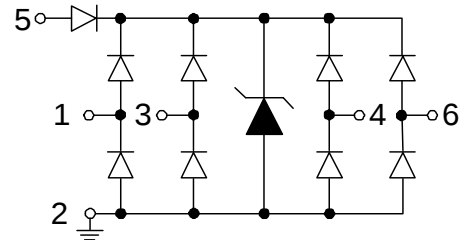


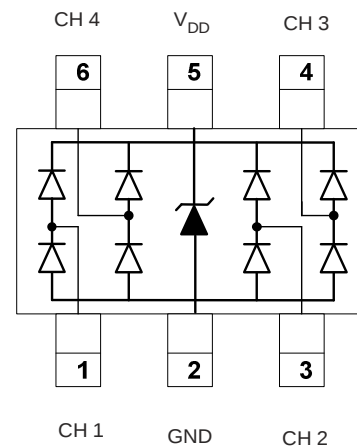
Descriptions

The ESD5325E 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 ESD5325E incorporates four pairs of low capacitance steering diodes plus a TVS diode. The ESD5325E may be used to provide ESD protection up to $\pm 30\text{kV}$ (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 6A (8/20 μs) .



Features

- Reverse stand-off voltage: 6V max. (V_{DD} to GND)
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 30\text{kV}$ (contact discharge)
IEC61000-4-5 (surge): 6A (8/20 μs)
- Low capacitance: $C_{I/O - GND} = 1.0\text{pF typ.}$
- Ultra-low leakage current: $I_R < 1\text{nA typ.}$
- Low clamping voltage: $V_{CL I/O - GND} = 12.5\text{V @ } I_{PP} = 16\text{A}$ (TLP)



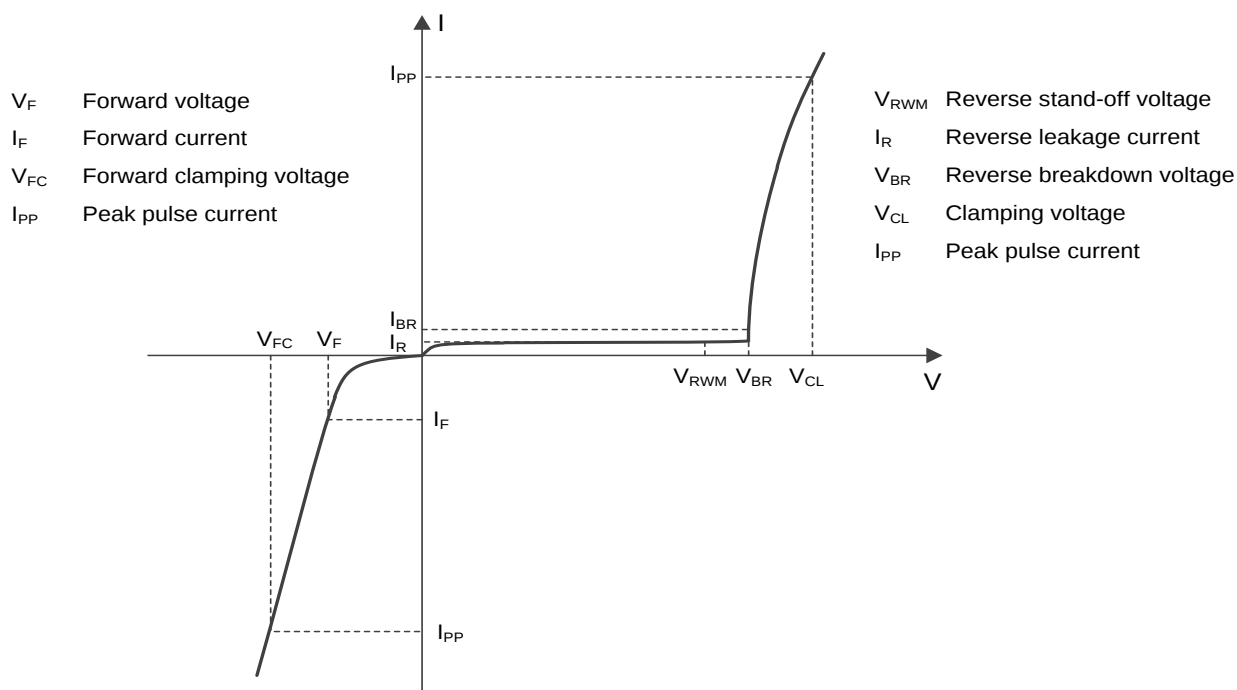
Applications

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

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	P_{pk}	70	W
Peak pulse current ($t_p = 8/20\mu s$)	I_{pp}	6	A
Operating Supply Voltage (VDD to GND)	V_{DC}	6	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	$^{\circ}C$
Operation temperature	T_{OP}	-40 to 85	$^{\circ}C$
Storage temperature	T_{STG}	-55 to 150	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$

