MTX-MTH1
User's Manual

Revision: 2.0
Release Date: March 10, 2025

Trademark:

TABLE OF CONTENT

Environmental Protection and Safety Announcement

- Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	X	X	O	O	O	O
外部信号连接器及线材	X	X	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在

SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出

SJ/T 11363-2006 标准规定的限量要求。

备注: 此产品所标示之环保使用期限,系指在一般正常使用状况下。

China RoHS Requirements (EN)

Poisonous or Hazardous Substances or Elements in Products

Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	**Mercury (Hg)**	**Cadmium (Cd)**	**Hexavalent Chromium (Cr(VI))**	**Polybrominated Biphenyls (PBB)**	**Polybrominated Diphenyl Ethers (PBDE)**
PCB & Other Components	X	X	O	O	O	O
Wires & Connectors for External Connections	X	X	O	O	O	O

O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

User's Notice

COPYRIGHT OF THIS MANUAL BELONGS TO THE MANUFACTURER. NO PART OF THIS MANUAL, INCLUDING THE PRODUCTS AND SOFTWARE DESCRIBED IN IT MAY BE REPRODUCED, TRANSMITTED OR TRANSLATED INTO ANY LANGUAGE IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION OF THE MANUFACTURER.

THIS MANUAL CONTAINS ALL INFORMATION REQUIRED TO USE THIS MOTHER-BOARD SERIES AND WE DO ASSURE THIS MANUAL MEETS USER'S REQUIREMENT BUT WILL CHANGE, CORRECT ANY TIME WITHOUT NOTICE. MANUFACTURER PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTY OF ANY KIND, AND WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTIAL OR CONSEQUENTIAL DAMAGES (INCLUDING DAMANGES FOR LOSS OF PROFIT, LOSS OF BUSINESS, LOSS OF USE OF DATA, INTERRUPTION OF BUSINESS AND THE LIKE).

PRODUCTS AND CORPORATE NAMES APPEARING IN THIS MANUAL MAY OR MAY NOT BE REGISTERED TRADEMARKS OR COPYRIGHTS OF THEIR RESPECTIVE COMPANIES, AND THEY ARE USED ONLY FOR IDENTIFICATION OR EXPLANATION AND TO THE OWNER'S BENEFIT, WITHOUT INTENT TO INFRINGE.

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	March 10, 2025

Packing List

Part Number	Description	QTY per Board
MTX-MTH1	MTX-MTH1 Mother Board	1
F05-JMTX28W-F	CPU COOLER	1
F04-MB-109-F	I/O Shield	1
F01-SP-A-BK-3F	Jumper	1
G01-COM-H2M22-1F	COM Cable	2
G01-SATA3-BL-1F	SATA Cable	1
G01-PW4PS2S-322-1F	Y-Power Cable	1

Chapter 1 Introduction of the Motherboard

1-1 Specifications

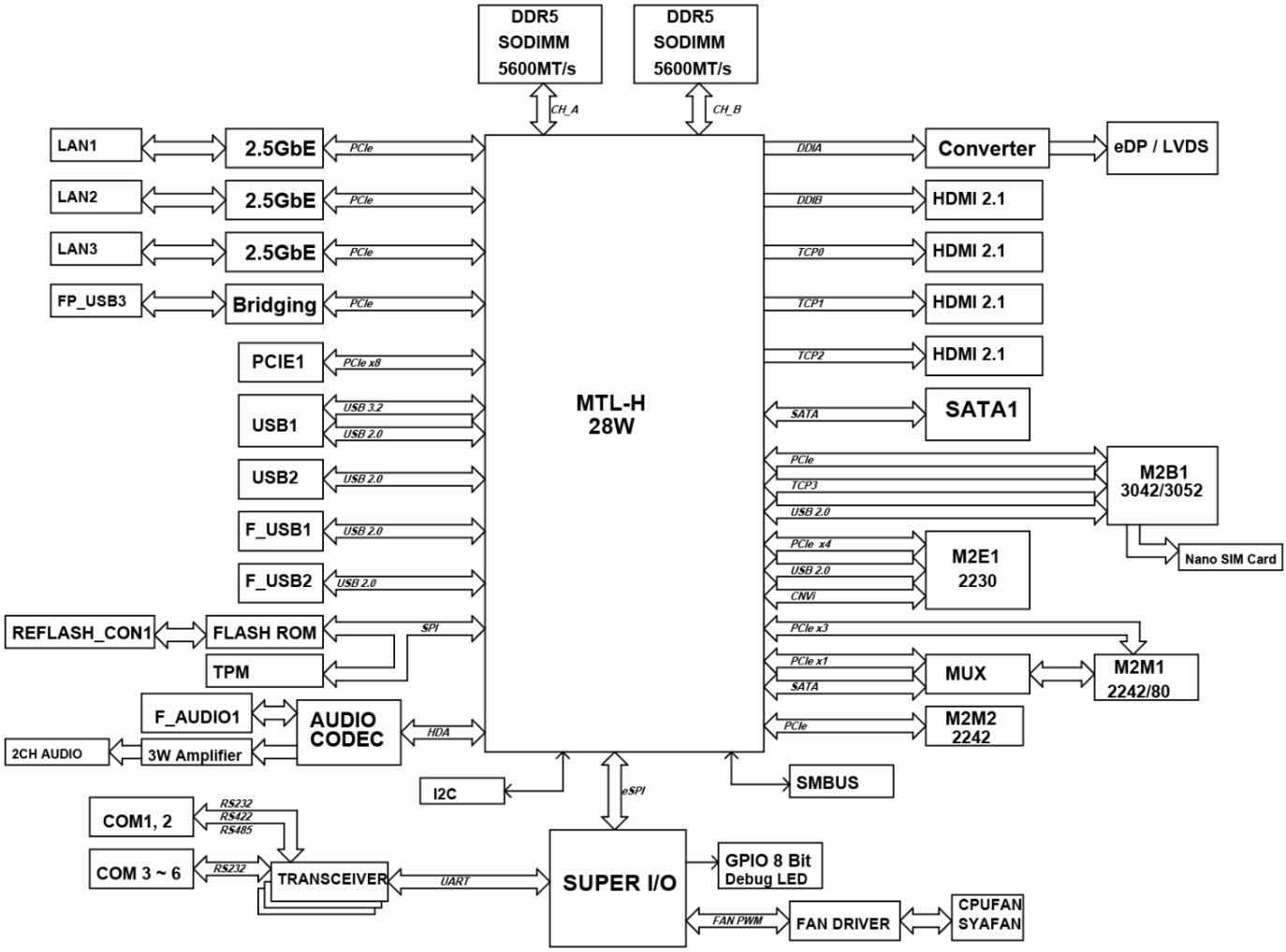
SYSTEM	
MB FORM FACTOR	Thin Mini-ITX
CPU	Onboard Intel® Core™ Ultra 7 Processor 155H (Formerly Meteor Lake, TDP 28W) Onboard Intel® Core™ Ultra 5 Processor 125H (Formerly Meteor Lake, TDP 28W)
CHIPSET	Intel® SoC
MEMORY	2 x DDR5 5600MHz, Dual Channel SO-DIMM, up to 96GB
BIOS	UEFI
WAKE ON LAN	Yes
WATCHDOG TIMER	255 Levels
SECURITY	TPM2.0 (dTPM, Optional)
RTC BATTERY	Lithium Battery
DIMENSION (W X D)	170.0 (W) x 170.0 (D) mm (6.7″ x 6.7″)
OS SUPPORT	Windows® 11 (64bit) Windows® 10 (64bit) Linux
POWER	
POWER REQUIREMENT	DC-in 12~36V
POWER ON MODE	AT / ATX (Default) Mode
CONNECTOR	DC Jack
DISPLAY	
GPU	Intel® Arc™ Graphics
LVDS	1 x 24-bit Dual Channel LVDS (Max. Resolution: 1920 x 1200 @60Hz, Co-lay eDP)
HDMI	4 x HDMI 2.1 (3840 x 2160@60Hz, Max Resolution up to 7680 x 4320@60Hz)
MULTIPLE DISPLAY	Support 4 Displays
AUDIO	
CODEC	Realtek Audio Codec
MIC-in	Internal Header for MIC-In
Line-out	Internal Header for Line-Out
AMPLIFIER	3W

LAN	
ETHERNET	1 x RJ45 for Intel® I226-LM 2.5GbE 2 x RJ45 for Intel® I226-V 2.5GbE
USB PORT	
USB	2 x USB 3.2 Gen 2x1 (10Gbps, Formerly USB 3.1 Gen 2) 2 x USB 2.0 Internal Header for 2 x USB 3.2 Internal Header for 4 x USB 2.0
SERIAL PORT	
COM	Internal Header for 4 x RS-232 Internal Header for 2 x RS-232/422/485
INTERNAL I/O	
GPIO	8-Bit
SMBUS	Yes
FAN	1 x 4-pin Connector for System Fan (PWM Mode)
ADDITIONAL	1 x Chassis intrusion 1 x AT/ATX Mode Selection
STORAGE	
SATA	1 x SATA3 1 x SATA Power Connector
RAID	RAID 0/1
EXPANSION	
M.2	1 x M-Key 2242 (PCIe 4.0 x 4) Support NVMe 1 x M-Key 2242/2280 (PCIe 4.0 x4 / SATA3) Support NVMe 1 x B-Key 3042/3052 (PCIe Gen.3 x1/USB3.2 Gen.2/USB2.0 interface) support 4G/5G Module 1 x E-Key 2230 (USB 2.0/PCIe x1) Support CNVi
PCIE	1 x PCIe x 8 (Gen. 5)
SIM	1 x Nano SIM Card Slot
ENVIRONMENT & CERTIFICATION	
OPERATING TEMPERATURE	-20°C ~ 60°C (-4°F ~ 140°F)
STORAGE TEMPERATURE	-20°C ~ 85°C (-4°F ~ 185°F)
OPERATING HUMIDITY	10 ~ 90% relative humidity, non-condensing
CERTIFICATION	CE/FCC Class A

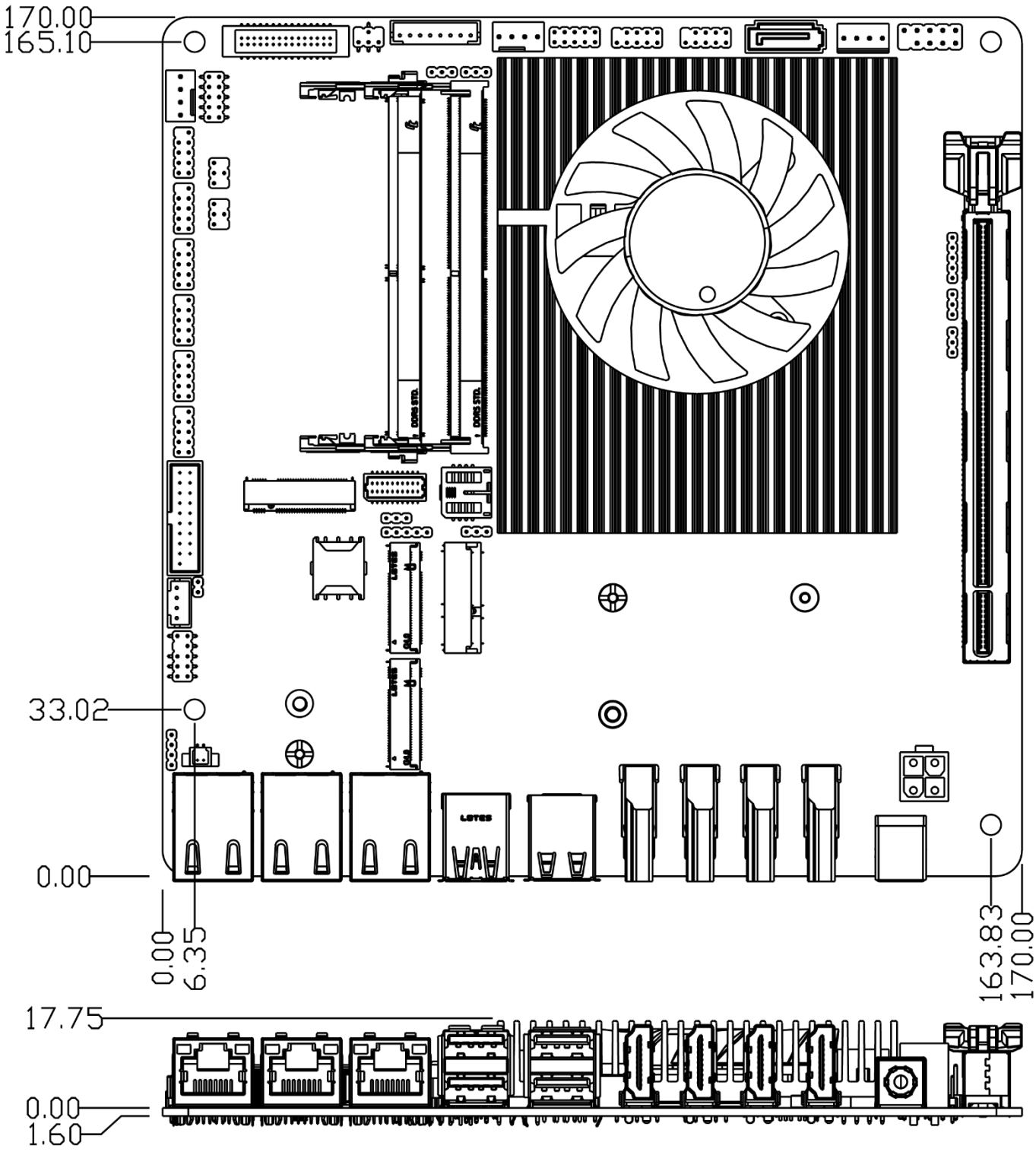
Ordering Information

PART NUMBER	MTX-MTH1-125H0010	MTX-MTH1-125H0210	MTX-MTH1-155H0010	MTX-MTH1-155H0210
CPU	Intel® Core™ Ultra 5 125H	Intel® Core™ Ultra 5 125H	Intel® Core™ Ultra 7 155H	Intel® Core™ Ultra 7 155H
SECURITY	Intel® PTT (fTPM)	TPM2.0 (dTPM)	Intel® PTT (fTPM)	TPM2.0 (dTPM)
POWER REQUIREMENT	DC-in 12~36V	DC-in 12~36V	DC-in 12~36V	DC-in 12~36V
GPU	Intel® Arc™ Graphics	Intel® Arc™ Graphics	Intel® Arc™ Graphics	Intel® Arc™ Graphics
LVDS	1 x LVDS/eDP	1 x LVDS/eDP	1 x LVDS/eDP	1 x LVDS/eDP
HDMI	4 x HDMI	4 x HDMI	4 x HDMI	4 x HDMI
MULTIPLE DISPLAY	Support 4 Displays	Support 4 Displays	Support 4 Displays	Support 4 Displays
ETHERNET	3 x 2.5GbE	3 x 2.5GbE	3 x 2.5GbE	3 x 2.5GbE
USB	6 x USB 2.0	6 x USB 2.0	6 x USB 2.0	6 x USB 2.0
USB	4 x USB 3.2	4 x USB 3.2	4 x USB 3.2	4 x USB 3.2
COM	4 x RS-232	4 x RS-232	4 x RS-232	4 x RS-232
COM	2 x RS-232/422/485	2 x RS-232/422/485	2 x RS-232/422/485	2 x RS-232/422/485
SATA	1 x SATA3	1 x SATA3	1 x SATA3	1 x SATA3
M.2	1 x M-Key 2242/2280	1 x M-Key 2242/2280	1 x M-Key 2242/2280	1 x M-Key 2242/2280
M.2	1 x M-Key 2242	1 x M-Key 2242	1 x M-Key 2242	1 x M-Key 2242
M.2	1 x B-key 3042/3052	1 x B-key 3042/3052	1 x B-key 3042/3052	1 x B-key 3042/3052
M.2	1 x E-Key 2230	1 x E-Key 2230	1 x E-Key 2230	1 x E-Key 2230
PCIE	1 x PCIE x8	1 x PCIE x8	1 x PCIE x8	1 x PCIE x8
SIM	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot	1 x Nano SIM Card Slot
OTHER	1 x Chassis intrusion	1 x Chassis intrusion	1 x Chassis intrusion	1 x Chassis intrusion
OPERATING TEMPERATURE	-20°C ~ 60°C (-4°F ~ 140°F)	-20°C ~ 60°C (-4°F ~ 140°F)	-20°C ~ 60°C (-4°F ~ 140°F)	-20°C ~ 60°C (-4°F ~ 140°F)

