StarFive
赛昉科技

VisionFive 2 Lite Datasheet

Version: 1.0

Date: 2025/09/30

Doc ID: VisionFive2Lite-DSEN-001

Legal Statements

Important legal notice before reading this documentation.

PROPRIETARY NOTICE

Information in this document is provided "as is," with all faults. Contents may be periodically updated or revised due to product development. Shanghai StarFive Semiconductor Co., Ltd. (hereinafter "StarFive") reserves the right to make changes without further notice to any products herein.

StarFive expressly disclaims all warranties, representations, and conditions of any kind, whether express or implied, including, but not limited to, the implied warranties or conditions of merchantability, fitness for a particular purpose, and non-infringement.

StarFive does not assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation indirect, incidental, special, exemplary, or consequential damages.

Contact Us

Address: Room 506, Building 2, No. 61 Shengxia Rd., China (Shanghai) Pilot Free Trade Zone, Shanghai, 201203, China

Website: http://www.starfivetech.com

Email:

- Sales: sales@starfivetech.com
- Support: support@starfivetech.com

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 new single board computer - VisionFive 2 Lite.

Revision History

Table 0-1 Revision History

Version	Released	Revision
1.0	2025/09/30	The first official 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.

Contents

List of Tables

List of Figures

1. Overview

Figure 1-1 VisionFive 2 Lite – Top View

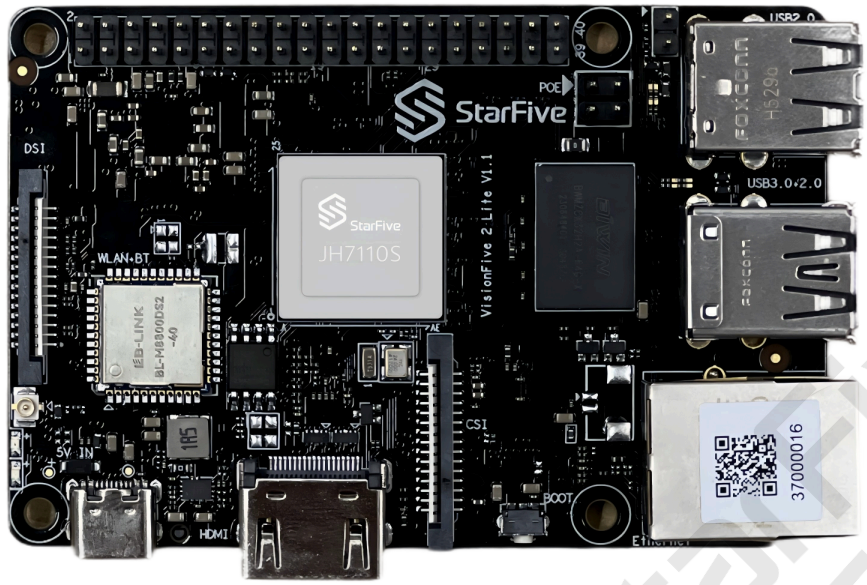
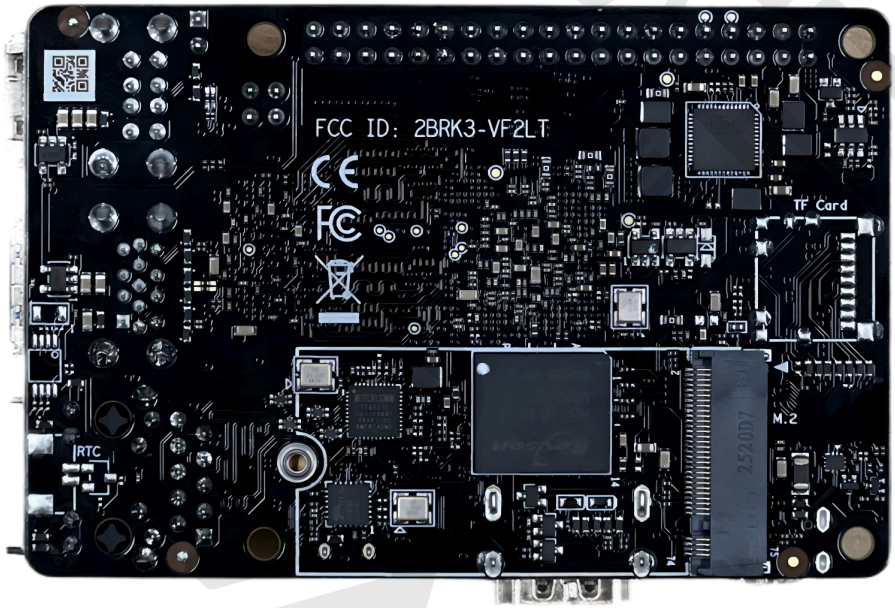


