

Revision	Date	Author	Description
1	18-04-2025	L.Brighenti	First Draft

01 – BLOCK DIAGRAM



File: block_diagram.kicad_sch

02 – CONNECTORS



File: connectors.kicad_sch

03 – POWER



File: power.kicad_sch

04 – POWER 2



File: power2.kicad_sch

05 – MCU



File: mcu.kicad_sch

06 – GPS–LTE



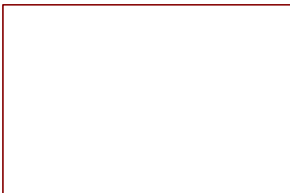
File: gps–lte.kicad_sch

07 – SENSORS

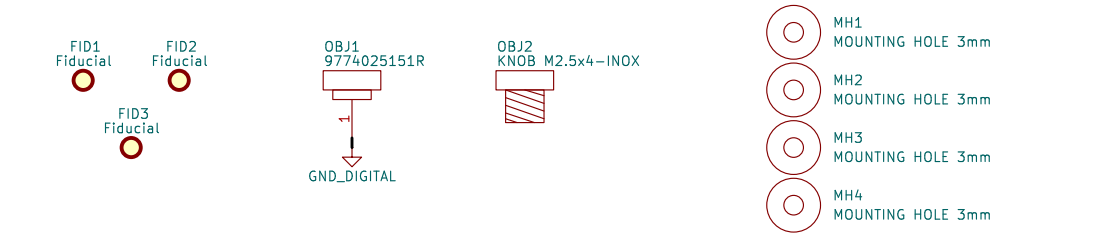


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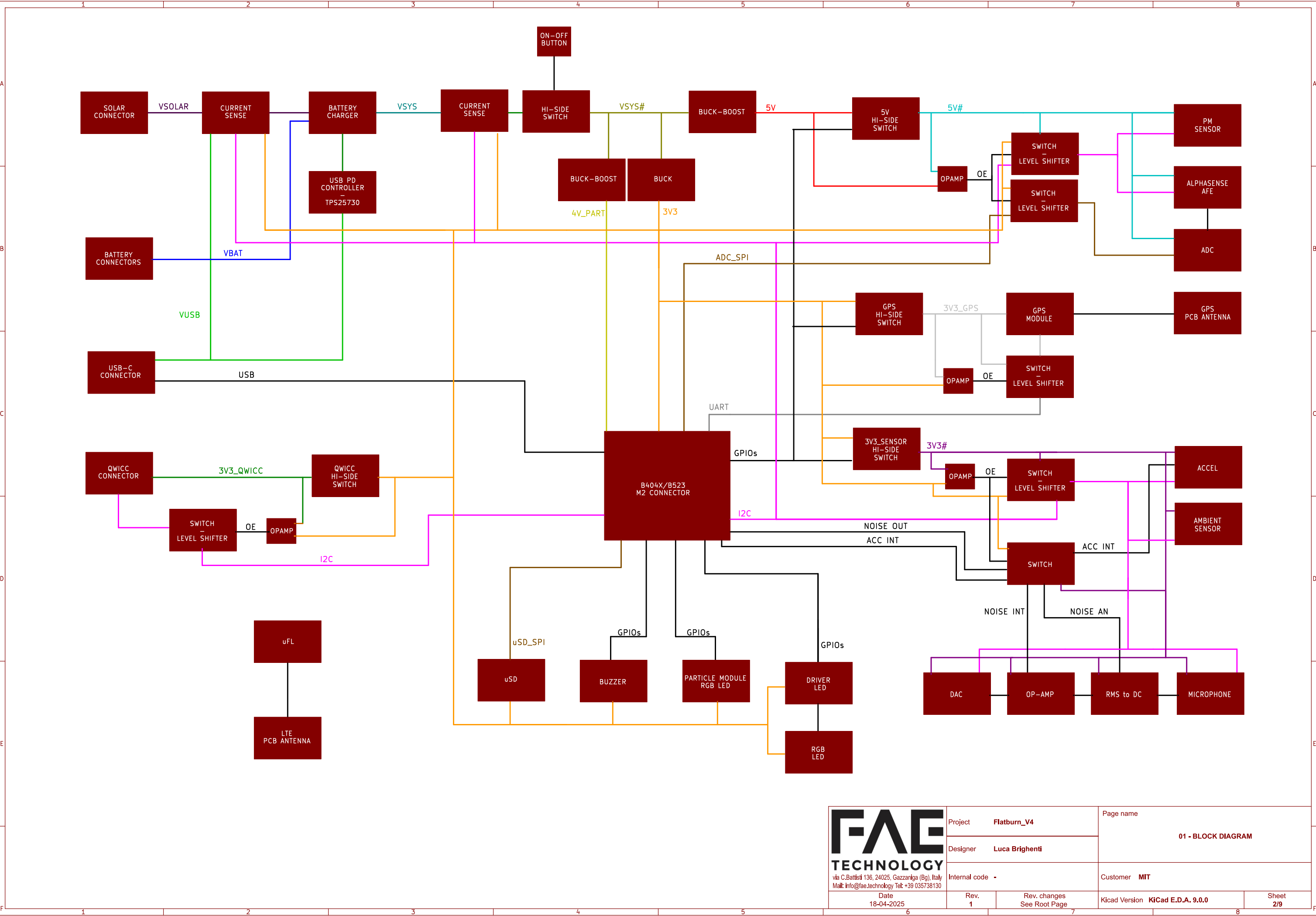
08 – SENSORS 2



File: sensors2.kicad_sch



 via C.Battisti 136, 24025, Gazzaniga (Bg), Italy Mail: info@fae.technology Tel: +39 035738130	Project	Flatburn_V4	Page name Root	
	Designer	Luca Brighenti		
	Internal code	-	Customer MIT	
	Date 18-04-2025	Rev. 1	Rev. changes See Root Page	Sheet 1/9

