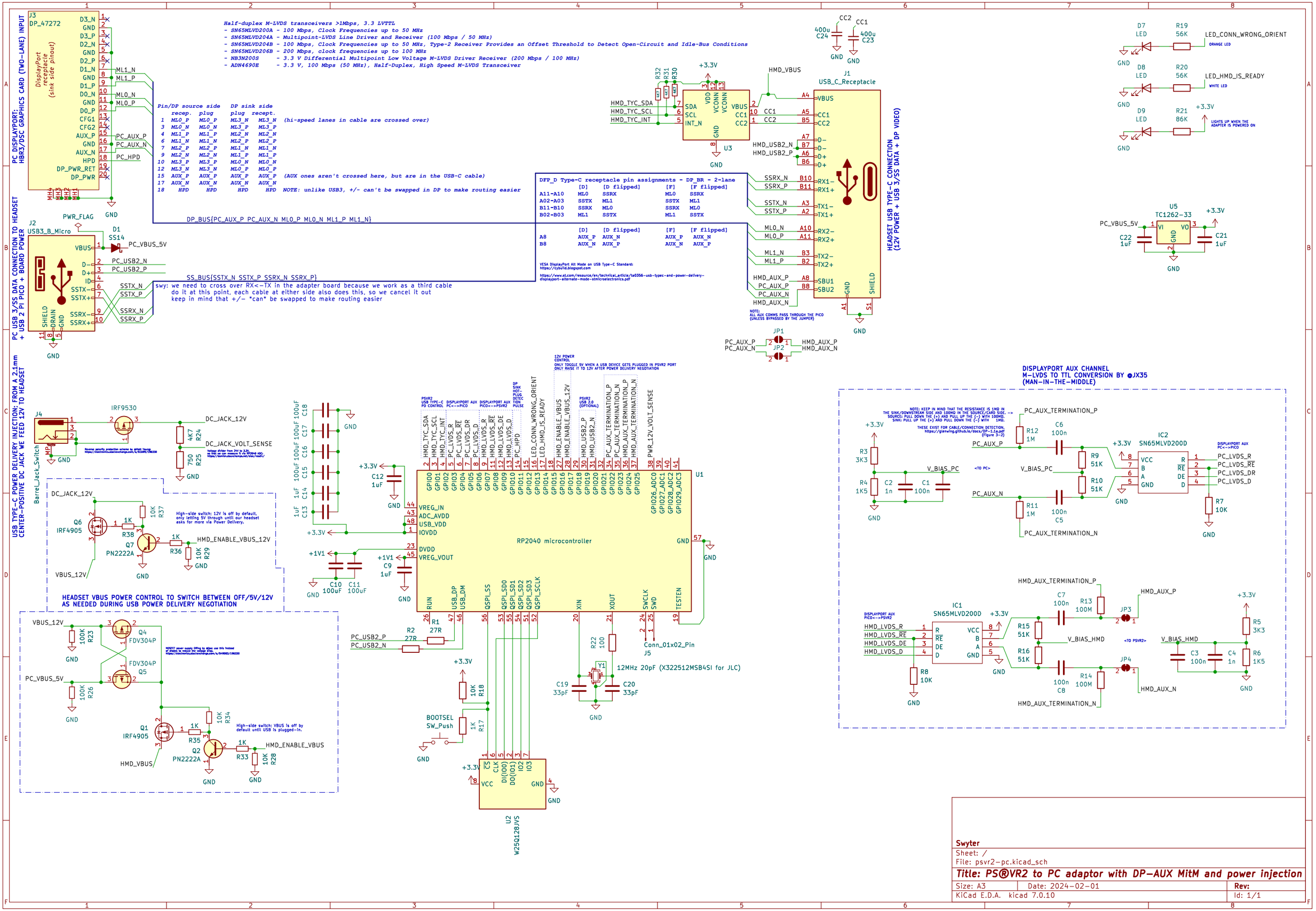
PC DISPLAYPORT: HBR3/DSC GRAPHICS CARD (TWO-LANE) INPUT
PC USB 3/SS DATA CONNECTION TO HEADSET + USB 2 PI PICO + BOARD POWER
USB TYPE-C POWER DELIVERY INJECTION: FROM A 2.1mm CENTER-POSITIVE DC JACK WE FEED 12V TO HEADSET
J3 DP_47272
DisplayPort receptacle (sink side pinout)
Half-duplex M-LVDS transceivers >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 DP sink side
recep. plug 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}
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
J2 USB3_B_Micro
D1 SS14
PWR_FLAG
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
J1 USB_C_Receptacle
HEADSET USB TYPE-C CONNECTION (12V POWER + USB 3/SS DATA + DP VIDEO)
NOTE: ALL AUX COMMS PASS THROUGH THE PICO (UNLESS BYPASSED BY THE JUMPER)
JP1 JP2
U3 HMD_TYC_SDA HMD_TYC_SCL HMD_TYC_INT
HMD_VBUS
CC2 400u C24 CC1 400u C23
D7 LED R19 56K LED_CONN_WRONG_ORIENT ORANGE LED
D8 LED R20 56K LED_HMD_IS_READY WHITE LED
D9 LED R21 86K LIGHTS UP WHEN THE ADAPTER IS POWERED ON
U5 TC1262-33 PC_VBUS_5V C22 1uF C21 1uF
J4 IRF9530 DC_JACK_12V DC_JACK_VOLT_SENSE
BarrelJack_Switch
Q6 IRF4905 Q7 PN2222A HMD_ENABLE_VBUS_12V VBUS_12V
High-side switch; 12V is off by default, only letting 5V through until our headset asks for more via Power Delivery.
HEADSET VBUS POWER CONTROL TO SWITCH BETWEEN OFF/5V/12V AS NEEDED DURING USB POWER DELIVERY NEGOTIATION
