

# SMAJ 5.0C ~ 188CA

## SURFACE MOUNT BI-DIRECTIONAL TRANSIENT VOLTAGE SUPPRESSOR

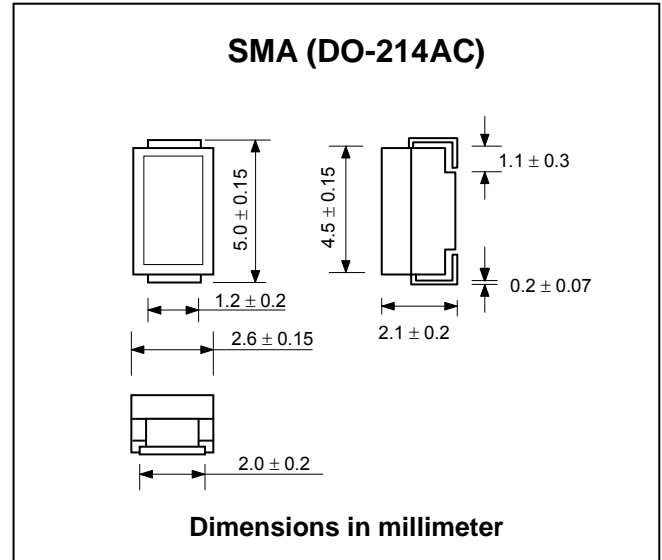
**Stand-off Voltage : 5.0 to 188V**  
**Peak Pulse Power : 400 W**

### FEATURES :

- \* 400W peak pulse power capability with a 10/1000 $\mu$ s waveform
- \* Optimized for LAN protection applications
- \* Low clamping
- \* Very fast response time
- \* Pb / RoHS Free

### MECHANICAL DATA

- \* Case : SMA Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead Formed for Surface Mount
- \* Mounting position : Any
- \* Weight : 0.064 grams



### DEVICES FOR UNIPOLAR APPLICATIONS

For uni-directional without "C"  
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 (Note1,2) Fig. 4	$P_{PPM}$	Minimum 400	W
Peak Pulse Current on 10/1000 $\mu$ s waveform (Note 1, Fig. 1)	$I_{PPM}$	See Table	A
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	120	°C/W
Typical thermal resistance, junction to leads	$R_{\theta JL}$	30	°C/W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	- 55 to + 150	°C

### Notes :

- (1) Non-repetitive Current pulse, per Fig. 3 and derated above  $T_a = 25^\circ\text{C}$  per Fig. 1
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal.
- (3) 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.

## ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified

Type	Breakdown Voltage @ $I_T^{(1)}$		Working Peak Reverse 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)
SMAJ5.0C	6.40	7.82	10	5.0	1600	41.7	9.6
SMAJ5.0CA	6.40	7.25	10	5.0	1600	43.5	9.2
SMAJ6.0C	6.67	8.15	10	6.0	1600	35.1	11.4
SMAJ6.0CA	6.67	7.37	10	6.0	1600	38.8	10.3
SMAJ6.5C	7.22	8.82	10	6.5	1000	32.5	12.3
SMAJ6.5CA	7.22	7.98	10	6.5	1000	35.7	11.2
SMAJ7.0C	7.78	9.51	10	7.0	400	30.1	13.3
SMAJ7.0CA	7.78	8.6	10	7.0	400	33.3	12.0
SMAJ7.5C	8.33	10.2	1.0	7.5	200	28.0	14.3
SMAJ7.5CA	8.33	9.21	1.0	7.5	200	31.0	12.9
SMAJ8.0C	8.89	10.9	1.0	8.0	100	26.7	15.0
SMAJ8.0CA	8.89	9.83	1.0	8.0	100	29.4	13.6
SMAJ8.5C	9.44	11.5	1.0	8.5	20	25.2	15.9
SMAJ8.5CA	9.44	10.4	1.0	8.5	20	27.8	14.4
SMAJ9.0C	10.0	12.2	1.0	9.0	10	23.7	16.9
SMAJ9.0CA	10.0	11.1	1.0	9.0	10	26.0	15.4
SMAJ10C	11.1	13.6	1.0	10	2.0	21.2	18.8
SMAJ10CA	11.1	12.3	1.0	10	2.0	23.5	17.0
SMAJ11C	12.2	14.9	1.0	11	1.0	19.9	20.1
SMAJ11CA	12.2	13.5	1.0	11	1.0	22.0	18.2
SMAJ12C	13.3	16.3	1.0	12	1.0	18.2	22.0
SMAJ12CA	13.3	14.7	1.0	12	1.0	20.1	19.9
SMAJ13C	14.4	17.6	1.0	13	1.0	16.8	23.8
SMAJ13CA	14.4	15.9	1.0	13	1.0	18.6	21.5
SMAJ14C	15.6	19.1	1.0	14	1.0	15.5	25.8
SMAJ14CA	15.6	17.2	1.0	14	1.0	17.2	23.2
SMAJ15C	16.7	20.4	1.0	15	1.0	14.8	26.9
SMAJ15CA	16.7	18.5	1.0	15	1.0	16.4	24.4
SMAJ16C	17.8	21.8	1.0	16	1.0	13.9	28.8
SMAJ16CA	17.8	19.7	1.0	16	1.0	15.4	26.0
SMAJ17C	18.9	23.1	1.0	17	1.0	13.1	30.5
SMAJ17CA	18.9	20.9	1.0	17	1.0	14.5	27.6
SMAJ18C	20.0	24.4	1.0	18	1.0	12.4	32.2
SMAJ18CA	20.0	22.1	1.0	18	1.0	13.7	29.2
SMAJ20C	22.2	27.1	1.0	20	1.0	11.2	35.8
SMAJ20CA	22.2	24.5	1.0	20	1.0	12.3	32.4
SMAJ22C	24.4	29.8	1.0	22	1.0	10.2	39.4
SMAJ22CA	24.4	26.9	1.0	22	1.0	11.3	35.5
SMAJ24C	26.7	32.6	1.0	24	1.0	9.3	43.0
SMAJ24CA	26.7	29.5	1.0	24	1.0	10.3	38.9
SMAJ26C	28.9	35.3	1.0	26	1.0	8.6	46.6
SMAJ26CA	28.9	31.9	1.0	26	1.0	9.5	42.1
SMAJ28C	31.1	38.0	1.0	28	1.0	8.0	50.0
SMAJ28CA	31.1	34.4	1.0	28	1.0	8.8	45.4
SMAJ30C	33.3	40.7	1.0	30	1.0	7.5	53.5
SMAJ30CA	33.3	36.8	1.0	30	1.0	8.3	48.4

