SZCJ

Shenzhen Changji Semiconductor Co., LTD.

# SMBG Plastic-Encapsulate Diodes

## 1.0SMB SERIES **Transient Voltage Suppressor Diodes**

### Features

- $P_{PP}$ 1000W
- $V_{RWM}$ 5.8V- 450V
- Glass passivated chip

### Applications

- Clamping Voltage

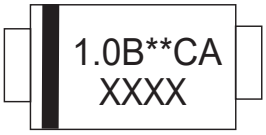
**SMBG**



Bi-directional

Uni-direction

### Marking




Cathode Band:for uni-directional products only
1.0B**CA = Device code, **=Voltage
C:Bi-directional or not
XXXX=Data Code

### Limiting Values (Absolute Maximum Rating)

| Item | Symbol | Unit | Conditions | Max |
|---|---|---|---|---|
| Peak pulse power dissipation | $P_{PPM}$ | W | with a 10/1000us waveform | 1000 |
| Peak pulse current (1) | $I_{PPM}$ | A | with a 10/1000us waveform | See Next Table |
| Power dissipation | $P_D$ | W | On infinite heat sink at $T_L$=75℃ | 5.0 |
| Peak forward surge current(2) | $I_{FSM}$ | A | 8.3 ms single half sine-wave unidirectional only | 100 |
| Operating junction and storage temperature range | $T_J$,$T_{STG}$ | ℃ | | -55 to +150 |

### Electrical Characteristics（$T_a$=25℃ Unless otherwise specified）

| Item | Symbol | Unit | Conditions | Max |
|---|---|---|---|---|
| Maximum instantaneous forward Voltage (3) | $V_F$ | V | at 50A for unidirectional only | 3.5/6.5 |
| Thermal resistance | $R_{\theta JL}$ | ℃/W | junction to lead | 20 |
| | $R_{\theta JA}$ | ℃/W | junction to ambient， $L_{Lead}$ = 10 mm | 100 |

### Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above $T_A$= 25℃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℃ 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) | $V_{C\ MAX.}$(V) | $I_{PP}$(A) | $I_R$(uA) |
| 1.0SMB6.8A | 1.0SMB6.8CA | 5.8 | 6.45 | 7.14 | 10 | 10.5 | 97.50 | 1000 |
| 1.0SMB7.5A | 1.0SMB7.5CA | 6.4 | 7.13 | 7.88 | 10 | 11.3 | 90.75 | 500 |
| 1.0SMB8.2A | 1.0SMB8.2CA | 7.0 | 7.79 | 8.61 | 10 | 12.1 | 84.75 | 200 |
| 1.0SMB9.1A | 1.0SMB9.1CA | 7.8 | 8.65 | 9.55 | 1 | 13.4 | 76.50 | 50 |
| 1.0SMB10A | 1.0SMB10CA | 8.6 | 9.50 | 10.50 | 1 | 14.5 | 70.75 | 10 |
| 1.0SMB11A | 1.0SMB11CA | 9.4 | 10.50 | 11.60 | 1 | 15.6 | 65.75 | 5 |
| 1.0SMB12A | 1.0SMB12CA | 10.2 | 11.40 | 12.60 | 1 | 16.7 | 61.50 | 5 |
| 1.0SMB13A | 1.0SMB13CA | 11.1 | 12.40 | 13.70 | 1 | 18.2 | 56.25 | 1 |
| 1.0SMB15A | 1.0SMB15CA | 12.8 | 14.30 | 15.80 | 1 | 21.2 | 48.25 | 1 |
| 1.0SMB16A | 1.0SMB16CA | 13.6 | 15.20 | 16.80 | 1 | 22.5 | 45.50 | 1 |
| 1.0SMB18A | 1.0SMB18CA | 15.3 | 17.10 | 18.90 | 1 | 25.5 | 40.25 | 1 |
| 1.0SMB20A | 1.0SMB20CA | 17.1 | 19.00 | 21.00 | 1 | 27.7 | 37.00 | 1 |
| 1.0SMB22A | 1.0SMB22CA | 18.8 | 20.90 | 23.10 | 1 | 30.6 | 33.50 | 1 |
| 1.0SMB24A | 1.0SMB24CA | 20.5 | 22.80 | 25.20 | 1 | 33.2 | 30.75 | 1 |
| 1.0SMB27A | 1.0SMB27CA | 23.1 | 25.70 | 28.40 | 1 | 37.5 | 27.25 | 1 |
| 1.0SMB30A | 1.0SMB30CA | 25.6 | 28.50 | 31.50 | 1 | 41.4 | 24.75 | 1 |
| 1.0SMB33A | 1.0SMB33CA | 28.2 | 31.40 | 34.70 | 1 | 45.7 | 22.50 | 1 |
| 1.0SMB36A | 1.0SMB36CA | 30.8 | 34.20 | 37.80 | 1 | 49.9 | 20.50 | 1 |
| 1.0SMB39A | 1.0SMB39CA | 33.3 | 37.1 | 41.00 | 1 | 53.9 | 19.00 | 1 |
| 1.0SMB43A | 1.0SMB43CA | 36.8 | 40.90 | 45.20 | 1 | 59.3 | 17.25 | 1 |
| 1.0SMB47A | 1.0SMB47CA | 40.2 | 44.70 | 49.40 | 1 | 64.8 | 15.75 | 1 |
| 1.0SMB51A | 1.0SMB51CA | 43.6 | 48.50 | 53.60 | 1 | 70.1 | 14.50 | 1 |