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



Definitions of electrical characteristics

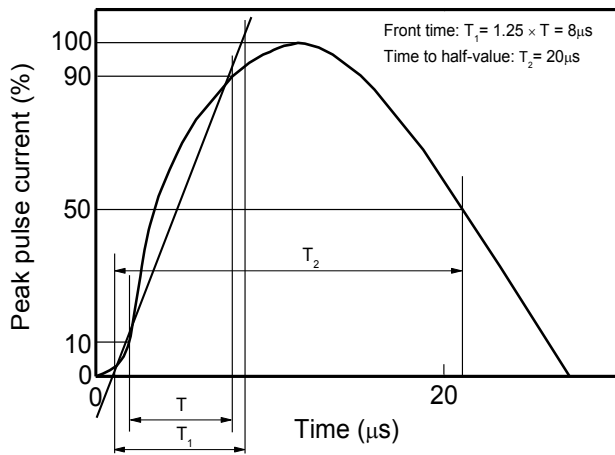
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

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	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}	$I_{PP} = 16A, t_p = 100ns$		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}	$I_{PP} = 1A, t_p = 8/20\mu s$		8.5		V
		$I_{PP} = 6A, t_p = 8/20\mu s$		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}	$I_{BR} = 1mA$	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}	$I_{PP} = 16A, t_p = 100ns$		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}	$I_{PP} = 1A, t_p = 8/20\mu s$		8.5		V
		$I_{PP} = 6A, t_p = 8/20\mu s$		11.0		V

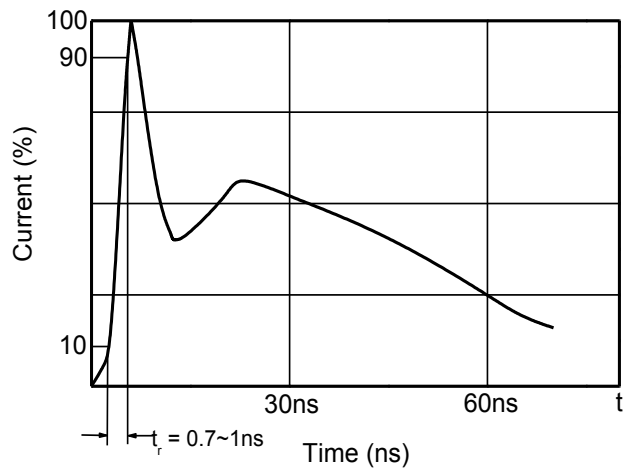
Notes:

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

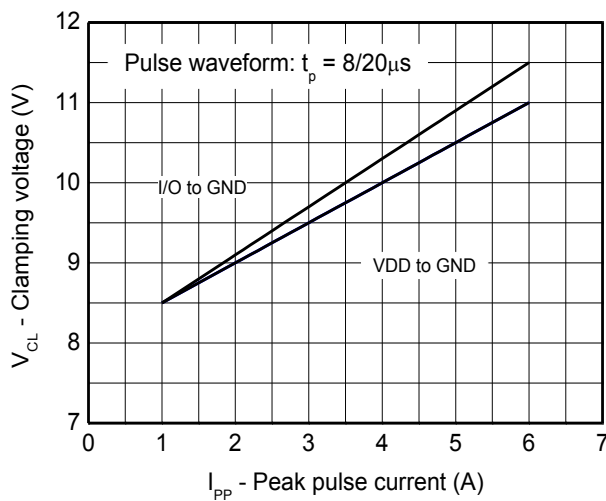
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)



