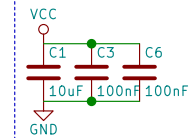
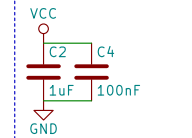


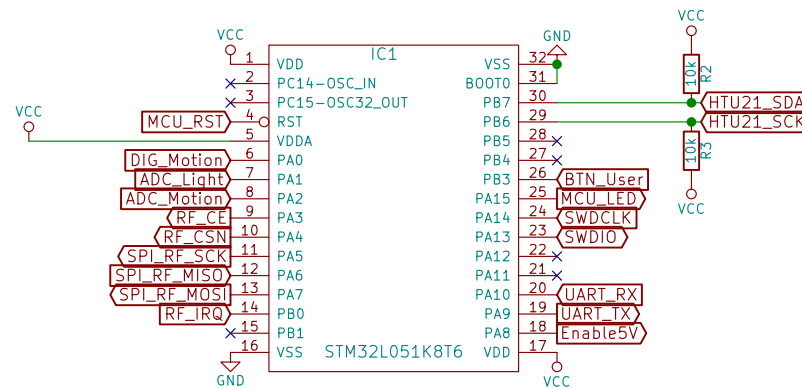
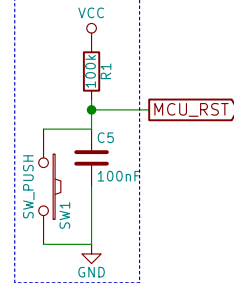
Close to VDD & VSS



Close to VDDA



Reset circuit



Peripherals:
RF module (SPI, CSN, CE, IRQ)
HTU21D (I2C)
Light sensor (adc, enable)
Motion (ADC, enable)
UART
SWD

