

**Features**

- 400W 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

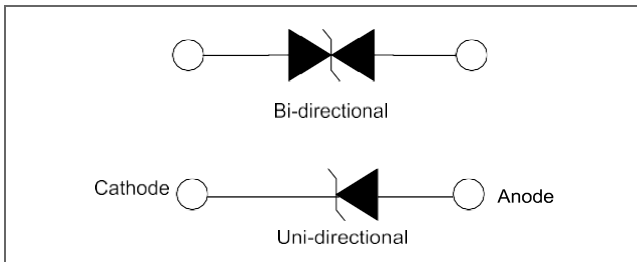
**RoHS**  
Compliant



**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 <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.3)	P <sub>PPM</sub>	400	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C	P <sub>D</sub>	3.3	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I <sub>FSM</sub>	60	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V <sub>F</sub>	3.5/5	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:**

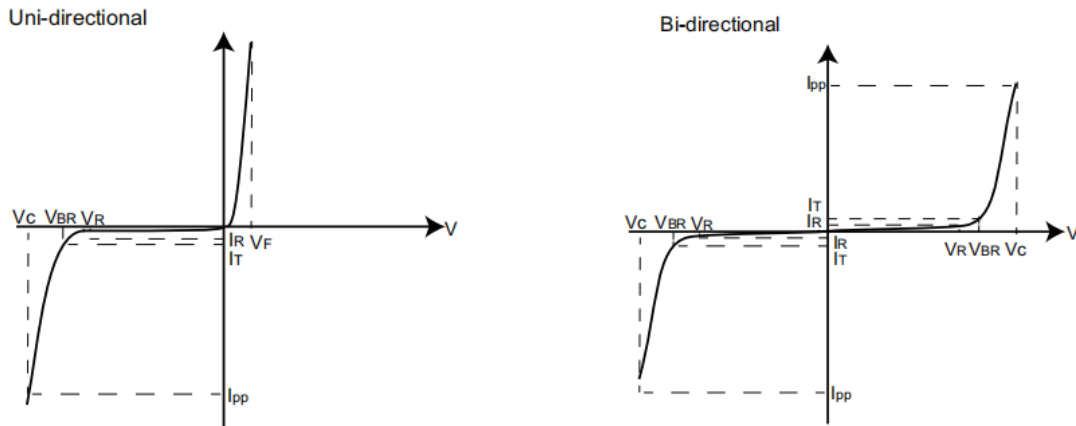
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. V<sub>F</sub> < 3.5V for single die parts and V<sub>F</sub>< 5V for stacked-die parts.

