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ರಮೇಶ: ನನ್ನ ಮನೆಯೂ ಸಹ ವಿಜಯನಗರದಲ್ಲಿಯೇ ಇದೆ.

ಅಧ್ಯಾಪಕ: ಒಳ್ಳೆಯದು, ನೀನು ವಿಜಯನಗರದಲ್ಲಿ ಇರುವೆಯೇ? ನೀನು ಯಾವಾಗಲಾದರೂ ನನ್ನ ಮನೆಗೆ ಬಾ, ಮಗು,

ರಮೇಶ: ಹಾ, ಗುರುಗಳೇ, ಅವಶ್ಯವಾಗಿ ಬರುತ್ತುನೆ. ಪಾಠವನ್ನು ಅರ್ಥಮಾಡಿಕೊಳ್ಳಲು ಕಪ್ಪವಾದಾಗ, ಕೇಳಲು ಖಂಡಿ ತವಾಗಿ ಬರುತ್ತುನೆ.

ಅಧ್ಯಾಪಕ: ಒಳ್ಳೆಯದು, ನಡೆಯಿರಿ, ಸಮಯ (ತಡ) ವಾಗಿದೆ.

शब्दार्थ:

शहर: नगर, लेते

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काम: कार्य, ईंथर

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Answer. Materialistic

Page: 56 _Block Name: Working with words

3 of 3

Book Name : Hornbill

Noert Solutions | Chapter-3 English

Class: 11th

Subject : English

Chapter: 3

Chapter Name: Discovering Tut: the Saga Continues

- Q1 Give reasons for the following
- King Tut's body has been subjected to repeated scrutiny.
- (ii) Howard Carter's investigation was resented.
- (iii) Carter had to chisel away the solidified resins to raise the king's remains.
- (iv) Tut's body was buried along with gilded treasures.
- (v) The boy king changed his name from Tutankhaten to Tutankhamun

Answer

- (i) King Tut was the last heir of a powerful dynasty. The mystery behind his death was still veiled. In order to discover more about his life and death, his mummy had been subjected to research again and again.
- (ii) Howard Carter, a british archeologist distorted every major joint of the mummy while his research in 1922 so that it could be separated from the gold coffin. This dismantling and fascination only towards the wealth of the mummy despite his interesting life story cost him much resentment.
- (iii) When Carter ultimately found the mummy after much effort, it was almost impossible for him to separate it from the solid gold coffin for the further research. Despite several attempts he was unable to separate it from the base. So he finally had to chisel it beneath the limbs and trunk to go ahead with the research.
- (iv) It's a well known belief that ancient Egyptians especially royal dynasties used to bury their loved ones with the things they would require in their afterlife such as boardgames, linen garments etc. So Tut was also buried with the things he would require accordingly.
- (v) King Tut was believed to be the 'Living image of the God Amun'. Hence with his enthronement he changed his name to Tutankhamun from Tutankhaten.



Book Name : Hornbill

Noert Solutions | Chapter-4 English

Class: 11th
Subject: English
Chapter: 4

Chapter Name: Landscape of the soul

Q1

- (i) Contrast the Chinese view of art with the European view with examples.
- (ii) Explain the concept of shanshui.

Answer

(i) Chinese view of art differs a lot from European view of art. European art lay emphasis on illusionistic features in a painting, the more real, the better art. Bringing a life into a painting is what an artist's main motive is. On the other hand, Chinese art deals with features that cover intricate details of philosophy which depicts ingentife, it is completely beyond the materialism of the world. An artist here, not just present his work before the audience but want them to understand and relate with the painting mentally and physically.

The painting of a 'landscape' by VVu Daozi and the painting of a 'housefly' by the blacksmith, presents a great difference between these two splendid art styles.

(ii) Shanshui is the terminology for the Chinese Philosophy. It's a holy concept consisting of 'Yang-Yin' theory which means 'mountain water' (Yang means mountain, which represents the male element and Yin means water, the female element). It is a major element in the classical Chinese paintings. It's a spiritual touch without which Chinese paintings would be non-existing.

Page: 38 , Block Name: Understanding the text

Q2

- (i) What do you understand by the terms 'outsider art' and 'art brut' or 'raw art'?
- (ii) Who was the "untutored genius who created a paradise" and what is the nature of his contribution to art?

Page 1 of 4 Aglasem Schools

Class 11 english hornbill book pdf free download. Class 11 english hornbill help book pdf. Class 11 english hornbill full book pdf.

Grid Connect \$2.75 Minimum order qty 10. QFN Packaged Chips The ESP32 SoC (system on a chip) is housed in surface-mount, Quad-Flat No-leads (QFN) packages in either 6×6 mm² or 5×5 mm² sizes with 48+1 connection pads (48 pads along the sides and one large thermal pad connected to ground on the bottom). Open-Smart on DealExtreme \$7.99 \$8.61 regular price. Compatible with ESP-WROOM-32 and ESP-32S module footprint. Video Board labeling of jumpers for "USB-powered" and "LiPo charged circuit enable" is reversed. \triangle ESP32-ADB Audio Developing Board ESP-WROOM-32 from module SiLabsCP2102 ESP32 audio development board with PCM5102A I²S DAC, USB-to-UART, LiPo charger, and 1.3" OLED display (SH1106 via I²C). Whitecat ESP32-WROVERor ESP32-

