



EPIC45P User Manual

Issue 1.2

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.	Memory	HDMI	VGA	LVDS	EDP	LAN	USB	COM/ 485	POWER
1	EPIC45P-L26-4300U VER1.2	I5-4300U	2	1.9G	DDR3L	1	1	1	/	2	8	6/2	12V
2	EPIC45P-L42-4300U VER1.2	I5-4300U	2	1.9G	DDR3L	1	1	1	/	4	6	2/1	12V

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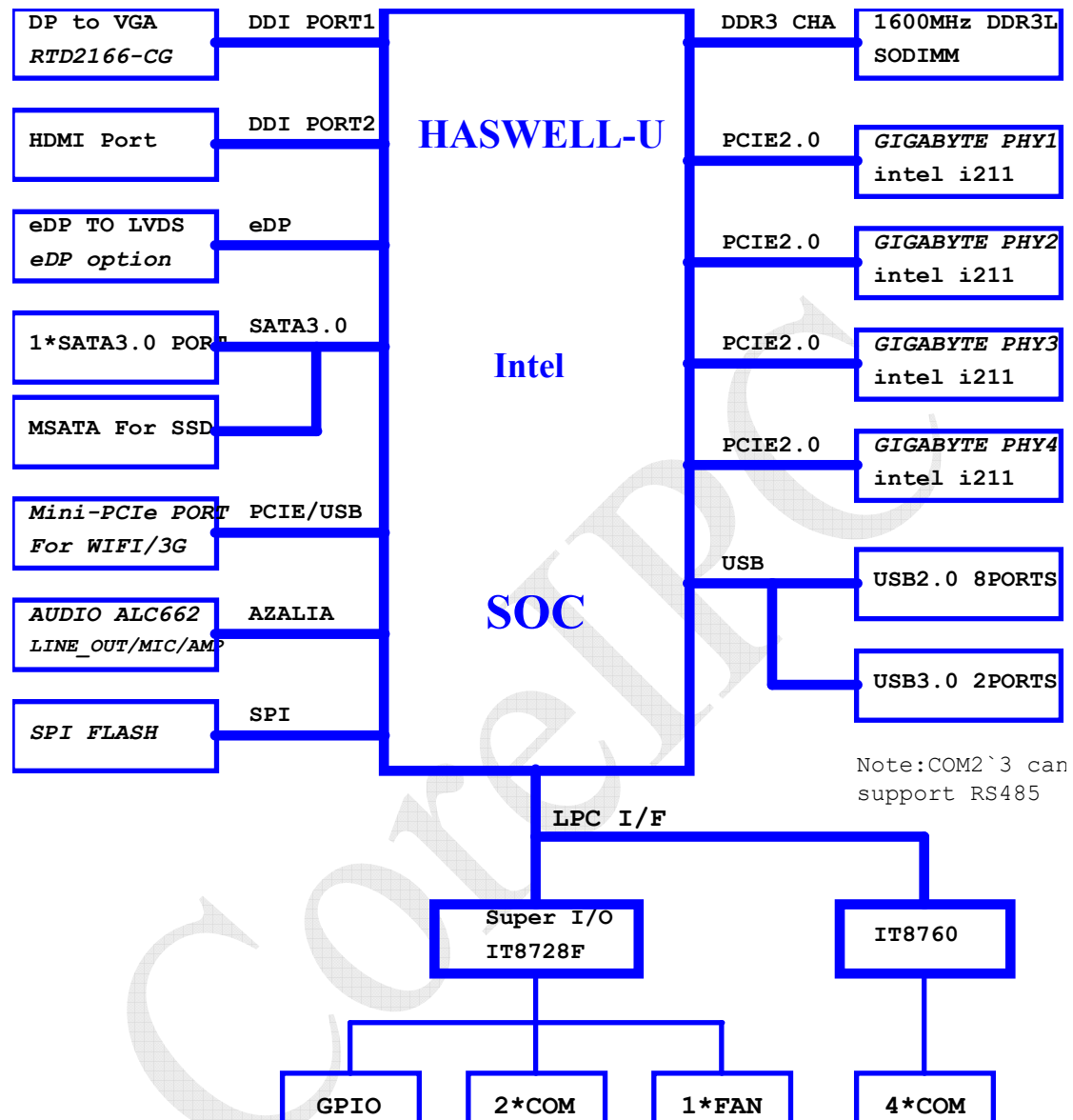
1. Product Description

EPIC45P is a 4-inch industrial motherboard from CoreIPC, supporting the full range of Intel® Haswell-U and Broadwell-U processors.

