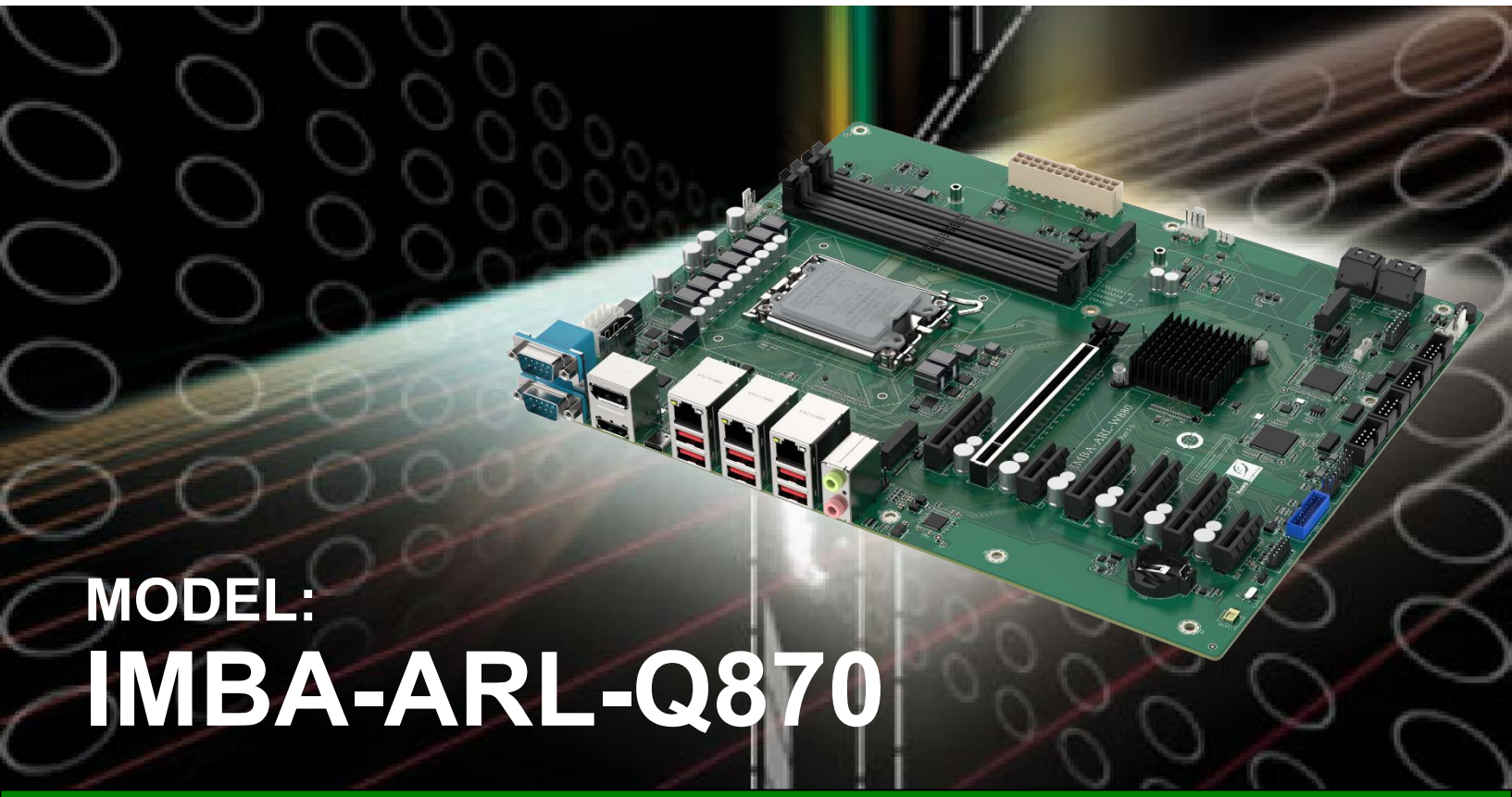
IEI Integration Corp.



