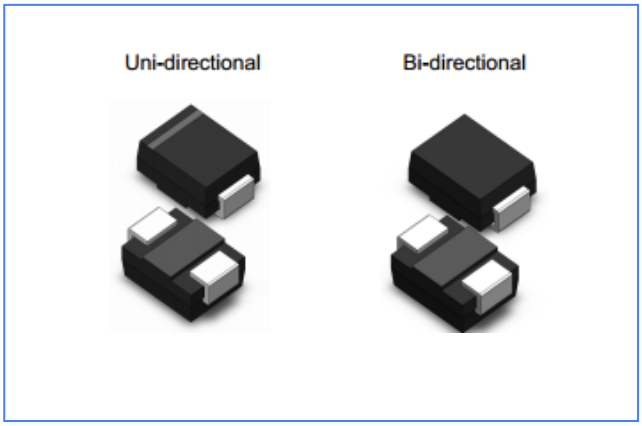
SMBJ-H Series

Description

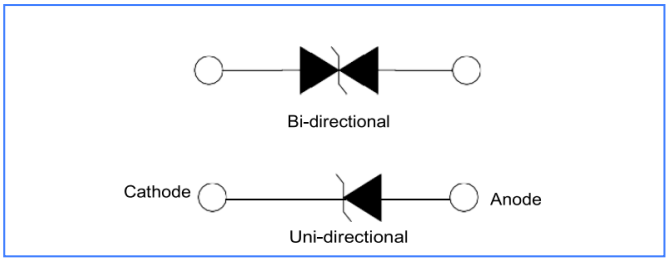
The SMBJ-H series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SMBJ-H series is supplied in YINT Semiconductor's exclusive, cost-effective, highly reliable and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer Applications.



Features

- Case: DO-214AA(SMB)
- Excellent clamping capability
- 600 W peak pulse power capability with a 10/1000 μs waveform
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Fast response time: typically less than 1.0ps from 0 Volts to VB min.
- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).
- AEC-Q101 qualified

Functional Diagram



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at TA=25ºC by 10/1000μs Waveform	P_{PK}	600	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave[1]	I_{FSM}	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only[2]	V_F	3.5	V
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

NOTES:

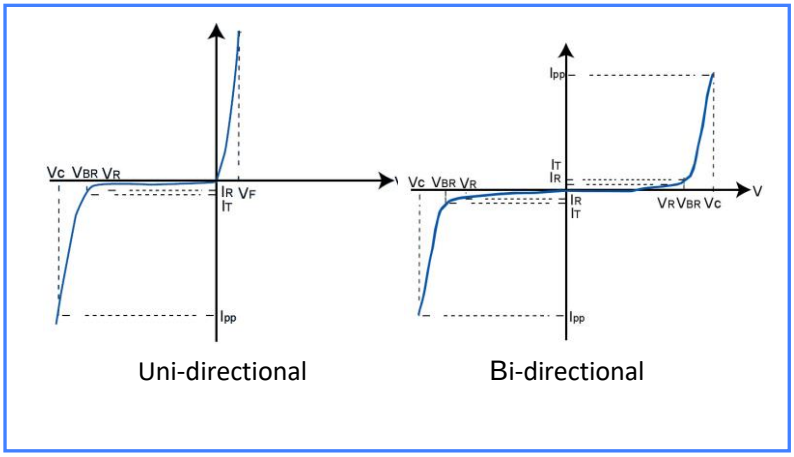
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Electrical characteristics (TA = 25 °C unless otherwise noted)

