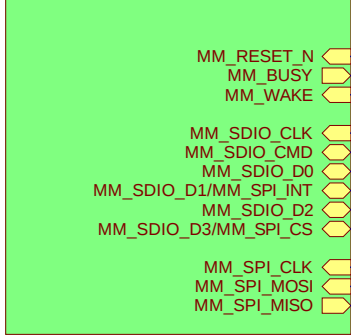
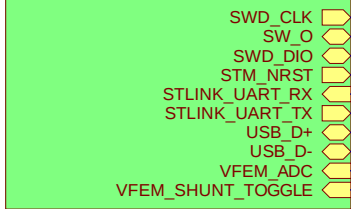


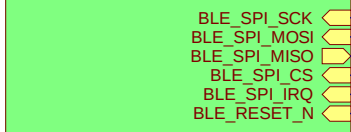
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HaLow_Module.SchDoc



U_Power
Power.SchDoc



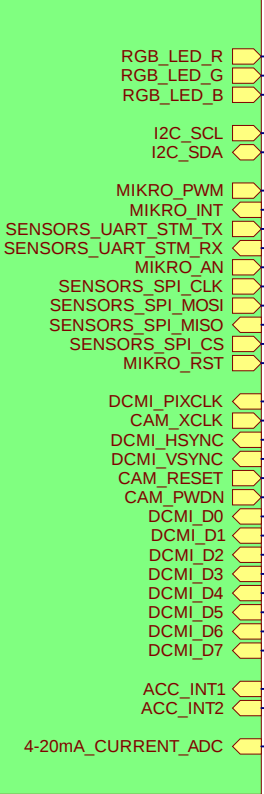
U_BLE_Module
BLE_Module.SchDoc



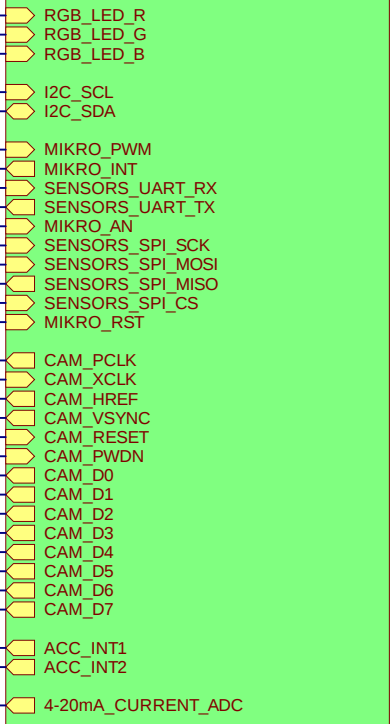
U_Revision_History
Revision_History.SchDoc



