灰度科技
HUIDU TECHNOLOGY

PRODUCT SPECIFICATION

LCD Android Board

HD-3588V

Version: V1.0

Update History

Version	Release time	Description
V1.0	August 20, 2024	First official release.

Contents

Chapter Ⅰ Product Description

Ⅰ. Overview

HD-3588V adopts RK3588 (Quad core Cortex-A76 + Quad-core Cortex-A55) octa-core processor, equipped with Android 13.0 system, the main frequency up to 2.4GHz, superb performance, and rich interfaces. Adopting Mali-G610 MC4 GPU, it supports 8K60FPS H.265/H.264/AV1/VP9/AVS2 video decoding, IR remote control, Wi-Fi, RJ45, USB and other rich interfaces, making the product more versatile and widely used in intelligent control fields such as advertising machines, interactive all-in-one machines, security, medical, transportation, finance, industrial control, etc.

Due to the characteristics of its hardware platform and Android intelligence, it can be used on the main board of the smart terminal when human-computer interaction and network device interaction are required, and it can be your best choice.

Ⅱ. Features

- High performance. The RK3588 chip adopts octa-core 64-bit mini-core architecture with a main frequency of up to 2.4GHz. It can play high-definition video in various formats and handle complex interactive operations.
- High stability. RK3588 Android all-in-one board adds unique technology to ensure product stability in terms of hardware and software, and can make the final product reach 7*24 hours unattended.
- High integration. RK3588 Android all-in-one board integrates Ethernet, two LVDS, MIPI, eDP, HDMI, Wi-Fi, audio power amplifier, TF expansion card, USB expansion port, IR remote control function, TP, backlight control, microphone and other functions.
- High scalability. 7 USB (5 pins, 1 USB 3.0 HOST, 1 USB OTG), 1 SATA ports,6 serial ports + 1 scalable debug serial port + 1 MCU programming serial port, five IO expansion ports can expand more peripheral devices.
- High definition. Supports LCD displays with various LVDS/ V-By-One/ MIPI/ EDP / HDMI interfaces, and supports cutting screens of various sizes and resolutions.
- It perfectly supports multiple mainstream touch screen functions such as multi-point infrared touch, multi-point capacitive touch, multi-point nano-film touch, multi-point acoustic wave touch, and multi-point optical touch.

Chapter II Specifications

Ⅰ. Basic Parameters

1. Hardware Parameters

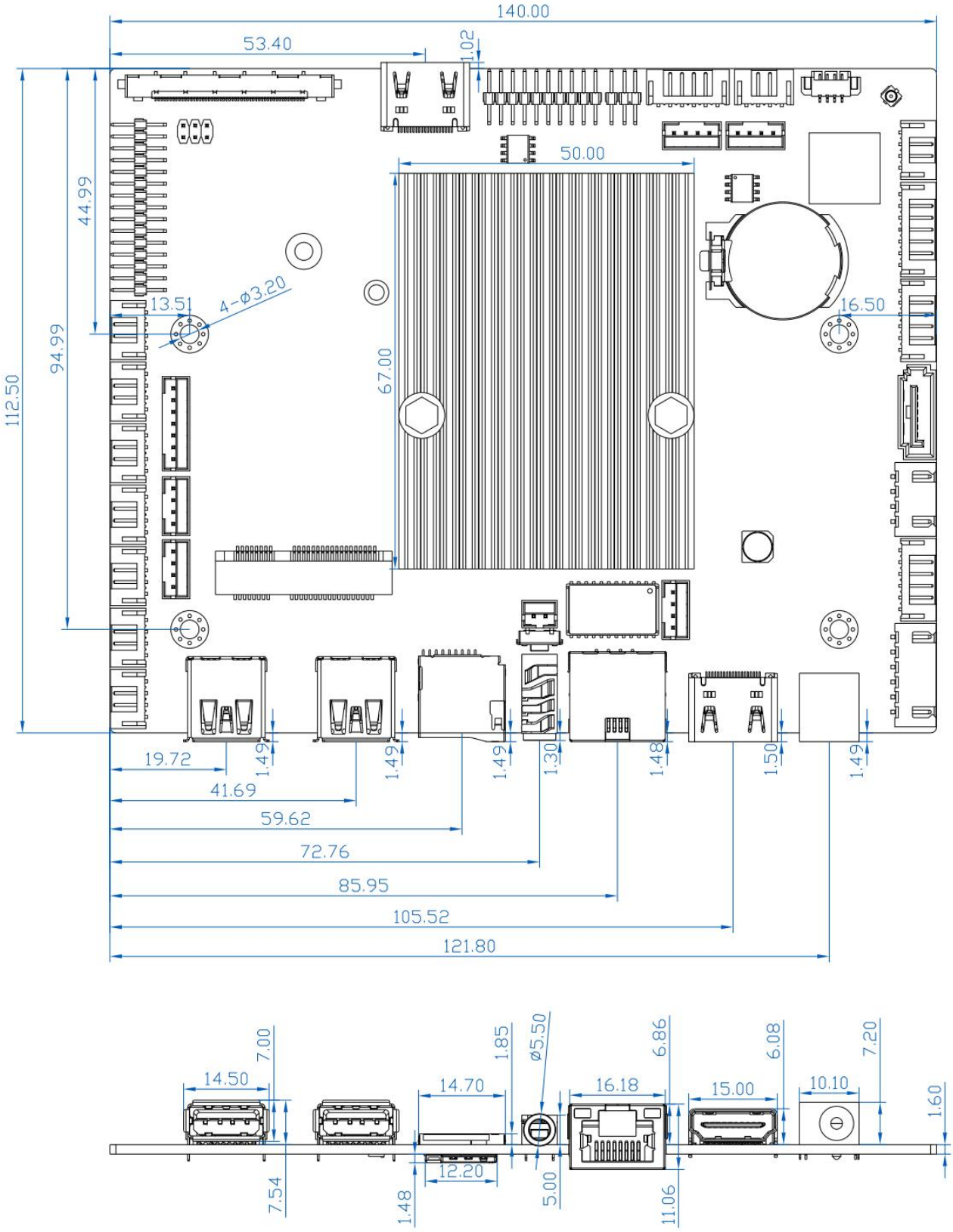
Hardware Specifications	
CPU	RK3588, Octa-core chip, Octa-core 64-bit size core architecture, 4*Cortex-A76 + 4*Cortex-A55, Android 13.0
GPU	ARM Mali-G610 MC4, OpenGL ES 1.1/2.0/3.1/3.2, Vulkan 1.1,1.2, OpenCL 1.1, 1.2, 2.0,embedded high-performance 2D image acceleration module
NPU	6TOPS
RAM/ Storage	Standard 4GB+64GB, 8GB+128GB, 16GB+256GB
Network	Support 1000Mbps Ethernet; Support 2.4GHz/ 5GHz Wi-Fi; Support Bluetooth 5.0; support Wi-Fi 6
Image rotation	Support 0 degree, 90 degree, 180 degree, 270 degree manual rotation; optional gravity sensor, support automatic rotation
Display interface	1*LVDS interface (single/dual, 6-bit/8-bit), support 3.3V/5V/12V power supply 1 channel HDMI 4K display/1 channel eDP interface (choose one, default HDMI OUT, eDP interface is not posted by default) 1 channel MIPI interface, 1 channel V-By-One interface, 1 channel HDMI IN interface, onboard backlight control supports 12V backlight power supply
Audio	Support standard left and right channel line output; support 3.5mm audio output interface
Amplifier	2 channel output (default 8 ohm 5 watt, compatible with 8 ohm 10 watt dual audio amplifier outputs)
Microphone	MIC input
Touch screen	Support USB multi-point infrared touch, multi-point capacitive touch, multi-point Nano film touch, multi-point sound wave touch, multi-point optical touch and more.
RTC	Built-in real-time clock function
USB	1-way USB-3.0 HOST, 1-way USB3.0 OTG, 5-way extended USB port(which EX-USB is multiplexed with PCIE-4G.)
Infrared	Infrared receiving socket, support infrared remote control function

