

## 1. General description

P6SMBJ series, 600W transient voltage suppressor (TVS) in SMB package, designed to protect electronic circuits against damage induced by lightning surges or other transient voltage events.

## 2. Features and benefits

- Peak pulse power 600W @ 10/1000μs waveform
- Excellent clamping capability
- Low incremental surge resistance
- Surface mount package for easy assembly and PCB space-saving
- Typical  $I_R < 1\mu A$  when  $V_{BR\ min} > 12V$
- Fast response time: typically  $< 1.0ps$  from 0V to  $V_{BR}$  minimum
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Guaranteed high temperature for reflow soldering: 260°C/10sec
- Mold compound complies to UL94V-0 flammability classification
- Meets MSL level 1, per J-STD-020
- Pb-free lead finish
- Halogen free and RoHS compliant



Bi-directional



Uni-directional

## 3. Applications

- Power supplies
- Industrial applications
- Power management circuits
- I/O interfaces



## 4. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
P6SMBJxxxXX	SMB	P6SMBJxxxXXJ	Tape and reel	3000	SMBJ	18-Oct-2020
eg. P6SMBJ5.0CA	SMB	P6SMBJ5.0CAJ	Tape and reel	3000	SMBJ	18-Oct-2020

## 5. Absolute maximum ratings

In accordance with the Absolute Maximum Rating System (IEC 60134).

$T_j = 25^\circ C$  unless otherwise specified.

Symbol	Parameter	Conditions	Values	Unit
<b>Absolute maximum rating</b>				
$P_{PPM}$	peak pulse power	[1]	600	W
$P_{M(AV)}$	steady state power dissipation	on infinite heatsink at $T_a = 50^\circ C$	5	W
$I_{FSM}$	peak forward surge current	$t_p = 8.3\ ms$ ; single half sine-wave pulse; duty cycle = 4 pulses per minute maximum; unidirectional units only	100	A
$V_F$	forward on-state voltage	$I_F = 50\ A$ ; unidirectional units only	3.5	V
$T_{stg}$	storage temperature range		-65 to 150	$^\circ C$
$T_j$	operating temperature range		-65 to 150	$^\circ C$

[1] In accordance with IEC 61643-321 (10/1000 μs current waveform).

## 6. Characteristics

$T_j = 25^\circ\text{C}$  unless otherwise specified.

