ConnectCore MP1 Dev Board

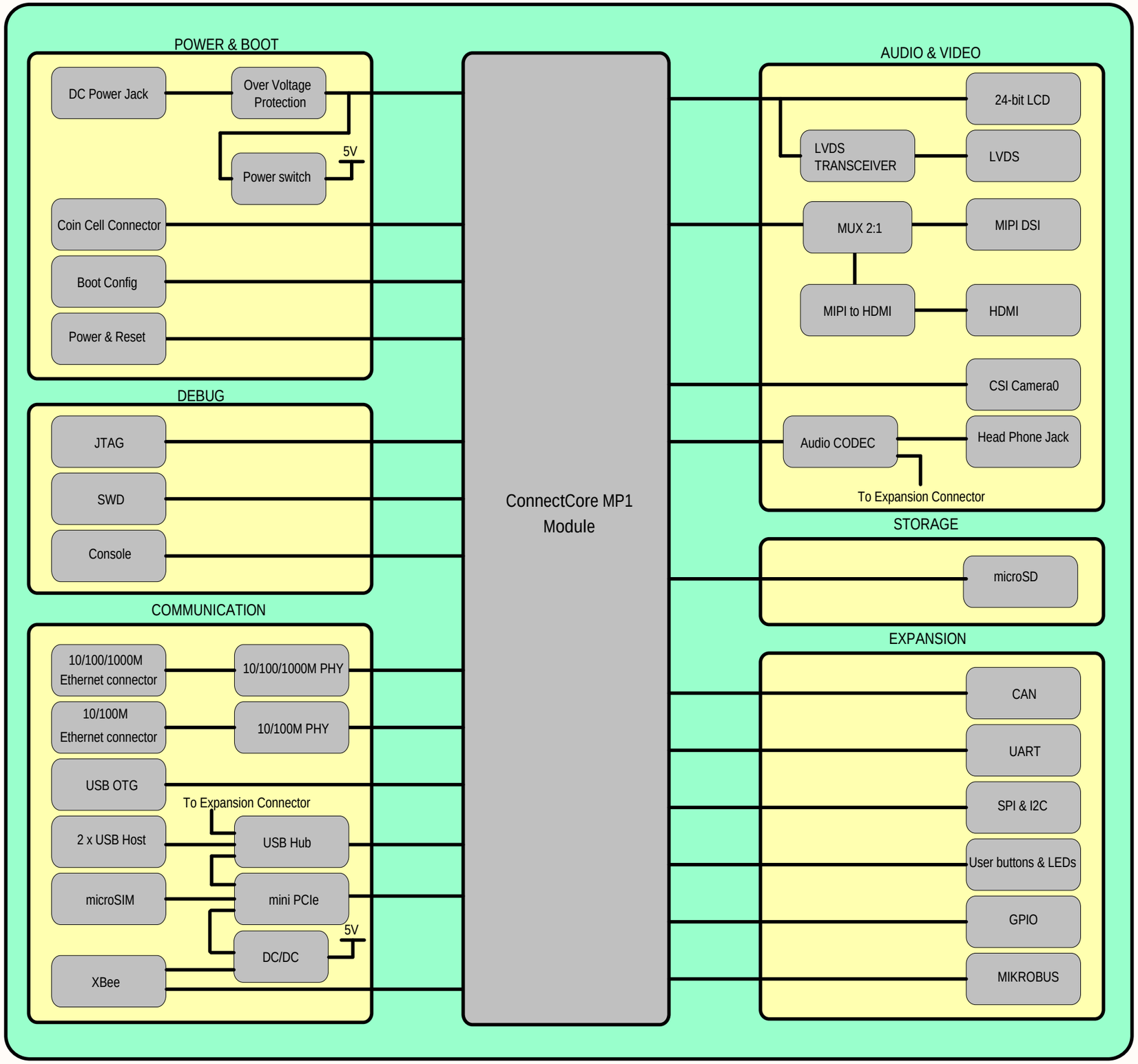
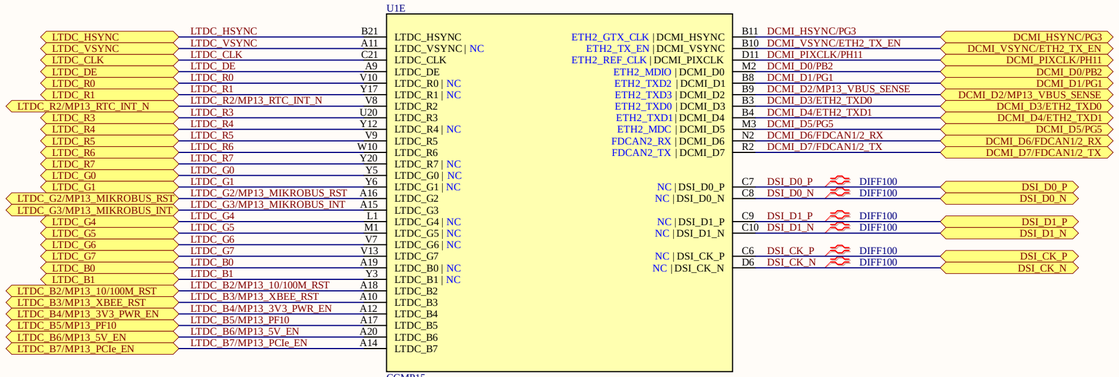


Table of Content

Title: Block Diagram		DIGI
Designer: Sébastien MEYER	Sheet: 1 of 18	
Variant: 55002167-02	Rev: A	
Description: ConnectCore MP1 Development board - CCMP13		

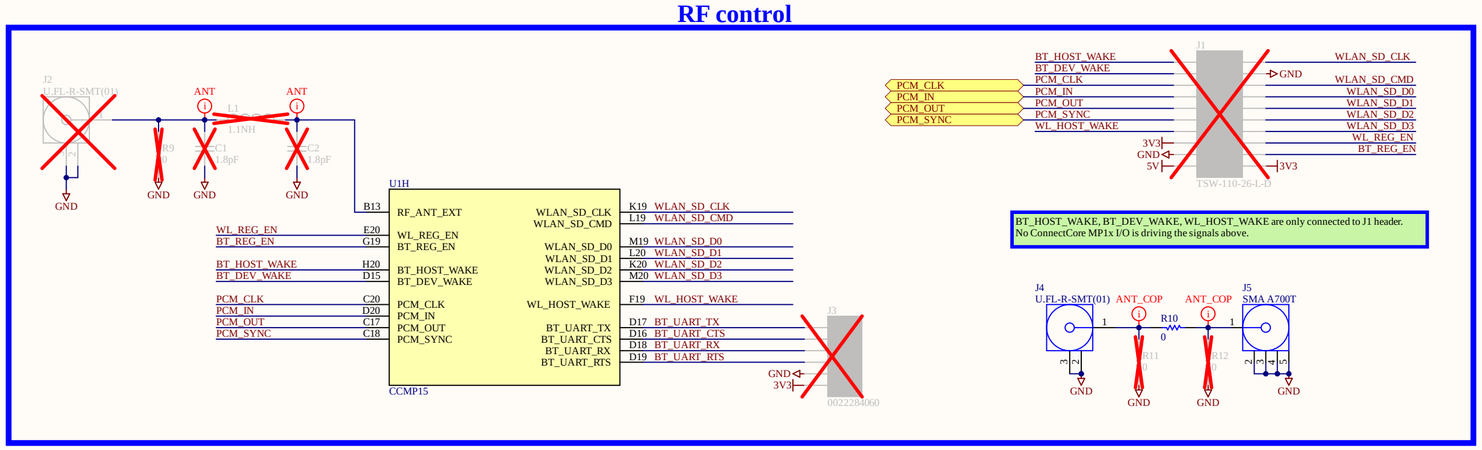
ConnectCore MP1 Module



Default PAD names correspond to default functionality of MP1 modules. PAD names in blue, when applied, correspond to MP13.

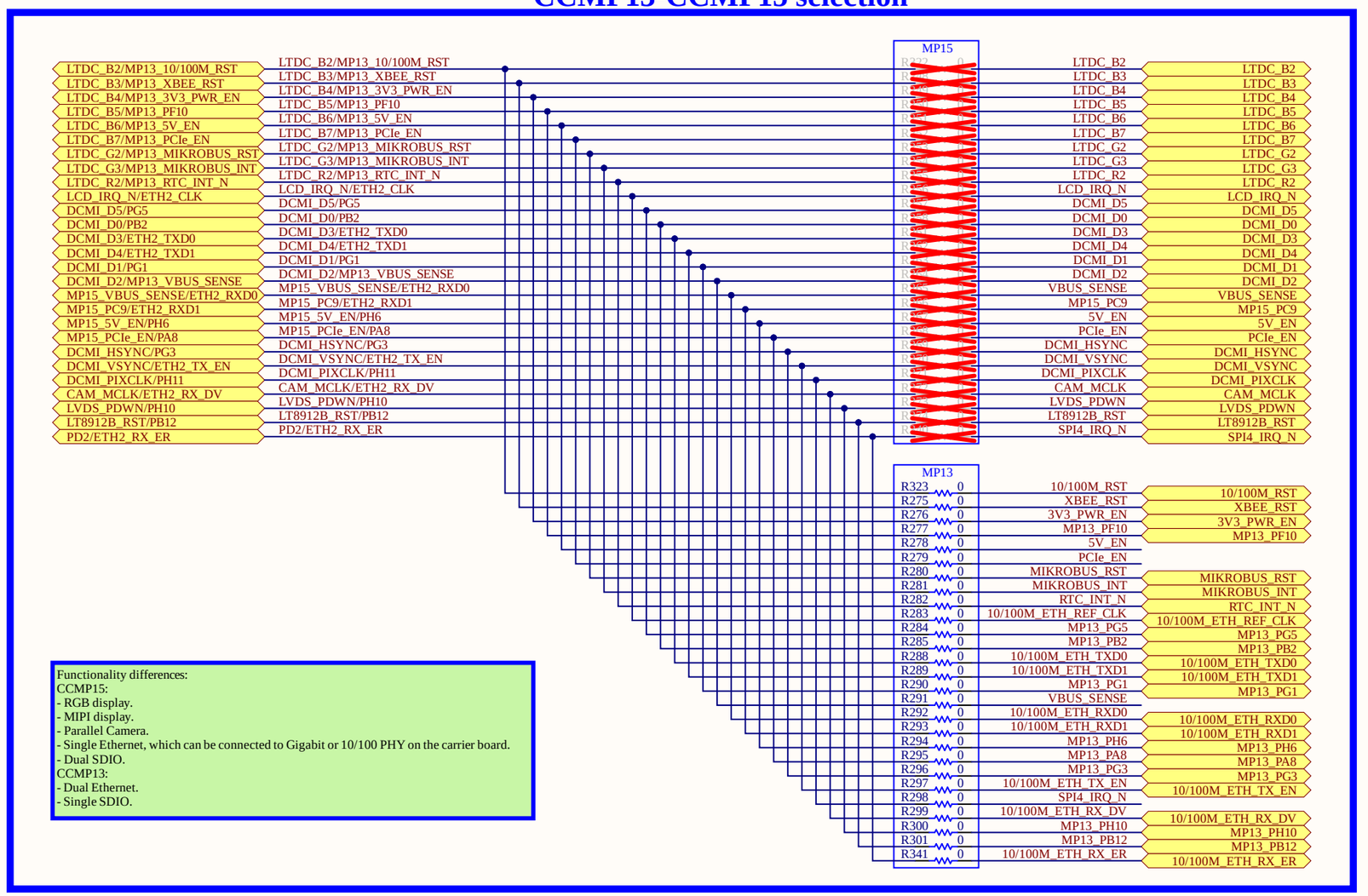
WARNING
Recommendation is not to use VDD to power external circuitry. This regulator has low output current capabilities and adding external load could cause malfunction of the system. This is specially critical on the ConnectCore MP13.

