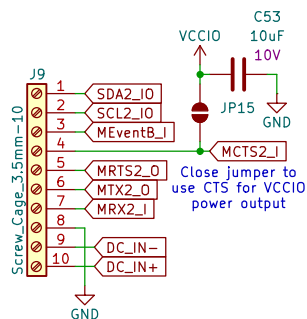
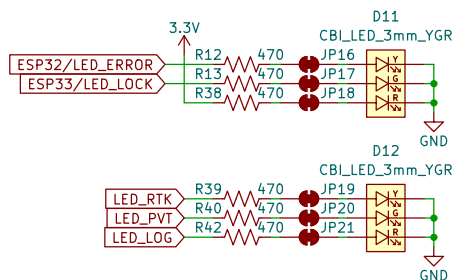


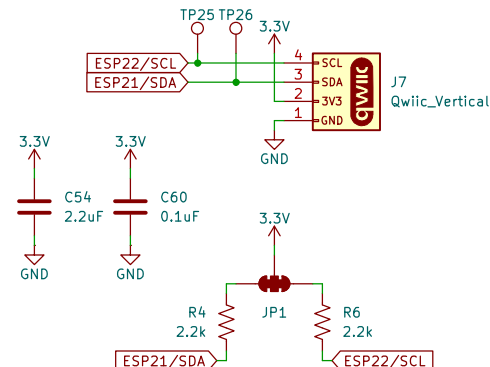
I/O Connector



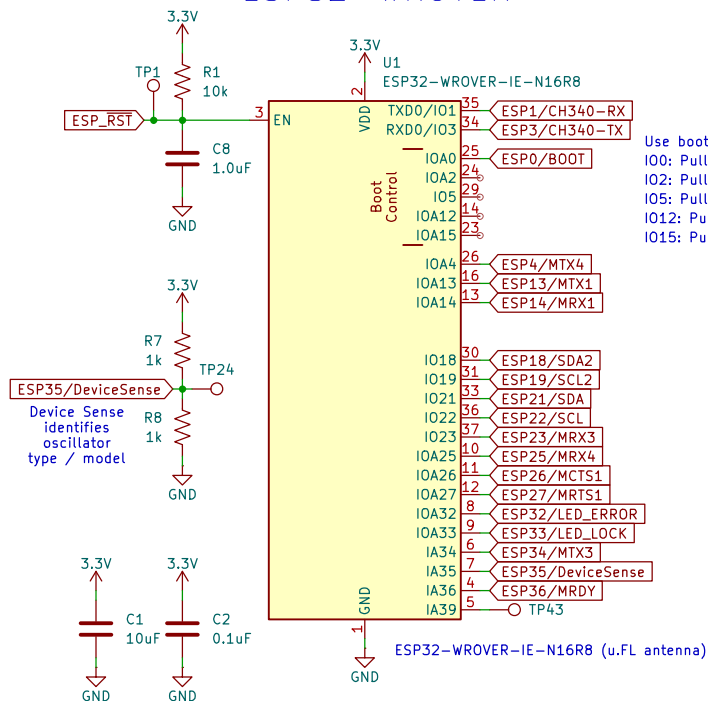
LEDs



Qwiic I²C (for OLED)



ESP32-WROVER



Power

File: Power.kicad_sch

USB

File: USB.kicad_sch

GNSS

File: GNSS.kicad_sch

Ethernet

File: Ethernet.kicad_sch

LevelShifting

File: LevelShifting.kicad_sch

LevelShifting_10MHz

File: LevelShifting_10MHz.kicad_sch



SPARKPNT

Designed by: P.C.

Sheet: /
File: SparkFun_RTK_mosaic-T.kicad_sch

Title: GPSDO (mosaic-T)

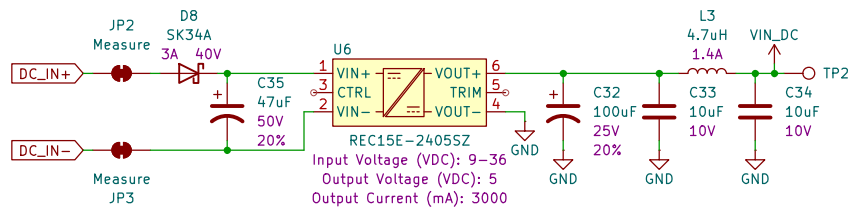
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KiCad E.D.A. 8.0.5

