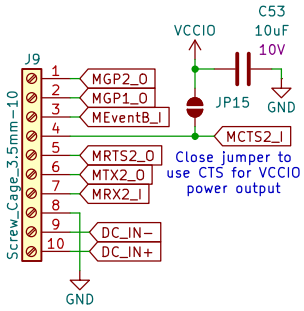
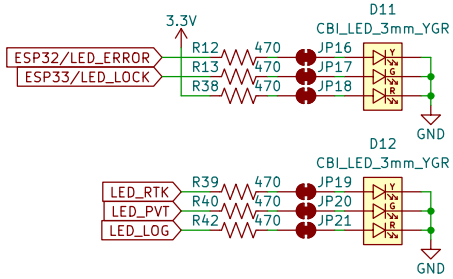
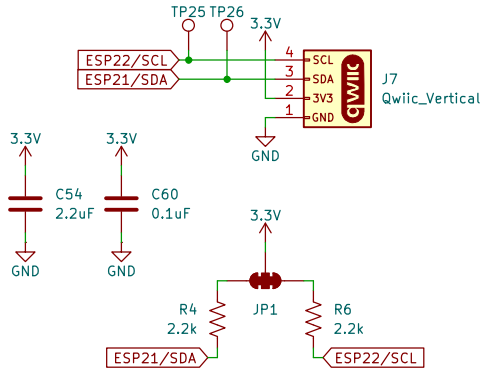
I/O Connector



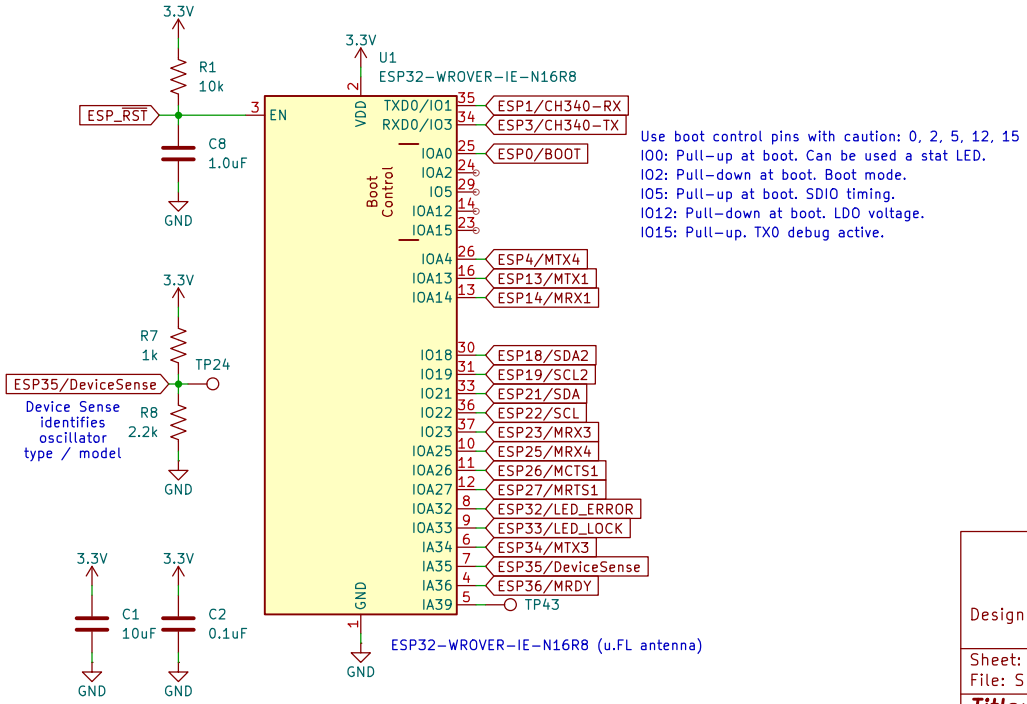
LEDs



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

Level_Shifting
File: Level_Shifting.kicad_sch

Level_Shifting_10MHz
File: Level_Shifting_10MHz.kicad_sch

Oscillator
File: Oscillator.kicad_sch

open source hardware

Designed by: P.C.

