CertusPro-NX Versa Board

Evaluation Board User Guide

FPGA-EB-02053-1.2

July 2023

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Acronyms in This Document

A list of acronyms used in this document.

Acronym	Definition
AC/DC	Alternating Current and Direct Current
ADC	Analog Digital Converter
caBGA	Chip Array Ball Grid Array
CMOS	Complementary Metal-Oxide Semiconductor
CSI	Camera Serial Interface
DDR	Double Data Rate
DRAM	Dynamic Random Access Memory
DIP	Dual Inline Package
ESD	Electro Static Discharge
FD-SOI	Fully Depleted Silicon On Insulator
FPGA	Field Programmable Logic Array
FTDI	Future Technology Devices International
GPIO	General Purpose Input/Output
I²C	Inter-Integrated Circuit
JTAG	Joint Test Action Group
LED	Light Emitting Diode
LPDDR	Low Power Double Data Rate
LVDS	Low-Voltage Differential Signaling
MIPI	Mobile Industry Processor Interface
PC	Personal Computer
PCIe	Peripheral Component Interconnect Express
PHY	Physical Layer Device
PMOD	Peripheral Module
RGMII	Reduced Gigabit Media Independent Interface
SerDes	Serializer/Deserializer
SFP	Small Form-Factor Pluggable Transceiver
SGMII	Serial Gigabit Media Independent Interface
SMA	Sub-Miniature A Connector
SPI	Serial Peripheral Interface
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

1.   Introduction

The Lattice Semiconductor CertusPro™-NX Versa Evaluation Board allows designers to investigate and experiment with the features of the CertusPro-NX Field Programmable Gate Array (FPGA). The features of the CertusPro-NX Versa Evaluation Board can assist engineers with the rapid prototyping and testing of their specific designs. This guide is intended to be referenced to demonstrate the CertusPro-NX FPGA and introduce board resources.

1.1.   CertusPro-NX Versa Evaluation Board

The CertusPro-NX Versa Evaluation Board features the CertusPro-NX FPGA in the LFG672 package which is built on Lattice Nexus™ FPGA platform using low power 28 nm FD-SOI technology. The board has the ability to expand the usability of the CertusPro-NX FPGA with SFP, PCIe, CSI, USB3 Controller, Raspberry PI HAT connector, PMOD, along with access to 2× SerDes channels. Easy-to-use board resources of the jumper, LED indicator, push button and switch are available for user-defined applications.

Figure 1.1. Top View of CertusPro-NX Versa Evaluation Board

RC/Edge PCIe
Muxes (U15-6)
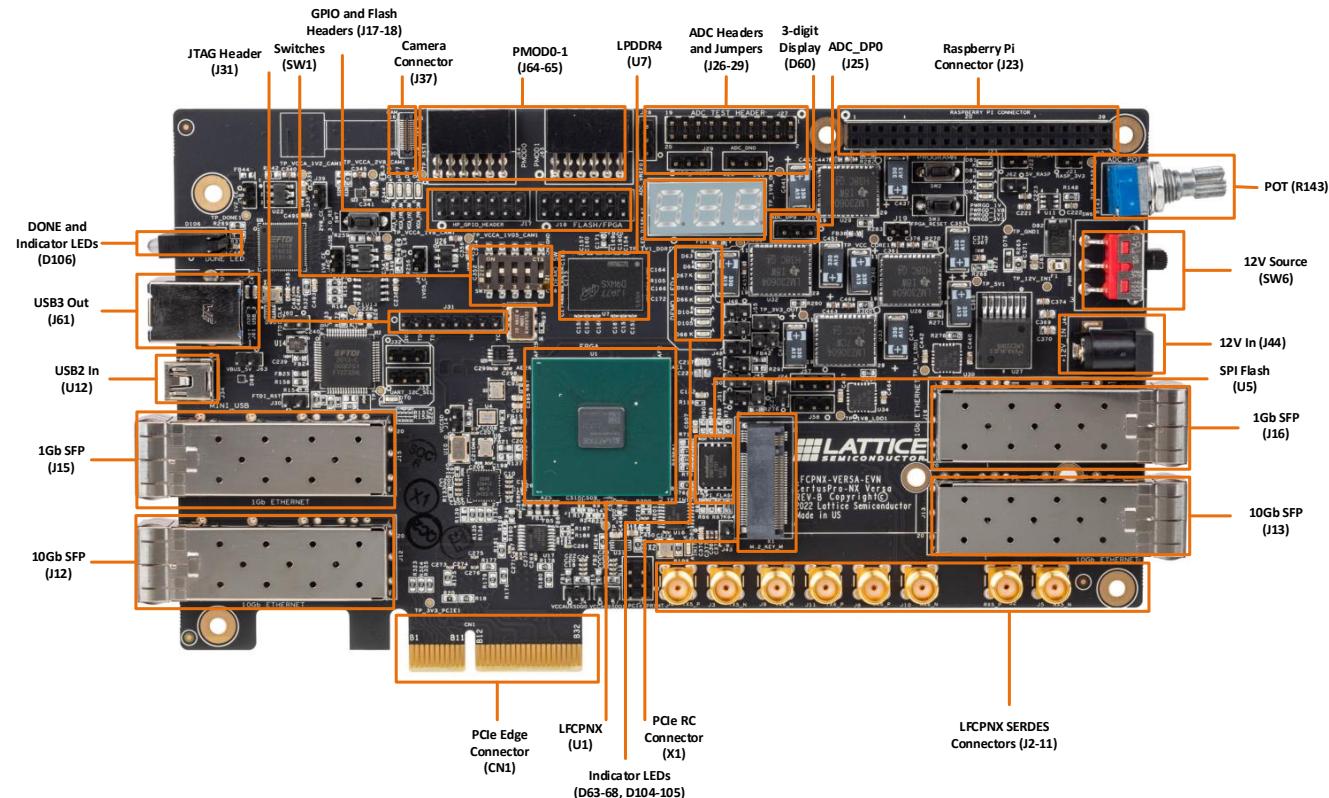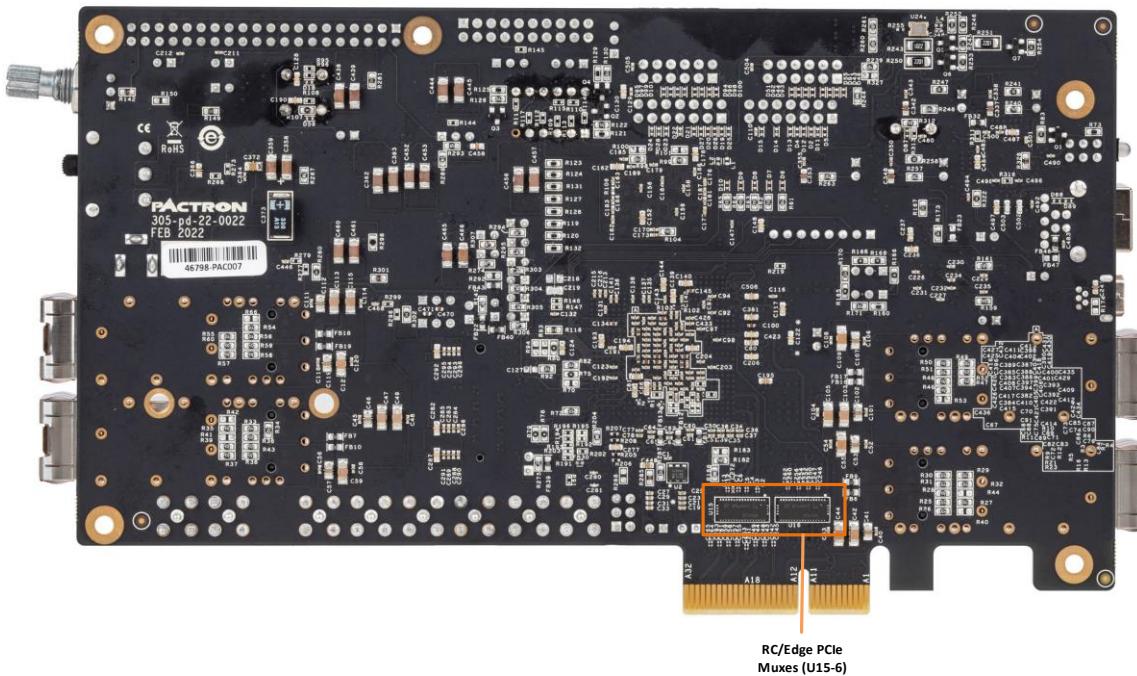
Figure 1.2. Bottom View of CertusPro-NX Versa Evaluation Board

Figure 1.1 shows the top view of CertusPro-NX Versa Evaluation Board. Figure 1.2 shows the bottom view of CertusPro-NX Versa Evaluation Board.

1.2. Features

The CertusPro-NX Versa Evaluation Board includes the following features:

- CertusPro-NX FPGA (LFCPNX-100-9LFG672I)
- PCIe x4 Gen3 supports:
  - Endpoint configuration
  - Root port configuration
- 2×SFP 10G Ethernet
- 2×SFP 1G SGMII
- 2×SerDes channels with SMA
- LPDDR4 DRAM Memory
- On-board Boot Flash – 128 Mb Serial Peripheral Interface (SPI) Flash, with Quad read feature
- USB 3.0 Controller
- USB-B connection for device programming and Inter-Integrated Circuit Bus (I^2C) utility
- MIPI CSI-2 Camera connector
- 7 Segment Display, Eight input DIP switches, four push buttons, 24 status LEDs for customer purposes
- Lattice Radiant® software programming support
- Multiple reference clock sources
- Potentiometer for ADC test

> **Caution:** The CertusPro-NX Versa Board contains ESD-sensitive components. ESD safe practices should be followed while handling and using the development board.

1.3. CertusPro-NX Device

The CertusPro-NX Versa Evaluation Board features the CertusPro-NX device in an LFG672 package, also referred to as LFCPNX-100-9LFG672I. The low-power general purpose FPGA can be used in a wide range of applications across multiple markets, and is optimized for bridging and processing needs in edge applications. For more information on the capabilities of CertusPro-NX device, see CertusPro-NX Family Data Sheet (FPGA-DS-02086).

1.4. Applying Power to the Board

The CertusPro-NX Versa Evaluation Board comes ready to power up. The board can power up using a 12 V DC power source input. The power supply can be connected with the right-angle DC power input jack J44, which is fused with a surface mounted fuse F1, as shown in Figure 1.3 and Table 1.1. The fuse can prevent the crashed current from flowing into the internal circuits and cause serious damage. Power LEDs light after applying 12 V DC power to the CertusPro-NX Evaluation Board to indicate that the board is functioning.

Figure 1.3. 12 V DC Power Supply

Table 1.1. Board Power Supply

Part Designator	Description
J44	12 V DC Input Supply Jack
F1	12 V DC Input Supply Fuse
SW6	—

2.   Jumper Definitions
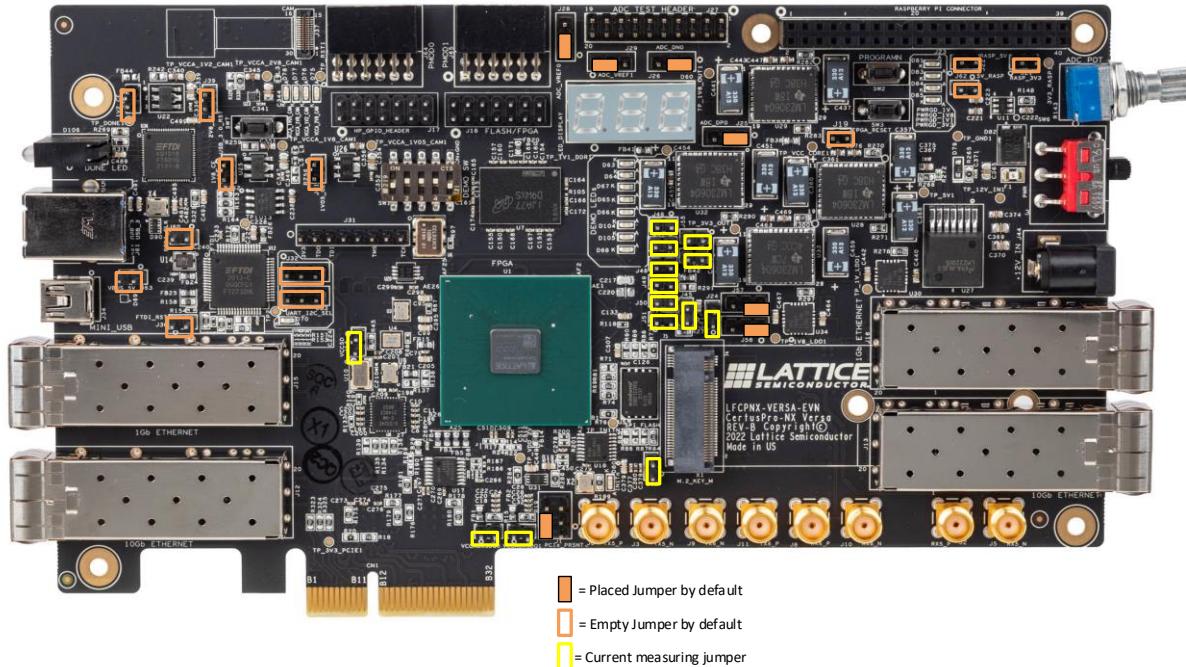
Figure 2.1. Top View of CertusPro-NX Versa Evaluation Board – Jumper Selection

Table 2.1. Jumper Details

Part	Description	Settings
J63	Powering the board from USB 2.0	Default Open
J60	FTDI_12MHz reference clock for FPGA	Default Open
J30	FTDI RESET	Default OPEN (Active FTDI)/Short (Reset FTDI)
J19	PROGRAMN pulldown	Default Open
J38	Camera 1.2 V Enable/Disable	Default Open
J39	Camera 2.8 V Enable/Disable	Default Open
J40	Camera 1.8 V Enable/Disable	Default Open
J41	Camera 1.05 V Enable/Disable	Default Open
J32, J33	FTDI UART/ I2C Select	Default 1-2 Short (1-2 Short FTDI UART/2-3 Short for FTDI I2C)
J4, J7, J14, J24, J42, J43, J45, J46, J47, J48, J49, J50, J51, J55	Current Measurement 2 Pin Header	—
J1	PCIe Link selection	Default Short 2-4 for PCIe X4, Short 1-2 for PCIe X1
J22	Raspberry Pi 5 V Selection	Default Open
J21	Raspberry Pi 3.3 V Selection	Default Open
J62	Powering the board from Raspberry Pi 5 V	Default Open
J57	VCCIO Selection for Bank 2	Default 1-2 for Short VCCIO2=3.3V, 2-3 for Short VCCIO2=1.8V
J58	VCCIO Selection for Bank 0	Default 1-2 for Short VCCIO0=3.3V, 2-3 for Short VCCIO0=1.8V
J26	ADC_DN0 Selection Jumper	Default 1–2 (GND)/2-3 (Pin 5 of J27)

Part	Description	Settings
J25	ADC_DP0 Selection Jumper	Default 1–2 (POT)/2-3 (Pin 3 of J27)
J28	ADC_REFP0 Selection Jumper	Default 1–2 (ADC_Vref)/2-3 (connector Input Voltage)
J29	ADC_REFP1 Selection Jumper	Default 1–2 (ADC_Vref)/2-3 (connector Input Voltage)

3. Programming and I²C

The JTAG/SPI programming architecture and I2C interface of the CertusPro-NX Versa Board are shown in Figure 3.1.
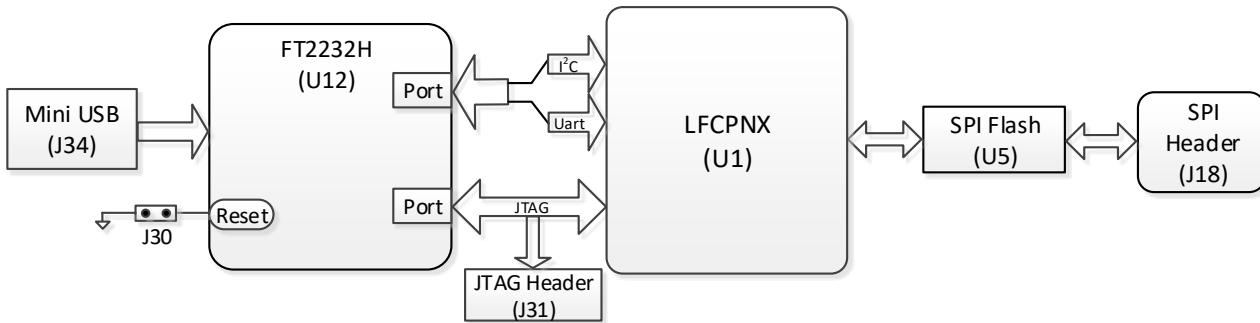
Figure 3.1. Configuration Architecture

3.1. JTAG Download Interface

The CertusPro-NX Versa Board has a built-in download controller for programming the CertusPro-NX device. It uses an FT2232H Future Technology Devices International (FTDI) part to convert USB to JTAG. To use the built-in download cable, connect the USB cable from a PC with Radiant Programmer tool installed to the mini USB connector on the board. The USB hub on the PC detects the cable of the USB function on Port 0, making the built-in cable available for use with the Radiant programming software.

3.2. Alternate JTAG Download Interface

J31 is an 8-pin standalone JTAG header used with an external Lattice download cable that is available separately, when the FTDI part is disabled from the JTAG chain after resetting FTDI. A USB download cable can be attached to the board using this JTAG Header to interface with the CertusPro-NX device. For details on the connection between the USB download cable and J28, refer to Programming Cables User Guide (FPGA-UG-02042).

JTAG Header can also be used as test point when USB to JTAG is working. The JTAG connection is shown in Table 3.1.

Table 3.1. JTAG Connection

J31 Pin Number	Signal Name	CertusPro-NX Pin
1	3V3_OUT	—
2	TDO	M8
3	TDI	L9
4	—	—
5	—	—
6	TMS	L7
7	GND	—
8	TCK	M5

3.3. Other FPGA Configuration Pins

The CertusPro-NX Versa Board provides test points for other FPGA configuration pins as shown in Table 3.2.

Table 3.2. Other JTAG Signals

Signal Name	CertusPro-NX Ball Location	Test Point	Push Button
PROGRAMN	G4	—	SW2
INITN	G2	TP_INITN	—
DONE	G5	TP_DONE1	—

- INITN: Open drain pin. This signal is driven to LOW when configuration sequence is started, indicating the device is in initialization state. At this moment, the LED (D28) is lighted with red color. This signal is released after initialization is completed, and the configuration download starts.
- DONE: Open drain pin. This signal is driven to LOW during configuration time. This signal releasing indicates the device has completed configuration. At this moment, the LED (D29) is lighted with green color.

For more information on Certus-NX JTAG and SPI programming, refer to sysCONFIG Usage Guide for Nexus Platform (FPGA-TN-02099).

3.4. JTAG to MSPI Pass-through Interface

The download controller can also access the JTAG to MSPI pass-through circuit that allows the slave SPI Flash to be erased, programmed, and read with Radiant Programmer.

3.5. SPI Flash Device Selection in Programmer

The Flash device on this board is a Winbond W25Q512JVEIQ which is powered by default to 3.3 V. Flash device programming is discussed in more detail in sysCONFIG Usage Guide for Nexus Platform (FPGA-TN-02099).
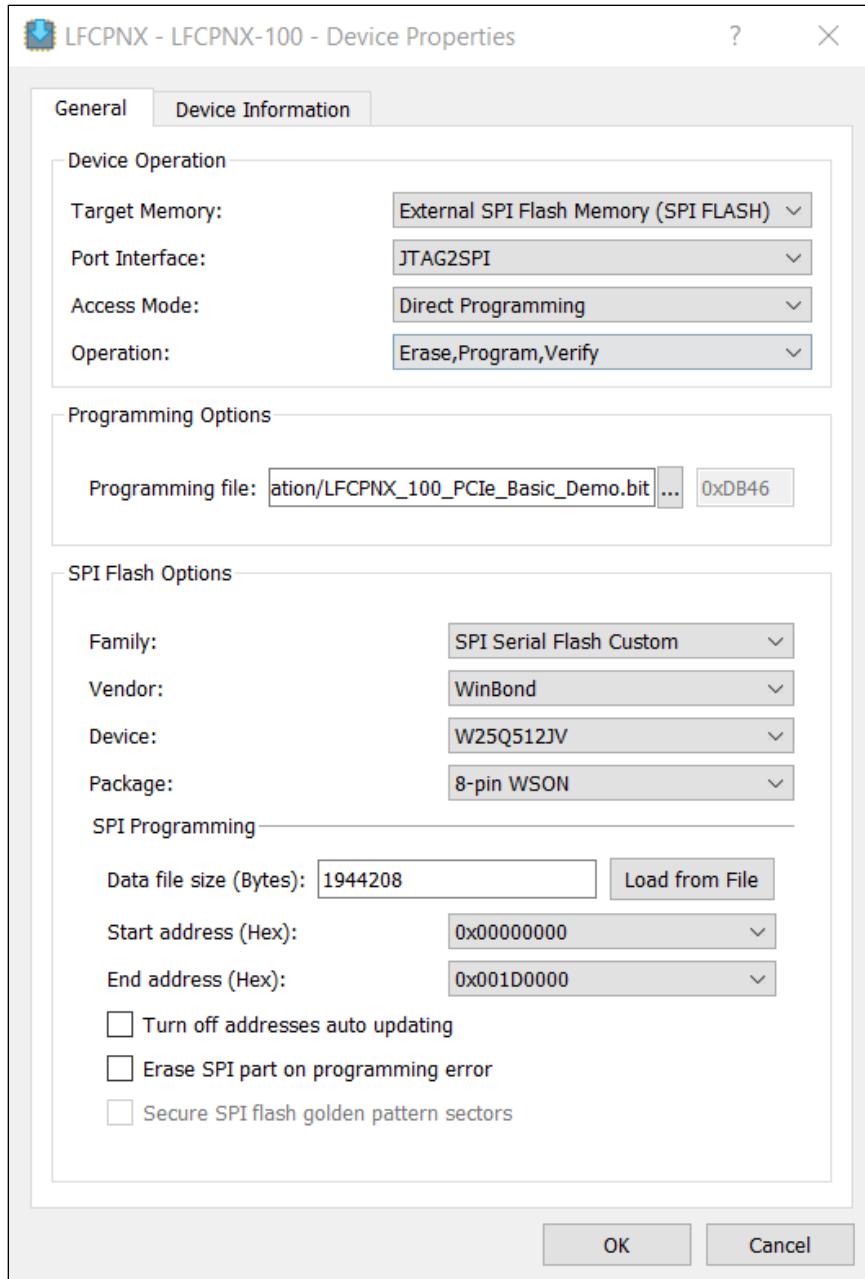
Figure 3.2. SPI Flash Operation Dialog

3.6. Programming the FPGA

This section guides you through the process of uploading the bit file in SPI Flash. Follow the instructions below.

