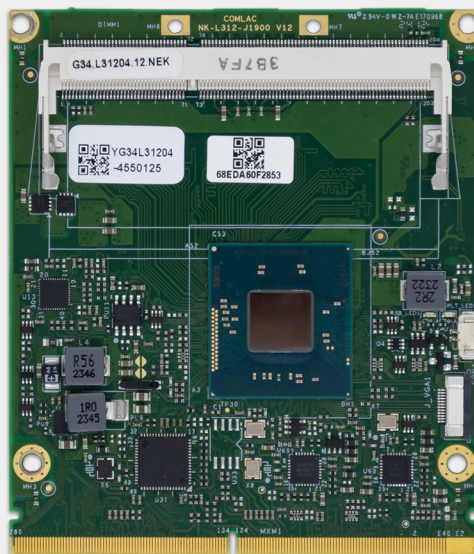




NK-L312-J1900

User Manual

 Small size, modular design

 MXM3.0 high-speed connector

 NODKA custom signal specification

 High reliability installation method

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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.

Contents

Chapter 1 Product Introduction	01
1.1 Product Brief Description	01
1.2 Product Specifications.....	01
1.3 Block Diagram	02
1.4 Mechanical Drawing.....	02
1.4.1 Motherboard Front Dimensional Drawing.....	02
1.5 Packaging List	03
1.5.1 Ordering Information	03
1.5.2 Packaging List	03
Chapter 2 Interface Introduction	04
2.1 Interface Introduction	04
2.2 Battery	04
2.3 DDR3-SO DIMM	04
2.4 VGA FPC	05
2.5 MXM3.0 Pin Definition	05
Chapter 3 Installation Instructions	13
3.1 Cooler Installation Instructions.....	13
3.2 SO-DIMM Memory Installation Instructions.....	13
Chapter 4 AMI BIOS Setup	14
4.1 Shortcut Key Reference	14
4.2 Main Menu	14
4.2.1 System Date/Time Configuration.....	15
4.3 Advanced Menu	15
4.3.1 Scheduled Wake-up Function	16
4.3.2 COM Mode Configuration	16
4.3.3 Hardware Monitor.....	16
4.3.4 Turbo Mode Configuration	17
4.3.5 System OS Settings.....	18
4.3.6 USB Power Settings During Shutdown/Sleep	18
4.3.7 GPIO Configuration.....	18
4.3.8 Watchdog Timer Settings	19
4.4 Chipset Menu.....	19
4.4.1 Primary Display Selection	20
4.4.2 Backlight Brightness Inverted Mode Adjustment	20
4.4.3 USB on and off Settings	21
4.4.4 Network on and off Settings.....	21
4.4.5 Power-on Auto Boot.....	22
4.5 Security Menu.....	22
4.5.1 Administrator Password	22
4.5.2 User Password.....	23
4.6 BOOT Menu	23
4.6.1 Boot Splash Screen.....	23
4.6.2 Boot Order Configuration	23
4.7 Save & Exit Menu	24
4.7.1 Reset Without Saving Changes	24
4.7.2 Restore Default Settings.....	24
4.7.3 Single Boot Override	24
Appendix 1 Watchdog Example	25

Chapter 1 Product Introduction

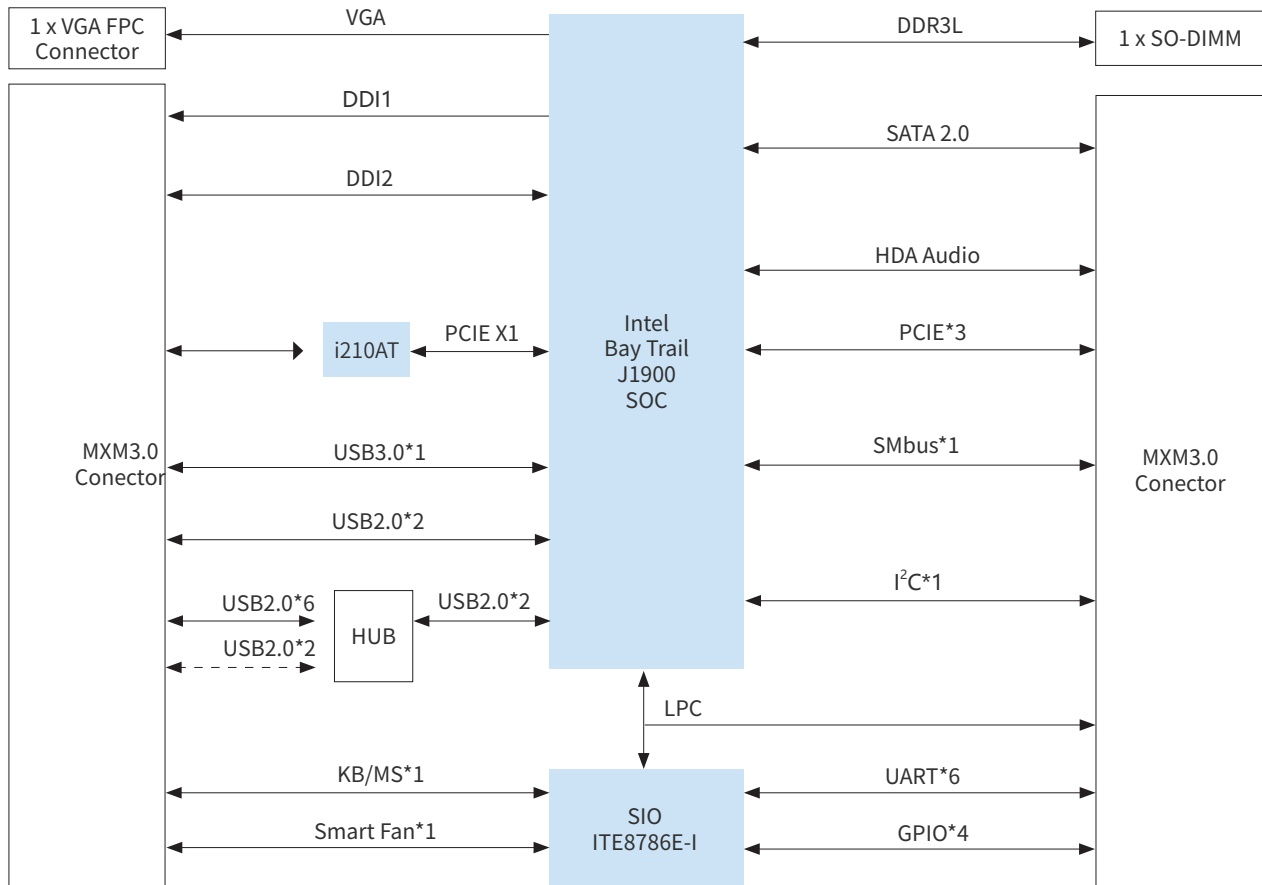
1.1 Product Brief Description

The L312-J1900 base Intel® Celeron® J1900 processor, Quad-core, base frequency 2.0 GHz,TDP 10W,Support 1 x DDR3L-1333MHz SO-DIMM slot, up to 8GB,Support 1 x VGA FPC Connector,1 x DDI dual display,Type3 Interface Signals with MXM3.0 Gold Finger.