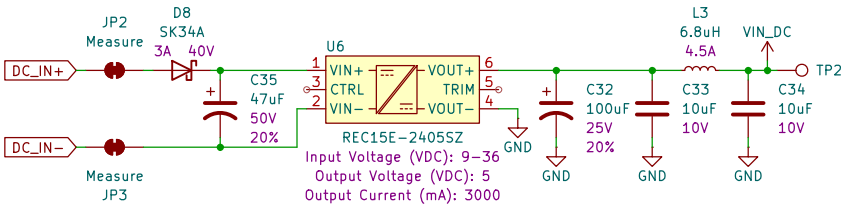
SPARKPNT

Sheet: /
File: SparkPNT_GNSSDO_Plus.kicad_sch

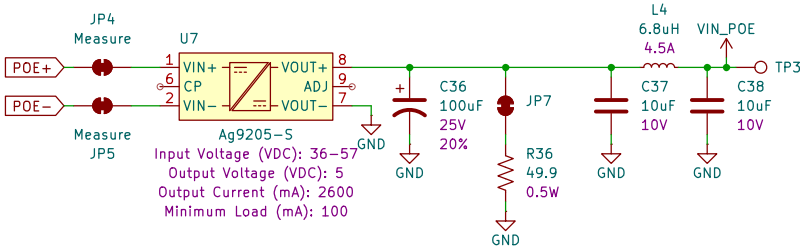
Title: GNSSDO Plus (mosaic-T, STP3593LF)

