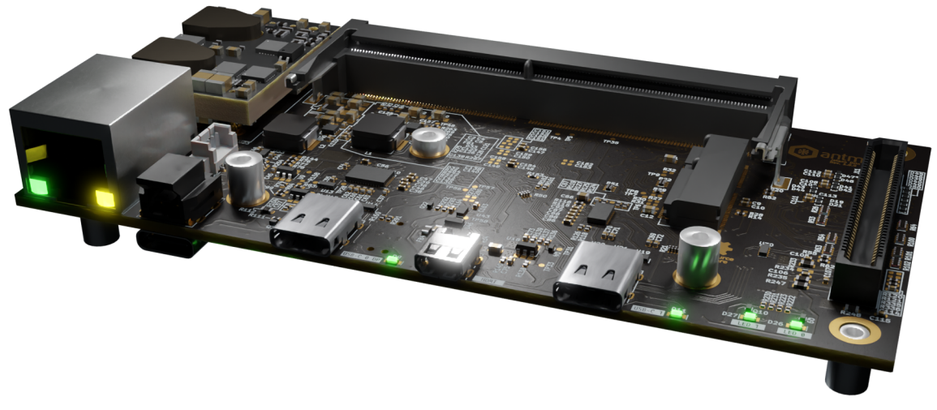
Jetson Orin Baseboard

github.com/antmicro/jetson-orin-baseboard



SoM
File: som.kicad_sch

M.2
File: m-2.kicad_sch

USB Debug, DP
File: usb.kicad_sch

USB3
File: usb3.kicad_sch

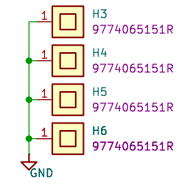
HDMI
File: hdmi.kicad_sch

Ethernet
File: ethernet.kicad_sch

CSI
File: csi.kicad_sch

Peripherals
File: peripherals.kicad_sch

Supply
File: supply.kicad_sch



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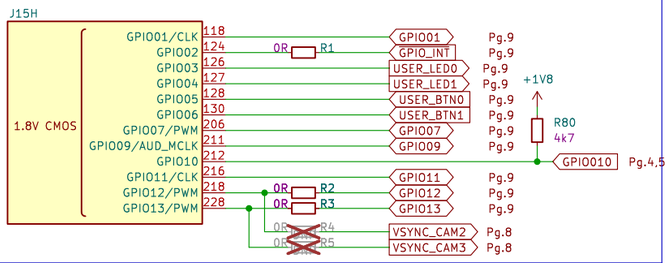
Sheet: /
File: jetson-orin-baseboard.kicad_sch

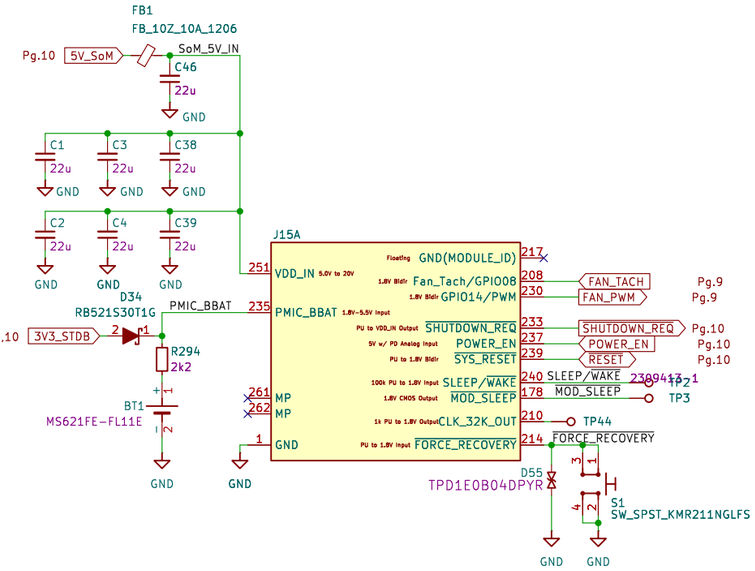
Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 1/10

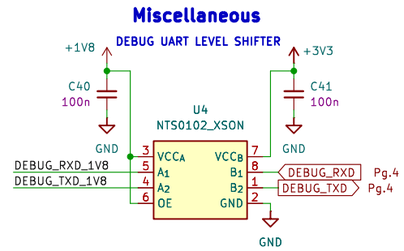
GPIO



Power & CTRL



Miscellaneous



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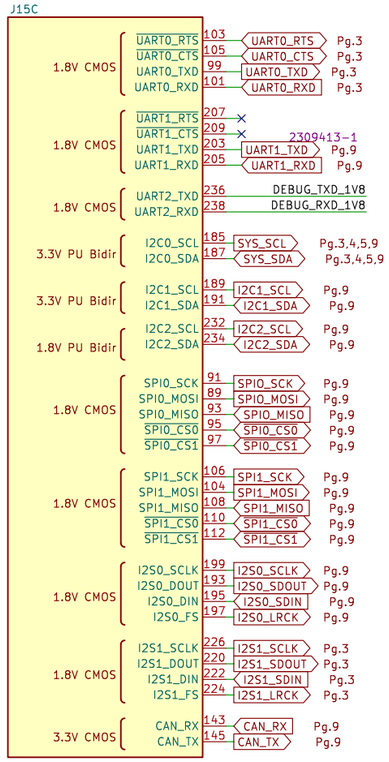
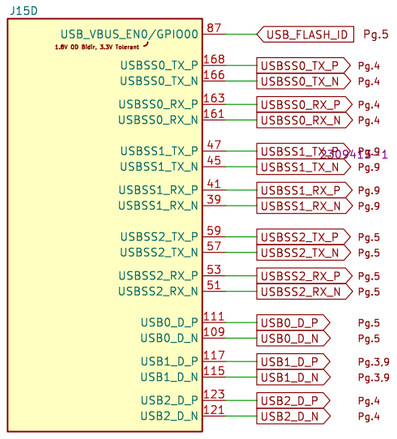
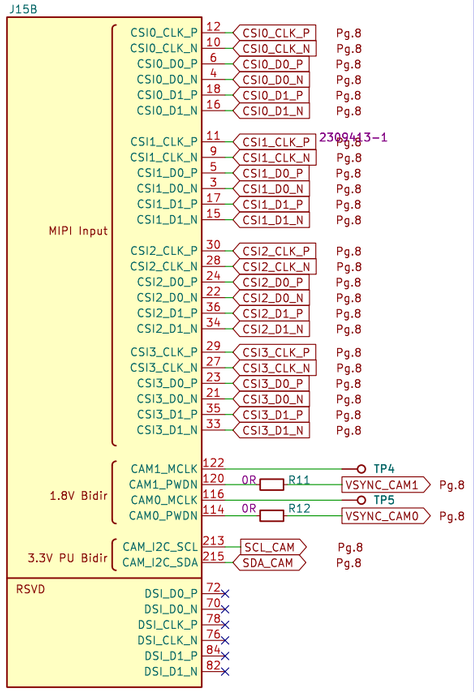
UART/I2C/SPI/I2S/CAN