| 1.0SMB56A | 1.0SMB56CA | 47.8 | 53.20 | 58.80 | 1 | 77.0 | 13.25 | 1 |
| 1.0SMB62A | 1.0SMB62CA | 53.0 | 58.90 | 65.10 | 1 | 85.0 | 12.00 | 1 |
| 1.0SMB68A | 1.0SMB68CA | 58.1 | 64.60 | 71.40 | 1 | 92.0 | 11.25 | 1 |
| 1.0SMB75A | 1.0SMB75CA | 64.1 | 71.30 | 78.80 | 1 | 103.0 | 10.00 | 1 |
| 1.0SMB82A | 1.0SMB82CA | 70.1 | 77.90 | 86.10 | 1 | 113.0 | 9.00 | 1 |
| 1.0SMB91A | 1.0SMB91CA | 77.8 | 86.50 | 95.50 | 1 | 125.0 | 8.25 | 1 |
| 1.0SMB100A | 1.0SMB100CA | 85.5 | 95.0 | 105.0 | 1 | 137.0 | 7.50 | 1 |
| 1.0SMB110A | 1.0SMB110CA | 94.0 | 105.0 | 116.0 | 1 | 152.0 | 6.75 | 1 |
| 1.0SMB120A | 1.0SMB120CA | 102.0 | 114.0 | 126.0 | 1 | 165.0 | 6.25 | 1 |
| 1.0SMB130A | 1.0SMB130CA | 111.0 | 124.0 | 137.0 | 1 | 179.0 | 5.75 | 1 |
| 1.0SMB150A | 1.0SMB150CA | 128.0 | 143.0 | 158.0 | 1 | 207.0 | 5.00 | 1 |
| 1.0SMB160A | 1.0SMB160CA | 136.0 | 152.0 | 168.0 | 1 | 219.0 | 4.75 | 1 |
| 1.0SMB170A | 1.0SMB170CA | 145.0 | 162.0 | 179.0 | 1 | 234.0 | 4.50 | 1 |
| 1.0SMB180A | 1.0SMB180CA | 154.0 | 171.0 | 189.0 | 1 | 246.0 | 4.25 | 1 |
| 1.0SMB200A | 1.0SMB200CA | 171.0 | 190.0 | 210.0 | 1 | 274.0 | 3.75 | 1 |
| 1.0SMB220A | 1.0SMB220CA | 185.0 | 209.0 | 231.0 | 1 | 328.0 | 3.25 | 1 |
| 1.0SMB2 50A | 1.0SMB250CA | 214.0 | 237.0 | 263.0 | 1 | 344.0 | 3.00 | 1 |
| 1.0SMB300A | 1.0SMB300CA | 256.0 | 285.0 | 315.0 | 1 | 414.0 | 2.50 | 1 |
| 1.0SMB350A | 1.0SMB350CA | 300.0 | 332.0 | 368.0 | 1 | 482.0 | 2.25 | 1 |
| 1.0SMB400A | 1.0SMB400CA | 342.0 | 380.0 | 420.0 | 1 | 548.0 | 2.00 | 1 |
| 1.0SMB440A | 1.0SMB440CA | 376.0 | 418.0 | 462.0 | 1 | 602.0 | 1.75 | 1 |
| 1.0SMB480A | 1.0SMB480CA | 408.0 | 456.0 | 504.0 | 1 | 658.0 | 1.50 | 1 |
| 1.0SMB510A | 1.0SMB510CA | 434.0 | 485.0 | 535.0 | 1 | 698.0 | 1.50 | 1 |
| 1.0SMB530A | 1.0SMB530CA | 450.0 | 503.0 | 556.0 | 1 | 725.0 | 1.50 | 1 |

