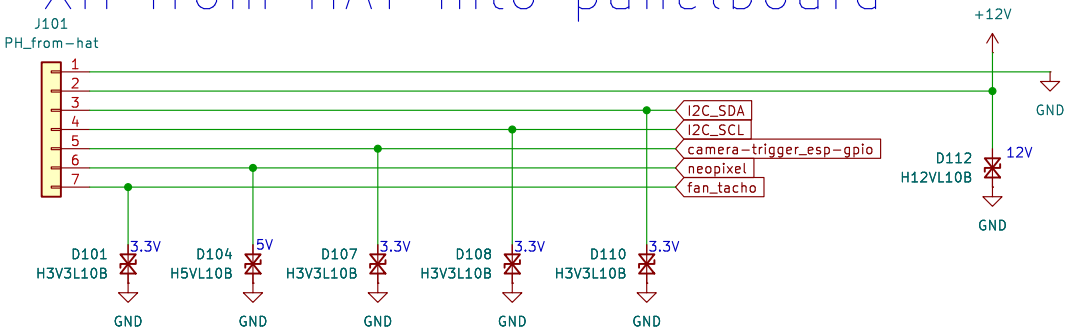
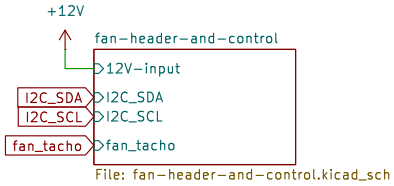
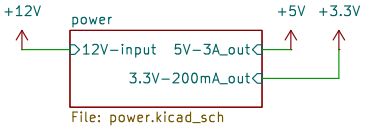
# XH from HAT into panelboard



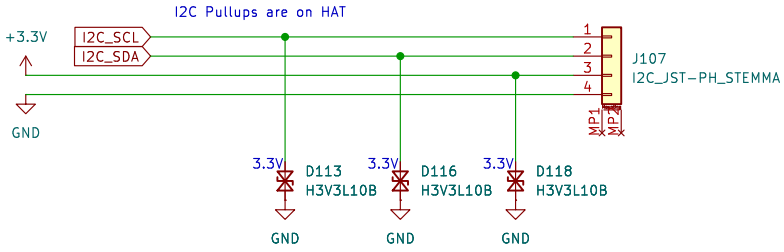

# Make 5V and 3.3V

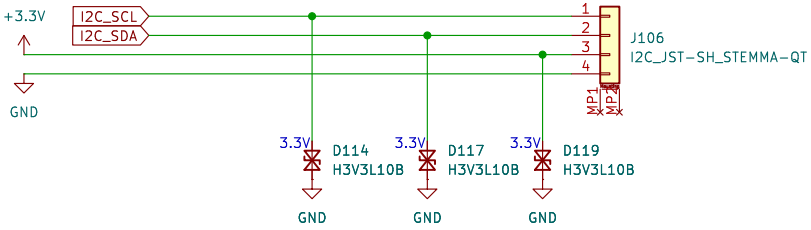



# STEMMA and STEMMA QT

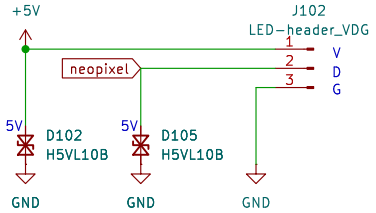
STEMMA and STEMMA QT for expansion
3.3V+I2C with max. 200 mA (peak 1A) output at 3.3V
pinout order is correct
double checked for PH and SH

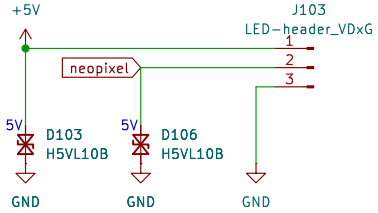


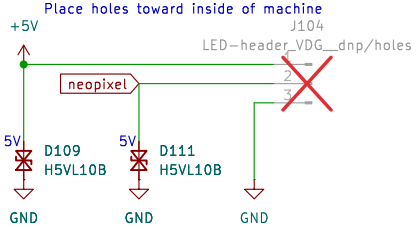




# Addressable LED connectors

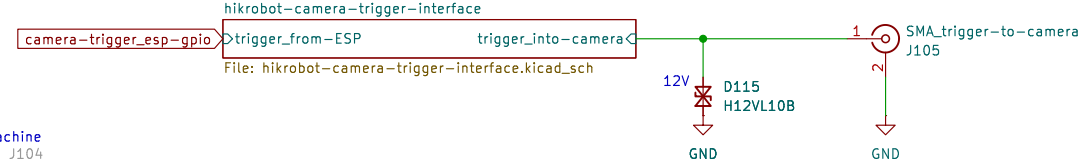
LED headers: 5V (3A max), Neopixel data, GND
VDG: square pins, no key, connectors fit between shrouded connector and board
ARGB/JRAINBOW: round pins, key: 12x3 as VDxG, f connector is overmolded and requires PCB cutout when M is shrouded
Both: ESD protection, 2.54 mm pitch. PC Mainboards have supervisor chips for overcurrent but our buck converter will OCP OK
For visualization and explanation of common neopixel headers on PC parts:
https://pcinq.com/what-is-argb-headers-hubs-cables-controllers-explained/

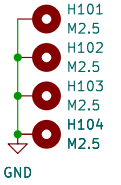



# Trigger output into HIKROBOT camera Line 0



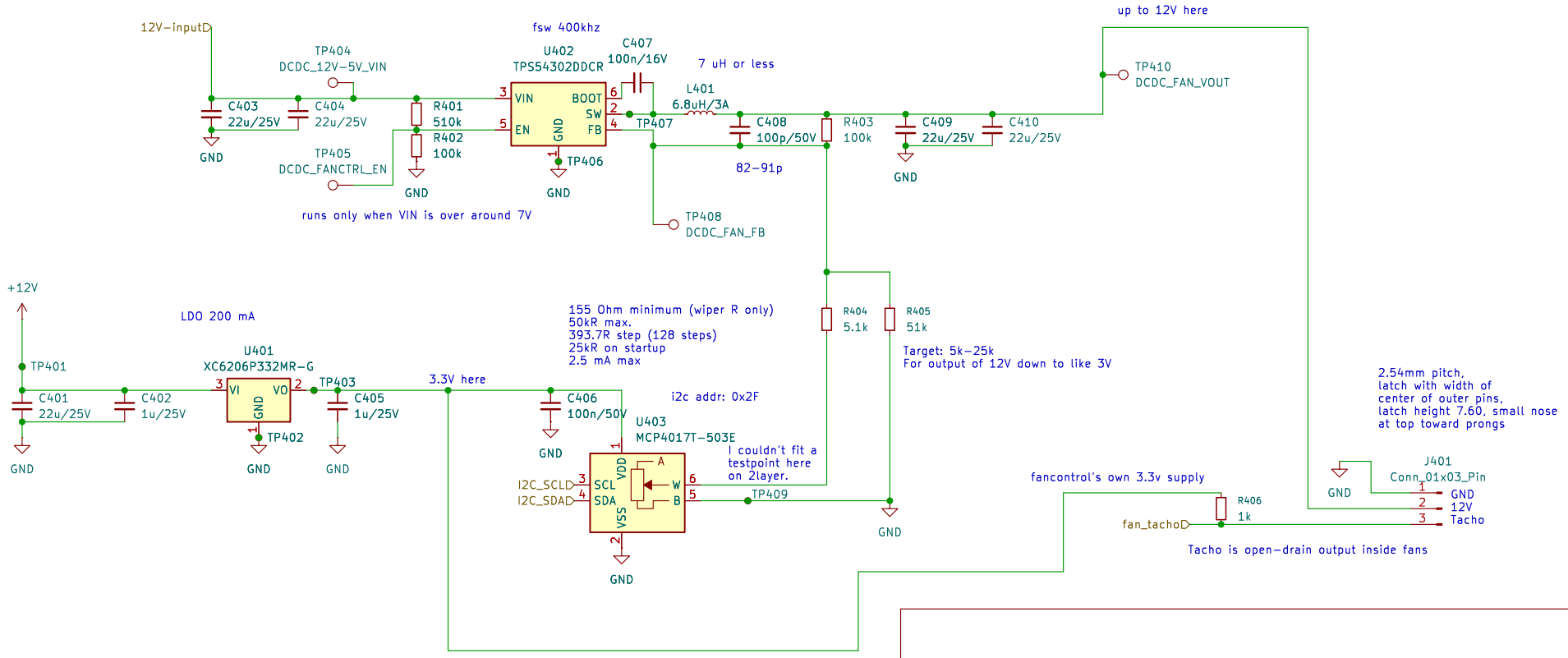

christiankuttke
openUC2 GmbH

| | | |
|---|---|---|
| Sheet: / | | |
| File: hat-panelboard.kicad_sch | | |
| **Title: mAIkroscope::hat-panelboard** | | |
| Size: A4 | Date: 2025-08-19 | **Rev: A** |
| KiCad E.D.A. 9.0.3 | | Id: 1/4 |

For reference for connectors and tacho electrical spec:
https://www.noctua.at/pub/media/wysiwyg/Noctua_PWM_specifications_white_paper.pdf