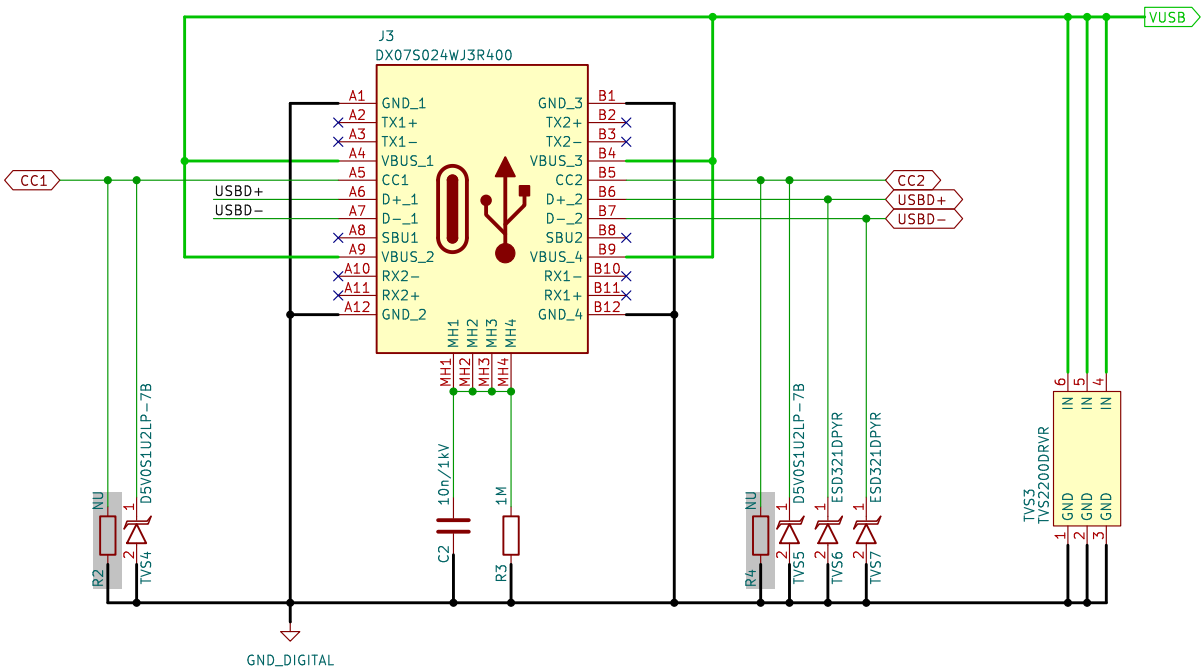


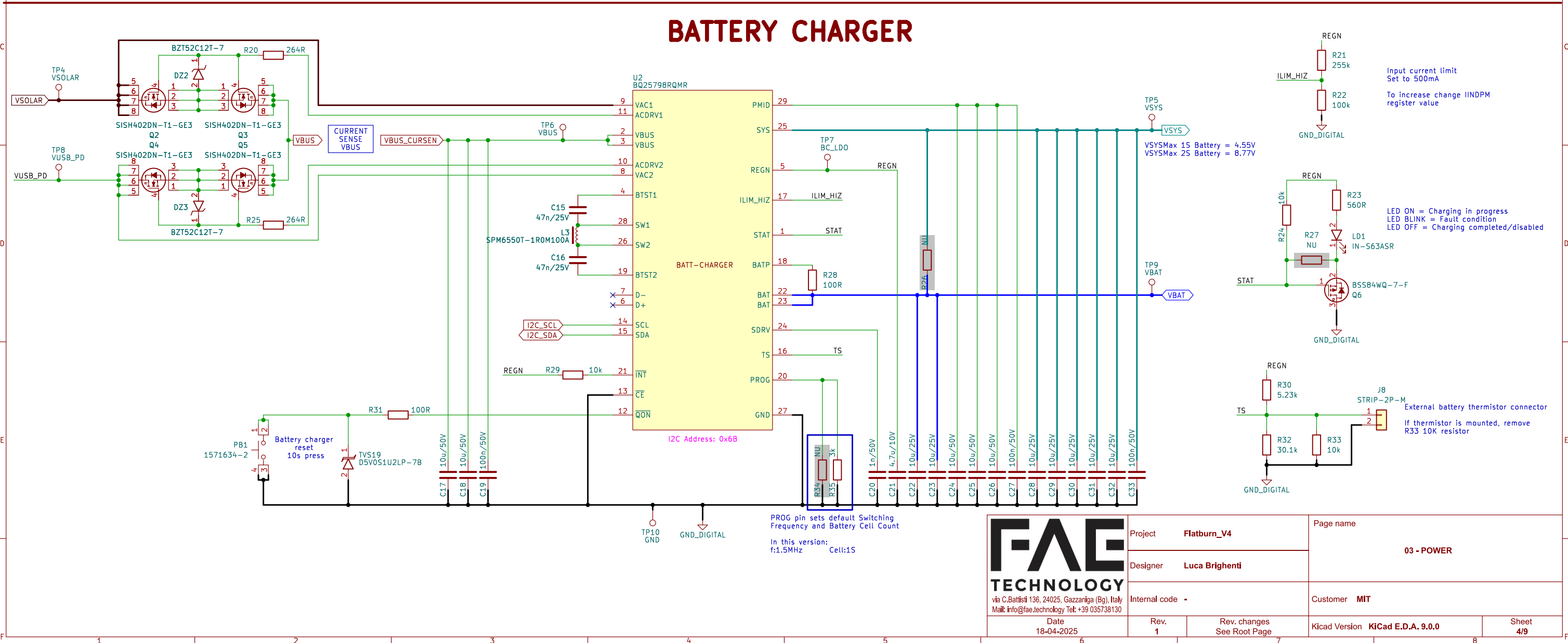
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Date
18-04-2025

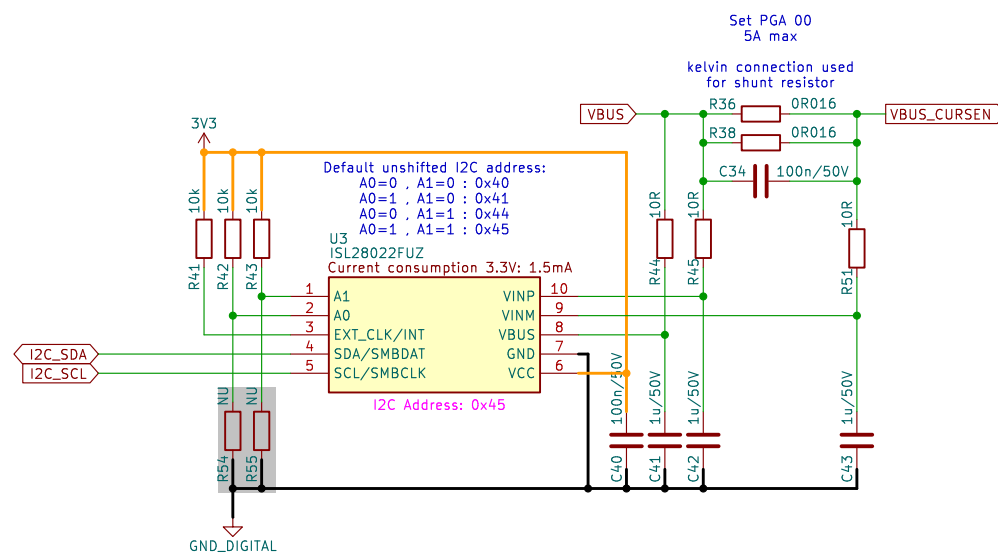
Project Flatburn_V4		Page name 01 - BLOCK DIAGRAM	
Designer Luca Brighenti			
Internal code -		Customer MIT	
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USB TYPE-C

