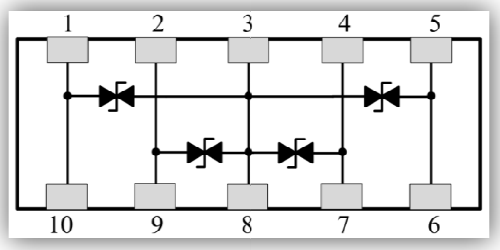
Description

■ This device is an ultra low capacitance ESD product designed to protect very high speed data interfaces. ESD0524V015T has atypical capacitance of only 0.05pf (I/O to GND), and it can be used to meet the ESD immunity requirements of IEC61000-4-2



Schematic Diagram

Application

- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interface (DVI)
- Display Port Interface (DP)
- Unified Display Interface (UDI)
- Mobile Display Digital Interface (MDDI)
- Gigabit Ethernet
- USB2.0 and USB3.0
- IEEE1394 interface

Feature

- ESD protection for high speed data lines to IEC61000-4-2
- ESD contact discharge Max 20KV
- ESD air discharge Max 25KV
- Surface mount
- Extremely low capacitance
- Very low leakage current
- Fast response time
- Bi-directional ESD protection
- Lead free solder termination
- The best ESD protection for high frequency, low voltage applications

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Maximum Contact discharge voltage Per IEC61000-4-2	---	20KV	V
Maximum Air discharge voltage Per IEC61000-4-2	---	25KV	V
Maximum Operating temperature	T_{OPER}	-40 to +90	℃
Maximum Storage temperature	T_{STG}	-55 to +125	℃
Maximum lead temperature for soldering during 10s	T_L	260	℃

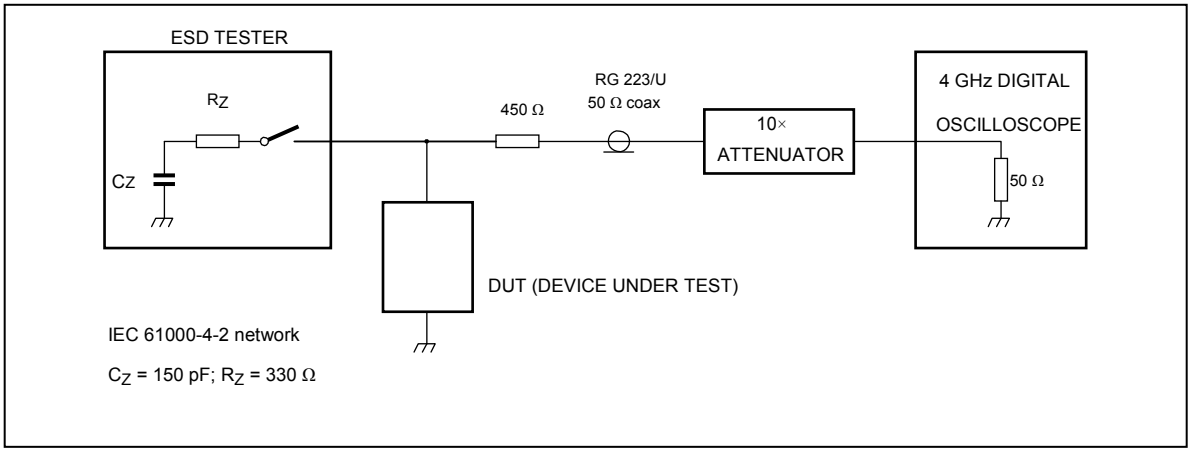
Electrical Characteristics(T_A=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Rated Voltage	V_R	---	---	---	5	V
Trigger voltage	V_T	IEC61000-4-2 8KV contact discharge	---	450	---	V
Clamping voltage	V_C	IEC61000-4-2 8KV contact discharge	---	40	---	V
Leakage current	I_L	DC 5V shall be applied on component	---		0.01	uA
Capacitance	C_P	V_R = 0V, f = 1MHz	---	0.05		pF

