Product Manual

ECB32-PB Single Board Computer



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Product Overview

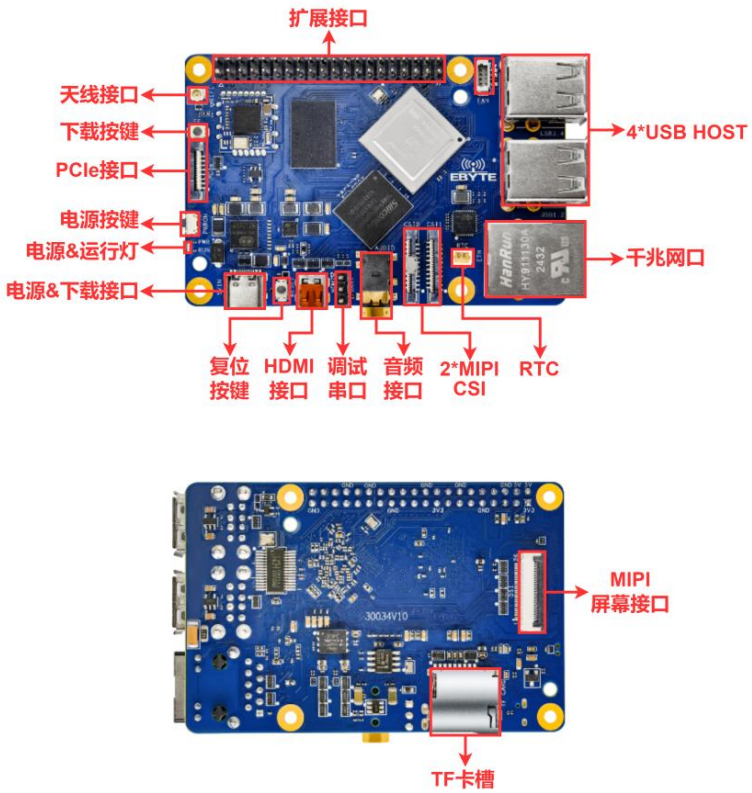
1.1.Product Introduction

The Ebyte ECB32-PB series single-board computers are meticulously designed based on Allwinner's T527/A527 series processors. They support MIPI DSI video interface, MIPI CSI camera interface, HDMI video interface, PCIe interface, USB host interface, USB OTG interface, Ethernet interface, audio interface, TF card expansion interface, Wi-Fi and Bluetooth, UART debug serial port, and a rich set of extended GPIO interfaces. They are widely applicable in content sharing and self-service kiosks, smart manufacturing, and other e-commerce and industrial equipment.

Ebyte provides a comprehensive software development manual, application examples, and software development environment. These effectively help users quickly get started and verify, improve development efficiency, and accelerate product development and time to market.

The ECB32-PB series single-board computers include three specific product models, all designed with domestically produced industrial-grade components. They differ primarily in processor model, NPU support, DRAM memory capacity, and eMMC storage configuration. Customers can select the appropriate model based on their needs. For product selection details, please refer to the Product Selection section.

The functional diagram of the ECB32-PB series single board computer is as follows:



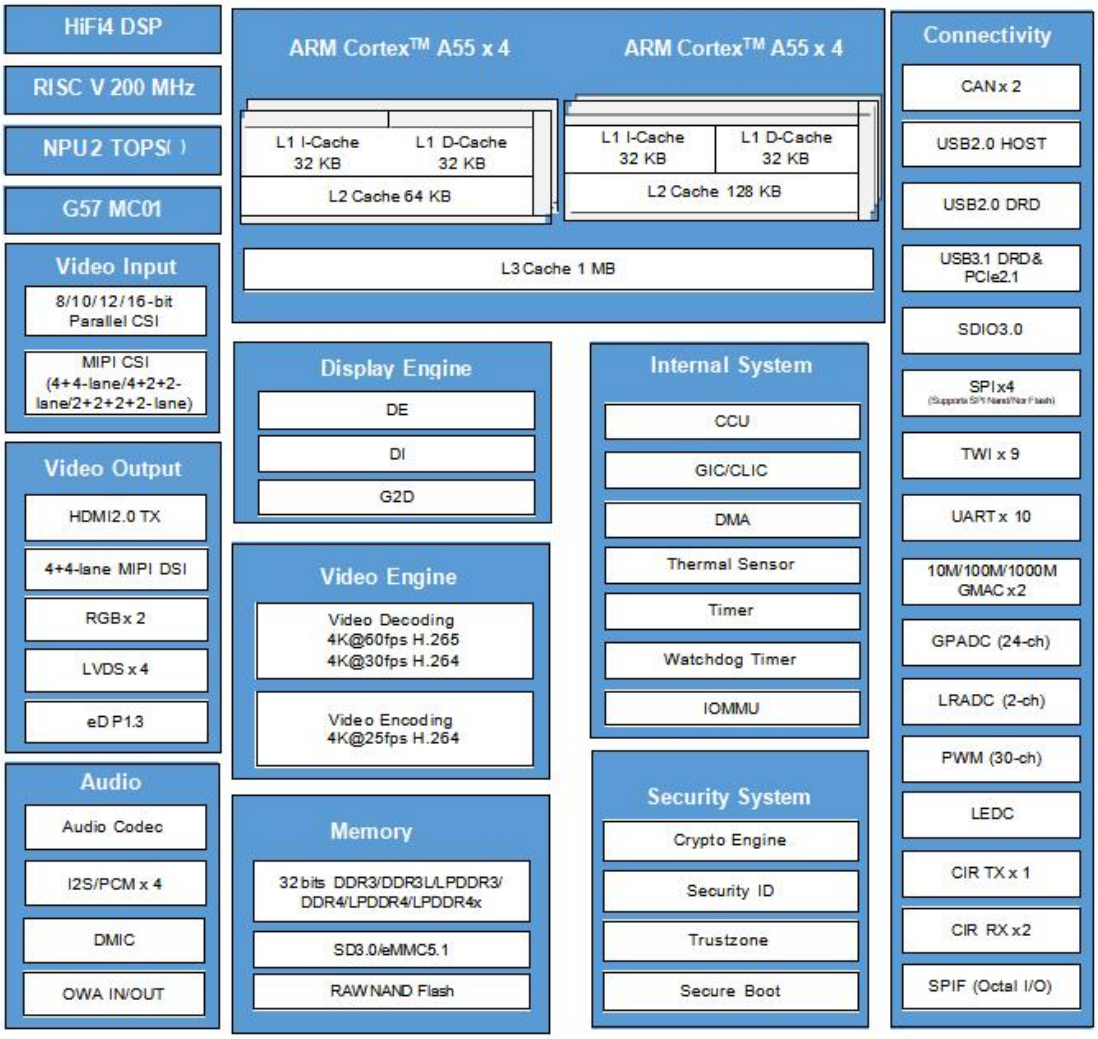
Single board computer function description diagram

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1.2. Allwinner T527/A527Chip Introduction

The Allwinner T527 series is a high-performance SoC based on the octa-core Cortex-A55 AI platform, supporting a 1.8GHz clock speed and suitable for commercial, industrial, and automotive applications. This chip family integrates an octa-core Cortex-A55 CPU, a HiFi4 DSP, a 2 TOPS NPU, and an ARM G57 MC1 GPU. It boasts powerful video capabilities, including support for 4K@60fps H.265 decoder, 4K@30fps H.264 decoder, 4K@25fps H.264 encoder, DI, and AWonder systems, providing users with a smooth experience and professional AI visual effects.

