

SMBJ SERIES

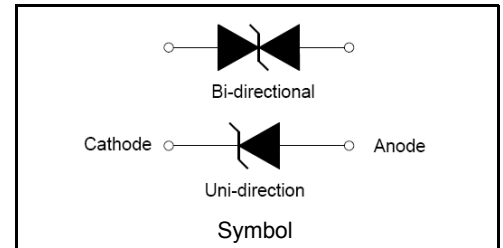
Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors

Features

- Voltage Range 5.0V - 440V
- 600W Peak Pulse Power Dissipation
- For surface mounted applications
- Reliable low cost construction utilizing molded plastic technique
- Response Time is Typically < 1 ns
- Uni-direction, less than 5.0ns for Bi-direction, from 0 Volts to BV min
- ESD Rating of above 16 kV per Human Body Model
- ESD Rating of above 30 kV (Contact Discharge) per IEC61000-4-2
- EFT (Electrical Fast Transients) Rating of 40 A per IEC61000-4-4
- 4kW (8/20 μ s) Peak Pulse Power Dissipation per IEC61000-4-5
- Plastic material has UL flammability classification 94V-0
- Typical IR less than 1uA above 10V
- Meets MSL 1 Requirements
- Solid-state silicon avalanche technology
- Lead and body according with RoHS standard



SMB



Complies with the following standards

- IEC 61000-4-2 level 4:
 - 30 kV (air discharge)
 - 30 kV (contact discharge)
- IEC 61000-4-5
- MIL STD 883G, method 3015-7: class 3B
- Resin meets UL 94, V0
- ROHS compliant

Ordering Information

Device	Qty per Reel	Reel Size
SMBJxxA(CA)X	3000	13Inch

“xx” = Working Peak Reverse Voltage

Maximum Ratings and Electrical Characteristics

Characteristics	Symbols	Value	Unit
Peak Power Dissipation At $T_j = 25^\circ\text{C}$, $T_p = 1\text{ms}$ (Note 1,2)	P_{PK}	600	W
Peak Forward Surge Current 8.3ms single half sine-wave super	I_{FSM}	100	A
Typical Junction capacitance at $V_R=4\text{V}$, $f=1\text{MHz}$	C_J	390	pF
Lead Soldering Temperature	T_L	260 (10 sec.)	$^\circ\text{C}$
Operating Temperature Range	T_J	-55 to +155	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

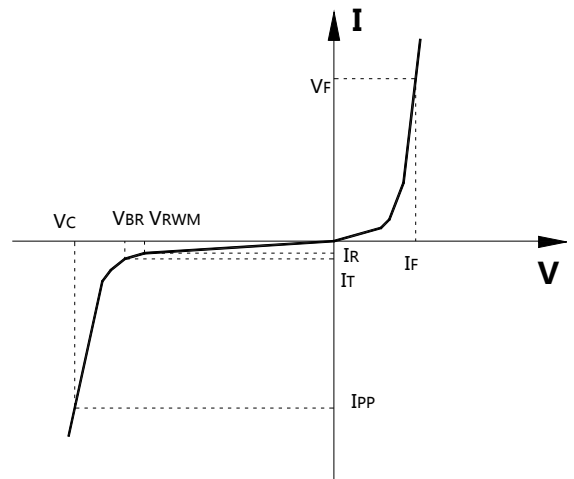
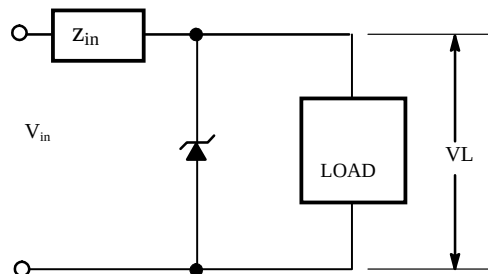
1. Non-repetitive current pulse, per fig. 4 and derated above $T_A = 25^\circ\text{C}$ per fig.1.
2. Thermal Resistance junction to Lead
3. 8.3ms single half-sine wave duty cycle= 4 pulses maximum per minute (unidirectional units only).
4. Ratings at 25°C ambient temperature unless otherwise specified.
5. Single phase, half wave, 60Hz, resistive or inductive load.
6. For Capacitive Load, Derate Current By 20%