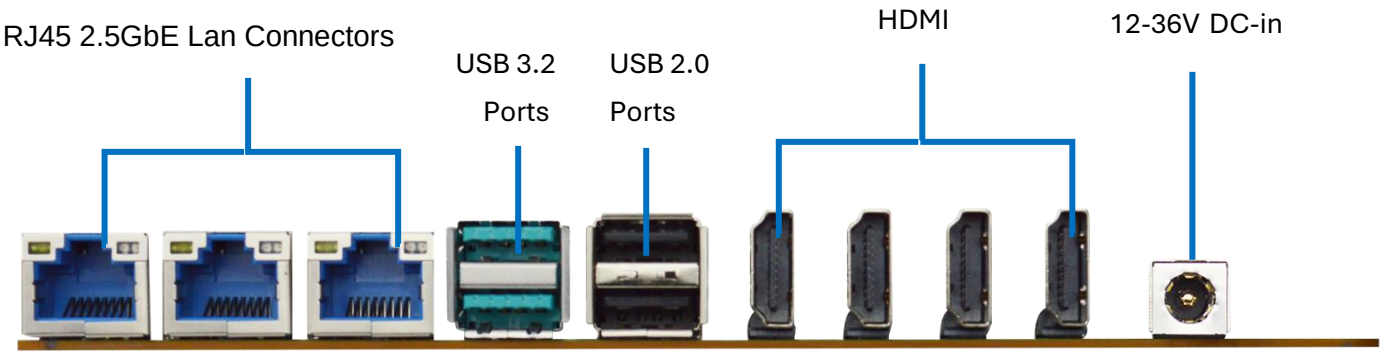
1-2 Block Diagram



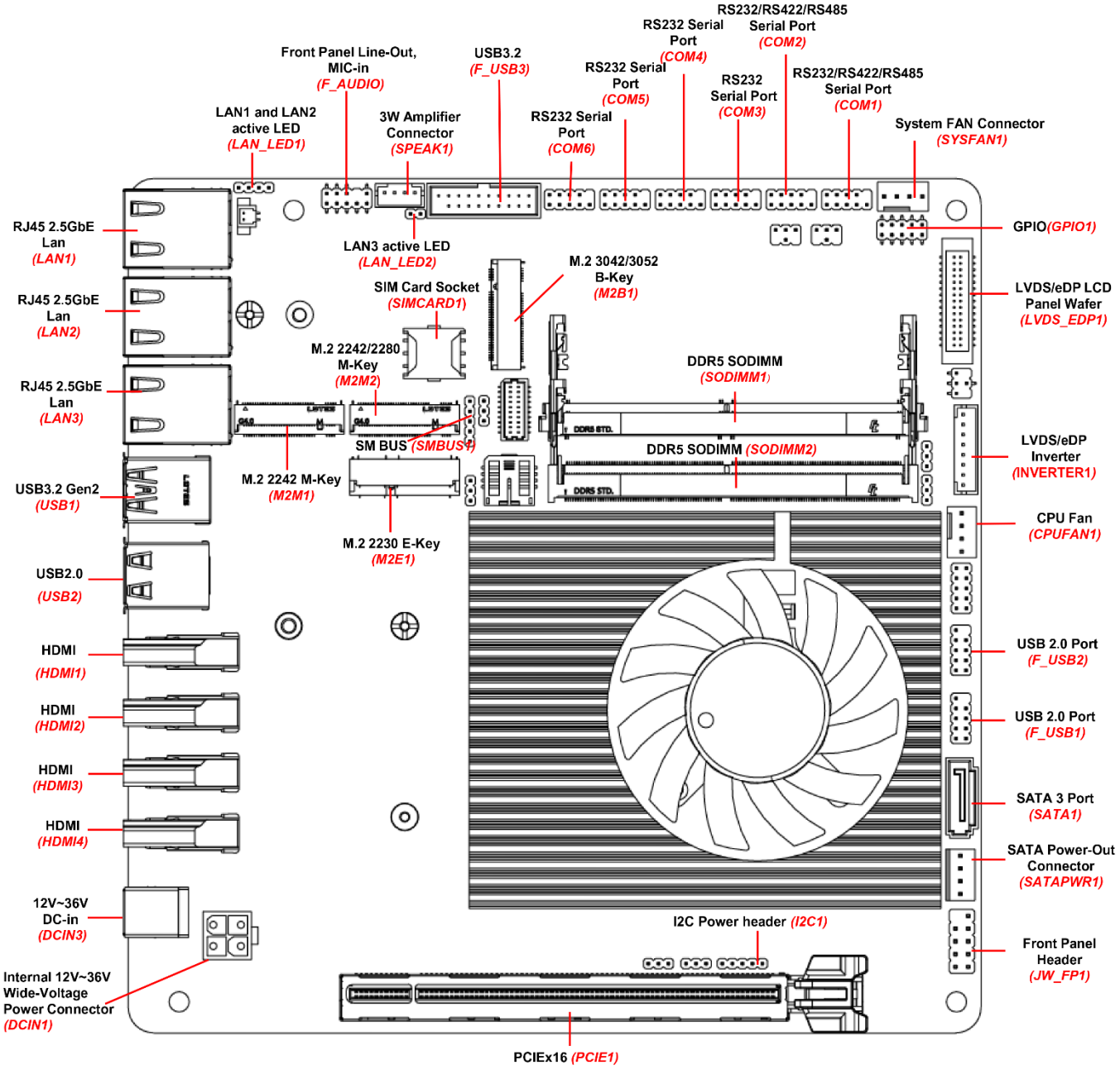
1-3 Dimension

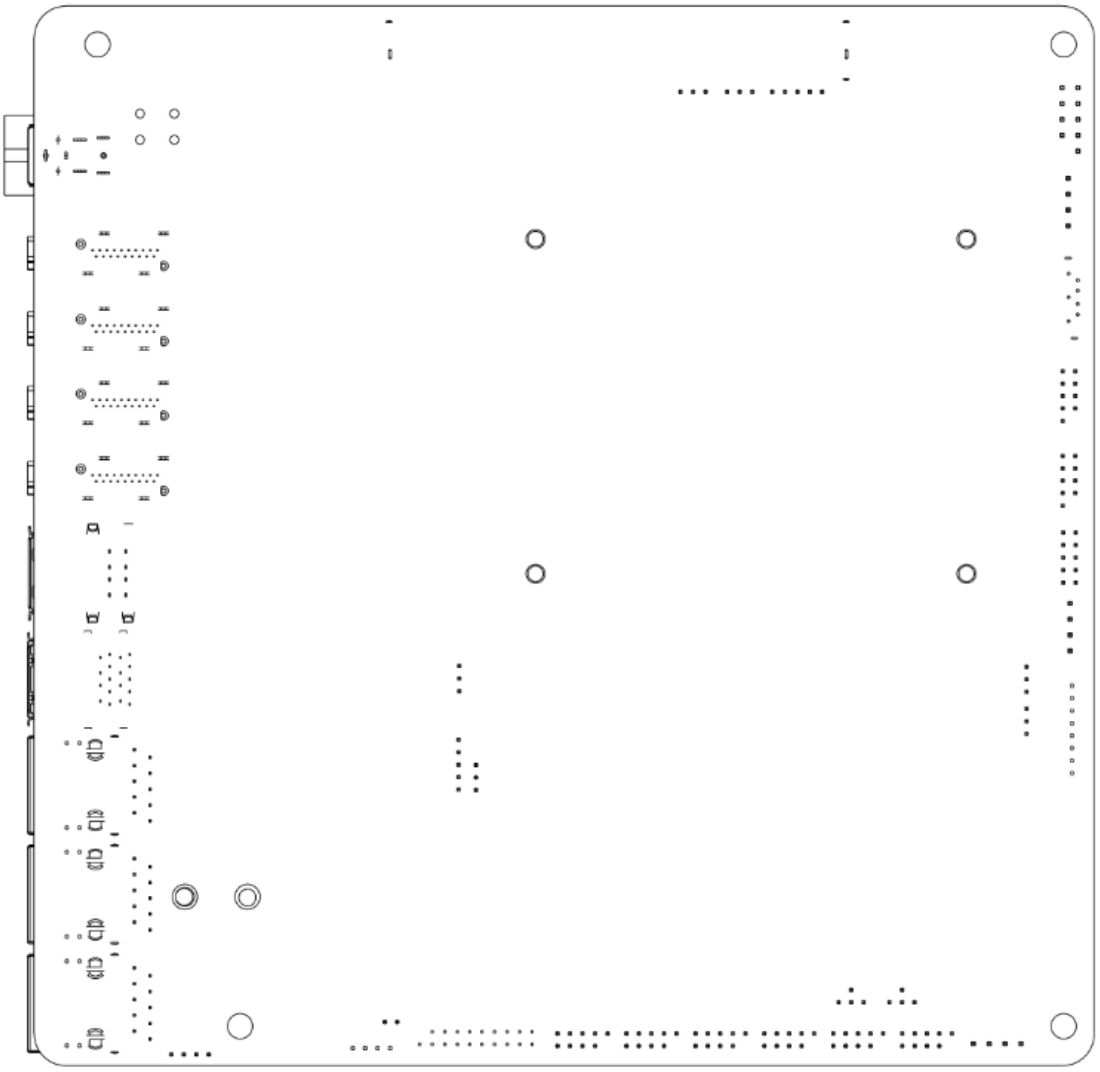


1-4 I/O Placement

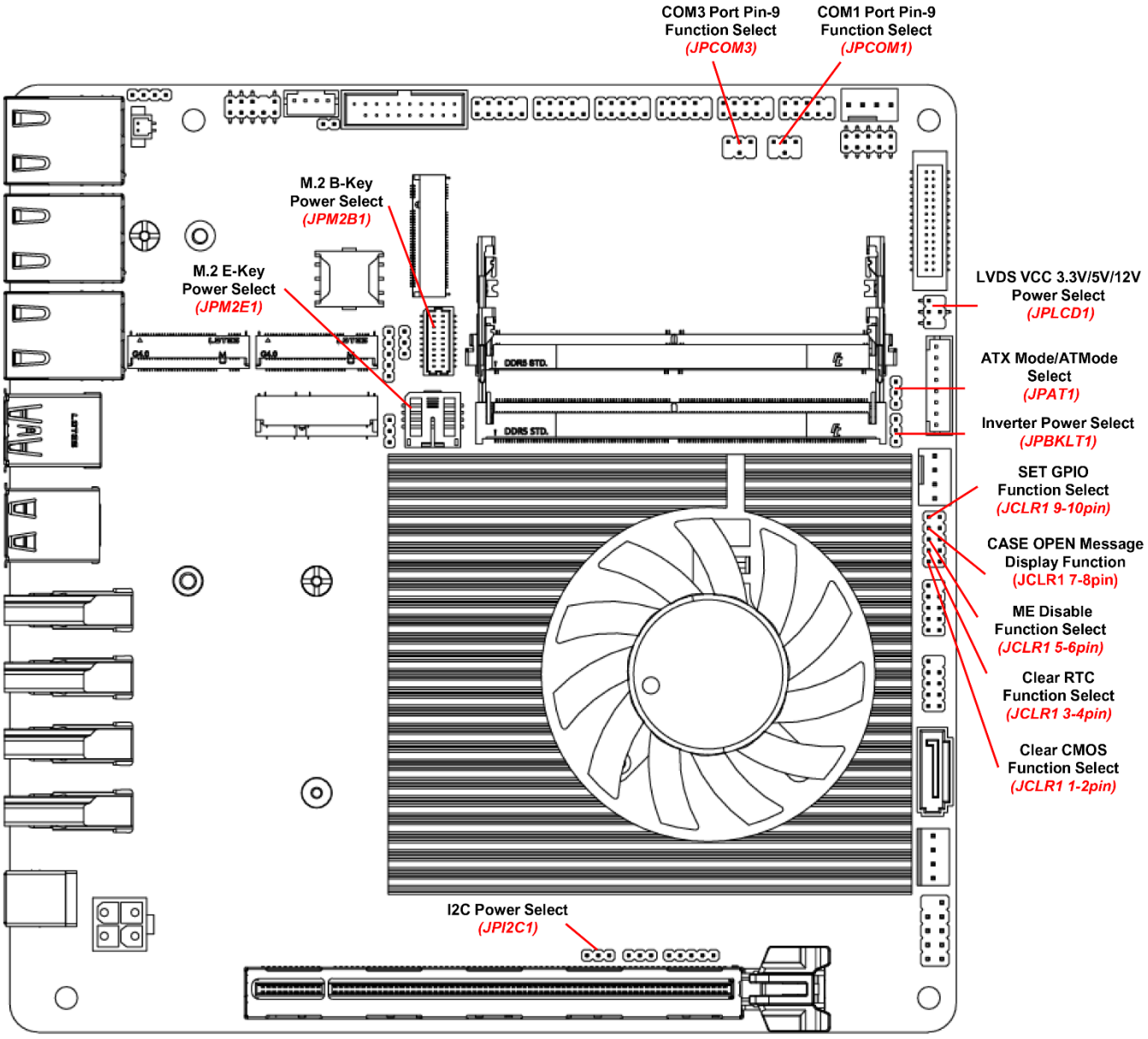


1-5 Motherboard Placement





1-6 Jumper Positions



Chapter 2 Hardware Information

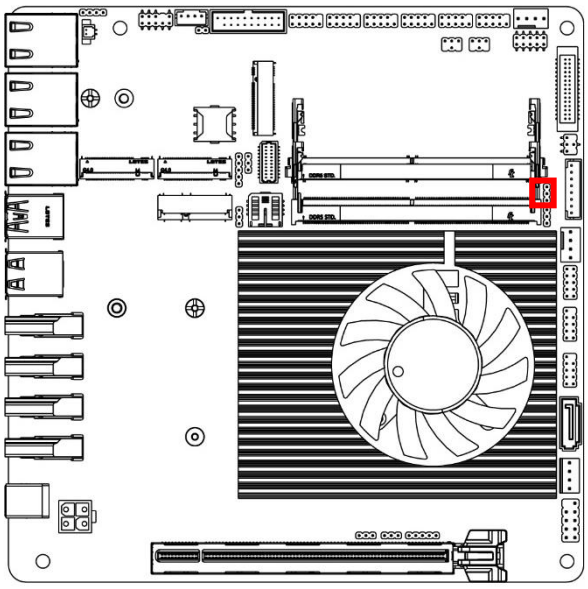
2-1 List of Jumpers

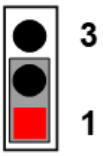
Please refer to the table below for all of the board's jumpers that you can configure for your application.

Location Printing	Function
JPAT1	ATX Mode/AT Mode Select
JPBKLT1	Inverter Power Select
JPI2C1	I2C Power Select
JPM2B1	M.2 B-key Power Select
JPM2E1	M.2 E-key Power Select
JPLCD1	LVDS PVCC 3.3V/5V/12V Power Select
JPCOM1	COM1 Port Pin-9 Function Select
JPCOM3	COM3 Port Pin-9 Function Select
JCLR1 (1-2 pin)	Clear CMOS Function Select
JCLR1 (3-4 pin)	Clear RTC Function Select
JCLR1 (5-6 pin)	ME Disable Function Select
JCLR1 (7-8 pin)	CASE OPEN Message Display Function
JCLR1 (9-10 pin)	SET GPIO Function Select

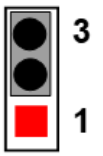
2-2 Jumper Settings

(1) ATX Mode/AT Mode Select (JPAT1)



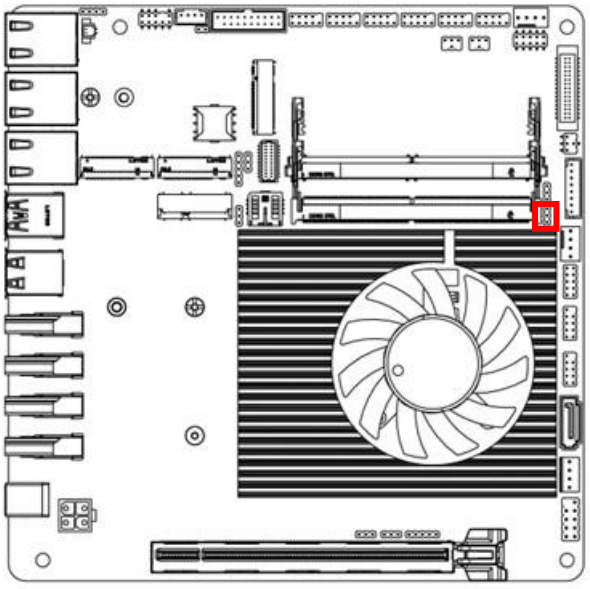


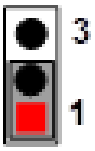
1-2 Closed: ATX Mode Selected;



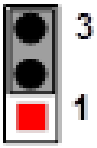
2-3 Closed: AT Mode Selected.

(2) Inverter Power Select (JPBKLT1)



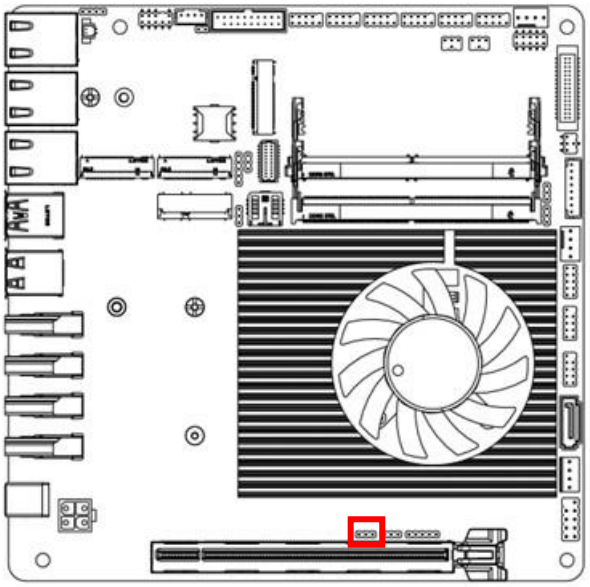


1-2 Closed: VCC=5V

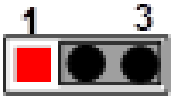


2-3 Closed: VCC=12V.

(3) I2C Power Select (JPI2C1)

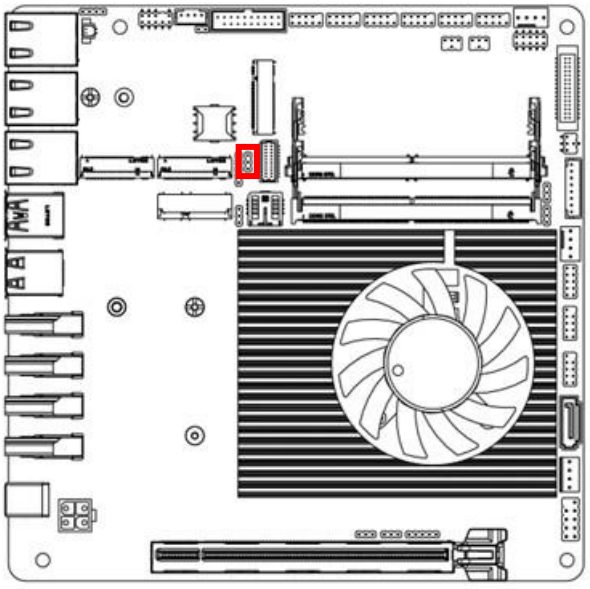


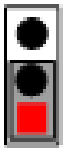
1-2 Closed: VCC=3VSB



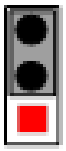
2-3 Closed: VCC=5VSB

(4) M.2 B-key Power Select (JPM2B1)



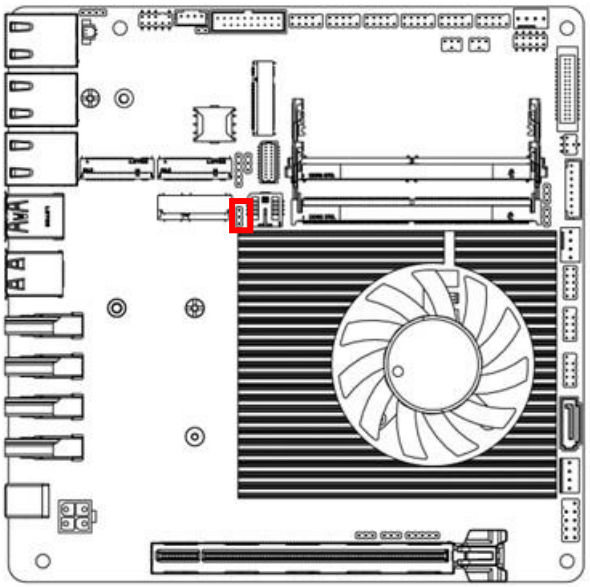


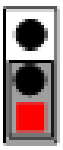
1-2 Closed: VCC=3.3V



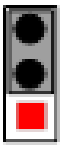
2-3 Closed: VCC=3VSB

(5) M.2 E-key Power Select (JPM2E1)



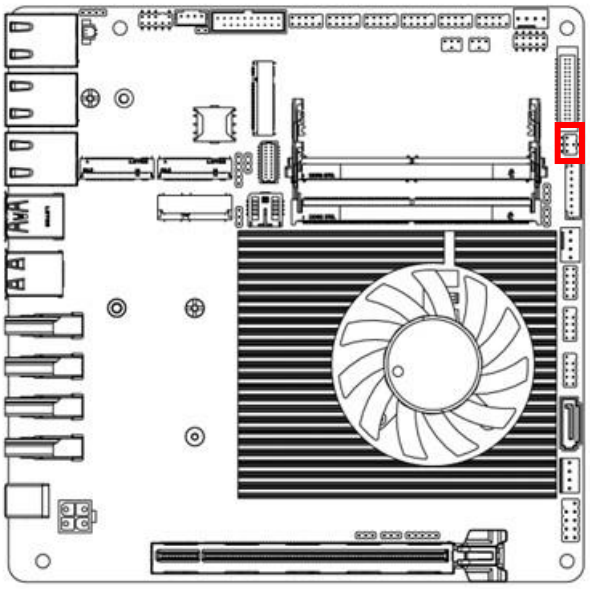


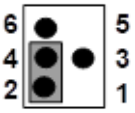
1-2 Closed: VCC=3.3V



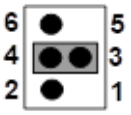
2-3 Closed: VCC=3VSB

(6) LVDS VCC 3.3V/5V/12V Power Select (JPLCD1)

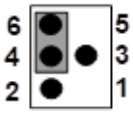




2-4 Closed:
VCC=3.3V

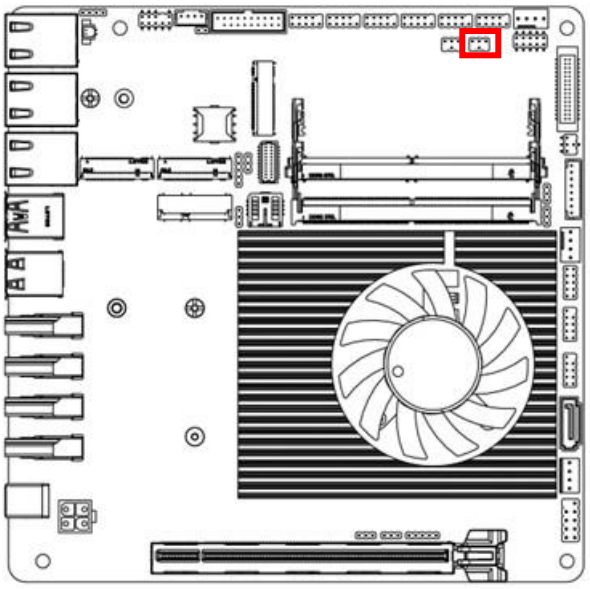


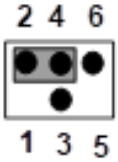
3-4 Closed:
Pin5= 5V



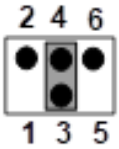
6-4 Closed:
Pin5=12V

(7) COM1 Port Pin-9 Function Select (JPCOM1)

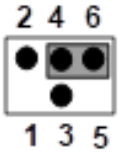




2-4 Closed:
PIN9=RS232;

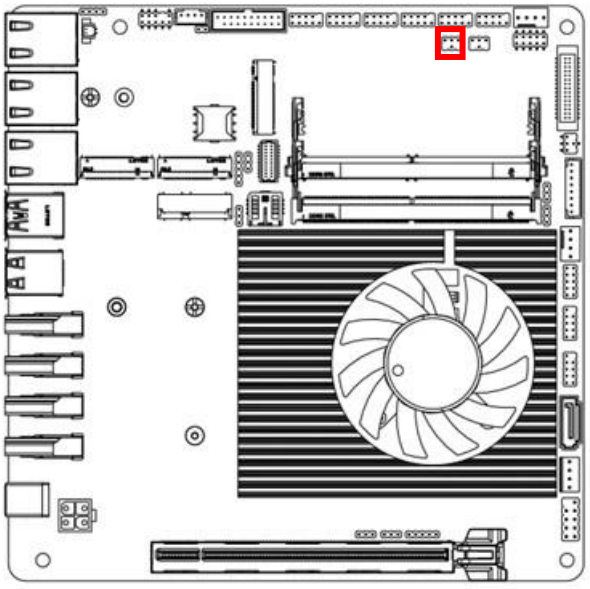


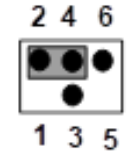
3-4 Closed:
PIN9=5V;



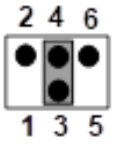
4-6 Closed:
PIN9=12V

(8) COM3 Port Pin-9 Function Select (JPCOM3)

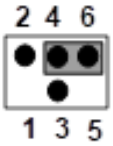




2-4 Closed:
PIN9=RS232;

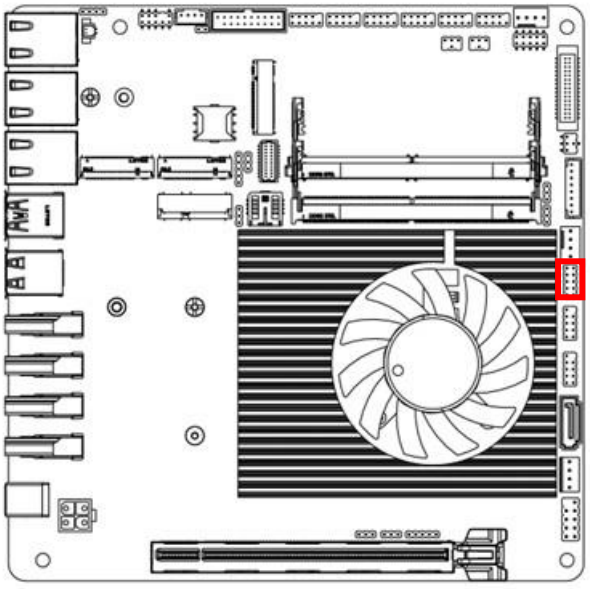


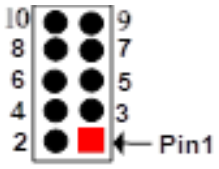
3-4 Closed:
PIN9=5V;



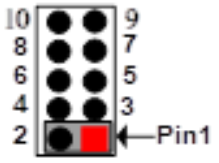
4-6 Closed:
PIN9=12V

(9) Clear CMOS Function Select (JCLR1 1-2 pin)



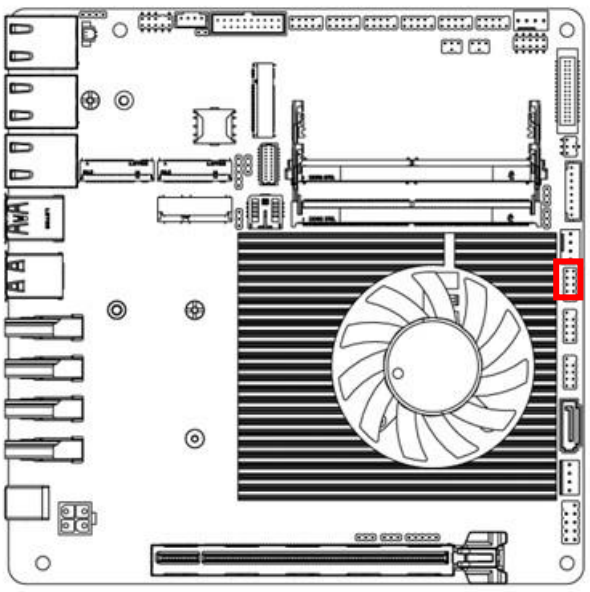


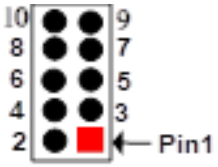
1-2 Open: Normal(Default)



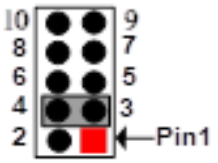
1-2 Closed: Clear CMOS

(10) Clear RTC Function Select (JCLR1 3-4 pin)



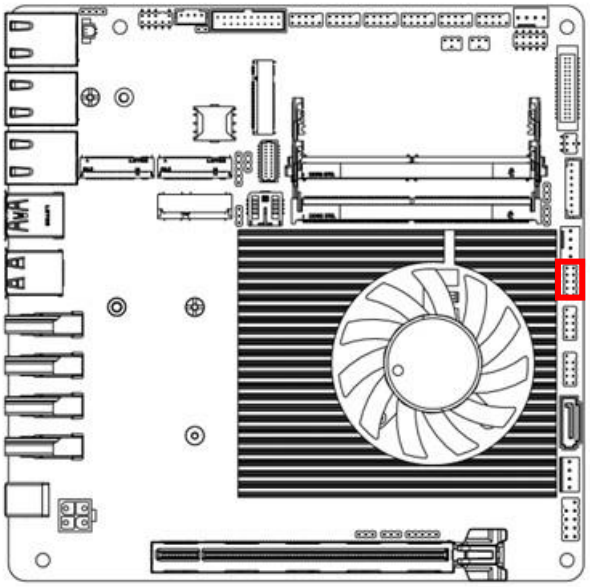


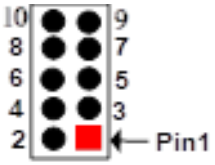
3-4 Open: Normal(Default)



