StarFive 赛昉科技

VisionFive 2 Product Brief

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Legal Statements

Important legal notice before reading this documentation.

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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

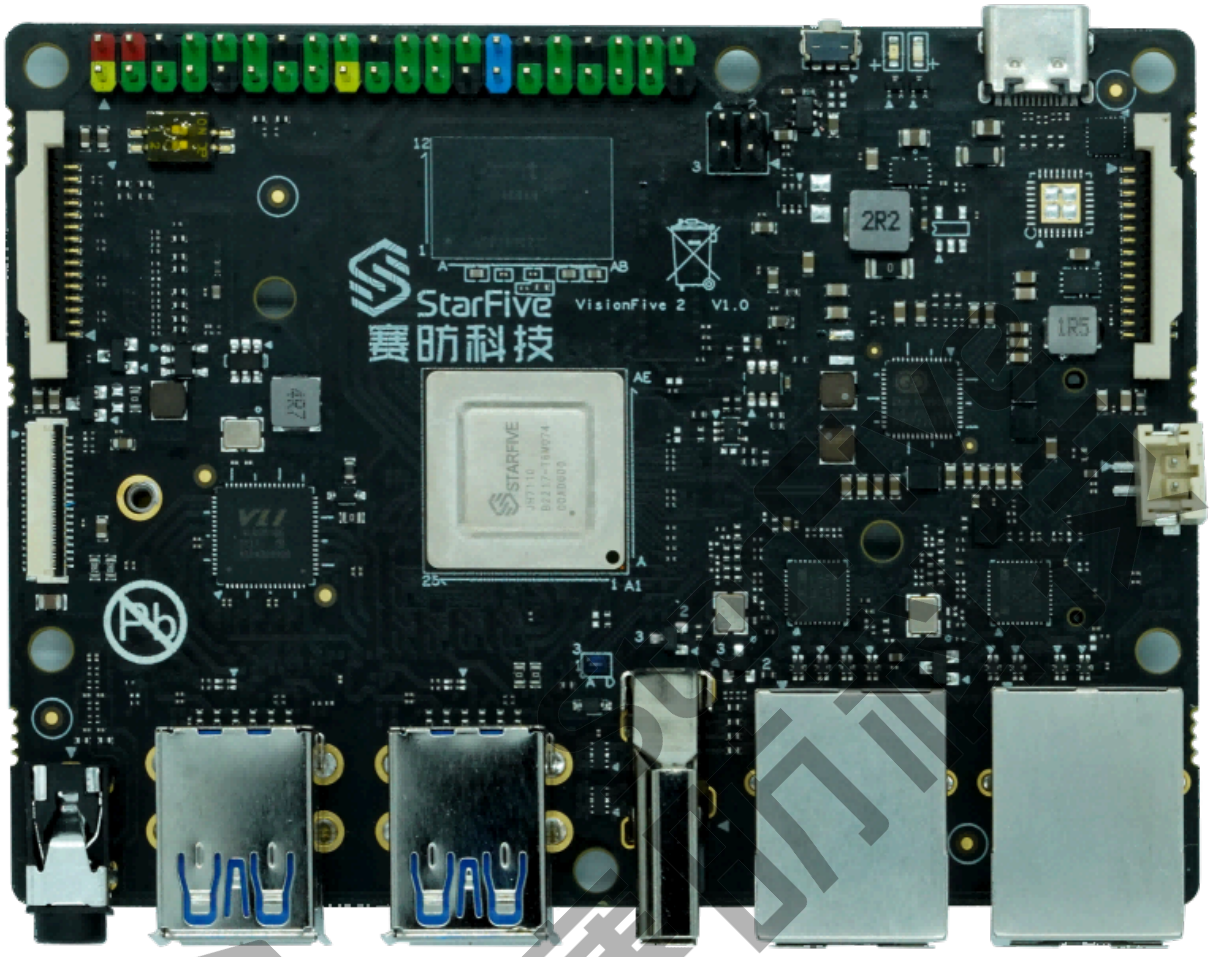
Version	Released	Revision
1.0	2022/08/23	The first release.
1.1	2022/09/08	• Updated the mechanical drawings. • Updated the description about Reset button.
1.2	2022/10/20	• Revised the display of MIPI CSI. • Updated the USB port description. • Added 1 × USB device port. • Updated the GPU description. • Updated the Reset button description.
1.3	2022/12/08	Updated the power requirement via USB-C port. Added a note on using spacers in Physical Specifications *(on page 7)*. Updated the dimensions.