To program the .bit file, you need to install Lattice Radiant 2.2 or later versions.

Note: The software programs are available at http://www.latticesemi.com/en/Products/DesignSoftwareAndIP. The software programs are available for download only if you log into your account at this website.

1. Connect the 12 V power adapter to the J44 connector of the CertusPro-NX Versa Board.
2. Connect the USB Cable to the J34 connector of the CertusPro-NX Versa Board.

3. If the Radiant project is already opened in Lattice Radiant software, click the Radiant Programmer icon from the toolbar. If the project is not opened, click the **Windows Start** menu and choose **Radiant Programmer** to open the stand-alone Radiant Programmer. The **Radiant Programmer - Getting Started** dialog pops up (Figure 3.3). The default project name is **Untitled**. Enter a desired project name and browse to choose the project location from the **Project Location** area. Click OK.
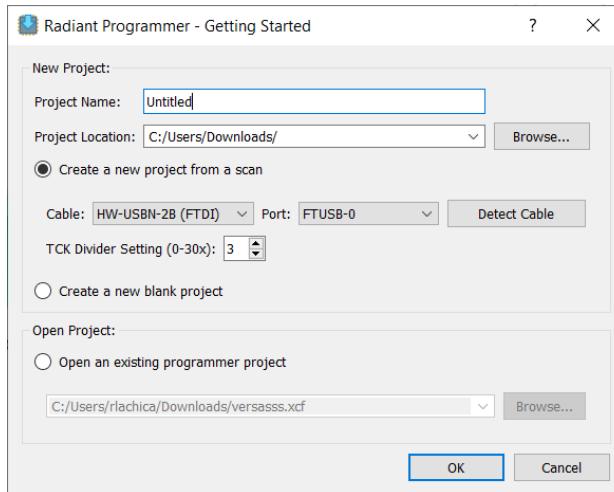
Figure 3.3. Stand-alone Radiant Programmer Opened from Windows Start Menu

4. You can see the selected project opened in the Programmer (Figure 3.4).
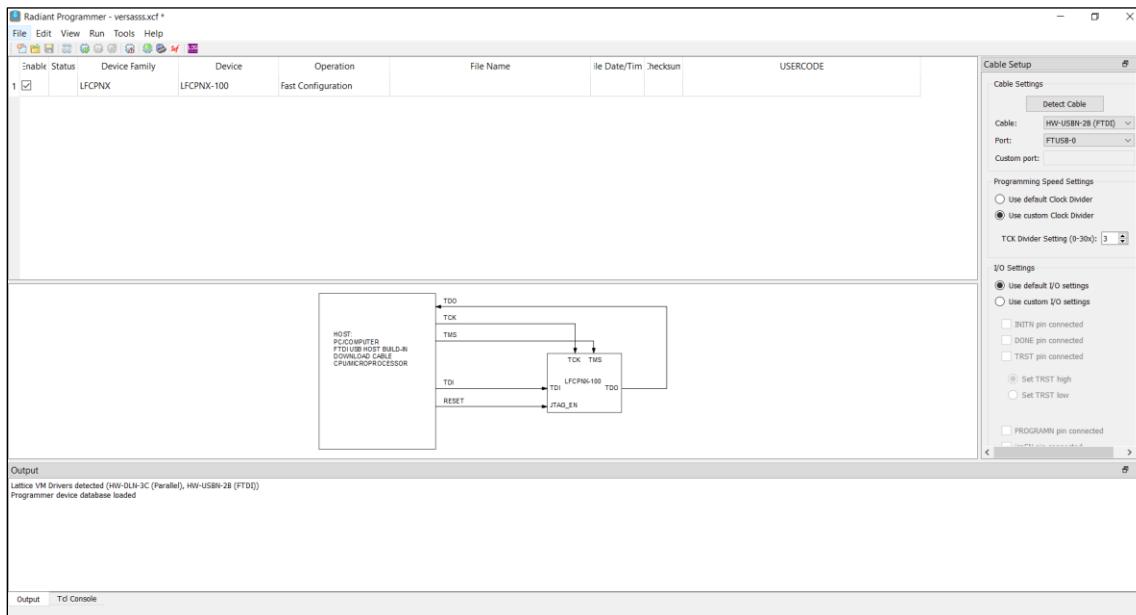
Figure 3.4. Radiant Programmer Opened from Windows Start Menu

5. If the settings you see are not the same as those shown in Figure 3.5, manually make changes and make settings (device family, device, and so on) the same as those shown in Figure 3.5.

Figure 3.5. FPGA Device Setting

6. Click on **Fast Configuration** from the **Operation** column (Figure 3.5). The **Device Properties** dialog pops up (Figure 3.6). Change the **Target Memory** settings using the drop-down menu, and then you can see the device properties settings exactly as those shown in Figure 3.6.
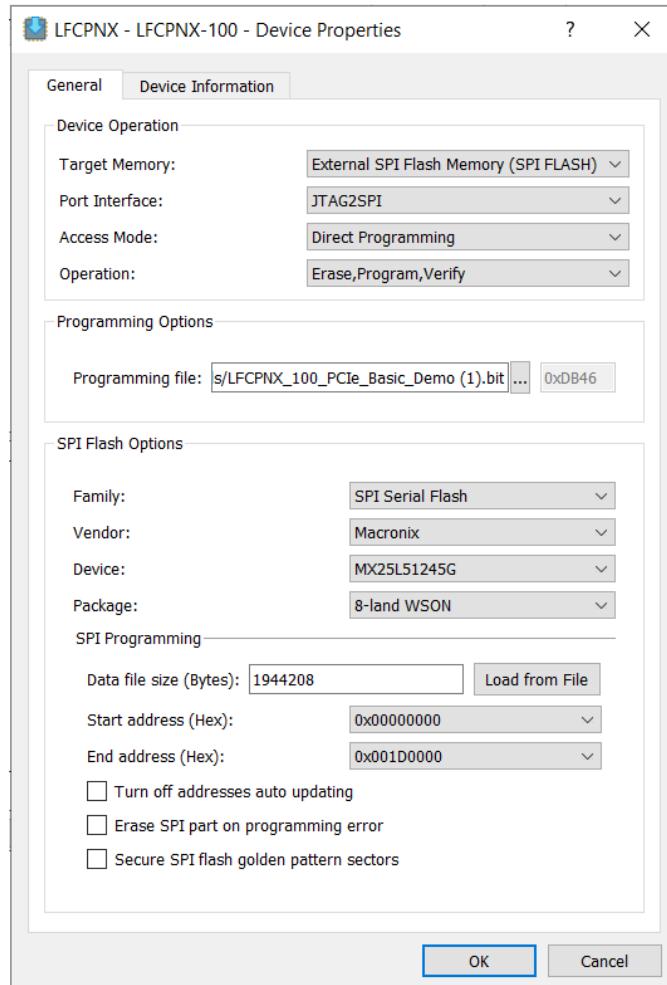
Figure 3.6. Device Properties Dialog for SPI Flash Programming Setting

7. Browse to choose the programming file "LFCPNX_100_PCIe_Basic_Demo".bit (Figure 3.6).
8. Click **OK**.
9. Click the **Program Device** icon from the toolbar (Figure 3.7) to start the programming.

Figure 3.7. Programmer Toolbar

10. Check the Output console for the status of the programming. You should see **Operation: Successful**, as shown in Figure 3.8.
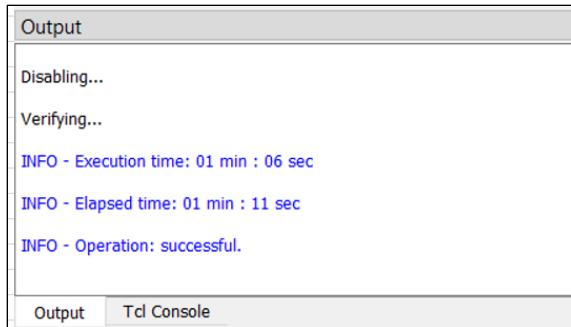
Figure 3.8. Programmer Output Window

11. If there is any issue or problem, refer to the Troubleshooting section for more details.

12. After programming, power cycle the board.

3.7. Troubleshooting

This section guides you through the troubleshooting process while testing the design.

- If you get verification error while dumping the .bit file, try changing the TCK frequency to be greater than 4. The TCK Divider setting option can be found from the right-click menu of the Radiant Programmer Window (Figure 3.9).

  Restart programming by clicking the **Program Device** icon .
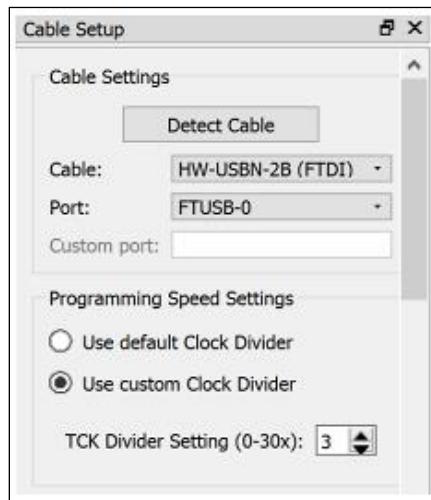
Figure 3.9. TCK Frequency Setting

- If the device is not detected on port FTUSB-0, click on **Detect Cable** and select the port FTUSB-1 (Figure 3.10).
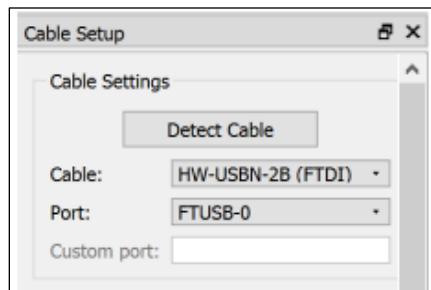
Figure 3.10. Port Selecting

4. CertusPro-NX Clock Sources

The CertusPro-NX Versa Board has three clock sources for the CertusPro-NX FPGA. Refer to Table 4.1 and Figure 4.1 for more details regarding the clock sources.

Table 4.1. Clock Sources

Clock Frequency	Signal Name	Clock Sources	CertusPro-NX Ball	Type
161.1 MHz	F_SFP_161.1328Mhz_CLK_P F_SFP_161.1328Mhz_CLK_N	U2	C14/D13	Differential
125 MHz	F_CLKIN_125Mhz	U4	P24	Single Ended
125 MHz	F_125Mhz_P F_125Mhz_N	U3	W24/W23	Differential
100 MHz	F_DDR_100Mhz_P F_DDR_100MHz_N	U6	AB19/AB18	Differential
27 MHz	CAM_CLK	U24	20 (Camera)	Single Ended
19.44 MHz	PLL_CLKIN2_P	U10	12 (PLL)	Single Ended
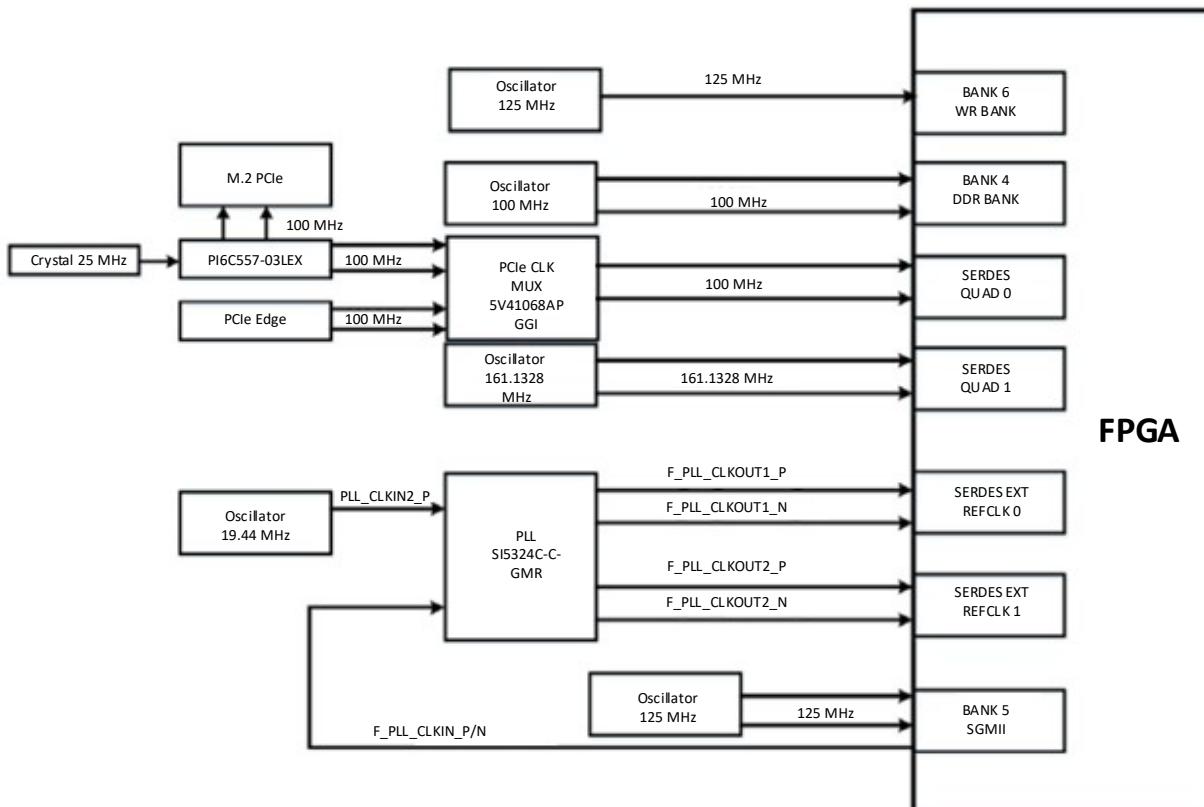
Figure 4.1. Clock Scheme

5. Power Scheme

The CertusPro-NX Versa Evaluation Board has most of the on-board regulators powered by an external 12 V power. Refer to Appendix A. CertusPro-NX Versa Evaluation Board Schematics to see the details of these power supply options.

Figure 5.1 shows the high-level power supply architecture of the board. Table 5.1 shows the voltage options available for various VCCIO supplies.
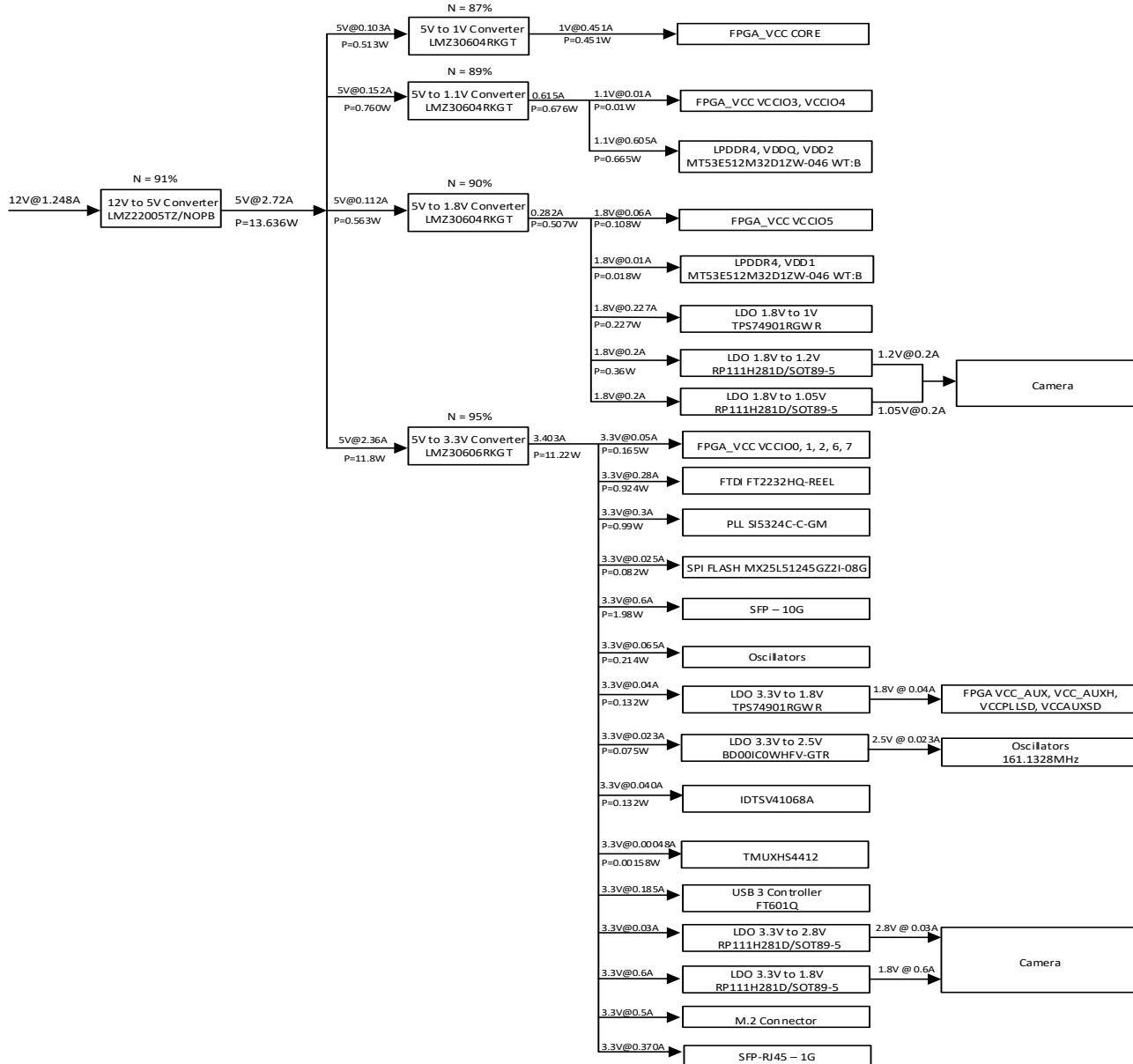
Figure 5.1. Power Scheme

Table 5.1. VCCIO Supply Options

VCCIO Bank	3.3 V	2.5 V	1.8 V	1.5 V	1.2 V	1.1 V
VCCIO0	Default	—	Selectable	—	—	—
VCCIO1	Fixed	—	—	—	—	—
VCCIO2	Default	—	Selectable	—	—	—
VCCIO3	—	—	—	—	—	Fixed
VCCIO4	—	—	—	—	—	Fixed
VCCIO5	—	—	Fixed	—	—	—
VCCIO6	Fixed	—	—	—	—	—
VCCIO7	Fixed	—	—	—	—	—

The CertusPro-NX Versa Evaluation Boards provide status LEDs to provide a visual indication of power status (Table 5.2).

Table 5.2. Status LED Definition

LED Designator	Color	Description
D81	Green	PWRGD_1V
D83	Green	PWRGD_1V8
D84	Green	PWRGD_1V1
D85	Green	PWRGD_3V3
D78	Green	VCCA_1V05_CAM
D77	Green	VCCA_1V8_CAM
D76	Green	VCCA_1V2_CAM
D75	Green	VCCA_2V8_CAM

6. Control Buses – I²C, UART, and SPI

This section describes the topology of the various configuration and communication buses.

6.1. I²C Topology

The CertusPro-NX Versa Evaluation Board uses the I²C bus to support CertusPro-NX configuration. The I²C bus has the signal names FTDI_I2C_SCL and FTDI_I2C_SDA. When the jumpers (J32, J33) are closed, the I2C bus is connected to a dedicated CertusPro-NX GPIO bank 1. I2C and UART share the same output port B on FTDI chip. The I2C connections are summarized in Table 6.1.

Table 6.1. I²C Bus Connections

Signal Name	CertusPro-NX Ball Location	FTDI Chip Ball Location	Jumper
FTDI_I2C_SCL	M7	38	J32
FTDI_I2C_SDA	M6	39&40	J33

6.2. UART Topology

The board provides one UART communication interface by providing a flexible connection between the CertusPro-NX device and FTDI chip. Close the two jumpers, J32 and J33, to connect to two general-purpose I/O in Bank 1, as shown in Table 6.2. This UART is alternative with I²C bus by setting FTDI configuration.

Table 6.2. UART Bus Connections

Signal Name	CertusPro-NX Ball Location	FTDI Chip Ball Location	Jumper
FTDI_UART_TXD	L8	38	J32
FTDI_UART_RXD	M9	39	J33

Note: The signal name and ball location refer to the FTDI chip perspective. When assigning the pins in Radiant, make sure the UART soft IP TX signal is connected to pin M9 (FTDI_UART_RXD). Repeat the same process for the RX signal.

6.3. SPI Topology

6.3.1. SPI Configuration

One of the major functions of SPI connections on the board is to support CertusPro-NX configuration from the SPI Flash or the Parallel Configuration Header (J18), as shown in Table 6.3. The CertusPro-NX Versa Evaluation Board can support both Master SPI (MSPI) and Slave SPI (SSPI) modes for CertusPro-NX configuration.

Table 6.3. SPI Bus Connections

Signal Name	CertusPro-NX Ball	Parallel Configuration Header Pin
CONN_FLASH_MCLK	G6	12
CONN_FLASH _MOSI	H7	5
CONN_FLASH _MISO	H6	7
CONN_FLASH_CS	G7	2
CONN_FLASH_DQ2	K5	11
CONN_FLASH_DQ3	H4	9
MCSNO	H3	3

7. LEDs and Switches

This section describes the CertusPro-NX Versa Evaluation Board LEDs and switches that can be used in demo and customer designs.

7.1. DIP Switch

Five CertusPro-NX pins are connected to the DIP switch (SW1) to allow manual actuating input to the FPGA. One side of each switch is connected to GPIOs within bank 5, and is pulled up through 4.7 kΩ resistors. The other side is grounded. The designated pins are connected as shown in Table 7.1.

Table 7.1. DIP Switch Signals

Signal Name	CertusPro-NX Ball Location	CertusPro-NX Bank
DIP_SW1	AA23	5
DIP_SW2	AB22	5
DIP_SW3	AC22	5
DIP_SW4	AA22	5
DIP_SW5	W21	5

7.2. Push Buttons

The CertusPro-NX Versa Evaluation Board provides four push button switches, SW2, SW3, SW7, for demo and user applications. One of the buttons is a pre-defined functional pin, and the other three are generic pins. Pressing these buttons drives a logic level "0" to the corresponding I/O pins. The designated pins are connected as shown in Table 7.2.

Table 7.2. Push Button Switch Signals

Signal Name	CertusPro-NX Ball Location	Push Button Reference	Logic Level at Button Pressed
PROGRAMN	G4	SW2	0
FPGA_RESET	N9	SW3	0
F_USB3.0_RESET	H21	SW7	0

For more information on PROGRAMN, refer to sysCONFIG Usage Guide for Nexus Platform (FPGA-TN-02099).

7.3. General Purpose LEDs

The CertusPro-NX Versa Evaluation Board provides eight LEDs that are connected to I/O within Bank 1. The LEDs are lighted with green color when the output is driven LOW. The designated pins are connected as shown in Table 7.3.

Table 7.3. General Purpose LED Signals

Signal Name	CertusPro-NX Ball Location	CertusPro-NX Bank/Color
LED_0	R5	1/Green
LED_1	R4	1/Green
LED_2	R8	1/Green
LED_3	R9	1/Green
LED_4	U8	1/Green
LED_5	R7	1/Green
LED_6	R6	1/Green
LED_7	P8	1/Green

7.4. 7-Segment LED

The CertusPro-NX Versa Evaluation Board provides one 3-digit 7-segment LEDs that are connected to I/O within Bank 1. The LEDs are lighted based on a segment coding. The designated pins are connected as shown in Table 7.4.

Table 7.4. 7-Segment LED Signals

Signal Name	CertusPro-NX Ball Location
SEG_A	M4
SEG_B	M3
SEG_C	M2
SEG_D	M1
SEG_E	N1
SEG_F	N2
SEG_G	N3
SEG_DP	N4
K_DIG1	AC21
K_DIG2	W22
K_DIG3	AE26

8. Headers/Connectors and CertusPro-NX Device Ball Mapping

This section describes the CertusPro-NX Versa Evaluation Board headers/connectors and ball mapping.

8.1. SMA Connectors

Table 8.1. SMA Connections

SMA Designator	Signal Name	CertusPro-NX Ball Location
J6	F_SFP5_TX_P	A18
J3	F_SFP5_TX_N	A17
J11	F_SFP6_TX_P	A15
J9	F_SFP6_TX_N	A14
J8	F_SFP6_RX_P	C16
J10	F_SFP6_RX_N	B16
J2	F_SFP5_RX_P	B20
J5	F_SFP5_RX_N	B19

8.2. Raspberry PI Board GPIO Header

The CertusPro-NX Versa Evaluation Board provides a 40-pin receptacle, which is compatible with the GPIO header of Raspberry PI 2/3 serial models, or can be used for general purpose I/O.

Table 8.2. Raspberry PI Header Pin Connections

J23 Pin Number	Signal Name	CertusPro-NX Ball Location
1	3V3_RASP	—
2	5V_RASP	—
3	RASP_IO02	J22
4	5V_RASP	—
5	RASP_IO03	J21
6	GND	—
7	RASP_IO04	J20
8	RASP_IO14	L26
9	GND	—
10	RASP_IO15	L25
11	RASP_IO17	L23
12	RASP_IO18	L22
13	RASP_IO27	N21
14	GND	—
15	RASP_IO22	N26
16	RASP_IO23	N25
17	3V3_RASP	—
18	RASP_IO24	N24
19	RASP_IO10	L21
20	GND	—
21	RASP_IO09	K21
22	RASP_IO25	N23
23	RASP_IO11	K24
24	RASP_IO08	K19
25	GND	—

J23 Pin Number	Signal Name	CertusPro-NX Ball Location
26	RASP_IO07	K18
27	RASP_ID_SD	N19
28	RASP_ID_SC	P18
29	RASP_IO05	J19
30	GND	—
31	RASP_IO06	K20
32	RASP_IO12	K25
33	RASP_IO13	K26
34	GND	—
35	RASP_IO19	L20
36	RASP_IO16	L24
37	RASP_IO26	N22
38	RASP_IO20	L19
39	GND	—
40	RASP_IO21	M26

8.3. External Flash Configuration Header

Table 8.3. SPI Flash Configuration Header Pin Connections

J18 Pin Number	Signal Name	CertusPro-NX Ball Location
1	CONN_PROGRAMN	G4
2	CONN_FLASH_CS	G7[1]
3	MCSNO	H3
4	DONE	G5
5	CONN_FLASH_MOSI	H7[1]
6	CONN_INITN	G2
7	CONN_FLASH_MISO	H6[1]
8	—	—
9	CONN_FLASH_DQ3	H4[1]
10	VCCIO0	—
11	CONN_FLASH_DQ2	K5[1]
12	CONN_FLASH_MCLK	G6[1]
13	GND	—
14	GND	—

Note:

1. These connections are possible if 0 Ω resistors installed.

8.4. ADC Test Header

Table 8.4. ADC Test Header Pin Details

J27 Pin Number	Signal Name	CertusPro-NX Ball Location
1	GND	—
2	GND	—
3	J25 Pin 3	—
4	GND	—
5	J26 Pin 3	—
6	GND	—
7	GND	—

J27 Pin Number	Signal Name	CertusPro-NX Ball Location
8	GND	—
9	ADC_DP1	AE1
10	GND	—
11	ADC_DN1	AD1
12	GND	—
13	GND	—
14	GND	—
15	VREF1_CON	—
16	GND	—
17	GND	—
18	GND	—
19	VREF0_CON	—
20	GND	—

8.5. PMOD Header

J64 and J65 headers can be used as GPIO or as a connector to PMOD interface.

Table 8.5. PMOD Header Pin Details

Pin Name		Signal Name	CertusPro-NX Ball Location
J65	1	PMOD1_1	T1
	2	PMOD1_2	U2
	3	PMOD1_3	U3
	4	PMOD1_4	V1
	7	PMOD1_7	V3
	8	PMOD1_8	W2
	9	PMOD1_9	Y1
	10	PMOD1_10	AA1
J64	1	PMOD0_1	T3
	2	PMOD0_2	T2
	3	PMOD0_3	U1
	4	PMOD0_4	U6
	7	PMOD0_7	V2
	8	PMOD0_8	W1
	9	PMOD0_9	W3
	10	PMOD0_10	AB1

8.6. Camera Connector

Table 8.6. Camera Connector Pin Details

J37 Pin Number	Signal Name	Certus-NX Ball Location
1	No Connect	—
2	SLVS_CN	AE12
3	SLVS_CP	AE13
4	GND	—
5	SLVS_3N	W18
6	SLVS_3P	W17
7	GND	—
8	SLVS_1N	AE19
9	SLVS_1P	AF19
10	GND	—
11	SLVS_0N	AF20
12	SLVS_0P	AF21
13	GND	—
14	SLVS_2N	AD18
15	SLVS_2P	AC18
16	GND	—
17	GND	—
18	AGND_S	—
19	No Connect	—
20	CAM_CLK	—
21	FRM_SYNC	AE24
22	CAM_SDA	AB20
23	CAM_SCL	AF24
24	CAM_RST	AC20
25	VCCA1V2CAM	—
26	VCCA1V8CAM	—
27	GND	—
28	GND	—
29	VCCA2V8CAM	—
30	GND	—

8.7. SFP Connectors

Table 8.7. SFP Connector Pin Details

SGMII – 1Gbe Ethernet –1		
J15 Pin Number	**Signal Name**	**CertusPro-NX Ball Location**
1	GND	—
2	F_SFP3_TX_FAULT	T20
3	F_SFP3_TX_DISABLE	T19
4	F_SFP3_I2C_SDA	T18
5	F_SFP3_I2C_SCL	U19
6	F_SFP3_ABS	U22
7	—	—
8	F_SFP3_LOS	U18
9	—	—
10	GND	—
11	GND	—
12	F_SFP3_RX_P	V24
13	F_SFP3_RX_N	V25
14	GND	—
15	3V3_OUT	—
16	3V3_OUT	—
17	GND	—
18	F_SFP3_TX_P	U26
19	F_SFP3_TX_N	V26
20	GND	—

SGMII – 1Gbe Ethernet –2		
J16 Pin Number	**Signal Name**	**CertusPro-NX Ball Location**
1	GND	—
2	F_SFP4_TX_FAULT	U23
3	F_SFP4_TX_DISABLE	U24
4	F_SFP4_I2C_SDA	U25
5	F_SFP4_I2C_SCL	V18
6	F_SFP4_ABS	V20
7	—	—
8	F_SFP4_LOS	V19
9	—	—
10	GND	—
11	GND	—
12	F_SFP4_RX_P	V23
13	F_SFP4_RX_N	V22
14	GND	—
15	3V3_OUT	—
16	3V3_OUT	—
17	GND	—
18	F_SFP4_TX_P	W25
19	F_SFP4_TX_N	W26
20	GND	—

10Gbe Ethernet –1		
J12 Pin Number	Signal Name	CertusPro-NX Ball Location
1	GND	—
2	F_SFP1_TX_FAULT	P26
3	F_SFP1_TX_DISABLE	P25
4	F_SFP1_I2C_SDA	P23
5	F_SFP1_I2C_SCL	P22
6	F_SFP1_ABS	P21
7	—	—
8	F_SFP1_LOS	R20
9	—	—
10	GND	—
11	GND	—
12	F_SFP1_RX_P	B13
13	F_SFP1_RX_N	C12
14	GND	—
15	3V3_OUT	—
16	3V3_OUT	—
17	GND	—
18	F_SFP1_TX_P	A12
19	F_SFP1_TX_N	A11
20	GND	—

10Gbe Ethernet –2		
J13 Pin Number	Signal Name	CertusPro-NX Ball Location
1	GND	—
2	F_SFP2_TX_FAULT	R21
3	F_SFP2_TX_DISABLE	R19
4	F_SFP2_I2C_SDA	R18
5	F_SFP2_I2C_SCL	R22
6	F_SFP2_ABS	T22
7	—	—
8	F_SFP2_LOS	R25
9	—	—
10	GND	—
11	GND	—
12	F_SFP2_RX_P	B10
13	F_SFP2_RX_N	C10
14	GND	—
15	3V3_OUT	—
16	3V3_OUT	—
17	GND	—
18	F_SFP2_TX_P	A9
19	F_SFP2_TX_N	A8
20	GND	—

8.8. PCIe Edge Connector

Table 8.8. PCIe Edge Connector Pin Details

CN1 Pin Name	Signal Name	CertusPro-NX Ball	CN1 Pin Name	Signal Name	CertusPro-NX Ball
A1	PCIe_EC_PRSNT#1	—	B1	12V_IN_PCIE	—
A2	12V_IN_PCIE	—	B2	12V_IN_PCIE	—
A3	12V_IN_PCIE	—	B3	12V_IN_PCIE	—
A4	GND	—	B4	GND	—
A5	No Connection	—	B5	PCIe_SMCLK	T8
A6	No Connection	—	B6	PCIe_SMDATA	T7
A7	No Connection	—	B7	GND	—
A8	No Connection	—	B8	3V3_PCIe	—
A9	3V3_PCIe	—	B9	PCIe_TRST	P9
A10	3V3_PCIe	—	B10	No Connection	—
A11	F_PCIe_EC_PRSNT	R26	B11	PCIe_WAKE	P19
A12	GND	—	B12	No Connection	—
A13	F_PCIe_EC_100MHz_CLK_P	F20[1]	B13	GND	—
A14	F_PCIe_EC_100MHz_CLK_N	E20[1]	B14	EP_PCIe_RXD0_P	G24[1]
A15	GND	—	B15	EP_PCIe_RXD0_N	G25[1]
A16	EP_PCIe_TXD0_P	F26[1]	B16	GND	—
A17	EP_PCIe_TXD0_N	E26[1]	B17	PCIe_EC_PRSNT#2	—
A18	GND	—	B18	GND	—
A19	No Connection	—	B19	EP_PCIe_RXD1_P	E24[1]
A20	GND	—	B20	EP_PCIe_RXD1_N	D25[1]
A21	EP_PCIe_TXD1_P	C26[1]	B21	GND	—
A22	EP_PCIe_TXD1_N	B26[1]	B22	GND	—
A23	GND	—	B23	EP_PCIe_RXD2_P	C24[1]
A24	GND	—	B24	EP_PCIe_RXD2_N	B23[1]
A25	EP_PCIe_TXD2_P	A25[1]	B25	GND	—
A26	EP_PCIe_TXD2_N	A24[1]	B26	GND	—
A27	GND	—	B27	EP_PCIe_RXD3_P	C21[1]
A28	GND	—	B28	EP_PCIe_RXD3_N	C22[1]
A29	EP_PCIe_TXD3_P	A22[1]	B29	GND	—
A30	EP_PCIe_TXD3_N	A21[1]	B30	No Connection	—
A31	GND	—	B31	PCIe_EC_PRSNT#2	—
A32	No Connection	—	B32	GND	—

Note:
1. Connects to CPNX if Endpoint PCIe selected.

8.9. M.2 PCIe Connector

Table 8.9. M.2 PCIe Connector Pin Details

X1 Pin Name	Signal Name	CertusPro-NX Ball	X1 Pin Name	Signal Name	CertusPro-NX Ball
1	GND	—	39	GND	—
2	3V3_OUT	—	40	No Connection	—
3	GND	—	41	RC_PCIe_RXD0_N	G25[1]
4	3V3_OUT	—	42	No Connection	—
5	RC_PCIe_RXD3_N	C22[1]	43	RC_PCIe_RXD0_P	G24[1]

X1 Pin Name	Signal Name	CertusPro-NX Ball	X1 Pin Name	Signal Name	CertusPro-NX Ball
6	No Connection	—	44	No Connection	—
7	RC_PCIe_RXD3_P	C21[1]	45	GND	—
8	No Connection	—	46	No Connection	—
9	GND	—	47	RC_PCIe_TXD0_N	E26[1]
10	No Connection	—	48	No Connection	—
11	RC_PCIe_TXD3_N	A21[1]	49	RC_PCIe_TXD0_P	F26[1]
12	3V3_OUT	—	50	M2_PCIE_RST#	N20
13	RC_PCIe_TXD3_P	A22[1]	51	GND	—
14	3V3_OUT	—	52	M2_CLKREQ#	AB3
15	GND	—	53	M.2_PCIE_100Mhz_CLK_N	
16	3V3_OUT	—	54	M2_WAKE#	P20
17	RC_PCIe_RXD2_N	B23[1]	55	M.2_PCIE_100Mhz_CLK_P	—
18	3V3_OUT	—	56	No Connection	—
19	RC_PCIe_RXD2_P	C24[1]	57	GND	—
20	No Connection	—	58	No Connection	—
21	GND	—	59	—	—
22	No Connection	—	60	—	—
23	RC_PCIe_TXD2_N	A24[1]	61	—	—
24	No Connection	—	62	—	—
25	RC_PCIe_TXD2_P	A25[1]	63	—	—
26	No Connection	—	64	—	—
27	GND	—	65	—	—
28	No Connection	—	66	—	—
29	RC_PCIe_RXD1_N	D25[1]	67	No Connection	—
30	No Connection	—	68	No Connection	—
31	RC_PCIe_RXD1_P	E24[1]	69	No Connection	—
32	No Connection	—	70	3V3_OUT	—
33	GND	—	71	GND	—
34	No Connection	—	72	3V3_OUT	—
35	RC_PCIe_TXD1_N	B26[1]	73	GND	—
36	No Connection	—	74	3V3_OUT	—
37	RC_PCIe_TXD1_P	C26[1]	75	GND	—
38	No Connection	—	—	—	—

Note:
1. Connects to CPNX if Root-Complex PCIe selected.

8.10. HP_GPIO HEADER

Table 8.10. HP_GPIO HEADER Pin Details

J17 Pin Number	Signal Name	CertusPro-NX Ball Location
1	GND	—
2	GND	—
3	HP_GPIO6	AB23
4	HP_GPIO1	AD23
5	HP_GPIO7	AB24
6	HP_GPIO2	AC24
7	HP_GPIO8	AD26
8	HP_GPIO3	AC25

J17 Pin Number	Signal Name	CertusPro-NX Ball Location
9	No Connection	—
10	HP_GPIO4	AC26
11	No Connection	—
12	HP_GPIO5	AB26
13	VCCIO5_1V8	—
14	VCCIO5_1V8	—

9. Software Requirements

The following software versions are required to develop designs for the CertusPro-NX Versa Evaluation Board:

- Lattice Radiant Software 3.0 or later
- Lattice Radiant Programmer 3.0 or later

10. Storage and Handling

Static electricity can shorten the life span of electronic components. Observe these tips to prevent damage that can occur from electrostatic discharge:

- Use antistatic precautions such as operating on an antistatic mat and wearing an antistatic wristband.
- Store the development board in the provided packaging.
- Touch a metal USB housing to equalize voltage potential between you and the board.

