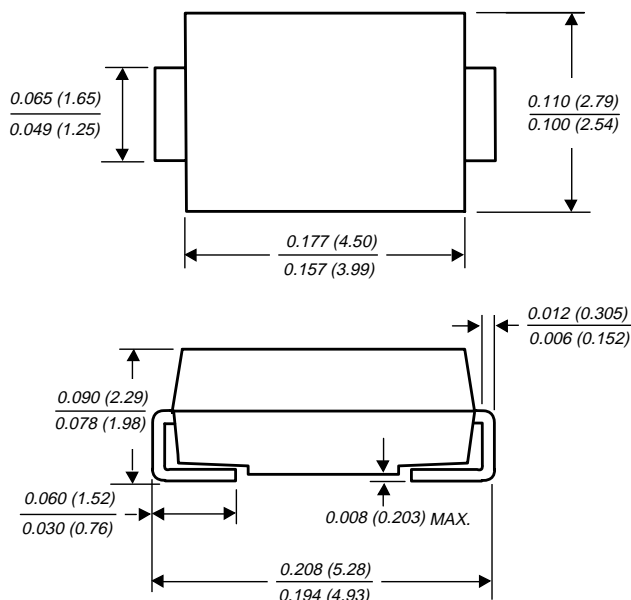


# SMAJ5.0 THRU SMAJ170CA

## SURFACE MOUNT TRANSZORB™ TRANSIENT VOLTAGE SUPPRESSOR

*Stand-off Voltage - 5.0 to 170 Volts      Peak Pulse Power - 300 Watts*

### DO-214AC



Dimensions in inches and (millimeters)

### FEATURES

- ◆ 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 (IEC801-4)
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to V<sub>(BR)</sub> min.
- ◆ 300W peak pulse power capability with a 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- ◆ High temperature soldering guaranteed: 250°C/10 seconds 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:** For uni-directional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation

**Mounting Position:** Any

**Weight:** 0.002 ounces, 0.064 gram

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bi-directional 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 ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak pulse power dissipation with a 10/1000μs waveform (NOTE 1, 2, FIG.1)	PPM	Minimum 300	Watts
Peak pulse current with a 10/1000μs waveform (NOTE 1)	IPPM	SEE TABLE 1	Amps
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTES 2, 3) - unidirectional only	IFSM	40.0	Amps
Maximum instantaneous forward voltage at 25A (NOTE 3)	V <sub>F</sub>	3.5	Volts
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 T<sub>A</sub>=25°C per Fig. 2
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0mm) copper pads to each terminal
- (3) Measured on 8.3ms single half sine-wave. For uni-directional devices only.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted) TABLE 1

