D-3588 Mainboard Specification

Document Version

Version	V1.1
Date	2023-08-01

Changelog

1.0.0	2022-10-14	Chinese and English merged version.
1.0.1	2022-11-03	Add a motherboard diagram.
1.0.2	2022-11-18	Update the WiFi6 module with 2.4G/5GHz WiFi by default.
1.0.3	2023-02-16	Update the default serial port configuration of the motherboard.
1.0.4	2023-03-10	Fixed KIO's K4 number and added a physical size map.
1.0.5	2023-07-26	Added the description of interface definition for MIPI-CSI.
1.1.0	2023-08-01	Update documentation based on V3.0 hardware

Contents

1   RK3588 Brief

RK3588 chip has the characteristics of high performance and high expansion application. At present, it is the most cost-effective chip in the Rockchip product line, and its hardware specifications are in a leading position in the industry.

- CPU: Octa-core 64-bit size core architecture, quad-core Cortex-A76 + quad-core Cortex-A55, based on high-end 8nm technology, the main frequency is up to 2.4GHz.

- GPU: ARM Mali-G610 MC4, support OpenGL ES 1.1/2.0/3.1/3.2, OpenCL 1.1,1.2,2.0, Vulkan 1.1,1.2, Embedded high performance 2D image acceleration module.

- NPU: 6 tops AI work force, three nuclear architecture, support int4/int8/int16/FP16/BF16/TF32.

- Multimedia: Support H.265/H.264/AV1/VP9/AVS2 video decoding, up to 8K@60FPS; Support H.264/H.265 video encoding, up to 8K@30FPS.

- Display: Support multiple screen display, up to 8K@60FPS; Supports EDP/DP/HDMI2.1/MIPI display interfaces *

- Video input: Supports multiple camera input (4*4lanes or 4*2lanes+2*4Lanes) MIPI CSI-2 and DVP interface; 32MP ISP, support HDR and 3DNR; Supports HDMI2.0 input, up to 4K@60FPS *

- High speed interface: Support PCIe3.0/PCIe2.0/SATA3.0/RGMII/TYPE-C/USB3.1/USB2.0*

* Related functions are internal features of the CPU. For details about whether the mainboard supports these functions, see the corresponding interface descriptions.

2   Product Overview

D-3588 mainboard is based on Rockchip RK3588 high-performance application processor platform. RK3588 is a low power, high performance processor for computing, personal mobile internet devices and other smart device applications. It integrates quad-core Cortex-A76, quad-core Cortex-A55, and Mali-G610 MC4 high-performance GPUs clocked at up to 2.4GHz, with superior computing performance, 2D/3D graphics processing capabilities and Full HD video codec capabilities. It perfectly supports 8K@60fps decoding and 8K@60fps output.

This mainboard is specially designed for **ultra-thin** applications with strict material selection and design. The compact size and rich interface facilitate its integration into the complete machine, bringing a smooth experience and superior performance to the final product. It can be applied to digital signage, touch interactive, consumer electronics, entertainment systems and other industries.

