Power

File: power.kicad_sch

HDMI connectors

File: hdmi.kicad_sch

GSV2001 splitter

File: gsv2001.kicad_sch

MS2130 capture

File: ms2130.kicad_sch

ESP32-S31

File: esp32.kicad_sch

LED output

File: led.kicad_sch

HDMI in -> GSV2001 -> HDMI out (4K60 to the TV)
GSV2001 output B (1080p) -> MS2130 -> USB 2.0 -> ESP32-S31 -> LED data
USB-C: 5 V in and ESP32 programming

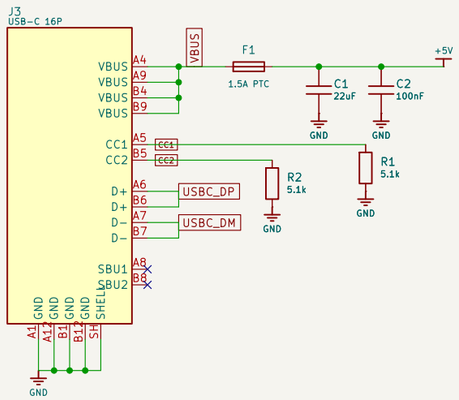
Build notes, bring-up steps and open items: README.md

Sheet: /
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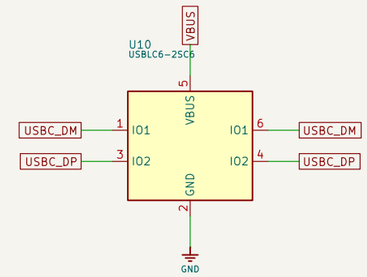
Title: HDMI Light v3

Size: A4	Date:	**Rev: A**
KiCad E.D.A. 10.0.5		Id: 1/7

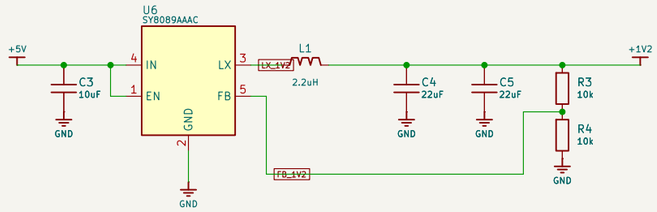
USB-C: 5 V in, and the ESP32's USB-Serial/JTAG for flashing



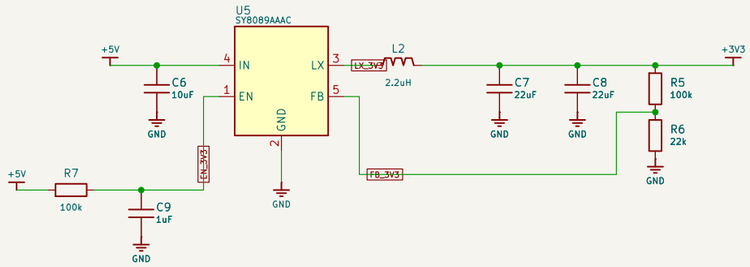
ESD protection on the USB pair



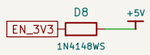
1.2 V for the GSV2001 (always on, comes up first)



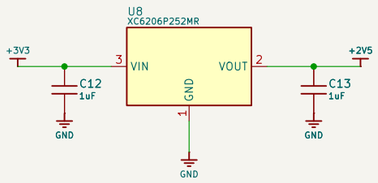
3.3 V (enable delayed by R7/C9 so it never leads 1.2 V)



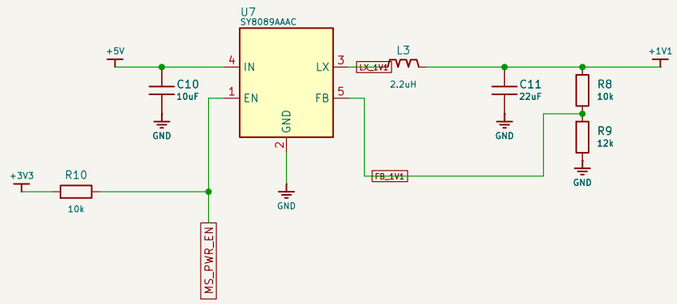
D8 empties C9 as soon as 5 V drops, so a quick re-plug gets the full enable delay again



