

ESP32-DevKitS(-R)

[\[中文\]](#)

This user guide provides information on ESP32-DevKitS(-R), an ESP32-based flashing board produced by Espressif. ESP32-DevKitS(-R) is a combination of two board names: ESP32-DevKitS and ESP32-DevKitS-R. S stands for springs, and R stands for WROVER.



The document consists of the following major sections:

- [Getting Started](#): Provides an overview of ESP32-DevKitS(-R) and hardware/software setup instructions to get started.
- [Hardware Reference](#): Provides more detailed information about ESP32-DevKitS(-R)'s hardware.
- [Related Documents](#): Gives links to related documentation.

Getting Started

This section describes how to get started with ESP32-DevKitS(-R). It begins with a few introductory sections about ESP32-DevKitS(-R), then Section [How to Flash a Board](#) provides instructions on how to mount a module onto ESP32-DevKitS(-R), get it ready, and flash firmware onto it.

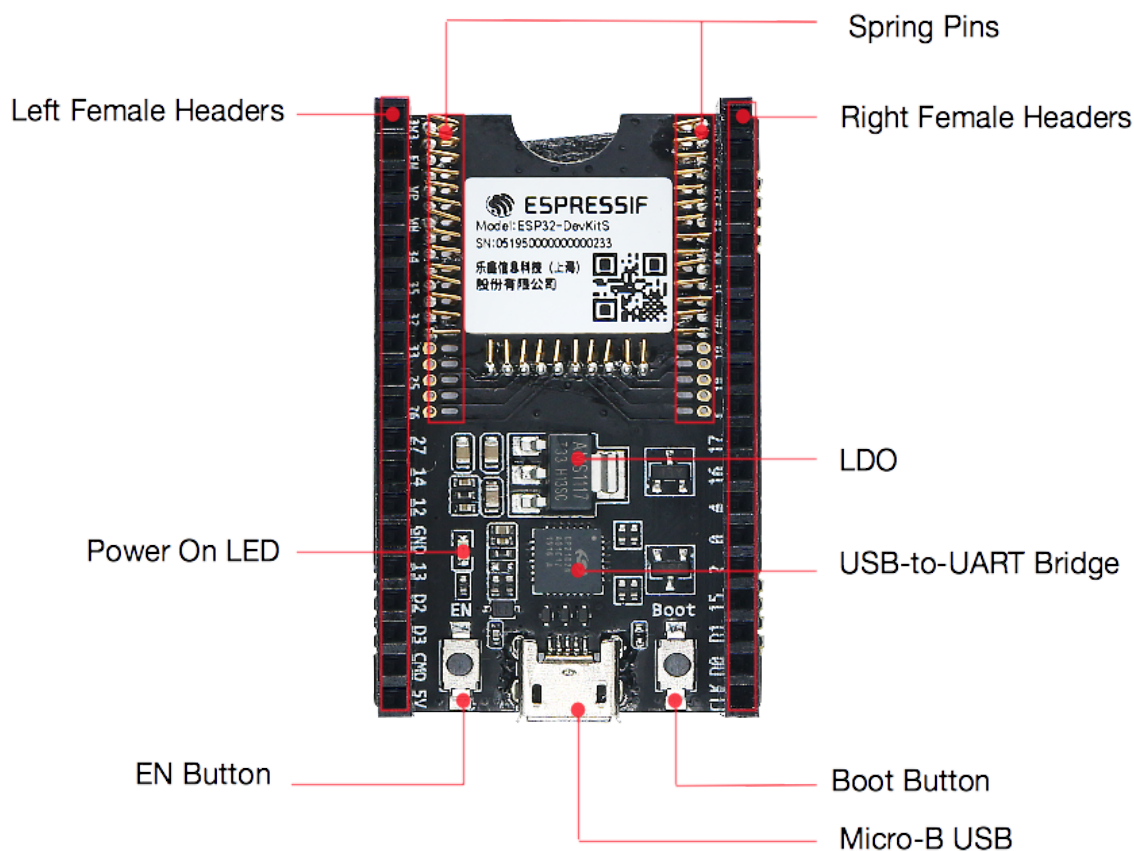
Overview

ESP32-DevKitS(-R) is Espressif's flashing board designed specifically for ESP32. It can be used to flash an ESP32 module without soldering the module to the power supply and signal lines. With a module mounted, ESP32-DevKitS(-R) can also be used as a mini development board like ESP32-DevKitC.

