



# CrossLinkU-NX System-on-Module (SoM) Board

## *Preliminary* User Guide

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## Abbreviations in This Document

A list of abbreviations used in this document.

| Abbreviation | Definition                                  |
|--------------|---------------------------------------------|
| AON          | Always On                                   |
| B2B          | Board to Board                              |
| CNN          | Convolutional Neural Network                |
| CSI-2        | Camera Serial Interface 2                   |
| DC           | Direct Current                              |
| ESD          | Electrostatic Discharge                     |
| eSPI         | Enhanced Serial Peripheral Interface        |
| FPGA         | Field Programmable Gate Array               |
| FTDI         | Future Technology Devices International     |
| GPIO         | General Purpose Input Output                |
| HMI          | Human Machine Interface                     |
| HUB          | Host-accelerated Unified Bridge             |
| I2C          | Inter-Integrated Circuit                    |
| JTAG         | Joint Test Action Group                     |
| LDO          | Low-Drop Out                                |
| MIPI         | Mobile Industry Processor Interface         |
| OSC          | Oscillator                                  |
| QSPI         | Quad Serial Peripheral Interface            |
| RPI          | Raspberry Pi                                |
| SoM          | System-on-Module                            |
| SPI          | Serial Peripheral Interface                 |
| UART         | Universal Asynchronous Receiver-Transmitter |
| USB          | Universal Serial Bus                        |

# 1. Introduction

Lattice Semiconductor introduces a cutting-edge System on Module (SoM) built on the CrossLinkU™-NX LIFCL-33U FPGA, designed for resource-constrained Edge AI applications. This SoM provides direct access to Camera Serial Interface 2 (CSI-2) input, USB 3.1 Device interface, digital I/O, and an Always-On (AON) feature, enabling advanced functionality with lowest power footprint in compact designs.

Paired with small form factors, purpose-built carrier card to connect CrossLinkU-NX CrossLinkU-NX SoM with Raspberry Pi CM5, the solution delivers a complete platform for intelligent systems. The carrier card integrates essential interfaces from CM5, such as 1-G Ethernet, USB 3.1 Host, microSD storage, and GPIOs, while providing debug interfaces for both SoM and CM5. This ensures seamless connectivity and flexibility for diverse applications.

Our highly optimized Convolutional Neural Network (CNN) runs efficiently on the CrossLinkU-NX LIFCL-33U device, supporting real-time person and gesture detection for up to five individuals. Combined with the Host-accelerated Unified Bridge (HUB), this solution ensures a smooth and responsive user experience for Human-Machine Interface (HMI) applications at the edge.

## 2. Features

- LIFCL-33U FPGA (LIFCL-33U-CTG104)
  - MIPI CSI-2 receiver Soft D-PHY interface for camera data
  - Support SPI Flash configuration
- Board resources
  - On-board JTAG connector header
  - 22-pin standard connector for Raspberry Pi (RPI) camera
  - On-board 100-pin B2B connector to connect with carrier card
  - 64 Mb for HyperRAM memory interface with the CrossLinkU-NX device
  - On-board USB type C connector for USB aggregation
  - On-board 512 Mb SPI Flash interface with the CrossLinkU-NX device
- Programming Circuit
  - Supports Radiant Programmer through a USB or FTDI interface using JTAG or SPI
  - On-board Flash
  - On-board JTAG header

Figure 4.1 and Figure 4.2 show the top and bottom views of the CrossLinkU-NX SoM and its key components.



### 3. CrossLinkU-NX SoM Board Architecture

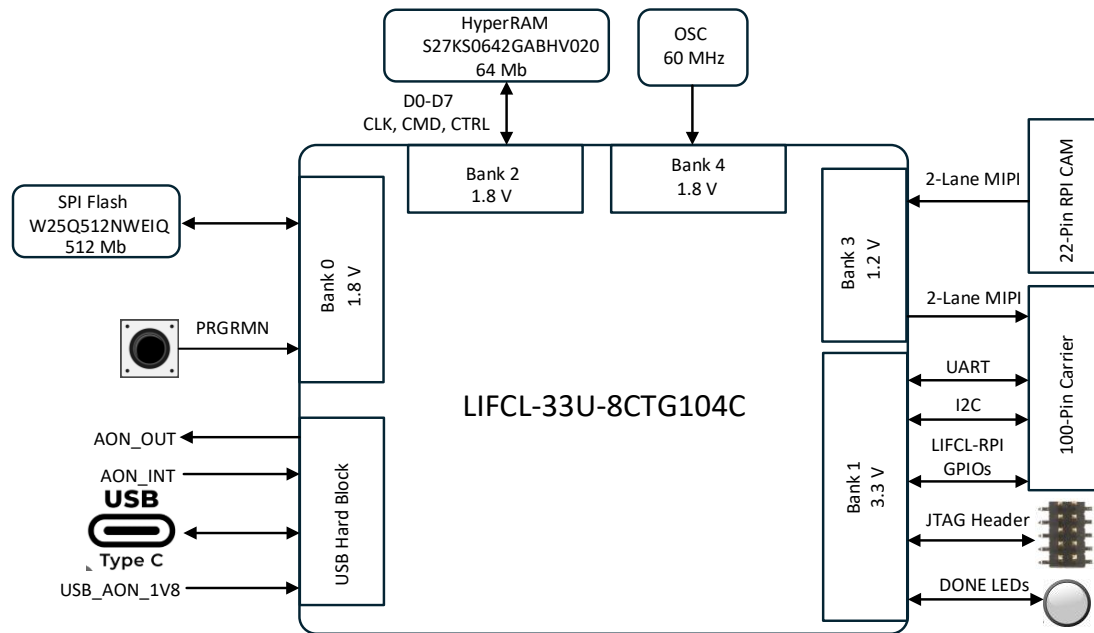


Figure 3.1. CrossLinkU-NX SoM Board Block Diagram

## 4. CrossLinkU-NX SoM Board Top and Bottom Views

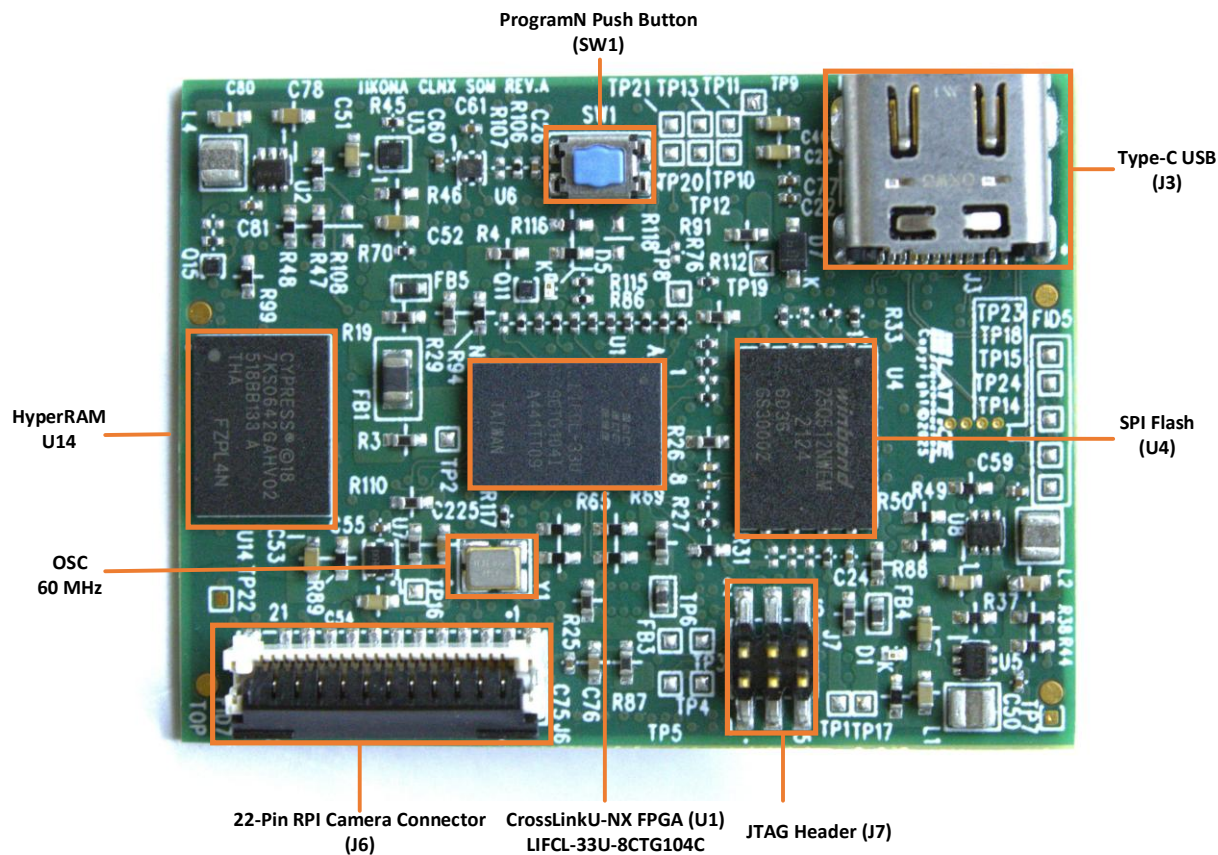


Figure 4.1. CrossLinkU-NX SoM Board, Top View

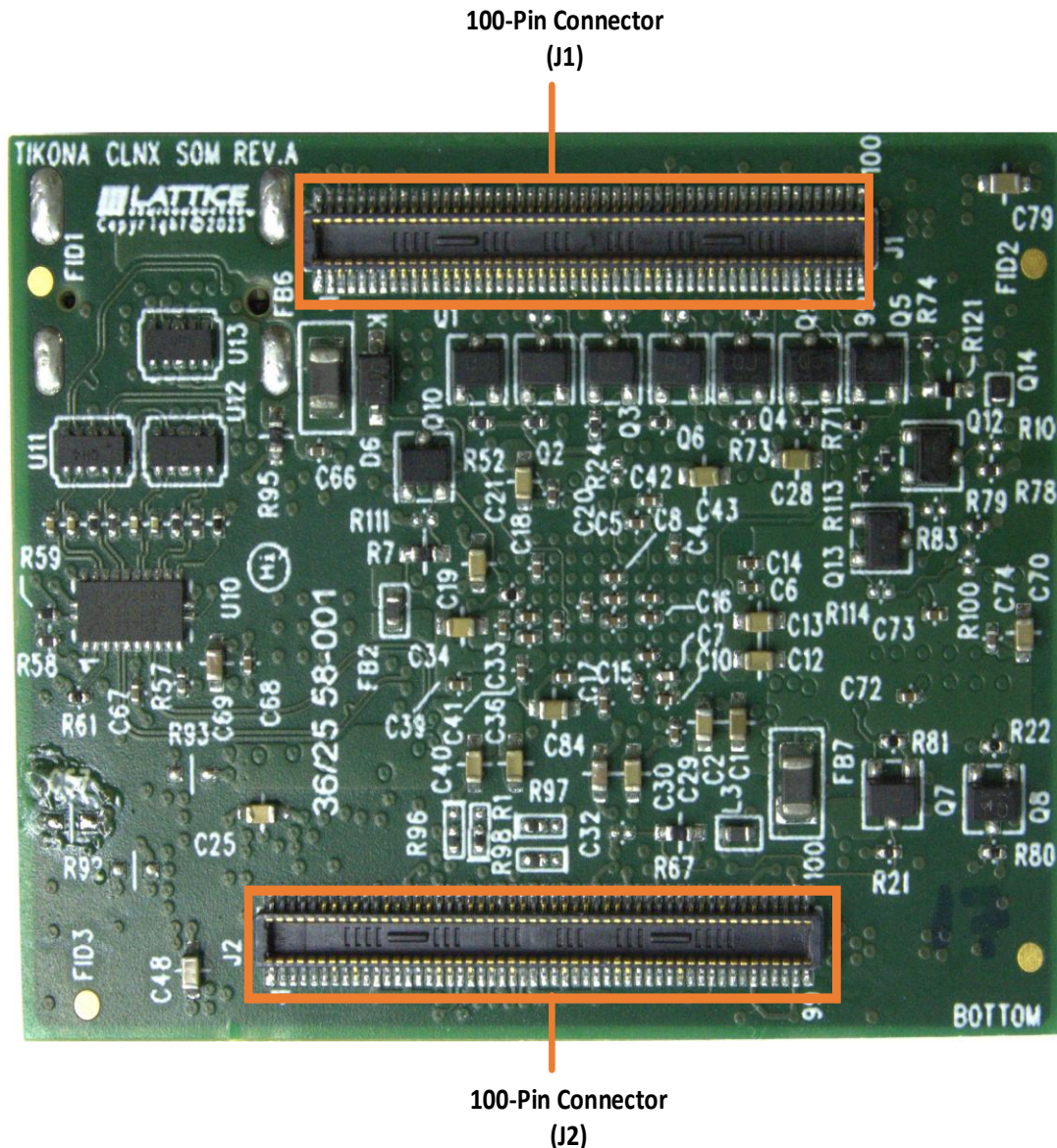


Figure 4.2. CrossLinkU-NX SoM, Bottom View

## 4.1. Further Information

The following references provide detailed information on the CrossLinkU-NX SoM Board and the LIFCL-33U FPGA device:

- [Appendix A. CrossLinkU-NX SoM Board Schematics](#)
- [Appendix B. CrossLinkU-NX SoM Board Bill of Material](#)
- [Lattice Boards for CrossLink-NX and CrossLinkU-NX Devices](#)
- [CrossLink-NX-33 and CrossLinkU-NX Data Sheet \(FPGA-DS-02104\)](#)
- [CrossLinkU-NX SoM for HMI Demonstration reference design \(FPGA-RD-02333\)](#)

The Lattice CrossLinkU-NX SoM Board Power through the USB Type C or Carrier Board 100-Pin Connector. It works within appropriate power supply conditions.