1.2 Product Specifications

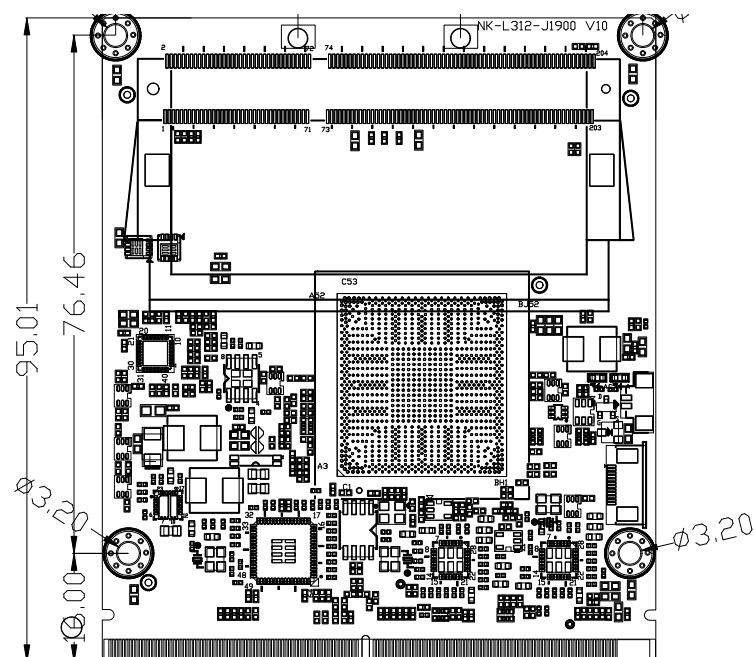
	Project	Content
Processor System	CPU	Intel® Celeron® J1900 processor 2.0GHz,TDP 10W
	Chipset	Intel® SoC integrated
	BIOS	AMI 64Mb UEFI BIOS
Memory	Technology	Single Channel(Non-ECC) DDR3L-1333MHz, up to 8GB
	Slot	1 x DDR3L SO-DIMM slot
Graphic	Controller	Intel HD graphics integrated
Expansion Signals	Display	2 x DDI,1 x VGA FPC Connector
	Ethernet	Intel I210AT controller
	Serial Port	2 x Uart (9 line) , 4 x Uart (3 line)
	USB	1 x USB 3.0,8 x USB2.0 ^[1]
	Audio	1 x Intel HDA Audio codec
	GPIO	1 x 4bit GPIO
	Fan	1 x Smart FAN
	PCIE	3 port 3 lanes(3x1)
	SATA	2 x SATA 2.0
	other	1 x KB/MS, 1 x I ² C, 1 x Buzzer, 1 x Smbus, 1 x LPC
Watchdog Timer	Output&Interval	System reset, programmable from 1~255 seconds
Power	Type	5V
	Power Consumption	TBD
O.S Support	MS Windows	Windows7/10
	Linux	Linux
Mechanism	Dimensions	(L)95mm x (W)82mm
	Gross Weight	0.04kg
Environment	Temperature	Operating: 0°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 Mechanical Drawing

1.4.1 Motherboard Front Dimensional Drawing



1.5 Packaging List

1.5.1 Ordering Information

Part No.	Model	Description
F34.L51004.11.NEK	NK-L510-H110	Type5, 138*100.1mm NK-L510-H110 Comlac SBC, 2x DDR4 SO-DIMM

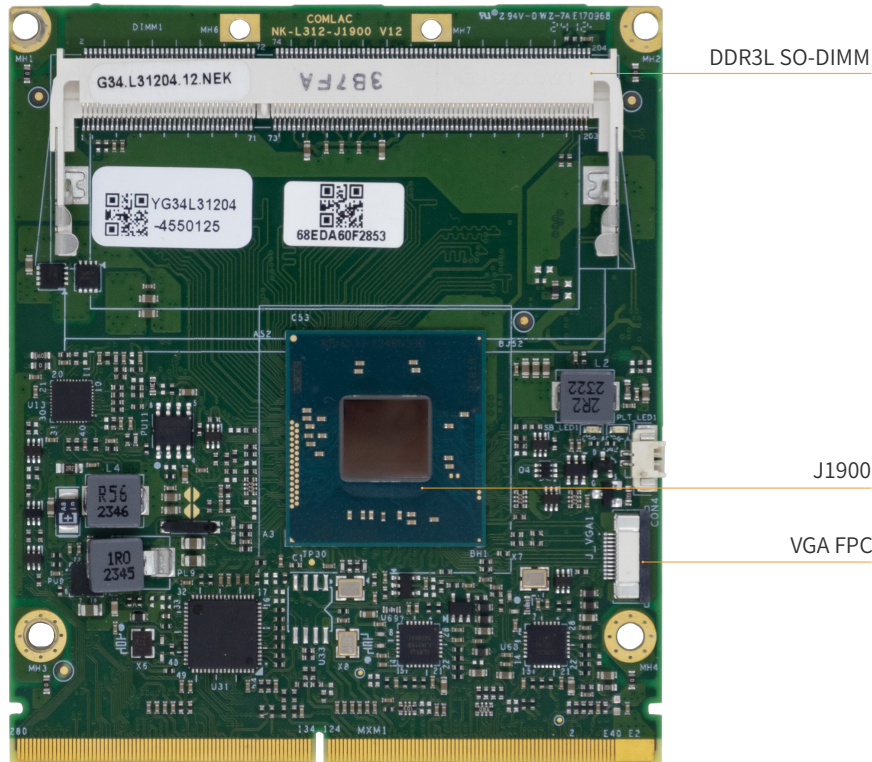
1.5.2 Packaging List

料号 Part No.	描述 Description
KF0.000612.00.J03	GA FPC Flexible Flat Cable, 100mm Length

Chapter 2 Interface Introduction

2.1 Interface Introduction

The interfaces on the motherboard are only internal interfaces. The internal interfaces need to be connected to the equipment through wires to realize the corresponding functions. The interface positions are as shown in the figure below:



2.2 Battery

A default RTC Battery is provided to power the RTC system. If not in use, the carrier board needs to provide an RTC Battery for power supply, which is connected to VBAT_J. The pin definition is as follows:

Battery Pin Definition			
Pin	Pin Name	Pin	Pin Name
1	VBAT_J /+	2	GND/-

2.3 DDR3-SO DIMM

The DDR3 SO-DIMM interface has a total of 204 pins. The pins include power, address control, data, reference calibration, etc., which are responsible for power supply, transmission of command data, and calibration signals to ensure the efficient and stable operation of the memory. It can achieve high-bandwidth and low-power data storage and transmission to meet the memory performance requirements of mobile devices.

2.4 VGA FPC

VGA FPC interface, through the flexible FPC transmission of standard VGA video signals, pin definition is shown in the table below:

VGA FPC Pin Definition			
Pin	Pin Name	Pin	Pin Name
1	GND	2	CRT_VS
3	CRT_HS	4	GND
5	CRT_RED	6	GND
7	CRT_GREEN	8	GND
9	CRT_BLUE	10	GND
11	CRT_DCC_DATA	12	CRT_DCC_CLK

2.5 MXM3.0 Pin Definition

MXM NO.	Type	Function	Remark
E1	S	5V Standby Power	Stable 5V Power Supply
E2	S	5V Standby Power	Stable 5V Power Supply
E3	S	GND	Power Ground
1	I	BOARD_PWROK	Carrier Board Power S0 Indicator Signal(Pulled low if there is a problem)
3	O	HDA_SYNC	HDA Audio Signal (to Audio Codec Extension HP/MIC)
5	O	HDA_CLK	HDA Audio Signal (to Audio Codec Extension HP/MIC)
7	O	HDA_SDOUT	HDA Audio Signal (to Audio Codec Extension HP/MIC)
9	I	HDA_SDIN0	HDA Audio Signal (to Audio Codec Extension HP/MIC)
11	O	HDA_RST#	HDA Audio Signal (to Audio Codec Extension HP/MIC)
13	S	GND	Signal Ground
15	/	NC	Reserved Pin (Leave floating)
17	/	NC	Reserved Pin (Leave floating)
19	/	NC	Reserved Pin (Leave floating)
21	/	NC	Reserved Pin (Leave floating)
23	/	NC	Reserved Pin (Leave floating)
25	/	NC	Reserved Pin (Leave floating)
27	/	NC	Reserved Pin (Leave floating)
29	/	NC	Reserved Pin (Leave floating)
31	/	NC	Reserved Pin (Leave floating)
33	/	NC	Reserved Pin (Leave floating)
35	/	NC	Reserved Pin (Leave floating)
37	S	GND	Signal Ground
39	IO	SIO_GP70	Programmable GPIO
41	IO	SIO_GP71	Programmable GPIO
43	IO	SIO_GP72	Programmable GPIO
45	IO	SIO_GP73	Programmable GPIO

