

# SMCJ 5.0 ~ 188A

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

**Stand-off Voltage** : 5.0 to 188V

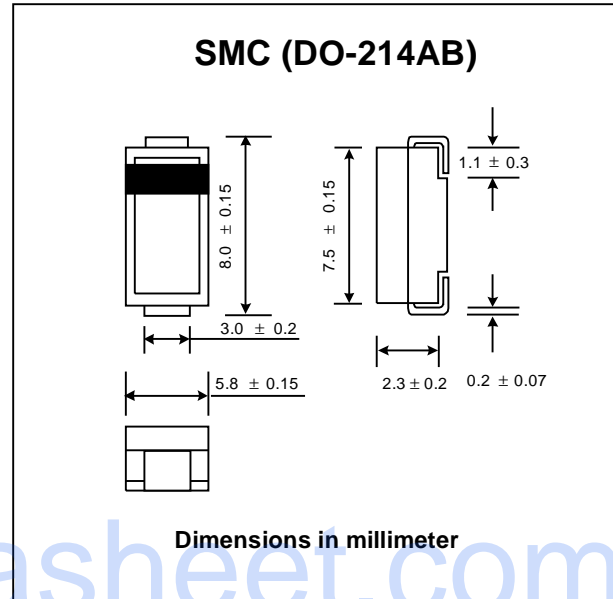
**Peak Pulse Power** : 1500 W

### FEATURES :

- \* 1500W peak pulse power capability with a 10/1000µs waveform
- \* Excellent clamping capability
- \* Very fast response time
- \* **Pb / RoHS Free**

### MECHANICAL DATA

- \* Case : SMC Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead Formed for Surface Mount
- \* Polarity : Color band denotes cathode end except Bipolar.
- \* Mounting position : Any
- \* Weight : 0.21 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	Unit
Peak Pulse Power Dissipation on 10/1000ms waveform <sup>(1) (2)</sup>	PPPM	Minimum 1500	W
Peak Forward Surge Current per Fig. 5 <sup>(2)</sup>	IFSM	200	A
Peak Pulse Current on 10/1000µs waveform <sup>(1)</sup>	IPPM	See Next Table	A
Maximum Instantaneous Forward Voltage at IF = 100A	VFM	3.5	V
Typical Thermal Resistance , Junction to Ambient <sup>(3)</sup>	RθJA	75	°C/W
Operating Junction and Storage Temperature Range	TJ, TSTG	- 55 to + 150	°C

### Notes :

- (1) Non-repetitive Current pulse, per Fig. 3 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on 0.31x 0.31" (8.0 x 8.0mm) copper pads to each terminal.
- (3) Mounted on minimum recommended pad layout

