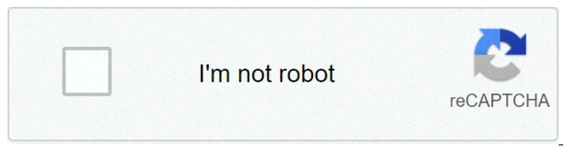

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Wemos lolin32 manual

This ESP32 LOLIN32 Council is equipped with a battery charging circuit board TP4054 lithium base. This advice is so big table for battery-powered applications. ESP32 has integrated antenna and RF balun, power amplifier, low noise amplifiers, filters, and power management module. The entire solution occupies the least amount of printed circuit board is used area.This circuit with 2.4 GHz dual-mode Wi-Fi and Bluetooth chip TSMC 40nm low-power technology, power and RF best property, safe, reliable and scalable for a variety of applications. The ESP32 doesnâ ¢ t replace the ESP8266, but improve upon it in every aspect. Not only it has WiFi support, but also has a Bluetooth 4.2 radio, which makes it even more versatile. The CPU is similar to ESP8266 to XtensaÃ LX6 ® 32-bit A ita s, but the ESP32 has two cores! Thereâ ¢ s also 128KB of ROM and 416KB SRAM, but the flash memory (for program and data storage) is still left up to an external chip (up to 64 MB). Features Lithium battery interface, 500mA charge 4MB relationship bluetooth current WIFI Flash high performance-price volumes Little Max, easily embeded to other products Strong function with lwIP support protocol freeRTOS suppporting three modes: AP, STA and AP + STA program support Lua, easily to develop technical specifications Microcontroller ESP-32 operating voltage 3.3V Digital I / O Pins 26 Pins 12 analog input clock speed (max) 240MHz Flash 4M bytes in length 5.8 mm Width 2.54 mm Weight 5.8g battery connector: 2.0mm It PH-2 documents and Download package includes 1x dual core LOLIN32 ESP32 WiFi + Bluetooth Development Board with charger (Tested and QC-OK) 2x male-male header for both sides PlatformIO Platform Espressif 32: Espressif Systems is a fabless semiconductor company private. They provide wireless communications and Wi-Fi chips that are widely used in mobile devices and the Internet of Things applications. Microcontroller ESP32 Frequency 240MHz Flash 4MB RAM 320KB provider Wemos Please lolin32 user ID for the option board in platformio.iniÃ ¢ (the project configuration file): [ENV: lolin32] = espressif32 platform edge = lolin32 You can ignore Wemos LOLIN32 the default settings for the development environment using the option board _ ***, where *** is a JSON object path from the edge lolin32.json manifesto. For example, board_build.mcu, board_build.f_cpu, etc. [env: lolin32] = espressif32 platform edge = lolin32; modify microcontroller board_build.mcu = ESP32; change MCU board_build.f_cpu frequency = 240000000L Wemos LOLIN32 supports the following loading protocols: esp-prog espota esptool iot-bus-JTAG JLINK MiniModule Olimex-arm-usb-OCD Olimex-arm-usb-OCD-h-arm-USB Olimex Olimex tiny-h-JTAG-tiny Tumpa default protocol is esptool you can change the upload protocol using the upload_protocol option: [ENV: lolin32] = platform espressif32 board = = lolin32 upload_protocol esptool Name Description Arduino Arduino Wiring-based Framework It allows you to write multi-platform software to control devices connected to a wide range of Arduino boards to create all kinds of creative coding, interactive objects, spaces or physical experiences Espressif IoT development Framework ESP-IDF is the official development framework for ESP32 ESP32 eS Series SoC. Â © Copyright 2014-present, PlatformIO. Wemos Lolin32 ESP-32-WROOM of IoT applications development platform with Bluetooth / Wi-Fi transmitter on ESP32 wireless communication controller. Espressif Systems did not stop there. Keeping up with the times and in a little miracle, Espressif launched a new powerful and flexible solution that combines the popular wireless standard WiFi and Bluetooth, It is found today in almost every electronic device, with a truly complete novelty, expanding the ESP32 family of products for a low power variety reasons of the hobbyists at professionals in the sector. The ESP32 series controllers are suitable for a wide range of unique applications: Internet of Things (IoT) connectors, calculation concepts, collection tools collection data storage, sensors of all types, streaming audio or video, add-ons for advanced electronic products, the mechanisms for recognition of images or image. Find also home automation applications that controls lighting, power outlets and the door locks. In addition, ESP32 can participate in the development of coordination and interaction of