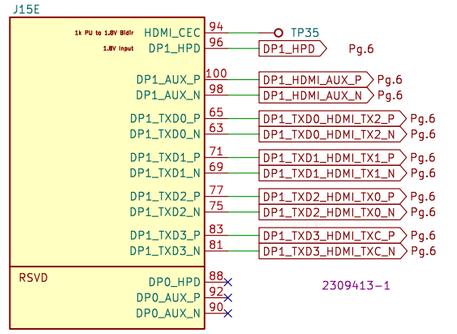
USB



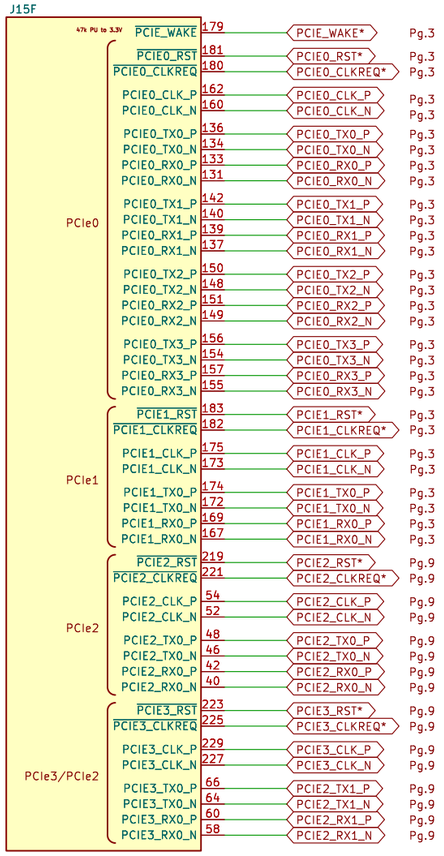
CSI



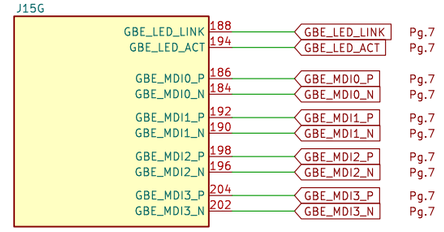
Video Output



PCIe



GbE



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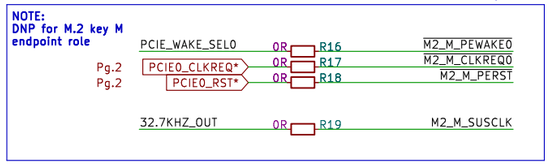
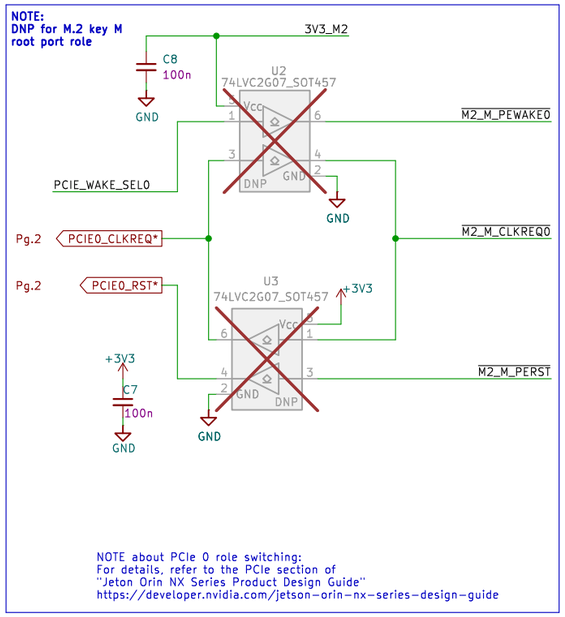
Sheet: /SoM/
File: som.kicad_sch

Title: Jetson Orin Baseboard

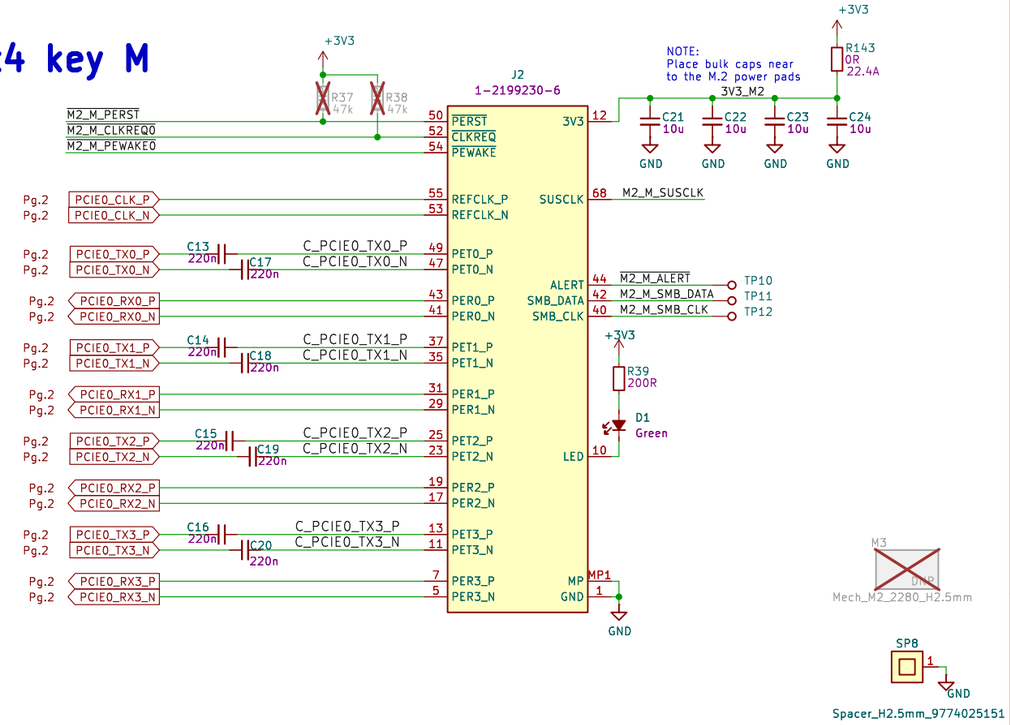
Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 2/10

PCIe0 Root Port / Endpoint mode selector

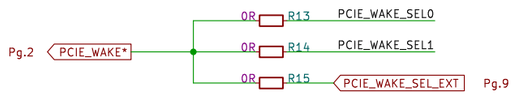




PCIe0 1x4 key M



M.2 PCIE_WAKE selector



SUSCLK SOURCE

PCIe1 1x1 key E

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Sheet: /M.2/

File: m-2.kicad_sch

Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 3/10

USB PD Controller

U6A
TPS65988DHRSHR

+3V3
PDC_LDO_1V8
PDC_LDO_3V3
C49 10u
C26 100n
C28 10u
C30 10u
GND

VIN_3V3 5
LDO_1V8 35
LDO_3V3 9
HRESET 44
ADCIN1 6
ADCIN2 10
GND 20
GND_EP 59

PDC_RESET
R41 0R
PDC_LDO_3V3
R42 10k
PDC_ADCIN1
R43 100k
R44 10k
PDC_ADCIN2
R45 100k

R33 4xOR_0201
GPIO0 16 PDC_FLIP → USBC0_FLIP
GPIO1 17 PDC_CTL0 → USBC0_CTL0
GPIO2 18 PDC_CTL1 → USBC0_CTL1
GPIO3/HPD1 30 → TP13
GPIO4/HPD2 31 PDC_HPD2 0R R65 → USBC_HPD Pg.6

I2C3_SCL/GPIO5 21 PDC_I2C3_SCL → TP24
I2C3_SDA/GPIO6 22 PDC_I2C3_SDA → TP25
I2C3_IRQ/GPIO7 23 PDC_I2C3_IRQ → TP26

SPI_POCI/GPIO8 36 PDC_MISO
SPI_PICO/GPIO9 37 PDC_MOSI
SPI_CLK/GPIO10 38 PDC_SCLK
SPI_CS/GPIO11 39 PDC_CS

GPIO12 40
GPIO13 41
GPIO14/PWM1 42 PDC_GPIO14 → R68 200R → D4 Green → GND
GPIO15/PWM2 43 PDC_GPIO15 → R69 200R → D5 Green → GND
GPIO16/PP_EXT1 48 USBC3_5V_PEN
GPIO17/PP_EXT2 49 USBC0_5V_PEN

