Description

The UL5325ES2 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(ElectrostaticDischarge).
The UL5325ES2 incorporates four pairs of low capacitance steering diodes plus a TVS diode. The UL5325ES2 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 UL5325ES2 is available in SOT-23-6L package. Standard products are Pb-free and Halogen-free.

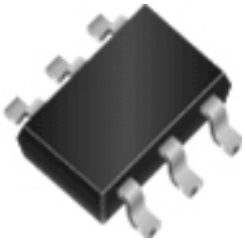
Features

- Reverse stand-off voltage: 6V max.
- Transient protection for each line according to IEC61000-4-2 (ESD): ±30kV (contact discharge) IEC61000-4-5 (surge): 6A (8/20μs)
- Low capacitance: $C_{I/O-GND}$ = 1.0pF typ.
- Ultra-low leakage current: IR <1nA typ.
- Low clamping voltage: VCL I/O - GND = 12.5V @ IPP = 16A (TLP)
- Solid-state silicon technology

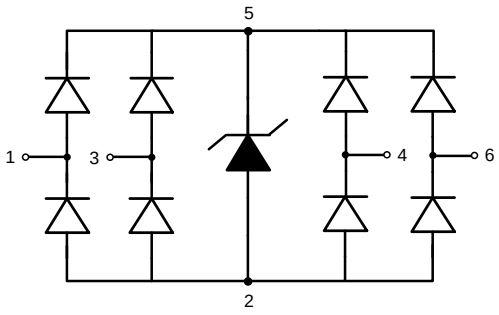
Applications

- USB 2.0 , USB3.0
- Video Graphics Cards
- DVI
- IEEE 1394
- Monitors and Flat Panel Displays
- 10/100 Ethernet
- Notebooks

