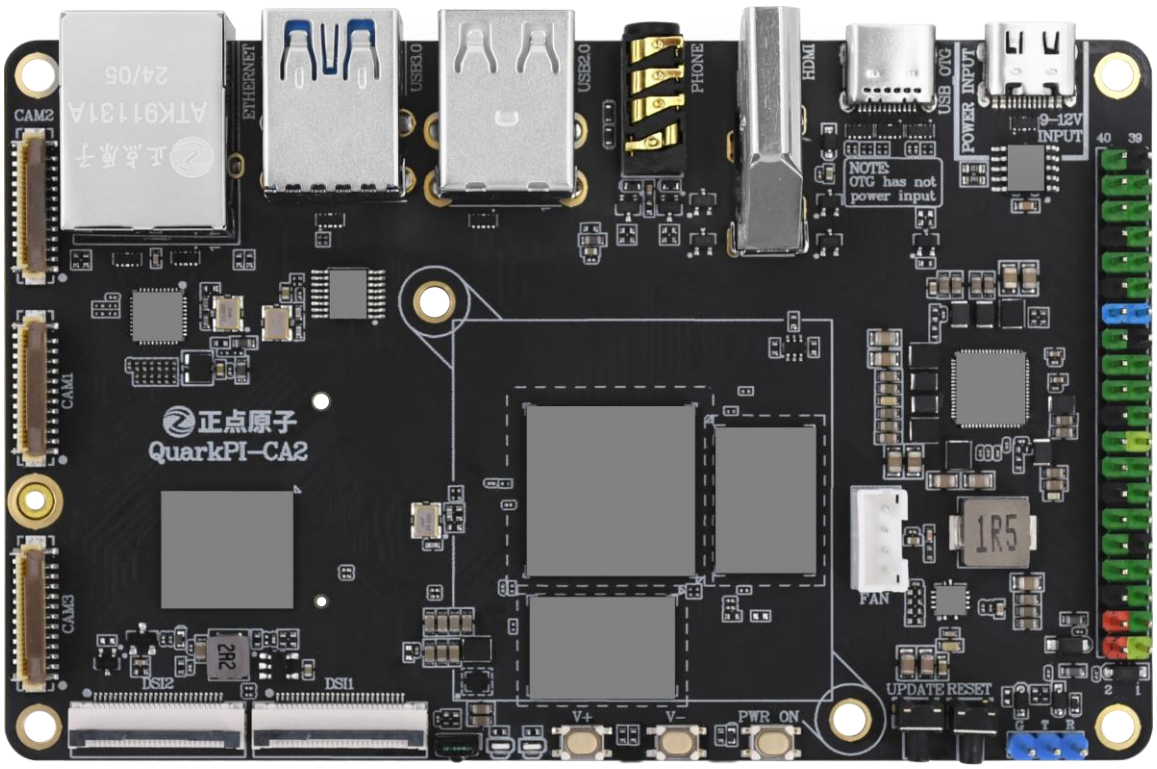
QuarkPi-CA2

Card computer Specification

V1.0



ALIENTEK

1. Shopping:

TMALL: https://zhengdianyuanzi.tmall.com

TAOBAO: https://openedv.taobao.com

2. Download

Address: http://www.openedv.com/docs/index.html

3. FAE

Website : www.alientek.com

Forum : http://www.openedv.com/forum.php

Videos : www.yuanzige.com

Fax : +86 - 20 - 36773971

Phone : +86 - 20 - 38271790

Disclaimer

The product specifications and instructions mentioned in this document are for reference only and subject to update without prior notice; Unless otherwise agreed, this document is intended as a product guide only, and none of the representations made herein constitutes a warranty of any kind.

In order to get the latest version of product information, please regularly visit the download center or contact the customer service of Taobao ALIENTEK flagship store. Thank you for your tolerance and support.

