

# VNS-3568 Mainboard Specification

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# Changelog

1.0.0	2023-10-07	Chinese and English merged version.
1.0.1	2023-10-10	Corrected some clerical errors, added the power supply change description.

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# 1 RK3568 Brief

The RK3568 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 the leading position in the industry.

- CPU: Quad-core 64-bit Cortex-A55 architecture, built on the basis of high-end 22nm process, with a maximum frequency of 2.0GHz.
- GPU: ARM Mali-G52 2EE, supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, embedded high-performance 2D acceleration hardware
- NPU: Support 0.8Tops computing power
- Multimedia: support 4K 60fps H.265/H.264/VP9 video decoding; support 1080P 100fps H.265/H.264 video encoding; support 8M ISP, support HDR
- Display: support multi-screen different display; support eDp/HDMI2.0/MIPI/LVDS/24bit RGB/T-CON
- Interface: Support USB2.0/USB3.0/PCIE3.0/PCIE2.1/SATA3.0/QSGMII



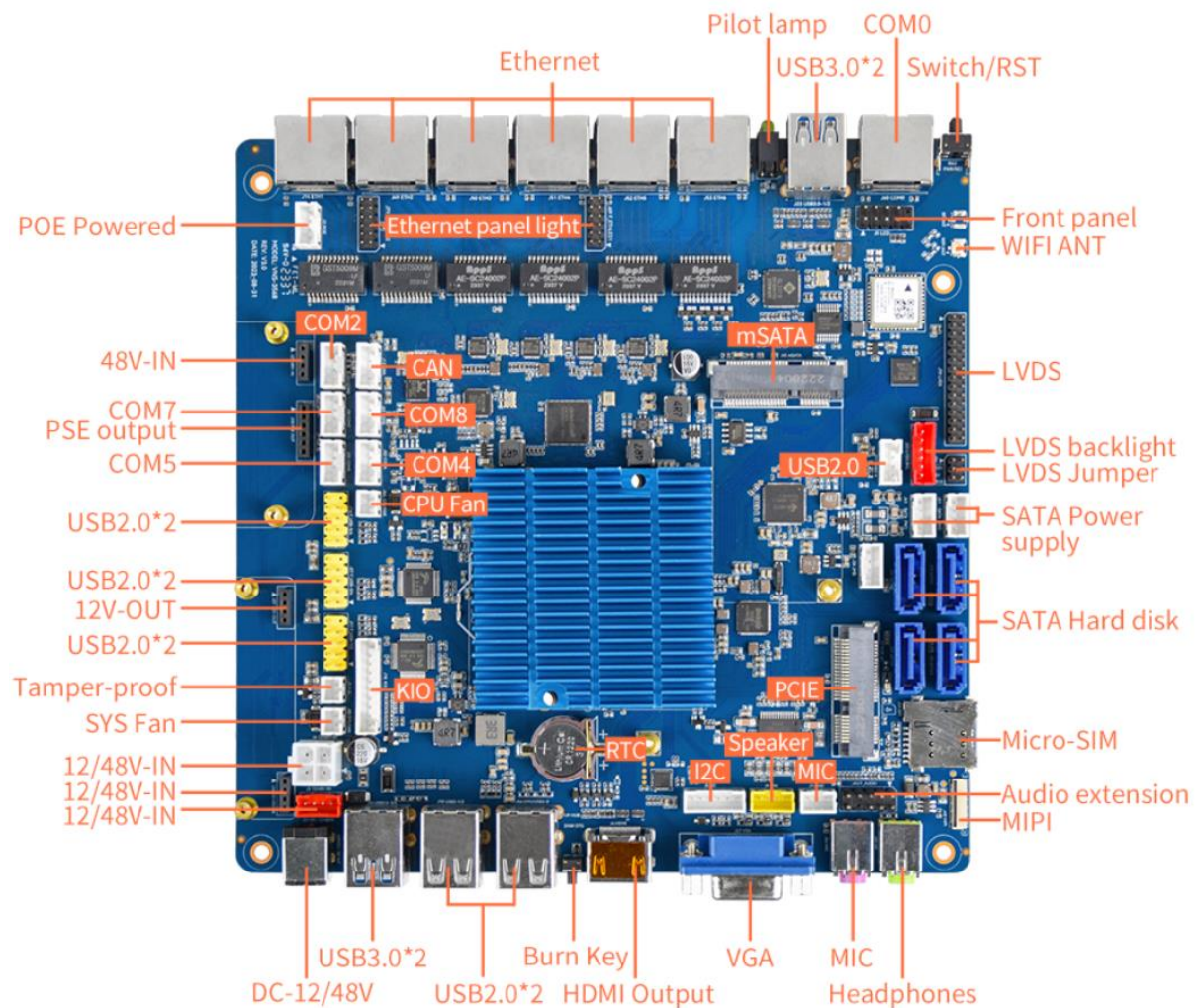
**\*Related functions are internal features of the CPU, please refer to the corresponding interface descriptions for motherboard support.**