Dimensions and Pin Configuration

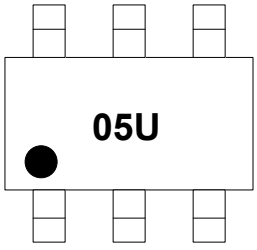


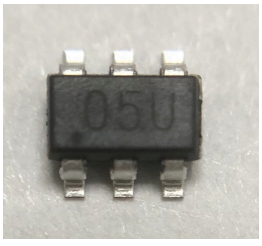
SOT-23-6L



Circuit and Pin Schematic

Marking Information





05U = Device Marking Code

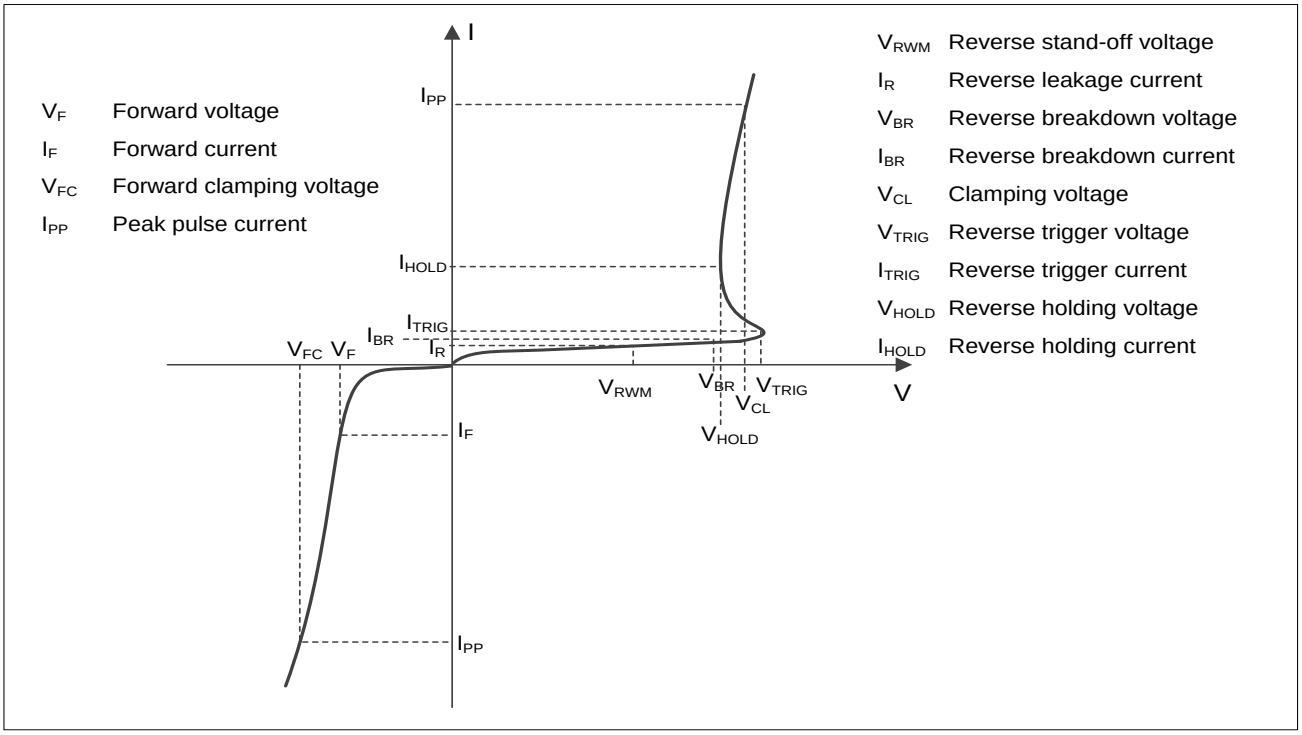
Ordering Information

Part Number	Marking	Packaging	Reel Size
UL5325ES2	05U	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Peak pulse current (t_p = 8/20μs)	I_{PP}	6	A
Operating Supply Voltage (VDD to GND)	V_{DC}	5	V
ESD according to IEC61000-4-2 air discharge(I/O pins)	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge(I/O pins)		±30	
Junction temperature	T_J	125	°C
Operation temperature	T_{OP}	-55 to 125	°C
Storage temperature	T_{STG}	-55 to 125	°C
Lead temperature	T_L	260	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)



Definitions of electrical characteristics

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
I/O Pins						
Reverse stand-off voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V		<1	500	nA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	6.0	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		12.5		V
Dynamic resistance *1)*	R_{DYN}	t_p = 100ns		0.24		Ω
Clamping voltage *2)*	V_{CL}	V_{ESD} = 8kV		12.5		V
Clamping voltage *3)*	V_{CL}	I_{PP} = 1A, t_p = 8/20μs		8.5		V
		I_{PP} = 6A, t_p = 8/20μs		11.5		V
Junction capacitance	$C_{I/O - GND}$	V_R = 0V, f = 1MHz, Any I/O to GND		1.0	1.6	pF
	$C_{I/O – I/O}$	V_R = 0V, f = 1MHz, Any I/O to I/O		0.50	0.80	pF
VDD Pin						
Reverse stand-off voltage	V_{RWM}				6	V
Reverse leakage current	I_R	V_{RWM} = 6V			1	μA
Reverse breakdown voltage	V_{BR}	I_{BR} = 1mA	6.0	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		12.0		V
Dynamic resistance *1)*	R_{DYN}	t_p = 100ns		0.21		Ω
Clamping voltage *2)*	V_{CL}	V_{ESD} = 8kV		12.0		V
Clamping voltage *3)*	V_{CL}	I_{PP} = 1A, t_p = 8/20μs		8.5		V
		I_{PP} = 6A, t_p = 8/20μs		11.0		V

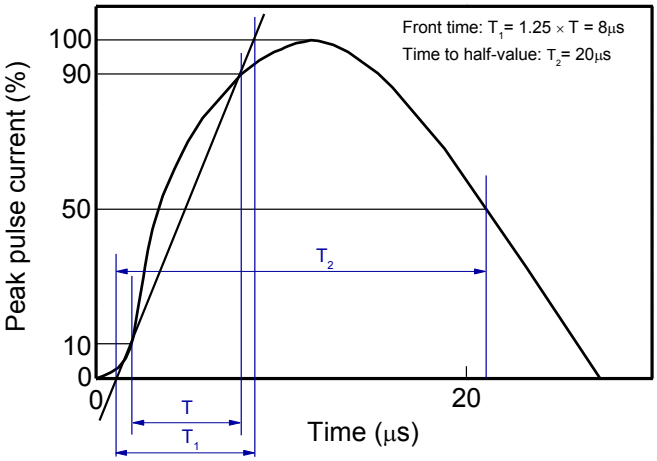
Notes:

1) TLP parameter: Z_0 = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

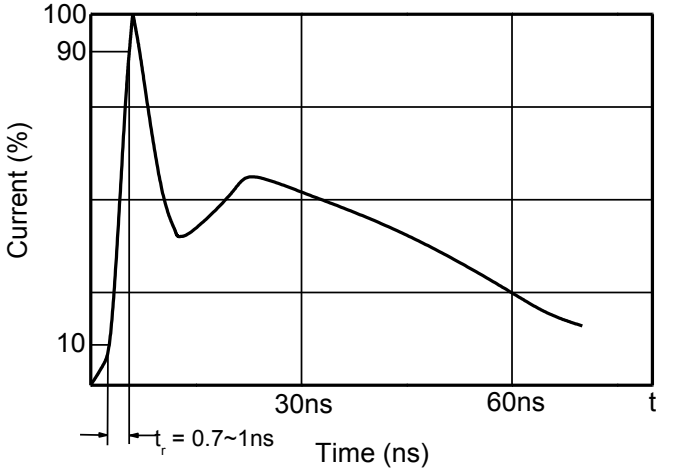
2) Contact discharge mode, according to IEC61000-4-2.

