

## Description

The P6SMB series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



DO-214AA(SMB)

## Features

- For surface mounted applications
- Reliable low cost construction utilizing molded plastic technique
- Plastic package has UL flammability classification 94V-0
- Typical IR less than 1uA above 13V
- Glass passivated chip junction in DO-15 Package
- 600W peak pulse capability at 10\*1000us waveform, repetition rate (duty cycles):0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- AEC -Q101 qualified.

## Maximum Ratings and Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at TA=25°C by 10x1000µs waveform (Fig.1)(Note 1)	P <sub>PPM</sub>	600	W
Power Dissipation on infinite heat sink at TA=75°C	P <sub>D</sub>	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only(Note 2)	I <sub>FSM</sub>	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional only (Note 3)	V <sub>F</sub>	3.5V/5.0	V
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>uJL</sub>	20	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>uJA</sub>	75	°C/W

### Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above TA=25°C per Fig. 2.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
3. V<sub>F</sub> < 3.5V for devices of V<sub>BR</sub> ≤ 200V and V<sub>F</sub> < 5.0V for devices of V<sub>BR</sub> ≥ 201V.

## Applications

Tvs devices are ideal for the protection of I/O interfaces, Vcc bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

**Rating And Characteristic Curves (TA=25°C unless otherwise noted)**

Figure 1 – Peak Pulse Power Rating

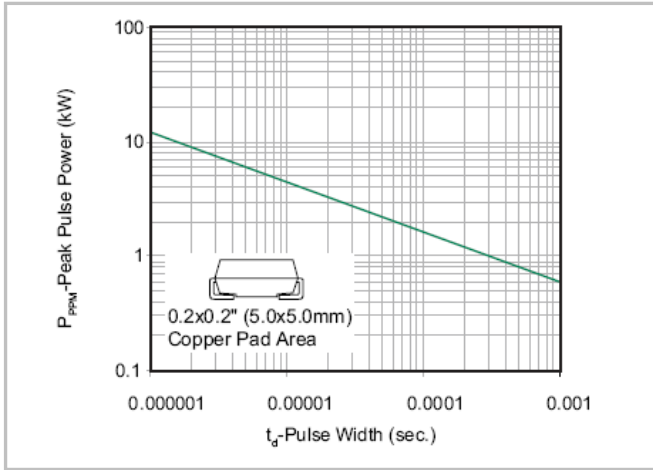


Figure 2 – Pulse Derating Curve

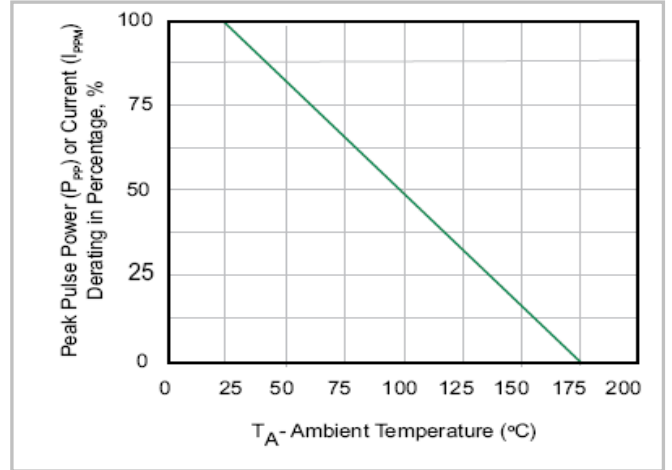


Figure 3 – Pulse Waveform

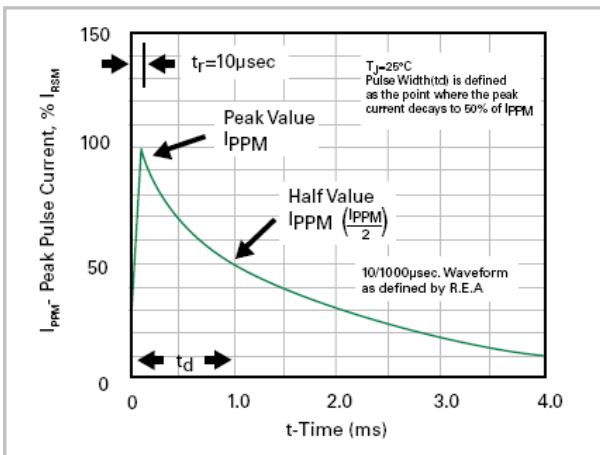


Figure 4 – Typical Junction Capacitance Uni- Directional

