

## Transient Voltage Suppressors SMBJ series

### Description:

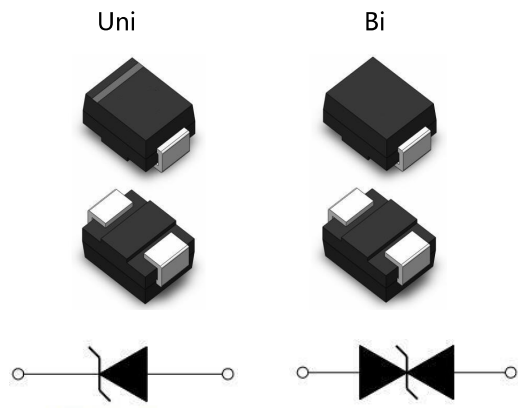
TVS is designed specifically to protect sensitive electronic Equipment from voltage transients induced by lightning and other transient voltage events.

Used in telecommunications, computer, industrial and consumer electronic applications. TVS is the ideal I/O interface, VCC bus and other vulnerable circuit protection device.

### Features:

- Low zener impedance
- Glass passivated chip junction
- Ideal for automated placement
- Available in uni-directional and bi-directional
- Excellent clamping capability
- 600W Peak power capability at 10×1000µs waveform Repetition rate ( duty cycle):0.01%
- Fast response time: typically less than 1.0ps
- High Temperature soldering: 260 °C/40 seconds at terminals
- IEC-61000-4-2ESD 15KV(Air), 8KV (Contact)

### Appearance:



### Packaging :

Part Number	Component Package	Quantity	Packaging
SMBJ***A/CA	DO-214AA (SMB)	2000 PCS	Tape & Reel

### Maximum Ratings (TA= 25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with a 10/1000µs waveform.(1)(2)	P <sub>PPM</sub>	600	W
Power Dissipation on infinite heat sink at T <sub>A</sub> =50°C	P <sub>M(AV)</sub>	5.0	W
Peak forward surge current 8.3 ms single half sine-wave uni-directional only.(2)	I <sub>FSM</sub>	100	A
Maximum Instantaneous Forward voltage at 100A for Unidirectional only	V <sub>F</sub>	3.5/5.0	V
Operating junction and storage temperature range.	T <sub>J</sub> T <sub>STG</sub>	-65 to +150	°C
Typical Thermal Resistance Junction to Lead	R <sub>UJL</sub>	20	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>ULA</sub>	100	°C/W

Notes:

- (1).Non-repetitive current pulse, per fig.3 and derated above TA= 25°C per fig.2.
- (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.

## SMBJ Series

### Electrical Characteristics (TA= 25 °C unless otherwise noted)

Part Number		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage @ $I_T$ $V_{BR}(V)$		Test Current $I_T$ (mA)	Max Clamping Voltage @ $I_{PP}$ $V_C(V)$	Max Peak Pulse Current $I_{PP}(A)$	Max Reverse Leakage @ $V_{RWM}$ $I_R(\mu A)$
Uni	Bi		Min	Max				
SMBJ5.0A	SMBJ5.0CA	5.0	6.40	7.00	10	9.2	65.22	800
SMBJ6.0A	SMBJ6.0CA	6.0	6.67	7.37	10	10.3	58.25	800
SMBJ6.5A	SMBJ6.5CA	6.5	7.22	7.98	10	11.2	53.57	500
SMBJ7.0A	SMBJ7.0CA	7.0	7.78	8.60	10	12.0	50.00	200
SMBJ7.5A	SMBJ7.5CA	7.5	8.33	9.21	1	12.9	46.51	100
SMBJ8.0A	SMBJ8.0CA	8.0	8.89	9.83	1	13.6	44.12	50
SMBJ8.5A	SMBJ8.5CA	8.5	9.44	10.40	1	14.4	41.67	20
SMBJ9.0A	SMBJ9.0CA	9.0	10.00	11.10	1	15.4	38.96	10
SMBJ10A	SMBJ10CA	10.0	11.10	12.30	1	17.0	35.29	5
SMBJ11A	SMBJ11CA	11.0	12.20	13.50	1	18.2	32.97	1
SMBJ12A	SMBJ12CA	12.0	13.30	14.70	1	19.9	30.15	1
SMBJ13A	SMBJ13CA	13.0	14.40	15.90	1	21.5	27.91	1
SMBJ14A	SMBJ14CA	14.0	15.60	17.20	1	23.2	25.86	1
SMBJ15A	SMBJ15CA	15.0	16.70	18.50	1	24.4	24.59	1
SMBJ16A	SMBJ16CA	16.0	17.80	19.70	1	26.0	23.08	1
SMBJ17A	SMBJ17CA	17.0	18.90	20.90	1	27.6	21.74	1
SMBJ18A	SMBJ18CA	18.0	20.00	22.10	1	29.2	20.55	1
SMBJ19A	SMBJ19CA	19.0	21.10	23.30	1	30.8	19.49	1
SMBJ20A	SMBJ20CA	20.0	22.20	24.50	1	32.4	18.52	1
SMBJ22A	SMBJ22CA	22.0	24.40	26.90	1	35.5	16.90	1
SMBJ24A	SMBJ24CA	24.0	26.70	29.50	1	38.9	15.42	1
SMBJ26A	SMBJ26CA	26.0	28.90	31.90	1	42.1	14.25	1
SMBJ28A	SMBJ28CA	28.0	31.10	34.40	1	45.4	13.22	1
SMBJ30A	SMBJ30CA	30.0	33.30	36.80	1	48.4	12.40	1
SMBJ33A	SMBJ33CA	33.0	36.70	40.60	1	53.3	11.26	1
SMBJ36A	SMBJ36CA	36.0	40.00	44.20	1	58.1	10.33	1
SMBJ40A	SMBJ40CA	40.0	44.40	49.10	1	64.5	9.30	1
SMBJ43A	SMBJ43CA	43.0	47.80	52.80	1	69.4	8.65	1
SMBJ45A	SMBJ45CA	45.0	50.00	55.30	1	72.7	8.25	1

