SM4F Series Datasheet

Description

The SMF series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. SM4F package is 50% smaller in footprint when compare to SMA package and deliverying one of the low height profiles (1.1mm) in the industry.

Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOD-123FL surface mount package
- Protects one I/O line
- Peak power dissipation of 2000W under 8/20μs waveform
- Low leakage current
- Solid-state silicon avalanche technology
- RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270℃
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020

Applications

SM4F devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuit used in cellular phones, portable devices, business machines, power supplies and other consumer applications.

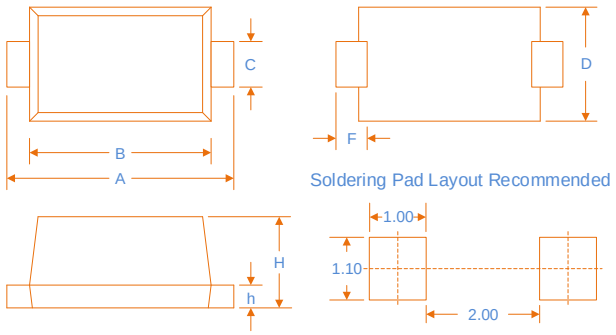
Maximum Ratings and Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Note2, Fig.1)	P_{PPM}	Minimum 400	Watts
Peak pulse power (tp=8/20μs waveform)	P_{PPM}	Minimum 2000	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at T_L=75℃ (Fig.5)	$P_{M(AV)}$	1.0	Watts
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only	V_F	3.5	V
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	40	Amps
Operating junction and Storage Temperature Ranges.	T_J,T_{STG}	-55 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	℃/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and Derating above T_A=25℃ per Fig.2.
2. Each terminal is surface Mounted on the 5.0mm×5.0mm (0.03mm thick) copper pads.
3. 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Dimensions (SOD123FL)



Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	0.138	0.154	3.50	3.90
B	0.102	0.118	2.60	3.00
C	0.030	0.043	0.75	1.10
D	0.063	0.079	1.60	2.00
F	0.031Typ.		0.80Typ.	
H	0.035	0.053	0.90	1.35
h	0.005	0.009	0.12	0.22

Electrical Characteristics (TA=25℃)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T		Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_R
Uni	Bi	UNI	BI	V_R(V)	Min(V)	Max(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SM4F5.0A	SM4F5.0CA	KE	AE	5	6.4	7	10	9.2	43.6	500
SM4F6.0A	SM4F6.0CA	KG	AG	6	6.67	7.37	10	10.3	38.8	400
SM4F6.5A	SM4F6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	35.8	350
SM4F7.0A	SM4F7.0CA	KM	AM	7	7.78	8.6	10	12.0	33.4	200
SM4F7.5A	SM4F7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	31.0	100
SM4F8.0A	SM4F8.0CA	KR	AR	8	8.89	9.83	1	13.6	29.4	50
SM4F8.5A	SM4F8.5CA	KT	AT	8.5	9.44	10.4	1	14.4	27.8	20
SM4F9.0A	SM4F9.0CA	KV	AV	9	10	11.1	1	15.4	26.0	10
SM4F10A	SM4F10CA	KX	AX	10	11.1	12.3	1	17.0	23.6	5
SM4F11A	SM4F11CA	KZ	AZ	11	12.2	13.5	1	18.2	22.0	3
SM4F12A	SM4F12CA	LE	BE	12	13.3	14.7	1	19.9	20.2	1
SM4F13A	SM4F13CA	LG	BG	13	14.4	15.9	1	21.5	18.6	1
SM4F14A	SM4F14CA	LK	BK	14	15.6	17.2	1	23.2	17.2	1
SM4F15A	SM4F15CA	LM	BM	15	16.7	18.5	1	24.4	16.4	1
SM4F16A	SM4F16CA	LP	BP	16	17.8	19.7	1	26.0	15.4	1
SM4F17A	SM4F17CA	LR	BR	17	18.9	20.9	1	27.6	14.6	1
SM4F18A	SM4F18CA	LT	BT	18	20	22.1	1	29.2	13.8	1
SM4F20A	SM4F20CA	LV	BV	20	22.2	24.5	1	32.4	12.4	1
SM4F22A	SM4F22CA	LX	BX	22	24.4	26.9	1	35.5	11.4	1
SM4F24A	SM4F24CA	LZ	BZ	24	26.7	29.5	1	38.9	10.4	1
SM4F26A	SM4F26CA	ME	CE	26	28.9	31.9	1	42.1	9.6	1
SM4F28A	SM4F28CA	MG	CG	28	31.1	34.4	1	45.4	8.8	1
SM4F30A	SM4F30CA	MK	CK	30	33.3	36.8	1	48.4	8.4	1
SM4F33A	SM4F33CA	MM	CM	33	36.7	40.6	1	53.3	7.6	1
SM4F36A	SM4F36CA	MP	CP	36	40	44.2	1	58.1	7.0	1

