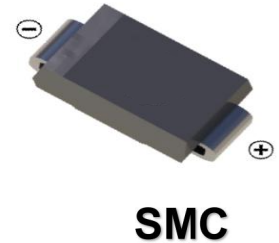


TVS DIODE

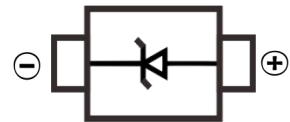
FEATURES

- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- Repetition Rate (duty cycle):0.01%
- Fast response time: typically less than 1.0ps
from 0 Volts to V(BR) for unidirectional types
- Typical IR less than 1mA above 10V
- High temperature soldering guaranteed: 260°C/10 seconds,
- Surface Mount device



MECHANICAL DATA

- Case: SMC(DO-214AB)
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.21 grams (approximate)



MAXIMUM RATINGS AND CHARACTERISTICS(T_A = 25°C unless otherwise noted)

| | Symbol | Value | Unit |
|---|-----------------------------------|----------------|------|
| Peak Power Dissipation at T _A =25°C, T _p =1ms (Note 1) | P _{PK} | Minimum 1500 | W |
| Peak pulse current with a 10/1000µs waveform (Note 1) | I _{PPM} | See next table | A |
| Steady State Power Dissipation | P _D | 6.5 | W |
| Typical thermal resistance, junction to ambient (Note 5) | R _{θJA} | 100.0 | °C/W |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load(JEDEC method) (Note 2, 3) - Unidirectional Only | I _{FSM} | 200 | A |
| Typical thermal resistance, junction to ambient (NOTE 5) | R _{θJL} | 20 | °C/W |
| Maximum Instantaneous Forward Voltage at 100.0A for Unidirectional Only (Note 4) | V _F | 3.5/5.0 | V |
| Operating junction and storage temperature range | T _J , T _{STG} | -55 ~+150 | °C |

- Notes: 1. Non-repetitive Current Pulse Per Fig. 3 and Derated above T_A=25°C Per Fig. 2.
 2. Mounted on 8.0mm² (.013mm Thick) Copper Pads to Each Terminal.
 3. 8.3ms Single Half Sine-wave or Equivalent Square Wave, Duty Cycle=4 Pulses Per Minute Maximum.
 4. V_F=3.5V on SMCJ5.0 thru SMCJ90 Devices and V_F=5.0V on SMCJ100 thru SMCJ170 Devices.
 5.Mounted on minimum recommended pad layout.

Devices for Bipolar Applications

1. For Bidirectional Use C or CA Suffix for Types SMCJ5.0 through Types SMCJ170.
2. Electrical Characteristics Apply in Both Directions.

