

Transient Voltage Suppressors (TVS) Data Sheet

Description

The SM4F 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 leakage
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 400W peak pulse power capability at 10/1000μs waveform
- Fast response time
- Typical IR less than 5μA above 12V
- High Temperature soldering: 260°C /40 seconds at terminals
- Typical maximum temperature coefficient $\Delta V_{BR} = 0.1\% \times V_{BR}@25^{\circ}\text{C} \times \Delta T$
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte tin lead-free Plated
- Halogen free and RoHS compliant
- 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
- IEC 61000-4-2 ESD 30KV(Air),30KV(contact)

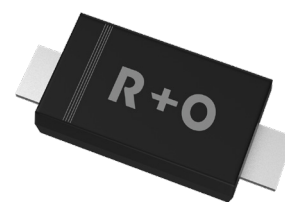
Breakdown Voltage

5.0 to 170 V

Peak Pulse Power

400 W

SOD-123FL



Bi-directional



Uni-directional



Applications

TVS devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	SYMBOL
Peak Pulse Power Dissipation with a 10/1000μs waveform (Note 1)	P_{PPM}	400	W
Peak Pulse Current with a 10/1000μs waveform.(Note1)	I_{PP}	See Next Table	A
Power Dissipation on Infinite Heat Sink at TL=75° C	$P_{M(AV)}$	3.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 2)	I_{FSM}	40	A
Maximum Instantaneous Forward Voltage at 15A for Unidirectional Only	V_F	3.5	V
Operating junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta J-L}$	40	°C /W
Typical thermal resistance junction to ambient	$R_{\theta J-A}$	180	°C /W

Note :

(1) Non-repetitive current pulse per Fig.5 and derated above TA= 25 ° C per Fig.1

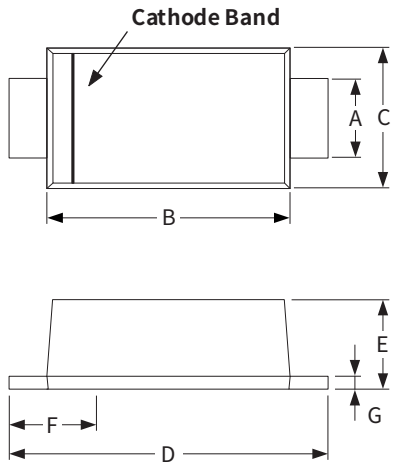
(2))Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

SM4F SERIES

400W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

● Package Outline Dimensions (SOD-123FL)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.430
B	2.55	2.85	0.100	0.111
C	1.60	1.90	0.063	0.074
D	3.60	3.90	0.031	0.043
E	1.00	1.20	0.031	0.035
F	0.40	0.90	0.047	0.055
G	0.10	0.25	0.003	0.007



● Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V_{BR} (V) @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Uni	Bi	Uni	Bi	V_{RWM} (V)	Min.	Max.	I_T (mA)	V_C (V)	I_{PP} (A)	I_R (μA)
SM4F3.3A	SM4F3.3CA	FAD	FHD	3.3	5.4	6.0	10	8.5	47.1	50
SM4F5.0A	SM4F5.0CA	FAE	FWE	5.0	6.40	7.00	10	9.2	43.5	800
SM4F6.0A	SM4F6.0CA	FAG	FWG	6.0	6.67	7.37	10	10.3	38.8	800
SM4F6.5A	SM4F6.5CA	FAK	FWK	6.5	7.22	7.98	10	11.2	35.7	500
SM4F7.0A	SM4F7.0CA	FAM	FWM	7.0	7.78	8.60	10	12.0	33.3	200
SM4F7.5A	SM4F7.5CA	FAP	FWP	7.5	8.33	9.21	1	12.9	31.0	100
SM4F8.0A	SM4F8.0CA	FAR	FWR	8.0	8.89	9.83	1	13.6	29.4	50
SM4F8.5A	SM4F8.5CA	FAT	FWT	8.5	9.44	10.40	1	14.4	27.8	20
SM4F9.0A	SM4F9.0CA	FAV	FWV	9.0	10.00	11.10	1	15.4	26.0	10
SM4F10A	SM4F10CA	FAX	FWX	10.0	11.10	12.30	1	17.0	23.5	5.0
SM4F11A	SM4F11CA	FAZ	FWZ	11.0	12.20	13.50	1	18.2	22.0	1.0
SM4F12A	SM4F12CA	FBE	FXE	12.0	13.30	14.70	1	19.9	20.1	1.0
SM4F13A	SM4F13CA	FBG	FXG	13.0	14.40	15.90	1	21.5	18.6	1.0
SM4F14A	SM4F14CA	FBK	FXK	14.0	15.60	17.20	1	23.2	17.2	1.0
SM4F15A	SM4F15CA	FBM	FXM	15.0	16.70	18.50	1	24.4	16.4	1.0
SM4F16A	SM4F16CA	FBP	FXP	16.0	17.80	19.70	1	26.0	15.4	1.0
SM4F17A	SM4F17CA	FBR	FXR	17.0	18.90	20.90	1	27.6	14.5	1.0
SM4F18A	SM4F18CA	FBT	FXT	18.0	20.00	22.10	1	29.2	13.7	1.0
SM4F20A	SM4F20CA	FBV	FXV	20.0	22.20	24.50	1	32.4	12.3	1.0
SM4F22A	SM4F22CA	FBX	FXX	22.0	24.40	26.90	1	35.5	11.3	1.0
SM4F24A	SM4F24CA	FBZ	FXZ	24.0	26.70	29.50	1	38.9	10.3	1.0
SM4F26A	SM4F26CA	FCE	FYE	26.0	28.90	31.90	1	42.1	9.5	1.0
SM4F28A	SM4F28CA	FCG	FYG	28.0	31.10	34.40	1	45.4	8.8	1.0
SM4F30A	SM4F30CA	FCK	FYK	30.0	33.50	36.80	1	48.4	8.3	1.0
SM4F33A	SM4F33CA	FCM	FYM	33.0	36.7	40.6	1	53.3	7.5	1.0

● **Electrical Characteristics** (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage V_{BR} (V) @ I_T		Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Uni	Bi	Uni	Bi	V_{RWM} (V)	Min.	Max.	I_T (mA)	V_C (V)	I_{PP} (A)	I_R (μA)
SM4F36A	SM4F36CA	FCP	FYP	36	40.00	44.20	1	58.1	6.9	1.0
SM4F40A	SM4F40CA	FCR	FYR	40	44.40	49.10	1	64.5	6.2	1.0
SM4F43A	SM4F43CA	FCT	FYT	43	47.80	52.80	1	69.4	5.8	1.0
SM4F45A	SM4F45CA	FCV	FYV	45	50.00	55.30	1	72.7	5.5	1.0
SM4F48A	SM4F48CA	FCX	FYX	48	53.30	58.90	1	77.4	5.2	1.0
SM4F51A	SM4F51CA	FCZ	FYZ	51	56.70	62.70	1	82.4	4.9	1.0
SM4F54A	SM4F54CA	FRE	FZE	54	60.00	66.30	1	87.1	4.6	1.0
SM4F58A	SM4F58CA	FRG	FZG	58	64.40	71.20	1	93.6	4.3	1.0
SM4F60A	SM4F60CA	FRK	FZK	60	66.70	73.70	1	96.8	4.1	1.0
SM4F64A	SM4F64CA	FRM	FZM	64	71.10	78.60	1	103.0	3.9	1.0
SM4F70A	SM4F70CA	FRP	FZP	70	77.80	86.00	1	113.0	3.5	1.0
SM4F75A	SM4F75CA	FRR	FZR	75	83.30	92.10	1	121.0	3.3	1.0
SM4F78A	SM4F78CA	FRT	FZT	78	86.70	95.80	1	126.0	3.2	1.0
SM4F85A	SM4F85CA	FRV	FZV	85	94.40	104.00	1	137.0	2.9	1.0
SM4F90A	SM4F90CA	FRX	FZX	90	100.00	111.00	1	146.0	2.7	1.0
SM4F100A	SM4F100CA	FRZ	FZZ	100	111.00	123.00	1	162.0	2.5	1.0
SM4F110A	SM4F110CA	FSE	FVE	110	122.0	135.0	1	177.0	2.3	1.0
SM4F120A	SM4F120CA	FSG	FVG	120	133.0	147.0	1	193.0	2.1	1.0
SM4F130A	SM4F130CA	FSK	FVK	130	144.0	159.0	1	209.0	1.9	1.0
SM4F150A	SM4F150CA	FSM	FVM	150	167.0	185.0	1	243.0	1.6	1.0
SM4F160A	SM4F160CA	FSP	FVP	160	178.0	197.0	1	259.0	1.5	1.0
SM4F170A	SM4F170CA	FSR	FVR	170	189.0	209.0	1	275.0	1.5	1.0

