2 ESD 15kV(Air), 8kV(Contact)

## Maximum Ratings

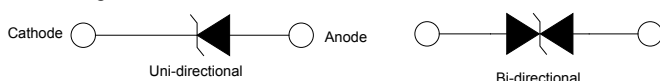
- Operating Junction Temperature Range: -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Typical Thermal Resistance: 15°C/W Junction to Lead
- Typical Thermal Resistance: 75°C/W Junction to Ambient

## Electrical Characteristics @ 25°C Unless Otherwise Specified

|                                                                              |           |                                |                            |
|------------------------------------------------------------------------------|-----------|--------------------------------|----------------------------|
| Peak Pulse Power Surge Current on 10/1000 $\mu$ s Waveform                   | $I_{PPM}$ | See the Table                  | Note 3                     |
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s Waveform                     | $P_{PPM}$ | 1500W                          | Note 3,4, Fig1             |
| Power Dissipation on infinite heat sink                                      | $P_D$     | 6.5W                           | $T_L = 75^\circ\text{C}$ . |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only | $I_{FSM}$ | 200A                           |                            |
| Maximum instantaneous forward voltage at 100A for unidirectional only        | $V_F$     | 3.5V MAX 1.7 TYP /5V MAX 4 TYP | Note 6                     |

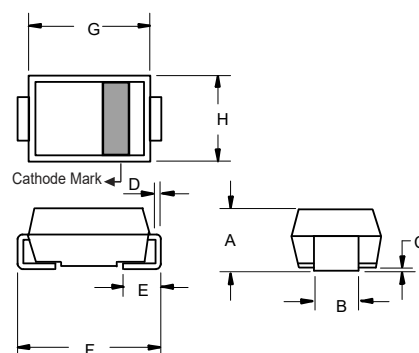
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.
3. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.4.
4. Mounted on 8.0mm<sup>2</sup>copper pads to each terminal.
5. Unidirectional and bidirectional available, for bidirectional devices add "C" suffix to the pn#SMCJ5.0CA
6.  $V_F<3.5\text{V}$  for devices of  $V_{BR}<200\text{V}$  and  $V_F<5.0\text{V}$  for devices of  $V_{BR}>201\text{V}$

Pin Configuration:



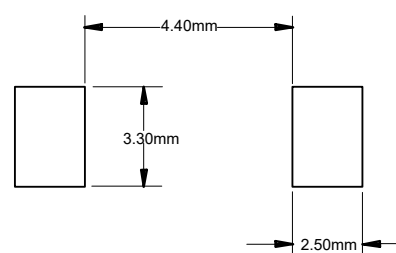
**1500 Watt TVS**  
**5.0 to 440 Volts**

