

DESCRIPTION

The SMF4L series of SOD-123FL small and flat lead lowprofile plastic package is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

FEATURES

- > 400W peak pulsepower capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- > Fast response time: typically less than 1.0ns from 0 Volts to V_{BR} min
- > High temperature soldering: 260°C/40 seconds at terminals
- > Low inductance, excellent clamping capability
- > Glass passivated junction
- > For surface mounted applications to optimize board space
- > Plastic package is flammability rated V-0 per Underwriters Laboratories
- > Typical failure mode is short from over-specified voltage or current
- > Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c



APPLICATIONS

SMF4L devices are ideal for the protection of portable devices/hard drives, notebooks, VCC busses, POS terminal, SSDs, power supplies, monitors, and vulnerable circuit used in other consumer applications.

MAXIMUM RATINGS @ 25°C UNLESS OTHERWISE SPECIFIED

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation at 10/1000 μ s waveform (Note1, 2)	PPPM	Minimum 400	Watts
Operating junction and Storage Temperature Range	T_J, T_{STG}	-55~150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	°C/W
Notes: 1. Non-repetitive current pulse. 2. SMF4L5.0~SMF4L9.0A/CA Peak Pulse Power Dissipation is 370W min, 400W typical @10/1000 μ s.			

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C UNLESS OTHERWISE SPECIFIED

PART NUMBER		REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE @IT	TEST CURRENT	MAXIMUM CLAMPING VOLTAGE @I _{PP}	PEAK PULSE CURRENT	REVERSE LEAKAGE @V _{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SMF4L5.0A	SMF4L5.0CA	5.0	6.40~7.00	10.0	9.2	40.1	800
SMF4L6.0A	SMF4L6.0CA	6.0	6.67~7.37	10.0	10.3	35.9	800
SMF4L6.5A	SMF4L6.5CA	6.5	7.22~7.98	10.0	11.2	33.1	500
SMF4L7.0A	SMF4L7.0CA	7.0	7.78~8.60	10.0	12.0	30.9	200
SMF4L7.5A	SMF4L7.5CA	7.5	8.33~9.21	1.0	12.9	28.7	100
SMF4L8.0A	SMF4L8.0CA	8.0	8.89~9.83	1.0	13.6	27.2	50
SMF4L8.5A	SMF4L8.5CA	8.5	9.44~10.40	1.0	14.4	25.7	20
SMF4L9.0A	SMF4L9.0CA	9.0	10.00~11.10	1.0	15.4	24.1	10
SMF4L10A	SMF4L10CA	10.0	11.10~12.30	1.0	17.0	23.5	5
SMF4L11A	SMF4L11CA	11.0	12.20~13.50	1.0	18.2	22.0	1
SMF4L12A	SMF4L12CA	12.0	13.30~14.70	1.0	19.9	20.1	1
SMF4L13A	SMF4L13CA	13.0	14.40~15.90	1.0	21.5	18.6	1