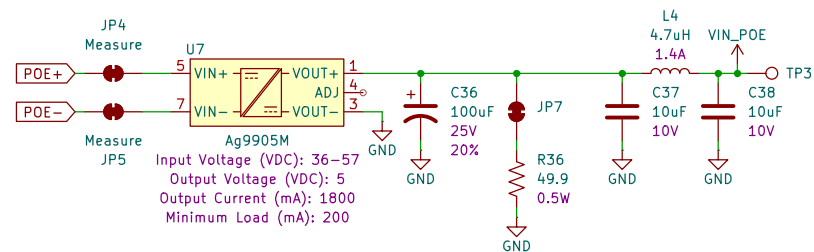
Rev: v10

Id: 1/7

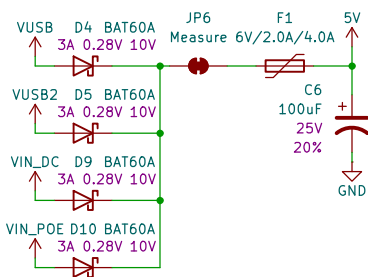
DC Power In



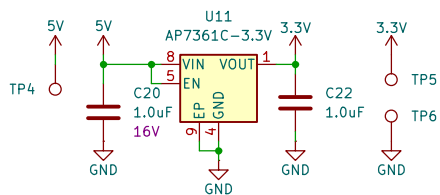
Power Over Ethernet



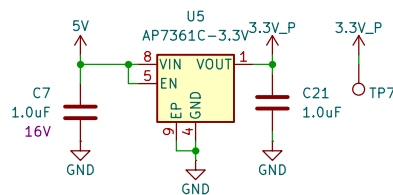
Power Mux



Main 3.3V



Peripheral 3.3V



Sheet: /Power/
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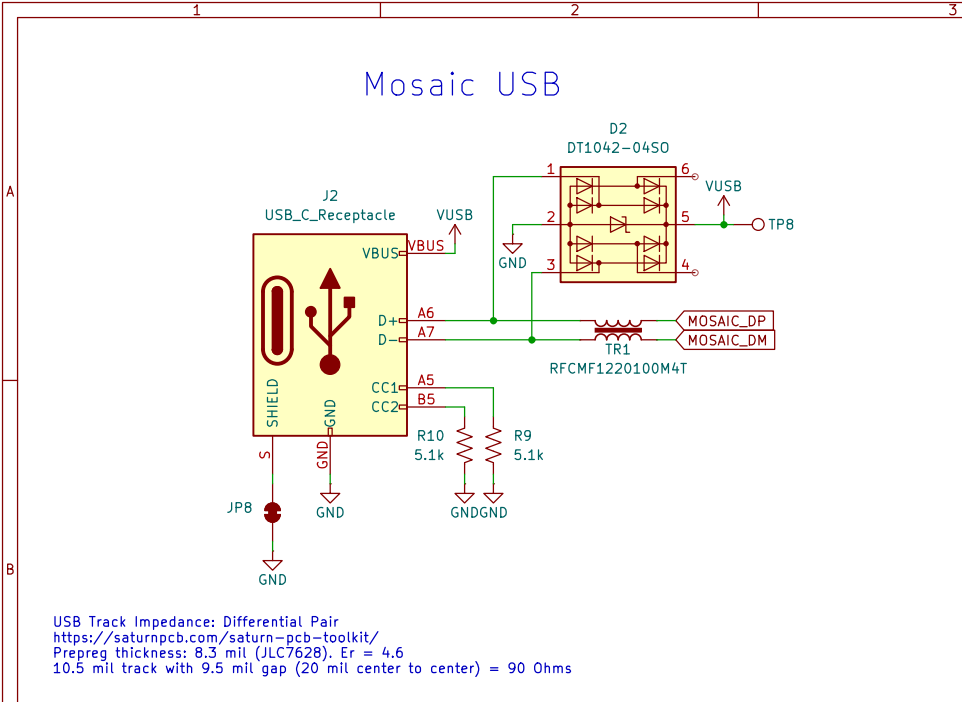
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Id: 2/7

[illegible]