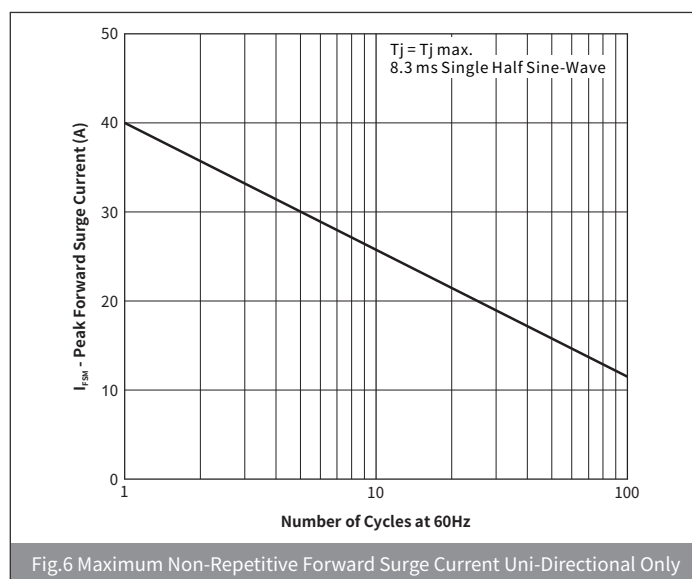
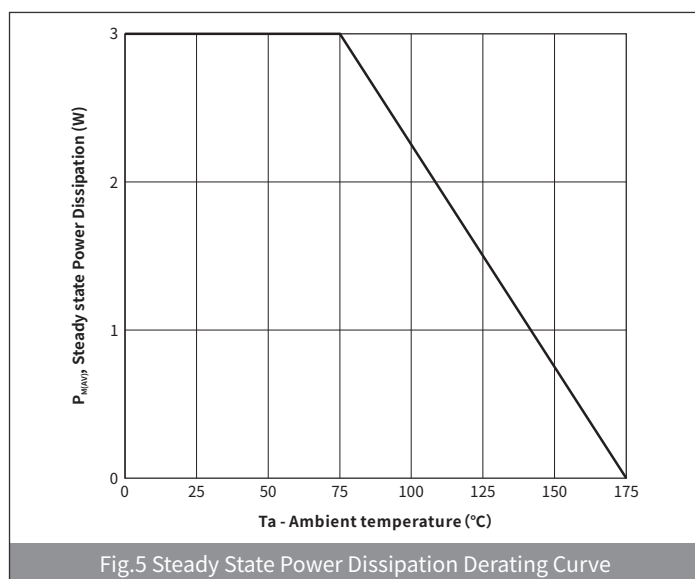
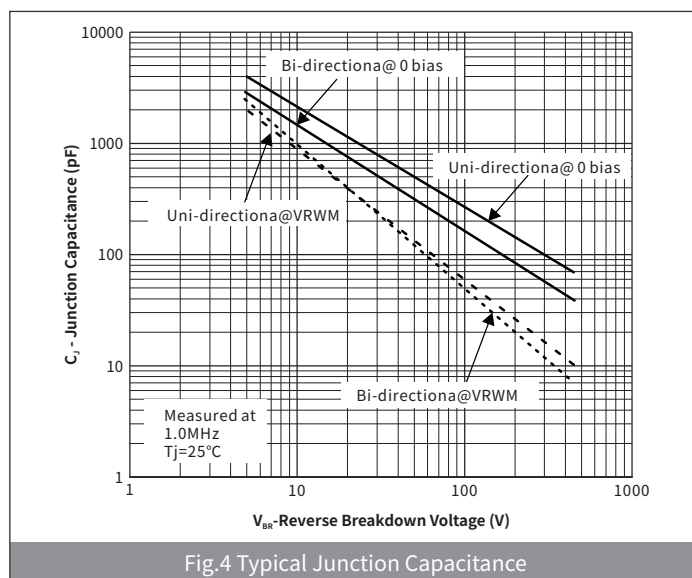
