CoreIPC

ITX67U-D3 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 [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 Model	Cores	Freq.	Memory	HDMI	VGA	LVDS	EDP	LAN	USB	PS2	LPT	COM /485	POWER
1	ITX67U-L26-6300U VER3.1	I5-6300U	2	2.4G	2*DDR4	1	1	1	/	2	8	1	1	6 / 2	12V
2	ITX67U-L26-6200U VER3.1	I5-6200U	2	2.3G	2*DDR4	1	1	1	/	2	8	1	1	6 / 2	12V
3	ITX67U-L26-7200U VER3.1	I5-7200U	2	2.5G	2*DDR4	1	1	1	/	2	8	1	1	6 / 2	12V
4	ITX67U-L26-6660U VER3.1	I7-6660U	2	2.6G	2*DDR4	1	1	1	/	2	8	1	1	6 / 2	12V

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1. Product Description

ITX67U-D3 is a CoreIPC ITX-series industrial motherboard supporting the full range of Intel® Skylake-U and Kaby Lake-U processors.

The key features of the ITX67U-D3 motherboard are as follows:

- Supports Intel® Skylake-U and Kaby Lake-U Celeron®, Pentium®, and Core™ i3/i5/i7 processors;
- Supports dual-channel 1333/1600 MHz DDR3L 1.35 V SO-DIMM memory, up to 32 GB;
- Supports VGA or DP, HDMI, and LVDS or eDP display interfaces;
- Supports 2 × Gigabit Ethernet ports (single-LAN optional);
- Supports 1 × M.2 Key E slot for Wi-Fi and Bluetooth;
- Supports 1 × M.2 Key M storage slot with automatic SATA/PCIe support;
- Supports 1 × mSATA interface; supports mSATA/4G by default and can optionally be configured for Wi-Fi/4G;
- Supports 8 × USB ports;
- Provides 6 × onboard RS232 serial ports, with 2 × RS485 supported by default; optional support for 4 × RS485 and 2 × RS422;
- 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.

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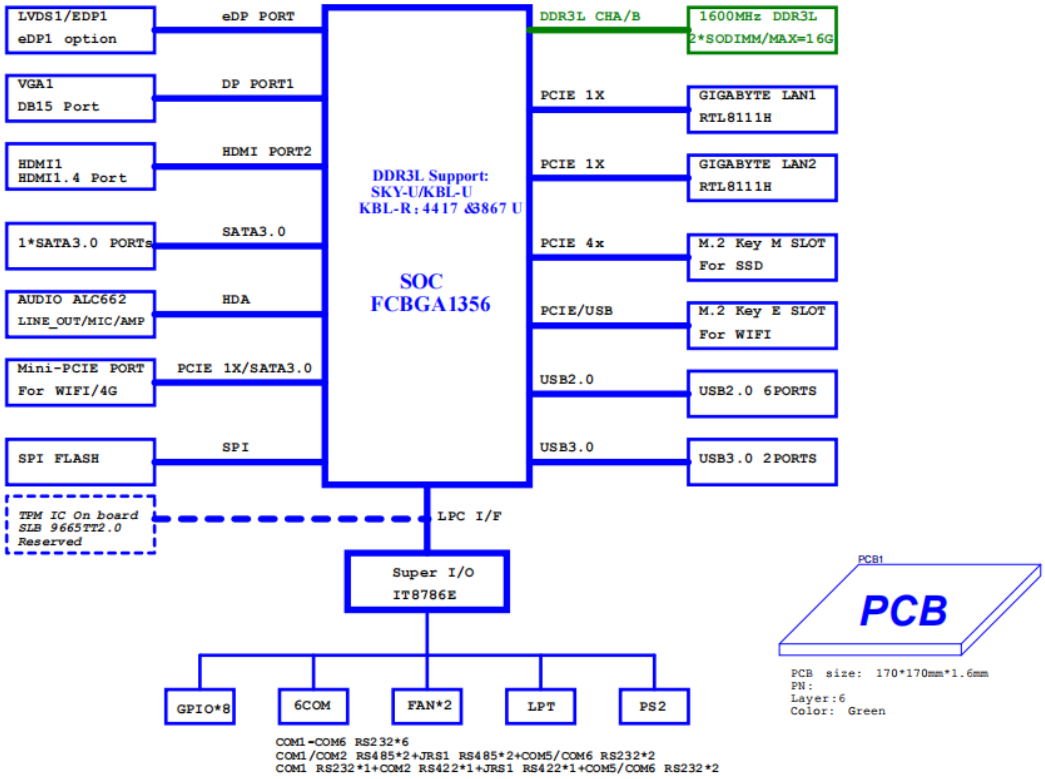
2. Motherboard Block Diagram