U_STM_MCU
STM_MCU.SchDoc



U_Sensors
Sensors.SchDoc

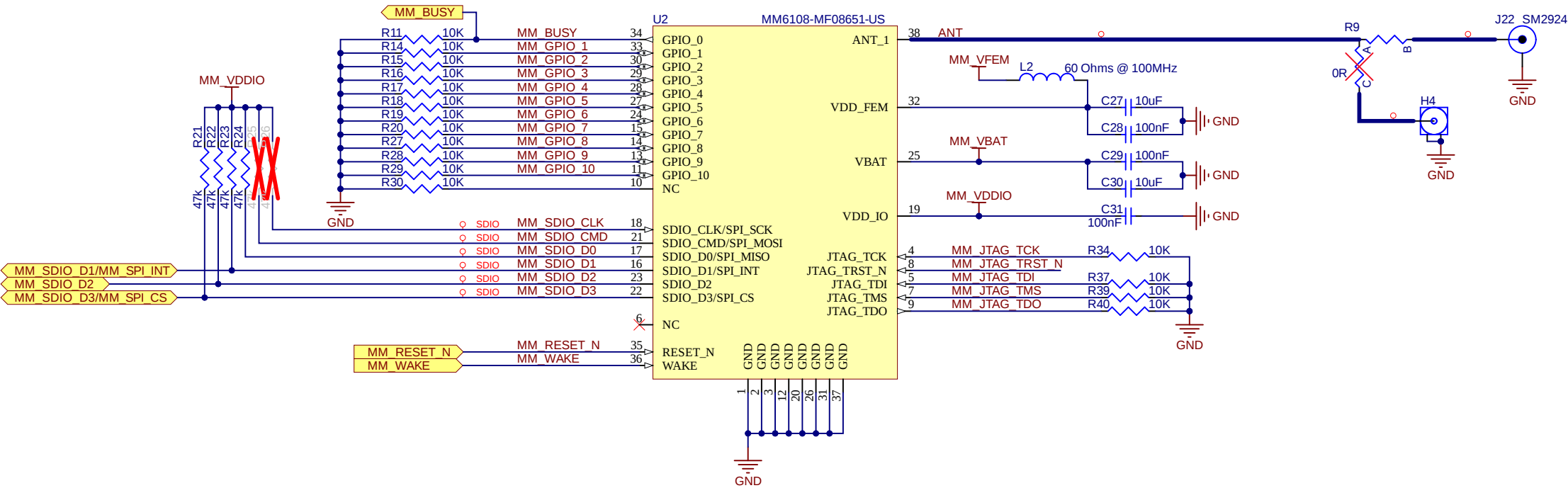


U_Mechanical
Mechanical.SchDoc

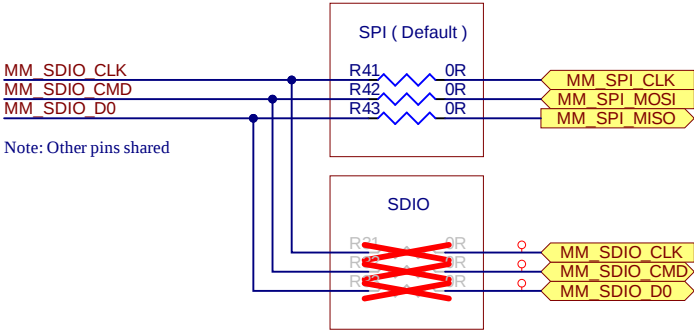


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Drawn: J. Garnier	Title Top Level			
Checked: Matthew Jay				
Approved: Chad O'Neill	PCBA No: MM6108_EKH05.PrjPcb	Drawing Revision: 3.0	Size: A4	
	Drawing No:			
Date Released:15/08/2024	File: Main.SchDoc	Sheet 1 of 8		

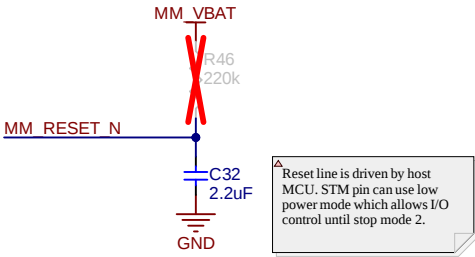
MM HaLow MODULE



SDIO/SPI SELECTION



RESET CIRCUIT



DEBUG HEADER

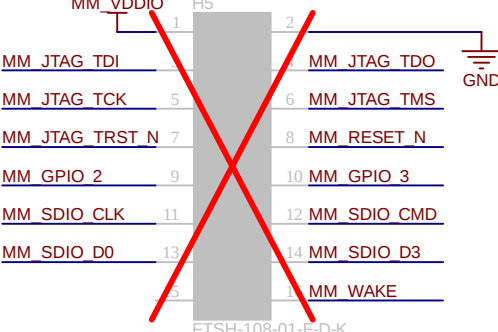


Table 8. Pin connection

Pin #	Name	Function			
		Mode "000"	Mode "001"	Mode "100"	Mode "010"
1	ADC2	ADC input 2			
2	ADC1	ADC input 1			
3	DIO4	GPIO4	UART_RXD	I2C2_CLK	PWM0
4	DIO5	GPIO5	UART_TXD	I2C2_DAT	PWM1
5	VIN	Power Supply			
6	ANATEST0/DIO14	GPIO14	I2C1_CLK	SPI_CLK	ADC_DAT
7	DIO7/BOOT ⁽¹⁾	GPIO7	UART_CTS	I2C2_DAT	PDM_CLK
8	GND	Ground			
9	DIO6	GPIO6	UART_RTS	I2C2_CLK	PDM_DAT
10	DIO8	GPIO8	UART_TXD	SPI_CLK	PDM_DAT
11	DIO11	GPIO11	UART_RXD	SPI_CS1	
12	DIO9	GPIO9	SWCLK	SPI_IN ⁽²⁾	
13	DIO10	GPIO10	SWDIO	SPI_out ⁽³⁾	
14	ANATEST1	Anatest1			
15	DIO0	GPIO0	UART_CTS	SPI_CLK	
16	DIO2	GPIO2	PWM0	SPI_OUT	PDM_CLK
17	DIO3	GPIO3	PWM1	SPI_IN	ADC_CLK
18	DIO1	GPIO1	UART_RTS	SPI_CS1	PDM_DAT
19	RESETN	Reset			
20	DIO12	GPIO12 ⁽⁴⁾		I2C1_CLK	
21 ⁽⁵⁾	GND	Ground or leave unconnected			
22 ⁽⁵⁾	N.C.	Leave unconnected			
23 ⁽⁵⁾	N.C.	Leave unconnected			

1. The pin DIO7/BOOT is monitored by bootloader after power-up or hardware reset and it should be low to prevent unwanted bootloader activation.