ELECTRICAL CHARACTERISTICS PER LINE@ 25°C UNLESS OTHERWISE SPECIFIED

PART NUMBER		REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE @IT	TEST CURRENT	MAXIMUM CLAMPING VOLTAGE @I _{PP}	PEAK PULSE CURRENT	REVERSE LEAKAGE @V _{RWM}
Unidirectional	Bidirectional	V _{RWM} (V)	V _{BR} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (uA)
SMF4L14A	SMF4L14CA	14.0	15.60~17.20	1.0	23.2	17.2	1
SMF4L15A	SMF4L15CA	15.0	16.70~18.50	1.0	24.4	16.4	1
SMF4L16A	SMF4L16CA	16.0	17.80~19.70	1.0	26.0	15.4	1
SMF4L17A	SMF4L17CA	17.0	18.90~20.90	1.0	27.6	14.5	1
SMF4L18A	SMF4L18CA	18.0	20.00~22.10	1.0	29.2	13.7	1
SMF4L20A	SMF4L20CA	20.0	22.20~24.50	1.0	32.4	12.3	1
SMF4L22A	SMF4L22CA	22.0	24.40~26.90	1.0	35.5	11.3	1
SMF4L24A	SMF4L24CA	24.0	26.70~29.50	1.0	38.9	10.3	1
SMF4L26A	SMF4L26CA	26.0	28.90~31.90	1.0	42.1	9.5	1
SMF4L28A	SMF4L28CA	28.0	31.10~34.40	1.0	45.4	8.8	1
SMF4L30A	SMF4L30CA	30.0	33.30~36.80	1.0	48.4	8.3	1
SMF4L33A	SMF4L33CA	33.0	36.70~40.60	1.0	53.3	7.5	1
SMF4L36A	SMF4L36CA	36.0	40.00~44.20	1.0	58.1	6.9	1
SMF4L40A	SMF4L40CA	40.0	44.40~49.10	1.0	64.5	6.2	1
SMF4L43A	SMF4L43CA	43.0	47.80~52.80	1.0	69.4	5.8	1
SMF4L45A	SMF4L45CA	45.0	50.00~55.30	1.0	72.7	5.5	1
SMF4L48A	SMF4L48CA	48.0	53.30~58.90	1.0	77.4	5.2	1
SMF4L51A	SMF4L51CA	51.0	56.70~62.70	1.0	82.4	4.9	1
SMF4L54A	SMF4L54CA	54.0	60.00~66.30	1.0	87.1	4.6	1
SMF4L58A	SMF4L58CA	58.0	64.40~71.20	1.0	93.6	4.3	1
SMF4L60A	SMF4L60CA	60.0	66.70~73.70	1.0	96.8	4.1	1
SMF4L64A	SMF4L64CA	64.0	71.10~78.60	1.0	103.0	3.9	1
SMF4L70A	SMF4L70CA	70.0	77.80~86.00	1.0	113.0	3.5	1
SMF4L75A	SMF4L75CA	75.0	83.30~92.10	1.0	121.0	3.3	1
SMF4L78A	SMF4L78CA	78.0	86.70~95.80	1.0	126.0	3.2	1
SMF4L85A	SMF4L85CA	85.0	94.40~104.00	1.0	137.0	2.9	1

Notes:

1. V_{BR} measured after I_T applied for 300μs, I_T= square wave pulse or equivalent.
2. Surge current waveform per 10/1000μs exponential wave and derated per Fig.2.
3. All terms and symbols are consistent with ANSI/IEEE C62.35.



