

Evaluation Note

ADV7612 Evaluation Board Rev. A

October 2010

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1. Introduction

This evaluation note is intended to provide application support for the ADV7612 evaluation board. It also provides details on the set up and manual configuration of the evaluation board. Software drivers are available for this evaluation board - a separate user guide is available for these software drivers.

This note applies to board revisions A.

2. Evaluation Kit

The ADV7612 evaluation board kit should consist of the following:

1. ADV7612 Evaluation Board
2. 7.5V DC power supply module
3. USB cable

3. Initial Hardware Configuration

The ADV7612 evaluation board is a standalone evaluation platform used to demonstrate all features of the ADV7612 receiver. To assemble the platform, connect the female connector of the 7.5V DC power supply module supplied with the evaluation kit to the motherboard power connector, J8. To turn the evaluation platform on, flick the power switch (S5) to position “ON”. The green power LED (D13) should light.

Once the board is powered up, connect the USB cable supplied with the evaluation kit to USB connector, J1. The platform should now resemble Figure 1 and is ready to use.

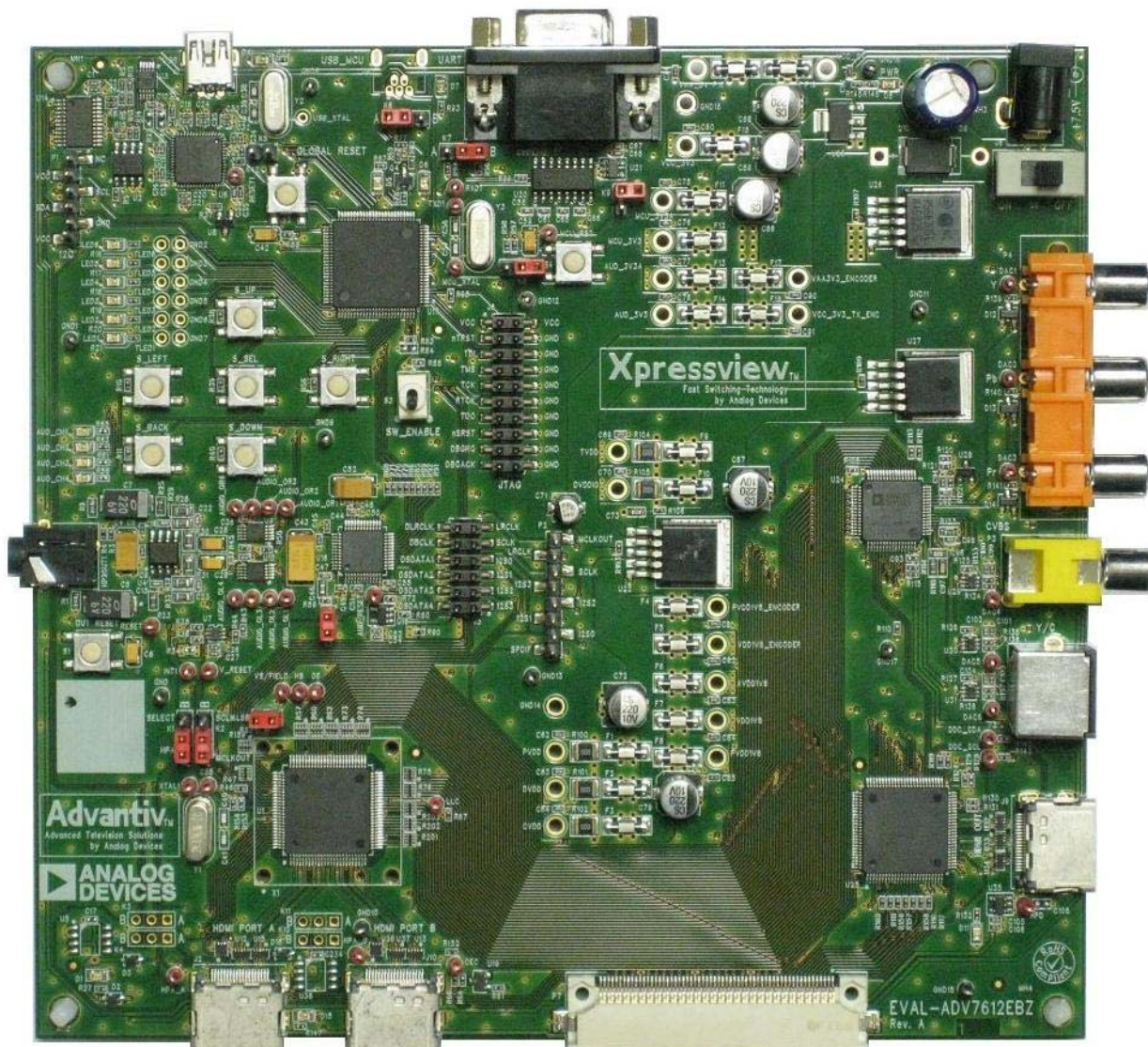


Figure 1 - Evaluation Platform

4. Initial Hardware Configuration

4.1 XRC Installation

1. Run ADI_Install_XRC_x file (where x is the version number to be installed e.g. 1.5)
2. Review the license agreement and click “I Agree” if the terms of the agreement are acceptable
3. Select the desired access links – desktop shortcut and/or start menu shortcut (see [Figure 2](#))

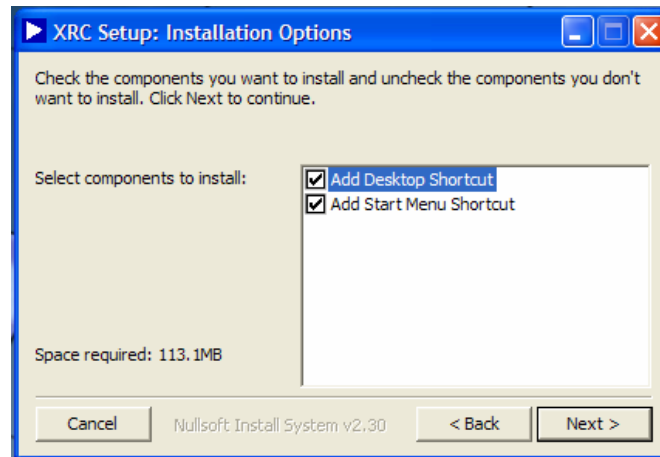


Figure 2 - Installation Options

4. Press “Next>”
5. Select the desired installation folder (see [Figure 3](#))

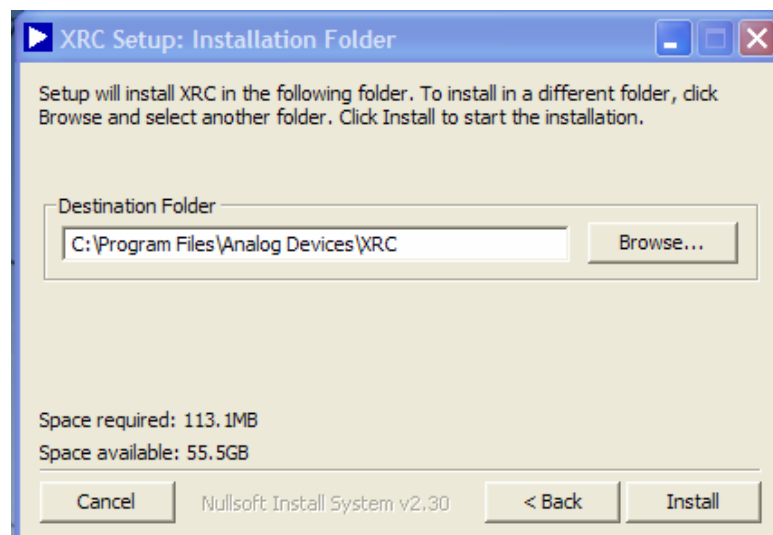


Figure 3 - Installation Folder

6. Press “Install”
7. When the install has completed, press “Close”

4.2 Loading/Unloading Boards

4.2.1 Loading a Board

The following steps must be performed to start a new XRC session by loading a new board.

1. Click “Choose Board...”
2. From the Board Selector window, select your attached system e.g. “ADV7612” as RX, “None” for MotherBoard and “ADV7511_ADV7341” for TX.
3. Click “Load”

Note: If the board is standalone, select the board in whichever window it is populated under (i.e. RX, Motherboard, TX) and leave the other windows at “None”.

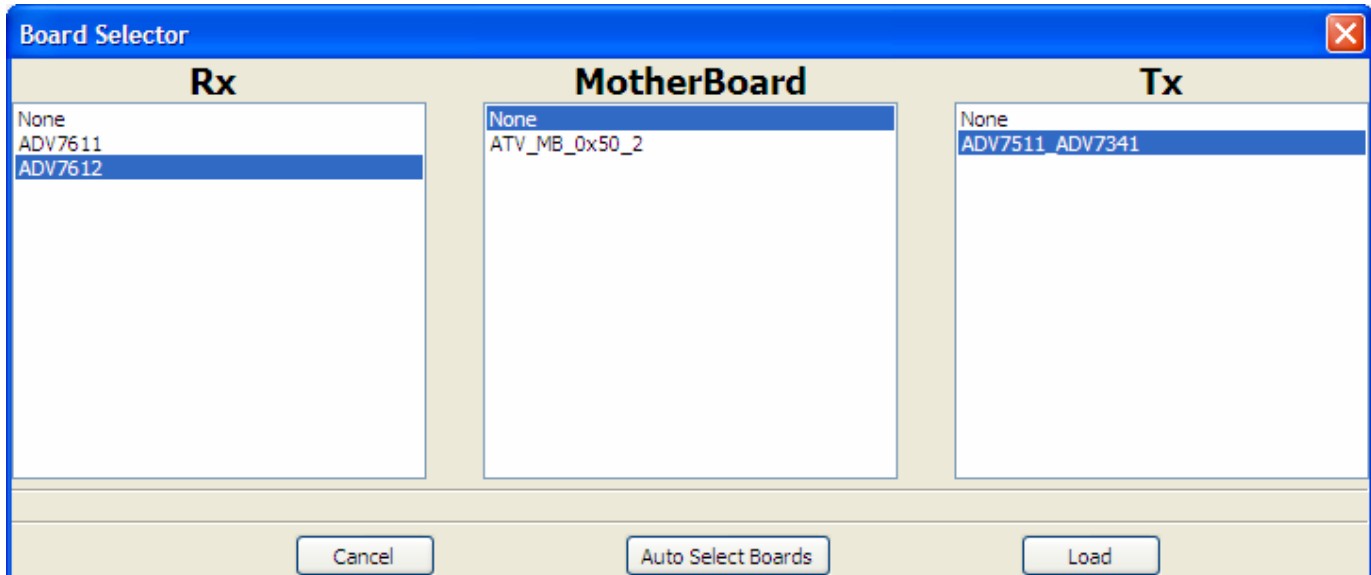


Figure 4 - Board Selection

4.2.2 Unloading a Board

The following steps must be performed to end an XRC session by unloading the selected board.

1. Select Files -> Unload Boards

4.3 Running Scripts

Scripts can be run by either of the following options:

1. Select Scripts -> Project Name e.g. ADV7612
2. Follow the script tree as outlined in the expanding menus (see [Figure 5](#))
3. Select Scripts -> Run Script
4. Open the script folder of the desired project
5. Select the desired script and click “Open”

Please be patient as the script may take several seconds to run. Successful download of the script is notified by the green light at the bottom of the screen flashing twice.

