



Certus-NX Versa Evaluation Board

User Guide

FPGA-EB-02032-1.0

April 2021

Disclaimers

Lattice makes no warranty, representation, or guarantee regarding the accuracy of information contained in this document or the suitability of its products for any particular purpose. All information herein is provided AS IS and with all faults, and all risk associated with such information is entirely with Buyer. Buyer shall not rely on any data and performance specifications or parameters provided herein. Products sold by Lattice have been subject to limited testing and it is the Buyer's responsibility to independently determine the suitability of any products and to test and verify the same. No Lattice products should be used in conjunction with mission- or safety-critical or any other application in which the failure of Lattice's product could create a situation where personal injury, death, severe property or environmental damage may occur. The information provided in this document is proprietary to Lattice Semiconductor, and Lattice reserves the right to make any changes to the information in this document or to any products at any time without notice.

Contents

Acronyms in This Document.....	5
1. Introduction.....	6
1.1. Certus-NX Versa Evaluation Board.....	6
1.2. Features.....	6
1.3. Certus-NX Device.....	9
1.4. Applying Power to the Board.....	9
2. Jumper Definition.....	10
3. Power Scheme.....	12
4. Programming and I ² C.....	14
4.1. JTAG Download Interface.....	14
4.2. Alternate JTAG Download Interface.....	14
4.3. JTAG to MSPI Pass-through Interface.....	14
4.4. SPI Flash Device Selection in Programmer.....	15
4.5. Other JTAG Configuration Pins.....	16
5. Certus-NX Clock Sources.....	17
6. Control Buses – I ² C, UART, and SPI.....	18
6.1. I ² C Topology.....	18
6.2. UART Topology.....	18
6.3. SPI Topology.....	18
7. LEDs and Switches.....	19
7.1. DIP Switch.....	19
7.2. General Purpose Push Buttons.....	19
7.3. General Purpose LEDs.....	20
7.4. 7-Segment LED.....	20
8. Headers/Connectors and Certus-NX Device Ball Mapping.....	21
8.1. PCIe Gold Finger.....	21
8.2. Soft D-PHY Camera Connector.....	21
8.3. Parallel Camera Connector.....	22
8.4. DDR3 Memory.....	22
8.5. SGMII Ethernet PHY.....	24
8.6. RGMII Ethernet PHY.....	25
8.7. PMOD Header.....	26
9. Software Requirements.....	27
10. Storage and Handling.....	27
11. Ordering Information.....	27
Appendix A. Certus-NX Versa Evaluation Board Schematics.....	28
Appendix B. Certus-NX Versa Evaluation Board Bill of Materials.....	44
References.....	56
Technical Support Assistance.....	57
Revision History.....	58

Figures

Figure 1.1. Top View of Certus-NX Versa Evaluation Board.....	7
Figure 1.2. Bottom View of Certus-NX Versa Evaluation Board	8
Figure 1.3. 12 V DC Power Supply.....	9
Figure 2.1. Top View of Certus-NX Versa Evaluation Board – Jumper Locations.....	10
Figure 3.1. Board Power Scheme.....	12
Figure 4.1. Configuration and I ² C Architecture.....	14
Figure 4.2. SPI Flash Operation Dialog.....	15
Figure A.1. Title Page	28
Figure A.2. Block Diagram.....	29
Figure A.3. USB Interface.....	30
Figure A.4. Bank-0 Configuration.....	31
Figure A.5. Bank-1 7-Segment&CLK.....	32
Figure A.6. Bank-2 PMOD&LEDs.....	33
Figure A.7. Bank-3, 4 DDR3&D-PHY	34
Figure A.8. Bank-5 SGMII GbE.....	35
Figure A.9. Bank-6 RGMII GbE	36
Figure A.10. Bank-7 Parallel Camera.....	37
Figure A.11. Soft D-PHY Camera	38
Figure A.12. PCIe.....	39
Figure A.13. Bank Power.....	40
Figure A.14. Power Decoupling.....	41
Figure A.15. Power Regulators	42
Figure A.16. Power Block Diagram.....	43

Tables

Table 1.1. Board Power Supply	9
Table 2.1. Jumper Table.....	11
Table 3.1. VCCIO Supply Options	12
Table 3.2. Status LED Definition.....	13
Table 4.1. JTAG Connections.....	14
Table 4.2. Other JTAG Signals	16
Table 5.1. Clock Sources	17
Table 6.1. I ² C Bus Connections	18
Table 6.2. UART Bus Connections	18
Table 6.3. Certus-NX SPI Connections.....	18
Table 7.1. DIP Switch Signals	19
Table 7.2. Push Button Switch Signals	19
Table 7.3. General Purpose LED Signals.....	20
Table 7.4. 7-Segment LED Signals	20
Table 11.1. Ordering Information	27

Acronyms in This Document

A list of acronyms used in this document.

Acronym	Definition
AC/DC	Alternating Current and Direct Current
caBGA	Chip Array Ball Grid Array
CMOS	Complementary Metal-Oxide Semiconductor
DDR	Double Data Rate
DIP	Dual Inline Package
ESD	Electro Static Discharge
FPGA	Field Programmable Logic Array
FTDI	Future Technology Devices International
GPIO	General Purpose Input/Output
I ² C	Inter-Integrated Circuit
JTAG	Joint Test Action Group
LED	Light Emitting Diode
LVDS	Low-Voltage Differential Signaling
PC	Personal Computer
PCIe	Peripheral Component Interconnect Express
PHY	Physical Layer Device
PMOD	Peripheral Module
RGMII	Reduced Gigabit Media Independent Interface
SGMII	Serial Gigabit Media Independent Interface
SPI	Serial Peripheral Interface
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

1. Introduction

The Lattice Semiconductor Certus™-NX Versa Evaluation Board allows designers to investigate and experiment with the features of the Certus-NX Field Programmable Gate Array (FPGA). The features of the Certus-NX Versa Evaluation Board can assist engineers with the rapid prototyping and testing of their specific designs. The Certus-NX Versa Evaluation board is part of the Certus-NX Versa Evaluation Board Kit. The guide is intended to be referenced in conjunction with demo user guides to demonstrate the Certus-NX FPGA.

The Certus-NX Versa Evaluation Board is part of the Certus-NX Versa Evaluation Kit, which includes the following:

- Certus-NX Versa Evaluation Board pre-loaded with demo design
- USB-A to USB-B (Mini) cable for programming FPGA through a PC
- 12V AC/DC power adapter and international plug adapters
- Lattice Radiant® software download information

The contents of this user guide include top-level functional descriptions of the various portions of the board, descriptions of the on-board headers, status indicators, push buttons and switches and a complete set of schematics.

1.1. Certus-NX Versa Evaluation Board

The Certus-NX Versa Evaluation Board features the Certus-NX FPGA in the 256-ball caBGA 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 Certus-NX FPGA with DDR3, soft D-PHY, 1Gbps Ethernet and 1x PCIe (Gen2) channel. Easy to use board resources of the jumper, LED indicator, push button and switch are available for user-defined applications.

[Figure 1.1](#) shows the top view of Certus-NX Versa Evaluation Board. [Figure 1.2](#) shows the bottom view of Certus-NX Versa Evaluation Board.

1.2. Features

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

- Certus-NX FPGA
- DDR3/DDR3L memory with 1066Mbps data rate and 16x bits data width
- Soft D-PHY camera connector and parallel camera connector
- SGMII and RGMII 1Gbps Ethernet interface
- 1x Gen2 PCIe interface with Gold finger connector
- USB-B connection for device programming and Inter-Integrated Circuit Bus (I²C) utility
- On-board Boot Flash – 128 Mb Serial Peripheral Interface (SPI) Flash, with Quad read feature
- Four input DIP switches, five push buttons, eight status LEDs and one 7-segment LED for customer purposes
- Three 12-pin PMOD interface connectors
- Lattice Radiant® software programming support
- Multiple reference clock sources

Caution: The Certus-NX Versa Evaluation Board contains ESD-sensitive components. ESD safe practices should be followed while handling and using the evaluation board.

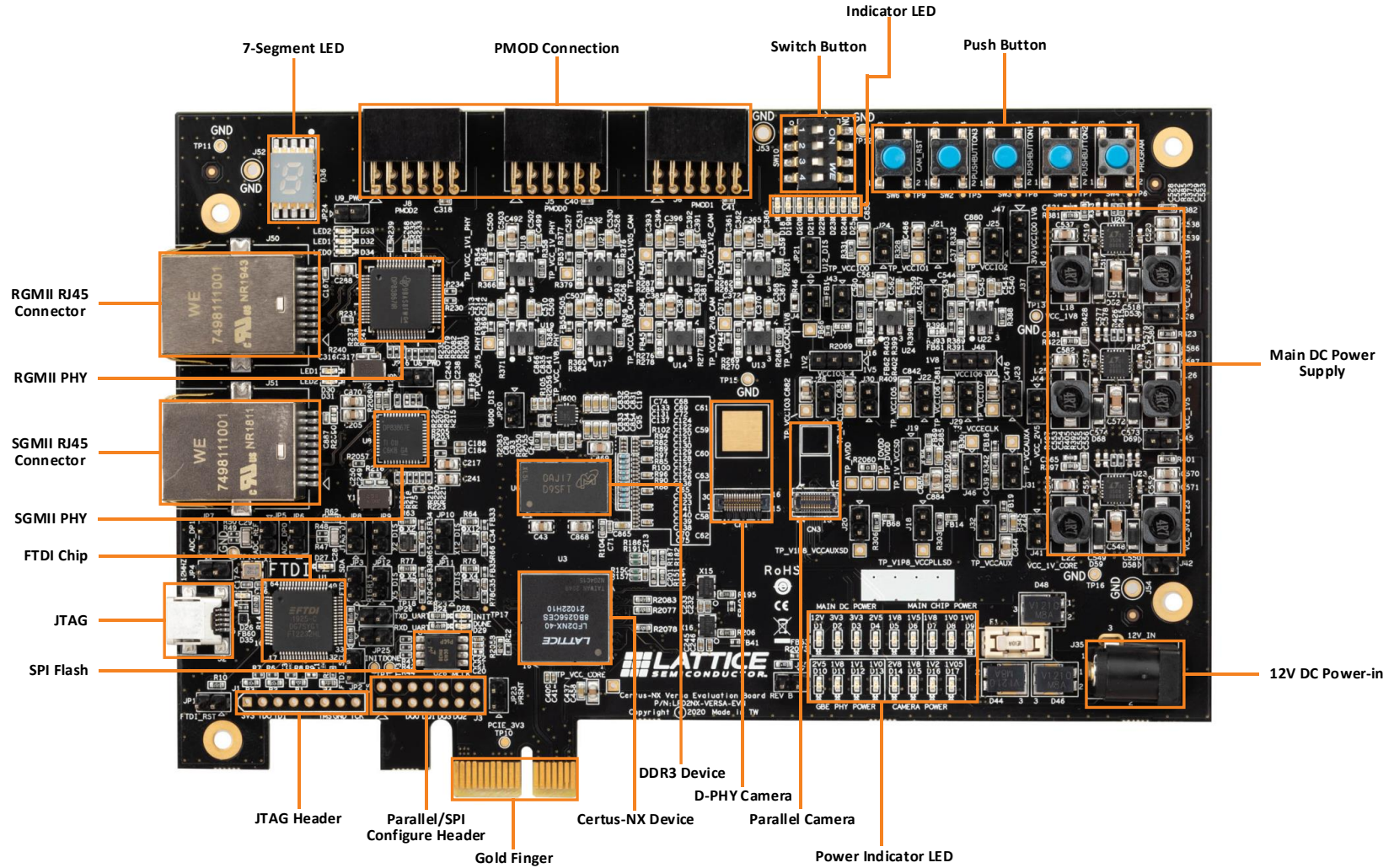


Figure 1.1. Top View of Certus-NX Versa Evaluation Board

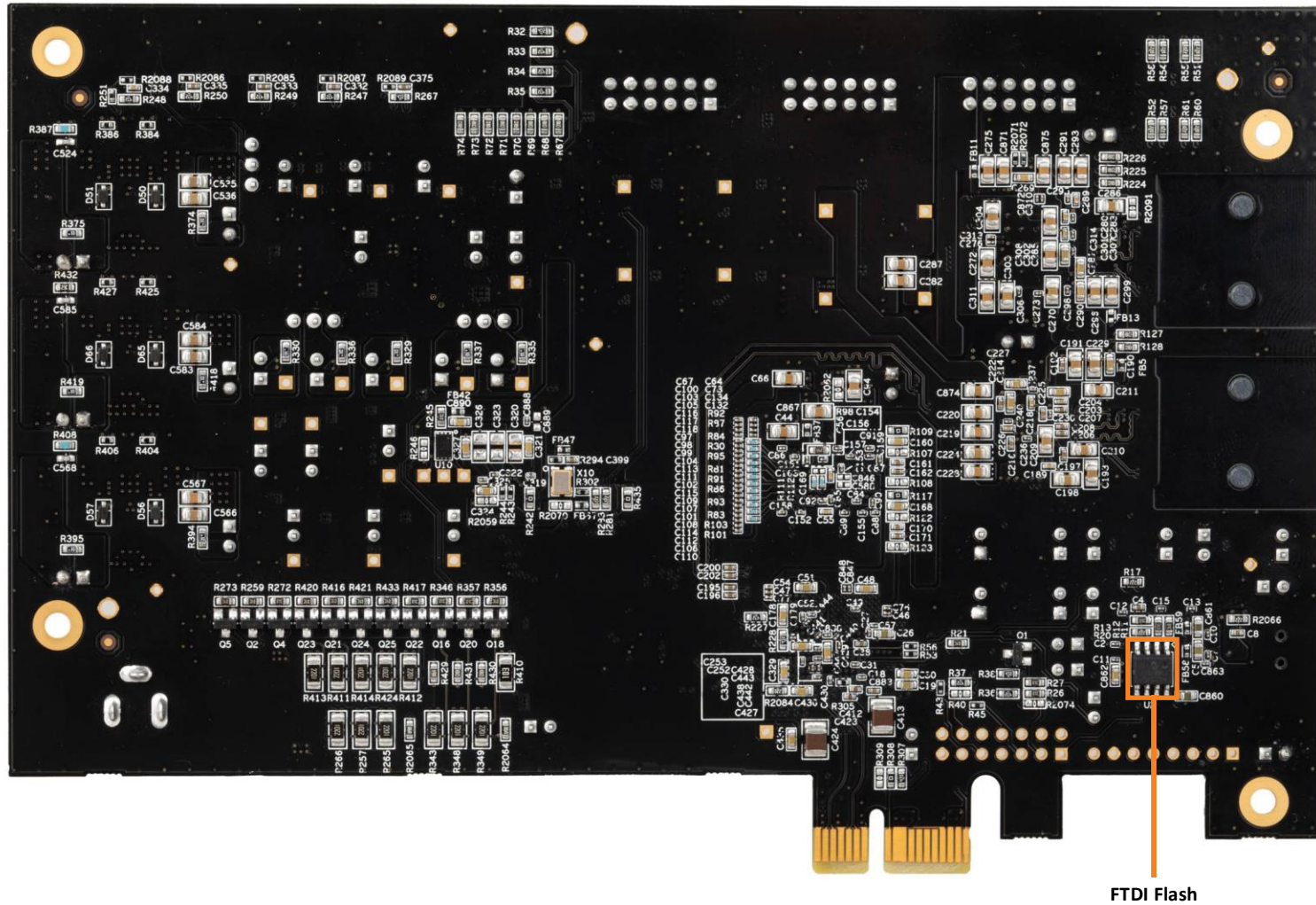


Figure 1.2. Bottom View of Certus-NX Versa Evaluation Board

1.3. Certus-NX Device

The Certus-NX Versa Evaluation Board features the Certus-NX device in a 256-ball caBGA package, also referred to as LFD2NX-40-8BG256C. The low-power general purpose FPGA can be used in a wide range of applications across multiple markets, and are optimized for bridging and processing needs in edge applications. For more information on the capabilities of Certus-NX device, see [Certus-NX Family Data Sheet \(FPGA-DS-02078\)](#).

1.4. Applying Power to the Board

The Certus-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 J35, 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 Certus-NX Versa Evaluation Board to indicate the board is functioning.

