ConnectCore 6UL Single Board Computer PRO

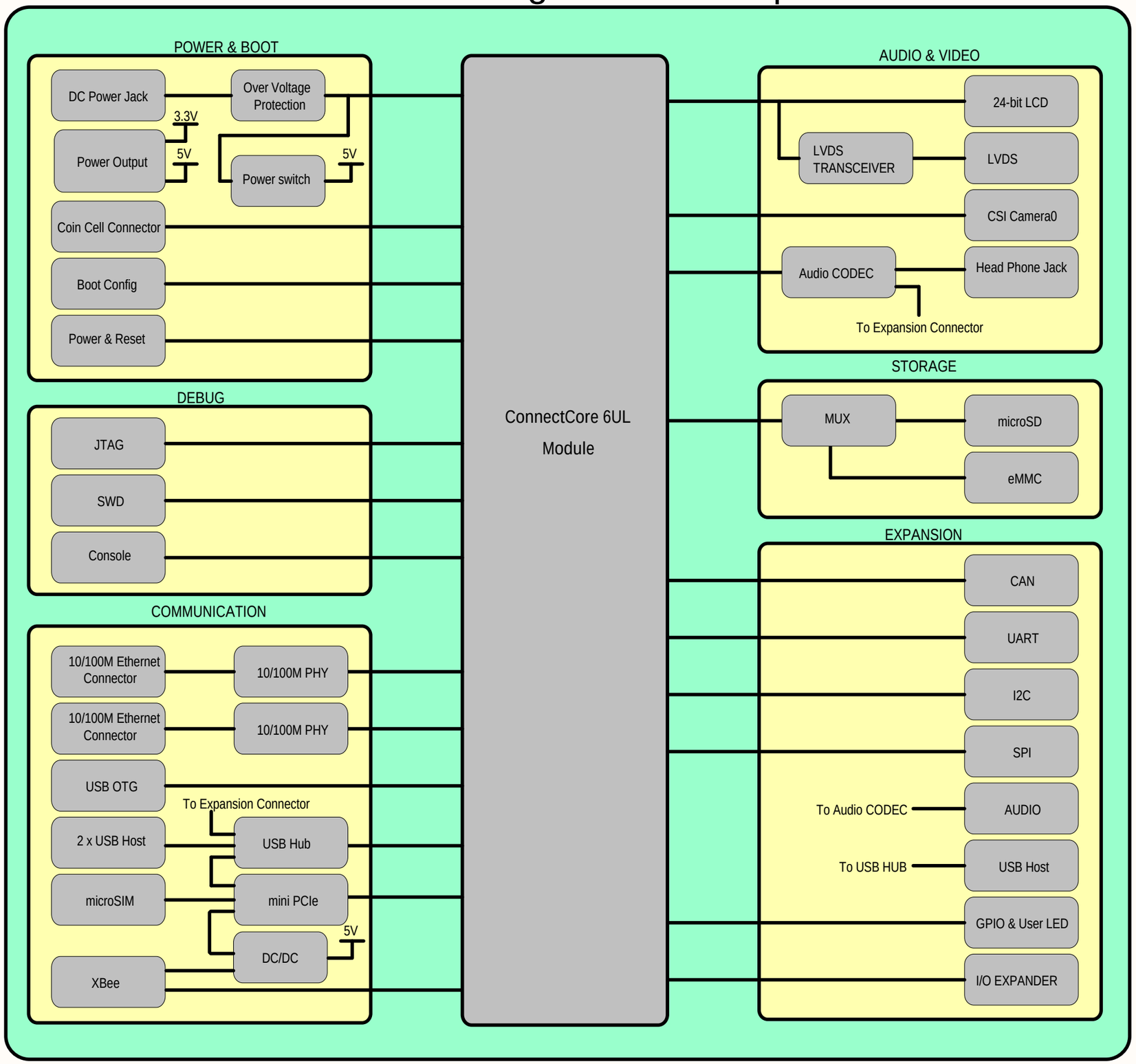
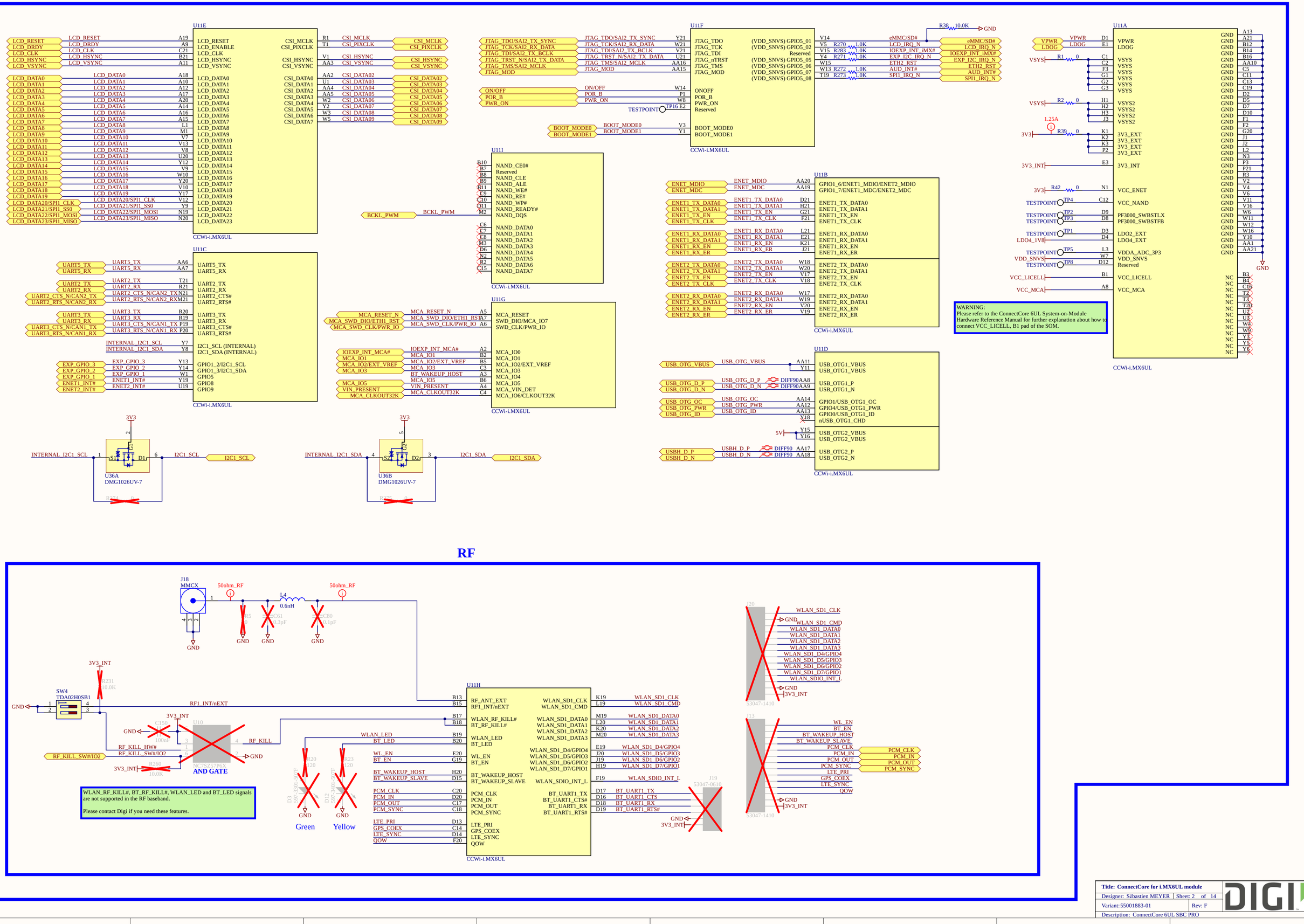


Table of Content

Title: Block Diagram	
Designer: Sébastien MEYER	Sheet: 1 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

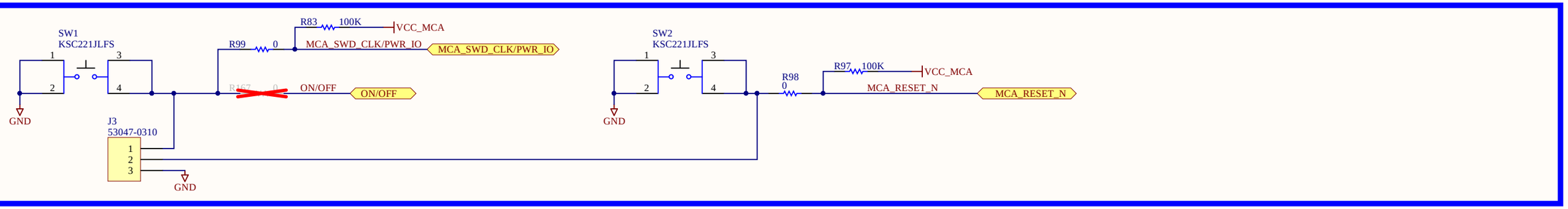
ConnectCore for i.MX6UL Module



RF

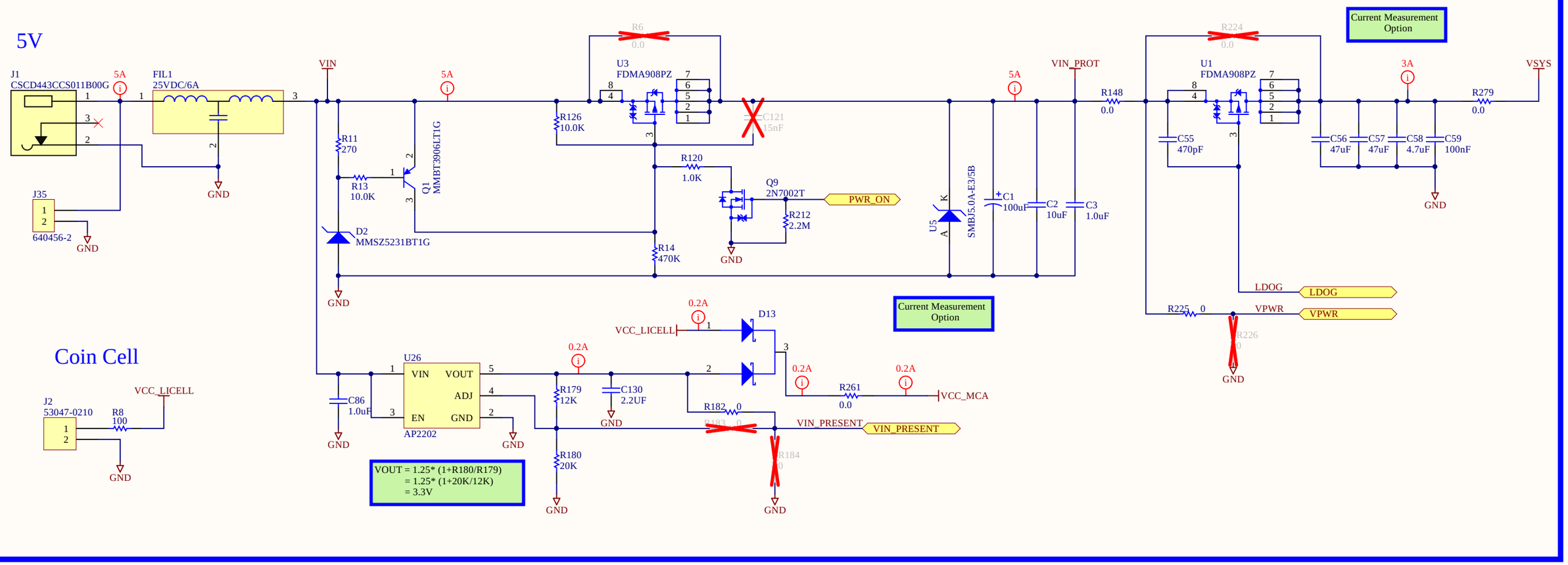
Title: ConnectCore for i.MX6UL module	
Designer: Sébastien MEYER	Sheet: 2 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