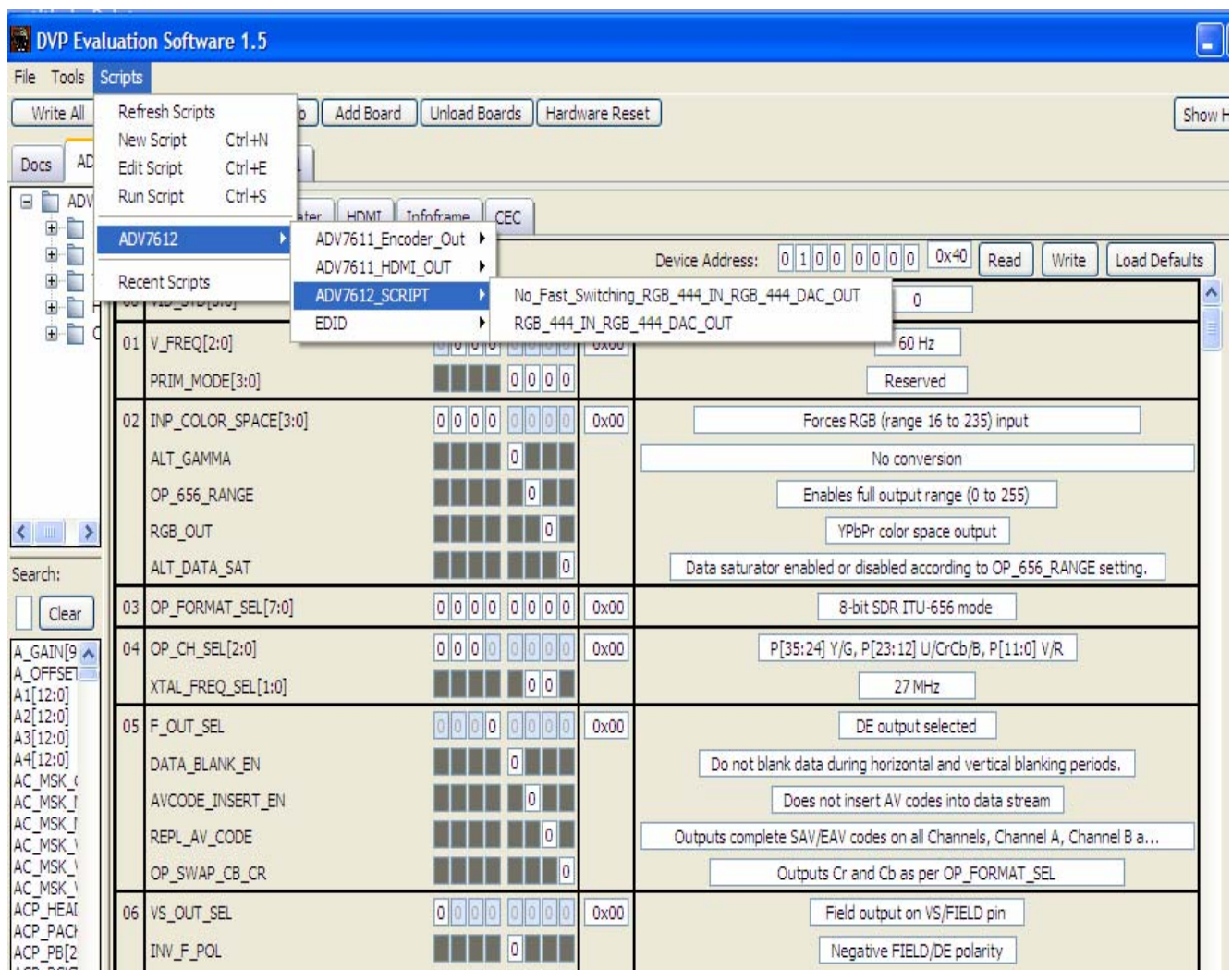


Figure 5 - XRC Script Tree

4.4 Other XRC Features

4.4.1 Register Control

The following steps must be performed to use XRC Register Control:

1. Select Tools -> Register Control
2. Enter the Device Address in HEX (see [Figure 6](#))
3. Enter the desired register address in HEX
4. Press the “Write” button to write a value to the selected register
5. Press the “Read” button to read a value from the selected register

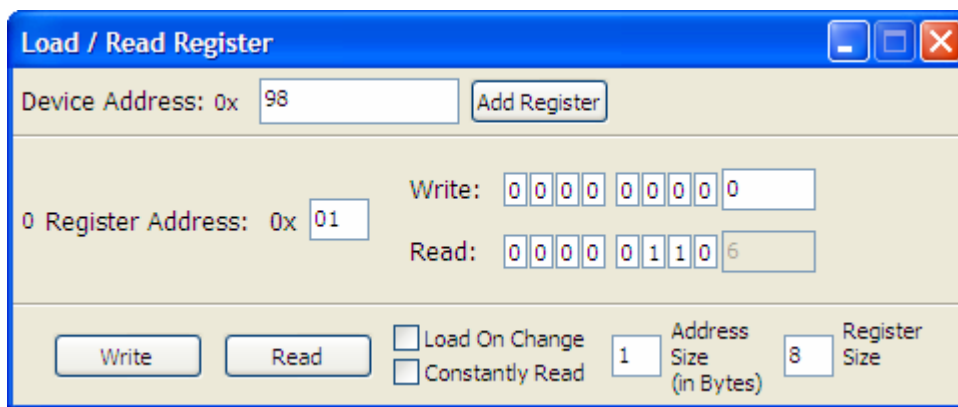


Figure 6 - Register Control Window

5. The ADV7612 Evaluation Platform in Depth

5.1 Hardware Overview

The following features of the ADV7612 evaluation board should be noted

5.1.1 Connectors

1. 2 x HDMI inputs (J2)
2. 1 x HDMI output (J9)
3. 1 x UART connector (J7)
4. 1 x USB connector (J1)
5. 1 x Audio output (U58)
6. 1 x S-video output (p5)
7. 1 x CVBS output (p3)
8. 1 x component (p4)
9. 1 x AV output connector (P7)

5.1.2 Jumpers

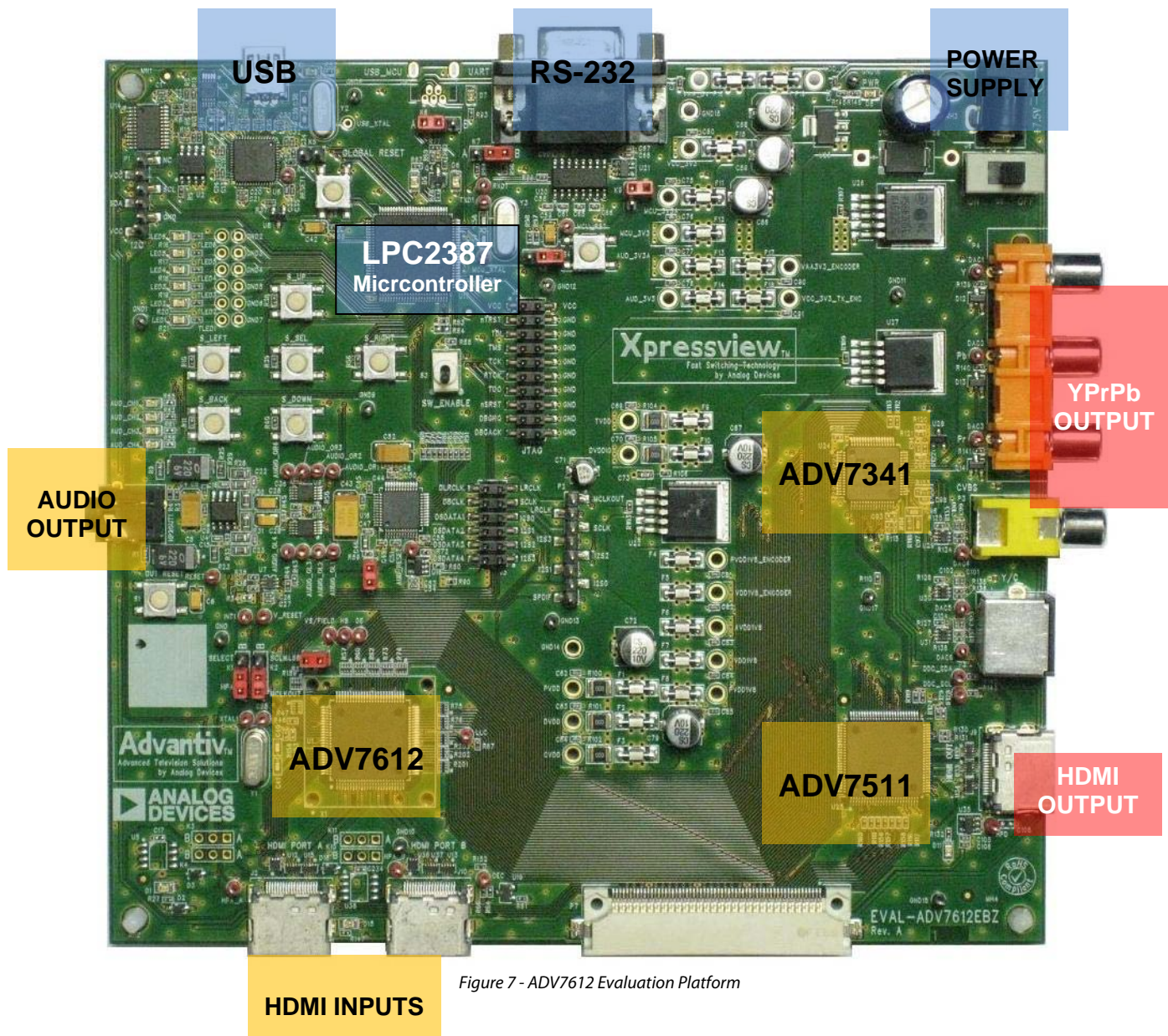
1. MCU boot ROM location (K7) – default position ‘B’
2. MCU reset (K8) – default position ‘not inserted’
3. USB MCU (K6)
4. I2C switch (K5)
5. MCU I2C (SDA, SCL) – default position inserted
6. Audio reset (J3)
7. Microcontroller reset control (K9) – default position ‘not inserted’
8. INT 2 reset (K1, K2)

5.1.3 Switches & Buttons

1. ON/OFF (S5)
2. Software enable/disable (S3)
3. DUT reset (S1)
4. MCU reset (S4)
5. Global reset (S2)
6. Software driver buttons (S_UP, S_DOWN, S_LEFT, S_RIGHT, S_SELECT, S_BACK)

5.1.4 Miscellaneous

1. 1x 20 way connectors (J6)
2. 1 x 12 way connectors (J5)
3. Software driver LEDS (LED1, LED2, LED3, LED4, LED5, LED6)
4. Audio channel LEDS (AUD_CH1, AUD_CH2, AUD_CH3, AUD_CH4)
5. I2C header (P1)



5.2 Using the ADV7612 Evaluation Platform

5.2.1 Connecting an Input Video Source

To connect an input video source to the ADV7612 evaluation board, use a HDMI cable and the input HDMI connector; J2 or J10. Do not use excessive force when connecting or disconnecting the cable as this may result in damage to the evaluation board.

5.2.2 Connecting to a Video Sink

To connect the ADV7612 evaluation board to a video sink, use a HDMI cable and the output HDMI connector; J9. Do not use excessive force when connecting or disconnecting the cable as this may result in damage to the evaluation board.

5.2.3 Connecting an Input Audio Source

To connect an input audio source to the ADV7612 evaluation board, use a TO Slink cable and the input audio connector; J2 or J10.

5.2.4 Connecting a Headphone

To use a headphone, connect the headphone to connector HP2OUT1.

5.2.5 Updating the Software Driver

To download updated software driver code to the microcontroller used on the ADV7612 evaluation board, please perform the following steps

1. Power off the board
2. Insert jumper K9
3. Ensure jumper K7 is in position A
4. Ensure that jumper K8 (MCU RESET) is not inserted
5. Connect a serial cable between the computer to be used for the download and the UART connector (J7), on the ADV7612 evaluation board
6. Power on the board by moving the ON/OFF switch (S5) to position ON.
7. Start the Flashmagic download by pressing “Start”. For information on where to obtain and how to use the Flashmagic tool, please see [Appendix 3 – Flash Magic](#).
8. When the download has completed, power off the board.
9. Remove jumper K9.
10. Ensure jumper K7 is in position B.
11. Power on the board by moving the ON/OFF switch (S5) to position ON.

