

Transient Voltage Suppressor

SMAJ5.0 - SMAJ440CA

Features

- Optimized for LAN protection applications
- Low profile package with built-in strain relief for SMT applications
- Low incremental surge resistance, excellent clamping capability
- 400W peak pulse power capability with very fast response time
- High temperature soldering guaranteed: 260°C / 10s at terminals
- Bi-directional applications use suffix C or CA (e.g. SMAJ10C, SMAJ10CA)
- RoHS compliant with Halogen-free

HF



Mechanical Data

- Case: SMA molded plastic
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Solder plated; solderable per MIL- STD-202, Method 208

Maximum Ratings (@T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000µs waveform ^{*1,2.}	P _{PPM}	Minimum 400	W
Peak pulse current with a 10/1000µs waveform ^{*1}	I _{PPM}	see E. Characteristics	A
Typical thermal resistance, junction to ambient ^{*2}	R _{θJA}	120	°C/W
Typical thermal resistance, junction to ambient ^{*2}	R _{θJL}	30	°C/W
Operating junction and storage temperature range	T _J , T _{STG}	-55 ~ +150	°C

Note *1: Non-repetitive current pulses, per Fig. 3 and derated above T_A = 25°C

Note *2: Mounted on minimum recommended pad layout

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Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Type	Device Marking Code		Breakdown Voltage V _{BR} @ I _T		Test Current	Reverse Standoff Voltage	Max. Reverse Leakage @ V _{RWM}	Max. Peak Pulse Current	Max. Clamping Voltage @ I _{PP}
	UNI	BI	(V)		I _T	V _{RWM}	I _{R_MAX}	I _{PP_MAX}	V _{C_MAX}
			Min.	Max.	(mA)	V	(μA)	(A)	(V)
SMAJ5.0	AAD	AWD	6.4	7.81	10	5.0	800	41.7	9.6
SMAJ5.0A	AAE	AWE	6.4	7.08	10	5.0	800	43.5	9.2
SMAJ6.0	AAF	AWF	6.67	8.15	10	6.0	800	35.1	11.4
SMAJ6.0A	AAG	AWG	6.67	7.37	10	6.0	800	38.8	10.3
SMAJ6.5	AAH	AWH	7.22	8.82	10	6.5	500	32.5	12.3
SMAJ6.5A	AAK	AWK	7.22	7.98	10	6.5	500	35.7	11.2
SMAJ6.8	AED	AFD	7.56	9.24	10	6.8	200	33.1	12.1
SMAJ6.8A	AEE	AFE	7.56	8.35	10	6.8	200	36.4	11.0
SMAJ7.0	AAL	AWL	7.78	9.51	10	7.0	200	30.1	13.3
SMAJ7.0A	AAM	AWM	7.78	8.6	10	7.0	200	33.3	12.0
SMAJ7.5	AAN	AWN	8.33	10.3	1.0	7.5	100	28.0	14.3
SMAJ7.5A	AAP	AWP	8.33	9.21	1.0	7.5	100	31.0	12.9
SMAJ8.0	AAQ	AWQ	8.89	10.9	1.0	8.0	50	26.7	15.0
SMAJ8.0A	AAR	AWR	8.89	9.83	1.0	8.0	50	29.4	13.6
SMAJ8.5	AAS	AWS	9.44	11.5	1.0	8.5	10	25.2	15.9
SMAJ8.5A	AAT	AWT	9.44	10.4	1.0	8.5	10	27.8	14.4
SMAJ9.0	AAU	AWU	10.0	12.2	1.0	9.0	5.0	23.7	16.9
SMAJ9.0A	AAV	AWV	10.0	11.1	1.0	9.0	5.0	26.0	15.4
SMAJ10	AAW	AWW	11.1	13.6	1.0	10	5.0	21.3	18.8
SMAJ10A	AAX	AWX	11.1	12.3	1.0	10	5.0	23.5	17.0
SMAJ11	AAZ	AWY	12.2	14.9	1.0	11	5.0	19.9	20.1
SMAJ11A	AAZ	AWZ	12.2	13.5	1.0	11	5.0	22.0	18.2
SMAJ12	ABD	AXD	13.3	16.3	1.0	12	5.0	18.2	22.0
SMAJ12A	ABE	AXE	13.3	14.7	1.0	12	5.0	20.1	19.9
SMAJ13	ABF	AXF	14.4	17.6	1.0	13	5.0	16.8	23.8
SMAJ13A	ABG	AXG	14.4	15.9	1.0	13	5.0	18.6	21.5
SMAJ14	ABH	AXH	15.6	19.1	1.0	14	5.0	15.5	25.8
SMAJ14A	ABK	AXK	15.6	17.2	1.0	14	5.0	17.2	23.2
SMAJ15	ABL	AXL	16.7	20.4	1.0	15	5.0	14.9	26.9
SMAJ15A	ABM	AXM	16.7	18.5	1.0	15	5.0	16.4	24.4

