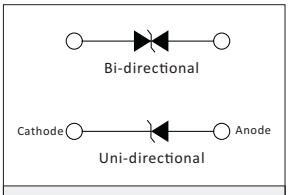
DESCRIPTION

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.

SOD-123FL PACKAGE

FEATURES

> 400W peak pulsepower capability at 10/1000μs waveform
> Fast response time:typically less than 1.0ns from 0 Volts to V_{BR} min
> Low inductance, excellent clamping capability
> For surface mounted applications to optimize board space
> 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



SCHEMATIC SYMBOL

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 10/1000μs waveform (Note1, 2)	P_{PPM}	400	Watts
Operating junction Temperature Range	T_J	-55~150	°C
Storage Temperature Range	T_{STG}	-55~150	°C
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 @10/1000μs.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C UNLESS OTHERWISE SPECIFIED

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I_T	Breakdown Voltage Max.@I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNT-POLAR	BI-POLAR	UNI	BI	V_{RWM}(V)	V_{BR}(V)	V_{BR}(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(uA)
SMF4L5.0A	SMF4L5.0CA	KE	WE	5.0	6.40	7.00	10	9.2	43.5	800
SMF4L6.0A	SMF4L6.0CA	KG	WG	6.0	6.67	7.37	10	10.3	38.8	800
SMF4L6.5A	SMF4L6.5CA	KK	WK	6.5	7.22	7.98	10	11.2	35.7	500
SMF4L7.0A	SMF4L7.0CA	KM	WM	7.0	7.78	8.60	10	12.0	33.3	200
SMF4L7.5A	SMF4L7.5CA	KP	WP	7.5	8.33	9.21	1	12.9	31.0	100
SMF4L8.0A	SMF4L8.0CA	KR	WR	8.0	8.89	9.83	1	13.6	29.4	50
SMF4L8.5A	SMF4L8.5CA	KT	WT	8.5	9.44	10.40	1	14.4	27.8	20
SMF4L9.0A	SMF4L9.0CA	KV	WV	9.0	10.00	11.10	1	15.4	26.0	10
SMF4L10A	SMF4L10CA	KX	WX	10.0	11.10	12.30	1	17.0	23.5	5
SMF4L11A	SMF4L11CA	KZ	WZ	11.0	12.20	13.50	1	18.2	22.0	1
SMF4L12A	SMF4L12CA	LE	XE	12.0	13.30	14.70	1	19.9	20.1	1

