

DESCRIPTION

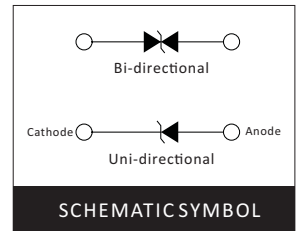
The SMBJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

FEATURES

- > Low profile package
- > Ideal for automated placement
- > Glass passivated chip junction
- > Available in uni-directional and Bi-directional
- > 600W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle): 0.01 %
- > For surface mounted applications to optimize board space
- > Excellent clamping capability
- > Very fast response time
- > Low incremental surge resistance
- > Meets MSL level 1, per J-STD-020, maximum peak of 260 °C

APPLICATIONS

TVS devices are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.



MAXIMUM RATINGS AND CHARACTERISTICS Ratings at 25 °C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 10/1000us waveform (Note1,Note2).	P _{PPM}	Minimum 600	Watts
Peak Pulse Current of on 10/1000us waveform(Note1).	I _{PPM}	See Table	Amps
Steady State Power Dissipation at T _A =50°C (Note2).	P _{M(AV)}	5.0	Watts
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V _F	3.5	Volts
Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3).	I _{FSM}	100	Amps

NOTES:

1. Non-repetitive current pulse, T_A = 25°C.
2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

THERMAL CONSIDERATIONS

Symbol	Parameter	Value	Unit
T _J	Operating Junction Temperature	-40 to +150	°C
T _S	Storage Temperature Range	-40 to +150	°C
R _{θJA}	Junction to Ambient on Printed Circuit	90	°C/W

ELECTRICAL CHARACTERISTICS

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@IT	Breakdown Voltage Max.@IT	Test Current	Maximum Clamping Voltage @IPP	Peak Pulse Current	Reverse Leakage @VRWM
UNI	BI	UNI	BI	VRWM(V)	VBR (V)	VBR (V)	IT(mA)	Vc(V)	IPP(A)	IR(uA)
SMBJ5.0A	SMBJ5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800
SMBJ6.0A	SMBJ6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
SMBJ6.5A	SMBJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
SMBJ7.0A	SMBJ7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
SMBJ7.5A	SMBJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.6	100
SMBJ8.0A	SMBJ8.0CA	KR	AR	8.0	8.89	9.83	1	13.6	44.2	50
SMBJ8.5A	SMBJ8.5CA	KT	AT	8.5	9.44	10.40	1	14.4	41.7	20
SMBJ9.0A	SMBJ9.0CA	KV	AV	9.0	10.00	11.10	1	15.4	39.0	10
SMBJ10A	SMBJ10CA	KX	AX	10.0	11.10	12.30	1	17.0	35.3	5
SMBJ11A	SMBJ11CA	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1
SMBJ12A	SMBJ12CA	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1
SMBJ13A	SMBJ13CA	LG	BG	13.0	14.40	15.90	1	21.5	28.0	1
SMBJ14A	SMBJ14CA	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1
SMBJ15A	SMBJ15CA	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1
SMBJ16A	SMBJ16CA	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1
SMBJ17A	SMBJ17CA	LR	BR	17.0	18.90	20.90	1	27.6	21.8	1
SMBJ18A	SMBJ18CA	LT	BT	18.0	20.00	22.10	1	29.2	20.6	1
SMBJ20A	SMBJ20CA	LV	BV	20.0	22.20	24.50	1	32.4	18.6	1
SMBJ22A	SMBJ22CA	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1
SMBJ24A	SMBJ24CA	LZ	BZ	24.0	26.70	29.50	1	38.9	15.5	1
SMBJ26A	SMBJ26CA	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1
SMBJ28A	SMBJ28CA	MG	CG	28.0	31.10	34.40	1	45.4	13.3	1
SMBJ30A	SMBJ30CA	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1
SMBJ33A	SMBJ33CA	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1
SMBJ36A	SMBJ36CA	MP	CP	36.0	40.00	44.20	1	58.1	10.4	1
SMBJ40A	SMBJ40CA	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1
SMBJ43A	SMBJ43CA	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1
SMBJ45A	SMBJ45CA	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1
SMBJ48A	SMBJ48CA	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1
SMBJ51A	SMBJ51CA	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1
SMBJ54A	SMBJ54CA	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1