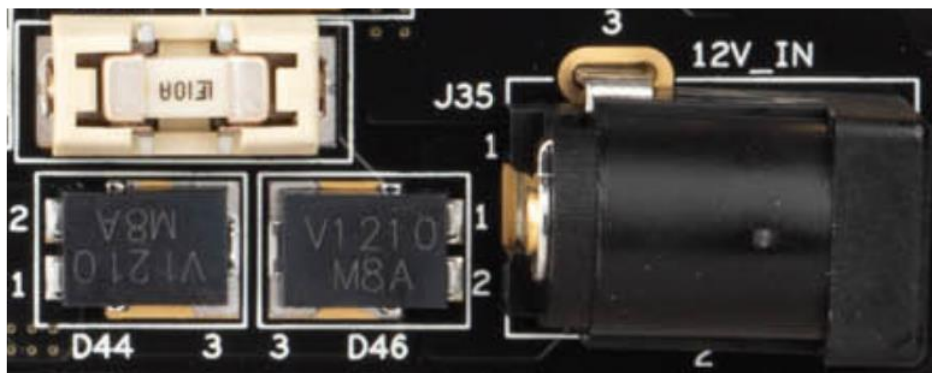


Figure 1.3. 12 V DC Power Supply

Table 1.1. Board Power Supply

Part Designator	Description
J35	12 V DC Input Supply Jack
F1	12 V DC Input Supply Fuse

2. Jumper Definition

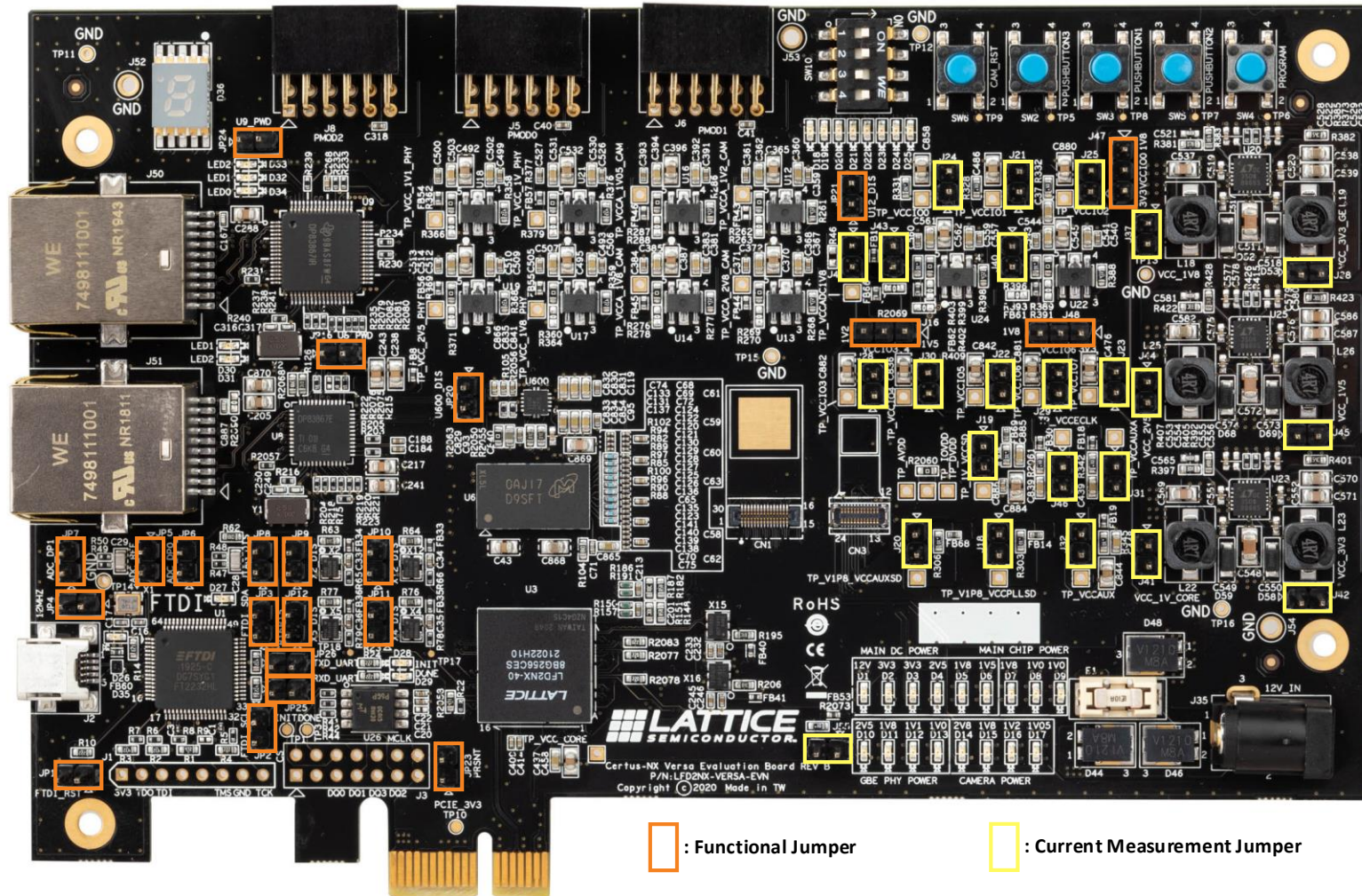


Figure 2.1. Top View of Certus-NX Versa Evaluation Board – Jumper Locations

Table 2.1. Jumper Table

Part Designator	Description	Setting
JP1	FTDI Reset Jumper	Default Open (Active FTDI)/Short (Reset FTDI)
JP2, JP3	I ² C Configuration Jumper	Default Open (I ² C bus unconnected)/Short (I ² C bus connected)
JP4	FTDI Oscillator Jumper	Default Short (12 MHz OSC connected)/Open (12 MHz OSC unconnected)
JP5, JP6, JP7	ADC Function Connector	Always Open. ADC Test Voltage Signal Input
JP8	JTAG_EN Function Jumper	Default Open (Used as JTAG interface)/Short (Used as GPIO)
JP9, JP10, JP11, JP12	Oscillator Standby Jumper	Default Open (Clock output enable)/Short (Clock output disable)
JP16, JP24	Ethernet Physical Layer Transceiver Power Down Jumper	Default Open (Physical Layer Transceiver active)/Short (Physical Layer Transceiver power down)
JP20	DDR Termination Regulator ON/OFF Jumper	Default Open (Regulator enable)/Short (Regulator disable)
JP21	1.2 V Regulator Chip Enable Jumper	Default Open (1.2 V power on)/ Short (1.2 V power down)
JP23	PCIe Add-in Card Present Jumper	Default Short (Presence detection enable)/Open (PCIe power using)
JP25, JP26	UART Debug Jumper	Default Short (UART bus connected)/Open (UART bus unconnected)
J47	VCCIO0 Supply Voltage Selection Jumper	Default 1–2 (1.8 V)/2-3 (3.3 V)
J16	VCCIO3,4 Supply Voltage Selection Jumper	Default 1–2 (1.5 V)/2-3 (1.2 V)
J48	VCCIO6 Supply Voltage Selection Jumper	Default 1–2 (3.3 V)/2-3 (1.8 V)
J4, J18, J19, J20, J21, J22, J23, J24, J25, J28, J29, J30, J31, J32, J37, J38, J40, J41, J42, J43, J44, J45, J46, and J55	Current Measurement 2 Pins Header	—

3. Power Scheme

The Certus-NX Versa Evaluation Board has most of on-board regulators powered by an external 12 V power. Refer to [Appendix A. Certus-NX Versa Evaluation Board Schematics](#) to see the details of these power supply options. [Figure 3.1](#) shows the high-level power supply architecture of the board. [Table 3.1](#) shows the voltage options available for the various VCCIO supplies.

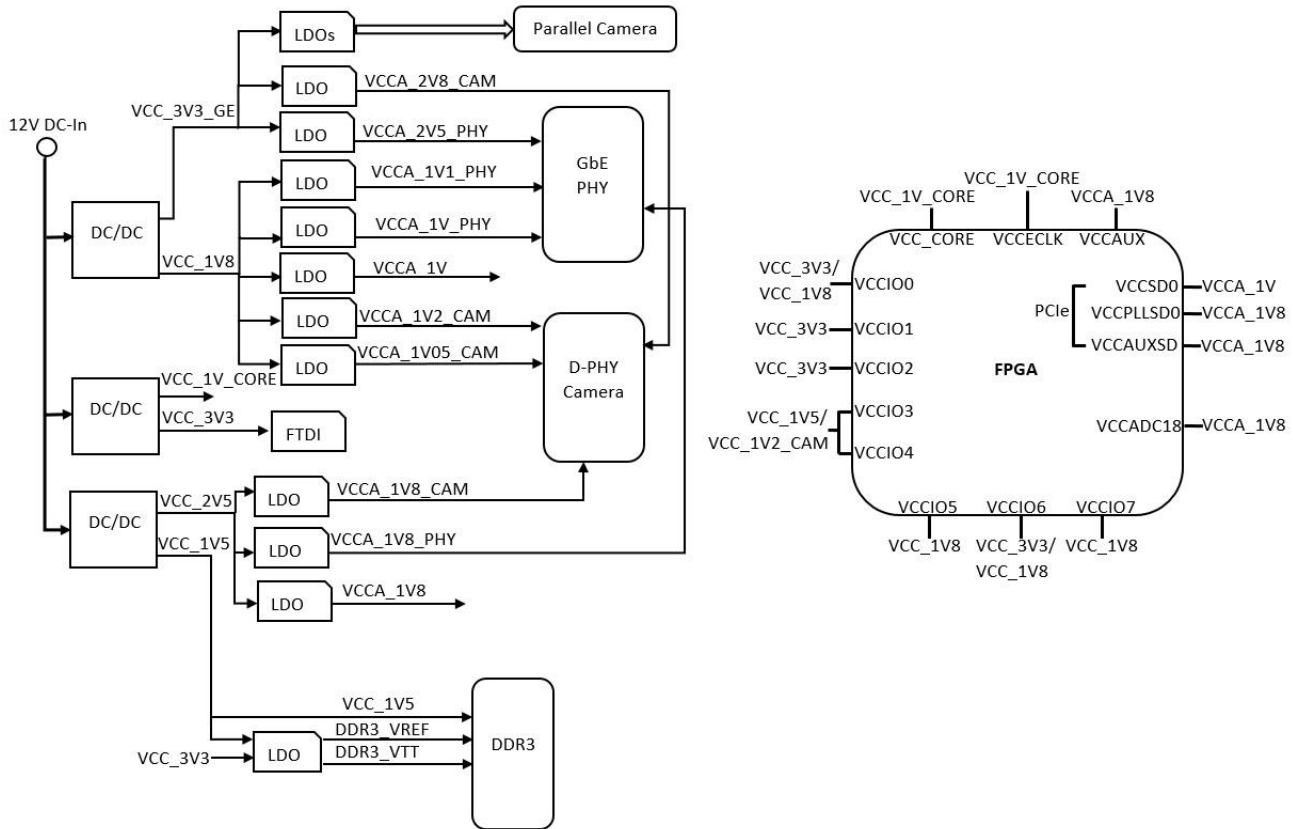


Figure 3.1. Board Power Scheme

Table 3.1. VCCIO Supply Options

VCCIO Bank	Selection Jumper	3.3 V	1.8 V	1.5 V	1.2 V
VCCIO0	J47	Selectable	Default	—	—
VCCIO1	—	Fixed	—	—	—
VCCIO2	—	Fixed	—	—	—
VCCIO3	J16	—	—	Default	Selectable
VCCIO4	J16	—	—	Default	Selectable
VCCIO5	—	—	Fixed	—	—
VCCIO6	J48	Default	Selectable	—	—
VCCIO7	—	—	Fixed	—	—

The Certus-NX Versa Evaluation Boards provide status LEDs to provide a visual indication of power status (Table 3.2).

Table 3.2. Status LED Definition

LED Designator	Color	Description
D1	Green	12 V power on
D2	Green	3.3 V power on
D3	Green	3.3 V for Ethernet power on
D4	Green	2.5 V power on
D5	Green	1.8 V power on
D6	Green	1.5 V power on
D7	Green	1.8 V for Certus-NX device power on
D8	Green	1 V for Certus-NX core power on
D9	Green	1 V for Certus-NX device power on
D10	Green	2.5 V for Ethernet power on
D11	Green	1.8 V for Ethernet power on
D12	Green	1.1 V for Ethernet power on
D13	Green	1 V for Ethernet power on
D14	Green	2.8 V for Camera power on
D15	Green	1.8 V for Camera power on
D16	Green	1.2 V for Camera power on
D17	Green	1.05 V for Camera power on
D26	Green	J2 USB header plug in

4. Programming and I²C

The JTAG/SPI programming architecture and I²C interface of the Certus-NX Versa Evaluation Board is shown in Figure 4.1.

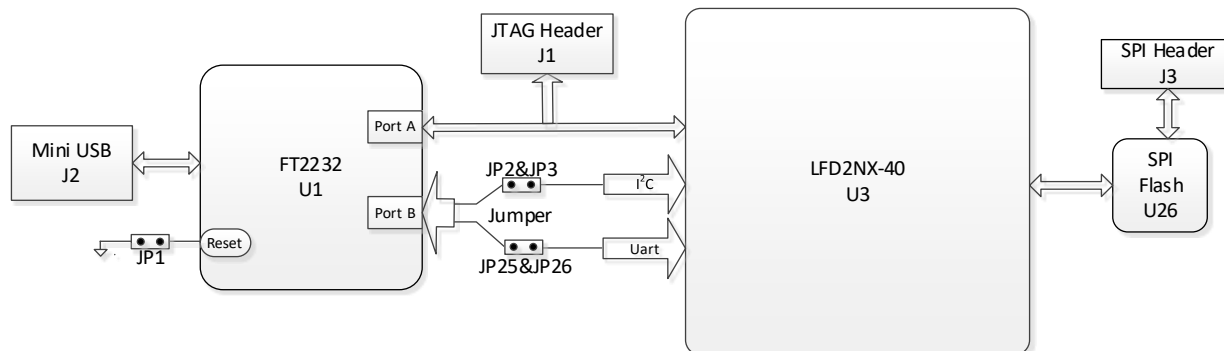


Figure 4.1. Configuration and I²C Architecture

4.1. JTAG Download Interface

The Certus-NX Versa Evaluation Board has a built-in download controller for programming the Certus-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 (J2) on the board. A mini USB to USB-A cable is included in the Certus-NX Versa Evaluation Kit. The USB hub on the PC detects the cable of the USB function on Port A, making the built-in cable available for use with the Radiant programming software.

4.2. Alternate JTAG Download Interface

J1 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 installing the JP1 jumper. A USB download cable can be attached to the board using J1 to interface with the Certus-NX device. For details on the connection between the USB download cable and J1, refer to [Programming Cables User Guide \(FPGA-UG-02042\)](#). J1 can also be used as test point when the configuration from USB to JTAG is working. The JTAG connections are listed in [Table 4.1](#).

Table 4.1. JTAG Connections

J1 Pin Number	JTAG Signal Name	Certus-NX Ball Location for JTAG
1	VCC_3V3	—
2	TDO	E14
3	TDI	F11
4	—	—
5	—	—
6	TMS	E11
7	GND	—
8	TCK	F14

4.3. 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.

4.4. SPI Flash Device Selection in Programmer

The Flash device on this board is a Micron MT25QU128ABA which powers up with 1.8 V (Figure 4.2).

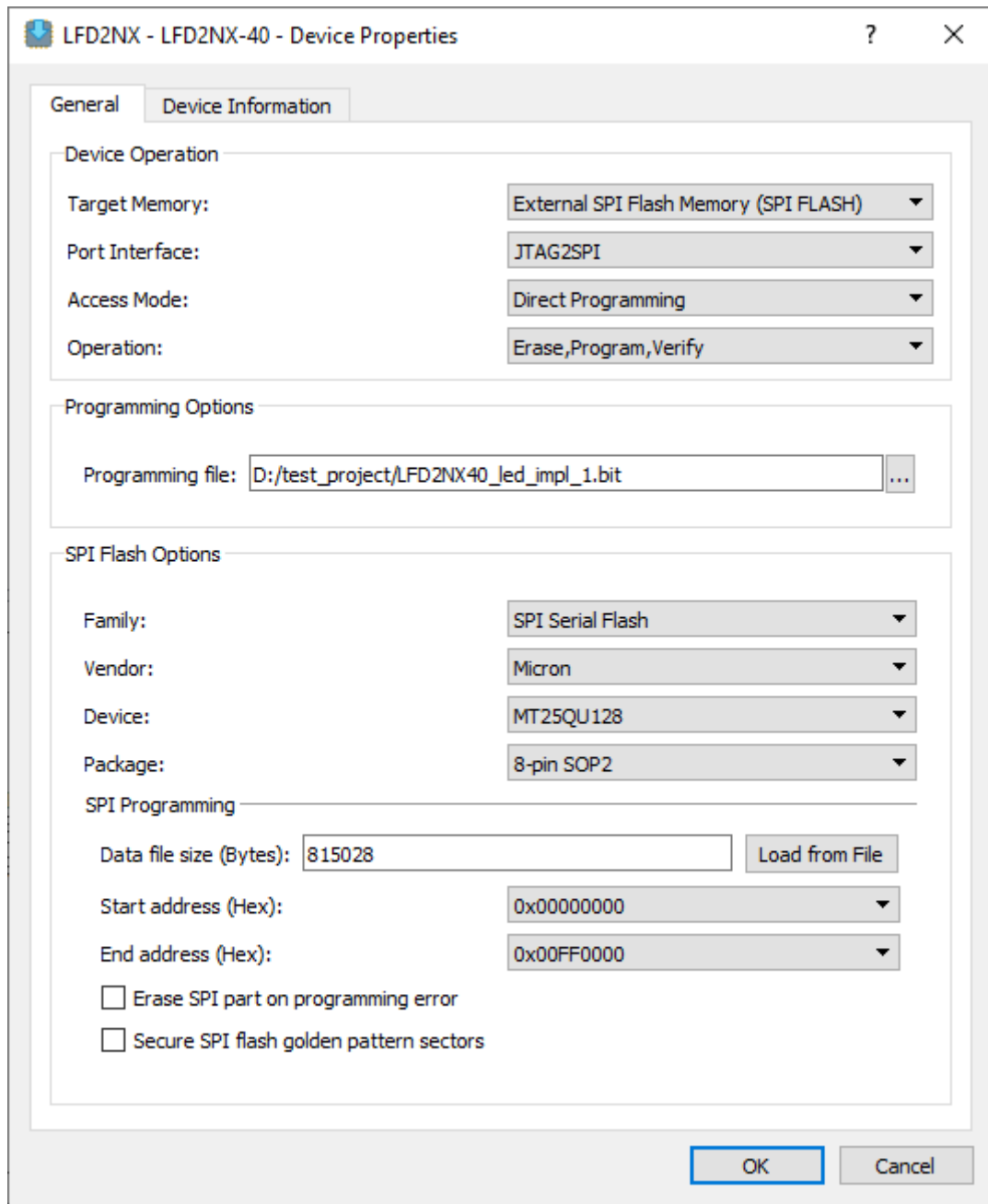


Figure 4.2. SPI Flash Operation Dialog

You may proceed with the Flash device programming by following the procedure described in [sysCONFIG Usage Guide for Nexus Platform \(FPGA-TN-02099\)](#).