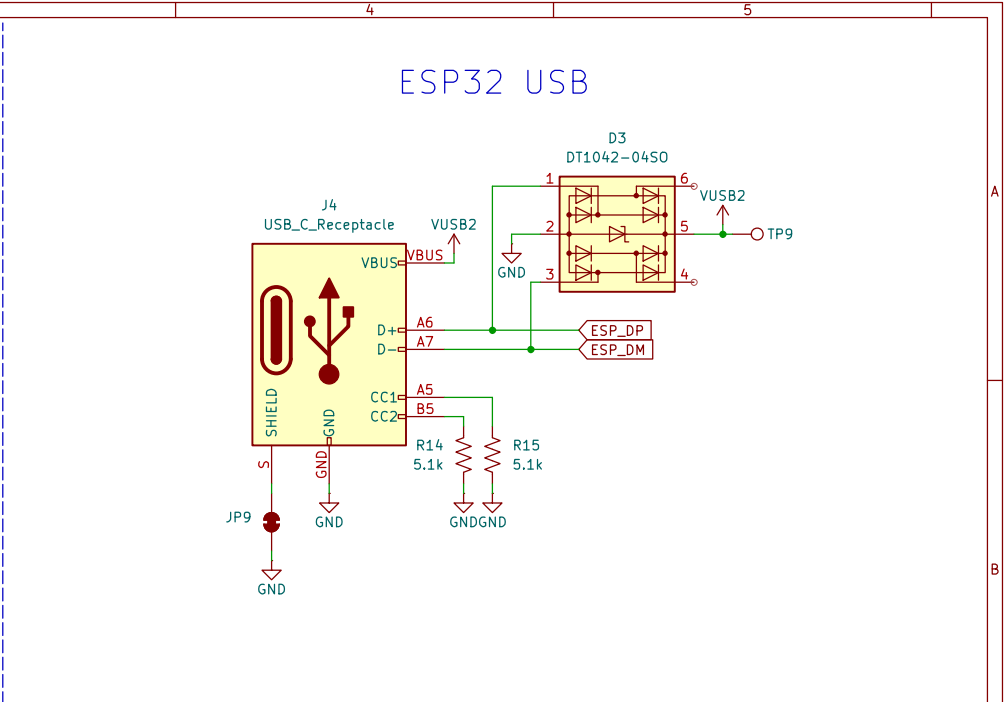
Mosaic USB

The schematic diagram illustrates the Mosaic USB interface circuit. It features a USB_C_Receptacle (J2) connected to a shielded cable (JP8). The receptacle pins are labeled SHIELD, GND, CC1, CC2, D+, D-, and VBUS. The shield is connected to ground through JP8. The D+ and D- signals are routed through resistors R10 and R9 (both 5.1k) to ground. The VBUS signal is connected to a diode bridge rectifier (D2, DT1042-0450) and a MOSFET driver (TR1, RFCMF1220100M4T). The MOSFET driver is configured as a source follower, driving the MOSAIC_DP and MOSAIC_DM signals. A test point TP8 is provided for VBUS measurement.

USB Track Impedance: Differential Pair
https://saturnpcb.com/saturn-pcb-toolkit/
Prepreg thickness: 8.3 mil (JLC7628). Er = 4.6
10.5 mil track with 9.5 mil gap (20 mil center to center) = 90 Ohms