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I_T	Breakdown Voltage Max.@I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNT-POLAR	BI-POLAR	UNI	BI	V_{RWM}(V)	V_{BR} (V)	V_{BR} (V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(uA)
SMF4L13A	SMF4L13CA	LG	XG	13.0	14.40	15.90	1	21.5	18.6	1
SMF4L14A	SMF4L14CA	LK	XK	14.0	15.60	17.20	1	23.2	17.2	1
SMF4L15A	SMF4L15CA	LM	XM	15.0	16.70	18.50	1	24.4	16.4	1
SMF4L16A	SMF4L16CA	LP	XP	16.0	17.80	19.70	1	26.0	15.4	1
SMF4L17A	SMF4L17CA	LR	XR	17.0	18.90	20.90	1	27.6	14.5	1
SMF4L18A	SMF4L18CA	LT	XT	18.0	20.00	22.10	1	29.2	13.7	1
SMF4L20A	SMF4L20CA	LV	XV	20.0	22.20	24.50	1	32.4	12.3	1
SMF4L22A	SMF4L22CA	LX	XX	22.0	24.40	26.90	1	35.5	11.3	1
SMF4L24A	SMF4L24CA	LZ	XZ	24.0	26.70	29.50	1	38.9	10.3	1
SMF4L26A	SMF4L26CA	ME	YE	26.0	28.90	31.90	1	42.1	9.5	1
SMF4L28A	SMF4L28CA	MG	YG	28.0	31.10	34.40	1	45.4	8.8	1
SMF4L30A	SMF4L30CA	MK	YK	30.0	33.30	36.80	1	48.4	8.3	1
SMF4L33A	SMF4L33CA	MM	YM	33.0	36.70	40.60	1	53.3	7.5	1
SMF4L36A	SMF4L36CA	MP	YP	36.0	40.00	44.20	1	58.1	6.9	1
SMF4L40A	SMF4L40CA	MR	YR	40.0	44.40	49.10	1	64.5	6.2	1
SMF4L43A	SMF4L43CA	MT	YT	43.0	47.80	52.80	1	69.4	5.8	1
SMF4L45A	SMF4L45CA	MV	YV	45.0	50.00	55.30	1	72.7	5.5	1
SMF4L48A	SMF4L48CA	MX	YX	48.0	53.30	58.90	1	77.4	5.2	1
SMF4L51A	SMF4L51CA	MZ	YZ	51.0	56.70	62.70	1	82.4	4.9	1
SMF4L54A	SMF4L54CA	NE	ZE	54.0	60.00	66.30	1	87.1	4.6	1
SMF4L58A	SMF4L58CA	NG	ZG	58	64.40	71.20	1	93.6	4.3	1
SMF4L60A	SMF4L60CA	NK	ZK	60	66.70	73.70	1	96.8	4.1	1
SMF4L64A	SMF4L64CA	NM	ZM	64	71.10	78.60	1	103.0	3.9	1
SMF4L70A	SMF4L70CA	NP	ZP	70	77.80	86.00	1	113.0	3.5	1
SMF4L75A	SMF4L75CA	NR	ZR	75	83.30	92.10	1	121.0	3.3	1
SMF4L78A	SMF4L78CA	NT	ZT	78	86.70	95.80	1	126.0	3.2	1
SMF4L85A	SMF4L85CA	NV	ZV	85	94.40	104.00	1	137.0	2.9	1
SMF4L90A	SMF4L90CA	NX	ZX	90	100.00	111.00	1	146.0	2.7	1
SMF4L100A	SMF4L100CA	NZ	ZZ	100	111.00	123.00	1	162.0	2.5	1
SMF4L110A	SMF4L110CA	PE	VE	110	122.00	135.00	1	177.0	2.3	1
SMF4L120A	SMF4L120CA	PG	VG	120	133.00	147.00	1	193.0	2.1	1

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@IT	Breakdown Voltage Max.@IT	Test Current	Maximum Clamping Voltage @IPP	Peak Pulse Current	Reverse Leakage @VRWM
UNT-POLAR	BI-POLAR	UNI	BI	VRWM(V)	VBR(V)	VBR(V)	IT(mA)	VC(V)	IPP(A)	IR(uA)
SMF4L130A	SMF4L130CA	PK	VK	130	144.00	159.00	1	209.0	1.9	1
SMF4L150A	SMF4L150CA	PM	VM	150	167.00	185.00	1	243.0	1.6	1
SMF4L160A	SMF4L160CA	PP	VP	160	178.00	197.00	1	259.0	1.5	1
SMF4L170A	SMF4L170CA	PR	VR	170	189.00	209.00	1	275.0	1.5	1

RATINGS AND CHARACTERISTIC CURVES (TA=25°C unless otherwise noted)

