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DS16EV51-AEVKD
DVI Extender Demo Kit for Dual or Single Link DVI Cables

General Description

The DS16EV51-AEVKD Dual/Single link DVI Cable Extender Demo Kit provides a complete DVI system extension solution using two National's DS16EV5110A's - Video Equalizers.

Two Molex DVI connectors are used as the input and the output connections for a dual or single link DVI system. This version of the kit demonstrates both a single link and a dual link DVI system.

The Analog Pins of a typical DVI link (R, G, B, Hsync, and Vsync) are not connected. The DDC signals, Hot Plug, 5V Power and 5V Ground are directly connected between the DVI connectors, making this demo kit HDCP compliant.

A 3.3V VCC 1-pin header (J4) and a GND 1-pin header (J5) are used for the power supply.

Alternately, an AC/DC power adapter (>800mA) is required for the evaluation kit to provide 5V DC voltage for easy portability. A 1.8 mm DC Power Jack is used to connect the AC/DC Power Adapter. National's LP3965, a 3.3V, 1500mA, Fast, Ultra Low Dropout Linear Regulator, converts the 5V power supply voltage to a 3.3V power supply voltage that powers the DS16EV5110A's.

Features

- **Compatible with DTV Resolutions 480i, 480p, 720i, 720p, 1080i, 1080p (8 bit, 10 bit, 12 bit color depth)**
- **Compatible with the Single Link Computer Resolutions of VGA, SVGA, XGA, SXGA, UXGA**
- **Compatible with the Dual Link Computer Resolutions of QXGA, WQXGA**
- **Supports TMDS DVI or HDMI Dual/Single Link**
- **Adjustable rotary switch for easy custom EQ boost level setting to reach maximum length of TMDS Interface with HDMI, or DVI Cables**
- **Single 3.3V Supply**
- **Ultra Portable with AC/DC Power Adapter (not included in the kit)**
- **500 mW Typical Power Consumption of each DS16EV5110A device**
- **>6kV ESD Rating**
- **-40 to 85C Industrial Temperature Range**
- **The DS16EV5110A demo kit extends TMDS with the 28 AWG STP DVI cable as follows**:

Format	Link	Resolution	Pixel bandwidth (MPixel/s) 60Hz LCD with 20% blanking	Per channel bandwidth (Gb/s) 60Hz LCD with 20% blanking	DVI Cable Length
VGA	Single	640 x 480	22.1	0.221	> 45m
SVGA	Single	800 x 600	34.6	0.346	> 40m
XGA	Single	1024 x 768	56.5	0.565	> 35m
SXGA	Single	1280 x 1024	94.4	0.944	> 30m
UXGA	Single	1600 x 1200	138.0	1.380	> 25m
HDTV	Single	1920 x 1080	149.3	1.493	> 25m
QXGA	Dual	2048 x 1536	113.2	1.132	> 30m
WQXGA	Dual	2560 x 1600	147.5	1.475	> 25m

