



## DESCRIPTION

This hardware is a modularized development board focused on monitoring environmental variables and sound recording. Its modular design allows for custom assembly of components based on the specific requirements of your application. The device is designed to streamline the non-industrialized production process through the soldering of prefabricated components.

## FEATURES

- ESP32 WROOM (BLE v4.0 & Wifi 802.11 b/g)
- Embedded RTC
- Micro SD Card Slot
- I2C and I2S pads sensors
- LDR 5mm (ADC)
- RGB Led
- Power Regulator: 6.5V to 3.3V
- Exposed UART Serial Pins
- Switch On/Off
- Reset Button
- Firmware Burn Button (or as regular button)
- 5mm holes for board support.
- Sensors isolated on the bottom surface for safe exposure for data collection.
- USB-C Connector

## APPLICATIONS

- Monitoring remote areas with data storage on a memory card.
- Monitoring structured environments with real-time data transmission via WiFi.
- Propagation of data via Bluetooth Low Energy for proximity-based applications.

## POWER COMSUMPTION

Power Supply:

- APK2112: 2.8V ~ 6.5V @ 800A - 3.3V @ 600mA

Operation mode:

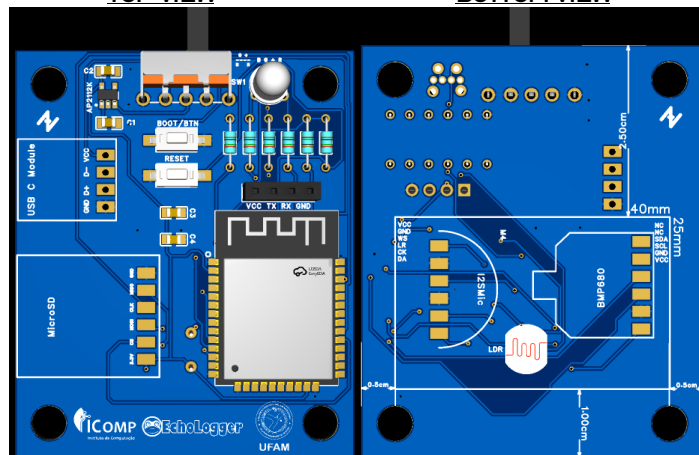
- Reading Sensors: 50mA
- SD Writing: 70mA
- Deepsleep: 15mA
- Waking up: 100mA
- BLE: 170mA (RX) ~ 200mA (TX)
- WIFI: 170mA (RX) ~ 260mA (TX)

Consumption Estimation (\*for the following setup):

- Routine: 1 min recording, 5 min sleeping.
- Cycle: Sleep (5min), Wakeup (2s), Record (1min), Writing (2s)
- Repeat the cycle for 1 hour (~ 10 cycles / hour)
- Estimation: 30mAh (3.3V - 0.15 Wh)

