

# SMBJ Series

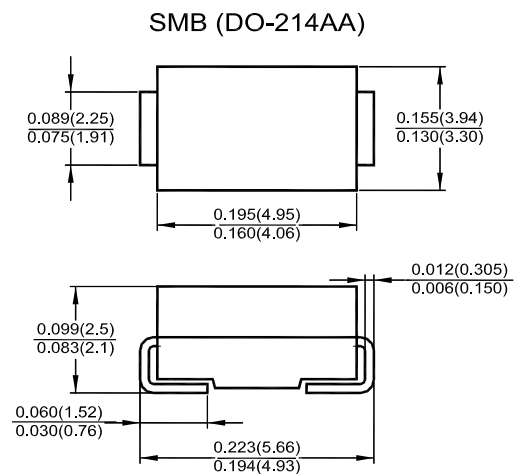
## Transient Voltage Suppressors

### Features

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 600 W peak pulse power capability
- Excellent clamping capability

### Mechanical Data

- **Case:** SMB (DO-214AA) molded plastic
- **Terminals:** Solder plated
- **Polarity:** For unidirectional types the color band denotes the cathode (except for bidirectional types)
- **Mounting Position:** Any



Dimensions in inches and (millimeters)

### Description

- Devices for bidirectional applications
- For bidirectional use C or CA suffix for types SMBJ5.0 thru types SMBJ440A (e.g. SMBJ5.0C, SMBJ440CA)
- Electrical characteristics apply in both directions

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ unless otherwise specified)

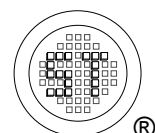
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation <sup>1)</sup>	$P_{PPM}$	Min. 600	W
Peak Pulse Current <sup>1)</sup>	$I_{PPM}$	See Next Table	A
Steady State Power Dissipation <sup>2)</sup>	$P_{PK}$	2	W
Peak Forward Surge Current, Unidirectional only <sup>3)</sup>	$I_{FSM}$	100	A
Maximum Instantaneous Forward Voltage at 50 A, Unidirectional only <sup>4)</sup>	$V_F$	3.5 / 5	V
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	- 55 to + 150	$^\circ\text{C}$

<sup>1)</sup> Pulse with a 10 / 1000  $\mu\text{s}$  waveform.

<sup>2)</sup> Mounted on a 5 X 5 X 0.013 mm Copper pads to each terminal.

<sup>3)</sup> Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum. For uni-directional devices only.

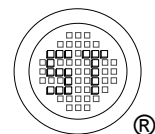
<sup>4)</sup>  $V_F$ : 3.5 V Max. for types SMBJ5.0~SMBJ90,  $V_F$ : 5 V Max. for types SMBJ100~SMBJ440



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## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ unless otherwise specified)

