



# THE DATASHEET OF SMBJ24CAJ

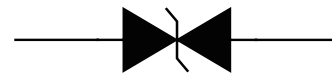


## 1. General description

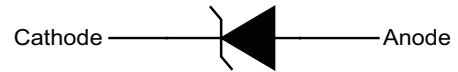
SMBJ series, 600W transient voltage suppressor (TVS) in SMB package, designed to protect electronic circuits against damage induced by lightning surges or other transient voltage events.

## 2. Features and benefits

- Peak pulse power 600W @ 10/1000 $\mu$ s 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  $V_{BR\ min} > 12$ V
- Fast response time: typically  $< 1.0$ ps 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 $^{\circ}$ 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
SMBJxxxXX	SMB	SMBJxxxXXJ	Tape and reel	3000	SMBJ	18-Oct-2020
eg. SMBJ5.0CA	SMB	SMBJ5.0CAJ	Tape and reel	3000	SMBJ	18-Oct-2020

## 5. Absolute maximum ratings

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

$T_j = 25\text{ }^{\circ}\text{C}$  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 $T_a = 50\text{ }^{\circ}\text{C}$	5	W
$I_{FSM}$	peak forward surge current	$t_p = 8.3\text{ ms}$ ; single half sine-wave pulse; duty cycle = 4 pulses per minute maximum; unidirectional units only	100	A
$V_F$	forward on-state voltage	$I_F = 50\text{ A}$ ; unidirectional units only	3.5	V
$T_{stg}$	storage temperature range		-65 to 150	$^{\circ}\text{C}$
$T_j$	operating temperature range		-65 to 150	$^{\circ}\text{C}$

[1] In accordance with IEC 61643-321 (10/1000  $\mu$ s current waveform).

