CoreIPC

ITX-R196 User Manual

Issue 1.1

www.CoreIPC.com

Security Guidance

Copyright Statement

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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.	Memory	HDMI	VGA	LVDS	eDP	LAN	USB	PS2	LPT	COM/ 485	POWER
1	ITX-R196-N42 VER1.1	J1900	4	2.0G	DDR3L	/	1	/	/	4	3	/	/	1 / 0	12V
2	ITX-R196-N62 VER1.1	J1900	4	2.0G	DDR3L	/	1	/	/	6	3	/	/	2 / 0	12V

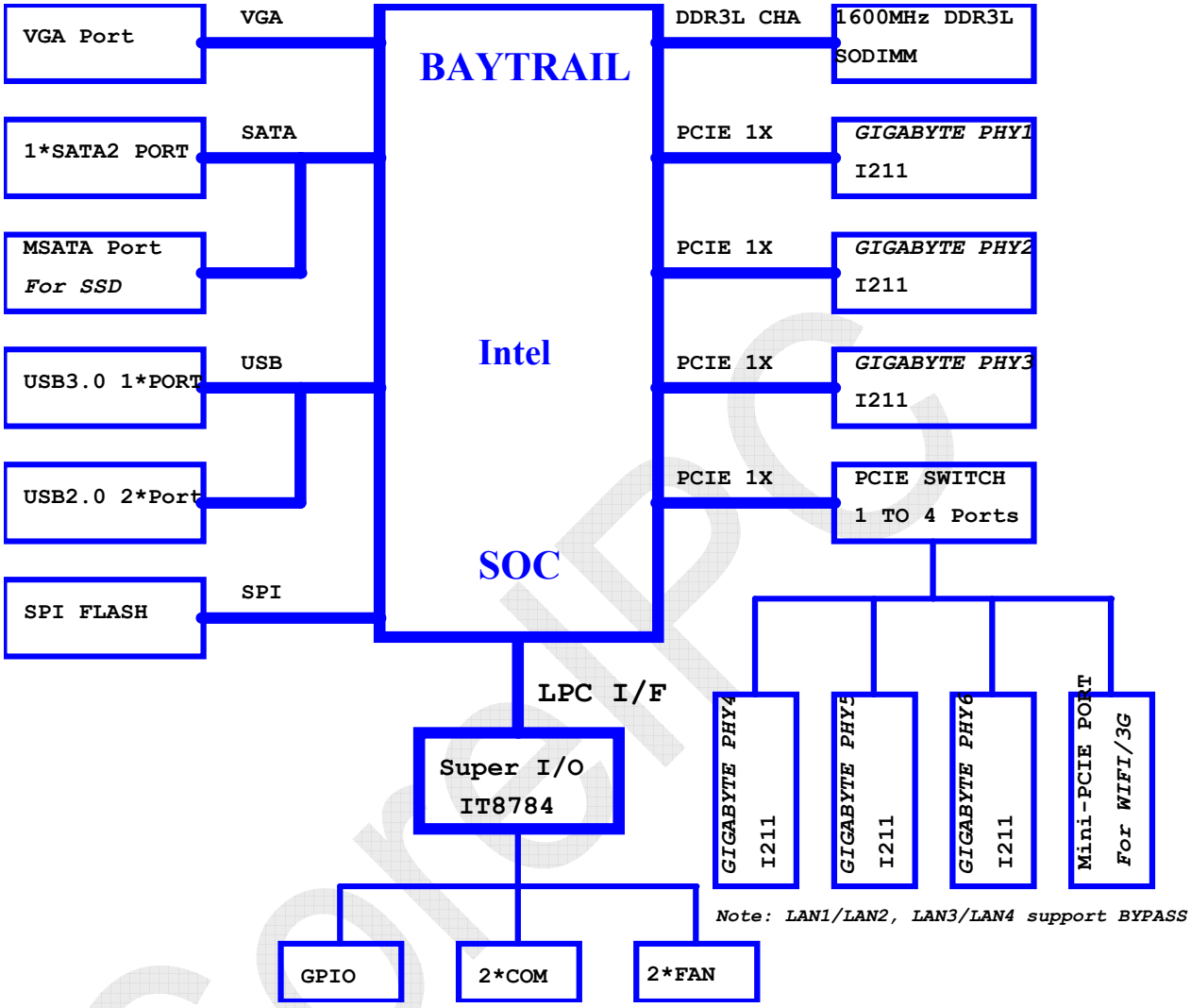
1. Product Description

ITX-R196 is a CoreIPC ITX-series router motherboard supporting Intel® Bay Trail-I/M/D series processors.

The main features of the ITX-R196 motherboard are as follows:

- Integrated Intel® Celeron® J1900 2.0 GHz quad-core processor, compatible with Bay Trail-I/M/D series processors;
- Supports single-channel 1600/1333 MHz DDR3L 1.35 V memory, up to 8 GB;
- Supports VGA display output;
- Supports four or six Intel® I211/I210 Gigabit Ethernet ports, with two optional bypass pairs;
- Supports one Mini PCIe slot for Wi-Fi/4G and one mSATA slot;
- Supports three or four USB ports;
- Supports two RS-232 serial ports;
- Fanless cooling supports fully enclosed systems for improved dust and moisture resistance;
- Supports a wide operating temperature range of -20°C to 60°C;
- Supports AT/ATX mode switching and 12 V DC power input.

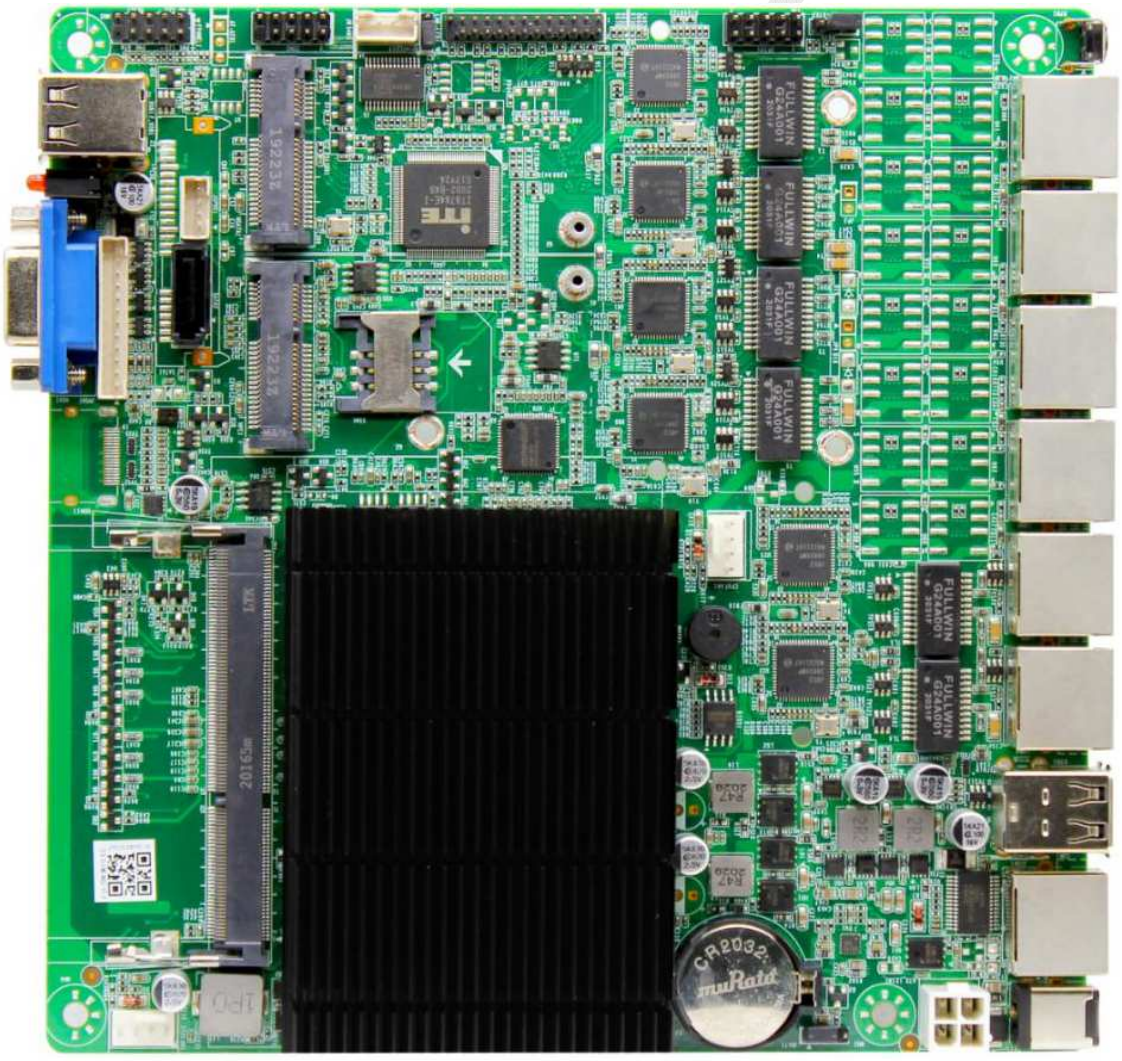
2. Motherboard Block Diagram



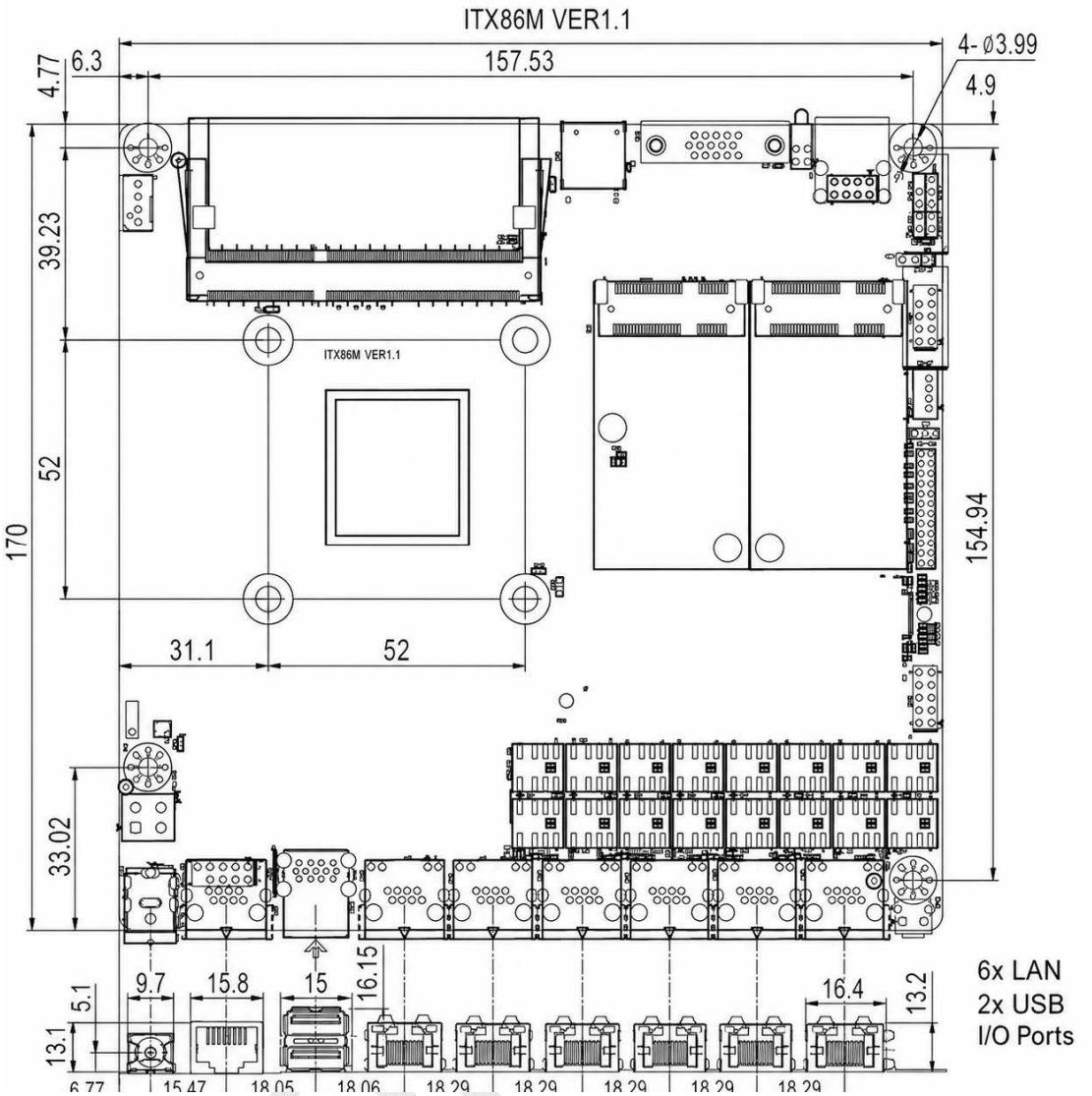
3. Motherboard Specifications

Item	Description
Processor	Integrated Intel® Celeron® J1900 2.0 GHz quad-core processor Compatible with Intel® Bay Trail-I/M/D series processors
Memory	1 × SO-DIMM slot; supports single-channel 1600/1333 MHz DDR3L 1.35 V memory, up to 8 GB
Display	Integrated Intel® HD Graphics
	1 × VGA port
Network	4 x Intel i211/i210 Gigabit network ports (optional support for 6 ports or 2 sets of BYPASS functionality) Supports Wake-on-LAN and PXE boot
	1 × Mini PCIe slot supporting half-size and full-size cards; with four Gigabit RJ-45 ports, only USB-interface Wi-Fi/4G modules are supported
Storage	1 × optional 2.5-inch SATA 2.0 drive connector, mutually exclusive with the SATA 2.0 connector
	1 × SATA 2.0 connector, mutually exclusive with the 2.5-inch SATA 2.0 drive connector; installed by default
	1 × full-size mSATA slot
Rear I/O	4 × RJ-45 Gigabit Ethernet ports; optional six-LAN configuration
	1 × USB 2.0 port and 1 × USB 3.0 port
	1 × Cisco-standard RS-232 serial port
	1 × optional power button
	1 × 12 V DC power input
Front I/O	1 × optional USB 2.0 port, mutually exclusive with the onboard 2 × 4-pin USB 2.0 header
	1 × optional VGA display port
	1 × optional SIM card slot
	1 × optional HDD/power indicator
Onboard I/O	1 × 4-pin ATX power connector, usable as a 12 V power input/output connector
	1 × 1 × 12-pin JVGA header carrying the same signals as the DB15 VGA port
	1 × 2 × 4-pin USB 2.0 header, mutually exclusive with the front I/O USB 2.0 port
	1 × optional 2 × 5-pin COM header with RS-485 support
	1 × 2 × 12-pin LAN LED header
	1 × optional drive power connector, mutually exclusive with the 2.5-inch SATA 2.0 drive connector
	1 × 2 × 5-pin front-panel switch and indicator header
Fan Headers	Fanless cooling design with one reserved 1 × 4-pin CPU fan header and one reserved 1 × 4-pin system fan header
GPIO	Supports four GPIO input/output channels

BIOS	64Mb Flash ROM
Watchdog	Supports hardware reset watchdog with 256 levels from 0 to 255 seconds
Operating System	Windows 7/Windows 10/Linux
Power Type	Powered by 12 V DC
Operating Temperature	-10℃～60℃
Storage Temperature	-20℃～70℃
Operating Humidity	5%-95% relative humidity, non-condensing
Dimensions	170mm x 170mm



Note: The image above shows the front view of ITX-R196 VER1.1. Images of other models may differ.



The diagram above shows the I/O interface layout of ITX-R196 VER1.1.

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 **1 × 204-pin DDR3L 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

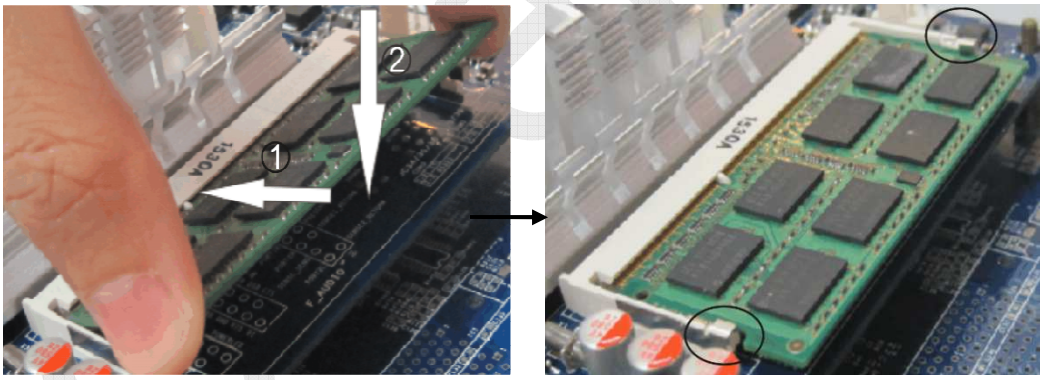
supported by this motherboard.

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.

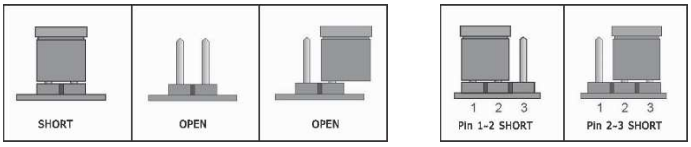


5. Jumper Settings

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: 2.54 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	Pin 1–2 shorted
Clear CMOS and restore all BIOS settings to factory defaults	Pin 2–3 shorted

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	1-2Pin
Enable Auto Power-on	2-3Pin

6. Pin Definitions

6.1. The motherboard provides one Cisco-standard RS-232 serial port.
The COM1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	RTS	2	DTR
3	TXD	4	GND
5	GND	6	RXD
7	DSR	8	CTS

The motherboard provides one standard 2 × 5-pin COM header with a 2.54 mm pitch.
The standard COM2 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

The motherboard provides one optional 1 × 4-pin RS-485 connector with a 2.0 mm pitch.
The JRS485 pin definition is as follows:

Pin	Signal Name
1	GND
2	TXD+(A)
3	TXD-(B)
4	+5V

COM2 RS-232/RS-485 selection jumper

JC2 settings:

Setting	Function (JC2)	
Pins 1-2 Shorted	RS232	COM2
Pins 2-3 Shorted	RS485	

6.2. The motherboard provides one onboard 1 × 12-pin JVGA1 connector with a 2.0 mm pitch. It carries the same signals as VGA1.

The JVGA1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	NC	2	VSYNC
3	HSYNC	4	GND
5	R	6	GND
7	G	8	GND
9	B	10	GND
11	DDC_SDA	12	DDC_SCL

6.3. The motherboard provides one 2 × 4-pin USB 2.0 header with a 2.54 mm pitch.
F_USB1 and USB1 are mutually exclusive.

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

6.4. The motherboard provides two 1 × 4-pin smart fan headers. The CPUFAN1 and SYSFAN1 pin definitions are as follows:

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

Note: DET is the fan speed pulse output; PWM is the fan speed PWM control signal.

6.5. The motherboard provides one 2 × 5-pin GPIO header with a 2.54 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

6.6. The motherboard provides one 1 × 4-pin SATA drive power connector with a 2.0 mm pitch. The JSPWR1 pin definition is as follows:

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

Be sure to confirm the location of Pin 1 on JSPWR1; incorrect connection may damage the drive. Use the power cable supplied by CoreIPC.

6.7. The motherboard provides one 2 × 5-pin FPANEL1 header with a 2.54 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	

6.8. The motherboard provides one 2 × 12-pin LAN LED header with a 2.0 mm pitch. The LAN-LED1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	LAN1_LED_ACT#	2	+3.3V
3	LAN1_LED_LINK100#	4	LAN1_LED_LINK1G#
5	LAN2_LED_ACT#	6	+3.3V

7	LAN2_LED_LINK100#	8	LAN2_LED_LINK1G#
9	LAN3_LED_ACT#	10	+3.3V
11	LAN3_LED_LINK100#	12	LAN3_LED_LINK1G#
13	LAN4_LED_ACT#	14	+3.3V
15	LAN4_LED_LINK100#	16	LAN4_LED_LINK1G#
17	LAN5_LED_ACT#	18	+3.3V
19	LAN5_LED_LINK100#	20	LAN5_LED_LINK1G#
21	LAN6_LED_ACT#	22	+3.3V
22	LAN6_LED_LINK100#	24	LAN6_LED_LINK1G#

