

## SPECIFICATION FOR APPROVAL

<p><b>CUSTOMER'S APPROVAL CHOP</b></p>  <p>Approval's Condition: _____</p> <p>Approved Date: _____</p>
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KINDLY RETURN A SET WITH YOUR COMPANY'S OFFICIAL STAMP ON APPROVAL OF THIS ITEM

**CUSTOMER'S NAME:** \_\_\_\_\_

**CUSTOMER'S MODEL NO. :** \_\_\_\_\_

**CUSTOMER'S PART NO. :** \_\_\_\_\_

**DESCRIPTION:** **SMBJ**

**Semitel'S MODEL NO. :** **SMBJ Series**

**VERSION:** **A**

**DATE:** **2019/12/19**

**Attachments:**

- Product Specification
- Sample Qty. :
- Test Data

Prepared By	Checked By	Approved By
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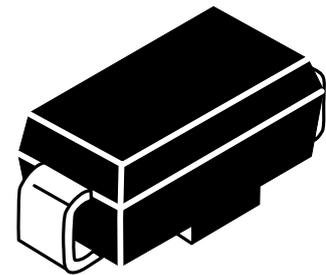


## Transient Voltage Suppression Diodes Surface Mount – 600W > SMBJ series

### Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS activates from an very high impedance status to a very low impedance status by operating in the avalanche mode and uses a large junction area to absorb large transient currents in a fast response time, protecting voltage sensitive electronics equipment from damaging.

Semitel supplies unipolar and bipolar TVS devices with axial and SMD packages, with maximum working voltage 5V to 550V, maximum power dissipation from 200W-5000W.



**SMB  
(JEDEC DO-214AA)**

### Features

- Glass passivated chip junction in SMB Package
- 600W peak pulse power @10/1000µs
- Typical  $I_R$  less than 1µA above 13V
- Low incremental surge resistance
- Excellent clamping capability
- Typical failure mode is short from over-specified voltag/current
- Fast response time: typically less than 1.0ps from 0V to BV min
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL94V-0 Flammability Rating
- Halogen free and RoHS compliant

### Order Information

Device	Qty per Box	Tape
SMBJ series	500	7" Reel
	3000	13" Reel

- Telecom and Network
- Industrial Products
- Business Machines
- Vehicles Electronics
- Power Adapter
- Consumer Products
- Security Protection

### Applications

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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Test Waveform	$P_{PPM}$	600	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	$P_D$	5.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only <sup>(1)</sup>	$I_{FSM}$	100	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only <sup>(2)</sup>	$V_F$	3.5/5.0	V
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	20	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	°C/W

#### Notes:

- 1) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.  
2)  $V_F < 3.5V$  for devices of  $V_{BR} \leq 200V$  and  $V_F < 5.0V$  for devices of  $V_{BR} \geq 201V$ .

Semitel'S MODEL NO. :	SMBJ Series	CUSTOMER'S MODEL NO. :	
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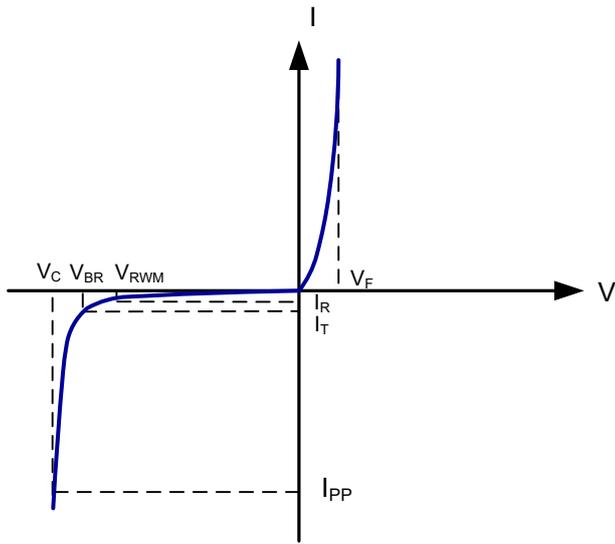
### Electrical Characteristics (TA=25°C unless otherwise noted)