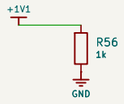
2.5 V for the MS2130's analogue supply



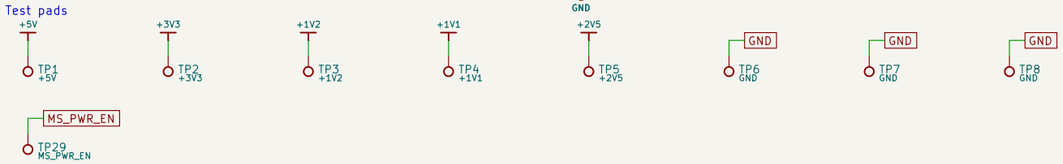
1.1 V for the MS2130 only (ESP32 pulls MS_PWR_EN low to switch the capture chip's core off)



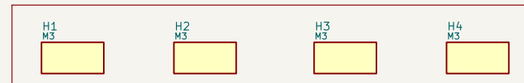
1.1 V bleed: with MS_PWR_EN low the rail really falls to zero



Test pads

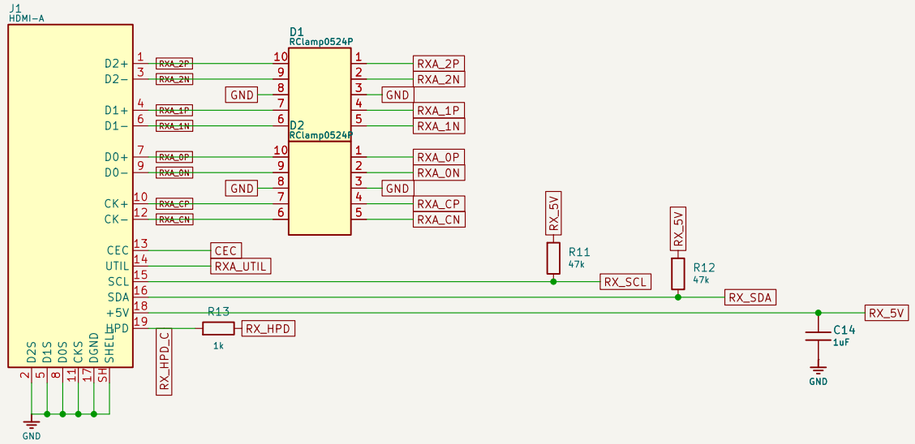


Mounting holes

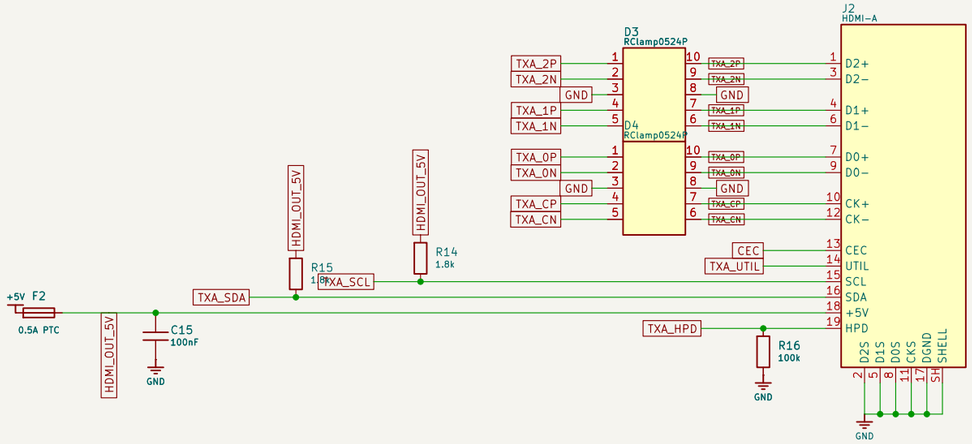


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Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.5		Id: 2/7

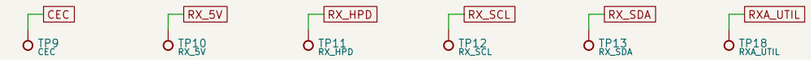
HDMI in (from the source)



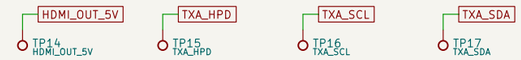
HDMI out (to the TV)



