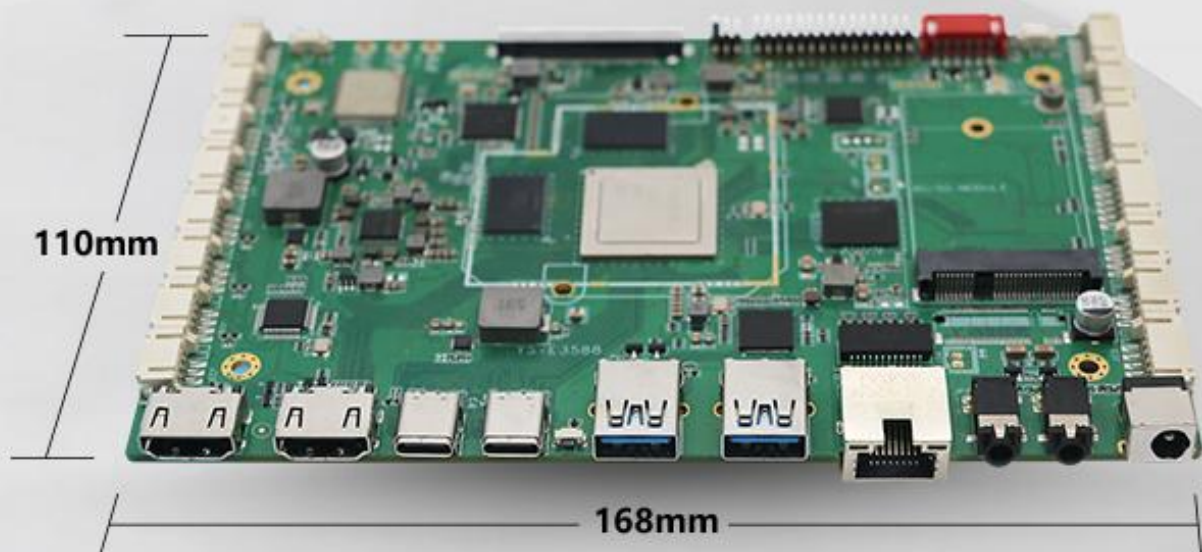


# Specification

## YS-E3588

Edge Computing Board



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# Declaration

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# Revision History

Version	Date	Author	Approver	Description
V1.0	2023.02.28	Zhang Wenjuan	Qin Yongling	Initial version
V2.0	2024.01.10	Zhang Wenjuan	Qin Yongling	1. Correct description error part 2. Change motherboard picture

