



## SMCG Plastic-Encapsulate Diodes

### 1.5SMC SERIES Transient Voltage Suppressor Diodes

#### Features

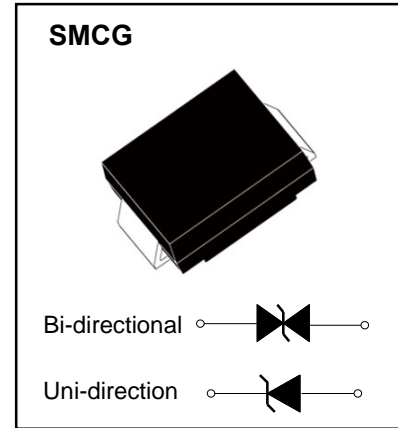
- P<sub>PP</sub> 1500W
- V<sub>RWM</sub> 5.8V- 509V
- Glass passivated chip

#### Applications

- Clamping Voltage

#### Marking

- 1.5SMCXXCA/XXA  
XX : From 6.8 To 600



#### Limiting Values (Absolute Maximum Rating)

| Item   | Symbol                            | Unit | Conditions                                       | Max            |
|--|-----------------------------------|------|--|----------------|
| Peak pulse power dissipation                     | P <sub>PPM</sub>                  | W    | with a 10/1000us waveform                        | 1500           |
| Peak pulse current (1)                           | I <sub>PPM</sub>                  | A    | with a 10/1000us waveform                        | See Next Table |
| Power dissipation                                | P <sub>D</sub>                    | W    | On infinite heat sink at T <sub>L</sub> =75°C    | 5.0            |
| Peak forward surge current(2)                    | I <sub>FSM</sub>                  | A    | 8.3 ms single half sine-wave unidirectional only | 200            |
| Operating junction and storage temperature range | T <sub>J</sub> , T <sub>STG</sub> | °C   |  | -55 to +150    |

#### Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| Item                                      | Symbol           | Unit | Conditions                                     | Max     |
|---|------------------|------|--|---------|
| Maximum instantaneous forward Voltage (3) | V <sub>F</sub>   | V    | at 100A for unidirectional only                | 3.5/6.5 |
| Thermal resistance                        | R <sub>θJL</sub> | °C/W | junction to lead                               | 15      |
|   | R <sub>θJA</sub> | °C/W | junction to ambient, L <sub>Lead</sub> = 10 mm | 75      |

#### Notes:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25°C per Fig.2.
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal
- (3) VF<3.5V for devices of VBR<200V and VF<5.0V for devices of VBR>201V