## 2 Product Overview

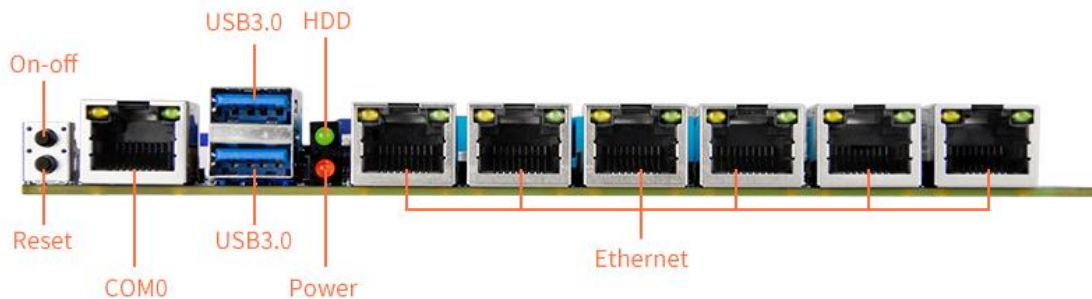
VNS-3568 mainboard is based on Rockchip RK3568 high-performance application processor platform. RK3568 is a low power, high performance processor for computing, personal mobile internet devices and other smart device applications. It integrates quad-core Cortex-A55 clocked at up to 2.0GHz, with superior computing performance, 2D/3D graphics processing capabilities and Full HD video codec capabilities. It perfectly supports 4Kx2K@60fps decoding and 4Kx2K HDMI output.

This mainboard is specially designed for **Intelligent industry** 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.

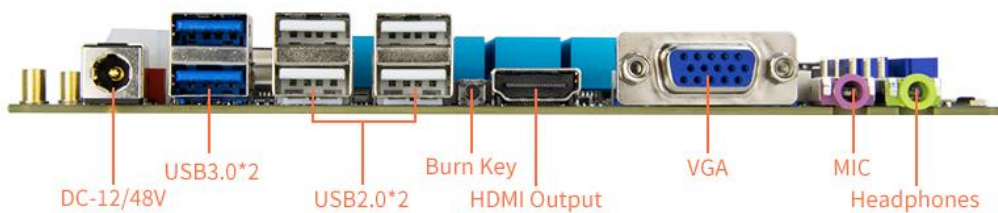
VNS-3568 V3.0 mainboard actual interface diagram as shown below.



Top view



Front view



Back view



### 3 Specification List

VNS-3568's system functions and interface features are shown in the following table.

Function & Interface	Detailed Description
<b>CPU</b>	RK3568 Cortex-A55 quad-core, up to 2.0GHz
<b>DDR</b>	LPDDR4 2GB (4GB   8GB optional)
<b>Storage</b>	The default comes with an 16GB EMMC NAND chip that can scale up to 128GB
<b>LVDS</b>	30-pin industry-standard dual LVDS supporting VESA/JEITA format up to 1080P output
<b>MIPI-DSI</b>	31-Pin FPC MIPI-DSI display port supporting up to 1920x1200
<b>HDMI Output</b>	1 HDMI 2.0 standard display interface supports up to 4K output
<b>VGA Output</b>	Industry-standard DB-15 VGA output up to 1080P
<b>Amplifier Output</b>	8 Ohm 6W Dual Audio Amplifier Output
<b>Headphone Output</b>	Stereo Headphone Output (Audio Jack)
<b>MIC Input</b>	Differential MIC input (Audio Jack)
<b>USB Interface</b>	8 horizontal connectors (USB Host 3.0x4, USB Hub 2.0x3 and USB OTGx1), 7 pin headers USB 2.0
<b>Serial Port</b>	1 TTL, 2 TTL/RS-232/RS-485 compatible, 3 TTL/RS-232 compatible,
<b>Camera</b>	Support USB camera within 8 million pixels
<b>WIFI</b>	Built-in high performance SDIO interface WiFi6 module, support IEEE 802.11 a/b/g/n/ac/ax, dual-band is configured by default.
<b>Bluetooth</b>	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
<b>Ethernet</b>	6 port 10/100/1000M Adaptive Ethernet RJ45 connector + <b>4-Pin POE PD header</b>
<b>m-PCIE 4G</b>	1 Industry standard m-PCIE 4G module interface
<b>Backlight Control</b>	1 port Industry standard LCD backlight control header, support for backlight switch and brightness adjustment
<b>GPIO Signals</b>	Up to 8-way GPIO signals for such as GPIO buttons and/or 3.3V digital input/output
<b>I2C Bus</b>	I2C pin header for I2C capacitive screen and etc
<b>Security Port</b>	1 Tamper control port
<b>CAN Bus</b>	1 CAN pin headers for CAN Bus peripherals
<b>m-SATA</b>	1 Industry standard mSATA module interface
<b>SATA HD</b>	4 Standard SATA 3.0 hard disk port with power supply header
<b>Real Time Clock</b>	Ultra-low-power RTC circuit (CR1220 battery) with timer and alarm functionalities
<b>LED Indicator</b>	Red LED indicator for standby and green LED indicator for running
<b>Fan Header</b>	SYS fan power and CPU fan power
<b>Buttons</b>	Recovery mode button, power switch button and reset button
<b>POE PSE</b>	4-way RJ45 network port PSE output 48V power supply (optional)
<b>DC Input</b>	Supports 9~15V wide voltage DC power input (18~52V power input optional)
<b>Ambient Requirement</b>	Working temperature -20°C ~ 70°C, working humidity 0%~95% (non-condensing)
<b>Physical Size</b>	Length*Width*Height (170mm*170mm*17.5mm), <b>PCB top side height 16mm</b>