MODEL:

IMBA-ARL-Q870

ATX motherboard supports LGA1851 high-Performance Intel® Core™ Ultra Processors (Series 2), DDR5, Quad independent displays, dual 2.5GbE LAN, M.2, USB 3.2, SATA 6Gb/s, HD Audio and RoHS

User Manual

Rev. 1.00 – March 17, 2026

RoHS Lead Free

Revision

Date	Version	Changes
March 17, 2026	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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1

Introduction

1.1 Introduction

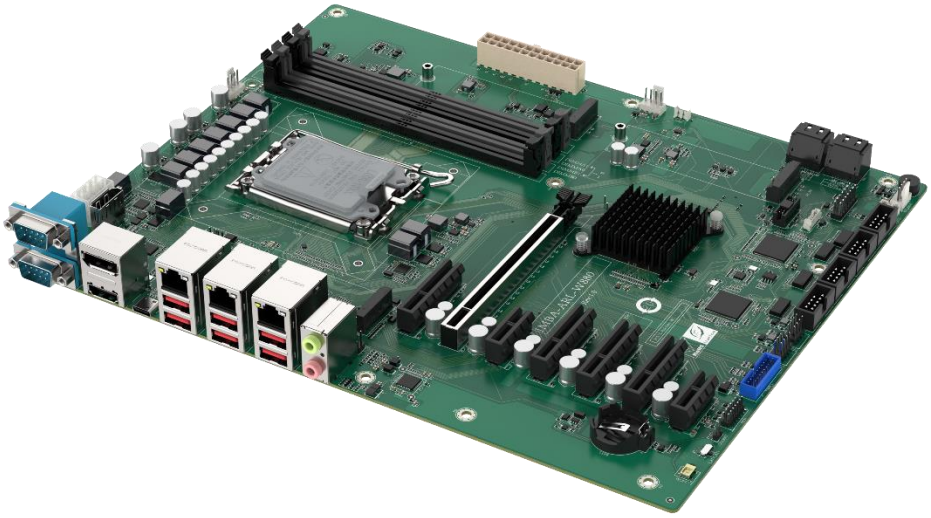


Figure 1-1: IMBA-ARL-Q870

The IMBA-ARL-Q870 is an ATX motherboard. It accepts a Socket LGA1851 high-Performance Intel® Core™ Ultra Processors (Series 2) and supports four 288-pin dual-channel DIMM DDR5 SDRAM unbuffered clocked DIMM modules up to 256 GB. The Intel® Q870 chipset supports four SATA 6Gb/s drives. Moreover, the IMBA-ARL-Q870 includes two DP, HDMI and USB4 for quad independent displays.

The IMBA-ARL-Q870 provides two 2.5GbE interfaces through the Intel® I226V and Intel® I226-LM controllers. Expansion and I/O includes two PCIe x16 slots, four PCIe x4 slots, one PCIe x1 slot, two M.2 M key, six COM ports, two USB 3.2 Gen 1, seven USB 3.2 Gen 2, and four USB 2,0.

1.2 Features

Some of the IMBA-ARL-Q870 motherboard features are listed below:

- ATX form factor
- LGA1851 supports High-Performance Intel® Core™ Ultra Processors (Series 2) (up to 125W)
- Four 288-pin 5600 MHz Dual-Channel DDR5 UDIMM&CUDIMM, supported up to 256GB
- Intel® I226-LM and Intel® I226V 2.5GbE controller
- Quad independent display by DP, HDMI, DP internal and USB4
- Four SATA 6Gb/s connectors support RAID 0, 1, 5, 10
- Four USB 2.0, Two USB 3.2 Gen 1 ports and seven USB 3.2 Gen 2 ports
- Two M.2 M-key slot for SSD; one M.2 B-key slot for IRIS2-2600
- Two PCIe Gen5 x16 slots
- Four PCIe Gen4 x4 open-end slots
- One PCIe Gen4 x1 slot
- Six serial ports
- TPM 2.0 security function
- RoHS compliant

1.3 Connectors

The connectors on the IMBA-ARL-Q870 are shown in the figure below.

