

## Electrostatic Discharge Protection Devices (ESD)

Low Capacitance

### ESD05V88D-LC

#### Description

The ESD05V88D-LC 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 over-voltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

#### Feature

- u Protects one data or I/O line
- u Low capacitance
- u Low clamping voltage
- u IEC 61000-4-2, level 4
- u IEC 61000-4-2 ( ESD ), > ±20KV ( air ), > ±11KV ( contact )

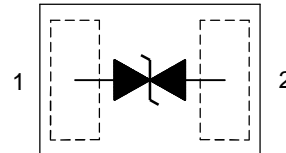
#### Applications

- u Cellular Handsets & Accessories
- u Digital Visual Interface (DVI)
- u RF Circuits
- u Display Port
- u USB Ports
- u MDDI Ports
- u PCI Express

#### SOD-882 / DFN-1006



#### Functional Diagram



#### Mechanical Data

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

#### Mechanical Characteristics

Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (tp=8/20μs waveform)	60	W
I <sub>PP</sub>	Peak Pulse Current (tp=8/20μs waveform)	2.5	A
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +125	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
T <sub>L</sub>	Soldering Temperature, t max = 10s	260	°C
	IEC61000-4-2 (ESD)	Air Discharge	>±20
		Contact Discharge	>±11
			KV

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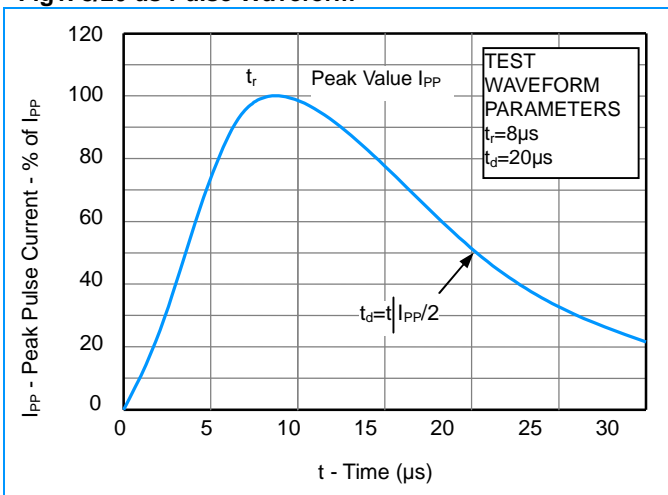
**ESD05V88D-LC**

Electrical Characteristics (T<sub>J</sub>=25 °C unless otherwise noticed )

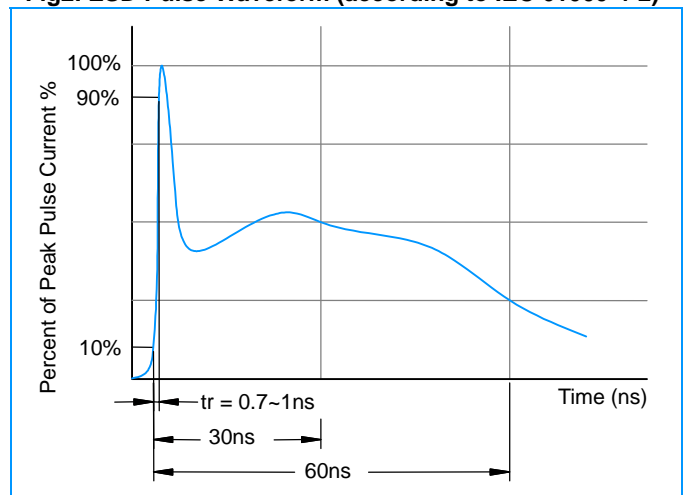
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse standoff voltage	V <sub>RWM</sub>		---	---	5.0	V
Breakdown voltage	V <sub>BR</sub>	I <sub>R</sub> = 1 mA	6.0	---	---	V
Reverse leakage current	I <sub>RM</sub>	V <sub>DRM</sub> = 5V	---	---	1	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs	---	---	14	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 2.5A, t <sub>p</sub> = 8/20μs	---	---	25	V
Junction capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz, Between I/O pins	---	0.3	0.5	pF