D-3588 V3.0 mainboard actual interface diagram as shown below.
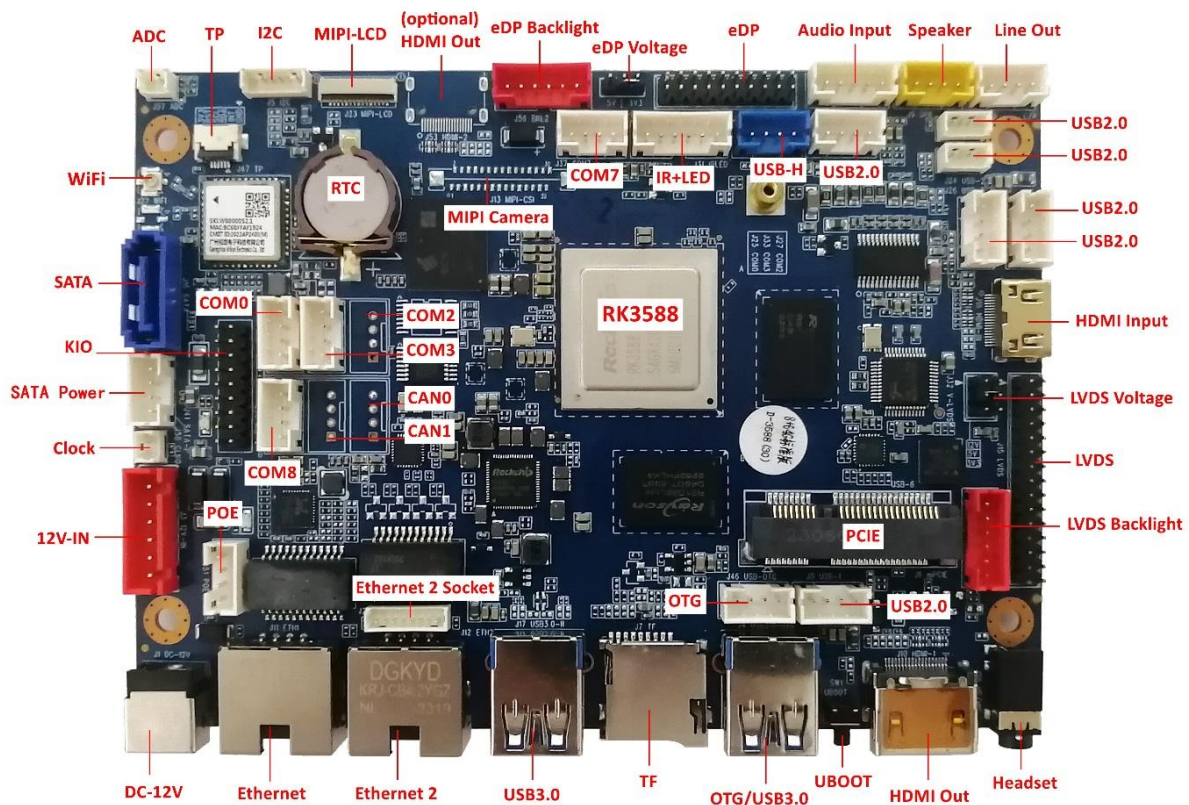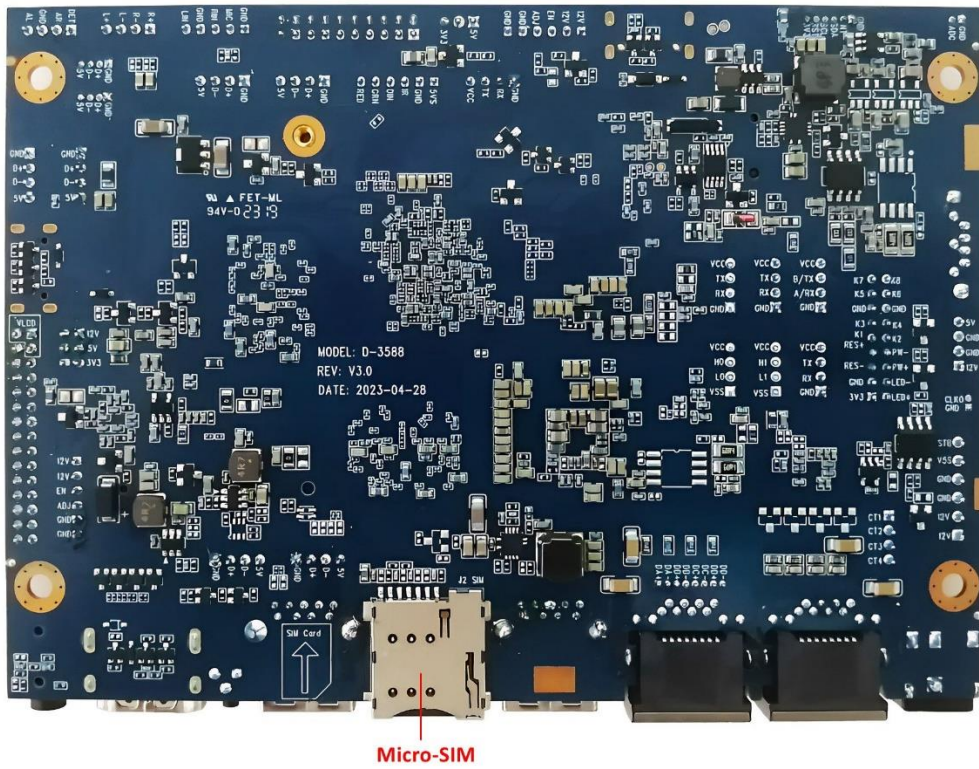
Micro-SIM

3   Specification List

D-3588's system functions and interface features are shown in the following table.

