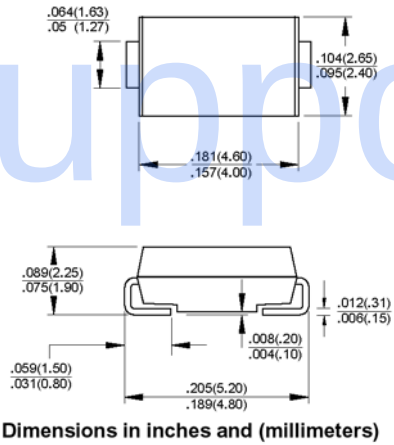
SMAJ5.0 thru 440CA

Surface Mount Transient Voltage Suppressors
Peak Pulse Power 400W Stand Off Voltage 5.0 to 440V

Features

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 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 IEC 1000-4-4 (IEC801-4)
- Low profile package with built-in strain relief for surface mounted applications
- Glass passivated junction
- Low incremental surge resistance, excellent clamping capability
- 400W peak pulse power capability with a 10/1000us wave-form, repetition rate (duty cycle): 0.01% (300W above 78V)
- Very fast response time
- High temperature soldering guaranteed: 250°C/10 seconds at terminals

DO-214AC (SMA)



Dimensions in inches and (millimeters)

Mechanical Data

- Case: JEDEC DO-214AC(SMA) molded plastic over passivated chip
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: For uni-directional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- Mounting Position: Any
- Weight: 0.002oz., 0.064g

Devices for Bidirectional Applications

For bi-directional devices, use suffix CA (e.g. SMAJ10CA). Electrical characteristics apply in both directions.

Maximum Ratings and Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000us waveform (1,2) (see Fig. 1)	P_{PPM}	400	W
Peak pulse current with a 10/1000us waveform (1)	I_{PPM}	See Next Table	A
Peak forward surge current, 8.3ms single half sine-wave uni-directional only (2)	I_{FSM}	40	A
Typical thermal resistance, junction to ambient (3)	$R_{\theta JA}$	120	°C/W
Typical thermal resistance, junction to lead	$R_{\theta JL}$	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°C per Fig. 2. Rating is 300W above 78V
2. Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal
3. Mounted on minimum recommended pad layout

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. V_F=3.5V at I_F=25A (uni-directional only)