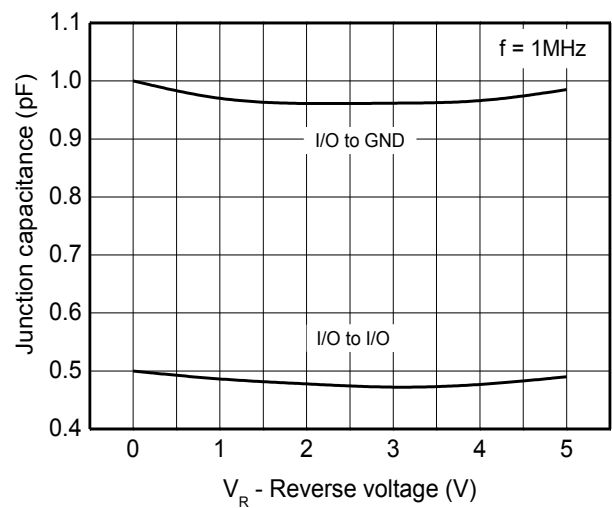
8/20 μs waveform per IEC61000-4-5



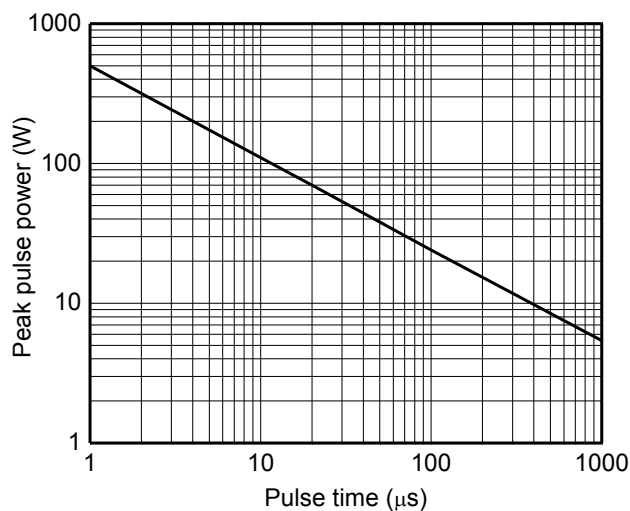
Contact discharge current waveform per IEC61000-4-2



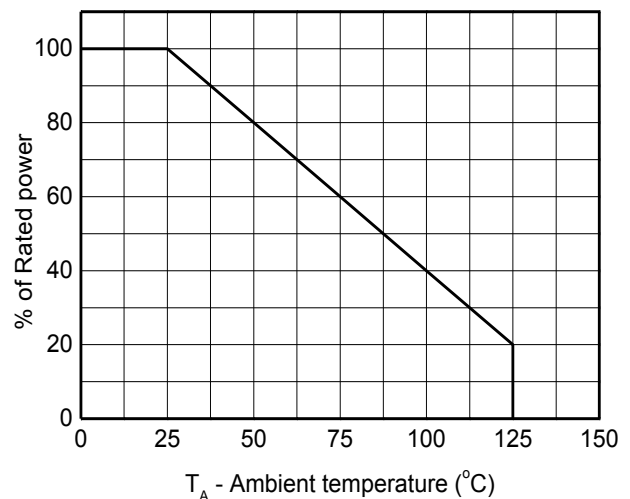
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