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@I_T		Test Current I_T(mA)	Maximum Reverse Leakage I_R @ V_R(μA)	Maximum Peak Pulse Current Ipp(A)	Maximum Clamping Voltage V_C @I_{PP}(V)
		BI	UNI		Min .V	Max .V				
SMBJ5.0CA-H	SMBJ5.0A-H	AEH	KEH	5.0	6.40	7.00	10	500	65.2	9.2
SMBJ6.0CA-H	SMBJ6.0A-H	AGH	KGH	6.0	6.67	7.37	10	500	58.3	10.3
SMBJ 6.5CA-H	SMBJ 6.5A-H	AKH	KKH	6.5	7.22	7.9	10	300	53.6	11.2
SMBJ7.0CA-H	SMBJ7.0 A-H	AMH	KMH	7.0	7.78	8.60	10	200	50.0	12.0
SMBJ7.5CA-H	SMBJ7.5A-H	APH	KPH	7.5	8.33	9.21	1	100	46.6	12.9
SMBJ8.0CA-H	SMBJ8.0A-H	ARH	KRH	8.0	8.89	9.83	1	50	44.2	13.6
SMBJ8.5CA-H	SMBJ8.5 A-H	ATH	KTH	8.5	9.44	10.40	1	20	41.7	14.4
SMBJ9.0CA-H	SMBJ9.0 A-H	AVH	KVH	9.0	10.00	11.10	1	10	39.0	15.4
SMBJ10CA-H	SMBJ10A-H	AXH	KXH	10.0	11.10	12.30	1	5	35.3	17.0
SMBJ11CA-H	SMBJ11A-H	AZH	KZH	11.0	12.20	13.50	1	1	33.0	18.2
SMBJ12CA-H	SMBJ12A-H	BEH	LEH	12.0	13.30	14.70	1	1	30.2	19.9
SMBJ13CA-H	SMBJ13A-H	BGH	LGH	13.0	14.40	15.90	1	1	28.0	21.5
SMBJ14CA-H	SMBJ14A-H	BKH	LKH	14.0	15.60	17.20	1	1	25.9	23.2
SMBJ15CA-H	SMBJ15A-H	BMH	LMH	15.0	16.70	18.50	1	1	24.6	24.4
SMBJ16CA-H	SMBJ16A-H	BPH	LPH	16.0	17.80	19.70	1	1	23.1	26.0
SMBJ17CA-H	SMBJ17A-H	BRH	LRH	17.0	18.90	20.90	1	1	21.8	27.6
SMBJ18CA-H	SMBJ18A-H	BTH	LTH	18.0	20.00	22.10	1	1	20.6	29.2
SMBJ20CA-H	SMBJ20A-H	BVH	LVH	20.0	22.20	24.50	1	1	18.6	32.4
SMBJ22CA-H	SMBJ22A-H	BXH	LXH	22.0	24.40	26.90	1	1	16.9	35.5
SMBJ24CA-H	SMBJ24A-H	BZH	LZH	24.0	26.70	29.50	1	1	15.5	38.9
SMBJ26CA-H	SMBJ26A-H	CEH	MEH	26.0	28.90	31.90	1	1	14.3	42.1
SMBJ28CA-H	SMBJ28A-H	CGH	MGH	28.0	31.10	34.40	1	1	13.3	45.4
SMBJ30CA-H	SMBJ30A-H	CKH	MKH	30.0	33.30	36.80	1	1	12.4	48.4
SMBJ33CA-H	SMBJ33A-H	CMH	MMH	33.0	36.70	40.60	1	1	11.3	53.3
SMBJ36CA-H	SMBJ36A-H	CPH	MPH	36.0	40.00	44.20	1	1	10.4	58.1
SMBJ40CA-H	SMBJ40A-H	CRH	MRH	40.0	44.40	49.10	1	1	9.3	64.5
SMBJ43CA-H	SMBJ43A-H	CTH	MTH	43.0	47.80	52.80	1	1	8.7	69.4
SMBJ45CA-H	SMBJ45A-H	CVH	MVH	45.0	50.00	55.30	1	1	8.3	72.7
SMBJ48CA-H	SMBJ48A-H	CXH	MXH	48.0	53.30	58.90	1	1	7.8	77.4
SMBJ51CA-H	SMBJ51A-H	CZH	MZH	51.0	56.70	62.70	1	1	7.3	82.4
SMBJ54CA-H	SMBJ54A-H	DEH	NEH	54.0	60.00	66.30	1	1	6.9	87.1
SMBJ58CA-H	SMBJ58A-H	DGH	NGH	58.0	64.40	71.20	1	1	6.5	93.6
SMBJ60CA-H	SMBJ60A-H	DKH	NKH	60.0	66.70	73.70	1	1	6.2	96.8
SMBJ64CA-H	SMBJ64A-H	DMH	NMH	64.0	71.10	78.60	1	1	5.9	103.0
SMBJ70CA-H	SMBJ70A-H	DPH	NPH	70.0	77.80	86.00	1	1	5.3	113.0