TVS DIODE

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Part Number (Uni) | Part Number (Bi) | Device Marking Code | | Breakdown Voltage V _{BR} @ I _T | | | Maximum Reverse Leakage I _R @ V _{RWM} (uA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Surge Current I _{PP} (A) | Maximum Clamping Voltage V _C @ I _{PP} (V) |
|-------------------|------------------|---------------------|-----|--|---------|---------------------|--|---|---|---|
| | | Uni | Bi | Min (V) | Max (V) | I _T (mA) | | | | |
| SMCJ5.0 | SMCJ5.0C | GDD | BDD | 6.40 | 7.30 | 10 | 800 | 5.0 | 156.25 | 9.6 |
| SMCJ5.0A | SMCJ5.0CA | GDE | BDE | 6.40 | 7.00 | 10 | 800 | 5.0 | 163.04 | 9.2 |
| SMCJ6.0 | SMCJ6.0C | GDF | BDF | 6.67 | 8.15 | 10 | 800 | 6.0 | 131.58 | 11.4 |
| SMCJ6.0A | SMCJ6.0CA | GDG | BDG | 6.67 | 7.37 | 10 | 800 | 6.0 | 145.63 | 10.3 |
| SMCJ6.5 | SMCJ6.5C | GDH | BDH | 7.22 | 8.82 | 10 | 500 | 6.5 | 121.95 | 12.3 |
| SMCJ6.5A | SMCJ6.5CA | GDK | BDK | 7.22 | 7.98 | 10 | 500 | 6.5 | 133.93 | 11.2 |
| SMCJ7.0 | SMCJ7.0C | GDL | BDL | 7.78 | 9.51 | 10 | 200 | 7.0 | 112.78 | 13.3 |
| SMCJ7.0A | SMCJ7.0CA | GDM | BDM | 7.78 | 8.60 | 10 | 200 | 7.0 | 125.00 | 12.0 |
| SMCJ7.5 | SMCJ7.5C | GDN | BDN | 8.33 | 10.20 | 1 | 100 | 7.5 | 104.90 | 14.3 |
| SMCJ7.5A | SMCJ7.5CA | GDP | BDP | 8.33 | 9.21 | 1 | 100 | 7.5 | 116.28 | 12.9 |
| SMCJ8.0 | SMCJ8.0C | GDQ | BDQ | 8.89 | 10.90 | 1 | 50 | 8.0 | 100.00 | 15.0 |
| SMCJ8.0A | SMCJ8.0CA | GDR | BDR | 8.89 | 9.83 | 1 | 50 | 8.0 | 110.29 | 13.6 |
| SMCJ8.5 | SMCJ8.5C | GDS | BDS | 9.44 | 11.50 | 1 | 20 | 8.5 | 94.34 | 15.9 |
| SMCJ8.5A | SMCJ8.5CA | GDT | BDT | 9.44 | 10.40 | 1 | 20 | 8.5 | 104.17 | 14.4 |
| SMCJ9.0 | SMCJ9.0C | GDU | BDU | 10.00 | 12.20 | 1 | 10 | 9.0 | 88.76 | 16.9 |
| SMCJ9.0A | SMCJ9.0CA | GDV | BDV | 10.00 | 11.10 | 1 | 10 | 9.0 | 97.40 | 15.4 |
| SMCJ10 | SMCJ10C | GDW | BDW | 11.10 | 13.60 | 1 | 5 | 10.0 | 79.79 | 18.8 |
| SMCJ10A | SMCJ10CA | GDX | BDX | 11.10 | 12.30 | 1 | 5 | 10.0 | 88.24 | 17.0 |
| SMCJ11 | SMCJ11C | GDY | BDY | 12.20 | 14.90 | 1 | 1 | 11.0 | 74.63 | 20.1 |
| SMCJ11A | SMCJ11CA | GDZ | BDZ | 12.20 | 13.50 | 1 | 1 | 11.0 | 82.42 | 18.2 |
| SMCJ12 | SMCJ12C | GED | BED | 13.30 | 16.30 | 1 | 1 | 12.0 | 68.18 | 22.0 |
| SMCJ12A | SMCJ12CA | GEE | BEE | 13.30 | 14.70 | 1 | 1 | 12.0 | 75.38 | 19.9 |
| SMCJ13 | SMCJ13C | GEF | BEF | 14.40 | 17.60 | 1 | 1 | 13.0 | 63.03 | 23.8 |
| SMCJ13A | SMCJ13CA | GEG | BEG | 14.40 | 15.90 | 1 | 1 | 13.0 | 69.77 | 21.5 |