MXM NO.	Type	Function	Remark
47	I	MXM_FANTAC2	Fan Speed Detection Signal
49	O	MXM_FANPWM2	Fan Speed Control Signal
51	S	GND	Signal Ground
53	IO	MXM_USB2_N3	Core Board USB2.0 lane 3 Data Negative Signal (USB2_CH3_DN)
55	IO	MXM_USB2_P3	Core Board USB2.0 lane 3 Data Positive Signal (USB2_CH3_DP)
57	IO	MXM_USB2_N5	Core Board USB2.0 lane 5 Data Negative Signal (USB2_CH5_DN)
59	IO	MXM_USB2_P5	Core Board USB2.0 lane 5 Data Positive Signal (USB2_CH5_DP)
61	S	GND	Signal Ground
63	IO	USB20_P1	Core Board USB2.0 lane 1 Data Negative Signal (USB2_CH1_DN)
65	IO	USB20_N1	Core Board USB2.0 lane 1 Data Positive Signal (USB2_CH1_DP)
67	IO	USB20_N0	Core Board USB2.0 lane 0 Data Negative Signal (USB2_CH0_DN)
69	IO	USB20_P0	Core Board USB2.0 lane 0 Data Positive Signal (USB2_CH0_DP)
71	S	GND	Signal Ground
73	/	NC	Reserved Pin (Leave floating)
75	/	NC	Reserved Pin (Leave floating)
77	S	GND	Signal Ground
79	I	MXM_USB3_RXN1	Core Board USB3.0 lane 1 Receive Negative Signal (USB3_CH1_RXN)
81	I	MXM_USB3_RXP1	Core Board USB3.0 lane 1 Receive Positive Signal (USB3_CH1_RXP)
83	S	GND	Signal Ground
85	/	NC	Reserved Pin (Leave floating)
87	/	NC	Reserved Pin (Leave floating)
89	S	GND	Signal Ground
E40	/	NC	Reserved Pin (Leave floating)
E41	/	NC	Reserved Pin (Leave floating)
E42	/	NC	Reserved Pin (Leave floating)
E43	/	NC	Reserved Pin (Leave floating)
E44	/	NC	Reserved Pin (Leave floating)
E45	/	NC	Reserved Pin (Leave floating)
E46	O	SLP_S3#	CPU Sleep Signal(Low during sleep, High during normal operation)
E47	O	SLP_S4#	CPU Hibernate Signal(Low during hibernation, High during normal operation)
E48	I	CLR_CMOS#	RTC Reset Signal(Connect to low for Clear CMOS, leave floating during normal use)
E49	I	+VBAT	RTC Battery Power
2	I	MXM_PWR_ON	Power Button Signal(Connect to switch on carrier board, low pulse $\geq 100\text{ms}$ to power on)
4	I	MXM_RESET	System Reset Signal(For system reboot, low pulse $\geq 100\text{ms}$ to take effect)
6	O	PS_ON#	Carrier Board S0 Power Enable Control(Active low)
8	O	PCI_RST#1	Reset All Devices(Active high)
10	I	WAKE#	Wake-up Signal(Low pulse from carrier board to wake system)
12	O	SATALED#	SATA Activity LED Indicator(Active low)
14	O	PCH_SPKR	Buzzer Signal(For motherboard status indication, connect to buzzer on carrier board)
16	O	SIO_PME#	SIO PME Signal Output(Active low pulse, leave floating if unused)

MXM NO.	Type	Function	Remark
18	S	GND	Signal Ground
20	IO	SMB_SDA	SMBUS Data Bus
22	O	SMB_SCL	SMBUS Clock Bus
24	O	I2C_SCL0	Clock Signal
26	IO	I2C_SDA0	Data signal
28	O	CLK_LPC1	Clock Signal
30	IO	LAD3	Address/Data Bus 3
32	IO	LAD2	Address/Data Bus 2
34	IO	LAD1	Address/Data Bus 1
36	IO	LAD0	Address/Data Bus 0
38	I	LFRAME#	LPC frame signal (valid at low level)
40	IO	SIO_SERIRQ	Serial interrupt request signal
42	IO	MXM_MS DAT	PS/2 Mouse Data Signal
44	IO	MXM_MS CLK	PS/2 Mouse Clock Signal
46	IO	MXM_KBK DAT	PS/2 Keyboard Data Signal
48	IO	MXM_KBK CLK	PS/2 Keyboard Clock Signal
50	S	GND	Signal Ground
52	IO	MXM_USB2_N7	Core Board USB2.0 lane 7 Data Negative Signal (USB2_CH7_DN)
54	IO	MXM_USB2_P7	Core Board USB2.0 lane 7 Data Positive Signal (USB2_CH7_DP)
56	IO	MXM_USB2_N8	Core Board USB2.0 lane 8 Data Negative Signal (USB2_CH8_DN)
58	IO	MXM_USB2_P8	Core Board USB2.0 lane 8 Data Positive Signal (USB2_CH8_DP)
60	S	GND	Signal Ground
62	IO	MXM_USB2_N6	Core Board USB2.0 lane 6 Data Negative Signal (USB2_CH6_DN)
64	IO	MXM_USB2_P6	Core Board USB2.0 lane 6 Data Positive Signal (USB2_CH6_DP)
66	IO	MXM_USB2_N4	Core Board USB2.0 lane 4 Data Negative Signal (USB2_CH4_DN)
68	IO	MXM_USB2_P4	Core Board USB2.0 lane 4 Data Positive Signal (USB2_CH4_DP)
70	S	GND	Signal Ground
72	O	MXM_USB3_TXN1	Core Board USB3.0 lane 1 Transmit Negative Signal (USB3_CH1_TXN)
74	O	MXM_USB3_TXP1	Core Board USB3.0 lane 1 Transmit Positive Signal (USB3_CH1_TXP)
76	S	GND	Signal Ground
78	/	NC	Reserved Pin (Leave floating)
80	/	NC	Reserved Pin (Leave floating)
82	S	GND	Signal Ground
84	/	NC	Reserved Pin (Leave floating)
86	/	NC	Reserved Pin (Leave floating)
88	S	GND	Signal Ground
90	/	NC	Reserved Pin (Leave floating)
91	/	NC	Reserved Pin (Leave floating)
93	/	NC	Reserved Pin (Leave floating)
95	S	GND	Signal Ground
97	I	PCIE_RXN1	Core Board PCIe Lane 1 Receive Negative Signal (PCIe_RX1_N)