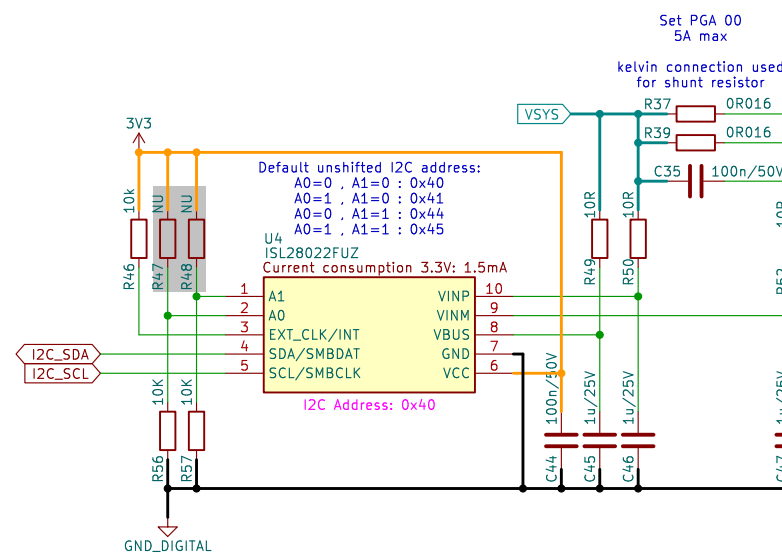


[illegible]