## Typical Characteristics

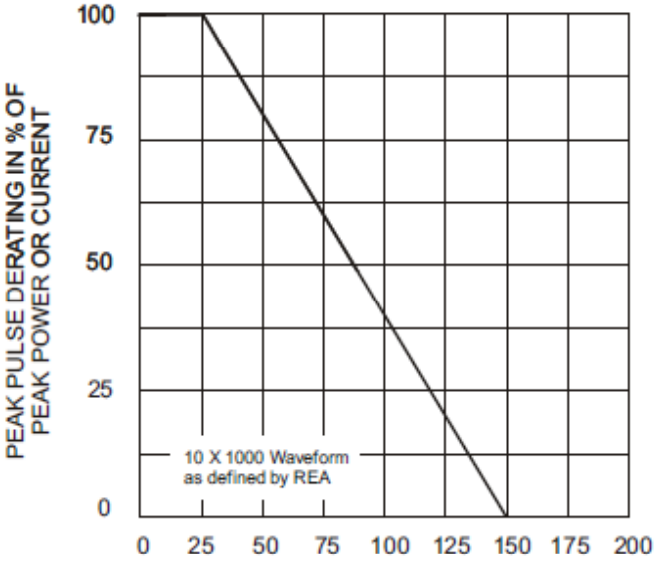



Fig. 1 - Pulse Derating Curve

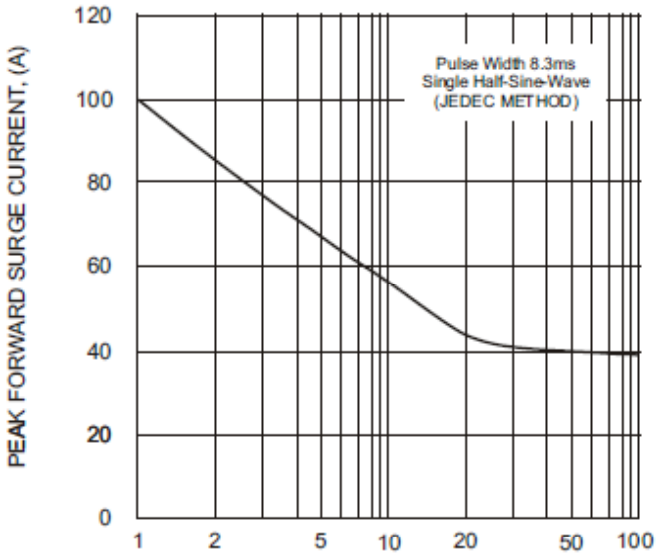



Fig. 2 - Maximum Non-Repetitive Surge Current

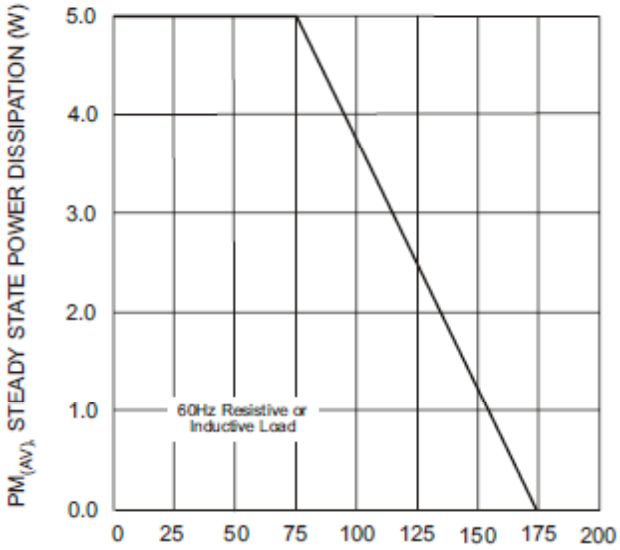



Fig. 3 - Steady State Power Derating Curve

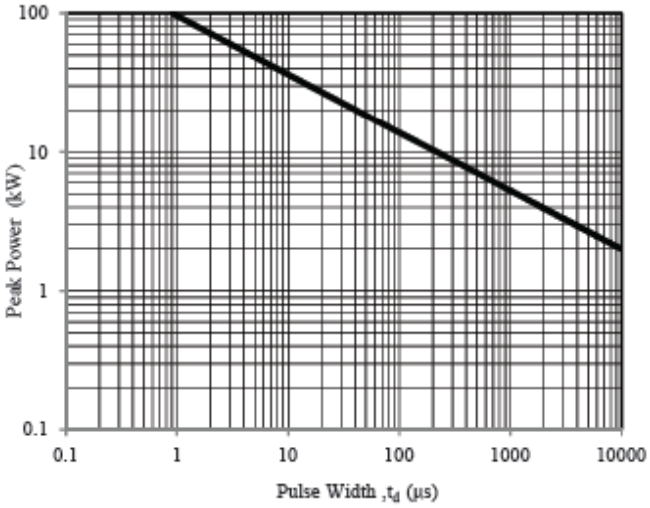



Fig. 4 - Peak Pulse Power Rating Curve

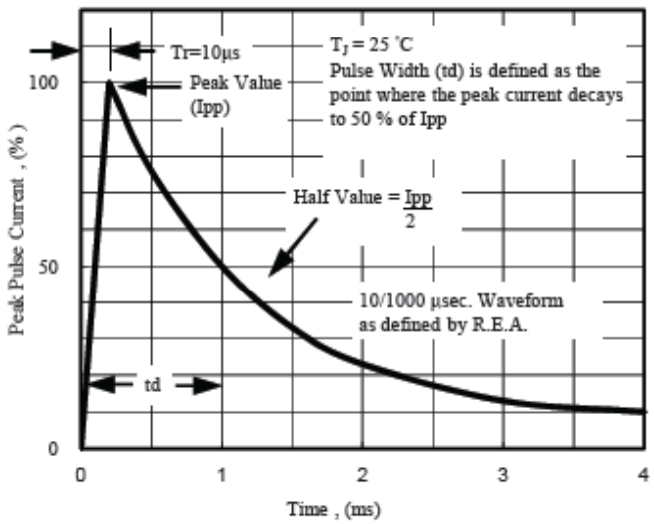



Fig. 5 - Pulse Waveform