Function & Interface	Detailed Description
CPU	RK3588 Quad-core Cortex-A76 and Quad-core Cortex-A55, up to 2.4GHz
DDR	LPDDR4 2GB (4GB|8GB|16GB|32GB optional)
Storage	The default comes with an 16GB EMMC NAND chip that can scale up to 128GB
LVDS	30-pin industry-standard dual LVDS supporting VESA/JEITA format up to 1080P output
MIPI-DSI	31-Pin FPC MIPI-DSI display port supporting up to 1920x1200
HDMI Output	2 HDMI 2.1 standard display interface supports up to 8K output (one is mixed with EDP)
HDMI Input	HDMI 2.0/1.4b standard video input interface, up to 1080p@60Hz
EDP	20-pin industry-standard EDP supporting 1~4 lanes format up to 4K@60Hz output
HP/MIC	Support CTIA 4-pole HP/MIC socket (Left-Right-GND-Mic)
Line Output	Support standard left and right channel line output (pin header)
Amplifier Output	8 Ohm 6W Dual Audio Amplifier Output
MIC Input	Single-End MIC input (pin header)
Line Input	Support standard left and right channel line input (pin header)
USB Interface	2 horizontal connectors (USB Host 3.0x1 and USB OTG 3.0x1), 8 pin headers (USB Hub 2.0x6, USB OTG 2.0x1 and USB Host 2.0x1)
Serial Port	1 TTL/485 compatible, 4 TTL/RS-232 compatible
Micro SD Card	Self-elastic micro SD card socket, up to 256GB capacity (TF is mixed with CAN0)
MIPI Camera	Support 4-Lane MIPI CSI camera up to 16 million pixels
USB Camera	Support USB camera within 8 million pixels
WIFI	Built-in high performance SDIO interface WiFi6 module, support IEEE 802.11 a/b/g/n/ac/ax, the default configuration of 2.4G/5GHz WiFi.
Bluetooth	Built-in high performance serial interface BT module with support for V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.0/BT v5.0
Ethernet	2 port 10/100/1000M Adaptive Ethernet RJ45 connector **+ 4-Pin POE header**
m-PCIE 4G	Industry standard m-PCIE 4G module interface
Backlight Control	2 port Industry standard LCD backlight control header for LVDS & EDP, support for backlight switch and brightness adjustment
Infrared RC	Standard infrared receiver pin header
GPIO Signals	Up to 8-way GPIO signals (2-way mixed with TP, 4-way mixed with TF) for such as GPIO buttons and/or 3.3V digital input/output
I2C Bus	I2C pin header and FPC for I2C capacitive screen and etc
ADC Input	1-way ADC voltage acquisition signal
CLK Clock	1-way CLKO homologous clock signal
CAN Bus	2 CAN pin headers (CAN0 mixed with TF) for CAN Bus peripherals
SATA HD	Standard SATA 3.0 hard disk port with power supply header
Real Time Clock	Ultra-low-power RTC circuit (CR1220 battery) with timer and alarm functionalities

Function & Interface	Detailed Description
LED Indicator	Red LED indicator for standby and green LED indicator for running
Buttons	Recovery mode button and power switch button
DC Input	Supports 9~15V wide voltage DC power input
Ambient Requirement	Working temperature -20°C ~ 70°C, working humidity 0%~95% (non-condensing)
Physical Size	Length*Width*Height (135mm*95mm*14mm), **PCB top side height 9mm**
Operating System	Recommended Android 12.0, Linux Buildroot/Debian 11/Ubuntu-20.04 optional

4   Interface definition

➢ J1 DC-12V Socket

[J1] DC-12V power socket, positive outer and negative inner, inner pin diameter 2.0mm, outer ring diameter 5.5mm.

➢ J2 Micro-SIM Card Socket

[J2] Micro-SIM Card Socket.
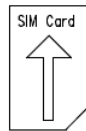
Note: The SIM card seat is a regular card slot. Please note that the SIM card gap faces outward when inserting the card.

➢ J3 DC-12V Input Header

[J3] DC-12V Input Header (SIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note
1	12V	DC Power Input (9~15V)
2	12V	DC Power Input (9~15V)
3	GND	Power Ground
4	GND	Power Ground
5	V5S	5V Standby Power Input
6	STB	Standby Enable Output (0V for Standby)

➢ J4 USB 3.0 OTG Type A

[J4] USB 3.0-OTG Horizontal Type A Jack (Standard jack).

Note: This interface is connected to the internal USB3_OTG0 signal, the default firmware burning port at the moment of power-on, can be connected to the PC for software burning; After entering Android, you can set it to USB ADB debugging port or common USB Host port through the software. J4 and J46 are the same group of OTG signals, and the two interfaces cannot be used simultaneously.

➢ J5 I2C Bus Header

[J5] I2C Bus Header (SIP 1.25mm-Square pad is pin 1).

