SMAJ Series

400W Transient Voltage Suppressor

Rev.03 - 20 May 2025 Product data sheet

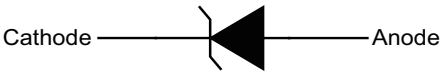
1. General description

SMAJ series, 400W transient voltage suppressor (TVS) in SMA package, designed to protect electronic circuits against damage induced by lightning surges or other transient voltage events.

2. Features and benefits

- Peak pulse power 400W @ 10/1000μs waveform
- Excellent clamping capability
- Low incremental surge resistance
- Surface mount package for easy assembly and PCB space-saving
- Typical I_R < 1μA when V_{BR} min > 12V
- Fast response time: typically < 1.0ps from 0V to V_{BR} minimum
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Guaranteed high temperature for reflow soldering: 260°C/10sec
- Mold compound complies to UL94V-0 flammability classification
- Meets MSL level 1, per J-STD-020
- Pb-free lead finish
- Halogen free and RoHS compliant

Bi-directional



Uni-directional

3. Applications

- Power supplies
- Industrial applications
- Power management circuits
- I/O interfaces

4. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
SMAJxxxXX	SMA	SMAJxxxXXJ	Tape and reel	5000	SMAJ	18-Oct-2020
eg. SMAJ5.0CA	SMA	SMAJ5.0CAJ	Tape and reel	5000	SMAJ	18-Oct-2020

5. Absolute maximum ratings

In accordance with the Absolute Maximum Rating System (IEC 60134).
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Values	Unit
Absolute maximum rating				
P_{PPM}	peak pulse power	[1]	400	W
$P_{M(AV)}$	steady state power dissipation	on infinite heatsink at T_a = 50 °C	3.3	W
I_{FSM}	peak forward surge current	t_p = 8.3 ms; single half sine-wave pulse; duty cycle = 4 pulses per minute maximum; unidirectional units only	60	A
V_F	forward on-state voltage	I_F = 35 A; unidirectional units only	3.5	V
T_{stg}	storage temperature range		-65 to 150	°C
T_j	operating temperature range		-65 to 150	°C

[1] In accordance with IEC 61643-321 (10/1000 μs current waveform).

6. Characteristics

T_j = 25 °C unless otherwise specified.