Type Number		V <sub>RMW</sub>	I <sub>R</sub> @V <sub>RMW</sub>	V <sub>BR</sub> @I <sub>T</sub> (V)			I <sub>T</sub>	V <sub>C</sub> @I <sub>PP</sub>	I <sub>PP</sub> MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
SMBJ5.0A	SMBJ5.0CA	5	800	6.4	6.7	7	10	9.2	65.3
SMBJ6.0A	SMBJ6.0CA	6	800	6.67	7.02	7.37	10	10.3	58.3
SMBJ6.5A	SMBJ6.5CA	6.5	500	7.22	7.6	7.98	10	11.2	53.6
SMBJ7.0A	SMBJ7.0CA	7	200	7.78	8.19	8.6	10	12	50
SMBJ7.5A	SMBJ7.5CA	7.5	100	8.33	8.77	9.21	1	12.9	46.6
SMBJ8.0A	SMBJ8.0CA	8	50	8.89	9.36	9.83	1	13.6	44.2
SMBJ8.5A	SMBJ8.5CA	8.5	20	9.44	9.92	10.4	1	14.4	41.7
SMBJ9.0A	SMBJ9.0CA	9	10	10	10.6	11.1	1	15.4	39
SMBJ10A	SMBJ10CA	10	5	11.1	11.7	12.3	1	17	35.3
SMBJ11A	SMBJ11CA	11	1	12.2	12.9	13.5	1	18.2	33
SMBJ12A	SMBJ12CA	12	1	13.3	14	14.7	1	19.9	30.2
SMBJ13A	SMBJ13CA	13	1	14.4	15.2	15.9	1	21.5	28
SMBJ14A	SMBJ14CA	14	1	15.6	16.4	17.2	1	23.2	25.9
SMBJ15A	SMBJ15CA	15	1	16.7	17.6	18.5	1	24.4	24.6
SMBJ16A	SMBJ16CA	16	1	17.8	18.8	19.7	1	26	23.1
SMBJ17A	SMBJ17CA	17	1	18.9	19.9	20.9	1	27.6	21.8
SMBJ18A	SMBJ18CA	18	1	20	21.1	22.1	1	29.2	20.6
SMBJ20A	SMBJ20CA	20	1	22.2	23.4	24.5	1	32.4	18.6
SMBJ22A	SMBJ22CA	22	1	24.4	25.7	26.9	1	35.5	16.9
SMBJ24A	SMBJ24CA	24	1	26.7	28.1	29.5	1	38.9	15.5
SMBJ26A	SMBJ26CA	26	1	28.9	30.4	31.9	1	42.1	14.3
SMBJ28A	SMBJ28CA	28	1	31.1	32.8	34.4	1	45.4	13.3
SMBJ30A	SMBJ30CA	30	1	33.3	35.1	36.8	1	48.4	12.4
SMBJ33A	SMBJ33CA	33	1	36.7	38.7	40.6	1	53.3	11.3
SMBJ36A	SMBJ36CA	36	1	40	42.1	44.2	1	58.1	10.4
SMBJ40A	SMBJ40CA	40	1	44.4	46.8	49.1	1	64.5	9.3
SMBJ43A	SMBJ43CA	43	1	47.8	50.3	52.8	1	69.4	8.7
SMBJ45A	SMBJ45CA	45	1	50	52.7	55.3	1	72.7	8.3
SMBJ48A	SMBJ48CA	48	1	53.3	56.1	58.9	1	77.4	7.8
SMBJ51A	SMBJ51CA	51	1	56.7	59.7	62.7	1	82.4	7.3
SMBJ54A	SMBJ54CA	54	1	60	63.2	66.3	1	87.1	6.9
SMBJ58A	SMBJ58CA	58	1	64.4	67.8	71.2	1	93.6	6.5
SMBJ60A	SMBJ60CA	60	1	66.7	70.2	73.7	1	96.8	6.2
SMBJ64A	SMBJ64CA	64	1	71.1	74.9	78.6	1	103	5.9
SMBJ70A	SMBJ70CA	70	1	77.8	81.9	86	1	113	5.3
SMBJ75A	SMBJ75CA	75	1	83.3	87.7	92.1	1	121	5
SMBJ78A	SMBJ78CA	78	1	86.7	91.3	95.8	1	126	4.8
SMBJ85A	SMBJ85CA	85	1	94.4	99.2	104	1	137	4.4
SMBJ90A	SMBJ90CA	90	1	100	105.5	111	1	146	4.1
SMBJ100A	SMBJ100CA	100	1	111	117	123	1	162	3.7
SMBJ110A	SMBJ110CA	110	1	122	128.5	135	1	177	3.4
SMBJ120A	SMBJ120CA	120	1	133	140	147	1	193	3.1
SMBJ130A	SMBJ130CA	130	1	144	151.5	159	1	209	2.9
SMBJ150A	SMBJ150CA	150	1	167	176	185	1	243	2.5
SMBJ160A	SMBJ160CA	160	1	178	187.5	197	1	259	2.3
SMBJ170A	SMBJ170CA	170	1	189	199	209	1	275	2.2
SMBJ180A	SMBJ180CA	180	1	201	211.5	222	1	292	2.1
SMBJ200A	SMBJ200CA	200	1	224	235.5	247	1	324	1.9
SMBJ220A	SMBJ220CA	220	1	246	259	272	1	356	1.7
SMBJ250A	SMBJ250CA	250	1	279	294	309	1	405	1.5
SMBJ300A	SMBJ300CA	300	1	335	353	371	1	486	1.3
SMBJ350A	SMBJ350CA	350	1	391	411.5	432	1	567	1.1
SMBJ400A	SMBJ400CA	400	1	447	470.5	494	1	648	0.9
SMBJ440A	SMBJ440CA	440	1	492	517.5	543	1	713	0.9

