

# Espressif

Documentatie Espressif microcontrollers

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# ESP32

De ESP32 is een budgetserie van laag-vermogen microcontrollers met geïntegreerde Wi-Fi en dual-mode Bluetooth. De ESP32-serie maakt gebruik van een Tensilica Xtensa LX6- microprocessor in zowel dual-core als single-core uitvoering. De ESP32 is gemaakt en ontwikkeld door Espressif Systems, een in Shanghai gevestigd Chinees bedrijf, en wordt vervaardigd door TSMC met behulp van hun 40nm-proces. Het is een opvolger van de ESP8266 microcontroller. Deze microcontroller is erg populair bij hobbyisten voor het ontwikkelen van Internet of things applicaties.

De ESP32 is verkrijgbaar in diverse uitvoeringen. Zelf heb ik een ESP32 Wroom 32D (38 pins) aangeschaft om mee te experimenteren.

[ESP32-ESP-WROOM-32.jpg](#)

## Pin bezetting ESP32 Wroom 32 (38 pins)

[ESP32-Pinout.png](#)

[ESP32-Pinout-2.jpg](#)

## ESP32-WROOM-32 (ESP-WROOM-32) Pin Configuration

Pin Category	Pin Name	Details
Power	<b>Micro-USB, 3.3V, 5V, GND</b>	<b>Micro-USB:</b> ESP32 can be powered through USB port <b>5V:</b> Regulated 5V can be supplied to this pin which is we be again regulated to 3.3V by on board regulator, to power the board. <b>3.3V:</b> Regulated 3.3V can be supplied to this pin to power the board. <b>GND:</b> Ground pins.
Enable	<b>En</b>	The pin and the button resets the microcontroller.
Analog Pins	<b>ADC1_0 to ADC1_5 and ADC2_0 to ADC2_9</b>	Used to measure analog voltage in the range of 0-3.3V.12-bit 18 Channel ADC
DAC pins	<b>DAC1 and DAC2</b>	Used for Digital to analog Conversion

Input/output Pins	<b>GPIO0 to GPIO39</b>	Totally 39 GPIO pins, can be used as input or output pins. 0V (low) and 3.3V (high). But pins 34 to 39 can be used as input only
Capacitive Touch pins	<b>T0 to T9</b>	These 10 pins can be used as touch pins normally used for capacitive pads
RTC GPIO pins	<b>RTCIO0 to RTCIO17</b>	These 18 GPIO pins can be used to wake up the ESP32 from deep sleep mode.
Serial	Rx, <b>Tx</b>	Used to receive and transmit TTL serial data.
External Interrupts	All GPIO	Any GPIO can be used to trigger an interrupt.

PWM	All GPIO	16 independent channels are available for PWM any GPIO can be made to work as PWM through software
VSPi	GPIO23 (MOSI), GPIO19(MISO), GPIO18(CLK) and GPIO5 (CS)	Used for SPI-1 communication.
HSPI	GPIO13 (MOSI), GPIO12(MISO), GPIO14(CLK) and GPIO15 (CS)	Used for SPI-2 communication.
IIC	GPIO21(SDA), GPIO22(SCL)	Used for I2C communication.
AREF	<b>AREF</b>	To provide reference voltage for input voltage.

## ESP32-WROOM-32 (ESP-WROOM-32) Technical features

Microprocessor	Tensilica Xtensa LX6
Maximum Operating Frequency	240MHz
Operating Voltage	3.3V
Analog Input Pins	12-bit, 18 Channel
DAC Pins	8-bit, 2 Channel
Digital I/O Pins	39 (of which 34 is normal GPIO pin)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
SRAM	520 KB
Communication	SPI(4), I2C(2), I2S(2), CAN, UART(3)
Wi-Fi	802.11 b/g/n

Bluetooth	V4.2 – Supports BLE and Classic Bluetooth
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# ESP8266 (ESP01, ESP01-S)

De ESP8266 is een goedkope microprocessor met Wi-Fi mogelijkheid en een volledige TCP/IP stack. De ESP8266 is ontwikkeld en wordt geproduceerd door de Chinese fabrikant Espressif Systems uit Shanghai.

[esp01-esp01s.jpg](#)

[ESP-01-ESP8266-pinout-gpio-pin.png](#)

## ESP8266 Pin Configuration

Pin Number	Pin Name	Alternate Name	Normally used for	Alternate purpose
1	<b>Ground</b>	-	Connected to the ground of the circuit	-
2	<b>TX</b>	GPIO - 1	Connected to Rx pin of programmer/uC to upload program	Can act as a General purpose Input/output pin when not used as TX
3	<b>GPIO-2</b>	-	General purpose Input/output pin	-
4	<b>CH_EN</b>	-	Chip Enable - Active high	-
5	<b>GPIO - 0</b>	Flash	General purpose Input/output pin	Takes module into serial programming when held low during start up
6	<b>Reset</b>	-	Resets the module	-
7	<b>RX</b>	GPIO - 3	General purpose Input/output pin	Can act as a General purpose Input/output pin when not used as RX
8	<b>Vcc</b>	-	Connect to +3.3V only	

Pin Configuration

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