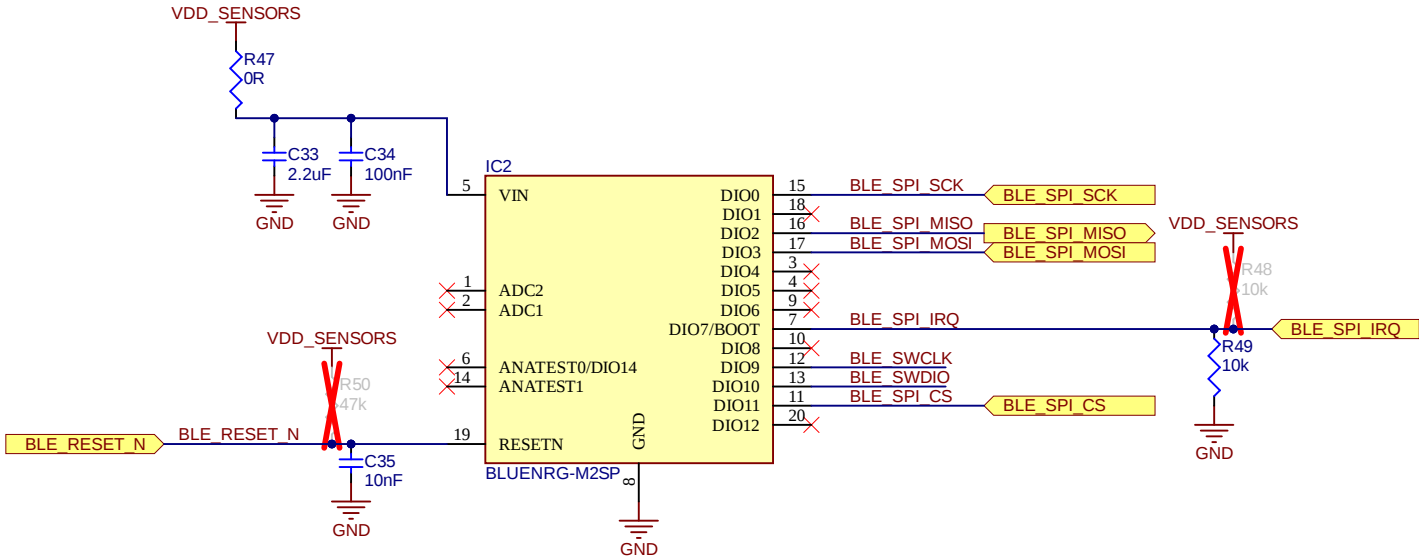
2. The function SPI_IN indicates that the pin is always an input when configured for SPI. Thus in case of SPI master role, it acts as MISO pin. In case of SPI slave role, this pin act as MOSI

3. The function SPI_OUT indicates that the pin is always an output when configured for SPI. Thus in case of SPI master role, it acts as MOSI pin. In case of SPI slave role, this pin act as MISO.

4. DIO12 can only be general purpose input pins (not output), or I2C1 clock pin.

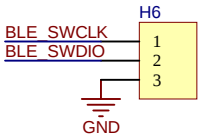
5. BLUENRG-M2SA only.

BLE MODULE

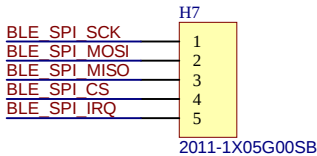


- Note:
- All unused pins should be left floating; do not ground
 - All GND pins must be well grounded
 - The area around the module should be free of any ground planes, power planes, trace routings, or metal for 6 mm from the module antenna position, in all directions.
 - Traces should not be routed underneath the module

BLE SWD HEADER



BLE SPI HEADER

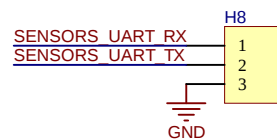


Morse Micro

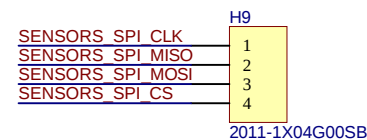
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Drawn: J. Garnier	Title BLE		
Checked: Matthew Jay			
Approved: Chad O'Neill	PCBA No: MM6108_EKH05.PrjPcb	Drawing Revision: 3.0	Size: A4
Date Released: 20/08/2024	File: BLE_Module.SchDoc	Sheet 4 of 8	