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3. Motherboard Specifications

Item	Description
Processor	Supports Intel® Skylake-U and Kaby Lake-U Pentium®, Celeron®, and Core™ i3/i5/i7 low-power processors
Memory	2 × SO-DIMM slots supporting dual-channel 1333/1600 MHz DDR3L memory, up to 32 GB
Display	Integrated Intel® HD Graphics 540/610/620 or equivalent, depending on the processor model
	1 × VGA or DP port (up to 4K at 60 Hz), 1 × HDMI port (up to 4K at 30 Hz), and 1 × LVDS or eDP interface (LVDS by default)
	Supports synchronous or asynchronous display via VGA or DP, HDMI, and LVDS or eDP
LAN	2 × Realtek RTL8111H Gigabit Ethernet controllers (single-LAN optional), supporting Wake-on-LAN and PXE boot
Storage	1 × 7-pin SATA 3.0 connector, supporting data transfer rates up to 6 Gbps
	1 × M.2 Key M 2280/2242 slot with automatic PCIe/SATA SSD support
Audio	Onboard ALC897 7.1-channel HD audio controller with MIC input, Line-out, and 2 × 5 W stereo amplifier output at 2 Ω
Expansion Slots	1 × Mini PCIe slot supporting mSATA and 4G modules by default; it can be hardware-configured for Wi-Fi and 4G
	1 × M.2 Key E slot supporting a Wi-Fi module
Rear I/O	1 × HDMI display port, supporting up to 4K at 30 Hz
	1 × VGA display port (mutually exclusive with the 4K 60 Hz DP port; VGA by default)
	2 × USB 2.0 ports (mutually exclusive with the RJ45 port)
	2 × USB 3.0 ports
	2 × RJ45 Gigabit Ethernet ports (LAN2 is mutually exclusive with the USB 2.0 ports)
	1 × Line-out jack (green) and 1 × microphone jack (red)
	1 × 12 V DC power input connector
Internal I/O	1 × JHDMI header (2 × 8-pin), sharing the same signals as HDMI1
	1 × JVGA connector (1 × 12-pin), sharing the same signals as the DB15 VGA port
	1 × LVDS header (2 × 15-pin), supporting dual-channel 24-bit output (mutually exclusive with eDP; LVDS by default)
	1 × panel backlight power connector (1 × 6-pin)
	1 × eDP header (2 × 15-pin), mutually exclusive with LVDS (optional)
	3 × USB 2.0 headers (2 × 5-pin); the dual-LAN version supports up to 6 internal USB 2.0 ports, while the single-LAN version supports up to 4
	1 × front audio header (2 × 5-pin)
	1 × amplifier connector (1 × 4-pin)
	6 × COM ports; COM1 and COM2 support RS485, Pin 9 of COM1/COM2 can provide power, and a 2-COM version is optional
	1 × LPT header

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	1 × PS/2 connector (1 × 6-pin)
	1 × red drive power connector (1 × 4-pin)
	1 × 4-pin ATX power connector, shared with a 2-pin Phoenix terminal
	1 × front-panel switch and LED header (2 × 5-pin)
Fan Headers	1 × 4-pin CPU smart fan header and 1 × 4-pin system smart fan header
GPIO	Supports 4-channel GPIO input/output
BIOS	64Mb Flash ROM
Watchdog	Supports hardware reset watchdog (256 levels, 0–255 seconds)
Security	Reserved footprint for an onboard TPM 2.0 chip
Operating System	Windows 7/Windows 10/Linux
Power Input	12 V DC power input
Operating Temperature	-10℃～60℃
Storage Temperature	-20℃～70℃
Operating Humidity	5%–95% relative humidity, non-condensing
Dimensions	170mm x 170mm