<b>Function &amp; Interface</b>	<b>Detailed Description</b>
<b>Operating System</b>	Recommended Android 11.0, Linux Buildroot/Debian 10/Ubuntu-20.04 optional

## 4 Interface Definition

### ➤ J1 Tamper-proof Header

[J1] Tamper-proof header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	negative electrode-	Line Cathode
2	Positive +	] Input low level, read 1 [Software GPIO number 122]

### ➤ J2 POE PD Header

[J2] 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 of the POE powered interface comes from the J14 Ethernet port. This interface is connected to the POE powered conversion board for 12V power supply conversion. The current size of the 12V power supply is affected by the power supply capability of the POE switch and the conversion capability of the adapter board. The typical current is 1 ~1.5A. This interface supports POE power supply equipment with 1/2 wires of the network cable being positive and 3/6 wires being negative. It can also be connected to POE power supply equipment with 4/5 wires of the network cable being positive and 7/8 wires being negative.

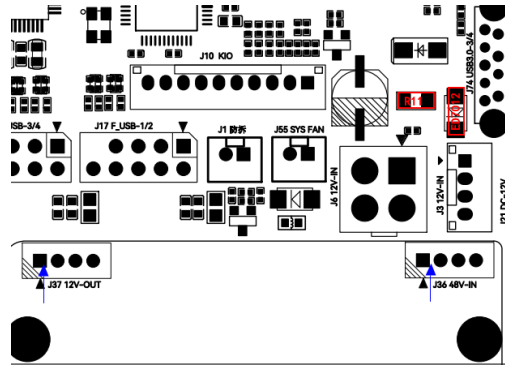
### ➤ J3 DC-12/48V Input Header

。 [J3] DC-12/48V Input Header (SIP 2.0mm-Square pad is pin 1), it is the same to J6/J21 Jack.

Pin#	Definition	Note
1	12/48V	Default DC Power Input (9~15V)
2	12/48V	Default DC Power Input (9~15V)
3	GND	Power Ground
4	GND	Power Ground

**Note:** If you need 48V power supply, you need to solder R11, replace ED7012 with a 48V\_TVS tube, add EXT-52VIN-12V small board to buckle J36 and J37, and fix it with screws. (When powered by 24V,

ED7012 is replaced with a 24V\_TV S tube. For different power supplies, the corresponding voltage-resistant TV S tube needs to be replaced)



➤ J4 HDMI Output Socket

[J4] Standard HDMI 2.0 Output Socket.

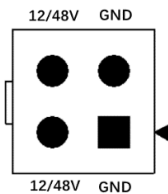
➤ J5 I2C Bus Header

[J5] I2C Bus Header (SIP 2.0mm-Square pad is 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

➤ J6 ATX 12/48V-IN Power Header

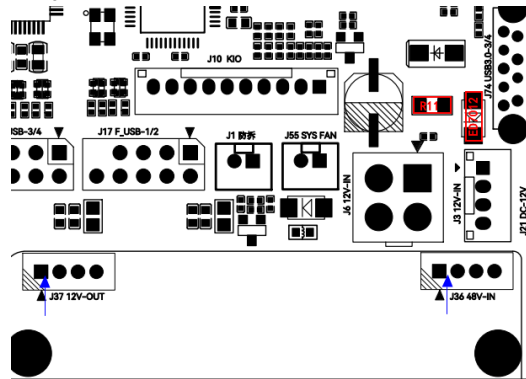
[J6] ATX 12/48V-IN Power Header (SIP 4.2mm-Square pad is pin 1), it is the same to J3/J21 Jack.