| SMCJ14 | SMCJ14C | GEH | BEH | 15.60 | 19.10 | 1 | 1 | 14.0 | 58.14 | 25.8 |
| SMCJ14A | SMCJ14CA | GEK | BEK | 15.60 | 17.20 | 1 | 1 | 14.0 | 64.66 | 23.2 |
| SMCJ15 | SMCJ15C | GEL | BEL | 16.70 | 20.40 | 1 | 1 | 15.0 | 55.76 | 26.9 |
| SMCJ15A | SMCJ15CA | GEM | BEM | 16.70 | 18.50 | 1 | 1 | 15.0 | 61.48 | 24.4 |
| SMCJ16 | SMCJ16C | GEN | BEN | 17.80 | 21.80 | 1 | 1 | 16.0 | 52.08 | 28.8 |
| SMCJ16A | SMCJ16CA | GEP | BEP | 17.80 | 19.70 | 1 | 1 | 16.0 | 57.69 | 26.0 |
| SMCJ17 | SMCJ17C | GEQ | BEQ | 18.90 | 23.10 | 1 | 1 | 17.0 | 49.18 | 30.5 |
| SMCJ17A | SMCJ17CA | GER | BER | 18.90 | 20.90 | 1 | 1 | 17.0 | 54.35 | 27.6 |
| SMCJ18 | SMCJ18C | GES | BES | 20.00 | 24.40 | 1 | 1 | 18.0 | 46.58 | 32.2 |
| SMCJ18A | SMCJ18CA | GET | BET | 20.00 | 22.10 | 1 | 1 | 18.0 | 51.37 | 29.2 |
| SMCJ19 | SMCJ19C | GEA | BEA | 21.13 | 25.76 | 1 | 1 | 19.0 | 44.10 | 34.0 |
| SMCJ19A | SMCJ19CA | GEB | BEB | 21.10 | 23.30 | 1 | 1 | 19.0 | 48.73 | 30.8 |
| SMCJ20 | SMCJ20C | GEU | BEU | 22.20 | 27.10 | 1 | 1 | 20.0 | 41.90 | 35.8 |
| SMCJ20A | SMCJ20CA | GEV | BEV | 22.20 | 24.50 | 1 | 1 | 20.0 | 46.30 | 32.4 |
| SMCJ22 | SMCJ22C | GEW | BEW | 24.40 | 29.80 | 1 | 1 | 22.0 | 38.07 | 39.4 |
| SMCJ22A | SMCJ22CA | GEX | BEX | 24.40 | 26.90 | 1 | 1 | 22.0 | 42.25 | 35.5 |
| SMCJ24 | SMCJ24C | GEY | BEY | 26.70 | 32.60 | 1 | 1 | 24.0 | 34.88 | 43.0 |
| SMCJ24A | SMCJ24CA | GEZ | BEZ | 26.70 | 29.50 | 1 | 1 | 24.0 | 38.56 | 38.9 |
| SMCJ26 | SMCJ26C | GFD | BFD | 28.90 | 35.30 | 1 | 1 | 26.0 | 32.19 | 46.6 |
| SMCJ26A | SMCJ26CA | GFE | BFE | 28.90 | 31.90 | 1 | 1 | 26.0 | 35.63 | 42.1 |
| SMCJ28 | SMCJ28C | GFF | BFF | 31.10 | 38.00 | 1 | 1 | 28.0 | 30.00 | 50.0 |
| SMCJ28A | SMCJ28CA | GFG | BFG | 31.10 | 34.40 | 1 | 1 | 28.0 | 33.04 | 45.4 |
| SMCJ30 | SMCJ30C | GFH | BFH | 33.30 | 40.70 | 1 | 1 | 30.0 | 28.04 | 53.5 |
| SMCJ30A | SMCJ30CA | GFK | BFK | 33.30 | 36.80 | 1 | 1 | 30.0 | 30.99 | 48.4 |
| SMCJ33 | SMCJ33C | GFL | BFL | 36.70 | 44.90 | 1 | 1 | 33.0 | 25.42 | 59.0 |
| SMCJ33A | SMCJ33CA | GFM | BFM | 36.70 | 40.60 | 1 | 1 | 33.0 | 28.14 | 53.3 |
| SMCJ36 | SMCJ36C | GFN | BFN | 40.00 | 48.90 | 1 | 1 | 36.0 | 23.33 | 64.3 |
| SMCJ36A | SMCJ36CA | GFP | BFP | 40.00 | 44.20 | 1 | 1 | 36.0 | 25.82 | 58.1 |
| SMCJ40 | SMCJ40C | GFQ | BFQ | 44.40 | 54.30 | 1 | 1 | 40.0 | 21.01 | 71.4 |
| SMCJ40A | SMCJ40CA | GFR | BFR | 44.40 | 49.10 | 1 | 1 | 40.0 | 23.26 | 64.5 |

TVS DIODE

| Part Number (Uni) | Part Number (Bi) | Device Marking Code | | Breakdown Voltage V_{BR} @ I_T | | | Maximum Reverse Leakage I_R @ V_{RWM} (μA) | Working Peak Reverse Voltage V_{RWM} (V) | Maximum Reverse Surge Current I_{PP} (A) | Maximum Clamping Voltage V_C @ I_{PP} (V) |
|----------------------|---------------------|---------------------------|-----|------------------------------------|---------|------------|---|---|---|---|
| | | Uni | Bi | Min (V) | Max (V) | I_T (mA) | | | | |
| SMCJ43 | SMCJ43C | GFS | BFS | 47.80 | 58.40 | 1 | 1 | 43.0 | 19.56 | 76.7 |
| SMCJ43A | SMCJ43CA | GFT | BFT | 47.80 | 52.80 | 1 | 1 | 43.0 | 21.61 | 69.4 |
| SMCJ45 | SMCJ45C | GFU | BFU | 50.00 | 61.10 | 1 | 1 | 45.0 | 18.68 | 80.3 |
| SMCJ45A | SMCJ45CA | GFV | BFV | 50.00 | 55.30 | 1 | 1 | 45.0 | 20.63 | 72.7 |
| SMCJ48 | SMCJ48C | GFW | BFW | 53.30 | 65.10 | 1 | 1 | 48.0 | 17.54 | 85.5 |
| SMCJ48A | SMCJ48CA | GFX | BFX | 53.30 | 58.90 | 1 | 1 | 48.0 | 19.38 | 77.4 |
| SMCJ51 | SMCJ51C | GFY | BFY | 56.70 | 69.30 | 1 | 1 | 51.0 | 16.47 | 91.1 |
| SMCJ51A | SMCJ51CA | GFZ | BFZ | 56.70 | 62.70 | 1 | 1 | 51.0 | 18.20 | 82.4 |
| SMCJ54 | SMCJ54C | GGD | BGD | 60.00 | 73.30 | 1 | 1 | 54.0 | 15.58 | 96.3 |
| SMCJ54A | SMCJ54CA | GGE | BGE | 60.00 | 66.30 | 1 | 1 | 54.0 | 17.22 | 87.1 |
| SMCJ58 | SMCJ58C | GGF | BGF | 64.40 | 78.70 | 1 | 1 | 58.0 | 14.56 | 103.0 |
| SMCJ58A | SMCJ58CA | GGG | BGG | 64.40 | 71.20 | 1 | 1 | 58.0 | 16.03 | 93.6 |
| SMCJ60 | SMCJ60C | GGH | BGH | 66.70 | 81.50 | 1 | 1 | 60.0 | 14.02 | 107.0 |
| SMCJ60A | SMCJ60CA | GGK | BGK | 66.70 | 73.70 | 1 | 1 | 60.0 | 15.50 | 96.8 |
| SMCJ64 | SMCJ64C | GGL | BGL | 71.10 | 86.90 | 1 | 1 | 64.0 | 13.16 | 114.0 |
| SMCJ64A | SMCJ64CA | GGM | BGM | 71.10 | 78.60 | 1 | 1 | 64.0 | 14.56 | 103.0 |
| SMCJ70 | SMCJ70C | GGN | BGN | 77.80 | 95.10 | 1 | 1 | 70.0 | 12.00 | 125.0 |
| SMCJ70A | SMCJ70CA | GGP | BGP | 77.80 | 86.00 | 1 | 1 | 70.0 | 13.27 | 113.0 |
| SMCJ75 | SMCJ75C | GGQ | BGQ | 83.30 | 102.00 | 1 | 1 | 75.0 | 11.19 | 134.0 |
| SMCJ75A | SMCJ75CA | GGR | BGR | 83.30 | 92.10 | 1 | 1 | 75.0 | 12.40 | 121.0 |
| SMCJ78 | SMCJ78C | GGS | BGS | 86.70 | 106.00 | 1 | 1 | 78.0 | 10.79 | 139.0 |
| SMCJ78A | SMCJ78CA | GGT | BGT | 86.70 | 95.80 | 1 | 1 | 78.0 | 11.90 | 126.0 |
| SMCJ80 | SMCJ80C | GGA | BGA | 88.96 | 108.80 | 1 | 1 | 80.0 | 10.47 | 143.2 |
| SMCJ80A | SMCJ80CA | GGB | BGB | 88.80 | 97.60 | 1 | 1 | 80.0 | 11.57 | 129.6 |
| SMCJ85 | SMCJ85C | GGU | BGU | 94.40 | 115.00 | 1 | 1 | 85.0 | 9.93 | 151.0 |
