1 Lines, Bi-directional, low Capacitance Transient Voltage Suppressors

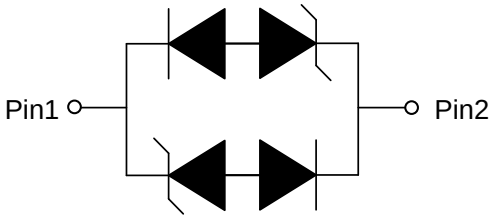
Descriptions

The SPD9105W is a low capacitance TVS (Transient Voltage Suppressor) array designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by Electrostatic Discharge (ESD), cable discharge events (CDE), lightning and other induced voltage surges.

The SPD9105W incorporates low capacitance steering diodes that reduce the typical capacitance to 1pF per line.

The SPD9105W may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 20A (8/20μs) according to IEC61000-4-5.

The SPD9105W is available in SOD-323 package. Standard products are Pb-free and Halogen-free.



Circuit diagram

Features

- Stand-off voltage: 5V Max.
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±30kV (contact discharge)
  IEC61000-4-4 (EFT): 40A - 5/50ns
  IEC61000-4-5 (surge): 20A (8/20μs).
- Low capacitance: C_J = 1pF typ.
- Ultra-low leakage current: I_R = 0.1nA typ.
- Low clamping voltage.
- Solid-state silicon technology

Applications

- 10/100 Ethernet
- STB
- Router
- Networking
- Modem

Absolute maximum ratings

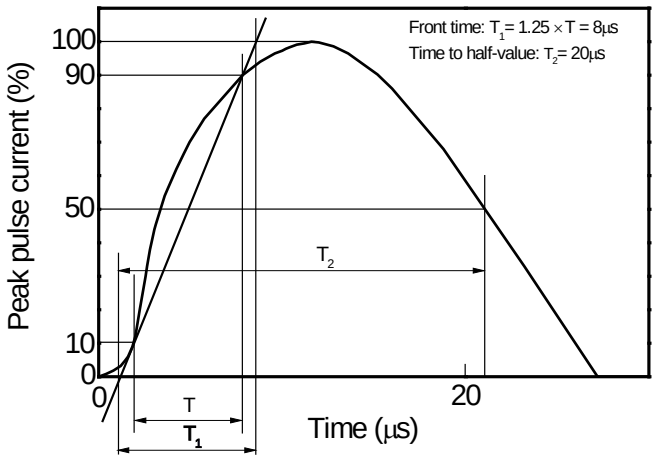
Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	360	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	20	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T_J	125	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (T_A = 25°C, unless otherwise noted)

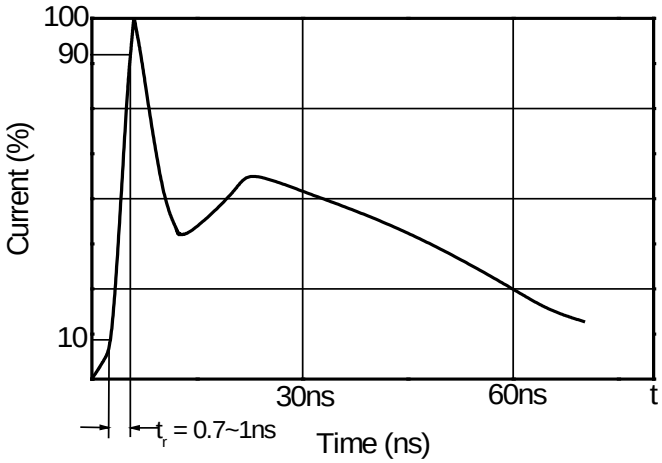
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5	V
Reverse leakage current	I_R	V_{RWM} = 5V		0.1	100	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	5.6			V
Clamping voltage 1)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			9	V
		I_{PP} = 5A, t_p = 8/20μs			11	V
		I_{PP} = 20A, t_p = 8/20μs			18	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz I/O to I/O		1.0	1.5	pF

1) According to IEC61000-4-5.

