Prisemi®

Surface mount transient voltage suppressor power 200 watts

Description

The SOD-123FL Series are designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Unidirectional
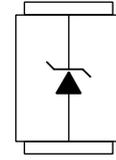
Applications

TVS device are ideal for the protection of I/O interfaces, V_{CC} bus and other vulnerable circuits used in telecom, computer industrial and consumer electronic application

Feature

➢ For surface mounted applications in order to optimize board space.

➢ Low profile package

➢ Glass passivated junction

➢ Low inductance

➢ Plastic package has Underwriters Laboratory Flammability

➢ Excellent clamping capability

➢ Fast response time: typical less than 1.0 ps.

➢ from 0V to V_{BR} min

➢ 200W peak pulse power capability at 10/1000us waveform, Repetition rate (duty cycle): 0.01%

➢ 2200W peak pulse power capability at 8/20us waveform, Repetition rate (duty cycle): 0.01%

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation on TA=25°C at 10/1000us (Note 1,2,5, Fig1)(Note 1,2,4, Fig1)	P_{PPM}	200	W
Peak Pulse Power Dissipation on TA=25°C at 8/20us	P_{PPM}	2200	W
Peak Forward Surge Current (Note 3)	I_{FSM}	20	A
Peak Pulse Current on 10/1000 us waveform (Note 1) Fig 2	I_{PPM}	see Table 1	A
Steady State Power Dissipation (Note 4)	$P_{M(AV)}$	1	W
Operating Junction and Storage Range	Tj, Tstg	±55 to ±150	℃
Typical Thermal Resistance	$R_{θJA}$	120	℃/W

Note :

1: Non-repetitive current pulse per Fig 3 ahd derated above TA=25℃ per Fig 2

2: Mounted on 5mm2 copper pads to each terminal

3: 8.3ms single half sinewave, or equivalent square wave duty cycle=4 pulses per minutes maximum

4: lead temperature at 75℃=TL

5: Peak pulse powe. waveform is tp=10/1000us

6: A transient suppressor is selected according to the working peak reverse voltage(V), WhiCh Shouid be RWM equal to or greater than the DC or continuous peak operating voltage level

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Electrical characteristics per line@25℃

Part Number	Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ IT (V)		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)
		MIN	MAX				
PTVSHC1DF5VU	5	6.4	7	10	9.2	21.7	400
PTVSHC1DF6VU	6	6.7	7.4	10	10.3	19.4	400
PTVSHC1DF6V5U	6.5	7.2	8	10	11.2	17.9	250
PTVSHC1DF7VU	7	7.8	8.6	10	12	16.7	100
PTVSHC1DF7V5U	7.5	8.3	9.2	1	12.9	15.5	50
PTVSHC1DF8VU	8	8.9	9.8	1	13.6	14.7	25
PTVSHC1DF8V5U	8.5	9.4	10.4	1	14.4	13.9	10
PTVSHC1DF9VU	9	10	11.1	1	15.4	13	5
PTVSHC1DF10VU	10	11.1	12.3	1	17	11.8	2.5
PTVSHC1DF11VU	11	12.2	13.5	1	18.2	11	2.5
PTVSHC1DF13VU	13	14.4	15.9	1	21.5	9.3	1
PTVSHC1DF14VU	14	15.6	17.2	1	23.2	8.6	1
PTVSHC1DF16VU	16	17.8	19.7	1	26	7.7	1
PTVSHC1DF17VU	17	18.9	20.9	1	27.6	7.2	1
PTVSHC1DF20VU	20	22.2	24.5	1	32.4	6.2	1
PTVSHC1DF22VU	22	24 4	26.9	1	35.5	5.6	1
PTVSHC1DF26VU	26	28.9	31.9	1	42.1	4.8	1
PTVSHC1DF28VU	28	31.1	34.4	1	45.4	4.4	1
PTVSHC1DF30VU	30	33.3	36.8	1	48.4	4.1	1
PTVSHC1DF40VU	40	44.4	49.1	1	64.5	3.1	1
PTVSHC1DF43VU	43	47.8	52.8	1	69.4	2.9	1
PTVSHC1DF45VU	45	50	55.3	1	72.7	2.8	1
PTVSHC1DF48VU	48	53.3	58.9	1	77.4	2.6	1
PTVSHC1DF51VU	51	56.7	62.7	1	82.4	2.4	1
PTVSHC1DF54VU	54	60	66.3	1	87.1	2.3	1
PTVSHC1DF58VU	58	64.4	71.2	1	93.6	2.1	1
PTVSHC1DF60VU	60	66.7	73.7	1	96.8	1.8	1

