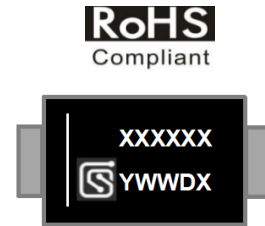


**Features**

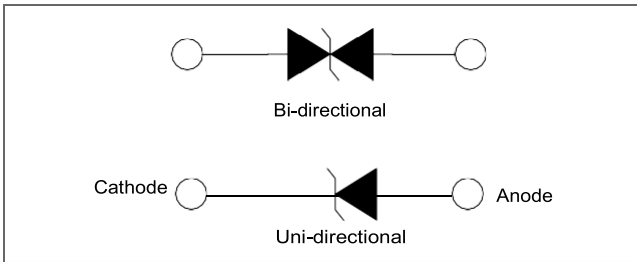
- 5000W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per 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 Automotive electronic applications.

**Function Diagram**




Maximum Ratings and Thermal Characteristics (T <sub>A</sub> =25°C unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T <sub>A</sub> =25°C by 10/1000µs Waveform (Fig.2)	P <sub>PPM</sub>	5000	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C	P <sub>D</sub>	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I <sub>FSM</sub>	300	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only	V <sub>F</sub>	3.5	V
Operating Temperature Range	T <sub>J</sub>	-55 to 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending

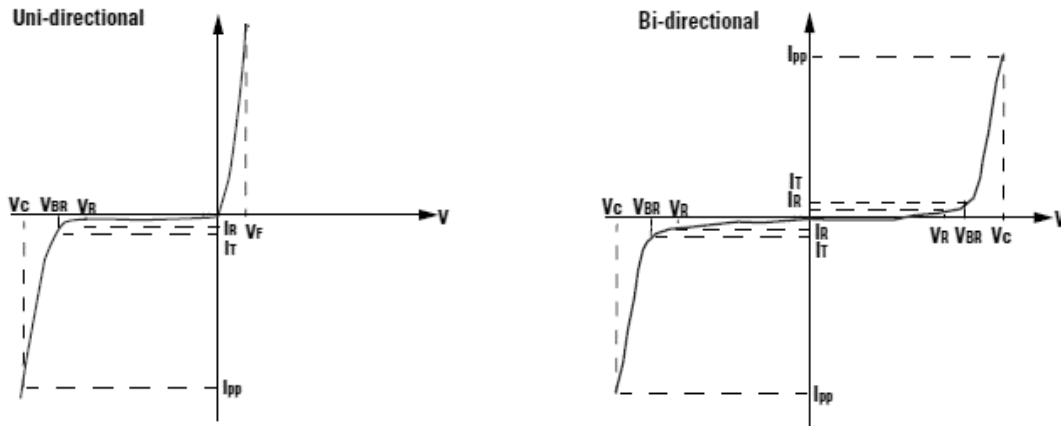
**Notes:**

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

**Characteristics (T = 25°C unless otherwise noted)**

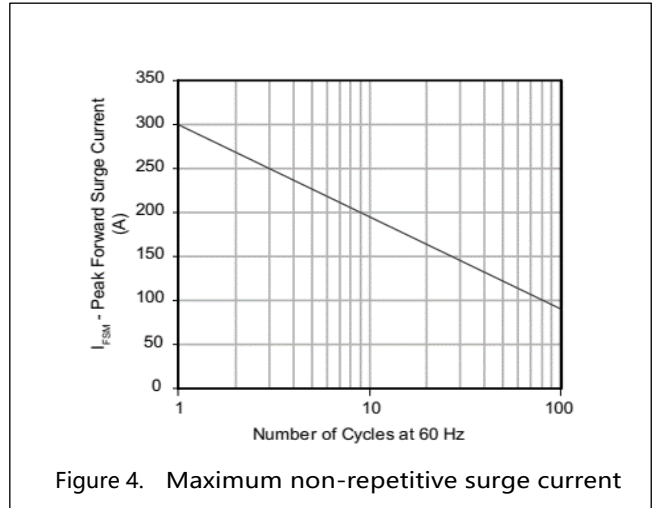
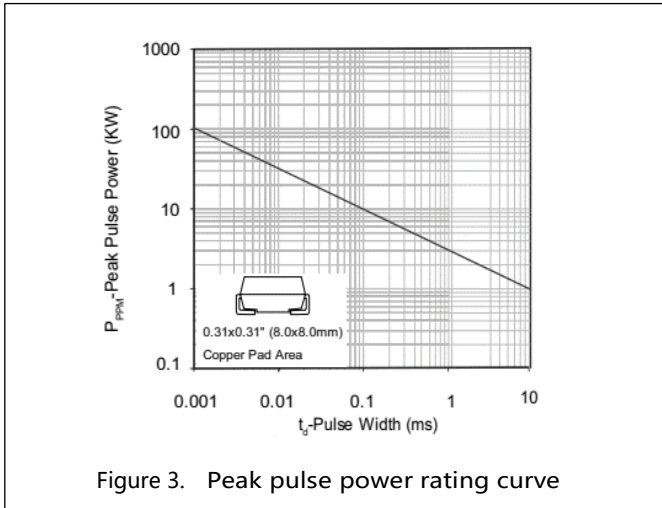
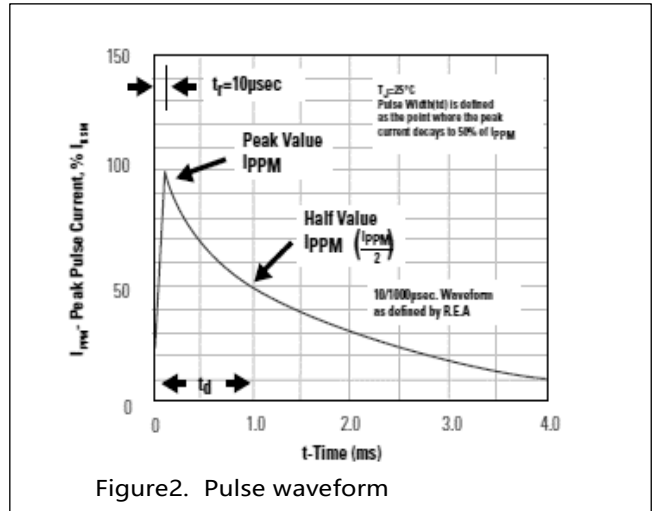
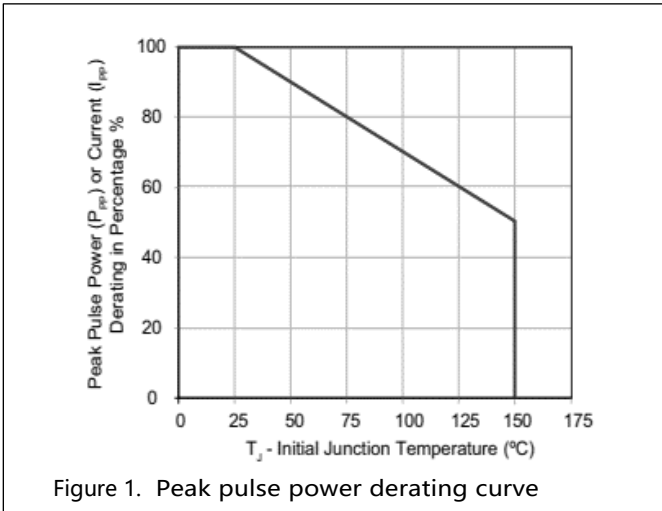
Part Number (Uni)	Part Number (Bi)	Key Marking		Reverse Stand off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>nn</sub> (V)	Maximum Peak Pulse Current I <sub>pp</sub> (A)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA)	Agency Approval 
		UNI	BI		MIN	MAX					
TP5.0SMD12A	TP5.0SMD12CA	A5012	A5012	12.0	13.3	14.7	10	19.9	252.0	800	
TP5.0SMD13A	TP5.0SMD13CA	A5013	A5013	13.0	14.4	15.9	10	21.5	233.0	500	
TP5.0SMD14A	TP5.0SMD14CA	A5014	A5014	14.0	15.6	17.2	10	23.2	216.0	200	
TP5.0SMD15A	TP5.0SMD15CA	A5015	A5015	15.0	16.7	18.5	1	24.4	205.0	100	
TP5.0SMD16A	TP5.0SMD16CA	A5016	A5016	16.0	17.8	19.7	1	26.0	193.0	50	
TP5.0SMD17A	TP5.0SMD17CA	A5017	A5017	17.0	18.9	20.9	1	27.6	181.0	20	
TP5.0SMD18A	TP5.0SMD18CA	A5018	A5018	18.0	20.0	22.1	1	29.2	172.0	10	
TP5.0SMD20A	TP5.0SMD20CA	A5020	A5020	20.0	22.2	24.5	1	32.4	155.0	5	
TP5.0SMD22A	TP5.0SMD22CA	A5022	A5022	22.0	24.4	26.9	1	35.5	141.0	5	
TP5.0SMD24A	TP5.0SMD24CA	A5024	A5024	24.0	26.7	29.5	1	38.9	129.0	5	
TP5.0SMD26A	TP5.0SMD26CA	A5026	A5026	26.0	28.9	31.9	1	42.1	119.0	5	
TP5.0SMD28A	TP5.0SMD28CA	A5028	A5028	28.0	31.1	34.4	1	45.4	110.0	5	
TP5.0SMD30A	TP5.0SMD30CA	A5030	A5030	30.0	33.3	36.8	1	48.4	103.0	5	
TP5.0SMD33A	TP5.0SMD33CA	A5033	A5033	33.0	36.7	40.6	1	53.3	93.9	5	
