

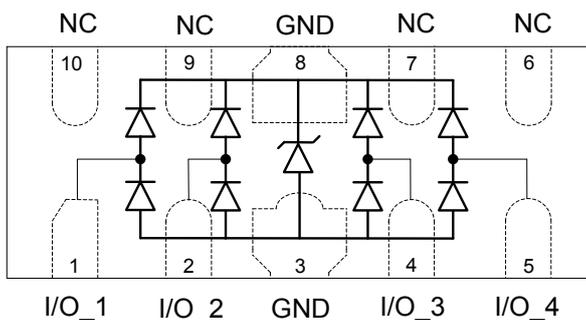
Description

The ST0524D25L is an ultra low capacitance TVS array, utilizing leading monolithic silicon technology 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 ST0524D25L has an ultra-low capacitance with a typical value at 0.2pF, and complies with the IEC 61000-4-2 (ESD) with $\pm 20\text{kV}$ air and $\pm 15\text{kV}$ 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 lengths 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 surge protection make ST0524D25L an ideal choice to protect HDMI, MDDI, USB 3.0 and other high speed ports.

Features

- ◆ Ultra low capacitance: 0.2pF typical (I/O to I/O)
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 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: $\pm 20\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-5 (Lightning) 4A (8/20 μs)
- ◆ RoHS Compliant

PIN Identification and 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
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

Applications

- ◆ HDMI 1.3/1.4/2.0, USB 2.0/3.0 and MDDI ports
- ◆ Monitors and flat panel displays
- ◆ Set-top box and Digital TV
- ◆ Video graphics cards
- ◆ Digital Visual Interface (DVI)
- ◆ Notebook Computers
- ◆ PCI Express and Serial SATA Ports