Revision History:

Version	Version Update Notes	Responsible person	Proofreading	Date
V1.0	release officially	ALIENTEK Linux Team	ALIENTEK Linux Team	2025.02.19

Catalogue

Chapter 1. Product Overview

1.1 Introduction to QuarkPi-CA2 Card Computer

QuarkPi-CA2 is a "Single Board Computer" board card developed by ALIENTEK based on the RK3588S chip from Rockchip. The direct translation in Chinese is "single-board computer". In a broader sense, a single-board computer is defined as a PC board that integrates a CPU, RAM, ROM, and "input/output interfaces" (including display interfaces and keyboards, mice, etc.). It can be called a stand-alone computer. Because the development board is only slightly larger than a credit card, another name for it is "card computer". The default operating system of QuarkPi-CA2 card computer is the Debian system optimized and customized by the ALIENTEK team. It also supports Android and Buildroot operating systems. The card computer provides a commercial-grade version. There are two options for memory and storage for you to choose from: 4G LPDDR4X + 32G EMMC, 8G LPDDR4X + 64G EMMC, and 16G LPDDR4X + 128G EMMC, which can meet the capacity requirements of most usage scenarios.

The RK3588S chip is a high-end general-purpose SoC. It adopts 8nm manufacturing process and integrates 4-core Cortex-A76 + 4-core Cortex-A55 processors and Mali-G610 graphics processing unit to provide a powerful performance foundation. It also includes a hardware decoder that supports mainstream encoding formats such as H.264, H.265, VP8, VP9, and AV1. It can decode 8K@60fps (in H.265 format) at its maximum. It also includes a hardware encoder that supports H.264 and H.265 encoding formats, and can encode 8K@30fps at its maximum. It has a built-in 3-core NPU with a computing power of up to 6TOPS, providing strong support for lightweight AI scenarios.

It provides abundant development documents and software resources, covering Debian system development and Android system development, etc., which greatly facilitates users' secondary development and shortens the research and development cycle.

Download link:

http://www.openedv.com/docs/boards/arm-linux/index.html

1.2 Application Areas

The application scope of the QuarkPi -CA2 card computer:

- Home automation devices (recorders, smart locks, TV boxes, access control and attendance systems, etc.).
- Servers (NAS, soft routers, private clouds, lightweight web servers, etc.).
- Multimedia fields (smart offices, digital campuses, live streaming, network cameras, etc.).
- Industrialization (electronic billboards, multi-channel video, information collection, unmanned supermarkets, etc.)

Chapter 2. Chip Resource Parameters

2.1 Parameters of RK3588S Chip

The summary table of the main resources of the RK3588S main control chip is as follows:

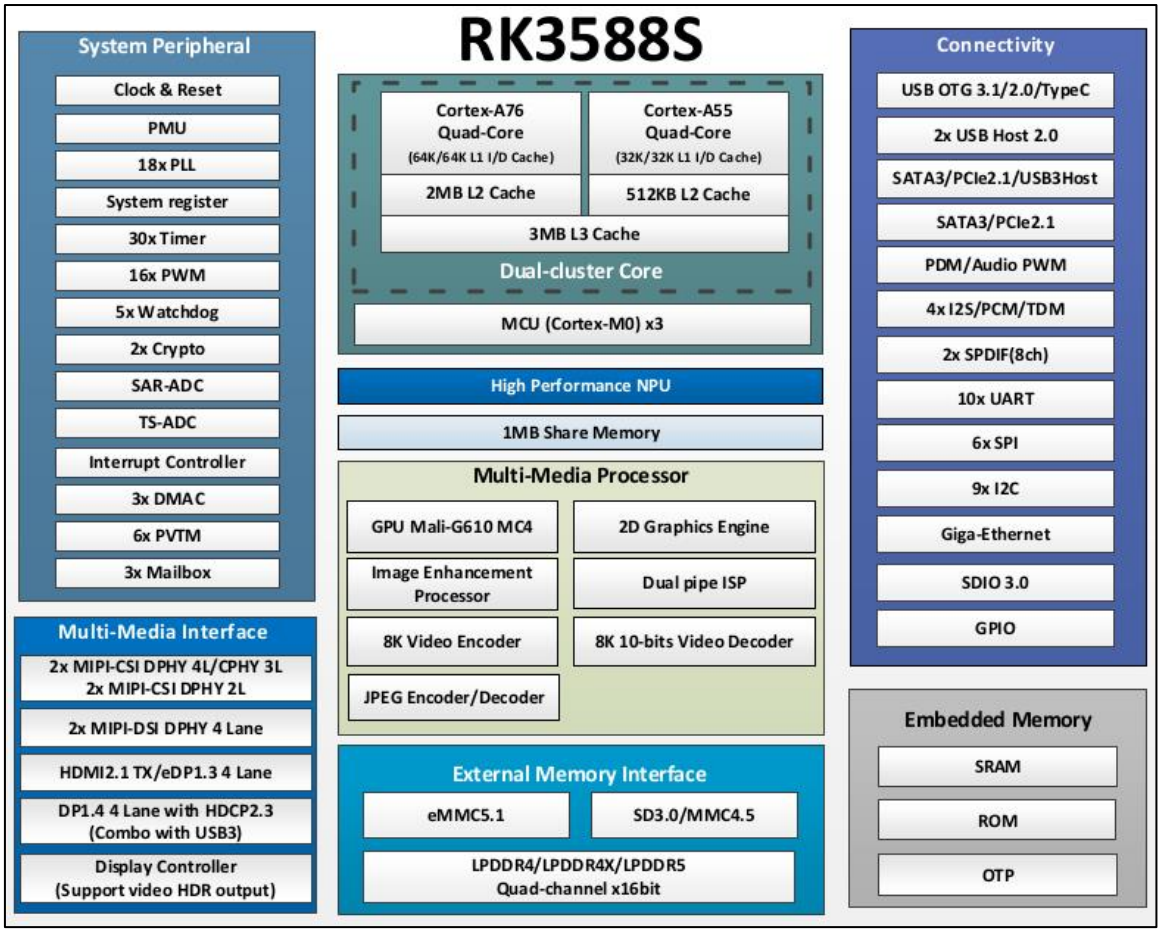


Figure 2.1-1 Chip resources

Chapter 3. Product Specifications

3.1 Appearance of QuarkPi-CA2

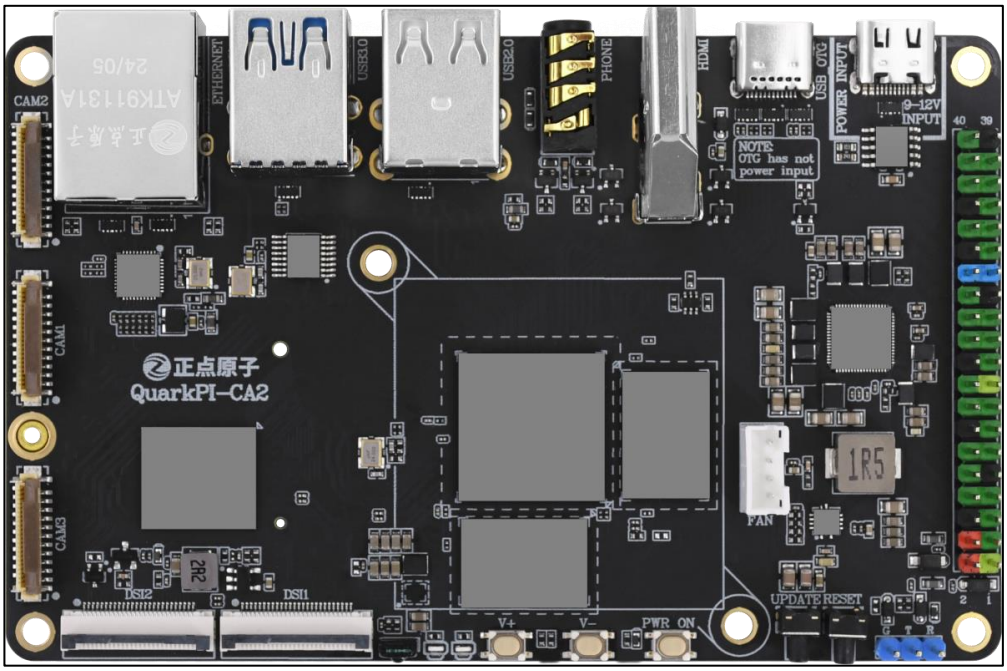


Figure 3.1-1 The front view of QuarkPi-CA2

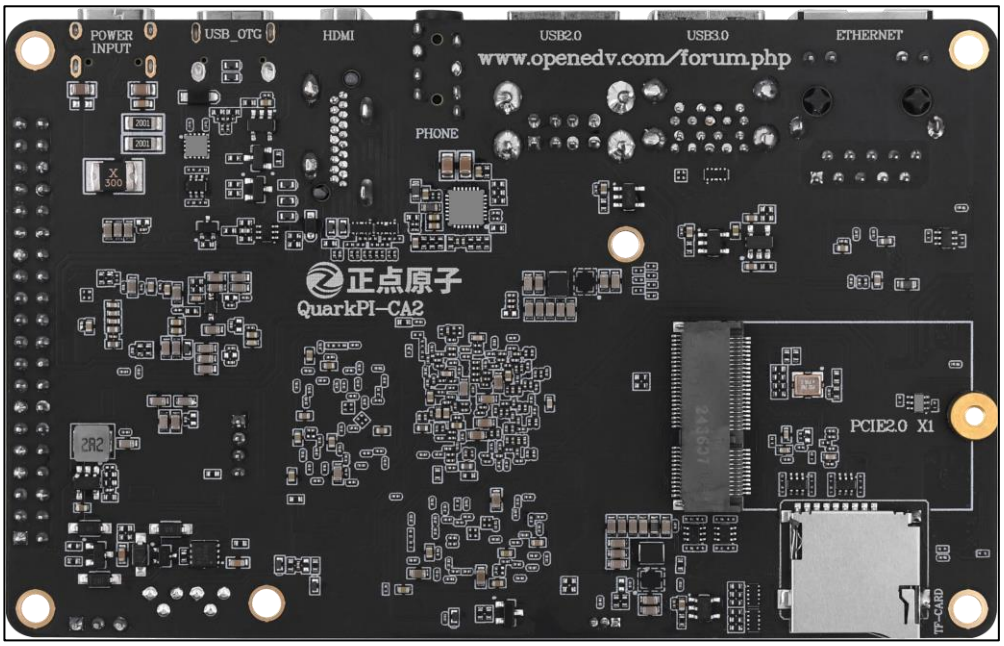


Figure 3.1-2 Back view of QuarkPi-CA2

3.2 Mechanical dimensions of QuarkPi-CA2

The size of the card computer is 115mm * 72mm. The image below is from "Development Board CD-ROM A Disk - Basic Information\03_hardware\QuarkPi-CA2_V1.0 Mechanical Dimension Chart.pdf". The design of the board fully considers humanized design and combines the design

experience of ALIENTEK for many years. After multiple improvements, this design was finally determined.

