

# SMBJ5.0 - 440A

# SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

**Stand-off Voltage : 5.0 to 440V**

**Peak Pulse Power : 600 W**

### FEATURES :

- \* 600W peak pulse power capability with a 10/1000µs waveform
- \* Excellent clamping capability
- \* Very fast response time
- \* Pb / RoHS Free

### MECHANICAL DATA

- \* Case : SMB Molded plastic
- \* Epoxy : UL94V-0 rate flame retardant
- \* Lead : Lead Formed for Surface Mount
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.108 gram

### DEVICES FOR BIPOLAR APPLICATIONS

For Bi-directional use C or CA Suffix  
Electrical characteristics apply in both directions

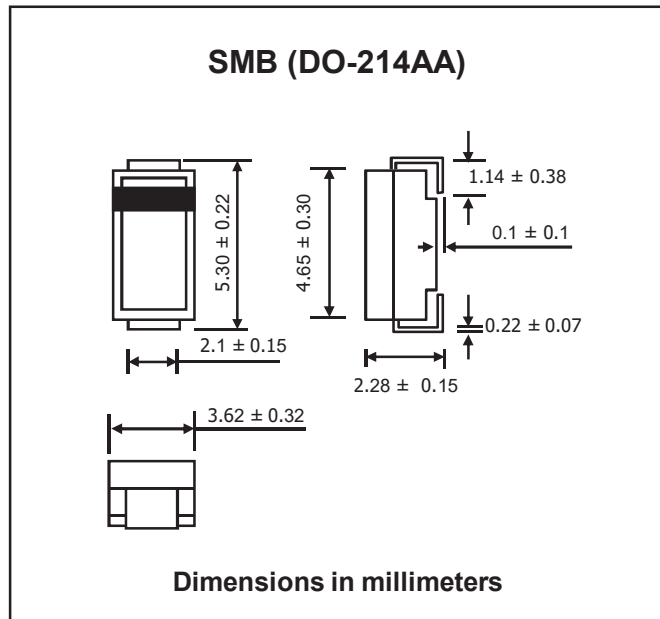
### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation on 10/1000µs waveform <sup>(1)(2)</sup> (Fig. 3)	P <sub>PPM</sub>	Minimum 600	W
Peak Pulse Current on 10/1000µs waveform <sup>(1)</sup> (Fig. 5)	I <sub>PPM</sub>	See Table	A
Typical Thermal resistance, Junction to ambient	R <sub>θJA</sub>	100	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	- 55 to + 150	°C

#### Notes :

- (1) Non-repetitive Current pulse, per Fig. 2 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal.





## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

Type No.	Breakdown Voltage @ $I_T^{(1)}$		Reverse Stand-off Voltage	Maximum Reverse Leakage @ $V_{WM}$	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage @ $I_{PPM}$
	$V_{BR}$ (V)		$I_T$	$V_{WM}$	$I_R^{(3)}$	$I_{PPM}^{(2)}$
	Min.	Max.	(mA)	(V)	( $\mu$ A)	(A)
SMBJ5.0	6.40	7.82	10	5.0	800	62.5
SMBJ5.0A <sup>(4)</sup>	6.40	7.07	10	5.0	800	65.2
SMBJ6.0	6.67	8.15	10	6.0	800	52.6
SMBJ6.0A	6.67	7.37	10	6.0	800	58.3
SMBJ6.5	7.22	8.82	10	6.5	500	48.7
SMBJ6.5A	7.22	7.98	10	6.5	500	53.6
SMBJ7.0	7.78	9.51	10	7.0	200	45.1
SMBJ7.0A	7.78	8.6	10	7.0	200	50.0
SMBJ7.5	8.33	10.2	1.0	7.5	100	42.0
SMBJ7.5A	8.33	9.21	1.0	7.5	100	46.5
SMBJ8.0	8.89	10.9	1.0	8.0	50	40.0
SMBJ8.0A	8.89	9.83	1.0	8.0	50	44.1
SMBJ8.5	9.44	11.5	1.0	8.5	10	37.7
SMBJ8.5A	9.44	10.4	1.0	8.5	10	41.7
SMBJ9.0	10.0	12.2	1.0	9.0	5.0	35.5
SMBJ9.0A	10.0	11.1	1.0	9.0	5.0	39.0
SMBJ10	11.1	13.6	1.0	10	1.0	31.9
SMBJ10A	11.1	12.3	1.0	10	1.0	35.3
SMBJ11	12.2	14.9	1.0	11	1.0	29.9
SMBJ11A	12.2	13.5	1.0	11	1.0	33.0
SMBJ12	13.3	16.3	1.0	12	1.0	27.3
SMBJ12A	13.3	14.7	1.0	12	1.0	30.2
SMBJ13	14.4	17.6	1.0	13	1.0	25.2
SMBJ13A	14.4	15.9	1.0	13	1.0	27.9
SMBJ14	15.6	19.1	1.0	14	1.0	23.3
SMBJ14A	15.6	17.2	1.0	14	1.0	25.8
SMBJ15	16.7	20.4	1.0	15	1.0	22.3
SMBJ15A	16.7	18.5	1.0	15	1.0	24.0
SMBJ16	17.8	21.8	1.0	16	1.0	20.8
SMBJ16A	17.8	19.7	1.0	16	1.0	23.1
SMBJ17	18.9	23.1	1.0	17	1.0	19.7
SMBJ17A	18.9	20.9	1.0	17	1.0	21.7
SMBJ18	20.0	24.4	1.0	18	1.0	18.6
SMBJ18A	20.0	22.1	1.0	18	1.0	20.5
SMBJ20	22.2	27.1	1.0	20	1.0	16.7
SMBJ20A	22.2	24.5	1.0	20	1.0	18.5
SMBJ22	24.4	29.8	1.0	22	1.0	15.2
SMBJ22A	24.4	26.9	1.0	22	1.0	16.9
SMBJ24	26.7	32.6	1.0	24	1.0	14.0
SMBJ24A	26.7	29.5	1.0	24	1.0	15.4
SMBJ26	28.9	35.3	1.0	26	1.0	12.4
SMBJ26A	28.9	31.9	1.0	26	1.0	14.2
SMBJ28	31.1	38	1.0	28	1.0	12.0
SMBJ28A	31.1	34.4	1.0	28	1.0	13.2
SMBJ30	33.3	40.7	1.0	30	1.0	11.2
SMBJ30A	33.3	36.8	1.0	30	1.0	12.4
SMBJ33	36.7	44.9	1.0	33	1.0	10.2
SMBJ33A	36.7	40.6	1.0	33	1.0	11.3
SMBJ36	40.0	48.9	1.0	36	1.0	9.3
SMBJ36A	40.0	44.2	1.0	36	1.0	10.3



## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

Type No.	Breakdown Voltage @ $I_T^{(1)}$		Reverse Stand-off Voltage	Maximum Reverse Leakage @ $V_{WM}$	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage @ $I_{PPM}$
	$V_{BR}$ (V)		$I_T$	$V_{WM}$	$I_R^{(3)}$	$I_{PPM}^{(2)}$
	Min.	Max.	(mA)	(V)	( $\mu$ A)	(A)
SMBJ40	44.4	54.3	1.0	40	1.0	8.4
SMBJ40A	44.4	49.1	1.0	40	1.0	9.3
SMBJ43	47.8	58.4	1.0	43	1.0	7.8
SMBJ43A	47.8	52.8	1.0	43	1.0	8.6
SMBJ45	50.0	61.1	1.0	45	1.0	7.5
SMBJ45A	50.0	55.3	1.0	45	1.0	8.3
SMBJ48	53.3	65.1	1.0	48	1.0	7.0
SMBJ48A	53.3	58.9	1.0	48	1.0	7.7
SMBJ51	56.7	69.3	1.0	51	1.0	6.6
SMBJ51A	56.7	62.7	1.0	51	1.0	7.3
SMBJ54	60.0	73.3	1.0	54	1.0	6.2
SMBJ54A	60.0	66.3	1.0	54	1.0	6.9
SMBJ58	64.4	78.7	1.0	58	1.0	5.8
SMBJ58A	64.4	71.2	1.0	58	1.0	6.4
SMBJ60	66.7	81.5	1.0	60	1.0	5.6
SMBJ60A	66.7	73.7	1.0	60	1.0	6.2
SMBJ64	71.1	86.9	1.0	64	1.0	5.3
SMBJ64A	71.1	78.6	1.0	64	1.0	5.8
SMBJ70	77.8	95.1	1.0	70	1.0	4.8
SMBJ70A	77.8	86.0	1.0	70	1.0	5.3
SMBJ75	83.3	102	1.0	75	1.0	4.5
SMBJ75A	83.3	92.1	1.0	75	1.0	4.9
SMBJ78	86.7	106	1.0	78	1.0	4.3
SMBJ78A	86.7	95.8	1.0	78	1.0	4.7
SMBJ85	94.4	115	1.0	85	1.0	3.9
SMBJ85A	94.4	104	1.0	85	1.0	4.4
SMBJ90	100	122	1.0	90	1.0	3.8
SMBJ90A	100	111	1.0	90	1.0	4.1
SMBJ100	111	136	1.0	100	1.0	3.4
SMBJ100A	111	123	1.0	100	1.0	3.7
SMBJ110	122	149	1.0	110	1.0	3.0
SMBJ110A	122	135	1.0	110	1.0	3.4
SMBJ120	133	163	1.0	120	1.0	2.8
SMBJ120A	133	147	1.0	120	1.0	3.1
SMBJ130	144	176	1.0	130	1.0	2.6
SMBJ130A	144	159	1.0	130	1.0	2.9
SMBJ150	167	204	1.0	150	1.0	2.2
SMBJ150A	167	185	1.0	150	1.0	2.5
SMBJ160	178	218	1.0	160	1.0	2.1
SMBJ160A	178	197	1.0	160	1.0	2.3
SMBJ170	189	231	1.0	170	1.0	2.0
SMBJ170A	189	209	1.0	170	1.0	2.2
SMBJ188	209	255	1.0	188	1.0	1.7
SMBJ188A	209	231	1.0	188	1.0	2.0
SMBJ200	222	271	1.0	200	1.0	1.7
SMBJ200A	222	246	1.0	200	1.0	1.9
SMBJ220	245	299	1.0	220	1.0	1.6
SMBJ220A	245	270	1.0	220	1.0	1.7



## ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified

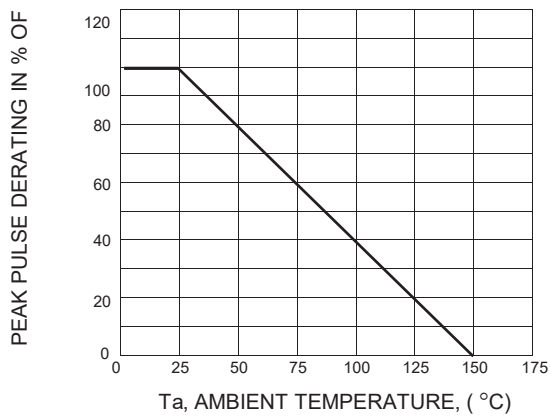
Type No.	Breakdown Voltage @ $I_T^{(1)}$		Reverse Stand-off Voltage	Maximum Reverse Leakage @ $V_{WM}$	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage @ $I_{PPM}$	
	$V_{BR}$ (V)						$I_T$
	Min.	Max.	(mA)	(V)	( $\mu$ A)	(A)	(V)
<b>SMBJ250</b>	278	339	1.0	250	1.0	1.4	439
<b>SMBJ250A</b>	278	307	1.0	250	1.0	1.5	403
<b>SMBJ300</b>	334	407	1.0	300	1.0	1.1	526
<b>SMBJ300A</b>	334	368	1.0	300	1.0	1.2	484
<b>SMBJ350</b>	389	475	1.0	350	1.0	1.0	614
<b>SMBJ350A</b>	389	430	1.0	350	1.0	1.1	565
<b>SMBJ400</b>	445	543	1.0	400	1.0	0.9	702
<b>SMBJ400A</b>	445	491	1.0	400	1.0	0.9	645
<b>SMBJ440</b>	489	597	1.0	440	1.0	0.8	772
<b>SMBJ440A</b>	489	540	1.0	440	1.0	0.8	710