11. Ordering Information

Table 11.1. Ordering Information

Description	Ordering Part Number	China RoHS Environment-Friendly Use Period (EFUP)
CertusPro-NX Versa Evaluation Board	LFCPNX-VERSA-EVN	

Appendix A. CertusPro-NX Versa Evaluation Board Schematics

CertusPro-NX Versa
Rev B

00.TITLE PAGE
01.BLOCK DIAGRAM
02.SERDES QUADS, PCIe edge
03.10G SFP, SERDES Power
04.BANK5,6,1G SFP,DIP SW,HP GPIO HEADER
05.BANK0,SPI FLASH,CONFG_PIN
06.BANK2,BANK3, BANK4, PMOD0 & PMOD1
07.LPDDR4
08.BANK1,LEDS, 7 SEG DISPLAY
09.BANK7, PLL, RASPBERRY_CONN
10.ADC,VSS, VSSSDQ
11.FTDI High-Speed USB
12.PCIe SWITCH SECTION
13.M2_CONNECTOR_SECTION
14.USB_FTD601_SECTION
15.CAMERA_CONN_SECTION
16.POWER_SUPPLY_SECTION_1
17.POWER_SUPPLY_SECTION_2
18.POWER_SUPPLY_SECTION_3
19.POWER DIAGRAM
20.CLOCK DIAGRAM

Lattice Semiconductor Applications
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Title COVER_PAGE

Size A3
Project CertusPro-NX Versa Board
Schematic Rev 1.0
Board Rev B
Date: Monday, May 09, 2022
Sheet 1 of 21

Figure A.1. Cover Page

BLOCK DIAGRAM

10 G SFP1 (1888 247-1)	10 G SFP2 (1888 247-1)	SMA (0733 91007 0)	SMA (0733 91007 0)	PCIe Edge	PCIe x4 SW TMUXHS 4412IRU AT	ROOT COMP LEX	SPI FLASH MX25L51245GZ2I-08G	USB 3.0

CH7 CH6 CH5 CH4 · CH3 CH2 CH1 CH0

SERDES QUAD 1 · **SERDES QUAD 0**

WR BANK 0 3.3V

PLL (SI5324C-C-GMR) RASP Interface USB3.0

WR BANK 7 3.3V

WR BANK 1 3.3V

3 – Digit 7 SEG, 8 LEDs FTDI (UART/I2C), FPGA Reset, PCIe Selection, USB 3.0 and JTAG

CERTUSPRO NX-FPGA

USB 3.0, SFP Miscellaneous Signals And 125 MHz OSC

WR BANK 6 3.3V

WR BANK 2 3.3V

USB 3.0, PMOD1 & PMOD 2 Page 6

HP BANK 5 1.8V · **HP BANK 4 1.1V** · **HP BANK 3 1.1V** · **ADC**

Potentiometer and 20 Pin ADC Header Page 10

DIP Switch 10 Pin HP GPIO Header SFP Control OSC LVDS_125_ MHz

1G SFP SFP-1GBT-05 · **1G SFP SFP-1GBT-05** · LPDDR4 (Page 8) MT53E512M32D1ZW-046 WT:B100MHz OSC (XLL535100:000000I) Page 6 · CAMERA iMX258

