

# SMAJ Series

## Transient Voltage Suppressor

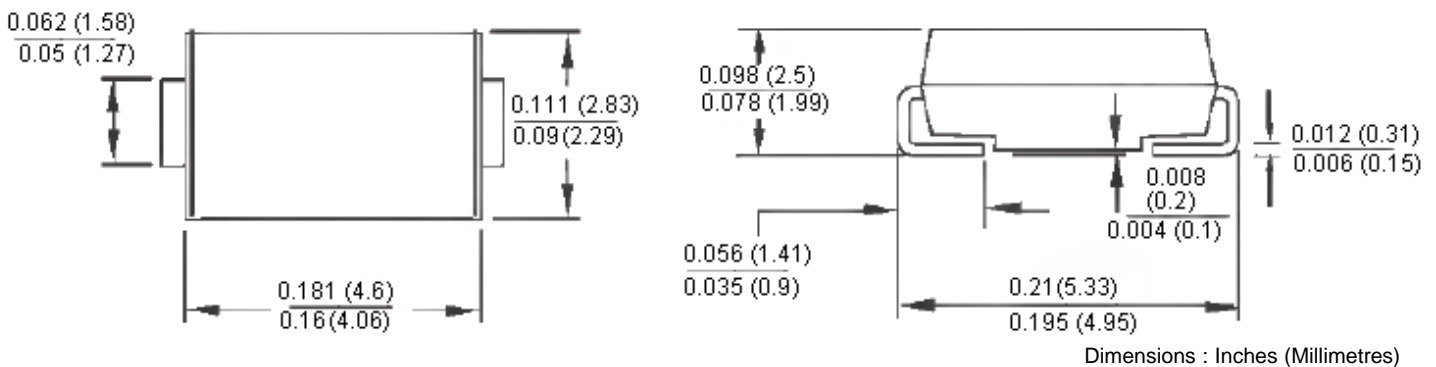


### Features:

- For surface mounted application.
- Low profile package.
- Built-in strain relief.
- Glass passivated junction.
- Excellent clamping capability.
- Fast response time : Typically less than 1.0 ps from 0 volts to 8 volts min.
- Typical  $I_R$  less than 1  $\mu A$  above 10 V.
- High temperature soldering guaranteed : 260°C / 10 s at terminals.
- Plastic material used carried underwriters laboratory flammability classification 94V-0.
- 400 watts peak pulse power capability with a 10 / 1,000  $\mu s$  waveform (300 W above 78 V).



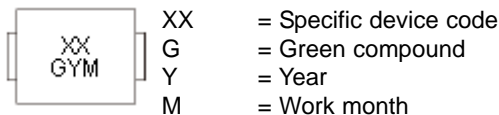
### SMA/DO-214AC



### Mechanical Data

Case : Moulded plastic.  
 Terminals : Pure tin plated, lead free.  
 Polarity : Indicated by cathode band.  
 Packaging : 12 mm tape per EIA std RS-481.

### Marking Diagram



### Maximum Ratings and Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Type Number	Symbol	Value	Unit
Peak Power Dissipation at $T_A = 25^\circ C$ , $T_p = 1$ ms (Note 1)	$P_{PK}$	Minimum 400	Watts
Steady State Power Dissipation	$P_D$	1	
Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) (Note 2, 3)	$I_{FSM}$	40	Amps
Maximum Instantaneous Forward Voltage at 25 A for Unidirectional Only	$V_F$	3.5	Volts
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

Note 1: Non-repetitive current pulse per Fig. 3 and derated above  $T_A = 25^\circ C$  per fig. 2.

Note 2: Mounted on 5 x 5 mm (0.013 mm thick) copper pads to each terminal.

Note 3: 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

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### Devices for bipolar applications

1. For bidirectional use C or CA suffix for types SMAJ5.0 through types SMAJ188.
2. Electrical characteristics apply in both directions.