TP5.0SMD36A	TP5.0SMD36CA	A5036	A5036	36.0	40.0	44.2	1	58.1	86.1	5	
TP5.0SMD40A	TP5.0SMD40CA	A5040	A5040	40.0	44.4	49.1	1	64.5	77.6	5	
TP5.0SMD43A	TP5.0SMD43CA	A5043	A5043	43.0	47.8	52.8	1	69.4	72.1	5	
TP5.0SMD45A	TP5.0SMD45CA	A5045	A5045	45.0	50.0	55.3	1	72.7	68.8	5	
TP5.0SMD48A	TP5.0SMD48CA	A5048	A5048	48.0	53.3	58.9	1	77.4	64.7	5	
TP5.0SMD51A	TP5.0SMD51CA	A5051	A5051	51.0	56.7	62.7	1	82.4	60.7	5	
TP5.0SMD54A	TP5.0SMD54CA	A5054	A5054	54.0	60.0	66.3	1	87.1	57.5	5	
TP5.0SMD58A	TP5.0SMD58CA	A5058	A5058	58.0	64.4	71.2	1	93.6	53.5	5	
TP5.0SMD60A	TP5.0SMDJ60CA	A5060	A5060	60.0	66.7	73.7	1	96.8	51.7	5	
TP5.0SMD64A	TP5.0SMD64CA	A5064	A5064	64.0	71.1	78.6	1	103.0	48.6	5	
TP5.0SMD70A	TP5.0SMD70CA	A5070	A5070	70.0	77.8	86.0	1	113.0	44.3	5	
TP5.0SMD75A	TP5.0SMD75CA	A5075	A5075	75.0	83.3	92.1	1	121.0	41.4	5	
TP5.0SMD78A	TP5.0SMD78CA	A5078	A5078	78.0	86.7	95.8	1	126.0	39.7	5	
TP5.0SMD85A	TP5.0SMD85CA	A5085	A5085	85.0	94.4	104.0	1	137.0	36.5	5	
TP5.0SMD90A	TP5.0SMD90CA	A5090	A5090	90.0	100.0	111.0	1	146.0	34.3	5	
TP5.0SMD100A	TP5.0SMD100CA	A5100	A5100	100.0	111.0	123.0	1	162.0	30.9	5	
TP5.0SMD110A	TP5.0SMD110CA	A5110	A5110	110.0	122.0	135.0	1	177.0	28.3	5	
TP5.0SMD120A	TP5.0SMD120CA	A5120	A5120	120.0	133.0	147.0	1	193.0	26.0	5	
TP5.0SMD130A	TP5.0SMD130CA	A5130	A5130	130.0	144.0	159.0	1	209.0	24.0	5	
TP5.0SMD140A	TP5.0SMD140CA	A5140	A5140	140.0	156.0	172.0	1	226.1	22.2	5	
TP5.0SMD150A	TP5.0SMD150CA	A5150	A5150	150.0	167.0	185.0	1	243.0	20.6	5	
TP5.0SMD160A	TP5.0SMD160CA	A5160	A5160	160.0	178.0	197.0	1	259.0	19.3	5	
TP5.0SMD170A	TP5.0SMD170CA	A5170	A5170	170.0	189.0	209.0	1	275.0	18.2	5	