Figure A.2. Block Diagram

SERDES QUADS, PCIe EDGE Connector

Figure A.3. SERDES QUADS, PCIe Edge
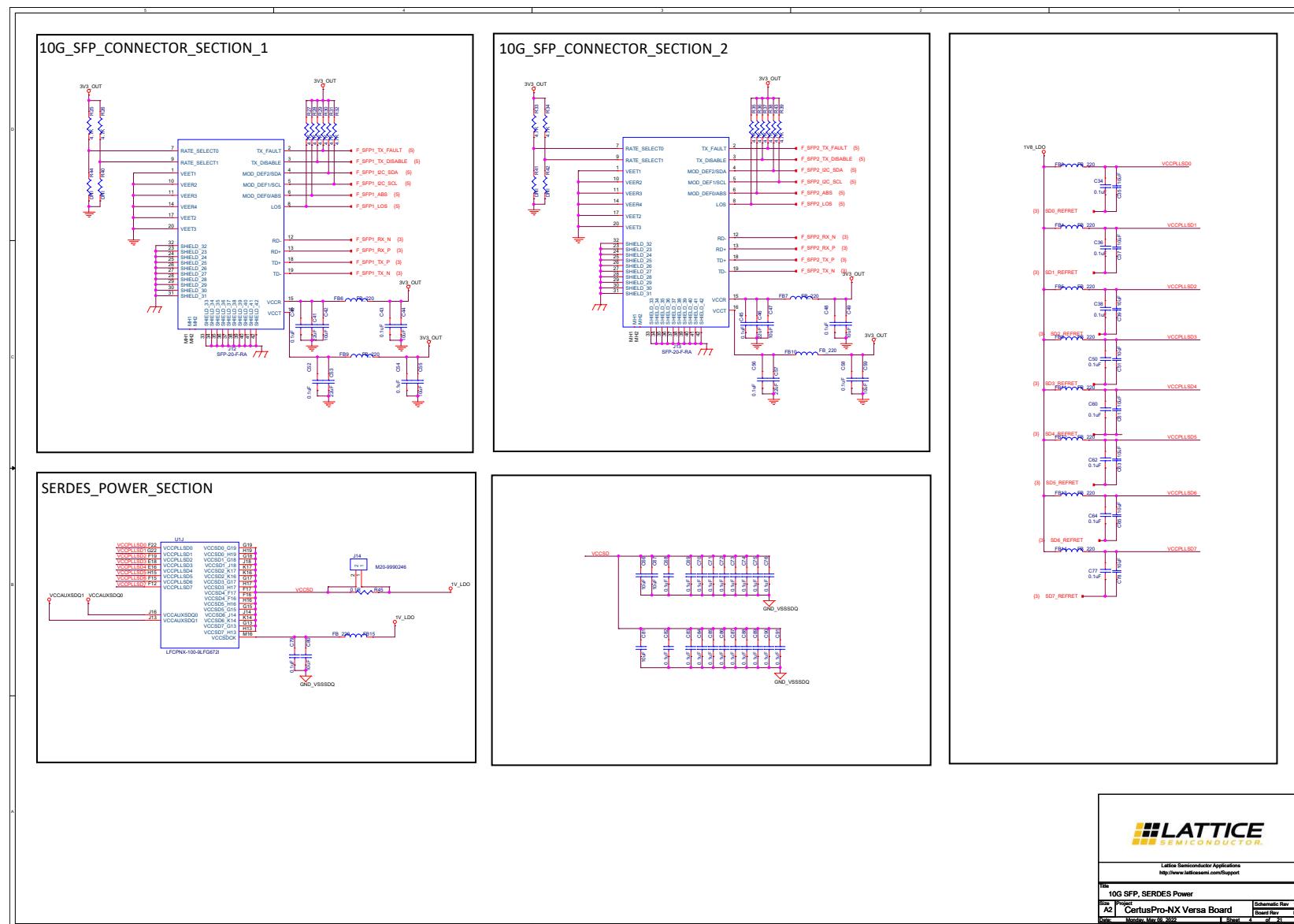
Figure A.4. 10G SFP, SERDES Power
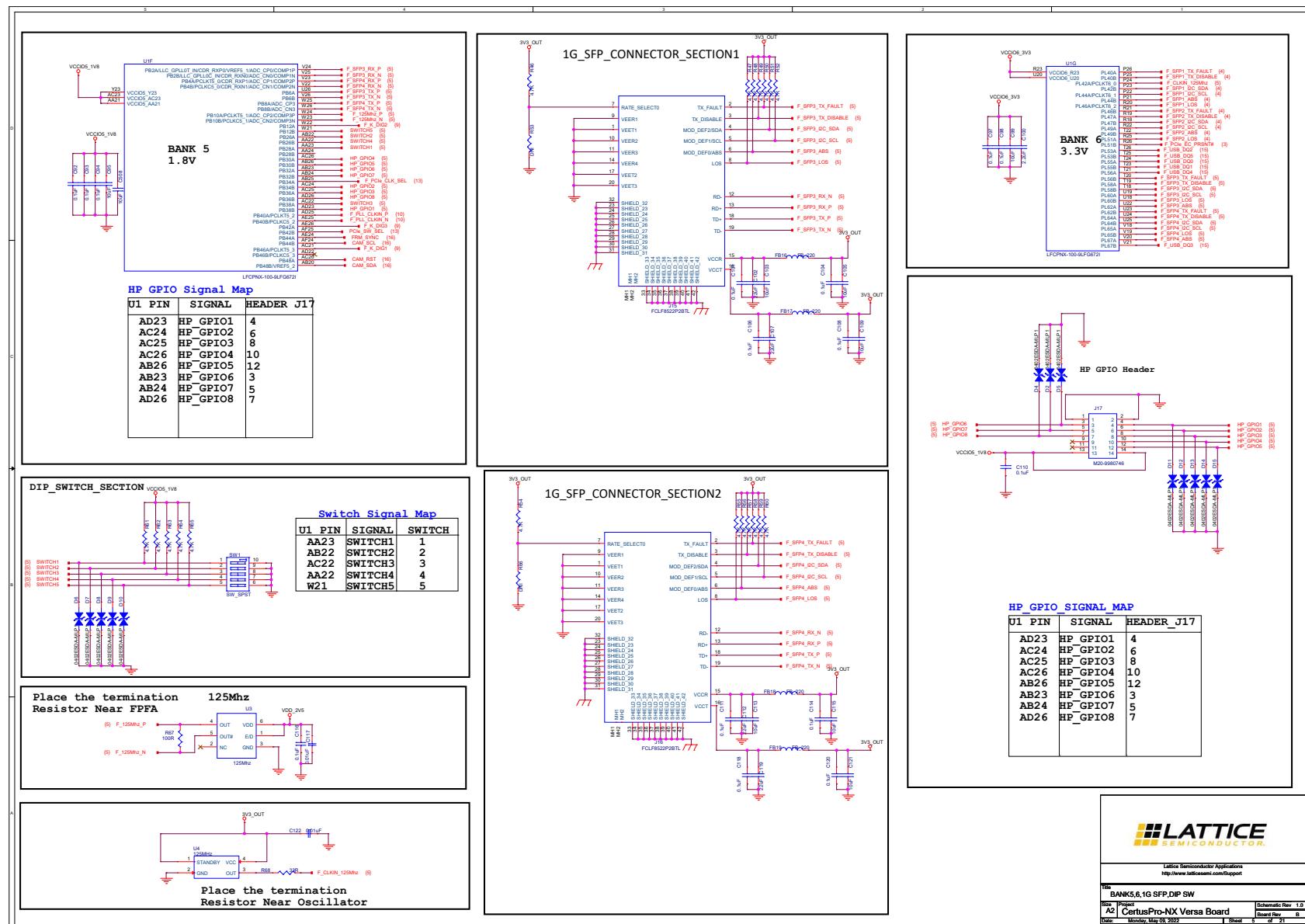
Figure A.5. Bank5, 6, 1G SFP DIP SW, HP GPIO HEADER
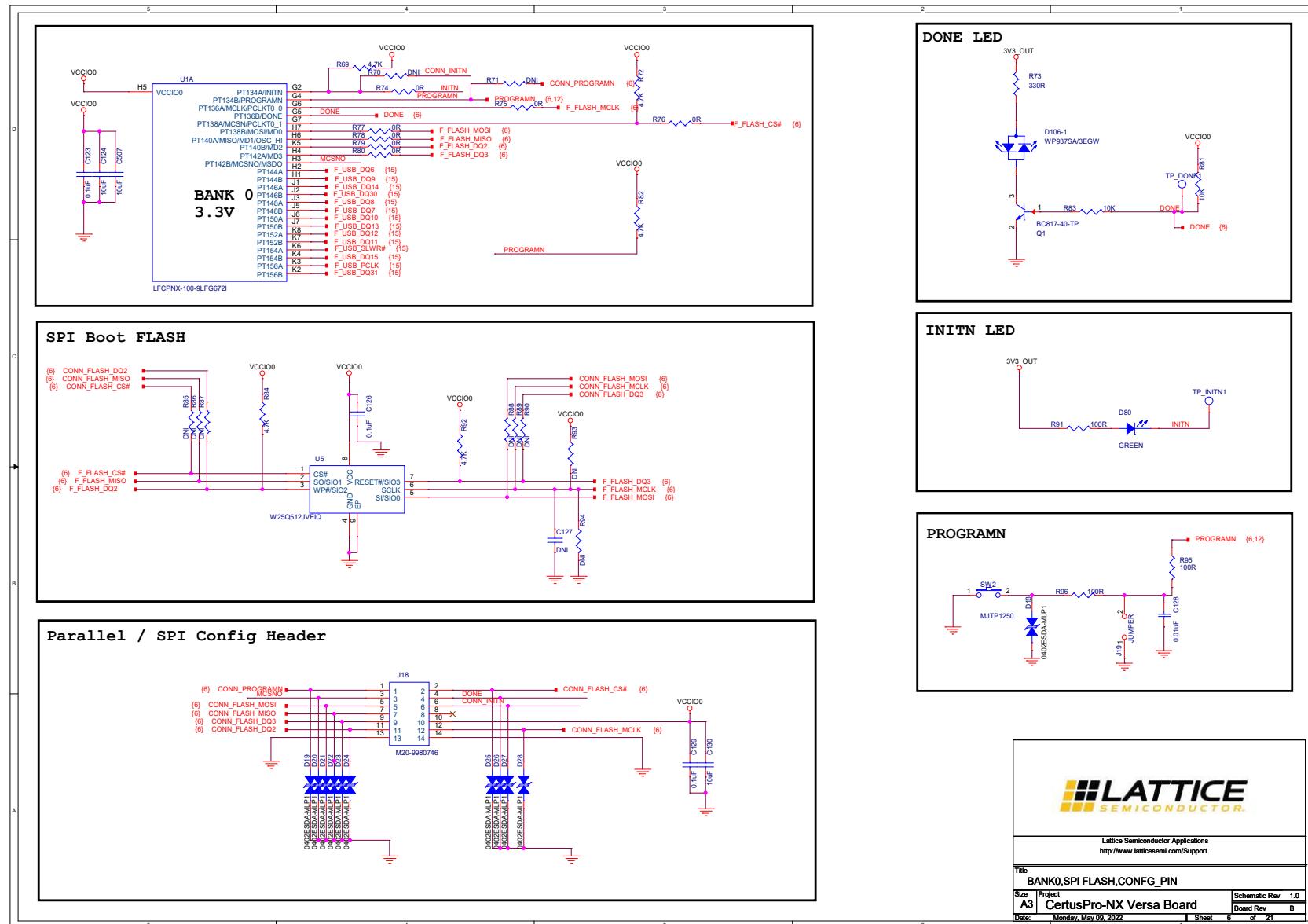
Figure A.6. Bank0, SPI Flash, CONFIG_PIN
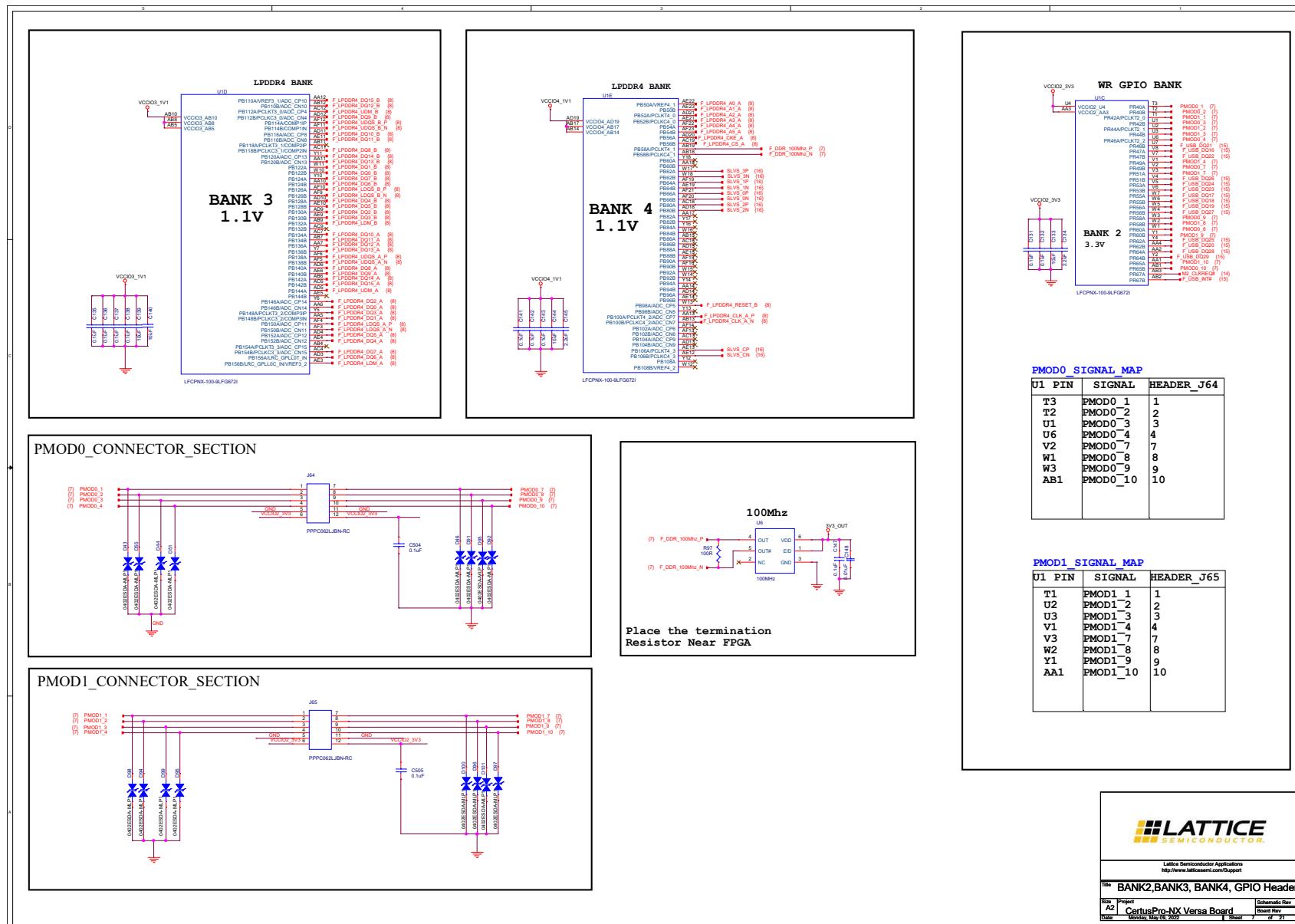
Figure A.7. BANK2, BANK3, BANK4, PMOD0 & PMOD1
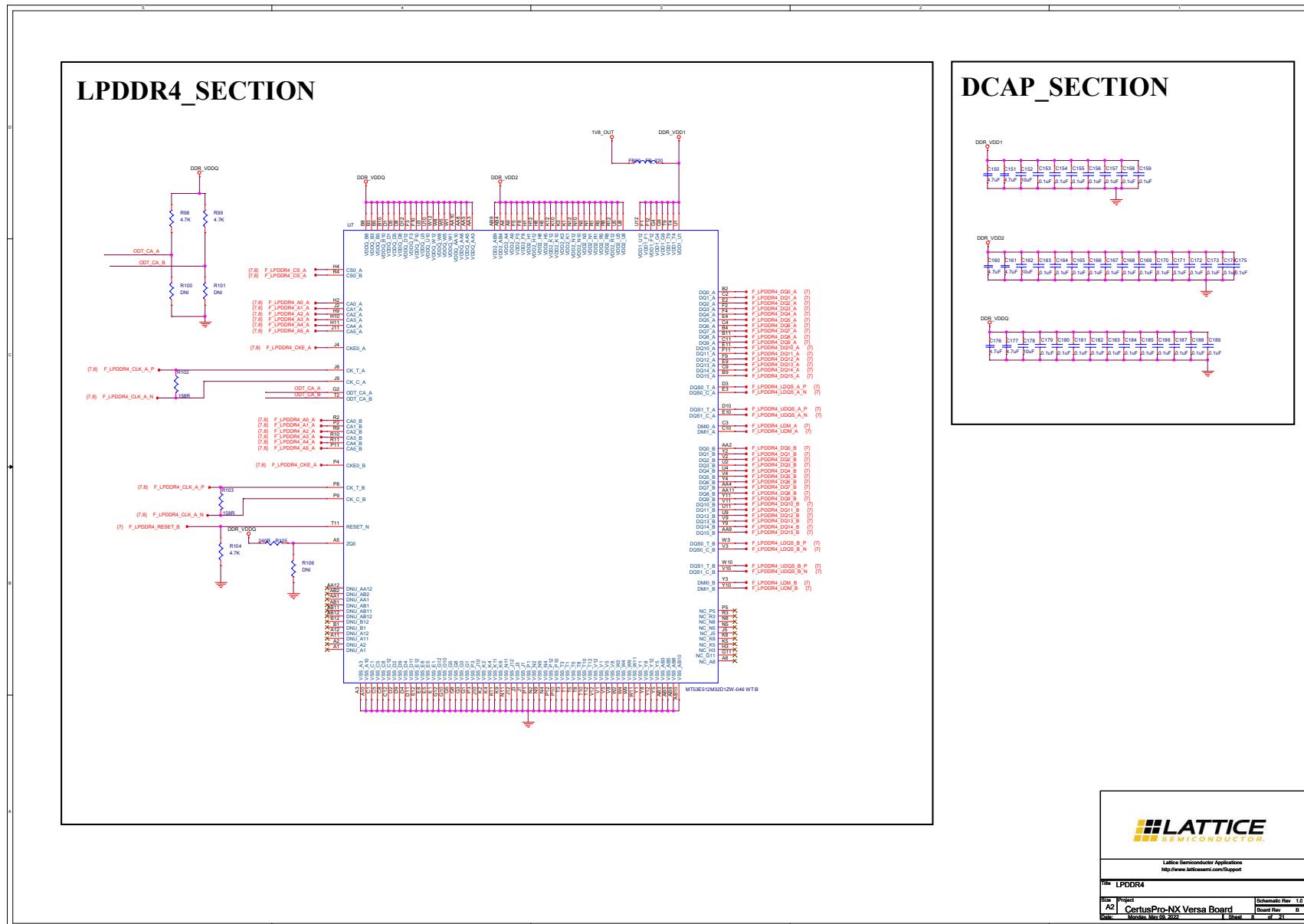
Figure A.8. LPDDR4
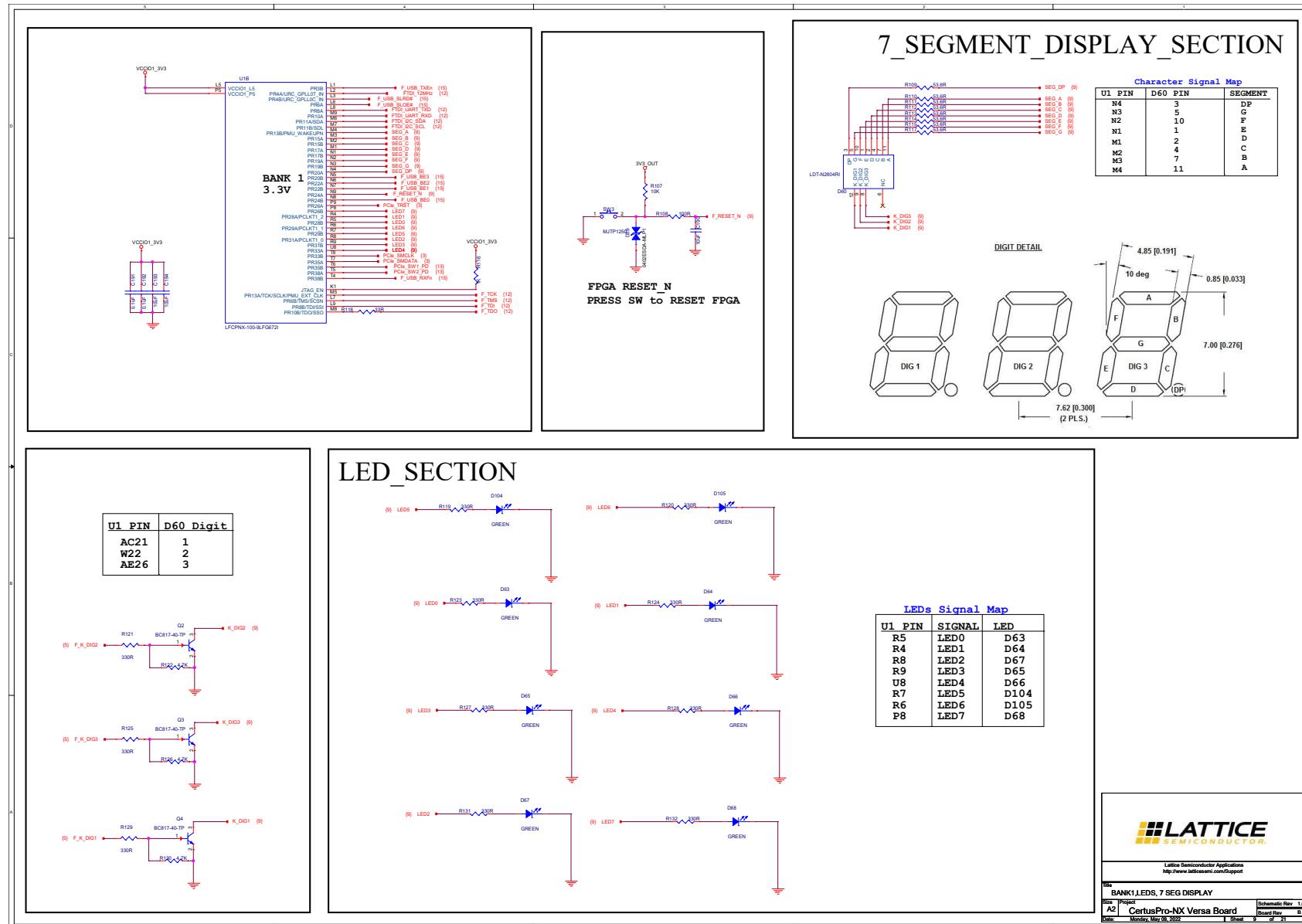
Figure A.9. BANK1, LEDS, 7 SEG DISPLAY
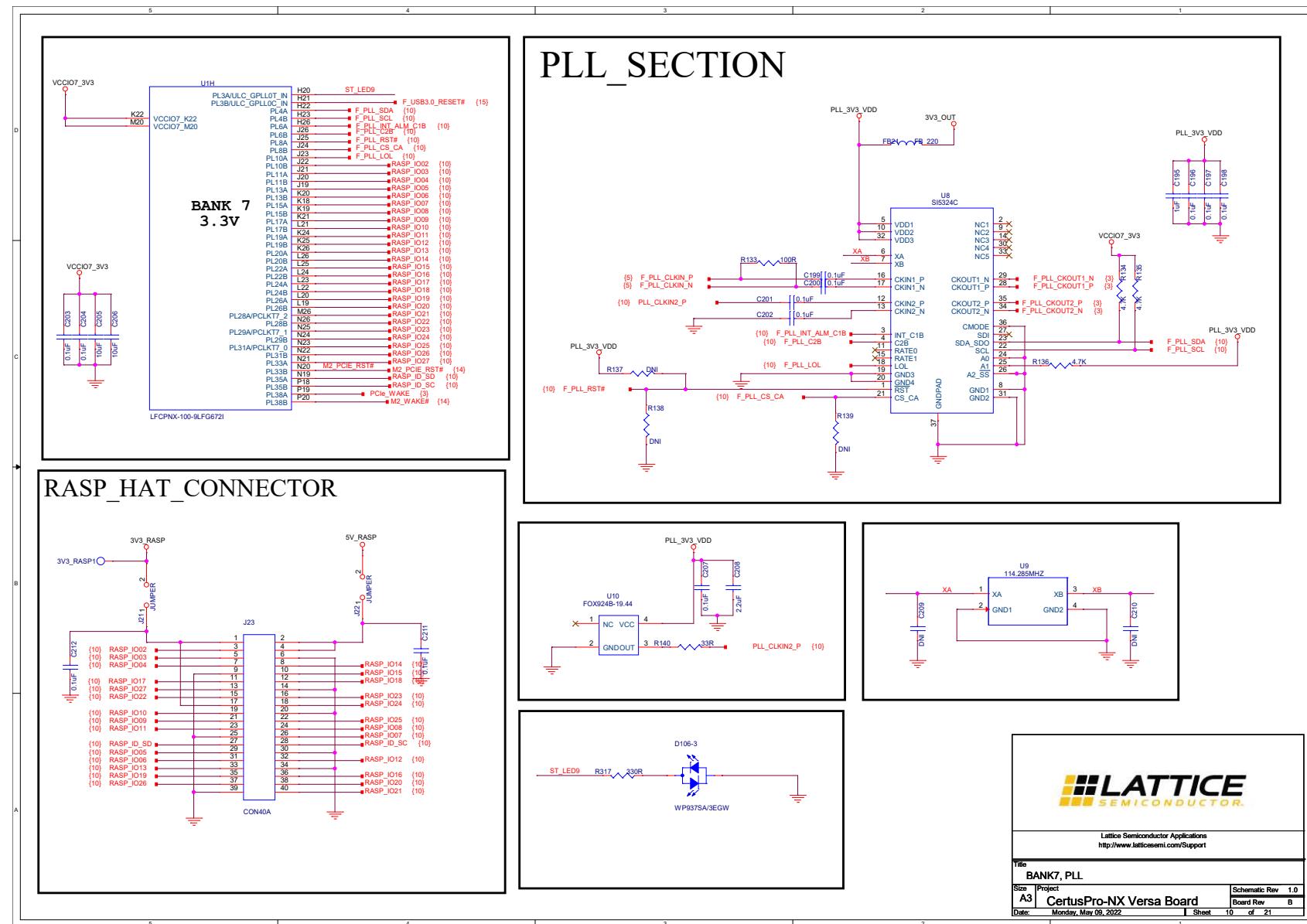
Figure A.10. BANK7, PLL, RASPBERRY_CONN