[illegible]

The board LEDs provide a visual indication of power status, as listed in [Table 5.1](#).

| LED Designator | Color | Description                          |
|----------------|-------|--------------------------------------|
| D1             | Green | 5 V Input (J3) or Carrier Board (J1) |

## 6. FPGA Resources

The CrossLinkU-NX SoM Board supports various development resources. It includes a 2-channel 2-lane MIPI interface. There is also a 22-pin standard RPI connector for cameras. Two 100-pin connectors connect the board with the carrier for CM5 interfacing. An on-board Type-C USB provides USB aggregation and power. The board also has a 512 Mb QSPI for FPGA configuration, a HyperRAM memory of 64 Mb, a ProgramN push button for FPGA reset, and a JTAG on-board header for programming. Below tables describe the FPGA pins and interfaces.

### 6.1. General Purpose Clock Source

There is one clock source available on the board, as shown in [Table 6.1](#).

**Table 6.1. FPGA Clock Source**

| Clock Source | Clock Frequency (MHz) | LIFCL-33U U1 Pin Number | Signal Name                    | Comment                                                             |
|--------------|-----------------------|-------------------------|--------------------------------|---------------------------------------------------------------------|
| Y1           | 60                    | H8                      | OSC_60MHZ                      | 60 MHz clock to the PB6A pin                                        |
| Y1           | 60                    | F8 & E8                 | USB_REFCLK_P &<br>USB_REFCLK_N | 60 MHz clock to FPGA<br>REFIN_CLK_EXT_P and<br>REFIN_CLK_EXT_N pins |

### 6.2. ProgramN Push Button

The Lattice CrossLinkU-NX SoM Board has one push button for ProgramN to reset FPGA pins. [Table 6.2](#) below describes the function and connection of the push button. When the push button is pressed, a logic 0 is sent to the FPGA.

**Table 6.2. Push Buttons to LIFCL-33U Pin Position**

| Push Button Designator | LIFCL-33U U1 Pin Number | Signal Name |
|------------------------|-------------------------|-------------|
| SW1                    | R6                      | CLNX_PROGN  |

### 6.3. LIFCL-33U Done LED

The Lattice CrossLinkU-NX SoM Board has one LED for Done Pin ([Table 6.3](#)). This LED glows green color to indicate LIFCL-33U device is programed successfully.

**Table 6.3. Done LED to LIFCL-33U Pin Position**

| Done LED Designator | LIFCL-33U U1 Pin Number | Signal Name |
|---------------------|-------------------------|-------------|
| D5                  | G2                      | CLNX_DONE   |

### 6.4. SPI or QSPI for FPGA Configuration

The Lattice CrossLinkU-NX SoM Board has a QSPI of 512 Mb (W25Q512NWEIQ) to store bit files. JTAG communication is used to write the bit file in SPI flash. Refer to [Table 6.4](#) for the CrossLinkU-NX SoM Board SPI or QSPI signals for FPGA configuration.

**Table 6.4. CrossLinkU-NX SoM Board SPI or QSPI for FPGA Configuration**

| CrossLinkU-NX SoM U1 Pin Number | Signal Name | Signal Comment         |
|---------------------------------|-------------|------------------------|
| B3                              | CSSPIN      | SPI Chip Select        |
| D3                              | DQ1_MISO    | QSPI DQ1/MISO Data Pin |
| E4                              | DQ2         | QSPI DQ2 Data Pin      |
| E3                              | DQ3         | QSPI DQ3 Data Pin      |
| D4                              | DQ0_MOSI    | QSPI DQ0/MISO Data Pin |
| B4                              | SPI_MCLK    | QSPI Clock Pin         |



## 6.5. HyperRAM Interface

The CrossLinkU-NX SoM Board has one HyperRAM memory interface of 64 Mb. The signal definitions of are provided in [Table 6.5](#).

**Table 6.5. HyperRAM Signal Definitions**

| CrossLinkU-NX SoM U1 Pin Number | Signal Name   | Signal Comment       |
|---------------------------------|---------------|----------------------|
| N5                              | HR_DQ0        | HyperRAM Data 0      |
| N4                              | HR_DQ1        | HyperRAM Data 1      |
| M5                              | HR_DQ2        | HyperRAM Data 2      |
| M4                              | HR_DQ3        | HyperRAM Data 3      |
| L4                              | HR_DQ4        | HyperRAM Data 4      |
| L3                              | HR_DQ5        | HyperRAM Data 5      |
| N3                              | HR_DQ6        | HyperRAM Data 6      |
| N2                              | HR_DQ7        | HyperRAM Data 7      |
| M3                              | HR_CS_CLNX    | HyperRAM Chip Select |
| M2                              | CLNX_HR_RESET | HyperRAM Reset       |
| K3                              | HR_CLK        | HyperRAM Clock       |
| K2                              | HR_CLK#       | HyperRAM Clock       |
| J2                              | HR_RWDS       | HyperRAM Strobe      |

## 6.6. 22-Pin RPI MIPI Connector Interface

The CrossLinkU-NX SoM Board has one 22-Pin RPI MIPI Connector Interface. The signal definitions of the LIFCL-33U device are provided in [Table 6.6](#).

**Table 6.6. 22-Pin RPI MIPI Connector (J6) Interface Definitions**

| LIFCL-33U Pin Number | Signal Name      | J6 Connector | Signal Comment                                  |
|----------------------|------------------|--------------|-------------------------------------------------|
| —                    | VCC_3V30         | J6.1         | Power                                           |
| E2                   | CLNX_I2C_SDA_3V3 | J6.2         | RPI Camera I2C Bus                              |
| E1                   | CLNX_I2C_SCL_3V3 | J6.3         | RPI Camera I2C Bus                              |
| —                    | GND              | J6.4         | Ground                                          |
| H2                   | RPI_CAM_GPIO_0   | J6.5         | CAM Control 0                                   |
| J1                   | RPI_CAM_GPIO_1   | J6.6         | CAM Control 1                                   |
| —                    | GND              | J6.7         | Ground                                          |
| J6                   | DIFF5_PCLK_P0    | J6.8         | MIPI Data Only when R97 2&3 Mount (Default DNI) |
| H6                   | DIFF5_PCLK_N0    | J6.9         | MIPI Data Only when R98 1&2 Mount (Default DNI) |
| —                    | GND              | J6.10        | Ground                                          |
| E6                   | DIFF3_PCLK_P0    | J6.11        | MIPI Data Only when R1 2&3 Mount (Default DNI)  |
| F7                   | DIFF3_PCLK_N0    | J6.12        | MIPI Data Only when R96 1&2 Mount (Default DNI) |
| —                    | GND              | J6.13        | Ground                                          |
| M7                   | DIFF1_PCLK_P     | J6.14        | MIPI Clock                                      |
| M6                   | DIFF1_PCLK_N     | J6.15        | MIPI Clock                                      |
| —                    | GND              | J6.16        | Ground                                          |
| L7                   | DIFF2_P          | J6.17        | MIPI Data 1                                     |
| L6                   | DIFF2_N          | J6.18        | MIPI Data 1                                     |
| —                    | GND              | J6.19        | Ground                                          |
| N7                   | DIFF0_P          | J6.20        | MIPI Data 0                                     |
| N6                   | DIFF0_N          | J6.21        | MIPI Data 0                                     |
| —                    | GND              | J6.22        | Ground                                          |

## 6.7. I2C Interface

The Lattice CrossLinkU-NX SoM Board has multiple I2C paths. They can implement various types of I2C functions. The signal definitions of the I2C paths are provided in [Table 6.7](#) and [Table 6.8](#).

**Table 6.7. I2C between LIFCL-33U (U1) and 22-Pin RPI (J6) Signal Definitions**

| LIFCL-33U (U1) | J6 RPI Camera Connector | Signal Name      | 100-Pin Connector (J2) | Signal Name         | Comment |
|----------------|-------------------------|------------------|------------------------|---------------------|---------|
| E1             | J6.3                    | CLNX_I2C_SCL_3V3 | J2.81                  | CLNX_I2C_SCL_3V3_CN | —       |
| E2             | J6.2                    | CLNX_I2C_SDA_3V3 | J2.83                  | CLNX_I2C_SDA_3V3_CN | —       |

**Table 6.8. I2C between LIFCL-33U (U1) and 100-Pin Connector (J1) Signal Definitions**

| LIFCL-33U (U1) | Signal Name  | 100-Pin Connector (J1) | 100-Pin Connector (J1)Signal Name | Comment |
|----------------|--------------|------------------------|-----------------------------------|---------|
| N8             | CLNX_SDA_1V8 | J1.51                  | CLNX_SDA_3V3                      | —       |
| M8             | CLNX_SDA_1V8 | J1.55                  | CLNX_SCL_3V3                      | —       |

## 6.8. UART Interfaces

The Lattice CrossLinkU-NX SoM Board has UART interfaces. The PC can communicate LIFCL-33U Device with serial terminal software, through carrier Board J16 and a USB cable. The signal definitions are described in [Table 6.9](#).

**Table 6.9. LIFCL-33U Device UART Definitions**

| LIFCL-33U U1 Pin Number | 100-Pin Connector(J1) | FTDI U9 Pin Number | Signal Name  |
|-------------------------|-----------------------|--------------------|--------------|
| G1                      | J1.33                 | 32                 | CLNX_UART_RX |
| F1                      | J1.35                 | 33                 | CLNX_UART_TX |

## 6.9. LIFCL-33U Device to 100-Pin J2 Connector MIPI Interface

The Lattice CrossLinkU-NX SoM Board has a MIPI interface between the LIFCL-33U (U1) device and the 100-Pin J2 Connector. The signal definitions are described in [Table 6.10](#).

**Table 6.10. MIPI between LIFCL-33U (U1) and 100-Pin Connector (J2) Signal Definitions**

| LIFCL-33U Pin Number | Signal Name  | J6 Connector | Signal Comment                              |
|----------------------|--------------|--------------|---------------------------------------------|
| F7                   | DIFF3_PCLK_P | J6.1         | MIPI Data Only when R1 1&2 Mount (Default)  |
| E6                   | DIFF3_PCLK_N | J6.2         | MIPI Data Only when R96 2&3 Mount (Default) |
| J6                   | DIFF5_PCLK_P | J6.3         | MIPI Data Only when R97 1&2 Mount (Default) |
| H6                   | DIFF5_PCLK_N | J6.4         | MIPI Data Only when R98 2&3 Mount (Default) |
| G7                   | DIFF4_PCLK_P | J6.5         | —                                           |
| G6                   | DIFF4_PCLK_N | J6.6         | —                                           |

## 6.10.100-Pin Connectors

The Lattice CrossLinkU-NX SoM Board has two 100-Pin connectors J1 and J2 and they mate with carrier board's J14 and J15 board to board connectors. The signal definitions are described in [Table 6.11](#) and [Table 6.12](#).

**Table 6.11. LIFCL-33U Device 100-Pin Definitions (J1)**

| Comment         | Carrier Board (J14) Signal | CrossLinkU-NX SoM 100-Pin (J1) |               |  |               | Carrier Board (J14) Signal | Comment        |
|-----------------|----------------------------|--------------------------------|---------------|--|---------------|----------------------------|----------------|
|                 |                            | J1 Signal                      | J1 Pin Number |  | J1 Pin Number | J1 Signal                  |                |
| —               | VCC_5V0                    | VCC_5V_CARRIER                 | 1             |  | 2             | GND                        | GND            |
| —               |                            |                                | 3             |  | 4             | CLNX_DONE_CN               | CPNX_HPIO_6P   |
| —               |                            |                                | 5             |  | 6             | CPNX_INTIN_CN              | CPNX_HPIO_6N   |
| —               |                            |                                | 7             |  | 8             | GND                        | GND            |
| —               |                            |                                | 9             |  | 10            | NC                         | NC             |
| —               |                            |                                | 11            |  | 12            | NC                         | NC             |
| —               | VCC_CAM                    | VCC_CAM1/VCC_3V30              | 13            |  | 14            | GND                        | GND            |
| —               |                            |                                | 15            |  | 16            | NC                         | NC             |
| —               | GND                        | GND                            | 17            |  | 18            | NC                         | NC             |
| —               | TP42                       | TP10                           | 19            |  | 20            | NC                         | NC             |
| —               | NC                         | TP11                           | 21            |  | 22            | NC                         | NC             |
| —               | TP43                       | NC                             | 23            |  | 24            | NC                         | NC             |
| —               | NC                         | NC                             | 25            |  | 26            | NC                         | NC             |
| —               | GND                        | GND                            | 27            |  | 28            | GND                        | GND            |
| —               | TP45                       | TP12                           | 29            |  | 30            | NC                         | NC             |
| —               | TP46                       | TP13                           | 31            |  | 32            | NC                         | NC             |
| U10 & J24.6     | CPNX_UART_TX               | CLNX_UART_TX_CN                | 33            |  | 34            | NC                         | NC             |
| U10 & J24.3     | CPNX_UART_RX               | CLNX_UART_RX_CN                | 35            |  | 36            | NC                         | NC             |
| —               | GND                        | GND                            | 37            |  | 38            | GND                        | GND            |
| —               | NC                         | NC                             | 39            |  | 40            | NC                         | NC             |
| —               | GND                        | GND                            | 41            |  | 42            | NC                         | NC             |
| —               | NC                         | NC                             | 43            |  | 44            | NC                         | NC             |
| —               | NC                         | NC                             | 45            |  | 46            | NC                         | NC             |
| —               | GND                        | GND                            | 47            |  | 48            | GND                        | GND            |
| —               | NC                         | NC                             | 49            |  | 50            | NC                         | NC             |
| CM5-GPIO8       | RPI_CPNX_CSN               | CLNX_SDA_3V3                   | 51            |  | 52            | NC                         | NC             |
| —               | NC                         | NC                             | 53            |  | 54            | NC                         | NC             |
| CM5-GPIO9       | RPI_CPNX_MISO              | CLNX_SCL_3V3                   | 55            |  | 56            | HOST_CAM_EN_CN             | RPI_CPNX_GPIO1 |
| —               | GND                        | GND                            | 57            |  | 58            | GND                        | GND            |
| —               | NC                         | NC                             | 59            |  | 60            | NC                         | NC             |
| —               | NC                         | NC                             | 61            |  | 62            | NC                         | NC             |
| —               | NC                         | NC                             | 63            |  | 64            | RPI_CLNX_GPIO2             | RPI_CPNX_GPIO2 |
| —               | NC                         | NC                             | 65            |  | 66            | RPI_CLNX_GPIO3             | RPI_CPNX_GPIO3 |
| —               | GND                        | GND                            | 67            |  | 68            | GND                        | GND            |
| —               | TP44                       | NC                             | 69            |  | 70            | NC                         | TP37           |
| —               | NC                         | NC                             | 71            |  | 72            | NC                         | NC             |
| —               | NC                         | NC                             | 73            |  | 74            | NC                         | TP38           |
| CM5-GPIO13      | RPI_CPNX_GPIO4             | AON_INT_3V3                    | 75            |  | 76            | NC                         | NC             |
| CM5-GPIO6       | RPI_CPNX_GPIO5             | RPI_GPIO5                      | 77            |  | 78            | NC                         | TP39           |
| —               | GND                        | GND                            | 79            |  | 80            | GND                        | GND            |
| —               | NC                         | NC                             | 81            |  | 82            | NC                         | NC             |
| —               | NC                         | NC                             | 83            |  | 84            | NC                         | NC             |
| CARRIER-J18     | XO3D_PROGRAM_N             | CLNX_PROGN                     | 85            |  | 86            | NC                         | NC             |
| —               | GND                        | GND                            | 87            |  | 88            | GND                        | GND            |
| LIFCL FTDI JTAG | TP40                       | CLNX_JTAG_EN_CN                | 89            |  | 90            | NC                         | NC             |
|                 | CPNX_JTAG_TDO              | CLNX_JTAG_TDO_CN               | 91            |  | 92            | NC                         | NC             |