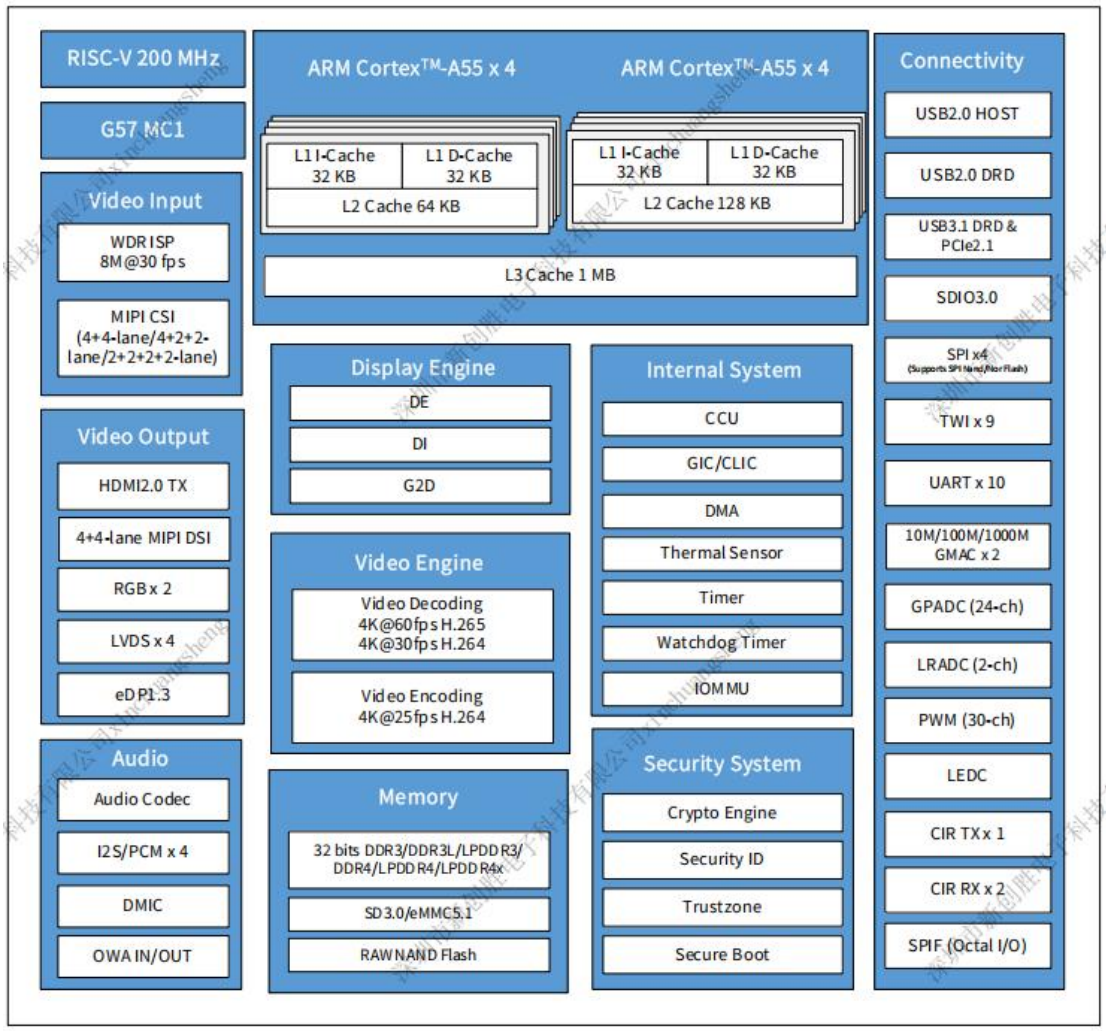


T527 system functional block diagram

Allwinner A527 Series Relative to T527, it is reduced HiFi4 DSP and NPU function, but with a higher main frequency of 2.0GHz, suitable for high-performance computing and graphics processing needs.

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A527 system functional block diagram

1.3.Typical Applications

- Industrial Control Single board computer;
- Automotive electronics;
- Industrial all-in-one machine;
- Smart cities;
- Tablet;
- IoT Gateway;
- Advertising all-in-one machine;
- Robot.
-

2. Product Selection

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2.1.Model configuration

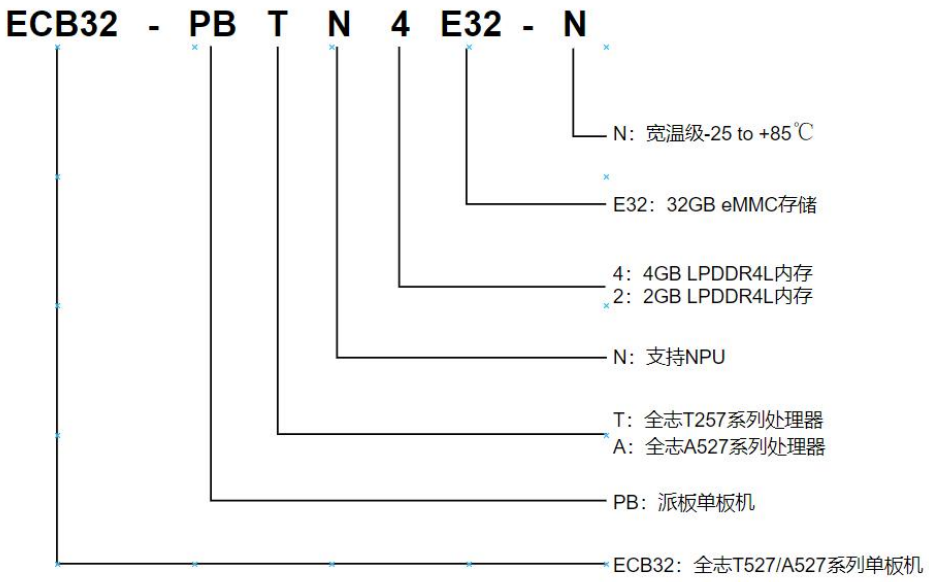
The ECB32-PB series single board computer selection and configuration table is as follows:

Product selection and configuration table

Serial number	Product Model	processor	Memory	storage	Operating temperature
1	ECB32-PBA2-N	A527	2GB LPDDR4	/	Wide temperature grade -25℃ ~ 85℃
2	ECB32-PBA4-N	A527	4GB LPDDR4	/	Wide temperature grade -25℃ ~ 85℃
3	ECB32-PBT2-N	T527	2GB LPDDR4	/	Wide temperature grade -25℃ ~ 85℃
4	ECB32-PBT4-N	T527	4GB LPDDR4	/	Wide temperature grade -25℃ ~ 85℃
5	ECB32-PBTN4E32-N	T527	4GB LPDDR4	32GB eMMC	Wide temperature grade -25℃ ~ 85℃

2.2.Model code

The product model coding is shown in the figure below:



Model code description

3. Specifications

3.1.Functional parameters

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ECB32-PB single board computer function parameter table