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Part Number	Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ IT (V)		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)
		MIN	MAX				
PTVSHC1DF64VU	64	71.1	78.6	1	103	1.7	1
PTVSHC1DF70VU	70	77.8	86	1	113	1.5	1
PTVSHC1DF75VU	75	83.3	92.1	1	121	1.4	1
PTVSHC1DF78VU	78	86.7	95.8	1	126	1.4	1
PTVSHC1DF85VU	85	94.4	104	1	137	1.3	1
PTVSHC1DF90VU	90	100	111	1	146	1.2	1
PTVSHC1DF100VU	100	111	123	1	162	1.1	1
PTVSHC1DF110VU	110	122	135	1	177	1	1
PTVSHC1DF120VU	120	133	147	1	193	0.9	1
PTVSHC1DF130VU	130	144	159	1	209	0.8	1
PTVSHC1DF150VU	150	167	185	1	243	0.7	1
PTVSHC1DF160VU	160	178	197	1	259	0.7	1
PTVSHC1DF170VU	170	189	209	1	275	0.6	1
PTVSHC1DF175VU	175	198	214	1	284	0.6	1

Typical Characteristics

T$_J$=25℃
Pulse Width(t$_d$) is defined as the point where the peak Current decays to 50% of I$_{PPM}$

10/1000µs.Waveform as defined by R.E.A
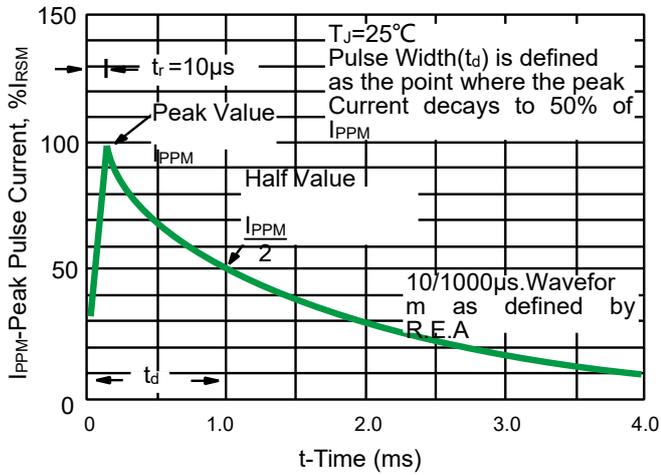
Fig 1.Pulse Waveform
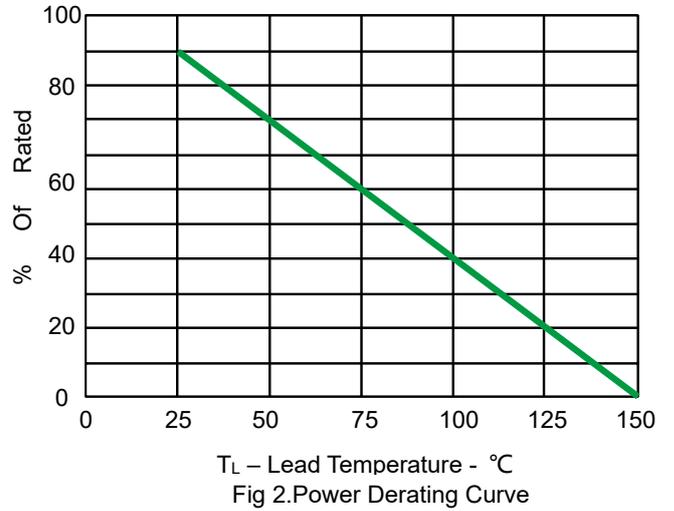
Fig 2.Power Derating Curve
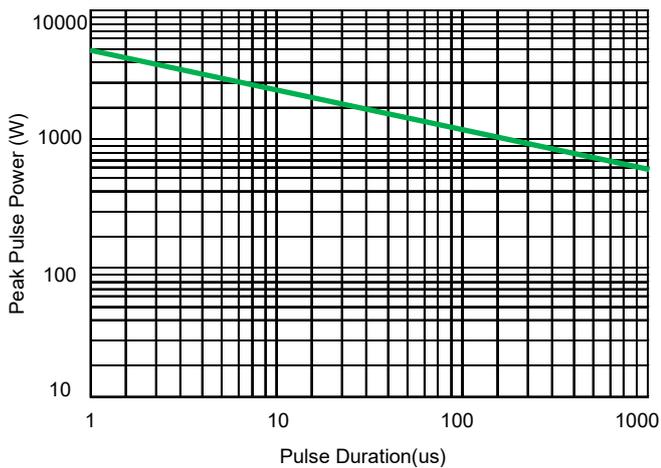

