

EPIC67P User Manual

Issue 1.1

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	PS2	LPT	COM/485	POWER
1	EPIC67P-3865U VER1.1	3865U	2	1.8G	1*DDR4	1	1	1	/	2	8	/	/	6 / 2	12V
2	EPIC67P-6300U VER1.1	I5-6300U	2	2.4G	1*DDR4	1	1	1	/	2	8	/	/	6 / 2	12V
3	EPIC67P-7200U VER1.1	I5-7200U	2	2.5G	1*DDR4	1	1	1	/	2	8	/	/	6 / 2	12V
4	EPIC67P-6500U VER1.1	I7-6500U	2	2.5G	1*DDR4	1	1	1	/	2	8	/	/	6 / 2	12V

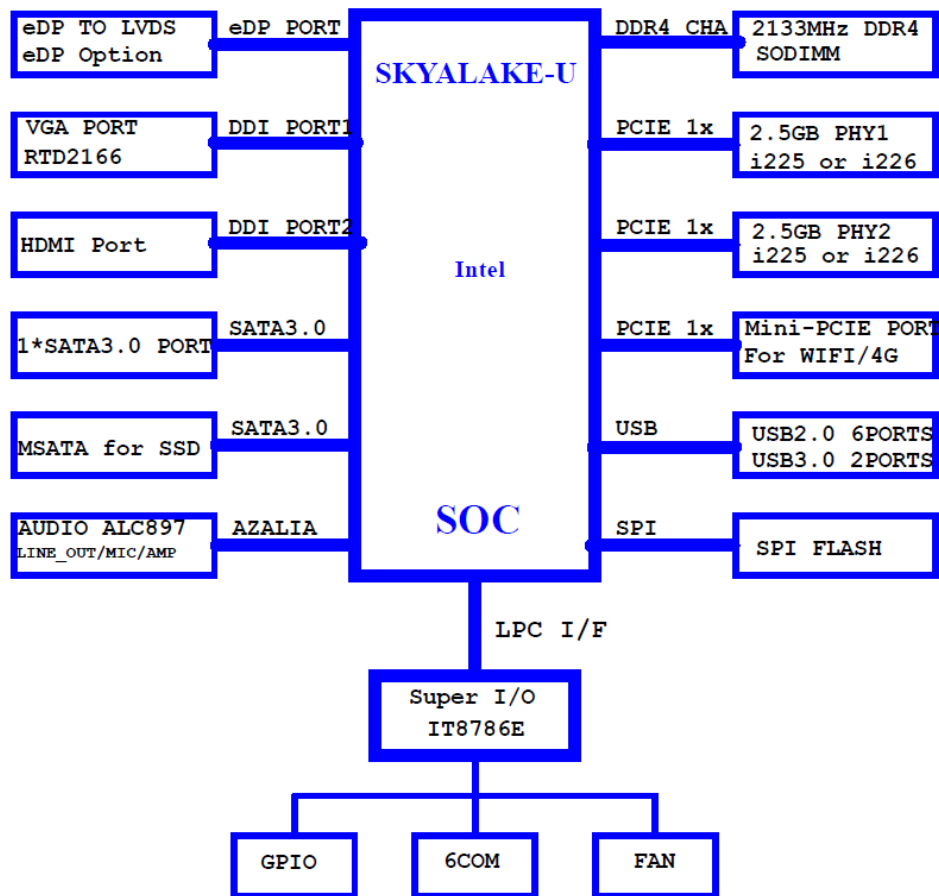
1. Product Description

EPIC67P is a CoreIPC 3.5-inch industrial motherboard supporting the full Intel® Skylake-U and Kaby Lake-U processor series.