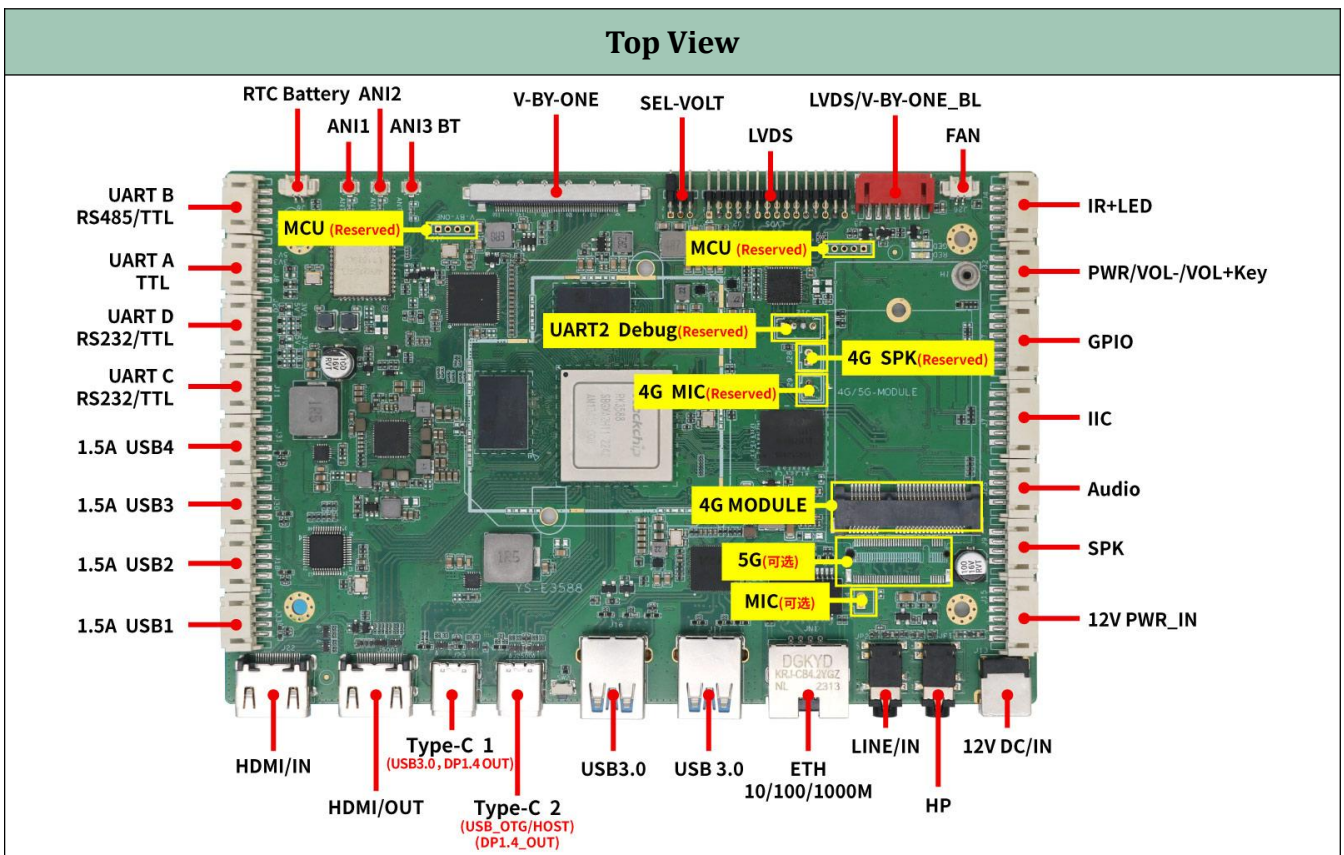
# Chapter 1 Product Introduction

## 1.1 Overview

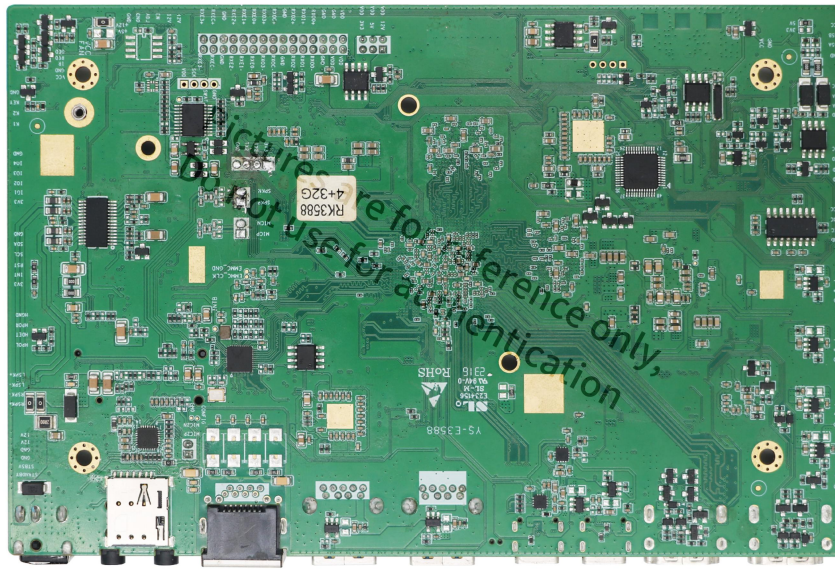


YS-E3588 is developed based on Rockchip RK3588, the CPU is Quad-core Cortex-A76+Quad-core Cortex-A55, NPU supports 6TOPS, with rich peripheral interfaces, support LVDS, V-BY-ONE 4K display, HDMI 2.1 output, DP1.4 output, GPIO, I2C, UART etc. It can be widely used in ARM-based PC and edge computing devices, personal mobile internet devices and other digital multimedia applications.

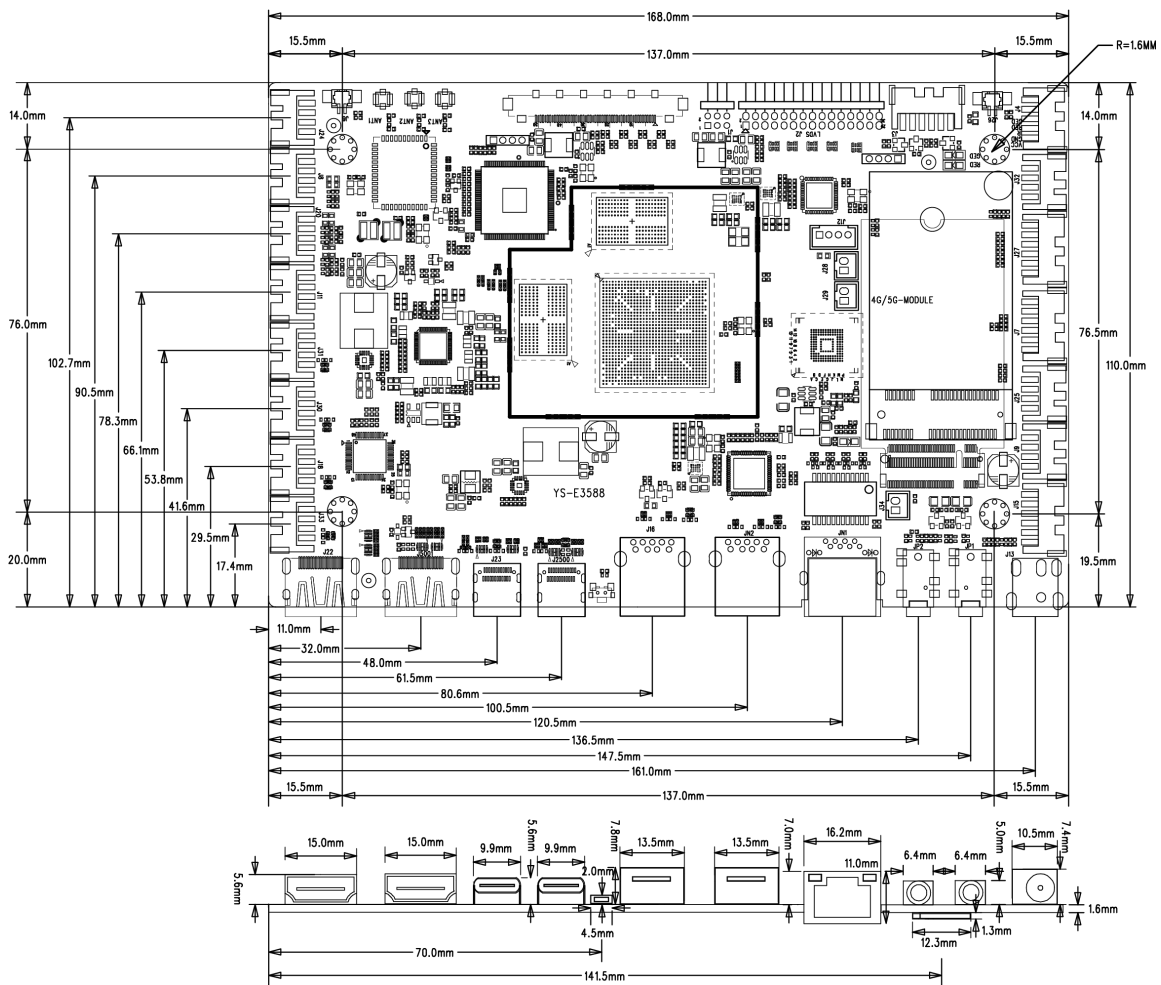
## 1.2 Pictures and Dimension



Bottom View

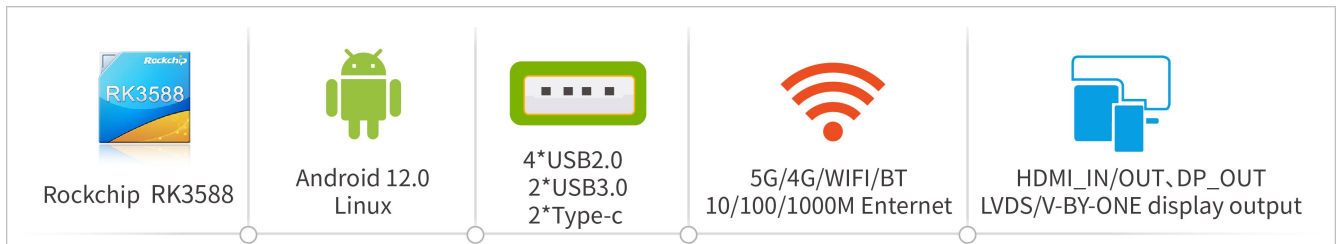


Dimension



\*PCBA length: 168mm    \*PCBA width: 110mm    \*PCBA height: 12mm    \*PCBA Location Hole:  $\Phi 3.2\text{mm} \times 4$