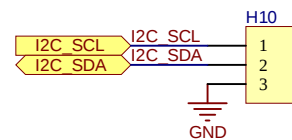
SENSORS UART HEADER



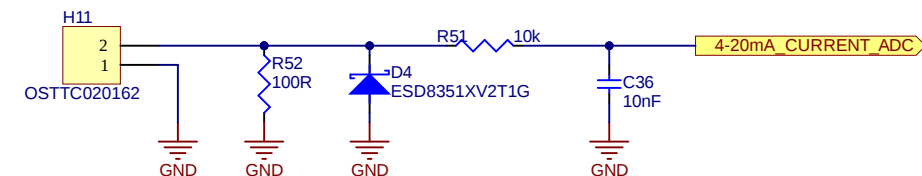
SENSORS SPI HEADER



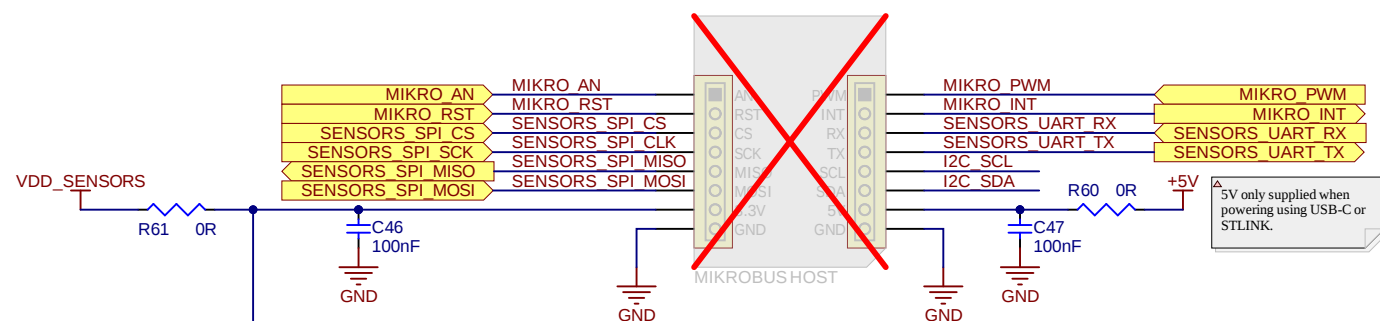
SENSORS I2C HEADER



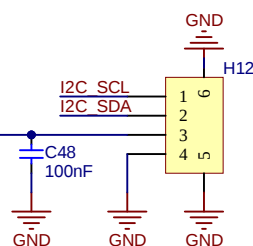
4-20mA CURRENT MEASUREMENT



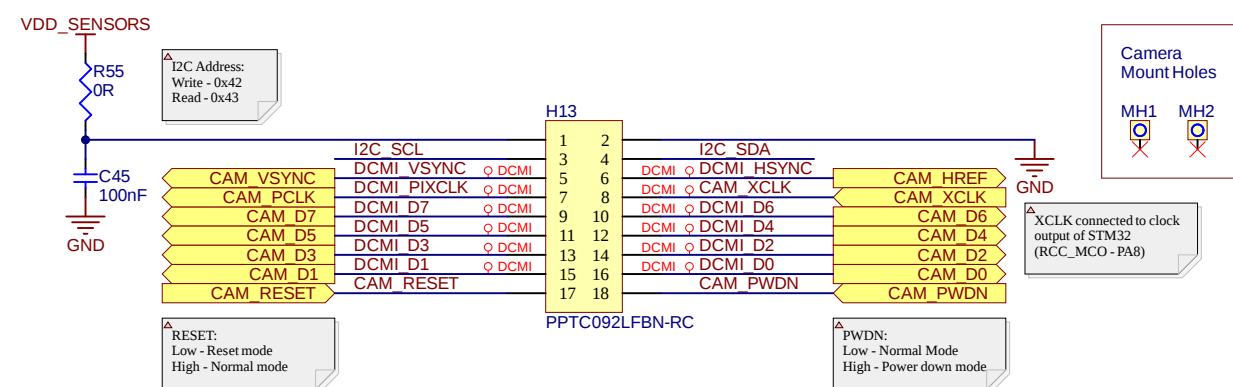
MIKROBUS HEADER