Power and Reset

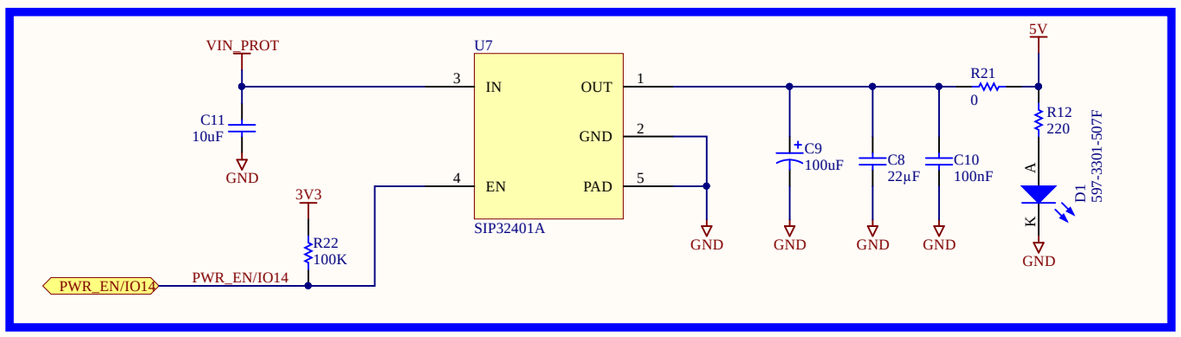


Supply Inputs

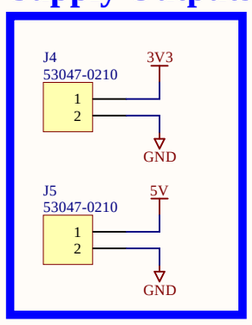
Over Voltage Protection



5V Load switch

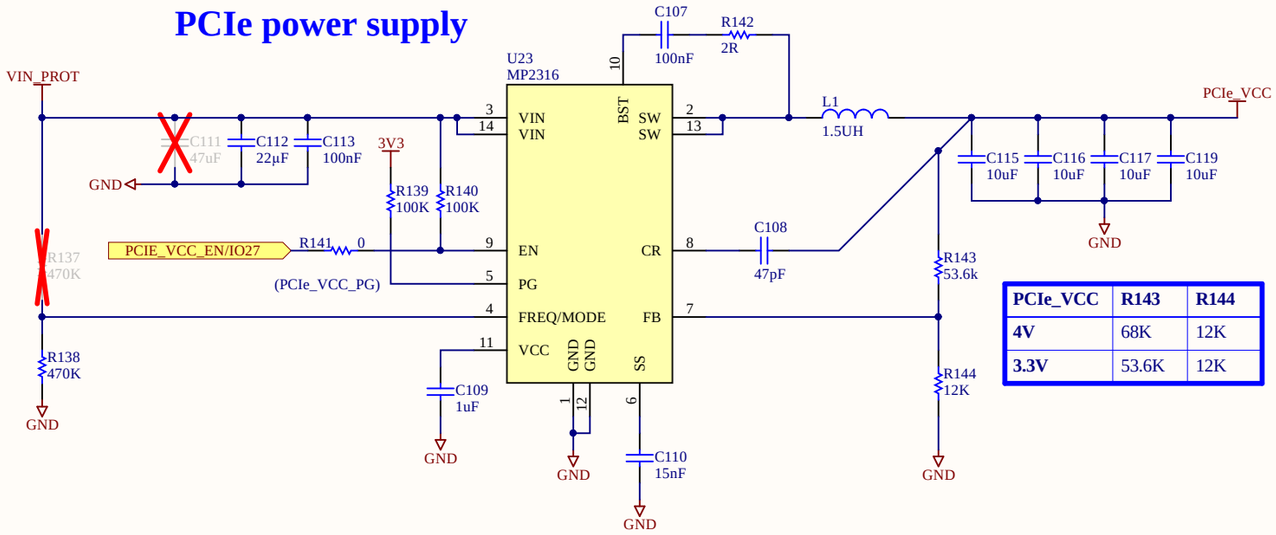


Supply Outputs



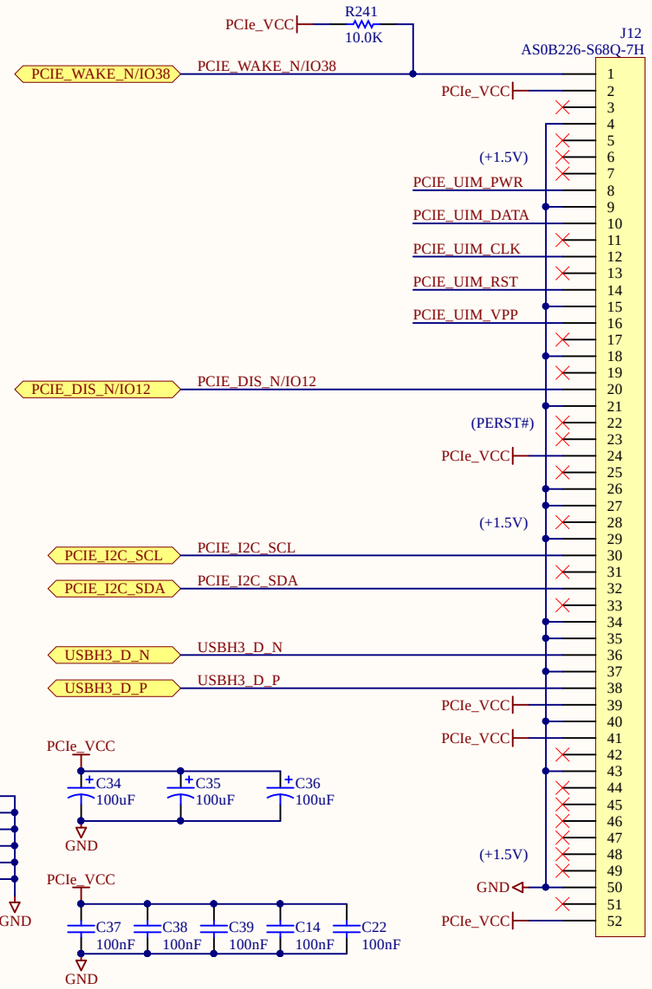
Title: Power, Boot		
Designer: Sébastien MEYER	Sheet: 3 of 14	
Variant: 55001883-01	Rev: F	
Description: ConnectCore 6UL SBC PRO		