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. Available with 2/4/8 GB LPDDR4 RAM options, VisionFive 2 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.

2. Specifications

VisionFive 2 has the following specifications.

Type	Item	Description
Processor:	StarFive JH7110	StarFive JH7110 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	The VisionFive 2 can 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; • JPEG 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 modules as OS and data storage
	2-Pin Fan Header	-
Power:	USB-C port	5 V DC via USB-C with PD, up to 30 W (minimum 3 A)
	GPIO Power In	5 V DC via GPIO header (minimum 3 A)

Type	Item	Description
	PoE (Power over Ethernet)	PoE 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)

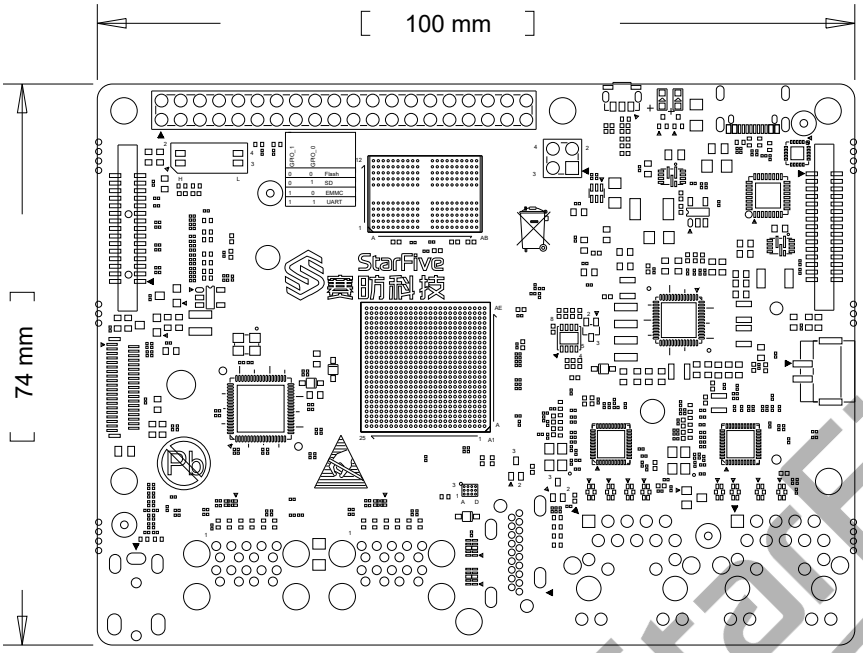
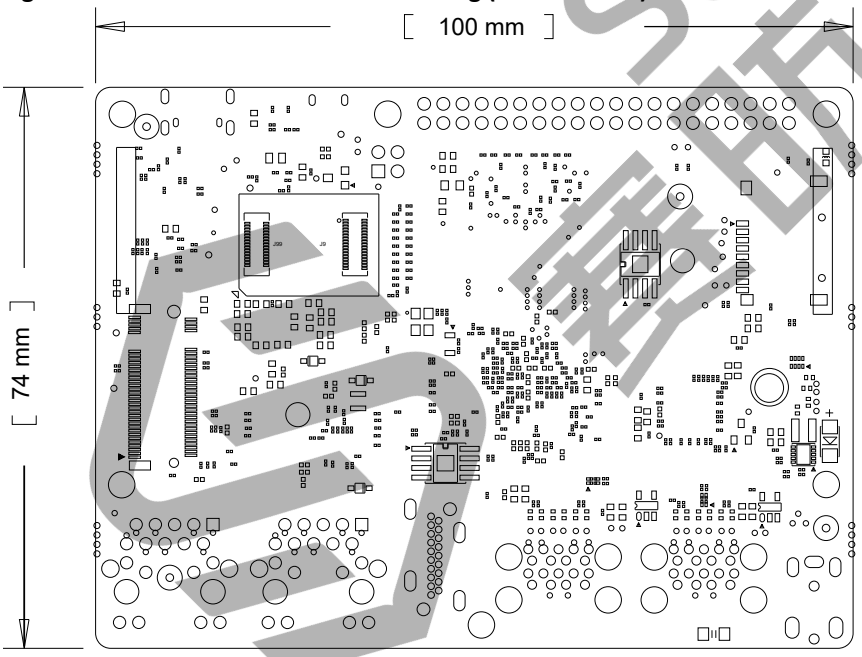