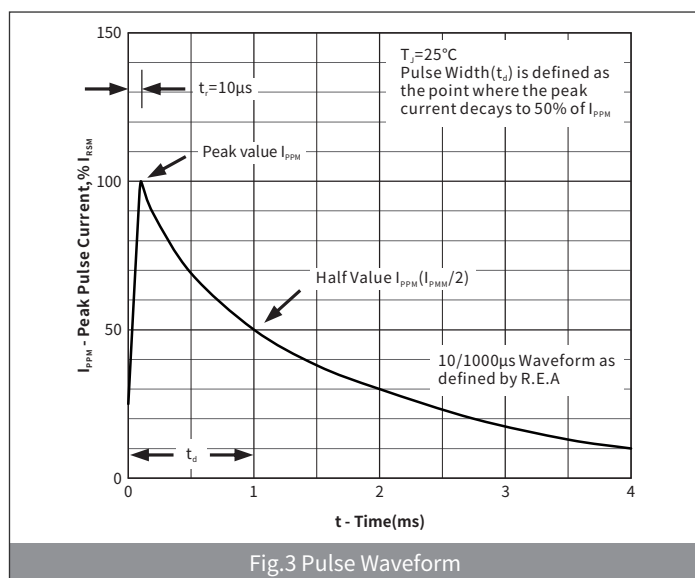
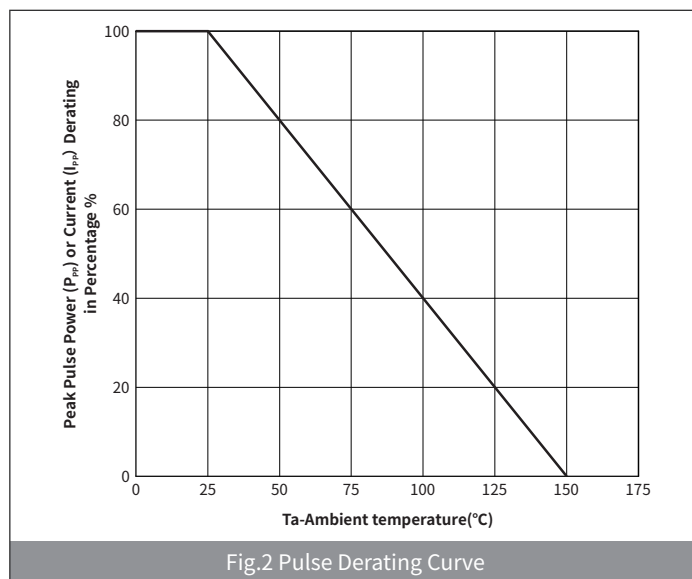
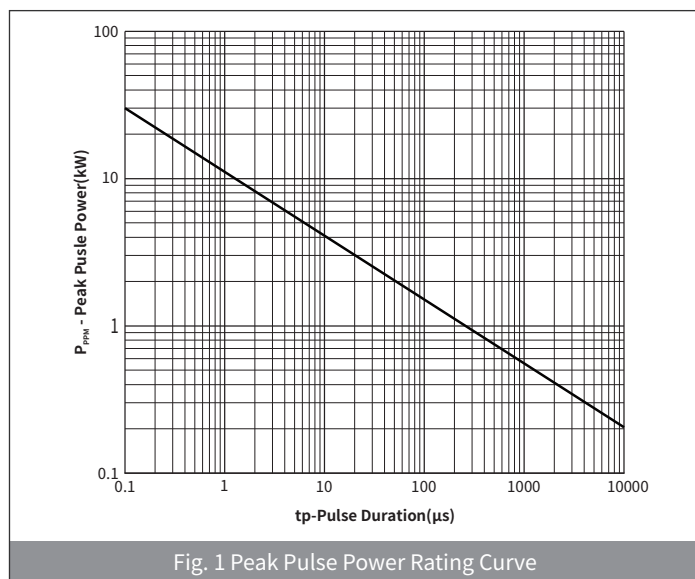
Note :

