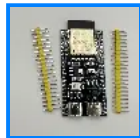
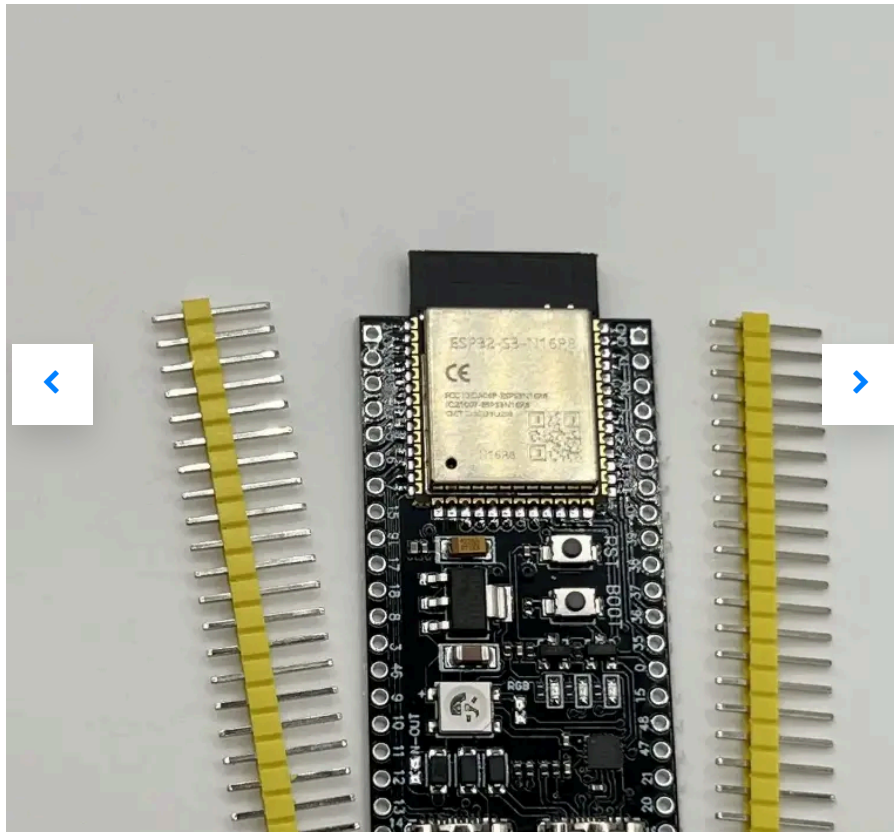


ESP32 S3 Development Board (N16R8)

Description

The ESP32-S3 Development Board (N16R8) is a high-performance, low-power IoT board built around the Espressif ESP32-S3 SoC. Equipped with 16 MB Flash and 8 MB PSRAM, it is designed for demanding AIoT and multimedia applications such as speech recognition, image processing, and real-time wireless connectivity. Featuring dual-core



Xtensa® LX7 processors, Wi-Fi (2.4 GHz), and Bluetooth® 5.0 LE, this board combines speed, efficiency, and flexibility for next-generation IoT solutions.

Key Features

- **Powerful Processing:** Dual-core Xtensa® LX7 CPU, up to 240 MHz.
- **Large Memory:** 16 MB Flash + 8 MB PSRAM for complex applications.
- **Wireless Connectivity:**
 - Wi-Fi 802.11 b/g/n (2.4 GHz, up to 150 Mbps)
 - Bluetooth 5.0 LE with Mesh support
- **Peripheral Rich:**
 - Up to 45 GPIOs
 - LCD & Camera interface
 - USB OTG + USB Serial/JTAG
 - 2× I²C, 2× I²S, 3× UART, multiple SPI modes
- **Security:** AES, RSA, SHA, HMAC, Digital Signature, Secure Boot, Flash Encryption.
- **AI & Multimedia Ready:** Optimized for voice, image recognition, and streaming applications.
- **Low Power:** Supports Active, Modem-sleep, Light-sleep, and Deep-sleep (<7 µA).

Specification

Chipset: Espressif ESP32-S3 SoC

CPU: Dual-core Xtensa® LX7 (240 MHz max)

Memory:

- Flash: 16 MB
- PSRAM: 8 MB
- SRAM: 512 KB
- ROM: 384 KB
- RTC SRAM: 16 KB

Wireless: Wi-Fi 2.4 GHz (802.11 b/g/n), Bluetooth 5.0
LE + Mesh

Interfaces:

- 3× UART, 2× I²C, 2× I²S
- SPI (Standard, Dual, Quad, Octal)
- LCD (RGB/8080/6800), DVP Camera interface
- SD/MMC, CAN (TWAI®)
- USB 2.0 OTG + JTAG/Serial

Analog: 2× 12-bit ADCs (20 channels), temperature
sensor, 14 touch inputs

Timers: 4× 54-bit general-purpose timers, 3
watchdog timers

Power Consumption: Deep-sleep < 7 µA

GPIOs: Up to 45 configurable

Security: AES-128/256, SHA, RSA, RNG, Secure Boot,
Flash Encryption

Application

- AIoT solutions (voice and image recognition)
- Smart home devices (automation, appliances, sensors)
- Smart agriculture (wireless sensors, controllers)
- Industrial automation & robotics
- Healthcare monitoring devices
- Consumer electronics & POS systems
- Wireless cameras and audio devices
- Low-power IoT hubs & data loggers
- USB-enabled AIoT products