## 6. Characteristics

$T_j = 25\text{ }^\circ\text{C}$  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
SMBJ5.0A	SMBJ5.0CA	5	6.45	6.98	10	9.2	65.3	400	B005AJ	B005CJ
SMBJ6.0A	SMBJ6.0CA	6	6.8	7.32	10	10.3	58.3	400	B006AJ	B006CJ
SMBJ6.5A	SMBJ6.5CA	6.5	7.27	7.92	10	11.2	53.6	250	B06FAJ	B06FCJ
SMBJ7.0A	SMBJ7.0CA	7	7.82	8.57	10	12	50	100	B007AJ	B007CJ
SMBJ8.0A	SMBJ8.0CA	8	8.95	9.76	1	13.6	44.2	50	B008AJ	B008CJ
SMBJ9.0A	SMBJ9.0CA	9	10.1	11	1	15.4	39	10	B009AJ	B009CJ
SMBJ10A	SMBJ10CA	10	11.21	12.19	1	17	35.3	5	B010AJ	B010CJ
SMBJ11A	SMBJ11CA	11	12.32	13.38	1	18.2	33	1	B011AJ	B011CJ
SMBJ12A	SMBJ12CA	12	13.43	14.57	1	19.9	30.2	1	B012AJ	B012CJ
SMBJ13A	SMBJ13CA	13	14.54	15.76	1	21.5	28	1	B013AJ	B013CJ
SMBJ14A	SMBJ14CA	14	15.75	17.04	1	23.2	25.9	1	B014AJ	B014CJ
SMBJ15A	SMBJ15CA	15	16.86	18.34	1	24.4	24.6	1	B015AJ	B015CJ
SMBJ16A	SMBJ16CA	16	17.97	19.52	1	26	23.1	1	B016AJ	B016CJ
SMBJ17A	SMBJ17CA	17	19.08	20.72	1	27.6	21.8	1	B017AJ	B017CJ
SMBJ18A	SMBJ18CA	18	20.19	21.9	1	29.2	20.6	1	B018AJ	B018CJ
SMBJ20A	SMBJ20CA	20	22.41	24.28	1	32.4	18.6	1	B020AJ	B020CJ
SMBJ22A	SMBJ22CA	22	24.63	26.66	1	35.5	16.9	1	B022AJ	B022CJ
SMBJ24A	SMBJ24CA	24	26.95	29.23	1	38.9	15.5	1	B024AJ	B024CJ
SMBJ26A	SMBJ26CA	26	29.12	31.67	1	42.1	14.3	1	B026AJ	B026CJ
SMBJ28A	SMBJ28CA	28	31.33	34.16	1	45.4	13.3	1	B028AJ	B028CJ
SMBJ30A	SMBJ30CA	30	33.55	36.54	1	48.4	12.4	1	B030AJ	B030CJ
SMBJ33A	SMBJ33CA	33	36.98	40.3	1	53.3	11.3	1	B033AJ	B033CJ
SMBJ36A	SMBJ36CA	36	40.3	43.9	1	58.1	10.4	1	B036AJ	B036CJ
SMBJ40A	SMBJ40CA	40	44.7	48.8	1	64.5	9.3	1	B040AJ	B040CJ
SMBJ43A	SMBJ43CA	43	48.2	52.4	1	69.4	8.7	1	B043AJ	B043CJ
SMBJ45A	SMBJ45CA	45	50.4	54.9	1	72.7	8.3	1	B045AJ	B045CJ
SMBJ48A	SMBJ48CA	48	53.7	58.5	1	77.4	7.8	1	B048AJ	B048CJ
SMBJ51A	SMBJ51CA	51	57.1	62.3	1	82.4	7.3	1	B051AJ	B051CJ
SMBJ54A	SMBJ54CA	54	60.5	65.8	1	87.1	6.9	1	B054AJ	B054CJ
SMBJ58A	SMBJ58CA	58	64.9	70.7	1	93.6	6.5	1	B058AJ	B058CJ
SMBJ60A	SMBJ60CA	60	67.2	73.2	1	96.8	6.2	1	B060AJ	B060CJ
SMBJ64A	SMBJ64CA	64	71.6	78	1	103	5.9	1	B064AJ	B064CJ
SMBJ70A	SMBJ70CA	70	78.4	85.4	1	113	5.3	1	B070AJ	B070CJ
SMBJ75A	SMBJ75CA	75	83.9	91.5	1	121	5	1	B075AJ	B075CJ
SMBJ78A	SMBJ78CA	78	87.4	95.1	1	126	4.8	1	B078AJ	B078CJ
SMBJ85A	SMBJ85CA	85	95.1	103.3	1	137	4.4	1	B085AJ	B085CJ