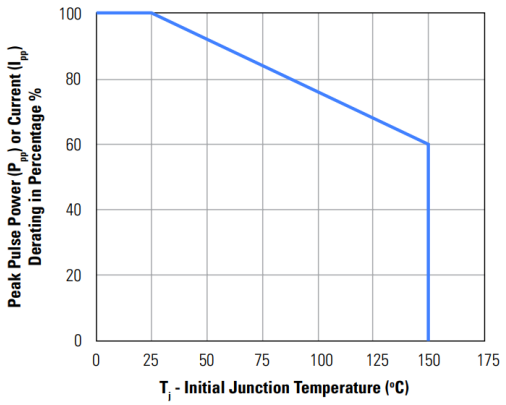
SMBJ75CA-H	SMBJ75A-H	DRH	NRH	75.0	83.30	92.10	1	1	5.0	121.0
SMBJ78CA-H	SMBJ78A-H	DTH	NTH	78.0	86.70	95.80	1	1	4.8	126.0
SMBJ85CA-H	SMBJ85A-H	DVH	NVH	85.0	94.4	104.0	1	1	4.4	137.0
SMBJ90CA-H	SMBJ90A-H	DXH	NXH	90.0	100.0	111.0	1	1	4.1	146.0
SMBJ100CA-H	SMBJ100A-H	DZH	NZH	100.0	111.0	123.0	1	1	3.7	162.0
SMBJ110CA-H	SMBJ110A-H	EEH	PEH	110.0	122.0	135.0	1	1	3.4	177.0
SMBJ120CA-H	SMBJ120A-H	EGH	PGH	120.0	133.0	147.0	1	1	3.1	193.0
SMBJ130CA-H	SMBJ130A-H	EKH	PKH	130.0	144.0	159.0	1	**1**	**2.9**	**209.0**
SMBJ150CA-H	SMBJ150A-H	EMH	PMH	150.0	167.0	185.0	1	1	2.5	243.0
SMBJ160CA-H	SMBJ160A-H	EPH	PPH	160.0	178.0	197.0	1	1	2.3	259.0
SMBJ170CA-H	SMBJ170A-H	ERH	PRH	170.0	189.0	209.0	1	1	2.2	275.0
SMBJ180CA-H	SMBJ180A-H	ETH	PTH	180.0	201.0	222.0	1	1	2.1	292.0
SMBJ190CA-H	SMBJ190A-H	ECH	PAH	190.0	211.0	233.0	1	1	2.0	308.0
SMBJ200CA-H	SMBJ200A-H	EVH	PVH	200.0	224.0	247.0	1	1	1.9	324.0
SMBJ210CA-H	SMBJ210A-H	EDH	PBH	210.0	237.0	263.0	1	1	1.8	340.0
SMBJ220CA-H	SMBJ220A-H	EXH	PXH	220.0	246.0	272.0	1	1	1.7	356.0
SMBJ250CA-H	SMBJ250A-H	EZH	PZH	250.0	279.0	309.0	1	1	1.5	405.0
SMBJ300CA-H	SMBJ300A-H	FEH	QEH	300.0	335.0	371.0	1	1	1.3	486.0
SMBJ350CA-H	SMBJ350A-H	FGH	QGH	350.0	391.0	432.0	1	1	1.1	567.0
SMBJ400CA-H	SMBJ400A-H	FKH	QKH	400.0	447.0	494.0	1	1	0.9	648.0
SMBJ440CA-H	SMBJ440A-H	FMH	QMH	440.0	492.0	543.0	1	1	0.9	713.0