The main features of the EPIC67P motherboard are as follows:

- Supports Intel® Skylake-U or Kaby Lake-U Celeron®, Pentium®, and Core™ i3/i5/i7 processors;
- Supports single-channel 2133 MHz DDR4 1.2 V SO-DIMM memory, up to 32 GB;
- Supports VGA, HDMI, and LVDS or eDP display outputs;
- Supports 2 × Intel® I226 2.5GbE ports; a single-LAN configuration is optional;
- Supports 1 × Mini PCIe interface for Wi-Fi or 4G modules;
- Supports 1 × mSATA storage interface;
- Supports 8 × USB ports;
- Provides 6 × RS232 serial ports, with 2 × RS485 supported by default and up to 4 × RS485 optional;
- Uses a dual-ball-bearing smart fan to support stable long-term operation;
- Supports AT/ATX power-mode switching and 12 V DC power input.

2. Motherboard Block Diagram

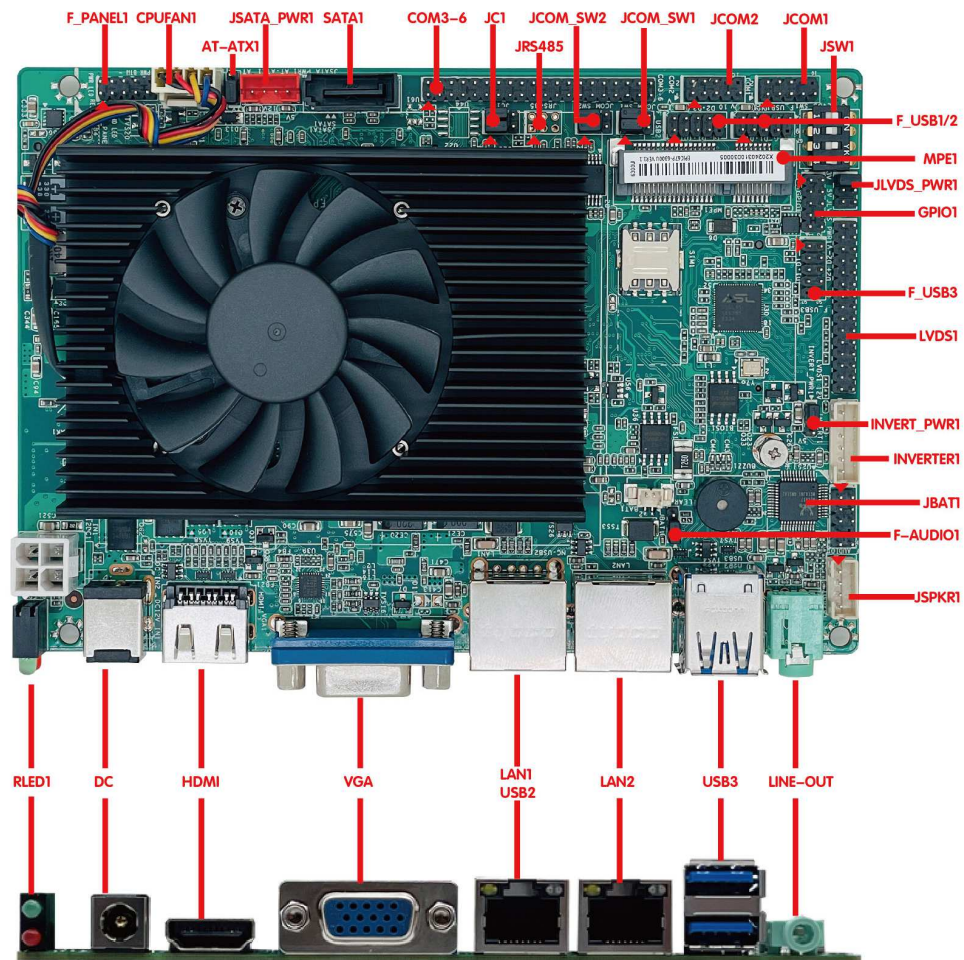


Note: support 1*RS422 or 2*RS485

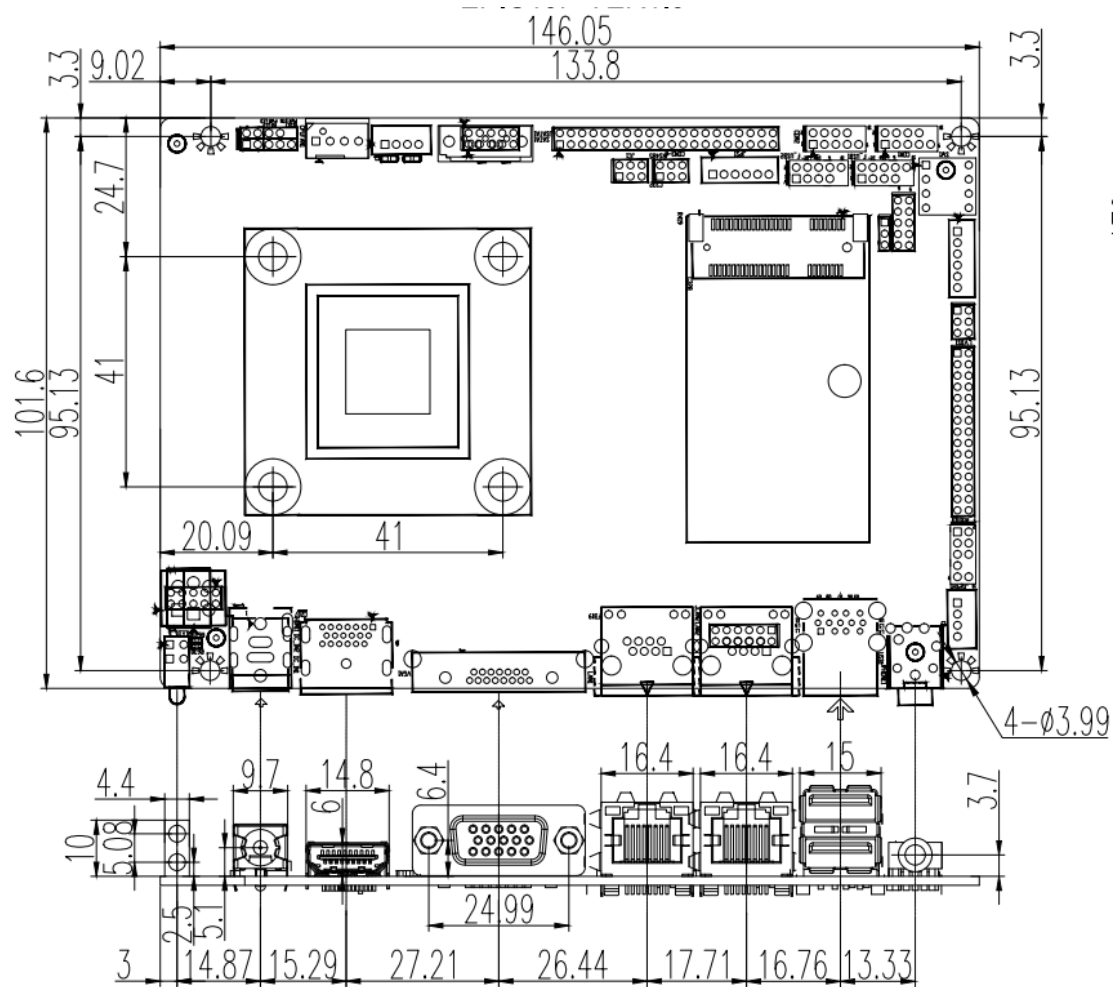
3. Motherboard Specifications

Item	Description			
Processor	Intel®Celeron 3865U	Intel®Core i5-6300U	Intel®Core i5-7200U	Intel®Core i7-6660U
	Dual-core, 1.8 GHz	Dual-core, 2.4 GHz (up to 3.0 GHz)	Dual-core, 2.5 GHz (up to 3.1 GHz)	Dual-core, 2.6 GHz (up to 3.4 GHz)
