



**THE DATASHEET OF
5.0SMLJ20CA-TP**



| | |
|---|----------------|
|  | E480232 |
|---|----------------|

Features

- Low Inductance
- Built in Strain Relief
- For Surface Mount Application in Order to Optimize Board Space
- High Temperature Soldering: 260°C/10 Seconds at Terminals
- Typical I_D : less than 1uA above 10V
- Low Profile Package
- Repetition Rate(duty cycle): 0.01%
- Glass Passivated Junction
- 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)

Mechanical Data

- Polarity: Color Band Denotes Positive End(cathode) Except Bi-directional Types

Maximum Ratings

- Operating Junction Temperature Range: -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Typical Thermal Resistance: 23°C/W Junction to Ambient

| | | | |
|--|--|---------------|----------|
| Peak Pulse Power Surge Current on 10/1000µs Waveform | I_{PPM} | See the Table | Note 3 |
| Peak Pulse Power Dissipation on 10/1000µs Waveform | P_{PPM} | 5000W(Min) | Note 3,4 |
| IEC 61000-4-2 ESD | Air | 30kV | |
| | Contact | 30kV | |
| Power Dissipation on infinite heat sink | P_D | 6.5W | TL=75°C |
| Maximum instantaneous forward voltage at 100 A for unidirectional only | V_F | 5.0V | |
| Fast response time | Typically less than 1.0ps from 0 Volts to BV Min | | |

Note:

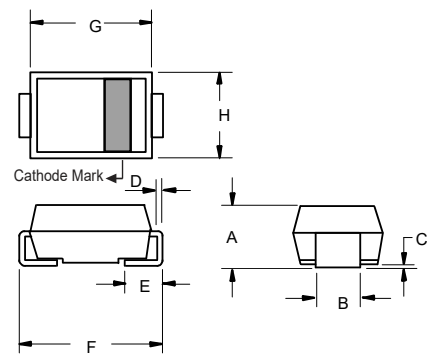
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.
3. Non-repetitive current pulse and derated above $T_A=25^\circ\text{C}$.
4. Mounted on 8.0mm² copper pads to each terminal.

Pin Configuration:



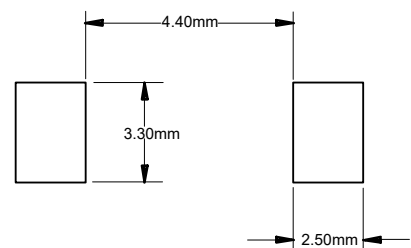
**5000 Watt TVS
11 to 400 Volts**

**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



| 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_{RWM} | Marking Code |
|-----------------|---------------------------|-------------------------------|------|--------------|----------------------------------|--------------------|------------------------------------|--------------|
| | | Min | Max | | | | | |
| Uni-directional | $V_{RWM}(V)$ | Min | Max | $I_T(mA)$ | $V_C(V)$ | $I_{PP}(A)$ | $I_D(\mu A)$ | |
| 5.0SMLJ11A | 11 | 12.2 | 13.5 | 10 | 18.2 | 275 | 800 | 5PEN |
| 5.0SMLJ12A | 12 | 13.3 | 14.7 | 10 | 19.9 | 252 | 800 | 5PEP |
| 5.0SMLJ13A | 13 | 14.4 | 15.9 | 10 | 21.5 | 233 | 500 | 5PEQ |
| 5.0SMLJ14A | 14 | 15.6 | 17.2 | 10 | 23.2 | 216 | 200 | 5PER |
| 5.0SMLJ15A | 15 | 16.7 | 18.5 | 1 | 24.4 | 205 | 100 | 5PES |
| 5.0SMLJ16A | 16 | 17.8 | 19.7 | 1 | 26 | 193 | 50 | 5PET |
| 5.0SMLJ17A | 17 | 18.9 | 20.9 | 1 | 27.6 | 181 | 20 | 5PEU |
| 5.0SMLJ18A | 18 | 20 | 22.1 | 1 | 29.2 | 172 | 10 | 5PEV |
| 5.0SMLJ20A | 20 | 22.2 | 24.5 | 1 | 32.4 | 155 | 5 | 5PEW |
| 5.0SMLJ22A | 22 | 24.4 | 26.9 | 1 | 35.5 | 141 | 5 | 5PEX |
| 5.0SMLJ24A | 24 | 26.7 | 29.5 | 1 | 38.9 | 129 | 5 | 5PEZ |
| 5.0SMLJ26A | 26 | 28.9 | 31.9 | 1 | 42.1 | 119 | 5 | 5PFE |
| 5.0SMLJ28A | 28 | 31.1 | 34.4 | 1 | 45.4 | 110 | 5 | 5PFG |
| 5.0SMLJ30A | 30 | 33.3 | 36.8 | 1 | 48.4 | 103 | 5 | 5PFK |
| 5.0SMLJ33A | 33 | 36.7 | 40.6 | 1 | 53.3 | 93.9 | 5 | 5PFM |
| 5.0SMLJ36A | 36 | 40 | 44.2 | 1 | 58.1 | 86.1 | 5 | 5PFP |
| 5.0SMLJ40A | 40 | 44.4 | 49.1 | 1 | 64.5 | 77.6 | 5 | 5PFR |
| 5.0SMLJ43A | 43 | 47.8 | 52.8 | 1 | 69.4 | 72.1 | 5 | 5PFT |
