

ESD5305H

4-Lines, Uni-directional, Low Capacitance Transient Voltage Suppressors

Descriptions

The ESD5305H 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 ESD (Electrostatic Discharge).

The ESD5305H incorporates four pairs of low capacitance steering diodes plus a TVS diode.

The ESD5305H may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 6A (8/20µs) according to IEC61000-4-5.

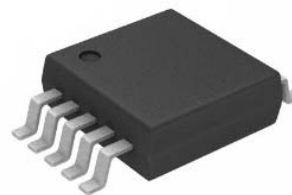
The ESD5305H is available in MSOP-10L package. Standard products are Pb-free and Halogen-free.

Features

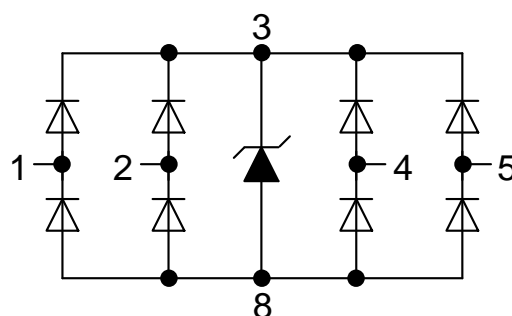
- Reverse stand-off voltage: 5V Max
- Transient protection for each line according to IEC61000-4-2 (ESD): ±30kV (contact discharge)
IEC61000-4-5 (surge): 6A (8/20µs)
- Low capacitance: $C_{I/O-GND} = 0.65\text{pF typ. (Vcc = floated)}$
 $C_{I/O-GND} = 0.35\text{pF typ. (Vcc = 5V)}$
- Ultra-low leakage current: $I_R < 1\text{nA typ.}$
- Low clamping voltage: $V_{CL} = 18\text{V @ } I_{PP} = 16\text{A (TLP)}$
- Solid-state silicon technology

Applications

- USB 2.0
- HDMI 1.3
- SATA and eSATA
- DVI
- IEEE 1394
- PCI Express
- Portable Electronics
- Notebooks



MSOP-10L



Circuit diagram



5305 = Device code
YY = Year code
WW = Week code

Marking & Pin configuration (Top View)

