

Pinout diagram for the MB1 module. The diagram shows a 2x16 pin header with pins labeled P3 through P30. The pins are connected to various functions:

- P3: LEDCOL1 / AIN5 / P0.04
- P4: AIN2 / P0.01
- P5: LEDCOL2 / AIN6 / P0.05
- P6: BUTTON_A / P0.17
- P7: LEDCOL3 / P0.12
- P8: LEDCOL4 / P0.11
- P9: AIN3 / P0.02
- P10: P0.18
- P11: LEDCOL7 / P0.10
- P12: LEDCOL3 / AIN7 / P0.06
- P13: BUTTON_B / AIN0 / P0.26
- P14: P0.20
- P15: P0.03
- P16: SCK / P0.23
- P17: MISO / P0.22
- P18: MOSI / P0.21
- P19: P0.16
- P20: +3.3V
- P21: SCL / P0.00
- P22: SDA / P0.30
- P23: GND
- P24: GND
- P25: GND
- P26: GND
- P27: GND
- P28: GND
- P29: GND
- P30: GND

The diagram also shows a 3V3 power supply and a GND connection.

The diagram illustrates the electrical connections for an ESP32-S3-WROOM-1 module. Key components and connections include:

- Power Supply:** A +3V3 source is connected to the module's 3V3 pin. A 10k resistor (R2) and a capacitor (C3) are connected to the EN pin. Two capacitors, C1 (10uF) and C2 (100nF), are connected to the 3V3 pin.
- Module Pins:** The module (U1) has pins 1 through 49. Pins 1-11 are connected to various components: SDA, SCL, CS, P2, MOSI, MISO, SCK, NRST, P12, D-, D+, ESP_UART1_TX, BOOT_STM32, ESP_UART1_RX, SW2, SW1, LED_RGB, TFTCS, P10, and TFTRESET.
- Other Connections:** Pins 12-14 are connected to P12, D-, and D+. Pins 15-17 are connected to ESP_UART1_TX, BOOT_STM32, and ESP_UART1_RX. Pins 18-25 are connected to SW2, SW1, LED_RGB, TFTCS, P10, and TFTRESET. Pins 26-49 are connected to a series of pins from 26 to 49.

The diagram illustrates a simple circuit for a power LED. A +3V3 power source is connected to a resistor labeled R1 with a value of 470 ohms. This resistor is in series with an LED component labeled LED1. The circuit is completed by connecting the LED to a ground symbol.

0

ESP_UART1_RX R3 LORA_TX LoRa_TX

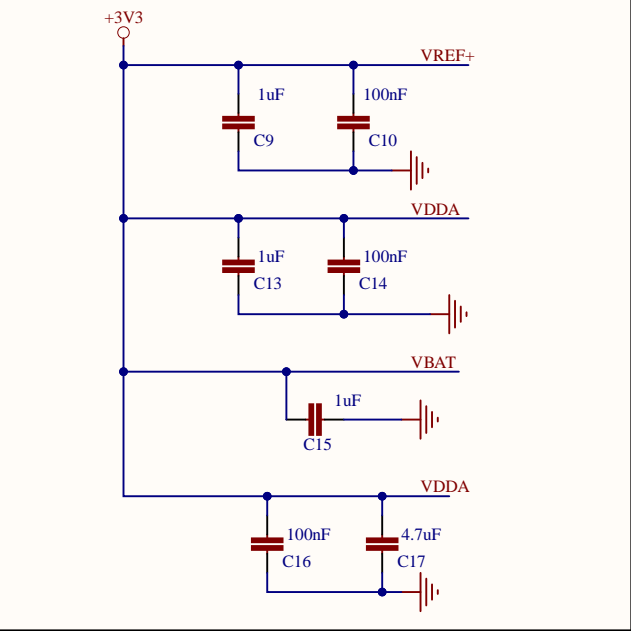
0

ESP_UART1_TX R4 LORA_RX LoRa_RX

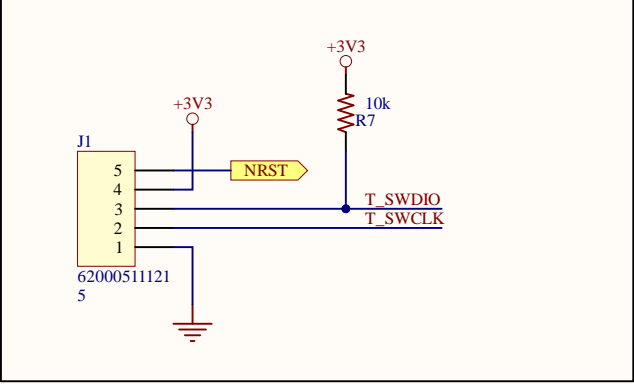
[illegible]

The diagram illustrates the connection of two modules: LCD1 and SK6812MINI_NOPoly. The LCD1 module is connected to a +3V3 power source and ground. The SK6812MINI_NOPoly LED module is connected to a +3V3 power source, ground, and a 100nF capacitor. The LED module is also connected to a LED_RGB signal line.

