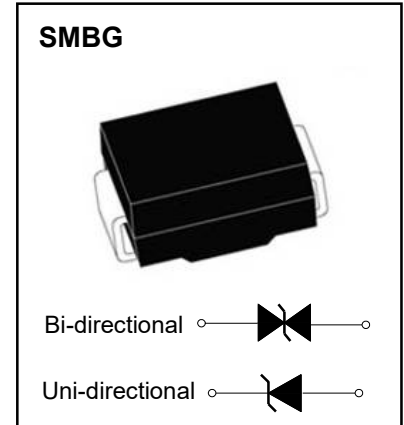




## SMBG Plastic-Encapsulate Diodes

### **P6SMB SERIES** Transient Voltage Suppressor Diodes

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{RWM}$	5.8-214	V
$I_R$	200-1	$\mu A$
$I_{PP}$	57.14-1.83	A
$V_C$	10.5-328	V
$P_{PPM}$	600	W



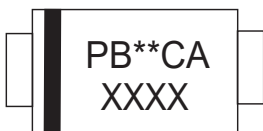
### Features

- For surface mounted applications in order to optimize board space
- Glass passivated chip junction
- Excellent clamping capability
- Low reverse leakage
- Very fast response time
- 600W peak pulse power capability with a 10/1000 us waveform by 0.01% duty cycle
- RoHS Compliant
- ESD protection of data lines in accordance with IEC 61000-4-2,
- 30kV(Air), 30kV (Contact)

### Mechanical Data

- Case: SMB(DO-214)
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Polarity: Color band denotes cathode end

### Marking



Cathode Band: for uni-directional products only

PB\*\*CA = Device code, \*\*=Voltage

C: Bi-directional or not

XXXX=Data Code

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

### Limiting Values (Absolute Maximum Rating)

Item	Symbol	Unit	Conditions	Max
Peak pulse power dissipation	$P_{PPM}$	W	with a 10/1000us waveform	600
Peak pulse current(note 1)	$I_{PPM}$	A	with a 10/1000us waveform	See Next Table
Power dissipation	$P_D$	W	On infinite heat sink at $T_L=50^{\circ}\text{C}$	5.0
Peak forward surge current	$I_{FSM}$	A	8.3 ms single half sine-wave uni-directional only (note 2)	100
Operating junction and storage temperature range	$T_J, T_{STG}$	$^{\circ}\text{C}$		-55 to +150

### Electrical Characteristics( $T_a=25^{\circ}\text{C}$ Unless otherwise specified)

Item	Symbol	Unit	Conditions	Max
Maximum instantaneous forward Voltage	$V_F$	V	at 35A for uni-directional only	3.5
Thermal resistance	$R_{\theta JL}$	$^{\circ}\text{C}/\text{W}$	junction to lead $T_L=50^{\circ}\text{C}$	20
	$R_{\theta JLA}$	$^{\circ}\text{C}/\text{W}$	junction to ambient $T_A=25^{\circ}\text{C}$	100

#### Notes:

(1) Non-repetitive current pulse at  $T_A=25^{\circ}\text{C}$ , per waveform of Figure 2.

(2) 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minutes maximum

(3) Thermal resistance from junction to ambient and from junction to lead mounted on 1" x 1"(25.4mm x 25.4mm)FR4 PCB, double sided copper, with minimum pad layout

