



# BKHD-1264N4L-PCIE Motherboard

VER 1.0

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## Safety Guide

To ensure optimal use of Beikong products, please review the user manual in its entirety. Before reviewing product-specific information, we kindly request that you carefully read the safety instructions.

## Product Version Identification

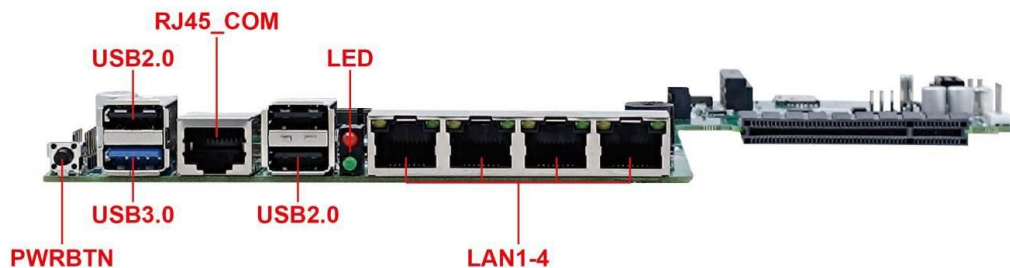
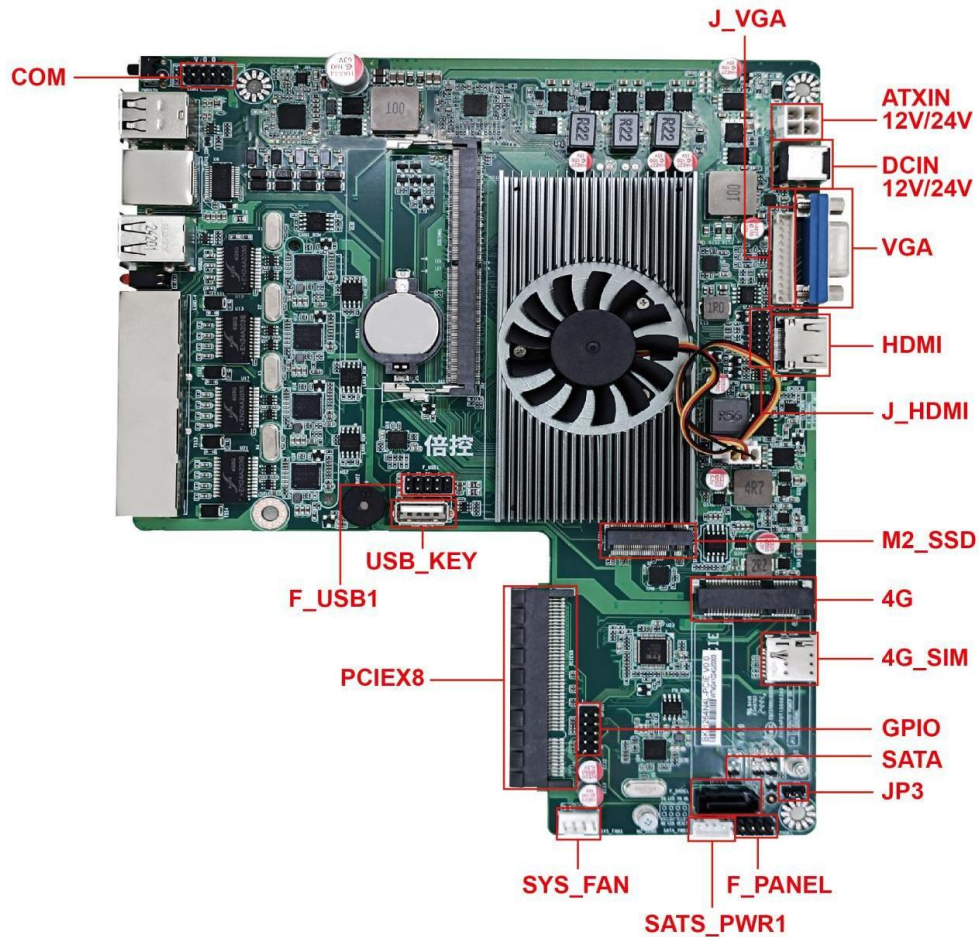
The product version number can be found on the motherboard, where X.X represents a number. For example, if the version is indicated as [VER1.0], it signifies that the current version of the motherboard is 1.0. The BIOS interface homepage provides information such as [XXXXNP-XXXX], which denotes the BIOS version number utilized by the current product. When updating the motherboard's BIOS, driver, or referencing other technical documents, please refer to the product version label for the most up-to-date information.