Ratings and Characteristic Curves (Ta=25℃ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

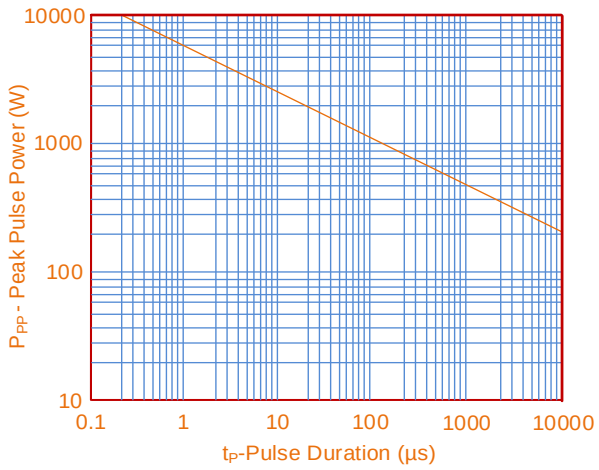


Figure 2. Pulse Derating Curve

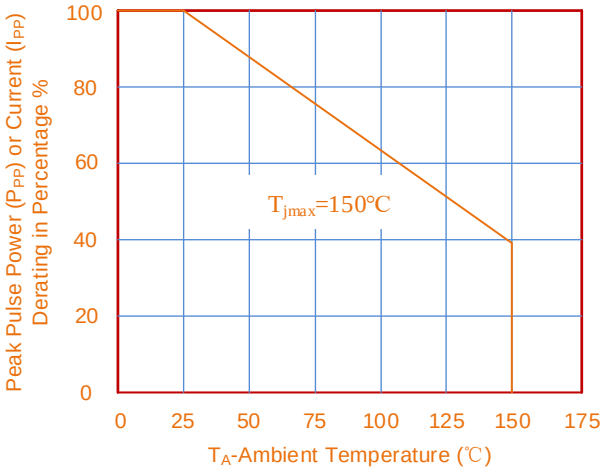


Figure 3. Pulse Waveform

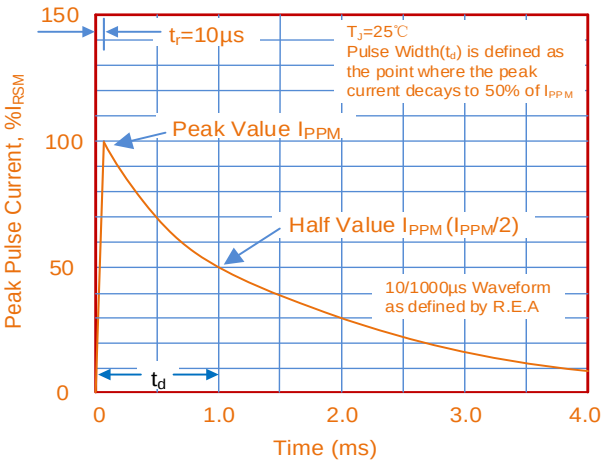


Figure 4. Typical Junction Capacitance