MXM NO.	Type	Function	Remark
99	I	PCIE_RXP1	Core Board PCIe Lane 1 Receive Positive Signal (PCie_RX1_P)
101	I	PCIE_RXN2	Core Board PCIe Lane 2 Receive Negative Signal (PCie_RX2_N)
103	I	PCIE_RXP2	Core Board PCIe Lane 2 Receive Positive Signal (PCie_RX2_P)
105	S	GND	Signal Ground
107	I	PCIE_RXN3	Core Board PCIe Lane 3 Receive Negative Signal (PCie_RX3_N)
109	I	PCIE_RXP3	Core Board PCIe Lane 3 Receive Positive Signal (PCie_RX3_P)
111	S	GND	Signal Ground
113	O	PE_CKN1	Core board PCIe Lane 0 CLK Negative signal
115	O	PE_CKP1	Core board PCIe lane 0 CLK Positive signal
117	O	PE_CKN2	Core board PCIe lane 1 CLK Negative signal
119	O	PE_CKP2	Core board PCIe lane 1 CLK Positive signal
121	S	GND	Signal Ground
123	/	NC	Reserved Pin (Leave floating)
125	/	NC	Reserved Pin (Leave floating)
133	S	GND	Signal Ground
135	/	NC	Reserved Pin (Leave floating)
137	/	NC	Reserved Pin (Leave floating)
139	/	NC	Reserved Pin (Leave floating)
141	/	NC	Reserved Pin (Leave floating)
143	/	NC	Reserved Pin (Leave floating)
145	/	NC	Reserved Pin (Leave floating)
147	/	NC	Reserved Pin (Leave floating)
149	S	GND	Signal Ground
151	/	NC	Reserved Pin (Leave floating)
153	/	NC	Reserved Pin (Leave floating)
155	/	NC	Reserved Pin (Leave floating)
157	/	NC	Reserved Pin (Leave floating)
159	S	GND	Signal Ground
161	/	NC	Reserved Pin (Leave floating)
163	/	NC	Reserved Pin (Leave floating)
165	/	NC	Reserved Pin (Leave floating)
167	/	NC	Reserved Pin (Leave floating)
169	S	GND	Signal Ground
171	IO	MDI3_P1	Network MDI lane 3 Positive Signal (MDI3_P)
173	IO	MDI3_N1	Network MDI lane 3 Negative Signal (MDI3_N)
175	IO	MDI2_P1	Network MDI lane 2 Positive Signal (MDI2_P)
177	IO	MDI2_N1	Network MDI lane 2 Negative Signal (MDI2_N)
179	S	GND	Signal Ground
181	IO	MDI1_P1	Network MDI lane 1 Positive Signal (MDI1_P)
183	IO	MDI1_N1	Network MDI lane 1 Negative Signal (MDI1_N)
185	IO	MDI0_P1	Network MDI lane 0 Positive Signal (MDI0_P)
187	IO	MDI0_N1	Network MDI lane 0 Negative Signal (MDI0_N)

MXM NO.	Type	Function	Remark
92	/	NC	Reserved Pin (Leave floating)
94	S	GND	Signal Ground
96	O	PCIE_TXN1	Core Board PCIe Lane 1 Transmit Negative Signal (PCIE_TX1_N)
98	O	PCIE_TXP1	Core Board PCIe Lane 1 Transmit Positive Signal (PCIE_TX1_P)
100	O	PCIE_TXP2	Core Board PCIe Lane 2 Transmit Positive Signal (PCIE_TX2_P)
102	O	PCIE_TXN2	Core Board PCIe Lane 2 Transmit Negative Signal (PCIE_TX2_N)
104	S	GND	Signal Ground
106	O	PCIE_TXP3	Core Board PCIe Lane 3 Transmit Positive Signal (PCIE_TX3_P)
108	O	PCIE_TXN3	Core Board PCIe Lane 3 Transmit Negative Signal (PCIE_TX3_N)
110	S	GND	Signal Ground
112	O	PE_CKN3	Core board PCIE lane 2 CLK Negative signal
114	O	PE_CKP3	Core board PCIE lane 2 CLK Positive signal
116	O	PE_CKN4	Core board PCIE lane 3 CLK Negative signal
118	O	PE_CKP4	Core board PCIE lane 3 CLK Positive signal
120	S	GND	Signal Ground
122	/	NC	Reserved Pin (Leave floating)
124	/	NC	Reserved Pin (Leave floating)
134	S	GND	Signal Ground
136	IO	MXM_USB2_N9	Core Board USB2.0 lane 9 Data Negative Signal (USB2_CH9_DN)
138	IO	MXM_USB2_P9	Core Board USB2.0 lane 9 Data Positive Signal (USB2_CH9_DP)
140	IO	MXM_USB2_N10	Core Board USB2.0 lane 10 Data Negative Signal (USB2_CH10_DN)
142	IO	MXM_USB2_P10	Core Board USB2.0 lane 10 Data Positive Signal (USB2_CH10_DP)
144	/	NC	Reserved Pin (Leave floating)
146	/	NC	Reserved Pin (Leave floating)
148	/	NC	Reserved Pin (Leave floating)
150	S	GND	Signal Ground
152	/	NC	Reserved Pin (Leave floating)
154	/	NC	Reserved Pin (Leave floating)
156	/	NC	Reserved Pin (Leave floating)
158	/	NC	Reserved Pin (Leave floating)
160	S	GND	Signal Ground
162	/	NC	Reserved Pin (Leave floating)
164	/	NC	Reserved Pin (Leave floating)
166	/	NC	Reserved Pin (Leave floating)
168	/	NC	Reserved Pin (Leave floating)
170	S	GND	Signal Ground
172	O	PE_CKN5	Core board PCIE lane 5 CLK Negative signal
174	O	PE_CKP5	Core board PCIE lane 5 CLK Positive signal
176	S	GND	Signal Ground
178	O	SPD1G#_LAN1	Gigabit Ethernet Indicator Signal
180	O	SPD100#_LAN1	Fast Ethernet Indicator Signal
182	O	ACT#_LAN1	Network Port Status Indicator Signal

MXM NO.	Type	Function	Remark
184	O	EDP_VDDEN	Core Board EDP Display VDD Power Enable Control
186	O	EDP_BKLCTL	Core Board EDP Display Backlight Adjustment Signal
188	O	EDP_BKLEN	Core Board EDP Display Backlight Power Enable Control
189	S	GND	Signal Ground
191	O	LVDS_RST#	LVDS Reset Signal
193	O	LVDS_LINK	LVDS Connection Status Signal
195	I	LVDS_6B_8B#	LVDS Data Encoding Configuration Signal
197	S	GND	Signal Ground
199	O	EDP_TXN1	Core Board EDP Display lane 1 Negative Signal (EDP_D1_N)
201	O	EDP_TXP1	Core Board EDP Display lane 1 Positive Signal (EDP_D1_P)
203	S	GND	Signal Ground
205	O	EDP_TXN0	Core Board EDP Display lane 0 Negative Signal (EDP_D0_N)
207	O	EDP_TXP0	Core Board EDP Display lane 0 Positive Signal (EDP_D0_P)
209	S	GND	Signal Ground
211	I	SATA_RXN1	Core Board SATA lane 1 Receive Negative Signal (SATA_RX1_N)
213	I	SATA_RXP1	Core Board SATA lane 1 Receive Positive Signal (SATA_RX1_P)
215	S	GND	Signal Ground
217	I	SATA_RXN0	Core Board SATA lane 0 Receive Negative Signal (SATA_RX0_N)
219	I	SATA_RXP0	Core Board SATA lane 0 Receive Positive Signal (SATA_RX0_P)
221	S	GND	Signal Ground
223	O	S_SOUT5	Core board Serial port 5 TX signal
225	I	S_SIN5	Core board Serial port 5 RX signal
227	O	S_SOUT4	Core board Serial port 4 TX signal
229	I	S_SIN4	Core board Serial port 4 RX signal
231	O	S_SOUT3	Core board Serial port 3 TX signal
233	I	S_SIN3	Core board Serial port 3 RX signal
235	I	S_DCD#1	Core board Serial port 1 DCD signal
237	I	S_RI#1	Core board Serial port 1 RI signal
239	I	S_CTS#1	Core board Serial port 1 CTS signal
241	O	S_DTR#1	Core board Serial port 1 DTR signal
243	O	S_RTS#1	Core board Serial port 1 RTS signal
245	I	S_DSR#1	Core board Serial port 1 DSR signal
247	O	MXM_SOUT1	Core board Serial port 1 TX signal
249	I	S_SIN1	Core board Serial port 1 RX signal
251	S	GND	Signal Ground
253	/	NC	Reserved Pin (Leave floating)
255	/	NC	Reserved Pin (Leave floating)
257	S	GND	Signal Ground
259	/	NC	Reserved Pin (Leave floating)
261	/	NC	Reserved Pin (Leave floating)
263	S	GND	Signal Ground