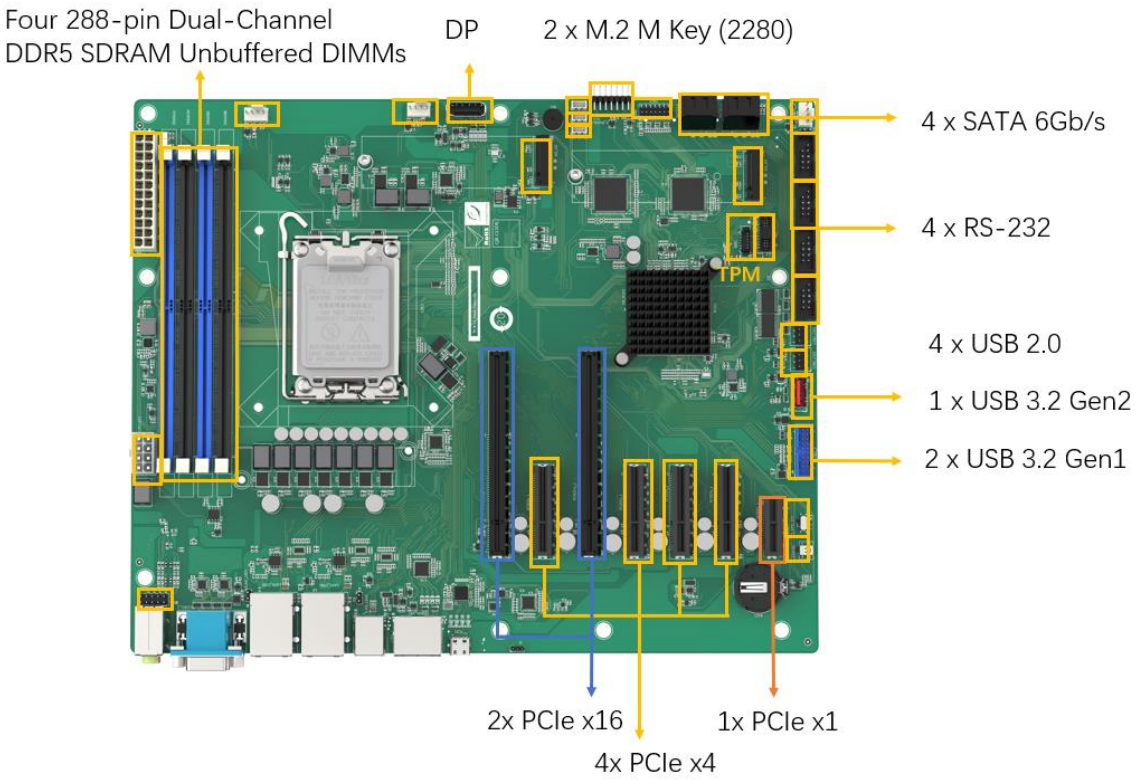


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the IMBA-ARL-Q870 are shown in the diagram below.