| Comment | Carrier Board (J14) Signal | CrossLinkU-NX SoM 100-Pin (J1) |               |  |               | Carrier Board (J14) Signal | Comment |
|---------|----------------------------|--------------------------------|---------------|--|---------------|----------------------------|---------|
|         |                            | J1 Signal                      | J1 Pin Number |  | J1 Pin Number | J1 Signal                  |         |
|         | CPNX_JTAG_TDI              | CLNX_JTAG_TDI_CN               | 93            |  | 94            | NC                         | —       |
|         | CPNX_JTAG_TMS              | CLNX_JTAG_TMS_CN               | 95            |  | 96            | NC                         | —       |
|         | CPNX_JTAG_CLK              | CLNX_JTAG_CLK_CN               | 97            |  | 98            | NC                         | —       |
| —       | GND                        | GND                            | 99            |  | 100           | GND                        | —       |

**Table 6.12. LIFCL-33U Device 100-Pin Definitions (J2)**

| Comment        | Carrier Board (J15) Signal | CrossLinkU-NX SoM 100-Pin (J2) |               |  |               | Carrier Board (J15) Signal | Comment |
|----------------|----------------------------|--------------------------------|---------------|--|---------------|----------------------------|---------|
|                |                            | J2 Signal                      | J2 Pin Number |  | J2 Pin Number | J2 Signal                  |         |
| —              | GND                        | GND                            | 1             |  | 2             | GND                        | —       |
| —              | NC                         | NC                             | 3             |  | 4             | NC                         | —       |
| —              | NC                         | NC                             | 5             |  | 6             | NC                         | —       |
| —              | GND                        | GND                            | 7             |  | 8             | GND                        | —       |
| —              | NC                         | NC                             | 9             |  | 10            | NC                         | —       |
| —              | NC                         | NC                             | 11            |  | 12            | NC                         | —       |
| —              | GND                        | GND                            | 13            |  | 14            | GND                        | —       |
| —              | NC                         | NC                             | 15            |  | 16            | NC                         | —       |
| —              | NC                         | NC                             | 17            |  | 18            | NC                         | —       |
| —              | GND                        | GND                            | 19            |  | 20            | GND                        | —       |
| —              | NC                         | NC                             | 21            |  | 22            | NC                         | —       |
| —              | NC                         | NC                             | 23            |  | 24            | NC                         | —       |
| —              | GND                        | GND                            | 25            |  | 26            | GND                        | —       |
| —              | NC                         | NC                             | 27            |  | 28            | NC                         | —       |
| —              | NC                         | NC                             | 29            |  | 30            | NC                         | —       |
| —              | GND                        | GND                            | 31            |  | 32            | GND                        | —       |
| CM5-MIPI0_D0_P | CPNX_CAM1_MIPI_D0P         | DIFF3_PCLK_P                   | 33            |  | 34            | NC                         | —       |
| CM5-MIPI0_D0_P | CPNX_CAM1_MIPI_D0N         | DIFF3_PCLK_N                   | 35            |  | 36            | NC                         | —       |
| —              | GND                        | GND                            | 37            |  | 38            | GND                        | —       |
| CM5-MIPI0_D1_P | CPNX_CAM1_MIPI_D1P         | DIFF5_PCLK_P                   | 39            |  | 40            | NC                         | —       |
| CM5-MIPI0_D1_P | CPNX_CAM1_MIPI_D1N         | DIFF5_PCLK_N                   | 41            |  | 42            | NC                         | —       |
| —              | GND                        | GND                            | 43            |  | 44            | GND                        | —       |
| CM5-MIPI0_C_P  | CPNX_CAM1_MIPI_CKP         | DIFF4_PCLK_P                   | 45            |  | 46            | NC                         | —       |
| CM5-MIPI0_C_P  | CPNX_CAM1_MIPI_CKN         | DIFF4_PCLK_N                   | 47            |  | 48            | NC                         | —       |
| —              | GND                        | GND                            | 49            |  | 50            | GND                        | —       |
| —              | NC                         | NC                             | 51            |  | 52            | NC                         | —       |
| —              | NC                         | NC                             | 53            |  | 54            | NC                         | —       |
| —              | GND                        | GND                            | 55            |  | 56            | GND                        | —       |
| —              | NC                         | NC                             | 57            |  | 58            | NC                         | —       |
| —              | NC                         | NC                             | 59            |  | 60            | NC                         | —       |
| —              | GND                        | GND                            | 61            |  | 62            | GND                        | —       |
| —              | NC                         | NC                             | 63            |  | 64            | NC                         | —       |
| —              | NC                         | CPNX_HPIO_1N                   | 65            |  | 66            | NC                         | —       |
| —              | GND                        | GND                            | 67            |  | 68            | GND                        | —       |
| —              | NC                         | CPNX_HPIO_2P                   | 69            |  | 70            | NC                         | —       |
| —              | NC                         | CPNX_HPIO_2N                   | 71            |  | 72            | NC                         | —       |
| —              | GND                        | GND                            | 73            |  | 74            | GND                        | —       |

| Comment | Carrier Board (J15) Signal | CrossLinkU-NX SoM 100-Pin (J2) |               |  |               | Carrier Board (J15) Signal | Comment |
|---------|----------------------------|--------------------------------|---------------|--|---------------|----------------------------|---------|
|         |                            | J2 Signal                      | J2 Pin Number |  | J2 Pin Number | J2 Signal                  |         |
| —       | NC                         | CPNX_HPIO_3P                   | 75            |  | 76            | NC                         | —       |
| —       | NC                         | CPNX_HPIO_3N                   | 77            |  | 78            | NC                         | —       |
| —       | GND                        | GND                            | 79            |  | 80            | GND                        | —       |
| —       | CPNX_SENS_SCL_3 V3         | CLNX_I2C_SCL_3V3_CN            | 81            |  | 82            | NC                         | —       |
| —       | CPNX_SENS_SDA_3 V3         | CLNX_I2C_SDA_3V3_CN            | 83            |  | 84            | NC                         | —       |
| —       | GND                        | GND                            | 85            |  | 86            | GND                        | —       |
| —       | NC                         | NC                             | 87            |  | 88            | NC                         | —       |
| —       | NC                         | NC                             | 89            |  | 90            | NC                         | —       |
| —       | GND                        | GND                            | 91            |  | 92            | GND                        | —       |
| —       | NC                         | NC                             | 93            |  | 94            | NC                         | —       |
| —       | NC                         | NC                             | 95            |  | 96            | NC                         | —       |
| —       | NC                         | NC                             | 97            |  | 98            | NC                         | —       |
| —       | GND                        | GND                            | 99            |  | 100           | GND                        | —       |

## 6.11. System Integration with Carrier and CM5

The system integration of the CrossLinkU-NX SoM Board with the Carrier board and CM5 is shown in [Figure 6.1](#).

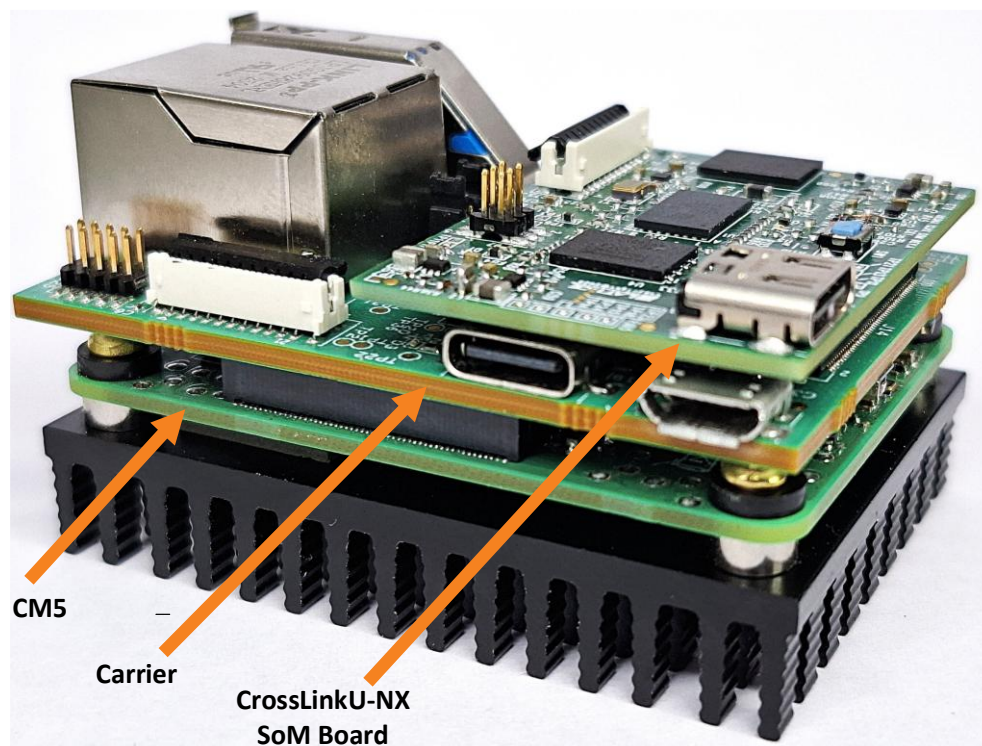


Figure 6.1. System Integration

## 6.12. Programming Steps for the CrossLinkU-NX SoM

Lattice Radiant Programmer can be used to program the .bit file to the CrossLinkU-NX SoM In SRAM. Radiant Programmer is integrated into the Lattice Radiant Software and is also available as a stand-alone version.

To program the CrossLinkU-NX SoM SRAM:

1. Mount the CrossLinkU-NX SoM on the carrier board and connect the Micro USB cable on the Carrier Board J16 connector.
2. Connect the type C USB cable adapter to Carrier board Connector J19 to power up the board.
3. In the Lattice Radiant software, click **Tools > Programmer**, or in Windows, go to **Start > Lattice Radiant Software 2025.2 > Radiant Programmer**.
4. Enter the project name and click **Browse...** to select the location where you want to save the project.
5. Click **Create a new blank project** and click **OK** (Figure 6.1).