I2C1_IRQ 29 PDC_I2C1_IRQn R244 0R → GPIO010 Pg.2,5
I2C1_SCL 27 PDC_I2C1_SCL R70 0R → SYS_SCL Pg.2,3,5,9
I2C1_SDA 28 PDC_I2C1_SDA R71 0R → SYS_SDA Pg.2,3,5,9

I2C2_IRQ 34 PDC_I2C2_IRQn → TP18
I2C2_SCL 32 PDC_I2C2_SCL → TP19
I2C2_SDA 33 PDC_I2C2_SDA → TP20

+3V3
PDC_I2C2_SDA R81 4k7 R130 4k7 PDC_I2C2_SCL
PDC_I2C1_SDA R246 4k7 R262 4k7 PDC_I2C1_SCL

D35
RB521S30T1G
PDC_LDO_3V3 → EEPROM_PWR Pg.9
C33 100n

U7
W25Q80DVUXIE TR
R131 1k
Pg.9 PDC_MOSI
Pg.9 PDC_MISO
Pg.9 EEPROM_PWR
Pg.9 EEPROM_PWR
Pg.9 PDC_SCLK
Pg.9 PDC_CS
SI/IO0 5
SO/IO1 2
WP/IO2 3
HOLD/IO3 7
SCLK 6
CS 1
VCC 8
EP 9
VSS 4

USB-C 0 Display Port alt mode

USB-PD Source/Sink

+3V3
R83 10k
+5V
C57 100n
R158 0R
GND
Pg.9 USBC0_FLG
USBC0_5V_PEN
R84 0R 1A
R99 10k
U12
AP22615AWU-7
IN 6
FLG 3
EN 4
OUT 1
ISET 5
GND 2
R104 2k2

Pg.10 USBPD2_HV
C58 100n
C148 4u7
+5V
C59 10u
DRAIN1 52

U6C
TPS65988DHRSHR
PP_HV2 1
PP2_CABLE 46
VBUS2 3 USBC0_VBUS
C2_CC1 45 USBC0_CC1
C2_CC2 47 USBC0_CC2
C2_USB_N/GPIO21 55
C2_USB_P/GPIO20 54
Pg.2 USB2_D_P
Pg.2 USB2_D_N

U16
TPD4E05U06QDQARQ1
DF2S30FS_SOD
C65 100n
C149 1u/16V
R106 4k7
D9 Green

USBC0
A4 VBUS
A5 CC1
B5 CC2
A6 D+
A7 D−
B11 RX1+
B10 RX1−
A2 TX1+
A3 TX1−
A11 RX2+
A10 RX2−
B2 TX2+
B3 TX2−
A8 SBU1
B8 SBU2
A1 GND
SH SH
J4
632723300011

C36 100n
C37 100n
C54 100n
C55 100n
C56 10u
Pg.2,3,5,9 SYS_SDA
Pg.2,3,5,9 SYS_SCL
R72 0R
R82 0R

CTL0	CTL1	CONFIGURATION
L	L	POWER DOWN
L	H	USB ONLY
H	L	4 LANE DP
H	H	USB + 2 LANE DP

U10
TUSB1046-DCIRNQT
USBC0_FLIP
USBC0_CTL0
USBC0_CTL1
VCC 1
FLIP/SCL 21
CTL0/SDA 22
CTL1/HPDIN 23

Pg.2 USBSS0_RX_P
Pg.2 USBSS0_RX_N
C140 100n
C143 100n USBSS0_RX_C_P 5
USBSS0_RX_C_N 4
SSRX_P
SSRX_N

Pg.2 USBSS0_TX_P
Pg.2 USBSS0_TX_N
C141 100n
C144 100n USBSS0_TX_C_P 8
USBSS0_TX_C_N 7
SSTX_P
SSTX_N

AUX_P 24
AUX_N 25
DP1_AUX_P
DP1_AUX_N
R205 100k
R207 100k

DP0_P 9
DP0_N 10
DP1_P 12
DP1_N 13
DP2_P 15
DP2_N 16
DP3_P 18
DP3_N 19
DP1_TXD0_P
DP1_TXD0_N
DP1_TXD1_P
DP1_TXD1_N
DP1_TXD2_P
DP1_TXD2_N
DP1_TXD3_P
DP1_TXD3_N

CAD_SNK/RSVD1 29
HPDIN/RSVD2 32
USBC_HPD R75 0R HPDIN
TP28

RX1_P 30 USBC0_RX1_P
RX1_N 31 USBC0_RX1_N
TX1_P 33 USBC0_TX1_P
TX1_N 34 USBC0_TX1_N
RX2_P 40 USBC0_RX2_P
RX2_N 39 USBC0_RX2_N
TX2_P 37 USBC0_TX2_P
TX2_N 36 USBC0_TX2_N
SBU1 27 USBC0_SBU_N
SBU2 26 USBC0_SBU_P
I2C_EN 17 USBC0_I2C_EN
SSEQ0/A0 11 USBC0_SSEQ0
SSEQ1 3 USBC0_SSEQ1
DPEQ0/A1 14 USBC0_DPEQ0
DPEQ1 2 USBC0_DPEQ1
EQ0 38 USBC0_EQ0
EQ1 35 USBC0_EQ1
GND 41

C60 100n USBC0_CONN_TX1_P
C62 100n USBC0_CONN_TX1_N
C61 100n USBC0_CONN_TX2_P
C63 100n USBC0_CONN_TX2_N

R85 1k
R86 1k
R87 1k
R88 1k
R89 1k
R90 1k
R91 1k
R92 1k
R93 1k
R94 1k
R95 1k
R96 1k
R97 1k
R98 1k

U13 TPD4E05U06QDQARQ1
U14 TPD4E05U06QDQARQ1
U15 TPD4E05U06QDQARQ1
R109 2M
R110 2M

USB-UART Bridge

U8
NCP730BMT330TBG
USBC3_VBUS
C32 10u/25V
VIN 6
EN 3
GND 2
VOUT 1
PG 5
FTDI_3V3

U5
FT230XQ-R
C34 10u
C27 100n
C29 100n
Vcc 10
VCCIO 1
3V3OUT 8
D+ 6
D− 7
RESET 9
GND 13
TXD 15 R56 0R DEBUG_RXD Pg.2
RXD 2 R57 0R DEBUG_TXD Pg.2
RTS 16 R58 0R PWR_SOFT Pg.10
CTS 4 R59 0R
CBUS0 12 FTDI_CBUS0 → TP15
CBUS1 11 FTDI_LED_RX
CBUS2 5 FTDI_LED_TX
CBUS3 14 FTDI_CBUS3 → TP16
USB_FTDI_P
USB_FTDI_N
FTDI_3V3 R46 10k
C31 100n
R73 200R RX → D3 Green
R72 200R TX → D2 Green

Debug USB-C 3

USB-PD Source/Sink

+5V
C45 100n
R144 0R 1A
TP27
USBC3_5V_PEN
U9
AP22615AWU-7
R74 10k
USBC3_FLG
R76 0R 1A
R77 10k
R78 2k2

Pg.10 USBPD1_HV
C53 100n
C136 4u7
C35 10u
DRAIN2 15

U6B
TPS65988DHRSHR
PP_HV1 11
PP1_CABLE 25
VBUS1 13 USBC3_VBUS
C1_CC1 24 USBC3_CC1
C1_CC2 26 USBC3_CC2
C1_USB_N/GPIO19 53
C1_USB_P/GPIO18 50