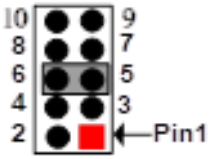
3-4 Closed: Clear RTC

(11) ME Disable Function Select (JCLR1 5-6 pin)



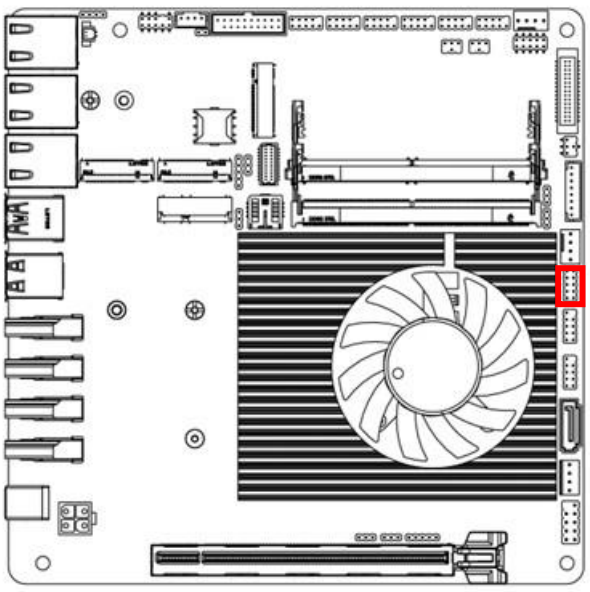


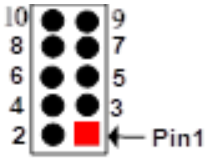
5-6 Open: Normal(Default)



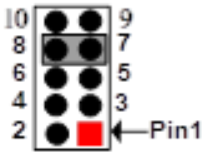
5-6 Closed: ME Disable

(12) CASE OPEN Message Display Function (JCLR1 7-8 pin)



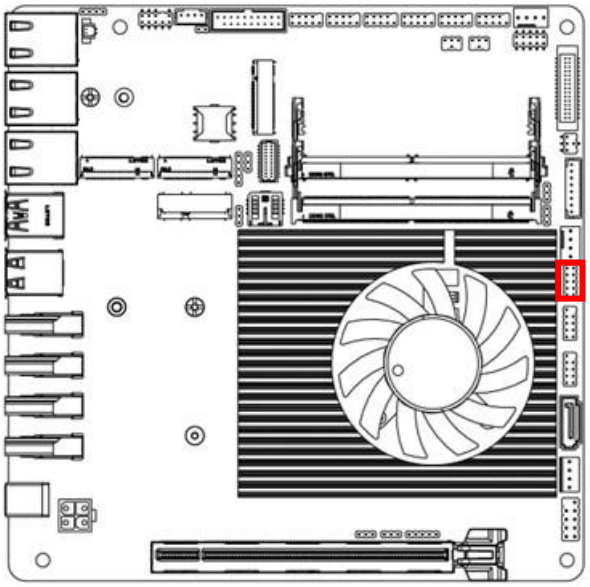


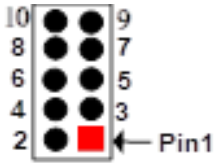
7-8 Open: Normal(Default)



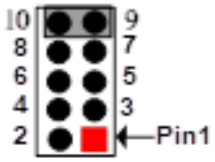
7-8 Closed: CASE OPEN

(13) SET GPIO Function Select (JCLR1 9-10 pin)





9-10 Open: 80 Port(Default)



9-10 Closed: SET GPIO

2-3 List of Connectors

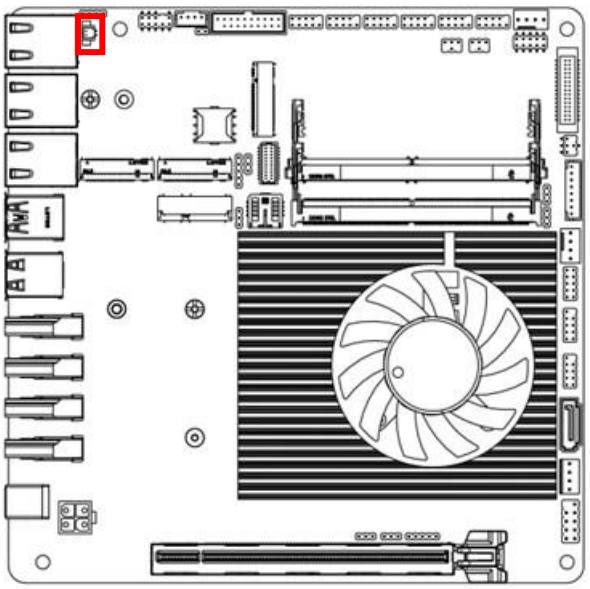
Please refer to the table below for all of the board's jumpers that you can configure for your application.

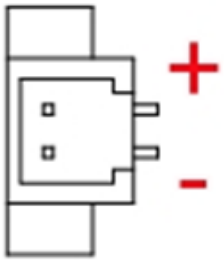
Location Printing	Function
BATCON1	RTC Battery Connector
LAN1	RJ45 2.5GbE Lan Connector
LAN2	RJ45 2.5GbE Lan Connector
LAN3	RJ45 2.5GbE Lan Connector
DCIN3	12V~36V DC-in Power Connector
LAN_LED2	LAN3 active LED Header
LAN_LED1	LAN1 and LAN2 active LED Header
DCIN1	Internal 12V~36V Wide-Voltage Power Connector
CPUFAN1	CPU FAN Connector
SYSFAN1	System FAN Connector
SPEAK1	3W Amplifier Connector
SATAPWR1	SATA HDD Power-Out Connector
I2C1	I2C Header
SMBUS1	SM BUS Header
SATA1	SATA 3 Port Connector
INVERTER1	LVDS/eDP Inverter Wafer
JW_FP1	Front Panel Header
F_AUDIO1	Front Panel Line-Out, MIC-In Header
F_USB1	USB2.0 Port Header
F_USB2	USB2.0 Port Header
COM1	RS232/RS422/RS485 Serial Port Header
COM2	RS232/RS422/RS485 Serial Port Header
COM3	RS232 Serial Port Header
COM4	RS232 Serial Port Header
COM5	RS232 Serial Port Header
COM6	RS232 Serial Port Header
GPIO1	8 Bit GPIO Port /80 Port Header
F_USB3	USB3.0 Port Header
REFLASH_CON1	Jetway Flash BIOS Header
LVDS_EDP1	LVDS/EDP LCD Panel Wafer
USB1	USB 3.2 Gen2 Connector
USB2	USB 2.0 Connector

Location Printing	Function
HDMI1	HDMI Connector
HDMI2	HDMI Connector
HDMI3	HDMI Connector
HDMI4	HDMI Connector
SIMCARD1	Nano-SIM Card Socket
M2M1	M.2 M KEY 2242 Socket
M2M2	M.2 M KEY 2242/2280 Socket
M2B1	M.2 B KEY 2242/3052 Socket
M2E1	M.2 E KEY 2230 Socket
SODIMM1	DDR5 SODIMM Socket
SODIMM2	DDR5 SODIMM Socket
PCIE1	PCIE Slot (PCIE by 16)

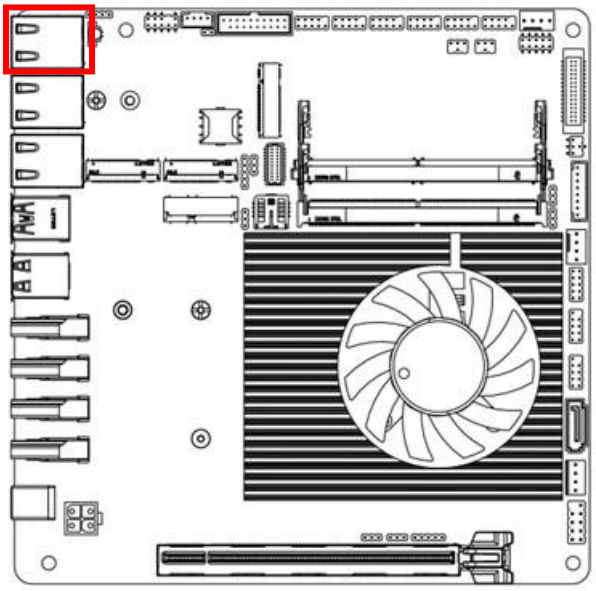
2-4 Connector Settings

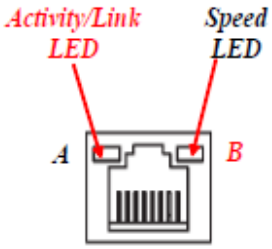
(1) RTC Battery Connector (BATCON1)





(2) RJ45 2.5GbE Lan Connector (LAN1)



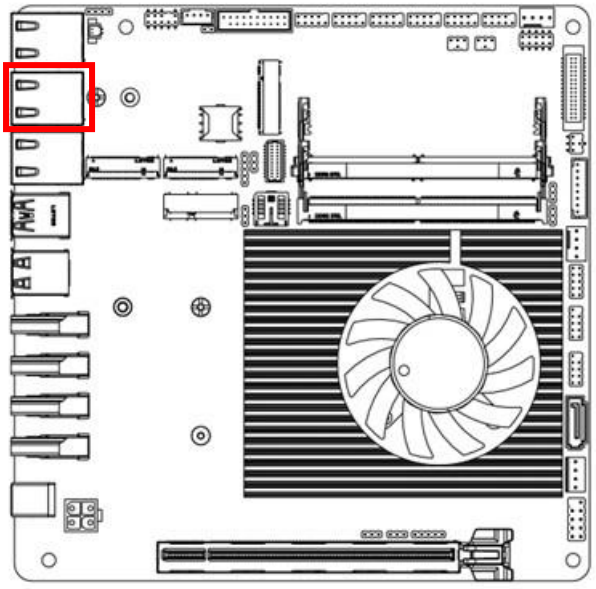


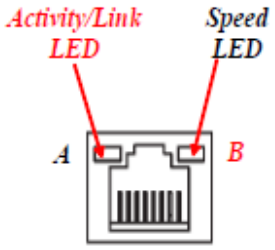
A: Activity/Link LED		B: Speed LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	Orange	1000Mbps connection
On	Link	**Green**	2.5Gbps connection

***Note:** **2.5Gbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*

Note: Standard specifications.

(3) RJ45 2.5GbE Lan Connector (LAN2)



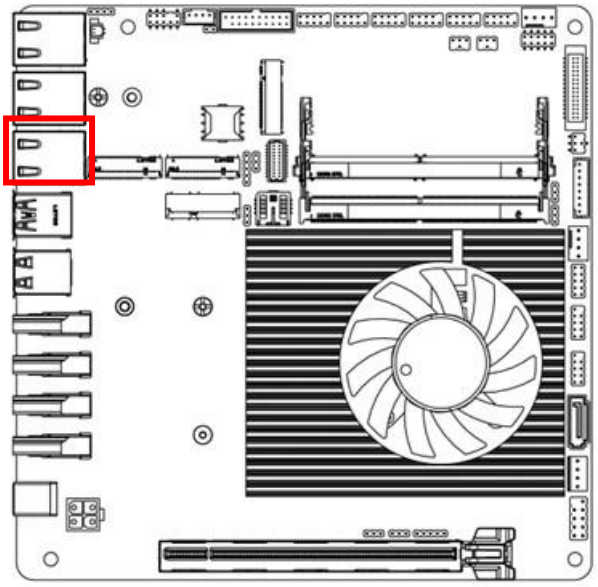


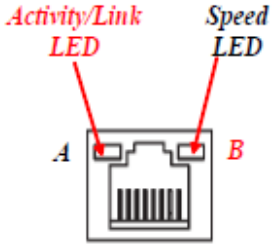
A: Activity/Link LED		B: Speed LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	Orange	1000Mbps connection
On	Link	**Green**	2.5Gbps connection

***Note:** **2.5Gbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*

Note: Standard specifications.

(4) RJ45 2.5GbE Lan Connector (LAN3)



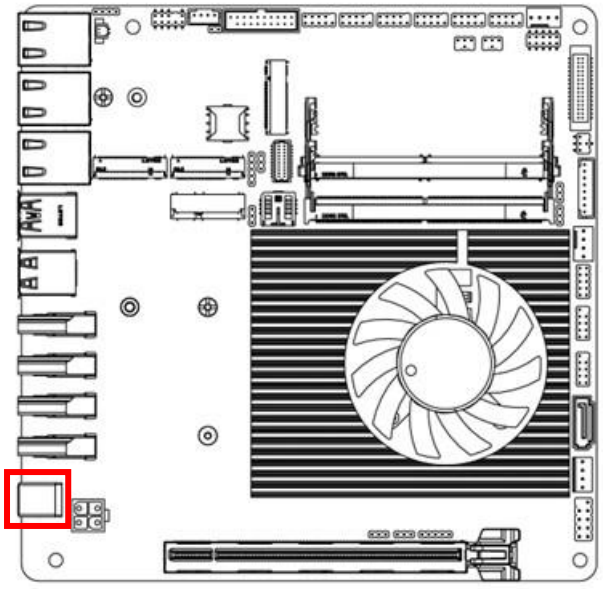


A: Activity/Link LED		B: Speed LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	Orange	1000Mbps connection
On	Link	**Green**	2.5Gbps connection

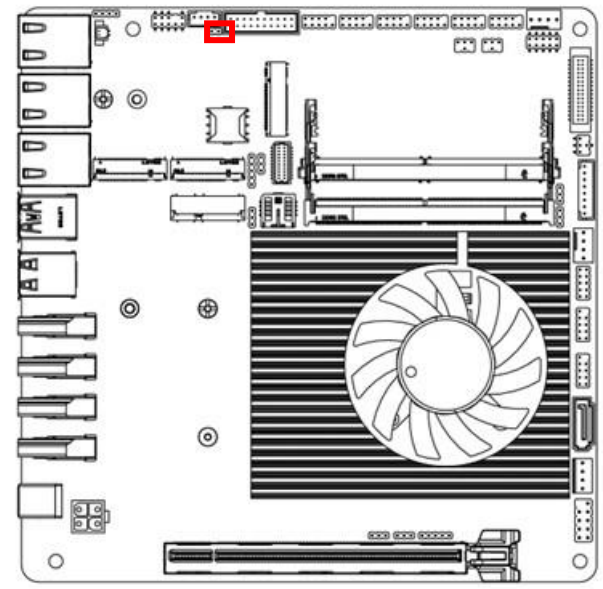
***Note:** **2.5Gbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*

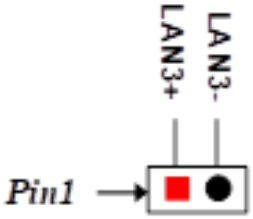
Note: Standard specifications.

(5) 12V~36V Wide-Voltage Power Connector (DCIN3)

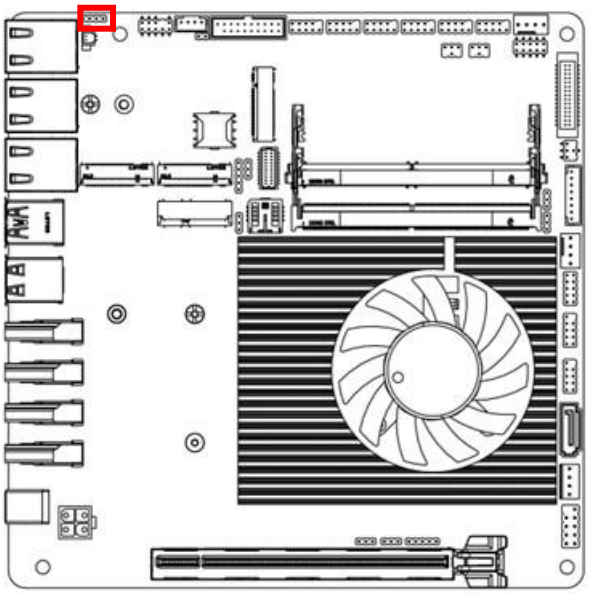


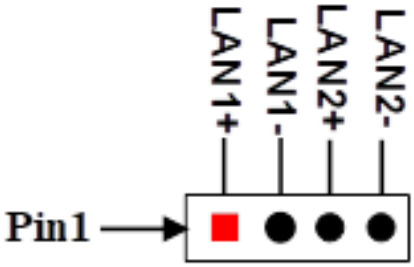
(6) LAN3 active LED Header (LAN_LED2)



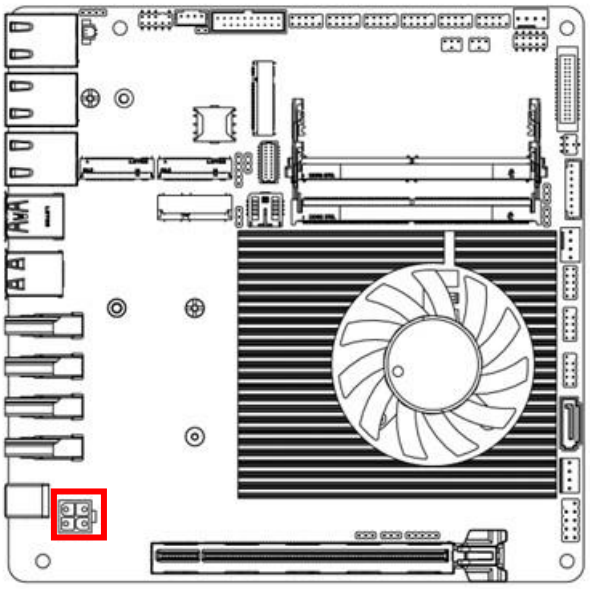


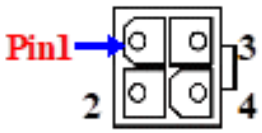
(7) LAN1 and LAN2 active LED Header (LAN_LED1)





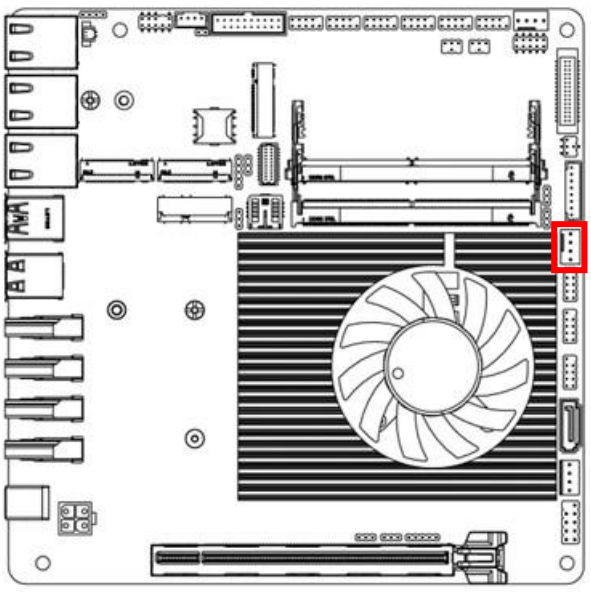
(8) Internal 12V~36V Wide-Voltage Power Connector (DCIN1)

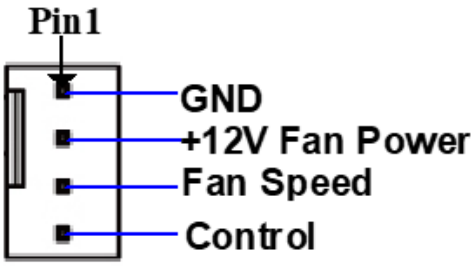




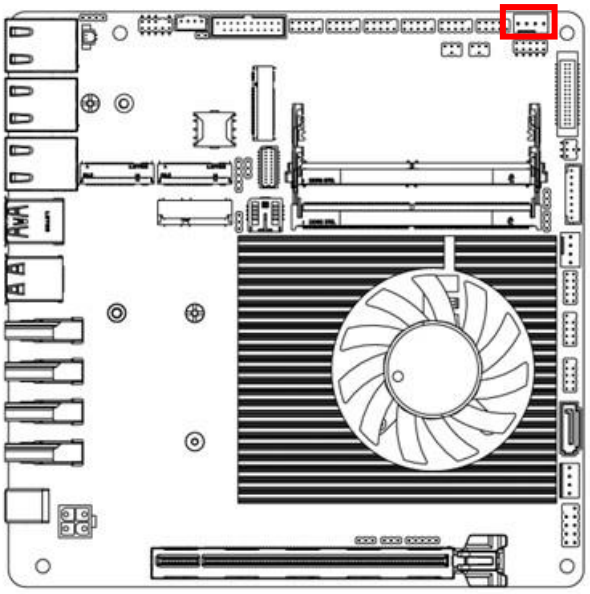
Pin No.	Definition
1	GND
2	GND
3	+12V~36V
4	+12V~36V

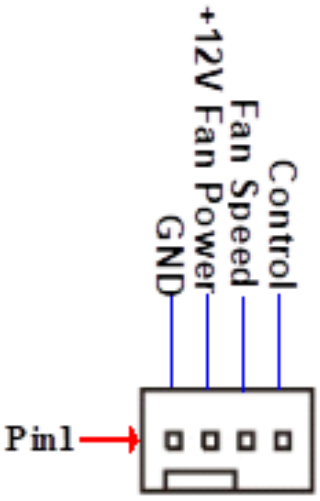
(9) CPU FAN Connector (CPUFAN1)



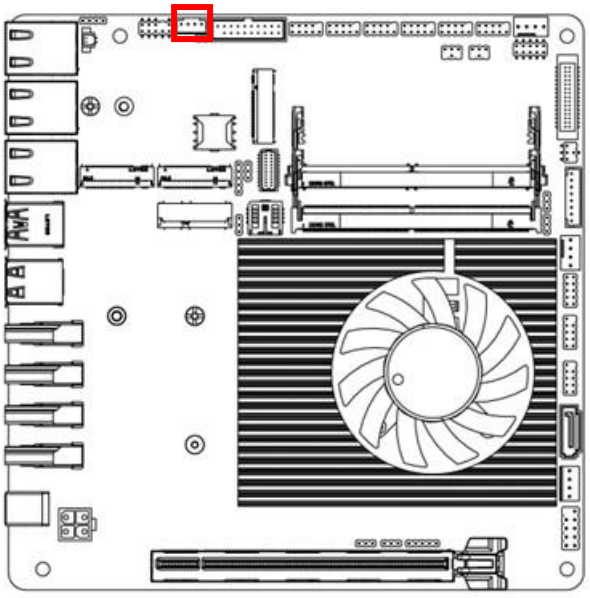


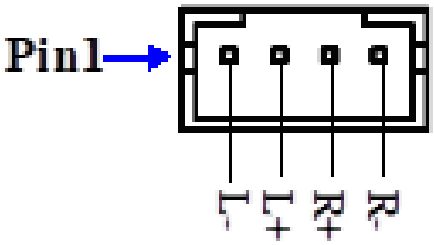
(10) System FAN Connector (SYSFAN1)



