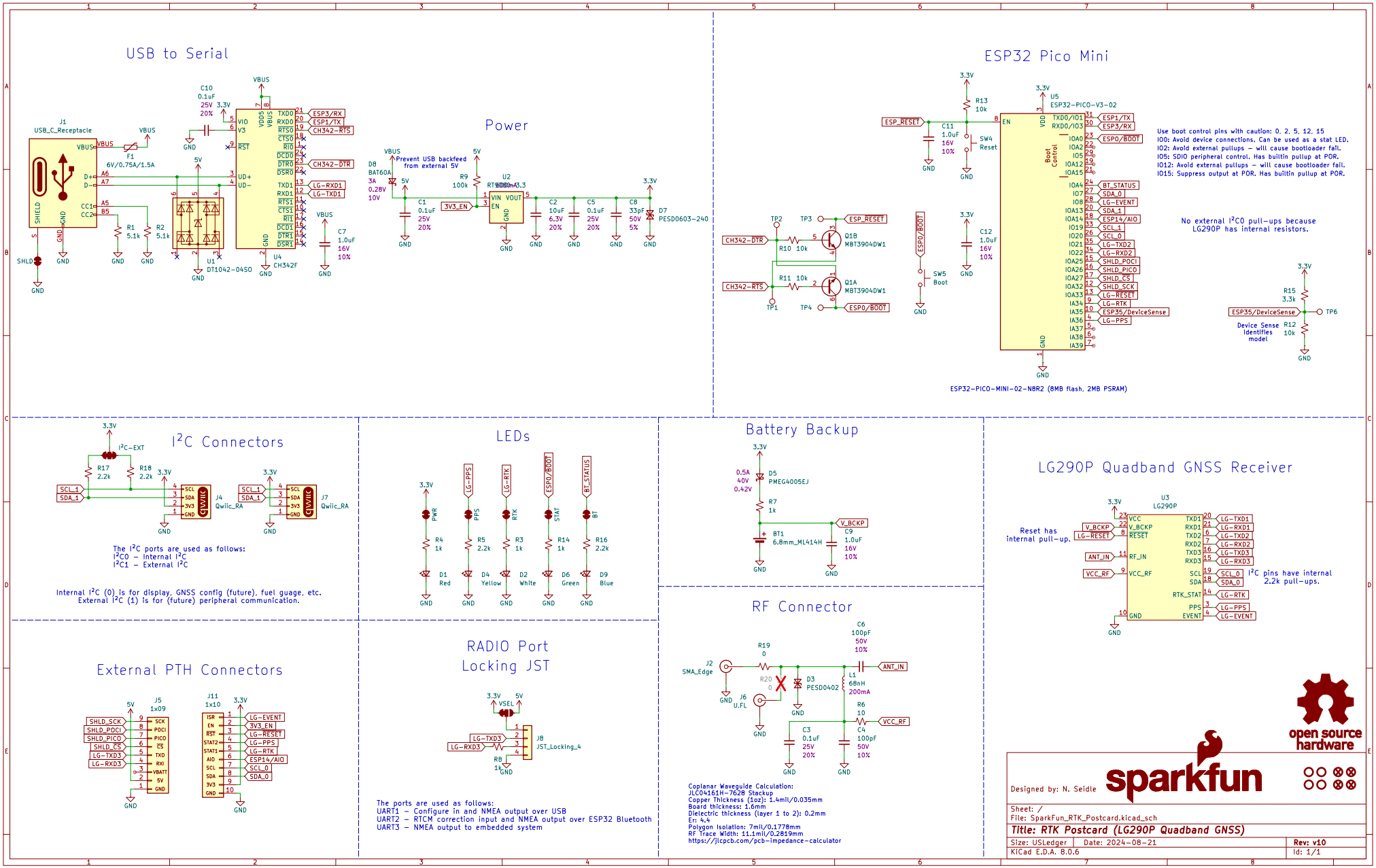
USB to Serial
J1
USB_C_Receptacle
F1
6V/0.75A/1.5A
R1 5.1k
R2 5.1k
U1
DT1042-04SO
U4
CH342F
C10 0.1uF 25V 20%
C7 1.0uF 16V 10%
ESP3/RX
ESP1/TX
CH342-RTS
CH342-DTR
LG-RXD1
LG-TXD1
Power
D8 BAT60A 3A 0.28V 10V
Prevent USB backfeed from external 5V
R9 100k
U2
RT9013-33GB
3V3_EN
C1 0.1uF 25V 20%
C2 10uF 6.3V 20%
C5 0.1uF 25V 20%
C8 33pF 50V 5%
D7 PESD0603-240
ESP32 Pico Mini
U5
ESP32-PICO-V3-02
R13 10k
C11 1.0uF 16V 10%
SW4 Reset
C12 1.0uF 16V 10%
SW5 Boot
ESP_RESET
ESP0/BOOT
Q1B MBT3904DW1
Q1A MBT3904DW1
R10 10k
R11 10k
Use boot control pins with caution: 0, 2, 5, 12, 15
IO0: Avoid device connections. Can be used as a stat LED.
