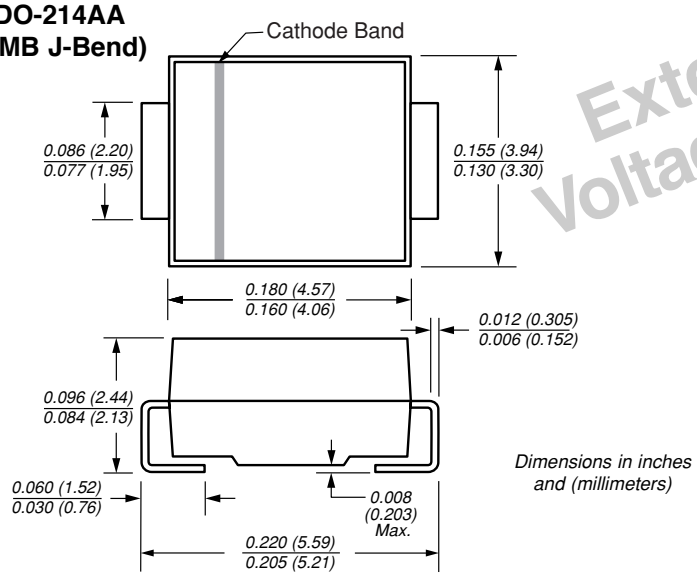


Surface Mount TRANSZORB® Transient Voltage Suppressors

Stand-off Voltage 5.0 to 188V
Peak Pulse Power 600W

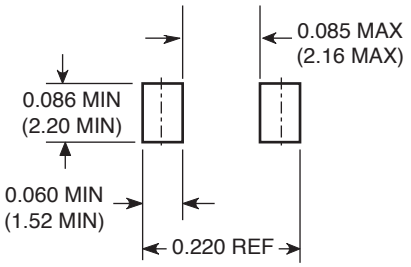
DO-214AA
(SMB J-Bend)



Dimensions in inches and (millimeters)

Extended Voltage Range

Mounting Pad Layout



Features

- Underwriters Laboratory Recognition under UL standard for safety 497B: Isolated Loop Circuit 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 10/1000μs 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 molded plastic over passivated junction

Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

Polarity: For unidirectional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation

Weight: 0.003 oz., 0.093 g

Flammability: Epoxy is rated UL 94V-0

Packaging Codes – Options (Antistatic):

51 – 2K per Bulk box, 20K/carton
52 – 750 per 7" plastic Reel (12mm tape), 15K/carton
5B – 3.2K per 13" plastic Reel (12mm tape), 32K/carton

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 & Thermal Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000μs waveform[1][2] (Fig. 1)	P_{PPM}	Minimum 600	W
Peak pulse current with a 10/1000μs waveform[1]	I_{PPM}	See Table Below	A
Peak forward surge current 8.3ms single half sine-wave uni-directional only[2]	I_{FSM}	100	A
Typical thermal resistance, junction to ambient[4]	$R_{\theta JA}$	100	°C/W
Typical thermal resistance, junction to lead	$R_{\theta JL}$	20	°C/W
Operating junction and storage temperature range	T_J, T_{STG}	–55 to +150	°C