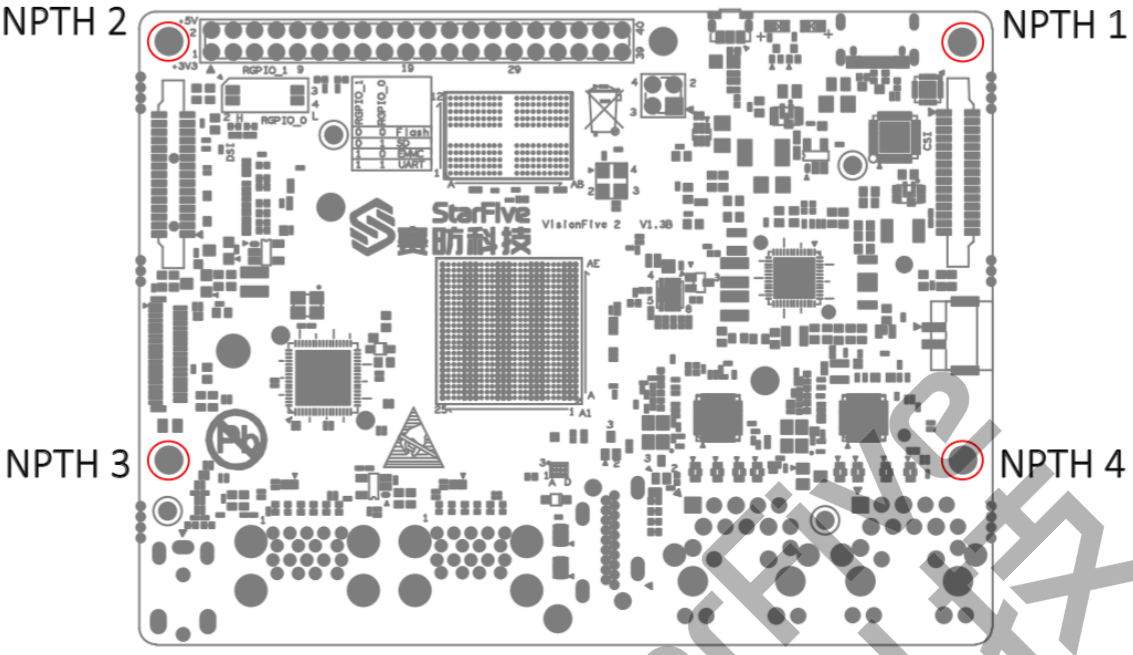
Figure 3-2 VisionFive 2 Mechanical Drawing (Bottom View)



Note:

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):

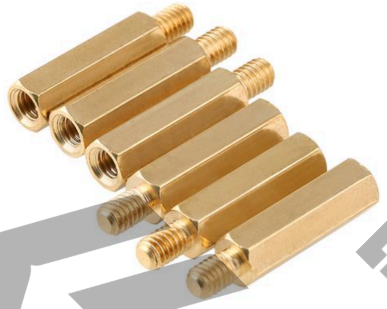
Figure 3-3 NPTHs on VisionFive 2



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