4.5. Other JTAG Configuration Pins

The Certus-NX Versa Evaluation Board provides test points for other JTAG configuration pins as shown in [Table 4.2](#).

Table 4.2. Other JTAG Signals

Signal Name	Certus-NX Ball Location	Test Point	Push Button
PROGRAMN	C12	TP6	SW4
INITN	D11	TP1	—
DONE	B16	TP3	—

- **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 \(FPGA-TN-02099\)](#).

5. Certus-NX Clock Sources

The Certus-NX Versa Evaluation Board has seven options for the Certus-NX clock sources, as shown in [Table 5.1](#).

Table 5.1. Clock Sources

Clock Frequency (MHz)	Signal Name	Certus-NX Ball Location	Clock Source	Comments
12	12MHz	G13	X1	JP4 installed and JP1 removed.
25	SYSTEM_25M_CLK	F16	X2	JP9 removed.
27	D-PHY_27M_CLK	G15	X12	JP10 removed.
100	CLK_CUSTOMER1	H11	X4	JP11 removed.
125	CLK_CUSTOMER2	H13	X5	JP12 removed.
100	100MHz_P/100MHz_N	P1/ P2	X15	Output pin F15 should be "1" or "Hiz".
125	125MHz_P/125MHz_N	L6/ K7	X16	Output pin H10 should be "1" or "Hiz".

The Certus-NX Versa Evaluation Board also has one additional clock source (X10) to support 27 MHz clock to camera module. This clock is a persistent output clock source and should always be connected with camera connector (CN1).

6. Control Buses – I²C, UART, and SPI

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

6.1. I²C Topology

The Certus-NX Versa Evaluation Board uses the I²C bus to support Certus-NX configuration. The I²C bus has the signal names SCL and SDA. When the jumpers (JP2 and JP3) are closed, the I²C bus is connected to a dedicated Certus-NX GPIO bank 1. The I²C and UART share same output port B on FTDI chip. Refer to [Figure 4.1](#) for the topology diagram. The I²C connections are summarized in [Table 6.1](#).

Table 6.1. I²C Bus Connections

Signal Name	Certus-NX Ball Location	FTDI Chip Ball Location	Jumper
SCL	G10	38	JP2
SDA	G9	39&40	JP3

6.2. UART Topology

The board provides support for UART communication by providing a flexible connection between the Certus-NX device and FTDI chip. Two jumpers (JP25 and JP26) can be closed to connect to two general purpose I/O (F10 and E13) in Bank 1 as shown in [Table 6.2](#). This UART is alternative with I²C bus by setting FTDI configuration. The LED (D27) will be light with green color in UART mode.

Table 6.2. UART Bus Connections

Signal Name	Certus-NX Ball Location	FTDI Chip Ball Location	Jumper
TXD_UART	F10	38	JP25
RXD_UART	E13	39	JP26

6.3. SPI Topology

6.3.1. SPI Configuration

One of the major functions of SPI connections on the board is to support Certus-NX configuration from the SPI Flash or the Parallel Configuration Header (J3), as shown in [Table 6.3](#). The Certus-NX Versa Evaluation Board can support both Master SPI (MSPI) and Slave SPI (SSPI) modes for Certus-NX configuration.

Table 6.3. Certus-NX SPI Connections

Signal Name	Certus-NX Ball	Parallel Configuration Header Pin
SPI_MCLK	C16	12
DQ0_MOSI	C14	5
DQ1_MISO	D16	7
CSSPIN	C15	8
DQ2	D15	11
DQ3	D12	9
MCSNO	C13	3

7. LEDs and Switches

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

7.1. DIP Switch

Four Certus-NX pins are connected to the DIP switch (SW10) to allow manually actuating input to the FPGA. One side of each switch is connected to GPIOs within bank 0, bank 3 and bank 4, and 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	Certus-NX Ball Location	Certus-NX Bank	Default I/O
DIP_SW1	L10	3	LVC MOS15
DIP_SW2	E16	0	LVC MOS18
DIP_SW3	L11	3	LVC MOS15
DIP_SW4	R3	4	LVC MOS15

7.2. General Purpose Push Buttons

The Certus-NX Versa Evaluation Board provides five push button switches – SW2, SW3, SW4, SW5 and SW6 for demos and user applications. Two of the buttons control pre-defined functional pins, and the other three is generic. 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	Certus-NX Ball Location	Push Button Reference	Certus-NX Bank	Default I/O
CAM_RST	G3	SW6	7	LVC MOS18
PROGRAMN	C12	SW4	0	LVC MOS18
PUSHBUTTON1	G4	SW3	7	LVC MOS18
PUSHBUTTON2	G2	SW5	7	LVC MOS18
PUSHBUTTON3	J16	SW2	2	LVC MOS33

For more information on PROGRAMN, refer to [sysCONFIG Usage Guide for Nexus Platform \(FPGA-TN-02099\)](#). SW6 is intended to be used as a global set/reset pin for camera module installed on connector (CN1) when active low. SW6 cannot be substituted for another function. SW2, SW3, and SW5 can be used as generic input.

For both push button and DIP switch inputs, it is recommended that the PULLMODE (set in Radiant software) be changed from the default DOWN to either UP or NONE to insure a solid logic “1” input.

7.3. General Purpose LEDs

The Certus-NX Versa Evaluation Board provides eight LEDs that are connected to I/O within Bank 2. 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	Certus-NX Ball Location	Certus-NX Bank/Color/Default I/O
LED_0	B3	2/Green/LVCMOS33
LED_1	A2	2/Green/LVCMOS33
LED_2	H16	2/Green/LVCMOS33
LED_3	B2	2/Green/LVCMOS33
LED_4	H15	2/Green/LVCMOS33
LED_5	H14	2/Green/LVCMOS33
LED_6	H12	2/Green/LVCMOS33
LED_7	J15	2/Green/LVCMOS33

7.4. 7-Segment LED

The Certus-NX Versa Evaluation Board provides one 7-Segment LED that is connected to I/O within Bank 1. The LEDs are lighted with blue color when the output is driven LOW. The designated pins are connected as shown in [Table 7.4](#).

Table 7.4. 7-Segment LED Signals

Signal Name	Certus-NX Ball Location	Certus-NX Bank/Color/Default I/O
S_SEG_A	G16	1/Blue/LVCMOS33
S_SEG_B	G14	1/Blue/LVCMOS33
S_SEG_C	G12	1/Blue/LVCMOS33
S_SEG_D	G11	1/Blue/LVCMOS33
S_SEG_E	E12	1/Blue/LVCMOS33
S_SEG_F	E10	1/Blue/LVCMOS33
S_SEG_G	E9	1/Blue/LVCMOS33
S_SEG_DP	F9	1/Blue/LVCMOS33

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

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

8.1. PCIe Gold Finger

Table 8.1. Gold Finger Pin Connections

CN2 Pin Name	Signal Name	Certus-NX Ball Location
A1	PRSNT1n	—
A2,A3,B1,B2,B3	12_IN_PCIE	—
A4,A12,A15,A18,B4,B7,B13,B16,B18	GND	—
A9,A10,B8	PCIE_3V3	—
A11	PCIE_PERSTn	A3
A13	PCIE_CLKP	A9
A14	PCIE_CLKN	B9
A16	x1_PERp0	A12
A17	x1_PERn0	A11
B14	x1_PETp0	A15
B15	x1_PETn0	A14
B17	PRSNT2n	—
—	R_ext	C11
—	Ref_return_pll	B12

8.2. Soft D-PHY Camera Connector

Table 8.2. D-PHY Camera Header Pin Connections

CN1 Pin Name	Signal Name	Certus-NX Ball Location
2	SLVS_CN	P16
3	SLVS_CP	P15
5	SLVS_3N	R15
6	SLVS_3P	R16
8	SLVS_1N	T15
9	SLVS_1P	T14
11	SLVS_0N	T8
12	SLVS_0P	T7
14	SLVS_2N	T4
15	SLVS_2P	T3
4,7,10,13,16,17,27,28,30, 18,29	GND	—
18,29	VCCA_2V8_CAM	—
20	CAM_CLK	—
21	FRM_SYNC	G6
22	CAM_SDA	F4
23	CAM_SCL	B1
24	CAM_RST	G3
25	VCCA_1V05_CAM	—
26	VCCA_1V8_CAM	—

8.3. Parallel Camera Connector

Table 8.2. Parallel Camera Header Pin Connections

CN3 Pin Name	Signal Name	Certus-NX Ball Location
1, 3,10,13,15	GND	—
2	AVDD	—
4	Camera_TRIG	D3
5	Camera_FVLD	C1
6	Camera_LVLVD	D1
7	Camera_SCL	E1
8	Camera_SDA	F2
9	Camera_INT	E2
11	IOVDD	—
12	DVDD	—
14	Camera_MCLK	D4
16	Camera_PCLK	F6
17	Camera_D0	E3
18	Camera_D1	D2
19	Camera_D2	C2
20	Camera_D3	E5
21	Camera_D4	E4
22	Camera_D5	E6
23	Camera_D6	D6
24	Camera_D7	D5

8.4. DDR3 Memory

Table 8.4. DDR3 Memory Pin Connections

U6 Pin Name	Signal Name	Certus-NX Ball Location
—	FPGA_VREF	R11,M15,R1,N10
E3	DDR3_DQ0	R13
F7	DDR3_DQ1	N11
F2	DDR3_DQ2	T12
F8	DDR3_DQ3	R14
H3	DDR3_DQ4	T11
H8	DDR3_DQ5	P10
G2	DDR3_DQ6	P11
H7	DDR3_DQ7	R10
F3	DDR3_DQS0	R12
G3	DDR3_DQS0#	T13
D7	DDR3_DQ8	M12
C3	DDR3_DQ9	L12
C8	DDR3_DQ10	M11
C2	DDR3_DQ11	N13
A7	DDR3_DQ12	M16
A2	DDR3_DQ13	M13
B8	DDR3_DQ14	M14
A3	DDR3_DQ15	N14

U6 Pin Name	Signal Name	Certus-NX Ball Location
C7	DDR3_DQS1	N16
B7	DDR3_DQS1#	N15
N3	DDR3_A0	R4
P7	DDR3_A1	P7
P3	DDR3_A2	R2
N2	DDR3_A3	L8
P8	DDR3_A4	R6
P2	DDR3_A5	T2
R8	DDR3_A6	R5
R2	DDR3_A7	P4
T8	DDR3_A8	P6
R3	DDR3_A9	T6
L7	DDR3_A10	P8
R7	DDR3_A11	T5
N7	DDR3_A12	R7
M2	DDR3_BA0	N8
N8	DDR3_BA1	R8
M3	DDR3_BA2	M8
K3	DDR3_CAS#	M10
J7	DDR3_K0	T9
K7	DDR3_K0#	T10
K9	DDR3_CEO	P9
L2	DDR3_CS0#	M9
E7	DDR3_DM0	N12
D3	DDR3_DM1	P14
K1	DDR3_ODT0	N9
J3	DDR3_RAS#	R9
T2	DDR3_RST#	P5
L3	DDR3_WE	L9

8.5. SGMII Ethernet PHY

Table 8.5. SGMII Ethernet PHY Pin Connections

U8 Pin Name	Signal Name	Certus-NX Ball Location
1	SGMII_MD0_P	—
2	SGMII_MD0_N	—
4	SGMII_MD1_P	—
5	SGMII_MD1_N	—
7	SGMII_MD2_P	—
8	SGMII_MD2_N	—
10	SGMII_MD3_P	—
11	SGMII_MD3_N	—
16	SGMII_MDIO_CLK	G1
17	SGMII_MDIO_DATA	F1
18	SGMII_CLK_OUT	J6
27	SGMII_PHY_SIP	L7
28	SGMII_PHY_SIN	M7
33	SGMII_PHY_COP	N4
34	SGMII_PHY_CON	M4
35	SGMII_PHY_SOP	P3
36	SGMII_PHY_SON	N3
43	SGMII_RST_N	L4
45	SGMII_LED2	—
46	SGMII_LED1	—
47	SGMII_LED0	—

8.6. RGMII Ethernet PHY

Table 8.6. RGMII Ethernet PHY Pin Connections

U9 Pin Name	Signal Name	Certus-NX Ball Location
2	RGMII_MD0_P	—
3	RGMII_MD0_N	—
5	RGMII_MD1_P	—
6	RGMII_MD1_N	—
10	RGMII_MD2_P	—
11	RGMII_MD2_N	—
13	RGMII_MD3_P	—
14	RGMII_MD3_N	—
20	RGMII_MDIO_CLK	L2
21	RGMII_MDIO_DATA	M1
22	RGMII_CLK_OUT	K1
40	RGMII_TXCLK	L1
52	RGMII_TXCTRL	J5
38	RGMII_TXD0	H6
37	RGMII_TXD1	H5
36	RGMII_TXD2	H4
35	RGMII_TXD3	H3
53	RGMII_RXCTRL	J2
43	RGMII_RXCLK	J1
44	RGMII_RXD0	K2
45	RGMII_RXD1	K4
46	RGMII_RXD2	K3
47	RGMII_RXD3	K6
59	RGMII_RST_N	M2
61	RGMII_LED2	—
62	RGMII_LED1	—
63	RGMII_LED0	—

8.7. PMOD Header

J5, J6, and J8 headers can be used as GPIO or as a connector to PMOD interface.

