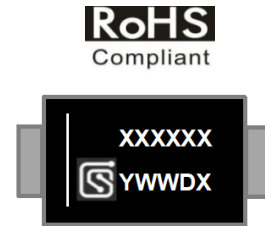


**Features**

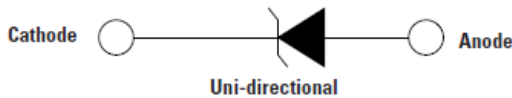
- Same power as standard SMB devices (600 W)
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- Typical failure mode is a short circuit condition for current events exceeding component rating
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- High reliability application and automotive grade AEC-Q101 qualified



**Applications**

TVS devices are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable 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>	600	W
Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C	P <sub>D</sub>	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>	-65 to 150	°C
Storage Temperature Range	T <sub>STG</sub>	-65 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending

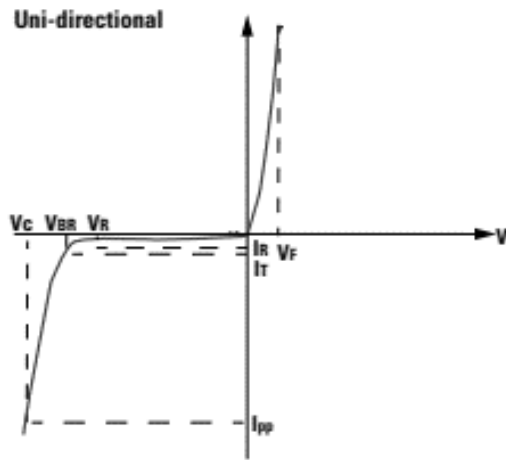
**Notes:**

- Mounted on 5.0x5.0mm copper pad to each terminal.
- Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only

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

Part Number (Uni)	Marking Code	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 
			MIN	MAX					
TPSMA6L5.0A	A6005	5.0	6.40	7.00	10	9.2	65.3	800	
TPSMA6L6.0A	A6006	6.0	6.67	7.37	10	10.3	58.3	800	
TPSMA6L6.5A	A606F	6.5	7.22	7.98	10	11.2	53.6	500	
TPSMA6L7.0A	A6007	7.0	7.78	8.60	10	12.0	50.0	200	
TPSMA6L7.5A	A607F	7.5	8.33	9.21	1	12.9	46.6	100	
TPSMA6L8.0A	A6008	8.0	8.89	9.83	1	13.6	44.2	50	
TPSMA6L8.5A	A608F	8.5	9.44	10.40	1	14.4	41.7	20	
TPSMA6L9.0A	A6009	9.0	10.00	11.10	1	15.4	39.0	10	
TPSMA6L10A	A6010	10.0	11.10	12.30	1	17.0	35.3	5	
TPSMA6L11A	A6011	11.0	12.20	13.50	1	18.2	33.0	1	
TPSMA6L12A	A6012	12.0	13.30	14.70	1	19.9	30.2	1	
TPSMA6L13A	A6013	13.0	14.40	15.90	1	21.5	28.0	1	
TPSMA6L14A	A6014	14.0	15.60	17.20	1	23.2	25.9	1	
TPSMA6L15A	A6015	15.0	16.70	18.50	1	24.4	24.6	1	
TPSMA6L16A	A6016	16.0	17.80	19.70	1	26.0	23.1	1	
TPSMA6L17A	A6017	17.0	18.90	20.90	1	27.6	21.8	1	
TPSMA6L18A	A6018	18.0	20.00	22.10	1	29.2	20.6	1	
TPSMA6L20A	A6020	20.0	22.20	24.50	1	32.4	18.6	1	
TPSMA6L22A	A6022	22.0	24.40	26.90	1	35.5	16.9	1	
TPSMA6L24A	A6024	24.0	26.70	29.50	1	38.9	15.5	1	
TPSMA6L26A	A6026	26.0	28.90	31.90	1	42.1	14.3	1	
TPSMA6L28A	A6028	28.0	31.10	34.40	1	45.4	13.3	1	
TPSMA6L30A	A6030	30.0	33.30	36.80	1	48.4	12.4	1	
TPSMA6L33A	A6033	33.0	36.70	40.60	1	53.3	11.3	1	
TPSMA6L36A	A6036	36.0	40.00	44.20	1	58.1	10.4	1	
TPSMA6L40A	A6040	40.0	44.40	49.10	1	64.5	9.3	1	
TPSMA6L43A	A6043	43.0	47.80	52.80	1	69.4	8.7	1	
TPSMA6L45A	A6045	45.0	50.00	55.30	1	72.7	8.3	1	
TPSMA6L48A	A6048	48.0	53.30	58.90	1	77.4	7.8	1	
TPSMA6L51A	A6051	51.0	56.70	62.70	1	82.4	7.3	1	
TPSMA6L54A	A6054	54.0	60.00	66.30	1	87.1	6.9	1	
TPSMA6L58A	A6058	58.0	64.40	71.20	1	93.6	6.5	1	
TPSMA6L60A	A6060	60.0	66.70	73.70	1	96.8	6.2	1	
TPSMA6L64A	A6064	64.0	71.10	78.60	1	103.0	5.9	1	
TPSMA6L70A	A6070	70.0	77.80	86.00	1	113.0	5.3	1	
TPSMA6L75A	A6075	75.0	83.30	92.10	1	121.0	5.0	1	
TPSMA6L78A	A6078	78.0	86.70	95.80	1	126.0	4.8	1	
TPSMA6L85A	A6085	85.0	94.40	104.00	1	137.0	4.4	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 through 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)**

