

## Silicon Avalanche Diodes

### 1500W Surface Mount Transient Voltage Suppressors

#### **NEW** **RoHS** 1.5SMC Series

##### FEATURES

- RoHS compliant
- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low Inductance
- Excellent clamping capability
- Repetition Rate (duty cycle): 0.05%
- Fast response time: typically less than 1.0ps from 0 Volts to BV min.
- Typical IR less than 1μA above 10V
- High temperature soldering: 250°C/10 seconds at terminals

##### DEVICES FOR BIPOLAR APPLICATION

For Bidirectional use Suffix CA for types 1.5SMC6.8CA thru types 1.5SMC550CA

Electrical characteristics apply in both directions

**Agency Approvals:** Recognized under the Components Program of Underwriters Laboratories.

**Agency File Number:** E128667



##### MAXIMUM RATINGS AND CHARACTERISTICS

@25°C AMBIENT TEMPERATURE (unless otherwise noted)

| PARAMETER                                                                                                 | SYMBOL                            | VALUE       | UNIT  |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Peak pulse power Dissipation on 10/1000μs waveform (Note 1.2, FIG.1)                                      | P <sub>PPM</sub>                  | Min 1500    | Watts |
| Peak pulse current of on 10/1000μs waveform (Note 1, FIG.3)                                               | I <sub>PPM</sub>                  | See Table 1 | Amps  |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method)(Note3) | I <sub>FSM</sub>                  | 200         | Amps  |
| Operating junction and Storage Temperature Range                                                          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

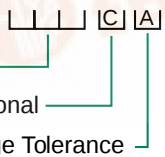
Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub> = 25°C per Fig.2
2. Mounted on 8.0mm<sup>2</sup> Copper Pads to each terminal
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum

##### Mechanical Specifications:

- Weight:** 0.007 ounce, 0.21 gram
- Case:** JEDEC DO214AB. Molded plastic over glass passivated junction
- Mounting Position:** Any
- Polarity:** Color band denoted positive end (cathode) except Bidirectional
- Terminal:** Solder plated, solderable per MIL-STD-750, Method 2026
- Standard Packaging:** 16mm tape (EIA STD RS-481)

##### ORDERING INFORMATION

1.5SMC 

Voltage

Bi-Directional

5% Voltage Tolerance

T = Tape and reel (3000 pcs)

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### 1500W Surface Mount Transient Voltage Suppressors