Table 8.7. J5, J6 and J8 Header Pin Connections

	Pin Name	Signal Name	Certus-NX Ball Location
J5	1	PMOD0_1	J11
	2	PMOD0_2	J12
	3	PMOD0_3	K11
	4	PMOD0_4	K12
	7	PMOD0_5	C8
	8	PMOD0_6	C7
	9	PMOD0_7	B7
	10	PMOD0_8	A7
J6	1	PMOD1_1	A6
	2	PMOD1_2	B6
	3	PMOD1_3	B5
	4	PMOD1_4	A5
	7	PMOD1_5	A4
	8	PMOD1_6	B4
	9	PMOD1_7	C4
	10	PMOD1_8	C5
J8	1	PMOD2_1	H1
	2	PMOD2_2	H2
	3	PMOD2_3	N1
	4	PMOD2_4	K5
	7	PMOD2_5	N2
	8	PMOD2_6	L3
	9	PMOD2_7	M3
	10	PMOD2_8	L5

9. Software Requirements

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

- Lattice Radiant Software 2.2 or later
- Lattice Radiant Programmer 2.2 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)
Certus-NX Versa Evaluation Board	LFD2NX-VERSA-EVN	

Appendix A. Certus-NX Versa Evaluation Board Schematics


<h1>Certus-NX Versa Evaluation Board</h1> <h2>Rev - 1.1</h2>																											
<p>01 - Title Page</p> <p>02 - Block Diagram</p> <p>03 - USB Interface</p> <p>04 - Bank-0 Configuration</p> <p>05 - Bank-1 7-Semgent&CLK</p> <p>06 - Bank-2 PMOD&LEDs</p> <p>07 - Bank-3,4 DDR3&D-PHY</p> <p>08 - Bank-5 SGMII GbE</p> <p>09 - Bank-6 RGMII GbE</p> <p>10 - Bank-7 Parallel Camera</p> <p>11 - Soft D-PHY Camera</p> <p>12 - PCIe</p> <p>13 - Bank Power</p> <p>14 - Power Decoupling</p> <p>15 - Power Regulators</p> <p>16 - Power Block Diagram</p>																											
																											
<p>Lattice Semiconductor Applications http://www.latticesemi.com/Support</p>																											
<table border="1"> <tr> <td colspan="3">Title</td> <td colspan="3">Title Page</td> </tr> <tr> <td>Size</td> <td>Project</td> <td colspan="2">Schematic Rev</td> <td colspan="2">1.1</td> </tr> <tr> <td>B</td> <td>Certus-NX Versa Evaluation Board</td> <td colspan="2">Board Rev</td> <td colspan="2">B</td> </tr> <tr> <td>Date:</td> <td>Thursday, March 18, 2021</td> <td>Sheet</td> <td colspan="3">1 of 16</td> </tr> </table>				Title			Title Page			Size	Project	Schematic Rev		1.1		B	Certus-NX Versa Evaluation Board	Board Rev		B		Date:	Thursday, March 18, 2021	Sheet	1 of 16		
Title			Title Page																								
Size	Project	Schematic Rev		1.1																							
B	Certus-NX Versa Evaluation Board	Board Rev		B																							
Date:	Thursday, March 18, 2021	Sheet	1 of 16																								