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

Electrical Characteristics

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

Device Type Modified "J" Bend Lead	Device Marking Code UNI	BI	Breakdown Voltage $V_{(BR)}$ at I_T[1] (V) Min	Max	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)
+SMBJ5.0	KD	KD	6.40	7.82	10	5.0	800	62.5	9.6
+SMBJ5.0A[5]	KE	KE	6.40	7.07	10	5.0	800	65.2	9.2
+SMBJ6.0	KF	KF	6.67	8.15	10	6.0	800	52.6	11.4
+SMBJ6.0A	KG	KG	6.67	7.37	10	6.0	800	58.3	10.3
+SMBJ6.5	KH	AH	7.22	8.82	10	6.5	500	48.8	12.3
+SMBJ6.5A	KK	AK	7.22	7.98	10	6.5	500	53.6	11.2
+SMBJ7.0	KL	KL	7.78	9.51	10	7.0	200	45.1	13.3
+SMBJ7.0A	KM	KM	7.78	8.60	10	7.0	200	50.0	12.0
+SMBJ7.5	KN	AN	8.33	10.2	1.0	7.5	100	42.0	14.3
+SMBJ7.5A	KP	AP	8.33	9.21	1.0	7.5	100	46.5	12.9
+SMBJ8.0	KQ	AQ	8.89	10.9	1.0	8.0	50	40.0	15.0
+SMBJ8.0A	KR	AR	8.89	9.83	1.0	8.0	50	44.1	13.6
+SMBJ8.5	KS	AS	9.44	11.5	1.0	8.5	20	37.7	15.9
+SMBJ8.5A	KT	AT	9.44	10.4	1.0	8.5	20	41.7	14.4
+SMBJ9.0	KU	AU	10.0	12.2	1.0	9.0	10	35.5	16.9
+SMBJ9.0A	KV	AV	10.0	11.1	1.0	9.0	10	39.0	15.4
+SMBJ10	KW	AW	11.1	13.6	1.0	10	5.0	31.9	18.8
+SMBJ10A	KX	AX	11.1	12.3	1.0	10	5.0	35.3	17.0
+SMBJ11	KY	KY	12.2	14.9	1.0	11	5.0	29.9	20.1
+SMBJ11A	KZ	KZ	12.2	13.5	1.0	11	5.0	33.0	18.2
+SMBJ12	LD	BD	13.3	16.3	1.0	12	5.0	27.3	22.0
+SMBJ12A	LE	BE	13.3	14.7	1.0	12	5.0	30.2	19.9
+SMBJ13	LF	LF	14.4	17.6	1.0	13	1.0	25.2	23.8
+SMBJ13A	LG	LG	14.4	15.9	1.0	13	1.0	27.9	21.5
+SMBJ14	LH	BH	15.6	19.1	1.0	14	1.0	23.3	25.8
+SMBJ14A	LK	BK	15.6	17.2	1.0	14	1.0	25.9	23.2
+SMBJ15	LL	BL	16.7	20.4	1.0	15	1.0	22.3	26.9
+SMBJ15A	LM	BM	16.7	18.5	1.0	15	1.0	24.6	24.4
+SMBJ16	LN	LN	17.8	21.8	1.0	16	1.0	20.8	28.8
+SMBJ16A	LP	LM	17.8	19.7	1.0	16	1.0	23.1	26.0
+SMBJ17	LQ	LQ	18.9	23.1	1.0	17	1.0	19.7	30.5
+SMBJ17A	LR	LR	18.9	20.9	1.0	17	1.0	21.7	27.6
+SMBJ18	LS	BS	20.0	24.4	1.0	18	1.0	18.6	32.2
+SMBJ18A	LT	BT	20.0	22.1	1.0	18	1.0	20.5	29.2
+SMBJ20	LU	LU	22.2	27.1	1.0	20	1.0	16.8	35.8
+SMBJ20A	LV	LV	22.2	24.5	1.0	20	1.0	18.5	32.4
+SMBJ22	LW	BW	24.4	29.8	1.0	22	1.0	15.2	39.4
+SMBJ22A	LX	BX	24.4	26.9	1.0	22	1.0	16.9	35.5
+SMBJ24	LY	BY	26.7	32.6	1.0	24	1.0	14.0	43.0
+SMBJ24A	LZ	BZ	26.7	29.5	1.0	24	1.0	15.4	38.9
+SMBJ26	MD	CD	28.9	35.3	1.0	26	1.0	12.9	46.6
+SMBJ26A	ME	CE	28.9	31.9	1.0	26	1.0	14.3	42.1
+SMBJ28	MF	MF	31.1	38.0	1.0	28	1.0	12.0	50.0
+SMBJ28A	MG	MG	31.1	34.4	1.0	28	1.0	13.2	45.4
+SMBJ30	MH	CH	33.3	40.7	1.0	30	1.0	11.2	53.5
+SMBJ30A	MK	CK	33.3	36.8	1.0	30	1.0	12.4	48.4

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

(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

+ Underwriters Laboratory Recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