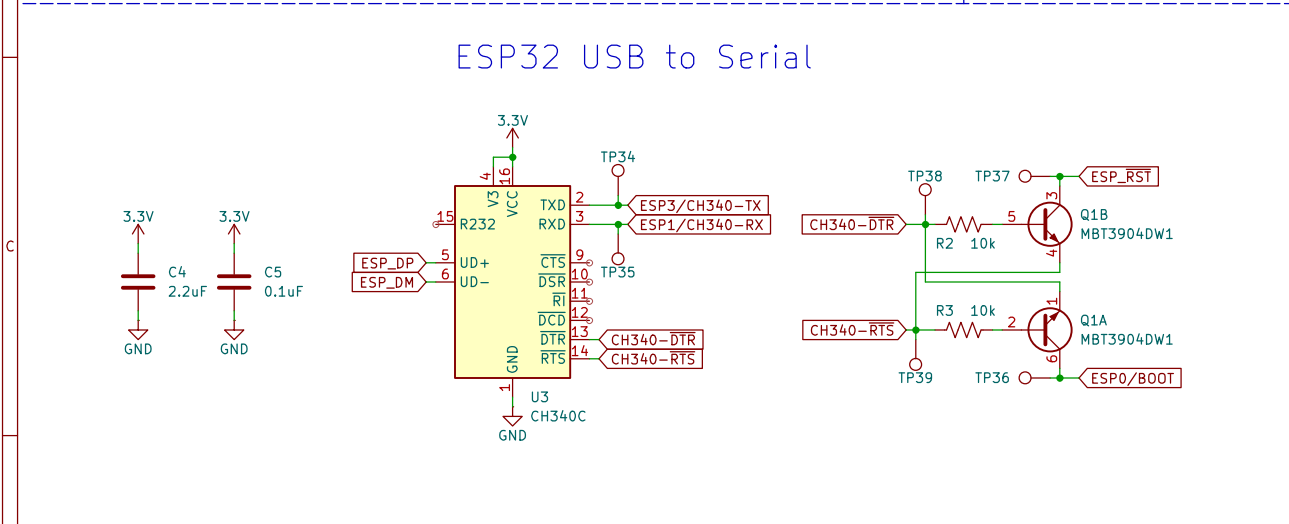
ESP32 USB

The diagram illustrates the USB interface for an ESP32. It features a USB-C receptacle (J4) connected to a USB-to-UART bridge (D3, DT1042-0450). The bridge's VBUS pin is connected to the receptacle's VBUS pin and a USB2 pin. The bridge's GND pin is connected to the receptacle's GND pin and a GND pin. The bridge's D+ pin is connected to the receptacle's D+ pin and the ESP32's DP pin. The bridge's D- pin is connected to the receptacle's D- pin and the ESP32's DM pin. The bridge's CC1 pin is connected to the receptacle's CC1 pin and a 5.1k resistor (R14) to GND. The bridge's CC2 pin is connected to the receptacle's CC2 pin and a 5.1k resistor (R15) to GND. The receptacle's SHIELD pin is connected to a JP9 pin, which is then connected to GND. The receptacle's S pin is connected to GND.



ESP32 USB to Serial

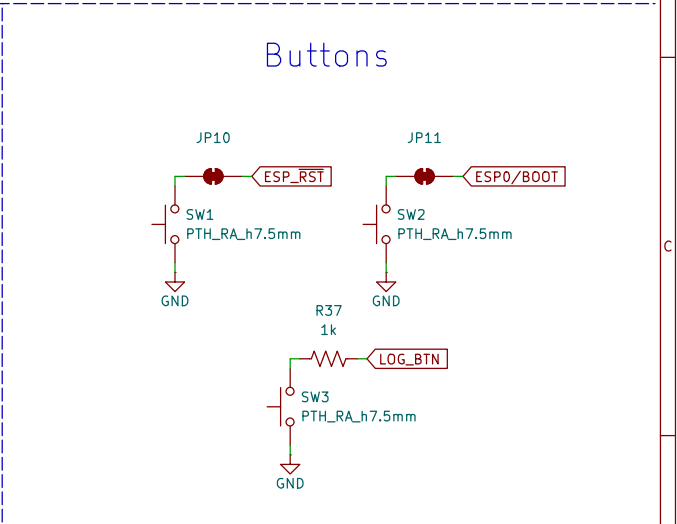
The diagram illustrates the wiring for an ESP32 USB to Serial module. The ESP32 chip (R232) is connected to a USB-to-UART bridge (U3, CH340C). The bridge has two channels: CH340-TX (pin 2) and CH340-RX (pin 3). The TX pin is connected to ESP32 pin 2 (TXD) and the RX pin is connected to ESP32 pin 3 (RXD). The bridge also has control pins: CH340-DTR (pin 13) and CH340-RTS (pin 14). The DTR pin is connected to ESP32 pin 10 (CTS) and the RTS pin is connected to ESP32 pin 11 (DSR). The bridge has a 3.3V supply (pin 4) and a GND (pin 1). The bridge is connected to a USB port (pin 15) and a USB-to-UART bridge (U3, CH340C). The bridge has two channels: CH340-TX (pin 2) and CH340-RX (pin 3). The TX pin is connected to ESP32 pin 2 (TXD) and the RX pin is connected to ESP32 pin 3 (RXD). The bridge also has control pins: CH340-DTR (pin 13) and CH340-RTS (pin 14). The DTR pin is connected to ESP32 pin 10 (CTS) and the RTS pin is connected to ESP32 pin 11 (DSR). The bridge has a 3.3V supply (pin 4) and a GND (pin 1). The bridge is connected to a USB port (pin 15) and a USB-to-UART bridge (U3, CH340C).



