VisionFive 2 Product Brief

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Legal Statements

Important legal notice before reading this documentation.

PROPRIETARY NOTICE

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Preface

About this guide and technical support information.

About this document

This document mainly provides the users with the features and technical specifications for StarFive VisionFive 2 Single Board Computer (SBC).

Revision History

Table 0-1 Revision History

Version	Released	Revision
1.3.2	2025/01/06	Updated the USB-C port power.
1.3.1	2023/07/18	Updated the description in Overview *(on page 5)*.
1.3	2022/12/08	Updated the power requirement via USB-C port. Added a note on using spacers in Physical Specifications *(on page 8)*. Updated the dimensions.
1.2	2022/10/20	• Revised the display of MIPI CSI. • Updated the USB port description. • Added 1 × USB device port. • Updated the GPU description. • Updated the Reset button description.
1.1	2022/09/08	• Updated the mechanical drawings. • Updated the description about Reset button.
1.0	2022/08/23	The first release.

Notes and notices

The following notes and notices might appear in this guide:

- **Tip:**
  Suggests how to apply the information in a topic or step.

- **Note:**
  Explains a special case or expands on an important point.

- **Important:**
  Points out critical information concerning a topic or step.

- **CAUTION:**
  Indicates that an action or step can cause loss of data, security problems, or performance issues.

- **Warning:**
  Indicates that an action or step can result in physical harm or cause damage to hardware.

1. Overview
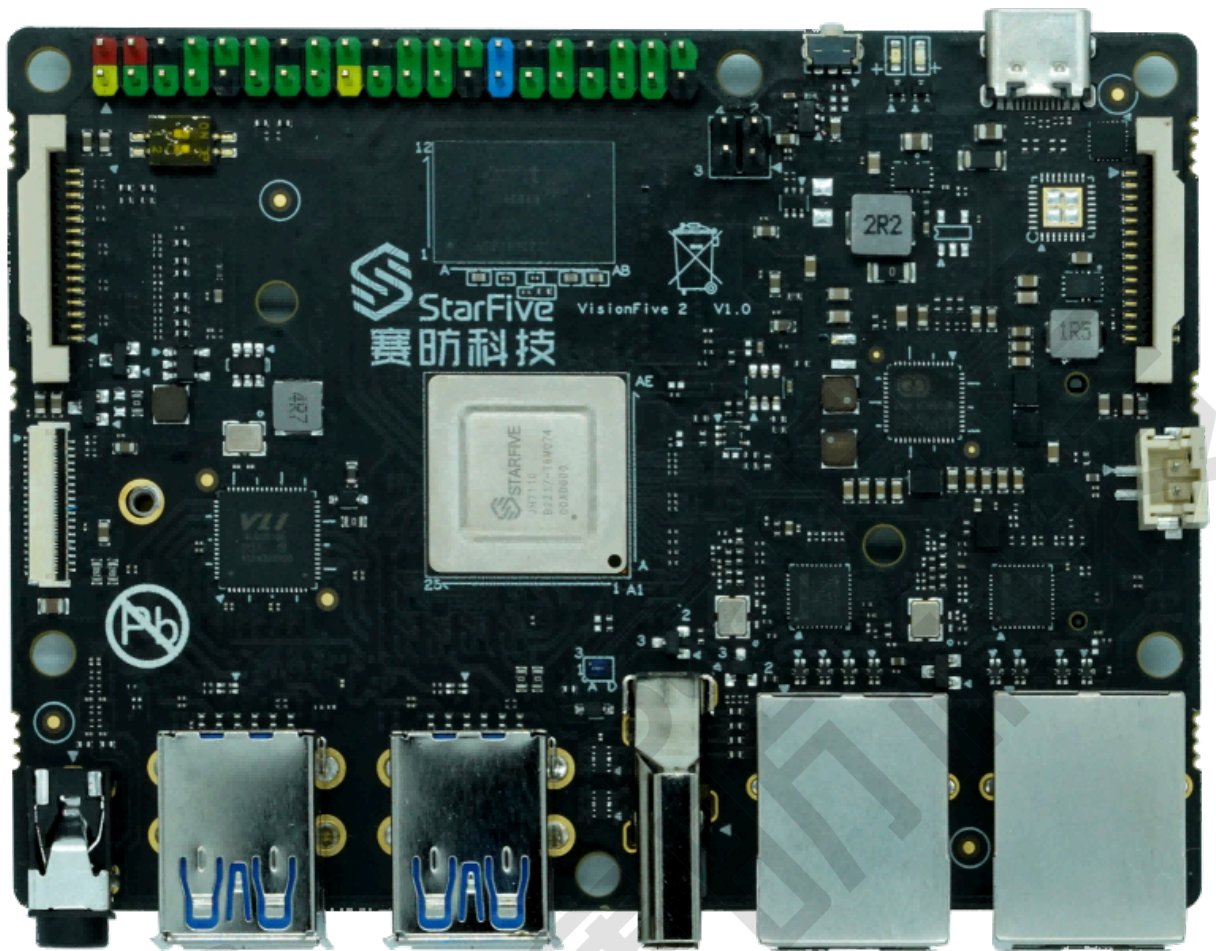
VisionFive 2 is the world's first high-performance RISC-V single board computer (SBC) with an integrated GPU. Compared with its last generation, VisionFive 2 has been fully upgraded with significant improvements in the processor work frequency, multimedia processing capabilities, scalability, etc. Its superior performance and reasonable price make VisionFive 2 the best affordable RISC-V development board ever.