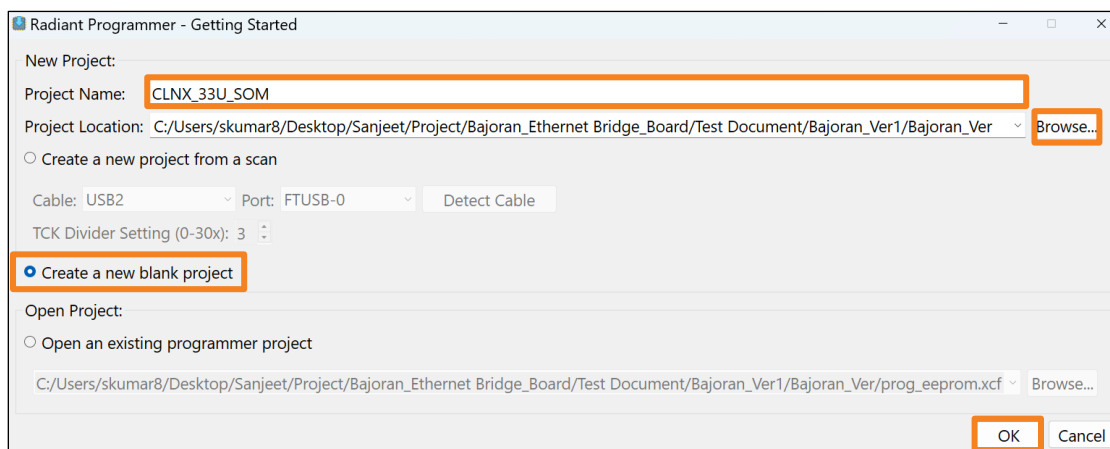


Figure 6.2. Radiant Programmer – Getting Started

6. Click **Detect Cable**. A Pop-up window appears. Select **FTUSB-0** for JTAG programming. Click **OK** (Figure 6.3).

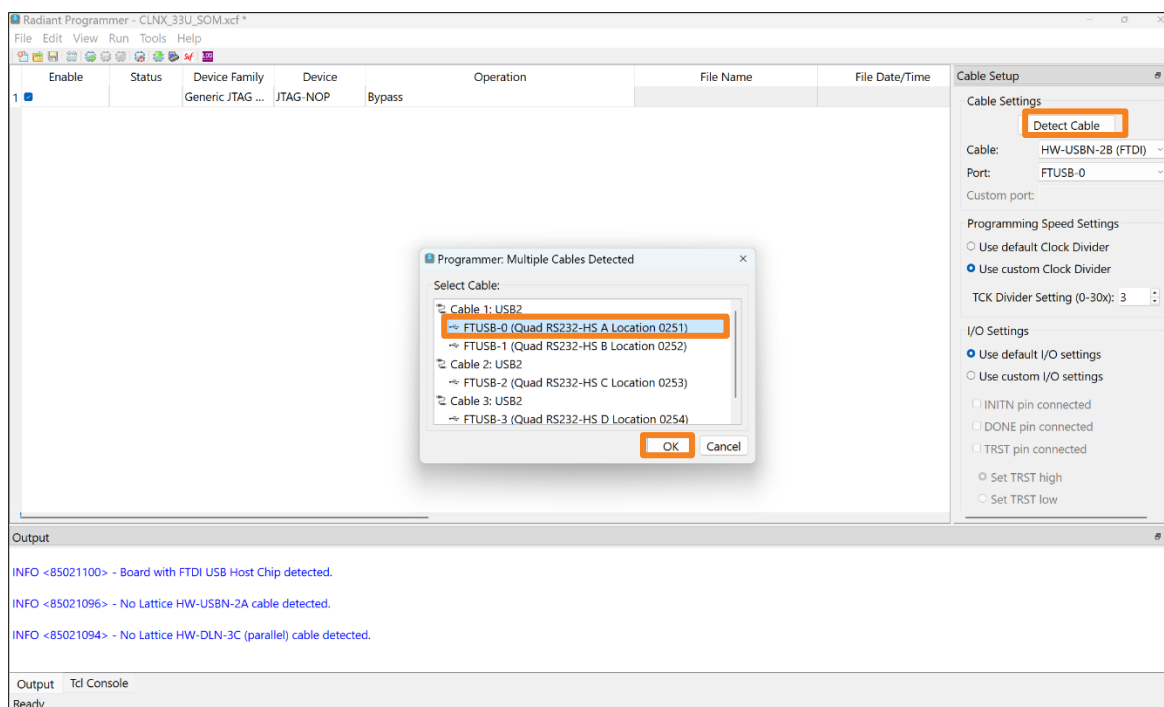


Figure 6.3. Radiant Programmer – Detect Cable

- Click the **Scan Device** icon. In the pop-up window, confirm the default setting. The following interface of Radiant Programmer appears (Figure 6.4).

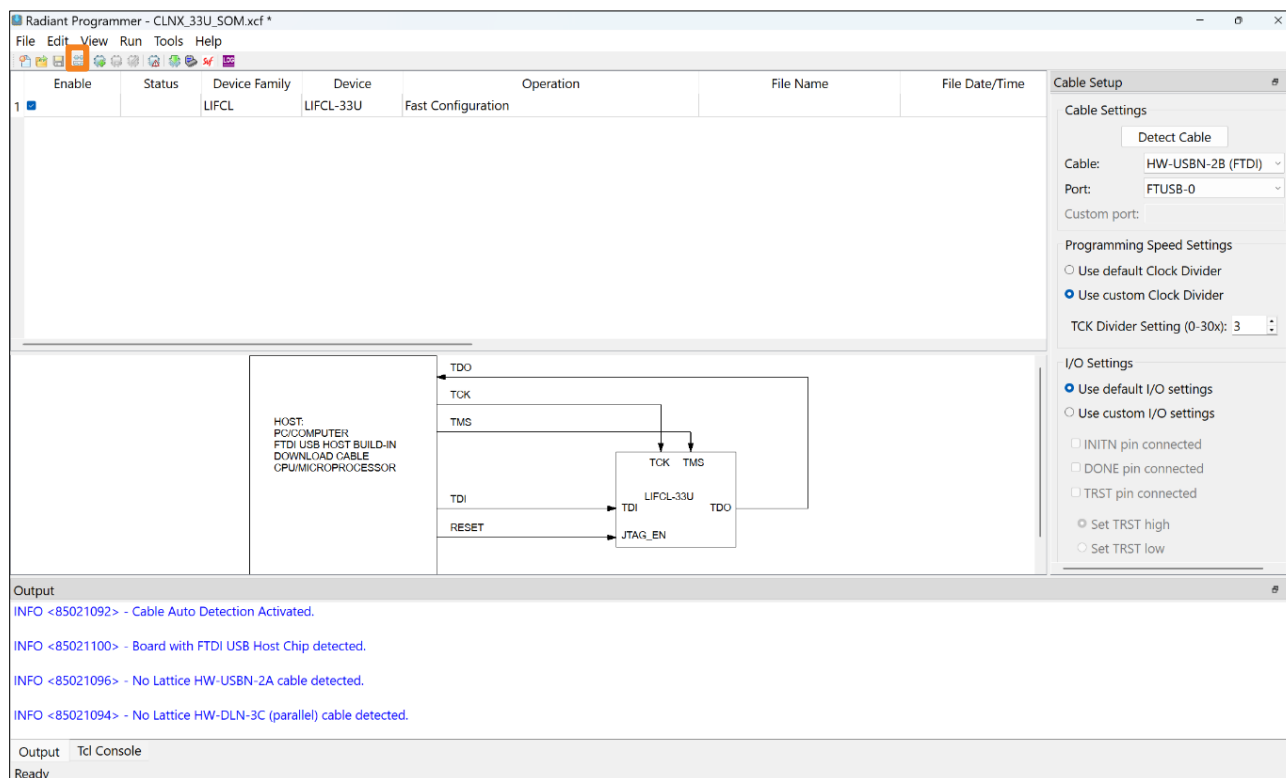


Figure 6.4. Radiant Programmer – Scan Device

- Double-click the **Operation** field. The **Device Properties** window opens. Select the programming file that is in .bit format. Click **OK** (Figure 6.5).

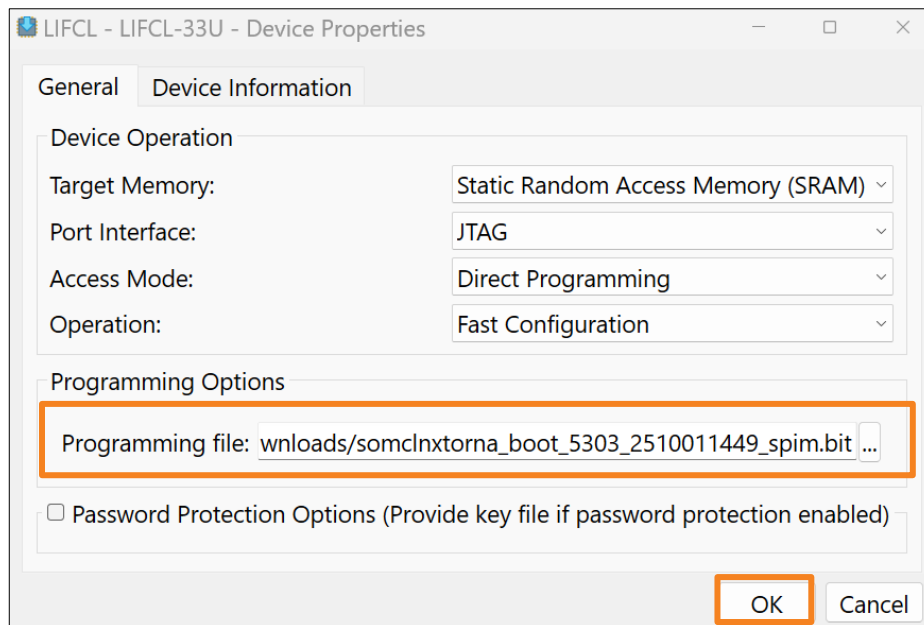


Figure 6.5. Radiant Programmer – Device Properties

- Click the Program  icon. After the programming is completed successfully, the message **Operation: successful** in blue color appears in the Output box (Figure 6.6).

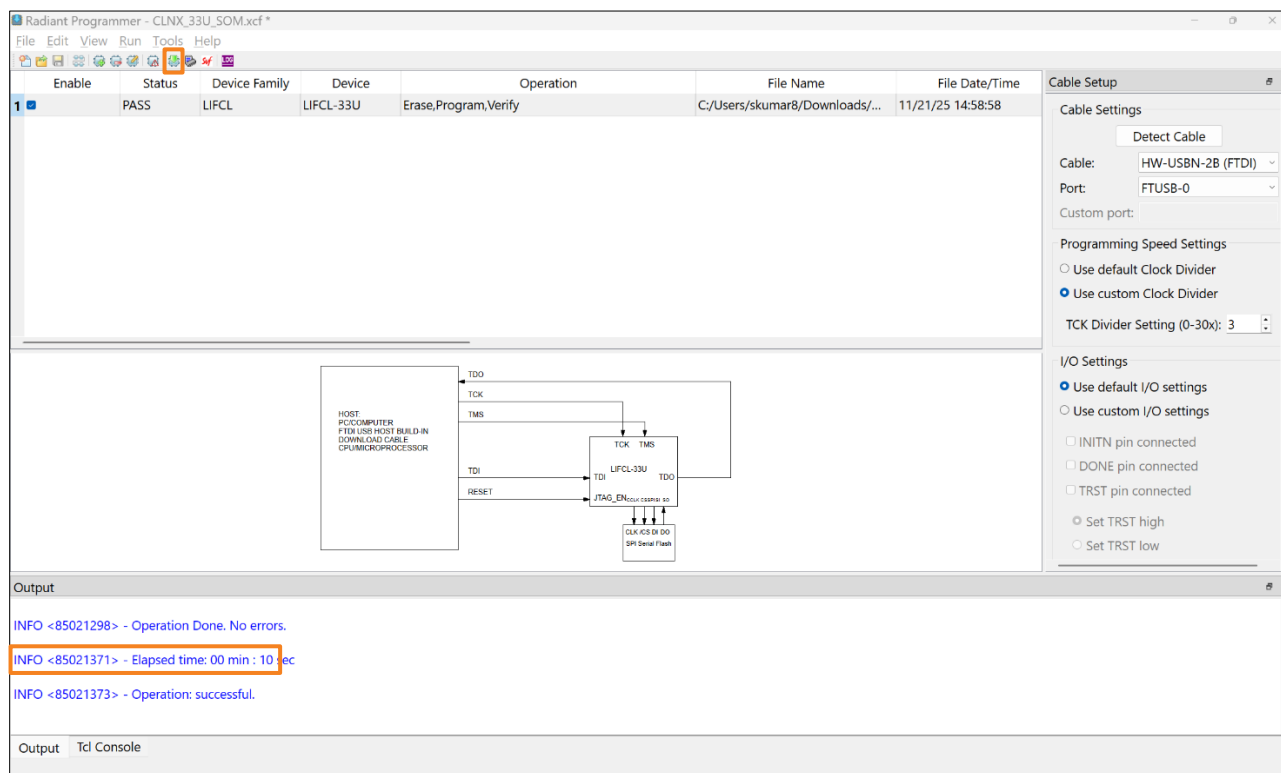
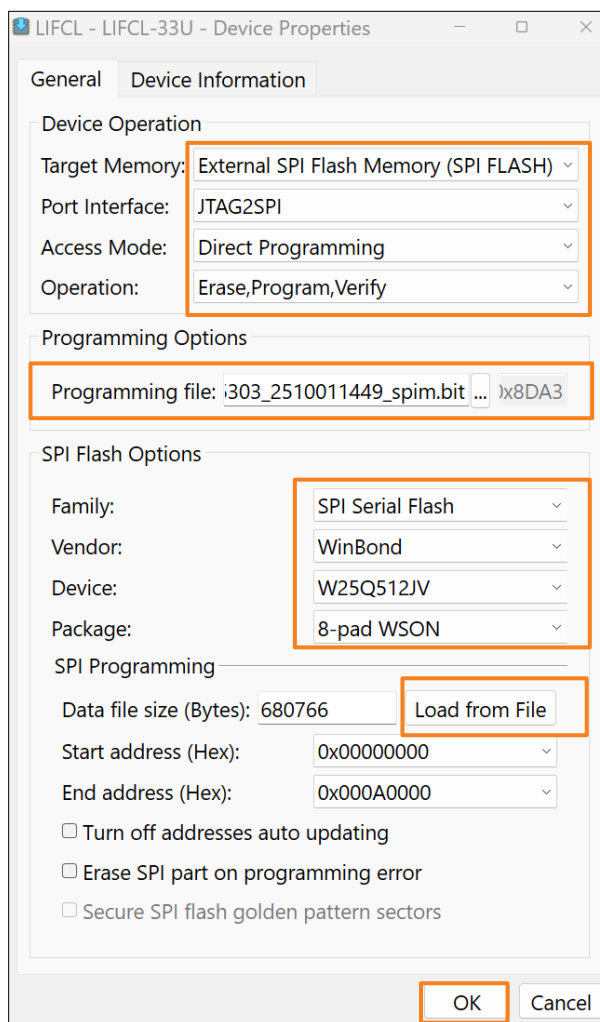


Figure 6.6. Radiant Programmer – Program

To program the CrossLinkU-NX SoM External Flash:

1. Follow the above steps 1 to 7.
2. Double-click the **Operation** field and select options upon the screenshot below (Figure 6.7).