PN (Uni)	PN (Bi)	Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T (V)		Test current I_T (mA)	Max. Clamping Voltage V_C @ I_{pp} (V)	Max. Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (µA)	Marking	
			Min	Max					Uni	Bi
SMAJ5.0A	SMAJ5.0CA	5	6.45	6.98	10	9.2	43.5	400	A005AJ	A005CJ
SMAJ6.0A	SMAJ6.0CA	6	6.8	7.32	10	10.3	38.8	400	A006AJ	A006CJ
SMAJ6.5A	SMAJ6.5CA	6.5	7.27	7.92	10	11.2	35.7	250	A06FAJ	A06FCJ
SMAJ7.0A	SMAJ7.0CA	7	7.82	8.57	10	12	33.3	100	A007AJ	A007CJ
SMAJ8.0A	SMAJ8.0CA	8	8.95	9.76	1	13.6	29.4	50	A008AJ	A008CJ
SMAJ9.0A	SMAJ9.0CA	9	10.1	11	1	15.4	26	10	A009AJ	A009CJ
SMAJ10A	SMAJ10CA	10	11.21	12.19	1	17	23.5	5	A010AJ	A010CJ
SMAJ11A	SMAJ11CA	11	12.32	13.38	1	18.2	22	1	A011AJ	A011CJ
SMAJ12A	SMAJ12CA	12	13.43	14.57	1	19.9	20.1	1	A012AJ	A012CJ
SMAJ13A	SMAJ13CA	13	14.54	15.76	1	21.5	18.6	1	A013AJ	A013CJ
SMAJ14A	SMAJ14CA	14	15.75	17.04	1	23.2	17.2	1	A014AJ	A014CJ
SMAJ15A	SMAJ15CA	15	16.86	18.34	1	24.4	16.4	1	A015AJ	A015CJ
SMAJ16A	SMAJ16CA	16	17.97	19.52	1	26	15.4	1	A016AJ	A016CJ
SMAJ17A	SMAJ17CA	17	19.08	20.72	1	27.6	14.5	1	A017AJ	A017CJ
SMAJ18A	SMAJ18CA	18	20.19	21.9	1	29.2	13.7	1	A018AJ	A018CJ
SMAJ20A	SMAJ20CA	20	22.41	24.28	1	32.4	12.3	1	A020AJ	A020CJ
SMAJ22A	SMAJ22CA	22	24.63	26.66	1	35.5	11.3	1	A022AJ	A022CJ
SMAJ24A	SMAJ24CA	24	26.95	29.23	1	38.9	10.3	1	A024AJ	A024CJ
SMAJ26A	SMAJ26CA	26	29.12	31.67	1	42.1	9.5	1	A026AJ	A026CJ
SMAJ28A	SMAJ28CA	28	31.33	34.16	1	45.4	8.8	1	A028AJ	A028CJ
SMAJ30A	SMAJ30CA	30	33.55	36.54	1	48.4	8.3	1	A030AJ	A030CJ
SMAJ33A	SMAJ33CA	33	36.98	40.3	1	53.3	7.5	1	A033AJ	A033CJ
SMAJ36A	SMAJ36CA	36	40.3	43.9	1	58.1	6.9	1	A036AJ	A036CJ
SMAJ40A	SMAJ40CA	40	44.7	48.8	1	64.5	6.2	1	A040AJ	A040CJ
SMAJ43A	SMAJ43CA	43	48.2	52.4	1	69.4	5.8	1	A043AJ	A043CJ
SMAJ45A	SMAJ45CA	45	50.4	54.9	1	72.7	5.5	1	A045AJ	A045CJ
SMAJ48A	SMAJ48CA	48	53.7	58.5	1	77.4	5.2	1	A048AJ	A048CJ
SMAJ51A	SMAJ51CA	51	57.1	62.3	1	82.4	4.9	1	A051AJ	A051CJ
SMAJ54A	SMAJ54CA	54	60.5	65.8	1	87.1	4.6	1	A054AJ	A054CJ
SMAJ58A	SMAJ58CA	58	64.9	70.7	1	93.6	4.3	1	A058AJ	A058CJ
SMAJ60A	SMAJ60CA	60	67.2	73.2	1	96.8	4.1	1	A060AJ	A060CJ
SMAJ64A	SMAJ64CA	64	71.6	78	1	103	3.9	1	A064AJ	A064CJ
SMAJ70A	SMAJ70CA	70	78.4	85.4	1	113	3.5	1	A070AJ	A070CJ
SMAJ75A	SMAJ75CA	75	83.9	91.5	1	121	3.3	1	A075AJ	A075CJ
SMAJ78A	SMAJ78CA	78	87.4	95.1	1	126	3.2	1	A078AJ	A078CJ
SMAJ85A	SMAJ85CA	85	95.1	103.3	1	137	2.9	1	A085AJ	A085CJ
SMAJ90A	SMAJ90CA	90	100	111	1	146	2.8	1	A090AJ	A090CJ
SMAJ100A	SMAJ100CA	100	111	123	1	162	2.5	1	A100AJ	A100CJ

T_j = 25 °C unless otherwise specified.

PN (Uni)	PN (Bi)	Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T (V)		Test current I_T (mA)	Max. Clamping Voltage V_C @ I_{pp} (V)	Max. Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (µA)	Marking	
			Min	Max					Uni	Bi
SMAJ110A	SMAJ110CA	110	122	135	1	177	2.3	1	A110AJ	A110CJ
SMAJ120A	SMAJ120CA	120	133	147	1	193	2.1	1	A120AJ	A120CJ
SMAJ130A	SMAJ130CA	130	144	159	1	209	1.9	1	A130AJ	A130CJ
SMAJ150A	SMAJ150CA	150	167	185	1	243	1.7	1	A150AJ	A150CJ
SMAJ160A	SMAJ160CA	160	178	197	1	259	1.6	1	A160AJ	A160CJ
SMAJ170A	SMAJ170CA	170	189	209	1	275	1.5	1	A170AJ	A170CJ
SMAJ180A	SMAJ180CA	180	201	222	1	292	1.4	1	A180AJ	A180CJ
SMAJ190A	SMAJ190CA	190	209	231	1	304	1.4	1	A190AJ	A190CJ
SMAJ200A	SMAJ200CA	200	224	247	1	324	1.3	1	A200AJ	A200CJ
SMAJ220A	SMAJ220CA	220	246	272	1	356	1.1	1	A220AJ	A220CJ