RF control



Title: ConnectCore MP15x SoM	
Designer: Sébastien MEYER	Sheet: 2 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

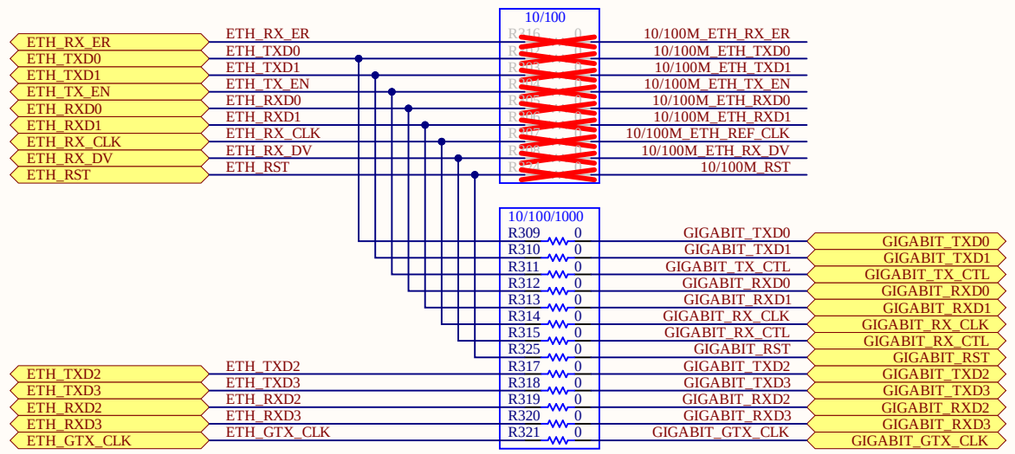
CCMP13-CCMP15 selection



Functionality differences:
CCMP15:
- RGB display.
- MIPI display.
- Parallel Camera.
- Single Ethernet, which can be connected to Gigabit or 10/100 PHY on the carrier board.
- Dual SDIO.

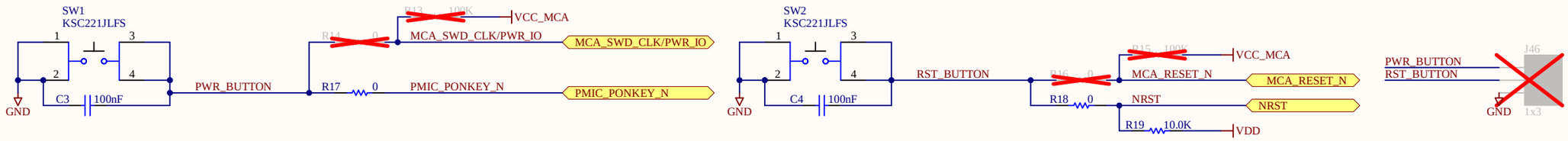
CCMP13:
- Dual Ethernet.
- Single SDIO.

Ethernet selection

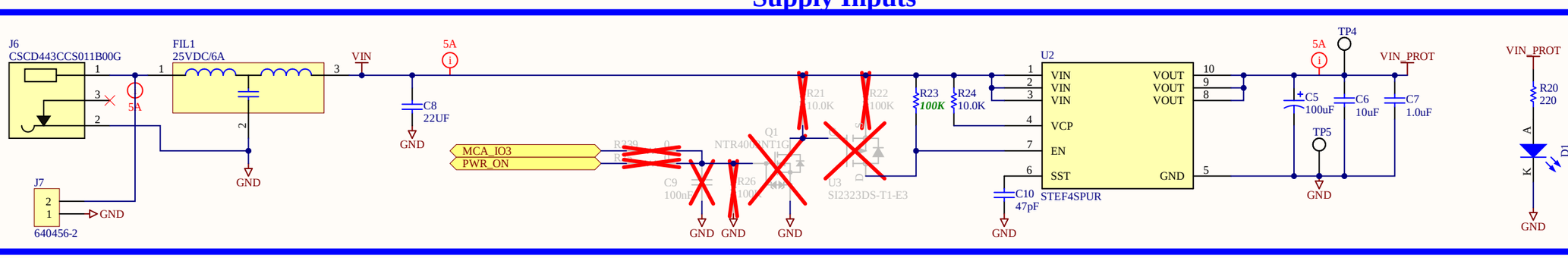


Title: CCMP13-CCMP15 selection		
Designer: Sébastien MEYER	Sheet: 3 of 18	
Variant: 55002167-02	Rev: A	
Description: ConnectCore MP1 Development board - CCMP13		