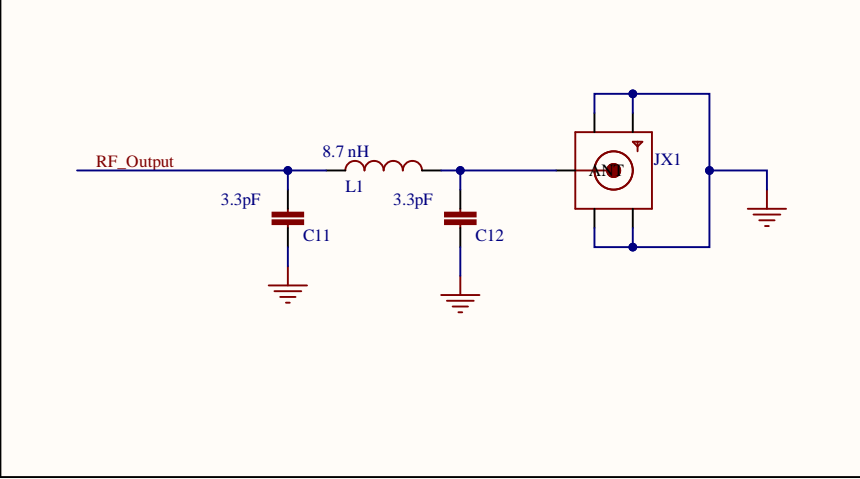
POWER SUPPLY DECOUPLING



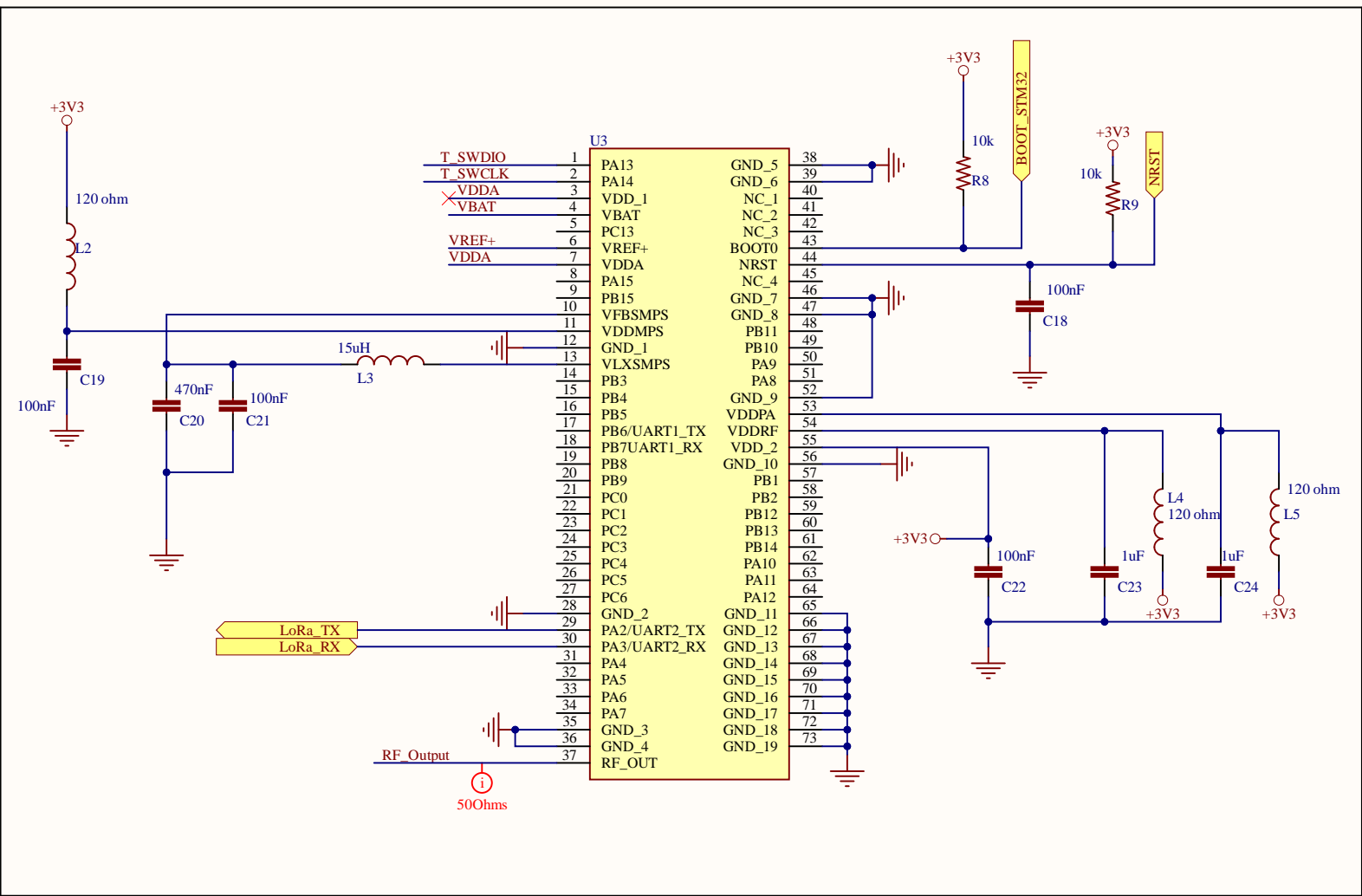