ELECTRICAL CHARACTERISTICS

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I _T	Breakdown Voltage Max.@I _T	Test Current	Maximum Clamping Voltage @I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}
UNI	BI	UNI	BI	V _{RWM} (V)	V _{BR} (V)	V _{BR} (V)	I _T (mA)	V _c (V)	I _{PP} (A)	I _R (uA)
SMBJ58A	SMBJ58CA	NG	DG	58	64.40	71.20	1	93.6	6.5	1
SMBJ60A	SMBJ60CA	NK	DK	60	66.70	73.70	1	96.8	6.2	1
SMBJ64A	SMBJ64CA	NM	DM	64	71.10	78.60	1	103.0	5.9	1
SMBJ70A	SMBJ70CA	NP	DP	70	77.80	86.00	1	113.0	5.3	1
SMBJ75A	SMBJ75CA	NR	DR	75	83.30	92.10	1	121.0	5.0	1
SMBJ78A	SMBJ78CA	NT	DT	78	86.70	95.80	1	126.0	4.8	1
SMBJ85A	SMBJ85CA	NV	DV	85	94.40	104.00	1	137.0	4.4	1
SMBJ90A	SMBJ90CA	NX	DX	90	100.00	111.00	1	146.0	4.1	1
SMBJ100A	SMBJ100CA	NZ	DZ	100	111.00	123.00	1	162.0	3.7	1
SMBJ110A	SMBJ110CA	PE	EE	110	122.00	135.00	1	177.0	3.4	1
SMBJ120A	SMBJ120CA	PG	EG	120	133.00	147.00	1	193.0	3.1	1
SMBJ130A	SMBJ130CA	PK	EK	130	144.00	159.00	1	209.0	2.9	1
SMBJ150A	SMBJ150CA	PM	EM	150	167.00	185.00	1	243.0	2.5	1
SMBJ160A	SMBJ160CA	PP	EP	160	178.00	197.00	1	259.0	2.3	1
SMBJ170A	SMBJ170CA	PR	ER	170	189.00	209.00	1	275.0	2.2	1
SMBJ180A	SMBJ180CA	PT	ET	180	201.00	222.00	1	292.0	2.1	1
SMBJ200A	SMBJ200CA	PV	EV	200	224.00	247.00	1	324.0	1.9	1
SMBJ220A	SMBJ220CA	PX	EX	220	246.00	272.00	1	356.0	1.7	1
SMBJ250A	SMBJ250CA	PZ	EZ	250	279.00	309.00	1	405.0	1.5	1
SMBJ300A	SMBJ300CA	QE	FE	300	335.00	371.00	1	486.0	1.3	1
SMBJ350A	SMBJ350CA	QG	FG	350	391.00	432.00	1	567.0	1.1	1
SMBJ400A	SMBJ400CA	QK	FK	400	447.00	494.00	1	648.0	0.9	1
SMBJ440A	SMBJ440CA	QM	FM	440	492.00	543.00	1	713.0	0.9	1

RATINGS AND CHARACTERISTIC CURVES ($T_A=25^\circ\text{C}$ unless otherwise noted)