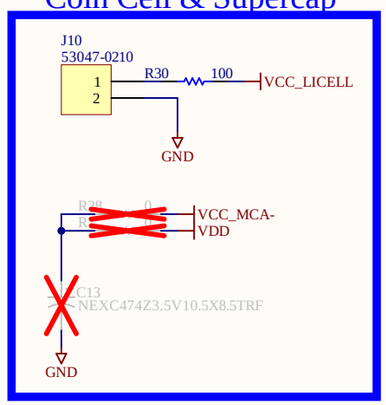
Power and Reset



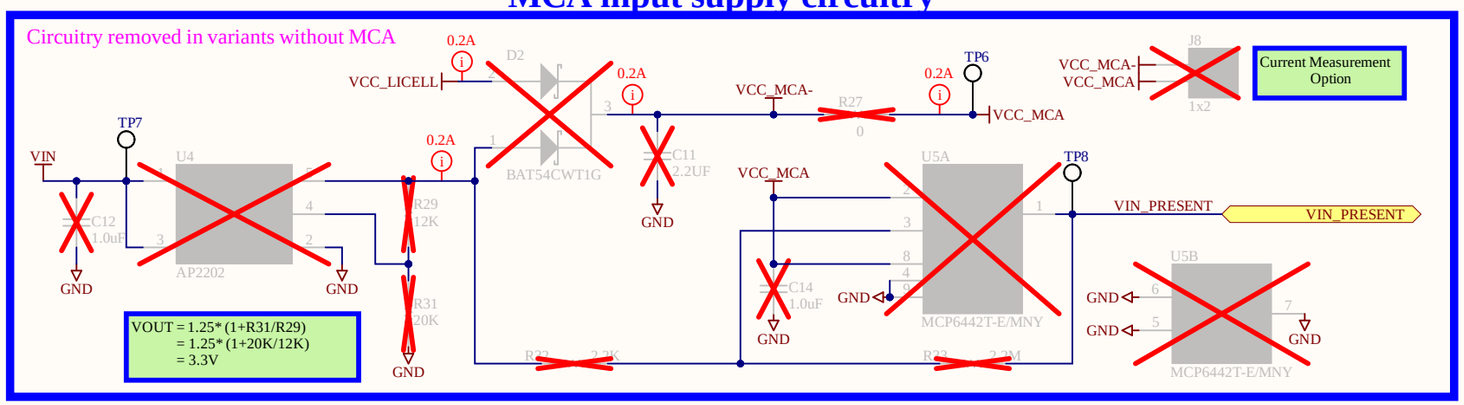
Supply Inputs



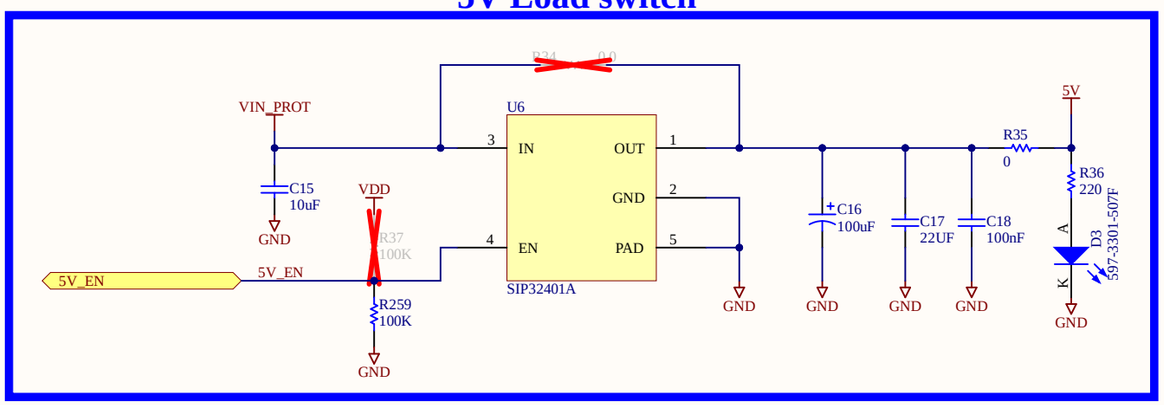
Coin Cell & Supercap



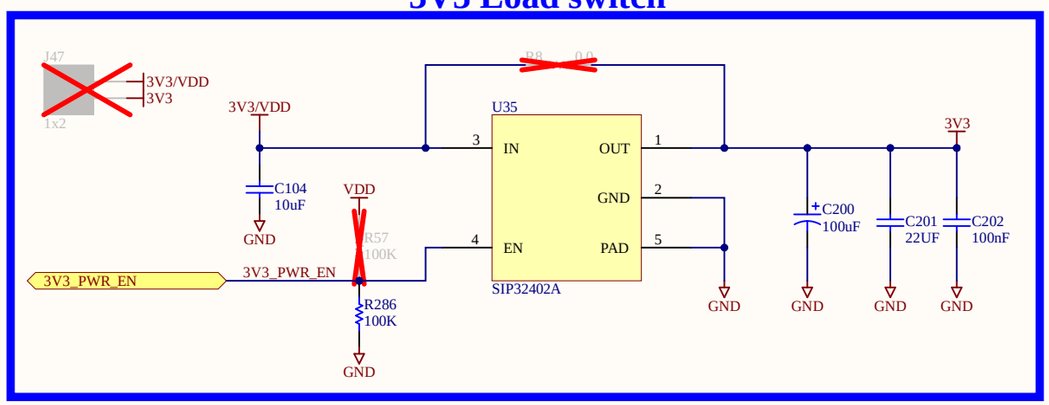
MCA input supply circuitry



5V Load switch



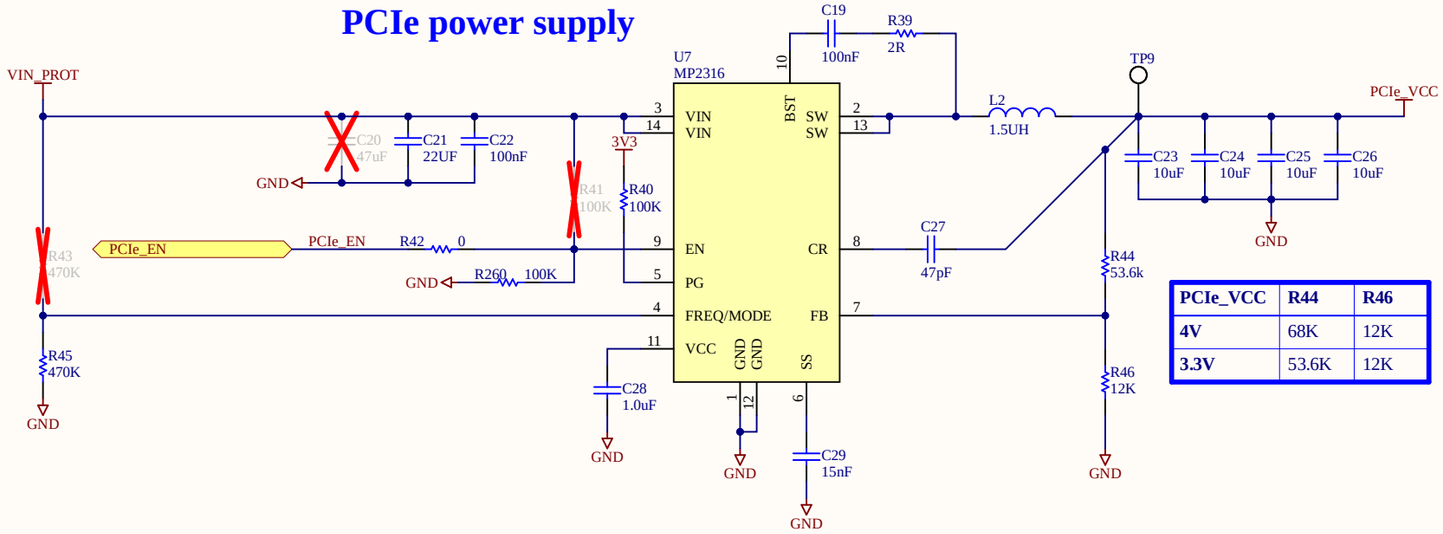
3V3 Load switch



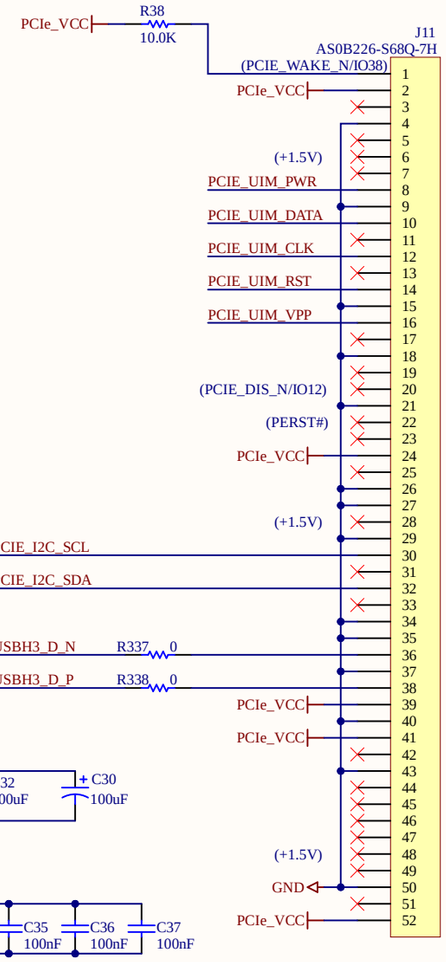
Title: Power, Reset	
Designer: Sébastien MEYER	Sheet: 4 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

miniPCIe

PCIe power supply

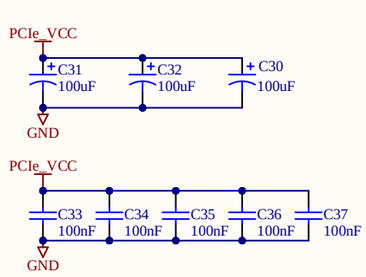


PCIe_VCC	R44	R46
4V	68K	12K
3.3V	53.6K	12K

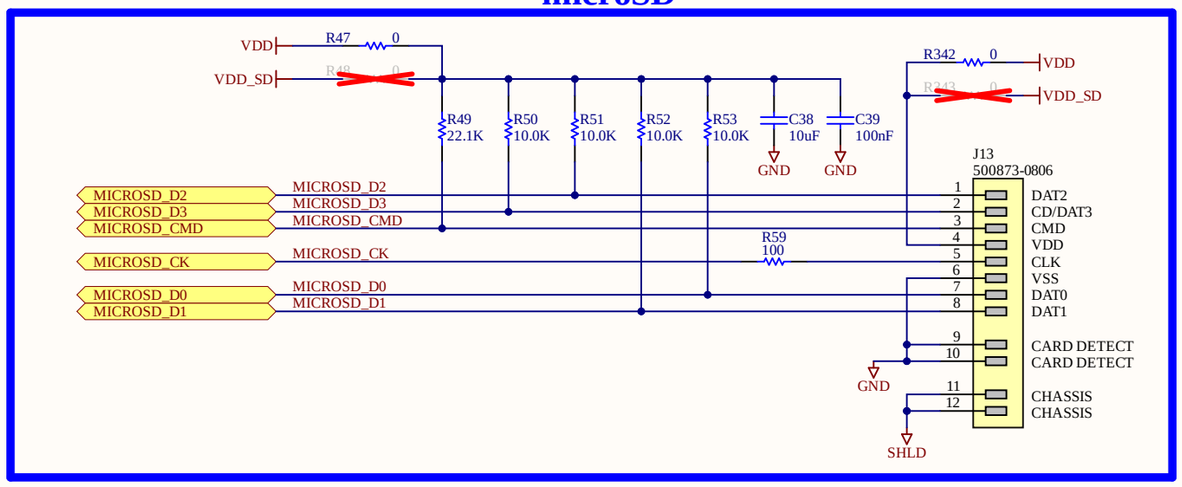


RTC

micro SIM

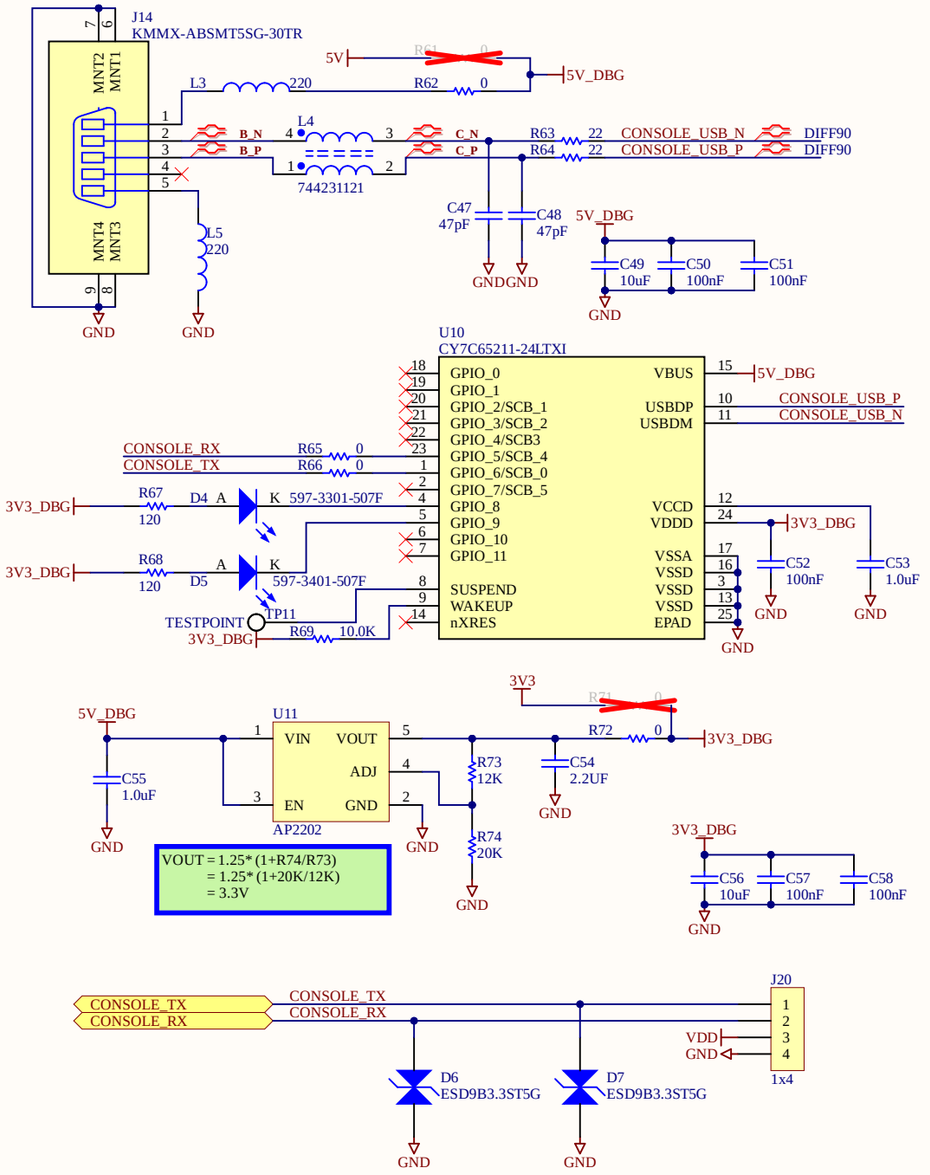


microSD

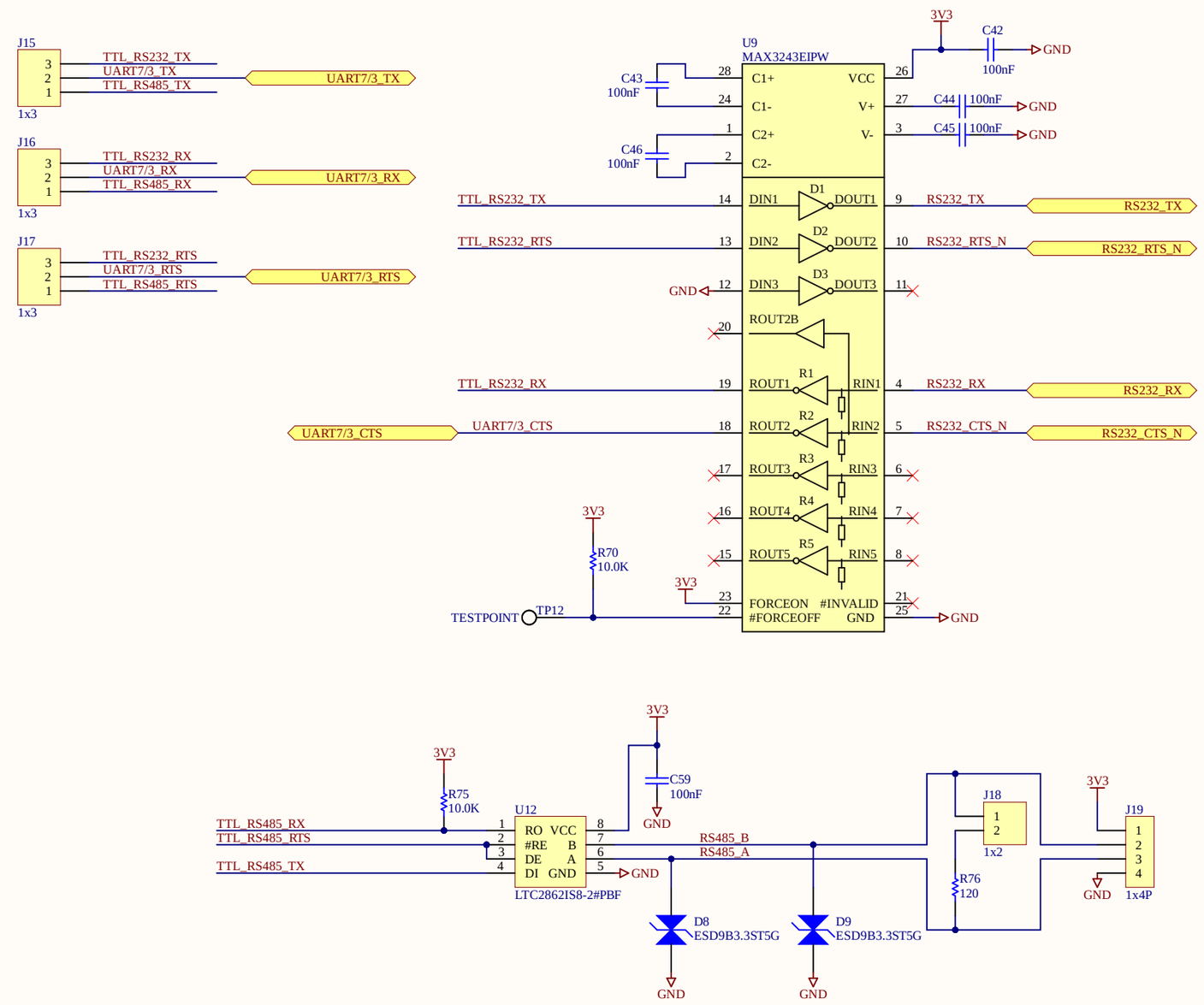


Title: MicroSD, RTC, Mini PCIe, MicroSIM	
Designer: Sébastien MEYER	Sheet: 5 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

