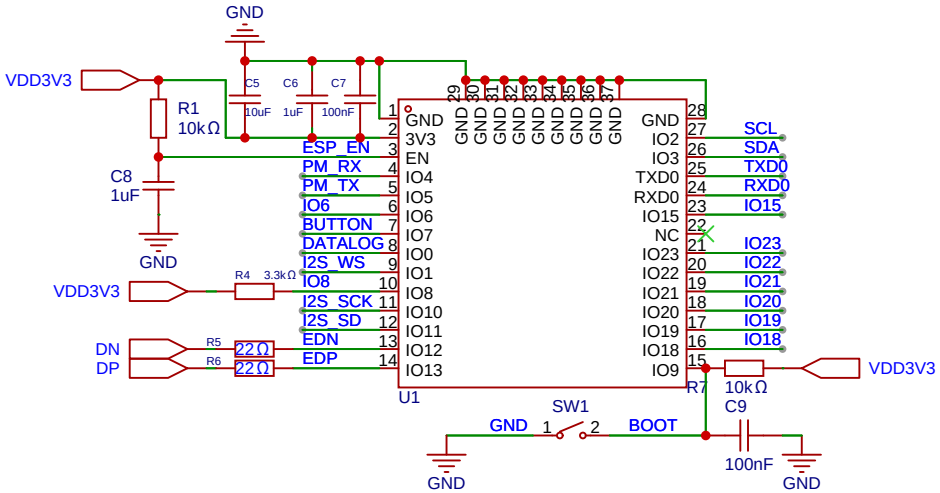
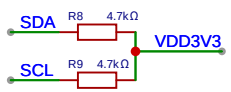
ESP32-C6-WROOM-1-N8



I2C Pull-up resistors



GPIO Map

GPIO	I2C	UART	I2S	Indication	USB
IO3	SDA				
IO2	SCL				
IO5		PM_TX			
IO4		PM_RX			
IO7				Button	
IO0				DATALOG	
IO1			WS(LRCL)		
IO10			SCK(BCKL)		
IO11			SD(DOUT)		
IO12					DN
IO13					DP

Brief description
The ESP32-C6-WROOM-1-N8 is a ready-to-use serial RF module from Espressif, providing wireless communication in the 2.4 GHz band (Wi-Fi 6/IEEE 802.11ax) and Bluetooth Low Energy/802.15.4 (Thread/Zigbee). The module features an integrated printed circuit board (PCB) antenna, a built-in clock resonator (40 MHz), external SPI flash (up to 8 MB in the N8 variant), and all the necessary passive components for proper radio operation. The receiving module is a complete RF node with passed RF testing and registration (including an FCC RF ID report).

Key Points / Technical Data (for certification form)
Module Name: ESP32-C6-WROOM-1-N8.
Manufacturer: Espressif Systems.

Supported Radio Standards: 2.4 GHz Wi-Fi 6 (IEEE 802.11ax), Bluetooth Low Energy (Bluetooth 5.x), IEEE 802.15.4 (Thread/Zigbee).

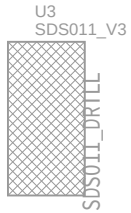
Antenna: Integrated printed circuit board (PCB) antenna (WROOM-1 variant). (The WROOM-1U variant also has a connector for an external antenna.)

Clock Source: Onboard 40 MHz crystal resonator/oscillator.

Memory/Flash: External SPI flash; 8 MB Quad SPI on the N8 variant.

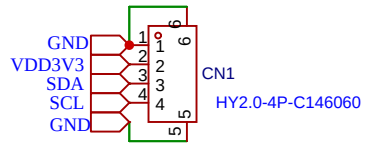
Hardware platform: ESP32-C6 SoC — 32-bit RISC-V, up to 160 MHz, integrated peripherals (SPI, UART, I2C, I2S, ADC, etc.).

RF Certifications/Reports: FCC RF test report/FCC ID (FCC ID 2AC7Z-ESPC6WROOM1) and corresponding RF certifications are available. The module also has CE-RED/SRRC certifications in the documentation/specifications.

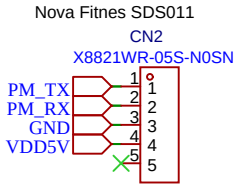


Schematic	Schematic Altruis Urban	Update Date	2025-11-24
		Create Date	2025-11-21
Page	Main MCU	Part Number	ES-ALTRUIST-URB-1
Drawn	Valerii Filimonov		
Reviewed	Pavel Sheremetev		
		VER	SIZE
ROBONOMICS		V1.0	A4
		PAGE 1 OF 3	
		Hardware for Cyberpunks	

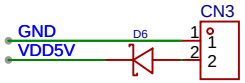
Temperature & Humidity Sensor
I2C bus for SHT30, BME280



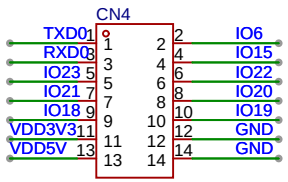
PM Sensor connections



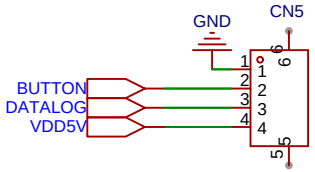
Power connections



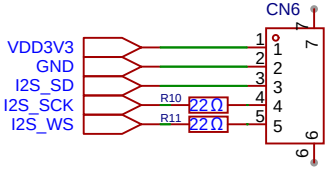
GPIOs



LED, Button connector



ICS43434 Noize



Device Connector Description

The device's printed circuit board (PCB) features six connectors for connecting external sensors, displaying information, and expanding functionality. Each connector has a fixed purpose and corresponds to a specific interface on the ESP32-C6 microcontroller.

CN1 — HY-4P connector
Used to connect a separate board with a BME280 sensor (temperature, humidity, and pressure).
This connector provides the power lines and I2C interface required for sensor operation.

CN2 — XH-5P connector
Designed for connecting the SDS011 laser dust sensor.
This connector supplies 5 V power, a UART bus for digital communication, and a common ground.

CN3 — PH-2P connector
The connector serves as an alternative power input for the device, bypassing USB-C.
It is designed to connect an external autonomous power supply module, such as a battery-powered unit with a solar panel, providing a stabilized 5 V voltage.

CN4 — Service Expansion Connector
This connector represents a set of available GPIO ports on the ESP32-C6 microcontroller.
It is used to connect additional modules and sensors, expand the device's functionality, or integrate it into custom systems.

CN5 — ZX-SH1.0-4P Connector
This connector is used to connect a sub-board with indicators (LED status indication) and a functional button for resetting the device to factory settings.

CN6 — HX ZH1.5-5PWT Connector
This connector is used to connect a separate board with the ICS43434 microphone, a digital MEMS microphone used as a noise level sensor.

The ICS43434 uses the I2S interface, so the connector provides the corresponding signal lines.

Schematic	Schematic Altruis Urban	Update Date	2025-11-25
		Create Date	2025-11-21
Page	Connectors	Part Number	ES-ALTRUIST-URB-1
Drawn	Valerii Filimonov		
Reviewed	Pavel Sheremetev		
		VER	SIZE
		V1	A4
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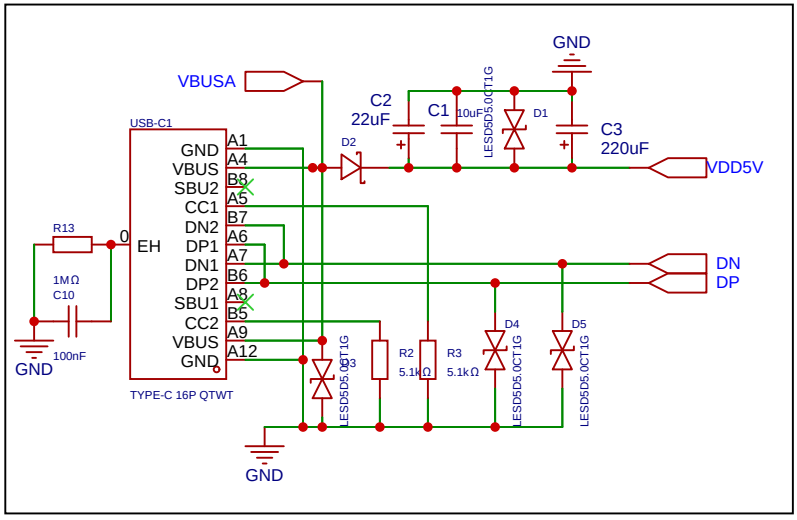
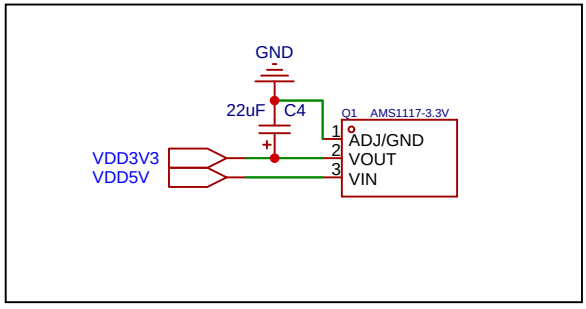
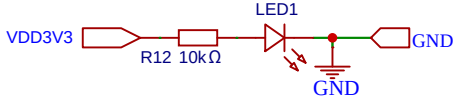
USB-C Connector



Power LDO



Power LED indication



Schematic	Schematic Altruis Urban	Update Date	2025-11-21
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Page	USB-C & POWER	Part Number	ES-ALTRUIST-URB-1
Drawn	Valerii Filimonov		
Reviewed	Sergei Lonshakov		

VER	SIZE	PAGE 3 OF 3
V1	A4	Hardware for Cyberpunks