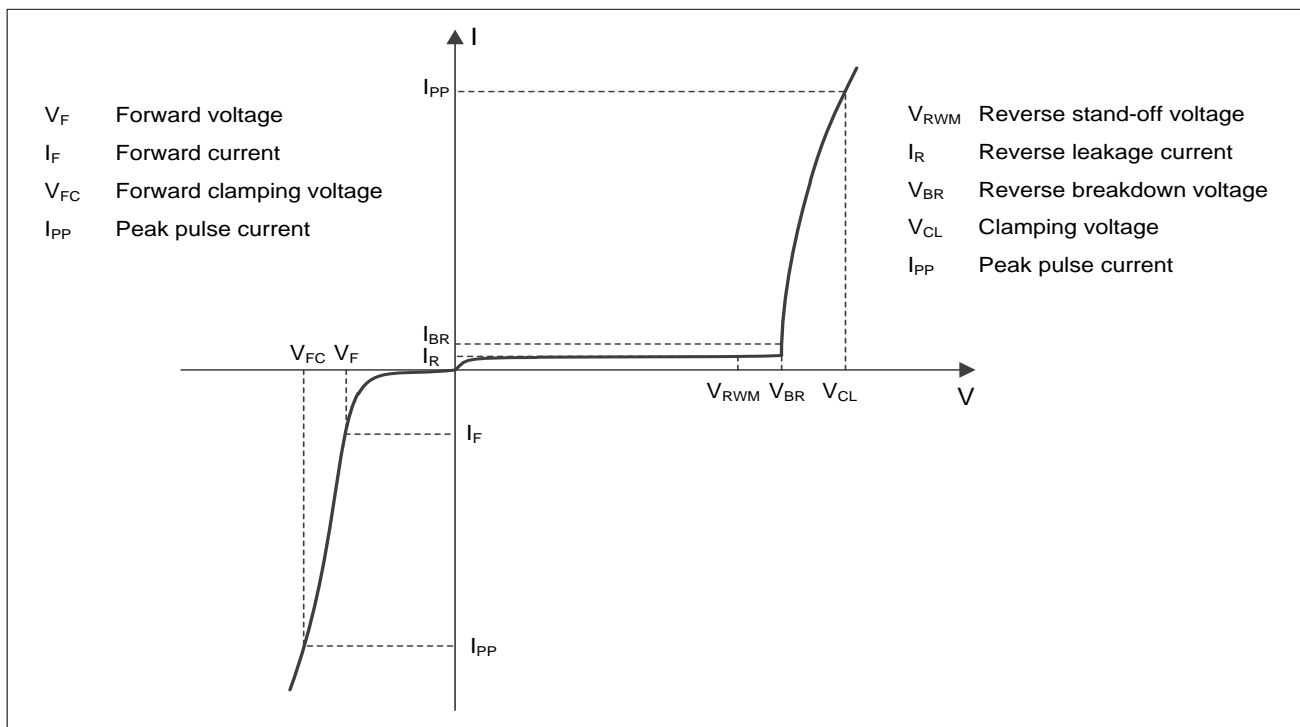
Order information

Device	Package	Shipping
ESD5305H-10/TR	MSOP-10L	2500/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	P_{pk}	100	W
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	6	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 30	kV
ESD according to IEC61000-4-2 contact discharge		± 30	
Operation junction temperature	T_J	125	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

Electrical characteristics ($T_A = 25^{\circ}C$, unless otherwise noted)