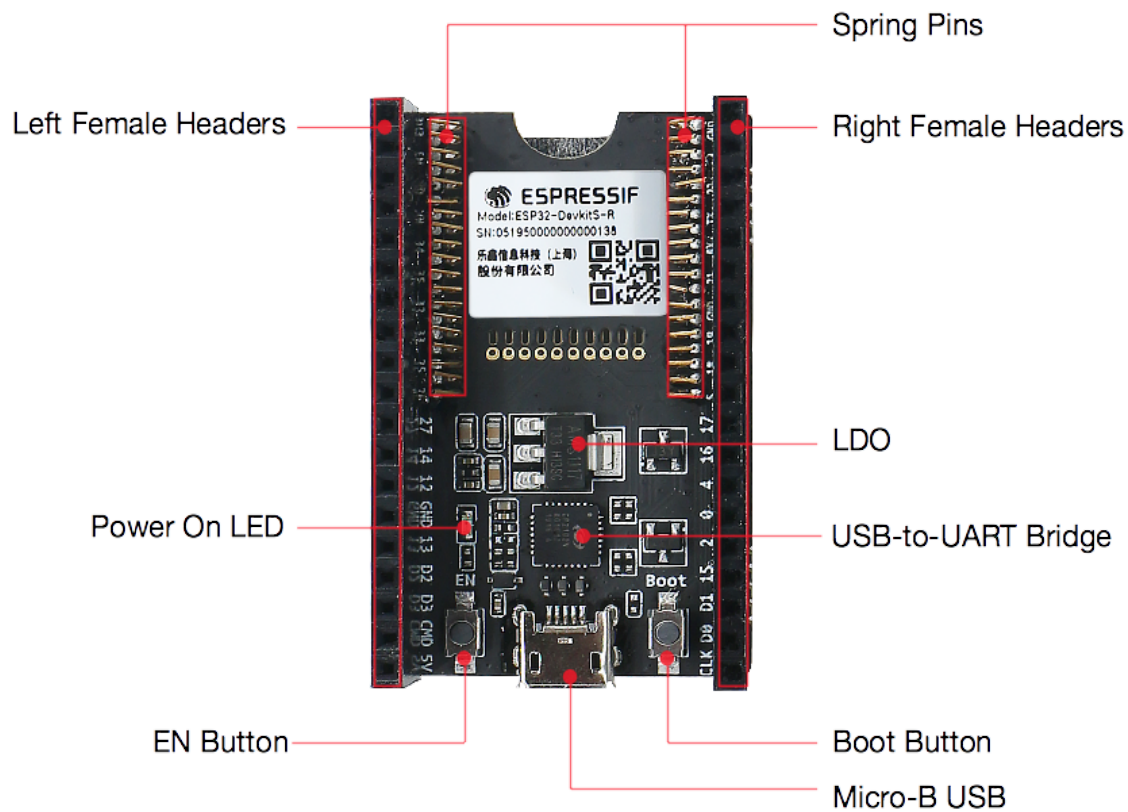
ESP32-DevKitS and ESP32-DevKitS-R boards vary only in layout of spring pins to fit the following ESP32 modules.

- **ESP32-DevKitS:**
 - [ESP32-WROOM-32](#)
 - [ESP32-WROOM-32D](#)
 - [ESP32-WROOM-32U](#)
 - [ESP32-SOLO-1](#)
 - [ESP32-WROOM-32E](#)
 - [ESP32-WROOM-32UE](#)
- **ESP32-DevKitS-R:**
 - [ESP32-WROVER \(PCB & IPEX\)](#)
 - [ESP32-WROVER-B \(PCB & IPEX\)](#)
 - [ESP32-WROVER-E](#)
 - [ESP32-WROVER-IE](#)

