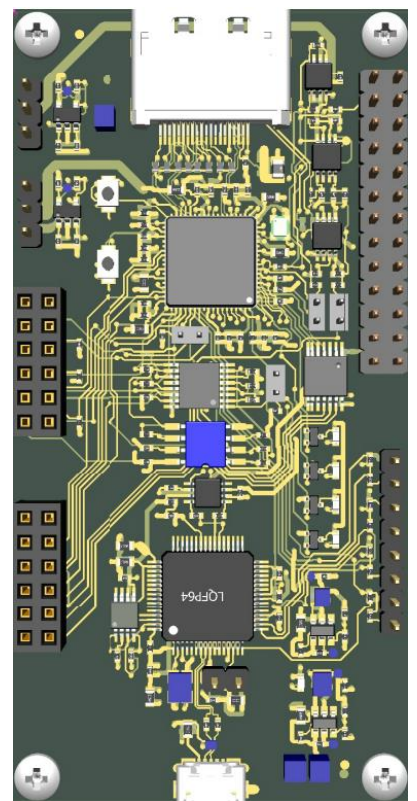


MAS_LIFCL

**Crosslink NX evaluation Board
Hardware Manual**



MAS_LIFCL Crosslink NX evaluation Board Hardware Manual

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Revision History:

Doc. Version	BOARD Version	Date	Change
V1.0	REV1	2020-12-16	Initial Version

Table of Contents

1 Introduction.....	5
1.1 The board	5
2 Headers and Connections.....	8
J1 JTAG Programming connector.....	8
J2 Micro USB connector.....	8
J3 Bank 3 power selection	9
J4 CSI-2 strip connector.....	9
J5 PMOD CONNECTOR	10
J6 PMOD CONNECTOR	11
J8 LVDS DP CONNECTOR.....	11
LEDS AND BUTTONS.....	12
JUMPER	12
Further Information.....	13
3 Programming the board.....	14
3.1 Programming Circuit	14
3.2 Programming the device	14
4 Power	17
4.1 Supply Voltage	17
4.2 Mechanical and Environmental	17
Ordering Information	18
Appendix A Schematics of the MAS_LIFCL Crosslink NX evaluation Board.....	19
Appendix B MAS_LIFCL Crosslink NX evaluation Board LAYOUT	20
Appendix C MAS_LIFCL Crosslink NX evaluation Board Bill of Materials	23
Appendix D MAS_LIFCL Crosslink NX evaluation Board accessories.....	31

Technical Support and Warranty	33
Technical Support	33
Warranty Conditions	34
Contact Information	36

1 Introduction

1.1 The board

This document describes the MAS Elettronica's LIFCL CrossLink-NX™ evaluation board.

The board's key component is the Lattice CrossLink-NX FPGA LIFCL-17-QFN72, which can receive input from the bridges CSI-2 and LVDS input and output to LVDS or CSI-2.

This board is designed to work with the PMOD (HIPER RAM interface) standard peripherals and 22 Pin Zif connector compliant devices, like 4K Image sensors like IMX415 or HDMI input board adapters.

The content of this user guide includes descriptions of on-board jumper settings, programming circuit, a complete set of schematics, and bill of materials for LIFCL CrossLink-NX™ evaluation board.

Key features of the LIFCL CrossLink-NX™ evaluation board include:

- CrossLink-NX FPGA LIFCL-17
- Quad 4-lane MIPI DSI/CSI-2 hard DPHY receiver/transmitter interface
- Quad 4-lane LVDS (or soft DPHY) receiver/transmitter interface through DP connector
- SPI flash configuration
- General Purpose Input/Output
- Dual PMOD connectors expansion headers available (single or dual usage)
- 5V power supply through micro USB connector.
- 4x user defined LEDs and 2x user defined push buttons.
- 50Mhz on board oscillator.
- Programming Circuit:
 - From programming software via USB/FTDI interface (JTAG or SPI)
 - From on board Flash
 - SPI external programmer using header

Below is shown the Board Block Diagram

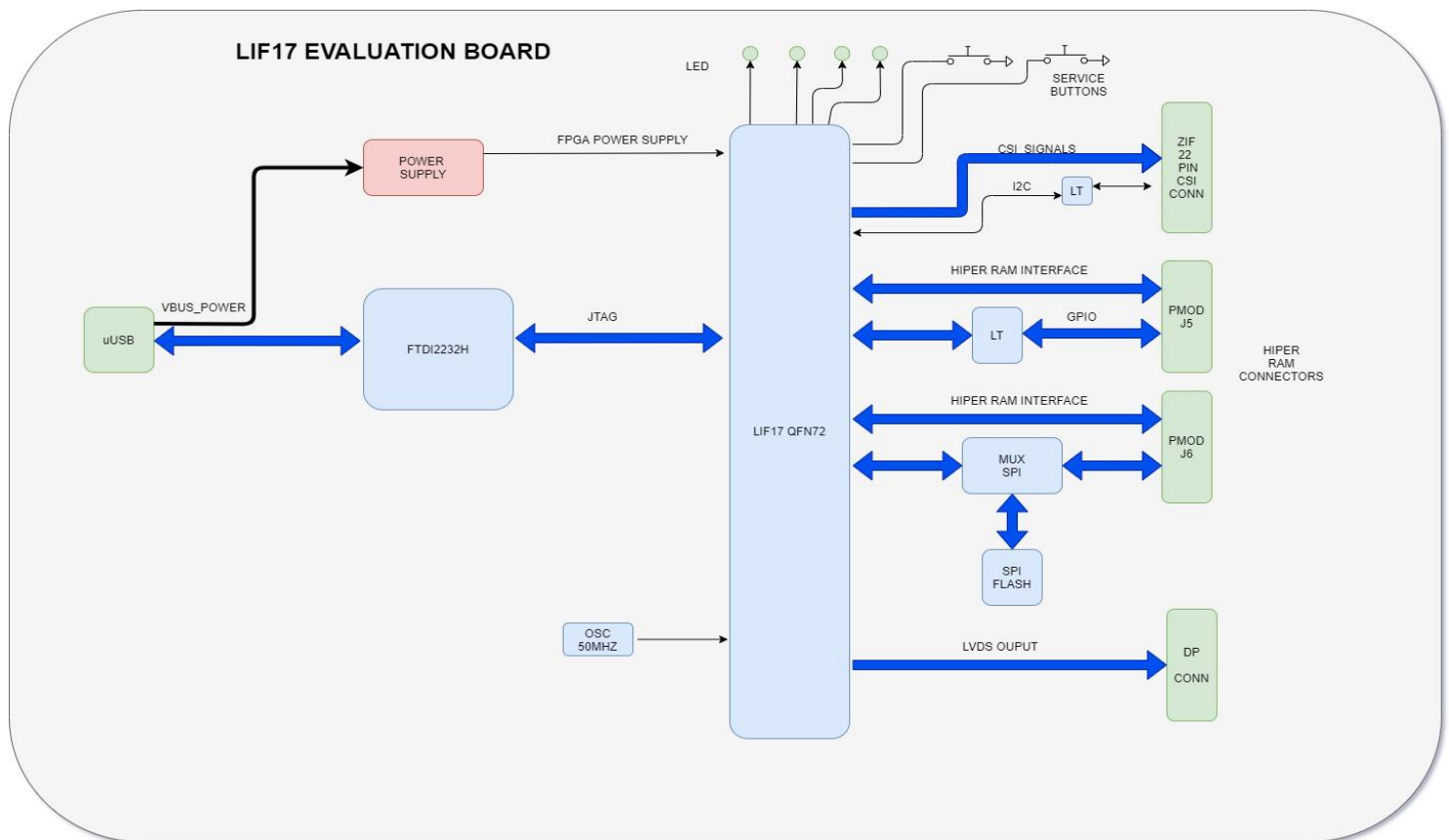


FIGURE 1 BLOCK DIAGRAM OF THE BOARD

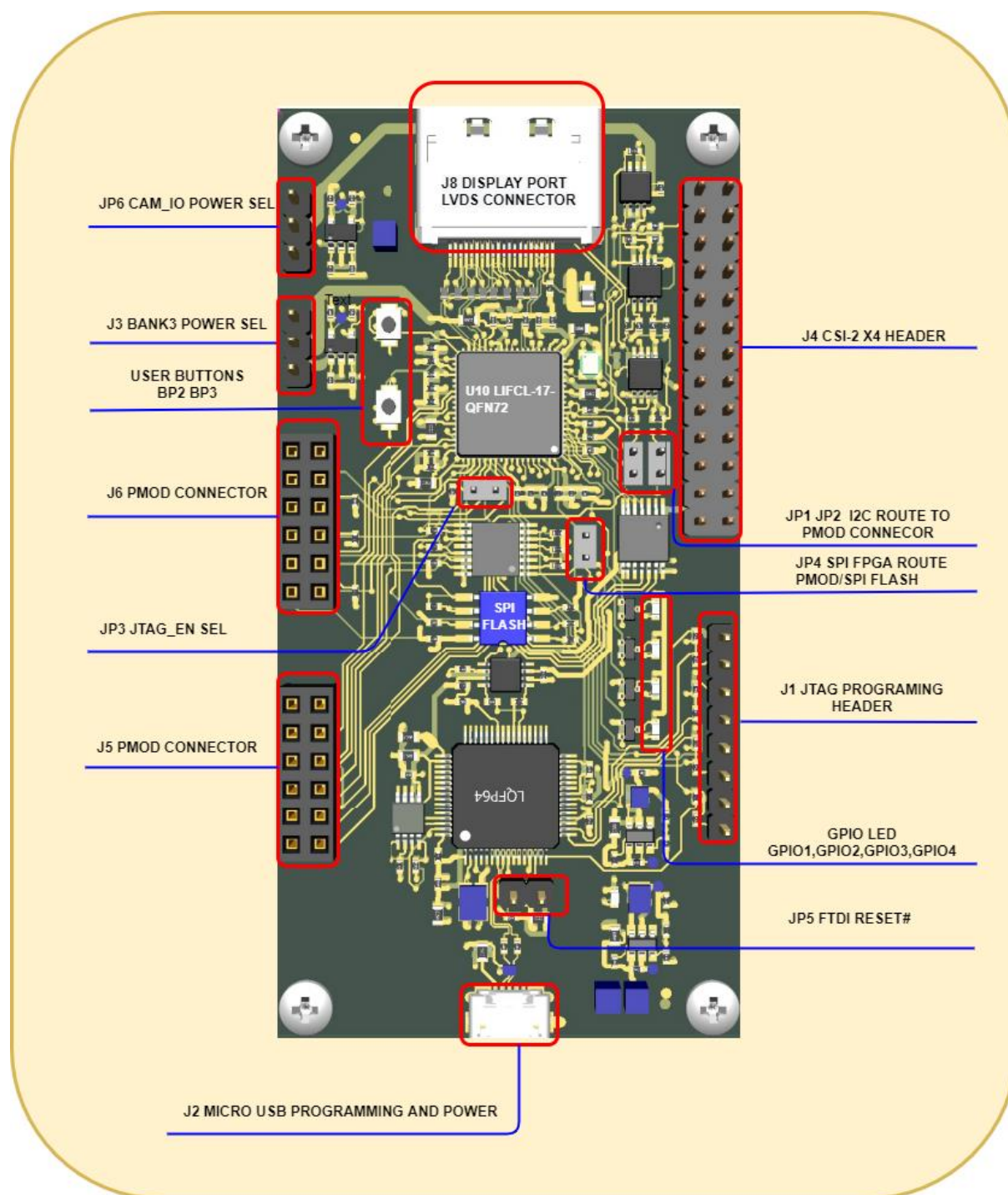


FIGURE 2 TOP OF THE BOARD

2 Headers and Connections

Below are described the pinout of the connectors of the board:

J1 JTAG Programming connector

J1 is a Header 8 pin 2,54mm pitch. Samtec Part Number TSW-108-24-T-S-LL

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
VCCIO_0	1	VCCIO BANK 0 POWER SUPPLY	P	TTL	3V3		
TDO	2	Test Data Output	S	TTL	3V3	45	Connected to FTDI
TDI	3	Test Data Input	S	TTL	3V3	46	Connected to FTDI
NC	4,5	NO CONNECT					
TMS	6	Test Mode Select	S	TTL	3V3	41	Connected to FTDI
GND	7	GROUND	P				
TCK	8	Test Clock	S	TTL	3V3	50	Connected to FTDI

J2 Micro USB connector

J2 is a Micro USB connector MOLEX 47346-0001

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
VBUS	1	5V POWER SUPPLY FROM USB	P	TTL	5V		
USB_DM	2	Test Data Output	S	TTL	USB	-	Connected to FTDI
USB_DP	3	Test Data Input	S	TTL	USB	-	Connected to FTDI
NC	4	NC					
GND	5	GROUND	P				

J3 Bank 3 power selection

J3 is a Header 3 pin 2,54mm pitch Samtec Part number TLW-103-05-G-S

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
1V8	1	1V8 POWER SUPPLY	P			-	Connect 1-2 for 1V8 bank 3 power supply
VCCIO_3	2	VCCIO_3 FPGA connection	P			-	
3V3	3	3V3 POWER SUPPLY	P			-	Connect 2-3 for 3v3 bank 3 power supply

J4 CSI-2 strip connector

J4 is a Header 2x13 2,54mm pitch Samtec Part number TSW-113-24-F-D-LL

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
3V3	1,2	3V3 POWER SUPPLY	P			-	
GND	7,8 11,12 15,16 19,20 23,24	Ground signal	P				
I2C_SCL_ADAPTER	3	I2C clock to sensor	S	TTL	1V8/3V3	44	
CAM0_CONN_PWDN	4	Sensor reset#	S	TTL	1V8/3V3	9	
I2C_SDA_ADAPTER	5	I2C data to sensor	S	TTL	1V8/3V3	42	
CAM0_CONN_MCLK	6	Sensor Master clock	S	TTL	1V8/3V3	8	
MIPI_PPHY0_CKP	9	Mipi clock positive signal	S	MIPI	1V2	68	
MIPI_PPHY0_CKN	10	Mipi clock negative signal	S	MIPI	1V2	69	
MIPI_PPHY0_DP0	13	Mipi data 0 positive signal	S	MIPI	1V2	4	
MIPI_PPHY0_DN0	14	Mipi data 0 negative signal	S	MIPI	1V2	3	
MIPI_PPHY0_DP1	17	Mipi data1 positive signal	S	MIPI	1V2	66	
MIPI_PPHY0_DN1	18	Mipi data1 negative signal	S	MIPI	1V2	67	
MIPI_PPHY0_DP2	21	Mipi data 2 positive signal	S	MIPI	1V2	1	
MIPI_PPHY0_DN2	22	Mipi data 2 negative signal	S	MIPI	1V2	2	

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
MIPI_PPHY0_DP3	25	Mipi data 3 positive signal	S	MIPI	1V2	64	
MIPI_PPHY0_DN3	26	Mipi data 3 negative signal	S	MIPI	1V2	65	

J5 PMOD CONNECTOR

J5 is a Socket 2x6 2,54mm pitch TE Connectivity Part number 5-534998-6

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
TRANS_3V3_1	1	Voltage translated PMOD signal Pin 1	S	TTL	3V3	13	
TRANS_3V3_0	2	Voltage translated PMOD signal Pin 2	S	TTL	3V3	14	
PMODE_3_2	3	PMODE pin 3 signal	S	TTL	3V3	42	
PMODE_2_2	4	PMODE pin 4 signal	S	TTL	3V3	55	
PMODE_3_3	5	PMODE pin 5 signal	S	TTL	3V3		See note 1
PMODE_2_3	6	PMODE pin 6 signal	S	TTL	3V3	52	
TRANS_3V3_2	7	Voltage translated PMOD signal Pin 7	S	TTL	3V3	15	
PMODE_2_4	8	PMODE pin 8 signal	S	TTL	3V3	43	
GND	9,10	Ground signal	P				
3V3	11,12	3V3 POWER SUPPLY	P			-	

Note 1. To have this signals available on the connector J6 put JP4 ON

J6 PMOD CONNECTOR

J6 is a Socket 2x6 2,54mm pitch TE Connectivity Part number 5-534998-6

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
PMODE_1_1	1	PMODE pin 1 signal	S	TTL	3V3	44	See note 1
PMODE_0_1	2	PMODE pin 2 signal	S	TTL	3V3	58	
PMODE_1_2	3	PMODE pin 3 signal	S	TTL	3V3	56	See note 1
PMODE_0_2	4	PMODE pin 4 signal	S	TTL	3V3	53	
PMODE_1_3	5	PMODE pin 5 signal	S	TTL	3V3	57	See note 1
PMODE_0_3	6	PMODE pin 6 signal	S	TTL	3V3	61	
PMODE_1_4	7	PMODE pin 7 signal	S	TTL	3V3	51	See note 1
PMODE_0_4	8	PMODE pin 8 signal	S	TTL	3V3	60	
GND	9,10	Ground signal	P				
3V3	11,12	3V3 POWER SUPPLY	P			-	

Note 1. To have this signals available on the connector J6 put JP4 ON

J8 LVDS DP CONNECTOR

J8 is a Display Port connector Molex 47272-0001

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
LVDS_DATAP0	1	LVDS DATA 0 POSITIVE	S	LVDS	1V8	24	
LVDS_DATAN0	3	LVDS DATA 0 NEGATIVE	S	LVDS	1V8	25	
LVDS_DATAP1	4	LVDS DATA 1 POSITIVE	S	LVDS	1V8	30	
LVDS_DATAN1	6	LVDS DATA 1 NEGATIVE	S	LVDS	1V8	31	
LVDS_DATAP2	7	LVDS DATA 2 POSITIVE	S	LVDS	1V8	33	
LVDS_DATAN2	9	LVDS DATA 2 NEGATIVE	S	LVDS	1V8	34	
LVDS_DATAP3	10	LVDS DATA 3 POSITIVE	S	LVDS	1V8	27	
LVDS_DATAN3	12	LVDS DATA 3 NEGATIVE	S	LVDS	1V8	28	
LVDS_I2C_SDA	13	I2C DATA	TTL	3V3	3V3	42	

Name	Pin #	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
LVDS_I2C_SCL	14	I2C CLOCK	S	TTL	3V3	44	
LVDS_CLKP	15	LVDS CLOCK POSITIVE	S	LVDS	1V8	22	
LVDS_CLKN	17	LVDS CLOCK NEGATIVE	S	LVDS	1V8	23	
3V3	18,20		P		3V3		
GND	2,5,8,11,16		P				

LEDS AND BUTTONS

LED connections are made through a MOS:

Name	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
GPIO_LED1	Connected to led D2	S	TTL	3V3	19	Active high
GPIO_LED2	Connected to led D3	S	TTL	3V3	20	Active high
GPIO_LED3	Connected to led D4	S	TTL	3V3	8	Active high
GPIO_LED4	Connected to led D5	S	TTL	3V3	9	Active high

Service buttons connections are made directly :

Name	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
PB2	Active low user button	S	TTL	3V3	36	Active low
PB3	Active low user button	S	TTL	3V3	37	Active low

JUMPER

Name	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
JP1	WHEN ON Connects FPGA pin 42 to I2C_SDA camera signal WHEN OFF Signals are used in PMOD connector J5	S	TTL	3V3	42	Default is OFF

Name	Description	I/O Type	I/O Level	Power Domain	PIN FPGA	Comments
JP2	WHEN ON Connects FPGA pin 44 to I2C_SDC camera signal WHEN OFF Signals are used in PMOD connector J5	S	TTL	3V3	44	Default is OFF
JP3	WHEN ON disables JTAG	S	TTL	3V3	50	Default is OFF
JP4	WHEN ON routes spi fpga signals to PMOD connector WHEN OFF routes spi fpga signals to SPI FLASH	S	TTL	3V3		Default is OFF
JP5	WHEN ON resets FTDI Chip	S	TTL	3V3		
JP6	WHEN 2-3 Camera I/O is 1V8 WHEN 1-2 Camera I/O is 3V3	S	TTL	1V8/3V3		Default is 2-3

Further Information

The following references provide detailed information on the **MAS_LIFCL Crosslink NX** device:

- Appendix A. [MAS_LIFCL Crosslink NX Board Schematics](#)
- Appendix B. [MAS_LIFCL Crosslink NX Board Mount](#)
- Appendix C. [MAS_LIFCL Crosslink NX Board Bill of Materials](#)
- Appendix C [MAS_LIFCL Crosslink NX evaluation Board accessories](#)
- [CrossLink-NX Family Data Sheet \(FPGA-DS-02049\)](#) for details on the CrossLink-NX FPGA
- More info can be found at <https://maselettronica.com/>

3 Programming the board

3.1 Programming Circuit

CrossLink-NX can be programmed via USB through the FTDI/JTAG interface using Lattice Radiant® programmer software, or by an external programmer connected to Header J1.