The main features of the EPIC45P motherboard are as follows:

- Supports Intel® Haswell-U or Broadwell-U Celeron®, Pentium®, and Core™ i3/i5/i7 processors;
- Supports single-channel 1600/1333 MHz DDR3L 1.35 V memory, up to 8 GB;
- Supports VGA, HDMI, and LVDS or eDP display outputs;
- Supports up to 4 × Intel® I211/I210 Gigabit Ethernet ports;
- Supports 1 × Mini PCIe slot for Wi-Fi/4G and 1 × mSATA slot;
- Supports up to 8 USB ports;
- Provides 6 onboard RS232 serial ports and supports up to 2 RS485 ports;
- Uses a dual-ball-bearing smart fan to ensure stable long-term system operation;
- Supports AT/ATX power mode switching and 12 V DC power input.

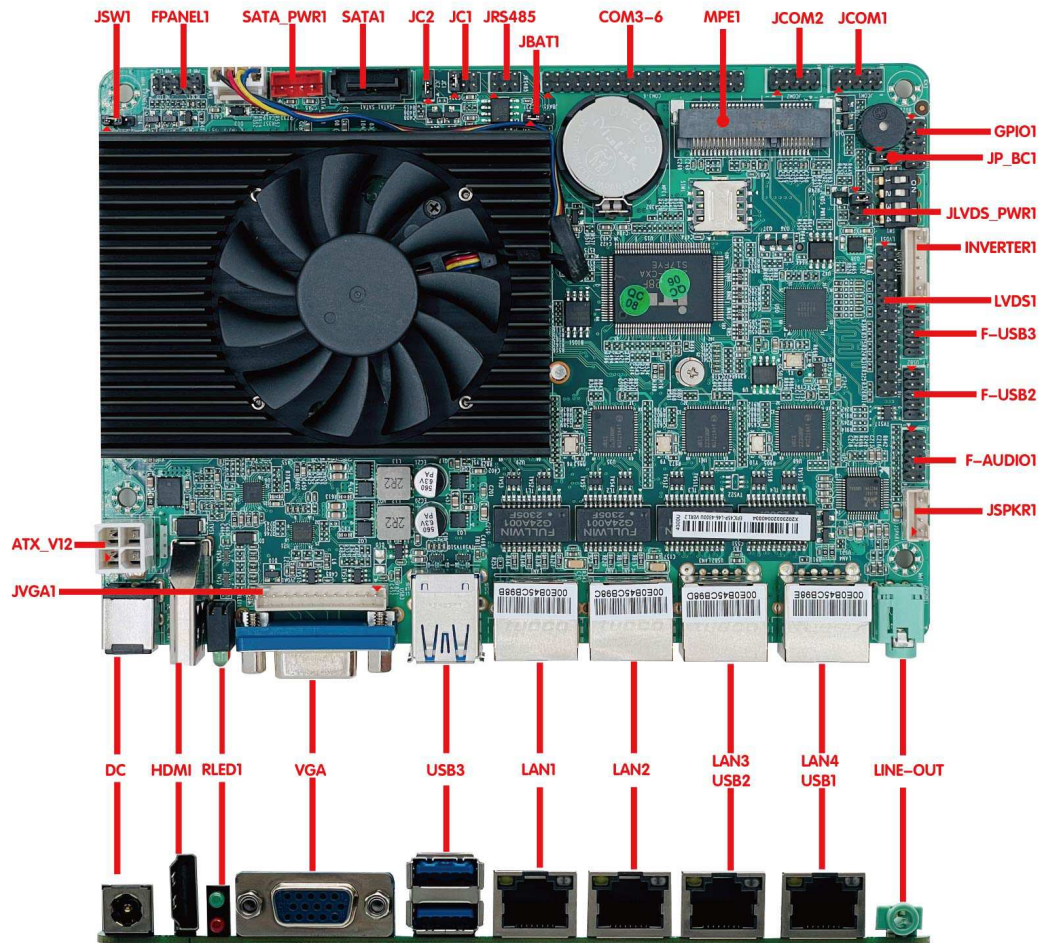
2. Motherboard Block Diagram



3. Motherboard Specifications

Item	Description			
Processor	Intel®Core i3-4030U	Intel®Core i3-5005U	Intel®Core i5-4300U	Intel®Core i5-5300U
	Dual-core 1.9 GHz	Dual-core 2.0 GHz	Dual-core 1.9 GHz (up to 2.9 GHz)	Dual-core 2.3 GHz (up to 2.9 GHz)
	Compatible with Intel® Haswell-U/Broadwell-U Celeron®, Pentium®, and Core™ i3/i5/i7 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 4400			
	1 × VGA, 1 × HDMI 1.4, and 1 × LVDS or eDP interface (mutually exclusive; LVDS by default)			
	Supports synchronous/asynchronous display via VGA, HDMI, and LVDS or eDP			
Network	4 × Intel® I211 Gigabit Ethernet controllers (2 or 3 LAN ports optional); supports Wake-on-LAN and PXE boot			
Storage	1 × mSATA 3.0 slot (full-size card)			
	1 × SATA 3.0 port			
Audio	Onboard ALC897 7.1-channel high-definition audio controller, supports MIC/Line-out and a stereo 2-ohm, 5 W amplifier			
