Power

File: power.kicad_sch

MCU

File: mcu.kicad_sch

Camera

File: camera.kicad_sch

Storage

File: storage.kicad_sch

Sensors

File: sensors.kicad_sch

USB

File: usb.kicad_sch

LED

File: led.kicad_sch

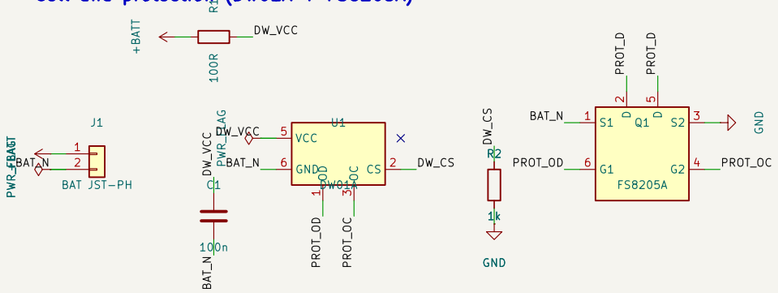
Root sheet

Sheet: /
File: toilet-monitor.kicad_sch

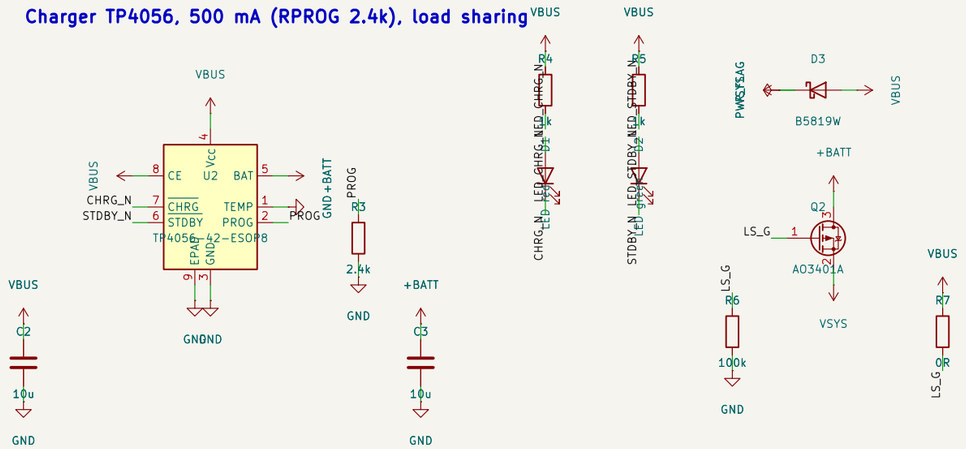
Title: Smart toilet health monitor, integrated board

Size: A4	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 1/8

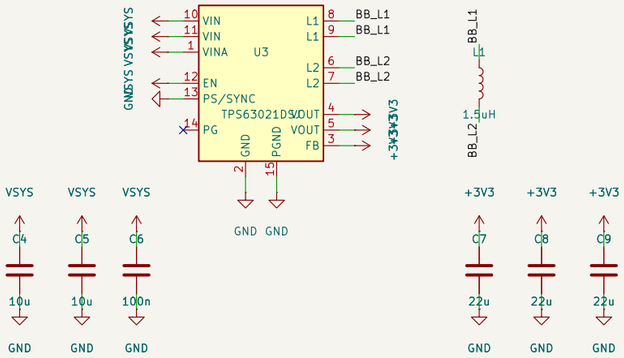
Cell and protection (DW01A + FS8205A)