| SMCJ85A | SMCJ85CA | GGV | BGV | 94.40 | 104.00 | 1 | 1 | 85.0 | 10.95 | 137.0 |
| SMCJ90 | SMCJ90C | GGW | BGW | 100.00 | 122.00 | 1 | 1 | 90.0 | 9.38 | 160.0 |
| SMCJ90A | SMCJ90CA | GGX | BGX | 100.00 | 111.00 | 1 | 1 | 90.0 | 10.27 | 146.0 |
| SMCJ100 | SMCJ100C | GGY | BGY | 111.00 | 136.00 | 1 | 1 | 100.0 | 8.38 | 179.0 |
| SMCJ100A | SMCJ100CA | GGZ | BGZ | 111.00 | 123.00 | 1 | 1 | 100.0 | 9.26 | 162.0 |
| SMCJ110 | SMCJ110C | GHD | BHD | 122.00 | 149.00 | 1 | 1 | 110.0 | 7.65 | 196.0 |
| SMCJ110A | SMCJ110CA | GHE | BHE | 122.00 | 135.00 | 1 | 1 | 110.0 | 8.47 | 177.0 |
| SMCJ120 | SMCJ120C | GHF | BHF | 133.00 | 163.00 | 1 | 1 | 120.0 | 7.01 | 214.0 |
| SMCJ120A | SMCJ120CA | GHG | BHG | 133.00 | 147.00 | 1 | 1 | 120.0 | 7.77 | 193.0 |
| SMCJ130 | SMCJ130C | GHH | BHH | 144.00 | 176.00 | 1 | 1 | 130.0 | 6.49 | 231.0 |
| SMCJ130A | SMCJ130CA | GHK | BHK | 144.00 | 159.00 | 1 | 1 | 130.0 | 7.18 | 209.0 |
| SMCJ140 | SMCJ140C | GHA | BHA | 155.68 | 190.40 | 1 | 1 | 140.0 | 5.99 | 250.6 |
| SMCJ140A | SMCJ140CA | GHB | BHB | 155.00 | 171.00 | 1 | 1 | 140.0 | 6.61 | 226.8 |
| SMCJ150 | SMCJ150C | GHL | BHL | 167.00 | 204.00 | 1 | 1 | 150.0 | 5.60 | 268.0 |
| SMCJ150A | SMCJ150CA | GHM | BHM | 167.00 | 185.00 | 1 | 1 | 150.0 | 6.17 | 243.0 |
| SMCJ160 | SMCJ160C | GHN | BHN | 178.00 | 218.00 | 1 | 1 | 160.0 | 5.23 | 287.0 |
| SMCJ160A | SMCJ160CA | GHP | BHP | 178.00 | 197.00 | 1 | 1 | 160.0 | 5.79 | 259.0 |
| SMCJ170 | SMCJ170C | GHQ | BHQ | 189.00 | 231.00 | 1 | 1 | 170.0 | 4.93 | 304.0 |
| SMCJ170A | SMCJ170CA | GHR | BHR | 189.00 | 209.00 | 1 | 1 | 170.0 | 5.45 | 275.0 |
| SMCJ180 | SMCJ180C | GHS | BHS | 200.16 | 244.80 | 1 | 1 | 180.0 | 4.66 | 322.2 |
| SMCJ180A | SMCJ180CA | GHT | BHT | 200.00 | 220.00 | 1 | 1 | 180.0 | 5.14 | 291.6 |
| SMCJ190 | SMCJ190C | GHU | BHU | 211.28 | 258.40 | 1 | 1 | 190.0 | 4.41 | 340.1 |
| SMCJ190A | SMCJ190CA | GHV | BHV | 211.00 | 232.00 | 1 | 1 | 190.0 | 4.87 | 307.8 |
| SMCJ200A | SMCJ200CA | GHW | BHW | 224.00 | 247.00 | 1 | 1 | 200.0 | 4.60 | 324.0 |
| SMCJ220A | SMCJ220CA | GHX | BHX | 246.00 | 272.00 | 1 | 1 | 220.0 | 4.20 | 356.0 |
| SMCJ250A | SMCJ250CA | GHZ | BHZ | 279.00 | 309.00 | 1 | 1 | 250.0 | 3.70 | 405.0 |
| SMCJ300A | SMCJ300CA | GJE | BJE | 335.00 | 371.00 | 1 | 1 | 300.0 | 3.10 | 486.0 |
| SMCJ350A | SMCJ350CA | GJG | BJG | 391.00 | 432.00 | 1 | 1 | 350.0 | 2.60 | 567.0 |
| SMCJ400A | SMCJ400CA | GJK | BJK | 447.00 | 494.00 | 1 | 1 | 400.0 | 2.30 | 648.0 |
| SMCJ440A | SMCJ440CA | GJM | BJM | 492.00 | 543.00 | 1 | 1 | 440.0 | 2.10 | 713.0 |