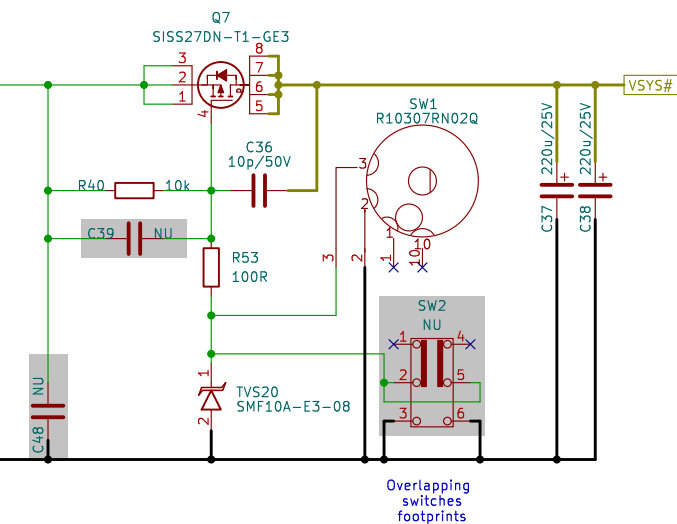
CURRENT SENSE VBUS



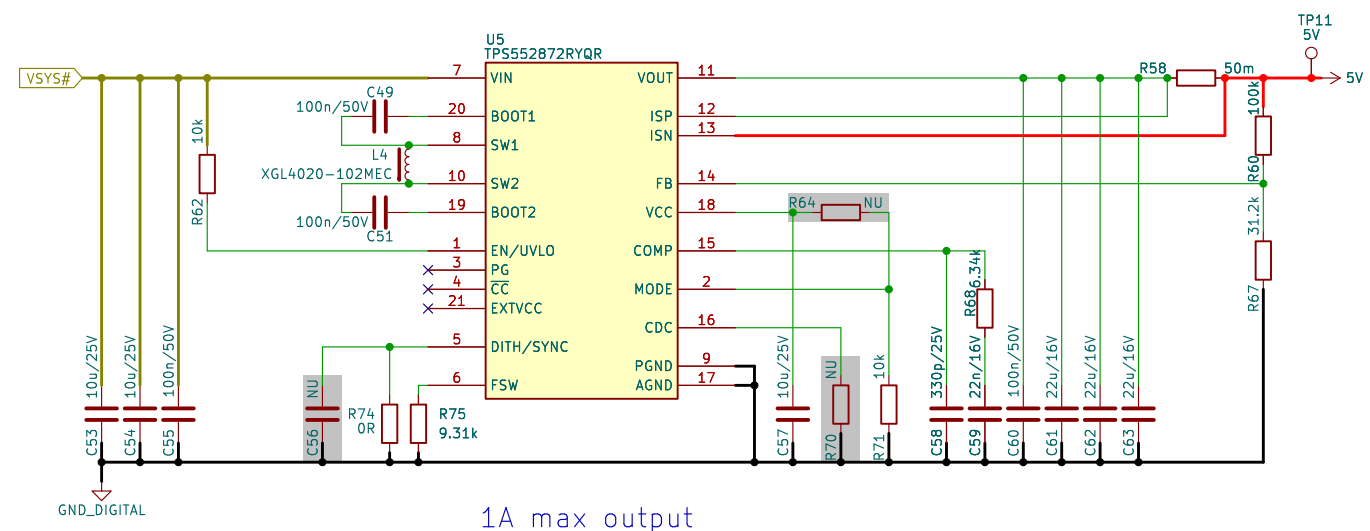
CURRENT SENSE VSYS



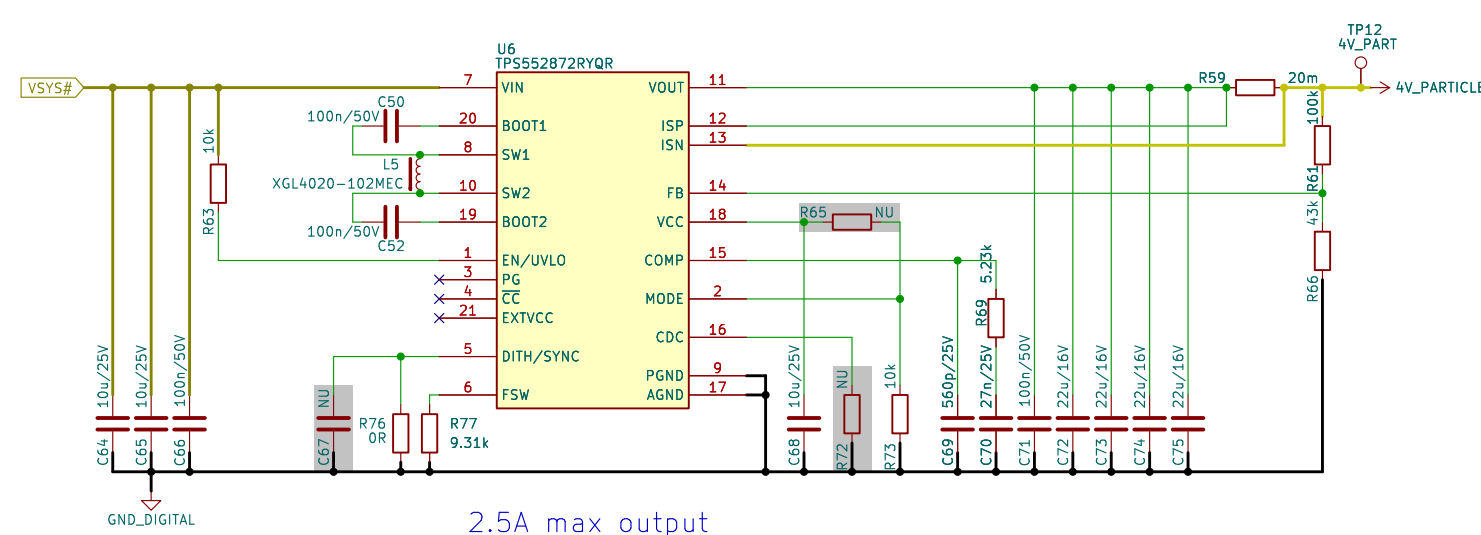
ON-OFF SWITCH



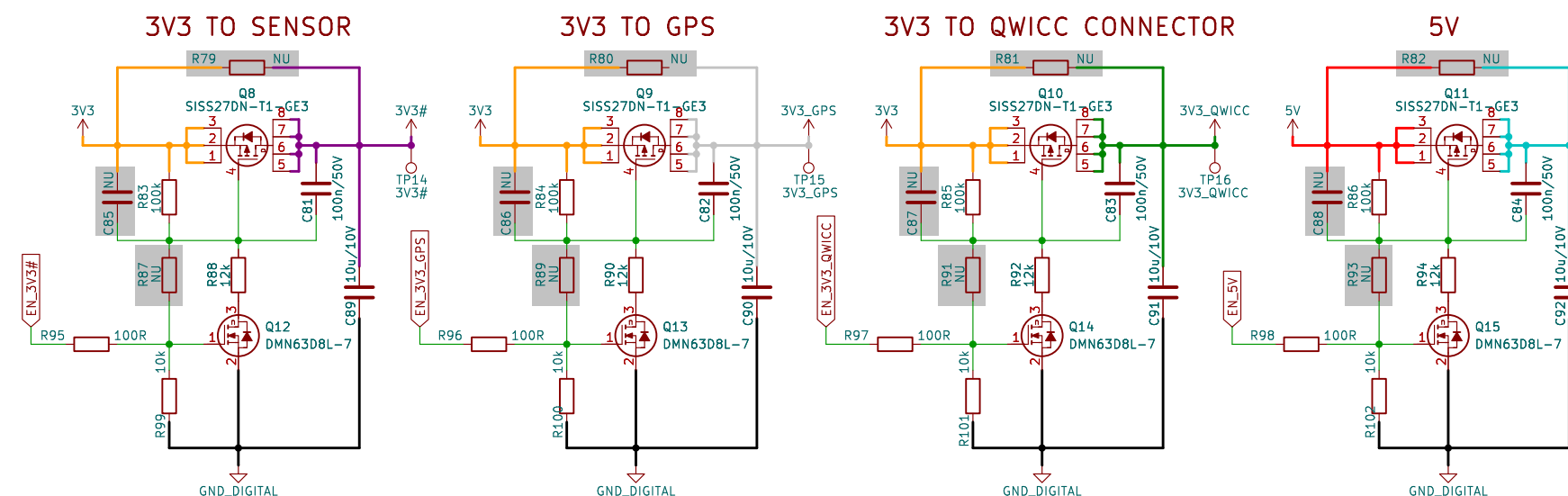
BUCK-BOOST 5V



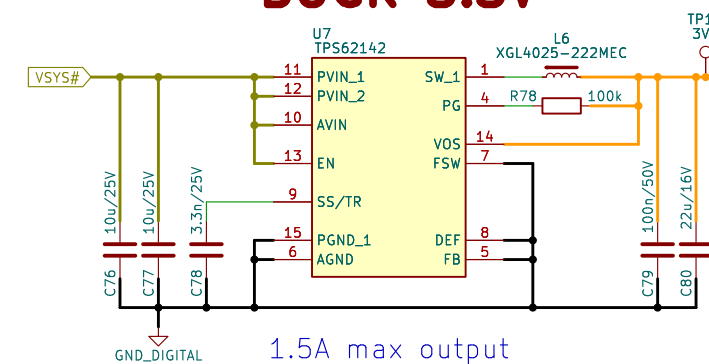
BUCK-BOOST 4V (PARTICLE MODULE)



POWER ENABLE



BUCK 3.3V



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TECHNOLOGY

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Rev.

1

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04 - POWER 2

Customer

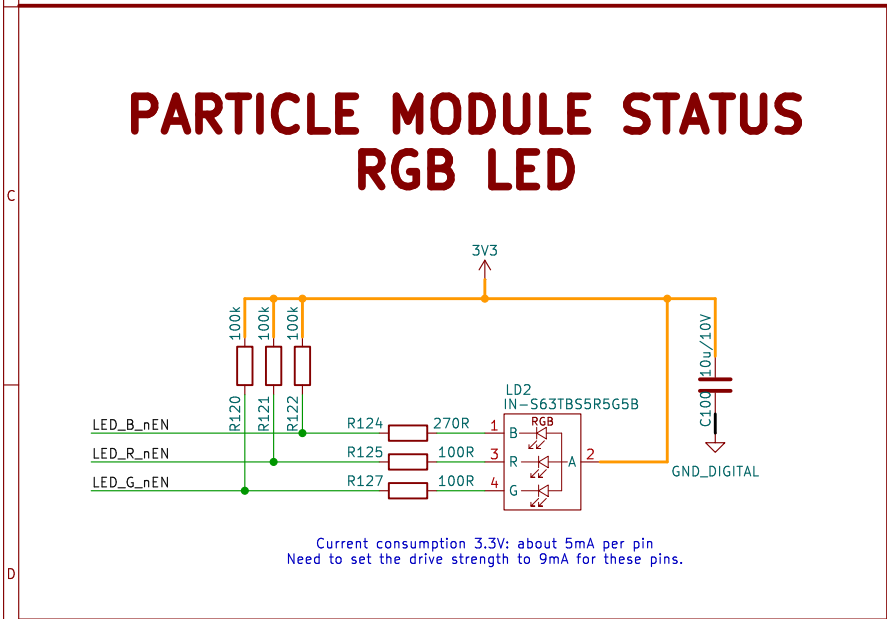
MIT

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[illegible]

RGB LED

3V3

LD3
IN-S63TBS5R5G5B

Current consumption 3.3V:
about 5mA per pin

LED_DI R141 33R

LED_SCL R142 33R

Max sink current set resistor
 $R = 1.21(V) / I_{outpin}(mA) \times 41$
 In this version: 5mA per pin

9.88k

R144

GND_DIGITAL

U9
TLC59711PWR
Current consumption 3.3V: 5mA

19	VCC	VREG	20
1	IREF		
3	OUTR0	OUTB3	18 X
4	OUTG0	OUTG3	17 X
5	OUTB0	OUTR3	16 X
6	OUTR1	OUTB2	15 X
7	OUTG1	OUTG2	14 X
8	OUTB1	OUTR2	13 X
9	SDTI	SDTO	12 X
10	SCKI	SCKO	11 X
2	GND	PAD	21

C102 100n/50V

C103 10u/10V

[illegible]

