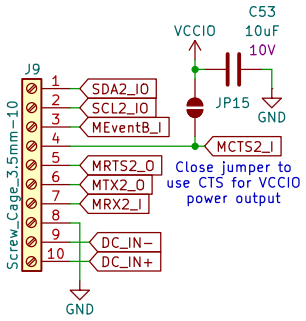
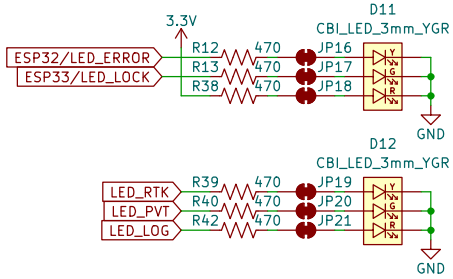
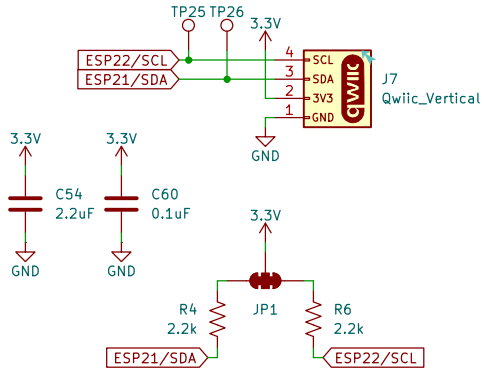
I/O Connector



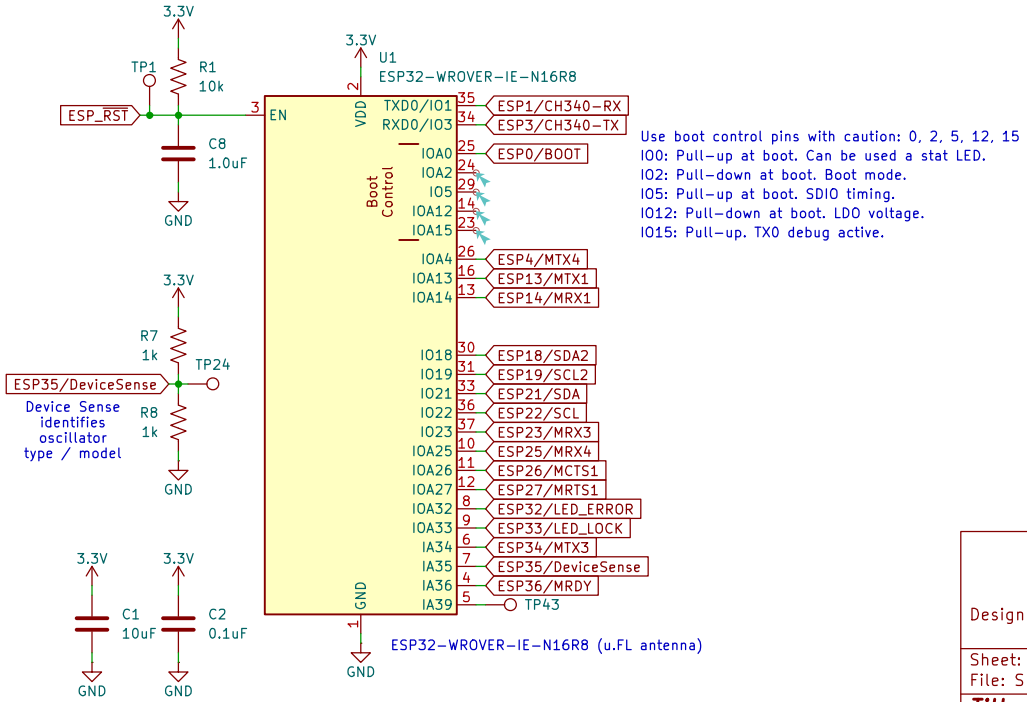
LEDs



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

open source hardware

Designed by: P.C.