Power input	1 Type-C interface, 5V input, shares an interface with USB Device;
HDMI	1 MicroHDMI display interface, maximum resolution supported4K@60fps2D display and4K@30fps3D display;
MIPI DSI	1-way 26-pin 4-lane MIPI DSI display interface, supporting a maximum resolution of 1920x1200@60fps;
MIPI CSI	2-way 22-pin 4-lane MIPI CSI camera interface, each lane supports 2.0Gbit/s transmission speed;
MINI PCIe	1 PCIE2.1x1 lane, 5Gbps/lane;
USB HOST	4-way USB2.0 HOST;
USB Device	1 USB Device, sharing the Type-C interface with the power supply;
Wi-Fi & BT	1 Wi-Fi, supporting IEEE 802.11b/g/n 1-way Bluetooth 4.2, sharing antenna with Wi-Fi
Network port	1Road 10/100/1000M AdaptiveRJ45Ethernet port;
TF card	1 TF card slot, supports plug-in detection;
Audio	1st Road3.5MM audio interface, supports headphones Output and Microphone input;
debug	1roadUARTDebug serial port;
FAN	1 radiator fan interface, 5V power supply, supports PWM speed regulation;
GPIO	1 set of 2.54mm 2x20Pin standard RPI expansion interface, multiplexing 2-way I2C, 1-way I2S, 1-way SPI, 5-way UART, and 2-way CAN;
button	1RESETbutton; 1PWRONbutton; 1FELbutton;
indicator light	1Two-color indicator light, red for power indicator and green for operation indicator;
Watchdog	Support on-chip watchdog function;
RTC	1-way 1.25mm2PinRTC battery holder;

3.2.Environmental characteristics

ECB32-PB Series Single Board Computer Environmental Characteristics Table

Operating temperature	Wide temperature range: -25℃ ~ 85℃ (in an environment with good heat dissipation conditions);
Storage temperature	-25℃ ~ 85℃;
Operating humidity	5~95% humidity, non-condensing;
Storage humidity	60℃@95% humidity, non-condensing;

4. Hardware Design

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4.1.power supply



Power supply and USB_Device interface diagram

4.1.1. Power supply design

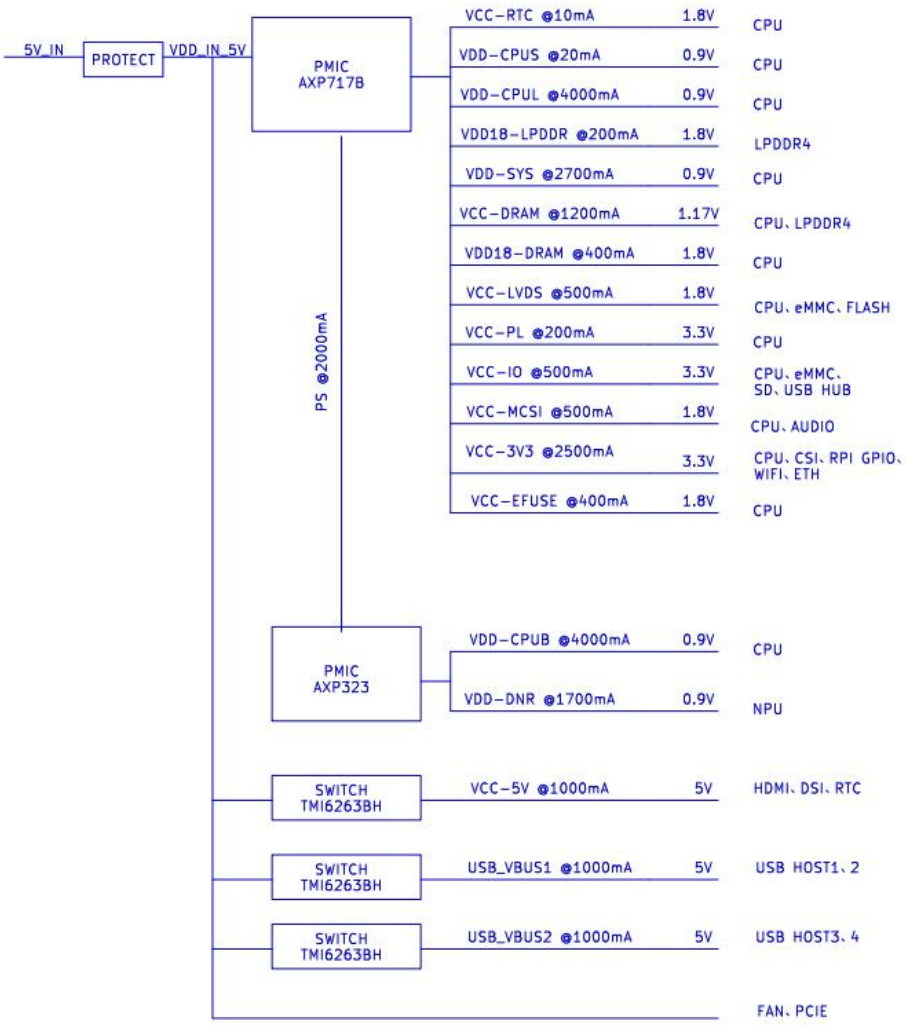
The single-board computer uses a Type-C connector for power supply, supports reversible insertion, and supports a 5V DC ±10% operating voltage. Typical power consumption is approximately 6W. To accommodate the need to connect higher-power devices to the USB interface, a 5V power input is also provided via the 5V power pin on the 2x20-pin expansion I/O connector. The power input connector is designed with reverse polarity protection. When the expansion I/O power connector is used to power the single-board computer, the Type-C connector remains unplugged. When powered by the Type-C connector, the expansion I/O power pin is a 5V output.

4.1.2. Power Tree

The single board computer power tree diagram is as follows:

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Single Board Computer Power Tree Diagram

4.1.3. I/O power status when the single-board computer is in sleep mode

When the ECB32-PB series SBC is in hibernation, only the following power I/Os are powered. Therefore, the SBC can only be woken up through the GPIO on the PL and PG.

I/O power status table when the single board computer is in sleep mode

power supply	Voltage	Typical I/O
RTC	1.8V	RESET、PWRON
ALDO3	3.3V	PL, PG

4.1.4. Single-board computer I/O interface power rail

The power-on time of the PMIC power supply of the ECB32-PB series single-board computer is mainly divided into two stages. The first stage is when the single-board computer PMIC automatically turns on the power supply after the 5V

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input power supply is valid (RANK1). The second stage is when the PMIC is turned off by default and is configured to turn on the power supply after the software is started (RANK4).

I/O Power Rails and Power-Up Sequencing

Pin Name	Power Rail	Voltage	Rank
5V IN	5V IN	5V	RANK 0
AP-NMI、PWRON、RESET	RTC	1.8V	RANK 1
FEL, MBIAS, USB, PB, PH, VCC-CARD	CLDO3	3.3V	RANK 1
PC	CLDO1	1.8V	RANK 1
PF	BLDO3/CLDO3	1.8V/3.3V	RANK 1
CK24M-OUT, HDMI-DET, LRADC, GPADC, LINEOUT, MIC	ALDO4	1.8V	RANK 1
PLPG	ALDO3	3.3V	RANK 1
PE,PI	DCDC4	3.3V	RANK 4
PD, PJ, PK	BLDO3/DCDC4	1.8V/3.3V	RANK 4
EDP,HDMI,HEADPHONE,PCIE,PM	BLDO3	1.8V	RANK 4
CK32K-OUTWREQIN	BLDO1	3.3V	RANK 4

4.1.5. Power consumption

Power consumption parameter table

Working conditions	Power supply voltage (V)	Average current (A)	Power consumption (W)
No-load	5.00	0.355	1.775
Normal	5.00	0.659	3.295
CPU blowfish	5.00	1.124	5.620
CPU cryptohash	5.00	0.899	4.495
CPU zlib	5.00	1.400	7.000
GPU grawing	5.00	1.165	5.825
Stress	5.00	1.274	6.370
Freeze	5.00	0.213	1.065
Mem	5.00	0.024	0.120

4.2.Launch Configuration

Boot order configuration

No need to set the boot sequence, ECB32-PB series single board computer boot When the processor starts, it will automatically read the status of BOOT_Select and select the order of enumerating media. BOOT_Select has a fixed configuration state on the single board computer. The default boot sequence is: SMHC0->EMMC_BOOT->EMMC_USER->try (except SPI in PJ)

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4.3.Buttons and indicator lights

The single board computer provides 3 buttons and 1 two-color indicator light.

