

# SMAJ 5.0 ~ 170A

# SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

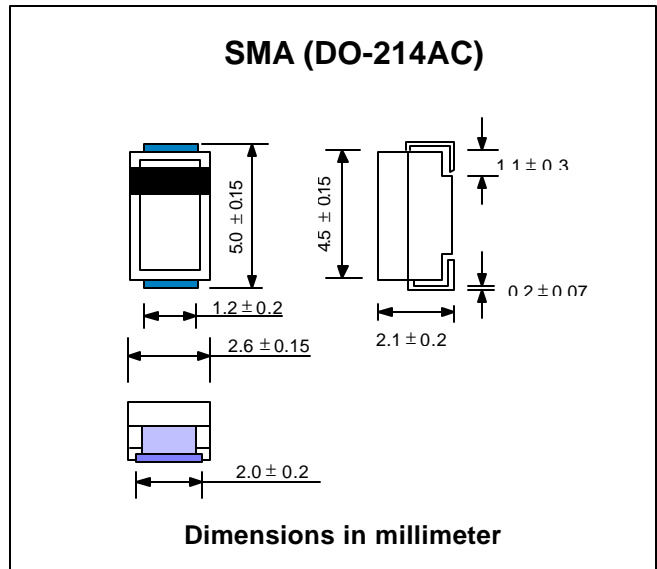
**V<sub>BR</sub> : 6.8 - 200 Volts**  
**P<sub>PK</sub> : 400 Watts**

### FEATURES :

- \* 400W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1µA above 10V

### MECHANICAL DATA

- \* Case : SMA 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 : 0.064 grams



### MAXIMUM RATINGS

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

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation (Note1,2,5) Fig. 4	PPPM	Minimum 400	Watts
Peak Forward Surge Current per Fig. 5 (Note 3)	I <sub>FSM</sub>	40	Amps
Peak Pulse Current on 10/1000µs waveform (Note 1, Fig. 1)	I <sub>PPM</sub>	See Table	Amps
Steady State Power Dissipation (Note 4)	P <sub>M(AV)</sub>	1.0	Watt
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. 3 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on 5.0mm<sup>2</sup> (0.013mm) copper pads to each terminal.
- (3) 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.
- (4) Lead temperature at T<sub>L</sub>=75° C
- (5) Peak pulse power waveform is 10/1000µs.