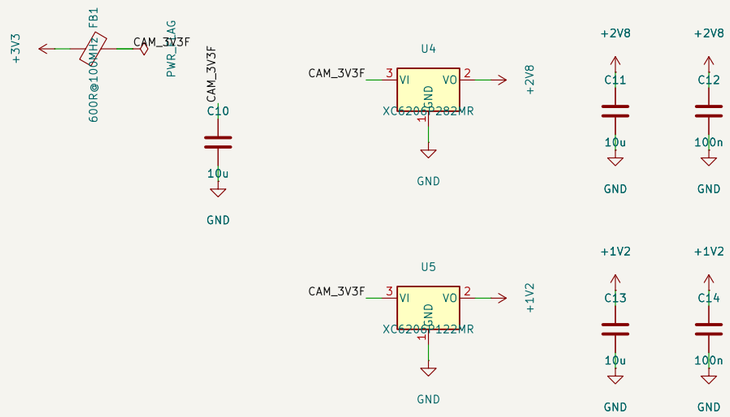
Charger TP4056, 500 mA (RPROG 2.4k), load sharing



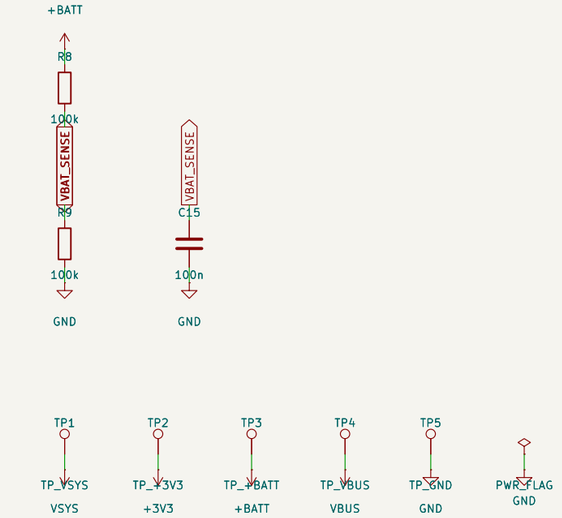
3.3V buck–boost TPS63021, 1.5uH, 2x10u in, 3x22u out



Camera LDOs behind a ferrite bead: 2.8V (AVDD) and 1.2V (DVDD)



Battery sense 2:1 divider to ADC1, test points



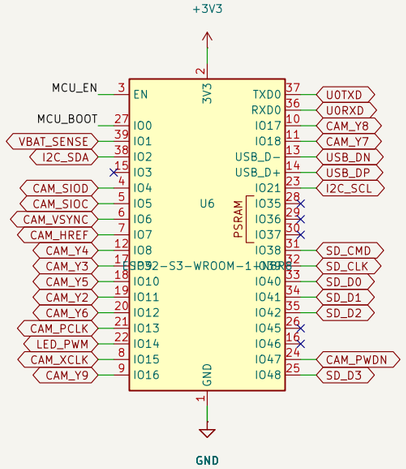
Cell, protection, charger, load sharing, 3.3V buck–boost, camera LDOs

Sheet: /Power/
File: power.kicad_sch

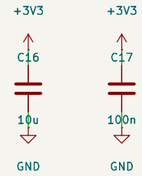
Title: Power

Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 2/8

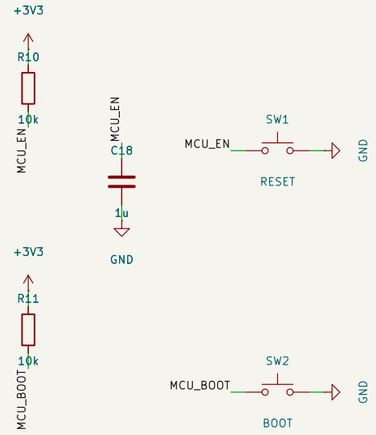
ESP32-S3-WROOM-1-N8R8. IO35-37 reserved by octal PSRAM; IO3/45/46 strapping, left open.