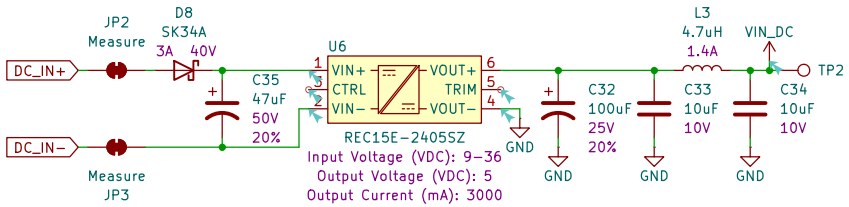
SPARKPNT

Sheet: /
File: SparkFun_RTK_mosaic-T.kicad_sch

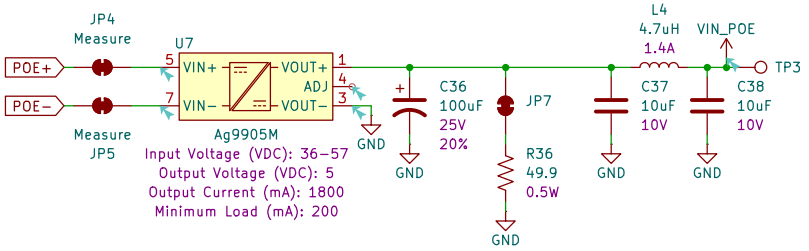
Title: GPSDO (mosaic-T)

Size: USLetter	Date: 2024-10-17	**Rev: v10**
KiCad E.D.A. 8.0.5		Id: 1/7

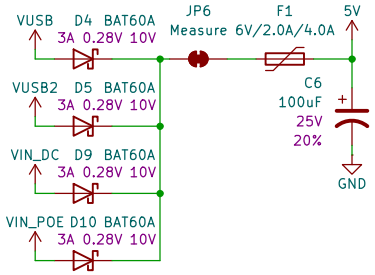
DC Power In



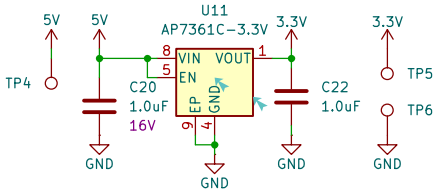
Power Over Ethernet



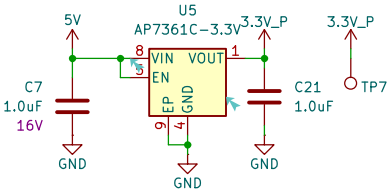
Power Mux



Main 3.3V



Peripheral 3.3V



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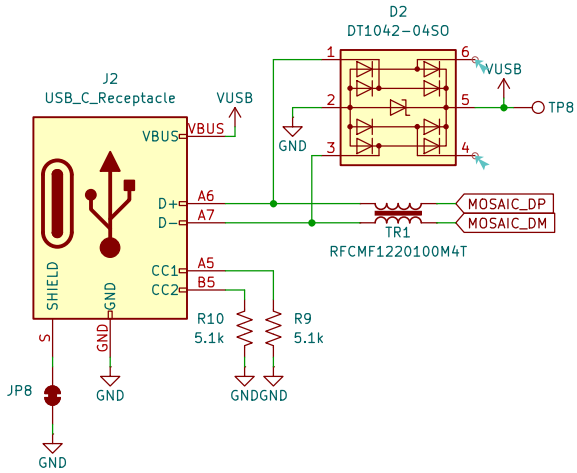
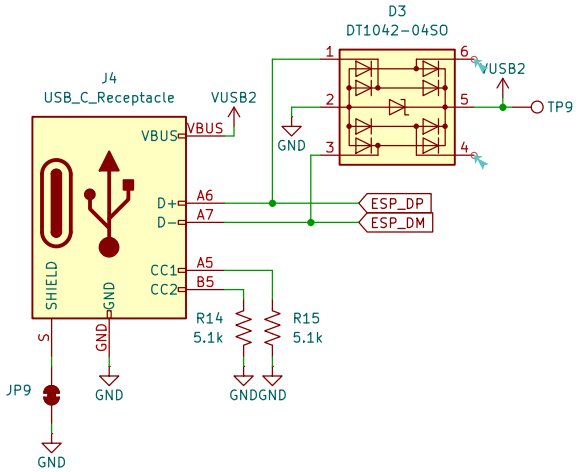
Title: Power	
Size: USLetter | Date:	**Rev:**
KiCad E.D.A. 8.0.5	Id: 2/7