**Notes:**

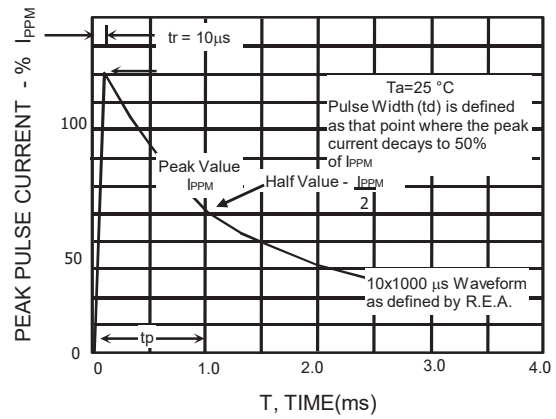
- (1) Pulse test :  $t_p \leq 50ms$ .
- (2) Surge Current Waveform per Figure 2 and Derate per Figure 1
- (3) For bi-directional types have  $V_{WM}$  of 10 Volts and less, the  $I_R$  limit is doubled
- (4) For the bi-directional SMBJ5.0CA, the maximum  $V_{BR}$  is 7.25V
- (5) "SMBJ" will be omitted in marking on the diode.

**RATING AND CHARACTERISTIC CURVES ( SMBJ5.0 - SMBJ440A )**

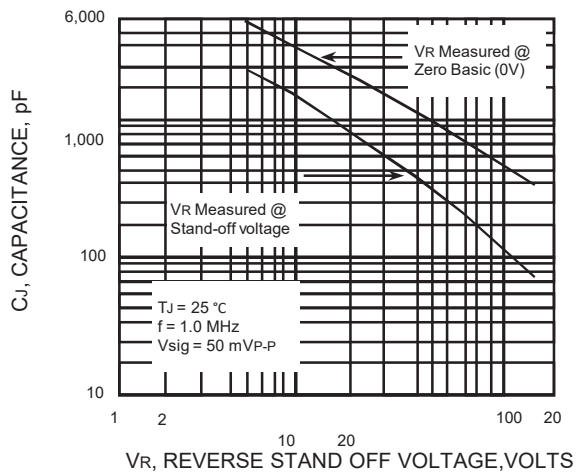
**FIG.1 - PULSE DERATING CURVE**



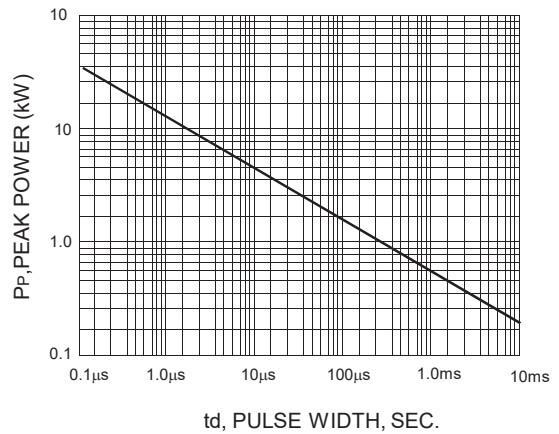
**FIG.2 - PULSE WAVEFORM**



**FIG.3 - TYPICAL JUNCTION CAPACITANCE**



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



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