

Transient Voltage Suppressor: SMBJ5.0 - SMBJ440CA

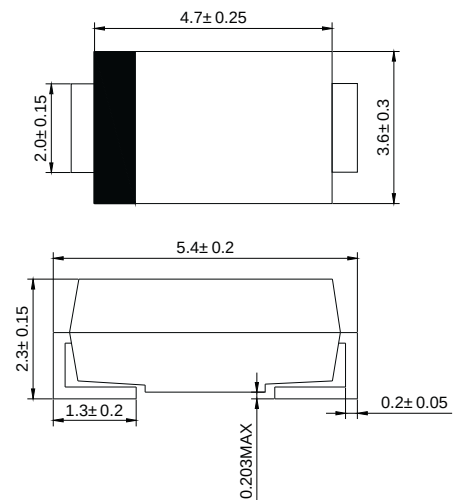
Features:

- 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 secs at terminals

Mechanical Data:

- Case: JEDEC DO-214AA moulded plastic over glass passivated junction
- Polarity: For uni-directional types the colour band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- Weight: 0.0003 ounces, 0.093 grams
- Flammability: epoxy is rated UL 94V-0

DO-214AA(SMB)



Dimensions in millimeters

Devices for Bidirectional Applications:

For bi-directional devices, use suffix C or CA (eg SMBJ10C, SMBJ10CA). Electrical characteristics apply in both directions. No colour band on bi-directional devices.

Maximum Ratings & Characteristics: Tamb=25°C

	Symbol:	Value:	Unit:
Peak power dissipation with a 10/1000µs waveform (NOTE1,2,FIG1)	P_{PPM}	Minimum 600	W
Peak pulse current with a 10/1000µs waveform (NOTE1)	I_{PPM}	See table below	A
Peak forward surge current, 8.3ms single half sine-wave uni-directional only (NOTE2)	I_{FSM}	100.0	A
Typical thermal resistance, junction to ambient (NOTE3)	R_{thJA}	100.0	°C/W
Typical thermal resistance, junction to lead	R_{thJL}	20	°C/W
Operational junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes:

1. Non-repetitive current pulses, per fig.3 and derated above $T_A=25^\circ\text{C}$ 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: $T_{amb}=25^{\circ}\text{C}$ unless otherwise specified $V_F=3.5\text{V}$ @ $I_F=50\text{A}$ (uni-directional only)

Type: Part No add C for Bi-directional	Device Marking Code:		$V_{(BR)}$			V_{WM}	$I_{RM} @ V_{WM}$	I_{PPM}	$V_c @ I_{PPM}$
	UNI	BI	Min (V)	Max (V)	mA (@ I_r)	μV	A	A	V
SMBJ5.0 (C)	BAD	BWD	6.40	7.82	10	5.0	800	62.5	9.6
SMBJ5.0 (C)A	BAE	BWE	6.40	7.07	10	5.0	800	65.2	9.2
SMBJ6.0 (C)	BAF	BWF	6.67	8.15	10	6.0	800	52.6	11.4
SMBJ6.0 (C)A	BAG	BWG	6.67	8.15	10	6.0	800	58.3	10.3
SMBJ6.5 (C)	BAH	BWH	7.22	8.82	10	6.5	500	48.8	12.3
SMBJ6.5 (C)A	BAK	BWK	7.22	7.98	10	6.5	500	53.6	11.2
SMBJ7.0 (C)	BAL	BWL	7.78	9.51	10	7.0	200	45.1	13.3
SMBJ7.0 (C)A	BAM	BWM	7.78	8.60	10	7.0	200	50.0	12.0
SMBJ7.5 (C)	BAN	BWN	8.33	10.2	1.0	7.5	100	42.0	14.3
SMBJ7.5 (C)A	BAP	BWP	8.33	9.21	1.0	.5	100	46.5	12.9
SMBJ8.0 (C)	BAQ	BWQ	8.89	10.9	1.0	8.0	50	40.0	15.0
SMBJ8.0 (C)A	BAR	BWR	8.89	9.83	1.0	8.0	50	44.1	13.6
SMBJ8.5 (C)	BAS	BWS	9.44	11.5	1.0	8.5	20	37.7	15.9
SMBJ8.5 (C)A	BAT	BWT	9.44	10.4	1.0	8.5	20	41.7	14.4
SMBJ9.0 (C)	BAU	BWU	10.0	12.2	1.0	9.0	10	35.5	16.9
SMBJ9.0 (C)A	BAV	BWV	10.0	11.1	1.0	9.0	10	39.0	15.4
SMBJ10 (C)	BAW	BWW	11.1	13.6	1.0	10	5.0	31.9	18.8
SMBJ10 (C)A	BAX	BWX	11.1	12.3	1.0	10	5.0	35.3	17.0
SMBJ11 (C)	BAY	BWY	12.2	14.9	1.0	11	5.0	29.9	20.1
SMBJ11 (C)A	BAZ	BWZ	12.2	13.5	1.0	11	5.0	33.0	18.2
SMBJ12 (C)	BBD	BXD	13.3	16.2	1.0	12	5.0	27.3	22.0
SMBJ12 (C)A	BBE	BXE	13.3	14.7	1.0	12	5.0	30.2	19.9
SMBJ13 (C)	BBF	BXF	14.4	17.6	1.0	13	5.0	25.2	23.8
SMBJ13 (C)A	BBG	BXG	14.4	15.9	1.0	13	5.0	27.9	21.5
SMBJ14 (C)	BBH	BXH	15.6	19.1	1.0	14	5.0	23.3	25.8
SMBJ14 (C)A	BBK	BXK	15.6	17.2	1.0	14	5.0	25.9	23.2
SMBJ15 (C)	BBL	BXL	16.7	20.4	1.0	15	5.0	22.3	26.9
SMBJ15 (C)A	BBM	BXM	16.7	18.5	1.0	15	5.0	24.6	24.4
SMBJ16 (C)	BBN	BXN	17.8	21.8	1.0	16	5.0	20.8	28.8
SMBJ16 (C)A	BBP	BXP	17.8	19.7	1.0	16	5.0	23.1	26.0
SMBJ17 (C)	BBQ	BXQ	18.9	23.1	1.0	17	5.0	19.7	30.5
SMBJ17 (C)A	BBR	BXR	18.9	20.9	1.0	17	5.0	21.7	27.6
SMBJ18 (C)	BBS	BXS	20.0	24.4	1.0	18	5.0	18.6	32.2
SMBJ18 (C)A	BBT	BXT	20.0	22.1	1.0	18	5.0	20.5	29.2
SMBJ20 (C)	BBU	BXU	22.2	27.1	1.0	20	5.0	16.8	35.8
SMBJ20 (C)A	BBV	BXV	22.2	24.5	1.0	20	5.0	18.5	32.4

