Technical Data
Data Sheet N1781, Rev. C

RoHS HF

SMF5.0-SMF170A
TRANSIENT VOLTAGE SUPPRESSOR

SOD-123FL

Features

- For surface mounted applications in order to optimize board space
- Low profile space
- Glass passivated chip
- Low inductance
- Excellent clamping capability
- Very fast response time
- Typical IR less than 1μA at V_{RWM}
- "-A" is an AEC-Q101 qualified device(V_{RWM} more than 10 V)
- This is a Halogen Free device
- Terminals finish: 100% Pure Tin
- 200 W peak pulse power capability with a 10/1000 μs waveform

Circuit Diagram

Mechanical Data

- Case: JEDEC SOD-123FL molded plastic over passivated chip
- Terminals: Solder plated, solderable per MIL-STD-750 Method 2026
- Polarity: For uni-directional types the band by laser denotes the cathode, which is positive with respect to the anode under normal TVS operation

Maximum Ratings@T_A=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000μs waveform (Note1,2)	P_{PPM}	200	W
Peak forward surge current 8.3ms single half sine-wave	I_{FSM}	20	A
Forward voltage @IF=200mA	V_F	1.25	V
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	100	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	220	°C/W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to +150	°C

Notes: 1. Non-repetitive current pulse and derated above T_A=25℃
2. Mounted on 5.0mm² copper pads to each terminal.

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Electrical Characteristics @T_A=25°C unless otherwise specified

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UNI	UNI	V_{RWM} (V)	Min.	Max.	I_T(mA)	V_C(V)	I_{PP}(A)	IR(uA)
SMF5.0	KD	5.00	6.40	7.82	10	9.6	20.80	400
SMF5.0A	KE	5.00	6.40	7.00	10	9.2	21.70	400
SMF6.0	KF	6.00	6.67	8.15	10	11.4	17.55	400
SMF6.0A	KG	6.00	6.67	7.37	10	10.3	19.40	400
SMF6.5	KH	6.50	7.22	8.82	10	12.3	16.30	250
SMF6.5A	KK	6.50	7.22	7.98	10	11.2	17.90	250
SMF7.0	KL	7.00	7.78	9.51	10	13.3	15.10	100
SMF7.0A	KM	7.00	7.78	8.60	10	12.0	16.70	100
SMF7.5	KN	7.50	8.33	10.20	1	14.3	14.00	50
SMF7.5A	KP	7.50	8.33	9.21	1	12.9	15.50	50
SMF8.0	KQ	8.00	8.99	10.90	1	15.0	13.35	25
SMF8.0A	KR	8.00	8.99	9.83	1	13.6	14.70	25
SMF8.5	KS	8.5	9.44	11.50	1	15.9	12.60	10
SMF8.5A	KT	8.5	9.44	10.40	1	14.4	13.90	10
SMF9.0	KU	9.0	10.00	12.20	1	16.9	11.85	5
SMF9.0A	KV	9.0	10.00	11.10	1	15.4	13.00	5
SMF10	KW	10	11.10	13.60	1	18.8	10.70	2.5
SMF10A	KX	10	11.10	12.30	1	17.0	11.80	2.5
SMF11	KY	11	12.20	14.90	1	20.1	9.95	2.5
SMF11A	KZ	11	12.20	13.50	1	18.2	11.00	2.5
SMF12	LD	12	13.30	16.30	1	22.0	9.15	2.5
SMF12A	LE	12	13.30	14.70	1	19.9	10.10	2.5
SMF13	LF	13	14.40	17.60	1	23.8	8.40	1
SMF13A	LG	13	14.40	15.90	1	21.5	9.30	1
SMF14	LH	14	15.60	19.10	1	25.8	7.75	1
SMF14A	LK	14	15.60	17.20	1	23.2	8.60	1
SMF15	LL	15	16.70	20.50	1	26.9	7.45	1
SMF15A	LM	15	16.70	18.50	1	24.4	8.20	1
SMF16	LN	16	17.80	21.80	1	28.8	6.95	1
SMF16A	LP	16	17.80	19.70	1	26.0	7.70	1
SMF17	LQ	17	18.90	23.10	1	30.5	6.50	1
SMF17A	LR	17	18.90	20.90	1	27.6	7.20	1
SMF18	LS	18	20.00	24.40	1	32.2	6.15	1
SMF18A	LT	18	20.00	22.10	1	29.2	6.80	1
SMF20	LU	20	22.20	27.10	1	35.8	5.65	1
SMF20A	LV	20	22.20	24.50	1	32.4	6.20	1
SMF22	LW	22	24.40	29.80	1	39.4	5.05	1
SMF22A	LX	22	24.40	26.90	1	35.5	5.60	1
SMF24	LY	24	26.70	32.60	1	43.0	4.60	1
SMF24A	LZ	24	26.70	29.50	1	38.9	5.10	1