## Typical Characteristics

Part Number		Device Marking Code		Breakdown Voltage VBR@IT		Test Current	Max Reverse Leakage @V <sub>RWM</sub>	Reverse Standoff Voltage	Max Peak Pulse Current <sup>(1)</sup>	Max Clamping Voltage @I <sub>PP</sub>
UNI	BI	UNI	BI	Min.(V)	Max.(V)	IT(mA)	I <sub>R</sub> (uA)	V <sub>RWM</sub> (V)	I <sub>PP</sub> (A)	V <sub>C</sub> (V)
P6SMB6.8A	P6SMB6.8CA	PB6.8A XXXX	PB6.8CA XXXX	6.45	7.14	10	200	5.8	57.14	10.5
P6SMB7.5A	P6SMB7.5CA	PB7.5A XXXX	PB7.5CA XXXX	7.13	7.88	10	100	6.4	53.1	11.3
P6SMB8.2A	P6SMB8.2CA	PB8.2A XXXX	PB8.2CA XXXX	7.79	8.61	10	50	7.0	49.59	12.1
P6SMB9.1A	P6SMB9.1CA	PB9.1A XXXX	PB9.1CA XXXX	8.65	9.55	1	20	7.8	44.78	13.4
P6SMB10A	P6SMB10CA	PB10A XXXX	PB10CA XXXX	9.50	10.5	1	10	8.6	41.38	14.5
P6SMB11A	P6SMB11CA	PB11A XXXX	PB11CA XXXX	10.50	11.60	1	5	9.4	38.46	15.6
P6SMB12A	P6SMB12CA	PB12A XXXX	PB12CA XXXX	11.40	12.60	1	1	10.2	35.93	16.7
P6SMB13A	P6SMB13CA	PB13A XXXX	PB13CA XXXX	12.40	13.70	1	1	11.1	32.97	18.2
P6SMB15A	P6SMB15CA	PB15A XXXX	PB15CA XXXX	14.30	15.80	1	1	12.8	28.3	21.2
P6SMB16A	P6SMB16CA	PB16A XXXX	PB16CA XXXX	15.20	16.80	1	1	13.6	26.67	22.5
P6SMB18A	P6SMB18CA	PB18A XXXX	PB18CA XXXX	17.10	18.90	1	1	15.3	23.81	25.2
P6SMB20A	P6SMB20CA	PB20A XXXX	PB20CA XXXX	19.00	21.00	1	1	17.1	21.66	27.7
P6SMB22A	P6SMB22CA	PB22A XXXX	PB22CA XXXX	20.90	23.10	1	1	18.8	19.61	30.6
P6SMB24A	P6SMB24CA	PB24A XXXX	PB24CA XXXX	22.80	25.20	1	1	20.5	18.07	33.2
P6SMB27A	P6SMB27CA	PB27A XXXX	PB27CA XXXX	25.70	28.40	1	1	23.1	16	37.5
P6SMB30A	P6SMB30CA	PB30A XXXX	PB30CA XXXX	28.50	31.50	1	1	25.6	14.6	41.1
P6SMB33A	P6SMB33CA	PB33A XXXX	PB33CA XXXX	31.40	34.70	1	1	28.2	13.13	45.7
P6SMB36A	P6SMB36CA	PB36A XXXX	PB36CA XXXX	34.20	37.80	1	1	30.8	12.02	49.9
P6SMB39A	P6SMB39CA	PB39A XXXX	PB39CA XXXX	37.10	41.00	1	1	33.3	11.13	53.9
P6SMB43A	P6SMB43CA	PB43A XXXX	PB43CA XXXX	40.90	45.20	1	1	36.8	10.12	59.3