Buttons

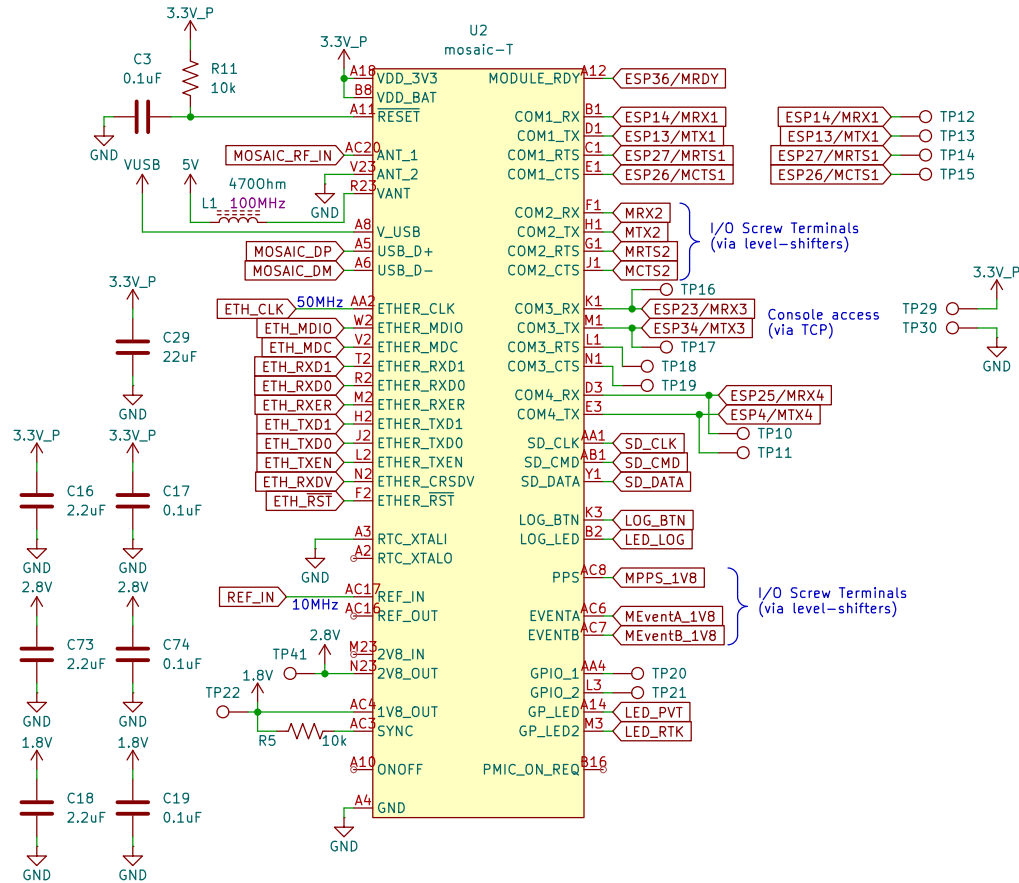
The diagram illustrates the wiring for three push buttons (SW1, SW2, SW3) connected to microcontroller pins. Each button is connected to a specific pin through a pull-up resistor (R37, 1k) and a through-hole pad (PTH_RA_h7.5mm). The buttons are connected to ground (GND) through the same PTH_RA_h7.5mm pads.

- SW1:** Connected to JP10 (ESP_RST) through a pull-up resistor (R37, 1k) and a through-hole pad (PTH_RA_h7.5mm). The button is connected to GND through the same PTH_RA_h7.5mm pad.
- SW2:** Connected to JP11 (ESP0/BOOT) through a pull-up resistor (R37, 1k) and a through-hole pad (PTH_RA_h7.5mm). The button is connected to GND through the same PTH_RA_h7.5mm pad.
- SW3:** Connected to LOG_BTN through a pull-up resistor (R37, 1k) and a through-hole pad (PTH_RA_h7.5mm). The button is connected to GND through the same PTH_RA_h7.5mm pad.