Size: USLetter	Date: 2025-01-02	Rev: v10
KiCad E.D.A. 8.0.7		Id: 1/8

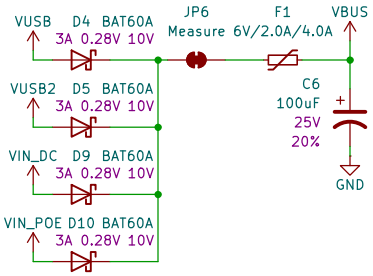
DC Power In



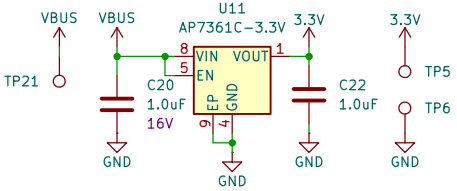
Power Over Ethernet



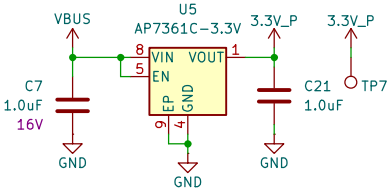
Power Mux



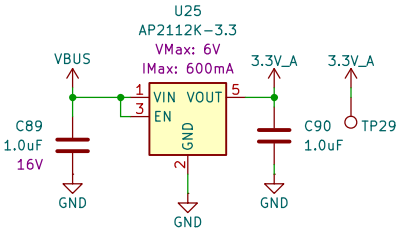
Main 3.3V



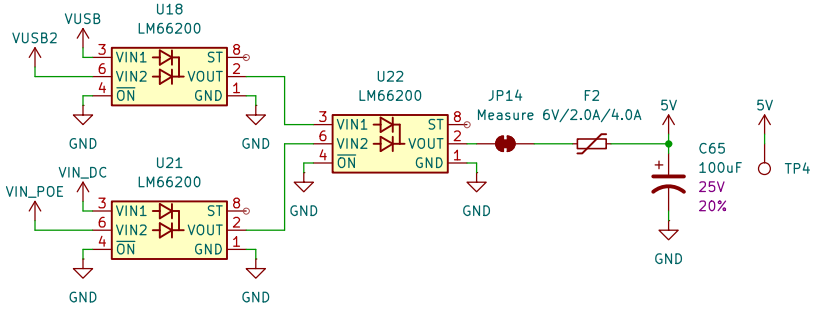
Peripheral 3.3V



Analog 3.3V



OCXO Power Mux



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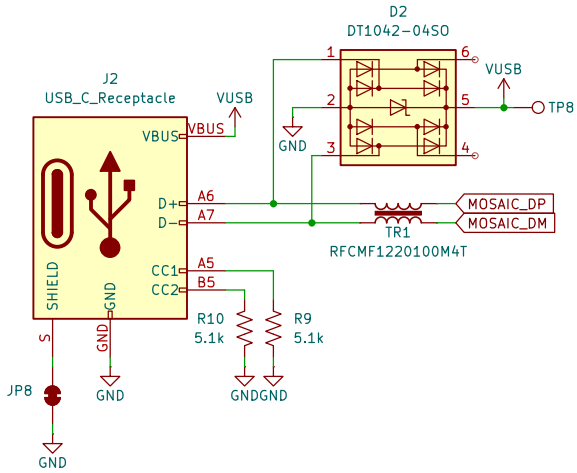
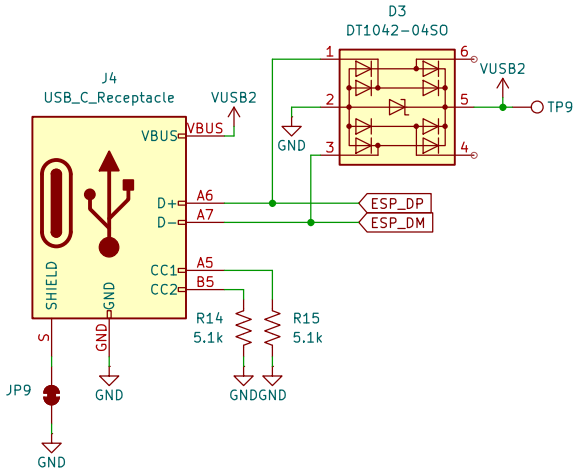
Title: Power	
Size: USLetter | Date:	**Rev:**
KiCad E.D.A. 8.0.7	Id: 2/8

Mosaic USB

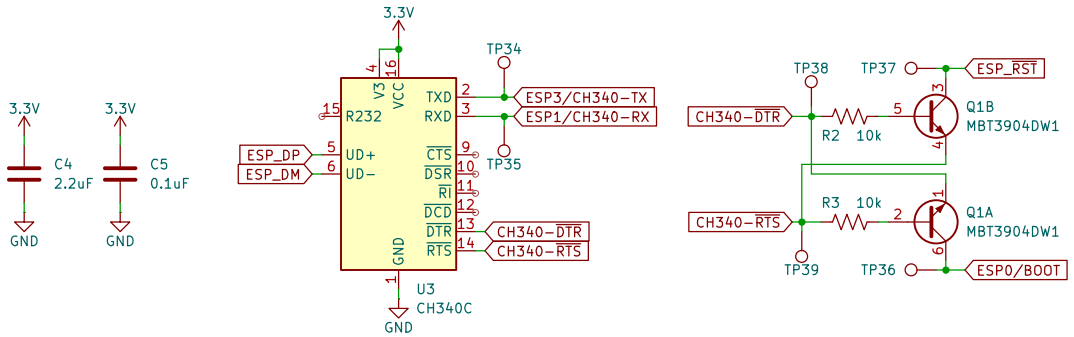


USB Track Impedance: Differential Pair
https://saturnpcb.com/saturn-pcb-toolkit/
Prepreg thickness: 8.3 mil (JLC7628). Er = 4.6
10.5 mil track with 9.5 mil gap (20 mil center to center) = 90 Ohms

