

ESP32

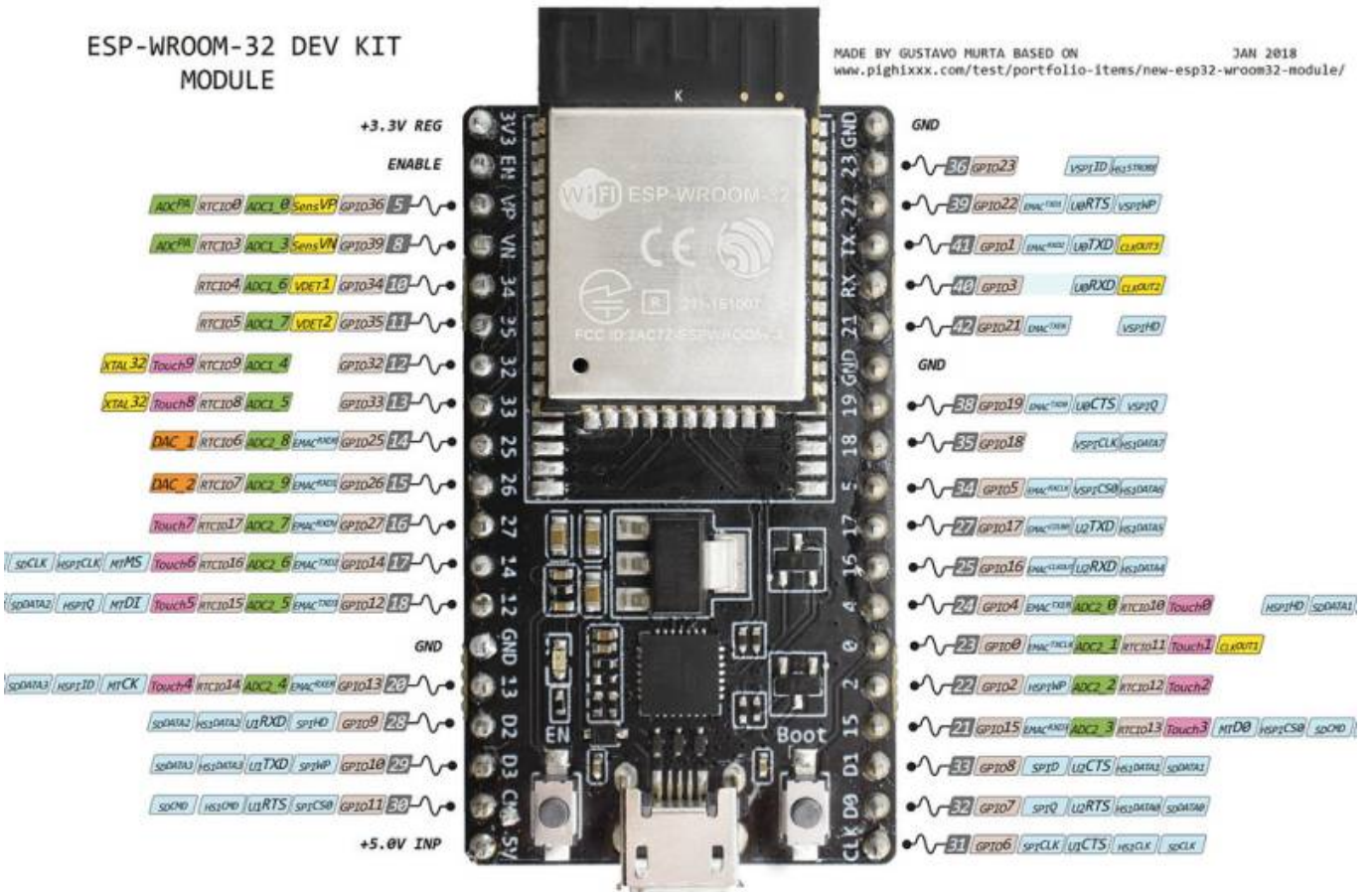


Figure 1 ESP 32 Controller. Source: <https://i0.wp.com/randomerdutorials.com/wp-content/uploads/2018/08/ESP32-DOIT-DEVKIT-V1-Board-Pinout-36-GPIOs-updated.jpg?quality=100&strip=all&ssl=1>

The ESP32 group of system on a chip microcontroller incorporates integrated Wi-Fi and dual-mode Bluetooth and is affordable and low energy. Espressif Solutions, a Chinese business firm with its headquarters in Shanghai, invented and launched Esp32. Dual-core CPU, Modular multilevel co-processor, and 80, 160, or 240 MHz co-processors-based systems are all present in it. Additionally, it has 512KB of SRAM capacity. Also, depending on your motherboard, it also supports external memory that could be 4–8Mb. It may consequently link to devices for the Internet of Things, including real-time processing, facial recognition, and images. The feature that this processor contains built-in wireless network and Bluetooth abilities is the major draw for its use. no necessity for extra radio modules. The ESp-32 is a small chip that incorporates every constituent.

Multiple programming frameworks are implemented by the ESP-32, such as the Arduino based Software (IDE), Gateway IO IDE, LUA, Micro-python, Espressif embedded IDF, Java Script language, etc.

Utilizing ESP32 should make it incredibly simple to manufacture rechargeable products like as peripherals, stereo equipment, baby monitors, wearable technology, etc.

For the purposes of our project we have selected this micro controller because of the necessity to send information wirelessly using one of the information platforms such as MQTT.

Specifications

| Parameter | Value |
|-------------------------|------------------------------------|
| CPU | 32-bit (LX6 single/dual core) |
| ROM | 448KB |
| SRAM | 16KB |
| Total RAM | 520KB |
| Clock Speed | 240 MHz |
| Wifi | 150Mbps |
| Protocols | BLE & Bluetooth v4.2 |
| GPIOs | 35 |
| DAC | Two channels |
| SAR DAC | 18 Streams of 12-bit |
| Serial Communication | 4 SPI, two I2C, two I2S, 3 UART |
| Physical LAN Connection | Ethernet MAC |
| Host Driver | 1 SD/SDIO/MMC |
| Slave microcontroller | 1 SDIO/SPI |
| LED Channels | 16 |
| Boot | Flash and protected |
| Algorithms | AES, RSA, RNS, HAS (SHA-2) and ECC |

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