## BOARD LAYOUT

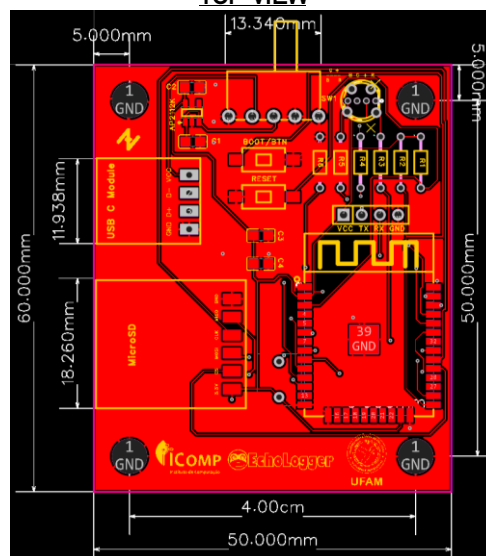
TOP VIEW



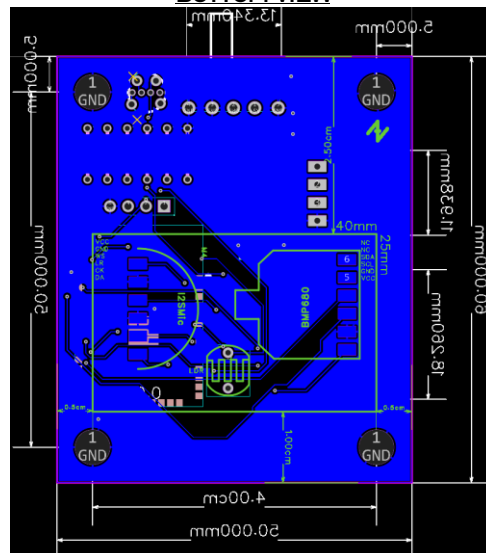
BOTTOM VIEW

## BOARD DIMENSIONS

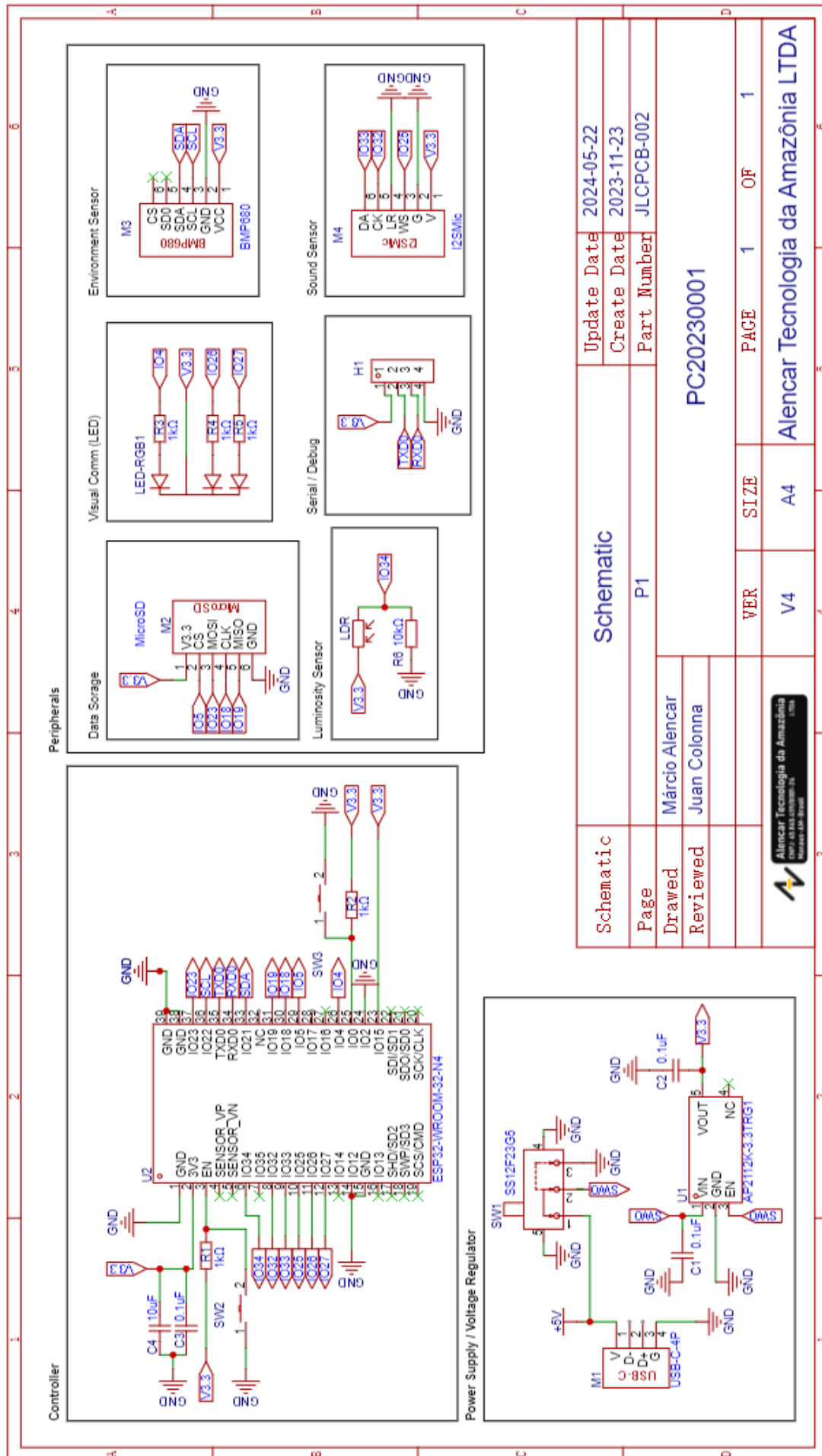
TOP VIEW













BOTTOM VIEW



## APPENDIX I – SCHEMATIC



## APPENDIX II – TABLE OF COMPONENTS

#	SCHEMATIC DESIGNATOR	ITEM DESCRIPTION	ALIEXPRESS	REFERENCE IMAGE
1	SW1	SS-12F23-G5	<a href="#">Link</a>	
2	M1	USB-C Module	<a href="#">Link</a>	
3	U1	AP2112K-3.3TRG1	<a href="#">Link</a>	
4	SW2, SW3	TS-1101-C-W	<a href="#">Link</a>	
5	U2	ESP32-WROOM-32	<a href="#">Link</a>	
6	M2	MicroSD Card Module	<a href="#">Link</a>	
7	RGB LED	5mm Common Anode RGB Led	<a href="#">Link</a>	
8	M3	BME680	<a href="#">Link</a>	
9	M4	I2S Microphone	<a href="#">Link</a>	
10	LDR	5mm LDR	<a href="#">Link</a>	
11	R1,R2,R3,R4,R5	Resistor 1K THP		
12	R6	Resistor 10K THP		
13	C1,C2,C3	Ceramic Capacitor 0.1uF SMD 0805		
14	C4	Ceramic Capacitor 10uF SMD 0805		

## APPENDIX III – DATA SAMPLING - BLE