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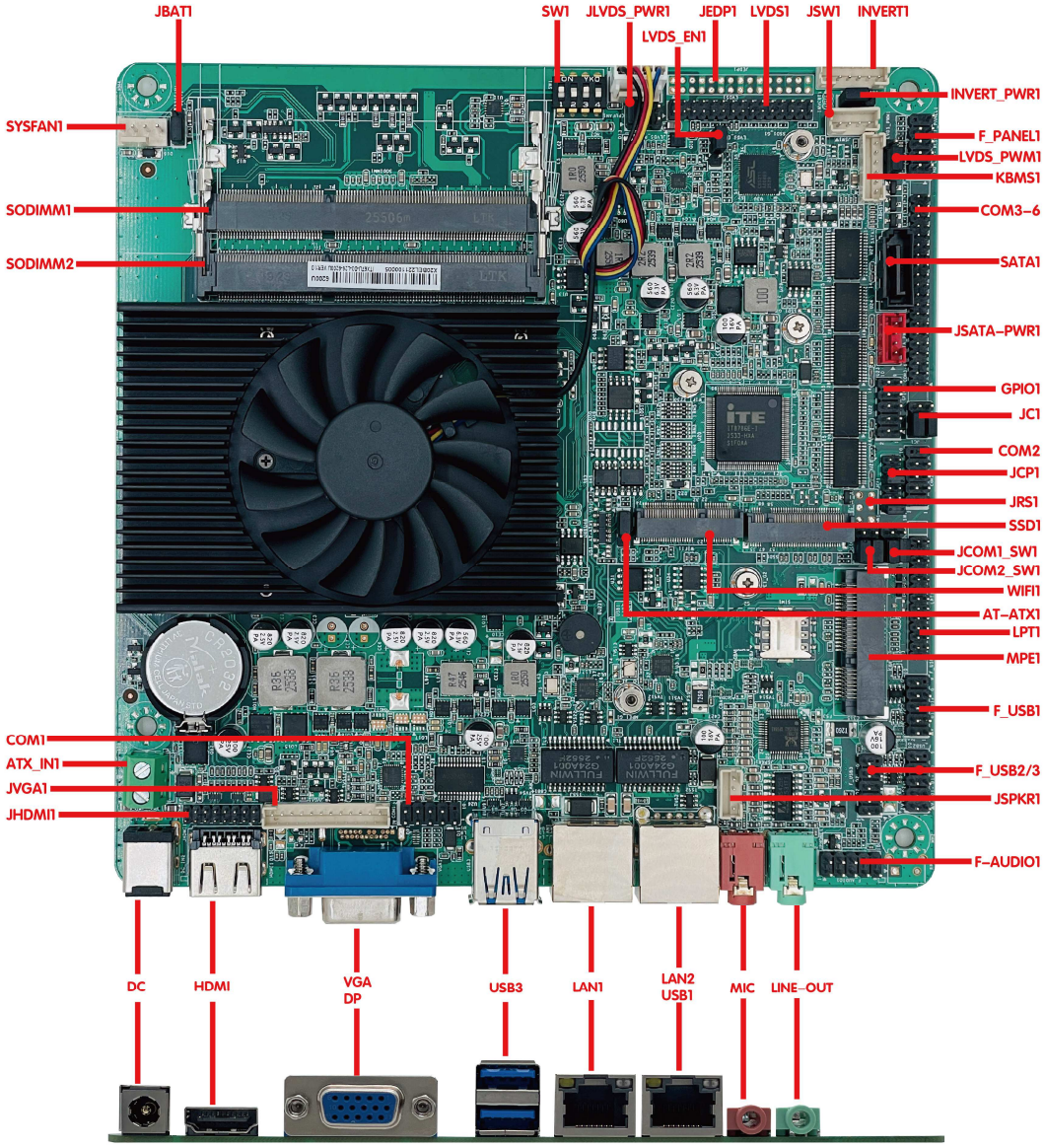

Note: The image above shows the front view of the ITX67U-D3-L26 VER1.0. Images of other models may differ.