MXM NO.	Type	Function	Remark
265	/	NC	Reserved Pin (Leave floating)
267	/	NC	Reserved Pin (Leave floating)
269	S	GND	Signal Ground
271	/	NC	Reserved Pin (Leave floating)
273	/	NC	Reserved Pin (Leave floating)
275	S	GND	Signal Ground
277	/	NC	Reserved Pin (Leave floating)
279	/	NC	Reserved Pin (Leave floating)
281	/	NC	Reserved Pin (Leave floating)
190	I	EDP_HPD#	Core Board EDP Display Hot Plug Detect Signal (EDP_HPD)
192	IO	EDP_AUXN	Core Board EDP Display AUX lane Negative Signal (EDP_AUX_N)
194	IO	EDP_AUXP	Core Board EDP Display AUX lane Positive Signal (EDP_AUX_P)
196	S	GND	Signal Ground
198	O	EDP_TXN3	Core Board EDP Display lane 3 Negative Signal (EDP_D3_N)
200	O	EDP_TXP3	Core Board EDP Display lane 3 Positive Signal (EDP_D3_P)
202	S	GND	Signal Ground
204	O	EDP_TXN2	Core Board EDP Display lane 2 Negative Signal (EDP_D2_N)
206	O	EDP_TXP2	Core Board EDP Display lane 2 Positive Signal (EDP_D2_P)
208	S	GND	Signal Ground
210	O	SATA_TXN1	Core Board SATA lane 1 Transmit Negative Signal (SATA_TX1_N)
212	O	SATA_TXP1	Core Board SATA lane 1 Transmit Positive Signal (SATA_TX1_P)
214	S	GND	Signal Ground
216	O	SATA_TXN0	Core Board SATA lane 0 Transmit Negative Signal (SATA_TX0_N)
218	O	SATA_TXP0	Core Board SATA lane 0 Transmit Positive Signal (SATA_TX0_P)
220	S	GND	Signal Ground
222	O	S_SOUT6	Core board Serial port 6 TX signal
224	I	S_SIN6	Core board Serial port 6 RX signal
226	I	S_DCD#2	Core board Serial port 2 DCD signal
228	I	S_RI#2	Core board Serial port 2 RI signal
230	I	S_CTS#2	Core board Serial port 2 CTS signal
232	O	S_DTR#2	Core board Serial port 2 DTR signal
234	O	S_RTS#2	Core board Serial port 2 RTS signal
236	I	S_DSR#2	Core board Serial port 2 DSR signal
238	O	S_SOUT2	Core board Serial port 2 TX signal
240	I	S_SIN2	Core board Serial port 2 RX signal
242	S	GND	Signal Ground
244	O	DDI2_TXN1	Core Board DDI2 Display lane 1 Negative Signal (DDI2_D1_N)
246	O	DDI2_TXP1	Core Board DDI2 Display lane 1 Positive Signal (DDI2_D1_P)
248	S	GND	Signal Ground
250	O	DDI2_TXN2	Core Board DDI2 Display lane 2 Negative Signal (DDI2_D2_N)
252	O	DDI2_TXP2	Core Board DDI2 Display lane 2 Positive Signal (DDI2_D2_P)
254	S	GND	Signal Ground

MXM NO.	Type	Function	Remark
256	O	DDI2_TXN3	Core Board DDI2 Display lane 3 Negative Signal (DDI2_D3_N)
258	O	DDI2_TXP3	Core Board DDI2 Display lane 3 Positive Signal (DDI2_D3_P)
260	S	GND	Signal Ground
262	O	DDI2_TXN0	Core Board DDI2 Display lane 0 Negative Signal (DDI2_D0_N)
264	O	DDI2_TXP0	Core Board DDI2 Display lane 0 Positive Signal (DDI2_D0_P)
266	S	GND	Signal Ground
268	IO	DDI2_AUXN	Core board DDI2 Display lane AUX Negative signal
270	IO	DDI2_AUXP	Core board DDI2 Display lane AUX Positive signal
272	I	DDI2_HPD#	Core board DDI2 Display lane HPD signal
274	IO	DDI2_SCL	Core board DDI2 Display lane DDC CLK signal
276	IO	DDI2_SDA	Core board DDI2 Display lane DDC DATA signal
278	IO	DDI1_SCL	Core board DDI1 Display lane DDC CLK signal
280	IO	DDI1_SDA	Core board DDI1 Display lane DDC DATA signal

Chapter 3 Installation Instructions

3.1 Cooler Installation Instructions

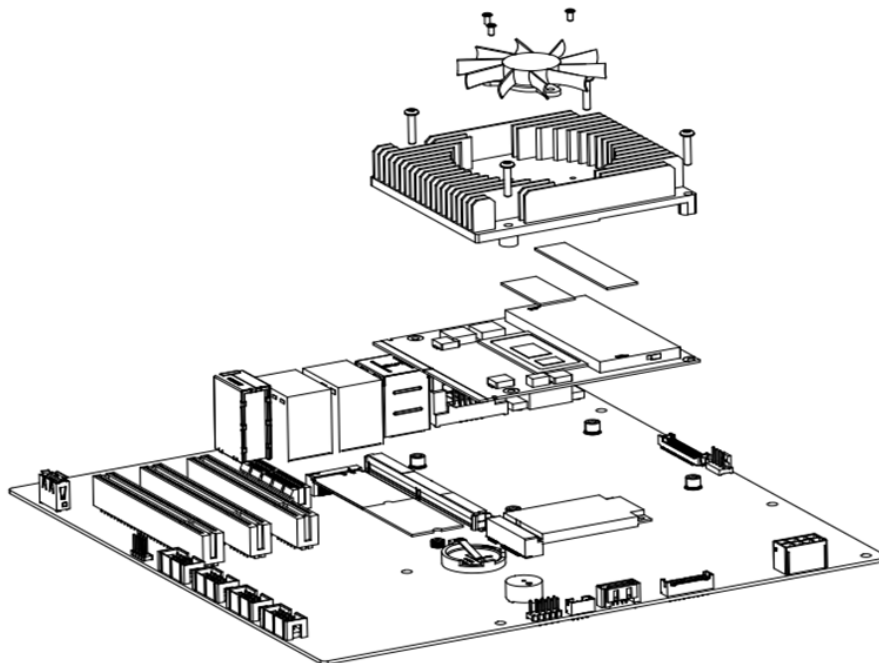
Step 1. Insert the core board into the carrier board interface, and install the motherboard standoffs. Screw the six M3 standoffs into the corresponding threaded holes on the motherboard.

Step 2. Apply thermal pads onto the CPU, bridge chip, and memory modules. Install the cooler by aligning its six M3×10L screws with the standoff holes on the motherboard, then fasten the screws.

Step 3. Secure the fan to the cooler using four M3×18 screws, fastening them into the fan mounting holes.

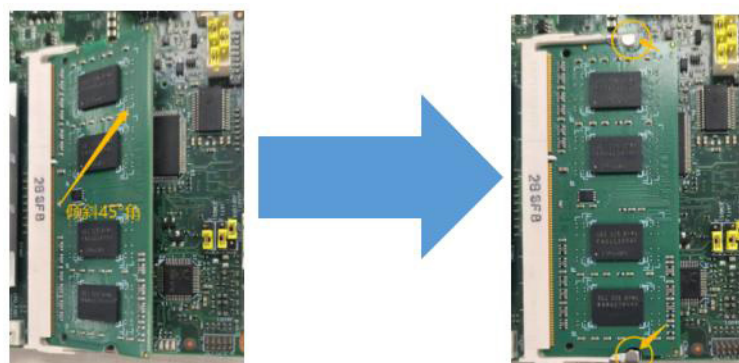
Step 4. Connect the cooler fan power cable to the FAN header on the carrier board (Caution: Fan operates at 12V).

Detailed operations are shown in the figure below:



3.2 SO-DIMM Memory Installation Instructions

Hold the SO-DIMM module at a 45-degree angle and insert it into the memory slot. Press down firmly until the retention clips on both sides engage automatically.



