Features

RoHS Compliant

-400W peak pulse power capability at 10/1000μs waveform,

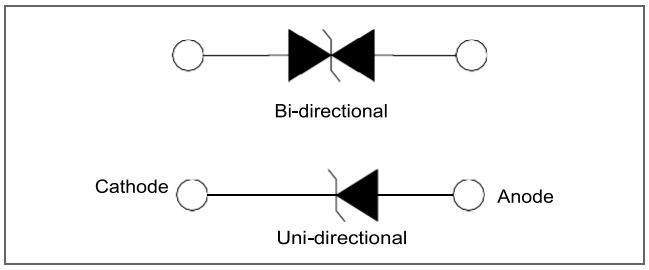
repetition rate (duty cycles):0.01%

- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C

Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Function Diagram



Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T_A=25°C by 10/1000μs Waveform (Fig.3)	P_{PPM}	400	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	1	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I_{FSM}	30	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V_F	3.5	V
Operating Temperature Range	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
®	Pending

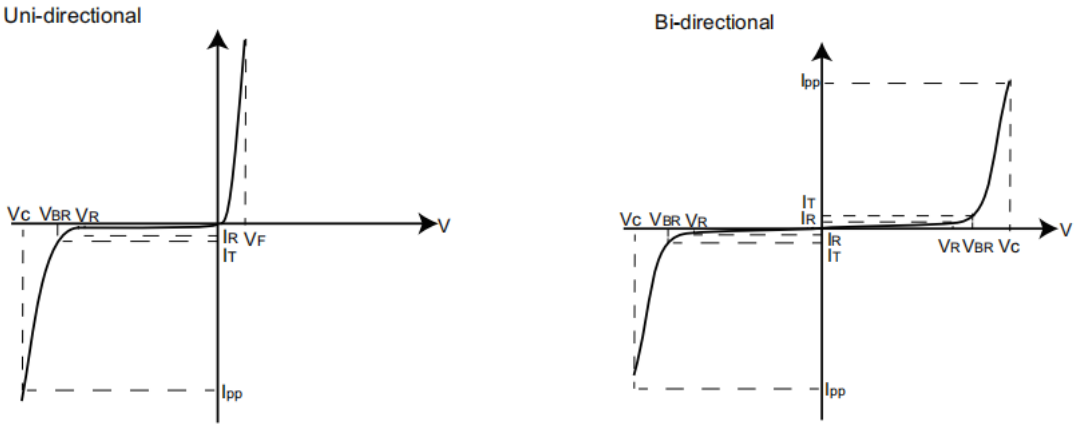
Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Characteristics (T =25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Key Marking UNI	Key Marking BI	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	Breakdown Voltage V_{BR} (Volts) @ I_T MAX	Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{pp} (V)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μA)	Agency Approval
SMF4L3.3A	-	3T	-	3.3	5.20	6.00	10	8.0	50.0	400	
-	SMF4L3.3CA	-	3T	3.3	5.20	6.50	10	8.0	50.0	400	
SMF4L5.0A	SMF4L5.0CA	05	05	5.0	6.40	7.00	10	9.2	40.1	800	
SMF4L6.0A	SMF4L6.0CA	06	06	6.0	6.67	7.37	10	10.3	35.9	800	
SMF4L6.5A	SMF4L6.5CA	6F	6F	6.5	7.22	7.98	10	11.2	33.1	500	
SMF4L7.0A	SMF4L7.0CA	07	07	7.0	7.78	8.60	10	12.0	30.9	200	
SMF4L7.5A	SMF4L7.5CA	7F	7F	7.5	8.33	9.21	1	12.9	28.7	100	
SMF4L8.0A	SMF4L8.0CA	08	08	8.0	8.89	9.83	1	13.6	27.2	50	
SMF4L8.5A	SMF4L8.5CA	8F	8F	8.5	9.44	10.40	1	14.4	25.7	20	
SMF4L9.0A	SMF4L9.0CA	09	09	9.0	10.00	11.10	1	15.4	26.4	5	
SMF4L10A	SMF4L10CA	10	10	10.0	11.10	12.30	1	17.0	23.5	5	
SMF4L11A	SMF4L11CA	11	11	11.0	12.20	13.50	1	18.2	22.0	1	
SMF4L12A	SMF4L12CA	12	12	12.0	13.30	14.70	1	19.9	20.1	1	
SMF4L13A	SMF4L13CA	13	13	13.0	14.40	15.90	1	21.5	18.6	1	
SMF4L14A	SMF4L14CA	14	14	14.0	15.60	17.20	1	23.2	17.2	1	
SMF4L15A	SMF4L15CA	15	15	15.0	16.70	18.50	1	24.4	16.4	1	
SMF4L16A	SMF4L16CA	16	16	16.0	17.80	19.70	1	26.0	15.4	1	
SMF4L17A	SMF4L17CA	17	17	17.0	18.90	20.90	1	27.6	14.5	1	
SMF4L18A	SMF4L18CA	18	18	18.0	20.00	22.10	1	29.2	13.7	1	
SMF4L20A	SMF4L20CA	20	20	20.0	22.20	24.50	1	32.4	12.3	1	
SMF4L22A	SMF4L22CA	22	22	22.0	24.40	26.90	1	35.5	11.3	1	
SMF4L24A	SMF4L24CA	24	24	24.0	26.70	29.50	1	38.9	10.3	1	
SMF4L26A	SMF4L26CA	26	26	26.0	28.90	31.90	1	42.1	9.5	1	
SMF4L28A	SMF4L28CA	28	28	28.0	31.10	34.40	1	45.4	8.8	1	
SMF4L30A	SMF4L30CA	30	30	30.0	33.30	36.80	1	48.4	8.3	1	
SMF4L33A	SMF4L33CA	33	33	33.0	36.70	40.60	1	53.3	7.5	1	
SMF4L36A	SMF4L36CA	36	36	36.0	40.00	44.20	1	58.1	6.9	1	
SMF4L40A	SMF4L40CA	40	40	40.0	44.40	49.10	1	64.5	6.2	1	
SMF4L43A	SMF4L43CA	43	43	43.0	47.80	52.80	1	69.4	5.8	1	
SMF4L45A	SMF4L45CA	45	45	45.0	50.00	55.30	1	72.7	5.5	1	
SMF4L48A	SMF4L48CA	48	48	48.0	53.30	58.90	1	77.4	5.2	1	
SMF4L51A	SMF4L51CA	51	51	51.0	56.70	62.70	1	82.4	4.9	1	
SMF4L54A	SMF4L54CA	54	54	54.0	60.00	66.30	1	87.1	4.6	1	
SMF4L58A	SMF4L58CA	58	58	58.0	64.40	71.20	1	93.6	4.3	1	
SMF4L60A	SMF4L60CA	60	60	60.0	66.70	73.70	1	96.8	4.1	1	
SMF4L64A	SMF4L64CA	64	64	64.0	71.10	78.60	1	103.0	3.9	1	
SMF4L70A	SMF4L70CA	70	70	70.0	77.80	86.00	1	113.0	3.5	1	
SMF4L75A	SMF4L75CA	75	75	75.0	83.30	92.10	1	121.0	3.3	1	
SMF4L78A	SMF4L78CA	78	78	78.0	86.70	95.80	1	126.0	3.2	1	
SMF4L85A	SMF4L85CA	85	85	85.0	94.40	104.0	1	137.0	2.9	1	

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 though the TVS at a specified test current (I_T)

V_C Clamping Voltage – Peak voltage measured across the TVS 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 =25°C unless otherwise noted)

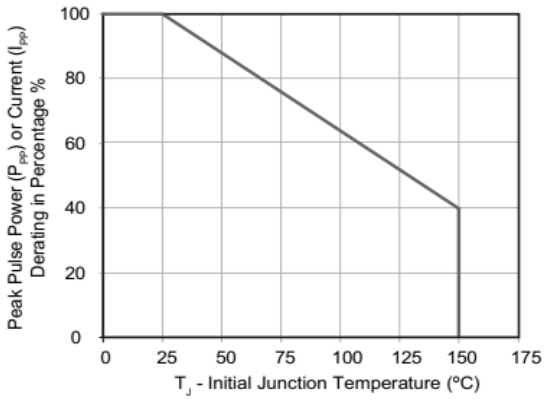


Figure 1. Peak pulse power derating curve

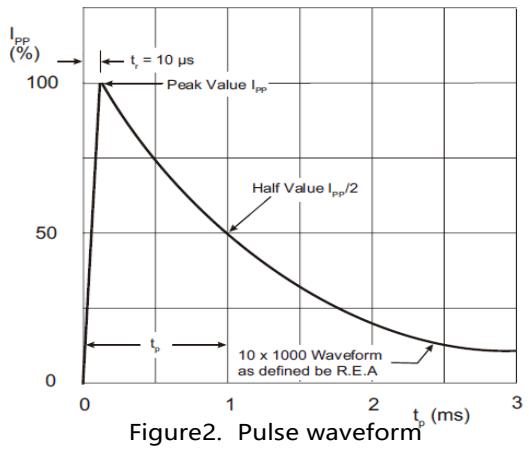


Figure2. Pulse waveform

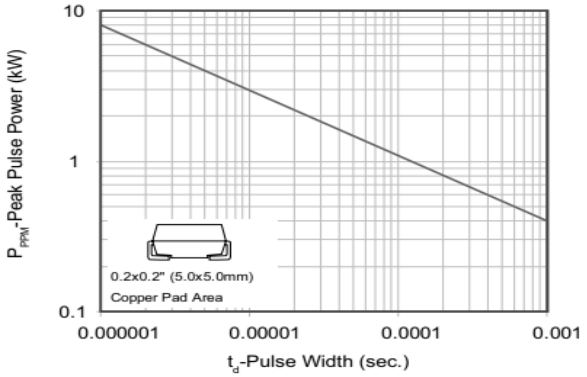


Figure3. Peak pulse power rating curve

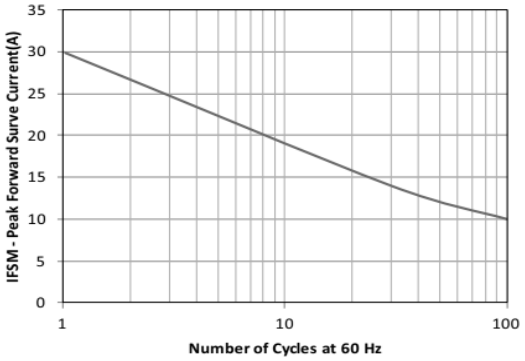
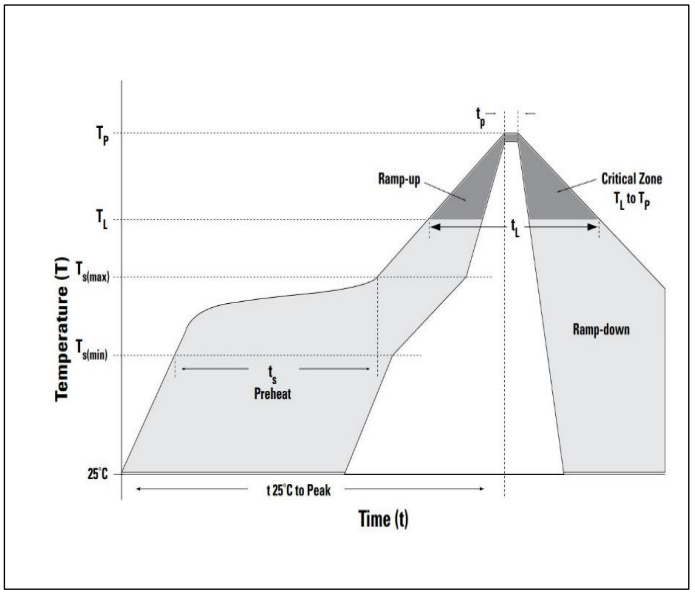