Electrical Characteristics: $T_{amb}=25^{\circ}\text{C}$ unless otherwise specified $V_F=3.5\text{V}$ @ $I_F=50\text{A}$ (uni-directional only)

Type: Part No add C for Bi-directional	Device Marking Code:		$V_{(BR)}$			V_{WM}	I_{RM} @ V_{WM}	I_{PPM}	V_c @ I_{PPM}
	UNI	BI	Min (V)	Max (V)	mA (@ I_T)	μV	A	A	V
SMBJ22 (C)	BBW	BXW	24.4	29.8	1.0	22	5.0	15.2	39.4
SMBJ22 (C)A	BBX	BXX	24.4	26.9	1.0	22	5.0	16.9	35.5
SMBJ2 (C)4	BBY	BXY	26.7	32.6	1.0	24	5.0	14.0	43.0
SMBJ24 (C)A	BBZ	BXZ	26.7	29.5	1.0	24	5.0	15.4	38.9
SMBJ26 (C)	BCD	BYD	28.9	35.3	1.0	26	5.0	12.9	46.6
SMBJ26 (C)A	BCE	BYE	28.9	31.9	1.0	26	5.0	14.3	42.1
SMBJ28 (C)	BCF	BYF	31.1	38.0	1.0	28	5.0	12.0	50.0
SMBJ28 (C)A	BCG	BYG	31.1	34.4	1.0	28	5.0	13.2	45.4
SMBJ30 (C)	BCH	BYH	33.3	40.7	1.0	30	5.0	11.2	53.5
SMBJ30 (C)A	BCK	BYK	33.3	36.8	1.0	30	5.0	12.4	48.4
SMBJ33 (C)	BCL	BYL	36.7	44.9	1.0	33	5.0	10.2	59.0
SMBJ33 (C)A	BCM	BYM	36.7	40.6	1.0	33	5.0	11.3	53.3
SMBJ36 (C)	BCN	BYN	40.0	48.9	1.0	36	5.0	9.3	64.3
SMBJ36 (C)A	BCP	BYP	40.0	44.2	1.0	36	5.0	10.3	58.1
SMBJ40 (C)	BCQ	BYQ	44.4	54.3	1.0	40	5.0	8.4	71.4
SMBJ40 (C)A	BCR	BYR	44.4	49.1	1.0	40	5.0	9.3	64.5
SMBJ43 (C)	BCS	BYS	47.8	58.4	1.0	43	5.0	7.8	76.7
SMBJ43 (C)A	BCT	BYT	47.8	52.8	1.0	43	5.0	8.6	69.4
SMBJ45 (C)	BCU	BYU	50.0	61.1	1.0	45	5.0	7.5	80.3
SMBJ45 (C)A	BCV	BYV	50.0	55.3	1.0	45	5.0	8.3	72.7
SMBJ48 (C)	BCW	BYW	53.3	65.1	1.0	48	5.0	7.0	85.5
SMBJ48 (C)A	BCX	BYX	53.3	58.9	1.0	48	5.0	7.8	77.4
SMBJ51 (C)	BCY	BYY	56.7	69.3	1.0	51	5.0	6.6	91.1
SMBJ51 (C)A	BCZ	BYZ	56.7	62.7	1.0	51	5.0	7.3	82.4
SMBJ54 (C)	BRD	BZD	60.0	73.3	1.0	54	5.0	6.2	96.3
SMBJ54 (C)A	BRE	BZE	60.0	66.3	1.0	54	5.0	6.9	87.1
SMBJ58 (C)	BRF	BZF	64.4	78.7	1.0	58	5.0	5.8	103
SMBJ58 (C)A	BRG	BZG	64.4	71.2	1.0	58	5.0	6.4	93.6
SMBJ60 (C)	BRH	BZH	66.7	81.5	1.0	60	5.0	5.6	107
SMBJ60 (C)A	BRK	BZK	66.7	73.7	1.0	60	5.0	6.2	96.8
SMBJ64 (C)	BRL	BZL	71.1	86.9	1.0	64	5.0	5.3	114
SMBJ64 (C)A	BRM	BZM	71.1	78.6	1.0	64	5.0	5.8	103
SMBJ70 (C)	BRN	BZN	77.8	95.1	1.0	70	5.0	4.8	125
SMBJ70 (C)A	BRP	BZP	77.8	86.0	1.0	70	5.0	5.3	113
SMBJ75 (C)	BRQ	BZQ	83.3	102	1.0	75	5.0	4.5	134
SMBJ75 (C)A	BRR	BZR	83.3	92.1	1.0	75	5.0	5.0	121