Expansion Slot	1 × Mini PCIe slot (supports half-size and full-size cards) for Wi-Fi/4G modules, with SIM interface			
Rear I/O Ports	1 × HDMI display port			
	1 × VGA display port			
	2 × USB 3.0 ports			
	4 × RJ45 Gigabit Ethernet ports (2 or 3 LAN ports optional; LAN3/LAN4 and USB 2.0 ports are mutually exclusive)			
	1 × Line-out port (green)			
	1 × power/HDD indicator			
	1 × 12 V DC power input connector			
	1 × 1 × 12-pin JVGA header (shares the same signals as the DB15 port)			
Onboard I/O	1 × 2 × 15-pin LVDS interface supporting dual-channel 24-bit output (can be changed to eDP by hardware modification; LVDS by default)			
	1 × 1 × 6-pin panel backlight power connector			
	2 × 2 × 5-pin USB 2.0 headers supporting up to 4 USB 2.0 ports (with two LAN ports, the onboard headers support only 1 USB 2.0 port; with three LAN ports, they support 3 USB 2.0 ports)			
	1 × 2 × 5-pin front audio header			
	1 × 1 × 4-pin amplifier connector			

	6 × COM ports (COM2 supports RS485/RS422; COM3 supports RS485)
	1 × drive power connector
	1 × 4-pin ATX power connector
	1 × 2 × 5-pin front-panel switch and LED header
Fan Connector	1 × 4-pin CPU fan connector
GPIO	Supports 4-input/4-output GPIO
BIOS	64Mb Flash ROM
Watchdog	Supports hardware reset (256 levels, 0–255 seconds)
Operating System	Windows 7/Windows 10/Linux
Power Type	DC 12 V power input
Operating Temperature	60°C~ -10°C
Storage Temperature	-20°C~70°C
Operating Humidity	5%–95% relative humidity, non-condensing
Dimensions	165mm x 115mm



The image can be enlarged for viewing. Pin 1 of each header is marked with a red triangle.

Note: The image above shows the front view of EPIC45P-L46 VER1.2. Images of other models may differ.