	Compatible with Intel® Skylake-U or Kaby Lake-U Pentium®, Celeron®, and Core™ i3/i5/i7 low-power processors			
Memory	1 × SO-DIMM slot supporting 2133 MHz DDR4 memory, up to 32 GB			
Display	Integrated Intel® HD Graphics 540/610/620/650 or other graphics supported by the installed processor			
	1 × VGA, 1 × HDMI supporting 4K at 60 Hz, and 1 × LVDS or eDP interface (LVDS by default)			
	Supports synchronous or asynchronous display output through VGA, HDMI, and LVDS or eDP			
Network	2 × Intel® I226 2.5GbE controllers (single LAN optional), supporting Wake-on-LAN and PXE boot			
Storage	1 × 7-pin SATA 3.0 drive connector, up to 6 Gbps			
	1 × mSATA interface			
Audio	Onboard ALC897 7.1-channel HD audio codec supporting MIC and Line-out, with 2 Ω, 5 W stereo amplifier output			
Expansion Slot	1 × Mini PCIe slot supporting Wi-Fi and 4G modules			
Rear I/O	1 × HDMI display port			
	1 × VGA display port			
	2 × USB 2.0 ports (mutually exclusive with LAN1; LAN1 is populated by default)			
	2 × USB 3.0 ports			
	2 × RJ-45 network ports; LAN1 and the USB 2.0 ports are mutually exclusive			
	1 × Line-out jack (green)			
	1 × power/HDD status indicator			
	1 × Clear CMOS push button, located behind the USB 3.0 connector			