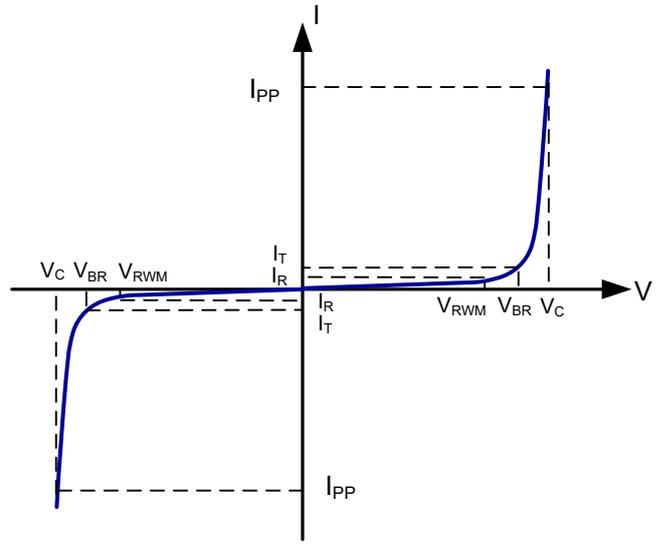
For bidirectional type having V<sub>RMW</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

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## I-V Curve Characteristics



Uni-Directional TVS



Bi-Directional TVS

**V<sub>RWM</sub> - Reverse Stand-Off Voltage** - Working Peak Reverse Voltage

**V<sub>BR</sub> - Breakdown Voltage** - Maximum current that flows through the TVS at a specified test current ( $I_T$ )

**I<sub>T</sub> - Test Current** - Test Current

**V<sub>C</sub> - Clamping Voltage** - Peak voltage measured across the suppressor at a specified  $I_{ppm}$  (peak impulse current)

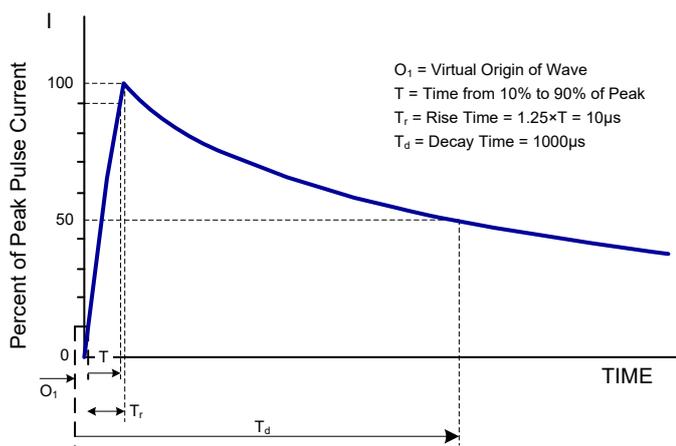
**I<sub>PP</sub> - Peak Pulse Current** - Maximum Reverse Peak Pulse Current