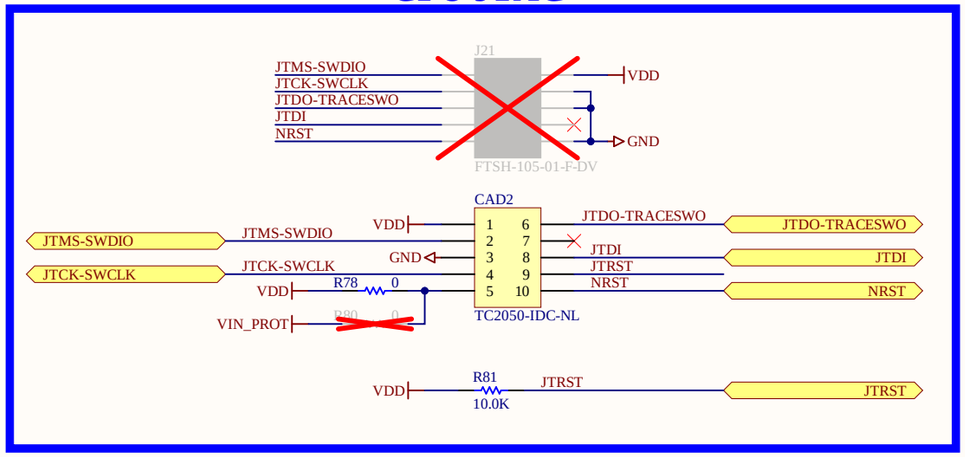
Console port



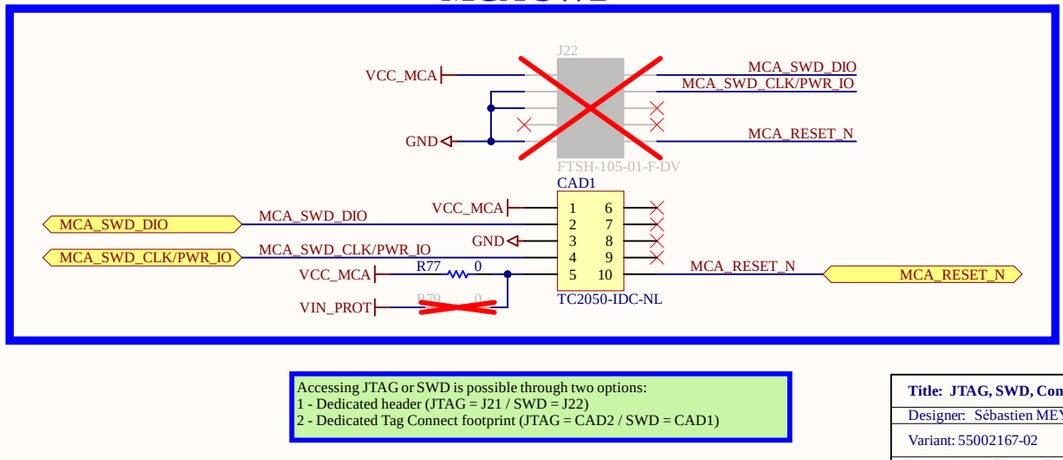
UART 7 - RS232 / RS485



CPU JTAG



MCA SWD



Accessing JTAG or SWD is possible through two options:
1 - Dedicated header (JTAG = J21 / SWD = J22)
2 - Dedicated Tag Connect footprint (JTAG = CAD2 / SWD = CAD1)

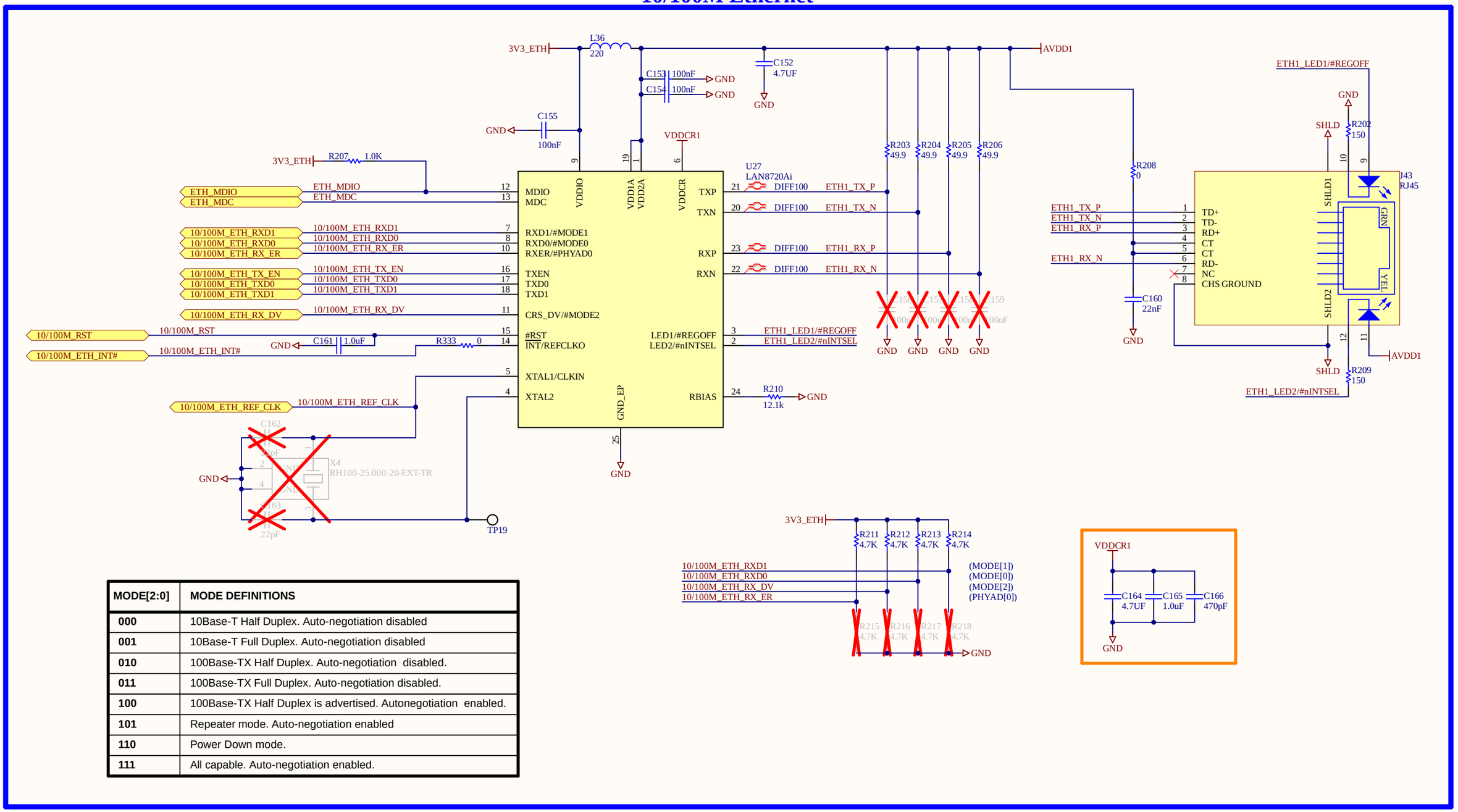
Title: JTAG, SWD, Console, UART	
Designer: Sébastien MEYER	Sheet: 6 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

10/100/1000M Ethernet

U34A
88E1512-A0-NNP2I000
S_INP
S_INN
S_OUTP
S_OUTN
TXD[0]
TXD[1]
TXD[2]
TXD[3]
TX_CLK
TX_CTRL
RXD[0]
RXD[1]
RXD[2]
RXD[3]
RX_CLK
RX_CTRL
MDC
MDIO
MDIP[0]
MDIN[0]
MDIP[1]
MDIN[1]
MDIP[2]
MDIN[2]
MDIP[3]
MDIN[3]
LED[0]
LED[1]
LED[2]/INT
GIGABIT_TXD0
GIGABIT_TXD1
GIGABIT_TXD2
GIGABIT_TXD3
GIGABIT_GTX_CLK
GIGABIT_TX_CTL
GIGABIT_RXD0
GIGABIT_RXD1
GIGABIT_RXD2
GIGABIT_RXD3
GIGABIT_RX_CLK
GIGABIT_RX_CTL
ETH_MDC
ETH_MDIO
LED_1_ACT
LED_1_1000
ETH1_TXRXA_P
ETH1_TXRXA_N
ETH1_TXRXB_P
ETH1_TXRXB_N
ETH1_TXRXC_P
ETH1_TXRXC_N
ETH1_TXRXD_P
ETH1_TXRXD_N
3V3_ETH
R85
4.99K
J23
RJ45
CT
TRD1+
TRD1-
TRD2+
TRD2-
TRD3+
TRD3-
TRD4+
TRD4-
GND
YEL
GRN
DIFF100
SHLD
SHLD1
SHLD2
D1
D2
D3
D4
R82
R84
120
CONFIG -> '0'
PHYADD[0] = 0
CONFIG -> '1' (Default)
PHYADD[0] = 1
U34B
88E1512-A0-NNP2I000
CONFIG
CLK125
RESET
XTAL_IN
XTAL_OUT
HSDACP
HSDACN
TSTPT
RSET
REG_IN
AVDD33
VDDO
VDDO_SEL
AVDD18_OUT
AVDDC18
AVDD18
DVDD_OUT
DVDD
REGCAP1
REGCAP2
EPAD_VSS
1V8_PHY
1V0_PHY
R86
R87
R334
R88
R89
R83
C73
C76
33pF
X1
RH100-25.000-20-EXT-TR
C85
0.22uF
C64
C65
C66
C67
C68
C69
C70
C71
C72
C74
C75
C77
C78
C79
C80
C81
C82
C83
C84
100nF
10uF
L6
L7
L8
L9
L10
120
TP13
TP14
TESTPOINT
C60
C61
C62
C63
3V3
SHLD

Title: 10/100/1000M Ethernet	
Designer: Sébastien MEYER	Sheet: 7 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

