

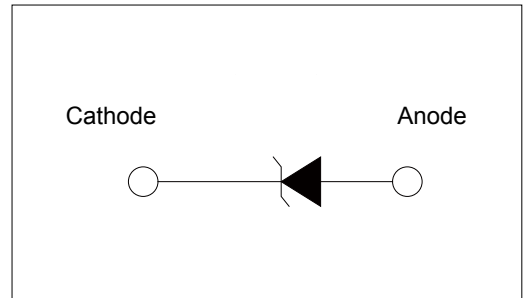
Transient Voltage Suppressors

SMFJ Series

Transient Voltage Suppressors - SMFJ Series

Features

- Fast response time
- Built-in strain relief
- Low incremental surge resistance
- Matte tin lead-free Plated
- Halogen free and RoHS compliant
- For surface mounted applications to optimize board space
- Compatible with industrial standard package SOD-123FL
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- 200W peak pulsepower capability at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- High temperature soldering : 260°C/ 40 seconds at terminals



Description

The SMFJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. SOD-123FL package is 50% smaller in footprint when compare to SMA package and delivering low height profile (1.1mm) in the industry.

Mechanical Characteristics

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation at TA=25°C by 10/1000µs (Note 1)	P_{PPM}	200	W
Thermal Resistance Junction- to- Ambient	R_{THJ-A}	220	°C/W
Thermal Resistance Junction- to- Lead	I_{FSM}	100	°C/W
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55°C to 150°C	°C

Notes:

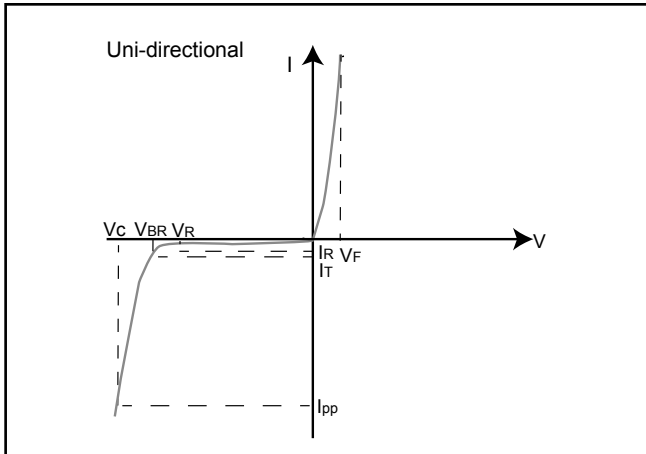
1. Non-repetitive current pulse, per Fig. 4 and derated above TA=25°C per Fig. 3