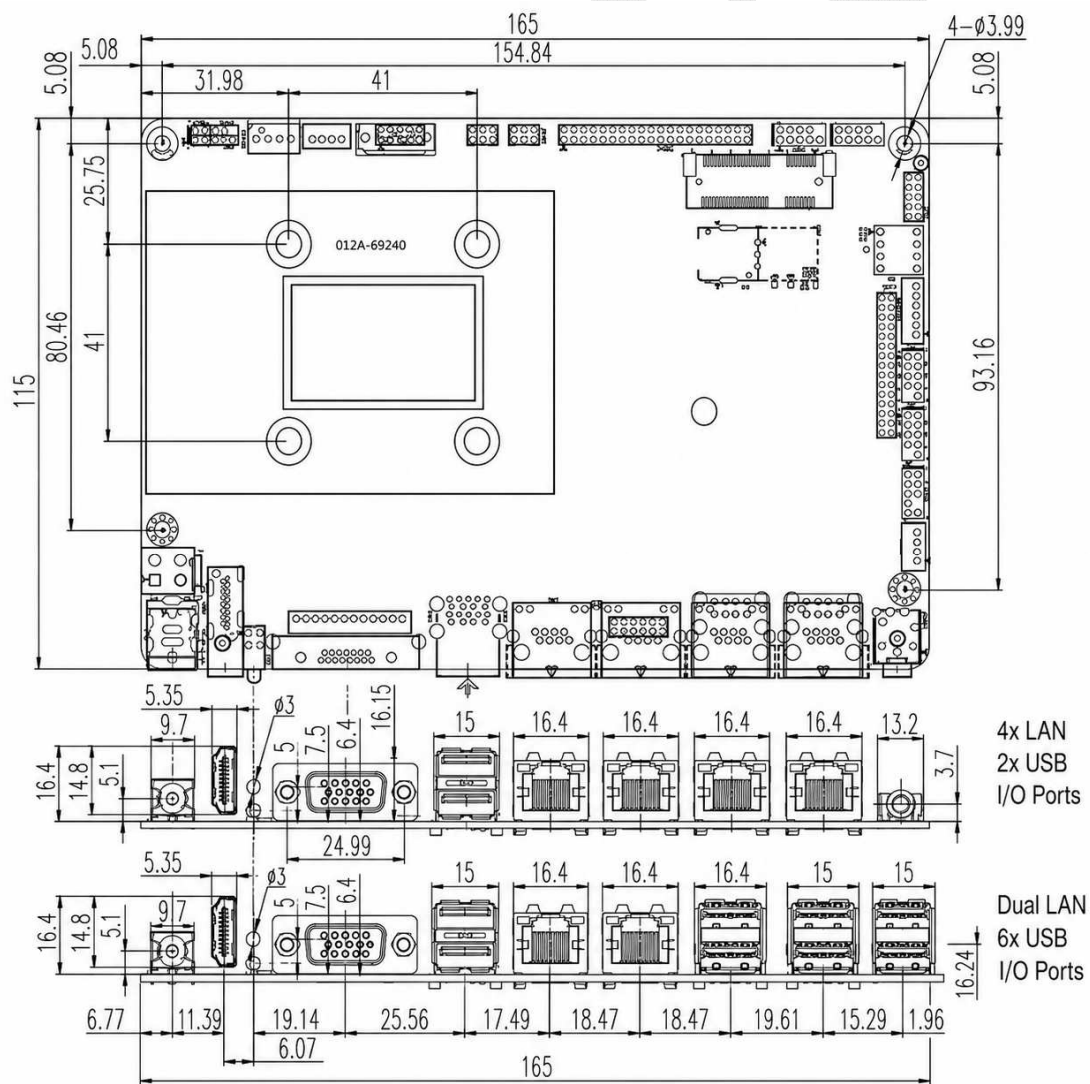
EPIC45P-IO-4CNP VER1.1



EPIC54P-IO-4CNP VER1.1
GPIO/COM Isolation



The above is the I/O expansion board, which supports GPIO and serial-port isolation.



