

### TRANSIENT VOLTAGE SUPPRESSOR

**BREAKDOWN VOLTAGE: 5.0 --- 188 V**  
**PEAK PULSE POWER: 600 W**

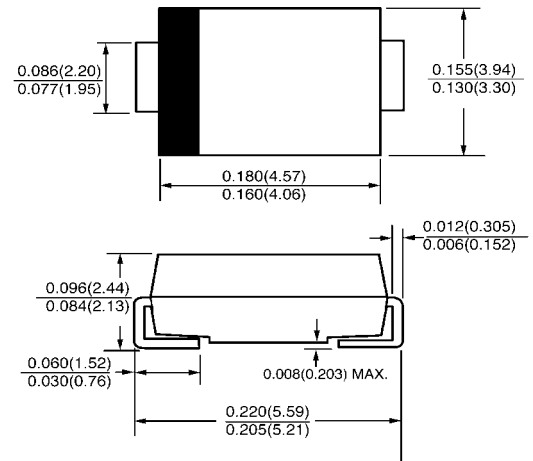
#### FEATURES

- ◇ 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 10/1000 $\mu$ 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 molded plastic over passivated junction
- ◇ Terminals: Solder plated, solderable per MIL-STD-750, method 2026
- ◇ Polarity: For uni-directional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- ◇ Weight: 0.003 ounces, 0.093 grams
- ◇ Flammability: Epoxy is rated UL 94V-0

#### DO-214AA(SMB)



inch(mm)

#### 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 CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNIT
Peak power dissipation with a 10/1000 $\mu$ s waveform (NOTE 1,2, FIG.1)	P <sub>PPM</sub>	Minimum 600	W
Peak pulse current with a 10/1000 $\mu$ s waveform (NOTE 1)	I <sub>PPM</sub>	See Table Below	A
Peak forward surge current, 8.3ms single half sine-wave uni-directional only (NOTE 2)	I <sub>FSM</sub>	100.0	A
Typical thermal resistance, junction to ambient (NOTE 3)	R <sub>θJA</sub>	100.0	°C/W
Typical thermal resistance, junction to lead	R <sub>θJL</sub>	20	°C/W
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55---+150	°C

NOTES: (1) Non-repetitive current pulses, per Fig. 3 and derated above T<sub>A</sub>=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.

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# 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 $V_{WM}$ $I_b$ ( $\mu A$ ) <sup>(3)</sup>	Maximum Peak Puls Surge Current $I_{PPM}$ (A) <sup>(2)</sup>	Maximum Clamping Voltage at $I_{PPM}$ $V_c$ (V)
	Uni	Bi	Min	Max					
+SMBJ5.0	KD	KD	6.40	7.82	10	5.0	800	62.5	9.6
+SMBJ5.0A	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	5.0	25.2	23.8
+SMBJ13A	LG	LG	14.4	15.9	1.0	13	5.0	27.9	21.5
+SMBJ14	LH	BH	15.6	19.1	1.0	14	5.0	23.3	25.8
+SMBJ14A	LK	BK	15.6	17.2	1.0	14	5.0	25.9	23.2
+SMBJ15	LL	BL	16.7	20.4	1.0	15	5.0	22.3	26.9
+SMBJ15A	LM	BM	16.7	18.5	1.0	15	5.0	24.6	24.4
+SMBJ16	LN	LN	17.8	21.8	1.0	16	5.0	20.8	28.8
+SMBJ16A	LP	LM	17.8	19.7	1.0	16	5.0	23.1	26.0
+SMBJ17	LQ	LQ	18.9	23.1	1.0	17	5.0	19.7	30.5
+SMBJ17A	LR	LR	18.9	20.9	1.0	17	5.0	21.7	27.6
+SMBJ18	LS	BS	20.0	24.4	1.0	18	5.0	18.6	32.2
+SMBJ18A	LT	BT	20.0	22.1	1.0	18	5.0	20.5	29.2
+SMBJ20	LU	LU	22.2	27.1	1.0	20	5.0	16.8	35.8
+SMBJ20A	LV	LV	22.2	24.5	1.0	20	5.0	18.5	32.4
+SMBJ22	LW	BW	24.4	29.8	1.0	22	5.0	15.2	39.4
+SMBJ22A	LX	BX	24.4	26.9	1.0	22	5.0	16.9	35.5
+SMBJ24	LY	BY	26.7	32.6	1.0	24	5.0	14.0	43.0
+SMBJ24A	LZ	BZ	26.7	29.5	1.0	24	5.0	15.4	38.9
+SMBJ26	MD	CD	28.9	35.3	1.0	26	5.0	12.9	46.6
+SMBJ26A	ME	CE	28.9	31.9	1.0	26	5.0	14.3	42.1
+SMBJ28	MF	MF	31.1	38.0	1.0	28	5.0	12.0	50.0
+SMBJ28A	MG	MG	31.1	34.4	1.0	28	5.0	13.2	45.4
+SMBJ30	MH	CH	33.3	40.7	1.0	30	5.0	11.2	53.5
+SMBJ30A	MK	CK	33.3	36.8	1.0	30	5.0	12.4	48.4