JTAG

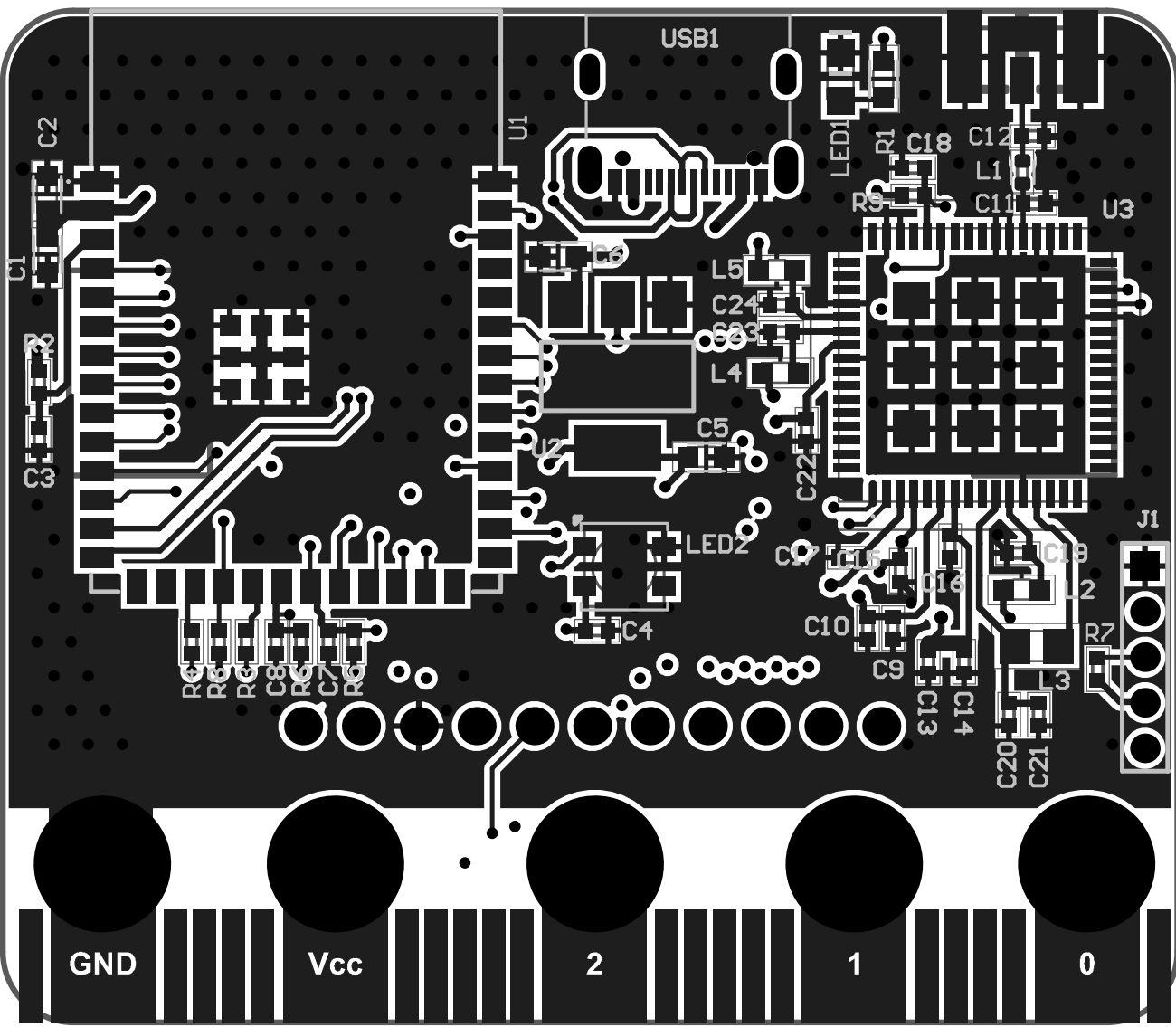
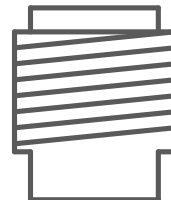


