Features

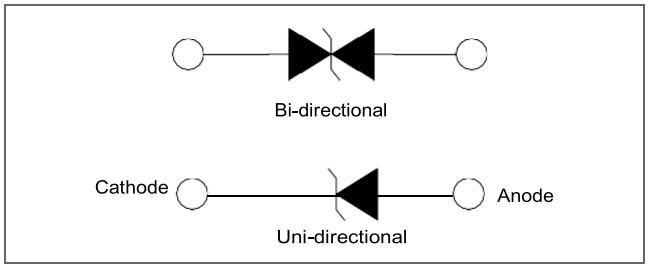
RoHS Compliant

- 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-frame maximum peak of 260°C
- High reliability application and automotive grade AEC-Q101 qualified

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	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending

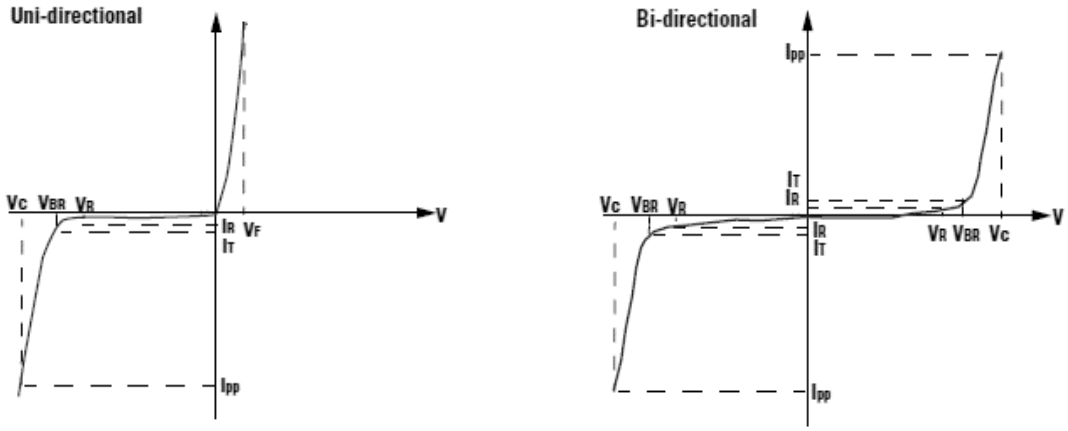
Notes:

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	Key Marking BI	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	Breakdown Voltage V_{BR} (Volts) @ I_T MAX	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
TPSMD10A	TPSMD10CA	AD010	AD010	10.0	11.10	12.30	1	17.0	176.5	5	
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	2	
TPSMD13A	TPSMD13CA	AD013	AD013	13.0	14.40	15.90	1	21.5	139.5	2	
TPSMD14A	TPSMD14CA	AD014	AD014	14.0	15.60	17.20	1	23.2	129.3	2	
TPSMD15A	TPSMD15CA	AD015	AD015	15.0	16.70	18.50	1	24.4	123.0	2	
TPSMD16A	TPSMD16CA	AD016	AD016	16.0	17.80	19.70	1	26.0	115.4	2	
TPSMD17A	TPSMD17CA	AD017	AD017	17.0	18.90	20.90	1	27.6	108.7	2	
TPSMD18A	TPSMD18CA	AD018	AD018	18.0	20.00	22.10	1	29.2	102.7	2	
TPSMD20A	TPSMD20CA	AD020	AD020	20.0	22.20	24.50	1	32.4	92.6	2	
TPSMD22A	TPSMD22CA	AD022	AD022	22.0	24.40	26.90	1	35.5	84.5	2	
TPSMD24A	TPSMD24CA	AD024	AD024	24.0	26.70	29.50	1	38.9	77.1	2	
TPSMD26A	TPSMD26CA	AD026	AD026	26.0	28.90	31.90	1	42.1	71.3	2	
TPSMD28A	TPSMD28CA	AD028	AD028	28.0	31.10	34.40	1	45.4	66.1	2	
TPSMD30A	TPSMD30CA	AD030	AD030	30.0	33.30	36.80	1	48.4	62.0	2	
TPSMD33A	TPSMD33CA	AD033	AD033	33.0	36.70	40.60	1	53.3	56.3	2	
TPSMD36A	TPSMD36CA	AD036	AD036	36.0	40.00	44.20	1	58.1	51.6	2	
TPSMD40A	TPSMD40CA	AD040	AD040	40.0	44.40	49.10	1	64.5	46.5	2	
TPSMD43A	TPSMD43CA	AD043	AD043	43.0	47.80	52.80	1	69.4	43.2	2	
TPSMD45A	TPSMD45CA	AD045	AD045	45.0	50.00	55.30	1	72.7	41.3	2	
TPSMD48A	TPSMD48CA	AD048	AD048	48.0	53.30	58.90	1	77.4	38.8	2	
TPSMD51A	TPSMD51CA	AD051	AD051	51.0	56.70	62.70	1	82.4	36.4	2	
TPSMD54A	TPSMD54CA	AD054	AD054	54.0	60.00	66.30	1	87.1	34.4	2	
TPSMD58A	TPSMD58CA	AD058	AD058	58.0	64.40	71.20	1	93.6	32.1	2	
TPSMD60A	TPSMD60CA	AD060	AD060	60.0	66.70	73.70	1	96.8	31.0	2	
TPSMD64A	TPSMD64CA	AD064	AD064	64.0	71.10	78.60	1	103.0	29.1	2	
TPSMD70A	TPSMD70CA	AD070	AD070	70.0	77.80	86.00	1	113.0	26.5	2	
TPSMD75A	TPSMD75CA	AD075	AD075	75.0	83.30	92.10	1	121.0	24.8	2	
TPSMD78A	TPSMD78CA	AD078	AD078	78.0	86.70	95.80	1	126.0	23.8	2	
TPSMD85A	TPSMD85CA	AD085	AD085	85.0	94.40	104.00	1	137.0	21.9	2	