The above is the I/O interface layout diagram of EPIC45P VER1.2.

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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.

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: 2.0 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

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6. Pin Definitions

6.1. The motherboard provides 2 × standard 2 × 5-pin JCOM headers (2.0 mm pitch).

The standard pin definitions of JCOM1 and JCOM2 are 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

6.2. The motherboard provides 1 × standard 2 × 20-pin header for four serial ports (2.0 mm pitch).

The COM3–COM6 pin definitions are as follows:

PIN	Signal Name	PIN	Signal Name
1	COM3_DCD	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR
5	GND	6	COM3_DSR
7	COM3_RTS	8	COM3_CTS
9	COM3-RI	10	NC
11	COM4_DCD	12	COM4_RXD
13	COM4_TXD	14	COM4_DTR
15	GND	16	COM4_DSR
17	COM4_RTS	18	COM4_CTS
19	COM4-RI	20	NC
21	COM5_DCD	22	COM5_RXD
23	COM5_TXD	24	COM5_DTR
25	GND	26	COM5_DSR
27	COM5_RTS	28	COM5_CTS
29	COM5-RI	30	NC
31	COM6_DCD	32	COM6_RXD
33	COM6_TXD	34	COM6_DTR
35	GND	36	COM6_DSR
37	COM6_RTS	38	COM6_CTS
39	COM6-RI	40	NC

6.3. RS232/RS485 selection jumpers for JCOM2 and COM3

JC1 Settings: JC1 can be configured by jumper to support RS422 on COM3.

This function also requires a hardware modification; please consult us in advance.

Interface	Function	JC1 Setting	Definition
COM2	RS232	1-2Pin (Default)	
	RS485	3-4Pin	The RS485 signals are available on the JRS485 header: Pin 1 is COM A and Pin 2 is COM B.
COM3	RS422	5-6Pin	The RS422 signals are available on the JRS485 header. This function requires component changes; please consult us in advance.

JC2 Settings:

Interface	Function	JC2 Setting	Definition
COM3	RS232	1-2Pin (Default)	

	RS485	2-3Pin	The RS485 signals are available on the JRS485 header: Pin 3 is COM A and Pin 4 is COM B.
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6.4. The motherboard provides 1 × 2 × 3-pin RS485 wiring header (2.0 mm pitch), supporting 2 RS485 channels.

The JRS485 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	TXD+(A1)	2	TXD-(B1)
3	RXD+(A2)	4	RXD-(B2)
5	+5V	6	GND

6.5. The motherboard provides 1 × 1 × 12-pin white JVGA1 connector (2.0 mm pitch), sharing the same signals as the VGA1 port.

JVGA1 Definition:

PIN	Signal Name	PIN	Signal Name
1	NC	2	VSYN
3	HSYN	4	GND
5	R	6	GND
7	G	8	GND
9	B	10	GND
11	DDC_SDA	12	DDC_SCL

6.6. The motherboard provides 1 × 2 × 15-pin LVDS header (2.0 mm pitch).

It can also be configured as a dual-channel eDP interface through a hardware modification. The

LVDS1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	LCDVDD (LVDS/eDP panel voltage, configured via JLVDS_PWR1)	2	LCDVDD (LVDS/eDP panel voltage, configured via JLVDS_PWR1)
3	LCDVDD (LVDS/eDP panel voltage, configured via JLVDS_PWR1)	4	NC (eDP_HDP)
5	GND	6	GND
7	LVDS_A0- (eDP_TX0-)	8	LVDS_A0+ (eDP_TX0+)
9	LVDS_A1- (eDP_TX1-)	10	LVDS_A1+ (eDP_TX1+)
11	LVDS_A2- (eDP_AUX-)	12	LVDS_A2+ (eDP_AUX+)
13	GND	14	GND
15	LVDSA_CLK-	16	LVDSA_CLK+
17	LVDS_A3-	18	LVDS_A3+
19	LVDS_B0-	20	LVDS_B0+
21	LVDS_B1-	22	LVDS_B1+
23	LVDS_B2-	24	LVDS_B2+
25	GND	26	GND
27	LVDSB_CLK-	28	LVDSB_CLK+
29	LVDS_B3-	30	LVDS_B3+

This board provides 3.3 V, 5 V, and 12 V panel operating-voltage options, as well as 5 V and 12 V panel backlight power options.