the circuits of industrial equipment systems or monitoring systems for electronic tags (beacons), educational robotics, industrial and service, in children's toys, in any compact portable smart device. Wemos lolin32 Specifications Model: Wemos Linin32 V1.0.0 Power: 5 V / 3.7 V of the external battery Operating Voltage: 3.3 V Current Consumption: up to 500mA controller: ESP-WROOM-32, POWER-Power, Dual- Core ESP32-D0WDQ6 PROCONTTORE bASED on the speed of clock LX6 Xtensa 32-bit: up to 240 MHz internal Memory: Ã ¢ ¬ "448 kbytes of ROM to load and basic functions - 520 Kbytes of static RAM for data and instructions You ¢ â ¬ "8 Kbyte of fast static RAM for the power domain in real time (RTC), accessible via the main CPU during startup by the mode of deep suspension - 8 Kbytes of RAM lens, static for the power domain real-time clock (RTC), accessible via the co-processor during deep sleep Mode Start Ã ¢ â ¬ "1 kbit EFUSE, 256 bits occupied by the system (MAC address and chip settings), 768 bits for user applications, including the flash encryption and ID chip integrated memory Ã ¢ ¬ "32 Mbit / 4 Mbit ROM, 40 MH z Radio Frequency Range: 2.4GHz-2.5GHz (2412m-2484m) WiFi: Ã ¢ ¬ "client, access point, client access point + (Station STODAP, STATION + SofTap) Ã ¢ ¬ "WiFi protocols: 802.11 B / G / N, up to 150 Mbps Ã ¢ â ¬" output power in 802.11b mode: +20.5 DBM Ã ¢ â ¬ "WiFi Mac Support Ã ¢ â ¬" STBC 2 - 1 Technology Ã ¢ ¬ "Antenna: PCB, Bluetooth onboard wired: Ã ¢ ¬" version 4.2 BR / EDR and BLE specific Ã ¢ ¬ "Transmit Power: + 12dBm Ã ¢ ¬" Nzif Receiver Sensitivity -97dBm Ã ¢ â ¬ "Adaptive frequency hopping (AFH) Ã ¢ â ¬" 1, Class-2 and Class-3 transmitter without external power amplifier - supports the multi-communication in both BT mode BLE and classic - Support for connections Multilink Multilink Piconect and ScarseNet Ã ¢ ¬ "Support for encryption and CVSD Voice Codecs SBC: WAPI, WEP, TKIP, AES, SHA-2, RSA, ECC generic outputs (I / O , GPIO): 26 analog inputs (ADC): 12, analog outputs 12-bit (DAC): 2, 8-bit current maximum for general use Contact: 12 mA, 6 mA recommended Interfaces: GPIO, UART, I2C, I2S, SPI, PWM, TOUCH, Ethernet Mac, SDCARD, SDIO, IRDA UART BAUD RATE: up to 5 Mbit / s built-in TX / TX switch, matching HF transformer, power amplifier incorporated blocks: matching network, locked in phase, power management, blocks built-in: sensor lobby adjusting, capacitive touch sensor Supports Arduino, NODEMCU, Microphyton, ESP-IDF support spiffs, ASSISTENUTO SITRUISCI Filette FATFS, UART / OTA firmware Update PROGRAMMABLE GPIO5 LED standalone Power: Ã ¢ ¬ "charger controller external battery: LTC4054 Ã ¢ ¬ "charging current: 500 mA Ã ¢ â ¬" indicator of the charging mode Ã ¢ â ¬ "compatible batteries: lithium polymer (Li-Pol), lithium ion (Li-ion) Ã ¢ â ¬ "connector: pH-2, 2.0 mm pin spacing for 2.54mm Size: 58 x 25.4 x 7.7 mm Weight: 5.8G autonomous power, Car ica battery, an indication Platform Wemos Linin32 includes a set of hardware, combining the set of hardware hardware primary set required to create an IoT device almost complete and independent, working from a stationary or autonomous power supply in the form of a battery rechargeable lithium battery of any shape and size. In addition to the ESP-WROON-32 chip and all of the minimum circuits, the scheme Board of Directors has a prudent controller LTC4054. Check and adjusts the voltage levels of a single battery element, pre-installed in the design of the project. The main reason for installing the emergency backup power mechanism is to ensure continuous and stable operation of the ESP32 chip in the event of a possible short or extended power switch on the main DC power supply, which will lead to some consequences Unfavorable and sometimes even undesirable. In standalone or emergency power mode, LTC4054 LTC4054 Monitors the current battery voltage. A lithium battery pack load offers 3.8 volts to its terminals. Inactive mode of the Wemos platform Linin32 ESP-WROOM-32, the battery voltage decreases without problems, and more load on the card, the faster the discharge occurs. If it reaches 2.9 volts, the power transfer to the card circuit stops until it is reloaded. The LTC4054 chip generates a low charge current of 500 mA at 4.2 volts, sufficient to load a single lithium battery with a nominal capacity of 2200-3000 mA. An integrated blue LED indicator connected to the LTC4054 controller shows the current charging status of the battery. Its constant