Chapter 4 AMI BIOS Setup

The AMI BIOS ROM contains an embedded setup utility that stores the system's fundamental input/output programs. This utility allows users to configure basic system settings, which are saved to the motherboard's FLASH memory. An onboard battery preserves these settings when power is disconnected by maintaining standby voltage to the FLASH. During the POST (Power-On Self-Test) sequence, press <Del> or <Esc> to access the CMOS SETUP screen.

Interface Structure:

Left column:

Gray text: Unconfigurable options

Blue text: Configurable options

Right column:

Upper section: Description of selected option

Lower section: Keyboard shortcut guide

4.1 Shortcut Key Reference

Shortcut Key Reference:

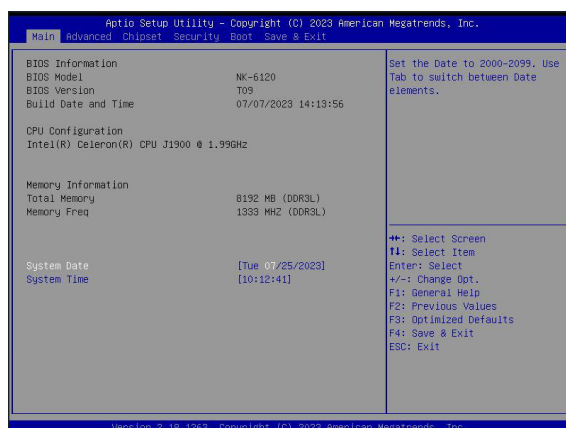
Hot Key	Function	Description
< ← > >	BIOS interface selection	Within BIOS interface
< ↑ > > ↓ >	BIOS option selection	Within BIOS interface
<CTRL>+<ALT>+<DEL>	Restart system	After system power-on
<Enter>	Confirm selection	Within BIOS interface
<DEL>	Enter BIOS setup interface	Within BIOS interface
<ESC>	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 Menu

Press <Del> during boot to enter BIOS Setup. The Main Menu will appear. Use arrow keys to navigate and <Enter> to select submenus.

The Main interface displays system information (BIOS version, CPU, memory) and allows configuration of system date/time.

Main Menu Interface:



4.2.1 System Date/Time Configuration

Select System Date or System Time to modify settings

Navigation: Press <Tab> or <← >/< →> between fields

Date format: MM/DD/YYYY

Time format: 24-hour clock (HH:MM:SS)

Value adjustment: Use +, -, or numeric keys

Field toggle: Press <Enter> to cycle through date/time components

Save: Press F4 → Reboot to apply changes

4.3 Advanced Menu

The Advanced menu provides access to critical system configurations:

CPU settings

Memory timings

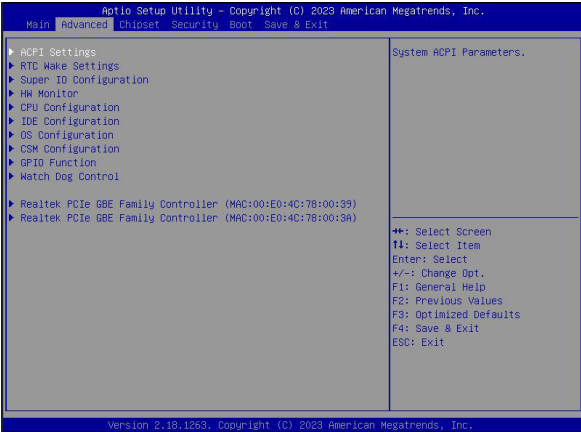
SATA controller options

Overclocking features

Virtualization settings

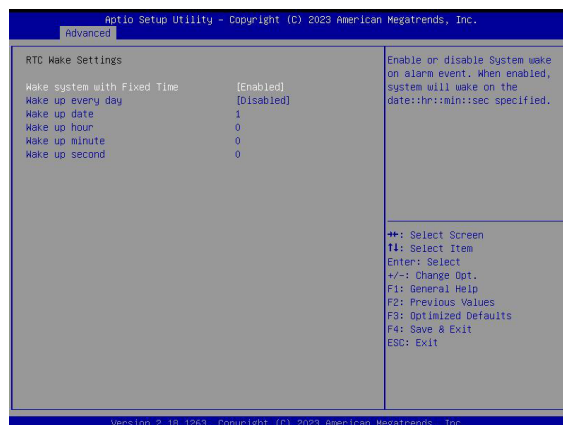
Navigate with <↑ >/< ↓ > arrow keys and press <Enter> to enter submenus.

Advanced Menu Interface:



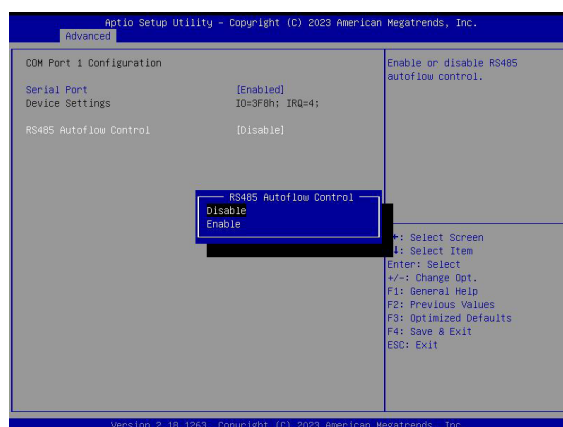
4.3.1 Scheduled Wake-up Function

In the Advanced interface, navigate sequentially to S5 RTC Wake Settings > Wake system from S5. This option allows enabling or disabling the system's scheduled wake-up function (disabled by default). When set to Enabled, you can specify the date, hour, minute, and second for the system to wake up at the designated time. After completing the settings, press F4 to save and exit. The configurations will take effect after a system restart.



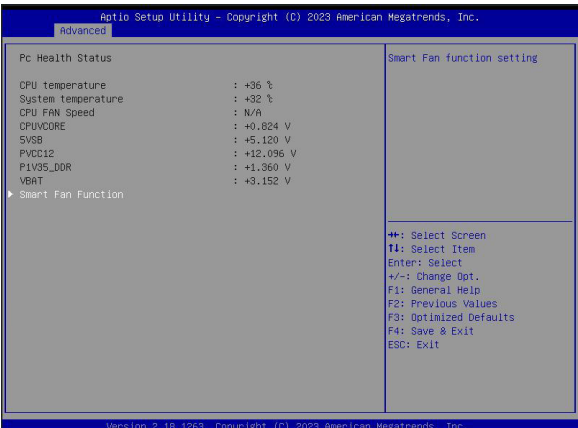
4.3.2 COM Mode Configuration

In the Advanced interface, select Super IO Configuration->Serial Port 1/2 Configuration->Serial Port/RS485 Autoflow Control, Serial Port X (X stands for serial port number) is Enabled or disabled COM port, default Enabled; RS485 Autoflow Control to enable or disable RS485 flow control, default Enable, the hardware serial port is set to RS485, then it needs to be set to Enabled. If RS232 mode is needed, the flow control of the corresponding serial port needs to be changed to Disable. Press F4 to save and exit. It will take effect after restart.

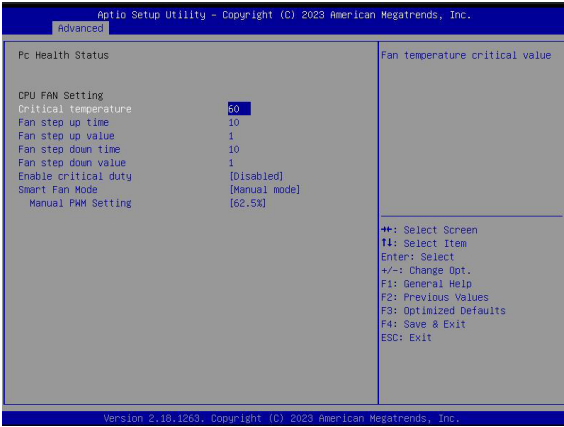


4.3.3 Hardware Monitor

In the Advanced interface, select HW Monitor to display information such as CPU temperature, system temperature, values of important voltage parameters, and Smart Fan Function.