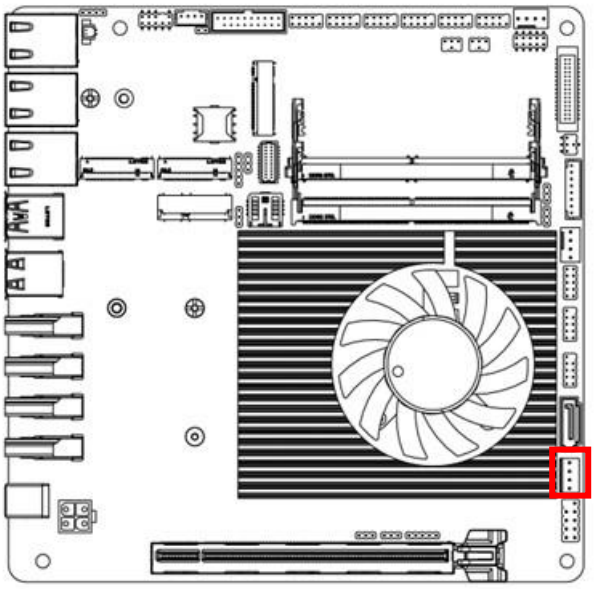


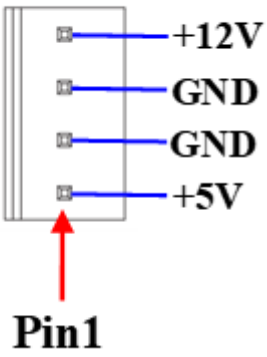
(11) 3W Amplifier Connector (SPEAK1)



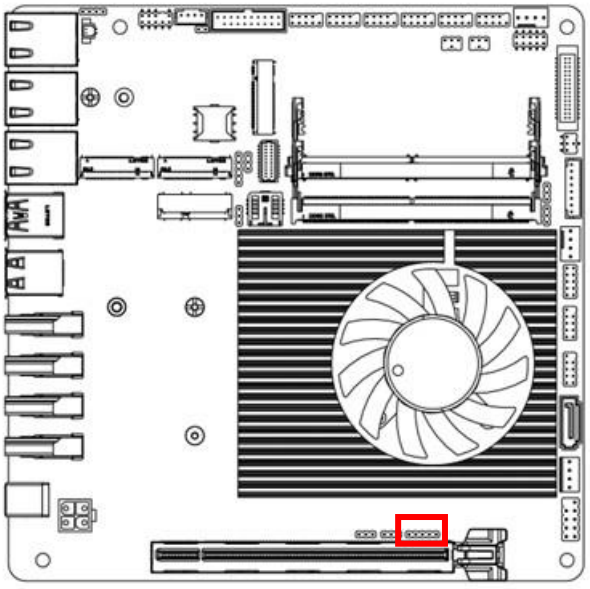


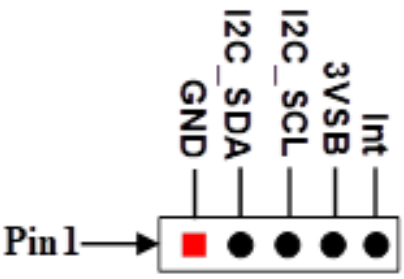
(12) SATA HDD Power-Out Connector (SATAPWR1)



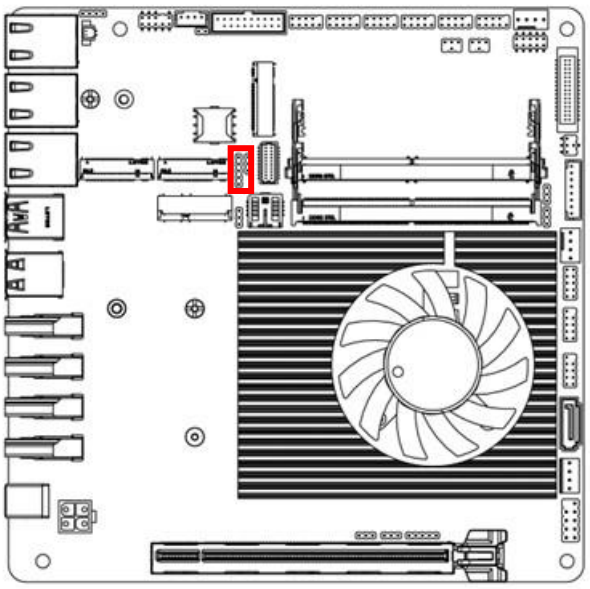


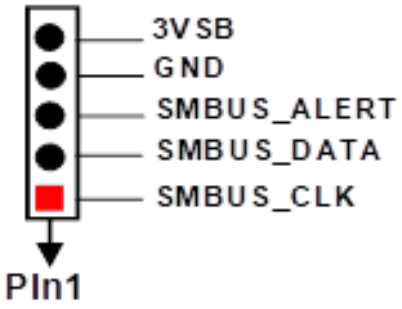
(13) I2C Header (I2C1)



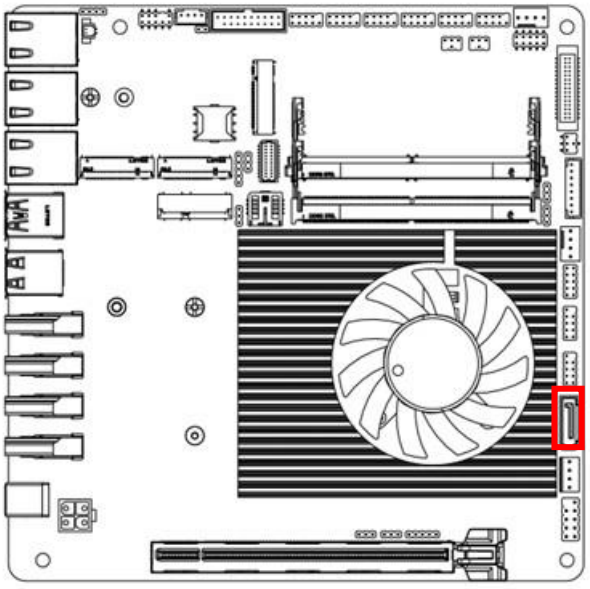


(14) SM BUS Header (SMBUS1)





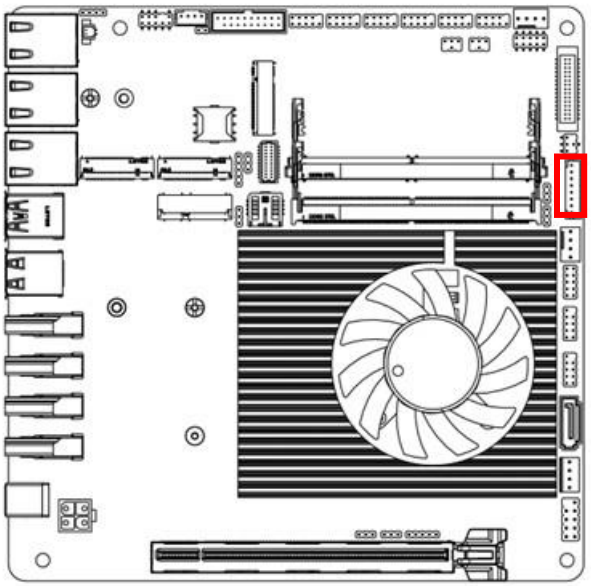
(15) SATA 3 Port Connector (SATA1)

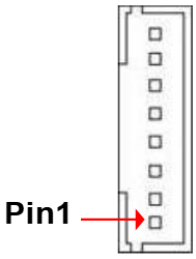


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Note: Standard specifications.

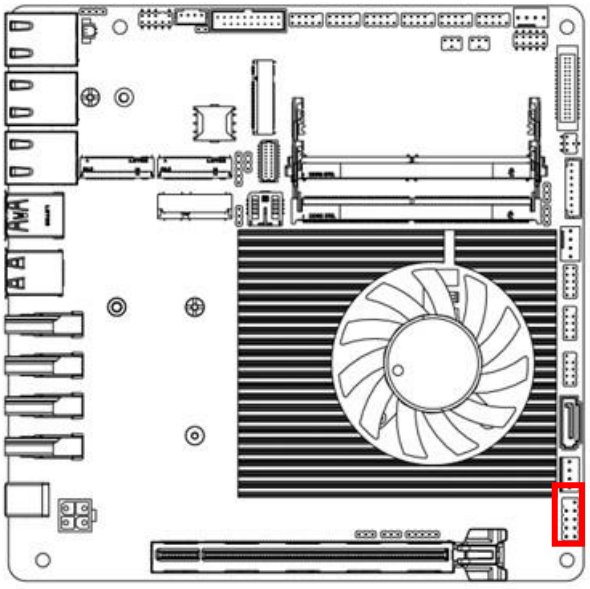
(16) LVDS/EDP Inverter Wafer (INVERTER1)

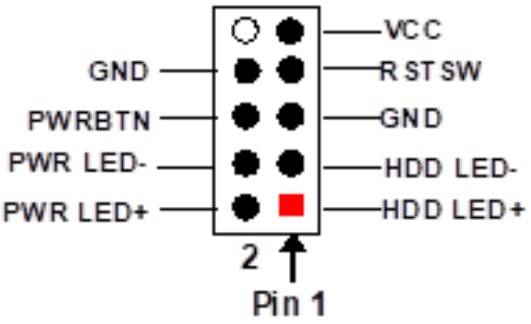




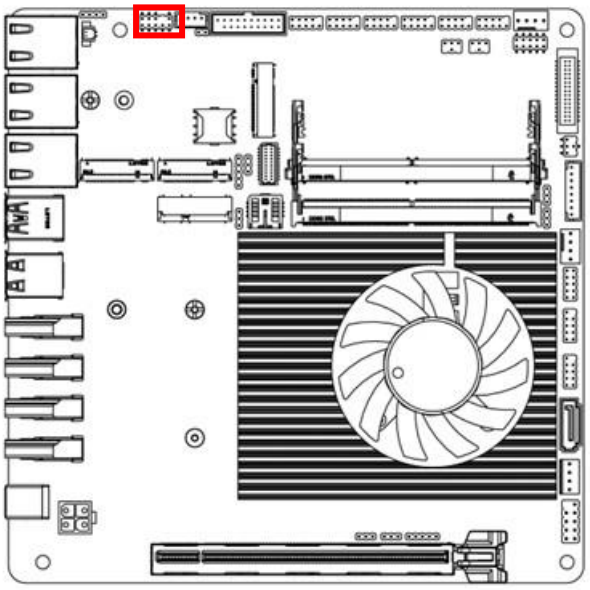
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	PVCC
4	PVCC
5	GND
6	GND
7	Backlight Up SW
8	Backlight Down SW

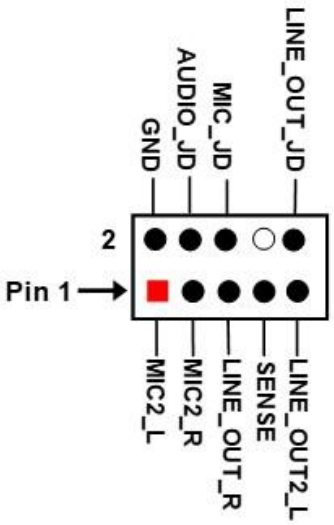
(17) Front Panel Header (JW_FP1)



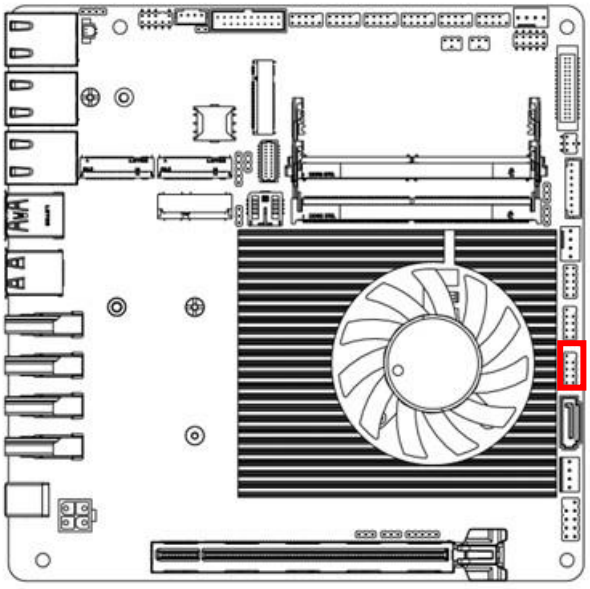


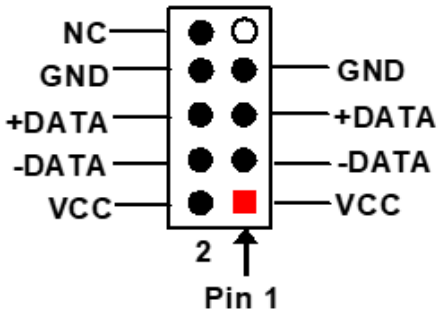
(18) Front Panel Line-Out, MIC-In Header (F_AUDIO1)



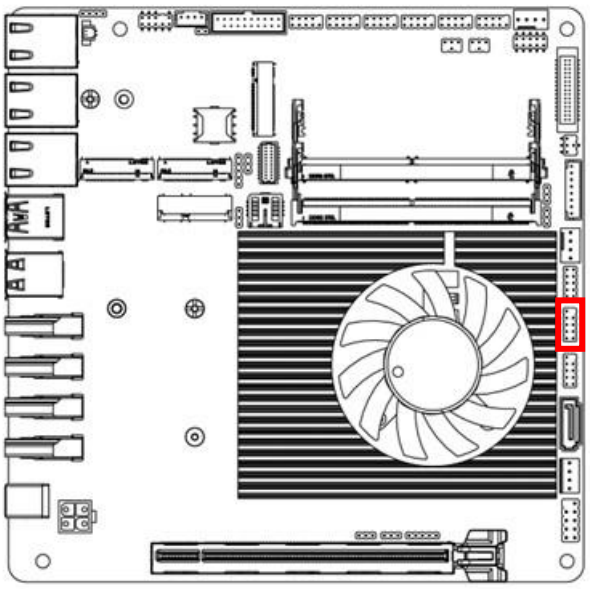


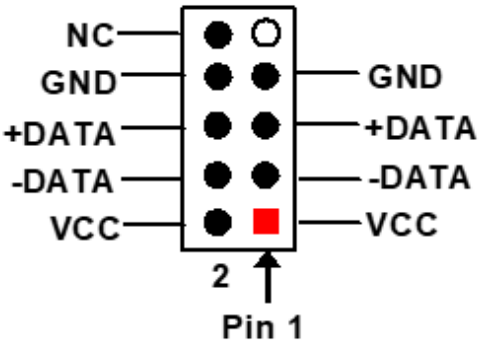
(19) USB2.0 Port Header (F_USB1)



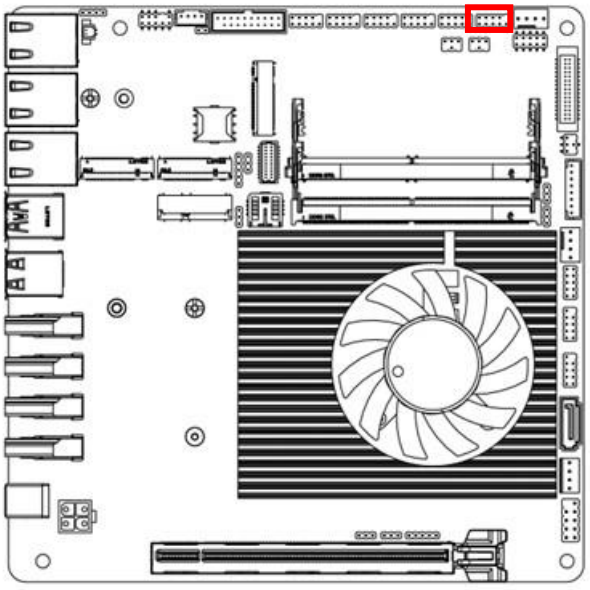


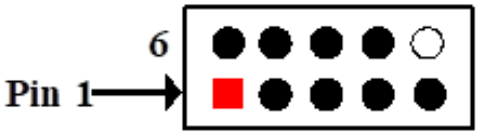
(20) USB2.0 Port Header (F_USB2)





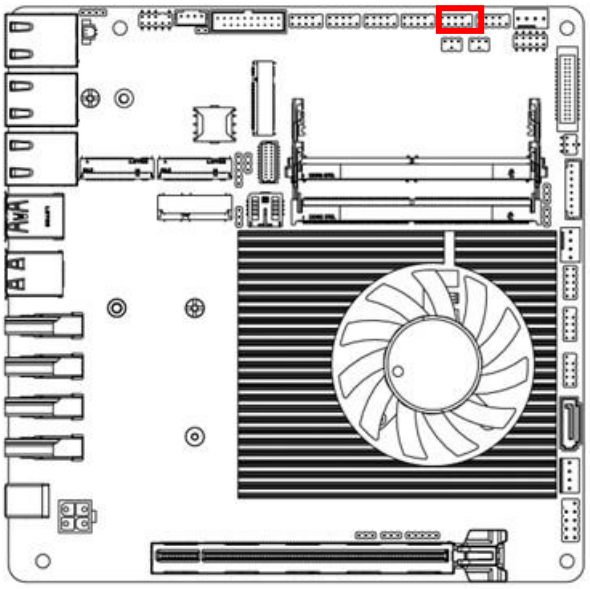
(21) RS232/RS422/RS485 Serial Port Header (COM1)

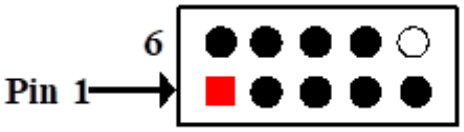




Pin NO.	RS232	*RS422	*RS485
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

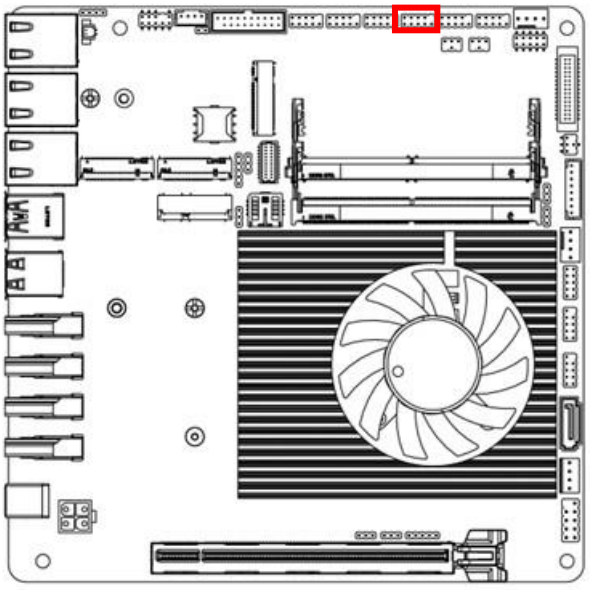
(22) RS232/RS422/RS485 Serial Port Header (COM2)

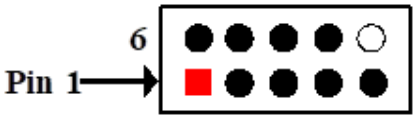




Pin NO.	RS232	*RS422	*RS485
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

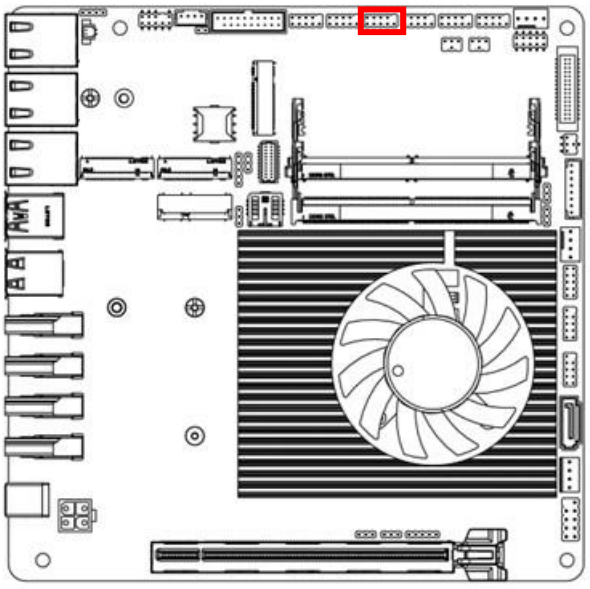
(23) RS232 Serial Port Header (COM3)

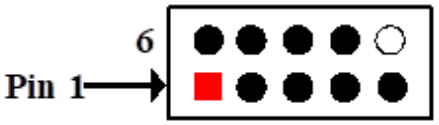




Pin NO.	RS232
Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

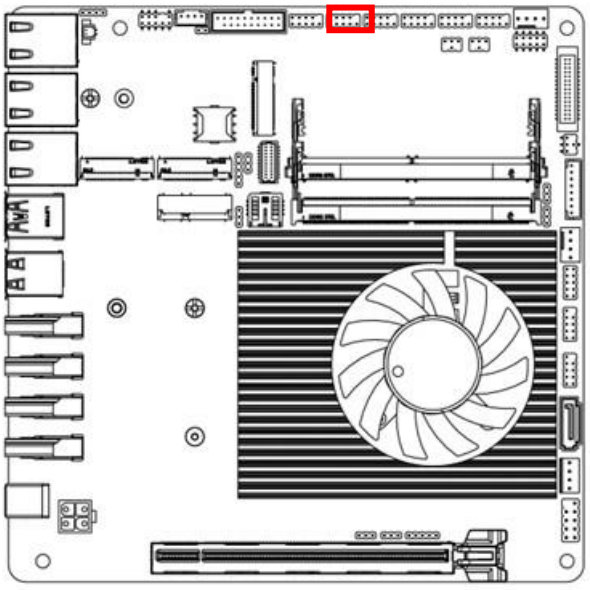
(24) RS232 Serial Port Header (COM4)

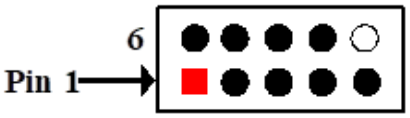




Pin NO.	RS232
Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

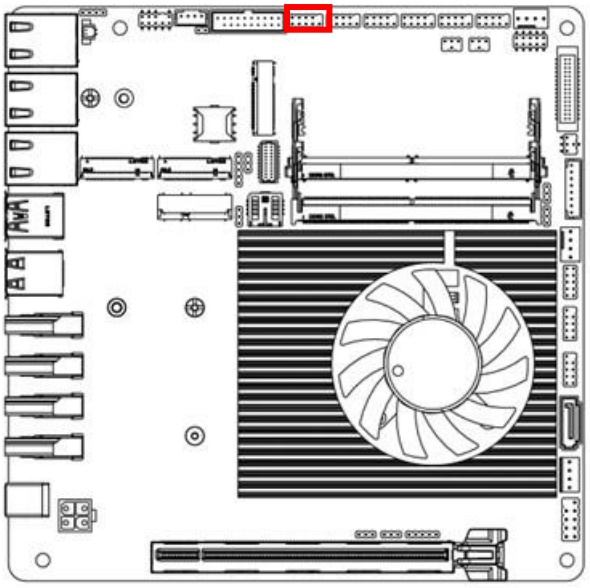
(25) RS232 Serial Port Header (COM5)