# 12V -> 12V down to 3V variable

Use TI webench power designer to get the coil/cap/fb values without calculating

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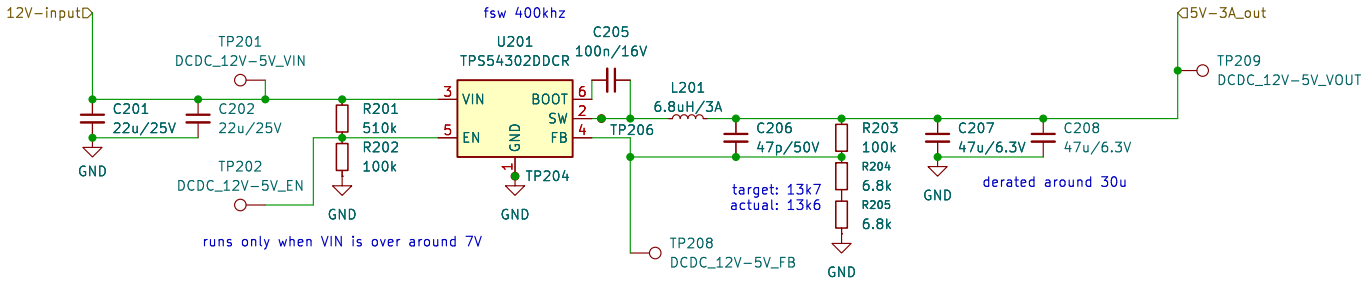
Sheet: /fan-header-and-control/
File: fan-header-and-control.kicad_sch

***Title: mAIkroscope::hat-panelboard***

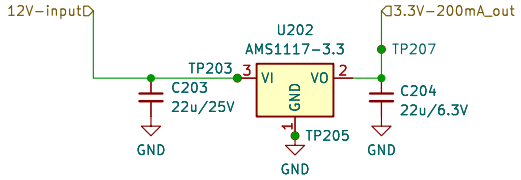
| Size: A4 | Date: 2025-08-19 | **Rev: A** |
|---|---|---|
| KiCad E.D.A. 9.0.3 | | Id: 4/4 |

# 12V -> 5V 3A for LEDs (ARGB etc.)

Use TI webench power designer to get the coil/cap/fb values without calculating




# 12V -> 3.3V 200mA avg (1A peak) for STEMMA

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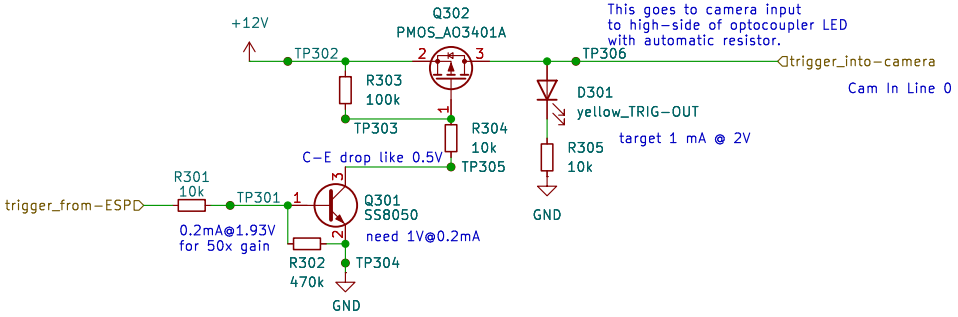
| Sheet: /power/ | | |
| File: power.kicad_sch | | |
| ***Title: mAIkroscope::hat-panelboard*** | | |
| Size: A4 | Date: 2025-08-19 | **Rev: A** |
| KiCad E.D.A. 9.0.3 | | Id: 2/4 |

This takes the 3.3V gpio levels from the ESP
and drives 12V signal level to the camera.

Hikrobot camera interfacing:
Cam In Line 0: +input to optoisolator LED, LED – to GND
Cam Out Line 1: + Source of optoisolator NPN (pullup),
– Drain of OI NPN (GND)
Cam I/O Line 2: Camera pulls up – pull pin LO for input.
Output NPN in Camera pulls pin LO. Also connect
GND reference.
In Camera is automatic resistor before optocoupler and it needs min. 5V.

V(GS)max is +–12V! So the gate is voltage–dividered between GND and Source
for V(GS) of –10.9V when PMOS is conducting.




Line 1 (from camera to HAT) and Line 2 (bidirectional) interfacing is not implemented.

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| Sheet: /hikrobot–camera–trigger–interface/ | | |
| File: hikrobot–camera–trigger–interface.kicad_sch | | |
| ***Title: mAIkroscope::hat–panelboard*** | | |
| Size: A4 | Date: 2025–08–19 | **Rev: A** |
| KiCad E.D.A. 9.0.3 | | Id: 3/4 |