Electrical Characteristics (Tamb=25℃ Unless Otherwise Specified)										
SMBJ PART NUMBER		MARKING CODE		VRWM	VBR @ IT (V)		IT	IR @ VRWM	VC(Max)	IPP(Max)
Uni-polar	Bi-polar	Uni	Bi	(V)	Min	Max	(mA)	(uA)	(V)	(A)
SMBJ5.0AX	SMBJ5.0CAX	KE	AE	5	6.38	7.35	10	800	9.2	65.3
SMBJ6.0AX	SMBJ6.0CAX	KG	AG	6	6.67	7.89	10	800	10.3	58.3
SMBJ6.5AX	SMBJ6.5CAX	KK	AK	6.5	7.22	8.3	10	500	11.2	53.6
SMBJ7.0AX	SMBJ7.0CAX	KM	AM	7	7.78	8.95	10	200	12	50
SMBJ7.5AX	SMBJ7.5CAX	KP	AP	7.5	8.33	9.58	1	100	12.9	46.5
SMBJ8.0AX	SMBJ8.0CAX	KR	AR	8	8.89	10.23	1	50	13.6	44.1
SMBJ8.5AX	SMBJ8.5CAX	KT	AT	8.5	9.44	10.82	1	20	14.4	41.7
SMBJ9.0AX	SMBJ9.0CAX	KV	AV	9	10	11.5	1	10	15.4	39
SMBJ10AX	SMBJ10CAX	KX	AX	10	11.1	12.8	1	5	17	35.3
SMBJ11AX	SMBJ11CAX	KZ	AZ	11	12.2	14	1	5	18.2	33
SMBJ12AX	SMBJ12CAX	LE	BE	12	13.3	15.3	1	5	19.9	30.2
SMBJ13AX	SMBJ13CAX	LG	BG	13	14.4	16.5	1	5	21.5	27.9
SMBJ14AX	SMBJ14CAX	LK	BK	14	15.6	17.9	1	5	23.2	25.9
SMBJ15AX	SMBJ15CAX	LM	BM	15	16.7	19.2	1	5	24.4	24.6
SMBJ16AX	SMBJ16CAX	LP	BP	16	17.8	20.5	1	5	26	23.1
SMBJ17AX	SMBJ17CAX	LR	BR	17	18.9	21.7	1	5	27.6	21.7
SMBJ18AX	SMBJ18CAX	LT	BT	18	20	23.3	1	5	29.2	20.5
SMBJ20AX	SMBJ20CAX	LV	BV	20	22.2	25.5	1	5	32.4	18.5
SMBJ22AX	SMBJ22CAX	LX	BX	22	24.4	28	1	5	35.5	16.9
SMBJ24AX	SMBJ24CAX	LZ	BZ	24	26.7	30.7	1	5	38.9	15.4
SMBJ26AX	SMBJ26CAX	ME	CE	26	28.9	33.2	1	5	42.1	14.3
SMBJ28AX	SMBJ28CAX	MG	CG	28	31.1	35.8	1	5	45.4	13.2
SMBJ30AX	SMBJ30CAX	MK	CK	30	33.3	38.3	1	5	48.4	12.4
SMBJ33AX	SMBJ33CAX	MM	CM	33	36.7	42.2	1	5	53.3	11.3
SMBJ36AX	SMBJ36CAX	MP	CP	36	40	46	1	5	58.1	10.3
SMBJ40AX	SMBJ40CAX	MR	CR	40	44.4	51.1	1	5	64.5	9.3
SMBJ43AX	SMBJ43CAX	MT	CT	43	47.8	54.9	1	5	69.4	8.6
SMBJ45AX	SMBJ45CAX	MV	CV	45	50	57.5	1	5	72.7	8.3
SMBJ48AX	SMBJ48CAX	MX	CX	48	53.3	61.3	1	5	77.4	7.8
SMBJ51AX	SMBJ51CAX	MZ	CZ	51	56.7	65.2	1	5	82.4	7.3
SMBJ54AX	SMBJ54CAX	NE	DE	54	60	69	1	5	87.1	6.9
SMBJ58AX	SMBJ58CAX	NG	DG	58	64.4	74.1	1	5	93.6	6.4
SMBJ60AX	SMBJ60CAX	NK	DK	60	66.7	76.7	1	5	96.8	6.2
SMBJ64AX	SMBJ64CAX	NM	DM	64	71.1	81.8	1	5	103	5.8
SMBJ70AX	SMBJ70CAX	NP	DP	70	77.8	89.5	1	5	113	5.3
SMBJ75AX	SMBJ75CAX	NR	DR	75	83	95.8	1	5	121	5
SMBJ78AX	SMBJ78CAX	NT	DT	78	86	99.7	1	5	126	4.8
SMBJ85AX	SMBJ85CAX	NV	DV	85	94	108.2	1	5	137	4.4
SMBJ90AX	SMBJ90CAX	NX	DX	90	100	115.5	1	5	146	4.1