Figure A.1. Title Page

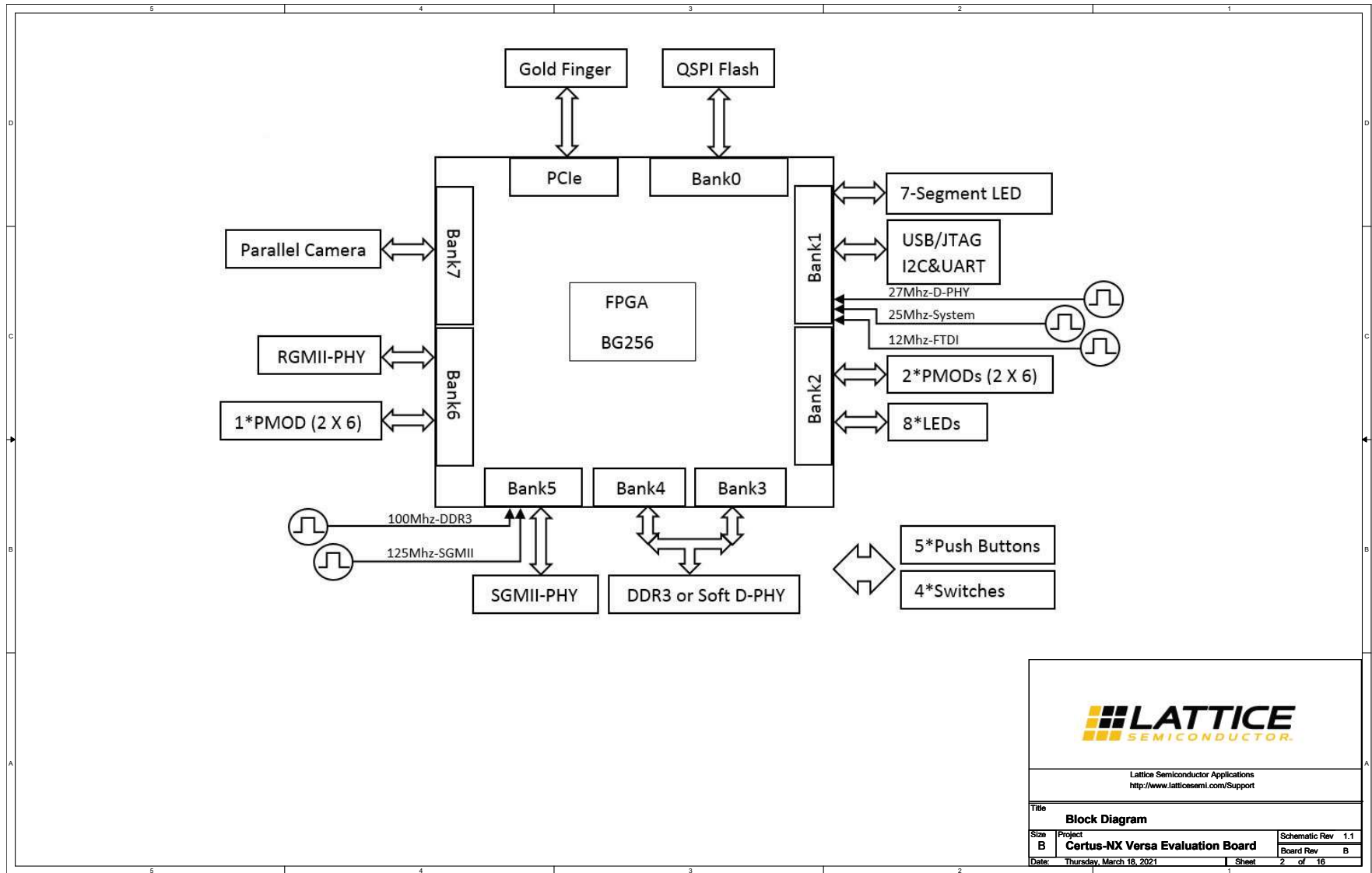


Figure A.2. Block Diagram

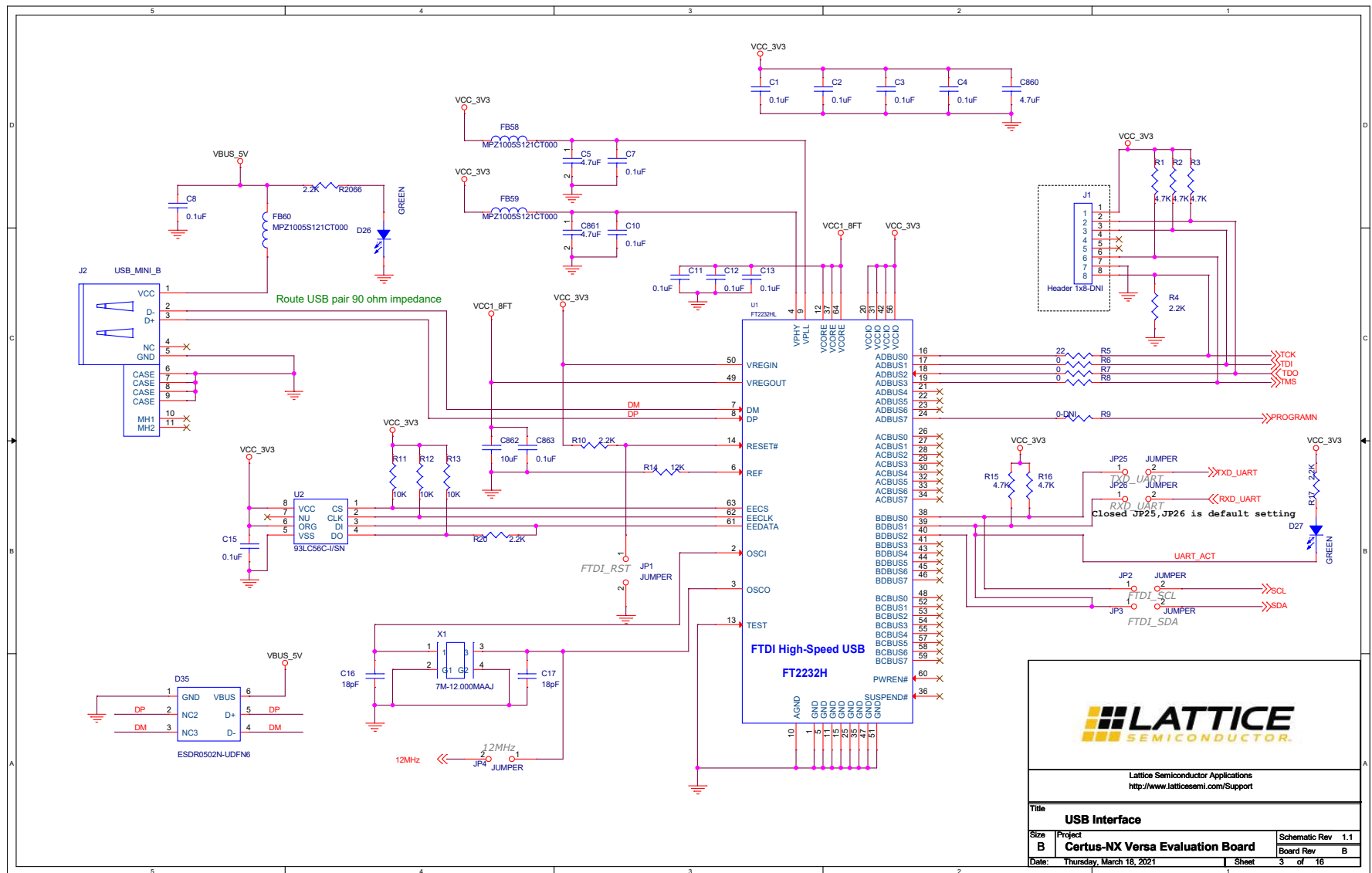


Figure A.3. USB Interface

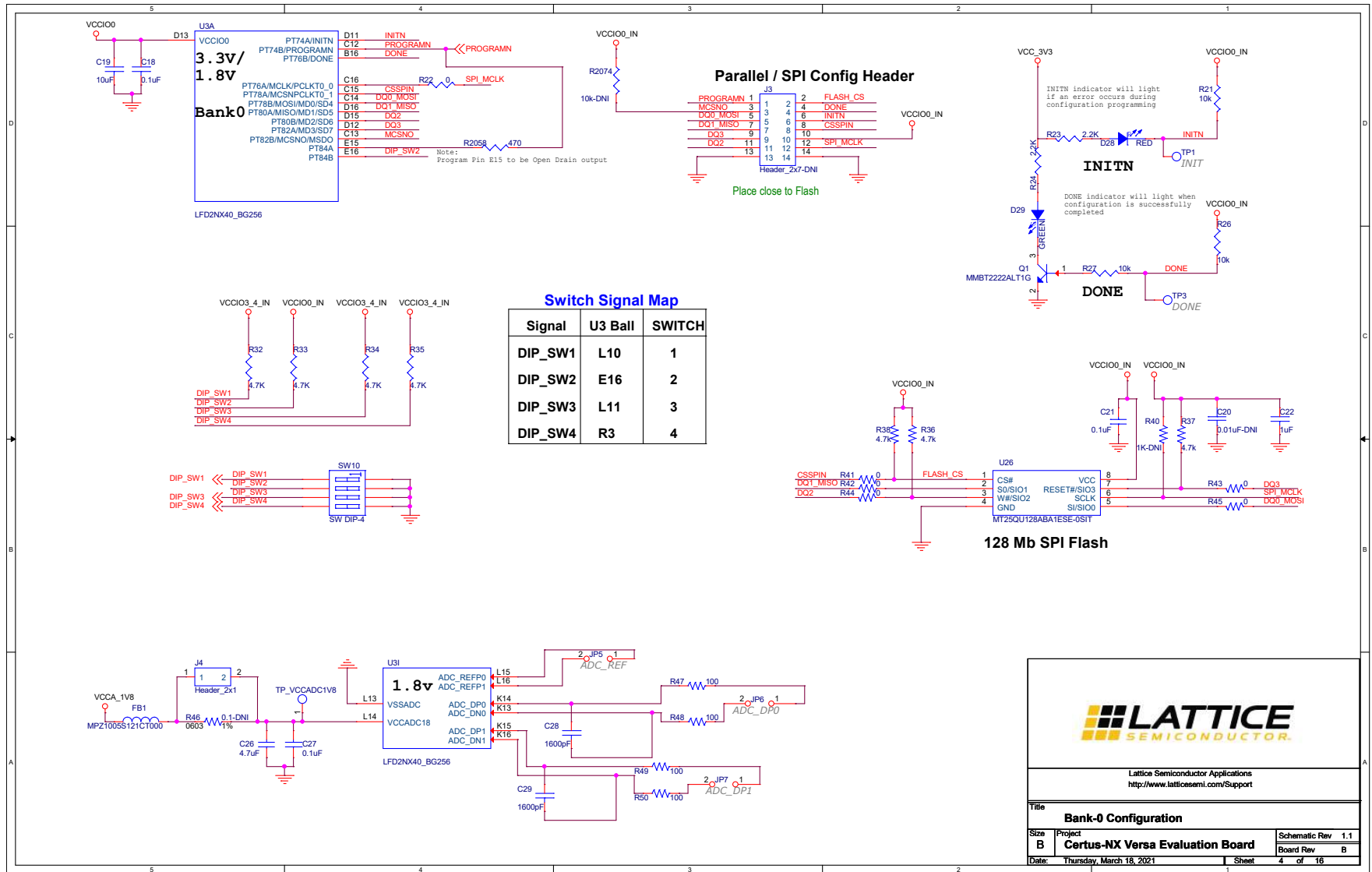


Figure A.4. Bank-0 Configuration

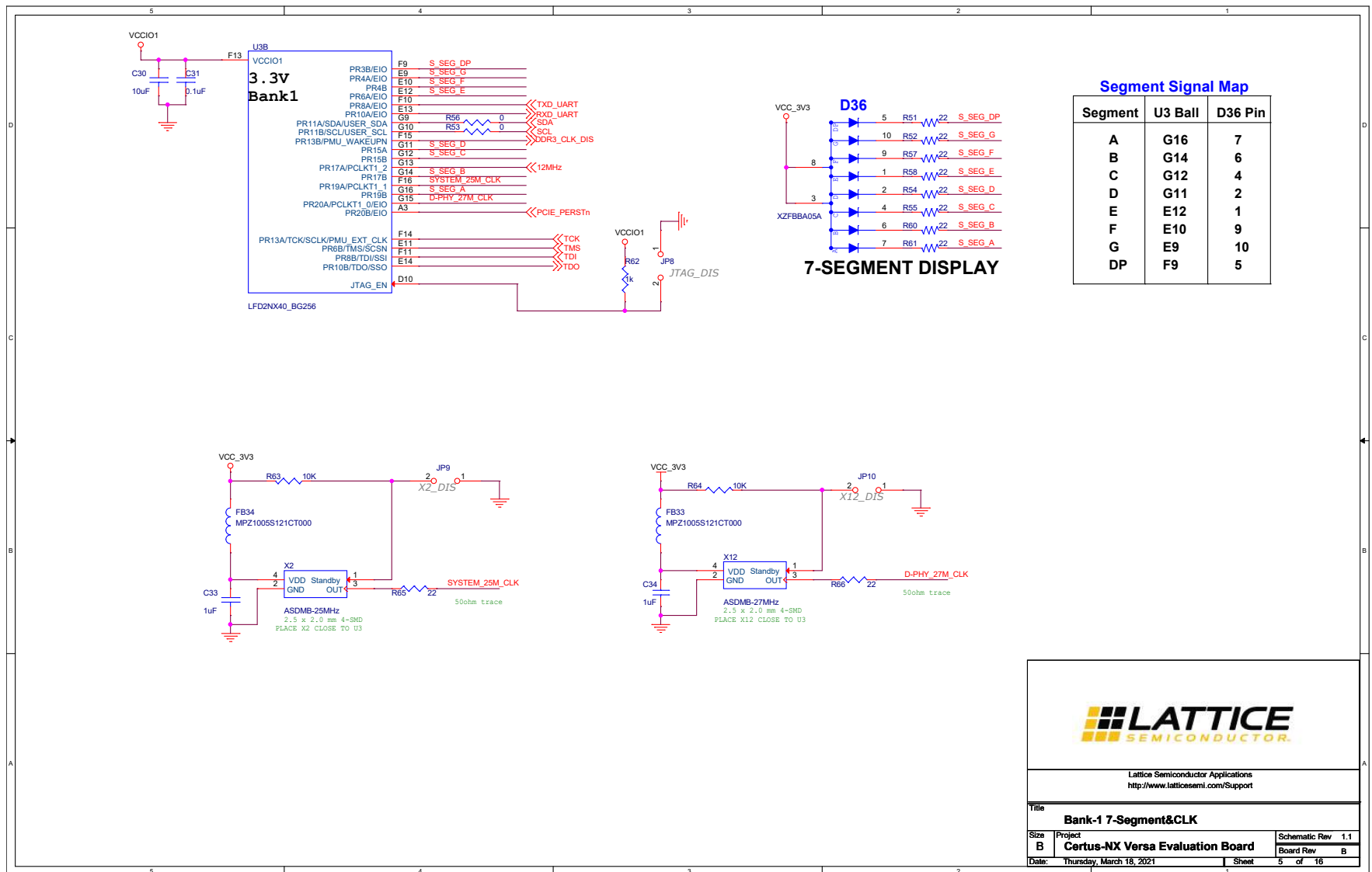


Figure A.5. Bank-1 7-Segment & CLK

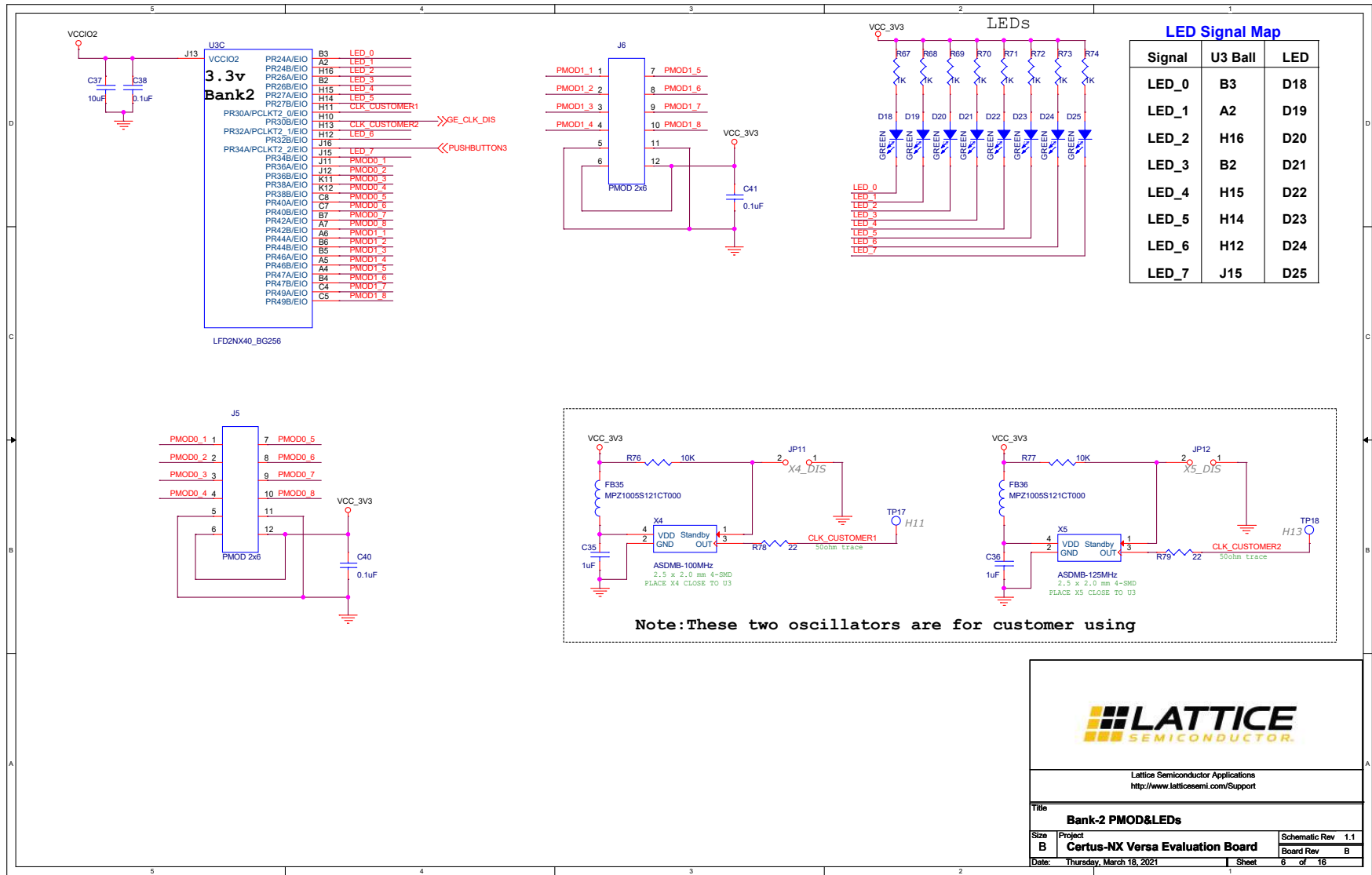


Figure A.6. Bank-2 PMOD&LEDs

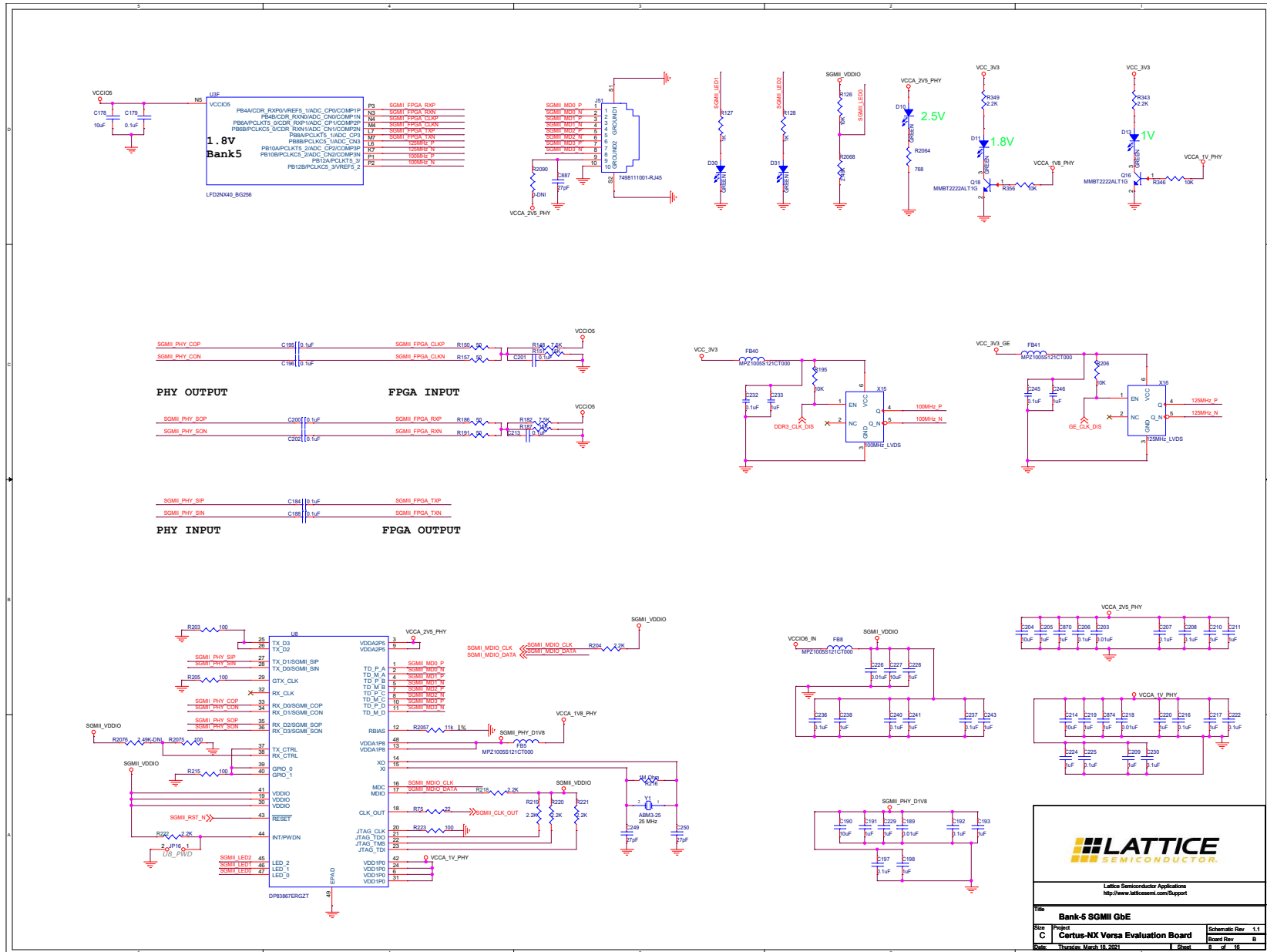


Figure A.8. Bank-5 SGMII GbE

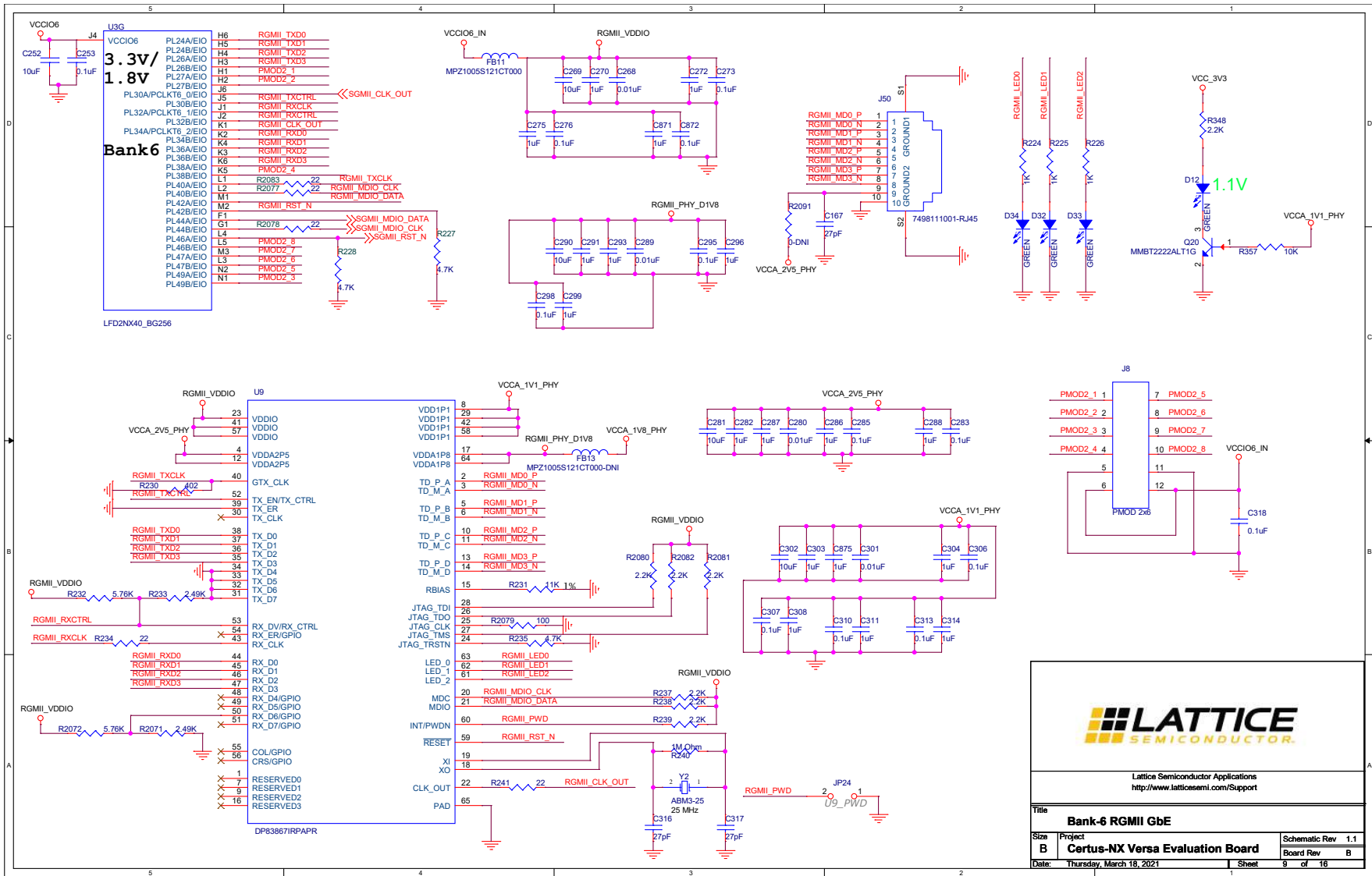


Figure A.9. Bank-6 RGMII GbE

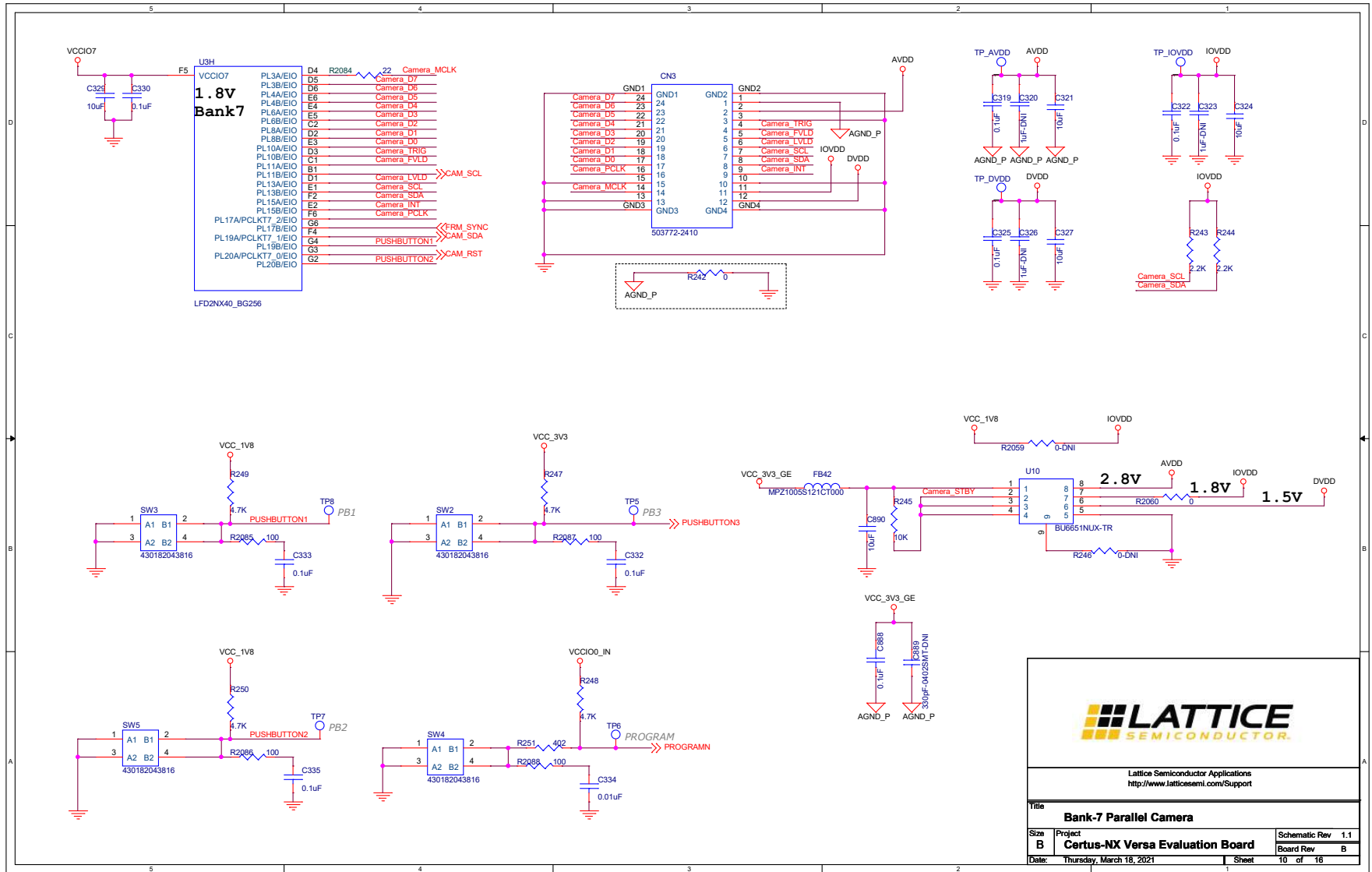


Figure A.10. Bank-7 Parallel Camera

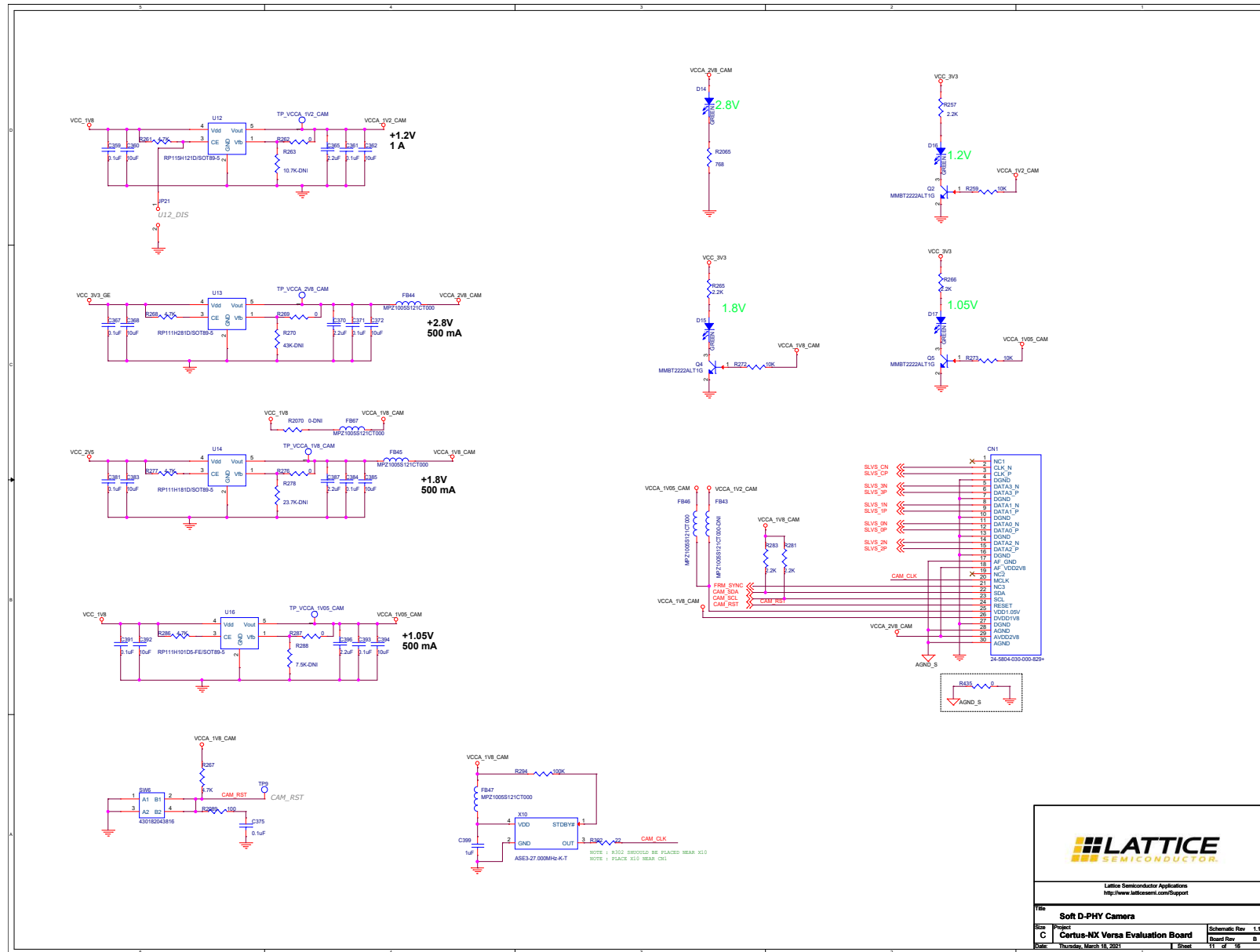


Figure A.11. Soft D-PHY Camera

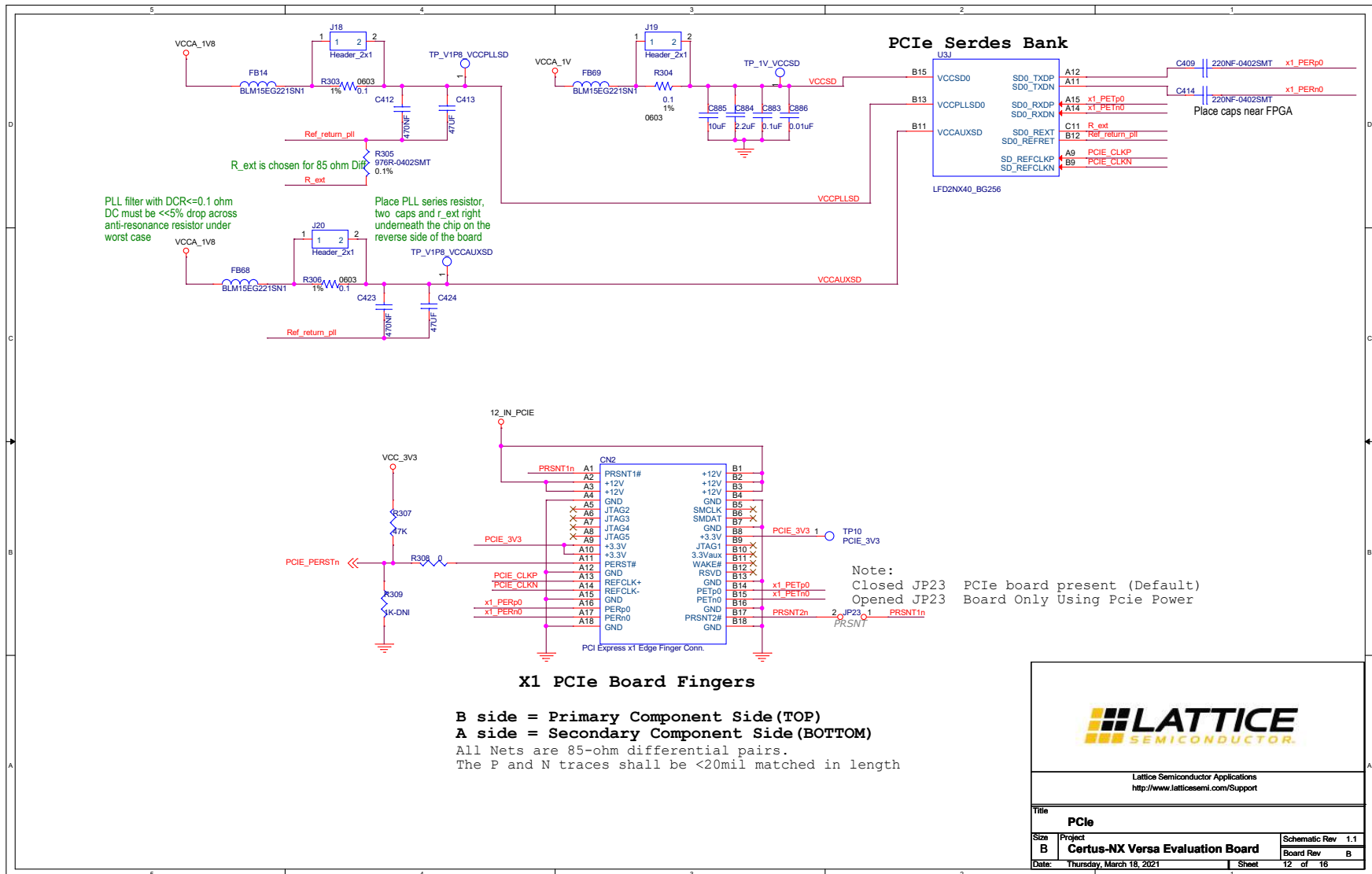


Figure A.12. PCIe

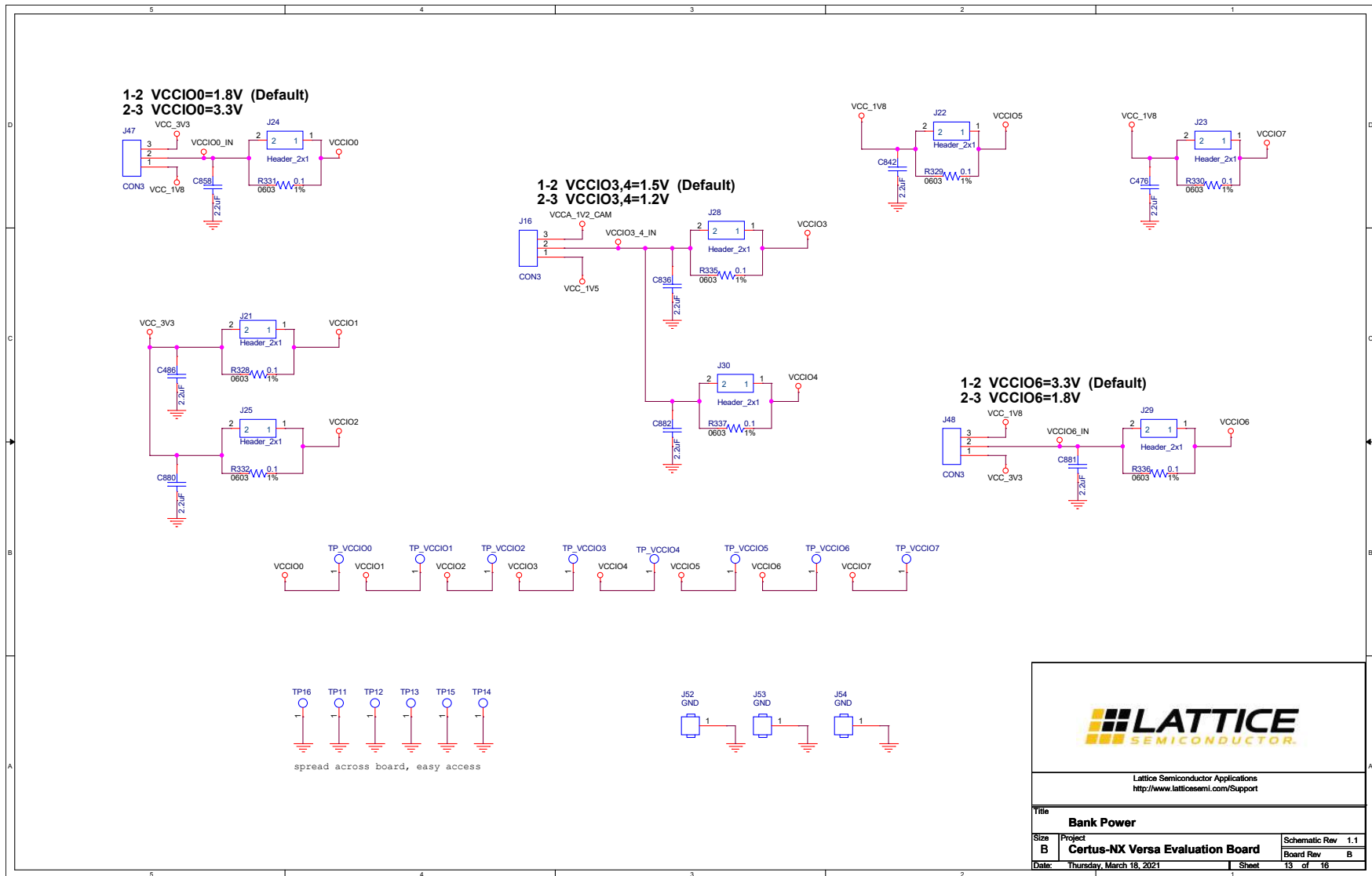


Figure A.13. Bank Power

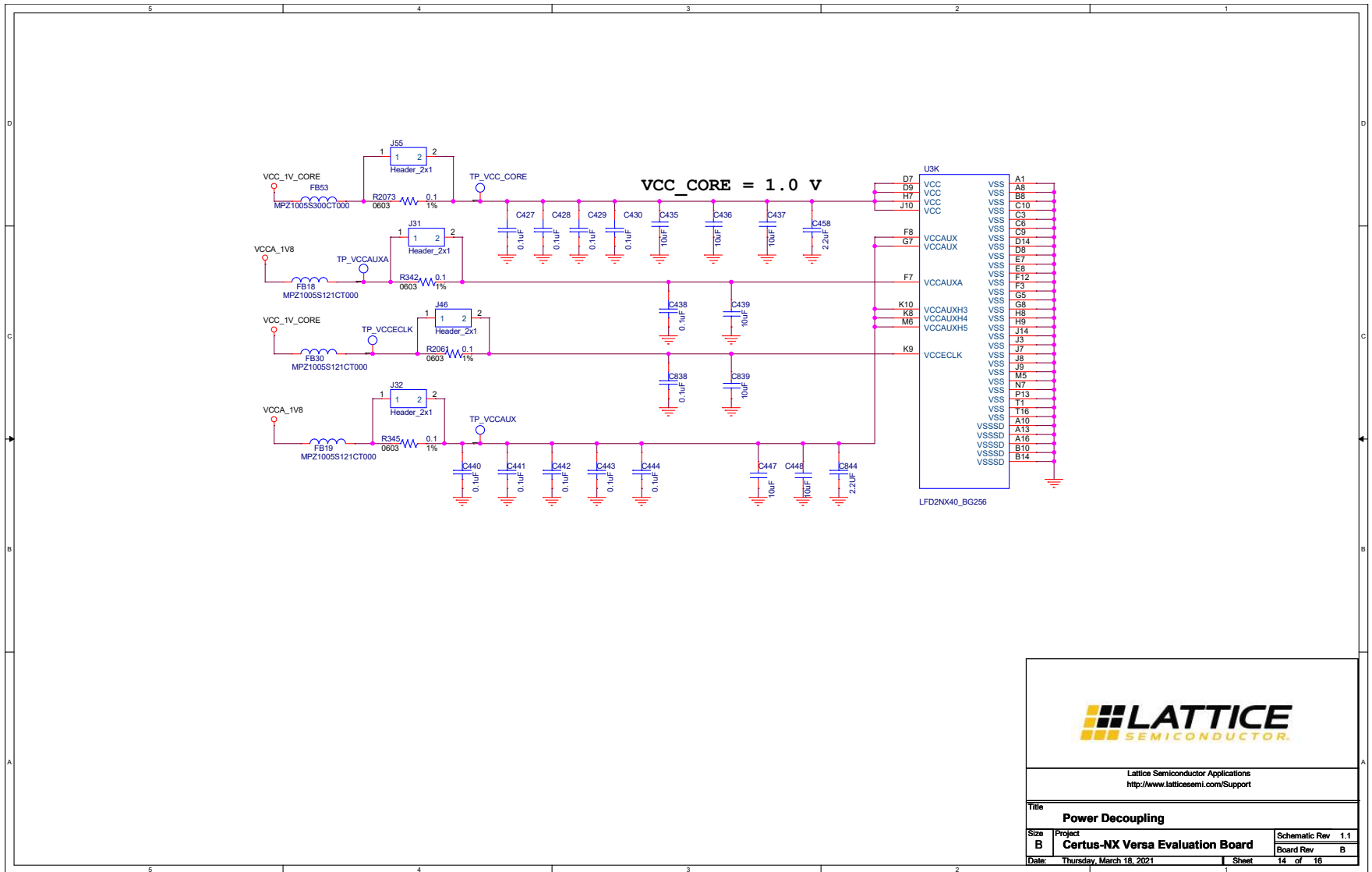


Figure A.14. Power Decoupling

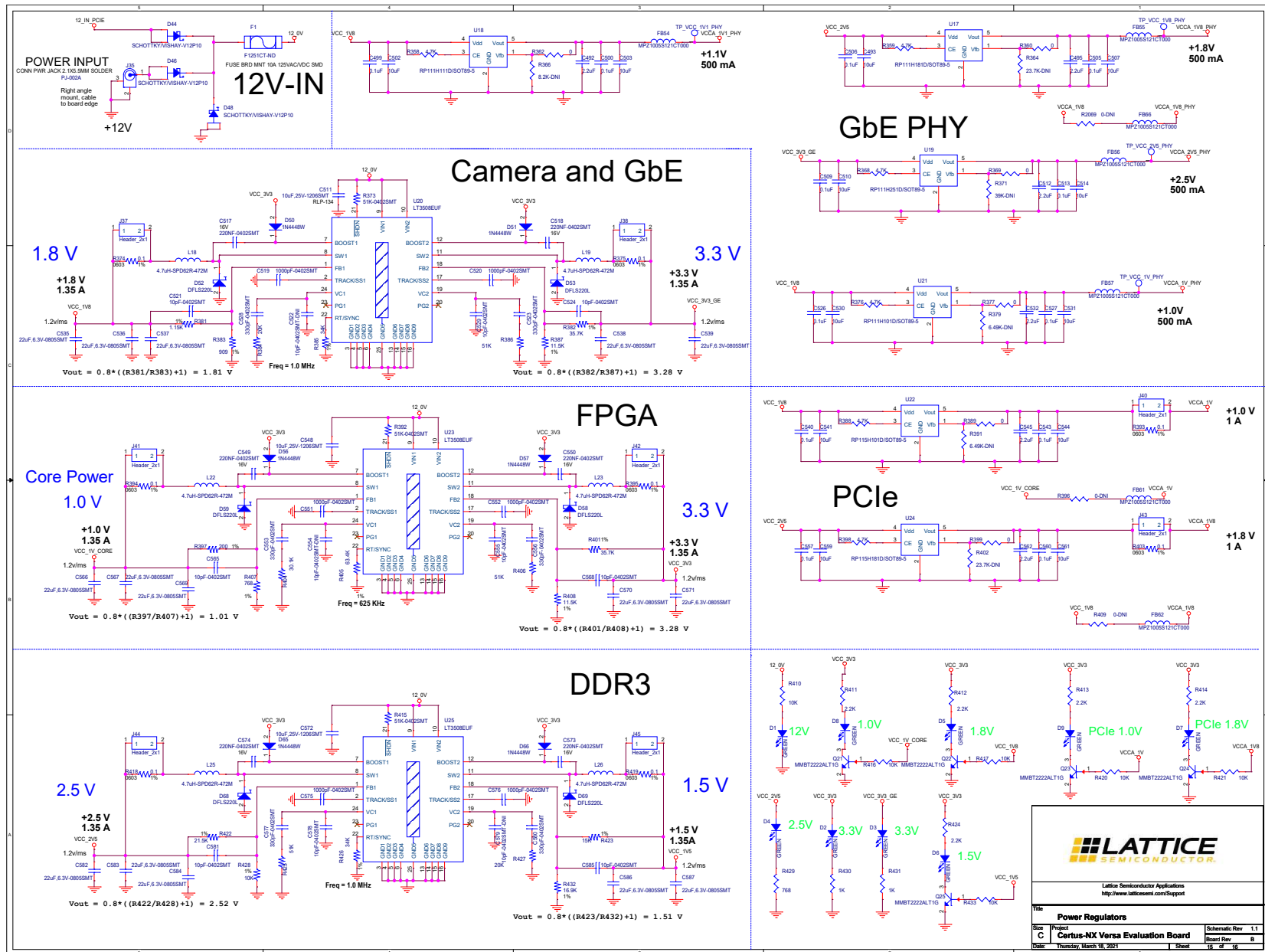


Figure A.15. Power Regulators

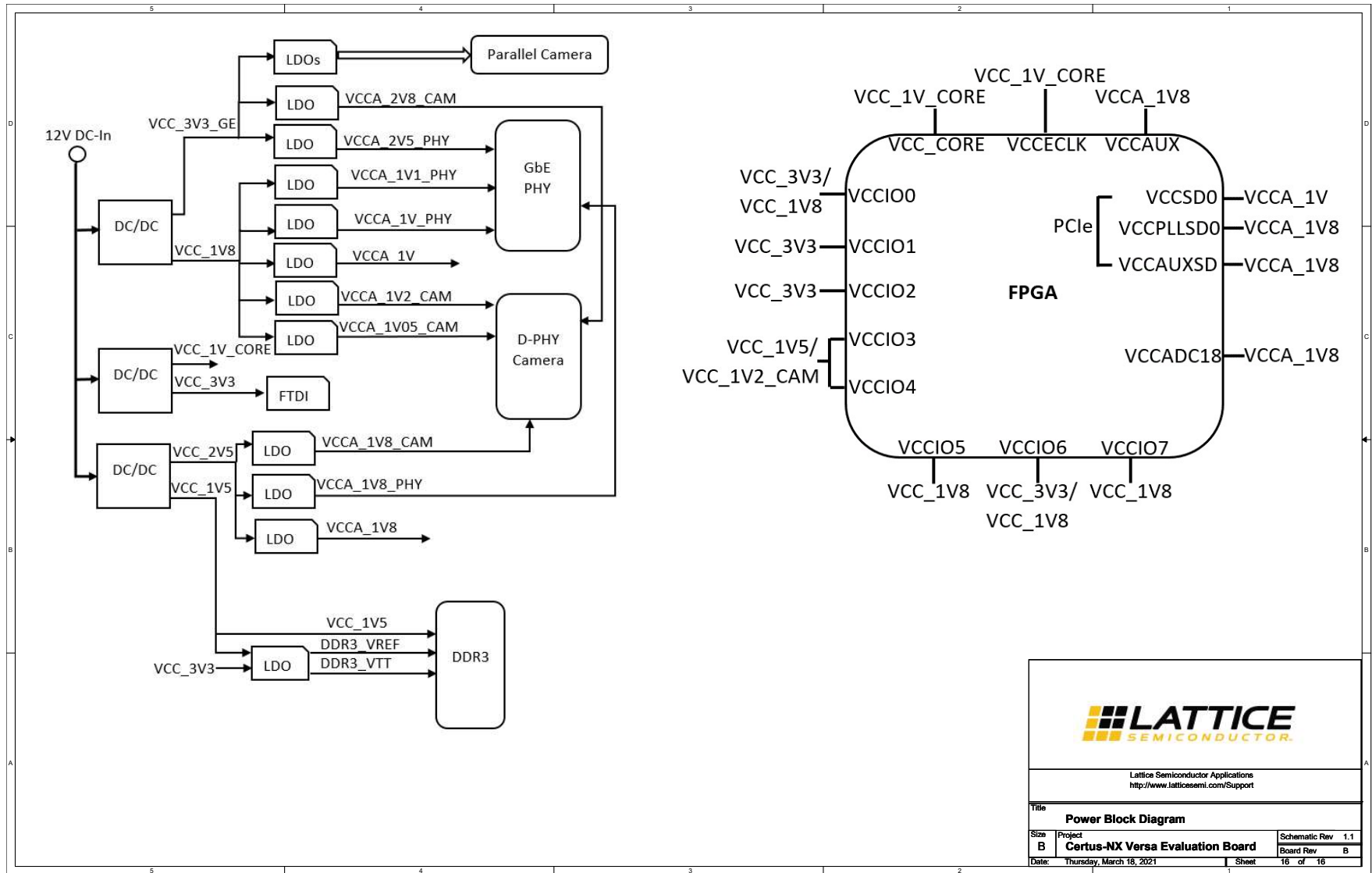


Figure A.16. Power Block Diagram

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

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
1	CN1	1	24-5804-030-000-829+	24580403003 0829	—	24-5804-030-000-829+	Kyocera / Sunny Optical	Sony IMX214 CSI Camera sensor
2	CN2	1	PCI Express x1 Edge Finger Connector	PCIE-X1	—	—	—	—
3	CN3	1	503772-2410	503772-2410	—	5037722410	Molex	0.4 BB CONN. HGT=0.8 W=2.5 REC ASSY
4	C1,C2,C3,C7,C10,C11, C12,C13,C15,C18,C27, C31,C46,C47,C49,C52, C54,C56,C57,C64,C68, C69,C70,C72,C73,C74, C76,C77,C84,C85,C86, C87,C88,C89,C97,C98, C99,C100,C101,C102, C103,C104,C105,C106, C107,C108,C109,C110, C111,C112,C113,C114, C115,C116,C117,C118, C120,C121,C122,C123, C124,C125,C126,C127, C128,C129,C130,C131, C132,C133,C134,C135, C136,C137,C138,C139, C140,C141,C151,C152, C153,C154,C155,C156, C179,C230,C236,C237, C240,C253,C273,C276, C283,C285,C295,C298, C306,C307,C310,C313, C319,C322,C325,C330, C427,C428,C429,C430, C438,C440,C441,C442, C443,C444,C838,C847, C848,C863,C872,C888	120	0.1uF	C0201	—	C0603X5R1C104K030BC	TDK	CAP CER 0.1UF 16V 10% X5R 0201

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
5	C4,C8,C21,C38,C40,C41,C59,C61,C63,C93,C95,C119,C161,C162,C170,C171,C184,C188,C192,C195,C196,C197,C200,C201,C202,C206,C207,C208,C213,C216,C222,C225,C232,C245,C318,C332,C333,C335,C359,C361,C367,C371,C375,C381,C384,C391,C393,C499,C500,C505,C506,C509,C513,C526,C527,C540,C543,C557,C560,C835,C841,C883	62	0.1uF	C0402	—	CL05B104KA5NNNC	Samsung	CAP CER 0.1UF 25V 10% X7R 0402
6	C5,C26,C829,C860,C861	5	4.7uF	C0603	—	CL10A475KA8NQNC	Samsung	CAP CER 4.7UF 6.3V 10% X5R 0603
