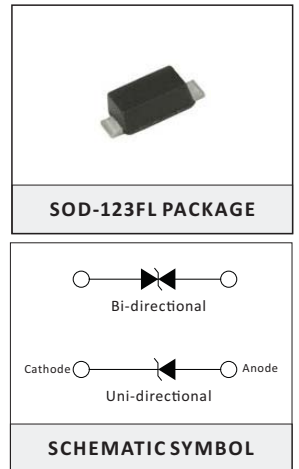


## DESCRIPTION

The SMF series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

## FEATURES

- > For surface mounted applications in order to optimize board space.
- > Low profile package.
- > Built-in strain relief.
- > Glass passivated junction.
- > Low inductance.
- > Excellent clamping capability.
- > Fast response time: typically less than 1.0ps from 0 Volts to  $V_{BR}$  min for unidirectional types.
- > Typical IR less than  $1\mu A$  above 10V
- > Plastic package has Underwriters Laboratory Flammability 94V-0.



## MAXIMUM RATINGS AND CHARACTERISTICS Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 10/1000us waveform (Note1).	PPPM	200	Watts
Peak Pulse Current of on 10/1000us waveform(Note1)	IPPM	See Table	Amps
Junction to Ambient on printed circuit	R $\theta$ JA	220	°C/W
Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) .(Note2)	IFSM	30	Amps
Operating junction Temperatur Range.	TJ	-55~+150	°C
Storage Temperature Range.	TSTG	-55~+150	°C

### NOTES:

1. Non-repetitive current pulse,  $T_A = 25^\circ C$ .
2. 8.3ms single half sine-wave, or equivalent square wave for Unidirectional Only , Duty cycle=4 pulses per minutes maximum.

## ELECTRICAL CHARACTERISTICS

Part Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I $\tau$	Breakdown Voltage Max.@I $\tau$	Test Current	Maximum Clamping Voltage @I $_{PP}$	Peak Pulse Current	Maximum Reverse Leakage @V $_{RWM}$
UNI	BI	UNI	BI	V $_R$ (V)	V $_B$ (V)	V $_B$ (V)	I $\tau$ (mA)	V $_C$ (V)	I $_{PP}$ (A)	I $_R$ ( $\mu$ A)
SMF5.0A	SMF5.0CA	AE	FE	5	6.4	7	10	9.2	21.7	800
SMF6.0A	SMF6.0CA	AG	FG	6	6.67	7.37	10	10.3	19.4	800
SMF6.5A	SMF6.5CA	AK	FK	6.5	7.22	7.98	10	11.2	17.9	500
SMF7.0A	SMF7.0CA	AM	FM	7	7.78	8.6	10	12	16.7	200
SMF7.5A	SMF7.5CA	AP	FP	7.5	8.33	9.21	1	12.9	15.5	100
SMF8.0A	SMF8.0CA	AR	FR	8	8.89	9.83	1	13.6	14.7	50
SMF8.5A	SMF8.5CA	AT	FT	8.5	9.44	10.4	1	14.4	13.9	20