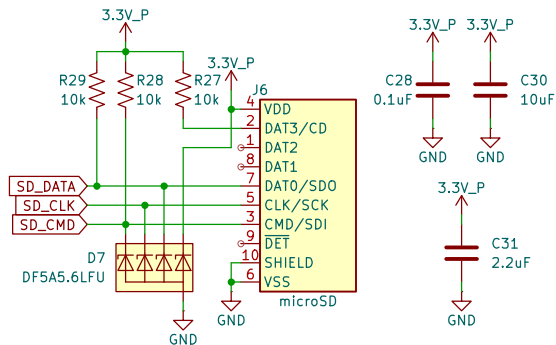


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Id: 3/7

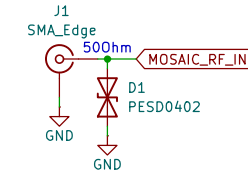
mosaic Tri-band GNSS



microSD

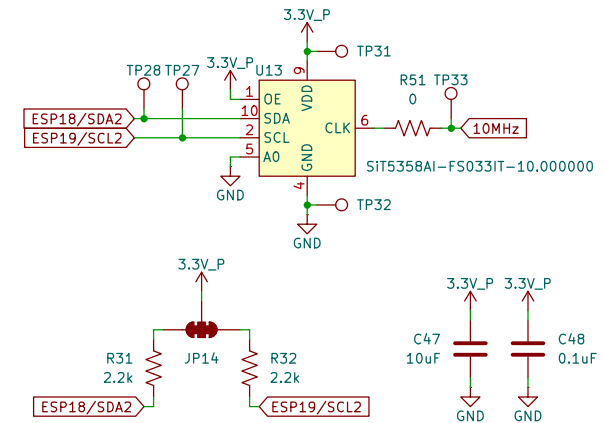


GNSS Antenna



Microstrip Calculation:
 Copper Thickness (1oz): 1.4mil/0.035mm
 Board thickness: 1.6mm
 Dielectric thickness (layer 1 to 2): 0.2mm
 Er: 4.6
 Polygon Isolation: 6mil/0.1524mm
 RF Trace Width: 13mil/0.33mm
<https://chemandy.com/calculators/coplanar-waveguide-with-ground-calculator.htm>

10MHz Oscillator



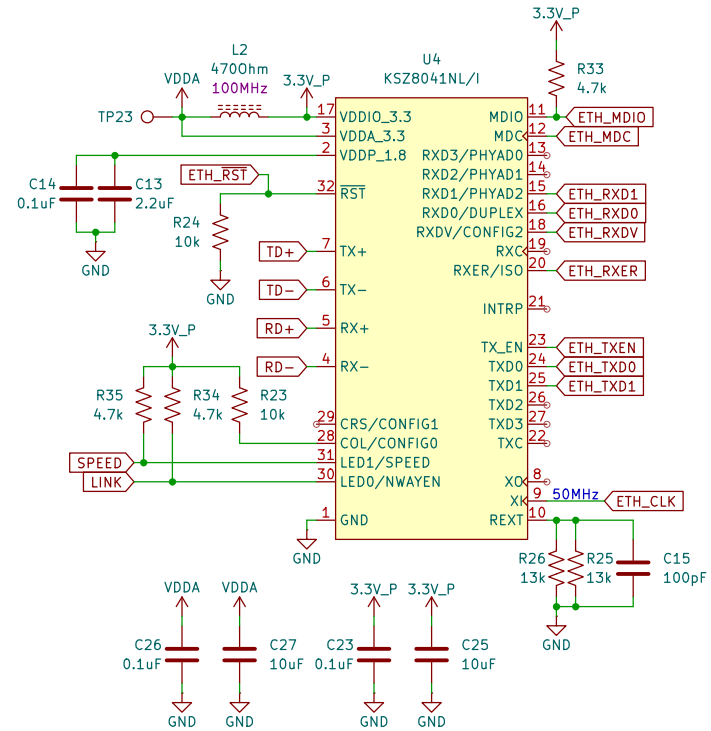
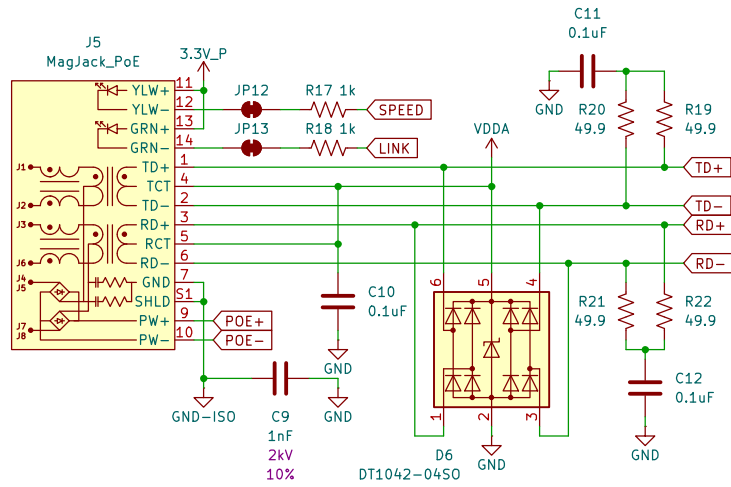
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Rev:
 Id: 4/7