**Figure 6.7. Program the External Flash**

3. Click the Program  icon. After the programming is completed successfully, the message **Operation: successful** in blue color appears in the Output box.

## 7. Software Requirements

The following software versions are required to develop designs for the CrossLinkU-NX SoM Board:

- Lattice Radiant Software 2025.2 or later
- Lattice Radiant Programmer 2025.2 or later
- Lattice Propel Software 2025.2 or later

## 8. 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 packaging provided.
- Touch a metal USB housing to equalize the voltage potential between you and the board.

## 9. Ordering Information

Table 9.1. Ordering Information

| Description             | Ordering Part Number | China RoHS Environment-Friendly Use Period (EFUP)                                   |
|-------------------------|----------------------|-------------------------------------------------------------------------------------|
| CrossLinkU-NX SoM Board | LIFCL-SOM-EVN        |  |

Appendix A. CrossLinkU-NX SoM Board Schematics

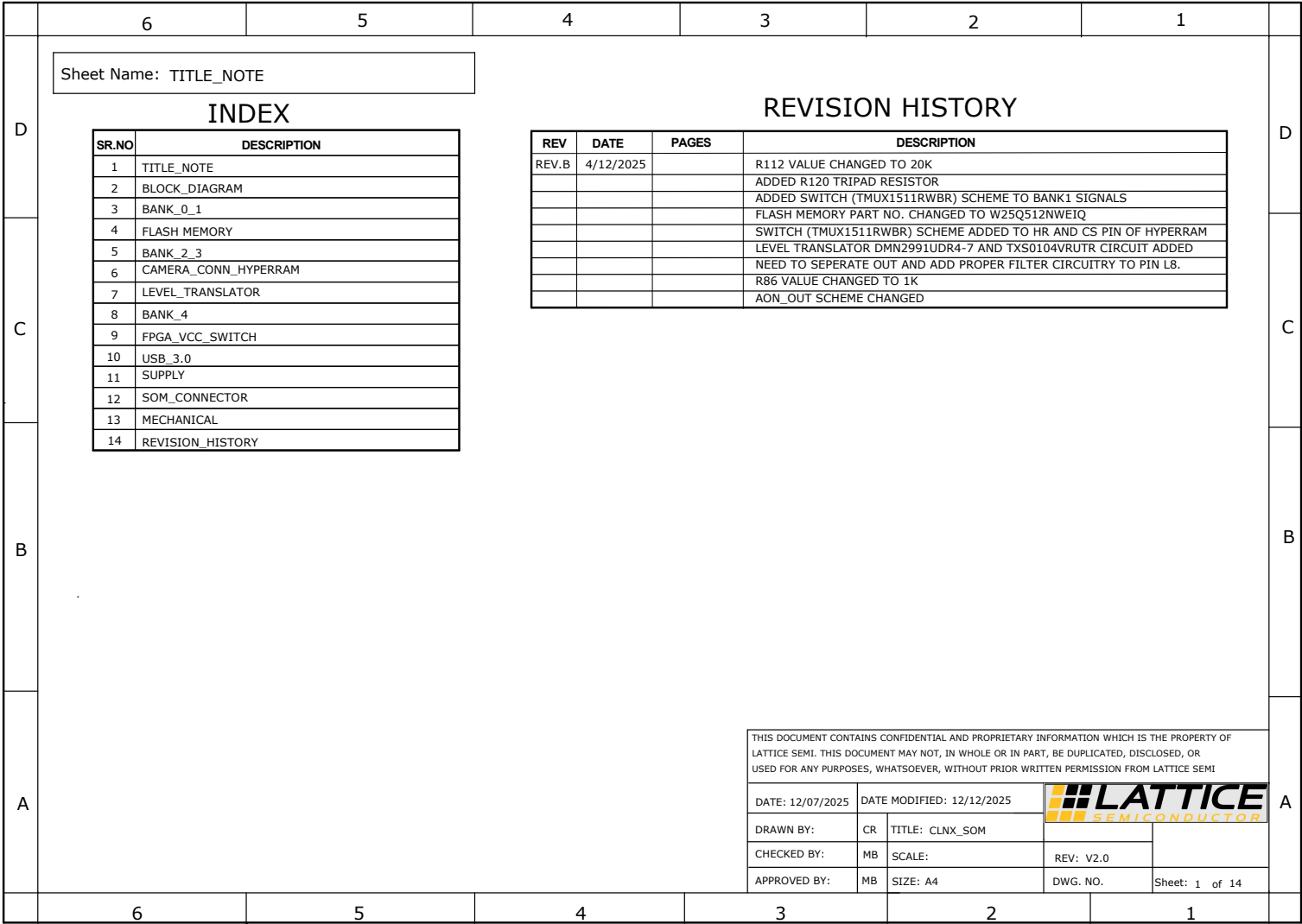


Figure A.1. Title Note





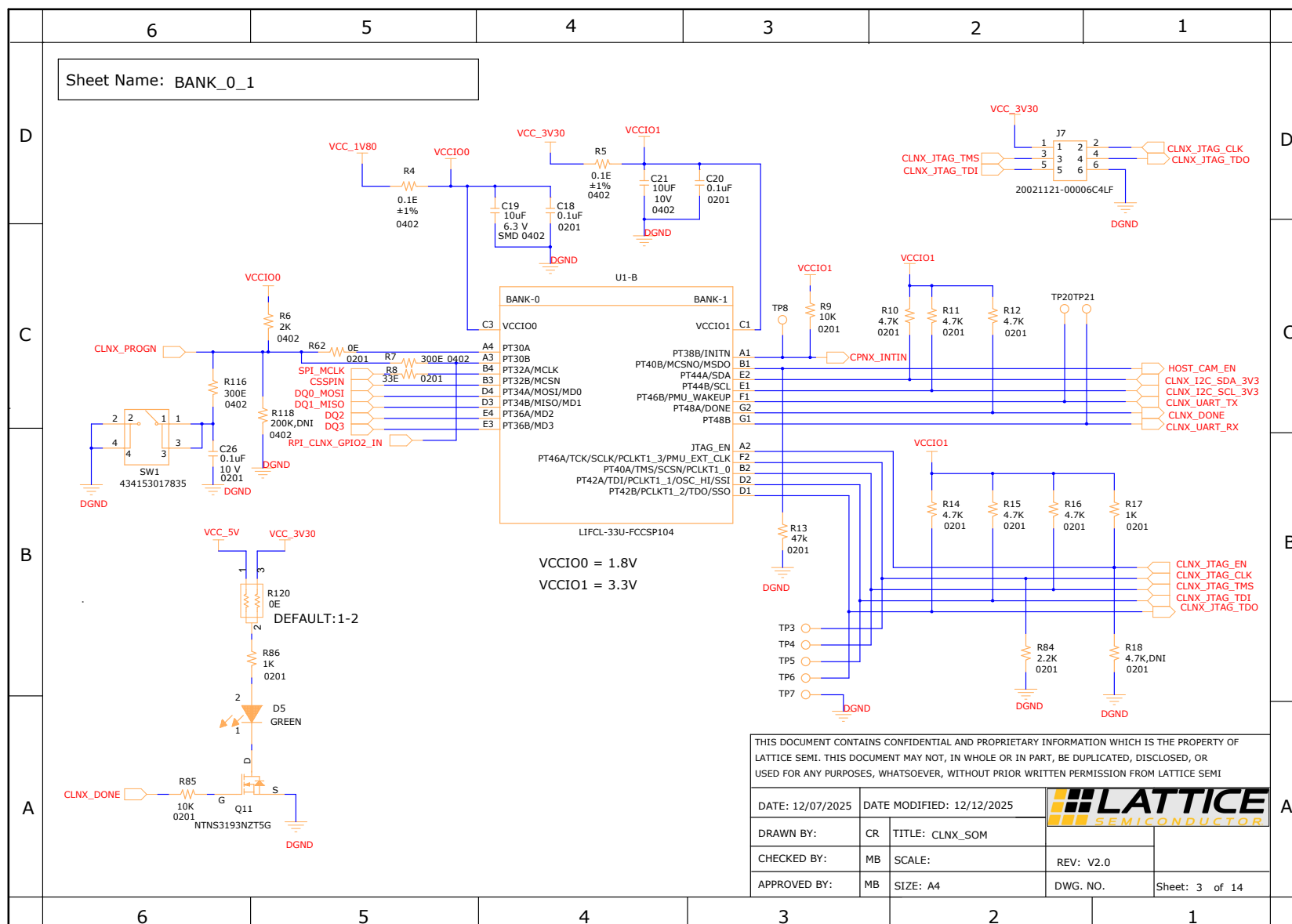


Figure A.3. Bank 0 and Bank 1



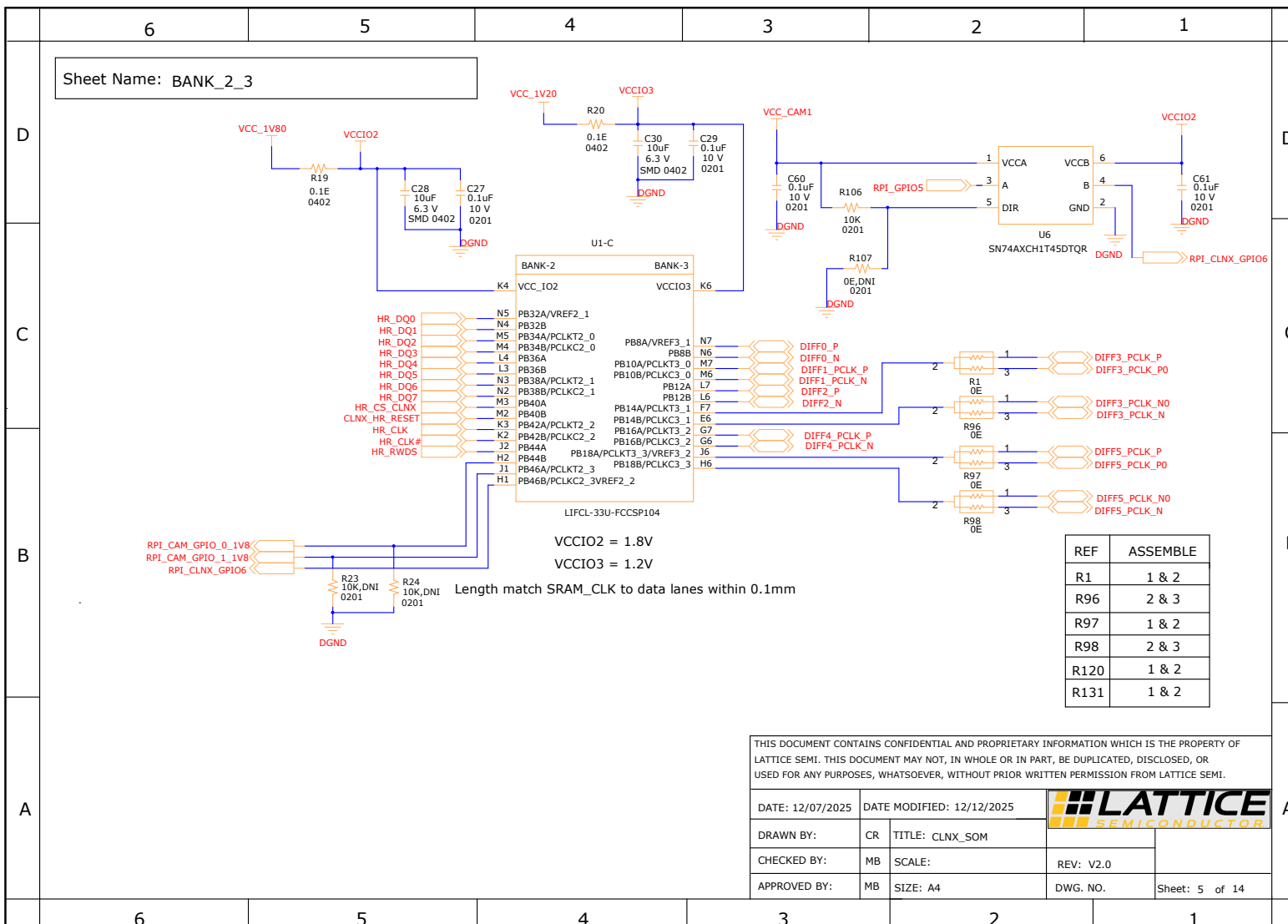


Figure A.5. Bank 2 and Bank 3

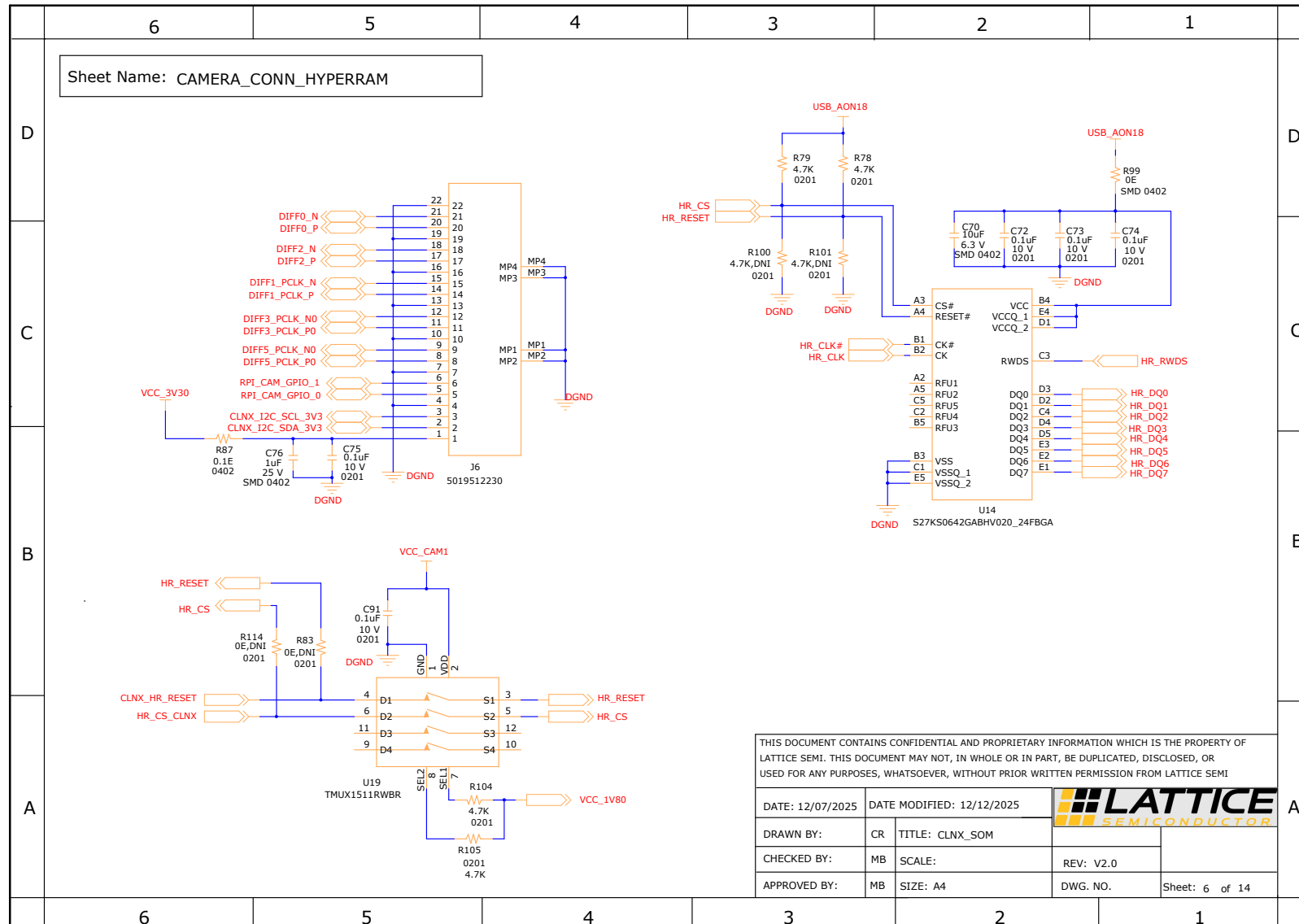


Figure A.6. Camera Connector and HyperRAM



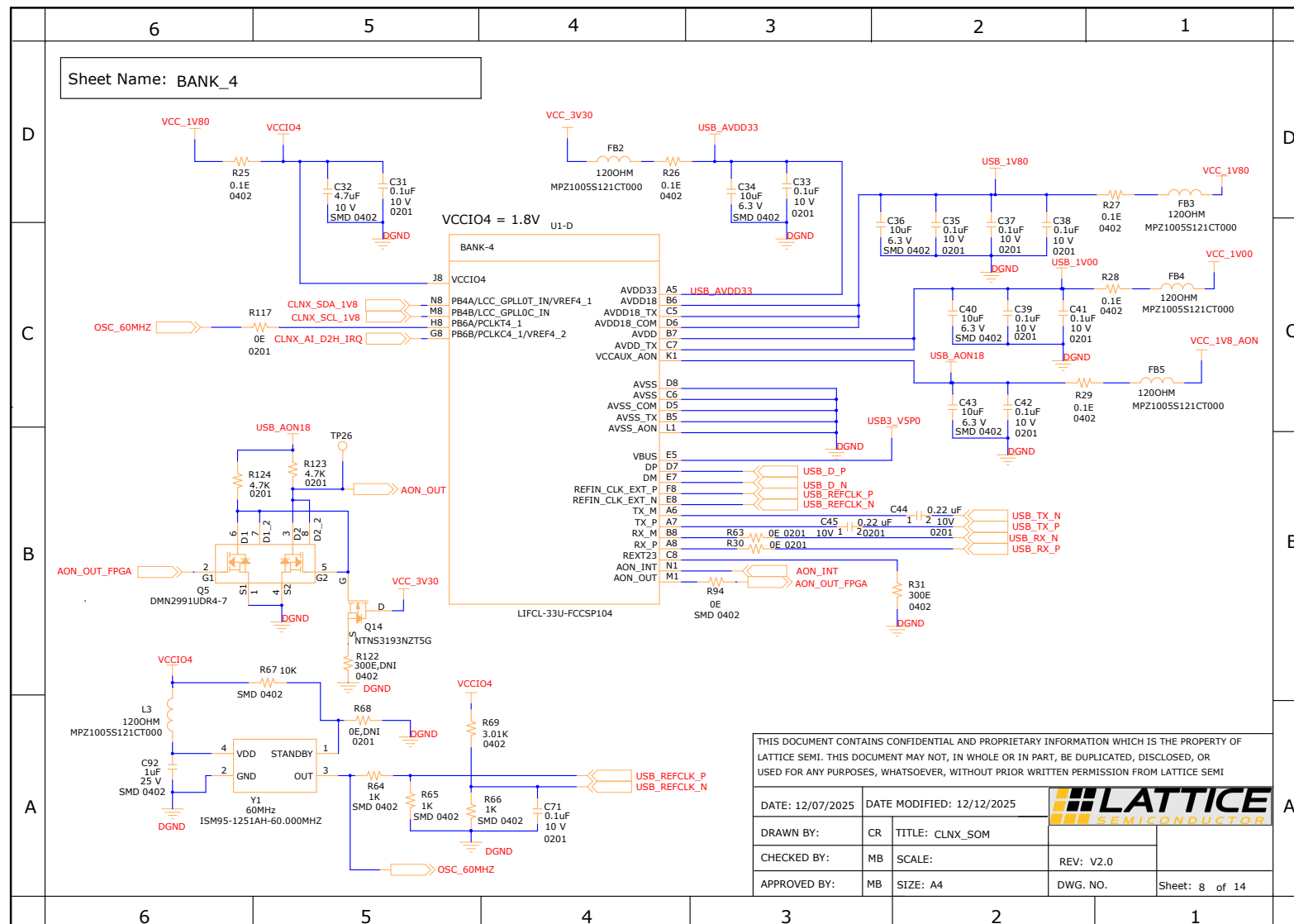


Figure A.8. Bank 4





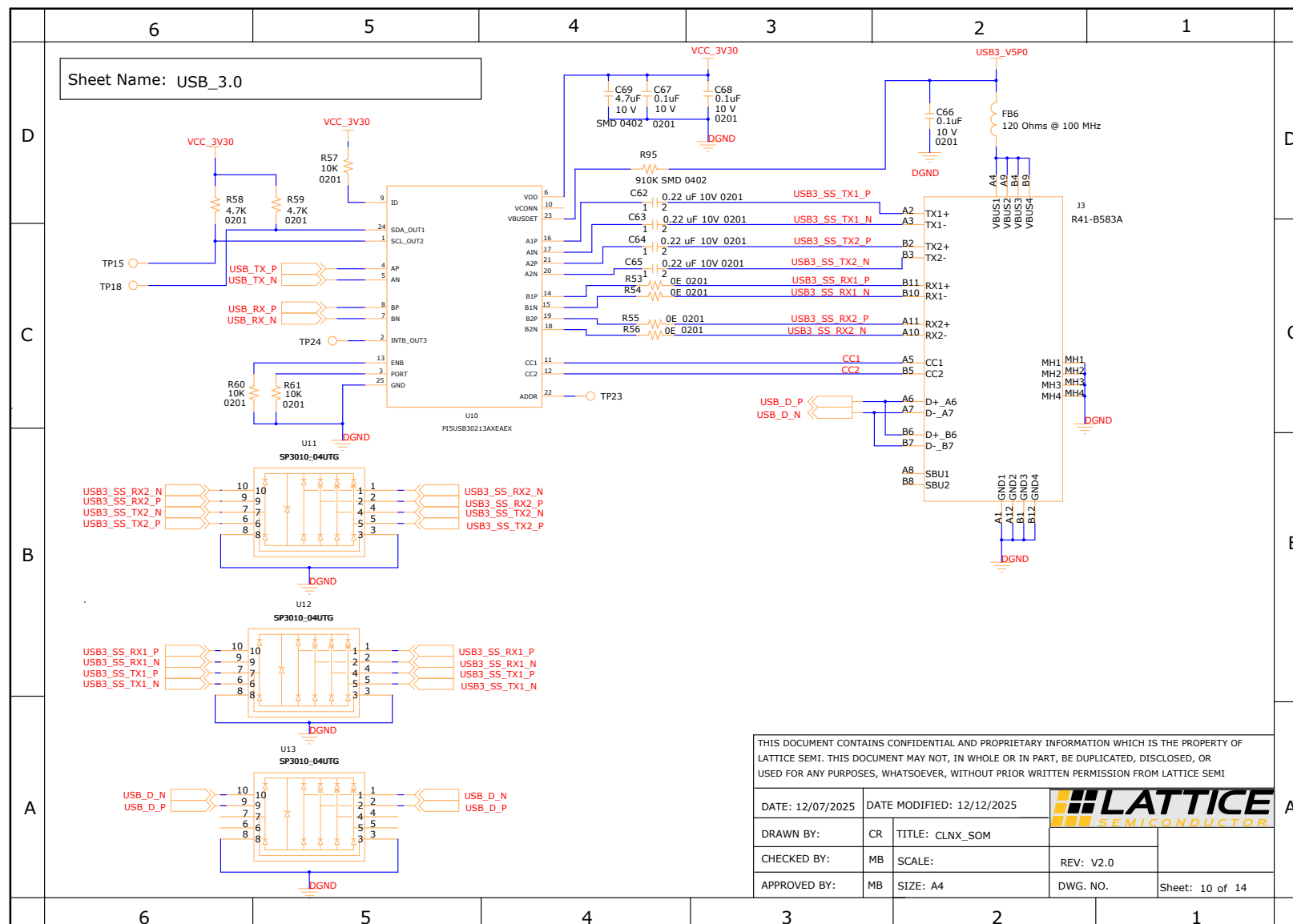


Figure A.10. USB 3.0

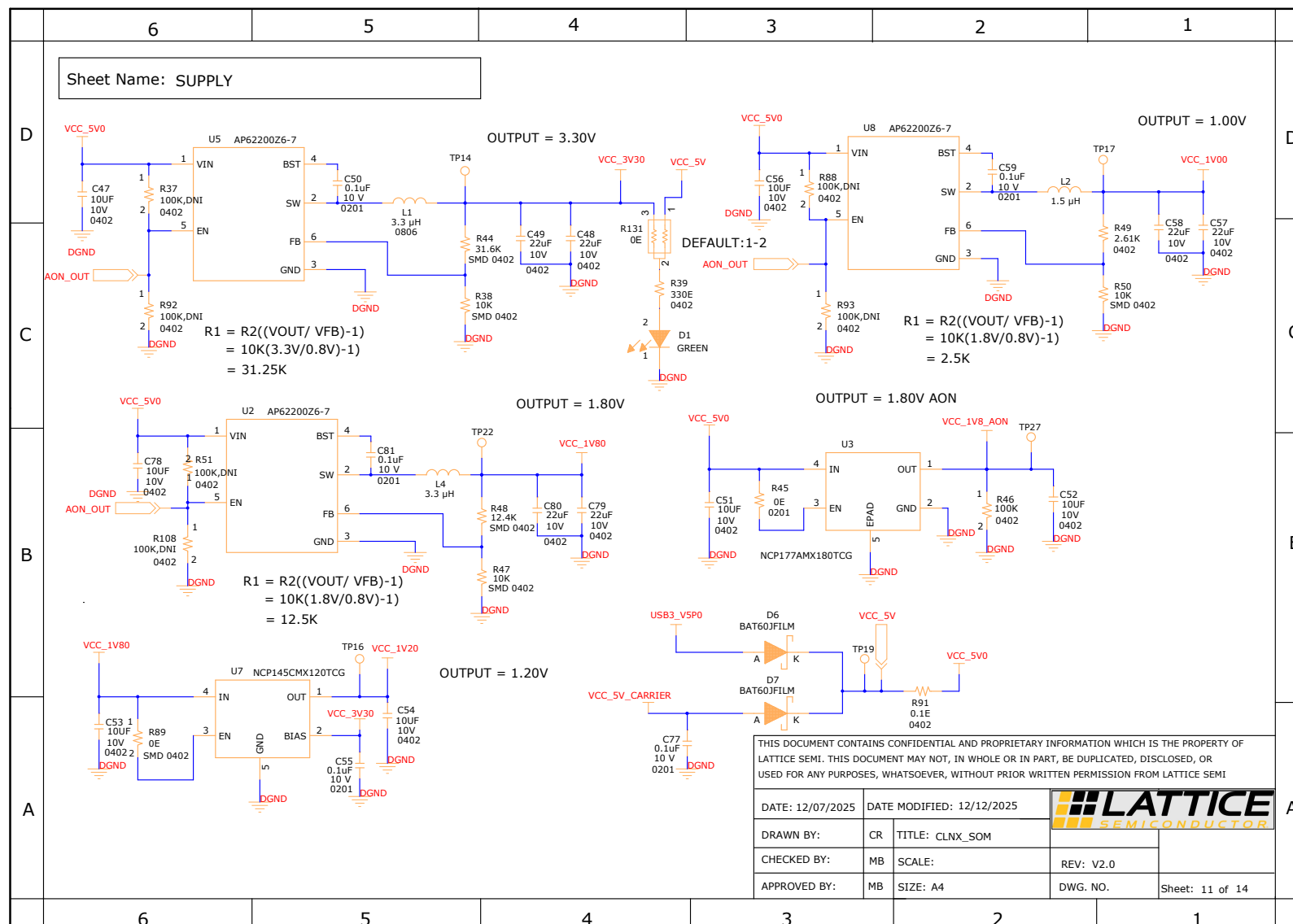


Figure A.11. Supply

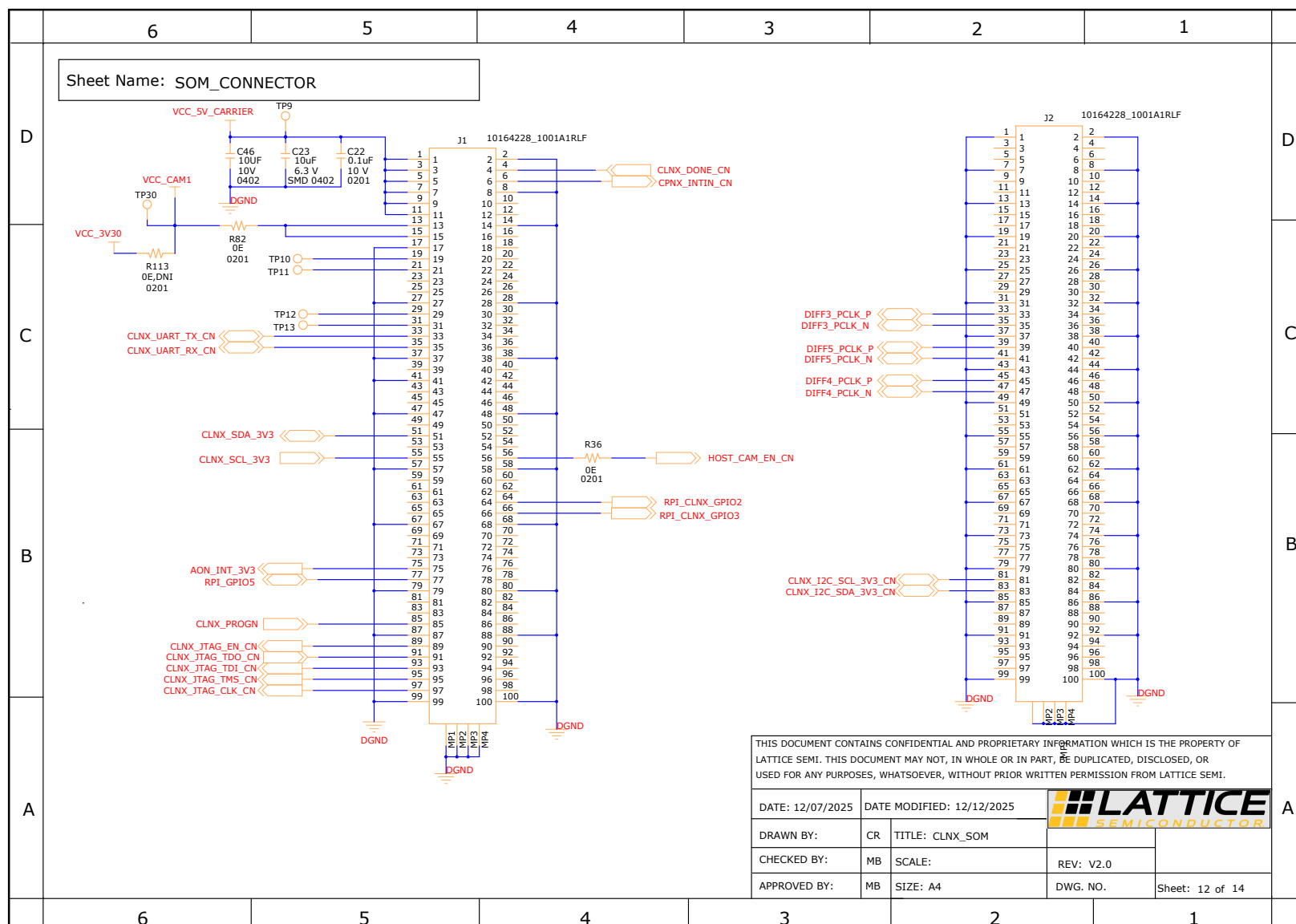


Figure A.12. SoM Connector

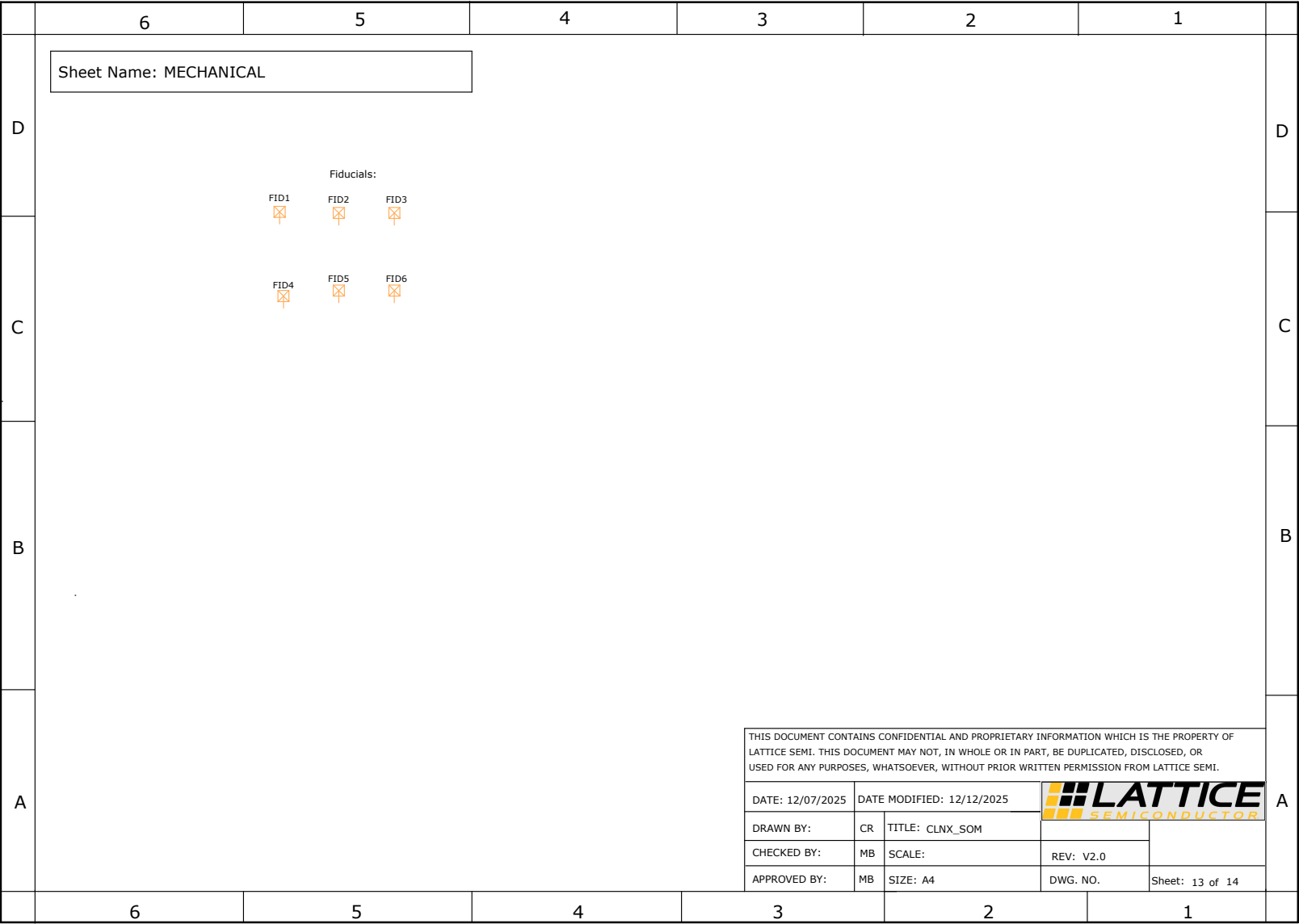


Figure A.13. Mechanical

|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------------|---------------------------------------------------------------------------------------|-----------|--|-----------------|--|---|--|---|
| 6 |                                                                                                                                                                                                                                                                        | 5         |                           | 4               |                                                                                       | 3         |  | 2               |  | 1 |  |   |
| D | Sheet Name: REVISION_HISTORY                                                                                                                                                                                                                                           |           |                           |                 |                                                                                       |           |  |                 |  |   |  | D |
|   | REVISION_HISTORY                                                                                                                                                                                                                                                       |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
| C | SR.NO                                                                                                                                                                                                                                                                  | DATE      | AUTHOR                    | REVIEWER        | REVISION NO.                                                                          | REMARKS   |  |                 |  |   |  | C |
|   | 1                                                                                                                                                                                                                                                                      | 20/8/2025 |                           |                 | REV.A                                                                                 |           |  |                 |  |   |  |   |
|   | 2                                                                                                                                                                                                                                                                      | 4/12/2025 |                           |                 | REV.B                                                                                 |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