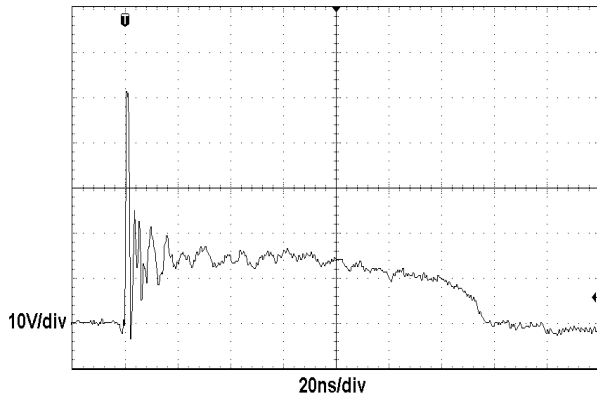


Non-repetitive peak pulse power vs. Pulse time

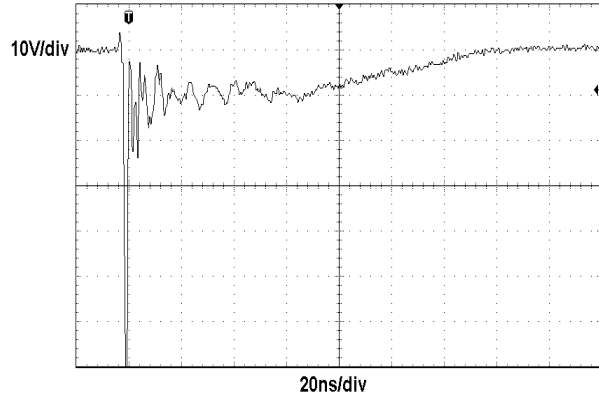


Power derating vs. Ambient temperature

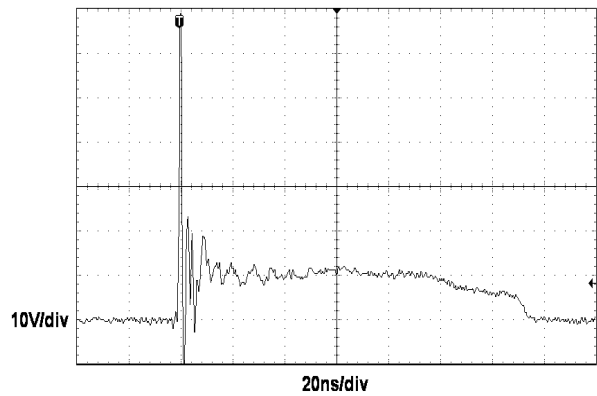
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)



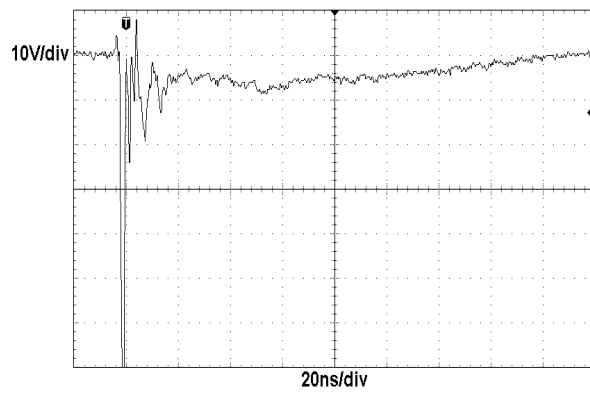
ESD clamping - I/O to GND
(+8kV contact discharge per IEC61000-4-2)



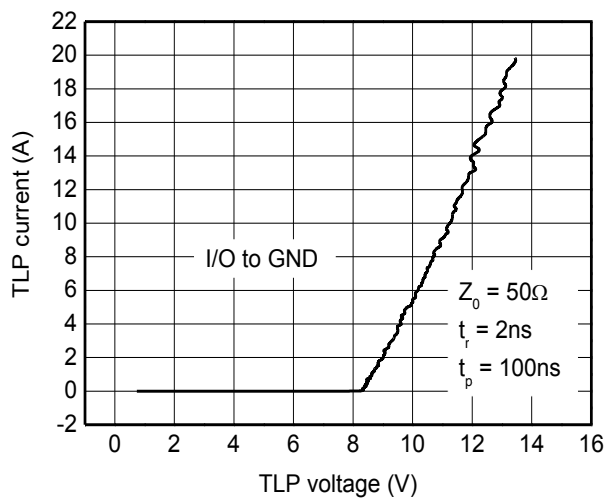
ESD clamping - I/O to GND
(-8kV contact discharge per IEC61000-4-2)



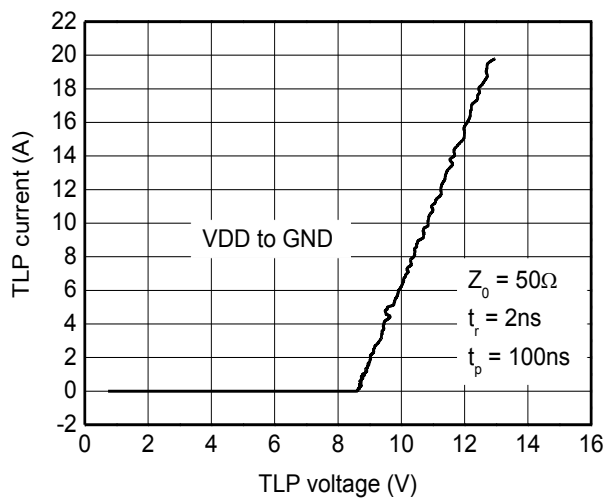
ESD clamping - VDD to GND
(+8kV contact discharge per IEC61000-4-2)