Device type	Device marking code		Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse surge current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)
	UNI	BI	Min.	Max.					
SMAJ5.0	AD	WD	6.40	7.82	10	5.0	800	41.7	9.6
SMAJ5.0A (5)	AE	WE	6.40	7.07	10	5.0	800	43.5	9.2
SMAJ6.0	AF	WF	6.67	8.15	10	6.0	800	35.1	11.4
SMAJ6.0A	AG	WG	6.67	7.37	10	6.0	800	38.8	10.3
SMAJ6.5	AH	WH	7.22	8.82	10	6.5	500	32.5	12.3
SMAJ6.5A	AK	WK	7.22	7.98	10	6.5	500	35.7	11.2
SMAJ7.0	AL	WL	7.78	9.51	10	7.0	200	30.1	13.3
SMAJ7.0A	AM	WM	7.78	8.60	10	7.0	200	33.3	12.0
SMAJ7.5	AN	WN	8.33	10.2	1.0	7.5	100	28.0	14.3
SMAJ7.5A	AP	WP	8.33	9.21	1.0	7.5	100	31.0	12.9
SMAJ8.0	AQ	WQ	8.89	10.9	1.0	8.0	50	26.7	15.0
SMAJ8.0A	AR	WR	8.89	9.83	1.0	8.0	50	29.4	13.6
SMAJ8.5	AS	WS	9.44	11.5	1.0	8.5	10	25.2	15.9
SMAJ8.5A	AT	WT	9.44	10.4	1.0	8.5	10	27.8	14.4
SMAJ9.0	AU	WU	10.0	12.2	1.0	9.0	5.0	23.7	16.9
SMAJ9.0A	AV	WV	10.0	11.1	1.0	9.0	5.0	26.0	15.4
SMAJ10	AW	WW	11.1	13.6	1.0	10	1.0	21.3	18.8
SMAJ10A	AX	WX	11.1	12.3	1.0	10	1.0	23.5	17.0
SMAJ11	AY	WY	12.2	14.9	1.0	11	1.0	19.9	20.1
SMAJ11A	AZ	WZ	12.2	13.5	1.0	11	1.0	22.0	18.2
SMAJ12	BD	XD	13.3	16.3	1.0	12	1.0	18.2	22.0
SMAJ12A	BE	XE	13.3	14.7	1.0	12	1.0	20.1	19.9
SMAJ13	BF	XF	14.4	17.6	1.0	13	1.0	16.8	23.8
SMAJ13A	BG	XG	14.4	15.9	1.0	13	1.0	18.6	21.5
SMAJ14	BH	XH	15.6	19.1	1.0	14	1.0	15.5	25.8
SMAJ14A	BK	XK	15.6	17.2	1.0	14	1.0	17.2	23.2
SMAJ15	BL	XL	16.7	20.4	1.0	15	1.0	14.9	26.9
SMAJ15A	BM	XM	16.7	18.5	1.0	15	1.0	16.4	24.4
SMAJ16	BN	XN	17.8	21.8	1.0	16	1.0	13.9	28.8
SMAJ16A	BP	XP	17.8	19.7	1.0	16	1.0	15.4	26.0
SMAJ17	BQ	XQ	18.9	23.1	1.0	17	1.0	13.1	30.5
SMAJ17A	BR	XR	18.9	20.9	1.0	17	1.0	14.5	27.6
SMAJ18	BS	XS	20.0	24.4	1.0	18	1.0	12.4	32.2
SMAJ18A	BT	XT	20.0	22.1	1.0	18	1.0	13.7	29.2
SMAJ20	BU	XU	22.2	27.1	1.0	20	1.0	11.2	35.8
SMAJ20A	BV	XV	22.2	24.5	1.0	20	1.0	12.3	32.4
SMAJ22	BW	XW	24.4	29.8	1.0	22	1.0	10.2	39.4
SMAJ22A	BX	XX	24.4	26.9	1.0	22	1.0	11.3	35.5
SMAJ24	BY	XY	26.7	32.6	1.0	24	1.0	9.3	43.0
SMAJ24A	BZ	XZ	26.7	29.5	1.0	24	1.0	10.3	38.9
SMAJ26	CD	YD	28.9	35.3	1.0	26	1.0	8.6	46.6
SMAJ26A	CE	YE	28.9	31.9	1.0	26	1.0	9.5	42.1
SMAJ28	CF	YF	31.1	38.0	1.0	28	1.0	8.0	50.0
SMAJ28A	CG	YG	31.1	34.4	1.0	28	1.0	8.8	45.4
SMAJ30	CH	YH	33.3	40.7	1.0	30	1.0	7.5	53.5
SMAJ30A	CK	YK	33.3	36.8	1.0	30	1.0	8.3	48.4

Notes: 1. $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent

2. Surge current waveform per Fig. 3 and derate per Fig. 2

3. For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled

4. All terms and symbols are consistent with ANSI/IEEE C62.35

5. For the bidirectional SMAJ5.0CA, the maximum $V_{(BR)}$ is 7.25V.

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. V_F=3.5V at I_F=25A (uni-directional only)

