

ESP 8266 ESP-12F Wifi Module



The Latest ESP-12F ESP8266 Wifi Module AP & Station Remote Serial Wireless IoT Board is an integrated chip designed for the needs of a new connected world. It can handle all the necessary overhead for communicating with your network, such as TCP/IP stack and communicating with your 802.11 networks.

It is completely addressable over SPI and UART protocols allowing you to connect your sensors or project directly to it through its GPIO's. ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and MCU (Micro Controller Unit) capability.

ESP8266 Serial Wifi Wireless Transceiver Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. ESP8266 Serial Wifi Wireless Transceiver Module is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost-effective board with a huge, and ever-growing, community.

ESP8266 Serial Wifi Wireless Transceiver Module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application-specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports

APSD for VoIP applications and Bluetooth co-existence interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions and requires no external RF parts.

FEATURES:

- Compatible with ESP-12 (ESP-202)
- WIFI @ 2.4 GHz, support for WPA / WPA2 security mode
- It is very easy to develop projects with AT commands
- Surface Mount Package with 2mm Pitch Pads
- Multiple GPIO's for all your sensor needs
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLL, regulators, DCXO and power management units
- +19.5dBm output power
- Power down leakage current of <10uA
- Integrated low power 32-bit CPU could be used as an application processor
- SDIO 1.1/2.0, SPI, UART
- STBC, 1×1 MIMO, 2×1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4ms guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)
- Both SMD and Inline package are available, and the pin pitch is 2.0mm.

SPECIFICATIONS:

- Compatibility: ESP-12
- Communication interface voltage(V): 3.3
- Working current(mA): 240
- Serial port baud rate: 115200(can be modified)

- Serial communication format: 8N1
- Antenna Type: Built-in PCB antenna
- Wireless Network Mode: station / softAP / SoftAP + station
- Wireless criteria: 802.11 b / g / n
- Length (mm): 16
- Width (mm): 24
- Height (mm): 4
- Weight (gm): 2

FUNCTIONAL DESCRIPTION:

MCU:

ESP8266EX is embedded with Tensilica L106 32-bit micro controller (MCU), which features extra low power consumption and 16-bit RSIC. The CPU clock speed is 80MHz. It can also reach a maximum value of 160MHz. ESP8266EX is often integrated with external sensors and other specific devices through its GPIOs; codes for such applications are provided in examples in the SDK.

Memory Organization:

Internal SRAM and ROM: ESP8266EX WiFi SoC is embedded with memory controller, including SRAM and ROM. MCU can visit the memory units through iBus, dBus, and AHB interfaces. All memory units can be visited upon request, while a memory arbiter will decide the running sequence according to the time when these requests are received by the processor. According to our current version of SDK provided, SRAM space that is available to users is assigned as below:▪RAM size < 36kB, that is to say, when ESP8266EX is working under the station mode and is connected to the router, programmable space accessible to user in heap and data section is around 36kB.)▪ There is no programmable ROM in the SoC, therefore, user program must be stored in an external SPI flash.

External SPI Flash:

This module is mounted with an 4 MB external SPI flash to store user programs. If larger definable storage space is required, a SPI flash with larger memory size is preferred.

Theoretically speaking, up to 16 MB memory capacity can be supported

Crystal: Currently, the frequency of crystal oscillators supported include 40MHz, 26MHz and 24MHz. The accuracy of crystal oscillators applied should be $\pm 10\text{PPM}$, and the operating temperature range should be between -20°C and 85°C . When using the downloading tools, please remember to select the right crystal oscillator type. In circuit design, capacitors C1 and C2, which are connected to the earth, are added to the input and output terminals of the crystal oscillator respectively. The values of the two capacitors can be flexible, ranging from 6pF to 22pF, however, the specific capacitive values of C1 and C2 depend on further testing and adjustment on the overall performance of the whole circuit. Normally, the capacitive values of C1 and C2 are within 10pF if the crystal oscillator frequency is 26MHz, while the values of C1 and C2 are $10\text{pF} < \text{C1}, \text{C2} < 22\text{pF}$ if the crystal oscillator frequency is 40MHz.

PIN FUNCTION:

Pin No	Pin Name	Function
1	RST	Reset the module
2	ADC	A/D Conversion result. Input voltage range 0-1v, scope: 0-1024
3	EN	Chip enable pin. Active high
4	IO16	GPIO16; can be used to wake up the chipset from deep sleep mode
5	IO14	GPIO14; HSPI_CLK
6	IO12	GPIO12; HSPI_MISO
7	IO13	GPIO13; HSPI_MOSI; UART0_CTS
8	VCC	3.3V power supply (VDD)
9	CS0	Chip selection

10	MISO	Salve output Main input
11	IO9	GPIO9
12	IO10	GBIO10
13	MOSI	Main output slave input
14	SCLK	Clock
15	GND	GND
16	IO15	GPIO15; MTDO; HSPICS; UART0_RTS
17	IO2	GPIO2; UART1_TXD
18	IO0	GPIO0
19	IO4	GPIO4
20	IO5	GPIO5
21	RXD	UART0_RXD; GPIO3
22	TXD	UART0_TXD; GPIO1

APPLICATIONS:

- Weather station
- IoT applications
- Home appliances
- Toys and Gaming applications
- Wireless control systems
- Home automation
- Security ID tags

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DIMENSION:

