

# SMBJ 5.0 - 170A

# SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

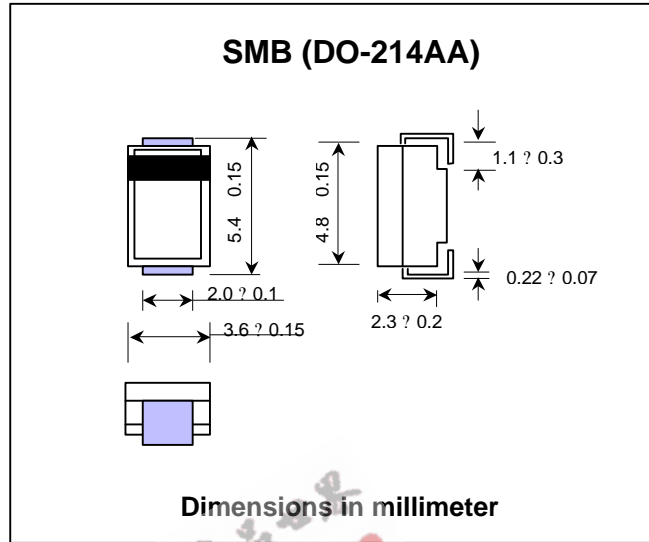
**V<sub>BR</sub> : 6.8 - 200 Volts**  
**P<sub>PK</sub> : 600 Watts**

**FEATURES :**

- \* 600W surge capability at 1ms
- \* Excellent clamping capability
- \* Low inductance
- \* Response Time Typically < 1ns
- \* Typical I<sub>R</sub> less then 1μA above 10V

**MECHANICAL DATA**

- \* Case : SMB Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead Formed for Surface Mount
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.108 gram



**MAXIMUM RATINGS**

Rating at Ta = 25 °C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation on 10/1000μs (1) waveform (Notes 1, 2, Fig. 3)	PPPM	Minimum 600	Watts
Peak Pulse Current on 10/1000μs waveform (Note 1, Fig. 5)	IPPM	See Table	Amps
Peak forward Surge Current 8.3 ms single half sine-wave superimposed on rated load ( JEDEC Method )(Notes 2, 3)			
Maximum Instantaneous Forward Voltage at 50A (Note 3,4 )	VFM	See Note 3, 4	Volts
Operating Junction and Storage Temperature Range	TJ, TSTG	- 65 to + 150	°C

**Note :**

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on 5.0mm<sup>2</sup> (0.013mm thick) land areas.
- (3) Measured on 8.3ms. Single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum.
- (4) V<sub>F</sub>=3.5V for SMBJ5.0 thru SMBJ90 devices and V<sub>F</sub>=5V for SMBJ100 thru SMBJ170 devices.



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Certificate Number: Q10561

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## ELECTRICAL CHARACTERISTICS

Rating at Ta = 25 °C ambient temperature unless otherwise specified

TYPE	Marking Code	Breakdown Voltage @ I <sub>T</sub> ( Note 1 )			Reverse Stand-off Voltage	Maximum Reverse Leakage @ V <sub>WM</sub>	Maximum Peak Pulse Surge Current (See Fig. 2)	Maximum Clamping Voltage @ IPPM
		V <sub>BR</sub> (V)		I <sub>T</sub>				
		Min.	Max.	(mA)				
SMBJ5.0	606I	6.40	7.55	10	5.0	800	62.5	9.6
SMBJ5.0A	656I	6.40	7.25	10	5.0	800	65.2	9.2
SMBJ6.0	607C	6.67	8.45	10	6.0	800	52.6	11.4
SMBJ6.0A	657C	6.67	7.67	10	6.0	800	58.3	10.3
SMBJ6.5	607I	7.22	9.14	10	6.5	500	48.7	12.3
SMBJ6.5A	657I	7.22	8.30	10	6.5	500	53.6	11.2
SMBJ7.0	608E	7.78	9.86	10	7.0	200	45.1	13.3
SMBJ7.0A	658E	7.78	8.95	10	7.0	200	50.0	12.0
SMBJ7.5	609A	8.33	10.67	1.0	7.5	100	42.0	14.3
SMBJ7.5A	659A	8.33	9.58	1.0	7.5	100	46.5	12.9
SMBJ8.0	609G	8.89	11.3	1.0	8.0	50	40.0	15.0
SMBJ8.0A	659G	8.89	10.23	1.0	8.0	50	44.1	13.6
SMBJ8.5	6010	9.44	11.92	1.0	8.5	20	37.7	15.9
SMBJ8.5A	6510	9.44	10.82	1.0	8.5	20	41.7	14.4
SMBJ9.0	6011	10.0	12.6	1.0	9.0	10	35.5	16.9
SMBJ9.0A	6511	10.0	11.5	1.0	9.0	10	39.0	15.4
SMBJ10	6012	11.1	14.1	1.0	10	5.0	31.9	18.8
SMBJ10A	6512	11.1	12.8	1.0	10	5.0	35.3	17.0
SMBJ11	6013	12.2	15.4	1.0	11	5.0	29.9	20.1
SMBJ11A	6513	12.2	14.0	1.0	11	5.0	33.0	18.2
SMBJ12	6014	13.3	16.9	1.0	12	5.0	27.3	22.0
SMBJ12A	6514	13.3	15.3	1.0	12	5.0	30.2	19.9
SMBJ13	6015	14.4	18.2	1.0	13	5.0	25.2	23.8
SMBJ13A	6515	14.4	16.5	1.0	13	5.0	27.9	21.5
SMBJ14	6017	15.6	19.8	1.0	14	5.0	23.3	25.8
SMBJ14A	6517	15.6	17.9	1.0	14	5.0	25.8	23.2
SMBJ15	6018	16.7	21.1	1.0	15	5.0	22.3	26.9
SMBJ15A	6518	16.7	19.2	1.0	15	5.0	24.0	24.4
SMBJ16	6019	17.8	22.6	1.0	16	5.0	20.8	28.8
SMBJ16A	6519	17.8	20.5	1.0	16	5.0	23.1	26.0
SMBJ17	6020	18.9	23.9	1.0	17	5.0	19.7	30.5
SMBJ17A	6520	18.9	21.7	1.0	17	5.0	21.7	27.6
SMBJ18	6022	20.0	25.3	1.0	18	5.0	18.6	32.2
SMBJ18A	6522	20.0	23.3	1.0	18	5.0	20.5	29.2
SMBJ20	6024	22.2	28.1	1.0	20	5.0	16.7	35.8
SMBJ20A	6524	22.2	25.5	1.0	20	5.0	18.5	32.4
SMBJ22	6026	24.4	30.9	1.0	22	5.0	15.2	39.4
SMBJ22A	6526	24.4	28.0	1.0	22	5.0	16.9	35.5
SMBJ24	6029	26.7	33.8	1.0	24	5.0	14.0	43.0
SMBJ24A	6529	26.7	30.7	1.0	24	5.0	15.4	38.9
SMBJ26	6031	28.9	36.6	1.0	26	5.0	12.4	46.6
SMBJ26A	6531	28.9	33.2	1.0	26	5.0	14.2	42.1
SMBJ28	6033	31.1	39.4	1.0	28	5.0	12.0	50.0
SMBJ28A	6533	31.1	35.8	1.0	28	5.0	13.2	45.4
SMBJ30	6036	33.3	42.2	1.0	30	5.0	11.2	53.5
SMBJ30A	6536	33.1	38.3	1.0	30	5.0	12.4	46.6