**P<sub>PPM</sub> - Peak Pulse Power Dissipation** - Max power dissipation

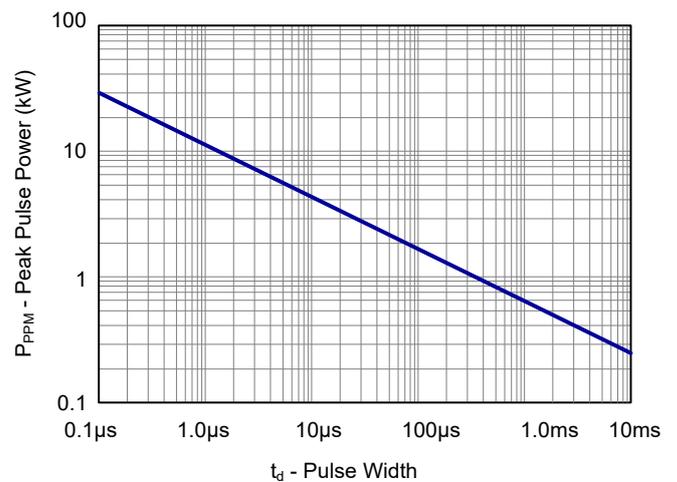
**I<sub>R</sub> - Reverse Leakage Current** - Current measured at  $V_{RWM}$