**ELECTRICAL CHARACTERISTICS** Rating at 25°C ambient temperature unless otherwise specified

Type	Breakdown Voltage @ $I_T^{(1)}$			Working Peak Reverse Voltage $V_{WM}$	Maximum Reverse Leakage @ $V_{WM}$ $I_R$	Maximum Peak Pulse Surge Current $I_{PPM}$	Maximum Clamping Voltage @ $I_{PPM}$ $V_C$
	$V_{BR}$ (V)		$I_T$ (mA)				
	Min.	Max.					
SMCJ5.0	6.40	7.82	10	5.0	1000	156.3	9.6
SMCJ5.0A	6.40	7.25	10	5.0	1000	163.0	9.2
SMCJ6.0	6.67	8.15	10	6.0	1000	131.6	11.4
SMCJ6.0A	6.67	7.37	10	6.0	1000	145.6	10.3
SMCJ6.5	7.22	8.82	10	6.5	500	122.0	12.3
SMCJ6.5A	7.22	7.98	10	6.5	500	133.9	11.2
SMCJ7.0	7.78	9.51	10	7.0	200	112.8	13.3
SMCJ7.0A	7.78	8.6	10	7.0	200	125.0	12.0
SMCJ7.5	8.33	10.2	1.0	7.5	100	104.9	14.3
SMCJ7.5A	8.33	9.21	1.0	7.5	100	116.3	12.9
SMCJ8.0	8.89	10.9	1.0	8.0	50	100.0	15.0
SMCJ8.0A	8.89	9.83	1.0	8.0	50	110.3	13.6
SMCJ8.5	9.44	11.5	1.0	8.5	20	94.3	15.9
SMCJ8.5A	9.44	10.4	1.0	8.5	20	104.2	14.4
SMCJ9.0	10.0	12.2	1.0	9.0	10	88.8	16.9
SMCJ9.0A	10.0	11.1	1.0	9.0	10	97.4	15.4
SMCJ10	11.1	13.6	1.0	10	5.0	79.8	18.8
SMCJ10A	11.1	12.3	1.0	10	5.0	88.2	17.0
SMCJ11	12.2	14.9	1.0	11	5.0	74.6	20.1
SMCJ11A	12.2	13.5	1.0	11	5.0	82.4	18.2
SMCJ12	13.3	16.3	1.0	12	5.0	68.2	22.0
SMCJ12A	13.3	14.7	1.0	12	5.0	75.4	19.9
SMCJ13	14.4	17.6	1.0	13	1.0	63.0	23.8
SMCJ13A	14.4	15.9	1.0	13	1.0	69.8	21.5
SMCJ14	15.6	19.1	1.0	14	1.0	58.1	25.8
SMCJ14A	15.6	17.2	1.0	14	1.0	64.7	23.2
SMCJ15	16.7	20.4	1.0	15	1.0	55.8	26.9
SMCJ15A	16.7	18.5	1.0	15	1.0	61.5	24.4
SMCJ16	17.8	21.8	1.0	16	1.0	52.1	28.8
SMCJ16A	17.8	19.7	1.0	16	1.0	57.7	26.0
SMCJ17	18.9	23.1	1.0	17	1.0	49.2	30.5
SMCJ17A	18.9	20.9	1.0	17	1.0	54.3	27.6
SMCJ18	20.0	24.4	1.0	18	1.0	46.6	32.2
SMCJ18A	20.0	22.1	1.0	18	1.0	51.4	29.2
SMCJ20	22.2	27.1	1.0	20	1.0	41.9	35.8
SMCJ20A	22.2	24.5	1.0	20	1.0	46.3	32.4
SMCJ22	24.4	29.8	1.0	22	1.0	38.1	39.4
SMCJ22A	24.4	26.9	1.0	22	1.0	42.3	35.5
SMCJ24	26.7	32.6	1.0	24	1.0	34.9	43.0
SMCJ24A	26.7	29.5	1.0	24	1.0	38.6	38.9
SMCJ26	28.9	35.3	1.0	26	1.0	32.2	46.6
SMCJ26A	28.9	31.9	1.0	26	1.0	35.6	42.1
SMCJ28	31.1	38.0	1.0	28	1.0	30.0	50.0
SMCJ28A	31.1	34.4	1.0	28	1.0	33.0	45.4
SMCJ30	33.3	40.7	1.0	30	1.0	28.0	53.5
SMCJ30A	33.3	36.8	1.0	30	1.0	31.0	48.4
SMCJ33	36.7	44.9	1.0	33	1.0	25.4	59.0
SMCJ33A	36.7	40.6	1.0	33	1.0	28.1	53.3
SMCJ36	40.0	48.9	1.0	36	1.0	23.3	64.3
SMCJ36A	40.0	44.2	1.0	36	1.0	25.8	58.1

**ELECTRICAL CHARACTERISTICS** Rating at 25°C ambient temperature unless otherwise specified

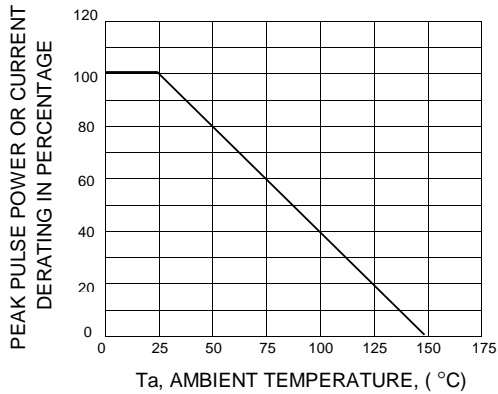
Type	Breakdown Voltage @ $I_T^{(1)}$			Working Peak Reverse Voltage $V_{WM}$	Maximum Reverse Leakage @ $V_{WM}$ $I_R$	Maximum Peak Pulse Surge Current $I_{PPM}$	Maximum Clamping Voltage @ $I_{PPM}$ $V_C$
	$V_{BR}$ (V)		$I_T$ (mA)				
	Min.	Max.					
SMCJ40	44.4	54.3	1.0	40	1.0	21.0	71.4
SMCJ40A	44.4	49.1	1.0	40	1.0	23.3	64.5
SMCJ43	47.8	58.4	1.0	43	1.0	19.6	76.7
SMCJ43A	47.8	52.8	1.0	43	1.0	21.6	69.4
SMCJ45	50.0	61.1	1.0	45	1.0	18.7	80.3
SMCJ45A	50.0	55.3	1.0	45	1.0	20.6	72.7
SMCJ48	53.3	65.1	1.0	48	1.0	17.5	85.5
SMCJ48A	53.3	58.9	1.0	48	1.0	19.4	77.4
SMCJ51	56.7	69.3	1.0	51	1.0	16.5	91.1
SMCJ51A	56.7	62.7	1.0	51	1.0	18.2	82.4
SMCJ54	60.0	73.3	1.0	54	1.0	15.6	96.3
SMCJ54A	60.0	66.3	1.0	54	1.0	17.2	87.1
SMCJ58	64.4	78.7	1.0	58	1.0	14.6	103
SMCJ58A	64.4	71.2	1.0	58	1.0	16.0	93.6
SMCJ60	66.7	81.5	1.0	60	1.0	14.0	107
SMCJ60A	66.7	73.7	1.0	60	1.0	15.5	96
SMCJ64	71.1	86.4	1.0	64	1.0	13.2	114
SMCJ64A	71.1	78.6	1.0	64	1.0	14.6	103
SMCJ70	77.8	95.1	1.0	70	1.0	12.0	125
SMCJ70A	77.8	86	1.0	70	1.0	13.3	113
SMCJ75	83.3	102	1.0	75	1.0	11.2	134
SMCJ75A	83.3	92.1	1.0	75	1.0	12.4	121
SMCJ78	86.7	106	1.0	78	1.0	10.8	139
SMCJ78A	86.7	95.8	1.0	78	1.0	11.9	126
SMCJ85	94.4	115	1.0	85	1.0	9.9	151
SMCJ85A	94.4	104	1.0	85	1.0	10.9	137
SMCJ90	100	122	1.0	90	1.0	9.4	160
SMCJ90A	100	111	1.0	90	1.0	10.3	146
SMCJ100	111	136	1.0	100	1.0	8.4	179
SMCJ100A	111	123	1.0	100	1.0	9.3	162
SMCJ110	122	149	1.0	110	1.0	7.7	196
SMCJ110A	122	135	1.0	110	1.0	8.5	177
SMCJ120	133	163	1.0	120	1.0	7.0	214
SMCJ120A	133	147	1.0	120	1.0	7.8	193
SMCJ130	144	176	1.0	130	1.0	6.5	231
SMCJ130A	144	159	1.0	130	1.0	7.2	209
SMCJ150	167	204	1.0	150	1.0	5.6	268
SMCJ150A	167	185	1.0	150	1.0	6.2	243
SMCJ160	178	218	1.0	160	1.0	5.2	287
SMCJ160A	178	197	1.0	160	1.0	5.8	259
SMCJ170	189	231	1.0	170	1.0	4.90	304
SMCJ170A	189	209	1.0	170	1.0	5.50	275
SMCJ188	209	255	1.0	188	1.0	4.40	344
SMCJ188A	209	231	1.0	188	1.0	4.60	328