I-V Curve characteristics

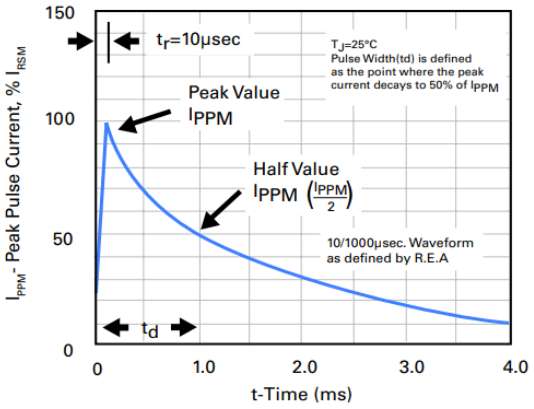


Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @V_{RWM}
V_{BR}	Breakdown Voltage @ I_T(Test Current)

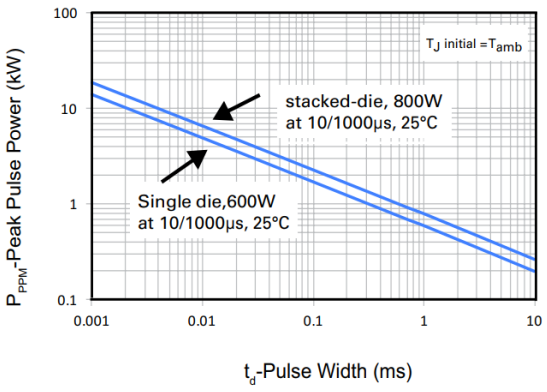
Rating & Characteristic Curves



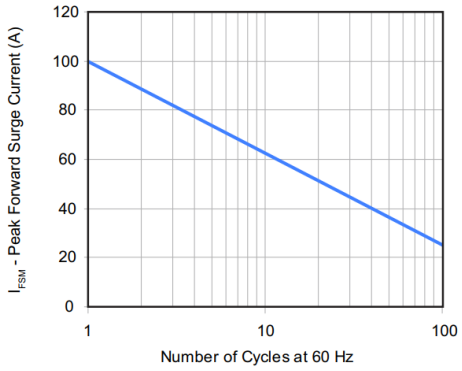
1.Peak pulse power derating curve



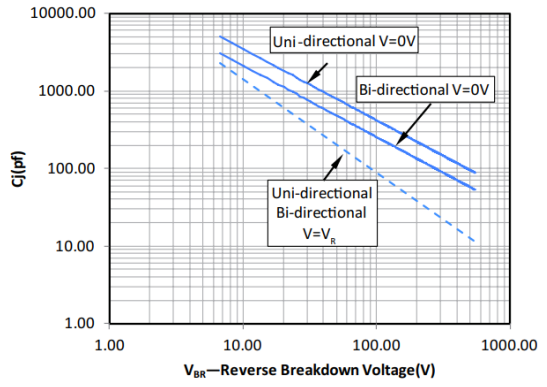
2. Pulse waveform



3. Peak pulse power rating curve

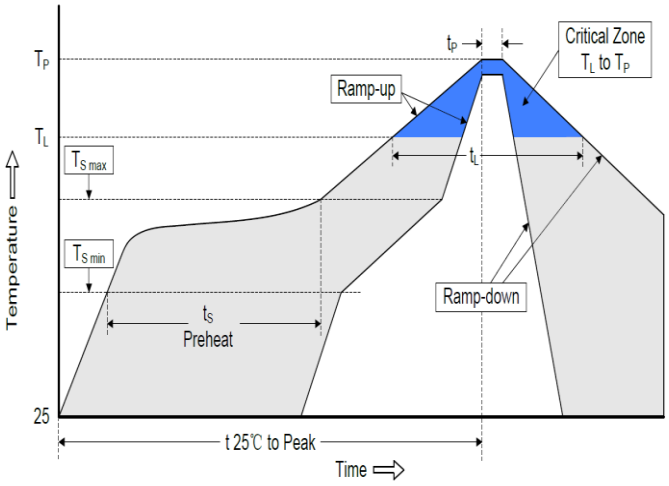


4. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



5. Typical Junction Capacitance

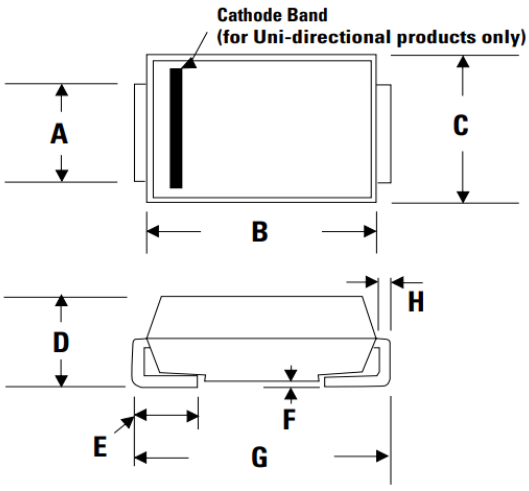
Soldering parameters



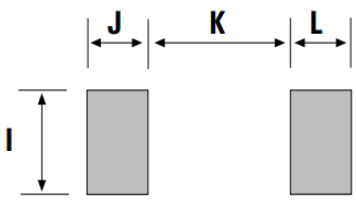
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max)(t_S)	 150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3°C/second max.
Time maintained above: - Temperature (T_L) - Time (t_L)	 217°C 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	8 minutes max.

Package outline dimensions in millimeters

DO-214AA (SMB J-Bend)

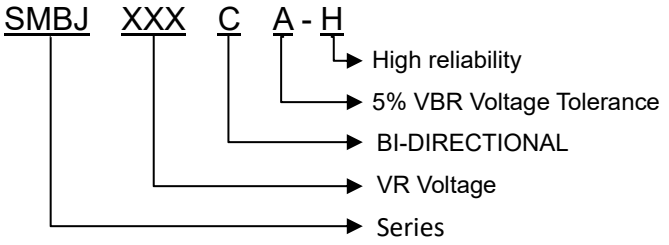


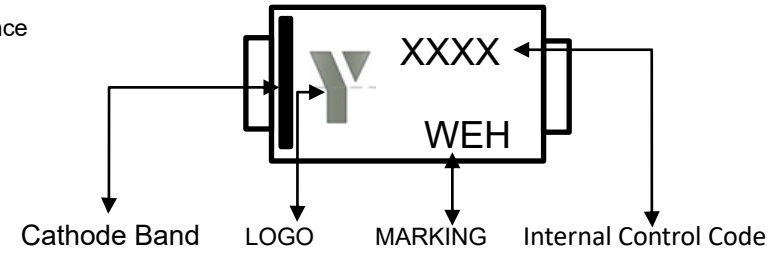
Mounting Pad Layout



Dimensions	Millimeter	
	Min	Max
A	1.930	2.200
B	4.060	4.750
C	3.300	3.940
D	1.990	2.610
E	0.760	1.520
F	-	0.203
G	5.210	5.590
H	0.152	0.305
I	2.260	-
J	2.160	-
K	-	2.740
L	2.160	-

Part number code & Marking code





(for Uni-directional products only)

Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.