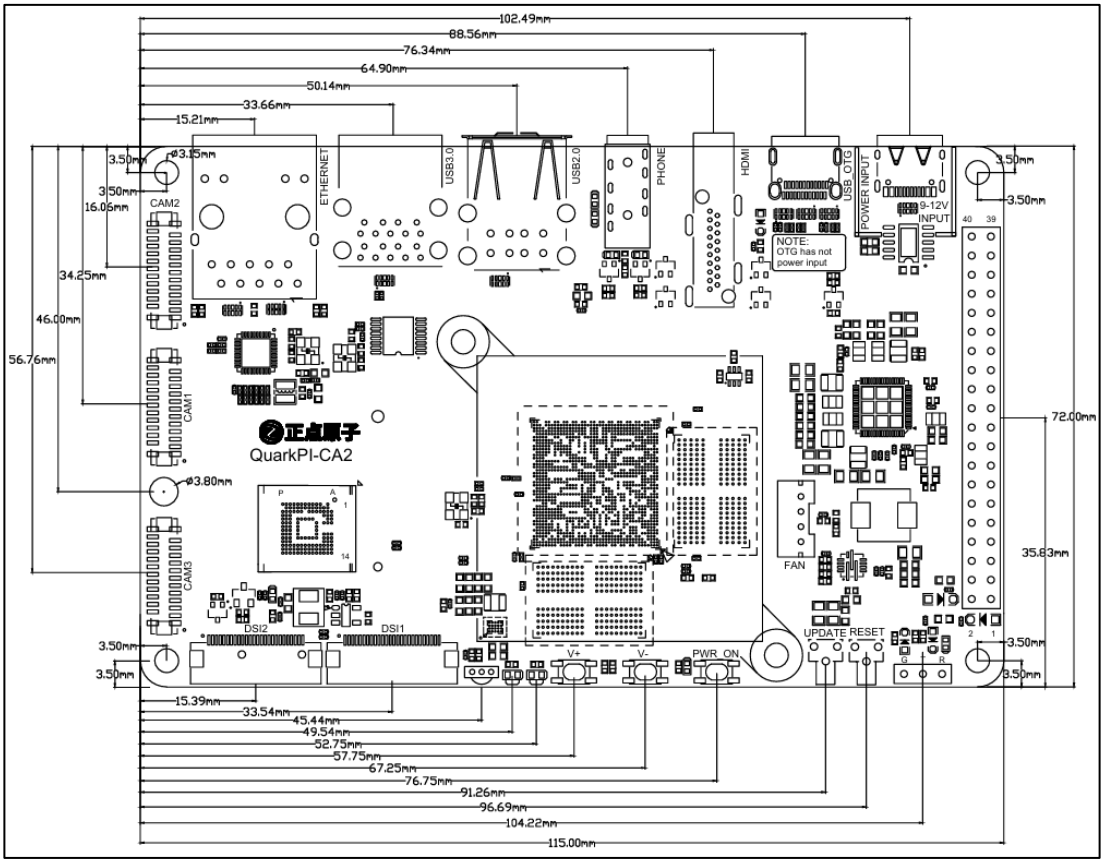


Figure 3.2-1 QuarkPi-CA2 mechanical dimensions

3.3 Peripheral Resources of QuarkPi-CA2

The resources of QuarkPi-CA2 are abundant. Most of the internal resources can be verified on this QuarkPi-CA2. Meanwhile, it is equipped with a rich set of interfaces and functional modules, making the entire QuarkPi-CA2 look very grand.