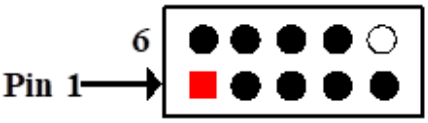




Pin NO.	RS232
Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

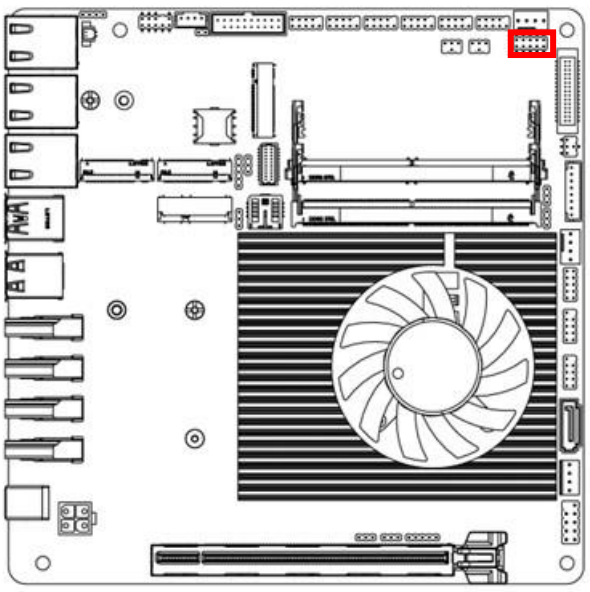
(26) RS232 Serial Port Header (COM6)

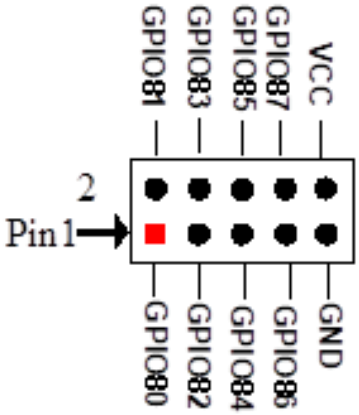




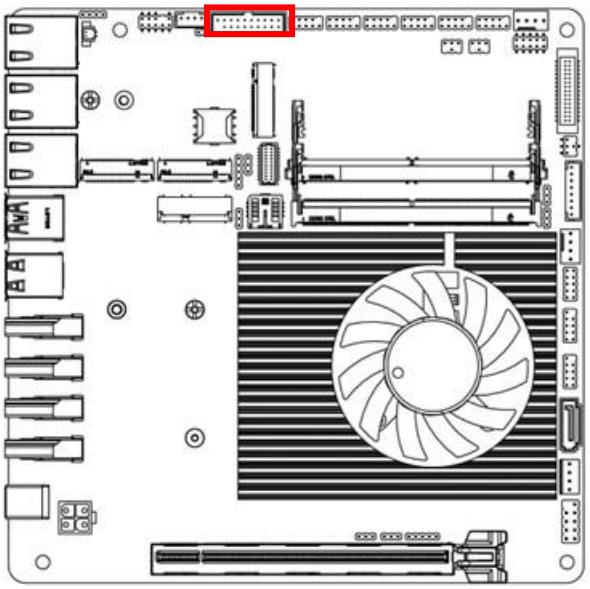
Pin NO.	RS232
Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI

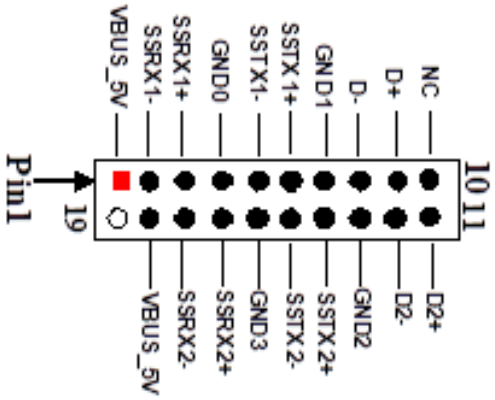
(27) 8 Bit GPIO Port /80 Port Header (GPIO1)



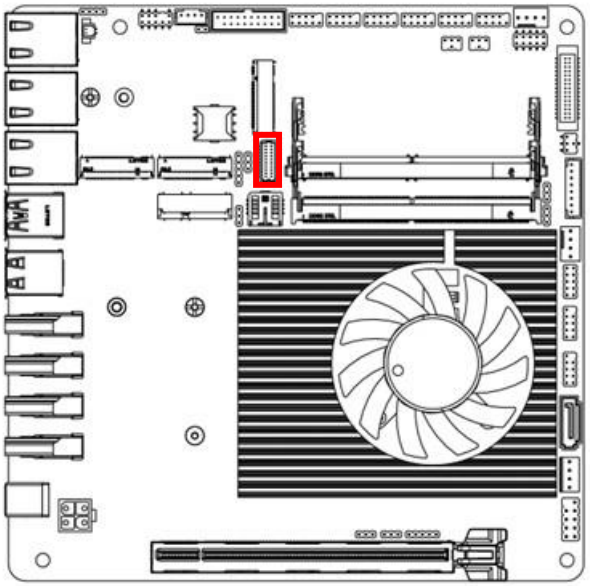


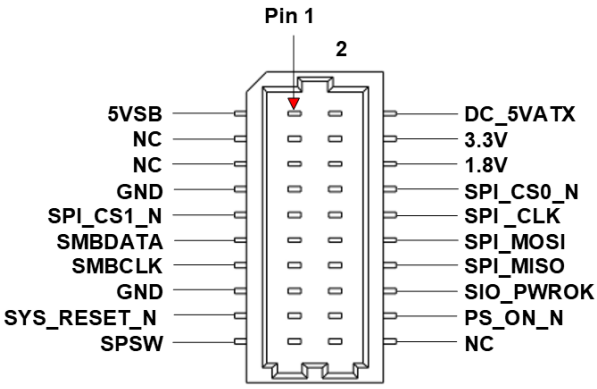
(28) USB3.0 Port Header (F_USB3)



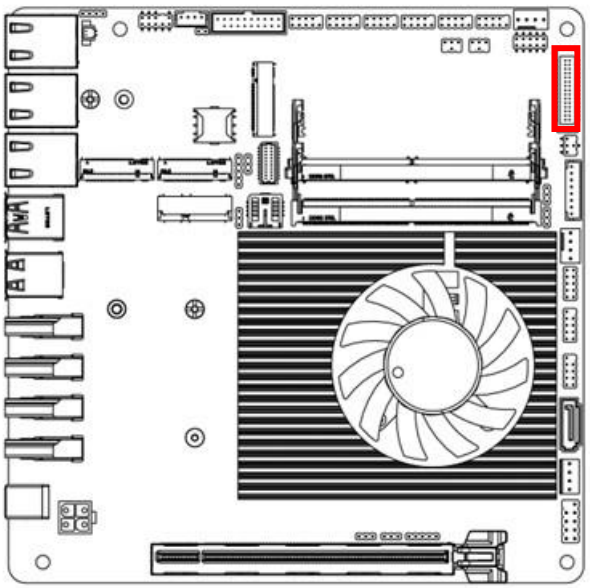


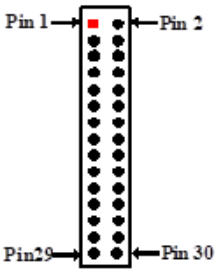
(29) Jetway Flash BIOS Header (REFLASH_CON1)





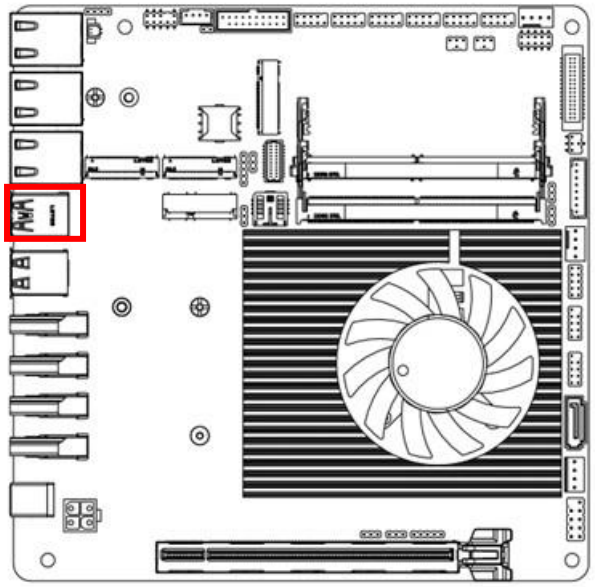
(30) LVDS/EDP LCD Panel Wafer (LVDS_EDP1)





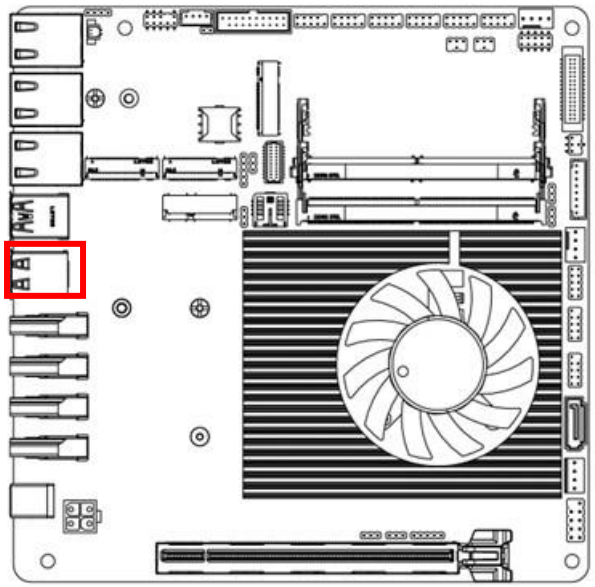
Pin Define	Pin NO.	Pin NO.	Pin Define
LVDSB_DATAN3	Pin 1	Pin 2	LVDSB_DATAP3
LVDSB_CLKN	Pin 3	Pin 4	LVDSB_CLKP
LVDSB_DATAN2	Pin 5	Pin 6	LVDSB_DATAP2
LVDSB_DATAN1	Pin 7	Pin 8	LVDSB_DATAP1
LVDSB_DATAN0	Pin 9	Pin 10	LVDSB_DATAP0
LVDS_DDC_SDA	Pin 11	Pin 12	LVDS_DDC_SCL
GND	Pin 13	Pin 14	GND
GND	Pin 15	Pin 16	GND
LVDSA_DATAP3	Pin 17	Pin 18	LVDSA_DATAN3
LVDSA_CLKP/eDP_AUXP	Pin 19	Pin 20	LVDSA_CLKN/eDP_AUXN
LVDSA_DATAP2/eDP_TX0P	Pin 21	Pin 22	LVDSA_DATAN2/eDP_TX0N
LVDSA_DATAP1/eDP_TX1P	Pin 23	Pin 24	LVDSA_DATAN1/eDP_TX1N
LVDSA_DATAP0	Pin 25	Pin 26	LVDSA_DATAN0
LCD_VCC	Pin 27	Pin 28	LCD_VCC
LCD_VCC	Pin 29	Pin 30	LCD_VCC

(31) USB 3.2 Gen2 Connector (USB1)



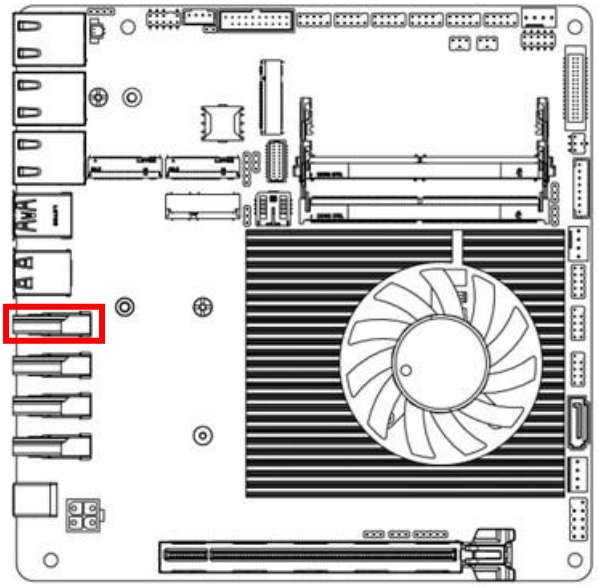
Note: Standard specifications.

(32) USB 2.0 Connector (USB2)



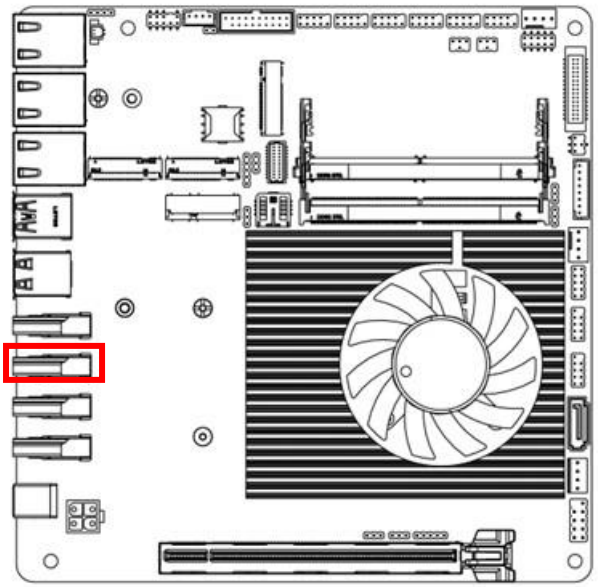
Note: Standard specifications.

(33) HDMI Connector (HDMI1)



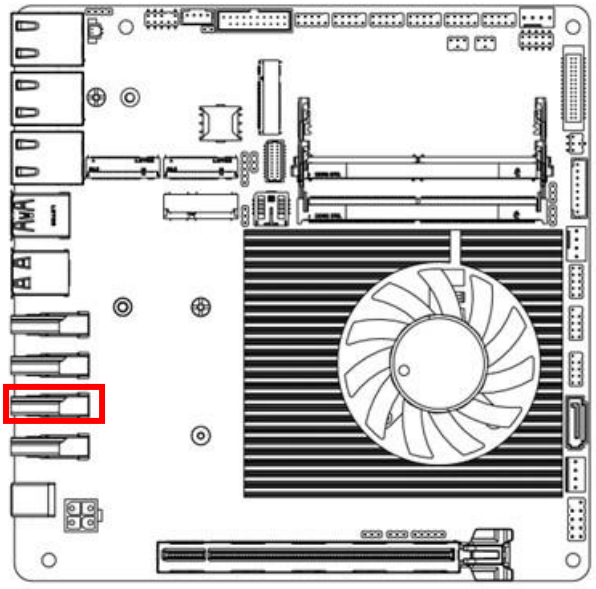
Note: Standard specifications.

(34) HDMI Connector (HDMI2)



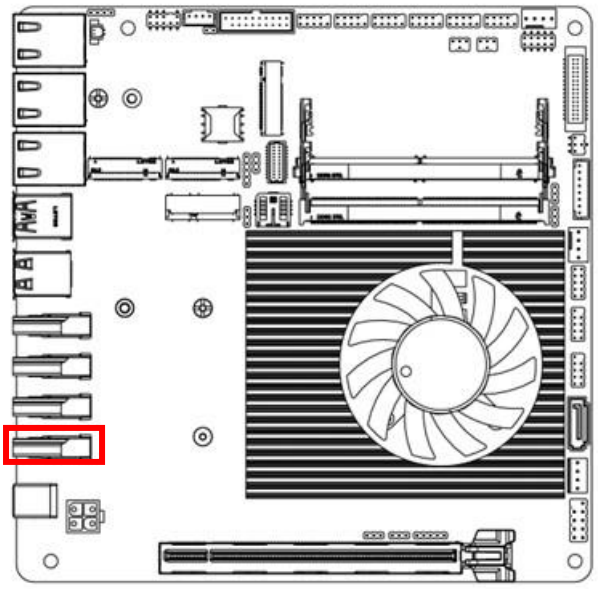
Note: Standard specifications.

(35) HDMI Connector (HDMI3)



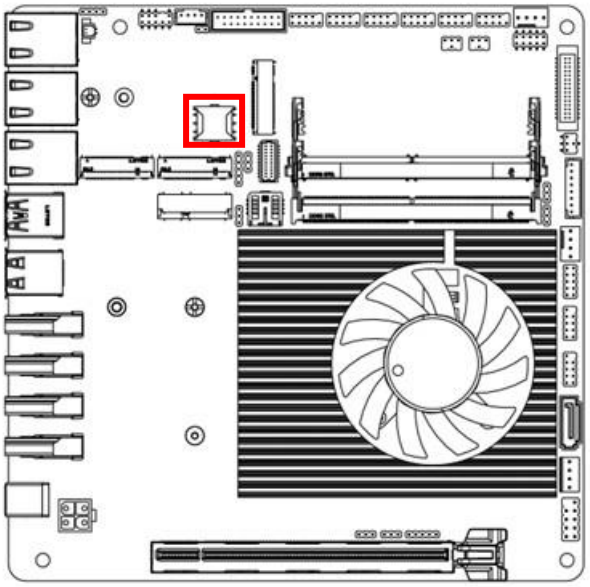
Note: Standard specifications.

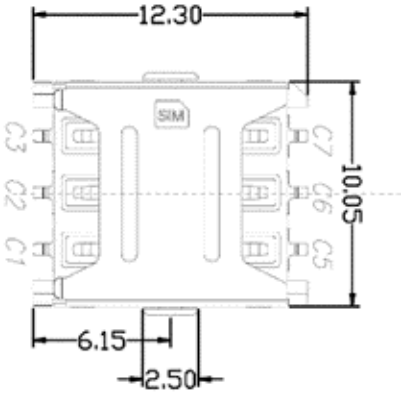
(36) HDMI Connector (HDMI4)



Note: Standard specifications.

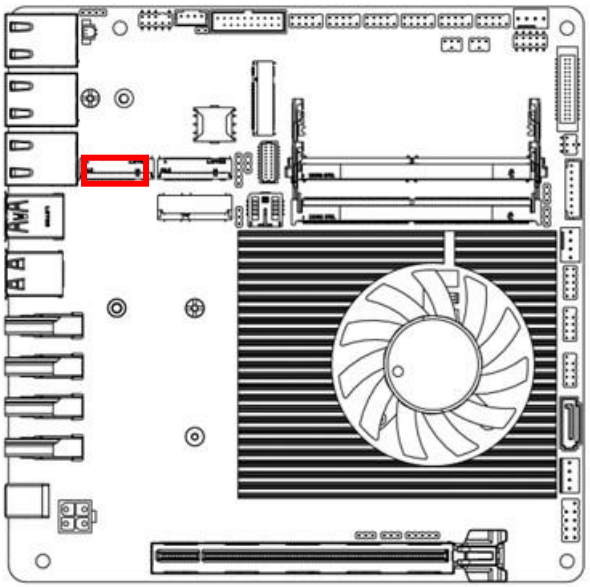
(37) Nano-SIM Card Socket (SIMCARD1)





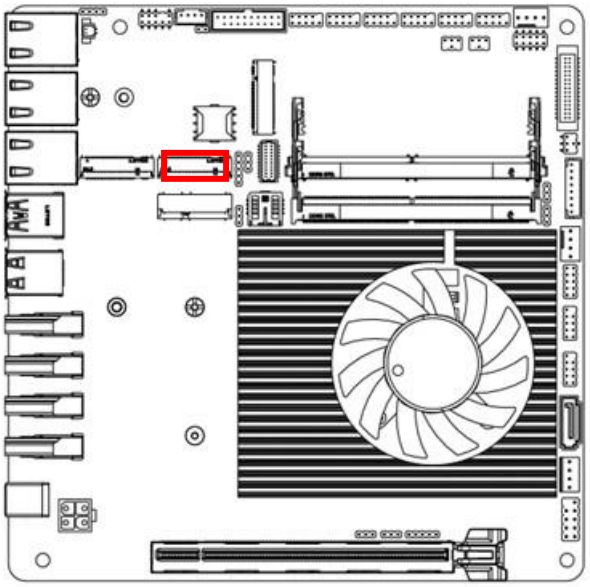
Note: Standard specifications.

(38) M.2 M KEY 2242 Socket (M2M1)



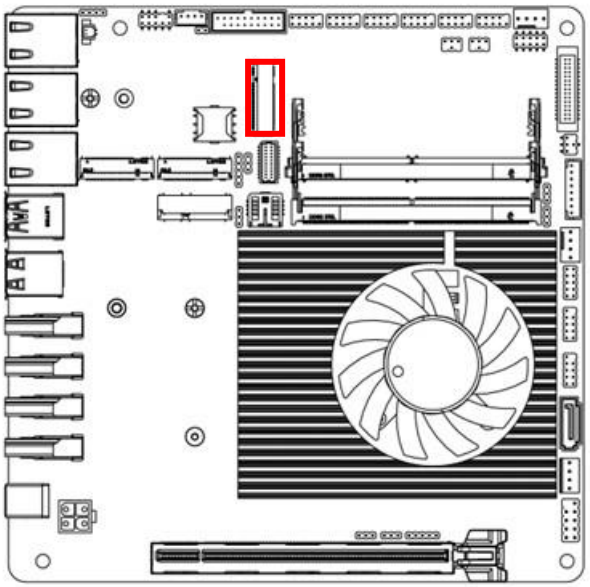
Note: Standard specifications.

(39) M.2 M KEY 2242/2280 Socket (M2M2)



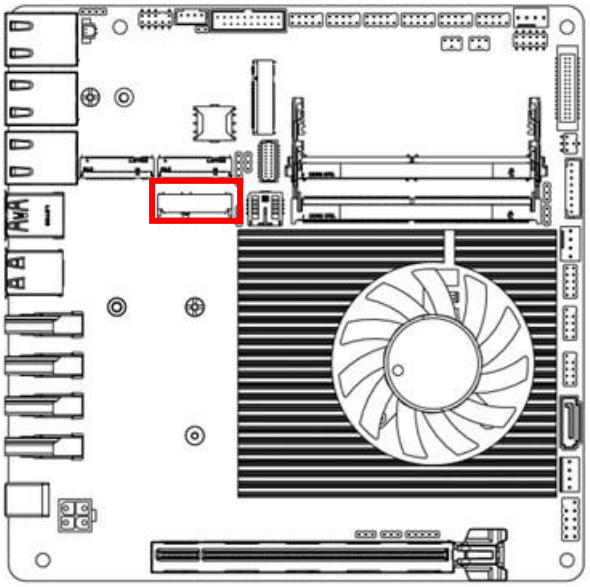
Note: Standard specifications.

(40) M.2 B KEY 3042/3052 Socket (M2B1)



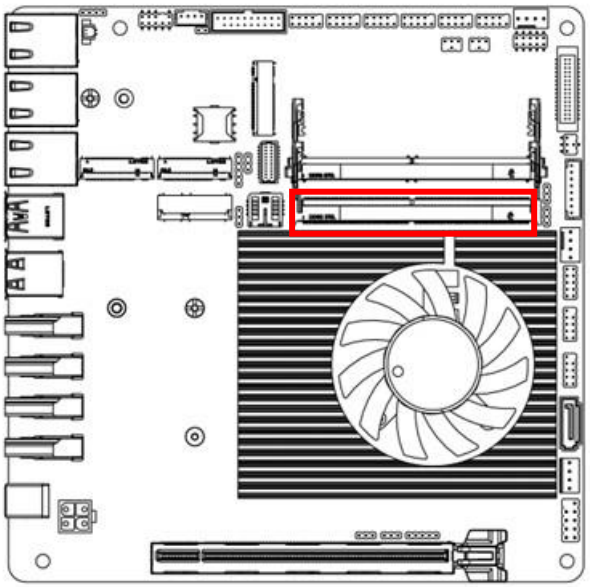
Note: Standard specifications.