Ethernet



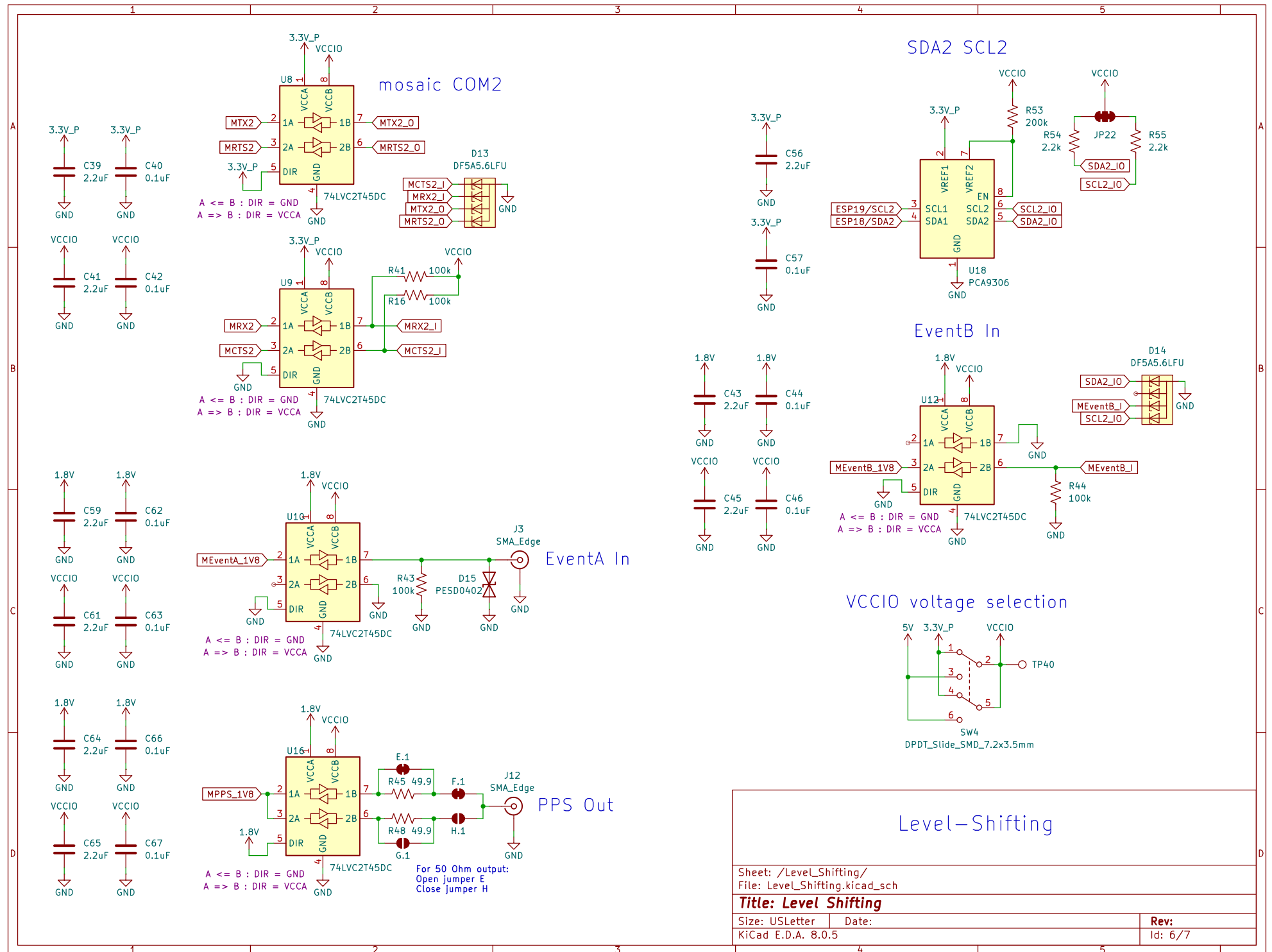
Ethernet Track Impedance: Differential Pair
<https://saturnpcb.com/saturn-pcb-toolkit/>
 Prepreg thickness: 8.3 mil (JLC7628), Er = 4.6
 9.0 mil track with 11.0 mil gap (20 mil center to center) = 100 Ohms
 Each pair should match in length to better than 0.5mm