Q4 FDV304P Q5 FDV304P
Q1 IRF4905 Q2 PN2222A HMD_ENABLE_VBUS HMD_VBUS
High-side switch: VBUS is off by default until USB is plugged-in.
U1 RP2040 microcontroller
PSVR2 USB TYPE-C PD CONTROL
DISPLAYPORT AUX PC<->PICO
DISPLAYPORT AUX PICO<->PSVR2
DP SINK HOT-PLUG DETECTION PULSE
12V POWER CONTROL
ONLY TOGGLE 5V WHEN A USB DEVICE GETS PLUGGED IN PSVR2 PORT
ONLY RAISE IT TO 12V AFTER POWER DELIVERY NEGOTIATION
PSVR2 USB 2.0 (OPTIONAL)
HMD_TYC_SDA HMD_TYC_SCL HMD_TYC_INT PC_LVDS_R PC_LVDS_RE PC_LVDS_DR PC_LVDS_D HMD_LVDS_R HMD_LVDS_RE HMD_LVDS_DE HMD_LVDS_D PC_HPD LED_CONN_WRONG_ORIENT LED_HMD_IS_READY HMD_ENABLE_VBUS HMD_ENABLE_VBUS_12V HMD_USB2_P HMD_USB2_N PC_AUX_TERMINATION_P PC_AUX_TERMINATION_N HMD_AUX_TERMINATION_P HMD_AUX_TERMINATION_N PWR_12V_VOLT_SENSE
PC_USB2_P PC_USB2_N
Conn_01x02_Pin J5
12MHz 20pF (X322512MSB4SI for JLC)
BOOTSEL SW_Push
U2 W25Q128JVS
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 100MΩ IN THE SOURCE/CARD SIDE. -> SOURCE: PULL DOWN THE (+) AND PULL UP THE (-) WITH 100MΩ. SINK: PULL UP THE (+) AND PULL DOWN THE (-) WITH 1MΩ.
THESE EXIST FOR CABLE/CONNECTION DETECTION. https://giaweilee.github.io/docs/DP-11a.pdf (Figure 3-2)
IC2 SN65MLVD200D
IC1 SN65MLVD200D
V_BIAS_PC V_BIAS_HMD
JP3 JP4
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