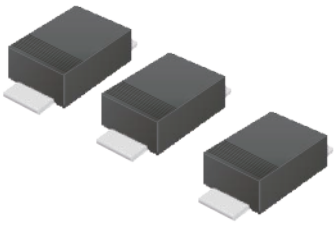
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PRODUCT DATASHEET

SMD TVS Devices

SMF Series SMD TVS Devices

SMF Series SMD TVS Devices



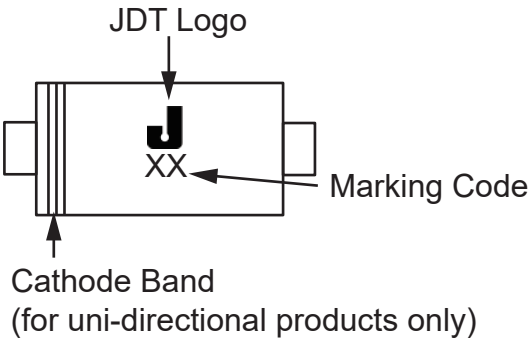
Description

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

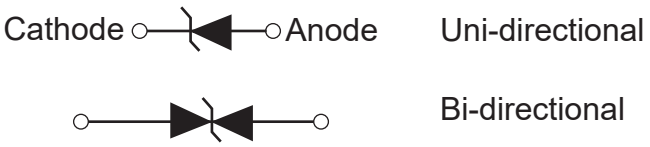
Features

- Low leakage
- Glass passivated chip
- Very fast response time
- Uni and Bidirectional unit
- Excellent clamping capability
- 200W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle):0.01%

Pin Description



Schematic Diagram



Maximum Ratings(T_A=25°C,RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000μs waveform(Note1)	P_{pp}	200	W
Power dissipation on infinite heat sink at T_L=75°C	P_D	0.4	W
Peak forward surge current, 8.3ms single half sine wave unidirectional only(Note2)	I_{FSM}	20	A
Maximum instantaneous forward voltage at 25A for unidirectional only	V_F	3.5	V
Operating junction and Storage Temperature Range	T_J / T_{STG}	-55 to +150	°C

Notes:

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

Performance Specification

Model		Working Peak Reverse Voltage V_{RWM}	Breakdown Voltage V_{BR} @ I_T			Clamping Voltage V_C @Ipp	Reverse Surge Current Ipp	Reverse Leakage I_R @V_{Rwm}	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	I_T(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMF3.3A	SMF3.3CA	3.3	4.22	6.58	10	8.8	22.70	500	AD	HD
SMF5.0A	SMF5.0CA	5.0	6.40	7.00	10	9.2	21.74	400	AE	HE
SMF6.0A	SMF6.0CA	6.0	6.67	7.37	10	10.3	19.42	400	AG	HG
SMF6.5A	SMF6.5CA	6.5	7.22	7.98	10	11.2	17.86	250	AK	HK
SMF7.0A	SMF7.0CA	7.0	7.78	8.60	10	12.0	16.67	100	AM	HM
SMF7.5A	SMF7.5CA	7.5	8.33	9.21	1	12.9	15.50	50	AP	HP
SMF8.0A	SMF8.0CA	8.0	8.89	9.83	1	13.6	14.71	25	AR	HR
SMF8.5A	SMF8.5CA	8.5	9.44	10.4	1	14.4	13.89	10	AT	HT
SMF9.0A	SMF9.0CA	9.0	10.0	11.1	1	15.4	12.99	5.0	AV	HV
SMF10A	SMF10CA	10.0	11.1	12.3	1	17.0	11.76	2.5	AX	HX
SMF11A	SMF11CA	11.0	12.2	13.5	1	18.2	10.99	2.5	AZ	HZ
SMF12A	SMF12CA	12.0	13.3	14.7	1	19.9	10.05	2.5	BE	IE
SMF13A	SMF13CA	13.0	14.4	15.9	1	21.5	9.30	1	BG	IG
SMF14A	SMF14CA	14.0	15.6	17.2	1	23.2	8.62	1	BK	IK
SMF15A	SMF15CA	15.0	16.7	18.5	1	24.4	8.20	1	BM	IM
SMF16A	SMF16CA	16.0	17.8	19.7	1	26.0	7.69	1	BP	IP
SMF17A	SMF17CA	17.0	18.9	20.9	1	27.6	7.25	1	BR	IR
SMF18A	SMF18CA	18.0	20.0	22.1	1	29.2	6.85	1	BT	IT
SMF19A	SMF19CA	19.0	21.1	23.3	1	30.6	6.54	1	BU	IU
SMF20A	SMF20CA	20.0	22.2	24.5	1	32.4	6.17	1	BV	IV
SMF22A	SMF22CA	22.0	24.4	26.9	1	35.5	5.63	1	BX	IX
SMF24A	SMF24CA	24.0	26.7	29.5	1	38.9	5.14	1	BZ	IZ
SMF26A	SMF26CA	26.0	28.9	31.9	1	42.1	4.75	1	CE	JE
SMF28A	SMF28CA	28.0	31.1	34.4	1	45.4	4.41	1	CG	JG
SMF30A	SMF30CA	30.0	33.3	36.8	1	48.4	4.13	1	CK	JK
SMF33A	SMF33CA	33.0	36.7	40.6	1	53.3	3.75	1	CM	JM
SMF36A	SMF36CA	36.0	40.0	44.2	1	58.1	3.44	1	CP	JP
SMF40A	SMF40CA	40.0	44.4	49.1	1	64.5	3.10	1	CR	JR