#### RoHS 1.5SMC Series

#### ELECTRICAL SPECIFICATION @ Tamb 25°C

| Part Number (Uni) | Part Number (Bi) | Device Marking Code |      | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (Volts) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu A$ ) |
|-------------------|------------------|---------------------|------|-----------------------------------------|--------------------------------------------|--------|-------------------------|---------------------------------------------------|-----------------------------------------|---------------------------------------------------|
|                   |                  | UNI                 | BI   |                                         | MIN                                        | MAX    |                         |                                                   |                                         |                                                   |
| 1.5SMC6.8A        | 1.5SMC6.8CA      | 6V8A                | 6V8C | 5.80                                    | 6.45                                       | 7.14   | 10                      | 10.5                                              | 144.8                                   | 1000                                              |
| 1.5SMC7.5A        | 1.5SMC7.5CA      | 7V5A                | 7V5C | 6.40                                    | 7.13                                       | 7.88   | 10                      | 11.3                                              | 134.5                                   | 500                                               |
| 1.5SMC8.2A        | 1.5SMC8.2CA      | 8V2A                | 8V2C | 7.02                                    | 7.79                                       | 8.61   | 10                      | 12.1                                              | 125.6                                   | 200                                               |
| 1.5SMC9.1A        | 1.5SMC9.1CA      | 9V1A                | 9V1C | 7.78                                    | 8.65                                       | 9.50   | 1                       | 13.4                                              | 113.4                                   | 50                                                |
| 1.5SMC10A         | 1.5SMC10CA       | 10A                 | 10C  | 8.55                                    | 9.50                                       | 10.50  | 1                       | 14.5                                              | 104.8                                   | 10                                                |
| 1.5SMC11A         | 1.5SMC11CA       | 11A                 | 11C  | 9.40                                    | 10.50                                      | 11.60  | 1                       | 15.6                                              | 97.4                                    | 5                                                 |
| 1.5SMC12A         | 1.5SMC12CA       | 12A                 | 12C  | 10.20                                   | 11.40                                      | 12.60  | 1                       | 16.7                                              | 91.0                                    | 5                                                 |
| 1.5SMC13A         | 1.5SMC13CA       | 13A                 | 13C  | 11.10                                   | 12.40                                      | 13.70  | 1                       | 18.2                                              | 83.5                                    | 5                                                 |
| 1.5SMC15A         | 1.5SMC15CA       | 15A                 | 15C  | 12.80                                   | 14.30                                      | 15.80  | 1                       | 21.2                                              | 71.7                                    | 5                                                 |
| 1.5SMC16A         | 1.5SMC16CA       | 16A                 | 16C  | 13.60                                   | 15.20                                      | 16.80  | 1                       | 22.5                                              | 67.6                                    | 5                                                 |
| 1.5SMC18A         | 1.5SMC18CA       | 18A                 | 18C  | 15.30                                   | 17.10                                      | 18.90  | 1                       | 25.2                                              | 60.3                                    | 5                                                 |
| 1.5SMC20A         | 1.5SMC20CA       | 20A                 | 20C  | 17.10                                   | 19.00                                      | 21.00  | 1                       | 27.7                                              | 54.9                                    | 5                                                 |
| 1.5SMC22A         | 1.5SMC22CA       | 22A                 | 22C  | 18.80                                   | 20.90                                      | 23.10  | 1                       | 30.6                                              | 49.7                                    | 5                                                 |
| 1.5SMC24A         | 1.5SMC24CA       | 24A                 | 24C  | 20.50                                   | 22.80                                      | 25.20  | 1                       | 33.2                                              | 45.8                                    | 5                                                 |
| 1.5SMC27A         | 1.5SMC27CA       | 27A                 | 27C  | 23.10                                   | 25.70                                      | 28.40  | 1                       | 37.5                                              | 40.5                                    | 5                                                 |
| 1.5SMC30A         | 1.5SMC30CA       | 30A                 | 30C  | 25.60                                   | 28.50                                      | 31.50  | 1                       | 41.4                                              | 36.7                                    | 5                                                 |
| 1.5SMC33A         | 1.5SMC33CA       | 33A                 | 33C  | 28.20                                   | 31.40                                      | 34.70  | 1                       | 45.7                                              | 33.3                                    | 5                                                 |
| 1.5SMC36A         | 1.5SMC36CA       | 36A                 | 36C  | 30.80                                   | 34.20                                      | 37.80  | 1                       | 49.9                                              | 30.5                                    | 5                                                 |
| 1.5SMC39A         | 1.5SMC39CA       | 39A                 | 39C  | 33.30                                   | 37.10                                      | 41.00  | 1                       | 53.9                                              | 28.2                                    | 5                                                 |
| 1.5SMC43A         | 1.5SMC43CA       | 43A                 | 43C  | 36.80                                   | 40.90                                      | 45.20  | 1                       | 59.3                                              | 25.6                                    | 5                                                 |
| 1.5SMC47A         | 1.5SMC47CA       | 47A                 | 47C  | 40.20                                   | 44.70                                      | 49.40  | 1                       | 64.8                                              | 23.5                                    | 5                                                 |
| 1.5SMC51A         | 1.5SMC51CA       | 51A                 | 51C  | 43.60                                   | 48.50                                      | 53.60  | 1                       | 70.1                                              | 21.7                                    | 5                                                 |
| 1.5SMC56A         | 1.5SMC56CA       | 56A                 | 56C  | 47.80                                   | 53.20                                      | 58.80  | 1                       | 77.0                                              | 19.7                                    | 5                                                 |