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

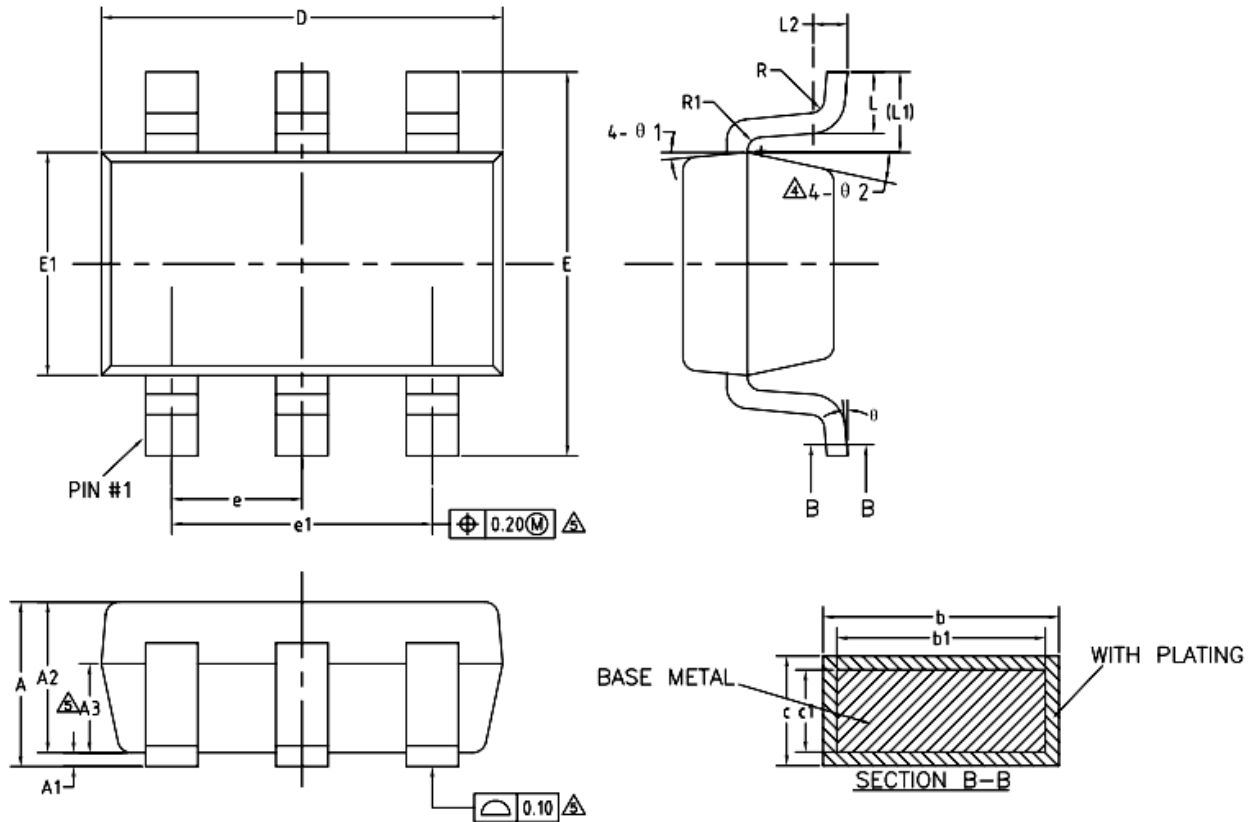


TLP Measurement - I/O to GND



TLP Measurement - VDD to GND

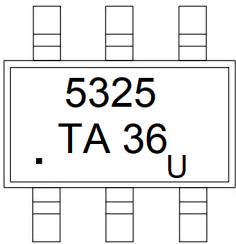
SOT23-6



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	—	—	1.25
A1	0	—	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	—	0.50
b1	0.36	0.38	0.45
c	0.14	—	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	—	—
R1	0.10	—	0.20
θ	0°	—	8°
θ1	3°	5°	7°
θ2	6°	—	14°

Marking



Ordering information

Order code	Package	Base qty	Delivery mode
UMW ESD5325E	SOT23-6	3000	Tape and reel