

**ESD PROTECTION DEVICE**

**STAND-OFF VOLTAGE - 5.0 Volts**  
**POWER DISSIPATION - 130 WATTS**

**GENERAL DESCRIPTION**

The L13ESDL5V0JA-4 is ultra low capacitance TVS arrays designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

**FEATURES**

- Protects four I/O lines and VCC line
- Low capacitance: 0.4 pF typical (I/O to I/O)
- Low clamping voltage
- IEC 61000-4-2, level 4 ( ESD ), > ±15KV ( air ) ; > ±8KV ( contact ).

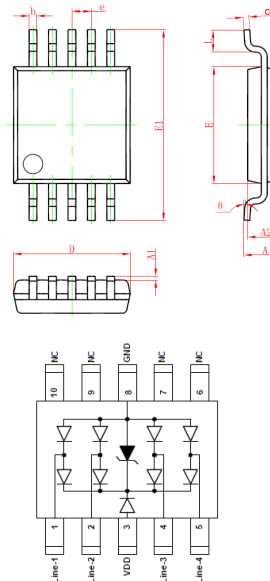
**APPLICATION**

- High Definition Multimedia Interface (HDMI)
- Digital Visual Interface (DVI)
- 10/100/1000 Ethernet
- Monitors and Flat Panel Displays
- Notebook Computers
- Set Top Box
- Projection TV

**MECHANICAL DATA**

- Case Material: "Green" molding compound UL flammability classification 94V-0 (No Br,Sb, Cl)
- Terminals: Lead Free Plating (Matte Tin Finish)
- Component in accordance to RoHs 2002/95/E

**MSOP-10L**



MSOP-10L		
DIM.	MIN.	MAX.
A	0.82	1.10
A1	0.02	0.15
A2	0.75	0.95
b	0.18	0.28
c	0.09	0.23
D	2.90	3.10
e	0.50 BSC	
E	2.90	3.10
E1	4.75	5.05
L	0.40	0.80
θ	0°	6°

All Dimensions in millimeter

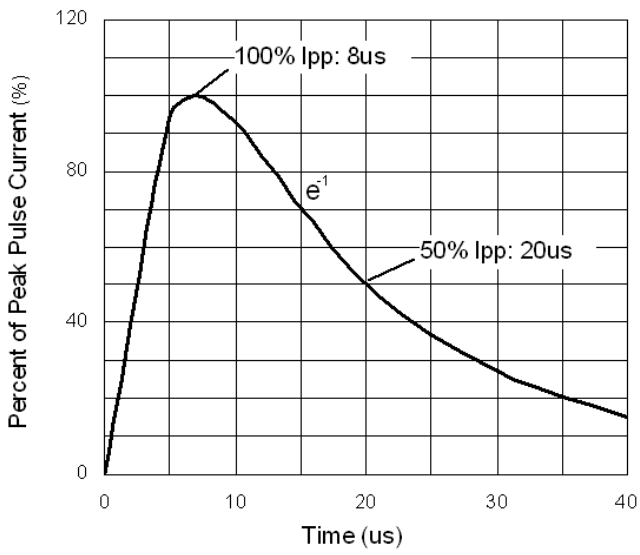
PIN ASSIGNMENT	
1, 2, 4, 5	Input Lines
6, 7, 9, 10	NC
3	V <sub>CC</sub>
8	Ground

