DS34RT5110-EVKH
HDMI Extender Demo Kit for HDMI Cables

General Description

The DS34RT5110-EVKH HDMI Cable Extender Demo Kit provides a complete HDMI system extension solution using National's DS34RT5110 - a DVI, HDMI Retimer with Input Equalization and Output De-Emphasis.

Two HDMI female connectors are used as the input and the output connections for a HDMI system.

The DDC signals are connected through an I2C buffer.

The Hot Plug, 5V Power and 5V Ground are directly connected between the HDMI connectors, making this demo kit HDCP compliant.

A 3.3V VCC 1-pin header (J22) and a GND 1-pin header (J23) 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 1.8mm 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 DS34RT5110.

Features

- Compatible with DTV Resolutions 480i, 480p, 720i, 720p, 1080i, and 1080p with 8 bit, 12 bit and 16 bit deep color depths.
- Compatible with Computer Resolutions of VGA, SVGA, XGA, SXGA, UXGA
- Supports TMDS HDMI Single Link
- Adjustable rotary switches for easy custom EQ boost level setting and De-Emphasis setting to reach maximum length of TMDS Interface with Twisted Pair , HDMI, or DVI Cables
- Single 3.3V Supply
- Ultra Portable with AC/DC Power Adapter (included in the kit)
- 8kV ESD Rating
- 0 to 70C Temperature Range

Applications

- Repeater Applications:
  - Digital Routers
  - HDMI / DVI Extender Hubs
- Source Applications:
  - Video Cards
  - Blu-ray DVD Players
  - Game Consoles
- Sink Applications:
  - High Definition Displays
  - Projectors

Ordering Information

PART: DS34T5110SQ
HDMI Demo board: DS34RT5110-EVKH
Demo Board ID: 551600199-044

Single Repeater Applications

The DS34RT5110 demo kit extends TMDS with the 28 AWG STP DVI cable as follows:

	Resolution	Pixel bandwidth (MPixel/s) 60Hz LCD with 20% blanking	Per channel bandwidth (Gb/s) 60Hz LCD with 20% blanking	HDMI Cable A (28 AWG)	HDMI Cable B (28 AWG)
HDTV (1080i)	1920 x1080	75	0.75	> 70m	> 20m
HDTV (1080p) 8 bit Color Depth	1920 x1080	150	1.5	> 35m	> 10m
HDTV (1080p) 12 bit Color Depth	1920 x1080	225	2.25	> 25m	> 7.5m
HDTV (1080p) 16 bit Color Depth	1920 x1080	300	3	> 20m	> 5m

Quick Start Guide:

1. Connect 3.3V DC power to J22 and ground to J23 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 HDMI cables to the HDMI Input and Output Connectors
3. Turn on the DVD/Computer and the Monitor/HDTV.

