

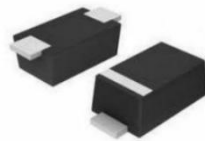
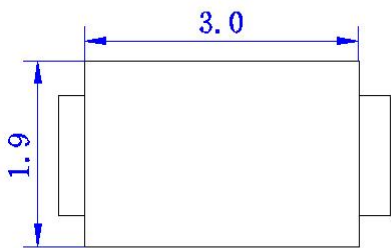
Description

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

Features

- Glass passivated or planar junction
- Excellent clamping capability
- Repetition rate (duty cycle): 0.01%
- Low profile package and low inductance
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- High temperature soldering: 260°C/10s at terminals.
- For surface mounted applications in order to optimize board space.

Dimensions & Symbol (Unit: mm Max)



Bi-directional



Un-directional

Mechanical Characteristics

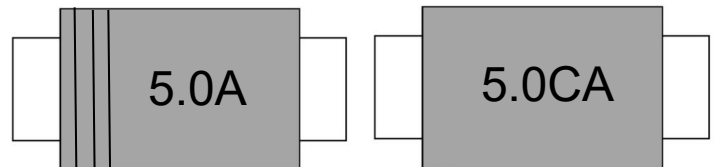
Package: SMF/SOD-123FL

- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Polarity: Color band denotes cathode except bi-directional models
- Weight: 0.017g
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- I/O Interface.
- Power lines
- Automotive and Telecommunication
- Industrial Electronics

Marking Information



5.0A: SMF5.0A Marking code

5.0CA: SMF5.0CA Marking code

Ordering information

Out line	Reel (pcs)	Per carton (pcs)	Reel diameters
Taping	3K	270K	7inch

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _{R@V_R}	V _{BR@I_T}		I _T	V _{C@I_{PP}}	I _{PP} ^①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMF3.3A	/	3.3A	/	3.3	200	5.2	6	10	8.0	25.00
SMF5.0A	SMF5.0CA	5.0A	5.0CA	5.0	400	6.40	7.00	10	9.2	21.74
SMF6.0A	SMF6.0CA	6.0A	6.0CA	6.0	400	6.67	7.37	10	10.3	19.42
SMF6.5A	SMF6.5CA	6.5A	6.5CA	6.5	250	7.22	7.98	10	11.2	17.86
SMF7.0A	SMF7.0CA	7.0A	7.0CA	7.0	100	7.78	8.60	10	12.0	16.67
SMF7.5A	SMF7.5CA	7.5A	7.5CA	7.5	50	8.33	9.21	1	12.9	15.51
SMF8.0A	SMF8.0CA	8.0A	8.0CA	8.0	25	8.89	9.83	1	13.6	14.71
SMF8.5A	SMF8.5CA	8.5A	8.5CA	8.5	10	9.44	10.40	1	14.4	13.89
SMF9.0A	SMF9.0CA	9.0A	9.0CA	9.0	5	10.00	11.10	1	15.4	12.99
SMF10A	SMF10CA	10A	10CA	10.0	2.5	11.10	12.30	1	17.0	11.77
SMF11A	SMF11CA	11A	11CA	11.0	2.5	12.20	13.50	1	18.2	10.99
SMF12A	SMF12CA	12A	12CA	12.0	2.5	13.30	14.70	1	19.9	10.06
SMF13A	SMF13CA	13A	13CA	13.0	1	14.40	15.90	1	21.5	9.31
SMF14A	SMF14CA	14A	14CA	14.0	1	15.60	17.20	1	23.2	8.63
SMF15A	SMF15CA	15A	15CA	15.0	1	16.70	18.50	1	24.4	8.20
SMF16A	SMF16CA	16A	16CA	16.0	1	17.80	19.70	1	26.0	7.70
SMF17A	SMF17CA	17A	17CA	17.0	1	18.90	20.90	1	27.6	7.25
SMF18A	SMF18CA	18A	18CA	18.0	1	20.00	22.10	1	29.2	6.85
SMF20A	SMF20CA	20A	20CA	20.0	1	22.20	24.50	1	32.4	6.18
SMF22A	SMF22CA	22A	22CA	22.0	1	24.40	26.90	1	35.5	5.64
SMF24A	SMF24CA	24A	24CA	24.0	1	26.70	29.50	1	38.9	5.15
SMF26A	SMF26CA	26A	26CA	26.0	1	28.90	31.90	1	42.1	4.76
SMF28A	SMF28CA	28A	28CA	28.0	1	31.10	34.40	1	45.4	4.41
SMF30A	SMF30CA	30A	30CA	30.0	1	33.30	36.80	1	48.4	4.14
SMF33A	SMF33CA	33A	33CA	33.0	1	36.70	40.60	1	53.3	3.76
SMF36A	SMF36CA	36A	36CA	36.0	1	40.00	44.20	1	58.1	3.45
SMF40A	SMF40CA	40A	40CA	40.0	1	44.40	49.10	1	64.5	3.11
SMF43A	SMF43CA	43A	43CA	43.0	1	47.8	52.80	1	69.4	2.89
SMF45A	SMF45CA	45A	45CA	45.0	1	50.00	55.30	1	72.7	2.76
SMF48A	SMF48CA	48A	48CA	48.0	1	53.30	58.90	1	77.4	2.59
SMF51A	SMF51CA	51A	51CA	51.0	1	56.70	62.70	1	82.4	2.43