PCIe power supply

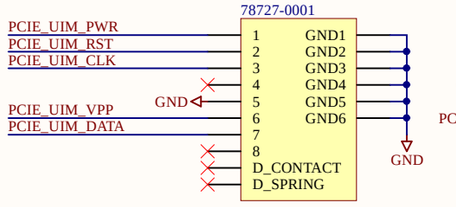


PCIe_VCC	R143	R144
4V	68K	12K
3.3V	53.6K	12K

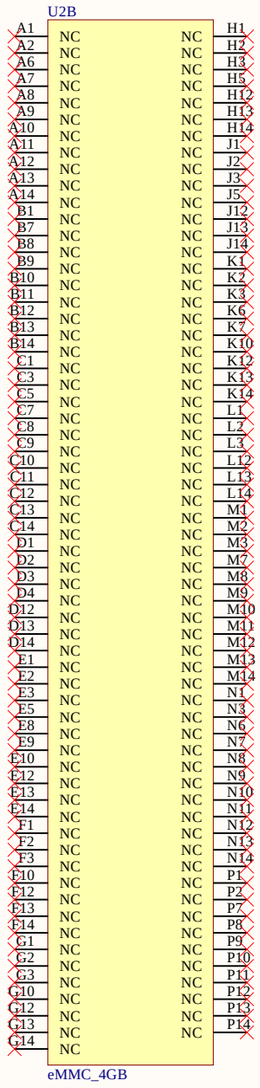
miniPCIe

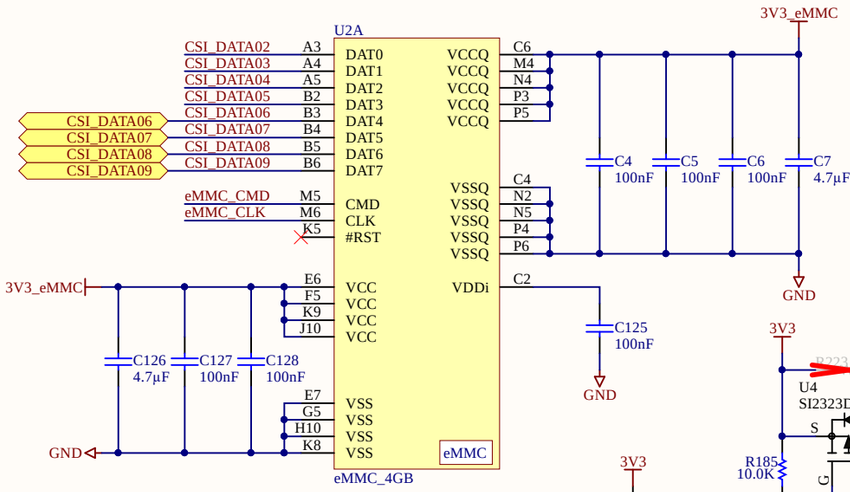


micro SIM

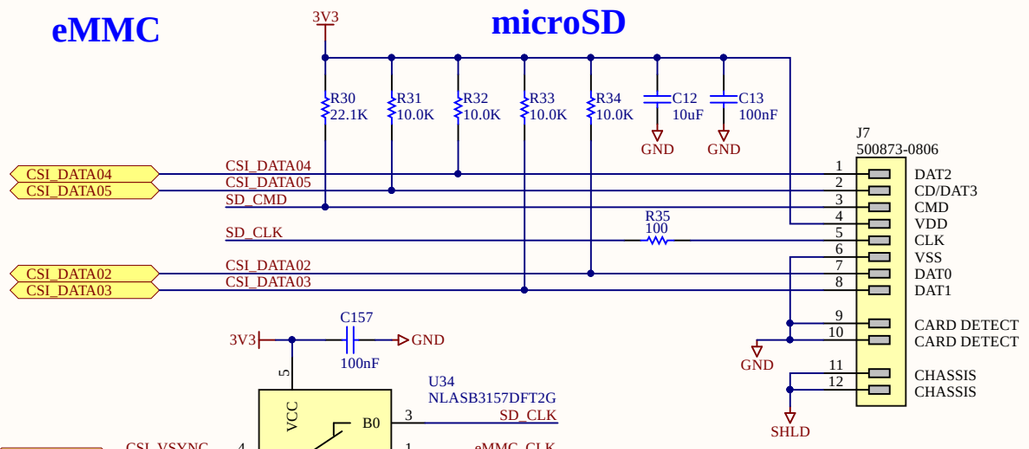


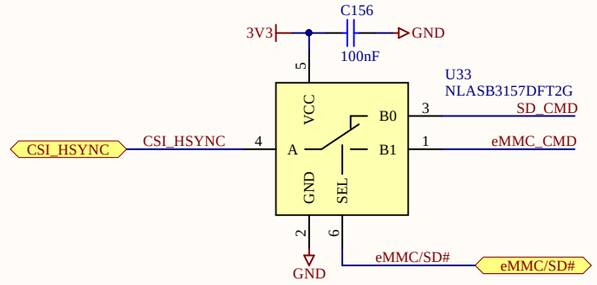
eMMC

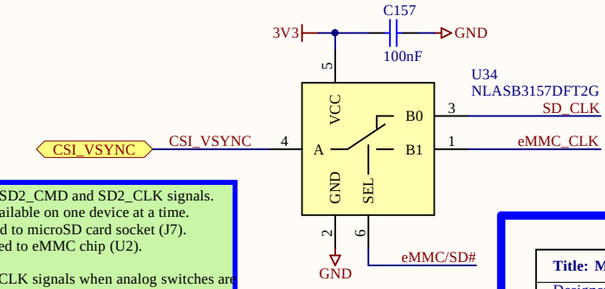




microSD





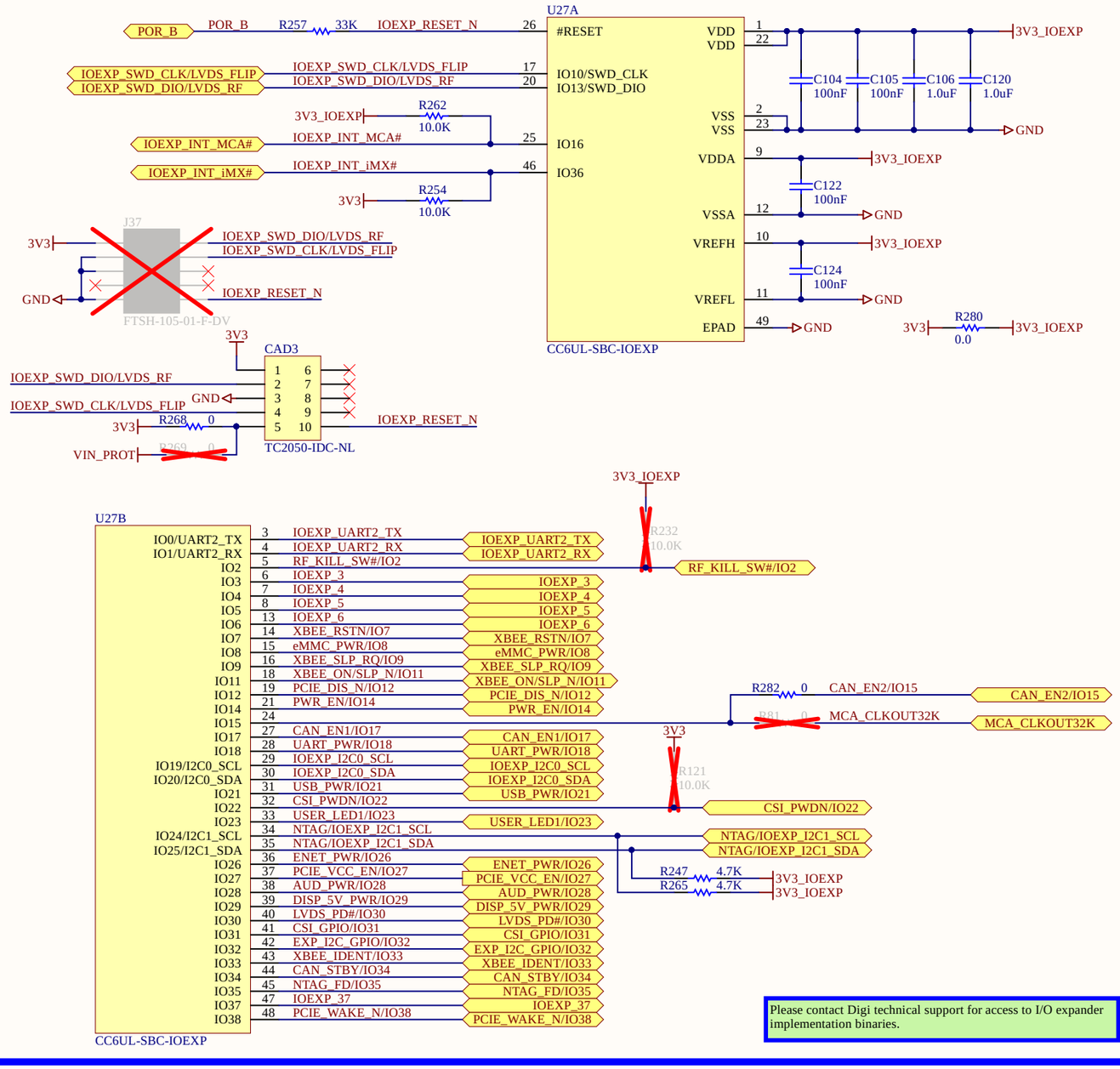


U33 and U34 are analog switches responsible for multiplexing SD2_CMD and SD2_CLK signals.
Through these switches, the CMD and CLK signals are only available on one device at a time.
When eMMC/SD# signal is LOW, CMD and CLK are connected to microSD card socket (J7).
When eMMC/SD# signal is HIGH, CMD and CLK are connected to eMMC chip (U2).

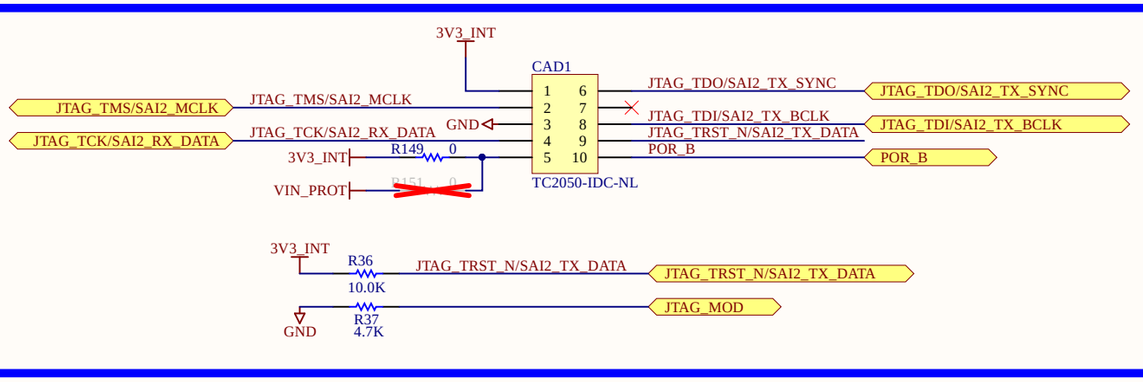
R243/R244/R245/R246 are available for connecting CMD and CLK signals when analog switches are not populated.

Title: MicroSD/eMMC, Mini PCIe, MicroSIM	
Designer: Sébastien MEYER	Sheet: 4 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