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UNI	UNI	V_{RWM} (V)	Min.	Max.	I_T(mA)	V_C(V)	I_{PP}(A)	IR(uA)
SMF26	MD	26	28.90	35.30	1	46.6	4.35	1
SMF26A	ME	26	28.90	31.90	1	42.1	4.80	1
SMF28	MF	28	31.10	38.00	1	50.0	4.00	1
SMF28A	MG	28	31.10	34.40	1	45.4	4.40	1
SMF30	MH	30	33.30	40.70	1	53.5	3.70	1
SMF30A	MK	30	33.30	36.80	1	48.4	4.10	1
SMF33	ML	33	36.70	44.90	1	59.0	3.45	1
SMF33A	MM	33	36.70	40.60	1	53.3	3.80	1
SMF36	MN	36	40.00	48.90	1	64.3	3.06	1
SMF36A	MP	36	40.00	44.20	1	58.1	3.40	1
SMF40	MQ	40	44.40	54.30	1	71.4	2.80	1
SMF40A	MR	40	44.40	49.10	1	64.5	3.10	1
SMF43	MS	43	47.80	58.40	1	76.7	2.60	1
SMF43A	MT	43	47.80	52.80	1	69.4	2.90	1
SMF45	MU	45	50.00	61.10	1	80.3	2.55	1
SMF45A	MV	45	50.00	55.30	1	72.7	2.80	1
SMF48	MW	48	53.30	65.10	1	85.5	2.35	1
SMF48A	MX	48	53.30	58.90	1	77.4	2.60	1
SMF51	MY	51	56.70	69.30	1	91.1	2.16	1
SMF51A	MZ	51	56.70	62.70	1	82.4	2.40	1
SMF54	ND	54	60.00	73.30	1	96.3	2.10	1
SMF54A	NE	54	60.00	66.30	1	87.1	2.30	1
SMF58	NF	58	64.40	78.70	1	103.0	2.00	1
SMF58A	NG	58	64.40	71.20	1	93.6	2.20	1
SMF60	NH	60	66.70	81.50	1	107.0	1.90	1
SMF60A	NK	60	66.70	73.70	1	96.8	2.10	1
SMF64	NL	64	71.10	86.90	1	114.0	1.79	1
SMF64A	NM	64	71.10	78.60	1	103.0	2.00	1
SMF70	NN	70	77.80	95.10	1	125.0	1.65	1
SMF70A	NP	70	77.80	86.00	1	113.0	1.80	1
SMF75	NQ	75	83.30	102.0	1	134.0	1.55	1
SMF75A	NR	75	83.30	92.10	1	121.0	1.70	1
SMF78	NS	78	86.70	106.0	1	139.0	1.45	1
SMF78A	NT	78	86.70	95.80	1	126.0	1.60	1
SMF85	NU	85	94.40	115.00	1	151.0	1.34	1
SMF85A	NV	85	94.40	104.00	1	137.0	1.50	1
SMF90	NW	90	100.00	122.00	1	160.0	1.30	1
SMF90A	NX	90	100.00	111.00	1	146.0	1.40	1
SMF100	NY	100	111.00	136.00	1	179.0	1.14	1
SMF100A	NZ	100	111.00	123.00	1	162.0	1.30	1

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UNI	UNI	V_{RWM} (V)	Min.	Max.	I_T(mA)	V_C(V)	I_{PP}(A)	IR(uA)
SMF110	PD	110	122.00	149.00	1	196.0	1.04	1
SMF110A	PE	110	122.00	135.00	1	177.0	1.20	1
SMF120	PF	120	133.00	163.00	1	214.0	0.95	1
SMF120A	PG	120	133.00	147.00	1	193.0	1.00	1
SMF130	PH	130	144.00	176.00	1	231.0	0.89	1
SMF130A	PK	130	144.00	159.00	1	209.0	1.00	1
SMF150	PL	150	167.00	204.00	1	268.0	0.75	1
SMF150A	PM	150	167.00	185.00	1	243.0	0.80	1
SMF160	PN	160	178.00	218.00	1	287.0	0.75	1
SMF160A	PP	160	178.00	197.00	1	259.0	0.80	1
SMF170	PQ	170	189.00	231.00	1	304.0	0.65	1
SMF170A	PR	170	189.00	209.00	1	275.0	0.70	1