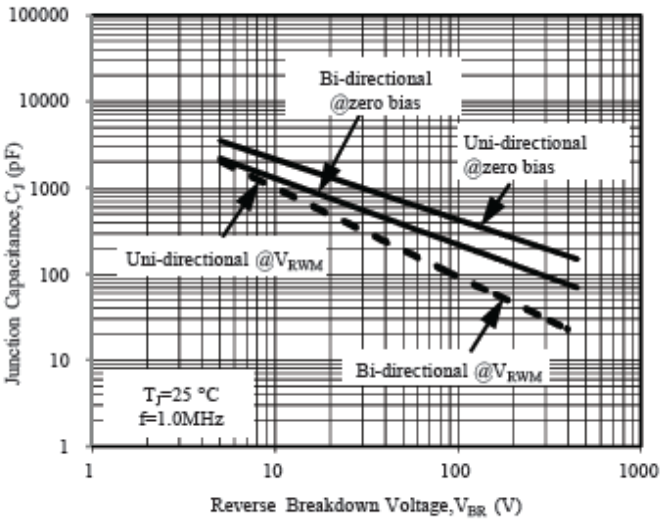
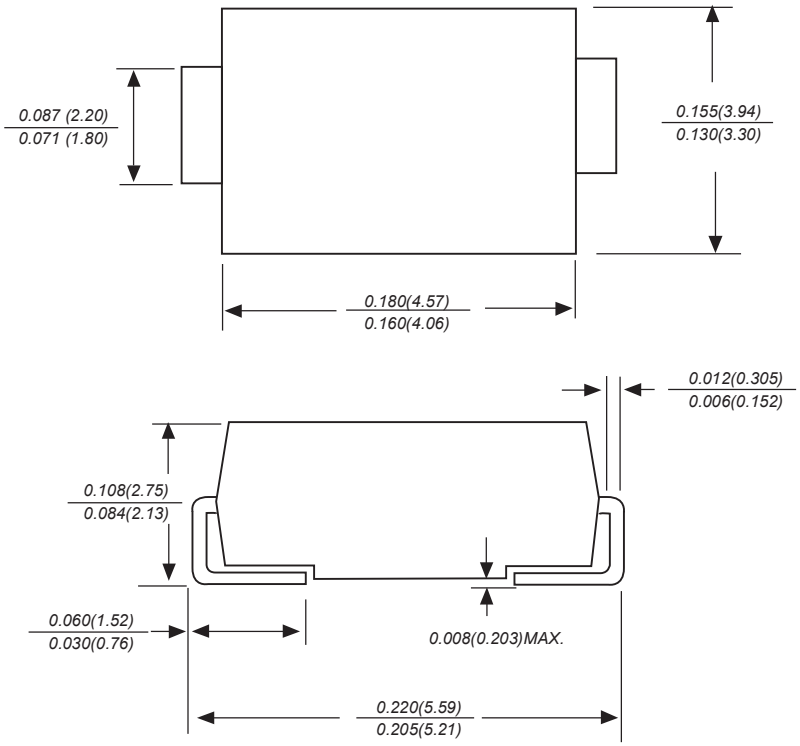


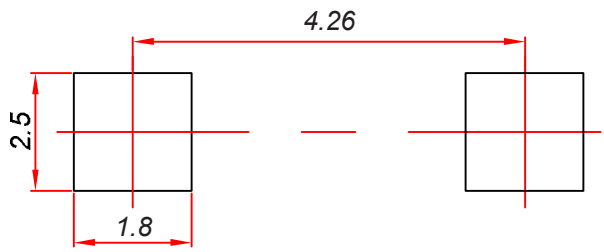

Fig. 6 - Typical Junction Capacitance

## SMBG Package Outline Dimensions




*Dimensions in inches and (millimeters)*

## SMBG Suggested Pad Layout




**Note:**
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

NOTICE

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## Reel Taping Specifications For Surface Mount Devices- SMBG