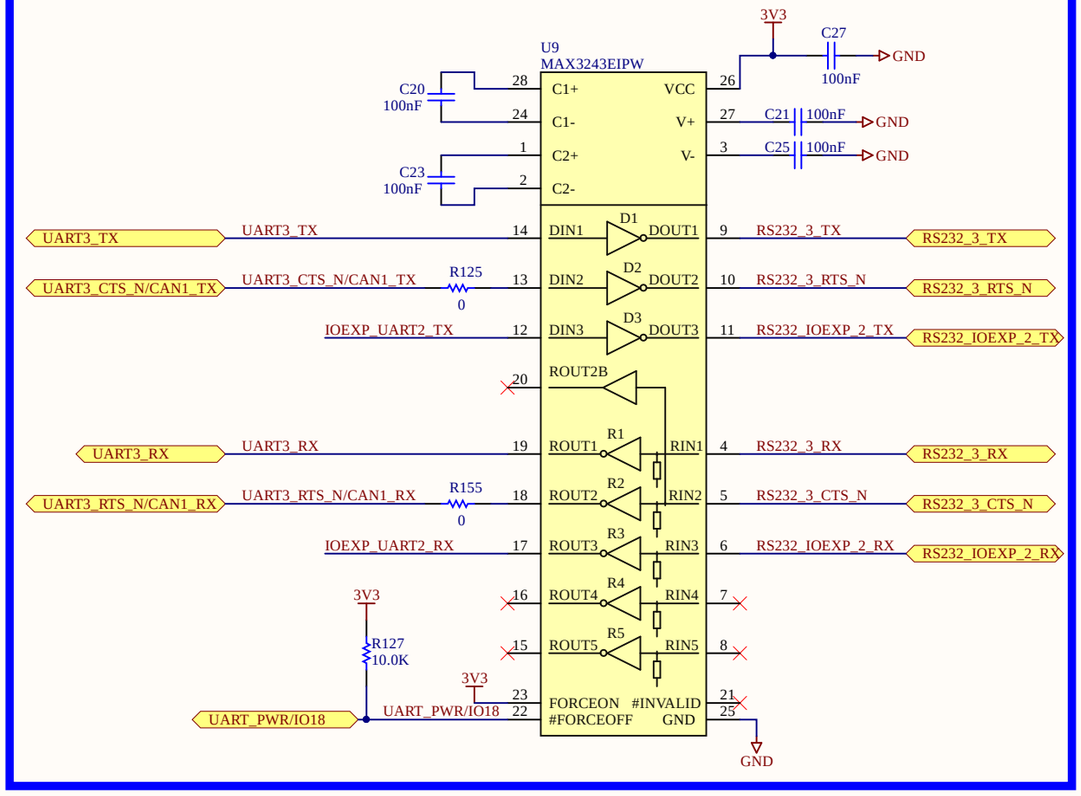
I/O EXPANDER



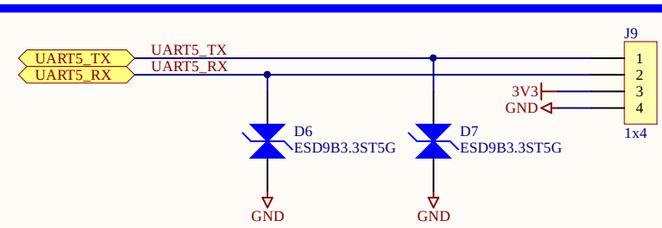
JTAG



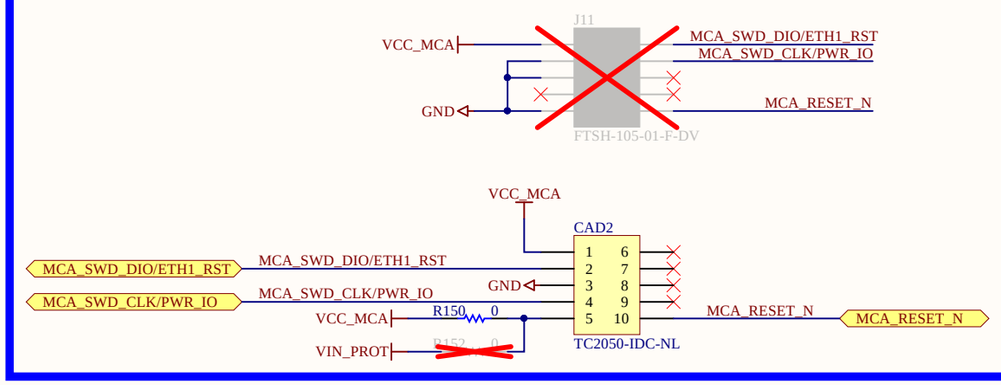
UART 3



Console TTL



SWD



Title: JTAG, SWD, Console, UART	
Designer: Sébastien MEYER	Sheet: 5 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

10/100M Ethernet

U8
SI2323DS-T1-E3
R27 0
R7 10.0K
C26 1nF
R51 100K
Q7 2N7002T
ENET_PWR/IO26
Enabled by default

U16
LAN8720Ai
L2 220
C15 4.7uF
C16 100nF
C17 100nF
C28 100nF
R49 1.0K
R50 1.0K
R44 49.9
R45 49.9
R46 49.9
R47 49.9
R48 0
C29 22nF
C30 100nF
C31 100nF
C32 100nF
C33 100nF
C40 4.7uF
C41 1.0uF
C42 470pF

J6
RJ45
R43 150
R52 150
R55 0

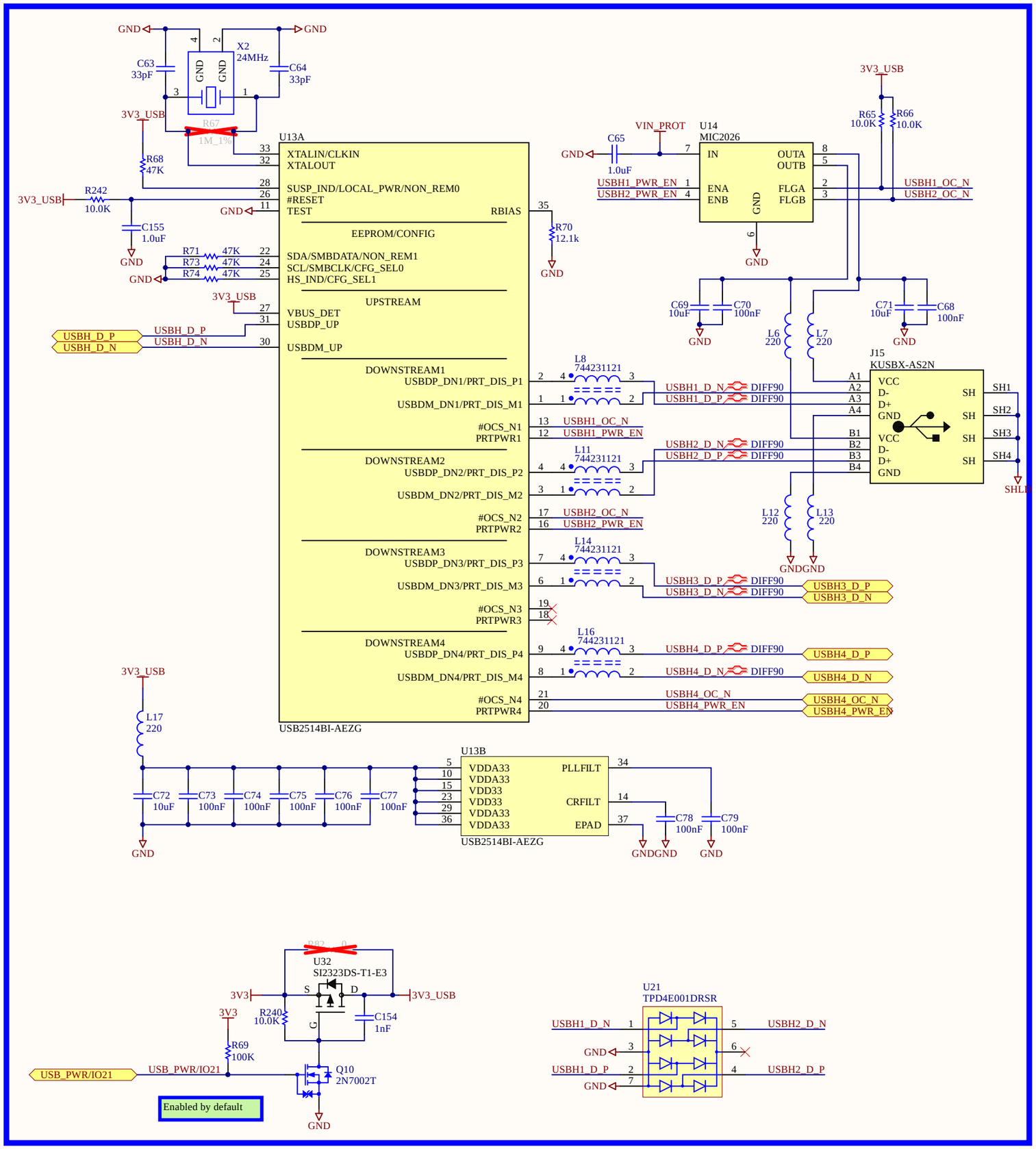
MODE[2:0]	MODE DEFINITIONS
000	10Base-T Half Duplex. Auto-negotiation disabled
001	10Base-T Full Duplex. Auto-negotiation disabled
010	100Base-TX Half Duplex. Auto-negotiation disabled.
011	100Base-TX Full Duplex. Auto-negotiation disabled.
100	100Base-TX Half Duplex is advertised. Autonegotiation enabled.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

U24
LAN8720Ai
L3 220
C43 4.7uF
C44 100nF
C45 100nF
C46 100nF
R85 49.9
R86 49.9
R87 49.9
R88 49.9
R79 0
C47 22nF
C48 100nF
C49 100nF
C50 100nF
C51 100nF
C52 4.7uF
C53 1.0uF
C54 470pF

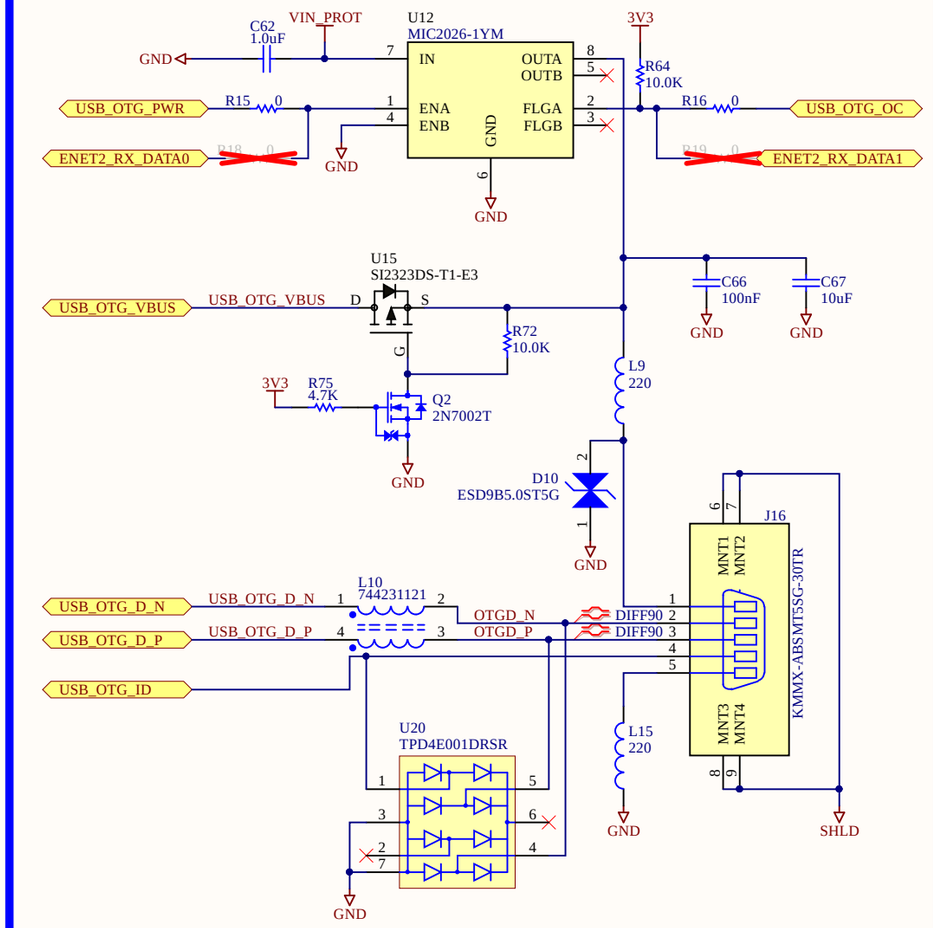
J8
RJ45
R76 150
R124 150

Title: 2x 10/100M Ethernet
Designer: Sébastien MEYER
Sheet: 6 of 14
Variant: 55001883-01
Rev: F
Description: ConnectCore 6UL SBC PRO

