

SMBJ5.0 THRU SMBJ188CA

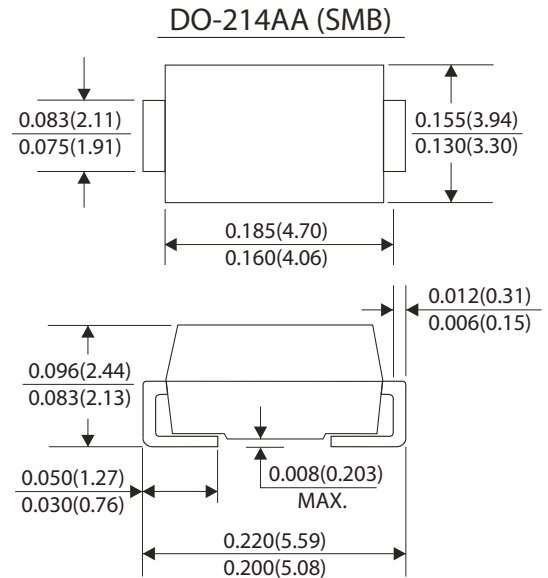
POWER 600Watts
VOLTAGE 5.0 to 188 Volts

Features

- Underwriters Laboratory recognition under UL standard for safety 497B : Isolated loop curcuit protection
- Low profile package with built-in strain relief for surface mounted applications
- Glass passivated junction
- Low incremental surge resistance, excellent clamping capability
- 600W peak pulse power capability with a 10/1000 μ S waveform, repetition rate(duty cycle) : 0.01%
- Very fast response time
- High temperature soldering guaranteed : 250 °C/10 seconds at terminals

Mechanical Data

- Case : JEDEC DO-214AA(SMB) molded plastic over passivated chip
- Terminals : Solder 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
- Mounting Position : Any
- Weight : 0.003 ounce, 0.093 gram



Dimensions in inches and (millimeters)

Devices For Bidirectional Applications

- For bi-directional devices, use suffix C or CA (e.g. SMBJ10C, SMBJ10CA). Electrical characteristics apply in both directions.

Maximum Ratings And Electrical Characteristics

(Ratings at 25 °C ambient temperature unless otherwise specified)

	Symbols	Values	Units
Peak pulse power dissipation with a 10/1000 μ S waveform (Note 1,2, Fig. 1)	PPPM	Minimum 600	Watts
Peak pulse current with a waveform (Note 1)	IPPM	See next table	Amps
Peak forward surge current, 8.3mm single half sine-wave unidirectional only (Note 2)	IFSM	100	Amps
Typical thermal resistance, junction to ambient (Note 3)	R θ JA	100	°C/W
Typical thermal resistance, junction to lead	R θ JL	20	°C/W
Operating junction and storage temperature range	TJ,TSTG	-55 to +150	°C

Notes:

- (1) Non repetitive current pulse, per Fig.3 and derated above TA=25 °C per Fig.2
- (2) Mounted on 0.2×0.2"(5.0×5.0mm) copper pads to each terminal
- (3) Mounted on minimum recommended pad layout



ELECTRICAL CHARACTERISTIC

Ratings at 25 °C ambient temperature unless otherwise specified. VF=3.5V at IF=50A (uni-directional only)