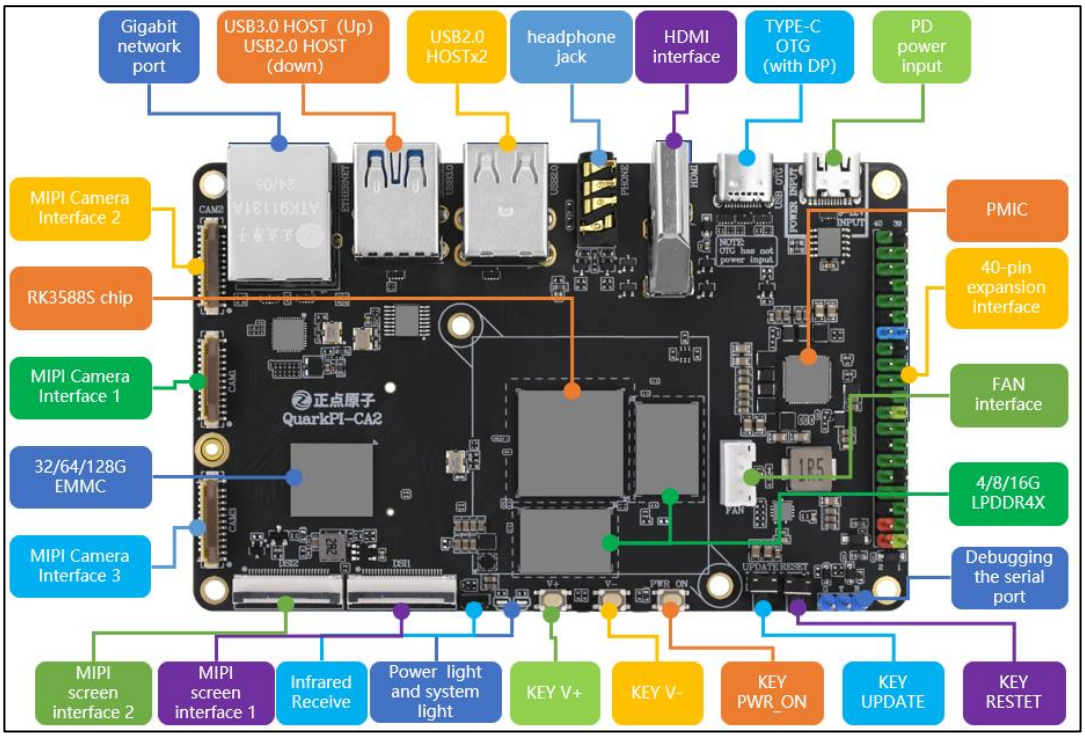


Figure 3.3-1 QuarkPi-CA2 Frontal Resource Diagram

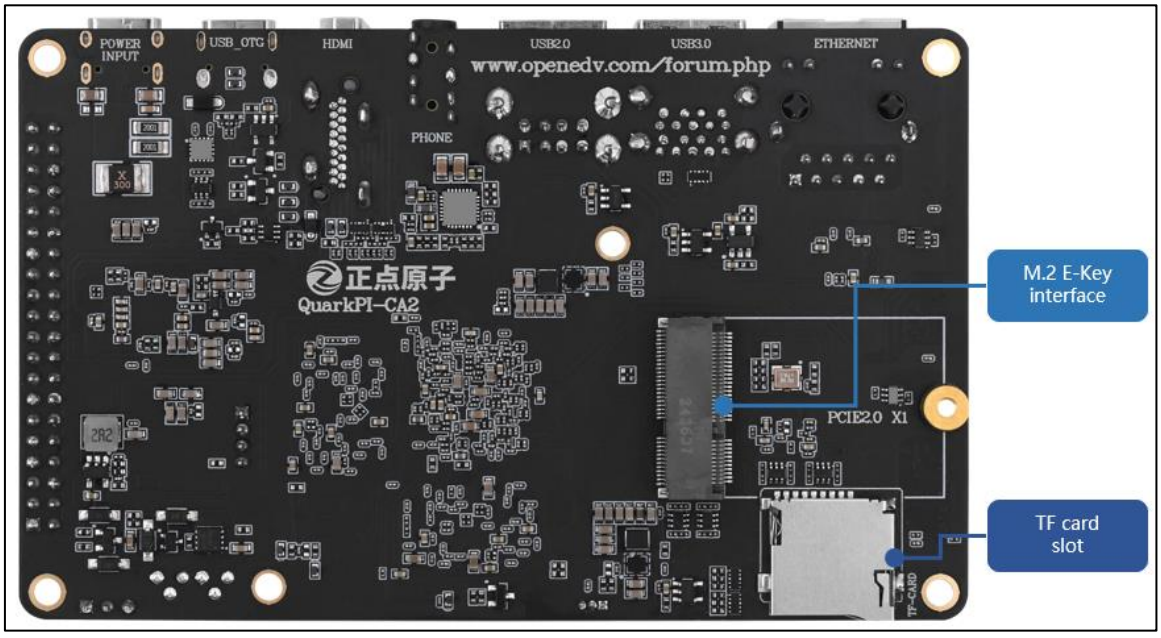


Figure 3.3-2 QuarkPi-CA2 Backside Resource Map

From the two pictures above, we can see that QuarkPi-CA2 integrates a large number of components and has a rich set of interfaces. At the same time, we have made the size of QuarkPi-CA2 to be 115mm * 72mm, which is a relatively compact size.

The resources of ALIENTEK QuarkPi-CA2 are as follows:

- Main chip: RK3588S
- Two LPDDR4X SDRAM chips (total capacity of 4GB, 8GB or 16GB)
- EMMC chip (capacity of 32GB, 64GB or 128GB)

- RK806-1 power management chip
- HDMI interface (up to 4K 60 frames per second)
- Gigabit Ethernet port
- 4 USB interfaces (1*3.0 + 3*2.0)
- TYPE-C interface (supports USB 3.0 and DP output)
- TYPE-C PD power supply interface
- One reset button for resetting the card computer
- One UPDATE button for burning the card computer
- One 3.5mm headset-microphone integrated interface
- Three function buttons (volume increase/decrease and PWR_ON button derived from RK806-1)
- 4P cooling fan interface
- 3P debugging serial port interface
- Infrared receiving sensor
- 26P MIPI screen interface *2
- 22P MIPI camera interface *3
- 40P expansion interface
- TF CARD slot
- M.2 E-KEY WIFI/BT expansion card interface

The reasonable arrangement of interface layout and the reduction of size to such an extent while still retaining a large number of interfaces enable us to achieve various application scenarios. We can use it as a small portable computer for lightweight office scenarios. With the 40P expansion interface, it can serve as a base for realizing our various imaginative ideas. The reserved M.2 interface on the card computer can be connected with a WIFI module to achieve a private NAS or a small gateway.

