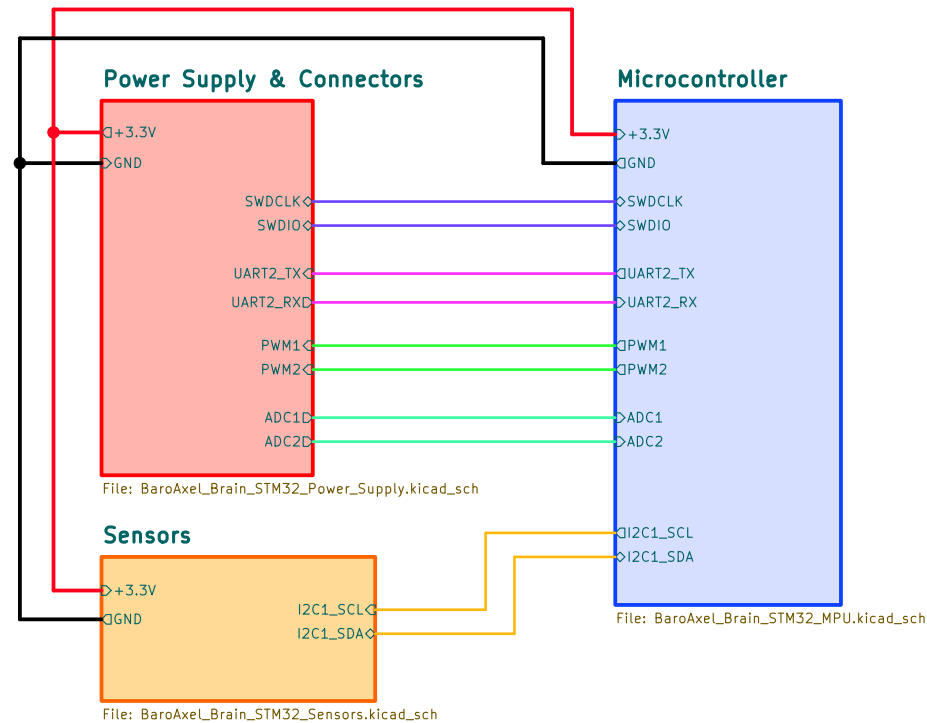


BaroAxel Brain Board



BaroAxel Brain Board
Electro Scientific Club

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www.medyanis-hiou.netlify.app



STM32 Based Barometer/Accelerometer Board.
Electro Scientific Club | Mohamed Yanis Hiou



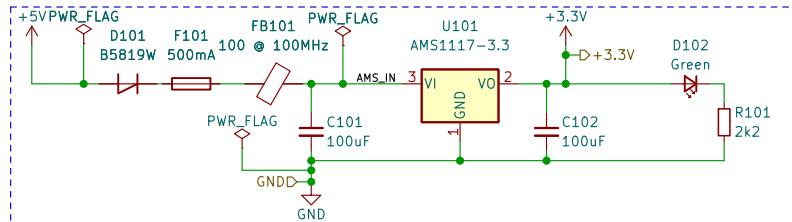
Sheet: /
File: BaroAxel_Brain.kicad_sch

Title: BaroAxel Brain Board

Size: A4	Date:	Rev: 1.2
KiCad E.D.A. kicad (6.0.7)		Id: 1/4

1) Power Supply & Connectors

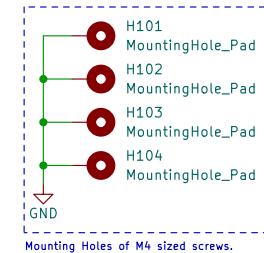
(1) Regulator



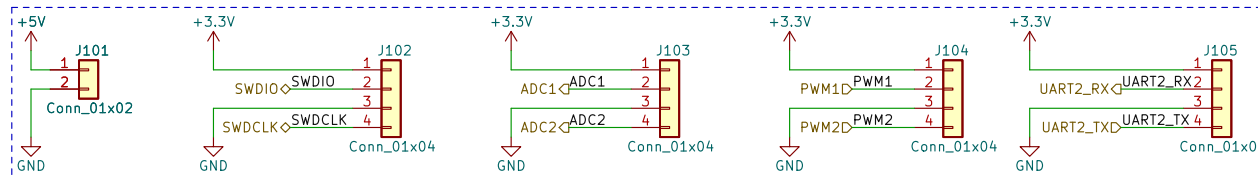
+5V is coming from the Power Connector.
Shockley Diode is used for Input Reverse Polarity protection.
Min. of 22uF capacitors in VI and VO.