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)

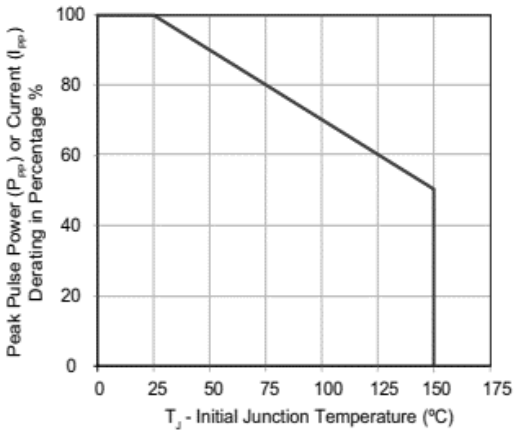


Figure 1. Peak pulse power derating curve

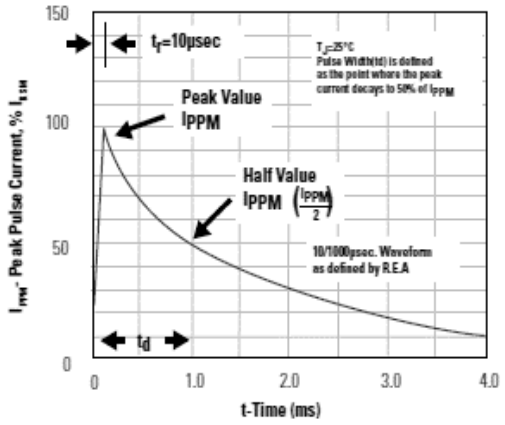


Figure2. Pulse waveform

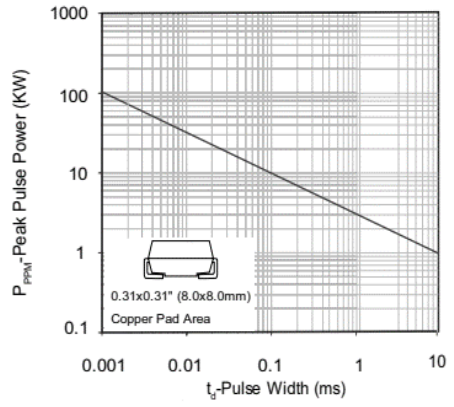


Figure 3. Peak pulse power rating curve

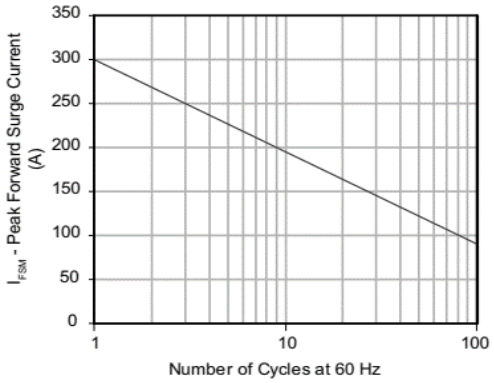
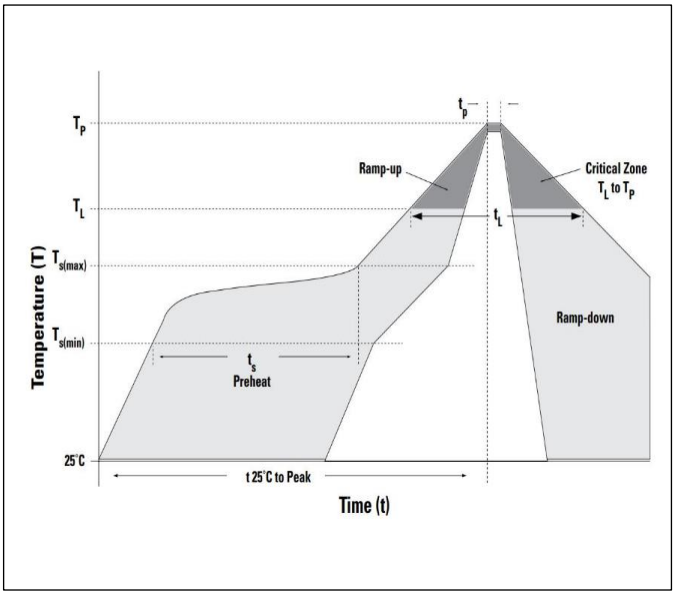


Figure 4. Maximum non-repetitive surge current

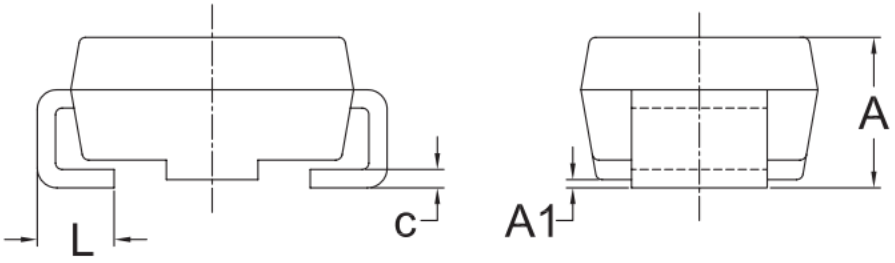
Soldering Parameters

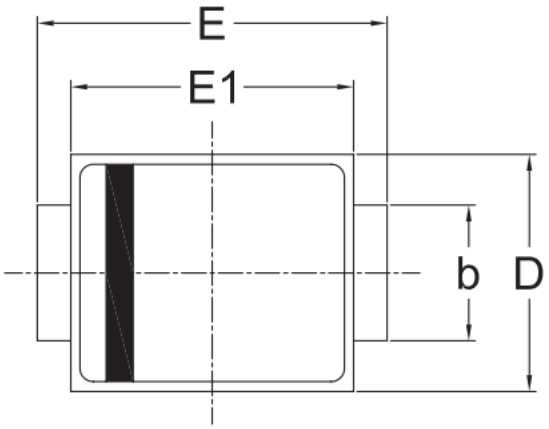