Electrical Characteristics

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

Device Type Modified "J" Bend Lead	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					
+SMBJ33	ML	CL	36.7	44.9	1.0	33	1.0	10.2	59.0
+SMBJ33A	MM	CM	36.7	40.6	1.0	33	1.0	11.3	53.3
+SMBJ36	MN	CN	40.0	48.9	1.0	36	1.0	9.3	64.3
+SMBJ36A	MP	CP	40.0	44.2	1.0	36	1.0	10.3	58.1
+SMBJ40	MQ	CQ	44.4	54.3	1.0	40	1.0	8.4	71.4
+SMBJ40A	MR	CR	44.4	49.1	1.0	40	1.0	9.3	64.5
+SMBJ43	MS	CS	47.8	58.4	1.0	43	1.0	7.8	76.7
+SMBJ43A	MT	CT	47.8	52.8	1.0	43	1.0	8.6	69.4
+SMBJ45	MU	MU	50.0	61.1	1.0	45	1.0	7.5	80.3
+SMBJ45A	MV	MV	50.0	55.3	1.0	45	1.0	8.3	72.7
+SMBJ48	MW	MW	53.3	65.1	1.0	48	1.0	7.0	85.5
+SMBJ48A	MX	MX	53.3	58.9	1.0	48	1.0	7.8	77.4
+SMBJ51	MY	MY	56.7	69.3	1.0	51	1.0	6.6	91.1
+SMBJ51A	MZ	MZ	56.7	62.7	1.0	51	1.0	7.3	82.4
+SMBJ54	ND	ND	60.0	73.3	1.0	54	1.0	6.2	96.3
+SMBJ54A	NE	NE	60.0	66.3	1.0	54	1.0	6.9	87.1
+SMBJ58	NF	NF	64.4	78.7	1.0	58	1.0	5.8	103
+SMBJ58A	NG	NG	64.4	71.2	1.0	58	1.0	6.4	93.6
+SMBJ60	NH	NH	66.7	81.5	1.0	60	1.0	5.6	107
+SMBJ60A	NK	NK	66.7	73.7	1.0	60	1.0	6.2	96.8
+SMBJ64	NL	NL	71.1	86.9	1.0	64	1.0	5.3	114
+SMBJ64A	NM	NM	71.1	78.6	1.0	64	1.0	5.8	103
+SMBJ70	NN	NN	77.8	95.1	1.0	70	1.0	4.8	125
+SMBJ70A	NP	NP	77.8	86.0	1.0	70	1.0	5.3	113
+SMBJ75	NQ	NQ	83.3	102	1.0	75	1.0	4.5	134
+SMBJ75A	NR	NR	83.3	92.1	1.0	75	1.0	5.0	121
+SMBJ78	NS	NS	86.7	106	1.0	78	1.0	4.3	139
+SMBJ78A	NT	NT	86.7	95.8	1.0	78	1.0	4.8	126
+SMBJ85	NU	NU	94.4	115	1.0	85	1.0	4.0	151
+SMBJ85A	NV	NV	94.4	104	1.0	85	1.0	4.4	137
+SMBJ90	NW	NW	100	122	1.0	90	1.0	3.8	160
+SMBJ90A	NX	NX	100	111	1.0	90	1.0	4.1	146
+SMBJ100	NY	NY	111	136	1.0	100	1.0	3.4	179
+SMBJ100A	NZ	NZ	111	123	1.0	100	1.0	3.7	162
+SMBJ110	PD	PD	122	149	1.0	110	1.0	3.1	196
+SMBJ110A	PE	PE	122	135	1.0	110	1.0	3.4	177
+SMBJ120	PF	PF	133	163	1.0	120	1.0	2.8	214
+SMBJ120A	PG	PG	133	147	1.0	120	1.0	3.1	193
+SMBJ130	PH	PH	144	176	1.0	130	1.0	2.6	231
+SMBJ130A	PK	PK	144	159	1.0	130	1.0	2.9	209
+SMBJ150	PL	PL	167	204	1.0	150	1.0	2.2	268
+SMBJ150A	PM	PM	167	185	1.0	150	1.0	2.5	243
+SMBJ160	PN	PN	178	218	1.0	160	1.0	2.1	287
+SMBJ160A	PP	PP	178	197	1.0	160	1.0	2.3	259
+SMBJ170	PQ	PQ	189	231	1.0	170	1.0	2.0	304
+SMBJ170A	PR	PR	189	209	1.0	170	1.0	2.2	275
SMBJ188	PT	PT	209	255	1.0	188	1.0	1.7	344
SMBJ188A	PS	PS	209	231	1.0	188	1.0	2.0	328

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

(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

+ Underwriters Laboratory Recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Fig. 1 – Peak Pulse Power Rating Curve