Device Type	Device Marking Code		Breakdown Voltage V _(BR) at I _T ⁽¹⁾ (V)		Test Current I _T (mA)	Stand-off Voltage V _{WM} (V)	Maximum Reverse Leakage at V _{WM} I _D (μA) ⁽³⁾	Maximum Peak Pulse Surge Current I _{PPM} (A) ⁽²⁾	Maximum Clamping Voltage at I _{PPM} V _C (V)
	UNI	BI	Min	Max					
SMBJ5.0(C)	KD	KD	6.40	7.82	10	5.0	800	62.5	9.6
SMBJ5.0(C)A ⁽⁵⁾	KE	KE	6.40	7.07	10	5.0	800	65.2	9.2
SMBJ6.0(C)	KF	KF	6.67	8.15	10	6.0	800	52.6	11.4
SMBJ6.0(C)A	KG	KG	6.67	7.37	10	6.0	800	58.3	10.3
SMBJ6.5(C)	KH	AH	7.22	8.82	10	6.5	500	48.8	12.3
SMBJ6.5(C)A	KK	AK	7.22	7.98	10	6.5	500	53.6	11.2
SMBJ7.0(C)	KL	KL	7.78	9.51	10	7.0	200	45.1	13.3
SMBJ7.0(C)A	KM	KM	7.78	8.60	10	7.0	200	50.0	12.0
SMBJ7.5(C)	KN	AN	8.33	10.2	1.0	7.5	100	42.0	14.3
SMBJ7.5(C)A	KP	AP	8.33	9.21	1.0	7.5	100	46.5	12.9
SMBJ8.0(C)	KQ	AQ	8.89	10.9	1.0	8.0	50	40.0	15.0
SMBJ8.0(C)A	KR	AR	8.89	9.83	1.0	8.0	50	44.1	13.6
SMBJ8.5(C)	KS	AS	9.44	11.5	1.0	8.5	20	37.7	15.9
SMBJ8.5(C)A	KT	AT	9.44	10.4	1.0	8.5	20	41.7	14.4
SMBJ9.0(C)	KU	AU	10.0	12.2	1.0	9.0	10	35.5	16.9
SMBJ9.0(C)A	KV	AV	10.0	11.1	1.0	9.0	10	39.0	15.4
SMBJ10(C)	KW	AW	11.1	13.6	1.0	10	5.0	31.9	18.8
SMBJ10(C)A	KX	AX	11.1	12.3	1.0	10	5.0	35.3	17.0
SMBJ11(C)	KY	KY	12.2	14.9	1.0	11	5.0	29.9	20.1
SMBJ11(C)A	KZ	KZ	12.2	13.5	1.0	11	5.0	33.0	18.2
SMBJ12(C)	LD	BD	13.3	16.3	1.0	12	5.0	27.3	22.0
SMBJ12(C)A	LE	BE	13.3	14.7	1.0	12	5.0	30.2	19.9
SMBJ13(C)	LF	LF	14.4	17.6	1.0	13	1.0	25.2	23.8
SMBJ13(C)A	LG	LG	14.4	15.9	1.0	13	1.0	27.9	21.5
SMBJ14(C)	LH	BH	15.6	19.1	1.0	14	1.0	23.3	25.8
SMBJ14(C)A	LK	BK	15.6	17.2	1.0	14	1.0	25.9	23.2
SMBJ15(C)	LL	BL	16.7	20.4	1.0	15	1.0	22.3	26.9
SMBJ15(C)A	LM	BM	16.7	18.5	1.0	15	1.0	24.6	24.4
SMBJ16(C)	LN	LN	17.8	21.8	1.0	16	1.0	20.8	28.8
SMBJ16(C)A	LP	LM	17.8	19.7	1.0	16	1.0	23.1	26.0
SMBJ17(C)	LQ	LQ	18.9	23.1	1.0	17	1.0	19.7	30.5
SMBJ17(C)A	LR	LR	18.9	20.9	1.0	17	1.0	21.7	27.6
SMBJ18(C)	LS	BS	20.0	24.4	1.0	18	1.0	18.6	32.2
SMBJ18(C)A	LT	BT	20.0	22.1	1.0	18	1.0	20.5	29.2
SMBJ20(C)	LU	LU	22.2	27.1	1.0	20	1.0	16.8	35.8
SMBJ20(C)A	LV	LV	22.2	24.5	1.0	20	1.0	18.5	32.4
SMBJ22(C)	LW	BW	24.4	29.8	1.0	22	1.0	15.2	39.4
SMBJ22(C)A	LX	BX	24.4	26.9	1.0	22	1.0	16.9	35.5
SMBJ24(C)	LY	BY	26.7	32.6	1.0	24	1.0	14.0	43.0
SMBJ24(C)A	LZ	BZ	26.7	29.5	1.0	24	1.0	15.4	38.9
SMBJ26(C)	MD	CD	28.9	35.3	1.0	26	1.0	12.9	46.6
SMBJ26(C)A	ME	CE	28.9	31.9	1.0	26	1.0	14.3	42.1
SMBJ28(C)	MF	MF	31.1	38.0	1.0	28	1.0	12.0	50.0
SMBJ28(C)A	MG	MG	31.1	34.4	1.0	28	1.0	13.2	45.4
SMBJ30(C)	MH	CH	33.3	40.7	1.0	30	1.0	11.2	53.5
SMBJ30(C)A	MK	CK	33.3	36.8	1.0	30	1.0	12.4	48.4