(unconfirmed) WiFiBoy WB32-TF ESP-WROOM-32 ? Incorporates ESP32 using their own LCM3 series module. Adafruit\$8.95 AnalogLamb \$3.99 or \$4.99 \$3.99 with ESP32 revision 1. For use with modules of ESP-WROOM-32 compatible footprint. Notably, it uses a planar inverted-F antenna (shaped metal) for Wi-Fi. U.FL connector is for the LoRA antenna. ESP32 based compact surface-mount PCB module with PCB trace meandered inverted-F antenna. Ai-Thinker ESP-32S was a remake/clone of Espressif's ESP-WROOM-32 module. Including "fake news", fuses, and bit-logic Quickie: additional ESP32 serial channels in Arduino IDE Big ESP32 boards review and test Measuring weight using an ESP32, a strain gauge, and a HX711 Build your own \$50 connected Geiger counter KRACK Wi-Fi attack: how to protect our ESP8266 and ESP32? Data-read is supported on the flash and SRAM. TTGO LoRa32 U.FL for LoRa ? Datasheet Known manufacture dates: Silicon Rev.Wafer Lot NumberYearWeek 0PC3W29201710th ESP32-D2WD ESP32-D2WD is a variation with 2 MiB (16 Mibit) of embedded flash. TTGO ESP32 Dev Module ESP-WROOM-32 SILabsCP210? Footprint compatible with Espressif ESP-WROOM-32 module. number: MSIP-CRM-es5-ESP-WROOM-32 SRRC CMIIT ID: 2016DP7751 NCC ID: CCAH16LP3210T7 A special variation of the ESP-WROOM-32 module with 16 MiB flash is used with the SHA2017 Badge. The second and third serial UARTs can be accessed from two onboard 4-pin connectors, which the Freematics OBD-II adapter and GPS receiver can be hooked on. An especially nice "skinny long neck" form factor for breadboard use! Schematic Seller: Switch Science (¥680) KUC Architect ESP-WROOM-32 Breakout A-Type MK-PKBN-047 ESP-WROOM-32 Breakout B-Type MK-PKBN-048 ESP-WROOM-32 Breakout B-Type B ESPRIT and other Freematics hardware. Label on the underside reads "GOOUUU-ESP32". ESP32 can access the external QSPI flash and SRAM through high-speed caches. Buyers should use prudence and careful judgement when ordering. Pycom€19.95 Minimum order qty 10.€15.95 each for qty 100. Makestro/DycodeX ESP-WROOM-32 Breakout Simple breakout board with "Reset" and "Flash" switches. Does not appear to be sold separately. Long delivery time for this item. Datasheet Photo: Size comparison to €1 coin Known manufacture dates: Silicon Rev.Wafer Lot NumberYearWeek 0P6W255201647th QFN Packaged Module ESP32-PICO-D4 SiP (system in package) module is housed in a 7×7 mm² Quad-Flat No-leads (QFN) package with 48+1 connection pads (48 pads along the sides and one large thermal pad connected to ground on the bottom). AE2 (ceramic antenna) are for the LoRa WAN transceiver. Industrial, Commercial, and General Consumer Devices Maker Model Notes DingTalk Alibaba M1 Eveia Eveia A smart pedal exercise machine with ESP32 based wireless connectivity. Notably, W33 has a ceramic antenna and U.FL connector. News @ESP32net on Twitter ESP32 tag on Hackaday.com Projects Readings & Documentation Getting Started Official Espressif Resources Documentation on ESP32.com Forums Ethernet on ESP32 using LAN8720 JTAG Debugging Watson IoT Platform Luca Dentella's ESP32 Blog Posts ESP32 Tutorials from TechTutorialsX Arduino: hello world, uploading a program, Wi-Fi network connection, Wi-Fi getting started, Wi-Fi soft AP, MQTT publishing, MQTT subscribing, JSON message creation, JSON message sending over MQTT, HTTP GET, HTTP POST, LED PWM fading, buzzer PWM, HTTP POST to bottle application, external interrupts, timer interrupts, aREST library, creating a class, auto keyword, MFRC522 RFID, WebSocket server, WebSocket server over soft AP, WebSocket server receiving & parsing JSON, socket server, HTTPS GET request, async HTTP server, async HTTP server serving a HTML from PROGMEM, HTTP server getting query parameters, HTTP server serving HTML & JavaScript, HTTP server external & internal redirects, HTTP server route not found handling, software reset, SSD1306 OLED display, SSD1306 OLED drawing QR code, free heap, random number generation, task argument variable passing, task priority, task execution core ID, task execution on specific core, dual-core execution speed-up, queues, queue insertion, queue messages waiting & empty spaces, task communication using queues, queue performance test ESP-IDF: Wi-Fi automatic connection, wi-Fi automatic connection, script execution from computer, file writing, file reading, file upload to file system, script execution from file system, HTTP POST, SHA-256, uPyCraft IDE getting started, uPyCraft script execution, lists, dictionaries, string split method, simple URL query string parser, thread creation, thread function argument passing, timer interrupts, external interrupts MicroPython & Picoweb: web server, HTTP content-type, HTTP response code, obtaining HTTP request method, serving JSON, Picoweb app query parameters Espruino JavaScript: getting started, Wi-Fi network scan, Wi-Fi connection, array map, SHA1 hash, number to string conversion, array every method, objects Bluetooth: BTstack library, finding device with Python & BTStack, receiving data through RFCOMM, advertising SPP service with SDP Other: serial communication with Python Random Nerd Tutorials IoT Bits ESP32 Articles Notable Videos Engineers.SG Linux.conf.au 2017 & Open Hardware Mini-Conference Microcontroller Hardware & Software (Angus Gratton, 2017 Jan 17, 23 min.) IoTuz Software Design, Manufacturing, Working with KiCad (Bob Powers, 2017 Jan 17, 28 min.) IoTuz Software Design, Manufacturing, Working with KiCad (Bob Powers, 2017 Jan 17, 28 min.) IoTuz Software Design, Manufacturing, Working Workin 2017 Jan 17, 29 min.) MicroPython for ESP32 (Nick Moore, PyCon Australia, 2017 Aug 4, 25 min.) How to add Wi-Fi control to any project — ESP32 beginner's guide (GreatScott, 2017 Oct 1, 11 min.) Wi-Fi Range Testing with ESP32 & Webcam: 10 km Using Directional Antenna (Florian Euchner, 2017 Apr 8, 534 min.) Small Fruit: Disembiggening (Miniaturizing) the Mac Plus (Jeroen Domburg, Hackaday Superconference, 2017 Nov 12, 31.4 min.) — see also: close-up video Andreas Spiess's ESP32 Videos ESP32 tutorial, Arduino IDE, tests, and comparison with ESP8266 Huge mailbag with ESP8266 Huge mailbag with ESP82 boards, capacitive LED switches, power supplies, and more Introduction into ESP32 with first tests: PWM, servo, web, touch sensors — "ESP32: it's not as difficult as you think" Deep Sleep, RTC Memory, "Secret" LoLin Pins Which ESP32 revision? "WeMos" / Lily GO (not WEMOS.cc group) D1 R32 ESP-WROOM-32 from module WCHCH340 Arduino-style development board. The motherboard contains a display unit, a main control unit and a debug unit. Rev. AE1 (ceramic antenna) and UFL1 (U.FL connector for external antenna) are for ESP32 wireless connectivity. Up to 8 MiB of external flash/SRAM memory are mapped onto the CPU data space, supporting 8-bit, 16-bit and 32-bit access. Also includes "EN" & "Boot" (IO0) buttons and 1117 LDO. Thats why it's not in the driver yet. Info: Videos: Presentations: Hardware kit preparation, IoTuz hardware design, manufacturing, working with KiCad, IoTuz software design challenges and ESP-IDF, ESP32 development example using IoTuz Brief demos: Touchscreen demo, short overview, full demo, hardware intro, controls, infrared, demos, BreakOut Tetris, IoTuz on ESP-WROVER-KIT Repositories: Hardware, Firmware, Drivers ProtoCentral HeartyPatch SHA2017 Badge Kevin Webster BlazeTrak Koenraad Verheyden Cube A "3D" PCB with NeoPixel LEDs, 9-axis IMU (accelerometer & gyro), and battery power connector. LIFXLifi Labs LIFX Mini is a product family of remotely controllable, Wi-Fi enabled, LED based lights. G01 Pycom€36.95 Minimum order gty 10.