USB_HOST

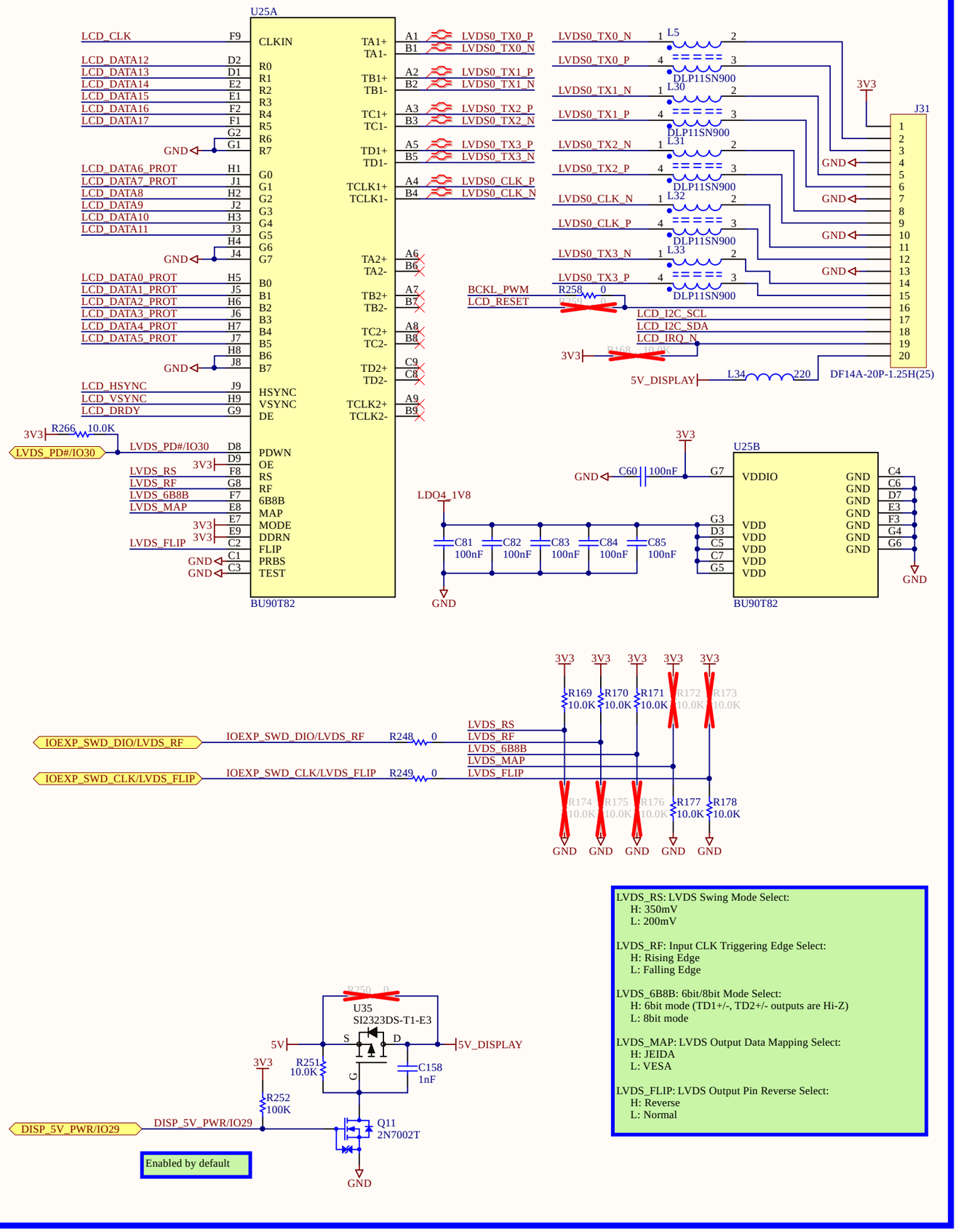


USB_OTG



Title: USB OTG, USB Hub, USB Host	
Designer: Sébastien MEYER	Sheet: 7 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

LVDS



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

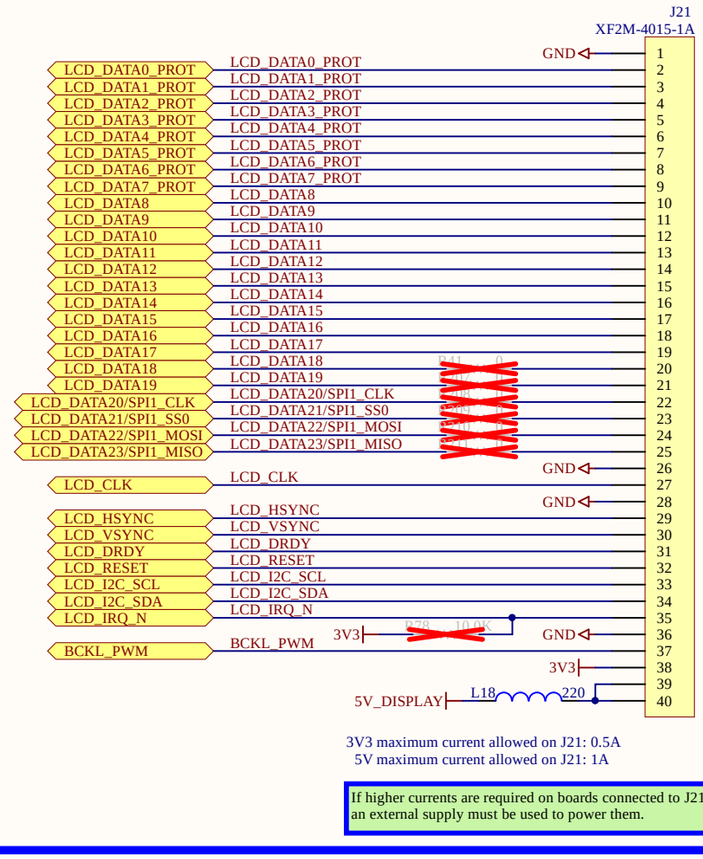
LVDS_RF: Input CLK Triggering Edge Select:
H: Rising Edge
L: Falling Edge

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

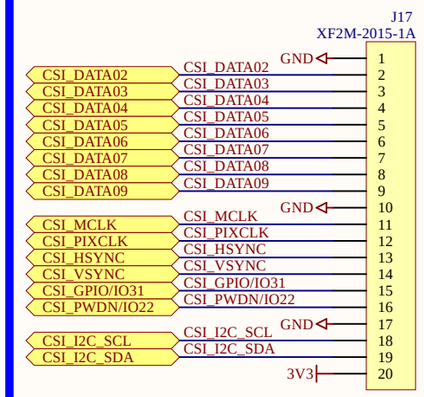
Parallel Display 0



3V3 maximum current allowed on J21: 0.5A
5V maximum current allowed on J21: 1A

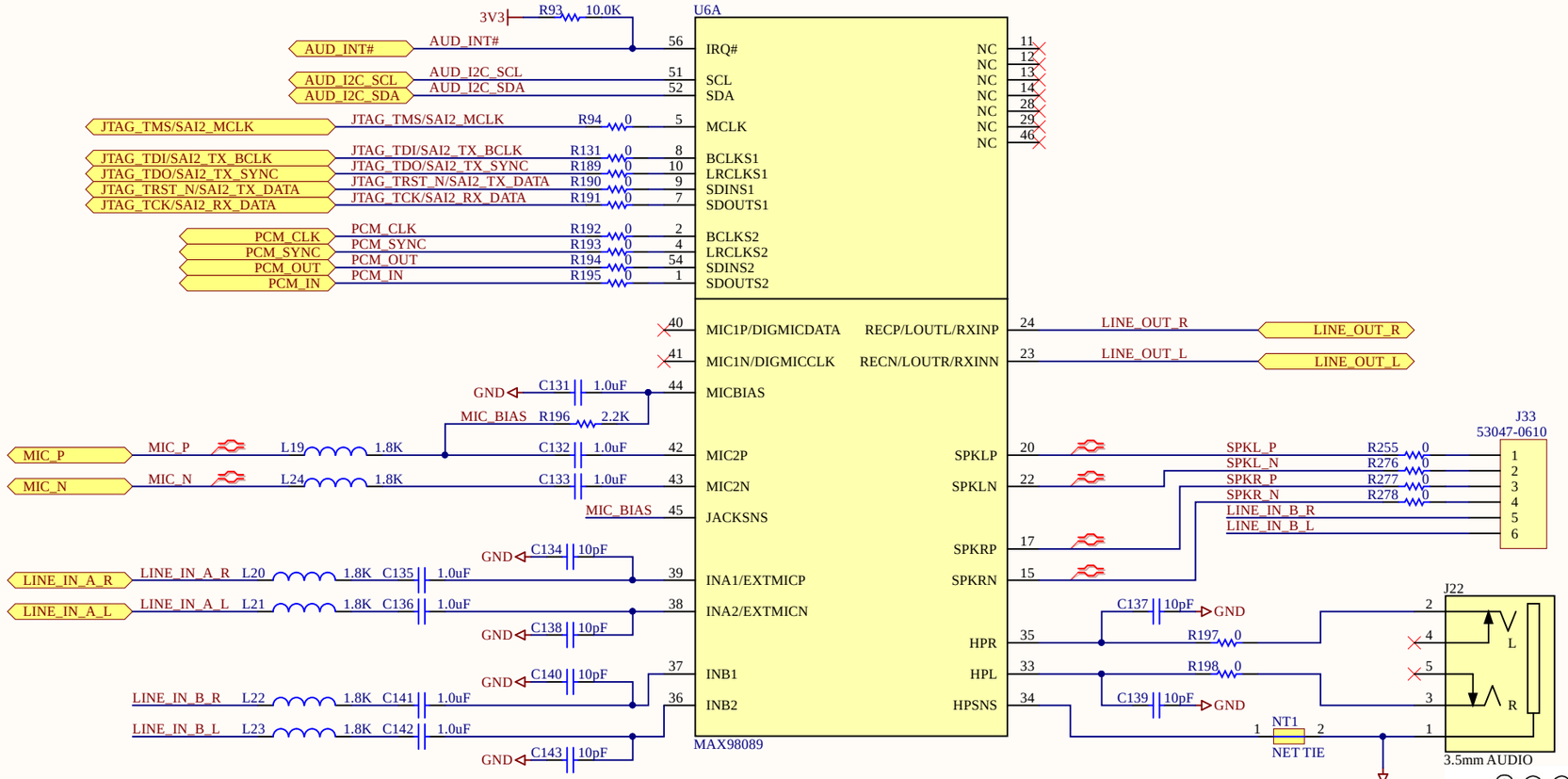
If higher currents are required on boards connected to J21,
an external supply must be used to power them.