The circuit is described below:

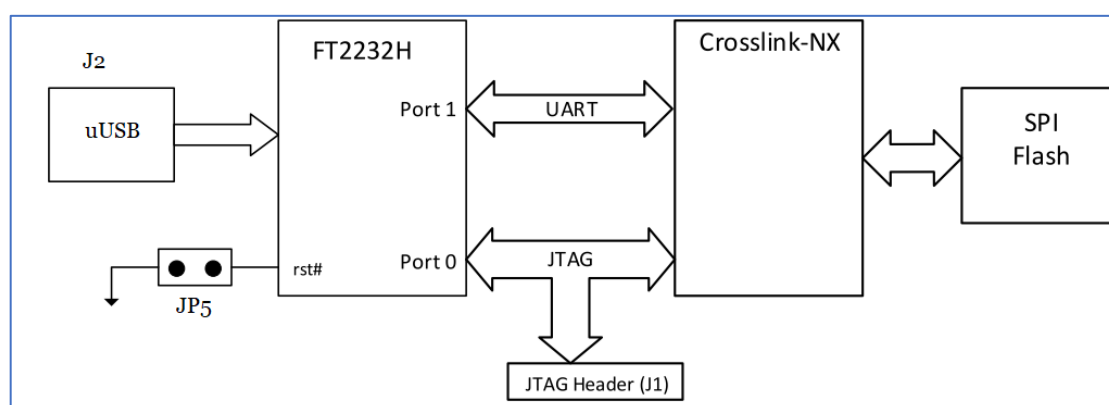


FIGURE 3. PROGRAMMING BLOCK

The FTDI/JTAG interface is used to program both CrossLink-NX and SPI Flash Memory (Macronix 25L12833 128Mb).

3.2 Programming the device

This section describes the procedure for programming a pattern to the SRAM (volatile) configuration memory of the Crosslink-NX device. The Crosslink-NX can be programmed through JTAG, I2C, or SPI interfaces. This section focuses on JTAG programming through the USB/FTDI interface. For details on the other configuration modes, refer to the [CrossLink-NX sysConfig Usage Guide \(FPGA-UG-02099\)](#).

The board is programmed through Lattice Radiant programmer software, which can be started as a standalone tool or from a Lattice Radiant project.

To program the CrossLink-NX device:

1. Power on the board, start a programming project by launching the Lattice Radiant tool and initiating a board scan, as shown in Figure 4.

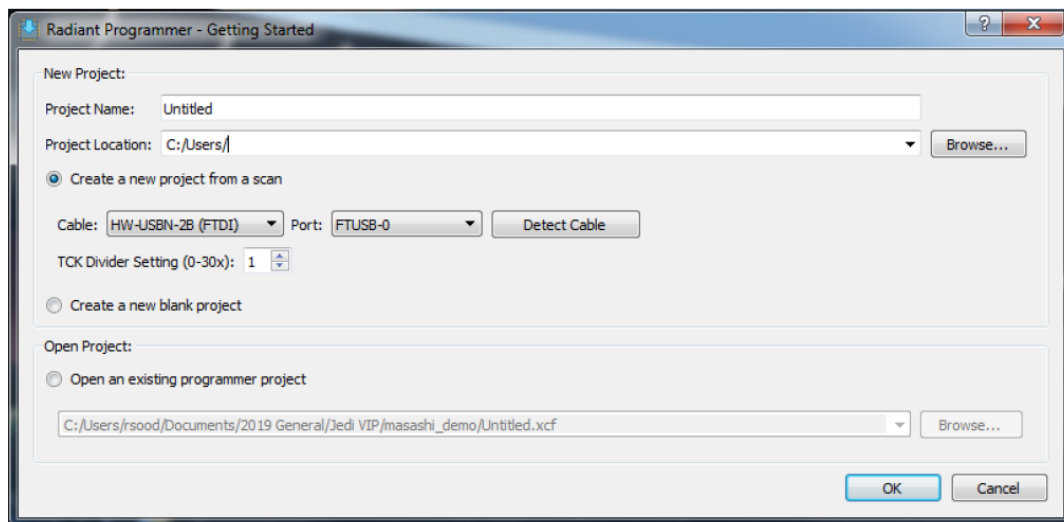


FIGURE 4. STARTING PROGRAMMER

2. After the board is successfully scanned, the main interface opens as shown in Figure 5. Enter the file name.

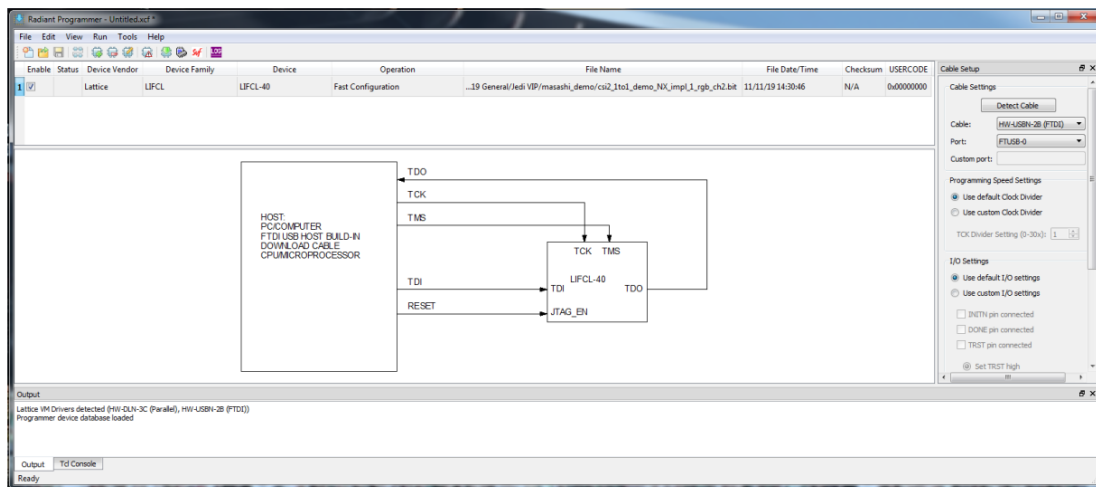


FIGURE 5. ENTERING FILE NAME

3. Double click on the Operation field to open the Device Properties dialog box and select the appropriate programming mode. In this example, Fast Configuration in Operation and JTAG in Programming Mode are selected. Click OK.

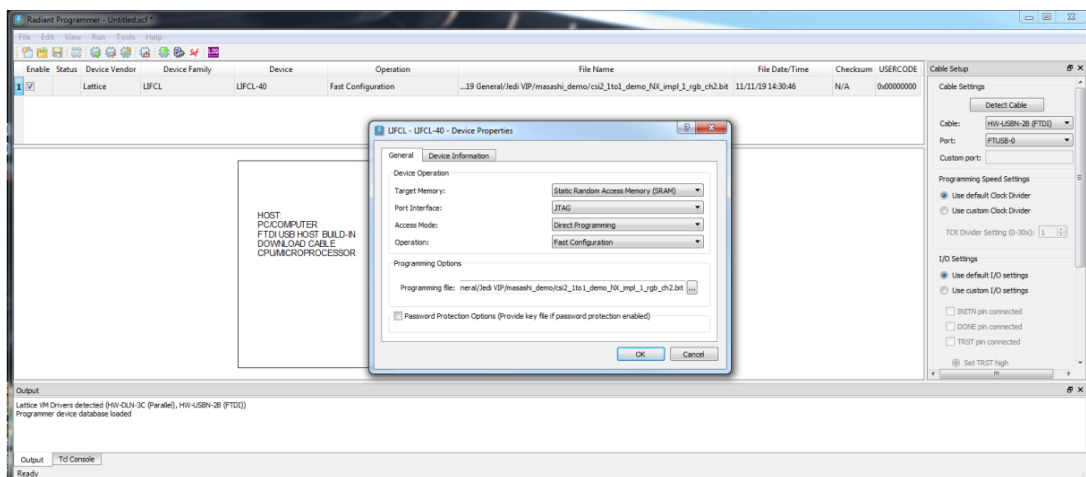


FIGURE 6. ENTERING PROGRAMMING MODE

4. In the main view, click the Program button to configure the Crosslink-NX on the board.

4 Power

4.1 Supply Voltage

Name	Description	I/O Type	Min	Typ	Max	Unit
5V	5V Main power supply	Input	4.75	5.0	5.25	V
I_5V	5V Main current	Input		TBD	500	mA
3V3	3V3 internal supply	Input	3.0	3.3	3.6	V
1V8	1V8 internal supply	Input	1.7	1.8	1.9	V
1V2	1V2 internal supply	Input	1.14	1.2	1.26	V
1V0	1V0 internal supply	Input	0.95	1.0	1.05	V

4.2 Mechanical and Environmental

Form Factor

Dimension

87 X 44 mm

Operating Temperature

Standard: 0°C to +60°C

Rugged: -20°C to +85°C (optional)

Humidity

5-90% RH operating, non-condensing

5-95% RH storage

Ordering Information

ORDERING CODE	DESCRIPTION	COMMENTS
ADP_002_0_0	Full feature board	Standard product
ADP_002_1_0	Board without programming IC	Available uppon request