Definitions of electrical characteristics

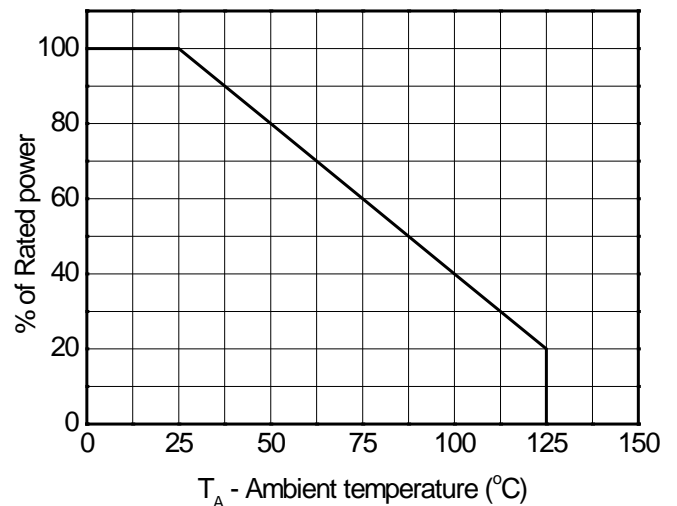
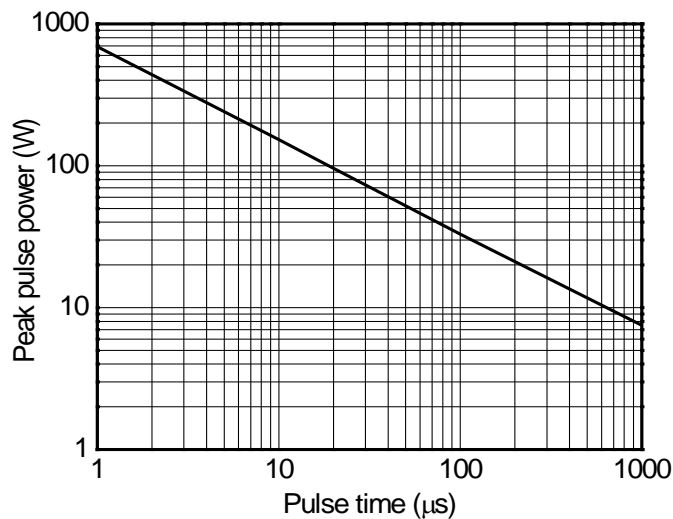
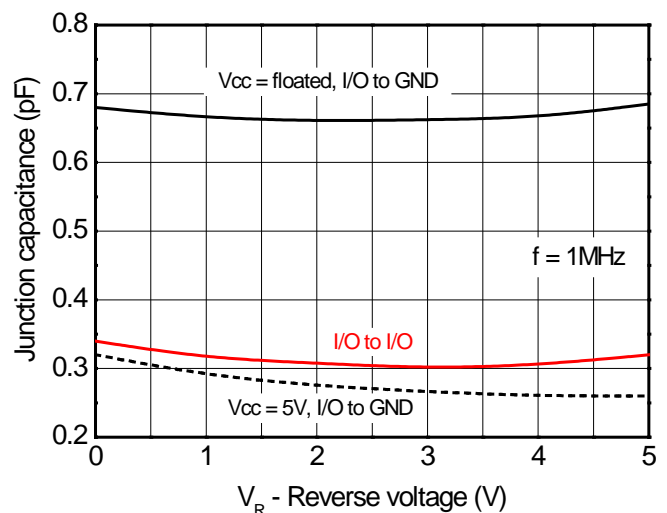
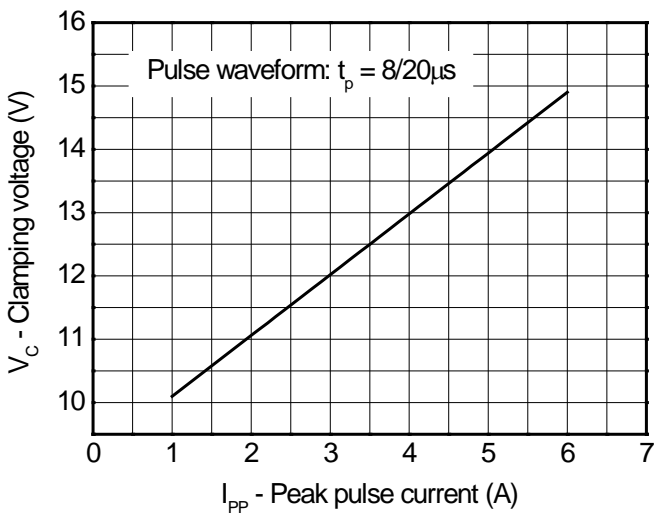
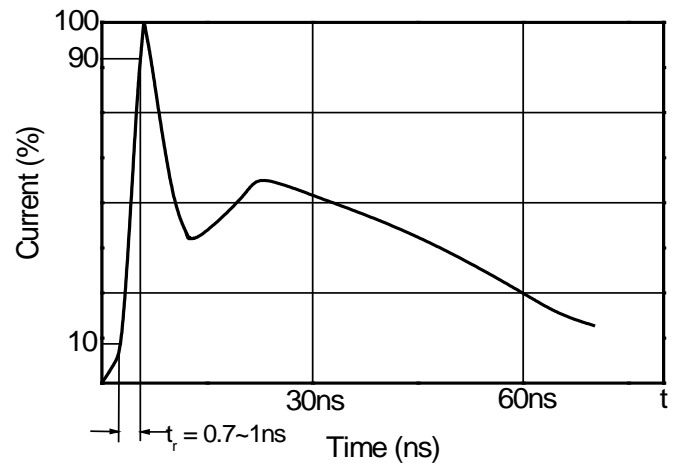
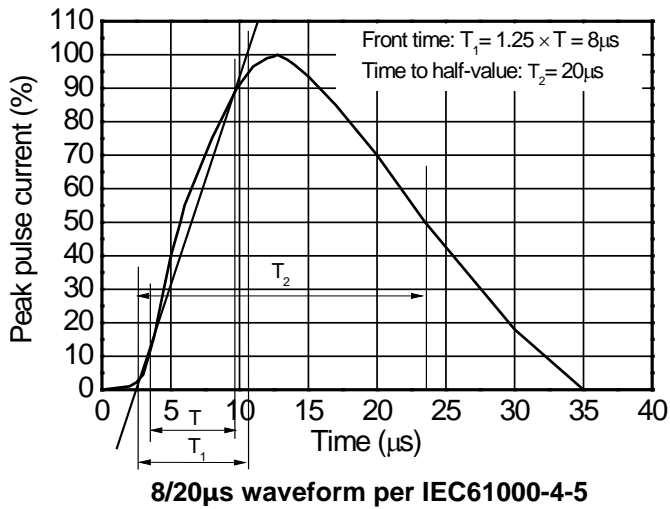
Electrical characteristics (T_A = 25°C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V _{RWM}				5.0	V
Reverse leakage current	I _R	V _{RWM} = 5V		<1	100	nA
Reverse breakdown voltage	V _{BR}	I _{BR} = 1mA	7.0	8.0	9.0	V
Forward voltage	V _F	I _F = 10mA	0.6	0.9	1.2	V
Clamping voltage ¹⁾	V _{CL}	I _{PP} = 16A, t _p = 100ns		18		V
Dynamic resistance ¹⁾	R _{DYN}			0.49		Ω
Clamping voltage ²⁾	V _{CL}	I _{PP} = 1A, t _p = 8/20μs			11	V
		I _{PP} = 6A, t _p = 8/20μs			16	V
Junction capacitance	C _{I/O - GND}	V _R = 0V, f = 1MHz, V _{CC} = floated, Any I/O to GND		0.65	1.0	pF
		V _R = 0V, f = 1MHz, V _{CC} = 5V, Any I/O to GND		0.35	0.50	pF
	C _{I/O - I/O}	V _R = 0V, f = 1MHz, Any I/O to I/O		0.35	0.50	pF