Electrical Characteristics

Type Number		Reverse Stand-Off Voltage	Breakdown Voltage@IT		Test Current	Maximum Clamping Voltage @IPP	Peak Pulse Current	Reverse Leakage @VR
UNI	BI	VR(V)	VBR MIN.(V)	VBR MAX.(V)	IT(mA)	VC(V)	IPP(A)	IR(μA)
SMFJ5.0A	SMFJ5.0CA	5.0	6.40	7.25	10	9.2	21.7	400
SMFJ6.0A	SMFJ6.0CA	6.0	6.67	7.67	10	10.3	19.4	400
SMFJ6.5A	SMFJ6.5CA	6.5	7.22	8.30	10	11.2	17.9	250
SMFJ7.0A	SMFJ7.0CA	7.0	7.78	8.95	10	12.0	16.7	100
SMFJ7.5A	SMFJ7.5CA	7.5	8.33	9.58	1	12.9	15.5	50
SMFJ8.0A	SMFJ8.0CA	8.0	8.89	10.23	1	13.6	14.7	25
SMFJ8.5A	SMFJ8.5CA	8.5	9.44	10.82	1	14.4	13.9	10
SMFJ9.0A	SMFJ9.0CA	9.0	10.00	11.50	1	15.4	13.0	5.0
SMFJ10A	SMFJ10CA	10.0	11.10	12.80	1	17.0	11.8	2.5
SMFJ11A	SMFJ11CA	11.0	12.20	14.00	1	18.2	11.0	2.5
SMFJ12A	SMFJ12CA	12.0	13.30	15.30	1	19.9	10.1	2.5
SMFJ13A	SMFJ13CA	13.0	14.40	16.50	1	21.5	9.30	1
SMFJ14A	SMFJ14CA	14.0	15.60	17.90	1	23.2	8.60	1
SMFJ15A	SMFJ15CA	15.0	16.70	19.20	1	24.4	8.20	1
SMFJ16A	SMFJ16CA	16.0	17.80	20.50	1	26.0	7.70	1
SMFJ17A	SMFJ17CA	17.0	18.90	21.70	1	27.6	7.20	1
SMFJ18A	SMFJ18CA	18.0	20.00	23.30	1	29.2	5.80	1
SMFJ20A	SMFJ20CA	20.0	22.20	25.50	1	32.4	6.20	1
SMFJ22A	SMFJ22CA	22.0	24.40	28.00	1	35.5	5.60	1
SMFJ24A	SMFJ24CA	24.0	26.70	30.70	1	38.9	5.10	1
SMFJ26A	SMFJ26CA	26.0	28.90	33.20	1	42.1	4.80	1
SMFJ28A	SMFJ28CA	28.0	31.10	35.80	1	45.4	4.40	1
SMFJ30A	SMFJ30CA	30.0	33.30	38.30	1	48.4	4.10	1
SMFJ33A	SMFJ33CA	33.0	36.70	42.20	1	53.3	3.80	1
SMFJ36A	SMFJ36CA	36.0	40.00	46.00	1	58.1	3.40	1
SMFJ40A	SMFJ40CA	40.0	44.40	51.10	1	64.5	3.10	1
SMFJ43A	SMFJ43CA	43.0	47.80	54.90	1	69.4	2.90	1
SMFJ45A	SMFJ45CA	45.0	50.00	57.50	1	72.7	2.80	1
SMFJ48A	SMFJ48CA	48.0	53.30	61.30	1	77.4	2.60	1
SMFJ51A	SMFJ51CA	51.0	56.70	65.20	1	82.4	2.40	1
SMFJ54A	SMFJ54CA	54.0	60.00	69.00	1	87.1	2.30	1
SMFJ58A	SMFJ58CA	58.0	64.40	74.10	1	93.6	2.10	1
SMFJ60A	SMFJ60CA	60.0	66.70	76.70	1	96.8	1.80	1
SMFJ64A	SMFJ64CA	64.0	71.10	81.80	1	103.0	1.70	1
SMFJ70A	SMFJ70CA	70.0	77.80	89.50	1	113.0	1.50	1
SMFJ75A	SMFJ75CA	75.0	83.30	95.80	1	121.0	1.40	1
SMFJ78A	SMFJ78CA	78.0	86.70	99.70	1	126.0	1.40	1
SMFJ85A	SMFJ85CA	85.0	94.40	108.20	1	137.0	1.30	1
SMFJ90A	SMFJ90CA	90.0	100.00	115.50	1	146.0	1.20	1
SMFJ100A	SMFJ100CA	100.0	111.00	128.00	1	162.0	1.10	1
SMFJ110A	SMFJ110CA	110.0	122.00	140.50	1	177.0	1.00	1
SMFJ120A	SMFJ120CA	120.0	133.00	153.00	1	193.0	0.90	1
SMFJ130A	SMFJ130CA	130.0	144.00	165.50	1	209.0	0.80	1
SMFJ150A	SMFJ150CA	150.0	167.00	192.60	1	243.0	0.70	1
SMFJ160A	SMFJ160CA	160.0	178.00	205.00	1	259.0	0.70	1
SMFJ170A	SMFJ170CA	170.0	189.00	217.50	1	275.0	0.60	1

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I-V Curve Characteristics



- P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation
- V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation
- V_{BR} Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current (I_T)
- V_C Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)
- I_R Reverse Leakage Current -- Current measured at V_R
- V_F Forward Voltage Drop for Uni-directional

Ratings and Characteristic Curves ($T_A = 25^\circ C$ unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

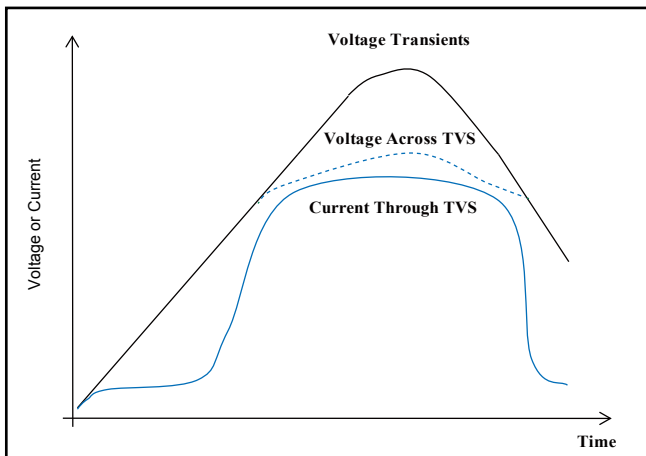
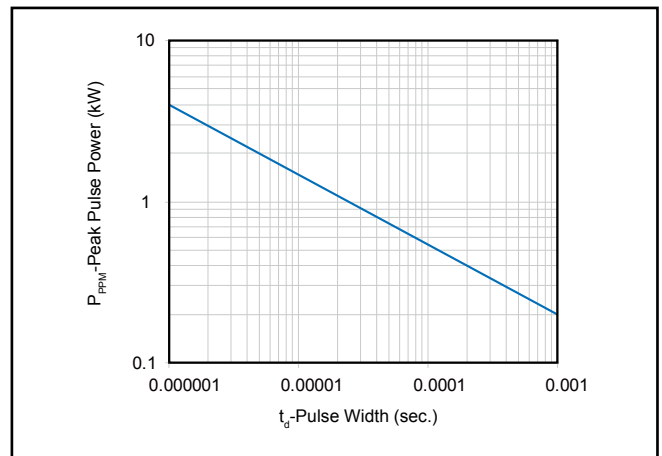