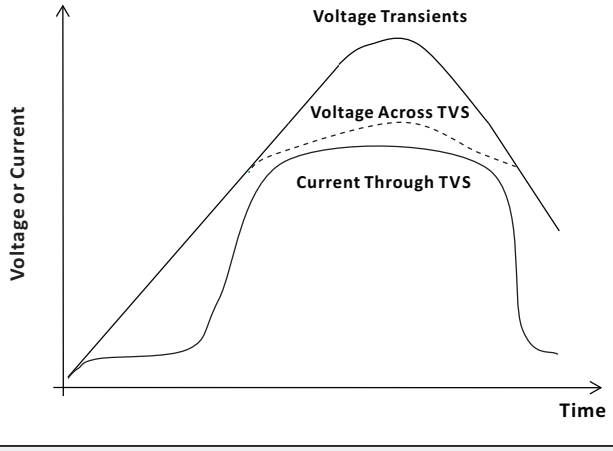


Figure 1 - TVS Transients Clamping Waveform

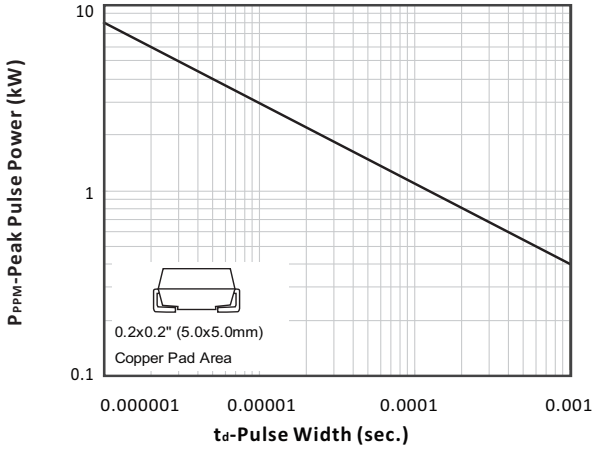


Figure 2 - Peak Pulse Power Rating Curve

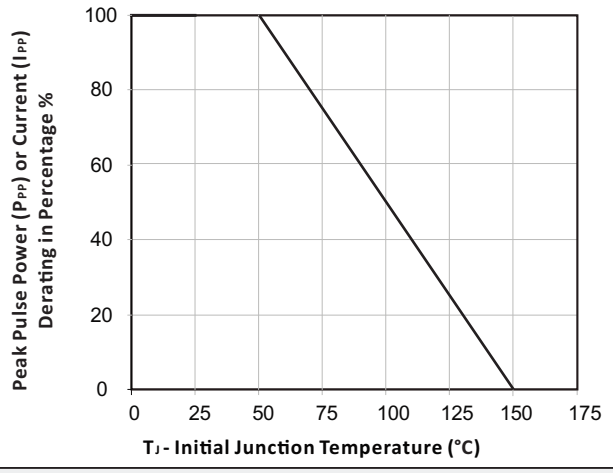


Figure 3 - Peak Pulse Power Derating Curve

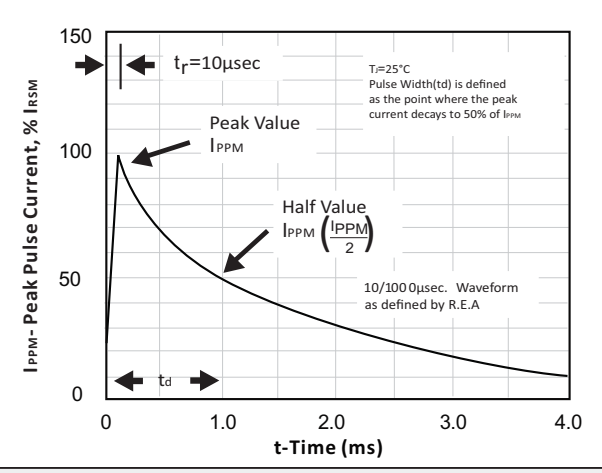


Figure 4 - Pulse Waveform - 10/1000µS

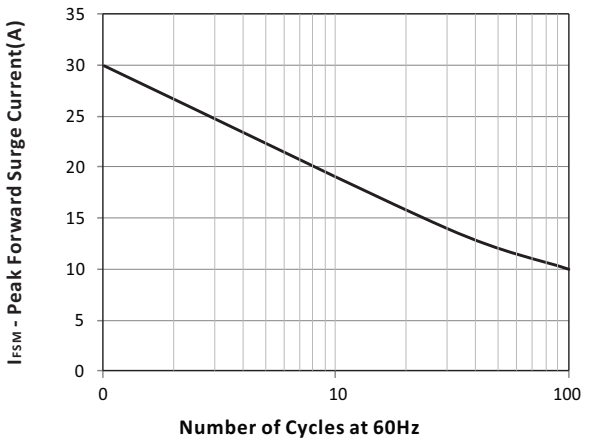
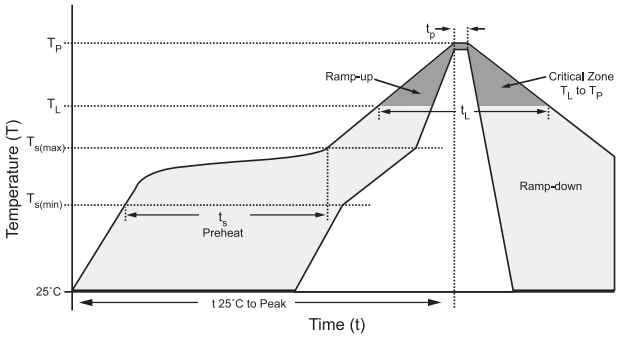


