ESP32

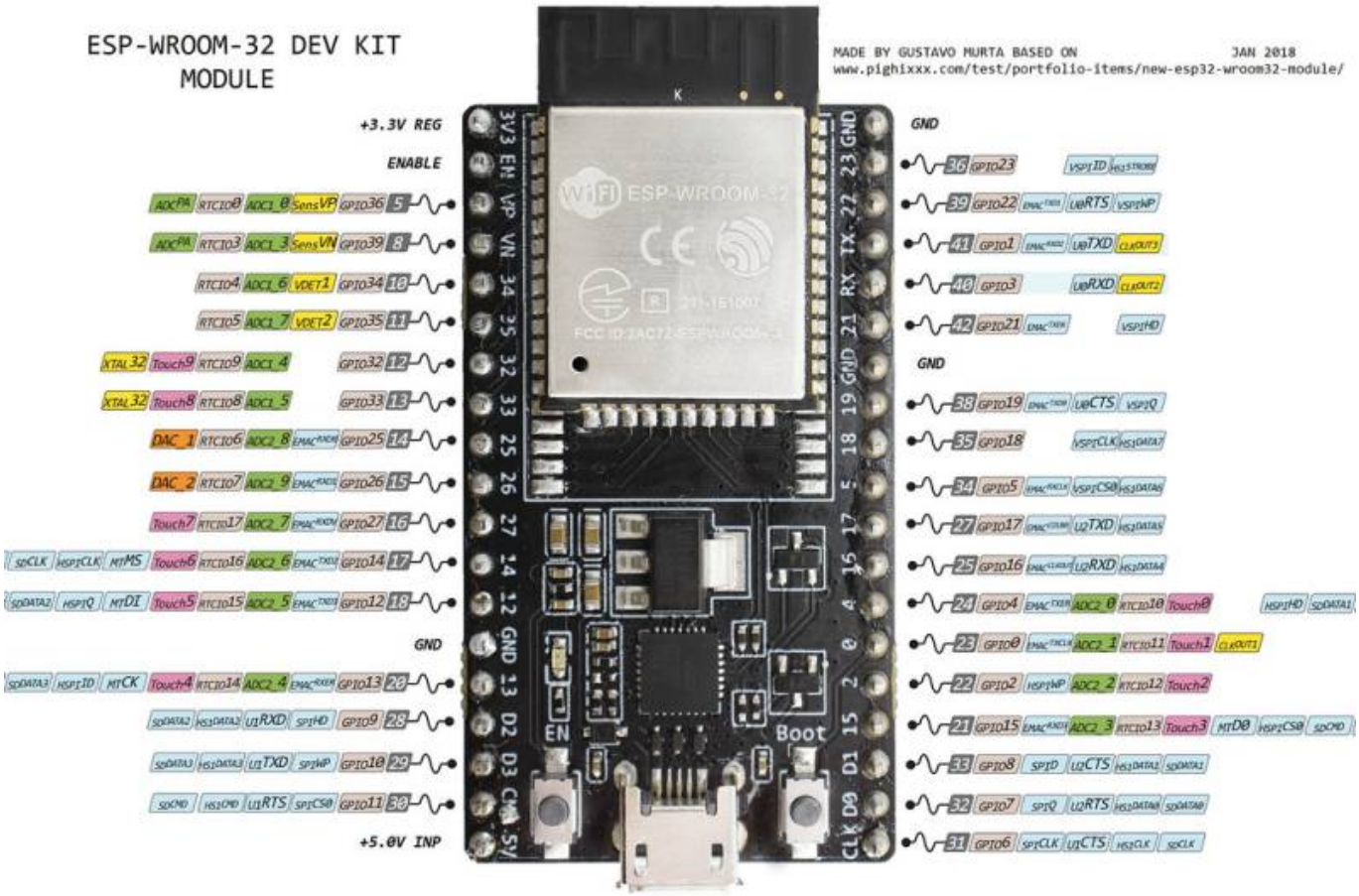

Figure 1 ESP 32 Controller. Source: https://i0.wp.com/randomnerdtutorials.com/wp-content/uploads/2018/08/ESP32-DOIT-DEVKIT-V1-Board-Pinout-36-GPIOs-updated.jpg?quality=100&strip=all&ssl=1

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

Table 1.1: System 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 12C, two 12S, 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