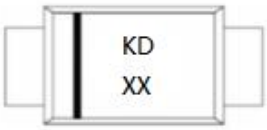
Notes: (1) "A" Suffix Designates 5% Tolerance Devices, No Suffix Designates 10% Tolerance Devices
(2) I_T pulse test：tp≤5.0mS
(3) Surge current waveform 10 / 1000 μS.

Ordering Information

Device	Package	Shipping
SMF5.0-SMF170A	SOD-123FL	3000pcs / reel
SMF5.0TR-SMF170ATR	SOD-123FL	3000pcs / reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

Marking Diagram(Except SMF5.0A)



Where XX is YM

KD = Marking code
Y = Year code
M = Month code

Old marking is without date code.
New marking with date code is performed from Nov, 2020.

SMF5.0A Specific Marking Diagram

Where XXXX is YYMM

KE = Marking code
YY = Year code
MM = Month code

Old marking is without date code.
New marking with date code is performed from 2110.

Ratings and Characteristics Curves

Fig.1 Peak Pulse Power Rating Curve

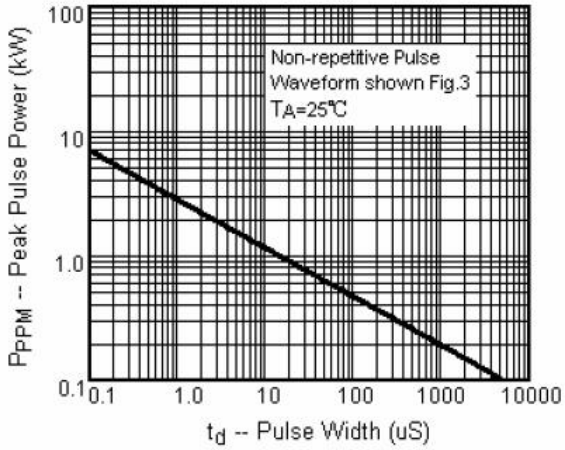


Fig.2 Pulse Derating Cure

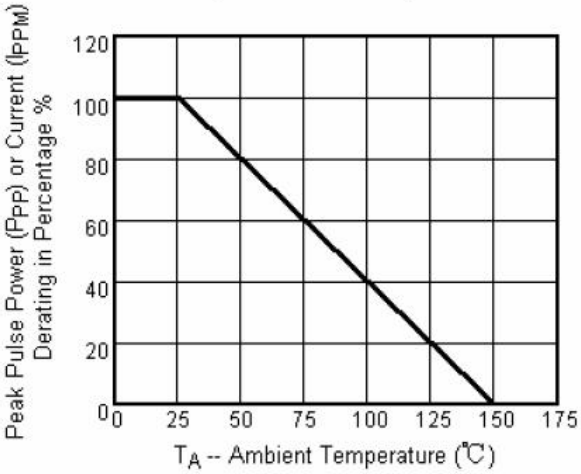


