

1500W Transient Voltage Suppressor

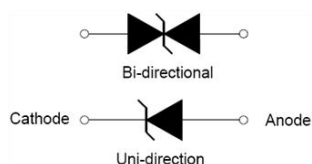
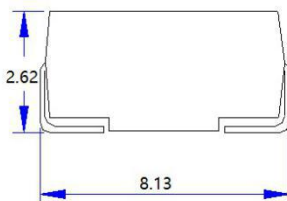
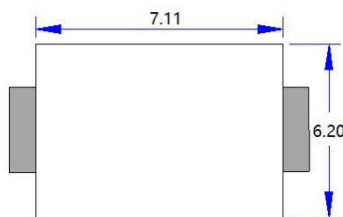
Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

Features

- Glass passivated or planar junction
- Excellent clamping capability
- Repetition rate (duty cycle): 0.01%
- Low profile package and low inductance
- 1500W Peak Pulse power capability at 10×1000µs waveform.
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- High temperature soldering: 260°C/10s at terminals.
- Plastic package has Underwriters Laboratory Flammability 94V-0.
- For surface mounted applications in order to optimize board space.

Dimensions & Symbol (Unit: mm Max)



Mechanical Characteristics

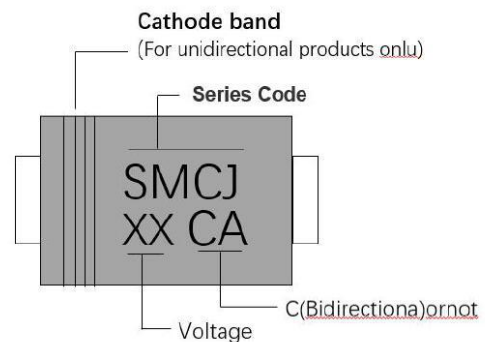
Package: SMC/DO-214AB

- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.28g
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- I/O Interface.
- AC/DC Power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

Marking Information



Ordering Information

| Out line | Reel (pcs) | Per carton (pcs) | Reel diameters (mm) |
|----------|------------|------------------|---------------------|
| Taping | 3K | 60K | 330 |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