4.3.1. FEL button

The ECB32-PB series single-board computers support forced firmware burning. Press and hold the FEL button, power on, and then release it to enter firmware upgrade mode.

4.3.2. Reset button

The reset button is located as shown in the figure below, marked as "RESET". Pressing the button resets the processor and memory power.



Reset button location diagram

4.3.3. Power button

The power button is shown in the figure below and is labeled "PWRON".Can realize long press to shut down and long press to start function.

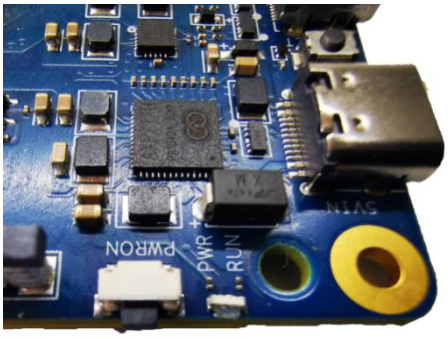


Diagram of the power button and indicator light location

4.3.4. indicator light

The position of the red and green dual-color indicator lights is shown in the figure above.The green power

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indicator light indicates the running status. Flashing indicates that the single-board computer is running normally. The user can program the green light to light up by configuring the PD14 pin to a low level.

4.4.Memory and storage design

4.4.1. Memory

The ECB32-PB series single-board computers have a 32-bit LPDDR4 SDRAM memory. Two capacities are available: 2GB and 4GB.

4.4.2. storage

ECB32-PB Series Single Board Computer support For TF card storage, it is recommended that users purchase a TF card of 16G or larger.

inECB32-PBTN4E32-N models also support up to32GB eMMC on-board storage, connected to the processor via the SMHC2 (SDC2) bus, supports 150MHz HS400 mode, and has a tested maximum read speed of up to 232MB/s.

In addition, a NOR FLASH chip position is reserved on the board, which can be used as startup code storage and user parameter storage. If you need to use this function, please contact Ebyte for customization.

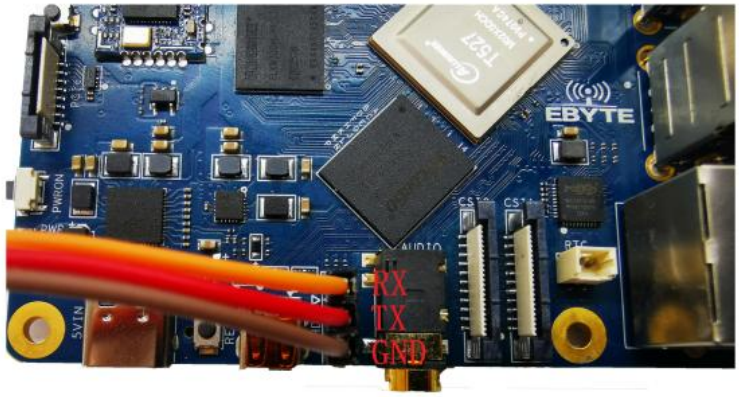


TF card interface diagram

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4.5.Debug interface

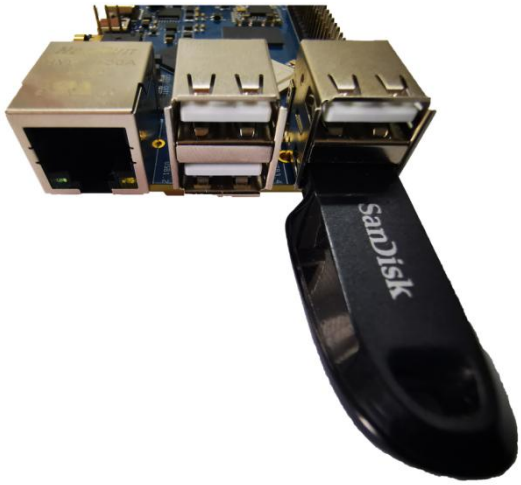


Debug interface diagram

The debug interface uses a 1x3pin 2.54mm pin header to bring out the UART serial port signal. Users can use a 3.3V TTL-to-USB module, connect one USB end to the computer, and the TTL end to the UART debug interface on the single-board computer. When using, pay attention to connecting the single-board computer TX to the RX of the conversion module, and the single-board computer RX to the TX of the conversion module.

The RX and TX signals of the single-board computer debugging serial port are respectively added with pull-up and pull-down resistors to increase signal stability, and a diode is added to the RX signal line for leakage protection.

4.6.USB2.0 interface



USB2.0 interface diagram

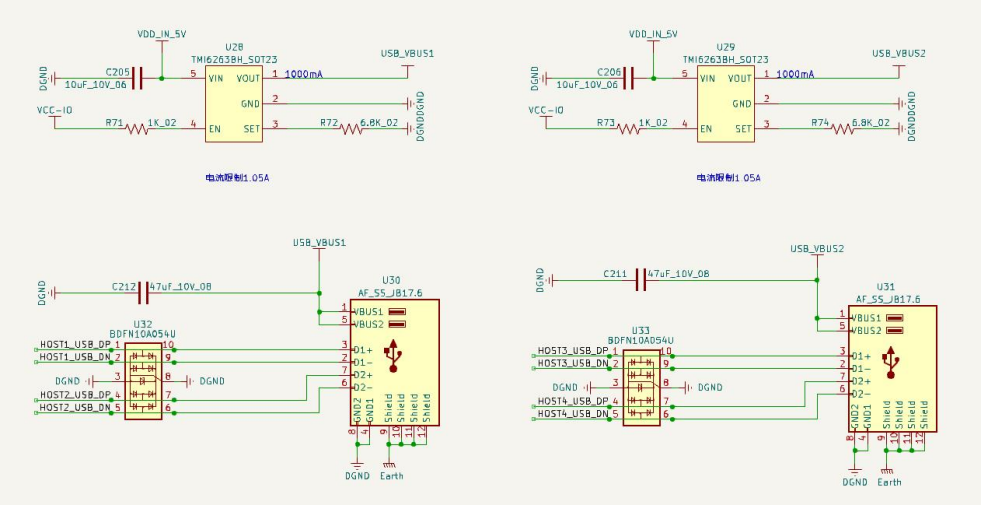
This product provides four USB 2.0 ports, two double-row USB ports located on the right front of the SBC. Users can use these ports to connect external devices such as a mouse, keyboard, and USB flash drive, or connect multiple devices to an external USB hub. Note that the USB 2.0 ports only support host mode.