Pin#	Definition	Note
1	GND	Power GND
2	GND	Power GND
3	12/48V	Default DC Power Input (9~15V)

4	12/48V	Default DC Power Input (9~15V)
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**Note: If you need 48V power supply, you need to solder R11, replace ED7012 with a 48V\_TVS tube, add EXT-52VIN-12V small board to buckle J36 and J37, and fix it with screws. (When powered by 24V, ED7012 is replaced with a 24V\_TVS tube. For different power supplies, the corresponding voltage-resistant TVS tube needs to be replaced)**



### ➤ J7 m-PCIE 4G Socket

[J7] Standard m-PCIE 4G Socket.

### ➤ J8 Front Panel Header

[J8] Front Panel Header (DIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	HD+	Running indicator+	2	LED+	Power indicator light+
3	HD-	Running indicator-	4	LED-	Power indicator light-
5	RES-	Reset-	6	PW-	Power switch-
7	RES+	Reset+	8	PW+	Power switch+
9	GND	Digital Ground	10	Null	Null

### ➤ 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 KIO Keypad Header

[J10] KIO Keypad Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	3V3	Power output supply 3.3V
2	K1	K1 (Regular GPIO #88)
3	K2	K2 (Regular GPIO #89)
4	K3	K3 (Regular GPIO #90)
5	K4	K4 (Regular GPIO #91)
6	K5	K5 (Regular GPIO #107)
7	K6	K6 (Regular GPIO #108)
8	K7	K7(Regular GPIO #109)
9	K8	K8 (Regular GPIO #110)
10	GND	Digital Ground

## ➤ J11 USB 2.0 Host Header

[J11] 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 main chip USB2\_HOST2 port Hubx7 expansion port.

## ➤ J12 CAN Header

[J12] CAN Header (SIP 2.0mm-Square pad is pin 1)

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

**Note:** The corresponding interface of the CAN port software is can0; if you need to use this interface, please solder the U9827 chip.

### ➤ J13 MIC-IN Header

[J13] Audio input header (SIP 2.0mm-Square is pin 1).

Pin#	Definition	Note
1	DET	Microphone detect signal
2	MIC-R	Right microphone input
3	GND	Audio Ground

### ➤ J14 RJ45 Internal Gigabit Ethernet Jack 1

[J14] RJ45 Internal Gigabit Ethernet Jack 1.

### ➤ J15 SATA Hard Disk Socket 1

[J15] SATA 3.0 Hard Disk Standard 7-Pin Data Cable Socket 1.

### ➤ J16 USB 2.0 DIP Header

[J16] USB 2.0 header (DIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	5V	Power output 5V	2	5V	Power output 5V
3	D-	USB Differential Data+	4	D-	USB Differential Data+
5	D+	USB Differential Data-	6	D+	USB Differential Data-
7	GND	Digital Ground	8	GND	Digital Ground
9	Null	Null	10	GND	Digital Ground

**Note: This port is the main chip USB2\_HOST2 port Hubx7 expansion port**

### ➤ J17 USB 2.0 DIP Header

[J17] USB 2.0 header (DIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	5V	Power output 5V	2	5V	Power output 5V
3	D-	USB Differential Data+	4	D-	USB Differential Data+
5	D+	USB Differential Data-	6	D+	USB Differential Data-
7	GND	Digital Ground	8	GND	Digital Ground
9	Null	Null	10	GND	Digital Ground

**Note: This port is the main chip USB2\_HOST2 port Hubx7 expansion port**

### ➤ J18 Double USB 2.0 Type A Socket

[J18] Standard Double USB 2.0 Type A Socket.

**Note: This port is the main chip USB2\_HOST3 port Hubx4 expansion port**

### ➤ J19 LVDS Header

[J19] 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+

### ➤ J20 LVDS Backlight Control Header

[J20] LVDS Backlight Control Header (SIP 2.0mm-Square pad is pin 1).

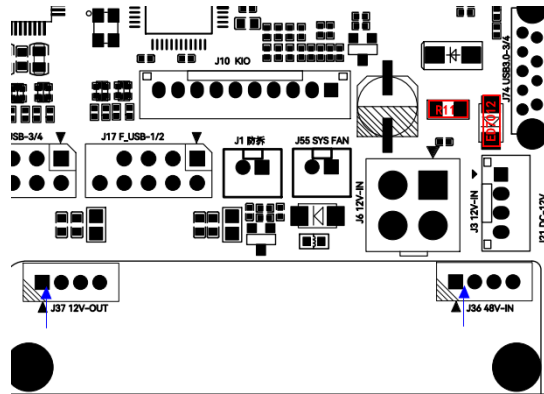
Pin#	Definition	Note
1	12V	If the current exceeds 2A, external 12V is recommended
2	12V	If the current exceeds 2A, external 12V is recommended
3	EN	The default output is 5V
4	ADJ	3.3V square wave (1KHz Freq.)
5	GND	Power Ground
6	GND	Power Ground



➤ J21 DC-12/48V Socket

[J21] DC-12/48V power socket (Default DC Power Input 9~15V), positive outer and negative inner, inner pin diameter 2.0mm, outer ring diameter 5.5mm, it is the same to J3/J6 Jack.