Appendix A Schematics of the MAS_LIFCL Crosslink NX evaluation Board

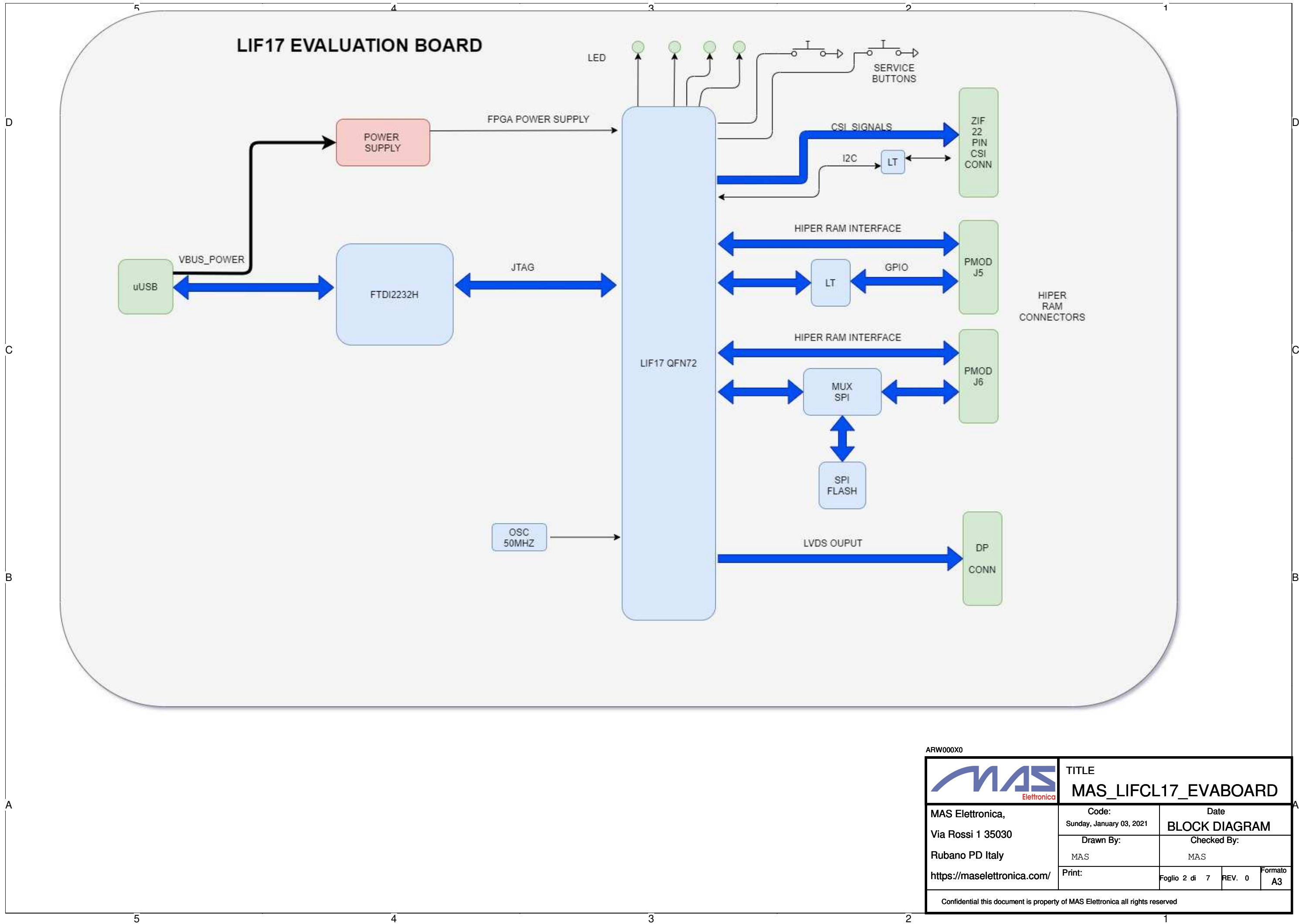
MAS LIFCL EVALUATION BOARD

Page Index:

- 1. THIS PAGE
- 2. BLOCK DIAGRAM
- 3 POWER DIAGRAM
- 4. REVISION HISTORY
- 5. POWER_IN_FTDI
- 6. POWER SUPPLIES
- 7. FPGA LIF17
- 8. SPECIFIC CONNECTORS
- 9. LVDS CONNECTOR

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Rev. Code	Date	By	Description
0	10/11/2020	S.M.	FIRST RELEASE OF SCHEMATICS

