

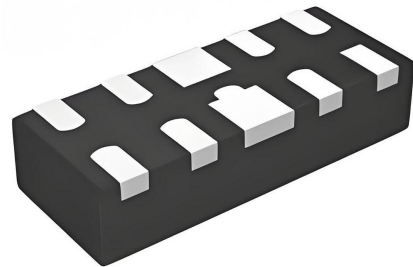
ECELCAH5VUL

Ultra Low Capacitance Array for ESD Protection

The ECELCAH5VUL 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 ECELCAH5VUL has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 15\text{kV}$ air and $\pm 8\text{kV}$ 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 ECELCAH5VUL an ideal choice to protect HDMI, MDDI, USB 3.0 and other high speed ports.

Features

- Protects two or four I/O lines
- Low capacitance:0.3pf Typical between I/O channel
- Working voltages : 5V
- Low clamping voltage
- Up to 4 lines protects
- Meets MSL 1 Requirements
- ROHS compliant



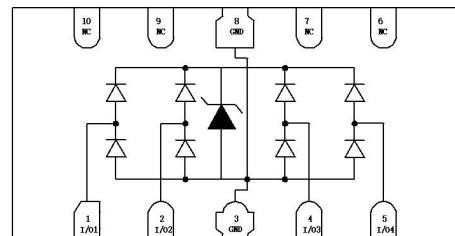
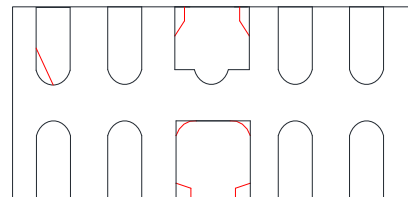
Main applications

- High Definition Multi-Media Interface (HDMI1.3/1.4/2.0)
- Digital Visual Interface (DVI)
- Display Port Interface
- Serial ATA
- PCI Express
- USB 1.1/2.0/3.0/3.1/OTG
- IEEE 1394 Firewire Ports
- Projection TV Monitors and Flat Panel Displays
- Notebook Computers
- Set Top Box
- Projection TV

Protection solution to meet

- IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)