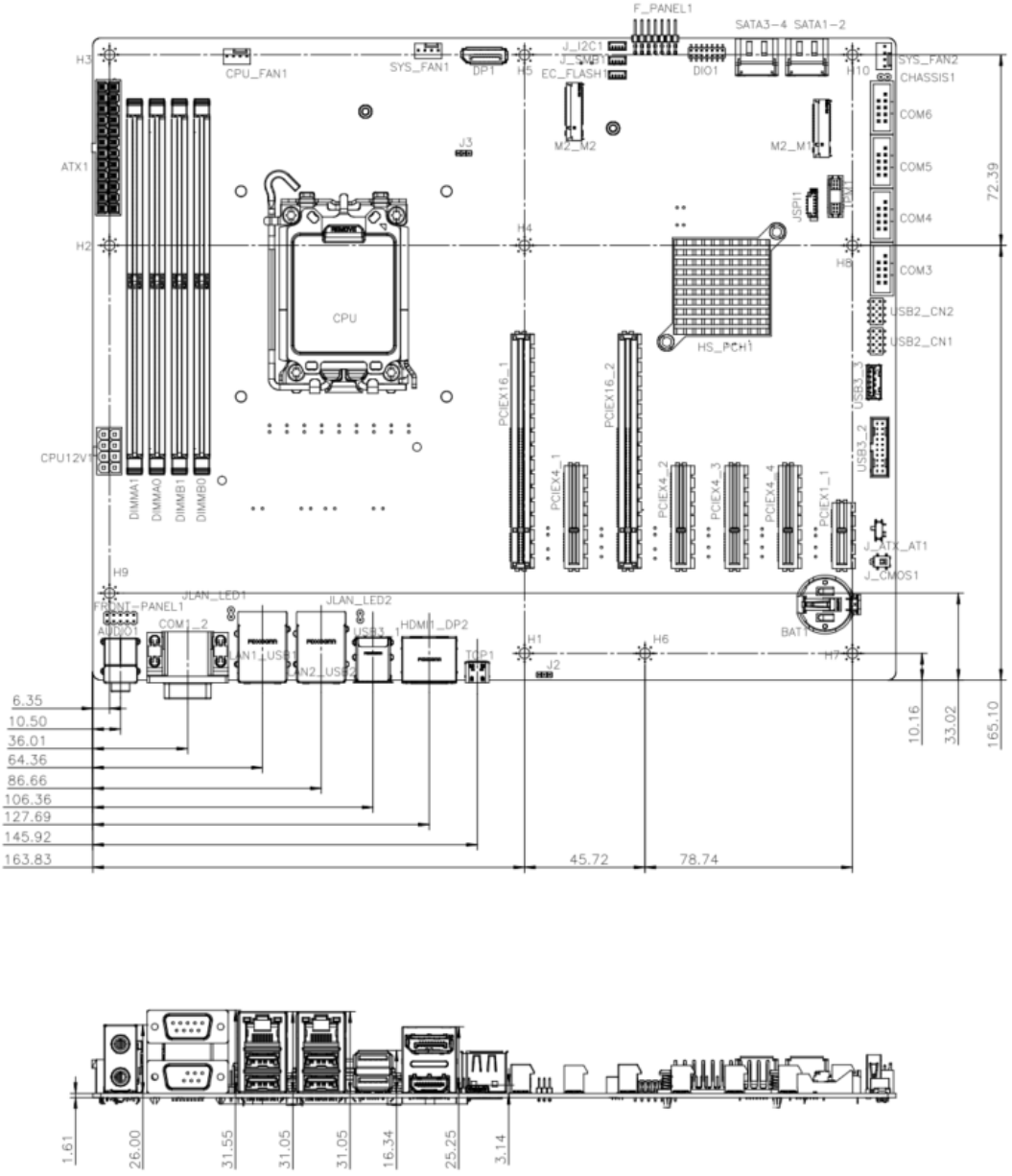


Figure 1-3: IMBA-ARL-Q870 Dimensions (mm)

1.5 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

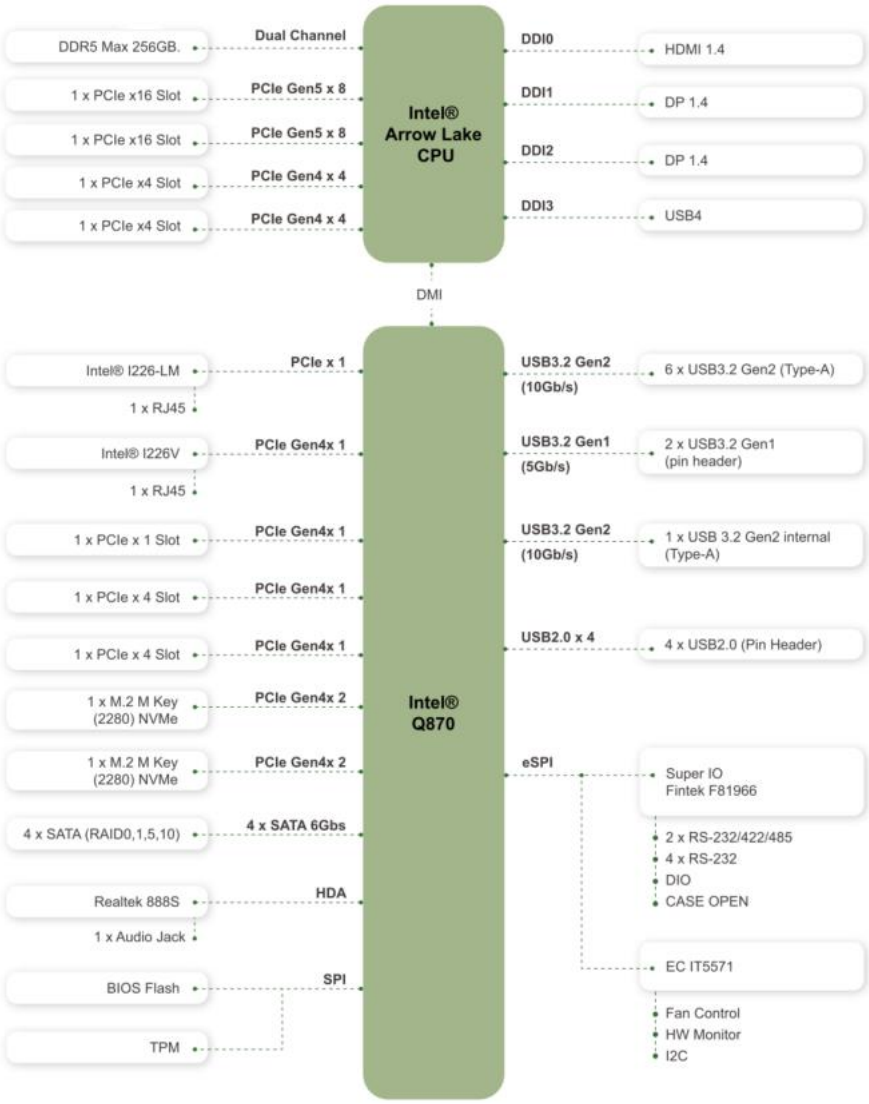


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

The IMBA-ARL-Q870 technical specifications are listed below.