# Catalog

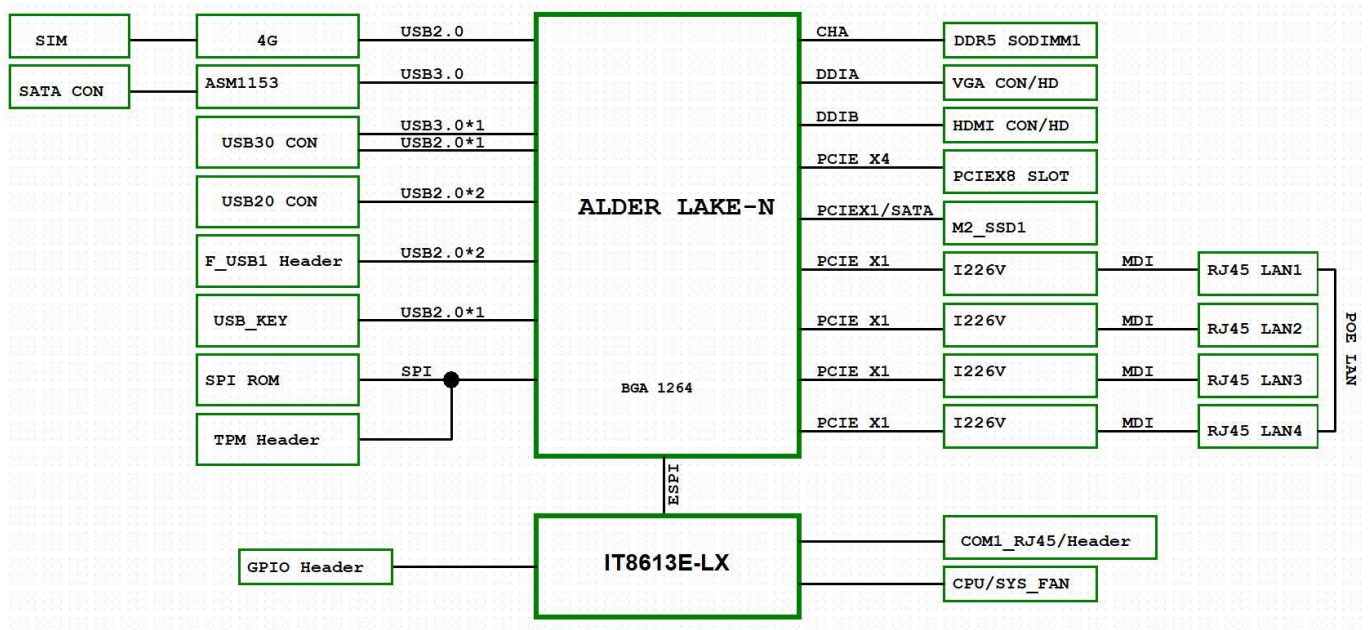
Copyright Notice: .....	1
Responsibility Statement: .....	1
Safety Guide .....	1
Product Version Identification .....	1
Product Images .....	3
Block Diagram .....	4
Product Profile .....	5
Motherboard Specifications .....	6
Motherboard Installation .....	7
Memory Installation .....	8
Jumper Setting .....	9
Motherboard Pin Definition .....	13
SATA interface .....	13
SATA PWR .....	13
CPU/System cooling fan power socket: CPU/SYS_FAN .....	13
Serial Port (COM) .....	14
Front panel pin: F_PANEL .....	14
USB Expansion pin: F_USB .....	15
GPIO pins: .....	15
J_VGA .....	16
J_HDMI .....	16
BIOS User Guide .....	17
Advanced Settings .....	18
ACPI Settings .....	18
Network Stack Settings .....	19
Chipset Settings .....	19
Security Settings .....	20
Boot Settings .....	21
Save&Exit Settings .....	22
Common fault analysis and solutions .....	23
Useful Links .....	24

## Product Images

Please be advised that products manufactured in different batches may exhibit slight variations in appearance. To ensure the most accurate representation, please refer to the actual received goods.



## Block Diagram



## Product Profile

1264N4L-PCIE is a dedicated motherboard designed for highly scalable industrial scenarios. Equipped with an Intel N100 processor (4 cores/4 threads), it integrates 4×2.5Gb Ethernet ports and PCIe x8 expansion slots. By supporting wide voltage input, full-stack industrial interfaces and wide temperature operation, it provides a "strongly scalable, hard-core and reliable" hardware base for machine vision, motion control and field communication equipment.

### Main features:

Multiple network architecture: Four-port 2.5Gb adaptive Ethernet supports link aggregation, VLAN isolation for backup network and storage traffic, and PXE/WoL functions for unattended operation and maintenance.

Improved expandability: One PCIe x8 slot (x4 lanes) supports expansion of industrial camera acquisition cards, motion control cards, and multi-port PoE+ switch cards. The mPCIe expansion slot (USB channel) can be expanded with 4G/5G modules or AI accelerator cards.

Industrial interface ready: Multiple industrial interfaces are provided, including a COM serial port for connecting to PLCs and inverters. GPIO can be used to connect limit switches and relay controls, and an RJ45 console allows for on-site debugging without a display. A reserved Nano-SIM card slot provides network redundancy by inserting an IoT card or cellular module.

## Motherboard Specifications

<b>Processor</b>	Product Collection	Intel® Processor N-series	
	Sockets Supported	FCBGA1264	
<b>Memory specifications</b>	Memory type	DDR5 SO-DIMM	
	Maximum capacity	16GB	
	Maximum frequency	4800 MT/s	
<b>Storage specifications</b>	SATA	1*SATA 3.0 [ASM1153 Controller]	
	M.2	1*M.2 Key-M 2280 (PCIe Gen3 x1/SATA)	
<b>Network features</b>	Ethernet	4*2.5GbE	
	Controller	4*Intel I226V	
<b>Display functions</b>	Onboard	1*VGA/1*HD	
<b>I/O Chip</b>	Chip	IT8613E-LX	
<b>Backplane I/O</b>	USB	3*USB-A 2.0/1*USB-A 3.0	
	Display	1*VGA/1*HD	
	COM	2*DB9 COM	
	LAN	4*RJ45	
	Power supply	1*Jack DC 5.5/2.5mm	
	SATA	1*SATA Data connector/1*SATA Power socket	
<b>Onboard I/O</b>	Pins	1*F_PANEL	
		1*F_USB1 (can expand 2x USB2.0 ports)	
		1*JVGA/1*JHD	
		1*J_COM (RS232)	
		1*JGPIO	
	SIM	1*SIM Card slots	
	Fan	1*SYS_FAN/1*CPU_FAN	
<b>Power supply mode</b>	DC	12~24V	
<b>Motherboard size</b>	Specification	180 mm*225 mm	
<b>Work Environment</b>	Temperature	Working: -20℃~60℃; Storage: -20℃~60℃;	
	Humidity	0%~90% (Relative humidity, no condensation)	
<b>Operating system</b>	Windows 10/11	Linux kernel 5.18 or higher	VMware/Proxmox VE