## Typical Characteristics

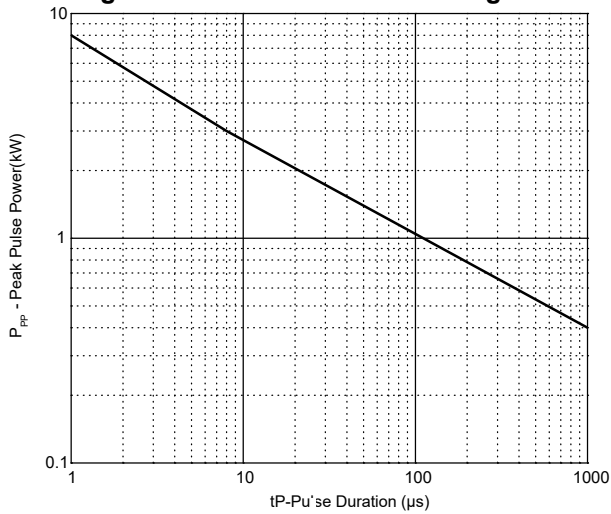
Part Number		Device Marking Code		Breakdown Voltage VBR@IT		Test Current	Max Reverse Leakage @V <sub>RWM</sub>	Reverse Standoff Voltage	Max Peak Pulse Current <sup>(1)</sup>	Max Clamping Voltage @I <sub>PP</sub>
UNI	BI	UNI	BI	Min.(V)	Max.(V)	IT(mA)	I <sub>R</sub> (uA)	V <sub>RWM</sub> (V)	I <sub>PP</sub> (A)	V <sub>C</sub> (V)
P6SMB47A	P6SMB47CA	PB47A XXXX	PB47CA XXXX	44.70	49.40	1	1	40.2	9.26	64.8
P6SMB51A	P6SMB51CA	PB51A XXXX	PB51CA XXXX	48.50	53.60	1	1	43.6	8.56	70.1
P6SMB56A	P6SMB56CA	PB56A XXXX	PB56CA XXXX	53.20	58.80	1	1	47.8	7.79	77
P6SMB62A	P6SMB62CA	PB62A XXXX	PB62CA XXXX	58.90	65.10	1	1	53.0	7.06	85
P6SMB68A	P6SMB68CA	PB68A XXXX	PB68CA XXXX	64.40	71.40	1	1	58.1	6.52	92
P6SMB75A	P6SMB75CA	PB75A XXXX	PB75CA XXXX	71.30	78.80	1	1	64.1	5.83	103
P6SMB82A	P6SMB82CA	PB82A XXXX	PB82CA XXXX	77.90	86.10	1	1	70.1	5.31	113
P6SMB91A	P6SMB91CA	PB91A XXXX	PB91CA XXXX	86.50	95.50	1	1	77.8	4.8	125
P6SMB100A	P6SMB100CA	PB100A XXXX	PB100CA XXXX	95.00	105.00	1	1	85.5	4.38	137
P6SMB110A	P6SMB110CA	PB110A XXXX	PB110CA XXXX	105.00	116.00	1	1	94.0	3.95	152
P6SMB120A	P6SMB120CA	PB120A XXXX	PB120CA XXXX	114.00	126.00	1	1	102.0	3.64	165
P6SMB130A	P6SMB130CA	PB130A XXXX	PB130CA XXXX	124.00	137.00	1	1	111.0	3.35	179
P6SMB150A	P6SMB150CA	PB150A XXXX	PB150CA XXXX	143.00	158.00	1	1	128.0	2.9	207
P6SMB160A	P6SMB160CA	PB160A XXXX	PB160CA XXXX	152.00	168.00	1	1	136.0	2.74	219
P6SMB170A	P6SMB170CA	PB170A XXXX	PB170CA XXXX	162.00	179.00	1	1	145.0	2.56	234
P6SMB180A	P6SMB180CA	PB180A XXXX	PB180CA XXXX	171.00	189.00	1	1	154.0	2.44	246
P6SMB200A	P6SMB200CA	PB200A XXXX	PB200CA XXXX	190.00	210.00	1	1	171.0	2.19	274
P6SMB220A	P6SMB220CA	PB220A XXXX	PB220CA XXXX	209.00	231.00	1	1	185.0	1.83	328
P6SMB250A	P6SMB250CA	PB250A XXXX	PB250CA XXXX	237.00	263.00	1	1	214.0	1.83	328

