

4-Line Ultra Low Capacitance TVS Array

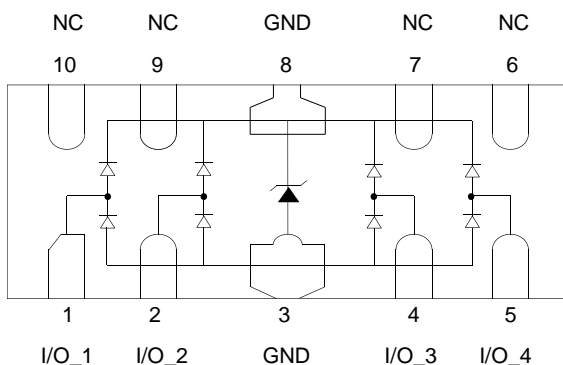
Description

The PESDR0524P is an ultra low capacitance TVS array, to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The PESDR0524P has an ultra-low capacitance with a typical value at 0.36pF, and complies with the IEC61000-4-2(ESD) standard with ±20kV air and ±20kV contact discharge. It is assembled into a 10—pin 2.5x1.0x0.5mm. lead-free DFN package. The flow through style package allows for easy PCB layout and matched trace length necessary to maintain consistent impedance between high speed differential lines such as USB 3.0 and HDMI. The small size, ultra-low capacitance and high ESD protection make PESDR0524P an ideal choice to protect HDMI, DDI, MDDI, USB3.0 and other high speed ports.

Features

- Ultra low capacitance: 0.36pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Low operating voltage: 5.5V
- Low clamping voltage
- Up to 4 lines protects
- Leadless flow-through package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: ±20kV
Contact discharge: ±20kV
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 3.5A (8/20µs)
- RoHS Compliant

Dimensions and Pin Configuration



Circuit and Pin Schematic

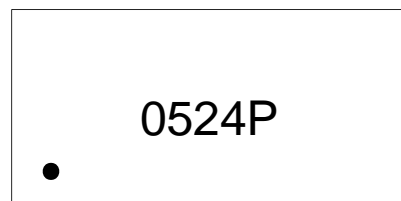
Mechanical Characteristics

- Package: DFN2510-10 (2.5x1.0x0.5mm)
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below

Applications

- HDMI 1.4 & 2.0, USB 3.0 & 3.1 and MDDI ports
- Monitors and flat panel displays
- Set-top box and Digital TV
- Video graphics cards
- Digital Video Interface (DVI)
- Notebook Computers
- PCI Express and Serial SATA Ports

Marking Information



0524P = Device Marking Code

Ordering Information

Part Number	Shipping	Reel Size
PESDR0524P	3000/Tape & Reel	7 inch

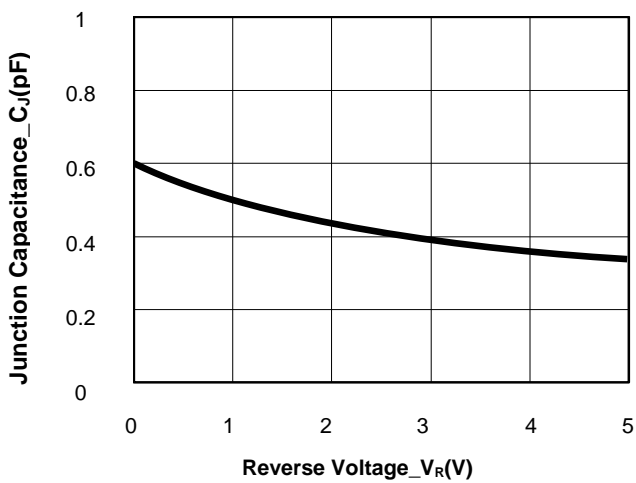
Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P _{PK}	52	W
Peak Pulse Current (8/20μs)	I _{PP}	3.5	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±25	kV
ESD per IEC 61000-4-2 (Contact)		±25	
Operating Temperature Range	T _{OP}	-55 to +125	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