The USB interface is designed with a current limiting circuit to prevent excessive current from burning out the

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internal chip. The two USB interfaces on the same socket can support a maximum current output of 1000mA. The reference circuit is as follows:

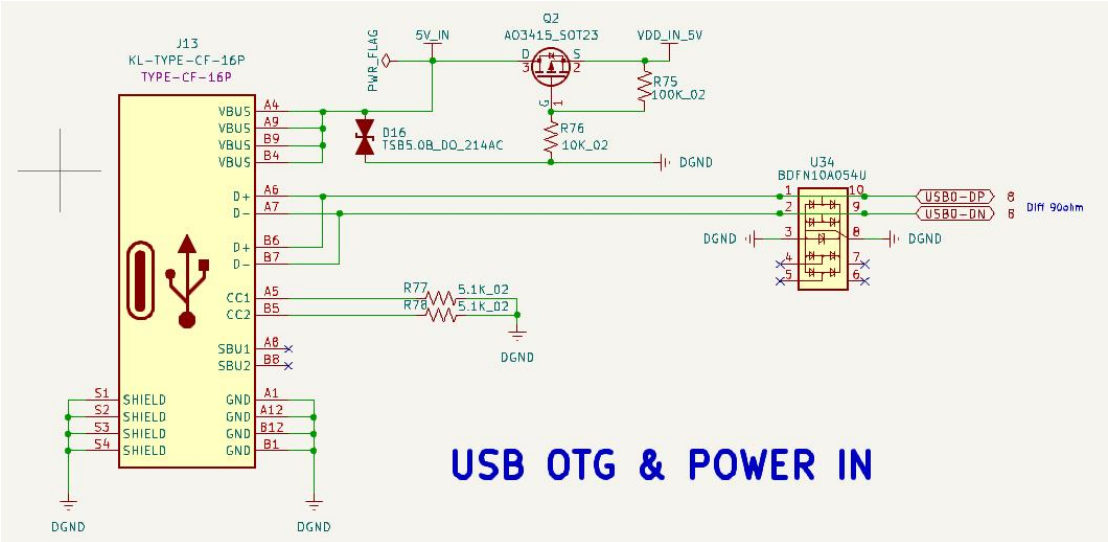


USB2.0 reference circuit diagram

4.7.USB_OTG interface

The USB_OTG port and the power input port share a TYPE-C port, located at the lower left of the front of the single-board computer.

The CC detection pins of the TYPE-C interface are connected to 5.1K pull-down resistors, so OTG only supports Device mode. Users can directly burn programs through this interface. The circuit design is shown in the figure below:



USB_OTG reference circuit diagram

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4.8.Network interface



Ethernet interface diagram

The single board computer has a Gigabit RJ45 Ethernet port located on the right side of the front of the single board computer. The connection status can be determined by the network port LED, see the table below:

LED status indicator

Connection Status	LED Status	Transfer Status	LED Status
10M connection	Two lights are off	10M transmission	Two lights are off
100M connection	Yellow LED is on	100M transmission	Yellow LED flashes
1000M connection	Green LED on	1000M transmission	Green LED flashes

4.9.Audio Interface



Audio interface diagram

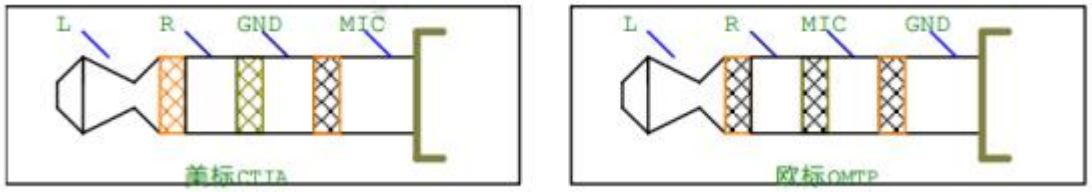
The audio interface uses a 3.5mm, CTIA four-section headphone interface, which supports most headphone

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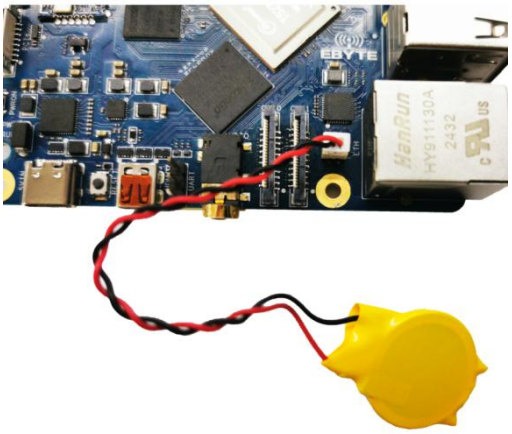
outputs and microphone inputs on the market.

Note that different standard headphone jack structures and wiring sequences are different. You need to connect according to the actual interface used. For details, refer to the corresponding headphone jack manual. This product uses the American standard CTIA four-segment headphone. The differences between the American standard and European standard interfaces are shown in the figure below.



Comparison chart of four-section earphone structure definition

4.10.RTC



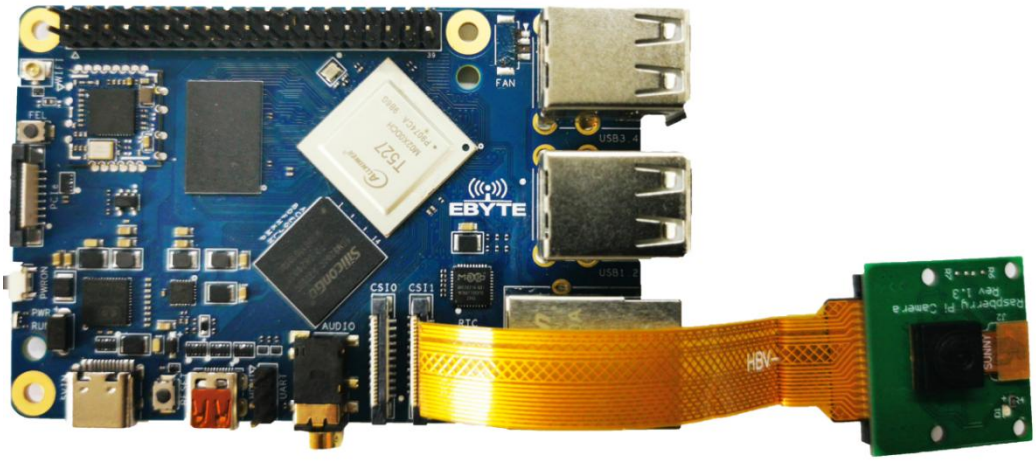
RTC battery interface diagram

The single-board computer uses a separate RTC chip to provide clock data. The chip features automatic power-loss detection and power switching circuitry. The main power supply is a +5V power supply, and the backup power supply is a +3V battery. The battery voltage must be maintained between 2.0V and 3.5V for normal operation. In battery-powered mode, the oscillator consumes less than 500nA. A CR2032 battery is recommended. The battery connector is a 2-pin, 1.25mm-pitch connector located on the lower right side of the front of the single-board computer.

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4.11.MIPI CSI interface



MIPI CSI camera interface diagram

The SBC provides two MIPI CSI camera interfaces, located on the lower right side of the front panel. MIPI CSI0 and MIPI CSI1 are both connected using a 22-pin, 0.5mm FPC cable, as shown below. This interface is compatible with the CSI interface of the Raspberry Pi 5 and can be used by purchasing a Raspberry Pi 5 camera through e-commerce platforms. Alternatively, you can purchase cameras compatible with the Raspberry Pi 4B and 3B+ and convert the 15-pin to 22-pin using an adapter cable.

Each interface uses 4 lanes, and each lane has the highest rate2.0 Gbps,conform toMIPI-CSI2 V1.1 and MIPI DPHY V1.1 specifications. This productMIPI CSI interface supports up to 4K@60fpsresolution.

Pay attention to the pin numbers when connecting and be careful not to insert them in the wrong direction. Refer to the pin numbers next to the connector and match them with the pins on the camera side. The detailed pin definitions are as follows.