Device type	Device marking code		Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse surge current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)
	UNI	BI	Min.	Max.					
SMAJ33	CL	YL	36.7	44.9	1.0	33	1.0	6.8	59.0
SMAJ33A	CM	YM	36.7	40.6	1.0	33	1.0	7.5	53.3
SMAJ36	CN	YN	40.0	48.9	1.0	36	1.0	6.2	64.3
SMAJ36A	CP	YP	40.0	44.2	1.0	36	1.0	6.9	58.1
SMAJ40	CQ	YQ	44.4	54.3	1.0	40	1.0	5.6	71.4
SMAJ40A	CR	YR	44.4	49.1	1.0	40	1.0	6.2	64.5
SMAJ43	CS	YS	47.8	58.4	1.0	43	1.0	5.2	76.7
SMAJ43A	CT	YT	47.8	52.8	1.0	43	1.0	5.8	69.4
SMAJ45	CU	YU	50.0	61.1	1.0	45	1.0	5.0	80.3
SMAJ45A	CV	YV	50.0	55.3	1.0	45	1.0	5.5	72.7
SMAJ48	CW	YW	53.3	65.1	1.0	48	1.0	4.7	85.5
SMAJ48A	CX	YX	53.3	58.9	1.0	48	1.0	5.2	77.4
SMAJ51	CY	YY	56.7	69.3	1.0	51	1.0	4.4	91.1
SMAJ51A	CZ	YZ	56.7	62.7	1.0	51	1.0	4.9	82.4
SMAJ54	RD	ZD	60.0	73.3	1.0	54	1.0	4.2	96.3
SMAJ54A	RE	ZE	60.0	66.3	1.0	54	1.0	4.6	87.1
SMAJ58	RF	ZF	64.4	78.7	1.0	58	1.0	3.9	103
SMAJ58A	RG	ZG	64.4	71.2	1.0	58	1.0	4.3	93.6
SMAJ60	RH	ZH	66.7	81.5	1.0	60	1.0	3.7	107
SMAJ60A	RK	ZK	66.7	73.7	1.0	60	1.0	4.1	96.8
SMAJ64	RL	ZL	71.1	86.9	1.0	64	1.0	3.5	114
SMAJ64A	RM	ZM	71.1	78.6	1.0	64	1.0	3.9	103
SMAJ70	RN	ZN	77.8	95.1	1.0	70	1.0	3.2	125
SMAJ70A	RP	ZP	77.8	86.0	1.0	70	1.0	3.5	113
SMAJ75	RQ	ZQ	83.3	102	1.0	75	1.0	3.0	134
SMAJ75A	RR	ZR	83.3	92.1	1.0	75	1.0	3.3	121
SMAJ78	RS	ZS	86.7	106	1.0	78	1.0	2.9	139
SMAJ78A	RT	ZT	86.7	95.8	1.0	78	1.0	3.2	126
SMAJ85	RU	ZU	94.4	115	1.0	85	1.0	2.0	151
SMAJ85A	RV	ZV	94.4	104	1.0	85	1.0	2.2	137
SMAJ90	RW	ZW	100	122	1.0	90	1.0	1.9	160
SMAJ90A	RX	ZX	100	111	1.0	90	1.0	2.1	146
SMAJ100	RY	ZY	111	136	1.0	100	1.0	1.7	179
SMAJ100A	RZ	ZZ	111	123	1.0	100	1.0	1.9	162
SMAJ110	SD	VD	122	149	1.0	110	1.0	1.5	196
SMAJ110A	SE	VE	122	135	1.0	110	1.0	1.7	177
SMAJ120	SF	VF	133	163	1.0	120	1.0	1.4	214
SMAJ120A	SG	VG	133	147	1.0	120	1.0	1.6	193
SMAJ130	SH	VH	144	176	1.0	130	1.0	1.3	231
SMAJ130A	SK	VK	144	159	1.0	130	1.0	1.4	209
SMAJ150	SL	VL	167	204	1.0	150	1.0	1.1	268
SMAJ150A	SM	VM	167	185	1.0	150	1.0	1.2	243
SMAJ160	SN	VN	178	218	1.0	160	1.0	1.0	287
SMAJ160A	SP	VP	178	197	1.0	160	1.0	1.2	259
SMAJ170	SQ	VQ	189	231	1.0	170	1.0	0.99	304
SMAJ170A	SR	VR	189	209	1.0	170	1.0	1.09	275
SMAJ180A	ST	VT	201	222	1.0	180	1.0	1.4	292
SMAJ200A	SV	VV	224	247	1.0	200	1.0	1.2	324
SMAJ220A	SX	VX	246	272	1.0	220	1.0	1.1	356
SMAJ250A	SZ	VZ	279	309	1.0	250	1.0	1.0	405
SMAJ300A	TE	UE	335	371	1.0	300	1.0	0.8	486
SMAJ350A	TG	UG	391	432	1.0	350	1.0	0.7	567
SMAJ400A	TK	UK	447	494	1.0	400	1.0	0.6	648
SMAJ440A	TM	UM	492	543	1.0	440	1.0	0.6	713