Description of Components



ESP32-DevKitS - front



ESP32-DevKitS-R - front

Key Component	Description
Spring Pins	Click the module in. The pins will fit into the mc
2.54 mm Female Headers	These female headers are connected to pins of
USB-to-UART Bridge	Single-chip USB to UART bridge provides transf
LDO	5V-to-3.3V low-dropout voltage regulator (LDC
Micro-USB Connector/Micro USB Port	USB interface. Power supply for the board as w
EN Button	Reset button.
Boot Button	Download button. Holding down Boot and then
Power On LED	Turns on when the USB or power supply is contr

How to Flash a Board

Before powering up your ESP32-DevKitS(-R), please make sure that it is in good condition with no obvious signs of damage.

Required Hardware

- An ESP32 module of your choice

- USB 2.0 cable (Standard-A to Micro-B)
- Computer running Windows, Linux, or macOS

Hardware Setup

Please mount a module of your choice onto your ESP32-DevKitS(-R) according to the following steps:

- Gently put your module on the ESP32-DevKitS(-R) board. Make sure that castellated holes on your module are aligned with spring pins on the board.
- Press your module down into the board until it clicks.
- Check whether all spring pins are inserted into castellated holes. If there are some misaligned spring pins, place them into castellated holes with tweezers.

Software Setup

Preferred Method

The ESP-IDF development framework provides a preferred way of flashing binaries onto ESP32-DevKitS(-R). Please proceed to [Get Started](#), where Section [Installation Step by Step](#) will quickly help you set up the development environment and then flash an application example onto your ESP32-DevKitS(-R).

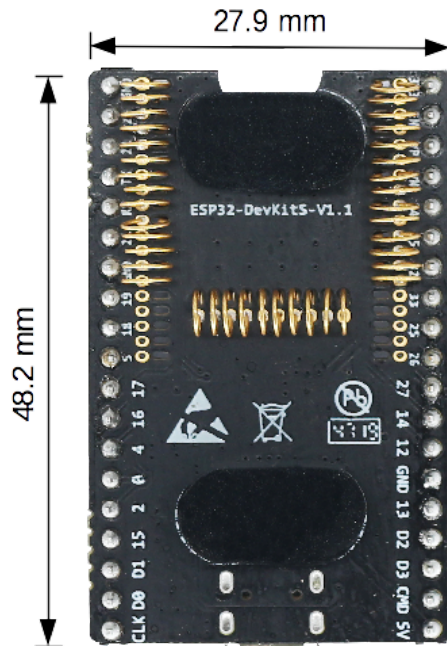
Alternative Method

As an alternative, Windows users can flash binaries using the [Flash Download Tool](#). Just download it, unzip it, and follow the instructions inside the *doc* folder.

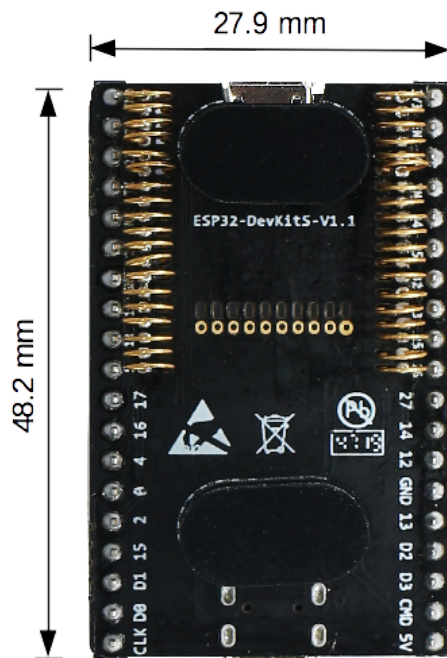
Note

1. To flash binary files, ESP32 should be set to Firmware Download mode. This can be done either by the flash tool automatically, or by holding down the Boot button and tapping the EN button.
2. After flashing binary files, the Flash Download Tool restarts your ESP32 module and boots the flashed application by default.

Board Dimensions



ESP32-DevKitS board dimensions - back



ESP32-DevKitS-R board dimensions - back

Contents and Packaging

Retail orders

If you order a few samples, each ESP32-DevKitS(-R) comes in an individual package in either antistatic bag or any packaging depending on a retailer.