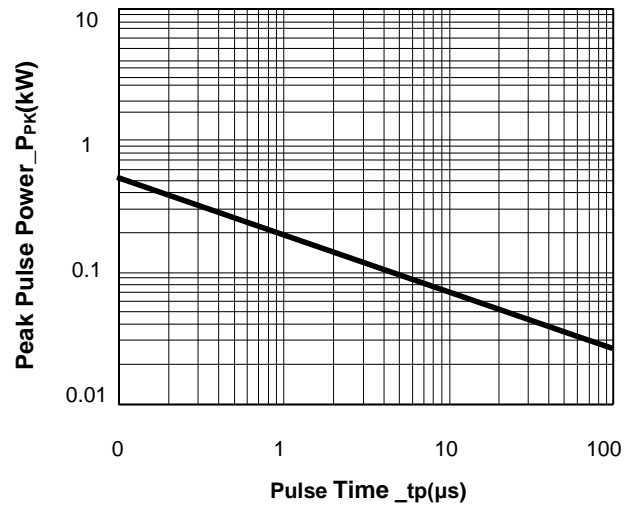
Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			5.5	V	Any I/O pin to ground
Breakdown Voltage	V _{BR}	6.0			V	I _T = 1mA, any I/O pin to ground
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5V, any I/O pin to ground
Clamping Voltage	V _C		8.6	10	V	I _{PP} = 1A (8/20μs pulse), any I/O pin to ground
Clamping Voltage	V _C		11.4	15	V	I _{PP} = 3.5A (8/20μs pulse), any I/O pin to ground
Junction Capacitance	C _J		0.1	0.25	pF	V _R = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C _J		0.36	0.6	pF	V _R = 0V, f = 1MHz, any I/O pin to ground

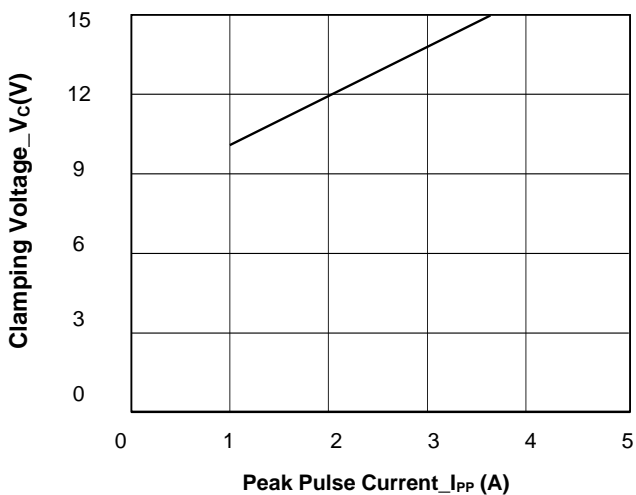
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



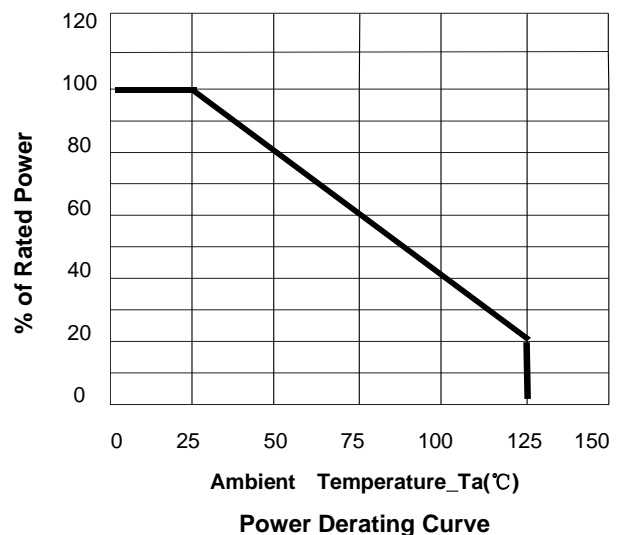
Junction Capacitance vs. Reverse Voltage



