

Features

- 3000W peak pulse power capability at 10/1000μs 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-free maximum peak of 260°C
- High reliability application and automotive grade AEC-Q101 qualified

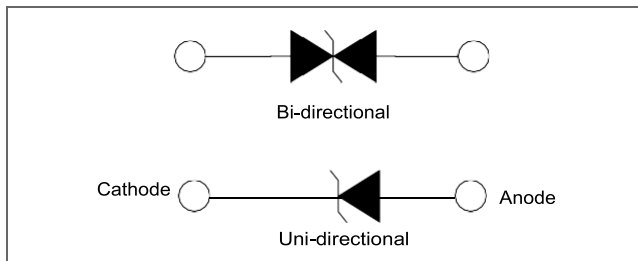
RoHS
Compliant



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 10/1000μs Waveform (Fig.3)	P _{PPM}	3000	W
Power Dissipation on Infinite Heat Sink at T _L =50°C	P _D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I _{FSM}	300	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V _F	3.5/5	V
Operating Temperature Range	T _J	175	°C
Storage Temperature Range	T _{STG}	-55 to 175	°C

AGENCY	AGENCY FILE NUMBER
	Pending

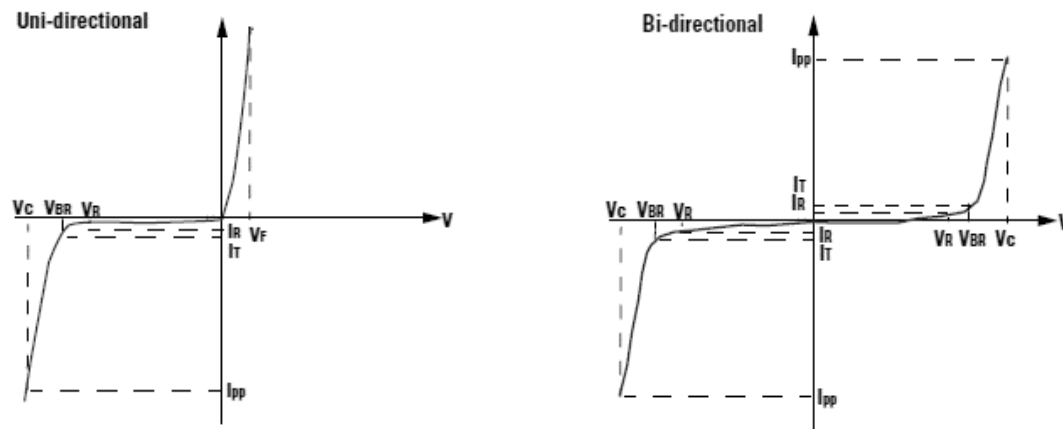
Notes:

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		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 Leakag I _R @ V _R (μA)	Agency Approval 
		UNI	BI		MIN	MAX					
TPSMD10A	TPSMD10CA	AD010	AD010	10.0	11.10	12.30	1	17.0	176.5	3	
TPSMD11A	TPSMD11CA	AD011	AD011	11.0	12.20	13.50	1	18.2	164.8	2	
TPSMD12A	TPSMD12CA	AD012	AD012	12.0	13.30	14.70	1	19.9	150.8	1.5	
TPSMD13A	TPSMD13CA	AD013	AD013	13.0	14.40	15.90	1	21.5	139.5	1	
TPSMD14A	TPSMD14CA	AD014	AD014	14.0	15.60	17.20	1	23.2	129.3	1	
TPSMD15A	TPSMD15CA	AD015	AD015	15.0	16.70	18.50	1	24.4	123.0	1	
TPSMD16A	TPSMD16CA	AD016	AD016	16.0	17.80	19.70	1	26.0	115.4	1	
TPSMD17A	TPSMD17CA	AD017	AD017	17.0	18.90	20.90	1	27.6	108.7	1	
TPSMD18A	TPSMD18CA	AD018	AD018	18.0	20.00	22.10	1	29.2	102.7	1	
TPSMD20A	TPSMD20CA	AD020	AD020	20.0	22.20	24.50	1	32.4	92.6	1	
TPSMD22A	TPSMD22CA	AD022	AD022	22.0	24.40	26.90	1	35.5	84.5	1	
TPSMD24A	TPSMD24CA	AD024	AD024	24.0	26.70	29.50	1	38.9	77.1	1	
TPSMD26A	TPSMD26CA	AD026	AD026	26.0	28.90	31.90	1	42.1	71.3	1	
TPSMD28A	TPSMD28CA	AD028	AD028	28.0	31.10	34.40	1	45.4	66.1	1	
TPSMD30A	TPSMD30CA	AD030	AD030	30.0	33.30	36.80	1	48.4	62.0	1	
TPSMD33A	TPSMD33CA	AD033	AD033	33.0	36.70	40.60	1	53.3	56.3	1	
TPSMD36A	TPSMD36CA	AD036	AD036	36.0	40.00	44.20	1	58.1	51.6	1	
TPSMD40A	TPSMD40CA	AD040	AD040	40.0	44.40	49.10	1	64.5	46.5	1	
TPSMD43A	TPSMD43CA	AD043	AD043	43.0	47.80	52.80	1	69.4	43.2	1	
TPSMD45A	TPSMD45CA	AD045	AD045	45.0	50.00	55.30	1	72.7	41.3	1	
TPSMD48A	TPSMD48CA	AD048	AD048	48.0	53.30	58.90	1	77.4	38.8	1	
TPSMD51A	TPSMD51CA	AD051	AD051	51.0	56.70	62.70	1	82.4	36.4	1	
TPSMD54A	TPSMD54CA	AD054	AD054	54.0	60.00	66.30	1	87.1	34.4	1	
TPSMD58A	TPSMD58CA	AD058	AD058	58.0	64.40	71.20	1	93.6	32.1	1	
TPSMD60A	TPSMD60CA	AD060	AD060	60.0	66.70	73.70	1	96.8	31.0	1	
TPSMD64A	TPSMD64CA	AD064	AD064	64.0	71.10	78.60	1	103.0	29.1	1	
TPSMD70A	TPSMD70CA	AD070	AD070	70.0	77.80	86.00	1	113.0	26.5	1	
TPSMD75A	TPSMD75CA	AD075	AD075	75.0	83.30	92.10	1	121.0	24.8	1	
TPSMD78A	TPSMD78CA	AD078	AD078	78.0	86.70	95.80	1	126.0	23.8	1	
TPSMD85A	TPSMD85CA	AD085	AD085	85.0	94.40	104.00	1	137.0	21.9	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°C unless otherwise noted)