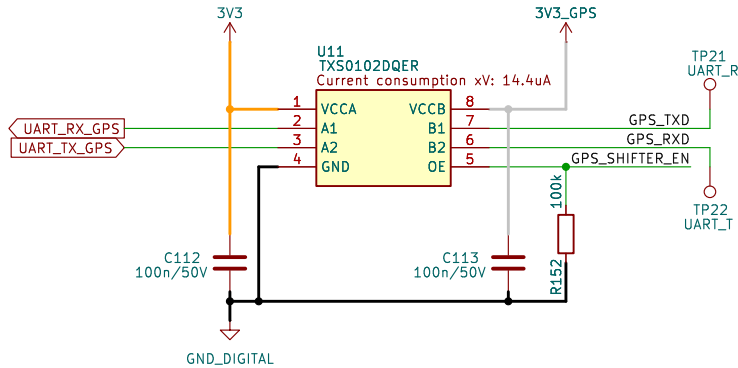
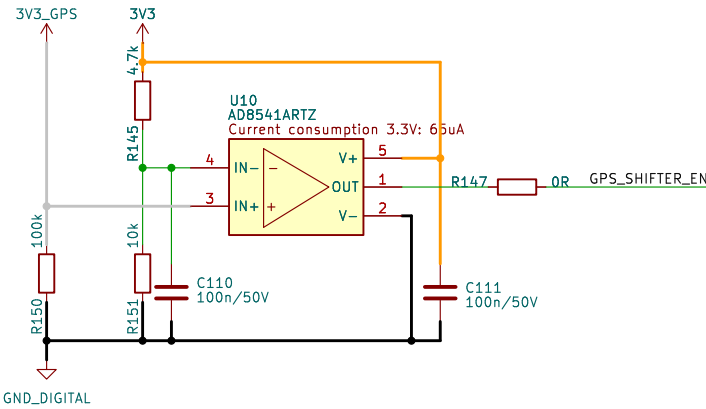
The schematic diagram illustrates the pin connections for the MDT420E01001 module, which is a 75-pin device with a KEY E connector. The module is connected to various external components and modules as follows:

- Power and Ground:**
 - Pin 1 (VCC) is connected to a 3V3 supply.
 - Pin 2 (GND) is connected to GND.
 - Pin 3 (VCC) is connected to a 3V3 supply.
 - Pin 4 (GND) is connected to GND.
 - Pin 5 (VCC) is connected to a 3V3 supply.
 - Pin 6 (GND) is connected to GND.
 - Pin 7 (VCC) is connected to a 3V3 supply.
 - Pin 8 (GND) is connected to GND.
 - Pin 9 (VCC) is connected to a 3V3 supply.
 - Pin 10 (GND) is connected to GND.
 - Pin 11 (VCC) is connected to a 3V3 supply.
 - Pin 12 (GND) is connected to GND.
 - Pin 13 (VCC) is connected to a 3V3 supply.
 - Pin 14 (GND) is connected to GND.
 - Pin 15 (VCC) is connected to a 3V3 supply.
 - Pin 16 (GND) is connected to GND.
 - Pin 17 (VCC) is connected to a 3V3 supply.
 - Pin 18 (GND) is connected to GND.
 - Pin 19 (VCC) is connected to a 3V3 supply.
 - Pin 20 (GND) is connected to GND.
 - Pin 21 (VCC) is connected to a 3V3 supply.
 - Pin 22 (GND) is connected to GND.
 - Pin 23 (VCC) is connected to a 3V3 supply.
 - Pin 24 (GND) is connected to GND.
 - Pin 25 (VCC) is connected to a 3V3 supply.
 - Pin 26 (GND) is connected to GND.
 - Pin 27 (VCC) is connected to a 3V3 supply.
 - Pin 28 (GND) is connected to GND.
 - Pin 29 (VCC) is connected to a 3V3 supply.
 - Pin 30 (GND) is connected to GND.
 - Pin 31 (VCC) is connected to a 3V3 supply.
 - Pin 32 (GND) is connected to GND.
 - Pin 33 (VCC) is connected to a 3V3 supply.
 - Pin 34 (GND) is connected to GND.
 - Pin 35 (VCC) is connected to a 3V3 supply.
 - Pin 36 (GND) is connected to GND.
 - Pin 37 (VCC) is connected to a 3V3 supply.
 - Pin 38 (GND) is connected to GND.
 - Pin 39 (VCC) is connected to a 3V3 supply.
 - Pin 40 (GND) is connected to GND.
 - Pin 41 (VCC) is connected to a 3V3 supply.
 - Pin 42 (GND) is connected to GND.
 - Pin 43 (VCC) is connected to a 3V3 supply.
 - Pin 44 (GND) is connected to GND.
 - Pin 45 (VCC) is connected to a 3V3 supply.
 - Pin 46 (GND) is connected to GND.
 - Pin 47 (VCC) is connected to a 3V3 supply.
 - Pin 48 (GND) is connected to GND.
 - Pin 49 (VCC) is connected to a 3V3 supply.
 - Pin 50 (GND) is connected to GND.
 - Pin 51 (VCC) is connected to a 3V3 supply.
 - Pin 52 (GND) is connected to GND.
 - Pin 53 (VCC) is connected to a 3V3 supply.
 - Pin 54 (GND) is connected to GND.
 - Pin 55 (VCC) is connected to a 3V3 supply.
 - Pin 56 (GND) is connected to GND.
 - Pin 57 (VCC) is connected to a 3V3 supply.
 - Pin 58 (GND) is connected to GND.
 - Pin 59 (VCC) is connected to a 3V3 supply.
 - Pin 60 (GND) is connected to GND.
 - Pin 61 (VCC) is connected to a 3V3 supply.
 - Pin 62 (GND) is connected to GND.
 - Pin 63 (VCC) is connected to a 3V3 supply.
 - Pin 64 (GND) is connected to GND.
 - Pin 65 (VCC) is connected to a 3V3 supply.
 - Pin 66 (GND) is connected to GND.
 - Pin 67 (VCC) is connected to a 3V3 supply.
 - Pin 68 (GND) is connected to GND.
 - Pin 69 (VCC) is connected to a 3V3 supply.
 - Pin 70 (GND) is connected to GND.
 - Pin 71 (VCC) is connected to a 3V3 supply.
 - Pin 72 (GND) is connected to GND.
 - Pin 73 (VCC) is connected to a 3V3 supply.
 - Pin 74 (GND) is connected to GND.
 - Pin 75 (VCC) is connected to a 3V3 supply.
- Resistors:**
 - R107, R108, R109, R110, R111, R116, R117, R118, R119, R123.
- Capacitors:**
 - C101, C97, C98, C99.
- External Modules and Connections:**
 - TP18, TP19, TP20 (Sensors/Probes).
 - VUSB_EN, I2C_SCL, I2C_SDA, uC_MODE, uC_RST, UART_TX_GPS, UART_RX_GPS, ADC_SPI_MOSI, ADC_SPI_SCK, uSD_SPI_CS, uSD_SPI_MISO, uSD_SPI_MOSI, uSD_SPI_SCK, uSD_SPI_CD, nUSB_SINK_EN, ADC_SPI_MISO, EN_3V3_GPS, EN_3V3#, EN_5V, IMU_INT, EN_3V3_QWICC, ADC_nDRDY, NOISE_INT, NOISE_AN, LED_SCL, LED_DI, LED_R_nEN, LED_G_nEN, LED_B_nEN, BUZZER_PWM, USB+, USB-.



