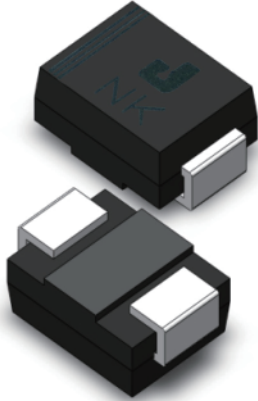


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PRODUCT DATASHEET

SMD TVS Devices

SMBJ Series SMD TVS Devices



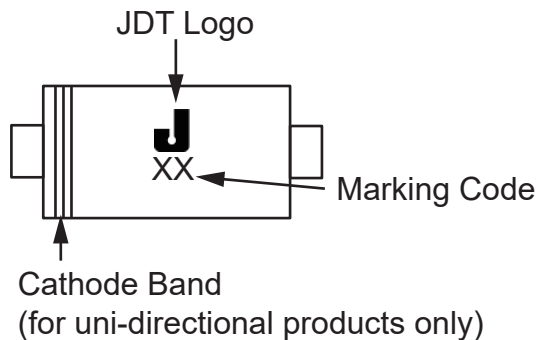
Description

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

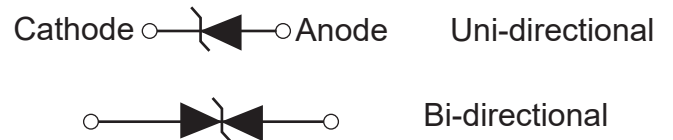
Features

- Low leakage
- Glass passivated chip
- Very fast response time
- Uni and Bidirectional unit
- Excellent clamping capability
- 600W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01%

Pin Description



Schematic Diagram



Maximum Ratings($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	5.0	W
Peak pulse power dissipation on 10/1000 μ s waveform	P_{PP}	600	W
Maximum instantaneous forward voltage at 25A for unidirectional	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note1)	I_{FSM}	100	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	$^{\circ}\text{C/W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$
Operating and Storage Temperature Range	T_J / T_{STG}	-55 to +150	$^{\circ}\text{C}$

Notes: Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

Performance Specification I.