Datasheet: DS1117.

(3) Mounting Holes



(2) Connectors



+5V is gonna be filtered and reduced to 3V3 by the regulator in (1)(1).
J2 is an SWD programming connector of the pins 21 and 22 of the MCU in (2)(3).
J3 is an analog sensors connector of the pins 14 and 15 of the MCU in (2)(3).
J4 is a PWM signal connector of the pins 12 and 13 of the MCU in (2)(3).
J5 is a UART protocol connector of the pins 8 and 9 of the MCU in (2)(3).

Power Supply's section of the BaroAxel Brain PCB.
AMS1117-3.3 Reulator and Board's Connectors.

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Sheet: /Power Supply & Connectors/

File: BaroAxel_Brain_STM32_Power_Supply.kicad_sch

Title: BaroAxel Brain PCB | Power Supply & Coonectors Section

Size: A4

Date:

Rev: 1.2

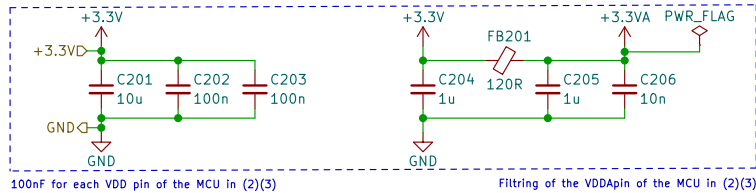
KiCad E.D.A. kicad (6.0.7)

Id: 1/4



2) Microcontroller Section

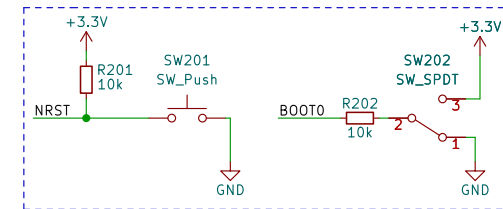
(1) Decapling Caps



100nF for each VDD pin of the MCU in (2)(3)

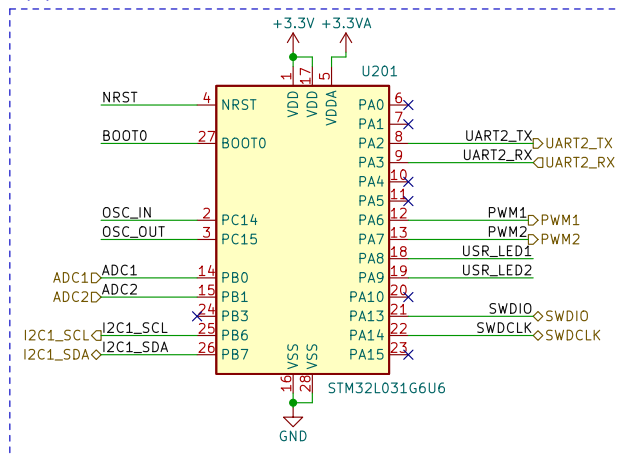
Filtrage of the VDDApin of the MCU in (2)(3)

(2) BOOT & Reset Switches



Reset Button with Pull-Up Resistor to pin 4 of the MCU in (2)(3)
Boot Mode Selector to pin 27 of the MCU in (2)(3)

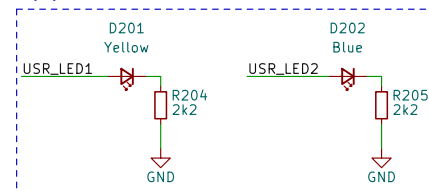
(3) STM32 Microcontroller



I2C protocol is used to read the data from the sensors in (3).
UART protocol is used to send the result after filtering and processing the data.
PC14 & PC15 are connected to the High Speed Externet Crystal in (2)(4).
ADC1 & ADC2 are connectors in (1)(2) to read analog data from an external sensor.
PWM1 & PWM2 are connectors in (1)(2) for controlling actuators with PWM signals.
USR_LED1 & USR_LED2 in (2)(6) are just indicators.