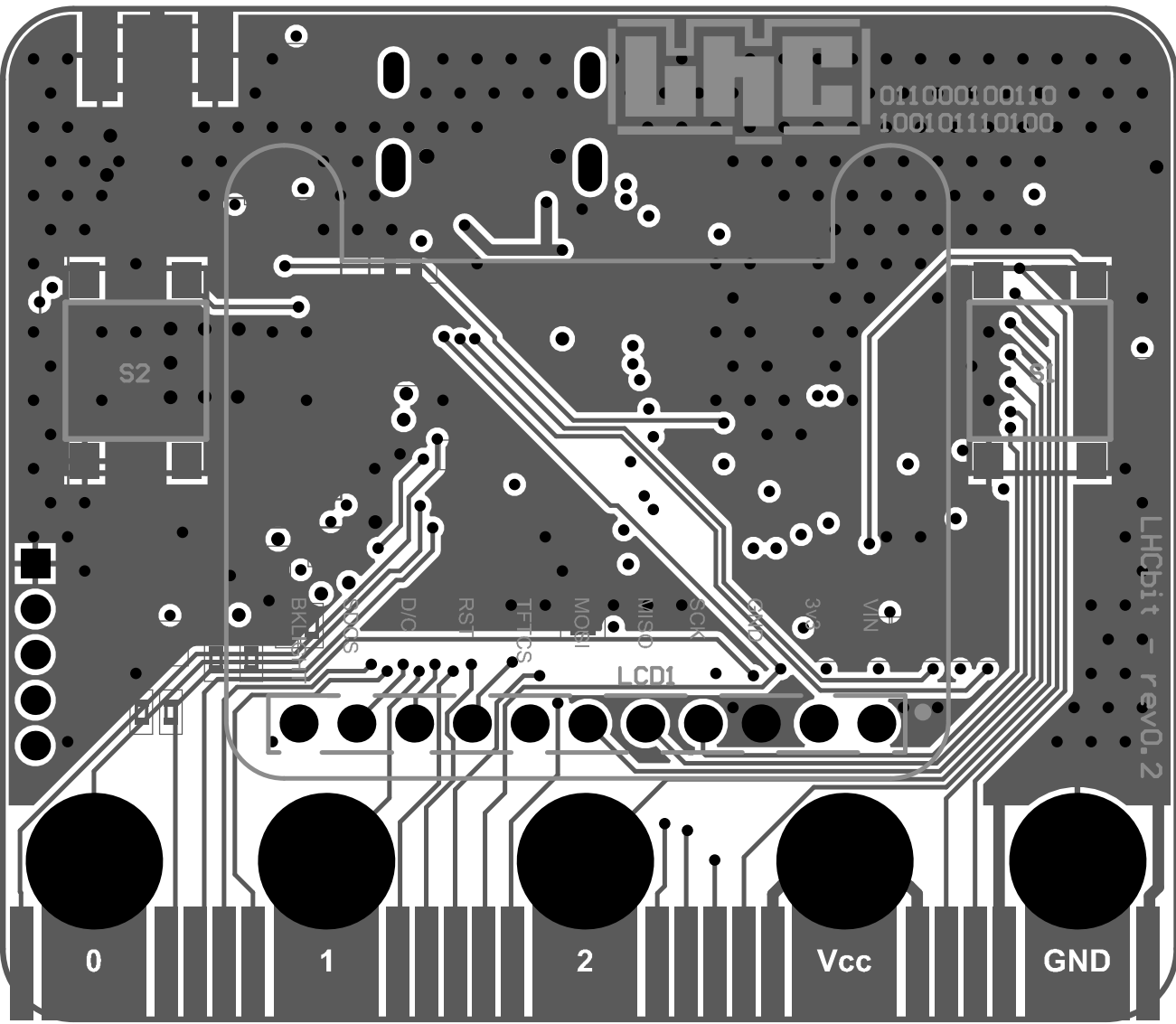
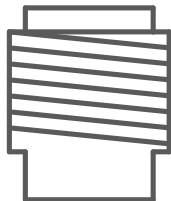
RF FILTER / SWITCH / ANTENNA CONNECTOR