DFN2510



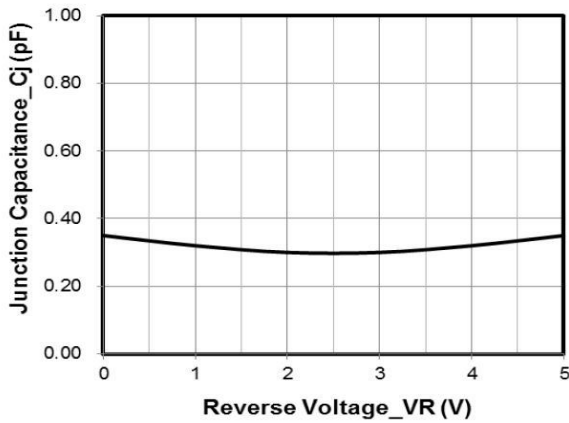
Ordering Information

Device	Qty per Reel	Reel Size
ECELCAH5VUL	3000	7 Inch

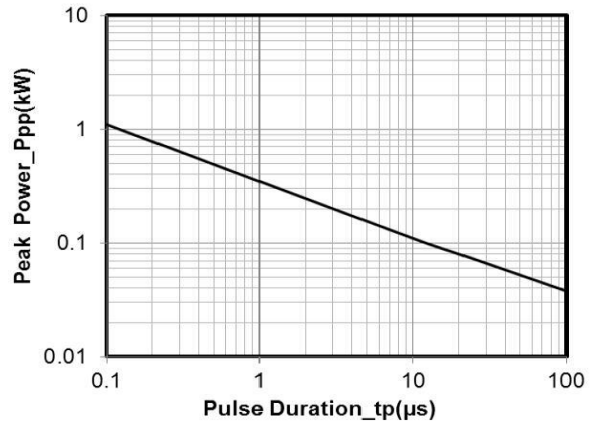
Maximum ratings (Tamb=25°C Unless Otherwise Specified)			
Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20µs waveform)	P _{PPP}	35	Watts
Peak Pulse Current (8/20µs)	I _{PP}	3.5	A
ESD Rating per IEC61000-4-2:	Contact Air	8 15	KV
Lead Soldering Temperature	T _L	260 (10 sec.)	°C
Operating Temperature Range	T _J	-55 ~ +125	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical characteristics (Tamb=25°C Unless Otherwise Specified)						
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage	Any I/O to Ground			5.0	V
V _{PT}	Punch-Through Voltage	I _T = 2µA, any I/O pin to ground	5.8	8.0		V
V _{SB}	Snap-Back Voltage	I _T = 1mA, any I/O pin to ground	4.5	5.0		V
I _r	Reverse Leakage Current	V _{RWM} = 5V, Any I/O to Ground			0.5	µA
V _c	Clamping Voltage	I _{PP} = 1A(8 x 20µs pulse), any I/O pin to Ground			8.5	V
		I _{PP} = 3.5A(8 x 20µs pulse), any I/O pin to Ground			10	V
C _J	Junction Capacitance	V _R = 0V, f = 1MHz, between I/O pins		0.3	0.4	pF
		V _{IN} = 0V, f = 1MHz, any I/O pin to Ground			0.8	pF

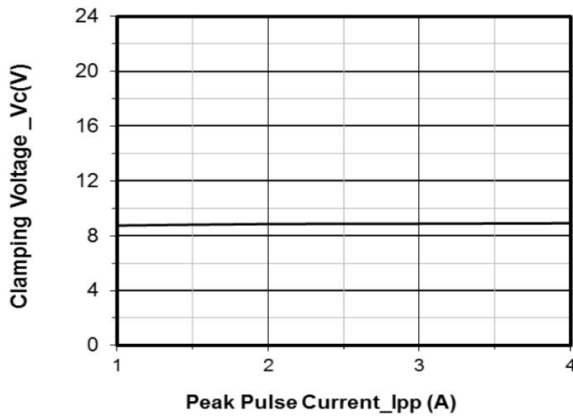
Typical electrical characterist applications



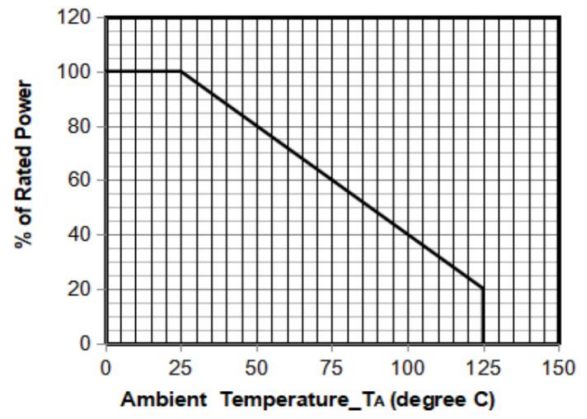
Junction Capacitance vs. Reverse Voltage



