

**Surface Mount Transient Voltage Suppressors**
**Peak Pulse Power 600W Breakdown Voltage 6.8 to 550V**

# P6SMB6.8A thru P6SMB550CA

**Features**

- Low profile package with built-in strain relief for surface mounted applications
- Plastic package has UL flammability classification 94V-0
- Very-fast response time
- Excellent clamping capability
- Low incremental surge resistance
- Glass passivated junction
- High temperature soldering guaranteed: 250°C/10seconds at terminals
- 600W peak pulse power capability with a 10/1000 $\mu$ s waveform, repetition rate (duty cycle) : 0.01%

**Outline**

**Mechanical Data**

- Case : JEDEC DO-214AA(SMB) molded plastic body
- Terminals: Pure tin plated, solderable per MIL-STD-750 method 2026
- Polarity: For uni-directional types, the band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- Weight: 0.003 oz., 0.093 gram

**Devices for bidirectional applications**

For bi-directional devices, use suffix CA (e.g. P6SMB10CA). Electrical characteristics apply in both directions.

**Maximum Ratings and Characteristics**( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000 $\mu$ s waveform (Fig. 1)	PPPM	Minimum 600 (Note 1, 2)	W
Peak pulse current with a 10/1000 $\mu$ s waveform (Note 1)	IPPM	See next table	A
Power dissipation on infinite heatsink, $T_A=50^\circ\text{C}$	PM(AV)	5	W
Peak forward surge current, 8.3ms single half sine wave uni-directional only (Note 2)	IFSM	100	A
Typical thermal resistance, junction-to-leads	R $\theta$ JL	20	$^\circ\text{C}/\text{W}$
Typical thermal resistance, junction-to-ambient (Note 3)	R $\theta$ JA	100	$^\circ\text{C}/\text{W}$
Operating junction and storage temperature range	T $_j$ ;T $_{STG}$	-55 ~ +150	$^\circ\text{C}$

 Notes: 1.Non-repetitive current pulse, per Fig. 3 and derated above  $T_A=25^\circ\text{C}$  per Fig. 2

2.Mounted on 0.2"×0.2" (5mm×5mm) copper pads to each terminal

3.Mounted on minimum recommended pad layout



**Electrical Characteristics** Ratings at 25°C ambient temperature, unless otherwise noted.  $V_F=3.5V$  at  $I_F=50A$ (uni-directional only)

Device	Device Marking Code		Breakdown Voltage $V_{(BR)}$ (V) <sup>1</sup>		Test current at $I_T$ (mA)	Standoff voltage $V_{WM}$ (V)	Maximum reverse leakage at $V_{WM}$ $I_{D^3}$ ( $\mu A$ )	Maximum peak pulse Current $I_{PPM^2}$ (A)	Maximum clamping voltage at $I_{PPM}$ $V_C$ (V)	Maximum temperature coefficient of $V_{(BR)}$ ( $\%/^{\circ}C$ )
	UNI	BI	Min	Max						
P6SMB6.8A	6V8A	6V8C	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6SMB7.5A	7V5A	7V5C	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6SMB8.2A	8V2A	8V2C	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6SMB9.1A	9V1A	9V1C	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6SMB10A	10A	10C	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6SMB11A	11A	11C	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6SMB12A	12A	12C	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6SMB13A	13A	13C	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6SMB15A	15A	15C	14.3	15.8	1.0	12.8	1.0	28.3	21.2	0.084
P6SMB16A	16A	16C	15.2	16.8	1.0	13.6	1.0	26.7	22.5	0.086
P6SMB18A	18A	18C	17.1	18.9	1.0	15.3	1.0	23.8	25.2	0.088
P6SMB20A	20A	20C	19.0	21.0	1.0	17.1	1.0	21.7	27.7	0.090
P6SMB22A	22A	22C	20.9	23.1	1.0	18.8	1.0	19.6	30.6	0.092
P6SMB24A	24A	24C	22.8	25.2	1.0	20.5	1.0	18.1	33.2	0.094
P6SMB27A	27A	27C	25.7	28.4	1.0	23.1	1.0	16.0	37.5	0.096
P6SMB30A	30A	30C	28.5	31.5	1.0	25.6	1.0	14.5	41.4	0.097
P6SMB33A	33A	33C	31.4	34.7	1.0	28.2	1.0	13.1	45.7	0.098
P6SMB36A	36A	36C	34.2	37.8	1.0	30.8	1.0	12.0	49.9	0.099
P6SMB39A	39A	39C	37.1	41.0	1.0	33.3	1.0	11.1	53.9	0.100
P6SMB43A	43A	43C	40.9	45.2	1.0	36.8	1.0	10.1	59.3	0.101
P6SMB47A	47A	47C	44.7	49.4	1.0	40.2	1.0	9.3	64.8	0.101
P6SMB51A	51A	51C	48.5	53.6	1.0	43.6	1.0	8.6	70.1	0.102
P6SMB56A	56A	56C	53.2	58.8	1.0	47.8	1.0	7.8	77.0	0.103
P6SMB62A	62A	62C	58.9	65.1	1.0	53.0	1.0	7.1	85.0	0.104
P6SMB68A	68A	68C	64.6	71.4	1.0	58.1	1.0	6.5	92.0	0.104
P6SMB75A	75A	75C	71.3	78.8	1.0	64.1	1.0	5.8	103	0.105
P6SMB82A	82A	82C	77.9	86.1	1.0	70.1	1.0	5.3	113	0.105
P6SMB91A	91A	91C	86.5	95.5	1.0	77.8	1.0	4.8	125	0.106
P6SMB100A	100A	100C	95.0	105	1.0	85.5	1.0	4.4	137	0.106
P6SMB110A	110A	110C	105	116	1.0	94.0	1.0	3.9	152	0.107
P6SMB120A	120A	120C	114	126	1.0	102	1.0	3.6	165	0.107
P6SMB130A	130A	130C	124	137	1.0	111	1.0	3.4	179	0.107
P6SMB150A	150A	150C	143	158	1.0	128	1.0	2.9	207	0.108
P6SMB160A	160A	160C	152	168	1.0	136	1.0	2.7	219	0.108
P6SMB170A	170A	170C	162	179	1.0	145	1.0	2.6	234	0.108
P6SMB180A	180A	180C	171	189	1.0	154	1.0	2.4	246	0.108
P6SMB200A	200A	200C	190	210	1.0	171	1.0	2.2	274	0.108