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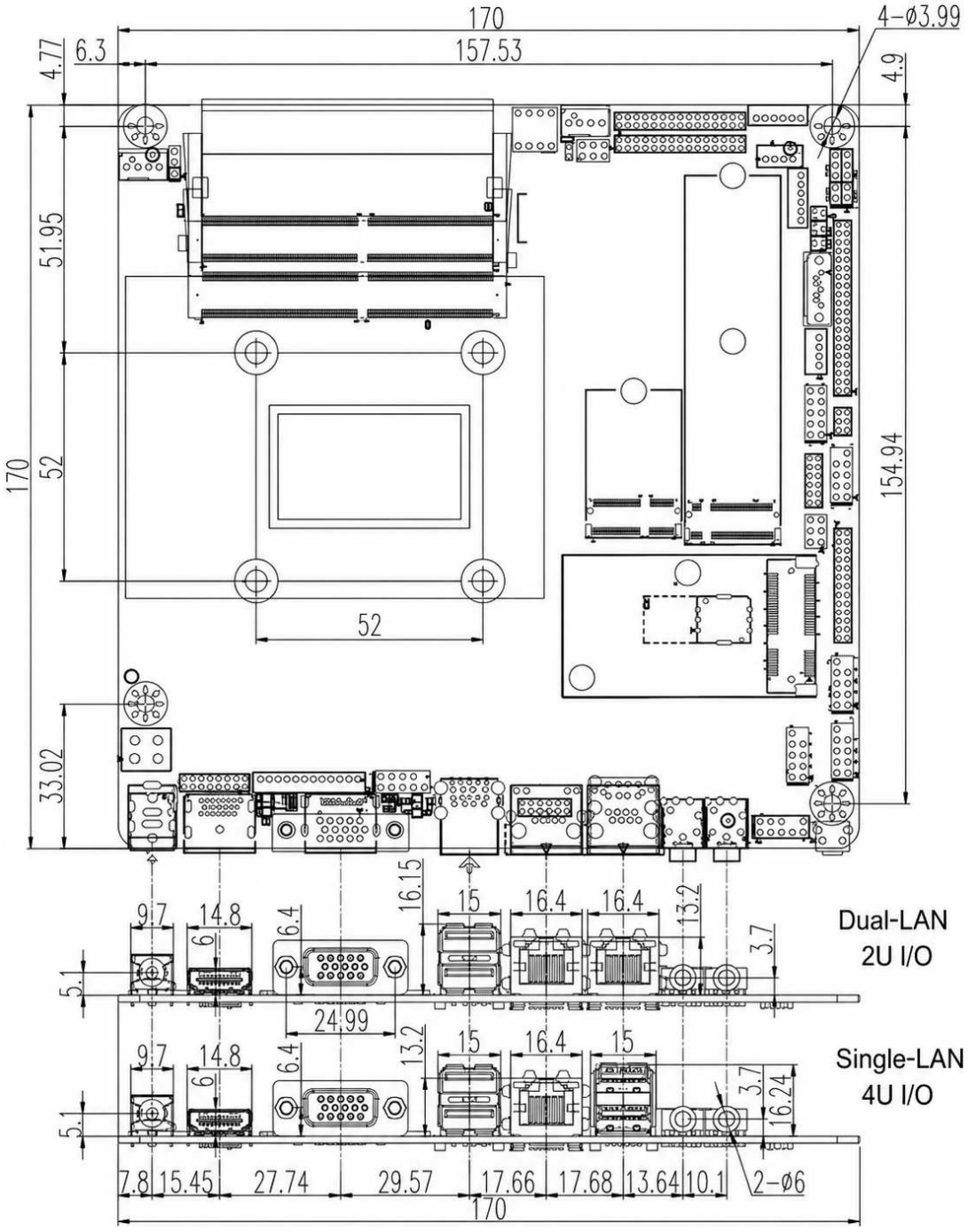

The above diagram shows the I/O interface layout of the ITX67U-D3 VER1.0 series motherboard.

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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 **2 × 240-pin DDR3 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.

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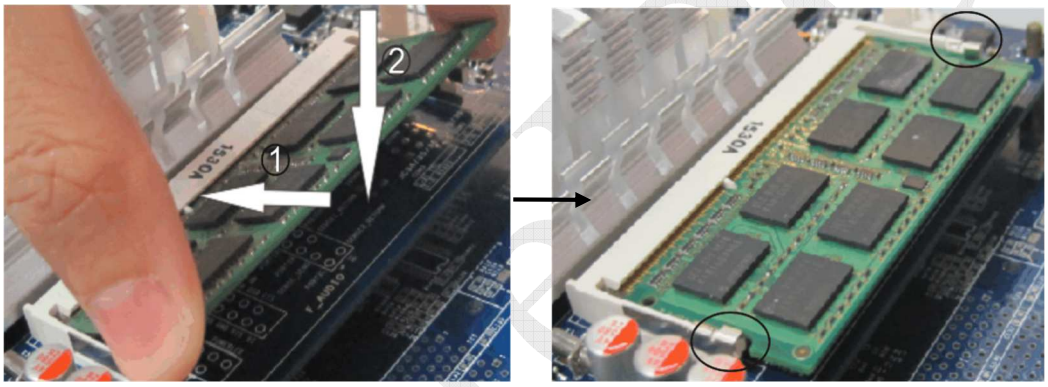
Memory Installation Steps:

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.