If the Flash magic tool gives a warning, please check the setup and jumper positions carefully.

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5.2.6 Interfacing with the Software Driver

Jumper K8, when inserted, pulls the microcontroller reset low. To use the software driver, please ensure that K8 is removed.

To stop and start the software driver (e.g. to allow access to the I2C over XRC), toggle the SW_ENABLE switch on the evaluation board. When disabled, the driver will send the message “REP: Driver Disabled”. When enabled, the driver will send the message “REP: Driver Enabled” and any status updates will be displayed.

Please see the software driver documentation for the functions performed by software driver buttons (S_UP, S_DOWN, S_LEFT, S_RIGHT, S_SELECT, S_BACK) and LEDS (LED1, LED2, LED3, LED4, LED5, LED6). To enable the software driver, switch the software enable switch (S10) to SW_ENABLE. To disable the software driver, switch the software enable switch (S3) away from SW_ENABLE.

For information on the latest software driver, please contact your FAE or email ATV_VIDEORX_Apps@analog.com.

6. Appendix 1 – Schematics

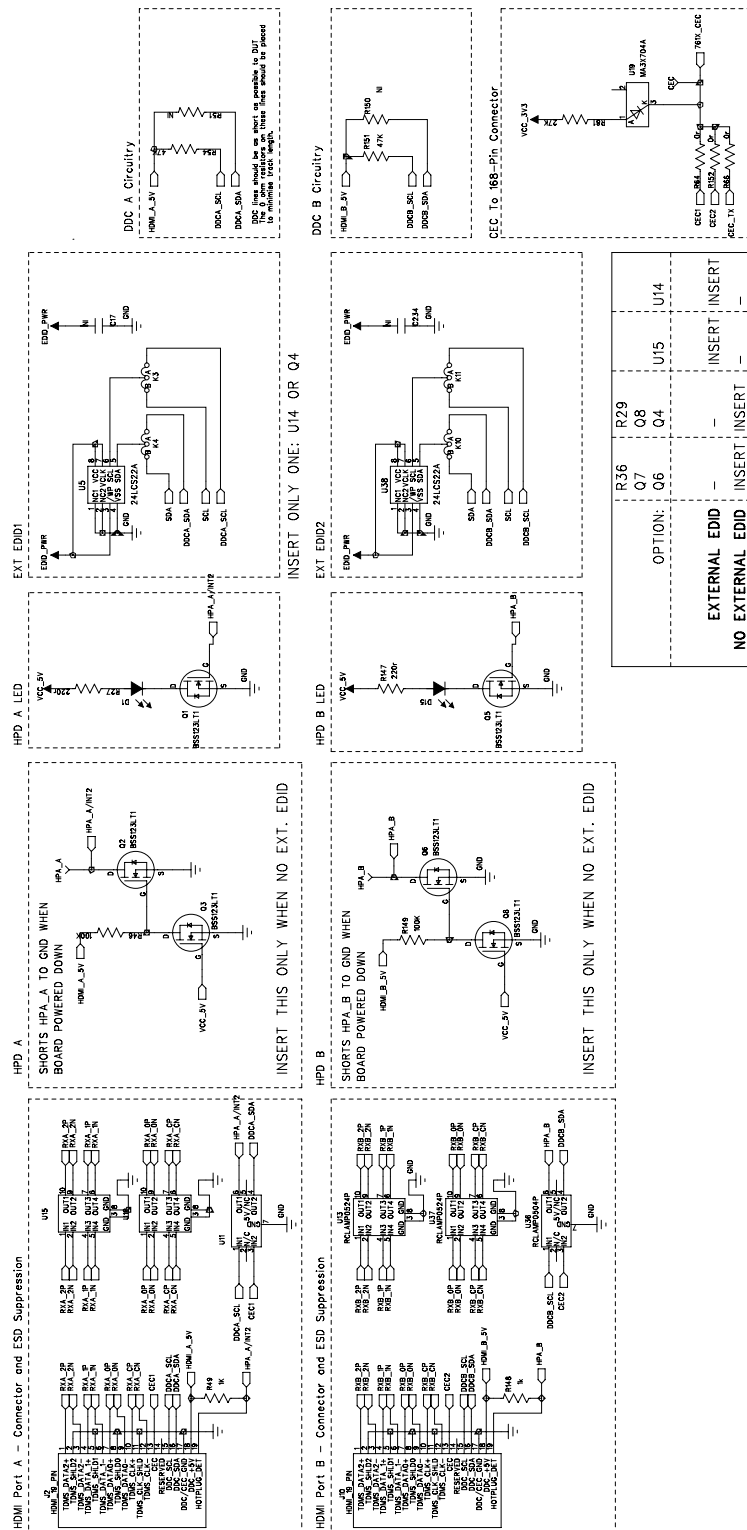


Figure 8 HDMI Inputs Schematics Page