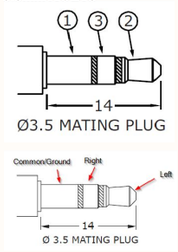
Parallel Camera

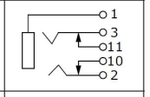


Title: Displays and Cameras	
Designer: Sébastien MEYER	Sheet: 8 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

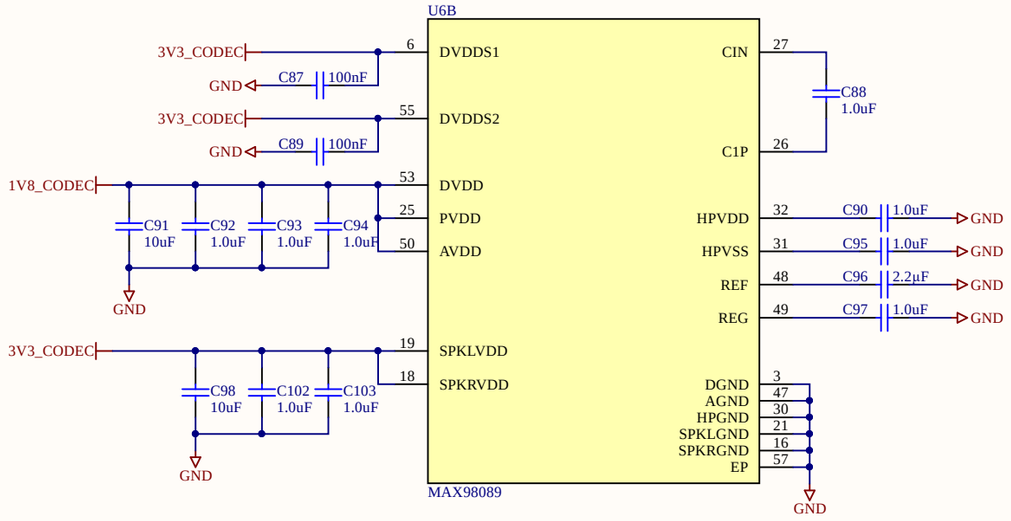
AUDIO

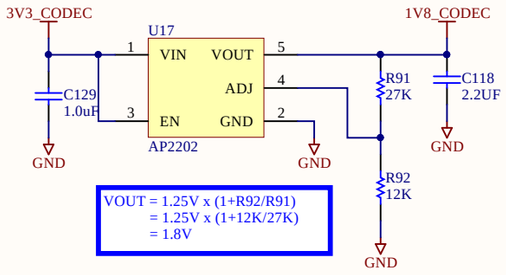


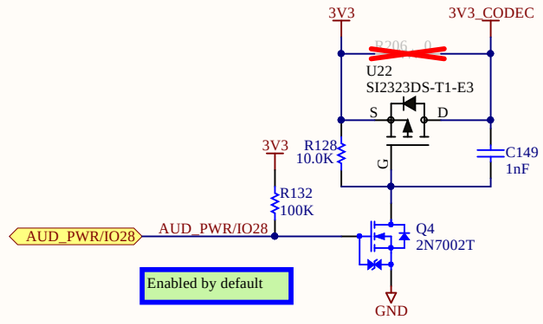


Model No.	SJ1-3515-SMT
Schematic	
PIN	
1	sleeve
2	tip
3	ring
10	tip switch
11	ring switch

WARNING:
Right and left channels are inverted on J22.
J22.2 should be the left channel and J22.3 should be right channel.

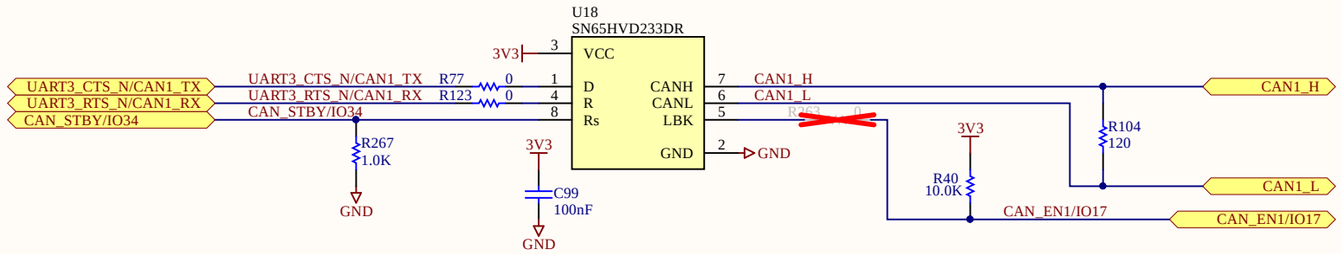




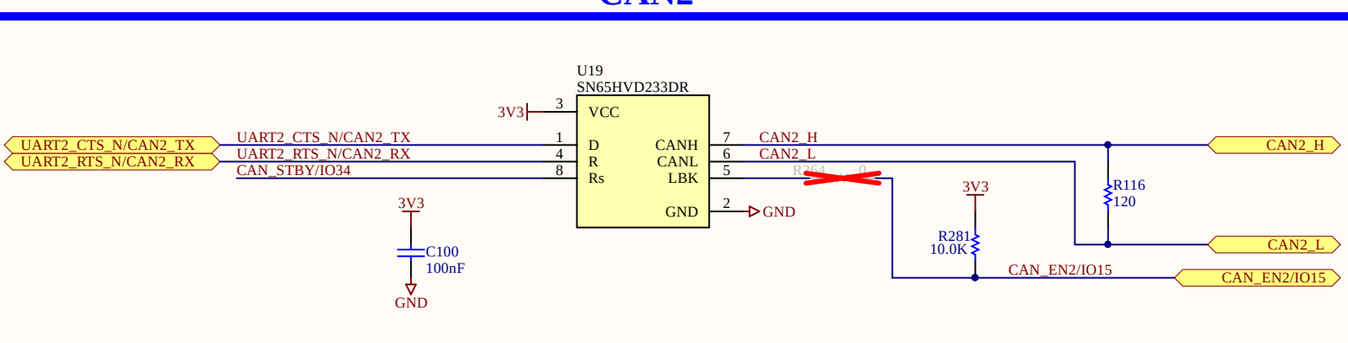


Title: Audio		
Designer: Sébastien MEYER	Sheet: 9 of 14	
Variant: 55001883-01	Rev: F	
Description: ConnectCore 6UL SBC PRO		