Specification/Model	IMBA-ARL-Q870
Form Factor	ATX
CPU Supported	High-Performance Intel® Core™ Ultra Processors (Series 2) (up to 125W)
Chipset	Intel® Q870
Memory	Four 288-pin 5600 MHz Dual-Channel DDR5 SDRAM Unbuffered, Clocked Unbuffered DIMM supported up to 256GB
Graphics Engine	New Intel® Xe Graphics architecture with SRIOV, Genlock
Display Output	Quad independent display 1 x DP1.4 (up to 4K@60Hz) 1 x HDMI1.4 (up to 4K@30Hz) 1 x USB4 (up to 4K@60Hz) 1 x DP1.4 (up to 4K@60Hz) internal
Ethernet Controllers	LAN1: Intel® I226-LM 2.5GbE controller LAN2: Intel® I226V 2.5GbE controller
Audio	Realtek ALC888S HD codec 2 x Audio Jack (Line-out, Mic-in) on rear IO 1 x Analog audio (2x5 pin)
BIOS	AMI UEFI BIOS
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansions	2 x PCIe x16 (Gen5 x 8) 4 x PCIe x4 (Gen4 x 4) 1 x PCIe x1 (Gen4 x 4) 1 x M.2 M Key (2280, PCIe x2) NVMe support 1 x M.2 M Key (2280, PCIe x2) NVMe support

Specification/Model	IMBA-ARL-Q870
I/O Interface Connectors	
Audio Connectors	One internal audio connector (10-pin header)
Chassis Intrusion	One 2-pin header
Digital I/O	12-bit digital I/O
Ethernet	Two RJ-45 GbE ports
Fan	1 x CPU fan connector (1x4 pin) 2 x System fan connector (1x4 pin)
Front Panel	One 7-pin header (power LED, HDD LED, speaker, power button, reset button)
I²C	One 4-pin wafer connector
LAN LED	Two 2-pin headers for LAN1 LED and LAN2 LED
Serial ATA	Four SATA 6Gb/s connectors (support RAID 0, 1, 5, 10)
Serial Ports	2x RS-232/422/485 via DB-9 (RS-485 support AFC) 4x RS-232 via internal box header
SMBus	One 4-pin wafer connector
USB Ports	4 x USB 2.0 (2x4 pin, P=2.54) 2 x USB 3.2 Gen1 (2 x10 pin, p=2.00 pin wafer) (5Gb/s) 6 x USB 3.2 Gen2 (Type-A) (10Gb/s)
Environmental and Power Specifications	
Power Supply	AT/ATX power supply
Power Consumption	3.3V@5.21A, 5V@11.59A, 12V@5.68A, 5Vsb@0.95A (Intel Ultra 9 285 with DDR5 6400MHz CUDIMM 16GB memory)
Operating Temperature	-10ºC ~ 60ºC
Storage Temperature	-30ºC ~ 70ºC
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	

Specification/Model	IMBA-ARL-Q870
Dimensions	244 mm x 305 mm
Weight (GW/NW)	GW:1200g / NW:700g
Certification	CE/FCC compliant

Table 1-1: IMBA-ARL-Q870 Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the IMBA-ARL-Q870 is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-ARL-Q870 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The IMBA-ARL-Q870 is shipped with the following components:

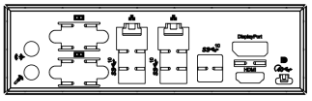
Quantity	Item and Part Number	Image
1	IMBA-ARL-Q870 single board computer	
2	SATA cable	
1	I/O shielding	
1	Quick installation guide	

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Dual port USB cable with bracket, 30mm, P=2.54 (**P/N**: 19800-003100-100-RS)	
Dual port USB 3.0 cable 457mm with bracket, P=2.00 (**P/N**: 19800-010500-200-RS)	
RS-232 cable, 500mm, P=2.54 (**P/N**: 19800-010900-200-RS)	
High-performance cooler, 80W, 72*48.5*73.5mm (**P/N**: 19100-000333-00-RS)	
Cooler module, 125W (**P/N**: 19100-000326-00-RS)	
Cooler module, 65W (**P/N**: 19100-000323-00-RS)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 IMBA-ARL-Q870 Layout

The figures below show all the peripheral interface connectors.