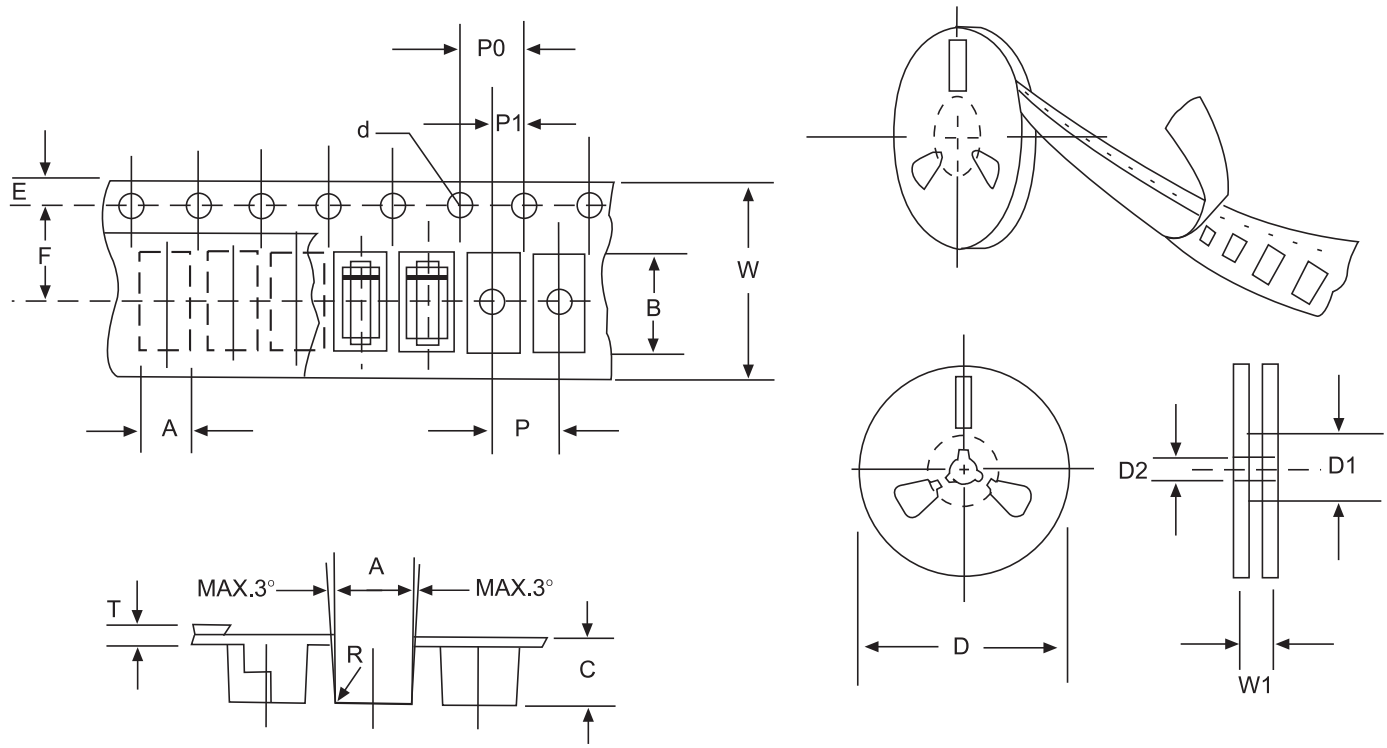



**FIG:CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

| ITEM | SYMBOL | SMBG mm(inch) |
|---|---|---|
| Carrier width | A | 4.09±0.1(0.161±0.004) |
| Carrier length | B | 5.82±0.1(0.229±0.004) |
| Carrier depth | C | 2.50±0.1(0.100±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) |
| Stroket hole position | E | 1.75±0.1(0.069±0.004) |
| Punch hole position | F | 5.65±0.05(0.222±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) |
| Totall tape thickness | T | 0.32±0.1(0.013±0.004) |
| Tape width | W | 12.0±0.2(0.472±0.008) |
| Reel width | W1 | 16.8±2.0(0.661±0.079) |

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