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



| DIMENSIONS |        |       |       |       |      |
|------------|--------|-------|-------|-------|------|
| 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 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 |     |
|-----------------|-----------|---------------------------|-------------------------------|-------|--------------|----------------------------------|--------------------|------------------------------------|--------------|-----|
| Uni-Polar       | Bi-Polar  | $V_{WM}(V)$               | Min                           | Max   | $I_T(mA)$    | $V_C(V)$                         | $I_{PP}(A)$        | $I_D(\mu A)$                       | UNI          | BI  |
| SMCJ5.0A        | SMCJ5.0CA | 5                         | 6.4                           | 7.0   | 10           | 9.2                              | 163.0              | 800                                | GDE          | BDE |
| SMCJ6.0A        | SMCJ6.0CA | 6                         | 6.7                           | 7.4   | 10           | 10.3                             | 145.7              | 800                                | GDG          | BDG |
| SMCJ6.5A        | SMCJ6.5CA | 6.5                       | 7.2                           | 8.0   | 10           | 11.2                             | 134.0              | 500                                | GDK          | BDK |
| SMCJ7.0A        | SMCJ7.0CA | 7                         | 7.8                           | 8.6   | 10           | 12.0                             | 125.0              | 200                                | GDM          | BDM |
| SMCJ7.5A        | SMCJ7.5CA | 7.5                       | 8.3                           | 9.2   | 1            | 12.9                             | 116.3              | 100                                | GDP          | BDP |
| SMCJ8.0A        | SMCJ8.0CA | 8                         | 8.9                           | 9.8   | 1            | 13.6                             | 110.3              | 50                                 | GDR          | BDR |
| SMCJ8.5A        | SMCJ8.5CA | 8.5                       | 9.4                           | 10.4  | 1            | 14.4                             | 104.2              | 20                                 | GDT          | BDT |
| SMCJ9.0A        | SMCJ9.0CA | 9                         | 10.0                          | 11.1  | 1            | 15.4                             | 97.4               | 10                                 | GDV          | BDV |
| SMCJ10A         | SMCJ10CA  | 10                        | 11.1                          | 12.3  | 1            | 17.0                             | 88.3               | 5                                  | GDY          | BDY |
| SMCJ11A         | SMCJ11CA  | 11                        | 12.2                          | 13.5  | 1            | 18.2                             | 82.5               | 1                                  | GDZ          | BDZ |
| SMCJ12A         | SMCJ12CA  | 12                        | 13.3                          | 14.7  | 1            | 19.9                             | 75.4               | 1                                  | GEE          | BEE |
| SMCJ13A         | SMCJ13CA  | 13                        | 14.4                          | 15.9  | 1            | 21.5                             | 69.8               | 1                                  | GEG          | BEG |
| SMCJ14A         | SMCJ14CA  | 14                        | 15.6                          | 17.2  | 1            | 23.2                             | 64.7               | 1                                  | GEK          | BEK |
| SMCJ15A         | SMCJ15CA  | 15                        | 16.7                          | 18.5  | 1            | 24.4                             | 61.5               | 1                                  | GEM          | BEM |
| SMCJ16A         | SMCJ16CA  | 16                        | 17.8                          | 19.7  | 1            | 26.0                             | 57.7               | 1                                  | GEP          | BEP |
| SMCJ17A         | SMCJ17CA  | 17                        | 18.9                          | 20.9  | 1            | 27.6                             | 54.4               | 1                                  | GER          | BER |
| SMCJ18A         | SMCJ18CA  | 18                        | 20.0                          | 22.1  | 1            | 29.2                             | 51.4               | 1                                  | GET          | BET |
| SMCJ20A         | SMCJ20CA  | 20                        | 22.2                          | 24.5  | 1            | 32.4                             | 46.3               | 1                                  | GEV          | BEV |
| SMCJ22A         | SMCJ22CA  | 22                        | 24.4                          | 26.9  | 1            | 35.5                             | 42.3               | 1                                  | GEX          | BEX |
| SMCJ24A         | SMCJ24CA  | 24                        | 26.7                          | 29.5  | 1            | 38.9                             | 38.6               | 1                                  | GEZ          | BEZ |
| SMCJ26A         | SMCJ26CA  | 26                        | 28.9                          | 31.9  | 1            | 42.1                             | 35.7               | 1                                  | GFE          | BFE |
| SMCJ28A         | SMCJ28CA  | 28                        | 31.1                          | 34.4  | 1            | 45.4                             | 33.1               | 1                                  | GFG          | BFG |
| SMCJ30A         | SMCJ30CA  | 30                        | 33.3                          | 36.8  | 1            | 48.4                             | 31.0               | 1                                  | GFK          | BFK |
| SMCJ33A         | SMCJ33CA  | 33                        | 36.7                          | 40.6  | 1            | 53.3                             | 28.2               | 1                                  | GFM          | BFM |
| SMCJ36A         | SMCJ36CA  | 36                        | 40.0                          | 44.2  | 1            | 58.1                             | 25.9               | 1                                  | GFP          | BFP |
| SMCJ40A         | SMCJ40CA  | 40                        | 44.4                          | 49.1  | 1            | 64.5                             | 23.3               | 1                                  | GFR          | BFR |
| SMCJ43A         | SMCJ43CA  | 43                        | 47.8                          | 52.8  | 1            | 69.4                             | 21.7               | 1                                  | GFT          | BFT |
| SMCJ45A         | SMCJ45CA  | 45                        | 50.0                          | 55.3  | 1            | 72.7                             | 20.6               | 1                                  | GFV          | BFV |
| SMCJ48A         | SMCJ48CA  | 48                        | 53.3                          | 58.9  | 1            | 77.4                             | 19.4               | 1                                  | GFX          | BFX |
| SMCJ51A         | SMCJ51CA  | 51                        | 56.7                          | 62.7  | 1            | 82.4                             | 18.2               | 1                                  | GFZ          | BFZ |
| SMCJ54A         | SMCJ54CA  | 54                        | 60.0                          | 66.3  | 1            | 87.1                             | 17.3               | 1                                  | GGE          | BGE |
| SMCJ58A         | SMCJ58CA  | 58                        | 64.4                          | 71.2  | 1            | 93.6                             | 16.1               | 1                                  | GGG          | BGG |
| SMCJ60A         | SMCJ60CA  | 60                        | 66.7                          | 73.7  | 1            | 96.8                             | 15.5               | 1                                  | GGK          | BGK |
| SMCJ64A         | SMCJ64CA  | 64                        | 71.1                          | 78.6  | 1            | 103.0                            | 14.6               | 1                                  | GGM          | BGM |
| SMCJ70A         | SMCJ70CA  | 70                        | 77.8                          | 86.0  | 1            | 113.0                            | 13.3               | 1                                  | GGP          | BGP |
| SMCJ75A         | SMCJ75CA  | 75                        | 83.3                          | 92.1  | 1            | 121.0                            | 12.4               | 1                                  | GGR          | BGR |
| SMCJ78A         | SMCJ78CA  | 78                        | 86.7                          | 95.8  | 1            | 126.0                            | 11.9               | 1                                  | GGT          | BGT |
| SMCJ85A         | SMCJ85CA  | 85                        | 94.4                          | 104.0 | 1            | 137.0                            | 11.0               | 1                                  | GGV          | BGV |
| SMCJ90A         | SMCJ90CA  | 90                        | 100.0                         | 111.0 | 1            | 146.0                            | 10.3               | 1                                  | GGX          | BGX |
| SMCJ100A        | SMCJ100CA | 100                       | 111.0                         | 123.0 | 1            | 162.0                            | 9.3                | 1                                  | GGZ          | BGZ |
| SMCJ110A        | SMCJ110CA | 110                       | 122.0                         | 135.0 | 1            | 177                              | 8.5                | 1                                  | GHE          | BHE |
| SMCJ120A        | SMCJ120CA | 120                       | 133.0                         | 147.0 | 1            | 193                              | 7.8                | 1                                  | GHG          | BHG |
| SMCJ130A        | SMCJ130CA | 130                       | 144.0                         | 159.0 | 1            | 209                              | 7.2                | 1                                  | GHK          | BHK |
| SMCJ150A        | SMCJ150CA | 150                       | 167.0                         | 185.0 | 1            | 243                              | 6.2                | 1                                  | GHM          | BHM |
| SMCJ160A        | SMCJ160CA | 160                       | 178.0                         | 197.0 | 1            | 259                              | 5.8                | 1                                  | GHP          | BHP |
| SMCJ170A        | SMCJ170CA | 170                       | 189.0                         | 209.0 | 1            | 275                              | 5.5                | 1                                  | GHR          | BHR |
| SMCJ180A        | SMCJ180CA | 180                       | 201.0                         | 222.0 | 1            | 292                              | 5.1                | 1                                  | GHT          | BHT |
| SMCJ200A        | SMCJ200CA | 200                       | 224.0                         | 247.0 | 1            | 324                              | 4.6                | 1                                  | GHV          | BHV |

