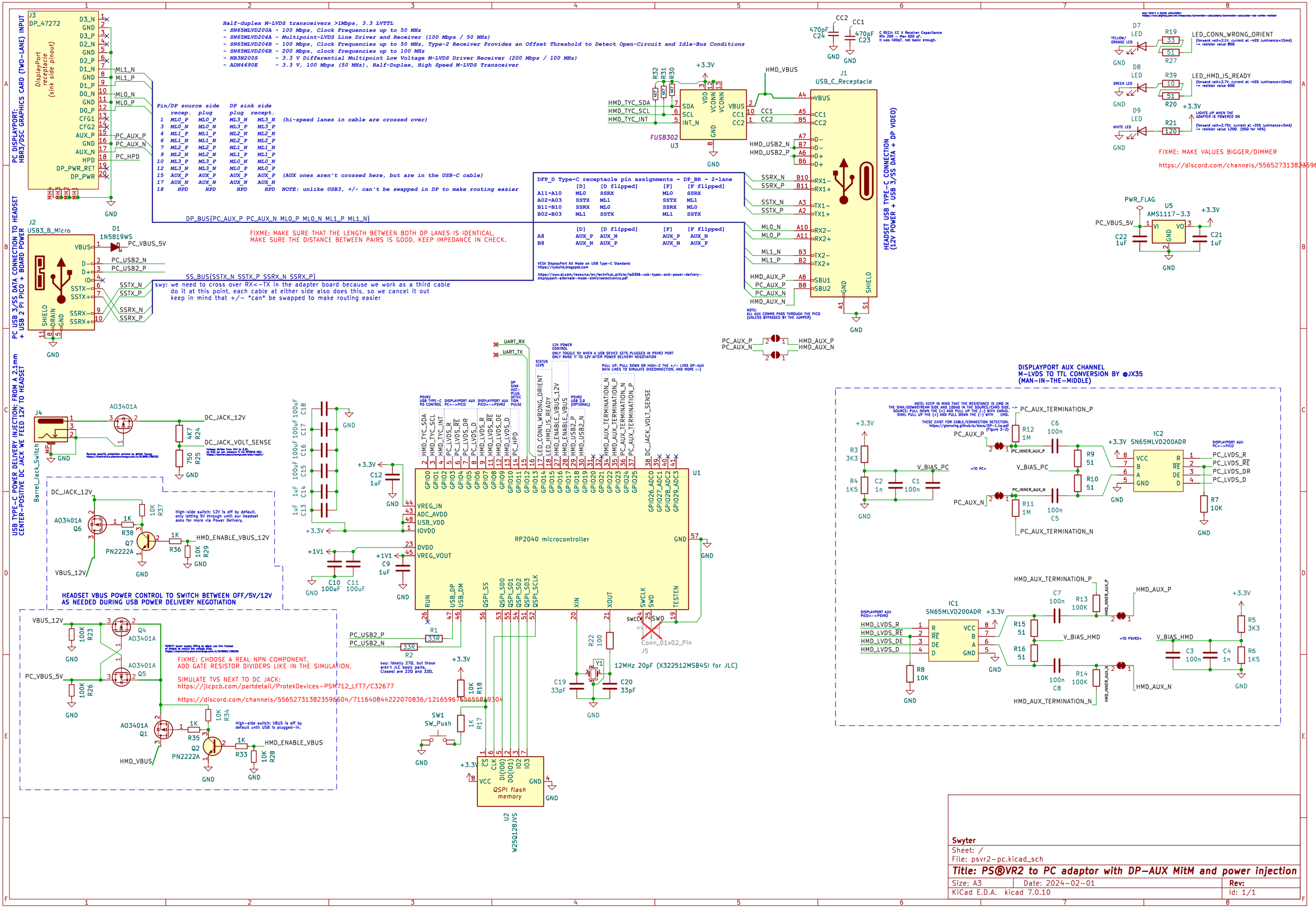
PC DISPLAYPORT: HBR3/DSC GRAPHICS CARD (TWO-LANE) INPUT
J3
DP_47272
DisplayPort receptacle (sink side pinout)
Half-duplex M-LVDS transceivers >1Mbps, 3.3 LVTTL
- SN65MLVD200A - 100 Mbps, Clock Frequencies up to 50 MHz
- SN65MLVD204A - Multipoint-LVDS Line Driver and Receiver (100 Mbps / 50 MHz)
- SN65MLVD204B - 100 Mbps, Clock Frequencies up to 50 MHz, Type-2 Receiver Provides an Offset Threshold to Detect Open-Circuit and Idle-Bus Conditions
- SN65MLVD206B - 200 Mbps, clock frequencies up to 100 MHz
- NB3N200S - 3.3 V Differential Multipoint Low Voltage M-LVDS Driver Receiver (200 Mbps / 100 MHz)
- ADN4690E - 3.3 V, 100 Mbps (50 MHz), Half-Duplex, High Speed M-LVDS Transceiver
Pin/DP source side recep. plug — DP sink side plug recept.