Model		Reverse Stand off Voltage V_R	Breakdown Voltage $V_{BR} @ I_T$		Test Current I_T	Clamping Voltage $V_C @ I_{PP}$	Peak Pulse Current I_{PP}	Reverse Leakage $I_R @ V_R$	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMBJ3.3A	SMBJ3.3CA	3.0	4.20	6.55	1	8.7	69.1	150	KC	AC
SMBJ5.0A	SMBJ5.0CA	5.0	6.40	7.00	10	9.2	65.2	120	KE	AE
SMBJ6.0A	SMBJ6.0CA	6.0	6.67	7.37	10	10.3	58.3	120	KG	AG
SMBJ6.5A	SMBJ6.5CA	6.5	7.22	7.98	10	11.2	53.6	120	KK	AK
SMBJ7.0A	SMBJ7.0CA	7.0	7.78	8.60	10	12.0	50.0	50	KM	AM
SMBJ7.5A	SMBJ7.5CA	7.5	8.33	9.21	1	12.9	46.5	50	KP	AP
SMBJ8.0A	SMBJ8.0CA	8.0	8.89	9.83	1	13.6	44.1	20	KR	AR
SMBJ8.5A	SMBJ8.5CA	8.5	9.44	10.4	1	14.4	41.7	10	KT	AT
SMBJ9.0A	SMBJ9.0CA	9.0	10.0	11.1	1	15.4	39.0	5	KV	AV
SMBJ10A	SMBJ10CA	10.0	11.1	12.3	1	17.0	35.3	2	KX	AX
SMBJ11A	SMBJ11CA	11.0	12.2	13.5	1	18.2	33.0	1	KZ	AZ
SMBJ12A	SMBJ12CA	12.0	13.3	14.7	1	19.9	30.2	1	LE	BE
SMBJ13A	SMBJ13CA	13.0	14.4	15.9	1	21.5	27.9	1	LG	BG
SMBJ14A	SMBJ14CA	14.0	15.6	17.2	1	23.2	25.9	1	LK	BK
SMBJ15A	SMBJ15CA	15.0	16.7	18.5	1	24.4	24.6	1	LM	BM
SMBJ16A	SMBJ16CA	16.0	17.8	19.7	1	26.0	23.1	1	LP	BP
SMBJ17A	SMBJ17CA	17.0	18.9	20.9	1	27.6	21.8	1	LR	BR
SMBJ18A	SMBJ18CA	18.0	20.0	22.1	1	29.2	20.6	1	LT	BT
SMBJ20A	SMBJ20CA	20.0	22.2	24.5	1	32.4	18.6	1	LV	BV
SMBJ22A	SMBJ22CA	22.0	24.4	26.9	1	35.5	16.9	1	LX	BX
SMBJ24A	SMBJ24CA	24.0	26.7	29.5	1	38.9	15.4	1	LZ	BZ
SMBJ26A	SMBJ26CA	26.0	28.9	31.9	1	42.1	14.3	1	ME	CE
SMBJ28A	SMBJ28CA	28.0	31.1	34.4	1	45.4	13.2	1	MG	CG
SMBJ30A	SMBJ30CA	30.0	33.3	36.8	1	48.4	12.4	1	MK	CK
SMBJ33A	SMBJ33CA	33.0	36.7	40.6	1	53.3	11.3	1	MM	CM
SMBJ36A	SMBJ36CA	36.0	40.0	44.2	1	58.1	10.4	1	MP	CP
SMBJ40A	SMBJ40CA	40.0	44.4	49.1	1	64.5	9.3	1	MR	CR
SMBJ43A	SMBJ43CA	43.0	47.8	52.8	1	69.4	8.7	1	MT	CT
SMBJ45A	SMBJ45CA	45.0	50.0	55.3	1	72.7	8.3	1	MV	CV
SMBJ48A	SMBJ48CA	48.0	53.3	58.9	1	77.4	7.8	1	MX	CX
SMBJ51A	SMBJ51CA	51.0	56.7	62.7	1	82.4	7.3	1	MZ	CZ
SMBJ54A	SMBJ54CA	54.0	60.0	66.3	1	87.1	6.9	1	NE	DE
SMBJ58A	SMBJ58CA	58.0	64.4	71.2	1	93.6	6.4	1	NG	DG
SMBJ60A	SMBJ60CA	60.0	66.7	73.7	1	96.8	6.2	1	NK	DK

Performance Specification II.

Model		Reverse Stand off Voltage V_R	Breakdown Voltage $V_{BR} @ I_T$		Test Current I_T	Clamping Voltage $V_C @ I_{PP}$	Peak Pulse Current I_{PP}	Reverse Leakage $I_R @ V_R$	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMBJ64A	SMBJ64CA	64.0	71.1	78.6	1	103.0	5.8	1	NM	DM
SMBJ70A	SMBJ70CA	70.0	77.8	86.0	1	113.0	5.3	1	NP	DP
SMBJ75A	SMBJ75CA	75.0	83.3	92.1	1	121.0	5.0	1	NR	DR
SMBJ78A	SMBJ78CA	78.0	86.7	95.8	1	126.0	4.8	1	NT	DT
SMBJ85A	SMBJ85CA	85.0	94.4	104.0	1	137.0	4.4	1	NV	DV
SMBJ90A	SMBJ90CA	90.0	100.0	111.0	1	146.0	4.1	1	NX	DX
SMBJ100A	SMBJ100CA	100.0	111.0	123.0	1	162.0	3.7	1	NZ	DZ
SMBJ110A	SMBJ110CA	110.0	122.0	135.0	1	177.0	3.4	1	PE	EE
SMBJ120A	SMBJ120CA	120.0	133.0	147.0	1	193.0	3.1	1	PG	EG
SMBJ130A	SMBJ130CA	130.0	144.0	159.0	1	209.0	2.9	1	PK	EK
SMBJ150A	SMBJ150CA	150.0	167.0	185.0	1	243.0	2.5	1	PM	EM
SMBJ160A	SMBJ160CA	160.0	178.0	197.0	1	259.0	2.3	1	PP	EP
SMBJ170A	SMBJ170CA	170.0	189.0	209.0	1	275.0	2.2	1	PR	ER
SMBJ180A	SMBJ180CA	180.0	201.0	222.0	1	292.0	2.1	1	PT	ET
SMBJ190A	SMBJ190CA	190.0	211.0	234.0	1	307.0	2.0	1	PB	EB
SMBJ200A	SMBJ200CA	200.0	224.0	247.0	1	324.0	1.9	1	PV	EV
SMBJ210A	SMBJ210CA	210.0	233.0	258.0	1	337.0	1.8	1	PW	EW
SMBJ220A	SMBJ220CA	220.0	246.0	272.0	1	356.0	1.7	1	PX	EX
SMBJ250A	SMBJ250CA	250.0	279.0	309.0	1	405.0	1.5	1	PZ	EZ
SMBJ300A	SMBJ300CA	300.0	335.0	371.0	1	486.0	1.3	1	QE	FE
SMBJ350A	SMBJ350CA	350.0	391.0	432.0	1	567.0	1.1	1	QG	FG
SMBJ400A	SMBJ400CA	400.0	447.0	494.0	1	648.0	0.9	1	QK	FK
SMBJ440A	SMBJ440CA	440.0	492.0	543.0	1	713.0	0.8	1	QM	FM
SMBJ550A	SMBJ550CA	550.0	611.0	679.0	1	1000.0	0.6	1	QP	FP

