

Features

- 400W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

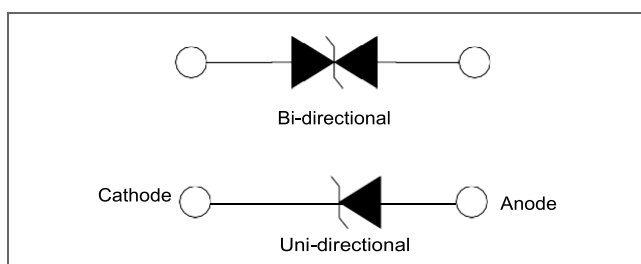
RoHS
Compliant



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Function Diagram



Maximum Ratings and Thermal Characteristics (T _A =25°C unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T _A =25°C by 10/1000 μ s Waveform (Fig.3)	P _{PPM}	400	W
Power Dissipation on Infinite Heat Sink at T _L =50°C	P _D	3.3	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I _{FSM}	60	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V _F	3.5	V
Operating Temperature Range	T _J	-55 to 150	°C
Storage Temperature Range	T _{STG}	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending

Notes:

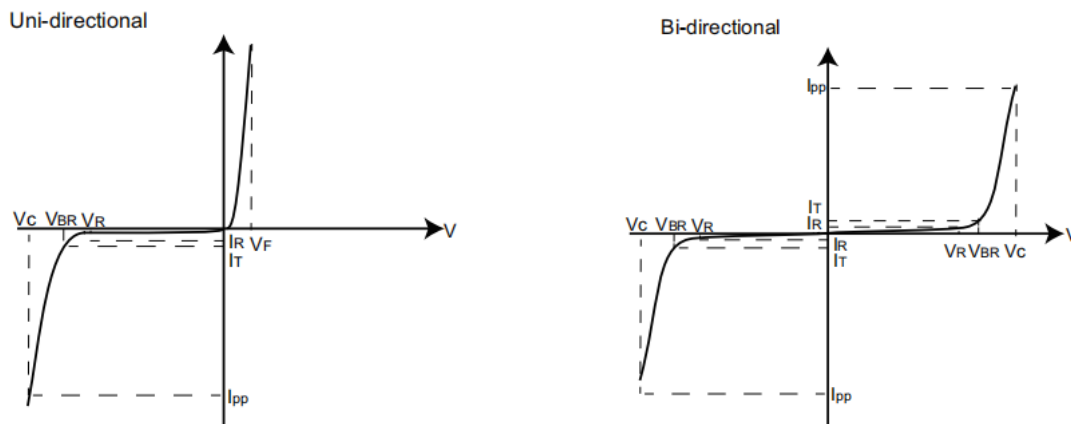
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. V_F < 3.5V for single die parts and V_F < 5V for stacked-die parts.