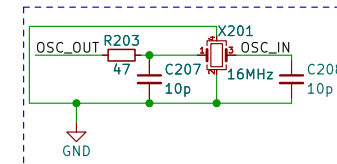
Datasheet: DS10668.
Application Note: AN4467.

(6) LEDs



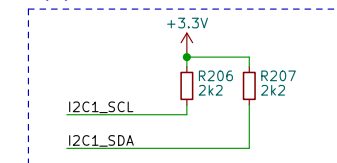
Indicators LEDs that are connected to the pins 18 and 19 of the MCU in (2)(3).

(4) HSE Crystal



16MHz Crystal Oscillator of the MCU in (2)(3).
Application Note: AN2867.

(5) Pull-Up Resistors



I2C Pull-Up resistors, pins 25 and 26 of the MCU in (2)(3).

Microcontroller's Section of the BaroAxel Brain PCB.
STM32L031G6U6 Microcontroller.
High Speed Crystal Oscillator 16MHz.
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Sheet: /Microcontroller/
File: BaroAxel_Brain_STM32_MPU.kicad_sch

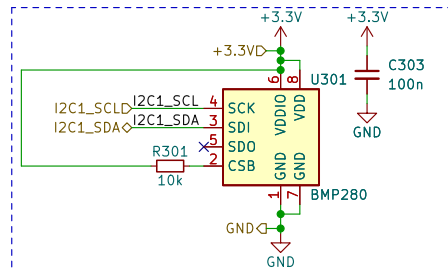
Title: BaroAxel Brain PCB | STM32 MCU Section

Size: A4	Date:	Rev: 1.2
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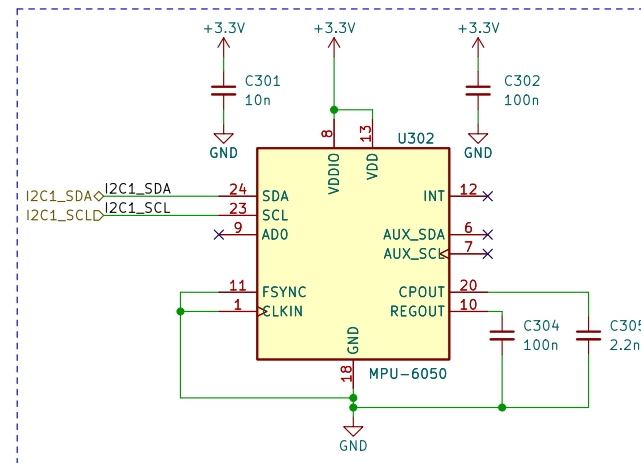
3) Sensors Section

(1) BMP280



CSB pin is Pulled-Up in order to interface with the sensor via I2C protocol.
The I2C wires are connected to the pins 25 and 26 of the MCU in (2)(3).
Datasheet: DS001-11.

(2) MPU6050



MPU6050 interfaced by I2C communication protocol.
The I2C wires are connected to the pins 25 and 26 of the MCU in (2)(3).
Datasheet: RM-MPU-6000A-00.

Sensors' section of the BaroAxel Brain PCB.
MPU6050 and BMP280 Sensors.

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Sheet: /Sensors/

File: BaroAxel_Brain_STM32_Sensors.kicad_sch

Title: BaroAxel Brain PCB | Sensors Section

Size: A4

Date:

KiCad E.D.A. kicad (6.0.7)

Rev: 1.2

Id: 3/4