SMF43A	SMF43CA	43.0	47.8	52.8	1	69.4	2.88	1	CT	JT
SMF45A	SMF45CA	45.0	50.0	55.3	1	72.7	2.75	1	CV	JV
SMF48A	SMF48CA	48.0	53.3	58.9	1	77.4	2.58	1	CX	JX
SMF51A	SMF51CA	51.0	56.7	62.7	1	82.4	2.43	1	CZ	JZ
SMF54A	SMF54CA	54.0	60.0	66.3	1	87.4	2.30	1	DE	KE
SMF58A	SMF58CA	58.0	64.4	71.2	1	93.6	2.14	1	RG	KG

Model		Working Peak Reverse Voltage V_{RWM}	Breakdown Voltage V_{BR} @ I_T			Clamping Voltage V_C @Ipp	Reverse Surge Current Ipp	Reverse Leakage I_R @V_{Rwm}	Marking	
(Uni)	(Bi)	(V)	Min(V)	Max(V)	I_T(mA)	Max(V)	Max(A)	Max(μA)	Uni.	Bi.
SMF60A	SMF60CA	60.0	66.7	73.7	1	96.8	2.07	1	RK	KK
SMF64A	SMF64CA	64.0	71.1	78.6	1	103.0	1.94	1	RM	KM
SMF70A	SMF70CA	70.0	77.8	86.0	1	113.0	1.77	1	RP	KP
SMF75A	SMF75CA	75.0	83.3	92.1	1	121.0	1.65	1	RR	KR
SMF78A	SMF78CA	78.0	86.7	95.8	1	126.0	1.59	1	RT	KT
SMF80A	SMF80CA	80.0	88.8	97.6	1	129.0	1.55	1	RU	KU
SMF85A	SMF85CA	85.0	94.4	104.0	1	137.0	1.46	1	RV	KV
SMF90A	SMF90CA	90.0	100.0	111.0	1	146.0	1.37	1	RW	KW
SMF100A	SMF100CA	100.0	111.0	123.0	1	162.0	1.23	1	RX	KX
SMF110A	SMF110CA	110.0	122.0	135.0	1	177.0	1.13	1	SE	LE
SMF120A	SMF120CA	120.0	133.0	147.0	1	193.0	1.04	1	SG	LG
SMF130A	SMF130CA	130.0	144.0	159.0	1	209.0	0.96	1	SK	LK
SMF140A	SMF140CA	140.0	155.0	171.0	1	224.0	0.89	1	SL	LL
SMF150A	SMF150CA	150.0	167.0	185.0	1	243.0	0.82	1	SM	LM
SMF160A	SMF160CA	160.0	178.0	197.0	1	259.0	0.77	1	SP	LP
SMF170A	SMF170CA	170.0	189.0	209.0	1	275.0	0.73	1	SR	LR
SMF180A	SMF180CA	180.0	200.0	220.0	1	292.0	0.68	1	ST	LT
SMF190A	SMF190CA	190.0	211.0	232.0	1	308.0	0.65	1	SV	LV
SMF200A	SMF200CA	200.0	224.0	247.0	1	324.0	0.62	1	SX	LX
SMF220A	SMF220CA	220.0	246.0	272.0	1	356.0	0.56	1	SZ	LZ
SMF250A	SMF250CA	250.0	279.0	309.0	1	405.0	0.50	1	TE	ME
SMF300A	SMF300CA	300.0	335.0	371.0	1	486.0	0.41	1	TG	MG
SMF350A	SMF350CA	350.0	391.0	432.0	1	567.0	0.36	1	TK	MK