| 5.0SMLJ45A | 45 | 50 | 55.3 | 1 | 72.7 | 68.8 | 5 | 5PFV |
| 5.0SMLJ48A | 48 | 53.3 | 58.9 | 1 | 77.4 | 64.7 | 5 | 5PFX |
| 5.0SMLJ51A | 51 | 56.7 | 62.7 | 1 | 82.4 | 60.7 | 5 | 5PFZ |
| 5.0SMLJ54A | 54 | 60 | 66.3 | 1 | 87.1 | 57.5 | 5 | 5RGE |
| 5.0SMLJ58A | 58 | 64.4 | 71.2 | 1 | 93.6 | 53.5 | 5 | 5PGG |
| 5.0SMLJ60A | 60 | 66.7 | 73.7 | 1 | 96.8 | 51.7 | 5 | 5PGK |
| 5.0SMLJ64A | 64 | 71.1 | 78.6 | 1 | 103 | 48.6 | 5 | 5PGM |
| 5.0SMLJ70A | 70 | 77.8 | 86 | 1 | 113 | 44.3 | 5 | 5PGP |
| 5.0SMLJ75A | 75 | 83.3 | 92.1 | 1 | 121 | 41.4 | 5 | 5PGR |
| 5.0SMLJ78A | 78 | 86.7 | 95.8 | 1 | 126 | 39.7 | 5 | 5PGT |
| 5.0SMLJ85A | 85 | 94.4 | 104 | 1 | 137 | 36.5 | 5 | 5PGV |
| 5.0SMLJ90A | 90 | 100 | 111 | 1 | 146 | 34.3 | 5 | 5PGX |
| 5.0SMLJ100A | 100 | 111 | 123 | 1 | 162 | 30.9 | 5 | 5PGZ |
| 5.0SMLJ110A | 110 | 122 | 135 | 1 | 177 | 28.3 | 5 | 5PHE |
| 5.0SMLJ120A | 120 | 133 | 147 | 1 | 193 | 26 | 5 | 5PHG |
| 5.0SMLJ130A | 130 | 144 | 159 | 1 | 209 | 24 | 5 | 5PHK |
| 5.0SMLJ150A | 150 | 167 | 185 | 1 | 243 | 20.6 | 5 | 5PHM |
| 5.0SMLJ160A | 160 | 178 | 197 | 1 | 259 | 19.3 | 5 | 5PHP |
| 5.0SMLJ170A | 170 | 189 | 209 | 1 | 275 | 18.2 | 5 | 5PHR |
| 5.0SMLJ180A | 180 | 200 | 220 | 1 | 292 | 17.1 | 5 | 5PHT |
| 5.0SMLJ190A | 190 | 211 | 258 | 1 | 308 | 16.2 | 5 | 5PHV |
| 5.0SMLJ200A | 200 | 224 | 247 | 1 | 324 | 15.4 | 5 | 5PHW |
| 5.0SMLJ220A | 220 | 246 | 272 | 1 | 356 | 14.0 | 5 | 5PHX |
| 5.0SMLJ250A | 250 | 279 | 309 | 1 | 405 | 12.3 | 5 | 5PHZ |
| 5.0SMLJ300A | 300 | 335 | 371 | 1 | 486 | 10.3 | 5 | 5PJE |
| 5.0SMLJ350A | 350 | 391 | 432 | 1 | 567 | 8.8 | 5 | 5PJG |
| 5.0SMLJ400A | 400 | 447 | 494 | 1 | 648 | 7.7 | 5 | 5PJK |