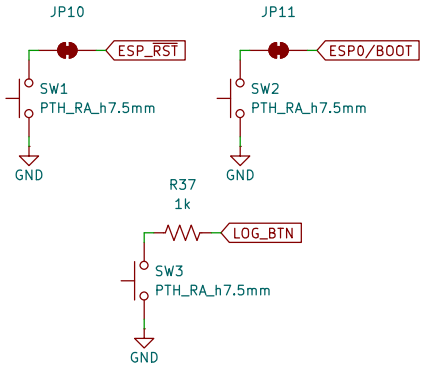
ESP32 USB



ESP32 USB to Serial – CH340C



Buttons



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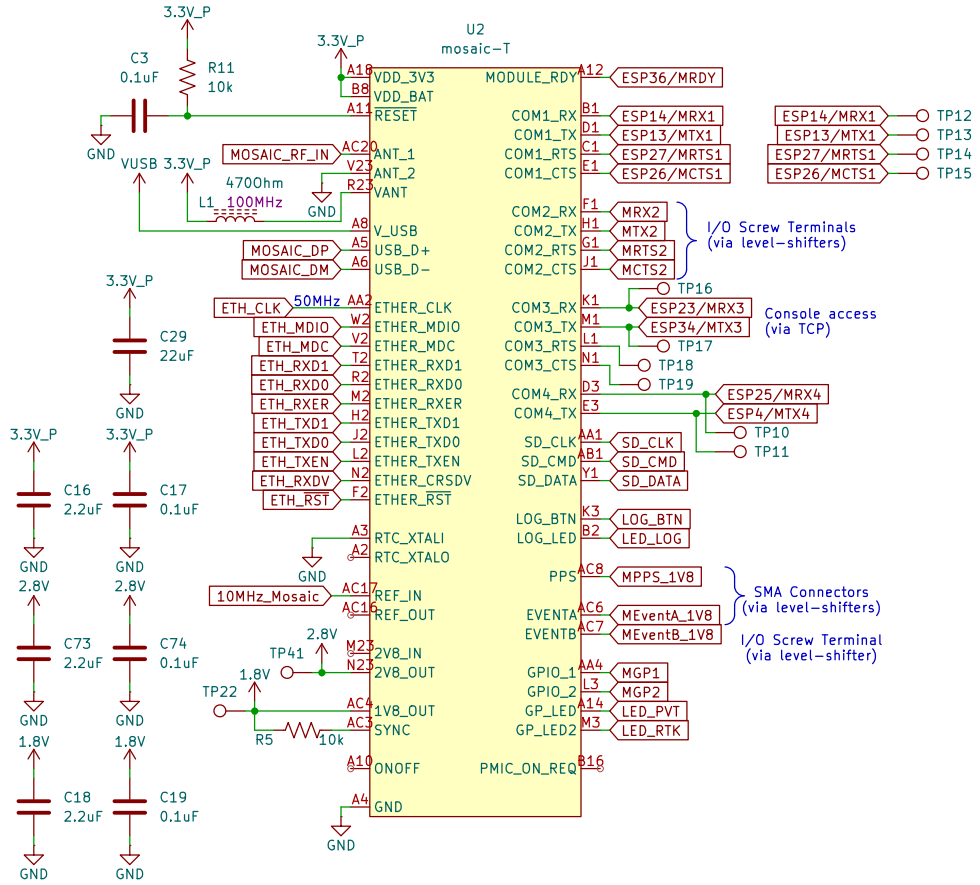
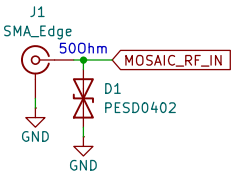
File: USB.kicad_sch	
Title: USB	
Size: USLetter	Date:
KiCad E.D.A. 8.0.7	Rev:
	Id: 3/8