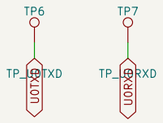
Supply decoupling



Reset (EN) and boot (IO0)



Debug UART0 test pads (GND pad is on the power sheet)



ESP32-S3-WROOM-1-N8R8, reset and boot, decoupling, debug UART

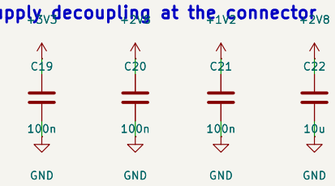
Sheet: /MCU/
File: mcu.kicad_sch

Title: MCU

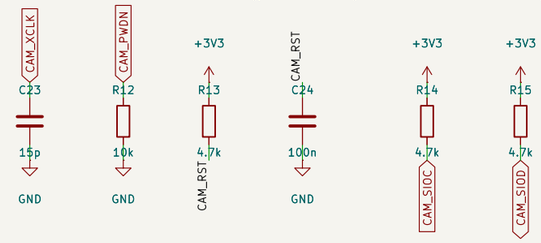
Size: A3 | Date: | **Rev: A**
KiCad E.D.A. 10.0.7 | Id: 3/8

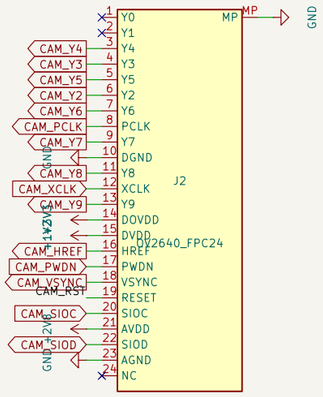
OV2640 module, 24-pin 0.5 mm FPC. DOVDD 3.3V, AVDD 2.8V, DVDD 1.2V, as on the ESP32-CAM.

Supply decoupling at the connector



XCLK load, PWDN default off (pull-down), RESET RC, SCCB pull-ups





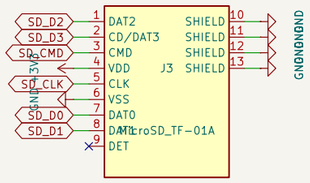
OV2640 on 24-pin FPC (ESP32-CAM pin order), supplies, SCCB pull-ups

Sheet: /Camera/
File: camera.kicad_sch

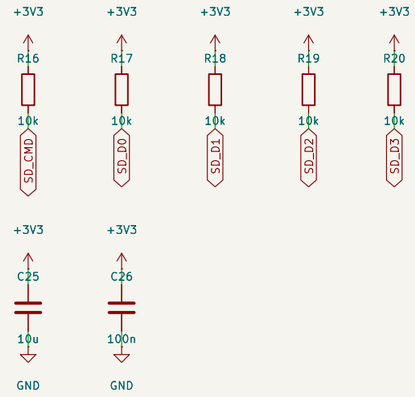
Title: Camera

Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 4/8

microSD, SDMMC 4-bit. Card detect unused (no spare GPIO).



Pull-ups and decoupling



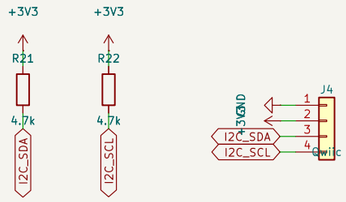
microSD push-push socket on SDMMC 4-bit, 10k pull-ups

Sheet: /Storage/
File: storage.kicad_sch

Title: Storage

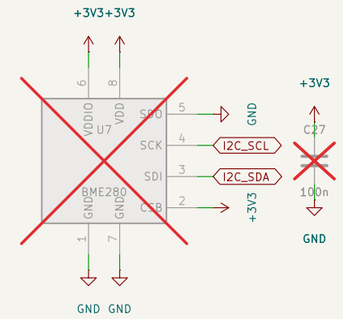
Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 5/8

I2C bus pull-ups (populated) and Qwiic connector



AS7341 is a 1.8V part; it is not placed on the board. Use a breakout on the Qwiic connector.