## 1.3 Product Detailed Parameters



### Detail Specification

<b>SOC</b>	RockChip RK3588
<b>CPU</b>	Quad-core Cortex-A76 and Quad-core Cortex-A55 Max CPU frequency: 2.2-2.4GHz
<b>GPU</b>	Mali-G610 MC4 OpenGL ES 1.1/2.0/ 3.2 OpenCL up to 2.2 Vulkan 1.1/1.2 Special 2D hardware engine with MMU
<b>NPU</b>	Supports up to 6TOPs Supports INT4/INT8/INT16/FP16/BF16/TF32
<b>OS</b>	<b>Android:</b> Android 12.0 <b>Linux:</b> Debian11
<b>Video CODEC</b>	<p><b>Video Decoder</b></p> <p>Real-time video decoder of MPEG-1, MPEG-2, MPEG-4, H.263, H.264, H.265, VC-1, VP9, VP8, MVC, AV1</p> <p>8K@60fps H.265/VP9/AVS2</p> <p>8K@30fps H.264 AVC/MVC</p> <p>4K@60fps AV1</p> <p>1080P@60fps MPEG-2/-1/VC-1/VP8</p> <p><b>Video Encoder</b></p> <p>Real-time H.265/H.264 video encoding</p> <p>Support up to 8K@30fps</p> <p><b>(Up to 32 channels 1080P@30fps Decoding and 16-way 1080P@30fps code)</b></p>
<b>ROM</b>	4GB/8GB (Up to 32GB) 64bit LPDDR4/LPDDR4x
<b>Storage</b>	32GB/128GB EMMC
<b>Display Output</b>	1*HDMI2.1 (8K@60Hz or 4K@120Hz) 2*DP1.4 (Type-C, up to 8K@30HZ) 1*LVDS (Up to 1920x1080) 1*V-BY-ONE (4K@60HZ)
<b>Display Input</b>	1*HDMI2.0 (4K@60HZ)
<b>Audio</b>	1*SPK (L&R audio-out, Up to 1*8Ω/5W speaker)

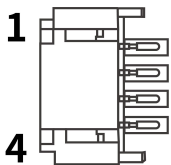
	1*HP (CTIA) 1*MIC (Reserved Interface) 1*4G-MIC (Reserved Interface) 1*4G-SPK (Single Track ,Reserved Interface) 1*LINE-IN
<b>Network</b>	Ethernet: Support 10/100/1000M GMAC WIFI: Support 2.4GHz/5GHz Band,dual-band WIFI6 (System:IEE Std.802.11b/g/n/ac/ax) Bluetooth: 5.2 4G LTE: Support Mini_PCIE Module 5G NR: M.2 Module(Reserved Interface)
<b>USB</b>	1*Type-C USB3.0 OTG/HOST 1*Type-C USB3.0 HOST 2*Type-A USB3.0 HOST 4*USB2.0 HOST(4Pin*2.0mm Wafer)
<b>UART</b>	5*TTL(2*Optional TTL or RS232, 1 *Optional TTL or RS48,2* TTL)
<b>Other</b>	1*IIC 4*GPIO 1*FAN 3*Key (1*PWR_Key,1*Vol-_Key,1*Vol+_Key) 1*IR+LED

## 1.4 Configuration & General Precautions

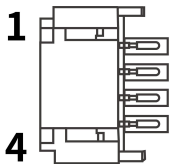
1. Relative humidity  $\leq$  85%
2. Storage temperature: - 30 °C to+70 °C
3. Operating temperature: - 15 °C to+60 °C
4. During the assembly of the whole machine, please do not operate the wiring with power to avoid short circuit between bare board and peripheral equipment.
5. Pay attention to the anti-static treatment during the assembly and transportation of the whole machine, and it is necessary to wear electrostatic protection tools such as electrostatic bracelet (sleeve).
6. When assembling the whole machine, it can be installed at the bottom or side, but do not deform or twist the board, and do not bear heavy pressure.
7. Proper distance shall be reserved at the wiring position of each terminal to avoid squeezing the terminal during installation.
8. The connecting line between this board and the supporting module board should not be too long, otherwise it may affect the image quality.
9. The internal wiring of the whole machine shall be reasonable, and the connecting wires shall not pass through the PCB board directly as far as possible.
10. In order to achieve better EMC effect for the whole machine, it is recommended that the screen wire between the main board and the screen should be shielded wire.
11. The specifications of the peripherals connected to the installation shall be confirmed with our company, including but not limited to: voltage limit, current limit, timing, power domain, etc.

## Chapter 2 Interface Pin Name

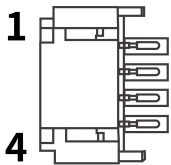
### J33 (4PIN/2.0) USB1

Exterior	Pin No.	Pin Name	Description
	1	+5V	Power Supply
	2	D1-	USB data-
	3	D1+	USB data+
	4	GND	Ground

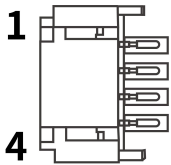
### J18 (4PIN/2.0) USB2

Exterior	Pin No.	Pin Name	Description
	1	+5V	Power Supply
	2	D2-	USB data-
	3	D2+	USB data+
	4	GND	Ground

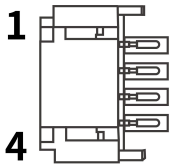
### J30 (4PIN/2.0) USB3

Exterior	Pin No.	Pin Name	Description
	1	+5V	Power Supply
	2	D3-	USB data-
	3	D3+	USB data+
	4	GND	Ground

### J31 (4PIN/2.0) USB4

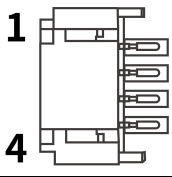
Exterior	Pin No.	Pin Name	Description
	1	+5V	Power Supply
	2	D4-	USB data-
	3	D4+	USB data+
	4	GND	Ground

### J11 (4PIN/2.0) UART C (Optional RS232/TTL UART, TTL Power Domain 3.3V)

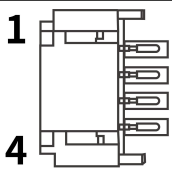
Exterior	Pin No.	Pin Name	Description
	1	VCC	5V Power Supply (Optional 3.3V)
	2	RXC	UART Receive
	3	TXC	UART Transmit
	4	GND	Ground



