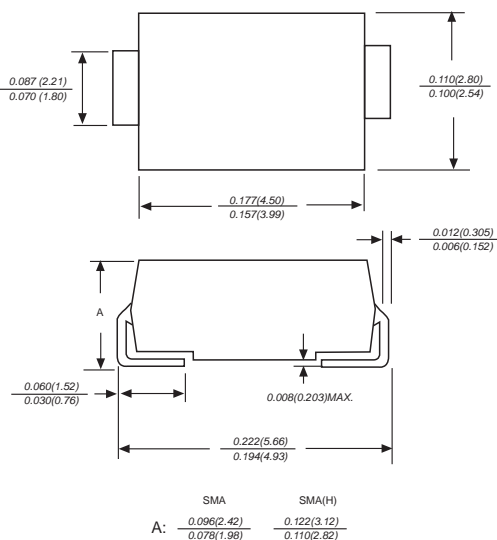


# SMAJ5.0 THRU SMAJ170CA

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Stand-off Voltage: 5.0-170 Volts Peak pulse power: 300 Watts

### DO-214AC



Dimensions in inches and (millimeters)

### FEATURE

- ◆ Optimized for LAN protection applications
- ◆ Ideal for ESD protection of data lines in accordance with IEC 1000-4-2(IEC801-2)
- ◆ Ideal for EFT protection of data lines in accordance with IEC1000-4-4(IEC801-2)
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ 300w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0v to  $V_{(BR)}$  min
- ◆ High temperature soldering guaranteed: 250°C/10S at terminals

### MECHANICAL DATA

**Case:** JEDEC DO-214AC molded plastic body over passivated chip

**Terminals:** Solder plated, solderable per MIL-STD 750, method 2026

**Polarity:** Color band denotes cathode except for bidirectional types

**Mounting Position:** Any

**Weight:** 0.003 ounce, 0.093 grams  
0.004 ounce, 0.111 grams SMA(H)

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use suffix C or CA for types SMAJ5.0 thru SMAJ170 (e.g. SMAJ5.0C, SMAJ170CA)  
Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak pulse power dissipation with a 10/1000ms wavetorm(NOTE 1,2,5,FIG.1)	P <sub>PPM</sub>	Minimum 300	Watts
Peak forward surge current (Note 4)	I <sub>FSM</sub>	40.0	Amps
Peak pulse current with a 10/1000ms waveform(NOTE 1)	I <sub>PPM</sub>	See Table 1	Amps
Steady state power dissipation (Note 3)	P <sub>M(AV)</sub>	1.0	Watts
Maximum instantaneous forward voltage at 25A(Note 4)	V <sub>F</sub>	3.5	Volts
Operating junction and storage temperature range	T <sub>STG</sub> , T <sub>J</sub>	-55 to + 150	°C

- Notes:**
1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2
  2. Mounted on 5.0mm<sup>2</sup> copper pads to each terminal
  3. Lead temperature at  $T_L=75^\circ\text{C}$  per Fig.5
  4. Measured on 8.3ms single half sine-wave. For uni-directional devices only.
  5. Peak pulse power waveform is 10/1000ms