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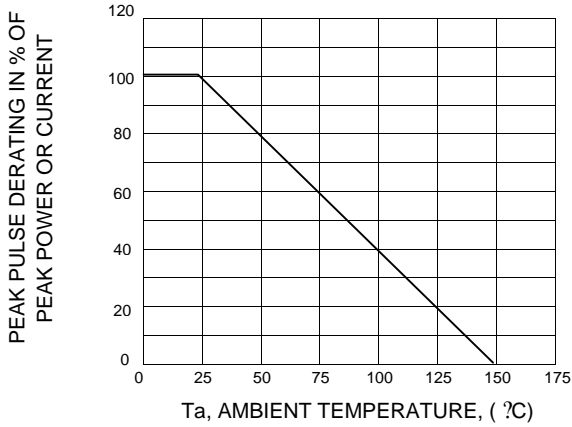
TYPE	Marking Code	Breakdown Voltage @ $I_T$ ( Note 1 )		$I_T$ (mA)	Reverse Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage @ $V_{WM}$ $I_R$ ( $\mu$ A)	Maximum Peak Pulse Surge Current (See Fig. 2) $I_{PPM}$ (A)	Maximum Clamping Voltage @ $I_{PPM}$ $V_C$ (V)
		$V_{BR}$ (V)						
		Min.	Max.					
SMBJ33	6040	36.7	46.5	1.0	33	5.0	10.2	59.0
SMBJ33A	6540	36.7	42.2	1.0	33	5.0	11.3	53.3
SMBJ36	6043	40.0	50.7	1.0	36	5.0	9.3	64.3
SMBJ36A	6543	40.0	46.0	1.0	36	5.0	10.3	58.1
SMBJ40	6048	44.4	56.3	1.0	40	5.0	8.4	71.4
SMBJ40A	6548	44.4	51.1	1.0	40	5.0	9.3	64.5
SMBJ43	6051	47.8	60.5	1.0	43	5.0	7.8	76.7
SMBJ43A	6551	47.8	54.9	1.0	43	5.0	8.6	69.4
SMBJ45	6054	50.0	63.3	1.0	45	5.0	7.5	80.3
SMBJ45A	6554	50.0	57.5	1.0	45	5.0	8.3	72.7
SMBJ48	6057	53.3	67.5	1.0	48	5.0	7.0	85.5
SMBJ48A	6557	53.3	61.3	1.0	48	5.0	7.7	77.4
SMBJ51	6061	56.7	71.8	1.0	51	5.0	6.6	91.1
SMBJ51A	6561	56.7	65.2	1.0	51	5.0	7.3	82.4
SMBJ54	6065	60.0	76.0	1.0	54	5.0	6.2	96.3
SMBJ54A	6565	60.0	69.0	1.0	54	5.0	6.9	87.1
SMBJ58	6070	64.4	81.6	1.0	58	5.0	5.8	103.0
SMBJ58A	6570	64.4	74.1	1.0	58	5.0	6.4	93.6
SMBJ60	6072	66.7	84.5	1.0	60	5.0	5.6	107
SMBJ60A	6572	66.7	76.7	1.0	60	5.0	6.2	96.8
SMBJ64	6076	71.1	90.1	1.0	64	5.0	5.3	114
SMBJ64A	6576	71.1	81.8	1.0	64	5.0	5.8	103
SMBJ70	6084	77.8	98.6	1.0	70	5.0	4.8	125
SMBJ70A	6584	77.8	89.5	1.0	70	5.0	5.3	113
SMBJ75	6090	83.3	105.7	1.0	75	5.0	4.5	134
SMBJ75A	6590	83.3	95.8	1.0	75	5.0	4.9	121
SMBJ78	6093	86.7	109.8	1.0	78	5.0	4.3	139
SMBJ78A	6593	86.7	99.7	1.0	78	5.0	4.7	126
SMBJ85	60B0	94.4	119.2	1.0	85	5.0	3.9	151
SMBJ85A	65B0	94.4	108.2	1.0	85	5.0	4.4	137
SMBJ90	60B1	100	126.5	1.0	90	5.0	3.8	160
SMBJ90A	65B1	100	115.5	1.0	90	5.0	4.1	146
SMBJ100	60B2	111	141.0	1.0	100	5.0	3.4	179
SMBJ100A	65B2	111	128.0	1.0	100	5.0	3.7	162
SMBJ110	60B3	122	154.5	1.0	110	5.0	3.0	196
SMBJ110A	65B3	122	140.5	1.0	110	5.0	3.4	177
SMBJ120	60B4	133	169.0	1.0	120	5.0	2.8	214
SMBJ120A	65B4	133	153.0	1.0	120	5.0	3.1	193
SMBJ130	60B5	144	182.5	1.0	130	5.0	2.6	231
SMBJ130A	65B5	144	165.5	1.0	130	5.0	2.9	209
SMBJ150	60B8	167	211.5	1.0	150	5.0	2.2	268
SMBJ150A	65B8	167	192.5	1.0	150	5.0	2.5	243
SMBJ160	60B9	178	226.0	1.0	160	5.0	2.1	287
SMBJ160A	65B9	178	205.0	1.0	160	5.0	2.3	259
SMBJ170	60D0	189	239.5	1.0	170	5.0	2.0	304
SMBJ170A	65D0	189	217.5	1.0	170	5.0	2.2	275