| MCC Part Number | Reverse Stand-Off Voltage | Breakdown Voltage $V_{BR}(V)$ | | Test Current $I_T(mA)$ | Max. Clamping Voltage @ I_{PP} $V_C(V)$ | Peak Pulse Current $I_{PP}(A)$ | Reverse Leakage Current@ V_{RWM} $I_D(\mu A)$ | Marking Code |
|-----------------|---------------------------|-------------------------------|------|------------------------|---|--------------------------------|---|--------------|
| | | Min | Max | | | | | |
| Bi-directional | $V_{RWM}(V)$ | Min | Max | $I_T(mA)$ | $V_C(V)$ | $I_{PP}(A)$ | $I_D(\mu A)$ | |
| 5.0SMLJ11CA | 11 | 12.2 | 13.5 | 10 | 18.2 | 275 | 800 | 5BEN |
| 5.0SMLJ12CA | 12 | 13.3 | 14.7 | 10 | 19.9 | 252 | 800 | 5BEP |
| 5.0SMLJ13CA | 13 | 14.4 | 15.9 | 10 | 21.5 | 233 | 500 | 5BEQ |
| 5.0SMLJ14CA | 14 | 15.6 | 17.2 | 10 | 23.2 | 216 | 200 | 5BER |
| 5.0SMLJ15CA | 15 | 16.7 | 18.5 | 1 | 24.4 | 205 | 100 | 5BES |
| 5.0SMLJ16CA | 16 | 17.8 | 19.7 | 1 | 26 | 193 | 50 | 5BET |
| 5.0SMLJ17CA | 17 | 18.9 | 20.9 | 1 | 27.6 | 181 | 20 | 5BEU |
| 5.0SMLJ18CA | 18 | 20 | 22.1 | 1 | 29.2 | 172 | 10 | 5BEV |
| 5.0SMLJ20CA | 20 | 22.2 | 24.5 | 1 | 32.4 | 155 | 5 | 5BEW |
| 5.0SMLJ22CA | 22 | 24.4 | 26.9 | 1 | 35.5 | 141 | 5 | 5BEX |
| 5.0SMLJ24CA | 24 | 26.7 | 29.5 | 1 | 38.9 | 129 | 5 | 5BEZ |
| 5.0SMLJ26CA | 26 | 28.9 | 31.9 | 1 | 42.1 | 119 | 5 | 5BFE |
| 5.0SMLJ28CA | 28 | 31.1 | 34.4 | 1 | 45.4 | 110 | 5 | 5BFG |
| 5.0SMLJ30CA | 30 | 33.3 | 36.8 | 1 | 48.4 | 103 | 5 | 5BFK |
| 5.0SMLJ33CA | 33 | 36.7 | 40.6 | 1 | 53.3 | 93.9 | 5 | 5BFM |
| 5.0SMLJ36CA | 36 | 40 | 44.2 | 1 | 58.1 | 86.1 | 5 | 5BFP |
| 5.0SMLJ40CA | 40 | 44.4 | 49.1 | 1 | 64.5 | 77.6 | 5 | 5BFR |
| 5.0SMLJ43CA | 43 | 47.8 | 52.8 | 1 | 69.4 | 72.1 | 5 | 5BFT |
| 5.0SMLJ45CA | 45 | 50 | 55.3 | 1 | 72.7 | 68.8 | 5 | 5BFV |
| 5.0SMLJ48CA | 48 | 53.3 | 58.9 | 1 | 77.4 | 64.7 | 5 | 5BFX |
| 5.0SMLJ51CA | 51 | 56.7 | 62.7 | 1 | 82.4 | 60.7 | 5 | 5BFZ |
| 5.0SMLJ54CA | 54 | 60 | 66.3 | 1 | 87.1 | 57.5 | 5 | 5BGE |
| 5.0SMLJ58CA | 58 | 64.4 | 71.2 | 1 | 93.6 | 53.5 | 5 | 5BGG |
| 5.0SMLJ60CA | 60 | 66.7 | 73.7 | 1 | 96.8 | 51.7 | 5 | 5BGK |
| 5.0SMLJ64CA | 64 | 71.1 | 78.6 | 1 | 103 | 48.6 | 5 | 5BGM |
| 5.0SMLJ70CA | 70 | 77.8 | 86 | 1 | 113 | 44.3 | 5 | 5BGP |
| 5.0SMLJ75CA | 75 | 83.3 | 92.1 | 1 | 121 | 41.4 | 5 | 5BGR |
| 5.0SMLJ78CA | 78 | 86.7 | 95.8 | 1 | 126 | 39.7 | 5 | 5BGT |
| 5.0SMLJ85CA | 85 | 94.4 | 104 | 1 | 137 | 36.5 | 5 | 5BGV |
| 5.0SMLJ90CA | 90 | 100 | 111 | 1 | 146 | 34.3 | 5 | 5BGX |
| 5.0SMLJ100CA | 100 | 111 | 123 | 1 | 162 | 30.9 | 5 | 5BGZ |
| 5.0SMLJ110CA | 110 | 122 | 135 | 1 | 177 | 28.3 | 5 | 5BHE |
| 5.0SMLJ120CA | 120 | 133 | 147 | 1 | 193 | 26 | 5 | 5BHG |
| 5.0SMLJ130CA | 130 | 144 | 159 | 1 | 209 | 24 | 5 | 5BHK |
| 5.0SMLJ150CA | 150 | 167 | 185 | 1 | 243 | 20.6 | 5 | 5BHM |
| 5.0SMLJ160CA | 160 | 178 | 197 | 1 | 259 | 19.3 | 5 | 5BHP |
| 5.0SMLJ170CA | 170 | 189 | 209 | 1 | 275 | 18.2 | 5 | 5BHR |

