



# **Nodemcu-32s Datasheet**

**Version V1**

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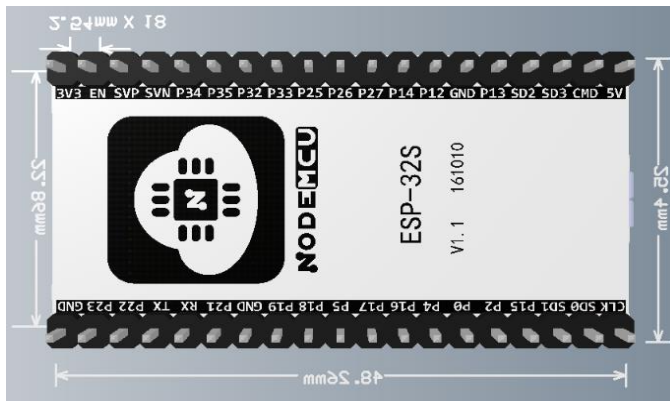
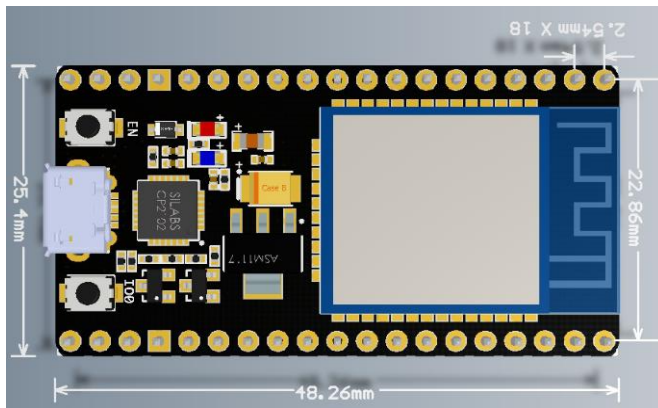
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## 1. Product overview

The core of this module is the ESP32 chip, which is scalable and adaptive. Two CPU cores can be individually controlled. The clock frequency is adjustable from 80 MHz to 240 MHz and supports RTOS. It is a general-purpose Wi-Fi+BT+BLE MCU module.ESP-WROOM-32s

The module integrates traditional Bluetooth, Bluetooth low energy and Wi-Fi. Wide range of uses: Wi-Fi supports a wide range of communication connections, as well as direct connection to the Internet via a router; Bluetooth allows users to connect to a mobile phone or broadcast a BLE Beacon for signal detection. The module supports data rates up to 150 Mbps and antenna output power of 20 dBm for maximum wireless communication. As a result, this module has industry-leading specifications and performs well in terms of high integration, wireless transmission distance, power consumption, and network connectivity.

## Appearance size



## Features

- 802.11b/g/n (802.11n, speed up to 150Mbps)
- WIFI Frequency Range 2.4GHz ~ 2.5GHz
- Clock frequency adjustment range from 80 MHz to 240 MHz, support for RTOS
- Built-in 2-channel 12-bit high-precision ADC with up to 18 channels
- Support UART/GPIO/ADC/DAC/SDIO/SD card/PWM/I2C/I2S interface
- Support multiple sleep modes, ESP32 chip sleep current is less than 5  $\mu$ A

- Embedded Lwip protocol stack
- Supports STA/AP/STA + AP operation mode
- Supports remote firmware upgrade (FOTA)
- General AT commands can be used quickly
- Support secondary development, integrated Windows, Linux development environment

## Product Specification

**Table 1 Description of main parameters**

Module model	ESP-WROOM-32s
Size	25.4*48.26*3mm(±0.2mm)
Certification	FCC/CE-RED/IC/TELEC/KCC/SRRC/NCC/ BQB/ RoHS/REACH
SPI Flash	32Mbit(default)
Support interface	UART/GPIO/ADC/DAC/SDIO/SD card /PWM/I2C/I2S
Integrated crystal oscillator	40MHz Crystal oscillator
IO Port	38
Antenna	Onboard antenna
Power Supply	Voltage 3.0V ~ 3.6V, Typical 3.3V, Current >500mA
Operating Temperature	-40 °C ~ 85 °C
Storage Environment	-40 °C ~ 120 °C

## 2. Pin Definition

The ESP-WROOM-32s module has a total of 38 interfaces, as shown in Figure 1, and Table 2 is the interface definition.

Figure 1 ESP-WROOM-32s pin diagram

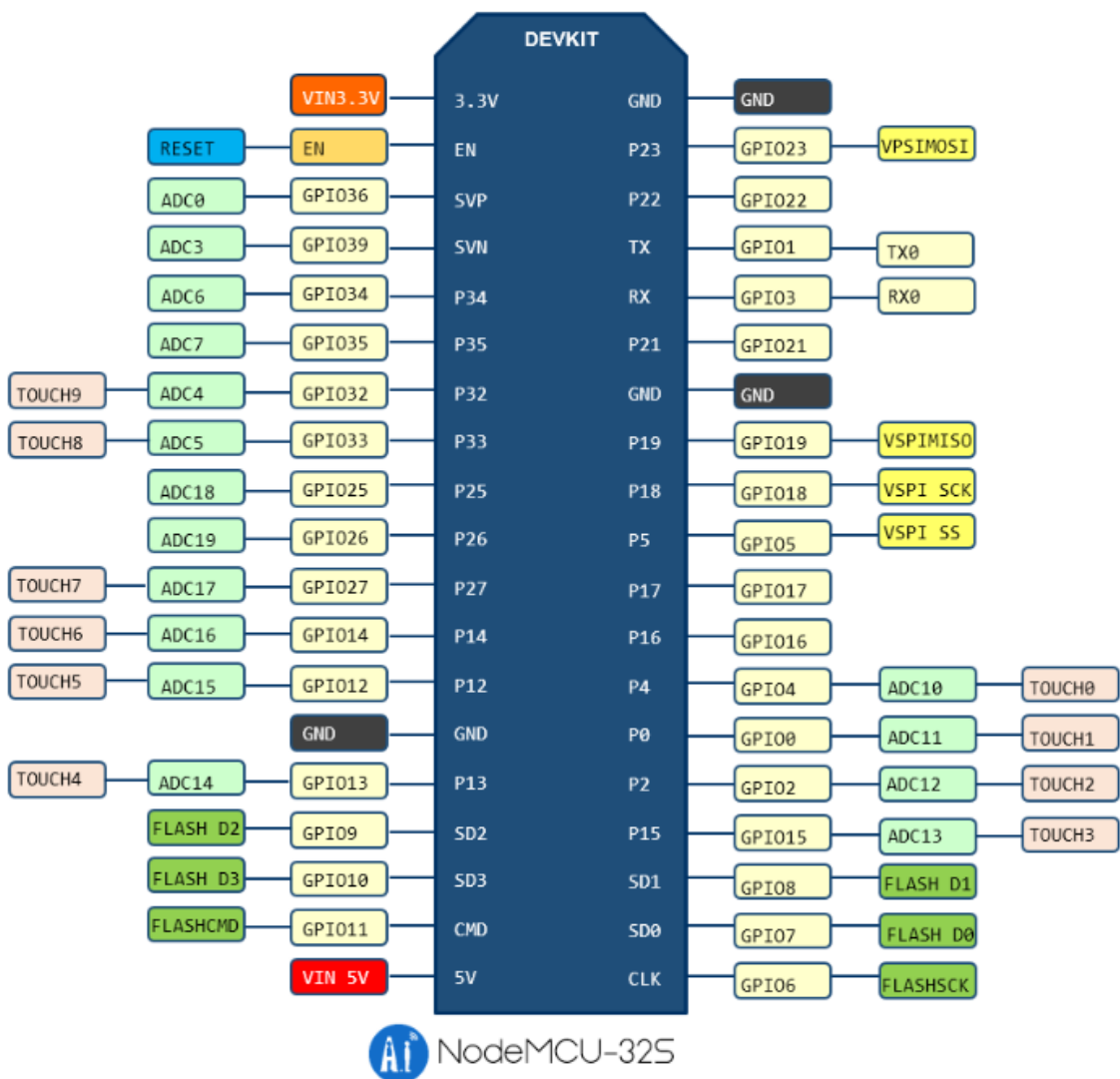


Table 2 pin function definition

No.	Pin Name	Functional Description
1	3.3V	Module power supply pin
2	EN	Chip Enabled Pin, Active High
3	SVP	GPIO36, ADC1_CH0, RTC_GPIO0
4	SVN	GPIO39, ADC1_CH3, RTC_GPIO3
5	P34	GPIO34, ADC1_CH6, RTC_GPIO4
6	P35	GPIO35, ADC1_CH7, RTC_GPIO5
7	P32	GPIO32, XTAL_32K_P (32.768kHz Crystal input), ADC1_CH4, TOUCH9, RTC_GPIO9
8	P33	GPIO33, XTAL_32K_N (32.768kHz Crystal output), ADC1_CH5, TOUCH8, RTC_GPIO8
9	P25	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RXD0
10	P26	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RX_DV
11	P27	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC_RX_DV
12	P14	GPIO14, ADC2_CH6, TOUCH6, RTC_GPIO16, MTMS,

		HSPICLK, HS2_CLK,SD_CLK, EMAC_TXD2
13	P12	GPIO12, ADC2_CH5, TOUCH5, RTC_GPIO15, MTDI, HSPIQ, HS2_DATA2,SD_DATA2, EMAC_TXD3
14	GND	GND
15	P13	GPIO13, ADC2_CH4, TOUCH4, RTC_GPIO14, MTCK, HSPID, HS2_DATA3,SD_DATA3, EMAC_RX_ER
16	SD2	GPIO9, SD_DATA2, SPIHD, HS1_DATA2, U1RXD
17	SD3	GPIO10, SD_DATA3, SPIWP, HS1_DATA3, U1TXD
18	CMD	GPIO11, SD_CMD, SPICS0, HS1_CMD, U1RTS
19	5V	Module power supply pin
20	CLK	GPIO6, SD_CLK, SPICLK, HS1_CLK, U1CTS
21	SD0	GPIO7, SD_DATA0, SPIQ, HS1_DATA0, U2RTS
22	SD1	GPIO8, SD_DATA1, SPID, HS1_DATA1, U2CTS
23	P15	GPIO15, ADC2_CH3, TOUCH3, MTDO, HSPICS0, RTC_GPIO13, HS2_CMD,SD_CMD, EMAC_RXD3
24	P2	GPIO2, ADC2_CH2, TOUCH2, RTC_GPIO12, HSPIWP, HS2_DATA0,SD_DATA0
25	P0	GPIO0, ADC2_CH1, TOUCH1, CLK_OUT1, RTC_GPIO11, EMAC_TX_CLK; <b>Download mode:</b>



		<b>external pull low, running mode: floating or external pull high</b>
26	P4	<b>GPIO4, ADC2_CH0, TOUCH0, RTC_GPIO10, HSPiHD, HS2_DATA1,SD_DATA1, EMAC_TX_ER</b>
27	P16	<b>GPIO16, HS1_DATA4, U2RXD, EMAC_CLK_OUT</b>
28	P17	<b>GPIO17, HS1_DATA5, U2TXD, EMAC_CLK_OUT_180</b>
29	P5	<b>GPIO5, VSPICS0, HS1_DATA6, EMAC_RX_CLK</b>
30	P18	<b>GPIO18, VSPICLK, HS1_DATA7</b>
31	P19	<b>GPIO19, VSPIQ, U0CTS, EMAC_TXD0</b>
32	GND	<b>GND</b>
33	P21	<b>GPIO21, VSPIHD, EMAC_TX_EN</b>
34	RX	<b>GPIO3, U0RXD, CLK_OUT2</b>
35	TX	<b>GPIO1, U0TXD, CLK_OUT3, EMAC_RXD2</b>
36	P22	<b>GPIO22, VSPIWP, U0RTS, EMAC_TXD1</b>
37	P23	<b>GPIO23, VSPID, HS1_STROBE</b>
38	GND	<b>GND</b>

## How to download the running program of ESP-WROOM-32s

Download mode: you can download directly after connecting the USB cable. Note: The baud rate cannot be selected 1152000.

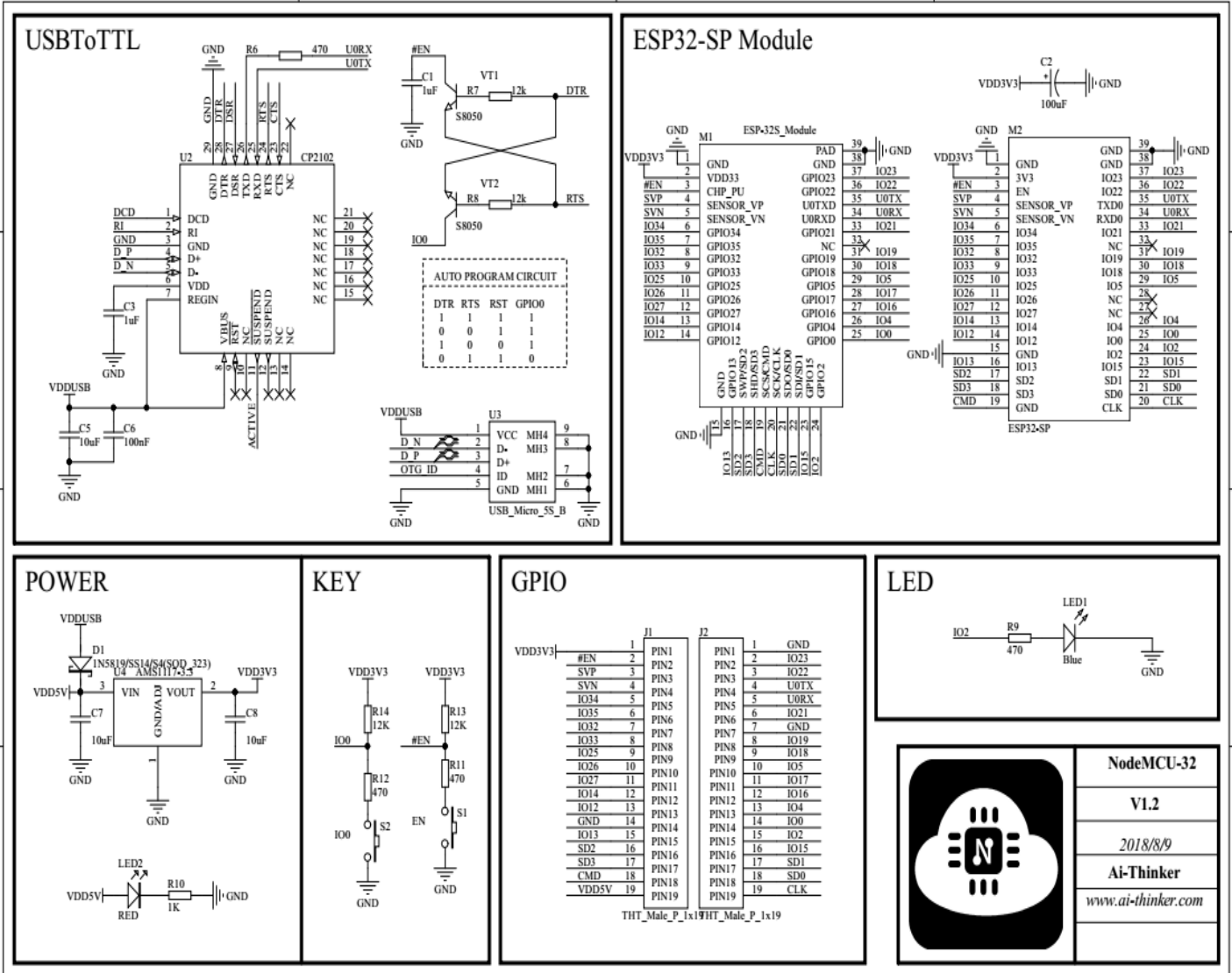
Run mode: press the EN button on the development board, the development board will go to the run mode

### NOTE:

For the performance of the specific module, please see the technical specifications of the ESP-WROOM-32 module.

[https://www.espressif.com/sites/default/files/documentation/esp32-wroom-32\\_datasheet\\_cn.pdf](https://www.espressif.com/sites/default/files/documentation/esp32-wroom-32_datasheet_cn.pdf)

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