### Notes:

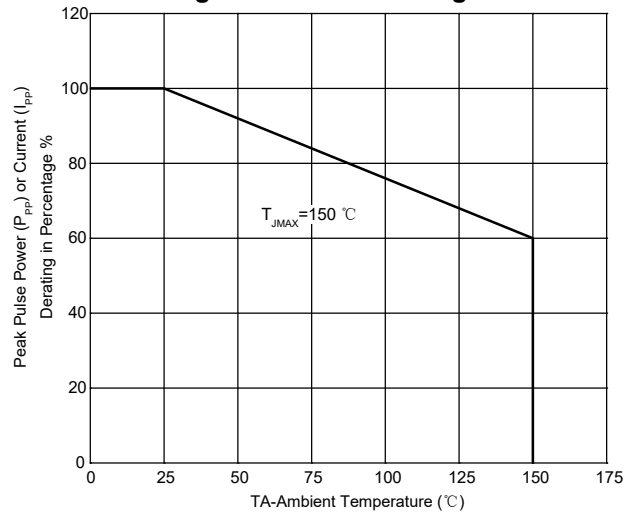
(1) Waveform of P6SMB6.8A -P6SMB250CA are defined as per fig.3

# Typical Characteristics

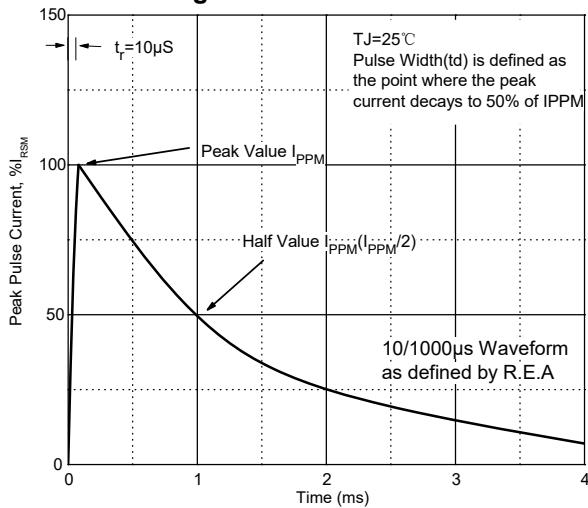
**Figure 1. Peak Pulse Power Rating Curve**