**MAXIMUM RATINGS (T<sub>j</sub>= 25°C unless otherwise noticed)**

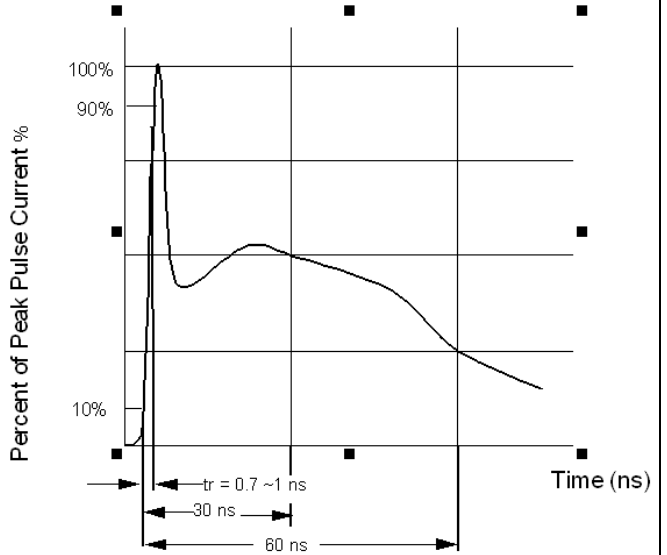
Rating	Symbol	Value	Unit
Peak Pulse Power (tp = 8/20us)	P <sub>pk</sub>	130 (Max)	W
Peak Pulse Current (tp = 8/20us)	I <sub>pp</sub>	5.0	A
Operating Junction Temperature Range	T <sub>J</sub>	-55 to + 125	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to + 150	°C
Soldering Temperature, t max = 10s	T <sub>L</sub>	260	°C

**ELECTRICAL CHARACTERISTICS (T<sub>j</sub>= 25°C unless otherwise noticed)**

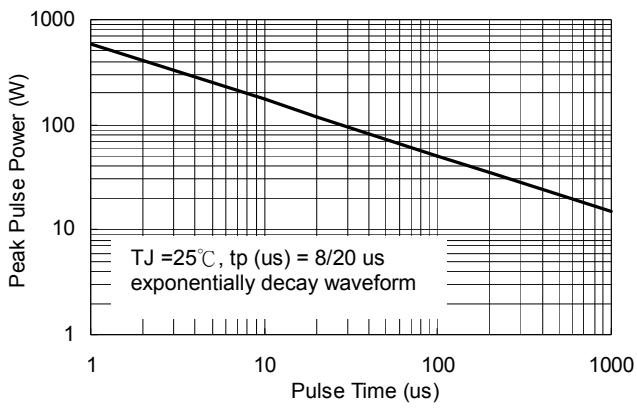
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse standoff voltage	V <sub>RWM</sub>	Any I/O pin to ground	---	---	5.0	V
Breakdown voltage	V <sub>BR</sub>	I <sub>R</sub> = 1 mA	6.0	---	---	V
Reverse leakage current	I <sub>RM</sub>	V <sub>DRM</sub> = 5V	---	----	1	uA
Clamping Voltage	V <sub>C</sub>	I <sub>pp</sub> = 1A, tp = 8/20μs, Any I/O pin to ground	---	---	15	V
Clamping Voltage	V <sub>C</sub>	I <sub>pp</sub> = 5A, tp = 8/20μs, Any I/O pin to ground	---	---	26	V
Junction capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz, Between I/O pins	---	0.4	0.5	pF
Junction capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz, Any I/O pin to ground	---	0.8	0.9	pF



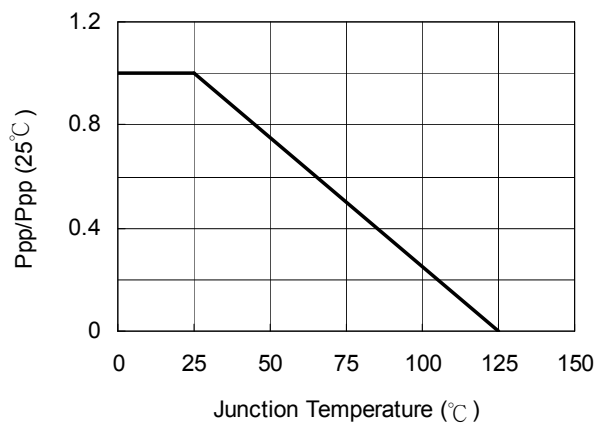
**Figure 1. 8/20 us pulse waveform according to IEC 61000-4-5**