| B |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  | B |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
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|   | DATE: 12/07/2025                                                                                                                                                                                                                                                       |           | DATE MODIFIED: 12/12/2025 |                 |  |           |  |                 |  |   |  |   |
|   | DRAWN BY:                                                                                                                                                                                                                                                              |           | CR                        | TITLE: CLNX_SOM |                                                                                       |           |  |                 |  |   |  |   |
|   | CHECKED BY:                                                                                                                                                                                                                                                            |           | MB                        | SCALE:          |                                                                                       | REV: V2.0 |  |                 |  |   |  |   |
|   | APPROVED BY:                                                                                                                                                                                                                                                           |           | MB                        | SIZE: A4        |                                                                                       | DWG. NO.  |  | Sheet: 14 of 14 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
|   |                                                                                                                                                                                                                                                                        |           |                           |                 |                                                                                       |           |  |                 |  |   |  |   |
| 6 |                                                                                                                                                                                                                                                                        | 5         |                           | 4               |                                                                                       | 3         |  | 2               |  | 1 |  |   |

Figure A.14. Revision History

## Appendix B. CrossLinkU-NX SoM Board Bill of Material

| Item | Reference                                                                                                                       | Qty | Part Name          | Description                                                               | Manufacturer Part Number | Manufacturer                 | Package   |
|------|---------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|---------------------------------------------------------------------------|--------------------------|------------------------------|-----------|
| 1    | C1-2, C12-13, C19, C23, C25, C28, C30, C34, C36, C40, C43, C70, C83-84                                                          | 16  | 10uF               | CAP CER 10UF 6.3V X5R 0402                                                | 8.85012E+11              | Würth Elektronik             | SMD 0402  |
| 2    | C3-11, C14-18, C20, C22, C24, C26-27, C29, C31, C33, C35, C37-39, C41-42, C50, C55, C59-61, C66-68, C71-75, C77, C81-82, C85-91 | 51  | 0.1uF              | CAP CER 0.1UF 10V X5R 0201                                                | C0603X5R1A104K030BC      | TDK Corporation              | 201       |