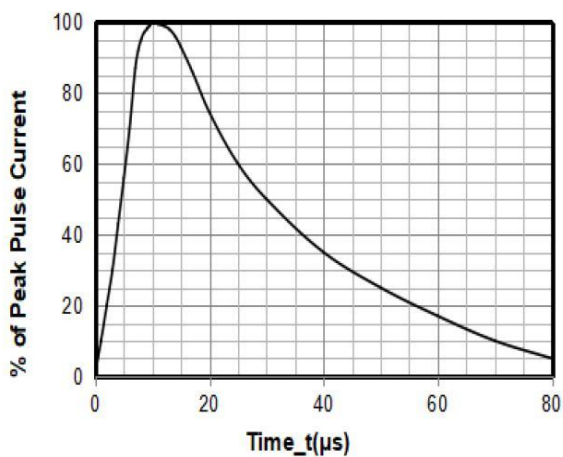
Peak Pulse Power vs. Pulse Time



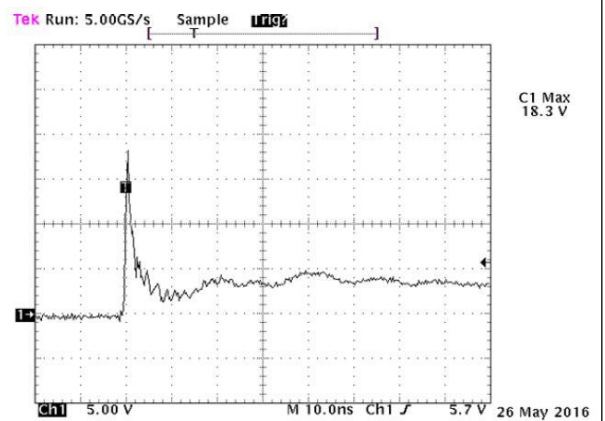
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



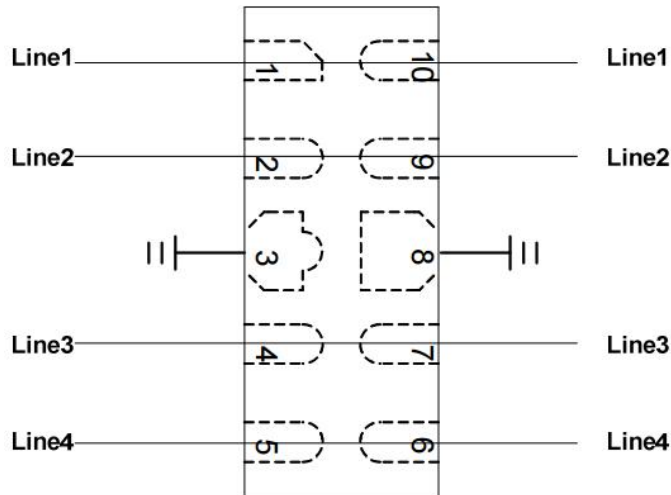
8 X 20μs Pulse Waveform



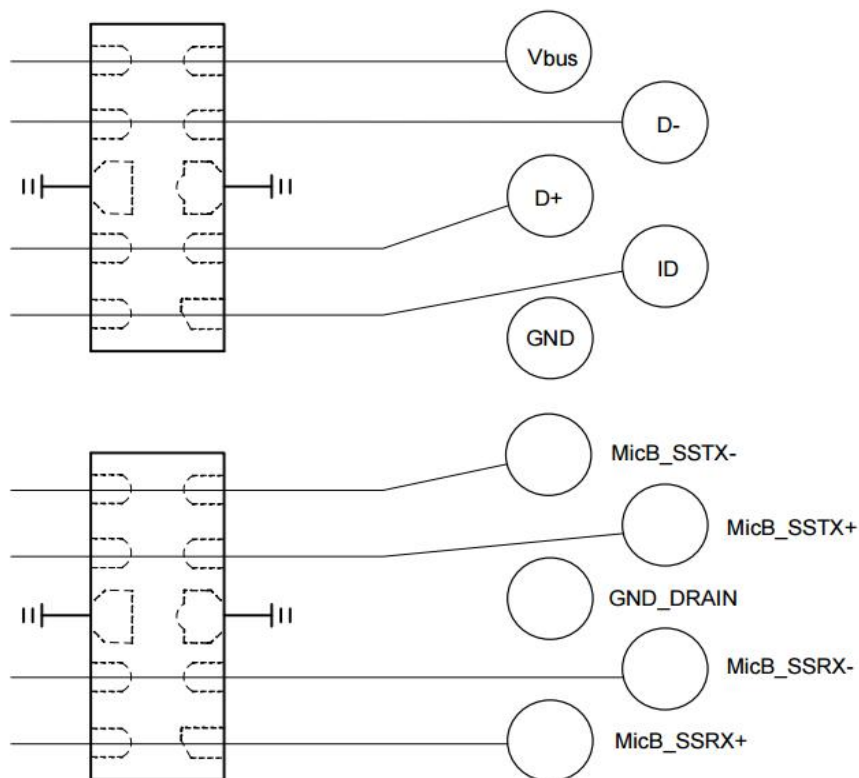
**Note: Data is taken with a 10x attenuator
Contact discharge current waveform
per IEC61000-4-2**