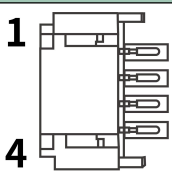
**J20 (4PIN/2.0) UART D (Optional RS232/TTL UART, TTL Power Domain 3.3V)**

Exterior	Pin No.	Pin Name	Description
	1	VCC	5V Power Supply (Optional 3.3V)
	2	RXD	UART Receive
	3	TXD	UART Transmit
	4	GND	Ground

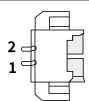
**J8 (4PIN/2.0) TTL UART A (TTL Power Domain 3.3V)**

Exterior	Pin No.	Pin Name	Description
	1	VCC	5V Power Supply (Optional 3.3V)
	2	RXA	UART Receive
	3	TXA	UART Transmit
	4	GND	Ground

**J24 (4PIN/2.0) RS485 UART B (Optional RS485/TTL UART, TTL Power Domain 3.3V)**

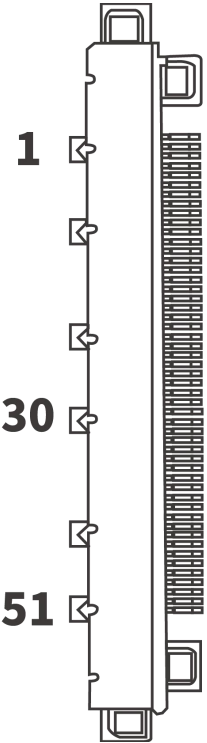
Exterior	Pin No.	Pin Name	Description
	1	VCC	5V Power Supply (Optional 3.3V)
	2	485B/RX	UART Receive/485B
	3	485A/TX	UART Transmit/485A
	4	GND	Ground

**J6 (2PIN/1.25) RTC Battery**

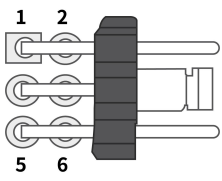
Exterior	Pin No.	Pin Name	Description
	1	VCC	Battery Positive
	2	GND	Battery Negative

**CNW1 V-BY-ONE (51PIN/0.5mm)**

Exterior	Pin No.	Pin Name	Description
	1	GND	Ground
	2	VBX1_7P	VBYONE Signal
	3	VBX1_7N	VBYONE Signal
	4	GND	Ground
	5	VBX1_6P	VBYONE Signal
	6	VBX1_6N	VBYONE Signal
	7	GND	Ground

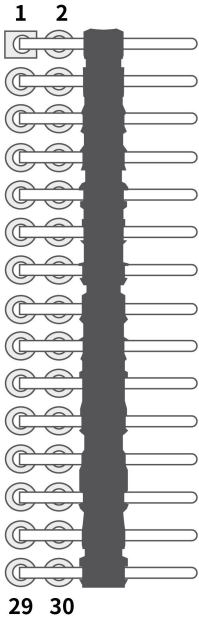
	8	VBX1_5P	VBYONE Signal
	9	VBX1_5N	VBYONE Signal
	10	GND	Ground
	11	VBX1_4P	VBYONE Signal
	12	VBX1_4N	VBYONE Signal
	13	GND	Ground
	14	VBX1_3P	VBYONE Signal
	15	VBX1_3N	VBYONE Signal
	16	GND	Ground
	17	VBX1_2P	VBYONE Signal
	18	VBX1_2N	VBYONE Signal
	19	GND	Ground
	20	VBX1_1P	VBYONE Signal
	21	VBX1_1N	VBYONE Signal
	22	GND	Ground
	23	VBX1_0P	VBYONE Signal
	24	VBX1_0N	VBYONE Signal
	25	GND	Ground
	26	LOCKN-OUT	Reserved Control Signal
	27	HTPDN	Reserved Control Signal
	28	SEL-LVDS	Reserved Control Signal
	29	AGP	Reserved Control Signal
	30	SCN-EN	Reserved Control Signal
	31	Bit-SEL1	Reserved Control Signal
	32	LD-EN2	Reserved Control Signal
	33	BOE-SCL	IIC Signal
	34	BOE-SDA	IIC Signal
	35	2D/3D	Control Signal
	36	L/R-IN	Control Signal
	37	L/R-OUT	Control Signal
	38	NC	Null
	39	GND	Ground
	40	GND	Ground
	41	GND	Ground
	42	GND	Ground
	43	NC	Null
	44-50	VCC	12V Power Supply
	51	VCC-VX1	12V Power Supply

## J1 (6PIN/2.0) LVDS\_SEL\_VOLT

Exterior	Pin No.	Pin Name	Description
	1	12V	12 VPower Supply
	2	VCC_LCD	Screen Voltage Port
	3	5V	5V Power Supply
	4	VCC_LCD	Screen Voltage Port
	5	3.3V	3.3V Power Supply
	6	VCC_LCD	Screen Voltage Port

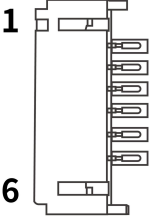
**Note: The LVDS screen uses a jumper cap to select the screen power supply. Connect 3.3V to VCC\_LCD, then the screen voltage is 3.3V.**

## J2 (30PIN/2.0) LVDS

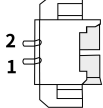
Exterior	Pin No.	Pin Name	Description
	1	VDD	Power Supply
	2	VDD	Power Supply
	3	VDD	Power Supply
	4	GND	Ground
	5	GND	Ground
	6	GND	Ground
	7	RX00-	LVDS Signal
	8	RX00+	LVDS Signal
	9	RX01-	LVDS Signal
	10	RX01+	LVDS Signal
	11	RX02-	LVDS Signal
	12	RX02+	LVDS Signal
	13	GND	Ground
	14	GND	Ground
	15	RXOC-	LVDS Signal
	16	RXOC+	LVDS Signal
	17	RX03-	LVDS Signal
	18	RX03+	LVDS Signal
	19	RXE0-	LVDS Signal
	20	RXE0+	LVDS Signal
	21	RXE1-	LVDS Signal
	22	RXE1+	LVDS Signal
	23	RXE2-	LVDS Signal
	24	RXE2+	LVDS Signal
	25	GND	Ground

	26	GND	Ground
	27	RXEC-	LVDS Signal
	28	RXEC+	LVDS Signal
	29	RXE3-	LVDS Signal
	30	RXE3+	LVDS Signal

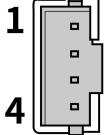
**J3 (6PIN/2.0) LVDS/V-BY-ONE -BL**

Exterior	Pin No.	Pin Name	Description
	1	GND	Ground
	2	GND	Ground
	3	ADJ	Backlight Brightness Adjustment
	4	EN	Backlight On/Off Control
	5	+12V	Screen Backlight Power Supply
	6	+12V	Screen Backlight Power Supply