**Electrical Characteristics(Cont.)**

Device	Device Marking Code		Breakdown Voltage $V_{(BR)}$ (V) <sup>1</sup>		Test current at $I_T$ (mA)	Standoff voltage $V_{WM}$ (V)	Maximum reverse leakage at $V_{WM}$ $I_D^3$ ( $\mu$ A)	Maximum peak pulse Current $I_{PPM}^2$ (A)	Maximum clamping voltage at $I_{PPM}$ $V_C$ (V)	Maximum temperature coefficient of $V_{(BR)}$ (%/ $^{\circ}$ C)
	UNI	BI	Min	Max						
P6SMB220A	220A	220C	209	231	1.0	185	1.0	1.8	328	0.108
P6SMB250A	250A	250C	237	263	1.0	214	1.0	1.7	344	0.108
P6SMB300A	300A	300C	285	315	1.0	256	1.0	1.4	414	0.108
P6SMB350A	350A	350C	333	368	1.0	300	1.0	1.2	482	0.108
P6SMB400A	400A	400C	380	420	1.0	342	1.0	1.1	548	0.108
P6SMB440A	440A	440C	418	462	1.0	376	1.0	1.0	602	0.108
P6SMB480A	480A	480C	456	504	1.0	408	1.0	0.9	658	0.108
P6SMB510A	510A	510C	485	535	1.0	434	1.0	0.9	698	0.108
P6SMB530A	530A	530C	503.5	556.5	1.0	450	1.0	0.8	725	0.108
P6SMB540A	540A	540C	513	567	1.0	459	1.0	0.8	740	0.108
P6SMB550A	550A	550C	522.5	577.5	1.0	495	1.0	0.8	760	0.108

Note: 1.  $V_{(BR)}$  measured after  $I_T$  applied for 300 $\mu$ s,  $I_T$ =square wave pulse or equivalent

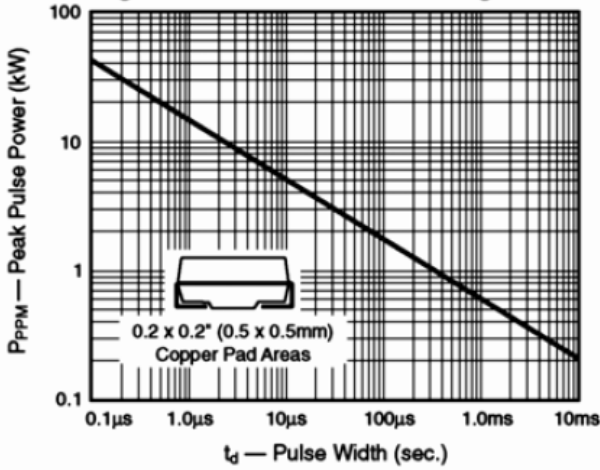
2. Surge current waveform per Fig. 3 and derate per Fig.2