VisionFive 2 boasts a quad-core 64-bit SoC with RV64GC ISA, running up to 1.5 GHz, and integrated with IMG BXE-4-32 MC1, supporting OpenCL 3.0, OpenGL ES 3.2, and Vulkan 1.2. VisionFive 2 available with 2/4/8 GB LPDDR4 RAM options, provides rich I/O peripherals such as M.2 connector, eMMC socket, USB 3.0 ports, a 40-pin GPIO header, Gigabit Ethernet ports, a TF card slot, and many more. It has onboard audio and video processing capabilities and has MIPI-CSI and MIPI-DSI connectors as multimedia peripherals. The open source SBC also provides wide software compatibility including support for Debian, Ubuntu, OpenSUSE, OpenKylin, OpenEuler, Deepin and other software running on theses operating systems.

2. Specifications

VisionFive 2 has the following specifications.

Type	Item	Description
Processor	StarFive JH-7110	StarFive JH-7110 with RISC-V quad-core CPU with 2 MB L2 cache and a monitor core, supporting RV64GC ISA, working up to 1.5 GHz
	Imagination GPU	IMG BXE-4-32 MC1 with work frequency up to 600 MHz
Memory	2 GB/4 GB/8 GB	LPDDR4 SDRAM, up to 2,800 Mbps
Storage	Onboard TF card slot	VisionFive 2can boot from a TF card.
	Flash	The firmware to store U-Boot and BootLoader.
Multimedia	Video Output	• 1 × 2-lane MIPI DSI display port, supporting up to 1080p@30fps • 1 × 4-lane MIPI DSI display port, supporting up to 2K@30fps in both single display and dual display modes. • 1 × HDMI 2.0, supporting up to 4K@30fps or 2K@60fps ✎ **Note:** Only one MIPI DSI port can be used for display at a time.
	Camera	1 × 2-lane MIPI CSI camera port, supporting up to 1080p@30fps
	Encoder/Decoder	• Video decoder supports up to 4K@60fps and multi-stream for H264/H265; • Video encoder supports up to 1080p@30fps and multi-stream for H265; • JEPG encoder/decoder
	Audio	4-pole stereo audio jack
Connectivity	Ethernet	2 × RJ45 Gigabit Ethernet ports
	USB Host	4 × USB 3.0 ports (multiplexed with a PCIe 2.0 1x lane).
	USB Device	1 × USB device port (by reusing the USB-C port)
	M.2 Connector	M.2 M-Key
	eMMC Socket	For eMMC module as OS and data storage.
	2-Pin Fan Header	-
Power	USB-C port	9 V to 12 V DC via USB-C with PD, up to 30 W (minimum 2 A)
	GPIO Power In	5 V DC via GPIO header (minimum 3 A)

Type	Item	Description
	PoE (Power over Ethernet)	Power function is enabled and requires separate PoE HAT
GPIO	40-Pin GPIO Header	1 × 40-pin GPIO header, supporting various interface options: • 3.3 V (on 2 pins) • 5 V (on 2 pins) • Ground (on 8 pins) • GPIO • CAN bus • DMIC • I2C • I2S • PWM • SPI • UART • and so on
Boot Mode	Boot mode setting pins	You can choose one of the following boot modes: • 1-bit QSPI Nor Flash • SDIO3.0 • eMMC • UART
Button	Reset button	To reset VisionFive 2, press and hold the Reset button for more than 3 seconds to ensure the reset is successful.
Dimensions	100 × 74 mm	-
Compliance	RoHS, FCC, CE	-
Environment	Recommended operating temperature	0-50 ℃
Other	Debug function	UART TX and UART RX are available through the 40-pin GPIO header.