| Part Number | | Marking | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\text{①}}$ |
|-------------|-----------|----------|-----------|-------|---------------|--------------|--------|-------|--------------|---------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMCJ5.0A | SMCJ5.0CA | SMCJ5.0A | SMCJ5.0CA | 5.0 | 800 | 6.40 | 7.00 | 10 | 9.2 | 163 |
| SMCJ6.0A | SMCJ6.0CA | SMCJ6.0A | SMCJ6.0CA | 6.0 | 800 | 6.67 | 7.37 | 10 | 10.3 | 145.7 |
| SMCJ6.5A | SMCJ6.5CA | SMCJ6.5A | SMCJ6.5CA | 6.5 | 500 | 7.22 | 7.98 | 10 | 11.2 | 134 |
| SMCJ7.0A | SMCJ7.0CA | SMCJ7.0A | SMCJ7.0CA | 7.0 | 200 | 7.78 | 8.60 | 10 | 12 | 125 |
| SMCJ7.5A | SMCJ7.5CA | SMCJ7.5A | SMCJ7.5CA | 7.5 | 100 | 8.33 | 9.21 | 1 | 12.9 | 116.3 |
| SMCJ8.0A | SMCJ8.0CA | SMCJ8.0A | SMCJ8.0CA | 8.0 | 50 | 8.89 | 9.83 | 1 | 13.6 | 110.3 |
| SMCJ8.5A | SMCJ8.5CA | SMCJ8.5A | SMCJ8.5CA | 8.5 | 20 | 9.44 | 10.4 | 1 | 14.4 | 104.2 |
| SMCJ9.0A | SMCJ9.0CA | SMCJ9.0A | SMCJ9.0CA | 9.0 | 5 | 10.0 | 11.1 | 1 | 15.4 | 97.4 |
| SMCJ10A | SMCJ10CA | SMCJ10A | SMCJ10CA | 10.0 | 1 | 11.1 | 12.3 | 1 | 17 | 88.3 |
| SMCJ11A | SMCJ11CA | SMCJ11A | SMCJ11CA | 11.0 | 1 | 12.2 | 13.5 | 1 | 18.2 | 82.5 |
| SMCJ12A | SMCJ12CA | SMCJ12A | SMCJ12CA | 12.0 | 1 | 13.3 | 14.7 | 1 | 19.9 | 75.4 |
| SMCJ13A | SMCJ13CA | SMCJ13A | SMCJ13CA | 13.0 | 1 | 14.4 | 15.9 | 1 | 21.5 | 69.8 |
| SMCJ14A | SMCJ14CA | SMCJ14A | SMCJ14CA | 14.0 | 1 | 15.6 | 17.2 | 1 | 23.2 | 64.7 |
| SMCJ15A | SMCJ15CA | SMCJ15A | SMCJ15CA | 15.0 | 1 | 16.7 | 18.5 | 1 | 24.4 | 61.5 |
| SMCJ16A | SMCJ16CA | SMCJ16A | SMCJ16CA | 16.0 | 1 | 17.8 | 19.7 | 1 | 26 | 57.7 |
| SMCJ17A | SMCJ17CA | SMCJ17A | SMCJ17CA | 17.0 | 1 | 18.9 | 20.9 | 1 | 27.6 | 54.4 |
| SMCJ18A | SMCJ18CA | SMCJ18A | SMCJ18CA | 18.0 | 1 | 20.0 | 22.1 | 1 | 29.2 | 51.4 |
| SMCJ20A | SMCJ20CA | SMCJ20A | SMCJ20CA | 20.0 | 1 | 22.2 | 24.5 | 1 | 32.4 | 46.3 |
| SMCJ22A | SMCJ22CA | SMCJ22A | SMCJ22CA | 22.0 | 1 | 24.4 | 26.9 | 1 | 35.5 | 42.3 |
| SMCJ24A | SMCJ24CA | SMCJ24A | SMCJ24CA | 24.0 | 1 | 26.7 | 29.5 | 1 | 38.9 | 38.6 |
| SMCJ26A | SMCJ26CA | SMCJ26A | SMCJ26CA | 26.0 | 1 | 28.9 | 31.9 | 1 | 42.1 | 35.7 |
| SMCJ28A | SMCJ28CA | SMCJ28A | SMCJ28CA | 28.0 | 1 | 31.1 | 34.4 | 1 | 45.4 | 33.1 |
| SMCJ30A | SMCJ30CA | SMCJ30A | SMCJ30CA | 30.0 | 1 | 33.3 | 36.8 | 1 | 48.4 | 31 |
| SMCJ33A | SMCJ33CA | SMCJ33A | SMCJ33CA | 33.0 | 1 | 36.7 | 40.6 | 1 | 53.3 | 28.2 |
| SMCJ36A | SMCJ36CA | SMCJ36A | SMCJ36CA | 36.0 | 1 | 40.0 | 44.2 | 1 | 58.1 | 25.9 |
| SMCJ40A | SMCJ40CA | SMCJ40A | SMCJ40CA | 40.0 | 1 | 44.4 | 49.1 | 1 | 64.5 | 23.3 |
| SMCJ43A | SMCJ43CA | SMCJ43A | SMCJ43CA | 43.0 | 1 | 47.8 | 52.8 | 1 | 69.4 | 21.7 |
| SMCJ45A | SMCJ45CA | SMCJ45A | SMCJ45CA | 45.0 | 1 | 50.0 | 55.3 | 1 | 72.7 | 20.6 |
| SMCJ48A | SMCJ48CA | SMCJ48A | SMCJ48CA | 48.0 | 1 | 53.3 | 58.9 | 1 | 77.4 | 19.4 |
| SMCJ51A | SMCJ51CA | SMCJ51A | SMCJ51CA | 51.0 | 1 | 56.7 | 62.7 | 1 | 82.4 | 18.2 |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