**Note: If you need 48V power supply, you need to solder R11, replace ED7012 with a 48V\_TVS tube, add EXT-52VIN-12V small board to buckle J36 and J37, and fix it with screws. (When powered by 24V, ED7012 is replaced with a 24V\_TVS tube. For different power supplies, the corresponding voltage-resistant TVS tube needs to be replaced)**



➤ J23 Double USB 3.0 Type A Socket

[J23] Standard Double USB 3.0 Type A Socket.

➤ J24 Micro-SIM Card Socket

[J24] Micro-SIM Card Socket.



**Note: The SIM card holder is a conventional medium card slot. When inserting the card, please make sure that the SIM card is inserted with the notch facing outwards.**

➤ J25 48V Input Header

[J25] 48V Input Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	48V	DC Power Input 48V

2	48V	DC Power Input 48V
3	GND	Digital Ground
4	GND	Digital Ground

**Note: This interface needs to be used with J38 POE PSE.**

### ➤ J27 VGA Output Jack

[J27] Standard VGA Output Jack.

### ➤ J29 Dual-Tier LED

[J29] User defined dual-tier LED. Lower power LED light (on the power); Upper level LED lights (flicker controlled by software after turning on).

### ➤ J30 SATA Hard Disk Socket 2

[J30] SATA 3.0 Hard Disk Standard 7-Pin Data Cable Socket 2.

### ➤ J31 Data Serial Port 2

[J31] Built-in Serial Port 2 (SIP 2.0mm-Square pad is pin 1). The output level is TTL only. **The related software device node name is ttyS2.**

Pin#	Definition	Note
1	GND	Digital Ground
2	RX	Data receive TTL
3	TX	Data transmit TTL
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).

### ➤ J32 Data Serial Port 4

[J32] Built-in Serial Port 4 (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 ttyS4.**

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)

### ➤ J33 SATA Hard Disk Socket 3

[J33] SATA 3.0 Hard Disk Standard 7-Pin Data Cable Socket 3.

### ➤ J35 Data Serial Port 5

[J35] Built-in Serial Port 5 (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 ttyS5.**

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)

### ➤ J36 12/48V Input Header

[J36] 12/48V Input Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	12/48V	DC Power Input (12~48V)
2	12/48V	DC Power Input (12~48V)
3	GND	Power Ground
4	GND	Power Ground

**Note: This interface cannot be used directly. J36 and J37 need to be connected to the EXT-52VIN-12V small board at the same time, and used in conjunction with the 48V power supply function of J3/J6/J21/J75.**

### ➤ J37 12V Output Header

[J37] 12V Output Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	12V	DC Power Input 12V

2	12V	DC Power Input 12V
3	GND	Power Ground
4	GND	Power Ground

**Note:** This interface cannot be used directly. J36 and J37 need to be connected to the EXT-52VIN-12V small board at the same time, and used in conjunction with the 48V power supply function of J3/J6/J21/J75.

### ➤ J38 POE PSE Header

[J38] POE PSE Header (SIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note
1	PSE1	Transformer Center1
2	PSE2	Transformer Center2
3	PSE3	Transformer Center3
4	PSE4	Transformer Center4
5	SDA	I2C Bus data signal
6	SCL	I2C Bus clock signal

**Note:** To use this interface, you need to solder R11, replace ED7012 with a 48V\_TVS tube, add EXT-52VIN-12V small plates to buckle on J36 and J37, EXT-PSEX4 small plates to buckle on J25 and J38, and fix them with screws. J50/J51/J52/J53 detects POE PD and supports PSE output power supply of 48V.

### ➤ J39 3-Pole HP OUT Jack

[J39] 3-Pole 3.5mm Headphone Jack (CTIA Standard jack). It supports insert detection for speaker mute.



### ➤ J40 SATA Hard Disk Socket 4

[J40] SATA 3.0 Hard Disk Standard 7-Pin Data Cable Socket 4.