€28.95 each for gty 100. Pins: 38 Akizuki Electric AE-ESP-WROOM-32 module with "skinny long neck" form factor for easy breadboard use. Pium Pium TECHBASE Moduino X1 ESP32-WROVER based industrial IoT module. Note to the beginner If you are just getting started and don't know what to purchase, it would probably be best for you to purchase a development board (instead of an surface-mount module) for easier hardware setup and an better first time experience. Seeed Studio \$2.25 \$4.50 regular price. Grid Connect \$2.35 Minimum order gty 10. Size: 25.5 mm × 18 mm × 3.1 mm Datasheet ESP32-WROOM-32 U 0 MiB Compatible with the electrical connection footprint of the Espressif ESP-WROOM-32 from module FTDIFT232RL A large development & demo board with large, circular touch pads. Maker Model Notes Aitendo P-ESP32D Buttoned breakout board compatible with ESP-WROOM-32 and ESP-32S footprint. Alternatively, real-time chat via IRC is a great way to converse with others, learn new things, and sometimes get answers to questions on the spot. Available with either 4 MiB flash (using ESP-32S-ALB module) or 16 MiB flash (using ALB-WROOM module). EM shield: None. LDO: TPS73633DBVR (SOT23-5) Joshua Valdés ESP-WROOM-32-Board Repository Note: This repository contains designs for a board based around the scrapped/defunct ESP3212 module. Minimum order quantity direct from Espressif is listed at 650 pieces. Capacitors: 100 μF (GRM31CB30J476M) & 1 μF (GRM188R71E104K) between 3.3 V line and ground. Micro-B USB connector and CP2102 USB-to-UART bridge provides a serial programming interface that also provides a se 10.£8.65 each for qty 100. NINA-W131 has connection pad for an external antenna. Solder mask color: Black Board identifier label (verbatim): ESP32 Core board V2 ESP32-DevKitC V4 ESP-WROOM-32 SiLabsCP2104 Ai-Thinker NodeMCU-32S ESP-32S SiLabsCP2102 AnalogLamb ESP32 Development Board ESP32-DevKitC. ESP (clock), and a flash memory chip, but vary in features such as antenna configuration, capacity of the flash memory chip, and EM shielding. For small quantities, Espressif will likely direct you to an appropriate distributor to contact. Guoyun Technology 果云科技; a.k.a. Goouuu Tech ESP32F Breakout Board Buttoned breakout board with with "BOOT" and "RST" buttons, an LED, six resistors, and a capacitor. Audio Spectrum Visualization 8-octave for SH1106 OLED (G6EJD; video) 8-octave for ILI9341 (Tobozo) Development Tools and Environments PCB Design Resources Hardware listed below includes the Quad-Flat No-Leads (QFN) packaged ESP32 chips and system-in-package module, various surface-mount printed circuit board modules, a large variety of development boards, and industrial, commercial, and general consumer devices. LDO: TS1117CW-3.3V Switch Science ESP-WROOM-32 FTDIFT231XS ThaiEasyElec ESPino32 ESP-WROOM-32 SiLabsCP210x thingTronics WiTooth ESP-WROOM-32 SiLabsCP2102 Development board with USB-A plug for easily plugging the board into a computer for programming or directly into a typical USB power adapter — no cable required. GNDTeknik ESP-WROOM-32 Breakout Kit ESP-WROOM-32 SiLabsCP2104 Development board/module with USB-to-UART, Reset & Boot (IOO) buttons, Liion battery connector & charger, two Grove connectors, LED on IO2, and three indicator LEDs. Headers are 0.1" spaced for breadboard compatibility. (code) Download, upload, delete, stream and directory services Adel Kassah's TUNIOT ESP32 Programming Videos Mongoose OS Videos See also: user guide tutorial videos playlist, Early boards have a typographical error in the labeling — i.e., "ESP32 MniniKIT". Second voltage regulator for power on / power off sensors through a dedicated GPIO. Espressif's official, publicly sold development boards are ESP32-PICO-KIT, ESP32-DevKitC, and ESP-WROVER-KIT. Eckstein \$\infty\$ 7.95 Includes 19\% VAT. Typically this means connections are broken out with 0.1\" spaced headers (in contrast to the more tightly spaced connections seen on the compact surface-mount module boards). without a HydraBus board, DFRobot ESP-WROOM-32 0 MiB Clone/remake of Espressif ESP-WROOM-32 module, Prices listed in the table above were last updated on 2017 Dec 8. Not to be confused with P-ESP32D, which has buttons and a few other components. Regulatory certificates: FCC ID: 2AC7Z-ESP32WROVER CE notified body; Bay Area Compliance Laboratories Corp. (Does not include a U.F.L connector.) Size: 31.4 mm × 18 mm × 3.5 mm Datasheet User guide Pinout Footprint differs from ESP-WROVER. footprint. USB bus power operation and Lipo battery operation are selectable by on-board jumper. Having said that, if you wish to purchase only the chip and not a module board, you can purchase the chip through vendors listed below. Features include $8 \times DIO / 4 \times AI / 2 \times AO$, $2 \times Ethernet$ (optional), $1 \times Serial$ Port RS-232/485, OLED 0.96" 128×64 (optional), power supply with UPS (optional), U.F.L (I-PEX) antenna mount(s), and ExCard extension modules support. Engineered for mobile devices, wearable electronics, and IoT applications, ESP32 achieves ultra-low power consumption through power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating, multiple power modes, and dynamic power saving features including fine resolution clock gating for modes. scaling. ESP32-WROVER based development board with 1.3 inch OLED (GPIO26-SDA, GPIO27-SCL) TP4056+DW06+LM39100 battery charging, over-charging, protection, LED indicator (red charging, green full), auto-download function, SD card slot, and a control button (GPIO5). Repository Pictures: 2017 Feb 17: Rendering 2017 Mar 8: Bare board 2017 Mar 15: Finished board Versions: 1.0, 1.1 Availability: Unreleased; under development Watterott ESP-WROOM-32 SiLabsCP2104 LOLIN32 Pro ESP32-WROVER SiLabsCP2104 "WeMos" / Lily GO (not WEMOS.co group) LoLin OLED or D-duino ESP-WROOM-32 SiLabsCP2102 WiFi&Bluetooth Battery ESP-WROOM-32 SiLabsCP2102 WiFi&Bluetooth Battery ESP-WROOM-32 SiLabsCP2102 Clone of Travis Lin's X-32. Watterott 6.00 Includes 19% VAT. See also: Pycom expansion boards & shields LoPy4 (None) Triple network board with Wi-Fi, BLE, and Sigfox. International System of Quantities (ISQ) notation is used to represent the measure of data described on this page. Physical package footprint/dimensions can be found in chapter 6 of the ESP32 Datasheet. G01 4 MiB OEM module version of the GPy. Supports Cellular LTE-CAT M1/NB1, Wi-Fi and Bluetooth. Up to 16 MiB of external flash are memory mapped onto the CPU code space, supporting 8-bit, 16-bit and 32-bit access. Sample code History: 2017 Oct 18: Video 2017 Oct 23: Submitted