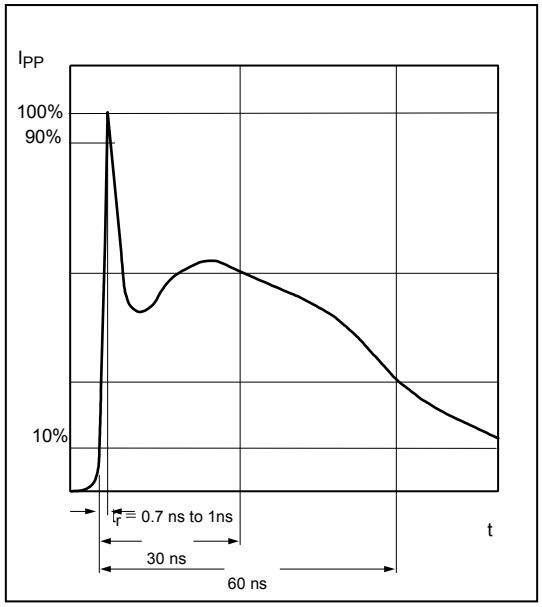
Note: 1 Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.

2 After reliability tests such as high temp storage, temp cycles, continuous ESD strike etc, the maximum leakage current is less than 10uA.

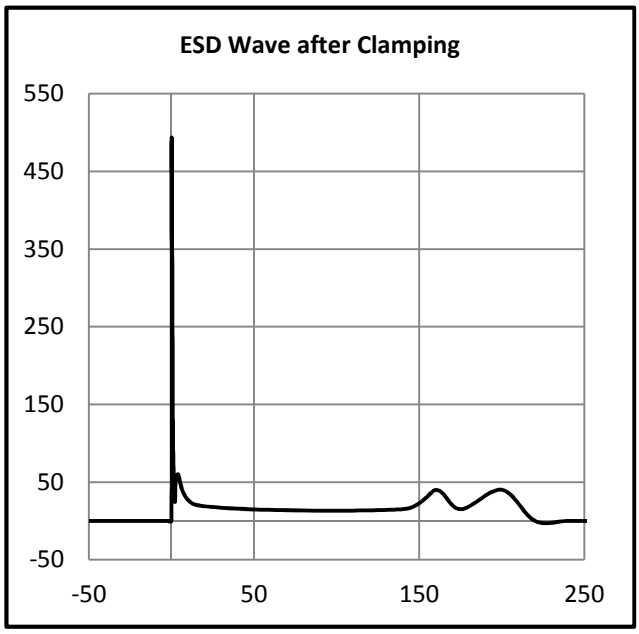
ESD Clamping Test



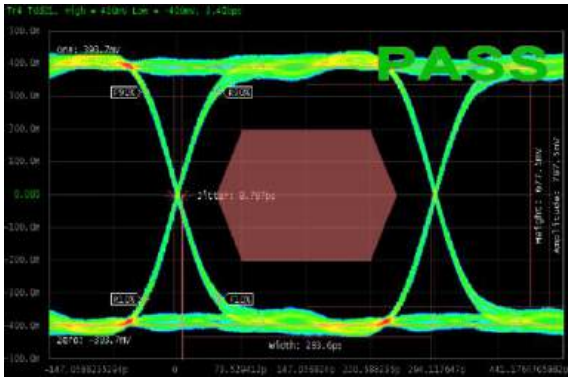
Typical Characteristics



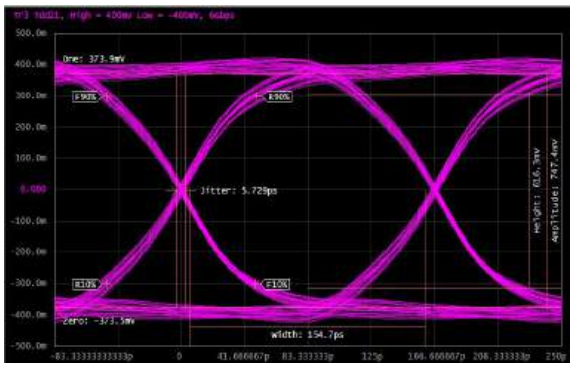
ESD Pulse Waveform
(according to IEC 61000-4-2)