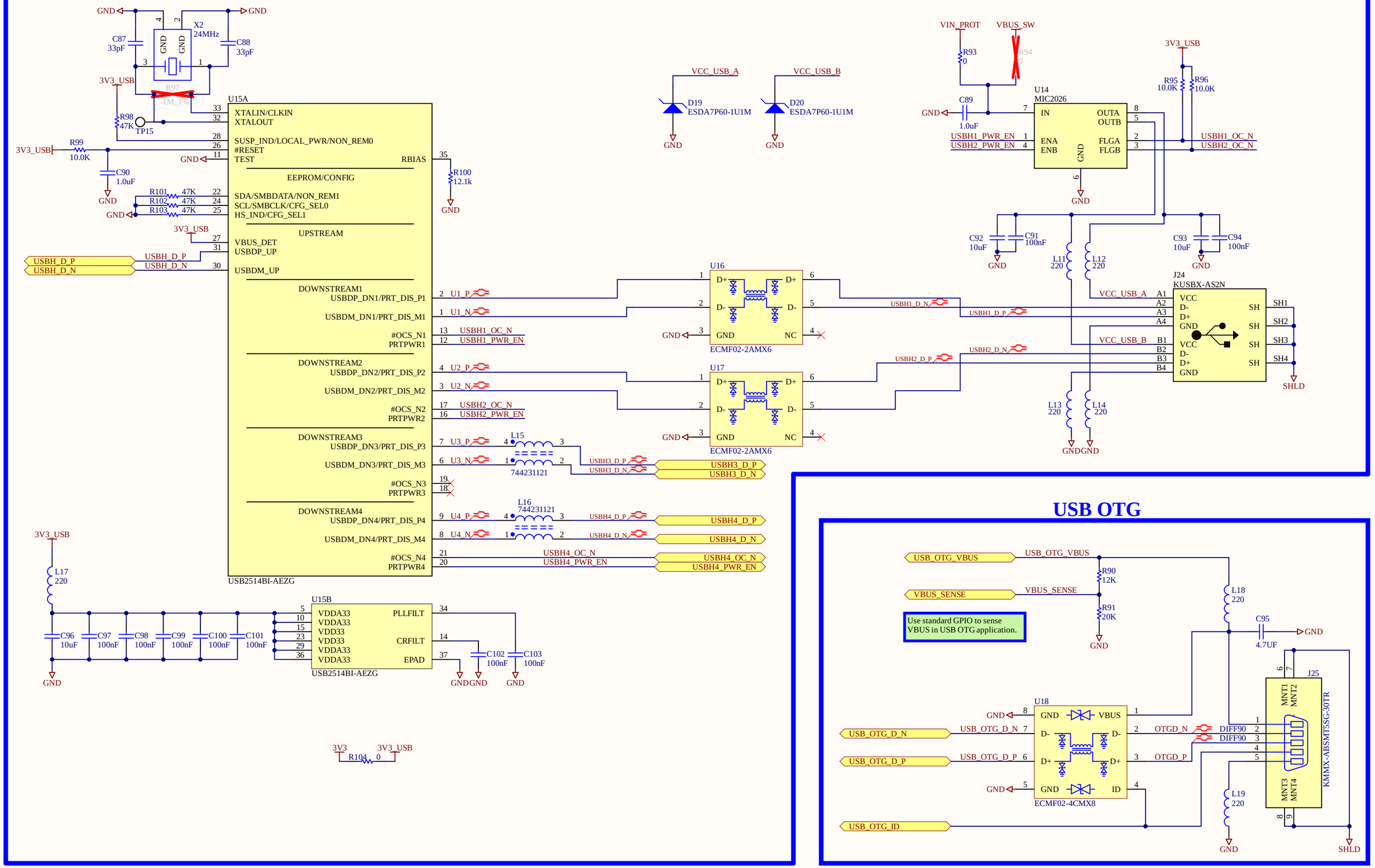
10/100M Ethernet



MODE[2:0]	MODE DEFINITIONS
000	10Base-T Half Duplex. Auto-negotiation disabled
001	10Base-T Full Duplex. Auto-negotiation disabled
010	100Base-TX Half Duplex. Auto-negotiation disabled.
011	100Base-TX Full Duplex. Auto-negotiation disabled.
100	100Base-TX Half Duplex is advertised. Autonegotiation enabled.
101	Repeater mode. Auto-negotiation enabled
110	Power Down mode.
111	All capable. Auto-negotiation enabled.

Title: 10/100M Ethernet	
Designer: Sébastien MEYER	Sheet: 8 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

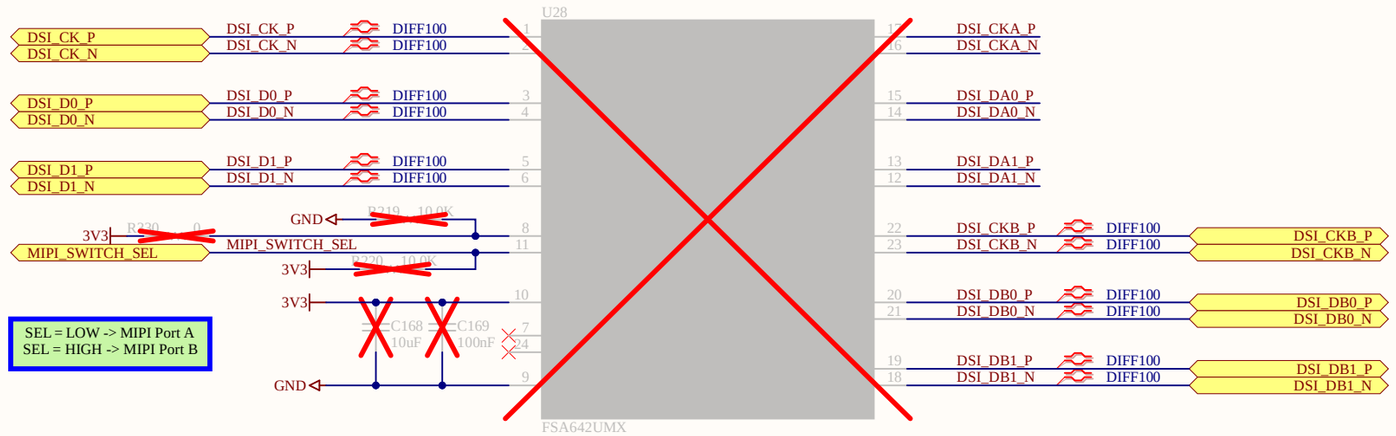
USB HOST



USB OTG

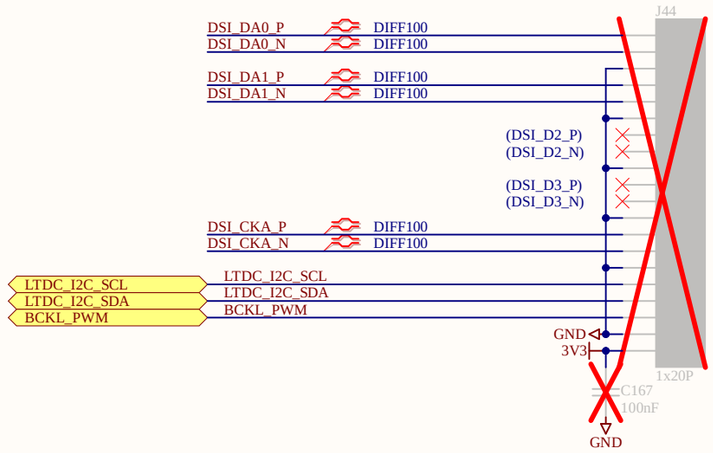
Title: USB OTG, USB Hub	
Designer: Sébastien MEYER	Sheet: 9 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