glow indicates that the battery is in recharged mode. When the battery charge cycle is complete (or the battery is physically absent), the LED turns off completely. The Peculiarities of the LTC4054 controller work the operation of the short cause from the LED. First Ignition, USB port All you need for a quick start with the Wemos Lolin32 module is already present on the card. Communication between PCs and the Lolin32 platform is implemented on the CP2104 Silabs interface converter chip, installed on the card and connecting the central ESP-Wroon-32 controller and built-in USB port. Therefore, the whole user must do is connect the PC and the cutting board with the usual wire with micro-USB B connectors. If devices with such a CP2104 chip were not connected before, the Windows operating system will take the appropriate driver from to install. First of all, the USB port is intended to control the module. Allows you to add your applications to the ESP32 controller or the owner software download (firmware). Otherwise, the USB port is used only to power the card. Real-time RTC power domain, ESP32 energy saving mode The ESP32 chip is prepared by the developers of Expressif systems for different operating modes, depending on the characteristics of the designed product and how it is powered. For example, with a reliable external source of constant voltage, stable, the controller is free to work in an active full mode. On the other hand, the autonomous or emergency power supply from the battery forces to think of maximum and efficient energy savings, directly related to the duration of the Wemos Lolin32 platform. For these purposes, the ESP32 chip hosts an Ultra-Low Power Co-Processor co-processor (ULP processor) and provides the following modes: Active mode Ã ¢ â,¬ "The radio transmitter units are constantly lit. The chip can transmit and receive data or conduct radio surveillance. The current consumption is 95-240 mA. Hibernate modem modem modem - All the features of the ESP32 chip are functional, except for WiFi and Bluetooth radio transmitter blocks. Furthermore, the frequency of the Processor is automatically adjusted according to the load of the core and the devices used. Consequently, current consumption is reduced to 20-68 mA. Lightweight sleep mode Ã ¢ â,¬ "The ESP32 processor is interrupted, while the Real-time power domain memory RTC and peripherals, as well as ULP processor, are operational. The output of the suspension mode is based on Wake-up events (Mac, Host, RTC Timer or External Interrupts). The operating current in the light suspension mode does not exceed 0.8 but. Deep sleep mode Ã ¢ â,¬ "Only memory and peripherals (RTC_GPIO, RTC_i2C) of the RTC real-time power domain, including the ULP processor, the receiving voltage. All other ESP32 elements are de-energized. The settings of the WiFi and Bluetooth connection are stored in the RTC memory. As a result, energy consumption is reduced to 10-150 Ã‚¼a. Hibernation mode Ã ¢ â,¬ "The crystal oscillator 8 MHz crystal, the ULP and RTC domain memory are de-energized. The RTC timer and some RTC GPIO pins remain active, which can return to the hibernation mode. The operating current in hibernation mode is only 5 Î¼a. Wemos Lilin32 Pinout, ESP-WROOM-32 ESP32 Pinout Receipt Digital data and transmission between the controller and the peripherals linked to the general purpose of the Board of Directors Administration (GPIO) is based on the 3.3-volt logic. The range of digital input / output output voltage of + 2,645 â ¬ | + 3.6 volts is commonly known as a high-level signal or a logical device. Voltages in the range of -0.3Ã ¢ â ¬ | + 0.33 volt are called low-level or logic zero signals. Many ESP-Skroom-controlled resistors 32 pins have incorporated that fix the level of the logic signal contact on more (pull-up) or less (pull-down). Most of the card pins can be smoothed with various interfaces (UART, I2C, I2S, PWM, HSPI, VSPI, EMAC of Service Channel and others). The recommended current for a single GPIO pin is 6 milliamps, with a current limit of 12 milliampi. of the platform operating voltage VCC PIN 3 V3 Ã ¢ â ¬ ", designed to power external devices. Chip_en Ã ¢ â ¬" ESP32 Contact in operating mode Can also be used to restart the Skroom-32 controller (reset). GPIO0 - General PIN for general use, data input / output. Re-assignable to compatible functions. The output is defined by the numbering GPIO (eg, GPIO1 = 1). A low-level signal on GPIO0 PIN puts the mode