mosaic Tri-band GNSS

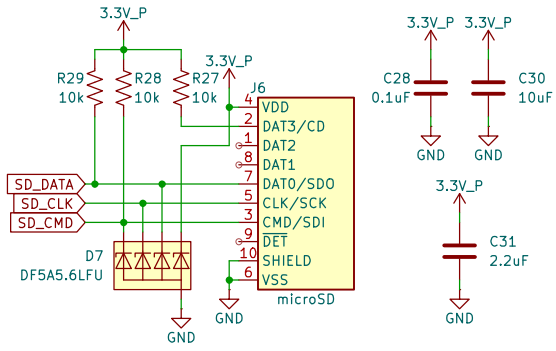


GNSS Antenna



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

microSD



Sheet: /GNSS/
File: GNSS.kicad_sch

Title: GNSS

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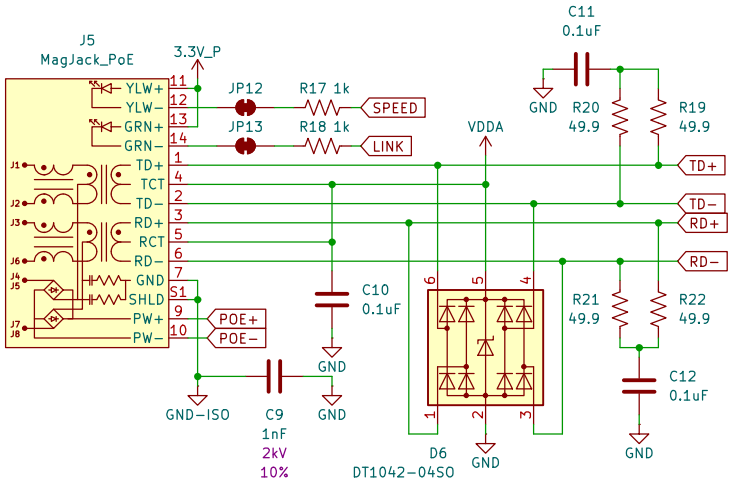
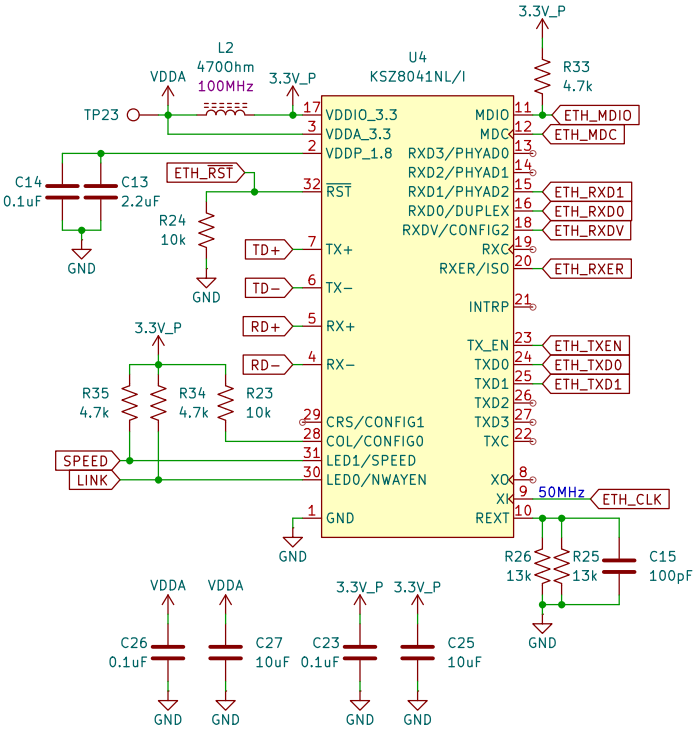
KiCad E.D.A. 8.0.7		Id: 4/8