Device	Device Marking Code		Breakdown Voltage V <sub>(BR)</sub> (Volts) at I <sub>T</sub> (NOTE 1)		Test Current I <sub>T</sub> (mA)	Working Peak Reverse Voltage V <sub>WM</sub> (Volts)	Maximum Reverse Leakage a V <sub>WM</sub> (NOTE 3) I <sub>D</sub> (μA)	Maximum Peak Pulse Surge Current I <sub>PPM</sub> (NOTE 2) (Amps)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)
	UNI	BI	Min.	Max.					
SMAJ5.0	AD	WD	6.4	7.82	10	5.0	800	31.3	9.6
SMAJ5.0A	AE	WE	6.4	7.07	10	5.0	800	32.6	9.2
SMAJ6.0	AF	WF	6.67	8.15	10	6.0	800	26.3	11.4
SMAJ6.0A	AG	WG	6.67	7.37	10	6.0	800	29.1	10.3
SMAJ6.5	AH	WH	7.22	8.82	10	6.5	500	24.4	12.3
SMAJ6.5A	AK	WK	7.22	7.98	10	6.5	500	26.8	11.2
SMAJ7.0	AL	WL	7.78	9.51	10	7.0	200	22.6	13.3
SMAJ7.0A	AM	WM	7.78	8.6	10	7.0	200	25.0	12.0
SMAJ7.5	AN	WN	8.33	10.3	1.0	7.5	100	21.0	14.3
SMAJ7.5A	AP	WP	8.33	9.21	1.0	7.5	100	23.3	12.9
SMAJ8.0	AQ	WQ	8.89	10.9	1.0	8.0	50.0	20.0	15.0
SMAJ8.0A	AR	WR	8.89	9.83	1.0	8.0	50.0	22.1	13.6
SMAJ8.5	AS	WS	9.44	11.5	1.0	8.5	10.0	18.9	15.9
SMAJ8.5A	AT	WT	9.44	10.4	1.0	8.5	10.0	20.8	14.4
SMAJ9.0	AU	WU	10.0	12.2	1.0	9.0	5.0	17.8	16.9
SMAJ9.0A	AV	WV	10.0	11.1	1.0	9.0	5.0	19.5	15.4
SMAJ10	AW	WW	11.1	13.6	1.0	10.0	5.0	16.0	18.8
SMAJ10A	AX	WX	11.1	12.3	1.0	10.0	5.0	17.6	17.0
SMAJ11	AY	WY	12.2	14.9	1.0	11.0	5.0	14.9	20.1
SMAJ11A	AZ	WZ	12.2	13.5	1.0	11.0	5.0	16.5	18.2
SMAJ12	BD	XD	13.3	16.3	1.0	12.0	5.0	13.6	22.0
SMAJ12A	BE	XE	13.3	14.7	1.0	12.0	5.0	15.1	19.9
SMAJ13	BF	XF	14.4	17.6	1.0	13.0	5.0	12.6	23.8
SMAJ13A	BG	XG	14.4	15.9	1.0	13.0	5.0	14.0	21.5
SMAJ14	BH	XH	15.6	19.1	1.0	14.0	5.0	11.6	25.8
SMAJ14A	BK	XK	15.6	17.2	1.0	14.0	5.0	12.9	23.2
SMAJ15	BL	XL	16.7	20.4	1.0	15.0	5.0	11.2	26.9
SMAJ15A	BM	XM	16.7	18.5	1.0	15.0	5.0	12.3	24.4
SMAJ16	BN	XN	17.8	21.8	1.0	16.0	5.0	10.4	28.8
SMAJ16A	BP	XP	17.8	19.7	1.0	16.0	5.0	11.5	26.0
SMAJ17	BQ	XQ	18.9	23.1	1.0	17.0	5.0	9.8	30.5
SMAJ17A	BR	XR	18.9	20.9	1.0	17.0	5.0	10.9	27.6
SMAJ18	BS	XS	20.0	24.4	1.0	18.0	5.0	9.3	32.2
SMAJ18A	BT	XT	20.0	22.1	1.0	18.0	5.0	10.3	29.2
SMAJ20	BU	XU	22.2	27.1	1.0	20.0	5.0	8.4	35.8
SMAJ20A	BV	XV	22.2	24.5	1.0	20.0	5.0	9.3	32.4
SMAJ22	BW	XW	24.4	29.8	1.0	22.0	5.0	7.6	39.4
SMAJ22A	BX	XX	24.4	26.9	1.0	22.0	5.0	8.5	35.5
SMAJ24	BY	XY	26.7	32.6	1.0	24.0	5.0	7.0	43.0
SMAJ24A	BZ	XZ	26.7	29.5	1.0	24.0	5.0	7.7	38.9
SMAJ26	CD	YD	28.9	35.3	1.0	26.0	5.0	6.4	46.6
SMAJ26A	CE	YE	28.9	31.9	1.0	26.0	5.0	7.1	42.1
SMAJ28	CF	YF	31.1	38.0	1.0	28.0	5.0	6.0	50.0
SMAJ28A	CG	YG	31.1	34.4	1.0	28.0	5.0	6.6	45.4
SMAJ30	CH	YH	33.3	40.7	1.0	30.0	5.0	5.6	53.5
SMAJ30A	CK	YK	33.3	36.8	1.0	30.0	5.0	6.2	48.4
SMAJ33	CL	YL	36.7	44.9	1.0	33.0	5.0	5.1	59.0
SMAJ33A	CM	YM	36.7	40.6	1.0	33.0	5.0	5.6	53.3
SMAJ36	CN	YN	40.0	48.9	1.0	36.0	5.0	4.7	64.3
SMAJ36A	CP	YP	40.0	44.2	1.0	36.0	5.0	5.2	58.1
SMAJ40	CQ	YQ	44.4	54.3	1.0	40.0	5.0	4.2	71.4
SMAJ40A	CR	YR	44.4	49.1	1.0	40.0	5.0	4.7	64.5
SMAJ43	CS	YS	47.8	58.4	1.0	43.0	5.0	3.9	76.7
SMAJ43A	CT	YT	47.8	52.8	1.0	43.0	5.0	4.3	69.4
SMAJ45	CU	YU	50.0	61.1	1.0	45.0	5.0	80.3	3.7
SMAJ45A	CV	YV	50.0	55.3	1.0	45	5.0	72.7	4.1
SMAJ48	CW	YW	53.3	65.1	1.0	48	5.0	85.5	3.5
SMAJ48A	CX	YX	53.3	58.9	1.0	48	5.0	77.4	3.9
SMAJ51	CY	YY	56.7	69.3	1.0	51	5.0	91.1	3.3
SMAJ51A	CZ	YZ	56.7	62.7	1.0	51	5.0	82.4	3.6

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted) TABLE 1 (Cont'd)