### ➤ J41 SATA Power Supply Header 1

[J41] SATA Power Supply Header 1 (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 of this interface does not exceed 1A. For 3.5-inch large hard drives, if the power supply is insufficient, it is recommended to use an external power supply!**

### ➤ J43 Audio Extension Interface

[J43] Audio Line Output (DIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	MIC-L	Analog left channel microphone input	2	GND	Audio Ground
3	MIC-R	Analog right channel microphone input	4	SENSE	Front audio induction signal
5	HP-R	Analog stereo output right channel	6	MIC-DEL	Front microphone detect signal
7	GND	Audio Ground	8	null	null
9	HP-L	Analog stereo output left channel	10	HP-DEL	Front headphone detect signal

### ➤ J44 LVDS Voltage Header

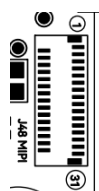
[J44] LVDS Voltage Header (DIP 2.0mm-Square pad is pin 1). If pin 1 and 2 are jumper shorted, the VLCD of J19 is 12V. If pin 3 and 4 are jumper shorted, the VLCD of J19 is 5V. If pin 5 and 6 are jumper shorted, the VLCD of J19 is 3.3V. Please adjust the jumper position according to the actual logic voltage of the LCD screen. Be careful not to jumper to the wrong position or it may damage the LCD screen and the motherboard circuit.

### ➤ J45 mSATA Socket

[J45] mSATA Socket. Support standard mSATA modules.

### ➤ J48 MIPI Panel FPC Connector

[J48] 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 (Not connected by default, need to solder 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:** Depending on the backlight current of different LCD screens, the feedback resistor of the motherboard needs to be adjusted. The default backlight current configuration is 160mA, that is,  $(200/160)*2=2.5R$ , then two 2.49R-0603 resistors are selected for R117 and R9223.

## ➤ J49 RJ45 Internal Gigabit Ethernet Jack 2

[J49] RJ45 Internal Gigabit Ethernet Jack 2.

### ➤ J50 RJ45 Internal Gigabit Ethernet Jack 3

[J50] RJ45 Internal Gigabit Ethernet Jack 3.

**Note: J50 is directly connected to J38 POE PSE, supports voltage output 44~57V, output current 0.52~0.68A, OCP typical value 0.85A, and can be connected to RJ45 network cameras.**

### ➤ J51 RJ45 Internal Gigabit Ethernet Jack 4

[J51] RJ45 Internal Gigabit Ethernet Jack 4.

**Note: J51 is directly connected to J38 POE PSE, supporting voltage output 44~57V, output current 0.52~0.68A, OCP typical value 0.85A, and can be connected to RJ45 network cameras.**

### ➤ J52 RJ45 Internal Gigabit Ethernet Jack 5

[J52] RJ45 Internal Gigabit Ethernet Jack 5.

**Note: J52 is directly connected to J38 POE PSE, supporting voltage output 44~57V, output current 0.52~0.68A, OCP typical value 0.85A, and can be connected to RJ45 network cameras.**

### ➤ J53 RJ45 Internal Gigabit Ethernet Jack 6

[J53] RJ45 Internal Gigabit Ethernet Jack 6.

**Note: J53 is directly connected to J38 POE PSE, supporting voltage output 44~57V, output current 0.52~0.68A, OCP typical value 0.85A, and can be connected to RJ45 network cameras.**

### ➤ J54 Dual USB 2.0 Type A Socket

[J54] Dual USB 2.0 Type A socket.

**Note: The upper port is the main chip USB2\_HOST3 port Hubx4 expansion port, and the lower port is the direct USB3\_OTG signal. The default is the firmware burning and debugging port.**

### ➤ J55 SYS Fan Power Header

[J55] SYS fan power header (SIP 2.0mm-Square pad is pin 1). It is controlled by GPIO #20 (Low active)

Pin#	Definition	Note
1	GND	Digital Ground
2	12V	12V output with on/off switch

### ➤ J56 MIC IN Jack

[J56] 3.5mm Microphone Jack. Support for 2 and 3 segment microphones.

### ➤ J57 USB 2.0 DIP Header

[J57] USB 2.0 header (DIP 2.54mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	5V	Power output 5V	2	5V	Power output 5V
3	D-	USB Differential Data+	4	D-	USB Differential Data+
5	D+	USB Differential Data-	6	D+	USB Differential Data-
7	GND	Digital Ground	8	GND	Digital Ground
9	Null	Null	10	GND	Digital Ground

**Note:** This port is the main chip USB2\_HOST2 port Hubx7 expansion port

### ➤ J58 Data Serial Port 7

[J58] Built-in Serial Port 7 (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 U9016 mounted, RS-485 if U67 mounted). **The related software device node name is ttyS7.**

Pin#	Definition	Note
1	GND	Digital Ground
2	RX A	Data receive (TTL or RS-232 or RS-484 level)
3	TX B	Data transmit (TTL or RS-232 or RS-484 level)
4	VCC	Power output (Default 3.3V, 5V option)