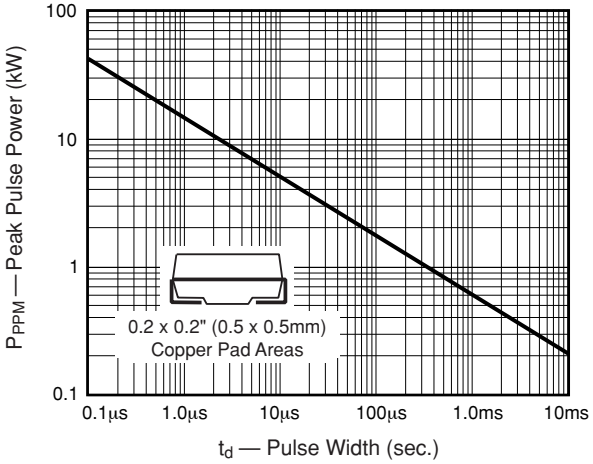


Fig. 2 – Pulse Derating Curve

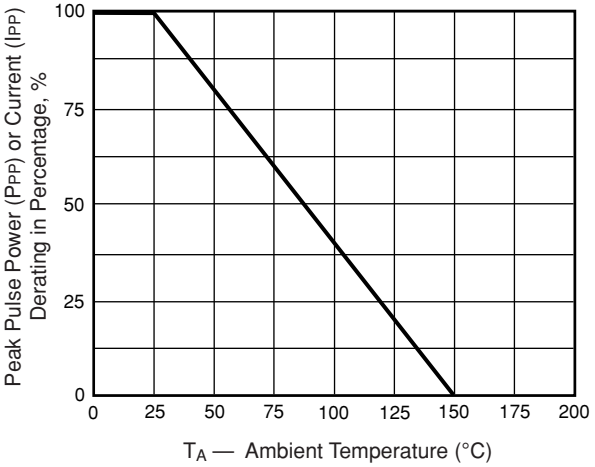


Fig. 3 – Pulse Waveform

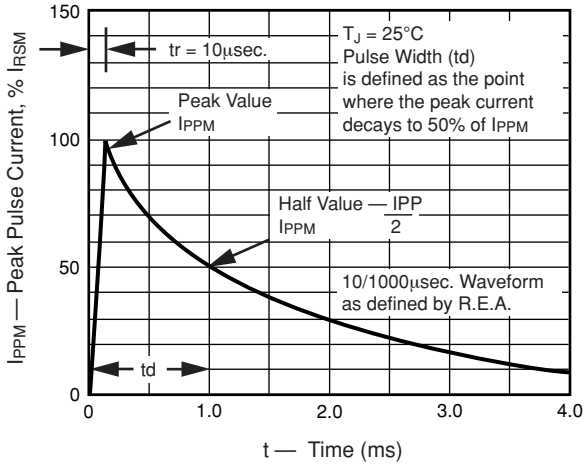


Fig. 4 – Typical Junction Capacitance

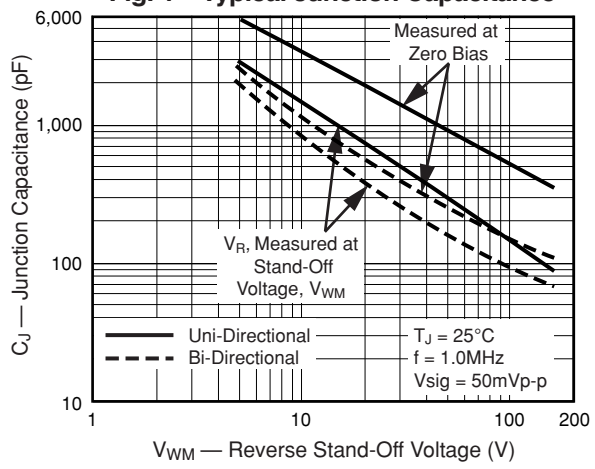


Fig. 5 – Typical Transient Thermal Impedance

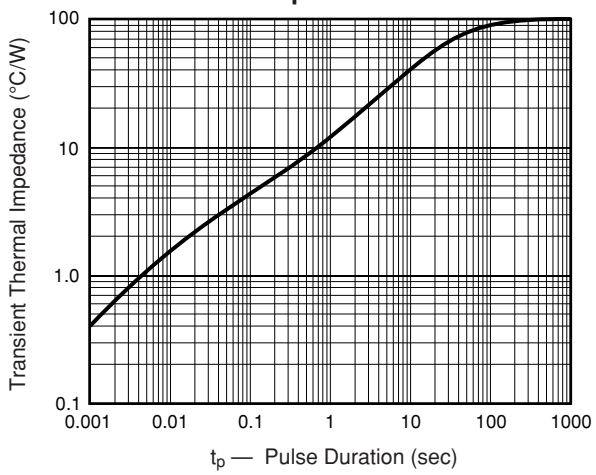
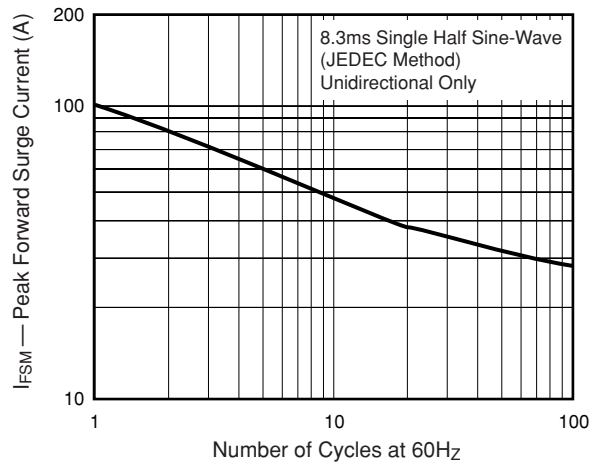


Fig. 6 – Maximum Non-Repetitive Peak Forward Surge Current



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