**ELECTRICAL CHARACTERISTICS**

Part Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I <sub>T</sub>	Breakdown Voltage Max.@I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Maximum Reverse Leakage @V <sub>RWM</sub>
UNI	BI	UNI	BI	V <sub>R</sub> (V)	V <sub>B</sub> (V)	V <sub>B</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> ( $\mu$ A)
SMF9.0A	SMF9.0CA	AV	FV	9	10	11.1	1	15.4	13	10
SMF10A	SMF10CA	AX	FX	10	11.1	12.3	1	17	11.8	5
SMF11A	SMF11CA	AZ	FZ	11	12.2	13.5	1	18.2	11	1
SMF12A	SMF12CA	BE	GE	12	13.3	14.7	1	19.9	10.1	1
SMF13A	SMF13CA	BG	GG	13	14.4	15.9	1	21.5	9.3	1
SMF14A	SMF14CA	BK	GK	14	15.6	17.2	1	23.2	8.6	1
SMF15A	SMF15CA	BM	GM	15	16.7	18.5	1	24.4	8.2	1
SMF16A	SMF16CA	BP	GP	16	17.8	19.7	1	26	7.7	1
SMF17A	SMF17CA	BR	GR	17	18.9	20.9	1	27.6	7.2	1
SMF18A	SMF18CA	BT	GT	18	20	22.1	1	29.2	6.8	1
SMF20A	SMF20CA	BV	GV	20	22.2	24.5	1	32.4	6.2	1
SMF22A	SMF22CA	BX	GX	22	24.4	26.9	1	35.5	5.6	1
SMF24A	SMF24CA	BZ	GZ	24	26.7	29.5	1	38.9	5.1	1
SMF26A	SMF26CA	CE	HE	26	28.9	31.9	1	42.1	4.8	1
SMF28A	SMF28CA	CG	HG	28	31.1	34.4	1	45.4	4.4	1
SMF30A	SMF30CA	CK	HK	30	33.3	36.8	1	48.4	4.1	1
SMF33A	SMF33CA	CM	HM	33	36.7	40.6	1	53.3	3.8	1
SMF36A	SMF36CA	CP	HP	36	40	44.2	1	58.1	3.4	1
SMF40A	SMF40CA	CR	HR	40	44.4	49.1	1	64.5	3.1	1
SMF43A	SMF43CA	CT	HT	43	47.8	52.8	1	69.4	2.9	1
SMF45A	SMF45CA	CV	HV	45	50	55.3	1	72.7	2.8	1
SMF48A	SMF48CA	CX	HX	48	53.3	58.9	1	77.4	2.6	1
SMF51A	SMF51CA	CZ	HZ	51	56.7	62.7	1	82.4	2.4	1
SMF54A	SMF54CA	DE	IE	54	60	66.3	1	87.1	2.3	1
SMF58A	SMF58CA	DG	IG	58	64.4	71.2	1	93.6	2.1	1
SMF60A	SMF60CA	DK	IK	60	66.7	73.7	1	96.8	1.86	1
SMF64A	SMF64CA	DM	IM	64	71.1	78.6	1	103	1.75	1
SMF70A	SMF70CA	DP	IP	70	77.8	86	1	113	1.59	1
SMF75A	SMF75CA	DR	IR	75	83.3	92.1	1	121	1.49	1
SMF78A	SMF78CA	DT	IT	78	86.7	95.8	1	126	1.43	1
SMF85A	SMF85CA	DV	IV	85	94.4	104	1	137	1.31	1
SMF90A	SMF90CA	DX	IX	90	100	111	1	146	1.23	1
SMF100A	SMF100CA	EZ	JZ	100	111	123	1	162	1.11	1
SMF110A	SMF110CA	EE	JE	110	122	135	1	177	1.02	1
SMF120A	SMF120CA	EG	JG	120	133	147	1	193	0.93	1
SMF130A	SMF130CA	EK	JK	130	144	159	1	209	0.86	1
SMF150A	SMF150CA	EM	JM	150	167	185	1	243	0.74	1
SMF160A	SMF160CA	EP	JP	160	178	197	1	259	0.69	1
SMF170A	SMF170CA	ER	JR	170	189	209	1	275	0.65	1