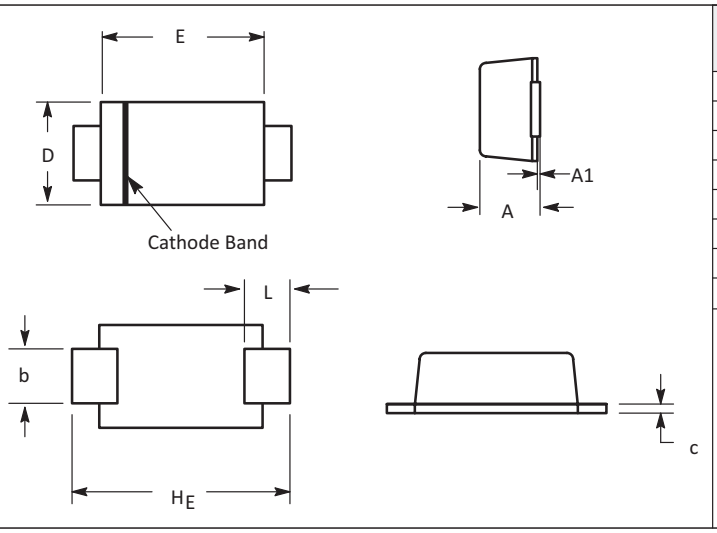
Figure 5-Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

SOLDERING PARAMETERS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Min (Ts(min))	150°C
	Temperature Max (Ts(max)	200°C
	Time (min to max) (ts)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
Ts(max)to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (tp)		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.	Max.	Min.	Max.
A	1.05	1.45	0.041	0.057
A1	0.00	0.10	0.000	0.004
b	0.80	1.10	0.031	0.043
c	0.15	0.25	0.006	0.010
D	1.75	1.95	0.069	0.077
E	2.70	3.10	0.106	0.122
L	0.80	1.10	0.032	0.043
H_E	3.50	3.90	0.138	0.154

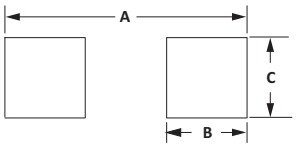
NOTES:

1.Dimensions are exclusive of mold flash and metal burrs

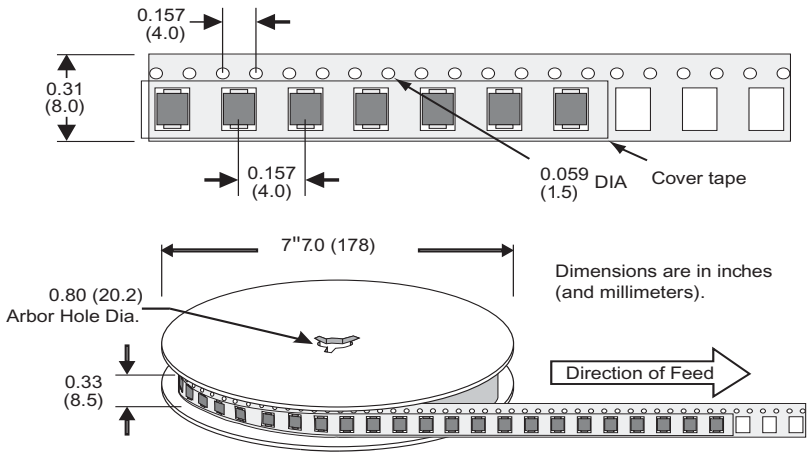
2.Cathode Band is only applicable to the unidirectional package

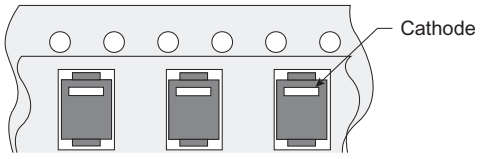
RECOMMENDED PAD LAYOUT DIMENSIONS

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



TAPE AND REEL SPECIFICATION





Cathode Band is only applicable to the unidirectional package

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SMF4Lxx(C)A	SOD-123FL	3000PCS	7"

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