Typical Performance Characteristics
(TA=25°C unless otherwise Specified)

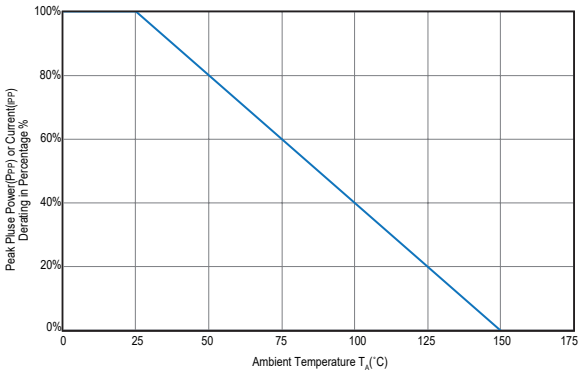


Fig.1:Pulse Derating Curve

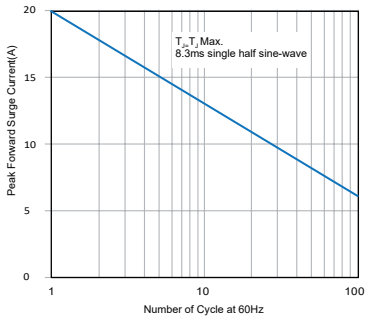


Fig. 2:Max. Non-Repetitive Surge Current

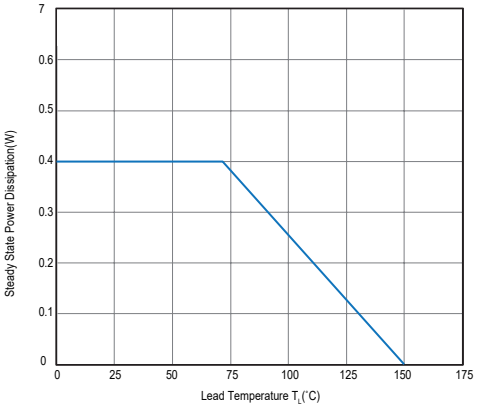


Fig. 3:Steady State Power Derating Curve

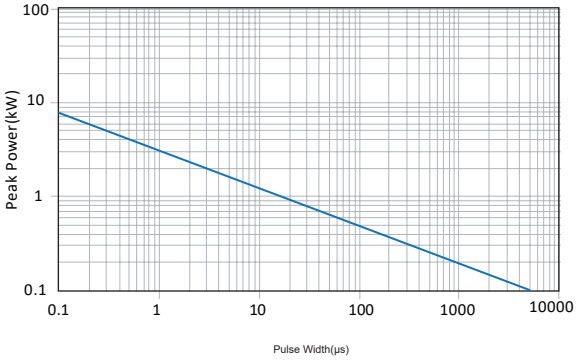


Fig. 4:Peak Pulse Power Rating Curve

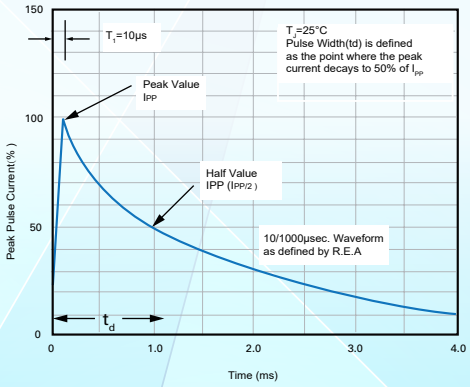


Fig 5:Pulse Waveform

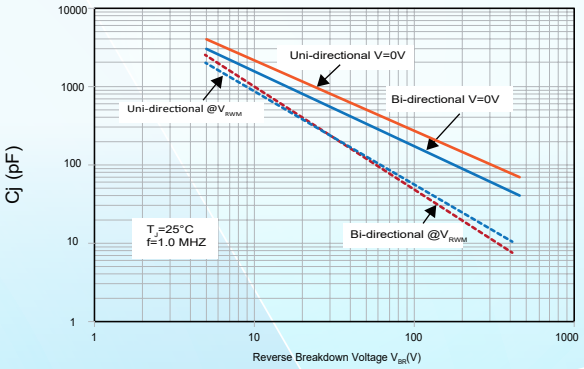
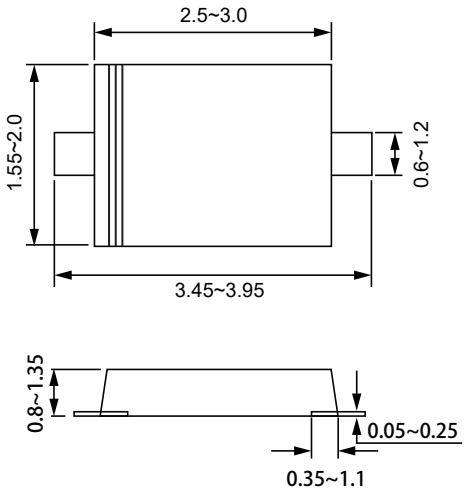


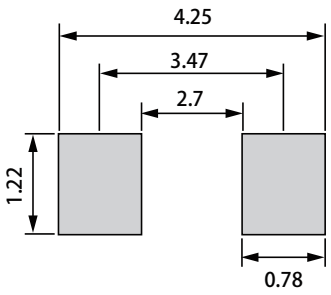
Fig 6: Typical Junction Capacitance

Mechanical Data

Case	Molded Plastic
Epoxy	UL 94V-0 rate flame retardant
Lead	Solderable per MIL-STD-750, method 2026
Polarity	Color band denoted cathode end except bipolar
Moisture Sensitivity	Level 1 per J-STD-020.