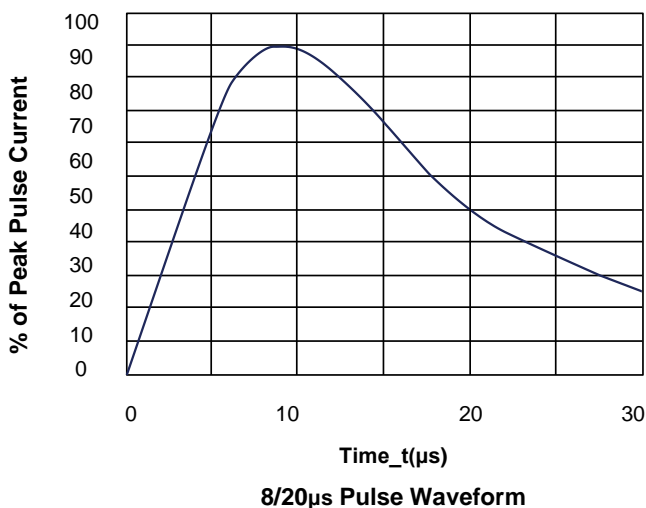
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



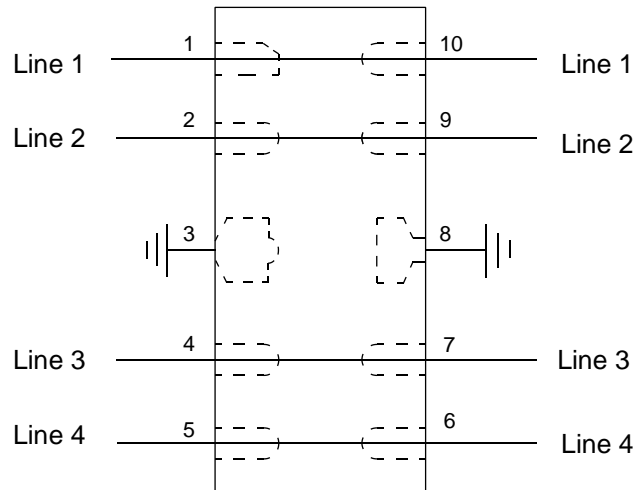
Power Derating Curve



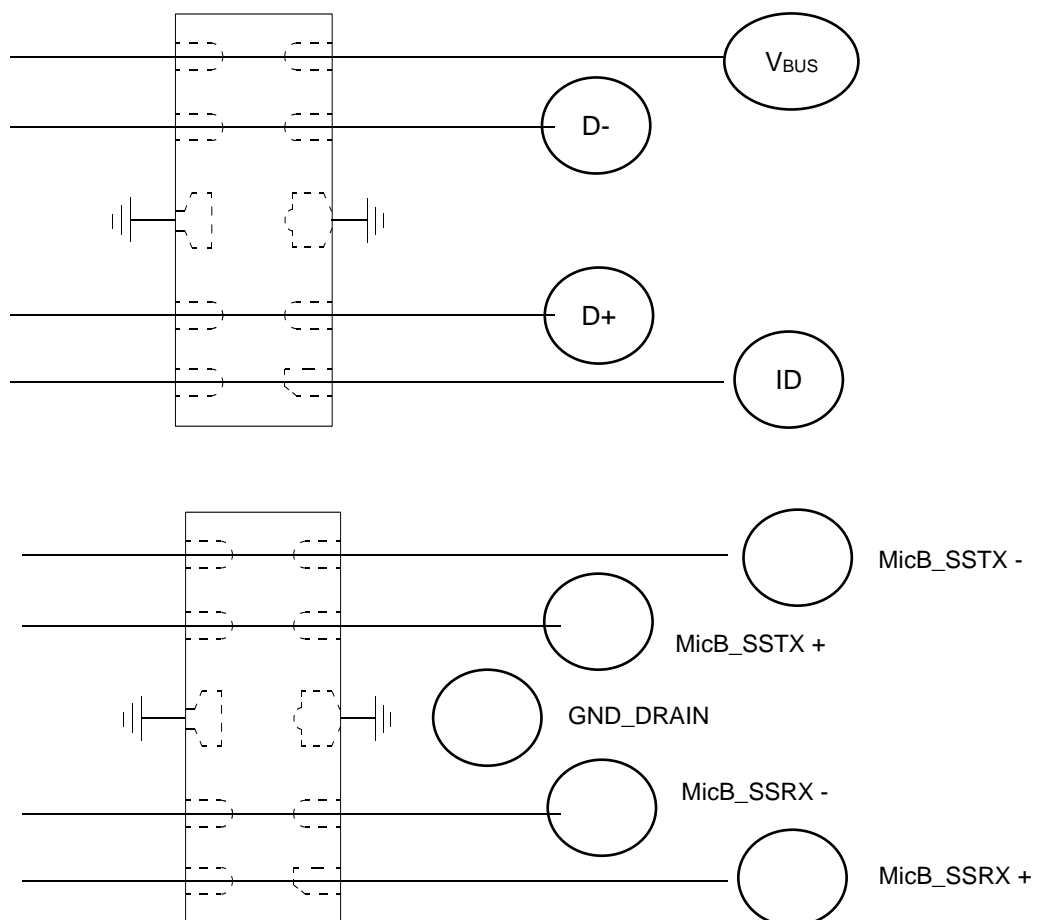
8/20μs Pulse Waveform

Typical Application

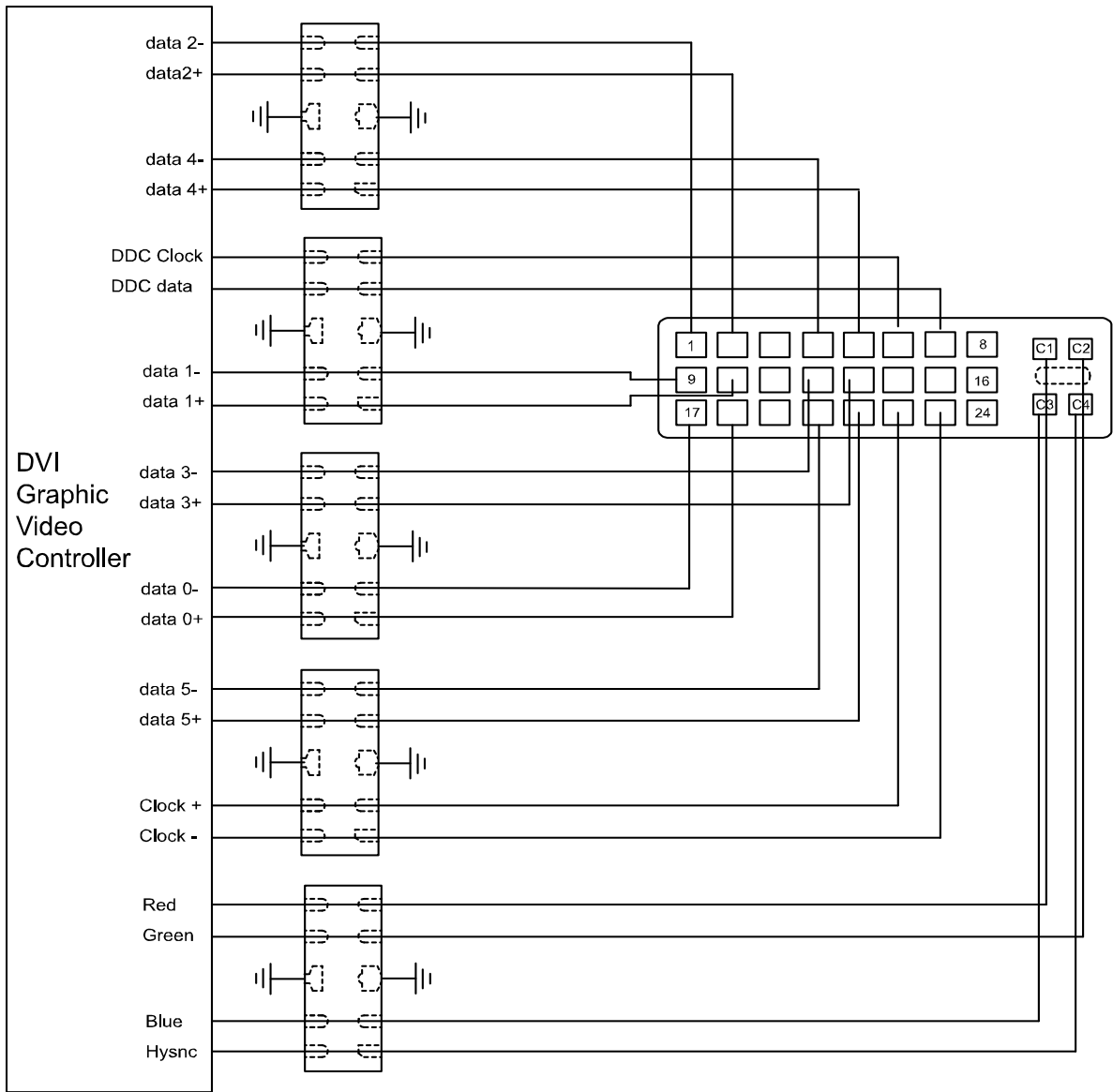
The PESDR0524P is designed for easy PCB layout by allowing the traces to run straight through the device. The PCB traces could be used to connect the pin pairs for each line. For example, line 1 enters at pin 1 and exits at pin 10 and the PCB trace connects Pin 1 and Pin 10 together. Ground is connected at Pin 3 and Pin 8.