IO2: Avoid external pullups – will cause bootloader fail.
IO5: SDIO peripheral control. Has builtin pullup at POR.
IO12: Avoid external pullups – will cause bootloader fail.
IO15: Suppress output at POR. Has builtin pullup at POR.
No external I²C0 pull-ups because LG290P has internal resistors.
R15 3.3k
R12 10k
ESP35/DeviceSense
TP6
Device Sense identifies model
ESP32-PICO-MINI-02-N8R2 (8MB flash, 2MB PSRAM)
I²C Connectors
I²C-EXT
R17 2.2k
R18 2.2k
J4 Qwiic_RA
J7 Qwiic_RA
The I²C ports are used as follows:
I²C0 – Internal I²C
I²C1 – External I²C
Internal I²C (0) is for display, GNSS config (future), fuel guage, etc.
External I²C (1) is for (future) peripheral communication.
LEDs
PWR
PPS
RTK
STAT
BT
R4 1k
R5 2.2k
R3 1k
R14 1k
R16 2.2k
D1 Red
D4 Yellow
D2 White
D6 Green
D9 Blue
Battery Backup
D5 PMEG4005EJ
R7 1k
BT1 6.8mm_ML414H
C9 1.0uF 16V 10%
V_BCKP
LG290P Quadband GNSS Receiver
U3 LG290P
Reset has internal pull-up.
I²C pins have internal 2.2k pull-ups.
RF Connector
J2 SMA_Edge
J6 U.FL
R19 0
R20 0
D3 PESD0402
C6 100pF 50V 10%
L1 68nH 200mA
R6 10
C3 0.1uF 25V 20%
C4 100pF 50V 10%
ANT_IN
VCC_RF
Coplanar Waveguide Calculation:
JLC04161H-7628 Stackup
Copper thickness (1oz): 1.4mil/0.035mm
Board thickness: 1.6mm
Dielectric thickness (layer 1 to 2): 0.2mm
Er: 4.4
Polygon Isolation: 7mil/0.1778mm
RF Trace Width: 11.1mil/0.2819mm
https://jlcpcb.com/pcb-impedance-calculator
External PTH Connectors
J5 1x09
J11 1x10
RADIO Port
Locking JST
J8 JST_Locking_4
The ports are used as follows:
UART1 – Configure in and NMEA output over USB
UART2 – RTCM correction input and NMEA output over ESP32 Bluetooth
UART3 – NMEA output to embedded system
open source hardware
sparkfun
Designed by: N. Seidle
Sheet: /
File: SparkFun_RTK_Postcard.kicad_sch
Title: RTK Postcard (LG290P Quadband GNSS)
Size: USLedger
Date: 2024-08-21
Rev: v10
KiCad E.D.A. 8.0.6
Id: 1/1