Characteristics (T = 25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Key Marking UNI BI		Reverse Stand off Voltage V _R (Volts)	Breakdown Voltage V _{BR} (Volts) @ I _T		Test Current I _T (mA)	Maximum Clamping Voltage V _C @ I _{nn} (V)	Maximum Peak Pulse Current I _{pp} (A)	Maximum Reverse Leakage I _R @ V _R (μA)	Agency Approval 
\	SMAJ5.0CA	\	A005C	5.0	6.40	7.00	10	9.2	43.5	400	
SMAJ5.0A	\	A005A	\	5.0	6.40	7.00	10	9.2	43.5	100	
\	SMAJ6.0CA	\	A006C	6.0	6.67	7.37	10	10.3	38.8	400	
SMAJ6.0A	\	A006A	\	6.0	6.67	7.37	10	10.3	38.8	100	
\	SMAJ6.5CA	\	A06FC	6.5	7.22	7.98	10	11.2	35.7	150	
SMAJ6.5A	\	A06FA	\	6.5	7.22	7.98	10	11.2	35.7	80	
SMAJ7.0A	SMAJ7.0CA	A007A	A007C	7.0	7.78	8.60	10	12.0	33.3	60	
SMAJ7.5A	SMAJ7.5CA	A07FA	A07FC	7.5	8.33	9.21	1	12.9	31.0	50	
SMAJ8.0A	SMAJ8.0CA	A008A	A008C	8.0	8.89	9.83	1	13.6	29.4	30	
SMAJ8.5A	SMAJ8.5CA	A08FA	A08FC	8.5	9.44	10.40	1	14.4	27.8	20	
SMAJ9.0A	SMAJ9.0CA	A009A	A009C	9.0	10.00	11.10	1	15.4	26.0	10	
SMAJ10A	SMAJ10CA	A010A	A010C	10.0	11.10	12.30	1	17.0	23.5	5	
SMAJ11A	SMAJ11CA	A011A	A011C	11.0	12.20	13.50	1	18.2	22.0	1	
SMAJ12A	SMAJ12CA	A012A	A012C	12.0	13.30	14.70	1	19.9	20.1	1	
SMAJ13A	SMAJ13CA	A013A	A013C	13.0	14.40	15.90	1	21.5	18.6	1	
SMAJ14A	SMAJ14CA	A014A	A014C	14.0	15.60	17.20	1	23.2	17.3	1	
SMAJ15A	SMAJ15CA	A015A	A015C	15.0	16.70	18.50	1	24.4	16.4	1	
SMAJ16A	SMAJ16CA	A016A	A016C	16.0	17.80	19.70	1	26.0	15.4	1	
SMAJ17A	SMAJ17CA	A017A	A017C	17.0	18.90	20.90	1	27.6	14.5	1	
SMAJ18A	SMAJ18CA	A018A	A018C	18.0	20.00	22.10	1	29.2	13.7	1	
SMAJ20A	SMAJ20CA	A020A	A020C	20.0	22.20	24.50	1	32.4	12.4	1	
SMAJ22A	SMAJ22CA	A022A	A022C	22.0	24.40	26.90	1	35.5	11.3	1	
SMAJ24A	SMAJ24CA	A024A	A024C	24.0	26.70	29.50	1	38.9	10.3	1	
SMAJ26A	SMAJ26CA	A026A	A026C	26.0	28.90	31.90	1	42.1	9.5	1	
SMAJ28A	SMAJ28CA	A028A	A028C	28.0	31.10	34.40	1	45.4	8.8	1	
SMAJ30A	SMAJ30CA	A030A	A030C	30.0	33.30	36.80	1	48.4	8.3	1	
SMAJ33A	SMAJ33CA	A033A	A033C	33.0	36.70	40.60	1	53.3	7.5	1	
SMAJ36A	SMAJ36CA	A036A	A036C	36.0	40.00	44.20	1	58.1	6.9	1	
SMAJ40A	SMAJ40CA	A040A	A040C	40.0	44.40	49.10	1	64.5	6.2	1	
SMAJ43A	SMAJ43CA	A043A	A043C	43.0	47.80	52.80	1	69.4	5.8	1	
SMAJ45A	SMAJ45CA	A045A	A045C	45.0	50.00	55.30	1	72.7	5.5	1	
SMAJ48A	SMAJ48CA	A048A	A048C	48.0	53.30	58.90	1	77.4	5.2	1	
SMAJ51A	SMAJ51CA	A051A	A051C	51.0	56.70	62.70	1	82.4	4.9	1	
SMAJ54A	SMAJ54CA	A054A	A054C	54.0	60.00	66.30	1	87.1	4.6	1	
SMAJ58A	SMAJ58CA	A058A	A058C	58.0	64.40	71.20	1	93.6	4.3	1	
SMAJ60A	SMAJ60CA	A060A	A060C	60.0	66.70	73.70	1	96.8	4.1	1	
SMAJ64A	SMAJ64CA	A064A	A064C	64.0	71.10	78.60	1	103.0	3.9	1	
SMAJ70A	SMAJ70CA	A070A	A070C	70.0	77.80	86.00	1	113.0	3.6	1	
SMAJ75A	SMAJ75CA	A075A	A075C	75.0	83.30	92.10	1	121.0	3.3	1	
SMAJ78A	SMAJ78CA	A078A	A078C	78.0	86.70	95.80	1	126.0	3.2	1	
SMAJ85A	SMAJ85CA	A085A	A085C	85.0	94.40	104.0	1	137.0	2.9	1	