Smart Fan Function: The Smart Fan Mode can be set, which is divided into Manual mode (Manual model) and intelligent mode (SMART FAN). The default is SMART FAN mode. Select Manual model. According to the application requirements of users, the system temperature risk value of the fan can be set respectively. Fan start-up temperature, fan stop temperature, fan setting mode, duty cycle, etc.



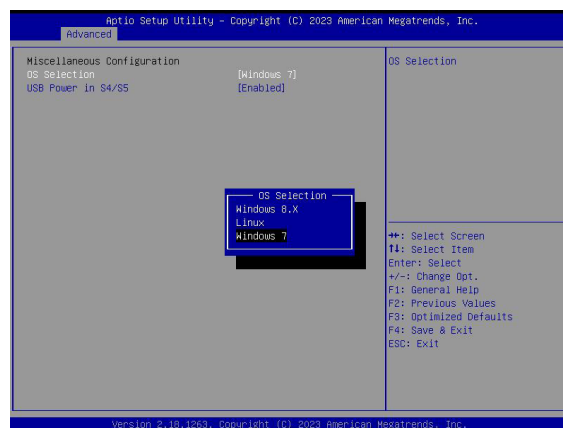
4.3.4 Turbo Mode Configuration

In the Advanced interface, select CPU Configuration-> Turbo Mode in sequence. You can set to start or disable the overclocking mode. The default is Disabled.



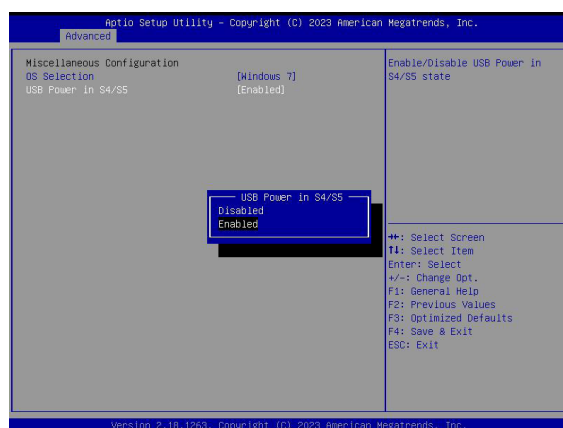
4.3.5 System OS Settings

In the Advanced interface, navigate to OS Configuration -> OS Selection. Based on the operating system used by the customer, configure the OS Settings in the BIOS. Select Windows 7 / Windows 8.x / Linux (defaults to Windows 7). After completing the settings, press F4 to save and exit. The changes will be applied after the system reboots.



4.3.6 USB Power Settings During Shutdown/Sleep

In the Advanced interface, navigate step-by-step to OS Configuration -> USB Power in S4/S5. This setting allows you to Enable or Disable whether USB ports continue to provide power when the system is in S4/S5 states. The default is Enabled, meaning USB ports remain powered.

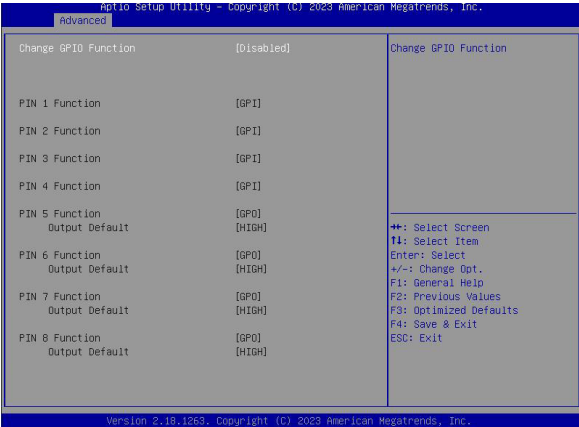


4.3.7 GPIO Configuration

Path: Advanced -> GPIO Function -> Change GPIO Function.

Setting	Action	
GPlo Function	Enables/disables	Disabled
GPlo Mode (when Enabled)	GPI (input) / GPo (output)	-
GPo State	HIGH/LOW	-

Press F4 to save and reboot.

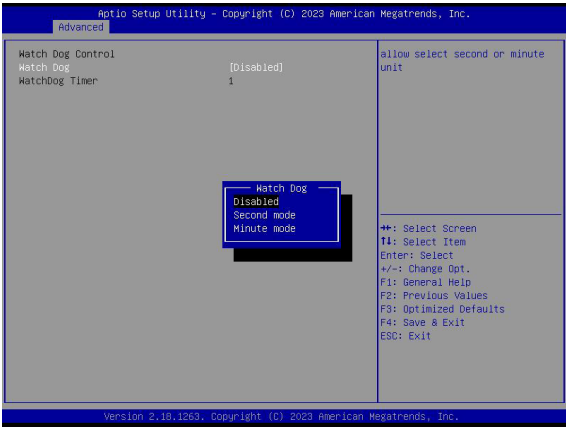


4.3.8 Watchdog Timer Settings

Path: Advanced → Watch Dog Control → Watch Dog.

Setting	Action	
Watch Dog	Enables/Disables system watchdog timer	Disabled

Press F4 to save and reboot. For usage details, refer to Appendix 1.



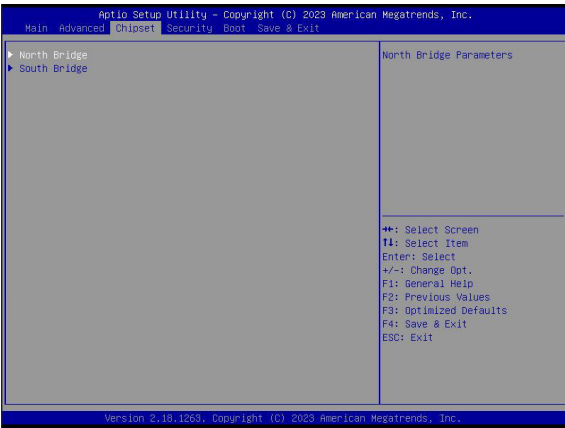
4.4 Chipset Menu

Configures motherboard chipset functions - the integrated circuit managing data flow between core components.

Key Configurable Areas:

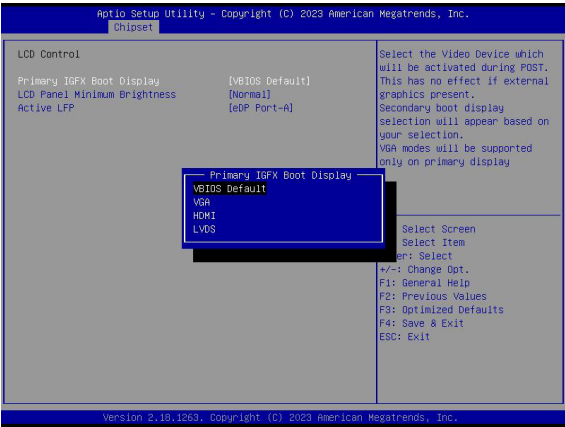
- PCIe lane allocation
- USB controller settings
- Storage controller modes (AHCI/RAID)
- Integrated peripheral management

Use < ↑ > ↓ > to select options, Press Enter to access submenus, Figure: Chipset Configuration Interface:



4.4.1 Primary Display Selection

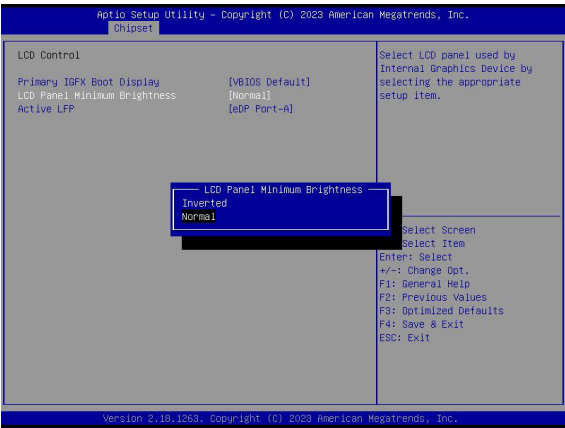
Path: Chipset → System Agent (SA) Configuration → Graphics Configuration → Primary Display
Configures display output priority (e.g., iGPU, dGPU). Press F4 to save and reboot