Ordering Information

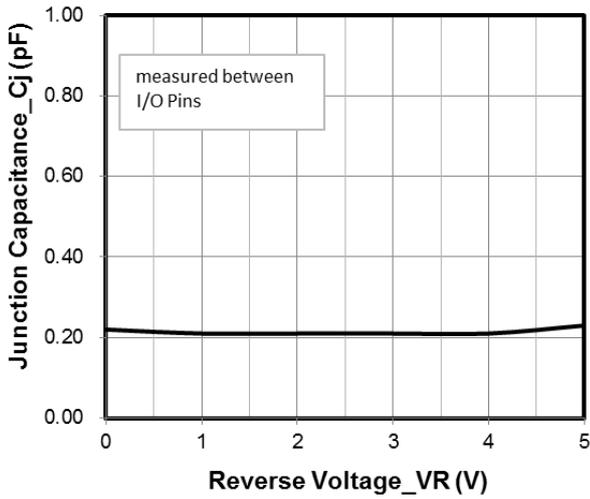
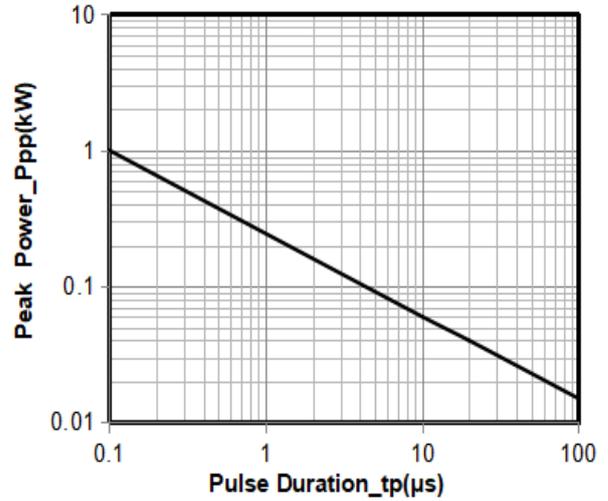
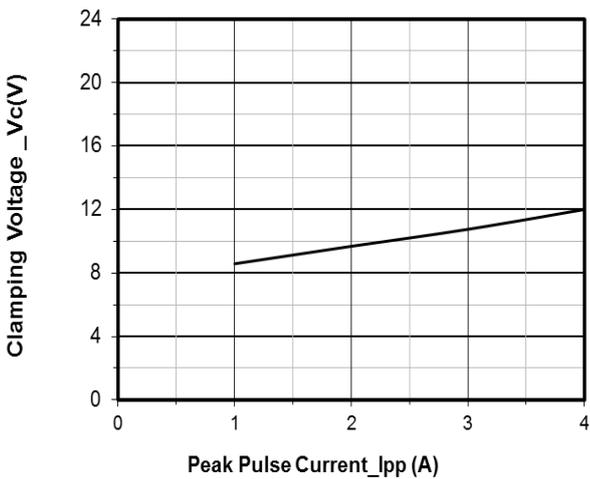
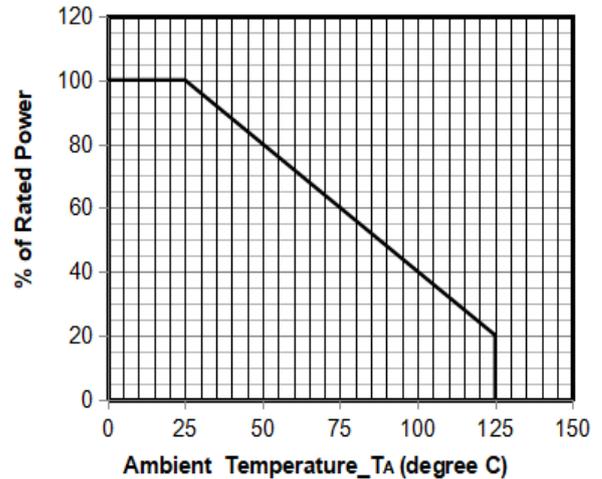
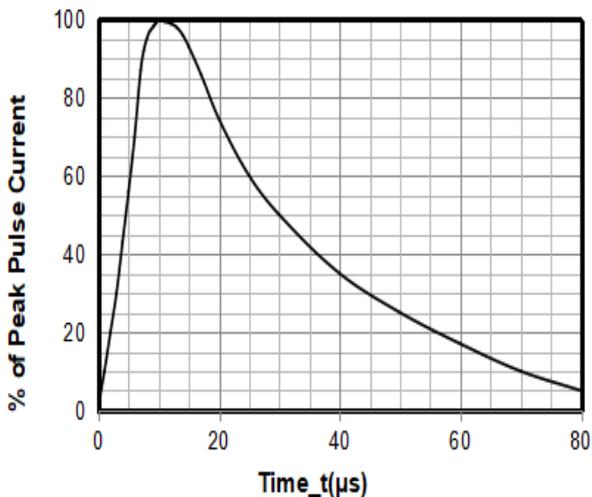
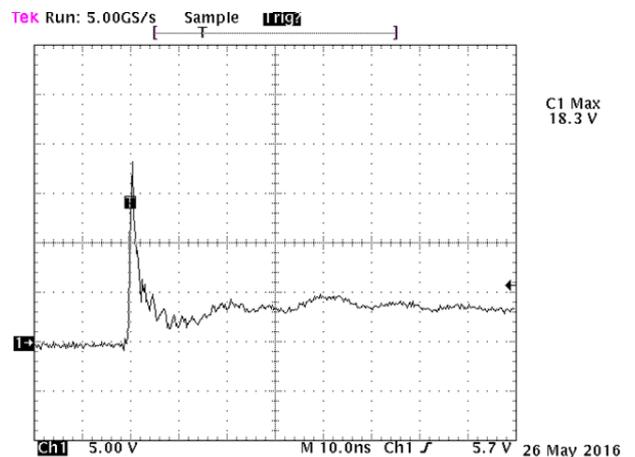
Part Number	Packaging	Reel Size
ST0524D25L	3000/Tape & Reel	7 inch

