



NUC32R User Manual

Issue 1.1A

www.CoreIPC.com

Security Guidance

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- To help you use the CoreIPC motherboard, please read the [User Manual] carefully.
- For product-related information, please be sure to read these safety instructions carefully.
- Identifying the Product Version
You can find the version of this motherboard labeled [Issue:X.X] on the motherboard itself. X.X represents a number; for example, a label reading [Issue1.0] indicates that the version of this motherboard is 1.0. Please note the product version when updating the motherboard's BIOS or drivers, or when referring to other technical documentation.

Basic Safety Tips

1. Before using this product, please be sure to read the product manual carefully.
2. Any cards not yet ready for installation should be stored in anti-static bags.
3. Before removing the board from the antistatic bag, place your hand on a grounded metal object for a moment (such as 10 seconds) to discharge any static electricity from your body and hands.
4. When handling circuit boards, you must wear anti-static gloves and make it a habit to touch only the edges.
5. To prevent electric shock or damage to the product, be sure to turn off the AC power before inserting, removing, or reconfiguring the board.
6. Before moving a board or the entire unit, you must first turn off the AC power.
7. For complete systems, be sure to turn off the AC power before adding or removing any boards.
8. Before connecting or disconnecting any device, you must first turn off the AC power.
9. To avoid unnecessary damage to the product caused by frequent power cycles, wait at least 30 seconds after turning it off before turning it back on.

Ordering Information

No.	Model	CPU	Cores	Freq.	TDP	Memory	HDMI	DP	LAN	USB	PS2	LPT	COM/ 485	POWER
1	NUC32R VER1.1A	N95	4	Up to 3.4G	15W	DDR4	1	1	4	5	/	/	2 / 0	12V
2	NUC32R VER1.1A	N100	4	Up to 3.4G	6W	DDR4	1	1	4	5	/	/	2 / 0	12V
3	NUC32R VER1.1A	N200	4	Up to 3.7G	6W	DDR4	1	1	4	5	/	/	2 / 0	12V
4	NUC32R VER1.1A	I3-N305	8	Up to 3.8G	15W	DDR4	1	1	4	5	/	/	2 / 0	12V
5	NUC32R VER1.1A	N150	4	Up to 3.6G	6W	DDR4	1	1	4	5	/	/	2 / 0	12V
6	NUC32R VER1.1A	N250	4	Up to 3.8G	6W	DDR4	1	1	4	5	/	/	2 / 0	12V

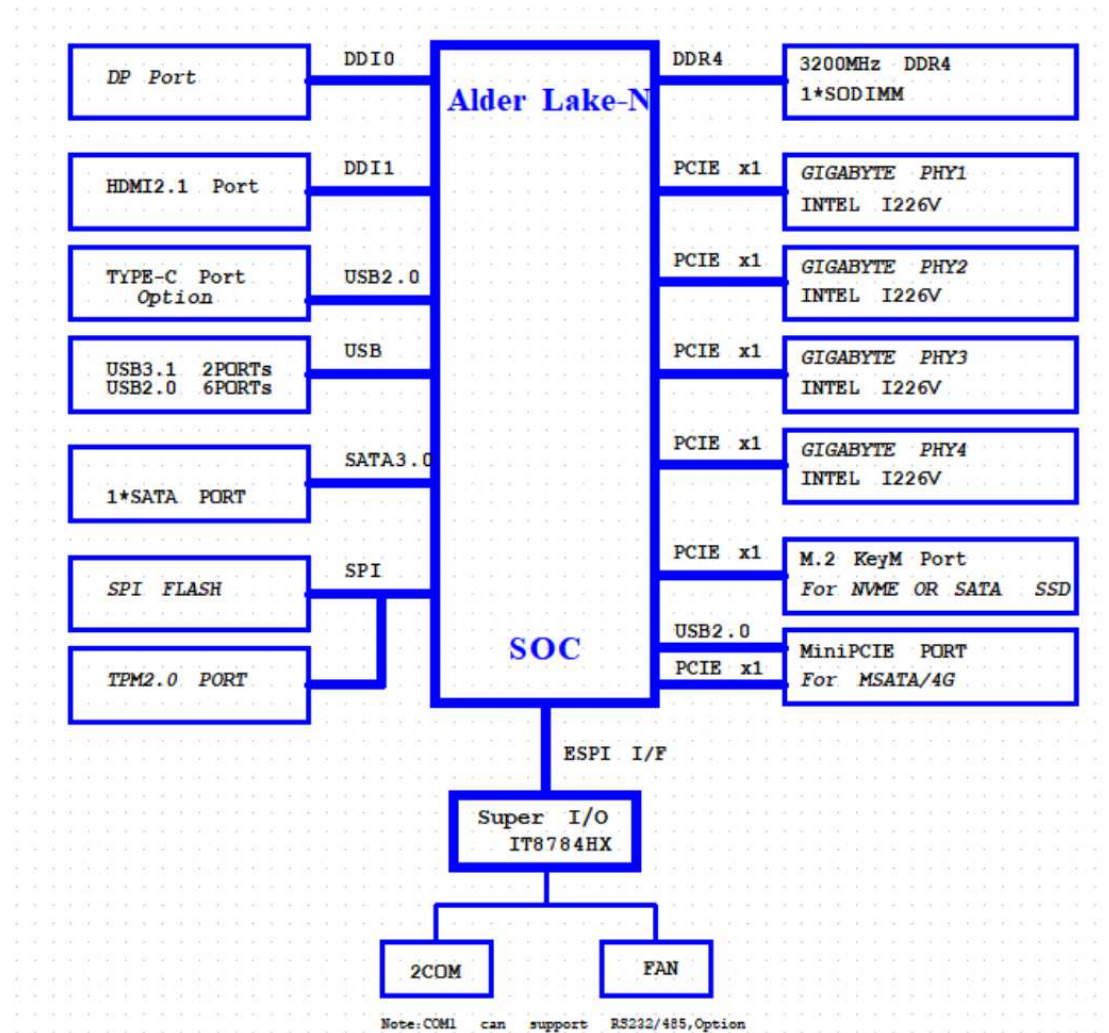
1. Product Description

NUC32R is a CoreIPC NANO-series multi-LAN motherboard supporting the full range of Intel® Alder Lake processors. It is widely applicable to soft routers, network security systems, industrial control, cloud terminals, and other applications.

The main features of the NUC32R motherboard are as follows:

- Integrated Intel® Celeron® N100 0.8 GHz quad-core processor; compatible with the full range of Intel® Alder Lake-N and Twin Lake-N processors;
- 1 × SO-DIMM slot supporting single-channel DDR4-3200 memory, up to 32 GB;
- Supports DP and HDMI display outputs;
- Supports 4 × Intel® I225-V or I226 2.5GbE ports;
- Supports 1 × Mini PCIe slot for Wi-Fi/4G and 1 × M.2 Key M 2280/2242 slot supporting PCIe/SATA auto-detection SSDs;
- Supports 2 × USB 3.1 ports, 6 × USB 2.0 ports, and 1 × USB Type-C port (USB 2.0);
- Provides 2 × RS-232 serial ports, with optional support for 1 × RS-485 port;
- Fanless cooling supports fully enclosed system designs for improved dust and moisture resistance;
- Supports a wide operating temperature range of -10°C to 60°C;
- Supports AT/ATX power mode selection and 12 V DC power input.

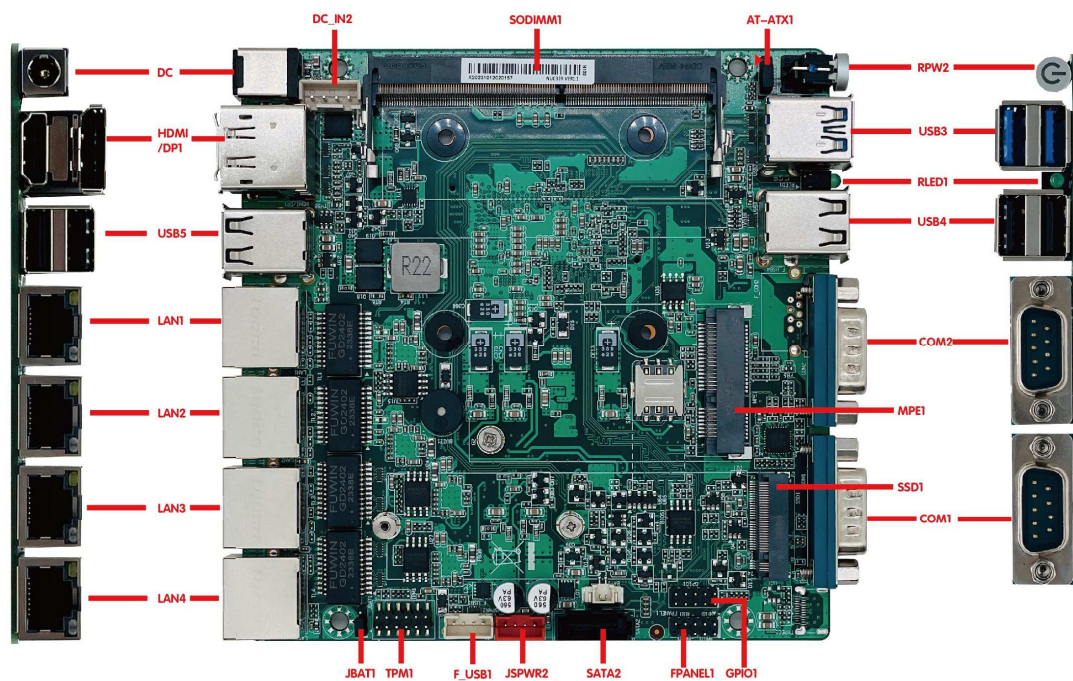
2. Motherboard Block Diagram



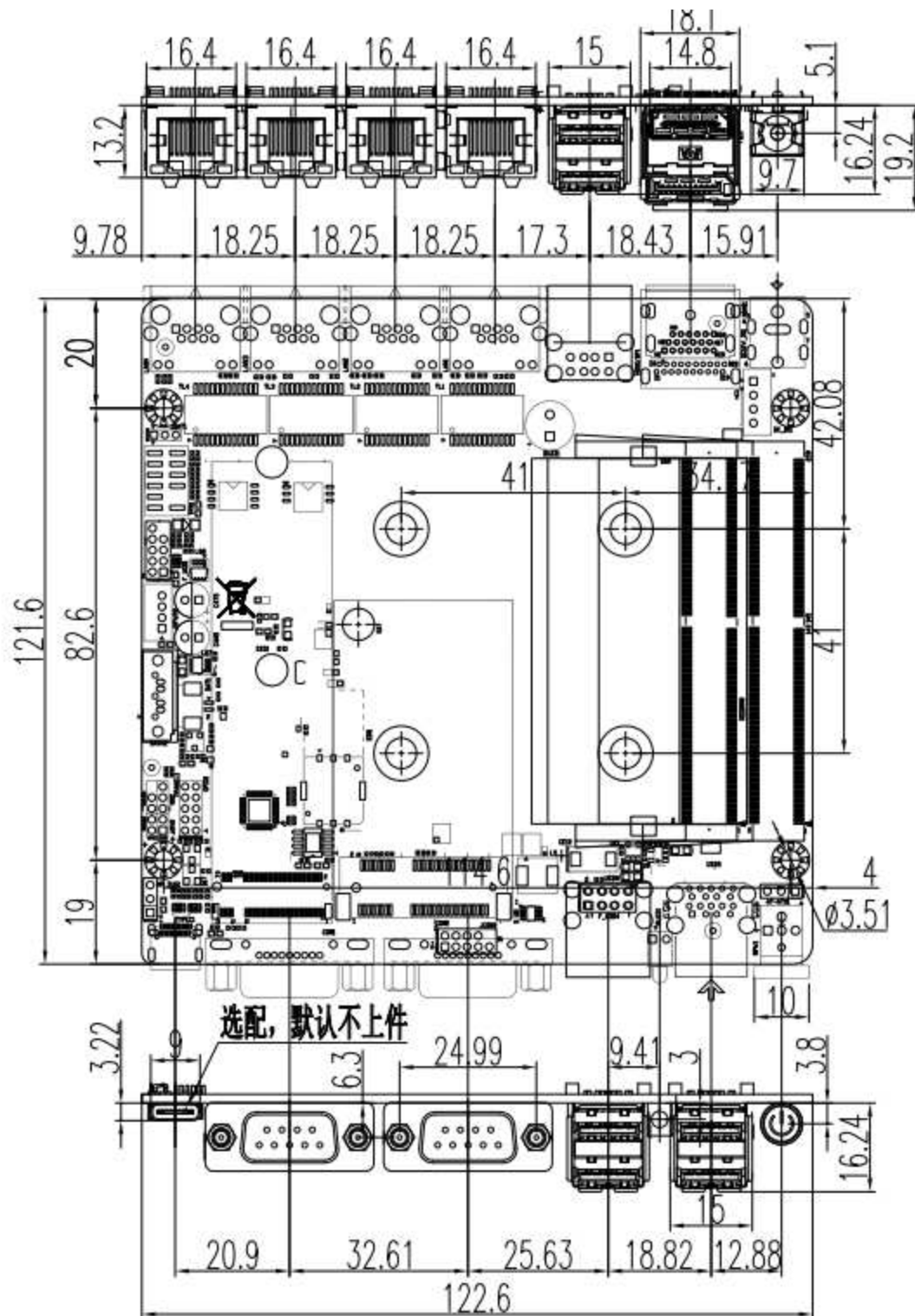
3. Motherboard Specifications

Item	Description
Processor	Integrated Intel® Celeron® N100 0.8 GHz quad-core processor, TDP 6 W Compatible with the full range of Intel® Alder Lake-N and Twin Lake-N processors
Memory	1 × SO-DIMM slot; single-channel DDR4-3200 memory; up to 32 GB
Display	Integrated Intel® UHD Graphics
	1 × HDMI 1 port (4K at 60 Hz) and 1 × DP port (4K at 60 Hz) Supports synchronous or asynchronous HDMI and DP display output
LAN	4 × Intel® I225 or I226 2.5GbE controllers with Wake-on-LAN and PXE boot support
Storage	1 × 7-pin SATA 3.0 drive port, up to 6 Gbps (mutually exclusive with the mSATA signal)
	1 × M.2 Key M 2280/2242 slot supporting PCIe/SATA auto-detection SSDs
Expansion Slots	1 × Mini PCIe slot supporting 4G modules and Wi-Fi by default; hardware modification can enable mSATA support
Rear I/O	4 × Intel® I225-V or I226 2.5GbE ports
	2 × USB 2.0 ports
	1 × stacked HDMI + DP display connector
	1 × 12 V DC power input connector
Front I/O	2 × USB 3.1 ports
	2 × USB 2.0 ports
	2 × DB9 RS-232 serial ports (both are RS-232 by default; COM1 can optionally support RS-485 through a hardware modification)
	1 × optional console port sharing the same signal as the front-I/O DB9 COM2 port
	1 × optional USB Type-C port (USB 2.0), mutually exclusive with one USB signal on the F_USB1 header
	1 × HDD activity LED
	1 × optional auto power-on DIP switch
	1 × power button with power LED
Internal I/O	1 × 2 × 5-pin USB 2.0 header. The two F_USB1 signals are shared with the 4G module and the USB Type-C port. When the Type-C connector is not installed, only one USB 2.0 signal is available on the header by default.
	1 × 2 × 6-pin TPM 2.0 header
	1 × drive power connector
	1 × 4-pin white power connector
	1 × 2 × 5-pin GPIO header
	1 × 2 × 5-pin front-panel switch and LED header
Fan Header	Rear-mounted CPU with fanless cooling design; 1 × 4-pin CPU fan header reserved

GPIO	Supports 4-channel GPIO input/output
BIOS	128Mb Flash ROM
Watchdog	Supports hardware reset (256 levels, 0-255 seconds)
Operating System	Windows 10/Windows 11/Linux
Power Type	12 V DC power input
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Operating Humidity	5%-95% relative humidity, non-condensing
Dimensions	120mm x 120mm



Note: The image above shows the front view of NUC32R VER1.1A. Other models may differ.
The image can be enlarged for viewing. Pin 1 of each header is marked with a red triangle.



The above drawing shows the dimensions of NUC32R VER1.1A.

4. Board Installation



Safety Precautions

Before installing the motherboard, please read and follow the safety precautions below:

- Do not remove or damage the serial number label, distributor warranty label, or any other warranty-related labels on the motherboard before installation. Otherwise, it may affect the warranty validation.
- Before installing or removing the motherboard or any other hardware devices, make sure the power is turned off and the power cord is unplugged from the power outlet.
- When installing hardware devices into the motherboard connectors or slots, make sure the connectors are firmly and properly seated.
- When handling the motherboard, avoid touching the metal contacts or circuit areas to prevent short circuits.
- When handling the motherboard, CPU, or memory module, it is recommended to wear an anti-static wrist strap. If an anti-static wrist strap is not available, make sure your hands are dry and touch a grounded metal object first to discharge static electricity.
- Before installation, place the motherboard on an anti-static mat or inside an anti-static bag.
- Before unplugging the power connector from the motherboard, make sure the power supply is turned off.
- Before turning on the power, make sure the power supply voltage is set according to the local voltage standard.
- Before turning on the power, make sure all hardware cables and power cables are correctly connected.
- Do not allow screws to contact the circuits or components on the motherboard, as this may cause damage or malfunction.
- Make sure no screws or metal objects are left on the motherboard or inside the computer chassis.
- Do not place the computer system on an unstable surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the power during installation may cause damage to the motherboard, other devices, or personal injury.
- If you are not familiar with the installation process, or if you encounter any technical problems while using this product, please consult qualified technical personnel.

Memory Installation

This motherboard provides **2 × 260-pin DDR4 SO-DIMM memory slot**.

Before installing the memory module, please note the following:

- 1) Make sure the memory module you purchased is compatible with the specifications supported by this motherboard.
- 2) Before installing or removing the memory module, make sure the computer power is turned off to prevent damage.
- 3) The memory module is designed with a foolproof notch. If the insertion direction is

incorrect, the module cannot be inserted. In this case, please change the insertion direction immediately.

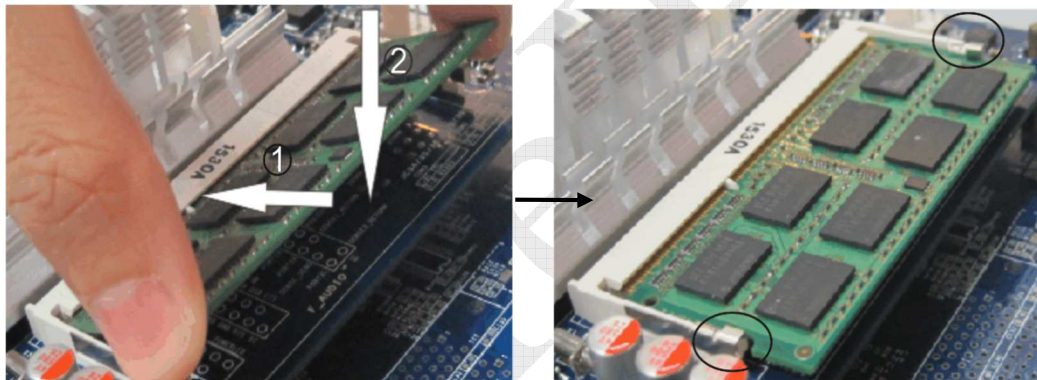
Memory Installation Steps:

- 1) Before installing or removing the memory module, turn off the power and unplug the AC power cord.
- 2) Carefully hold the memory module by both edges. Do not touch the metal contacts.
- 3) Align the gold fingers of the memory module with the memory slot. Make sure the notch on the memory module matches the key in the slot.
- 4) Insert the memory module into the slot at an angle of approximately 30 degrees, then gently press it down until you hear a “click” sound. This indicates that the memory module has been properly installed and is ready for use.

Note: Do not apply excessive force when pressing down the memory module to avoid damage.

- 5) To remove the memory module, push the retaining clips on both sides of the DIMM slot outward at the same time, then remove the memory module carefully.

Note: The installation diagram is for reference only.

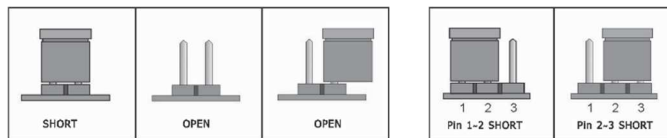


5. Jumper Settings

Jumper Description

For a **2-pin header**, installing a jumper cap on the two pins will close the circuit, creating a short connection.

For a **3-pin header**, the jumper cap can be installed on **Pin 1–2** or **Pin 2–3** to close the corresponding circuit and create a short connection.



How to Identify Pin 1 of a Jumper?

- 1) Carefully check the motherboard. The pin marked with “1” or indicated by a thick white line is usually Pin 1.
- 2) Check the solder pads on the back side of the motherboard. In most cases, the square solder pad indicates Pin 1.

Clear CMOS Jumper:

The motherboard provides 1 × 1×3-pin Clear CMOS header JBAT1 for clearing or retaining CMOS settings.

Pin pitch: 2.0 mm

The CMOS is powered by the onboard button battery. Clearing the CMOS will permanently erase the previous system configuration and restore the system settings to the default factory values.

To clear the CMOS, follow the steps below:

- 1) Turn off the computer and disconnect the power supply.
- 2) Short Pin 2–3 of JBAT1 for approximately 5 seconds.
- 3) Power on the computer.
- 4) During startup, follow the on-screen prompt to enter BIOS Setup, then load the optimized default settings.
- 5) Save the settings and exit BIOS Setup.

Pin definition is shown below:

JBAT1 Definition:

Function	JBAT1 Setting
Normal operation	1-2Pin
Clear CMOS and restore all BIOS settings to factory defaults	2-3Pin

AT/ATX Power Mode Jumper

The motherboard provides **1 × 1×3-pin AT-ATX1 jumper** for selecting the power-on mode.

Pin pitch: 2.54 mm

The power-on behavior can be configured by the jumper setting.

AT-ATX1 Definition:

Function	AT-ATX1 Setting
Disable Auto Power-on	Pins 1-2 (default)
Enable Auto Power-on	2-3Pin

6. Pin Definitions

6.1. The motherboard supports 2 serial ports through two standard DB9 RS-232 connectors. COM1 can optionally be configured as RS-485, and COM2 can optionally be configured as a console port. Please confirm optional requirements before ordering.

The motherboard provides 1 × 2 × 5-pin optional JCOM2 serial header (2.0 mm pitch). JCOM2 shares the same signals as COM2. The standard JCOM2 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	DCD (A)	2	RXD (B)
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

Note: The standard motherboard supports only 2 × RS-232 ports by default. RS-485 support requires a hardware modification and advance production arrangement. Please contact CoreIPC sales before ordering.

6.2. The motherboard provides 1 × 2 × 5-pin USB 2.0 header (2.0 mm pitch). The F_USB1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	+5V	2	+5V
3	Data0-	4	Data1-
5	Data0+	6	Data1+
7	GND	8	GND
9		10	GND

6.3. The motherboard provides 1 × 2 × 5-pin FPANEL1 header (2.0 mm pitch).

The chassis power switch, reset switch, HDD LED, and power LED can be connected to this header.

The FPANEL1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	HDDLED+	2	PWRLED+
3	HDDLED-	4	PWRLED-
5	GND	6	PWRBTN#
7	RESETBTN#	8	GND
9	NC	10	

6.4. The motherboard provides 1 × optional 1 × 4-pin fan header. The CPUFAN1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	GND	2	+12V
3	DET	4	PWM

Note: DET: fan speed pulse output; PWM: fan speed PWM control.

6.5. The motherboard provides 1 × 2 × 6-pin TPM 2.0 header. The TPM1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	SPI POWER	2	SPI CS#
3	SPI MISO	4	SPI MOSI
5	NC	6	SPI CLK

7	GND	8	SPI RESET
9	NC		
11	NC	12	SPI IRQ

6.6. The motherboard provides 1 × 2 × 5-pin GPIO header (2.0 mm pitch). The GPIO1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	GND	2	+5V
3	GPO1	4	GPI1
5	GPO2	6	GPI2
7	GPO3	8	GPI3
9	GPO4	10	GPI4

6.7. The motherboard provides 1 × red 1 × 4-pin SATA drive power connector (2.0 mm pitch). The JSPWR2 pin definition is as follows:

PIN	Signal Name
1	+12V
2	GND
3	GND
4	+5V

Be sure to verify the location of Pin 1 on JSPWR1. Incorrect connection may damage the drive. Use only the power cable supplied by CoreIPC.

6.8. The motherboard provides 1 × 1 × 4-pin DC power connector. The DC_IN1 pin definition is as follows:

PIN	Signal Name
1	+12V
2	+12V
3	GND
4	GND