**Characteristic Curves**

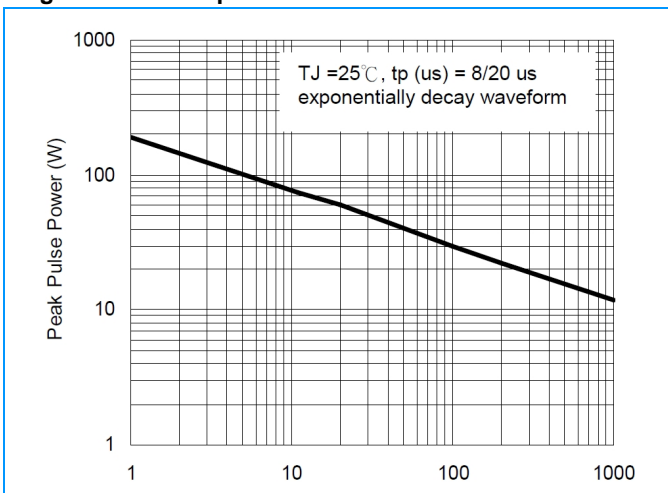
**Fig1. 8/20 us Pulse Waveform**



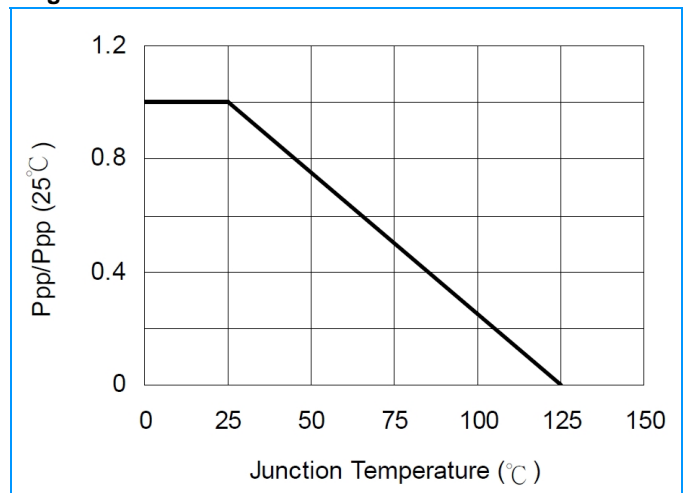
**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**