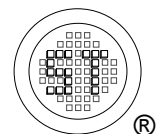
Uni-directional / Bi-directional Type <sup>3)</sup>	Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage <sup>1)</sup>		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) at $I_{PPM}$	Maximum Peak Pulse Current $I_{PPM}$ (A)	Maximum Reverse Leakage <sup>2)</sup> $I_D$ ( $\mu\text{A}$ ) at $V_{WM}$
		$V_{BR}$ (V) Min. at $I_T$	$V_{BR}$ (V) Max. at $I_T$				
SMBJ5.0 / C	5	6.4	7.3	10	9.6	65	800
SMBJ5.0A / CA	5	6.4	7	10	9.2	68	800
SMBJ6.0 / C	6	6.67	8.15	10	11.4	55	800
SMBJ6.0A / CA	6	6.67	7.37	10	10.3	61	800
SMBJ6.5 / C	6.5	7.22	8.82	10	12.3	51	500
SMBJ6.5A / CA	6.5	7.22	7.98	10	11.2	56	500
SMBJ7.0 / C	7	7.78	9.51	10	13.3	47	200
SMBJ7.0A / CA	7	7.78	8.6	10	12	52	200
SMBJ7.5 / C	7.5	8.33	10.3	1	14.3	44	100
SMBJ7.5A / CA	7.5	8.33	9.21	1	12.9	48	100
SMBJ8.0 / C	8	8.89	10.9	1	15	42	50
SMBJ8.0A / CA	8	8.89	9.83	1	13.6	46	50
SMBJ8.5 / C	8.5	9.44	11.5	1	15.9	39	20
SMBJ8.5A / CA	8.5	9.44	10.4	1	14.4	43	20
SMBJ9.0 / C	9	10	12.2	1	16.9	37	10
SMBJ9.0A / CA	9	10	11.1	1	15.4	40	10
SMBJ10 / C	10	11.1	13.6	1	18.8	33	5
SMBJ10A / CA	10	11.1	12.3	1	17	37	5
SMBJ11 / C	11	12.2	14.9	1	20.1	31	5
SMBJ11A / CA	11	12.2	13.5	1	18.2	34	5
SMBJ12 / C	12	13.3	16.3	1	22	28	5
SMBJ12A / CA	12	13.3	14.7	1	19.9	31	5
SMBJ13 / C	13	14.4	17.6	1	23.8	26	5
SMBJ13A / CA	13	14.4	15.9	1	21.5	29	5
SMBJ14 / C	14	15.6	19.1	1	25.8	24.4	5
SMBJ14A / CA	14	15.6	17.2	1	23.2	27	5
SMBJ15 / C	15	16.7	20.4	1	26.9	23.1	5
SMBJ15A / CA	15	16.7	18.5	1	24.4	25.1	5
SMBJ16 / C	16	17.8	21.8	1	28.8	21.8	5
SMBJ16A / CA	16	17.8	19.7	1	26	24.2	5
SMBJ17 / C	17	18.9	23.1	1	30.5	20	5
SMBJ17A / CA	17	18.9	20.9	1	27.6	22.8	5
SMBJ18 / C	18	20	24.4	1	32.2	19.5	5
SMBJ18A / CA	18	20	22.1	1	29.2	21.5	5
SMBJ20 / C	20	22.2	27.1	1	35.8	17.6	5
SMBJ20A / CA	20	22.2	24.5	1	32.4	19.4	5
SMBJ22 / C	22	24.4	29.8	1	39.4	15	5
SMBJ22A / CA	22	24.4	26.9	1	35.5	17.7	5
SMBJ24 / C	24	26.7	32.6	1	43	14.6	5
SMBJ24A / CA	24	26.7	29.5	1	38.9	16	5
SMBJ26 / C	26	28.9	35.3	1	46.6	13.5	5
SMBJ26A / CA	26	28.9	31.9	1	42.1	14.9	5
SMBJ28 / C	28	31.1	38	1	50	12.6	5
SMBJ28A / CA	28	31.1	34.4	1	45.4	13.8	5
SMBJ30 / C	30	33.3	40.7	1	53.5	11.7	5
SMBJ30A / CA	30	33.3	36.8	1	48.4	13	5
SMBJ33 / C	33	36.7	44.9	1	59	10.6	5
SMBJ33A / CA	33	36.7	40.6	1	53.3	11.8	5



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## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ unless otherwise specified)

Uni-directional / Bi-directional Type <sup>3)</sup>	Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage <sup>1)</sup>		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) at $I_{PPM}$	Maximum Peak Pulse Current $I_{PPM}$ (A)	Maximum Reverse Leakage <sup>2)</sup> $I_D$ ( $\mu\text{A}$ ) at $V_{WM}$
		$V_{BR}$ (V) Min. at $I_T$	$V_{BR}$ (V) Max. at $I_T$				
SMBJ36 / C	36	40	48.9	1	64.3	9.8	5
SMBJ36A / CA	36	40	44.2	1	58.1	10.8	5
SMBJ40 / C	40	44.4	54.3	1	71.4	8.8	5
SMBJ40A / CA	40	44.4	49.1	1	64.5	9.7	5
SMBJ43 / C	43	47.8	58.4	1	76.7	8.2	5
SMBJ43A / CA	43	47.8	52.8	1	69.4	9	5
SMBJ45 / C	45	50	61.1	1	80.3	7.8	5
SMBJ45A / CA	45	50	55.3	1	72.7	8.6	5
SMBJ48 / C	48	53.3	65.1	1	85.5	7.3	5
SMBJ48A / CA	48	53.3	58.9	1	77.4	8.1	5
SMBJ51 / C	51	56.7	69.3	1	91.1	6.9	5
SMBJ51A / CA	51	56.7	62.7	1	82.4	7.6	5
SMBJ54 / C	54	60	73.3	1	96.3	6.5	5
SMBJ54A / CA	54	60	66.3	1	87.1	7.2	5
SMBJ58 / C	58	64.4	78.7	1	103	6.1	5
SMBJ58A / CA	58	64.4	71.2	1	93.6	6.7	5
SMBJ60 / C	60	66.7	81.5	1	107	5.8	5
SMBJ60A / CA	60	66.7	73.7	1	96.8	6.5	5
SMBJ64 / C	64	71.1	86.9	1	114	5.5	5
SMBJ64A / CA	64	71.1	78.6	1	103	6.1	5
SMBJ70 / C	70	77.8	95.1	1	125	5	5
SMBJ70A / CA	70	77.8	86	1	113	5.5	5
SMBJ75 / C	75	83.3	102	1	134	4.7	5
SMBJ75A / CA	75	83.3	92.1	1	121	5.2	5
SMBJ78 / C	78	86.7	106	1	139	4.5	5
SMBJ78A / CA	78	86.7	95.8	1	126	5	5
SMBJ85 / C	85	94.4	115	1	151	4.1	5
SMBJ85A / CA	85	94.4	104	1	137	4.6	5
SMBJ90 / C	90	100	122	1	160	3.9	5
SMBJ90A / CA	90	100	111	1	146	4.3	5
SMBJ100 / C	100	111	136	1	179	3.5	5
SMBJ100A / CA	100	111	123	1	162	3.8	5
SMBJ110 / C	110	122	149	1	196	3.2	5
SMBJ110A / CA	110	122	135	1	177	3.5	5
SMBJ120 / C	120	133	163	1	214	2.9	5
SMBJ120A / CA	120	133	147	1	193	3.2	5
SMBJ130 / C	130	144	176	1	231	2.7	5
SMBJ130A / CA	130	144	159	1	209	3	5
SMBJ150 / C	150	167	204	1	268	2.3	5
SMBJ150A / CA	150	167	185	1	243	2.5	5
SMBJ160 / C	160	178	218	1	287	2.2	5
SMBJ160A / CA	160	178	197	1	259	2.4	5
SMBJ170 / C	170	189	231	1	304	2	5
SMBJ170A / CA	170	189	209	1	275	2.2	5
SMBJ180 / C	180	200.2	244.8	1	322.2	1.8	5
SMBJ180A / CA	180	201	222	1	292	2.1	5



