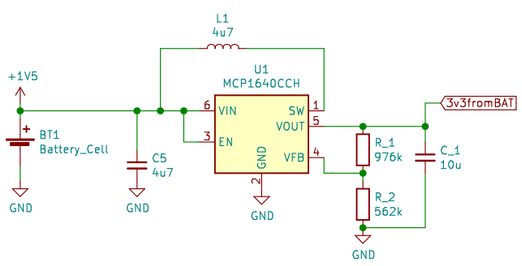
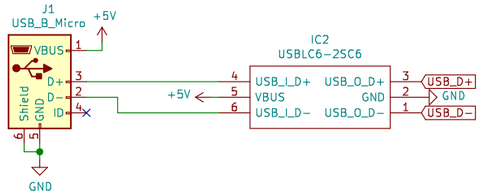
Power section

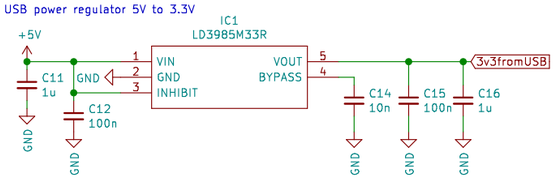
Reference design from datasheet for MCP1640 step-up from 1.5V battery to 3.3V



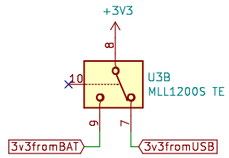
USB connector



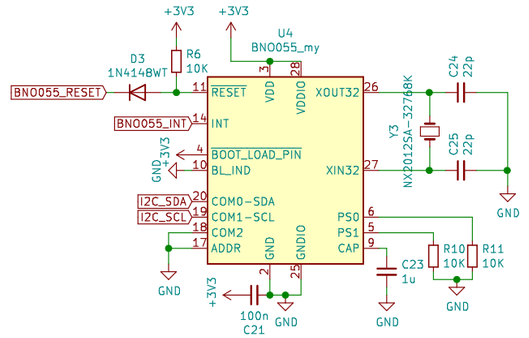
USB power regulator 5V to 3.3V



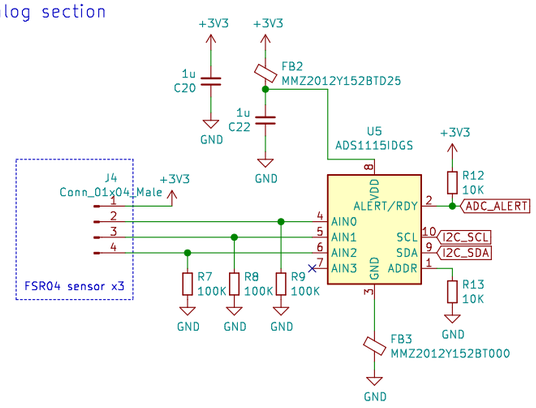
Power selector switch



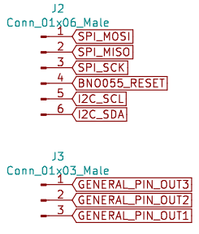
BNO055 9DOF senzor I2C and 32.768 kHz OSC



Analog section

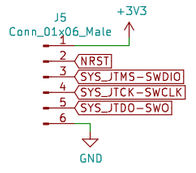


Pinout section



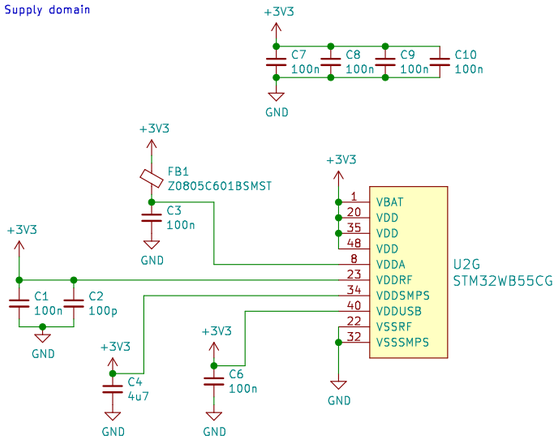
ST-Link

For DEBUGGING ONLY
These pins are not necessary
just in case MCU comes without
DFU firmware (allows USB programming)
3.3V and GND are in Analog section