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	UNI	BI	(V)		I_T	V_{RWM}	I_{R_MAX}	I_{PP_MAX}	V_C
			Min.	Max.	(mA)	(V)	(μ A)	(A)	(V)
SMAJ16	ABN	AXN	17.8	21.8	1.0	16	5.0	13.9	28.8
SMAJ16A	ABP	AXP	17.8	19.7	1.0	16	5.0	15.4	26.0
SMAJ17	ABQ	AXQ	18.9	23.1	1.0	17	5.0	13.1	30.5
SMAJ17A	ABR	AXR	18.9	20.9	1.0	17	5.0	14.5	27.6
SMAJ18	ABS	AXS	20.0	24.4	1.0	18	5.0	12.4	32.2
SMAJ18A	ABT	AXT	20.0	22.4	1.0	18	5.0	13.7	29.2
SMAJ20	ABU	AXU	22.2	27.1	1.0	20	5.0	11.2	35.8
SMAJ20A	ABV	AXV	22.2	24.5	1.0	20	5.0	12.3	32.4
SMAJ22	ABW	AXW	24.4	29.8	1.0	22	5.0	10.2	39.4
SMAJ22A	ABX	AXX	24.4	26.9	1.0	22	5.0	11.3	35.5
SMAJ24	ABY	AXY	26.7	32.6	1.0	24	5.0	9.3	43.0
SMAJ24A	ABZ	AXZ	26.7	29.5	1.0	24	5.0	10.3	38.9
SMAJ26	ACD	AYD	28.9	35.3	1.0	26	5.0	8.6	46.6
SMAJ26A	ACE	AYE	28.9	31.9	1.0	26	5.0	9.5	42.1
SMAJ28	ACF	AYF	31.3	38.0	1.0	28	5.0	8.0	50.0
SMAJ28A	ACG	AYG	31.3	34.4	1.0	28	5.0	8.8	45.4
SMAJ30	ACH	AYH	33.3	40.7	1.0	30	5.0	7.5	53.5
SMAJ30A	ACK	AYK	33.3	36.8	1.0	30	5.0	8.3	48.4
SMAJ33	ACL	AYL	36.7	44.9	1.0	33	5.0	6.8	59.0
SMAJ33A	ACM	AYM	36.7	40.6	1.0	33	5.0	7.5	53.3
SMAJ36	ACN	AYN	40.0	48.9	1.0	36	5.0	6.2	64.3
SMAJ36A	ACP	AYP	40.0	44.2	1.0	36	5.0	6.9	58.1
SMAJ40	ACQ	AYQ	44.4	54.3	1.0	40	5.0	5.6	71.4
SMAJ40A	ACR	AYR	44.4	49.1	1.0	40	5.0	6.2	64.5
SMAJ43	ACS	AYS	47.8	58.4	1.0	43	5.0	5.2	76.7
SMAJ43A	ACT	AYT	47.8	52.8	1.0	43	5.0	5.8	69.4
SMAJ45	ACU	AYU	50.0	61.1	1.0	45	5.0	5.0	80.3
SMAJ45A	ACV	AYV	50.0	55.3	1.0	45	5.0	5.5	72.7
SMAJ48	ACW	AYW	53.3	65.1	1.0	48	5.0	4.7	85.5
SMAJ48A	ACX	AYX	53.3	58.9	1.0	48	5.0	5.2	77.4
SMAJ50	AEF	AFF	55.5	67.8	1.0	50	5.0	4.5	89.5
SMAJ50A	AEG	AFG	55.5	61.3	1.0	50	5.0	4.9	81.0