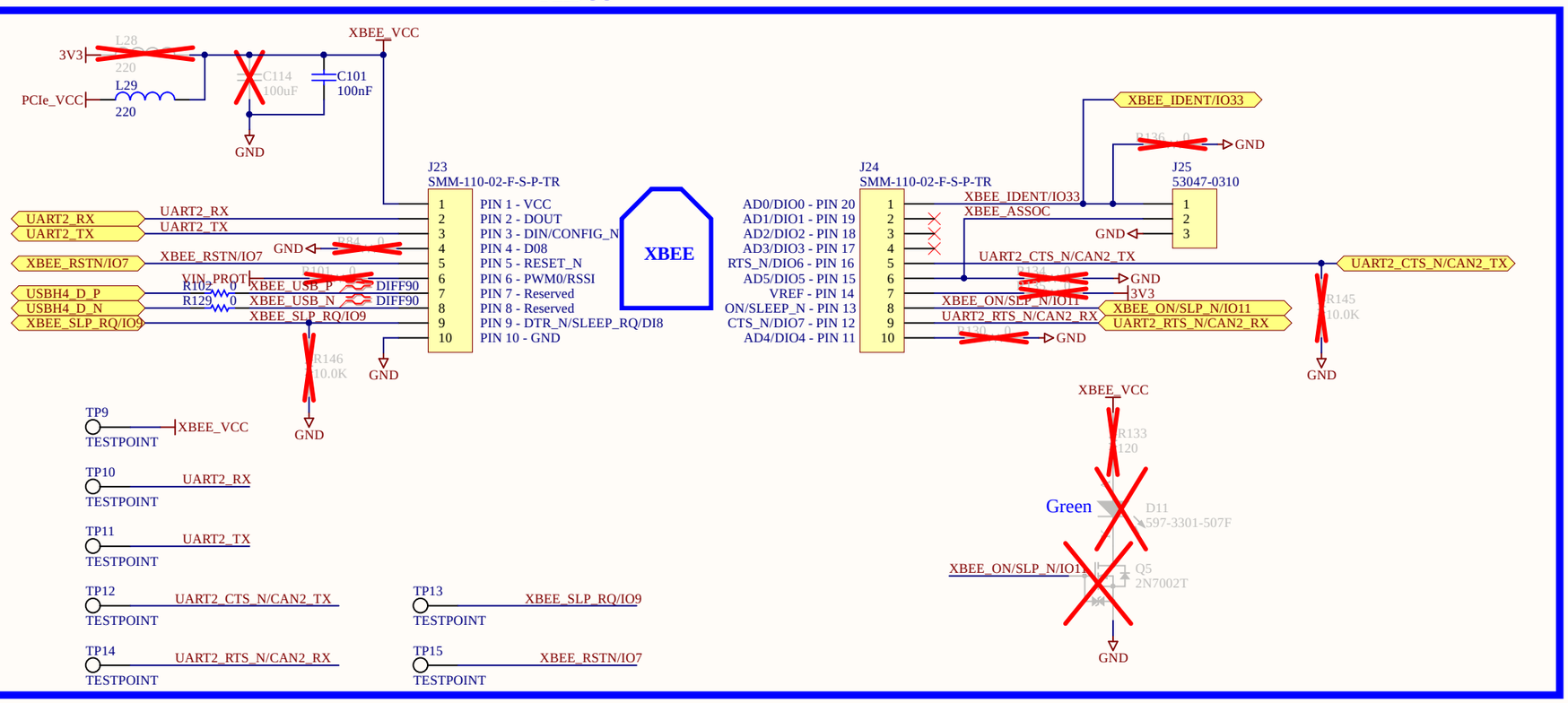
CAN1



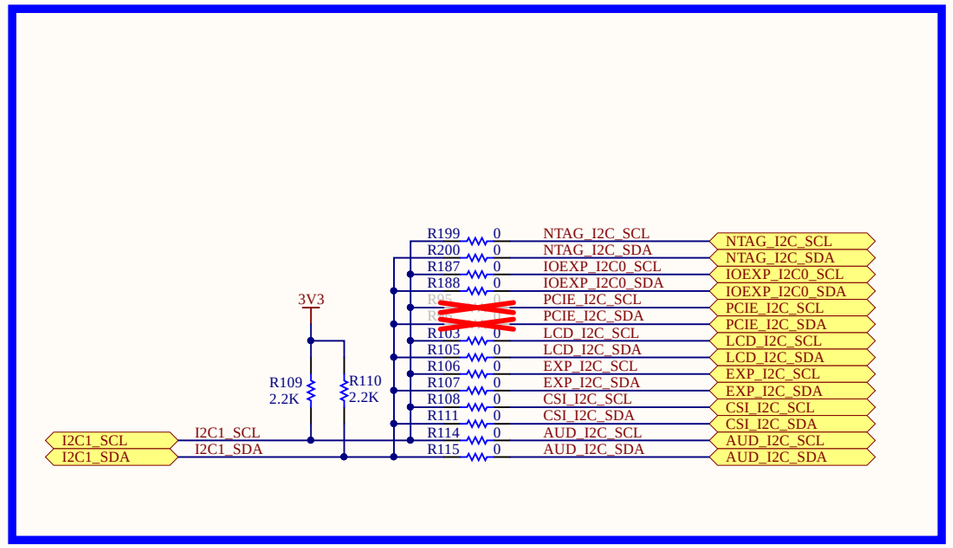
CAN2



XBee



I2C

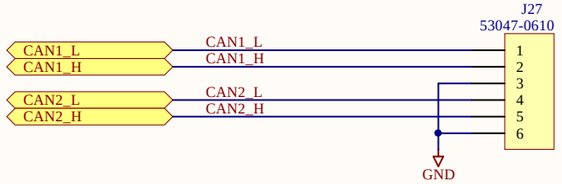


I2C1 (3.3V)

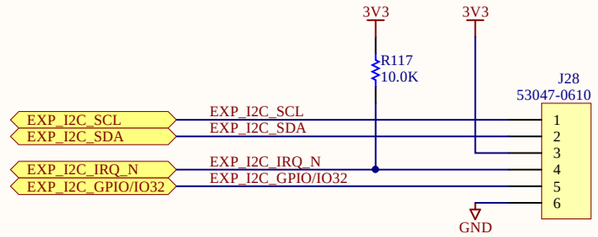
Peripheral	Speed (kbps)	Addresses (hex)	Default Address (hex)
PCIe Port	TBD	TBD	TBD
LVDS0 Touch	TBD	TBD	TBD
LCD Touch	TBD	TBD	TBD
Expansion Port	TBD	TBD	TBD
Camera	TBD	TBD	TBD
Audio CODEC	400	Write : 0x20 Read : 0x21	Write : 0x20 Read : 0x21
IOEXP	TBD	TBD	TBD
NTAG	TBD	Write : 0xAA Read : 0xAB	Write : 0xAA Read : 0xAB

Title: CAN, I2C, XBee		
Designer: Sébastien MEYER	Sheet: 10 of 14	
Variant: 55001883-01	Rev: F	
Description: ConnectCore 6UL SBC PRO		