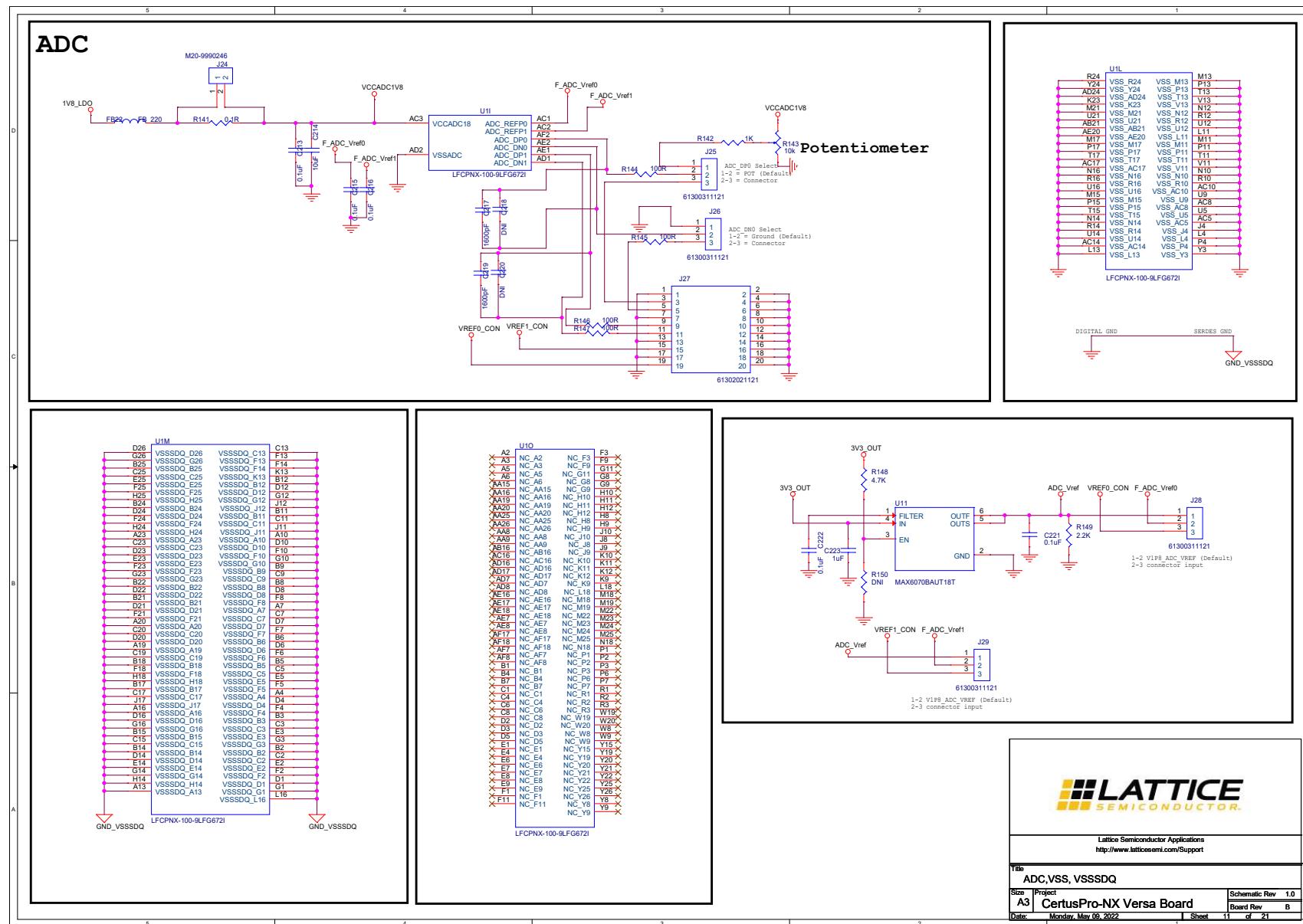
Figure A.11. ADC, VSS, VSSSDQ
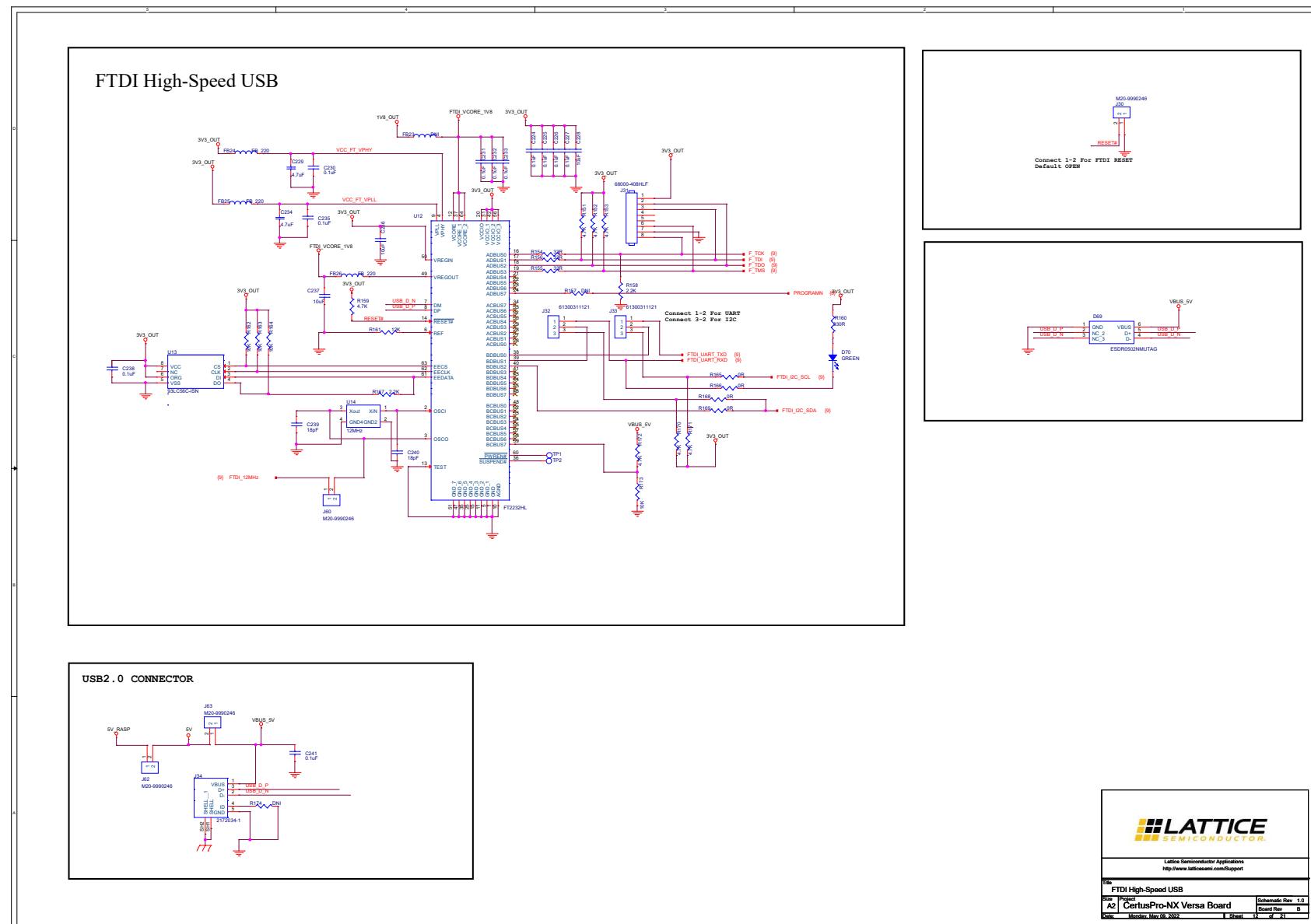
Figure A.12. FTDI High-speed USB
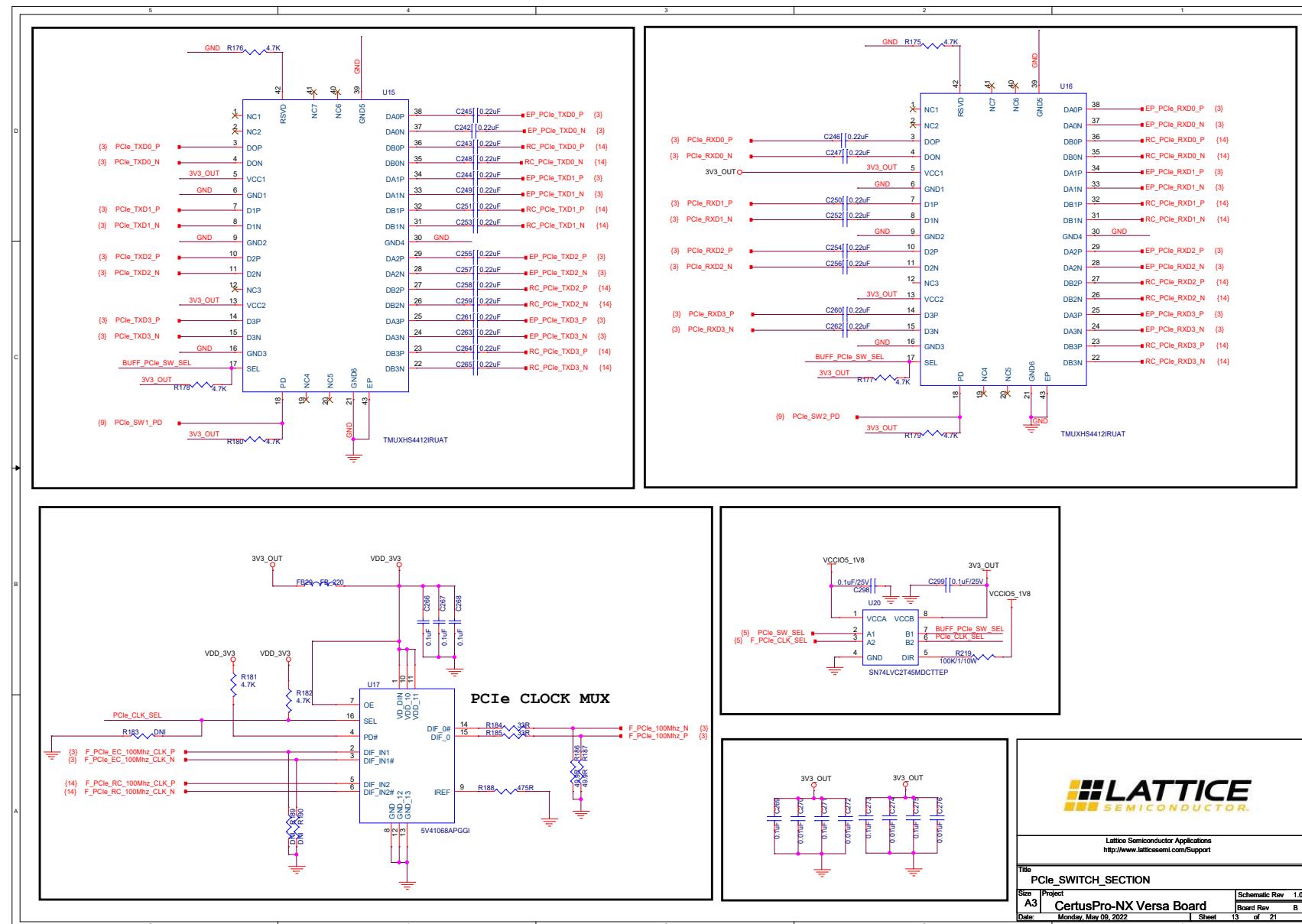
Figure A.13. PCIe_SWITCH_SECTION
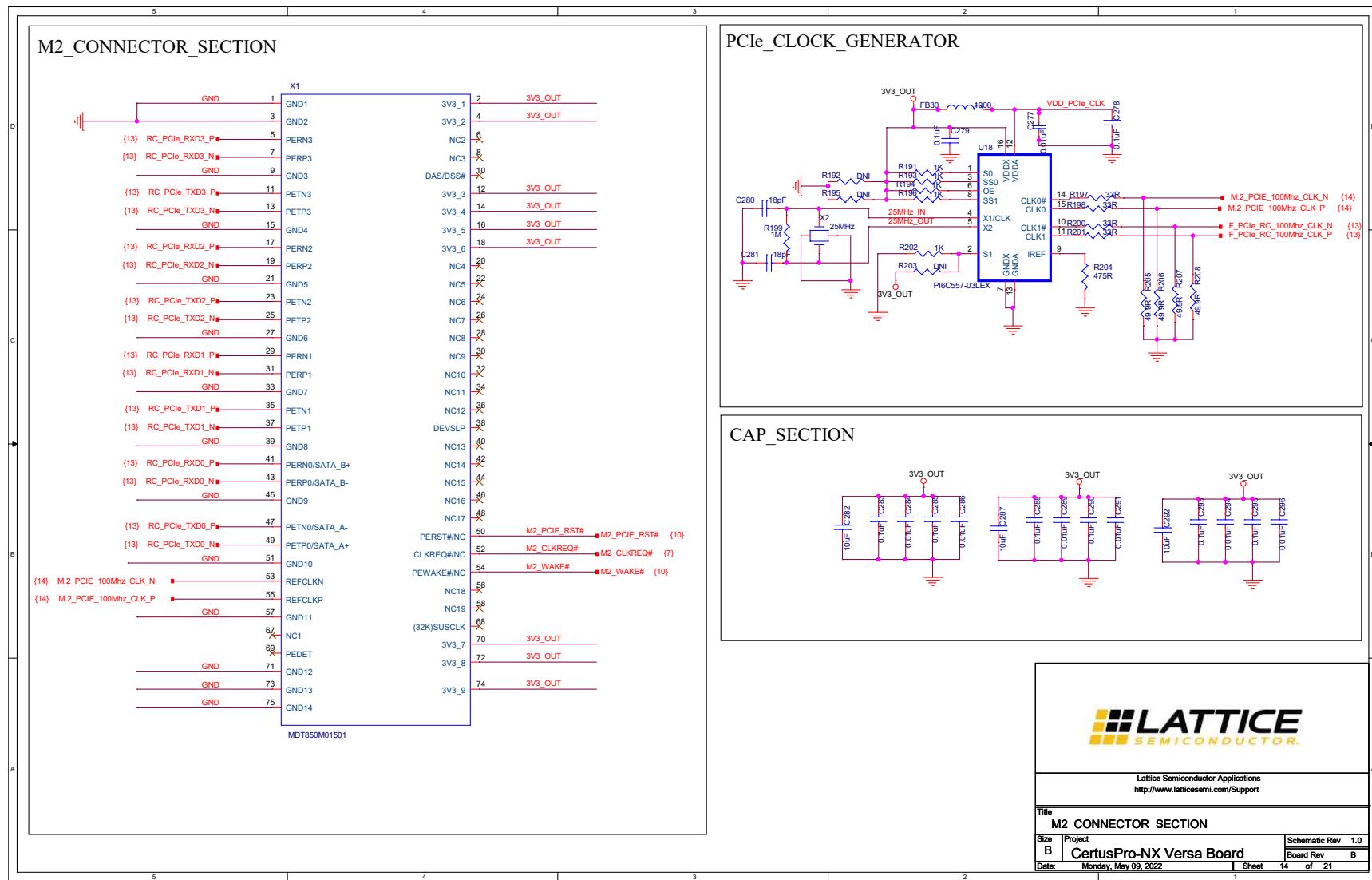
Figure A.14. M2_CONNECTOR_SECTION
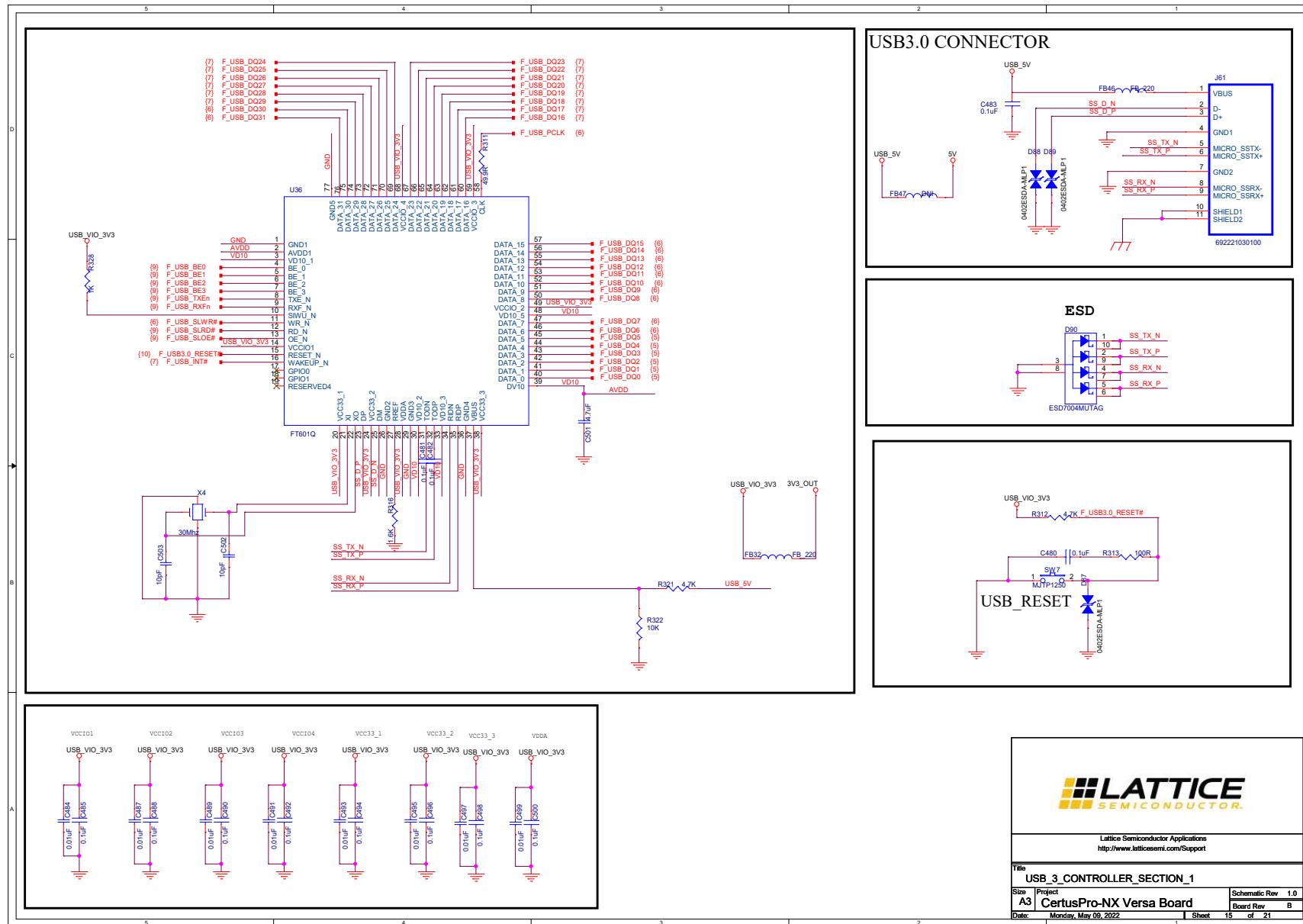
Figure A.15. USB_FTD601_SECTION
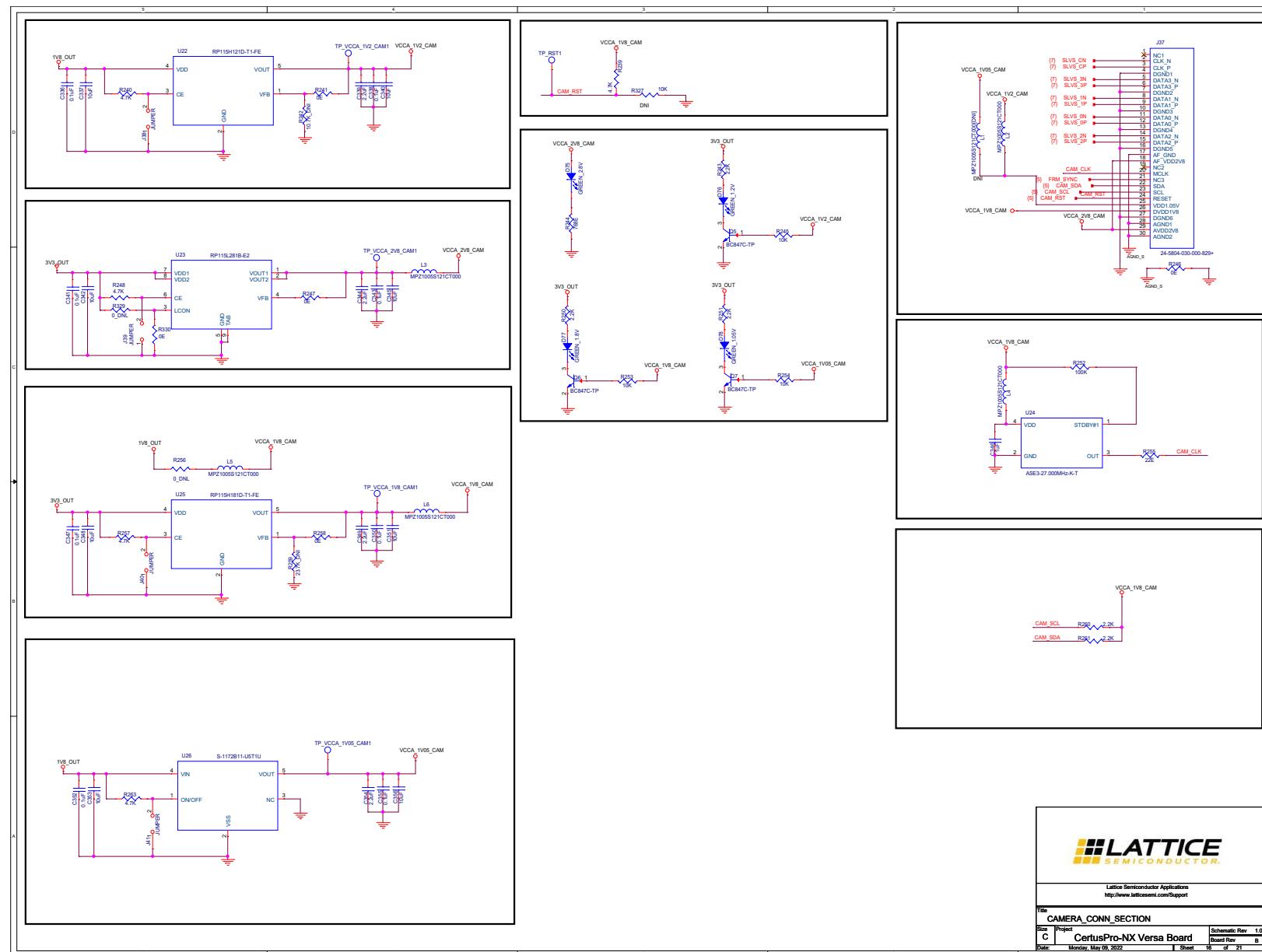
Figure A.16. CAMERA_CONN_SECTION
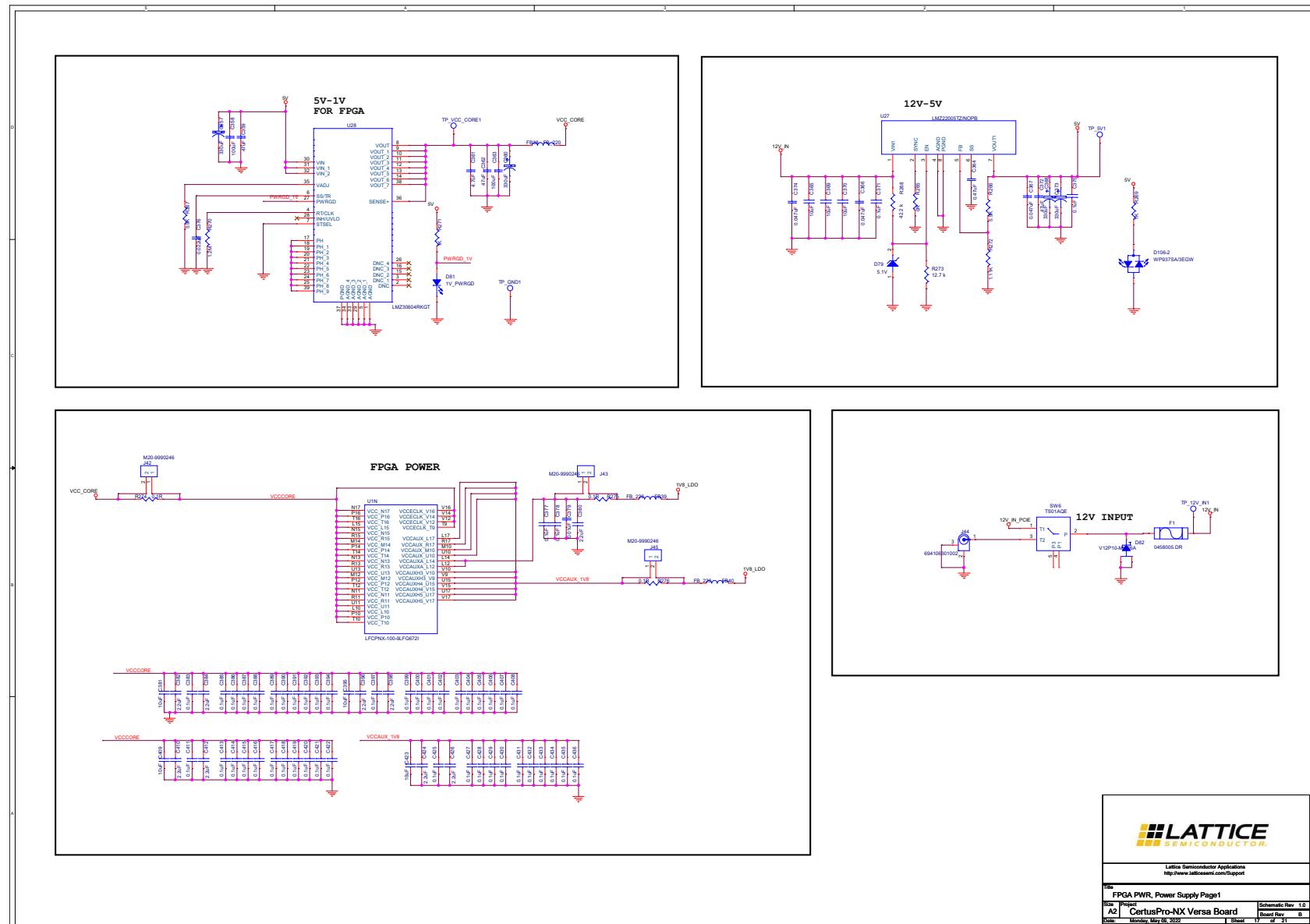
Figure A.17. POWER_SUPPLY_SECTION_1
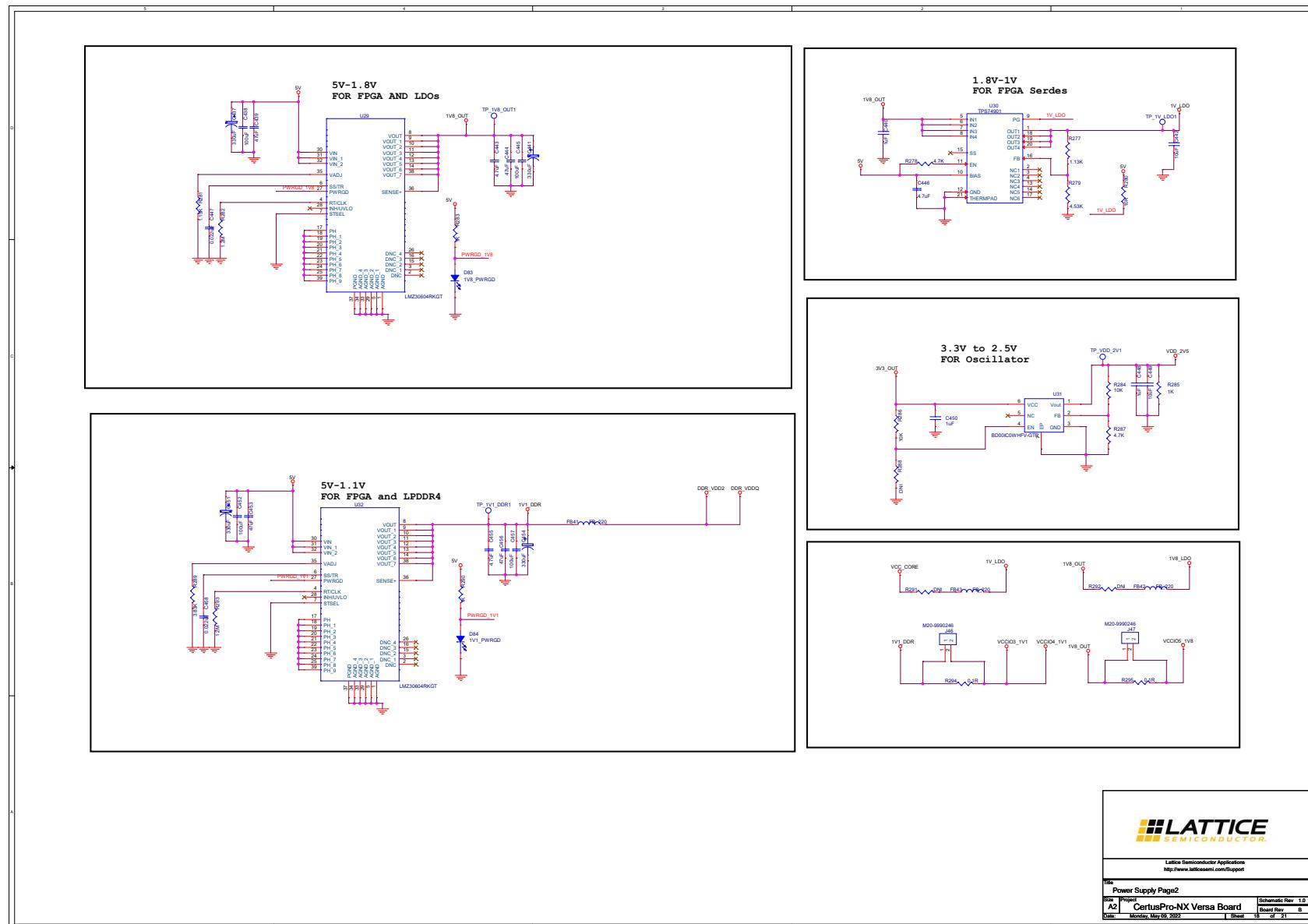
Figure A.18. POWER_SUPPLY_SECTION_2
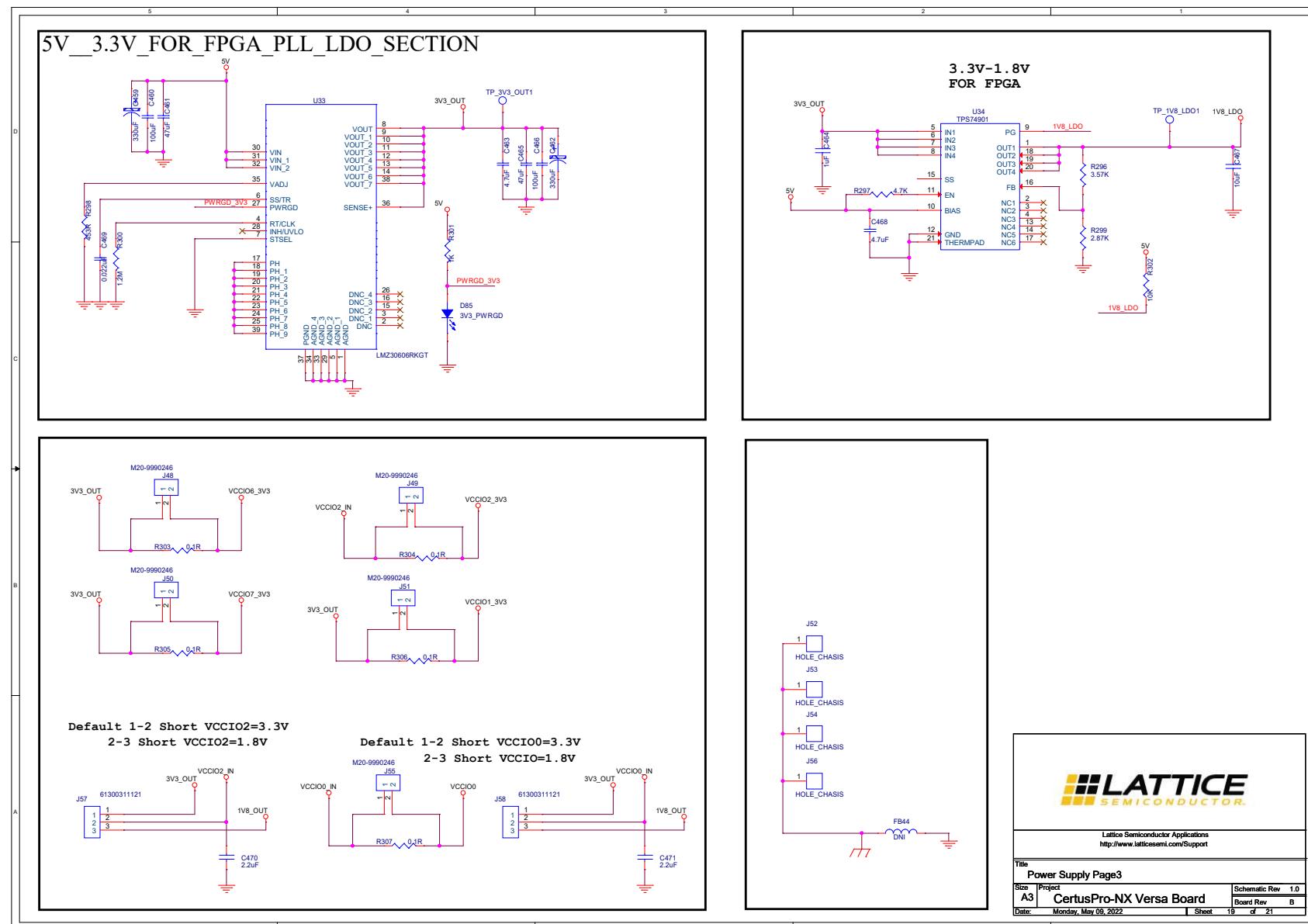
Figure A.19. POWER_SUPPLY_SECTION_3