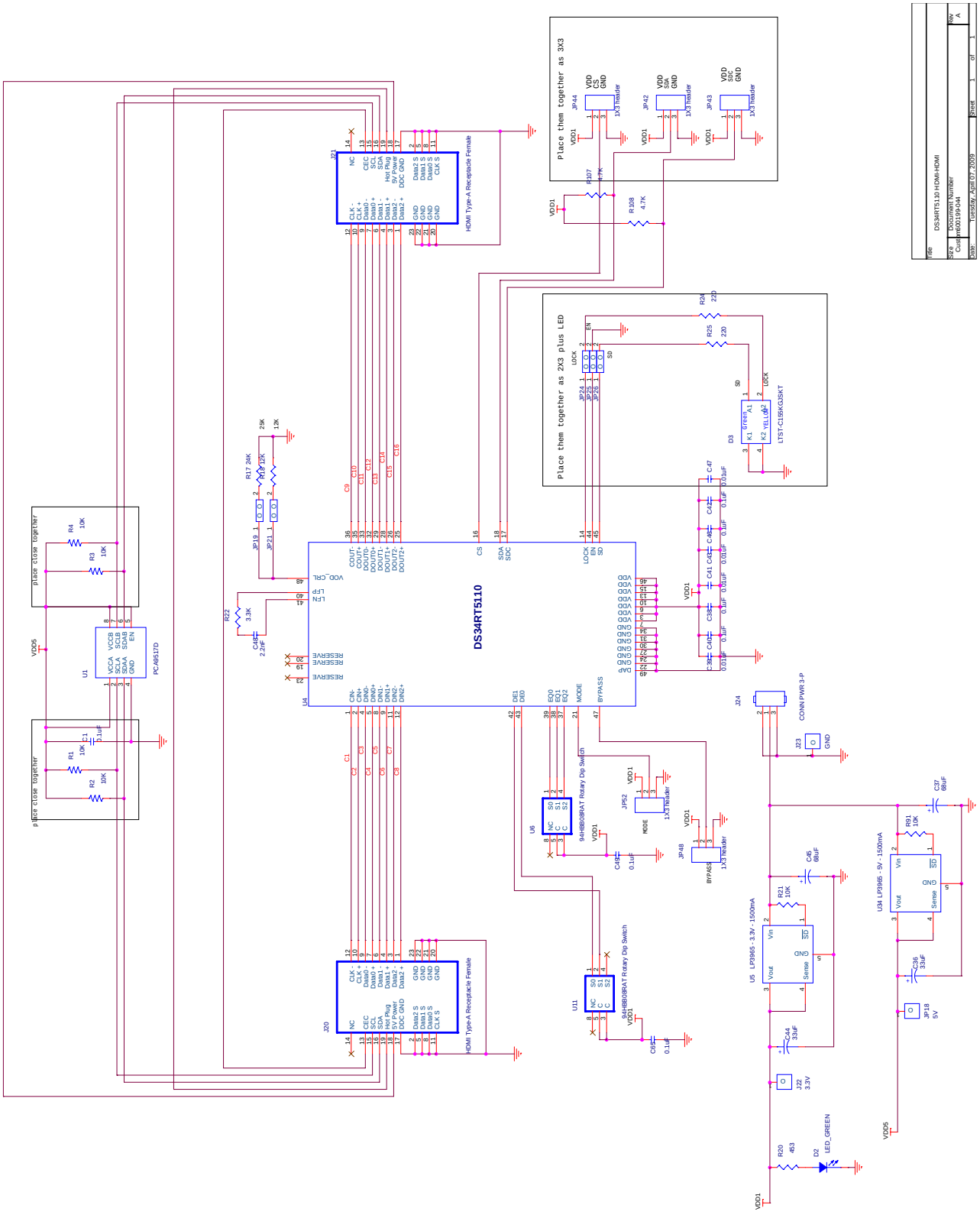
Adjustment and Control Description

Component	Name	Function
D2	PWR	The LED turns on when 5V DC applies
D3	SD / LOCK	The “GREEN” LED turns on when the incoming signal is detected by DS34RT5110 The “ORANGE” LED turns on when the PLL of the DS34RT5110 is locked
J24	5V DC	Optional DC Power Jack for 1.5 mm Adaptor Plug
J22	3.3V	3.3V VCC power supply
J23	GND	GND
JP19, JP21	VOD_CRL	Connect JP19, Sets external resistor = 24K ohm for VO = 1000mVpp Connect JP21, Sets external resistor = 12K ohm for VO = 2000mVpp
JP24, JP25, JP26	LOCK /EN /SD	Connect JP24 and JP26 to enable D3 Connect JP25 to disable the device outputs Or, use as SD-EN, LOCK-EN auto control. See datasheet
JP48	BYPASS	Connect JP48 to VDD to bypass Reclock function
JP52	MODE	Connect JP52 to VDD to bypass the clock PLL function
U6	Rotary Switch (EQ)	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.
U11	Rotary Switch (DE)	Turn the switch to control the DE setting. “0” = 0 dB, “1” = -3 dB, “2” = -6 dB, “3” = -9 dB, “4”, “5”, “6”, “7” = N/A

Bill of Materials

QYT	DESIGNATION	DESCRIPTION
7	C1,C38,C40,C42,C46,C49, C65	0.1uF +/- 10% 16V 0402
2	C36,C44	33uF +/- 10% 16V 3528
2	C37,C45	68uF +/- 10% 16V 3528
4	C39,C41,C43,C47	0.01uF +/- 10% 16V 0402
1	C48	2.2nF +/- 10% 16V 0402
1	D2	LEDSSF-LXH103LGD
1	D3	LTST-C155KGJSKT
1	JP18	HDR1X1
5	JP19,JP21,JP24,JP25,JP26	HDR1X2
2	JP48,JP52	HDR1X3
2	J20,J21	HDMI Female 500254-1927
1	J22	HDR1X1
1	J23	HDR1X1
1	J24	PJ-014D
6	R1,R2,R3,R4,R21,R91	10K +/- 1% 1/10 W 0402
1	R17	24K +/- 1% 1/10 W 0402
1	R18	12K +/- 1% 1/10 W 0402
1	R20	453 +/- 1% 1/10 W 0402
1	R22	3.3K +/- 1% 1/10 W 0402
2	R24,R25	220 +/- 1% 1/10 W 0402
1	U1	PCA9517D
1	U4	DS34RT5110 LLP48
1	U5	LP3965 - 3.3V - 1500mA SOT223-5
2	U6,U11	94HBB08RAT Rotary Dip Switch
1	U34	LP3965 - 5V - 1500mA SOT223-5