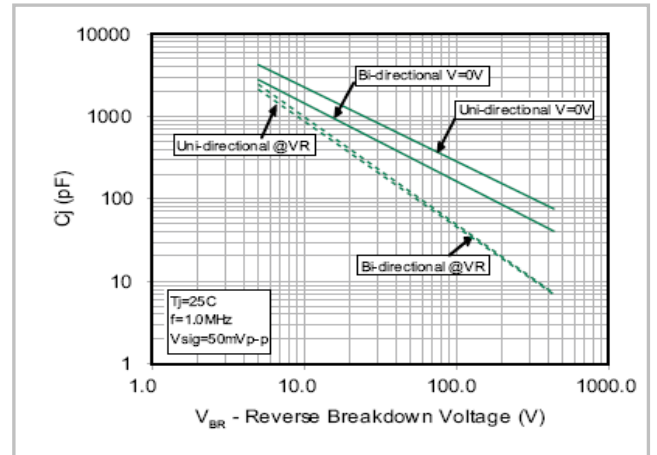


Figure 5 – Steady State Power Derating Curve

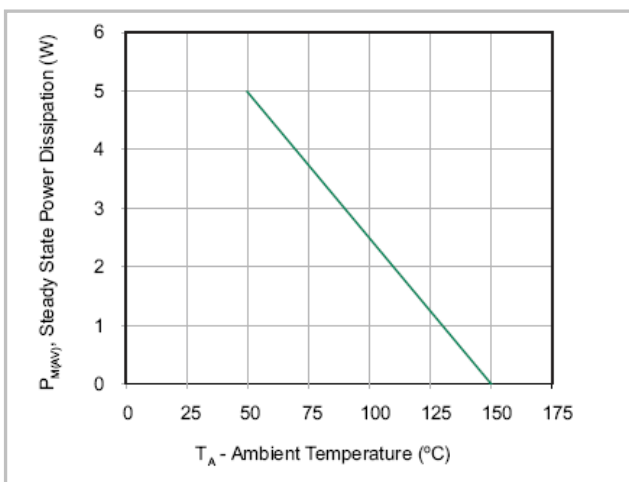
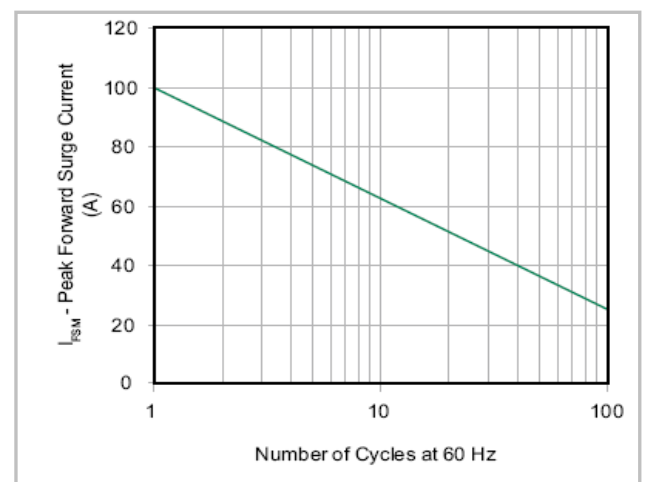


Figure 6 – Maximum Non-Repetitive Forward Surge Current





## Electrical Characteristics

P6KE PART NUMBER		REVERSE STANDOFF VOLTAGE VRWM(V)	BREAKDOWN VOLTAGE VBR(V) MIN. @IT	BREAKDOWN VOLTAGE VBR(V) MAX. @IT	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @Ipp Vc(V)	PEAK PULSE CURRENT Ipp (A)	REVERSE LEAKAGE @VRWM IR(μA)
UNI-POLAR	BI-POLAR							
P6SMB6.8A	P6SMB6.8CA	5.8	6.45	7.14	10	10.5	58.1	1000
P6SMB7.5A	P6SMB7.5CA	6.4	7.13	7.88	10	11.3	54	500
P6SMB8.2A	P6SMB8.2CA	7.02	7.79	8.61	10	12.1	50.4	200
P6SMB9.1A	P6SMB9.1CA	7.78	8.65	9.55	1	13.4	45.5	50
P6SMB10A	P6SMB10CA	8.55	9.5	10.5	1	14.5	42.1	10
P6SMB11A	P6SMB11CA	9.4	10.5	11.6	1	15.6	39.1	5
P6SMB12A	P6SMB12CA	10.2	11.4	12.6	1	16.7	36.5	5
P6SMB13A	P6SMB13CA	11.1	12.4	13.7	1	18.2	33.5	5
P6SMB15A	P6SMB15CA	12.8	14.3	15.8	1	21.2	28.8	5
P6SMB16A	P6SMB16CA	13.6	15.2	16.8	1	22.5	27.1	5
P6SMB18A	P6SMB18CA	15.3	17.1	18.9	1	25.5	24.2	5
P6SMB20A	P6SMB20CA	17.1	19	21	1	27.7	22	5
P6SMB22A	P6SMB22CA	18.8	20.9	23.1	1	30.6	19.9	5
P6SMB24A	P6SMB24CA	20.5	22.8	25.2	1	33.2	18.4	5
P6SMB27A	P6SMB27CA	23.1	25.7	28.4	1	37.5	16.3	5
P6SMB30A	P6SMB30CA	25.6	28.5	31.5	1	41.4	14.7	5
P6SMB33A	P6SMB33CA	28.2	31.4	34.7	1	45.7	13.3	5
P6SMB36A	P6SMB36CA	30.8	34.2	37.8	1	49.9	12.2	5
P6SMB39A	P6SMB39CA	33.3	37.1	41	1	53.9	11.3	5
P6SMB43A	P6SMB43CA	36.8	40.9	45.2	1	59.3	10.3	5
P6SMB47A	P6SMB47CA	40.2	44.7	49.4	1	64.8	9.4	5
P6SMB51A	P6SMB51CA	43.6	48.5	53.6	1	70.1	8.7	5
P6SMB56A	P6SMB56CA	47.8	53.2	58.8	1	77	7.9	5
P6SMB62A	P6SMB62CA	53	58.9	65.1	1	85	7.2	5
P6SMB68A	P6SMB68CA	58.1	64.6	71.4	1	92	6.6	5
P6SMB75A	P6SMB75CA	64.1	71.3	78.8	1	103	5.9	5
P6SMB82A	P6SMB82CA	70.1	77.9	86.1	1	113	5.4	5