Typical Performance Characteristics

(TA=25°C unless otherwise Specified)

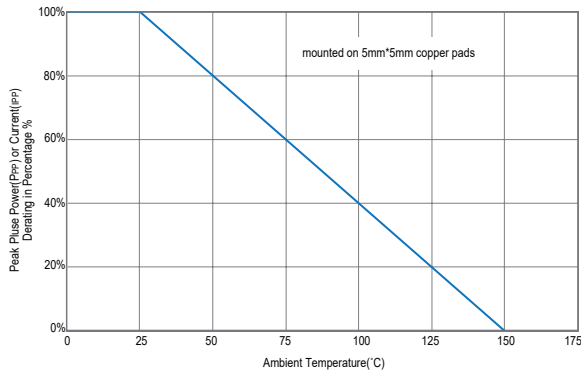


Fig. 1: Pulse Derating Curve

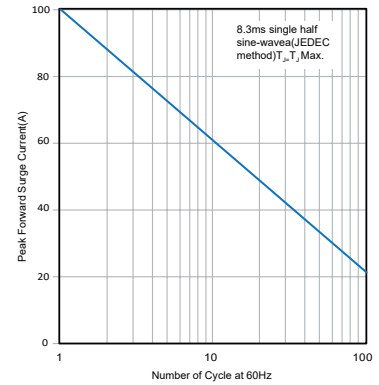


Fig. 2: Max. Non-Repetitive Surge Current Curve

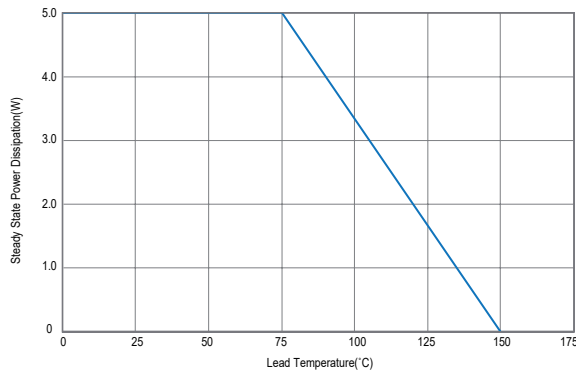


Fig. 3: Steady State Power Derating Curve

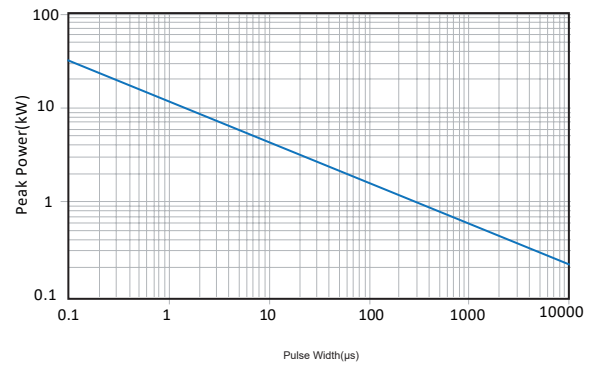


Fig. 4: Peak Pulse Power Rating Curve

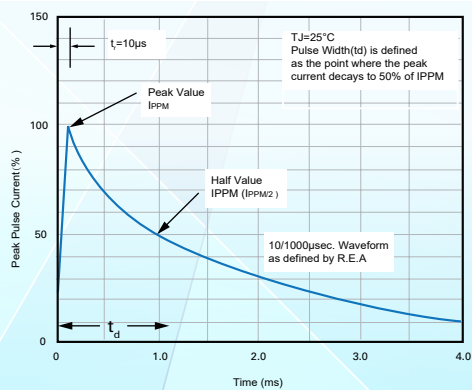


Fig 5: Pulse Waveform