Pin#	Definition	Note
1	GND	Digital Ground
2	INT	Interrupt input (3.3V level)
3	SDA	I2C Bus data
4	SCL	I2C Bus clock signal
5	RST	Mainboard reset output (3.3V level)
6	3V3	Power output supply 3.3V

➢ J6 m-PCIE 4G Socket

[J6] Standard m-PCIE 4G Socket. USB signals are from Hub USB-6.

➢ J7 TF Card Socket

[J7] Standard TF Card Socket.

Note: The CAN0 interface and TF interface are reused in conflict and cannot be used at the same time.

➢ J8 USB 2.0 Host Header

[J8] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J9 Speaker Header

[J9] Speaker Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	R+	Speaker right channel +
2	R-	Speaker right channel -
3	L-	Speaker left channel -

4	L+	Speaker left channel +

➢ J10 HDMI Output Socket 1

[J10] Standard HDMI Output Socket 1.

➢ J11 RJ45 Internal Gigabit Ethernet Jack

[J11] RJ45 Internal Gigabit Ethernet Jack.

➢ J12 RJ45 Extended Gigabit Ethernet Jack

[J12] RJ45 Extended Gigabit Ethernet Jack.

➢ J13 MIPI-CSI Camera

[J13] MIPI-CSI camera FPC -30-0.5mm.

Pin#	Definition	Note
1	NC	Not Connected
2	AFVDD	2.8V Power Supply
3	DVDD	1.2V Power Supply
4	DOVDD	1.8V Power Supply
5	NC	Not Connected
6	AGND	Digital Ground
7	AVDD	2.8V Power Supply
8	DGND	Digital Ground
9	I2C_SDA	I2C Clock
10	I2C_SCL	I2C Data
11	RESET	Reset Signal
12	NC	Not Connected
13	GND	Digital Ground
14	XCLK	Main Clock
15	GND	Digital Ground
16	DP3	MIPI Data3 Positive
17	DN3	MIPI Data3 Negative
18	GND	Digital Ground
19	DP2	MIPI Data2 Positive
20	DN2	MIPI Data2 Negative
21	GND	Digital Ground
22	DP1	MIPI Data1 Positive
23	DN1	MIPI Data1 Negative

24	GND	Digital Ground
25	CLKP	MIPI Clock Positive
26	CLKN	MIPI Clock Negative
27	GND	Digital Ground
28	DP0	MIPI Data0 Positive
29	DN0	MIPI Data0 Negative
30	GND	Digital Ground

➢ **J15 LVDS Header**

[J15] Dual LVDS header (DIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Pin#	Definition
1	VLCD	2	VLCD
3	VLCD	4	GND
5	GND	6	GND
7	RXO0-	8	RXO0+
9	RXO1-	10	RXO1+
11	RXO2-	12	RXO2+
13	GND	14	GND
15	RXOC-	16	RXOC+
17	RXO3-	18	RXO3+
19	RXE0-	20	RXE0+
21	RXE1-	22	RXE1+
23	RXE2-	24	RXE2+
25	GND	26	GND
27	RXEC-	28	RXEC+
29	RXE3-	30	RXE3+

➢ **J16 SATA Hard Disk Socket**

[J16] SATA 3.0 Hard Disk Standard 7-Pin Data Cable Socket.

➢ **J17 USB 3.0 Host Socket**

[J17] USB 3.0 Host Socket.

➢ **J18 HDMI Input Jack**

[J18] HDMI-C Jack (Type C Mini Jack).

➢ J19 LVDS Backlight Control Header

[J19] LVDS Backlight Control Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	12V	If the current exceeds 2A, external 12V is recommended
2	12V	If the current exceeds 2A, external 12V is recommended
3	EN	The default output is 5V
4	ADJ	3.3V square wave (1KHz Freq.)
5	GND	Power Ground
6	GND	Power Ground

➢ J20 Audio Input Header

[J20] Audio input header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	GND	Audio Ground
2	MIC	Mono microphone input
3	RIN	Line input right channel
4	GND	Audio Ground
5	LIN	Line input left channel

➢ J21 Ethernet Jack Header

[J21] Ethernet Jack (SIP 1.25mm-Square pad is pin 1).

Pin#	Definition	Note
1	DA+	Tranceive Data+
2	DA-	Tranceive Data-
3	DB+	Receive Data+
4	DB-	Bi-directional Data-
5	DC+	Bi-directional Data+
6	DC-	Receive Data-
7	DD+	Bi-directional Data+
8	DD-	Bi-directional Data-

➢ J22 WiFi Antenna IPEX

[J22] Standard IPEX 3dBi antenna connector (Φ2.0mm).