and posted to Tindie Pesky Products Kris "onehorse" Winer ESP32 Development Board N25Q032A FTDIFT230XQ Other notable components: MAX1555 LiPo battery charger, 3.3 V MIC5528 LDO supplying 500 mA Gerber files available on OSH Park Antenna connection: Plated through-hole at end of antenna trace for soldering on an antenna. ESP32-SOLO-1? B only), and three mount holes. (1313) SRRC CMIIT ID: 2017DP3657 ESP32-WROVER-I 4 MiB (MIFA disabled) ESP32-ZERO from SiP module 0 MiB Availability: Unreleased ESP32-ZERO V2 is a compact surface-mount PCB module which incorporates an ESP32-PICO series system-in-package (SiP) QFN module with a 3D antenna. LDO: AMS1117 Availability: Released and purchasable. Minimum order quantity direct from Espressif is listed at 550 pieces. Note about Taobao: Taobao is a Chinese marketplace. Version 1.1 (2016 October 15) AnalogLamb ESP32-WROVER Breakout Board For the Espressif: ESP32-PICO Core Board V2, ESP32-PICO Core Board V3, ESP32-PICO C PICO Motherboard, ESP32-PICO-ADB, ESP32-PICO-CAM, ESP32-PICO-C them working Bosch BME680 environmental sensor: air quality, temperature, pressure, and humidity (code) Arduino IDE pin mapping; determining, changing definitions ADC and some of its more advanced functions Adding a new board definition to the Arduino IDE pin mapping; determining, changing, or adding definitions ADC and some of its more advanced functions. down timer (code) How to connect and get I2C devices working (code) Audio spectrum analyser using FFT (code) 8-octave audio spectrum display (code) Beneral purpose web server (code) Sensor server & clients for DHT, SHT, BMP085, BMP180, DS18B20, etc. ESP32-D0WD AnalogLamb \$3.70 Electrodragon \$2.40 Select model from "Choose an option" pop-up menu on seller's page. Unless stated otherwise, "ESP-WROOM-32" implies Espressif's ESP-WROOM-32 module and not ESP-WROOM-32 clones. Identifier Seller Price per Chip Seller Notes ESP32-D0WDQ6 AnalogLamb \$3.00 Electrodragon \$2.40 Select model from "Choose an option" pop-up menu on seller's page. ESP-WROOM-32 module used for Wi-Fi/Bluetooth connectivity. (But has solder pads for a shield.) Visit the Historical page for information on Espressif's ESP-WROOM-03 beta module, Ai-Thinker's ESP3201, ESP3201, and ESP-32E modules, and Pycom's S01 module. Development board with microSD card slot. 2: Uses CP2102 USB=UART; has enable/disable jumper for LiPo charger. Clone of Heltec Automation's WIFI LoRa 32 board. Features include 4×DIO / 2×AI, 1× Serial Port RS-232/485, OLED 0.96" 128×64 (optional), battery power support, and U.FL (I-PEX) antenna mount(s). Notable differences from original ESP32 Monster Board: Added "LiPo charger enable/disable jumper", allowing for either LiPo battery power operation (and recharging by USB power) or only USB power mode. RTC slow SRAM: 8 KiB For co-processor accessing during deep-sleep mode. Wireless connectivity: Wi-Fi: 802.11 b/g/n/e/i (802.11n) @ 2.4 GHz up to 150 Mbit/s) Bluetooth: v4.2 BR/EDR and Bluetooth Low Energy (BLE) Memory: Internal memory: ROM: 448 KiB For booting and core functions. The LIFX Mini Day & dusk" automation. Availability: Released and in stock. Schematic Indoor Corgi Elec. Maker Model Notes Adam Vadala-Roth Vento A solar powered Wi-Fi development platform; descendant of the tech behind SunLeaf, eFuse; 1 Kibit Of which 256 bits are reserved for customer applications, including Flash-Encryption and Chip-ID. Hackaday, io project Video History; ESP32-PICO-ADB from SiP module SiLabsCP2102 ESP32-PICO Double Decker from SiP module SiLabsCP2102N Stackable development board pair with stackable development bo Kalam32-Dev (SoC directly incorporated.) W25Q32 FTDIFT231X Development board with "Arduino Uno style" form factor, two capacitive touch switches, three WS2812B addressable RGB LEDs, and battery connector. SKYLAB WG215? Has column-similar/redundant dual-row connections along the longest sides for easier stand-alone use without a breadboard (but still could be used with a breadboard). Previously released as simply "P-ESP32". Pins: 38 Kyoritsu Electronics Industry KP-ESP32X Breakout board contains ESP32-PICO-D4 SiP, battery connector & charger circuit with LiPo charge status LEDs, Reset & pull-up IO0 buttons, and a green LED on GPIO4. number: 211-161007 ISED cert. Datasheet Moduino X2 ESP32-WROVER based industrial IoT modules, development boards break out connections to be larger and more "human scale" for easier prototyping and development and frequently include additional circuity and interfaces for power supply and programming. Successor/replacement: In lieu of ESP-32S, Ai-Thinker presently sells Espressif ESP-WROOM-32 modules manufactured by Ai-Thinker. Preliminary ESP32 port Supported Xtensa boards Mongoose OS NuttX RTOS MicroPython Hybrid C/Python Zerynth "Zerynth Introduces Python on ESP32" (2017 Sept 30) Lua JavaScript mruby (Carson McDonald & Yamamoto Masaya) Forth CForth Discussion on ForthHub BASIC TinyBasic (See also: BASIC in ESP32 textcast demonstration.) Other Code & Libraries ESP32" OTA-HTTPS: Secure Over-The-Air Updates (Article) Lightweight HTTP client for ESP32. Code execution is supported. Prices listed below are approximate and do not include shipping costs. L04 Pycom€24.15 Minimum order qty 10.€18.55 each for qty 100. The LIFX Mini White has a warm white 2700 K color temperature. Not to be confused with the previously released P-ESP32, P-ESP32B, and P-ESP32C boards, which are merely basic breakout boards without buttons nor other components. Geekworm on DealExtreme \$4.80 Sold in 5 pack. Processor frequency simply listed at 160 MHz. ESP32-WROVER 4 MiB ESP32 based surface-mount PCB module with 4 MiB pSRAM. You can also find sellers in venues like eBay and AliExpress using search gueries with "ESP32-D0WD06" or " development board with Micro-USB connector, LiPo battery JST connector, on/off switch, USB-to-UART bridge, 7×7 LED matrix (controlled by charlieplexing method using IS31FL3731), Neopixel LED (IO15), power LED, reset & flash button, large silicone buttons with capacitive touch areas immediately above, microSD card slot, gesture & light sensor photo transistor (KDT00030TR), I2S breakout connector, I2C Grove connector, GPIO Grove connector, ESP32-WROVER is configured to use the MIFA PCB antenna. IntoRobot W32 0 MiB W33 0 MiB ITEAD PSH-C32IM160913001 PN25F08 0 MiB Wiki article Schematic Compared to other modules, 1 MiB is an unusually small flash memory pSRAM Antenna EM Shield Notes Espressif ESP-WROOM-32 0 MiB Initial production release (nonbeta) module board created by Espressif. Size: 23 mm × 39 mm XiaoJ ESP32-Mini-Board ESP-WROOM-32 SiLabsCP2102 Sold by: XiaoJ的杂货铺 LDO: AMS1117 History: 2016 Aug 28: Prototype first seen Large Development, Specialty & Project Boards Maker Model Surface-Mount Module Flash Memory USB=UART Notes Espressif ESP-WROVER-KIT previously ESP32-DevKitJ ESP32-WROVER or ESP-WROOM-32 from module FTDIFT2232HL ESP32-LyraTD-MSC (previously ESP32-LyraTD-MSC) is a circular board for audio playback & recording intended to be used in an "Alexa type" product. lipoyang GPduino-T Morecat Lab