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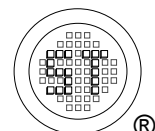
## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ unless otherwise specified)

Uni-directional / Bi-directional Type <sup>3)</sup>	Stand-off Voltage $V_{WM}$ (V)	Breakdown Voltage <sup>1)</sup>		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C$ (V) at $I_{PPM}$	Maximum Peak Pulse Current $I_{PPM}$ (A)	Maximum Reverse Leakage <sup>2)</sup> $I_D$ ( $\mu\text{A}$ ) at $V_{WM}$
		$V_{BR}$ (V) Min. at $I_T$	$V_{BR}$ (V) Max. at $I_T$				
SMBJ188 / C	188	209	255	1	344	1.7	1
SMBJ188A / CA	188	209	231	1	328	2	1
SMBJ200 / C	200	222	271	1	351	1.7	1
SMBJ200A / CA	200	222	246	1	323	1.9	1
SMBJ220 / C	220	245	299	1	386	1.6	1
SMBJ220A / CA	220	245	270	1	355	1.7	1
SMBJ250 / C	250	278	339	1	439	1.4	1
SMBJ250A / CA	250	278	307	1	403	1.5	1
SMBJ300 / C	300	334	407	1	526	1.1	1
SMBJ300A / CA	300	334	368	1	484	1.2	1
SMBJ350 / C	350	389	475	1	614	1	1
SMBJ350A / CA	350	389	430	1	565	1.1	1
SMBJ400 / C	400	445	543	1	702	0.9	1
SMBJ400A / CA	400	445	491	1	645	0.9	1
SMBJ440 / C	440	489	597	1	772	0.8	1
SMBJ440A / CA	440	489	540	1	710	0.8	1