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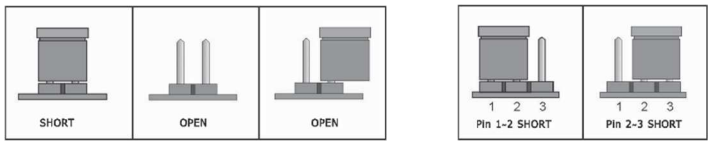
5. Jumper Settings

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

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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

LVDS Enable Jumper: The motherboard provides 1 × LVDS_EN1 1 × 3-pin jumper (2.54 mm pitch) for enabling or disabling the LVDS function.

The LVDS_EN1 settings are as follows:

Interface	Function	LVDS_EN1Setting
LVDS1	Disable LVDS	1-2Pin
	Enable LVDS	2-3Pin

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6. Pin Definitions

1. The motherboard provides 2 × standard COM headers (2 × 5-pin, 2.54 mm pitch).

The standard COM1 and COM2 pin definitions are 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

COM1 and COM2 voltage-selection jumper (2.0 mm pitch), JCP1 settings:

Interface	Function	JCP1Setting	Interface	Function	JCP1Setting
COM1	RI	1-2Pin (default)	COM2	RI	7-8Pin (default)
	5V	3-4Pin		5V	9-10Pin
	12V	5-6Pin		12V	11-12Pin

Note: The standard 2-COM version supports 1 × RS485, while the 6-COM version supports 2 × RS485.

In addition to RS232, COM1 and COM2 also support RS485.

RS485 support on COM3 and COM4 requires a hardware modification. The RS485 signals are available on the JRS1 header. Please consult us before ordering.

RS422 support on COM2 and COM3 requires a hardware modification. Please consult us before ordering.

2. The motherboard provides 1 × standard 4-COM header (2 × 20-pin, 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

3. RS232/RS485 selection jumpers for COM2 and JCOM3

RS232/RS485 selection jumpers for JCOM1 and JCOM2:

Interface	Function	JCOM1_SW1Setting	JC1Setting	Definition

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COM1	RS232	1-3Pin ,2-4Pin (default)	1-3Pin (default)	COM1 Pin 2: RXD COM1 Pin 3: TXD
	RS485	3-5Pin ,4-6Pin	3-5Pin	COM1 Pin 1: A COM1 Pin 2: B

Interface	Function	JCOM2_SW1Setting	JC1Setting	Definition
COM2	RS232	1-3Pin ,2-4Pin (default)	2-4Pin (default)	COM2 Pin 2: RXD COM2 Pin 3: TXD
	RS485	3-5Pin ,4-6Pin	4-6Pin	COM2 Pin 1: A COM2 Pin 2: B

4. COM3 supports RS232, RS485, and RS422, while COM4 supports RS232 and RS485.

RS485 on COM3/COM4 and RS422 on COM3 require a hardware modification. Connect the corresponding signals to the JRS1 header:

Interface	Function	Remarks
COM3	RS232	
	RS485	COM3 RS485 signals are available on the JRS1 header: Pin 1 is COM A and Pin 2 is COM B.
	RS422	COM3 RS422 signals are available on the JRS1 header.
Interface	**Function**	**Remarks**
COM4	RS232	
	RS485	COM4 RS485 signals are available on the JRS1 header: Pin 3 is COM A and Pin 4 is COM B.

COM3 and COM4 support RS232 by default. RS485 or RS422 support requires a hardware modification; please contact our sales team in advance.

The JRS1 RS485 wiring header for COM3 and COM4 (2.54 mm pitch) is defined as follows:

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

COM3 and COM4 support RS232 by default. RS485 or RS422 support requires a hardware modification; please contact our sales team in advance.

