



BKHD-1744NP-20-6L Motherboard

VER 1.1

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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.

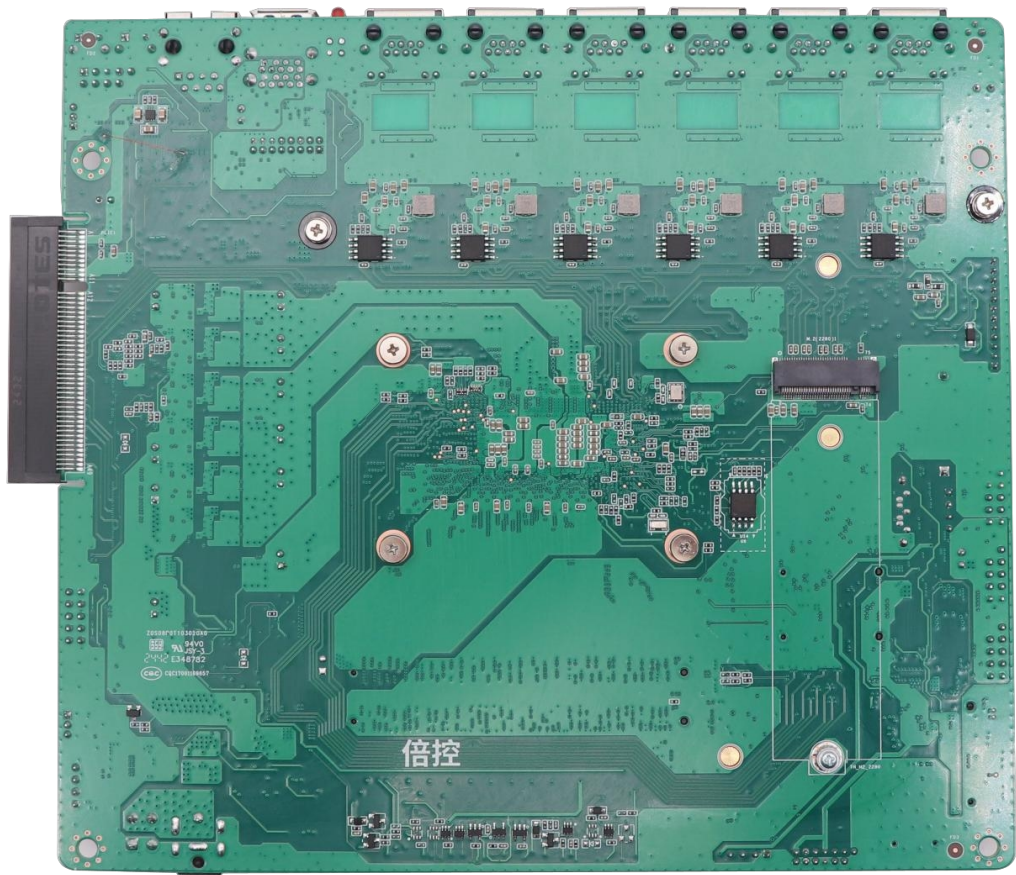
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Product Images

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.





Product Profile

The 1744NP-20-6L is a compact, industrial-grade embedded motherboard designed for multi-port network applications, edge computing, and embedded storage. It's ideal for building high-performance routers, firewalls, NAS devices, or IoT gateways. Equipped with Intel's 12th/13th Generation laptop processors, 6x 2.5GbE ports, and a PCIe x8 expansion slot, it provides a reliable hardware foundation for high-performance computing, high-speed network transmission, flexible scalability, and wide-temperature durability. It's ideal for small and medium-sized businesses, industrial automation, or remote deployment environments requiring multitasking and reliable network connectivity.

Main features:

High-Performance Processor and Memory

Equipped with optional Intel 12th/13th Gen processors, it delivers powerful multi-core performance. Dual-channel DDR5 memory supports up to 96GB, making it ideal for compute-intensive tasks.

Multi-Port High-Speed Network Connectivity

Provides six 2.5GbE ports equipped with an Intel I226V network controller, supporting network redundancy, port splitting, and high-speed data transfer, optimizing multi-device connectivity and bandwidth utilization.

Hybrid Storage and Multiple Expansions

Provides one SATA and one M.2 Key-M SSD slot for high-speed and high-capacity storage. PCIe x8 and M.2 Key-E/B offer expansion flexibility, ready for various expansion cards.

Extensive Onboard I/O and Display Output

Common onboard ports include USB 3.2, RJ45, and COM ports. Onboard pins support expansion for USB, GPIO, COM ports, TPM modules, and display ports. A reserved SIM card slot supports wireless network access with a cellular module.