**V<sub>F</sub> - Forward Voltage** - Drop for Uni-directional

## Ratings and Characteristic Curves (TA=25°C unless otherwise noted)

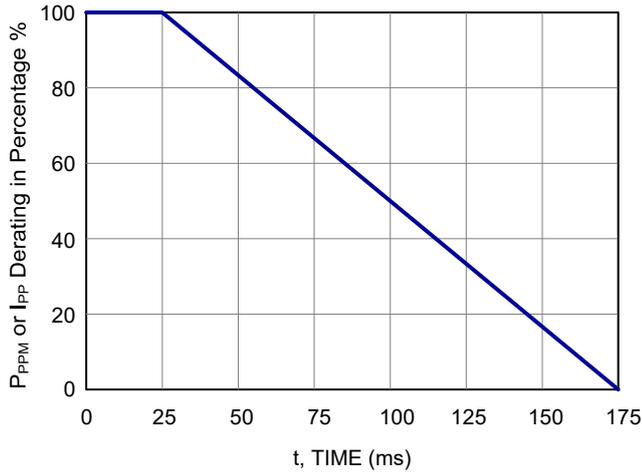


Pulse Waveform- 10/1000µs

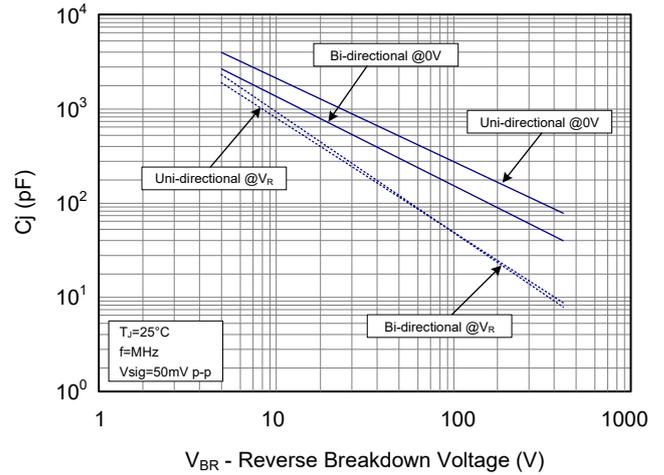


Peak Pulse Power Rating Curve

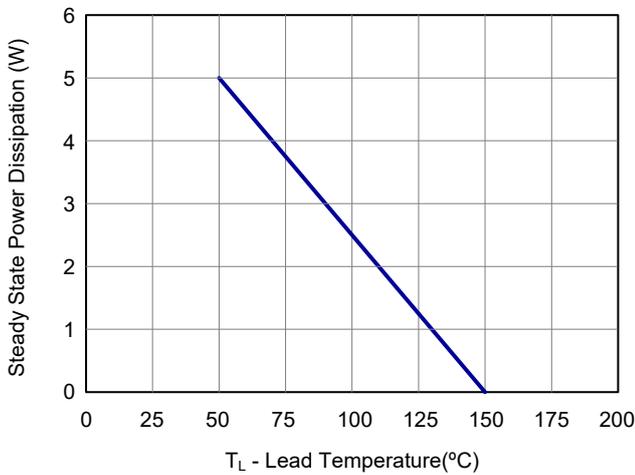
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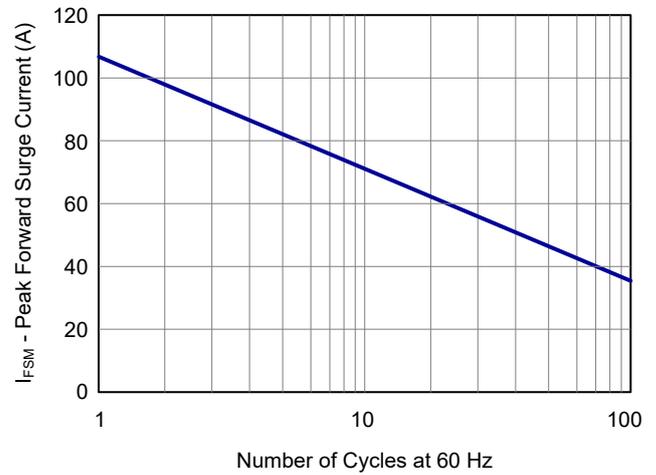
**Pulse Derating Curve**



**Typical Junction Capacitance**



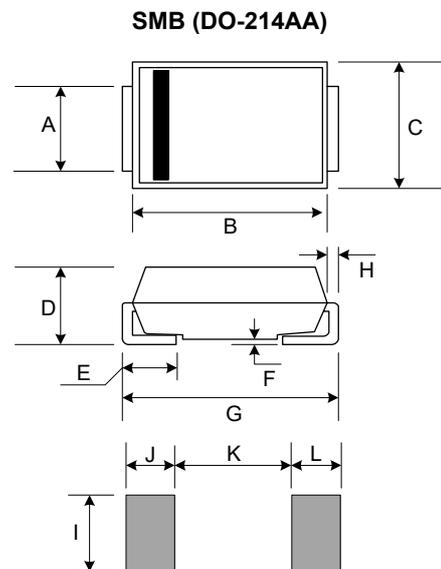
**Steady State Power Derating Curve**



**Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**

**Product Dimensions**

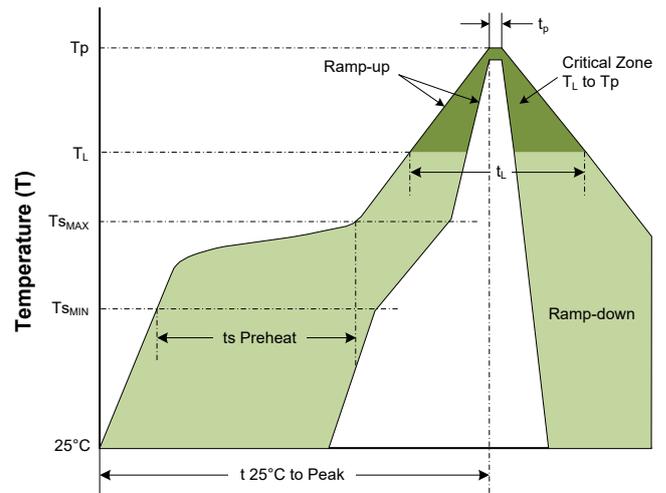
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.077	0.086	1.950	2.200
B	0.160	0.180	4.060	4.570
C	0.130	0.155	3.300	3.940
D	0.084	0.096	2.130	2.440
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.205	0.220	5.210	5.590
H	0.006	0.012	0.152	0.305
I	0.089	-	2.260	-
J	0.085	-	2.160	-
K	-	0.107	-	2.740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



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## Soldering Parameters

Profile Feature	Lead-Free Assembly
Average Ramp-up Rate ( $T_{S_{MAX}}$ to $T_p$ ) Average Ramp-down Rate ( $T_p$ to $T_L$ )	3°C/second max. 6°C/second max.
<b>Preheat</b> • Temperature Min ( $T_{S_{MIN}}$ ) • Temperature Max ( $T_{S_{MAX}}$ ) • Time ( $t_s$ Preheat)	150°C 200°C 60-180 seconds
<b>Time maintained above:</b> • Temperature ( $T_L$ ) • Time ( $t_L$ )	217°C 60-150 seconds
<b>Peak/Classification Temperature</b> • Temperature ( $T_p$ )	260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual Peak</b> Time ( $t_p$ )	20-40 seconds
<b>Time 25°C to peak Temperature</b>	8 minutes max
<b>Do not exceed</b>	280 °C



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