Sheet: /Ethernet/
 File: Ethernet.kicad_sch

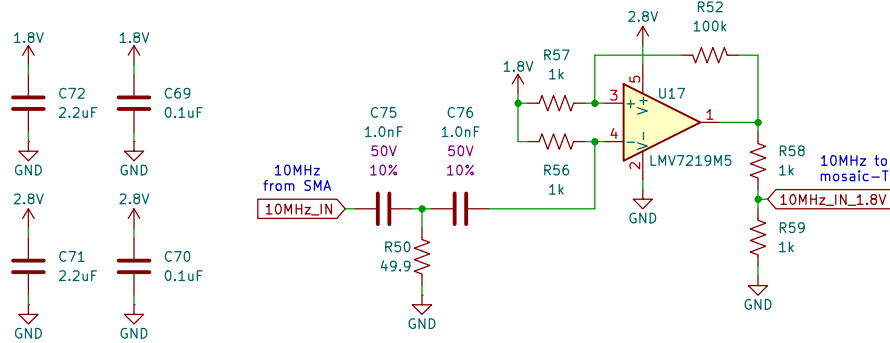
Title: Ethernet

Size: USLetter Date:
 KiCad E.D.A. 8.0.5

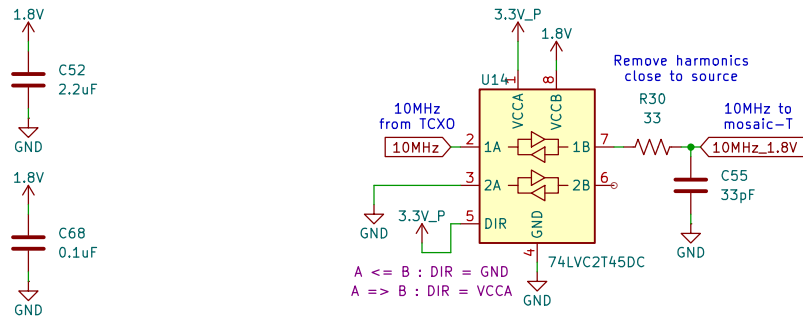
Rev:
 Id: 5/7



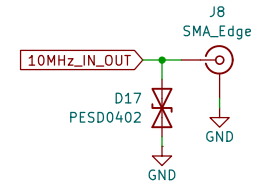
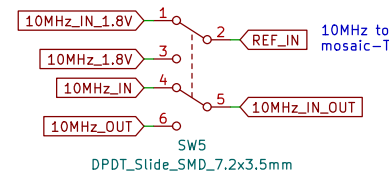
10MHz In



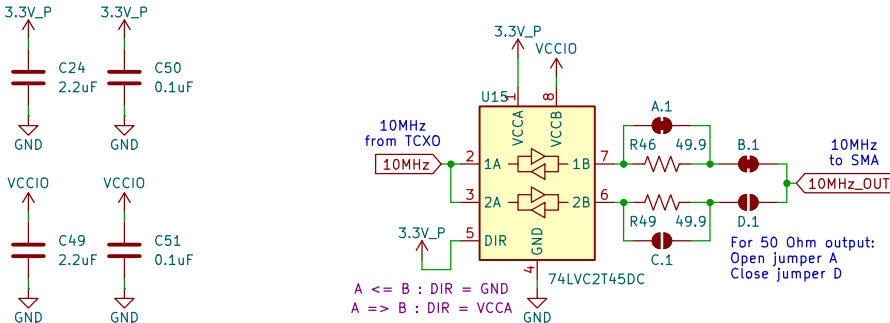
10MHz 1.8V for mosaic-T



10MHz In / Out



10MHz Out



Level-Shifting 10MHz

Sheet: /LevelShifting_10MHz/
File: LevelShifting_10MHz.kicad_sch

Title: Level Shifting 10MHz

Size: USLetter Date:
KiCad E.D.A. 8.0.5

Rev:
Id: 7/7