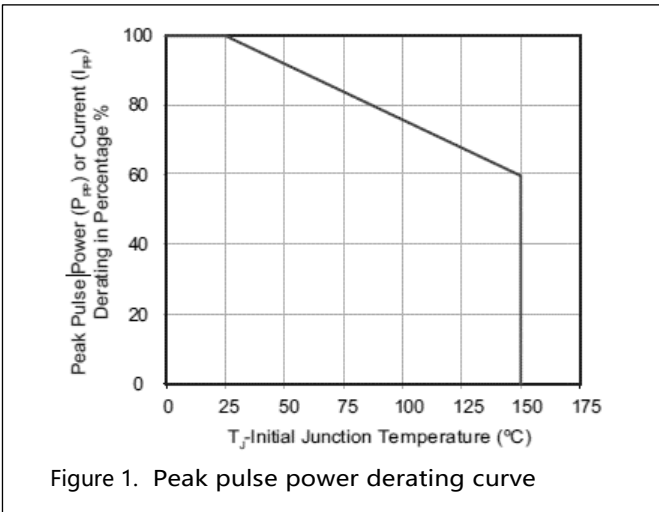


Figure 1. Peak pulse power derating curve

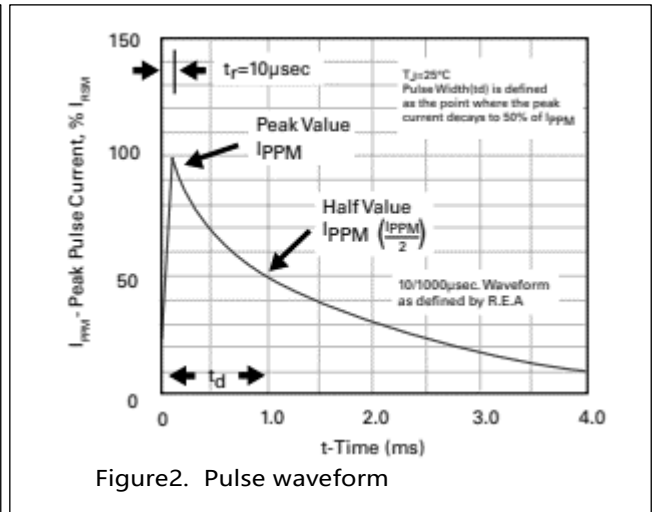


Figure 2. Pulse waveform

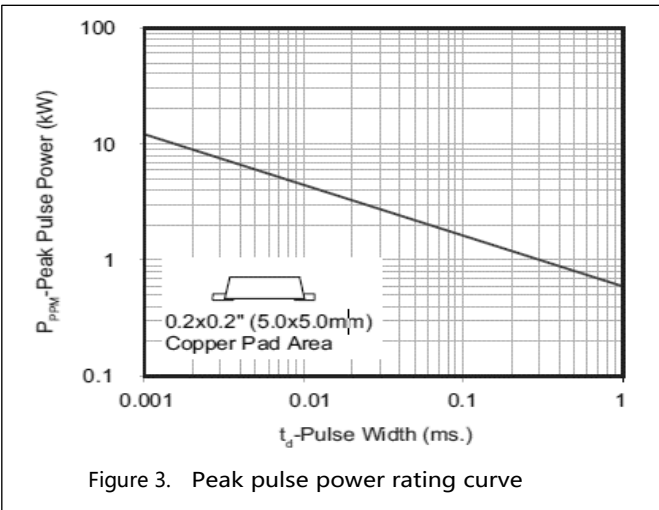


Figure 3. Peak pulse power rating curve

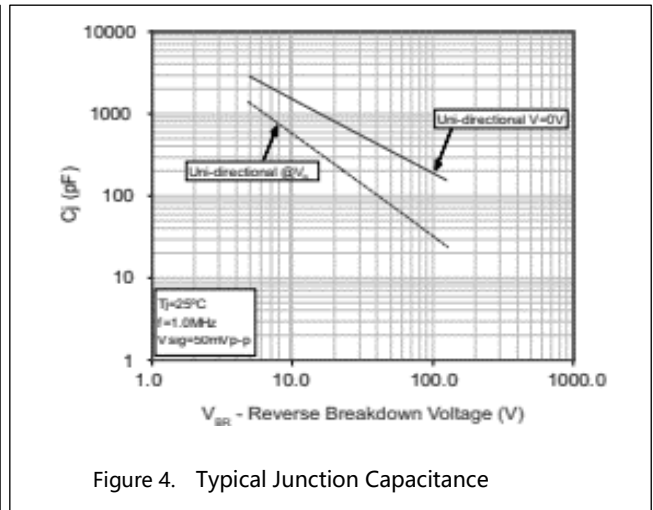