D6
DF2S30FS_SOD
C64 100n
C147 1u/16V
R105 4k7
D8 Green

USBC3
A4 VBUS
A5 CC1
B5 CC2
D+ 6
D− 7
SBU1 A8
SBU2 B8
GND A1
SHIELD SH
J3
USB4105-GF-A

USB_FTDI_P
USB_FTDI_N
R127 27R
R117 27R
C145 47p
C146 47p
USBC3_D_P A6
USBC3_D_N A7

USBC3_CC1 1
USBC3_D_P 2
USBC3_D_N 4
USBC3_CC2 5
3
U11
TPD4E05U06QDQARQ1

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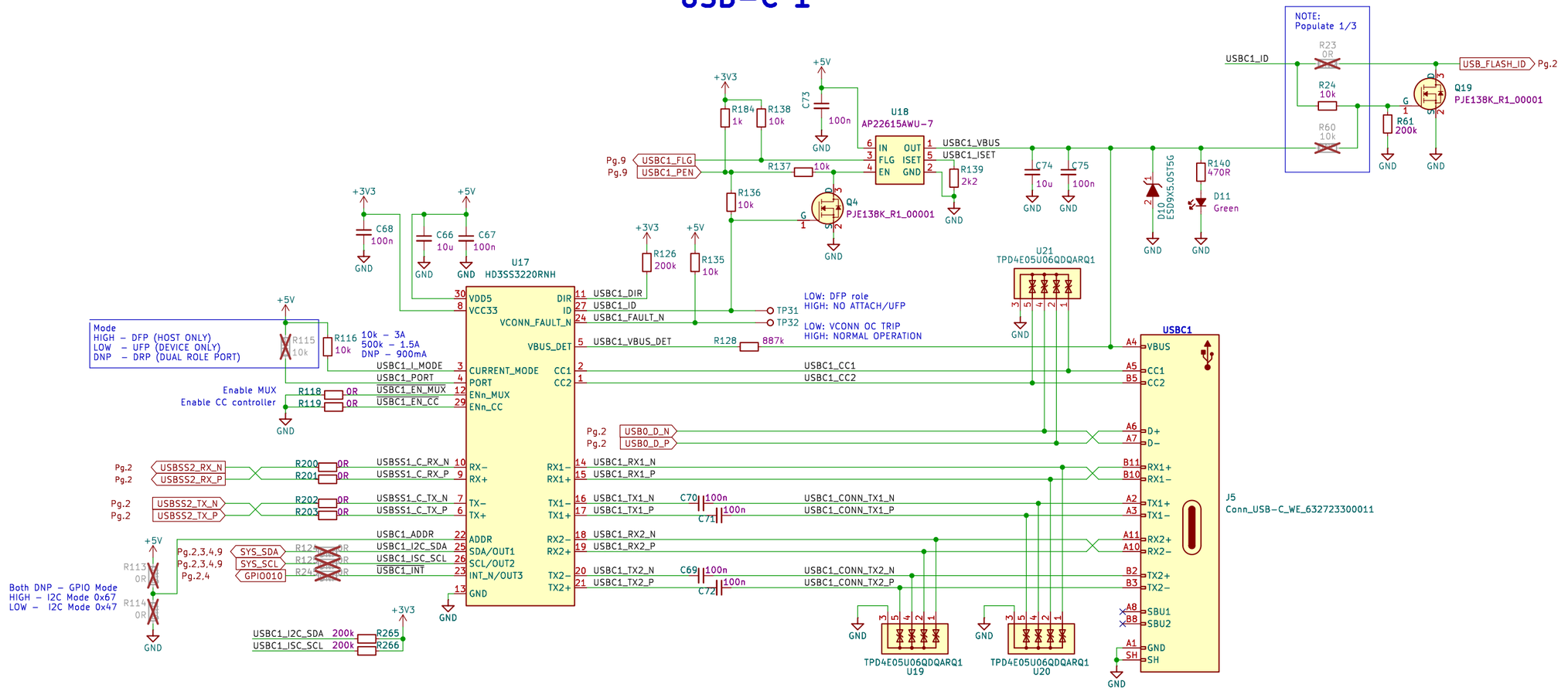
Sheet: /USB Debug, DP/
File: usb.kicad_sch
Title: Jetson Orin Baseboard
Size: A3 | Date: 2024-06-06 | **Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1 | Id: 4/10

USB-C 1



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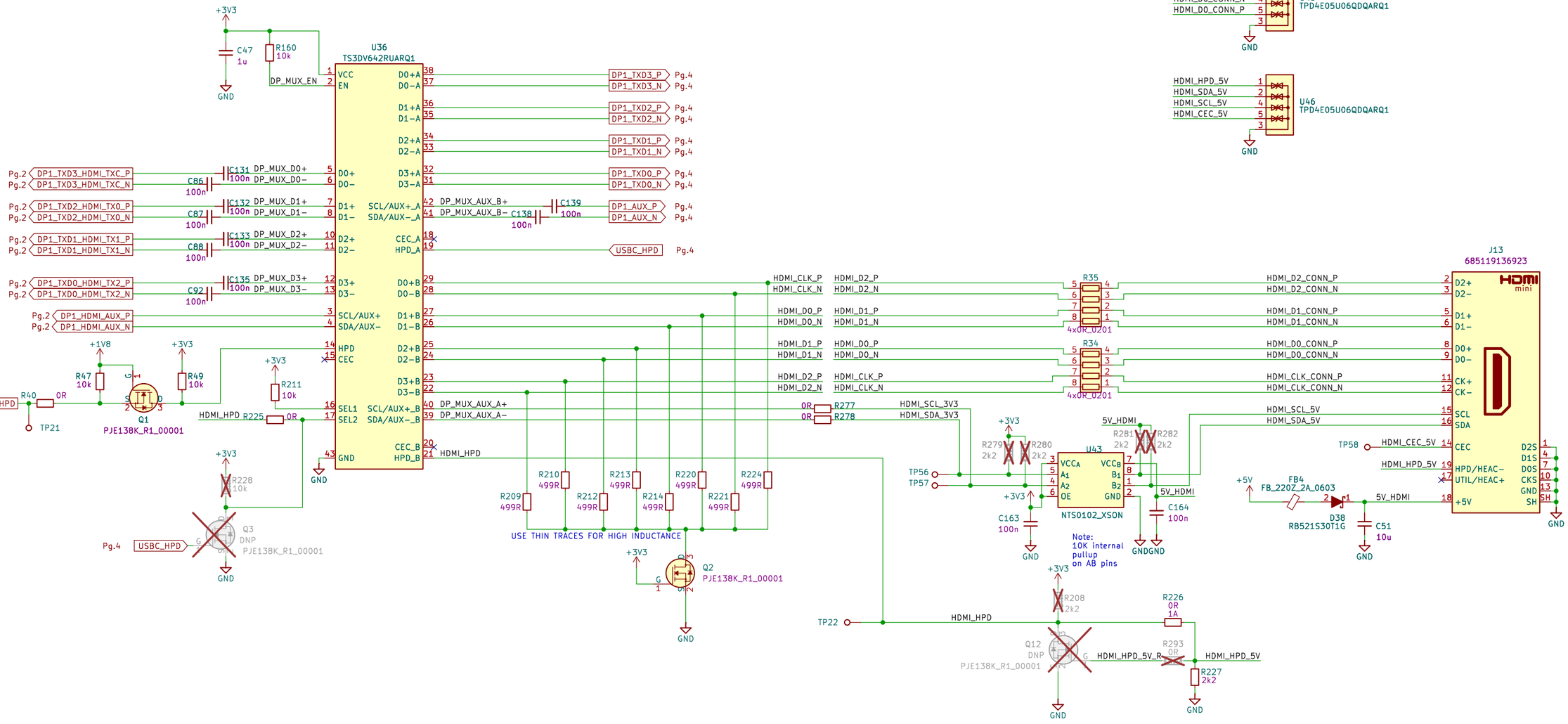
Sheet: /USB3/		
File: usb3.kicad_sch		
Title: Jetson Orin Baseboard		
Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 5/10

