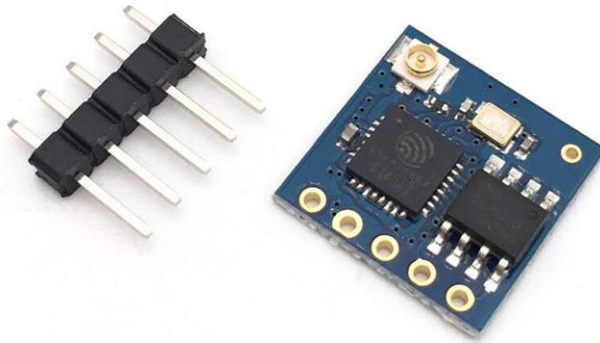




## **5Pin Serial WIFI Transceiver Wireless Module**

### **Model: ESP05-8266**



#### **Overview:**

ESP8266 is a highly integrated chip designed for the needs of a new connected world. It offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor.

ESP8266 has powerful on-board processing and storage capabilities that allow 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, and the entire solution, including front-end module, is designed to occupy minimal PCB area.

#### **Features:**

- SDIO 2.0, SPI, UART
- 32-pin QFN package
- Integrated RF switch, balun, 24dBm PA, DCXO, and PMU
- Integrated RISC processor, on-chip memory and external memory interfaces
- Integrated /baseband processors
- Quality of Service management
- I2S interface for high fidelity audio applications
- On-chip low-dropout linear regulators for all internal supplies
- Proprietary spurious-free clock generation architecture
- Integrated WEP, TKIP, AES, and WAPI engines

#### **Solutions:**

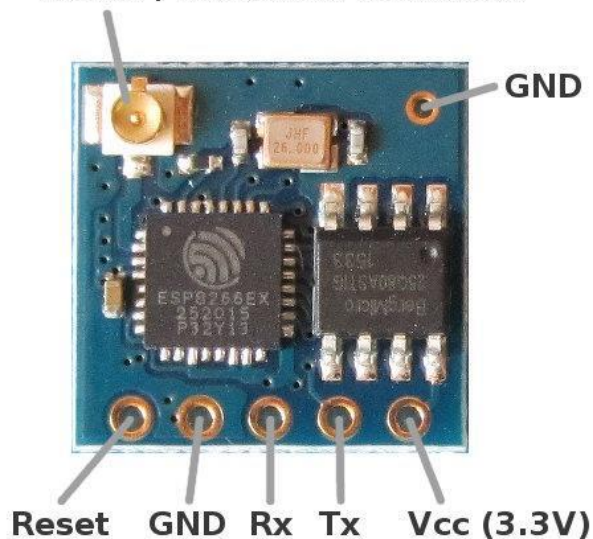
- Supports APSD for optimal VoIP applications
- Patented spurious noise cancellation algorithm for integration in SOC applications
- Supports Bluetooth co-existence interface
- Self-calibrated RF to ensure optimal performance under all operating conditions
- Zero factory tuning
- No external RF components

## Specifications:

- 802.11 b/g/n
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLLs, regulators, DCXO and power management units
- +19.5dBm output power in 802.11b mode
- Power down leakage current of <10uA
- Integrated low power 32-bit CPU could be used as application processor
- SDIO 1.1/2.0, SPI, UART
- STBC, 1x1 MIMO, 2x1 MIM
- A-MPDU & A-MSDU aggregation & 0.4ms guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

## Pinouts:

### **Aerial / antennae connector**



- **Reset** - active low reset (apply low voltage level to reset), EXT\_RSTB pin 32 on ESP8266 chip
- **GND** - GND or 0V of power supply
- **Rx** - UART receive pin (3.3V logic level)
- **Tx** - UART transmit pin (3.3V logic level)
- **Vcc** - 3.3V power supply Vcc connection

\*There is an aerial or antennae connector at the top left of the board for an external aerial / antennae.

\*\*An additional GND connection can be found at the top right of the board.

## More Product Details:

### **Operating Voltage**

The ESP8266 chip and ESP-05 module operate at a voltage of 3.3V (working range is 3.0V to 3.6V). I/O pins including the UART pins operate with 3.3V logic.

The chip and module I/O and UART pins are **NOT** 5V tolerant.

## Current Consumption

An operating current average value of 80mA is given for the ESP8266 chip in the datasheet.

The ESP8266 SDK getting started guide gives the following note for their evaluation board modules:

*The ESP8266 Wi-Fi module needs 3.3V power supply and may draw current in the order of 500mA.*

Note that this current value is for the Espressif modules and not the ESP-05, but it does give some idea of the current that some modules can draw. The following current consumption values are for the ESP8266 chip when transmitting and receiving. These are the highest typical values from the datasheet.

## Transmit Current

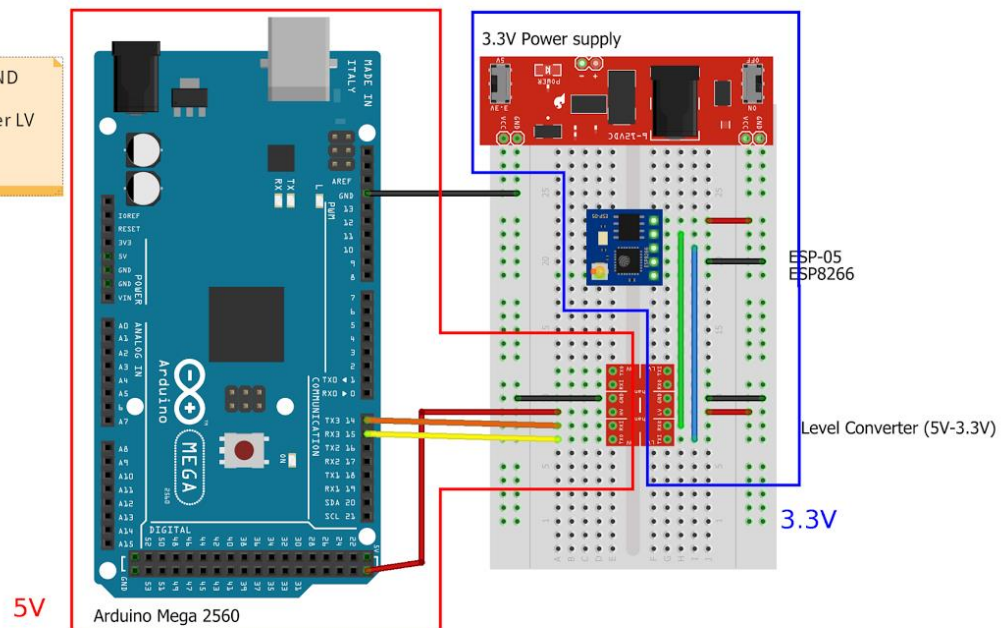
The datasheet for the ESP8266 shows a highest typical current consumption of **170mA** under the following conditions: Tx802.11b, CCK 11Mbps, P OUT=+17dBm.

## Receive Current

The datasheet for the the ESP8266 shows a highest typical current consumption of **56mA** under the following conditions: Rx 802.11g, 1024 bytes packet length, -70dBm.

## Wiring Diagram:

Mega GND - Level Converter GND - ESP-05 GND  
Mega 5V - Level Converter HV  
3.3V supply to ESP-05 VCC and Level Converter LV  
Mega TX - Level Converter - ESP-05 RX  
Mega RX - Level Converter - ESP-05 TX



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