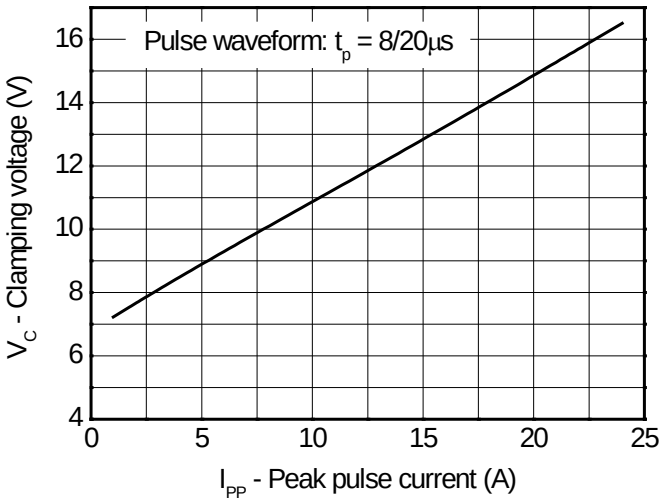
Typical characteristics (T_A = 25°C, unless otherwise noted)



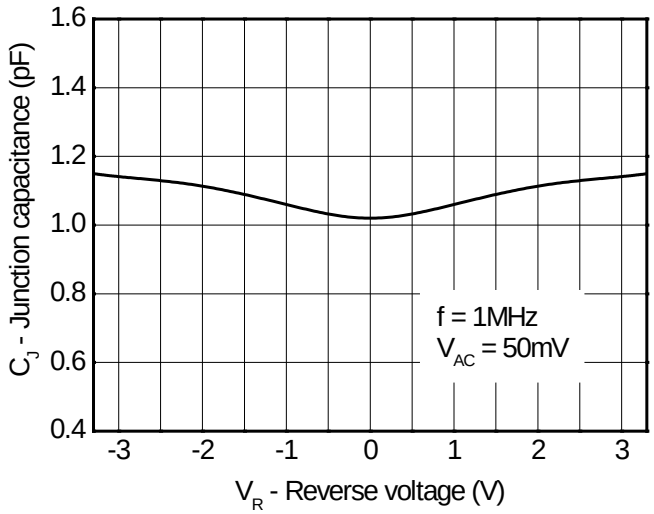
8/20μs waveform per IEC61000-4-5



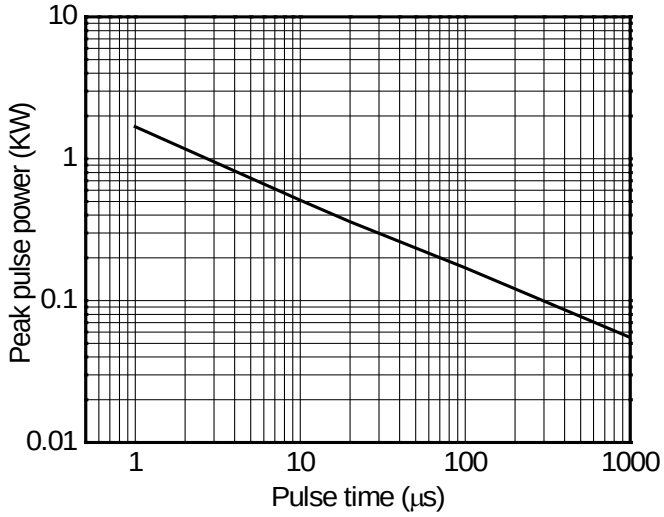
Contact discharge current waveform per IEC61000-4-2



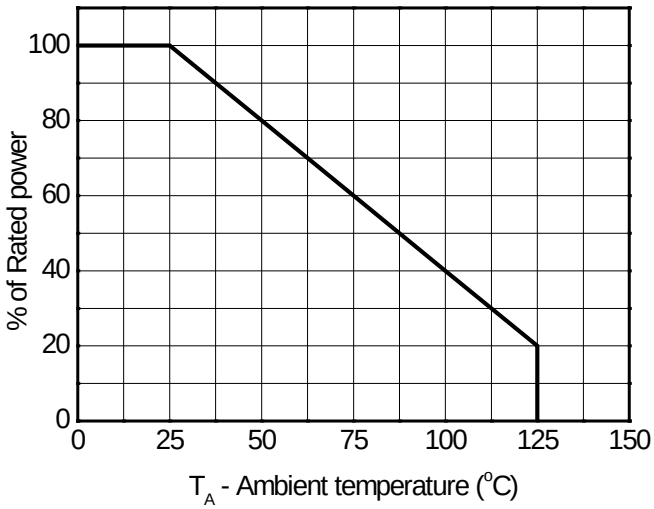
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