| 1.5SMC62A         | 1.5SMC62CA       | 62A                 | 62C  | 53.00                                   | 58.90                                      | 65.10  | 1                       | 85.0                                              | 17.9                                    | 5                                                 |
| 1.5SMC68A         | 1.5SMC68CA       | 68A                 | 68C  | 58.10                                   | 64.60                                      | 71.40  | 1                       | 92.0                                              | 16.5                                    | 5                                                 |
| 1.5SMC75A         | 1.5SMC75CA       | 75A                 | 75C  | 64.10                                   | 71.30                                      | 78.80  | 1                       | 103.0                                             | 14.8                                    | 5                                                 |
| 1.5SMC82A         | 1.5SMC82CA       | 82A                 | 82C  | 70.10                                   | 77.90                                      | 86.10  | 1                       | 113.0                                             | 13.5                                    | 5                                                 |
| 1.5SMC91A         | 1.5SMC91CA       | 91A                 | 91C  | 77.80                                   | 86.50                                      | 95.50  | 1                       | 125.0                                             | 12.2                                    | 5                                                 |
| 1.5SMC100A        | 1.5SMC100CA      | 68A                 | 100C | 85.50                                   | 95.00                                      | 105.00 | 1                       | 137.0                                             | 11.1                                    | 5                                                 |
| 1.5SMC110A        | 1.5SMC110CA      | 75A                 | 110C | 94.00                                   | 105.00                                     | 116.00 | 1                       | 152.0                                             | 10.0                                    | 5                                                 |
| 1.5SMC120A        | 1.5SMC120CA      | 120A                | 120C | 102.00                                  | 114.00                                     | 126.00 | 1                       | 165.0                                             | 9.2                                     | 5                                                 |
| 1.5SMC130A        | 1.5SMC130CA      | 130A                | 130C | 111.00                                  | 124.00                                     | 137.00 | 1                       | 179.0                                             | 8.5                                     | 5                                                 |
| 1.5SMC150A        | 1.5SMC150CA      | 150A                | 150C | 128.00                                  | 143.00                                     | 158.00 | 1                       | 207.0                                             | 7.3                                     | 5                                                 |
| 1.5SMC160A        | 1.5SMC160CA      | 160A                | 160C | 136.00                                  | 152.00                                     | 168.00 | 1                       | 219.0                                             | 6.9                                     | 5                                                 |
| 1.5SMC170A        | 1.5SMC170CA      | 170A                | 170C | 145.00                                  | 162.00                                     | 179.00 | 1                       | 234.0                                             | 6.5                                     | 5                                                 |
| 1.5SMC180A        | 1.5SMC180CA      | 180A                | 180C | 154.00                                  | 171.00                                     | 189.00 | 1                       | 246.0                                             | 6.2                                     | 5                                                 |
| 1.5SMC200A        | 1.5SMC200CA      | 200A                | 200C | 171.00                                  | 190.00                                     | 210.00 | 1                       | 274.0                                             | 5.5                                     | 5                                                 |
| 1.5SMC220A        | 1.5SMC220CA      | 220A                | 220C | 185.00                                  | 209.00                                     | 231.00 | 1                       | 328.0                                             | 4.6                                     | 5                                                 |
| 1.5SMC250A        | 1.5SMC250CA      | 250A                | 250C | 214.00                                  | 237.00                                     | 263.00 | 1                       | 344.0                                             | 4.4                                     | 5                                                 |
| 1.5SMC300A        | 1.5SMC300CA      | 300A                | 300C | 256.00                                  | 285.00                                     | 315.00 | 1                       | 414.0                                             | 3.7                                     | 5                                                 |
| 1.5SMC350A        | 1.5SMC350CA      | 350A                | 350C | 300.00                                  | 332.00                                     | 368.00 | 1                       | 482.0                                             | 3.2                                     | 5                                                 |
| 1.5SMC400A        | 1.5SMC400CA      | 400A                | 400C | 342.00                                  | 380.00                                     | 420.00 | 1                       | 548.0                                             | 2.8                                     | 5                                                 |
| 1.5SMC440A        | 1.5SMC440CA      | 440A                | 440C | 376.00                                  | 418.00                                     | 462.00 | 1                       | 602.0                                             | 2.5                                     | 5                                                 |
| 1.5SMC480A        | 1.5SMC480CA      | 480A                | 480C | 408.00                                  | 456.00                                     | 504.00 | 1                       | 658.0                                             | 2.3                                     | 5                                                 |
| 1.5SMC510A        | 1.5SMC510CA      | 510A                | 510C | 434.00                                  | 485.00                                     | 535.00 | 1                       | 698.0                                             | 2.1                                     | 5                                                 |
| 1.5SMC530A        | 1.5SMC530CA      | 530A                | 530C | 477.00                                  | 503.50                                     | 556.50 | 1                       | 725.0                                             | 2.1                                     | 5                                                 |
| 1.5SMC540A        | 1.5SMC540CA      | 540A                | 540C | 459.00                                  | 513.00                                     | 567.00 | 1                       | 740.0                                             | 2.0                                     | 5                                                 |
| 1.5SMC550A        | 1.5SMC550CA      | 550A                | 550C | 495.00                                  | 522.50                                     | 577.50 | 1                       | 760.0                                             | 2.0                                     | 5                                                 |