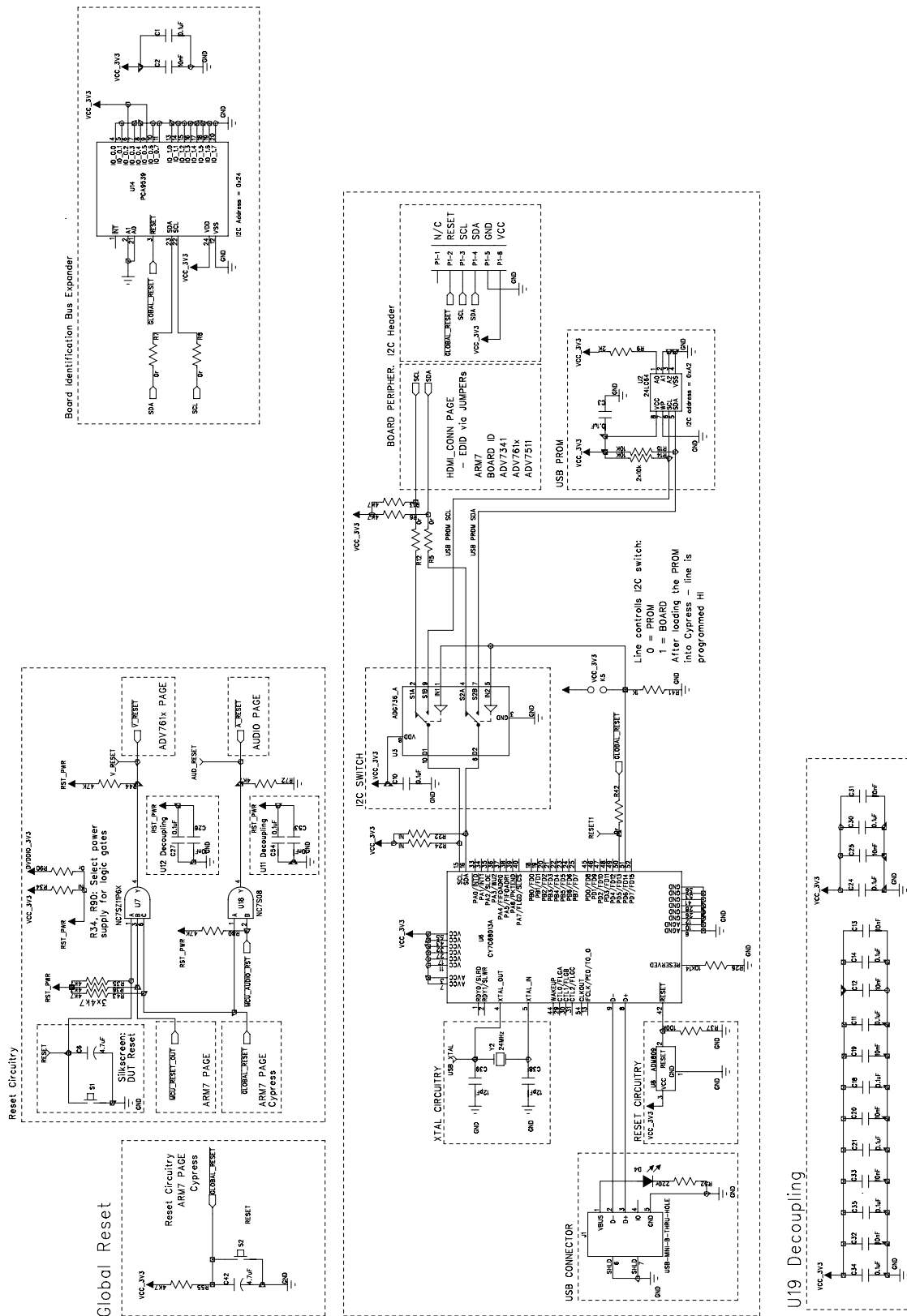


Figure 9: USB + Reset Circuitry Schematics Page

Eval Note

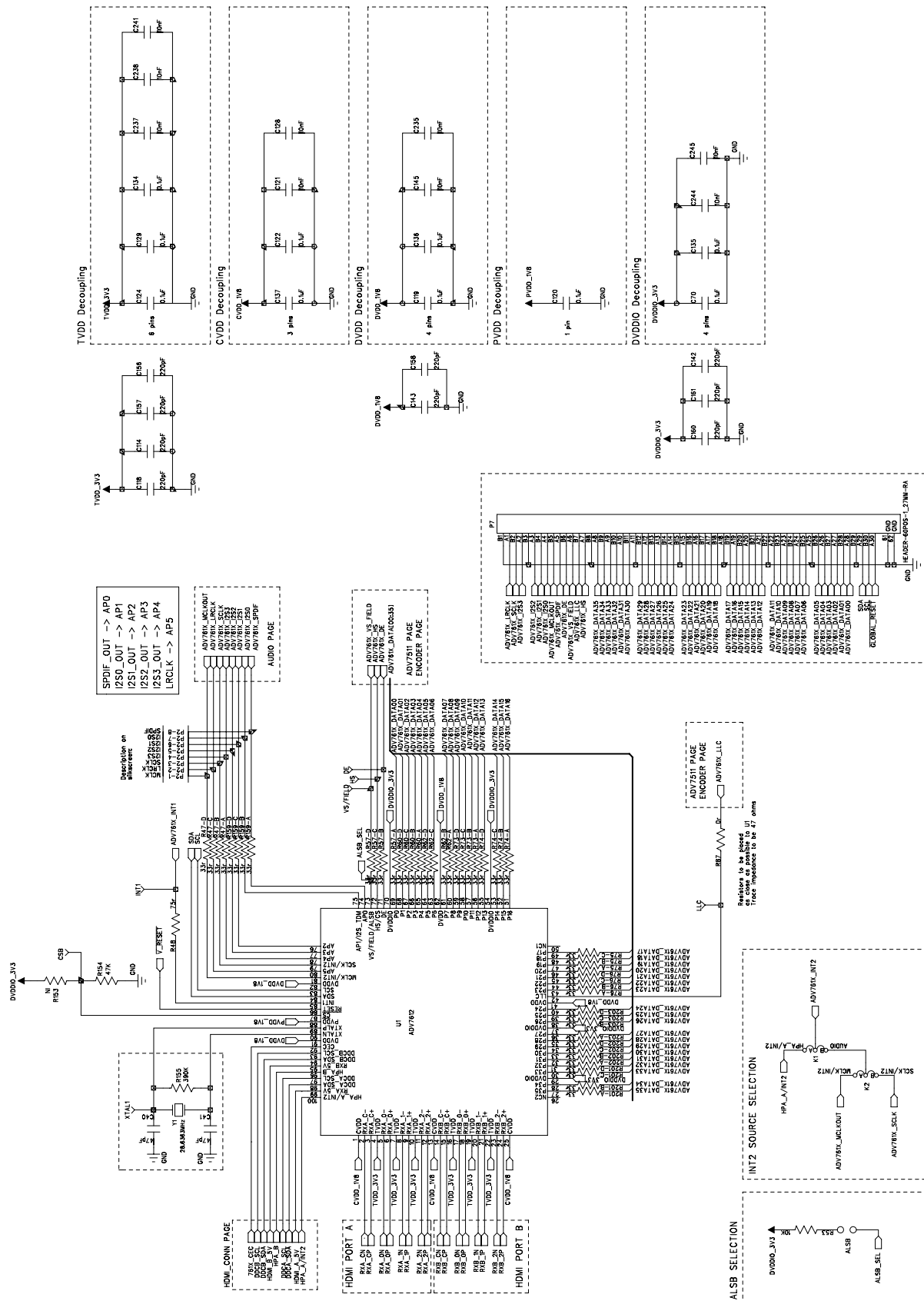


Figure 10: ADV7612 Schematics Page

Eval Note

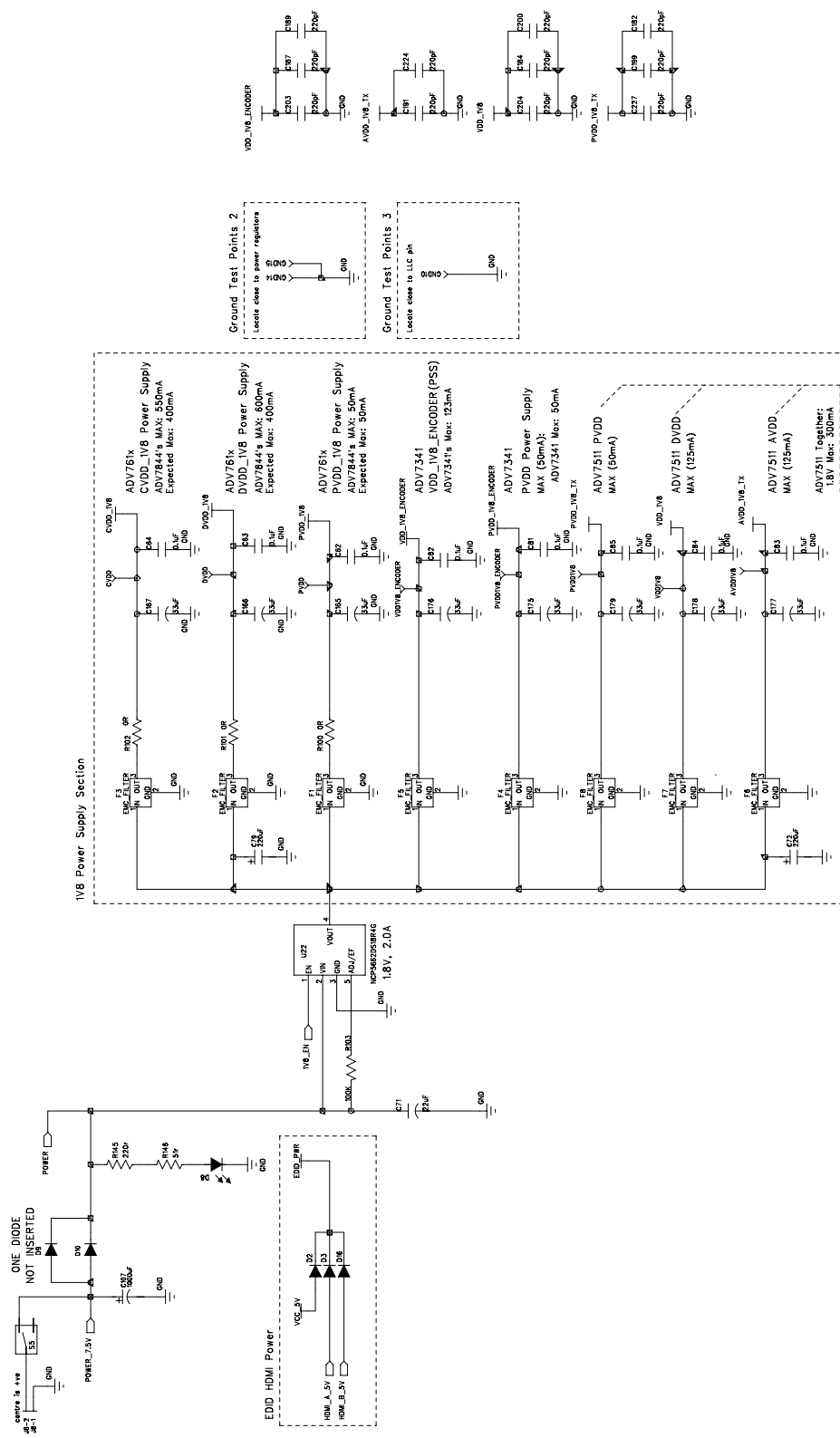


Figure 11: Power Schematics Page 1 of 2

Eval Note

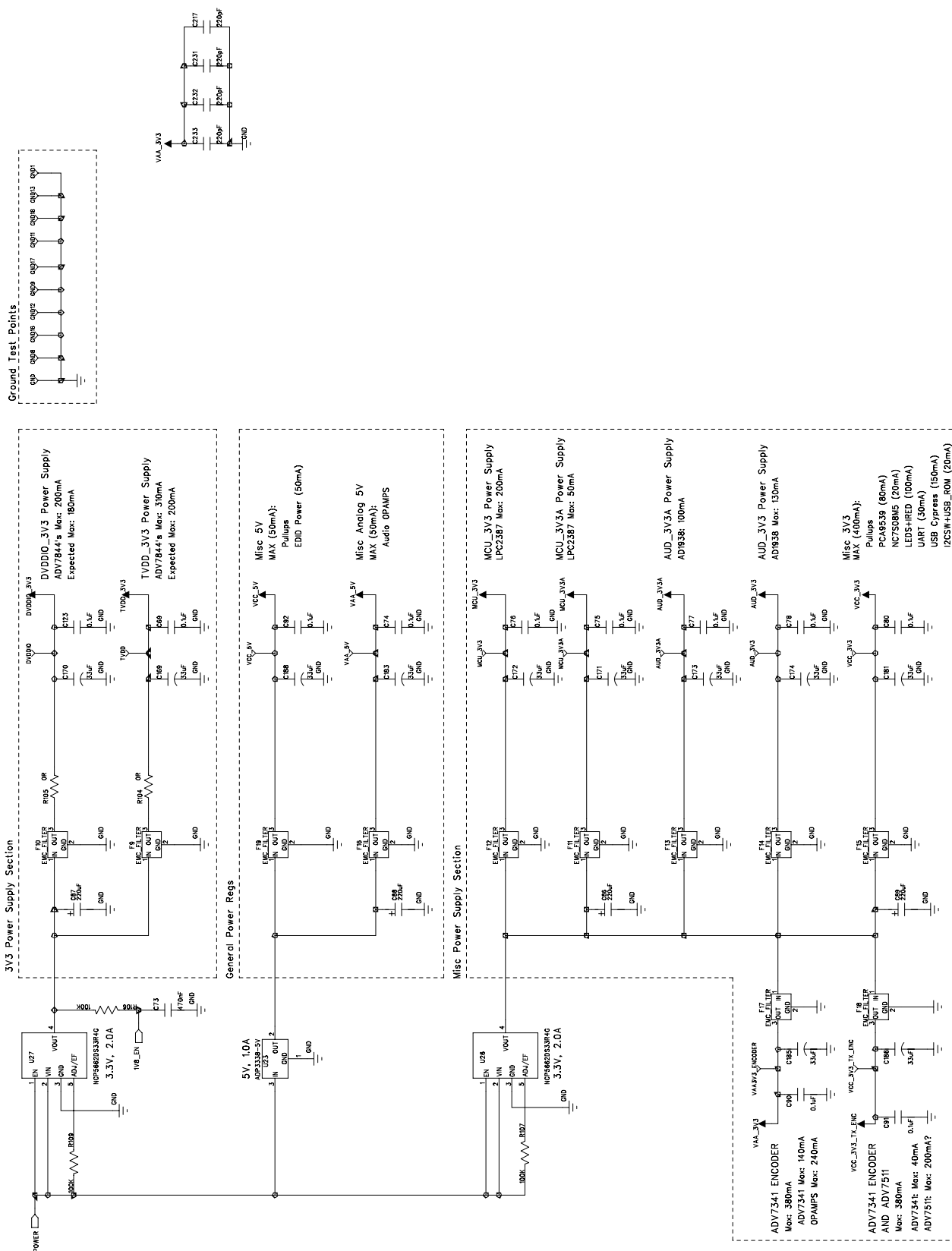


Figure 12: Power Schematics Page 2 of 2

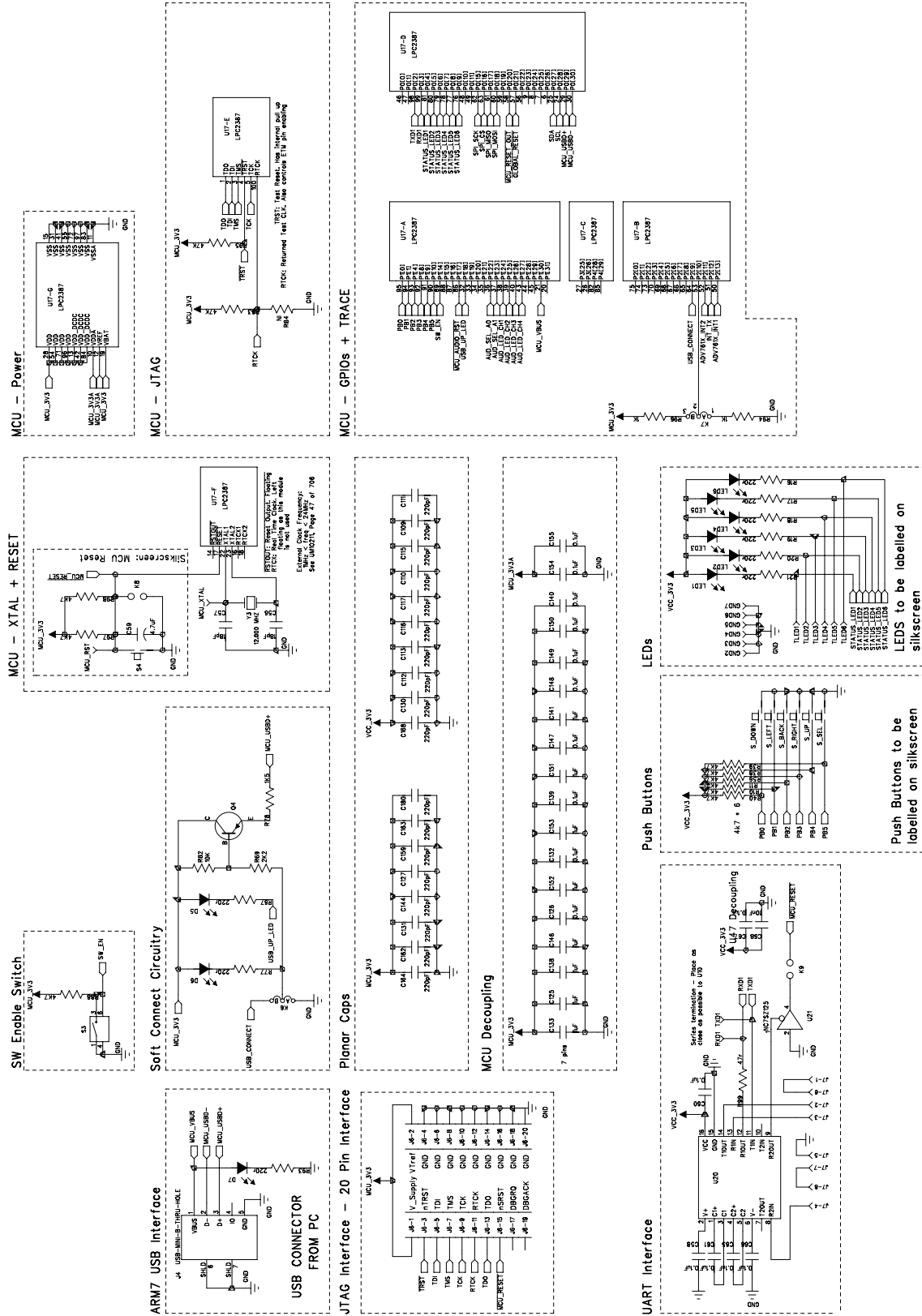


Figure 13: Microcontroller Schematics Page

Eval Note

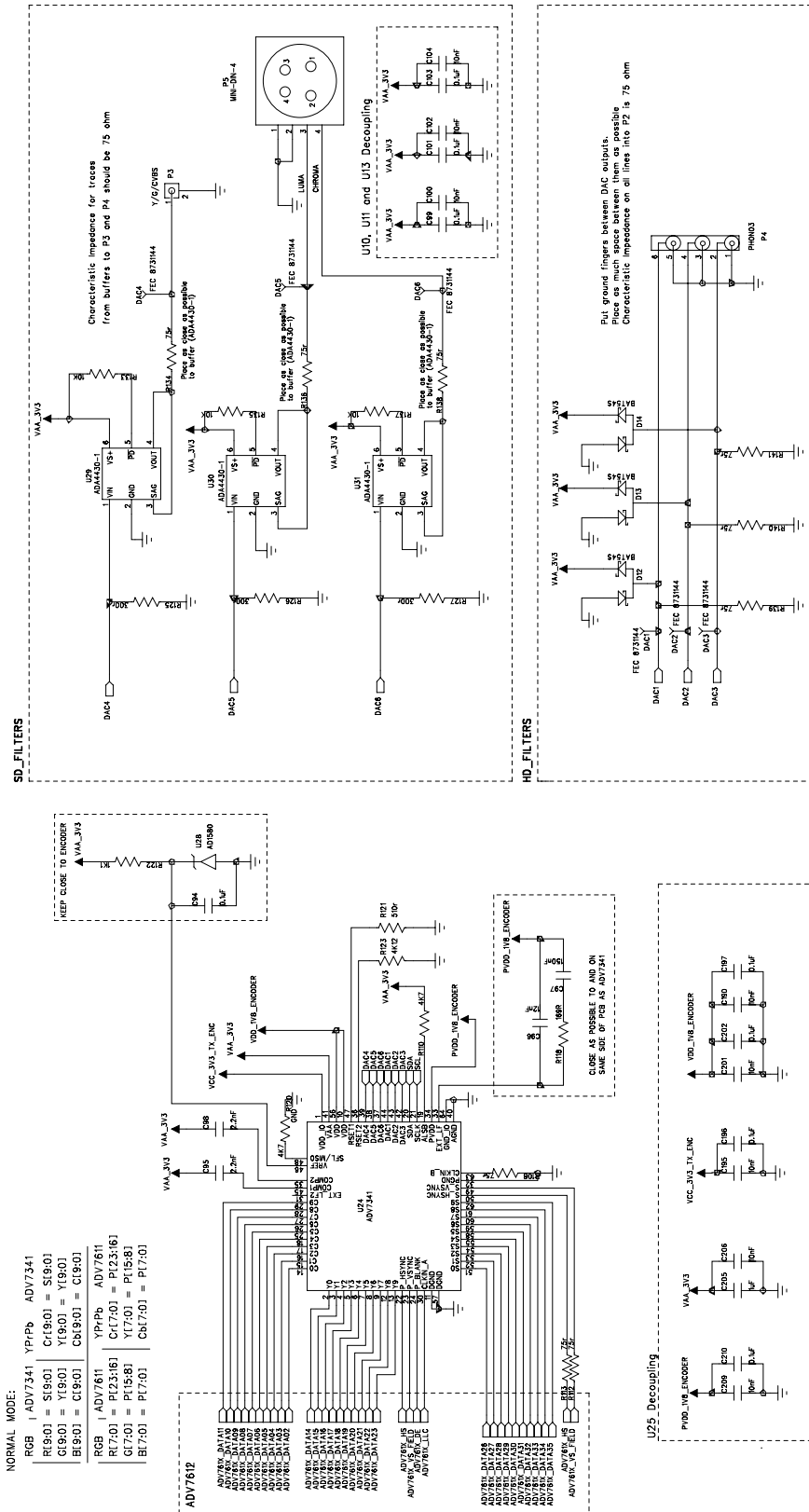


Figure 14: Encoder Schematics Page

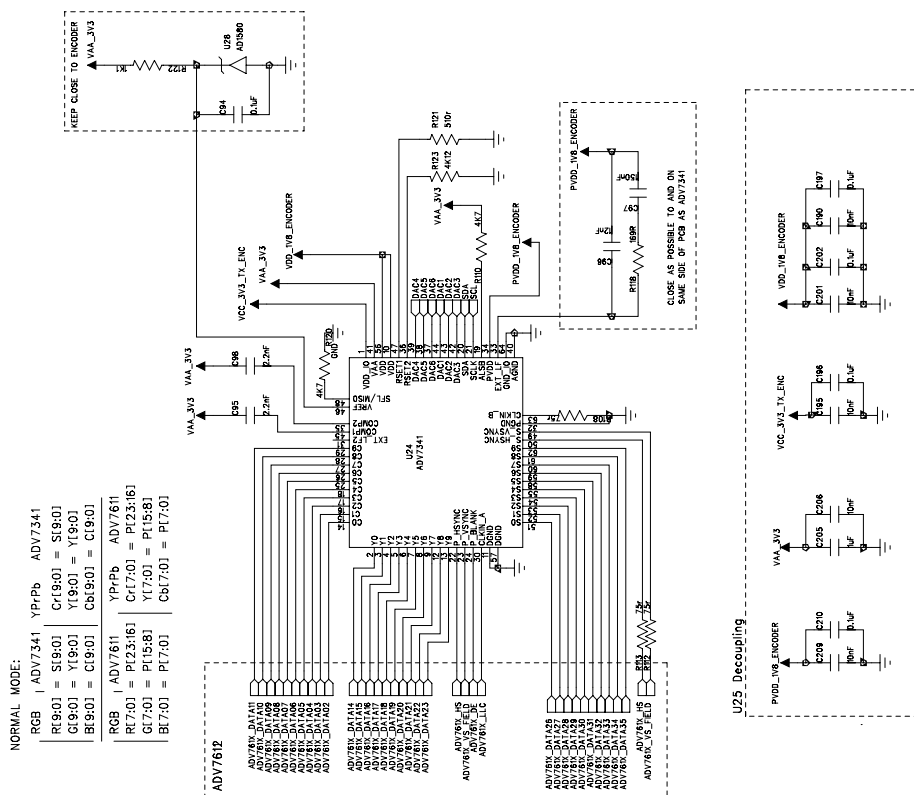
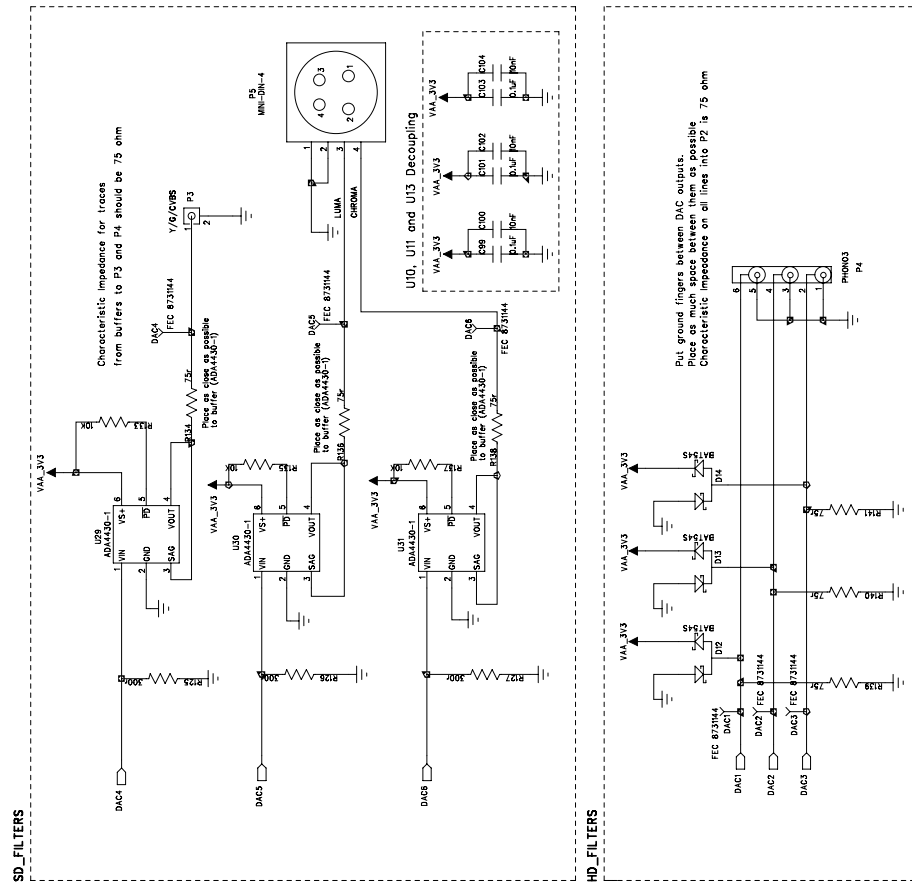