Typical Application

The ECELCAH5VUL 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.

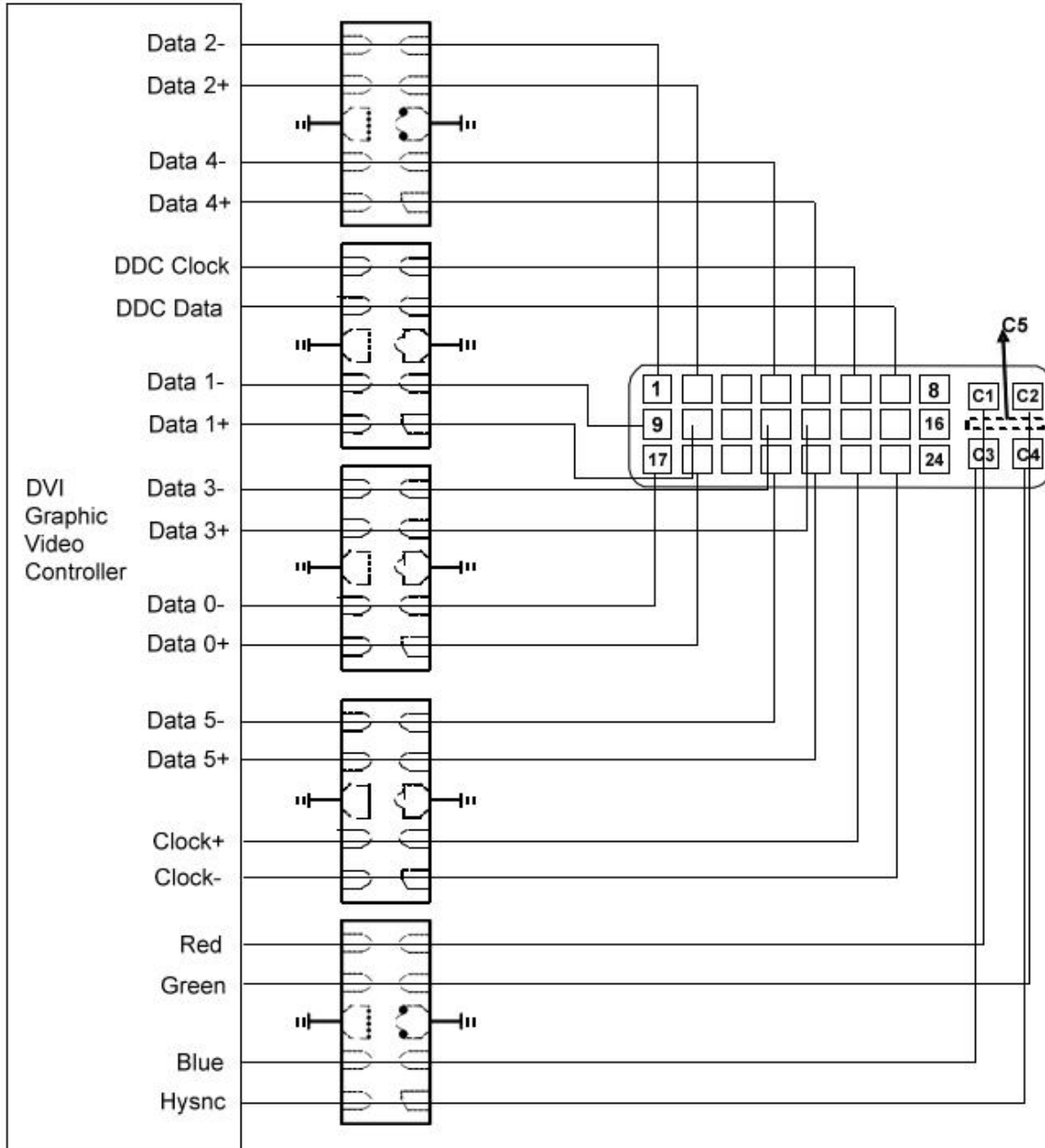


ECELCAH5VUL on USB 3.0 Port Application



