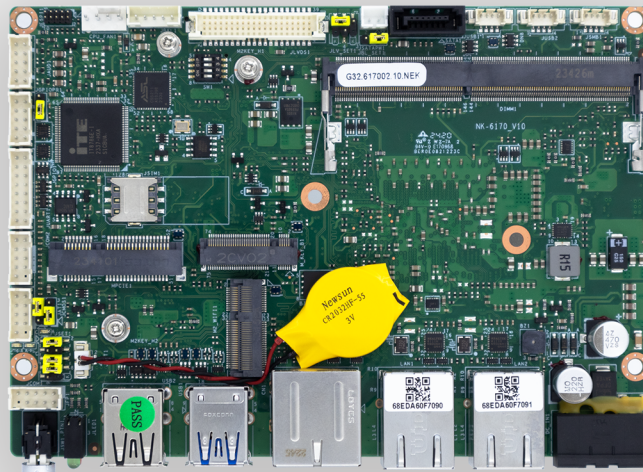




NK-6170

User Manual



Rich CPU platform options



DC-IN power protection



12-24V DC wide voltage design



Flexible optional accessories



LVDS and eDP Co-lay design



Wafer design ensures reliable wiring

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If you believe your product is defective, please follow these steps:

- Collect all information about the problem encountered (e.g., CPU frequency, Nodka products used, other hardware and software, etc.). Note any abnormalities and list any messages that appear on the screen when the problem occurs.
- Call your supplier and describe the problem. Please have your manual, product, and any useful information ready.
- If your product is diagnosed as defective, obtain return information from your supplier. This will allow us to process your return more quickly.
- Carefully package the defective product, complete warranty card, and a copy of the proof of purchase date (such as your sales receipt) in a transportable box. Products returned without proof of purchase date are not eligible for warranty service.

Technical Support and Service

- For the latest information and documentation on this product, please visit the official Nodka website at www.nodka.com.
 - If you need technical support, please contact your local distributor, sales representative, or customer service center. Before seeking technical consultation, please collect the following product information:
 - Product name and serial number
 - Description of peripheral devices
 - Description of user software (operating system, version, application software, etc.)
 - Complete description of the problem encountered
 - Complete content of any error messages
-

Safety Instructions

- Please read these safety instructions carefully.
 - Please keep this user manual for future reference.
 - Before cleaning the device with a damp cloth, unplug the power cord from the socket. Do not use liquid or spray cleaners to clean the device.
 - The power socket should be installed near the device for easy connection; avoid stepping on the power cord, especially at the plug, socket, or connection points on the device.
 - Do not use the device in a humid environment.
 - Do not place the device near heat sources such as radiators, heat registers, stoves, or other heat-producing devices (including amplifiers).
 - Before installation, ensure the device is placed on a stable surface. Accidental drops may cause damage to the device.
 - The openings on the device casing are for air convection to prevent overheating. Do not cover these openings.
 - When connecting the device to a power adapter, please follow the rated input voltage and current markings on the device. Do not use a power adapter that is not provided with the product or does not match the specifications. Due to differences in circuit design, using an incompatible power adapter may damage internal components.
 - Before connecting the device to a power socket, ensure the voltage of the power socket meets the requirements. Read, note, and follow all safety instructions to ensure proper and safe installation and connection of the device.
 - Place the power cord in a location where it is not easily tripped over, and do not cover the power cord with any objects.
 - Please pay attention to all warning labels on the device.
 - If the device is not used for a long time, disconnect it from the power socket to avoid damage from excessive voltage fluctuations.
 - Do not allow any liquid to enter the ventilation openings to prevent fire or short circuits.
 - Do not open the device by yourself; for your safety, please have the device opened by a certified engineer.
 - If any of the following situations occur, please have the device repaired by a professional:
 - The power cord or plug is damaged
 - Liquid has entered the device
 - The device has been exposed to a highly humid environment
 - The device is not functioning properly, or you cannot get it to work properly using the user manual
 - The device has been dropped or damaged
 - The device has obvious external damage
 - If the product is a display screen, do not apply excessive pressure to the screen, as this may cause permanent damage to the screen.
 - Do not place the device in an environment outside the recommended storage temperature range, i.e., below -40° C (40° F) or above 85° C (185° F), as this may damage the device.
 - Any unverified components may cause unexpected damage to the device. To ensure proper installation, only use the components provided in the accessory box, such as screws.
 - Note: The computer is equipped with a battery-powered real-time clock circuit. If the battery is replaced incorrectly, there is a risk of explosion. Therefore, only use the same type or equivalent battery recommended by the manufacturer for replacement. Please follow the manufacturer's instructions for disposing of old batteries.
 - Whenever performing hardware operations, be sure to completely disconnect the chassis power. When the device is powered on, do not change any connections or configurations to avoid damaging sensitive electronic components due to sudden power surges.
 - Avoid direct sunlight on the display screen and keep it away from strong light and other heat sources. Prolonged exposure to such environments may cause the display screen to fade and be damaged.
 - If consumers use a power adapter for charging, they should purchase a power adapter that is certified by CCC and meets standard requirements.
 - Warning: Operating this device in a residential environment may cause radio interference.
-

Warnings and Notes



- Warning to users: There are non-insulated dangerous voltages inside the product, which may cause electric shock.
- During operation, users must pay special attention to the warning information in this manual to avoid personal injury.
- Maintenance information is for authorized service personnel only. To reduce the risk of electric shock, do not perform any maintenance other than the provided operating information unless authorized.
- To reduce the risk of electric shock, do not disassemble the casing (or back). There are no user-serviceable parts inside the device. Please consult authorized service personnel for service information.

The notes in this manual help users avoid hardware damage or data loss. For example, if the battery is replaced incorrectly, there is a risk of explosion. Therefore, only use the same type or equivalent battery recommended by the manufacturer for replacement. Please follow the manufacturer's instructions for disposing of old batteries.



Maintenance Warnings

Warning: Maintenance information is for authorized service personnel only. To reduce the risk of electric shock, do not perform any maintenance other than the provided operating information unless authorized.

Warning: To reduce the risk of electric shock, do not disassemble the casing (or back). There are no user-serviceable parts inside the device. Please consult authorized service personnel for service information.

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Chapter 1: Product Introduction

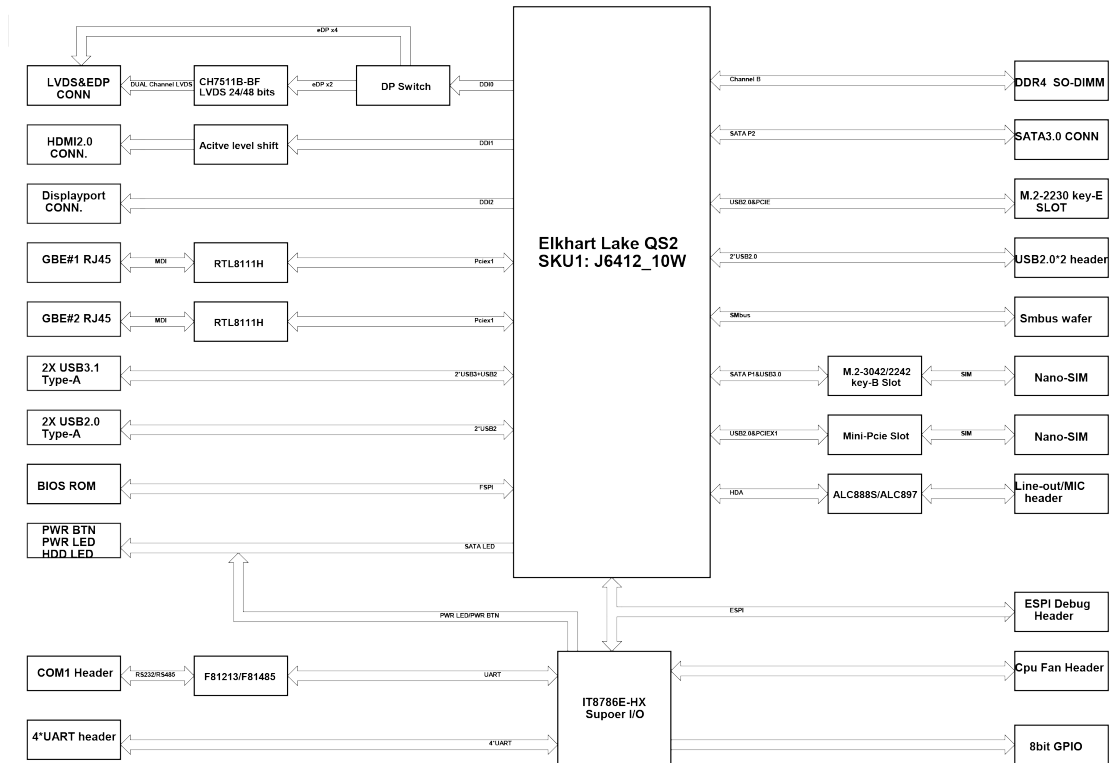
1.1 Product Overview

The 3.5-inch embedded motherboard is specifically designed for various embedded applications and system integration customers. The NK-6170 features an Intel Celeron J6412 quad-core processor, supports up to 32GB of single-channel SO-DIMM memory (Non-ECC), and offers rich I/O interfaces including 2 LAN ports, 6 USB ports, 2 COM ports, and 4 TTL ports. It also includes built-in mini PCIe, M.2-2230, and M.2-2242/3042 interfaces, allowing for flexible expansion modules based on customer needs. It supports dual displays via HDMI, DP, and LVDS/eDP, and features a 12~24V wide voltage design, making it suitable for automation, machine vision, and industrial control applications.

1.2 Product Specifications

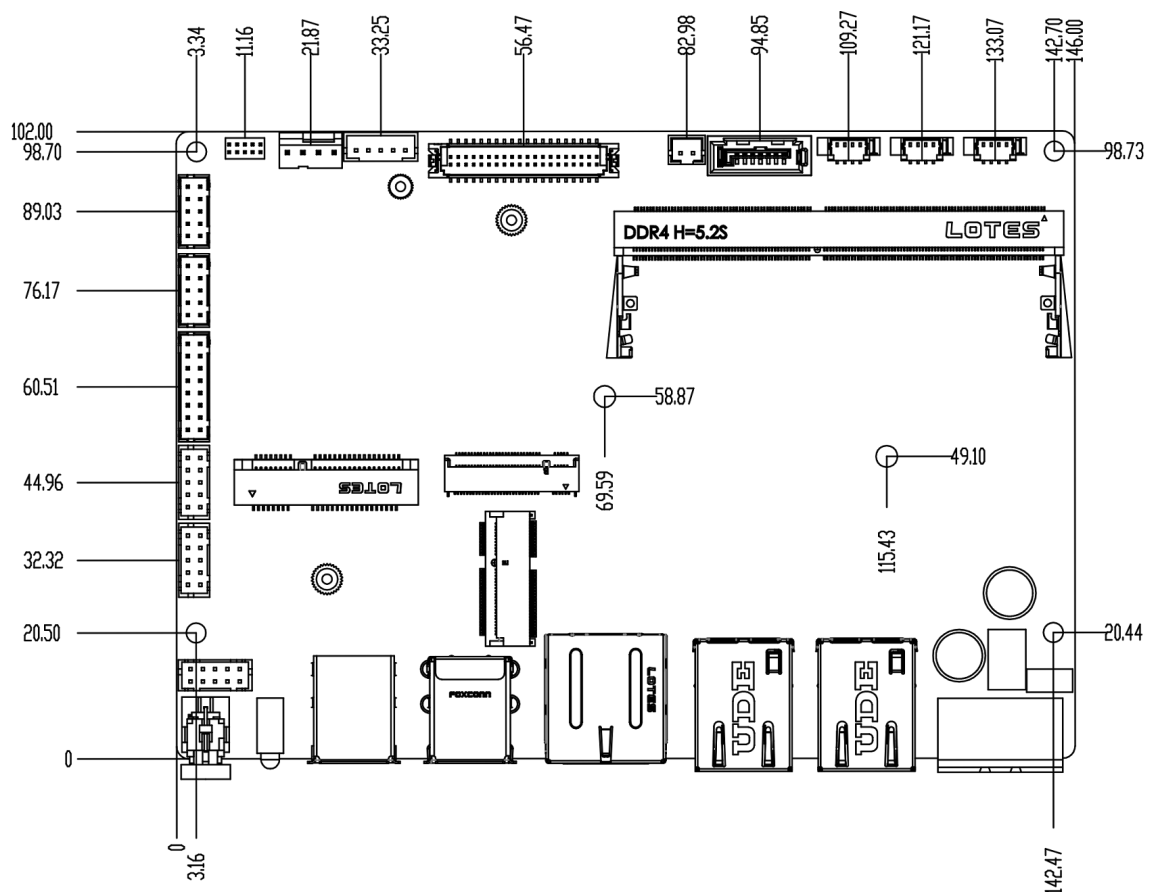
Item		Parameter
Processor System	CPU	Intel® Celeron® J6412 processor (2.0GHz, up to 2.6GHz), TDP 10W
	Chipset	Intel® SoC integrated
	BIOS	AMI 256Mb UEFI BIOS
Memory	Technology	Single Channel(Non-ECC) DDR4 3200MHz, up to 32GB
	Slot	1 x DDR4 SO-DIMM slot
Storage	SATA	1 x SATA3.0 port
	M.2	1 x M.2-2242 B Key SSD slot(SATA3.0)
Graphic	Controller	Intel® UHD graphics integrated
Audio	Codec	Realtek ALC897 codec
Rear I/O	Display	1 x DP1.4, resolution up to 4096x2160@60Hz
		1 x HDMI, resolution up to 4096 x 2160@30Hz
	Ethernet	2 x GbE(RJ45), Realtek 8111H controller
	USB	2 x USB3.2(10Gbps), 2 x USB2.0(480Mbps)
	Button	1 x Power Button(White for power on,Blink for sleep mode,Off for power off)
Internal I/O	Indicators	1 x SATA LED(Red), 1 x Power LED(Green)
	Display	1 x LVDS, dual channel 18/24bit, resolution up to 1920x1200@60Hz
		1 x eDP1.3, resolution up to 4096x2160@60Hz(share connector with LVDS)
	Audio	1 x Audio wafer(Mic-in/Line-out, 2*5pin)
	USB	2 x USB2.0 wafer(1*4pin)
	Serial Port	1 x RS232/RS485 wafer(2*5pin), 1 x RS232 wafer(2*5pin), 4 x TTL wafer(2*8pin)
	Fan	1 x Smart Fan wafer(1*4pin)
	SMbus	1 x SMBus wafer(1*4pin)
	eSPI	1 x eSPI header for debug
	GPIO	1 x 8bit GPIO(2*5pin)
Expansion Slots	M.2 slot	1 x M.2-3042 B Key slot with Nano-SIM socket for 5G module (USB3.0 Signal, share connector with M.2-2242)
		1 x M.2-2230 E key slot for wifi module(PCIe/USB2.0)
	Mini-PCIe slot	1 x Mini-PCIe slot with Nano-SIM socket
Security	TPM	fTPM2.0 supported
Watchdog Timer	Output&Interval	System reset, programmable from 1~255 seconds
Power	Type	12~24V DC input, +/-10% tolerance
	Interface	1 x 2-pin phoenix terminal block
	Power Consumption	16.3W(Idle mode), 17.5(Typical mode)
O.S Support	MS Windows	Windows10/11
	Linux	Linux
Mechanism	Dimensions	(L)146mm x (W)102mm
	Gross Weight	0.14kg
Environment	Temperature	Operating: -10°C ~60°C with SSD
		Storage: -40°C ~85°C
	Humidity	5~95% (Non-condensing)
	Vibration	5~500Hz, 3Grms operating