MIPI switch and display



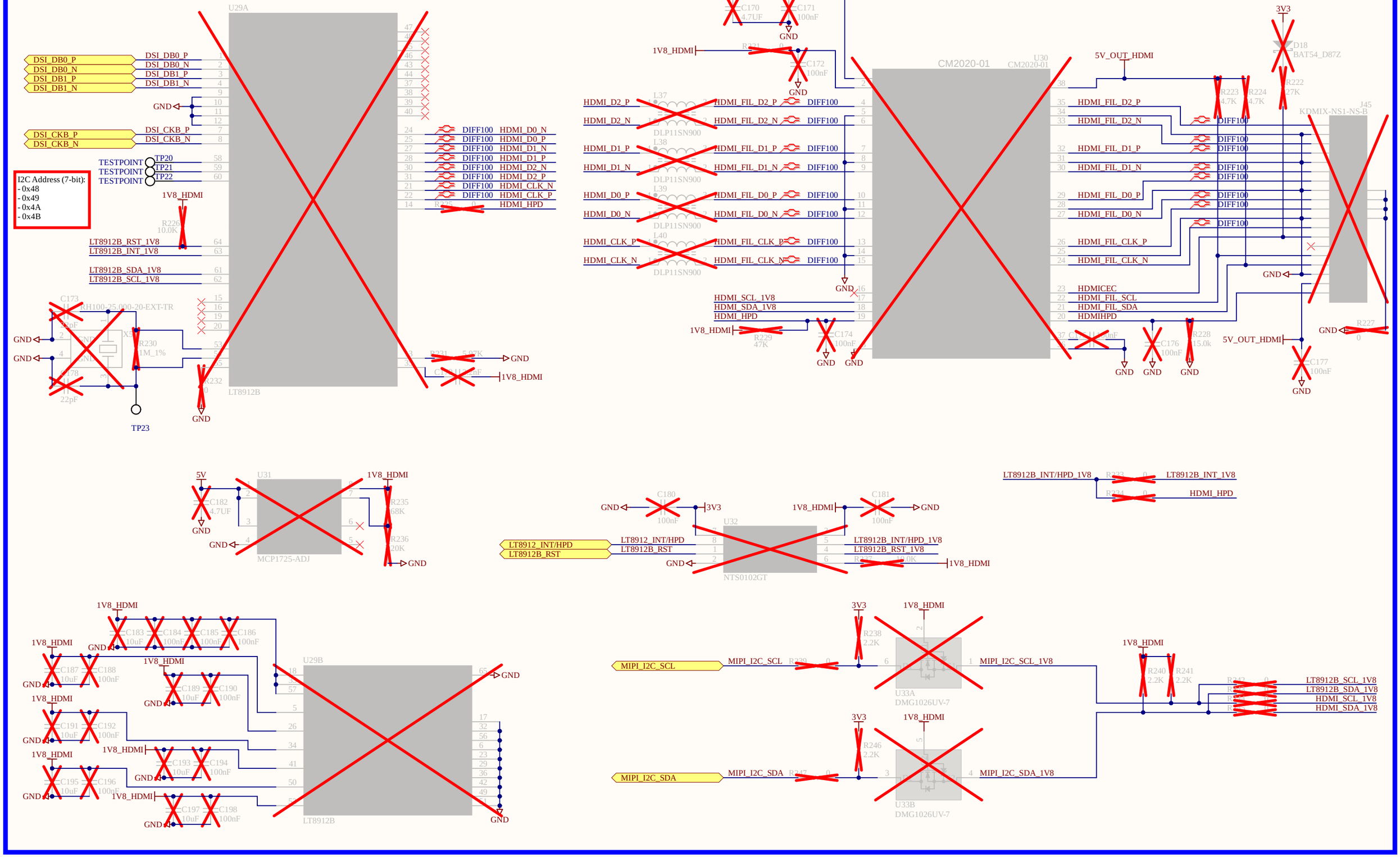
MIPI Port A => External MIPI Display

MIPI Port B => HDMI



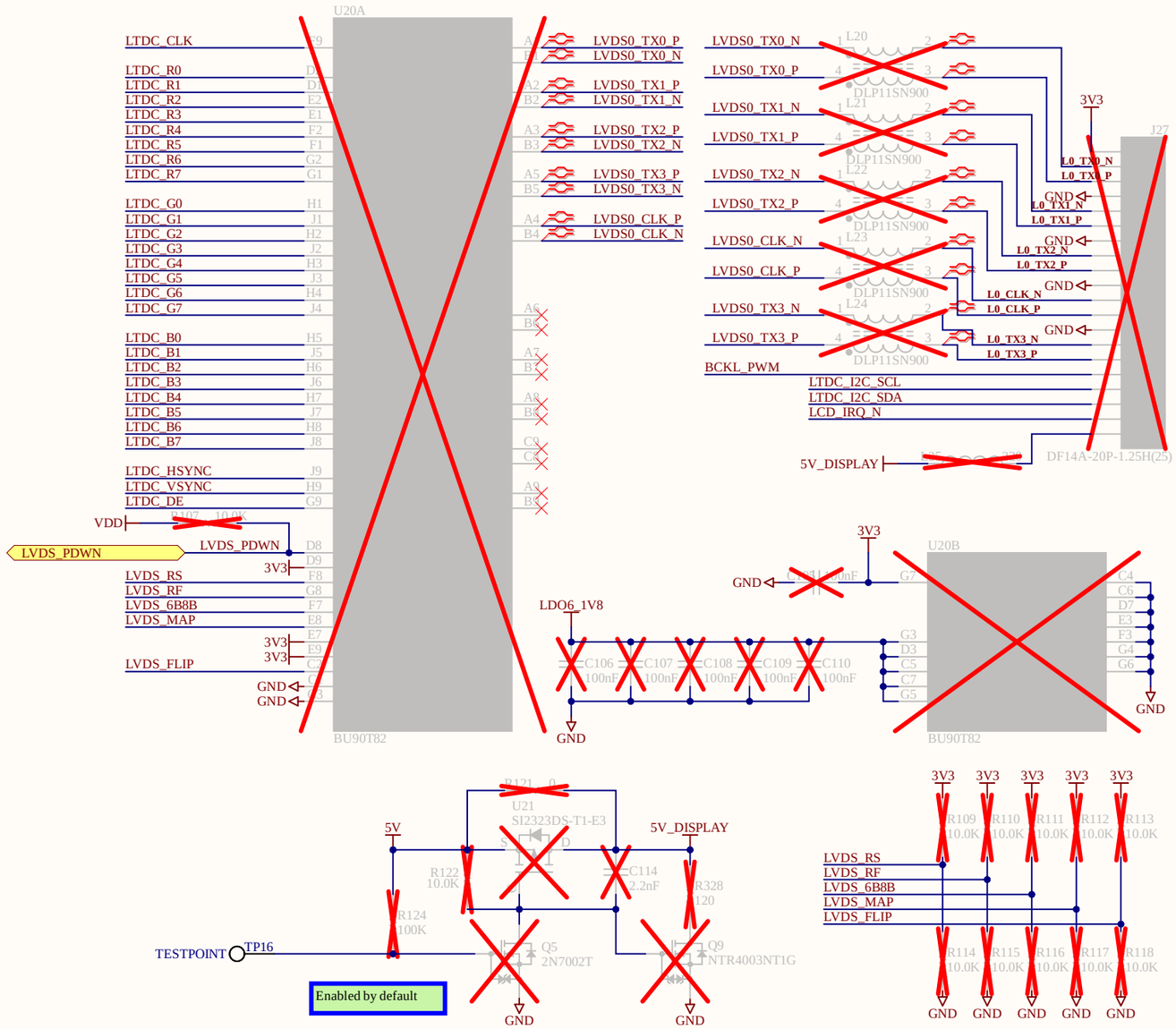
Title: MIPI Display, HDMI	
Designer: Sébastien MEYER	Sheet: 10 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

HDMI display



Title: MIPI Display, HDMI	
Designer: Sébastien MEYER	Sheet: 11 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

LVDS



Enabled by default

LVDS_RS: LVDS Swing Mode Select:
H: 350mV
L: 200mV

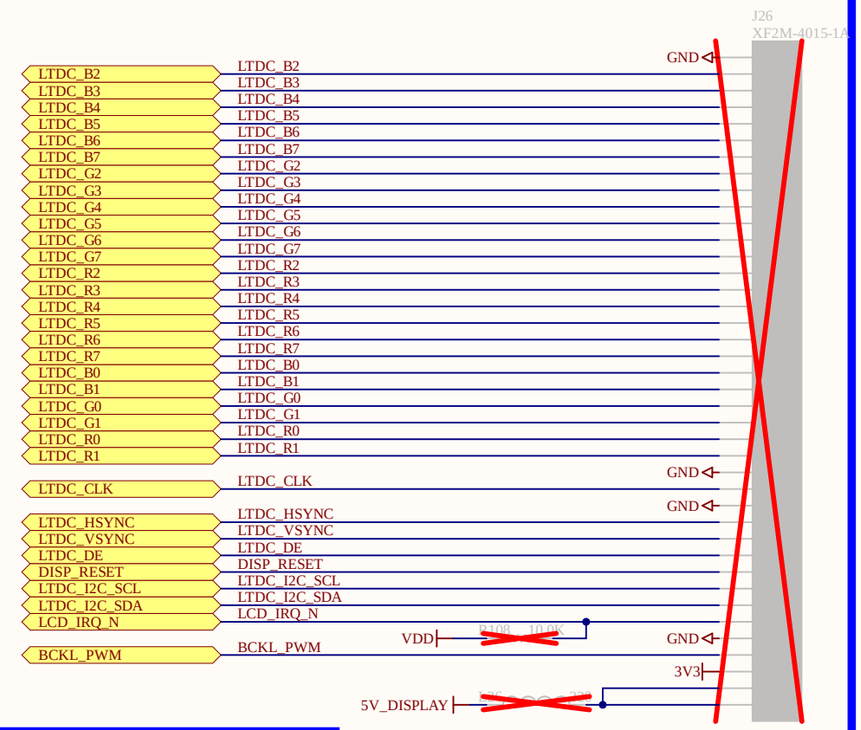
LVDS_RF: Input CLK Triggering Edge Select:
H: Rising Edge
L: Falling Edge

LVDS_6B8B: 6bit/8bit Mode Select:
H: 6bit mode (TD1+/-, TD2+/- outputs are Hi-Z)
L: 8bit mode

LVDS_MAP: LVDS Output Data Mapping Select:
H: JEIDA
L: VESA

LVDS_FLIP: LVDS Output Pin Reverse Select:
H: Reverse
L: Normal

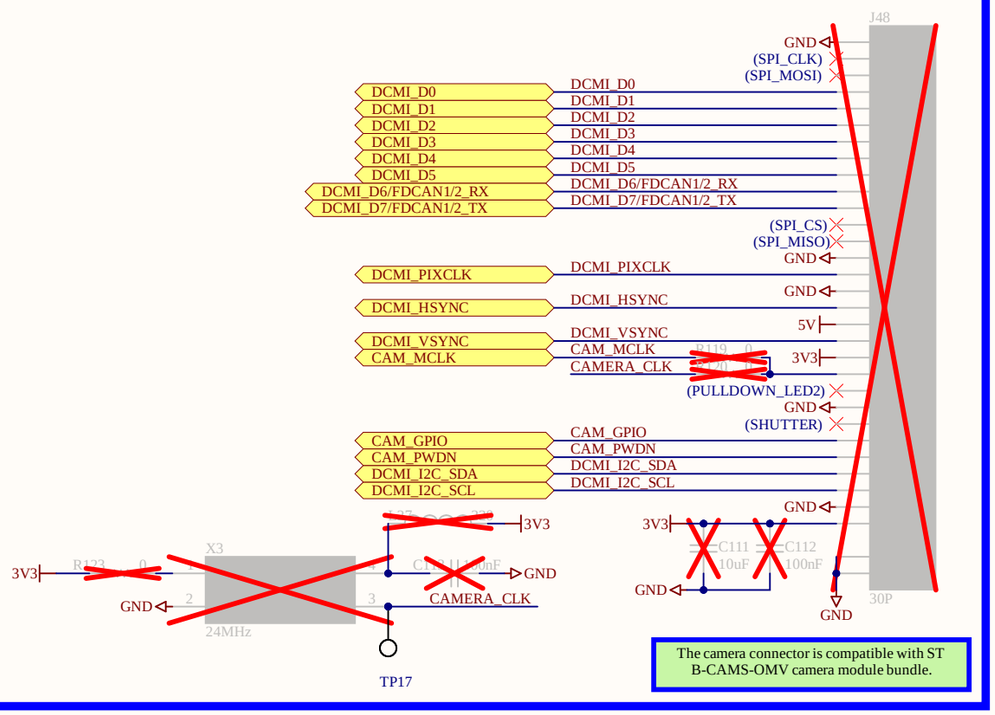
Parallel Display



If higher currents are required on boards connected to J26,
an external supply must be used to power them.

3V3 maximum current allowed on J26: 0.5A
5V maximum current allowed on J26: 1A

Parallel Camera



The camera connector is compatible with ST
B-CAMS-OMV camera module bundle.

Title: LVDS, Parallel Display, Camera	
Designer: Sébastien MEYER	Sheet: 12 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

AUDIO

U22A

VDD — R125 10.0K — 56 IRQ#

I2C Address (7-bit): 0x10

AUD_I2C_SCL_1V8 — 51 SCL
AUD_I2C_SDA_1V8 — 52 SDA

I2S2/1_MCK — I2S2/1_MCK — R126 0 — 5 MCLK

INFO:
STM32MP1xx supports I2S serial data line swapping thanks to IOSWP bit in SPI_CFG2 register.

I2S2/1_CK — I2S2/1_CK — R127 0 — 8 BCLKS1
I2S2/1_WS — I2S2/1_WS — R128 0 — 10 LRCLKS1
I2S2/1_SDO — I2S2/1_SDO — R129 0 — 9 SDINS1
I2S2/1_SDI — I2S2/1_SDI — R130 0 — 7 SDOUTS1

PCM_CLK — PCM_CLK — R131 0 — 2 BCLKS2
PCM_SYNC — PCM_SYNC — R132 0 — 4 LRCLKS2
PCM_OUT — PCM_OUT — R133 0 — 54 SDINS2
PCM_IN — PCM_IN — R134 0 — 1 SDOUTS2

NC: 11, 12, 13, 14, 28, 29, 46

40 MIC1P/DIGMICDATA
41 MIC1N/DIGMICCLK
44 MICBIAS — GND — C115 1.0uF
MIC_BIAS — R135 2.2K

J28: 2 — L, 3 — R, 1 1 — NT1 — 2 — GND
SJ1-3533NG
NET TIE

R136 0 — MIC_P — L28 1.8K — C116 1.0uF — 42 MIC2P
R137 0 — MIC_N — L29 1.8K — C117 1.0uF — 43 MIC2N
MIC_BIAS — 45 JACKSNS

LINE1_IN_R — LINE1_IN_R — L30 1.8K — C119 1.0uF — 39 INA1/EXTMICP
LINE1_IN_L — LINE1_IN_L — L31 1.8K — C120 1.0uF — 38 INA2/EXTMICN
GND — C118 10pF
GND — C122 10pF

LINE2_IN_R — LINE2_IN_R — L32 1.8K — C124 1.0uF — 36 INB2
LINE2_IN_L — LINE2_IN_L — L33 1.8K — C126 1.0uF
GND — C123 10pF — 37 INB1
GND — C127 10pF

MAX98089

24 RECP/LOUTL/RXINP — LINE_OUT_R — LINE_OUT_R
23 RECN/LOUTR/RXINN — LINE_OUT_L — LINE_OUT_L

20 SPKLP — SPKL_P — SPKL_P
22 SPKLN — SPKL_N — SPKL_N
SPKR_P — SPKR_P
SPKR_N — SPKR_N
17 SPKRP
15 SPKRN

J29: 2 — L, 3 — R, 1 — NT2 — 2 — GND
SJ1-3533NG
NET TIE

C121 10pF — GND — 35 HPR — R138 0
33 HPL — R139 0
C125 10pF — GND — 34 HPSNS

U22B

3V3_CODEC — 6 DVDDS1 — GND — C128 100nF
3V3_CODEC — 55 DVDDS2 — GND — C130 100nF
1V8_CODEC — 53 DVDD — C135 10uF, C136 1.0uF, C137 1.0uF, C138 1.0uF — GND
25 PVDD
50 AVDD
3V3_CODEC — 19 SPKLVDD — C142 10uF, C143 1.0uF, C144 1.0uF — GND
18 SPKRVDD

27 CIN — C129 1.0uF
26 C1P
32 HPVDD — C134 1.0uF — GND
31 HPVSS — C139 1.0uF — GND
48 REF — C140 2.2UF — GND
49 REG — C141 1.0uF — GND