MIPI CSI0 Interface Definition Table

Pin number	Pin Definition	Functional Description	Pin level
1	GND	GND	0V
2	MCSIA-D0N	CSI differential signaling	1V8
3	MCSIA-D0P	CSI differential signaling	1V8
4	GND	GND	0V
5	MCSIA-D1N	CSI differential signaling	1V8
6	MCSIA-D1P	CSI differential signaling	1V8
7	GND	GND	0V
8	MCSIA-CKN	CSI differential clock signal	1V8
9	MCSIA-CKP	CSI differential clock signal	1V8
10	GND	GND	0V
11	MCSIB-D0N	CSI differential signaling	1V8
12	MCSIB-D0P	CSI differential signaling	1V8

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13	GND	GND	0V
14	MCSIB-D1N	CSI differential signaling	1V8
15	MCSIB-D1P	CSI differential signaling	1V8
16	GND	GND	0V
17	CSI0_PWR_EN	Power enable signal	3V3
18	NC	/	/
19	GND	GND	0V
20	CSI0_I2C3_SCL	I2C clock signal	3V3
21	CSI0_I2C3_SDA	I2C data signal	3V3
22	VDD_CSI0	3.3V power supply	3V3

MIPI CSI1 Interface Definition Table

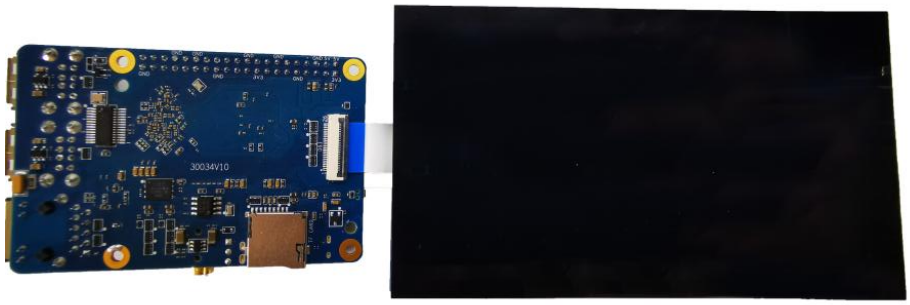
Pin number	Pin Definition	Functional Description	Pin level
1	GND	GND	0V
2	MCSIC-D0N	CSI differential signaling	1V8
3	MCSIC-D0P	CSI differential signaling	1V8
4	GND	GND	0V
5	MCSIC-D1N	CSI differential signaling	1V8
6	MCSIC-D1P	CSI differential signaling	1V8
7	GND	GND	0V
8	MCSIC-CKN	CSI differential clock signal	1V8
9	MCSIC-CKP	CSI differential clock signal	1V8
10	GND	GND	0V
11	MCSID-D0N	CSI differential signaling	1V8
12	MCSID-D0P	CSI differential signaling	1V8
13	GND	GND	0V
14	MCSID-D1N	CSI differential signaling	1V8
15	MCSID-D1P	CSI differential signaling	1V8
16	GND	GND	0V
17	CSI1_PWR_EN	Power enable signal	3V3
18	NC	/	/
19	GND	GND	0V
20	CSI1_I2C5_SCL	I2C clock signal	3V3
21	CSI1_I2C5_SDA	I2C data signal	3V3
22	VDD_CSI1	3.3V power supply	3V3

4.12.MIPI DSI interface

Design a MIPI DSI display interface, located on the right side of the back of the single board computer, as shown below.4-lane MIPI DSI,Highest support1920x1200@60fps resolution.

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MIPI DSI display interface diagram

The DSI display interface uses a 26-pin, 0.5mm pitch FPC connector. Connect to the display using a 26-pin, 0.5mm FPC cable. Pay attention to the pin numbers when connecting to avoid reverse insertion. Refer to the pin numbers on the connector side to match the pins on the display. Detailed pin definitions are shown in the table below. Ebyte ECA11-5LMxxxxC series MIPI-specific displays are recommended.

MIPI DSI0 Interface Definition Table

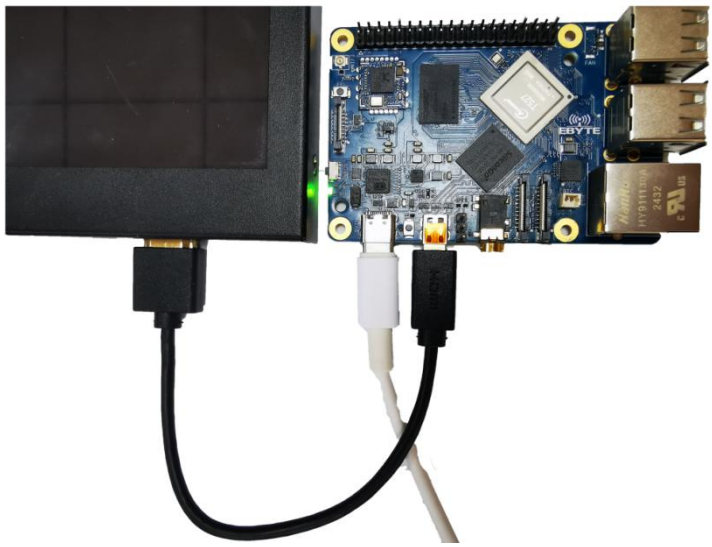
Pin number	Pin Definition	Functional Description	Pin level
1	GND	GND	0V
2	DSI_LCD_RESET	LCD screen reset signal	1V8
3	GND	GND	0V
4	DSI_D3N	DSI differential signal	1V8
5	DSI_D3P	DSI differential signal	1V8
6	GND	GND	0V
7	DSI_D2N	DSI differential signal	1V8
8	DSI_D2P	DSI differential signal	1V8
9	GND	GND	0V
10	DSI_D0N	DSI differential signal	1V8
11	DSI_D0P	DSI differential signal	1V8
12	GND	GND	0V
13	DSI_CLKN	DSI differential clock signal	1V8
14	DSI_CLKP	DSI differential clock signal	1V8
15	GND	GND	0V
16	DSI_D1N	DSI differential signal	1V8
17	DSI_D1P	DSI differential signal	1V8
18	GND	GND	0V
19	/	LCD detection pin	/
20	DSI_BL_CTR	Backlight control signal	3V3
21	DSI_TP_RST	Touch screen reset signal	3V3
22	DSI_TP_SDA	I2C data signal	3V3
23	DSI_TP_SCL	I2C clock signal	3V3
24	DSI_TP_INT	Touch screen interrupt signal	3V3

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25	VCC-5V	5V power supply	5V
26	VCC-5V	5V power supply	5V

4.13.HDMI interface



HDMI display interface diagram

One HDMI display port is designed and located on the lower front of the SBC. It supports HDMI 2.0 and HDCP 1.4 protocols, and supports up to 4K@60fps 2D display or 4K@30fps 3D display.

The ECB32-PB series SBCs have built-in levelshift circuits on the HDMI I2C and CEC pins. These 5V-tolerant pins support direct connection to the device without the need for an external level shifter chip. A Schottky diode is connected in series to the 5V power pin of the HDMI port to prevent leakage to the device after the SBC is powered off.