PN (Uni)	PN (Bi)	Reverse Stand off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR} @ I_T$ (V)		Test current $I_T$ (mA)	Max. Clamping Voltage $V_C @ I_{pp}$ (V)	Max. Peak Pulse Current $I_{pp}$ (A)	Maximum Reverse Leakage $I_R @ V_R$ ( $\mu\text{A}$ )	Marking	
			Min	Max					Uni	Bi
P6SMBJ5.0A	P6SMBJ5.0CA	5	6.45	6.98	10	9.2	65.3	400	6B005J	6B005J
P6SMBJ6.0A	P6SMBJ6.0CA	6	6.8	7.32	10	10.3	58.3	400	6B006J	6B006J
P6SMBJ6.5A	P6SMBJ6.5CA	6.5	7.27	7.92	10	11.2	53.6	250	6B06FJ	6B06FJ
P6SMBJ7.0A	P6SMBJ7.0CA	7	7.82	8.57	10	12	50	100	6B007J	6B007J
P6SMBJ8.0A	P6SMBJ8.0CA	8	8.95	9.76	1	13.6	44.2	50	6B008J	6B008J
P6SMBJ9.0A	P6SMBJ9.0CA	9	10.1	11	1	15.4	39	10	6B009J	6B009J
P6SMBJ10A	P6SMBJ10CA	10	11.21	12.19	1	17	35.3	5	6B010J	6B010J
P6SMBJ11A	P6SMBJ11CA	11	12.32	13.38	1	18.2	33	1	6B011J	6B011J
P6SMBJ12A	P6SMBJ12CA	12	13.43	14.57	1	19.9	30.2	1	6B012J	6B012J
P6SMBJ13A	P6SMBJ13CA	13	14.54	15.76	1	21.5	28	1	6B013J	6B013J
P6SMBJ14A	P6SMBJ14CA	14	15.75	17.04	1	23.2	25.9	1	6B014J	6B014J
P6SMBJ15A	P6SMBJ15CA	15	16.86	18.34	1	24.4	24.6	1	6B015J	6B015J
P6SMBJ16A	P6SMBJ16CA	16	17.97	19.52	1	26	23.1	1	6B016J	6B016J
P6SMBJ17A	P6SMBJ17CA	17	19.08	20.72	1	27.6	21.8	1	6B017J	6B017J
P6SMBJ18A	P6SMBJ18CA	18	20.19	21.9	1	29.2	20.6	1	6B018J	6B018J
P6SMBJ20A	P6SMBJ20CA	20	22.41	24.28	1	32.4	18.6	1	6B020J	6B020J
P6SMBJ22A	P6SMBJ22CA	22	24.63	26.66	1	35.5	16.9	1	6B022J	6B022J
P6SMBJ24A	P6SMBJ24CA	24	26.95	29.23	1	38.9	15.5	1	6B024J	6B024J
P6SMBJ26A	P6SMBJ26CA	26	29.12	31.67	1	42.1	14.3	1	6B026J	6B026J
P6SMBJ28A	P6SMBJ28CA	28	31.33	34.16	1	45.4	13.3	1	6B028J	6B028J
P6SMBJ30A	P6SMBJ30CA	30	33.55	36.54	1	48.4	12.4	1	6B030J	6B030J
P6SMBJ33A	P6SMBJ33CA	33	36.98	40.3	1	53.3	11.3	1	6B033J	6B033J
P6SMBJ36A	P6SMBJ36CA	36	40.3	43.9	1	58.1	10.4	1	6B036J	6B036J
P6SMBJ40A	P6SMBJ40CA	40	44.7	48.8	1	64.5	9.3	1	6B040J	6B040J
P6SMBJ43A	P6SMBJ43CA	43	48.2	52.4	1	69.4	8.7	1	6B043J	6B043J
P6SMBJ45A	P6SMBJ45CA	45	50.4	54.9	1	72.7	8.3	1	6B045J	6B045J
P6SMBJ48A	P6SMBJ48CA	48	53.7	58.5	1	77.4	7.8	1	6B048J	6B048J
P6SMBJ51A	P6SMBJ51CA	51	57.1	62.3	1	82.4	7.3	1	6B051J	6B051J
P6SMBJ54A	P6SMBJ54CA	54	60.5	65.8	1	87.1	6.9	1	6B054J	6B054J
P6SMBJ58A	P6SMBJ58CA	58	64.9	70.7	1	93.6	6.5	1	6B058J	6B058J
P6SMBJ60A	P6SMBJ60CA	60	67.2	73.2	1	96.8	6.2	1	6B060J	6B060J
P6SMBJ64A	P6SMBJ64CA	64	71.6	78	1	103	5.9	1	6B064J	6B064J
P6SMBJ70A	P6SMBJ70CA	70	78.4	85.4	1	113	5.3	1	6B070J	6B070J
P6SMBJ75A	P6SMBJ75CA	75	83.9	91.5	1	121	5	1	6B075J	6B075J
P6SMBJ78A	P6SMBJ78CA	78	87.4	95.1	1	126	4.8	1	6B078J	6B078J
P6SMBJ85A	P6SMBJ85CA	85	95.1	103.3	1	137	4.4	1	6B085J	6B085J
P6SMBJ90A	P6SMBJ90CA	90	100	111	1	146	4.1	1	6B090J	6B090J
P6SMBJ100A	P6SMBJ100CA	100	111	123	1	162	3.7	1	6B100J	6B100J

$T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

PN (Uni)	PN (Bi)	Reverse Stand off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR} @ I_T$ (V)		Test current $I_T$ (mA)	Max. Clamping Voltage $V_C @ I_{pp}$ (V)	Max. Peak Pulse Current $I_{pp}$ (A)	Maximum Reverse Leakage $I_R @ V_R$ ( $\mu$ A)	Marking	
			Min	Max					Uni	Bi
P6SMBJ110A	P6SMBJ110CA	110	122	135	1	177	3.4	1	6B110J	6B110J
P6SMBJ120A	P6SMBJ120CA	120	133	147	1	193	3.1	1	6B120J	6B120J
P6SMBJ130A	P6SMBJ130CA	130	144	159	1	209	2.9	1	6B130J	6B130J
P6SMBJ150A	P6SMBJ150CA	150	167	185	1	243	2.5	1	6B150J	6B150J
P6SMBJ160A	P6SMBJ160CA	160	178	197	1	259	2.3	1	6B160J	6B160J
P6SMBJ170A	P6SMBJ170CA	170	189	209	1	275	2.2	1	6B170J	6B170J
P6SMBJ180A	P6SMBJ180CA	180	201	222	1	292	2.1	1	6B180J	6B180J
P6SMBJ190A	P6SMBJ190CA	190	209	231	1	304	2	1	6B190J	6B190J
P6SMBJ200A	P6SMBJ200CA	200	224	247	1	324	1.9	1	6B200J	6B200J
P6SMBJ220A	P6SMBJ220CA	220	246	272	1	356	1.7	1	6B220J	6B220J