Notes: (1) Pulse test: t_p ≤ 50ms

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

(3) For bi-directional types having 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

(5) For the bidirectional SMBG/SMBJ5.0CA, the maximum V_(BR) is 7.25V



ELECTRICAL CHARACTERISTIC

Ratings at 25 °C ambient temperature unless otherwise specified. VF=3.5V at IF=50A (uni-directional only)

Device Type	Device Marking Code		Breakdown Voltage $V_{(BR)}$ at $I_T^{(1)}$ (V)		Test Current I_T (mA)	Stand-off Voltage V_{WM} (V)	Maximum Reverse Leakage Current $I_{D(VWM)}$ (A) ⁽³⁾	Maximum Peak Pulse Surge Current I_{PPM} (A) ⁽²⁾	Maximum Clamping Voltage at I_{PPM} V_c (V)
	UNI	BI	Min	Max					
SMBJ33(C)	ML	CL	36.7	44.9	1.0	33	1.0	10.2	59.0
SMBJ33(C)A	MM	CM	36.7	40.6	1.0	33	1.0	11.3	53.3
SMBJ36(C)	MN	CN	40.0	48.9	1.0	36	1.0	9.3	64.3
SMBJ36(C)A	MP	CP	40.0	44.2	1.0	36	1.0	10.3	58.1
SMBJ40(C)	MQ	CQ	44.4	54.3	1.0	40	1.0	8.4	71.4
SMBJ40(C)A	MR	CR	44.4	49.1	1.0	40	1.0	9.3	64.5
SMBJ43(C)	MS	CS	47.8	58.4	1.0	43	1.0	7.8	76.7
SMBJ43(C)A	MT	CT	47.8	52.8	1.0	43	1.0	8.6	69.4
SMBJ45(C)	MU	MU	50.0	61.1	1.0	45	1.0	7.5	80.3
SMBJ45(C)A	MV	MV	50.0	55.3	1.0	45	1.0	8.3	72.7
SMBJ48(C)	MW	MW	53.3	65.1	1.0	48	1.0	7.0	85.5
SMBJ48(C)A	MX	MX	53.3	58.9	1.0	48	1.0	7.8	77.4
SMBJ51(C)	MY	MY	56.7	69.3	1.0	51	1.0	6.6	91.1
SMBJ51(C)A	MZ	MZ	56.7	62.7	1.0	51	1.0	7.3	82.4
SMBJ54(C)	ND	ND	60.0	73.3	1.0	54	1.0	6.2	96.3
SMBJ54(C)A	NE	NE	60.0	66.3	1.0	54	1.0	6.9	87.1