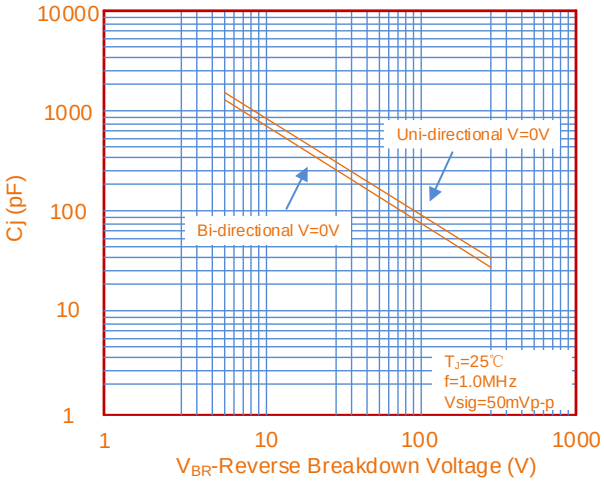


Figure 5. Steady State Power Dissipation Derating Curve

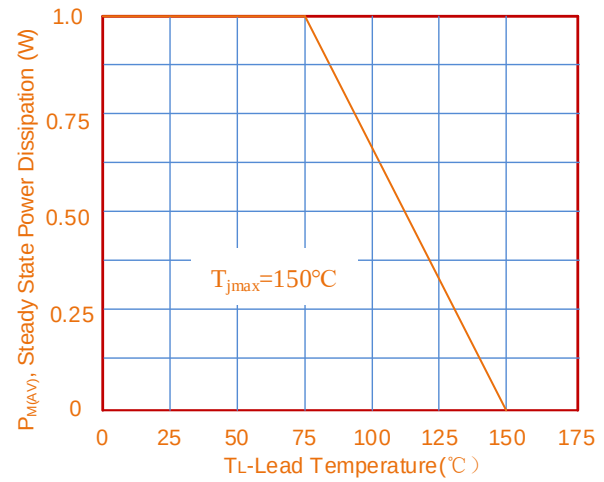
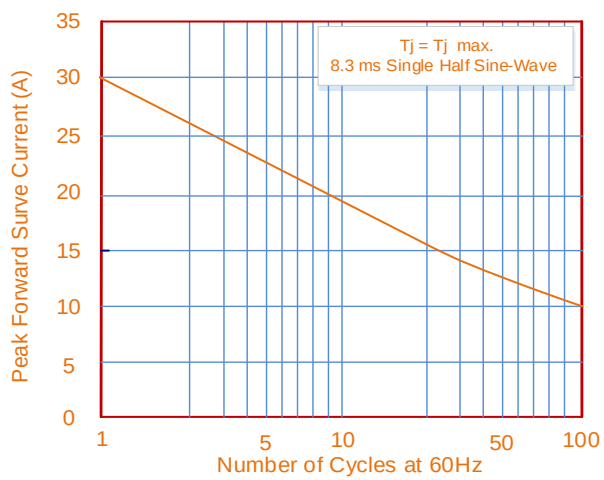
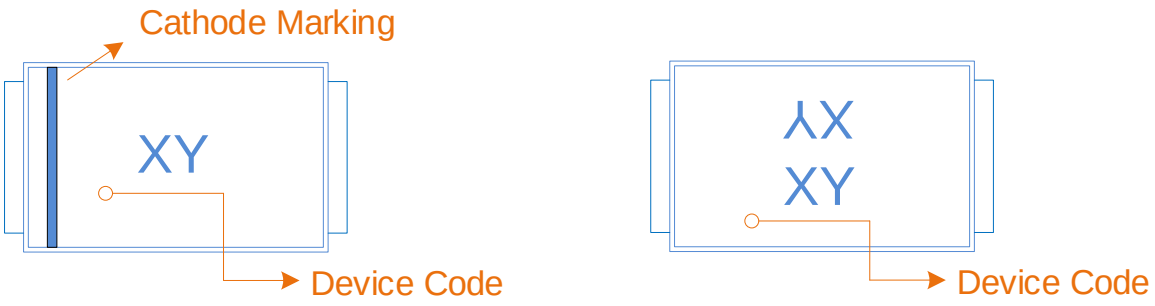


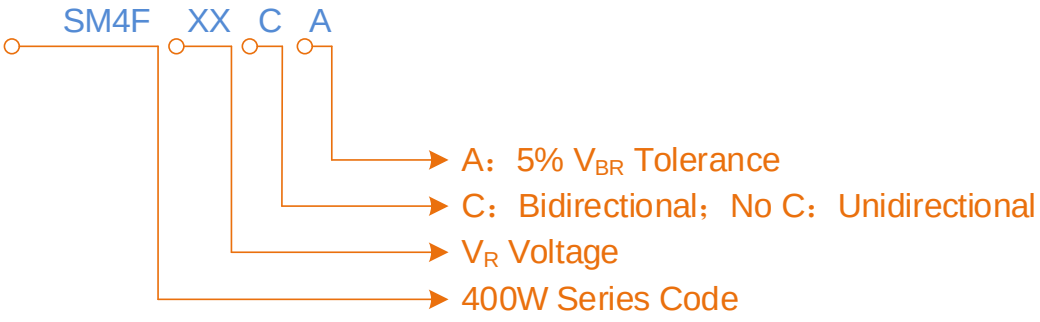
Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



