CoreIPC

EPIC32P User Manual

Issue 1.0

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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 [VER:X.X] on the motherboard itself. X.X represents a number; for example, a label reading [VER1.0] 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.

1. Product Description

The EPIC32P is a 3.5-inch industrial motherboard from CoreIPC's EPIC series that supports the full range of Intel® Alder Lake CPUs. It is widely applicable in industrial tablets, communications control, medical instruments, industrial control, financial equipment, cloud terminals, and other fields.

The main features of the EPIC32P motherboard are as follows:

- Features an integrated Intel® Celeron Alder Lake quad-core processor, compatible with the entire Alder Lake-N CPU series;
- 1 SODIMM slot, supports single-channel 3200MHz DDR4 memory, with a maximum capacity of 32GB;
- Supports three simultaneous or asynchronous displays via VGA, HDMI, LVDS, or eDP;
- Supports 2 Realtek Gigabit Ethernet ports; single Ethernet port is optional;
- Supports 1 M.2 Key E (Wi-Fi/Bluetooth) and 1 M.2 Key B 5G (30x52mm), compatible with 4G (30x42mm);
- Supports 1 M.2 KeyM 2280 SSD with adaptive PCIe and SATA signals;
- Supports 8 USB ports;
- Built-in 6 RS232 serial ports; supports 2 RS485 by default (optional support for 2 RS485);
- Supports fanless cooling and can be built into an enclosed system for dust and moisture protection;
- Supports a wide operating temperature range of -20 to 60 degrees;
- Supports switching between AT and ATX modes, powered by a 12V DC power supply.

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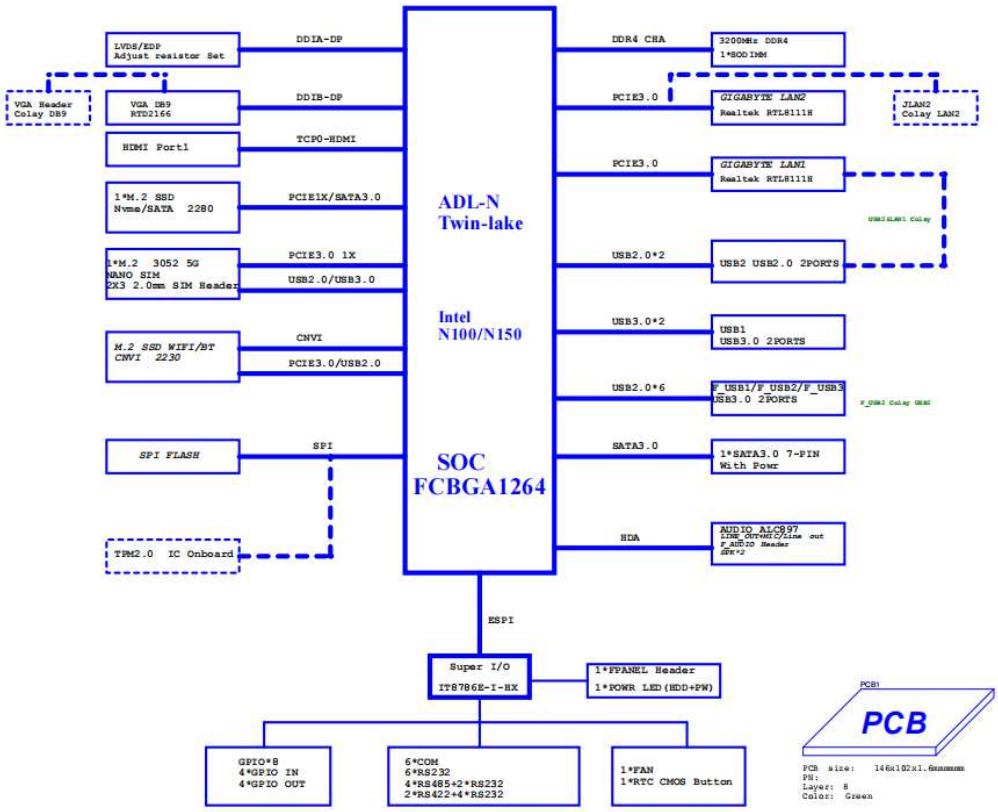
2. Motherboard Frame Diagram



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3. Motherboard Detailed Specifications

Item	Description
CPU	Features an Intel® N100 2.0 GHz quad-core processor with a TDP of 10 W Compatible with Intel® Alder Lake-N series processors
Memory	1* SODIMM slot, supports 3200 MHz DDR4 memory, with a maximum capacity of 32 GB
Display	Integrated Intel® UHD Graphics Ultra
	1 VGA port, 1 HDMI 2.0 port, 1 LVDS or eDP port (default: LVDS)
	Supports VGA, HDMI, or EDP, LVDS, or eDP for synchronous/asynchronous triple-display output
Network	2* Realtek RTL8111H Gigabit network cards, supporting Wake-on-LAN and PXE (single network option available)
Storage	1* 7-pin SATA 3.0 hard drive connector, with a transfer rate of up to 6 Gbps
	1* 1 M.2 Key-M slot, supports adaptive 2280 PCIe SATA SSDs
Audio	On-board ALC897 7.1-channel high-fidelity audio controller, supports MIC/Line-out, and a 5W dual-channel amplifier (2 ohms)
Expansion Slot	1* M.2 Key E 2230 slot, supports Wi-Fi/Bluetooth
	1* M.2 Key B 3052 slot, supports 5G modules, backward compatible with 4G modules (30x42mm)
Rear Panel I/O Ports	1* HDMI 2.0 display port, supports 4K at 60 Hz
	1* VGA display port
	2 USB 3.0 ports
	2* RJ-45 Gigabit Ethernet ports (note: either the LAN2 port or the USB 2.0 port can be used, but not both)
	1* Line Out jack (green)
	1* Power and hard drive indicator lights
	1* Clear CMOS pushbutton switch (located behind the USB 3.0 connector)
	1* 12V DC power input connector
Built-in I/O interfaces	1* LVDS interface (2×15-pin), supports dual-channel 24-bit (hardware-configurable to support eDP; LVDS is the default)
	1* Display backlight power connector, 1*6-pin
	3* USB 2.0 headers, 2*5-pin (Single-network configuration supports 4 USB 2.0 ports; dual-network configuration supports 6 USB 2.0 ports)
	1* Front audio jack, 2*5-pin (supports line-out and MIC)
	1* Amplifier Connector 1*4-pin
	6* COM ports (COM1–6 support RS232 by default; COM1 and COM2 support either RS232 or RS485; COM3 optionally supports RS485 or RS422; COM4 optionally supports RS485;

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	and COM1 through COM6 optionally support six TTL serial ports)
	1* Hard Drive Power Connector
	1* 2-pin Phoenix connector or ATX 4-pin connector for 12V power input
	1* Front panel switch buttons and indicator lights connector 2*5-pin
Fan Connector	1*4-pin CPU fan connector
GPIO	Supports 4 GPIO input/output channels
BIOS	128Mb Flash ROM
Secure Encryption	TPM 2.0 Sticker on the Reserve Board
Watchdog	Supports hardware reset function (256 levels, 0–255 seconds)
Operating System	Windows 10/Windows 11/Linux
Power type	Powered by DC 12V power supply
Operating temperature	60℃～-20℃
Storage temperature	-20℃～70℃
Operating humidity	5%-95% relative humidity, non-condensing
Dimensions	146mm x 102mm

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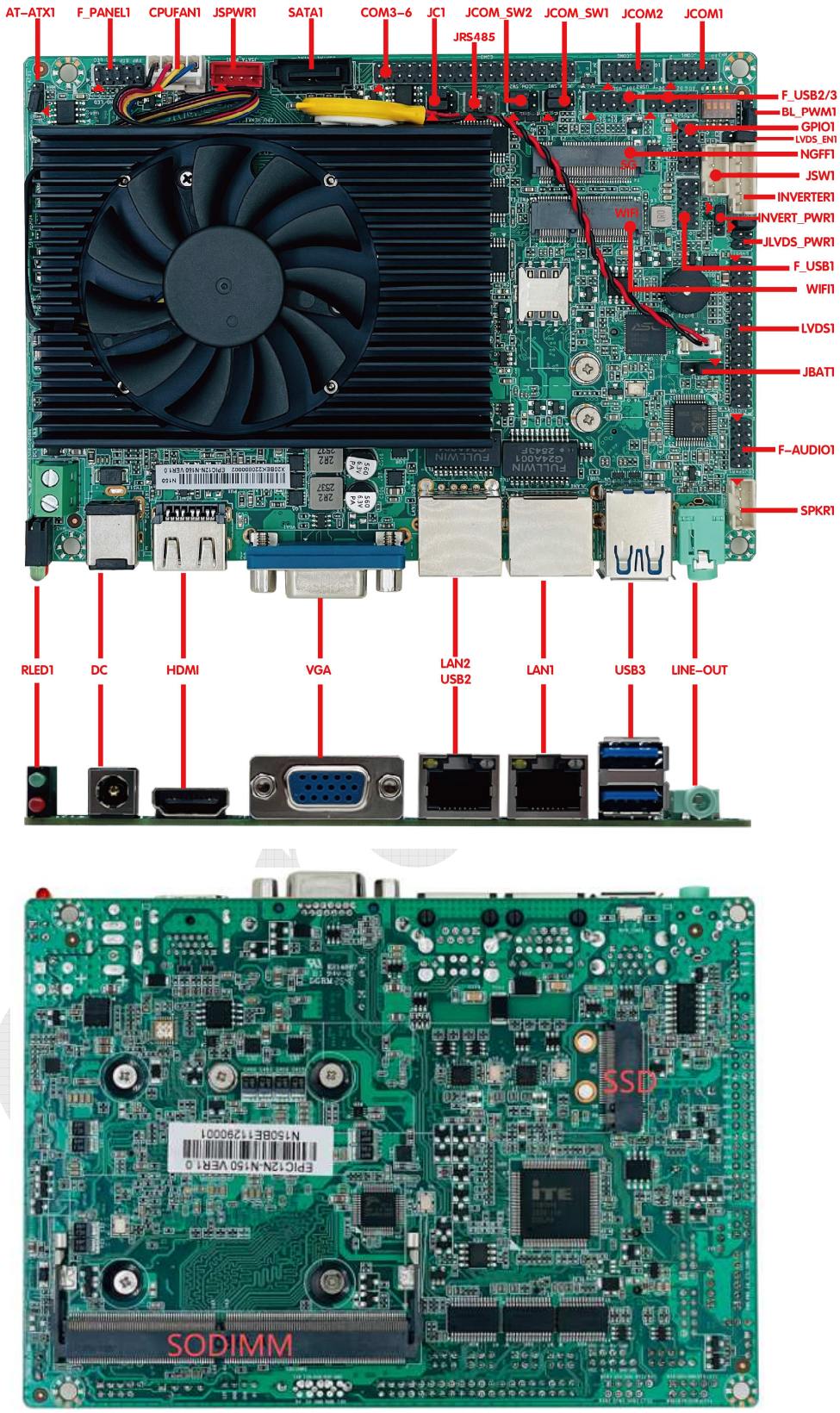

The image can be enlarged for viewing; the first pin of all header pins is marked with a red triangle.

Please note: The above are the front and back images of the EPIC32P-L26 VER1.0. Images for other models may differ.

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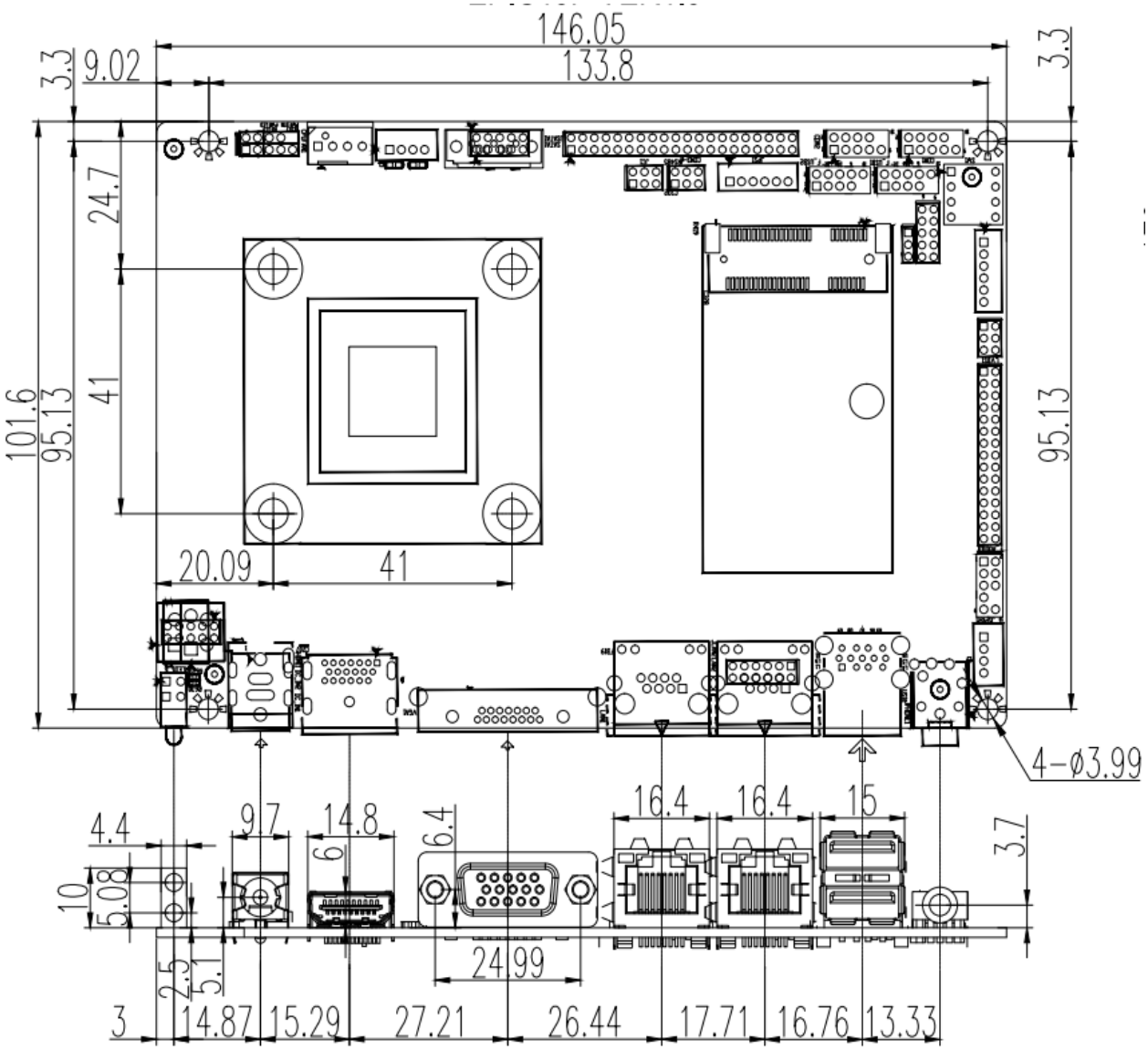

The above is the I/O interface structure diagram of EPIC60P V1.1.

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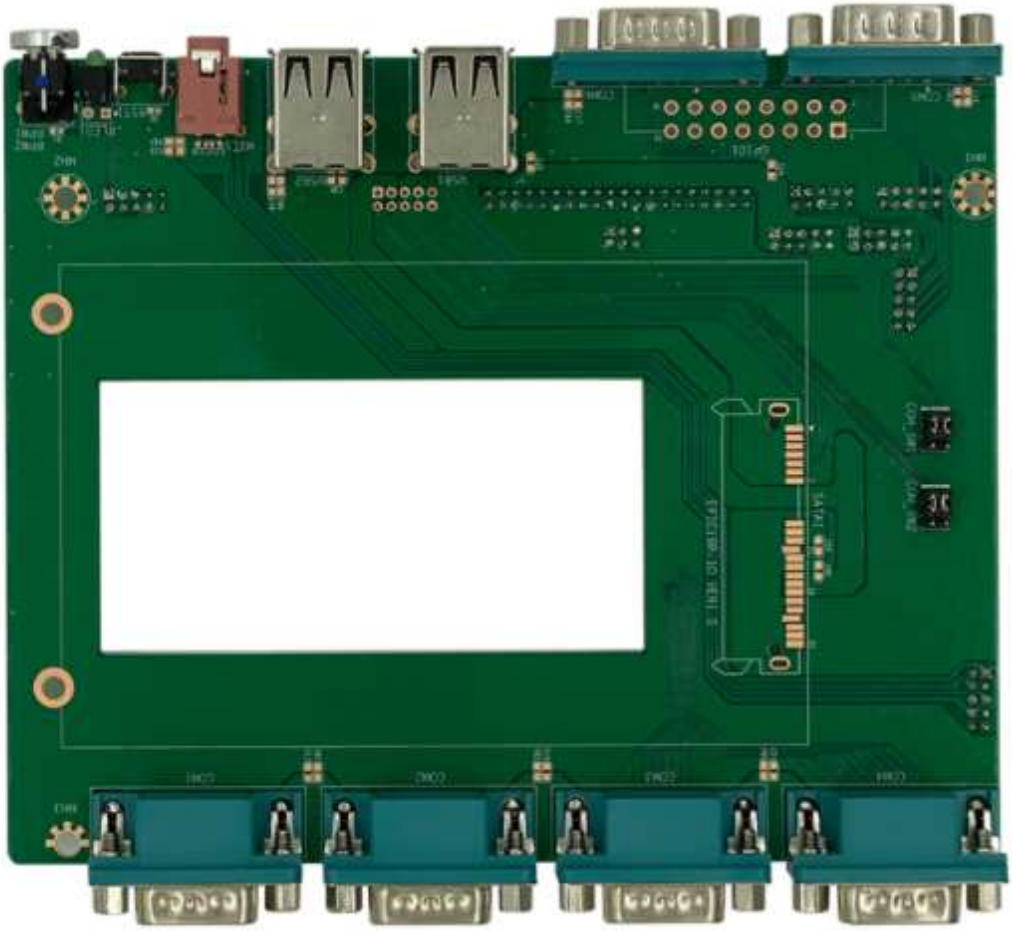

EPIC32P VER1.0 compatible I/O board

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4. Motherboard installation

Safety Precautions：

- Do not remove the serial number or warranty sticker from the motherboard before installation, as this will affect the product warranty period.
- Always turn off the power and unplug the power cord before installing or removing the motherboard or other hardware.
- When installing other hardware into the motherboard's sockets, ensure the connectors and sockets are securely connected.
- Avoid touching metal wires when handling the motherboard to prevent short circuits.
- Wear an anti-static wrist strap when handling the motherboard, CPU, or memory modules. If you do not have an anti-static wrist strap, ensure your hands are dry and touch a metal object to discharge static electricity.
- Place the motherboard in an anti-static mat or bag before installation.
- Ensure the power supply is switched off before unplugging the motherboard.
- Before turning on the power, ensure the power supply voltage is set to the standard value shown in the window.
- Before turning on the power, ensure all hardware cables and power cords are correctly connected.
- Do not allow screws to come into contact with circuitry or components on the motherboard to avoid damage or malfunction.
- Ensure no screws or metal objects remain on the motherboard or inside the computer case.
- Do not place the computer case on an unstable surface.
- Do not place the computer case in an environment with excessively high temperatures.
- Turning on the power during installation may cause damage to the motherboard, other devices, or yourself.
- If you are unfamiliar with the installation process or encounter any technical problems using this product, please consult a professional technician.

Memory installation

The motherboard provides one 260-pin DDR4 SO-DIMM memory slot.

Before you begin installing the memory, please note the following information：

1) Please first confirm that the memory you purchased is compatible with the specifications supported by this motherboard.
2) Before installing or removing memory, please ensure that the computer is powered off to avoid damage.
3) The memory module is designed with a foolproof marking. If you insert it in the wrong direction, the memory module will not be able to be inserted. In this case, please change the insertion direction immediately.

Install memory:

1) Please turn off the power and unplug the AC power cord before installing or removing the memory.

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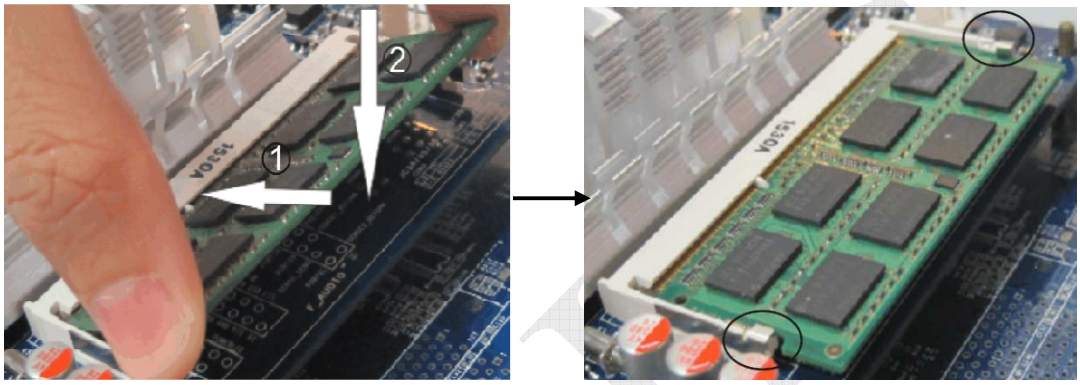
2) Hold the memory module carefully at both ends, being careful not to touch the metal contacts.
3) Align the gold fingers of the memory module with the memory slot, making sure the gold finger recesses align with the protruding points of the slot.
4) Insert the memory module at a 30-degree angle into the memory slot, then press it down until you hear a "click" sound. This indicates that the memory is successfully installed and ready to use. (Note: Do not press the memory module down too hard to avoid damaging it.)
5) To remove the memory module, push the latches on both ends of the DIMM slot outwards simultaneously, and then remove the memory module.

The installation diagram below is for reference only：



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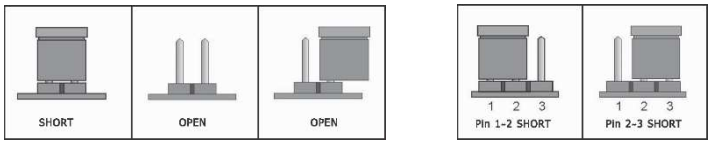
5. Jumper settings

Jumper Description

2-pin connector: Inserting the jumper cap into both pins will close (short circuit) it.
3-pin connector: A jumper cap can be inserted into pins 1-2 or pins 2-3 to close (short circuit).



How do I identify the position of pin 1 of a jumper?

1) Please carefully inspect the motherboard. Any pin marked "1" or with a thick white line is pin 1.
2) When examining the pads on the backplate, square pads are typically for pin 1.

Clear CMOS Jumper: The motherboard provides one 1*3PIN JBAT1 connector: CMOS content clear/retain settings (pin pitch: 2.54 mm). The CMOS is powered by a coin cell battery on the board. Clearing the CMOS will permanently erase the previous system configuration and set it to the original (factory settings) system settings. The steps are:

1) Shut down the computer and disconnect the power;
2) Short the JBAT1 2-3 pins for about 5 seconds;
3) Turn on the computer;
4) Press the key prompted on the screen during startup to enter the BIOS settings and reload the optimal default values;
5) Save and exit the settings.

The pin definitions are as follows:

JBAT1 definition：

Corresponding functions	JBAT1 settings
Normal working status	1-2Pin
Clear CMOS contents; restore all BIOS settings to factory defaults.	2-3Pin

Power-on function jumper: The motherboard provides one 1*3 AT-ATX1 jumper (pin pitch: 2.54 mm), which can be used to control whether the power is on or off.

AT-ATX1 Definition：

Corresponding functions	AT-ATX1 settings
Turn off the call auto-start function	1-2Pin
Enable call auto-start function	2-3Pin

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6. Pin definitions

6.1 The motherboard provides two 2*5Pin standard COM header ports (pin pitch: 2.0mm), JCOM1 and JCOM2 with standard pin definitions:

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

In addition to supporting RS232, JCOM1 and JCOM2 also support RS485.
JCOM1 RS232 and RS485 selection jumper：

Interface	Corresponding functions	JC1 settings	JCOM_SW1 settings	Remark
COM1	RS232	1-3 Pins (Default)	Pins 1-3, Pins 2-4 (default)	
	RS485	3-5pin	3-5pin，4-6Pin	The RS485 function of COM1 is located on the JCOM1 header; pin 1 is COM A, and pin 2 is COM B.

JCOM2 RS232 and RS485 selection jumper：

Interface	Corresponding functions	JC1 settings	JCOM_SW2 settings	Remark
COM2	RS232	2-4 Pins (Default)	Pins 1-3, Pins 2-4 (default)	
	RS485	4-6Pin	3-5Pin，4-6Pin	The RS485 function of COM2 is located on the JCOM2 header; pin 1 is COM A, and pin 2 is COM B.

6.2 The motherboard provides one 2*20Pin standard 4-pin serial port (pin pitch: 2.0mm), COM3-6 defined:

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

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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

COM3 can be adjusted to support RS485/RS422, and COM4 can be adjusted to support RS485. Please contact us if you require support for both RS485 and RS422.
COM3 and COM4 support RS232, RS485/RS422 connectors by default (pin spacing 2.0mm).

The JRS485 pin definitions are as follows:

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

Interface	Corresponding functions	Settings	Definition
COM3	RS232	(default)	
	RS485	Adjust hardware	The RS485 function of serial port 3 is located on the JRS485 pin 1, with pin 1 being COM A and pin 1 being COM B.
COM3	RS422	Adjust hardware	The RS422 function is on the JRS485 pinout. This function requires material modification to be implemented. Please inquire in advance if you have any needs.
Interface	**Corresponding functions**	**Settings**	**Definition**
COM4	RS232	(default)	
	RS485	Adjust hardware	The RS485 function of serial port 4 is located on the JRS485 pin header. Pin 3 is COM A, and pin 4 is COM B.

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6.3 The motherboard provides one 2*15Pin LVDS header (pin pitch: 2.0mm). The LVDS1 pin definitions are as follows:

The LVDS1 can be configured to use an eDP interface by changing the hardware settings. The default interface is LVDS. If you require an eDP interface, please contact us before placing your order.

PIN	Signal name	PIN	Signal name
1	LCDVDD（LVDS and EDP screen voltages are set via JLVDS_PWR1 ）	2	LCDVDD（LVDS and EDP screen voltages are set via JLVDS_PWR1 ）
3	LCDVDD（LVDS and EDP screen voltages are set 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+

The blue text is the eDP definition.

Note: This board offers three screen operating voltage options: 3.3V, 5V, and 12V, as well as 5V and 12V screen backlight power supply voltage options. Before using LVDS, please understand its required rated operating voltage. The LCD screen will only display normally when the selected LCD voltage matches the voltage of the LCD screen being used. The setup method is as follows:

INVERTER1 (LVDS and EDP backlight power supply interface) definition

PIN	Signal name
1	12V/5V (INVERT_PWR1 setting)
2	12V/5V (INVERT_PWR1 setting)
3	Backlight Enable
4	Backlight brightness control
5	GND
6	GND

INVERT_PWR1 (LVDS and EDP screen backlight power supply) setting:

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Interface	Corresponding functions	INVERT_PWR1 settings
LVDS1	12V （默认）	1-2Pin
	5V	2-3Pin

JLVDS_PWR1 (LVDS and EDP screen operating voltage LCDVDD) setting：

Interface	Corresponding functions	JLVDS_PWR1 settings
LVDS1	3.3V （默认）	1-2Pin
	5V	3-4Pin
	12V	5-6pin

LVDS Function Enable Jumper: The motherboard provides a 1*3 PIN LVDS_EN1 jumper (pin pitch: 2.54 mm), which can be used to control the enabling and disabling of the LVDS function.

LVDS_EN1 definition：

Interface	Corresponding functions	LVDS_EN1 settings
LVDS1	Turn off LVDS	1-2Pin
	Turn on LVDS	2-3Pin

BL_PWM1 (LVDS screen PWM inversion) setting:

Interface	Corresponding functions	INVERT_PWR1 settings
LVDS1	default	1-2Pin
	Reversal	2-3Pin

The motherboard has a built-in SW1 DIP switch used to set the LVDS resolution. Detailed settings are as follows:

No.	DIP switch method	Resolution/ bits	No.	DIP switch method	Resolution/bits	No.	DIP switch method	Resolution/bits
1		800x600 Single 6	2		1024x768 Single 6	3		1280x768 Single 6

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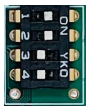
4		1280x800 Single 6	5		1280x960 Single 6	6		1280x1024 Double 8
7		1366*768 Single 6	8		1366x768 Single 8	9		1440x900 Double 8
10		1024*600 Single 6	11		1920x1080 Dual 6 15.6-inch	12		1920x1080 Dual 8" 21.5"
13		1920x1080 Dual 8" 42-inch	14		1280x1024 Double 8	15		1280x800 Single 8
16		1024x768 Single 8	17			18		

6.4 The motherboard provides one 2*5PIN (pin pitch: 2.0mm) front audio jack. The pin definitions for F_AUDIO1 are 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

6.5 The motherboard has a built-in 1*4PIN (pin pitch: 2.0mm) power amplifier interface. The pin definitions for JSPKR1 are as follows:

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

6.6 The motherboard has three built-in USB 2.0 ports (2.0mm pin pitch, 2x5pin), and supports up to six USB 2.0 ports by default. When the motherboard is on a single network, the F_USB2 pin signal is transferred to the USB 2 port multiplexed in the LAN2 interface. The pin definitions for F_USB1, F_USB2, and F_USB3 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

Note: F_USB3 is not enabled by default.

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6.7 This board provides one 1*4Pin smart 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

6.8 This board provides one 1*4Pin red SATA hard drive power connector (pin pitch: 2.0mm). The JSPWR1 pin definitions are as follows:

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

Please ensure you are correctly positioning pin 1 of JSPWR1, otherwise you may damage your hard drive. Use the power cord provided with your device.

6.9 The motherboard provides one 2*5 Pin SATA3.0 header (pin spacing: 2.0mm, optional). The JSATA1 pin definitions are as follows:

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

6.10 This board provides one 2*5Pin F_PANEL1 connector (pin pitch: 2.0mm). The chassis power switch, reset switch, hard drive indicator light, and power indicator light can be connected to this connector. The F_PANEL1 pin definitions are 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	

6.11 The motherboard provides one 2*5 Pin GPIO header (pin pitch: 2.0mm). The pin definitions for GPIO1 are as follows:

PIN	Signal name	PIN	Signal name
1	GND	2	+5V

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3	GPO1	4	GPI1
5	GPO2	6	GPI2
7	GPO3	8	GPI3
9	GPO4	10	GPI4

6.12 The motherboard provides one 1*2 Pin Phoenix power connector (pin spacing: 5.5mm, optional). The DC12V_IN3 pin definition is as follows:

PIN	Signal name
1	GND
2	+12V

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