1 ML0_P ML0_P ML3_N ML3_N (hi-speed lanes in cable are crossed over)
3 ML0_N ML0_N ML3_P ML3_P
4 ML1_P ML1_P ML2_N ML2_N
6 ML1_N ML1_N ML2_P ML2_P
7 ML2_P ML2_P ML1_N ML1_N
9 ML2_N ML2_N ML1_P ML1_P
10 ML3_P ML3_P ML0_N ML0_N
12 ML3_N ML3_N ML0_P ML0_P
15 AUX_P AUX_P AUX_P AUX_P (AUX ones aren't crossed here, but are in the USB-C cable)
17 AUX_N AUX_N AUX_N AUX_N
18 HPD HPD HPD HPD NOTE: unlike USB3, +/- can't be swapped in DP to make routing easier
DP_BUS{PC_AUX_P PC_AUX_N ML0_P ML0_N ML1_P ML1_N}
FIXME: MAKE SURE THAT THE LENGTH BETWEEN BOTH DP LANES IS IDENTICAL, MAKE SURE THE DISTANCE BETWEEN PAIRS IS GOOD, KEEP IMPEDANCE IN CHECK.
PC USB 3/SS DATA CONNECTION TO HEADSET + USB 2 Pi PICO + BOARD POWER
J2
USB3_B_Micro
D1
1N5819WS
SS_BUS{SSTX_N SSTX_P SSRX_N SSRX_P}
swy: we need to cross over RX<-TX in the adapter board because we work as a third cable do it at this point, each cable at either side also does this, so we cancel it out keep in mind that +/- *can* be swapped to make routing easier
DFP_D Type-C receptacle pin assignments - DP_BR - 2-lane
[D] [D flipped] [F] [F flipped]
A11-A10 ML0 SSRX ML0 SSRX
A02-A03 SSTX ML1 SSTX ML1
B11-B10 SSRX ML0 SSRX ML0
B02-B03 ML1 SSTX ML1 SSTX
[D] [D flipped] [F] [F flipped]
A8 AUX_P AUX_N AUX_P AUX_N
B8 AUX_N AUX_P AUX_N AUX_P
VESA DisplayPort Alt Mode on USB Type-C Standard: https://cyborlid.blogspot.com
https://www.st.com/resource/en/technical_article/ta0356-usb-typec-and-power-delivery-displayport-alternate-mode-stmicroelectronics.pdf
HEADSET USB TYPE-C CONNECTION (12V POWER + USB 3/SS DATA + DP VIDEO)
J1
USB_C_Receptacle
FUSB302
U3
HMD_VBUS
HMD_TYC_SDA
HMD_TYC_SCL
HMD_TYC_INT
HMD_USB2_N
HMD_USB2_P
NOTE: ALL AUX COMMS PASS THROUGH THE PICO (UNLESS BYPASSED BY THE JUMPER)
C RECV: CC X Receiver Capacitance Min 200 - Max 600 pF. It was 400pF, not basic enough.