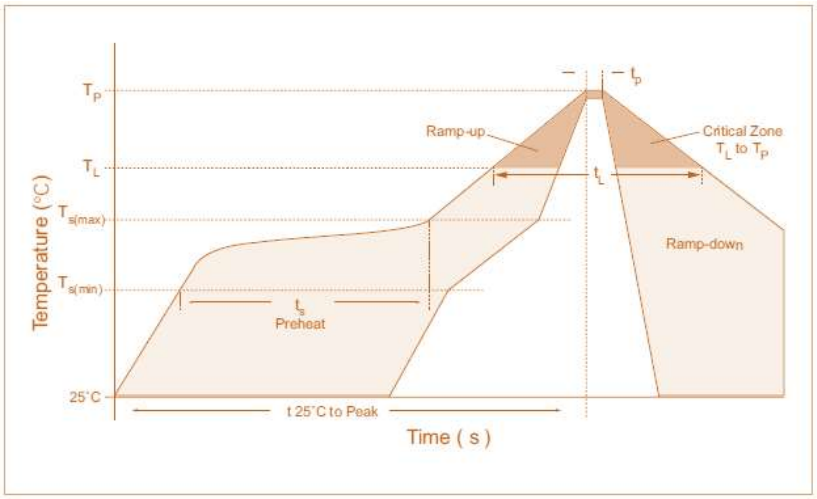
Marking Code



Part Number Code



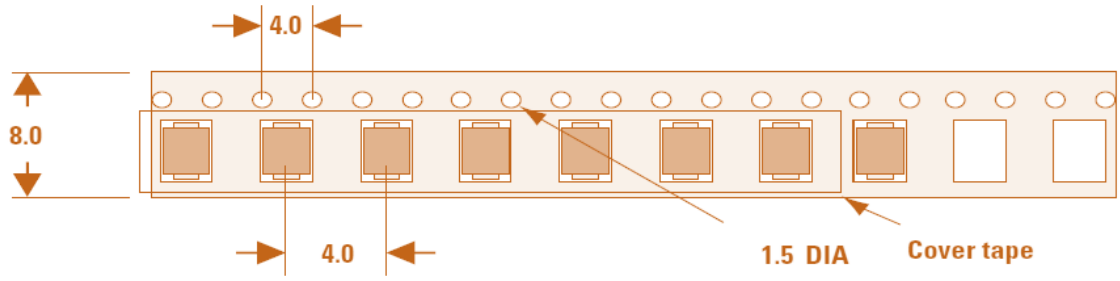
Soldering Parameters



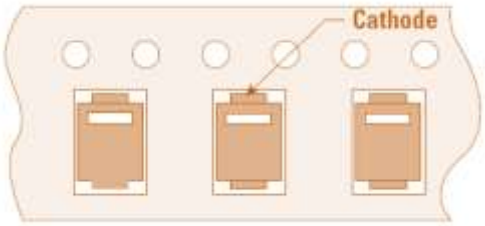
Reflow Condition		Lead-free Soldering
Pre Heat	· Temperature Min ($T_{s(min)}$)	150°C
	· Temperature Max ($T_{s(max)}$)	200°C
	· Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	· Temperature (T_L)	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 (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 Temperature		260°C

Packaging Specification

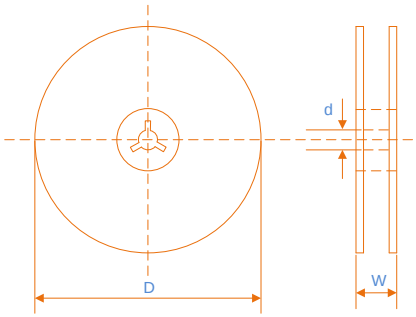
Tape



For Uni-Devices



7 Inches Reel



D	Φ178.0±2.0
d	Φ13.0
W	9.5

Quantity: 3000PCS/Reel