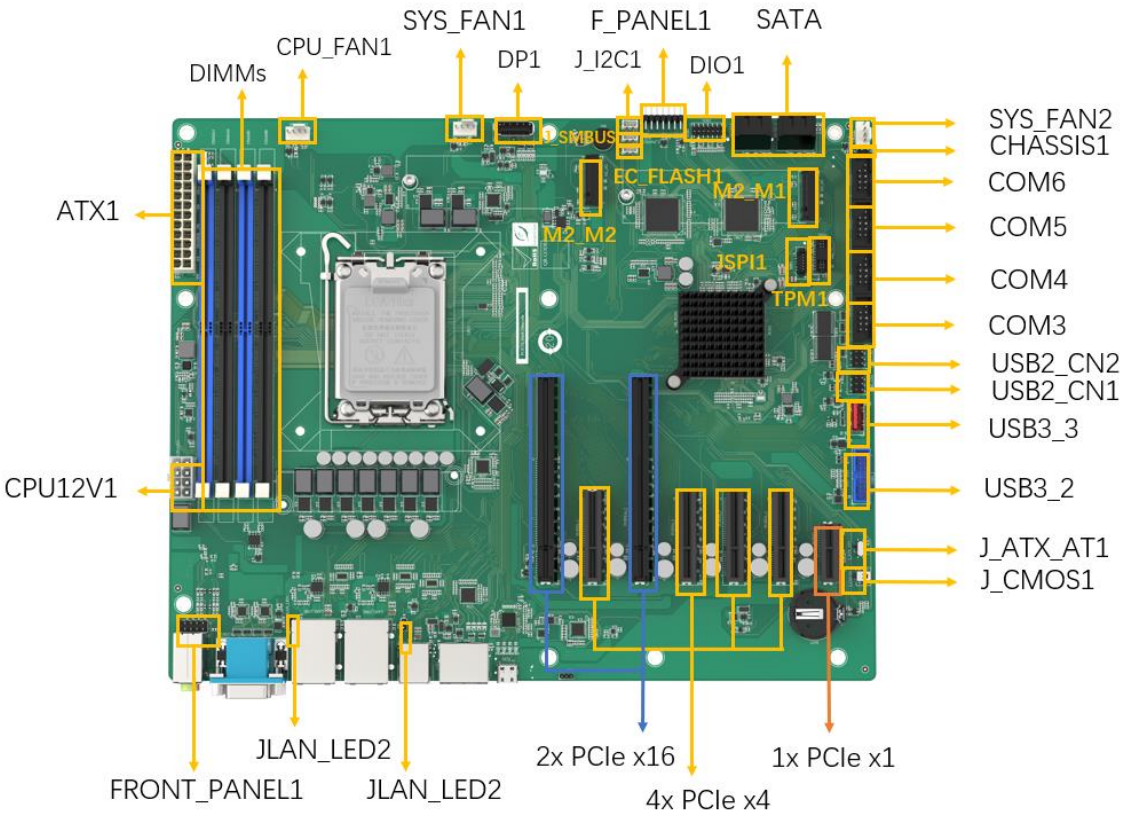


Figure 3-1: Peripheral Interface Connectors

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX CPU 12V power connector	8-pin Molex power connector	CPU12V1
ATX power connector	24-pin connector	ATX1
Chassis intrusion connector	2-pin header	CHASSIS1
AT/ATX power mode setting	3-pin switch	J_ATX_AT1
Digital I/O connector	14-pin header	DIO1
Clear CMOS jumper	Button	J_CMOS1
Fan connectors	4-pin wafer	CPU_FAN1, SYS_FAN1, SYS_FAN2
Audio connector for iEi AC-KIT-888S kit	10-pin header	FRONT_PANEL1
Front panel connector	14-pin header	F_PANEL1
I^2C connector	4-pin wafer	J_I2C1
SMBus connector	4-pin wafer	J_SMB1
LAN1 link LED connector	2-pin header	JLAN_LED1, JLAN_LED2
M.2 M key slots	M-key slot	M2_M1, M2_M2
PCIe x1 slots	PCIe x1 slot	PCIEX1_1,
PCIe x4 slots	PCIe x4 slot	PCIEX4_1, PCIEX4_2, PCIEX4_3, PCIEX4_4
PCIe x16 slots	PCIe x16 slot	PCIEX16_1 PCIEX16_2
DDR5 DIMM slots	288-pin socket	DIMMA0, DIMMA1, DIMMB0, DIMMB1