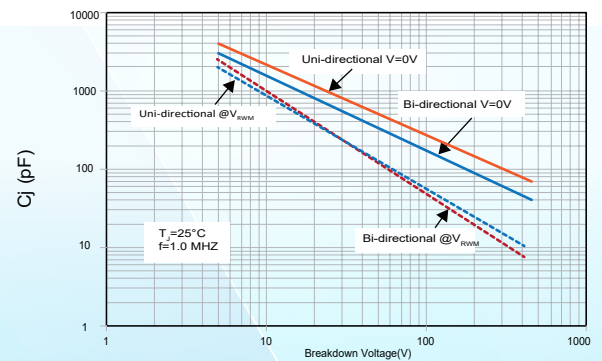
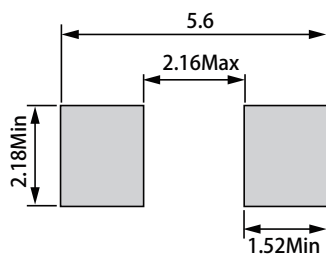
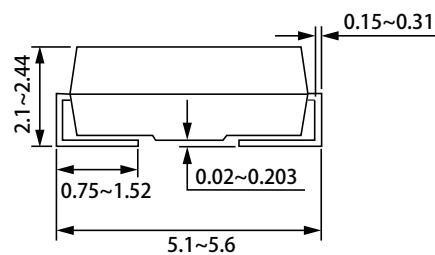
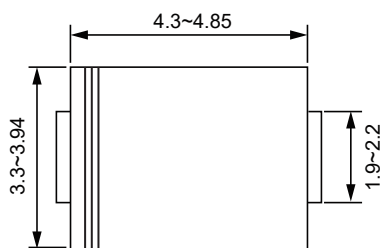


Fig 6: Typical Junction Capacitance

Mechanical Data

Case	Molded Plastic over glass passivated junction
Terminals	Solderable per MIL-STD-750, method 2026
Polarity	Color band denotes cathode end except Bipolar
Mounting position	Any

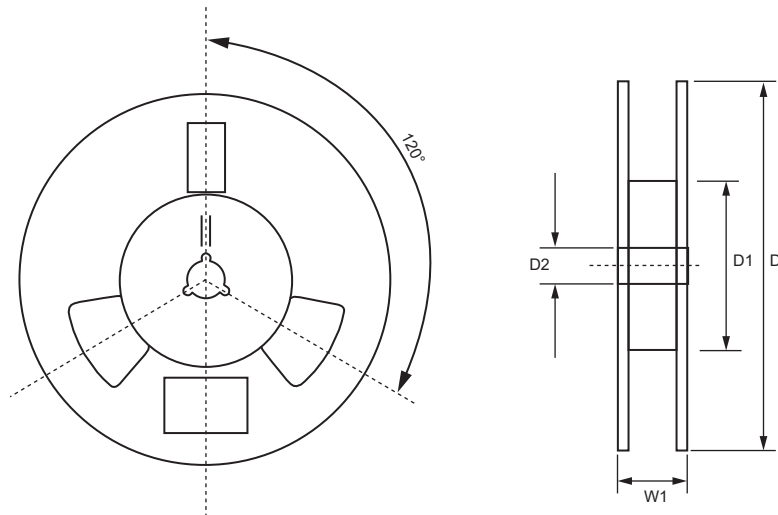
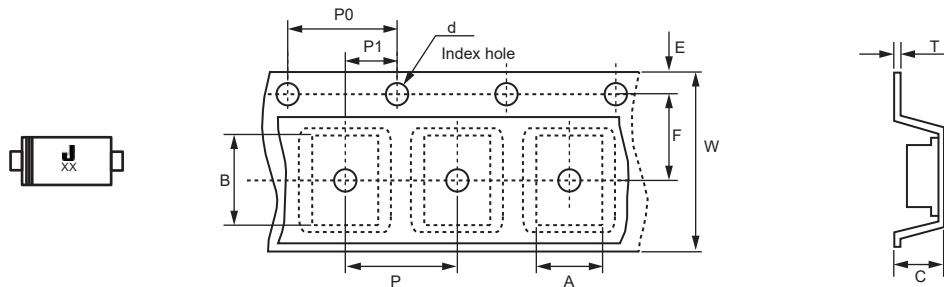