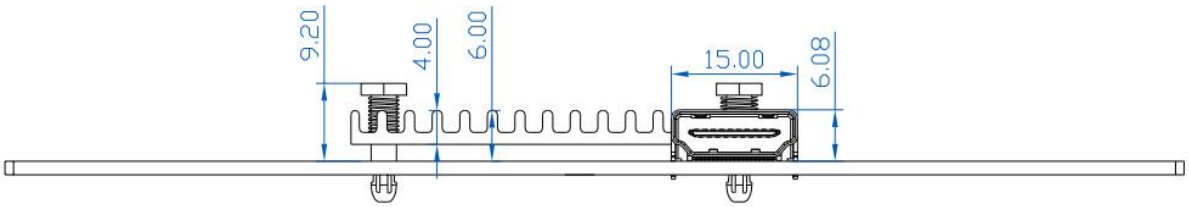
LED	Power light, power on green light is always on, power off red light is always on System running light, power on green light flashing, power off does not light up
Button	1*upgrade key
Serial port	4-way UART, 1-way DEBUG, 1 MCU burning serial port; optional RS232, RS485
GPIO	5-way IO input and output control, can be used for key scanning control
KEY	Support physical switch
Storage humidity	10%～90%, no condensation
Storage temperature	-40℃~70℃
Operating temperature	-20℃~70℃