## Motherboard Installation

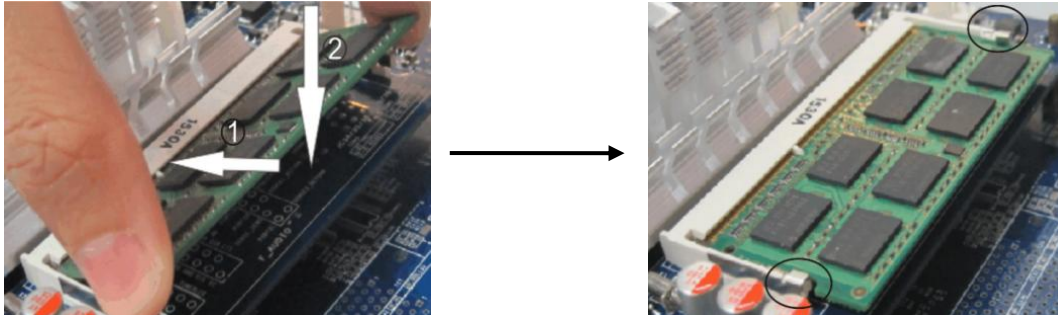
### Safety Note

- Please do not remove the serial number and agent warranty sticker from the motherboard prior to installation. Doing so may affect the product's warranty recognition standard.
- Prior to installing or removing the motherboard or other hardware devices, please ensure that the power is turned off and the power cord is unplugged from the socket.
- When installing additional hardware devices on the motherboard interfaces, please ensure that the connectors and sockets are securely fastened.
- When handling the motherboard, please avoid contact with the metal wiring components to prevent the risk of short circuits.
- It is recommended that an anti-static wrist strap be worn when handling the motherboard, central processing unit (CPU), or memory. In the absence of an anti-static wrist strap, it is advisable to ensure that your hands are dry and to touch a metal object first in order to eliminate static electricity.
- Before installing the motherboard, we kindly request that place it on an antistatic mat or in an antistatic bag.
- Make sure the power adapter is turned off before unplugging the motherboard power connector.
- Before turning on the power, make sure the voltage of the adapter is within the standard voltage range.
- Before turning on the power, make sure all hardware device cables and power cords are properly connected.
- Do not allow the fixing screws to collide with the circuits or parts on the motherboard to avoid damage or malfunction of the motherboard.
- Make sure there are no loose screws or metal parts on the motherboard or inside the computer case before using the unit.
- Please secure the computer host in a stable location before starting the device.
- To prevent system failure, do not place the unit in an environment where the temperature is excessive.
- Turning on the power before installation is complete may damage the motherboard, other equipment, or yourself.
- If you are unfamiliar with how to perform the installation, or if you have any technical problems using this product, please contact a professional technician.



## Memory Installation

The motherboard provides one DDR5 SODIMM memory slot.



### **Before installing memory:**

1. Please confirm that the memory you purchased is compatible with the specifications supported by this motherboard.
2. Before installing or removing the memory, please make sure that the power of the computer is turned off to avoid damage.
3. The memory design has a foolproof mark. If you insert the memory in the wrong direction, the memory cannot be installed. Please change the direction.

### **When installing memory:**

1. Before installing or removing memory, please turn off the power and unplug the power cord.
2. Carefully hold the two ends of the Memory Stick and do not touch the metal contacts on the Memory Stick.
3. Align the metal contacts of the memory with the memory slot, making sure that the concave hole is aligned with the convex point of the upper slot.
4. Insert the memory into the slot at an angle of 30 degrees, then press the Memory Stick down until you hear a "click," indicating that the memory has been successfully installed and is ready to use. (Note: Do not press the Memory Stick too hard to avoid damaging the memory).
5. To remove the Memory Stick, push out the tabs at both ends of the memory slot simultaneously, and then remove the Memory Stick.

### **To remove the memory:**

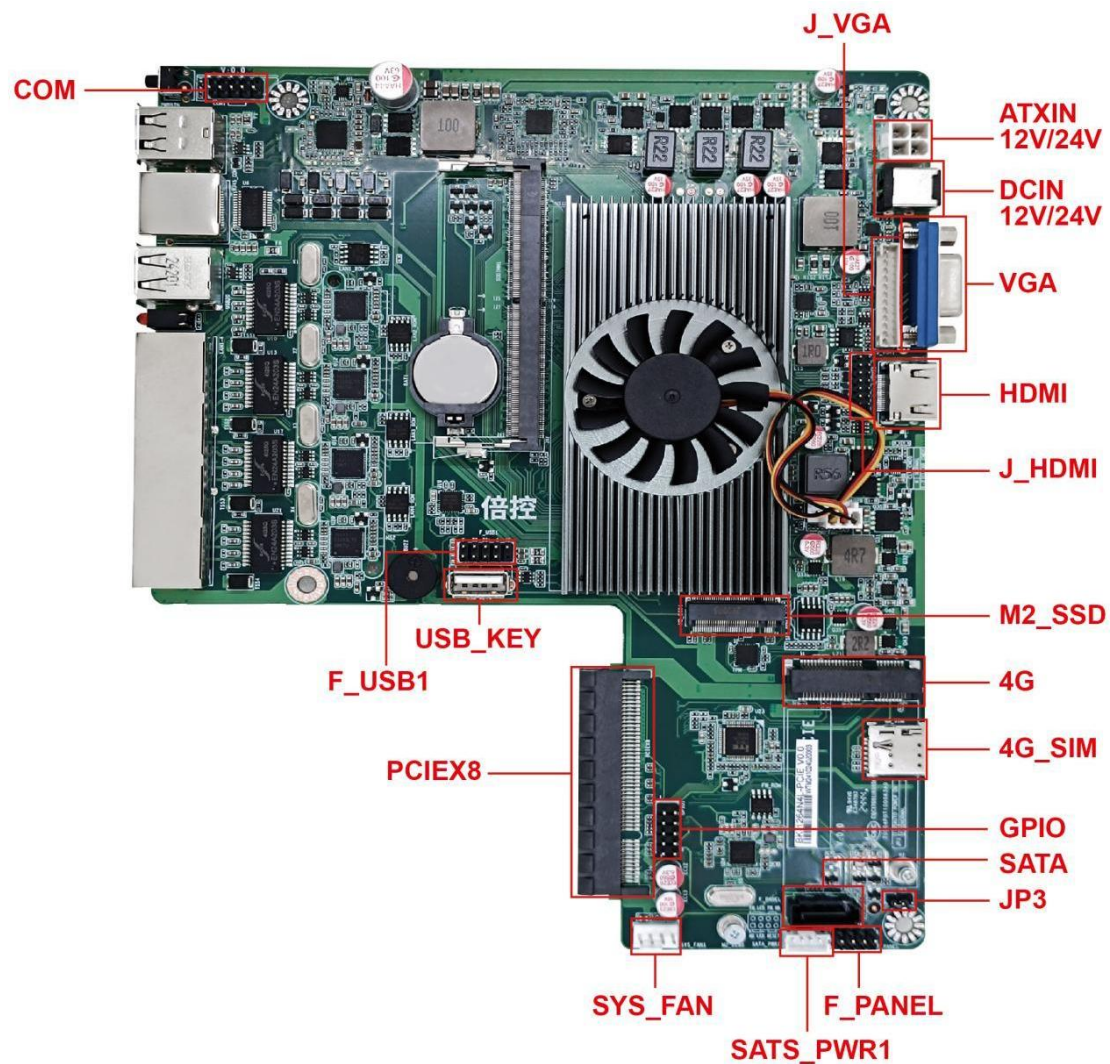
Use two fingers to push the latches at either end of the slot outward, the memory will pop up, then remove the memory.