Test pads, input side



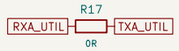
Test pads, output side



R55 NOT FITTED: hot-plug pull-up to the source's 5 V, only if the GSV2001's RX_HPD output proves to be open-drain



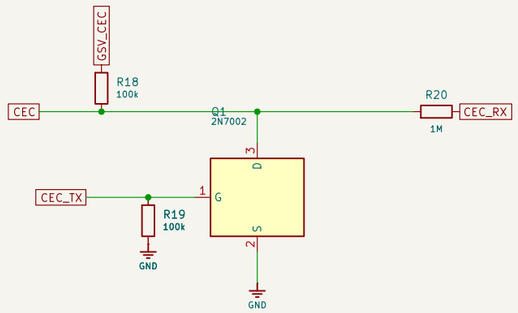
ARC: the utility line runs straight from the TV side to the source side (R17)



eARC experiment: C70 would AC-couple the two hot-plug pins. NOT FITTED, untested.



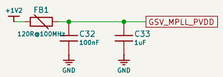
CEC: one copper bus across both connectors. The ESP32 listens through 1M (CEC_RX) and pulls low through Q1 (CEC_TX);
the GSV2001's CEC pin sees the bus only through R18 (100k). Nothing here loads the bus when the board is off.



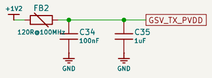
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File: hdmi.kicad_sch	
Title: HDMI Light v3 – HDMI connectors	
Size: A3	Date:
KiCad E.D.A. 10.0.5	Id: 3/7

RX from the HDMI input, TXA to the TV at full rate, TXB (downscaled to 1080p) to the MS2130.

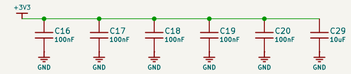
PLL supply (pin 2)



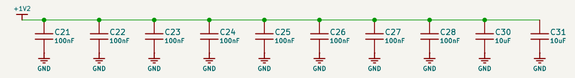
TX PLL supply (pin 24)



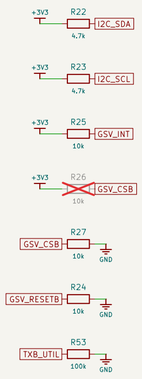
3.3 V decoupling (TVDD, DVDDIO)

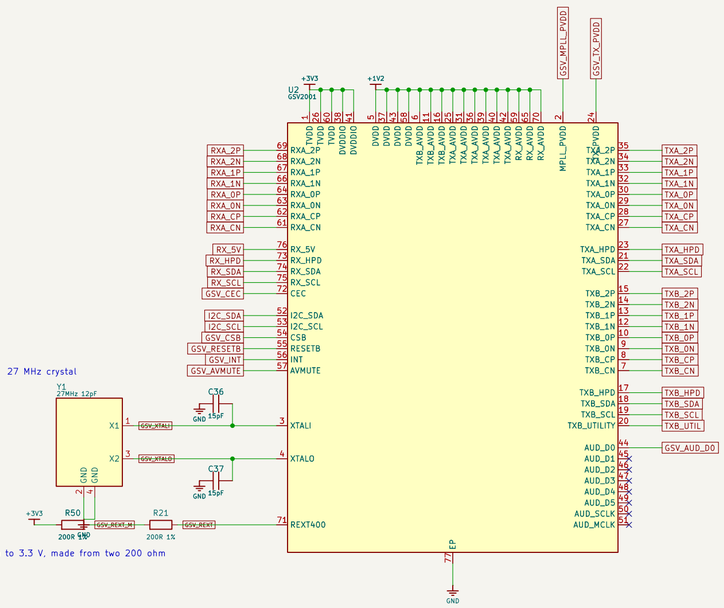


1.2 V decoupling (DVDD, RX/TX AVDD)



Control pulls. CSB is undocumented (low = I2C on the sister chip): R27 pulls it down, R26 is NOT FITTED.

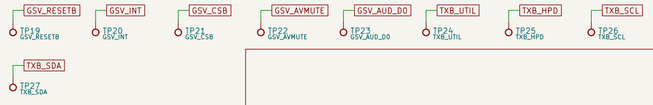




27 MHz crystal

REXT: 400 ohm to 3.3 V, made from two 200 ohm

Test pads



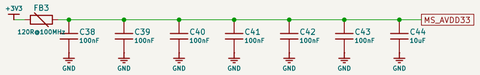
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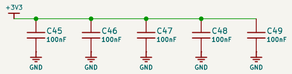
Size: A2 | Date: | **Rev: A**
KiCad E.D.A. 10.0.5 | Id: 4/7

HDMI input comes from the GSV2001's output B (TXB_*), USB 2.0 goes to the ESP32.