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 ( $I_r$ )
- $V_C$  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

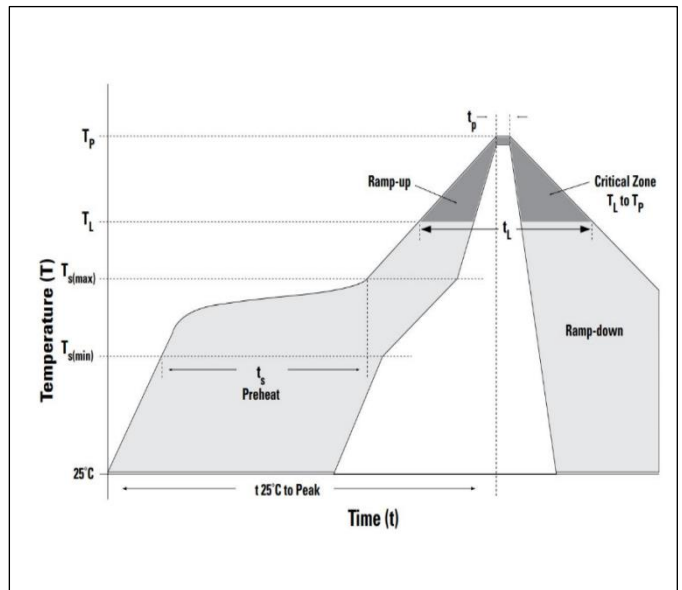
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



**Soldering Parameters**

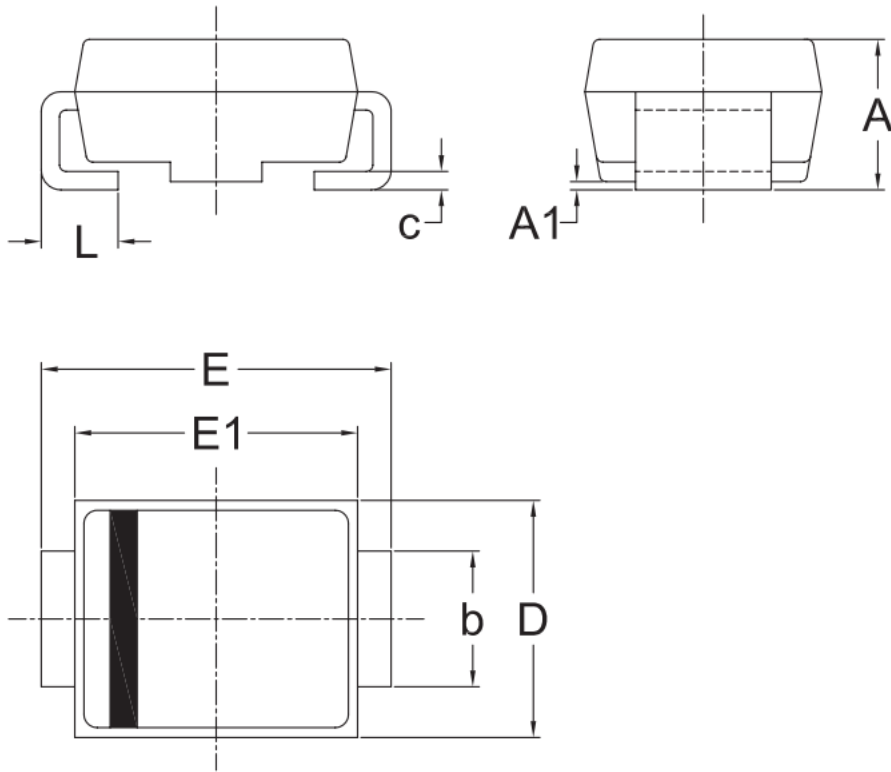
**Soldering profile**

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 <sup>+0/-5</sup> °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