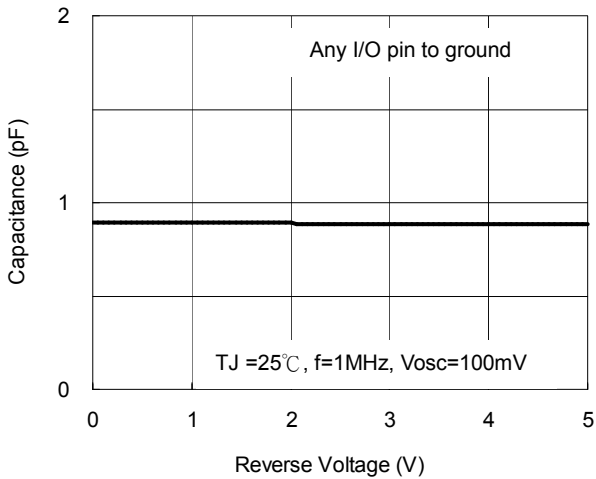
**Figure 2. ESD pulse waveform according to IEC 61000-4-2**



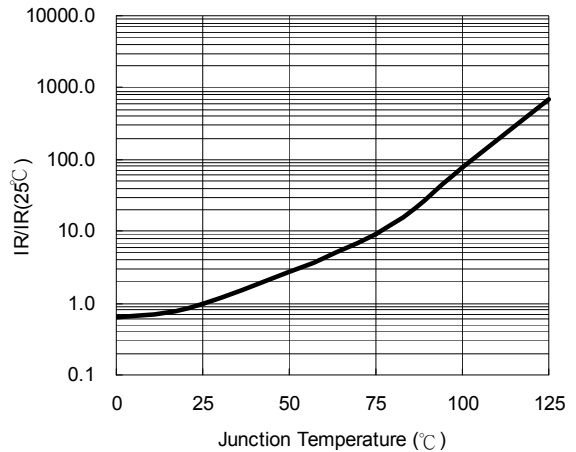
**Figure 3. Power Dissipation versus Pulse Time**