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ^①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMF54A	SMF54CA	54A	54CA	54.0	1	60.00	66.30	1	87.1	2.30
SMF58A	SMF58CA	58A	58CA	58.0	1	64.4	71.20	1	93.6	2.14
SMF60A	SMF60CA	60A	60CA	60.0	1	66.7	73.70	1	96.8	2.07
SMF64A	SMF64CA	64A	64CA	64.0	1	71.10	78.60	1	103.0	1.95
SMF70A	SMF70CA	70A	70CA	70.0	1	77.8	86.00	1	113.0	1.77
SMF75A	SMF75CA	75A	75CA	75.0	1	83.3	92.10	1	121.0	1.66
SMF78A	SMF78CA	78A	78CA	78.0	1	86.70	95.8	1	126.0	1.59
SMF85A	SMF85CA	85A	85CA	85.0	1	94.40	104.0	1	137.0	1.46
SMF90A	SMF90CA	90A	90CA	90.0	1	100.0	111.0	1	146.0	1.37
SMF100A	SMF100CA	100A	100CA	100.0	1	111.0	123.0	1	162.0	1.24
SMF110A	SMF110CA	110A	110CA	110.0	1	122.0	135.0	1	177.0	1.13
SMF120A	SMF120CA	120A	120CA	120.0	1	133.0	147.0	1	193.0	1.04
SMF130A	SMF130CA	130A	130CA	130.0	1	144.0	159.0	1	209.0	0.96
SMF150A	SMF150CA	150A	150CA	150.0	1	167.0	185.0	1	243.0	0.83
SMF160A	SMF160CA	160A	160CA	160.0	1	178.0	197.00	1	259.0	0.78
SMF170A	SMF170CA	170A	170CA	170.0	1	189.0	209.0	1	275.0	0.73
SMF180A	SMF180CA	180A	180CA	180.0	1	201.1	222.0	1	292.0	0.69
SMF190A	SMF190CA	190A	190CA	190.0	1	211.0	243.0	1	308.0	0.65

① Surge waveform: 10/1000μs

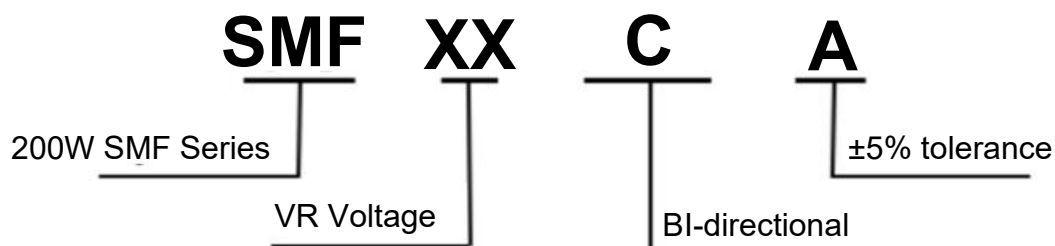
V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown Voltage