Figure4. Maximum non-repetitive surge current

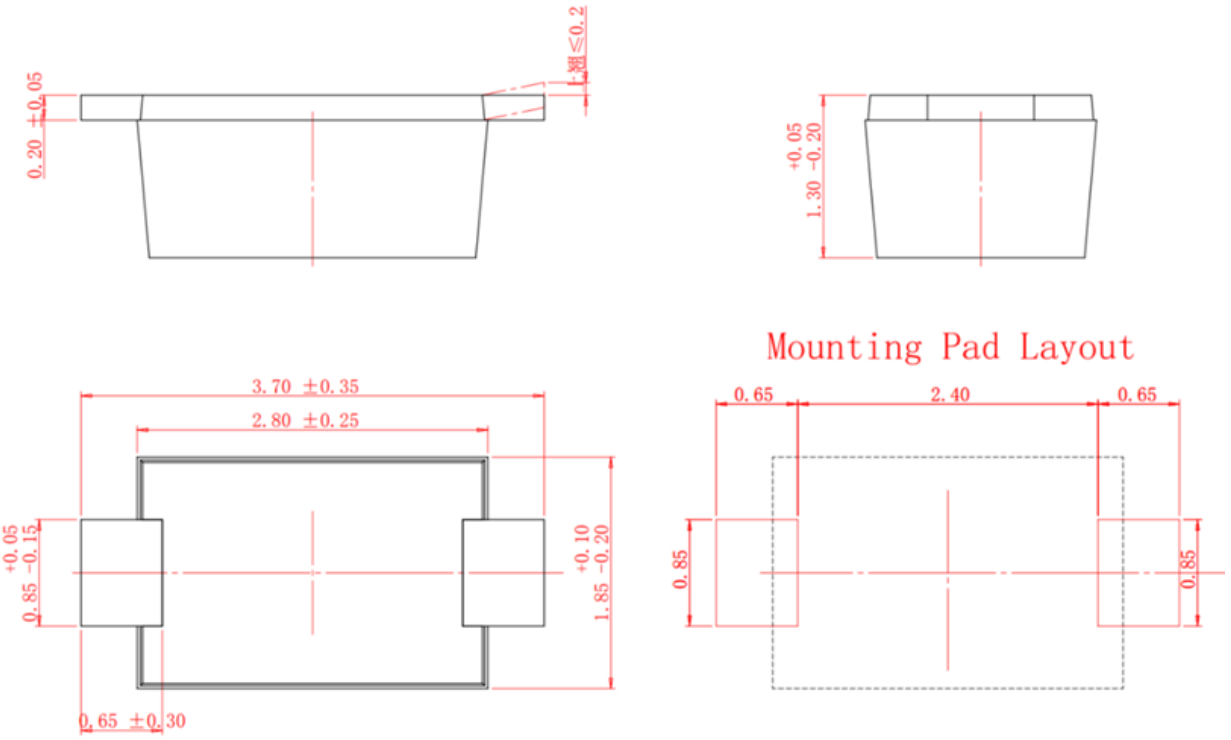
Soldering Parameters

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_A) to peak		3°C/second max
$T_{S(max)}$ to T_A – Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (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		260°C

Soldering profile



Dimensions

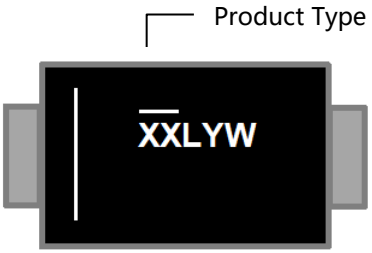

0.20 +0.05
1.30 ≤0.2
+0.05
1.30 -0.20
3.70 ±0.35
2.80 ±0.25
+0.05
0.85 -0.15
+0.10
1.85 -0.20
0.65 ±0.30
Mounting Pad Layout
0.65
2.40
0.65
0.85
0.85

Part Numbering

SMF4L xx xx

- xx (second): A: Uni-directional; CA: Bi-directional
- xx (first): Reverse Standard off Voltage V_R
- SMF4L: Product series

Part Marking

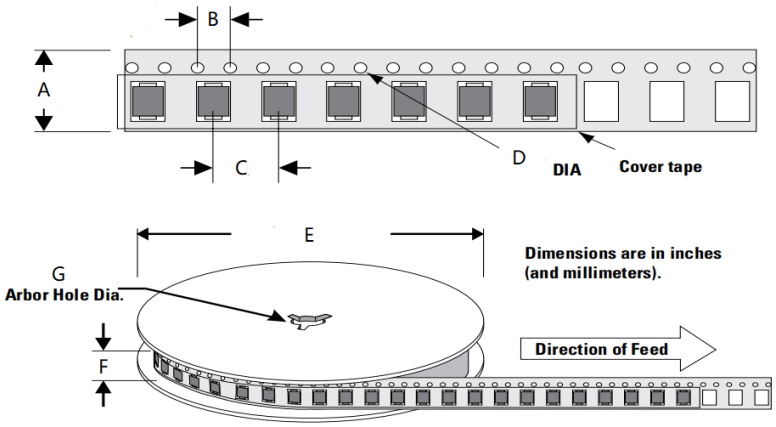


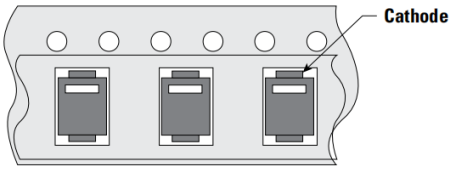
(for uni-directional products only)

Packing

Part number	Package name	Small packing quantity	Packing method
SMF4LXXXX	SOD-123F	3000	Tape & Reel

Tape and Reel Specification





Symbol	Millimeter
A	8.00±0.10
B	4.00±0.10
C	4.00±0.10
D	1.55±0.05
E	177.80±2.00
F	11.50±1.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-July-2021
1.1	3.3V voltage change	3-November-2022
1.2	Update Package Sizes	4 -Jan- 2024

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