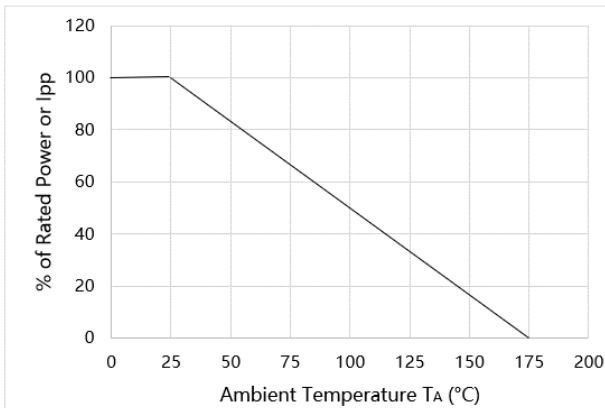


Figure 1. Peak pulse power derating curve

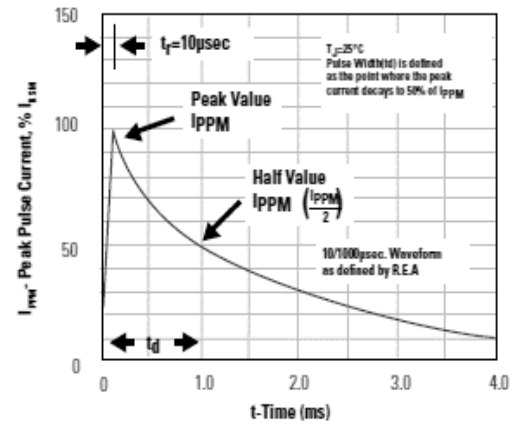


Figure2. Pulse waveform

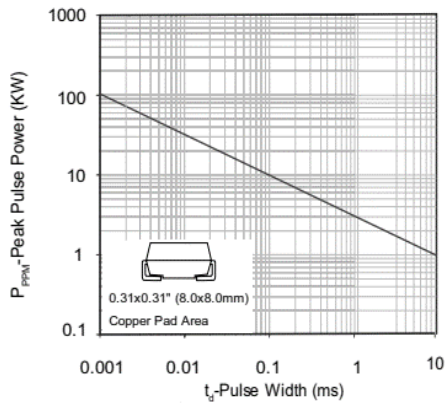


Figure 3. Peak pulse power rating curve

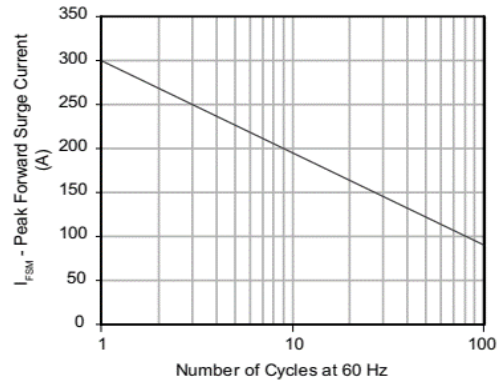
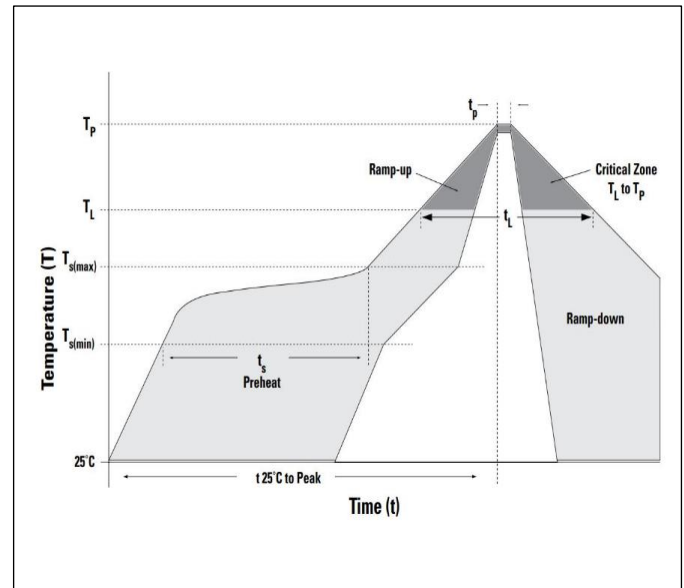


Figure 4. Maximum non-repetitive surge current

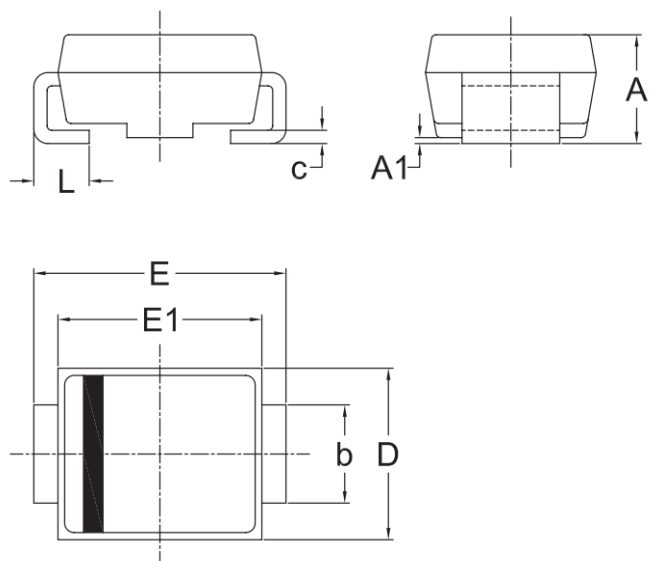
Soldering Parameters

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 – 120 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