| 3    | C21, C46-47, C51-54 C56, C78                                                                                                    | 9   | 10UF               | CAP CER 10UF 10V X5R 0402                                                 | CC0402MRX5R6BB106        | YAGEO                        | 402       |
| 4    | C32, C69                                                                                                                        | 2   | 4.7uF              | CAP CER 4.7UF 10V X5R 0402                                                | KGM05CR51A475MH          | KYOCERA AVX                  | SMD 0402  |
| 5    | C44-45 C62-65                                                                                                                   | 6   | 0.22 uF            | CAP CER 0.22UF 10V X5R 0201                                               | GRM033R61A224KE90D       | Murata Electronics           | 201       |
| 6    | C48-49, C57-58, C79-80                                                                                                          | 6   | 22uF               | CAP CER 22UF 10V X5R 0402                                                 | GRM158R61A226ME15D       | Murata Electronics           | 402       |
| 7    | C76, C92                                                                                                                        | 2   | 1uF                | CAP CER 1UF 25V X5R 0402                                                  | KGM05HR51E105KH          | KYOCERA AVX                  | SMD 0402  |
| 8    | D1, D5                                                                                                                          | 2   | GREEN              | Green 571nm LED Indication - Discrete 1.97V 2-SMD, 0201                   | APG0603CGC-TT            | Kingbright                   | SMD 0201  |
| 9    | D6-7                                                                                                                            | 2   | BAT60JFILM         | DIODE SCHOTTKY 10V 3A SOD323                                              | BAT60JFILM               | STMicroelectronics           | SOD323    |
| 10   | FB1, FB6-8                                                                                                                      | 4   | 120 Ohms @ 100 MHz | 120 Ohms @ 100 MHz 1 Power Line Ferrite Bead 0805 (2012 Metric) 3A 30mOhm | BLM21PG121SN1D           | Murata Electronics           | 805       |
| 11   | FB2-5, L3                                                                                                                       | 5   | 120OHM             | FERRITE BEAD 120 OHM 0402 1LN                                             | MPZ1005S121CT000         | TDK Corporation              | 402       |
| 12   | FID1-6                                                                                                                          | 6   | —                  | —                                                                         | —                        | —                            | —         |
| 13   | J1-2                                                                                                                            | 2   | 100 Pins Connector | 100 Position Connector Header, Outer Shroud Contacts Surface Mount Gold   | 10164228-1001A1RLF       | Amphenol ICC (FCI)           | SMD       |
| 14   | J3                                                                                                                              | 1   | R41-B583A          | USB TYPE-C CONNECTOR, ONBOARD SM                                          | R41-B583A                | Mitsumi Electric Company Ltd |           |
| 15   | J6                                                                                                                              | 1   | 5019512230         | CONN FFC VERT 22POS 0.5MM SMD                                             | 5019512230               | Molex                        | 22POS SMD |
| 16   | J7                                                                                                                              | 1   | 20021121-00006C4LF | CONN HEADER SMD 6POS 1.27MM                                               | 20021121-00006C4LF       | Amphenol ICC (FCI)           |           |