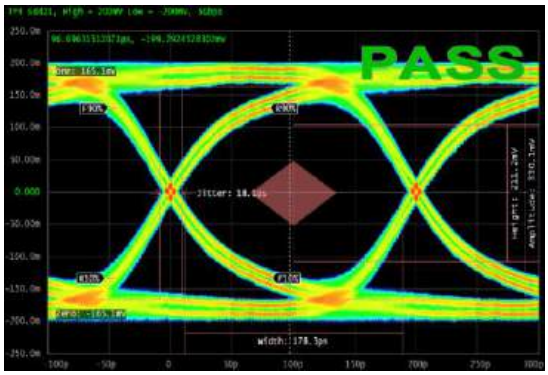
Typical ESD Response
（IEC 61000-4-2, 8kV contact discharge）



HDMI 1.4 Mask at 3.4 Gbps

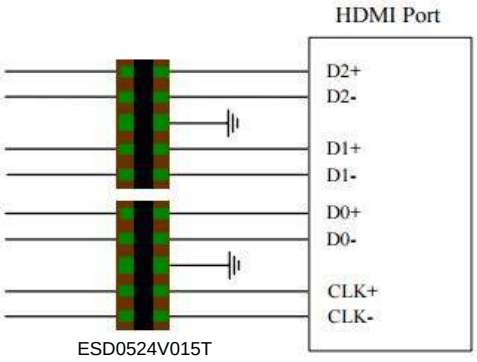


HDMI 2.0 Mask at 6.0 Gbps

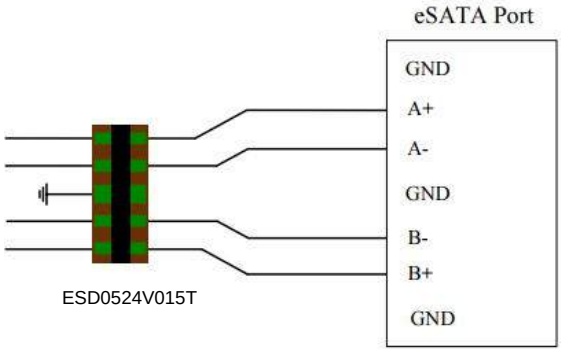


USB 3.0 Mask at 5.0 Gbps

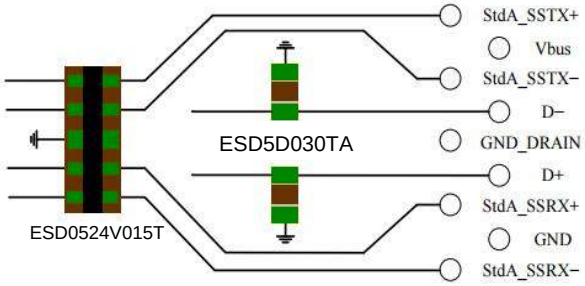
Applications Information



ESD Protection for HDMI

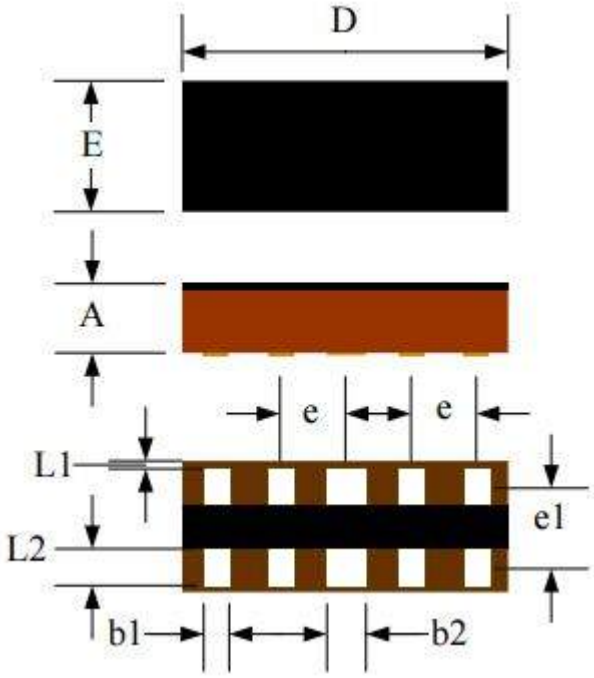


ESD Protection for eSATA

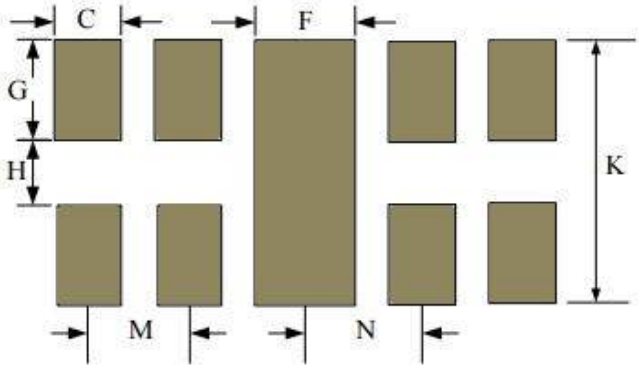


ESD Protection for USB 3.0 Type A

Package Dimension



Recommended Solder Pad Footprint