	1 × 12 V DC power input			
Onboard I/O	1 × 2 × 15-pin LVDS header supporting dual-channel 24-bit output; eDP is available through a hardware modification, with LVDS provided by default			
	1 × 1 × 6-pin panel backlight power connector			
	6 × USB 2.0 ports through 2 × 5-pin headers; the single-LAN version supports 4 onboard USB 2.0 ports, while the dual-LAN version supports 6			
	1 × 2 × 5-pin front-audio header supporting Line-out and MIC			
	1 × 1 × 4-pin amplifier header			

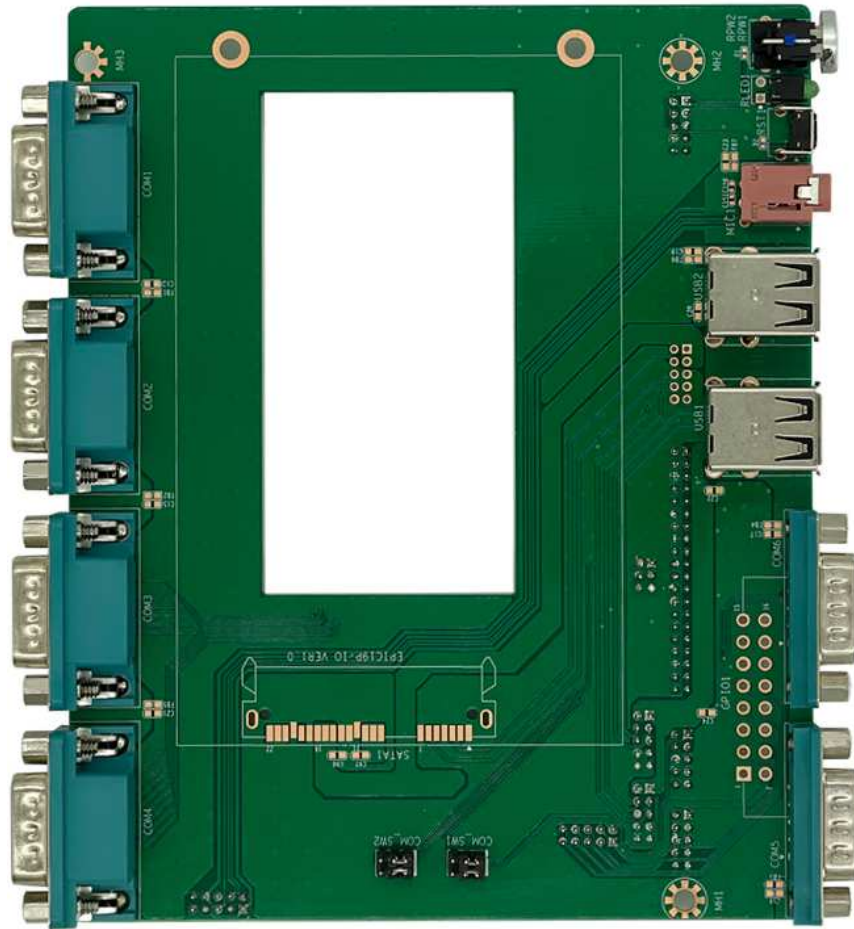
	6 × COM ports. COM1-COM6 support RS232 by default; COM1/COM2 can be jumper-configured for RS232 or RS485; COM3 can be hardware-configured for RS485/RS422; COM4 can be hardware-configured for RS485
	1 × drive power connector
	1 × 2-pin Phoenix terminal or ATX 4-pin 12 V power input connector
	1 × 2 × 5-pin front-panel switch and LED header
Fan Connector	1 × 4-pin CPU smart-fan header
GPIO	Supports 4-channel GPIO input/output
BIOS	64Mb Flash ROM
Watchdog	Supports hardware reset with 256 levels from 0 to 255 seconds
Operating System	Windows 10/Linux
Power Input	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	146mm x 102mm