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

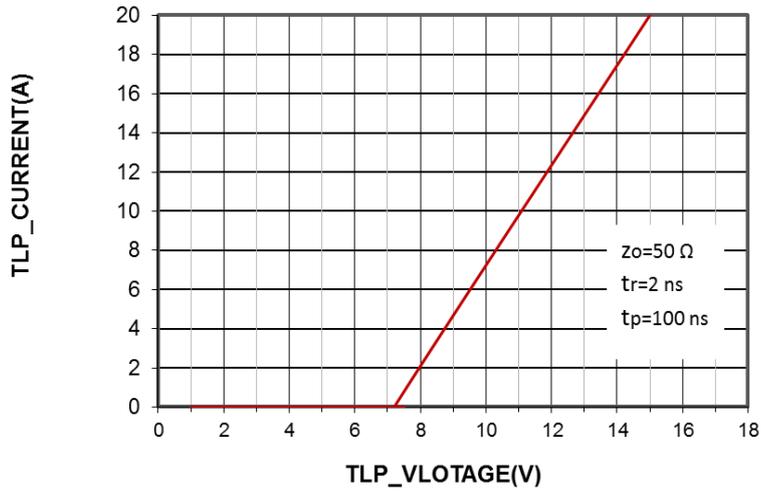
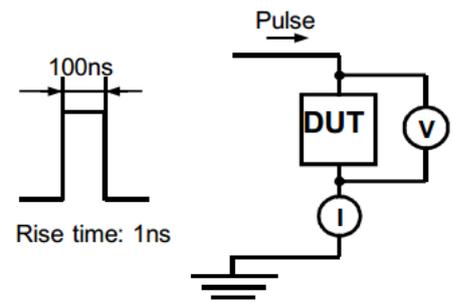
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	60	W
Peak Pulse Current (8/20μs)	IPP	4	A
ESD per IEC 61000-4-2 (Air)	VESD	±20	kV
ESD per IEC 61000-4-2 (Contact)		±15	
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	Tstg	-55 to +150	°C

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

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	Any I/O pin to ground
Breakdown Voltage	VBR	6			V	IT = 1mA, any I/O pin to ground
Reverse Leakage Current	IR			0.5	μA	VRWM = 5V, any I/O pin to ground
Clamping Voltage	VC			10	V	IPP = 1A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	VC			15	V	IPP = 4A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	CJ		0.2	0.3	pF	VR = 0V, f = 1MHz, between I/O pins
Junction Capacitance	CJ			0.5	pF	VR = 0V, f = 1MHz, any I/O pin to ground

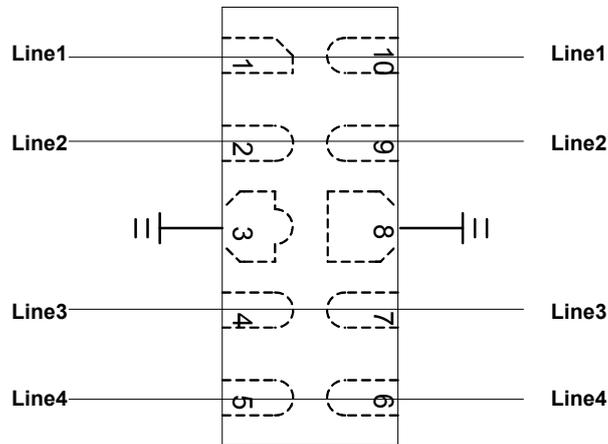
Typical Performance Characteristics (TA=25°C unless otherwise specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current

Power Derating Curve

8 X 20μs Pulse Waveform


Note: Data is taken with a 10x attenuator
Contact discharge current waveform
per IEC61000 4 2