Revision History

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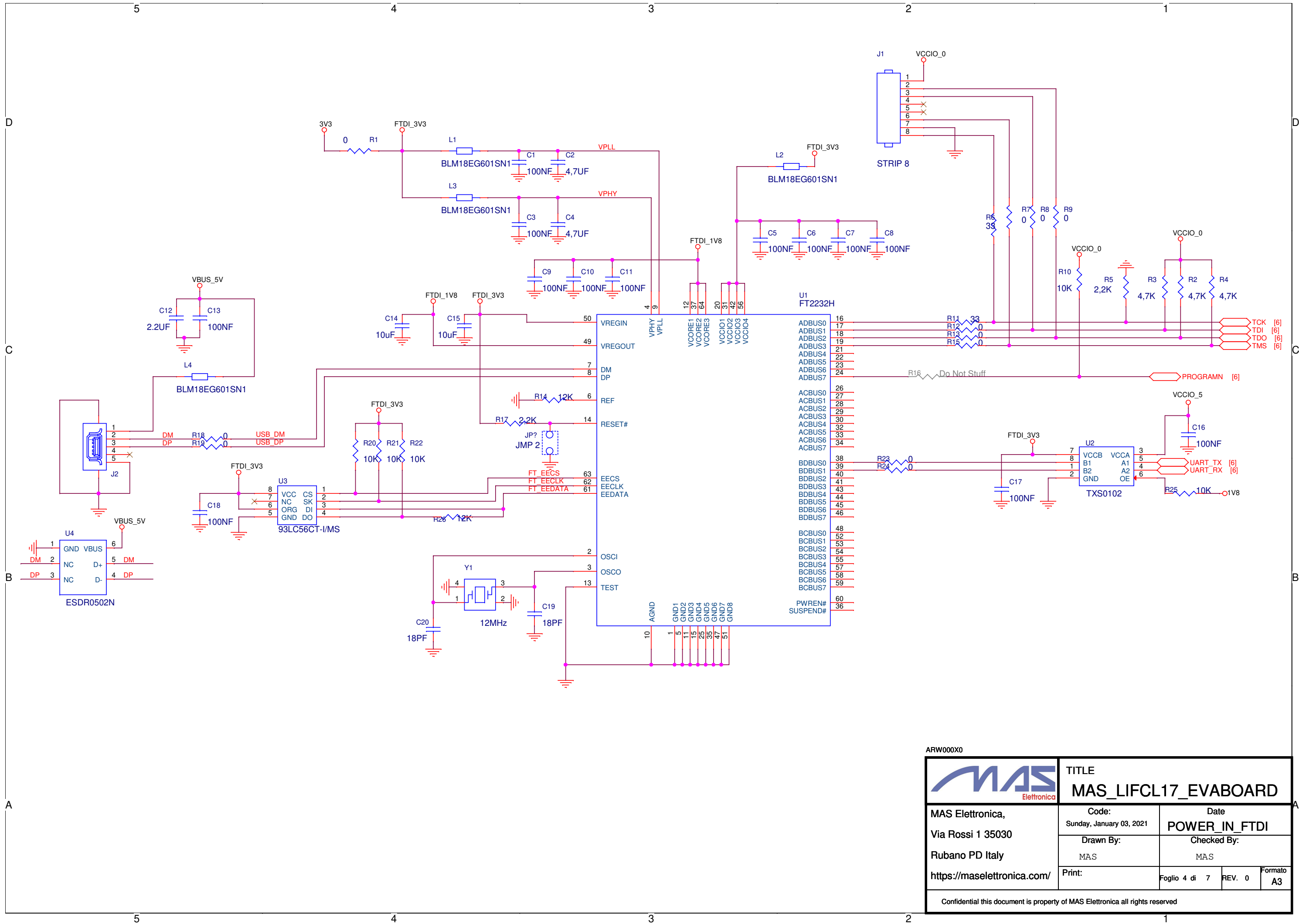
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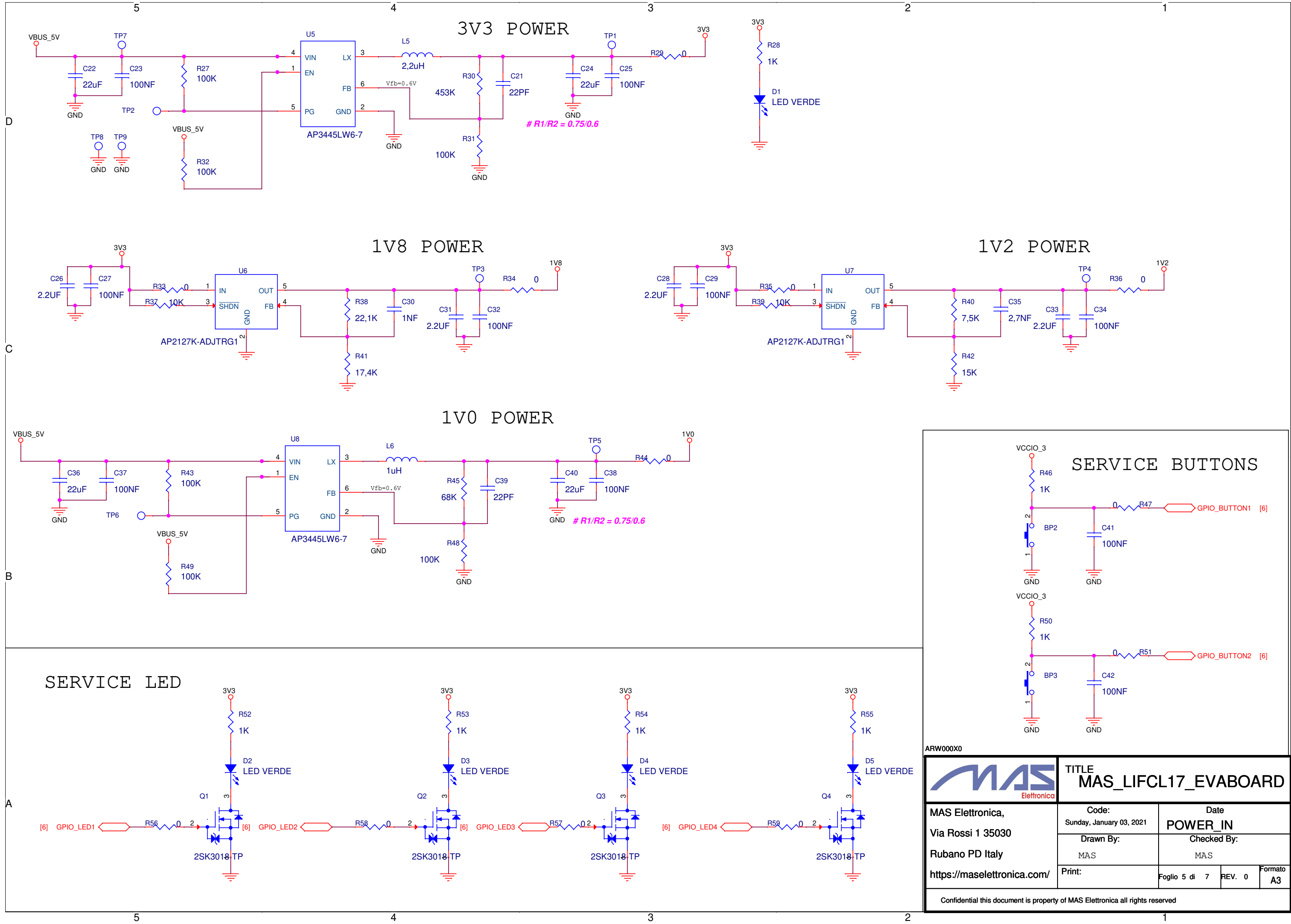
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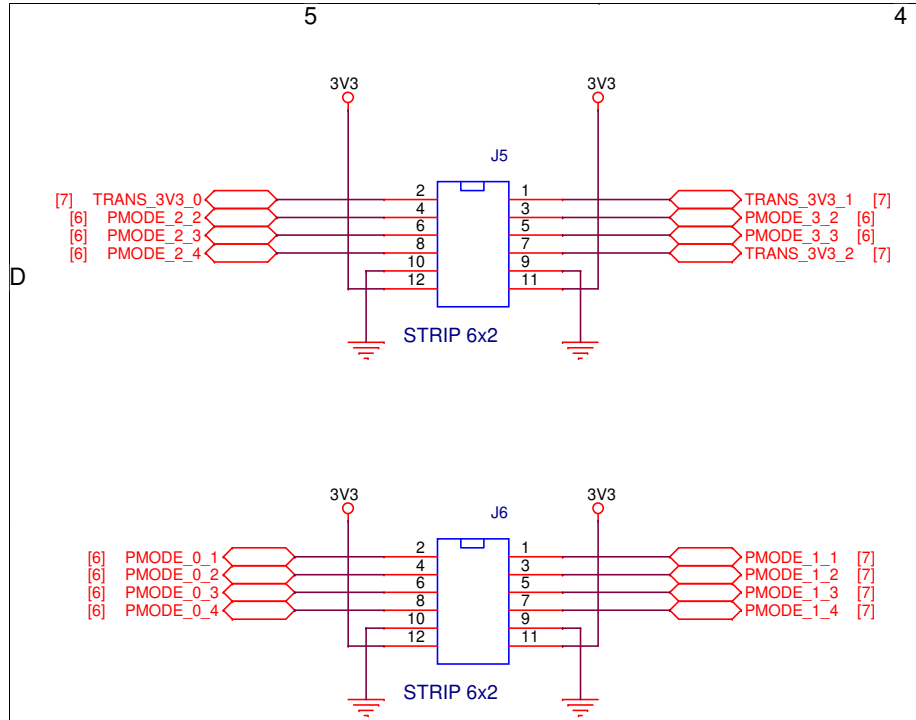
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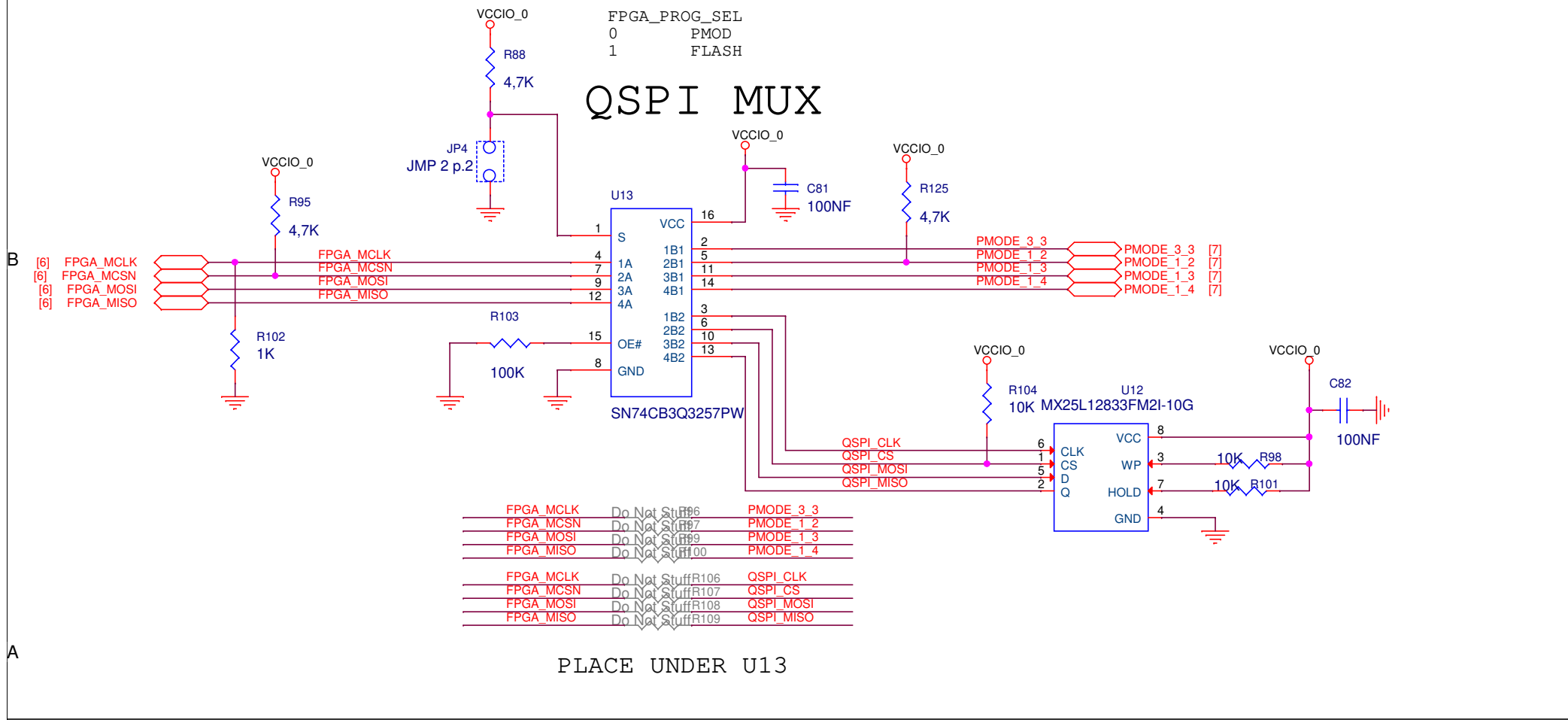
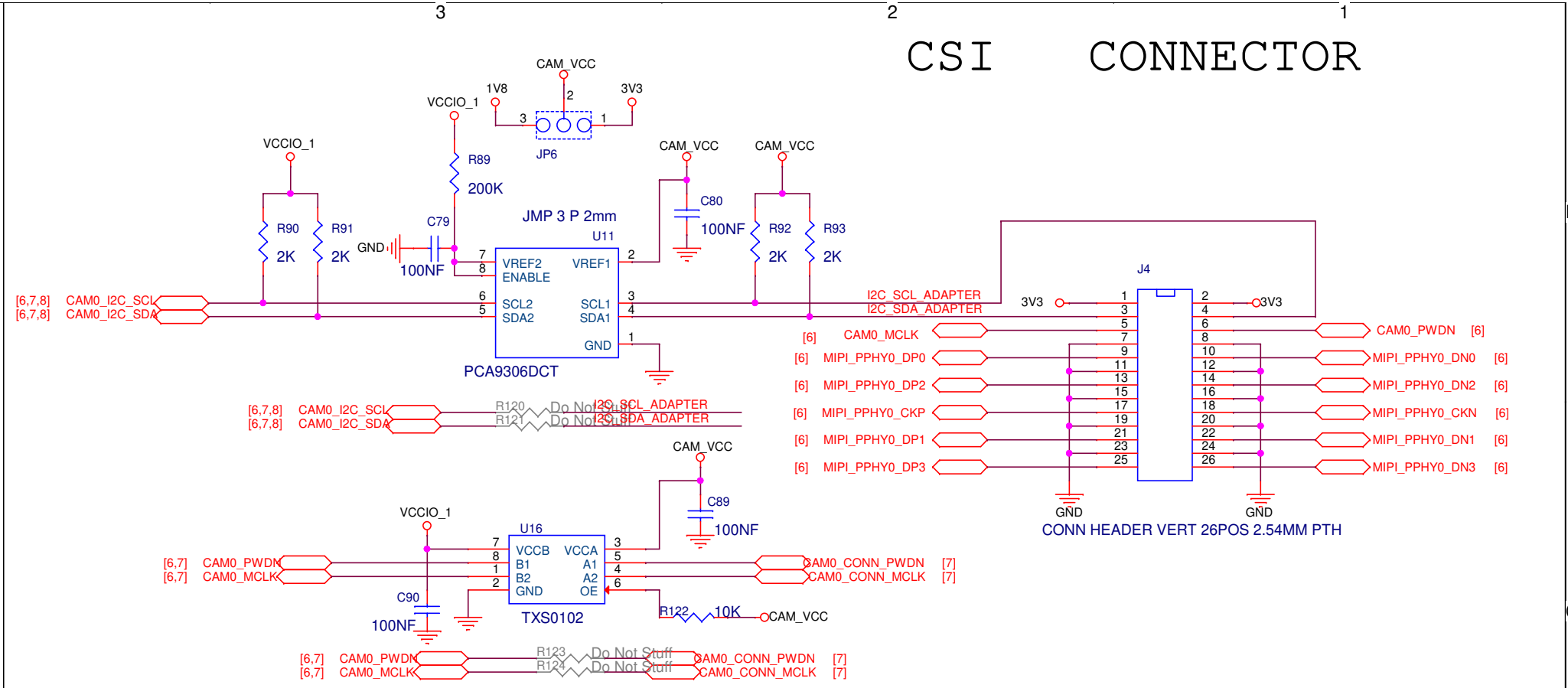