3. For bidirectional types with  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled

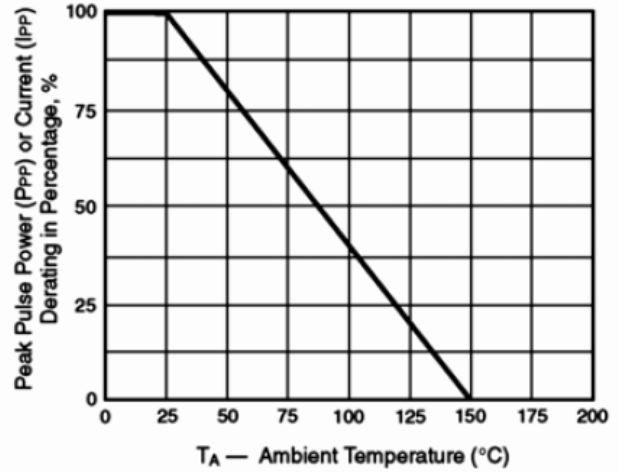
4. All terms and symbols are consistent with ANSI/IEEE C62.35

**Characteristic Curves**

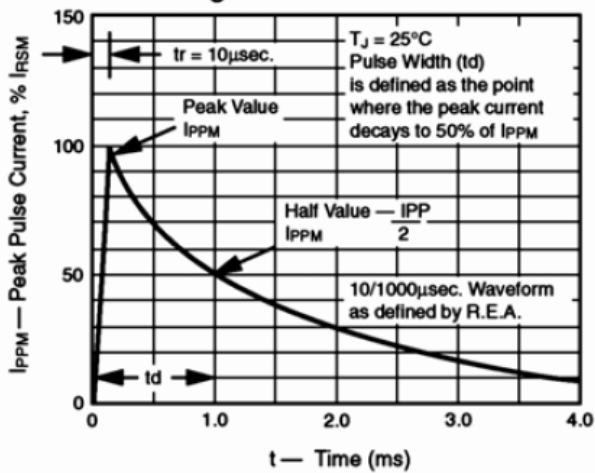
**Fig. 1 – Peak Pulse Power Rating Curve**



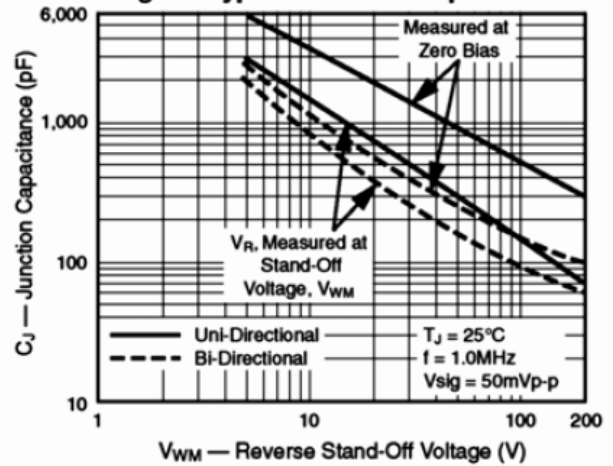
**Fig. 2 – Pulse Derating Curve**



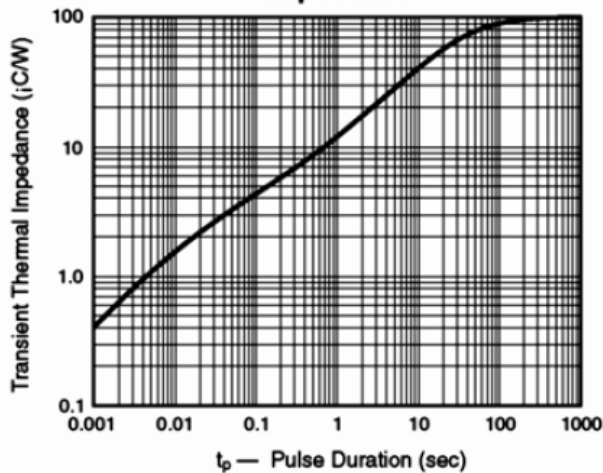
**Fig. 3 – Pulse Waveform**



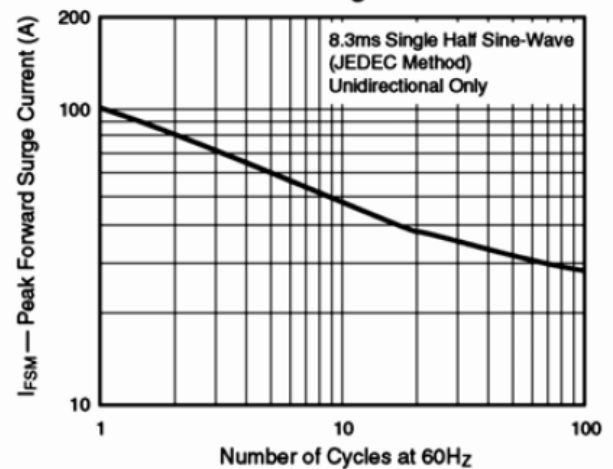
**Fig. 4 – Typical Junction Capacitance**