**Note:**

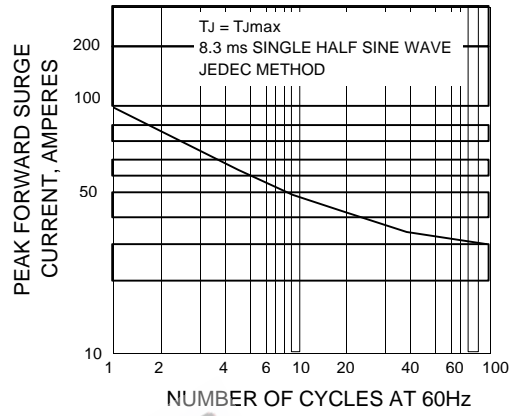
- ( 1 )  $V_{BR}$  measured after  $I_T$  applied for 300  $\mu$ s.,  $I_T$  = square wave pulse or equivalent.
- ( 2 ) Surge Current Waveform per Figure 5 and Derate per Figure 1
- ( 3 ) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " ( $V_{WM}$ ) which should be equal to or greater then the D.C. or continuous peak operating voltage level.

**RATING AND CHARACTERISTIC CURVES ( SMBJ5.0 - SMBJ170A )**

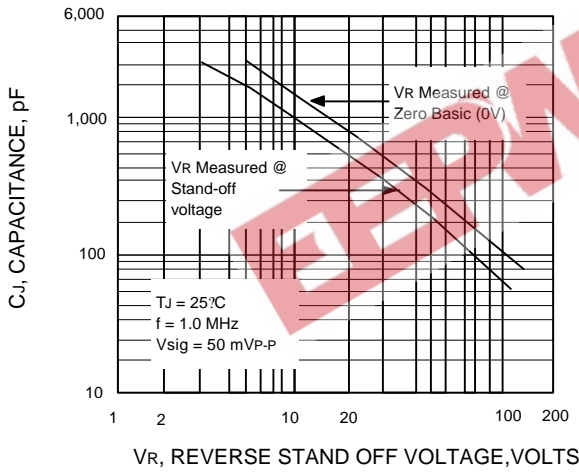
**FIG.1 - PULSE DERATING CURVE**



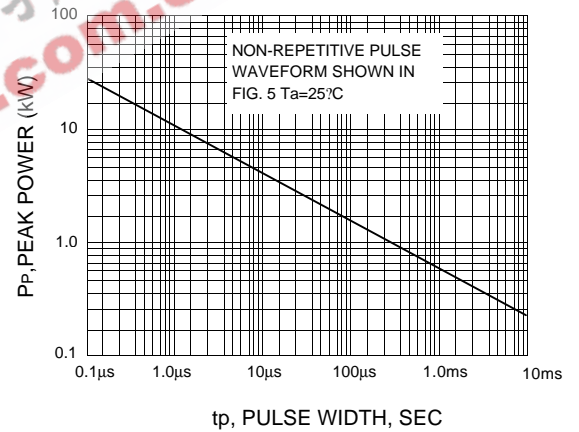
**FIG.2 - MAXIMUM NON-REPETITIVE PERK FORWARD SURGE CURRENT**



**FIG.3 - TYPICAL JUNCTION CAPACITANCE**



**FIG.4 - PEAK PULSE POWER RATING CURVE**



**FIG.5 - PULSE WAVEFORM**