**UPDATE : SEPTEMBER 5, 2000**

## ELECTRICAL CHARACTERISTICS

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

TYPE	Marking Code	Breakdown Voltage @ Ir (Note 1)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ VWM	Maximum Peak Impulse Surge Current (Note 1)	Maximum Clamping Voltage @ IPPM (Note 1)
		VBR (V)		Ir				
		Min.	Max.	(mA)	VWM (V)	ID (µA)	IPPM (A)	Vc (V)
SMAJ5.0	S06H	6.40	7.3	10	5.0	800	41.6	9.6
SMAJ5.0A	S56H	6.40	7.0	10	5.0	800	43.5	9.2
SMAJ6.0	S07A	6.67	8.15	10	6.0	800	35.1	11.4
SMAJ6.0A	S57A	6.67	7.37	10	6.0	800	38.8	10.3
SMAJ6.5	S07G	7.22	8.82	10	6.5	500	32.5	12.3
SMAJ6.5A	S57G	7.22	7.98	10	6.5	500	35.7	11.2
SMAJ7.0	S08C	7.78	9.51	10	7.0	200	30.1	13.3
SMAJ7.0A	S58C	7.78	8.6	10	7.0	200	33.3	12.0
SMAJ7.5	S08I	8.33	10.3	1.0	7.5	100	28.0	14.3
SMAJ7.5A	S58I	8.33	9.21	1.0	7.5	100	31.0	12.9
SMAJ8.0	S09B	8.89	10.9	1.0	8.0	50	26.5	15.0
SMAJ8.0A	S59B	8.89	9.83	1.0	8.0	50	29.4	13.6
SMAJ8.5	S010	9.44	11.5	1.0	8.5	10	25.1	15.9
SMAJ8.5A	S510	9.44	10.4	1.0	8.5	10	27.7	14.4
SMAJ9.0	S011	10.0	12.2	1.0	9.0	5.0	23.6	16.9
SMAJ9.0A	S511	10.0	11.1	1.0	9.0	5.0	26.0	15.4
SMAJ10	S012	11.1	13.6	1.0	10	5.0	21.2	18.8
SMAJ10A	S512	11.1	12.3	1.0	10	5.0	23.5	17.0
SMAJ11	S013	12.2	14.9	1.0	11	5.0	20.0	20.1
SMAJ11A	S513	12.2	13.5	1.0	11	5.0	22.0	18.2
SMAJ12	S014	13.3	16.3	1.0	12	5.0	18.1	22.0
SMAJ12A	S514	13.3	14.7	1.0	12	5.0	20.1	19.9
SMAJ13	S015	14.4	17.6	1.0	13	5.0	16.8	23.8
SMAJ13A	S515	14.4	15.9	1.0	13	5.0	18.6	21.5
SMAJ14	S016	15.6	19.1	1.0	14	5.0	15.5	25.8
SMAJ14A	S516	15.6	17.2	1.0	14	5.0	17.2	23.2
SMAJ15	S018	16.7	20.4	1.0	15	5.0	14.8	26.9
SMAJ15A	S518	16.7	18.5	1.0	15	5.0	16.4	24.4
SMAJ16	S019	17.8	21.8	1.0	16	5.0	13.8	28.8
SMAJ16A	S519	17.8	19.7	1.0	16	5.0	15.3	26.0
SMAJ17	S020	18.9	23.1	1.0	17	5.0	13.1	30.5
SMAJ17A	S520	18.9	20.9	1.0	17	5.0	14.5	27.6
SMAJ18	S021	20.0	24.4	1.0	18	5.0	12.4	32.2
SMAJ18A	S521	20.0	22.1	1.0	18	5.0	13.7	29.2
SMAJ20	S023	22.2	27.1	1.0	20	5.0	11.1	35.8
SMAJ20A	S523	22.2	24.5	1.0	20	5.0	12.3	32.4
SMAJ22	S026	24.4	29.8	1.0	22	5.0	10.1	39.4
SMAJ22A	S526	24.4	26.9	1.0	22	5.0	11.2	35.5
SMAJ24	S028	26.7	32.6	1.0	24	5.0	9.3	43.0
SMAJ24A	S528	26.7	29.5	1.0	24	5.0	10.3	38.9
SMAJ26	S030	28.9	35.3	1.0	26	5.0	8.6	46.6
SMAJ26A	S530	28.9	31.9	1.0	26	5.0	9.5	42.1
SMAJ28	S033	31.1	38.0	1.0	28	5.0	8.0	60.0
SMAJ28A	S533	31.1	34.4	1.0	28	5.0	8.8	45.4
SMAJ30	S035	33.3	40.7	1.0	30	5.0	7.5	53.5
SMAJ30A	S535	33.3	36.8	1.0	30	5.0	8.3	48.4

## ELECTRICAL CHARACTERISTICS

Rating at  $T_a = 25^\circ\text{C}$  ambient temperature unless otherwise specified