(41) M.2 E KEY 2230 Socket (M2E1)



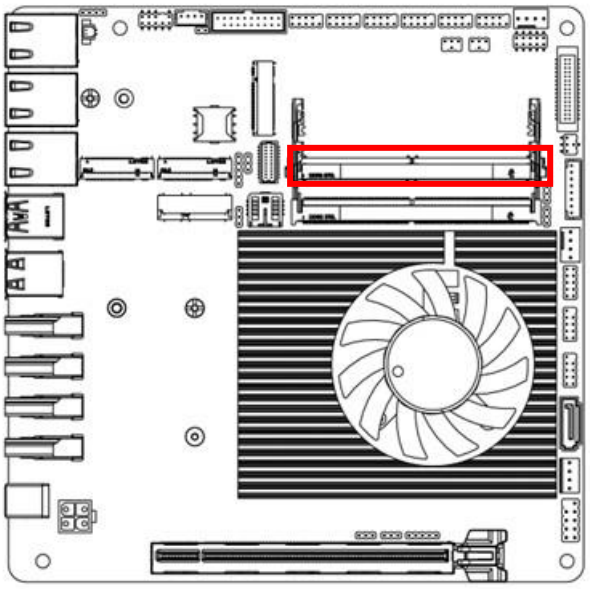
Note: Standard specifications.

(42) DDR5 SODIMM Socket Up (SODIMM2)



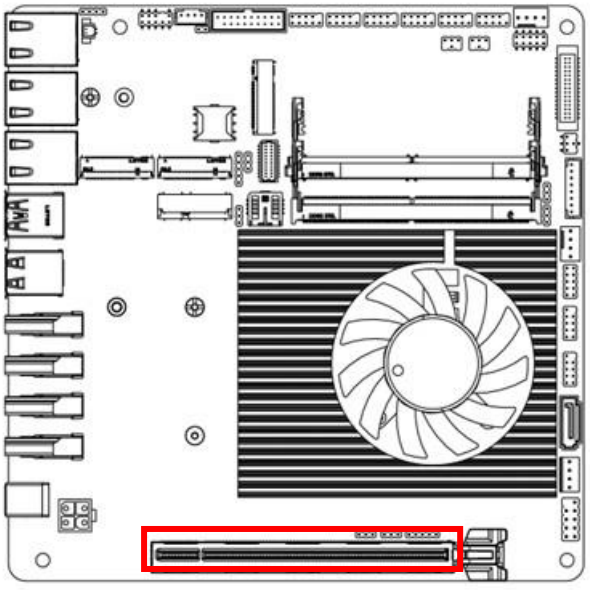
Note: Standard specifications.

(43) DDR5 SODIMM Socket Down (SODIMM1)



Note: Standard specifications.

(44) PCIE Slot (PCIE by 16) (PCIE1)



Note: Standard specifications.

2-5 Maximum Voltage & Current Limit

Below is a list of maximum voltage & Current Limit specification for motherboard interface (including but not limited to slots, connectors and headers) for setup reference:

Parts		Working Voltage	Current Support
USB Port From	USB1	5V	900mA x2
	USB2	5V	500mA x2
	FP_USB1	5V	500mA x2
	FP_USB2	5V	500mA x2
	FP_USB3	5V	500mA x2
JW_FP1		5V	1A
LVDS/EDP1		3.3V/5V/12V	2A
INVERTER1		5V/12V	2A
CPUFAN1		12V	1.5A
SYSFAN1		12V	1.5A
GPIO1		5V	1A
SMBUS1		3.3V	500mA
I2C1		3V/5V	500mA
JPCOM1		5V/12V	500mA
JPCOM3		5V/12V	500mA

Chapter 3 Introducing BIOS

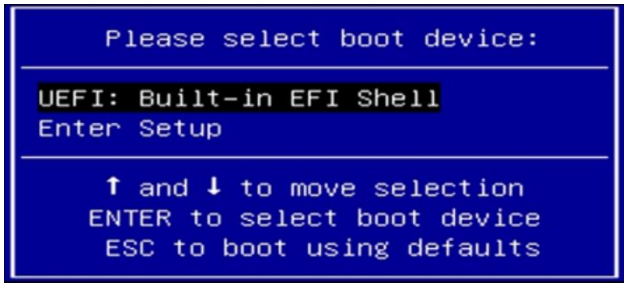
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup.
If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

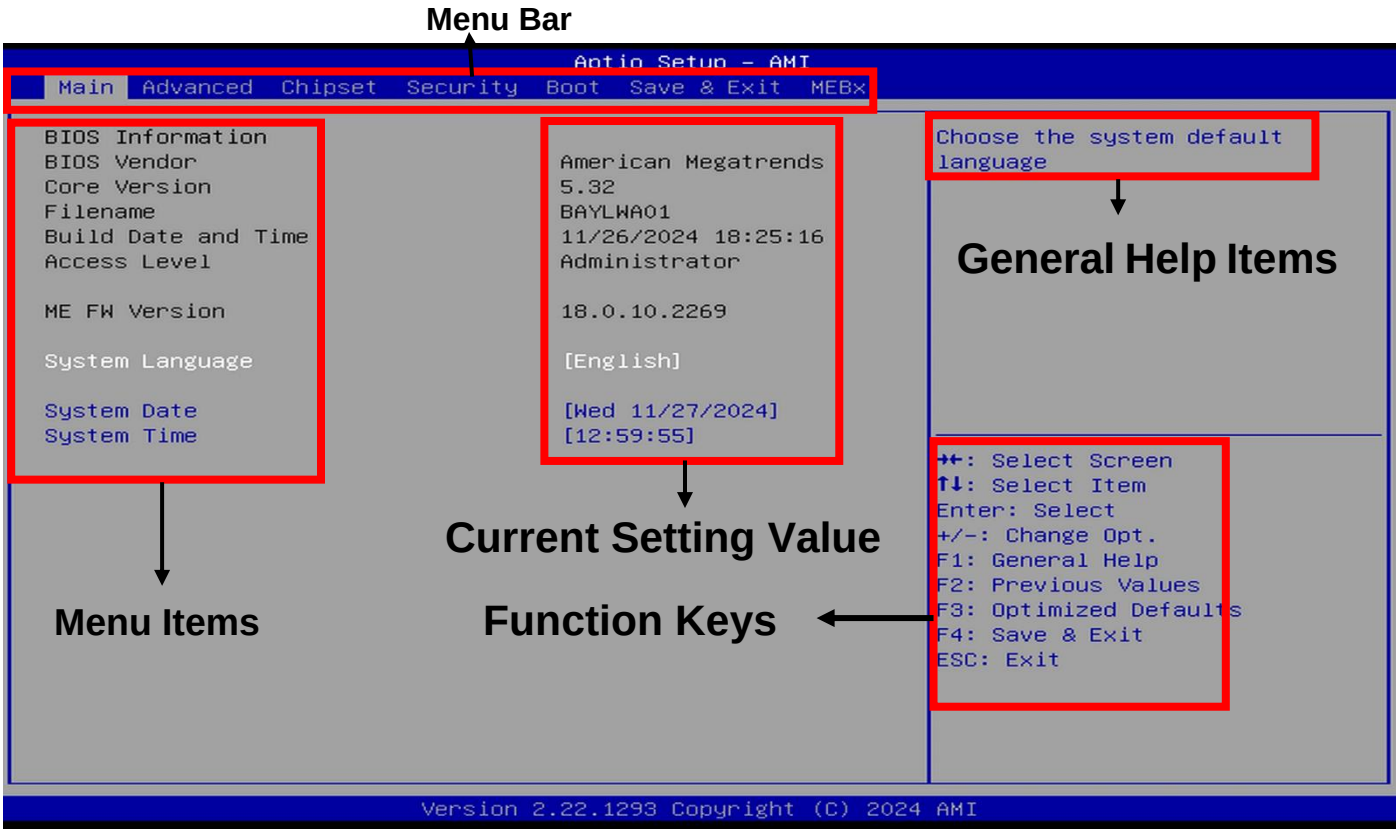
Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



BIOS Boot Menu Screen (boot device options please refer to actual configuration)

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen.
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press 【F1】 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

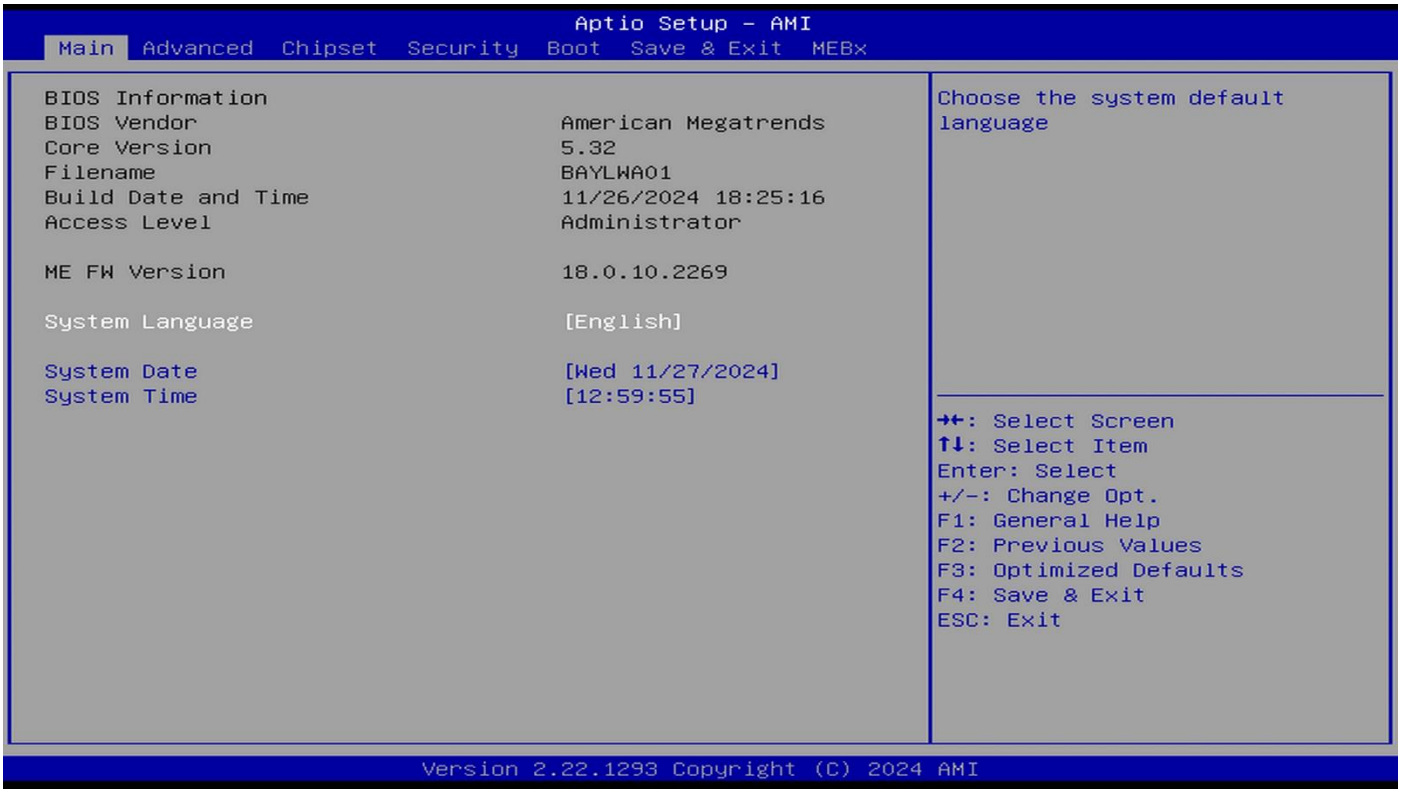
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.



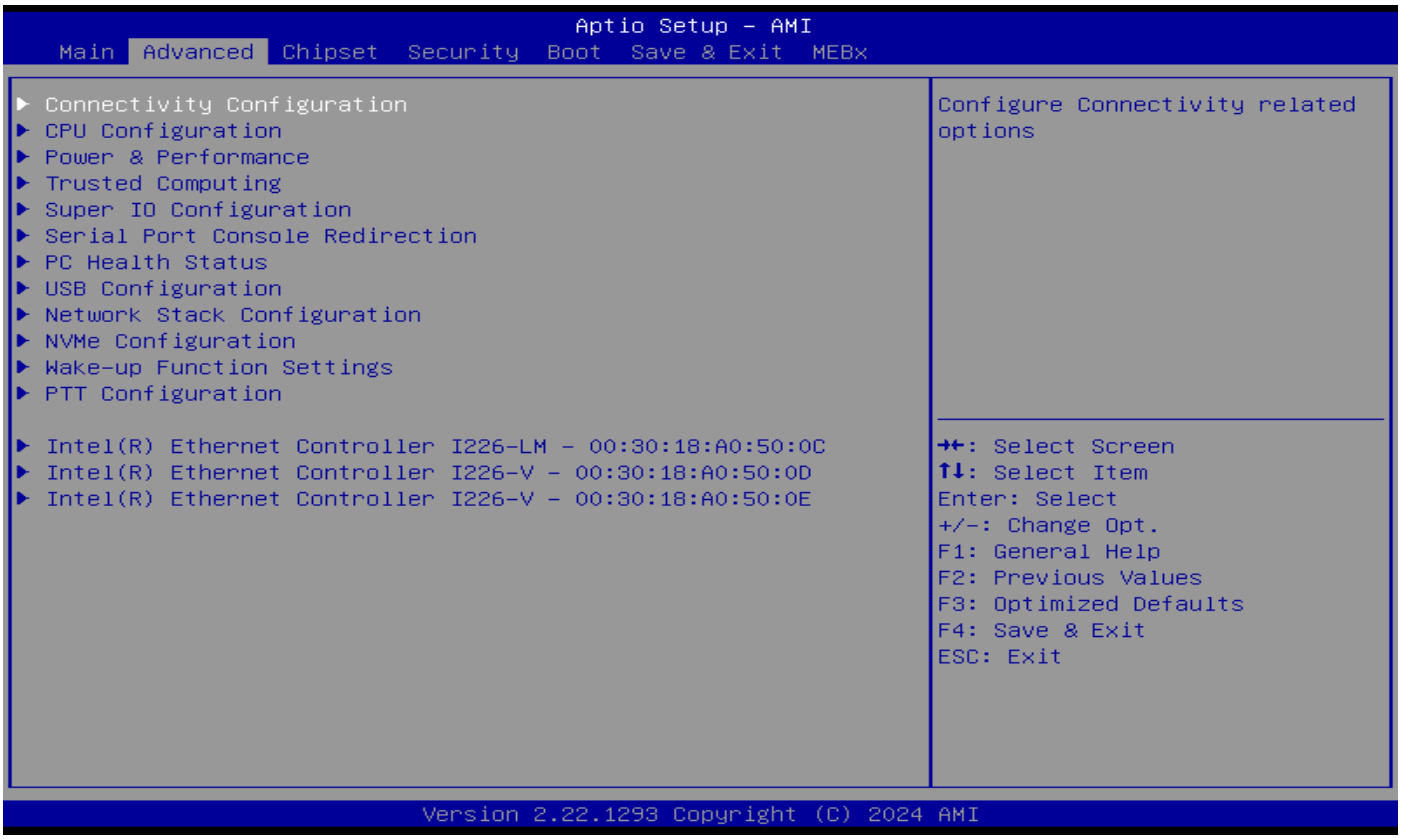
System Date

Set the date. Please use [Tab] to switch between date elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **Connectivity Configuration**
  Use this item to configure Connectivity related options. Press [Enter] to make settings for the following sub-items:
  CNVi CRF Present
  CNVi Mode
  This option configures Connectivity.
  CNVi Mode Set the default value to: [Auto Detection]
  The optional settings: [Disabled Integrated]; [Auto Detection].
  [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled;
  [Disabled Integrated] disables Integrated Solution.
- **CPU Configuration**
  Press [Enter] to view current CPU configuration and make settings for the following sub-items:
- **Efficient-Core Information**
  Use this item to displays the E-Core information.
  Press [Enter] to make settings for the following sub-items:
  L1 Date Cache/L1 Instruction Cache/L2 Cache/L3 Cache
- **Performance-Core Information**
  Use this item to displays the P-Core information.
  Press [Enter] to make settings for the following sub-items:
  L1 Date Cache/L1 Instruction Cache/L2 Cache/L3 Cache
  Boot Performance Mode

Use this item to select the performance state that the BIOS will set starting from reset vector.
Boot Performance Mode Set the default value to: [Max Non-Turbo Performance]
The optional settings: [Min Non-Turbo Performance]; [Max Non-Turbo Performance]; [Turbo Performance].

Intel(R) SpeedStep(tm)

This item allows more than two frequency ranges to be supported.
Intel(R) SpeedStep(tm) Set the default value to: [Enabled]
The optional settings: [Disabled]; [Enabled].

Turbo Mode

Use this item to enable or disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).
Turbo Mode Set the default value to: [Enabled]
The optional settings: [Disabled]; [Enabled]; [Customized]

C states

Use this item to enable or disable CPU Power Management. When set as [Enabled], it allows CPU to go to C states when it's not 100% utilized.
C states Set the default value to: [Enabled]
The optional settings: [Disabled]; [Enabled].

Enhanced C-states

Use this item to Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.
Enhanced C-states Set the default value to: [Enabled]
The optional settings: [Disabled]; [Enabled].

Package C State Limit

Use this item to maximum package C State Limit setting. CPU default: leaves to factory default value. Auto: initializes to deepest available package C State Limit.
Package C State Limit Set the default value to: [Auto]
The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [CPU Default]; [Auto].

- **Power & Performance**

Press [Enter] to make settings for the following sub-items:

- **CPU – Power Management Control**

CPU-Power Management Control Options.
Press [Enter] to make settings for the following sub-items:

Power Limit 1

Use this item to set Power Limit 1 in Milli Watts. BIOS will round to the nearest 1/8W when programming.

0 = no custom override. For 12.50W, enter 12500.

Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR).

Other SKUs: This value must be between Min Power Limit and Processor Base Power (TDP) Limit. If value is 0, BIOS will program Processor Base Power (TDP) value.

Power Limit 1 Set the default value to: [0]

Power Limit 1 Time Window

Use this item to set Power Limit 1 Time Window value in seconds. The value may vary from 0 to 128. 0 = default value (28 sec for Mobile and 8 sec for Desktop). Defines time window which Processor Base Power (TDP) value should be maintained.

Power Limit 1 Time Window Set the default value to: [0]

The optional settings are: [0]; [1]; [2]; [3]; [4]; [5]; [6]; [7]; [8]; [10]; [12]; [14]; [16]; [20]; [24]; [28]; [32]; [40]; [48]; [56]; [64]; [80]; [96]; [112]; [128].

Power Limit 2

Use this item to set Power Limit 2 Value in Milli Watts. BIOS will round to the nearest 1/8W when programming.

0=no custom override. For 12.50w, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

Power Limit 2 Set the default value to: [0]

Power Limit 4 Override

If this option isdisabled, BIOS will leave the default values for Power Limit

Power Limit 4 Override Set the default value to: [Disabled]

The optional settings: [Disabled]; [Enabled].

Power Limit 4

Power Limit 4 in Milli Watts.BIOS will round to the nearest1/8W when programming. For 12.50W, enter 12500. If the value is 0, BIOS leaves default value.

Power Limit 4 Set the default value to: [0]

- **GT-Power Management Control**

Press [Enter] to make settings for the following sub-items:

RC6(Render Standby)

Use this item to check to enable render standby support.

RC6(Render Standby) Set the default value to: [Enabled]

The optional settings: [Disabled]; [Enabled].

Maximum GT frequency

Use this item to Maximum GT frequency limited by the user. Choose between 200MHZ (RPN) and 1200MHZ (RP0). Value beyond the range will be clipped to min/max supported by SKU.

Maximum GT frequency Set the default value to: [Default Max Frequency]

The optional settings: [Default Max Frequency]; [100Mhz] ; [150Mhz] ; [200Mhz] ; [250Mhz] ; [300Mhz] ; [350Mhz] ; [400Mhz] ; [450Mhz] ; [500Mhz] ; [550Mhz] ; [600Mhz] ; [650Mhz] ; [700Mhz] ; [750Mhz] ; [800Mhz] ; [850Mhz] ; [900Mhz] ; [950Mhz] ; [1000Mhz] ; [1050Mhz] ; [1100Mhz] ; [1150Mhz] ; [1200Mhz].

Disable Turbo GT frequency

Use this item to enabled: disables turbo GT frequency. Disabled: GT frequency is not limited.

Disable Turbo GT frequency Set the default value to: [Disabled]

The optional settings: [Disabled]; [Enabled].

- **Trusted Computing**

Press [Enter] to make settings in the following sub-items:

Security Device Support

Use this item to enables or disables BIOS support for security device. O.S will not show security device. TCG EFI protocol and INT1A interface will not be available.

The optional settings: [Disabled]; [Enabled].

Security Device Support Set the default value to: [Enabled]

When set as [Enabled], user can make setting in the following items that appear:

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank.

The optional settings: [Disabled]; [Enabled].

SHA256 PCR Bank Set the default value to: [Enabled]

SHA384 PCR Bank

Use this item to enable or disable SHA384 PCR Bank.

The optional settings: [Disabled]; [Enabled].

SHA384 PCR Bank Set the default value to: [Disabled]

Pending Operation

Use this item to schedule an operation for security device.

The optional settings: [None]; [TPM Clear].

Pending Operation Set the default value to: [None]

Note:** **Your computer will reboot during restart in order to change State of Security Device.

- **Super IO Configuration**

Press [Enter] to make settings for the following sub-items:

Super IO Configuration

- **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal settings for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=4]; [IO=2F8h; IRQ=3]; [IO=3E8h; IRQ=4]; [IO=2E8h; IRQ=3].

Change Settings Set the default value to: [Auto]

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [[RS485].

Transmission Mode Select Set the default value to: [RS232]

Mode Speed Select

Use this item to RS232/RS422/RS485 Speed Select.

The optional settings are: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

Mode Speed Select Set the default value to: [RS232=1Mbps, RS422/RS485=10Mbps]

- **Serial Port 2 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Select Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=4]; [IO=2F8h; IRQ=3]; [IO=3E8h; IRQ=4]; [IO=2E8h; IRQ=3].

Change Settings Set the default value to: [Auto]

Transmission Mode Select

The optional settings are: [RS422]; [RS232]; [[RS485].

Transmission Mode Select Set the default value to: [RS232]

Mode Speed Select

Use this item to RS232/RS422/RS485 Speed Select.

The optional settings are: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

Mode Speed Select Set the default value to: [RS232=1Mbps, RS422/RS485=10Mbps]

- **Serial Port 3 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Select Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=10]; [IO=2F8h; IRQ=10]; [IO=3E8h; IRQ=10]; [IO=2E8h; IRQ=10]; [IO=2F0h; IRQ=10]; [IO=2E0h; IRQ=10].

Change Settings Set the default value to: [Auto]

- **Serial Port 4 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Select Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=10]; [IO=2F8h; IRQ=10]; [IO=3E8h; IRQ=10];

[IO=2E8h; IRQ=10]; [IO=2F0h; IRQ=10]; [IO=2E0h; IRQ=10].

Change Settings Set the default value to: [Auto]

- **Serial Port 5 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Select Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=11]; [IO=2F8h; IRQ=11]; [IO=3E8h; IRQ=11]; [IO=2E8h; IRQ=11]; [IO=2F0h; IRQ=11]; [IO=2E0h; IRQ=11].

