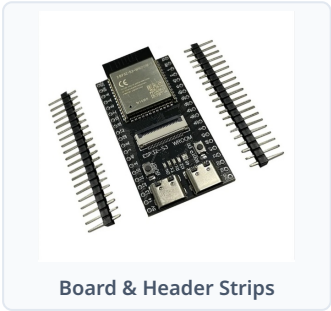


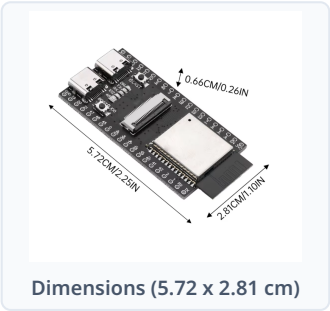
Product Description

The **ESP32-S3-CAM** is a compact, high-performance Wi-Fi + Bluetooth® LE MCU development board featuring the **ESP32-S3-WROOM-1 (N16R8)** module. Equipped with **16MB Flash** and **8MB PSRAM**, it is tailored for edge AI, video streaming, and face recognition applications.

It integrates an FPC camera connector (OV2640/OV5640), an on-board MicroSD slot, dual **USB Type-C** connectors (USB OTG & CP2102 UART), an addressable WS2812 RGB LED, and 45 broken-out GPIO pins.



Board & Header Strips



Dimensions (5.72 x 2.81 cm)

Technical Specifications

Parameter	Specification Details
Core Microcontroller	Xtensa® 32-bit LX7 dual-core CPU, running at clock frequencies up to 240 MHz
Memory Setup	16 MByte (128 Mbit) Flash 8 MByte (64 Mbit) Octal PSRAM
Wireless Connectivity	Wi-Fi 802.11 b/g/n (2.4 GHz) + Bluetooth® 5.0 (LE) & Bluetooth Mesh
Camera Interface	On-board FPC connector for camera modules (e.g. OV2640 2MP / OV5640 5MP)
USB Interface	Dual USB Type-C ports (1x Native USB OTG 1.1 + 1x CP2102 USB-to-UART Bridge)
Peripherals & Indicators	MicroSD Card Slot, WS2812 RGB LED (GPIO48), Power LED, Reset & Boot Buttons
Operating Voltage	Supply: 5V via USB Type-C Operating Circuit: 3.0V to 3.6V (LDO)
Physical Dimensions	5.72 cm x 2.81 cm x 0.66 cm (2.25" x 1.10" x 0.26")

Key Peripherals & Features

Communication & Storage

- Hardware Interfaces: **I2C** , **I2S** , **SPI** , **UART**
- Full-Speed **USB 1.1 OTG** interface
- MicroSD/TF Card slot for local media storage
- Includes 2x 22-pin male header strips (2.54mm pitch)

AI Acceleration & Security

- Vector instructions for Neural Network & Machine Learning acceleration
- Hardware Crypto Engine: AES, SHA, RSA, ECC, RNG
- Secure Boot & Flash Encryption enabled
- OTP Memory & Digital Signature module

Pinout & Functional Interface Diagram