Fig 3. Non Repetitive Peak Pulse Power vs. Pulse time
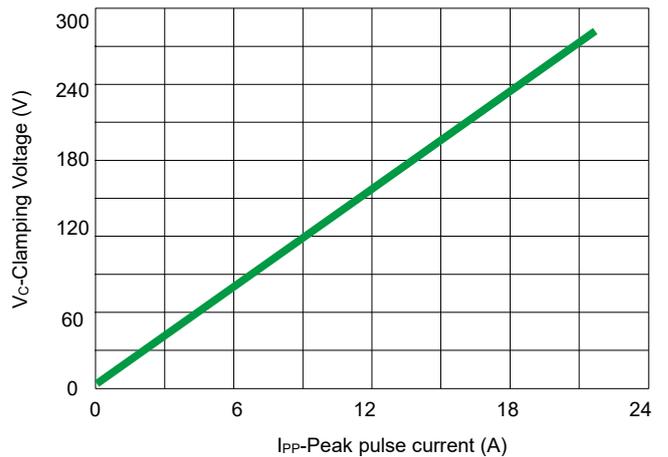

Fig 4. Clamping voltage vs. Peak pulse current

Solder Reflow Recommendation

Peak Temp=257℃, Ramp Rate=0.802deg. ℃/sec
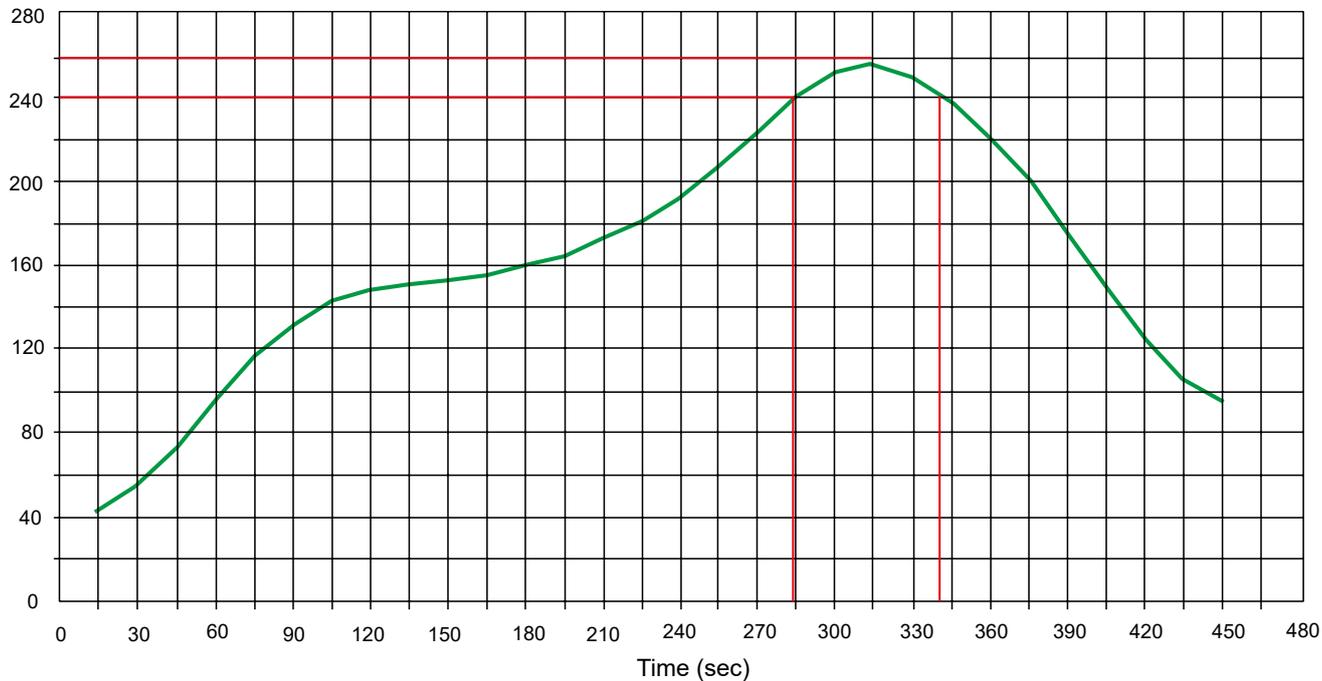
PCB Design