3) Non-repetitive current pulse, according to IEC61000-4-5.

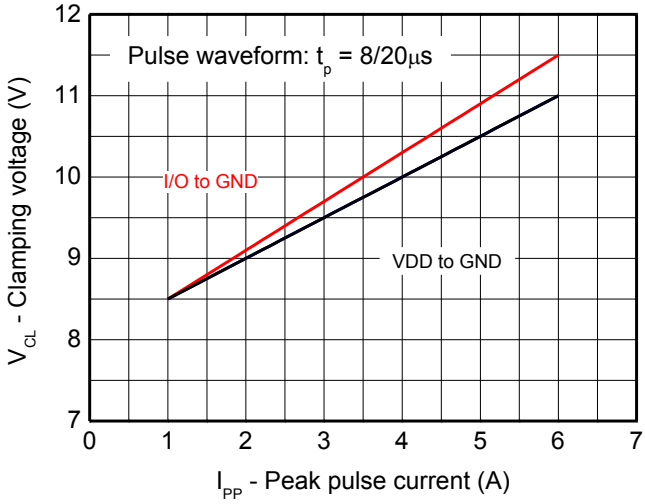
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



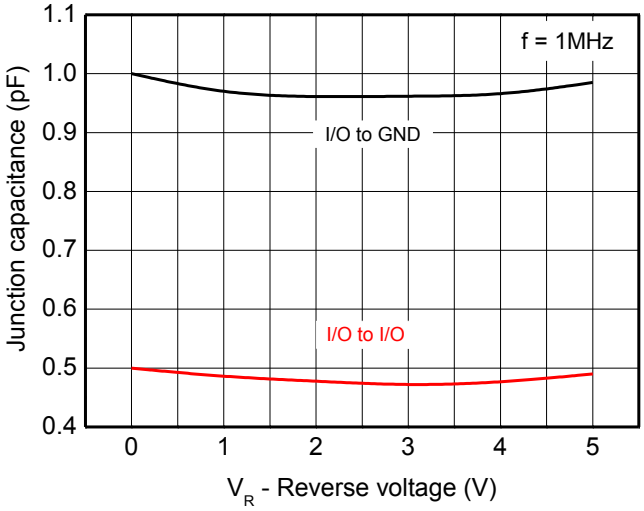
8/20μs waveform per IEC61000-4-5



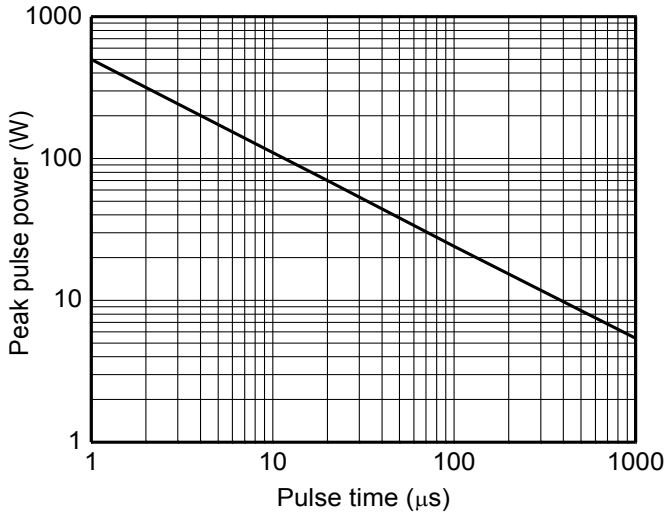
Contact discharge current waveform per IEC61000-4-2