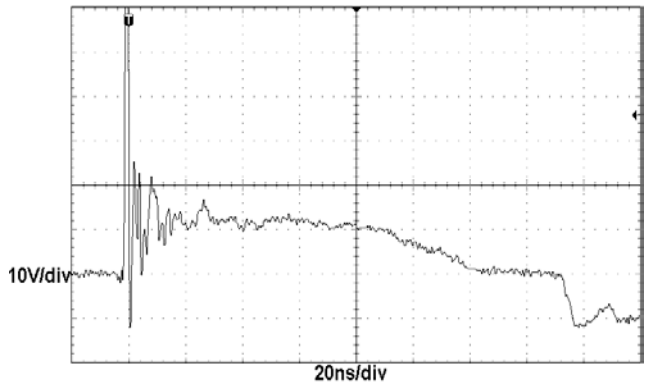


Non-repetitive peak pulse power vs. Pulse time

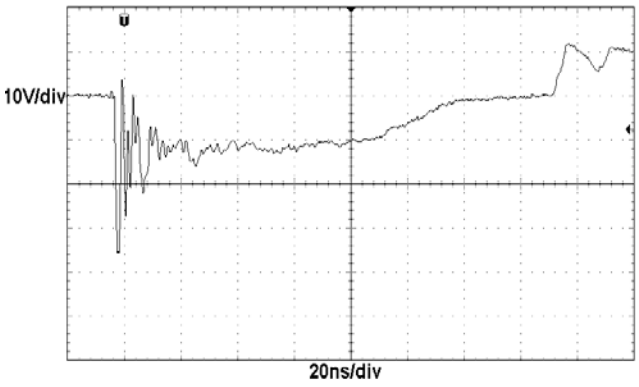


Power derating vs. Ambient temperature

Typical characteristics (T_A=25°C, unless otherwise noted)



ESD clamping
(+8kV contact discharge per IEC61000-4-2)



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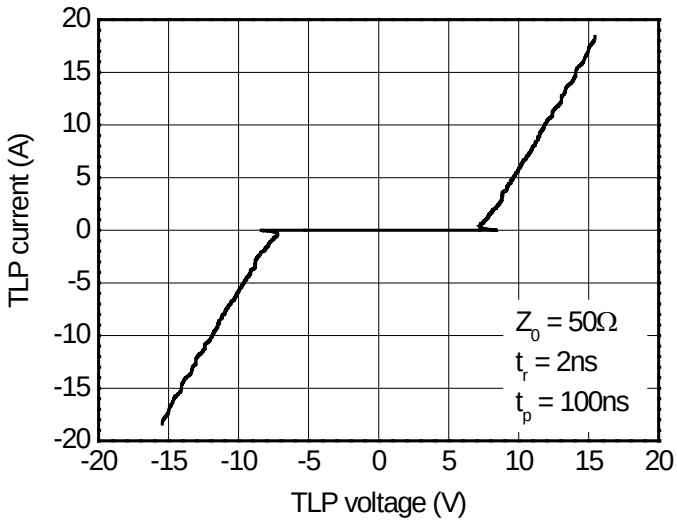
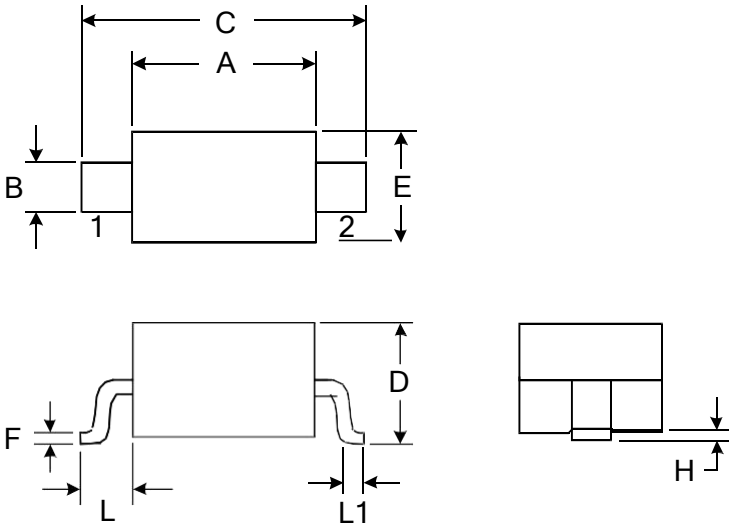


TLP Measurement

Outline Drawing - SOD-323



DIMENSIONS				
SYMBOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	1.600	1.800	0.063	0.071
B	0.250	0.350	0.010	0.014
C	2.500	2.700	0.098	0.106
D		1.000		0.039
E	1.200	1.400	0.047	0.055
F	0.080	0.150	0.003	0.006
L	0.475 REF		0.019REF	
L1	0.250	0.400	0.010	0.016
H	0.000	0.100	0.000	0.004

Marking

Ordering information

Order code	Package	Baseqty	Delivery mode
UMW SPD9105W	SOD-323	3000	Tape and reel