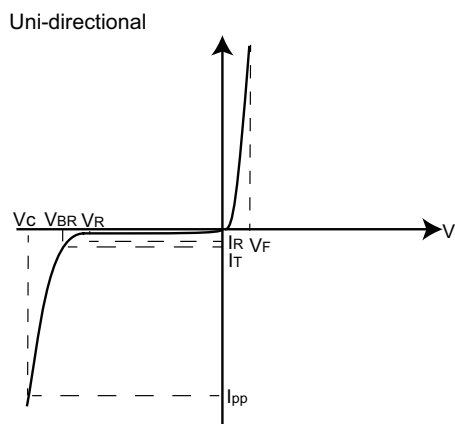


Fig. 1. I-V curve characteristics; Uni-directional

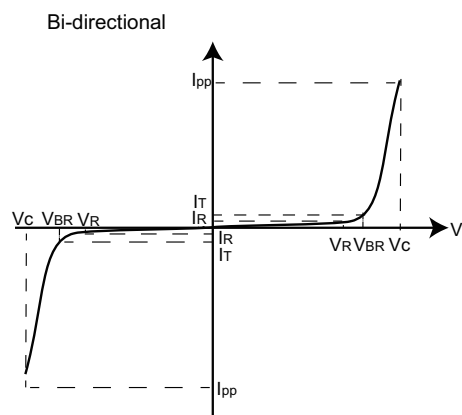


Fig. 2. I-V curve characteristics; Bi-directional

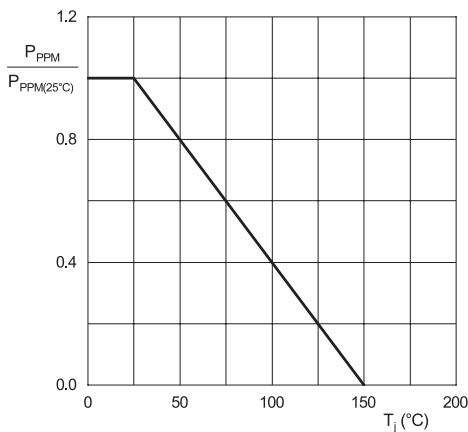


Fig. 3. Peak pulse power derating curve

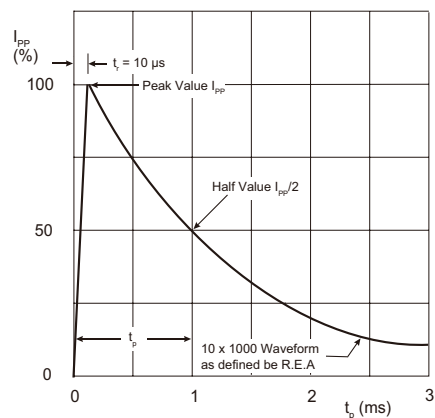


Fig. 4. Pulse waveform

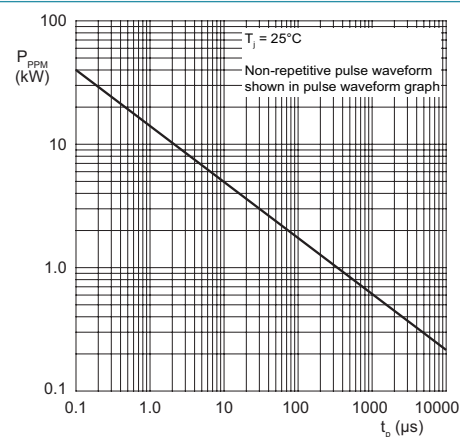


Fig. 5. Peak pulse power rating curve

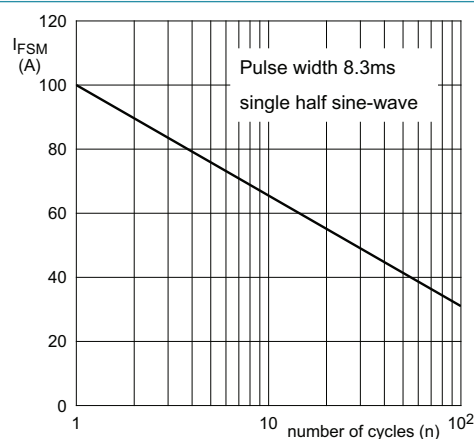


Fig. 6. Maximum non-repetitive surge current  