### Ratings and Characteristic Curves

Fig. 1 Peak Pulse Power Rating Curve

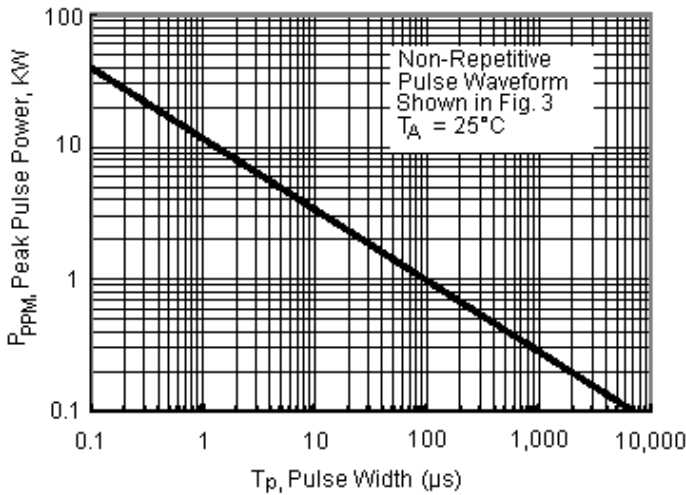


Fig. 2 Pulse Derating Curve

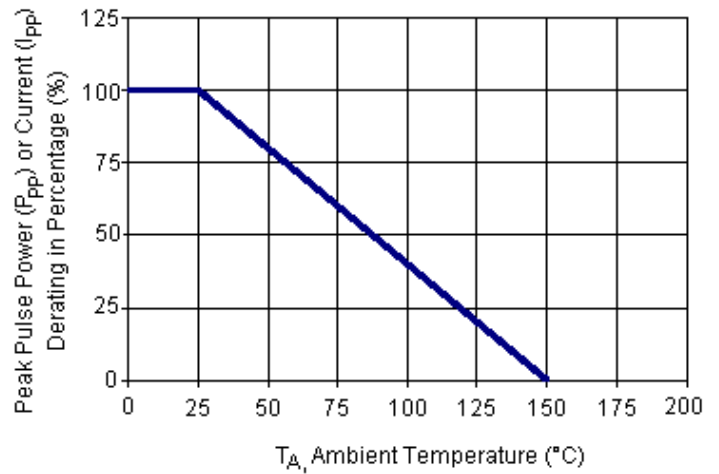


Fig. 3 Clamping Power Pulse Waveform

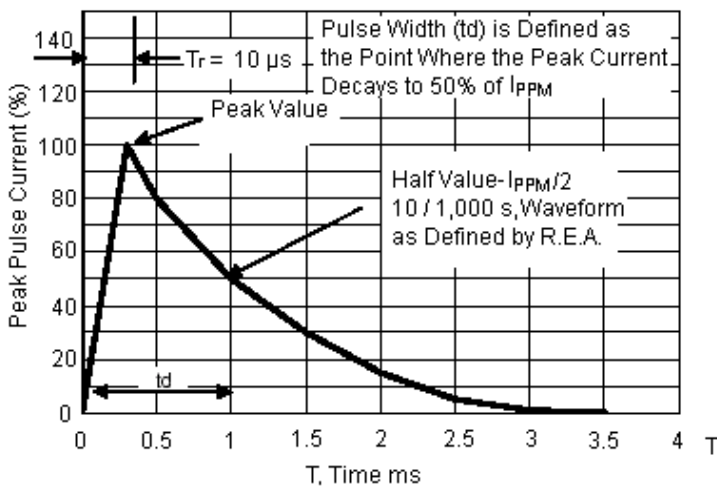
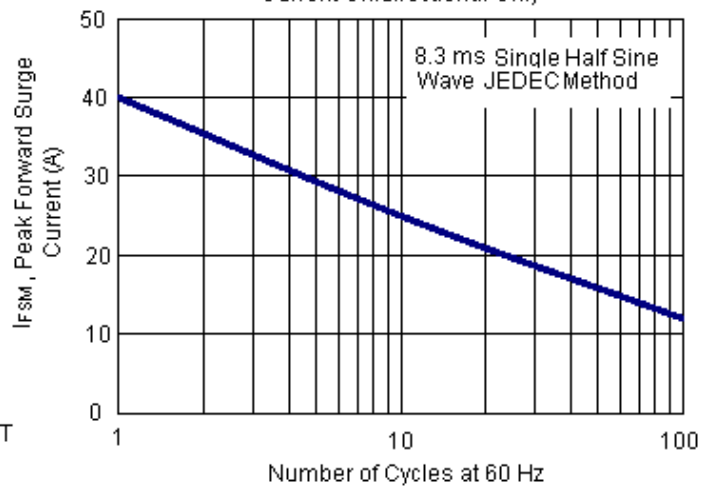