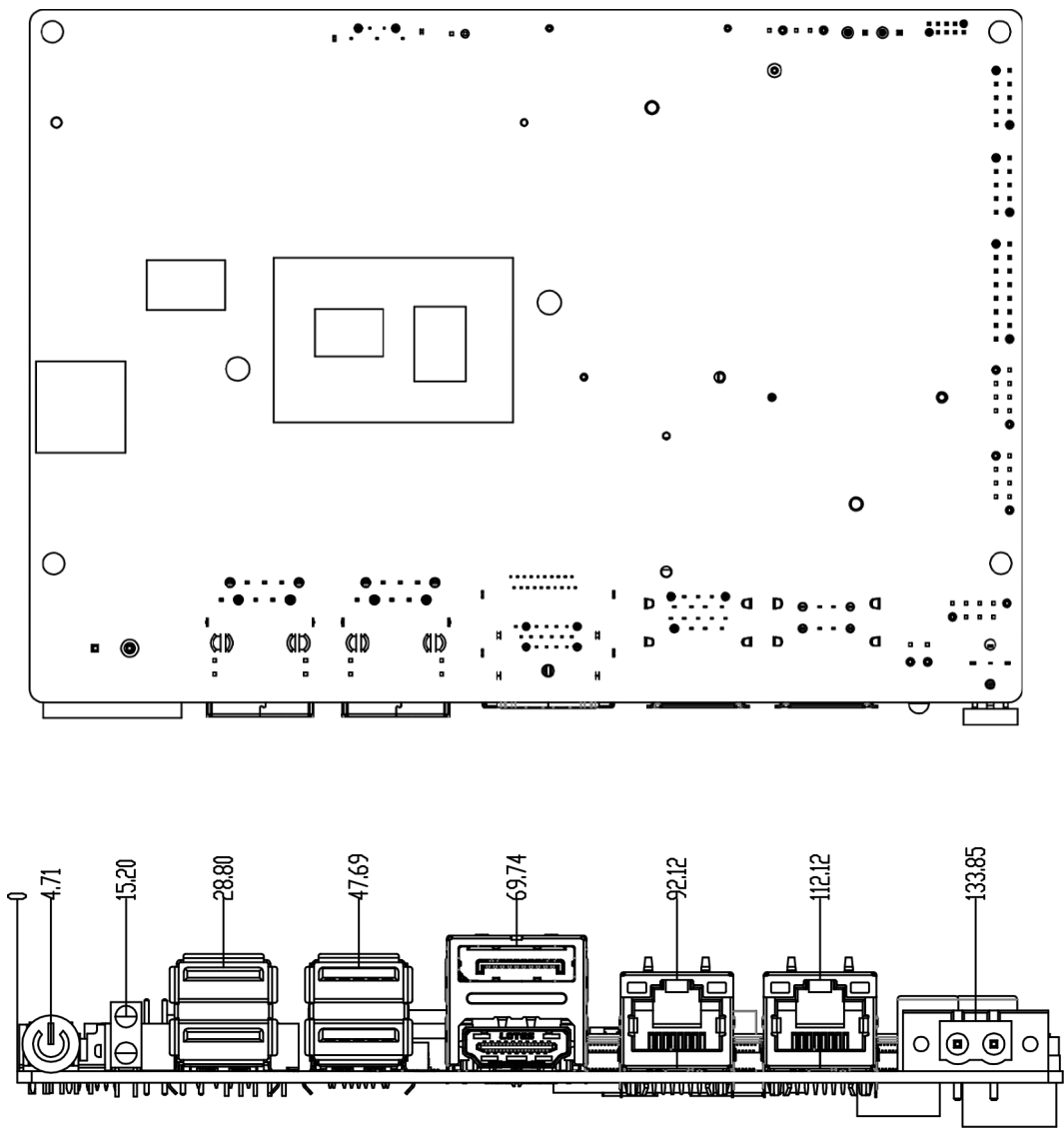
1.3 Block Diagram



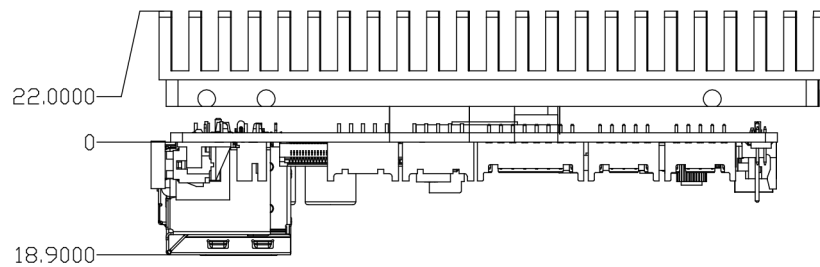
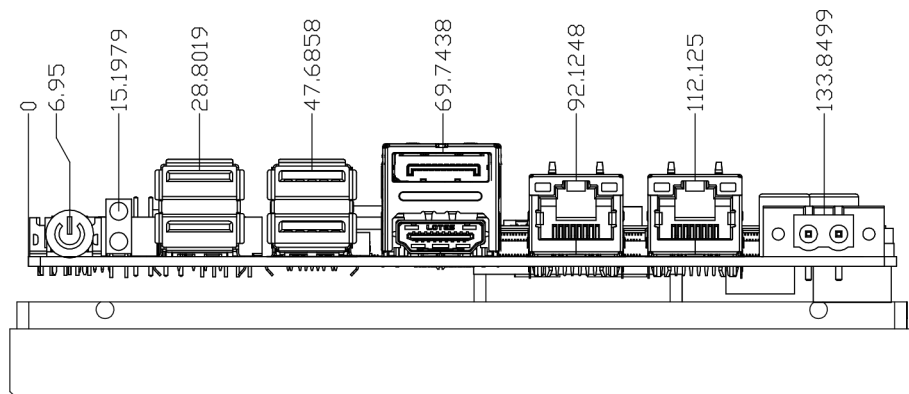
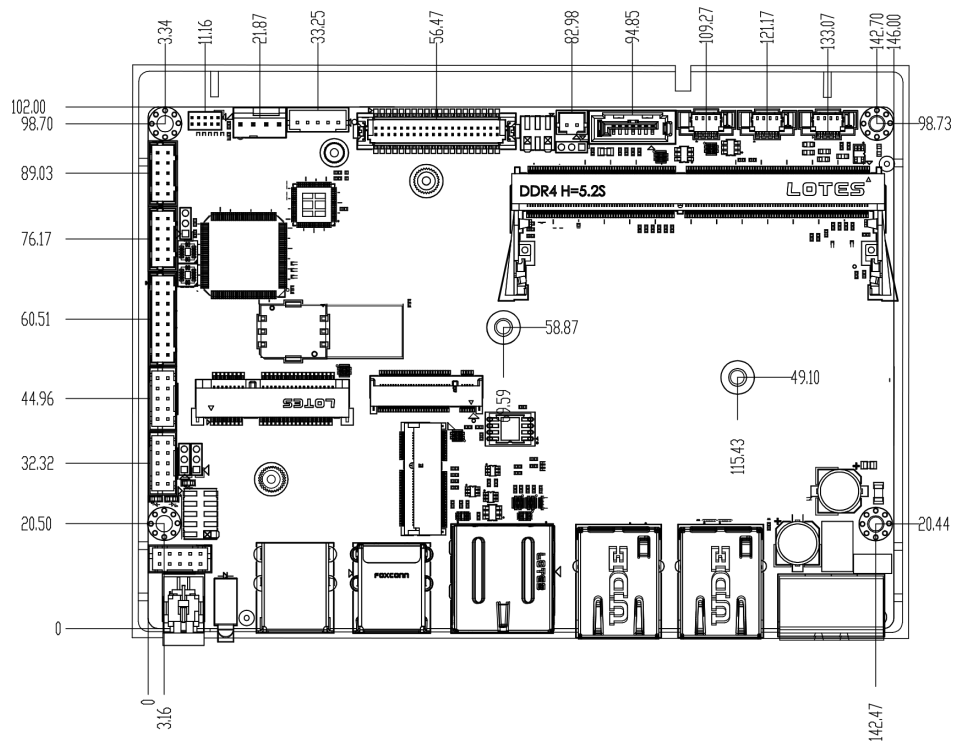
1.4 Structural Diagram

1.4.1 Motherboard Dimensions





1.4.2 Heat Sink Dimensions



1.5 Package Contents

1.5.1 Ordering Information

Part No.	Model	Description
F32.617005.10.NEK	NK-6170	3.5", Elkhart Lake, J6412, DDR4 SO-DIMM, M.2-2242(SATA3.0), Standard, compose, 2*COM Cable, 1*SATA Cable

1.5.2 Package Contents

Part No.	Qty	Description
KF0.001140.00.L54	2	COM Cable,2*5pin wafer to DB9 cable, length=250mm
KF0.001049.00.L54	1	SATA Cable,signal and power cable, length=150mm
JF7.000041.00.D03	1	2-pin terminal block,pitch 5.08mm

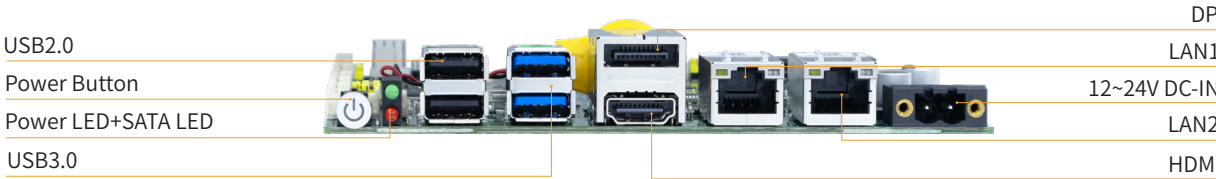
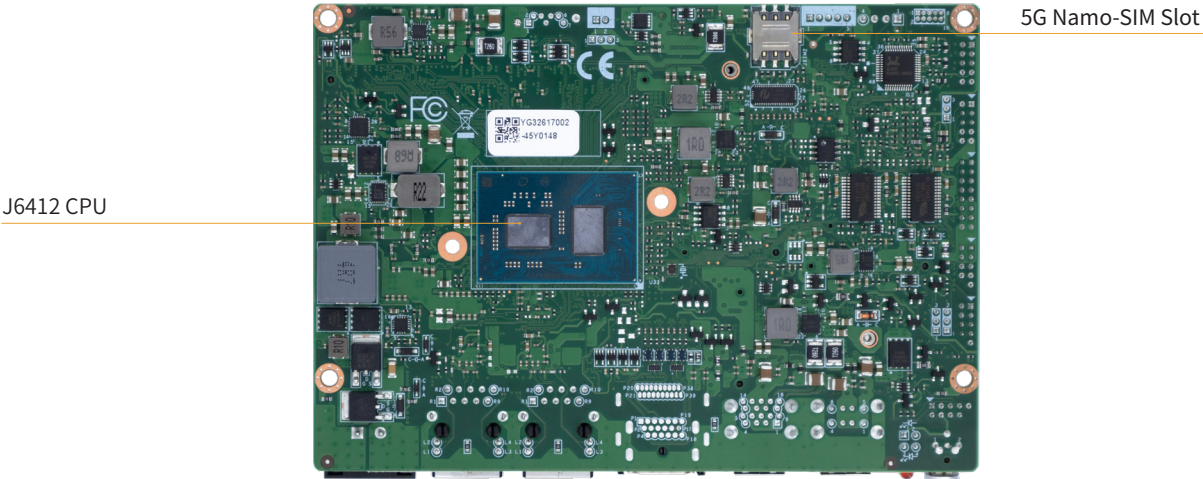
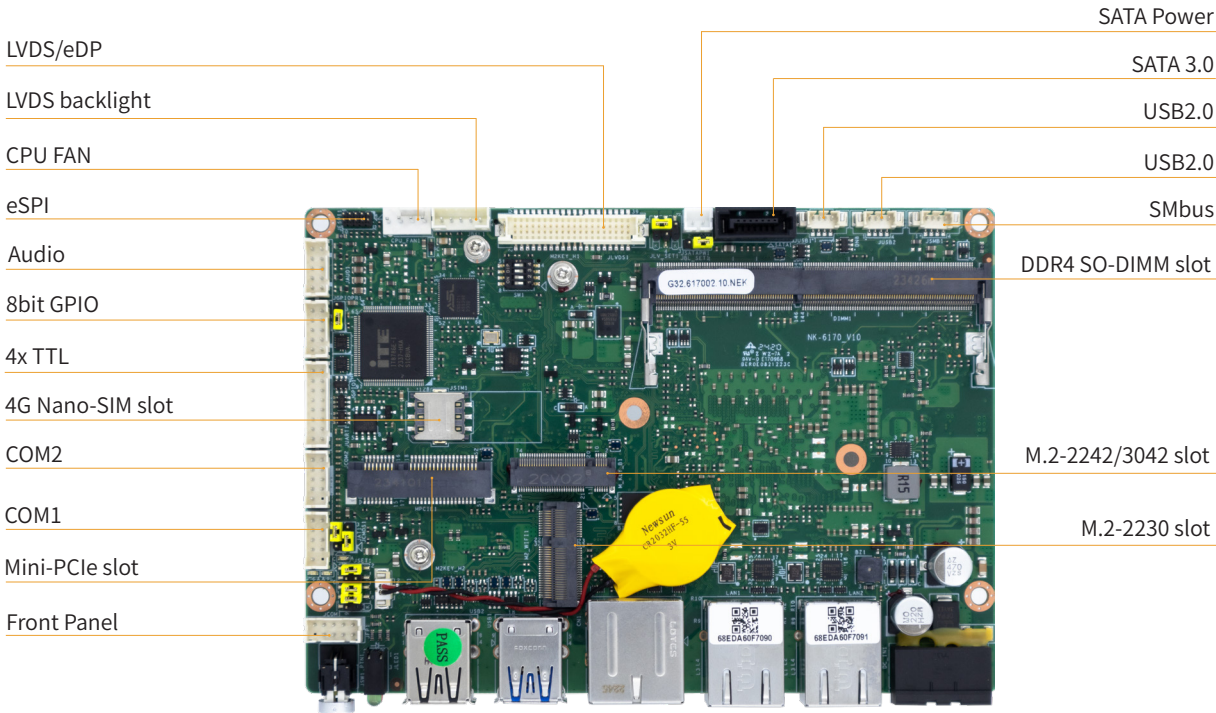
1.5.3 Optional Accessories

Part No.	Description
C2Z.617001.0A.NDJ	Heatsink for NK-6170
C3Z.NKEB01.10.NDJ	AEB-4COM00, 2 x RS485/422/232(DB9) ,2 x RS232 wafer I/O expansion kit
C3Z.000001.00.NDJ	CM-060W-CWT0, 12V/60W adapter, 180cm power cord
C3Z.000002.00.NDJ	CM-090W-HKA, 12V/84W adapter, 180cm power cord
KF0.001140.00.L54	COM Cable,2*5pin wafer to DB9 cable, length=250mm
KF0.001047.00.L54	USB cable, 1*4pin wafer to USB2.0 type-A cable, length=150mm
KF0.000949.00.Y09	Audio Cable, 2*5pin wafer to Mic-in/Line-out cable, length=300mm

Chapter 2: Interfaces and Jumpers

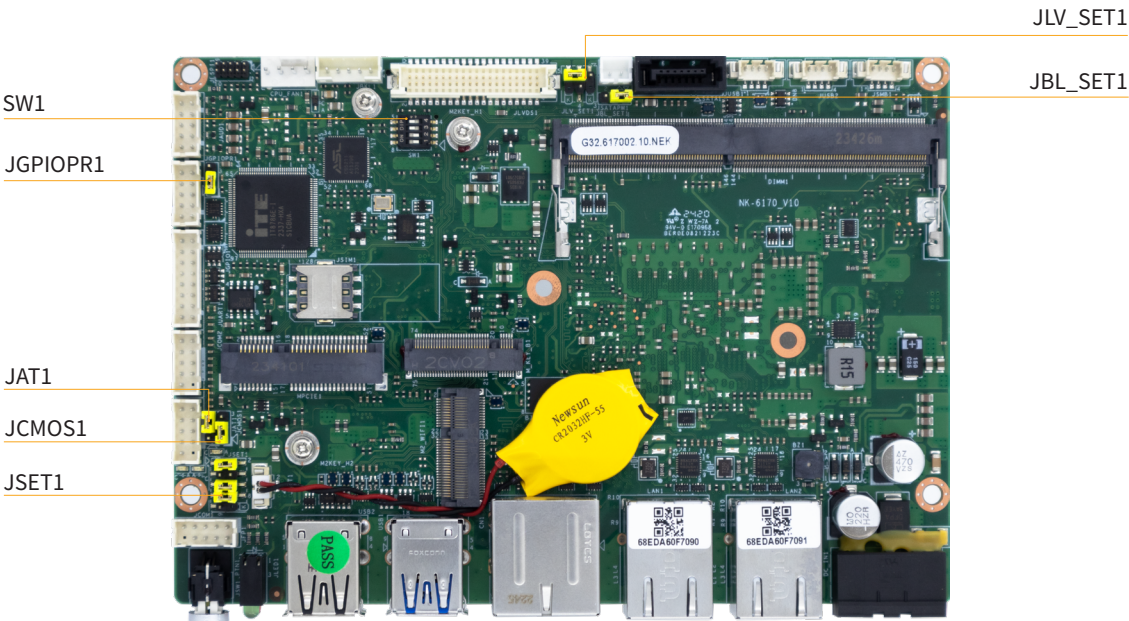
2.1 Interface Overview

The motherboard's interfaces are divided into internal interfaces and rear I/O interfaces. Internal interfaces need to be connected to the device via cables, while rear I/O interfaces can be directly connected to the device to achieve corresponding functions. The interface locations are shown below:



2.2 Jumper Overview

Jumpers are used to close circuits. They consist of a metal bridge with two pins and a small metal clip. To "close" a jumper, connect the pins with the jumper. To "open" a jumper, remove the jumper from the pins. Some jumpers have three pins labeled 1, 2, and 3. In this case, connect pins 1-2 or 2-3 with the jumper. The jumper locations are shown below:



2.3 Interface and Jumper Functions

2.3.1 Power button

The rear I/O interface includes a button with a white indicator light. The button can be used to power on, sleep, or power off the motherboard. The indicator light status is as follows:

Power button Function	
Indicator Light Status	Indicator Function
White On	Power on or running state
White Blinking	Sleep mode
White Off	Power off or standby state

2.3.2 JAT1

The motherboard supports ATX and AT power-on modes. ATX is the default mode, where the system starts by pressing the power button. AT mode allows the system to power on automatically when power is connected. JAT1 is the jumper for selecting between AT and ATX modes. The hardware settings for auto power-on are as follows:

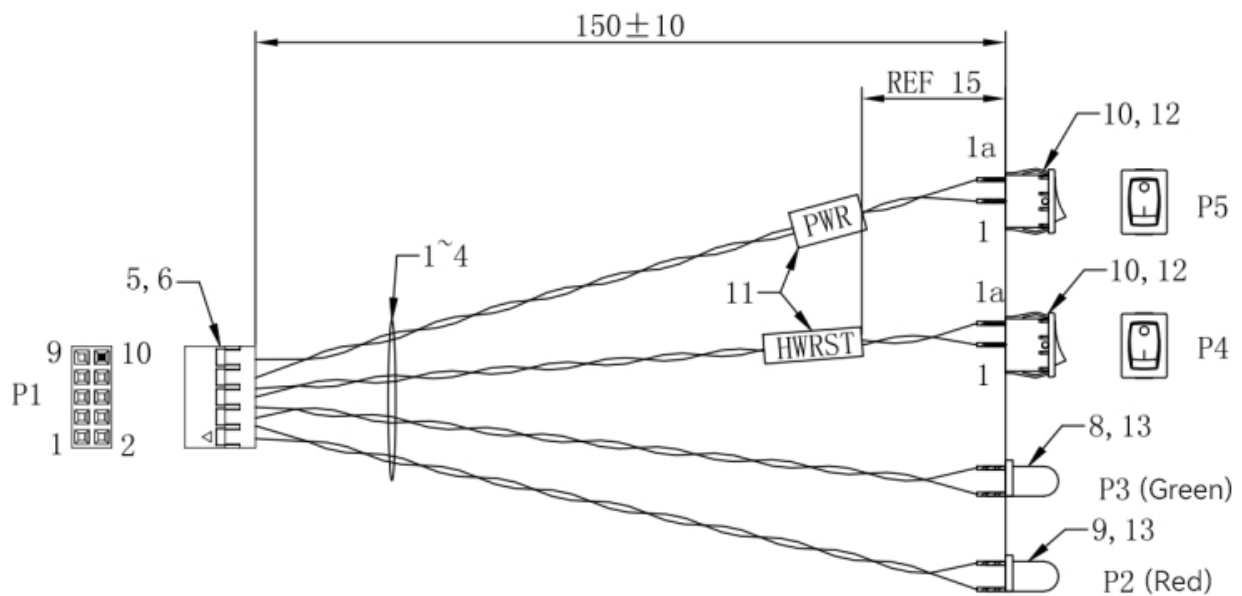
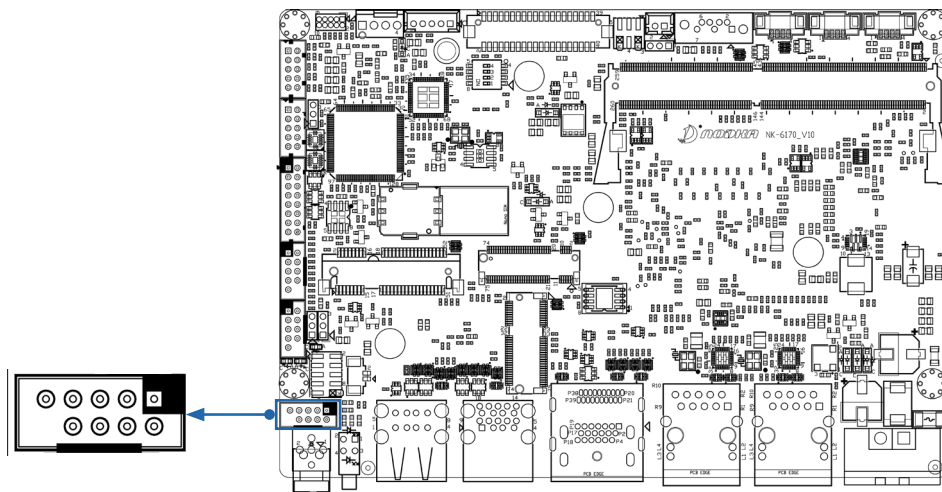
JAT1 Jump Settings	
Setting	Function
1-2 Short	AT mode, auto power-on
2-3 Short	ATX mode, power-on by button (default)

2.3.3 JFP1

JFP1 is a built-in 2*5pin wafer interface with a pitch of 2mm. It provides signals for power, reset, HDD LED, and power LED. It can be connected to an external panel via cables. The pin definitions and cable diagrams are as follows:

JFP1 Pin Definitions

Pin	Pin Name	Pin	Pin Name
1	SATA_LED+	2	PWR_LED+
3	SATA_LED-	4	PWR_LED-
5	GND	6	GND
7	HWRST_N	8	PWER_SW_N
9	N/C		



2.3.4 Status Indicators

The motherboard has two status indicators: a green power LED and a red HDD LED. The functions are as follows:

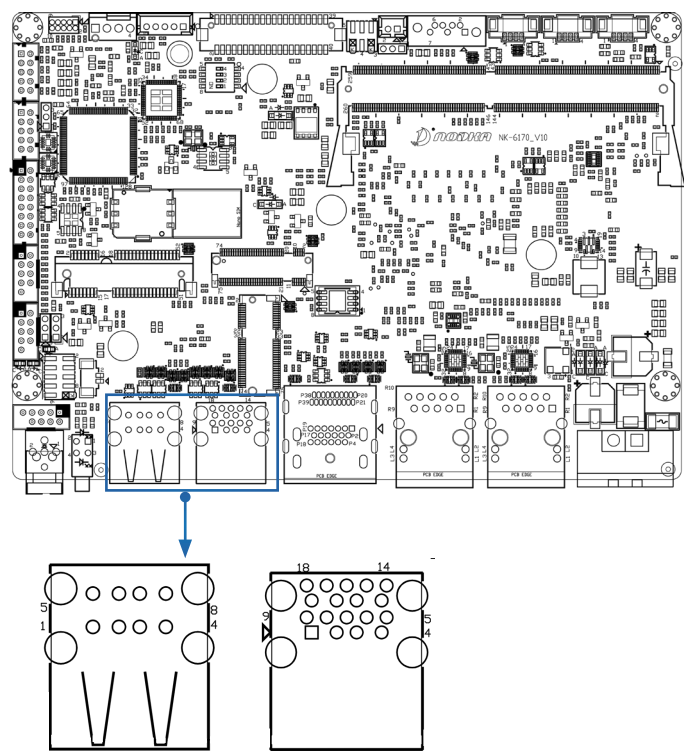
Indicator Function	
Indicator Light Status	Indicator Function
Green Power LED On	Power on or running state
Green Power LED Blinking	Sleep mode
Green Power LED Off	Power off or standby state
Red HDD LED Blinking	SSD reading or writing data
Red HDD LED Off	SSD not reading or writing data

2.3.5 USB Interfaces

USB is an external bus standard that regulates the connection and communication between computers and external devices. It offers fast transmission speeds, ease of use, hot-plugging, flexible connections, and independent power supply. It can connect various peripherals such as mice, keyboards, USB drives, and cameras.

The motherboard has a total of 6 USB ports, including 2 USB3.0 and 2 USB2.0 ports on the rear I/O, and 2 USB2.0 ports internally. The internal wafer interfaces can be converted to standard Type-A interfaces via cables. The functions are as follows:

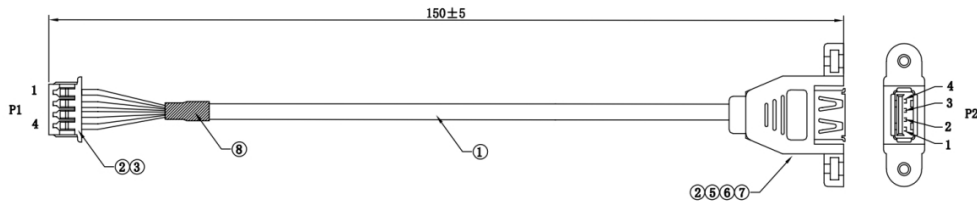
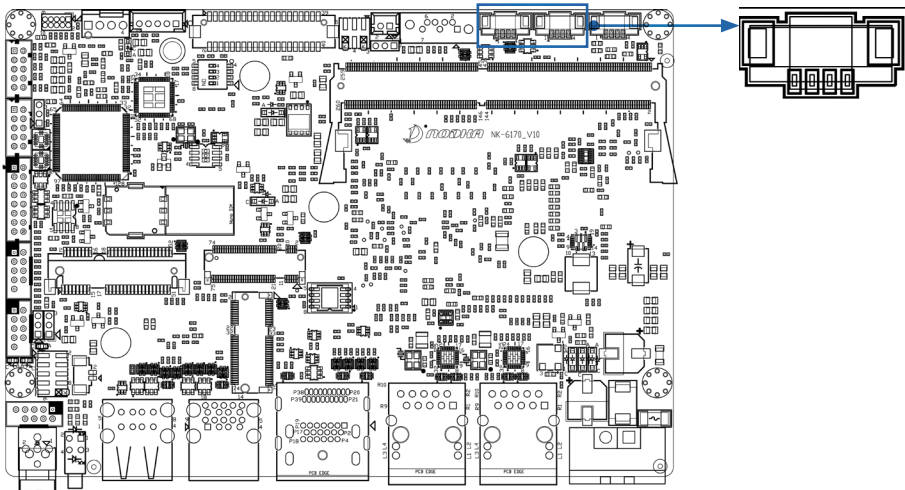
USB2.0/3.0 Function		
USB Version	Theoretical Maximum Speed	Maximum Voltage/Current
USB3.0	5Gbps	5V/1300mA
USB2.0	480Mbps	5V/1300mA



2.3.5.1 JUSB1/JUSB2

JUSB1 and JUSB2 are built-in 1*4pin wafer interfaces with a pitch of 1.25mm. They can be connected to USB2.0 Type-A interfaces via cables. The pin definitions and cable diagrams are as follows:

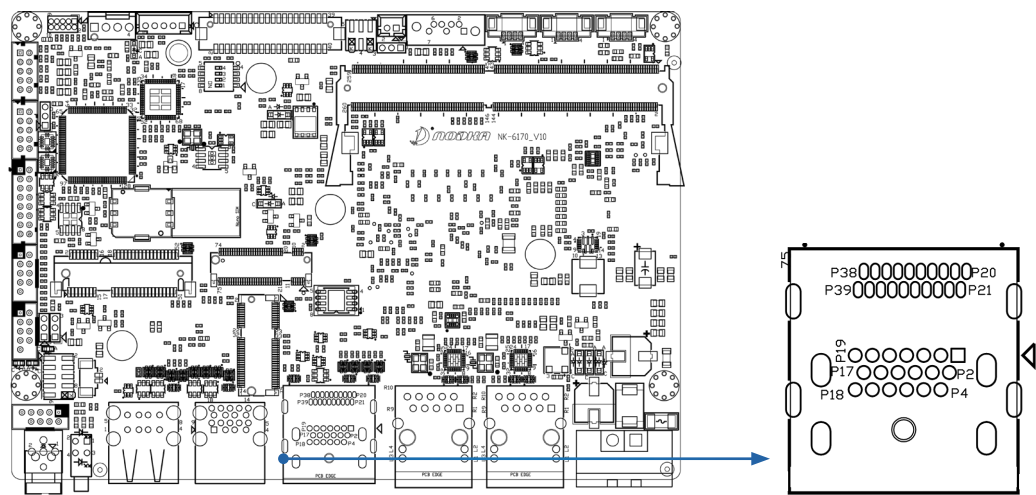
JUSB1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	PVCC5_ JUSB20_X	2	D-
3	D+	4	GND



2.3.6 Display Interfaces

The motherboard includes multiple video interfaces, including DP, HDMI, and LVDS/eDP for dual display. These interfaces use various video protocols to convert the computer's video output signal into a signal suitable for display on a monitor. The DP and HDMI functions are as follows:

DP/HDMI Function		
Display Interface	Signal Type	Maximum Resolution
DP	Digital Signal	2560x1600@60Hz
HDMI	Digital Signal	1920x1080@60Hz



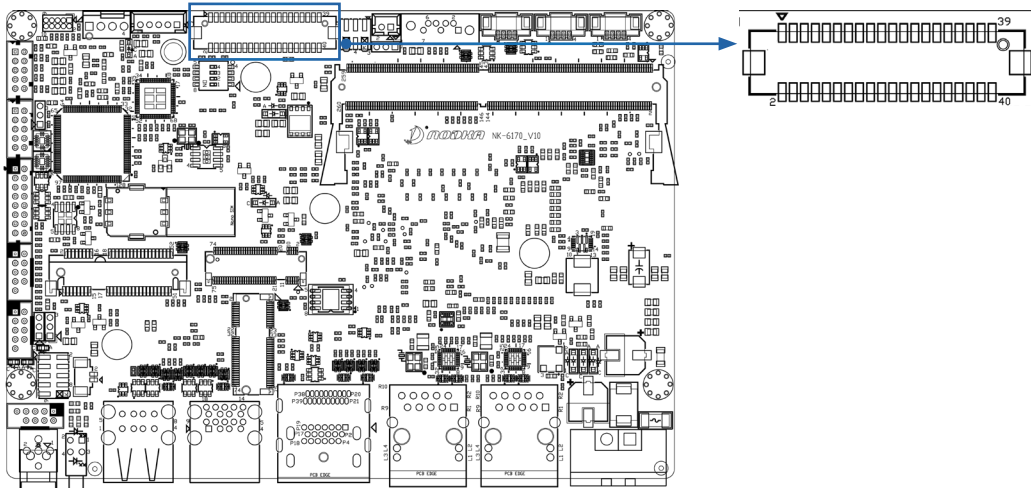
2.3.6.1 JLVDS1

JLVDS1 is a built-in LVDS/eDP multiplex interface. It supports both LVDS and eDP protocols, typically used to connect LCD screens to electronic devices or computer systems for transmitting image and video data. Users can choose the corresponding interface based on the LCD screen's interface type and create a display cable to connect to the LCD screen. The LCD screen's driving voltage can be set to 3.3V, 5V, or 12V (default) via JLV_SET1. The LVDS/eDP pin definitions and JLV_SET1 LCD driving voltage jumper settings are as follows:

- Dual-channel 18/24bit LVDS, supports up to 1920x1200@60Hz resolution
- eDP1.3 interface, supports up to 2560x1600@60Hz resolution

LVDS / eDP Pin Definitions							
LVDS				eDP			
Pin	Pin Name	Pin	Pin Name	Pin	Pin Name	Pin	Pin Name
1	GND	2	N/C	1	N/C	2	N/C
3	CLK1P	4	CLK2N	3	N/C	4	N/C
5	CLK1N	6	CLK2P	5	N/C	6	N/C
7	A0P	8	GND	7	N/C	8	GND
9	A0N	10	B0P	9	N/C	10	N/C
11	A1P	12	B0N	11	N/C	12	N/C
13	A1N	14	B1P	13	N/C	14	N/C
15	A2P	16	B1N	15	N/C	16	N/C
17	A2N	18	B2P	17	N/C	18	N/C
19	A3P	20	B2N	19	N/C	20	N/C
21	A3N	22	B3P	21	N/C	22	N/C
23	GND	24	B3N	23	GND	24	N/C
25	PANEL_DET	26	VCC_LCD	25	PANEL_DET	26	VCC_LCD
27	N/C	28	VCC_LCD	27	EDP1_AUX_DN	28	VCC_LCD
29	N/C	30	GND	29	EDP1_AUX_DP	30	GND
31	N/C	32	N/C	31	EDP1_TXP3	32	EDP1_TXP1
33	N/C	34	N/C	33	EDP1_TXN3	34	EDP1_TXN1
35	N/C	36	N/C	35	EDP1_TXP2	36	EDP1_TXP0
37	N/C	38	N/C	37	EDP1_TXN2	38	EDP1_TXN0
39	GND	40	N/C	39	GND	40	EDP1_HPD

Note: For LVDS screens, pin 25 (PANEL_DET) should be grounded; for eDP screens, pin 25 (PANEL_DET) should be left floating.