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WiFi-BareBoard32 WiFi-BB32 Morgan Allen LoRaNeT32 OHC2017 IoTuz Project board created for the 2017 Open Hardware Conference, a mini-conference during Linux.conf.au 2017. If you are a distributor or otherwise interested in ordering a large quantity of parts, the minimum order quantities for parts direct from Espressif are listed in the
Espressif Products Ordering Information document. Footprint: Compatible with ESP-WROOM-32 & ESP-32S. FCC ID: 2AA53-LCM3 Pycom W01 4 MiB L01 4 MiB
ESP32 ESP-WROOM-32 SiLabsCP2102 Vaguely, the board visually looks like a cross between the DOIT ESP32 DevKit and the XiaoJ ESP32-Mini-Board designs. For news and information, follow @ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32 chips and the ESP32-PICO-D4 Datasheet for information on ESP32-PICO-D4 Datasheet for
information on the SiP module. But, having said that, the main drawback to online chat is that not everyone is active or looking at the channel (chat room) at the same moment — people work at different hours and live in different hours and live in different hours. ESP32 BadAppleBad: SSD1306 OLED & RLE video data (Lutz Lisseck)
Bad Apple video by Touhou on ESP32 with SSD1306 OLED; uses the Heatshrink compression library to decompress the RLE encoded video data. The primary "upper-deck" board contains the ESP32-PICO-D4, camera, and display. Documentation (pinout, datasheet, drawings) See also: OEM Reference Board for Pycom modules. Elecrow$5.90
Electrodragon$3.50 Geekworm on DealExtreme $6.11 $6.54 regular price. Aubreey on Amazon $19.22 eBox on Taobao ¥40 Eckstein €12.50 Includes 19% VAT. Code: ESP32 OLED WebRadio Seller: Microwavement on Tindie ($26) ESP32-ADB-Edge ESP-WROOM-32 from module SiLabsCP2102 Board with MEMS Microphone (ICS-43434) and class-D
amplifier embedded 1-channel DAC (Maxim MAX98357A); intended for Amazon Alexa experimentation and development. (Although, not made by WEMOS.) Sellers: Banggood and various vendors on AliExpress. There have been several different ESP32-Lyra boards developed internally — varying in physical form and technical specifications. SRAM:
520 KiB For data and instruction. ESP-WROOM-32 module used in the stand-alone "MATRIX Voice Wi-Fi/BT/MC" edition. Created by Espressif Systems, ESP32 is a low-cost, low-power system on a chip (SoC) series with Wi-Fi & dual-mode Bluetooth capabilities! The ESP32 family includes the chips ESP32-D0WDQ6 (and ESP32-D0WD), ESP32-D2WD,
ESP32-SOWD, and the system in package (SiP) ESP32-PICO-D4. Tweets by @ESP32net SPI0 is permanently reserved for cache access to the flash chip. Compact ESP32 based development board with battery connector, and the typical development board component accountrements. Lacks USB-to-UART; only a direct UART connection is provided. For
example, the older ESP32-Lyra32T V2 and ESP32-Lyra32T V2 and ESP32-Lyra32T V2 and ESP32-Lyra7 boards were rectangular with built-in touch-based controls. Identifier Processor Cores EmbeddedFlash Mem. SiLabsCP2102 ESP32 development board with OLED display and battery connector. Seen on Freematics ESPRIT development board. Not FCC certified. Maker Model Flash Memory
Antenna EM Shield USB=UART Notes Espressif ESP32-PICO-KIT V4 from SiP module SiLabsCP2102 ESP32-PICO-KIT V4 is a development board based around the ESP32-PICO-KIT V4 is a development board based around the ESP32-PICO-KIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development board based around the ESP32-PICO-WIT V4 is a development based around the ESP32-PICO-WIT V
non-typical frequency; note ESP-IDF crystal frequency setting. \( \triangle \) The schematic posted for the DFRobot ESP-WROOM-32 module is incorrect; the DFRobot ESP-WROOM-32 module is incorrect; the DFRobot ESP-WROOM-32 module is incorrect; the DFRobot ESP-WROOM-32 module does not use a 40 MHz crystal oscillator. (In contrast to the MATRIX Voice base-model, which is intended to be coupled with a Raspberry Pi.) Renesas GR-LYCHEE RETO
ROBOT Emme Stephen Heppell Learnometer Project purpose: Monitor your classroom environment for factors that hinder learning. The most notable difference from V3 to V4 is the pinout arrangement. TTGO LoRa U.FL for LoRa? NINA-W13 series (previously NINA-W1 series) of Wi-Fi modules. B only), reset &
user buttons, UEXT connector to attach different sensors & modules, 40 pin GPIO 0.1" step connector, LiPo charger & step up converter allowing ESP32-EVB to run from LiPo battery, 5 V power barrel jack, CH340T USB-to-UART (Rev. Data-write is supported on the SRAM. Example of using libcurl with ESP32 (Forum Post) MQTT LibWebSockets
Lightweight C library built to use minimal CPU and memory resources, providing fast throughput in both directions as client or server. Pinout Availability: Released & purchasable(Although rather pricy.) Freematics ESP32 Module (also 16 MiB in future variation) 0 MiB Clone/remake of Espressif ESP-WROOM-32 module. MakestroRp 59000 Olimex
€6.00 €4.80 each for qty 50 or more. Prices listed in the table above were last updated on 2017 Dec 8. The LIFX Mini) features multi-color adjustable whites, and "day & dusk" automation. V2: 5.75 cm long, more stable Micro-USB connector. Guoyun Technology 果云科技; a.k.a. Goouuu Tech ESP-32F
FCC ID 2AM77-ESP-32F. Hardware reference design (ZIP) Schematic, layout, Gerbers, and BOM. Photos: 2017 Apr 30: Assembled board 2017 June 30: Operational with peripherals Available, but should be available soon. Has connections available to solder on two Grove connectors. Kibidango crowd-funding page eBox ESP32-T ESP
Bit,ESP-WROOM-32 or ESP-32S (not included) SiLabsCP2102 ESP32-ST development board only has solder pads for the ESP-WROOM-32(not included) SiLabsCP2102 Although similar in design to the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board only has solder pads for the ESP32-ST development board on the ESP32-ST development board on the ESP32-ST development board on the ESP32-ST development b
daughterboards for special usage cases. Antenna variations: Sold by default with ESP32-WROVER (PCB trace antenna). "Lower layer" board has the USB connector and functions as a USB to UART bridge. Electrodragon $4.00 select configuration (PCB trace or with U.FL/I-PEX antenna) from "Choose an option pop-up menu on seller's page.
Kickstarter Purchasing Disclaimer: Vendors are listed here for informational purposes only. These pins should be treated as NC (No Connection). DFRobot SKU: TEL0111 eBox & Widora ESP32-Bit 0 MiB Antenna: on-board ceramic antenna and connector for an external antenna. Announcement Availability: To be released 2017 August 8. ShenZhen2U
$4.95 $4.50 for qty 10 or more. Schematic Repository Ayarafun/LamLoei Node32S ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 PTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS Baoshi JESP32 ESP-WROOM-32 PTDIFT231XS Baoshi JESP32 ESP-WROOM-32 FTDIFT231XS BAOSHI JESP32 ESP-WROOM-32 FTDIF
search query results include LoRa boards too.) WIFI LoRa 32? Repository Versions/revisions: Rev. Because these wireless communication module boards are designed for incorporation into final products — e.g., typically no USB-