**Fig3. Power Dissipation Versus Pulse Time**



**Fig4. Peak Pulse Power Versus TJ**



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### Characteristic Curves

Fig5. Typical Junction Capacitance

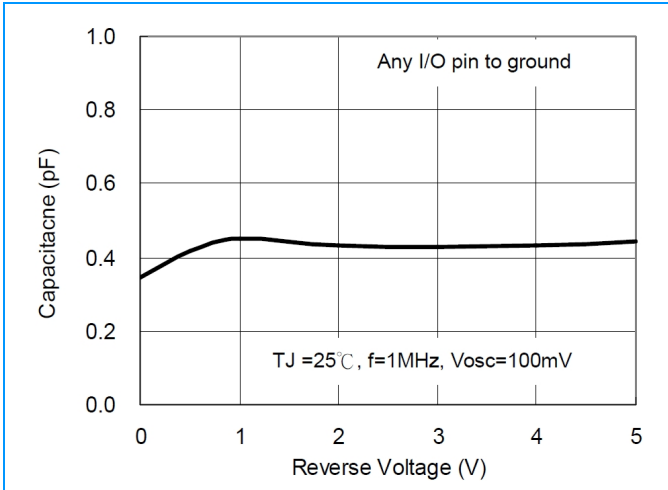


Fig6. Reverse Leakage Current Versus TJ

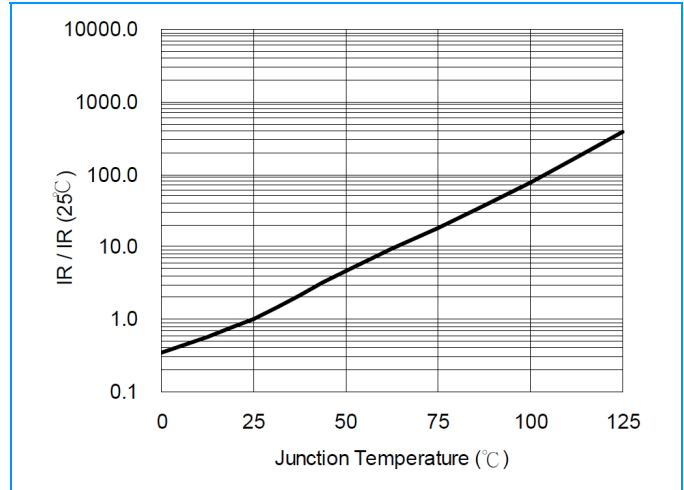


Fig7. ESD Test Configuration

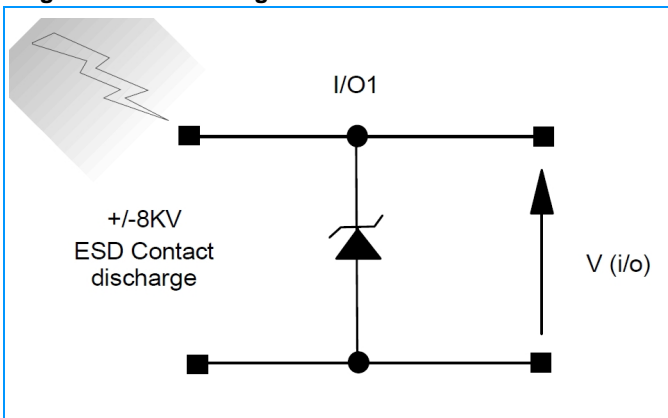


Fig8. Clamped +8 kV ESD Voltage Waveform

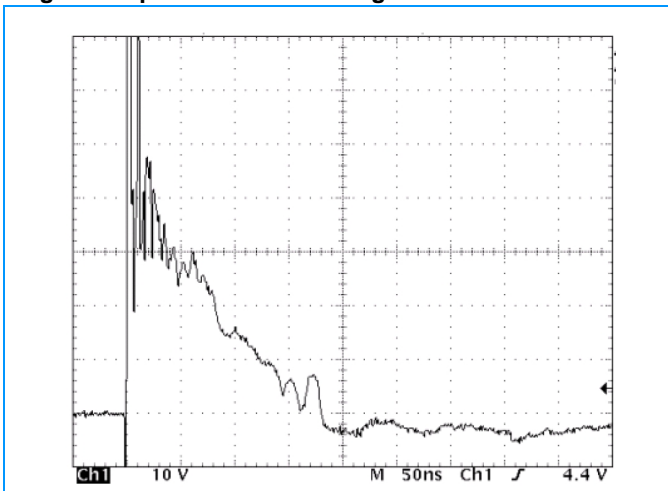
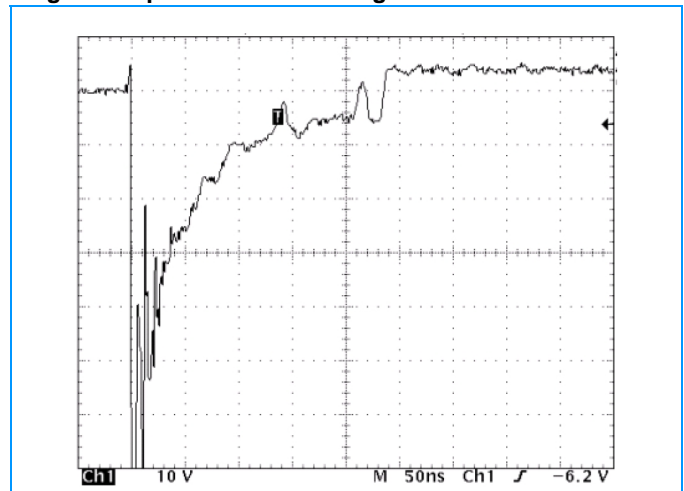