V_C: Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp}

I_R: Reverse Leakage Current

Part number code

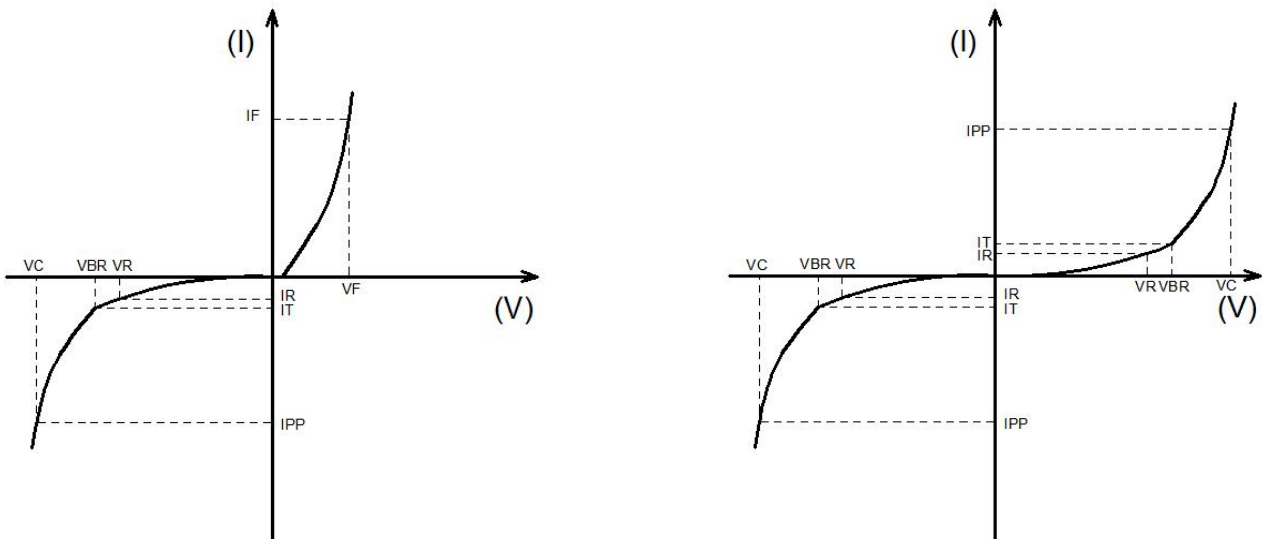


Absolute Maximum Ratings ($T=25^{\circ}\text{C}$, $\text{RH}=45\%-75\%$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000 μs waveform	P_{PP}	200	W
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	1.0	W
Operating junction temperature range	T_j	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Ratings And V-I Characteristics Curves ($T=25^{\circ}\text{C}$, unless otherwise noted)

FIG1: V-I cure characteristics



Symbol	Parameter
I_F	Mean Forward Current
V_F	Maximum Forward Voltage @ I_F
V_R	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_R
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}