HDMI Connector



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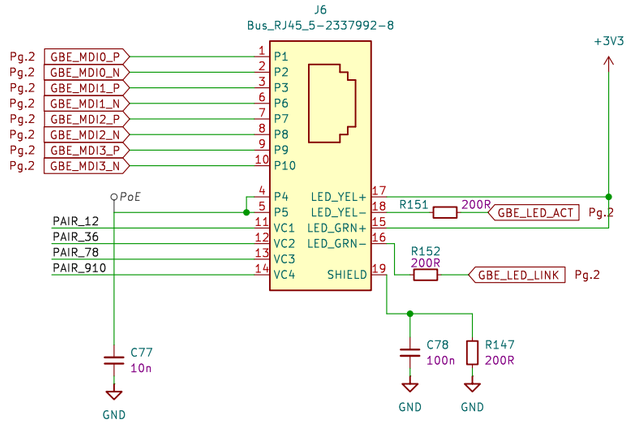
Sheet: /HDMI/
File: hdmi.kicad_sch

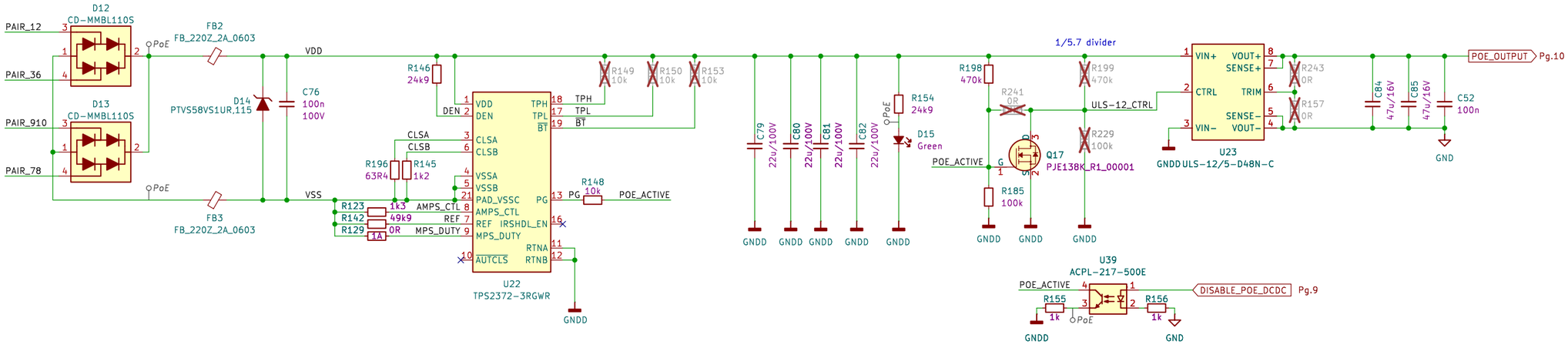
Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 6/10

Ethernet Connector



Power over Ethernet



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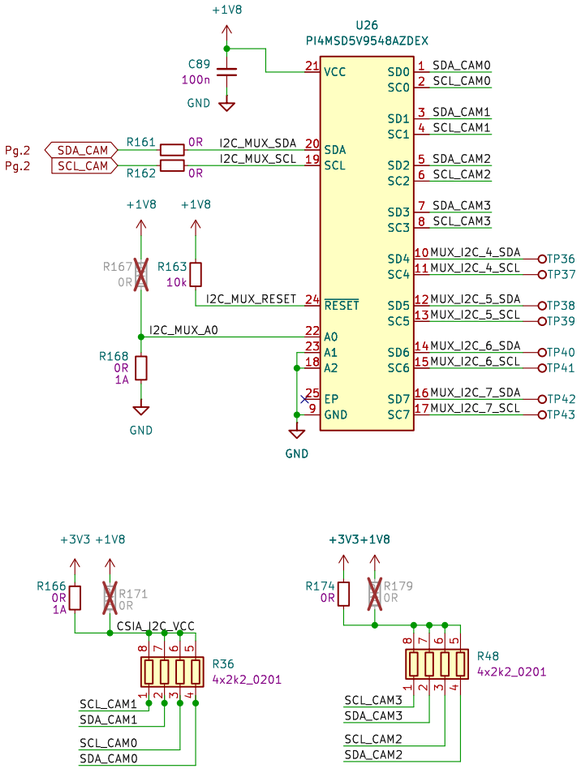
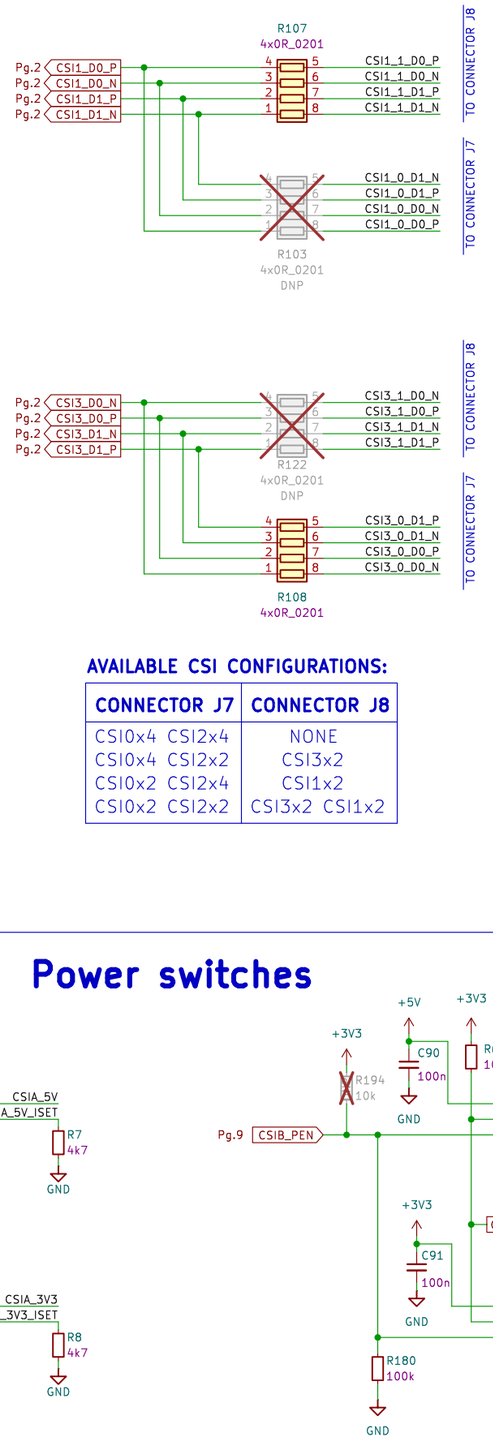
Sheet: /Ethernet/		
File: ethernet.kicad_sch		
Title: Jetson Orin Baseboard		
Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 7/10