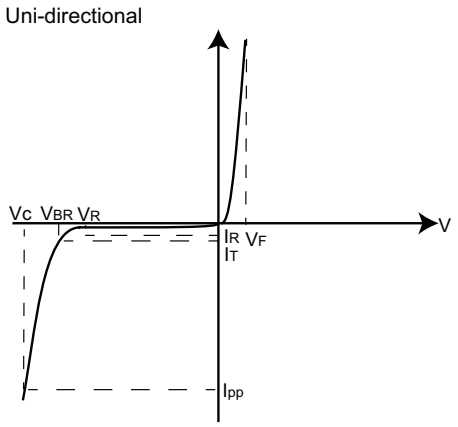


Fig. 1. I-V curve characteristics; Uni-directional

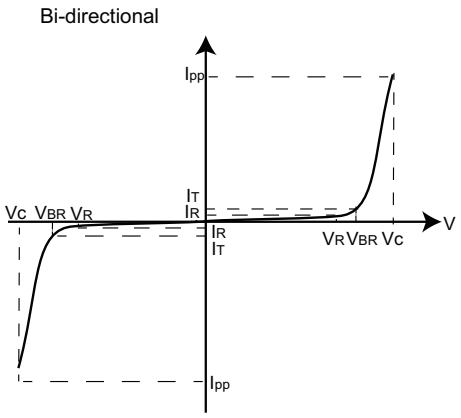


Fig. 2. I-V curve characteristics; Bi-directional

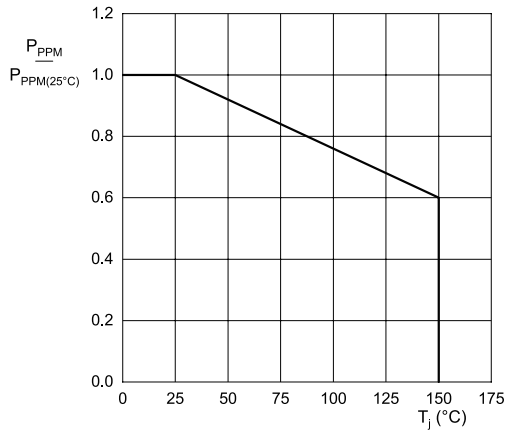


Fig. 3. Peak pulse power derating curve

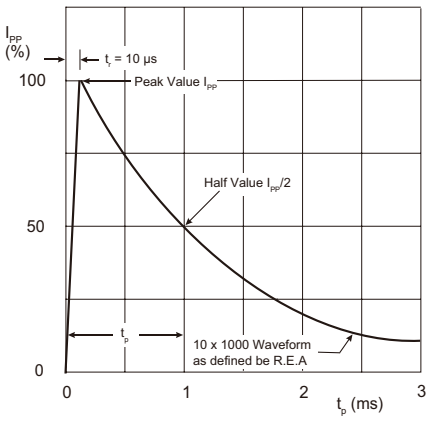


Fig. 4. Pulse waveform

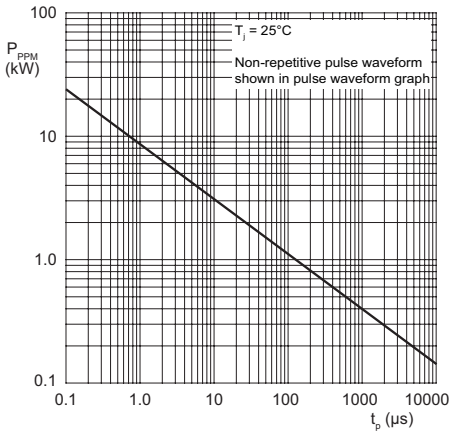


Fig. 5. Peak pulse power rating curve

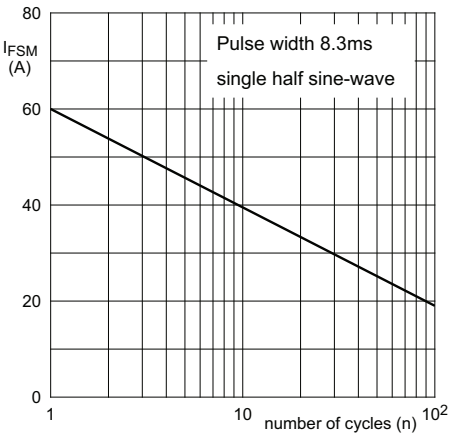


Fig. 6. Maximum non-repetitive surge current Uni-directional only

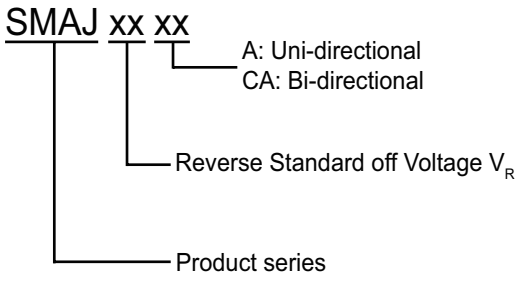