4.14.PCIe interface



MINI PCIE interface diagram

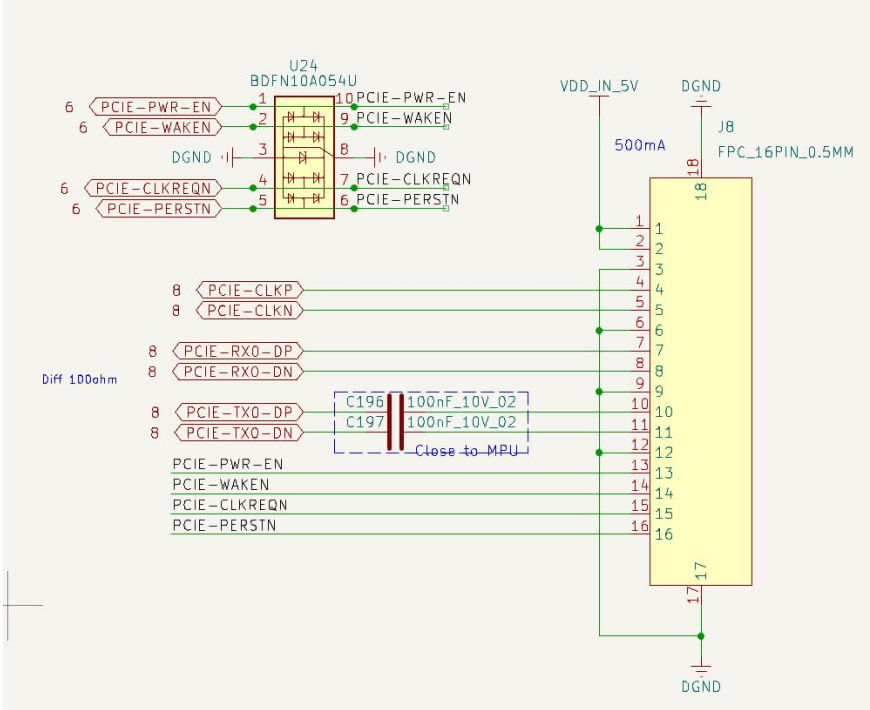
One PCIe interface is designed and connected using a 122-pin 0.5mm FPC flexible cable, located on the left side of

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the front of the single-board computer.

The interface is compatible with the PCIe interface of Raspberry Pi 5 and supportsPCIe2.1, users can connect WIFI, Bluetooth and 4G communication modules through the PCIe interface. The interface circuit diagram is as follows:



PCIe interface circuit diagram

The PCIe interface is defined in the following table:

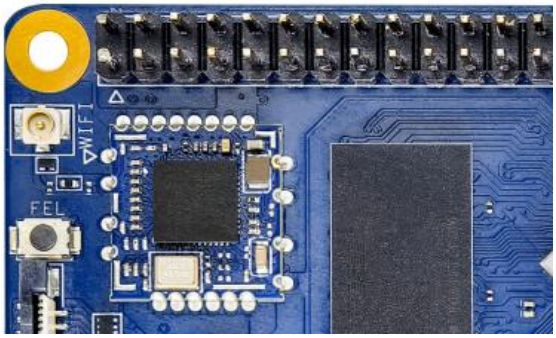
PCIE Interface Definition Table

Pin number	Pin Definition	Functional Description	Pin level
1	VDD_IN_5V	5V power supply	5V
2	VDD_IN_5V	5V power supply	5V
3	GND	GND	0V
4	PCIE-CLKP	PCIE_CLK differential signal	1.8V
5	PCIE-CLKN	PCIE_CLK differential signal	1.8V
6	GND	GND	0V
7	PCIE-RX0-DP	PCIE_RX differential signal	1.8V
8	PCIE-RX0-DN	PCIE_RX differential signal	1.8V
9	GND	GND	0V
10	PCIE-TX0-DP	PCIE_TX differential signal	1.8V
11	PCIE-TX0-DN	PCIE_TX differential signal	1.8V
12	GND	GND	0V
13	PCIE-PWR-EN	Power Enable	3.3V
14	PCIE-WAKEN	WAN signal enable	3.3V
15	PCIE-CLKREQN	Clock Enable	3.3V
16	PCIE-PERSTN	Reset signal	3.3V

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4.15.WIFI/Bluetooth interface



WIFI/Bluetooth antenna and module schematic

The single-board computer supports Wi-Fi and Bluetooth. The board features an integrated Wi-Fi module, the Ebyte WM103-WF8723DU high-performance Wi-Fi+BT dual-mode module. This module utilizes USB 2.0 communication, complies with IEEE 802.11b/g/n standards and Bluetooth 4.2, and offers a maximum data rate of 150Mbps. For more information, refer to the EWM103-WF8723DU User Manual.

The single-board computer provides a Wi-Fi/Bluetooth antenna interface using an IPX miniature RF connector. Users can connect a dedicated Wi-Fi/Bluetooth antenna operating in the 2.4GHz to 2.484GHz frequency band. The Ebyte ECB32-PB single-board computer comes with one Wi-Fi/Bluetooth antenna by default.

4.16.FAN interface



Radiator installation diagram

The SBC provides two heat sink mounting holes and supports the installation of an active heat sink. A one-piece anodized aluminum heat sink with an integrated fan is installed. A thermal pad is installed between the heat sink and the heat-generating chip for heat transfer. It is directly mounted to the SBC using spring pins. A radial fan reduces noise and extends service life, pushing air through the extruded and milled aluminum heat sink for rapid heat dissipation. The

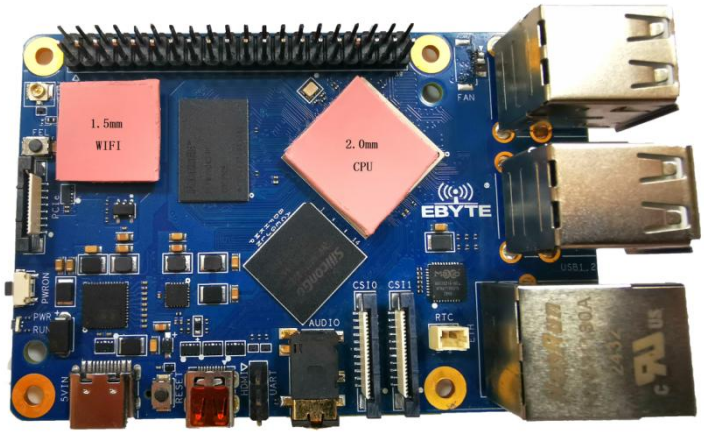
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mounting holes and fan connector are compatible with Raspberry Pi 5 heat sinks. A 1x4-pin 1.0mm heat sink fan power and control connector is provided. The connector definition is as follows:

Pin number	Pin Definition	Pin Description
1	FAN-FRQ	Speed acquisition
2	GND	Power ground
3	FAN-PWM	PWM speed control
4	VDD_IN_5V	5V power supply

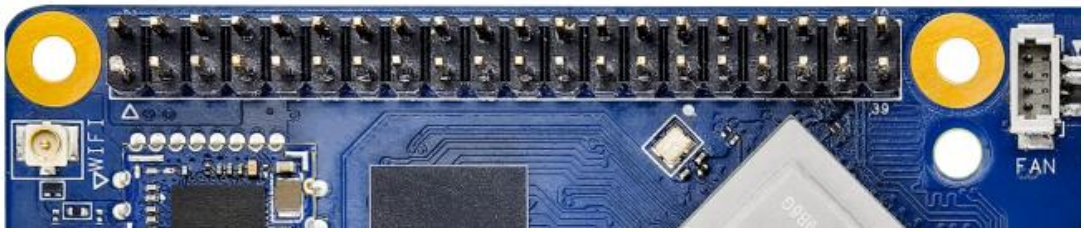
The radiator is not installed on the board at the factory On the machine, since the heat sink is not designed to be repeatedly removed from the single board computer,Once installed, it will be difficult to remove, so choose carefully If the user needs to install a radiator, there are two red thermal conductive silicone sheets of different thicknesses in the product radiator packaging bag. The 1.5mm thick silicone pad is attached to the WIFI module, and the 2.0mm thick silicone pad is attached to the processor. The specific mounting positions are as shown in the figure below:



Radiator silicone sheet installation diagram

4.17.Raspberry Pi expansion interface

Design a Raspberry Pi 2x20Pin 2.54mm standard expansion interface, located on the upper front of the single-board computer, as shown in the figure below.