7	C16,C17,C71	3	18pF	C0402	—	CL05C180JA5NNNC	Samsung	CAP CER 18PF 25V 10% NPO 0402
8	C19,C30,C37,C48,C51,C160,C168,C178,C190,C204,C214,C227,C252,C269,C281,C290,C302,C321,C324,C327,C329,C360,C362,C368,C372,C383,C385,C392,C394,C435,C436,C437,C439,C447,C448,C493,C502,C503,C507,C510,C514,C530,C531,C541,C544,C559,C561,C830,C831,C832,C833,C834,C839,C854,C862,C865,C885,C890	58	10uF	C0603	—	LMK107BJ106MALTD	Taiyo Yuden	CAP CER 10UF 10V X5R 20% 0603
9	C20,C588,C846	3	0.01uF	C0402	DNI	CL05B103KA5NNNC	Samsung	CAP CER 10000PF 16V 5% X7R 0402
10	C22,C33,C34,C35,C36,C233,C246,C399	8	1uF	C0402	—	LMK105BJ105KV-F	Taiyo Yuden	CAP CER 1UF 10V X5R 0402
11	C28,C29	2	1600pF	C0805	—	C0805C162J5GAC7800	Kemet	CAP CER 1600PF 50V NPO 0805

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
12	C43,C44,C66,C94,C191,C193,C198,C205,C209,C210,C211,C217,C219,C220,C224,C228,C229,C238,C241,C243,C270,C272,C275,C282,C286,C287,C288,C291,C293,C296,C299,C303,C304,C308,C311,C314,C867,C870,C871,C874,C875	41	1uF	RLP-133	—	CL21B105KOFNNNG	Samsung	CAP CER 1UF 16V X7R 0805
13	C55,C58,C60,C62,C169,C189,C203,C218,C226,C268,C280,C289,C301,C334,C866,C886	16	0.01uF	C0402	—	CL05B103KA5NNNC	Samsung	CAP CER 10000PF 16V 5% X7R 0402
14	C65,C67,C75,C90,C91,C92,C157,C158,C159	9	0.01uF	C0201	—	CL03A103KA3NNNC	Samsung	CAP CER 10000PF 16V 10% X7R 0201
15	C163	1	18pF	C0402	DNI	CL05C180JA5NNNC	Samsung	CAP CER 18PF 25V 10% NPO 0402
16	C167,C249,C250,C316,C317,C887	6	27pF	C0402	—	C0402C270K5GACTU	KEMET	CAP CER 27PF 50V COG/NPO 0402
17	C320,C323,C326	3	1uF	RLP-133	DNI	CL21B105KOFNNNG	Samsung	CAP CER 1UF 16V X7R 0805
18	C365,C370,C387,C396,C458,C476,C486,C492,C495,C512,C532,C545,C562,C836,C842,C844,C858,C880,C881,C882,C884	21	2.2uF	RLP-133	—	CL21B225KOFNNNE	Samsung	CAP CER 2.2UF 16V X7R 0805
19	C409,C414	2	220nF	R0402_HS	—	CL05B224KO5NNNC	Samsung	PCIe CAP CER 0.22UF 16V X7R 0402
20	C412,C423	2	470nF	C0402	—	CGA2B3X7S1A474K050BE	TDK Corporation	CAP CER 0.47UF 10V X7S 0402
21	C413,C424	2	47uF	C1210	—	JMK325B7476KMHPR	Taiyo Yuden	CAP CER 47UF 6.3V X7R 1210
22	C511,C548,C572	3	10uF	RLP-134	—	TMK316B7106KL-TD	Taiyo Yuden	CAP CER 10UF 25V X7R 1206

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
23	C517,C518,C549,C550, C573,C574	6	220nF	RLP-130-A	—	CL05A224KO5NNNC	Samsung	CAP CER 0.22UF 16V X5R 0402
24	C519,C520,C551,C552, C575,C576,C840	7	1000pF	RLP-130-A	—	CL05B102KB5NFNC	Samsung	CAP CER 1000PF 50V X7R 0402
25	C521,C524,C529,C555, C565,C568,C578,C581, C585	9	10pF	RLP-130-A	—	CL05C100CB5NNNC	Samsung	CAP CER 10PF 50V COG/NPO 0402