LED_CONN_WRONG_ORIENT
LED_HMD_IS_READY
LIGHTS UP WHEN THE ADAPTER IS POWERED ON
FIXME: MAKE VALUES BIGGER/DIMMER
https://discord.com/channels/556527313823596604/7
PWR_FLAG
U5
AMS1117-3.3
PC_VBUS_5V
USB TYPE-C POWER DELIVERY INJECTION: FROM A 2.1mm CENTER-POSITIVE DC JACK WE FEED 12V TO HEADSET
J4
BarrelJack_Switch
AO3401A
DC_JACK_12V
DC_JACK_VOLT_SENSE
Reverse polarity protection scheme by @Ali5 Yousif https://electronics.stackexchange.com/q/81899/196330
Voltage divider from 24V to 3.3V, so that we can measure it via RP2040 ADC https://docs.espressif.com/projects/esp-idf/en/latest/esp32/hw-reference/esp32/get-started-devkitc.html#guidelines-for-power-supply
High-side switch; 12V is off by default, only letting 5V through until our headset asks for more via Power Delivery.
HMD_ENABLE_VBUS_12V
VBUS_12V
HEADSET VBUS POWER CONTROL TO SWITCH BETWEEN OFF/5V/12V AS NEEDED DURING USB POWER DELIVERY NEGOTIATION
PC_VBUS_5V
MOSFET power supply ORing by @jau: use this instead of diodes to reduce the voltage drop. https://electronics.stackexchange.com/q/54083/196330
FIXME: CHOOSE A REAL NPN COMPONENT, ADD GATE RESISTOR DIVIDERS LIKE IN THE SIMULATION.
SIMULATE TVS NEXT TO DC JACK:
https://jlcpcb.com/partdetail/ProtekDevices-PSM712_LFT7/C32677
https://discord.com/channels/556527313823596604/711640844222070836/1216596765655589304
High-side switch: VBUS is off by default until USB is plugged-in.
HMD_ENABLE_VBUS
HMD_VBUS
RP2040 microcontroller
U1
QSPI flash memory
U2
W25Q128JVS
12MHz 20pF (X322512MSB4SI for JLC)
Conn_01x02_Pin
J5
SW1
SW_Push
PC_USB2_P
PC_USB2_N
swy: Ideally 27Ω, but those aren't JLC basic parts. Closest are 22Ω and 33Ω.
DISPLAYPORT AUX CHANNEL M-LVDS TO TTL CONVERSION BY @JX35 (MAN-IN-THE-MIDDLE)
NOTE: KEEP IN MIND THAT THE RESISTANCE IS 1MΩ IN THE SINK/DOWNSTREAM SIDE AND 100kΩ IN THE SOURCE/CARD SIDE. -> SOURCE: PULL DOWN THE (+) AND PULL UP THE (-) WITH 100kΩ. SINK: PULL UP THE (+) AND PULL DOWN THE (-) WITH 1MΩ.
THESE EXIST FOR CABLE/CONNECTION DETECTION. https://glenwing.github.io/docs/DP-1.1a.pdf (Figure 3-2)
PC_AUX_TERMINATION_P
PC_AUX_TERMINATION_N
IC2
SN65MLVD200ADR
IC1
SN65MLVD200ADR
HMD_AUX_TERMINATION_P
HMD_AUX_TERMINATION_N
HMD_AUX_P
HMD_AUX_N
V_BIAS_PC
V_BIAS_HMD
Swyter
Sheet: /
File: psvr2-pc.kicad_sch
Title: PS®VR2 to PC adaptor with DP-AUX MitM and power injection
Size: A3
Date: 2024-02-01
Rev:
KiCad E.D.A. kicad 7.0.10
Id: 1/1