Industrial-grade design and reliability

The compact size makes it suitable for embedded applications. Dual power modes support various power supply methods, multiple fan ports, and wide temperature and humidity range ensure long-term stable operation. The TPM 2.0 security module supports a watchdog timer and hardware monitoring functions to ensure system security.

Motherboard Specifications

Processor	Product Collection	Intel 12th/13th Gen Processors
	Sockets Supported	FCBGA1744
Memory specifications	Memory type	2*DDR5 SO-DIMM
	Maximum capacity	2*48GB
	Maximum frequency	4800 MT/s
Storage specifications	SATA	1*SATA 3.0 (6Gb/s)
	M.2	2*M.2 Key-M 2280 (PCIe Gen4 x4)
Network features	Ethernet	6*2.5GbE
	Controller	6*Intel I226V
Extension interface	PCIe	1*PCIe x8 (Gen4)
	M.2 Key-E	1*M.2 Key-E 2230 (PCIe+USB+CNVi Signal)
	M.2 Key-E	1*M.2 Key-B 3052 (USB Signal)
Display functions	Onboard Pins	1*JVGA/1*JHDMI
Backplane I/O	USB	2*USB-A 3.2
	LAN	6*RJ45
	LED	PWR LED/HDD LED
	Button	1*Power button, 1*Reset button
	COM	1*RJ45 COM
	Power Supply	1*Jack DC IN 55*25
	SATA	1*SATA Data connector/1*SATA Power socket
Onboard I/O	Pins	1*JTPM 2.0
		1*JGPIO (8-Way)
		1*J_COM2 (RS232)
		3*F_USB (can expand 6x USB2.0 ports)
		1*JVGA/1*JHDMI
	Fan	1*SYS_FAN/1*CPU_FAN
	SIM	1*SIM Card slot
Power supply mode	DC	ATX 4-PIN or DC_IN 12V
Motherboard size	Specification	180 mm*200 mm
Work Environment	Temperature	Working: -20℃~55℃; Storage: -20℃~60℃;
	Humidity	5%~90% (Relative humidity, no condensation)

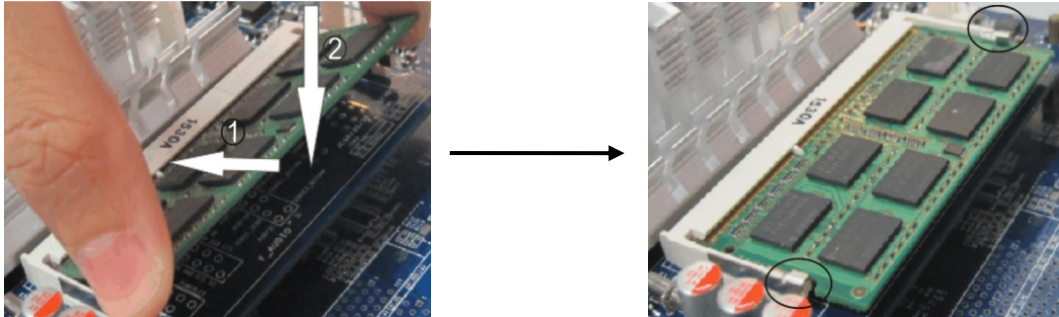
Motherboard Installation

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 DDR5 SODIMM memory slots.



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.