Fig.3 Pulse Waveform

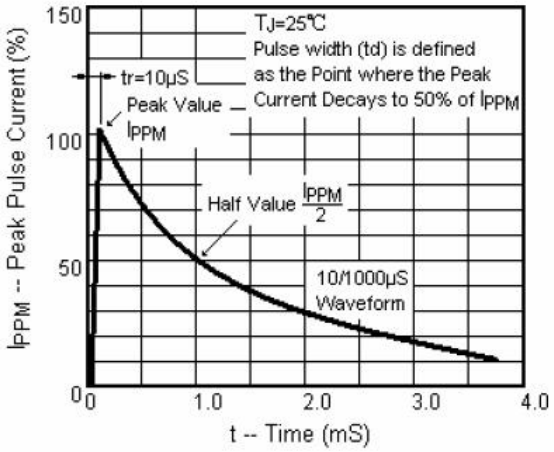


Fig.4 Typical Junction Capacitance

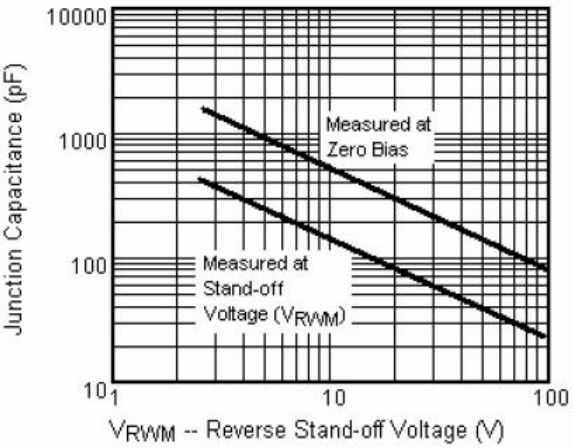
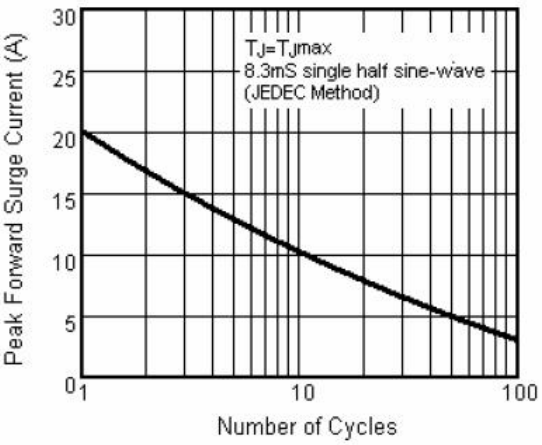


Fig.2 Maximum Non-Repetitive Peak Forward Surge Current



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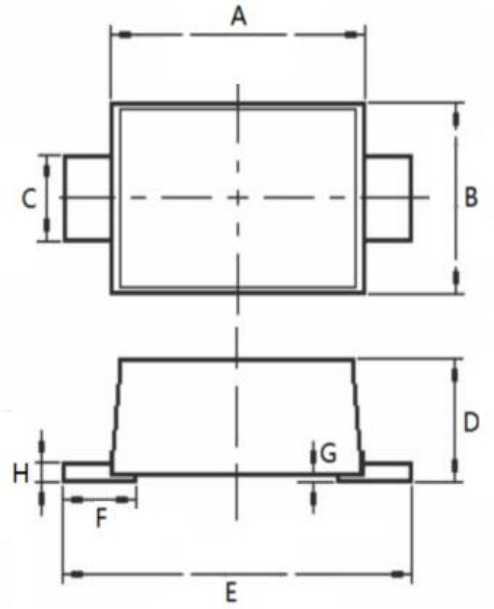
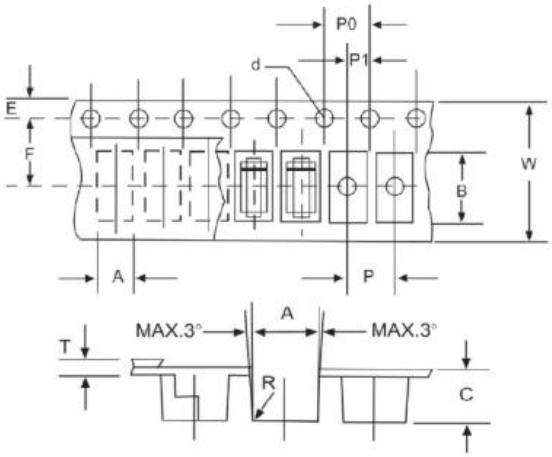
Mechanical Dimensions SOD-123FL(Millimeters/Inches)



SYMBOL	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.50	3.05	0.098	0.138
B	1.55	1.95	0.061	0.077
C	0.60	1.10	0.024	0.043
D	0.80	1.40	0.031	0.055
E	3.35	4.05	0.132	0.159
F	0.35	1.10	0.0137	0.043
G	-	0.1	-	0.004
H	0.05	0.25	0.002	0.010

Carrier Tape Specification SOD-123FL



SYMBOL	Millimeters	
	Min.	Max.
A	1.95	2.15
B	3.85	4.05
C	1.35	1.55
d	1.50	1.60
E	1.65	1.85
F	3.40	3.60
P	3.90	4.10
P0	3.90	4.10
P1	1.90	2.10
W	7.90	8.30

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