

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

**SMBJXXX(C)A**

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**Product specification**

## Description

Transient voltage suppression diodes, also known as TVS diodes, are protective electronic parts that protect electrical equipment from voltage spikes introduced by wires.

## Applications

- computer system
- domestic appliance
- video input


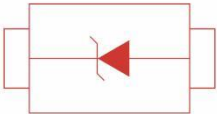


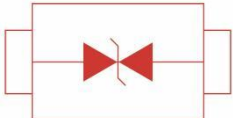

## Features

- For surface mounted applications
- Excellent clamping capability
- 400 W peak pulse power capability with a 10/1000 $\mu$ s Waveform.
- $V_{RWM}$  3.3-440V
- Low profile package and low inductance
- Typical IR less than 1 $\mu$ A above 10 V
- Fast response time: typically less than 1.0ps from 0V to  $V_{BRmin}$ .

## Mechanical Characteristics

- Package: SMA/DO-214AC
- Case Material:Molded Plastic. UL Flammability Classification Rating 94V-0 .RoHS compliant
- Moisture Sensitivity: Meet MSL 1
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models  
Weight: 0.07g(approximate)

## Reference News

PACKAGE OUTLINE	PIN CONFIGURATION	Marking Information
		
<b>Unipolar</b>		
		
<b>Bipolar</b>		

**Electrical Characteristics (T=25°C)**

Part Number		Marking		V <sub>R</sub>	I <sub>R</sub> @V <sub>R</sub>	V <sub>BR</sub> @I <sub>T</sub>		I <sub>T</sub>	V <sub>C</sub> @I <sub>PP</sub>	I <sub>PP</sub> <sup>①</sup>
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMBJ3.3A	/	SMBJ3.3A	/	3.3	600	5.2	6	10	8.0	75.00
SMBJ5.0A	SMBJ5.0CA	SMBJ5.0A	SMBJ5.0CA	5.0	800	6.40	7.00	10	9.2	65.22
SMBJ6.0A	SMBJ6.0CA	SMBJ6.0A	SMBJ6.0CA	6.0	800	6.67	7.37	10	10.3	58.26
SMBJ6.5A	SMBJ6.5CA	SMBJ6.5A	SMBJ6.5CA	6.5	500	7.22	7.98	10	11.2	53.58
SMBJ7.0A	SMBJ7.0CA	SMBJ7.0A	SMBJ7.0CA	7.0	200	7.78	8.60	10	12.0	50.00
SMBJ7.5A	SMBJ7.5CA	SMBJ7.5A	SMBJ7.5CA	7.5	100	8.33	9.21	1	12.9	46.52
SMBJ8.0A	SMBJ8.0CA	SMBJ8.0A	SMBJ8.0CA	8.0	50	8.89	9.83	1	13.6	44.12
SMBJ8.5A	SMBJ8.5CA	SMBJ8.5A	SMBJ8.5CA	8.5	20	9.44	10.40	1	14.4	41.67
SMBJ9.0A	SMBJ9.0CA	SMBJ9.0A	SMBJ9.0CA	9.0	10	10.00	11.10	1	15.4	38.97
SMBJ10A	SMBJ10CA	SMBJ10A	SMBJ10CA	10.0	5	11.10	12.30	1	17.0	35.30
SMBJ11A	SMBJ11CA	SMBJ11A	SMBJ11CA	11.0	1	12.20	13.50	1	18.2	32.97
SMBJ12A	SMBJ12CA	SMBJ12A	SMBJ12CA	12.0	1	13.30	14.70	1	19.9	30.16
SMBJ13A	SMBJ13CA	SMBJ13A	SMBJ13CA	13.0	1	14.40	15.90	1	21.5	27.91
SMBJ14A	SMBJ14CA	SMBJ14A	SMBJ14CA	14.0	1	15.60	17.20	1	23.2	25.87
SMBJ15A	SMBJ15CA	SMBJ15A	SMBJ15CA	15.0	1	16.70	18.50	1	24.4	24.60
SMBJ16A	SMBJ16CA	SMBJ16A	SMBJ16CA	16.0	1	17.80	19.70	1	26.0	23.08
SMBJ17A	SMBJ17CA	SMBJ17A	SMBJ17CA	17.0	1	18.90	20.90	1	27.6	21.74
SMBJ18A	SMBJ18CA	SMBJ18A	SMBJ18CA	18.0	1	20.00	22.10	1	29.2	20.55
SMBJ20A	SMBJ20CA	SMBJ20A	SMBJ20CA	20.0	1	22.20	24.50	1	32.4	18.52
SMBJ22A	SMBJ22CA	SMBJ22A	SMBJ22CA	22.0	1	24.40	26.90	1	35.5	16.91
SMBJ24A	SMBJ24CA	SMBJ24A	SMBJ24CA	24.0	1	26.70	29.50	1	38.9	15.43
SMBJ26A	SMBJ26CA	SMBJ26A	SMBJ26CA	26.0	1	28.90	31.90	1	42.1	14.26
SMBJ28A	SMBJ28CA	SMBJ28A	SMBJ28CA	28.0	1	31.10	34.40	1	45.4	13.22
SMBJ30A	SMBJ30CA	SMBJ30A	SMBJ30CA	30.0	1	33.30	36.80	1	48.4	12.40
SMBJ33A	SMBJ33CA	SMBJ33A	SMBJ33CA	33.0	1	36.70	40.60	1	53.3	11.26
SMBJ36A	SMBJ36CA	SMBJ36A	SMBJ36CA	36.0	1	40.00	44.20	1	58.1	10.33
SMBJ40A	SMBJ40CA	SMBJ40A	SMBJ40CA	40.0	1	44.40	49.10	1	64.5	9.31
SMBJ43A	SMBJ43CA	SMBJ43A	SMBJ43CA	43.0	1	47.80	52.80	1	69.4	8.65
SMBJ45A	SMBJ45CA	SMBJ45A	SMBJ45CA	45.0	1	50.00	55.30	1	72.7	8.26
SMBJ48A	SMBJ48CA	SMBJ48A	SMBJ48CA	48.0	1	53.30	58.90	1	77.4	7.76
SMBJ51A	SMBJ51CA	SMBJ51A	SMBJ51CA	51.0	1	56.70	62.70	1	82.4	7.29
SMBJ54A	SMBJ54CA	SMBJ54A	SMBJ54CA	54.0	1	60.00	66.30	1	87.1	6.89
SMBJ58A	SMBJ58CA	SMBJ58A	SMBJ58CA	58.0	1	64.40	71.20	1	93.6	6.42
SMBJ60A	SMBJ60CA	SMBJ60A	SMBJ60CA	60.0	1	66.70	73.70	1	96.8	6.20
SMBJ64A	SMBJ64CA	SMBJ64A	SMBJ64CA	64.0	1	71.10	78.60	1	103.0	5.83