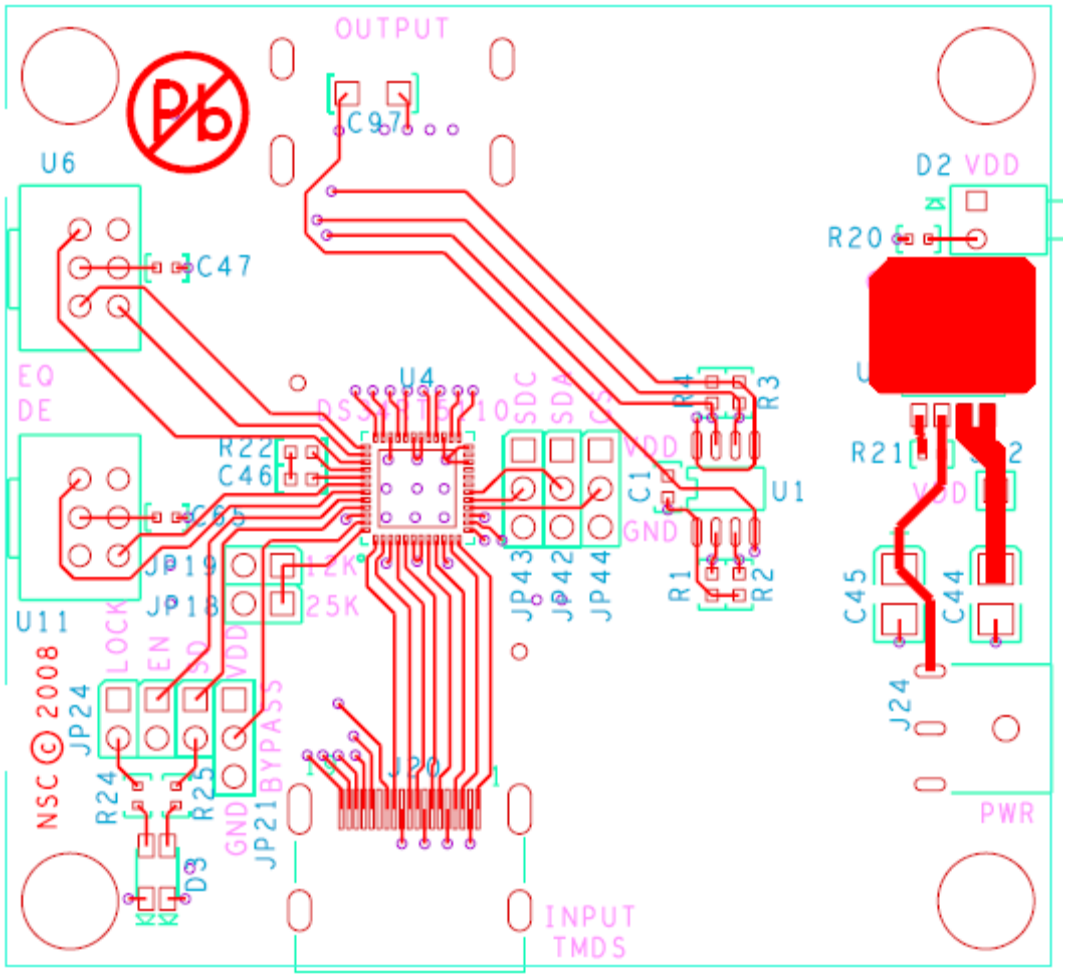
Schematics



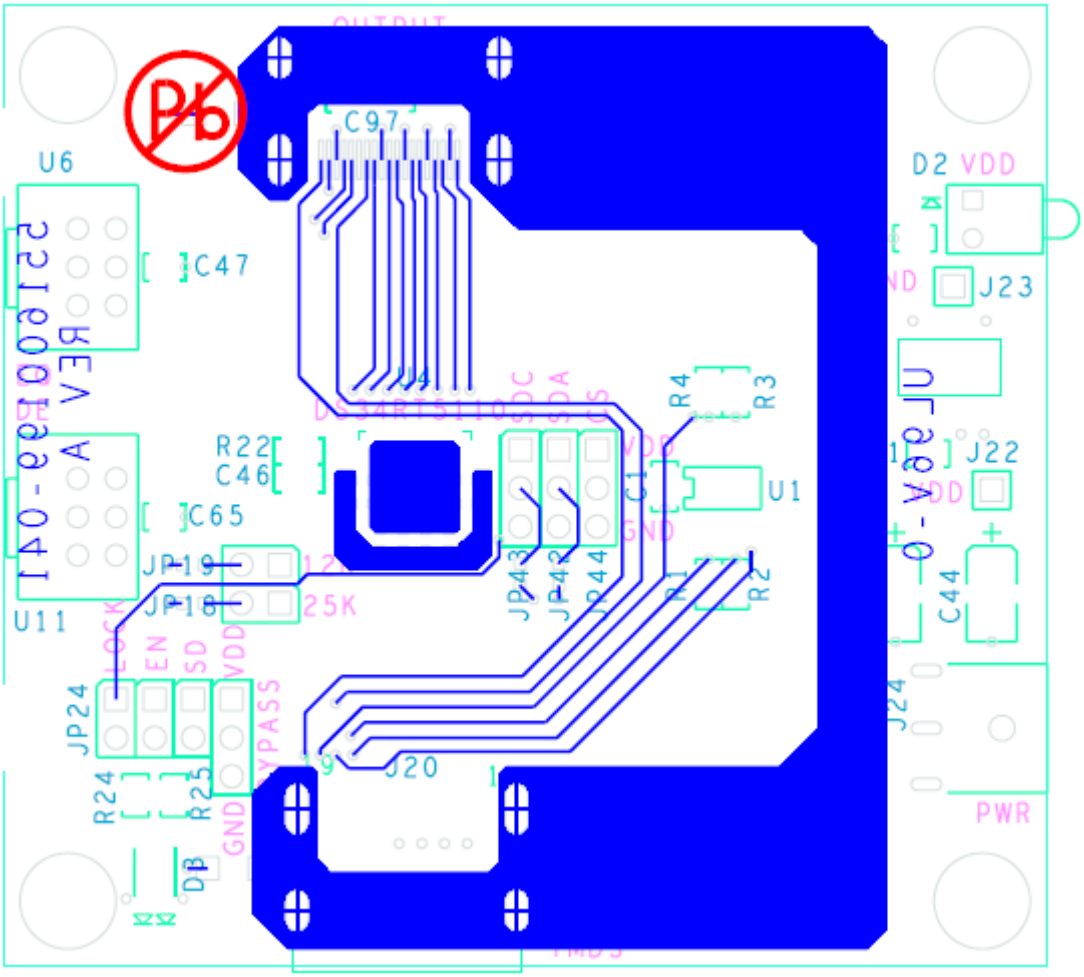
Layout Considerations

- 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 DS34RT5110.
- Place power supply decoupling capacitors close to the VCC pins.

Layout (Top Layer)



Layout (Bottom Layer)



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