3. Physical Specifications
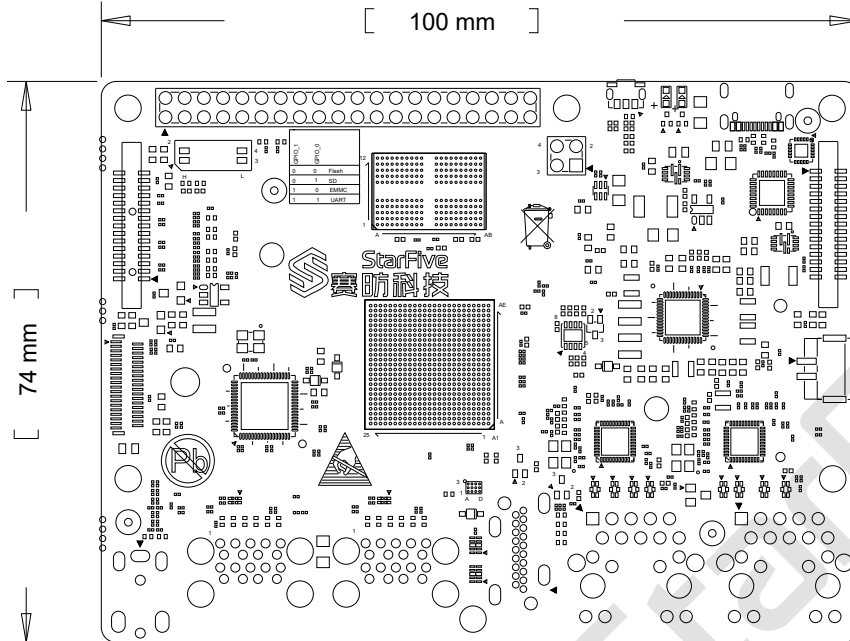
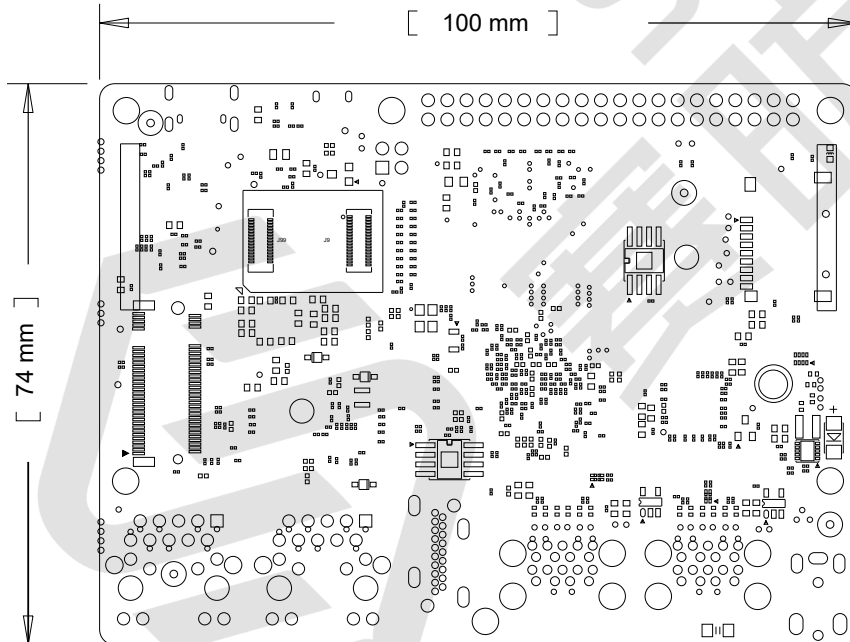**Figure 3-1 VisionFive 2 Mechanical Drawing (Top View)**

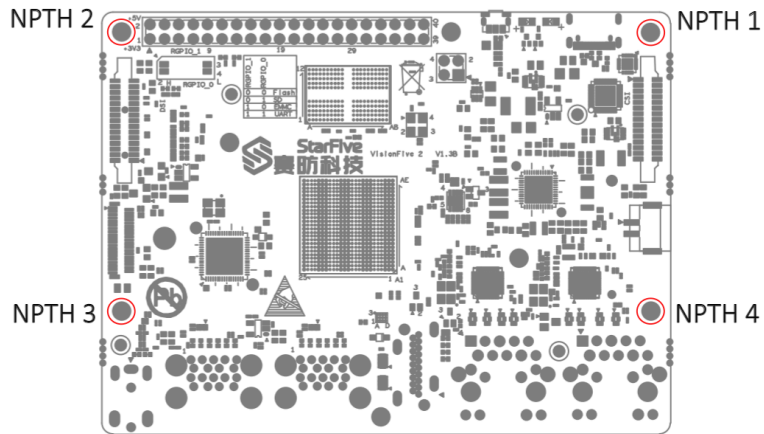**Figure 3-2 VisionFive 2 Mechanical Drawing (Bottom View)**

⚠️ **Warning:**

During the use of VisionFive 2, avoid contact with hard objects that may cause damage. Thus, StarFive recommends that you use spacers for the following NPTHs (Non Plating Through Hole):

Figure 3-3 NPTHs on VisionFive 2

For spacers, StarFive strongly recommends that you use the copper columns or studs with the following specifications:

- Single head hexagonal copper columns (Size: M2.5*10+6mm)

Figure 3-4 Single head hexagonal copper columns

- Double way hexagon copper studs (Size: M2.5*4)

Figure 3-5 Double way hexagon copper studs