Electrical Characteristics: T_{amb}=25°C unless otherwise specified V_F=3.5V @ I_F=50A (uni-directional only)

Type: Part No add C for Bi-directional	Device Marking Code:		V _(BR)			V _{WM}	I _{RM} @ V _{WM}	I _{PPM}	V _C @ I _{PPM}
			Min (V)	Max (V)	mA (@I _F)	μV	A	A	V
SMBJ78 (C)	BRS	BZS	86.7	106	1.0	78	5.0	4.3	139
SMBJ78 (C)A	BRT	BZT	86.7	95.8	1.0	78	5.0	4.8	126
SMBJ85 (C)	BRU	BZU	94.4	115	1.0	85	5.0	4.0	151
SMBJ85 (C)A	BRV	BZV	94.4	104	1.0	85	5.0	4.4	137
SMBJ90 (C)	BRW	BZW	100	122	1.0	90	5.0	3.8	160
SMBJ90 (C)A	BRX	BZX	100	111	1.0	90	5.0	4.1	146
SMBJ100 (C)	BRY	BZY	111	136	1.0	100	5.0	3.4	179
SMBJ100 (C)A	BRZ	BZZ	111	123	1.0	100	5.0	3.7	162
SMBJ110 (C)	BSD	BVD	122	149	1.0	110	5.0	3.1	196
SMBJ110 (C)A	BSE	BVE	122	135	1.0	110	5.0	3.4	177
SMBJ120 (C)	BSF	BVF	133	163	1.0	120	5.0	2.8	214
SMBJ120 (C)A	BSG	BVG	133	147	1.0	120	5.0	3.1	193
SMBJ130 (C)	BSH	BVH	144	176	1.0	130	5.0	2.6	231
SMBJ130 (C)A	BSK	BVK	144	159	1.0	130	5.0	2.9	209
SMBJ150 (C)	BSL	BVL	167	204	1.0	150	5.0	2.2	268
SMBJ150 (C)A	BSM	BVM	167	185	1.0	150	5.0	2.5	243
SMBJ160 (C)	BSN	BVN	178	218	1.0	160	5.0	2.1	287
SMBJ160 (C)A	BSP	BVP	178	197	1.0	160	5.0	2.3	259
SMBJ170 (C)	BSQ	BVQ	189	231	1.0	170	5.0	2.0	304
SMBJ170 (C)A	BSR	BVR	189	209	1.0	170	5.0	2.2	275
SMBJ188 (C)	BST	BVT	209	255	1.0	168	5.0	1.7	344
SMBJ188 (C)A	BSS	BVS	209	231	1.0	188	5.0	2.0	328
SMBJ200 (C)	BSU	BVU	222	271	1.0	200	5.0	1.6	375
SMBJ200 (C)A	BSV	BVV	222	246	1.0	200	5.0	1.9	324
SMBJ220 (C)	BSW	BVW	244	298	1.0	220	5.0	1.4	428
SMBJ220 (C)A	BSX	BVX	244	271	1.0	220	5.0	1.7	356
SMBJ240 (C)	BSY	BVY	267	326	1.0	240	5.0	1.2	500
SMBJ240 (C)A	BSZ	BVZ	267	296	1.0	240	5.0	1.5	405
SMBJ300 (C)	BTF	BXF	333	406	1.0	300	5.0	1.1	545
SMBJ300 (C)A	BTG	BXG	333	370	1.0	300	5.0	1.3	486
SMBJ360 (C)	BTH	BXH	400	488	1.0	360	5.0	0.9	667
SMBJ360 (C)A	BTK	BXK	400	444	1.0	360	5.0	1.1	567
SMBJ400 (C)	BTL	BXL	444	542	1.0	400	5.0	0.7	832
SMBJ400 (C)A	BTM	BXM	444	493	1.0	400	5.0	0.9	648
SMBJ440 (C)	BTN	BXN	489	597	1.0	440	5.0	0.7	857
SMBJ440 (C)A	BTP	BXP	489	543	1.0	440	5.0	0.9	713