to-UART nor programming/reset buttons — minimizing both cost and physical size. Photo of bare board tinyFab TF01EINKV1 Circuit board under development Kit Microwavemont ESP32 Super Board ESP-WROOM-32 from module FTDIFT231X
GRANDE ESP32 Monster Board ESP-WROOM-32 from module SiLabsCP2102 ESP-W
technology integration are listed below. The Magic Cauldron ESP-WROOM-32 SiLabsCP2104 Small development board designed for compatibility with shields designed for the ESP8266 based WeMos D1 Mini. FCC ID
2AC7Z-ESP32PICOKIT Schematic Pinout N.b., V4 pinout differs from V3 pinout. A Getting started guide Electronic Sweet Peas ESP320 (tentative) SiLabsCP2104 Gravitech MakerAsia Nano32 or FTDIFT231XQ Heltec Automation WIFI Kit 32 ? Clock frequency: up to 240 MHz Performance: up to 600 DMIPS Ultra low power co-processor: allows you
to do ADC conversions, computation, and level thresholds while in deep sleep. Sometimes erroneously listed as a DOIT board. Includes connectors for USB and battery. ESP32-WROOM-32D previously ESP-WROOM-32D 0 MiB Revision of the ESP-WROOM-32D module which uses an ESP32-D0WD chip instead of an ESP32-D0WDQ6 chip. Once
programming is done, the lower-deck board can be removed. A: Schematic Rev. ESP32.net is independently operated and not affiliated with Espressif Systems. At its heart, there's a dual-core or single-core Tensilica Xtensa LX6 microprocessor with a clock rate of up to 240 MHz. ESP32 is highly integrated with built-in antenna switches, RF balun
power amplifier, low-noise receive amplifier, filters, and power management modules. User guide Repository & shield libraries Seller: WAVGAT on AliExpress Network Revolution Red "Pi Exclusive Board" Kit MKPPK21 ESP-WROOM-32 (None) PatternAgents thingSoC
ESP32S ESP-32S or ESP-WROOM-32 (None) SunDUINO ESP32 MiniBoard ESP-WROOM-32 (None) Development breakout board for ESP-WROOM-32 (None) SunDUINO ESP32 MiniBoard ESP32 MiniBo
Size: 38 mm × 40.6 mm(Excluding the protruding antenna of the module.) Documentation: Manual Seller: Eleshop, jp (Kyoritsu) Lily GO ESP-WROOM-32 Breadboard Kit Clone of Indoor Corgi Elec.'s E32-BreadPlus. LDO: AMS1117 Versions: V1: 6.5 cm long. Pinout: top & bottom History: #ESPectro32 on Twitter Related: ESPectro32 + ALORA Ver
Module PCB has green color solder mask coating. Repository eBox ESP-32S/ESP-WROOM-32 Breakout Board with "Reset" and "IO0" buttons; nearly identical to Ai-Thinker's "ESP-32S Breakout Board with "Reset" and "IO0" buttons; nearly identical to Ai-Thinker's "ESP-32S Breakout Board" Has dual-row connections along the longest sides, making this board incompatible for breadboard use. The CORE2 model
incorporates an ESP32-based module for Wi-Fi and Bluetooth connectivity. Clone of Heltec Automation's WIFI Kit 32 board. Wiring connections to these pins will cause incorrect behavior of the LoRa radio. Prices listed in the table above were last updated on 2017 Oct 8. AnalogLamb $9.99 $6.99 each for qty 100 or more. $7.95 regular price. 15 V)
and GND. You can use SPI1 to also write to other peripherals connected in parallel with the flash (but with another /CS), however, this is tricky to implement because it means you can't simultaneously access flash anymore. L01 FCC ID 2AJMTLOPY01R. Datasheet ThingsOnInternet 4zerobox An industrial toolkit for IoT solution providers, 4zerobox is a
python-programmable modular tool to develop industrial IoT solutions that solves interfacing issues with PLCs and IoT cloud services. Pinout Repository (for all Heltec WIFI kits) Availability: purchasable through AliExpress. The LIFX Mini is a HomeKit-enabled accessory; controllable from Apple's iOS and tvOS. Getting started guide Reference design
(ZIP) Availability: unreleased; coming soon. Microwavemont ESP32-PICO-D4 SiP, has a Micro-USB connector, LiPo battery connector and charger circuit, USB to UART bridge, and LED for blink test. Uses ESP32-PICO-D4 SiP module. Ai-Thinker is an
officially licensed manufacturer of Espressif ESP-WROOM-32 modules. However, unlike the ESP-WROOM-32D, ESP32-WROOM-32D, ESP32
based compact surface-mount PCB module with U.FL antenna connector. U.FL connector is for the LoRA antenna. Size: 1.15 in × 1.05 in (29.21 mm × 26.72 mm) Schematic Tiny ESP32-WROVER pSRAM Board ESP32 wrover tiny module ESP32-WROVER pSRAM. Seen sold in various Asian electronics resellent
online market venues. ? Similar to DOIT's ESPDUINO-32 board, but was available before the ESPDUINO-32. Schematic Size: 60.96 mm × 43.18 mm Repository (KiCad project) Versions/revisions: 1.0 (photos), 1.1 (photos), 1.2 (photos), 1.2 (photos), 1.2 (photos), 1.3 (photos), 1.4 (photos), 1.5 (photos), 1.5 (photos), 1.6 (photos), 1.6 (photos), 1.7 (photos), 1.8 (photos), 1.8 (photos), 1.8 (photos), 1.9 (photos)
FT232RQ for the USB-to-UART chip. AnalogLamb ESP-32S module. United Technologies WB_MODE_V1 25Q32A 0 MiB Appears to be a clone of the ESP-32S module. Similar in design to the Ai-Thinker ESP-32S breakout board. Sold with Guoyun Technology's ESP-32F module, which is a clone of the ESP-WROOM-32
Getting started guide Schematic V2 fixed the auto-reset issue seen in V1. U.FL for LoRa SiLabsCP2102 ESP32 development board with 0.96 inch OLED display, battery connector, and LoRa (SX1278). For the most part, this means you'll see binary prefixes — e.g., kibi (Ki) and mebi (Mi) — used for memory capacities and data sizes. This board features
solder points for combining together an ESP32-DevKitC, 2.2 inch TFT display, battery manager module, and other components. Available with breakout board (£8.45). RTC fast SRAM: 8 KiB For data storage and main CPU during RTC Boot from the deep-sleep mode. ESP32-LyraTD-MSC will be the first ESP32-Lyra board approved for public release.
ABRA$8.49 eBox/Widora ESP32-Bit Module has a built-in ceramic antenna and U.FL connector. Sellers: various vendors on AliExpress TTGO MINI D1 ESP32 MINI32 V1.0.0 ESP-WROOM-32 SiLabsCP210? GPIO16, GPIO17, SD CMD, SD CLK, SD DATA 1 are used for internally connecting the embedded flash, and are not
recommended for other uses. \( \triangle Datasheet Known manufacture dates: Silicon Rev. Wafer Lot NumberYearWeek 1PP3376201713th TUBIPP6198201727th ESP32-S0WD is a variation with a single-core (instead of dual-core) processor. Also sold with ESP32-S0WD is a variation with a single-core (instead of dual-core) processor. Also sold with ESP32-S0WD is a variation with a single-core (instead of dual-core) processor.
Core on Arduino IDE including data passing and task synchronization ENP32 and ESP32, ESP8266, and Arduino support Arduino guide to infrared (IR) communication ESP32 and ESP32, ESP8266, and Arduino support Arduino support Arduino guide to infrared (IR) communication ESP32 and ESP32, ESP8266, and Arduino support Arduino guide to infrared (IR) communication ESP32 and ESP32, ESP8266, and Arduino support Arduino sup
presence detector (Arduino IDE) USB cable testing; esp. Version: 0.1 (Prototype) History: Availability: Unreleased; under development M5Stack Core MATRIX Voice An open-source voice recognition platform consisting of a 3.14 inches in diameter development board, with a radial array of 7 MEMS microphones connected to a Xilinx