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

Part Number (Uni)	Part Number (Bi)	Key Marking		Reverse Stand off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub> MIN MAX		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>pp</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								
P4SMA6.8A	P4SMA6.8CA	A06E	A06E	5.80	6.45	7.14	10	10.5	39.0	1000	
P4SMA7.5A	P4SMA7.5CA	A07F	A07F	6.40	7.13	7.88	10	11.3	36.3	500	
P4SMA8.2A	P4SMA8.2CA	A08T	A08T	7.02	7.79	8.61	10	12.1	33.9	200	
P4SMA9.1A	P4SMA9.1CA	A09O	A09O	7.78	8.65	9.55	1	13.4	30.6	50	
P4SMA10A	P4SMA10CA	A010	A010	8.55	9.50	10.50	1	14.5	28.3	10	
P4SMA11A	P4SMA11CA	A011	A011	9.40	10.50	11.60	1	15.6	26.3	5	
P4SMA12A	P4SMA12CA	A012	A012	10.20	11.40	12.60	1	16.7	24.6	5	
P4SMA13A	P4SMA13CA	A013	A013	11.10	12.40	13.70	1	18.2	22.5	1	
P4SMA15A	P4SMA15CA	A015	A015	12.80	14.30	15.80	1	21.2	19.3	1	
P4SMA16A	P4SMA16CA	A016	A016	13.60	15.20	16.80	1	22.5	18.2	1	
P4SMA18A	P4SMA18CA	A018	A018	15.30	17.10	18.90	1	25.5	16.1	1	
P4SMA20A	P4SMA20CA	A020	A020	17.10	19.00	21.00	1	27.7	14.8	1	
P4SMA22A	P4SMA22CA	A022	A022	18.80	20.90	23.10	1	30.6	13.4	1	
P4SMA24A	P4SMA24CA	A024	A024	20.50	22.80	25.20	1	33.2	12.3	1	
P4SMA27A	P4SMA27CA	A027	A027	23.10	25.70	28.40	1	37.5	10.9	1	
P4SMA30A	P4SMA30CA	A030	A030	25.60	28.50	31.50	1	41.4	9.9	1	
P4SMA33A	P4SMA33CA	A033	A033	28.20	31.40	34.70	1	45.7	9.0	1	
P4SMA36A	P4SMA36CA	A036	A036	30.80	34.20	37.80	1	49.9	8.2	1	
P4SMA39A	P4SMA39CA	A039	A039	33.30	37.10	41.00	1	53.9	7.6	1	
P4SMA43A	P4SMA43CA	A043	A043	36.80	40.90	45.20	1	59.3	6.9	1	
P4SMA47A	P4SMA47CA	A047	A047	40.20	44.70	49.40	1	64.8	6.3	1	
P4SMA51A	P4SMA51CA	A051	A051	43.60	48.50	53.60	1	70.1	5.8	1	
P4SMA56A	P4SMA56CA	A056	A056	47.80	53.20	58.80	1	77.0	5.3	1	
P4SMA62A	P4SMA62CA	A062	A062	53.00	58.90	65.10	1	85.0	4.8	1	
P4SMA68A	P4SMA68CA	A068	A068	58.10	64.60	71.40	1	92.0	4.5	1	
P4SMA75A	P4SMA75CA	A075	A075	64.10	71.30	78.80	1	103.0	4.0	1	
P4SMA82A	P4SMA82CA	A082	A082	70.10	77.90	86.10	1	113.0	3.6	1	
P4SMA91A	P4SMA91CA	A091	A091	77.80	86.50	95.50	1	125.0	3.3	1	
P4SMA100A	P4SMA100CA	A100	A100	85.50	95.00	105.00	1	137.0	3.0	1	
P4SMA110A	P4SMA110CA	A110	A110	94.00	105.00	116.00	1	152.0	2.7	1	
P4SMA120A	P4SMA120CA	A120	A120	102.00	114.00	126.00	1	165.0	2.5	1	
P4SMA130A	P4SMA130CA	A130	A130	111.00	124.00	137.00	1	179.0	2.3	1	
P4SMA150A	P4SMA150CA	A150	A150	128.00	143.00	158.00	1	207.0	2.0	1	
P4SMA160A	P4SMA160CA	A160	A160	136.00	152.00	168.00	1	219.0	1.9	1	
P4SMA170A	P4SMA170CA	A170	A170	145.00	162.00	179.00	1	234.0	1.8	1	
P4SMA180A	P4SMA180CA	A180	A180	154.00	171.00	189.00	1	246.0	1.7	1	
P4SMA200A	P4SMA200CA	A200	A200	171.00	190.00	210.00	1	274.0	1.5	1	
P4SMA220A	P4SMA220CA	A220	A220	185.00	209.00	231.00	1	328.0	1.3	1	
P4SMA250A	P4SMA250CA	A250	A250	214.00	237.00	263.00	1	344.0	1.2	1	
P4SMA300A	P4SMA300CA	A300	A300	256.00	285.00	315.00	1	414.0	1.0	1	

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>pp</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					
P4SMA350A	P4SMA350CA	A350	A350	299.30	332.50	367.50	1	482.0	0.83	1	
P4SMA380A	P4SMA380CA	A380	A380	324.90	361.00	399.00	1	524.4	0.76	1	
P4SMA400A	P4SMA400CA	A400	A400	342.00	380.00	420.00	1	552.0	0.72	1	
P4SMA440A	P4SMA440CA	A440	A440	376.20	418.00	462.00	1	607.2	0.66	1	
P4SMA500A	P4SMA500CA	A500	A500	427.50	475.00	525.00	1	690.0	0.58	1	
P4SMA520A	P4SMA520CA	A520	A520	444.60	494.00	546.00	1	717.6	0.56	1	
P4SMA550A	P4SMA550CA	A550	A550	470.30	522.50	577.50	1	759.0	0.53	1	
P4SMA600A	P4SMA600CA	A600	A600	513.00	570.00	630.00	1	828.0	0.48	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

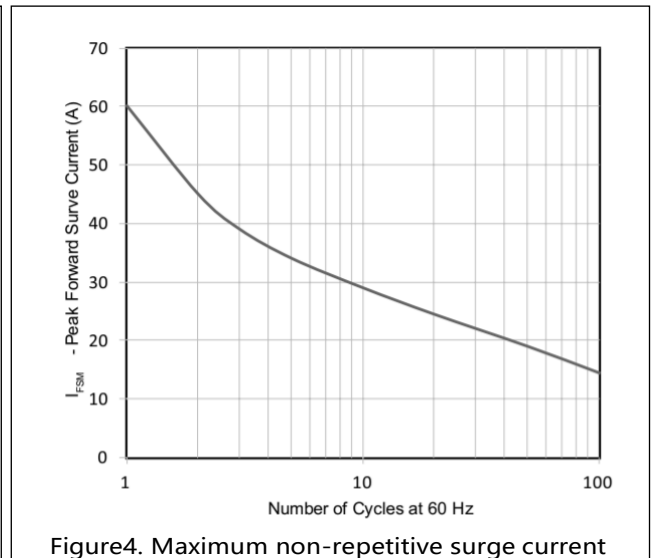
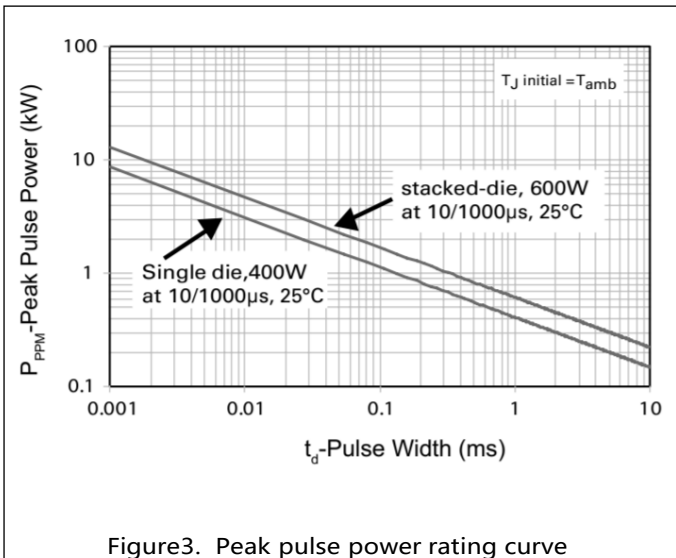
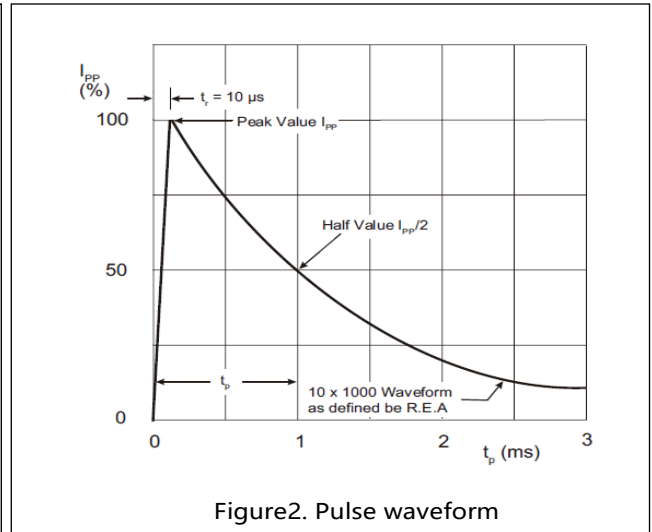
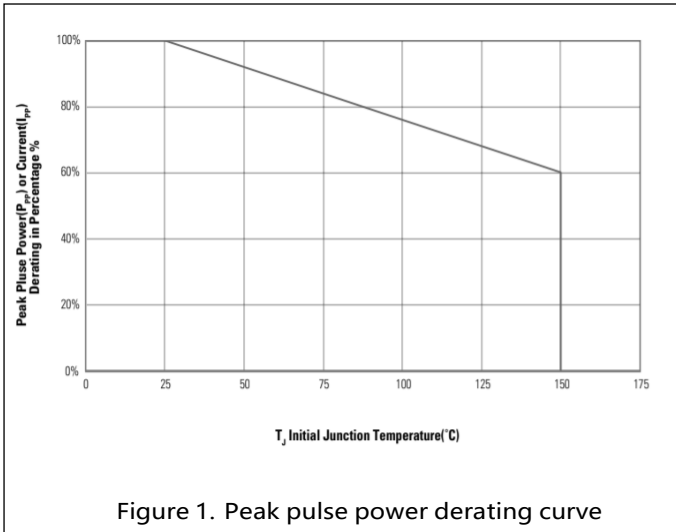
$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current ( $I_T$ )

$V_C$  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

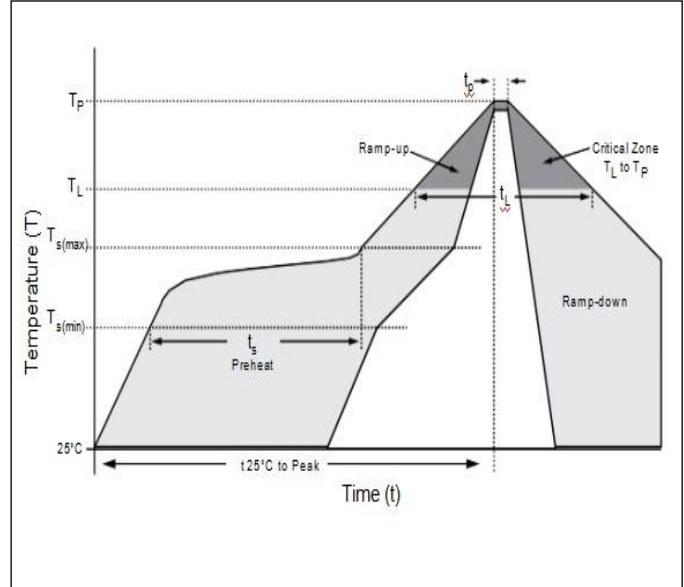
**Ratings and Characteristic Curves (T = 25°C unless otherwise noted)**



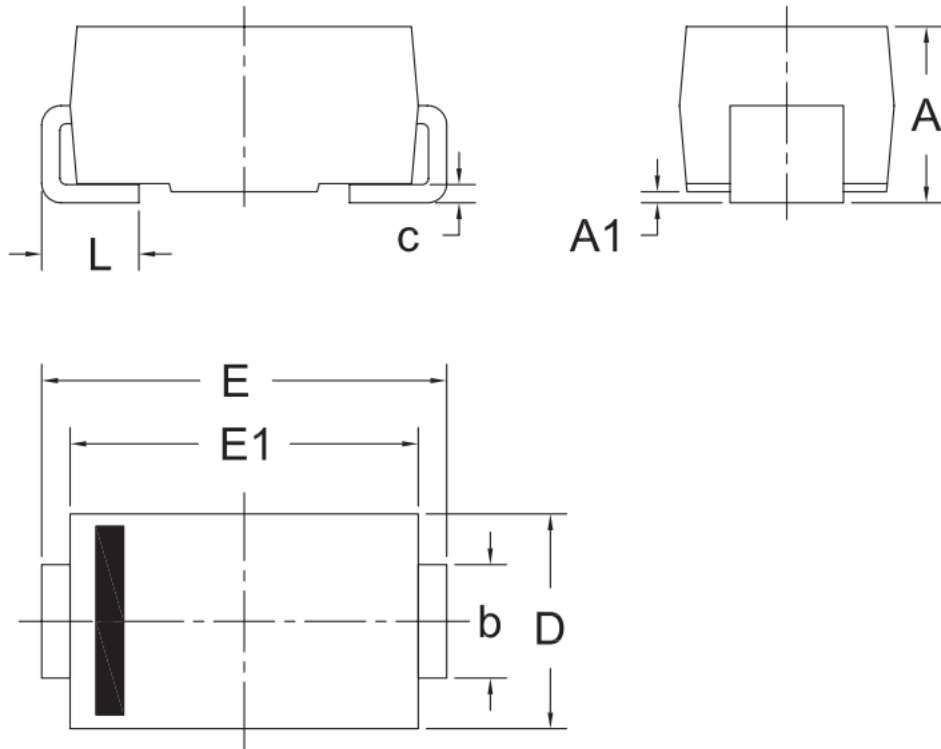
### Soldering Parameters

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 <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

### Soldering profile



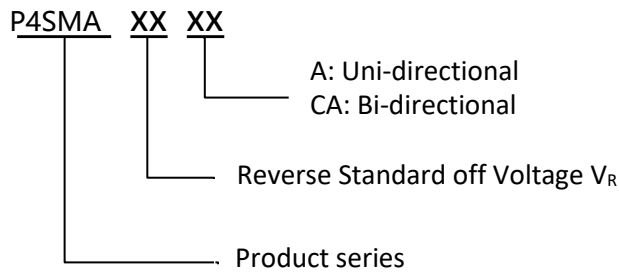
Dimensions



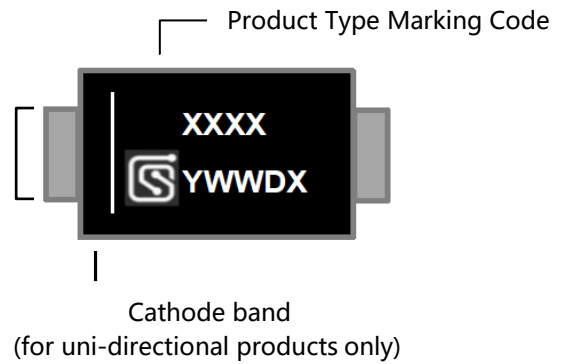
UNIT	A	A1	b	c	D	E	E1	L	
mm	Max	2.45	0.20	1.65	0.25	2.85	5.25	4.55	1.55
	Min	1.95	0.10	1.35	0.15	2.55	4.75	4.25	0.85

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

Part Numbering



Part Marking

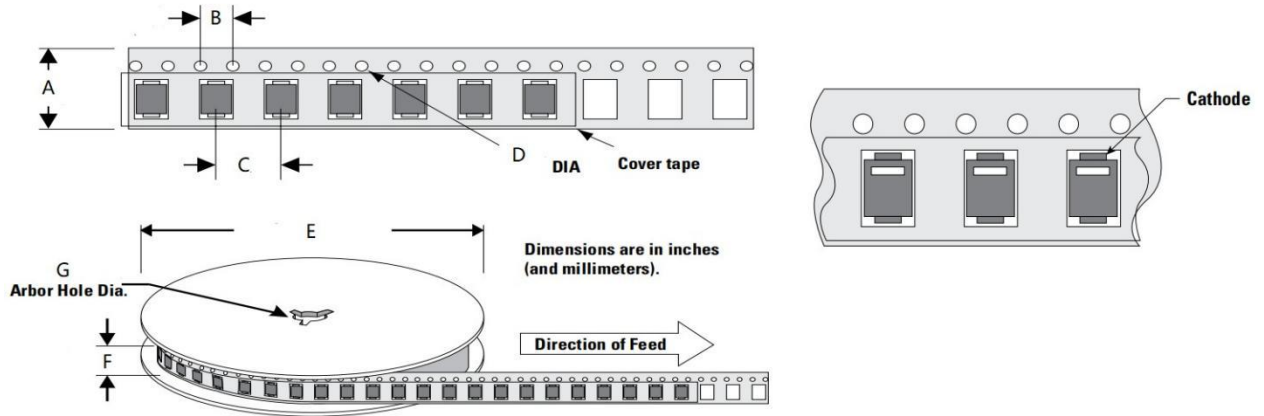


Packing

Part number	Package name	Small packing quantity	Packing method
P4MAXXXX	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-July-2020

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