Fig. 4 Maximum Non-Repetitive Forward Surge Current Unidirectional Only



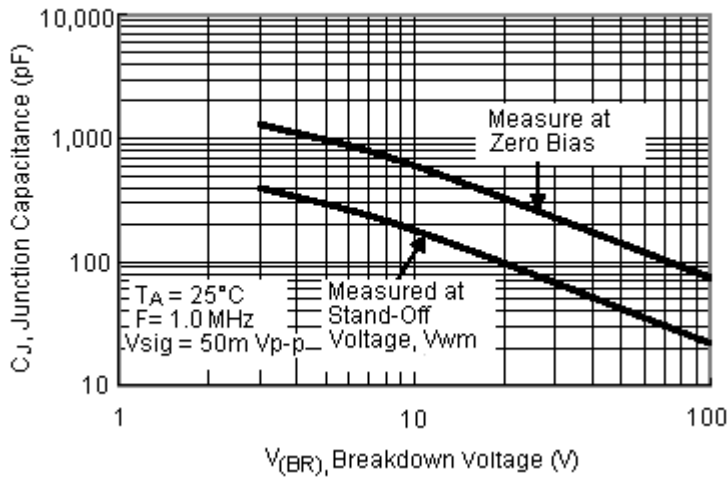
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### Ratings and Characteristic Curves

Fig. 5 Typical Junction Capacitance



### Electrical Characteristics (TA = 25°C unless otherwise noted)

Device	Device Marking Code	Working Peak Reverse Voltage V <sub>WM</sub>	Breakdown Voltage V <sub>BR</sub> (V) at I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (V) (Note 5)	Maximum Peak Pulse Surge Current I <sub>PPM</sub> (A) (Note 5)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA)	
			Min.	Max.					
SMAJ5.0	AD	5	6.4	7.3	10	9.6	41.7	800	
SMAJ5.0A	AE			7		9.2			
SMAJ6.0	AF	6	6.67	8.15		11.4	35.1		
SMAJ6.0A	AG			7.37		10.3	38.8		
SMAJ6.5	AH	6.5	7.22	8.82		12.3	32.5		500
SMAJ6.5A	AK			7.98		11.2	35.7		
SMAJ7.0	AL	7	7.78	9.51		13.3	30.1		200
SMAJ7.0A	AM			8.6		12	33.3		
SMAJ7.5	AN	7.5	8.33	10.3	14.3	28	100		
SMAJ7.5A	AP			9.21	12.9	31			
SMAJ8.0	AQ	8	8.89	10.9	15	26.7	50		
SMAJ8.0A	AR			9.83	13.6	29.4			
SMAJ8.5	AS	8.5	9.44	11.5	15.9	25.2	10		
SMAJ8.5A	AT			10.4	14.4	27.8			
SMAJ9.0	AU	9	10	12.2	16.9	23.7	5		
SMAJ9.0A	AV			11.1	15.4	26			
SMAJ10	AW	10	11.1	13.6	18.8	21.3			
SMAJ10A	AX			12.3	17	23.5			

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			Min.	Max.				
SMAJ11	AY	11	12.2	14.9	1	20.1	19.9	5
SMAJ11A	AZ			13.5		18.2	22	
SMAJ12	BD	12	13.3	16.3		22	18.2	
SMAJ12A	BE			14.7		19.9	20.1	
SMAJ13	BF	13	14.4	17.6		23.8	16.8	
SMAJ13A	BG			15.9		21.5	18.6	
SMAJ14	BH	14	15.6	19.1		25.8	15.5	
SMAJ14A	BK			17.2		23.2	17.2	
SMAJ15	BL	15	16.7	20.4		26.9	14.9	
SMAJ15A	BM			18.5		24.4	16.4	
SMAJ16	BN	16	17.8	21.8		28.8	13.9	
SMAJ16A	BP			19.7		26	15.4	
SMAJ17	BQ	17	18.9	23.1		30.5	13.1	
SMAJ17A	BR			20.9		27.6	14.5	
SMAJ18	BS	18	20	24.4		32.2	12.4	
SMAJ18A	BT			22.1		29.2	13.7	
SMAJ20	BU	20	22.2	27.1		35.8	11.2	
SMAJ20A	BV			24.5		32.4	12.3	
SMAJ22	BW	22	24.4	29.8		39.4	10.2	
SMAJ22A	BX			26.9		35.5	11.3	
SMAJ24	BY	24	26.7	32.6		43	9.3	
SMAJ24A	BZ			29.5		38.9	10.3	
SMAJ26	CD	26	28.9	35.3		46.6	8.6	
SMAJ26A	CE			31.9		42.1	9.5	
SMAJ28	CF	28	31.1	38		50	8	
SMAJ28A	CG			34.4		45.4	8.8	
SMAJ30	CH	30	33.3	40.7		53.5	7.5	
SMAJ30A	CK			36.8		48.4	8.3	
SMAJ33	CL	33	36.7	44.9		59	6.8	
SMAJ33A	CM			40.6		53.3	7.5	