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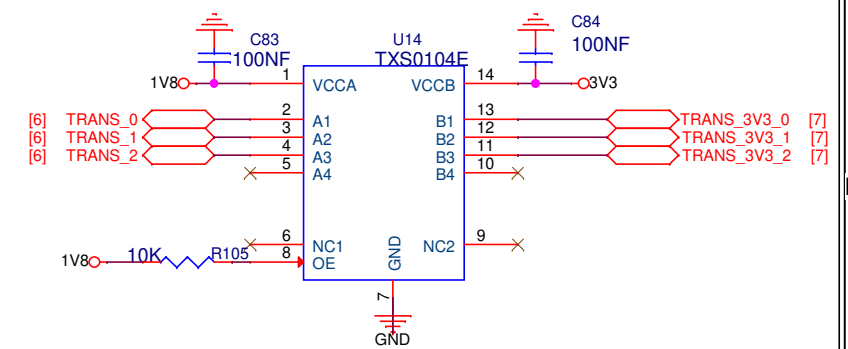




PMOD X HIPERRAM MODULE

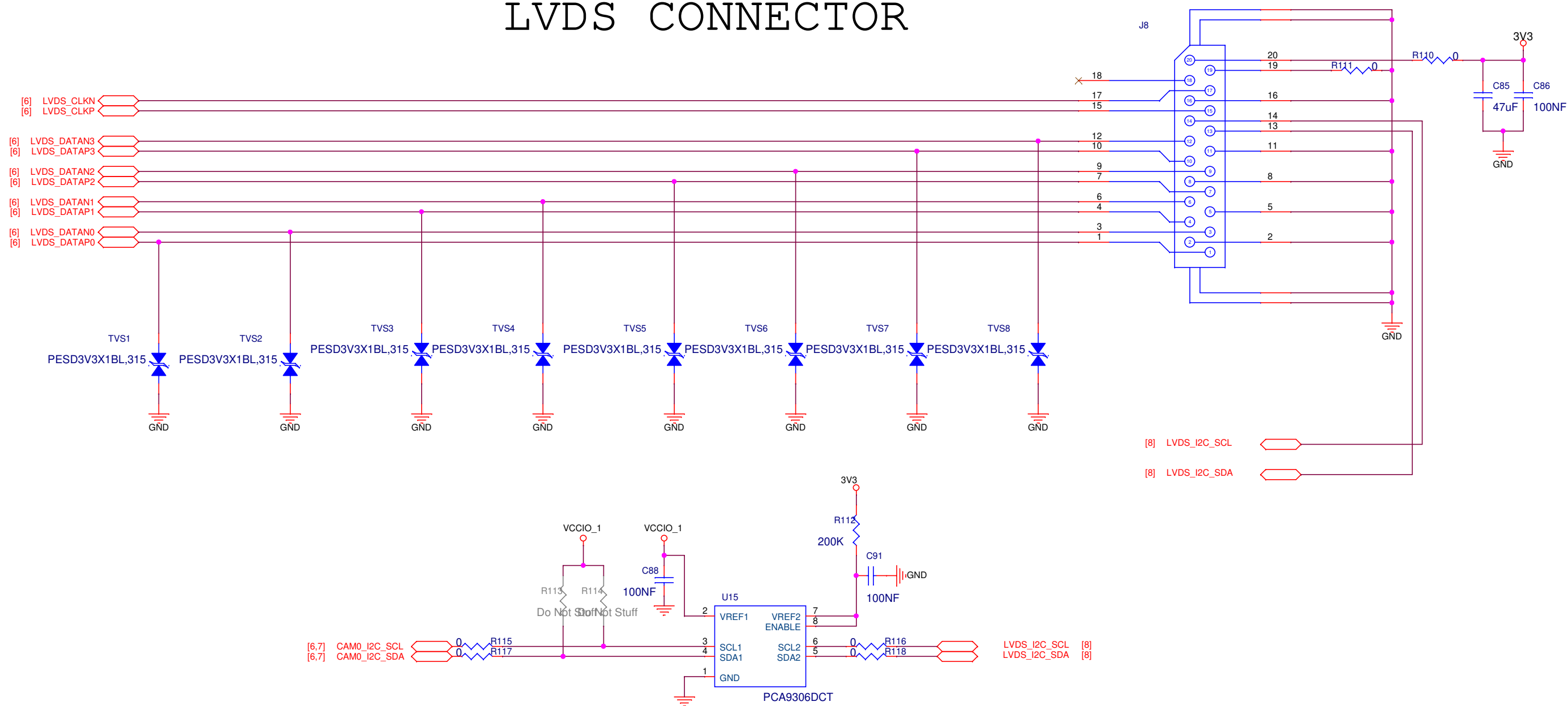


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LVDS CONNECTOR



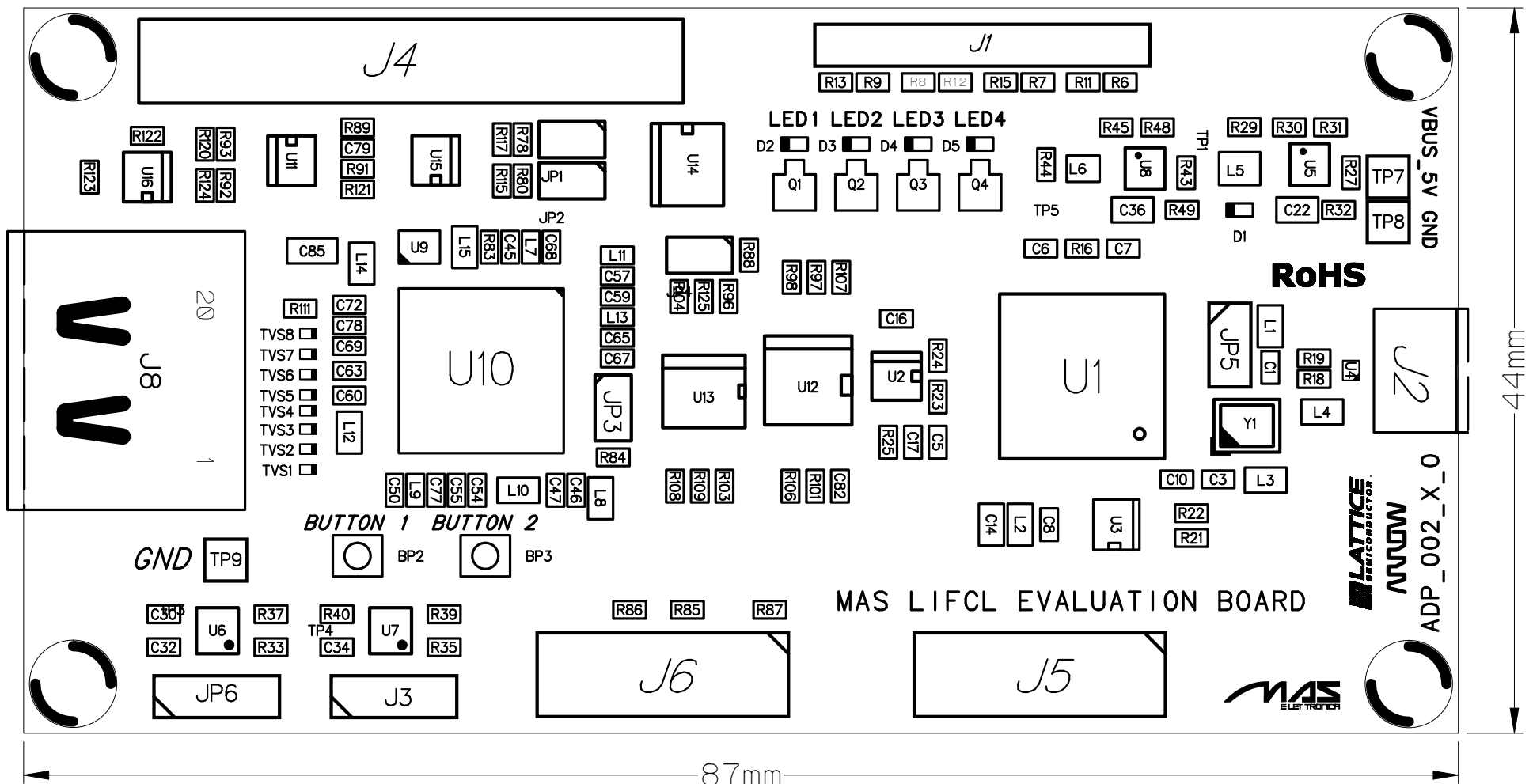
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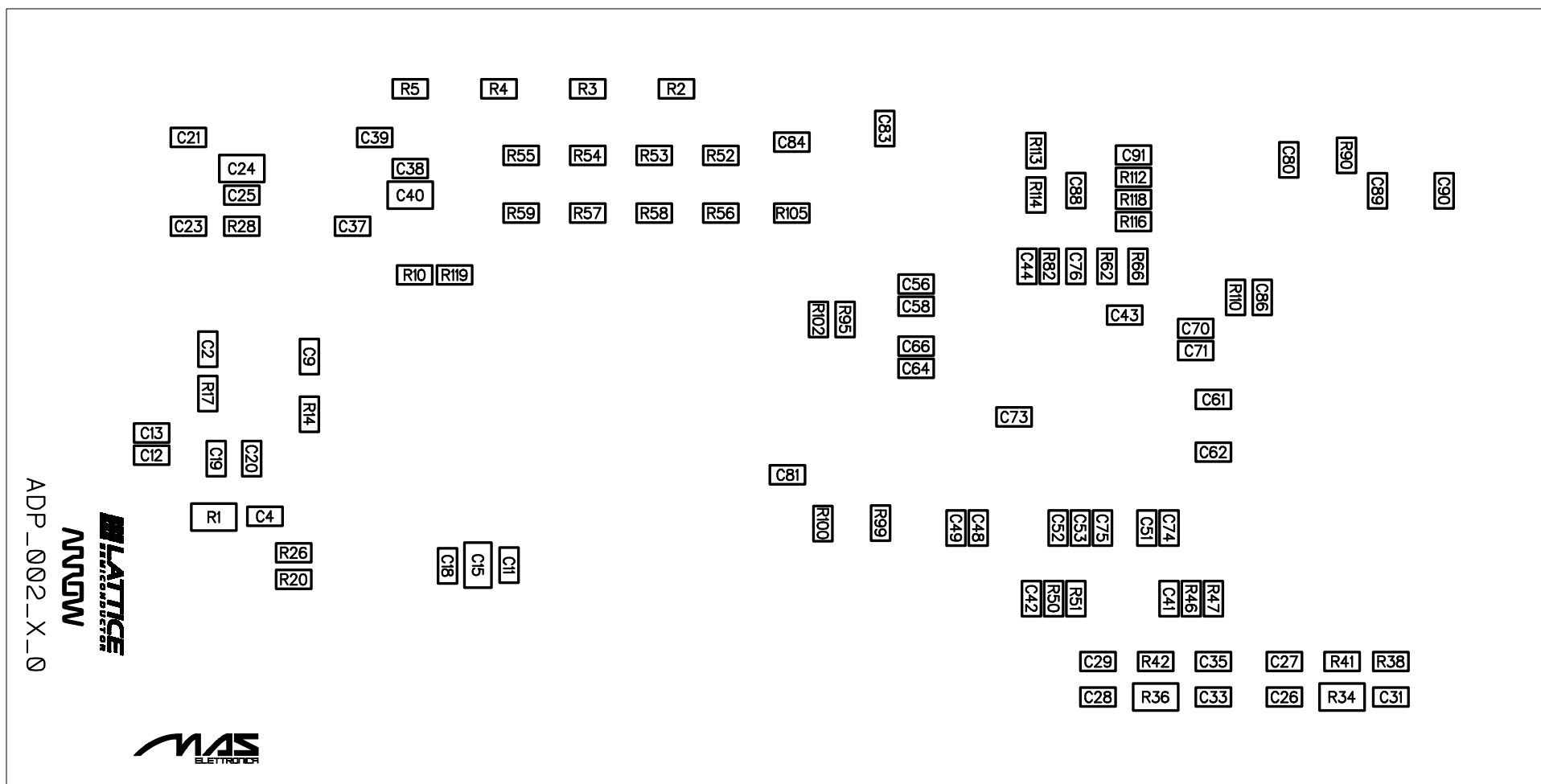
Appendix B MAS_LIFCL Crosslink NX evaluation Board LAYOUT