Mosaic USB

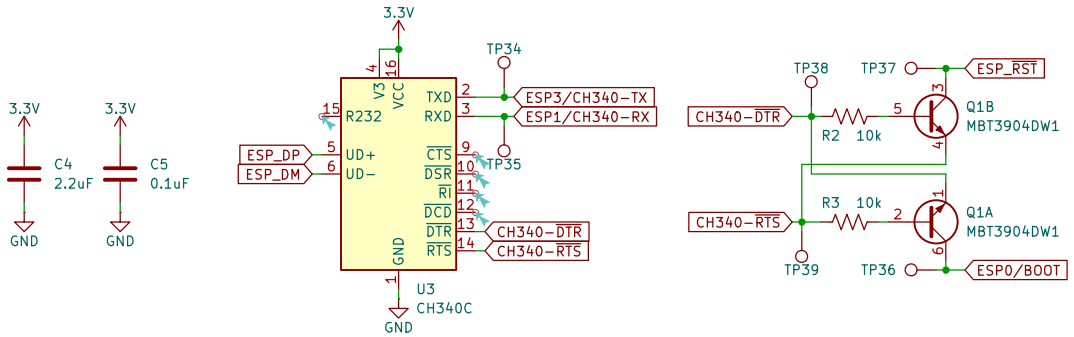


USB Track Impedance: Differential Pair
https://saturnpcb.com/saturn-pcb-toolkit/
Prepreg thickness: 8.3 mil (JLC7628). Er = 4.6
10.5 mil track with 9.5 mil gap (20 mil center to center) = 90 Ohms