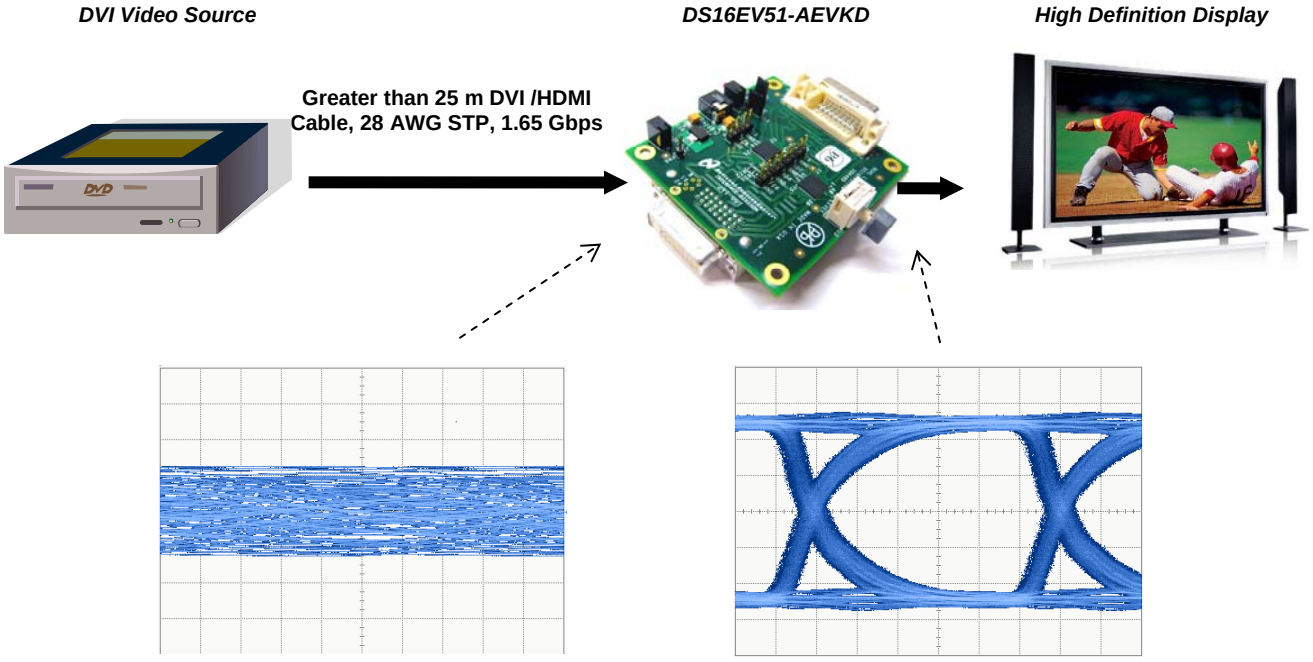
Applications

High Definition Displays and Televisions
High Definition Front- Projectors
LCD Computer Monitors
DVI-D/HDMI Cable Extender

Ordering Information

PART: DS16EV5110ASQ
DVI Demo Board for DVI Dual/Single Link Cables: DS16EV51-AEVKD
HDMI Demo Board for HDMI Cables: DS16EV51-AEVKH
CAT5 Demo Board for CAT5 Cables: DS16EV51-AEVKC

Typical Applications



Bill of Materials

DESIGNATION	QTY	DESCRIPTION
C2, C4, C6, C8, C10, C12, C15, C17	8	0.01uF ±10% Ceramic Capacitor 0402
C1, C3, C5, C7, C9, C11, C13, C14, C16	9	0.1uF ±10% Ceramic Capacitor 0402
C59	1	33uF ±10% Tantalum Capacitor 3528
C60	1	68uF ±10% Tantalum Capacitor 3528
D4	1	LED Green
D5	1	LED Red
R19, R23	2	453 ohm ±5% Resistor 0402
R20	1	1K ohm ±5% Resistor 0402
R24	1	10K ohm ±5% Resistor 0402
R21, R22	2	50 ohm ±5% Resistor 0402
J45, J46	2	DVI-I Receptacle Female
J47	1	DC Power Jack 1.8 mm
J4, J5	2	1 pin header (J4: VDD=3.3V, J5:GND)
J7, J8, J9, J10, J11, J12	5	1X2 pin header
J15	1	1X3 pin header
U13, U14	2	National DS16EV5110A
U15	1	National LP3965 – 3.3V -1500mA
U3	1	94HBB08RAT Rotary Dip Switch

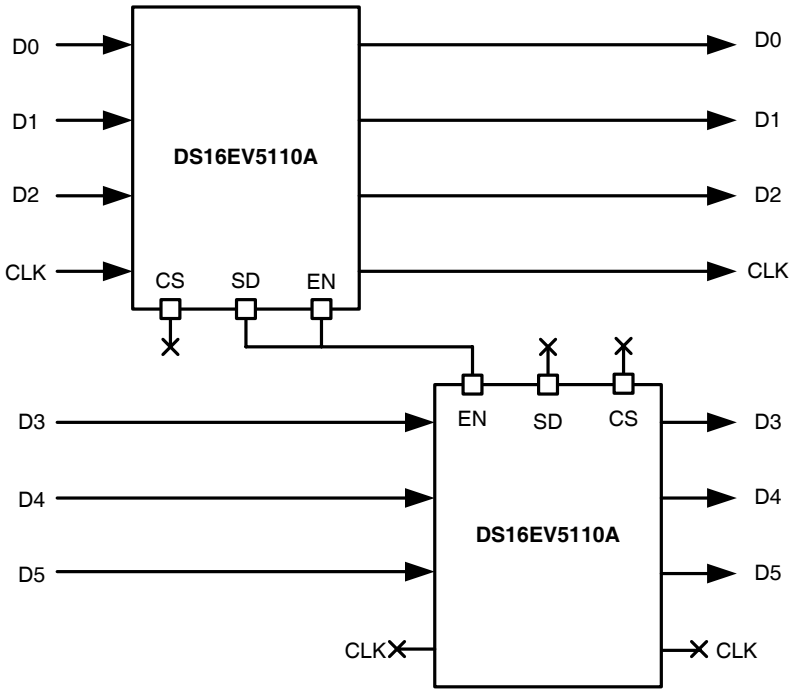
Quick Start Guide:

1. Connect 3.3V DC power to J4 and ground to J5 from the power supply.
   Or, plug the AC/DC power adapter to the DC power Jack
   AC/DC power adapter requirement: Output DC 4V~6V, Output current > 800mA
2. Attach two DVI cables to the DVI Input and Output Connectors
3. Turn on the DVD/Computer and the Monitor/HDTV.

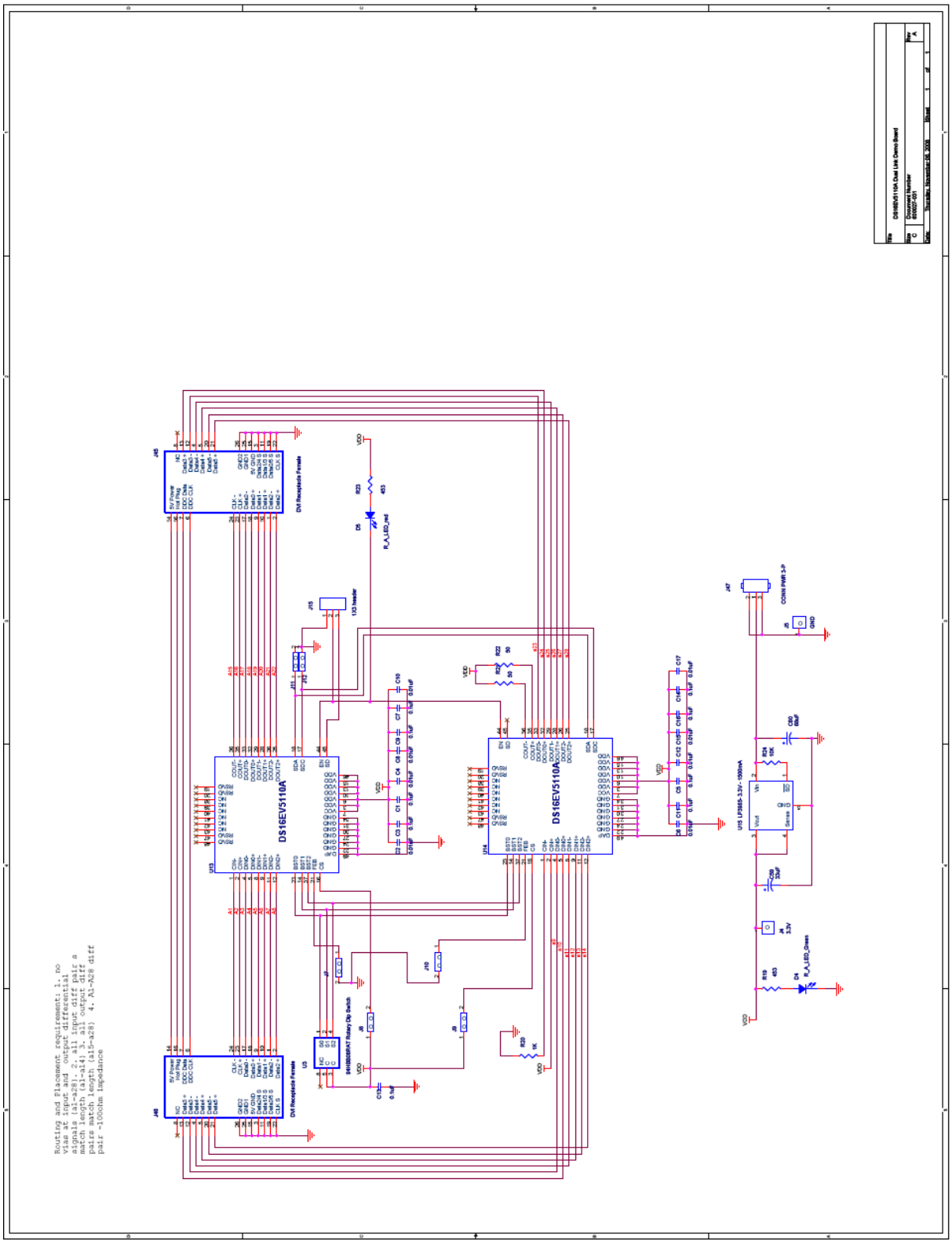
Adjustment and Control Description

Component	Name	Function
D4	PWR	The LED turns on when 5V DC applied
D5	SD	The LED turns on when the DS16EV5110 does not detect clock signal
J47	5V DC	Optional DC Power Jack for 1.8 mm Adaptor Plug
J4	3.3V	3.3V VCC power supply
J5	GND	GND
J10	FEB and GND	Optional SMBus control of U14 (See Datasheet)
J9	CS and VDD	Optional SMBus control of U14 (See Datasheet)
J7	FEB and GND	Optional SMBus control of U13 (See Datasheet)
J8	CS and VDD	Optional SMBus control of U13 (See Datasheet)
J11, J12	SDA, SDC and GND	Optional SMBus access (See Datasheet)