of updating the software ESP32 in software mode. RTC_GPIO0Ã ¢ â ¬ | 17 is the digital pin in real time RTC power domain. The incoming signals from the devices connected to the pin RTC_GPIO wake ESP32 from the modes of light suspension. It requires pre-planning. Sens_vp (positive), sens_vn (negative) Ã ¢ â ¬ "Contact of the interior hall sensor connected to the amplifier inside of the ADC1 signal. Escludisce the sensor use of the room in conjunction with other functions that distort the magnetic field measurements surrounding. XTAL_32KP (Positive), XTAL_32KN (Positive) - Contact to the external oscillator quartz to 32,768 kHz. VDET1, VDET2 Ã ¢ â ¬ "analog contact in real time of RTC power domain. Similar to Digital Pins, designed to bring the ESP32 processor from power saving mode. It requires pre-preparation program. VCC 5 V Ã ¢ â ¬ "Contacts to provide Wemos Linin32 with stabilized voltage of 5 volts. GND Ã ¢ â ¬" General, earth. Do not exceed the maximum of 12 milliami and of over 3.3 volt voltage current on the GPIO pins, damaging the ESP32 microcontroller. Special functions and interfaces A0 419 â ¬ Ã ¢ â ¬ "analog-to-digital converter (ADC1, ADC2). Permissible input voltage 0-3.3 V, conversion range from 0-4095, 12 bits. Under the condition of active WiFi communication, ADC2 pins can not be used as analog pins. DAC1, DAC2 Ã ¢ â ¬ "Digital-to-analogs Converter (DAC1, DAC2). The outputs generated on the board pin The analog voltage output, sets the level of the software through the values of variables ranging from 0 to 255. The figure capacity is 8-bit. UART Ã ¢ ¬ "asynchronous serial bus interface, which includes the main line of the receive signal Rx, TX line and partecipates © service lines of the request to send data RTS and CTS permission to send data. Of the 3 interfaces existing UART ESP32 in only UART0 and UART2 are available. the user can reassign each line to any GPIO. by default, the Arduino IDE a prey UART0 bus GPIO1 PIN (TX) and GPIO3 (RX). I2C / IIC is bidirectional serial interface consists of data SDA and SCL clock lines. Allows to one of several parallel connected external sensors, sensors, displays, etc., to be switched on the same bus in master mode or device. Each device must have a unique address to be addressed. ESP32 has two hardware I2C interfaces, user reassigned to any GPIO. by default, the Arduino IDE provides an I2C bus with GPIO22 PIN (SCL) and GPIO21 (SDA). SPI is a ' peripheral interface s eriale (HSPI, VSPI) configurable bus for connecting external devices in the master mode and slave. Bus is composed of main lines: transfer of data from Master to Slave Mosi and slaves to Master Miso, Clock Clk and CS0 peripheral selection. In addition, the SPI includes quadwp and quadhd service pin. I2S Ã ¢ â,¬ "Electric bus interface used to change digital stereo audio devices with a serial bus and cameras and displays with a parallel bus. It is used for the collection, processing and transmission of audio data or to receive / Transmit information. The IL Contains two I2S protocol buses, each bus line (data, BCK, WS, Sync, Enable) can be reassigned by the user to any GPIO. Furthermore, the I2S0 and I2S1 timing lines are assigned to Pin Designated CLK_OUT1-3. Touch0 ... Contact of the capacitive sensor. He responds to a change in the capacity in the electrical output circuit caused by a person or object that touches the corresponding contact. It can serve as a source of awaken the ESP-SKROOM-32 from energy-saving suspension mode. SD / SSIO / MMC Ã ¢ â,¬ "Host interface (HS2) that support SD V3.01 memory cards. SIIO / SPI Ã ¢ â,¬" Peripheral interface (SD) that supports Memory cards Industrial Sixi 2.0. PWM Ã ¢ â,¬ "PWM width modulation (PWM) Ã ¢ â,¬" Digital impulse width modulation of a software-controlled signal. Any GPIO pin in the switch-32 supports PWM. Ethernet MAC (EMAC) Ã ¢ â,¬ "IEEE-802.3-2008 Access control of compatible media (Mac) Mii / RMII interfaces. To connect to a physical LAN bus (twisted pair, fiber, etc.), the ESP32 processor It requires a physical external physical interface device. The phy is connected via a Mii to 17 signal interface or an 8-sign signal RMII interface. The built-in 4 MB built-in flash memory of the ESP-Wroon-32 controller is tied hardware With 6 hidden pins (GPIO6-GPIO11), whose pins are not on the Wemos tab Linin32. Therefore, it is not advisable to use these pins or reassign them to other functions. Programming in idiuine IDE before starting