Notes: 1. $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent

2. Surge current waveform per Fig. 3 and derate per Fig. 2

3. For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled

4. All terms and symbols are consistent with ANSI/IEEE C62.35

5. For parts without A, the V_{BR} is +10%

RATINGS AND CHARACTERISTIC CURVES

(T_A = 25°C unless otherwise noted)

Fig. 1 – Peak Pulse Power Rating Curve

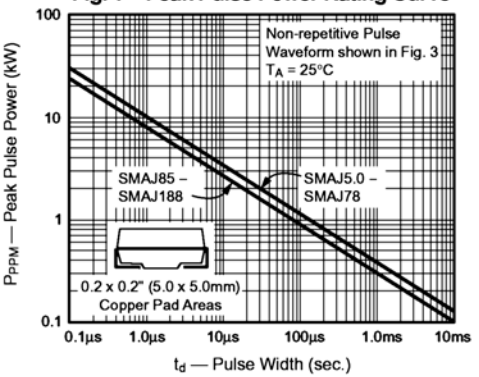


Fig. 2 – Pulse Derating Curve

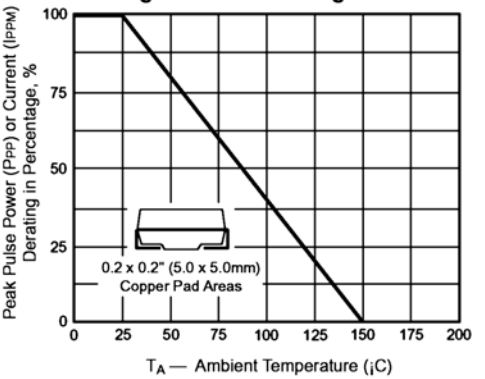


Fig. 3 – Pulse Waveform

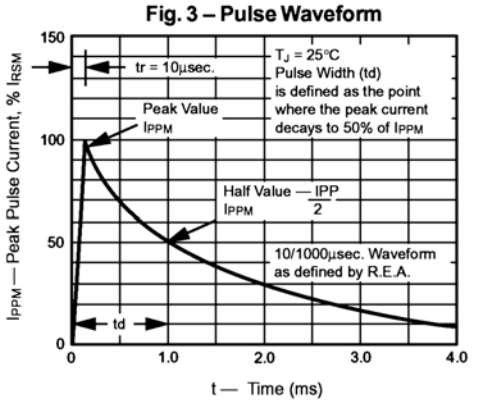


Fig. 4 – Typical Junction Capacitance

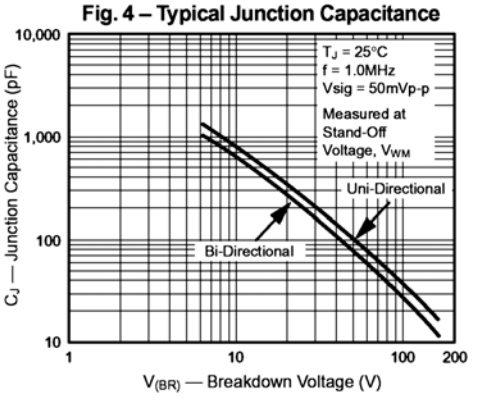


Fig. 5 – Typical Transient Thermal Impedance

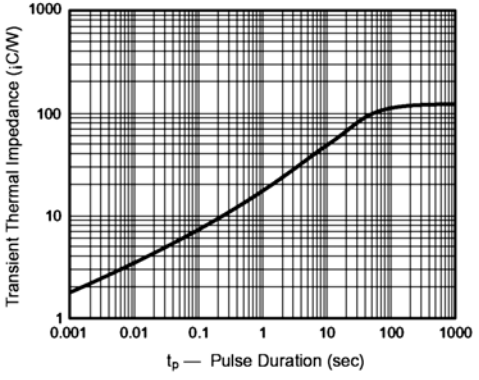


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only