## Jumper Setting

Before installing the hardware device, you can set the corresponding jumpers according to your needs based on the following table.

### To identify the first pin of a jumper or connector

Look at the marking next to the jumper or connector. The triangle symbol "▲" or "1" or a bold line indicates the first pin; check the pad on the back of the motherboard. The square pad is the first pin. When connecting the connector to the device, be careful to distinguish the first pin. Mixing the pins will damage the motherboard.



The pictures are for reference only, please refer to the actual product.

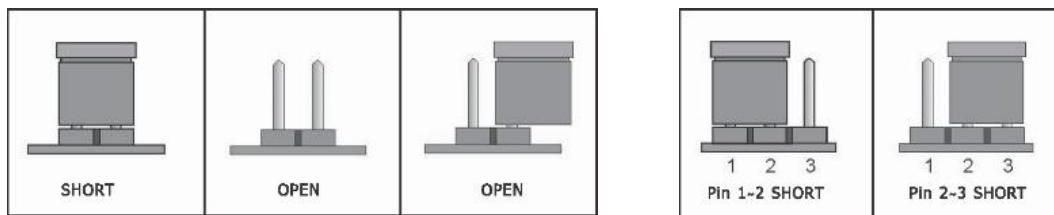
Item	Describe
JCOM	Onboard COM pin for expanding COM interface
PWR 12V/24V ATX	Power socket for motherboard and processor power supply
JVGA/JHDMI	Onboard pin for expanding video port
F_USB	Onboard USB pin for expanding USB 2.0 interface
USB_KEY	Onboard USB-A 2.0 port
M2_SSD	M.2 Key-M Storage SSD interface
4G	Mini PCIe slot to add cellular module (USB signal)
PCIe x8	Can be used to install expansion cards for PCIe x8/x4/x2/x1 interfaces
GPIO	Onboard GPIO (General-Purpose Input/Output) pins
SATA	SATA HDD/SSD Data Connectors
SATA_PWR1	SATA HDD/SSD power socket
JP3	Jumper switch to enable or disable automatic power on
SYS_FAN	System fan, used to install chassis fan
F_PANEL	Used to connect the chassis' power switch, restart button, power indicator light, hard disk indicator light, etc.
SODIMM	DDR5 SO-DIMM memory slot (RAM)




Item	Describe
USB 2.0	Double-layer USB-Type-A 2.0 port
USB 3.0	Upper USB-Type-A 2.0 port/Lower USB-Type-A 3.0
RJ45 COM	RJ45 port for COM RS232 standard
RJ45 Connectors	RJ45 Ethernet port for LAN/WAN
	Link LED: Green and solid, indicating the network is connected
	Active LED: Orange flashing, indicating data transmission
BWR_BTN	Button to turn the device ON or OFF

**2-pin headers:** Insert a jumper cap into both pins turns them off (short).


**3-pin headers:** Insert a jumper cap into pins 1-2 or pins 2-3 to off (short) them.



#### JP3 Jumper Setting

JP3	PIN	Definition
	1-2	Enable Automatic Power On
	2-3	Normal (Default)

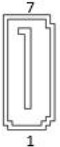
#### CLR\_CMOS Jumper Setting

CLR_CMOS	State	Definition
	Open	Normal (Default)
	Short	Data Clearance

## Motherboard Pin Definition

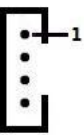
### SATA interface.

The motherboard provides 7-pin SATA data socket:

Image	PIN	Definition	PIN	Definition
	1	GND	2	SATA_TX+
	3	SATA_TX-	4	GND
	5	SATA_RX-	6	SATA_RX+
	7	GND		

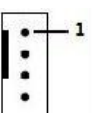
### SATA PWR

The motherboard provides 4-pin SATA power socket:

Image	PIN	Definition
	1	5V
	2	GND
	3	GND
	4	12V

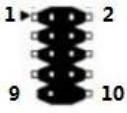
### CPU/System cooling fan power socket: CPU/SYS\_FAN

The motherboard provides 4-pin cooling fan connectors (pin header spacing: 2.54mm):


Image	PIN	Definition
	1	GND
	2	+12V
	3	Sense
	4	Control

## Serial Port (COM)

The motherboard provides 2\*5pin COM pin (pin header spacing: 2.54mm):

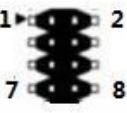
Image	PIN	Definition	PIN	Definition
	1	-ND CD	2	SIN
	3	SOUT	4	DTR
	5	GND	6	DSR
	7	RTS	8	CTS
	9	RI	10	N/A

The motherboard provides 1 RJ45 COM port:

Image	PIN	Definition	PIN	Definition
	1	RTS#	2	DTR#
	3	TXD	4	N/A
	5	GND	6	RXD
	7	DSR#	8	CTS#

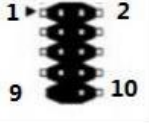
## Front panel pin: F\_PANEL

The motherboard provides 2\*4pin F\_PANEL pin (pin header spacing: 2.54mm):

Image	PIN	Definition	PIN	Definition
	1	HDD_LED	2	PWR_LED
	3	HDD_LED	4	PWR_LED
	5	Reset	6	PWR_BTN
	7	Reset	8	PWR_BTN

## USB Expansion pin: F\_USB

The motherboard provides 2\*5pin F\_USB pin (pin header spacing: 2.54mm):

Image	PIN	Definition	PIN	Definition
	1	VCC +5V	2	VCC +5V
	3	USB1 Date-	4	USB2 Date-
	5	USB1 Date+	6	USB2 Date+
	7	GND	8	GND
	9	/	10	GND

## GPIO pins:


The motherboard provides 2\*5pin GPIO pin header (pin header spacing: 2.00mm):

Image	PIN	Definition	PIN	Definition
	1	SIO_PD0	2	SIO_PD4
	3	SIO_PD1	4	SIO_PD5
	5	SIO_PD2	6	SIO_PD6
	7	SIO_PD3	8	SIO_PD7
	9	GND	10	VCC



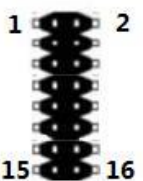
## J\_VGA

The motherboard provides VGA expansion pin header:

Image	PIN	Definition	PIN	Definition
	1	GND	2	VSYNC
	3	HSYNC	4	GND
	5	R	6	GND
	7	G	8	GND
	9	B	10	GND
	11	SDA	12	SCL

## J\_HDMI

The motherboard provides HDMI expansion pin header:

Image	PIN	Definition	PIN	Definition
	1	DDI1_TXP2L	2	DDI1_SCLDDC
	3	DDI1_TXN2L	4	DDI1_DALDDC
	5	DDI1_TXP1L	6	N/A
	7	DDI1_TXN1L	8	HDMI-B_PLUG
	9	DDI1_TXP0L	10	5V_HDMI
	11	DDI1_TXN0L	12	GND
	13	DDI1_TXCPL	14	GND
	15	DDI1_TXCNL	16	GND

## BIOS User Guide

This motherboard uses AMI BIOS. BIOS stands for Basic Input Output System. It is a set of programs stored on a ROM chip on the computer's motherboard. It stores the computer's most important basic I/O programs, the power-on self-test program, and the system startup program. It can read and write specific information about system settings from the CMOS. Its primary function is to provide the most basic and immediate hardware settings and control for the computer.

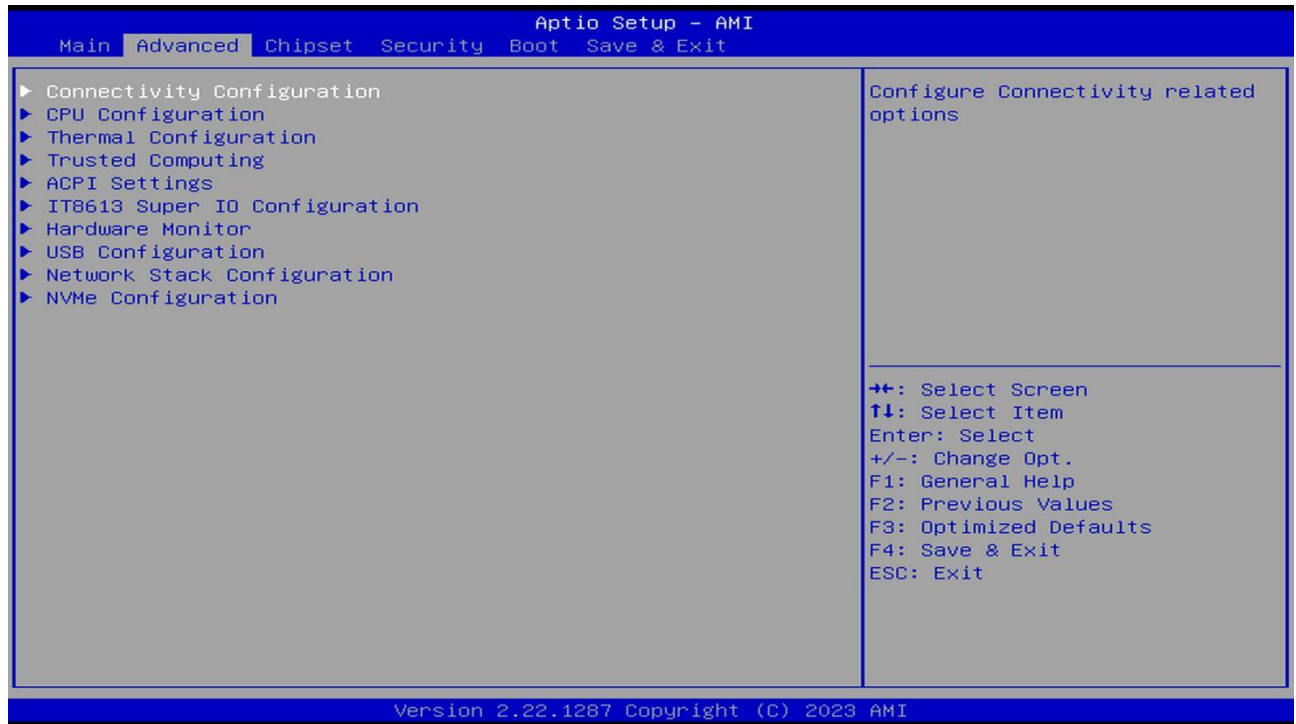
Note: Because the BIOS version of the motherboard is constantly updated, the BIOS information in this manual is for reference only.

When the computer starts, the BIOS enters the power-on self-test (post) program. The self-test program is a series of diagnostic programs built into the BIOS. When the self-test program is complete, the following message appears: Press DEL to run Setup