**Figure 4. Peak pulse power versus TJ**



**Figure 5. Typical Junction Capacitance**



**Figure 6. Reverse Leakage Current versus TJ**

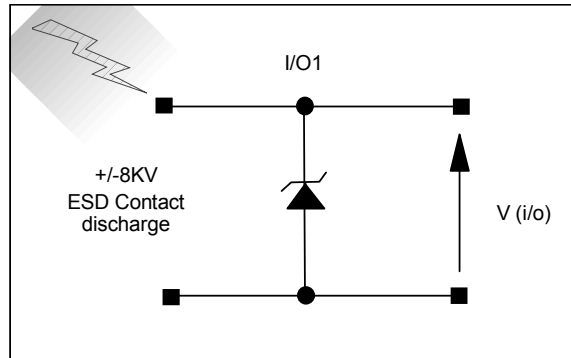


Figure 7. ESD Test Configuration

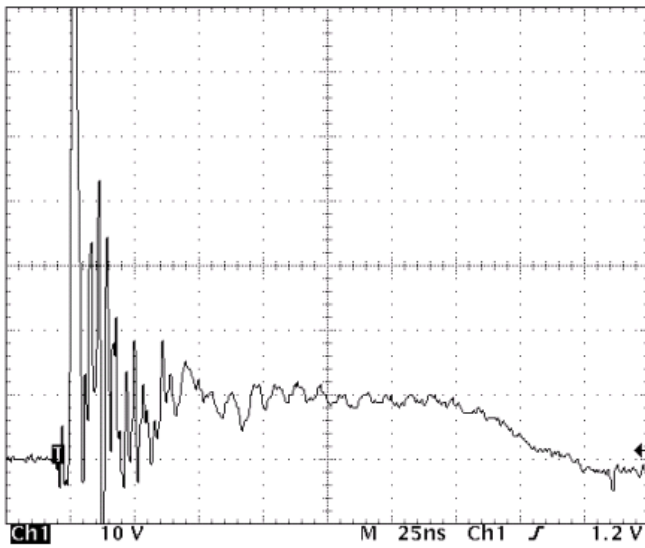


Figure 8. Clamped +8 kV ESD voltage waveform

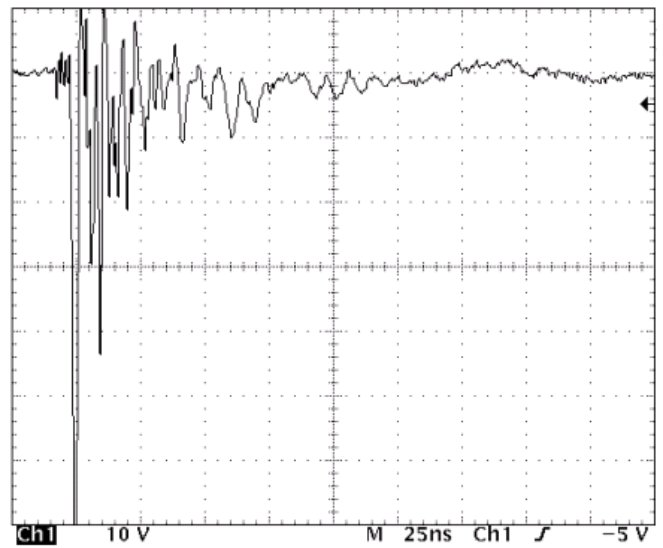


Figure 9. Clamped -8 kV ESD voltage waveform

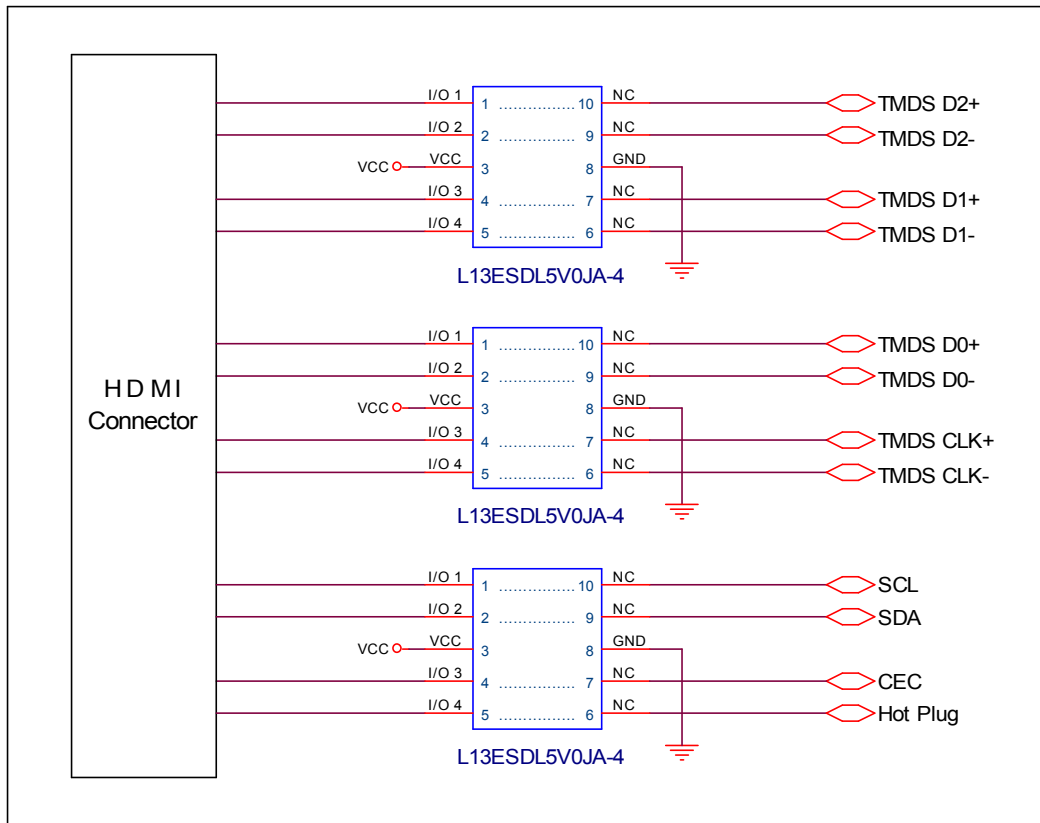