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Part Number |             | Reverse Stand-off Voltage | Breakdown Voltage $V_{BR}$ @ $I_T$ |         | Test Current | Max. Clamping Voltage @ $I_{PP}$ | Max. Peak Pulse Current | Max. Reverse Leakage @ $V_{RWM}$ |
|-------------|-------------|---------------------------|------------------------------------|---------|--------------|----------------------------------|-------------------------|----------------------------------|
| UNI-POLAR   | BI-POLAR    | $V_{RWM}(V)$              | Min.(V)                            | Max.(V) | $I_T(mA)$    | $V_{C\text{MAX.}}(V)$            | $I_{PP}(A)$             | $I_R(\mu A)$                     |
| 1.5SMC6.8A  | 1.5SMC6.8CA | 5.8                       | 6.45                               | 7.14    | 10           | 10.5                             | 144.80                  | 1000                             |
| 1.5SMC7.5A  | 1.5SMC7.5CA | 6.4                       | 7.13                               | 7.88    | 10           | 11.3                             | 134.50                  | 500                              |
| 1.5SMC8.2A  | 1.5SMC8.2CA | 7.0                       | 7.79                               | 8.61    | 10           | 12.1                             | 125.60                  | 200                              |
| 1.5SMC9.1A  | 1.5SMC9.1CA | 7.8                       | 8.65                               | 9.55    | 1            | 13.4                             | 113.40                  | 50                               |
| 1.5SMC10A   | 1.5SMC10CA  | 8.6                       | 9.50                               | 10.50   | 1            | 14.5                             | 104.80                  | 10                               |
| 1.5SMC11A   | 1.5SMC11CA  | 9.4                       | 10.50                              | 11.60   | 1            | 15.6                             | 97.40                   | 5                                |
| 1.5SMC12A   | 1.5SMC12CA  | 10.2                      | 11.40                              | 12.60   | 1            | 16.7                             | 91.00                   | 5                                |
| 1.5SMC13A   | 1.5SMC13CA  | 11.1                      | 12.40                              | 13.70   | 1            | 18.2                             | 83.50                   | 1                                |
| 1.5SMC15A   | 1.5SMC15CA  | 12.8                      | 14.30                              | 15.80   | 1            | 21.2                             | 71.70                   | 1                                |
| 1.5SMC16A   | 1.5SMC16CA  | 13.6                      | 15.20                              | 16.80   | 1            | 22.5                             | 67.60                   | 1                                |
| 1.5SMC18A   | 1.5SMC18CA  | 15.3                      | 17.10                              | 18.90   | 1            | 25.5                             | 60.30                   | 1                                |
| 1.5SMC20A   | 1.5SMC20CA  | 17.1                      | 19.00                              | 21.00   | 1            | 27.7                             | 54.90                   | 1                                |
| 1.5SMC22A   | 1.5SMC22CA  | 18.8                      | 20.90                              | 23.10   | 1            | 30.6                             | 49.70                   | 1                                |
| 1.5SMC24A   | 1.5SMC24CA  | 20.5                      | 22.80                              | 25.20   | 1            | 33.2                             | 45.80                   | 1                                |
| 1.5SMC27A   | 1.5SMC27CA  | 23.1                      | 25.70                              | 28.40   | 1            | 37.5                             | 40.50                   | 1                                |
| 1.5SMC30A   | 1.5SMC30CA  | 25.6                      | 28.50                              | 31.50   | 1            | 41.4                             | 36.70                   | 1                                |
| 1.5SMC33A   | 1.5SMC33CA  | 28.2                      | 31.40                              | 34.70   | 1            | 45.7                             | 33.30                   | 1                                |
| 1.5SMC36A   | 1.5SMC36CA  | 30.8                      | 34.20                              | 37.80   | 1            | 49.9                             | 30.50                   | 1                                |
| 1.5SMC39A   | 1.5SMC39CA  | 33.3                      | 37.10                              | 41.00   | 1            | 53.9                             | 28.20                   | 1                                |
| 1.5SMC43A   | 1.5SMC43CA  | 36.8                      | 40.90                              | 45.20   | 1            | 59.3                             | 25.60                   | 1                                |
| 1.5SMC47A   | 1.5SMC47CA  | 40.2                      | 44.70                              | 49.40   | 1            | 64.8                             | 23.50                   | 1                                |
| 1.5SMC51A   | 1.5SMC51CA  | 43.6                      | 48.50                              | 53.60   | 1            | 70.1                             | 21.70                   | 1                                |
| 1.5SMC56A   | 1.5SMC56CA  | 47.8                      | 53.20                              | 58.80   | 1            | 77.0                             | 19.70                   | 1                                |