(1) Suffix 'A ' denotes 5% tolerance device.

(2) Add suffix ' CA ' after part number to specify Bi-directional devices.

(3) For Bi-Directional devices having VR of 10 volts and under, the IR limit is double.

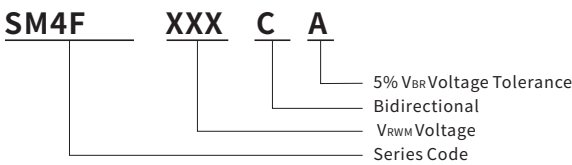
● Ratings And Characteristics Curves ($T_a=25^\circ\text{C}$ Unless otherwise specified)



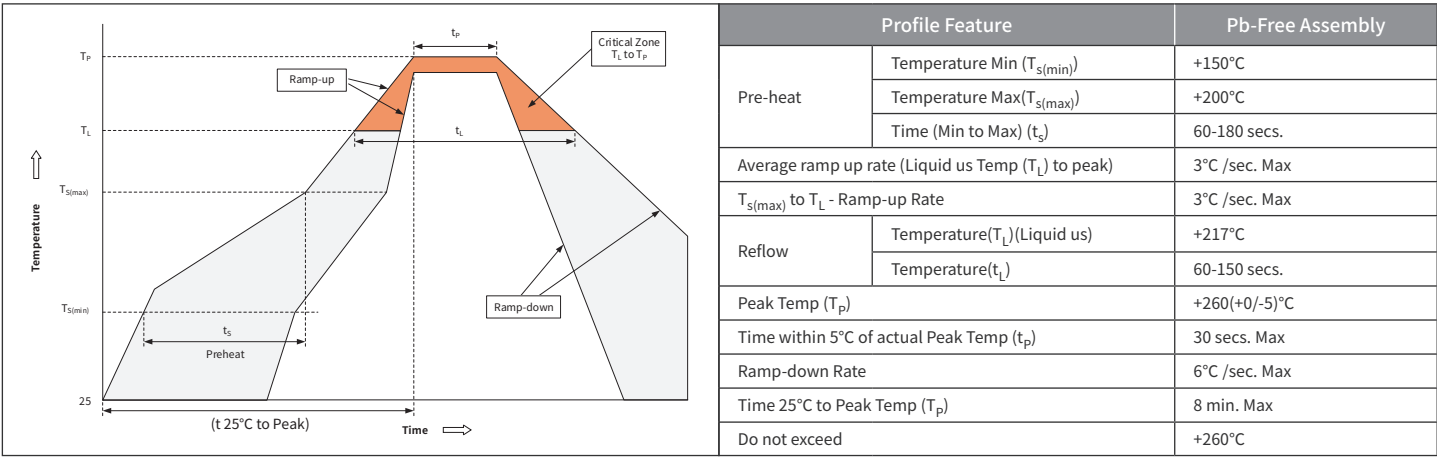
● Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOD-123FL	R1	0.0169	3000	15000	150000	7"

● Part Numbering



● Soldering Parameters



● Packaging (SOD-123FL)