I2C Mux



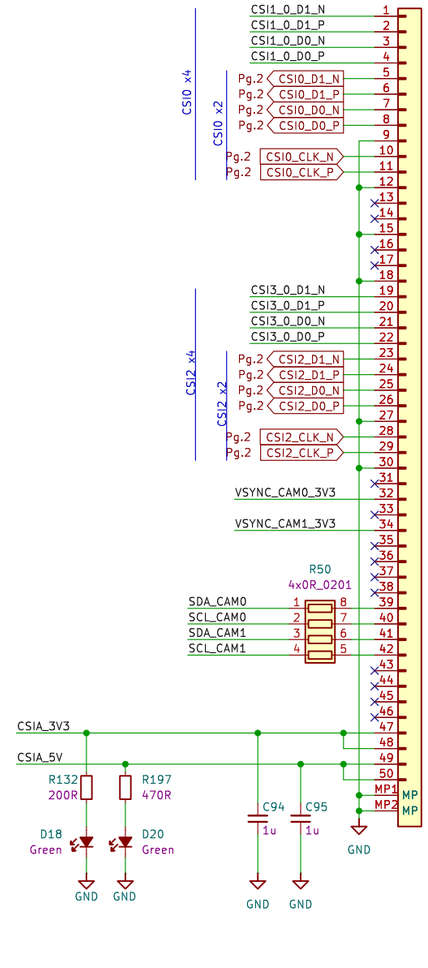
CSI Mux



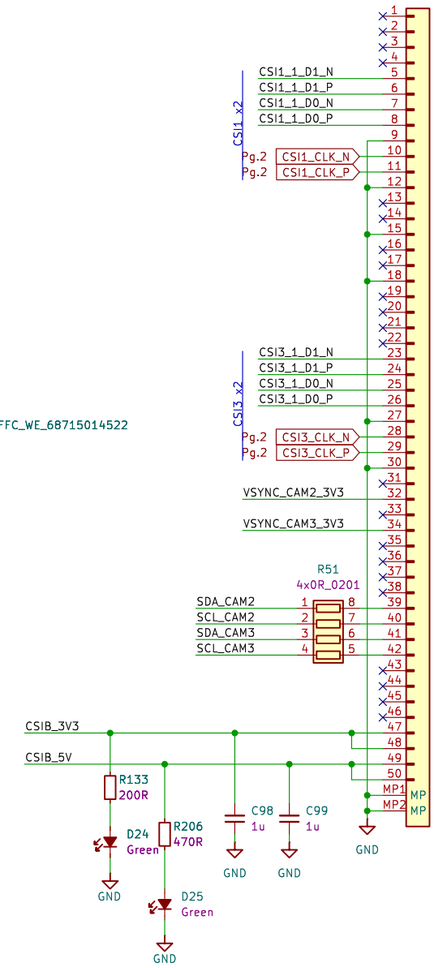
AVAILABLE CSI CONFIGURATIONS:

CONNECTOR J7	CONNECTOR J8
CSI0x4 CSI2x4	NONE
CSI0x4 CSI2x2	CSI3x2
CSI0x2 CSI2x4	CSI1x2
CSI0x2 CSI2x2	CSI3x2 CSI1x2

CSI connector J7

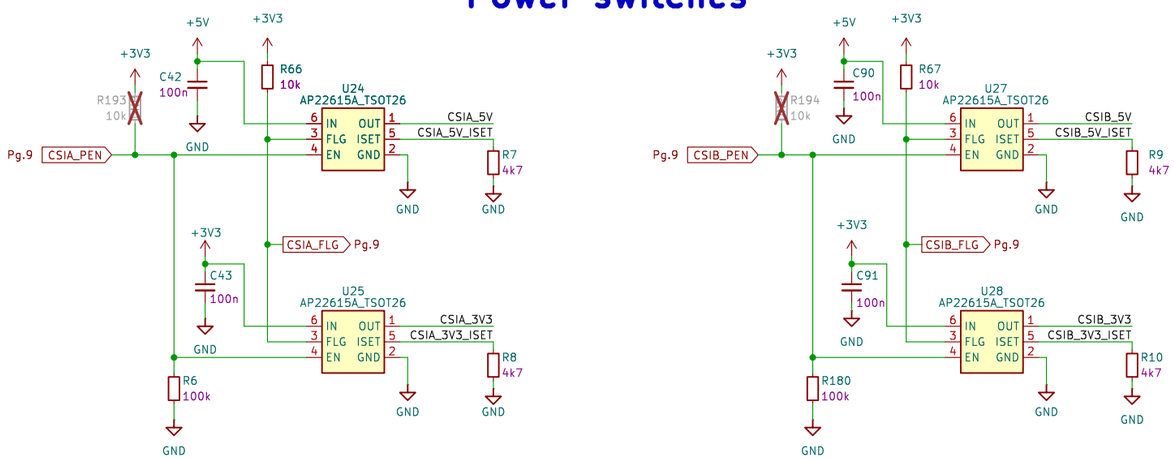


CSI connector J8

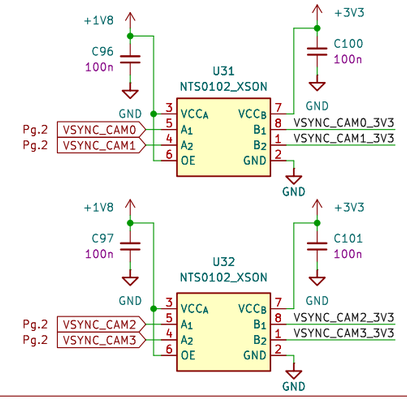


Power switches

ALL SWITCHES
1.5A CURRENT LIMIT



Level shifters



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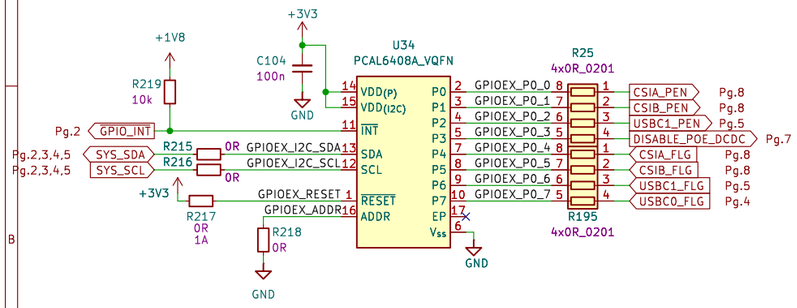
Sheet: /CSI/
File: csi.kicad_sch

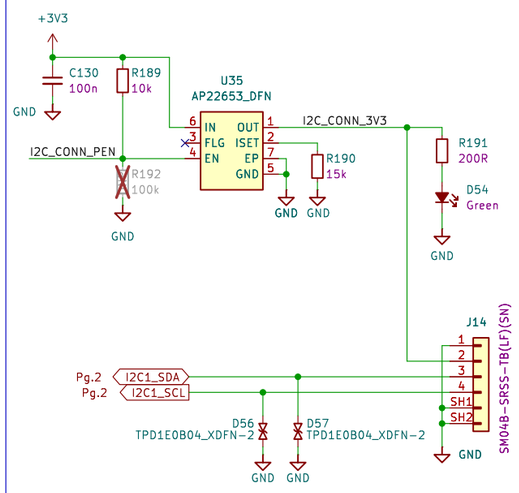
Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 8/10