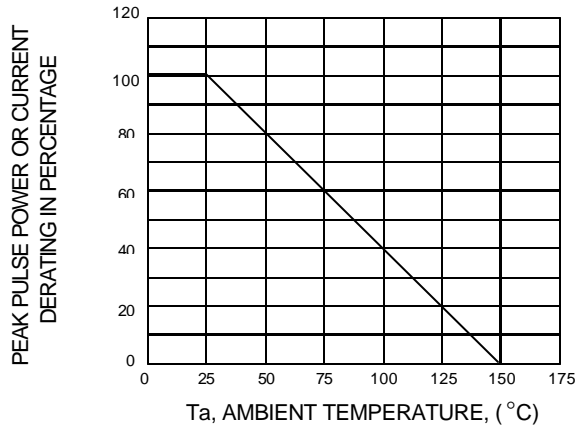
TYPE	Marking Code	Breakdown Voltage @ $I_r$ (Note 1)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ $V_{WM}$	Maximum Peak Impulse Surge Current (Note 1)	Maximum Clamping Voltage @ $I_{PPM}$ (Note 1)
		$V_{BR}$ (V)		$I_T$				
		Min.	Max.	(mA)	$V_{WM}$ (V)	$I_D$ ( $\mu\text{A}$ )	$I_{PPM}$ (A)	$V_C$ (V)
SMAJ33	S039	36.7	44.9	1.0	33	5.0	6.8	59.0
SMAJ33A	S539	36.7	40.6	1.0	33	5.0	7.5	53.3
SMAJ36	S042	40.0	48.9	1.0	36	5.0	6.2	64.3
SMAJ36A	S542	40.0	44.2	1.0	36	5.0	6.9	58.1
SMAJ40	S047	44.4	54.3	1.0	40	5.0	5.6	71.4
SMAJ40A	S547	44.4	49.1	1.0	40	5.0	6.2	64.5
SMAJ43	S050	47.8	58.4	1.0	43	5.0	5.2	76.7
SMAJ43A	S550	47.8	52.8	1.0	43	5.0	5.7	69.4
SMAJ45	S053	50.0	61.1	1.0	45	5.0	5.0	80.3
SMAJ45A	S553	50.0	55.3	1.0	45	5.0	5.5	72.7
SMAJ48	S056	53.3	65.1	1.0	48	5.0	4.7	85.5
SMAJ48A	S556	53.3	58.9	1.0	48	5.0	5.2	77.4
SMAJ51	S060	56.7	69.3	1.0	51	5.0	4.4	91.1
SMAJ51A	S560	56.7	62.7	1.0	51	5.0	4.9	82.4
SMAJ54	S063	60.0	73.3	1.0	54	5.0	4.2	96.3
SMAJ54A	S563	60.0	66.3	1.0	54	5.0	4.6	87.1
SMAJ58	S068	64.4	78.7	1.0	58	5.0	3.9	103.0
SMAJ58A	S568	64.4	71.2	1.0	58	5.0	4.3	93.6
SMAJ60	S071	66.7	81.5	1.0	60	5.0	3.7	107
SMAJ60A	S571	66.7	73.7	1.0	60	5.0	4.1	96.8
SMAJ64	S075	71.1	86.4	1.0	64	5.0	3.5	114
SMAJ64A	S575	71.1	78.6	1.0	64	5.0	3.9	103
SMAJ70	S082	77.8	95.1	1.0	70	5.0	3.2	125
SMAJ70A	S582	77.8	86	1.0	70	5.0	3.5	113
SMAJ75	S088	83.3	102	1.0	75	5.0	3.0	134
SMAJ75A	S588	83.3	92.1	1.0	75	5.0	3.3	121
SMAJ78	S091	86.7	106	1.0	78	5.0	2.9	139
SMAJ78A	S591	86.7	95.8	1.0	78	5.0	2.2	126
SMAJ85	S099	94.4	115	1.0	85	5.0	2.6	151
SMAJ85A	S599	94.4	104	1.0	85	5.0	2.9	137
SMAJ90	S0B1	100	122	1.0	90	5.0	2.5	160
SMAJ90A	S5B1	100	111	1.0	90	5.0	2.7	146
SMAJ100	S0B2	111	136.0	1.0	100	5.0	2.2	179
SMAJ100A	S5B2	111	123.0	1.0	100	5.0	2.5	162
SMAJ110	S0B3	122	149	1.0	110	5.0	2.0	196
SMAJ110A	S5B3	122	135	1.0	110	5.0	2.3	177
SMAJ120	S0B4	133	163.0	1.0	120	5.0	1.9	214
SMAJ120A	S5B4	133	147.0	1.0	120	5.0	2.0	193
SMAJ130	S0B5	144	176	1.0	130	5.0	1.7	231
SMAJ130A	S5B5	144	159	1.0	130	5.0	1.9	209
SMAJ150	S0B8	167	204	1.0	150	5.0	1.5	268
SMAJ150A	S5B8	167	185	1.0	150	5.0	1.6	243
SMAJ160	S0B9	178	218.0	1.0	160	5.0	1.4	287
SMAJ160A	S5B9	178	197.0	1.0	160	5.0	1.5	259
SMAJ170	S0D0	189	231	1.0	170	5.0	1.3	304
SMAJ170A	S5D0	189	209	1.0	170	5.0	1.4	275