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

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#### RoHS 1.5SMC Series

Ratings and Characteristic Curves  $T_A=25^\circ\text{C}$  unless otherwise noted

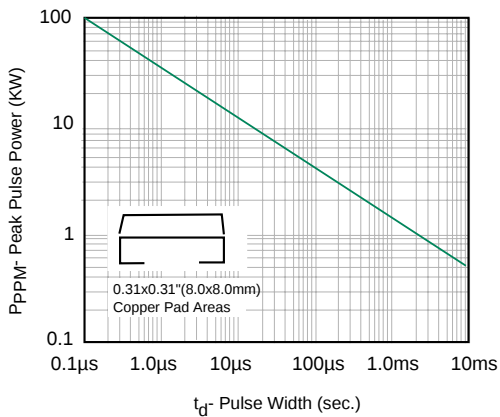


Fig. 1 Peak Pulse Power Rating

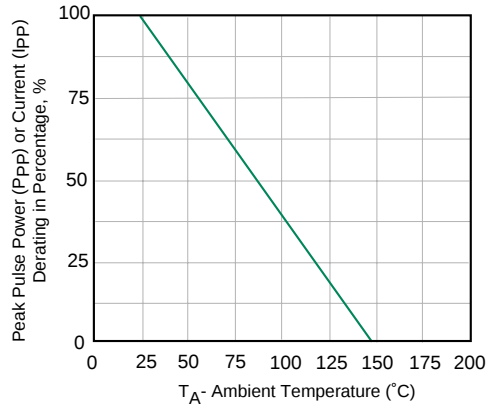


Fig. 2 Pulse Derating Curve

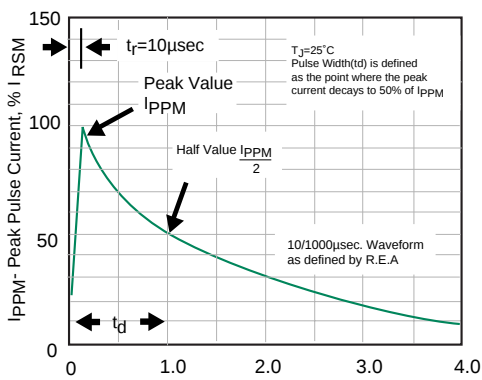


Fig. 3 Pulse Waveform

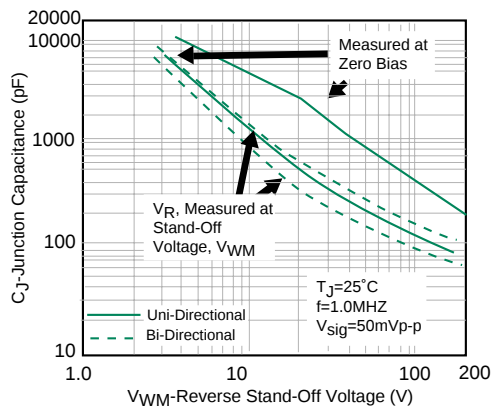


Fig. 4- Typical Junction Capacitance

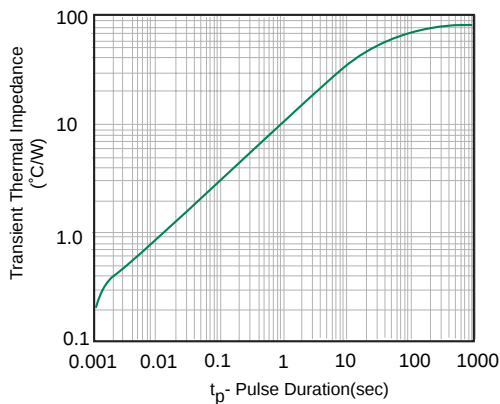


Fig. 5- Typ. Transient Thermal Impedance

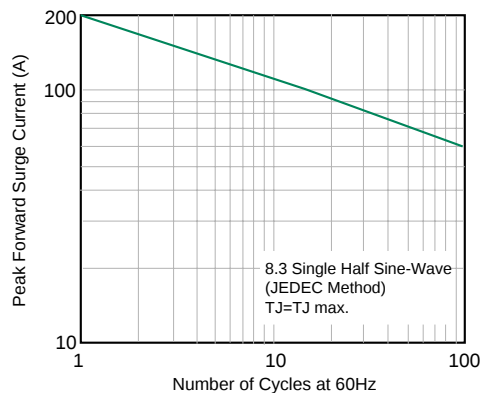


Fig. 6- Maximum Non-Repetitive Forward Surge Current  
Uni-Directional Use Only

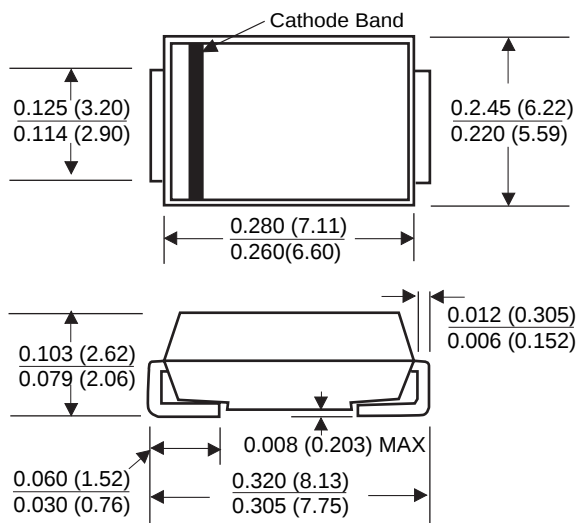
## Silicon Avalanche Diodes

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#### RoHS 1.5SMC Series

#### Package Outline Dimensions and Pad Layouts

DO-214AB (SMC J-Bend)



Dimensions in inches and (millimeters)