➢ J23 MIPI Panel FPC Connector

[J23] MIPI Panel FPC Connector (FPC-0.3mm 31-Pin Top/Bottom Contact).
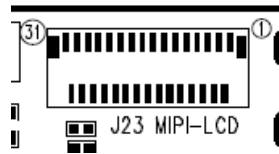
Pin#	Definition	Note
1	LED+	LED Anode
2	LED+	LED Anode
3	LED+	LED Anode
4	NC	Not Connected
5	LED-	LED Cathode
6	LED-	LED Cathode
7	LED-	LED Cathode
8	LED-	LED Cathode
9	GND	Digital Ground
10	GND	Digital Ground
11	MIPI_D2P	+MIPI differential lane2
12	MIPI_D2N	-MIPI differential lane2
13	GND	Digital Ground
14	MIPI_D1P	+MIPI differential lane1
15	MIPI_D1N	-MIPI differential lane1
16	GND	Digital Ground
17	MIPI_CKP	+MIPI differential clock output
18	MIPI_CKN	-MIPI differential clock output
19	GND	Digital Ground
20	MIPI_D0P	+MIPI differential lane0
21	MIPI_D0N	-MIPI differential lane0
22	GND	Digital Ground
23	MIPI_D3P	+MIPI differential lane3
24	MIPI_D3N	-MIPI differential lane3
25	GND	Digital Ground
26	VDD-1V8	Power Supply 1.8V (Default is not connected, need to weld R9232 0R)
27	RESET	Reset Signal in 1.8V
28	GND	Digital Ground
29	VDD-1V8	Power Supply 1.8V
30	VDD-3V3	Power Supply 3.3V
31	VDD-3V3	Power Supply 3.3V

Note: According to the size of the backlight current of the LCD screen, the feedback resistance of the motherboard needs to be adjusted. The default backlight current is 160mA, that is, (200/160)*2=2.5R, then two resistors of 2.49R-0603 are used for R117 and R9223.

➢ J24 USB 2.0 Host Header

[J24] USB 2.0 Host Header (SIP 1.25mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J25 Data Serial Port 0

[J25] Built-in Serial Port 0 (SIP 2.0mm-Square pad is pin 1). The output level is RS-485 by default and it could be setup to TTL if required (RS-485 if U9823 mounted). **The related software device node name is ttyS0**.

Pin#	Definition	Note
1	GND	Digital Ground
2	RX|A	Data receive or A (TTL or RS-485 level)
3	TX|B	Data transmit or B (TTL or RS-485 level)
4	VCC	Power output (Default 3.3V, 5V option)

➢ J26 USB 2.0 Host Header

[J26] USB 2.0 Host Header (SIP 1.25mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J27 Data Serial Port 2

[J27] Built-in Serial Port 2 (SIP 2.0mm-Square pad is pin 1). The output level is TTL by default and it could be setup to RS-232 if required (RS-232 if U9825 mounted). **The related software device node name is ttyS2**.

Pin#	Definition	Note
1	GND	Digital Ground
2	RX	Data receive (TTL or RS-232 level)
3	TX	Data transmit (TTL or RS-232 level)
4	VCC	Power output (Default 3.3V, 5V option)

Note: If you need to use the debugging serial port as a data serial port, please contact the supplier to obtain the customized software; this serial port will output the startup information in the first 5 seconds of power on (the upper or lower machine should handle this kind of data fault tolerance).

➢ J28 4-Pole HP/Mic Jack

[J28] 4-Pole 3.5mm Headphone & Microphone Jack (CTIA Standard jack). It is the same signals with J20/J30. It supports insert detection for speaker mute.
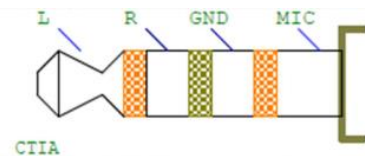
➢ J29 USB 2.0 Host Header

[J29] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J30 Audio Line Output

[J30] Audio Line Output (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	DET	Headphone detect signal
2	AR	Stereo output right channel
3	GND	Audio Ground
4	AL	Stereo output left channel

➤ J31 Remote Control & LED Header

[J31] Remote Control & LED Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	5VS	Power output 5V standby
2	GND	Digital Ground
3	IR	5V level IRDA remote control input signal
4	DIN	3.3V level GPIO input signal
5	GRN	Running indicator for external green LED
6	RED	Standby indicator for external red LED

➤ J32 LVDS Voltage Header

[J32] LVDS Voltage Header (DIP 2.0mm-Square pad is pin 1). If pin 1 and 2 are jumper shorted, the VLCD of J15 is 12V. If pin 3 and 4 are jumper shorted, the VLCD of J15 is 5V. If pin 5 and 6 are jumper shorted, the VLCD of J15 is 3.3V. Please adjust the jumper position according to the actual logic voltage of the LCD screen. Be careful not to jumper to the wrong position or it may damage the LCD screen and the motherboard circuit.