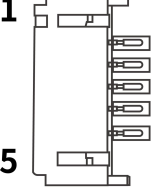
**J26 (2PIN/1.25) FAN**

Exterior	Pin No.	Pin Name	Description
	1	FAN	FAN Negative
	2	5V	FAN Positive

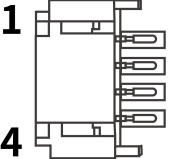
**J12 (4PIN/2.0) UART 2 Debug (TTL Debug, Power Domain 3.3V)**

Exterior	Pin No.	Pin Name	Description
	1	3V3	3.3V Power Supply
	2	RX2	UART Receive
	3	TX2	UART Transmit
	4	GND	Ground

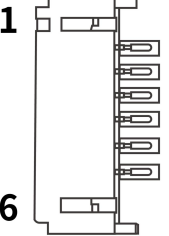
**J4 (5PIN/2.0) IR+LED**

Exterior	Pin No.	Pin Name	Description
	1	VCC	+5V Power Supply
	2	GND	Ground
	3	IR	Remote Control Infrared
	4	RED	Red Light
	5	GED	Green Light

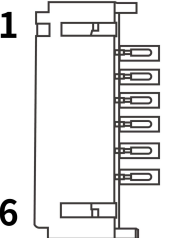
**J32 (4PIN/2.0) PWR/VOL-/VOL+ Key**

Exterior	Pin No.	Pin Name	Description
	1	K1	Volume up
	2	K2	Volume down
	3	PWR	Power on/off
	4	GND	Ground

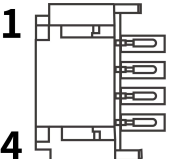
**J27 (6PIN/2.0) GPIO (Power Domain3.3V)**

Exterior	Pin No.	Pin Name	Description
	1	3.3V	Power Supply
	2	IO1	GPIO1
	3	IO2	GPIO2
	4	IO3	GPIO3
	5	IO4	GPIO4
	6	GND	Ground

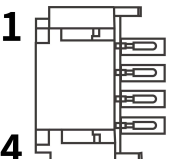
**J7 (6PIN/2.0) IIC (Power Domain3.3V)**

Exterior	Pin No.	Pin Name	Description
	1	3.3V	Power
	2	INT	Interrupt
	3	RST	Reset
	4	SCL	Clock
	5	SDA	Data
	6	GND	Ground

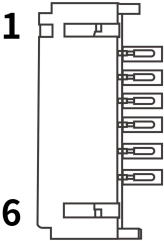
**J25 (4PIN/2.0) Audio**

Exterior	Pin No.	Pin Name	Description
	1	HPOL	Left Channel
	2	HDET	Test
	3	HPOR	Right Channel
	4	HGND	Ground


**J9 (4PIN/2.0) SPK**

Exterior	Pin No.	Pin Name	Description
	1	RPK+	Positive output for right Channel
	2	RPK-	Negative output for right Channel
	3	LPK-	Negative output for left Channel
	4	LPK+	Positive output for left Channel


**J15 (6PIN/2.54) 12V PWR\_IN**

Exterior	Pin No.	Pin Name	Description
	1	STB	Power supply enable, connect to PSON
	2	S5V	5V constant power supply (standby), connect to 5VS
	3	GND	Ground
	4	GND	Ground
	5	+12V	12V Power Input
	6	+12V	12V Power Input


**J34 (2PIN/2.0) MIC**

Exterior	Pin No.	Pin Name	Description
	1	MIC2P	MIC+
	2	MIC2N	MIC-

**J29 4G MIC**

Exterior	Pin No.	Pin Name	Description
	1	MICP	Positive input for 4G microphone
	2	MICN	Negative input for 4G microphone

**J28 4G SPK**

Exterior	Pin No.	Pin Name	Description
	1	SPKP	4G Speaker Positive Output
	2	SPKN	4G Speaker Negative Output

## Chapter 3 Electrical Characteristics

### ◆ Normal Operating Conditions

Interface Type		Min	Typ	Max
Standard power parameters	VCC	11V	12V	13.5V
	Ripple	/	/	±3%
	Current	2A	3A	/

### ◆ Power Consumption

Interface Type		Min	Typ	Max
Power Supply Current (with no display connected )	Operation Current	/	260mA	350mA
	STAND-BY CURRENT	/	10mA	30mA
	BATTERY OPERATION CURRENT	/	0.0024mA	/

### ◆ USB Supply Electricity

USB Interface	Voltage	Typical Current	Max Current
OTG_USB	5V	500mA	1.5A
HOST_USB	5V	500mA	1.5A

**Note: It is recommended that the total current of USB peripheral should not exceed 3000 mA, otherwise the machine will be unable to operate normally.**

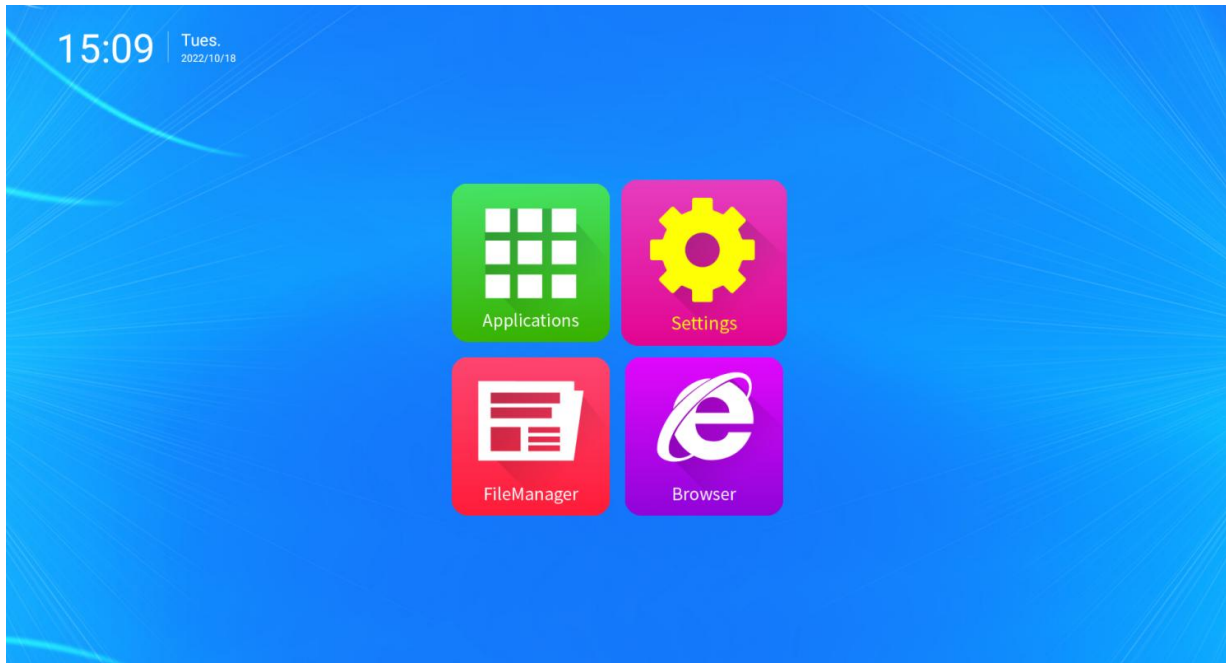
### ◆ other

interface type	rated current	maximum current	-
External 5V	/	3000mA	/
External 3.3V	/	3000mA	/