For bi-directional type having  $V_{WM}$  of 10volts and less, the  $I_R$  limit is double. For parts without A, the  $V_{BR}$  is  $\pm 10\%$

**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@ $V_{WM}$ | Marking Code |     |
|--------------------|-----------|---------------------------------|----------------------------------|-------|-----------------|----------------------------------------|--------------------------|-----------------------------------------|--------------|-----|
| SMCJ220A           | SMCJ220CA | 220                             | 246.0                            | 272.0 | 1               | 356                                    | 4.2                      | 1                                       | GHX          | BHX |
| SMCJ250A           | SMCJ250CA | 250                             | 279.0                            | 309.0 | 1               | 405                                    | 3.7                      | 1                                       | GHZ          | BHZ |
| SMCJ300A           | SMCJ300CA | 300                             | 335.0                            | 371.0 | 1               | 486                                    | 3.1                      | 1                                       | GJE          | BJE |
| SMCJ350A           | SMCJ350CA | 350                             | 391.0                            | 432.0 | 1               | 567                                    | 2.6                      | 1                                       | GJG          | BJG |
| SMCJ400A           | SMCJ400CA | 400                             | 447.0                            | 494.0 | 1               | 648                                    | 2.3                      | 1                                       | GJK          | BJK |
| SMCJ440A           | SMCJ440CA | 440                             | 492.0                            | 543.0 | 1               | 713                                    | 2.1                      | 1                                       | GJM          | BJM |

For bi-directional type having  $V_{WM}$  of 10volts and less, the  $I_R$  limit is double. For parts without A, the  $V_{BR}$  is  $\pm 10\%$