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	UNI	BI	(V)		I_T	V_{RWM}	I_{R_MAX}	I_{PP_MAX}	V_C
			Min.	Max.	(mA)	(V)	(μ A)	(A)	(V)
SMAJ51	ACY	AYY	56.7	69.3	1.0	51	5.0	4.4	91.1
SMAJ51A	ACZ	AYZ	56.7	62.7	1.0	51	5.0	4.9	82.4
SMAJ54	ARD	AZD	60.0	73.3	1.0	54	5.0	4.2	96.3
SMAJ54A	ARE	AZE	60.0	66.3	1.0	54	5.0	4.6	87.1
SMAJ56	ATY	AUY	62.2	76.0	1	56	5	4.0	99.9
SMAJ56A	ATZ	AUZ	62.2	68.8	1	56	5	4.4	90.3
SMAJ58	ARF	AZF	64.4	78.7	1.0	58	5.0	3.9	103.0
SMAJ58A	ARG	AZG	64.4	71.2	1.0	58	5.0	4.3	93.6
SMAJ60	ARH	AZH	66.7	81.5	1.0	60	5.0	3.7	107.0
SMAJ60A	ARK	AZK	66.7	73.7	1.0	60	5.0	4.1	96.8
SMAJ63	ARL	AZL	69.9	85.4	1.0	63	5.0	3.5	112.8
SMAJ63A	ARM	AZM	69.9	77.2	1.0	63	5.0	3.9	102.1
SMAJ64	ARN	AZN	71.1	86.9	1.0	64	5.0	3.5	114.0
SMAJ64A	ARP	AZP	71.1	78.6	1.0	64	5.0	3.9	103.0
SMAJ70	AEH	AFH	77.8	95.1	1.0	70	5.0	3.2	125.0
SMAJ70A	AEK	AFK	77.8	86.0	1.0	70	5.0	3.5	113.0
SMAJ75	ARQ	AZQ	83.3	102.0	1.0	75	5.0	3.0	134.0
SMAJ75A	ARR	AZR	83.3	92.1	1.0	75	5.0	3.3	121.0
SMAJ78	ARS	AZS	86.7	106.0	1.0	78	5.0	2.9	139.0
SMAJ78A	ART	AZT	86.7	95.8	1.0	78	5.0	3.2	126.0
SMAJ85	ARU	AZU	94.4	115.0	1.0	85	5.0	2.6	151.0
SMAJ85A	ARV	AZV	94.4	104.0	1.0	85	5.0	2.9	137.0
SMAJ90A	ARX	AZX	100.0	111.0	1.0	90	5.0	2.7	146.0
SMAJ100	ARY	AZY	111.0	136.0	1.0	100	5.0	2.2	179.0
SMAJ100A	ARZ	AZZ	111.0	123.0	1.0	100	5.0	2.5	162.0
SMAJ110	ASD	AVD	122.0	149.0	1.0	110	5.0	2.0	196.0
SMAJ110A	ASE	AVE	122.0	135.0	1.0	110	5.0	2.3	177.0
SMAJ120	ASF	AVF	133.0	163.0	1.0	120	5.0	1.9	214.0
SMAJ120A	ASG	AVG	133.0	147.0	1.0	120	5.0	2.1	193.0
SMAJ130	ASH	AVH	144.0	176.0	1.0	130	5.0	1.7	231.0
SMAJ130A	ASK	AVK	144.0	159.0	1.0	130	5.0	1.9	209.0