Part Number		Reverse Stand-Off Voltage $V_{RWM}(V)$	Breakdown Voltage @ $I_T$ $V_{BR}(V)$		Test Current $I_T$ (mA)	Max Clamping Voltage @ $I_{PP}$ $V_C(V)$	Max Peak Pulse Current $I_{PP}(A)$	Max Reverse Leakage @ $V_{RWM}$ $I_R(\mu A)$
Uni	Bi		Min	Max				
SMBJ48A	SMBJ48CA	48.0	53.30	58.90	1	77.4	7.75	1
SMBJ51A	SMBJ51CA	51.0	56.70	62.70	1	82.4	7.28	1
SMBJ54A	SMBJ54CA	54.0	60.00	66.30	1	87.1	6.89	1
SMBJ58A	SMBJ58CA	58.0	64.40	71.20	1	93.6	6.41	1
SMBJ60A	SMBJ60CA	60.0	66.70	73.70	1	96.8	6.20	1
SMBJ64A	SMBJ64CA	64.0	71.10	78.60	1	103.0	5.83	1
SMBJ70A	SMBJ70CA	70.0	77.80	86.00	1	113.0	5.31	1
SMBJ75A	SMBJ75CA	75.0	83.30	92.10	1	121.0	4.96	1
SMBJ78A	SMBJ78CA	78.0	86.70	95.80	1	126.0	4.76	1
SMBJ80A	SMBJ80CA	80.0	88.80	97.60	1	129.6	4.63	1
SMBJ85A	SMBJ85CA	85.0	94.40	104.00	1	137.0	4.38	1
SMBJ90A	SMBJ90CA	90.0	100.00	111.00	1	146.0	4.11	1
SMBJ100A	SMBJ100CA	100.0	111.00	123.00	1	162.0	3.70	1
SMBJ110A	SMBJ110CA	110.0	122.00	135.00	1	177.0	3.39	1
SMBJ120A	SMBJ120CA	120.0	133.0	147.00	1	193.0	3.11	1
SMBJ130A	SMBJ130CA	130.0	144.0	159.0	1	209.0	2.87	1
SMBJ140A	SMBJ140CA	140.0	155.00	171.00	1	226.8	2.65	1
SMBJ150A	SMBJ150CA	150.0	167.00	185.00	1	243.0	2.47	1
SMBJ160A	SMBJ160CA	160.0	178.00	197.00	1	259.0	2.32	1
SMBJ170A	SMBJ170CA	170.0	189.00	209.00	1	275.0	2.18	1
SMBJ180A	SMBJ180CA	180.0	201.00	220.00	1	291.6	2.06	1
SMBJ190A	SMBJ190CA	190.0	211.00	232.00	1	307.8	1.95	1
SMBJ200A	SMBJ200CA	200.0	224.00	247.00	1	324.0	1.85	1
SMBJ220A	SMBJ220CA	220.0	246.00	272.00	1	356.0	1.69	1
SMBJ250A	SMBJ250CA	250.0	279.00	309.00	1	405.0	1.48	1
SMBJ300A	SMBJ300CA	300.0	335.00	371.00	1	486.0	1.23	1
SMBJ350A	SMBJ350CA	350.0	391.00	432.00	1	567.0	1.06	1
SMBJ400A	SMBJ400CA	400.0	447.00	494.00	1	648.0	0.93	1
SMBJ440A	SMBJ440CA	440.0	492.00	543.00	1	713.0	0.84	1

Note: 1.Suffix 'A' denotes 5% tolerance device.