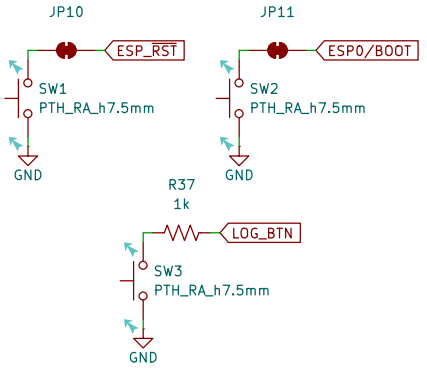
ESP32 USB



ESP32 USB to Serial



Buttons



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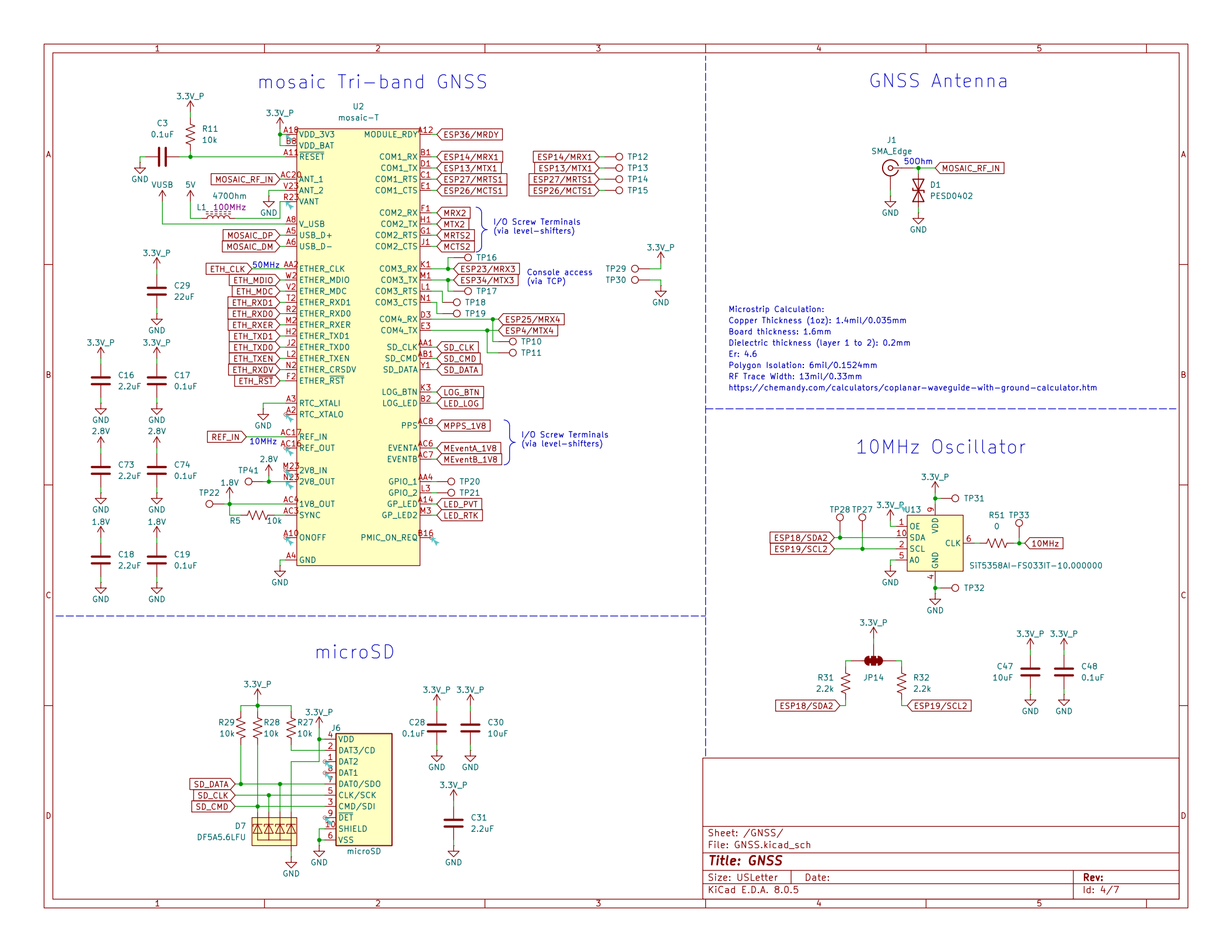
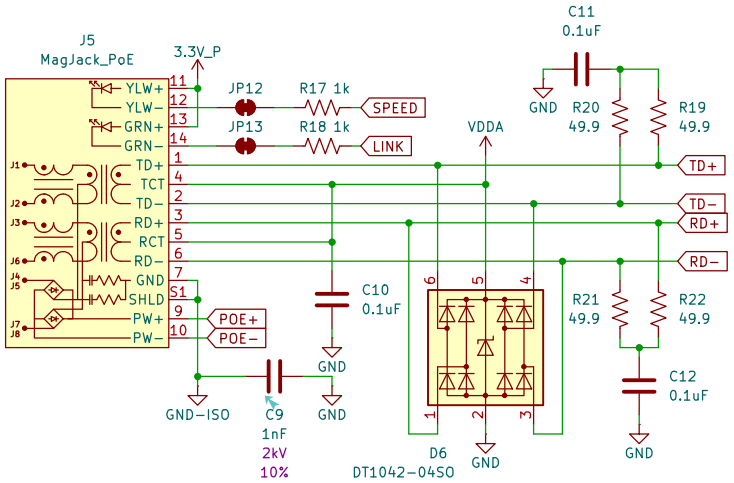
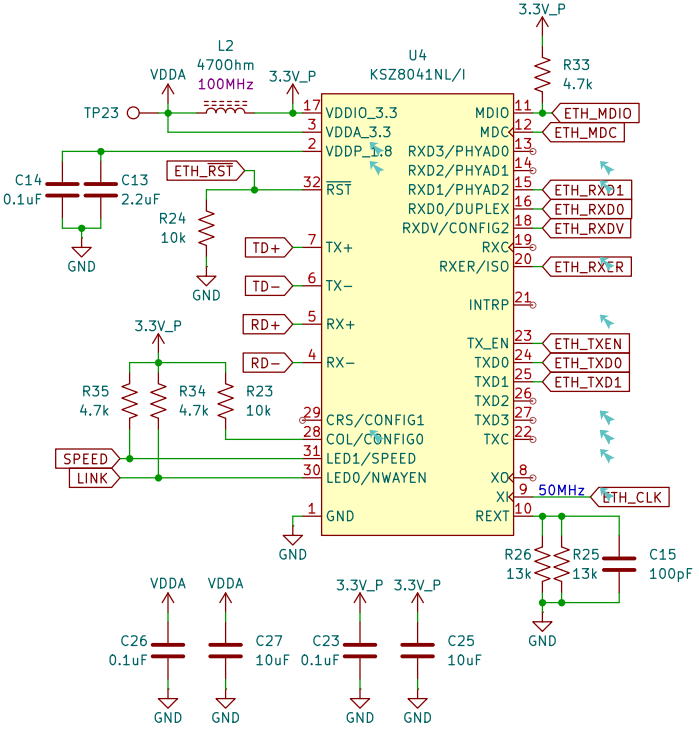
Title: USB	
Size: USLetter Date:	**Rev:**
KiCad E.D.A. 8.0.5	Id: 3/7