MAS_LIFCL Crosslink NX evaluation Board Hardware Manual

ADP_002_X_0 Assembly TOP



ADP_002_X_0 Assembly BOTTOM



Appendix C MAS_LIFCL Crosslink NX evaluation Board Bill of Materials

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
1	49	C1 C3 C5 C6 C7 C8 C9 C10 C11 C13 C16 C17 C18 C23 C25 C27 C29 C32 C34 C37 C38 C41 C42 C43 C48 C49 C54 C55 C58 C59 C62 C63 C66 C67 C72 C75 C76 C78 C79 C80 C81 C82 C83 C84 C86 C88 C89 C90 C91	100NF	CAP CER 0.1UF 16V X7R 0402	SMD_0402	Murata Electronics	GRM155R71C104KA88J
2	2	C2 C4	4,7UF	CAP CER 4.7UF 10V X5R 0402	SMD_0402	TDK Corporation	C1005X5R1A475M050BC
3	5	C12 C26 C28 C31 C33	2.2UF	CAP CER 2.2UF 25V X5R 0402	SMD_0402	Murata Electronics	GRM155R61E225ME15D
4	2	C14 C15	10uF	CAP CER 10UF 10V X5R 0603	SMD_0603	TDK Corporation	C1608X5R1A106M080AC
5	2	C19 C20	18PF	CAP CER 18PF 50V C0G 0402	SMD_0402	TDK Corporation	C1005C0G1H180J050BA
6	2	C21 C39	22PF	CAP CER 22PF 50V C0G/NP0 0402	SMD_0402	Murata Electronics	GRM1555C1H220JZ01D
7	4	C22 C24 C36 C40	22uF	CAP CER 22UF 6.3V X5R 0603	SMD_0603	TDK Corporation	C1608X5R0J226M080AC
8	1	C30	1NF	CAP CER 1000PF 50V X7R 0402	SMD_0402	Murata Electronics	GRM15XR71H102KA86D
9	1	C35	2,7NF	CAP CER 2700PF 50V X7R 0402	SMD_0402	Samsung Electro-Me- chanics	CL05B272KB5NNNC
10	4	C44 C50 C56 C64	470PF	CAP CER 470PF 50V C0G/NP0 0402	SMD_0402	Murata Electronics	GRM1555C1H471JA01D

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
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12	4	C46 C52 C60 C70	2,2NF	CAP CER 2200PF 50V X7R 0402	SMD_0402	Walsin Technology Corporation	0402B222K500CT
13	2	C57 C65	2,2UF	CAP CER 2.2UF 6.3V X5R 0402	SMD_0402	Panasonic Electronic Components	ECJ-0EB0J225M
14	1	C68	10UF	CAP CER 10UF 10V X5R 0402	SMD_0402	Samsung Electro-Mechanics	CL05A106MP5NUNC
15	1	C69	1NF	CAP CER 1000PF 50V X7R 0402	SMD_0402	Murata Electronics	GRM15XR71H102KA86D
16	1	C73	4,7nF	COND.CER. 4,7nF 50V 0402 X7R SMD	SMD_0402	MURATA	GRM15XR71H472KA86
17	1	C74	330pF	CAP CER 330PF 50V X7R 0402	SMD_0402	Yageo	CC0402JRX7R9BB331
18	1	C77	560PF	CAP CER 560PF 50V X7R 0402	SMD_0402	Murata Electronics	GRM155R71H561KA01D
19	1	C85	47uF	CAP CER 47UF 6.3V X5R 0805	SMD_0805	Taiyo Yuden	JMK212BJ476MG-T
20	5	D1 D2 D3 D4 D5	LED VERDE	LED GREEN CLEAR 0603 SMD	SMD_0603	Dialight	5988070107F
21	1	J1	STRIP 8	CONN HEADER VERT 8POS 2.54MM	PTH	Samtec Inc.	TSW-108-24-T-S-LL
22	1	J2	47346-0001	CONN RCPT USB2.0 MICRO B SMD R/A	SMD 5pin	Molex	0473460001

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
23	1	J3	JMP 3	CONN HEADER VERT 3POS 2.54MM	PTH	Samtec Inc.	TLW-103-05-G-S
24	1	J4	CONN HEADER VERT 26POS 2.54MM PTH	CONN HEADER VERT 26POS 2.54MM PTH	26P_2X13_P 2_54mm_PT H	WURTH	61302621121
25	2	J5 J6	STRIP 6x2	CONN RCPT 12POS 0.1 GOLD PCB	2X6_P2_54_ PTH	TE CONN	55349986
26	1	J8	47272-0001	CONN RCPT DIS- PLAYPORT 20P SMD RA	20 PIN SMD	Molex	0472720001
27	4	JP1 JP2 JP3 JP4	JMP 2 p.2	STRIP MASC.1x2P P=2.00 post H=3.25	PTH	SAMTEC	MTMM-102-03-T-S-025
28	1	JP5	JMP 2	STRIP MASC.1x2P P=2.54 H=7.62	PTH	SAMTEC	TLW-102-05-G-S
29	1	JP6	JMP 3 P 2mm	STRIP MASC.1x3P P=2.00 post H=3.25	PTH	SAMTEC	MTMM-103-03-T-S-121
30	5	L1 L2 L3 L4 L15	BLM18EG601SN 1	FERRITE BEAD 600 OHM 0603 1LN	SMD_0603	Murata Electronics	BLM18EG601SN1D
31	1	L5	2,2uH	FIXED IND 2.2UH 2.2A 84 MOHM SMD	SMD_2520	Murata Electronics	DFE252012P-2R2M=P2
32	1	L6	1uH	FIXED IND 1UH 2.16A 68 MOHM SMD	Ind_2016	TDK Corporation	VLS201612CX-1R0M-1

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
33	4	L7 L9 L11 L13	BLM15AG121SN1D	FERRITE BEAD 120 OHM 0402 1LN	SMD_0402	Murata Electronics	BLM15AG121SN1D
34	4	L8 L10 L12 L14	BLM18PG121SN1D	FERRITE BEAD 120 OHM 0603 1LN	SMD_0603	Murata Electronics	BLM18PG121SN1D
35	2	PB2,PB3	B3U-1000P-B	SWITCH TACTILE SPST-NO 0.05A 12V	2P SMD	Omron	B3U-1000P-B
36	4	Q1 Q2 Q3 Q4	2SK3018-TP	N-CHANNEL MOSFET, SOT-323 PACKAG	SOT-323-3	Micro Commercial Co	2SK3018-TP
37	3	R1 R34 R36	0	RES SMD 0 OHM JUMPER 1/10W 0603	SMD_0603	Vishay Dale	CR0603-J/-000ELF
38	9	R2 R3 R4 R85 R86 R87 R88 R95 R125	4,7K	RES SMD 4.7K OHM 5% 1/5W 0402	SMD_0402	Vishay Dale	
39	2	R5 R17	2,2K	RES SMD 2.2K OHM 5% 1/5W 0402	SMD_0402	Vishay Dale	
40	3	R6 R11 R62	33	RESIS.CHIP 33R 5% 0402 SMD	SMD_0402	ROYAL OHM	
41	31	R7 R8 R9 R12 R13 R15 R18 R19 R23 R24 R29 R33 R35 R44 R47 R51 R56 R57 R58 R59 R78 R80 R82 R83 R110 R111 R115 R116 R117 R118 R119	0	RESIS.CHIP 0R 5% 0402 SMD	SMD_0402	ROYAL OHM	