SOD-123FL



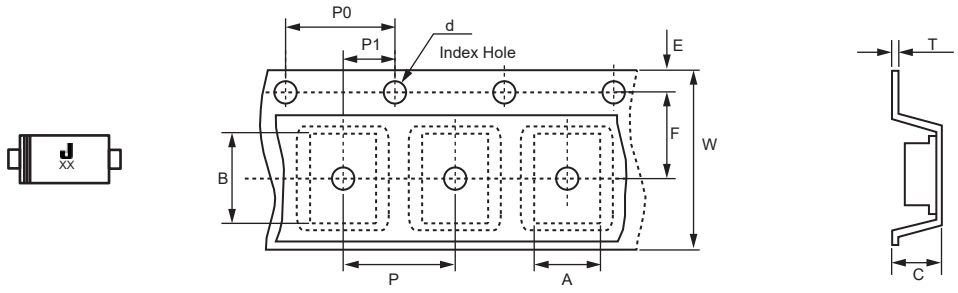


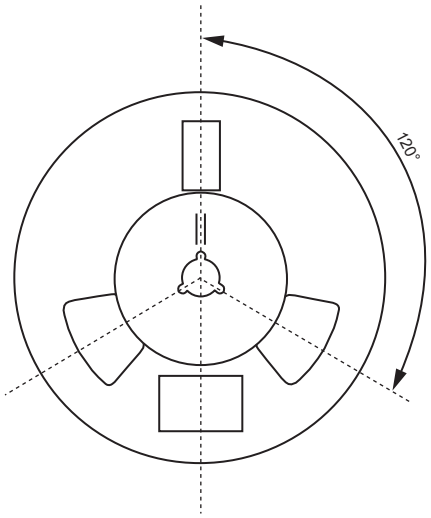
Recommend Pad Layout

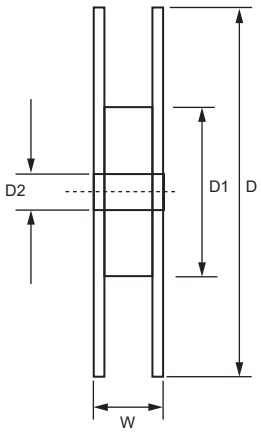
Packaging Quantity

Package	Weight	Quantity	Reel Size	Packaging Option
SOD-123FL	0.014g(approx)	3000pcs	7 inch	Tape and reel

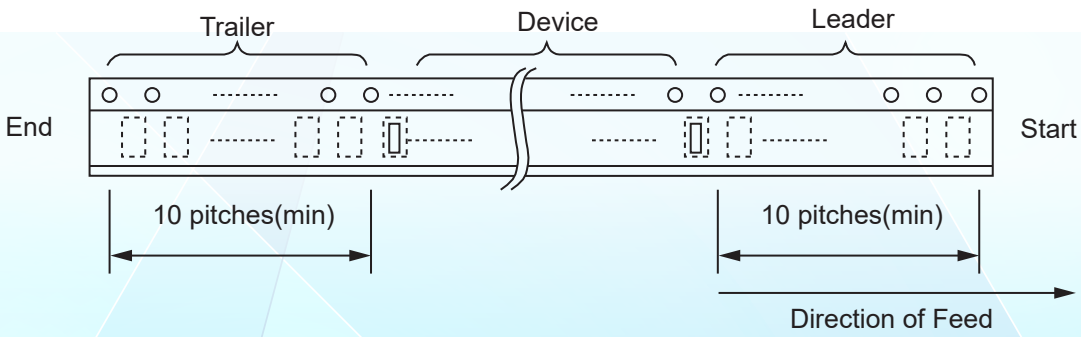
Tape and Reel Specification





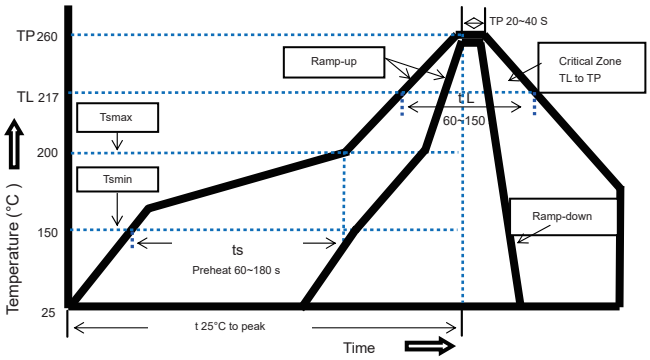


Symbol	Dimensions(mm)
A	2.00±0.1
B	4.00±0.1
C	1.45±0.1
d	1.55±0.1
D	178 Max.
D1	62 Min.
D2	13.0±0.2
E	1.75±0.10
F	3.50±0.05
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.05
W	8.00±0.3
W1	11.4 Min.



Notes:1.A, B, and C the clearance between the component and the cavity must be within 0.5mm max. for 8mm tape and 12mm tape, 1.0mm max. for 16mm tape and 24mm tape.

Soldering Parameters



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts max to T p)	3°C/second mac.
Preheat	
-Temperature Min(Ts min)	150°C
-Temperature Max(Ts max)	200°C
-Time(Ts min to Ts max)	60~180 seconds
Time maintained above:	
-Temperature(TL)	217°C
-Time(tL)	60~150 seconds
Peak Temperature(Tp)	260°C
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max
Storage Condition	0°C~35°C,≤70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free
- Recommended maximum paste thickness is 0.25mm Devices can be cleaned using standard industry methods and solvents.
- Note 1:All temperature refer to topside of the package, measured on the package body surface.
- Note 2: If reflow temperatures exceed the recommended

Part Number System

SMF XXX C A

- A — 5% VOLTAGETOLERANCE
- C — BI-DIRECTIONAL
- XXX — VOLTAGE
- SMF — SERIES