***Sizes in mm**

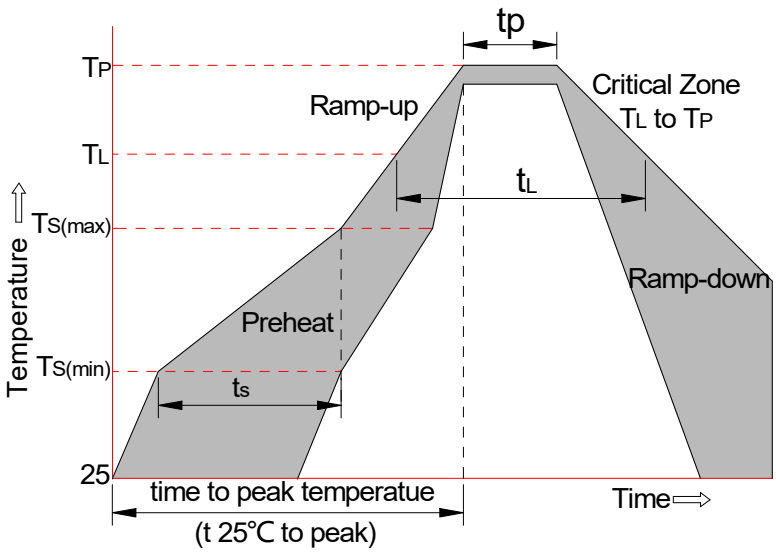
Notes：

This solder pad layout is for reference purposes only.

Dimension	Unit: Millimeters	
	Min.	Max.
A	0.40	0.60
b1	0.10	0.30
b2	0.20	0.40
D	2.40	2.60
E	0.90	1.10
e	0.40	0.60
e1	0.50	0.70
L1	0.04	0.06
L2	0.20	0.40

Dimension	Unit: Millimeters	
	Min.	Max.
C	0.20	0.30
F	0.35	0.45
G	0.55	0.65
H	0.25	0.35
K	1.40	1.60
M	0.45	0.55
N	0.45	0.55

Solder Reflow Recommendations



Reflow Condition		Pb-Free Assembly
Pre-heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
xTime 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C