**Electrical Characteristics (T_{amb}=25°C Unless Otherwise Specified)**

SMBJ PART NUMBER		MARKING CODE		VRWM	VBR @ IT (V)		IT	IR @ VRWM	VC(Max)	IPP(Max)
Uni-polar	Bi-polar	Uni	Bi	(V)	Min	Max	(mA)	(uA)	(V)	(A)
SMBJ100AX	SMBJ100CAX	NZ	DZ	100	111	128	1	5	162	3.7
SMBJ110AX	SMBJ110CAX	PE	EE	110	122	140.5	1	5	177	3.4
SMBJ120AX	SMBJ120CAX	PG	EG	120	133	153	1	5	193	3.1
SMBJ130AX	SMBJ130CAX	PK	EK	130	144	165.5	1	5	209	2.9
SMBJ150AX	SMBJ150CAX	PM	EM	150	167	192.5	1	5	243	2.5
SMBJ160AX	SMBJ160CAX	PP	EP	160	178	205	1	5	259	2.3
SMBJ170AX	SMBJ170CAX	PR	ER	170	189	217.5	1	5	275	2.2
SMBJ180AX	SMBJ180CAX	PT	ET	180	200	230.4	1	5	290	2.1
SMBJ190AX	SMBJ190CAX	PV	EV	190	211	243.2	1	5	306	2
SMBJ200AX	SMBJ200CAX	PX	EX	200	222	256	1	5	322	1.9
SMBJ210AX	SMBJ210CAX	PZ	EZ	210	233	268.8	1	5	339	1.8
SMBJ220AX	SMBJ220CAX	QE	FE	220	244	281.6	1	5	355	1.7
SMBJ250AX	SMBJ250CAX	QG	FG	250	278	309	1	5	403	1.5
SMBJ300AX	SMBJ300CAX	QK	FK	300	333	371	1	5	484	1.2
SMBJ350AX	SMBJ350CAX	QM	FM	350	389	432	1	5	565	1.1
SMBJ400AX	SMBJ400CAX	QP	FP	400	444	494	1	5	645	0.9
SMBJ440AX	SMBJ440CAX	QR	FR	440	489	543	1	5	710	0.8

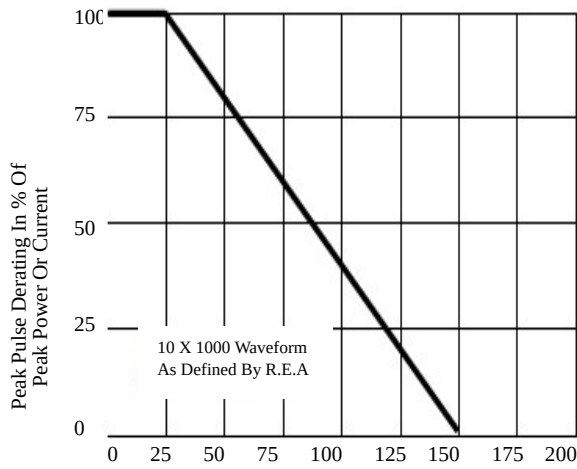
Symbol	Parameter
V_{RWM}	Working Peak Reverse Voltage
V_{BR}	Breakdown Voltage @ I_T
V_C	Clamping Voltage @ I_{PP}
I_T	Test Current
I_R	Leakage current at V_{RWM}
I_{PP}	Peak pulse current