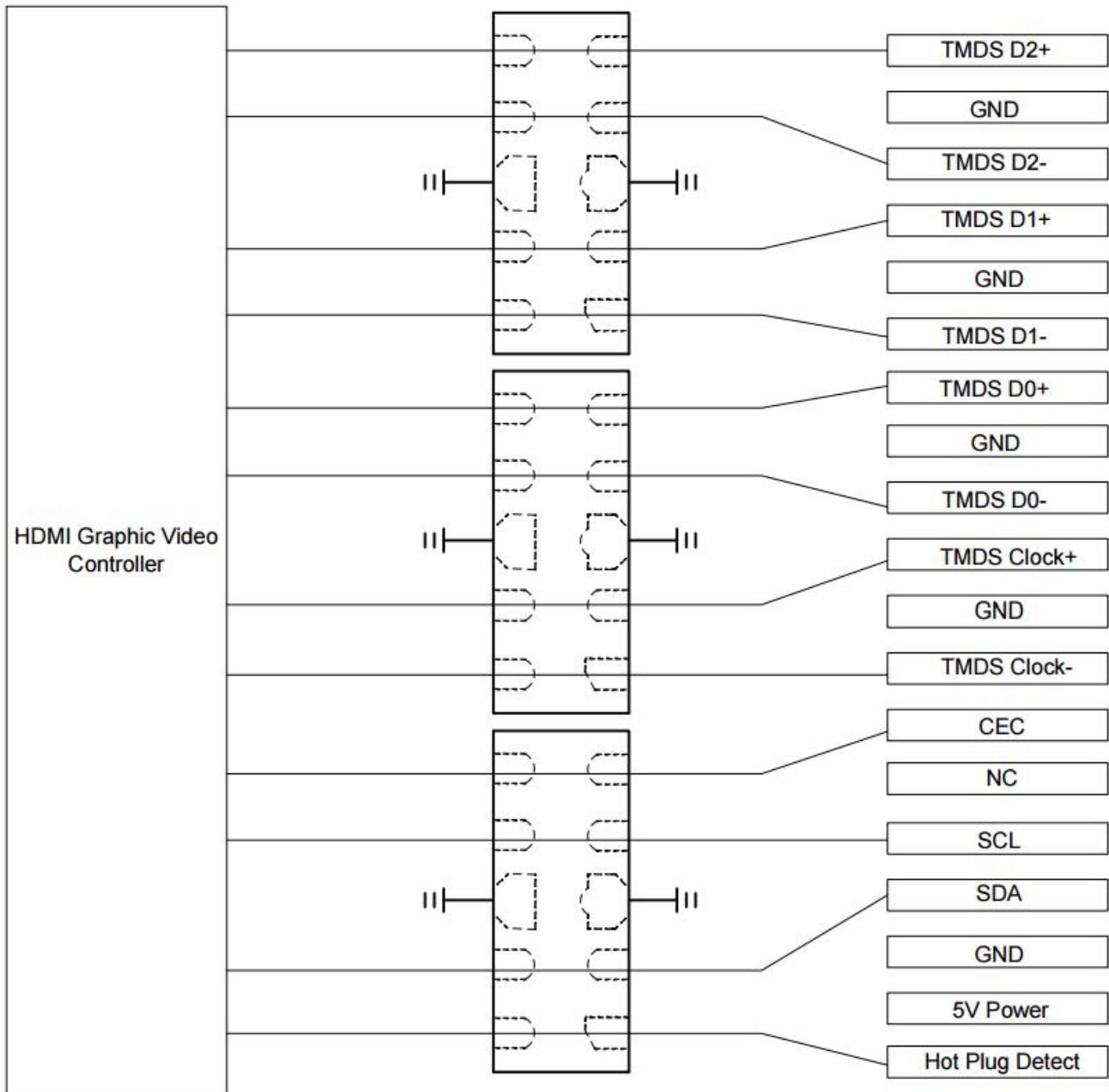
Typical Application

ECELCAH5VUL on DVI Port Application



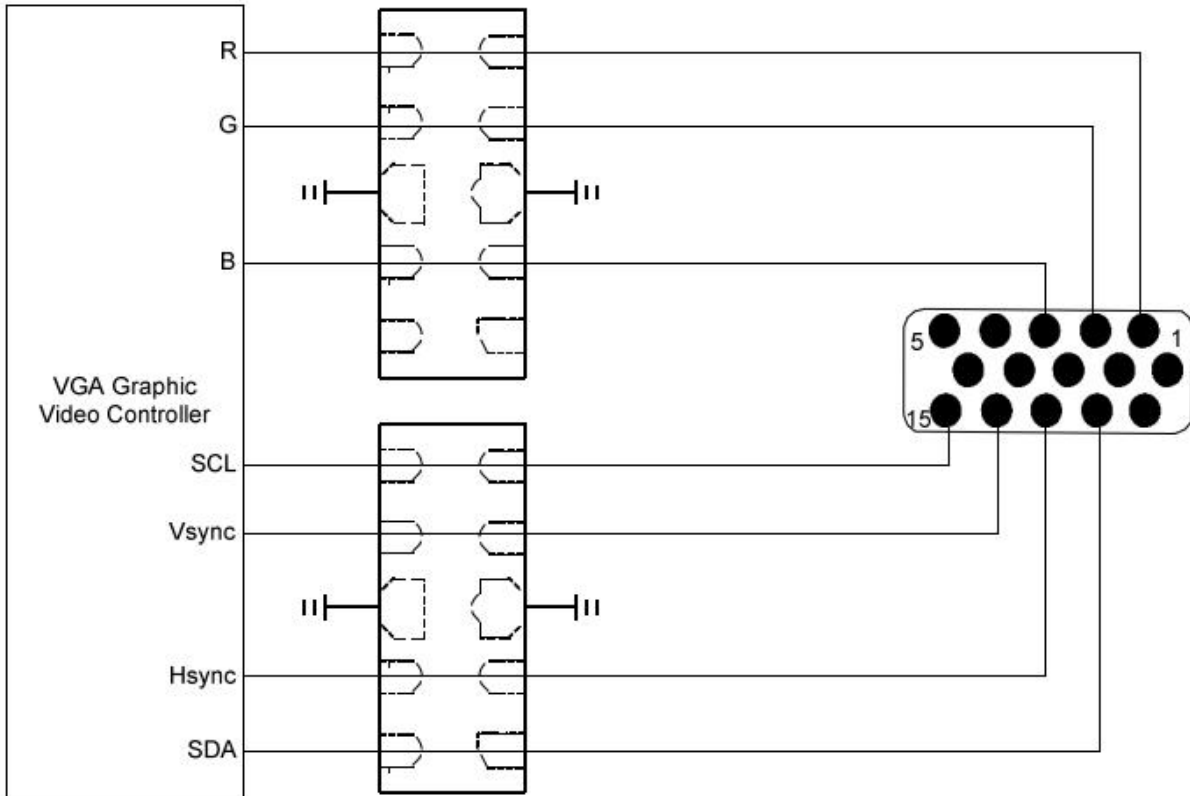
Typical Application

ECELCAH5VUL on HDMI Port Application