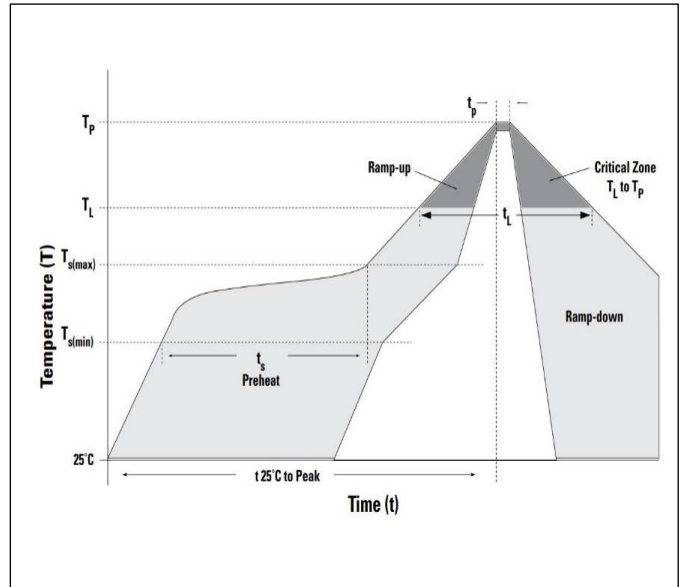


Figure 4. Typical Junction Capacitance

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 – 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 ( $t_p$ )		30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_p$ )		8 minutes Max.
Do not exceed		280°C