**Notes :**

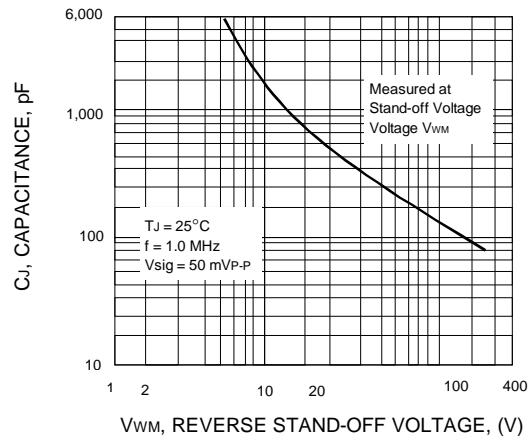
- (1) Pulse test :  $t_p \leq 50\text{ms}$ .
- (2) Surge Current Waveform per Figure 5 and Derate per Figure 1
- (3) For bi-directional types have  $V_{WM}$  of 10 Volts and less , the  $I_R$  limit is doubled
- (4) For the bi-directional SMBJ5.0CA, the maximum  $V_{BR}$  is 7.25V
- (5) "SMCJ" will be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

## RATING AND CHARACTERISTIC CURVES ( SMCJ5.0 - SMCJ188A )

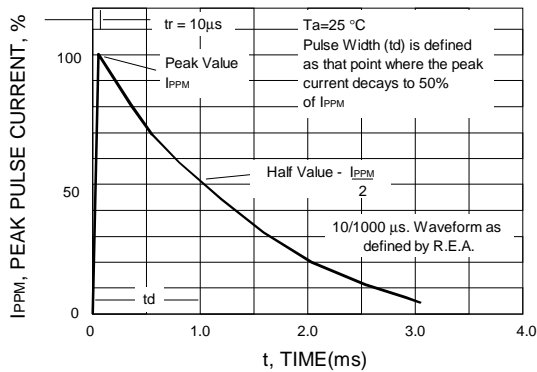
**FIG.1 - PULSE DERATING CURVE**



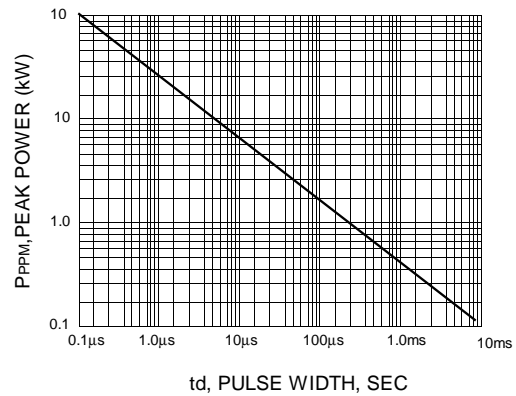
**FIG.2 - TYPICAL JUNCTION CAPACITANCE**



**FIG.3 - PULSE WAVEFORM**



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



**FIG.5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT**