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

Device	Device Marking Code		Working Peak Reverse Voltage V <sub>WM</sub> (Volts)	Breakdown Voltage V <sub>(BR)</sub> (Volts) at I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)(NOTE5)	Maximum Peak Puls Reverse Current I <sub>PPM</sub> (NOTE5) (Amps)	Maximum Reverse Leakage a V <sub>WM</sub> I <sub>d</sub> ( μA)
	UNI	BI		MIN	MAX				
SMAJ5.0	AD	WD	5.0	6.40	7.81	10	9.6	31.3	800
SMAJ5.0A	AE	WE	5.0	6.40	7.08	10	9.2	32.6	800
SMAJ6.0	AF	WF	6.0	6.67	8.15	10	11.4	26.3	800
SMAJ6.0A	AG	WG	6.0	6.67	7.37	10	10.3	29.1	800
SMAJ6.5	AH	WH	6.5	7.22	8.82	10	12.3	24.4	500
SMAJ6.5A	AK	WK	6.5	7.22	7.98	10	11.2	26.8	500
SMAJ7.0	AL	WL	7.0	7.78	9.51	10	13.3	22.6	200
SMAJ7.0A	AM	WM	7.0	7.78	8.60	10	12.0	25.0	200
SMAJ7.5	AN	WN	7.5	8.33	10.3	1.0	14.3	21.0	100
SMAJ7.5A	AP	WP	7.5	8.33	9.21	1.0	12.9	23.3	100
SMAJ8.0	AQ	WQ	8.0	8.89	10.9	1.0	15.0	20.0	50.0
SMAJ8.0A	AR	WR	8.0	8.89	9.83	1.0	13.6	22.1	50.0
SMAJ8.5	AS	WS	8.5	9.44	11.5	1.0	15.9	18.9	10.0
SMAJ8.5A	AT	WT	8.5	9.44	10.4	1.0	14.4	20.8	10.0
SMAJ9.0	AU	WU	9.0	10.0	12.2	1.0	16.9	17.8	5.0
SMAJ9.0A	AV	WV	9.0	10.0	11.1	1.0	15.4	19.5	5.0
SMAJ10	AW	WV	10.00	11.1	13.6	1.0	18.8	16.0	5.0
SMAJ10A	AX	WX	10.00	11.1	12.3	1.0	17.0	17.6	5.0
SMAJ11	AY	WY	11.00	12.2	14.9	1.0	20.1	14.9	5.0
SMAJ11A	AZ	WZ	11.00	12.2	13.5	1.0	18.2	16.5	5.0
SMAJ12	BD	XD	12.00	13.3	16.3	1.0	22.0	13.6	5.0
SMAJ12A	BE	XE	12.00	13.3	14.7	1.0	19.9	15.1	5.0
SMAJ13	BF	XF	13.00	14.4	17.6	1.0	23.8	12.6	5.0
SMAJ13A	BG	XG	13.00	14.4	15.9	1.0	21.5	14.0	5.0
SMAJ14	BH	XH	14.00	15.6	19.1	1.0	25.8	11.6	5.0
SMAJ14A	BK	XK	14.00	15.6	17.2	1.0	23.2	12.9	5.0
SMAJ15	BL	XL	15.00	16.7	20.4	1.0	26.9	11.2	5.0
SMAJ15A	BM	XM	15.00	16.7	18.5	1.0	24.4	12.3	5.0
SMAJ16	BN	XN	16.00	17.8	21.8	1.0	28.8	10.4	5.0
SMAJ16A	BP	XP	16.00	17.8	19.7	1.0	26.0	11.5	5.0
SMAJ17	BQ	XQ	17.00	18.9	23.1	1.0	30.5	9.8	5.0
SMAJ17A	BR	XR	17.00	18.9	20.9	1.0	27.6	10.9	5.0
SMAJ18	BS	XS	18.00	20.0	24.4	1.0	32.2	9.3	5.0
SMAJ18A	BT	XT	18.00	20.0	22.1	1.0	29.2	10.3	5.0
SMAJ20	BU	XU	20.00	22.2	27.1	1.0	35.8	8.4	5.0
SMAJ20A	BV	XV	20.00	22.2	24.5	1.0	32.4	9.3	5.0
SMAJ22	BW	XW	22.00	24.4	29.8	1.0	39.4	7.6	5.0
SMAJ22A	BX	XX	22.00	24.4	26.9	1.0	35.5	8.5	5.0
SMAJ24	BY	XY	24.00	26.7	32.6	1.0	43.0	7.0	5.0
SMAJ24A	BZ	XZ	24.00	26.7	29.5	1.0	38.9	7.7	5.0
SMAJ26	CD	YD	26.00	28.9	35.3	1.0	46.6	6.4	5.0
SMAJ26A	CE	YE	26.00	28.9	31.9	1.0	42.1	7.1	5.0
SMAJ28	CF	YF	28.00	31.1	38.0	1.0	50.0	6.0	5.0
SMAJ28A	CG	YG	28.00	31.1	34.4	1.0	45.4	6.6	5.0
SMAJ30	CH	YH	30.00	33.3	40.7	1.0	53.5	5.6	5.0
SMAJ30A	CK	YK	30.00	33.3	36.8	1.0	48.4	6.2	5.0