POWER DIAGRAM

12V@1.248A	12V to 5V Converter LMZ22005TZ/NOPB (N = 91%)	5V@2.72A P=13.636W

5V@0.103A P=0.513W → 5V to 1V Converter LMZ30604RKGT (N = 87%) → 1V@0.451A P=0.451W → FPGA_VCC CORE

5V@0.152A P=0.760W → 5V to 1.1V Converter LMZ30604RKGT (N = 89%) 0.615A P=0.676W →
- 1.1V@0.01A P=0.01W → FPGA_VCC VCCIO3, VCCIO4
- 1.1V@0.605A P=0.665W → LPDDR4, VDDQ, VDD2 MT53E512M32D1ZW-046 WT:B

5V@0.112A P=0.563W → 5V to 1.8V Converter LMZ30604RKGT (N = 90%) 0.282A P=0.507W →
- 1.8V@0.06A P=0.108W → FPGA_VCC VCCIO5
- 1.8V@0.01A P=0.018W → LPDDR4, VDD1 MT53E512M32D1ZW-046 WT:B
- 1.8V@0.227A P=0.227W → LDO 1.8V to 1V TPS74901RGWR
- 1.8V@0.2A P=0.36W → LDO 1.8V to 1.2V RP111H281D/SOT89-5 → 1.2V@0.2A → Camera
- 1.8V@0.2A → LDO 1.8V to 1.05V RP111H281D/SOT89-5 → 1.05V@0.2A → Camera

5V@2.36A P=11.8W → 5V to 3.3V Converter LMZ30606RKGT (N = 95%) 3.403A P=11.22W →
- 3.3V@0.05A P=0.165W → FPGA_VCC VCCIO0, 1, 2, 6, 7
- 3.3V@0.28A P=0.924W → FTDI FT2232HQ-REEL
- 3.3V@0.3A P=0.99W → PLL SI5324C-C-GM
- 3.3V@0.025A P=0.082W → SPI FLASH MX25L51245GZ2I-08G
- 3.3V@0.6A P=1.98W → SFP – 10G
- 3.3V@0.065A P=0.214W → Oscillators
- 3.3V@0.04A P=0.132W → LDO 3.3V to 1.8V TPS74901RGWR → 1.8V @ 0.04A → FPGA VCC_AUX, VCC_AUXH, VCCPLLSD, VCCAUXSD
- 3.3V@0.023A P=0.075W → LDO 3.3V to 2.5V BD00IC0WHFV-GTR → 2.5V @ 0.023A → Oscillators 161.1328MHz
- 3.3V@0.040A P=0.132W → IDTSV41068A
- 3.3V@0.00048A P=0.00158W → TMUXHS4412
- 3.3V@0.185A → USB 3 Controller FT601Q
- 3.3V@0.03A → LDO 3.3V to 2.8V RP111H281D/SOT89-5 → 2.8V @ 0.03A → Camera
- 3.3V@0.6A → LDO 3.3V to 1.8V RP111H281D/SOT89-5 → 1.8V @ 0.6A → Camera
- 3.3V@0.5A → M.2 Connector
- 3.3V@0.370A → SFP-RJ45 – 1G

Lattice Semiconductor Applications	
http://www.latticesemi.com/Support	
Title POWER DIAGRAM	
Size A2	**Project** CertusPro-NX Versa Board	**Schematic Rev** 1.0 **Board Rev** B
Date: Monday, May 09, 2022	**Sheet** 20 of 21

Figure A.20. POWER DIAGRAM

CLOCK_DIAGRAM_SECTION
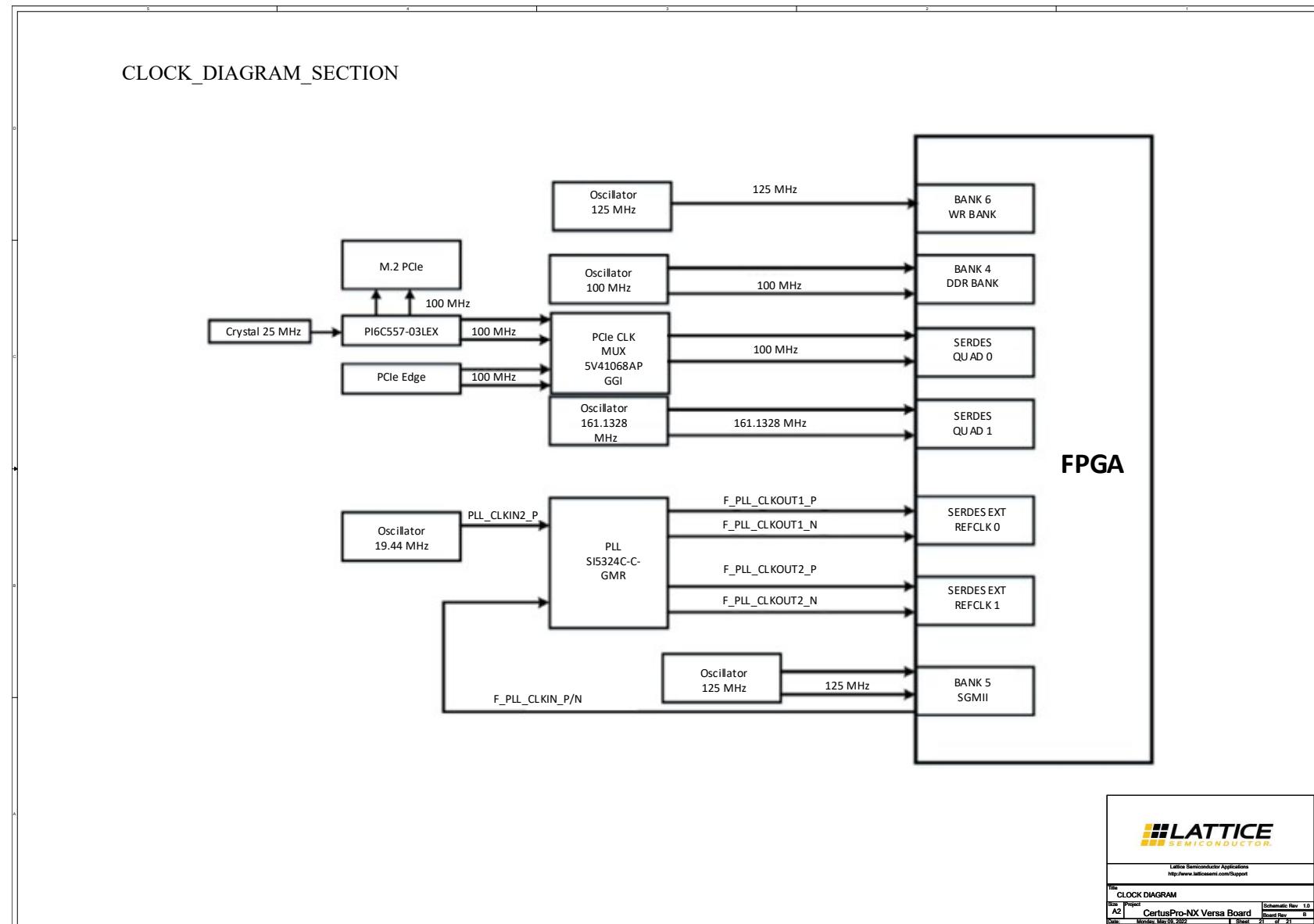
Figure A.21. CLOCK DIAGRAM

Appendix B. CertusPro-NX Versa Evaluation Board Bill of Materials

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
1	CN1	1	PCIE_X4_EdgeConn	pcie_64_pin	DNL	—	—	—
2	C1,C8,C9,C10,C11,C16,C17, C18,C20,C22,C24,C26,C28, C30,C32,C34,C36,C38,C40, C43,C45,C48,C50,C52,C54, C56,C58,C60,C62,C64,C68, C69,C70,C71,C72,C73,C74, C75,C76,C77,C79,C82,C83, C84,C85,C86,C87,C88,C89, C90,C91,C92,C93,C94,C97, C98,C101,C104,C106,C108, C110,C111,C114,C116,C118, C120,C123,C126,C129,C131, C132,C135,C136,C137,C138, C141,C142,C143,C147,C153, C154,C155,C156,C157,C158, C159,C163,C164,C165,C166, C167,C168,C169,C170,C171, C172,C173,C174,C175,C179, C180,C181,C182,C183,C184, C185,C186,C187,C188,C189, C191,C192,C196,C197,C198, C199,C200,C201,C202,C203, C204,C207,C211,C212,C213, C215,C216,C224,C225,C226, C227,C230,C231,C232,C233, C235,C266,C267,C268,C269, C271,C273,C275,C278,C279, C283,C285,C288,C290,C293, C295,C371,C375,C377,C378, C383,C385,C386,C387,C388, C389,C390,C391,C392,C393, C394,C397,C399,C400,C401, C402,C403,C404,C405,C406, C407,C408,C411,C413,C414, C415,C416,C417,C418,C419, C420,C421,C422,C425,C427, C428,C429,C430,C431,C432, C433,C434,C435,C436,C480, C481,C482,C483,C485,C488, C490,C492,C494,C496,C498, C500,C504,C505,C509,C510, C511,C512	217	0.1uF	cap0402	—	GRM155R71H104KE14J	Murata Electronics	CAP CER 0.1UF 50V X7R 0402

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
3	C2,C3,C4,C5,C6,C7,C12,C13, C14,C15,C242,C243,C244, C245,C246,C247,C248,C249, C250,C251,C252,C253,C254, C255,C256,C257,C258,C259, C260,C261,C262,C263,C264, C265	34	0.22uF	cap0201	—	C0603X5R1E224K030BC	TDK Corporation	CAP CER 0.22UF 25V X5R 0201
4	C19,C21,C23,C25,C27,C29, C31,C33,C35,C37,C39,C51, C61,C63,C65,C78,C150, C151,C160,C161,C176,C177, C229,C234,C446,C468,C501	27	4.7uF	cap0402	—	CL05A475KP5NRNC	Samsung Electro-Mechanics	CAP CER 4.7UF 10V X5R 0402
5	C41,C46,C53,C57,C102, C107,C112,C119	8	22uF	cap0805	—	GRM21BR61E226ME44K	Murata Electronics	CAP CER 22UF 25V X5R 0805
6	C42,C44,C47,C49,C55,C59, C103,C105,C109,C113,C115, C121	12	10uF	cap1206	—	CL31A106MBHNNNE	Samsung Electro-Mechanics	CAP CER 10UF 50V X5R 1206
7	C66,C67,C80,C81,C95,C99, C124,C130,C133,C139,C140, C144,C152,C162,C178,C190, C193,C194,C205,C206,C214, C228,C236,C237,C282,C287, C292,C381,C395,C409,C423, C442,C449,C467,C507,C508	36	10uF	cap0603	—	CM105X5R106M25AT	Kyocera International Inc. Electronic Components	10µF ±20% 25V Ceramic Capacitor X5R 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
8	C100,C134,C145,C208,C380, C382,C384,C396,C398,C410, C412,C424,C426,C470,C471	15	2.2uF	cap0402	—	GRM155C81E225KE11D	Murata Electronics	CAP CER 2.2UF 25V X6S 0402
9	C117,C122,C128,C148,C277, C379,C484,C487,C489,C491, C493,C495,C497,C499	14	0.01uF	cap0603	—	CC0603KRX7R9BB103	Yageo	CAP CER 10000PF 50V X7R 0603
10	C127	1	DNI	cap0603	DNL	CM105X5R106M25AT	Kyocera International Inc. Electronic Components	10µF ±20% 25V Ceramic Capacitor X5R 0603
11	C195,C223,C440,C448,C450, C464	6	1uF	cap0603	—	GRT188R61H105KE13D	Murata Electronics	CAP CER 1UF 50V X5R 0603
12	C209,C210	2	DNI	cap0402	DNL	CC0402JRNPO9BN180	Yageo	CAP CER 18PF 50V C0G/NP0 0402
13	C217,C219	2	1600pF	cap0805	—	C0805C162J5GAC7800	KEMET	CAP CER 1600PF 50V NP0 0805
14	C218,C220	2	DNI	cap0805	DNL	C0805C162J5GAC7800	KEMET	CAP CER 1600PF 50V NP0 0805

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
15	C221,C222,C238,C241	4	0.1uF	cap0603	—	CC0603ZRY5V9BB104	Yageo	CAP CER 0.1UF 50V Y5V 0603
16	C239,C240,C280,C281	4	18pF	cap0402	—	CC0402JRNPO9BN180	Yageo	CAP CER 18PF 50V C0G/NP0 0402
17	C270,C272,C274,C276,C284, C286,C289,C291,C294,C296	10	0.01uF	cap0402	—	GCM155R71H103KA55D	Murata Electronics	CAP CER 10000PF 50V X7R 0402
18	C298,C299	2	0.1uF/25V	cap0402	—	GRM155R61E104KA87D	Murata	CAP CER 0.1UF 25V X5R 0402
19	C336,C343,C350,C355	4	0.1uF	CAP0402	—	CL05B104KA5NNNC	Samsung Electro-Mechanics	Multilayer Ceramic Capacitors MLCC - SMD/SMT 100nF+/-10% 25V X7R 1005
20	C337,C340,C342,C345,C348, C351,C353,C356	8	10uF	CAP0603	—	LMK107BJ106MALTD	Taiyo Yuden	Multilayer Ceramic Capacitors MLCC - SMD/SMT 0603 10VDC 10uF 20% X5R
21	C338,C341,C347,C352	4	0.1uF	CAP0402	—	CL05B104KA5NNNC	Samsung Electro-Mechanics	CAP CER 0.1UF 25V X7R 0402
22	C339,C344,C349,C354	4	2.2uF	CAP0805	—	CL21B225KOFNNNE	Samsung Electro-Mechanics	Multilayer Ceramic Capacitors MLCC - SMD/SMT 2.2uF+/-10% 16V X7R 2012
23	C346	1	1uF	CAP0402	—	LMK105BJ105KV-F	Taiyo Yuden	CAP CER 1UF 10V X5R 0402
24	C357,C360,C368,C373,C437, C441,C451,C454,C459,C462	10	330uF	cap2917	—	10TPB330M	Panasonic Electronic Components	CAP TANT POLY 330UF 10V 2917
25	C358,C363,C438,C445,C452, C457,C460,C466	8	100uF	cap1206	—	C3216X5R1A107M160AC	TDK Corporation	CAP CER 100UF 10V X5R 1206
26	C359,C362,C439,C444,C453, C456,C461,C465	8	47uF	cap1206	—	C3216X5R1E476M160AC	TDK Corporation	CAP CER 47UF 25V X5R 1206
27	C361,C443,C455,C463	4	4.7uF	cap0603	—	C1608X5R1E475M080AC	TDK Corporation	CAP CER 4.7UF 25V X5R 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
28	C364	1	0.47uF	CAP0402	—	CC0402KRX5R6BB474	Yageo	CAP CER 0.47UF 10V X5R 0402
29	C365,C369,C370	3	10uF	cap0805	—	C2012X5R1E106M085AC	TDK Corporation	CAP CER 10UF 25V X5R 0805
30	C366,C367,C374	3	0.047uF	cap0603	—	C0603C473K5RACAUTO	KEMET	CAP CER 0.047UF 50V X7R 0603
31	C372	1	47uF	cap0805	—	C2012X5R1A476M125AC	TDK Corporation	CAP CER 47UF 10V X5R 0805
32	C376,C447,C458,C469	4	0.022uF	cap0603	—	C0603C223K5RACTU	Kemet	CAP CER 0.022UF 50V X7R 0603
33	C502,C503	2	10pF	cap0603	—	CC0603JRNPO9BN100	Yageo	CAP CER 10PF 50V C0G/NPO 0603
34	D2,D4,D5,D6,D7,D8,D9,D10, D11,D12,D13,D14,D15,D18, D19,D20,D21,D22,D23,D24, D25,D26,D27,D28,D43,D44, D46,D51,D55,D59,D87,D88, D89,D91,D92,D93,D94,D95, D96,D97,D98,D99,D100, D101	44	DIODE_SUPPRESSOR ESD 30VDC 0402	ESD0402	—	0402ESDA-MLP1	Eaton - Electronics Division	SUPPRESSOR ESD 30VDC 0402 HFREE
35	D60	1	LDT-N2804RI	display_12P-PTH	—	LDT-N2804RI	Lumex Opto/Components Inc.	DISPLAY 7SEG 0.28" TRP RED 12DIP
36	D63,D64,D65,D66,D67,D68, D70,D80,D104,D105	10	GREEN	led_0603	—	SML-D12M8WT86	Rohm Semiconductor	LED GREEN DIFFUSED 0603 SMD
37	D69	1	ESDR0502NMUTAG	UDFN-6	—	ESDR0502NMUTAG	ON Semiconductor	TVS DIODE 5.5V 6UDFN
38	D75	1	GREEN_2.8V	LED_0603	—	5988070107F	Dialight	LED GREEN CLEAR 0603 SMD

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
39	D76	1	GREEN_1.2V	LED_0603	—	5988070107F	Dialight	LED GREEN CLEAR 0603 SMD
40	D77	1	GREEN_1.8V	LED_0603	—	5988070107F	Dialight	LED GREEN CLEAR 0603 SMD
41	D78	1	GREEN_1.05V	LED_0603	—	5988070107F	Dialight	LED GREEN CLEAR 0603 SMD
42	D79	1	5.1V	sod-323	—	BZT52C5V1S-TP	Micro Commercial Co	DIODE ZENER 5.1V 200MW SOD323
43	D81	1	1V_PWRGD	led_0603	—	SML-D12M8WT86	Rohm Semiconductor	LED GREEN DIFFUSED 0603 SMD
44	D82	1	V12P10-M3/86A	TO-277A	—	V12P10-M3/86A	Vishay Semiconductor Diodes Division	DIODE SCHOTTKY 100V 12A TO277A
45	D83	1	1V8_PWRGD	led_0603	—	SML-D12M8WT86	Rohm Semiconductor	LED GREEN DIFFUSED 0603 SMD
46	D84	1	1V1_PWRGD	led_0603	—	SML-D12M8WT86	Rohm Semiconductor	LED GREEN DIFFUSED 0603 SMD
47	D85	1	3V3_PWRGD	led_0603	—	SML-D12M8WT86	Rohm Semiconductor	LED GREEN DIFFUSED 0603 SMD
48	D90	1	ESD7004MUTAG	10UDFN_10P	—	ESD7004MUTAG	ON Semiconductor	TVS DIODE 5V 10V 10UDFN
49	D106	1	WP937SA/3EGW	LED_CBI	—	WP937SA/3EGW	Kingbright	REDGREEN TRI-LEVEL LED INDICATOR
50	FB1,FB2,FB3,FB4,FB5,FB6, FB7,FB8,FB9,FB10,FB11, FB12,FB13,FB14,FB15,FB16, FB17,FB18,FB19,FB20,FB21, FB22,FB25,FB26,FB29, FB32,FB38,FB39,FB40,FB41, FB42,FB43,FB46	34	FB_220	FB0603	Alternate PN : MPZ1608S22 1ATD25	BLM18KG221SN1D	Murata Electronics	FERRITE BEAD 220 OHM 0603 1LN
51	FB23,FB44,FB47	3	DNI	FB0603	DNL	BLM18KG221SN1D	Murata Electronics	FERRITE BEAD 220 OHM 0603 1LN
52	FB30	1	1000	FB0402	—	BLM15HG102SN1B	Murata Electronics	Ferrite Beads
53	F1	1	0458005.DR	fus1206	—	0458005.DR	Littelfuse Inc.	FUSE BRD MNT 5A 32VAC 75VDC 1206

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
54	J1	1	61300621121	conn_header_6 pos	—	61300621121	Würth Elektronik	CONN HEADER VERT 6POS 2.54MM
55	J2,J3,J5,J6,J8,J9,J10,J11	8	733910070	sma_jack_st	—	733910070	Molex	CONN SMA RCPT STR 50 OHM PCB
56	J4,J7,J14,J24,J30,J42,J43, J45,J46,J47,J48,J49,J50,J51, J55,J60,J62,J63	18	M20-9990246	HDR_1X2	—	M20-9990246	Harwin Inc.	CONN HEADER VERT 2POS 2.54MM
57	J12,J13	2	SFP-20-F-RA	sfp_6367036_c age-bot	—	1888247-1	TE Connectivity AMP Connectors	CONN SFP+ RCPT 20POS SLD R/A SMD
58	J15	1	FCLF8522P2BTL	SFP_6367036_C AGE-BOT	DNL	FCLF8522P2BTL	II-VI / Finisar	CONN SFP+ RCPT 20POS SLD R/A SMD
59	J16	1	FCLF8522P2BTL	SFP_6367036_C AGE-BOT	DNL	SFP-1GBT-05	Bel Magnetic Solutions	CONN SFP+ RCPT 20POS SLD R/A SMD
60	J17,J18	2	M20-9980746	14pin_bergstick	—	M20-9980746	Harwin Inc.	CONN HEADER VERT 14POS 2.54MM
61	J19,J21,J22,J38,J39,J40,J41	7	JUMPER	HDR_1X2	—	61300211121	Wurth Elektronik	Headers & Wire Housings WR-PHD 2.54mm 2Pin THT Header
62	J23	1	CON40A	header_20x02_ 254x254_st_cu s	—	PPTC202LFBN-RC	Sullins Connector Solutions	CONN HDR 40POS 0.1 TIN PCB
63	J25,J26,J28,J29,J32,J33,J57, J58	8	61300311121	conn_header_3 pos	—	61300311121	Wurth Electronics Inc.	CONN HEADER VERT 3POS 2.54MM