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	UNI	BI	(V)		I_T	V_{RWM}	I_{R_MAX}	I_{PP_MAX}	V_C
			Min.	Max.	(mA)	(V)	(μ A)	(A)	(V)
SMAJ150	ASL	AVL	167.0	204.0	1.0	150	5.0	1.5	268.0
SMAJ150A	ASM	AVM	167.0	185.0	1.0	150	5.0	1.6	243.0
SMAJ160	ASN	AVN	178.0	218.0	1.0	160	5.0	1.4	287.0
SMAJ160A	ASP	AVP	178.0	197.0	1.0	160	5.0	1.5	259.0
SMAJ170	ASQ	AVQ	189.0	231.0	1.0	170	5.0	1.3	304.0
SMAJ170A	ASR	AVR	189.0	209.0	1.0	170	5.0	1.5	275.0
SMAJ175	AEL	AFL	194.6	237.8	1.0	175	5.0	1.3	309.8
SMAJ175A	AEM	AFM	194.6	215.2	1.0	175	5.0	1.4	280.3
SMAJ180	ATW	AUW	200.0	245.0	1.0	180	5.0	1.2	321.0
SMAJ180A	ATX	AUX	200.0	221.0	1.0	180	5.0	1.4	291.0
SMAJ188	AST	AVT	209.0	255.0	1.0	188	5.0	1.2	344.0
SMAJ188A	ASS	AVS	209.0	231.0	1.0	188	5.0	1.2	328.0
SMAJ190	AEN	AFN	211.0	278.0	1.0	190	5.0	1.2	339.0
SMAJ190A	AEP	AFP	211.0	233.0	1.0	190	5.0	1.3	307.0
SMAJ200	ASU	AVU	222.0	272.0	1.0	200	5.0	1.1	356.0
SMAJ200A	ASV	AVV	222.0	246.0	1.0	200	5.0	1.2	323.0
SMAJ220	ASW	AVW	245.0	299.0	1.0	220	5.0	1.0	392.0
SMAJ220A	ASX	AVX	245.0	270.0	1.0	220	5.0	1.1	355.0
SMAJ240	ASY	AVY	267.0	326.0	1.0	240	5.0	0.9	428.0
SMAJ240A	ASZ	AVZ	267.0	295.0	1.0	240	5.0	1.0	388.0
SMAJ250	ATS	AUS	278.0	340.0	1.0	250	5.0	0.9	446.0
SMAJ250A	ATT	AUT	278.0	307.0	1.0	250	5.0	1.0	404.0
SMAJ300	ATF	AUF	333.0	408.0	1.0	300	5.0	0.7	535.0
SMAJ300A	ATG	AUG	333.0	368.0	1.0	300	5.0	0.8	485.0
SMAJ350	ATQ	AUQ	389.0	476.0	1.0	350	5.0	0.6	624.0
SMAJ350A	ATR	AUR	389.0	430.0	1.0	350	5.0	0.7	565.0
SMAJ360	ATH	AUH	400.0	489.0	1.0	360	5.0	0.6	642.0
SMAJ360A	ATK	AUK	400.0	442.0	1.0	360	5.0	0.7	582.0
SMAJ400	ATL	AUL	445.0	544.0	1.0	400	5.0	0.6	713.0
SMAJ400A	ATM	AUM	445.0	491.0	1.0	400	5.0	0.6	646.0
SMAJ440	ATN	AUN	489.0	598.0	1.0	440	5.0	0.5	784.0
SMAJ440A	ATP	AUP	489.0	540.0	1.0	440	5.0	0.6	711.0

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Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise noted)

