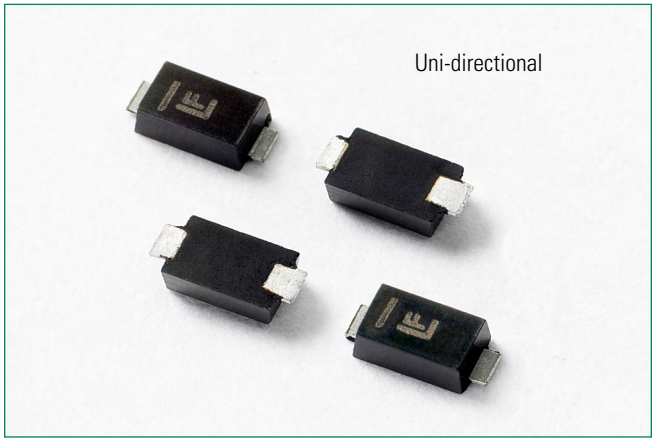
TPSMA6L-E Series

Surface Mount – 600 W

AUTOMOTIVE GRADE RoHS



Description

Littelfuse TPSMA6L-E Series of Transient Voltage Suppression (TVS) Diodes can provide secondary transient voltage protection from transients induced by load dump and other transient voltage events for sensitive electronics. The TPSMA6L-E Series offers superior electrical performance in a small footprint SOD128 package, allowing designers to upgrade their circuit protection without altering their existing design footprint or provide more robust protection in new circuit layouts.

Features

- Top-glass technology for enhanced reliability TVS
- Low profile package (SOD128)
- Ideal for automated placement
- 600 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01%
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Available in uni-directional
- Solder dip 260 °C, 10s
- AEC-Q101 qualified and PPAP capable
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Meets MSL level 1, per J-ED-020, LF maximum peak of 260 °C
- Manufactured Front-End in Spain and Back-End in Thailand, these products support reliable global production scalability and long-term supply chain resiliency.

Applications

Designed to use in the harsh automotive environments for low voltage high frequency inverters, freewheeling, DC-to-DC electronic application.

Agency Approvals

Agency	Agency File Number
	E230531

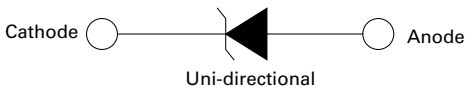
Maximum Ratings and Thermal Characteristics

(T_A=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with 10/1000 µs exponential pulse	P_{PPM}	600	W
Peak Forward Surge Current 8.3 ms. (Jedec Method) (Note 1)	I_{FSM}	100	A
Max. Forward Voltage Drop at I_F = 25 A	V_F	3.5	V
Operating Junction Temperature Range	T_J	-65 to 185	°C
Storage Temperature Range	T_{STG}	-65 to 185	°C
Typical Thermal Resistance Junction to Lead	$R_{th\ (j-l)}$	20	°C/W

Notes:
1. Mounted on 0.31 x 0.31" (8.0 x 8.0 mm) copper pads to each terminal

Functional Diagram



Physical Specifications

Weight	0.0180 grams
Case	SOD-128. Epoxy meets UL 94V-0 flammability rating.
Polarity	Color band denotes cathode end.
Terminal	Matte tin plated leads, solderable per MIL-ED-750 Method 2026, J-ED-002 and JESD22-B102. Meets JESD 201 class 1A whisker test.

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Electrical Characteristics (T_A=25 °C unless otherwise noted)