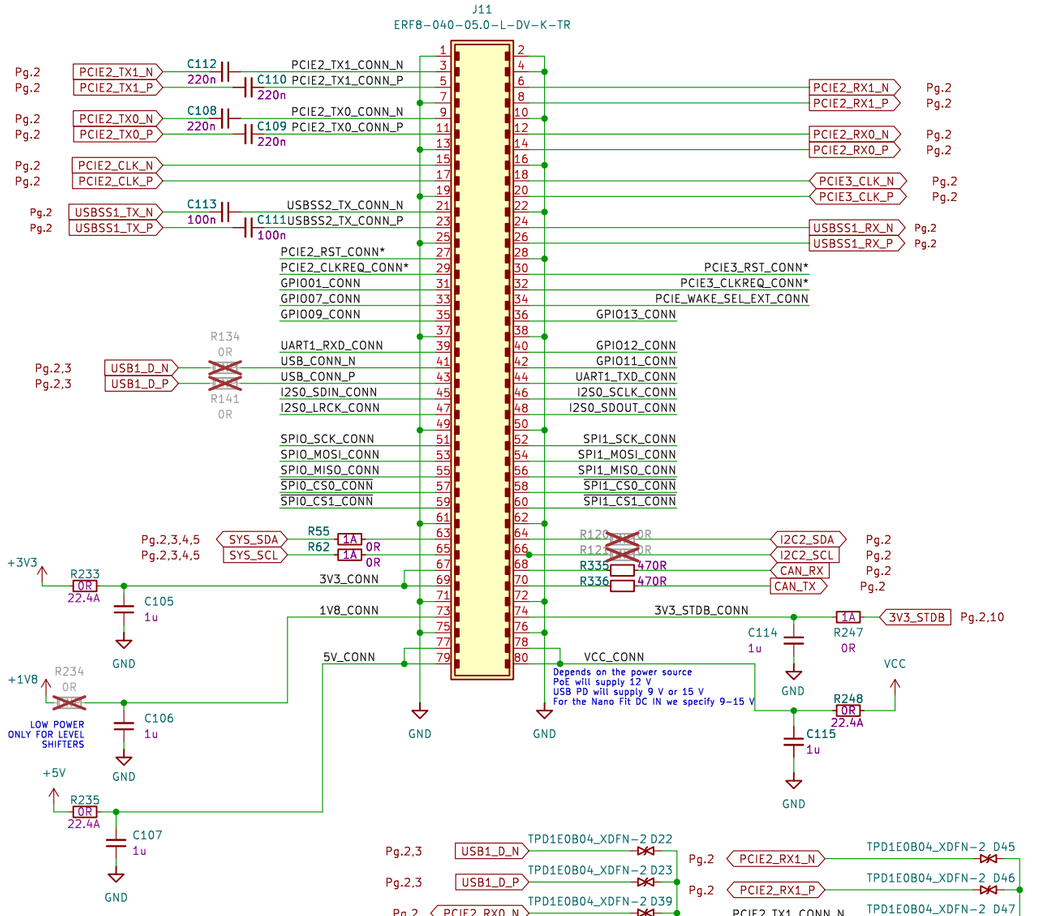
GPIO expander



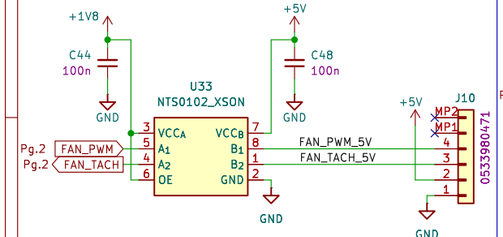
I2C connector



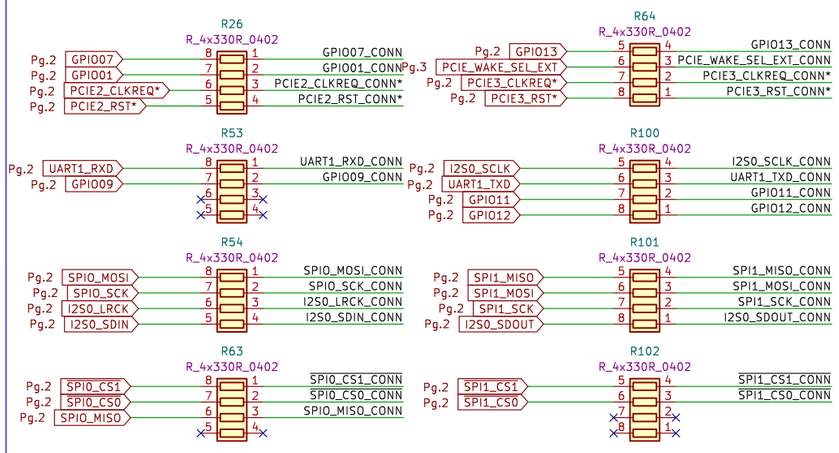
Expansion connector



Fan connector

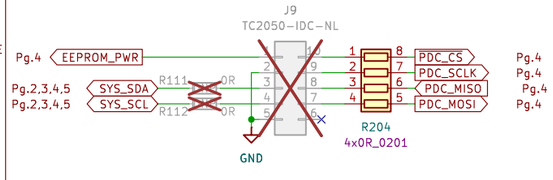


Expansion connector resistors

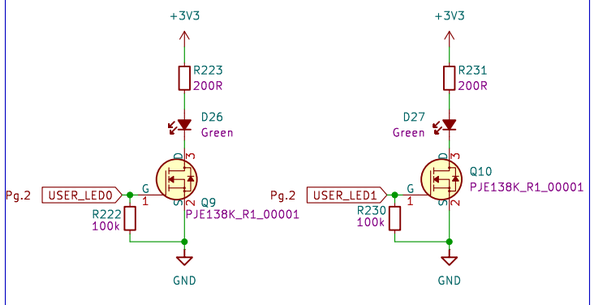


Debug connector

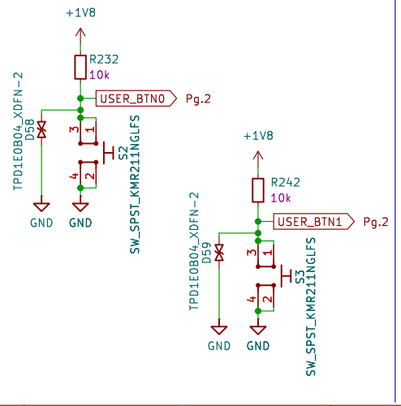
pinout compatible with
www.github.com/antmicro/ftdi-toolkit

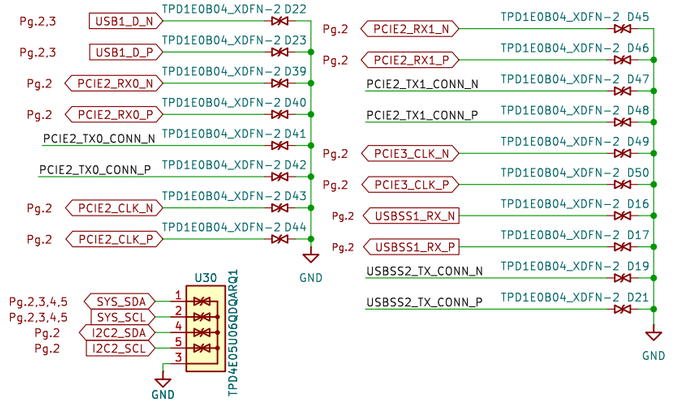


LED indicators



Buttons





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Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
KiCad E.D.A. kicad 7.0.10+1		Id: 9/10