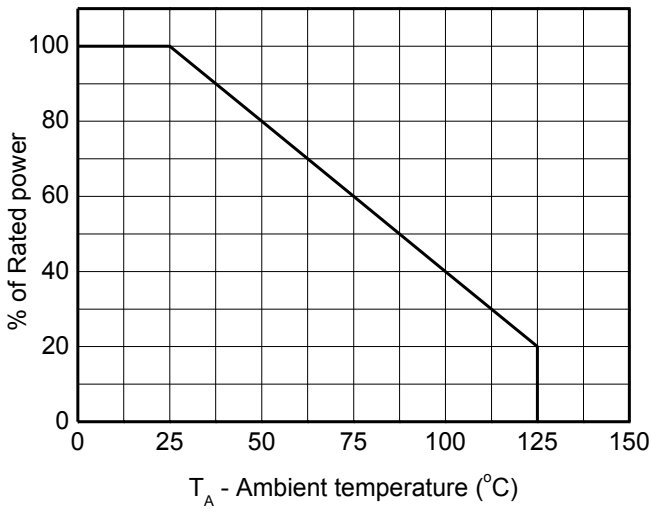
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

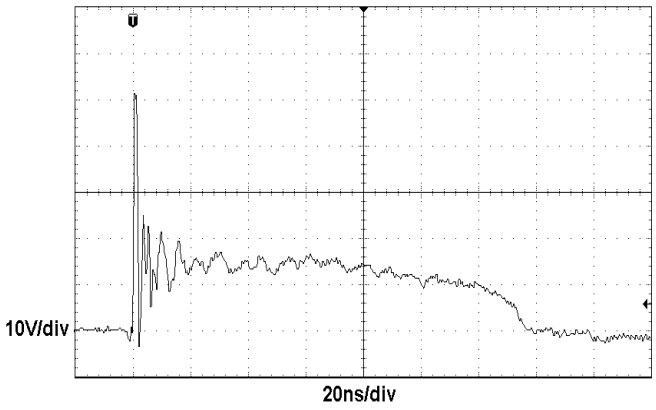


Non-repetitive peak pulse power vs. Pulse time

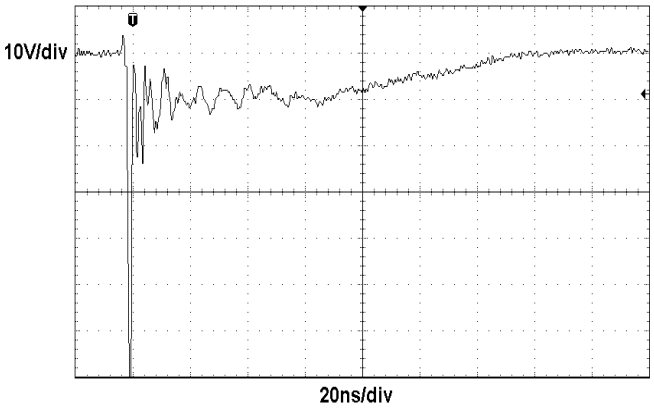


Power derating vs. Ambient temperature

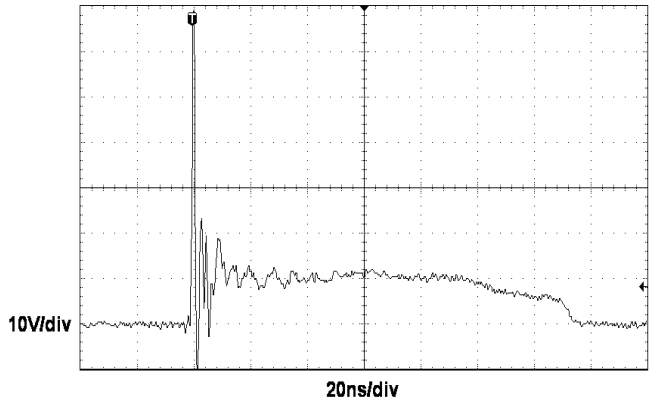
Typical Performance Characteristics (T_A=25℃ unless otherwise Specified)



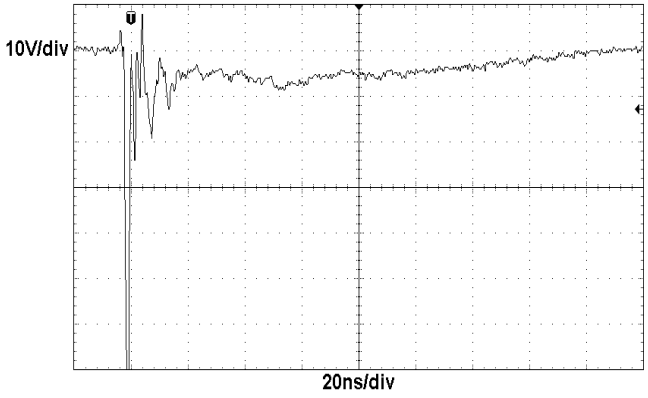
ESD clamping - I/O to GND
(+8kV contact discharge per IEC61000-4-2)