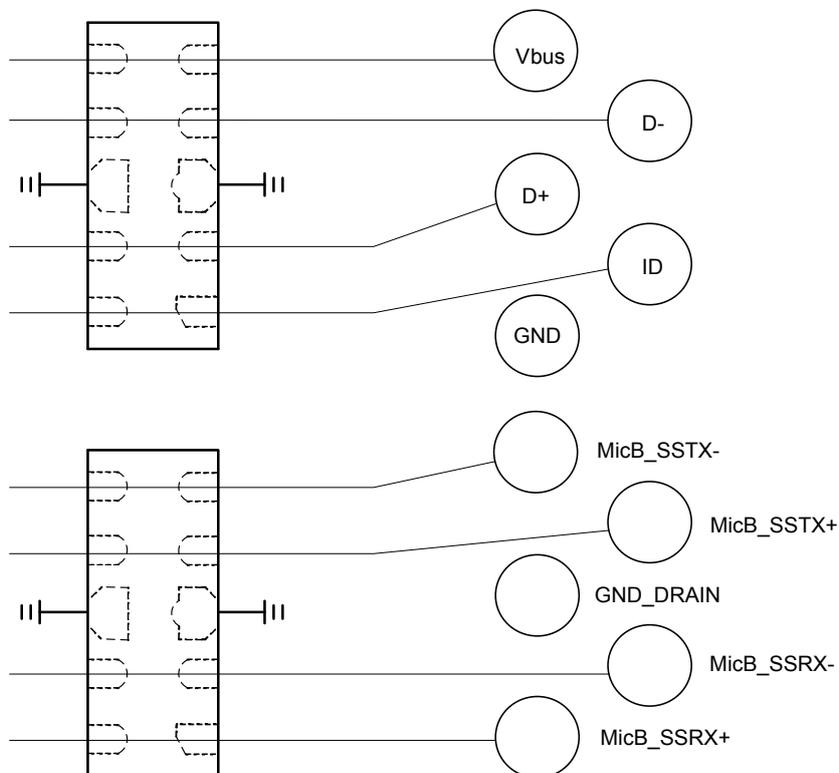
Typical Performance Characteristics (TA=25°C unless otherwise specified)

Transmission Line Pulsing (TLP) Measurement

Transmission Line Pulsing System

Typical Application

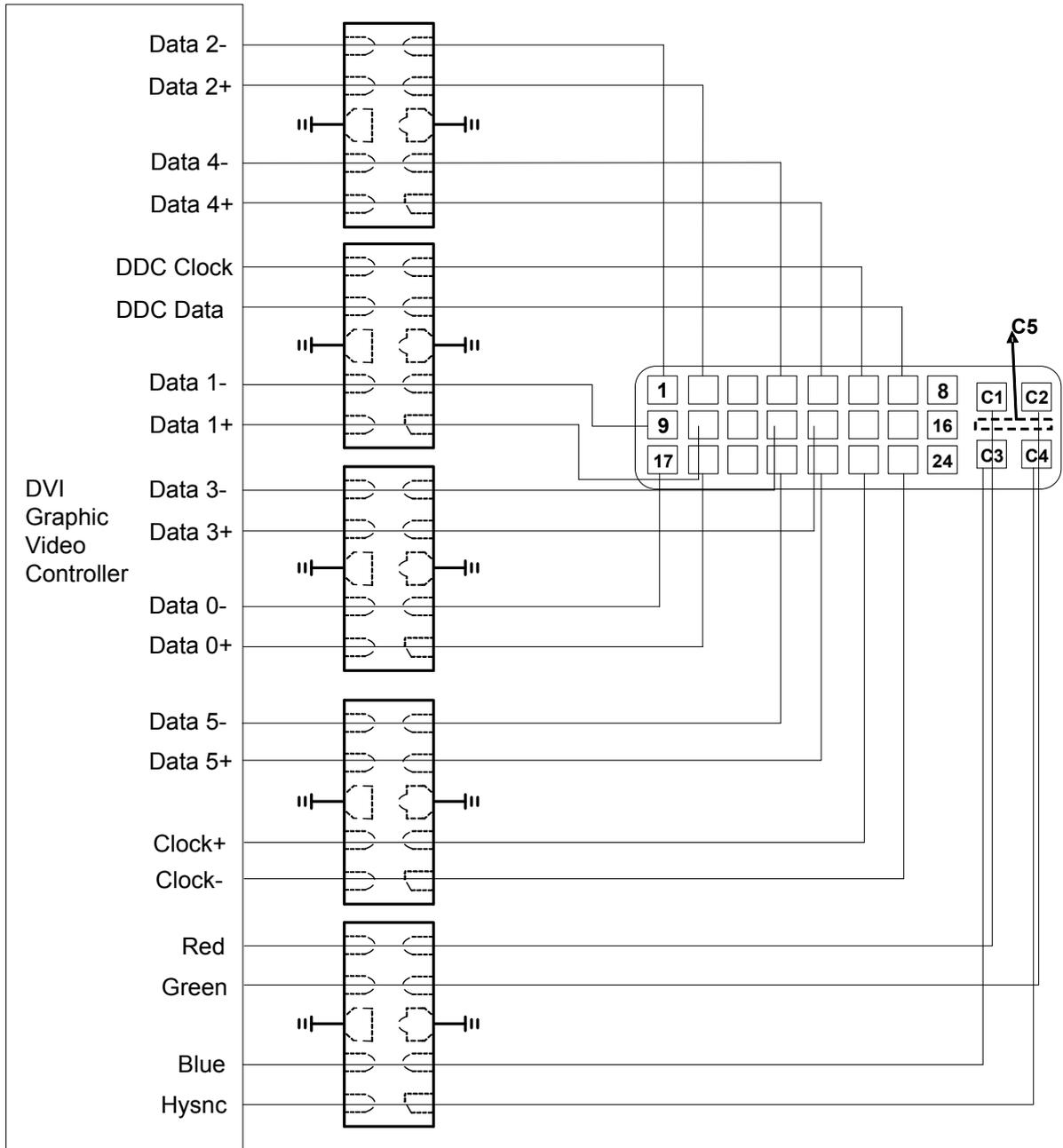
The ST0524D25L is designed for easy PCB layout by allowing the traces to run straight through the device. The PCB traces could be used to connect the pin pairs for each line. For example, line 1 enters at pin 1 and exits at pin 10 and the PCB trace connects Pin 1 and Pin 10 together. Ground is connected at Pin 3 and Pin 8.