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

Wholesale Orders

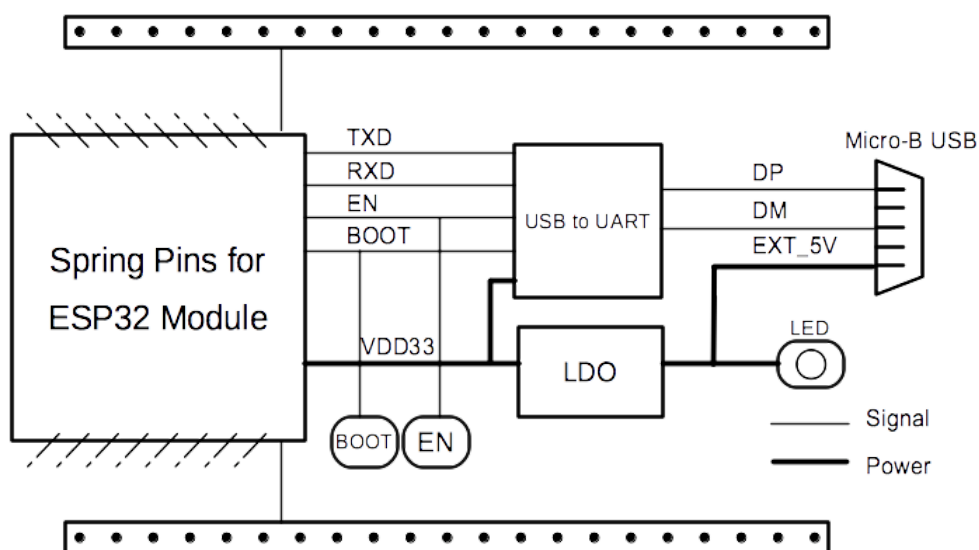
If you order in bulk, the boards come in large cardboard boxes.

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

Hardware Reference

Block Diagram

A block diagram below shows the components of ESP32-DevKitS(-R) and their interconnections.



ESP32-DevKitS(-R) (click to enlarge)

Power Supply Options

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

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

It is advised to use the first option: micro USB port.

Header Blocks

.		
	Label	Signal
L1	3V3	VDD 3V3

.	Label	Signal
L2	EN	CHIP_PU
L3	VP	SENSOR_VP
L4	VN	SENSOR_VN
L5	34	GPIO34
L6	35	GPIO35
L7	32	GPIO32
L8	33	GPIO33
L9	25	GPIO25
L10	26	GPIO26
L11	27	GPIO27
L12	14	GPIO14
L13	12	GPIO12
L14	GND	GND
L15	13	GPIO13
L16	D2	SD_DATA2
L17	D3	SD_DATA3
L18	CMD	SD_CMD
L19	5V	External 5V
R1	GND	GND
R2	23	GPIO23
R3	22	GPIO22
R4	TX	U0TXD
R5	RX	U0RXD
R6	21	GPIO21
R7	GND	GND
R8	19	GPIO19
R9	18	GPIO18
R10	5	GPIO5
R11	17	GPIO17

.	Label	Signal
R12	16	GPIO16
R13	4	GPIO4
R14	0	GPIO0
R15	2	GPIO2
R16	15	GPIO15
R17	D1	SD_DATA1
R18	D0	SD_DATA0
R19	CLK	SD_CLK

For the image of header blocks, please refer to [Description of Components](#).

Related Documents

- [ESP32-DevKitS\(-R\) Schematics](#) (PDF)
- [ESP32 Datasheet](#) (PDF)
- [ESP32-WROOM-32 Datasheet](#) (PDF)
- [ESP32-WROOM-32D & ESP32-WROOM-32U Datasheet](#) (PDF)
- [ESP32-SOLO-1 Datasheet](#) (PDF)
- [ESP32-WROVER Datasheet](#) (PDF)
- [ESP32-WROVER-B Datasheet](#) (PDF)
- [Espressif Product Ordering Information](#) (PDF)

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