

Product Description – NodeMCU ESP32-C2 Development Board (ESPC2-12 Module)

The **NodeMCU ESP32-C2 Development Board**, powered by the advanced **ESPC2-12 module**, is a compact, reliable, and highly efficient microcontroller platform designed for modern IoT applications. Built around the **ESP32-C2 RISC-V processor clocked at 120 MHz**, this development board provides exceptional performance for wireless networking, sensor integration, automation projects, and embedded development. Whether you're a hobbyist, student, or professional engineer, the ESP32-C2 board offers the perfect balance of processing power, connectivity, and ease of use.

High-Performance RISC-V Architecture

At the heart of the board lies the **ESP32-C2 microcontroller**, featuring a 120 MHz RISC-V core that delivers excellent computational efficiency. This modern architecture ensures low latency, fast execution times, and exceptional power optimization—key factors for battery-powered or always-on IoT devices. The processor supports a wide variety of applications ranging from home automation and wireless sensors to consumer electronics and smart appliances.

Reliable Wi-Fi 4 Connectivity

The ESP32-C2 comes with built-in **Wi-Fi 4 (802.11 b/g/n)** networking, enabling seamless connection to wireless networks with stable performance and energy efficiency. Its high-quality **PCB onboard antenna** ensures a strong and reliable wireless signal, making it ideal for cloud-connected devices, remote monitoring systems, and real-time data streaming. Developers building connected IoT solutions will appreciate the board's ability to handle smooth wireless communication with low power consumption.

Optimized Memory Architecture

With **272 KB of SRAM** and **4 MB of onboard Flash**, this development board provides ample storage for firmware, libraries, and program data. The memory configuration supports a wide range of applications, from simple automation scripts to larger embedded programs using popular frameworks like the **ESP-IDF** and **Arduino IDE**. This makes the board both beginner-friendly and suitable for advanced users.

Versatile GPIO and ADC Functionality

Equipped with **14 multifunctional GPIO pins**, the NodeMCU ESP32-C2 Development Board allows you to interface with sensors, motors, actuators, displays, and other external hardware. The board also features **four 12-bit ADC channels**, offering precise analog input readings within a 0–3.3V range. Whether you're building a temperature sensor, light meter, RF controller, or full automation system, this board provides the flexibility you need.

Easy Connectivity with USB-UART Interface

For effortless programming and debugging, the board includes a **CH343P USB-to-UART interface** accessible via a standard Micro-USB port. This enables plug-and-play connectivity with Windows, macOS, and Linux without needing additional adapters. Beginners will find it incredibly easy to upload sketches and test prototypes, while experienced developers can take advantage of advanced debugging tools.

Efficient Power Management

Operating at **3.3V**, the ESP32-C2 Development Board supports **5V input via Micro-USB**, simplifying power supply options. Its low power consumption makes it ideal for battery-powered or energy-constrained IoT deployments. The onboard voltage regulator ensures stable operation even when handling multiple peripherals simultaneously.

Compact and Lightweight Design

With compact dimensions of approximately **26mm x 48mm**, this development board fits perfectly into space-limited projects. Whether you're embedding it into a wearable device, smart controller, or compact IoT sensor node, its small footprint and lightweight design make it extremely versatile. The onboard PCB antenna further eliminates the need for external modules, simplifying design and reducing cost.

Ideal for IoT, Smart Home, and Automation Projects

The NodeMCU ESP32-C2 Development Board is perfectly suited for:

- Smart home automation (lights, switches, sensors)
- Wireless monitoring systems
- Environmental sensors (temperature, humidity, air quality)
- Robotics and DIY hobby projects
- Cloud-connected gadgets and appliances
- Educational learning and prototyping
- Low-cost commercial IoT products

Why Choose the ESP32-C2 Development Board?

- Powerful 120 MHz RISC-V processor
- Reliable Wi-Fi 4 wireless connectivity

- Ample memory for complex applications
- Easy programming with Micro-USB
- Compact, durable, and beginner-friendly
- Excellent value for IoT and embedded system development