### ➤ J59 Data Serial Port8

[J59] Built-in Serial Port 8 (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-485 if U9856 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)



## ➤ J60 Data Serial Port 0

[J60] Built-in Serial Port 0 (RJ45 Socket). 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 ttyS0.**

Pin#	Definition	Note	Pin#	Definition	Note
1	NC	Not connected	2	NC	Not connected
3	<b>TX0</b>	<b>Data transmit</b>	4	GND	Digital Ground
5	GND	Digital Ground	6	<b>RX0</b>	<b>Data receive</b>
7	NC	Not connected	8	NC	Not connected

## ➤ J61 SATA Power Supply Header 2

[J61] SATA Power Supply Header 2 (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 of this interface does not exceed 1A. For 3.5-inch large hard drives, if the power supply is insufficient, it is recommended to use an external power supply!**

## ➤ J63 Ethernet Panel Light 2

[J63] Ethernet Panel Light 2 (DIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	AT4+	Ethernet 4 Act light+	2	LK4+	Ethernet 4 Link light+
3	AT4-	Ethernet 4 Act light-	4	LK4-	Ethernet 4 Link light-
5	AT5+	Ethernet 5 Act light+	6	LK5+	Ethernet 5 Link light+
7	AT5-	Ethernet 5 Act light-	8	LK5-	Ethernet 5 Link light-
9	AT6+	Ethernet 6 Act light+	10	LK6+	Ethernet 6 Link light+
11	AT6-	Ethernet 6 Act light-	12	LK6-	Ethernet 6 Link light-

## ➤ J64 CPU Fan Power Header

[J64] CPU fan power header (SIP 2.0mm-Square pad is pin 1). It is controlled by GPIO #21 (Low active)

Pin#	Definition	Note
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1	GND	Digital Ground
2	12V	12V output with on/off switch

### ➤ J69 Ethernet Panel Light 1

[J69] Ethernet Panel Light 1 (DIP 2.0mm-Square pad is pin 1).

Pin#	Definition	Note	Pin#	Definition	Note
1	AT1+	Ethernet 1 Act light+	2	LK1+	Ethernet 1 Link light+
3	AT1-	Ethernet 1 Act light-	4	LK1-	Ethernet 1 Link light-
5	AT2+	Ethernet 2 Act light+	6	LK2+	Ethernet 2 Link light+
7	AT2-	Ethernet 2 Act light-	8	LK2-	Ethernet 2 Link light-
9	AT3+	Ethernet 3 Act light+	10	LK3+	Ethernet 3 Link light+
11	AT3-	Ethernet 3 Act light-	12	LK3-	Ethernet 3 Link light-

### ➤ J74 Double USB 3.0 Type A Socket

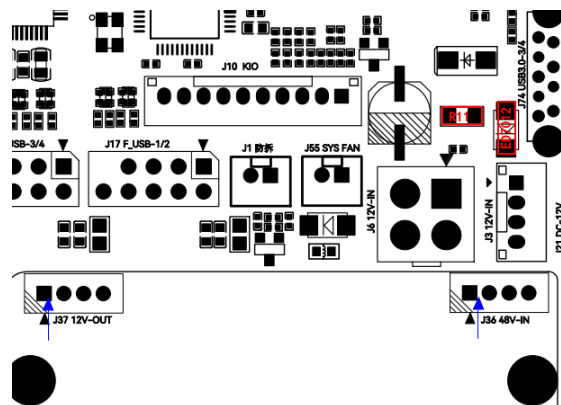
[J74] Standard Double USB 3.0 Type A Socket.

### ➤ J75 DC-12/48V Input Header

[J75] DC-12/48V Input Header (SIP 3.81mm-Square pad is pin 1), it is the same to J3/J6/J21 Jack.

Pin#	Definition	Note
1	12/48V	Default DC Power Input (9~15V)
2	GND	Power GND

**Note:** If you need 48V power supply, you need to solder R11, replace ED7012 with a 48V\_TVS tube, add EXT-52VIN-12V small board to buckle J36 and J37, and fix it with screws. (When powered by 24V, ED7012 is replaced with a 24V\_TVS tube. For different power supplies, the corresponding voltage-resistant TVS tube needs to be replaced.