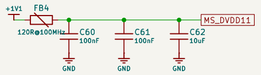
Analogue 3.3 V, filtered from the 3.3 V rail



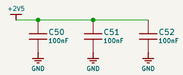
Digital 3.3 V decoupling



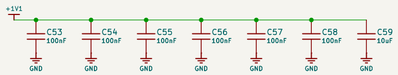
Digital 1.1 V, filtered from the 1.1 V rail



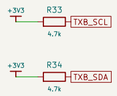
2.5 V decoupling



Analogue 1.1 V decoupling



DDC pull-ups for the link from the GSV2001's output B

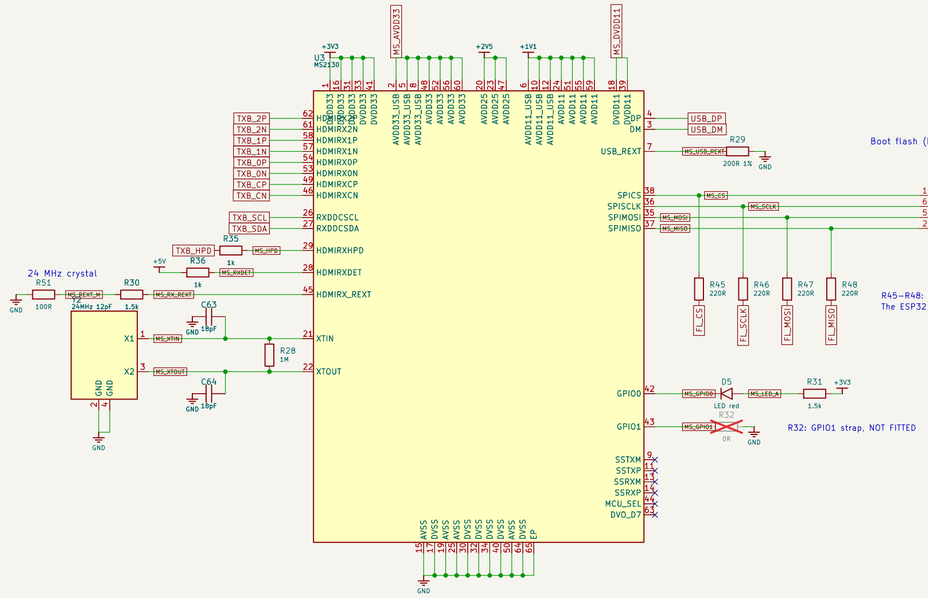


Hot-plug to the GSV2001 stays low while the MS2130 core is off



USB plug detect (datasheet option): the ESP32 is the host, so it drives GPIO0 itself through R58.
ESP32 pin floating = demo-board wiring (D5 status LED). High = host present, low = absent.





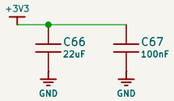
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Title: HDMI Light v3 – MS2130 capture		
Size: A2	Date:	**Rev: A**
KiCad E.D.A. 10.0.5		Id: 5/7

USB HS host (DM/DP, pads under the module) goes to the MS2130; IO33/IO34 are USB-Serial/JTAG to the USB-C.

FL_* reach the MS2130 boot flash through R45-R48: leave floating unless programming it.