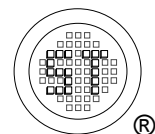
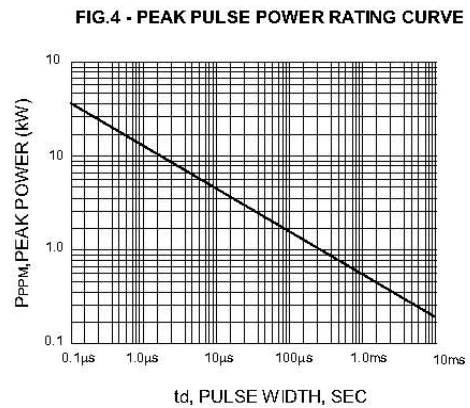
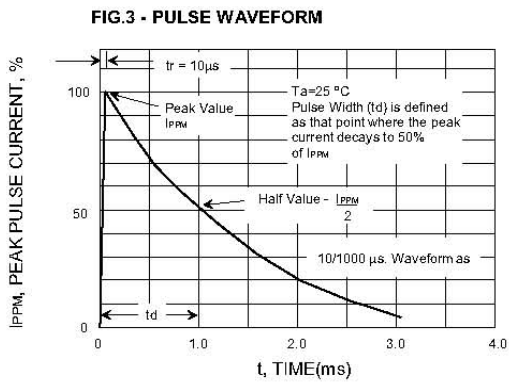
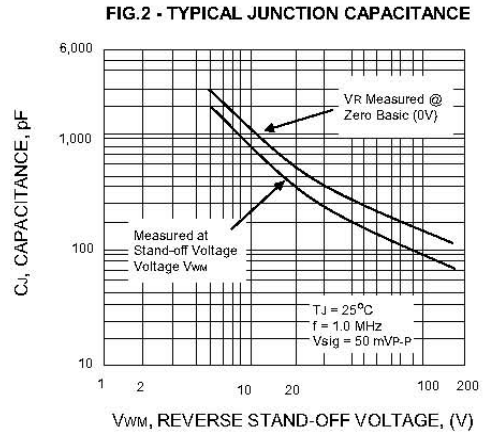
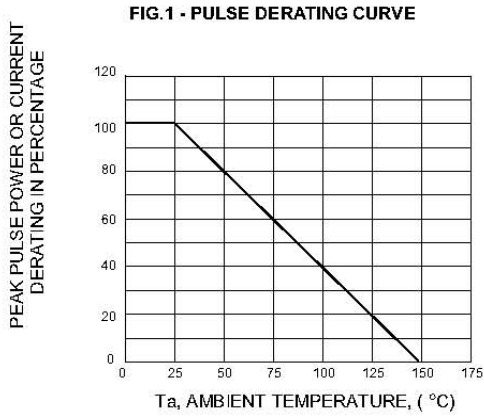
<sup>1)</sup>  $V_{BR}$  measured after  $I_T$  applied for 300  $\mu\text{s}$  square wave pulse or equivalent.

<sup>2)</sup> For bidirectional types having  $V_{RWM}$  of 10 V and less, the  $I_D$  limit is doubled.

<sup>3)</sup> For bidirectional use C or CA suffix types, the electrical characteristics apply in both directions.



## RATING AND CHARACTERISTIC CURVES (SMBJ5.0C - SMBJ440CA)



## RATING AND CHARACTERISTIC CURVES (SMBJ5.0 - SMBJ440A)

FIG. 1 - PULSE DERATING CURVE

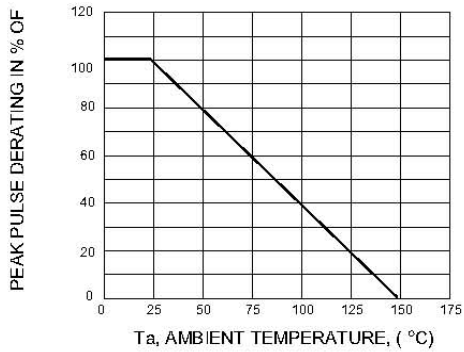


FIG. 2 - MAXIMUM NON-REPETITIVE PERK FORWARD SURGE CURRENT

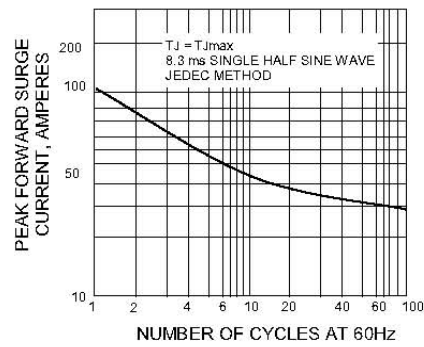


FIG. 3 - TYPICAL JUNCTION CAPACITANCE

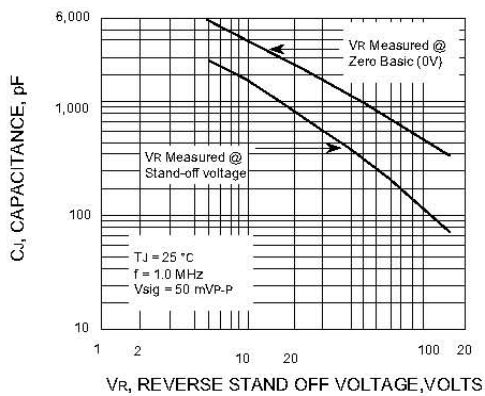


FIG. 4 - PEAK PULSE POWER RATING CURVE

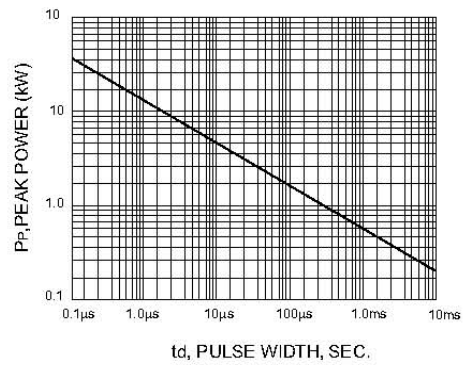


FIG. 5 - PULSE WAVEFORM