Figure 1-2 VisionFive 2 Lite – Bottom View



VisionFive 2 Lite is a budget-friendly and feature-rich RISC-V single board computer tailored for education, AIoT, smart home, and IIoT applications. Powered by StarFive's JH-7110S quad-core processor, it features robust image and video processing capabilities along with versatile expansion interfaces including PCIe, HDMI, USB 3.0, and Gigabit Ethernet. With full support for mainstream Linux distributions and open-source toolchains, it enables fast development and smooth integration. Whether for learning, prototyping, or embedded deployment, VisionFive 2 Lite delivers an exceptional balance of performance and affordability.

1.1. Block Diagram

The following figure displays the block diagrams of VisionFive 2 Lite.

Figure 1-3 VisionFive 2 Lite Block Diagram - Top View

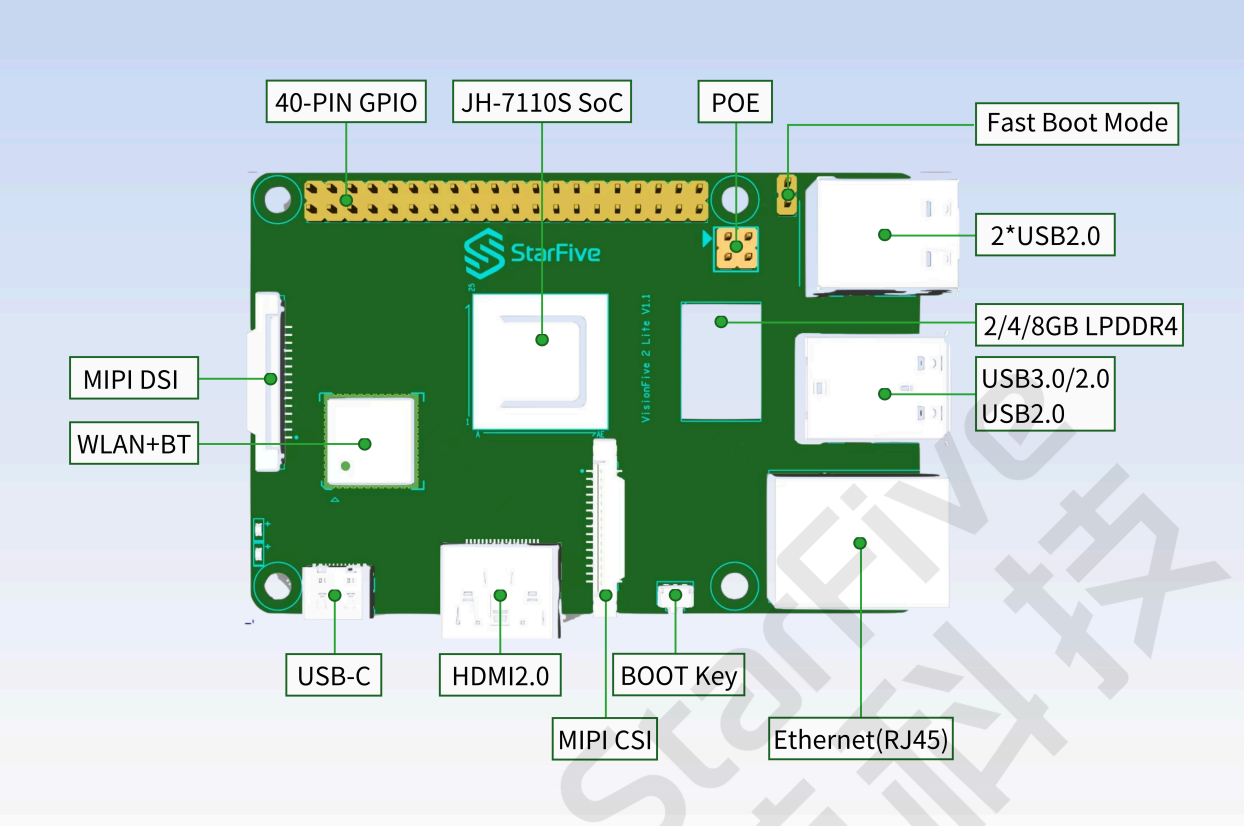
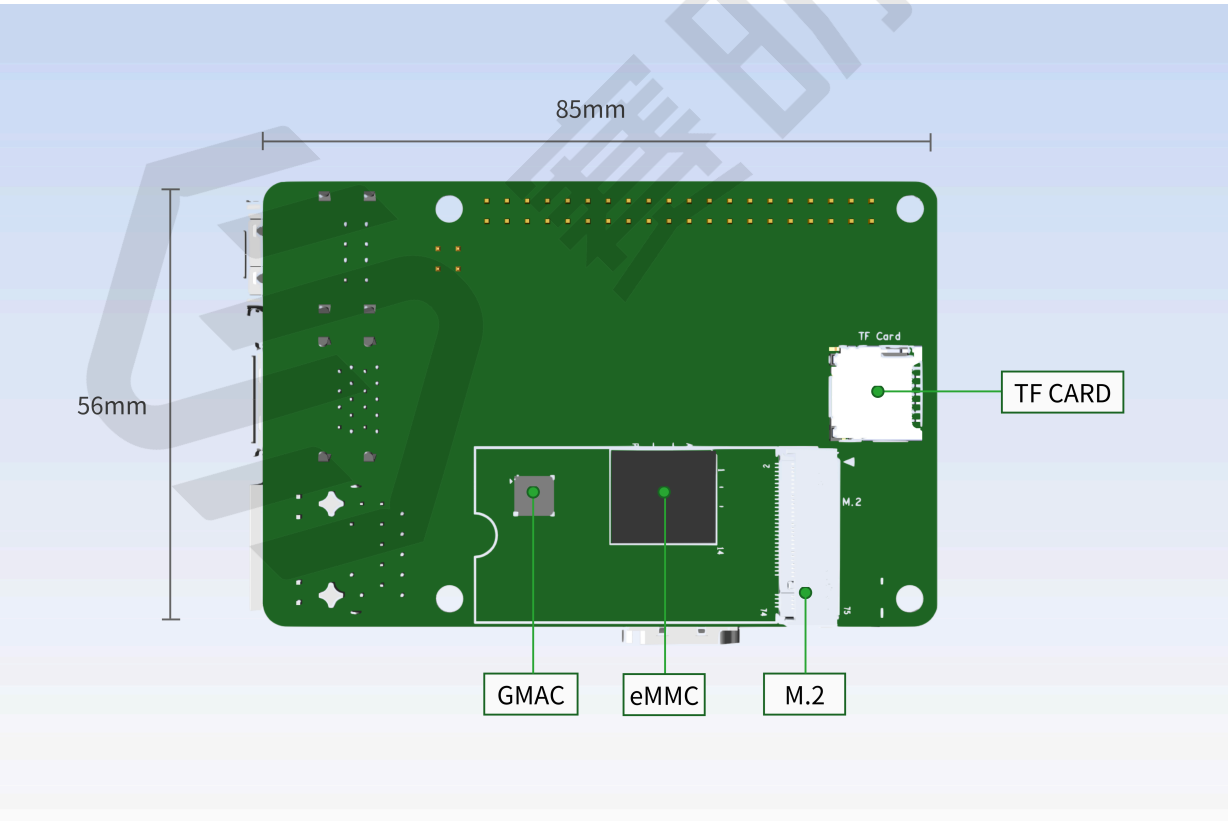


Figure 1-4 VisionFive 2 Lite Block Diagram - Bottom View



2. Features

VisionFive 2 Lite provides the following features.