Part Number (Uni)	Part Number (Bi)	Key Marking		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_R (μ A)	Agency Approval 
		UNI	BI		MIN	MAX					
SMAJ90A	SMAJ90CA	A090A	A090C	90.0	100.0	111.0	1	146.0	2.8	1	
SMAJ100A	SMAJ100CA	A100A	A100C	100.0	111.0	123.0	1	162.0	2.5	1	
SMAJ110A	SMAJ110CA	A110A	A110C	110.0	122.0	135.0	1	177.0	2.3	1	
SMAJ120A	SMAJ120CA	A120A	A120C	120.0	133.0	147.0	1	193.0	2.1	1	
SMAJ130A	SMAJ130CA	A130A	A130C	130.0	144.0	159.0	1	209.0	1.9	1	
SMAJ150A	SMAJ150CA	A150A	A150C	150.0	167.0	185.0	1	243.0	1.7	1	
SMAJ160A	SMAJ160CA	A160A	A160C	160.0	178.0	197.0	1	259.0	1.6	1	
SMAJ170A	SMAJ170CA	A170A	A170C	170.0	189.0	209.0	1	275.0	1.5	1	
SMAJ180A	SMAJ180CA	A180A	A180C	180.0	201.0	222.0	1	292.0	1.4	1	
SMAJ200A	SMAJ200CA	A200A	A200C	200.0	224.0	247.0	1	324.0	1.3	1	
SMAJ220A	SMAJ220CA	A220A	A220C	220.0	246.0	272.0	1	356.0	1.1	1	
SMAJ250A	SMAJ250CA	A250A	A250C	250.0	279.0	309.0	1	405.0	1.0	1	
SMAJ300A	SMAJ300CA	A300A	A300C	300.0	335.0	371.0	1	486.0	0.8	1	
SMAJ350A	SMAJ350CA	A350A	A350C	350.0	391.0	432.0	1	567.0	0.7	1	
SMAJ400A	SMAJ400CA	A400A	A400C	400.0	447.0	494.0	1	648.0	0.6	1	
SMAJ440A	SMAJ440CA	A440A	A440C	440.0	492.0	543.0	1	713.0	0.6	1	

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation

V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

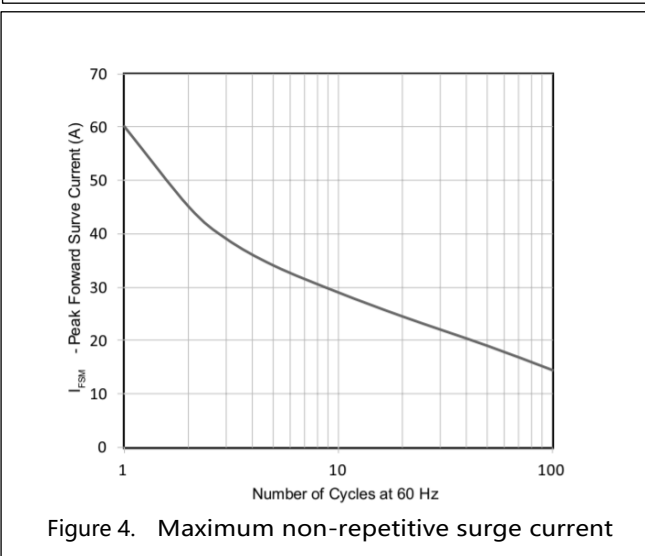
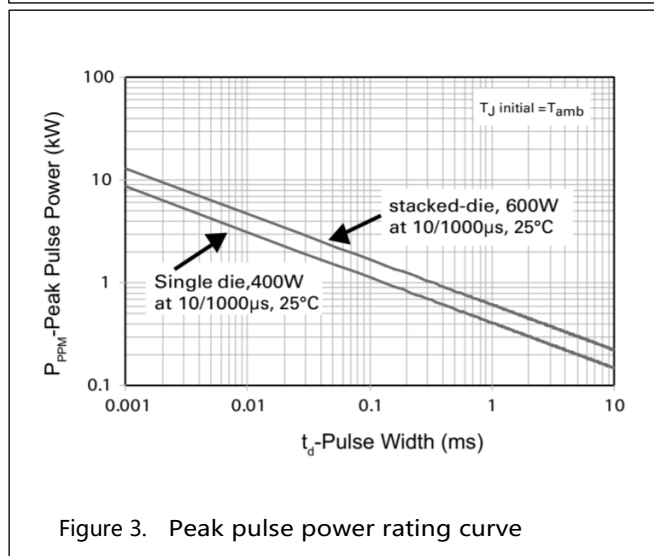
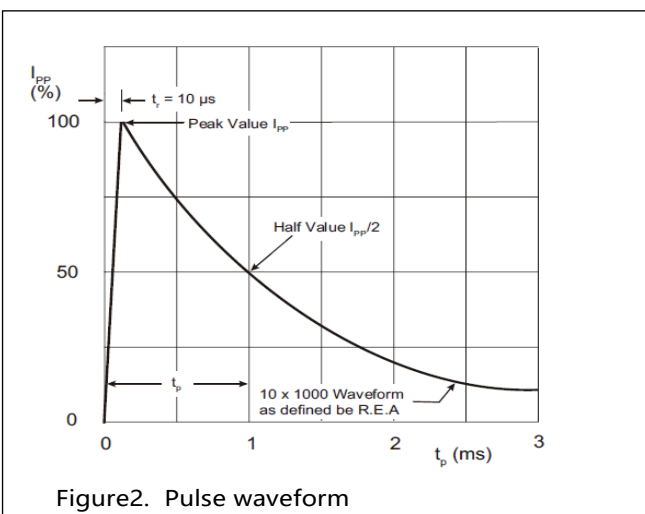
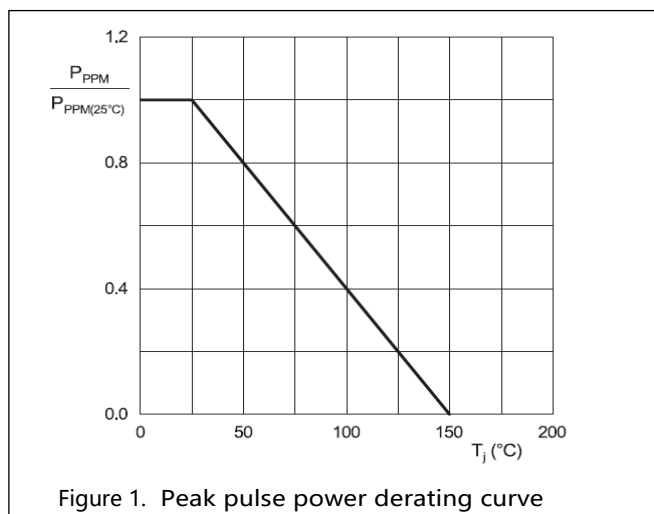
V_{BR} Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current (I_T)