SMBJ58(C)	NF	NF	64.4	78.7	1.0	58	1.0	5.8	103
SMBJ58(C)A	NG	NG	64.4	71.2	1.0	58	1.0	6.4	93.6
SMBJ60(C)	NH	NH	66.7	81.5	1.0	60	1.0	5.6	107
SMBJ60(C)A	NK	NK	66.7	73.7	1.0	60	1.0	6.2	96.8
SMBJ64(C)	NL	NL	71.1	86.9	1.0	64	1.0	5.3	114
SMBJ64(C)A	NM	NM	71.1	78.6	1.0	64	1.0	5.8	103
SMBJ70(C)	NN	NN	77.8	95.1	1.0	70	1.0	4.8	125
SMBJ70(C)A	NP	NP	77.8	86.0	1.0	70	1.0	5.3	113
SMBJ75(C)	NQ	NQ	83.3	102	1.0	75	1.0	4.5	134
SMBJ75(C)A	NR	NR	83.3	92.1	1.0	75	1.0	5.0	121
SMBJ78(C)	NS	NS	86.7	106	1.0	78	1.0	4.3	139
SMBJ78(C)A	NT	NT	86.7	95.8	1.0	78	1.0	4.8	126
SMBJ85(C)	NU	NU	94.4	115	1.0	85	1.0	4.0	151
SMBJ85(C)A	NV	NV	94.4	104	1.0	85	1.0	4.4	137
SMBJ90(C)	NW	NW	100	122	1.0	90	1.0	3.8	160
SMBJ90(C)A	NX	NX	100	111	1.0	90	1.0	4.1	146
SMBJ100(C)	NY	NY	111	136	1.0	100	1.0	3.4	179
SMBJ100(C)A	NZ	NZ	111	123	1.0	100	1.0	3.7	162
SMBJ110(C)	PD	PD	122	149	1.0	110	1.0	3.1	196
SMBJ110(C)A	PE	PE	122	135	1.0	110	1.0	3.4	177
SMBJ120(C)	PF	PF	133	163	1.0	120	1.0	2.8	214
SMBJ120(C)A	PG	PG	133	147	1.0	120	1.0	3.1	193
SMBJ130(C)	PH	PH	144	176	1.0	130	1.0	2.6	231
SMBJ130(C)A	PK	PK	144	159	1.0	130	1.0	2.9	209
SMBJ150(C)	PL	PL	167	204	1.0	150	1.0	2.2	268
SMBJ150(C)A	PM	PM	167	185	1.0	150	1.0	2.5	243
SMBJ160(C)	PN	PN	178	218	1.0	160	1.0	2.1	287
SMBJ160(C)A	PP	PP	178	197	1.0	160	1.0	2.3	259
SMBJ170(C)	PQ	PQ	189	231	1.0	170	1.0	2.0	304
SMBJ170(C)A	PR	PR	189	209	1.0	170	1.0	2.2	275
SMBJ188(C)	PT	PT	209	255	1.0	188	1.0	1.7	344
SMBJ188(C)A	PS	PS	209	231	1.0	188	1.0	2.0	328