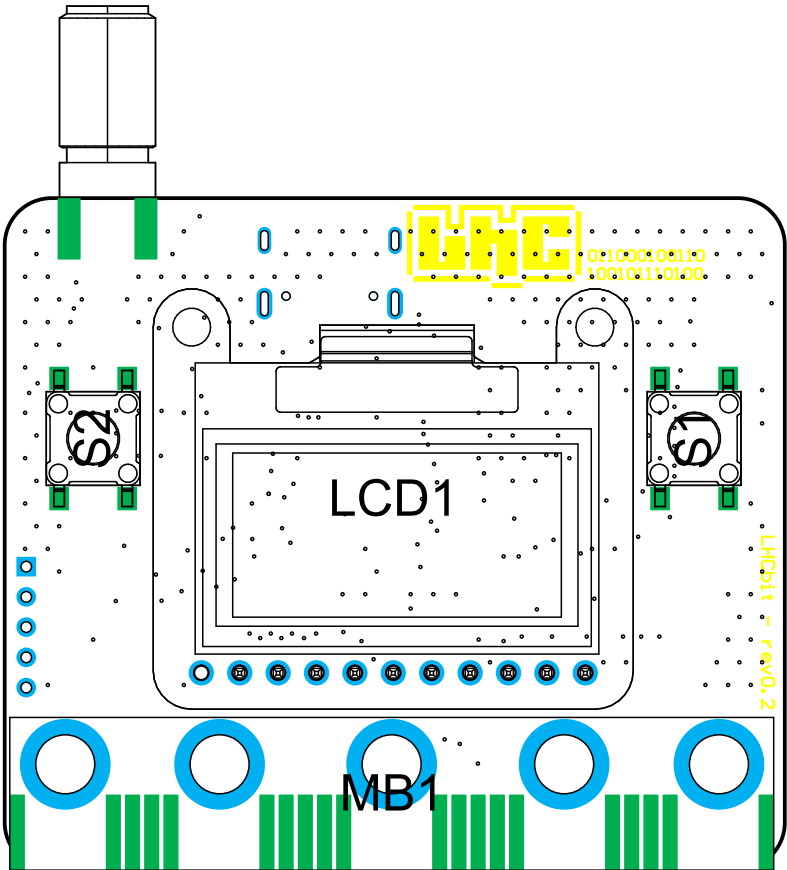
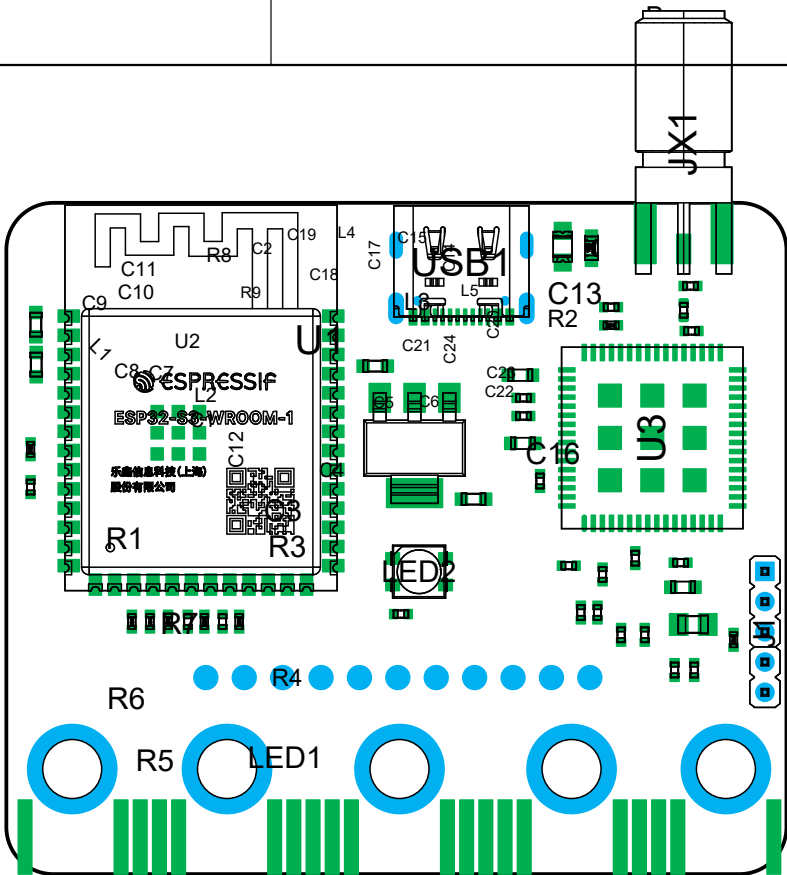


