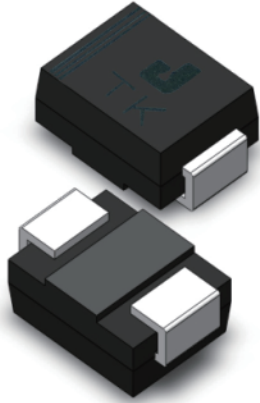


为 您 的 产 品 保 驾 护 航

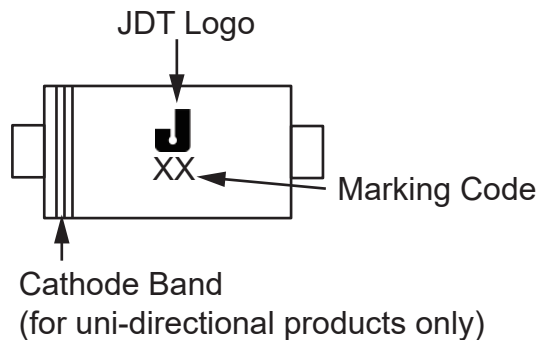
PRODUCT DATASHEET

SMD TVS Devices

SMAJ Series SMD TVS Devices



Pin Description



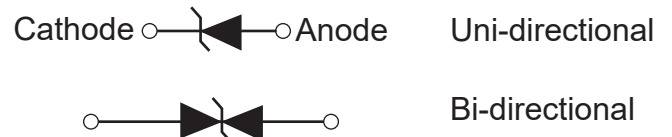
Description

The SMAJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

- Low leakage
- Glass passivated chip
- Very fast response time
- Uni and Bidirectional unit
- Excellent clamping capability
- 400W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01%

Schematic Diagram



Maximum Ratings($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	1.0	W
Peak pulse power dissipation on 10/1000 μ s waveform	P_{PP}	400	W
Maximum instantaneous forward voltage at 25A for unidirectional	V_F	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note1)	I_{FSM}	40	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	$^{\circ}\text{C/W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	$^{\circ}\text{C/W}$
Operating and Storage Temperature Range	T_J / T_{STG}	-55 to +150	$^{\circ}\text{C}$

Notes: Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

Performance Specification I.