Fig9. Clamped -8 kV ESD Voltage Waveform

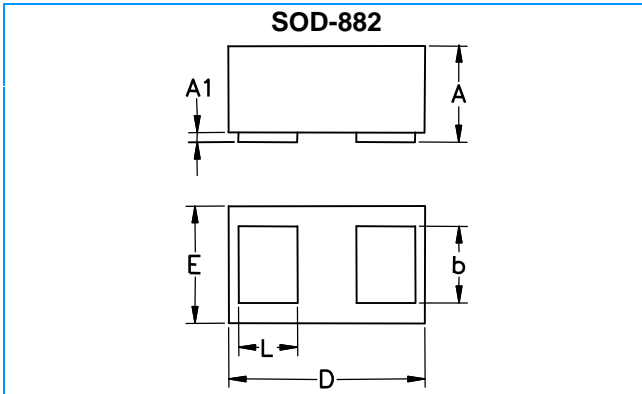


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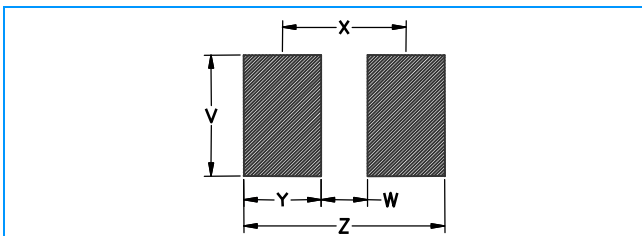
#### Dimension



Dimension	Min.	Max.
A	0.47	0.53
A1	0.00	0.05
B	0.25	0.55
D	0.95	1.075
E	0.55	0.675
L	0.20	0.45

All Dimensions in millimeter

#### Soldering Pad Layout

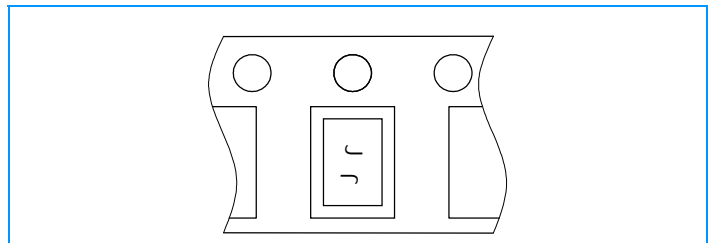


Dimension	Millimeters	Inches
Z	1.30	0.051
X	0.75	0.029
W	0.20	0.007
Y	0.55	0.021
V	0.80	0.031