FIG.1 – PEAK PULSE POWER RATING CURVE

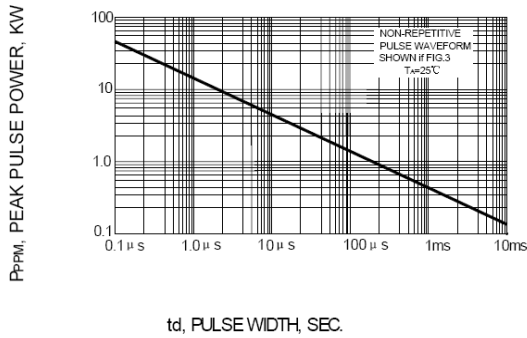


FIG.2 – PULSE DERATING CURVE

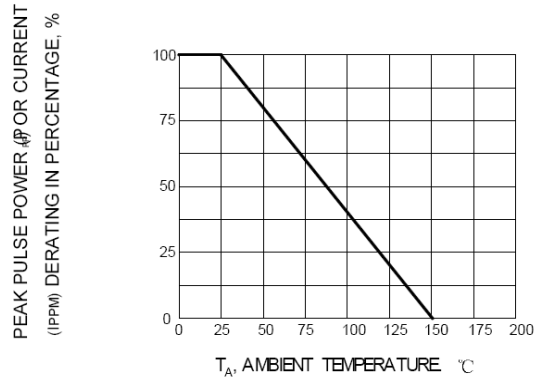


FIG.3 -- PULSE WAVEFORM

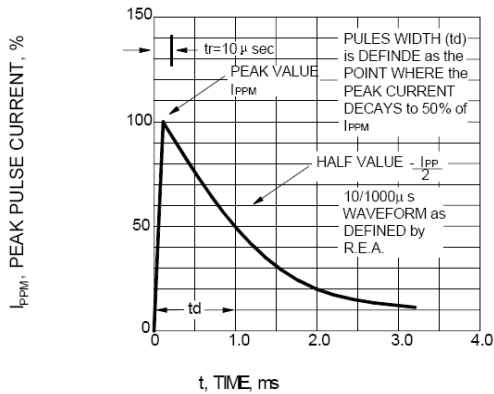


FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

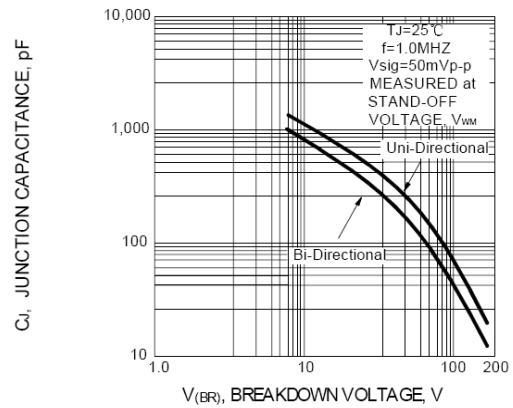


FIG.5 -- TYPICAL TRANSIENT THERMAL IMPEDANCE

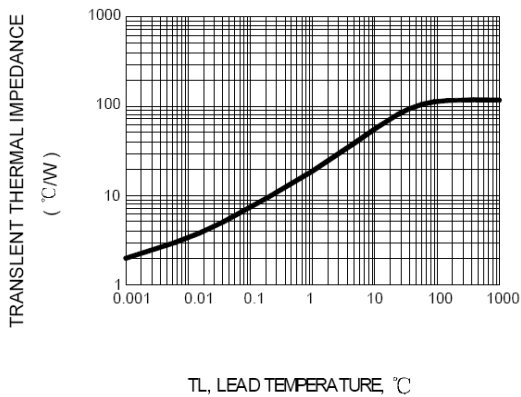
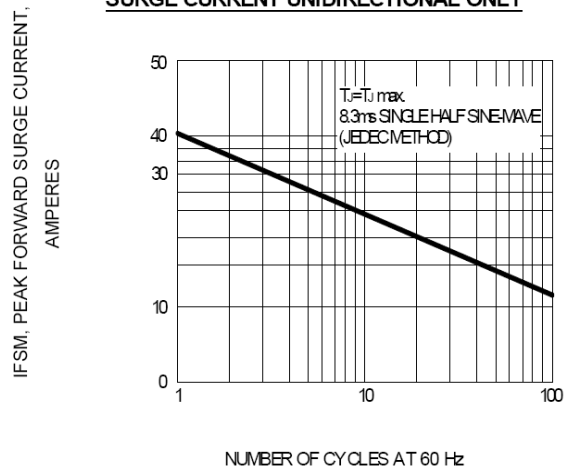