3 DGND
47 AGND
30 HPGND
21 SPKLGND
16 SPKRGND
57 EP — GND

MAX98089

3V3_CODEC — U24 — 1 VIN, 5 VOUT, 4 ADJ, 3 EN, 2 GND — AP2202
C133 1.0uF — GND
GND
R142 27K — C132 2.2UF — 1V8_CODEC
R144 12K — GND

VOUT = 1.25V x (1+R144/R142)
= 1.25V x (1+12K/27K)
= 1.8V

R140 0
U23 SI2323DS-T1-E3
3V3 — S, D — 3V3_CODEC
R141 10.0K
R143 100K
C131 2.2nF
R329 120
Q6 2N7002T
Q10 NTR4003NT1G
GND
TESTPOINT — TP18

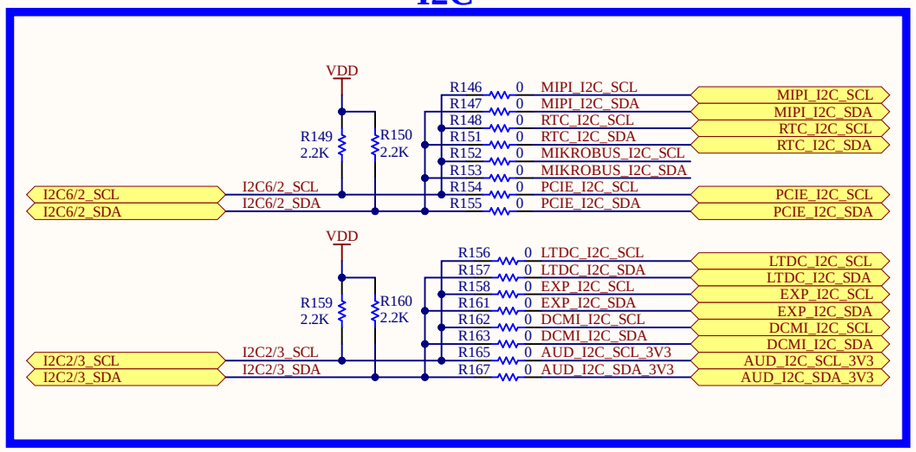
Enabled by default

GND — C86 100nF — 1V8_CODEC
3V3 — C199 100nF — GND

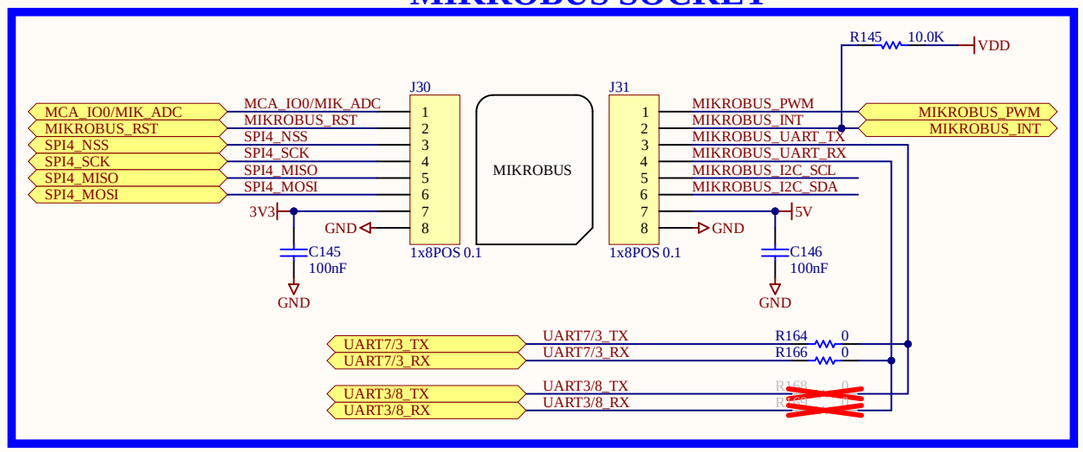
U13
AUD_I2C_SCL_1V8 — 5 A1 — VCC (A) 3 — VCC (B) 7 — 3V3
AUD_I2C_SDA_1V8 — 4 A2 — B1 8 — AUD_I2C_SCL_3V3 — AUD_I2C_SCL_3V3
B2 1 — AUD_I2C_SDA_3V3 — AUD_I2C_SDA_3V3
1V8_CODEC — R92 10.0K — 6 OE — GND 2 — GND
NTS0102GT

Title: Audio	
Designer: Sébastien MEYER	Sheet: 13 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

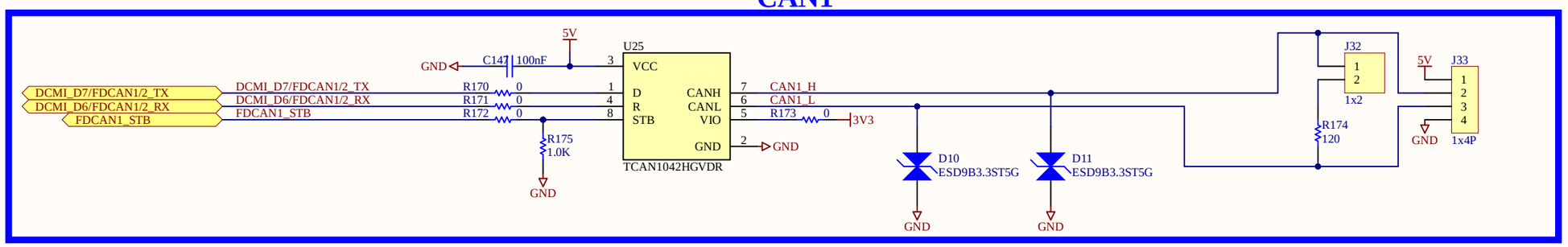
I2C



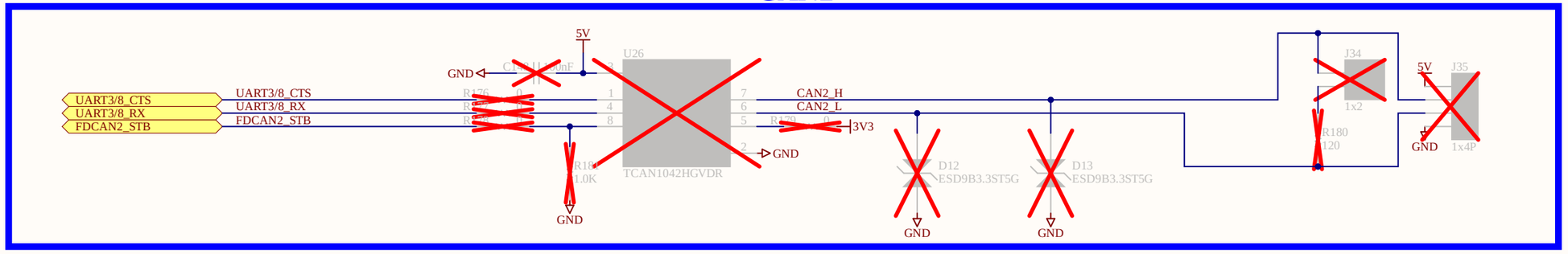
MIKROBUS SOCKET



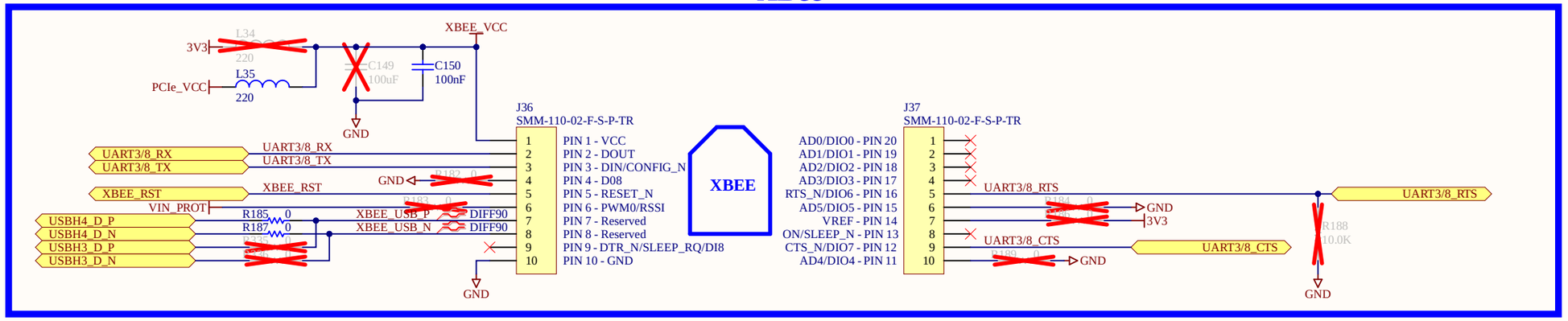
CAN1



CAN2



XBee

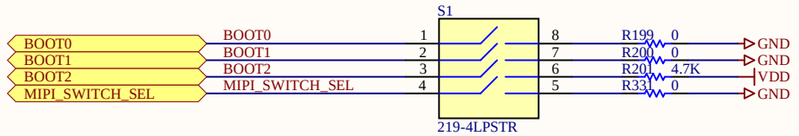


Title: CAN, I2C, XBee, MIKROBUS	
Designer: Sébastien MEYER	Sheet: 14 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

Boot Mode

BOOT2	BOOT1	BOOT0	Initial boot mode	Comments
0	0	0	UART and USB	
0	0	1	Serial NOR Flash	
0	1	0	eMMC	
0	1	1	NAND Flash	Default
1	0	0	Reserved (NoBoot)	
1	0	1	SD card	
1	1	0	UART and USB	
1	1	1	Serial NAND Flash	

Note: BOOTx pins are 5V tolerant I/O with programmable pull-down



S1.1	S1.2	S1.3	S1.4	**Description**
OFF	OFF	OFF	-	Boot from NAND
OFF	OFF	ON	-	Serial NAND flash
OFF	ON	OFF	-	Serial NOR flash
OFF	ON	ON	-	MicroSD card
ON	OFF	OFF	-	eMMC
ON	OFF	ON	-	UART and USB
ON	ON	OFF	-	UART and USB
ON	ON	ON	-	Reserved (NoBoot)