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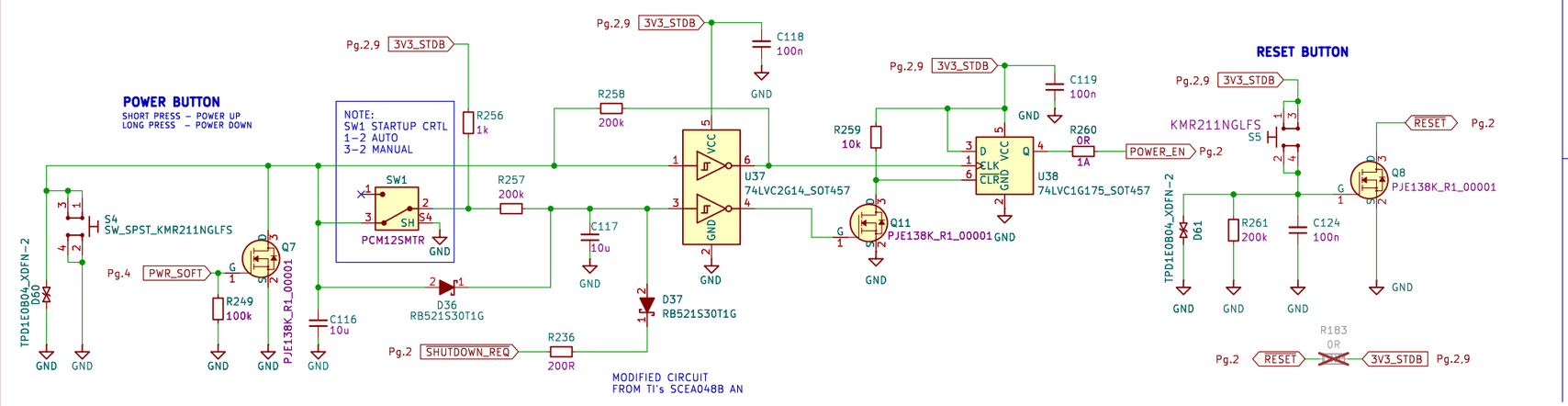
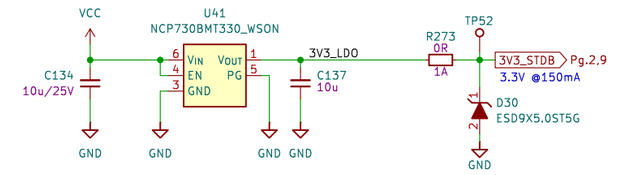
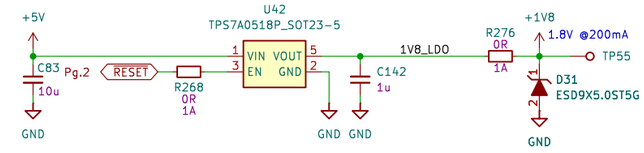
POWER-UP AND RESET CIRCUITRY



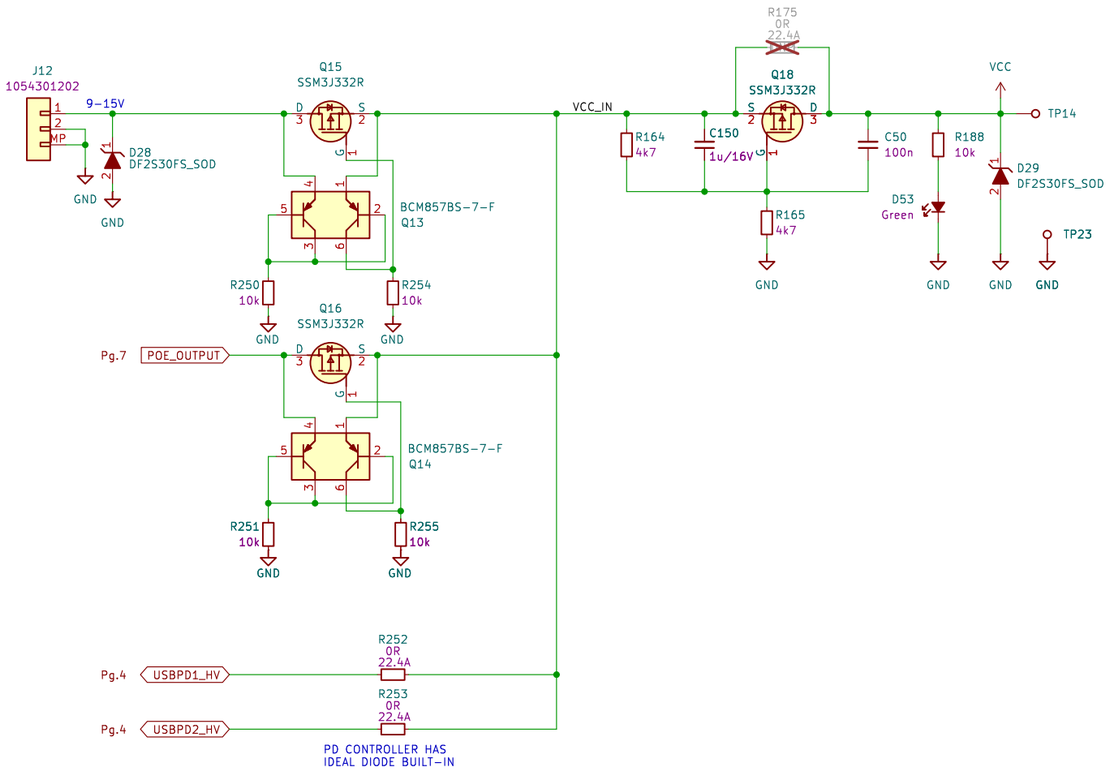
3V3 STANDBY LDO



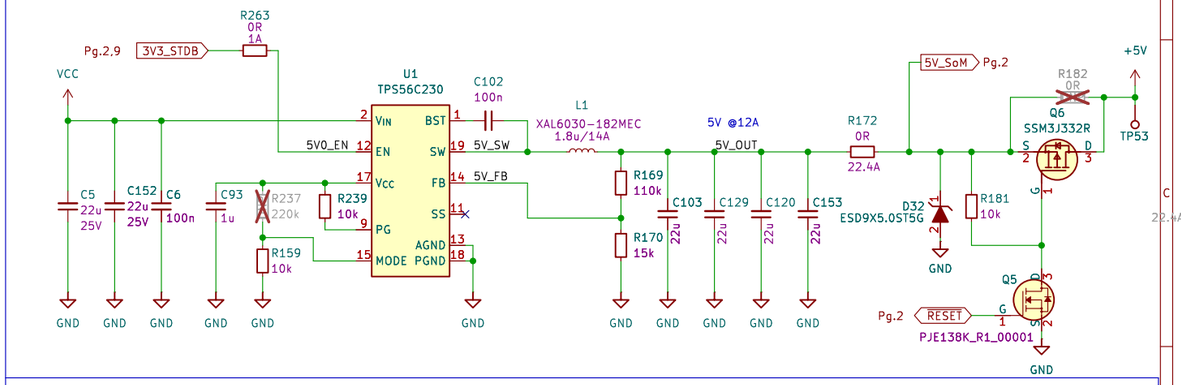
1V8 LDO



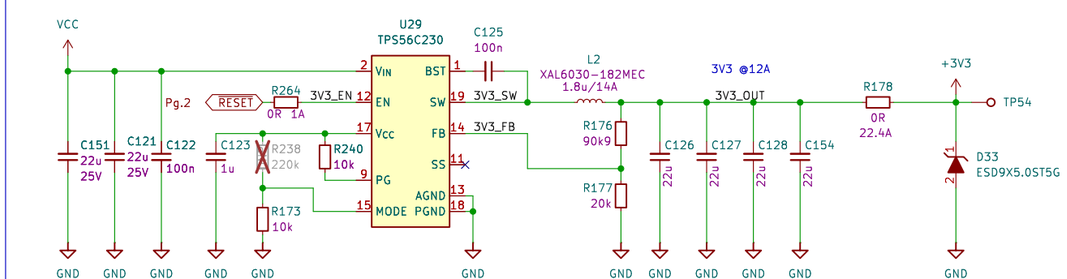
INPUT SELECTOR AND SOFT START



5V DCDC



3V3 DCDC



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Sheet: /Supply/
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Title: Jetson Orin Baseboard

Size: A3	Date: 2024-06-06	**Rev: 1.1.6**
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