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

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(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  $I_b$  limit is doubled

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

+Underwriters Laboratory Recognition for the classification of protectors (QVG2) under the UL standard for safety 497B and file number E239431 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 $V_{WM}$ $I_D$ ( $\mu A$ ) <sup>(3)</sup>	Maximum Peak Pulse Surge Current $I_{PPM}$ (A) <sup>(2)</sup>	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V)
	Uni	Bi	Min	Max					
+SMBJ33	ML	CL	36.7	44.9	1.0	33	5.0	10.2	59.0
+SMBJ33A	MM	CM	36.7	40.6	1.0	33	5.0	11.3	53.3
+SMBJ36	MN	CN	40.0	48.9	1.0	36	5.0	9.3	64.3
+SMBJ36A	MP	CP	40.0	44.2	1.0	36	5.0	10.3	58.1
+SMBJ40	MQ	CQ	44.4	54.3	1.0	40	5.0	8.4	71.4
+SMBJ40A	MR	CR	44.4	49.1	1.0	40	5.0	9.3	64.5
+SMBJ43	MS	CS	47.8	58.4	1.0	43	5.0	7.8	76.7
+SMBJ43A	MT	CT	47.8	52.8	1.0	43	5.0	8.6	69.4
+SMBJ45	MU	MU	50.0	61.1	1.0	45	5.0	7.5	80.3
+SMBJ45A	MV	MV	50.0	55.3	1.0	45	5.0	8.3	72.7
+SMBJ48	MW	MW	53.3	65.1	1.0	48	5.0	7.0	85.5
+SMBJ48A	MX	MX	53.3	58.9	1.0	48	5.0	7.8	77.4
+SMBJ51	MY	MY	56.7	69.3	1.0	51	5.0	6.6	91.1
+SMBJ51A	MZ	MZ	56.7	62.7	1.0	51	5.0	7.3	82.4
+SMBJ54	ND	ND	60.0	73.3	1.0	54	5.0	6.2	96.3
+SMBJ54A	NE	NE	60.0	66.3	1.0	54	5.0	6.9	87.1
+SMBJ58	NF	NF	64.4	78.7	1.0	58	5.0	5.8	103
+SMBJ58A	NG	NG	64.4	71.2	1.0	58	5.0	6.4	93.6
+SMBJ60	NH	NH	66.7	81.5	1.0	60	5.0	5.6	107
+SMBJ60A	NK	NK	66.7	73.7	1.0	60	5.0	6.2	96.8
+SMBJ64	NL	NL	71.1	86.9	1.0	64	5.0	5.3	114
+SMBJ64A	NM	NM	71.1	78.6	1.0	64	5.0	5.8	103
+SMBJ70	NN	NN	77.8	95.1	1.0	70	5.0	4.8	125
+SMBJ70A	NP	NP	77.8	86.0	1.0	70	5.0	5.3	113
+SMBJ75	NQ	NQ	83.3	102	1.0	75	5.0	4.5	134
+SMBJ75A	NR	NR	83.3	92.1	1.0	75	5.0	5.0	121
+SMBJ78	NS	NS	86.7	106	1.0	78	5.0	4.3	139
+SMBJ78A	NT	NT	86.7	95.8	1.0	78	5.0	4.8	126
+SMBJ85	NU	NU	94.4	115	1.0	85	5.0	4.0	151
+SMBJ85A	NV	NV	94.4	104	1.0	85	5.0	4.4	137
+SMBJ90	NW	NW	100	122	1.0	90	5.0	3.8	160
+SMBJ90A	NX	NX	100	111	1.0	90	5.0	4.1	146
+SMBJ100	NY	NY	111	136	1.0	100	5.0	3.4	179
+SMBJ100A	NZ	NZ	111	123	1.0	100	5.0	3.7	162
+SMBJ110	PD	PD	122	149	1.0	110	5.0	3.1	196
+SMBJ110A	PE	PE	122	135	1.0	110	5.0	3.4	177
+SMBJ120	PF	PF	133	163	1.0	120	5.0	2.8	214
+SMBJ120A	PG	PG	133	147	1.0	120	5.0	3.1	193
+SMBJ130	PH	PH	144	176	1.0	130	5.0	2.6	231
+SMBJ130A	PK	PK	144	159	1.0	130	5.0	2.9	209
+SMBJ150	PL	PL	167	204	1.0	150	5.0	2.2	268
+SMBJ150A	PM	PM	167	185	1.0	150	5.0	2.5	243
+SMBJ160	PN	PN	178	218	1.0	160	5.0	2.1	287
+SMBJ160A	PP	PP	178	197	1.0	160	5.0	2.3	259
+SMBJ170	PQ	PQ	189	231	1.0	170	5.0	2.0	304
+SMBJ170A	PR	PR	189	209	1.0	170	5.0	2.2	275
+SMBJ188	PT	PT	209	255	1.0	188	5.0	1.7	344
+SMBJ188A	PS	PS	209	231	1.0	188	5.0	2.0	328