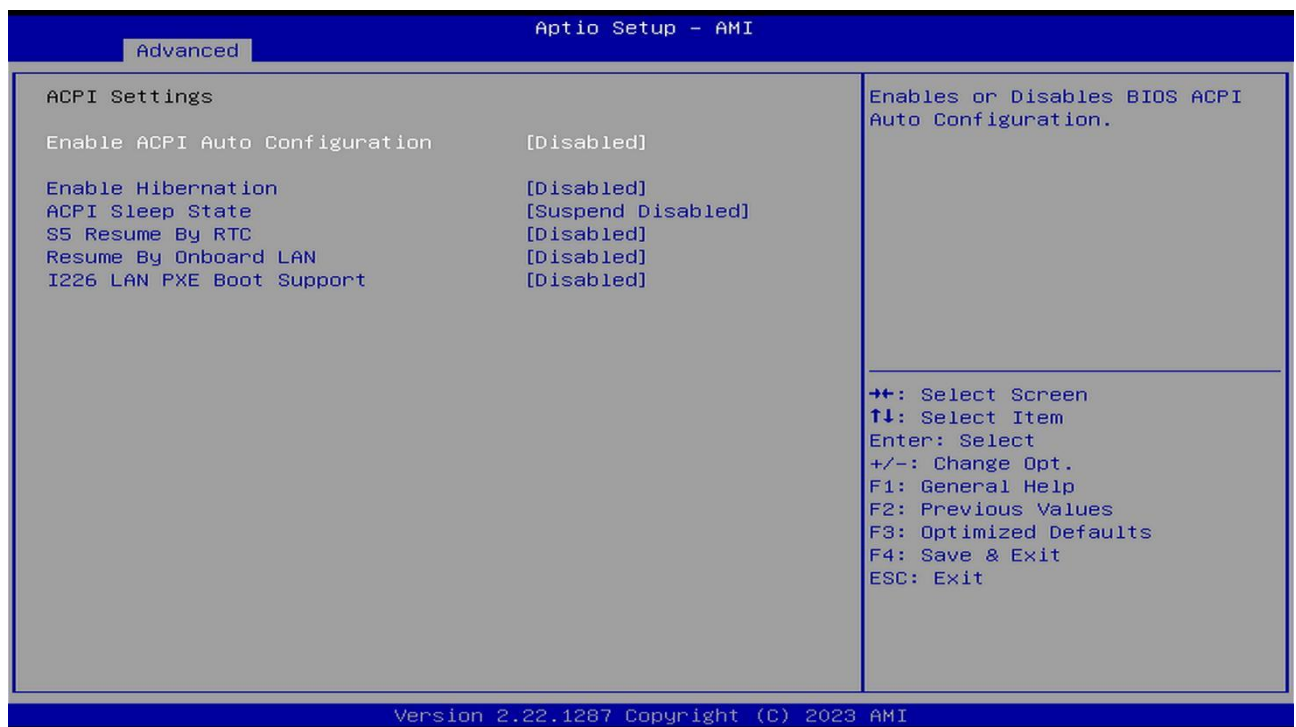
If this message disappears before you respond, you can press <Ctrl> + <Alt> + <Del> at the same time to restart the computer, or shut down and then restart the computer, or press the power button on the case to restart the computer.

- Use the <↑><↓><←><→> arrow keys to move the item you want to change
- Press the <Enter> key to enter the sub-interface of the item.
- Use the <Enter> key to select the item to be changed and press the <Enter> key to change it.
- <Page Up/+>Increase value or change
- <Page Down/->Decrease value or change
- <F1>Set submenu help
- <F3>Set to default value (restore factory settings)
- <F4>Save BIOS settings

## Advanced Settings

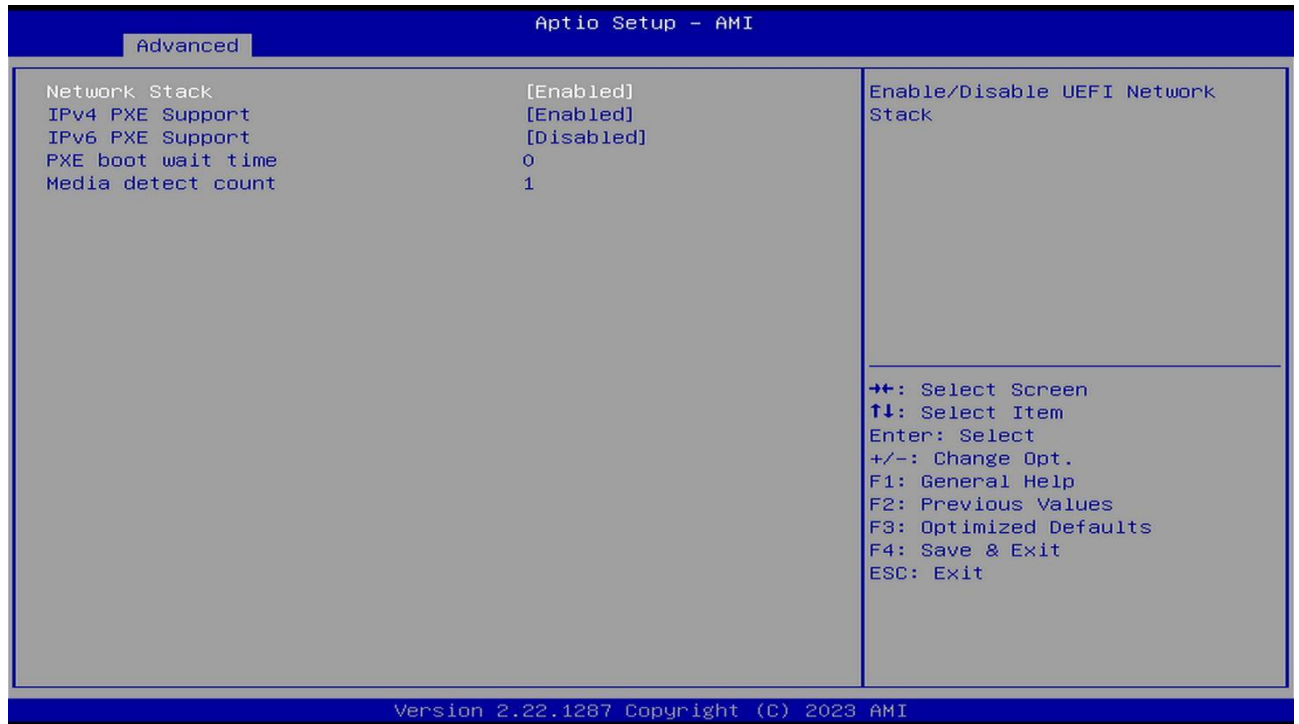


## ACPI Settings



[Resume By onboard LAN] This option is used to set up Wake-up on LAN.