MULTIPROTOCOL LPWAN 32-BIT ARM MICROCONTROLLER







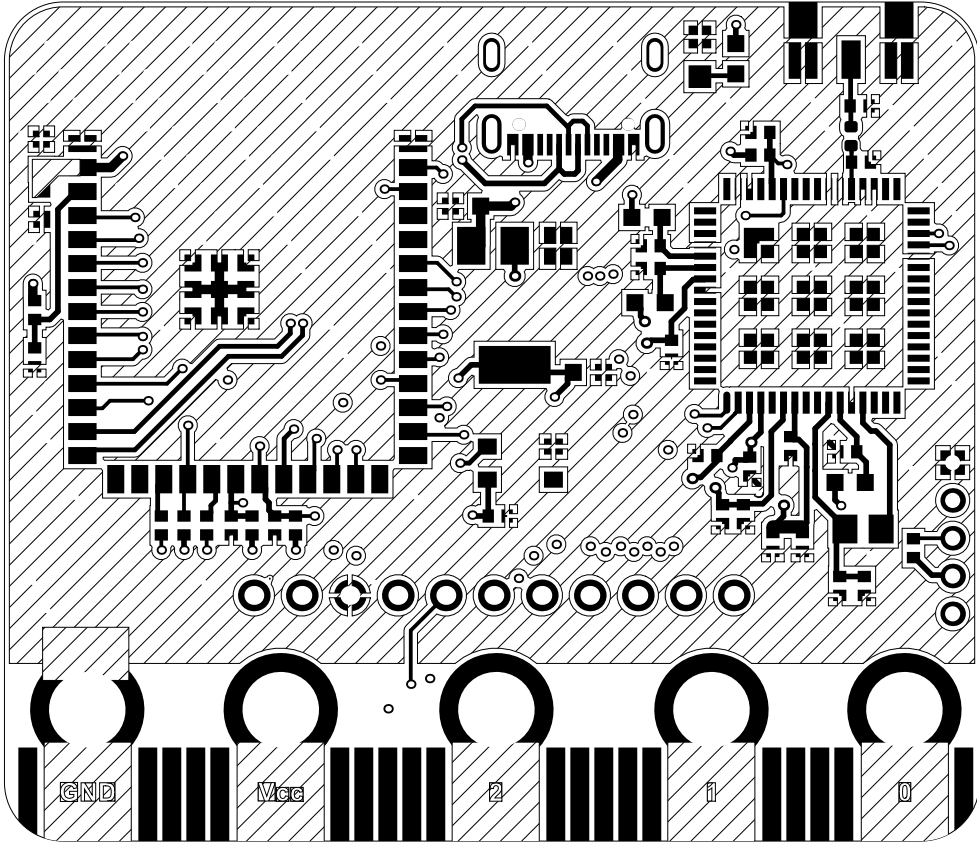


Bill Of Materials

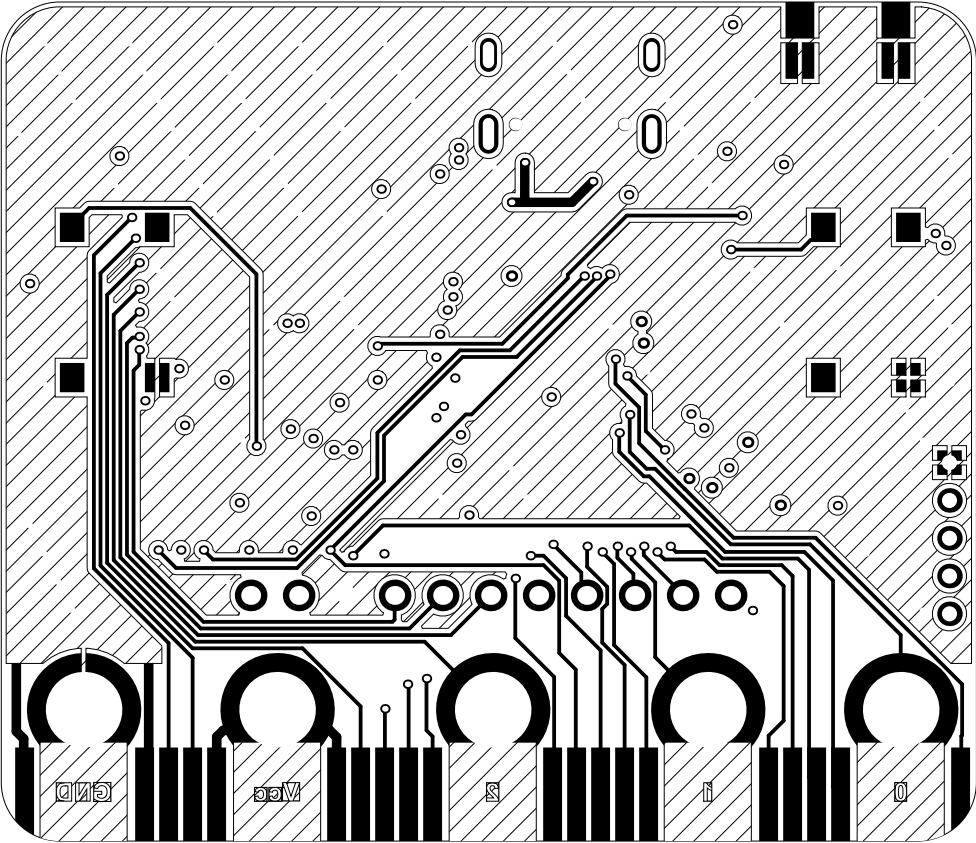
Designator	Quantity	Part Number
C1	1	CL10A106KP8NNN C
C2	1	CC0603KRX7R9BB 104
C3, C4, C7, C8, C10, C14, C16, C18, C19, C21, C22	11	C0402C104K8
C5, C6	2	CL10A105KO8NNN C
C9, C13, C15, C23, C24	5	CL05A105KA5NQN C
C17	1	CL05A475MQ5NRN C
C20	1	GRM155R61H474K E11D
JX1	1	SMA-J-P-H-ST-EM1
L1	1	LQW15AN8N7G00 D
L2, L4, L5	3	YI160808U121-2R5 T
L3	1	MLZ2012M150WTD 25
LCD1	1	
LED1	1	AP2012EC
LED2	1	SK6812MINI
R1	1	RC0603FR-07470R L
R2, R5, R6, R7, R8, R9	6	RC0402FR-0710KL
R3, R4	2	PA0402-R-070RL
S1, S2	2	DTSM-6
U1	1	ESP32-S3- WROOM-1-N16R2
U2	1	TLV1117LV33DCY R
U3	1	RAK3172-SIP-9- SM-NI
USB1	1	TYPEC-304-ACP16


DATA		Time Energy		
DRAWN	19/04/2024	TITLE		
		Neras X - Apolo		
		SIZE	DWG. NO.	
			0.2	
SCALE: 1:1				SHEET 1 OF 3

Top Layer (Scale 5:2)