4.4.2 Backlight Brightness Inverted Mode Adjustment

Path : Chipset -> North Bridge-> LCD Control -> LCD Panel Minimum Brightness

Can set the minimum brightness of the LCD screen under the system is Normal or Inverted mode adjustment. Press F4 to save and reboot

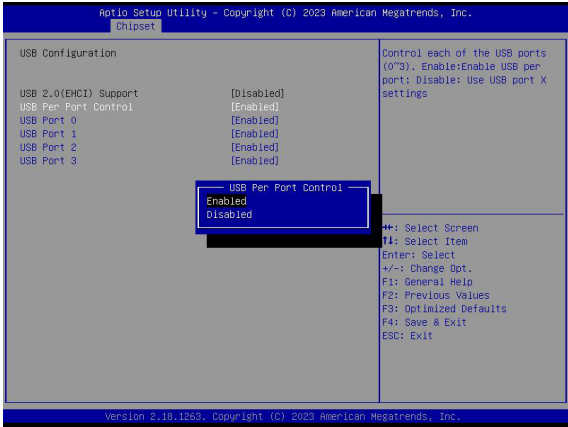


4.4.3 USB on and off Settings

Path : Chipset ->South Bridge->USB Configuration-> USB Per Port Control / USB Port X

Set the function of turning on and off the USB interface of the motherboard; USB Per Port Control is set to Disabled to close all USB interfaces (use with caution). USB Port X (X represents the USB port number) is set to Disabled to close a single USB interface and is set to Enabled. Start a single USB interface, which is Enabled by default.

Press F4 to save and reboot

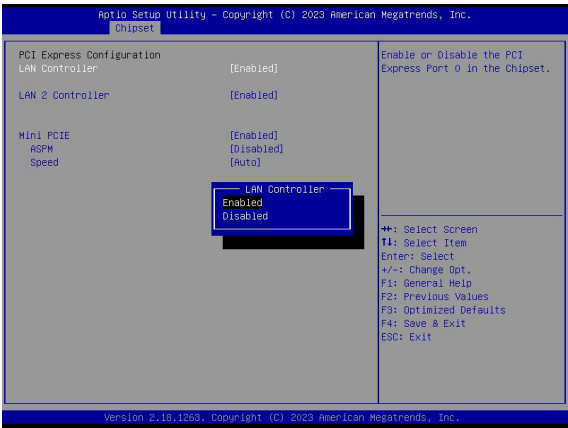


4.4.4 Network on and off Settings

Path : Chipset ->South Bridge->PCI Express Configuration -> LAN X Controller

Set the function of enabling and disabling the LAN interface of the motherboard. For LAN Port X (X represents the LAN port number), set it to Disabled to disable a single LAN interface. Set it to Enabled to enable a single LAN interface. The default is Enabled.

Press F4 to save and reboot

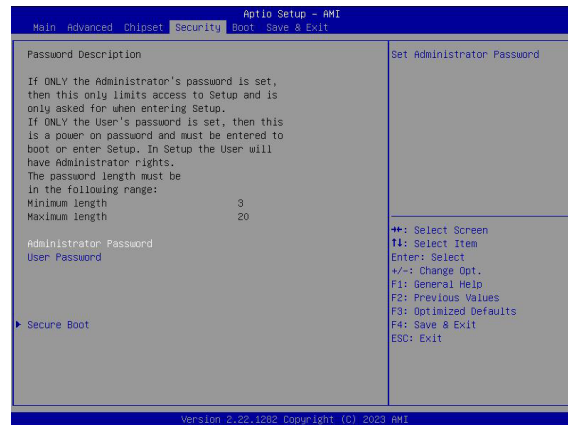


4.4.5 Power-on Auto Boot

Path : Chipset -> South Bridge -> Restore AC Power Loss

Set to turn on or off the power-on auto-start function. S0 State is in AT mode. After connecting to the power supply. Automatic power-on and startup The S5 State is in ATX mode. After connecting to the Power supply, the Power button needs to be pressed to turn it on.

Press F4 to save and reboot



4.5 Security Menu

Configures system access controls and password protection.

Navigation:

- Use arrow keys to select options
- Press Enter to access submenus

Figure: Security Configuration Interface.



4.5.1 Administrator Password

Path: Security → Administrator Password

- Set 6+ character password (letters/numbers/symbols)
- Press F4 to save and reboot

4.5.2 User Password

- Path: Security → User Password
- Set 6+ character password (letters/numbers/symbols)
 - Press F4 to save and reboot.

Figure: Save & Exit Interface



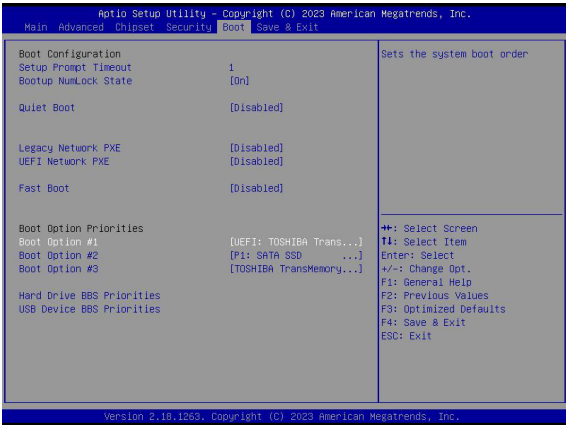
WARNING: Passwords cannot be recovered. Loss may require motherboard replacement.

4.6 BOOT Menu

Configures system startup behavior.

- Navigation:
- Use < ↑ > < ↓ > to select options
 - Press Enter to modify settings

Figure: Boot Configuration Interface



4.6.1 Boot Splash Screen

Path: Boot → Quiet Boot.

Setting	Effect
Enabled	Shows OEM logo during POST
Disabled	Displays text POST messages

4.6.2 Boot Order Configuration

- Path: Boot → Boot Option Priorities
- Boot Option #1: Primary boot device
 - Boot Option #2: Secondary boot device
 - Reorder using +/- keys
- Press F4 to save and reboot

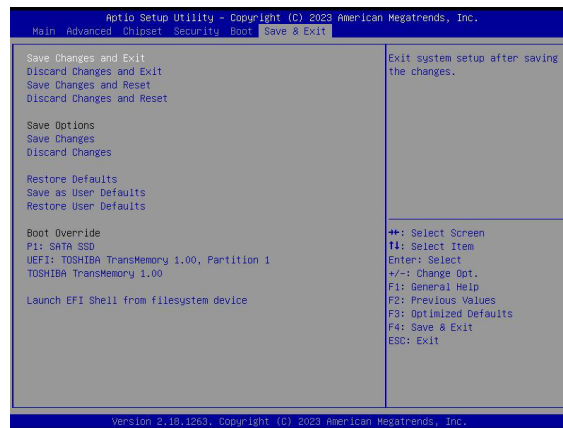
4.7 Save & Exit Menu

Manages BIOS configuration persistence.

Key Functions:

- Save changes and exit
- Discard changes and exit
- Load optimized defaults

Figure: Save & Exit Interface



4.7.1 Reset Without Saving Changes

Path: Save & Exit → Discard Changes and Reset

Press F4 to reboot without applying any modified settings.

4.7.2 Restore Default Settings

Path: Save & Exit → Restore Defaults

Press F4 to load factory-optimized BIOS configurations and reboot.

4.7.3 Single Boot Override

Path: Save & Exit → Boot Override

Select a device (e.g., UEFI: USB Drive) to force a one-time boot from that device. Press F4 to execute immediate reboot with selected device.

Appendix 1 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
```