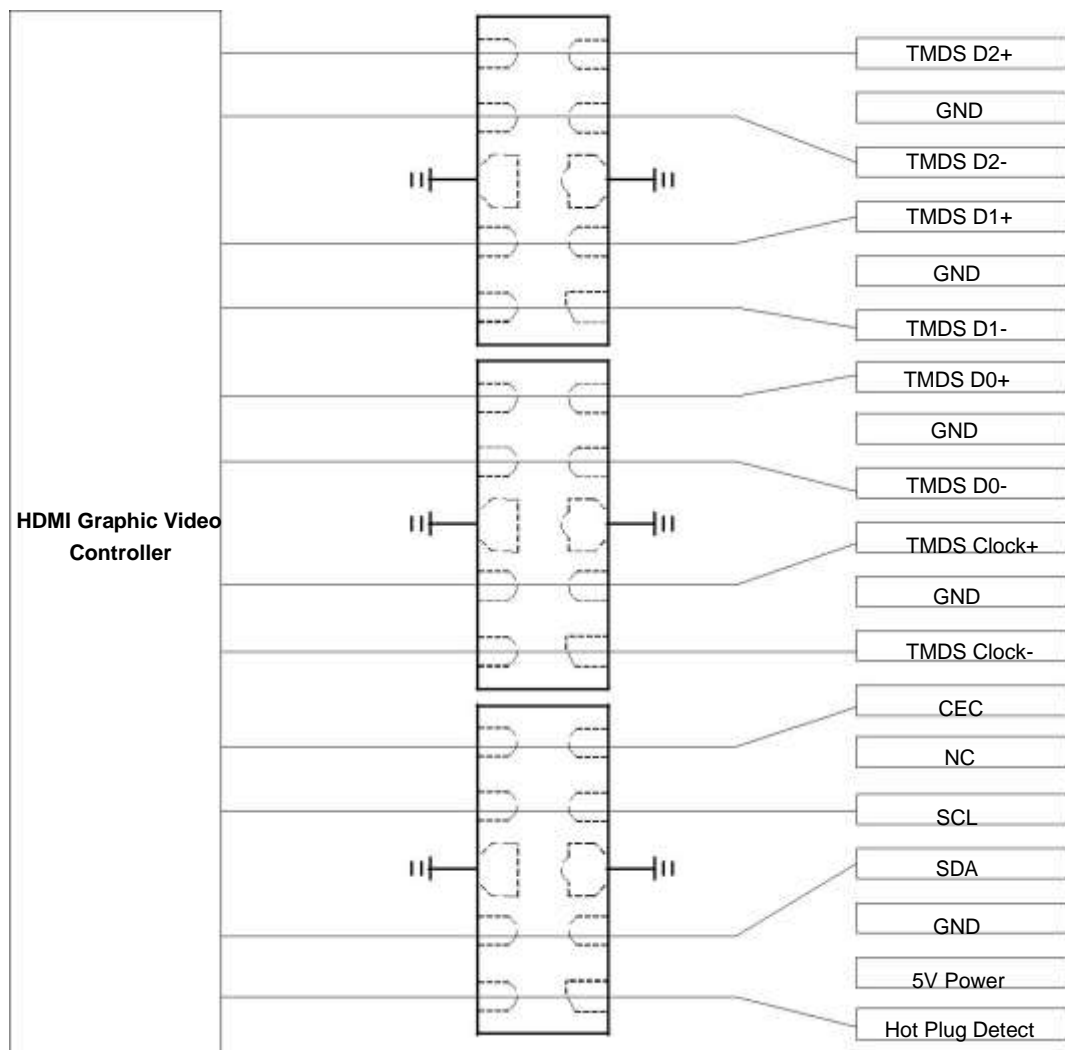
PESDR0524P on USB3.0 Port Application



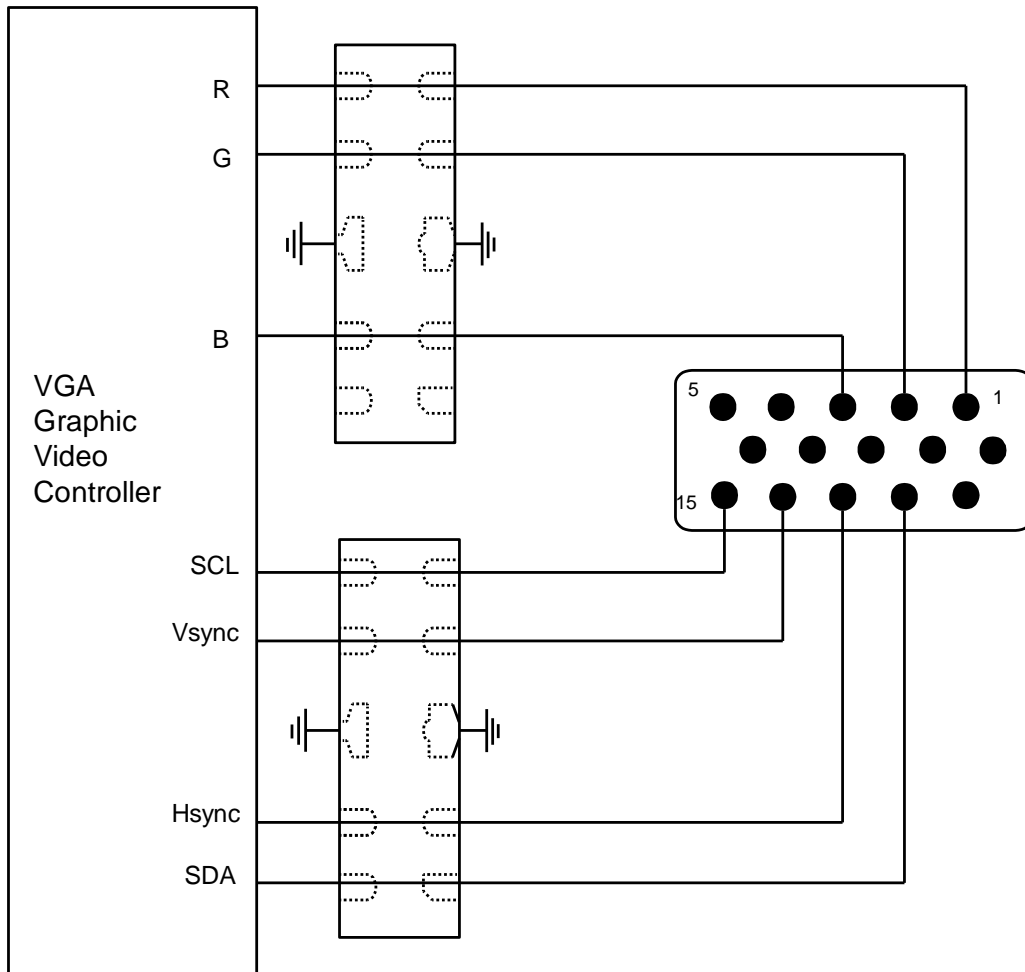