Change Settings Set the default value to: [Auto]

- **Serial Port 6 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Select Set the default value to: [Enabled]

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=11]; [IO=2F8h; IRQ=11]; [IO=3E8h; IRQ=11]; [IO=2E8h; IRQ=11]; [IO=2F0h; IRQ=11]; [IO=2E0h; IRQ=11].

Change Settings Set the default value to: [Auto]

ERP Support

Use this item to make setting for energy-related products function. Disable ERP to active all wake-up function.

The optional settings: [Disabled]; [Enabled].

ERP Support Set the default value to: [Disabled]

Case Open Detect

Use this item to detect if case have ever been opened. Show message in POST.

The optional settings: [Disabled]; [Enabled].

Case Open Detect Set the default value to: [Disabled]

When set as [Enabled], system will detect if COPEN has been short or not (*refer to* ***JCLR1*** *jumper setting for Case Open Detection*); if Pin 7&8 of ***JCLR1*** are short, system will show Case Open Message during POST.

System State after Power Failure

Use this item to specify what state to go to when power is re-applied after a power failure.

The optional settings: [Always On]; [Always Off]; [Former State].
System State after Power Failure Set the default value to: [Always Off]

WatchDog Reset Timer

Use this item to support WDT reset function.

The optional settings: [Disabled]; [Enabled].

WatchDog Reset Timer Set the default value to: [Disabled]

When set as [Enabled], user can make settings in the following items that appear:

WatchDog Reset Timer Value

User can set a value in the range of [10] to [255] seconds or [1] to [255] minutes.

WatchDog Reset Timer Value Set the default value to: [10]

WatchDog Reset Timer Unit

The optional settings are: [Sec.]; [Min.].

WatchDog Reset Timer Unit Set the default value to: [Sec]

WatchDog Wake-up Timer

Use this item to support WDT Wake-up.

The optional settings are: [Disabled]; [Enabled].

WatchDog Wake-up Timer Set the default value to: [Disabled]

When set as [Enabled], user can make settings in the following items that appear:

WatchDog Wake-up Timer Value

User can set a value in the range of [10]~[4095] seconds, or [1]~[4095] minutes.

WatchDog Reset Timer Value Set the default value to: [10]

WatchDog Wake-up Timer Unit

The optional settings are: [Sec.]; [Min.].

WatchDog Reset Timer Unit Set the default value to: [Sec]

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select ‘AT or ATX Mode’ on MB jumper at first (refer to **JPAT1** jumper setting Pin 1&2 of for **ATX Mode** & Pin 2&3 of **AT Mode** Select).

- **Serial Port Console Redirection**

Press [Enter] to make settings for the following sub-items:

COM1

Console Redirection

Console Redirection enable or disable.

The optional settings: [Disabled]; [Enabled].

Console Redirection Set the default value to: [Disabled]

When set as **[Enabled**], user can make further settings in the ‘**Console Redirection Settings**’ screen:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using)

will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following sub-items：

Terminal Type

The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].
[ANSI]: Extended ASCII char set;
[VT100]: ASCII char set;
[VT100Plus]: Extends VT100 to support color, function keys, etc.
[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Terminal Type Set the default value to: [ANSI]

Bits per second

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].

Bits per second Set the default value to: [115200]

Data Bits

The optional settings: [7]; [8].

Data Bits Set the default value to: [8]

Parity

A parity bit can be sent with the data bits to detect some transmission errors.
The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].
[Even]: parity bit is 0 if the num of 1's in the data bits is even;
[Odd]: parity bit is 0 if num of 1's in the data bits is odd;
[Mark]: parity bit is always 1;
[Space]: parity bit is always 0;
Parity Set the default value to: [None]
[Mark] and **[Space]**: parity do not allow for error detection. They can be used as an additional data bit.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
The optional settings: [1]; [2].
Stop Bits Set the default value to: [1]

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS].
Flow Control Set the default value to: [None]

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
The optional settings: [Disabled]; [Enabled].
VT-UTF8 Combo Key Support Set the default value to: [Enabled]

Recorder Mode

With this mode enabled only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].
Recorder Mode Set the default value to: [Disabled]

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings: [Disabled]; [Enabled].

Resolution 100x31 Set the default value to: [Disabled]

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Putty KeyPad Set the default value to: [VT100]

Serial Port for Out-of-Band Management/

Windows Emergency Management Services (EMS)

Console Redirection EMS

Use this item to enable or disable console redirection.

The optional settings: [Disabled]; [Enabled].

Console Redirection EMS Set the default value to: [Disabled]

When set as **[Enabled]**, user can make further settings in '**Console Redirection Settings**' screen:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following sub-items.

Terminal Type EMS

The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is **[VT100+]** and then **[VT100]**. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Terminal Type EMS Set the default value to: [VT-UTF8]

Bits per second EMS

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings: [9600]; [19200]; [57600]; [115200].

Bits per second EMS Set the default value to: [115200]

Flow Control EMS

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Flow Control EMS Set the default value to: [None]

Data Bits EMS

The default setting is: [8].

**This item may or may not show up, depending on different configuration.*

Parity EMS

The default setting is: [None].

**This item may or may not show up, depending on different configuration.*

Stop Bits EMS

The default setting is: [1].

**This item may or may not show up, depending on different configuration.*

- **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**'.

- **SmartFAN Configuration**

Press [Enter] to make settings for SmartFAN Configuration:

SmartFAN Configuration

CPUFAN Smart Mode

The optional settings: [Disabled]; [Enabled].

CPUFAN Smart Mode Set the default value to: [Enabled]

When set as [Enabled], the following sub-items shall appear:

CPUFAN Full-Speed Temperature

Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.

CPUFAN Full-Speed Temperature Set the default value to: [75]

CPUFAN Full-Speed Duty

Use this item to set CPUFAN full-speed duty. Fan will run at full speed when above this pre-set duty.

CPUFAN Full-Speed Duty Set the default value to: [100]

CPUFAN Idle-Speed Temperature

Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN Idle-Speed Temperature Set the default value to: [40]

CPUFAN Idle-Speed Duty

Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below this pre-set duty.

CPUFAN Idle-Speed Duty Set the default value to: [40]

SYSFAN1 Smart Mode

The optional settings: [Disabled]; [Enabled].

SYSFAN1 Smart Mode Set the default value to: [Enabled]

When set as [Enabled], the following sub-items shall appear:

SYSFAN1 Full-Speed Temperature

Use this item to set SYSFAN1 full speed temperature. Fan will run at full speed when above this

pre-set temperature.

SYSFAN1 Full-Speed Temperature Set the default value to: [75]

SYSFAN1 Full-Speed Duty

Use this item to set SYSFAN1 full-speed duty. Fan will run at full speed when above this pre-set duty.

SYSFAN1 Full-Speed Duty Set the default value to: [100]

SYSFAN1 Idle-Speed Temperature

Use this item to set SYSFAN1 idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

SYSFAN1 Idle-Speed Temperature Set the default value to: [30]

SYSFAN1 Idle-Speed Duty

Use this item to set SYSFAN1 idle speed duty. Fan will run at idle speed when below this pre-set duty.

SYSFAN1 Idle-Speed Duty Set the default value to: [40]

- **USB Configuration**

Press [Enter] to make settings for the following sub-items:

USB Configuration

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings: [Enabled]; [Disabled].

XHCI Hand-off Set the default value to: [Enabled]

USB Mass Storage Driver Support

Use this item to enable or disable USB Mass storage driver support.

The optional settings: [Disabled]; [Enabled].

USB Mass Storage Driver Support Set the default value to: [Enabled]

USB hardware delay and time-out

USB Transfer time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers.

The optional settings: [1 sec]; [5 sec]; [10 sec]; [20 sec].

USB Transfer time-out Set the default value to: [20 sec]

Device reset time-out

Use this item to set USB mass storage device start unit command time-out.

The optional settings: [10 sec]; [20 sec]; [30 sec]; [40 sec].

Device reset time-out Set the default value to: [20 sec]

Device power-up delay

Use this item to set maximum time the device will take before it properly reports itself to the host controller. ‘Auto’ uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

The optional settings: [Auto]; [Manual].

Device power-up delay Set the default value to: [Auto]

Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**'**,** the delay range is 1 .. 40 seconds, in one second increments.

- **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.

Network Stack

Use this item to enable or disable UEFI Network Stack.

The optional settings: [Disabled]; [Enabled].

Network Stack Set the default value to: [Disabled]

When set as **[Enabled]**, the following sub-items shall appear:

IPv4 PXE Support

Use this item to enable/disable IPv4 PXE Boot Support. When set as [Disabled], IPv4 PXE boot support will not be available.

The optional settings: [Disabled]; [Enabled].

IPv4 PXE Support Set the default value to: [Enabled]

IPv6 PXE Support

Use this item to enable/disable IPv6 PXE Boot Support. When set as [Disabled], IPv6 PXE boot support will not be available.

The optional settings: [Disabled]; [Enabled].

IPv6 PXE Support Set the default value to: [Disabled]

PXE boot wait time

Wait time in seconds to press [ESC] key to abort the PXE boot.

Use either [+]/[-] or numeric keys to set the value.

PXE boot wait time Set the default value to: [5]

Media detect count

Use this item to set number of times presence of media will be checked.

Use either [+]/[-] or numeric keys to set the value.

Media detect count Set the default value to: [5]

- **NVMe Configuration**

Use this item to set NVMe Device options settings.

NVMe Configuration

- **Wake-up Function Settings**

Wake-up System With Fixed Time

This item will only show when* *'Wake-up System with Dynamic Time'*** *is set as [Disabled].*

Use this item to enable or disable system wake-up by RTC alarm. When this function is enabled, system will wake on the time (hr::min::sec) specified.

The optional settings: [Disabled]; [Enabled].

Wake-up System With Fixed Time Set the default value to: [Disabled]

When set as [Enabled], user can make settings in the following items that appear:

Wake-up Hour

Use this item to select 0-23 for example enter 3 for 3am and 15 for 3pm.

Wake-up Hour Set the default value to: [0]

Wake-up Minute

Use this item to select 0-59.

Wake-up Minute Set the default value to: [0]

Wake-up Second

Use this item to select 0-59.

Wake-up Second Set the default value to: [0]

Wake-up System with Dynamic Time

This item will only show when* *'Wake-up System with Fixed Time'*** *is set as [Disabled].*

Use this item to enable or disable system wake-up by RTC alarm. When enabled, system will wake on the current time + Increase minute(s).

Wake-up System with Dynamic Time Set the default value to: [Disabled]

When set as [Enabled], user can make settings in the following items that appear:

Wake-up Minute Increase

Use this item to select 1-60 minute(s).

Wake-up Minute Increase Set the default value to: [1]

USB Power Gating S4-S5

USB Wake-up is affected by ERP function in S4. Please disable ERP before activating this function in S4.

The optional settings: [Disabled]; [Enabled].

USB Power Gating S4-S5 Set the default value to: [Enabled]

PCIE Wake-up from S3-S5

The optional settings: [Disabled]; [Enabled].

PCIE Wake-up from S3-S5 Set the default value to: [Disabled]

- **PTT Configuration**

Press [Enter] to make settings for the following sub-items:

PTT Capability/state

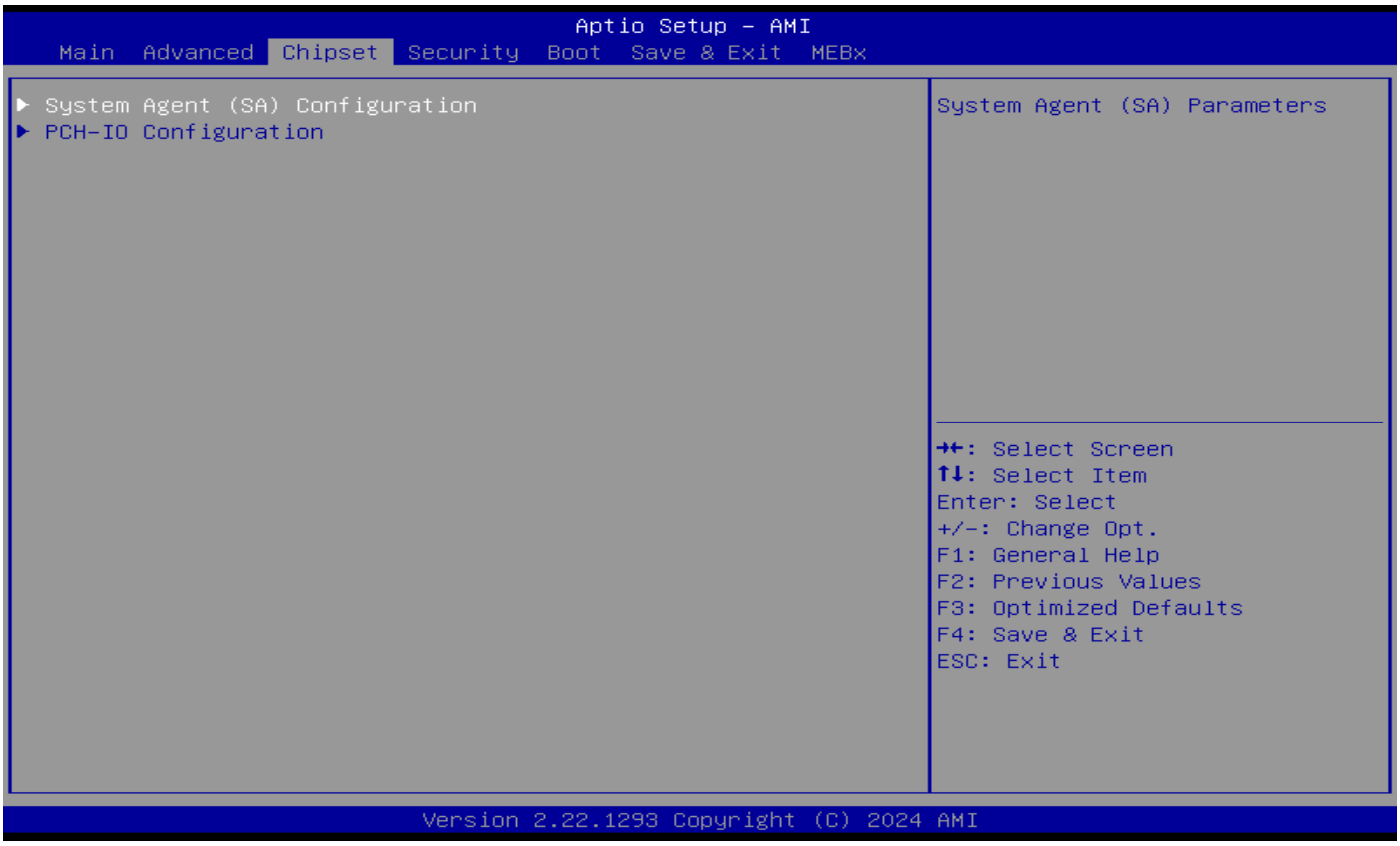
TPM Device Selection

The optional settings: [dTPM]; [PTT].

TPM Device Selection Set the default value to: [PTT]

- **Intel (R) Ethernet Controller I226-LM – XX:XX:XX:XX:XX:XX**
- **Intel (R) Ethernet Controller I226-V – XX:XX:XX:XX:XX:XX**
- **Intel (R) Ethernet Controller I226-V – XX:XX:XX:XX:XX:XX**

3-8 Chipset Menu



- **System Agent (SA) Configuration**

  Press [Enter] to make settings for the following sub-items:

  System Agent (SA) Configuration

  - **VMD setup menu**

  Press [Enter] to make settings for the following sub-items:

  Enable VMD controller

  Use this item to enable/disable to VMD controller
  The optional settings: [Disabled]; [Enabled].
  When set as [Enabled], the following sub-items shall appear:

  Enable VMD Global Mapping

  Use this item to enable/disable to VMD global mapping
  The optional settings: [Disabled]; [Enabled].
  When set as [Disabled], the following sub-items shall appear:

  Map SOC SATA Controller under VMD

  Use this item to Map/UnMap this root port to VMD
  The optional settings: [Disabled]; [Enabled].

  Primary Display

  Use this item to select the IGD or external Graphics as the primary display.

  The optional settings: [AUTO]; [IGFX].

  Primary Display Set the default value to: [AUTO]

  Internal Graphices

Keep IGFX enabled based on the setup options.
The optional settings: [AUTO]; [Disabled]; [Enabled].
Internal Graphices Set the default value to: [AUTO]

Active LFP

Use this item to select the Active LFP Configuration.

The optional settings: [Disabled]; [Enabled].

Active LFP Set the default value to: [Disabled]

When set as [Enabled], the following sub-item shall appear:

Panel Type

The optional settings are: [800x480 1ch 18-bit]; [800x600 1ch 18-bit]; [800x600 1ch 24-bit]; [1024x600 1ch 18-bit]; [1024x768 1ch 18-bit]; [1024x768 1ch 24-bit]; [1280x800 1ch 18-bit]; [1280x800 1ch 24-bit]; [1366x768 1ch 18-bit]; [1366x768 1ch 24-bit]; [1440x900 2ch 18-bit]; [1440x900 2ch 24-bit]; [1280x1024 2ch 24-bit]; [1680x1050 2ch 24-bit]; [1920x1080 2ch 24-bit]; [eDP].

Panel Type Set the default value to: [eDP]

Backlight Control

Use this item to make back light control setting.

The optional settings are: [PWM Inverted]; [PWM Normal].

Backlight Control Set the default value to: [PWM Normal]

- **PCH-IO Configuration**

  Press [Enter] to make settings for the following sub-items:

  PCH-IO Configuration

- **SATA Configuration**

  SATA Device Options Settings.

  SATA Configuration

  SATA Controller(s)

  Use this item to enable/disable SATA Device.

  The optional settings are: [Enabled]; [Disabled].

  SATA Controller(s) Set the default value to: [Enabled]

  When set as [Enabled], the following sub-items shall appear:

  Serial ATA Port

  Port

  Use this item to enable or disable SATA Port.

  The optional settings are: [Disabled]; [Enabled].

  Port Set the default value to: [Enabled]

  M.2 SATA

  Port

  Use this item to enable or disable SATA Port.

  The optional settings are: [Disabled]; [Enabled].

  Port Set the default value to: [Enabled]

HD Audio

Use this item to control detection of the HD-Audio device.

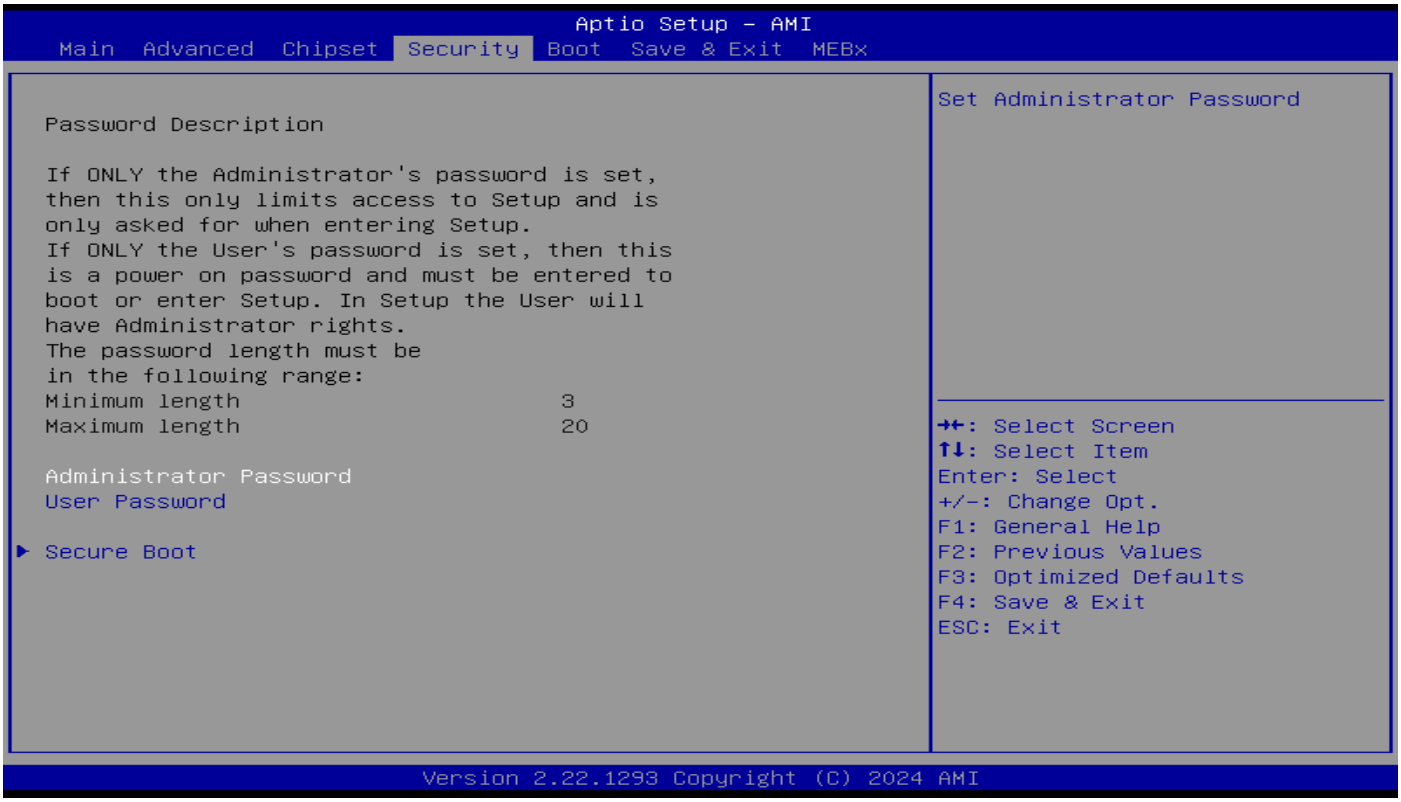
Disabled= HDA will be unconditionally disabled.

Enabled= HDA will be unconditionally enabled.

The optional settings: [Disabled]; [Enabled].

HD Audio Set the default value to: [Enabled]

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  System Mode

  Secure Boot

  Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.

The optional settings: [Disabled]; [Enabled].
Secure Boot Set the default value to: [Enabled]

Secure Boot Mode

Set UEFI Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.
In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.
The optional settings: [Standard]; [Custom].
Secure Boot Mode Set the default value to: [Standard]
When set as [**Custom**], user can make further settings in the following items that show up:

- **Restore Factory Keys**

Use this item to force system to User Mode, to install factory default Secure Boot key databases.

- **Reset To Setup Mode**

Use this item to Delete all secure boot key databases from NVRAM.

- **Key Management**

This item enables expert users to modify Secure Boot Policy variables without full authentication, which includes the following items:

Vendor Keys

Factory Key Provision

This item is for user to install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.
The optional settings: [Disabled]; [Enabled].
Factory Key Provision Set the default value to: [Disabled]

- **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot key databases.

- **Reset To Setup Mode**

Use this item to Delete all Secure Boot key databases from NVRAM.

- **Enroll Efi Image**

This item allows the image to run in Secure Boot mode.
Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

- **Export Secure Boot variables**

Use this item to save NVRAM content of Secure Boot variables to a file.