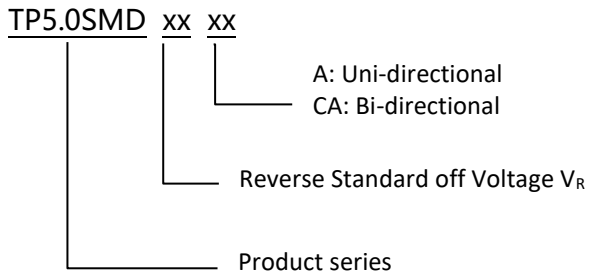
Dimensions



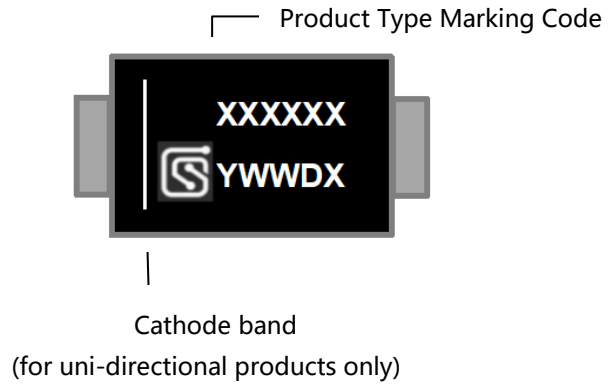
UNIT	A	A1	b	c	D	E	E1	L	
mm	Max	2.83	0.30	3.10	0.25	6.15	8.15	7.05	1.60
	Min	2.33	0.00	2.80	0.15	5.85	7.65	6.75	0.90

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

Part Numbering



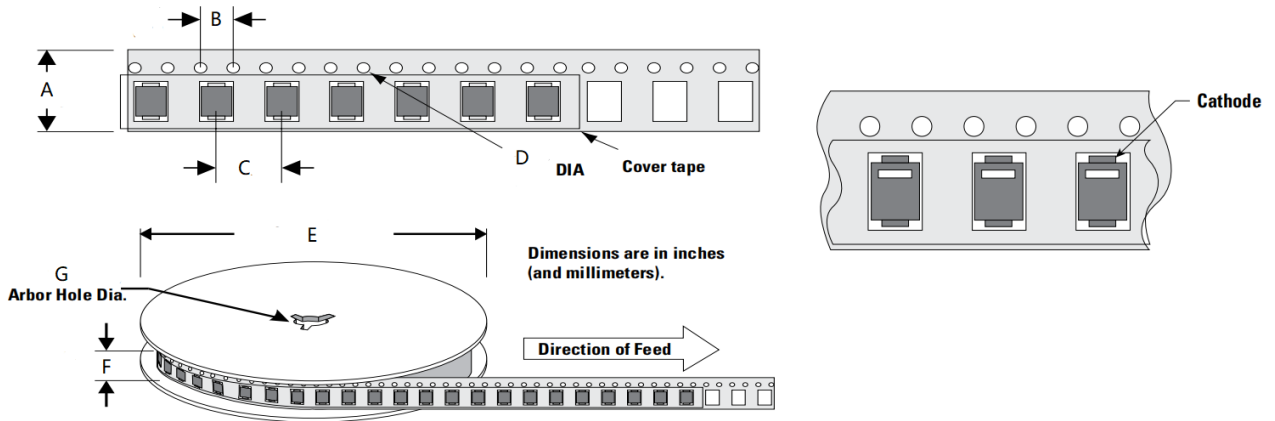
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
TP5.0SMDXXXX	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	Preliminary release	13-Sep-2022