26	C522,C554,C579	3	10pF	RLP-130-A	DNI	CL05C100CB5NNNC	Samsung	CAP CER 10PF 50V COG/NPO 0402
27	C523,C528,C553,C556, C577,C580	6	330pF	RLP-130-A	—	CL05B331KB5NNNC	Samsung	CAP CER 330PF 50V X7R 0402
28	C535,C536,C537,C538, C539,C566,C567,C569, C570,C571,C582,C583, C584,C586,C587,C868, C869	17	22uF	RLP-133	—	CL21A226MQQNNNE	Samsung	CAP CER 22UF 6.3V X5R 0805
29	C889	1	330pF	RLP-130-A	DNI	CL05B331KB5NNNC	Samsung	CAP CER 330PF 50V X7R 0402
30	D1,D2,D3,D4,D5,D6,D7, D8,D9,D10,D11,D12, D13,D14,D15,D16,D17, D18,D19,D20,D21,D22, D23,D24,D25,D26,D27, D29,D30,D31,D32,D33, D34	33	GREEN	APT1608	—	5988070107F	Dialight	Micro LED SMD Green 0603 package
31	D28	1	RED	APT1608	—	5988010107F	Dialight	Micro LED SMD Red 0603 package
32	D35	1	ESDR0502N-UDFN6	UDFN6_040	—	ESDR0502NMUTBG	ON semi	TVS DIODE 5.5VWM 6UDFN
33	D36	1	XZFBBA05A	LED10-057- 394- XZFBBA05A	—	XZFBBA05A	SunLED	7-SEGMENT DISPLAY LED 0.2" BLUE CA SMD
34	D44,D46,D48	3	SCHOTTKY/VISHAY- V12P10	V12P10	—	V12P10-M3/86A	Vishay	DIODE SCHOTTKY 100V 12A TO277A
35	D50,D51,D56,D57,D65, D66	6	1N4448W	1N4448W	—	1N4448WS	On Semi	DIODE GEN PURP 75V 150MA SOD323F

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
36	D52,D53,D58,D59,D68, D69	6	DFLS220L	DFLS220L	—	DFLS220L-7	Diodes Incorporated	DIODE SCHOTTKY 20V 2A POWERDI123
37	FB1,FB5,FB8,FB11, FB18,FB19,FB30,FB33, FB34,FB35,FB36,FB37, FB40,FB41,FB42,FB44, FB45,FB46,FB47,FB54, FB55,FB56,FB57,FB58, FB59,FB60,FB61,FB62, FB66,FB67	30	MPZ1005S121CT000	FB0402	—	MPZ1005S121CT000	TDK Corporation	FERRITE BEAD 120 OHM 0402 1LN
38	FB13,FB43	2	MPZ1005S121CT000	FB0402	DNI	MPZ1005S121CT000	TDK Corporation	FERRITE BEAD 120 OHM 0402 1LN
39	FB14,FB68,FB69	3	BLM15EG221SN1	R0402	—	BLM15EG221SN1D	Murata	PCle FERRITE BEAD 220 OHM 0402 1LN
40	FB53	1	MPZ1005S300CT000	FB0402	—	MPZ1005S300CT000	TDK Corporation	FERRITE BEAD 30 OHM 0402 1LN
41	F1	1	F1251CT-ND	154010	—	0154010.DR	Littelfuse	FUSE BRD MNT 10A 125VAC/VDC SMD
42	JP1,JP2,JP3,JP4,JP5,JP6, JP7,JP8,JP9,JP10,JP11, JP12,JP16,JP20,JP21, JP23,JP24,JP25,JP26	19	JUMPER	Header_1x2	—	Regular 100Mil Header	—	—
43	J1	1	Header 1x8	hdr_amp_872 20_8_1x8_10 0	DNI	Regular 100Mil Header	—	—
44	J2	1	USB_MINI_B	usb2-0-rec- 240-0001-9	—	UX60-MB-5ST	Hirose	CONN RECEPT MINI USB2.0 5POS
45	J3	1	Header_2x7	Header_2x7	DNI	Regular 100Mil Header	—	—
46	J4,J18,J19,J20,J21,J22, J23,J24,J25,J28,J29,J30, J31,J32,J37,J38,J40,J41, J42,J43,J44,J45,J46,J55	24	Header_2x1	Header_2x1	—	Regular 100Mil Header	—	—
47	J5,J6,J8	3	PMOD 2x6	PPPC062LJBN -RC	—	PPPC062LJBN-RC	Sullins	CONN HDR 12POS 0.1 GOLD PCB R/A
48	J16,J47,J48	3	CON3	CON3	—	Regular 100Mil Header	—	—