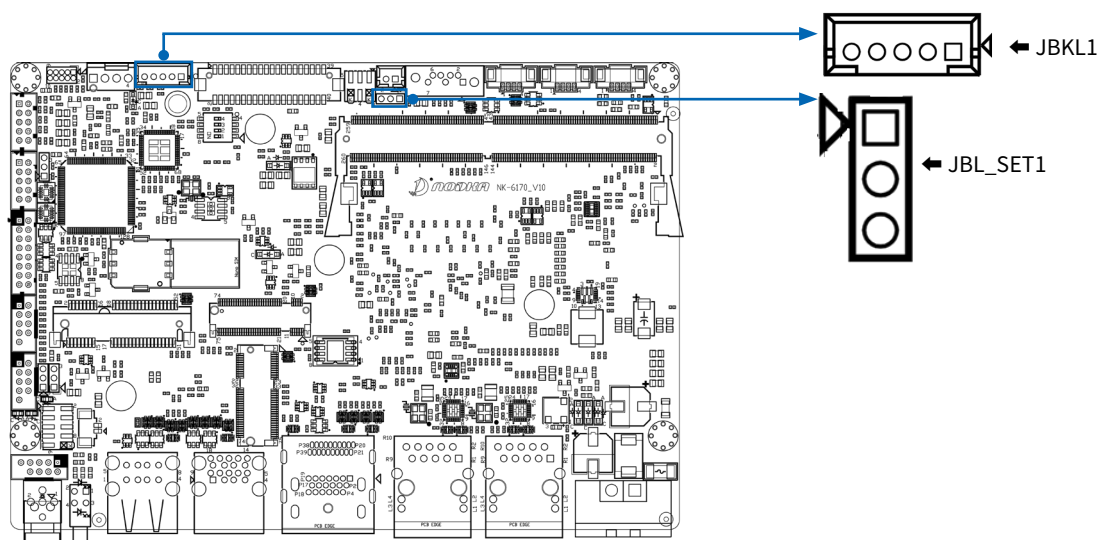
JLV_SET1 Jump Settings	
Setting	Function
1-3 Short	Set LCD driving voltage to 5V@1.5A
3-4 Short	Set LCD driving voltage to 12V@1.5A
3-5 Short	Set LCD driving voltage to 3.3V @1.5A(default)

2.3.6.2 JBKL1 & JBL_SET1

JBKL1 is a built-in LVDS backlight interface that provides power to the LCD screen's backlight module. Users can choose the corresponding interface based on the LCD screen's interface type and create a backlight cable. The backlight driving voltage can be set to 5V or 12V (default) via JBL_SET1. The JBKL1 pin definitions and JBL_SET1 backlight driving voltage jumper settings are as follows:

JBKL1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	VCC_BKL	2	GND
3	LCD_BL_EN	4	BKL_CONTROL
5	GND		

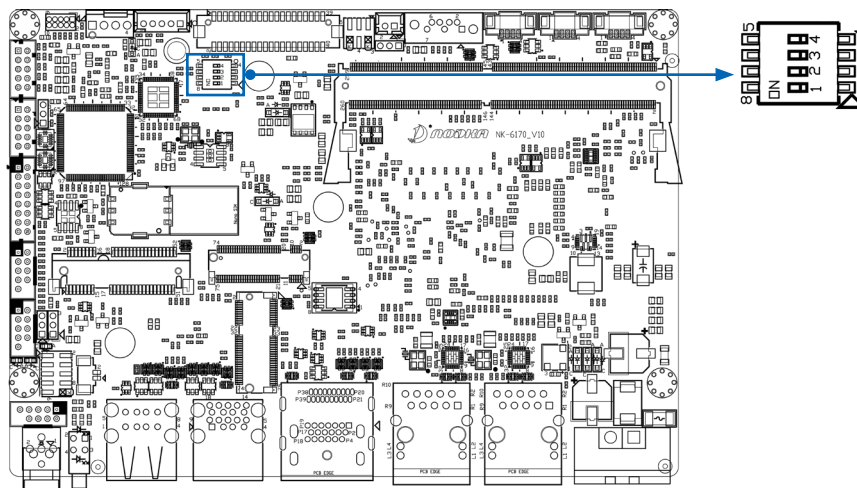
JBL_SET1 Jump Settings	
Setting	Function
1-2 Short	Set backlight voltage to 12V@1.5A (default)
2-3 Short	Set backlight voltage to 5V@1.5A



2.3.6.3 SW1 DIP Switch

SW1 is a DIP switch for setting the LVDS resolution. It uses a 4-bit DIP switch to configure the display resolution. Each switch can be set to 0 or 1, providing 16 different combinations corresponding to 16 different display resolutions. By changing the DIP switch settings, users can select the appropriate display resolution for specific application needs. The SW1 function settings are as follows:

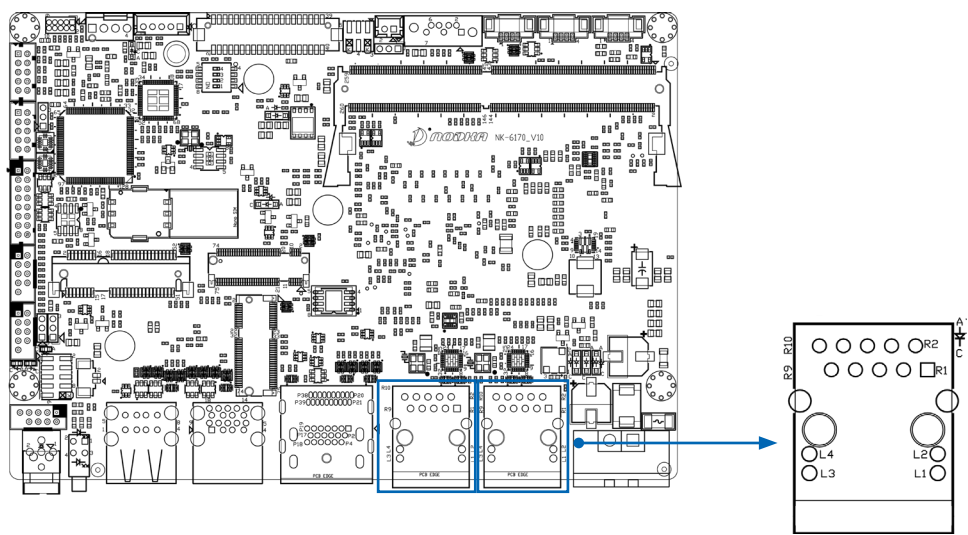
SW1 Function Settings			
Switch 1-4 (Left to Right)	Resolution	Port	Color Depth
0000	1280 X 800	24bit	single
0001	800 X 600	24bit	single
0010	1024 x 600	24bit	single
0011	1024 X 768	24bit	single
0100	1280 x 720	24bit	single
0101	800 X 480	24bit	single
0110	1366 X 768	24bit	single
0111	1440 X 900	24bit	dual
1001	1366 x 768	24bit	dual
1000	1440 X 900	24bit	dual
1010	1280 X 1024	24bit	dual
1011	1400 X 1050	24bit	dual
1100	1600 X 900	24bit	dual
1101	1680 X 1050	24bit	dual
1110	1600 X 1200	24bit	dual
1111	1920 X 1080	24bit	dual



2.3.7 Network Ports

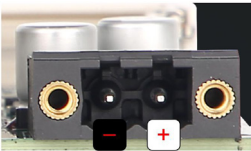
The network port is primarily used for sending and receiving data, enabling communication between the device and the computer network. Common network ports include 10M (10Mbps), 100M (100Mbps), and 1000M (1Gbps) based on transmission speed. The motherboard supports 2 Gigabit Ethernet ports and Wake-on-LAN (WoL) functionality. The network indicator status is as follows:

Network Indicator Status		
Indicator	Indicator Status	Indicator Function
Signal Indicator L	Yellow On	Network connected
	Yellow Blinking	Data transmission
	Off	Connection error or not connected
Status Indicator R	Orange On	1000Mbps
	Green On	100Mbps
	Off	10Mbps



2.3.8 Power Interface

The 12-24V DC-IN power input interface uses a 2-pin lockable Phoenix terminal connector, effectively preventing accidental disconnection and greatly improving power connection stability. The DC-IN interface pin definitions are as follows:



DC-IN 1 Pin Definitions	
Interface Label	Interface Function
+	12-24V
-	GND

 **When connecting the power supply, please ensure the "+" and "-" of the power supply match the "+" and "-" on the motherboard to avoid reverse connection, which may prevent the motherboard from powering on or even damage it.**

2.3.9 COM Interfaces

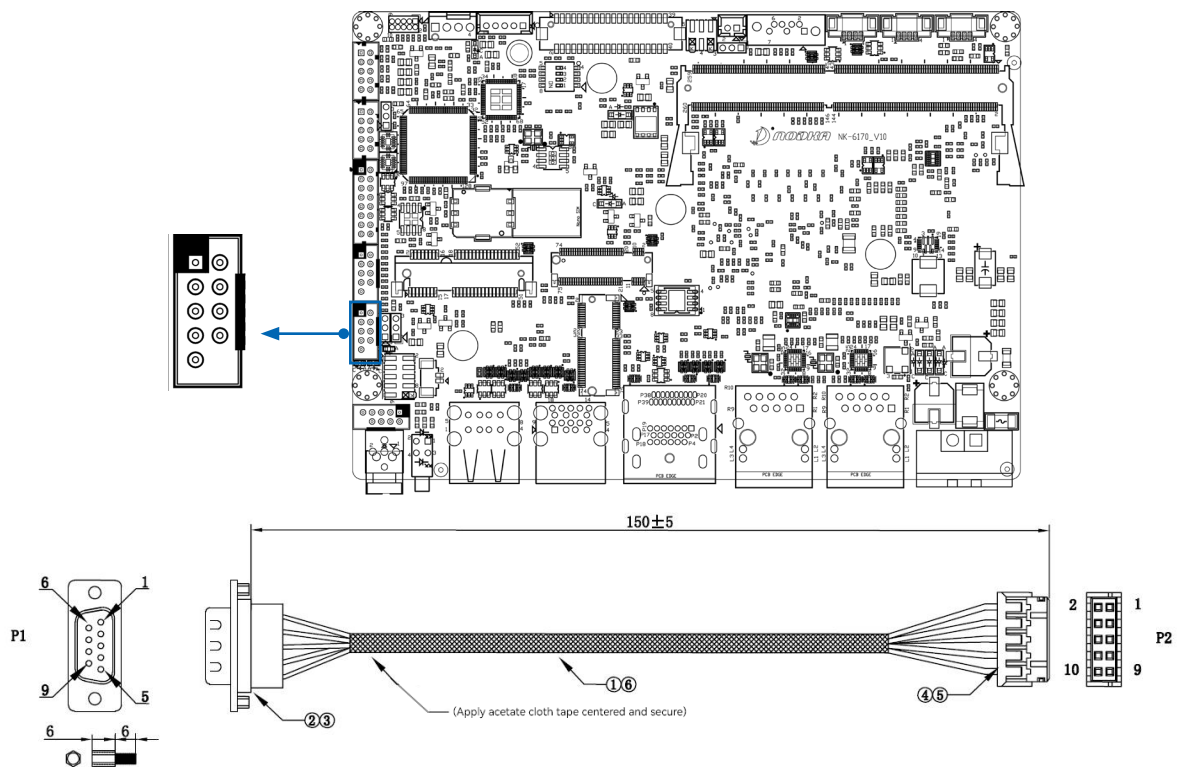
COM (Communication Port) is a serial communication interface on a computer that can use different serial communication protocols such as RS-232, RS-422, and RS-485. These protocols define data transmission rules, voltage, and signal characteristics to ensure reliable data transmission between COM ports.

2.3.9.1 JCOM1

JCOM1 is a built-in 2*5pin wafer interface with a pitch of 2mm. It can be connected to a 9-pin serial port via cables. It supports Wake-on-Ring functionality by default and can operate in RS485 or RS232 mode (default). The mode can be switched via JSET1 and BIOS settings. The COM pin definitions and mode settings are as follows:

JCOM1 Pin Definitions			
RS232		RS485	
Pin	Pin Name	Pin	Pin Name
1	COM_DCD#	1	D-
2	COM_DSR#	2	N/C
3	COM_SIN	3	D+
4	COM_RTS#	4	N/C
5	COM_SOUT	5	N/C
6	COM_CTS#	6	N/C
7	COM_DTR#	7	N/C
8	COM_RI#	8	N/C
9	GND	9	GND

JSET1 Serial Mode Settings	
Setting	Function
1-3, 4-6, 7-9 Short	Set RS485 mode
1-2, 5-6, 7-8 Short	Set RS232 mode



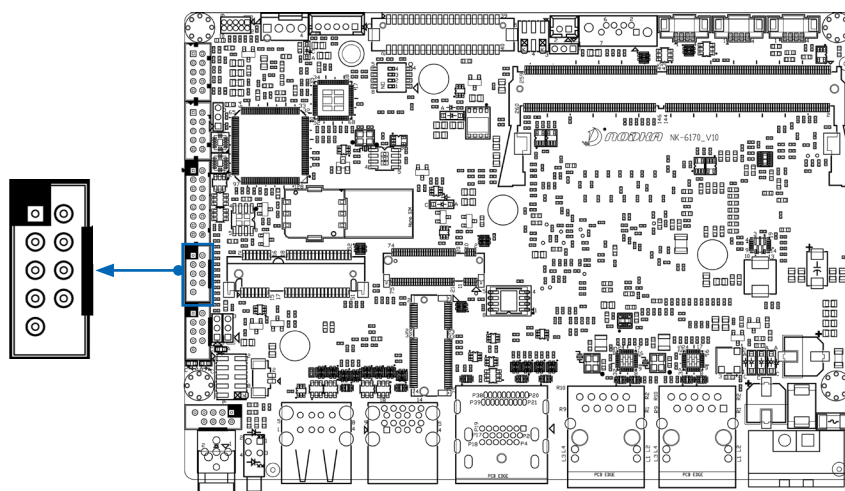
(Each finished product (1 pc) is equipped with two studs)

2.3.9.2 JCOM2

JCOM2 is a built-in 2*5pin wafer interface with a pitch of 2mm. It can be connected to a 9-pin COM port via cables. It supports Wake-on-Ring functionality by default and only supports RS232 mode. The pin definitions and cable diagrams are as follows:

JCOM2 Pin Definitions

Pin	Pin Name	Pin	Pin Name
1	COM_DCD#	2	COM_DSR#
3	COM_SIN	4	COM_RTS#
5	COM_SOUT	6	COM_CTS#
7	COM_DTR#	8	COM_RI#
9	GND		

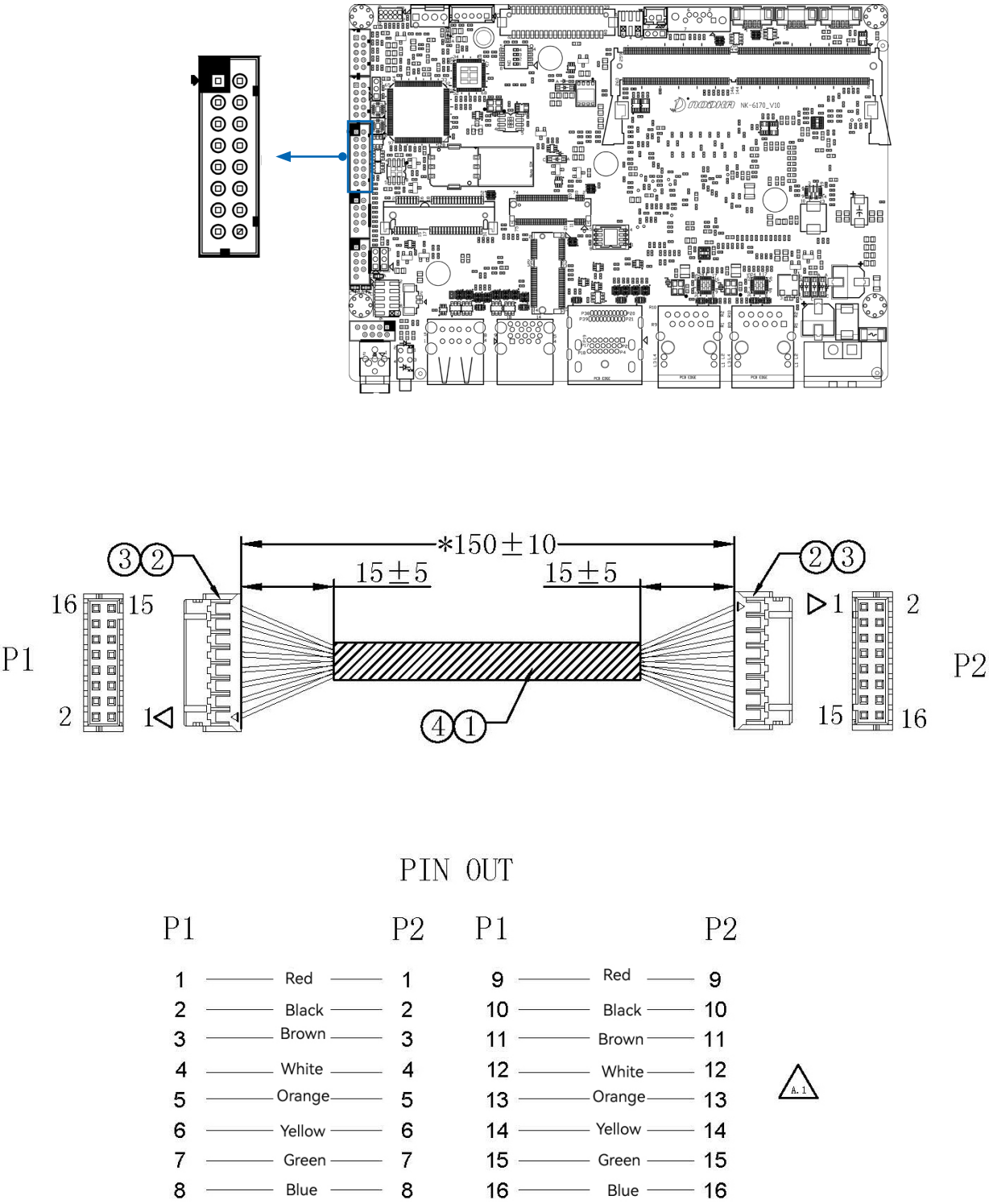


2.3.9.3 JUART1

JUART1 is a built-in 2*8pin wafer interface with a pitch of 2mm. It can be connected to a serial port expansion card (AEB-4COM00) to flexibly expand multiple serial ports (RS485/RS422/RS232), supporting up to 4 serial ports. Refer to Appendix 1 for AEB-4COM00 details. The pin definitions and cable diagrams are as follows:

JUART1 Pin Definitions

Pin	Pin Name	Pin	Pin Name
1	UART_SOUTC	2	UART_SOUTE
3	UART_SINC	4	UART_SINE
5	UART_RTSC	6	UART_RTSE
7	GND	8	GND
9	UART_SOUTD	10	UART_SOUTF
11	UART_SIND	12	UART_SINF
13	UART_RTSD	14	UART_RTSEF
15	PVCC5_UART (5V@1.5A)	16	PVCC5_UART (5V@1.5A)

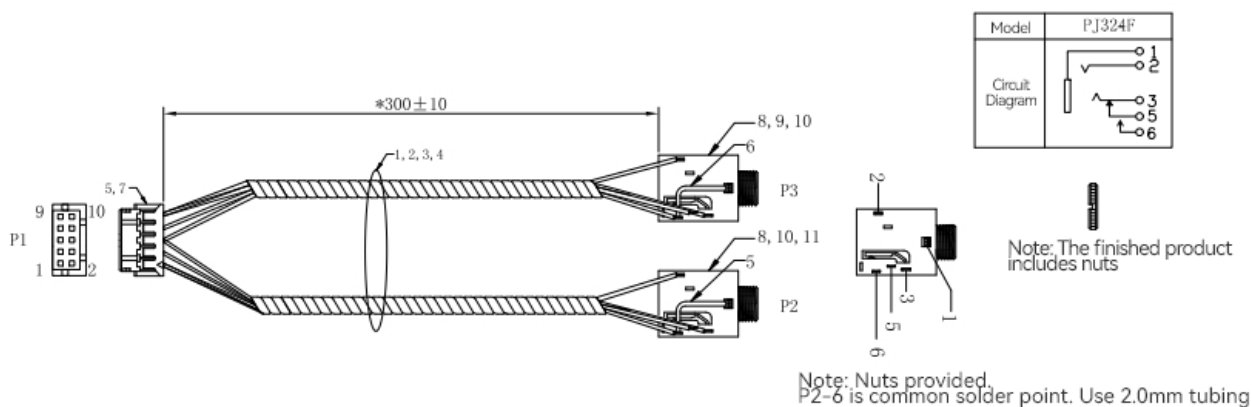
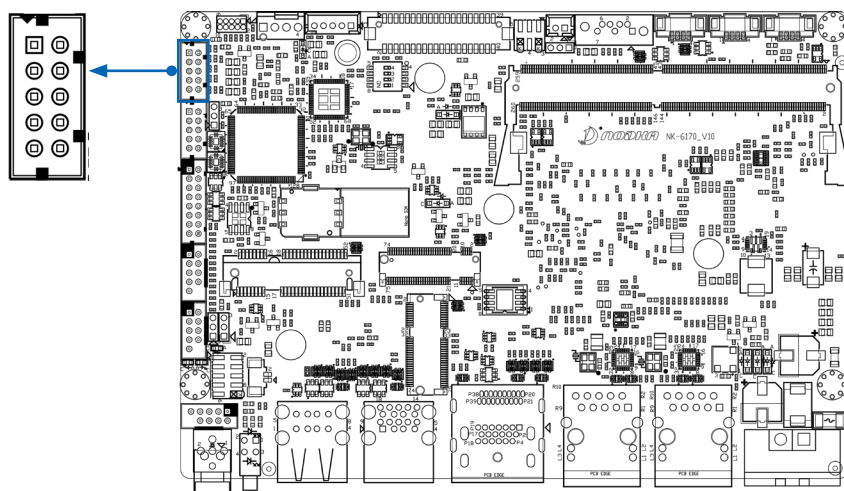


2.3.10 JAUD1 Audio Interface

JAUD1 is a built-in 2*5pin wafer interface with a pitch of 2mm. It can be connected to Line-out and Mic-in via cables, allowing external devices such as microphones, headphones, or speakers to be connected. The pin definitions and cable diagrams are as follows:

JAUD1 Pin Definitions

Pin	Pin Name	Pin	Pin Name
1	A_MIC2_L	2	AGND
3	A_MIC2_R	4	PRESENCE#
5	A_LINE2_L	6	MIC_JD
7	AGND	8	N/C
9	A_LINE2_R	10	ADUIO_JD



2.3.11 Storage Interfaces

The motherboard supports two storage interfaces: SATA 2.0 and M.2-2242.

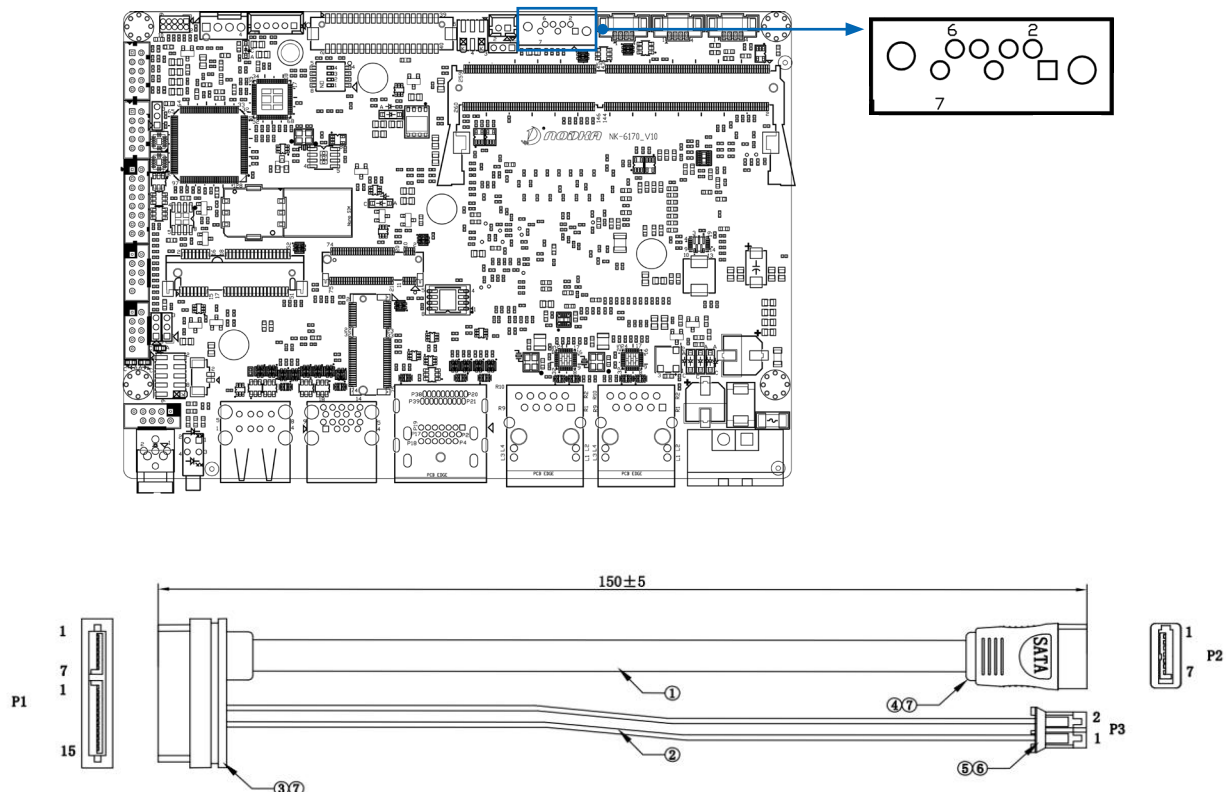
SATA 3.0 is an interface standard for connecting hard drive storage devices. It supports a maximum transfer rate of 6 Gbps (gigabits per second), delivering faster data transmission speeds.

M.2-2242 is a size specification under the M.2 form factor, designed for M.2 storage devices. It is compatible with solid-state drives (SSDs) or other storage devices that adhere to the M.2-2242 dimensional standard.

2.3.11.1 SATA1 Interface

SATA1 is a built-in SATA interface for 2.5-inch HDD/SSD, requiring additional power. JSATAPWR1 is the power interface for HDD/SSD (supports 5V). It can be connected to a 2.5-inch HDD or SSD via cables. The pin definitions and cable diagrams are as follows:

SATA1 & JSATAPWR1 Pin Definitions					
SATA1				JSATAPWR1	
Pin	Pin Name	Pin	Pin Name	Pin	Pin Name
1	GND	2	SATA1_TXP_C	1	+5V@3A
3	SATA1_TXN_C	4	GND	2	GND
5	SATA0_RXN_C	6	SATA0_RXP_C	N/C	N/C
7	GND	8	GND	N/C	N/C
9	GND	N/C	N/C	N/C	N/C

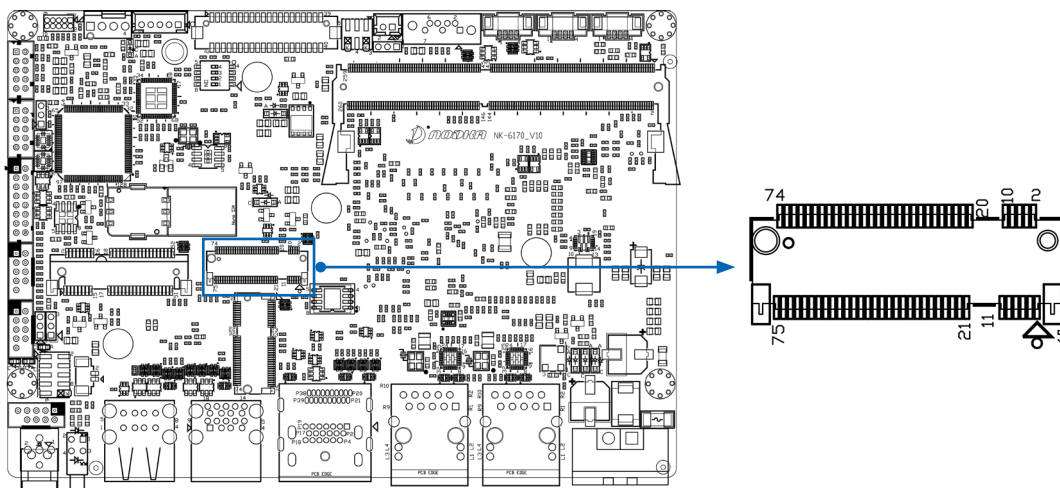


2.3.11.2 M.2-2242 Interface

M_2_SSD is an M.2-2242 interface, where "2242" indicates the M.2 module's dimensions of 22mm wide and 42mm long. The motherboard has a built-in M-Key SSD connector supporting SATA protocol SSDs. The interface location and pin definitions are as follows:

M.2-2242 M-Key Pin Definitions

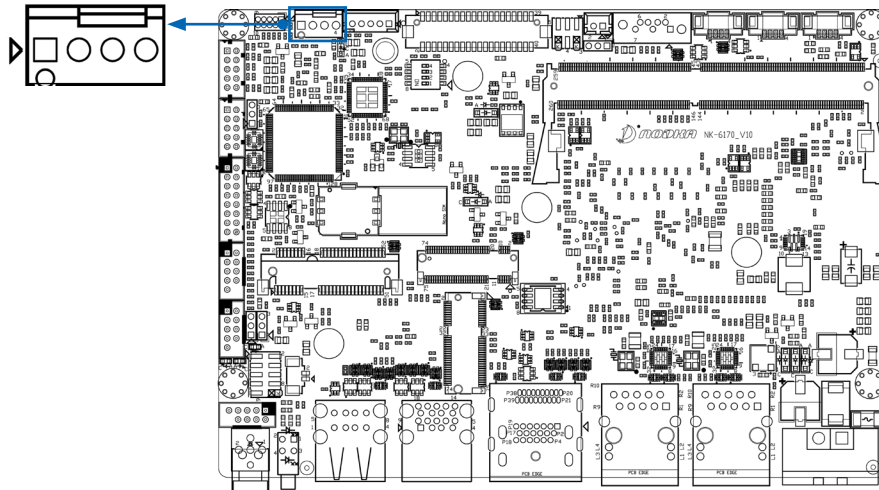
Pin	Pin Name	Pin	Pin Name
1	GND	2	VCC3_M_2_SSD
3	GND	4	VCC3_M_2_SSD
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	VCC3_M_2_SSD
11	N/C	12	VCC3_M_2_SSD
13	N/C	14	VCC3_M_2_SSD
15	GND	16	VCC3_M_2_SSD
17	N/C	18	VCC3_M_2_SSD
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C
29	N/C	30	N/C
31	N/C	32	N/C
33	GND	34	N/C
35	N/C	36	N/C
37	N/C	38	N/C
39	GND	40	N/C
41	SATA1_RXP	42	N/C
43	SATA1_RXN	44	N/C
45	GND	46	N/C
47	SATA1_TXN	48	N/C
49	SATA1_TXP	50	PLTRST_N
51	GND	52	N/C
53	N/C	54	N/C
55	N/C	56	N/C
57	GND	58	N/C
67	N/C		
69	N/C	68	N/C
71	GND	70	VCC3_M_2_SSD
73	GND	72	VCC3_M_2_SSD
75	GND	74	VCC3_M_2_SSD