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			Min.	Max.				
SMAJ36	CN	36	40	48.9	1	64.3	6.2	5
SMAJ36A	CP			44.2		58.1	6.9	
SMAJ40	CQ	40	44.4	54.3		71.4	5.6	
SMAJ40A	CR			49.1		64.5	6.2	
SMAJ43	CS	43	47.8	58.4		76.7	5.2	
SMAJ43A	CT			52.8		69.4	5.8	
SMAJ45	CU	45	50	61.1		80.3	5	
SMAJ45A	CV			55.3		72.7	5.5	
SMAJ48	CW	48	53.3	65.1		85.5	4.7	
SMAJ48A	CX			58.9		77.4	5.2	
SMAJ51	CY	51	56.7	69.3		91.1	4.4	
SMAJ51A	CZ			62.7		82.4	4.9	
SMAJ54	RD	54	60	73.3		96.3	4.2	
SMAJ54A	RE			66.3		87.1	4.6	
SMAJ58	RF	58	64.4	78.7		103	3.9	
SMAJ58A	RG			71.2		93.6	4.3	
SMAJ60	RH	60	66.7	81.5		107	3.7	
SMAJ60A	RK			73.7		96.8	4.1	
SMAJ64	RL	64	71.1	86.9		114	3.5	
SMAJ64A	RM			78.6		103	3.9	
SMAJ70	RN	70	77.8	95.1		125	3.2	
SMAJ70A	RP			86		113	3.5	
SMAJ75	RQ	75	83.3	102		134	3	
SMAJ75A	RR			92.1		121	3.3	
SMAJ78	RS	78	86.7	106		139	2.9	
SMAJ78A	RT			95.8		126	3.2	
SMAJ85	RU	85	94.4	115		151	2	
SMAJ85A	RV			104		137	2.2	
SMAJ90	RW	90	100	122	160	1.9		
SMAJ90A	RX			111	146	2.1		
SMAJ100	RY	100	111	136	179	1.7		
SMAJ100A	RZ			123	162	1.9		

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Device	Device Marking Code	Working Peak Reverse Voltage $V_{WM}$	Breakdown Voltage VBR (V) at $I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V) (Note 5)	Maximum Peak Pulse Surge Current $I_{PPM}$ (A) (Note 5)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu\text{A}$ )
			Min.	Max.				
SMAJ110	SD	110	122	149	1	196	1.6	5
SMAJ110A	SE			135		177		
SMAJ120	SF	120	133	163		214	1.4	
SMAJ120A	SG			147		193	1.6	
SMAJ130	SH	130	144	176		231	1.3	
SMAJ130A	SK			159		209	1.5	
SMAJ150	SL	150	167	204		266	1.1	
SMAJ150A	SM			185		243	1.3	
SMAJ160	SN	160	178	218		287	1	
SMAJ160A	SP			197		259	1.2	
SMAJ170	SQ	170	189	231		304	1	
SMAJ170A	SR			209		275	1.1	
SMAJ188	ST	188	209	255		344	0.9	
SMAJ188A	SS			231		328	0.91	

#### Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2.
2. Mounted on  $5 \times 5$  mm copper pads to each terminal.
3. Lead temperature at  $T_L = 75^\circ\text{C}$ .
4. Measure on 8.3 ms single half sine-wave duty cycle = 4 pulses per minutes maximum.
5. Peak pulse power waveform is 10/1,000  $\mu\text{s}$ .
6. For Bi-Directional devices having  $V_R$  of 10 volts and under, the  $I_R$  limit is double.

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