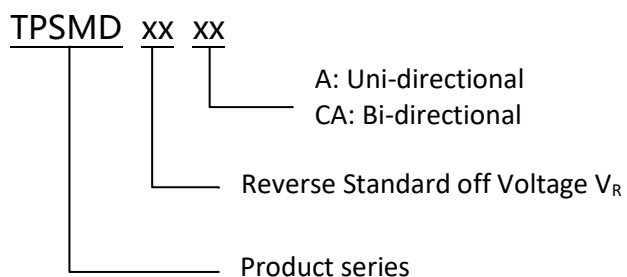


Dimensions

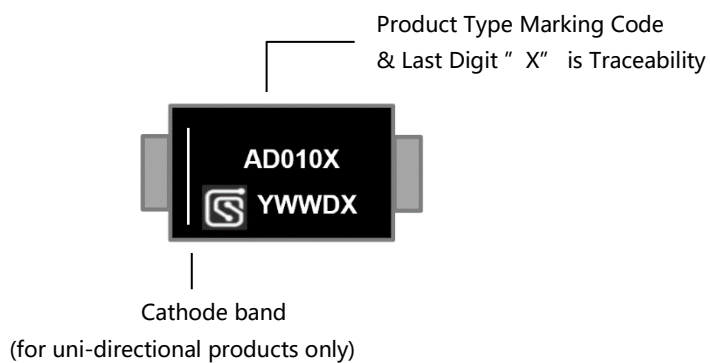


unit		A	A1	b	c	D	E	E1	L
max	mm	2.95	0.30	3.30	0.30	6.22	8.40	7.11	1.60
min		1.99	0.01	2.70	0.00	5.50	7.40	6.50	0.76

Part Numbering



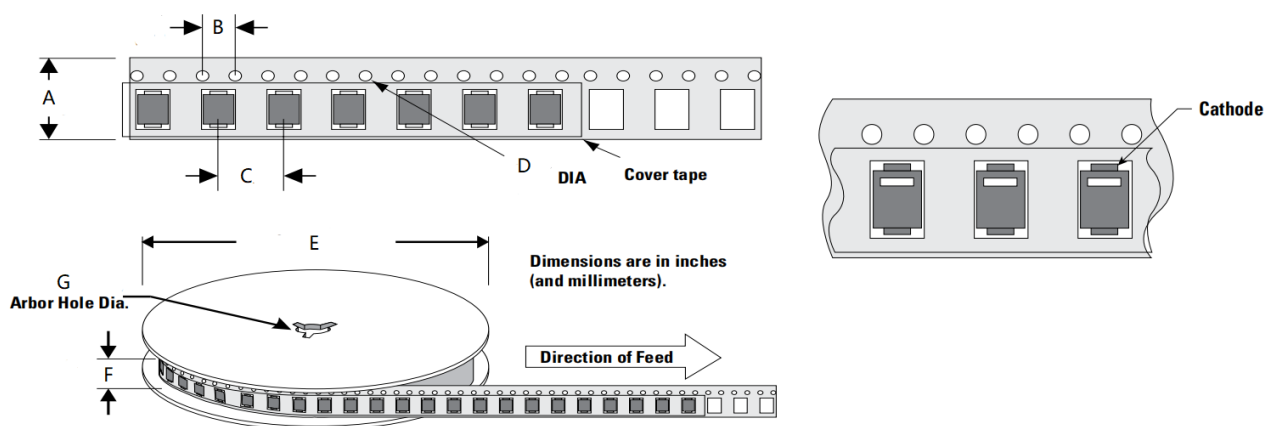
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
TPSMDXXXX	DO-214AB	3000	Tape & Reel

Tape and Reel Specification



Symbol	Millimeter
A	16.00±0.10
B	4.00±0.10
C	8.00±0.10
D	1.55±0.05
E	330.20±2.00
F	19.70±2.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-Aug-2021
1.1	Upgrade T_j/T_{STG} From 150°C to 175°C	1-Jul-2022
1.2	Update Reverse Leakage Current (IR)	4-Mar-2024
1.3	Update Dimensions	25-Apr-2024