Connector	Type	Label
RS-232 serial port connectors	10-pin box header	COM3, COM4, COM5, COM6
SATA 6Gb/s connectors	8-pin SATA connector	SATA1, SATA 2, SATA3, SATA 4
Flash SPI ROM connector	6-pin header	JSPI1
Internal USB 2.0 connectors	8-pin header	USB2_CN1, USB2_CN2
Internal USB 3.2 Gen 1 connector	20-pin box header	USB3_2
Internal USB 3.2 Gen 2 connector	USB Type A	USB3_3
DP Connector	DP	DP1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
External dual RS-232/422/485 connector	Dual DB-9	COM1_2
External HDMI and DP combo connector	HDMI, DisplayPort	HDMI1_DP2
External USB4 connectorr	USB4	TCP1
External 2.5GbE RJ-45 and dual USB 3.2 Gen 2 combo connector	USB 3.2, RJ45	LAN1_USB1, LAN2_USB2,
External dual USB 3.2 Gen 2 connector	USB 3.2	USB3_1
Audio Jack Connector	Audio jack	AUDIO1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IMBA-ARL-Q870.

3.2.1 CPU 12V Power Connector

CN Label: **CPU12V1**

CN Type: 8-pin Molex power connector, p=4.2mm

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

This connector provides power to the CPU.

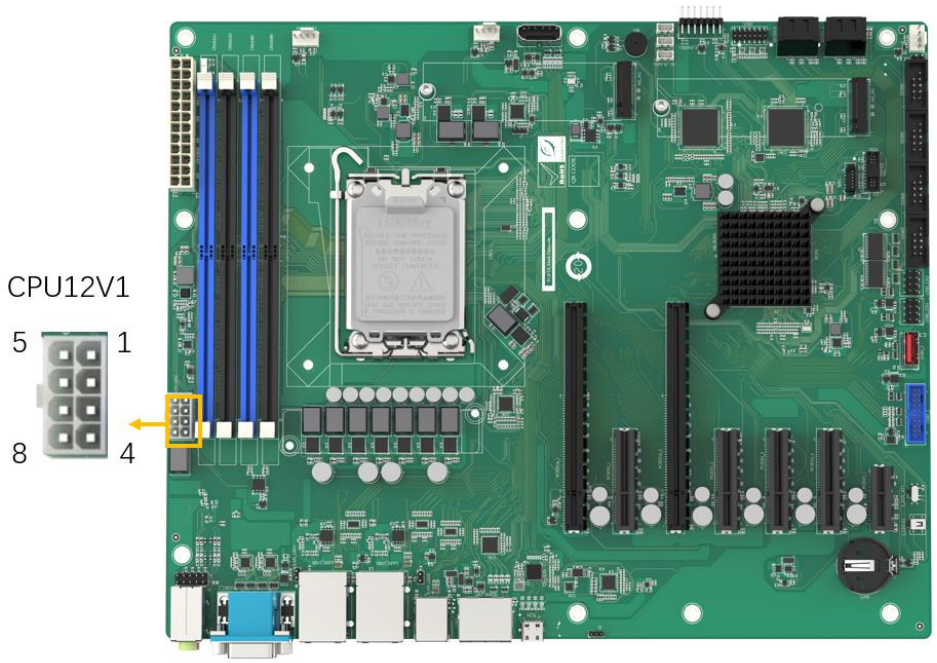


Figure 3-2: CPU 12V Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

Table 3-3: CPU 12V Power Connector Pinouts

3.2.2 ATX Power Connector

CN Label: **ATX1**

CN Type: 24-pin connector, p=4.2 mm

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

The ATX power connector connects to an ATX power supply.