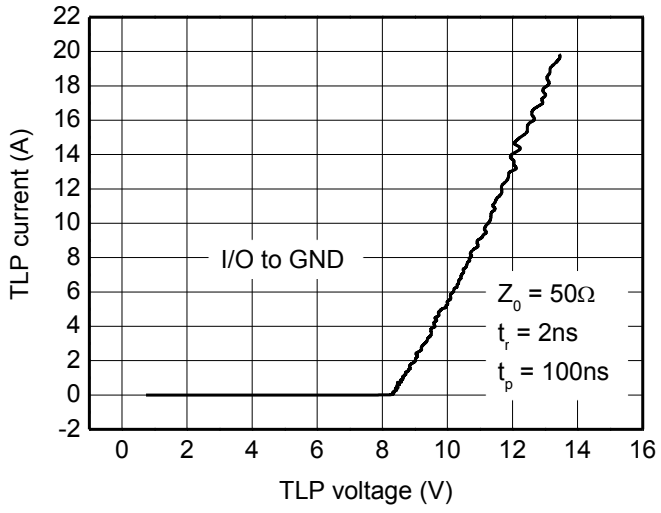
ESD clamping - I/O to GND
(-8kV contact discharge per IEC61000-4-2)



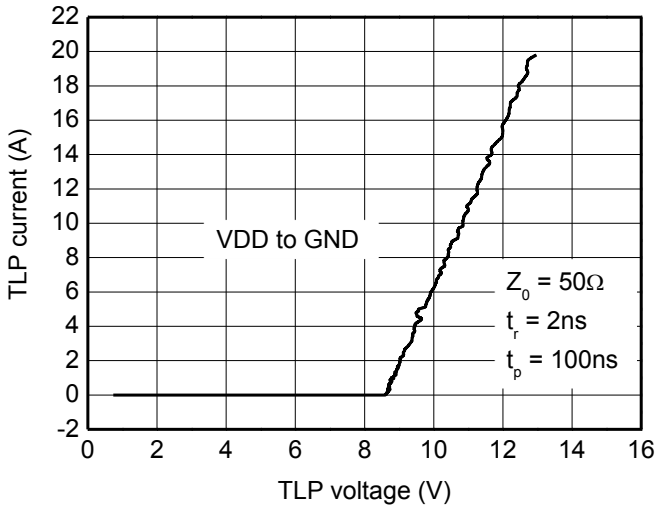
ESD clamping - VDD to GND
(+8kV contact discharge per IEC61000-4-2)



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

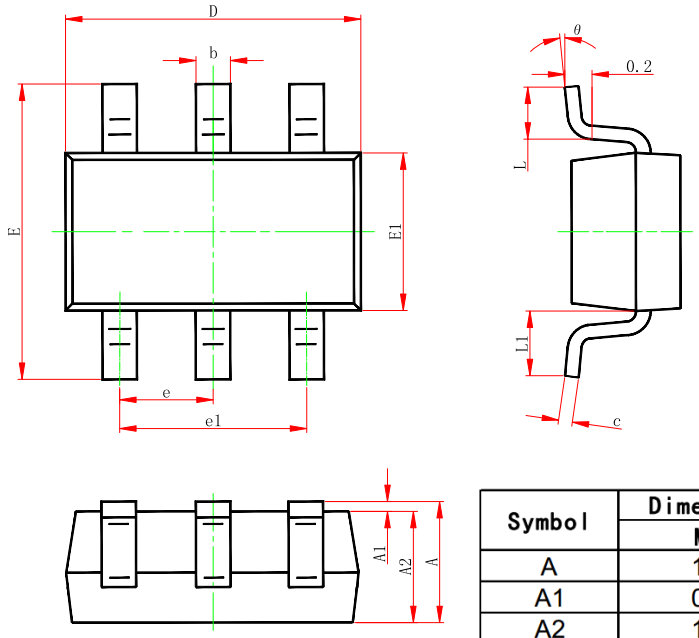


TLP Measurement - I/O to GND



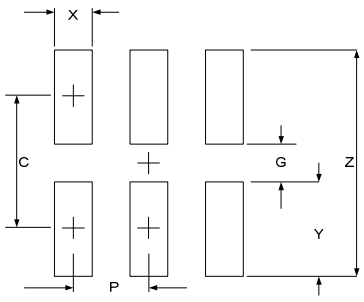
TLP Measurement - VDD to GND

SOT23-6 Package Outline Drawing



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF.		0.024REF.	
θ	0°	8°	0°	8°

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.50	0.098
G	1.40	0.055
P	0.95	0.037
X	0.60	0.024
Y	1.10	0.043
Z	3.60	0.141