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

Device	Device Marking Code		Working Peak Reverse Voltage V <sub>WM</sub> (Volts)	Breakdown Voltage V <sub>(BR)</sub> (Volts) at I <sub>r</sub>		Test Current I <sub>r</sub> (mA)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)(NOTE5)	Maximum Peak Puls Reverse Current I <sub>PPM</sub> (NOTE5) (Amps)	Maximum Reverse Leakage a V <sub>WM</sub> I <sub>D</sub> ( $\mu$ A)
	UNI	BI		MIN	MAX				
SMAJ33	CL	YL	33.00	36.7	44.9	1.0	59.0	5.1	5.0
SMAJ33A	CM	YM	33.00	36.7	40.6	1.0	53.3	5.6	5.0
SMAJ36	CN	YN	36.00	40.0	48.9	1.0	64.3	4.7	5.0
SMAJ36A	CP	YP	36.00	40.0	44.2	1.0	58.1	5.2	5.0
SMAJ40	CQ	YQ	40.00	44.4	54.3	1.0	71.4	4.2	5.0
SMAJ40A	CR	YR	40.00	44.4	49.1	1.0	64.5	4.7	5.0
SMAJ43	CS	YS	43.00	47.8	58.4	1.0	76.7	3.9	5.0
SMAJ43A	CT	YT	43.00	47.8	52.8	1.0	69.4	4.3	5.0
SMAJ45	CU	YU	45.00	50.0	61.1	1.0	80.3	3.7	5.0
SMAJ45A	CV	YV	45.00	50.0	55.3	1.0	72.7	4.1	5.0
SMAJ48	CW	YW	48.00	53.3	65.1	1.0	85.5	3.5	5.0
SMAJ48A	CX	YX	48.00	53.3	58.9	1.0	77.4	3.9	5.0
SMAJ51	CY	YY	51.00	56.7	69.3	1.0	91.1	3.3	5.0
SMAJ51A	CZ	YZ	51.00	56.7	62.7	1.0	82.4	3.6	5.0
SMAJ54	RD	ZD	54.00	60.0	73.3	1.0	96.3	3.1	5.0
SMAJ54A	RE	ZE	54.00	60.0	66.3	1.0	87.1	3.4	5.0
SMAJ58	RF	ZF	58.00	64.4	78.7	1.0	103.0	2.9	5.0
SMAJ58A	RG	ZG	58.00	64.4	71.2	1.0	93.6	3.2	5.0
SMAJ60	RH	ZH	60.00	66.7	81.5	1.0	107.0	2.8	5.0
SMAJ60A	RK	ZK	60.00	66.7	73.7	1.0	96.8	3.1	5.0
SMAJ64	RL	ZL	64.00	71.1	86.4	1.0	114.0	2.6	5.0
SMAJ64A	RM	ZM	64.00	71.1	78.6	1.0	103.0	2.9	5.0
SMAJ70	RN	ZN	70.00	77.8	95.1	1.0	125	2.4	5.0
SMAJ70A	RP	ZP	70.00	77.8	86.0	1.0	113	2.7	5.0
SMAJ75	RQ	ZQ	75.00	83.3	102	1.0	134	2.2	5.0
SMAJ75A	RR	ZR	75.00	83.3	92.1	1.0	121	2.5	5.0
SMAJ78	RS	ZS	78.00	86.7	106	1.0	139	2.2	5.0
SMAJ78A	RT	ZT	78.00	86.7	95.8	1.0	126	2.4	5.0
SMAJ85	RU	ZU	85.00	94.4	115	1.0	151	2.0	5.0
SMAJ85A	RV	ZV	85.00	94.4	104	1.0	137	2.2	5.0
SMAJ90	RW	ZW	90.00	100	122	1.0	160	1.9	5.0
SMAJ90A	RX	ZX	90.00	100	111	1.0	146	2.1	5.0
SMAJ100	RY	ZY	100.00	111	136	1.0	179	1.7	5.0
SMAJ100A	RZ	ZZ	100.00	111	123	1.0	162	1.9	5.0
SMAJ110	SD	VD	110.00	122	149	1.0	196	1.5	5.0
SMAJ110A	SE	VE	110.00	122	135	1.0	177	1.7	5.0
SMAJ120	SF	VF	120.00	133	163	1.0	214	1.4	5.0
SMAJ120A	SG	VG	120.00	133	147	1.0	193	1.6	5.0
SMAJ130	SH	VH	130.00	144	176	1.0	231	1.3	5.0
SMAJ130A	SK	VK	130.00	144	159	1.0	209	1.4	5.0
SMAJ150	SL	VL	150.00	167	204	1.0	268	1.1	5.0
SMAJ150A	SM	VM	150.00	167	185	1.0	243	1.2	5.0
SMAJ160	SN	VN	160.00	178	218	1.0	287	1.0	5.0
SMAJ160A	SP	VP	160.00	178	197	1.0	259	1.2	5.0
SMAJ170	SQ	VQ	170.00	189	231	1.0	304	0.99	5.0
SMAJ170A	SR	VR	170.00	189	209	1.0	275	1.09	5.0