**Electrical Characteristics (T=25°C)**

Part Number		Marking		V <sub>R</sub>	I <sub>R</sub> @V <sub>R</sub>	V <sub>BR</sub> @I <sub>T</sub>		I <sub>T</sub>	V <sub>C</sub> @I <sub>PP</sub>	I <sub>PP</sub> <sup>①</sup>
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMBJ70A	SMBJ70 CA	SMBJ70A	SMBJ70 CA	70.0	1	77.80	86.00	1	113.0	5.31
SMBJ75A	SMBJ75 CA	SMBJ75A	SMBJ75 CA	75.0	1	83.30	92.10	1	121.0	4.96
SMBJ78A	SMBJ78 CA	SMBJ78A	SMBJ78 CA	78.0	1	86.70	95.80	1	126.0	4.77
SMBJ85A	SMBJ85 CA	SMBJ85A	SMBJ85 CA	85.0	1	94.40	104.0	1	137.0	4.38
SMBJ90A	SMBJ90 CA	SMBJ90A	SMBJ90 CA	90.0	1	100.0	111.0	1	146.0	4.11
SMBJ100A	SMBJ100 CA	SMBJ100A	SMBJ100 CA	100.0	1	111.0	123.0	1	162.0	3.71
SMBJ110A	SMBJ110 CA	SMBJ110A	SMBJ110 CA	110.0	1	122.0	135.0	1	177.0	3.39
SMBJ120A	SMBJ120 CA	SMBJ120A	SMBJ120 CA	120.0	1	133.0	147.0	1	193.0	3.11
SMBJ130A	SMBJ130 CA	SMBJ130A	SMBJ130 CA	130.0	1	144.0	159.0	1	209.0	2.88
SMBJ150A	SMBJ150 CA	SMBJ150A	SMBJ150 CA	150.0	1	167.0	185.0	1	243.0	2.47
SMBJ160A	SMBJ160 CA	SMBJ160A	SMBJ160 CA	160.0	1	178.0	197.0	1	259.0	2.32
SMBJ170A	SMBJ170 CA	SMBJ170A	SMBJ170 CA	170.0	1	189.0	209.0	1	275.0	2.19
SMBJ180A	SMBJ180 CA	SMBJ180A	SMBJ180 CA	180.0	1	201.0	222.0	1	292.0	2.06
SMBJ190A	SMBJ190 CA	SMBJ190A	SMBJ190 CA	190.0	1	209.0	233.0	1	308.0	1.96
SMBJ200A	SMBJ200 CA	SMBJ200A	SMBJ200 CA	200.0	1	224.0	247.0	1	324.0	1.86
SMBJ210A	SMBJ210 CA	SMBJ210A	SMBJ210 CA	210.0	1	237.0	263.0	1	340.0	1.79
SMBJ220A	SMBJ220 CA	SMBJ220A	SMBJ220 CA	220.0	1	246.0	272.0	1	356.0	1.69
SMBJ250A	SMBJ250 CA	SMBJ250A	SMBJ250 CA	250.0	1	279.0	309.0	1	405.0	1.49
SMBJ300A	SMBJ300 CA	SMBJ300A	SMBJ300 CA	300.0	1	335.0	371.0	1	486.0	1.24
SMBJ350A	SMBJ350 CA	SMBJ350A	SMBJ350 CA	350.0	1	391.0	432.0	1	567.0	1.06
SMBJ400A	SMBJ400 CA	SMBJ400A	SMBJ400 CA	400.0	1	447.0	494.0	1	648.0	0.93
SMBJ440A	SMBJ440 CA	SMBJ440A	SMBJ440 CA	440.0	1	492.0	543.0	1	713.0	0.85