Typical Characteristics

FIG2: Pulse Derating Curve

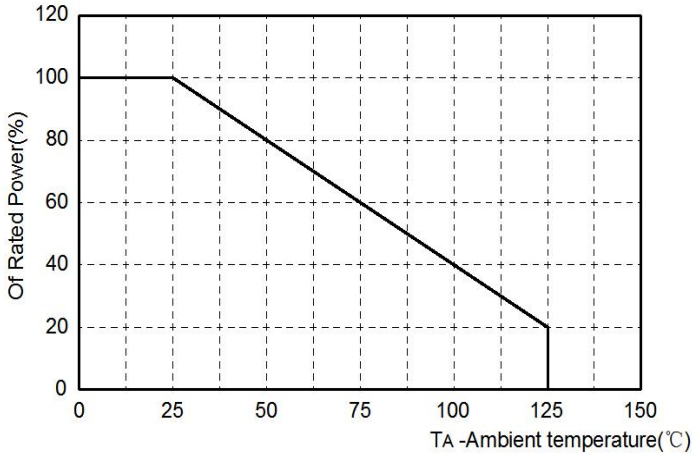


FIG3: Pulse Waveform

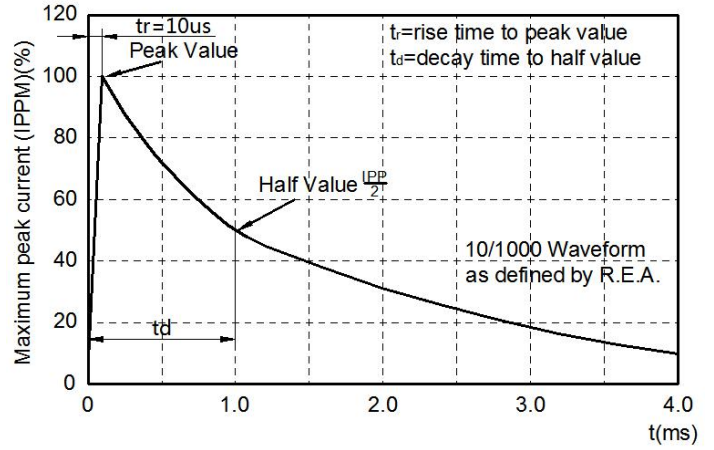


FIG4: Peak Pulse Power Rating Curve

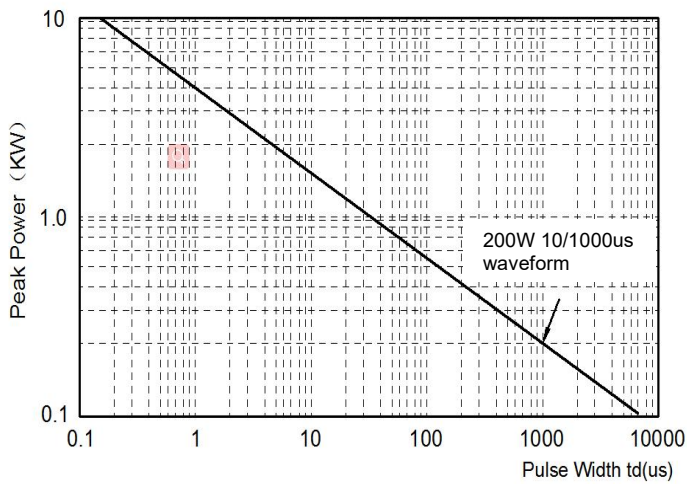
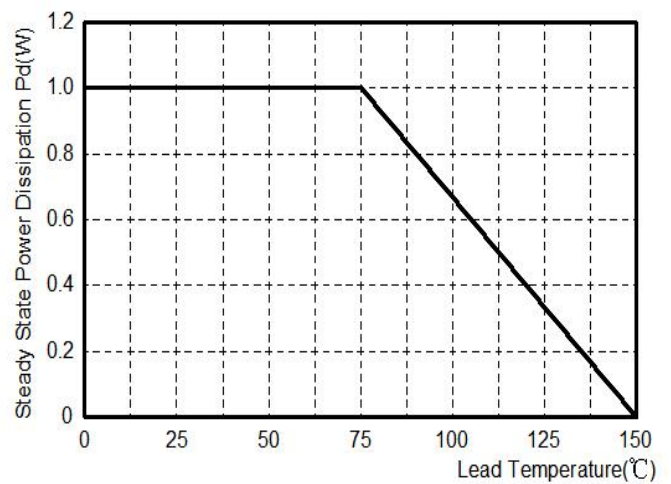
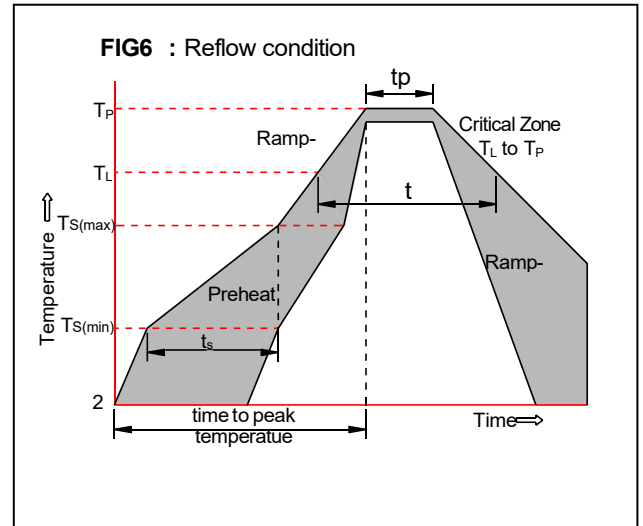