## Network Stack Settings

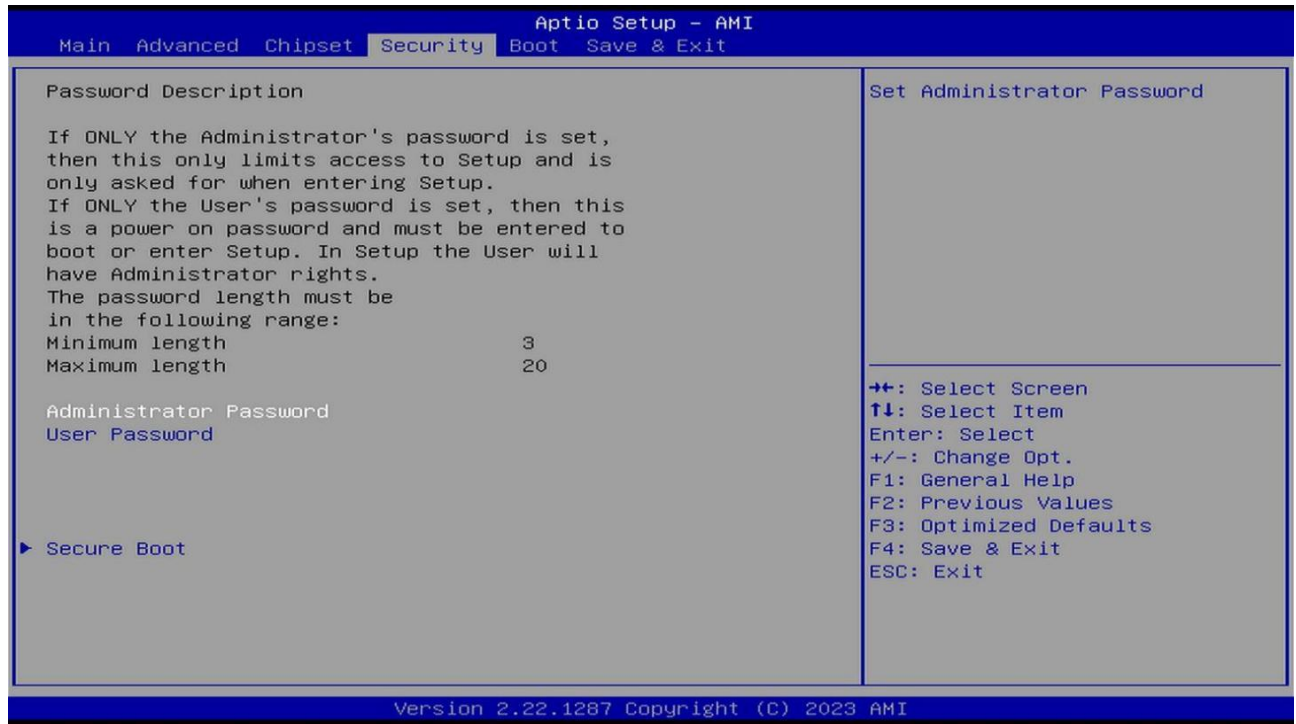


[IPv4 PXE Support] This option is used to set up Wake on LAN.