Figure 2 - Peak Pulse Power Rating Curve



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Ratings and Characteristic Curves (TA=25°C unless otherwise noted) (Continued)

Figure 3 - Pulse Derating Curve

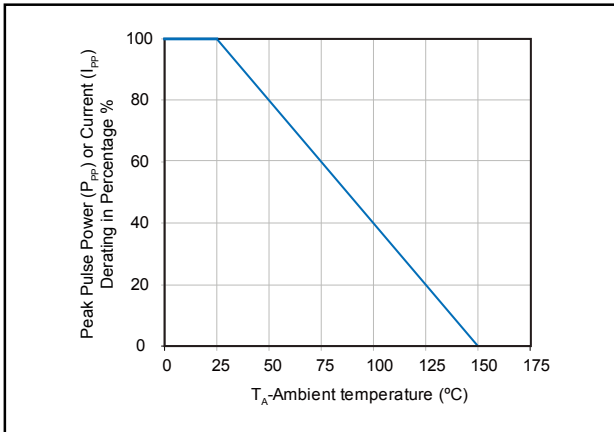


Figure 4 - Pulse Waveform - 10/1000 μS

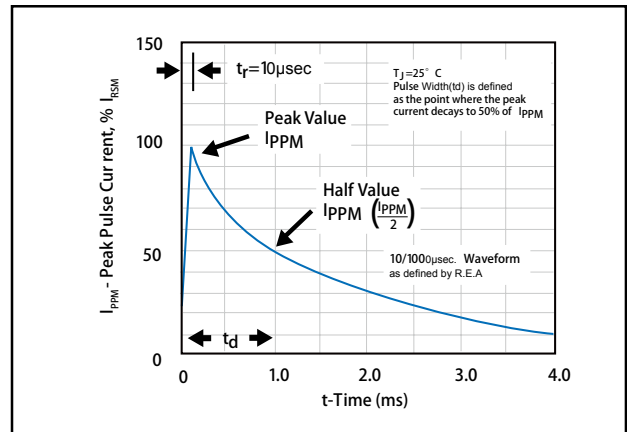


Figure 5 - Steady State Power Dissipation Derating Curve

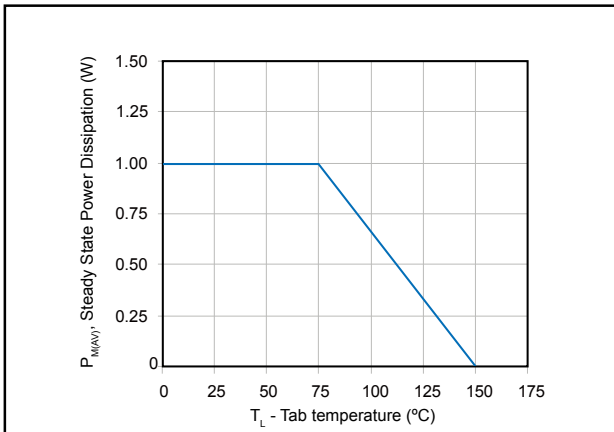


Figure 6 - Forward Voltage

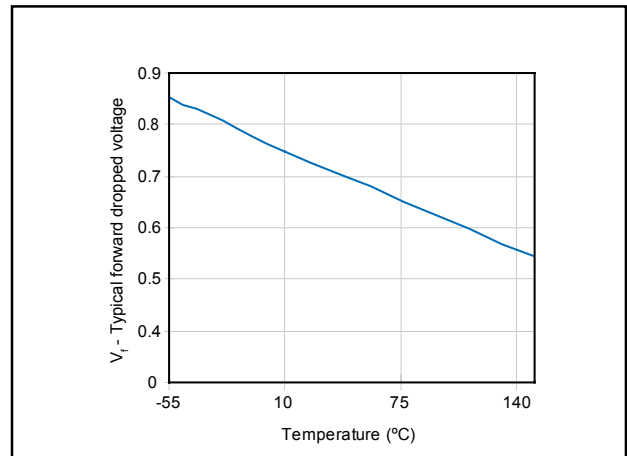
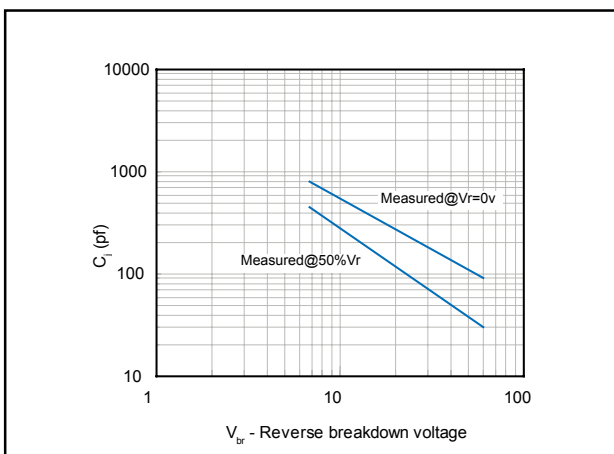


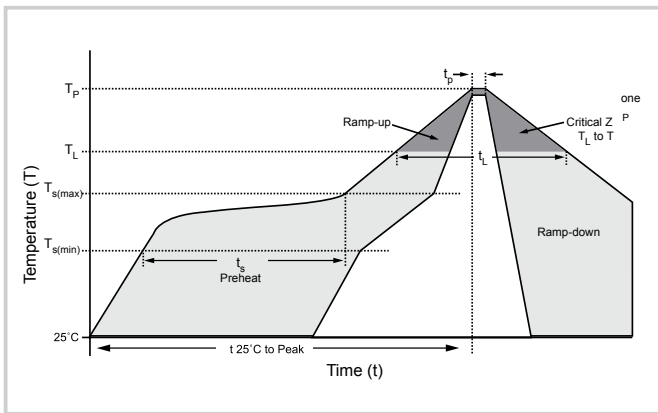
Figure 7 - C_j vs. Working Peak Reverse Voltage



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Soldering Parameters

	Reflow Condition	Lead-free assembly
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) (Liquidus)	217°C
	- Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °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		280°C