Part Number	Marking Code	Maximum Reverse Leakage Current I_{RM} at V_{RM}		Breakdown Voltage V_{BR} at I_R (V) (1)				Max. Clamping Voltage V_{CL} at I_{PP} max. 1ms. Expo.		Agency Approval
		(µA)	(V)	Min.	Nom.	Max.	(mA)	(V)	(A)	
TPSMA6L5.0A-E	0A	500	5.0	6.40	6.70	7.00	10	9.0	65.2	X
TPSMA6L6.0A-E	0B	250	6.0	6.67	7.02	7.37	10	10.3	58.3	X
TPSMA6L6.5A-E	0C	250	6.5	7.22	7.60	7.98	10	11.2	53.6	X
TPSMA6L7.0A-E	0D	100	7.0	7.78	8.20	8.60	1	12.0	50.0	X
TPSMA6L7.5A-E	0E	50	7.5	8.33	8.77	9.21	1	12.9	46.5	X
TPSMA6L8.0A-E	0F	25	8.0	8.89	9.36	9.83	1	13.6	44.1	X
TPSMA6L8.5A-E	0G	10	8.5	9.44	9.92	10.40	1	14.4	41.7	X
TPSMA6L9.0A-E	0H	1	9.0	10.00	10.55	11.10	10	15.4	39.0	X
TPSMA6L10A-E	0I	1	10.0	11.10	11.70	12.30	10	17.0	35.3	X
TPSMA6L11A-E	0J	1	11.0	12.20	12.85	13.50	10	18.2	33.0	X
TPSMA6L12A-E	0K	1	12.0	13.30	14.00	14.70	10	19.9	30.2	X
TPSMA6L13A-E	0L	0.5	13.0	14.40	15.15	15.90	1	21.5	27.5	X
TPSMA6L14A-E	0M	0.5	14.0	15.60	16.40	17.20	1	23.2	27.9	X
TPSMA6L15A-E	0N	0.5	15.0	16.70	17.60	18.50	1	24.4	24.6	X
TPSMA6L16A-E	0O	0.5	16.0	17.80	18.75	19.70	1	26.0	23.1	X
TPSMA6L17A-E	0P	0.5	17.0	18.90	19.90	20.90	1	27.6	21.7	X
TPSMA6L18A-E	0Q	0.5	18.0	20.00	21.00	22.10	1	29.2	20.5	X
TPSMA6L20A-E	0R	0.5	20.0	22.20	23.35	24.50	1	32.4	18.5	X
TPSMA6L22A-E	0S	0.5	22.0	24.40	25.60	26.90	1	35.5	16.9	X
TPSMA6L24A-E	0T	0.5	24.0	26.70	28.10	29.50	1	38.9	15.4	X
TPSMA6L26A-E	0U	0.5	26.0	28.90	30.40	31.90	1	42.1	14.2	X
TPSMA6L28A-E	0X	0.5	28.0	31.10	32.80	34.40	1	45.4	13.2	X
TPSMA6L30A-E	0Y	0.5	30.0	33.30	35.10	36.80	1	48.4	12.4	X
TPSMA6L33A-E	0Z	0.5	33.0	36.70	38.70	40.60	1	53.3	11.3	X
TPSMA6L36A-E	9E	0.5	36.0	40.00	42.10	44.21	1	58.1	10.3	X
TPSMA6L40A-E	9F	0.5	40.0	44.40	46.80	49.10	1	64.5	9.3	X
TPSMA6L43A-E	9G	0.5	43.0	47.80	50.30	52.80	1	69.4	8.6	X
TPSMA6L45A-E	9H	0.5	45.0	50.00	52.65	55.30	1	72.7	8.3	X
TPSMA6L48A-E	9I	0.5	48.0	53.30	56.10	58.90	1	77.4	7.8	X
TPSMA6L51A-E	9J	0.5	51.0	56.70	59.70	62.70	1	82.4	7.3	X
TPSMA6L54A-E	9K	0.5	54.0	60.00	63.15	66.30	1	87.1	6.9	X
TPSMA6L58A-E	9L	0.5	58.0	64.40	67.80	71.20	1	93.6	6.4	X
TPSMA6L60A-E	9M	0.5	60.0	66.70	70.20	73.70	1	96.8	6.2	X
TPSMA6L64A-E	9N	0.5	64.0	71.10	74.85	78.60	1	103.0	5.8	X