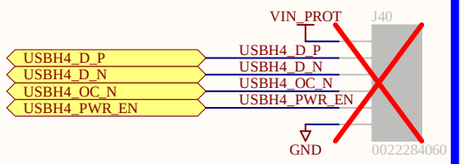
Title: Boot

Designer: Sébastien MEYER | Sheet: 15 of 18

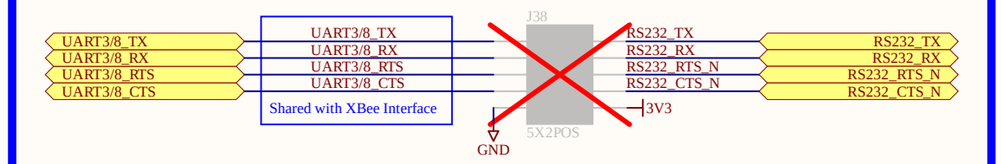
Variant: 55002167-02 | Rev: A

Description: ConnectCore MP1 Development board - CCMP13

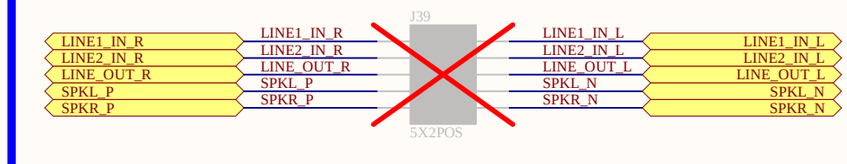
USB



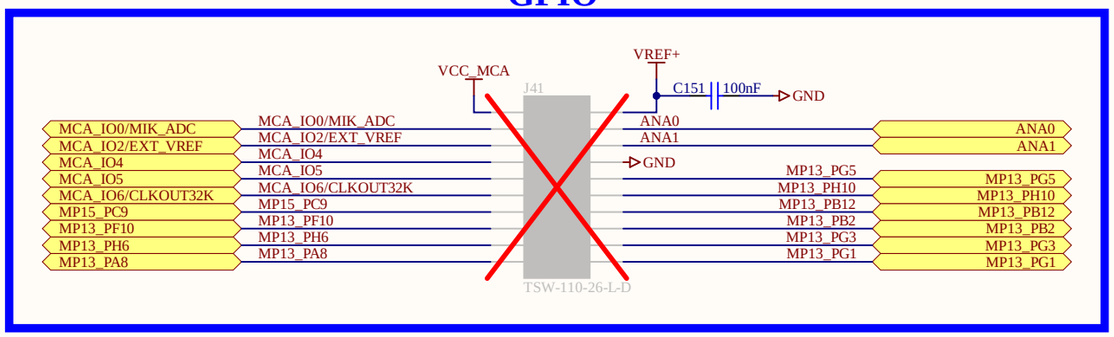
UART



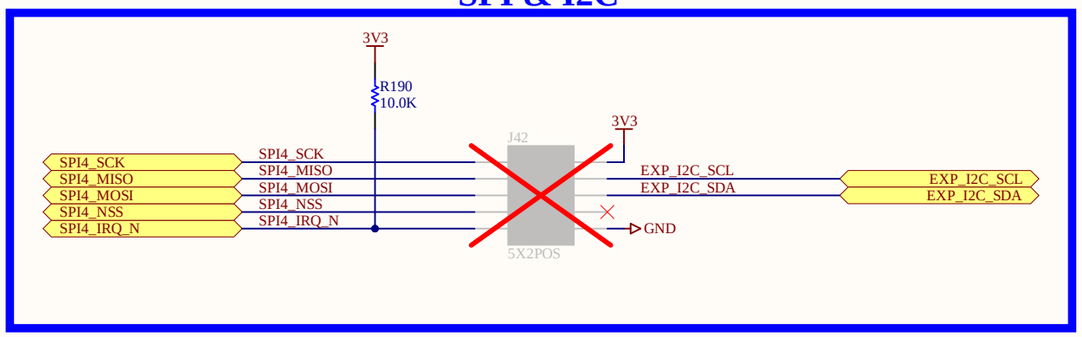
AUDIO



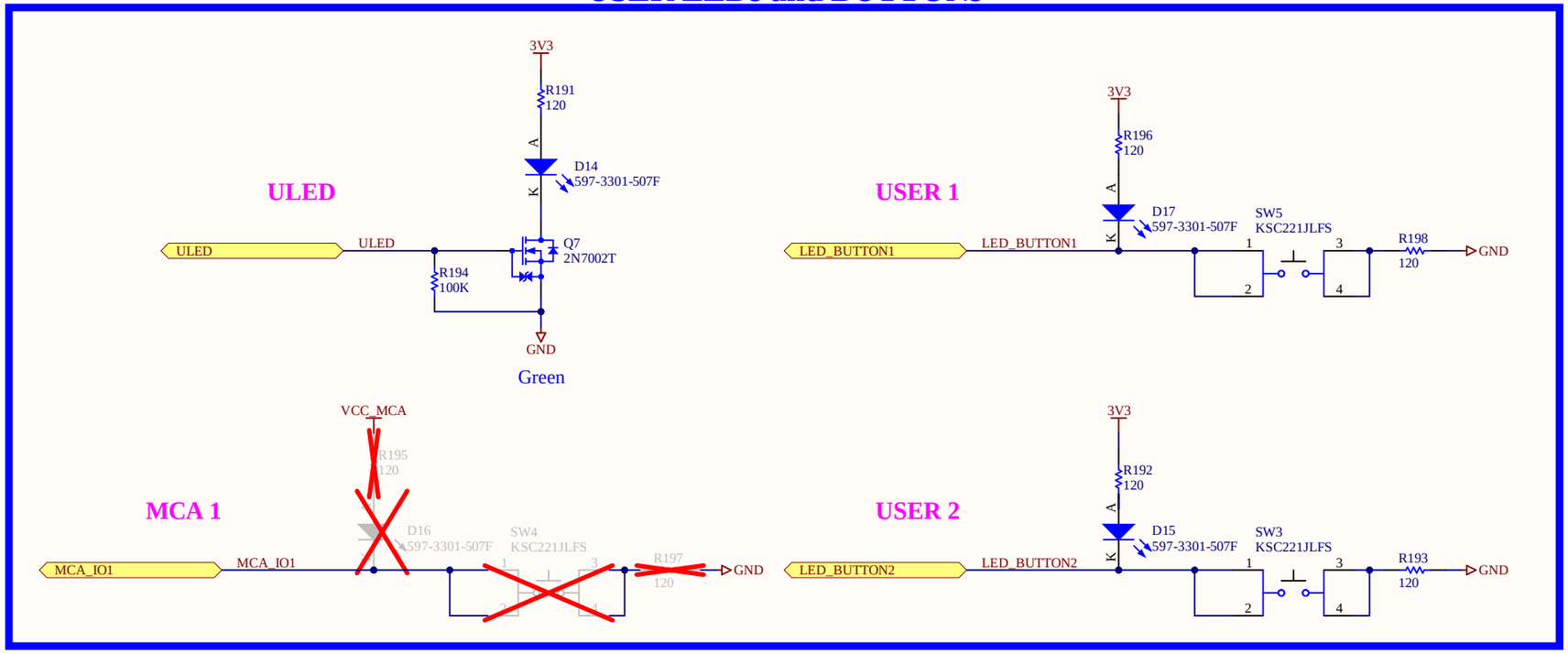
GPIO



SPI & I2C



USER LEDs and BUTTONs



Title: Expansion headers, User LEDs & buttons	
Designer: Sébastien MEYER	Sheet: 16 of 18
Variant: 55002167-02	Rev: A
Description: ConnectCore MP1 Development board - CCMP13	

System Power Rails

Voltage (V)	Supply Name	Block	Generated by	Output current (mA)	Notes
5.0	VIN	Overvoltage Prot	External DC supply	-	
		MCA LDO			
	VIN_PROT	CCMP1	Overvoltage Prot	-	
		5V load switch			
		USB Host VBUS			
	5V	HDMI	SIP32401A (U6)	2400	
		LVDS0			
		Parallel Display			
		CAN1, CAN2			
3.3	3V3	RS232	PMIC SW2	2000	Used also inside the SOM
		RS485			
		Gigabit Ethernet			
		10/100 Ethernet			
		USB Hub			
		LVDS			
		Parallel Display			
		Parallel Camera			
		AUDIO			
	PCIe_VCC	PCIe minicard	VIN_PROT	3000	
		XBee			
	VCC_MCA	MCA	AP2202 (U4)	150	
3.0	VCC_LICELL	RTC	External Coin Cell	-	
1.8	LDO6_1V8	LVDS	PMIC LDO6	150	
	1V8_CODEC	AUDIO	AP2202 (U24)	150	
	1V8_HDMI	HDMI	MCP1725 (U31)	500	

GPIO Table

Signal Name	CCMP15 GPIO	CCMP13 GPIO	MCA GPIO
10/100M_ETH_INT#	PC12	PH2	
10/100M_RST	PG0	PH7	
3V3_PWR_EN		PH3	
5V_EN	PC10	PF9	
CAM_GPIO	PF14		
CAM_PWDN	PE0		
DISP_RESET	PG3		
FDCAN1_STB	PC7	PC7	
FDCAN2_STB	PE5	PC6	
GIGABIT_RST	PG0	PI2	
LCD_IRQ_N	PG1		
LED_BUTTON1	PA13	PA13	
LED_BUTTON2	PA14	PA14	
LT8912_INT/HPD	PF15		
LT8912B_RST	PA9		
LVDS_PDWN	PA8		
MCA_IO1			MCA_IO1
MIKROBUS_INT	PF13	PF3	
MIKROBUS_RST	PF12	PH13	
PCIe_EN	PC11	PB6	
RTC_INT_N	PA4	PG7	
SPI4_IRQ_N	PD2	PH11	
USB_OTG_ID	PA10	PA10	
ULED	PC3	PG0	
VBUS_SENSE	PC8	PE6	
XBEE_RST	PZ2	PG15	

Interrupts Usage

IO index	CCMP15	CCMP13
0	PA0*	
1	PG1	
2	PD2	PH2
3		PF3
4	PA4	
5		
6		PE6
7		PG7
8	PC8	PF8*
9		
10	PA10	PA10
11		PH11
12	PC12	
13	PA13/PF13	PA13
14	PA14	PA14
15	PF15	

*Used inside the SOM

Title: GPIO Table, System Power Rails

Designer: Sébastien MEYER | Sheet: 17 of 18

Variant: 55002167-02 | Rev: A

Description: ConnectCore MP1 Development board - CCMP13

Format: DD/MM/YYYY

17/06/2022 - CCMP1 Development Board
* Revision: 01
- Initial version

14/09/2022 - CCMP1 Development Board
* Revision: 02
- PCB spin: 3001744x-01 rev A #NAME? 3001744x-02 rev A

11/10/2022 - CCMP1 Development Board
* Revision: 03
- Populate R23.
- Remove R183.
- Remove Ethernet and USB switches.
- Remove MCA LED and button.

16/11/2022 - CCMP1 Development Board
* 55002167-01 rev 1P:
- Populate R56.
- Remove R57, R237, U32, C180, C181.
- Fix Mikrobus socket naming.
- Fix I2C address table.
* 55002167-02 rev 04:
- Remove X4.

06/02/2023 - CCMP1 Development Board
* 55002167-02 rev 1P : NPRO-006303
- Initial version of ConnectCore MP13x variant.

15/06/2023 - CCMP1 Development Board
* 55002167-01 rev 2P : ECO-012617
- Move from 3001744x-02 revA PCB to 3001744x-03 revA PCB.
- Fix bottom and Mikroe serigraphy on the PCB.
- Fixing HDMI hotplug and touch interrupt line conflict. We have now a dedicated I/O for HDMI hotplug and a seperate one for LCD_IRQ_N.

21/08/2023 - CCMP1 Development Board
* 55002167-01 rev 3P : ECO-012667
- ConnectCore MP15x SoM moving from 30016952-03 revA to 30016952-04 revA PCB. No changes on the DVK.

10/10/2023 - CCMP1 Development Board
* 55002167-01 rev 4P, 55002167-02 rev 2P: ECO-012796
- ConnectCore MP1 U-Boot partition layout update. Move revision without hardware changes.

29/11/2023 - CCMP1 Development Board
* 55002167-01 rev 5P: ECO-012915
- ConnectCore MP1 label update. Move revision without hardware changes.

11/12/2023 - CCMP1 Development Board
* 55002167-01 rev 6P, 55002167-02 rev 3P: ECO-012913
- Move from 3001744x-03 revA PCB to 3001744x-04 revA PCB.
- Replace the SOM populated on the CCMP13 DVK by CCMP133 (CC-WST-DX58-NK).

05/02/2023 - CCMP1 Development Board
* 55002167-01 rev 7P, 55002167-02 rev 4P: ECO-013024
- No hardware changes.

14/03/2023 - CCMP1 Development Board
* 55002167-01 rev A, 55002167-02 rev A: ECO-013113
- Replace U30 (EOL) by 16000235. Replace R221 by 10K resistor.

LBL1
LABEL
28000351_LABEL

TXT1
LABEL
TEXT
95015873

P2
Mechanical Socket
LPF245-1270-21AB55A + MGS245-SB01-21A9512

Title: History
Designer: Sébastien MEYER | Sheet: 18 of 18
Variant: 55002167-02 | Rev: A
Description: ConnectCore MP1 Development board - CCMP13