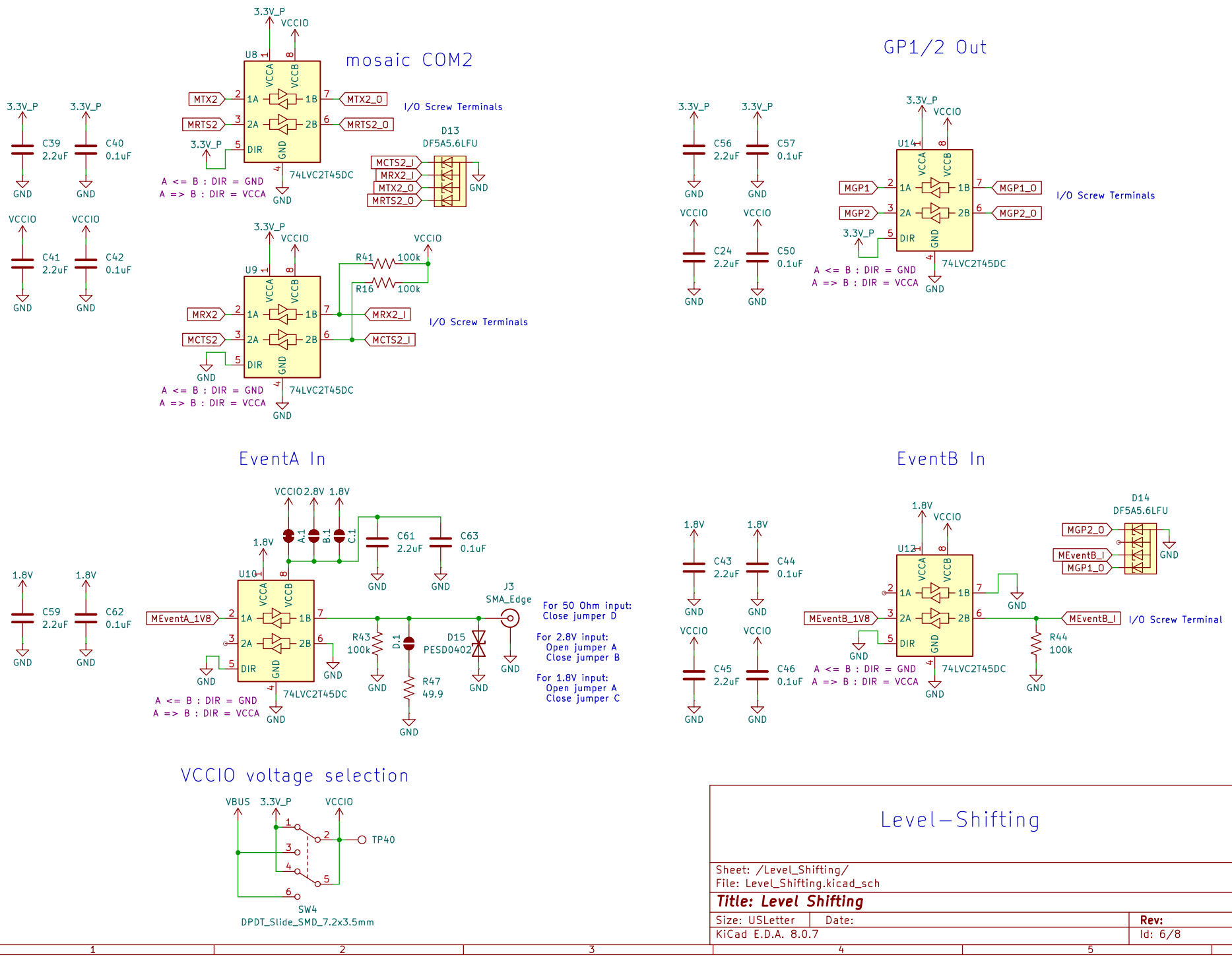
Ethernet

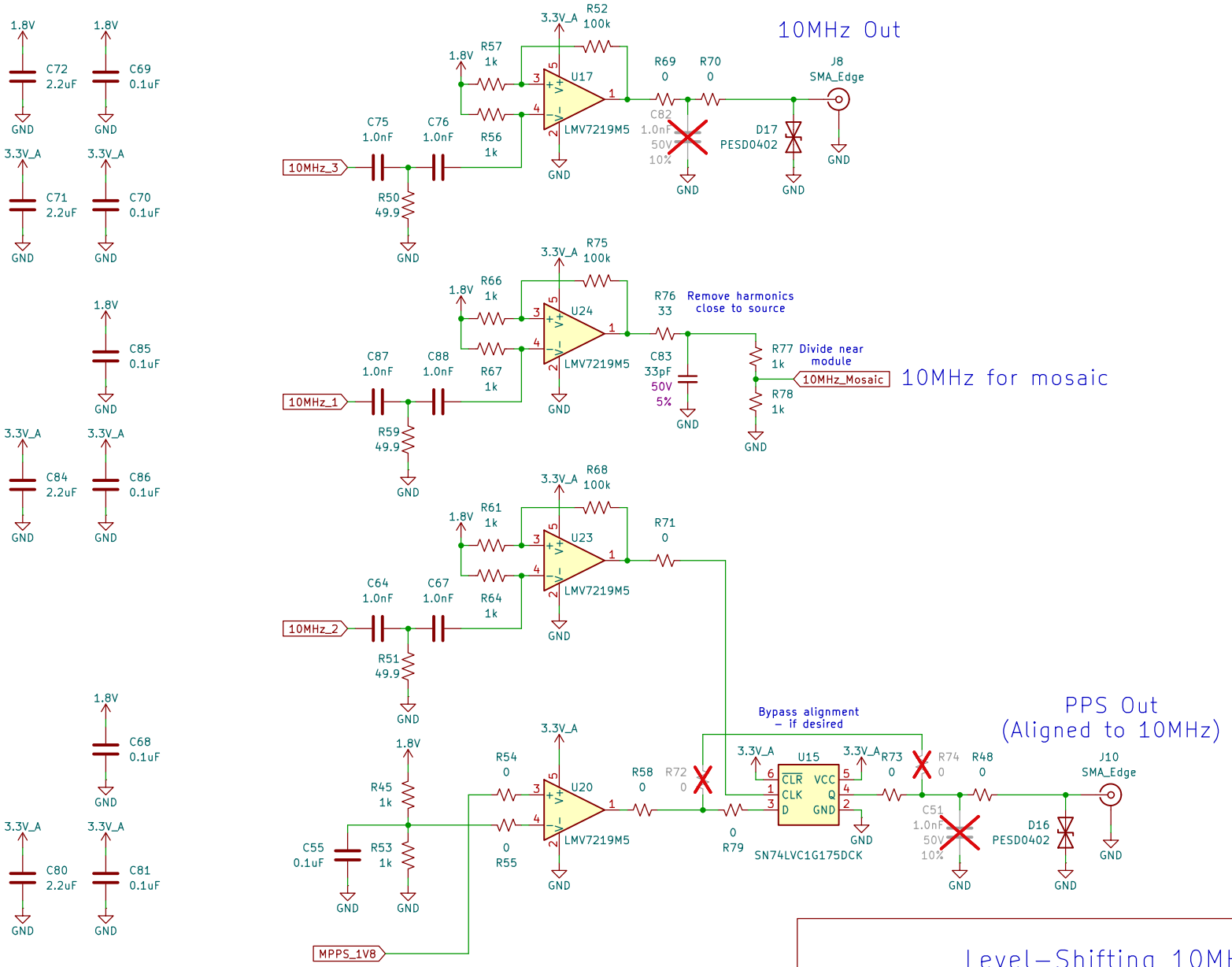




Ethernet Track Impedance: Differential Pair
https://saturnpcb.com/saturn-pcb-toolkit/
Prepreg thickness: 8.3 mil (JLC7628). Er = 4.6
9.0 mil track with 11.0 mil gap (20 mil center to center) = 100 Ohms
Each pair should match in length to better than 0.5mm