**Typical Protection Circuit**

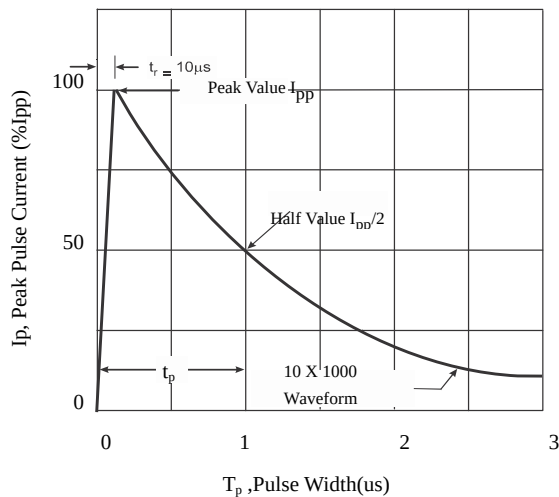


Typical Electrical Characteristics Applications

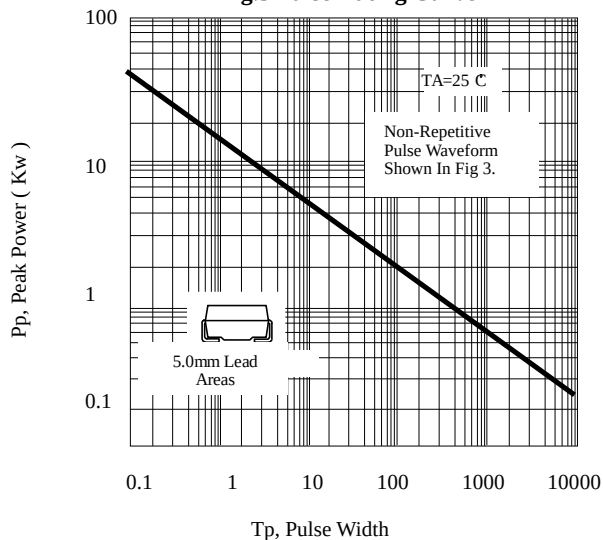
Rating and Characteristics Curves



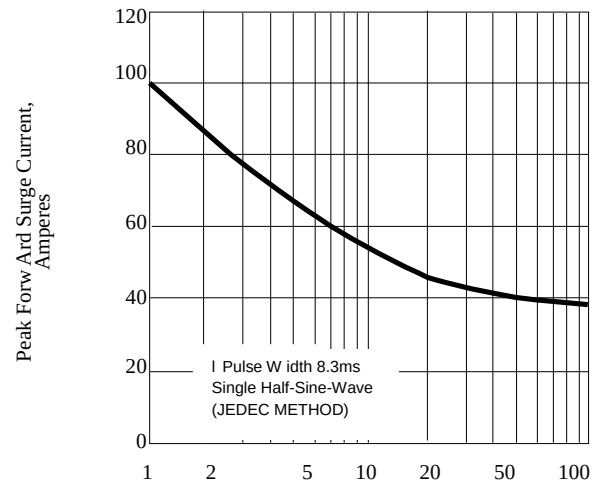
T_a , Ambient Temperature ($^{\circ}\text{C}$)
Fig. 1 Pulse Derating Curve



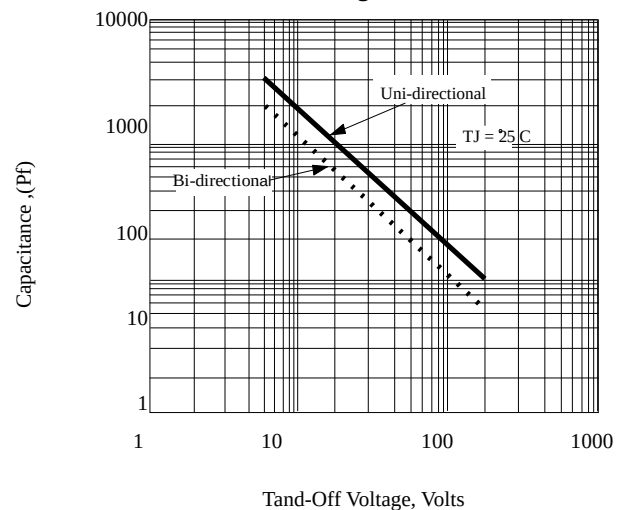
T_p , Pulse Width (μs)
Fig. 3 Pulse Rating Curve



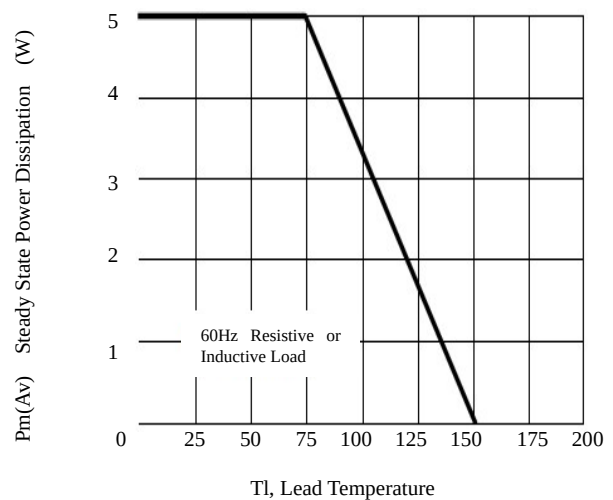
T_p , Pulse Width
Fig. 5 Pulse Rating Curve