Note: 1.Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
 2.Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
 3.For Bi-Directional devices having VR of 10 volts and under, the IR limit is double

TVS DIODE

Typical Characteristics

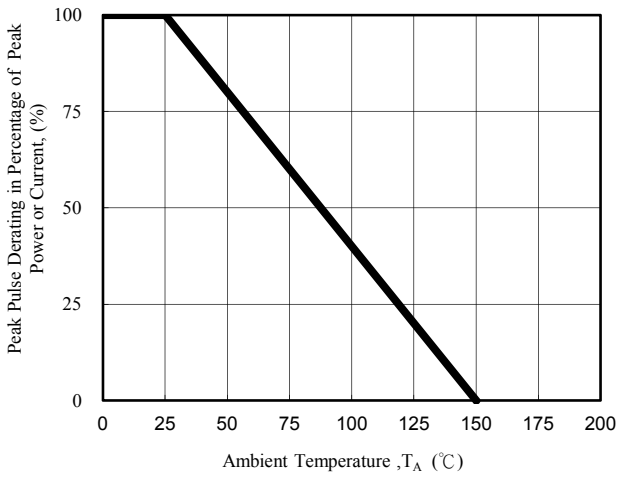


Fig. 1 - Pulse Derating Curve

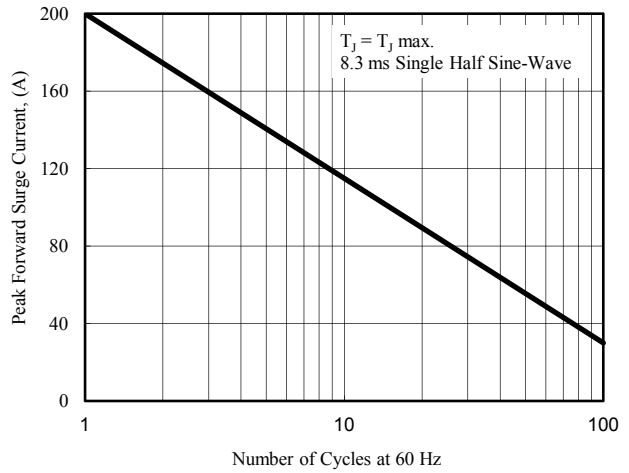


Fig. 2 - Maximum Non-Repetitive Surge Current

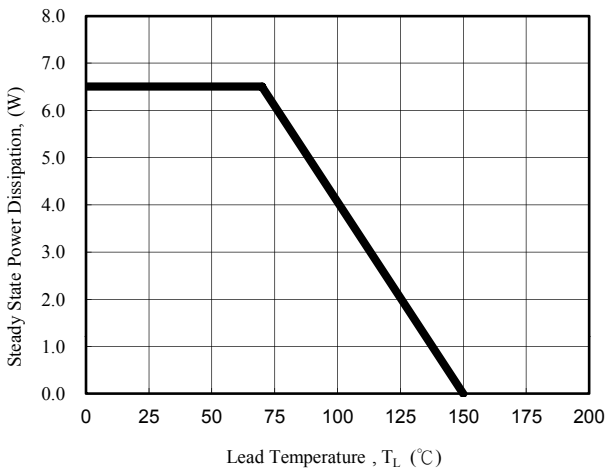


Fig. 3 - Steady State Power Derating Curve

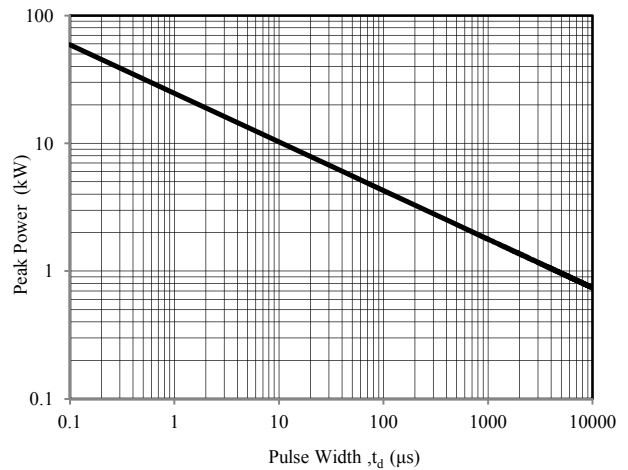


Fig. 4 - Peak Pulse Power Rating Curve

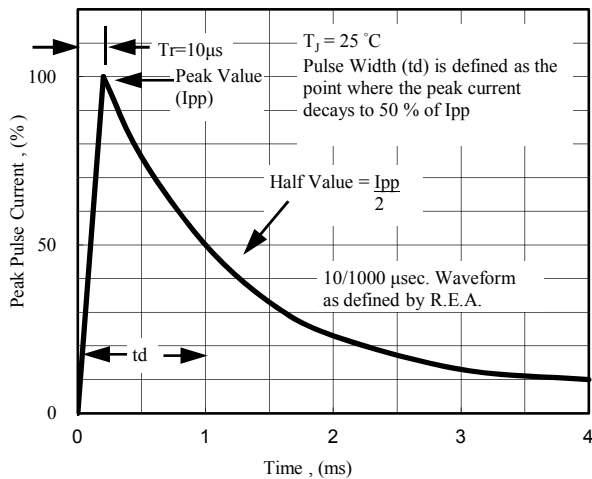


Fig. 5 - Pulse Waveform

