

TPSMF4L-E Series

Surface Mount – 400 W



Agency Approvals

Agency	Agency File Number
	E230531

Maximum Ratings and Thermal Characteristics

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with 10/1000 μs exponential pulse	P_{PPM}	400	W
Peak Forward Surge Current 8.3 ms. (Jedec Method) (Note 1)	I_{FSM}	40	A
Max. Forward Voltage Drop at $I_F = 25\text{ A}$	V_F	3.5	V
Operating Temperature Range	T_J	$V_{BR} \leq 43\text{ V}$	-65 to 175 $^\circ\text{C}$
		$V_{BR} > 43\text{ V}$	-65 to 150 $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to 175	$^\circ\text{C}$
Typical Thermal Resistance Junction to Ambient Air	$R_{th(j-a)}$	75	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Lead	$R_{th(j-l)}$	15	$^\circ\text{C/W}$

Notes:

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

Functional Diagram



Description

The TPSMF4L-E series in SOD-123FL flat lead low-profile package is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events, and it's especially suitable for automotive application.

Features

- Low profile package (SOD-123FL)
- Ideal for automated placement
- 400 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
- Solder dip 260 $^\circ\text{C}$, 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 $^\circ\text{C}$
- Manufactured outside China and Taiwan

Applications

Designed to protect sensitive electronic components from voltage transients caused by inductive load switching and lightning. Suitable for use in ICs, MOSFETs, and signal lines of sensor units across consumer electronics, computing, industrial, automotive, and telecommunications applications.

Physical Specifications

Weight	0.0165 grams
Case	SOD-123FL. Epoxy meets UL 94V-0 flammability rating.
Polarity	For unidirectional types color band denotes cathode end.
Terminal	Matte tin plated leads, solderable per MILSTD-750 Method 2026, J-ED-002 and JESD22-B102. Meets JESD 201 class 1A whisker test.

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Electrical Characteristics ($T_A=25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Part Number	Marking Code	Breakdown Voltage V_{BR} (Volts) @ $I_T^{(1)}$		Test Current I_T (mA)	Stand-off Voltage V_{WM} (V)	Maximum Reverse Leakage @ V_{WM} I_D (μA) ⁽¹⁾	Maximum Peak Surge Current I_{PPM} (A) ⁽²⁾	Maximum Clamping Voltage @ I_{PPM} V_C (V)	Agency Approval 
		Min	Max						
TPSMF4L5.0A-E	AA	6.40	7.07	10	5.0	1000	43.5	9.2	X
TPSMF4L6.0A-E	AB	6.67	7.37	10	6.0	1000	38.8	10.3	X
TPSMF4L6.5A-E	AC	7.22	7.98	10	6.5	500	35.7	11.2	X
TPSMF4L7.0A-E	AD	7.78	8.60	10	7.0	200	33.3	12.0	X
TPSMF4L7.5A-E	AE	8.33	9.21	1.0	7.5	100	31.0	12.9	X
TPSMF4L8.0A-E	AF	8.89	9.83	1.0	8.0	50	29.4	13.6	X
TPSMF4L8.5A-E	AG	9.44	10.40	1.0	8.5	20	27.8	14.4	X
TPSMF4L9.0A-E	AH	10.00	11.10	1.0	9.0	10	26.0	15.4	X
TPSMF4L10A-E	AI	11.10	12.30	1.0	10	5.0	23.5	17.0	X
TPSMF4L11A-E	AJ	12.20	13.50	1.0	11	5.0	22.0	18.2	X
TPSMF4L12A-E	AK	13.30	14.70	1.0	12	5.0	20.1	19.9	X
TPSMF4L13A-E	AL	14.40	15.90	1.0	13	1.0	18.6	21.5	X
TPSMF4L14A-E	AM	15.60	17.20	1.0	14	1.0	17.2	23.2	X
TPSMF4L15A-E	AN	16.70	18.50	1.0	15	1.0	16.4	24.4	X
TPSMF4L16A-E	AO	17.80	19.70	1.0	16	1.0	15.4	26.0	X
TPSMF4L17A-E	AP	18.90	20.90	1.0	17	1.0	14.5	27.6	X
TPSMF4L18A-E	AQ	20.00	22.10	1.0	18	1.0	13.7	29.2	X
TPSMF4L20A-E	AR	22.20	24.50	1.0	20	1.0	12.3	32.4	X
TPSMF4L22A-E	AS	24.40	26.90	1.0	22	1.0	11.0	35.5	X
TPSMF4L24A-E	AT	26.70	29.50	1.0	24	1.0	10.3	38.9	X
TPSMF4L26A-E	AU	28.90	31.90	1.0	26	1.0	9.5	42.1	X
TPSMF4L28A-E	AV	31.10	34.40	1.0	28	1.0	8.8	45.4	X
TPSMF4L30A-E	AW	33.30	36.80	1.0	30	1.0	8.3	48.4	X
TPSMF4L33A-E	AX	36.70	40.60	1.0	33	1.0	7.5	53.3	X
TPSMF4L36A-E	AY	40.00	44.20	1.0	36	1.0	6.9	58.1	X
TPSMF4L40A-E	AZ	44.40	49.10	1.0	40	1.0	6.2	64.5	X
TPSMF4L43A-E	A1	47.80	52.80	1.0	43	1.0	5.8	69.4	X
TPSMF4L45A-E	A2	50.00	55.30	1.0	45	1.0	5.5	72.7	X
TPSMF4L48A-E	A3	53.30	58.90	1.0	48	1.0	5.2	77.4	X
TPSMF4L51A-E	A4	56.70	62.70	1.0	51	1.0	4.9	82.4	X
TPSMF4L54A-E	A5	60.00	66.30	1.0	54	1.0	4.6	87.1	X
TPSMF4L58A-E	A6	64.40	71.20	1.0	58	1.0	4.3	93.6	X
TPSMF4L60A-E	A7	66.70	73.70	1.0	60	1.0	4.1	96.8	X
TPSMF4L64A-E	A8	71.10	78.60	1.0	64	1.0	3.9	103.0	X