Device	Device Marking Code		Breakdown Voltage V <sub>(BR)</sub> (Volts) at I <sub>T</sub> (NOTE 1)		Test Current I <sub>T</sub> (mA)	Working Peak Reverse Voltage V <sub>WM</sub> (Volts)	Maximum Reverse Leakage a V <sub>WM</sub> (NOTE 3) I <sub>D</sub> (μA)	Maximum Peak Pulse Surge Current I <sub>PPM</sub> (NOTE 2) (Amps)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)
	UNI	BI	Min.	Max.					
SMAJ54	RD	ZD	60.0	73.3	1.0	54	5.0	96.3	3.1
SMAJ54A	RE	ZE	60.0	66.3	1.0	54	5.0	87.1	3.4
SMAJ58	RF	ZF	64.4	78.7	1.0	58	5.0	103	2.9
SMAJ58A	RG	ZG	64.4	71.2	1.0	58	5.0	93.6	3.2
SMAJ60	RH	ZH	66.7	81.5	1.0	60	5.0	107	2.8
SMAJ60A	RK	ZK	66.7	73.7	1.0	60	5.0	96.8	3.1
SMAJ64	RL	ZL	71.1	86.4	1.0	64	5.0	114	2.6
SMAJ64A	RM	ZM	71.1	78.6	1.0	64	5.0	103	2.9
SMAJ70	RN	ZN	77.8	95.1	1.0	70	5.0	125	2.4
SMAJ70A	RP	ZP	77.8	86	1.0	70	5.0	113	2.7
SMAJ75	RQ	ZQ	83.3	102	1.0	75	5.0	134	2.2
SMAJ75A	RR	ZR	83.3	92.1	1.0	75	5.0	121	2.5
SMAJ78	RS	ZS	86.7	106	1.0	78	5.0	139	2.2
SMAJ78A	RT	ZT	86.7	95.8	1.0	78	5.0	126	2.4
SMAJ85	RU	ZU	94.4	115	1.0	85	5.0	151	2
SMAJ85A	RV	ZV	94.4	104	1.0	85	5.0	137	2.2
SMAJ90	RW	ZW	100	122	1.0	90	5.0	160	1.9
SMAJ90A	RX	ZX	100	111	1.0	90	5.0	146	2.1
SMAJ100	RY	ZY	111	136	1.0	100	5.0	179	1.7
SMAJ100A	RZ	ZZ	111	123	1.0	100	5.0	162	1.9
SMAJ110	SD	VD	122	149	1.0	110	5.0	196	1.5
SMAJ110A	SE	VE	122	135	1.0	110	5.0	177	1.7
SMAJ120	SF	VF	133	163	1.0	120	5.0	214	1.4
SMAJ120A	SG	VG	133	147	1.0	120	5.0	193	1.6
SMAJ130	SH	VH	144	176	1.0	130	5.0	231	1.3
SMAJ130A	SK	VK	144	159	1.0	130	5.0	209	1.4
SMAJ150	SL	VL	167	204	1.0	150	5.0	268	1.1
SMAJ150A	SM	VM	167	185	1.0	150	5.0	243	1.2
SMAJ160	SN	VN	178	218	1.0	160	5.0	287	1.0
SMAJ160A	SP	VP	178	197	1.0	160	5.0	259	1.2
SMAJ170	SQ	VQ	189	231	1	170	5.0	304	0.99
SMAJ170A	SR	VR	189	209	1.0	170	5.0	275	1.09

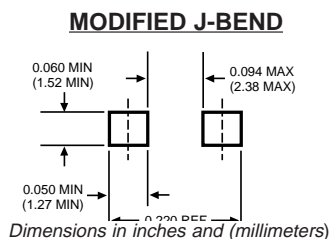
### NOTES:

- (1) V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300μs square wave pulse or equivalent
- (2) Surge current waveform per Fig. 3 and derate per Fig. 2
- (3) For bi-directional types having V<sub>WM</sub> of 10 Volts and less, the I<sub>D</sub> limit is doubled
- (4) For the bi-directional SMAJ5.0CA, the maximum V<sub>(BR)</sub> is 7.25V.
- (5) All terms and symbols are consistent with ANSI/IEEE C62.35

## APPLICATION NOTES

### RECOMMENDED PAD LAYOUT

The pad dimensions should be 0.010" (2.5mm) longer than the contact size in the lead axis. This allows a solder fillet to form, see figure below. Contact factory for soldering methods.



This device is designed specifically for transient voltage suppression from threats generated by ESD for board level load switching components.

The wide leads assure a large surface contact for good heat dissipation, and a low resistance path for surge current flow to ground.

This series is designed to optimize board space and for use with surface mount technology automated assembly equipment.

They can be easily mounted on printed circuit boards and ceramic substrates to protect sensitive components from transient voltage damage.

# MAXIMUM RATINGS AND CHARACTERISTIC CURVES SMAJ5.0 THRU SMAJ170CA