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
49	J35	1	PJ-002A	—	—	694106301002	Würth	CONN PWR JACK 2.1X5.5MM SOLDER
50	J50,J51	2	7498111001-RJ45	RJ45- 7498111001	—	7498111001	Würth	CONN MAGJACK 1PORT 1000 BASE-T
51	J52,J53,J54	3	GND	TUR_TH	—	—	—	—
52	L18,L19,L22,L23,L25, L26	6	4.7uH-SPD62R-472M	SPD62R	—	SPD62R-472M	API Delevan Inc.	FIXED IND 4.7UH 2A 150 MOHM SMD
53	Q1,Q2,Q4,Q5,Q16,Q18, Q20,Q21,Q22,Q23,Q24, Q25	12	MMBT2222ALT1G	MMBT2222AL T-1	—	MMBT2222ALT1G	ON Semiconductor	TRANS NPN 40V 0.6A SOT23
54	R1,R2,R3,R15,R16,R32, R33,R34,R35,R36,R37, R38,R227,R228,R247, R248,R249,R250,R261, R267,R268,R277,R286, R358,R359,R368,R376, R388,R398	29	4.7K	R0603	—	RC0603FR-074K7L	Yageo	RES SMD 4.7K OHM 1% 1/10W 0603
55	R4,R10,R17,R20,R23, R24,R281,R283,R2066	9	2.2K	R0603	—	RC0603FR-072K2L	Yageo	RES SMD 2.2K OHM 1% 1/10W 0603
56	R5,R65,R66,R75,R78, R79,R234,R241,R302	9	22	R0402	—	ERJ-2RKF22R0X	Panasonic	RES SMD 22 OHM 1% 1/10W 0402
57	R6,R7,R8,R22,R41,R42, R43,R44,R45,R53,R56	11	0	R0402	—	RC0402FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1/16W 0402
58	R9	1	0	R0402	DNI	RC0402FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1/16W 0402
59	R11,R12,R13,R21,R26, R27,R63,R64,R76,R77, R126,R195,R206,R245, R259,R272,R273,R346, R356,R357,R416,R417, R420,R421,R428,R433, R2050,R2055	28	10K	R0603	—	RC0603FR-0710KL	Yageo	RES SMD 10K OHM 1% 1/10W 0603
60	R14	1	12K	R0603	—	RC0603FR-0712KL	Yageo	RES SMD 12K OHM 1% 1/10W 0603
61	R40,R309	2	1K	R0603	DNI	RC0603FR-071KL	Yageo	RES SMD 1K OHM 1% 1/10W 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
62	R46	1	0.1	0603	DNI	ERJ-3RSFR10V	Panasonic	RES 0.1 OHM 1% 1/10W 0603
63	R47,R48,R49,R50,R203, R205,R215,R223,R2075, R2079,R2085,R2086, R2087,R2088,R2089	15	100	R0402	—	RC0402FR-07100RL	Yageo	RES SMD 100 OHM 1% 1/16W 0402
64	R51,R52,R54,R55,R57, R58,R60,R61,R2077, R2078,R2083,R2084	12	22	R0603	—	RC0603FR-0722RL	Yageo	RES SMD 22 OHM 1% 1/10W 0603
65	R62,R67,R68,R69,R70, R71,R72,R73,R74,R104, R127,R128,R224,R225, R226,R430,R431	17	1K	R0603	—	RC0603FR-071KL	Yageo	RES SMD 1K OHM 1% 1/10W 0603
66	R80,R81,R82,R83,R84, R85,R86,R87,R88,R89, R90,R91,R92,R93,R94, R95,R96,R97,R100, R101,R102,R103,R111, R112	24	49.9	R0402	—	CRCW040249R9FKED	Vishay Dale	Thick Film Resistors - SMD 1/16 W 49.9 1%
67	R98	1	240	R0603	—	ERJ-3EKF2400V	Panasonic	RES SMD 240 OHM 1% 1/10W 0603
68	R105,R235	2	4.7K	R0402	—	RC0402FR-074K7L	Yageo	RES SMD 4.7K OHM 1% 1/16W 0402
69	R107,R108,R122,R123, R246,R396,R409,R2059, R2062,R2069,R2070, R2090,R2091	13	0	R0603	DNI	RC0603FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1% 1/10W 0603
70	R109,R117,R242,R262, R269,R276,R287,R308, R360,R362,R369,R377, R389,R399,R435,R2060, R2063	17	0	R0603	—	RC0603FR-070RL	Yageo	RES SMD 0 OHM JUMPER 1% 1/10W 0603
71	R148,R182	2	7.5K	R0603	—	RC0603FR-077K5L	Yageo	RES SMD 7.5K OHM 1% 1/10W 0603
72	R150,R157,R186,R191	4	50	R0402	—	FC0402E50R0FST1	Vishay	RES 50 OHM 50MW 1% 0402 SMD

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
73	R151,R187,R423	3	15K	R0603	—	RC0603FR-0715KL	Yageo	RES SMD 15K OHM 1% 1/10W 0603
74	R204,R218,R219,R220, R221,R222,R237,R238, R239,R243,R244,R2080, R2081,R2082	14	2.2K	R0402	—	ERJ-2RKF2201X	Panasonic	RES SMD 2.2K OHM 1% 1/10W 0402
75	R216,R240	2	1M	R0402	—	RC0402JR-071ML	Yageo	RES SMD 1M OHM 1% 1/16W 0402
76	R230,R251	2	402	R0402	—	ERJ-2RKF4020X	Panasonic	RES SMD 402 OHM 1% 1/10W 0402
77	R231,R2057	2	11k	R0402	—	ERJ-2RKF1102X	Panasonic	RES SMD 11K OHM 1% 1/10W 0402
78	R232,R2072	2	5.76K	R0402	—	RC0402FR-075K76L	Yageo	RES SMD 5.76K OHM 1% 1/16W 0402
79	R233,R2071	2	2.49K	R0402	—	RC0402FR-072K49L	Yageo	RES SMD 2.49K OHM 1% 1/16W 0402
80	R257,R265,R266,R343, R348,R349,R411,R412, R413,R414,R424	11	2.2K	R1206	—	RC1206FR-072K2L	Yageo	RES SMD 2.2K OHM 1% 1/4W 1206
81	R263	1	10.7K	R0603	DNI	RC0603FR-0710K7L	Yageo	RES SMD 10.7K OHM 1% 1/10W 0603
82	R270	1	43K	R0603	DNI	RC0603FR-0743KL	Yageo	RES SMD 43K OHM 1% 1/10W 0603
83	R278,R364,R402	3	23.7K	R0603	DNI	RC0603FR-0723K7L	Yageo	RES SMD 23.7K OHM 1% 1/10W 0603
84	R288	1	7.5K	R0603	DNI	RC0603FR-077K5L	Yageo	RES SMD 7.5K OHM 1% 1/10W 0603
85	R294,R2056	2	100K	R0402	—	RC0402FR-07100KL	Yageo	RES SMD 100K OHM 1% 1/16W 0402
86	R303,R304,R306,R328, R329,R330,R331,R332, R335,R336,R337,R342, R345,R374,R375,R393, R394,R395,R403,R418, R419,R2061,R2073	23	0.1	0603	—	ERJ-3RSFR10V	Panasonic	RES 0.1 OHM 1% 1/10W 0603
87	R305	1	976R	R0402	—	RP73PF1E976RBDT	TE Connectivity Passive Product	976 Ohms 0.1% 0.1W, 1/10W Chip Resistor

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
								0402 (1005 Metric) Thin Film
88	R307	1	47K	R0603	—	RC0603FR-0747KL	Yageo	RES SMD 47K OHM 1% 1/10W 0603
89	R366	1	8.2K	R0603	DNI	RC0603FR-078K2L	Yageo	RES SMD 8.2K OHM 1% 1/10W 0603
90	R371	1	39K	R0603	DNI	RC0603FR-0739KL	Yageo	RES SMD 39K OHM 1% 1/10W 0603
91	R373,R392,R415	3	51K	R0402	—	RC0402FR-0751KL	Yageo	RES SMD 51K OHM 1% 1/16W 0402
92	R379,R391	2	6.49K	R0603	DNI	RC0603FR-076K49L	Yageo	RES SMD 6.49K OHM 1% 1/10W 0603
93	R381	1	1.15K	R0603	—	RC0603FR-071K15L	Yageo	RES SMD 1.15K OHM 1% 1/10W 0603
94	R382,R401	2	35.7K	R0603	—	RC0603FR-0735K7L	Yageo	RES SMD 35.7K OHM 1% 1/10W 0603
95	R383	1	909	R0603	—	RC0603FR-07909RL	Yageo	RES SMD 909 OHM 1% 1/10W 0603
96	R384,R427	2	20K	R0402	—	ERJ-2RKF2002X	Panasonic	RES SMD 20K OHM 1% 1/10W 0402
97	R385,R426	2	34K	R0402	—	RC0402FR-0734KL	Yageo	RES SMD 34K OHM 1% 1/16W 0402
98	R386,R406,R425	3	51K	R0402	—	RC0402FR-0751KL	Yageo	RES SMD 51K OHM 1% 1/16W 0402
99	R387,R408	2	11.5K	R0603	—	RC0603FR-0711K5L	Yageo	RES SMD 11.5K OHM 1% 1/10W 0603
100	R397	1	200	R0603	—	RC0603FR-07200RL	Yageo	RES SMD 200 OHM 1% 1/10W 0603
101	R404	1	30.1K	R0402	—	ERJ-2RKF3012X	Panasonic	RES SMD 30.1K OHM 1% 1/10W 0402
102	R405	1	63.4K	R0402	—	ERJ-2RKF6342X	Panasonic	RES SMD 63.4K OHM 1% 1/10W 0402
103	R407,R429,R2064, R2065	4	768	R0603	—	RC0603FR-07768RL	Yageo	RES SMD 768 OHM 1% 1/10W 0603
104	R410	1	10K	R1206	—	RC1206JR-0710KL	Yageo	RES SMD 10K OHM 5% 1/4W 1206
105	R422	1	21.5K	R0603	—	RC0603FR-0721K5L	Yageo	RES SMD 21.5K OHM 1% 1/10W 0603

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
106	R432	1	16.9K	R0603	—	RC0603FR-0716K9L	Yageo	RES SMD 16.9K OHM 1% 1/10W 0603
107	R2058	1	470	R0603	—	RC0603FR-07470RL	Yageo	RES SMD 470 OHM 1% 1/10W 0603
108	R2068	1	2.49K	R0603	—	RC0603FR-072K49L	Yageo	RES SMD 2.49K OHM 1% 1/10W 0603
109	R2074	1	10K	R0603	DNI	RC0603FR-0710KL	Yageo	RES SMD 10K OHM 1% 1/10W 0603
110	R2076	1	2.49K	R0402	DNI	RC0402FR-072K49L	Yageo	RES SMD 2.49K OHM 1% 1/16W 0402
111	SW2,SW3,SW4,SW5,SW6	5	430182043816	430182043816	—	PTS645SM43SMTR92 LFS	C&K Components	SWITCH TACTILE SPST-NO 0.05A 12V
112	SW10	1	SW DIP-4	418121270804	—	418121270804	Würth	SWITCH SLIDE DIP SPST 25MA 24V
113	TP_VCC_1V_PHY, TP_VCCIO1, TP_1V_VCCSD, TP_VCCIO2,TP_VCCIO3, TP_VCCIO4,TP_VCCIO5, TP_VCCIO6,TP_VCCIO7, TP_VCC_1V1_PHY, TP_VCCA_1V2_CAM, TP_VCC_1V8_PHY, TP_VCCA_1V8_CAM, TP_VCCADC1V8, TP_V1P8_VCCPLSD, TP_V1P8_VCCAUXSD, TP_VCC_2V5_PHY, TP_VCCA_2V8_CAM, TP_VCCA_1V05_CAM, TP_VCC_CORE, TP_VCCIO0, TP_VCCECLK, TP_VCCAUXA, TP_VCCAUX,TP_IOVDD, TP_DVDD,TP_AVDD	27	TP_S_40_63	tp_s_40_63	—	—	—	—
114	TP1,TP3	2	TestPoint	TP50	—	—	—	—
115	TP5,TP6,TP7,TP8,TP9,TP17,TP18	7	TestPoint_SMT	TPC32	—	—	—	—

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
116	TP10	1	PCIE_3V3	TP50	—	—	—	—
117	TP11,TP12,TP13,TP14,TP15,TP16	6	TestPoint_Hole	TP	—	—	—	—
118	U1	1	FT2232HL	tqfp64_0p5_1 2p2x12p2_h1 p6	—	FT2232HL-REEL	FTDI	IC USB HS DUAL UART/FIFO 64-LQFP
119	U2	1	93LC56C-I/SN	so8_50_244	—	93LC56C-I/SN	Microchip Technology	IC EEPROM 2KBIT 3MHZ 8SOIC
120	U3	1	LFD2NX40_BG256	BG256	—	LFD2NX-40-8BG256C	LATTICE	FPGA BG256 PCIe DDR3 CDR SOFT D-PHY
121	U6	1	MT41K64M16TW-107:J	MT41J64M16 TW-093	—	MT41K64M16TW-107:J	Micron	DDR3 1866Mhz Device operate at both 1.35V AND 1.5V
122	U8	1	DP83867ERGZT	48VQFN_DP8 3867	—	DP83867ERGZT	Texas Instruments	IC ETHERNET PHY 48VQFN
123	U9	1	DP83867IRPAPR	64HTQFP	—	DP83867IRPAPR	Texas Instruments	IC ETHERNET RGMII PHY 64TQFP
124	U10	1	BU6651NUX-TR	VSON008X20 30	—	BU6651NUX-TR	Rohm Semiconductor	IC REG LIN 1.5V/1.8V/2.8V 8VSON
125	U12	1	RP115H121D-T1- FE/SOT89-5	SOT89-5	—	RP115H121D-T1-FE	Ricoh	IC REG LDO FIXED 1.2V 1A OUTPUT SOT89-5
126	U13	1	RP111H281D-T1- FE/SOT89-5	SOT89-5	—	RP111H281D-T1-FE	Ricoh	IC REG LDO FIXED 2.8V 0.5A OUTPUT SOT89-5
127	U14,U17	2	RP111H181D-T1- FE/SOT89-5	SOT89-5	—	RP111H181D-T1-FE	Ricoh	IC REG LDO FIXED 1.8V 0.5A OUTPUT SOT89-5
128	U16	1	RP111H101D5-T1- FE/SOT89-5	SOT89-5	—	RP111H101D5-T1-FE	Ricoh	IC REG LDO FIXED 1.05V 0.5A OUTPUT SOT89-5
129	U18	1	RP111H111D-T1- FE/SOT89-5	SOT89-5	—	RP111H111D-T1-FE	Ricoh	IC REG LDO FIXED 1.1V 0.5A OUTPUT SOT89-5
130	U19	1	RP111H251D-T1- FE/SOT89-5	SOT89-5	—	RP111H251D-T1-FE	Ricoh	IC REG LDO FIXED 2.5V 0.5A OUTPUT SOT89-5
131	U20,U23,U25	3	LT3508EUF	LT3508EUF	—	LT3508EUF#PBF	Linear Technology/Anal og Devices	IC REG BUCK ADJ 1.4A DL 24QFN
132	U21	1	RP111H101D-T1- FE/SOT89-5	SOT89-5	—	RP111H101D-T1-FE	Ricoh	IC REG LDO FIXED 1.0V 0.5A OUTPUT SOT89-5
133	U22	1	RP115H101D-T1- FE/SOT89-5	SOT89-5	—	RP115H101D-T1-FE	Ricoh	IC REG LDO FIXED 1.0V 1A OUTPUT SOT89-5

Item	Reference	Qty	Part	PCB Footprint	Comments	Part Number	Manufacturer	Description
134	U24	1	RP115H181D-T1-FE/SOT89-5	SOT89-5	—	RP115H181D-T1-FE	Ricoh	IC REG LDO FIXED 1.8V 1A OUTPUT SOT89-5
135	U26	1	MT25QU128ABA1ESE-OSIT	SO8_MX25L1 2833FM2I10G	—	MT25QU128ABA1ESE-OSIT	Micron	IC FLASH 128Mb 166MHZ 8SOP
136	U600	1	TPS51200DRCT	QFN3X3-10-1	—	TPS51200DRCT	Texas Instruments	IC REG CONV DDR 10UT 10VSON
137	X1	1	7M-12.000MAAJ	xtal_4p_7m	—	7M-12.000MAAJ-T	TXC	CRYSTAL 12MHZ 18PF SMD
138	X2	1	ASDMB-25MHz	x4-2520	—	ASDMB-25.000MHZ-XY-T	Abracon LLC	OSC MEMS 25.000MHZ CMOS SMD 10ppm
139	X4	1	ASDMB-100MHz	x4-2520	—	ASDMB-100.000MHZ-XY-T	Abracon LLC	OSC MEMS 100.000MHZ CMOS SMD 10ppm
140	X5	1	ASDMB-125MHz	x4-2520	—	ASDMB-125.000MHZ-XY-T	Abracon LLC	OSC MEMS 125.000MHZ CMOS SMD 10ppm
141	X10	1	ASE3-27.000MHz-K-T	27MHZ	—	ASE3-27.000MHz-K-T	Abracon LLC	Standard Clock Oscillators 27.000M 1.8V 30ppm
142	X12	1	ASDMB-27MHz	x4-2520	—	ASDMB-27.000MHZ-XY-T	Abracon LLC	OSC MEMS 27.000MHZ CMOS SMD 10ppm
143	X15	1	100MHz_LVDS	DSC1123CI5	—	DSC1123CI5-100.0000	Microchip Technology/ Micrel	100 MHz LVDS MEMS (Silicon) Oscillator Surface Mount 2.25 V ~ 3.6 V 32 mA Enable/Disable
144	X16	1	125MHz_LVDS	DSC1123CI5	—	DSC1123CI5-125.0000	Microchip Technology/ Micrel	125 MHz LVDS MEMS (Silicon) Oscillator Surface Mount 2.25 V ~ 3.6 V 32 mA Enable/Disable
145	Y1,Y2	2	ABM3-25	XTAL_ABM3	—	ABM3-25.000MHZ-B2-T	Abracon	CRYSTAL 25.0000MHZ 18PF SMD
146	Certus-NX Versa Evaluation Board PCB REV B	1	—	—	—	—	PACTRON	—

References

Related documents available from your Lattice Semiconductor sales representative are listed below.

- [Programming Cables User Guide \(FPGA-UG-02042\)](#)
- [Certus-NX Family Data Sheet \(FPGA-DS-02078\)](#)
- [sysCONFIG Usage Guide for Nexus Platform \(FPGA-TN-02099\)](#)

Technical Support Assistance

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

Revision History

Revision 1.0, April 2021

Section	Change Summary
All	Initial release



www.latticesemi.com