➤ J33 Data Serial Port 3

[J33] Built-in Serial Port 3 (SIP 2.0mm-Square pad is pin 1). The output level is TTL by default and it could be setup to RS-232 if required (RS-232 if U9825 mounted). **The related software device node name is ttyS3**.

Pin#	Definition	Note
1	GND	Digital Ground
2	RX	Data receive (TTL or RS-232 level)
3	TX	Data transmit (TTL or RS-232 level)
4	VCC	Power output (Default 3.3V, 5V option)

➢ J34 USB 2.0 Host Header

[J34] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J35 USB 2.0 Host Header

[J35] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is the Hubx7 expansion port of the USB20_HOST1 port on the primary chip.

➢ J37 Data Serial Port 7

[J37] Built-in Serial Port 7 (SIP 2.0mm-Square pad is pin 1). The output level is RS-232 by default and it could be setup to TTL if required (RS-232 if U9826 mounted). **The related software device node name is ttyS7**.

Pin#	Definition	Note
1	GND	Digital Ground
2	RX	Data receive (TTL or RS-232 level)
3	TX	Data transmit (TTL or RS-232 level)
4	VCC	Power output (Default 3.3V, 5V option)

➢ J38 Keypad and Switch Header

[J38] Keypad and Switch header (DIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Pin#	Definition
1	3V3	2	LED+
3	GND	4	LED-

5	RES-	6	PW+
7	RES+	8	PW-
9	K1	10	K2
11	K3	12	K4
13	GND	14	GND
15	K5	16	K6
17	K7	18	K8

As shown below: Pin 6 and 8 as short press to turn screen on or off and long press to power down (software support required); Pin 5 and 7 as reboot; Pin 2 and 4 as LED indicator (or use pin1 and 3 directly). K1 as Volume Up, K2 as Volume Down, K3 as Sleep/Wake, K4 as Return, K5 as HOME (software support required), K6 ~ K8 as customized signal.

If K1~K8 is opened for GPIO use, the corresponding numbers are K1=#116 (INT reuse with I2C), K2=#125 (RST reuse with I2C), K3=#135, K4=#27, K5=#152 (D0 reuse with TF card), K6=#153 (D1 reuse with TF card), K7=#154 (reused with TF card D2), K8=#155 (reused with TF card D3).

17-K7	15-K5	13-GND	11-K3	9-K1	7-RES+	5-RES-	3-GND	1-3V3
18-K8	16-K6	14-GND	12-K4	10-K2	8-PW-	6-PW+	4-LED-	2-LED+

➢ J40 CAN Header 0

[J40] CAN Header 0 (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	VSS	Digital Ground
2	L1	L Data
3	H1	L Data
4	VCC	Power output (Default 3.3V, 5V option)

Note: The corresponding interface of the CAN0 software is can0. If you need to use this interface, weld the U9500 chip. The CAN0 interface and TF interface are reused in conflict and cannot be used at the same time.

➢ J41 SATA Power Supply Header

[J41] SATA Power Supply Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	12V	Power output 12V
2	GND	Power Ground
3	GND	Power Ground

4	5V	Power output 5V

Note: The maximum output current of 12V and 5V is not more than 1A. If the power supply is insufficient for a 3.5-inch hard disk, it is recommended to connect to an external power supply.

➤ J42 CAN Header 1

[J42] CAN Header 1 (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	VSS	Digital Ground
2	L1	L Data
3	H1	L Data
4	VCC	Power output (Default 3.3V, 5V option)

Note: The corresponding interface of CAN1 software is can0 or can1; To use this interface, weld the U9828 chip. If you need one CAN, please weld this chip. If two CAN channels are required, weld U9500 to form CAN0+CAN1 combination.

➤ J43 Data Serial Port8

[J43] Built-in Serial Port 7 (SIP 2.0mm-Square pad is pin 1). The output level is RS-232 by default and it could be setup to TTL if required (RS-232 if U9826 mounted). **The related software device node name is ttyS8**.

Pin#	Definition	Note
1	GND	Digital Ground
2	RX	Data receive (TTL or RS-232 level)
3	TX	Data transmit (TTL or RS-232 level)
4	VCC	Power output (Default 3.3V, 5V option)

➤ J44 USB2.0 Host Direct Header

[J44] USB 2.0 Host Direct Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	5V	Power output 5V

Note: This port is a pass-through USB port on the primary chip USB20_HOST0.

➢ **J46 USB OTG Header**

[J46] USB ADB Header (SIP 2.0mm-Square pad is pin 1), this port should only be used as system burn or ADB connection.

Pin#	Definition	Note
1	GND	Digital Ground
2	D+	USB Differential Data+
3	D-	USB Differential Data-
4	V5S	5V power supply from PC

Note: This port is a pass-through port of the main chip USB OTG port, and the signal and J4 are the same group, and the two cannot be used at the same time.

➢ **J47 I2C FPC Header**

[J47] I2C Bus Header (FPC-0.5mm Bottom Contact Triangle Pin-1).
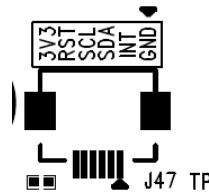
Pin#	Definition	Note
1	GND	Digital Ground
2	INT	Interrupt input (3.3V level)
3	SDA	I2C Bus data signal
4	SCL	I2C Bus clock signal
5	RST	Mainboard reset output (3.3V level)
6	3V3	Power output supply 3.3V

➢ **J51 POE PD Header**

[J51] POE PD Header (SIP 2.0mm-Square pad is pin 1)

Pin#	Definition	Note
1	CT1	Transformer Center1
2	CT2	Transformer Center2
3	CT3	Transformer Center3
4	CT4	Transformer Center4

Note: The power supply for the POE receiver port comes from the J11 Ethernet port. This port is connected to the external POE receiver board for 12V power supply conversion. The current of the 12V

power supply depends on the power supply capability of the POE switch and the conversion capability of the conversion board. This port supports a POE power supply device with 1/2 positive and 3/6 negative cables, or a POE power supply device with 4/5 positive and 7/8 negative cables.

➢ J53 HDMI Output Jack 2

[J53] HDMI-C Jack (Type C Mini Jack).

Note: HDMI output 2 and conflict, eDP interface signals cannot be used at the same time (and needs to adjust the welding).

➢ J54 eDP Header

[J54] eDP header (DIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Pin#	Definition
1	VLCD	2	VLCD
3	GND	4	GND
5	TX0-	6	TX0+
7	TX1-	8	TX1+
9	TX2-	10	TX2+
11	TX3-	12	TX3+
13	GND	14	GND
15	AUX-	16	AUX+
17	GND	18	GND
19	3.3V	20	NC

➢ J55 eDP Voltage Header

[J55] EDP LCD Voltage Header (SIP 2.0mm-Square pad is pin 1). If pin 1 and 2 are jumper shorted, the VLCD of J54 is 5V. If pin 2 and 3 are jumper shorted, the VLCD of J54 is 3.3V. Please adjust the jumper position according to the actual logic voltage of the LCD screen. Be careful not to jumper to the wrong position or it may damage the LCD screen and the motherboard circuit.

➢ J56 eDP Backlight Control Header

[J56] eDP Backlight Control Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	12V	If the current exceeds 2A, external 12V is recommended

2	12V	If the current exceeds 2A, external 12V is recommended
3	EN	The default output is 5V
4	ADJ	3.3V square wave (1KHz Freq.)
5	GND	Power Ground
6	GND	Power Ground

➢ J57 ADC Input Header

[J57] ADC input header (SIP 1.25mm-Square pad is pin 1).

Pin#	Definition	Note
1	GND	Audio Ground
2	ADC	1.8V Level ADC input

➢ J58 CLKO Clock Signal

[J58] CLKO Clock Signal (SIP 1.25mm-Square pad is pin 1)

| Pin#	Definition	Note
1	GND	Power Ground
2	CLK	CLK clock signal

➢ SW1 Recovery Mode Button

[SW1] On-board recovery mode button. First press and then hold for about 3-second while power on will enter the recovery mode.