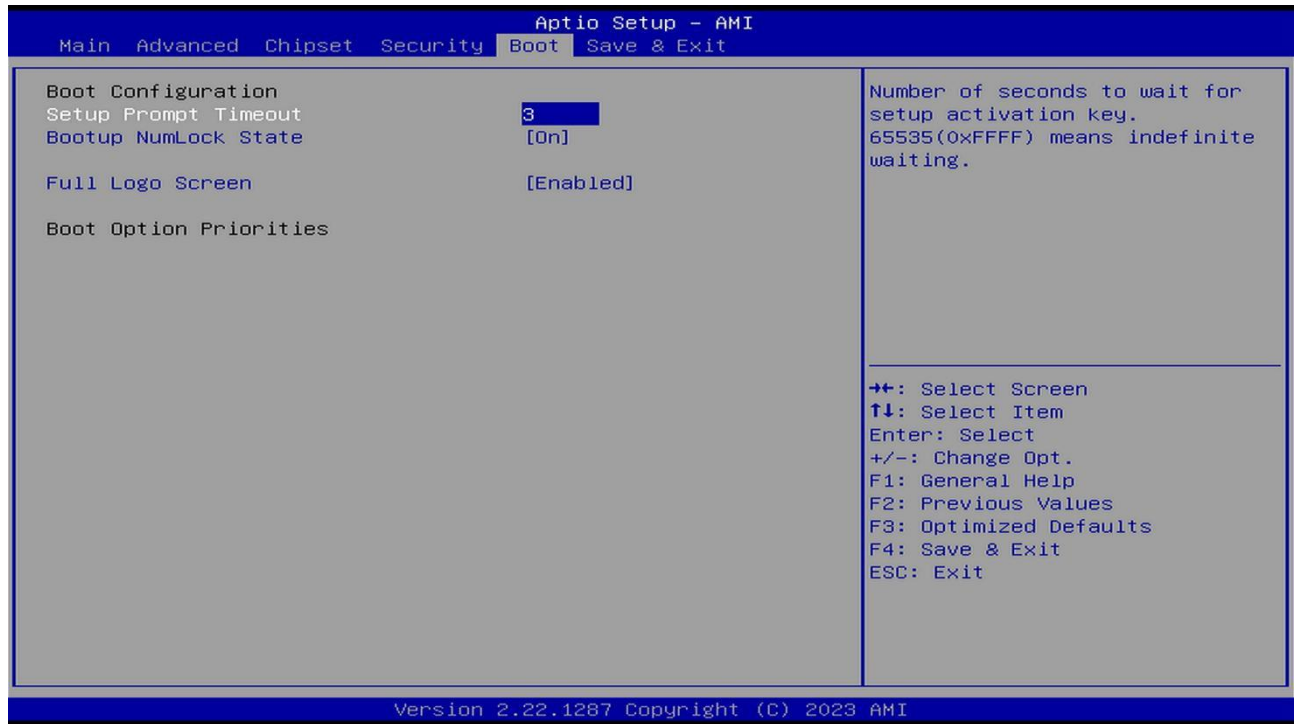
## Chipset Settings



## Security Settings



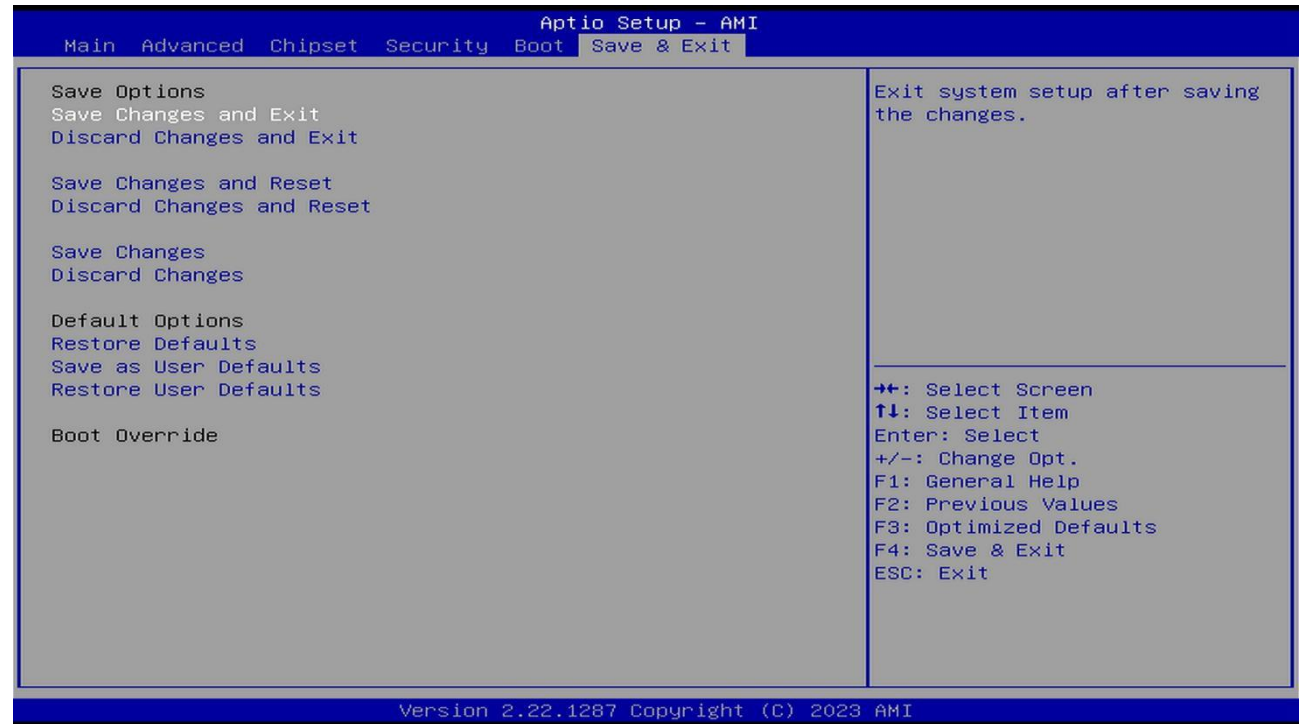
## Boot Settings



[Setup Prompt Timeout] This option is used to set the length of time the POST interface stays on.

[Bootup Numlock State] This option is used to set the state of Numlock after the system starts. When set to On, NumLock will be turned on after the system starts, and the numeric keys on the keypad will be valid. When set to Off, Numlock will be turned off after the system starts, and the direction keys on the keypad will be valid.

## Save&Exit Settings



## Common fault analysis and solutions

We have compiled some frequently asked questions for your reference. Please check <https://bkminipc.com/frequently-asked-questions-and-answers/>

Error	Inspection Method
Unable to start after power on	<p>Make sure the power cord is properly connected.</p> <p>Make sure that the power supply you are using meets the power supply requirements of the motherboard.</p> <p>Try to reinsert the Memory Stick.</p> <p>Try to replace the Memory Stick.</p> <p>Try to clear the CMOS of the main board.</p> <p>Please confirm if there is an external expansion card and if it is normal after removing the external card.</p>
Unable to display after power on	<p>Make sure the monitor is turned on.</p> <p>Make sure the monitor and host power cables are properly connected. Make sure the monitor and host cables are properly connected.</p> <p>Check to see if the monitor is in "Sleep" mode.</p> <p>Try changing the monitor interface or replacing the monitor.</p>
BIOS Setup cannot be saved	<p>Check that the CMOS battery is installed</p> <p>Try to replace the CMOS battery (CR2032)</p> <p>Adjust the time and date in BIOS setup</p>
Unable to find a bootable device	<p>Make sure the drive's power and data cables are properly connected.</p> <p>Make sure the operating system is installed on the drive.</p> <p>Make sure the hard drive is not physically damaged.</p>
Blue screen or freeze when logging on to the system	<p>Check if the Memory Stick and External Card are loose.</p> <p>Try removing the newly installed hardware and uninstalling the newly installed driver or software.</p> <p>Try replacing the memory with a different specification.</p>
Slow entry into the operating system	<p>Check if the CPU cooling fan is running normally.</p> <p>Check if the remaining space of the system partition is insufficient.</p> <p>Use software to check for bad sectors on the hard drive.</p>
System restarts automatically	<p>Confirm that the CPU cooling fan is rotating normally.</p> <p>Confirm that the switch/reset button has not been accidentally touched.</p> <p>Confirm that the Memory Stick and external card are loose.</p> <p>Confirm that the power supply has sufficient load capacity, try to replace the power supply</p> <p>Check if the system is infected with viruses.</p>
Unable to detect USB device	<p>Confirm that the USB device requires separate power.</p> <p>Confirm that the USB interface has poor contact.</p> <p>Confirm that the USB controller is enabled in the BIOS setup.</p>



## Useful Links

Submit your suggestions and ideas in the community	<a href="https://www.reddit.com/r/bkminipc/">https://www.reddit.com/r/bkminipc/</a>	
Watch our new product demos	<a href="https://www.youtube.com/@BKHD-PCs">https://www.youtube.com/@BKHD-PCs</a>	
Corporate News and Cooperation	<a href="https://www.linkedin.com/company/beikong/">https://www.linkedin.com/company/beikong/</a>	
Get our latest news on Meta	<a href="https://www.facebook.com/people/%E5%80%8D%E6%8E%A7/61558406109357/">https://www.facebook.com/people/%E5%80%8D%E6%8E%A7/61558406109357/</a>	