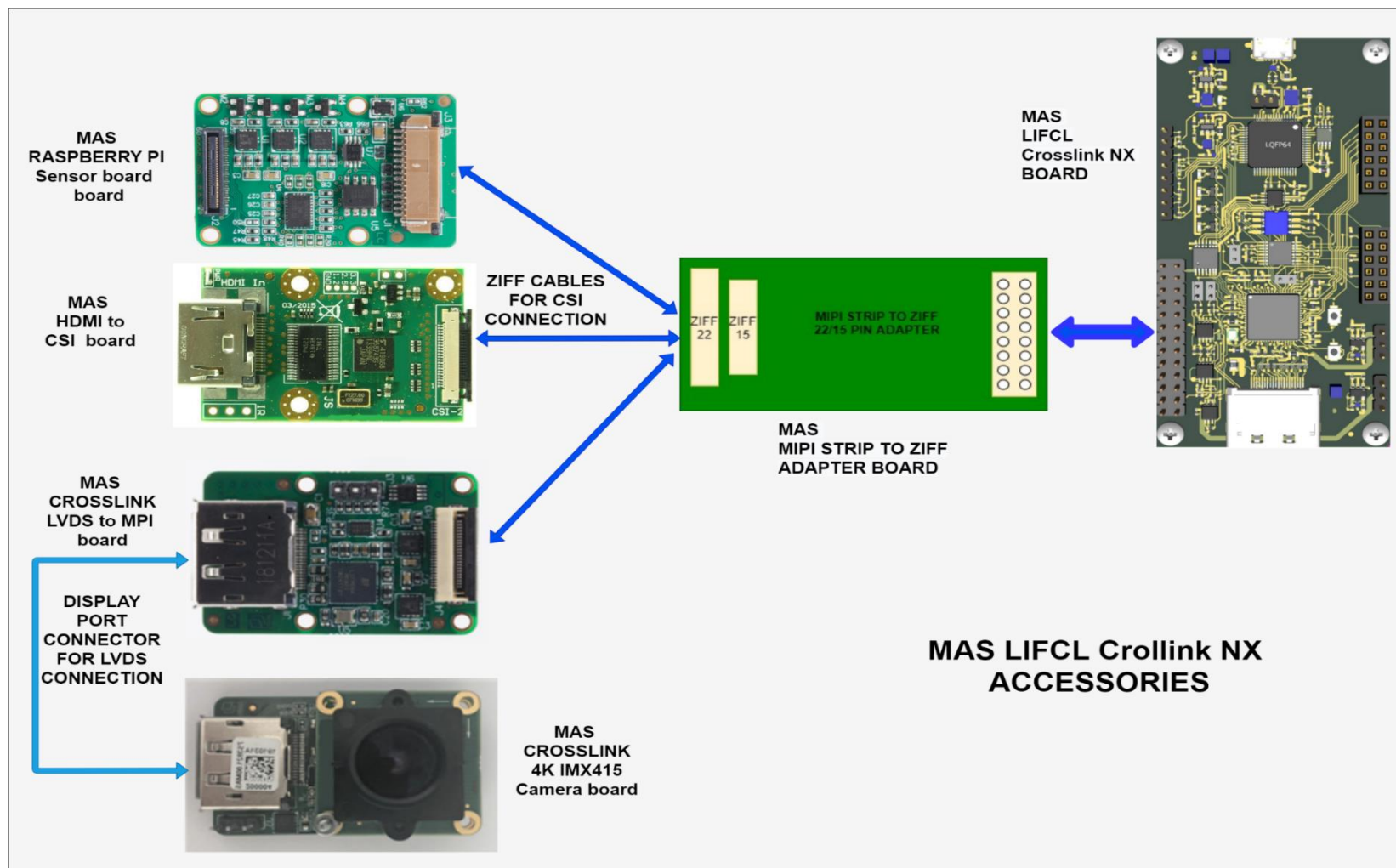
ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
42	12	R10 R20 R21 R22 R25 R37 R39 R66 R98 R101 R105 R122	10K	RESIS.CHIP 10K 5% 0402 SMD	SMD_0402	ROYAL OHM	
43	2	R14 R26	12K	RESIS.CHIP 12K 1% 0402 SMD	SMD_0402	ROYAL OHM	
45	4	R27 R32 R43 R49	100K	RESIS.CHIP 100K 5% 0402 SMD	SMD_0402	ROYAL OHM	
46	9	R28 R46 R50 R52 R53 R54 R55 R84 R102	1K	RESIS.CHIP 1K 5% 0402 SMD	SMD_0402	ROYAL OHM	
47	1	R30	453K	RES 453K OHM 1/10W 1% 0402 SMD	SMD_0402	PANASONIC	
48	3	R31 R48 R103	100K	RESIS.CHIP 100K 1% 0402 SMD	SMD_0402	ROYAL OHM	
49	1	R38	22,1K	RESIS.CHIP 22,1K 1% 0402 SMD	SMD_0402	KAMAYA	
50	1	R40	7,5K	RES 7,5K OHM 1/10W 1% 0402 SMD	SMD_0402	BOURNS	
51	1	R41	17,4K	RESIS.CHIP 17,4K 1% 0402 SMD	SMD_0402	YAGEO	
52	1	R42	15K	RESIS.CHIP 15K 1% 0402 SMD	SMD_0402	ROYAL OHM	
53	1	R45	68K	RESIS.CHIP 68K 1% 0402 SMD	SMD_0402	ROYAL OHM	

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
54	2	R89 R112	200K	RESIS.CHIP 200K 5% 0402 SMD	SMD_0402	ROYAL OHM	
55	4	R90 R91 R92 R93	2K	RESIS.CHIP 2K 5% 0402 SMD	SMD_0402	ROYAL OHM	
57	1	R104	10K	RESIS.CHIP 10K 1% 0402 SMD	SMD_0402	ROYAL OHM	
68	8	TVS1 TVS2 TVS3 TVS4 TVS5 TVS6 TVS7 TVS8	PESD3V3X1BL,3 15	TVS DIODE 3.3V SOD882	SOD882	Nexperia USA Inc.	PESD3V3X1BL,315
69	1	U1	FT2232H	IC USB HS DUAL UART/FIFO 64- LQFP	64-LQFP	FTDI, Future Tech- nology Devices Inter- national Ltd	FT2232HL-REEL
70	2	U2 U16	TXS0102	IC TRNSLTR BIDI- RECTIONAL SM8	SSOP8	Texas Instruments	TXS0102DCTR
71	1	U3	93LC56CT-I/MS	IC EEPROM 2K SPI 3MHZ 8MSOP	MSOP-8	Microchip Technol- ogy	93LC56CT-I/MS
72	1	U4	ESDR0502N	TVS DIODE 5.5V 6UDFN	6UDFN	ON Semiconductor	ESDR0502NMUTBG
73	2	U5 U8	AP3445LW6-7	IC REG BUCK AD- JUSTABLE 2A SOT26	SOT-26-6	Diodes Incorporated	AP3445LW6-7
74	2	U6 U7	AP2127K- ADJTRG1	IC REG LIN POS ADJ 300MA SOT23-5	SOT23-5	Diodes Incorporated	AP2127K-ADJTRG1
75	1	U9	50MHZ	XTAL OSC XO 50.0000MHZ CMOS SMD	SMD_2.0x1.6	Kyocera Interna- tional Inc. Electronic Components	KC2520K50.0000C1GE00

MAS_LIFCL Crosslink NX evaluation Board Hardware Manual

ITEM	QTY	REF DESIGNATOR	VALUE	DESCRIPTION	PACKAGE	MANUFACTURER	MANUFACTURER P/N
76	1	U10	LIFCL-17-QFN72	IC FPGA CROSS-LINK-NX 72QFN	QFN72	Lattice Semiconductor Corporation	LIFCL-17-7SG72C
77	2	U11 U15	PCA9306DCT	IC TRNSLTR BIDI-RECTIONAL SM8	8-SSOP	Texas Instruments	PCA9306DCTR
78	1	U12	MX25L12833FM 2I-10G	S-NOR 128M	8-SOP	Macronix	MX25L12833FM2I-10G
79	1	U13	SN74CB3Q3257 PW	IC QUAD1:2 FET MUX/DEMUX 16TSSOP	SMD	Texas Instruments	SN74CB3Q3257PWR
80	1	U14	TXS0104E	IC TRNSLTR BIDI-RECTIONAL 14TSSOP	TSSOP14	Texas Instruments	TXS0104EPWR
81	1	Y1	12MHz	CRYSTAL 12.0000MHZ 10PF SMD	SMD_3.2x2.5	Abracon LLC	ABM8G-12.000MHZ-4Y-T3

Appendix D MAS_LIFCL Crosslink NX evaluation Board accessories



MAS_LIFCL Crosslink NX evaluation Board Hardware Manual

Technical Support and Warranty

Technical Support

MAS Elettronica provides its product with one-year free technical support including:

1. Providing software and hardware resources related to the embedded products of MAS Elettronica;
2. Helping customers properly compile and run the source code provided by MAS Elettronica;
3. Providing technical support service if the embedded hardware products do not function properly under the circumstance that customers operate according to the instructions in the documents provided by MAS Elettronica;
4. Helping customers troubleshoot the products.

The following conditions will not be covered by our technical support service. We will take appropriate measures accordingly:

- a. Customers encounter issues related to software or hardware during their development process;
- b. Customers encounter issues caused by any unauthorized alter to the embedded operating system;
- c. Customers encounter issues related to their own applications;
- d. Customers encounter issues caused by any unauthorized alter to the source code provided by MAS Elettronica;

Warranty Conditions

1. 12-month free warranty on the PCB under normal conditions of use since the sales of the product;
2. The following conditions are not covered by free services; MAS Elettronica will charge accordingly:
 - Customers fail to provide valid purchase vouchers or the product identification tag is damaged, unreadable, altered or inconsistent with the products.
 - Products are damaged caused by operations inconsistent with the user manual;
 - Products are damaged in appearance or function caused by natural disasters (flood, fire, earthquake, lightning strike or typhoon) or natural aging of components or other force majeure;
 - Products are damaged in appearance or function caused by power failure, external forces, water, animals or foreign materials;
 - Products malfunction caused by disassembly or alter of components by customers or, products disassembled or repaired by persons or organizations unauthorized by MAS Elettronica, or altered in factory specifications, or configured or expanded with the components that are not provided or recognized by MAS Elettronica and the resulted damage in appearance or function;
 - Product failures caused by the software or system installed by customers or inappropriate settings of software or computer viruses;
 - Products purchased from unauthorized sales;
 - Warranty (including verbal and written) that is not made by MAS Elettronica and not included in the scope of our warranty should be fulfilled by the party who committed. MAS Elettronica has no any responsibility;
3. Within the period of warranty, the freight for sending products from customers to MAS Elettronica should be paid by customers; the freight from MAS Elettronica to customers should be paid by us. The freight in any direction occurs after warranty period should be paid by customers.
4. Please contact technical support if there is any repair request.

Note:

MAS Elettronica will not take any responsibility on the products sent back without the permission of the company.

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