2.Add suffix 'CA' after part number to specify Bi-directional devices.

3.For Bi-Directional devices having VR of 10 volts and under, the IR limit is double.

## Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

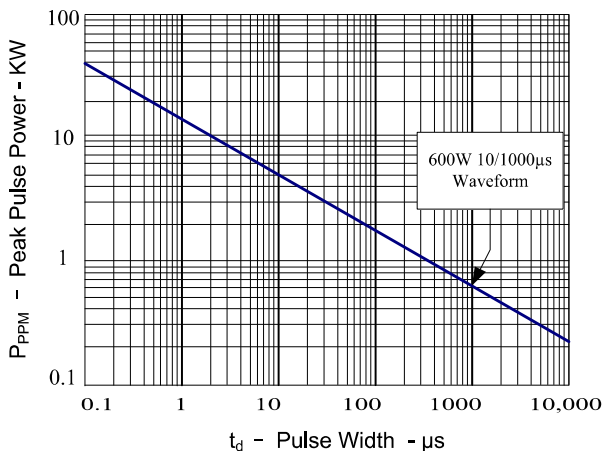


Figure 2: Pulse Derating Curve

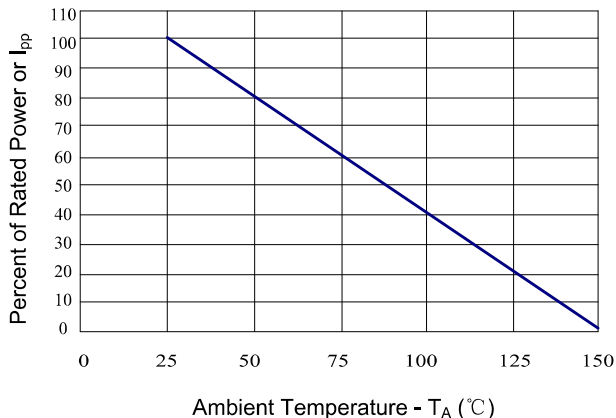


Figure 3: Pulse Waveform

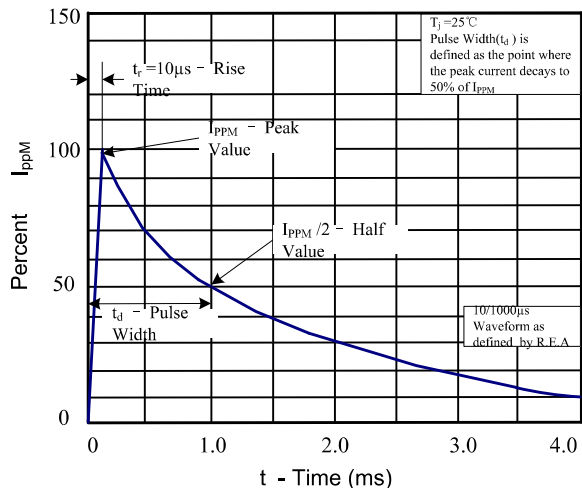


Figure 4: Typical Junction Capacitance

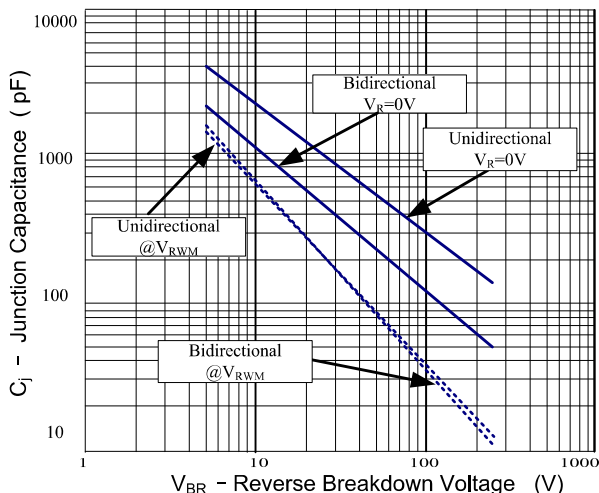


Figure 5: Steady State Power Dissipation Derating Curve

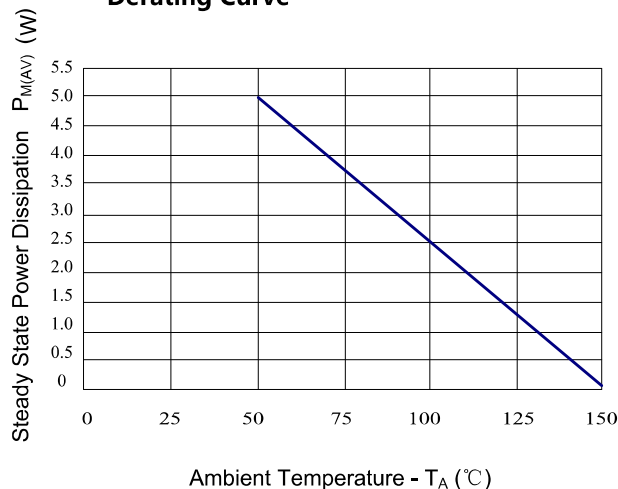
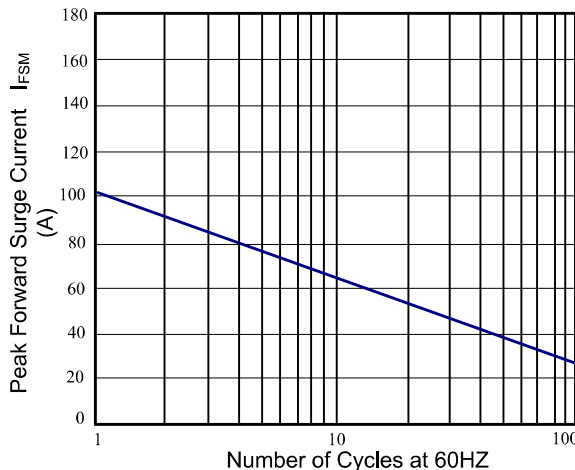
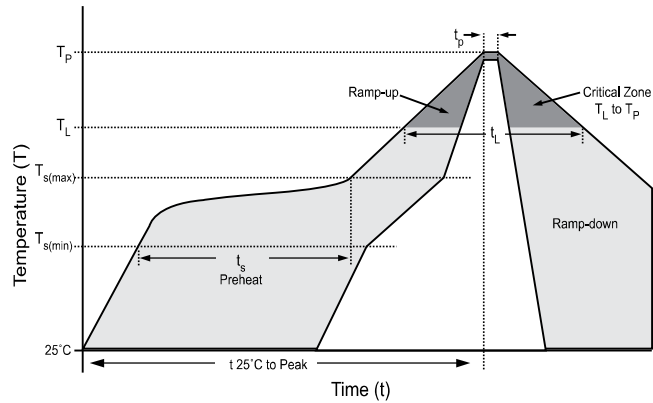


Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



### Soldering Parameters

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (TS max to TP)	3°C/ second max.
Preheat: Temperature Min (TS min) Temperature Max (TS max) Time(TSmin to TS max)	150°C 200°C 60-180 seconds