**Notes:**

① Surge waveform: 10/1000μs

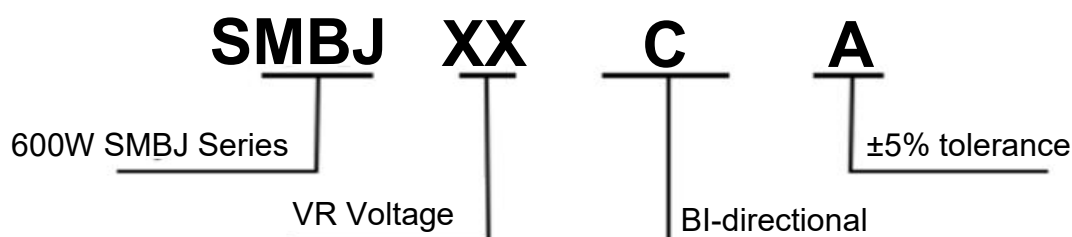
V<sub>R</sub> : Stand-off Voltage -- Maximum voltage that can be applied

V<sub>BR</sub>: Breakdown Voltage

V<sub>C</sub>: Clamping Voltage -- Peak voltage measured across the suppressor at a specified I<sub>pp</sub>

I<sub>R</sub>: Reverse Leakage Current

**Part number code**

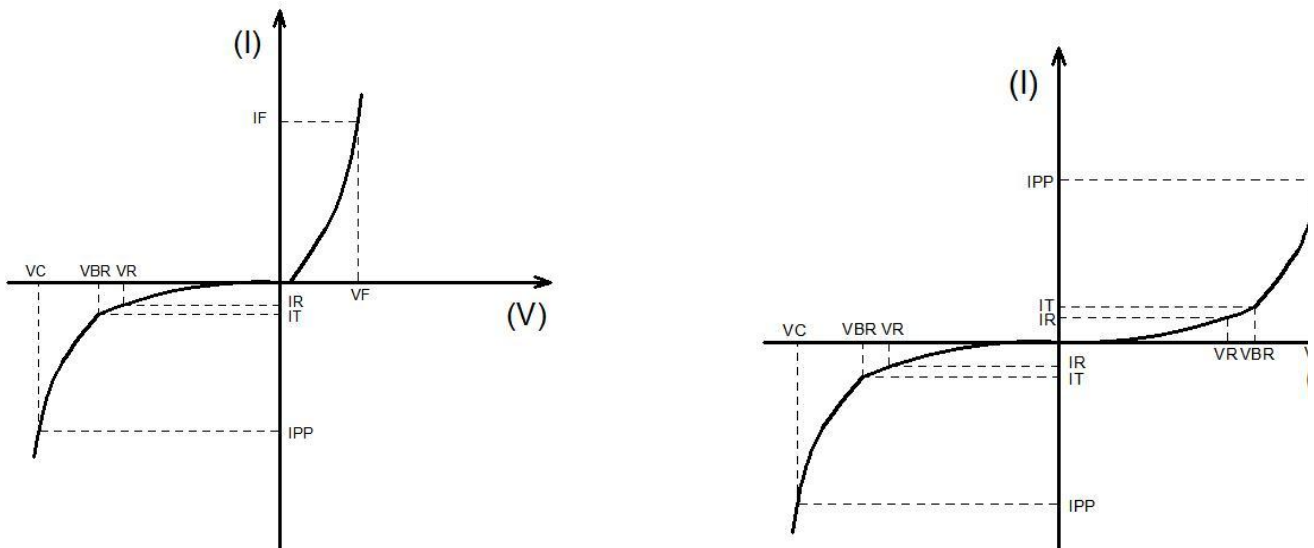


**Absolute Maximum Ratings(T=25°C, RH=45%-75%, unless otherwise noted)**

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000µs waveform	P <sub>PP</sub>	600	W
Steady state power dissipation at T <sub>L</sub> =75°C	P <sub>M(AV)</sub>	5.0	W
Operating junction temperature range	T <sub>j</sub>	-55 to +125	°C
Storage temperature range	T <sub>stg</sub>	-55 to +150	°C

**Ratings And V-I Characteristics Curves (T=25°C, unless otherwise noted)**

FIG1: V-I cure characteristics



Symbol	Parameter
I <sub>F</sub>	Mean Forward Current
V <sub>F</sub>	Maximum Forward Voltage @I <sub>F</sub>
V <sub>R</sub>	Peak Reverse Working Voltage
I <sub>R</sub>	Reverse Leakage Current @ V <sub>R</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>