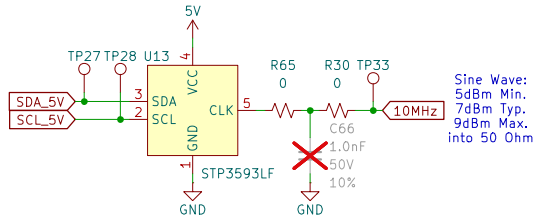
Sheet: /Ethernet/		
File: Ethernet.kicad_sch		
Title: Ethernet		
Size: USLetter	Date:	**Rev:**
KiCad E.D.A. 8.0.7		Id: 5/8

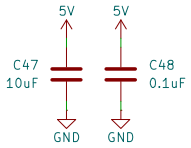

mosaic COM2
I/O Screw Terminals
74LVC2T45DC
A <= B : DIR = GND
A => B : DIR = VCCA
GP1/2 Out
EventA In
EventB In
VCCIO voltage selection
For 50 Ohm input:
Close jumper D
For 2.8V input:
Open jumper A
Close jumper B
For 1.8V input:
Open jumper A
Close jumper C
DPDT_Slide_SMD_7.2x3.5mm
Level-Shifting
Sheet: /Level_Shifting/
File: Level_Shifting.kicad_sch
Title: Level Shifting
Size: USLetter
Date:
Rev:
KiCad E.D.A. 8.0.7
Id: 6/8


10MHz Out
10MHz for mosaic
PPS Out
(Aligned to 10MHz)
Remove harmonics
close to source
Divide near
module
Bypass alignment
– if desired
10MHz_3
10MHz_1
10MHz_2
10MHz_Mosaic
MPPS_1V8
LMV7219M5
SN74LVC1G175DCK
PESD0402
SMA_Edge
Note: all paths use identical components to
ensure equal temperature dependence
Level–Shifting 10MHz
Sheet: /Level_Shifting_10MHz/
File: Level_Shifting_10MHz.kicad_sch
Title: Level Shifting 10MHz
Size: USLetter
Date:
Rev:
KiCad E.D.A. 8.0.7
Id: 7/8

10MHz Oscillator – STP3593LF

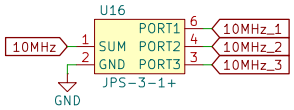
Supply Voltage: 5.0V (4.75V Min., 5.25V Max.)
Current Consumption: 1500mA (Warm Up), 600mA (Steady State)



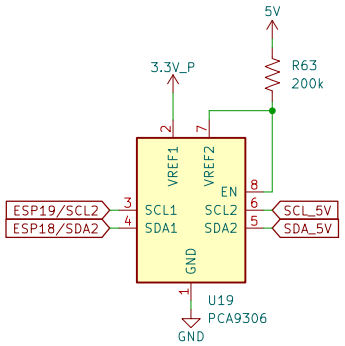


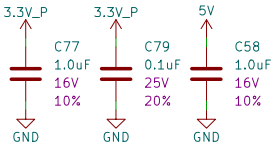
3-Way Splitter – JPS-3-1+

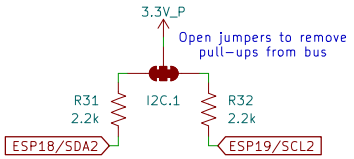
Typical Total Loss: 5.0dB at 10MHz

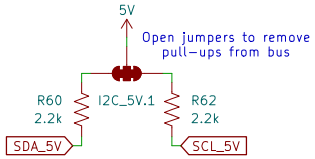


I2C Level Shifting – PCA9306









Sheet: /Oscillator/
File: Oscillator.kicad_sch

Title: Oscillator

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.7		Id: 8/8