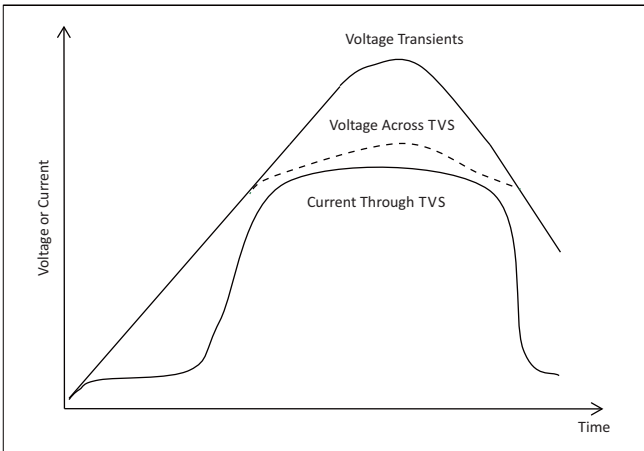


Figure 1 - TVS Transients Clamping Waveform

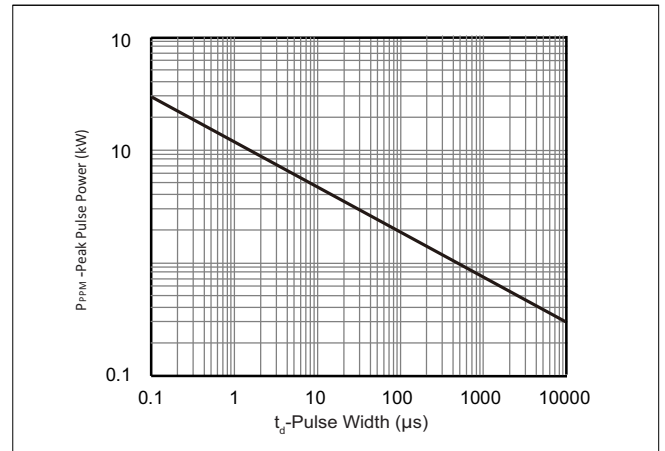


Figure 2 - Peak Pulse Power Rating Curve

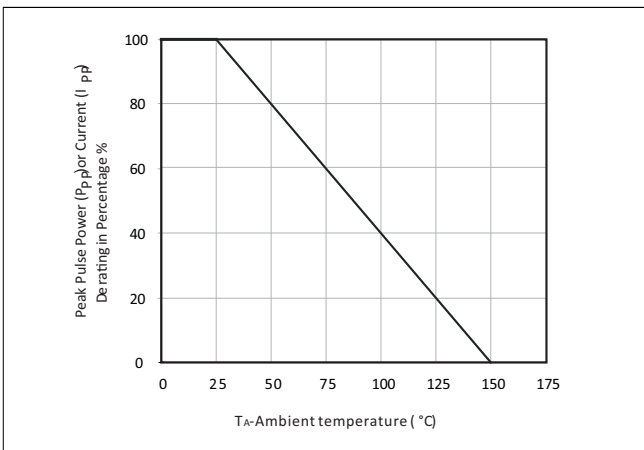


Figure 3 - Pulse Derating Curve

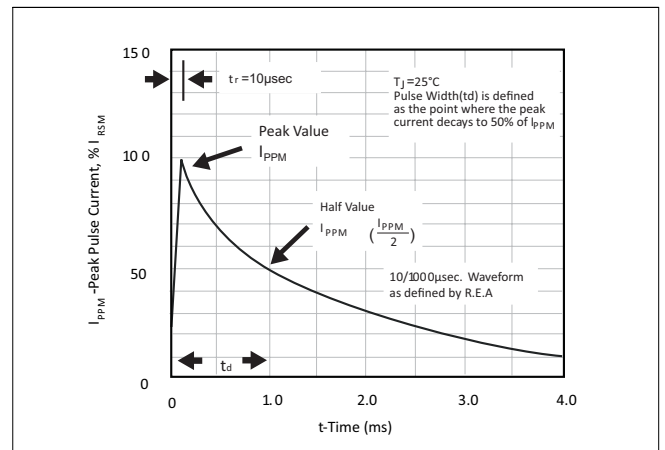


Figure 4 - Pulse Waveform

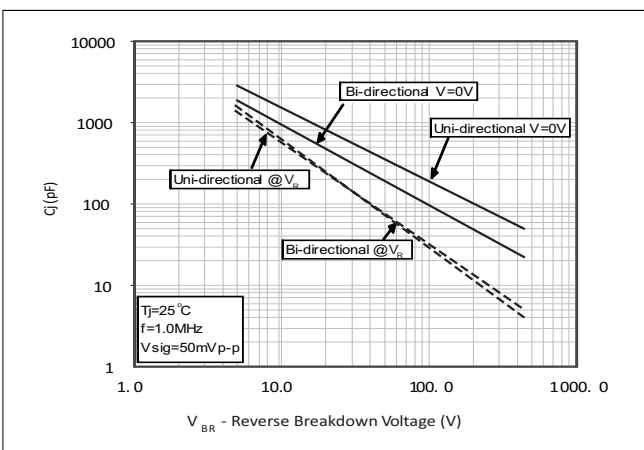


Figure 5 - Typical Junction Capacitance

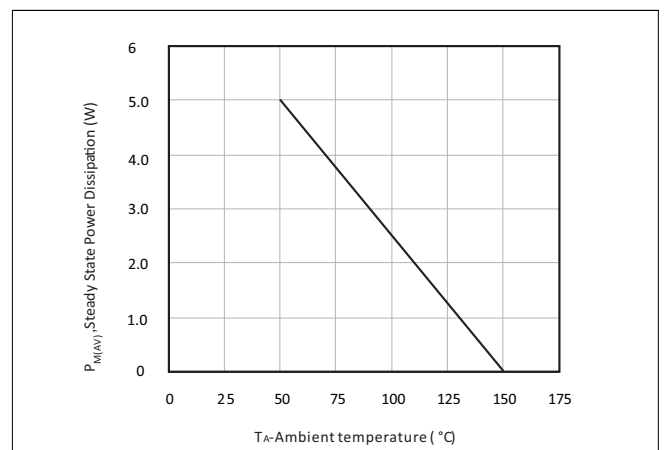


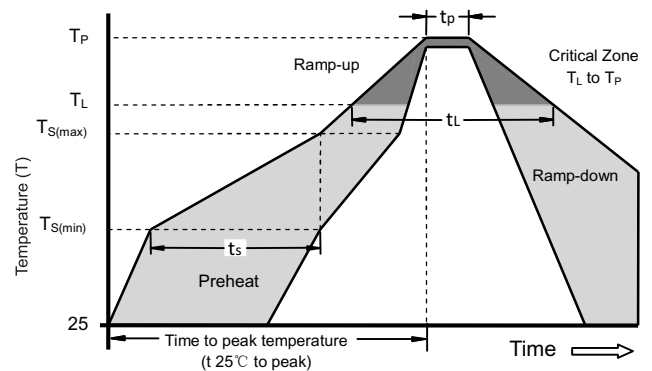
Figure 6 - Steady State Power Dissipation Derating Curve

ENVIRONMENTAL RELIABILITY CHARACTERISTICS

Testing Items	Technical Standards
High Temperature Reverse Bias Test	Temperature:150±3°C,Bias=80%V _{DRM} ;Time:168H
High Temperature Life Test	Temperature:150°C;Time:168H
High-Low Temperature Cycle Test	Temperature:From -40°C to 150°C;Dwell Time:30min,10-100 Cycles
High Temperature&High Humidity Test	Temperature:85°C.Humidity:85%; Time:168H
Pressure Cooker Test	Temperature:121°C,2 atm.Humidity:100%; Time:24H To 168H
Resistance Of Soldering Heat	Temperature:260 ±5°C;Time Of Dip Soldering:10s,3 Times

SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Min (T _s (min))	150°C
	Temperature Max (T _s (max))	200°C
	Time (min to max) (t _s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T _L) to peak)		3°C/second max
T _s (max)to T _L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T _L) (Liquidus)	217°C
	Time (min to max) (t _s)	60 – 150 seconds
Peak Temperature (T _P)		260°C
Time within 5°C of actual peak Temperature (t _p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T _P)		8 minutes Max.
Do not exceed		260°C



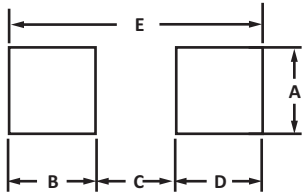
SMB PACKAGE DIMENSIONS

DIM	SMB PACKAGE DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.96	2.20	0.077	0.087
B	4.35	4.85	0.171	0.191
C	3.30	3.94	0.130	0.155
D	2.20	2.50	0.087	0.098
E	0.76	1.52	0.030	0.060
F	0.02	0.20	0.001	0.008
G	5.08	5.59	0.200	0.220
H	0.15	0.30	0.006	0.012