2.3.12 CPU_FAN1

CPU_FAN1 is a built-in CPU fan interface for connecting a 12V CPU fan. The fan's operating mode can be set via BIOS. Refer to Chapter 4, Section 4.3.4.1 for settings. The pin definitions are as follows:

CPU_FAN1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	CTRL	2	TACH
3	12V@1.5A	4	GND

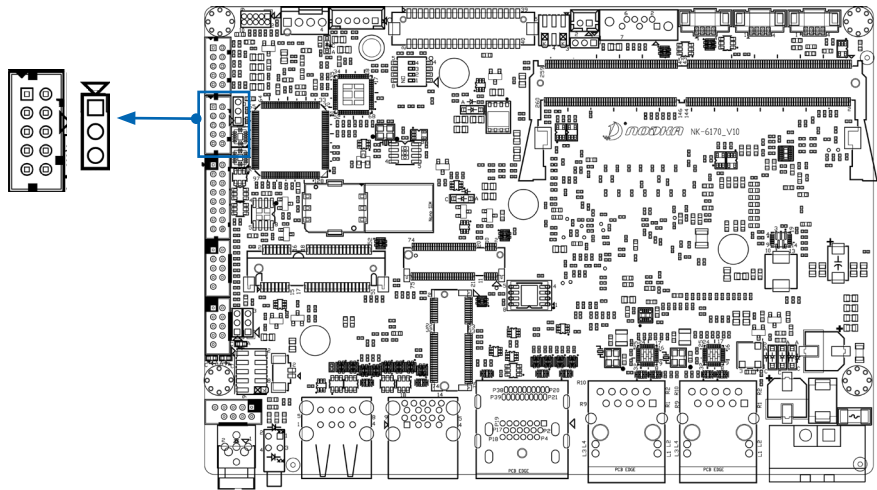


2.3.13 JGPIO1

JGPIO1 is a built-in GPIO interface that can set or read the high/low state of GPIO. Refer to Appendix 1 for GPIO examples. Based on actual usage, the driving voltage can be set to 5V (default) or 3.3V via JGPIOPR1. The pin definitions and driving voltage jumper settings are as follows:

JGPIO1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	JGPIO8	2	JGPIO1
3	JGPIO7	4	JGPIO2
5	JGPIO6	6	JGPIO3
7	JGPIO5	8	JGPIO4
9	PVCC_GPIO	10	GND

JGPIOPR1 Jump Settings	
Setting	Function
1-2 Short	Set GPIO to 3.3V@1.5A (default)
2-3 Short	Set GPIO to 5V@1.5A



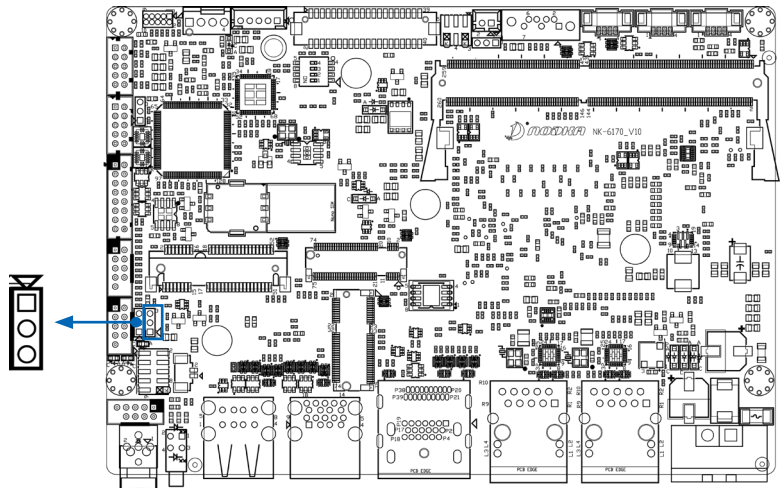
2.3.14 JCMOS1

CMOS is a readable/writable RAM chip on the system motherboard that stores specific parameters about the system configuration. It is powered by the system power and a backup battery, so the information is not lost when the system is powered off. However, when the backup battery is depleted, the CMOS information may be lost. JCMOS1 can be used to clear CMOS information.

Steps:

- Power off the system.
- Remove the jumper (1-2) and add it to (2-3), wait for 10 seconds. The BIOS will load the default factory settings (clears CMOS but not the time), then restore the jumper (1-2).
- To clear both CMOS and time information, remove the battery (BAT1), wait for 20 seconds, and the time and CMOS information will be cleared. Reinsert the battery, and the information is cleared.

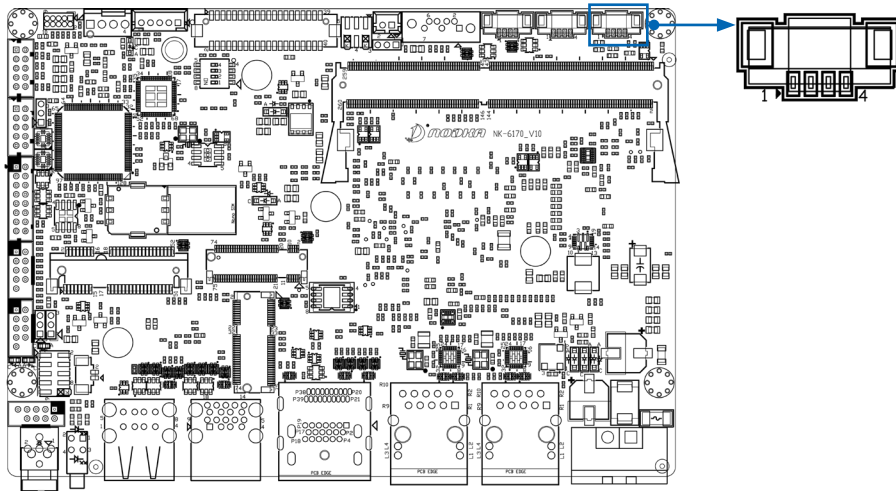
JCMOS1 Jump Settings	
Setting	Function
1-2 Short	Normal CMOS setting
2-3 Short	Clear CMOS information



2.3.15 JSMB1

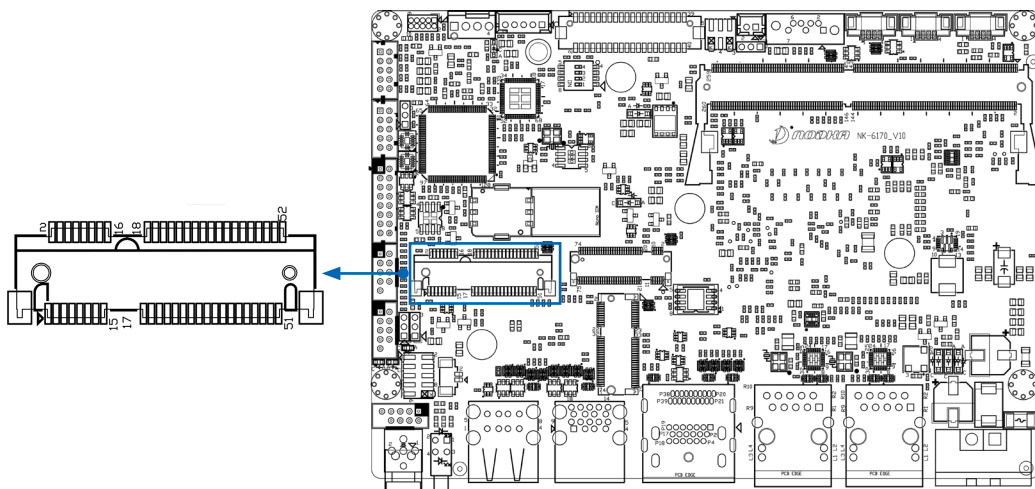
SM bus is a serial bus protocol based on the standard I2C protocol. It provides a communication method for managing and controlling various devices in a computer system. It can be used to monitor and manage hardware devices such as sensors, temperature monitors, and power management. The pin definitions are as follows:

JSMB1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	+5V@1.5A	2	SMB_CLK_DEV
3	SMB_DATA_DEV	4	GND



2.3.16 Mini-PCIe Interface MINIPCI1

Mini PCIe is a miniaturized PCI Express (PCIe) interface standard with dimensions of approximately 30mm x 26.8mm, supporting high-speed data transmission. It typically provides multiple PCI Express lanes to meet high-speed data transmission needs and supports multi-channel transmission. The motherboard has a built-in mini-PCIe connector supporting PCIe and USB2.0 signals, allowing for the expansion of WiFi, 4G modules, network cards, and other devices. The pin definitions are as follows:

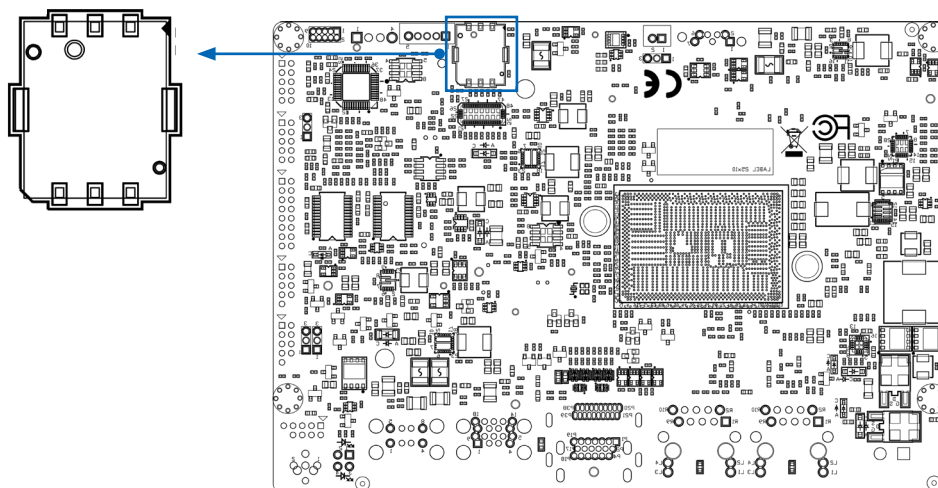


MINIPCIE1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	MINIPCIE_WAKE_N	2	P3VSB
3	N/C	4	GND
5	N/C	6	PVCC1V5
7	MINIPCIE_CLKREQ#	8	UIM1_PWR
9	GND	10	UIM1_DATA
11	CK_100M_MINIPCIE1_N	12	UIM1_CLK
13	CK_100M_MINIPCIE1_P	14	UIM1_RESET
15	GND	16	UIM1_VPP
17	N/C	18	GND
19	N/C	20	WLAN1_DIS_N
21	GND	22	PLTRST_N
23	MINIPCIE_RXN_R	24	P3VSB
25	MINIPCIE_RXP_R	26	GND
27	GND	28	PVCC1V5
29	GND	30	CN27_SMBCLK
31	MINIPCIE_TXN_R	32	CN27_SMBDATA
33	MINIPCIE_TXP_R	34	GND
35	GND	36	USB_MINI1_DN_R
37	GND	38	USB_MINI1_DP_R
39	P3VSB	40	N/C
41	P3VSB	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	PVCC1V5
49	N/C	50	GND
51	N/C	52	P3VSB

2.3.17 SIM Card Slot JSIM1

The SIM card slot is a communication component that allows a SIM card to be inserted and read. The SIM card slot primarily reads data through its contact terminals, enabling communication. The pin definitions are as follows:

JSIM1 Pin Definitions			
Pin	Pin Name	Pin	Pin Name
C5	GND	C1	UIM1_PWR
C6	UIM1_VPP	C2	UIM1_RESET
C7	UIM1_DATA	C3	UIM1_CLK



2.3.18 M.2-2230 Interface

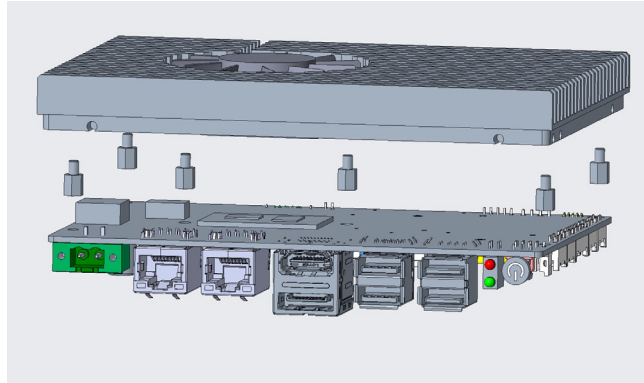
M.2_WIFI1 is an M.2-2230 interface, where "2230" indicates the M.2 module's dimensions of 22mm wide and 30mm long. The motherboard has a built-in M.2 E-Key connector supporting WiFi cards. The interface location and pin definitions are as follows:

M.2_WIFI Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	GND	2	PVCC3_M.2_WIFI
3	USB_BT_D+	4	PVCC3_M.2_WIFI
5	USB_BT_D-	6	N/C
7	GND	8	N/C
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	N/C	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	N/C	22	N/C
23	N/C	32	N/C
33	GND	34	N/C
35	PCIE4_TXP/WIFI_PCIE_TXP4_C	36	N/C
37	PCIE4_TXN/WIFI_PCIE_TXN4_C	38	N/C
39	GND	40	N/C
41	PCIE4_RXP/WIFI_PCIE_RXP4_C	42	N/C
43	PCIE4_RXN/WIFI_PCIE_RXN4_C	44	N/C
45	GND	46	N/C
47	CLK4_DP	48	N/C
49	CLK4_DN	50	M2_SUSCLK
51	GND	52	PLTRST_N_DEV
53	PVCC3_M.2_WIFI	54	BT_DISABLE#
55	PMC_WAKE_N	56	WIFI_DISABLE#
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	GND	64	N/C
65	N/C	66	N/C
67	N/C	68	N/C
69	GND	70	N/C
71	N/C	72	PVCC3_M.2_WIFI
73	N/C	74	PVCC3_M.2_WIFI
75	GND	x	x

Chapter 3 Quick Start Guide

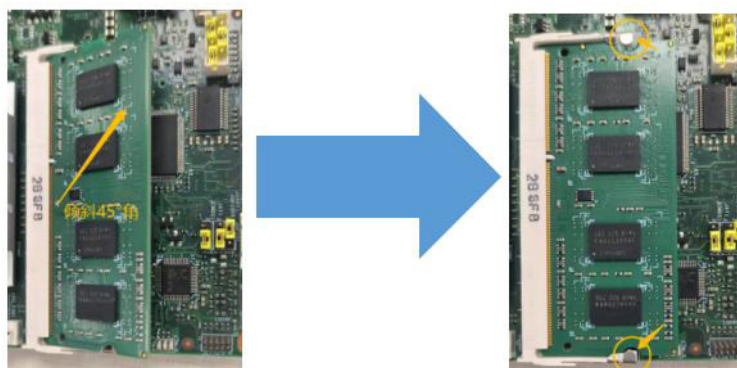
3.1 Heat Sink Installation

Prepare the memory and CPU thermal pads. Attach the corresponding thermal pads to the CPU and memory slots on the heat sink. Use 6 standoffs and 6 M3 screws to secure the motherboard to the heat sink.



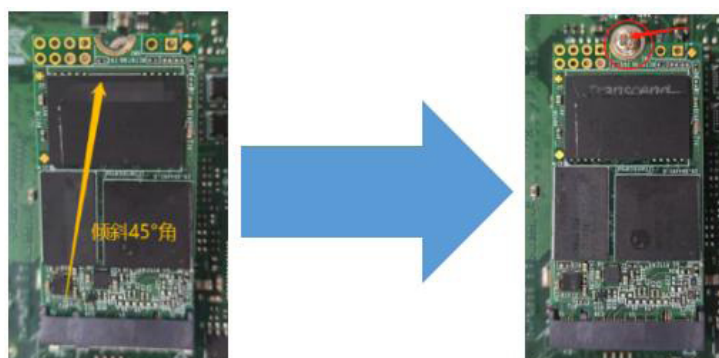
3.2 Memory Installation

Remove the SO-DIMM memory module, insert it into the memory slot at a 45° angle, and press it down into the slot.