Notes:

1. Tested with pulses Pulse test: $t_p \leq 50\text{ ms}$; $\delta < 2\%$
2. Exponential pulse waveform 10/1000 μs

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Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1 - Pulse Waveform

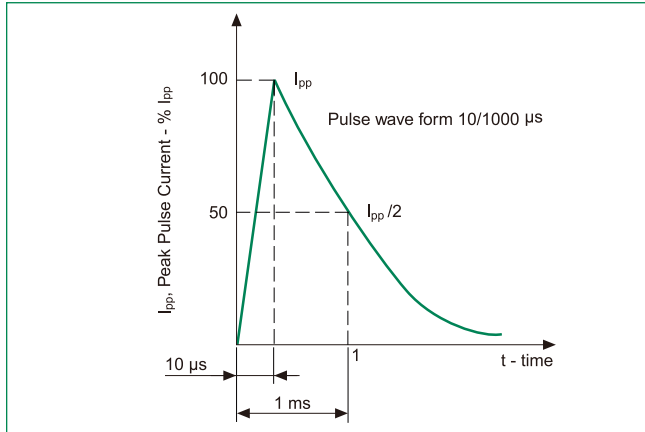


Figure 2 - Pulse Power or Current vs. Initial Junction Temperature

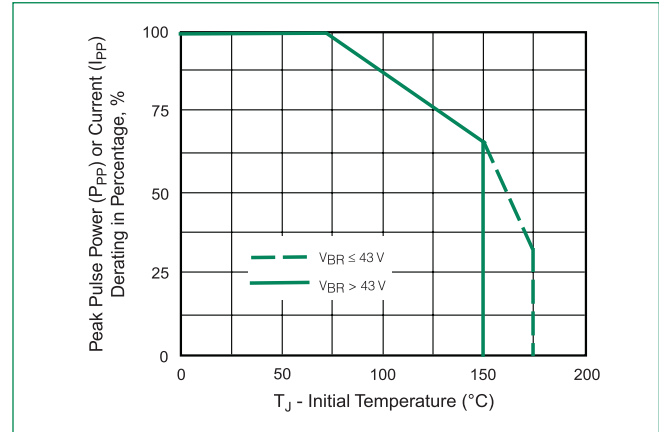


Figure 3 - Peak Pulse Power Rating Curve

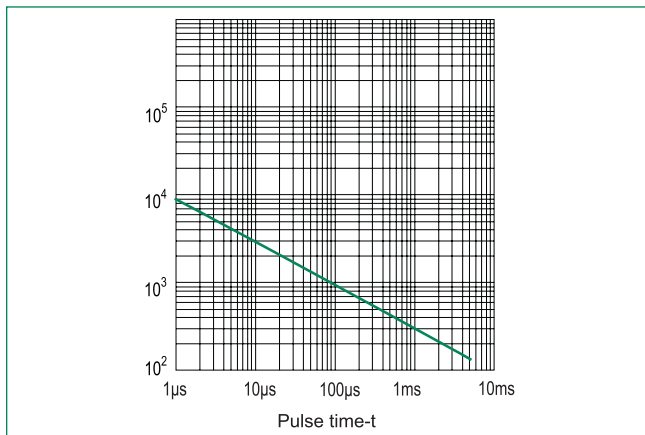
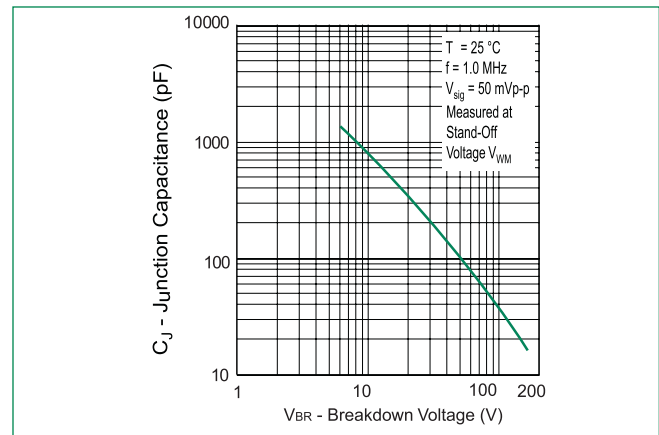
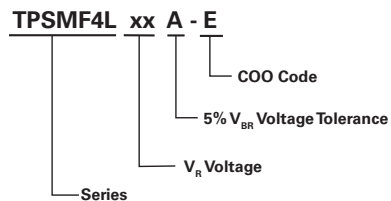


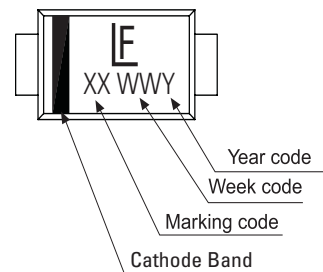
Figure 4 - Typical Junction Capacitance



Part Numbering System



Part Marking System



Part number	Component Package	Quantity	Packaging Option	Packaging Specification
TPSMF4LxxX-E	SOD-123FL	10000	13" diameter tape and reel	EIA RS-481

0.157 (4.0)

0.31 (8.0)

0.157 (4.0)

0.059 (1.5) DIA

Cover tape

13" 13.0 (330)

0.52 (13.3) Arbor Hole Dia.

0.37 (9.5)

Direction of Feed

Label

Cathode

Dimensions are in inches (and millimeters).



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Specifications are subject to change without notice.
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