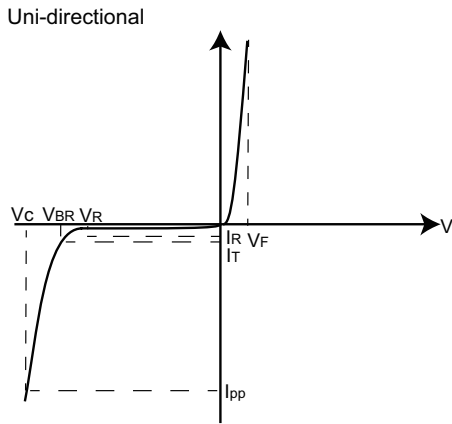


Fig. 1. I-V curve characteristics; Uni-directional

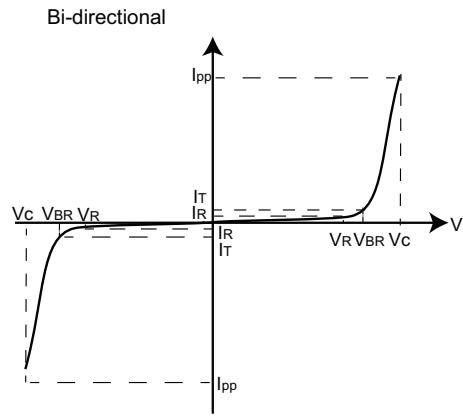


Fig. 2. I-V curve characteristics; Bi-directional

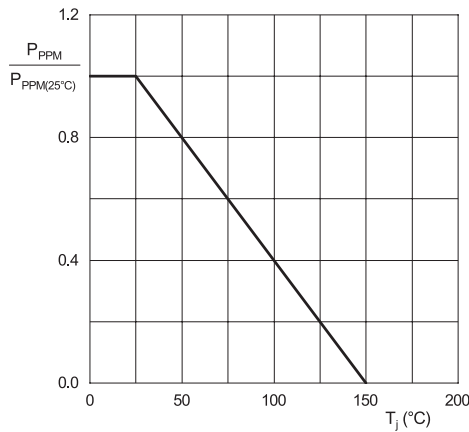


Fig. 3. Peak pulse power derating curve

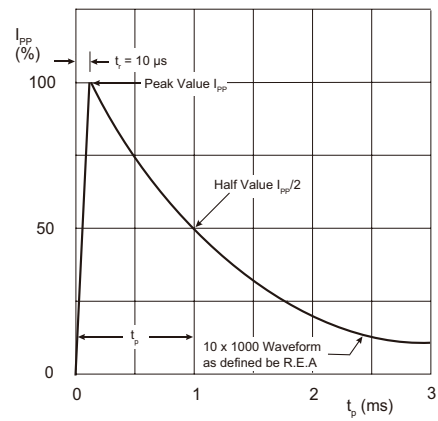


Fig. 4. Pulse waveform

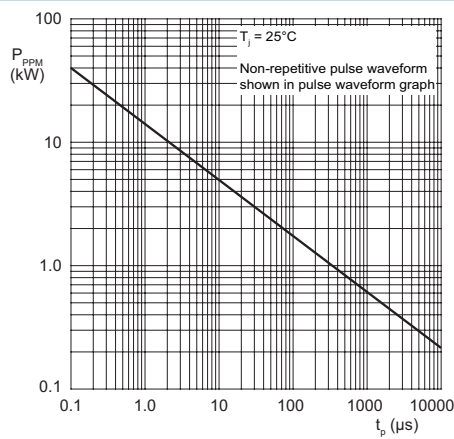


Fig. 5. Peak pulse power rating curve

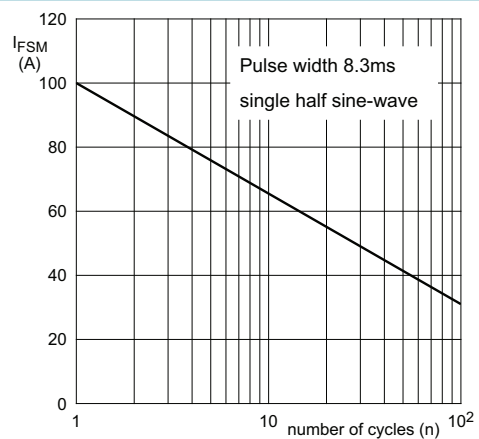
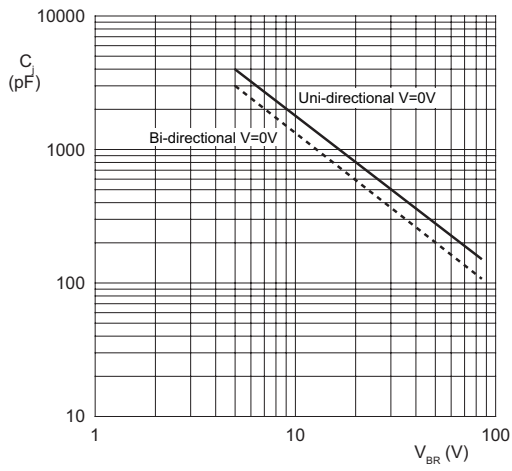
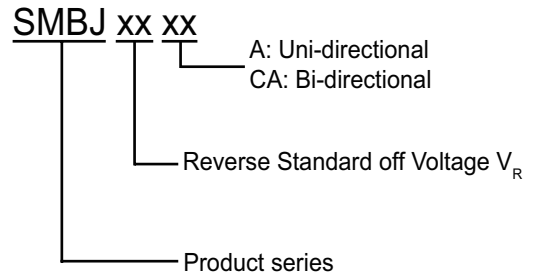