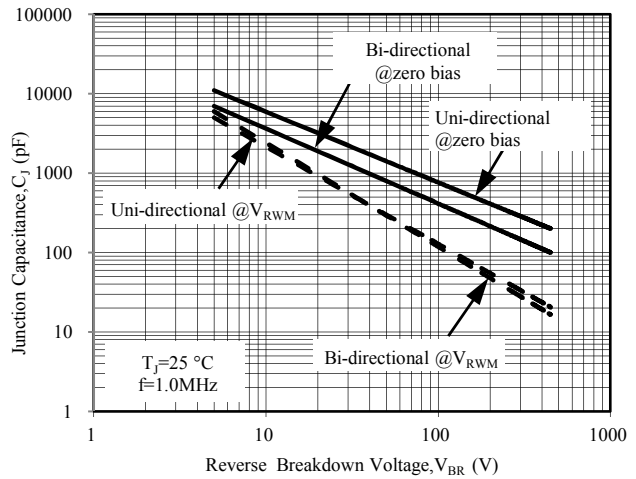
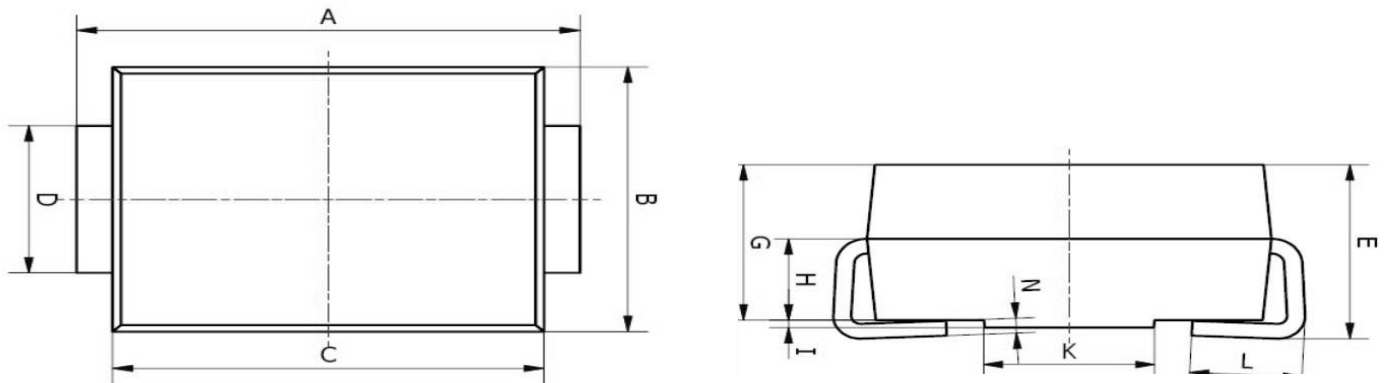


Fig. 6 - Typical Junction Capacitance

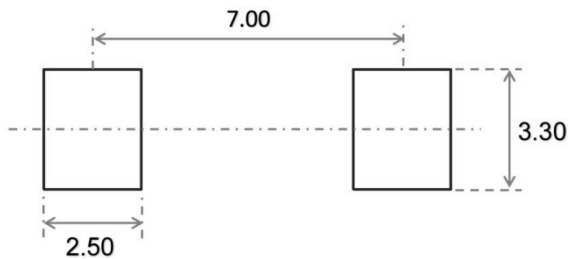
TVS DIODE

SMC Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 7.75 | 8.13 | 0.305 | 0.320 |
| B | 5.59 | 6.22 | 0.220 | 0.245 |
| C | 6.60 | 7.11 | 0.260 | 0.280 |
| D | 2.75 | 3.25 | 0.108 | 0.128 |
| E | 2.25 | 2.82 | 0.089 | 0.111 |
| G | 2.00 | 2.62 | 0.079 | 0.103 |
| H | 1.26 | 1.56 | 0.050 | 0.061 |
| I | 0.05 | 0.15 | 0.002 | 0.006 |
| K | 4.30 | 6.00 | 0.169 | 0.236 |
| L | 1.25 | 1.75 | 0.049 | 0.069 |
| N | 0.10 | 0.30 | 0.004 | 0.012 |

SMC Suggested Pad Layout



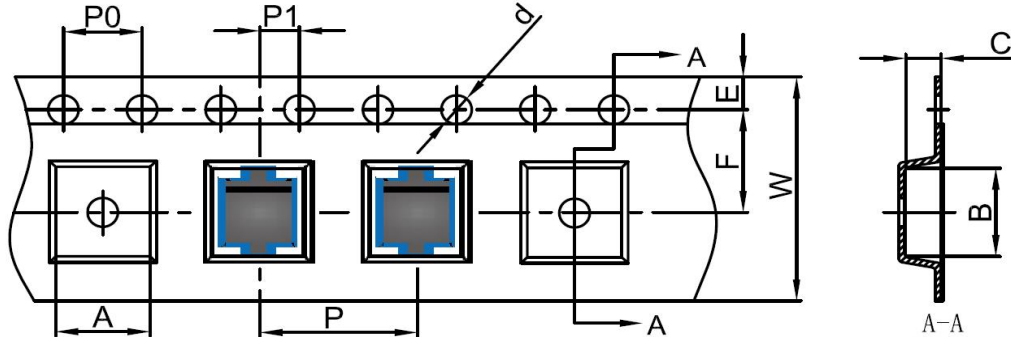
Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

TVS DIODE

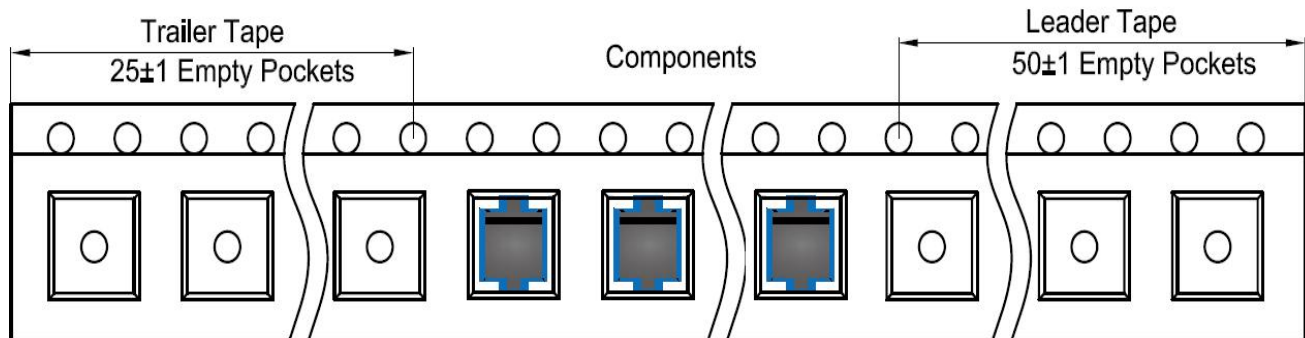
SMC Tape and Reel

SMC Embossed Carrier Tape

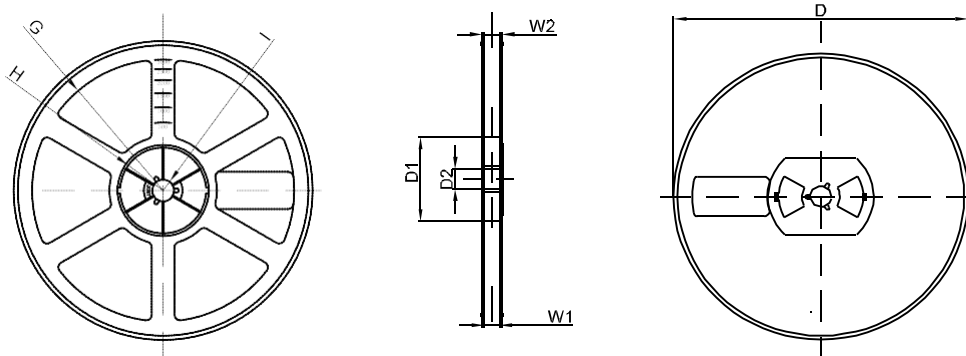


| DIMENSIONS ARE IN MILLIMETER | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| TYPE | A | B | C | d | E | F | P0 | P | P1 | W |
| SMC | 6.3 | 8.25 | 2.90 | Ø1.55 | 1.75 | 7.50 | 4.00 | 8.00 | 2.00 | 16.00 |
| TOLERANCE | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 |

SMC Tape Leader and Trailer



SMC Reel



| DIMENSIONS ARE IN MILLIMETER | | | | | | | | |
|------------------------------|------|-----|----|------|-----|-------|------|-------|
| REEL OPTION | D | D1 | D2 | G | H | I | W1 | W2 |
| 13" DIA | Ø330 | 100 | 21 | R165 | R50 | R6.50 | 16.4 | 21.00 |
| TOLERANCE | ±2 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 | ±1 |