Figure 15: HDMI TX Schematics Page

Eval Note

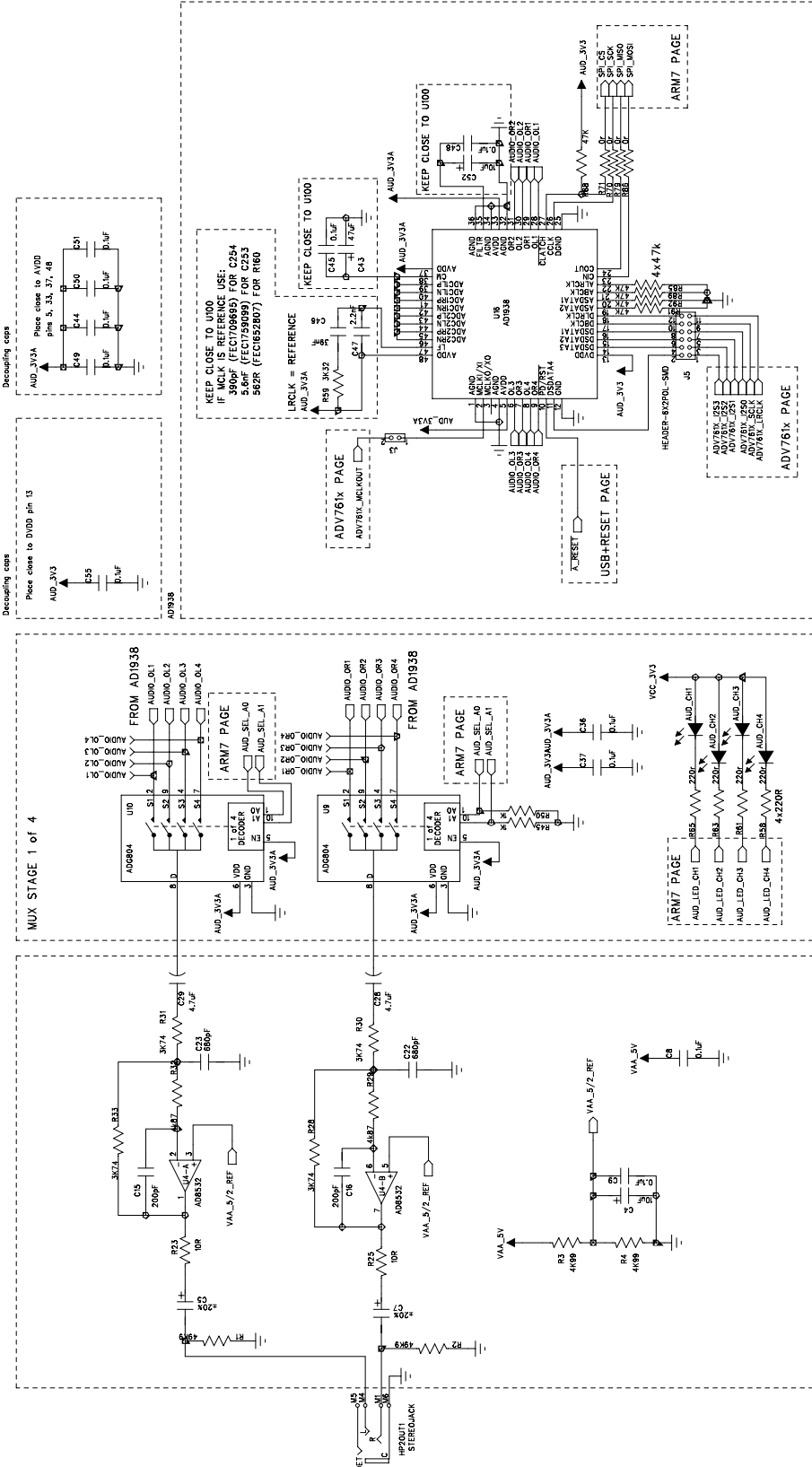
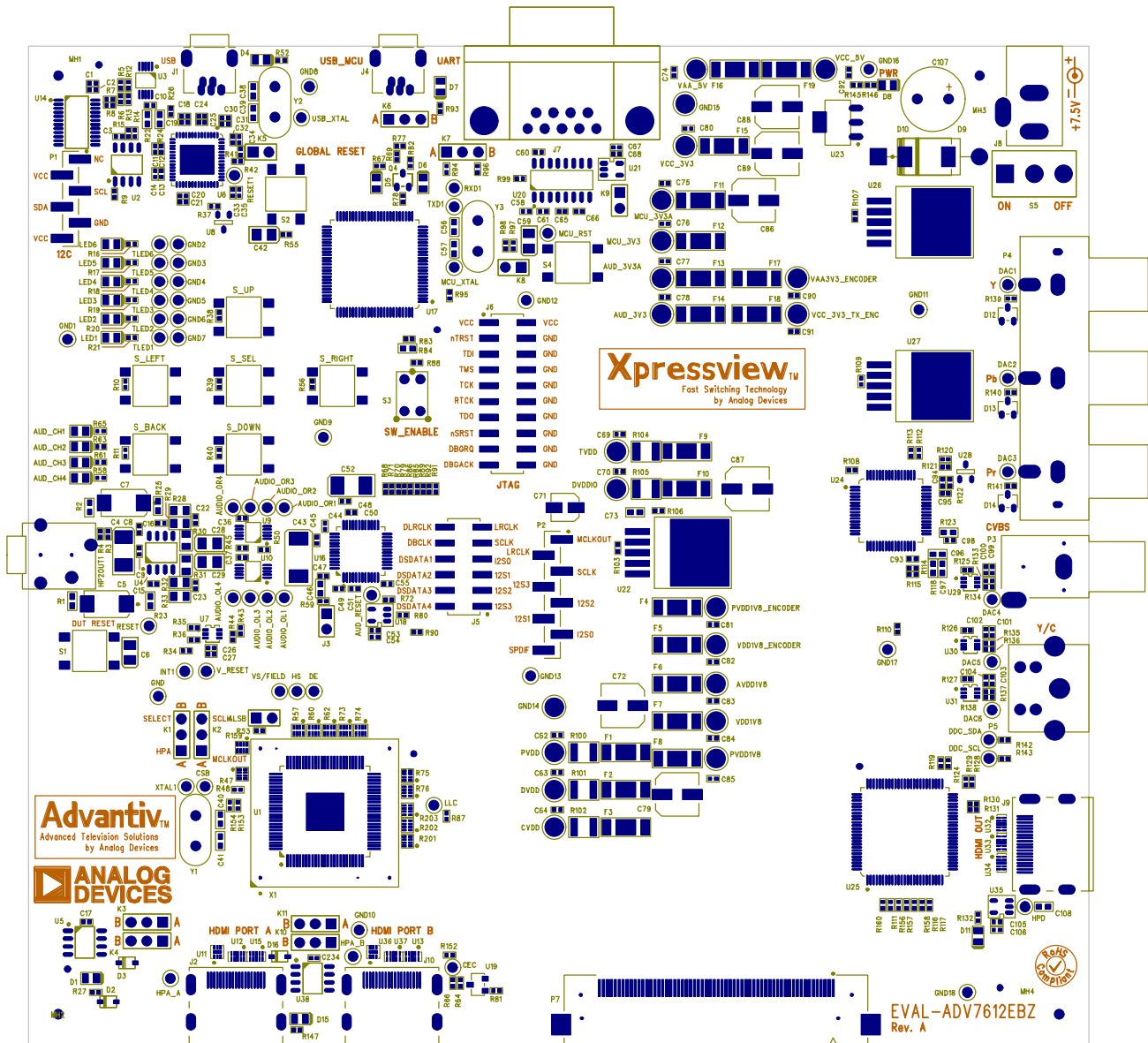


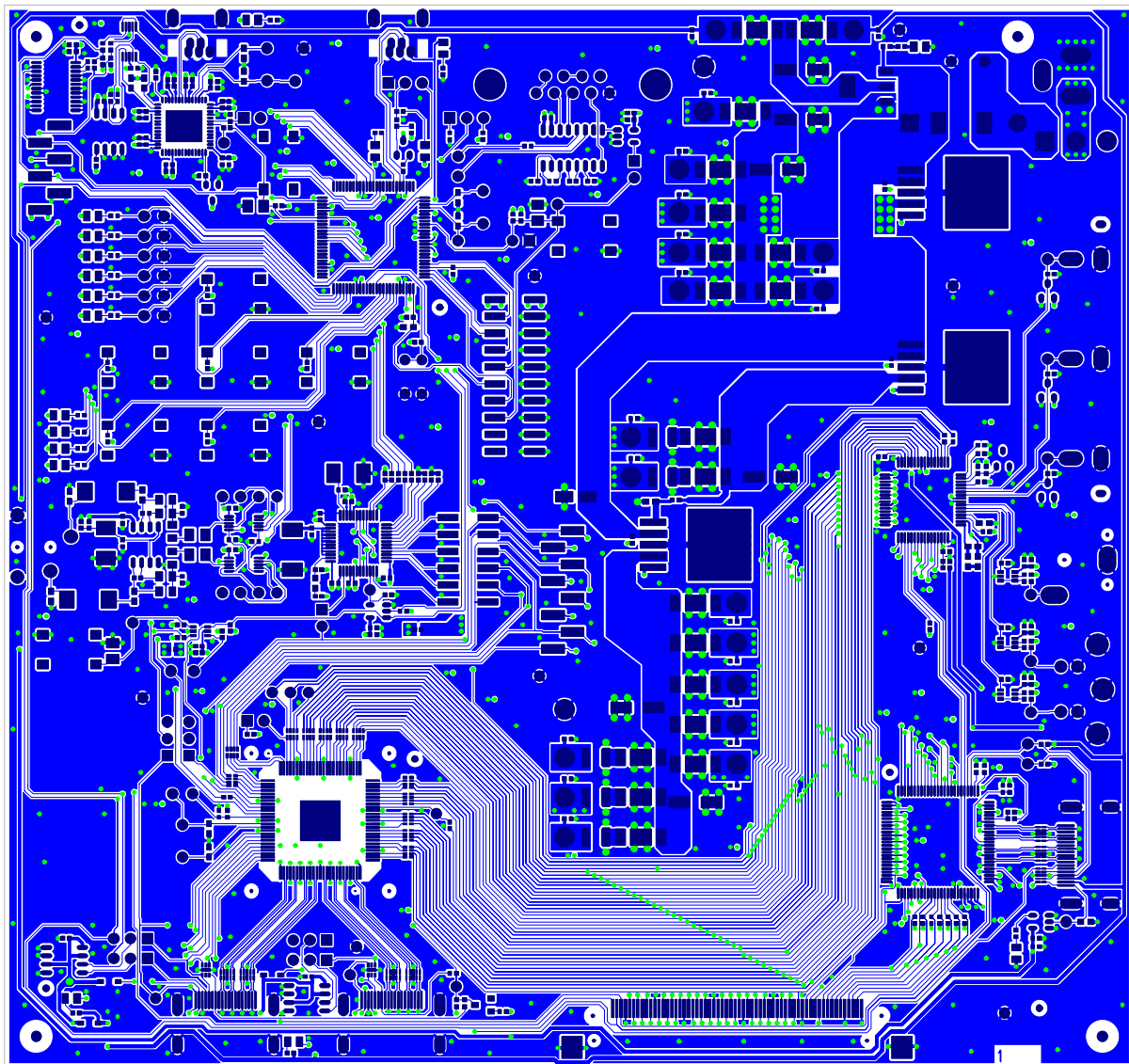
Figure 16: Audio Codec Schematics Page

7. Appendix 2 – Layout



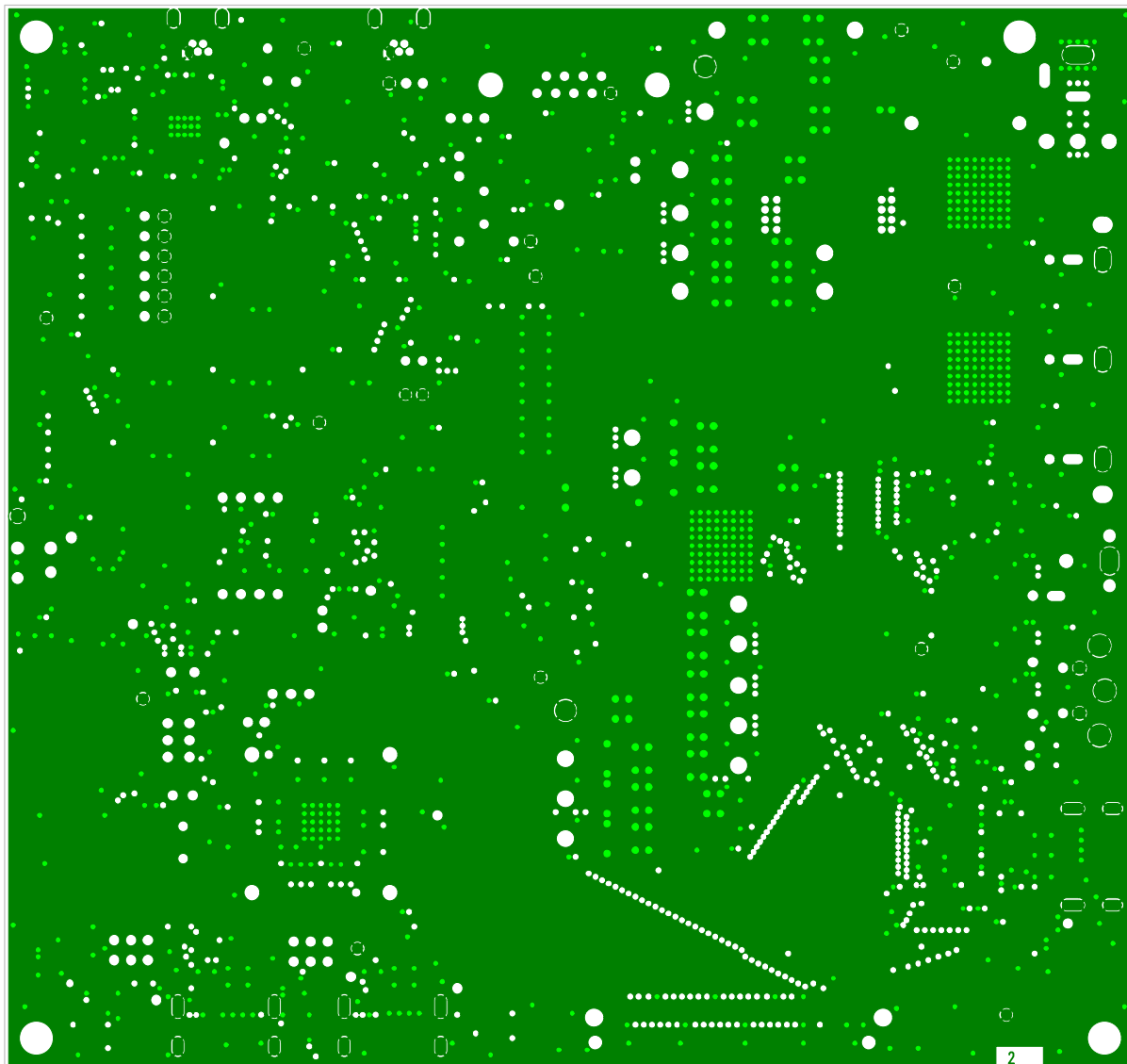
EVAL-ADV7612EBZ Rev. A (Primary Side View) Silkscreen – Primary Side