➤ **ANT WIFI Antenna IPEX**

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

➤ **SW1 Recovery Mode Button**

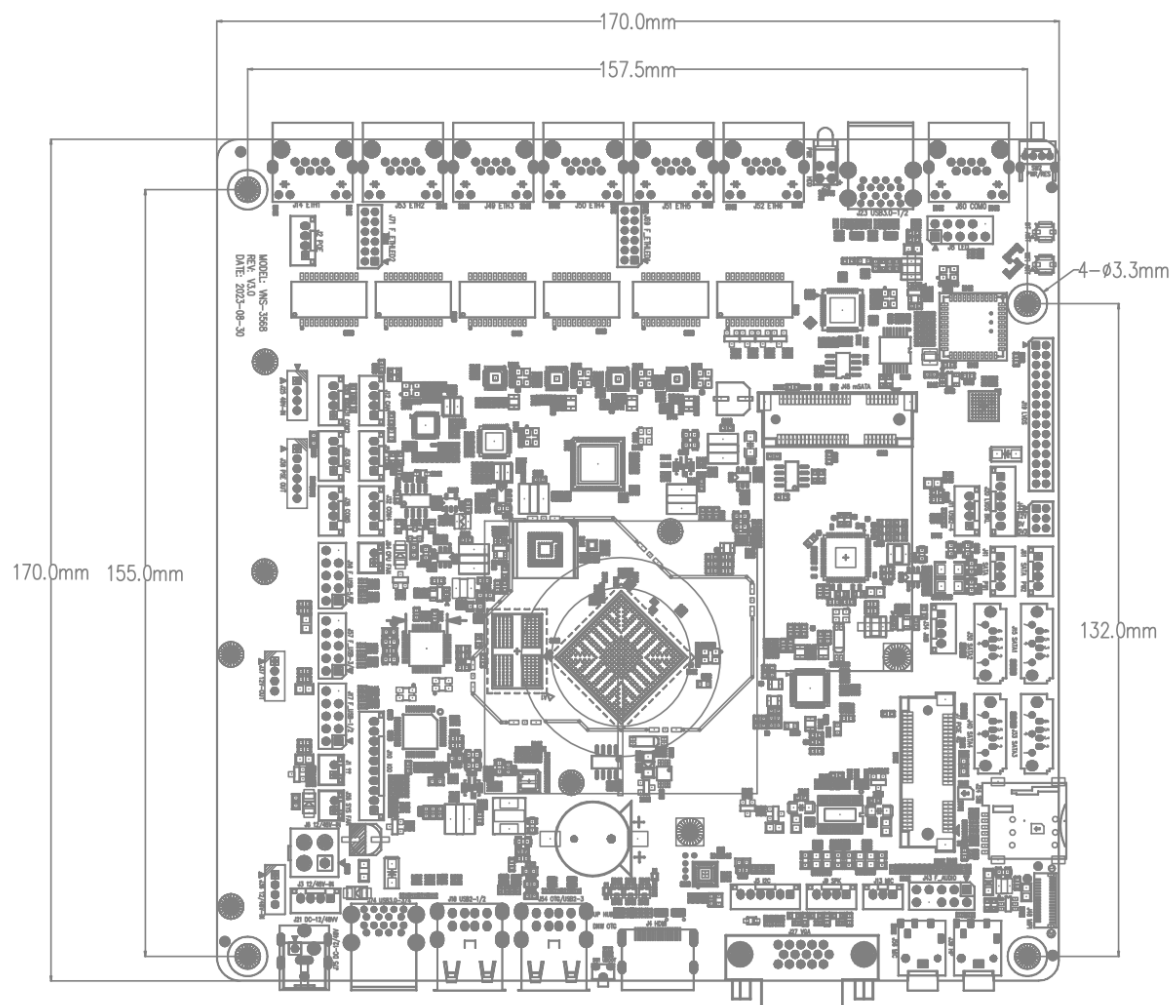
[SW1] On-board recovery mode button. First press and then hold for about 3-second while power on will enter the recovery mode.

➤ **SW2 Switch & Reset Button**

[SW2] Switch & reset small button, the upper key is the power key, press the system to shut down, and then press the system to turn on; The down key is the hardware reset key. Press it once to restart the system.

## 5 Physical Size

The PCB size is 170mm\*170mm and the fixing hole diameter is 3.3mm. The corresponding physical size parameters are shown in the figure below. For detailed size information, please consult the manufacturer for DXF file.



## 6 Assemble Precautions

Please note the following key points when using the VNS-3568 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. **If the LCD backlight power is above 20W, it is recommended to use a separate power board for backlight power supply.**
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.** When the serial port is connected to peripherals, level matching (3.3V TTL level, RS-232 level and RS-485 level) is also required.
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

The VNS-3568 motherboard supports dual-screen differential display combinations of any two outputs of LVDS/MIPI/HDMI/VGA! For relevant output combinations, please consult the manufacturer to provide corresponding abnormal display patches.

The internal serial port and extended serial port software port numbers of the VNS-3568 mainboard are as follows:

Port	Software Device Node
J31	/dev/ttyS2
J32	/dev/ttyS4
J35	/dev/ttyS5
J58	/dev/ttyS7
J59	/dev/ttyS8
J60	/dev/ttyS0