## ELECTRICAL CHARACTERISTICS

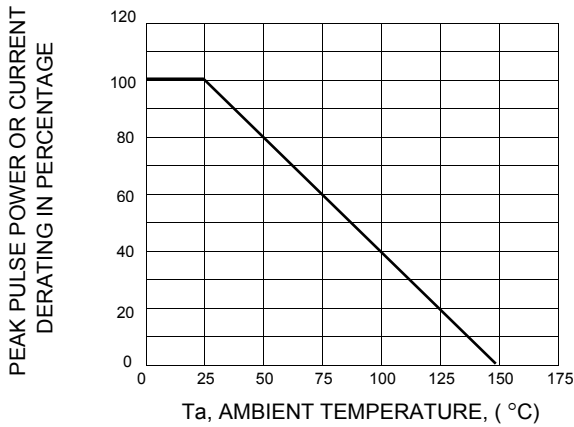
Rating at 25°C ambient temperature unless otherwise specified

Type	Breakdown Voltage @ $I_T^{(1)}$			Working Peak Reverse Voltage	Maximum Reverse Leakage @ $V_{WM}$	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage @ $I_{PPM}$
	$V_{BR}$ (V)		$I_T$ (mA)				
	Min.	Max.					
SMAJ33C	36.7	44.9	1.0	33	1.0	6.8	59.0
SMAJ33CA	36.7	40.6	1.0	33	1.0	7.5	53.3
SMAJ36C	40.0	48.9	1.0	36	1.0	6.2	64.3
SMAJ36CA	40.0	44.2	1.0	36	1.0	6.9	58.1
SMAJ40C	44.4	54.3	1.0	40	1.0	5.6	71.4
SMAJ40CA	44.4	49.1	1.0	40	1.0	6.2	64.5
SMAJ43C	47.8	58.4	1.0	43	1.0	5.2	76.7
SMAJ43CA	47.8	52.8	1.0	43	1.0	5.7	69.4
SMAJ45C	50.0	61.1	1.0	45	1.0	5.0	80.3
SMAJ45CA	50.0	55.3	1.0	45	1.0	5.5	72.7
SMAJ48C	53.3	65.1	1.0	48	1.0	4.7	85.5
SMAJ48CA	53.3	58.9	1.0	48	1.0	5.2	77.4
SMAJ51C	56.7	69.3	1.0	51	1.0	4.4	91.1
SMAJ51CA	56.7	62.7	1.0	51	1.0	4.9	82.4
SMAJ54C	60.0	73.3	1.0	54	1.0	4.2	96.3
SMAJ54CA	60.0	66.3	1.0	54	1.0	4.6	87.1
SMAJ58C	64.4	78.7	1.0	58	1.0	3.9	103
SMAJ58CA	64.4	71.2	1.0	58	1.0	4.3	93.6
SMAJ60C	66.7	81.5	1.0	60	1.0	3.7	107
SMAJ60CA	66.7	73.7	1.0	60	1.0	4.1	96.8
SMAJ64C	71.1	86.4	1.0	64	1.0	3.5	114
SMAJ64CA	71.1	78.6	1.0	64	1.0	3.9	103
SMAJ70C	77.8	95.1	1.0	70	1.0	3.2	125
SMAJ70CA	77.8	86	1.0	70	1.0	3.5	113
SMAJ75C	83.3	102	1.0	75	1.0	3.0	134
SMAJ75CA	83.3	92.1	1.0	75	1.0	3.3	121
SMAJ78C	86.7	106	1.0	78	1.0	2.9	139
SMAJ78CA	86.7	95.8	1.0	78	1.0	3.2	126
SMAJ85C	94.4	115	1.0	85	1.0	2.0	151
SMAJ85CA	94.4	104	1.0	85	1.0	2.2	137
SMAJ90C	100	122	1.0	90	1.0	1.9	160
SMAJ90CA	100	111	1.0	90	1.0	2.1	146
SMAJ100C	111	136	1.0	100	1.0	1.7	179
SMAJ100CA	111	123	1.0	100	1.0	1.9	162
SMAJ110C	122	149	1.0	110	1.0	1.5	196
SMAJ110CA	122	135	1.0	110	1.0	1.7	177
SMAJ120C	133	163	1.0	120	1.0	1.4	214
SMAJ120CA	133	147	1.0	120	1.0	1.6	193
SMAJ130C	144	176	1.0	130	1.0	1.3	231
SMAJ130CA	144	159	1.0	130	1.0	1.4	209
SMAJ150C	167	204	1.0	150	1.0	1.1	268
SMAJ150CA	167	185	1.0	150	1.0	1.2	243
SMAJ160C	178	218	1.0	160	1.0	1.0	287
SMAJ160CA	178	197	1.0	160	1.0	1.2	259
SMAJ170C	189	231	1.0	170	1.0	0.99	304
SMAJ170CA	189	209	1.0	170	1.0	1.09	275
SMAJ188C	209	255	1.0	188	1.0	0.90	344
SMAJ188CA	209	231	1.0	188	1.0	0.91	328

