

ESP32-PICO-DevKitM-2

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Overview

ESP32-PICO-DevKitM-2 is an ESP32-based development board produced by [Espressif](#).

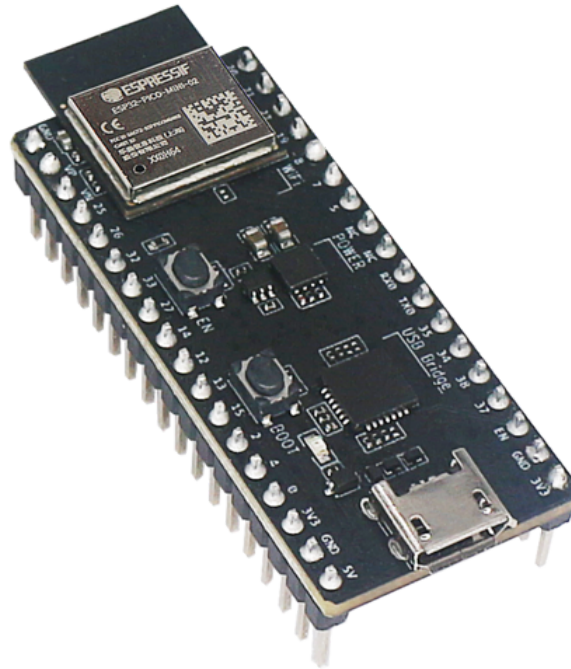
The core of this board is [ESP32-PICO-MINI-02](#) module with complete Wi-Fi and Bluetooth functionalities. The development board features a USB-to-UART Bridge circuit which allows developers to connect the board to a computer's USB port for flashing and debugging.

All the IO signals and system power on ESP32-PICO-MINI-02 are led out to two rows of 18 x 0.1" header pads on both sides of the development board for easy access. For compatibility with Dupont wires, all header pads are populated with two rows of male pin headers.

📌 Note

ESP32-PICO-DevKitM-2 comes with male headers by default.

ESP32-PICO-DevKitM-2 provides the users with hardware for development of applications based on the ESP32, making it easier for users to explore ESP32 functionalities.



ESP32-PICO-DevKitM-2 Overview (click to enlarge)

This guide covers:

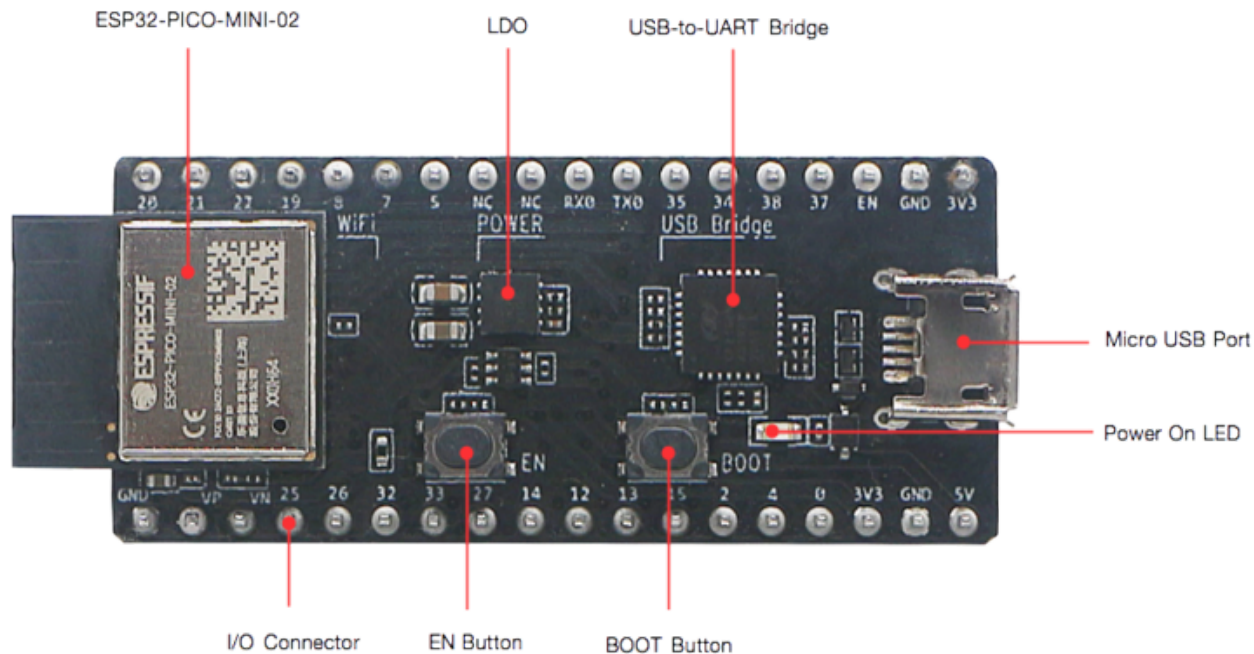
- [Getting Started](#): Provides an overview of the ESP32-PICO-DevKitM-2 and software setup instructions to get started.
- [Contents and Packaging](#): Provides information about packaging and contents for retail and wholesale orders.
- [Hardware Reference](#): Provides more detailed information about the ESP32-PICO-DevKitM-2's hardware.
- [Hardware Revision Details](#): Covers revision history, known issues, and links to user guides for previous versions (if any) of the ESP32-PICO-DevKitM-2.
- [Related Documents](#): Gives links to related documentation.