Figure 17: Layout Silkscreen (Top)



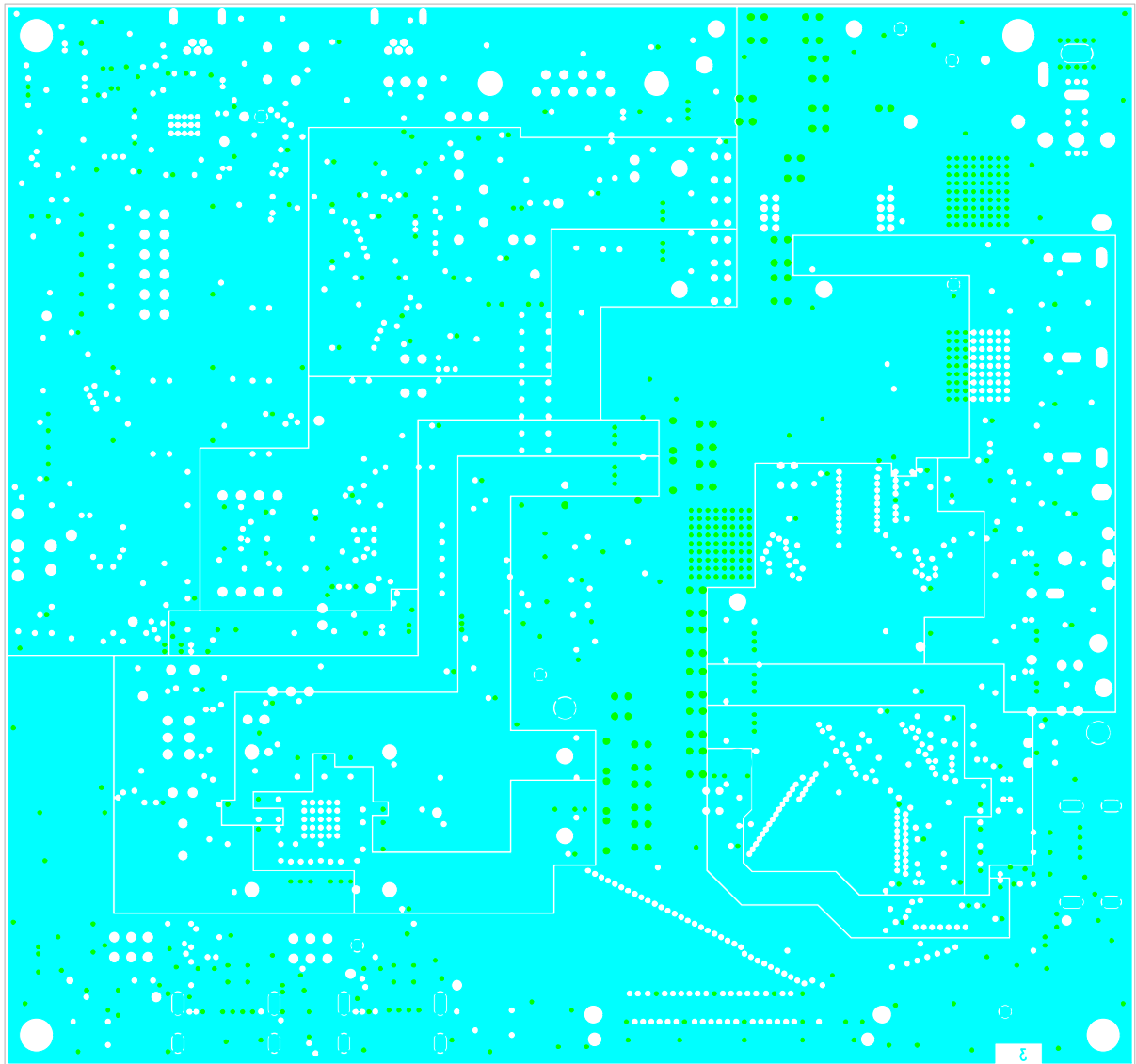
EVAL-ADV7612EBZ Rev. A (Primary Side View) Primary Side - Layer 1

Figure 18: Layout Layer 1 (Top)



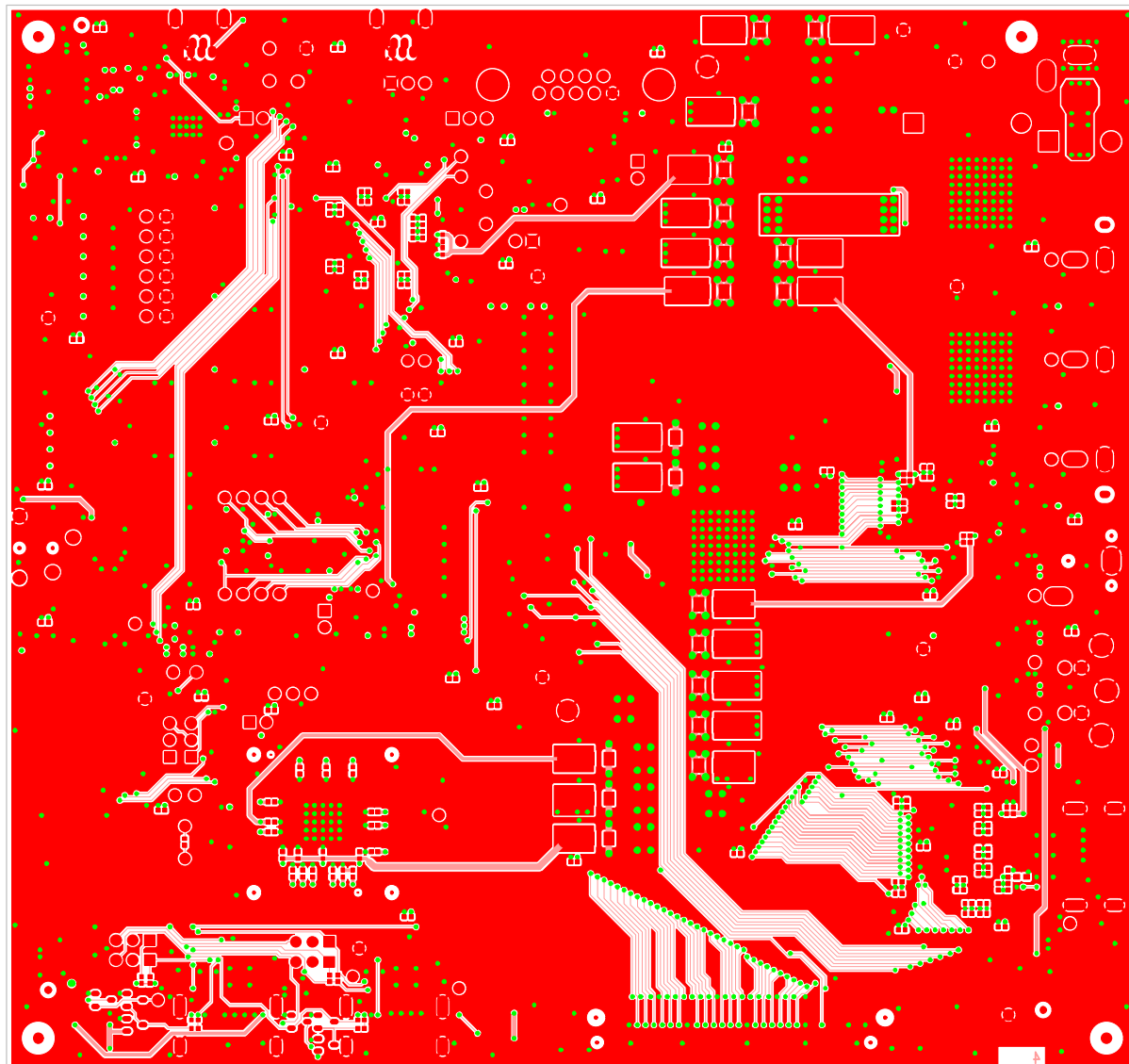
EVAL-ADV7612EBZ Rev. A (Primary Side View) Layer 2 GND

Figure 19: Layout Layer 2 (GND)



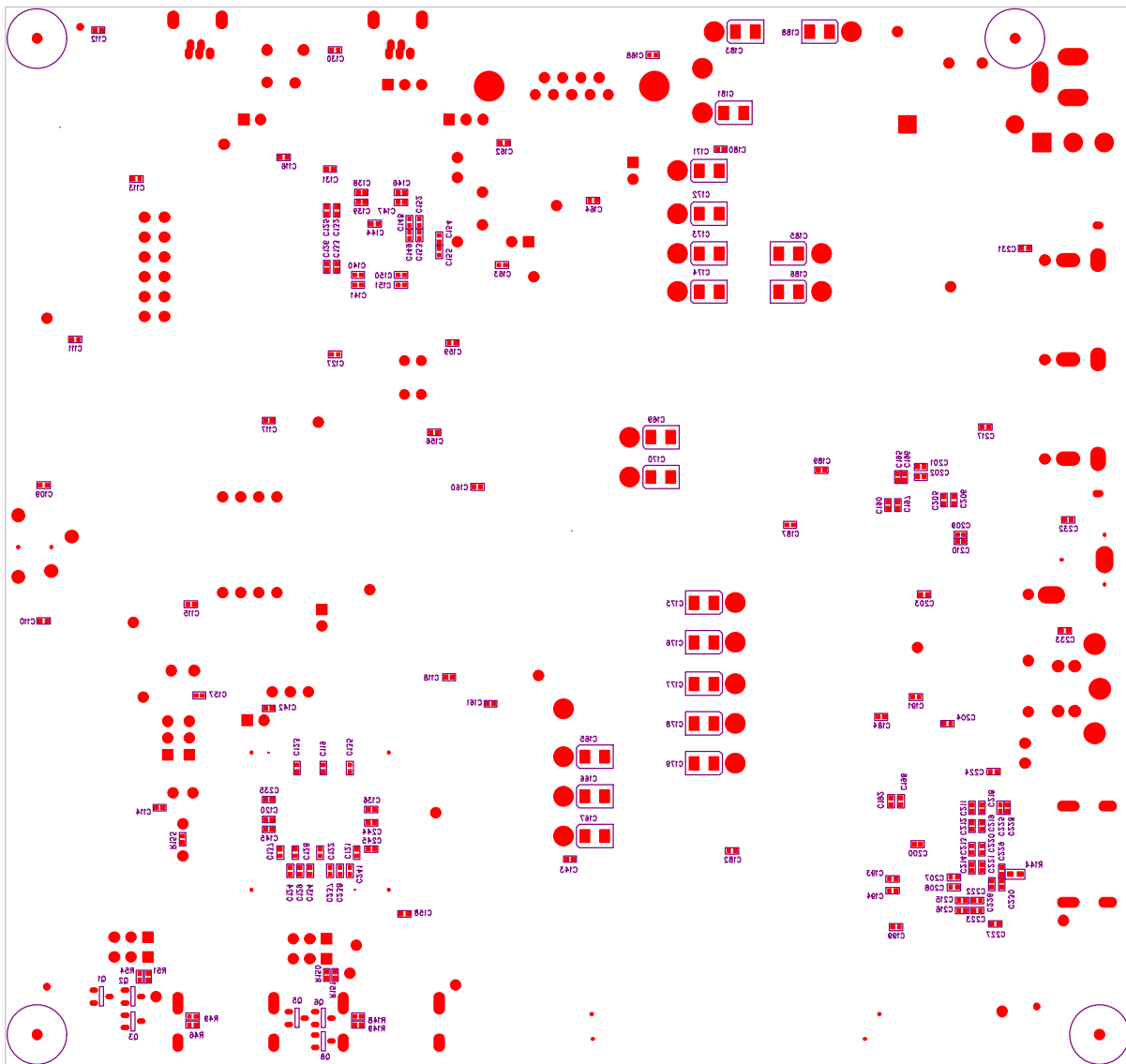
EVAL-ADV7612EBZ Rev. A (Primary Side View) Layer 3