Note: The image above shows the front view of EPIC67P-L26 VER1.0. Other models may differ.



The illustration above shows the I/O connector layout of the EPIC67P VER1.0 series motherboard.



I/O board for EPIC67P VER1.0

4. Board Installation

Safety Precautions:

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

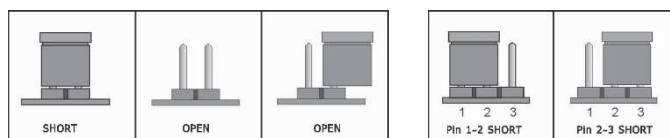
- Do not remove or damage the serial number label, distributor warranty label, or any other warranty-related labels on the motherboard before installation. Otherwise, it may affect the warranty validation.
- Before installing or removing the motherboard or any other hardware devices, make sure the power 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.

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

6. Pin Definitions

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

The standard JCOM1 and JCOM2 pin definitions are as follows:

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

6.2. COM1 and COM2 support both RS232 and RS485. The COM1 RS232/RS485 jumper settings are as follows:

Port	Function	JC1 Setting	JCOM_SW1 Setting	Remarks
COM1	RS232	1-3Pin Default	1-3Pin, Pin 2-4 (default)	
	RS485	3-5pin	3-5pin, 4-6Pin	COM1 RS485 is routed to the JCOM1 header: Pin 1 is COM A and Pin 2 is COM B.

COM2 RS232/RS485 jumper settings:

Port	Function	JC1 Setting	JCOM_SW2 Setting	Remarks
COM2	RS232	2-4Pin Default	1-3Pin, Pin 2-4 (default)	
	RS485	4-6Pin	3-5Pin, 4-6Pin	COM2 RS485 is routed to the JCOM2 header: Pin 1 is COM A and Pin 2 is COM B.

6.3. The motherboard provides 1 × 2 × 20-pin header for four serial ports (2.0 mm pitch). The COM3-COM6 pin definitions are as follows:

PIN	Signal	PIN	Signal
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

6.4. COM3 can be hardware-configured for RS232 or RS485/RS422, while COM4 can be hardware-configured for RS232 or RS485.

COM3 and COM4 support RS232 by default. Contact CoreIPC sales if RS485 or RS422 is required.

The JRS485 header for COM3/COM4 RS485/RS422 wiring has a 2.0 mm pitch. Its pin definition is as follows:

PIN	Signal	PIN	Signal
1	TXD+(A3)	2	TXD-(B3)
3	RXD+(A4)	4	RXD-(B4)
5	GND	6	GND

Port	Function	Setting	Definition
COM3	RS232	(default)	
	RS485	Hardware modification required	COM3 RS485 is routed to the JRS485 header: Pin 1 is COM A and Pin 2 is COM B.
COM3	RS422	Hardware modification required	RS422 is routed to the JRS485 header. Component changes are required; consult CoreIPC before ordering.
Port	Function	Setting	Definition
COM4	RS232	(default)	
	RS485	Hardware modification required	COM4 RS485 is routed to the JRS485 header: Pin 3 is COM A and Pin 4 is COM B.