Spartan6 FPGA & 8 MiB SDRAM with 18 RGBW LEDs & 64 GPIO pins. Seen listed under ambiguous names such as "LoLin ESP32 WeMos". For those seeking integration/inclusion of ESP32, using an surface-mount module board with ESP32 inside is often more desirable, since such modules combine an ESP32 chip, 40 MHz crystal (clock), flash
memory chip, and appropriate "glue" components into a ready-to-use, compact assembly. Note that the pSRAM column refers to inclusion of additional on-board pseudostatic RAM; this figure does not include the SRAM within the ESP32 chip itself. Streaming video can be watched through remote device, such as a PC or smartphone. Has dual-rown
connections along the longest sides, making this board incompatible for breadboard use. Size: 19.2 mm × 18 mm × 3.2 mm Datasheet If the model name seems rather odd to you, you're not alone. number: 21098-ESPWROOM-32 SiLabsCP2102
LoRaWAN enabled ESP32 board. ITEAD$6.99 Pycom W01 FCC ID 2AJMTWIPY01R. Has "WeMos" branding on the board, but not actually from WeMos. Watterott €4.24 Includes 19% VAT. Sold by: 联美科技 ("United Technologies") Price: $18 USD (approx.) Module: Clone of ESP-32S labeled "WB MODE V1". Documentation Pinout Schematic
Repository Fab-Lab Europe OCTOPUS ESP-WROOM-32 on Adafruit HUZZAH32 from module SiLabsCP2104 Freematics ESPRIT custom ESP-WROOM-32 Clone from module SiLabsCP2104 Freematics ESPRIT is an Arduino compatible development board based on Espressif ESP32 with additional features for telematics projects. Schematic Aitendo Io
Express ESP-WROOM-32 from module FTDIFT234XD Sold as DIY assembly parts kits: IEPK-F01, IEPK-S02, and IEPK-S01. Smart Prototyping $4.50 $3.50 each for qty 50 or more. Peripheral input/output: Rich peripheral interface with DMA that includes capacitive touch, ADCs (analog-to-digital converter), DACs (digital-to-analog converter), I2C
(Inter-Integrated Circuit), UART (universal asynchronous receiver/transmitter), CAN 2.0 (Controller Area Network), SPI (Serial Peripheral Interface), I<sup>2</sup>S (Integrated Inter-IC Sound), RMII (Reduced Media-Independent Interface), I<sup>3</sup>S (Integrated Inter-IC Sound), RMII (Reduced Media-Independent Interface), RMII (Reduced Med
includedHas pads for ESP-WROOM-32/ESP-32S module footprint. €4.76 for qty. Wiki article Photo by Hugatry Note: Unlike the official Espressif ESP-WROOM-32, this clone by DFRobot is not presently FCC certified. Antenna: MIFA (PCB trace) U.FL connector (for external antenna) Product page on Taobao. Size: 51 mm × 25 mm Pins: 38 Seeed
Studio ESP32 Breakout Kit ESP32 Extension Board Breakout board for Ai-Thinker ESP-32S module. B only) Features: Two relays (250 VAC / 10 A), Ethernet (100BASE-T), microSD card connector, infrared transmitter/receiver (Rev. See Binary prefix, Orders of magnitude (data), Orders of magnitude (bit rate), and Data rate units on Wikipedia for
more information. Board label name reads "ESP32-WROVER & ALB32R Breakout". In addition to the sellers listed below, you can contact Espressif directly for chip purchase inquiries. Small & Medium Development Boards/Modules (Not Using PCB Module) These small and medium sized development boards have USB-to-UART interfaces, but the
ESP32 chip is directly incorporated into the board (instead of using a ESP32-based surface-mount module). (1.25" copper wire can be used for the antenna.) Pycom WiPy 2.0 and 3.0 versions (None) Triple network board with Wi-Fi, BLE, and LoRa. FCC ID: 2AJMTLOPY1R Documentation (datasheet, pinout) Do not connect anything to pins
P5, P6 and P7, since these pins are used by the SPI bus that controls the LoRa radio. Wiki article Seller: WEMOS CC Store on AliExpress "WeMos" / Lily GO (not WEMOS.cc group) Pro ESP32 FTDIFT231XS Clone of the SparkFun ESP32 Thing board. Ai-Thinker ESP-32S Breakout Board Simple breakout board with "Reset" and "IOO" buttons. For
international shopping, intermediary agents are often used (for a fee, of course). Designed for the X-project family of stackable modules. Kilobyte on Tindie$4.99Ships from Switzerland. Video streaming has been tested using IP Camera Viewer 2 for macOS. Pro ESP32 OLED? Repository Arduino & SiFive Arduino Cinque
Arduino Cinque is based on SiFive's Freedom E310 — the industry's first commercially available RISC-V core — running at 320 MHz. An on-board ESP32 chip provides support for 2.4 GHz Wi-Fi and Bluetooth. The secondary "lower-deck" board contains the USB-to-serial bridge. Development Flashing/Testing Fixture Boards Fixture for temporarily
connecting to a module for the purpose of programming/flashing and testing. So, if you ask a question in the IRC channel, try to stick around, as it might take someone awhile to respond. Available without OLED too. Maker Model Seller Price per Module Seller Price per Module Seller Notes Espressif ESP-WROOM-32 FCC ID 2AC7Z-ESPWROOM32. Size: 25 mm × 18 mm ×
3 mm Headers: 0.1 inch; breadboard friendly layout AprilBrother ESPea32 ESP-32S SiLabsCP2104 Compact development board with small perfboard area that can be cut down to a smaller size if desired. ESP32-S0WD Electrodragon $2.00 Select model from "Choose an option" pop-up menu on seller's page. Lacks EM shield and is not FCC certified.
for power supply BLE current draw LoRa boards: what you need to know before you buy; incl. Those unfamiliar with Taobao should read Naomi Wu's "Source Parts on Taobao: an Insider's Guide" and Eric's "How to Buy Directly from Taobao" before attempting to make a purchase through the venue. ESP-IDF Example Project Library Forum Post
Temperature/Humidity Sensors Cameras LEDs Robotics Mini WiFi/BLE 4WD robot platform (Code, Summary Info) Gaming Wi-Fi Bluetooth BTstack Port for the Espressif ESP32 Platform Audio CAN Driver (Thomas Barth) Displays & Graphics DAC-Cosine (Krzysztof) API to operate cosine waveform generator inside ESP32. Nefry is pronounced
 "nefuri" (ne opuri). ESP32 chips with embedded flash do not support the address mapping between external flash and peripherals. The ESP32-LyraTD-MSC ("audio-mic development board") with a secondary "top" board. Used in the LIFX Mini (a Wi-Fi enabled light) as
seen in the "Internal Photos" exhibit attachment for FCC ID 2AA53-MINI. × 2.32 in.) Pinout Seen both with and without "WeMos" logo label. Regular price is $5.03 each ($25.15 for five). Two slightly different P-ESP32B boards have been seen in the wild: one with a green solder mask and thin 3.3 V trace, and another with yellow solder mask and
thicker 3.3 V trace. Note that because such ESP-WROOM-32 modules are officially licensed through Espressif, they are classified in this table to be Espressif modules even though they are manufactured by Ai-Thinker. Tronixlabs Australia €1.
coin Internals photo Known manufacture dates: Lot NumberYearWeek TJAGAPOP95201728th Pins GPIO16, GPIO17, SD_CMD, SD_CLK, SD_DATA_0 and SD_DATA_1 are used for connecting the embedded flash, and are not recommended for other uses. 