**NOTES:**

1. V<sub>(BR)</sub> measured after I<sub>r</sub> applied for 300ms, I<sub>r</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35
5. Peak pulse power waveform is 10/1000ms

# RATINGS AND CHARACTERISTIC CURVES SMAJ5.0 THUR SMAJ170CA

FIG. 1-PEAK PULSE POWER RATING CURVE

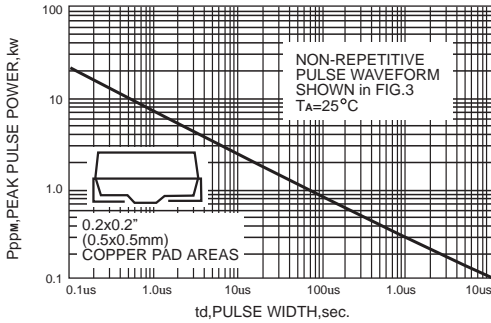


FIG. 2-PULSE DERATING CURVE

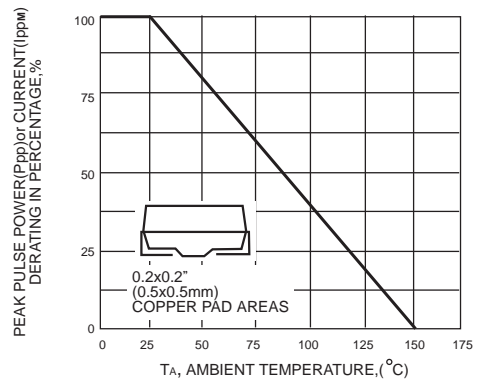


FIG.3-PULSE WAVEFORM

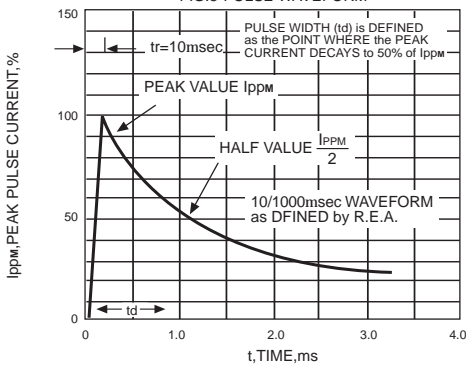


FIG. 4-TYPICAL JUNCTIONAL CAPACITANCE UNIDIRECTIONAL

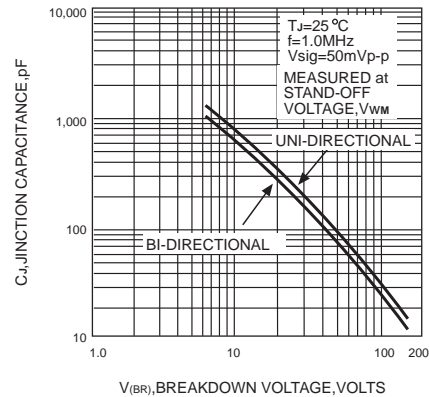


FIG.5-STEADY STATE POWER DERATING CURVE

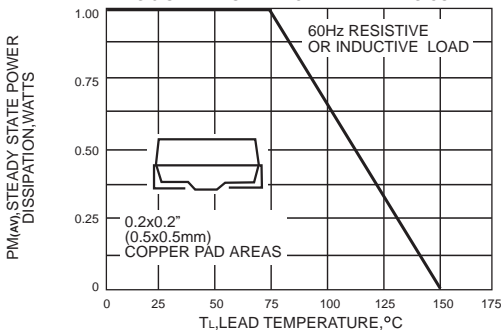


FIG.7-TYPICAL RESPONSE TO 8KV POSITLVE GOING ESD PULSE PER IEC1000-4-2(IEC801-2)

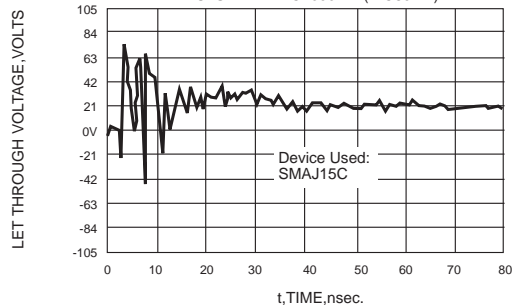


FIG.6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