Fig. 7. Part numbering

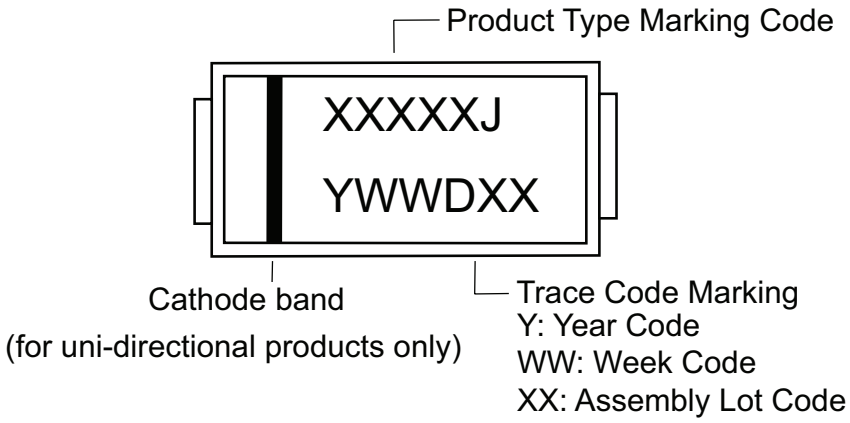
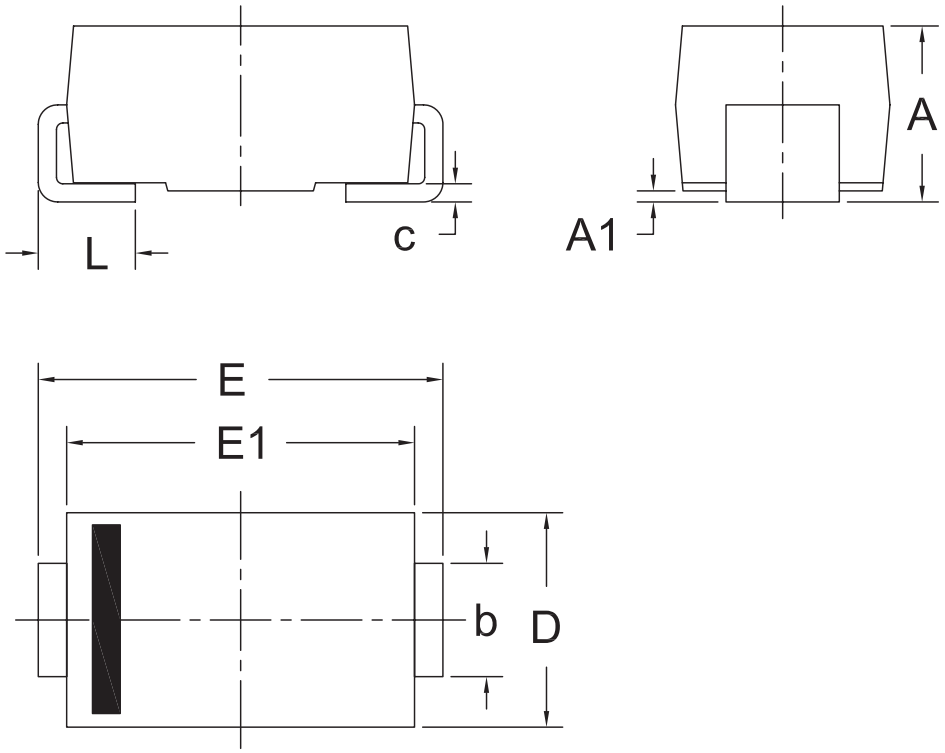


Fig. 8. Part marking

7. Package outline

SMA



UNIT		A	A1	b	c	D	E	E1	L
mm	Max	2.45	0.20	1.65	0.25	2.85	5.25	4.55	1.55
	Min	1.95	0.10	1.35	0.15	2.55	4.75	4.25	0.85

Remark: Dimensions D and E1 do not include mold flash & gate remain.

8. Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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[2] The term 'short data sheet' is explained in section "Definitions".
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