Model		Reverse Stand off Voltage V_R	Breakdown Voltage $V_{BR} @ I_T$		Test Current I_T	Clamping Voltage $V_C @ I_{PP}$	Peak Pulse Current I_{PP}	Reverse Leakage $I_R @ V_R$	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMAJ3.3A	SMAJ3.3CA	3.0	4.20	6.55	1	8.7	47.6	150	AA	WA
SMAJ5.0A	SMAJ5.0CA	5.0	6.40	7.00	10	9.2	43.5	120	AE	WE
SMAJ6.0A	SMAJ6.0CA	6.0	6.67	7.37	10	10.3	38.8	120	AG	WG
SMAJ6.5A	SMAJ6.5CA	6.5	7.22	7.98	10	11.2	35.7	80	AK	WK
SMAJ7.0A	SMAJ7.0CA	7.0	7.78	8.60	10	12.0	33.3	50	AM	WM
SMAJ7.5A	SMAJ7.5CA	7.5	8.33	9.21	1	12.9	31.0	50	AP	WP
SMAJ8.0A	SMAJ8.0CA	8.0	8.89	9.83	1	13.6	29.4	20	AR	WR
SMAJ8.5A	SMAJ8.5CA	8.5	9.44	10.4	1	14.4	27.8	10	AT	WT
SMAJ9.0A	SMAJ9.0CA	9.0	10.0	11.1	1	15.4	26.0	5	AV	WV
SMAJ10A	SMAJ10CA	10.0	11.1	12.3	1	17.0	23.5	2	AX	WX
SMAJ11A	SMAJ11CA	11.0	12.2	13.5	1	18.2	22.0	1	AZ	WZ
SMAJ12A	SMAJ12CA	12.0	13.3	14.7	1	19.9	20.1	1	BE	XE
SMAJ13A	SMAJ13CA	13.0	14.4	15.9	1	21.5	18.6	1	BG	XG
SMAJ14A	SMAJ14CA	14.0	15.6	17.2	1	23.2	17.3	1	BK	XK
SMAJ15A	SMAJ15CA	15.0	16.7	18.5	1	24.4	16.4	1	BM	XM
SMAJ16A	SMAJ16CA	16.0	17.8	19.7	1	26.0	15.4	1	BP	XP
SMAJ17A	SMAJ17CA	17.0	18.9	20.9	1	27.6	14.5	1	BR	XR
SMAJ18A	SMAJ18CA	18.0	20.0	22.1	1	29.2	13.7	1	BT	XT
SMAJ20A	SMAJ20CA	20.0	22.2	24.5	1	32.4	12.4	1	BV	XV
SMAJ22A	SMAJ22CA	22.0	24.4	26.9	1	35.5	11.3	1	BX	XX
SMAJ24A	SMAJ24CA	24.0	26.7	29.5	1	38.9	10.3	1	BZ	XZ
SMAJ26A	SMAJ26CA	26.0	28.9	31.9	1	42.1	9.5	1	CE	YE
SMAJ28A	SMAJ28CA	28.0	31.1	34.4	1	45.4	8.8	1	CG	YG
SMAJ30A	SMAJ30CA	30.0	33.3	36.8	1	48.4	8.3	1	CK	YK
SMAJ33A	SMAJ33CA	33.0	36.7	40.6	1	53.3	7.5	1	CM	YM
SMAJ36A	SMAJ36CA	36.0	40.0	44.2	1	58.1	6.9	1	CP	YP
SMAJ40A	SMAJ40CA	40.0	44.4	49.1	1	64.5	6.2	1	CR	YR
SMAJ43A	SMAJ43CA	43.0	47.8	52.8	1	69.4	5.8	1	CT	YT
SMAJ45A	SMAJ45CA	45.0	50.0	55.3	1	72.7	5.5	1	CV	YV
SMAJ48A	SMAJ48CA	48.0	53.3	58.9	1	77.4	5.2	1	CX	YX
SMAJ51A	SMAJ51CA	51.0	56.7	62.7	1	82.4	4.9	1	CZ	YZ
SMAJ54A	SMAJ54CA	54.0	60.0	66.3	1	87.1	4.6	1	RE	ZE
SMAJ58A	SMAJ58CA	58.0	64.4	71.2	1	93.6	4.3	1	RG	ZG
SMAJ60A	SMAJ60CA	60.0	66.7	73.7	1	96.8	4.1	1	RK	ZK

Performance Specification II.