## Curve Characteristics

Fig. 1 - Peak Pulse Power Rating Curve

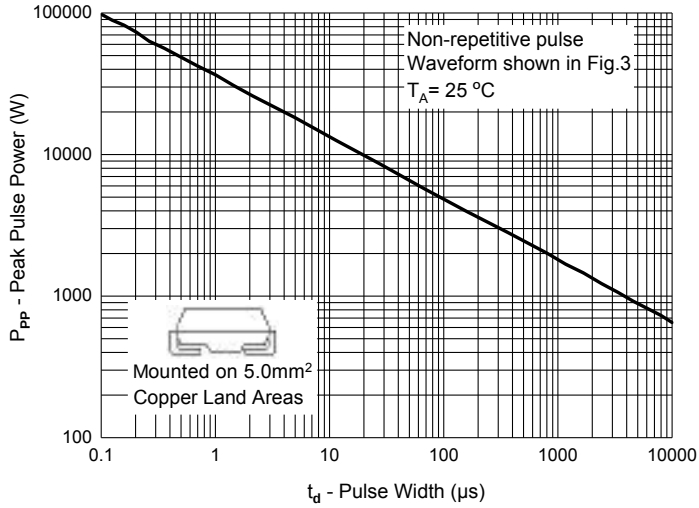


Fig. 2 - Typical Junction Capacitance

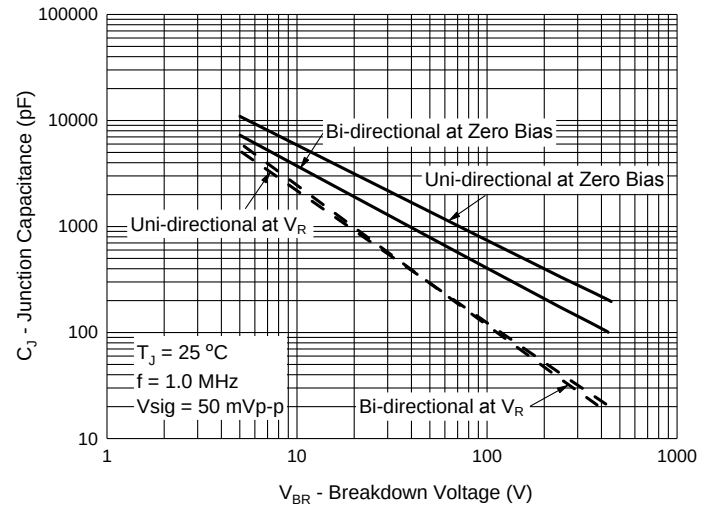


Fig. 3 - Pulse Waveform

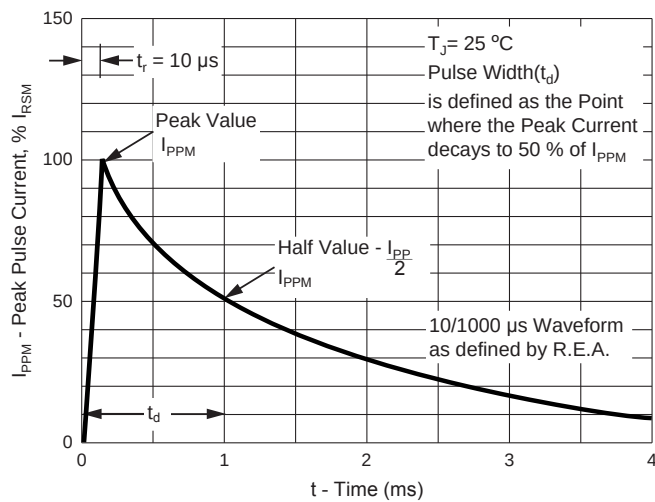
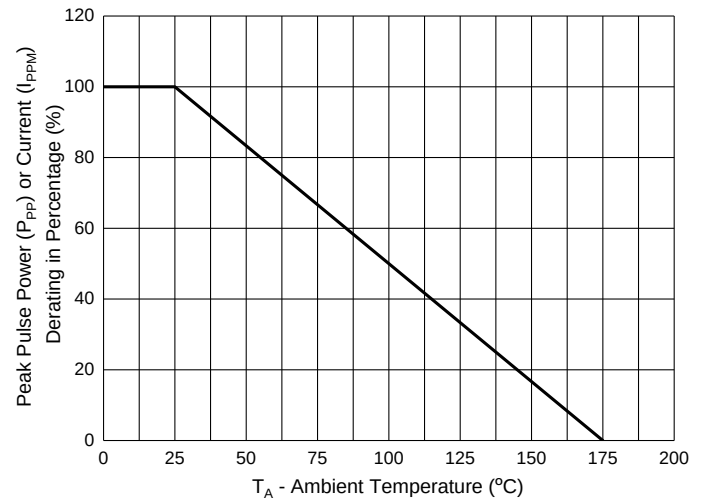


Fig. 4 - Pulse Derating Curve



## Ordering Information

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

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