V_C Clamping Voltage -- Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)

I_R Reverse Leakage Current -- Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

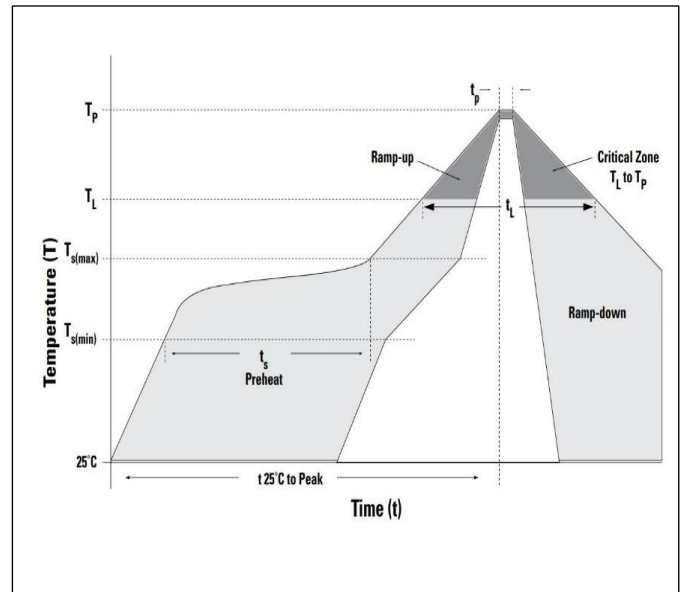
Ratings and Characteristic Curves ($T = 25^{\circ}\text{C}$ unless otherwise noted)



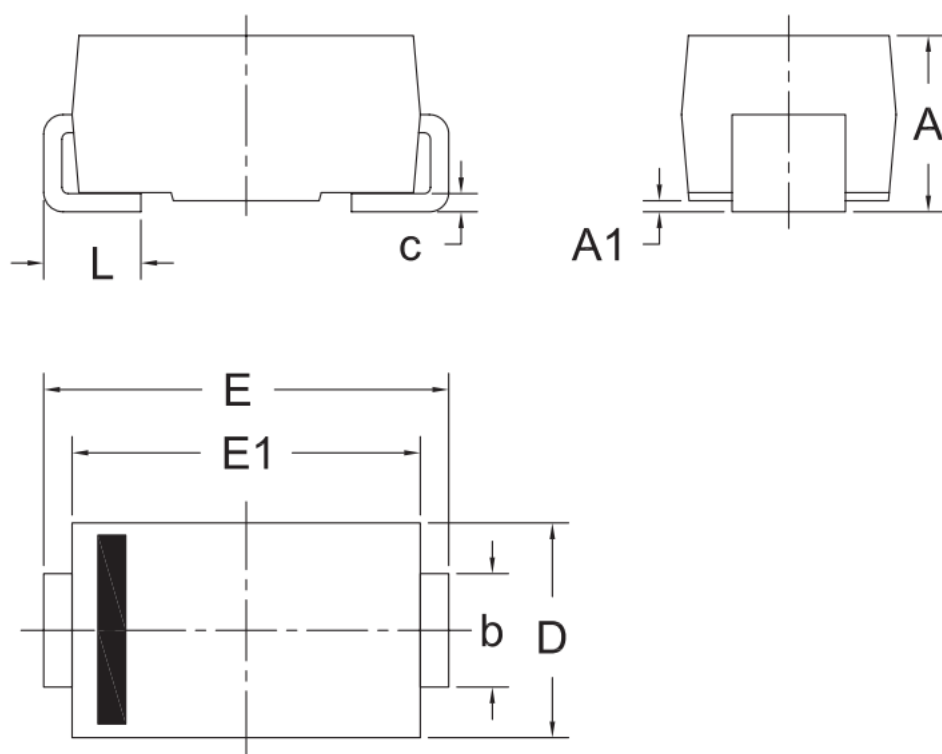
Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_A) to peak)		3°C/second max
$T_{s(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		260°C