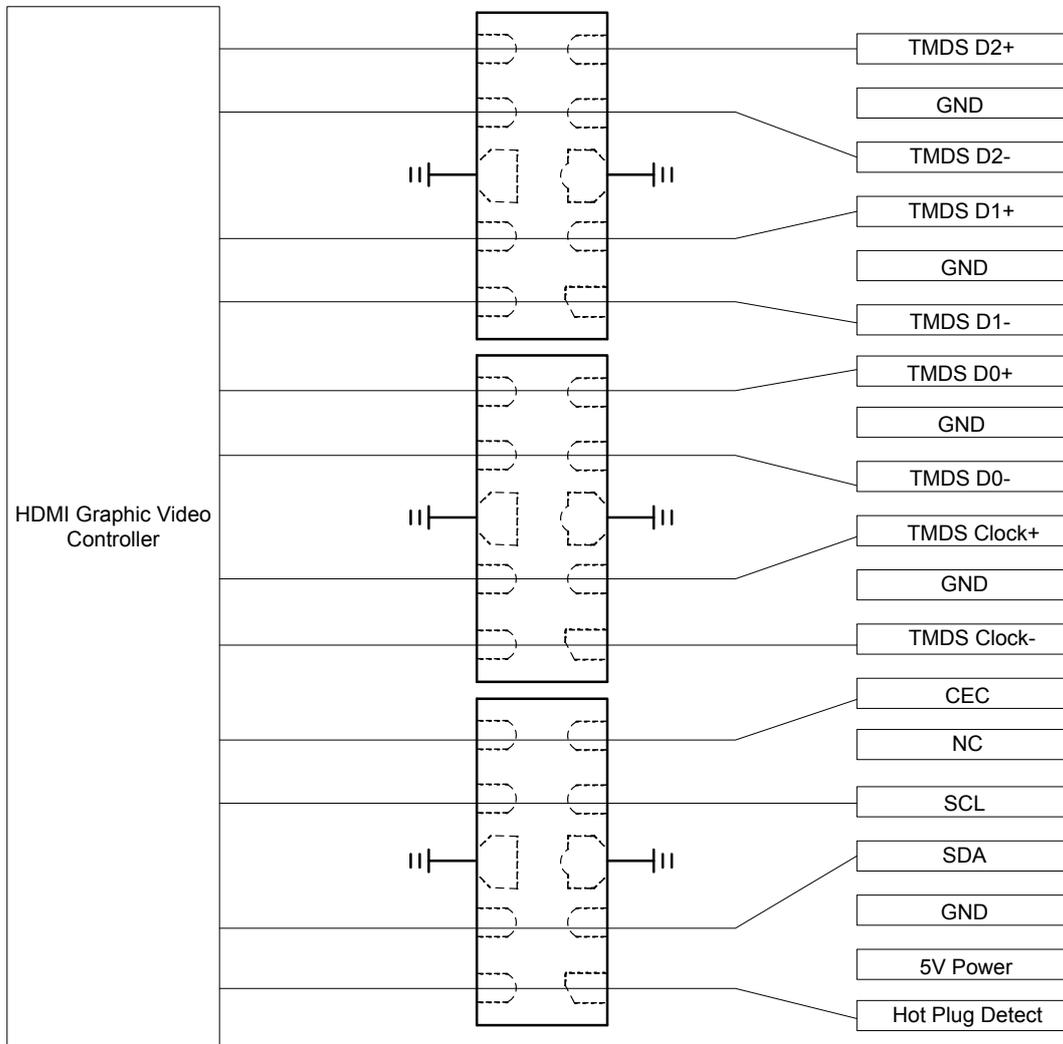
ST0524D25L on USB 3.0 Port Application



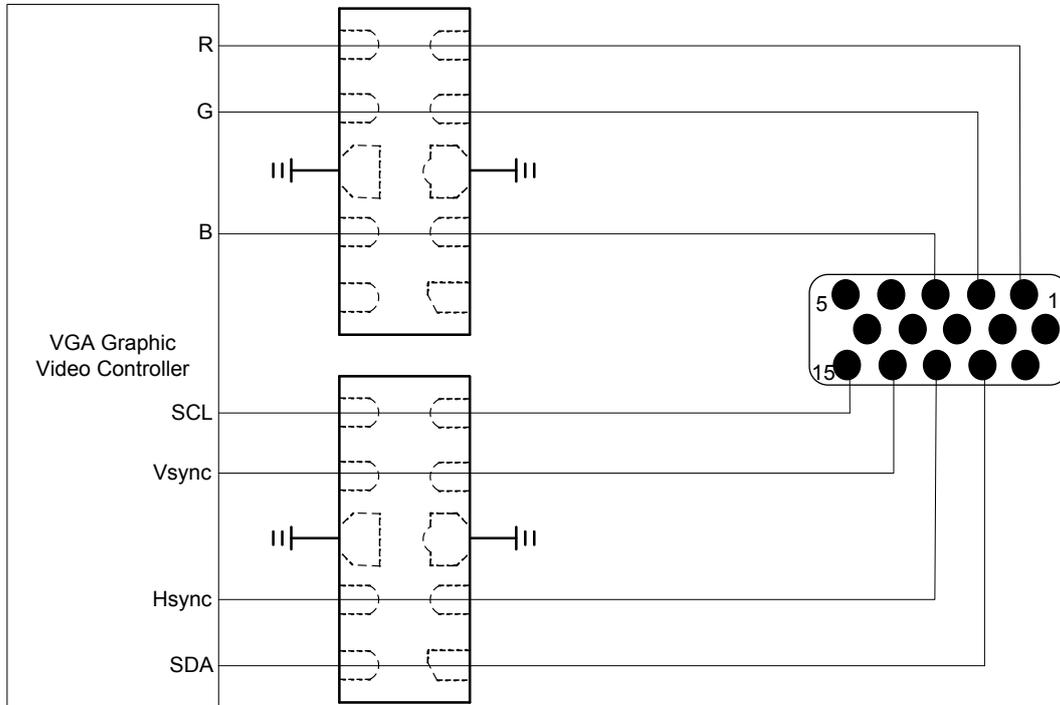
ST0524D25L on DVI Port Application



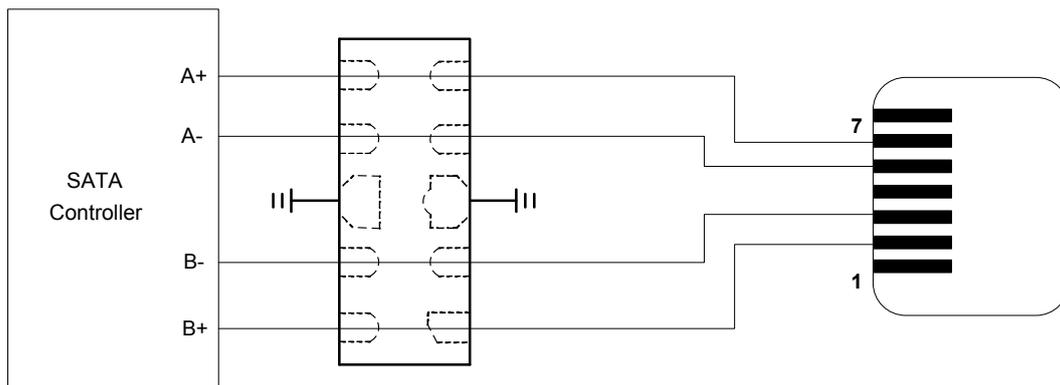
ST0524D25L on HDMI Port Application



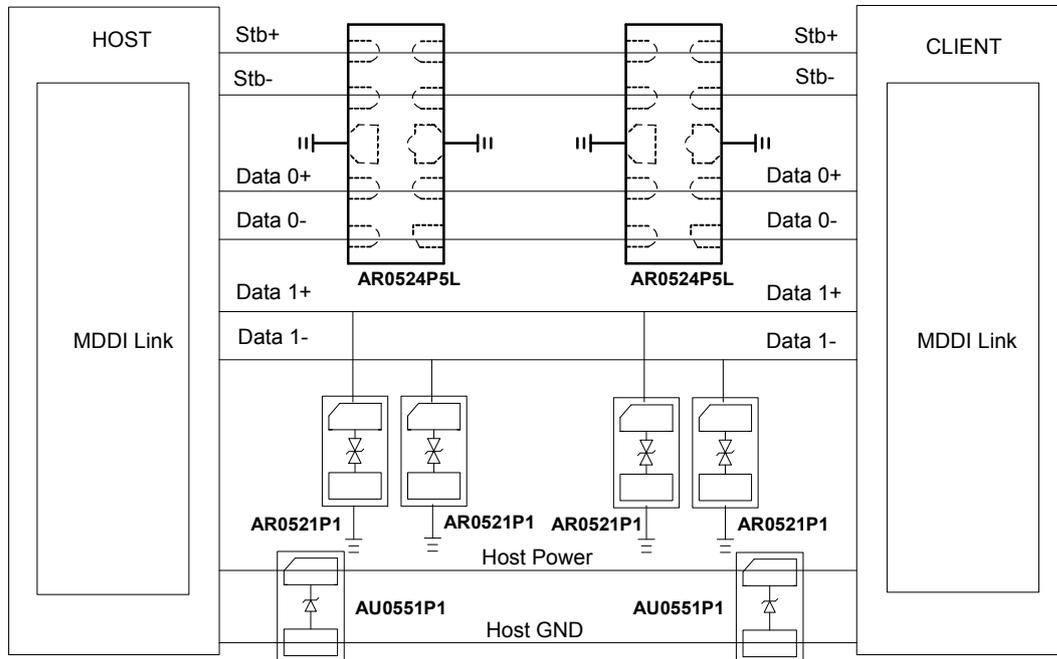
ST0524D25L on VGA Port Application



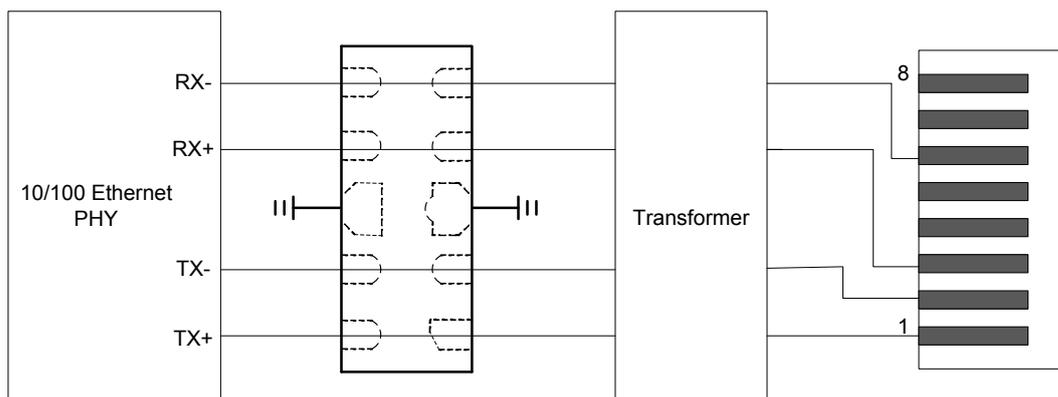
ST0524D25L on eSATA Port Application



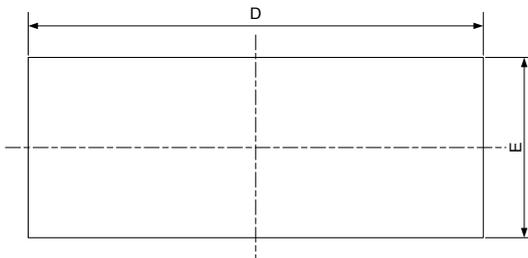