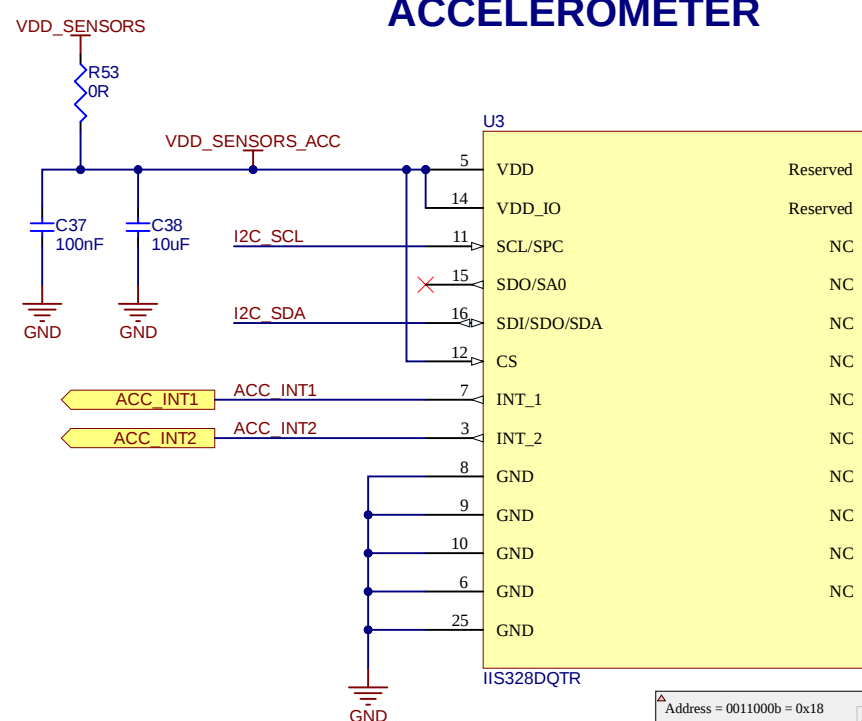
QWIIC CONNECTOR



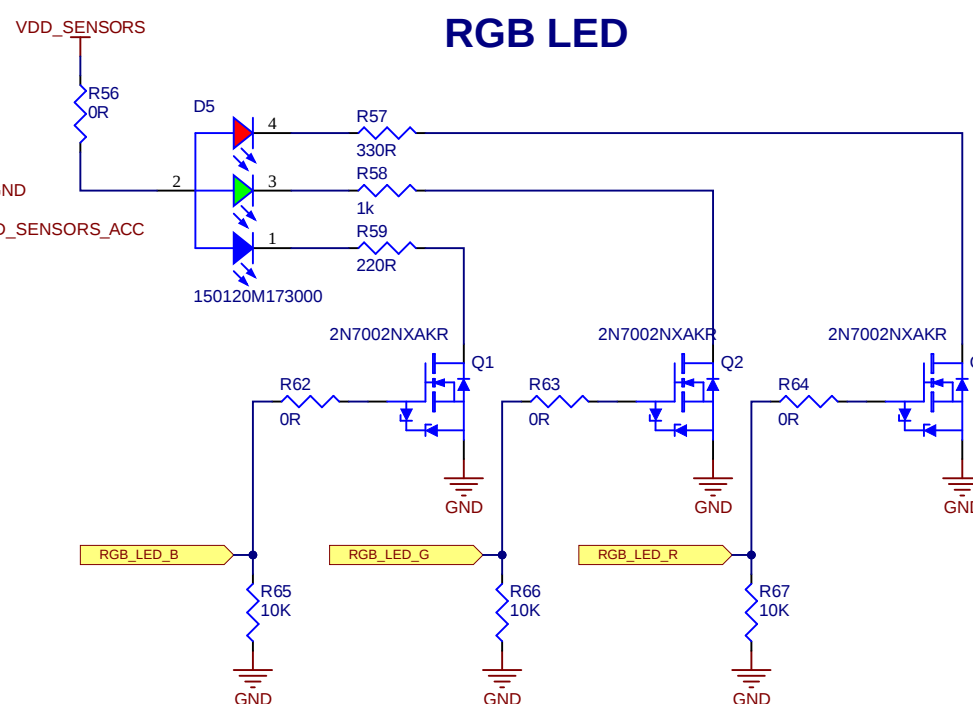
CAMERA HEADER



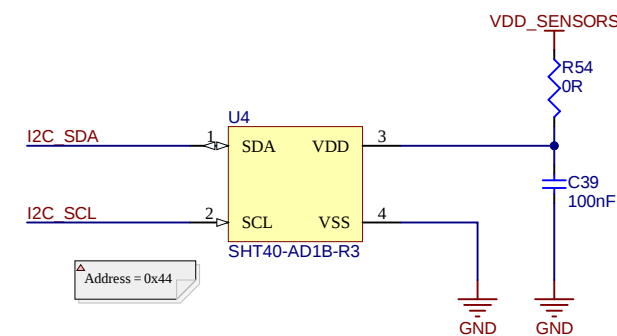
ACCELEROMETER



RGB LED

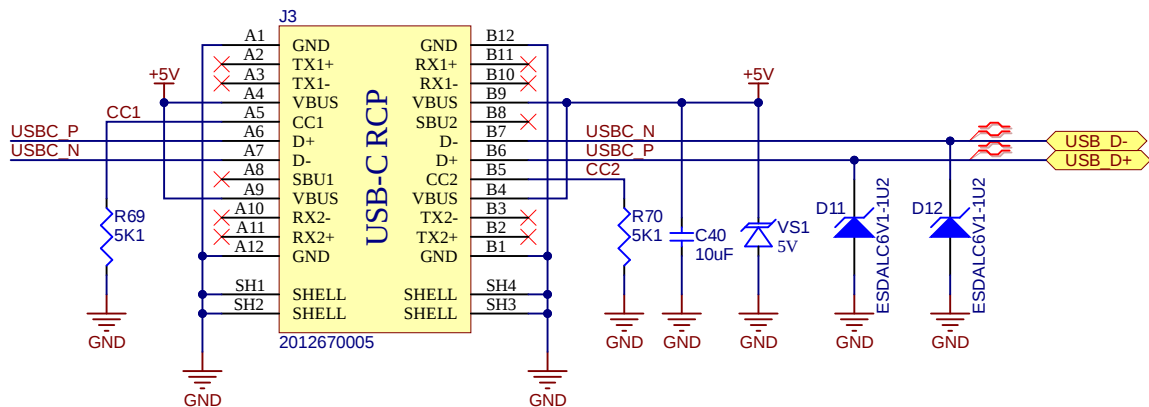


TEMPERATURE AND HUMIDITY SENSOR

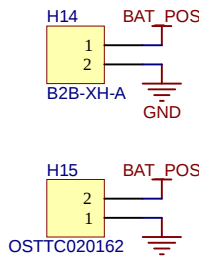


 Morse Micro <i>Level 8, 10-14 Waterloo Street Surry Hills, NSW 2010 AUSTRALIA (c) Copyright 2024</i>		
Drawn: J. Garnier	Title: Sensors	
Checked: Matthew Jay		
Approved: Chad O'Neill	PCBA No: MM6108_EKH05.PrjPcb	Size: A3
Date Released: 18/09/2024	Drawing No:	Drawing Revision: 3.0
	File: Sensors.SchDoc	Sheet 5 of 8