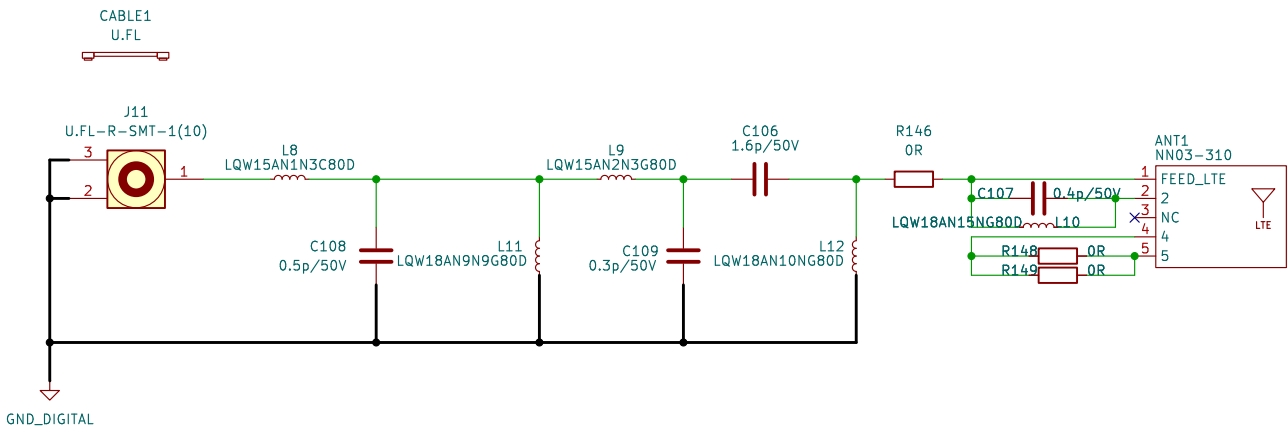
Project Flatburn_V4		Page name 05 - MCU	
Designer Luca Brighenti			
Internal code -		Customer MIT	
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GPS SIGNAL SWITCH (LEVEL SHIFTER)