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

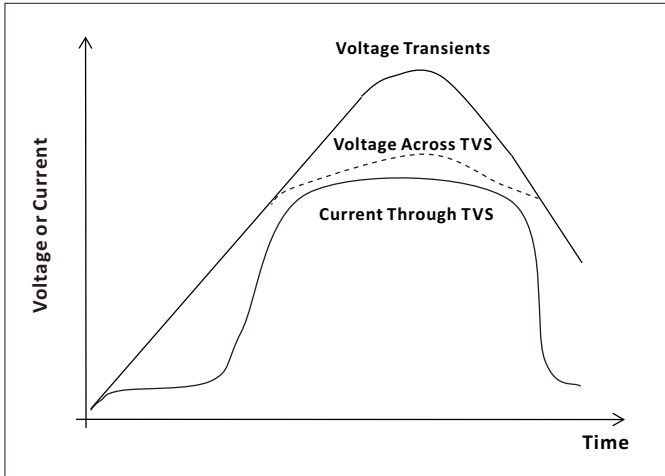


Figure 1 - TVS Transients Clamping Waveform

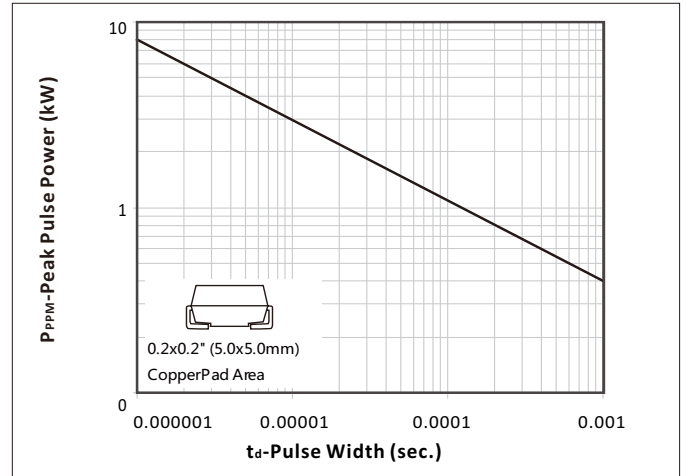


Figure 2 - Peak Pulse Power Rating Curve

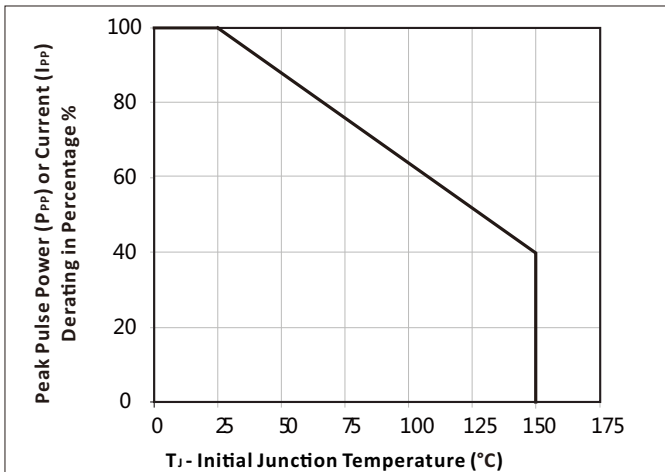


Figure 3 - Peak Pulse Power Derating Curve

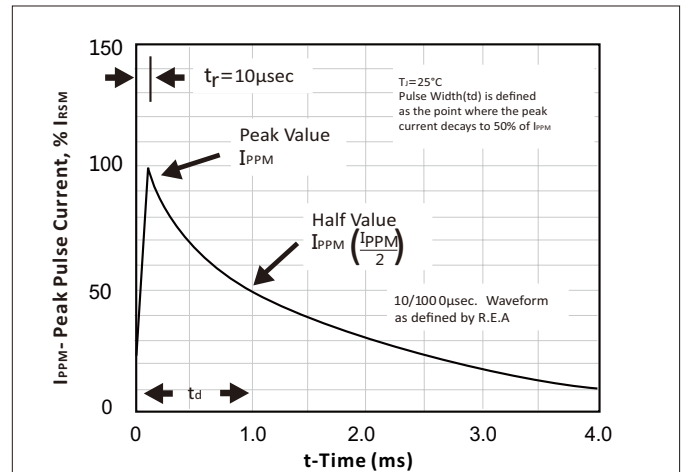


Figure 4 - Pulse Waveform - 10/1000µS

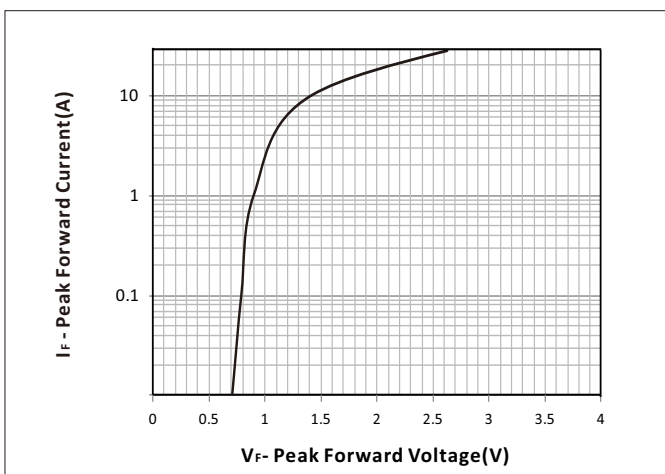


Figure 5 - Peak Forward Voltage Drop vs. Peak Forward Current

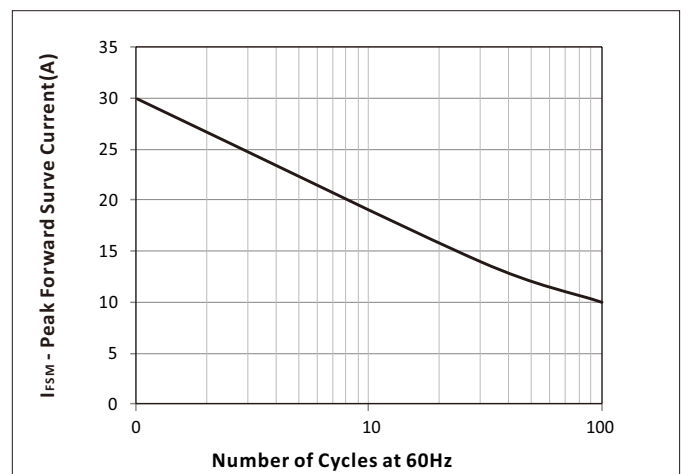
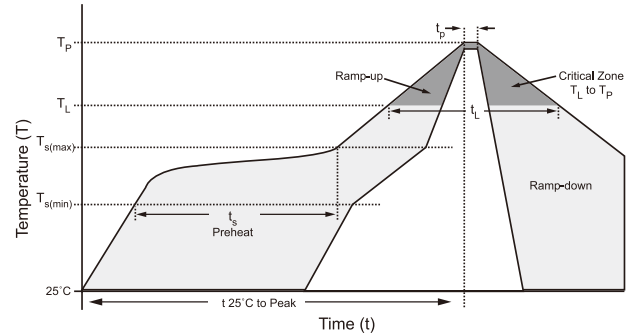