Uni-directional only

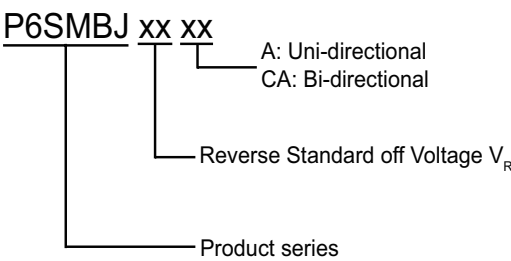


Fig. 7. Part numbering

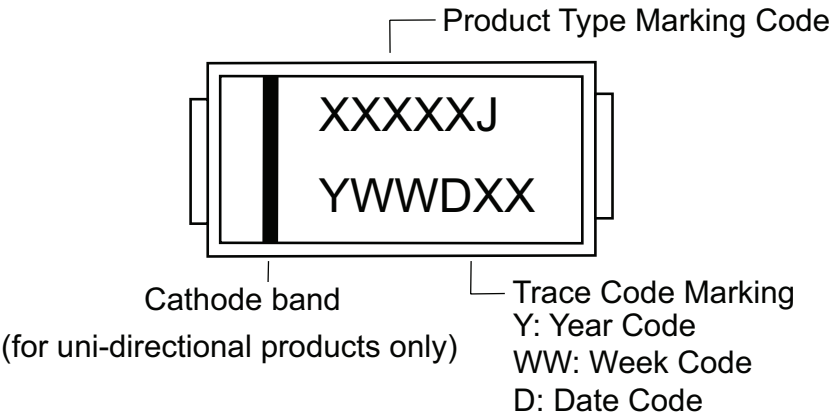
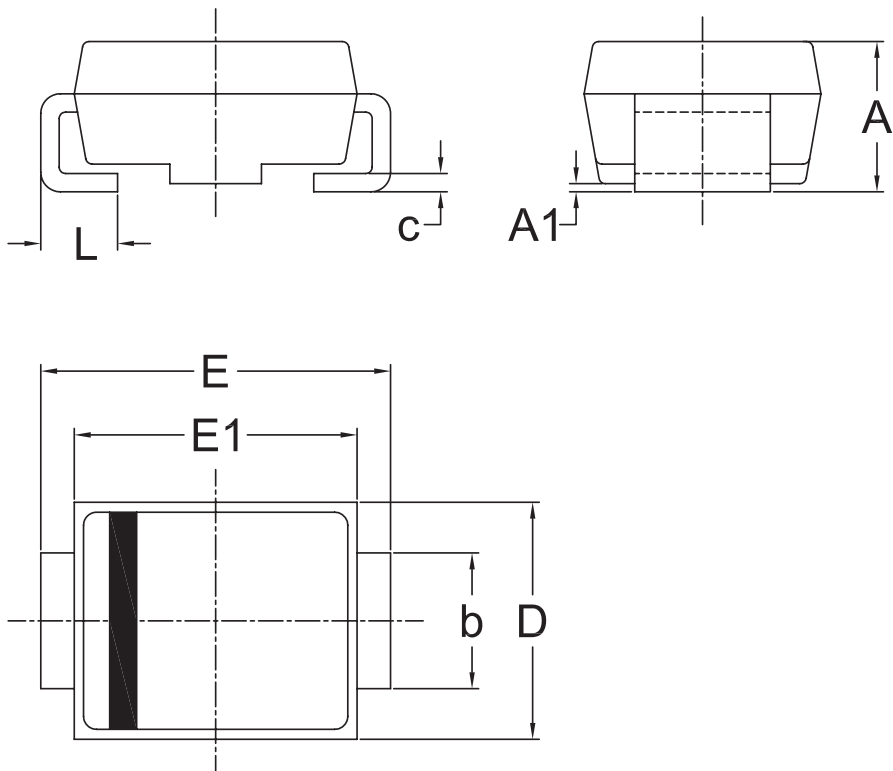


Fig. 8. Part marking

7. Package outline

SMB



UNIT	A	A1	b	c	D	E	E1	L	
mm	Max	2.50	0.30	2.15	0.25	3.75	5.54	4.65	1.50
	Min	2.00	0.00	1.85	0.15	3.45	5.04	4.35	0.80

Remark: Dimensions D and E1 do not include mold flash & gate remain.

## 8. Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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