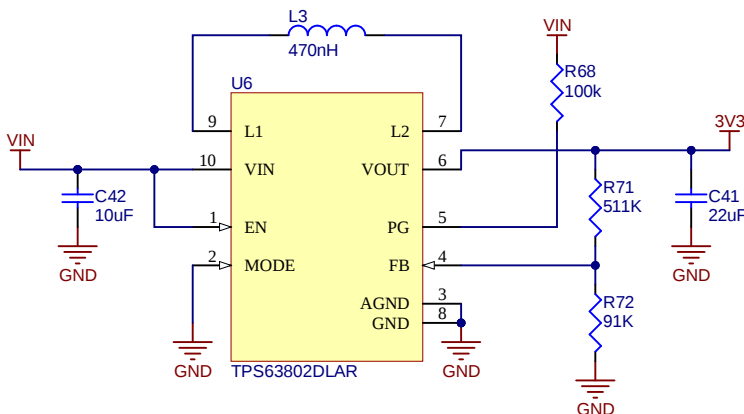
USB TYPE-C



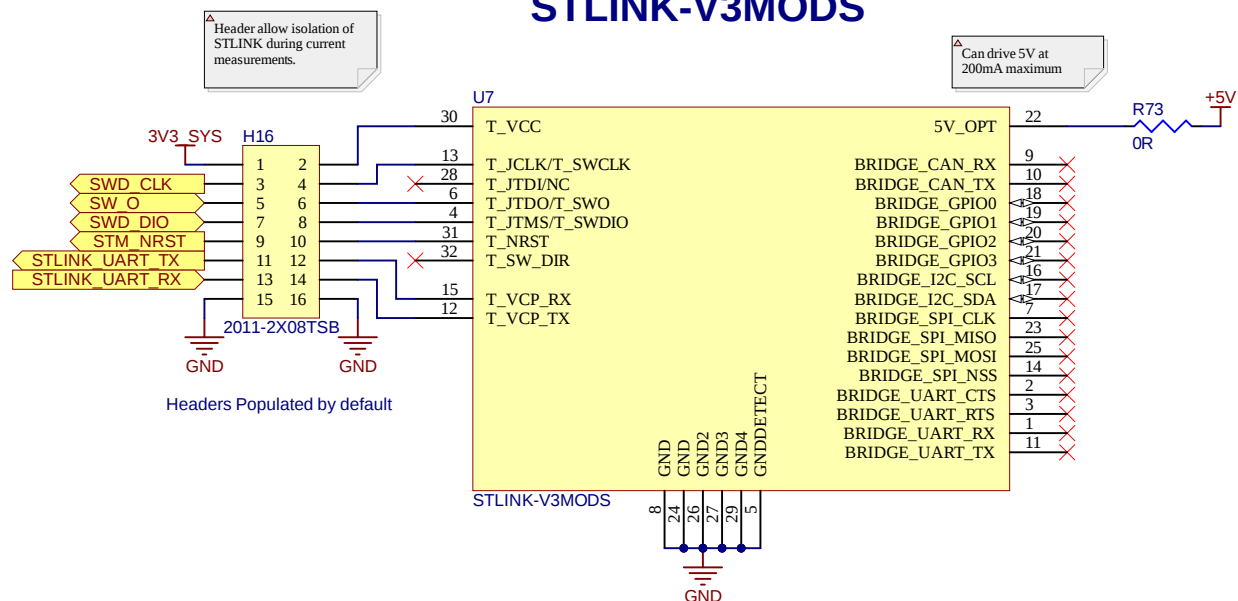
BATTERY CONNECTORS



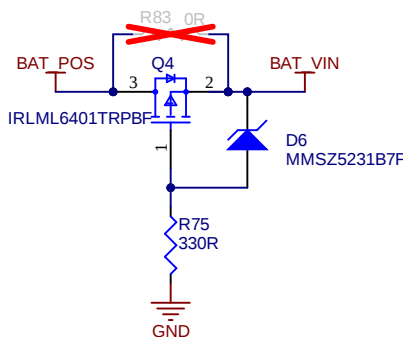
3V3 BUCK BOOST REGULATOR



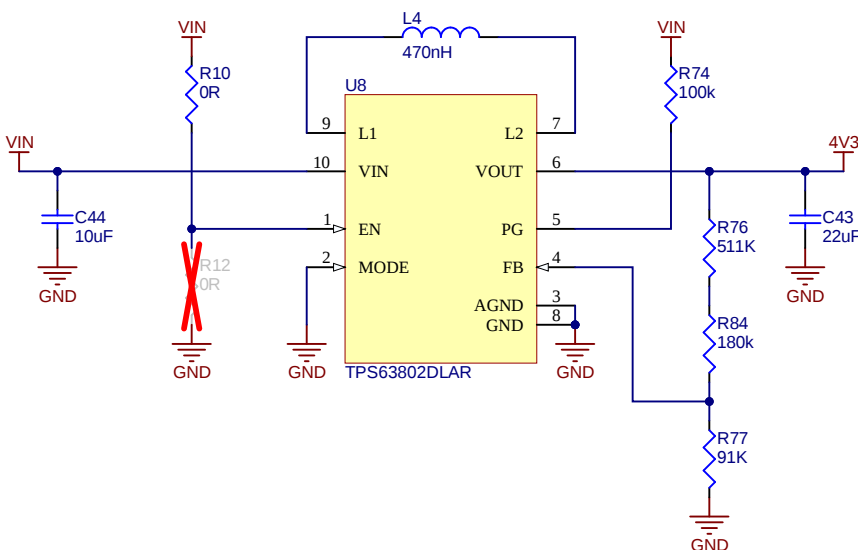
STLINK-V3MODS



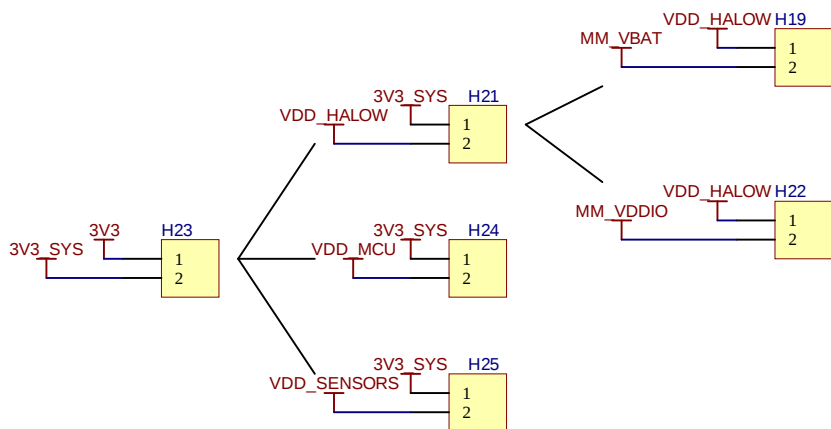
BATTERY REVERSE POLARITY PROTECTION



4V3 BUCK BOOST REGULATOR

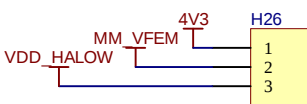


CURRENT MEASUREMENTS

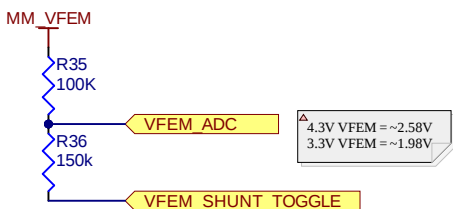


HaLow RF POWER SELECT

Options: 3V3 or 4V3

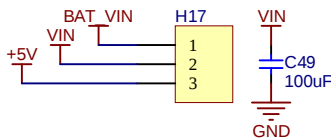


VFEM ADC



POWER INPUT SELECT

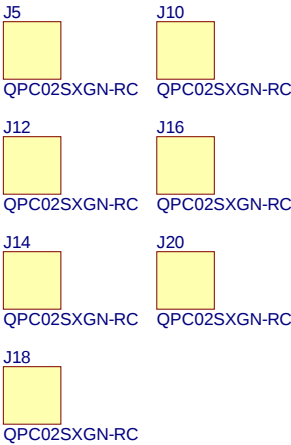
Options: Battery or USB



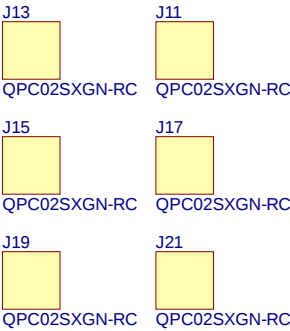
M_U Morse Micro Level 8, 10-14 Waterloo Street Surry Hills, NSW 2010 AUSTRALIA (c) Copyright 2024			
Drawn: J. Garnier	Title Power		
Checked: Matthew Jay	PCBA No: MM6108_EKH05.PrjPcb		Size: A3
Approved: Chad O'Neill	Drawing No:	Drawing Revision: 3.0	
Date Released: 14/10/2024	File: Power.SchDoc	Sheet 6 of 8	

JUMPER HEADERS

STLINK



CURRENT MEASURE HEADERS



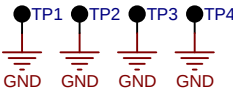
POWER INPUT SELECT



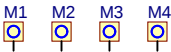
HaLow RF POWER SELECT



GND TEST POINTS



MOUNTING HOLES



FIDUCIALS



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Drawn: J. Garnier		Title Mechanical			