5   Physical Size

The PCB size is 135mm*95mm and the fixing hole diameter is 3.6mm. The corresponding physical size parameters are shown in the figure below. For detailed size information, please consult the manufacturer for DXF file.
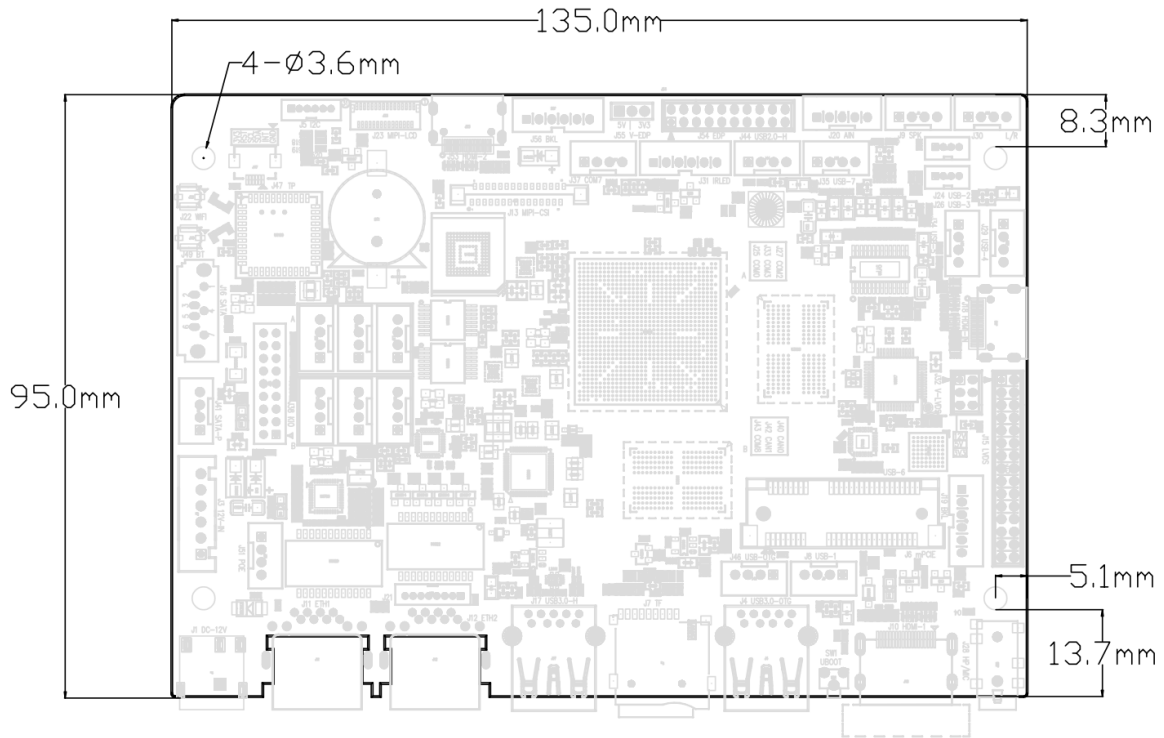
6   Assembly Precautions

Please note the following key points when using the D-3588 mainboard:

1. Relative humidity of this product: 10% to 90%, no condensation.

2. The working temperature of this product: -20°C ~ 70°C.

3. This storage temperature of this product: -40°C ~ 70°C.

4. Anti-static treatment is required during assembly and transportation of this product.

5. The board interface connection cable must not be too long. Otherwise, the signal quality may be affected.

6. Never allow the board to be distorted or heavily stressed during assembly.

7. Do not short circuit between mainboard and other peripherals.

8. When connecting to external LVDS or EDP LCD screen, pay attention to whether the screen voltage and current meet the requirements, and pay attention to the screen connector pin-1 direction.

9. When connecting to external LVDS or EDP LCD screen, pay attention to whether the backlight voltage and current meet the requirements.

10. When connecting to peripherals using USB, GPIO, Serial, I2C, SPI, HDMI, etc., pay attention to whether the IO voltage level and current of the peripheral meet the requirements. When using the power pin on these connectors to supply power to the external circuit, the regular power pin must not exceed 100mA, and the USB power pin must not exceed 500mA.

11. Please connect the power to the power input socket or connector, and evaluate whether the current of the whole board meets the requirements according to the total peripherals. It is strictly forbidden to directly supply power from the backlight connector.

12. The communication module should be mounted at least 5mm away from the metal housing to avoid signal interference.

7   Software Guide

D-3588 motherboard support LVDS/EDP/MIPI/HDMI any two output dual screen or three screen display combination! For related output combinations, consult the manufacturer to provide corresponding abnormal patches.

The software port numbers of the serial ports and expansion serial ports on the D-3588 mainboard are as follows：

Port	Software Device Node
J25	/dev/ttyS0
J27	/dev/ttyS2
J33	/dev/ttyS3
J37	/dev/ttyS7
J43	/dev/ttyS8