Figure 10. HDMI Interface ESD Protection

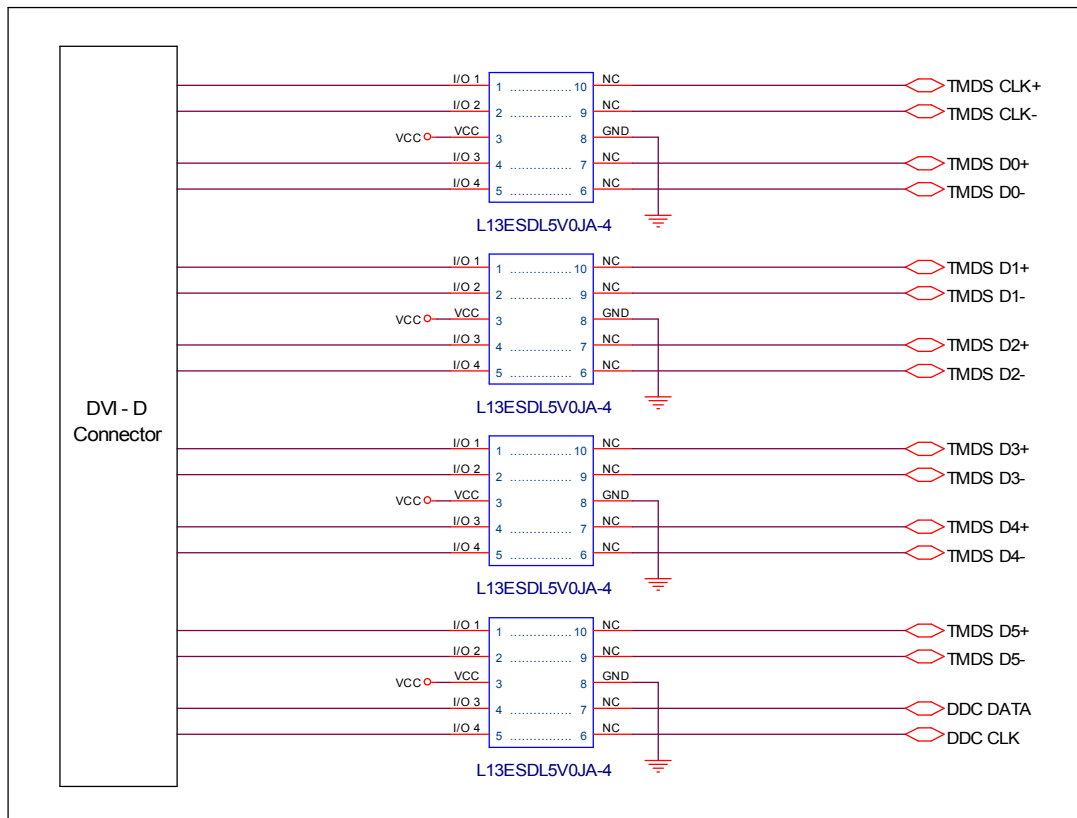


Figure 11. DVI Interface ESD Protection

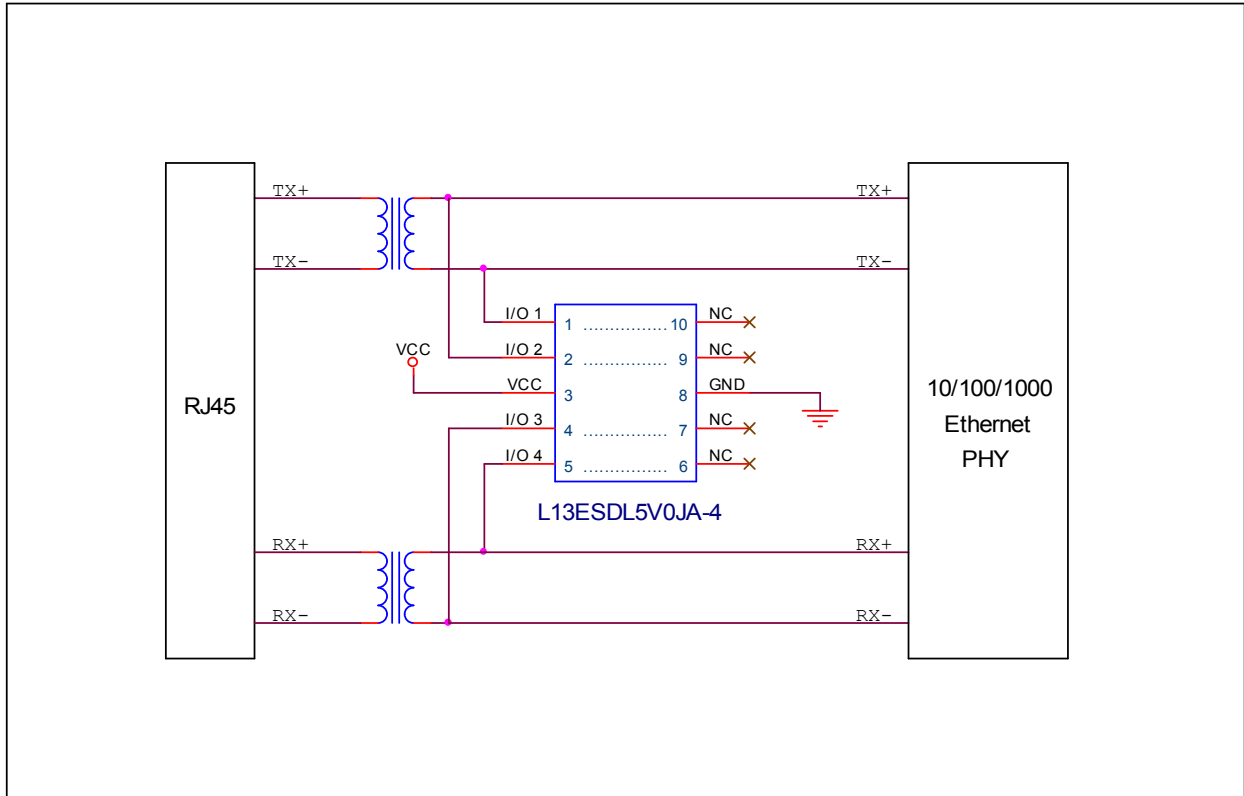


Figure 12. 10/100/1000 Ethernet ESD Protection

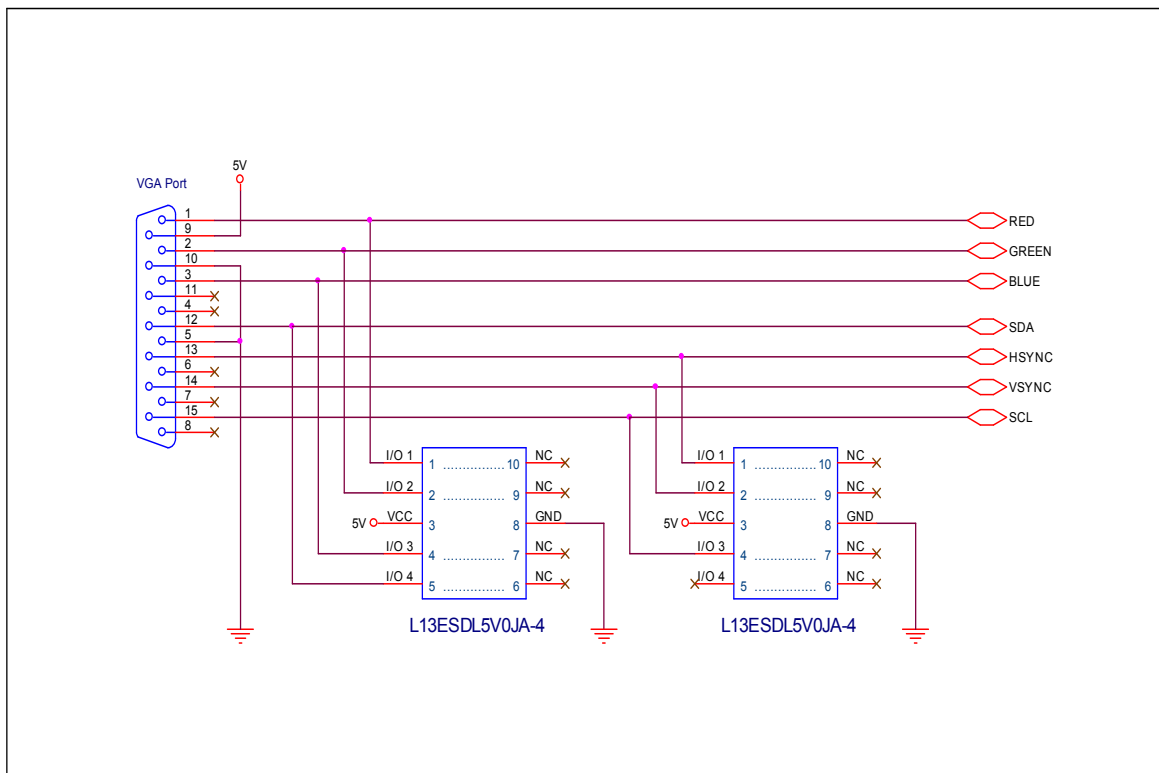


Figure 13. Monitors and Flat Panel Displays ESD Protection (VGA Port)

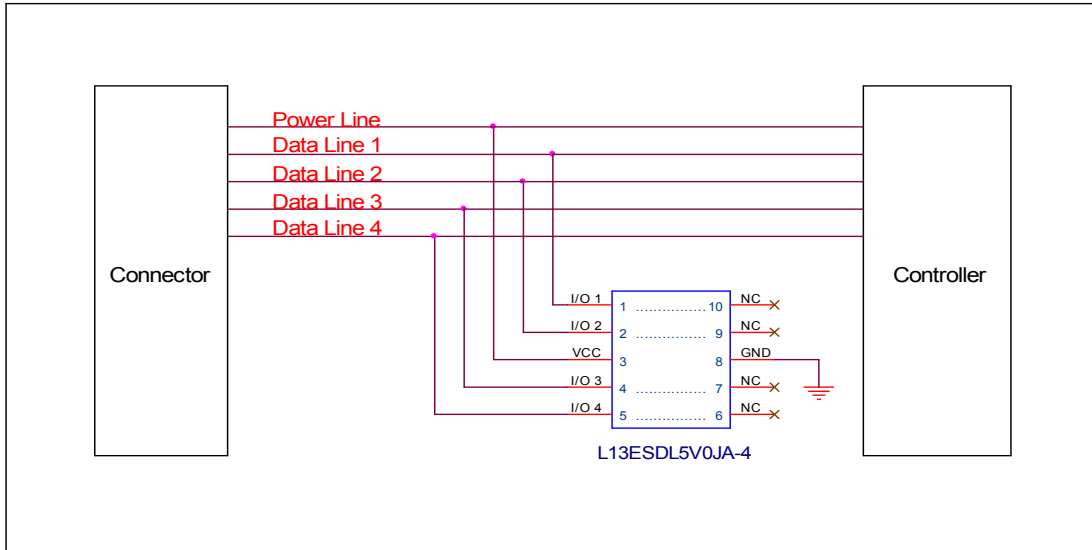
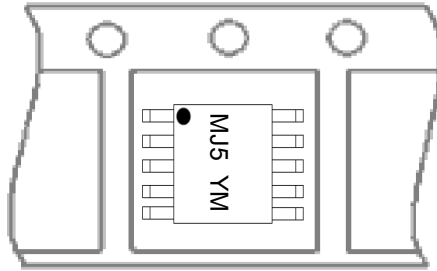


Figure 14. NB, STB, Projection TV ESD Protection

### Marking & Orientation

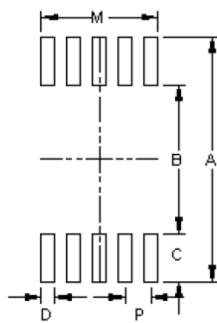


Y: Year, M: Month

### Packaging Information

DEVICE	Q'TY/REEL (PCS)	REEL DIA. (INCH)	Q'TY/BOX (PCS)	Q'TY/CARTON (PCS)
L13ESDL5V0JA-4	3000	7	45000	180K

### MSOP-10L Soldering Pad Layout



Dim.	Millimeters
A	5.80
B	3.60
C	1.10
D	0.25
M	2.25
P	0.50

## **Important Notice and Disclaimer**

LSC reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

LSC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does LSC assume any liability for application assistance or customer product design. LSC does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of LSC.

LSC products are not authorized for use as critical components in life support devices or systems without express written approval of LSC.