### Electrical Characteristics

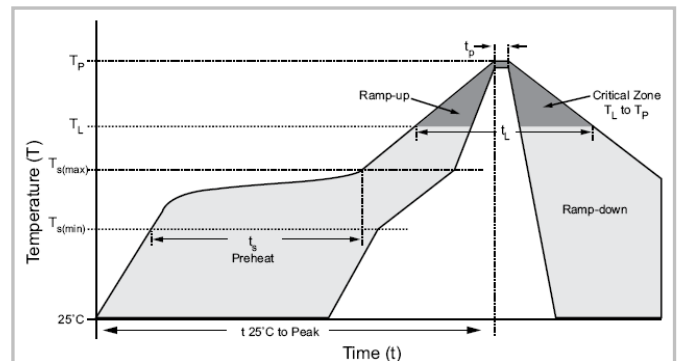
P6KE PART NUMBER		REVERSE STAND-OFF VOLTAGE $V_{RWM}(V)$	BREAKDOWN VOLTAGE $V_{BR}(V)$ MIN. @IT	BREAKDOWN VOLTAGE $V_{BR}(V)$ MAX. @IT	TEST CURRENT $I_T$ (mA)	MAXIMUM CLAMPING VOLTAGE @ $I_{pp}$ $V_c(V)$	PEAK PULSE CURRENT $I_{pp}$ (A)	REVERSE LEAKAGE @ $V_{RWM}$ $I_R(\mu A)$
UNI-POLAR	BI-POLAR							
P6SMB91A	P6SMB91CA	77.8	86.5	95.5	1	125	4.9	5
P6SMB100A	P6SMB100CA	85.5	95	105	1	137	4.5	5
P6SMB110A	P6SMB110CA	94	105	116	1	152	4	5
P6SMB120A	P6SMB120CA	102	114	126	1	165	3.7	5
P6SMB130A	P6SMB130CA	111	124	137	1	179	3.4	5
P6SMB150A	P6SMB150CA	128	143	158	1	207	2.9	5
P6SMB160A	P6SMB160CA	136	152	168	1	219	2.8	5
P6SMB170A	P6SMB170CA	145	162	179	1	234	2.6	5
P6SMB180A	P6SMB180CA	154	171	189	1	246	2.5	5
P6SMB200A	P6SMB200CA	171	190	210	1	274	2.2	5
P6SMB220A	P6SMB220CA	185	209	231	1	328	1.9	5
P6SMB250A	P6SMB250CA	214	237	263	1	344	1.8	5
P6SMB300A	P6SMB300CA	256	285	315	1	414	1.5	5
P6SMB350A	P6SMB350CA	300	332	368	1	482	1.3	5
P6SMB400A	P6SMB400CA	342	380	420	1	548	1.1	5
P6SMB440A	P6SMB440CA	376	418	462	1	602	1	5
P6SMB480A	P6SMB480CA	408	456	504	1	658	0.9	5
P6SMB510A	P6SMB510CA	434	485	535	1	698	0.9	5
P6SMB530A	P6SMB530CA	477	503.5	556.5	1	725	0.8	5
P6SMB540A	P6SMB540CA	459	513	567	1	740	0.8	5
P6SMB550A	P6SMB550CA	495	522.5	577.5	1	760	0.8	5