Getting Started

This section describes how to get started with the ESP32-PICO-DevKitM-2. It begins with a few introductory sections about the ESP32-PICO-DevKitM-2, then Section [Start Application Development](#) provides instructions on how to flash firmware onto the ESP32-PICO-DevKitM-2.

Description of Components

The following figure and the table below describe the key components, interfaces, and controls of the ESP32-PICO-DevKitM-2 board.



ESP32-PICO-DevKitM-2 board layout - front (click to enlarge)

Below is the description of the items identified in the figure starting from the top left corner and going clockwise.

Key Component	Description
ESP32-PICO-MINI-02	Standard ESP32-PICO-MINI-02 module soldered to the ESP32-PICO-MINI-02 module.
LDO	5V-to-3.3V Low dropout voltage regulator (LDO).
USB-to-UART bridge	CP2102N, single-chip USB-UART bridge that offers up to 3 Mbps transfer rate.
Micro-B USB Port	USB interface. Power supply for the board as well as the communication interface.
5V Power On LED	This red LED turns on when power is supplied to the board. For details, see the ESP32-PICO-MINI-02 Pin List .
I/O Connector	All the pins on ESP32-PICO-MINI-02 are broken out to pin headers. You can use these pins to connect to other components.
BOOT Button	Download button. Holding down Boot and then pressing EN initiates a full system reset.
EN Button	Reset button.

Start Application Development

Before powering up your ESP32-PICO-DevKitM-2, please make sure that the board is in good condition with no obvious signs of damage.

Required Hardware

- 1 x ESP32-PICO-DevKitM-2
- 1 x USB 2.0 A to Micro B cable
- 1 x Computer running Windows, Linux, or macOS

Software Setup

Please proceed to [Get Started](#), where Section [Installation Step by Step](#) will quickly help you set up the development environment.

Contents and Packaging

Retail Orders

If you order one or several samples of the board, each ESP32-PICO-DevKitM-2 development board comes in an individual package.

For retail orders, please go to <https://www.espressif.com/en/company/contact/buy-a-sample>.