Philip Luyckx

Sheet: /CPU/

File: cpu.sch

Title: Sensor

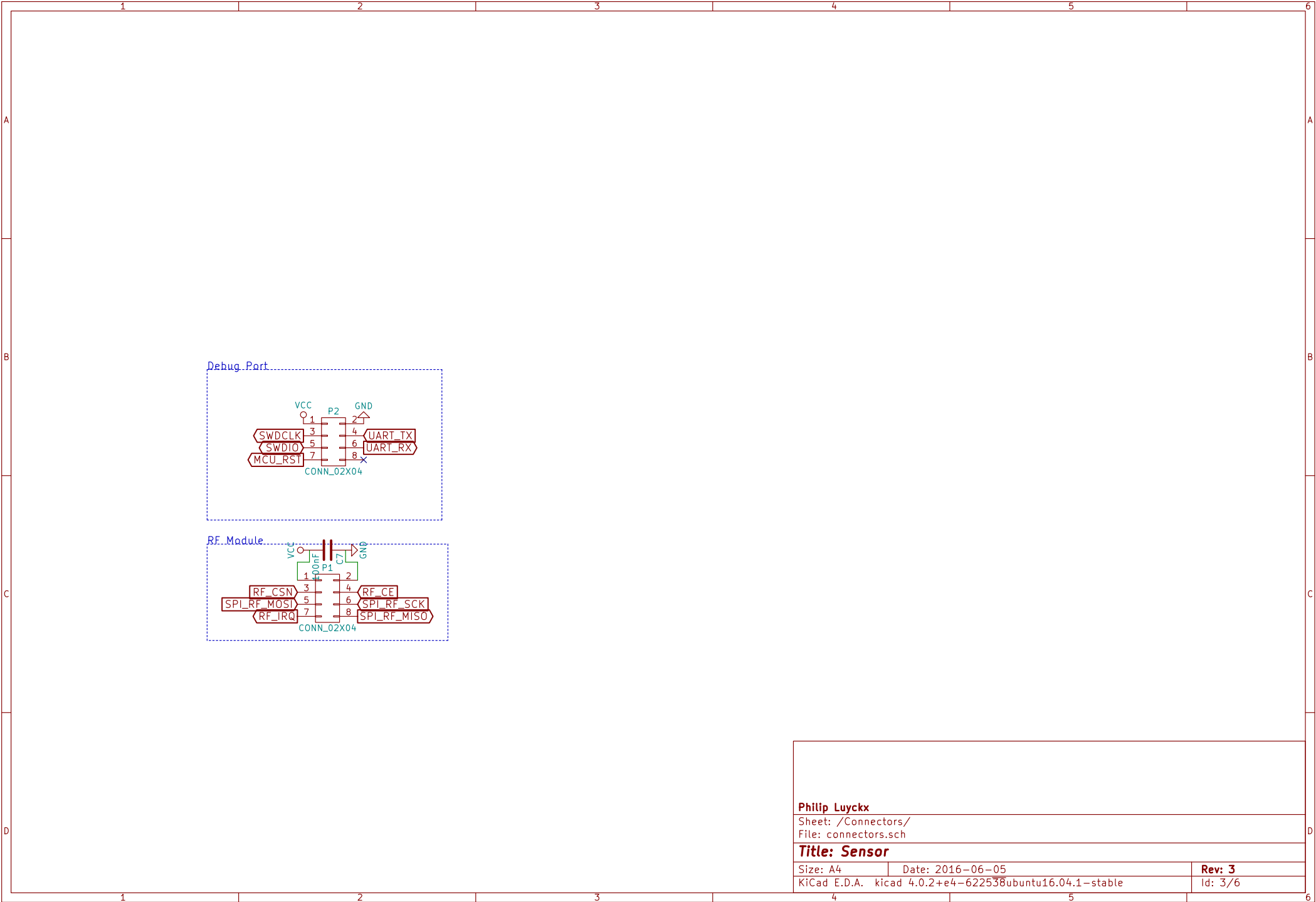
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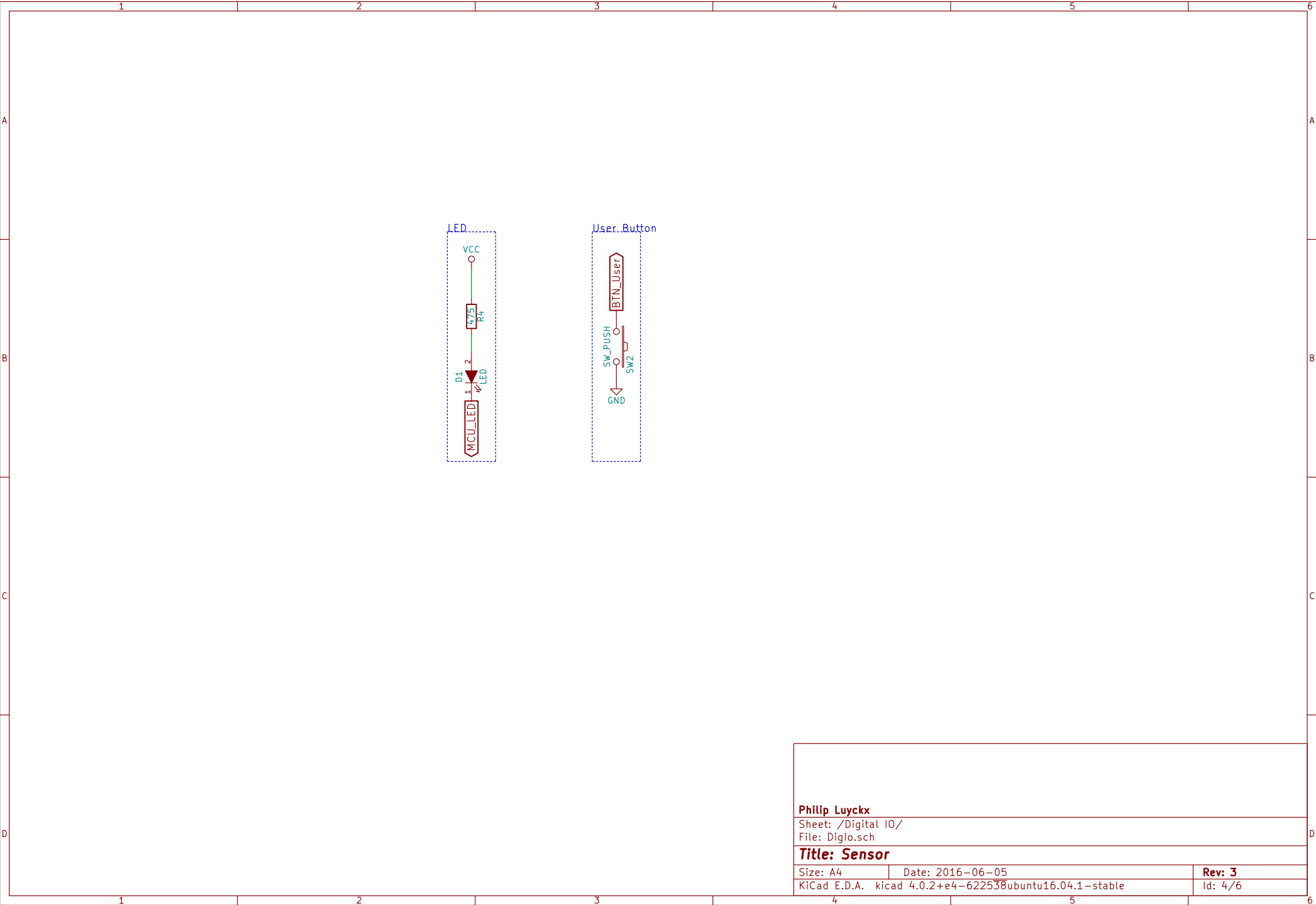
Date: 2016-06-05