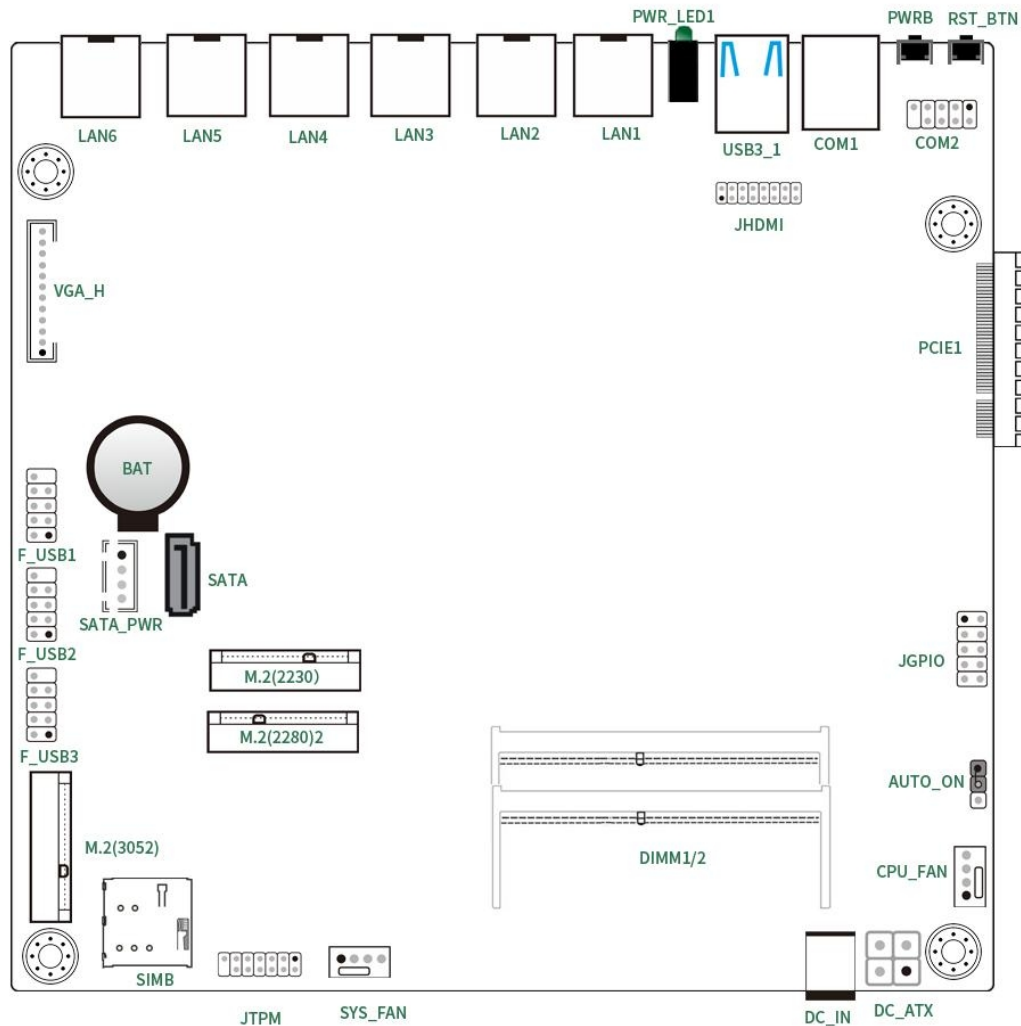
When installing memory:

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:

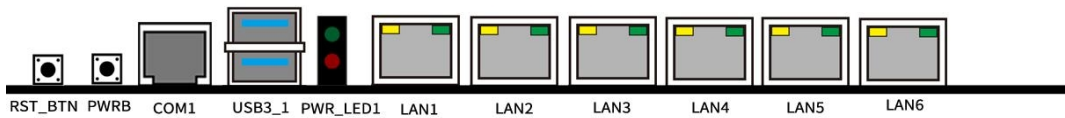
Use two fingers to push the latches at either end of the slot outward, the memory will pop up, then remove the memory.

Motherboard Interface & Pin Description



Item	Describe
COM 2	Onboard COM pin for expanding COM ports
JHDMI	Pins for expanding HDMI ports
VGA_H	Pins for expanding VGA ports
PCle x8	Can be used to install expansion cards for PCIe x8/x4/x2/x1 interfaces
F_USB 1/2/3	Onboard USB pin for expanding USB 2.0 port

BAT	CMOS battery, used to save BIOS settings (CR2032)
SATA_PWR	SATA HDD/SSD Power Socket
SATA	SATA HDD/SSD Data Connectors
M.2 2230	M.2 Key-E slot for installing modules
M.2 2280 1/2	M.2 Key-M Storage SSD slots
M.2 3052	M.2 Key-B slot for installing modules
JGPIO	Onboard GPIO (General-Purpose Input/Output) pins
SODIMM	DDR5 SO-DIMM memory slot (RAM)
AUTO_ON	Jumper to enable or disable Auto Power-On
CPU_FAN	For CPU fan power supply
SIMB	SIM card slot, used to install the SIM card
JTPM	TPM pin, used for external TPM module
SYS_FAN	System fan, used to install chassis fan
DC_IN	Jack DC 5.5/2.5mm Power connector, 12V
DC_ATX	Power socket for motherboard



Item	Describe
RST_BTN	Reset button
PWR_BTN	Power button
COM 1	RJ45 COM-RS232
USB3_1	Double-layer USB-Type-A 3.2 port
PWR_LED1	LED indicator: Green light for power, Red light for hard disk
LAN 1-6	RJ45 Ethernet port for LAN/WAN
RJ45 Connectors	Link LED: Green and solid, indicating the network is connected
	Active LED: Orange flashing, indicating data transmission