Reflow Condition		Lead–free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp (T_A) to peak		3°C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (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
mm	Max	2.83	0.30	3.10	0.25	6.15	8.15	7.05	1.60
	Min	2.33	0.00	2.80	0.15	5.85	7.65	6.75	0.90

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

Part Numbering

TPSMD xx xx

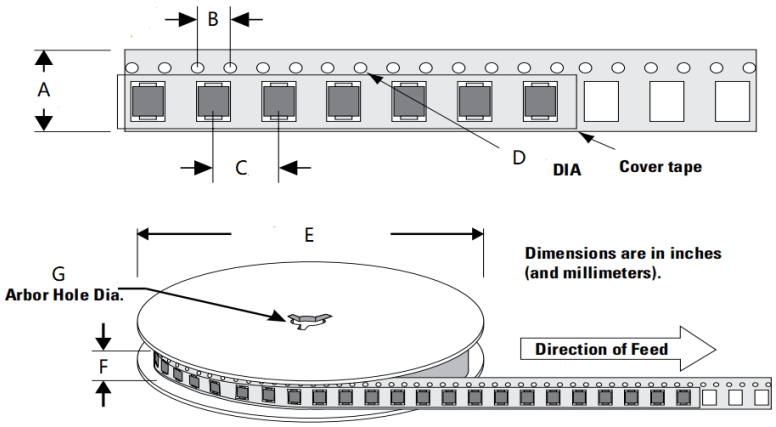
- xx (last): A: Uni-directional / CA: Bi-directional
- xx (middle): Reverse Standard off Voltage V_R
- TPSMD: Product series

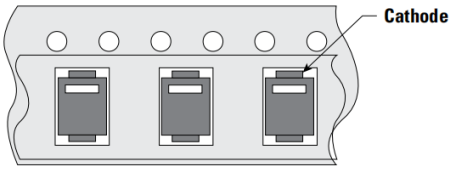
Part Marking

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