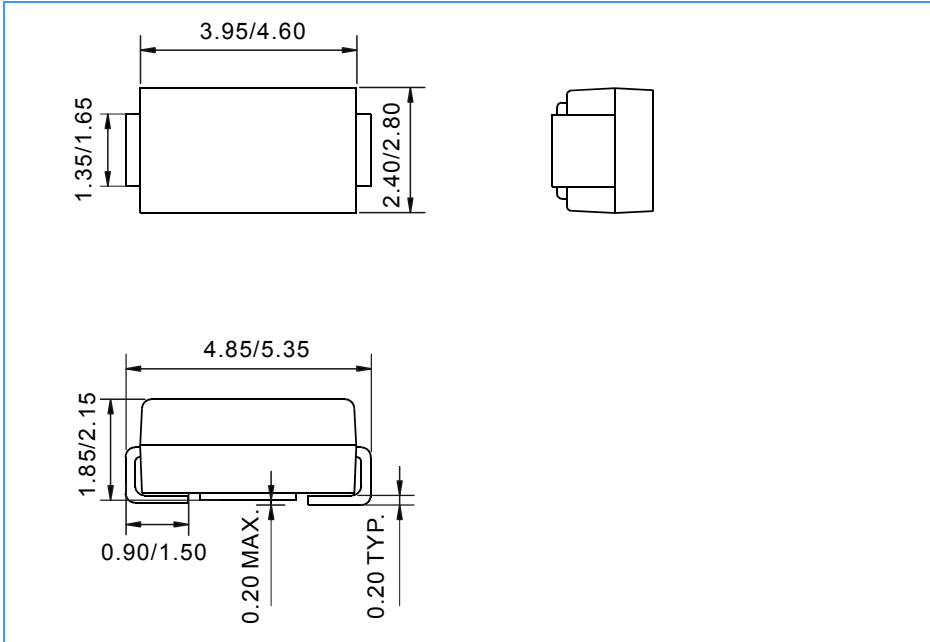
FIG.6 – MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY



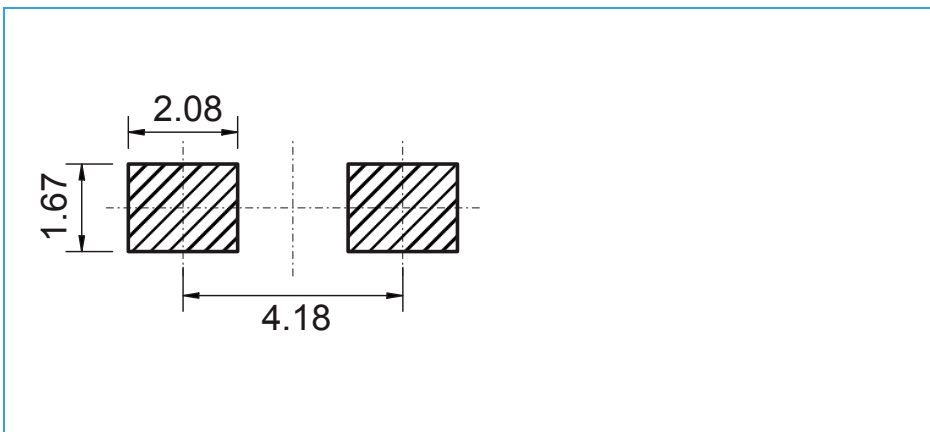
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Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



Ordering Information

Part Number	Package	Shipping Quantity
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