BME280 environment sensor, I2C address 0x76, DNP on revision A



BME280 footprint (DNP on rev A), I2C pull-ups, Qwiic for AS7341 breakout

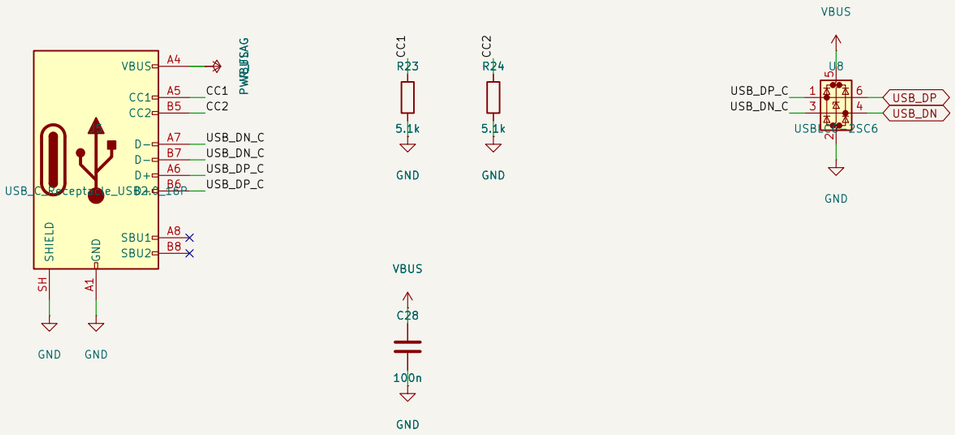
Sheet: /Sensors/
File: sensors.kicad_sch

Title: Sensors

Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 6/8

USB-C 16-pin receptacle, 5.1k on CC1/CC2 (UFP), SBU unused

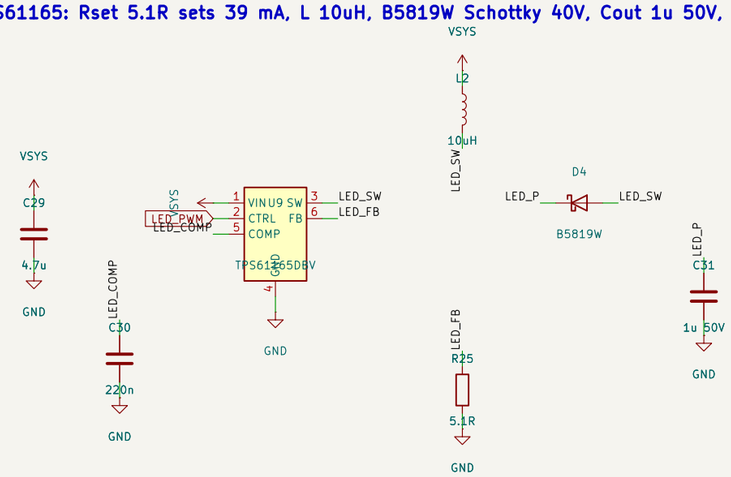
ESD protection USBLC6-2SC6, then native USB D+/D- on the module



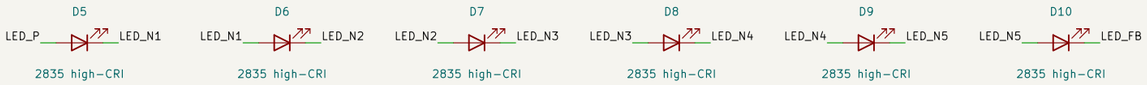
USB-C receptacle, CC pull-downs, ESD array, native USB to the module

Sheet: /USB/		
File: usb.kicad_sch		
Title: USB		
Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 7/8

TPS61165: Rset 5.1R sets 39 mA, L 10uH, B5819W Schottky 40V, Cout 1u 50V, COMP 220n



LED string: anode at LED_P, cathode into FB sense resistor



TPS61165 boost constant-current driver, 6 x high-CRI 2835 in series, PWM dimming

Sheet: /LED/ File: led.kicad_sch		
Title: LED		
Size: A3	Date:	**Rev: A**
KiCad E.D.A. 10.0.7		Id: 8/8