2.1. Hardware

This section describes the following VisionFive 2 Lite hardware functions.

Processor

- StarFive JH-7110S with RISC-V quad-core CPU with 2 MB L2 cache and a monitor core, supporting RV64GC ISA, working up to 1.25 GHz
- IMGBXE-4-32 MC1 with work frequency up to 400MHz

Memory

VisionFive 2 Lite provides the system memory of 2 GB, 4 GB, or 8 GB LPDDR4 SDRAM up to 2,800 Mbps.

Storage

- Onboard TF card slot or eMMC.
- QSPI Flash: The firmware to store U-Boot and BootLoader.

Video Processing

The video processing of VisionFive 2 Lite has the following features.

- 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

2.2. Interfaces

- 1× 2-lane MIPI DSI
- 1× 2-lane MIPI CSI
- 1× USB-C port for charging
- 1× USB device port (by reusing the USB-C port)
- 3× USB 2.0 and 1 ×USB 3.0/USB 2.0 ports
- 1× M.2 M-Key (size:2242)
- 1× WiFi 6 & BT 5.4

- 1× HDMI 2.0
- 1× RJ45 Ethernet port
- 1× 4-pin PoE header
- 1× 2-pin fastboot header
- 1× boot key (recovery mode)
- 1× 40-pin GPIO header

2.3. Software

Operating System

VisionFive 2 Lite supports Ubuntu and Debian operating system.

For more software resources, please follow the StarFive GitHub repository.

3. Mechanical Specification

Figure 3-1 VisionFive 2 Lite Mechanical Drawing - Top View

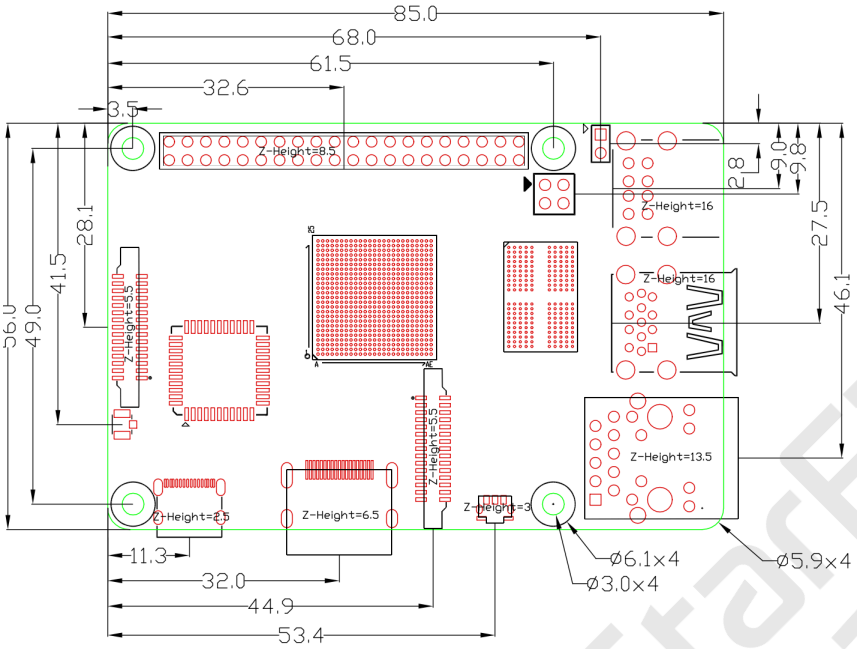
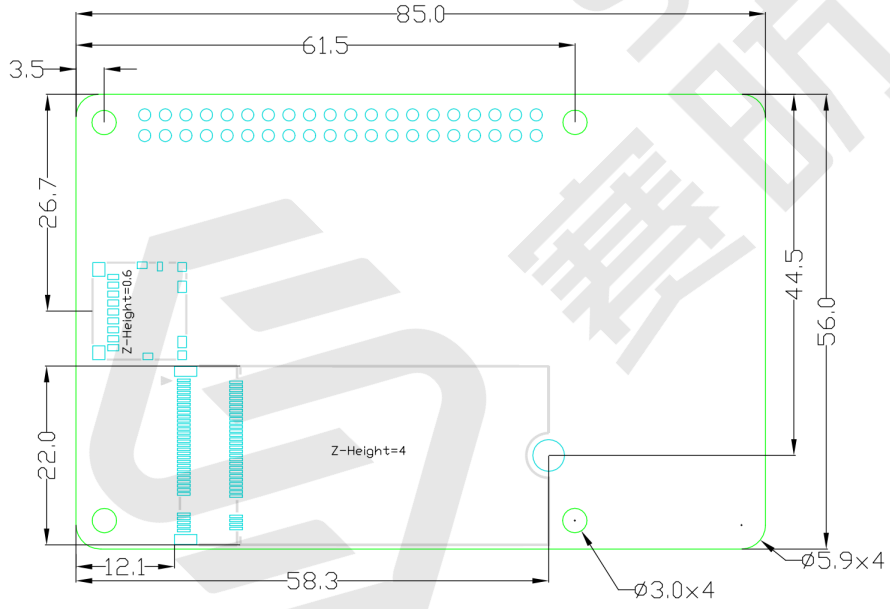