Number Of Cycles At 60hz
Fig. 2 Maximum Non-Repetitive Surge Current



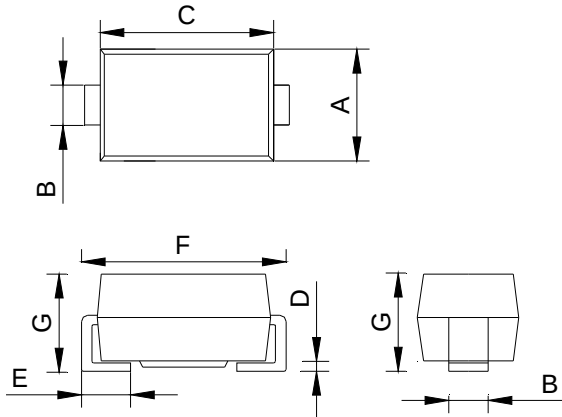
Tand-Off Voltage, Volts
Fig. 4 Typical Junction Capacitance



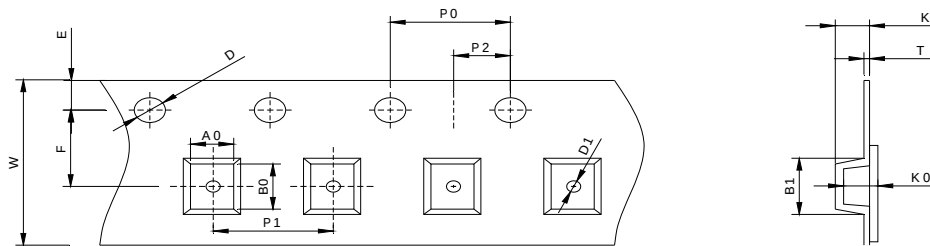
T_l , Lead Temperature
Fig. 6 Steady State Power Derating Curve

Package information
SMB
SMB Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability
- Classification Rating 94V-0
- Polarity Indicator: Cathode Band (Note: Bi-directional devices have no polarity indicator.)
- Weight: 0.003 ounces, 0.096 gram

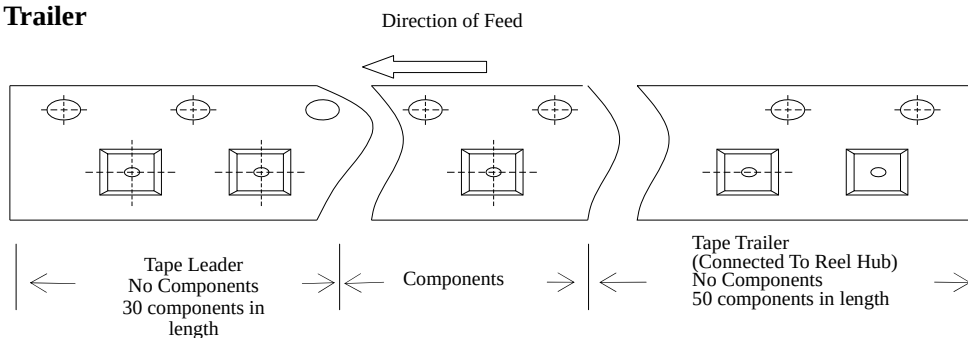

SMB

DIM	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	3.30	3.62	3.94	0.130	0.142	0.155
B	1.95	2.08	2.20	0.077	0.082	0.087
C	4.06	4.40	4.57	0.160	0.173	0.180
D	0.125	0.20	0.305	0.005	0.008	0.012
E	0.76	1.14	1.52	0.030	0.045	0.06
F	4.95	5.40	5.59	0.194	0.213	0.22
G	2.05	2.30	2.50	0.080	0.090	0.098

SMB Reel Dim


A0	B0	B1	D	D1	E	F	K0	T	W	P0	P1	P2
4.0	5.9	6.1	1.5	1.5	1.75	5.5	3.0	0.50	12.0	4.0	8.0	2.0

Dimension is in mm

Leader and Trailer


The LEADER is a minimum of 30 components in length and it consists of empty cavities with sealed cover tape
The TRAILER is a minimum of 50 components in length and it consists of empty cavities with sealed cover tape.