Wholesale Orders

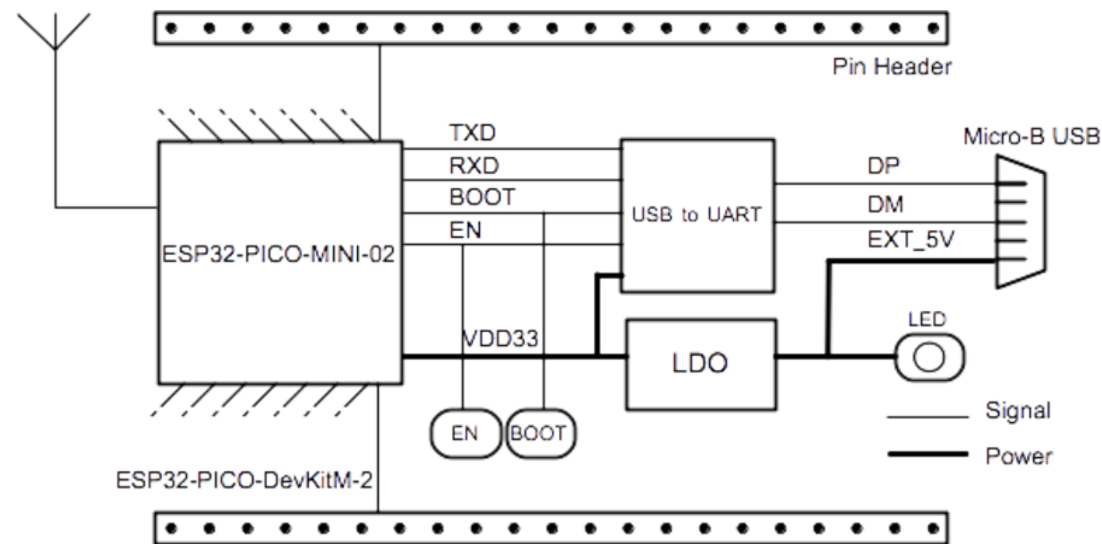
If you order in bulk, the boards come in large cardboard boxes.

For wholesale orders, please check [Espressif Product Ordering Information \(PDF\)](#)

Hardware Reference

Block Diagram

The block diagram below shows the main components of ESP32-PICO-DevKitM-2 and their interconnections.



Power Supply Options

There are three mutually exclusive ways to provide power to the board:

- Micro USB port, default power supply
- 5V/GND header pins
- 3V3/GND header pins

Warning

The power supply must be provided using **one and only one of the options above**, otherwise the board and/or the power supply source can be damaged.

Pin Descriptions

The two tables below provide the **Name** and **Function** of I/O header pins on both sides of the board, see [Description of Components](#). The pin numbering and header names are the same as in the schematic given in [Related Documents](#).

Header J2

No.	Name	Type	Function
1	IO20	I/O	GPIO20
2	IO21	I/O	GPIO21, VSPIHD, EMAC_TX_EN
3	IO22	I/O	GPIO22, VSPIWP, U0RTS, EMAC_TXD1
4	IO19	I/O	GPIO19, VSPIQ, U0CTS, EMAC_TXD0
5	IO8	I/O	GPIO8, SD_DATA1, HS1_DATA1, U2CTS
6	IO7	I/O	GPIO7, SD_DATA0, HS1_DATA0, U2RTS
7	IO5	I/O	GPIO5, VSPICS0, HS1_DATA6, EMAC_RX_CLK
8	NC	-	NC
9	NC	-	NC
10	RXD0	I/O	GPIO3, U0RXD (See 1), CLK_OUT2
11	TXD0	I/O	GPIO1, U0TXD (See 1), CLK_OUT3, EMAC_RXD2
12	IO35	I	ADC1_CH7, RTC_GPIO5
13	IO34	I	ADC1_CH6, RTC_GPIO4
14	IO38	I	GPIO38, ADC1_CH2, RTC_GPIO2
15	IO37	I	GPIO37, ADC1_CH1, RTC_GPIO1
16	EN	I	CHIP_PU
17	GND	P	Ground
18	VDD33 (3V3)	P	3.3 V power supply