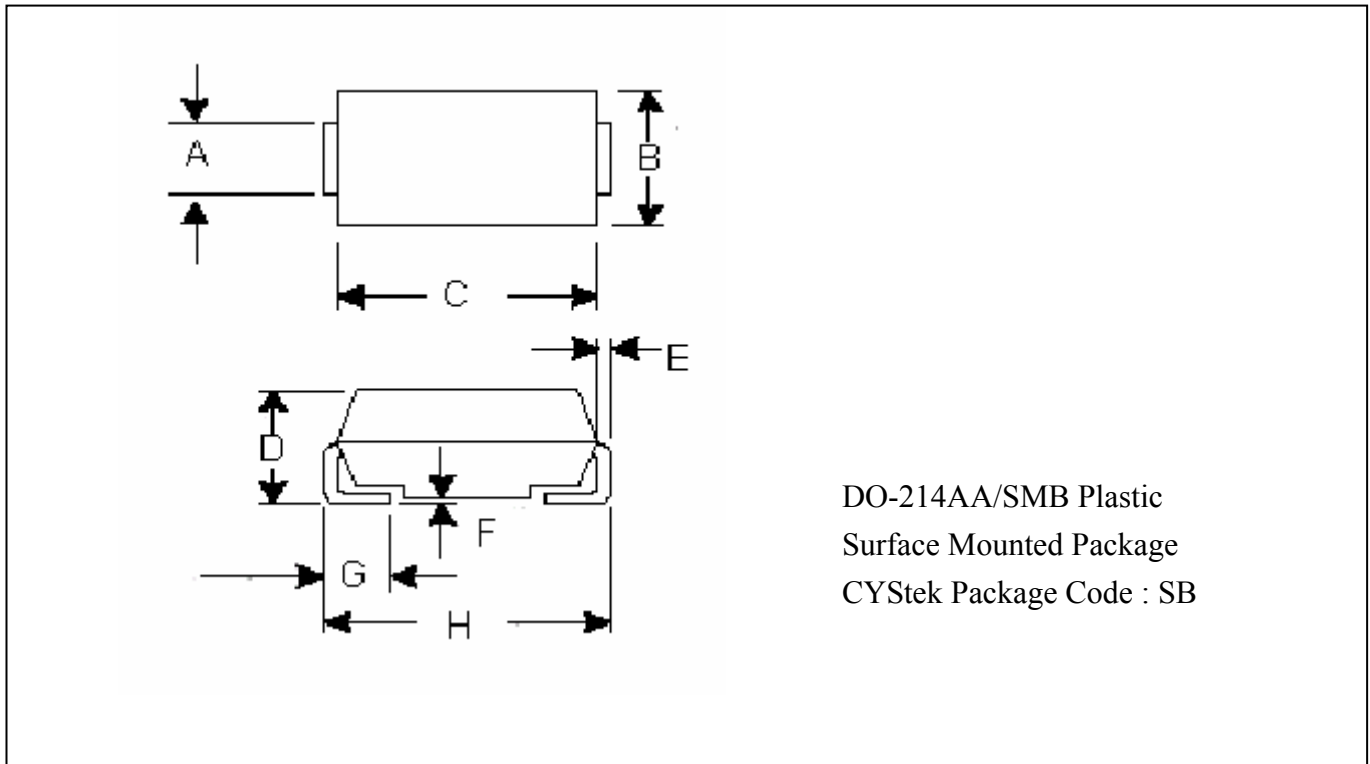
**Fig. 5 – Typical Transient Thermal Impedance**



**Fig. 6 – Maximum Non-Repetitive Peak Forward Surge Current**



**DO-214AA/SMB Dimension**



DO-214AA/SMB Plastic  
 Surface Mounted Package  
 CYStek Package Code : SB

\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.076	0.082	1.93	2.08	E	0.006	0.012	0.15	0.31
B	0.137	0.147	3.48	3.73	F	0.004	0.008	0.10	0.20
C	0.167	0.187	4.25	4.75	G	0.035	0.056	0.90	1.41
D	0.078	0.103	1.99	2.61	H	0.207	0.215	5.26	5.46

Notes : 1.Controlling dimension : millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material :**

- Lead : Pure tin plated
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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