Curve Characteristics

Fig. 1 - Peak Pulse Power Rating Curve

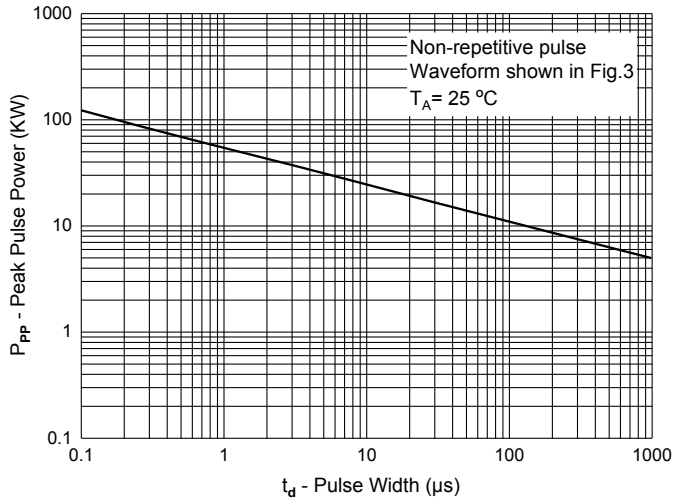


Fig. 2 - Typical Junction Capacitance

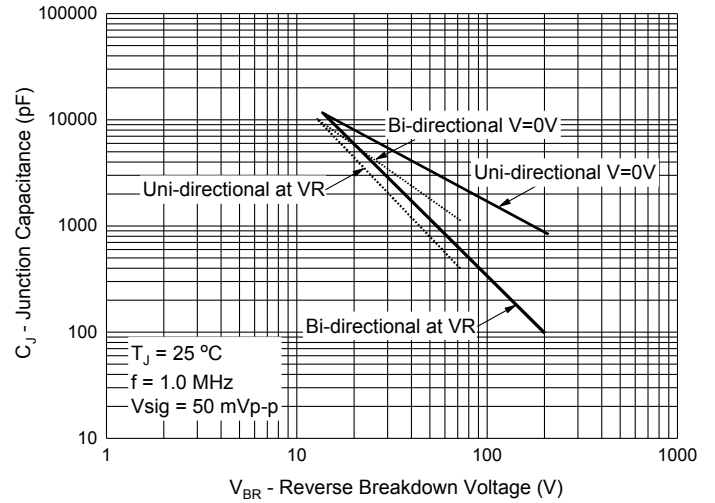


Fig. 3 - Pulse Waveform

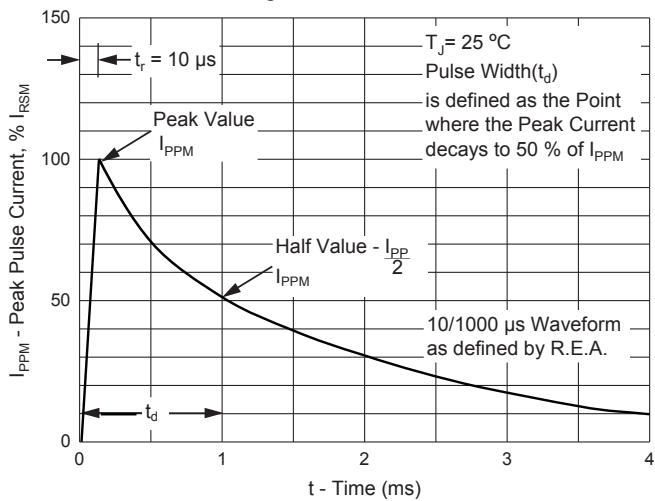
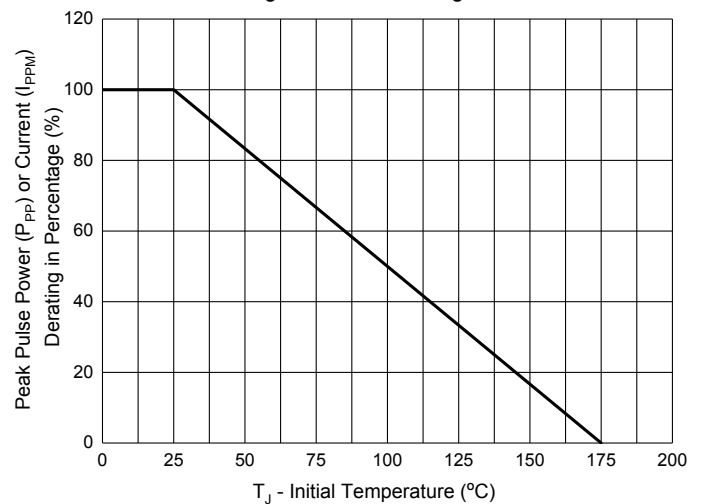


Fig. 4 - Pulse Derating Curve



Ordering Information

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

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