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Ratings & Characteristic Curves

FIG.1 – PEAK PULSE POWER RATING CURVE

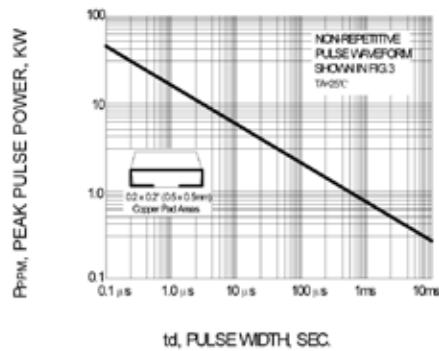


FIG.2 – PULSE DERATING CURVE

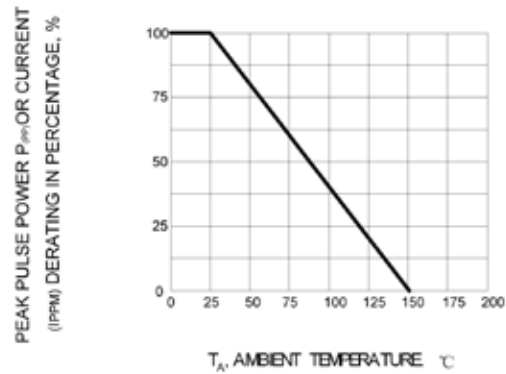


FIG.3 – PULSE WAVEFORM

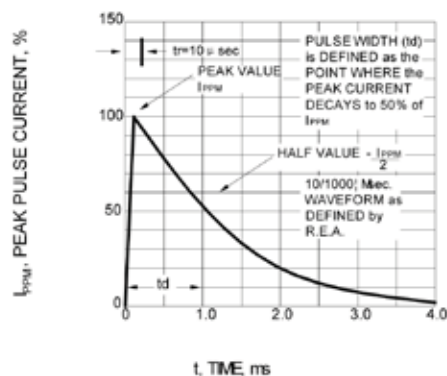


FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

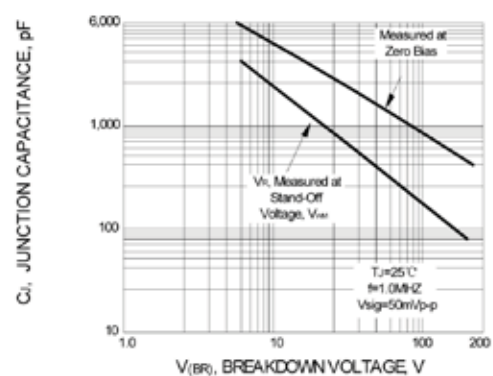


FIG.5 – TYPICAL TRANSIENT THERMAL IMPEDANCE

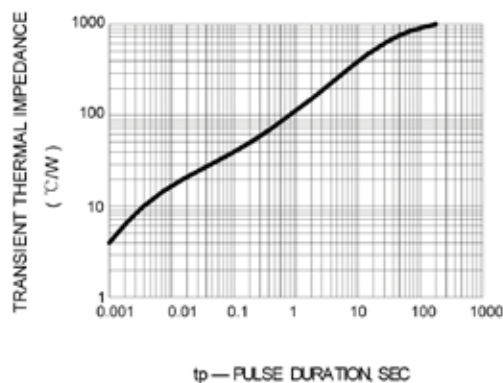


FIG.6 – MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