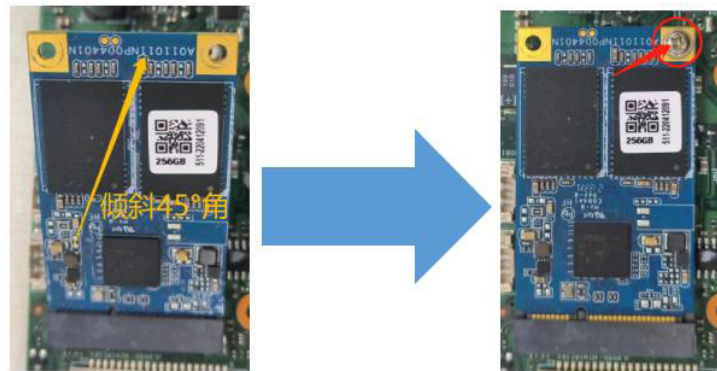
3.3 M.2 SSD Installation

Remove the M.2-2242 SSD, insert it into the M-KEY slot at a 45° angle, and secure it with an M2 screw.



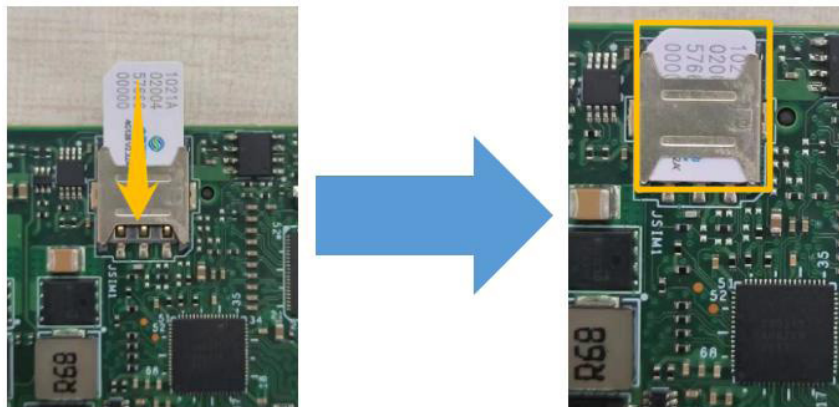
3.4 Mini-PCle Installation

Remove the MINI-PCle expansion card, insert it into the MINI-PCle slot at a 45° angle, and secure it with an M2 screw.



3.5 SIM Card Installation

Insert the SIM card into the SIM card slot and push it in to the appropriate position.



Chapter 4 AMI BIOS Settings

The AMI BIOS ROM has a built-in setup program that stores the computer's most important basic input/output programs, allowing users to modify basic system configurations. After setting, the system configuration is saved in the motherboard's FLASH. When the power is off, the onboard battery provides the necessary power to the FLASH to retain the settings. When the power is on, press the <Del> or <Esc> key during the POST process to access the CMOS SETUP screen. The interface is divided into left and right columns. The left column displays gray for non-configurable options and blue for configurable options. The right column displays a description of the selected option in the left column and shortcut key operations at the bottom.

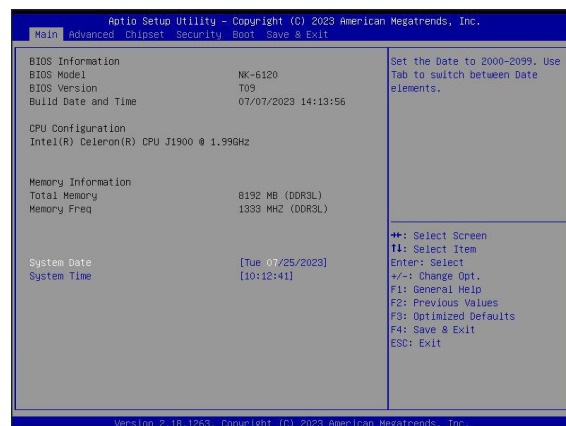
4.1 Shortcut Key Instructions

Hot Key	Function	Description
< ← > >	BIOS interface selection	Within BIOS interface
< ↑ > > ↓ >	BIOS option selection	Within BIOS interface
<CTRL>+<ALT>+<DEL>	Restart system	After system power-on
<Enter>	Confirm selection	Within BIOS interface
<DEL>	Enter BIOS setup interface	Within BIOS interface
<ESC>	Exit BIOS setup interface	After system power-on
<F3>	Load default	Within BIOS interface
<F4>	Save settings and exit	Within BIOS interface
<F7>	Call BIOS quick start option menu	After system power-on

4.2 Main Interface

After the system starts, press <Del> to enter the BIOS setup interface. The main menu will appear on the screen. Use the arrow keys to navigate through the options and press <Enter> to enter the submenu.

The Main interface is the first interface users see when entering the BIOS. It allows users to check BIOS version, CPU, memory, and other related information, as well as set the system date and time. The Main interface is shown below:

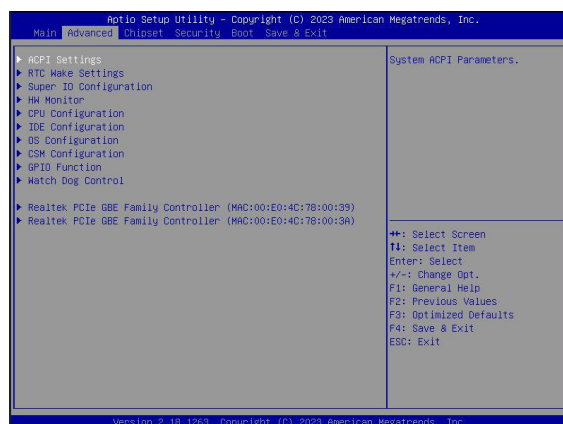


4.2.1 System Date and Time Settings

Select System Date or System Time to change the system date and time. Use the <Tab> key or < ← > > to move between fields. The system date format is "Month/Day/Year," and the system time is in 24-hour format as "Hour:Minute:Second ." Use the "+, " -, " and number keys to modify the values. Press Enter to switch between Month/Day/Year or Hour/Minute/Second. After setting, press F4 to save the settings, which will take effect after a restart.

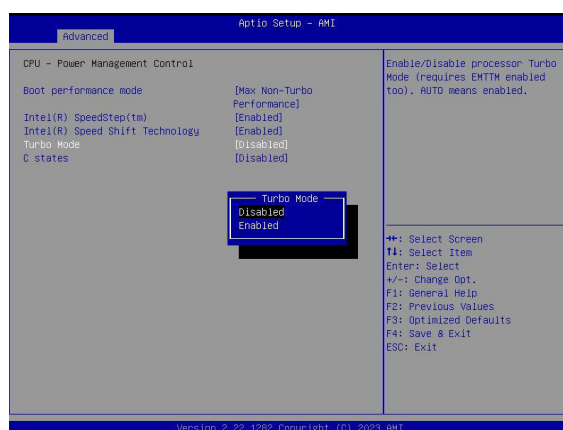
4.3 Advanced Interface

Enter the Advanced interface to configure system functions. It provides access to advanced system settings, including CPU settings, memory settings, SATA settings, overclocking settings, virtualization options, and more. Use the <↑> <↓> keys to select and <Enter> to enter the settings. This section introduces the Advanced settings.



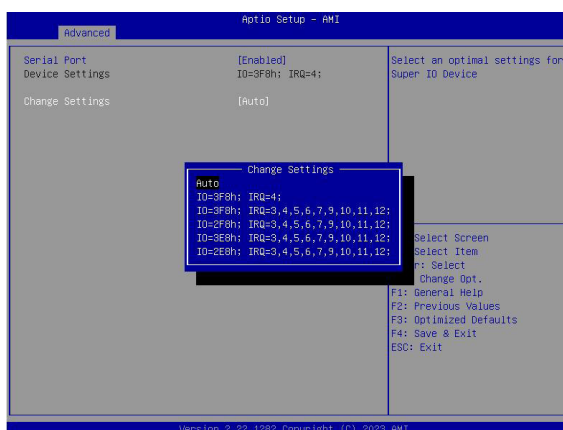
4.3.1 Turbo Mode Settings

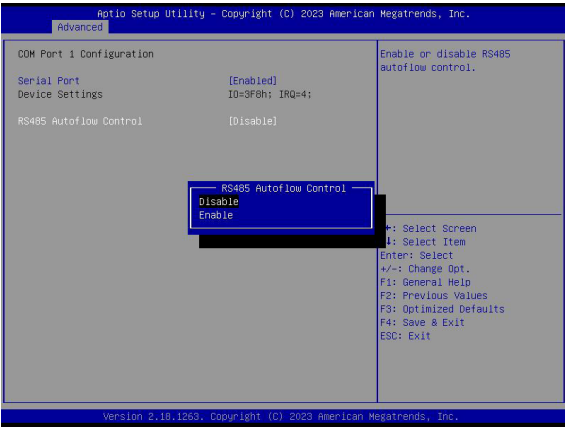
In the Advanced interface, navigate to Power & Performance -> CPU - Power Management Control -> Turbo Mode to enable or disable overclocking mode. The default is Disabled.



4.3.2 TPM Function Settings

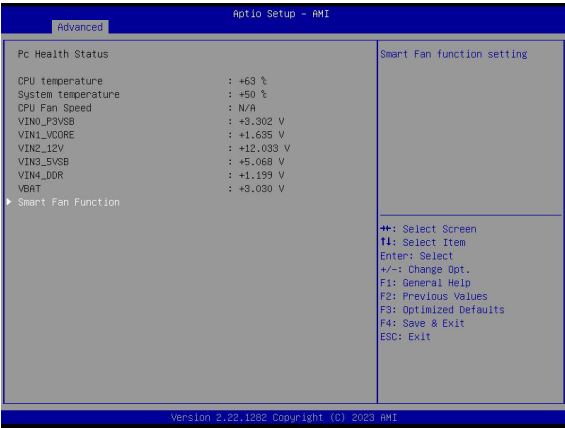
In the Advanced interface, navigate to Trusted Computing -> Security Device Support to enable or disable TPM functionality. After setting, press F4 to save and exit. The system will restart to apply the changes.



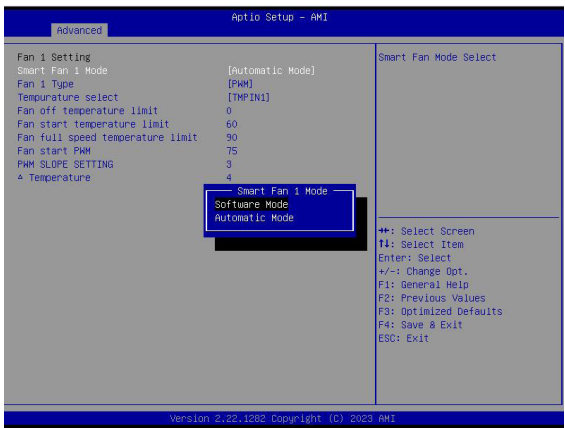


4.3.3 HW Monitor & Smart Fan

In the Advanced interface, select Hardware Monitor to display CPU temperature, system temperature, key voltage parameters, and Smart Fan Function information.

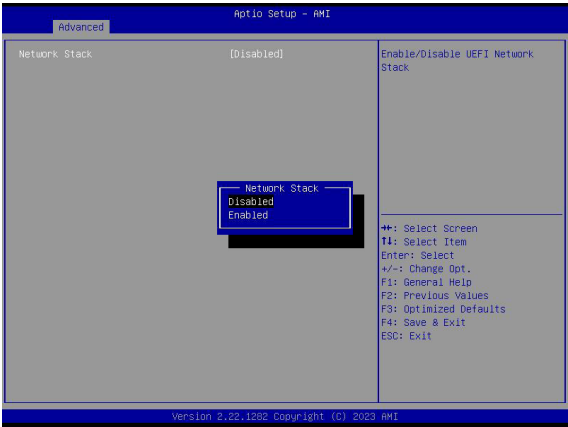


Smart Fan Function: You can set the Smart Fan Mode to Software mode or Automatic mode (default). In Software mode, you can set the system temperature risk value, fan start temperature, fan stop temperature, fan mode, duty cycle, etc., based on user application requirements.



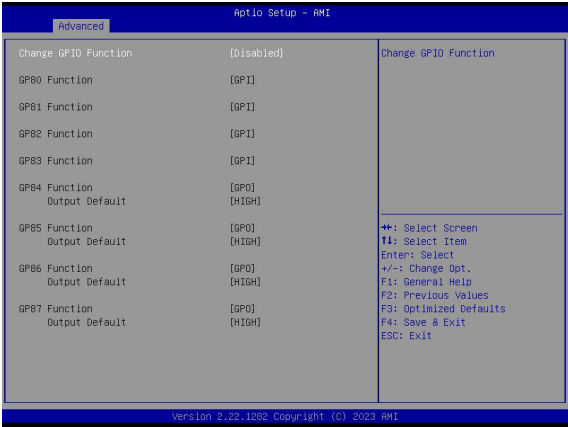
4.3.4 Wake-on-LAN

In the Advanced interface, navigate to Network Stack Configuration -> Network Stack to enable or disable Wake-on-LAN functionality. The default is Disabled. After setting, press F4 to save and exit. The system will restart to apply the changes.



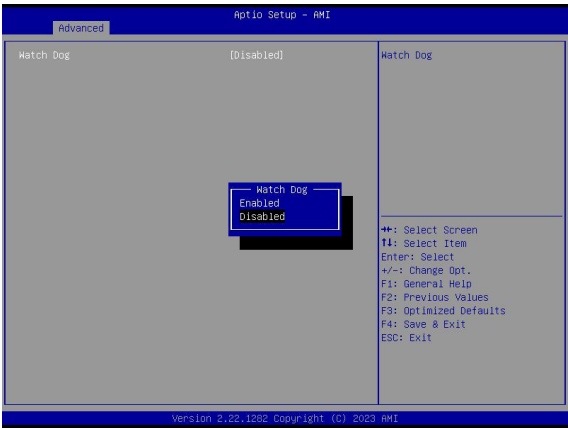
4.3.5 GPIO Settings

In the Advanced interface, go to Network Stack Configuration → Network Stack to enable or disable the Wake-on-LAN function. The default setting is Disabled. After configuration, press F4 to save and exit. A system restart is required for the changes to take effect.



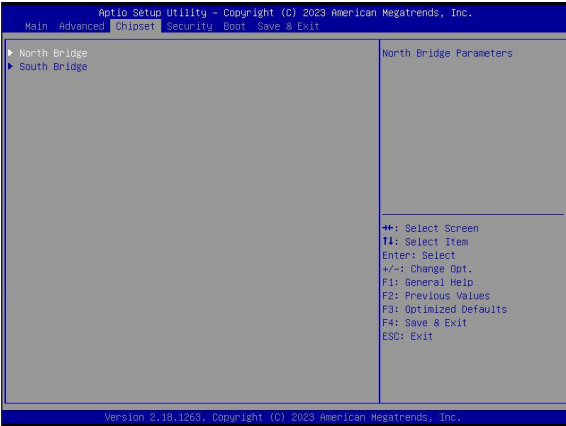
4.3.6 Watch Dog Settings

In the Advanced interface, navigate to Watch Dog Control -> Watch Dog to enable or disable the Watchdog function. The default is Disabled. After setting, press F4 to save and exit. For detailed usage, refer to Appendix 3.



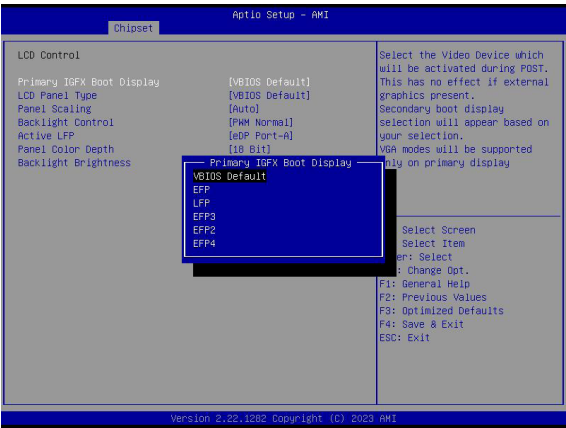
4.4 Chipset Interface

Enter the Chipset interface to configure the computer's chipset options. The chipset is the integrated circuit that connects the components on the motherboard. The settings here may involve PCIe configuration, USB configuration, hard drive controller settings, etc. Use the < ↑ > < ↓ > keys to select and <Enter> to enter the settings. This section introduces the Chipset settings.