Header J3

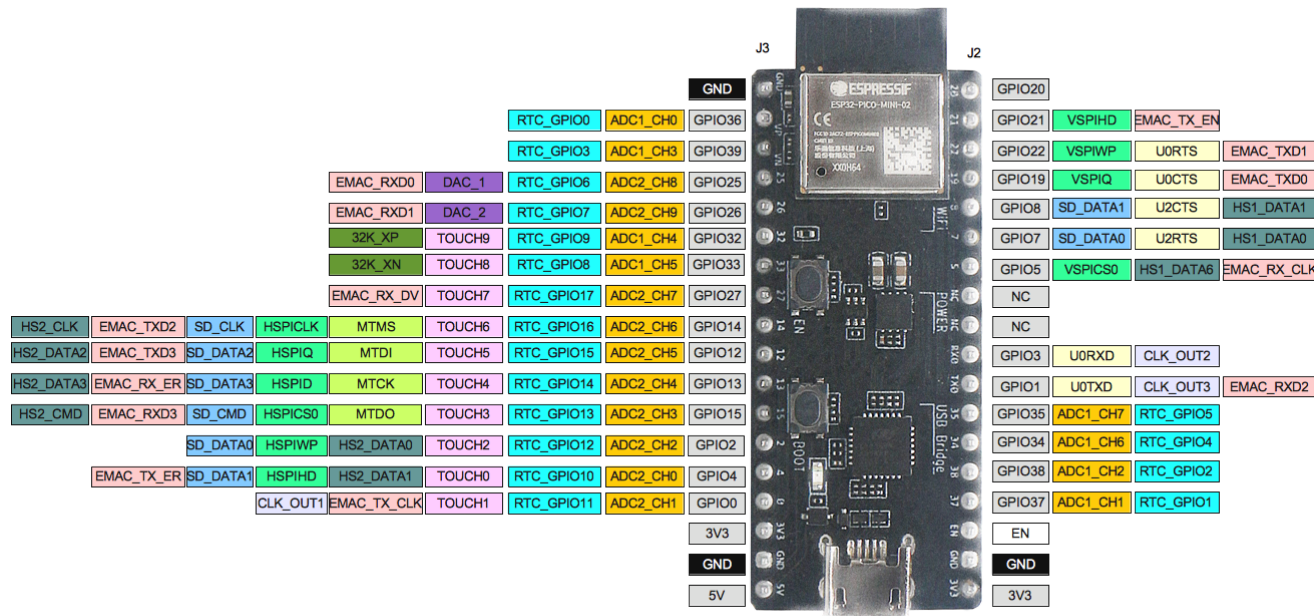
No.	Name	Type	Function
1	GND	P	Ground
2	SENSOR_VP (FSVP)	I	GPIO36, ADC1_CH0, RTC_GPIO0
3	SENSOR_VN (FSVN)	I	GPIO39, ADC1_CH3, RTC_GPIO3
4	IO25	I/O	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RX
5	IO26	I/O	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RX
6	IO32	I/O	32K_XP (See 2a), ADC1_CH4, TOUCH9, RTC_GPIO9
7	IO33	I/O	32K_XN (See 2b), ADC1_CH5, TOUCH8, RTC_GPIO8
8	IO27	I/O	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC
9	IO14	I/O	ADC2_CH6, TOUCH6, RTC_GPIO16, MTMS, HSPICL
10	IO12	I/O	ADC2_CH5, TOUCH5, RTC_GPIO15, MTDI (See 3), H
11	IO13	I/O	ADC2_CH4, TOUCH4, RTC_GPIO14, MTCK, HSPID, I
12	IO15	I/O	ADC2_CH3, TOUCH3, RTC_GPIO13, MTDO, HSPICS
13	IO2	I/O	ADC2_CH2, TOUCH2, RTC_GPIO12, HSPIWP, HS2_I
14	IO4	I/O	ADC2_CH0, TOUCH0, RTC_GPIO10, HSPIHD, HS2_I
15	IO0	I/O	ADC2_CH1, TOUCH1, RTC_GPIO11, CLK_OUT1, EM
16	VDD33 (3V3)	P	3.3V power supply

No.	Name	Type	Function
17	GND	P	Ground
18	EXT_5V (5V)	P	5V power supply

The following notes give more information about the items in the tables above.

1. This pin is connected to the pin of the USB bridge chip on the board.
2. 32.768 kHz crystal oscillator: a) input b) output
3. The operating voltage of ESP32-PICO-DevKitM-2's embedded SPI flash is 3.3 V. Therefore, the strapping pin MTDI should be pulled down during the module power-on reset. If connected, please make sure that this pin is not held up on reset.

Pin Layout



ESP32-PICO-DevKitM-2 Pin Layout (click to enlarge)

Hardware Revision Details

No previous versions available.

Related Documents

- [ESP32-PICO-MINI-02 Datasheet \(PDF\)](#)
- [Espressif Product Ordering Information \(PDF\)](#)
- [ESP32-PICO-DevKitM-2 Schematic \(PDF\)](#)
- [ESP32-PICO-DevKitM-2 PCB Layout \(PDF\)](#)

For other design documentation for the board, please contact us at sales@espressif.com.

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