# Chapter 4 System Instruction

## 4.1 Android System Interface Description

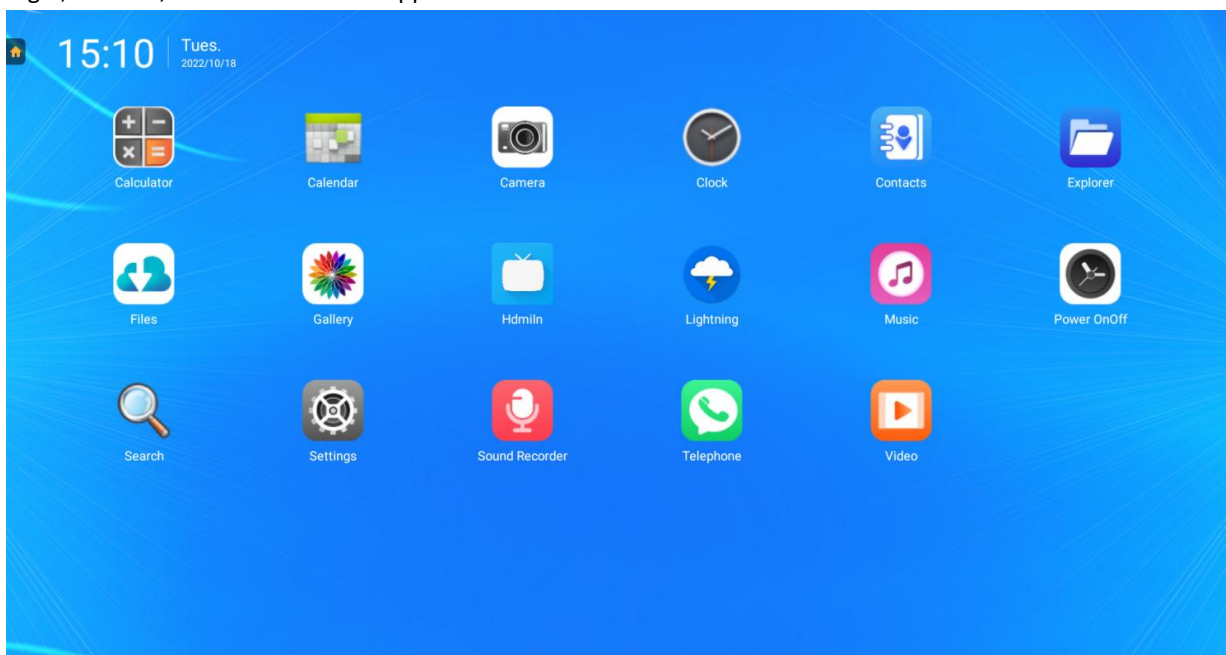
The main menu interface of Android is divided into four categories: apps, Settings, file management and browse.



Main Interface

### (1) Application interface

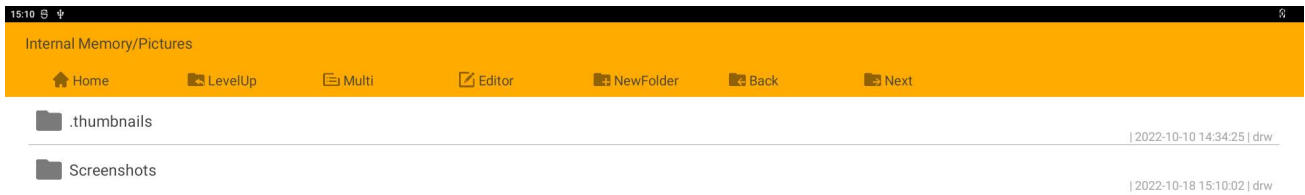
The application interface includes: timed on/off, video player, settings, picture library, file, camera, music, resource manager, browser, HDMI-IN and other applications.