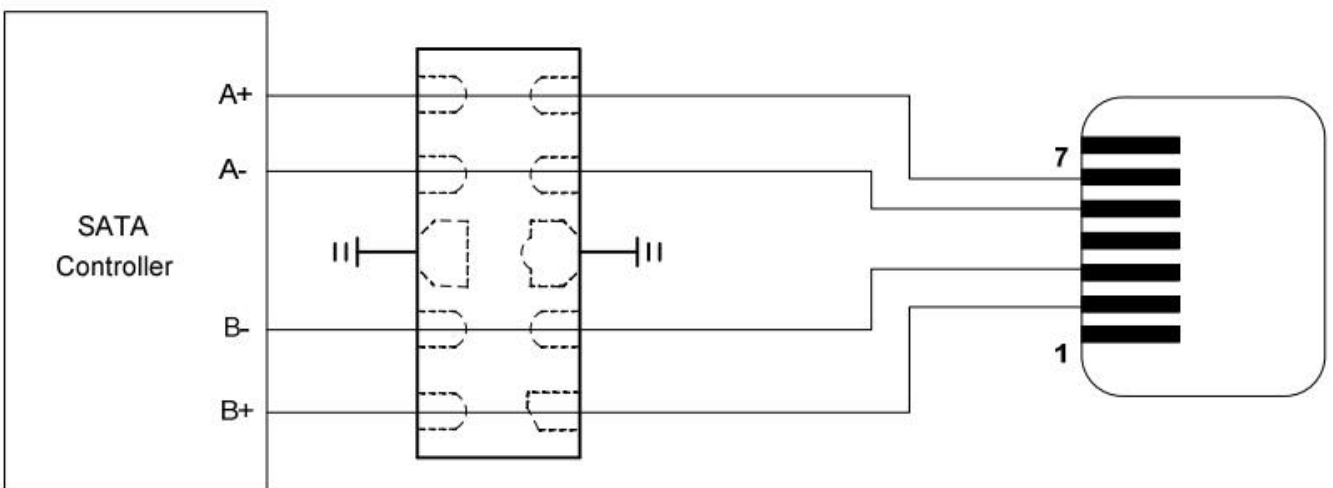


Typical Application

ECELCAH5VUL on VGA Port Application

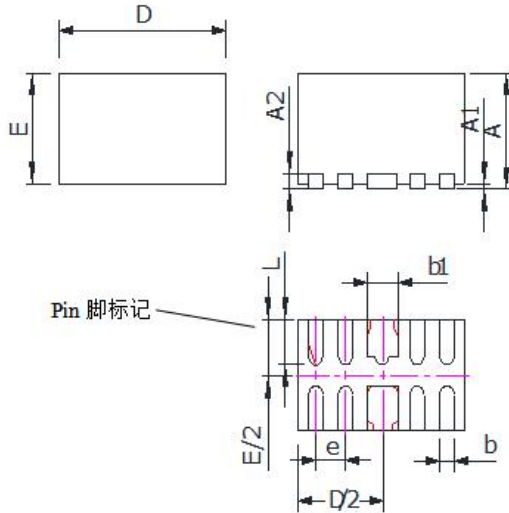


ECELCAH5VUL on eSATA Port Application



Package Information

DFN2510



DIM	Millimeters	
	Min	Max
A	0.45	0.65
A1	0.05REF	
A2	0.15REF	
b	0.15	0.25
b1	0.30	0.50
D	2.424	2.576
E	0.924	1.076
e	0.50REF	
L	0.30	0.45

Recommended Pad outline