| 1.5SMC62A   | 1.5SMC62CA  | 53.0                      | 58.90                              | 65.10   | 1            | 85.0                             | 17.90                   | 1                                |
| 1.5SMC68A   | 1.5SMC68CA  | 58.1                      | 64.60                              | 71.40   | 1            | 92.0                             | 16.50                   | 1                                |
| 1.5SMC75A   | 1.5SMC75CA  | 64.1                      | 71.30                              | 78.80   | 1            | 103.0                            | 14.80                   | 1                                |
| 1.5SMC82A   | 1.5SMC82CA  | 70.1                      | 77.90                              | 86.10   | 1            | 113.0                            | 13.50                   | 1                                |
| 1.5SMC91A   | 1.5SMC91CA  | 77.8                      | 86.50                              | 95.50   | 1            | 125.0                            | 12.20                   | 1                                |
| 1.5SMC100A  | 1.5SMC100CA | 85.5                      | 95.00                              | 105.00  | 1            | 137.0                            | 11.10                   | 1                                |
| 1.5SMC110A  | 1.5SMC110CA | 94.0                      | 105.0                              | 116.0   | 1            | 152.0                            | 10.00                   | 1                                |
| 1.5SMC120A  | 1.5SMC120CA | 102.0                     | 114.0                              | 126.0   | 1            | 165.0                            | 9.20                    | 1                                |
| 1.5SMC130A  | 1.5SMC130CA | 111.0                     | 124.0                              | 137.0   | 1            | 179.0                            | 8.50                    | 1                                |
| 1.5SMC150A  | 1.5SMC150CA | 128.0                     | 143.0                              | 158.0   | 1            | 207.0                            | 7.30                    | 1                                |
| 1.5SMC160A  | 1.5SMC160CA | 136.0                     | 152.0                              | 168.0   | 1            | 219.0                            | 6.90                    | 1                                |
| 1.5SMC170A  | 1.5SMC170CA | 145.0                     | 162.0                              | 179.0   | 1            | 234.0                            | 6.50                    | 1                                |
| 1.5SMC180A  | 1.5SMC180CA | 154.0                     | 171.0                              | 189.0   | 1            | 246.0                            | 6.20                    | 1                                |
| 1.5SMC200A  | 1.5SMC200CA | 171.0                     | 190.0                              | 210.0   | 1            | 274.0                            | 5.50                    | 1                                |
| 1.5SMC220A  | 1.5SMC220CA | 185.0                     | 209.0                              | 231.0   | 1            | 328.0                            | 4.60                    | 1                                |
| 1.5SMC250A  | 1.5SMC250CA | 214.0                     | 237.0                              | 263.0   | 1            | 344.0                            | 4.40                    | 1                                |
| 1.5SMC300A  | 1.5SMC300CA | 256.0                     | 285.0                              | 315.0   | 1            | 414.0                            | 3.70                    | 1                                |
| 1.5SMC350A  | 1.5SMC350CA | 300.0                     | 332.0                              | 368.0   | 1            | 482.0                            | 3.20                    | 1                                |
| 1.5SMC400A  | 1.5SMC400CA | 342.0                     | 380.0                              | 420.0   | 1            | 548.0                            | 2.80                    | 1                                |
| 1.5SMC440A  | 1.5SMC440CA | 376.0                     | 418.0                              | 462.0   | 1            | 602.0                            | 2.50                    | 1                                |
| 1.5SMC480A  | 1.5SMC480CA | 408.0                     | 456.0                              | 504.0   | 1            | 658.0                            | 2.30                    | 1                                |
| 1.5SMC510A  | 1.5SMC510CA | 434.0                     | 485.0                              | 535.0   | 1            | 698.0                            | 2.10                    | 1                                |
| 1.5SMC530A  | 1.5SMC530CA | 450.0                     | 503.0                              | 556.0   | 1            | 725.0                            | 2.10                    | 1                                |
| 1.5SMC540A  | 1.5SMC540CA | 459.0                     | 513.0                              | 567.0   | 1            | 740.0                            | 2.00                    | 1                                |
| 1.5SMC550A  | 1.5SMC550CA | 467.0                     | 522.5                              | 577.5   | 1            | 760.0                            | 2.00                    | 1                                |
| 1.5SMC600A  | 1.5SMC600CA | 509.0                     | 570.0                              | 630.0   | 1            | 820.0                            | 1.80                    | 1                                |

# Typical Characteristics

FIG1: Peak Pulse Power Rating Curve

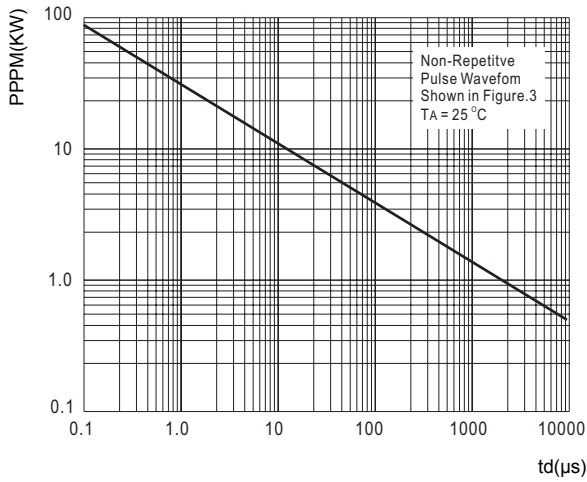


FIG2: Pulse Power or Current vs. Initial Junction Temperature

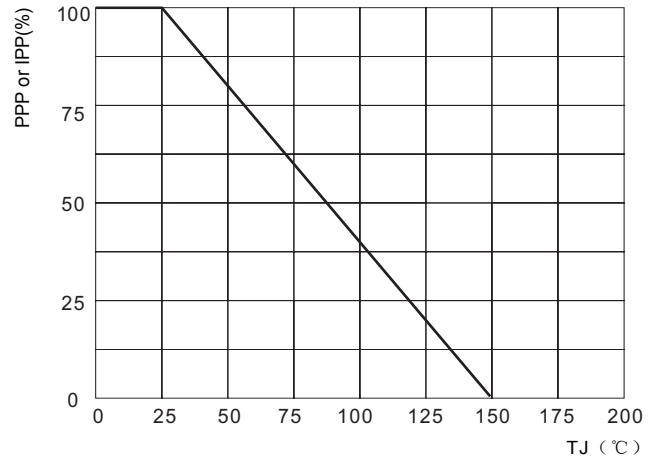


FIG3: Pulse Waveform

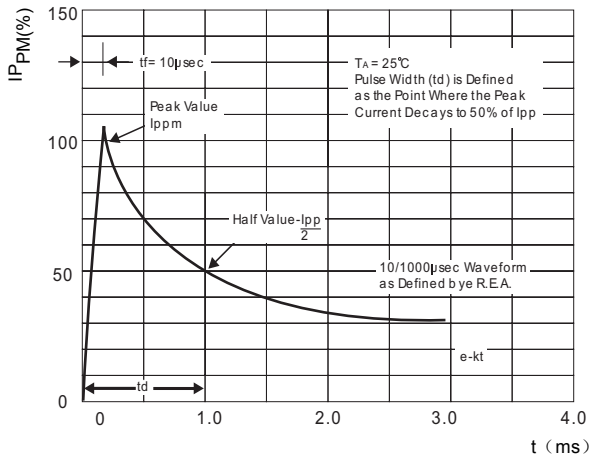


FIG4: Typical Transient Thermal Impedance

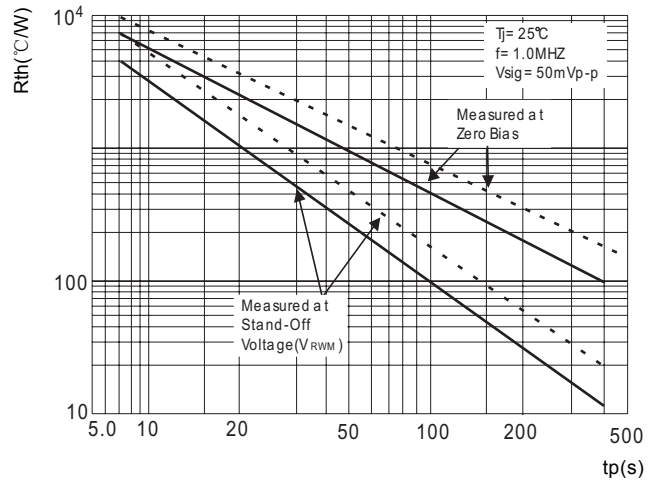


FIG5: Maximum Non-Repetitive Surge Current

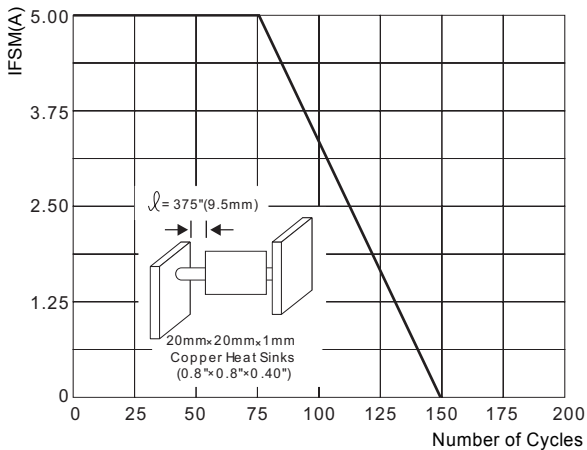
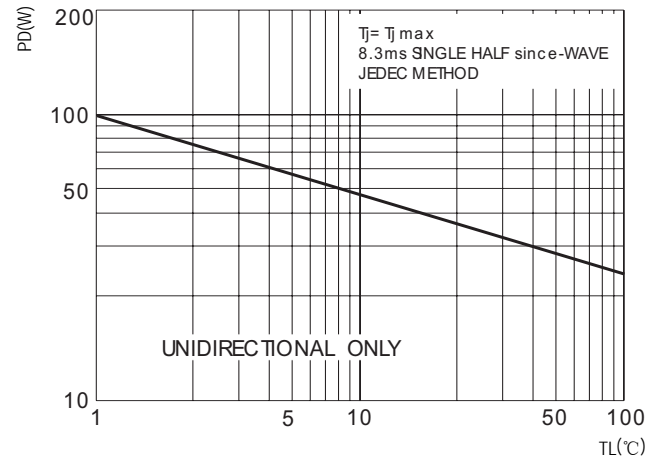
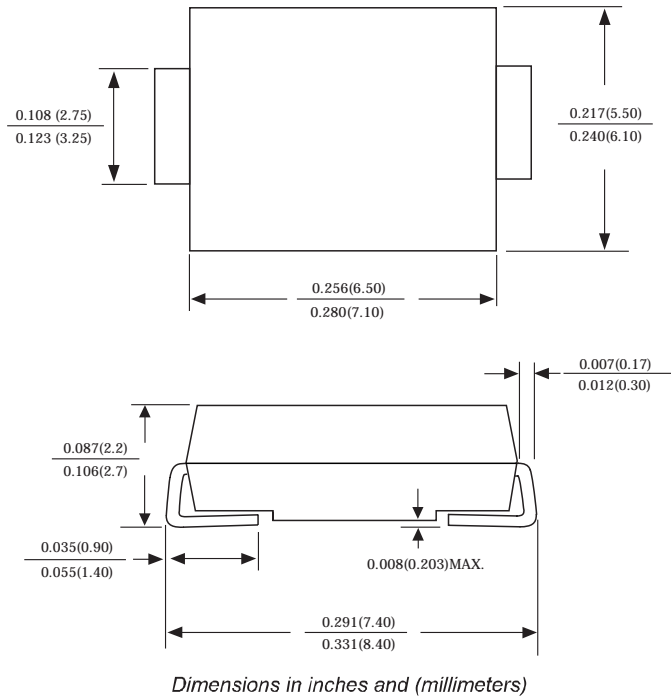


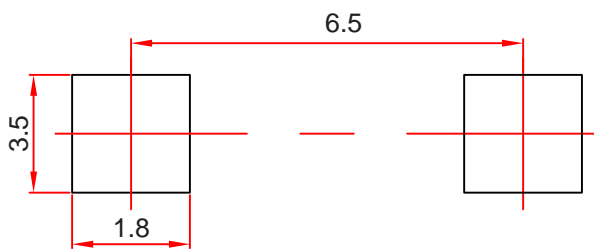
FIG6: Steady State Power Dissipation



## SMCG Package Outline Dimensions



## SMCG Suggested Pad Layout



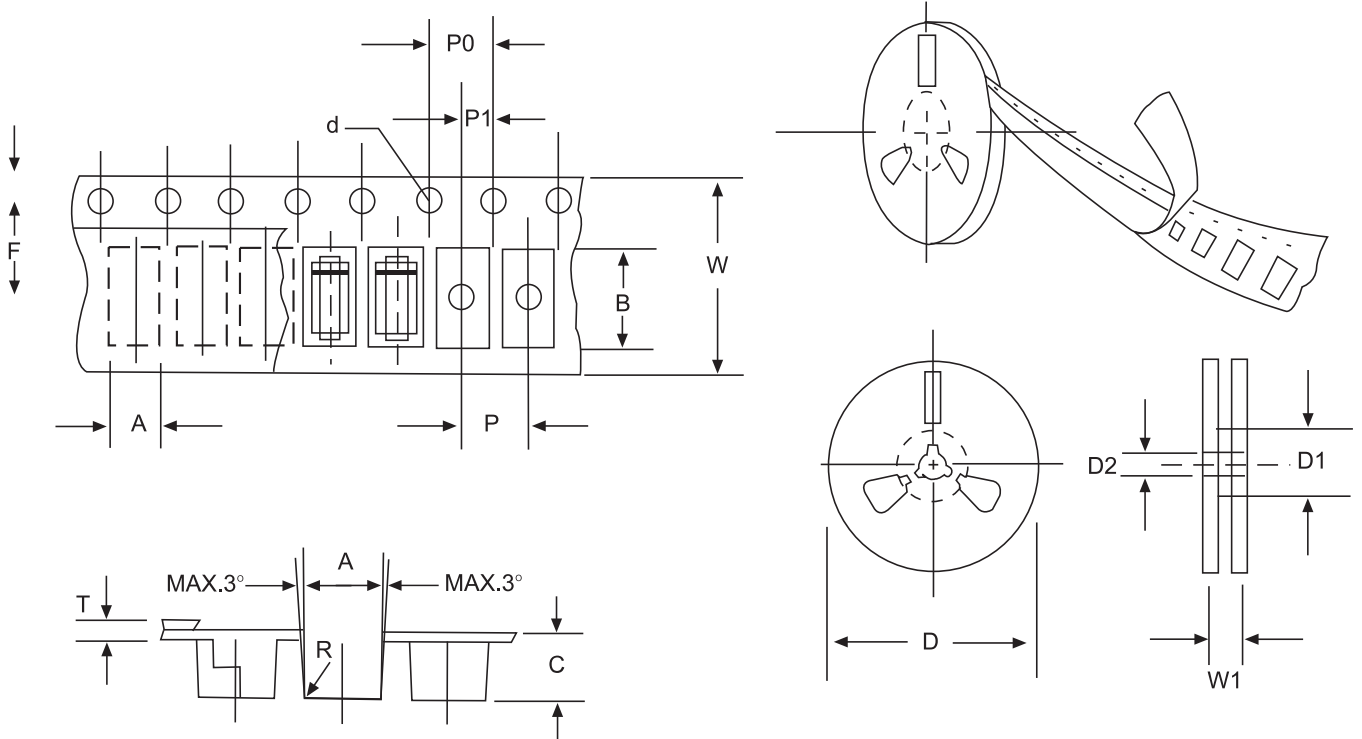
### Note:

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

### NOTICE

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## Reel Taping Specifications For Surface Mount Devices- SMCG



**FIG: CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

| ITEM                   | SYMBOL | SMCG mm(inch)          |
|------------------------|--------|------------------------|
| Carrier width          | A      | 6.05±0.1(0.238±0.004)  |
| Carrier length         | B      | 8.31±0.1(0.327±0.004)  |
| Carrier depth          | C      | 2.70±0.1(0.106±0.004)  |
| Sprocket hole          | d      | 1.55±0.05(0.061±0.002) |
| Reel outside diameter  | D      | 330±2.0(13±0.079)      |
| Reel inner diameter    | D1     | 75 ±1.0 ( 2.95 ±0.039) |
| Feed hole diameter     | D2     | 13±0.5(0.512±0.020)    |
| Sprocket hole position | E      | 1.75±0.1(0.069±0.004)  |
| Punch hole position    | F      | 7.65±0.05(0.301±0.002) |
| Punch hole pitch       | P      | 8.0±0.1(0.315±0.004)   |
| Sprocket hole pitch    | P0     | 4.0±0.1(0.157±0.004)   |
| Embossment center      | P1     | 2.0±0.1(0.079±0.004)   |
| Total tape thickness   | T      | 0.3±0.1(0.012±0.004)   |
| Tape width             | W      | 16.0±0.2(0.630±0.008)  |
| Reel width             | W1     | 24.0±2.0(0.945±0.079)  |

NOTE: Devices are packed in accordance with EIA standard RS-481-A and specification given above.

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