Figure 20: Layout Layer 3 (PWR)



EVAL-ADV7612EBZ Rev. A (Primary Side View) Secondary Side – Layer 4

Figure 21: Layout Layer 4 (Bottom)



EVAL-ADV7612EBZ Rev. A (Primary Side View) Silkscreen – Secondary Side

Figure 22: Layout Silkscreen (Bottom)

8. Appendix 3 – Flash Magic

Software Setup: the Flashmagic tool can be downloaded from www.flashmagictool.com. Analog Devices does not take responsibility for the content of any external sites.

Note: Please ensure the tool settings are configured to “Use DTR and RTS to control RST and ISP pin”. The tool settings are accessed by navigating through Options -> Advanced Options -> Hardware Config.

All other main settings should be as follows:

- Device: LPC2387
- COM: As per user device
- Baud rate: 115200
- Interface: None (ISP)
- Oscillator: 12
- Ensure “Verify after programming” is enabled
- Ensure “Erase blocks used by Hex File” is enabled
- Specify filename to download

Eval Note

9. Appendix 4 – Downloading from FTP

Using an FTP client (e.g. Filezilla – <http://filezilla-project.org/download.php?type=client> - Analog Devices does not take responsibility for the content of any external sites), please log on to download the latest evaluation software.

Host: ftp.analog.com

Username: e.g. adv7612

Password: supplied from FAE/product line

Port: leave empty (FTP client will automatically populate this)

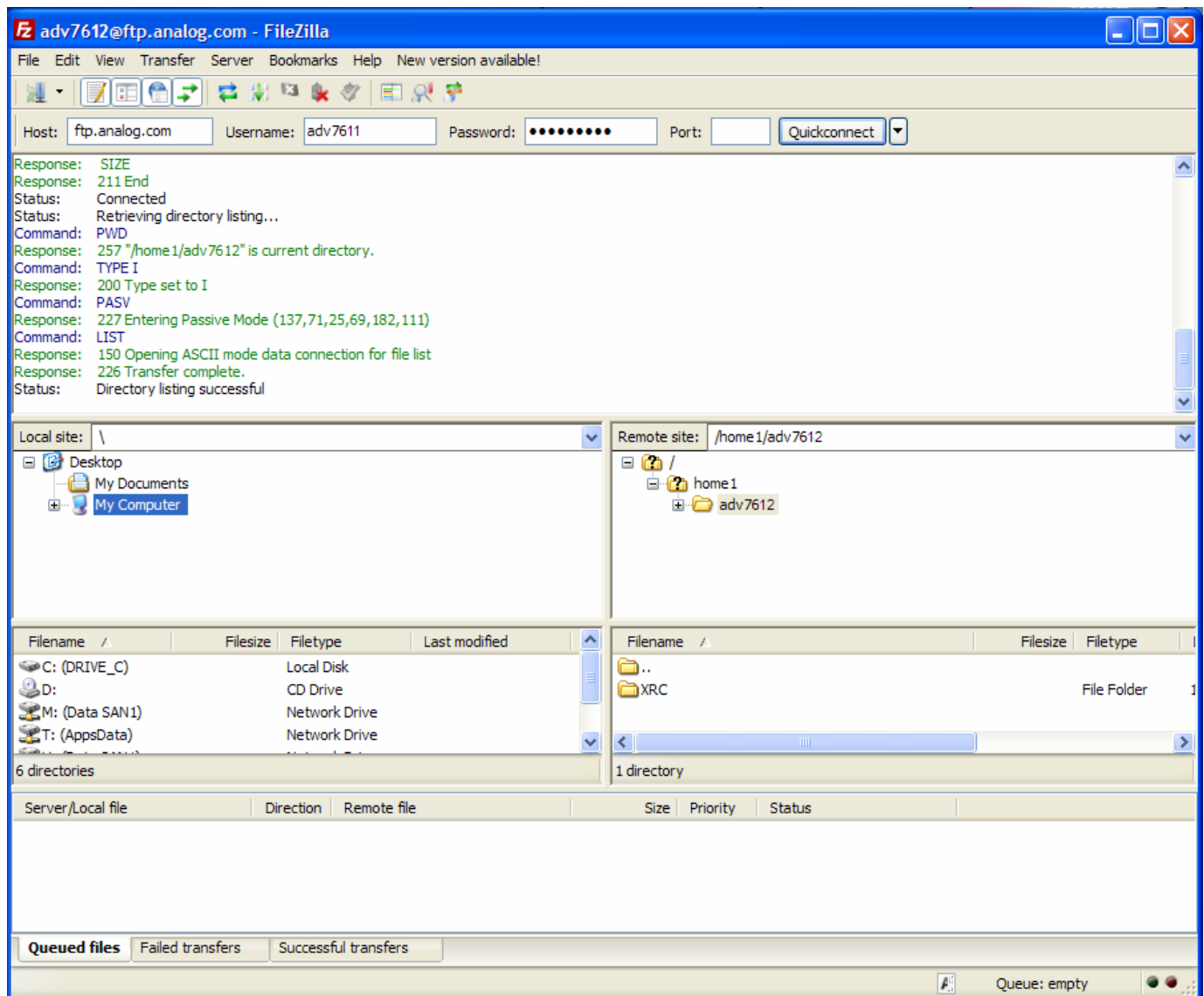
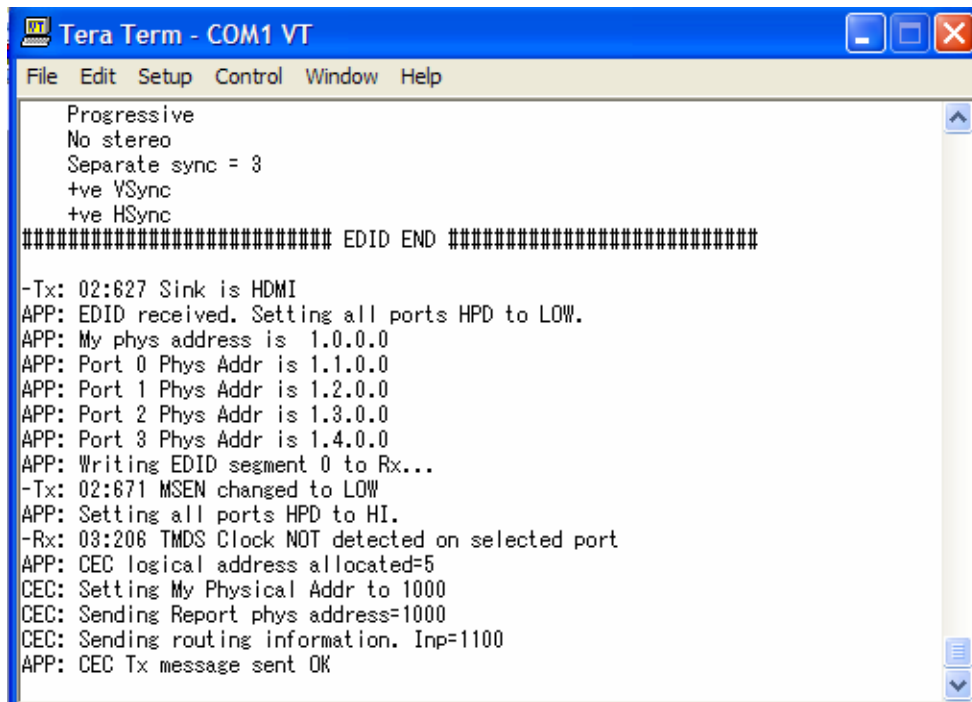


Figure 23 - Filezilla Settings

10. Appendix 5 – Software Driver Controls

When using the software driver, please connect a UART terminal e.g. Hyperterminal or TeraTerm for feedback on the status of the software driver.



```

Progressive
No stereo
Separate sync = 3
+ve VSync
+ve HSync
##### EDID END #####
-Tx: 02:627 Sink is HDMI
APP: EDID received. Setting all ports HPD to LOW.
APP: My phys address is 1.0.0.0
APP: Port 0 Phys Addr is 1.1.0.0
APP: Port 1 Phys Addr is 1.2.0.0
APP: Port 2 Phys Addr is 1.3.0.0
APP: Port 3 Phys Addr is 1.4.0.0
APP: Writing EDID segment 0 to Rx...
-Tx: 02:671 MSEN changed to LOW
APP: Setting all ports HPD to HI.
-Rx: 03:206 TMDS Clock NOT detected on selected port
APP: CEC logical address allocated=5
CEC: Setting My Physical Addr to 1000
CEC: Sending Report phys address=1000
CEC: Sending routing information. Inp=1100
APP: CEC Tx message sent OK
  
```

Figure 24. Software driver feedback

Please use the following commands to interface with the software driver

?	Print help
help	Print help
amute	Mute audio output <on or off>
arctx	ARC TX mode <on or off>
avmute	Send AVMUTE <on or off>
cec	CEC support <on or off>
dbg	Select debug output [rx] [tx] [hdcp] [edid] [cec] [int] [none] [all]
dbg+	Same as dbg command with output addition
dbg-	Same as dbg command with output removal
enc	Output encryption <on, off or us(same as upstream)>
fs	Fast switching <on or off>
i2cr	i2c read <device> <register> <byte count>
i2cw	i2c write <device> <register> <value>
i2cand	i2c AND register with value <device> <register> <value>
i2cor	i2c OR register with value <device> <register> <value>
i2cxor	i2c XOR register with value <device> <register> <value>
i2cdbg	i2c debug <device addr, dev addr, ...>
memr	Read memory <address(32-bit aligned)> <byte count>
memw	Write memory <address(32-bit aligned)> <value>
mode	Set operating mode <rec, rep, xmt or auto>
mute	Set mute mode <man or auto>
mtime	Set mute times in ms <For TMDS, For Blackout>
out	Set TX output <hdmi, dvi, us or forced>
port	Select input port <a, b, c, d, e, f, g n(none) or t(auto)>

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reset	Reset system
run	Resume software
stat	Print system status
stop	Stop software
vmute	Video output mute <on or off>
edidmod	Update RX EDID <on or off> EDID will be modified before being written to the RX internal EDID. Refer to REP_EVENT_TX_EDID_READY event processing in rep_notify.c
power	Power <on or off>, <mode 0 or 1>
cecaudio	send cec message about audio <opcode>, <directly addressed >, <parameters>
xmtmode	When no HDMI input connected (MXT mode), keep HDMI TX on or off <on or off>

UART Terminal Settings

- Baud rate: 115200
- Data: 8-bit
- Parity: none
- Stop: 1-bit
- Flow control: none