


Required Circuit For Bare Minimum ESP32 Module

 thecustomizewindows.com/2019/06/required-circuit-for-bare-minimum-esp32-module/

When you need many ESP32 for projects then you'll save money by avoiding full development board. Import tax is quite higher in many countries, yet the bare ESP32 module cost only \$3. Bare minimum ESP32 module is more than System on Chip. ESP32 module, unfortunately, does not have built-in USB-TTL/ UART hardware. That costs \$1.5 per piece and you do not need to connect USB-TTL/ UART hardware outside uploading program. In short, you can only buy a lot of bare ESP32 modules at a cheap rate, bulk order cheap PCB fabrication service for basic connection or just solder wires to work on any breadboard or prototyping board.

The bare minimum required components for the project is ESP-32 or variant and two resistors (220 Ohms, 10k), one LED. You can omit everything for real projects with a regulated voltage supply. Extra two push buttons, jumper wires, battery case depends on your project. One USB TTL/UART required for programming.

There are ready to use ESP32 adapter boards, ESP32 test board etc. Unfortunately, ESP32 test board does not cost lesser making it not cost effective when you need to program a minimum of 10 pieces of ESP32. Even you use the test board, you always need to know the required minimum circuit for the final project.

ESPer is a DIY ESP32 breakout board which can be easily made at home using commonly available components because the PCB is one-sided :

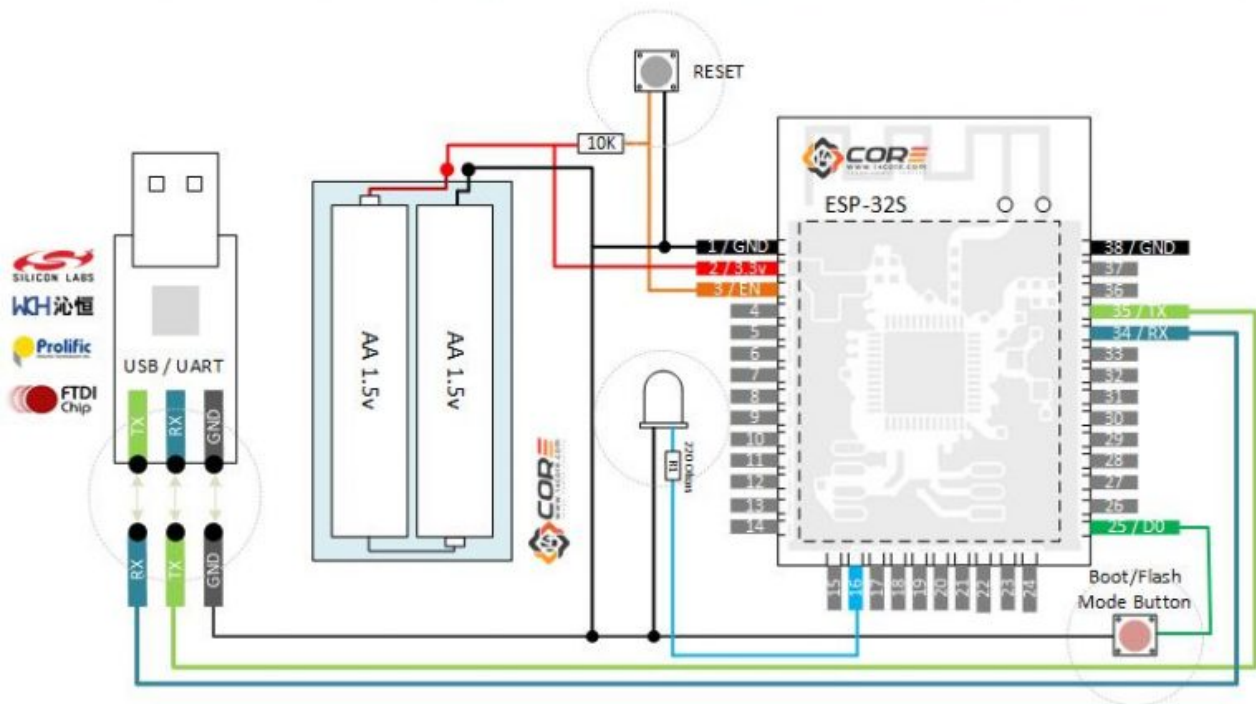
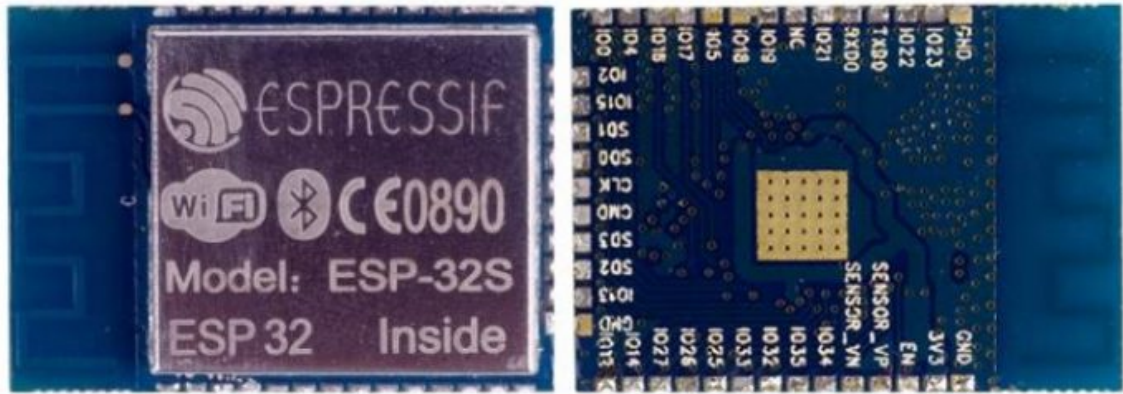
Vim

- 1 <https://github.com/TheProtoElectricEffect/ESPer>

We have many guides on our website on how create PCB at home, how to use flexible PCB, how to fabricate PCB and use soldering paste etc. You need a third hand with light, magnifying lens for comfortable work. A good soldering iron, hot air gun are bare necessity necessity. Investment behind some of the components will bring the cost of IoT projects down to \$5 per piece. That cost is practical to control an electrical appliance using IBM Watson IoT. Here is another guide for the PCB part :

Vim

- 1 <https://www.instructables.com/id/DIY-ESP32-Development-Board-ESPer/>



Another problem of using full development board is security. When there is no USB-TTL/ UART hardware with ESP32, it is not easy for an intruder to flash it. That is important for a security camera like things. ESP32 security camera does not have the USB-TTL/ UART hardware possibly for that reason. Of course, if there was ready to use bare socket available for ESP32 module then it would be made the works easier. Without spending significant, that is not possible.

It is completely your choice for the home projects whether you'll undergo these minimal steps to save money or buy full ESP32 development board. When you'll bulk purchase ESP32 development board, the cost will go down to \$7/board or lower. Cost of manufacturing in China so low that options become dubious except for some definite reasons!