Rev: 3

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Id: 2/6





Philip Luyckx

Sheet: /Digital IO/
File: Diglo.sch

Title: Sensor

Size: A4 Date: 2016-06-05
KiCad E.D.A. kicad 4.0.2+e4-622538ubuntu16.04.1-stable

Rev: 3
Id: 4/6

Reached 0,5mA
in short circuit
VCC is 1.8V

D2

GND

5600
R5

MCP60x4
U1C

10 +
9 -
8

ADC_Light

A circuit diagram showing a 10uF capacitor (labeled C11) connected between a +5V supply and a pin labeled MotionSensor_V+.

PIR

V+ 1

Out 2

GND 3

U3

MotionSensor_V+

Motion_Out

R6

100k

GND

+12V

C14

100nF

GND

1M R10

1M R11

GND

Motion_Offset

MCP60x4 Motion_Offset

5 +

6 -

7

MCP60x4

3 +

2 -

1

ADC_Motion

MCP60x4

12 +

13 -

14

DIG_Motion

1.6M R17

1M R15

GND

10k R7

100nF C13

1M R8

10k R9

100nF C16

1M R12

U1B

U1A

U1D

Amplify the motion output using band amplifiers

$$f_c = 1/(2 \cdot \pi \cdot R \cdot C)$$

A = $R_{\text{lowpass}} / R_{\text{highpass}}$

The highpass filter is at the input, the lowpass is in the feedback loop

Here:

$f_{\text{lowpass}} = 1.6\text{Hz}$

$f_{\text{highpass}} = 1.6\text{Hz}$

A = 100

Todo:

- * Is the amplification ok?
(no clipping?)
- * Are the frequencies ok?
(maybe lowpass should be higher and highpass lower)

Amplify the motion output using band amplifiers

```
fc = 1/(2*pi*R*C)
A = R_lowpass / R_highpass
The highpass filter is at the input, the lowpass is in the feedback loop
```

Here:

```
f_lowpass = 1.6Hz
f_highpass = 1.6Hz
A = 100
```

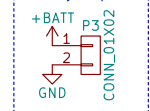
Sheet: /Sensors/
File: Sensors.sch

| | |
|--|------------------|
| Title: Sensor | |
| Size: A4 | Date: 2016-06-05 |
| KiCad E.D.A. kicad 4.0.2+e4-622538ubuntu16.04.1-stable | |

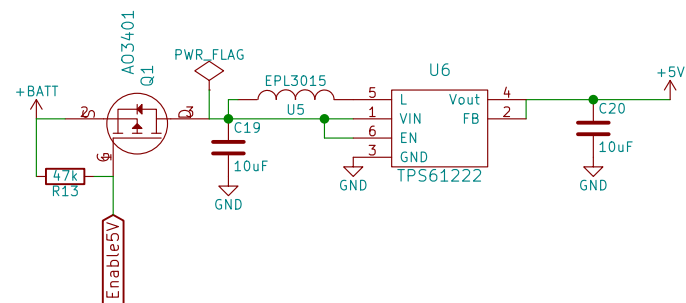
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| Rev: 3 |
| Id: 5/6 |



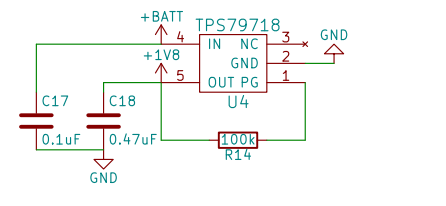
Battery Input



5V Supply



1V8 Supply



Philip Luyckx

Sheet: /Supply/

File: Supply.sch

Title: Sensor

Size: A4

Date: 2016-06-05

Rev: 3

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Id: 6/6