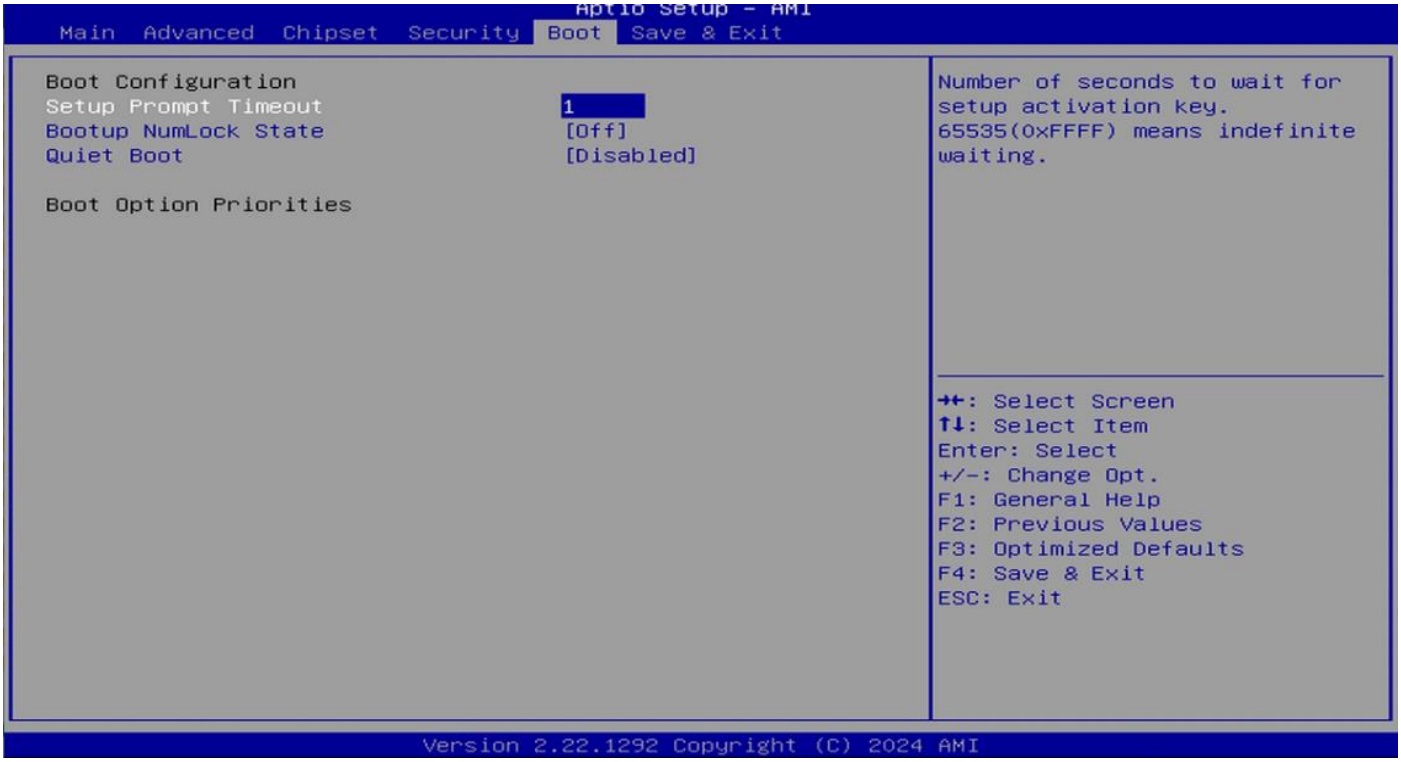
- **Export Secure Boot variables**

- **Platform Key(PK)**
- **Key Exchange Keys(KEK)**
- **Signatures(db)**
- **Forbidden Signatures(dbx)**
- **Authorized TimeStamps(dbt)**
- **OsRecovery Signatures(dbr)**

Use this item to enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, Modified, Mixed

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Setup Prompt Timeout Set the default value to: [1]

Bootup NumLock State

Use this item to select keyboard NumLock state.

The optional settings: [On]; [Off].

Bootup NumLock State Set the default value to: [Off]

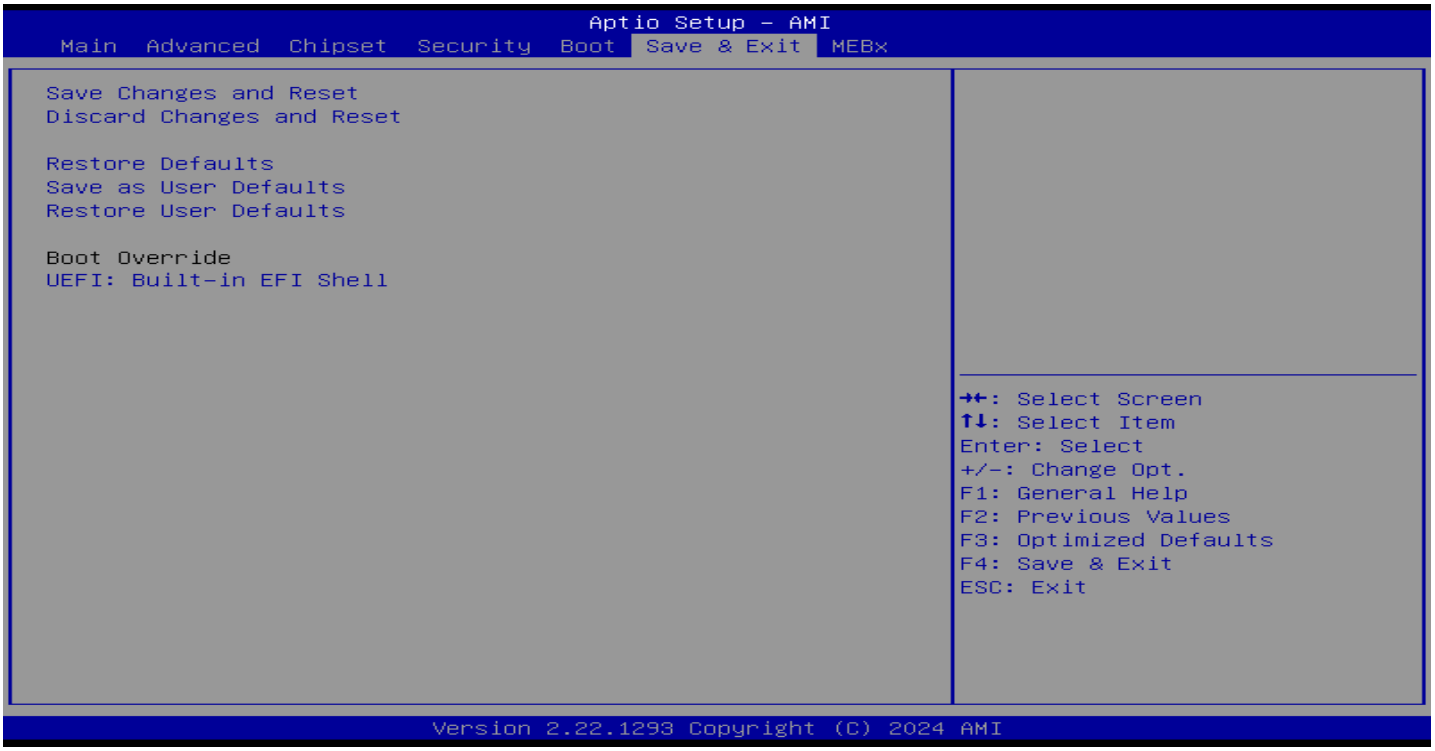
Quiet Boot

The optional settings: [Disabled]; [Enabled].

Quiet Boot Set the default value to: [Disabled]

Boot Option Priorities

3-11 Save & Exit Menu



Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system setup without saving any changes.

Restore Defaults

Use this item to restore /load default values for all the setup options.

Save as User Defaults

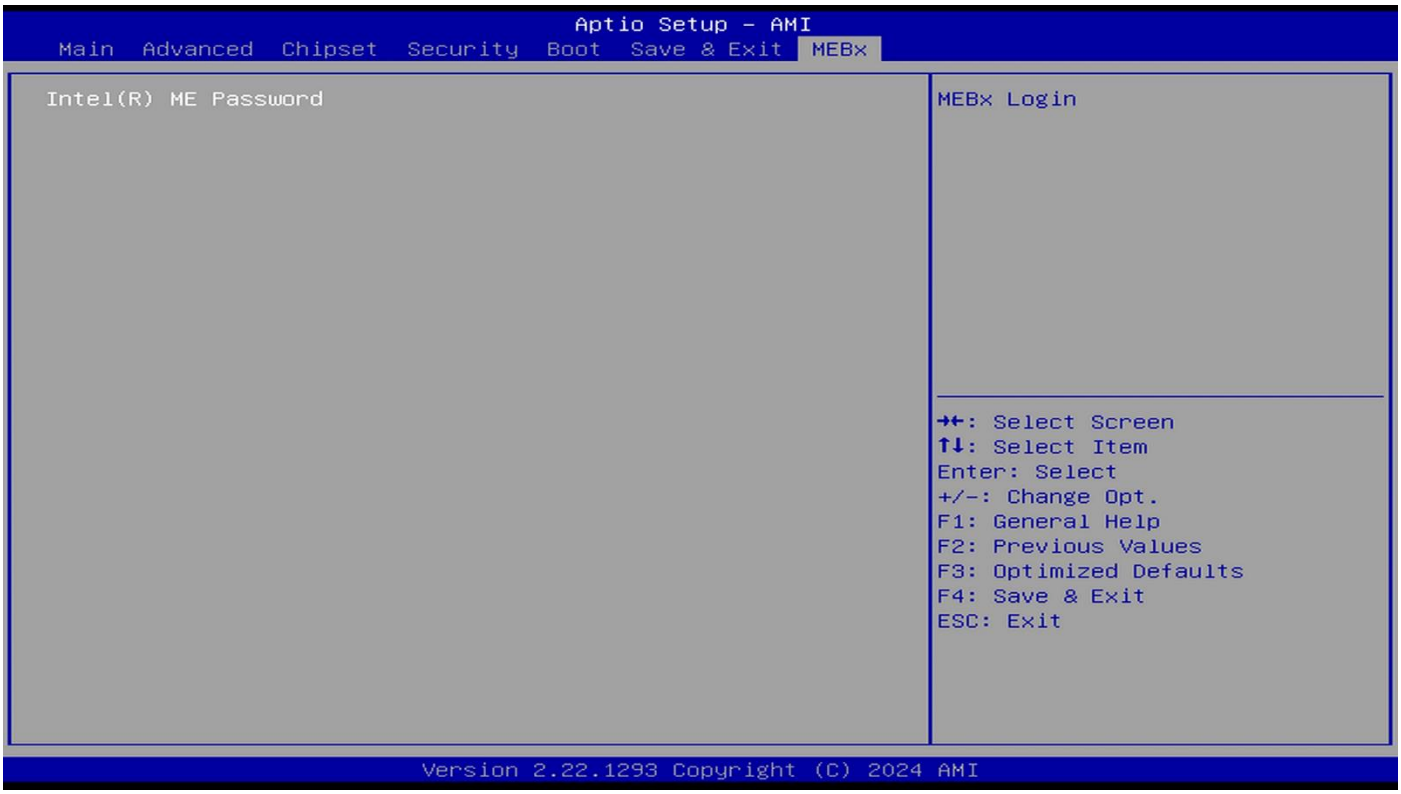
Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore the user defaults to all the setup options.

Boot Override

3-12 MEBx



- **Intel(R) ME Password**

  Use this item to MEBx Login

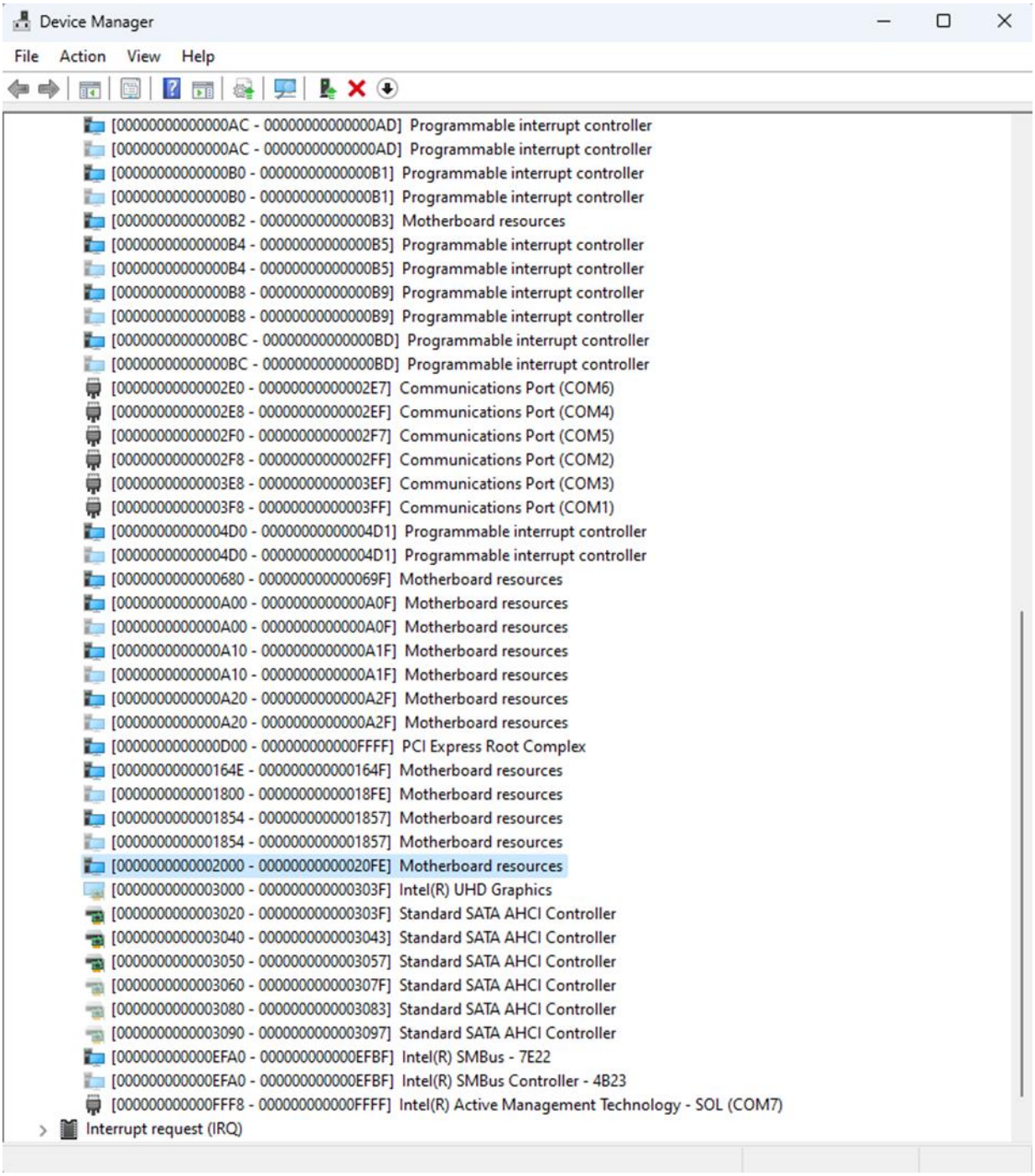
Appendix A

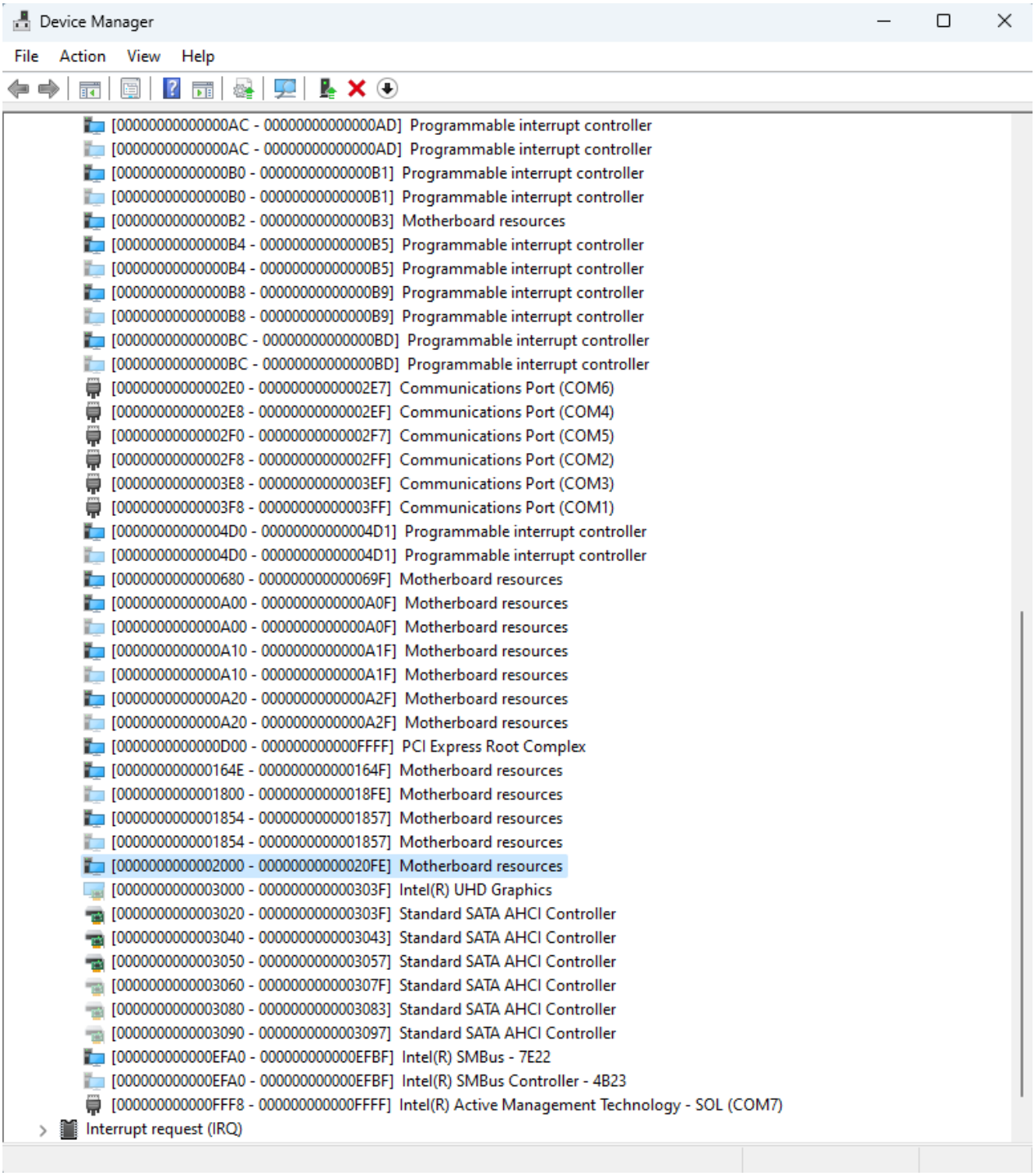
Mating Connector

Location Printing	Function	Vendor	Vendor P/N
BATCON1	RTC Battery Connector	Topt	WF125-102M-TFT0004D
COM1	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
COM2	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
COM3	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
COM4	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
COM5	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
COM6	RS232 Serial Port Header	Topt	PH200-205S-GBB0010A
CPUFAN1	CPU FAN Header	Topt	WF254-104S-TEW0004A
DCIN1	Internal 12V~36V Wide-Voltage Power Connector	DCNT	W42M-XXDST3XSNXX
DCIN3	12V~36V DC-in Power Connector	SHENG CONG	DJ-D020A
F_AUDIO1	Front Panel Audio Header	DCNT	P420-XXDG01SM4XX-2*5PN8P
F_USB1	USB 2.0 Port Header	Topt	PH2-F205-N9-SAB-G87
F_USB2	USB 2.0 Port Header	Topt	PH2-F205-N9-SAB-G87
F_USB3	USB3.0 Port Header	DCNT	P420-10DG01ST401
GPIO1	GPIO/80 Port Header	Kunguang	PH2.0 2*5P SQ8.1/5.8(0)/4.2 SMT
I2C1	I2C Header	Topt	PH200-A105-SGCB-RN
INVERTER1	LVDS Inverter Connector	Topt	WF2-1108-K-S6R-B0
JW_FP1	Front Panel Function Header	Kunguang	PH2.54 2*5P N10P SQ11.6/3.0
LAN_LED1	LAN1 and LAN2 active LED	DCNT	P420-XXSGO1ST4XX
LAN_LED2	LAN3 active LED	Topt	PH200-102S-GBB0001A
LVDS_EDP1	LVDS Port Header	Topt	1.25-DF13 2*15P SMT
REFLASH_CON1	Jetway Flash BIOS Header	Denentech	W10M-XXDSM38G0XX
SATA1	SATA3 Port Connector	Lotes	ABA-SAT-056-K01
SATAPWR1	SATA HDD Power-Out Connector	Topt	WF5-11XX-Q-S6W-B0
SMBUS1	SMBUS Header	Topt	PH200-A105-SGCB-RN
SPEAK1	3W Amplifier Connector	Topt	WF2-1104-S6W-B0
SYSFAN1	System FAN Connector	Topt	WF254-104S-TEW0004A

Appendix B

I/O Address Map




Device Manager
File Action View Help
[00000000000000AC - 00000000000000AD] Programmable interrupt controller
[00000000000000AC - 00000000000000AD] Programmable interrupt controller
[00000000000000B0 - 00000000000000B1] Programmable interrupt controller
[00000000000000B0 - 00000000000000B1] Programmable interrupt controller
[00000000000000B2 - 00000000000000B3] Motherboard resources
[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
[00000000000000BC - 00000000000000BD] Programmable interrupt controller
[00000000000000BC - 00000000000000BD] Programmable interrupt controller
[00000000000002E0 - 00000000000002E7] Communications Port (COM6)
[00000000000002E8 - 00000000000002EF] Communications Port (COM4)
[00000000000002F0 - 00000000000002F7] Communications Port (COM5)
[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
[0000000000000680 - 000000000000069F] Motherboard resources
[0000000000000A00 - 0000000000000A0F] Motherboard resources
[0000000000000A00 - 0000000000000A0F] Motherboard resources
[0000000000000A10 - 0000000000000A1F] Motherboard resources
[0000000000000A10 - 0000000000000A1F] Motherboard resources
[0000000000000A20 - 0000000000000A2F] Motherboard resources
[0000000000000A20 - 0000000000000A2F] Motherboard resources
[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
[000000000000164E - 000000000000164F] Motherboard resources
[0000000000001800 - 00000000000018FE] Motherboard resources
[0000000000001854 - 0000000000001857] Motherboard resources
[0000000000001854 - 0000000000001857] Motherboard resources
[0000000000002000 - 00000000000020FE] Motherboard resources
[0000000000003000 - 000000000000303F] Intel(R) UHD Graphics
[0000000000003020 - 000000000000303F] Standard SATA AHCI Controller
[0000000000003040 - 0000000000003043] Standard SATA AHCI Controller
[0000000000003050 - 0000000000003057] Standard SATA AHCI Controller
[0000000000003060 - 000000000000307F] Standard SATA AHCI Controller
[0000000000003080 - 0000000000003083] Standard SATA AHCI Controller
[0000000000003090 - 0000000000003097] Standard SATA AHCI Controller
[000000000000EFA0 - 000000000000EFBF] Intel(R) SMBus - 7E22
[000000000000EFA0 - 000000000000EFBF] Intel(R) SMBus Controller - 4B23
[000000000000FFF8 - 000000000000FFFF] Intel(R) Active Management Technology - SOL (COM7)
Interrupt request (IRQ)