**For bidirectional type having  $V_{RWM}$  of 10 volts and less, the  $I_R$  limit is double.**

**For parts without A ( $V_{BR}$  is  $\pm 10\%$  and  $V_C$  is 5% higher than with A parts).**

## Soldering Parameters

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 liquidus Temp ( $T_L$ ) to peak		3°C/second max
TS(max)to $T_L$ -ramp-up Rate		3°C/second max
Reflow	-Temperature ( $T_L$ )(Liquidus)	217°C
	-Time(min to max)( $t_s$ )	60-150 seconds
Peak Temperature( $T_P$ )		260 + 0/-5°C
Time within 5°C of actual peak Temperature( $t_p$ )		20-40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8minutes Max.
Do not exceed		280°C

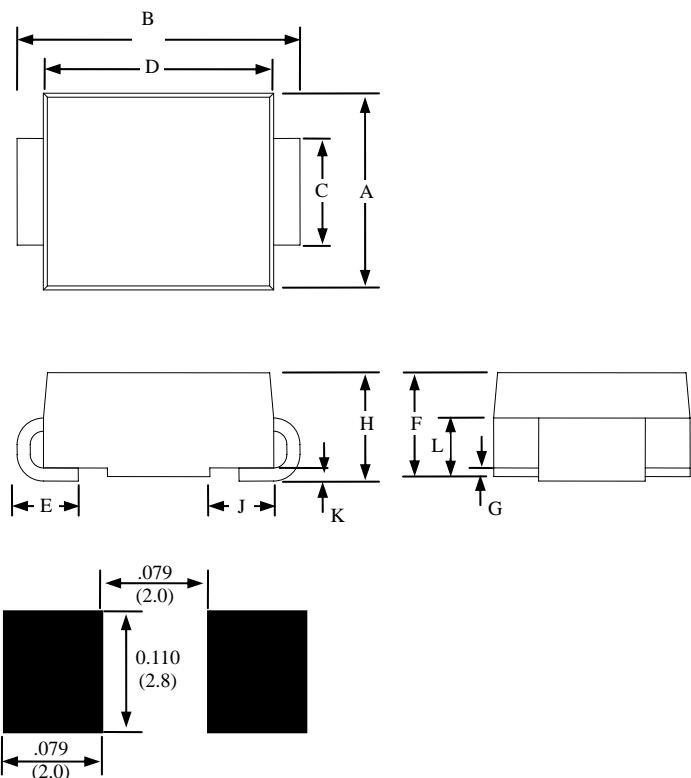


## Flow/Wave Soldering(Solder Dipping)

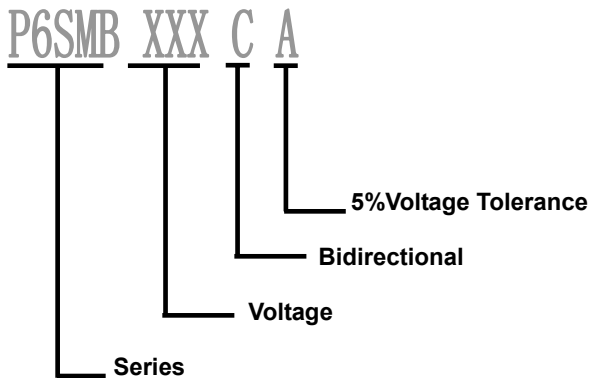
Peak Temperature:	260°C
Dipping Time:	10 seconds
Soldering:	1 time

## Dimensions

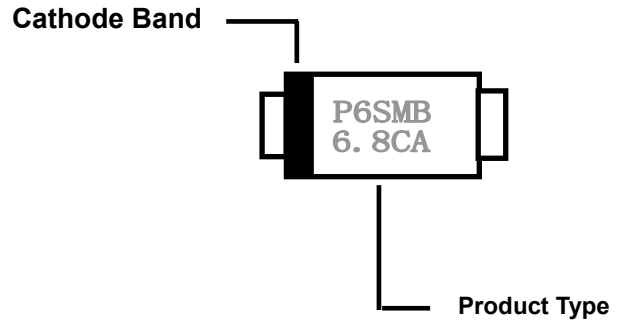
Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.134	0.155	3.40	3.94
B	0.205	0.22	5.21	5.59
C	0.075	0.083	1.90	2.11
D	0.166	0.185	4.22	4.70
E	0.036	0.056	0.91	1.42
F	0.073	0.087	1.85	2.2
G	0.002	0.008	0.05	0.20
H	0.077	0.094	1.95	2.40
J	0.043	0.053	1.09	1.35
K	0.008	0.014	0.20	0.35
L	0.039	0.049	0.99	1.24




## Part Numbering System



## Part Marking System



## Summary of Packing Options

Package Type	Description	Packing Quantity	Industry Standard
DO-214AA(SMB) 	Embossed Carrier Reel Pack	3000PCS	EIA-481-D

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