Application Interface



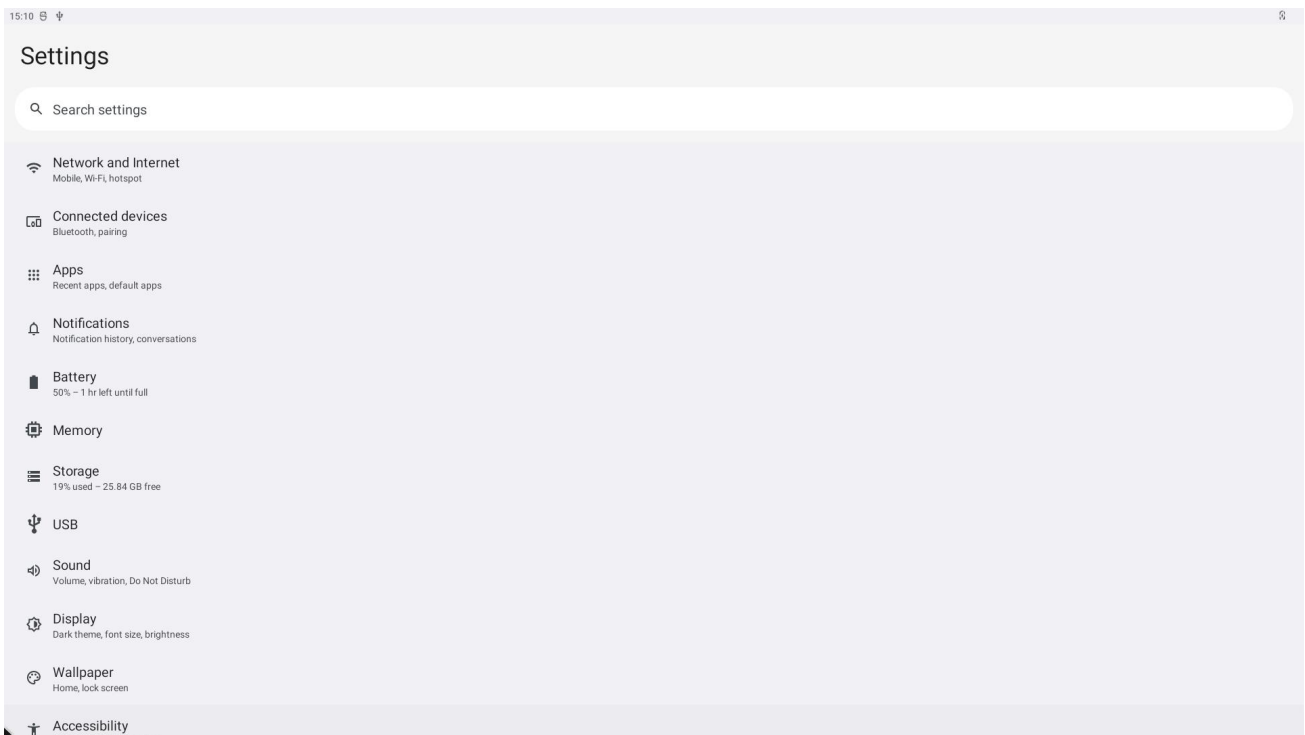
## (2) File Management Interface



File Management Interface

## (3) Setting Menu Interface

It supports the settings of wireless network and device display sound, and can also view the programs and applications installed on the device, as well as the storage memory.

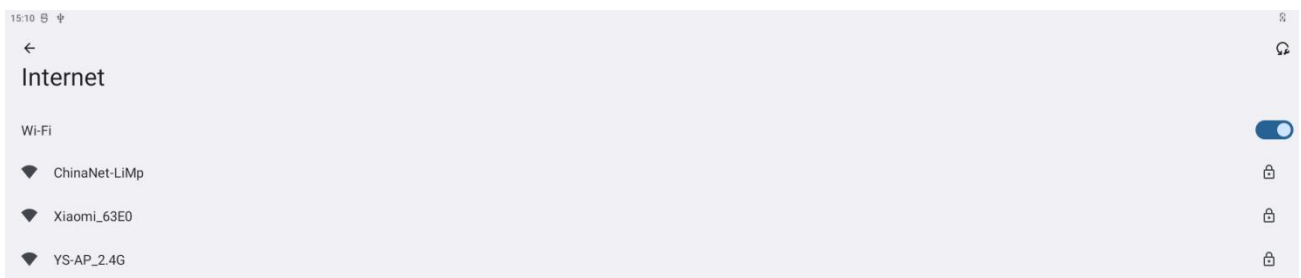


Setting Menu Interface

## 4.2 Network Interface Explanation

### (1) WIFI Network Signal Connection

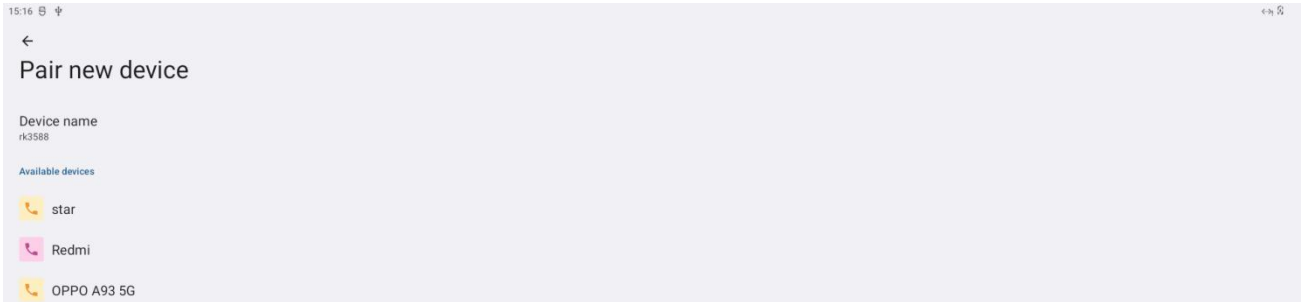
Enter the "Settings - Network and Internet - Internet" interface to turn on the WIFI switch, as shown below; Select the WIFI signal to be connected and enter the corresponding password to successfully connect.



WIFI Setting Interface

## (2) Bluetooth Signal Connection

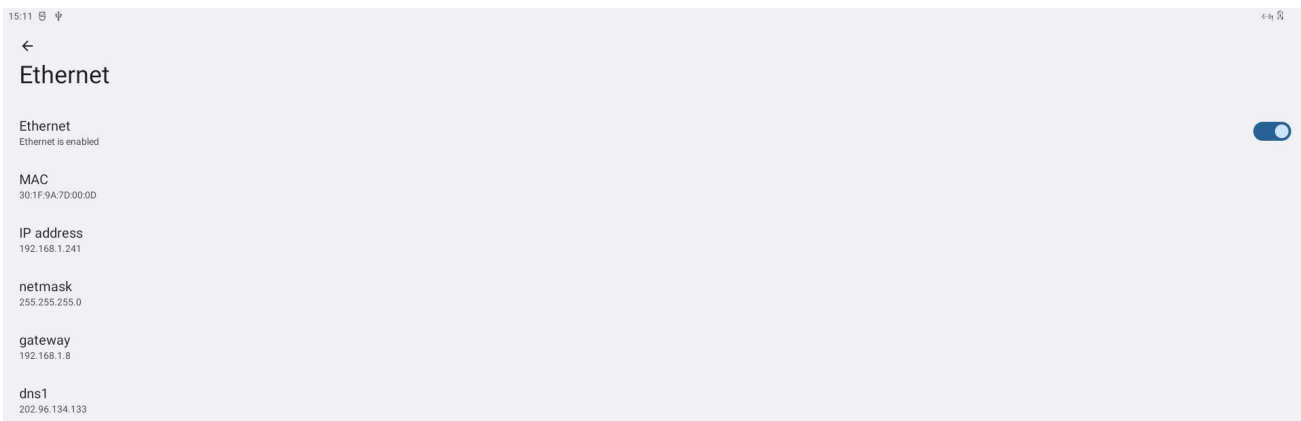
In the "Settings - Connected Devices - Pair with New Devices" interface, you can search for Bluetooth devices, as shown in the following figure. Find the Bluetooth devices to pair and click Pair.



Bluetooth Setting Interface

## (3) Ethernet Connection

Enter the "Settings - Network and Internet - Ethernet" interface, as shown in the following figure, turn on the Ethernet switch, and then automatically connect to the Ethernet after inserting the network cable. You can view the IP address, Ethernet MAC address and other information on the interface as shown in the figure.