Figure 3-2 VisionFive 2 Lite Mechanical Drawing - Bottom View



Dimensions

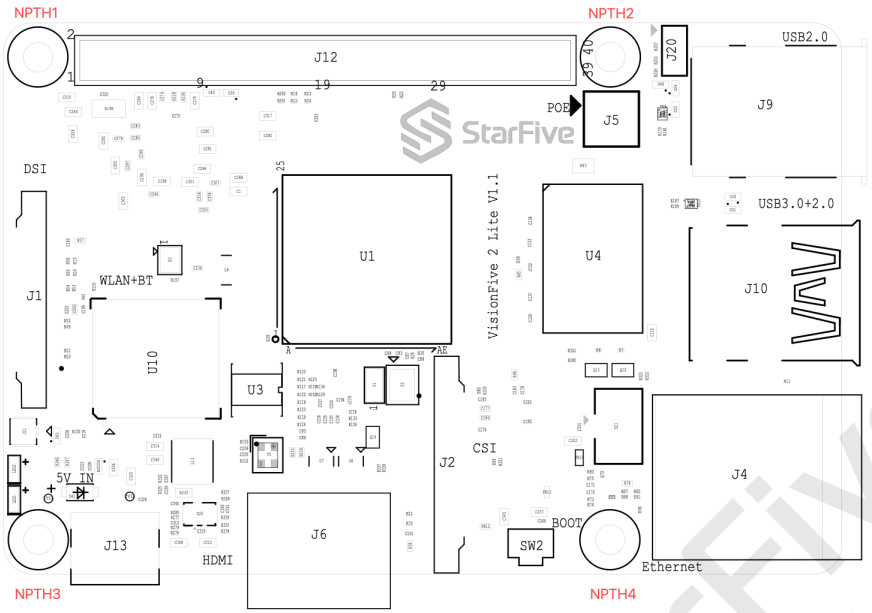
VisionFive 2 Lite has the following dimensions.

- Length: 85 mm
- Width: 56 mm

Warning:

During the use of VisionFive 2 Lite, 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 Lite



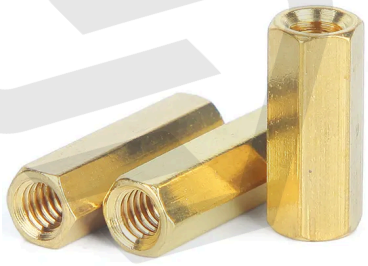
For spacers, StarFive strongly recommends that you use the copper columns or studs with the following specifications:

- 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



4. Electrical Specification

This chapter describes the VisionFive 2 Lite electrical specification.