Checked: Matthew Jay					
Approved: Chad O'Neill		PCBA No: MM6108_EKH05.PrjPcb		Drawing Revision: 3.0	Size: A4
Date Released: 4/09/2024		Drawing No:			
File: Mechanical.SchDoc				Sheet 7 of 8	

Revision History	
1.0	- Initial release.
2.0	- Connect USB data to STM - Connect RTS/CTS to BLE Module. - Swap UART pins of BLE Module. - Update buck boost output cap to 22uF - Reversed UART RX/TX connections on STLINK - Moved power supply for QSPI Flash to VDD_SENSORS - Updated battery connector to JST - Added bulk cap on Power select - Removed load switch for sensors power supply - Added option to change VFEM to 4.3V
3.0	- Updated SMA footprint. - Updated BLE module communication protocol from UART to SPI. Updated pinout as needed. - Removed 0ohm links to unneeded SPI/SDIO connections. - Combined the MM_SPI_CS and MM_SPI_INT pins with SDIO - Pin assignment updates to red status LED, MIKRO_AN and MIKRO_PWM - Updated VFEM High Power Select to 4.3V - Removed Vin & VFEM from power measure tree



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Checked: Matthew Jay	Revision History		
Approved: Chad O'Neill	PCBA No: MM6108_EKH05.PrjPcb	Drawing Revision: 3.0	Size: A4
Date Released: 2/09/2024	File: Revision_History.SchDoc	Sheet 8 of 8	