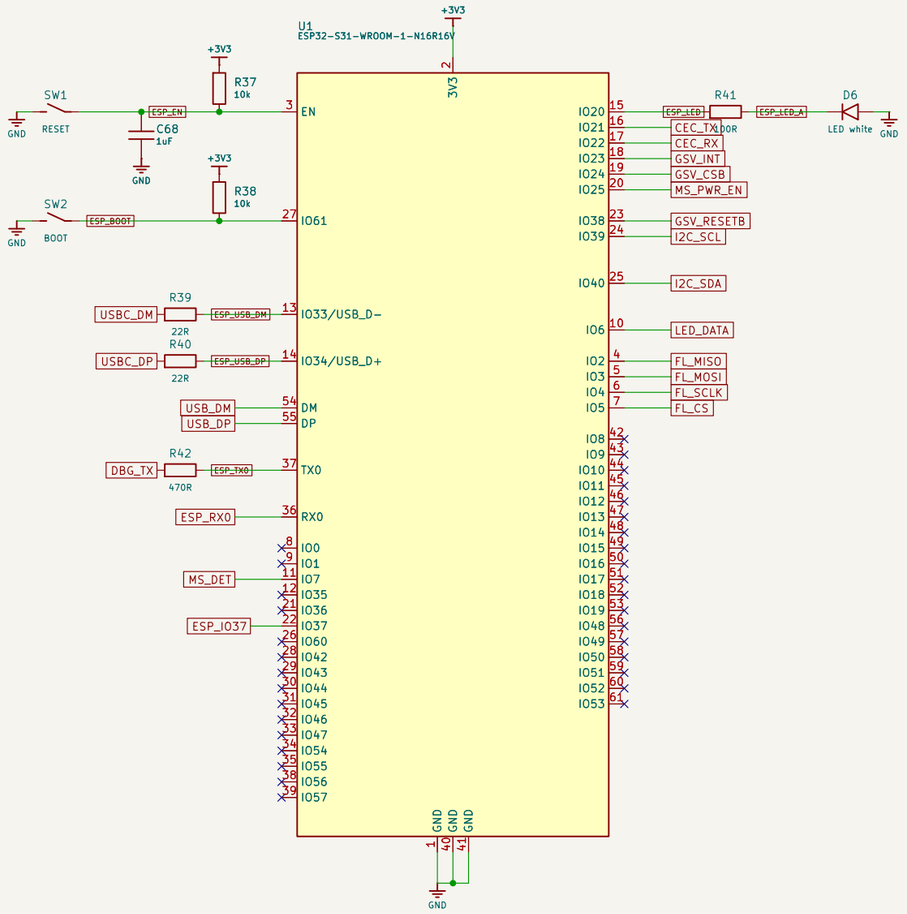
IO20-IO25 are SDIO pads on their own supply (3.3 V by default per ESP-IDF, undocumented): only signals that survive 1.8 V are on them.

Module supply

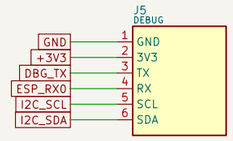


Reset

Boot (hold while resetting to flash)



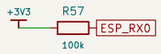
Debug header



GPIO37 is a strapping pin (JTAG source) with no internal pull: R49 keeps it from floating.



R57 keeps the console input from floating with nothing plugged into J5.



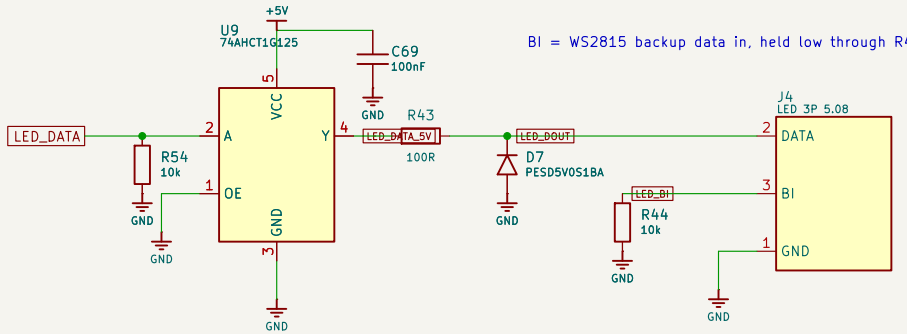
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Title: HDMI Light v3 - ESP32-S31

Size: A3 | Date: | **Rev: A**

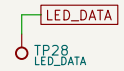
KiCad E.D.A. 10.0.5 | Id: 6/7

WS281x data: 3.3 V from the ESP32 buffered to 5 V. The strip has its own supply; only data and ground leave here.



BI = WS2815 backup data in, held low through R44 (10k, so a mis-wired strip cannot short)

Test pads



Sheet: /LED output/		
File: led.kicad_sch		
Title: HDMI Light v3 – LED output		
Size: A4	Date:	**Rev: A**
KiCad E.D.A. 10.0.5		Id: 7/7