Before using LVDS, confirm the rated operating voltage required by the LCD panel. The panel can display correctly only when the selected LCD voltage matches the panel voltage. The settings are as follows:

INVERTER1 (Backlight Power Connector) Definition:

PIN	Signal Name
1	12 V/5 V (configured via JP_BC1)
2	12 V/5 V (configured via JP_BC1)
3	Backlight Enable
4	Backlight Brightness Control
5	GND
6	GND

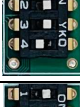
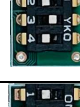
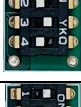
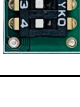
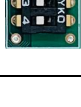
JP_BC1 (Panel Backlight Power) Settings:

Interface	Function	INVERT_PWR1 Setting
LVDS1	12V (Default)	1-2Pin
	5V	2-3Pin

JLVDS_PWR1 (Panel Operating Voltage) Settings:

Interface	Function	JLVDS_PWR1 Setting
LVDS1	3.3V (Default)	1-2Pin
	5V	3-4Pin
	12V	5-6pin

The motherboard provides 1 × SW1 DIP switch for setting the LVDS resolution. The detailed settings are as follows:

No.	DIP Switch Setting	Resolution/ Bit Depth	No.	DIP Switch Setting	Resolution/ Bit Depth	No.	DIP Switch Setting	Resolution/ Bit Depth
1		800x600 Single-channel 6-bit	2		1024x768 Single-channel 6-bit	3		1280x768 Single-channel 6-bit
4		1280x800 Single-channel 6-bit	5		1280x960 Single-channel 6-bit	6		1280x1024 Dual-channel 8-bit
7		1366*768 Single-channel 6-bit	8		1366x768 Single-channel 8-bit	9		1440x900 Dual-channel 8-bit
10		1024*600 Single-channel 6-bit	11		1920x1080 Dual-channel 6-bit 15.6-inch	12		1920x1080 Dual-channel 8-bit 21.5-inch
13		1920x1080 Dual-channel 8-bit 42-inch	14		1280x1024 Dual-channel 8-bit	15		1280x800 Single-channel 8-bit

16		1024x768 Single- channel 8-bit	17			18		
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6.7. The motherboard provides 1 × 2 × 5-pin front audio header (2.0 mm pitch). The F_AUDIO1 pin definition is as follows:

PIN	Signal Name	PIN	Signal Name
1	MIC-L	2	GND
3	MIC-R	4	NC
5	Line out-R	6	Sense Return1
7	GND	8	NC
9	Line OUT-L	10	Sense Return2

6.8. The motherboard provides 1 × 1 × 4-pin amplifier connector (2.0 mm pitch). The JSPKR1 pin definition is as follows:

PIN	Signal Name
1	SPKL-
2	SPKL+
3	SPKR-
4	SPKR+

6.9. The motherboard provides 2 × 2 × 5-pin USB 2.0 headers (2.0 mm pitch).

F_USB2 and USB2 are mutually exclusive. F_USB2 supports USB 2.0 only on the four-LAN motherboard version.

Important: When 4G support is required, F_USB3 supports only 1 × USB 2.0 port.

The F_USB2 and F_USB3 pin definitions are 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

6.10. This board provides 1 × 1 × 4-pin fan connector. The CPUFAN1 pin definition is as follows:

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

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

6.11. This board provides 1 × 1 × 4-pin SATA drive power connector (2.0 mm pitch). The SATA_PWR1 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.

6.12. This board 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	

6.13. 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	+5V	2	GND
3	GPO1	4	GPI1
5	GPO2	6	GPI2
7	GPO3	8	GPI3
9	GPO4	10	GPI4