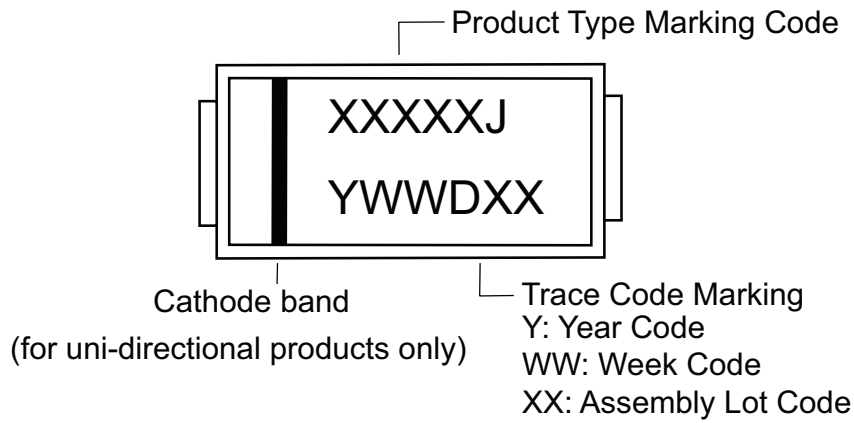
Fig. 6. Maximum non-repetitive surge current Uni-directional only



**Fig. 7. Typical junction capacitance**



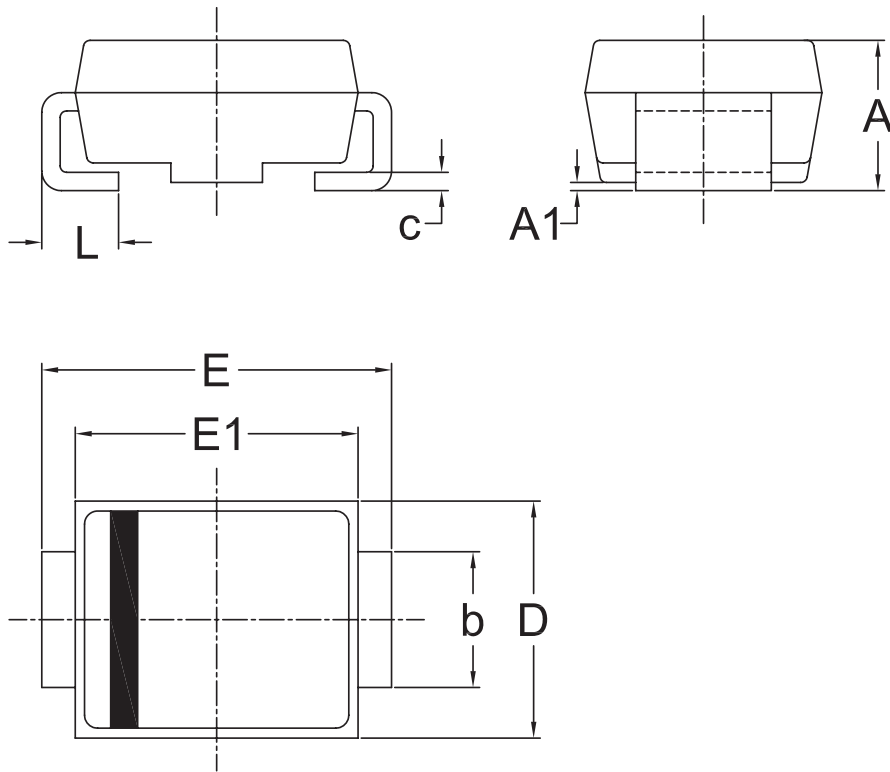
**Fig. 8. Part numbering**



**Fig. 9. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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