Physical Specifications

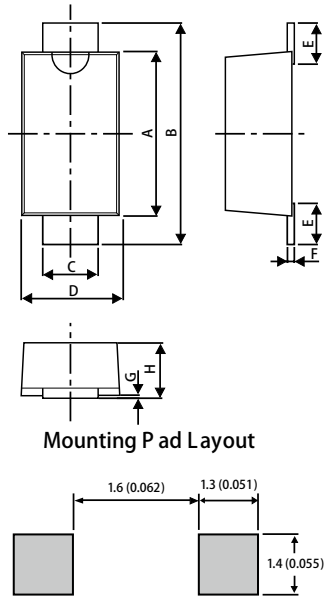
Weight	0.002 ounce, 0.061 gram
Case	JEDEC SOD-123FL molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Termina	Matte Tin axial leads, solderable per JESD22-B102D.

Environmental Specifications

Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

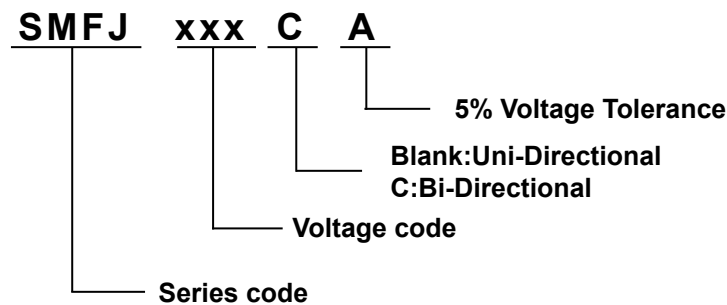
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Dimensions SOD-123FL



DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0984	0.1142	2.5	2.9
B	0.1339	0.1535	3.40	3.90
C	0.0275	0.0472	0.7	1.2
D	0.051	0.0787	1.5	2.0
E	0.0138	0.0354	0.35	0.90
F	0.0020	0.0039	0.05	0.26
G	0.0000	0.0039	0.00	0.10
H	0.0374	0.0433	0.95	1.10

Part Numbering System



Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SMFJxxxXX	SOD-123FL	3000	Tape&Reel	EIA STD RS-481

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