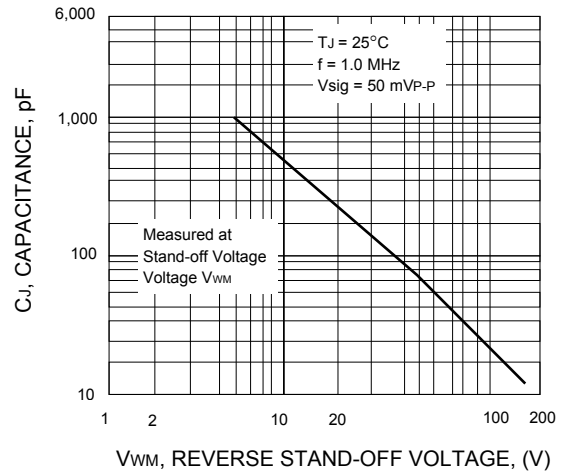
Note: (1) Pulse test :  $t_p \leq 50\text{ms}$ .

**RATING AND CHARACTERISTIC CURVES ( SMAJ5.0C - SMAJ188CA )**

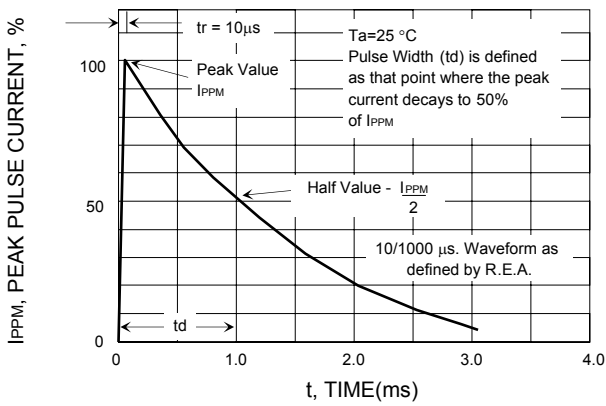
**FIG.1 - PULSE DERATING CURVE**



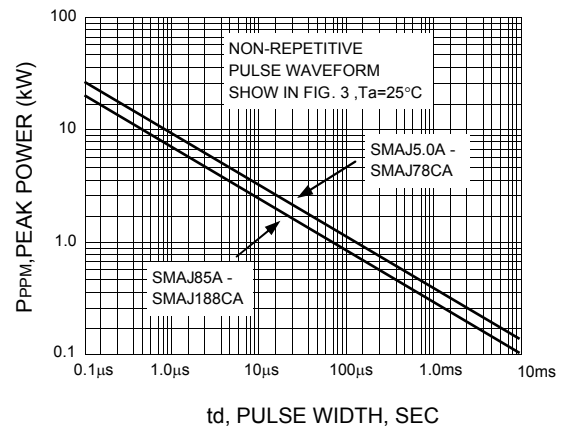
**FIG.2 - TYPICAL JUNCTION CAPACITANCE**



**FIG.3 - PULSE WAVEFORM**



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



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