STM32WB microcontroller section

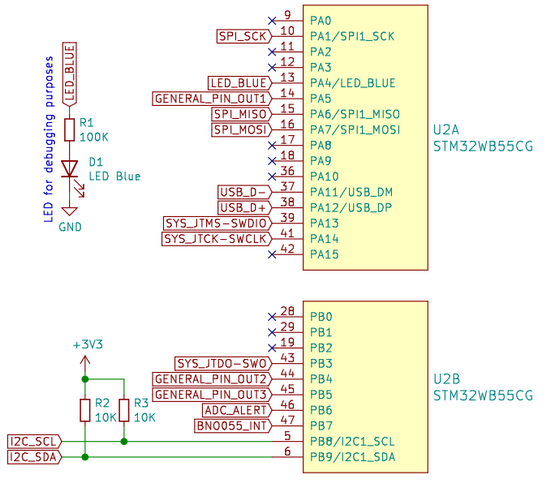
Supply domain



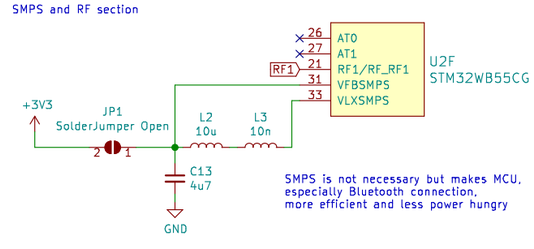
SpyPen
This pen uses ST32WB55 wireless Bluetooth LE microcontroller.
Powered by a 1.5 AAAA or AAA battery thanks to MCP1640 stepup to 3.3V
I2C connections to peripherals:
1. TI ADS1115 for converting analog FSR04 force input to digital
2. Bosch BNO055 for 9-way motion detection – Accelerometer, Gyroscope, Magnetometer

This is a prototype. It has few unnecessary parts
(ST-Link, SMPS, switch),
although these parts make debugging easier.

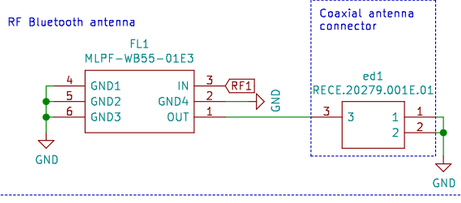
Pin setup for USB and peripherals



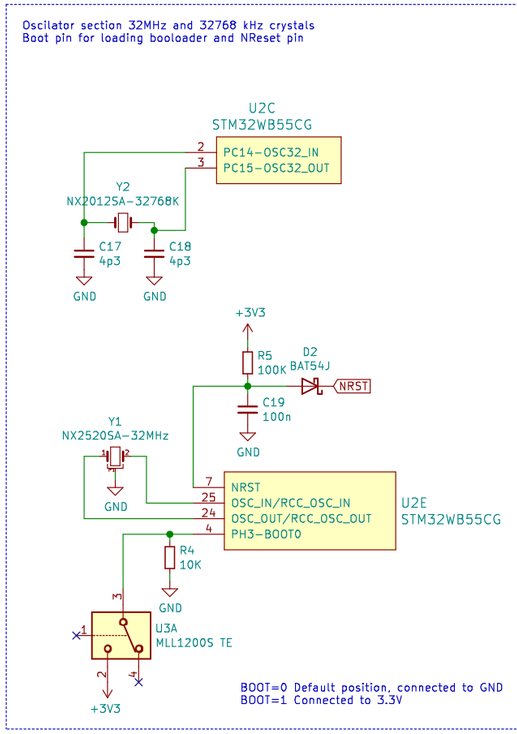
SMPS and RF section



RF Bluetooth antenna



Oscilator section 32MHz and 32768 kHz crystals
Boot pin for loading booloader and NReset pin



Author: Jakub Sencak

Sheet: /
File: STM32WB55_QFN48_IPD_REF_BOARD.sch

Title: SpyPen

Size: A3	Date: 2021-02-08	**Rev: v01**
KiCad E.D.A. kicad 5.1.9-1.fc32		Id: 1/1