| Part Number | | Marking | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\text{①}}$ |
|-------------|-----------|----------|-----------|-------|---------------|--------------|--------|-------|--------------|---------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMCJ54A | SMCJ54CA | SMCJ54A | SMCJ54CA | 54.0 | 1 | 60.0 | 66.3 | 1 | 87.1 | 17.3 |
| SMCJ58A | SMCJ58CA | SMCJ58A | SMCJ58CA | 58.0 | 1 | 64.4 | 71.2 | 1 | 93.6 | 16.1 |
| SMCJ60A | SMCJ60CA | SMCJ60A | SMCJ60CA | 60.0 | 1 | 66.7 | 73.7 | 1 | 96.8 | 15.5 |
| SMCJ64A | SMCJ64CA | SMCJ64A | SMCJ64CA | 64.0 | 1 | 71.1 | 78.6 | 1 | 103 | 14.6 |
| SMCJ70A | SMCJ70CA | SMCJ70A | SMCJ70CA | 70.0 | 1 | 77.8 | 86.0 | 1 | 113 | 13.3 |
| SMCJ75A | SMCJ75CA | SMCJ75A | SMCJ75CA | 75.0 | 1 | 83.3 | 92.1 | 1 | 121 | 12.4 |
| SMCJ78A | SMCJ78CA | SMCJ78A | SMCJ78CA | 78.0 | 1 | 86.70 | 95.8 | 1 | 126 | 11.9 |
| SMCJ85A | SMCJ85CA | SMCJ85A | SMCJ85CA | 85.0 | 1 | 94.4 | 104.0 | 1 | 137 | 11 |
| SMCJ90A | SMCJ90CA | SMCJ90A | SMCJ90CA | 90.0 | 1 | 100.0 | 111.0 | 1 | 146 | 10.3 |
| SMCJ100A | SMCJ100CA | SMCJ100A | SMCJ100CA | 100.0 | 1 | 111.0 | 123.0 | 1 | 162 | 9.3 |
| SMCJ110A | SMCJ110CA | SMCJ110A | SMCJ110CA | 110.0 | 1 | 122.0 | 135.0 | 1 | 177 | 8.5 |
| SMCJ120A | SMCJ120CA | SMCJ120A | SMCJ120CA | 120.0 | 1 | 133.0 | 147.0 | 1 | 193 | 7.8 |
| SMCJ130A | SMCJ130CA | SMCJ130A | SMCJ130CA | 130.0 | 1 | 144.0 | 159.0 | 1 | 209 | 7.2 |
| SMCJ150A | SMCJ150CA | SMCJ150A | SMCJ150CA | 150.0 | 1 | 167.0 | 185.0 | 1 | 243 | 6.2 |
| SMCJ160A | SMCJ160CA | SMCJ160A | SMCJ160CA | 160.0 | 1 | 178.0 | 197.0 | 1 | 259 | 5.8 |
| SMCJ170A | SMCJ170CA | SMCJ170A | SMCJ170CA | 170.0 | 1 | 189.0 | 209.0 | 1 | 275 | 5.5 |
| SMCJ180A | SMCJ180CA | SMCJ180A | SMCJ180CA | 180.0 | 1 | 201.0 | 222.0 | 1 | 292 | 5.1 |
| SMCJ190A | SMCJ190CA | SMCJ190A | SMCJ190CA | 190.0 | 1 | 211.0 | 233.0 | 1 | 308 | 4.8 |
| SMCJ200A | SMCJ200CA | SMCJ200A | SMCJ200CA | 200.0 | 1 | 224.0 | 247.0 | 1 | 324 | 4.6 |
| SMCJ210A | SMCJ210CA | SMCJ210A | SMCJ210CA | 210.0 | 1 | 237.0 | 263.0 | 1 | 340 | 4.4 |
| SMCJ220A | SMCJ220CA | SMCJ220A | SMCJ220CA | 220.0 | 1 | 246.0 | 272.0 | 1 | 356 | 4.2 |
| SMCJ250A | SMCJ250CA | SMCJ250A | SMCJ250CA | 250.0 | 1 | 279.0 | 309.0 | 1 | 405 | 3.7 |
| SMCJ300A | SMCJ300CA | SMCJ300A | SMCJ300CA | 300.0 | 1 | 335.0 | 371.0 | 1 | 486 | 3.1 |
| SMCJ350A | SMCJ350CA | SMCJ350A | SMCJ350CA | 350.0 | 1 | 391.0 | 432.0 | 1 | 567 | 2.6 |
| SMCJ400A | SMCJ400CA | SMCJ400A | SMCJ400CA | 400.0 | 1 | 447.0 | 494.0 | 1 | 648 | 2.3 |
| SMCJ440A | SMCJ440CA | SMCJ440A | SMCJ440CA | 440.0 | 1 | 492.0 | 543.0 | 1 | 713 | 2.1 |