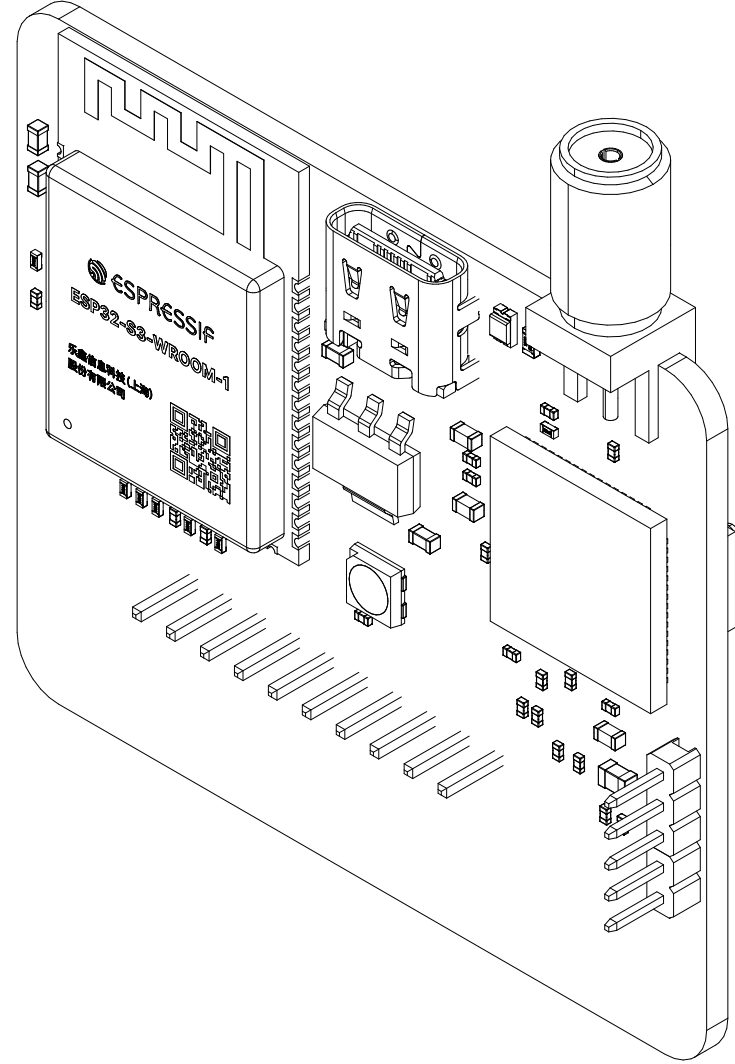


Bottom Layer (Scale 5:2)

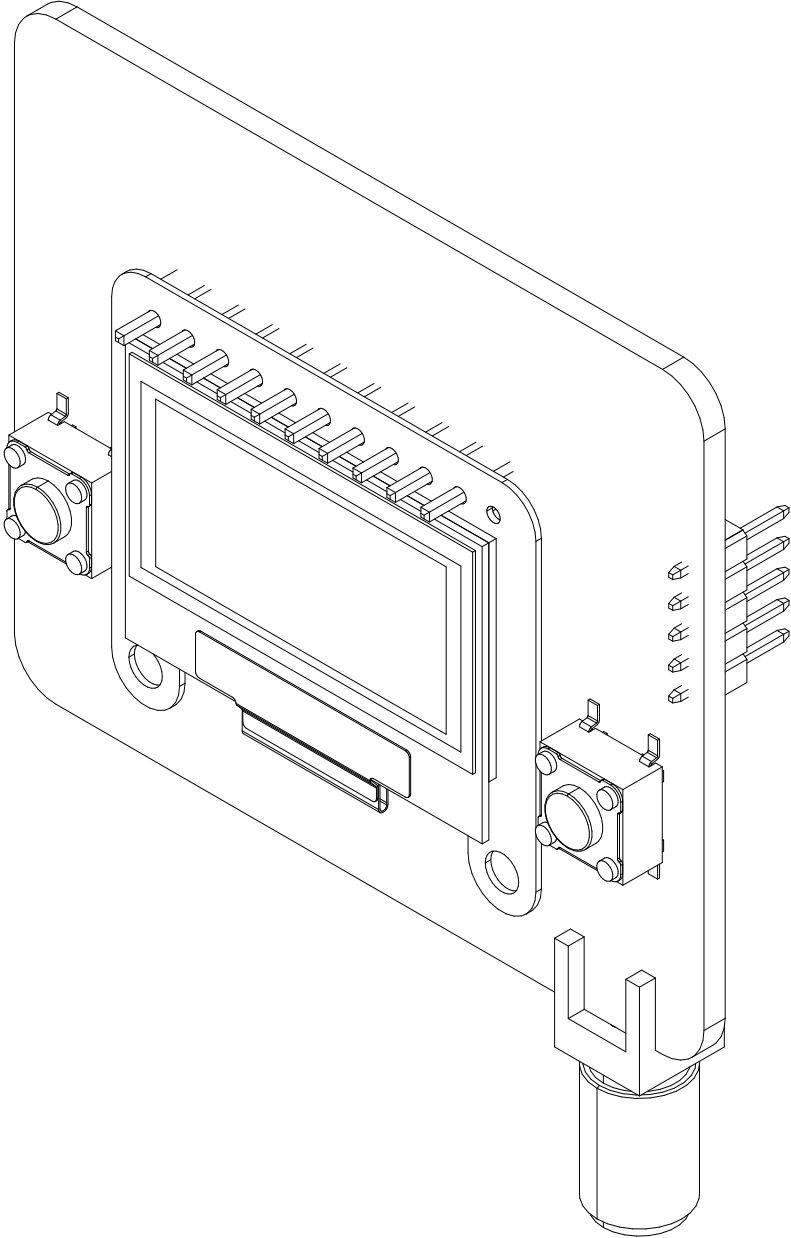



DATA		Time Energy		
DRAWN	19/04/2024	TITLE		
		Neras X - Apolo		
		SIZE	DWG. NO.	
			0.2	
SCALE:		1:1		SHEET 2 OF 3

View from Top side (Scale 5:2)



View from Bottom side (Scale 5:2)



DATA		Time Energy		
DRAWN	19/04/2024	TITLE		
		Neras X - Apolo		
		SIZE	DWG. NO.	
			0.2	
SCALE: 1:1			SHEET 3 OF 3	