Time maintained above: Temperature(TL) Time (TL)	217°C 60-150 seconds
Peak/Classification Temperature(TP):	260°C
Ramp-down Rate:	3°C/ second max.
Time 25°C to Peak Temperature	8 minutes max.
Do not exceed	280°C



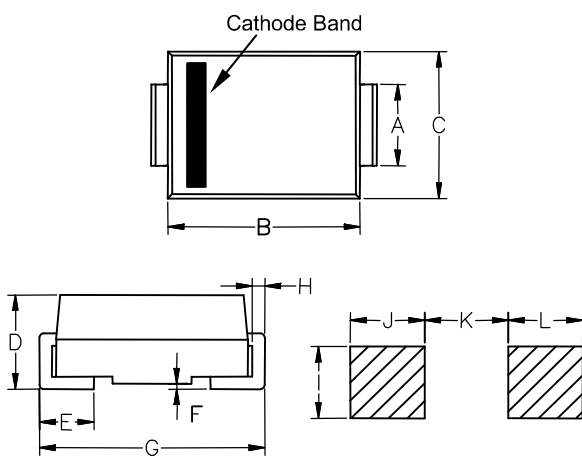
### Physical Specifications

<b>Weight</b>	0.003 ounce, 0.093 grams
<b>Case</b>	JEDEC DO214AA. Molded plastic body over glass passivated junction.
<b>Polarity</b>	Color band denotes positive end (cathode) except Bidirectional
<b>Terminal</b>	Matte Tin-Plated leads, Solderable Per JESD22-B102D

### Environmental Specifications

<b>Temperature Cycle</b>	JESD22-A104
<b>Pressure Cooker</b>	JESD22-A102
<b>High Temp. Storage</b>	JESD22-A103
<b>HTRB</b>	JESD22-A108
<b>Thermal Shock</b>	JESD22-A106

### Outline Drawing



DO-214AA (SMB)

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740
L	0.085	-	2.160	-