Model		Reverse Stand off Voltage V_R	Breakdown Voltage $V_{BR} @ I_T$		Test Current I_T	Clamping Voltage $V_C @ I_{PP}$	Peak Pulse Current I_{PP}	Reverse Leakage $I_R @ V_R$	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMAJ64A	SMAJ64CA	64.0	71.1	78.6	1	103.0	3.9	1	RM	ZM
SMAJ70A	SMAJ70CA	70.0	77.8	86.0	1	113.0	3.6	1	RP	ZP
SMAJ75A	SMAJ75CA	75.0	83.3	92.1	1	121.0	3.3	1	RR	ZR
SMAJ78A	SMAJ78CA	78.0	86.7	95.8	1	126.0	3.2	1	RT	ZT
SMAJ85A	SMAJ85CA	85.0	94.4	104.0	1	137.0	2.9	1	RV	ZV
SMAJ90A	SMAJ90CA	90.0	100.0	111.0	1	146.0	2.8	1	RX	ZX
SMAJ100A	SMAJ100CA	100.0	111.0	123.0	1	162.0	2.5	1	RZ	ZZ
SMAJ110A	SMAJ110CA	110.0	122.0	135.0	1	177.0	2.3	1	SE	VE
SMAJ120A	SMAJ120CA	120.0	133.0	147.0	1	193.0	2.1	1	SG	VG
SMAJ130A	SMAJ130CA	130.0	144.0	159.0	1	209.0	1.9	1	SK	VK
SMAJ150A	SMAJ150CA	150.0	167.0	185.0	1	243.0	1.7	1	SM	VM
SMAJ160A	SMAJ160CA	160.0	178.0	197.0	1	259.0	1.6	1	SP	VP
SMAJ170A	SMAJ170CA	170.0	189.0	209.0	1	275.0	1.5	1	SR	VR
SMAJ180A	SMAJ180CA	180.0	201.0	222.0	1	292.0	1.4	1	ST	VT
SMAJ200A	SMAJ200CA	200.0	224.0	247.0	1	324.0	1.3	1	SV	VV
SMAJ220A	SMAJ220CA	220.0	246.0	272.0	1	356.0	1.1	1	SX	VX
SMAJ250A	SMAJ250CA	250.0	279.0	309.0	1	405.0	1.0	1	SZ	VZ
SMAJ300A	SMAJ300CA	300.0	335.0	371.0	1	421.0	0.95	1	TE	UE
SMAJ350A	SMAJ350CA	350.0	391.0	432.0	1	445.0	0.90	1	TG	UG
SMAJ400A	SMAJ400CA	400.0	447.0	494.0	1	470.0	0.85	1	TK	UK
SMAJ440A	SMAJ440CA	440.0	492.0	543.0	1	500.0	0.80	1	TM	UM
SMAJ500A	SMAJ500CA	500.0	556.0	606.0	1	533.0	0.75	1	TP	UP
SMAJ550A	SMAJ550CA	550.0	611.0	617.0	1	571.0	0.70	1	TR	UR
SMAJ600A	SMAJ600CA	600.0	667.0	727.0	1	615.0	0.65	1	TT	UT

Typical Performance Characteristics

($T_A=25^{\circ}\text{C}$ unless otherwise Specified)