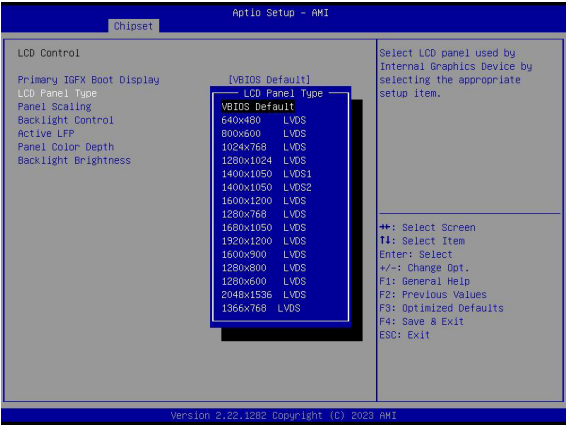
4.4.1 Display Priority

In the Chipset interface, navigate to System Agent (SA) Configuration -> Graphics Configuration -> LCD Control -> Primary IGFX Boot Display to set the display priority for the integrated graphics card in the system (EFP(DVI-D)/LFP(LVDS)/EFP3(DP2)/EFP2(DP1)/EFP4(DP3)). After setting, press F4 to save and exit. The system will restart to apply the changes.



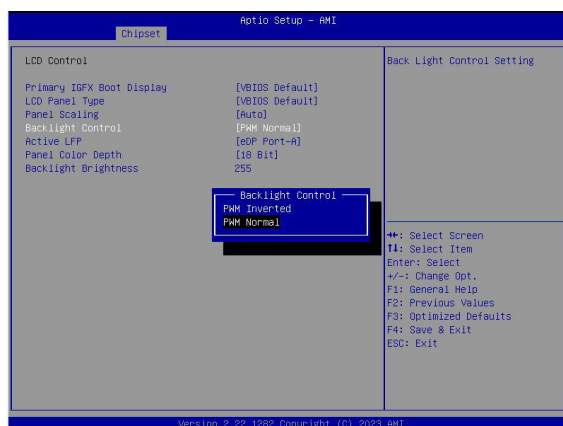
4.4.2 LVDS Resolution Settings

In the Chipset interface, navigate to System Agent (SA) Configuration -> Graphics Configuration -> LCD Control -> LCD Panel Type to set the LVDS resolution. After setting, press F4 to save and exit. The system will restart to apply the changes.



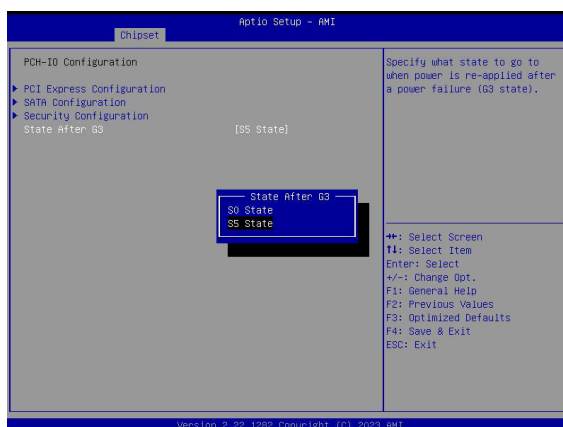
4.4.3 Backlight Brightness Inversion Mode

In the Chipset interface, navigate to System Agent (SA) Configuration -> Graphics Configuration -> LCD Control -> LCD Panel Minimum Brightness to set the LCD screen's minimum brightness to normal (PWM Normal) or inverted (PWM Inverted) mode. After setting, press F4 to save and exit. The system will restart to apply the changes.



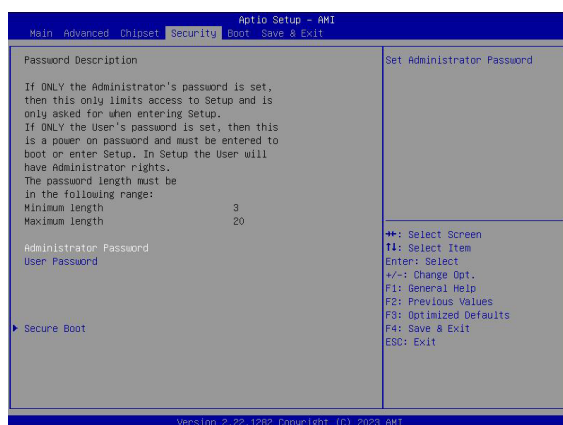
4.4.4 Power-on Auto Start

In the Chipset interface, navigate to PCH-IO Configuration -> State after G3 to enable or disable power-on auto start. Power on is AT mode, where the system powers on automatically when power is connected. Power off is ATX mode, where the system requires pressing the power button to start. The default is Power off. After setting, press F4 to save and exit. The system will restart to apply the changes.



4.5 Security Interface

Enter the Security interface to set password protection and other security functions. Select to enter the settings for administrator and user password protection options to enter the submenu. Use the <↑> <↓> keys to select and <Enter> to enter the settings. This section introduces the Security settings.



4.5.1 Administrator Password Settings

In the Security interface, select Administrator Password, press Enter, and use the keyboard to enter a password of six or more characters, including letters, numbers, and symbols. After setting, press F4 to save the settings. The system will restart to apply the changes.

4.5.2 User Password Settings

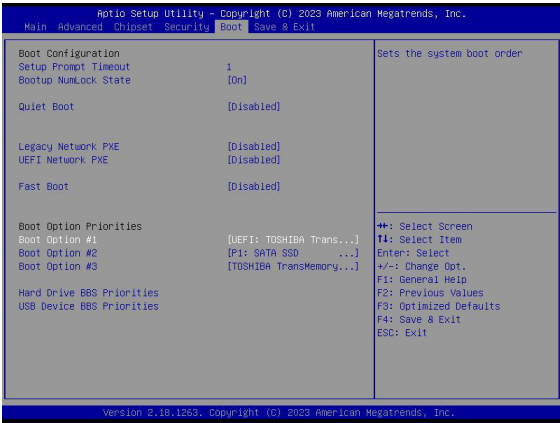
In the Security interface, select User Password, press Enter, and use the keyboard to enter a password of six or more characters, including letters, numbers, and symbols. After setting, press F4 to save the settings. The system will restart to apply the changes.



After setting the password, please remember it. Otherwise, you will not be able to access the system without the password, resulting in additional repair costs.

4.6 BOOT Interface

Enter the BOOT interface to set the system boot order, select boot options, and set the boot interface. Use the < ↑ > < ↓ > keys to select and <Enter> to enter the settings. This section introduces the BOOT settings.



4.6.1 Set Num Lock State at Boot

In the BOOT interface, select Boot Num Lock State to enable or disable the Num Lock key on the keyboard at boot. After setting, press F4 to save the settings. The system will restart to apply the changes.

4.6.2 Set Boot Logo

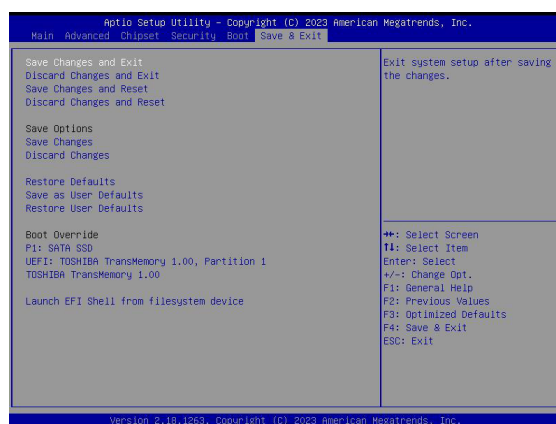
In the BOOT interface, select Quiet Boot to enable or disable the boot logo. Select "Enable" to show the boot logo, or "Disable" to hide it. After setting, press F4 to save the settings. The system will restart to apply the changes.

4.6.3 Set Boot Order

In the BOOT interface, select Boot Option Priorities to set the boot device order. Boot Option #1 is the first boot device, Boot Option #2 is the second, and so on. After setting, press F4 to save the settings. The system will restart to apply the changes.

4.7 Save & Exit Interface

Enter the Save & Exit interface to load or save settings and exit the BIOS parameter settings. Select to save and exit the BIOS parameter settings to enter the submenu. Use the < ↑ > < ↓ > keys to select and < Enter > to enter the settings. This section introduces the Save & Exit settings.



4.7.1 Save Changes and Reset

In the Save & Exit interface, select Save Changes and Reset, press F4 to save the settings, and the system will restart to apply the changes.

4.7.2 Discard Changes and Reset

In the Save & Exit interface, select Discard Changes and Reset, press F4 to save the settings, and the system will restart without applying the changes.

4.7.3 Restore Default Settings

In the Save & Exit interface, select Restore Defaults, press F4 to save the settings, and the system will restart to apply the default settings.

4.7.4 Set Boot Device Priority

In the Save & Exit interface, select Boot Override, press F4 to save the settings, and the system will restart to apply the changes.

Appendix 1 4-Serial Port Function Card - AEB-4COM00

A: Product Specifications

External Interface Rear I/O	Serial Port	1 x RS485/422/232
Internal Interface Internal I/O	Serial Port	1 x RS232 Wafer (2*5Pin)

B: Structural Diagram

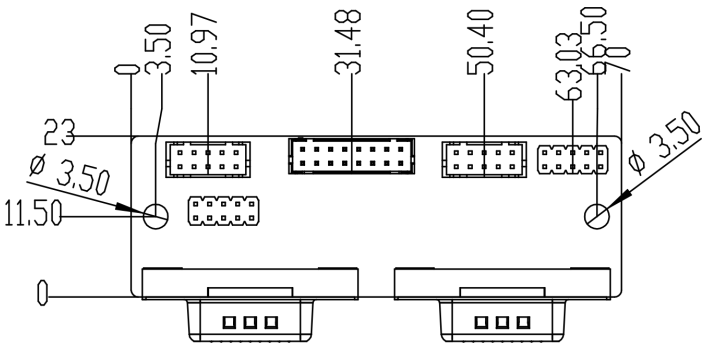


Figure B-1: Front View of the Card

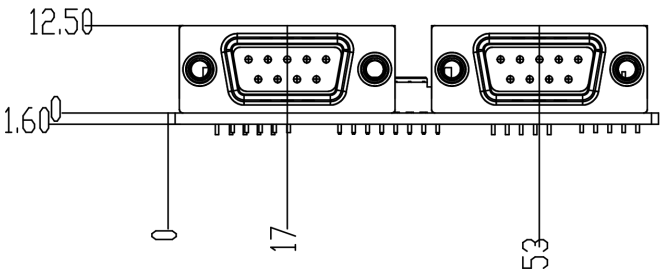
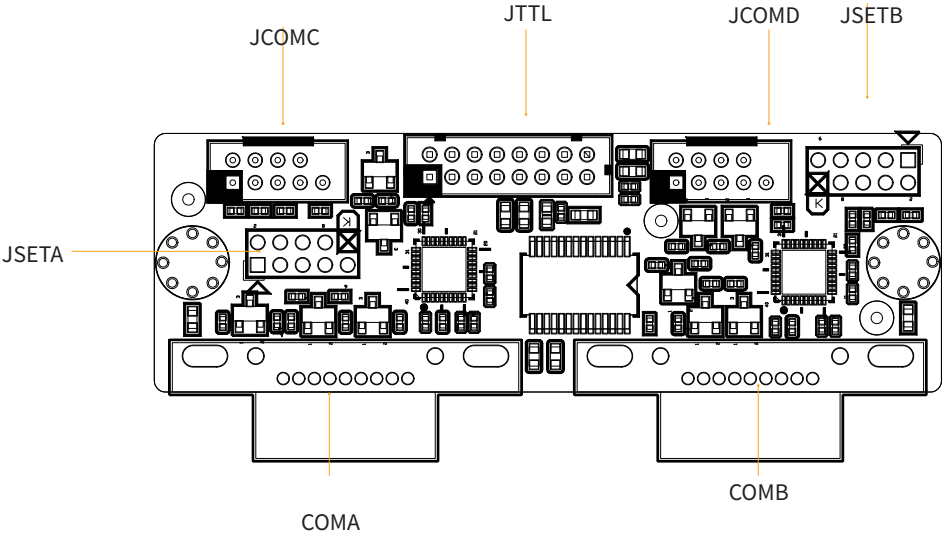


Figure B-2: I/O Dimensions of the Card

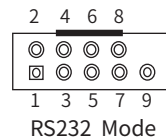
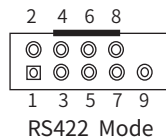
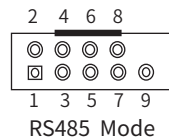
C: Interface and Jumper Functions



C.1 COMA/COMB

COMA/COMB are rear I/O serial port interfaces supporting RS485, RS422, and RS232 modes (default). Users can set the serial port mode via JSETA and JSETB jumpers based on actual usage. The pin definitions and serial port mode settings are as follows:

COMA/COMB Pin Definitions					
RS232		RS422		RS485	
Pin	Pin Name	Pin	Pin Name	Pin	Pin Name
1	COM_DCD	1	TX-	1	D-
2	COM_SIN	2	TX+	2	D+
3	COM_SOUT	3	N/C	3	N/C
4	COM_DTR#	4	RX-	4	N/C
5	GND	5	GND	5	GND
6	N/C	6	N/C	6	N/C
7	COM_RTS#	7	RX+	7	N/C
8	N/C	8	N/C	8	N/C
9	N/C	9	N/C	9	N/C



JSETA & JSETB Jump Settings	
Setting	Function
1-3, 4-6, 7-9 Short	Set RS485 mode
1-2, 5-6, 7-9 Short	Set RS422 mode
1-3, 5-6, 7-8 Short	Set RS232 mode

C.2 JCOMC/JCOMD

JCOMC/JCOMD are built-in 2*5pin wafer interfaces with a pitch of 2mm. They can be connected to a 9-pin COM port via cables. They support Wake-on-Ring functionality by default and only support RS232 mode. The pin definitions and cable diagrams are as follows:

JCOMC/JCOMD Pin Definitions			
Pin	Pin Name	Pin	Pin Name
1	N/C	2	N/C
3	COM_SIN	4	COM_RTS#
5	COM_OUT	6	N/C
7	N/C	8	N/C
9	GND	N/C	N/C

Appendix 2—GPIO Example

PIN 1 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT0); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT0); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT0); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT0); //OUTPUT LOW
```

PIN 2 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT1); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT1); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT1); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT1); //OUTPUT LOW
```

PIN 3 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT2); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT2); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT2); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT2); //OUTPUT LOW
```

PIN 4 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT3); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT3); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT3); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT3); //OUTPUT LOW
```

PIN 5 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT4); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT4); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT4); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT4); //OUTPUT LOW
```

PIN 6 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT5); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT5); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT5); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT5); //OUTPUT LOW
```

PIN 7 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT6); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT6); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT6); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT6); //OUTPUT LOW
```

PIN 8 Function:

```
IoWrite8(0xA01, IoRead8(0xA01)&~BIT7); //OUTPUT
IoWrite8(0xA01, IoRead8(0xA01)|BIT7); //INPUT
IoWrite8(0xA02, IoRead8(0xA02)|BIT7); //OUTPUT HIGH
IoWrite8(0xA02, IoRead8(0xA02)&~BIT7); //OUTPUT LOW
```

Appendix 3: Watchdog Example

```
IoWrite8(0x2E,0x88);
    IoWrite8(0x2E,0x88); //SIO ENTER
    IoWrite8(0x2E, 0x07);  //watchdog
    IoWrite8(0x2F, 0x08);

    if(gWatchdogmode==0)
    {
        IoWrite8(0x2E, 0xF1);
        IoWrite8(0x2F, 0x00); //disable watch dog
    }
    else if(gWatchdogmode==1)
    {
        IoWrite8(0x2E, 0xF0);
        IoWrite8(0x2F, 0x00);
        IoWrite8(0x2E, 0xF1);
        IoWrite8(0x2F, gWatchdogvalue); //SEC MODE
    }
    else
    {
        IoWrite8(0x2E, 0xF0);
        IoWrite8(0x2F, 0x08);
        IoWrite8(0x2E, 0xF1);
        IoWrite8(0x2F, gWatchdogvalue); //MIN MODE
    }

    IoWrite8(0x2E, 0xAA); //EXIT SIO
```