mosaic Tri-band GNSS
U2
mosaic-T
VDD_3V3
VDD_BAT
RESET
ANT_1
ANT_2
VANT
V_USB
USB_D+
USB_D-
ETHER_CLK
ETHER_MDIO
ETHER_MDC
ETHER_RXD1
ETHER_RXD0
ETHER_RXER
ETHER_TXD1
ETHER_TXD0
ETHER_TXEN
ETHER_CRSDV
ETHER_RST
RTC_XTALI
RTC_XTALO
REF_IN
REF_OUT
2V8_IN
2V8_OUT
1V8_OUT
SYNC
ONOFF
GND
MODULE_RDY
COM1_RX
COM1_TX
COM1_RTS
COM1_CTS
COM2_RX
COM2_TX
COM2_RTS
COM2_CTS
COM3_RX
COM3_TX
COM3_RTS
COM3_CTS
COM4_RX
COM4_TX
SD_CLK
SD_CMD
SD_DATA
LOG_BTN
LOG_LED
PPS
EVENTA
EVENTB
GPIO_1
GPIO_2
GP_LED
GP_LED2
PMIC_ON_REQ
ESP36/MRDY
ESP14/MRX1
ESP13/MTX1
ESP27/MRTS1
ESP26/MCTS1
MRX2
MTX2
MRTS2
MCTS2
I/O Screw Terminals
(via level-shifters)
ESP23/MRX3
ESP34/MTX3
Console access
(via TCP)
ESP25/MRX4
ESP4/MTX4
SD_CLK
SD_CMD
SD_DATA
LOG_BTN
LED_LOG
MPPS_1V8
MEventA_1V8
MEventB_1V8
I/O Screw Terminals
(via level-shifters)
LED_PVT
LED_RTK
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP10
TP11
TP20
TP21
TP29
TP30
TP41
TP22
MOSAIC_RF_IN
MOSAIC_DP
MOSAIC_DM
ETH_CLK
ETH_MDIO
ETH_MDC
ETH_RXD1
ETH_RXD0
ETH_RXER
ETH_TXD1
ETH_TXD0
ETH_TXEN
ETH_RXDV
ETH_RST
REF_IN
3.3V_P
5V
VUSB
1.8V
2.8V
GND
C3
0.1uF
R11
10k
R23
470Ohm
L1
100MHz
C29
22uF
C16
2.2uF
C17
0.1uF
C73
2.2uF
C74
0.1uF
C18
2.2uF
C19
0.1uF
R5
10k
GNSS Antenna
J1
SMA_Edge
50Ohm
MOSAIC_RF_IN
D1
PESD0402
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
U13
OE
SDA
SCL
A0
VDD
GND
CLK
SiT5358AI-FS033IT-10.000000
ESP18/SDA2
ESP19/SCL2
R51
0
10MHz
TP31
TP32
TP28
TP27
JP14
R31
2.2k
R32
2.2k
C47
10uF
C48
0.1uF
microSD
J6
VDD
DAT3/CD
DAT2
DAT1
DAT0/SDO
CLK/SCK
CMD/SDI
DET
SHIELD
VSS
SD_DATA
SD_CLK
SD_CMD
D7
DF5A5.6LFU
R29
10k
R28
10k
R27
10k
C28
0.1uF
C30
10uF
C31
2.2uF
Sheet: /GNSS/
File: GNSS.kicad_sch
Title: GNSS
Size: USLetter
Date:
Rev:
KiCad E.D.A. 8.0.5
Id: 4/7

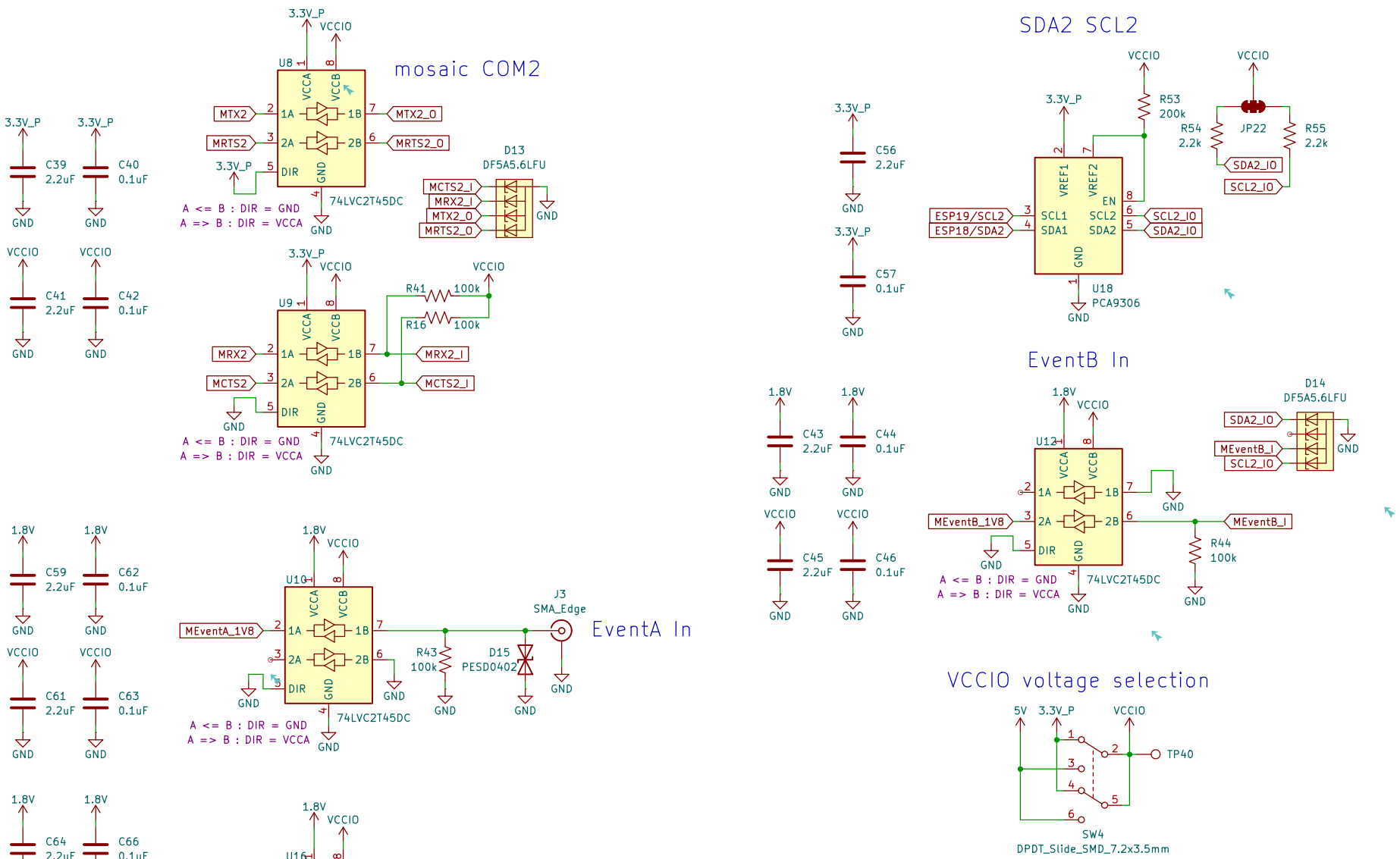
Ethernet



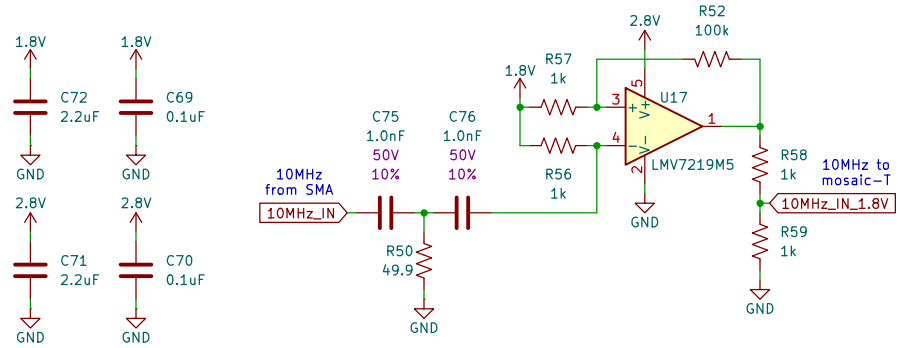


Ethernet Track Impedance: Differential Pair
https://saturnpcb.com/saturn-pcb-toolkit/
Prepreg thickness: 8.3 mil (JLC7628). Er = 4.6
9.0 mil track with 11.0 mil gap (20 mil center to center) = 100 Ohms
Each pair should match in length to better than 0.5mm