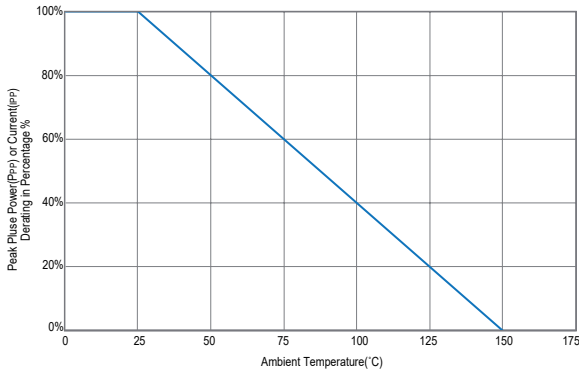


Fig. 1: Pulse Derating Curve

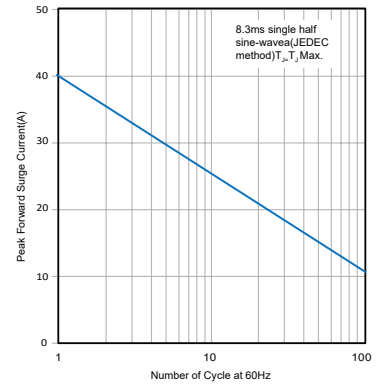


Fig. 2: Max. Non-Repetitive Surge Current

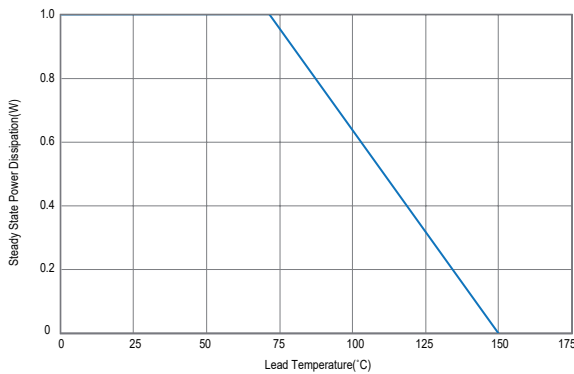


Fig. 3: Steady State Power Derating Curve

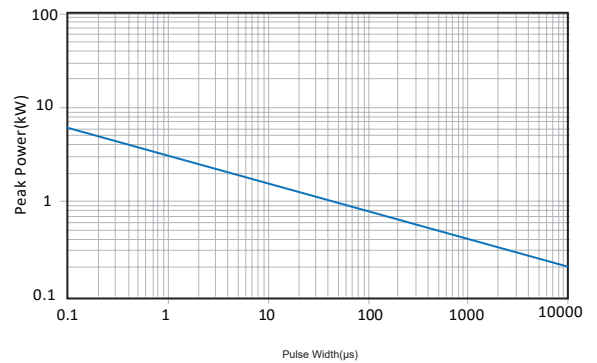


Fig. 4: Peak Pulse Power Rating Curve

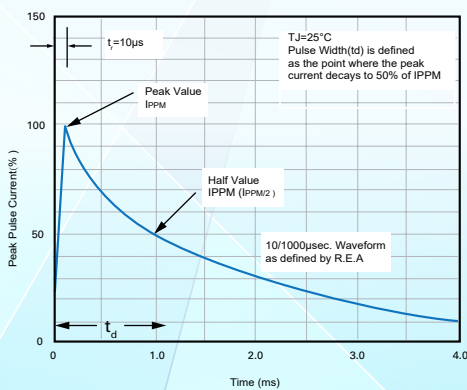


Fig 5: Pulse Waveform

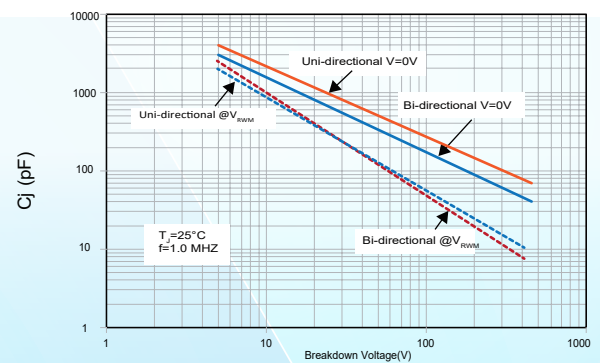
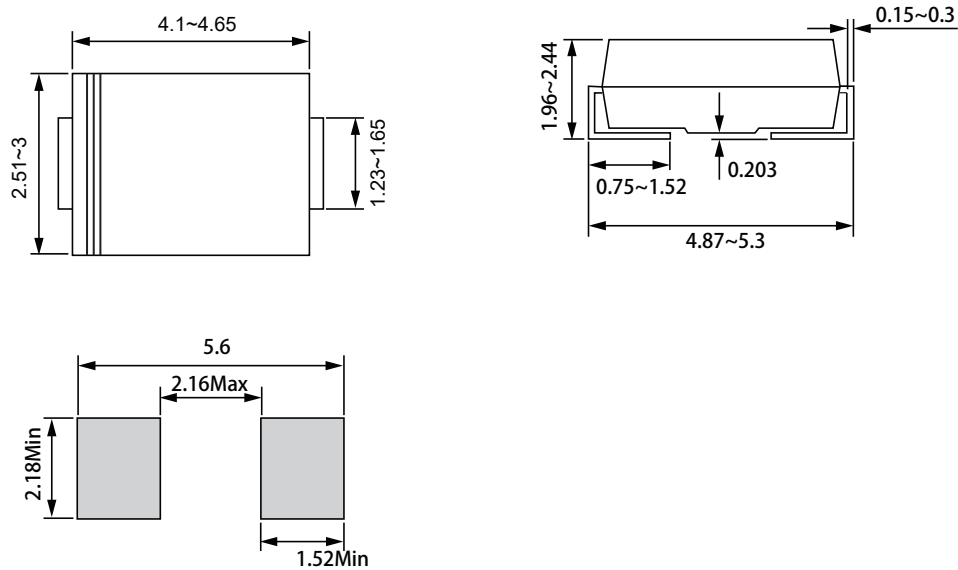