Notes: (1) Pulse test: $t_p \leq 50ms$

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

(3) For bi-directional types having 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

RATINGS AND CHARACTERISTIC CURVES SMBJ5.0 THRU SMBJ188CA

Fig. 1 Peak Pulse Power Rating Curve

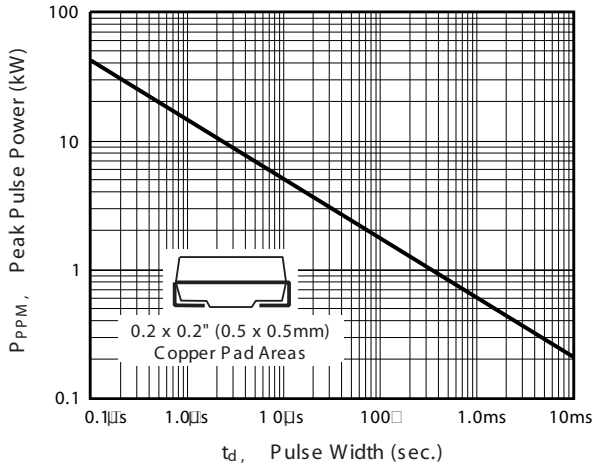


Fig. 2 Pulse Derating Curve

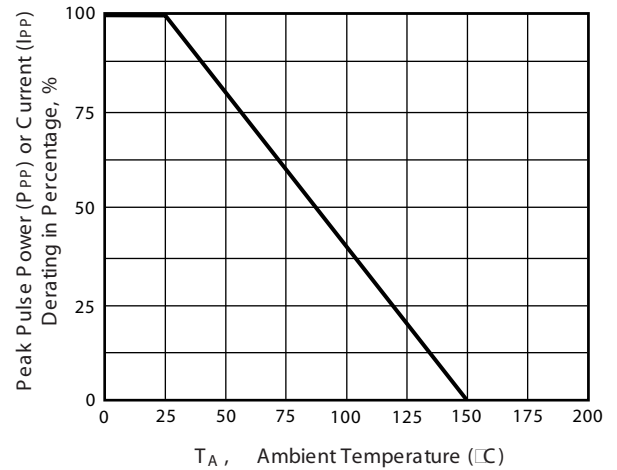


Fig. 3 Pulse Waveform

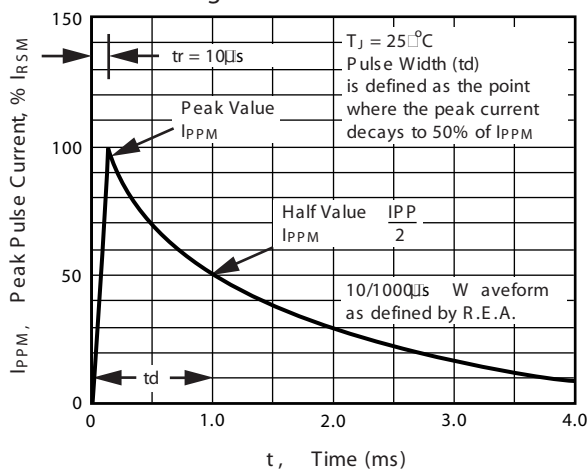


Fig. 4 Typical Junction Capacitance

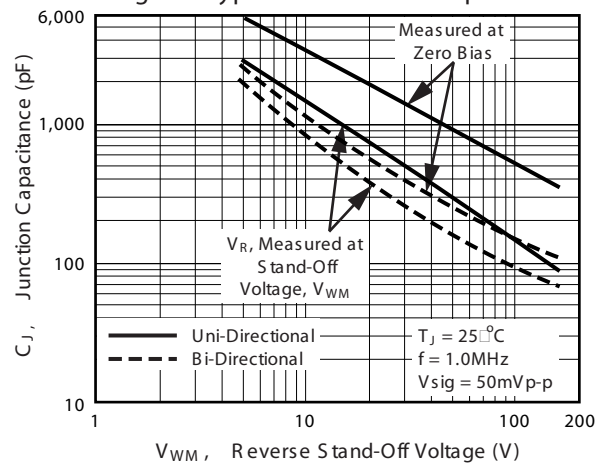


Fig. 5 Typical Transient Thermal Impedance

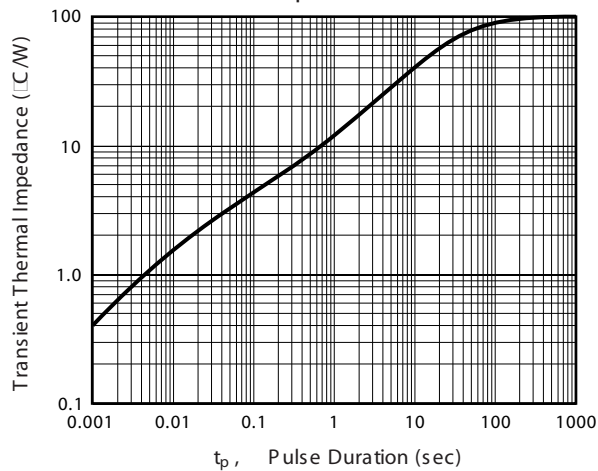


Fig. 6 Maximum Non-Repetitive Peak Forward Surge Current