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

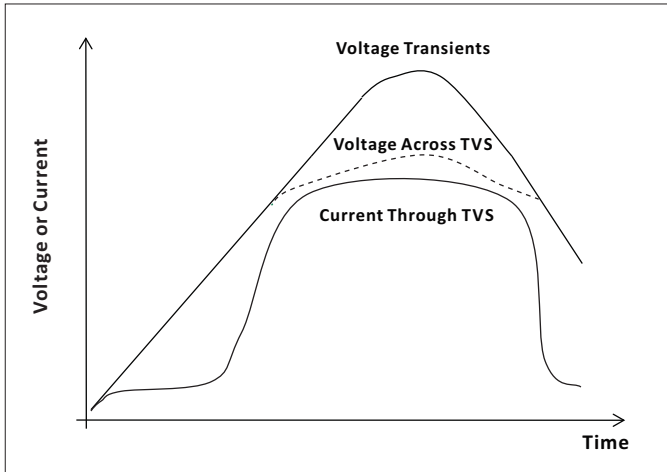


Figure 1 - TVS Transients Clamping Waveform

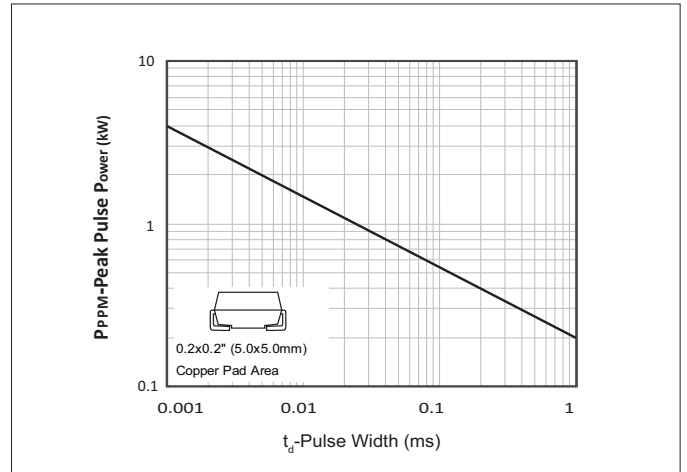


Figure 2 - Peak Pulse Power Rang Curve

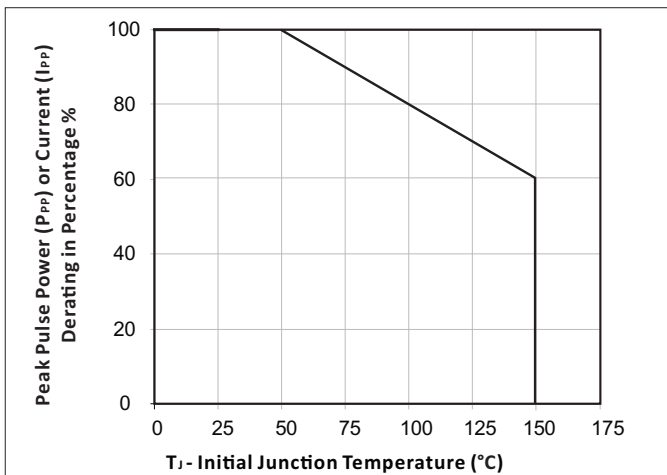


Figure 3 - Peak Pulse Power Derating Curve

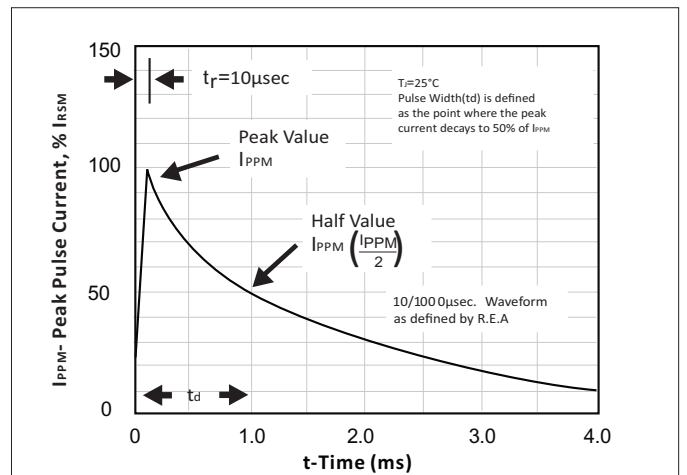


Figure 4 - Pulse Waveform - 10/1000µS

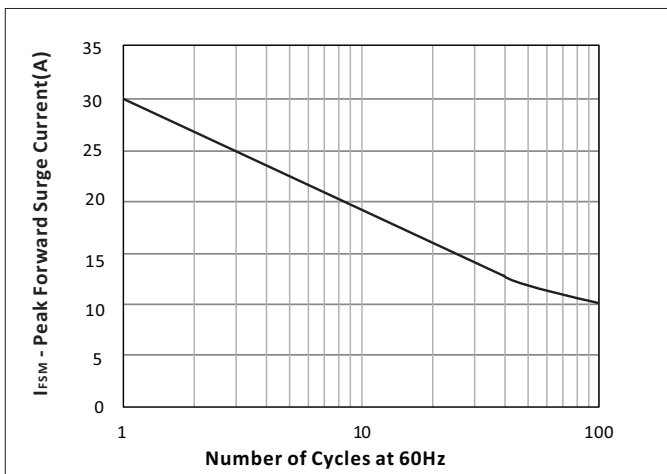
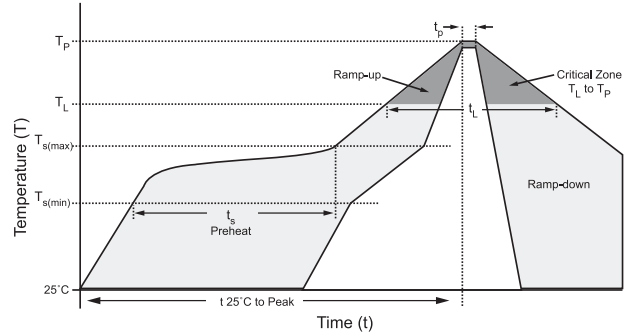