Note:

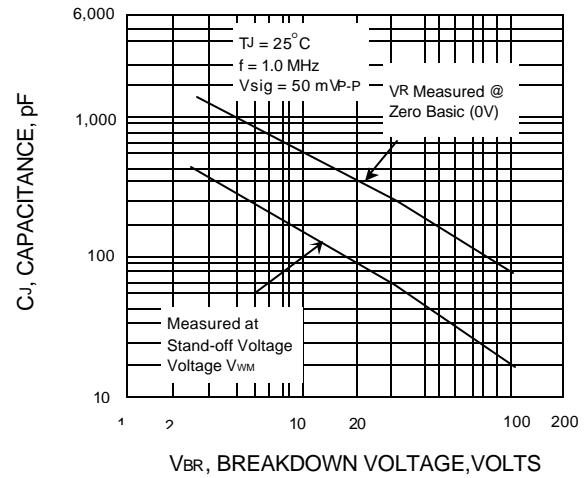
(1) Peak pulse power waveform is 10/1000 $\mu\text{s}$ .

## RATING AND CHARACTERISTIC CURVES ( SMAJ5.0 - SMAJ170A )

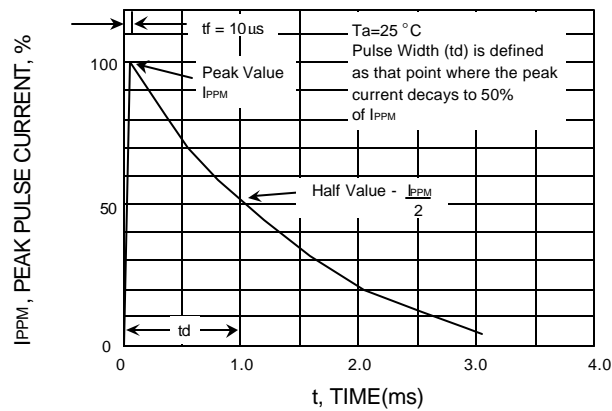
**FIG.1 - PULSE DERATING CURVE**



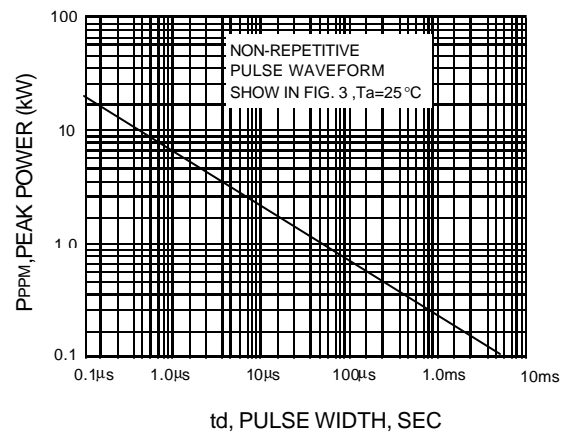
**FIG.2 - TYPICAL JUNCTION CAPACITANCE**



**FIG.3 - PULSE WAVEFORM**



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



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