3.4 QuarkPi-CA2 Resources

The Debian system resources pre-installed on the device are as shown in Table 3.4.1：

Type	Description	Note
Card computer name	QuarkPi-CA2	Omitted
Main chip	RK3588S	Omitted
Memory	4/8/16GB LPDDR4X	Omitted
Storage	32/64/128 GB EMMC	Omitted
U-Boot	Version: 2017.09	Provide source code
Linux Kernel	Version: 5.10.209	Provide source code
Power interface	TYPE-C PD power supply	Omitted
System burning method	Upper computer burning	Provide tools
HDMI interface	HDMI display, maximum support 8K @ 60fps	Provide source code
MIPI DSI interface	2 MIPI capacitive touch screens (only available from ALIENTEK)	Provide source code
MIPI CSI interface	3 MIPI cameras (only available from ALIENTEK)	Provide source code

Ethernet	10/100/1000M adaptive network ports	Provide source code
USB 2.0	3 Type-A interfaces (HOST);	Provide source code
USB 3.0	Type-A interface × 1 (HOST);	Provide source code
TYPE-C OTG	Support USB 3.0 OTG and DP output (maximum 8K@30P)	Provide source code
Debug serial port	Default parameter: 1.5M - 8 - N - 1	Provide source code
Function key	ADC implements 2 function buttons V+ and V-	Provide source code
UPDATE button	Upgrade function	Provide source code
RESET button	Reset function	Provide source code
PWRON button	Sleep function	Provide source code
TF card slot	Supports Micro SD(TF) card, up to 128GB	Provide source code
Infrared receiver	Supports infrared remote control function	Provide source code
Audio interface	Two-in-one interface for headphone output and microphone input	Provide source code
PCIE M.2 interface	Supports WIFI/BT interfaces × 1	Provide source code
Cooling fan interface	4P cooling fan interface (available only for ALIENTEK products)	Provide source code
40Pin interface	40-pin interface includes 28 GPIOs	Provide source code
IR module	Supports infrared receiving function	Provide source code

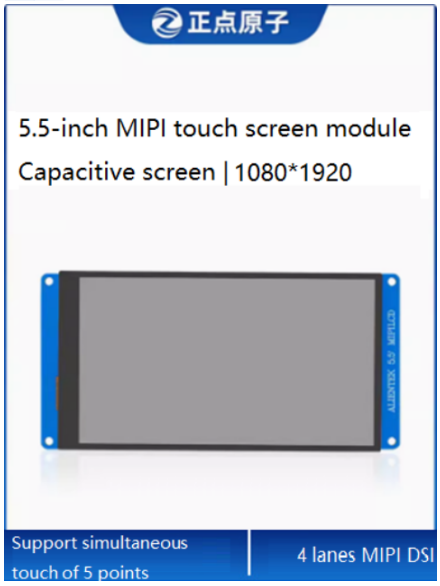
Table 3.4.1 Debian System Software Resources for Desktop Computers at Factory

This is the end of the explanation regarding the resources for the ALIENTEK QuarkPi-CA2. We will update the information on the materials from time to time. If you need updated materials, please pay attention to the official channels such as the official WeChat account or the after-sales group.

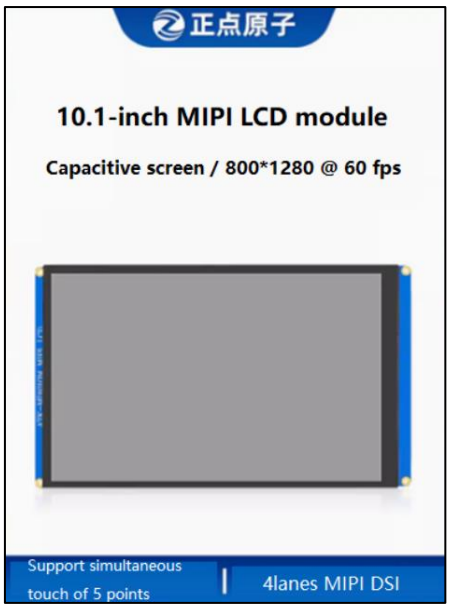
Note: Depending on the supply situation of the chips, different batches of boards may use different DDR or eMMC. However, this does not affect the overall functionality. Please be informed. If you have special requirements, please contact the technical support service of Taobao.