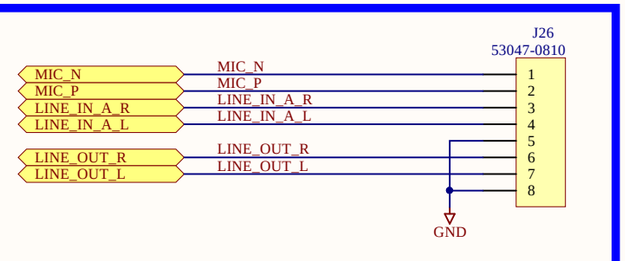
CAN



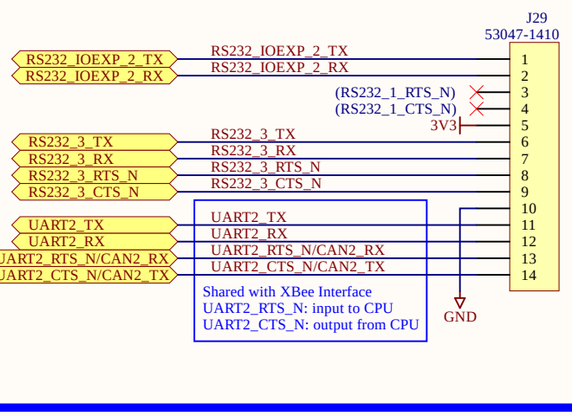
I2C



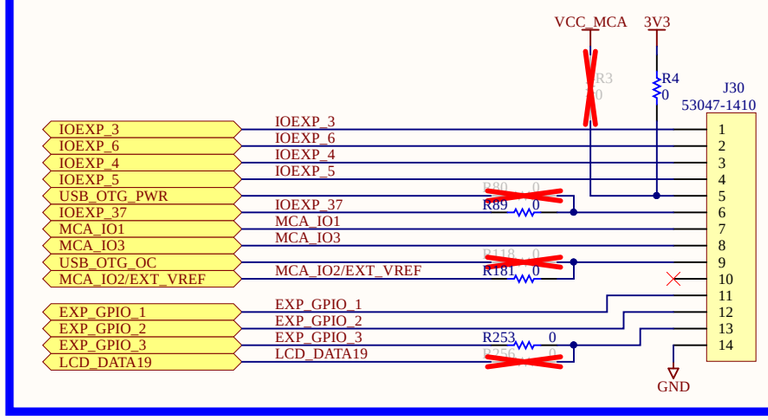
AUDIO



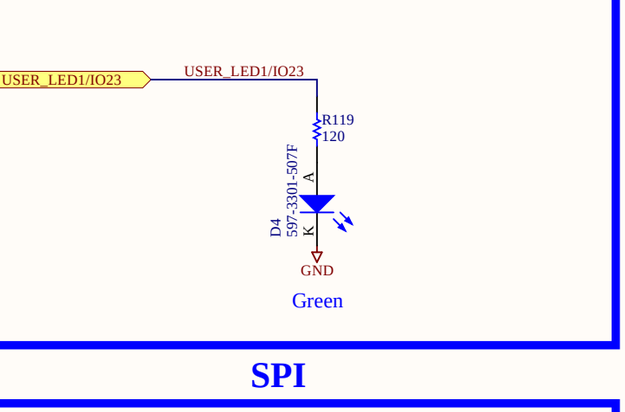
UART



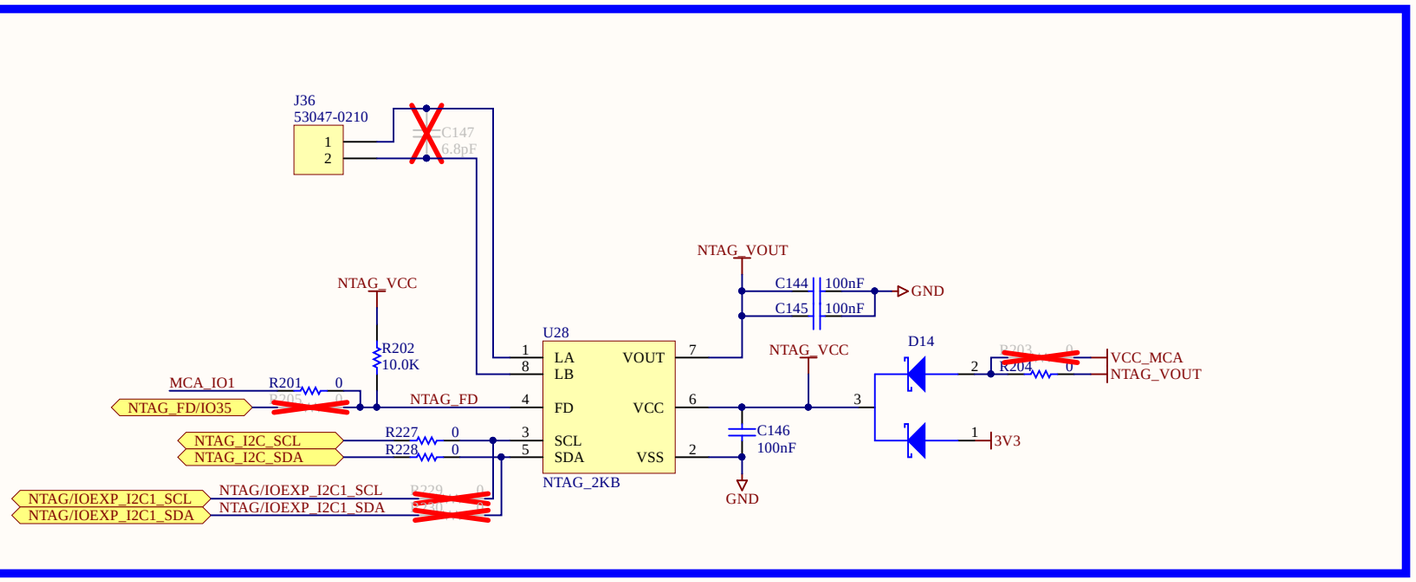
GPIO



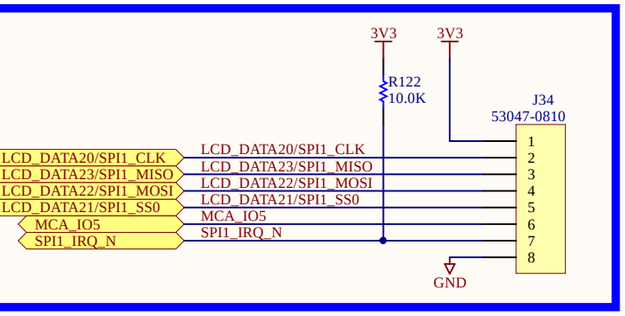
USER LED



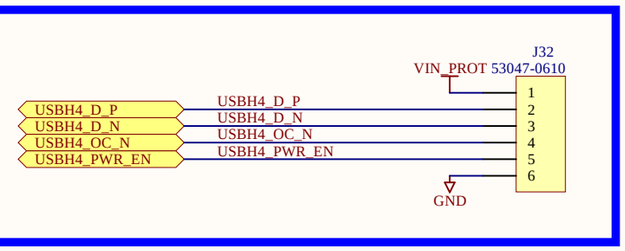
NFC NTAG I2C



SPI

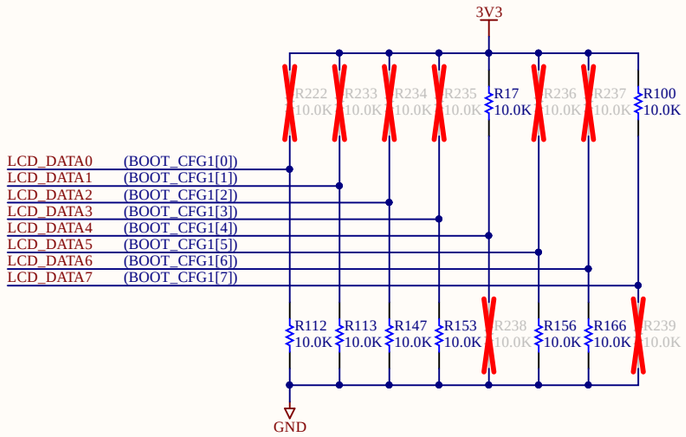


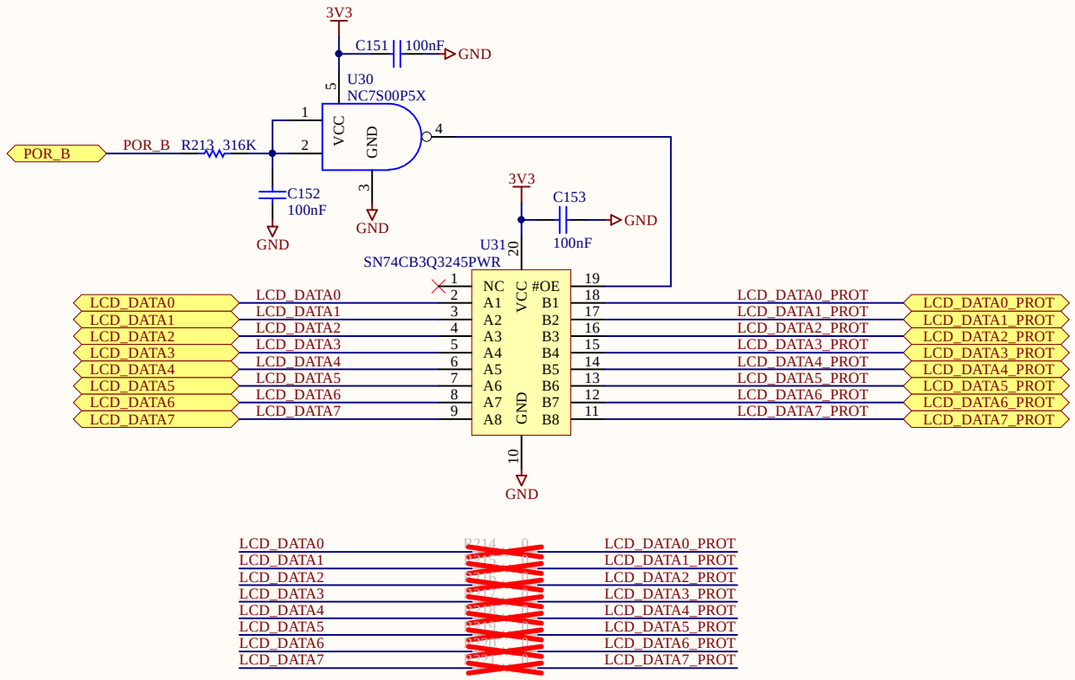
USB



Title: Expansion Connectors, User LEDs, NTAG	
Designer: Sébastien MEYER	Sheet: 11 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

Bootstrap

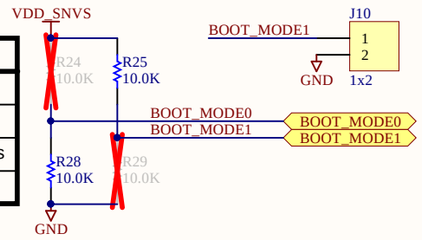




BOOTSTRAP	NAND
BOOT_CFG1[0]	Row Address Cycles: 00 - 3 cycles 01 - 2 cycles 10 - 4 cycles 11 - 5 cycles
BOOT_CFG1[1]	
BOOT_CFG1[2]	Number of devices: 00 - 1 device 01 - 2 devices 10 - 4 devices 11 - Reserved
BOOT_CFG1[3]	
BOOT_CFG1[4]	Pages in Block: 00 - 128 pages 01 - 64 pages 10 - 32 pages 11 - 256 pages
BOOT_CFG1[5]	
BOOT_CFG1[6]	Samsung's toggle mode DDR NAND 0 - Raw NAND 1 - Toggle mode NAND
BOOT_CFG1[7]	Boot Device Selection: 1 - Boot from NAND interface

Boot Mode

BOOT_MODE1	BOOT_MODE0	Description
0	0	Boot from Fuses
0	1	Serial Downloader
1	0	Boot from board settings
1	1	Reserved



Title: Bootstrap	
Designer: Sébastien MEYER	Sheet: 12 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	

System Power Rails

Voltage (V)	Supply Name	Block	Generated by	Current Capability (mA)	Notes
5.0	VIN	Overvoltage Prot	External DC supply	-	
		MCA LDO			
	VIN_PROT	ConnectCore 6UL	Overvoltage Prot	-	
		5V load switch			
		USB Host VBUS			
		USB OTG VBUS			
	5V	LVDS0	Load switch (U7)	-	
		Parallel LCD			
		CC6UL VBUS			
3.3	3V3	eMMC	PMIC SW2	1250	
		microSD			
		UART RS-232			
		I/O EXPANDER			
		2x10/100M ENET			
		USB Hub			
		LVDS			
		Parallel LCD			
		Parallel Camera			
		AUDIO			
		CAN1/2			
		XBee			
		NTAG			
	PCIe_VCC	PCIe minicard	VIN_PROT	3000	
	VCC_MCA	MCA	AP2202	150	
3.0	VCC_LICELL	RTC	External Coin Cell	-	
	VDD_SNVS	BOOT	PMIC VSNVS	-	
1.8	LDO4_1V8	LVDS	PMIC LDO4	350	
	1V8_CODEC	AUDIO	AP2202	150	

GPIO Table

Signal Name	GPIO	Use
i.MX6UL processor		
GPIO1_5	GPIO1_5	EXP_GPIO_1
GPIO1_8	GPIO1_8	ENET1_INT#
GPIO1_9	GPIO1_9	ENET2_INT#
GPIO5_01	GPIO5_01	eMMC/SD#
GPIO5_02	GPIO5_02	LCD_IRQ_N
GPIO5_03	GPIO5_03	IOEXP_INT_iMX#
GPIO5_05	GPIO5_05	EXP_I2C_IRQ_N
GPIO5_06	GPIO5_06	ETH2_RST
GPIO5_07	GPIO5_07	AUD_INT#
GPIO5_08	GPIO5_08	SPI1_IRQ_N
MCA (KL03)		
SWD_CLK	PTA0	PWR_IO
MCA_IO0	PTB0/LLWU_P4	KL4_INT_MCA#
MCA_IO4	PTA9	BT_WAKEUP_HOST

Title: GPIO Table, System Power Rails

Designer: Sébastien MEYER | Sheet: 13 of 14

Variant: 55001883-01 | Rev: F

Description: ConnectCore 6UL SBC PRO

Format: DD/MM/YYYY

12/02/2016 - ConnectCore i.MX6UL Single Board Computer
* Initial version

19/09/2016 - ConnectCore i.MX6UL Single Board Computer
* NPR004795 : 55001883-01 rev 03:
- PCB spin: 3001517x-01 revA => 3001517x-02 revA

08/11/2016 - ConnectCore i.MX6UL Single Board Computer
* NPR004832 : 55001883-01 rev 1P:
- Change R212 to 2.2M
- Populate R140
- Change R257 to 37K
- Depopulate BT and WLAN LEDs
- Marked CC6UL pad B7 as Reserved. This signal is used on the module.

21/02/2017 - ConnectCore i.MX6UL Single Board Computer
* ECO007182 : 55001883-01 rev 2P:
- Renamed signal CSI0_RSTN/IO22 in CSI0_PWDN/IO22
- Depopulate R121 (JIRA: CC6UL-541)
- Renamed signal MCA_IO2 in MCA_IO2/EXT_VREF
- Replace U11 P/N from 50001916-01 to 50001939-01
- Replace R24,R25, R28 and R29 resistors values from 1K to 10K (JIRA CC6UL-624)

05/05/2017 - ConnectCore 6UL SBC PRO
* ECO007036 : 55001883-01 rev A:
- Renamed nets CSI0_x into CSI_x
- Renamed signal DISP0_x into LCD_x
- Depopulate U10, C150, R260 and R231
- Renamed signal IOEXP_IO37 into IOEXP_37
- Depopulate R78 and R168 (fixing JIRA DEL-4191)

14/08/2017 - ConnectCore 6UL SBC PRO
* ECO007701 : 55001883-01 rev B
- Release to revB without changes.

28/09/2017 - ConnectCore 6UL SBC PRO
* ECO-008055: 55001883-01 rev C:
- Fixing JIRA CC6UL-869
- Depopulate SNVS circuitry on the module.
- Connecting USB to XBee socket for supporting XBee Cellular:
- Populate R102.
- Populate R129.
- Remove L28.
- Populate L29.

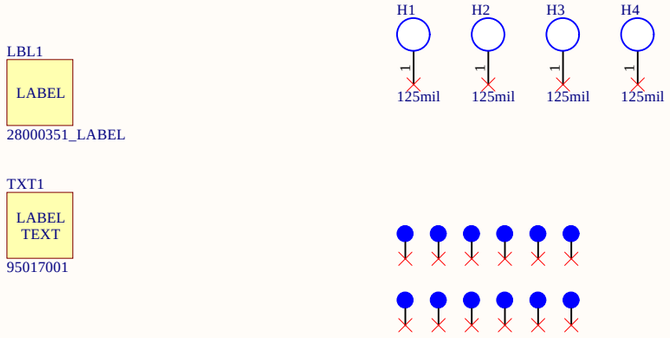
22/03/2018 - ConnectCore 6UL SBC PRO
* NPRO-005135: 55001883-02 rev A:
- Creation of variant 55001883-02.

13/08/2018 - ConnectCore 6UL SBC PRO
* ECO-009009: CC6UL Uboot MFG Test Correction:
- Module has to be moved to the next revision and the SBC follows as where-used.

05/06/2018 - ConnectCore 6UL SBC PRO
* ECO-009889: 55001883-01 rev E / 55001883-02 rev C:
- Remove R95 and R96.
- Update ConnectCore 6UL SOM symbol.

08/01/2020 - ConnectCore 6UL SBC PRO
* ECO-010193: 55001883-01 rev E1 / 55001883-02 rev C1:
- MCA firmware update. No BOM changes.

23/06/2020
* ECO-010625: 55001883-01 rev F / 55001883-02 rev D:
- Replace eMMC (U2) from 16051816 to 16000239



Title: History	
Designer: Sébastien MEYER	Sheet: 14 of 14
Variant: 55001883-01	Rev: F
Description: ConnectCore 6UL SBC PRO	