Figure 6 - Maximum Non-Repetitive Forward Surge Current Unidirectional Only



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_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_P)		260°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



SOD-123FL PACKAGE DIMENSION

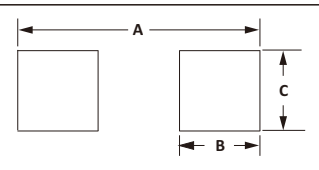
DIM	MILLIMETERS			INCHES		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90	0.95	1.00	0.035	0.037	0.039
A1	0.00	0.05	0.10	0.000	0.002	0.004
b	0.70	0.90	1.10	0.028	0.035	0.043
c	0.10	0.15	0.20	0.004	0.006	0.008
D	1.50	1.65	1.80	0.059	0.065	0.071
E	2.50	2.70	2.90	0.098	0.106	0.114
L	0.55	0.75	0.95	0.022	0.030	0.037
H _E	3.40	3.60	3.80	0.134	0.142	0.150

NOTES:

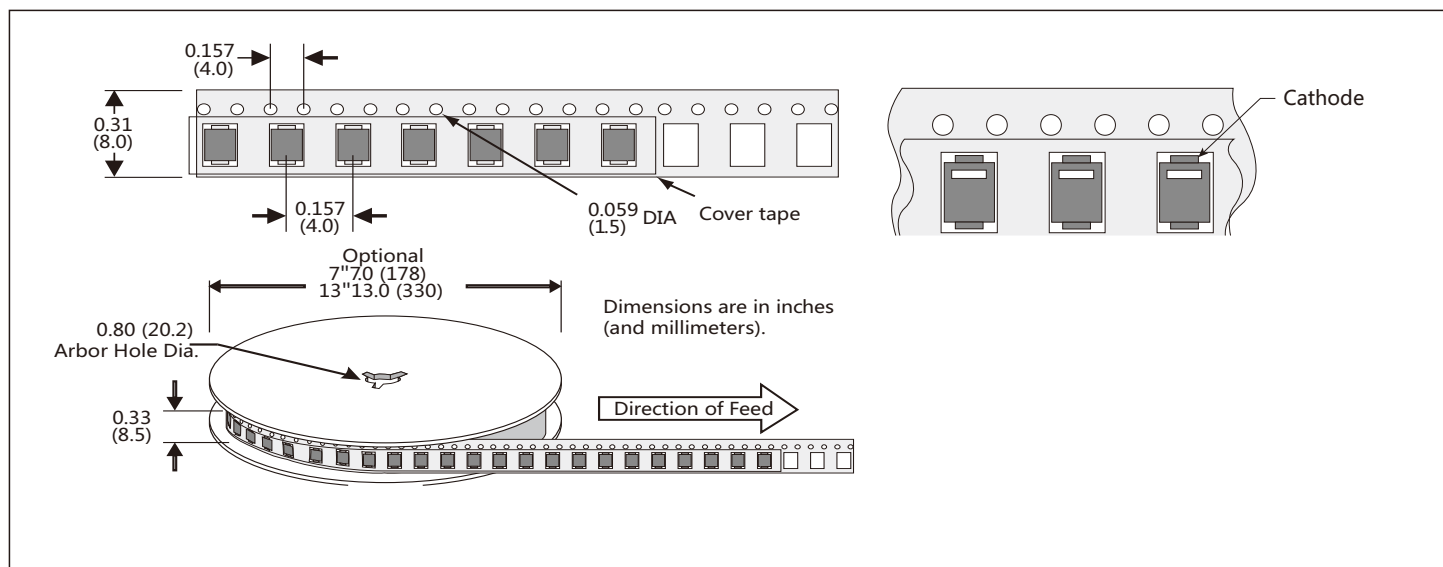
1. Dimensions are exclusive of mold flash and metal burrs
2. Cathode Band is only applicable to the unidirectional package

RECOMMENDED PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
A	4.19	0.165
B	0.91	0.036
C	1.22	0.048




TAPE AND REEL SPECIFICATION



ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SM F4Lxx(C)A	SOD-123FL	3000PCS	7"



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