3.5 Adapter Modules

Currently, the modules that the QuarkPi-CA2 is compatible with and sold in the official store of ALIENTEK are as follows:


正点原子
5.5-inch MIPI touch screen module
Capacitive screen | 1080*1920
Support simultaneous touch of 5 points
4 lanes MIPI DSI


正点原子
5.5-inch MIPI touch screen module
Capacitive screen | 720*1280@60fps
Support simultaneous touch of 5 points
4 lanes MIPI DSI


正点原子
10.1-inch MIPI LCD module
Capacitive screen / 800*1280 @ 60 fps
Support simultaneous touch of 5 points
4lanes MIPI DSI


正点原子
MIPI camera module MCIMX415
4 Lanes MIPI interface
800W pixels
4K resolution
High Dynamic Range(HDR)

Chapter 4. Product Information

4.1 Data Download

QuarkPi-CA2 Data Download Center: https://github.com/openedv

4.2 Data Description

The information is very abundant. Due to the limitations of this document's length, we cannot list all of them. Please download the documents from the cloud drive for further reference.

The document materials are constantly updated. Please use the latest cloud drive address to download the materials.

Chapter 5. Product Usage Precautions

5.1 Precautions

- Do not plug or unplug peripheral modules while the power is on!
- Before using the product, please read this manual and the relevant development manual carefully, and pay attention to the platform compatibility matters.
- Please follow all the instructions and warning information marked on the product.
- Please use this product in a cool, dry and clean place.
- Please keep this product dry. If it is accidentally splashed or soaked by any liquid, please immediately cut off the power and dry it thoroughly.
- Do not use organic solvents or corrosive liquids to clean this product.
- Do not use or store this product in a dusty or dirty environment.
- If it is not used for a long time, please package this product well and pay attention to moisture and dust prevention.
- During use, pay attention to the ventilation and heat dissipation of this product to avoid damage to components due to excessive temperature during operation.
- Do not use this product in an environment with alternating cold and hot temperatures to avoid condensation and damage to components.
- Do not handle this product roughly. Dropping, hitting or shaking it vigorously may damage the circuits and components.
- Be cautious of static electricity when using this product.
- FPC flexible cables are relatively fragile. When plugging or unplugging the cables, check if the metal contacts at both ends are misaligned or detached.
- All products are tested before shipment. For the first use, please perform a power-on test with the corresponding development board from ALIENTEK.
- Do not repair or disassemble this company's products by yourself. If the product malfunctions, please contact this company for repair in a timely manner.
- Unauthorized modification or use of unapproved accessories may damage this product. Any damage caused by this will not be repaired.

Chapter 6. After-sales Service

6.1 After-sales Service Terms

1). Please open the package in front of the courier upon receipt of the goods and sign for it only after confirming that there are no errors. If you find that the goods are missing after signing for them, take photos as evidence and contact the seller's customer service within 15 days to explain the situation and handle it. If you report the missing goods after 15 days, no replacement will be made. Within 15 days, we will cover all costs for product issues, including replacement and warranty (warranty for damage caused by human factors, replacement for other reasons).

2). 15 days to 1 month: We will cover the round-trip shipping costs for product issues. For damage to expensive main chips, LCD screens, or touch screens caused by human factors, the buyer needs to pay for the cost of the parts and one-way shipping, but no repair fee will be charged.

3). 1 to 3 months: For product issues not caused by human factors, we will cover the shipping cost for sending the product back for repair. For burned main chips and damaged LCD screens or touch screens, the buyer needs to pay for the cost of the parts, but no repair fee will be charged.

4). After 3 months: For product issues, the buyer will bear the round-trip shipping costs and the costs of chips, LCD screens, touch screens, etc. No repair handling fee will be charged.

6.2 After-sales Support

Technical support contact method: Contact customer service for the group number
QQ Group: ALIENTEK - Rockchip Exchange Group
ALIENTEK QuarkPi-CA2 Technical Support Group (Order number required)
Taobao Store: ALIENTEK Flagship Store
Forum: http://www.openedv.com/forum.php