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

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

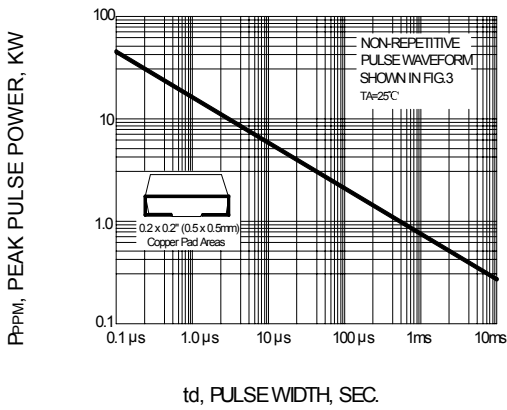
(3) For bi-directional types having  $V_{WM}$  of 10 Volts and less, the  $I_D$  limit is doubled

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

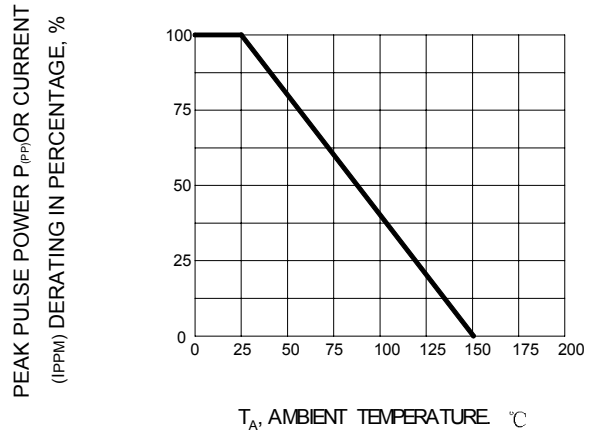
(5) For the bidirectional SMBG/SMBJ5.0CA, the maximum  $V_{(BR)}$  is 7.25V

+Underwriters Laboratory Recognition for the classification of protectors (QVG2) under the UL standard for safety 497B and file number E239431 for both uni-directional and bi-directional devices

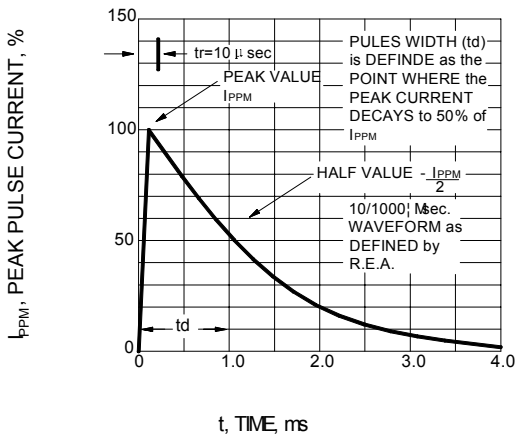
**FIG.1 – PEAK PULSE POWER RATING CURVE**



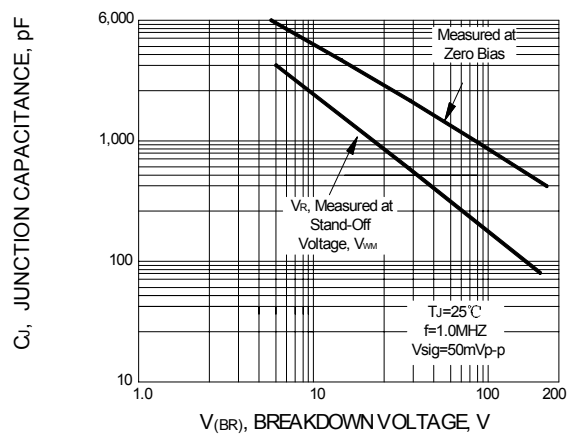
**FIG.2 – PULSE DERATING CURVE**



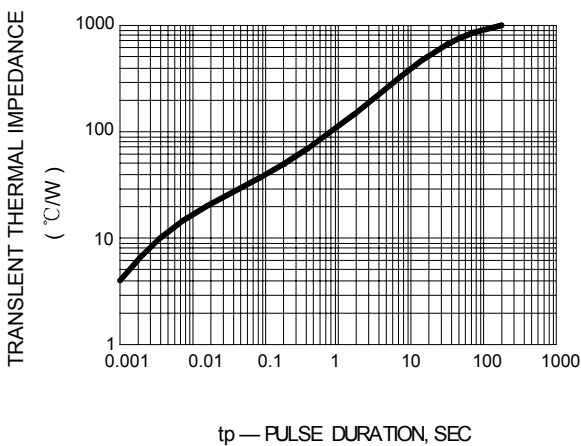
**FIG.3 – PULSE WAVEFORM**



**FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL**



**FIG.5 – TYPICAL TRANSIENT THERMAL IMPEDANCE**



**FIG.6 – MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT**