J15	Loop Back Control	Connect “LED” and “SD” to enable D5 function. Connect “SD” and “EN” to enable look back control function. When the clock signal is not detected, the DS16EV5110A enters power down mode.
U3	Rotary Switch	Turn the switch to control the EQ boost setting. “0” on the switch refers to the boost setting of “0X00”, “7” on the switch refers to the boost setting of “0X07”. See datasheet for detail Boost setting information.

Connection in Dual Link Application

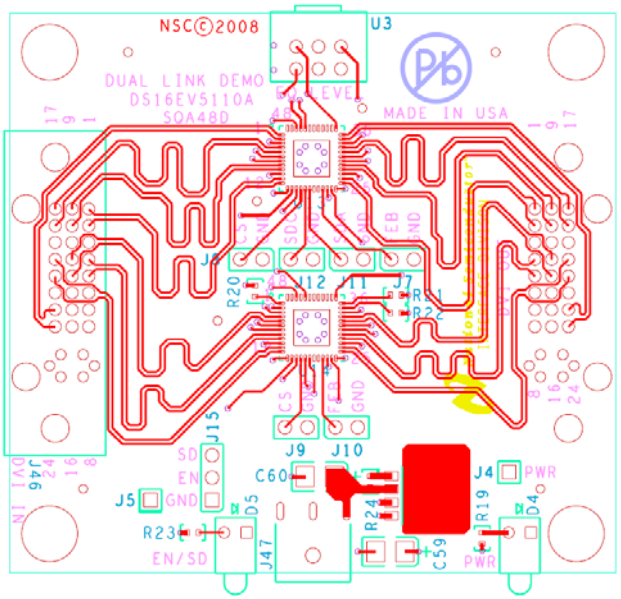


Schematics

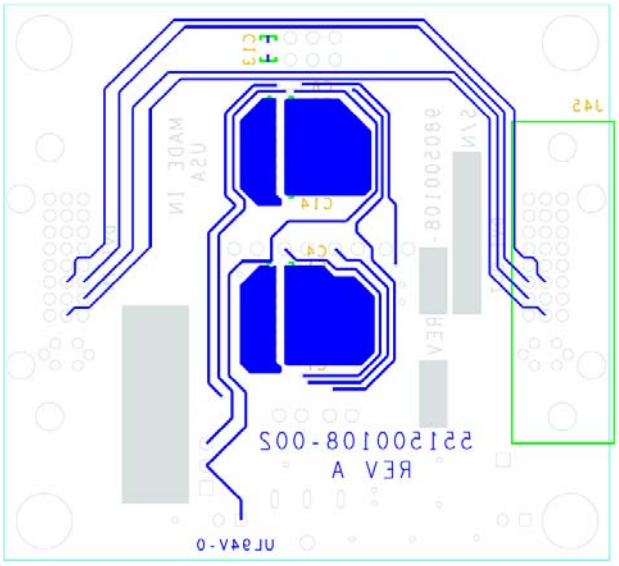


Layout Considerations

- Keep the clock and data transmission lines as short as possible with controlled 50 ohm single-ended impedance. Or, use differentially coupled traces with 100 ohm impedance.
- Avoid using vias on the clock and data transmission lines on the input side of the DS16EV5110A.
- Place power supply decoupling capacitors close to the VCC pins.



Top View Layout



Bottom View Layout

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