Notes:
1. Tested with pulses Pulse test: tp ≤ 50 ms; δ < 2%

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

Figure 1 - Pulse Waveform

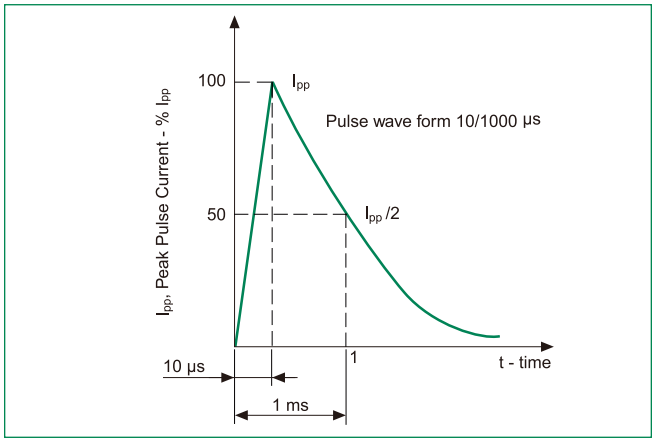


Figure 2 - Pulse Power or Current vs. Initial Junction Temperature

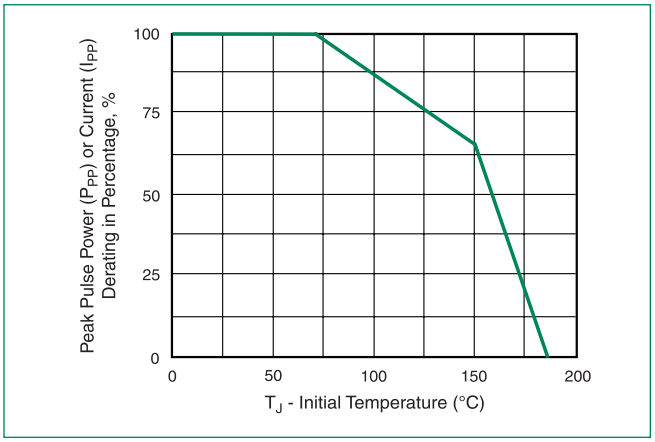


Figure 3 - Peak Pulse Power Rating Curve

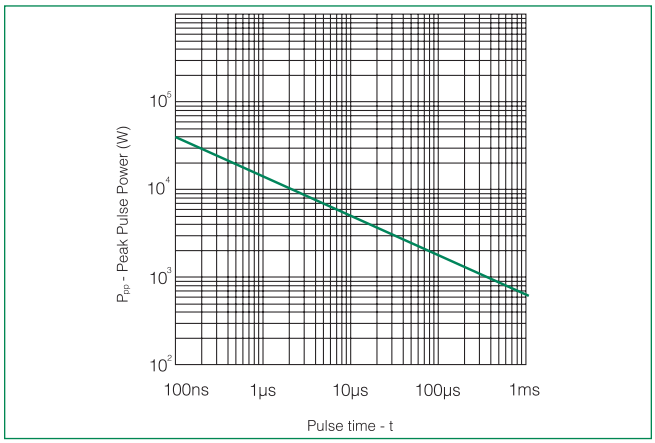
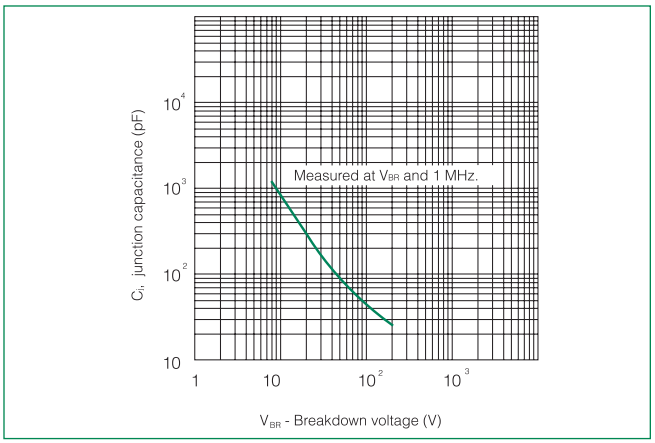
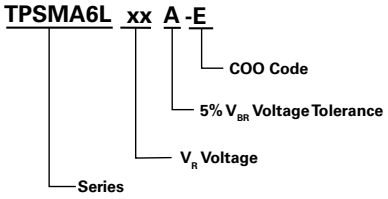


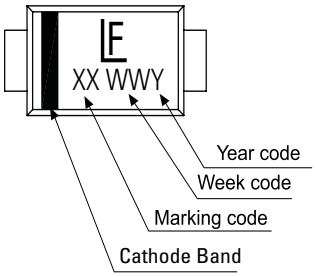
Figure 4 - Typical Junction Capacitance



Part Numbering System



Part Marking System



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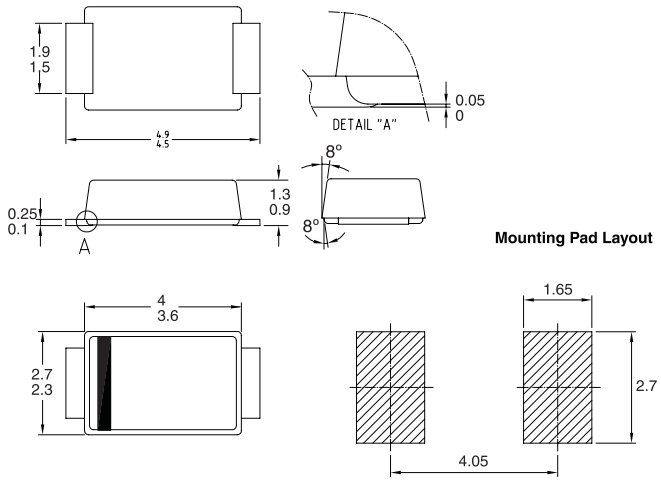
Dimensions - SOD128 Package



Packaging Options

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
TPSMA6LxxX-E	SOD-128	10000	13" diameter tape and reel	EIA RS-481

Tape and Reel Specification