ST0524D25L on MMDI Port Application



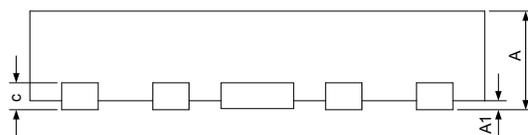
ST0524D25L on 10/100 Base Ethernet Port Application



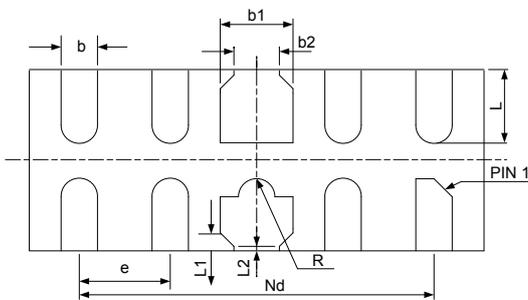
DFN2510-10 Package Outline Drawing



TOP VIEW



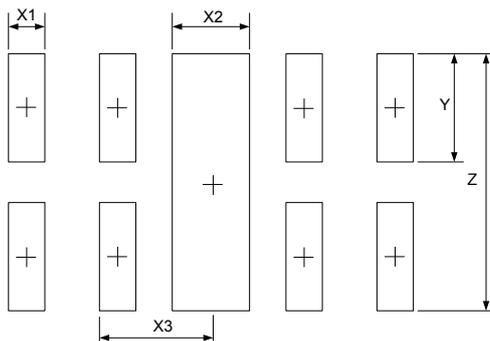
SIDE VIEW



BOTTOM VIEW

SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.450	0.500	0.550	0.018	0.020	0.022
A1	0.000	0.020	0.050	0.000	0.001	0.002
b	0.150	0.200	0.250	0.006	0.008	0.010
b1	0.350	0.400	0.450	0.014	0.016	0.018
b2	0.200	0.250	0.300	0.008	0.010	0.012
c	0.100	0.150	0.200	0.004	0.006	0.008
D	2.450	2.500	2.550	0.098	0.100	0.102
e	0.50BSC			0.020BSC		
Nd	2.00BSC			0.080BSC		
E	0.950	1.000	1.050	0.038	0.040	0.042
L	0.350	0.400	0.450	0.014	0.016	0.018
L1	0.075REF			0.003REF		
L2	0.050REF			0.002REF		
h	0.080	0.120	0.150	0.003	0.005	0.006
R	0.050	0.100	0.150	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

Contact Information

Sursemi Technologies, Inc.

396 Arbor Court, Simi Valley, CA 93065

Phone: (805) 402-0326 Email: sales@sursemi.com

Sursemi Co., Ltd. reserves the right to make changes to the product specification and data in this document without notice. Sursemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Sursemi assume any liability arising from the application or use of any products or circuits, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages.