

General info

ESP8266 is a SOC module contains:

- CPU: [Tensilca](#) Xtensa LX3, 32bit, 80MHz
- RAM: 32kB, DRAM 80kB, Flash 200kB
- WiFi 802.11 b/g/n (soft AP mode available)
- and more

Additionally on PCB:

- External SPI Flash 512kB with firmware

Device is 3,3V only and can consume over 200mA. Some FTDI or PL2303 converters are capable to provide 3,3V VCC but the power is not enough to provide stable supply.



- [Xtensa overview](#)
- [Xtensa LX3 instruction set](#)
- [Official software on Github](#)
- http://wiki.iteadstudio.com/ESP8266_Serial_WIFI_Module#AT_Commands
- <http://www.esp8266.com/wiki/doku.php>
- <https://github.com/guyz/pyesp8266>

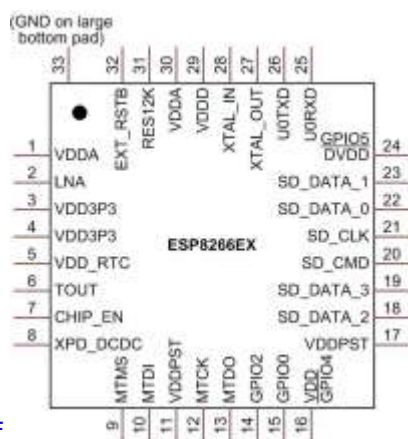
Memory MAP: http://www.esp8266.com/wiki/doku.php?id=esp8266_memory_map

[esp8266_specifications_english.pdf](#)
[0a-esp8266_datasheet_en_v4.3.pdf](#)

External software

- [esptool 0.4.8](#)
 - <https://github.com/themadinventor/esptool>
- [xtensa-lx106-elf-gcc 1.20.0-26-gb404fb9-2](#)
- [mkspiffs 0.1.2](#)

Pinout



[esp_pinout_01.pdf](#)

Pin #	GPIO	role / description			
15	GPIO0	FLSH	SPI_CS2		!!! Must be H during bootup. L=boot from UART
26	GPIO1	UART0_TXD	SPI_CS1		UART TX during flash programming 3,3V !
14	GPIO2	UART1_TXD			UART TX during flash programming
25	GPIO3	UART0_RXD			UART Rx during flash programming 3,3V !
16	GPIO4				
24	GPIO5				
21	GPIO6		SPI_CLD	SD_CLK	
22	GPIO7		SPI_MISO	SD_D0	
23	GPIO8		SPI_MOSI	SD_D1	
18	GPIO9	HSPI_HD	SPI_HD	SD_D2	
19	GPIO10	HSPI_WP	SPI_WP	SD_D3	
20	GPIO11		SPI_CS0	SD_CMD	
10	GPIO12	HSPI_MISO	MTDI		
12	GPIO13	HSPI_MOSI	MTCK	UART0_CTS / UART0_RXD2	Note: there is UART Swap register, and UART0 can be muxed to GPIO13 and GPIO15
9	GPIO14	HSPI CLK	MTMS		
13	GPIO15	HSPI CS	MTDO	UART0_RTS / UART0_TXD2	!!! Must be L durign bootup (H=SDIO mode)
8	GPIO16	XPD_DCDC			Depp sleep Timer output / USER / WAKE. Connect it to reset ping to wakeup from Deep Sleep mode
7		CH_PD	CHIP_EN		Chip power down - to enable chip needs to be pulled up
32		EXT_RSTB			External reset signal (active low)
6		T_OUT	ADC		
11		VDDPST			Digital I/O Power Supply (1.8V~3.3V)
17		VDDPST			Digital I/O Power Supply (1.8V~3.3V)
29		VDD			Analog power 3.0V~3.6V
30		VDDA			Analog power 3.0V~3.6V
27		XTAL_OUT			
28		XTAL_IN			

Pin #	GPIO	role / description			
31		RES12K			Serial connection with a 12kOhm resistor do ground

Firmwares

Own firmware in C

AT command

NodeMCU

It is LUA based firmware (command interpreter). <https://github.com/nodemcu/nodemcu-firmware>

NodeLua

<https://nodelua.org/>

ESP Easy

The ESP Easy firmware can be used to turn the ESP module into an easy multifunction sensor device for Home Automation solutions like Domoticz. Configuration of the ESP Easy is entirely web based, so once you've got the firmware loaded, you don't need any other tool besides a common web browser. <http://www.esp8266.nu>

Wiki page [ESP Easy](#)

Arduino

<https://github.com/esp8266/Arduino>

<https://github.com/markszabo/IRremoteESP8266>

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