Typical Characteristics

FIG2: Pulse Derating Curve

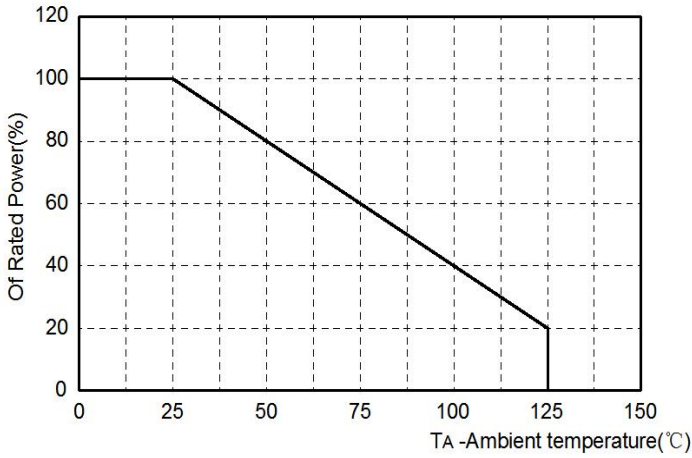


FIG3: Pulse Waveform

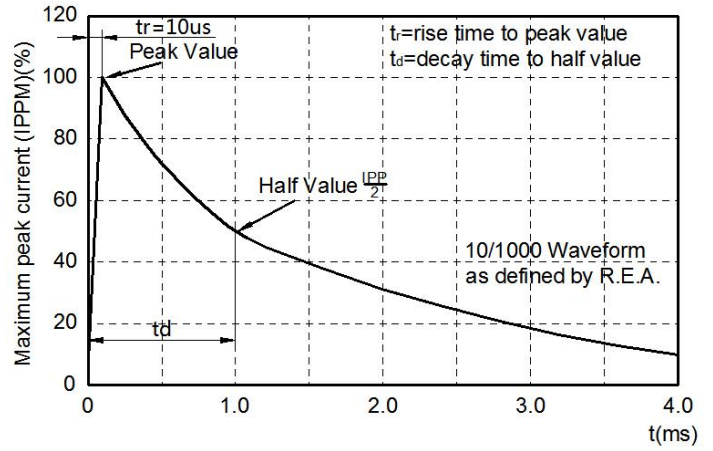


FIG4: Peak Pulse Power Rating Curve

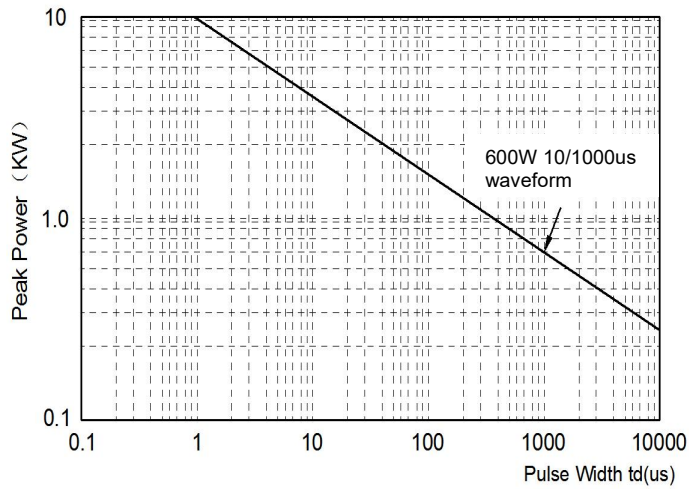
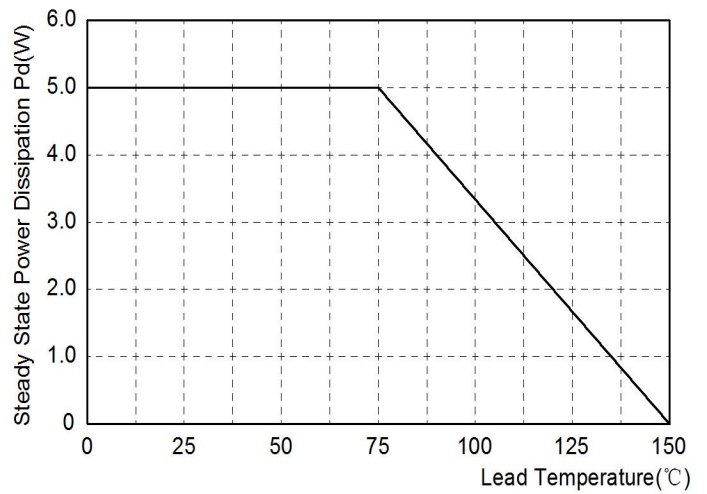
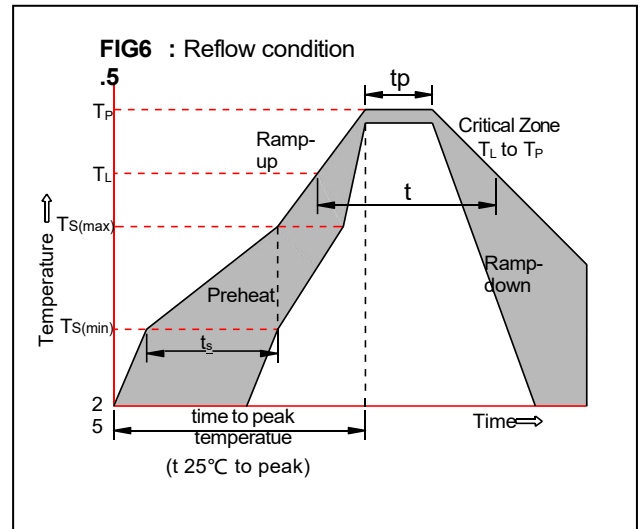


FIG5: Steady State Power Dissipation

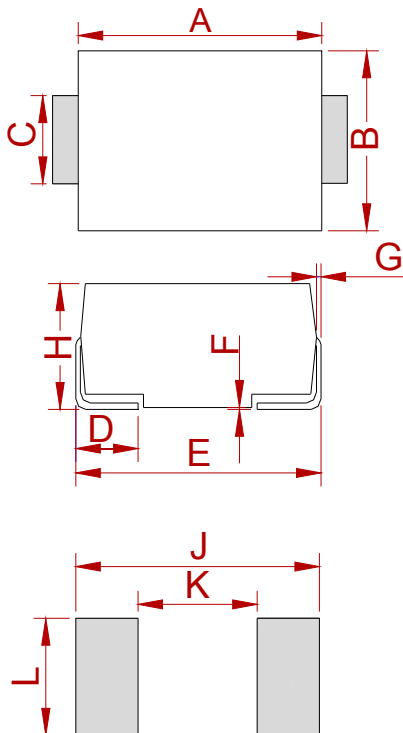


**Soldering parameters**

ReflowCondition		Pb-Free assembly (see as below)
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 (Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C



**PACKAGE ECHANICAL DATA**



DO-214AA (SMB)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

**REEL SPECIFICATION**

P/N	PKG	QTY
SMBJXXXA(CA)	SMB	3000

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