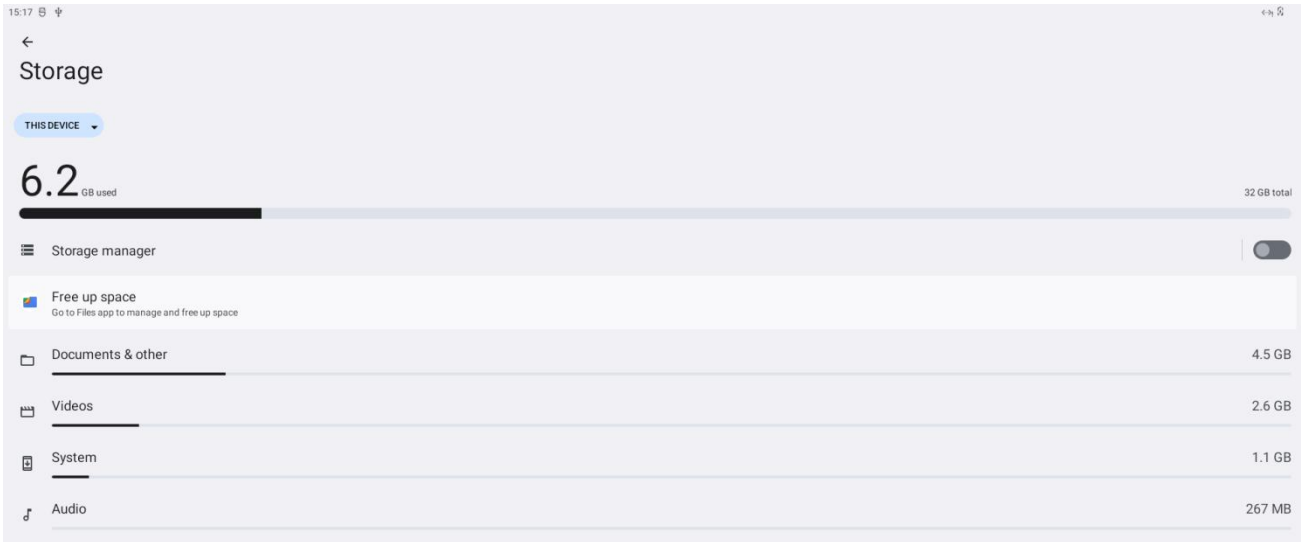
Ethernet Setting Interface

### NOTICE:

- The use of the wireless network must be connected to the WIFI antenna at the WIFI antenna holder
- The availability and coverage of WIFI signals depends on the number of signals, antenna performance and external environment.
- The Ethernet MAC address is the only permanent and valid device ID for this system.
- The network priority order for all Android devices is: ETH Ethernet network > WIFI wireless network.

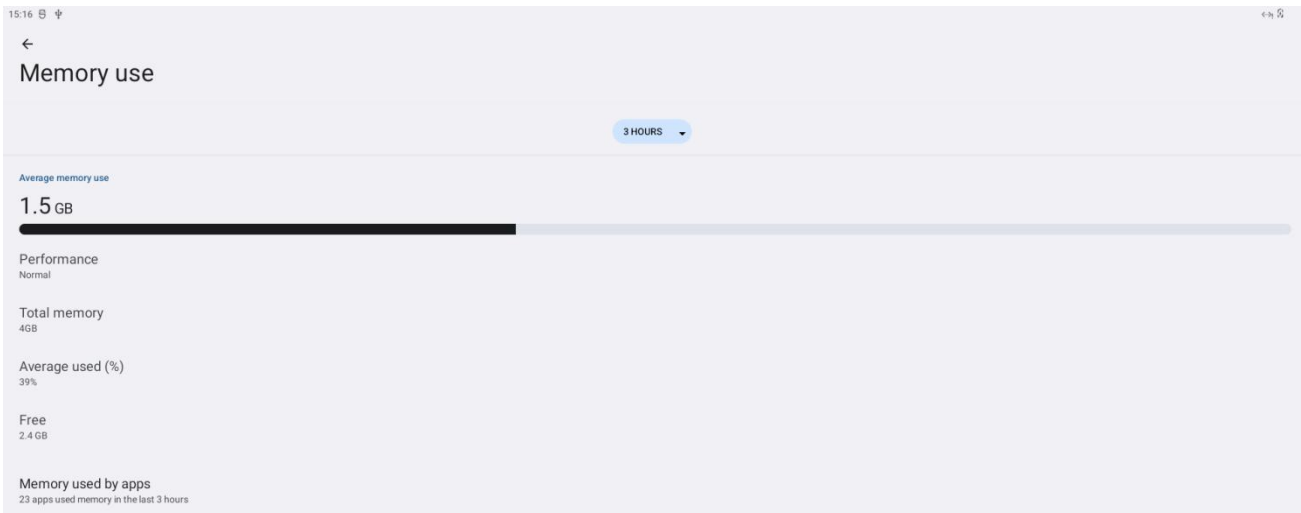
## 4.3 Viewing Storage and Memory

In the setting, select "Storage" and enter the interface below to display the storage information of the internal storage space. The display shows that 6.2G is the used capacity of the board, and "32G in total" is the total hardware storage capacity. The list shows the storage space used by each application.



Viewing Storage Interface

In the setting, select "Memory" and enter the interface below to display the storage information of the internal storage space. The display shows that 1.5GB is the used amount of the board, "4G in total" is the total hardware memory, and the list shows the storage space used by each application.



View memory interface

## 4.4 Setting The Notification Bar And Navigation Bar

In Settings, select Show: Select Hide Navigation bar, the navigation bar will be hidden. Select Slide Out of the navigation bar, and slide the mouse pointer from the bottom up to slide out of the navigation bar. The navigation bar disappears after 5 seconds. If you select Do not pull down Notification bar, the notification bar cannot be pulled down. Select Hide Status bar to hide the status bar that displays the time and other status on the upper part of the interface.

Hide Navigation Bar	<input checked="" type="checkbox"/>
Swipe Navigation Bar	<input checked="" type="checkbox"/>
Disable Expand statusbar	<input type="checkbox"/>
Hide Top Status Bar	<input type="checkbox"/>

### Setting The Notification Bar And Navigation Bar



navigation bar

**Note:**

If you select "Slide out navigation bar", select "Hide Navigation bar". If the status bar is hidden, the notification bar is forced to be hidden by default.

## Chapter 5 Contact Us



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*[Looking forward to working with you, thank you](#)*