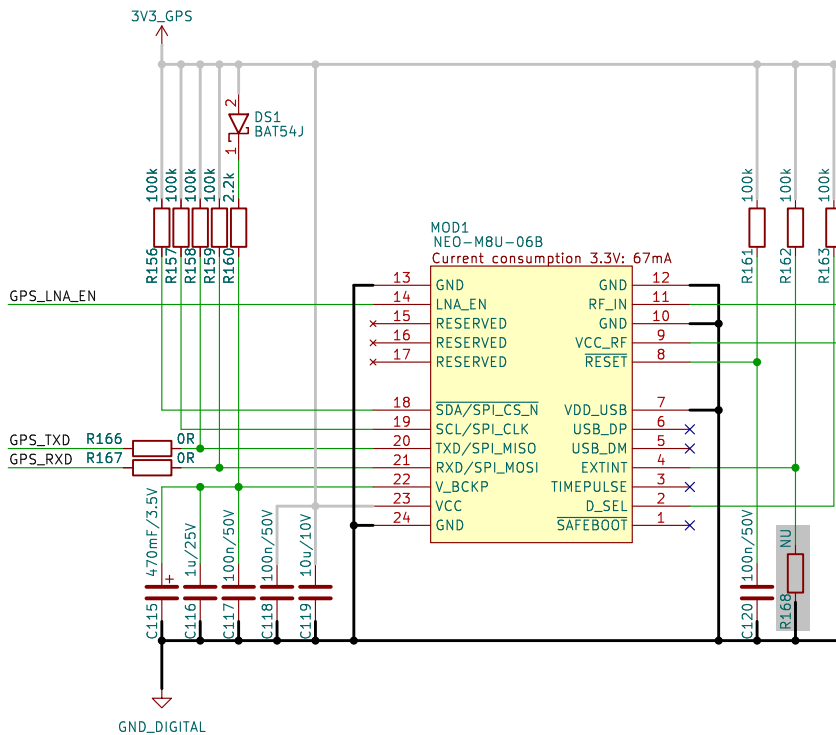
LTE ANTENNA

Supported Bands: 698–960MHz, 1710–2690Mhz



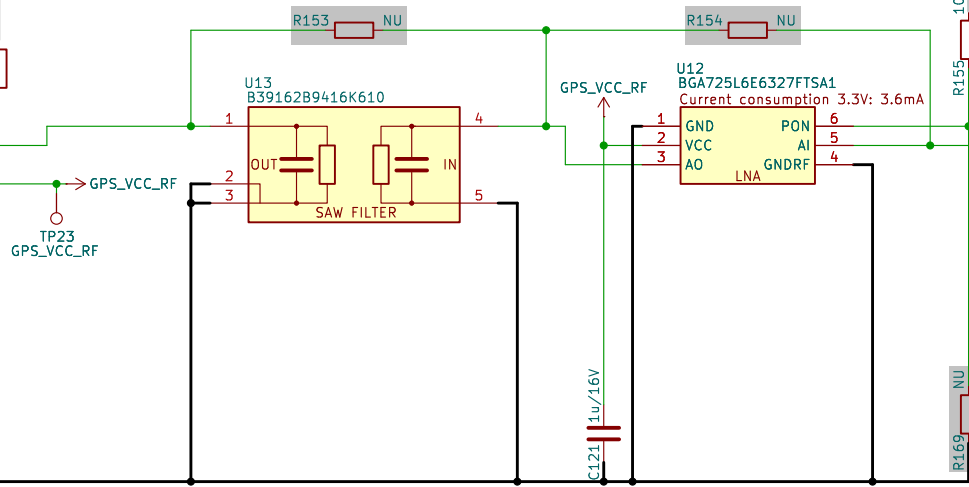
GPS MODULE

50Ω impedance trace



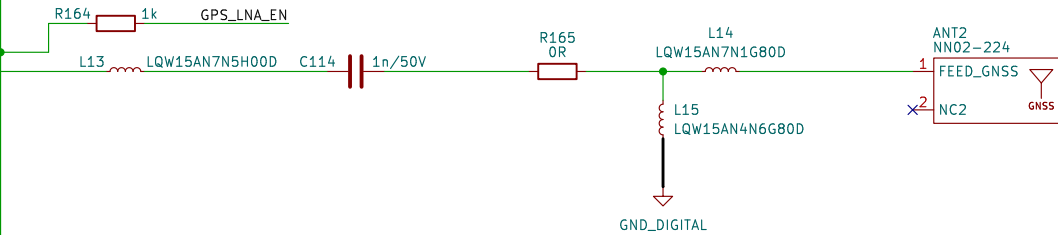
GPS SAW+LNA

50Ω impedance trace



GPS ANTENNA

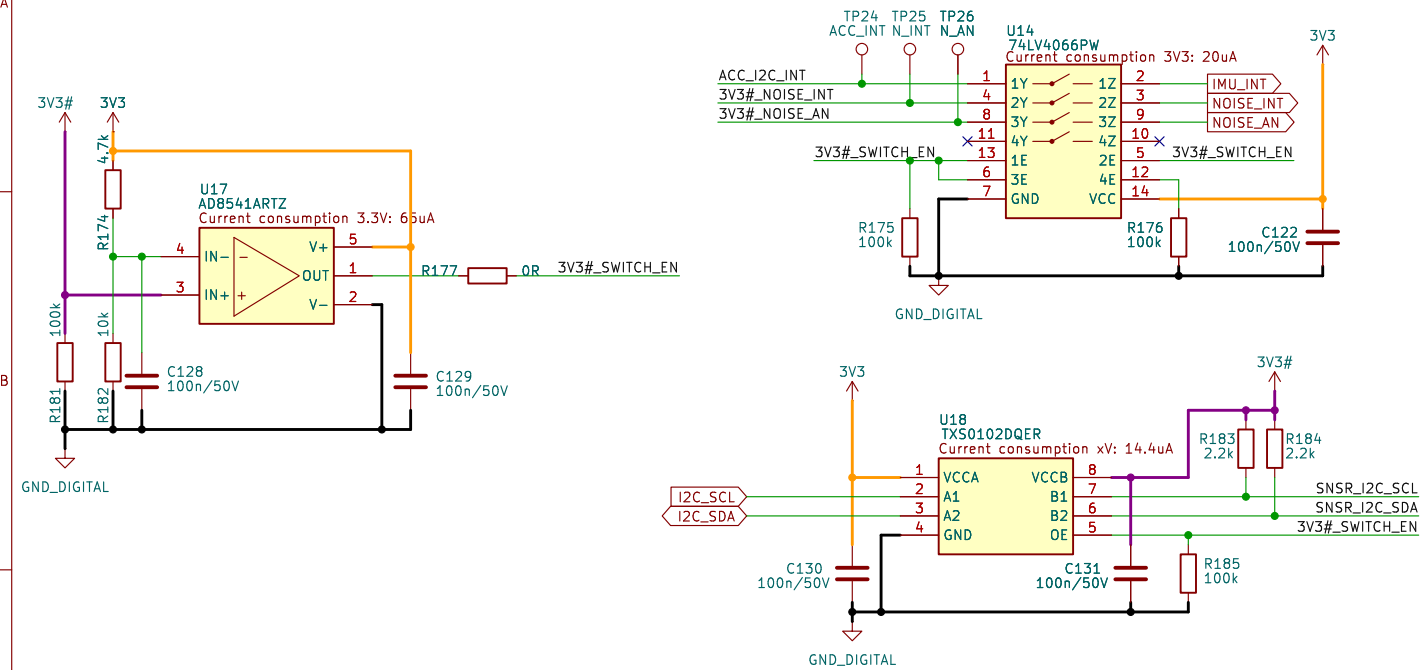
50Ω impedance trace
Supported Bands: 1559–1610MHz



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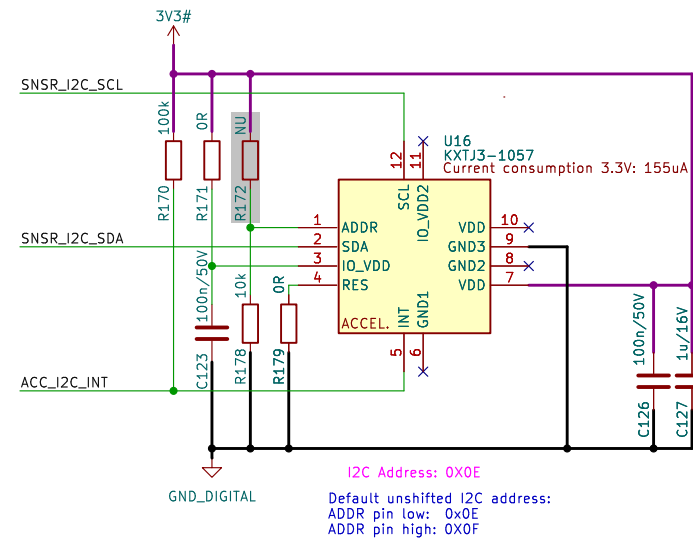
Project	Flatburn_V4	Page name	06 - GPS-LTE		
Designer	Luca Brighenti	Customer	MIT		
Internal code	-	Kicad Version	KiCad E.D.A. 9.0.0	Sheet	7/9
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3V3 SENSORS SIGNAL SWITCH

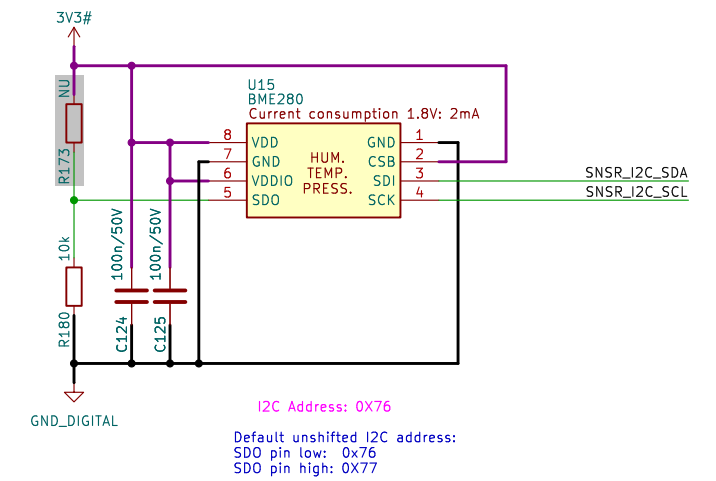


ACCELEROMETER

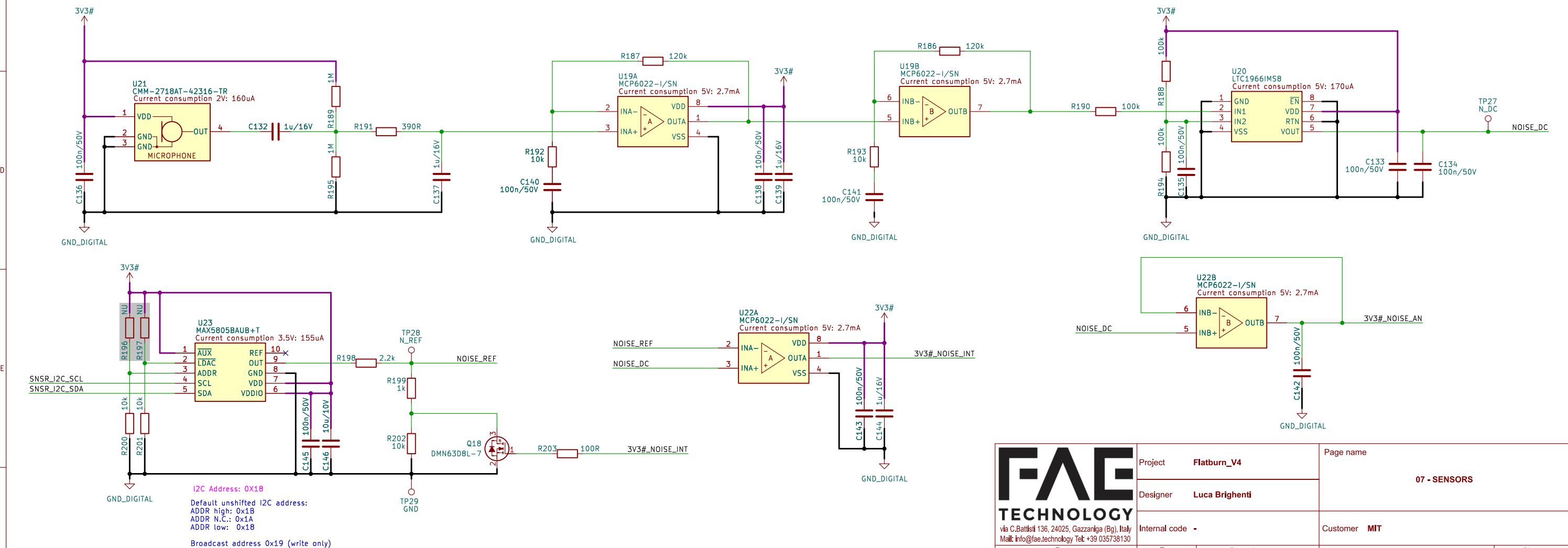
Alternative P/N: MXC6655XA
Default unshifted I2C address: 0X15