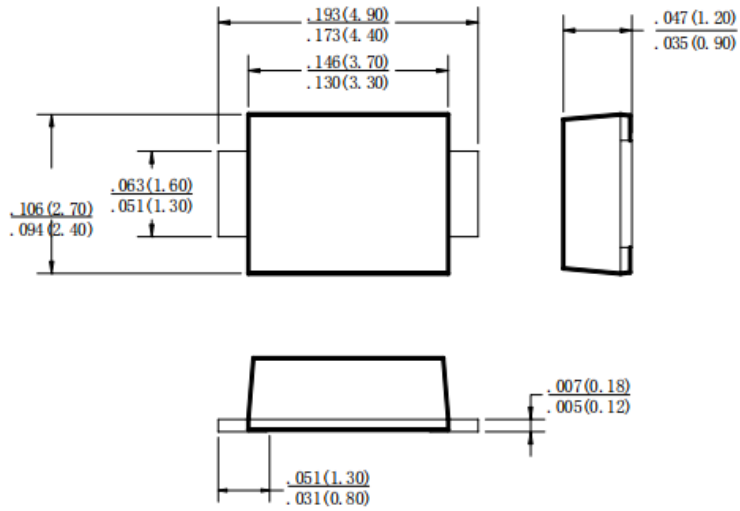


Dimensions

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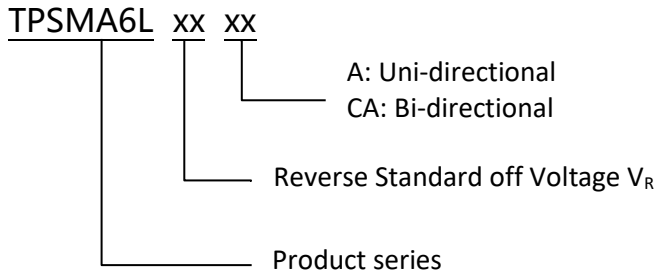
**SMAF Package Outline Dimensions**

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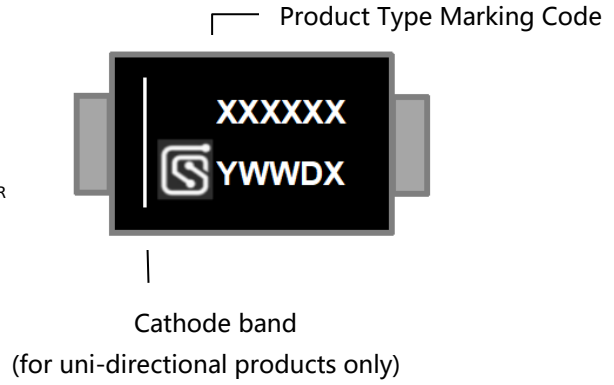


Dimensions in inches and (millimeters)

Part Numbering



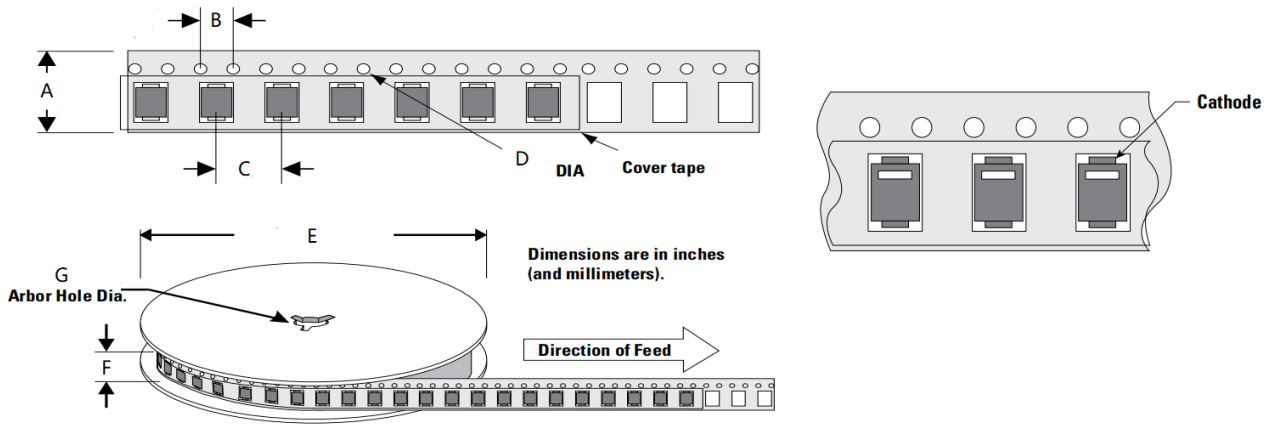
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
TPSMA6LXXXX	SMAF	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