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TPSMF4L Series

Power Transient Voltage Suppressor

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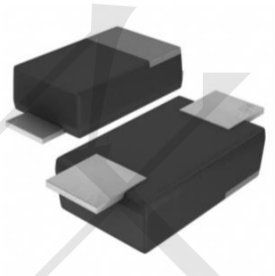
Features

- 400 watts Peak Pulse Power (10/1000μs)
- Unidirectional and Bidirectional Protection
- Fast Response Time : Typically < 1ns
- Excellent Clamping Capability
- Built-in Strain relief
- Low inductance
- Low profile package
- IEC 61000-4-2 (ESD) ±30kV(air), ±30kV(contact)
- MSL: Level 1



SOD-123FL

Mechanical Characteristics

- SOD-123FL package
- Matte tin lead – free plated
- Marking: Marking Code
- RoHS Compliant

Applications

- I/O Interfaces
- Power lines
- Telecommunication
- Industrial Electronics
- Consumer Electronics

Absolute Maximum Rating

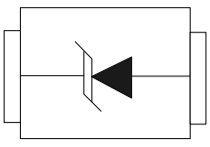
Rating	Symbol	Value	Units
Peak Pulse Power (tp =10/1000μs) (see Note1&2)	P_{PPM}	400	Watts
Peak pulse current (10/1000μs) (see Note2)	I_{PPM}	See Electrical Characteristics	A
Peak Forward surge current (see Note3)	I_{FSM}	20	A
Power Dissipation on infinite heat sink T_L = 50 °C (Fig4)	P_D	1.0	W
Operating Junction Temperature range	T_J	-55 to + 150	℃

Note1: Peak Pulse Power Rating as Pulse Width ,per Fig1.

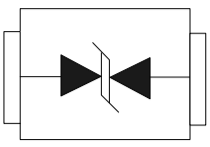
Note2: Peak Pulse Power or Current Derated above T_A=25℃ Per Fig. 2 and Non-Repetitive Current Pulse,Per Fig.3.

Note3: 8.3ms Single Half Sine Wave or Equivalent Square Wave unidirectional device only.

Pin Configuration



Unidirectional



Bidirectional

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Electrical Characteristics

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage V_{BR}@I_T (Volts)		Test Current I_T (mA)	Maximum Clamping Voltage V_C@I_{PP} (Volts)	Maximum Peak Pulse Current I_{pp} (Amps)	Maximum Reverse Leakage I_R@V_{RWM} (μA)
UNI-POLAR	BI-POLAR		MIN	MAX				
TPSMF4L5.0A	TPSMF4L5.0CA	5.0	6.4	7.0	10	9.2	43.5	400
TPSMF4L6.0A	TPSMF4L6.0CA	6.0	6.67	7.37	10	10.3	38.8	400
TPSMF4L6.5A	TPSMF4L6.5CA	6.5	7.22	7.98	10	11.2	35.7	250
TPSMF4L7.0A	TPSMF4L7.0CA	7.0	7.78	8.6	10	12	33.3	100
TPSMF4L7.5A	TPSMF4L7.5CA	7.5	8.33	9.21	1	12.9	31.0	50
TPSMF4L8.0A	TPSMF4L8.0CA	8.0	8.89	9.83	1	13.6	29.4	25
TPSMF4L8.5A	TPSMF4L8.5CA	8.5	9.44	10.4	1	14.4	27.8	10
TPSMF4L9.0A	TPSMF4L9.0CA	9.0	10.0	11.1	1	15.4	26.0	5
TPSMF4L10A	TPSMF4L10CA	10	11.1	12.3	1	17	23.5	2.5
TPSMF4L11A	TPSMF4L11CA	11	12.2	13.5	1	18.2	22.0	2.5
TPSMF4L12A	TPSMF4L12CA	12	13.3	14.7	1	19.9	20.1	2.5
TPSMF4L13A	TPSMF4L13CA	13	14.4	15.9	1	21.5	18.6	1
TPSMF4L14A	TPSMF4L14CA	14	15.6	17.2	1	23.2	17.2	1
TPSMF4L15A	TPSMF4L15CA	15	16.7	18.5	1	24.4	16.4	1
TPSMF4L16A	TPSMF4L16CA	16	17.8	19.7	1	26	15.4	1
TPSMF4L17A	TPSMF4L17CA	17	18.9	20.9	1	27.6	14.5	1
TPSMF4L18A	TPSMF4L18CA	18	20.0	22.1	1	29.2	13.7	1
TPSMF4L20A	TPSMF4L20CA	20	22.2	24.5	1	32.4	12.3	1
TPSMF4L22A	TPSMF4L22CA	22	24.4	26.9	1	35.5	11.3	1
TPSMF4L24A	TPSMF4L24CA	24	26.7	29.5	1	38.9	10.3	1
TPSMF4L26A	TPSMF4L26CA	26	28.9	31.9	1	42.1	9.5	1
TPSMF4L28A	TPSMF4L28CA	28	31.1	34.4	1	45.4	8.8	1
TPSMF4L30A	TPSMF4L30CA	30	33.3	36.8	1	48.4	8.3	1
TPSMF4L33A	TPSMF4L33CA	33	36.7	40.6	1	53.3	7.5	1
TPSMF4L36A	TPSMF4L36CA	36	40.0	44.2	1	58.1	6.9	1
TPSMF4L40A	TPSMF4L40CA	40	44.4	49.1	1	64.5	6.2	1
TPSMF4L43A	TPSMF4L43CA	43	47.8	52.8	1	69.4	5.8	1
TPSMF4L45A	TPSMF4L45CA	45	50.0	55.3	1	72.7	5.5	1
TPSMF4L48A	TPSMF4L48CA	48	53.3	58.9	1	77.4	5.2	1
TPSMF4L51A	TPSMF4L51CA	51	56.7	62.7	1	82.4	4.9	1
TPSMF4L54A	TPSMF4L54CA	54	60.0	66.3	1	87.1	4.6	1
TPSMF4L58A	TPSMF4L58CA	58	64.4	71.2	1	93.6	4.3	1