| Item | Reference                                                                                                    | Qty | Part Name     | Description                                                              | Manufacturer Part Number | Manufacturer                       | Package |
|------|--------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------|--------------------------|------------------------------------|---------|
| 17   | L1, L4                                                                                                       | 2   | 3.3 $\mu$ H   | 3.3 $\mu$ H Shielded Inductor 1.4 A<br>225mOhm Max 0806 (2016<br>Metric) | SRP2010DPA-3R3M          | Bourns Inc.                        | 806     |
| 18   | L2                                                                                                           | 1   | 1.5 $\mu$ H   | 1.5 $\mu$ H Shielded Inductor 2.1 A<br>110mOhm Max 0806 (2016<br>Metric) | SRP2010DPA-1R5M          | Bourns Inc.                        | 806     |
| 19   | Q5, Q8-10, Q12                                                                                               | 5   | DMN2991UDR4-7 | MOSFETs MOSFET BVDSS: 8V-<br>24V X2-DFN1010-6 T&R 5K                     | DMN2991UDR4-7            | Diodes Incorporated                | 6-DFN   |
| 20   | Q11, Q14                                                                                                     | 2   | NTNS3193NZT5G | MOSFET N-CH 20V 224MA<br>3XLLGA                                          | NTNS3193NZT5G            | onsemi                             | 3-XFLGA |
| 21   | R1, R96-98, R120, R131                                                                                       | 6   | 0E            | RES SMD 0 OHM JUMPER<br>1/20W 0201                                       | CRCW02010000Z0ED         | Vishay Dale                        | 201     |
| 22   | R2-5, R19-20, R25-29,<br>R87, R91, R109-110                                                                  | 15  | 0.1E          | RES 0.1 OHM 1% 1/6W 0402                                                 | ERJ-2BSFR10X             | Panasonic Electronic<br>Components | 402     |
| 23   | R6                                                                                                           | 1   | 2K            | RES 2K OHM 1% 1/16W 0402                                                 | RC0402FR-072KL           | YAGEO                              | 402     |
| 24   | R7, R31, R116                                                                                                | 3   | 300E          | RES 300 OHM 1/10W 1% 0402<br>SMD                                         | ERJ-2RKF3000X            | Panasonic Electronic<br>Components | 402     |
| 25   | R8                                                                                                           | 1   | 33E           | RES 33 OHM 1% 1/20W 0201                                                 | RC0201FR-0733RL          | YAGEO                              | 201     |
| 26   | R9, R22, R34, R57,<br>R60-61, R81, R85, R106                                                                 | 9   | 10K           | RES 10K OHM 1% 1/20W 0201                                                | RC0201FR-0710KL          | YAGEO                              | 201     |
| 27   | R10-12, R14-16, R32,<br>R42, R52, R58-59, R71,<br>R73, R75-79, R90,<br>R102-105, R119,<br>R123-124, R127-130 | 30  | 4.7K          | RES SMD 4.7K OHM 1% 1/20W<br>0201                                        | ERJ-1GNF4701C            | Panasonic Electronic<br>Components | 201     |
| 28   | R13                                                                                                          | 1   | 47k           | RES 47K OHM 1% 1/20W 0201                                                | RC0201FR-0747KL          | YAGEO                              | 201     |
| 29   | R17, R86                                                                                                     | 2   | 1K            | RES SMD 1K OHM 1% 1/20W<br>0201                                          | CRCW02011K00FKED         | Vishay Dale                        | 201     |
| 30   | R18, R70, R72, R74,<br>R100-101, R111                                                                        | 7   | 4.7K,DNI      | RES SMD 4.7K OHM 1% 1/20W<br>0201                                        | ERJ-1GNF4701C            | Panasonic Electronic<br>Components | 201     |
| 31   | R21, R23-24, R80                                                                                             | 4   | 10K,DNI       | RES 10K OHM 1% 1/20W 0201                                                | RC0201FR-0710KL          | YAGEO                              | 201     |
| 32   | R30, R33, R36, R45,<br>R53-56, R62-63, R82,<br>R117, R132                                                    | 13  | 0E            | RES SMD 0 OHM JUMPER<br>1/20W 0201                                       | CRCW02010000Z0ED         | Vishay Dale                        | 201     |
| 33   | R35, R40-41, R43                                                                                             | 4   | 1K,DNI        | RES SMD 1K OHM 1% 1/20W<br>0201                                          | CRCW02011K00FKED         | Vishay Dale                        | 201     |
| 34   | R37, R51, R88, R92-93,<br>R108                                                                               | 6   | 100K,DNI      | RES 100K OHM 1/10W 1% 0402<br>SMD                                        | ERJ-2RKF1003X            | Panasonic Electronic<br>Components | 402     |

| Item | Reference                          | Qty | Part Name          | Description                                                                       | Manufacturer Part Number | Manufacturer                      | Package  |
|------|------------------------------------|-----|--------------------|-----------------------------------------------------------------------------------|--------------------------|-----------------------------------|----------|
| 35   | R38, R47, R50, R67                 | 4   | 10K                | ±5% 0.063W, 1/16W Thick Film Resistor ±100ppm/°C ROHS                             | RMCF0402JT10K0           | Stackpole Electronics Inc         | SMD 0402 |
| 36   | R39                                | 1   | 330E               | Thick Film Resistors - SMD 0402 330ohms 1% Anti-Sulfur                            | ERJ-S02F3300X            | Panasonic                         | 402      |
| 37   | R44                                | 1   | 31.6K              | RES SMD 31.6K OHM 1% 1/10W 0402                                                   | ERJ-2RKF3162X            | Panasonic Electronic Components   | SMD 0402 |
| 38   | R46                                | 1   | 100K               | RES 100K OHM 1/10W 1% 0402 SMD                                                    | ERJ-2RKF1003X            | Panasonic Electronic Components   | 402      |
| 39   | R48                                | 1   | 12.4K              | RES 12.4K OHM 1% 1/16W 0402                                                       | RC0402FR-0712K4P         | YAGEO                             | SMD 0402 |
| 40   | R49                                | 1   | 2.61K              | RES SMD 2.61K OHM 1% 1/10W 0402                                                   | ERJ-2RKF2611X            | Panasonic Electronic Components   | 402      |
| 41   | R64-66                             | 3   | 1K                 | ±1% 0.063W, 1/16W Thick Film Resistor ±100ppm/°C ROHS                             | RC0402FR-071KL           | YAGEO                             | SMD 0402 |
| 42   | R68, R83, R107, R113-114, R125-126 | 7   | 0E,DNI             | RES SMD 0 OHM JUMPER 1/20W 0201                                                   | CRCW02010000Z0ED         | Vishay Dale                       | 201      |
| 43   | R69                                | 1   | 3.01K              | RES 3.01K OHM 1% 1/16W 0402                                                       | RC0402FR-073K01L         | YAGEO                             | 402      |
| 44   | R84                                | 1   | 2.2K               | RES 2.2K OHM 1% 1/20W 0201                                                        | RC0201FR-072K2L          | YAGEO                             | 201      |
| 45   | R89, R94, R99                      | 3   | 0E                 | Jumper 1/10W Thick Film Resistor ROHS                                             | ERJ-2GE0R00X             | Panasonic Electronic Components   | SMD 0402 |
| 46   | R95                                | 1   | 910K               | RES SMD 910K OHM 0.1% 1/16W 0402                                                  | RE0402BRE07910KL         | YAGEO                             | SMD 0402 |
| 47   | R112, R115, R121                   | 3   | 20K                | RES 20K OHM 1% 1/16W 0402                                                         | RC0402FR-0720KL          | YAGEO                             | SMD 0402 |
| 48   | R118                               | 1   | 200K,DNI           | RES SMD 200K OHM 1% 1/16W 0402                                                    | CRCW0402200KFKED         | Vishay Dale                       | 402      |
| 49   | R122                               | 1   | 300E,DNI           | RES 300 OHM 1/10W 1% 0402 SMD                                                     | ERJ-2RKF3000X            | Panasonic Electronic Components   | 402      |
| 50   | SW1                                | 1   | 4.34153E+11        | SWITCH TACTILE SPST-NO 0.05A 12V                                                  | 4.34153E+11              | Würth Elektronik                  |          |
| 51   | TP1-30                             | 30  | Test Point         | No Component                                                                      |                          |                                   |          |
| 52   | U1                                 | 1   | LIFCL-33U-8CTG104C | LATTICE CROSSLINK-NX EMBEDDED VI                                                  | LIFCL-33U-8CTG104C       | Lattice Semiconductor Corporation | FPGA     |
| 53   | U2, U5, U8                         | 3   | AP62200Z6-7        | Buck Switching Regulator IC Positive Adjustable 0.8V 1 Output 2A SOT-563, SOT-666 | AP62200Z6-7              | Diodes Incorporated               | SOT563   |



| Item | Reference | Qty | Part Name         | Description                                                                                                  | Manufacturer Part Number | Manufacturer          | Package  |
|------|-----------|-----|-------------------|--------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|----------|
| 54   | U3        | 1   | NCP177AMX180TCG   | Linear Voltage Regulator IC Positive Fixed 1 Output 500mA 4-XDFN (1x1)                                       | NCP177AMX180TCG          | onsemi                | 4-XDFN   |
| 55   | U4        | 1   | W25Q512NWEIQ      | IC FLASH 512MBIT SPI/QUAD 8WSON                                                                              | W25Q512NWEIQ             | Winbond Electronics   | 8-WSON   |
| 56   | U6        | 1   | SN74AXCH1T45DTQR  | Voltage Level Translator Bidirectional 1 Circuit 1 Channel 500Mbps 6-X2SON (1x0.8)                           | SN74AXCH1T45DTQR         | Texas Instruments     | 6-X2SON  |
| 57   | U7        | 1   | NCP145CMX120TCG   | IC REG LINEAR 1.8V 500MA 4-XDFN                                                                              | NCP145CMX120TCG          | onsemi                | 4-XDFN   |
| 58   | U9, U15   | 2   | TXS0104VRUTR      | Translation - Voltage Levels Four-bit bidirectional level shifter for                                        | TXS0104VRUTR             | Texas Instruments     | UQFN-12  |
| 59   | U10       | 1   | PI5USB30213AXEAEX | USB Switch IC 2 Channel 24-X1QFN (2x4)                                                                       | PI5USB30213AXEAEX        | Diodes Incorporated   | 24-X1QFN |
| 60   | U11-13    | 3   | SP3010-04UTG      | TVS DIODE 6VWM 12.3VC 10UDFN                                                                                 | SP3010-04UTG             | Littelfuse Inc        | 10UDFN   |
| 61   | U14       | 1   | S27KS0642GABHV020 | IC PSRAM 64MBIT HYPERBUS 24FBGA                                                                              | S27KS0642GABHV020        | Infineon Technologies | 24-FBGA  |
| 62   | U16-19    | 4   | TMUX1511RWBR      | Analogue Switch ICs 5-V, 1:1 (SPST), 4-channel analog switch with powered-off protection & 1.8-V input logic | TMUX1511RWBR             | Texas Instruments     | X2QFN-12 |
| 63   | Y1        | 1   | 60MHz             | 60 MHz XO (Standard) CMOS Oscillator 1.8V Enable/Disable 4-SMD, No Lead                                      | ISM95-1251AH-60.000MHZ   | ILSI                  | 4-SMD    |

For Item No.21, assemble upon the table below:

| Reference | Assemble |
|-----------|----------|
| R1        | 1 & 2    |
| R96       | 2 & 3    |
| R97       | 1 & 2    |
| R98       | 2 & 3    |
| R120      | 1 & 2    |
| R131      | 1 & 2    |

## References

- [CrossLinkU-NX Family Devices](#) web page
- [CrossLinkU-NX SoM Board](#) web page
- [Lattice Radiant Software FPGA design software](#) web page
- [Lattice Insights](#) for Lattice Semiconductor training courses and learning plans
- [Lattice Boards for CrossLink-NX and CrossLinkU-NX Devices](#)
- [CrossLink-NX-33 and CrossLinkU-NX Data Sheet \(FPGA-DS-02104\)](#)
- [CrossLinkU-NX SoM for HMI Demonstration reference design \(FPGA-RD-02333\)](#)

## Technical Support Assistance

Submit a technical support case through [www.latticesemi.com/techsupport](http://www.latticesemi.com/techsupport).

For frequently asked questions, refer to the Lattice Answer Database at [www.latticesemi.com/Support/AnswerDatabase](http://www.latticesemi.com/Support/AnswerDatabase).

## Revision History

### Revision 0.80, December 2025

| Section | Change Summary               |
|---------|------------------------------|
| All     | Initial preliminary release. |



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