writing and flashing sketches at Platform ESS32 Wemos linin32, you need to add its compatibility with the Arduino IDE environment. To do what, follow all the steps described in the chapter Ã ¢ â,¬ "giving the ESP32 platform to the idinate IDE". By default, The Lolin ESP controller ignition WROOM-32 starts the program code execution mode previously written in the internal memory. The new sketch is flashing by putting the ESP32 controller in the programming mode by shortening the GPIO0 and GND Pins (or holding the pre-welding button to these PINs) during the entire process until completion. During the programming of the module, the internal algorithm of the Arduino IDE editor flashes simultaneously its ESP32 software with each new sketch, thus removing previous versions of the firmware from the corresponding memory area. The following simple example makes the LED programmable, combined with the GPIO5 pin, flashes. Setup void () {// initializes the PIN LED_Builtin (GPIO5) in the PinMode in output mode (LED_Builtin, Output); } Void loop () {// illuminates the LED with low-level digitalwrite low signal (LED_Builtin, low); // Wait a second delay (1000); // Turn off the LED with a high digitization (LED_Builtin, high); delay (1000); } Some of the digital GPIO pins in the ESP32 chip are only to receive data from peripherals. An example of a sketch that monitors the status of the PIN GPIO36 and sends values to the serial port. // Define PIN INT INPUTPIN = 36; // Set a variable to store the signal level, 0 - low, 1 - high int val = 0; // Prepare the Void () {// configuration initializes the Input Pin PinMode (INPUTPIN, INPUT); // Open the serial port at 115200 bps. Serial.begin (115200); } // Loop Main Ring void () {// Read the value at the PIN input GPIO Val = Digitalread (InputPin); // output information on the serial serial port.println (val); // Wait a second delay (1000); } Wemos Lolin32 Updating the firmware on the software with the AT command prompt The Expressif Systems Team, for their ESP32 chips and their variants, the release firmware with a built-in control interpreter based on open source software development kits (SDK) ESP-IDF. The user can fill out the Custom firmware, add or removal of the support for the necessary functions in the project. In this firmware, the way the strike-32 processor is controlled is significantly different. The firmware code contains predefined script commands that perform various actions on the ESP-WROOMR-32 controller settings. The commands allow you to establish and break the WiFi or Bletooth BLE connections connection, send send Receive data, work with the file system (in the original firmware, the function is disabled) or change the UART bus parameters. Any AT command is sent Wemos Lolin32 via the UART serial device interface (GPIO16, GPIO17) from the master device and always begins with the AT acronym. The main UART0 bus in Lolin32 is used exclusively for processor programming. The list of supported AT commands is published in the section Ã ¢ technical information. All actual firmware archives for ESP-WROOM-32 with AT command prompt are freely accessible on the official website manufacturerÃ ¢ s. The firmware includes several binary files (.bin), whose purpose is clear with their names. The addresses of memory locations for each partition are written in the download file download.config. The ESP32 controller developer proposes to update the software using the Universal, Off-the-Shelf Flash Download the Tools program. Before writing a new version of the software, we strongly recommend that you cancel all the information and the partition table previously stored by the Flash memory WROOM-32 (Erase key). This procedure avoids possible errors subsequent Starting the ESP32 controller. Unfortunately, both are canceled memory, and updating software means that the ESP32 controller must be put into advance programming mode. In the Arduino application development environment, to access the AT commands, it is necessary to connect an optional USB-TTL converter to the PC's USB port, correctly connect the RX, TX and GND pins of both tabs. Then change the COM port of the compatible card with the one assigned to the CP210X USB-TTL adapter in the editor settings and open the serial port monitor at 115200 Baud. Finally, the firmware functionality is checked by sending a simple ATA command, which returns the response of a Ã ¢ oka to the window. Video Guide: Wemos Lolin32 OLED and GPIO GPIO