2. Software Parameters

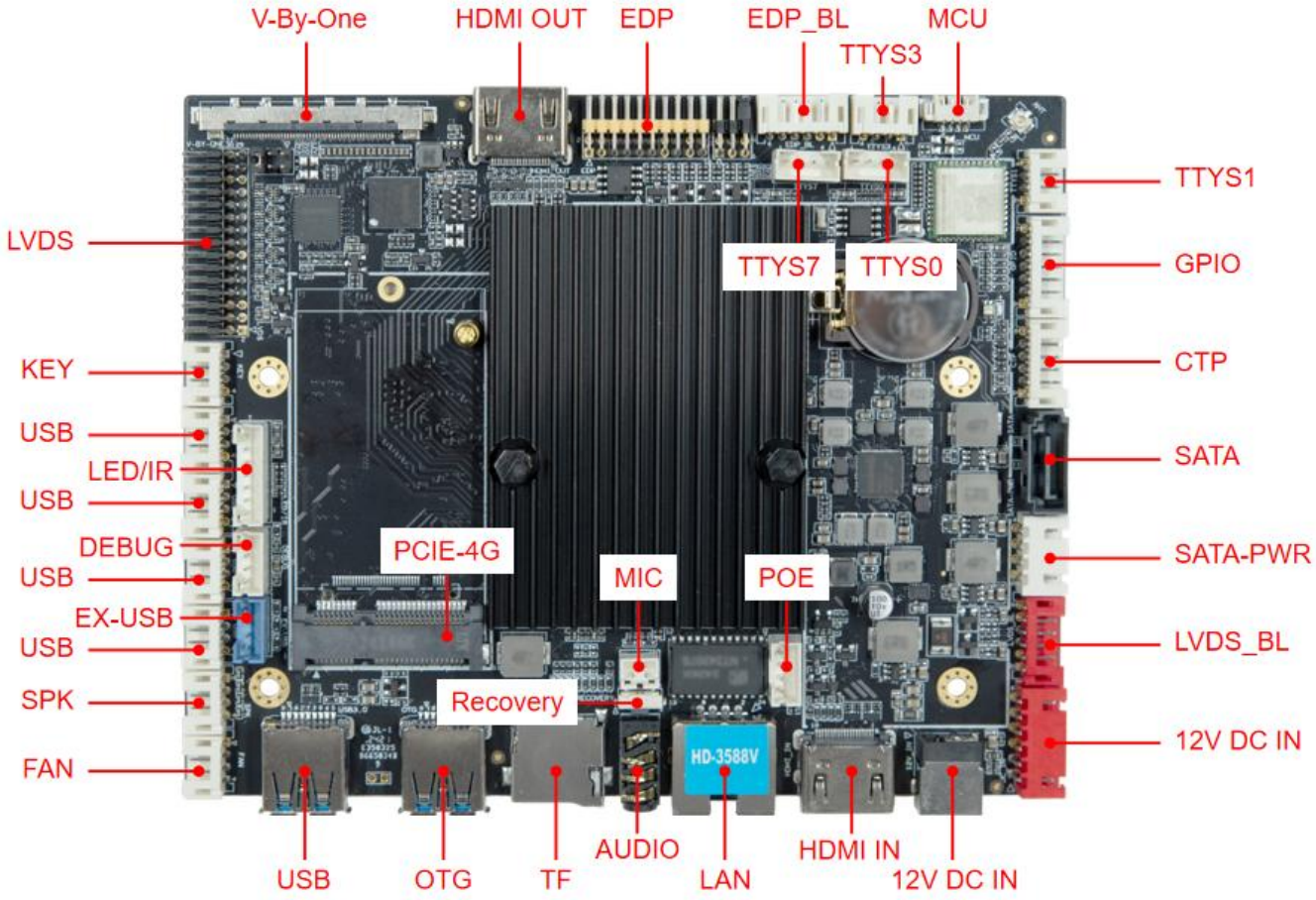
Software Specifications	
Operating system	Android 13.0
Audio	MP3, WMA, WAV, APE, FLAC, AAC, OGG, M4A, 3GPP and other formats
Video	Support MPEG-1, MPEG-2, MPEG-4, H.263, H.264, H.265, VC-1, VP9, VP8, AV1 and other video formats
Picture	Support JPG, BMP, PNG and other image formats
Built-in APP default	Calculator, Voice Recorder, Calendar, Settings, Clock, Video Player, Gallery, Camera, Music, Explorer, Browser, HDMI IN, etc.
Language	Support multi-languages
Input method	Standard Android keyboard, optional third-party input method
System Management	Original ecological Android system, open root privileges, and can carry out product customization development
	Real-time remote monitoring, system crash self-recovery, 7*24 hours unattended
	Support OTA remote upgrade; support U disk upgrade
	Support boot animation definition
	Support server/standalone mode switching
	Support Wi-Fi hotspot
System watchdog	Support software watchdog, hardware watchdog

Ⅱ. Dimensions





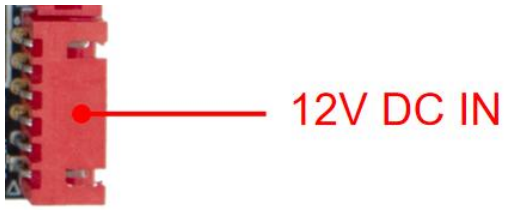
Ⅲ. Product Interface Diagram



IV. Interface Parameter Description

1. Power Interface

12V DC power supply is used to power the board system from the DC block and power socket.



No.	Definition	Attributes	Description
1	STB	output	standby signal output
2	5VS	input	standby 5V input
3	GND	ground wire	ground wire
4	GND	ground wire	ground wire
5	12V	input	12V input
6	12V	input	12V input

Note: The inner diameter of the DC power port is 2.0mm, and the outer diameter is 5.8mm.

2. LED/IR Interface (Remote control)

No.	Definition	Attributes	Description
1	RED	Output	Red light
2	3V3	power supply	3.3V output
3	GRN	output	green light
4	IO6	output	remote control signal output
5	INT	input	remote control signal input
6	GND	ground wire	ground wire
7	3V3	power supply	3.3Voutput

3. LVDS BL Interface

No.	Definition	Attributes	Description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	ADJ	Output	Backlight brightness control
4	EN	Output	Backlight enable control
5	12V	Power	12V output
6	12V	Power	12V output

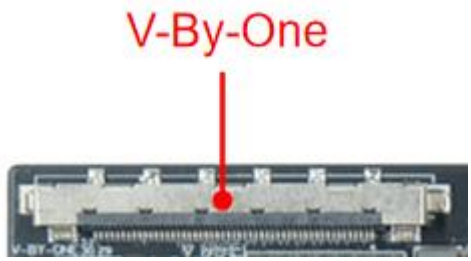
4. LVDS Interface

General LVDS interface definition, support single/dual, 6/8/10 bit 1080P LVDS screen. The screen voltage can be selected through the jumper cap, and can choose to support 3.3V/5V/12V screen power supply.
In order to avoid burning the board and screen, please pay attention to the following:
1. Please confirm whether the power supply voltage of the screen specification book is correct, and whether the corresponding power supply of the board can meet the maximum working current of the screen.
2. Please use a multimeter to confirm whether the power supply selected by the jumper cap is correct.
3. When connecting the screen cable of the 6/8-bit LVDS screen, it should be installed close to the pin1 end.

No.	Definition	Attributes	Description
1	VCC	power supply	3.3V/5V/12V optional output
2	VCC		

3	VCC		
4	GND	ground wire	ground wire
5	GND	ground wire	ground wire
6	GND	ground wire	ground wire
7	D0-	output	Odd 0-
8	D0+	output	Odd 0+
9	D1-	output	Odd 1-
10	D1+	output	Odd 1+
11	D2-	output	Odd 2-
12	D2+	output	Odd 2+
13	GND	ground wire	ground wire
14	GND	ground wire	ground wire
15	CK-	output	Odd Clock-
16	CK+	output	Odd Clock+
17	D3-	output	Odd 3-
18	D3+	output	Odd 3+
19	D4-	output	Even 0-
20	D4+	output	Even 0+
21	D5-	output	Even 1-
22	D5+	output	Even 1+
23	D6-	output	Even 2-
24	D6+	output	Even 2+
25	GND	ground wire	ground wire
26	GND	ground wire	ground wire
27	CK-	output	Even Clock-
28	CK+	output	Even Clock+
29	D7-	output	Even 3-
30	D7+	output	Even 3+

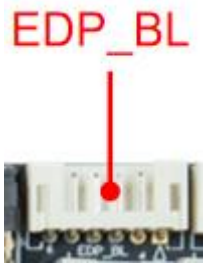
5. V-by-One Interface



No.	Definition	Attributes	Description
1	GND	Ground wire	ground wire
2	VBX-7P	Output	Pixel0 Positive Data
3	VBX-7N	Output	Pixel0 Negative Data
4	GND	Ground wire	Ground wire
5	VBX-6P	Output	Pixel1 Positive Data
6	VBX-6N	Output	Pixel1 Negative Data
7	GND	Ground wire	Ground wire
8	VBX-5P	Output	Pixe2 Positive Data
9	VBX-5N	Output	Pixel2 Negative Data
10	GND	Ground wire	Ground wire
11	VBX-4P	Output	Pixel3 Positive Data
12	VBX-4N	Output	Pixel3 Negative Data
13	GND	Ground wire	Ground wire
14	VBX-3P	Output	Pixel4 Positive Data
15	VBX-3N	Output	Pixel4 Negative Data
16	GND	Ground wire	Ground wire
17	VBX-2P	Output	Pixel5 Positive Data
18	VBX-2N	Output	Pixel5 Negative Data
19	GND	Ground wire	Ground wire
20	VBX-1P	Output	Pixel6 Positive Data
21	VBX-1N	Output	Pixel6 Negative Data
22	GND	Ground wire	Ground wire
23	VBX-0P	Output	Pixel7 Positive Data

24	VBX-0N	Output	Pixel7 Negative Data
25	GND	Ground wire	Ground wire
26	LOCKN-OUT	Output	CLOCK
27	HTPDN	Output	TCON
28	SEL	Null	TCON
29	AGP	Null	TCON
30	SCN-EN	Null	TCON
31	Bit-SEL	Null	TCON
32	LD-EN2	Null	TCON
33	BOE-SCL	Null	TCON
34	BOE-SDA	Null	TCON
35	2D/3D	Null	TCON
36	L/R-IN	Null	TCON
37	L/R OUT	Null	TCON
38	Null	Null	NC
39	GND	Ground wire	Ground wire
40	GND	Ground wire	Ground wire
41	GND	Ground wire	Ground wire
42	GND	Ground wire	Ground wire
43	Null	Null	NC
44	VCC-VX1	Power	Power
45	VCC-VX1	Power	Power
46	VCC-VX1	Power	Power
47	VCC-VX1	Power	Power
48	VCC-VX1	Power	Power
49	VCC-VX1	Power	Power
50	VCC-VX1	Power	Power
51	VCC-VX1	Power	Power

6. eDP BL Interface



No.	Definition	Attributes	Description
1	GND	Ground	Ground
2	GND	Ground	Ground
3	ADJ	Output	Backlight Enable Control
4	EN	Output	Backlight Enable Control
5	12V	Power	12V Output
6	12V	Power	12V Output

7. EDP Interface (Optional)

This interface is a common EDP screen interface, in the form of 10 * 2 double row pins, 3.3V screen power supply.

In order to avoid burning boards and screens, please note the following:

Confirm that the screen specification book screen supply voltage is correct and whether the board's corresponding power supply can meet the screen's maximum working current.

No.	Definition	Attributes	Description
1	VCC	Power	output
2	VCC	Power	output
3	GND	Ground	Ground
4	GND	Ground	Ground
5	D0-	Output	True Signal Link Lane 0
6	D0+	Output	Complement Signal Link Lane 0
7	D1-	Output	True Signal Link Lane 1
8	D1+	Output	Complement Signal Link Lane 1
9	D2-	Output	True Signal Link Lane 2
10	D2+	Output	Complement Signal Link Lane 2
11	D3-	Output	True Signal Link Lane 3
12	D3+	Output	Complement Signal Link Lane 3
13	GND	Ground	Ground
14	GND	Ground	Ground
15	AU-	Output	True Auxiliary Channel
16	AU+	Output	Complement Signal Link Lane 0
17	GND	Ground	Ground
18	GND	Ground	Ground
19	3V3	Power	Output
20	HPD	Input	Screen Hot Swap Detection Signal

8. MIPI_DSI Interface

No.	Definition	Attributes	Describe
1	LED+	Output	LED+
2	LED+	Output	LED+
3	NC	Null	NC
4	NC	Null	NC
5	NC	Null	NC
6	NC	Null	NC
7	NC	Null	NC
8	NC	Null	NC
9	LED-	Output	LED-
10	LED-	Output	LED-
11	GND	Ground wire	Ground wire
12	NC	Null	NC
13	NC	Null	NC
14	NC	Null	NC
15	NC	Null	NC
16	GND	Ground wire	Ground wire
17	NC	Null	NC
18	NC	Null	NC

19	GND	Ground wire	Ground wire
20	RXE3+	Output	MIPI 3+ Signal
21	RXE3-	Output	MIPI 3- Signal
22	GND	Ground wire	Ground wire
23	RXE2+	Output	MIPI 2+ Signal
24	RXE2-	Output	MIPI 2- Signal
25	GND	Ground wire	Ground wire
26	RXECLK+	Output	MIPI CLK + Signal
27	RXECLK-	Output	MIPI CLK - Signal
28	GND	Ground wire	Ground wire
29	RXE1+	Output	MIPI 1 + Signal
30	RXE1-	Output	MIPI 1 - Signal
31	GND	Ground wire	Ground wire
32	RXE0+	Output	MIPI 0 + Signal
33	RXE0-	Output	MIPI 0 - Signal
34	GND	Ground wire	Ground wire
35	NC	Null	NC
36	RST	Output	Reset
37	GND	Ground wire	Ground wire
38	VCC	Output	Power supply
39	VCC	Output	Power supply
40	NC	Null	NC

9. KEY Interface

No.	Definition	Attributes	Description
1	PWRON	Power switch	External button, control power on and power off
2	RESET	Reset signal	Reset signal interface, Reserve
3	Recovery	ADC	ADC Reserve
4	GND	GND	GND

10. MIC Interface

No.	Definition	Attributes	Description
1	MIC-P	Input	MIC+Input
2	MIC-N	Input	MIC-Input

11. MCU Interface

No.	Definition	Attributes	Description
1	GND	Ground wire	MIC+Input
2	CLK	Input	MIC-Input
3	DIO	Output	DIO
4	3V3	Power	3.3V output

12. TTYS Interface

4 groups of ordinary two-wire serial ports, can support common serial devices on the market, the level of the serial port for 0V to 3.3 V. If the level of the docking serial port is higher than 3.3 V, there should be isolation circuits or level conversion circuits, otherwise it will be burned out of the main control and the device. Precautions:
1. Whether the serial port voltage matches. It cannot be directly connected to RS232, RS485 serial devices.
2. Whether the connection of TX and RX is correct.

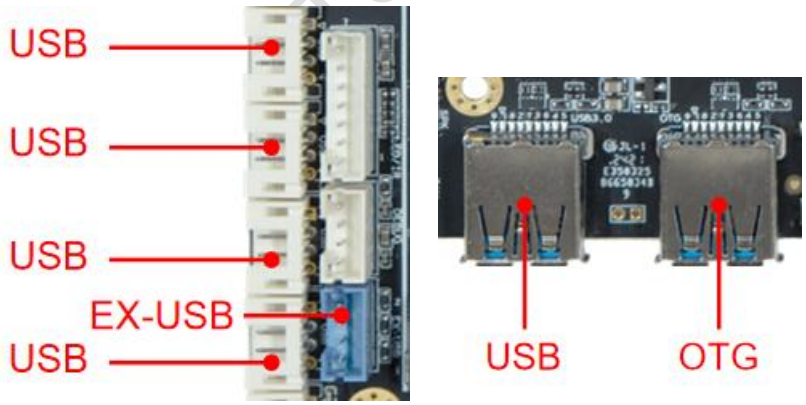
NO.	Definition	Attributes	Description
1	3v3	power supply	3.3V output
2	TX	output	TX
3	RX	input	RX
4	GND	ground wire	Ground wire

TTYS3, TTYS4, TTYS6, TTYS8 can adjust RS232 through; TTYS2, TTYS7 can adjust RS485 through hardware.

13. PoE Interface

No.	Definition	Attributes	Description
1	V1	CT1	Center tap Transformer center 1
2	V2	CT2	Center tap Transformer center 2
3	B1	CT3	Center tap Transformer center 3
4	B2	CT4	Center tap Transformer center 4

14. USB Interface



The board has two USB 3.0 standard ports and five built-in USB 2.0 sockets for peripheral expansion of USB ports (EX-USB is multiplexed with PCIE-4G).

No.	Definition	Attributes	Description
1	5V	power supply	5Voutput
2	DM	input/output	DM
3	DP	input/output	DP
4	GND	ground wire	ground wire

15. SPK Interface (Amplifier)

No.	Definition	Attributes	Description
1	SPKL+	output	right channel+
2	SPKL-	output	right channel-
3	SPKR-	output	left channel-
4	SPKR+	output	left channel+

16. TRS AUDIO 3.5mm Interface

17. GPIO Interface

NO.	Definition	Attributes	Description
1	GND	Ground wire	Ground wire
2	IO1	IO1	IO1
3	IO2	IO2	IO2
4	ADC2	IO3	IO3
5	ADC1	IO4	IO4
6	ADC0	IO5	IO5
7	3V3	Power	3.3V output

18. DEBUG Interface

No.	Definition	Attributes	Description
1	3V3	Power	3.3V output
2	TX	Output	TX
3	RX	Input	RX
4	GND	Ground wire	Ground wire

19. CTP Interface

NO.	Definition	Attributes	Description
1	3V3	Power	3.3V output
2	SCL	Input/output	I2C clock
3	SDA	Input/output	I2C data
4	INT	Input/output	to interrupt
5	RST	Input/output	Reset
6	GND	Ground wire	Ground wire

20. SATA-PWR Interface

NO.	Definition	Attributes	Description
1	5V0	Power	5V output
2	GND	Ground wire	Ground wire
3	GND	Ground wire	Ground wire
4	12V	Power	to interrupt

21. FAN Interface

NO.	Definition	Attributes	Description
1	GND	Ground wire	Ground wire
2	5V	Power	5V output
3	NC	Null	Null
4	PWM	RPM control	Duty Cycle Control

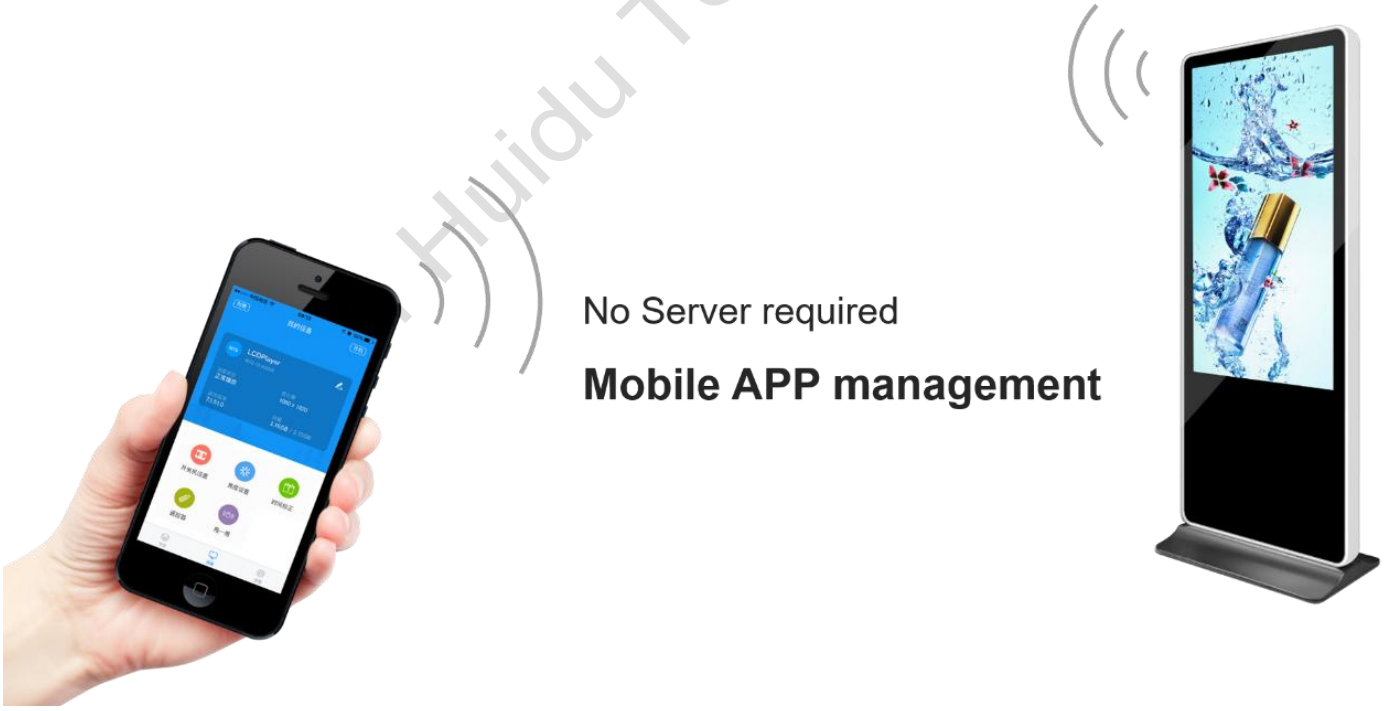
22. Other Interfaces

Storage interface	SD card	Data storage, maximum support 512G
	USB	HOST interface, support data storage, data import, USB mouse keyboard, camera, touch screen, etc.
	SATA	SATA3.0 interface specification, support for a variety of SATA hard disk up to 6Gbps/s transfer rate (750MB/s)

		SATA power supply support 12V/5V input, does not support 3.3V power supply
Ethernet interface	RJ45 interface	Support 1000Mbps wired network
HDMI OUT interface	Standard interface	Support HDMI output, maximum support 4K 60HZ
HDMI IN interface	Standard interface	Support HDMI input, maximum support 4K 60HZ
4G	PCI-E standard interface	Support 4G module
SIM card interface	Standard interface	Support various standards (depending on 4G module)

Chapter III Communication Methods

I . Wi-Fi Update Program



Ⅱ. U-disk update program

U-disk update programs

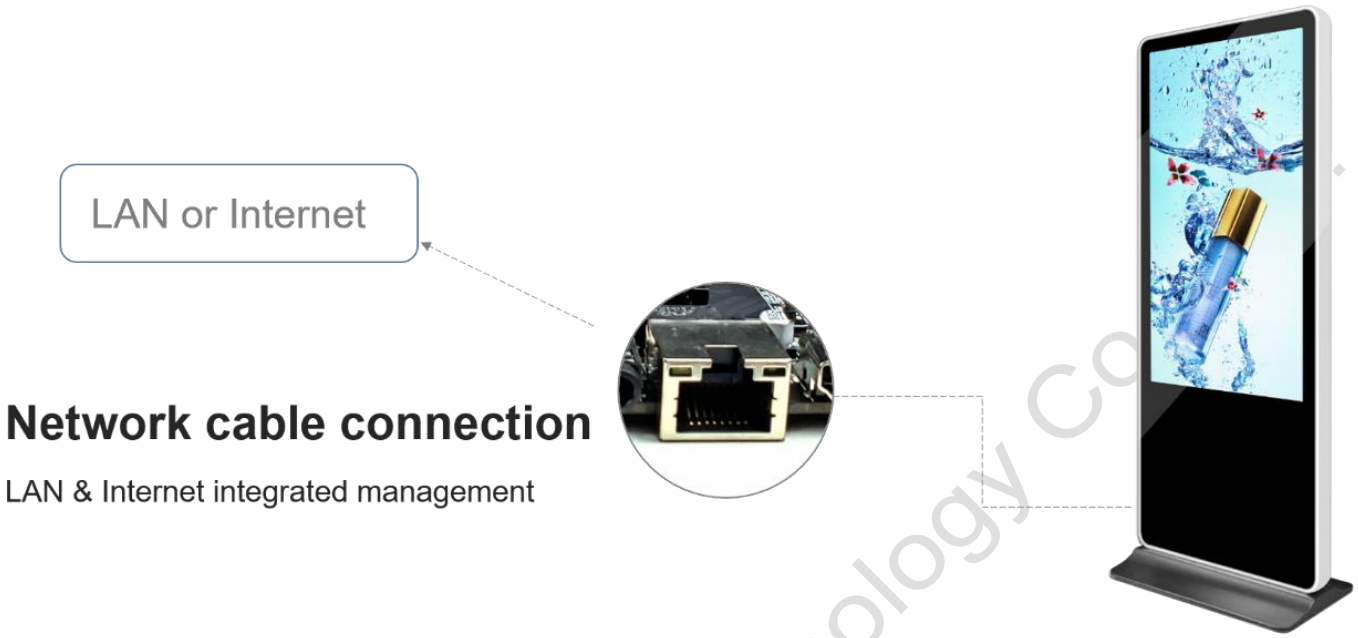
Support Interstitial & memory expansion