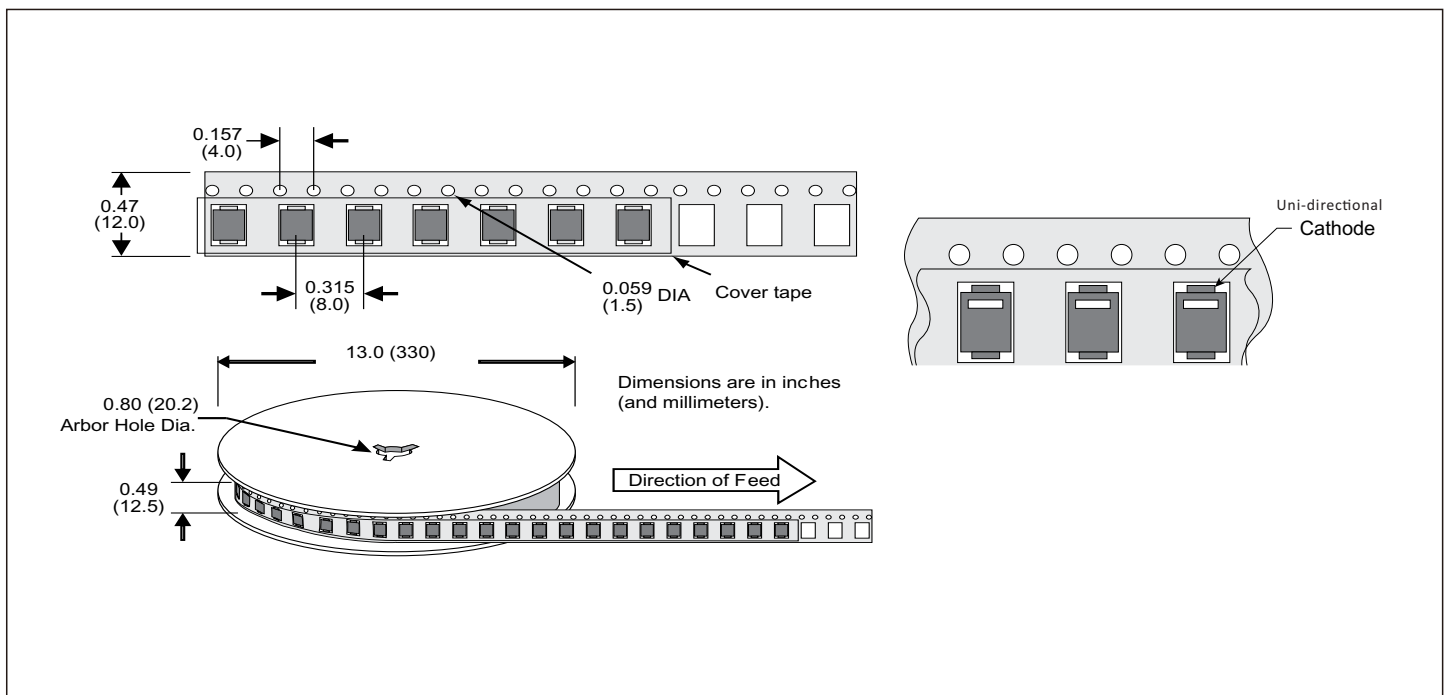
NOTES:
 1. Dimensions are exclusive of mold flash and metal burrs
 2. Cathode Band is only applicable to the unidirectional package

RECOMMENDED PAD LAYOUT DIMENSIONS

RECOMMENDED PAD LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	-	0.087	-
B	1.45	-	0.057	-
C	-	2.55	-	0.100
D	1.45	-	0.057	-
E	5.60 REF		0.220 REF	



TAPE AND REEL SPECIFICATION



ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SMBJxx(C)A	DO-214AA	3000PCS	13"