4.1. Power Requirements

Input Power

VisionFive 2 Lite supports various ways of powering, smart power adapter as well as fixed voltage:

- USB Type C 5V/3A
- 5V Power from PoE Header
- 5V Power from the GPIO Pin 2 and 4

4.2. GPIO Voltage

The required voltage level for all GPIO pins is 3.3 V.

5. Peripherals

VisionFive 2 Lite has the following peripherals.

5.1. GPIO Interface

VisionFive 2 Lite offers 40-Pin GPIO expansion which is compatible with most accessories on the market, 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

5.1.1. GPIO Pin Assignments

The following table describes the GPIO pin assignments.

Pin Name	Pin Num	Pin Num	Pin Name
+3.3V	1	2	+5V
GPIO58 (I2C SDA)	3	4	+5V
GPIO57 (I2C SCL)	5	6	GND
GPIO55	7	8	GPIO5 (UART TX)
GND	9	10	GPIO6 (UART RX)
GPIO42	11	12	GPIO38

Pin Name	Pin Num	Pin Num	Pin Name
GPIO43	13	14	GND
GPIO47	15	16	GPIO54
+3.3V	17	18	GPIO51
GPIO52 (SPI MOSI)	19	20	GND
GPIO53 (SPI MISO)	21	22	GPIO50
GPIO48 (SPI SCLK)	23	24	GPIO49 (SPI CE0)
GND	25	26	GPIO56
GPIO45	27	28	GPIO40
GPIO37	29	30	GND
GPIO39	31	32	GPIO46 (PWM0)
GPIO59 (PWM1)	33	34	GND
GPIO63	35	36	GPIO36
GPIO60	37	38	GPIO61
GND	39	40	GPIO44

5.1.2. GPIO Alternative Functions

All GPIOs can be switched (multiplexed) to support different functions including but not limited to SDIO, Audio, DMIC, SPI, I2C, UART, PWM, and CAN bus. For detailed instructions, refer to the *VisionFive 2 40-Pin GPIO Header User Guide*. The alternate peripheral functions are described in detail in the *JH7110 Datasheet*.

5.2. Camera and Display Interfaces

The following connectors are backward compatible with other industrial commonly used camera and display peripherals.

Camera

VisionFive 2 Lite has 1× 2-lane MIPI CSI camera port, supporting up to 1080p@30fps.

For the pin definition, see 2-Lane MIPI CSI Pin Definition *(on page 15)*.

Display

VisionFive 2 Lite has the following interfaces for camera and display.

- 1× 2-lane MIPI DSI display port, supporting up to 1080p@30fps

  For the pin definition, see 2-Lane MIPI DSI Pin Definition *(on page 16)*.

- 1× HDMI 2.0, supporting up to 4K@30fps or 2K@60fps

5.2.1. 2-Lane MIPI CSI Pin Definition

The following figure and table describe the 2-lane MIPI DSI definition:

Figure 5-1 2-Lane MIPI CSI Pin Definition

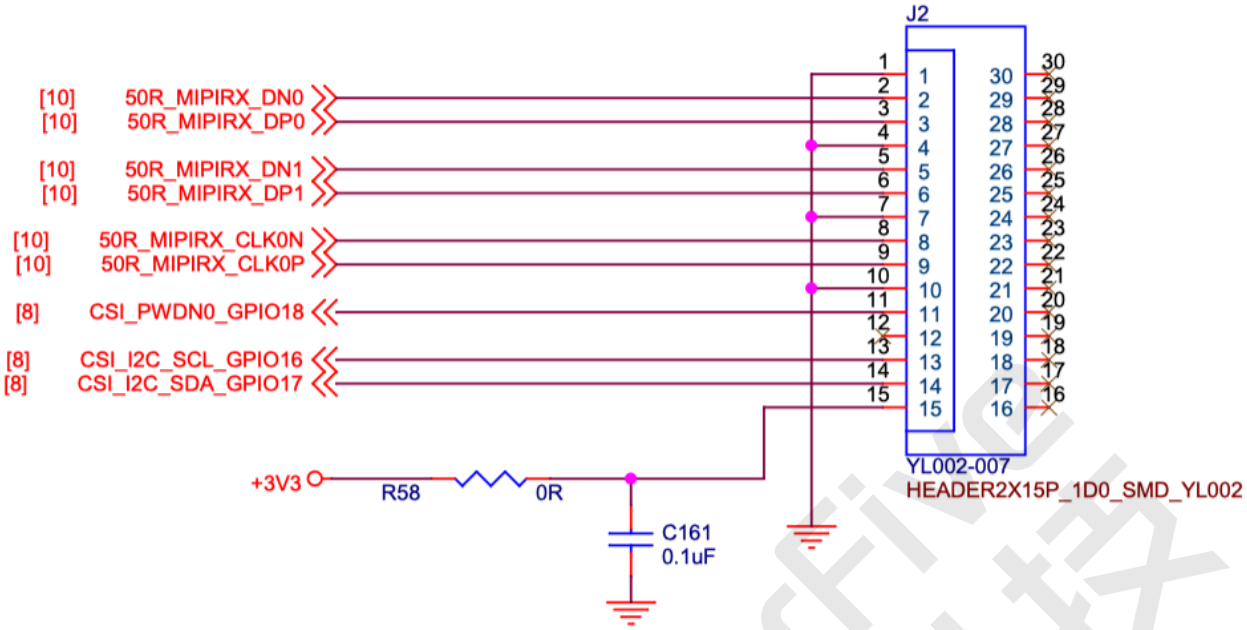


Table 5-2 2-Lane MIPI DSI Pin Definition

No.	Definition	Description	Voltage
1	GND	Ground	-
2	50R_MIPIRX_DN0	MIPI Input Lane 0 Negative	1.8V
3	50R_MIPIRX_DP0	MIPI Input Lane 0 Positive	1.8V
4	GND	Ground	-
5	50R_MIPIRX_ DN1	MIPI Input Lane 1 Negative	1.8V
6	50R_MIPIRX_ DP1	MIPI Input Lane 1 Positive	1.8V
7	GND	Ground	-
8	50R_MIPIRX_CLK0N	MIPI Input Clock 0 Negative	1.8V
9	50R_MIPIRX_CLK0P	MIPI Input Clock 0 Positive	1.8V
10	GND	Ground	-
11	CSI_PWDN0_GPIO18	CSI power control	3.3V
12	NC	NC	-
13	CSI_I2C_SCL_GPIO16	CSII2C SCL	3.3V
14	CSI_I2C_SDA_GPIO17	CSII2C SDA	3.3V
15	+3.3 V	Power Voltage for digital circuit 3.3 V	3.3V

5.2.2. 2-Lane MIPI DSI Pin Definition

The following figure and table describe the 2-lane MIPI DSI definition:

Figure 5-2 2-Lane MIPI DSI Pin Definition

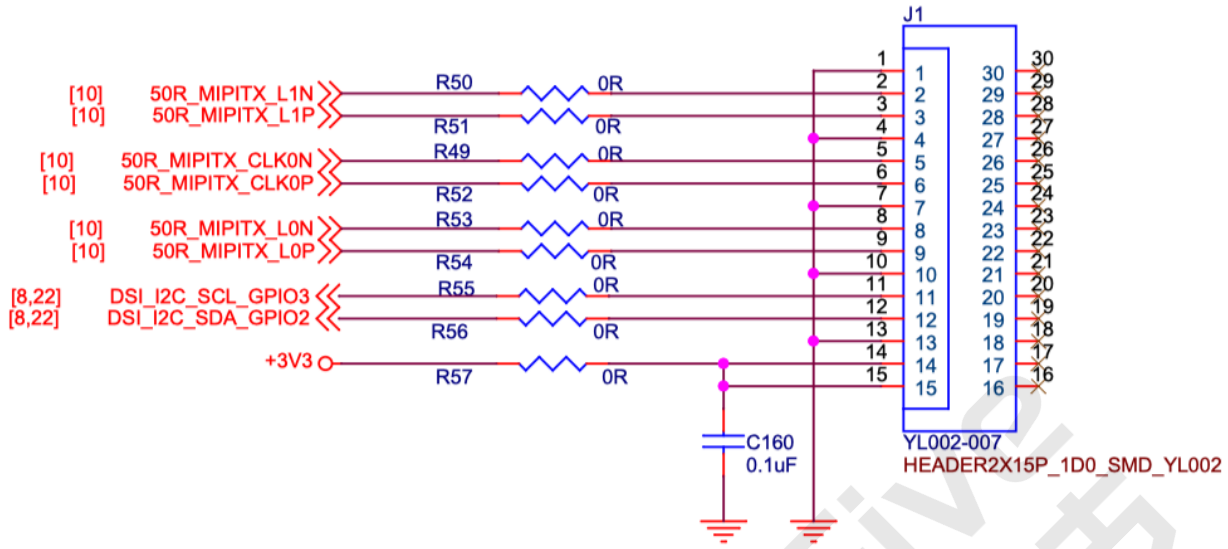


Table 5-3 2-Lane MIPI DSI Pin Definition

PIN NO.	Pin Definition	Description	Voltage
1	GND	Ground	-
2	50R_MIPITX_L1N	MIPI Output Lane 1 Negative	1.8V
3	50R_MIPITX_L1P	MIPI Output Lane 1 Positive	1.8V
4	GND	Ground	-
5	50R_MIPITX_CLK0N	MIPI Output Clock 0 Negative	1.8V
6	50R_MIPITX_CLK0P	MIPI Output Clock 0 Positive	1.8V
7	GND	Ground	-
8	50R_MIPITX_L0N	MIPI Output Lane 0 Negative	1.8V
9	50R_MIPITX_L0P	MIPI Output Lane 0 Positive	1.8V
10	GND	Ground	-
11	DSI_I2C_SCL_GPIO3	DSII2C SCL	3.3V
12	DSI_I2C_SDA_GPIO2	DSII2C SDA	3.3V
13	GND	Ground	-
14	+3.3V	Power Voltage for digital circuit 3.3 V	3.3V
15	+3.3V	Power Voltage for digital circuit 3.3 V	3.3V

5.3. USB Host

VisionFive 2 Lite has a 3× USB 2.0 and 1× USB 3.0/USB 2.0 ports (multiplexed with a PCIe 2.0 1× lane).

5.4. USB Device Port

VisionFive 2 Lite has 1× USB device port by reusing the USB-C port.

5.5. HDMI

VisionFive 2 Lite has 1× HDMI 2.0, supporting up to 4K@30fps or 2K@60fps.

5.6. M.2 Connector

VisionFive 2 Lite offers an M.2 M-Key SSD socket with 1× PCIe 2.0 interface, providing high speed storage access.

5.7. Gigabit Ethernet Port

VisionFive 2 Lite has 1× RJ45 Gigabit Ethernet port.

5.8. PoE Header

VisionFive 2 Lite provides Power over Ethernet (PoE) function. PoE carries electrical power through data cables, and reduces the cabling requirements for network devices. You can use this function by adding a separate PoE HAT out of our product package.

5.9. Fastboot Header

VisionFive 2 Lite has a 2-pin fastboot header. You can flash the OS image to the eMMC via a USB-C data cable. For detailed instructions, refer to the *VisionFive 2 Lite Quick Start Guide*.

5.10. Boot Button

VisionFive 2 Lite provides 1× Boot button for recovering the bootloader. For detailed instructions, refer to the *VisionFive 2 Lite Quick Start Guide*

6. Temperature Range and Thermals

The recommended ambient operating temperature range is 0 to 50 degrees Celcius.

To reduce thermal output when idling or under light load, VisionFive 2 Lite reduces the CPU clock speed and voltage. During heavier load, the speed and voltage (and hence thermal output) are increased. The internal governor will throttle back both the CPU speed and voltage to make sure the CPU temperature never exceeds 85 degrees C.

VisionFive 2 Lite will operate perfectly well without any extra cooling and is designed for sprint performance - expecting a light use case on average and ramping up the CPU speed when needed (for example, when loading a webpage). If a user wishes to load the system continually or operate it at a high temperature at full performance, further cooling may be needed.

7. Support

For support, post questions to the RVspace forum.