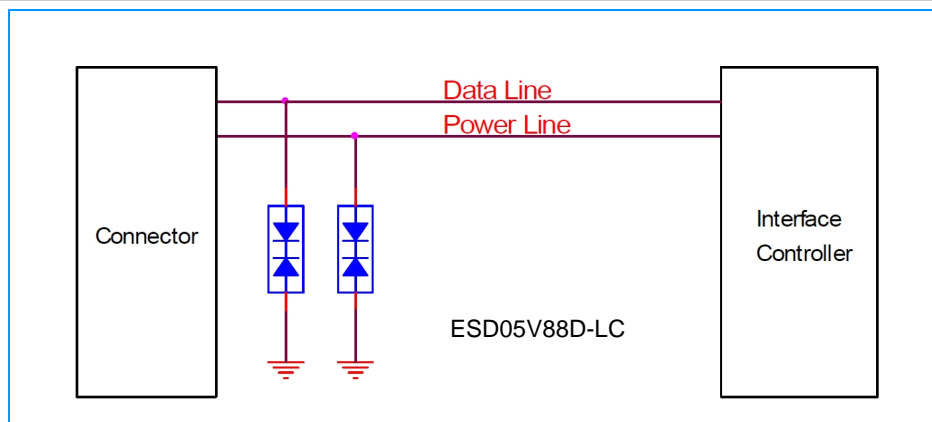
#### Packaging Information

Device	Q'TY/REEL (PCS)	REEL DIA. (INCH)
ESD05V88D-LC	3,000	7
	10,000	7

#### Marking & Orientation



#### Application Information



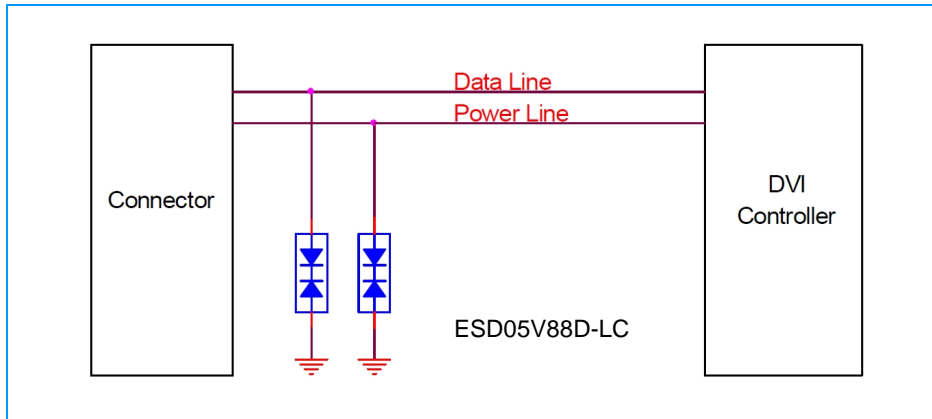
Cellular Handsets & Accessories ESD Protection