5. The motherboard provides 1 × LPT1 parallel-port header (2 × 13-pin, 2.0 mm pitch).

The LPT1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	STB-	2	AFD-
3	PD0	4	ERR-
5	PD1	6	INIT-
7	PD2	8	SLIN-
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK-	20	GND

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21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

6. The motherboard provides 1 × JVGA1 connector (1 × 12-pin, 2.0 mm pitch), sharing 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

7. The motherboard provides 1 × JHDMI header (2 × 8-pin, 2.0 mm pitch), sharing the same signals as HDMI1.

The JHDMI1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	TMDS Data2+	2	SCL
3	TMDS Data2-	4	SDA
5	TMDS Data1+	6	NC
7	TMDS Data1-	8	Hot Plug Detect
9	TMDS Data0+	10	+5V Power
11	TMDS Data0-	12	GND
13	TMDS Clock+	14	GND
15	TMDS Clock-	16	GND

8. The motherboard provides 1 × eDP header (2 × 15-pin, 2.0 mm pitch).

The JEDP1 pin definition is as follows:

Pin	Signal Name	Pin	Signal Name
1	PVDD	2	PVDD
3	NC	4	NC
5	EDP_TX0+	6	EDP_TX0-
7	GND	8	GND
9	EDP_TX1+	10	EDP_TX1-
11	GND	12	GND
13	EDP_TX2+	14	EDP_TX2-
15	GND	16	GND
17	EDP_TX3+	18	EDP_TX3-
19	GND	20	GND
21	EDP_AUX+	22	EDP_AUX-
23	GND	24	HPD_DET
25	BKLT_PWM Backlight Brightness Control	26	BKLT_EN (Backlight Enable)
27	GND	28	GND
29	INVERT_PWR (Backlight Power)	30	INVERT_PWR (Backlight Power)

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

Pin	Signal Name	Pin	Signal Name
1	LCDVDD	2	LCDVDD

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3	LCDVDD	4	NC
5	GND	6	GND
7	LVDS_A0-	8	LVDS_A0+
9	LVDS_A1-	10	LVDS_A1+
11	LVDS_A2-	12	LVDS_A2+
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 motherboard provides 3.3 V, 5 V, and 12 V panel operating-voltage options, as well as 5 V and 12 V panel backlight supply options.

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

INVERT1 (backlight power connector) pin definition:

Pin	Signal Name
1	12 V / 5 V (configured by INVERT_PWR1)
2	12 V / 5 V (configured by INVERT_PWR1)
3	Backlight Enable
4	Backlight Brightness Control
5	GND
6	GND

INVERT_PWR1 (panel backlight power) settings:

Interface	Function	INVERT_PWR1Setting
LVDS1	12V (default)	1-2Pin
	5V	2-3Pin

JLVDS_PWR1 (panel operating voltage) settings:

Interface	Function	JLVDS_PWR1Setting
LVDS1	3.3V (default)	1-2Pin
	5V	3-4Pin
	12V	5-6pin

The motherboard provides a 1 × 3-pin header for inverting the LVDS1 panel PWM signal.

The JLVDS_PWM1 settings are as follows:

Interface	Function	LVDS_PWM1Setting
LVDS1	PWM Normal	1-2Pin

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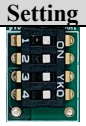
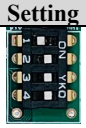
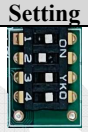
	(High)	
	PWM Inverted (Low)	2-3Pin

JSW1 (panel brightness adjustment connector) pin definition:

Pin	Signal Name
1	BLU+ Brightness Up
2	BLU- Brightness Down
3	Backlight Enable
4	GND

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		

10. The motherboard provides 1 × front audio header (2 × 5-pin, 2.54 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

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

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

12. The motherboard provides 1 × PS/2 keyboard/mouse connector (1 × 6-pin, 2.0 mm pitch). The KBMS1 pin definition is as follows:

Pin	Signal Name
1	+5V(standby)
2	KB_DT
3	KB_CK
4	MS_DT
5	MS_CK
6	GND

13. The motherboard provides 2 × USB 2.0 headers (2 × 5-pin, 2.54 mm pitch).
F_USB3 and USB1 are mutually exclusive. F_USB3 supports USB 2.0 only on the dual-LAN motherboard version.
The F_USB1, 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

14. The motherboard provides 2 × 1 × 4-pin fan headers. The CPUFAN1 and SYSFAN1 pin definitions are as follows:

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

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

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

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

Be sure to identify Pin 1 of JSATA_PWR1 correctly; otherwise, the hard drive may be damaged.
Use only the power cable supplied by our company.

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16. The motherboard provides 1 × FPANEL1 header (2 × 5-pin, 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	

17. The motherboard provides 1 × GPIO header (2 × 5-pin, 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

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