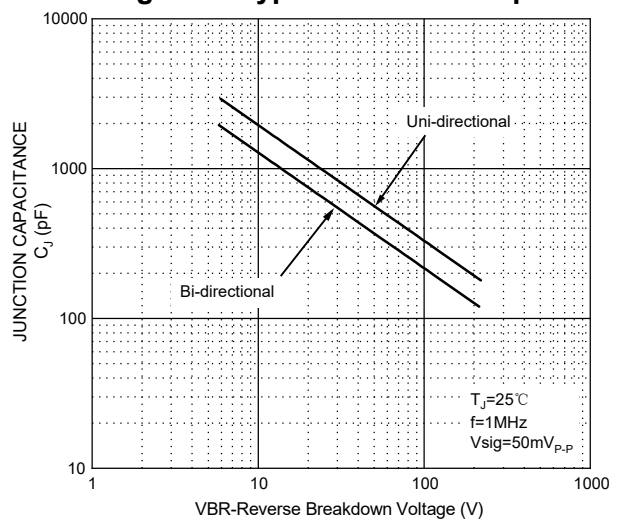
**Figure 2. Pulse Derating Curve**



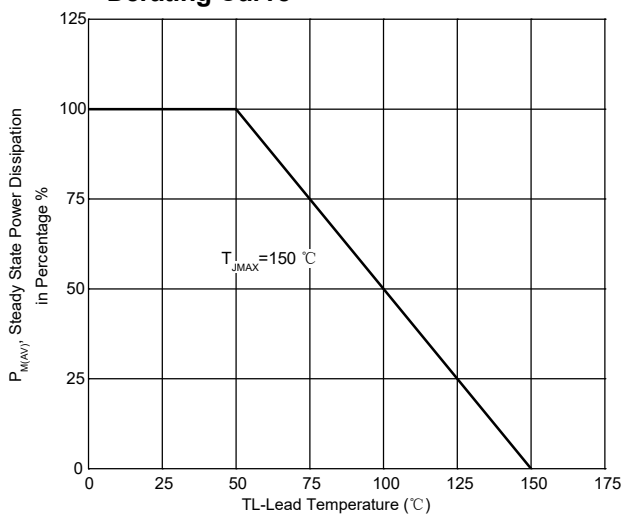
**Figure 3. Pulse Waveform**



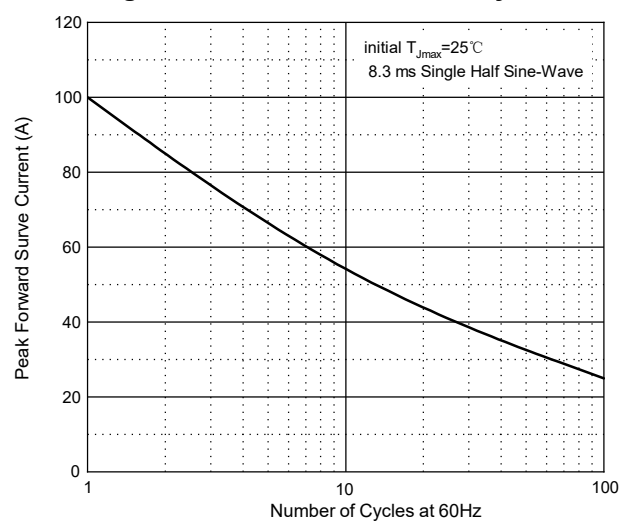
**Figure 4. Typical Junction Capacitance**



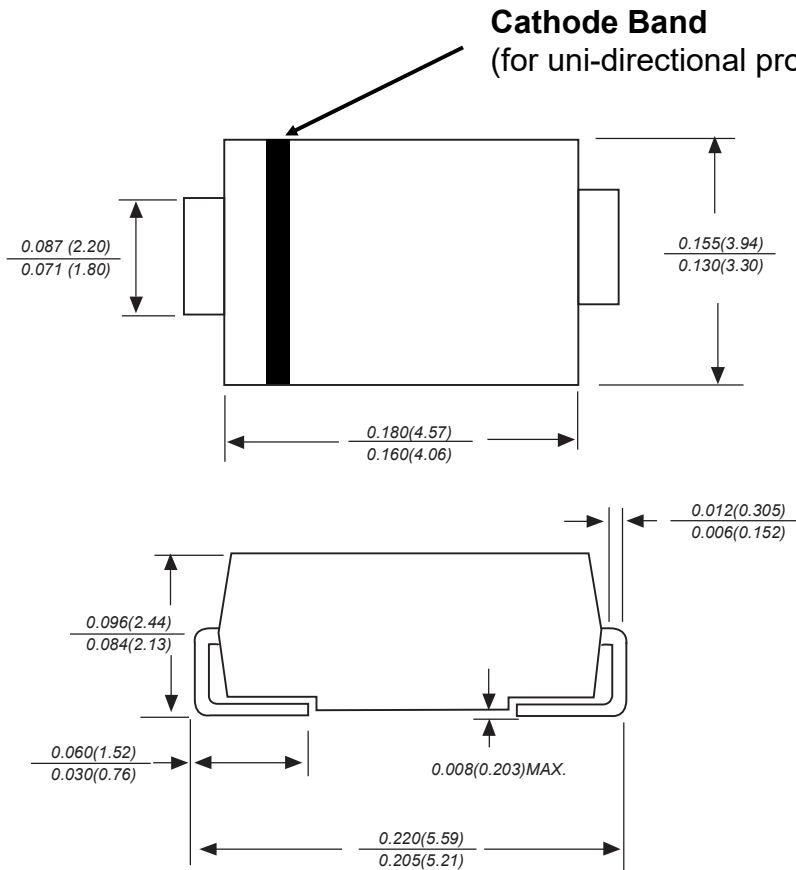
**Figure 5. Steady State Power Dissipation Derating Curve**



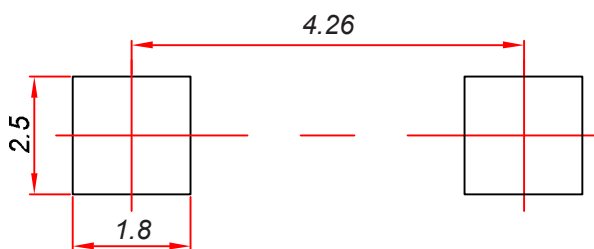
**Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