Fig 6: Typical Junction Capacitance

Mechanical Data

Case	Molded Plastic over glass passivated junction
Terminals	Matte Tin-plated leads
Polarity	Cathode Band(Note: Bi-directional devices have no polarity indicator.)

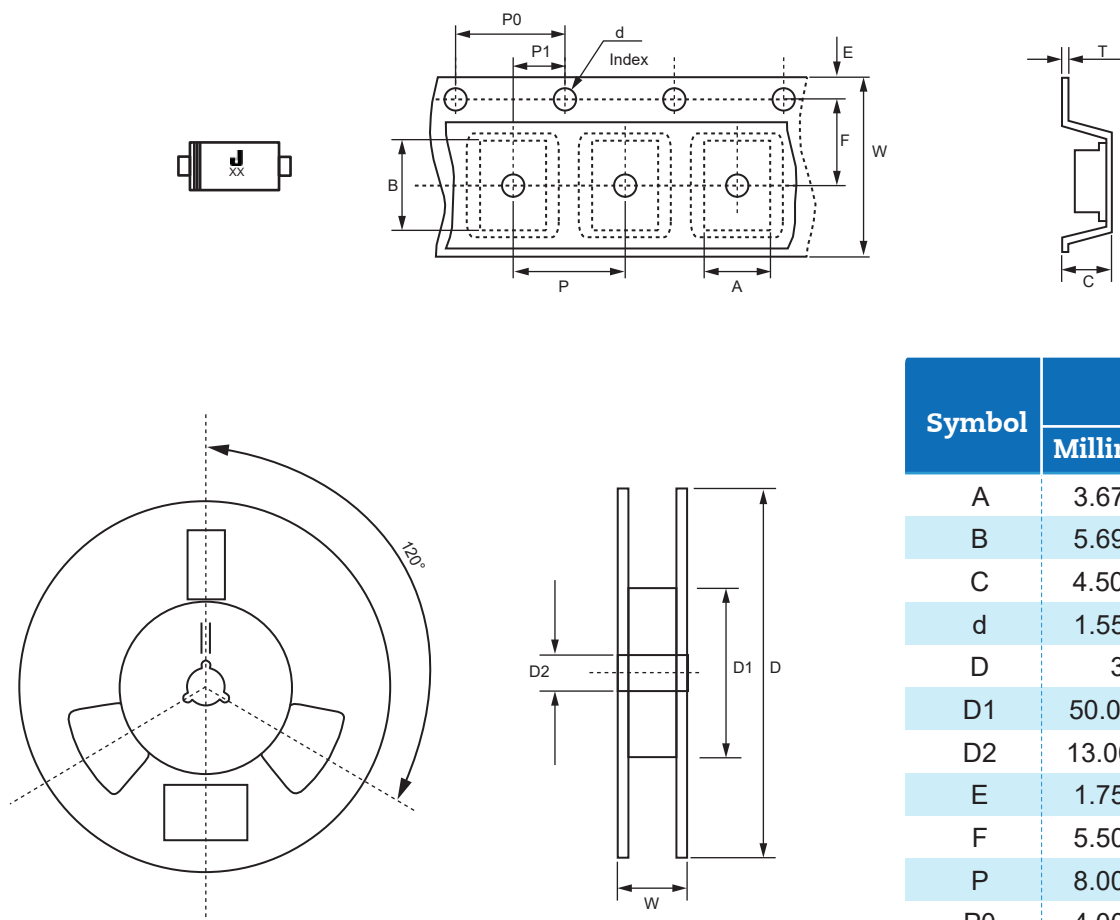


Recommend Pad Layout

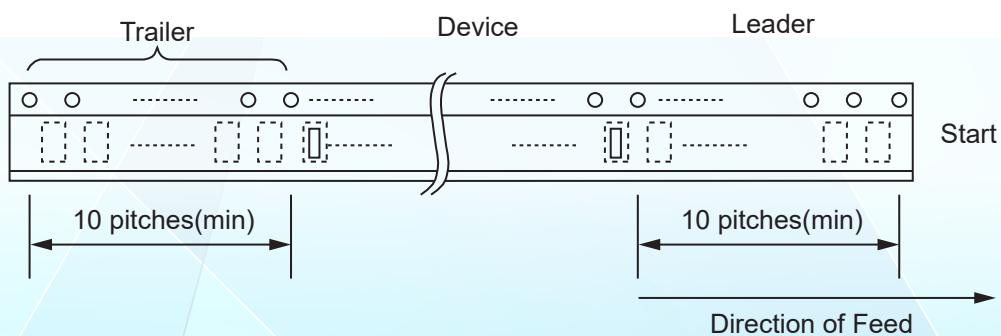
Packaging Quantity

Package	Weight	Quantity	Reel Size	Packaging Option
DO-214AC	0.63g(approx)	5000pcs	13 inch	Tape and reel-12mm tape/13"reel

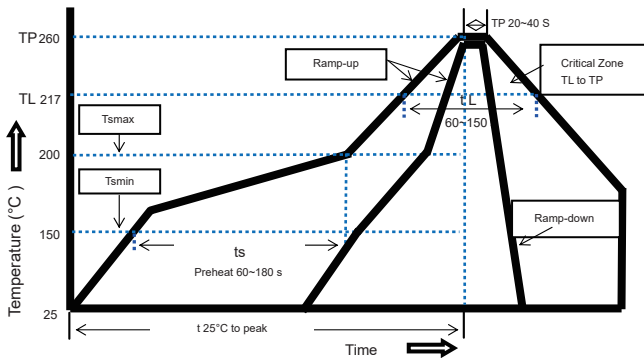
Tape and Reel Specification



Symbol	Dimensions	
	Millimeters	Inches
A	3.67±0.10	0.144±0.004
B	5.69±0.10	0.224±0.004
C	4.50(max)	0.177(max)
d	1.55±0.10	0.061±0.004
D	330	13
D1	50.00(min)	1.969(min)
D2	13.00±0.20	0.512±0.008
E	1.75±0.10	0.069±0.004
F	5.50±0.05	0.217±0.002
P	8.00±0.10	0.315±0.004
P0	4.00±0.10	0.157±0.004
P1	2.00±0.05	0.079±0.002
W	12.00±0.30	0.472±0.012
W1	18.40(max)	0.724(max)



Soldering Parameters



- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free
- Recommended maximum paste thickness is 0.25mm
Devices can be cleaned using standard industry methods and solvents.
- Note 1: All temperature refer to topside of the package, measured on the package body surface.
- Note 2: If reflow temperatures exceed the recommended

Profile Feature

Pb-Free Assembly

Average Ramp-Up Rate 3°C/second max.
(Ts max to T p)

Preheat

-Temperature Min(Ts min) 150°C
-Temperature Max(Ts max) 200°C
-Time(Ts min to Ts max) 60~180 seconds

Time maintained above:

-Temperature(TL) 217°C
-Time(tL) 60~150 seconds

Peak Temperature(Tp) 260°C

Ramp-Down Rate 6°C/second max.

Time 25°C to Peak Temperature 8 minutes max

Storage Condition 0°C~35°C, ≤70%RH

Part Number System

SMAJ XXX C A

5% VOLTAGE TOLERANCE

BI-DIRECTIONAL

VOLTAGE

SERIES