6.5. The motherboard provides 1 × 2 × 15-pin LVDS header (2.0 mm pitch). The LVDS1 pin definition is as follows:

LVDS1 can be changed to an eDP interface through a hardware modification. LVDS is provided by default. Contact sales before ordering if eDP is required.

PIN	Signal	PIN	Signal
1	LCDVDD (LVDS/eDP panel voltage, set by JLVDS_PWR1)	2	LCDVDD (LVDS/eDP panel voltage, set by JLVDS_PWR1)
3	LCDVDD (LVDS/eDP panel voltage, set by 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+

Blue text indicates the eDP pin definitions.

Note: The board provides 3.3 V, 5 V, and 12 V panel operating-voltage selections, as well as 5 V and 12 V backlight power selections.

Before using LVDS, confirm the panel's rated operating voltage. The selected LCD voltage must match the panel voltage for proper display operation. Configure the settings as follows:

INVERTER1 (LVDS/eDP backlight power connector) pin definition:

PIN	Signal
1	12 V / 5 V (set by INVERT_PWR1)
2	12 V / 5 V (set by INVERT_PWR1)
3	Backlight Enable
4	Backlight Brightness Control
5	GND
6	GND

INVERT_PWR1 (LVDS/eDP backlight power) settings:

Port	Function	INVERT_PWR1 Setting
LVDS1	12V (default)	1-2Pin
	5V	2-3Pin

JLVDS_PWR1 (LVDS/eDP panel operating voltage, LCDVDD) settings:

Port	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. Detailed settings are shown below:

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	11		1920x1080 Dual-channel 6-bit	12		1920x1080 Dual-channel 8-bit 21.5-inch

		6-bit			15.6-inch			
13		1920x10 80 Dual-channel 8-bit 42-inch	14		1280x102 4 Dual-channel 8-bit	15		1280x800 Single-channel 8-bit
16		1024x76 8 Single-channel 8-bit	17			18		

6.6. The motherboard provides 1 × 2 × 5-pin front-audio header (2.0 mm pitch). The F_AUDIO1 pin definition is as follows:

PIN	Signal	PIN	Signal
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

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

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

6.8. The motherboard provides 3 × 2 × 5-pin USB 2.0 headers (2.0 mm pitch), supporting 6 × onboard USB 2.0 ports by default.

The F_USB1, F_USB2, and F_USB3 pin definitions are as follows:

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

Note: F_USB3 is not populated by default.

6.9. The board provides 1 × 1 × 4-pin smart-fan header. The CPUFAN1 pin definition is as follows:

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

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

6.10. The board provides 1 × 1 × 4-pin red SATA drive power connector (2.0 mm pitch). The JSATA_PWR1 pin definition is as follows:

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

Be sure to identify Pin 1 of JSPWR1 correctly; an incorrect connection may damage the drive. Use only the power cable supplied by CoreIPC.

6.11. The motherboard provides 1 × optional 2 × 5-pin SATA 3.0 header (2.0 mm pitch). The JSATA1 pin definition is as follows:

PIN	Signal	PIN	Signal
1	SATA_TXP1	2	+5V
3	SATA_TXN1	4	+5V
5	GND	6	GND
7	SATA_RXN1	8	GND
9	SATA_RXP1	10	+12V

6.12. The board provides 1 × 2 × 5-pin F_PANEL1 header (2.0 mm pitch).

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

The F_PANEL1 pin definition is as follows:

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

6.14. The motherboard provides 1 × optional 1 × 2-pin Phoenix power terminal (5.5 mm pitch).

The DC12V_IN3 pin definition is as follows:

PIN	Signal
1	GND
2	+12V