Ⅲ. TF Card Update Program

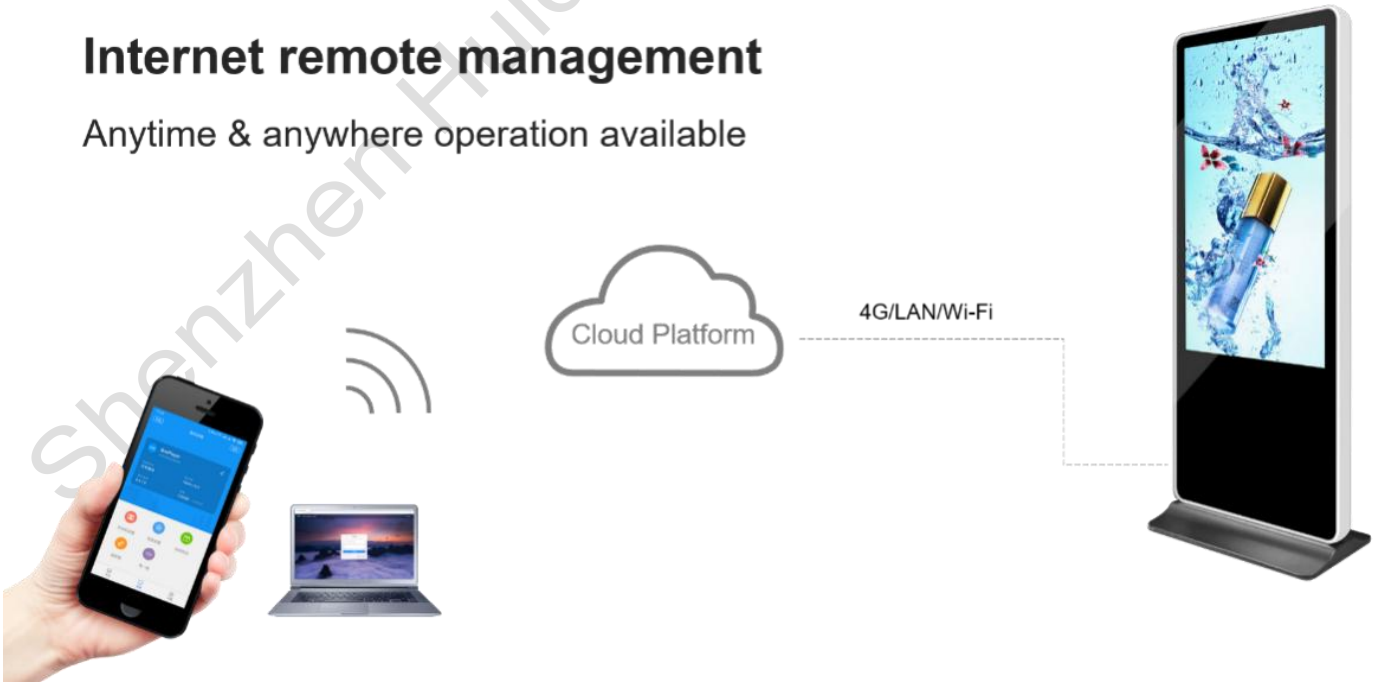
TF card update programs

Support Interstitial & memory expansion

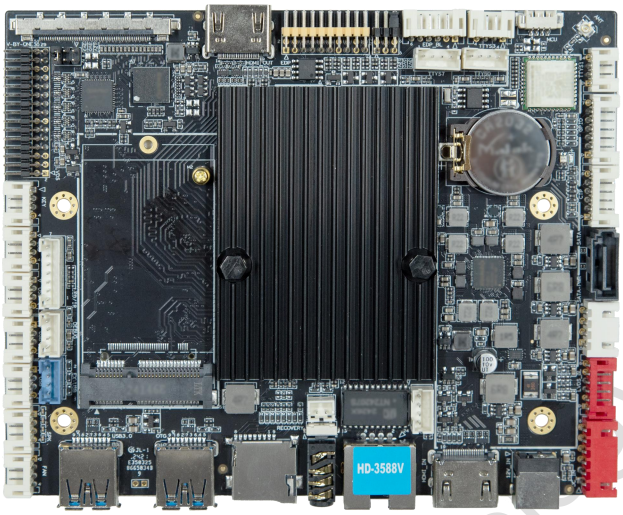
IV. Ethernet cable to Update

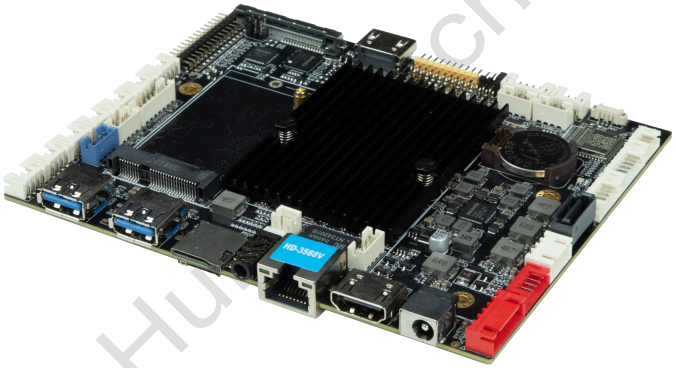


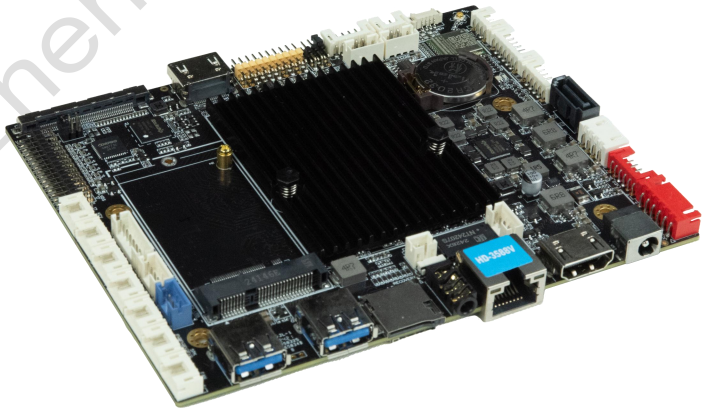
V. Internet Update



Chapter IV Appendix: Product Appearance







Note:

1. The model label is attached to the sales product. The product picture in the specification is different from the actual product. It is not a fake or inferior product. If you have any questions, please contact us for confirmation.

2. Do not operate with power on, Do not hot swap.