Jumper Setting

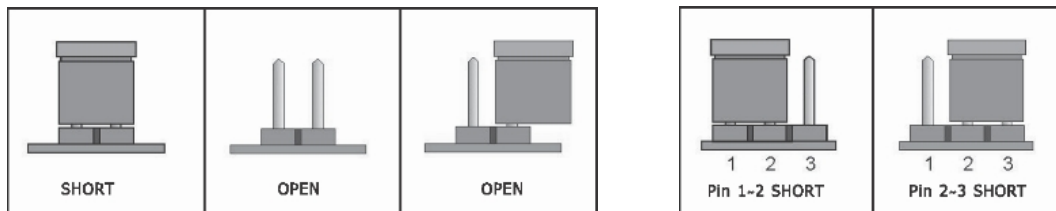
Before installing the hardware device, you can set the corresponding jumpers according to your needs based on the following table.

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.

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.



Restore on AC/Power Loss (AUTO_ON)

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

Motherboard Pin Definition

SATA Data

The motherboard provides 7-pin SATA data socket

Image	PIN	Definition	PIN	Definition
	1	GND	2	SATA_TXP
	3	SATA_TXN	4	GND
	5	SATA_RXN	6	SATA_RXP
	7	GND	/	/

SATA PWR

The motherboard provides 4-pin SATA power socket

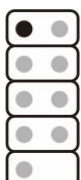
Image	PIN	Definition
	1	5V
	2	GND
	3	GND
	4	12V

Serial Port (COM)

The motherboard provides 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#

The motherboard provides COM pin (2*5-pin, 2.54mm pitch, 10th pin is empty)

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	/

USB Connectors Pins (F_USB 1,2,3)

Before connecting the USB expansion board, be sure to turn off the computer and unplug the power cord from the socket to avoid damaging the USB expansion board.

The motherboard provides F_USB pins (2*5-pin, 2.54mm pitch, 9th pin is empty)

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

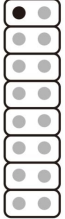
VGA Header (J_VGA)

The motherboard provides J_VGA pins (1*12-pin, 2.00mm pitch)

Image	PIN	Definition	PIN	Definition
	1	GND	2	VSynC
	3	HSynC	4	GND
	5	Red	6	GND
	7	Green	8	GND
	9	Blue	10	GND
	11	DCC_Data	12	DCC_Clk

HDMI Header (JHDMI)

The motherboard provides JHDMI pins (2*8-pin, 2.00mm pitch)

Image	PIN	Definition	PIN	Definition
	1	TMDS_TX2P	2	DCC_Clk
	3	TMDS_TX2N	4	DCC_Data
	5	TMDS_TX1P	6	N/A
	7	TMDS_TX1N	8	HPD_HDMI
	9	TMDS_TX0P	10	+5V
	11	TMDS_TX0N	12	GND
	13	TMDS_TXCP	14	GND
	15	TMDS_TXCN	16	GND

Cooling Fan Power Socket (SYS_FAN)

The motherboard provides 4-pin cooling fan connectors (1*4-pin, 2.54mm pitch)

Image	PIN	Definition
	1	GND
	2	+12V
	3	FAN_TAC
	4	FAN_PWM

Trusted Platform Module (TPM)

The motherboard provides TPM pin (2*7-pin, 2.00mm pitch, 14th pin is empty)

Image	PIN	Definition	PIN	Definition
	1	N/A	2	SPI_IRQ#
	3	PLTRST#	4	SPI_CS2#
	5	N/A	6	WP#
	7	+3.3V_SPI	8	GND
	9	N/A	10	SPI_CLK
	11	SPI_MISO	12	SPI_MOSI
	13	SPI_HOLD	14	/

Programmable Input And Output (J_GPIO)

The motherboard provides GPIO pins (2*5-pin, 2.54mm pitch)

Image	PIN	Definition	PIN	Definition
	1	GND	2	VCC
	3	GPIO 1	4	GPIO 5
	5	GPIO 2	6	GPIO 6
	7	GPIO 3	8	GPIO 7
	9	GPIO 4	10	GPIO 8

Power Socket (ATX powered)

The power socket allows the power supply to provide sufficient and stable power to all components on the motherboard. Before plugging into the power outlet, please make sure the power supply is turned off and all devices are installed correctly. The power socket has a fool-proof design, just confirm the correct direction and plug it in.

The motherboard provides ATX connector (2*2-pin):

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

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> + 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

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

Useful Links

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