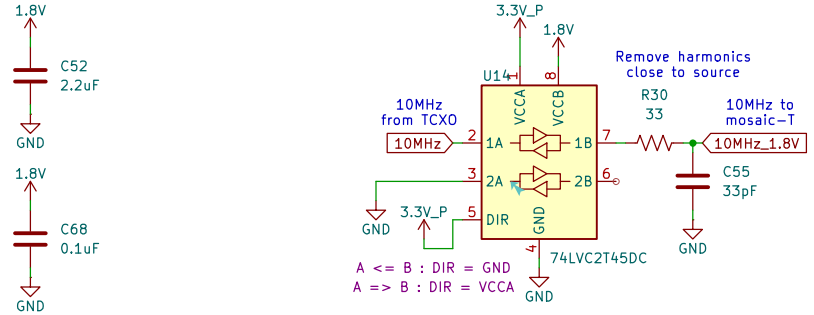
Sheet: /Ethernet/		
File: Ethernet.kicad_sch		
Title: Ethernet		
Size: USLetter	Date:	**Rev:**
KiCad E.D.A. 8.0.5		Id: 5/7


mosaic COM2
SDA2 SCL2
EventB In
EventA In
PPS Out
VCCIO voltage selection
U8
U9
U10
U12
U16
U18
74LVC2T45DC
PCA9306
DF5A5.6LFU
PESD0402
SMA_Edge
DPDT_Slide_SMD_7.2x3.5mm
A <= B : DIR = GND
A => B : DIR = VCCA
For 50 Ohm output:
Open jumper E
Close jumper H
Level-Shifting
Sheet: /Level_Shifting/
File: Level_Shifting.kicad_sch
Title: Level Shifting
Size: USLetter
Date:
Rev:
KiCad E.D.A. 8.0.5
Id: 6/7

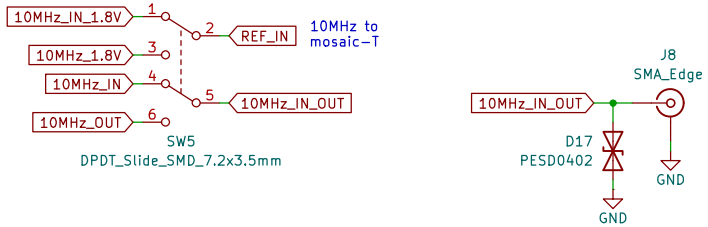
10MHz In



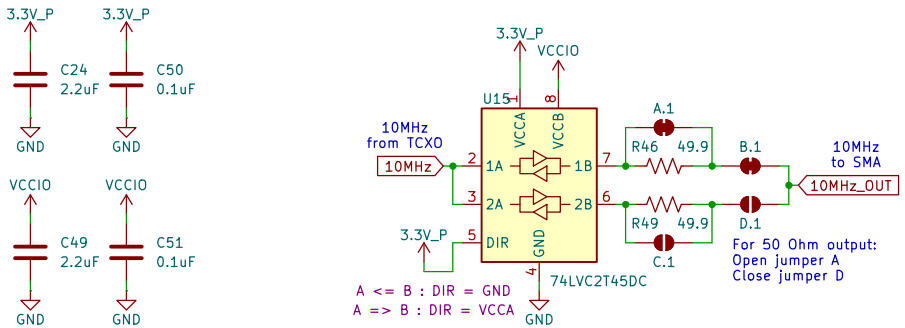
10MHz 1.8V for mosaic-T



10MHz In / Out



10MHz Out



Level-Shifting 10MHz

Sheet: /Level_Shifting_10MHz/
File: Level_Shifting_10MHz.kicad_sch

Title: Level Shifting 10MHz

Size: USLetter	Date:	Rev:
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