Announced on 2017 Sept 1, although its existence was publicly known before. Size: 78 mm × 26
mm Seller: Whitecat (£30) ESP32 N1 LORA (None) Whitecat N1 board with LoRa transceiver. Older version: SIP 3D ANT V3 Existing photos do not exhibit a shield, however, the board is designed to include an on-board EM shield. Features an xBee socket with switchable VCC voltage (3.3 V or 5 V), so 2G (SIM800) and 3G (SIM5360) xBee modules
will work on it to provide cellular network access. Sigfox maximum Tx power variations: 14 dBmW \leftarrow RCZ1 & RCZ3 (Europe, Oman, South Africa; Japan) 22 dBmW \leftarrow RCZ2 & RCZ4 (United States, Mexico, Brazil; Australia, New Zealand, Singapore, Taiwan, Hong Kong, Colombia, Argentina) FCC ID: 2AJMTSIPY1 Documentation (datasheet, pinout) Do
not connect anything to pins P5, P6 and P7, since these pins are used by the SPI bus that controls the Sigfox radio. ESP32 (ESP-IDF) Wi-Fi connect and resolve DNS Template for Connecting to the AWS IoT Platform Rudi's Standalone HTTP Server (Forum Post 1, 2; Video 1, 2) Pre-built ESP8266 & ESP32 Toolchains for NodeMCU Development & CI
Use Neil Kolban's ESP32 Code Snippets FeelFreeLinux's ESP32 Repository Ring Log (Edmund Huber) An on-disk ring buffer for persistent, fixed-sized logs. DOIT/SmartArduino ESP32 DevKit ESP-WROOM-32 SiLabsCP2102 Dongsen TechnologyTravis Lin D-duino-32 V1-V2.5 ESP-WROOM-32 V1-V2.5 ESP-WROOM-32 V1-V2.5 ESP-WROOM-32 V1-V2.5 ESP-WROOM-32 V1-V2.5 ESP
0.96" OLED, and programming buttons. Antennas: ESP32 Wi-Fi & Bluetooth uses the MIFA PCB trace and SX1278 LoRa uses an external antenna via the U.FL connector. AnalogLamb $6.69-$9.99 Price varies with flash memory size (4, 8, or 16 MiB) and quantity. Repository (Altium Designer files) Availability: Retired, but clones are still being actively
made by others. Package Size Notes ESP32-D0WDQ6 ESP32-D0WDQ6. (In the relative scheme of things, if this seems like driving a Ferrari with a tow truck, you're not alone.) Pinout poster Husarion CORE2 Robotics prototyping/development platform
with an ARM processor at its core. Power connectors: 5 V DC barrel & Micro-B USB (for power only) LDO: AMS1117 USB=UART: None on-board ThousanDIY Unopuino32S ESP-WROOM-32 from module SiLabsCP2102 United Technologies GHX BOARD V1 WB MODE V1 from module? Article AnalogLamb Maple ESP32 ESP-32S-ALB, ESP-32S,
orESP-WROOM-32 from module SiLabsCP2104 Arducam ESP32S UNO ESP-32S orESP-WROOM-32 from module SiLabsCP2102 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2104 Arducam ESP32S UNO ESP-32S orESP-WROOM-32 from module SiLabsCP2102 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2104 Arducam ESP32B ESP-WROOM-32 from module SiLabsCP2104 Arducam ESP32B ESP-WROOM-32 from module SiLabsCP2105 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO) Development board for ESP-WROOM-32 from module SiLabsCP2106 (rev 1.0-1.4 used FT232RO)
WiPy 2.0 (FCC ID 2AJMTWIPY2R), Pycom LoPy (FCC ID 2AJMTLOPY1R), and Pycom SiPy (FCC ID 2AJMTLOPY1R), and Pycom SiPy (FCC ID 2AJMTSIPY1) development boards/modules with FCC IDs. Development boards/modules with FCC IDs. Development boards/modules with FCC IDs. (FCC ID 2AJMTLOPY1R), and Pycom SiPy (FCC ID 2AJ
module component certified. (unconfirmed) WhyEngineer ESP32 CIRCLE ESP-WROOM-32 from module SiLabsCP2104 ESP32 SNOW ESP32-WROVER from module SiLabsCP2104 WiFiBoy WiFi
CANBus Triple Clone A CANBus Triple clone based on the Espressif ESP32 SoC. Notably, International System of Units (SI) defined metric prefixes (based on powers of two) are used where appropriate. Size: 25.5 mm × 18
mm × 2.8 mm FCC ID: 2AHMR-ESP32S Ai-Thinker wiki ESP32 article Availability: ESP-32S appears to be discontinued, although some sellers still appear to have modules available in their inventory. The product listing for P-ESP32D board with a green solder mask. 550 or more. Some sellers are calling it the
"MH-ET LIVE D1 mini", but MH-ET LIVE calls it the "ESP32 MiniKit". ALB32-WROVER Includes 4 MiB of pSRAM. Module options: This board is sold with either the IntoRobot W32 or W33 module. ALB32-WROVER 4 MiB and 16 MiB variations planned 4 MiB Footprint same as ESP-WROOM-32. However, low-level information transfer rates and
networking data rates (notably Wi-Fi and Bluetooth data rates) typically focus on raw bits per second (without the notion of the byte) with multiples expressed in powers of ten; thus use metric prefixes. Security: IEEE 802.11 standard security features all supported, including WFA, WPA/WPA2 and WAPI Secure boot Flash encryption 1024-bit OTP, up to the security features all supported, including WFA, WPA/WPA2 and WAPI Secure boot Flash encryption 1024-bit OTP, up to the security features all supported from the byte) with multiples expressed in powers of ten; thus use metric prefixes.
to 768-bit for customers Cryptographic hardware acceleration: AES, SHA-2, RSA, elliptic curve cryptography (ECC), random number generator (RNG) Clarification note: In this context, "RTC" is a bit of an "Espressifism" because it's used as shorthand for the low-power and analog subsystem which is separate from the CPU and the main "digital"
peripherals ("digital" is another Espressifism). Intended to be used in devices produced by Lifi Labs. QFN Packaged Chips with surface-mount PCB modules: If you wish to purchase just the Espressif ESP32 chip itself, understand that this means you're only receiving
the fabricated silicon contained within a tiny Quad-Flat No-leads package. Fluo Technology FluoWiFi Arduino-style development board with Atmel ATmega644P 8-bit AVR micro-controller running at 16 MHz at its core. Footprint unique and differs from other modules. Ai-Thinker ESP-32S FCC ID 2AHMR-ESP32S. History: 2017 Mar 13: Renderings,
photo, and video Availability: Unreleased; under development Kilobyte Benjamin Marty, a.k.a. Berkutta Tiny ESP32 Board ESP-WROOM-32 SiLabsCP2102 Tiny ESP32 board with optional battery header and BME280. Guoyun Technology 果云科技; a.k.a. Goouuu Tech ESP-32F (speculative) 0 MiB Clone/remake of Espressif ESP-
WROOM-32 module. Vento has an ARM Cortex M4F and uses an ESP32 SoC with PCB trace inverted-F antenna for Wi-Fi/Bluetooth. AliExpress Prices vary AnalogLamb $3.49 or $4.69 $3.49 for 4 MiB ESP-32S-ALB; $4.69 for 16 MiB ALB-WROOM. ESP32-Sense Kit consists of one motherboard and multiple
daughterboards. Nefry BT follows in the footsteps of the ESP-WROOM-02 (ESP8266) based Nefry v2.0. Designed to fit inside a repurposed Frisk mints container. Espressif with SMA connector, 8-digit toggle switch, 5 V power jack, and various headers. Before ordering, read all product
descriptions and check vendor ratings when possible. Surface-mount modules which have received FCC IDs include the Espressif ESP-WROOM32), ESP32-WROVER), Ai-Thinker ESP-32S (2AHMR-ESP32S), Guoyun ESP-32F (2AM77-ESP-32F), Pycom W01 (2AJMTWIPY01R) and L01 (2AJMTLOPY01R).
antenna knowledge PCBReflux's ESP32 Videos (Repository) Kolban's ESP32 Technical Tutorials (Repository) Note: the YouTube playlist is in reverse-chronological order. Olimex ESP32-EVB ESP-WROOM-32 from module WCHCH340T (rev. FCC ID: 2AM77-ESP-32F Size: 18 mm × 25.5 mm × 2.8 mm Not to be confused with Guoyun Technology's
breakout board labeled "ESP32F" (without the hyphen). Prices listed in the table above were last updated on 2017 Dec 11. Pinout from top & from bottom Repository (for all Heltec WIFI kits) Availability: purchasable through AliExpress. V2.5: Red solder mask. Maker Model Notes Aitendo P-ESP32B & P-ESP32C Simple breakout board compatible with
ESP-WROOM-32/ESP-32S footprint. Size: 76.2 mm × 25.4 mm(Excluding the protruding antenna of the module.) Pins: 38 Capacitors: C1: 10 μF, C2: 0.1 μF Documentation: Manual Seller: Eleshop.jp (Kyoritsu) NOA Labs ESP-32S Module Adapter Breakout Board Simple breakout board compatible with ESP-WROOM-32 and ESP-32S
footprint. All ESP32 chips thus far have been manufactured using TSMC's ultra-low power 40 nm process. They just copied over Espressif's ESP-WROOM-32 schematic without updating it to reflect the change. Simba Embedded Programming Platform Videos Brief demo videos; see YouTube description for links to source code and documentation
Package Size Notes ESP32-PICO-D4 SiP module combines ESP32 silicon, crystal oscillator, flash memory, filter capacitors, and RF matching links into a single package. DFRobot ESP-WROOM-32 Clone of Espressif's ES
ESP-WROOM-32 SiLabsCP2102 Small and convenient development board with ESP-WROOM-32 module installed, break out pin headers and minimum additional components. Code: ESP32 OLED WebRadio Seller: Microwavement board.
Similar to, but slightly different than, Heltec Automation's WIFI LoRa 32 board. Top-side mounted (instead of bottom-side mounted) ESP-WROOM-32 module. See also: Pycom expansion boards & shields GPy (None) FiPy (None) FiPy
USB connector, battery connector (IST PH 2-pin, 2.0 mm spaced), battery charging circuit (500 mA max charging current), and Reset button, (1313) MIC/TELEC cert. The kit features an ESP32-WROVER module, microSD card slot (for storage of audio files), 4-microphone array (supports up to 3 meter sensitivity when playing music). DSP chip for
handling the 4-mic array input, phone jack, left & right speaker output ports, audio driver chip, DC/DC boost power supply, power switch, battery connector, USB connectivity port, UART headers, I2C/SPI headers,
programming buttons and often without any other components (but some have capacitors); breaking out the surface-mount module's tightly-spaced connections into wider-spaced connections into wider-spaced connections for headers. There is some real time clock functionality as part of the RTC subsystem, but there's also a lot of other stuff. Out of Stock;
estimated shipment 2017 Dec 19. Embedded flash: Flash connected internally via IO16, IO17, SD CMD, SD CLK, SD DATA 1 on ESP32-PICO-D4. Grid Connect $3.25 Minimum order qty 10. Wiki article Size: 53 mm × 38 mm × 1.2 mm Switch Science ESP-WROOM-32 2-Line Breakout Breakout board for ESP-WROOM-32 2-Line Breakout Breakout Breakout board for ESP-WROOM-32 2-Line Breakout Break
WROOM-32 module. Seen soldered onto GHX BOARD V1 development board. For most questions, it's probably best to submit a post in the forums for widest community visibility and easily writing out the nitty-gritty details of your software,
firmware, and hardware. History: 2017 Aug 19: Announcement 2017 Aug 20: Video ePaper plus ESP32-ADB ESP-WROOM-32 from module FTDIFT231XS ESP32 web radio and Bluetooth audio development board with I2S DAC (TI PCM5102A) and class-
D amplifier (TI TPA3110), Grid Connect $3.95 Minimum order gty 10. Contact Espressif sales for distributors. EzSBC ESP32-01 Breakout & Dev Board IoT Controller ESP-WROOM-32 SiLabsCP2102 Explore Embedded Hornbill ESP32 Dev ESP-WROOM-32
SiLabsCP2102 Hornbill ESP32 Minima ESP-WROOM-32 (None) 52Pi Technology GeeekNET32 GeeekNET ESP32 Dev Board ESP-WROOM-32 SiLabsCP2104 Fusion CAN32 ESP-WROOM-32 Fusion CAN32 ES
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