FIG5: Steady State Power Dissipation

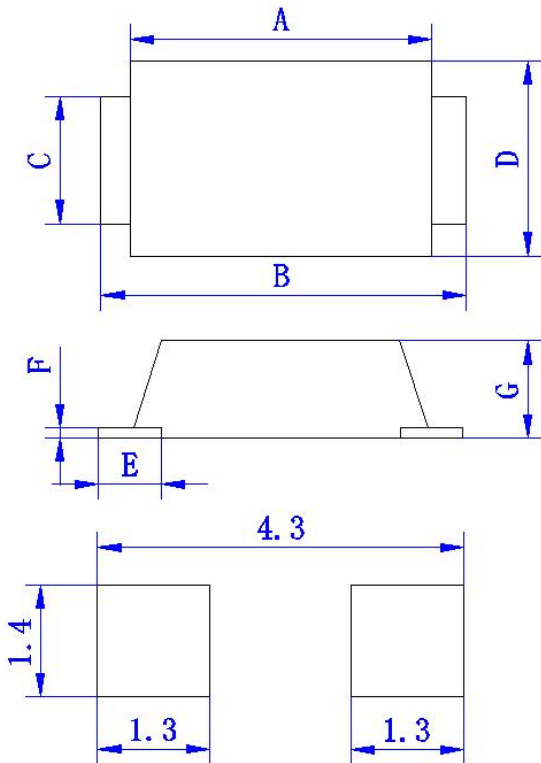


Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C

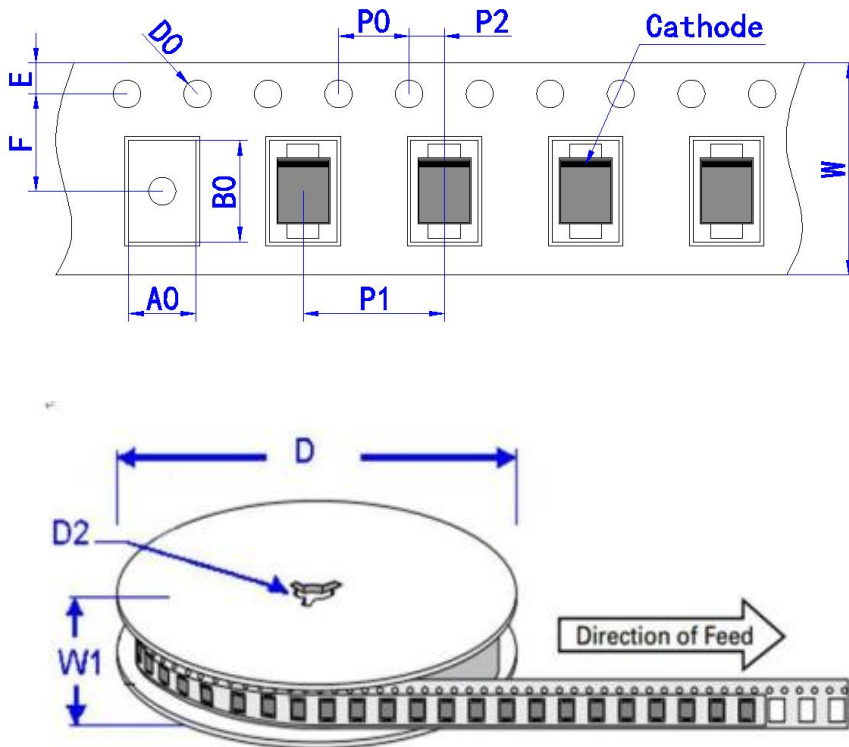


Package mechanical data



Ref.(mm)	Millimeters	
	Min.	Max.
A	2.5	3.0
B	3.4	4.0
C	0.7	1.1
D	1.5	1.9
E	0.45	0.95
F	0.05	0.26
G	0.9	1.1

Tape & reel specification - SOD-123FL



Ref.	Millimeters
A0	2.15±0.20
B0	3.95±0.20
C	178.00
D0	1.55±0.10
E	1.75±0.20
E1	13.50±1.00
F	3.50±0.10
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
W	8.00±0.30
W1	9.00±4.00

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