Figure 5 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

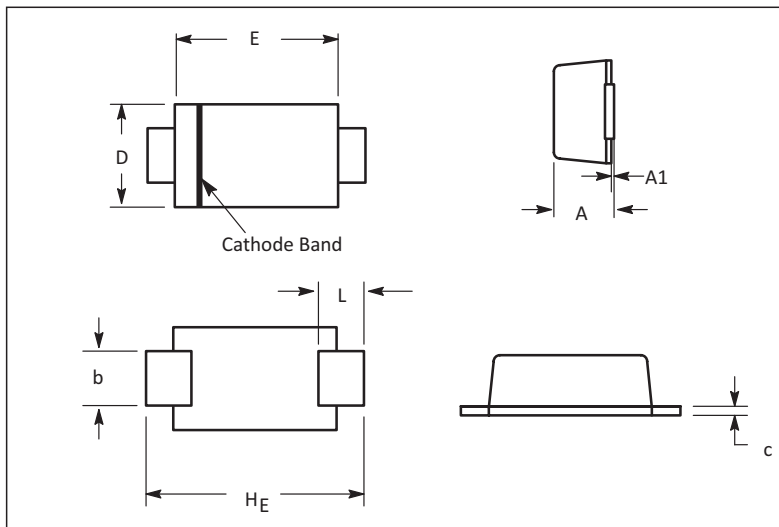


**SOLDERING PARAMETERS**

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 (TL) to peak)		3°C/second max
Ts(max)to TL - Ramp-up Rate		3°C/second max
Reflow	Temperature (TL) (Liquidus)	217°C
	Time (min to max) (tl)	60 – 150 seconds
Peak Temperature (TP)		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 (TP)		8 minutes Max.
Do not exceed		260°C



**SOD-123FL PACKAGE DIMENSION**



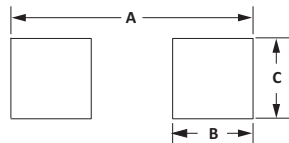
DIM	MILLIMETERS		INCHES	
	Min.	Max.	Min.	Max.
A	1.05	1.45	0.041	0.057
A1	0.00	0.10	0.000	0.004
b	0.80	1.10	0.031	0.043
c	0.15	0.25	0.006	0.010
D	1.75	1.95	0.069	0.077
E	2.70	3.10	0.106	0.122
L	0.80	1.10	0.032	0.043
HE	3.50	3.90	0.138	0.154

**NOTES:**

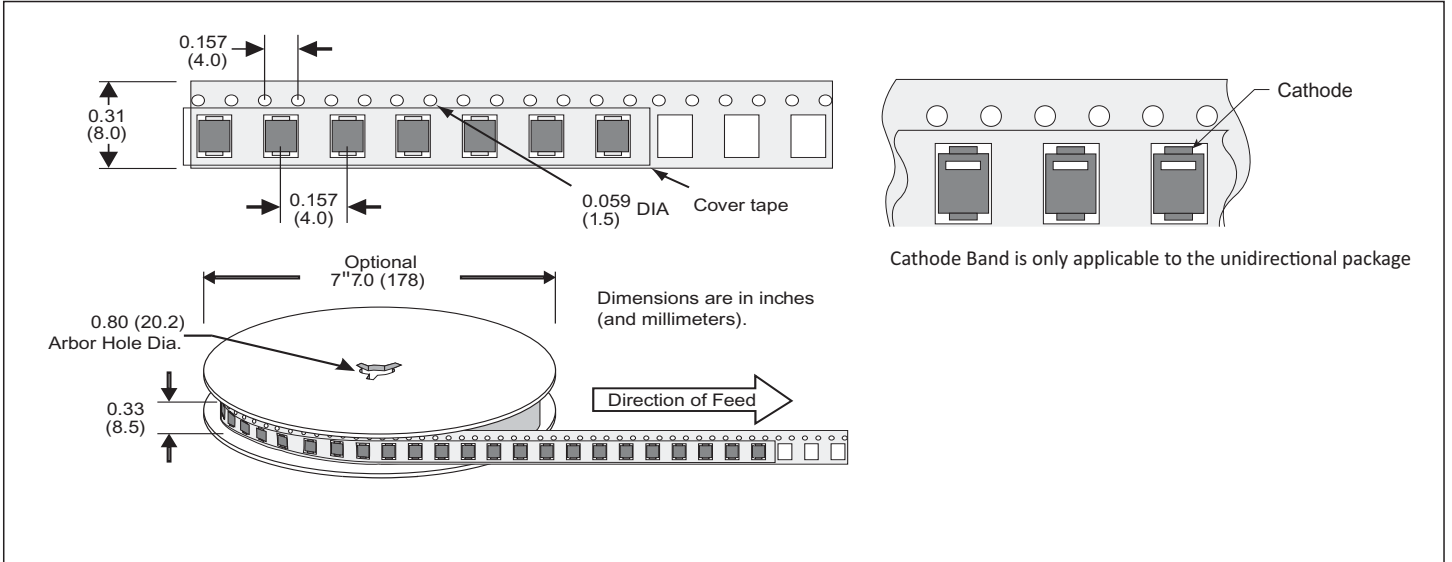
1. Dimensions are exclusive of mold flash and metal burrs
2. Cathode Band is only applicable to the unidirectional package

**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**



**ORDERING INFORMATION**

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

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