For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

➢ Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
➢ Do not make false economies and save copper for the ground connection.
➢ Place via holes to ground as close as possible to the anode of the TVS diode.
➢ Use as many via holes as possible for the ground connection.
➢ Keep the length of via holes in mind! The longer the more inductance they will have.

Product dimension (SOD-123FL)

Top View

Bottom View
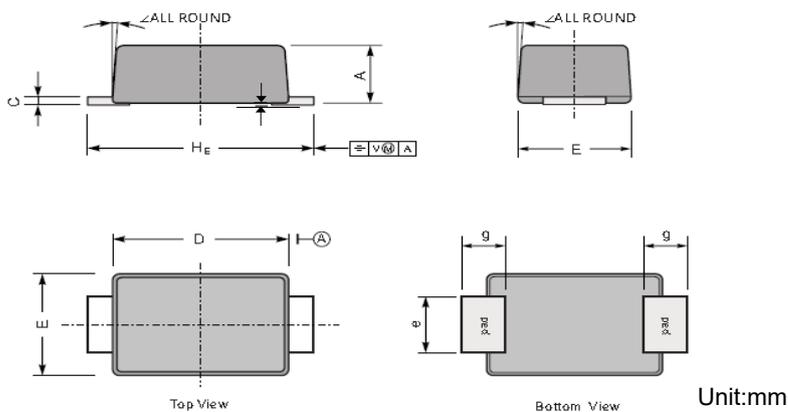
Unit:mm

Dim	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.031	0.047	0.80	1.20
C	0.002	0.010	0.05	0.25
H_E	0.138	0.154	3.50	3.90
E	0.061	0.077	1.55	1.95
D	0.098	0.114	2.50	2.90
g	0.020	0.043	0.50	1.10
e	0.024	0.039	0.60	1.00
k	0.004		0.10	
∠	7°			

1.2   2.0   1.2

1.4
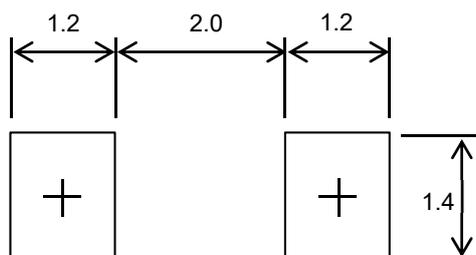
Suggested PCB Layout   Unit:mm

Ordering information

Device	Package	Reel	Shipping
PTVSHC1DF5VU~175VU	SOD-123FL (Pb-Free)	7"	3000 / Tape & Reel

Load with information

USER DIRECTION OF FEED

2.00 ± 0.05

4.00 ± 0.10

4.00 ± 0.10

Φ1.50 ± 0.10

1.75 ± 0.10

8.00 ± 0.10

3.50 ± 0.05

Φ1.10 ± 0.10

Unit：mm

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