**Electrostatic Discharge Protection Devices (ESD)**

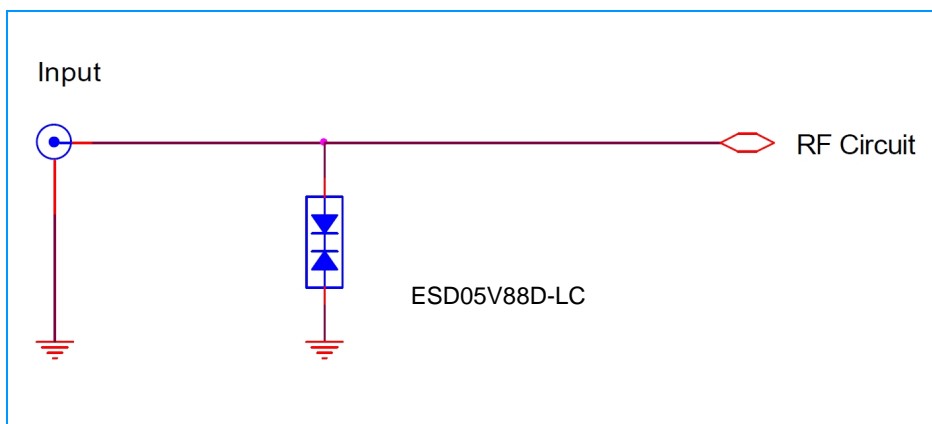
**Low Capacitance**

**ESD05V88D-LC**

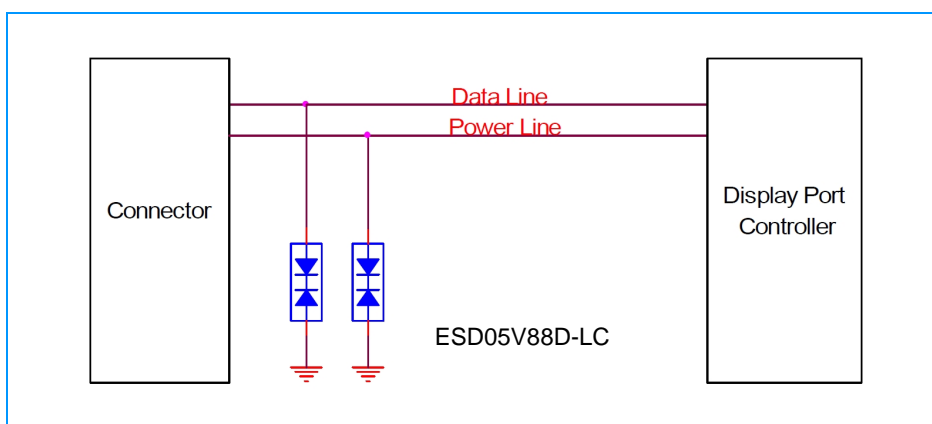
**Application Information (Continue)**



**DVI ESD Protection**



**RF Circuit ESD Protection**



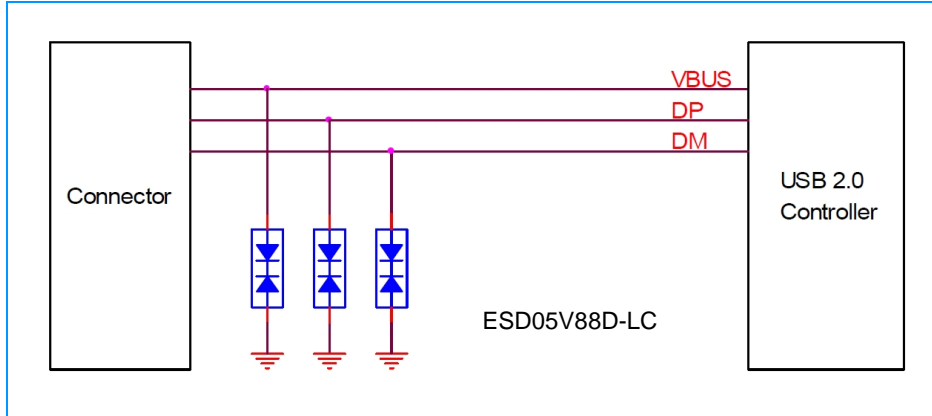
**Display Port ESD Protection**

**Electrostatic Discharge Protection Devices (ESD)**

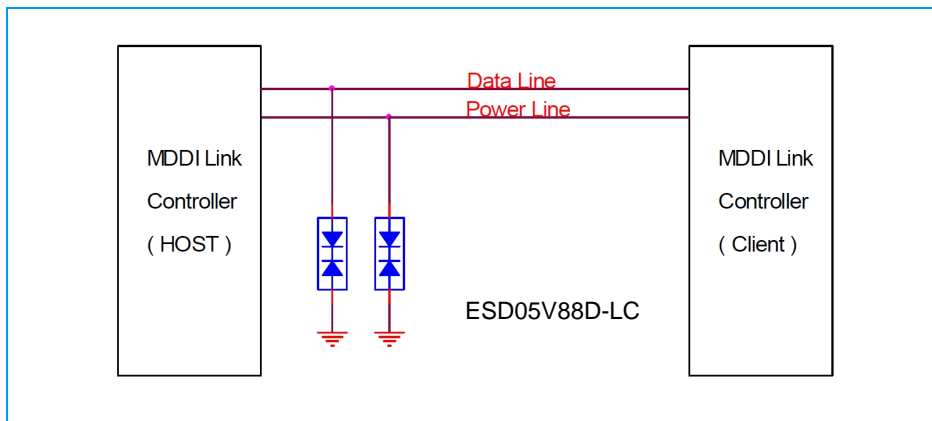
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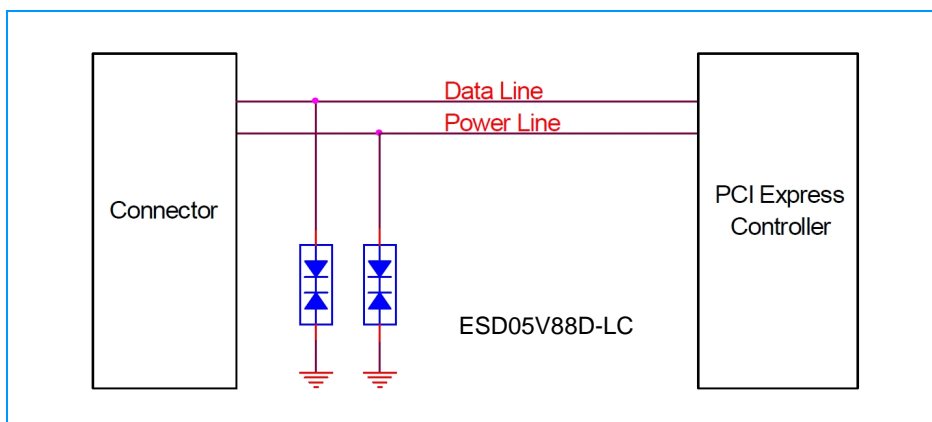
**Application Information (Continue)**



**USB2.0 Interface ESD Protection**



**MDDI ESD Protection**



**PCI Express ESD Protection**