Soldering profile



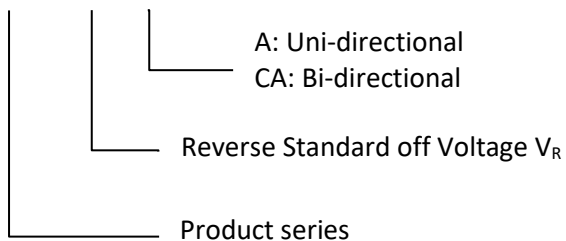
Dimensions



unit		A	A1	b	c	D	E	E1	L
max	mm	2.50	0.30	1.65	0.31	2.85	5.28	4.55	1.55
min		1.90	0	1.25	0.15	2.30	4.70	3.80	0.76

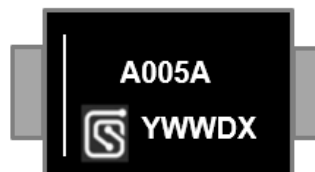
Part Numbering

SMAJ xx xx



Part Marking

Product Type Marking Code
& Last Digit "X" is Traceability code

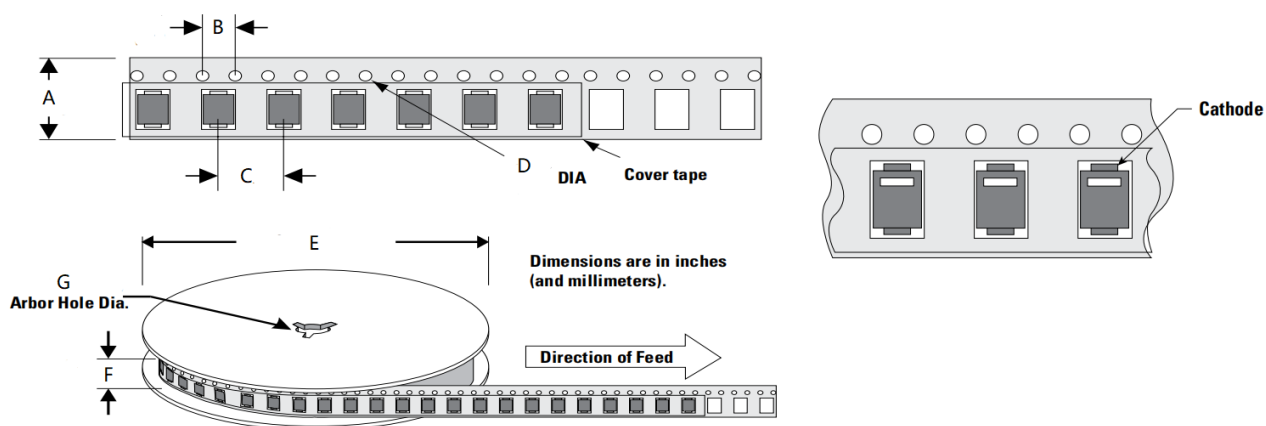


Cathode band
(for uni-directional products only)

Packing

Part number	Package name	Small packing quantity	Packing method
SMAJXXXX	DO-214AC	5000	Tape & Reel

Tape and Reel Specification



Symbol	Millimeter
A	12.00±0.10
B	4.00±0.10
C	4.00±0.10
D	1.55±0.05
E	330.20±2.00
F	15.70±2.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-Jul-2021
1.1	Modified Temperature Range & Details	16-Aug-2021
1.2	Modified Dimensions & Details	06-Jan2022
1.3	Update Package Sizes	12-Dec-2023
1.4	Add Remark For Marking Last Digit	31-Mar-2024
1.5	Update marking and dimension	27-Nov-2024