Raspberry Pi expansion interface diagram

The IO interface provides multiplexing functions including 1 group of SPI interface, 1 group of I2S interface,

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2 groups of CAN interface, 2 groups of I2C interface, and 5 groups of UART interface, which users can configure and use according to their needs.CAN signal is TTL level, so users need to use it in conjunction with an isolation transceiver.The recommended transceiver chip is Bairui CTM05S. In addition, the 3.3V and 5V power supplies provided by each expansion interface support 500mA current output. Detailed definitions are provided in the table below.

Raspberry Pi expansion interface pin definition table

Pin number	Pin Definition	Pin number	Pin Definition
1	3V3	2	5V
3	PI1-TWI4-SDA	4	5V
5	PI0-TWI4-SCK	6	GND
7	PE5-I2S2-MCLK	8	PI11-UART3-TX
9	GND	10	PI12-UART3-RX
11	PD18-UART4-TX	12	PE6-I2S2-BCLK
13	PD19-UART4-RX	14	GND
15	PI2-UART5-TX	16	PI3-UART5-RX
17	3V3	18	PI6-UART6-TX
19	PB2-SPI2-MOSI	20	GND
21	PB3-SPI2-MISO	22	PI7-UART6-RX
23	PB1-SPI2-CLK	24	PB0-SPI2-CS0
25	GND	26	PB6
27	PE2-TWI2-SDA	28	PE1-TWI2-SCK
29	PI15-CAN0-TX	30	GND
31	PI16-CAN0-RX	32	PD20-PWM2-UART2-TX
33	PD21-PWM3-UART2-RX	34	GND
35	PE7-I2S2-LRCK	36	PL5-S-CAN0-RX
37	PL4-S-CAN0-TX	38	PE9-I2S2-DIN0
39	GND	40	PE8-I2S2-DOUT0

5. Software Resources

The ECB32-PB single-board computer is equipped with an operating system based on the Linux 5.15 kernel. It comes with the cross-compilation toolchain Buildroot source code required for embedded Linux system development, U-boot source code, source code for the Linux kernel and various driver modules, as well as various development and debugging tools for Windows and Linux desktop environments..

operating system:

1. Linux file system built by Buildroot

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2. Linux file system transplanted by Debian

System source code:

1. U-boot 2018

2. Kernel 5.15

3. BuildRoot 2022.05

4. Debian 11

Development environment and tools:

1.USB burning tool: PhoenixSuit

2. SD card burning tool: PhoenixCard

System software resources are shown in the following table:

System software resource table

category	name	describe	Source code
SPL	spl-pub	Boot0, boot uboot	<SDK>/brandy/brandy-2.0/spl-pub/
BOOT	u-boot 2018.07	Bootloader	<SDK>/brandy/brandy-2.0/u-boot-2018/
Kernel	Kernel 5.15.147	Linux kernel	<SDK>/kernel/linux-5.15/
Bsp	BSP	Allwinner-related driver device tree in the kernel, etc.	<SDK>/bsp/
Device Driver	Audio	Built-in audio driver	bsp/drivers/sound/platform/*
	AWlink	CAN driver	bsp/awlink
	GMAC	Built-in MAC driver	bsp/gmac
	STMMAC	Built-in MAC driver	Bsp/stmmac
	GPADC	GPADC driver	bsp/gpadc
	GPIO	GPIO driver	bsp/pinctrl/*
	drm	Display screen related drivers	bsp/drm/panel/*
	LRADC	Button module driver	bsp/lradc/*
	MMC	MMC driver	bsp/mmc/*
	SPI	SPI driver	bsp/spi/*
	TWI	I2C Driver	bsp/twi/*
	UART	Serial port driver	bsp/uart/*
	VIN	Specific camera drivers	bsp/vin/modules/sensor/*
	Pcie	PCI Driver	bsp/pci/*
	IR	Infrared driver	bsp/ir-rx/* bsp/ir-tx/*
operating system	Buildroot 202205	Buildroot version 202205	<SDK>/buildroot/buildroot-202205
	Debian	Debian 11	<SDK>/debian/compressed_files/
Development Tools	PhoenixSuit	USB burning tool	/tools/PhoenixSuit
	PhoenixCard	SD card burning tool	/tools/PhoenixCard

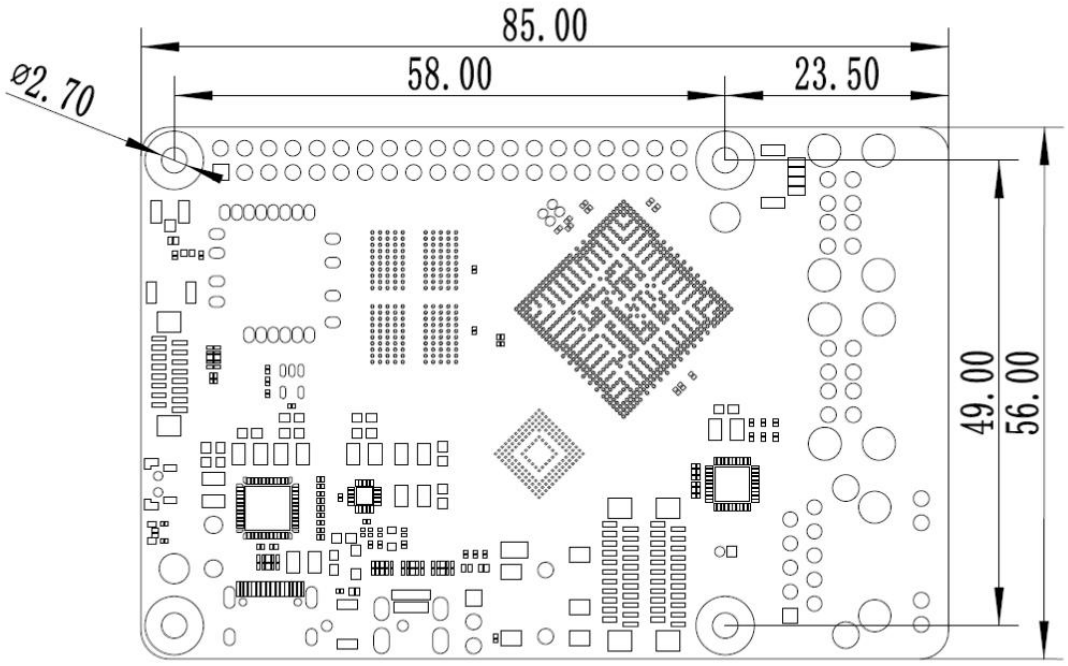
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6. Structural dimensions

Unit: mm; error: ±0.1mm.

The front dimensions are shown in the figure below:



Front structural dimensions of the single-board computer

7. Reference Documentation

- T527_Datasheet_V0.91.pdf
- A527_Datasheet_V0.92.pdf
- ECB32-PB Single Board Computer Product Manual V1.0.pdf
- MAE0621A Design Guide V1.1.pdf
- EWM103-WF8723DU_UserManual_CN_v1.0 .pdf

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8. Revision Notes

Revision Notes Table

Version	Modifications	Modification time	prepared by	Proofreading	Approval
V1.0	First Draft	25-7-23	WJ	LJQ	WFX

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