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

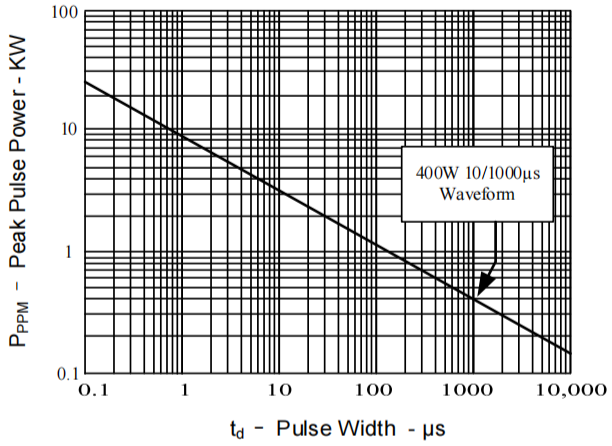


Figure 2: Pulse Derating Curve

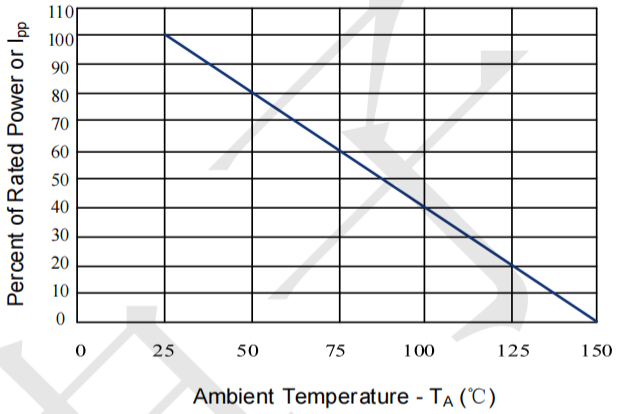


Figure 3: Pulse Waveform

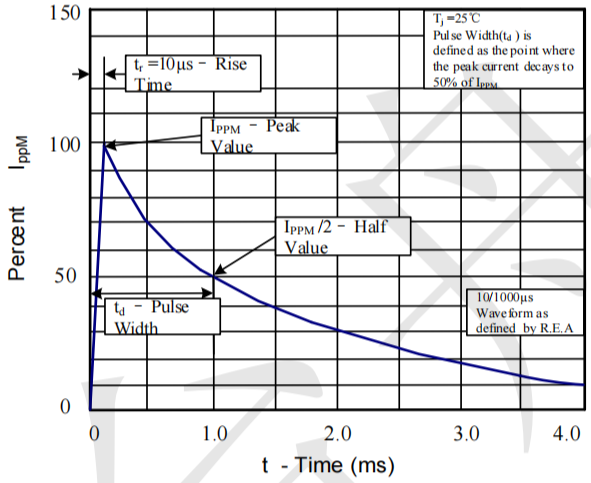


Figure 4: Steady State Power Dissipation Derating Curve

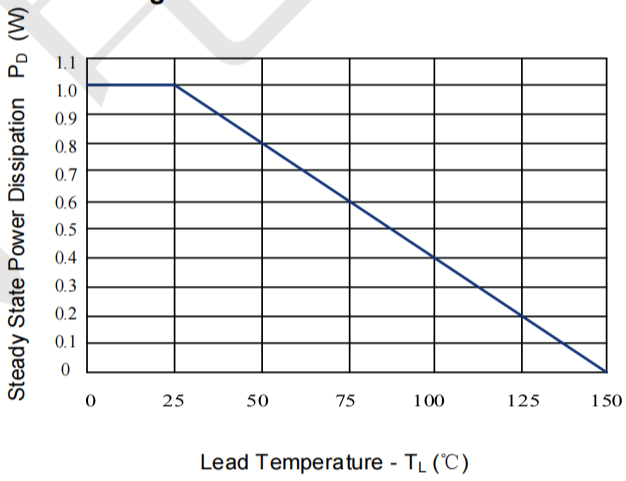
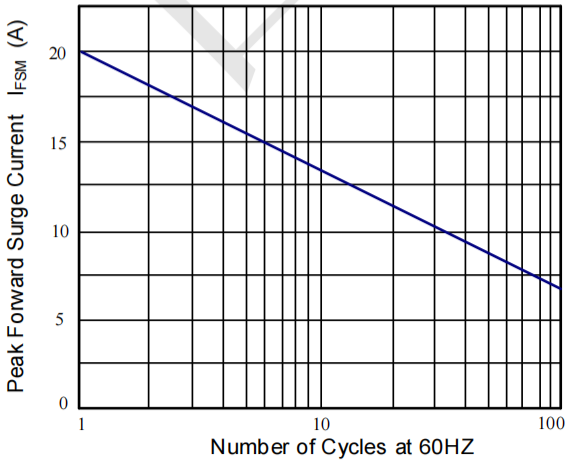


Figure 5: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



Note: The above typical parameters or typical characteristics are only indicative and do not make specific guarantees. If detailed values are required, additional communication and provision are required.

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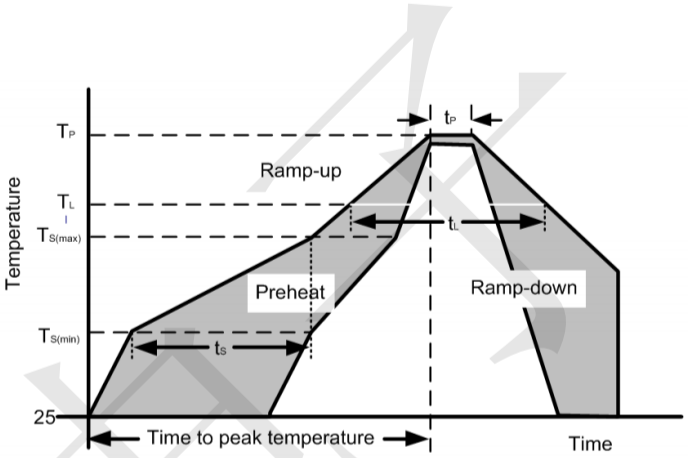
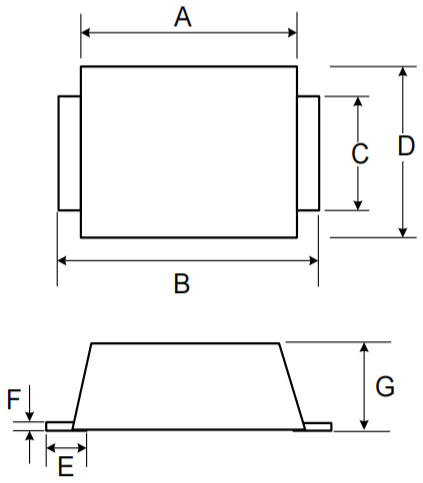
Soldering Parameters

Reflow Condition		
Pre-Heat	Temperature min ($T_{s(min)}$)	150°C
	Temperature max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60-190 s
Average ramp up rate (Liquidus Temp) (T_L) to peak		3°C/s max
Ts(max) to TL - Ramp-up Rate		3°C/s max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60-150 s
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within actual peak Temperature (t_p)		20-40 s
Ramp-down Rate		5°C/s max
Time 25°C to peak Temperature (T_P)		8 minutes max
Do not exceed		260°C

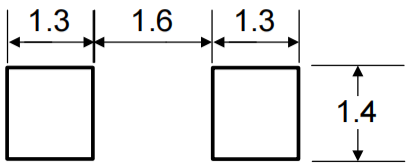


Outline Drawing – SOD-123FL

Ref.（mm）	Millimeters	
	Min.	Max.
A	2.50	2.95
B	3.40	3.95
C	0.70	1.10
D	1.50	1.90
E	0.45	0.95
F	0.05	0.26
G	0.90	1.35



Recommended Solder Pad Layout



Dimensions in mm