## SMBG Package Outline Dimensions



## SMBG Suggested Pad Layout



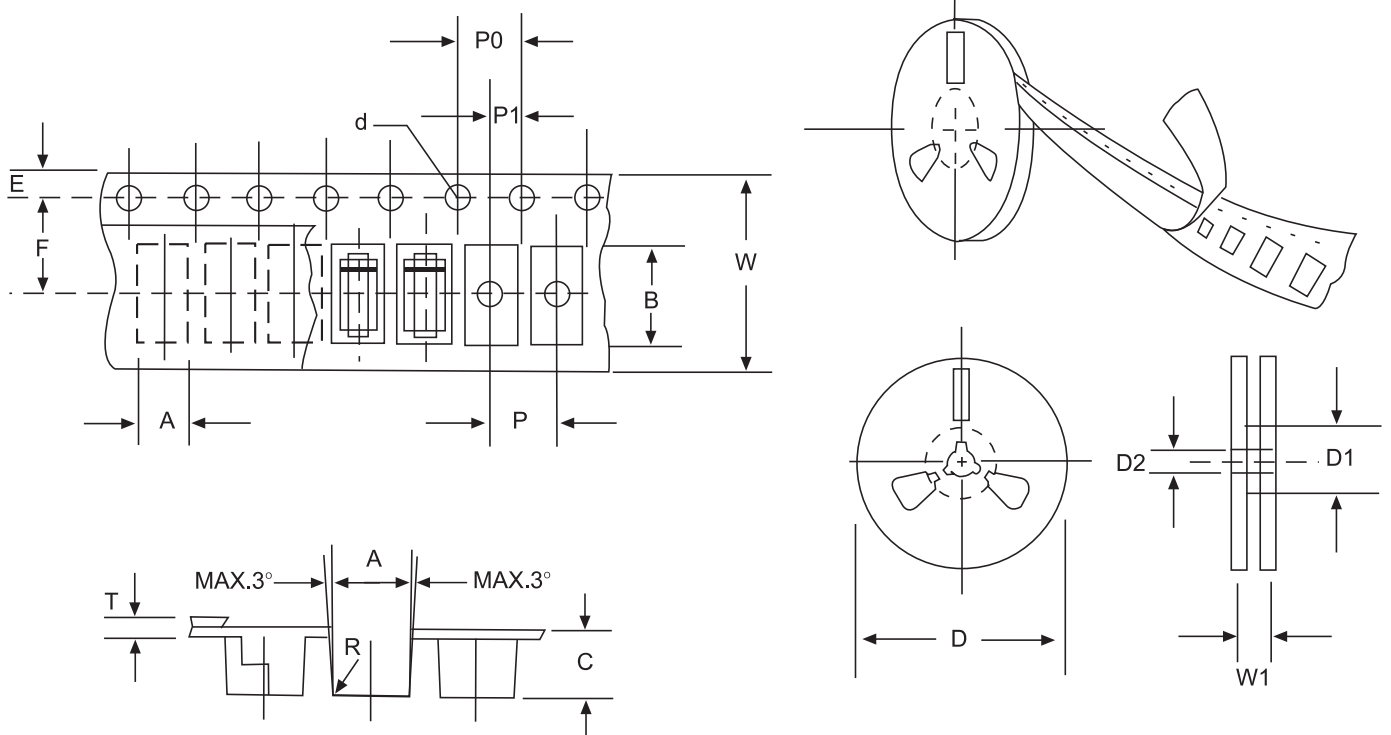
**Note:**

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- 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	5.83±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 inside diameter	D1	75±1.0 (2.95±0.039)
Feed hole position	D2	13±0.5 (0.512±0.020)
Sprocket 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 (0.157±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	0.32±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.