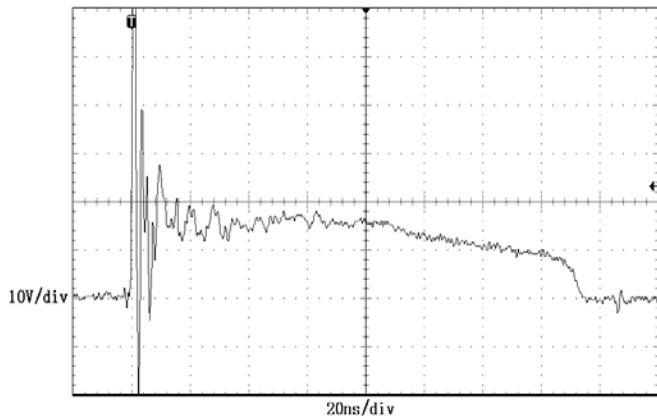
1) TLP parameter: Z₀ = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

2) According to IEC61000-4-5.

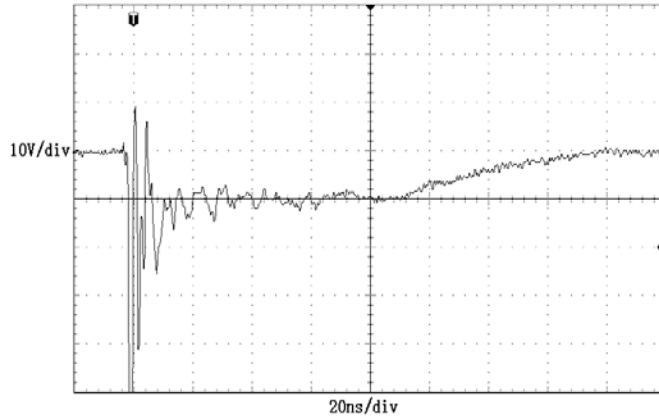
Typical characteristics ($T_A = 25\text{ C}$, unless otherwise noted)



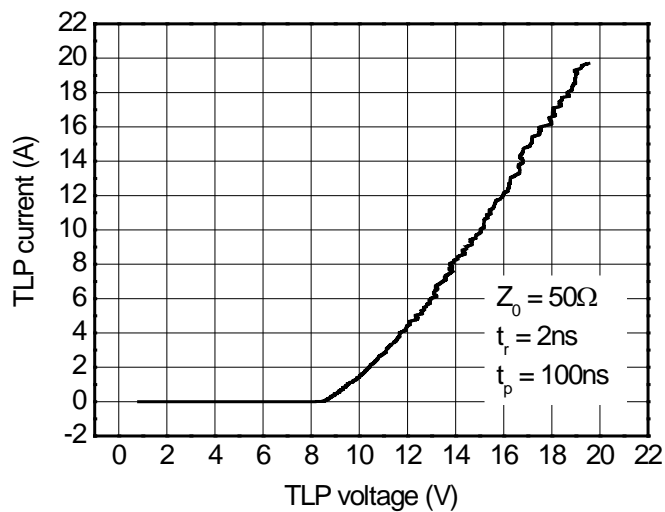
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)



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



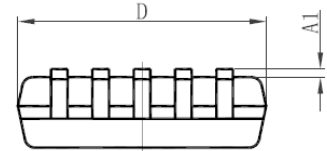
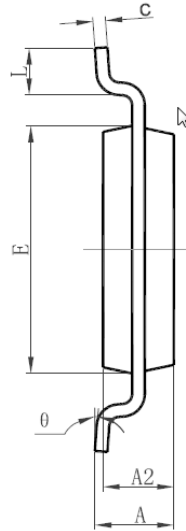
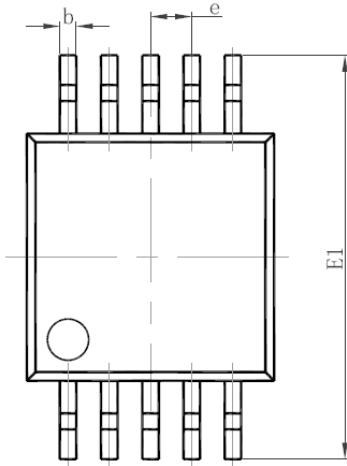
ESD clamping
(-8kV contact discharge per IEC61000-4-2)



TLP Measurement

Package outline dimensions

MSOP-10L



Symbol	Dimensions in millimeter		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.280	0.007	0.011
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.50(BSC)		0.020(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.0400	0.800	0.016	0.031
θ	0°	6°	0°	6°