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
64	J27	1	61302021121	header_m_20pos	—	61302021121	Würth Elektronik	CONN HEADER VERT 20POS 2.54MM
65	J31	1	68000-408HLF	8PINSTICK	—	68000-408HLF	Amphenol FCI	CONN HEADER 8POS .100 STR TIN
66	J34	1	2172034-1	2172034-1	—	2172034-1	TE Connectivity AMP Connectors	CONN RCPT USB2.0 MINI B 5P R/A
67	J37	1	24-5804-030-000-829+	camera_cable	—	24-5804-030-000-829+	Kyocera / Sunny Optical	Board to Board & Mezzanine Connectors 30P STR SMD 0.4mm BTB Rcpt H: 0.9mm
68	J44	1	694106301002	694106301002	—	694106301002	Würth Elektronik	CONN PWR JACK 2.1X5.5MM SOLDER
69	J52,J53,J54,J56	4	HOLE_CHASIS	hole35mmheader	DNL	—	—	—
70	J61	1	692221030100	692221030100_USB3P0	—	692221030100	Würth Elektronik	CONN RCPT USB3.0 TYPEB 9POS R/A
71	J64,J65	2	PPPC062LJBN-RC	conn_pppc062ljbn-rc_RA	—	PPPC062LJBN-RC	Sullins Connector Solutions	CONN HDR 12POS 0.1 GOLD PCB R/A
72	L1	1	MPZ1005S121CT000[DNI]	FB0402	DNL	MPZ1005S121CT000	TDK	Ferrite Beads 120 OHM 25%
73	L2,L3,L4,L5,L6	5	MPZ1005S121CT000	FB0402	—	MPZ1005S121CT000	TDK	Ferrite Beads 120 OHM 25%
74	Q1,Q2,Q3,Q4	4	BC817-40-TP	SOT23-3	—	BC817-40-TP	Micro Commercial Co	TRANS NPN 45V 0.8A SOT-23
75	Q5,Q6,Q7	3	BC847C-TP	SOT23-3	—	BC847C-TP	Micro Commercial Co	TRANS NPN 45V 0.1A SOT23
76	R1,R2,R7,R8	4	DNI	res0201	DNL	CRCW0201100RFKED	Vishay Dale	RES SMD 100 OHM 1% 1/20W 0201

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
77	R3,R4,R5,R6	4	976R	res0402	—	RP73PF1E976RBTD	TE Connectivity Passive Product	RES 976 OHM 0.1% 1/10W 0402
78	R9,R10,R11,R12	4	1.15K	res0402	—	CPF0402B1K15E1	TE Connectivity Passive Product	RES SMD 1.15KOHM 0.1% 1/16W 0402
79	R13,R14,R16,R17,R21,R22, R23,R24	8	DNI	res0402	DNL	ERJ-2RKD49R9X	Panasonic Electronic Components	RES SMD 49.9 OHM 0.5% 1/16W 0402
80	R15,R19,R45,R141,R274, R275,R276,R294,R295,R303, R304,R305,R306,R307	14	0.1R	res0603	—	ERJ-3RSFR10V	Panasonic Electronic Components	RES 0.1 OHM 1% 1/10W 0603
81	R18,R25,R26,R27,R28,R29, R30,R31,R32,R33,R34,R35, R36,R37,R38,R39,R43,R46, R47,R48,R49,R50,R51,R52, R54,R55,R56,R57,R58,R59, R60,R61,R62,R63,R64,R65, R69,R72,R82,R84,R92,R98, R99,R104,R122,R126,R130, R134,R135,R136,R148,R151, R152,R153,R159,R170,R171, R172,R175,R176,R177,R178, R179,R180,R181,R182,R278, R287,R297,R312,R321,R323, R324,R325	74	4.7K	res0603	—	RC0603JR-074K7L	Yageo	RES SMD 4.7K OHM 5% 1/10W 0603
82	R20,R74,R75,R76,R77,R78, R79,R80,R165,R166,R168, R169,R265	13	0R	res0603	—	ERJ-3GEY0R00V	Panasonic Electronic Components	RES SMD 0 OHM JUMPER 1/10W 0603
83	R40,R41,R42,R44,R53,R66, R100,R101,R137,R138,R139, R150,R183	13	DNI	res0603	DNL	RC0603JR-074K7L	Yageo	RES SMD 4.7K OHM 5% 1/10W 0603
84	R67,R91,R95,R96,R97,R108, R133,R144,R145,R146,R147, R313	12	100R	res0402	—	ERJ-2RKF1000X	Panasonic Electronic Components	RES SMD 100 OHM 1% 1/10W 0402
85	R68,R118,R140,R154,R155, R156,R184,R185,R197,R198, R200,R201	12	33R	res0402	—	ERJ-2GEJ330X	Panasonic Electronic Components	RES SMD 33 OHM 5% 1/10W 0402
86	R70,R71,R85,R86,R87,R88, R89,R90,R174,R291,R292	11	DNI	res0603	DNL	ERJ-3GEY0R00V	Panasonic Electronic Components	RES SMD 0 OHM JUMPER 1/10W 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
87	R73,R119,R120,R121,R123, R124,R125,R127,R128,R129, R131,R132,R160,R317	14	330R	res0603	—	ERJ-3EKF3300V	Panasonic Electronic Components	RES SMD 330 OHM 1% 1/10W 0603
88	R81,R83,R107,R162,R163, R164,R173,R280,R284,R286, R302,R322,R327	13	10K	res0603	—	RC1608F103CS	Samsung Electro-Mechanics	RES SMD 10K OHM 1% 1/10W 0603
89	R93,R94,R157	3	DNI	res0603	DNL	CPF0603F1K0C1	TE Connectivity Passive Product	RES SMD 1K OHM 1% 1/16W 0603
90	R102,R103	2	158R	res0201	—	RC0201FR-07158RL	Yageo	RES SMD 158 OHM 1% 1/20W 0201
91	R105	1	240R	res_0402	—	ERJ-2RKF2400X	Panasonic Electronic Components	RES SMD 240 OHM 1% 1/10W 0402
92	R106	1	DNI	res_0402	DNL	ERJ-2RKF2400X	Panasonic Electronic Components	RES SMD 240 OHM 1% 1/10W 0402
93	R109,R110,R111,R112,R113, R114,R115,R117	8	53.6R	res0402	—	RC0402FR-0753R6L	Yageo	RES SMD 53.6 OHM 1% 1/16W 0402
94	R116,R142,R269,R271,R283, R285,R290,R301,R328	9	1K	res0603	—	CPF0603F1K0C1	TE Connectivity Passive Product	RES SMD 1K OHM 1% 1/16W 0603
95	R143	1	10k	PTD901-1015K-B103	—	PTD901-1015K-B103	Bourns Inc.	POT 10K OHM 1/20W CARBON LINEAR
96	R149,R158,R167	3	2.2K	res0603	—	ERJ-3EKF2201V	Panasonic Electronic Components	RES SMD 2.2K OHM 1% 1/10W 0603
97	R161	1	12K	res0603	—	RC0603FR-0712KL	Yageo	RES SMD 12K OHM 1% 1/10W 0603
98	R186,R187,R205,R206,R207, R208	6	49.9R	res_0402	—	CRCW040249R9FKEDHP	Vishay Dale	RES SMD 49.9 OHM 1% 1/5W 0402
99	R188,R204	2	475R	res0603	—	RC0603FR-07475RL	Yageo	RES SMD 475 OHM 1% 1/10W 0603
100	R189,R190	2	DNI	res0402	DNL	CRCW040249R9FKEDHP	Vishay Dale	RES SMD 49.9 OHM 1% 1/5W 0402
101	R191,R193,R194,R196,R202	5	1K	res0402	—	CRCW04021K00FKEDC	Vishay Dale	RES 1K OHM 1% 1/16W 0402
102	R192,R195,R203	3	DNI	res0402	DNL	CRCW04021K00FKEDC	Vishay Dale	RES 1K OHM 1% 1/16W 0402
103	R199	1	1M	res0603	—	RK73B1JTTD105J	KOA Speer	RES MF 1.0M 1/10W 5% 0603
104	R219	1	100K/1/10W	res0402	—	ERJ-2RKF1003X	Panasonic	RES SMD 100K OHM 1% 1/10W 0402
105	R239,R240,R248,R257,R263	5	4.7K	RES0603	—	RC0603FR-074K7L	YAGEO	RES SMD 4.7K OHM 1% 1/10W 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
106	R241,R247,R330	3	0E	RES0603	—	RC0603FR-070RL	YAGEO	RES SMD 0 OHM JUMPER 1/10W 0603
107	R242	1	10.7K_DNI	RES0603	DNL	RC0603FR-0710K7L	Yageo	RES SMD 10.7K OHM 1% 1/10W 0603
108	R243,R250,R251	3	2.2K	RES1206	—	RC1206FR-072K2L	YAGEO	RES SMD 2.2K OHM 1% 1/4W 1206
109	R244	1	768E	RES0603	—	RC0603FR-07768RL	Yageo	RES SMD 768 OHM 1% 1/10W 0603
110	R245,R253,R254	3	10K	RES0603	—	RC0603FR-0710KL	YAGEO	RES SMD 10K OHM 1% 1/10W 0603
111	R246,R258	2	0E	RES0603	—	RC0603FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1% 1/10W 0603
112	R252	1	100K	RES0603	—	CR0603-16W-1003FT	Venkel	RES 100K OHM 1% 1/16W 0603
113	R255	1	22E	RES_0402	—	ERJ-2RKF22R0X	Panasonic	RES SMD 22 OHM 1% 1/10W 0402
114	R259	1	23.7K_DNI	RES0603	DNL	RC0603FR-0723K7L	Yageo	RES SMD 23.7K OHM 1% 1/10W 0603
115	R260,R261	2	2.2K	res0603	—	RC0603FR-072K2P	Yageo	RES SMD 2.2K OHM 1% 1/10W 0603
116	R266,R267	2	5.9K	res0603	—	RC0603FR-075K9L	Yageo	RES SMD 5.9K OHM 1% 1/10W 0603
117	R268	1	42.2 k	res0402	—	ERA-2AEB4222X	Panasonic Electronic Components	RES SMD 42.2KOHM 0.1% 1/16W 0402
118	R270,R282,R293,R300	4	1.2M	res0603	—	RC0603FR-071M2L	Yageo	RES SMD 1.2M OHM 1% 1/10W 0603
119	R272	1	1.11K	res1206	—	TNPW12061K11BEEA	Vishay Dale	RES 1.11K OHM 0.1% 1/4W 1206
120	R273	1	12.7 k	res0402	—	ERJ-2RKF1272X	Panasonic Electronic Components	RES SMD 12.7K OHM 1% 1/10W 0402
121	R277	1	1.13K	res0402	—	ERA-2AEB1131X	Panasonic Electronic Components	RES SMD 1.13KOHM 0.1% 1/16W 0402
122	R279	1	4.53K	res0402	—	ERJ-2RKF4531X	Panasonic Electronic Components	RES SMD 4.53K OHM 1% 1/10W 0402
123	R281	1	1.15K	res0603	—	RC0603FR-071K15L	Yageo	RES SMD 1.15K OHM 1% 1/10W 0603
124	R288	1	DNI	res0603	DNL	RC1608F103CS	Samsung Electro-Mechanics	RES SMD 10K OHM 1% 1/10W 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
125	R289	1	3.83K	res0603	—	RC0603FR-073K83L	Yageo	RES SMD 3.83K OHM 1% 1/10W 0603
126	R296	1	3.57K	res0402	—	ERJ-2RKF3571X	Panasonic Electronic Components	RES SMD 3.57K OHM 1% 1/10W 0402
127	R298	1	453R	res0603	—	CRCW0603453RFKEA	Vishay Dale	RES SMD 453 OHM 1% 1/10W 0603
128	R299	1	2.87K	res0402	—	CRCW04022K87FKED	Vishay Dale	RES SMD 2.87K OHM 1% 1/16W 0402
129	R311	1	49.9R	res0402	—	CRCW040249R9FKEDHP	Vishay Dale	RES SMD 49.9 OHM 1% 1/5W 0402
130	R316	1	1.6K	RES0402	—	RC0402FR-071K6L	Yageo	RES SMD 1.6K OHM 1% 1/16W 0402
131	R256,R329	2	0_DNL	RES0603	DNL	RC0603FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1% 1/10W 0603
132	SW1	1	SW_SPST	sw_spst-05_smd	—	219-5LPST	CTS Electrocomponents	SWITCH SLIDE DIP SPST 100MA 20V
133	SW2,SW3,SW7	3	MJTP1250	SW_TH2	—	MJTP1250	APEM Inc.	SWITCH TACTILE SPST-NO 0.05A 12V
134	SW6	1	TS01AQE	sw_500SSP1S1M6QEA	—	500SSP1S1M6QEA	E-Switch	SWITCH SLIDE SPDT 5A 120V
135	TP_VCC_CORE1,TP_RST1,TP_INITN1,TP_GND1,TP_DONE1,TP1,TP2,TP_1V_LDO1,TP_VDD_2V1,TP_5V1,TP_1V1_DDR1,TP_VCCA_1V2_CAM1,TP_12V_IN1,TP_VCCA_1V8_CAM1,TP_1V8_OUT1,TP_1V8_LDO1,TP_VCCA_2V8_CAM1,TP_3V3_PCIe1,TP_3V3_OUT1,3V3_RASP1,TP_VCCA_1V05_CAM1	21	VTTVREF	TP_50	DNL	—	—	—
136	U1	1	LFCPNX-100-9LFG672I	FPGA-672	Customer Supplied	LFCPNX-100-9LFG672I	Lattice	Jedi-D1 family of low-power general purpose FPGAs featuring 10G SerDes,
137	U2	1	511FCA000292CAG	osc_32x25_6pin_1p25mm	—	511FCA000292CAG	Silicon Labs	XTAL OSC XO 161.1328MHZ LVDS SMD
138	U3	1	125Mhz	830207511509	—	830207511509	Würth Elektronik	WE-SPXO CRYSTAL OSCILLATOR 125.0
139	U4	1	125MHz	osc_32x25_4pin_25mhz	—	SXO32C3A071-125.000M	Suntsu Electronics, Inc.	XTAL OSC XO 125.0000MHZ CMOS SMD
140	U5	1	W25Q512JVEIQ	8-WSON	—	W25Q512JVEIQ	Winbond Electronics	IC FLASH 512MBIT SPI/QUAD 8WSON

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
141	U6	1	100MHz	SXO75L3A271	—	SXO75L3A271-100.000MT	Suntsu Electronics, Inc.	XTAL OSC XO 100.0000MHZ LVDS SMD
142	U7	1	MT53E512M32D1ZW-046 WT:B	BGA_SDRAM_200	—	MT53E128M32D2DS-053 WT:A	Micron Technology Inc.	IC DRAM 4GBIT 1.866GHZ 200WFBGA
143	U8	1	SI5324C	QFN36_SI5324 C-C-GM	—	SI5324C-C-GM	Silicon Labs	Clock Synthesizer/Jitter Cleaner Any-frequency jitter attenuating clock
144	U9	1	114.285MHZ	osc_CS-023-114p285M	—	CS-023-114.285M	Connor-Winfield	CRYSTAL 114.2850MHZ 18PF SMD
145	U10	1	FOX924B-19.44	osc_5x3p2	—	FT5HNBPK19.44-T1	Fox Electronics	OSC TCXO 19.44MHZ HCMOS SMD
146	U11	1	MAX6070BAUT18T	sot23_6pin	—	MAX6070BAUT18+T	Maxim Integrated	Series Voltage Reference IC 0.08PCT SOT-23-6
147	U12	1	FT2232HL	LQFP64_FT2232HL	Customer Supplied	FT2232HL-REEL	FTDI, Future Technology Devices International Ltd	IC USB HS DUAL UART/FIFO 64-LQFP
148	U13	1	93LC56C-ISN	soic_8_150mil	—	93LC56C-I/SN	Microchip Technology	EEPROM Memory IC 2Kb _256 x 8, 128 x 16_ SPI 3MHz 8-SOIC
149	U14	1	12MHz	XTAL_7V-12p000MDDJ-T	—	7V-12.000MDDJ-T	TXC CORPORATION	CRYSTAL 12.0000MHZ 18PF SMD
150	U15,U16	2	TMUXHS4412IRUAT	QFN50P350X90 0X80-43N-D	—	TMUXHS4412IRUAT	Texas Instruments	4-CHANNEL 20GBPS DIFFERENTIAL 2:
151	U17	1	5V41068APGGI	SOP65P640X12 0-16N	—	5V41068APGGI	Renesas Electronics America Inc.	IC CLK MUX 2:1 16TSSOP
152	U18	1	PI6C557-03LEX	tssop16	—	PI6C557-03LEX	Diodes Incorporated	IC CLOCK GENERATOR 16TSSOP
153	U20	1	SN74LVC2T45MDCTTEP	SM8_SN74LVC2 T45MDCTTEP	—	SN74LVC2T45MDCTTEP	Texas	IC TRNSLTR BIDIRECTIONAL SM8
154	U22	1	RP115H121D-T1-FE	RP115H121D_S OT89-5	—	RP115H121D-T1-FE	Nisshinbo Micro Devices Inc.	IC REG LINEAR 1.2V 1A SOT89-5
155	U23	1	RP115L281B-E2	RP115H281L_D FN1218	—	RP115L281B-E2	Nisshinbo Micro Devices Inc.	IC REG LIN 2.8V 500MA DFN1216-8
156	U24	1	ASE3-27.000MHz-K-T	OSC_ASEDV-16000MHZ-LC-T	—	ASE3-27.000MHZ-KT	XTAL OSC XO 27.0000MHZ CMOS SMD	XTAL OSC XO 27.0000MHZ CMOS SMD

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
157	U25	1	RP115H181D-T1-FE	RP115H181D_SOT89-5	—	RP115H181D-T1-FE	Nisshinbo Micro Devices Inc.	IC REG LINEAR 1.8V 1A SOT89-5
158	U26	1	S-1172B11-U5T1U	S-1172B11_SOT89-5	—	S-1172B11-U5T1U	ABLIC U.S.A. Inc.	IC REG LINEAR 1.1V 1A SOT89-5
159	U27	1	LMZ22005TZ/NOPB	to_pmod_7	—	LMZ22005TZ/NOPB	Texas Instruments	DC DC CONVERTER 0.8-6V
160	U28,U29,U32	3	LMZ30604RKGT	RKG39	—	LMZ30604RKGT	Texas Instruments	DC DC CONVERTER 0.8-3.6V 14W
161	U30,U34	2	TPS74901	vqfn_20	—	TPS74901RGWR	Texas Instruments	IC REG LINEAR POS ADJ 3A 20VQFN
162	U31	1	BD00IC0WHFV-GTR	6-HVSOF	—	BD00IC0WHFV-GTR	Rohm Semiconductor	IC REG LINEAR POS ADJ 1A 6HVSOF
163	U33	1	LMZ30606RKGT	RKG39	—	LMZ30606RKGT	Texas Instruments	DC DC CONVERTER 0.8-3.6V 22W
164	U36	1	FT601Q	QFN76_FT601Q	—	FT601Q-B	FTDI	IC USB3-32BIT SYNC FIFO 76QFN
165	X1	1	MDT850M01501	conn_pci_MDT850M01501	—	MDT850M01501	Amphenol ICC (FCI)	PCIE M.2 CONNECTORS, P=0.5MM, H=
166	X2	1	25MHz	XTAL_ECS-250	—	ECS-250-18-33-JGN-TR	ECS Inc.	CRYSTAL 25.0000MHZ 18PF SMD
167	X4	1	30Mhz	XTAL_ABM8	—	ABM8-30.000MHZ-10-1-U-T	Abracon LLC	CRYSTAL 30.0000MHZ 10PF SMD
168	CERTUSPRO_NX_VERSA_BOARD REVA PCB	1	—	—	—	305-PD-22-0022	—	—

Technical Support Assistance

Submit a technical support case through www.latticesemi.com/techsupport.

For frequently asked questions, refer to the Lattice Answer Database at www.latticesemi.com/Support/AnswerDatabase.

Revision History

Revision 1.2, July 2023

Section	Change Summary
Introduction	In Figure 1.1. Top View of CertusPro-NX Versa Evaluation Board: • changed the label for the potentiometer from *12V source (SW6)* to *POT (R143)*; • changed the label of *PMOD0-1(J64-5)* to *PMOD0-1(J64-65)*; • changed the label of *ADC Headers and Jumpers (J25-9)* to *ADC Headers and Jumpers (J26-29)*; • newly added the label of *ADC_DP0 (J25)*; • changed the label of *Indicator LEDs (D63-8,D104-5)* to *Indicator LEDs (D63-68,D104-105)*.

Jumper Definitions	• In Figure 2.1. Top View of CertusPro-NX Versa Evaluation Board – Jumper Selection, changed the jumper placement for J26 from pins 2:3 to pins 1:2.
	• Table 2.1. Jumper Details:
	   • for J26, changed its Setting description from *Default 1–2 (GND)/2-3 (connector)* to *Default 1–2 (GND)/2-3 (Pin 5 of J27)*;
	   • for J25, changed its Setting description from *Default 1–2 (POT)/2-3 (connector)* to *Default 1–2 (POT)/2-3 (Pin 3 of J27)*.

Programming and I²C	Newly added the Programming the FPGA section and the Troubleshooting section.
Technical Support Assistance	Added the link to the Lattice Answer Database.

Revision 1.1, August 2022

Section	Change Summary
Control Buses – I²C, UART, and SPI	Added a table note concerning the signal name and ball location in Table 6.2. UART Bus Connections.

Revision 1.0, May 2022

Section	Change Summary
All	Initial release