① Surge waveform: 10/1000 μs

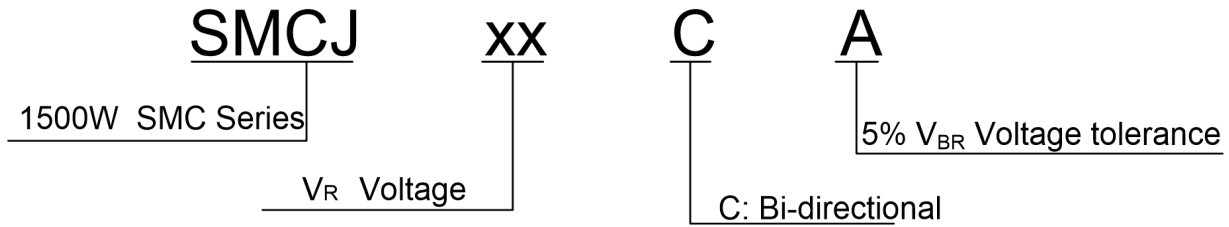
V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR} : Breakdown Voltage

V_C : Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp}

I_R : Reverse Leakage Current

Part Number Code



Absolute Maximum Ratings ($T_A=25^{\circ}C$, RH=45%-75%, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-------------|-------------|-------------|
| Storage temperature range | T_{stg} | -55 to +150 | $^{\circ}C$ |
| Operating junction temperature range | T_j | -55 to +150 | $^{\circ}C$ |
| Steady state power dissipation at $T_L=75^{\circ}C$ | $P_{M(AV)}$ | 8.0 | W |
| Peak pulse power dissipation on 10/1000 μ s waveform | P_{PP} | 1500 | W |
| Maximum Instantaneous Forward Voltage at 30A for Unidirectional | V_F | 5.0 | V |

Ratings And V-I Characteristics Curves ($T_A=25^{\circ}C$, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

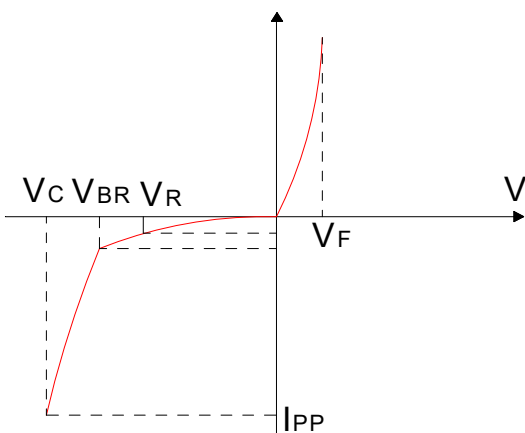
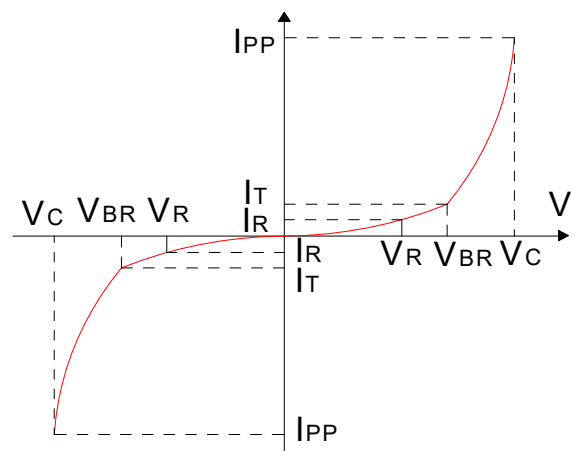


FIG.2:V- I curve characteristics (Bi-directional)



Typical Characteristics

FIG.3: Pulse waveform

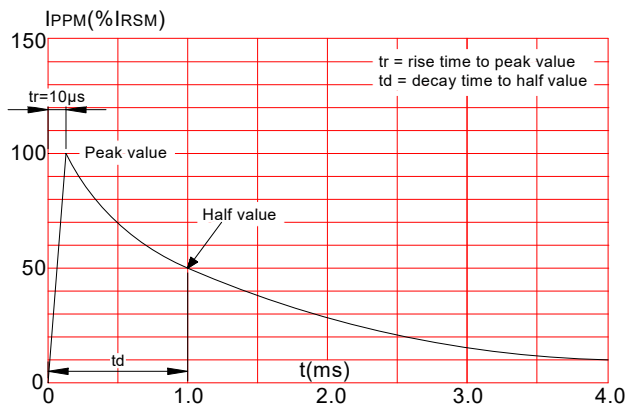
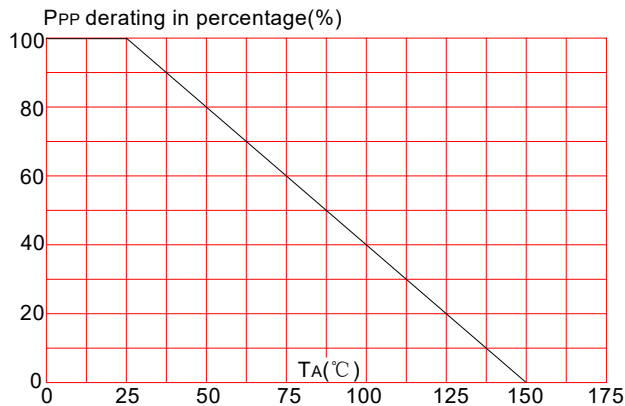
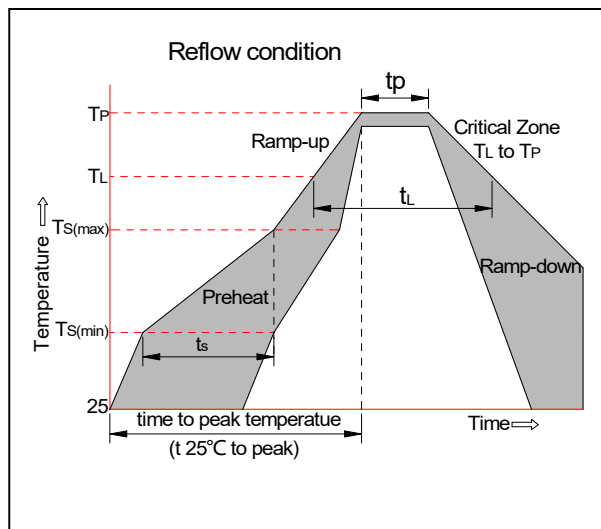


FIG.4: Pulse derating curve

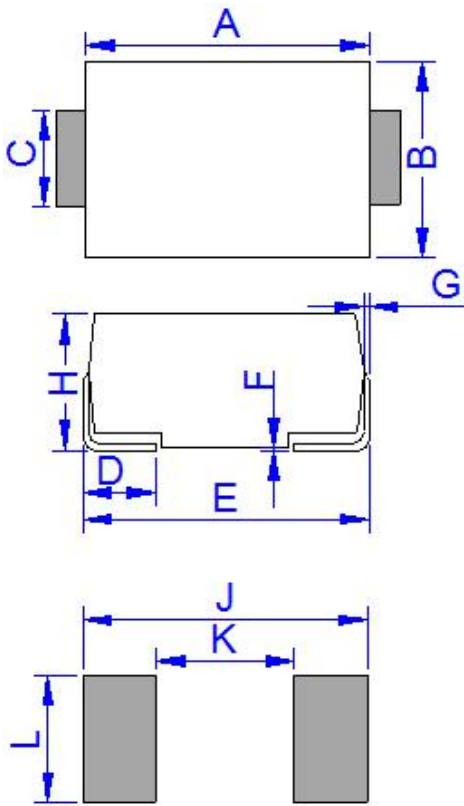


Soldering Parameters

| Reflow Condition | | Pb-Free assembly (see as below) |
|---|-----------------------------------|------------------------------------|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L)(Liquid us) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_p) | | 8 min. Max |
| Do not exceed | | +260°C |



Package Mechanical Data



DO-214AB (SMC)

| Ref | Dimensions | | | |
|-----|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 6.60 | 7.11 | 0.260 | 0.280 |
| B | 5.59 | 6.20 | 0.220 | 0.24 |
| C | 2.75 | 3.20 | 0.108 | 0.126 |
| D | 0.76 | 1.52 | 0.030 | 0.060 |
| E | 7.71 | 8.13 | 0.305 | 0.320 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 2.06 | 2.62 | 0.085 | 0.103 |
| J | 8.12 | | 0.32 | |
| K | | 4.69 | | 0.185 |
| L | 3.07 | | 0.121 | |