PESDR0524P on DVI Port Application



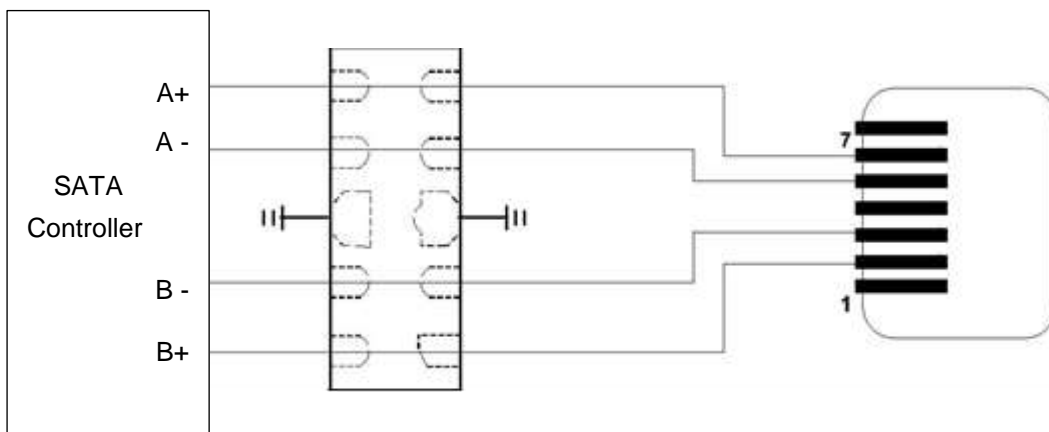
PESDR0524P on HDMI 1.4&2.0 Port Application