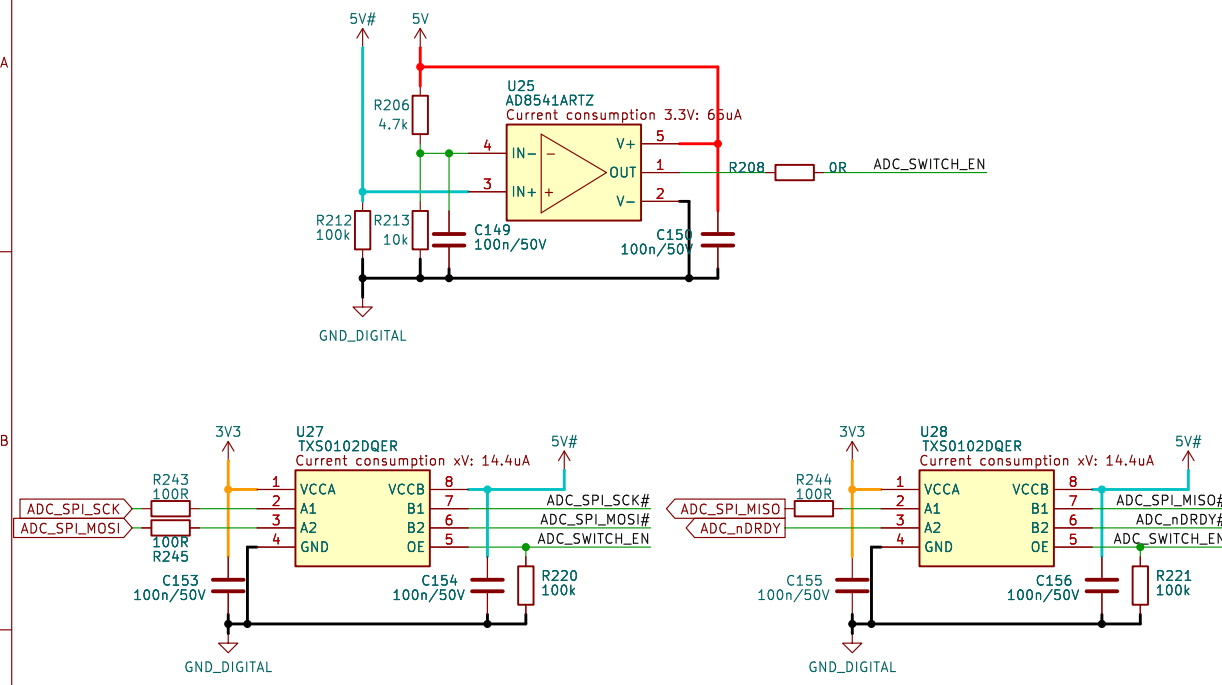
AMBIENT SENSOR



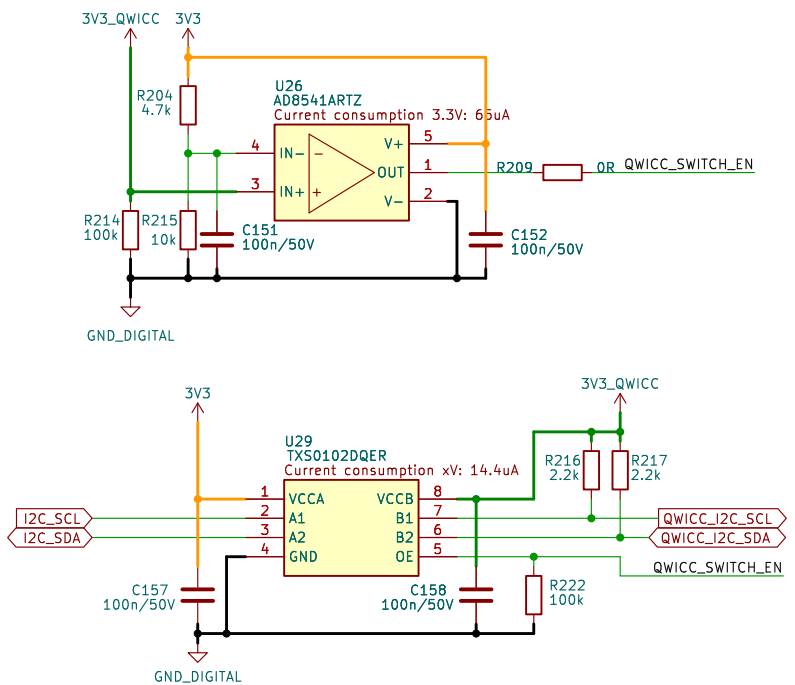
NOISE DETECTION



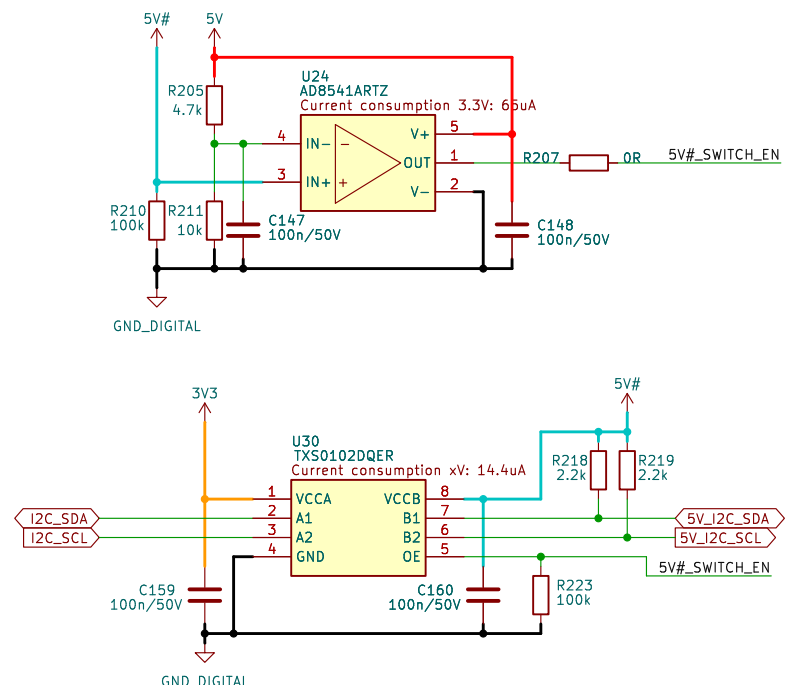
ADC SIGNAL SWITCH (LEVEL SHIFTER)



QWICC SIGNAL SWITCH



SPS30 SIGNAL SWITCH



ALPHASENSE AFE ADC