Recommend Pad Layout

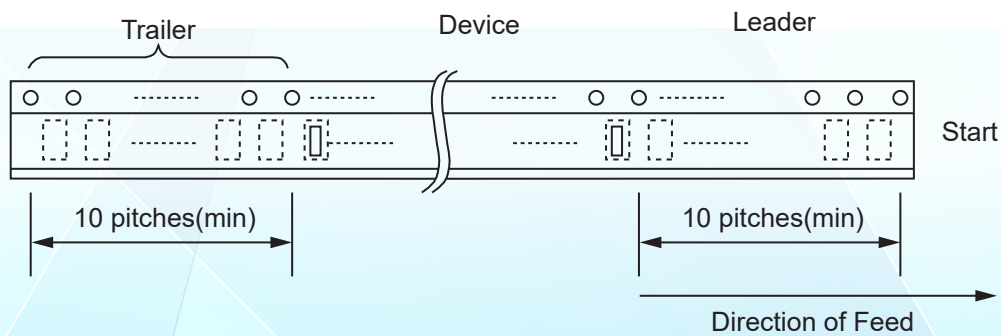
Packaging Quantity

Package	Weight	Quantity	Reel Size	Packaging Option
DO-214AA	0.092g(approx)	3000pcs	13 inch	Tape and reel-12mm tape/13"reel

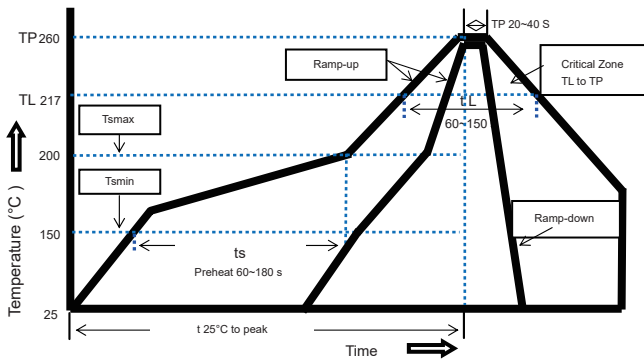
Tape and Reel Specification



Symbol	Dimensions(mm)
A	3.67±0.10
B	5.69±0.10
C	4.50(max)
d	1.55±0.10
D	330
D1	50.00(min)
D2	13.00±0.20
E	1.75±0.10
F	5.50±0.05
P	8.00±0.10
P0	4.00±0.10
P1	2.00±0.05
W	12.00±0.30
W1	18.40(max)



Soldering Parameters



- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free
- Recommended maximum paste thickness is 0.25mm
Devices can be cleaned using standard industry methods and solvents.
- Note 1: All temperature refer to topside of the package, measured on the package body surface.
- Note 2: If reflow temperatures exceed the recommended

Profile Feature

Pb-Free Assembly

Average Ramp-Up Rate 3°C/second max.
(Ts max to T p)

Preheat

-Temperature Min(Ts min) 150°C
-Temperature Max(Ts max) 200°C
-Time(Ts min to Ts max) 60~180 seconds

Time maintained above:

-Temperature(TL) 217°C
-Time(tL) 60~150 seconds

Peak Temperature(Tp) 260°C

Ramp-Down Rate 6°C/second max.

Time 25°C to Peak Temperature 8 minutes max

Storage Condition 0°C~35°C, ≤70%RH

Part Number System

SMBJ XXX C A

5% VOLTAGE TOLERANCE

BI-DIRECTIONAL

VOLTAGE

SERIES