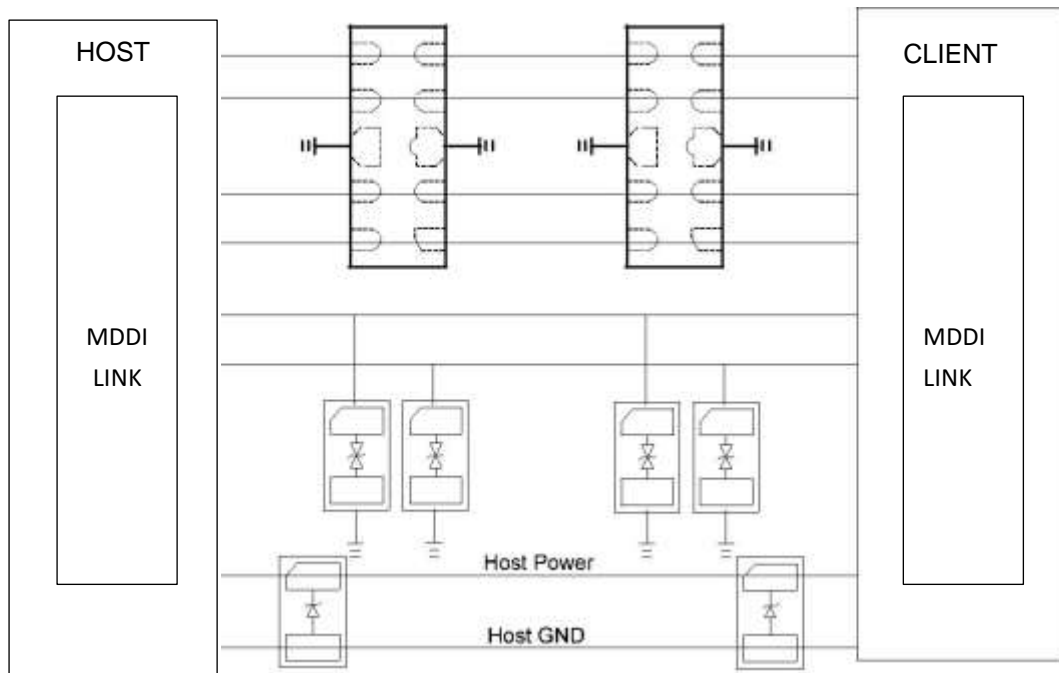
PESDR0524P on VGA Port Application



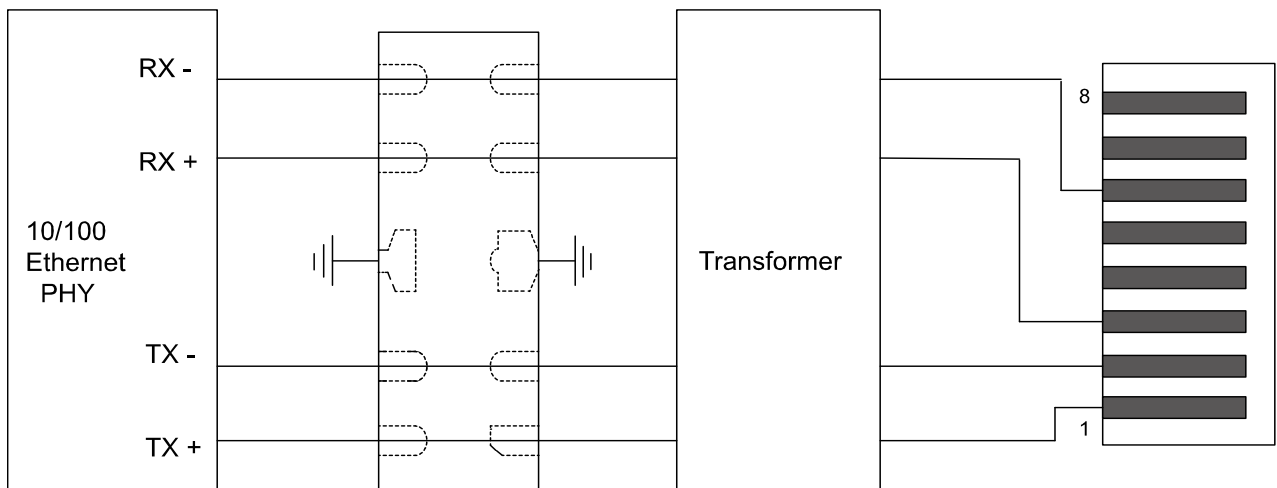
PESDR0524P on eSATA Port Application



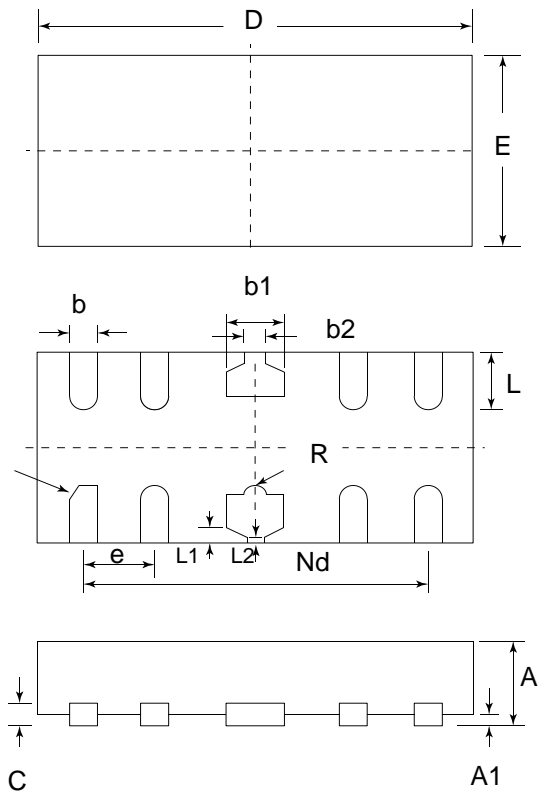
PESDR0524P on MDDI Port Application



PESDR0524P on 10/100 Base Ethernet Port Application

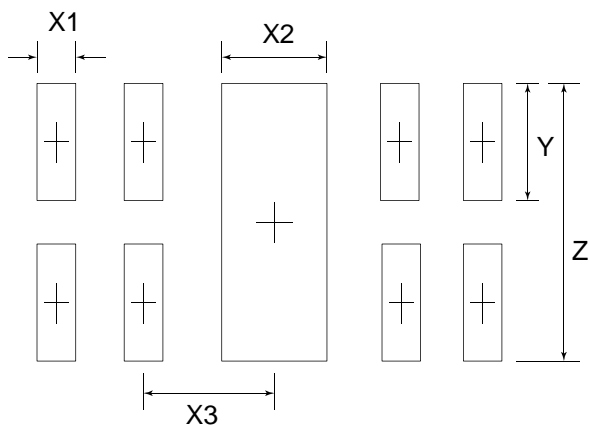


DFN2510-10 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
B1	0.35	0.40	0.45	0.014	0.016	0.018
B2	0.20	0.25	0.30	0.008	0.010	0.012
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.45	2.50	2.55	0.098	0.100	0.102
e	0.50BSC			0.020BSC		
Nd	2.00BSC			0.080BSC		
E	0.95	1.00	1.05	0.038	0.040	0.042
L	0.35	0.40	0.45	0.014	0.016	0.018
L1	0.075REF			0.003REF		
L2	0.050REF			0.002REF		
h	0.08	0.12	0.15	0.003	0.005	0.006
R	0.05	0.10	0.15	0.002	0.004	0.006

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X1	0.200	0.008
X2	0.400	0.016
X3	0.500	0.020
Y	0.600	0.024
Z	1.400	0.056