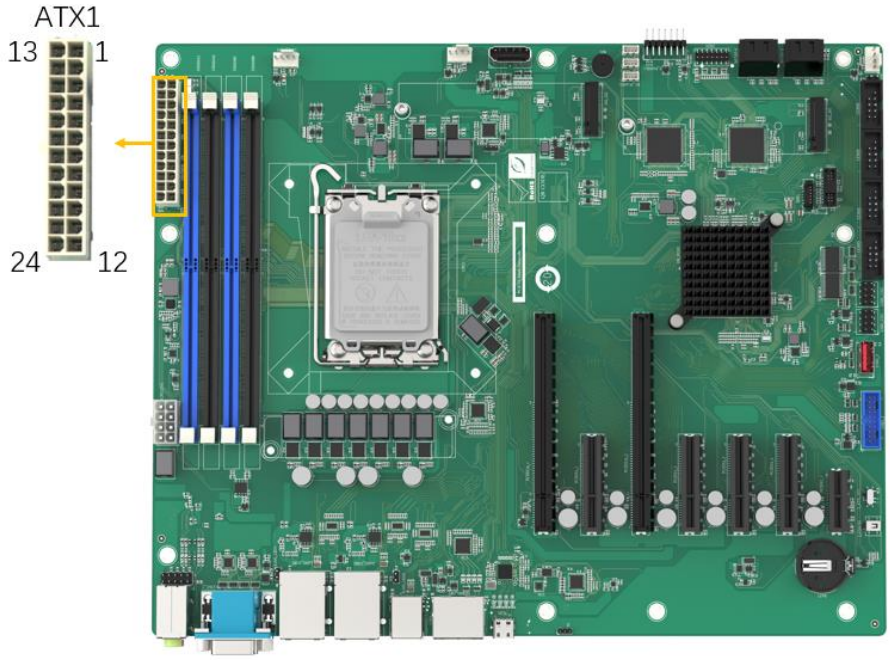


Figure 3-3: ATX Power Connector Location

Pin	Description	Pin	Description
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWRGD_PS	20	NC

Pin	Description	Pin	Description
9	+5V	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 3-4: ATX Power Connector Pinouts

3.2.3 Chassis Intrusion Connector

CN Label: **CHASSIS1**

CN Type: 2-pin header, p=2.54 mm

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.

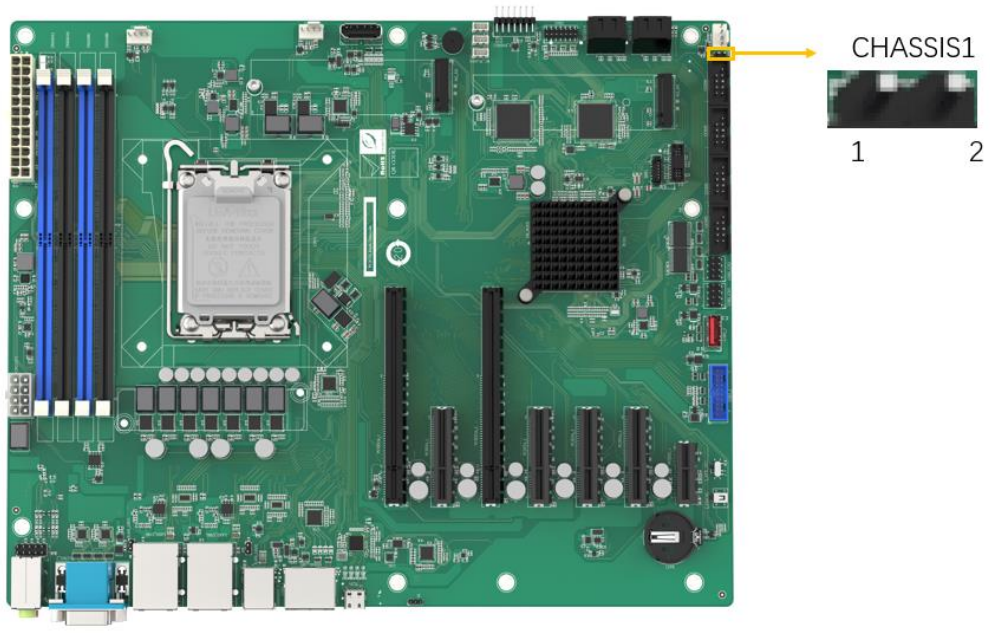


Figure 3-4: Chassis Intrusion Connector Location

Pin	Description	Pin	Description
1	CASEOPEN_N	2	GND

Table 3-5: Chassis Intrusion Connector Pinouts

3.2.4 AT/ATX Power Mode Setting

CN Label: **J_ATX_AT1**

CN Type: 3-pin switch

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The AT/ATX power mode selection is made through the AT/ATX power mode switch.

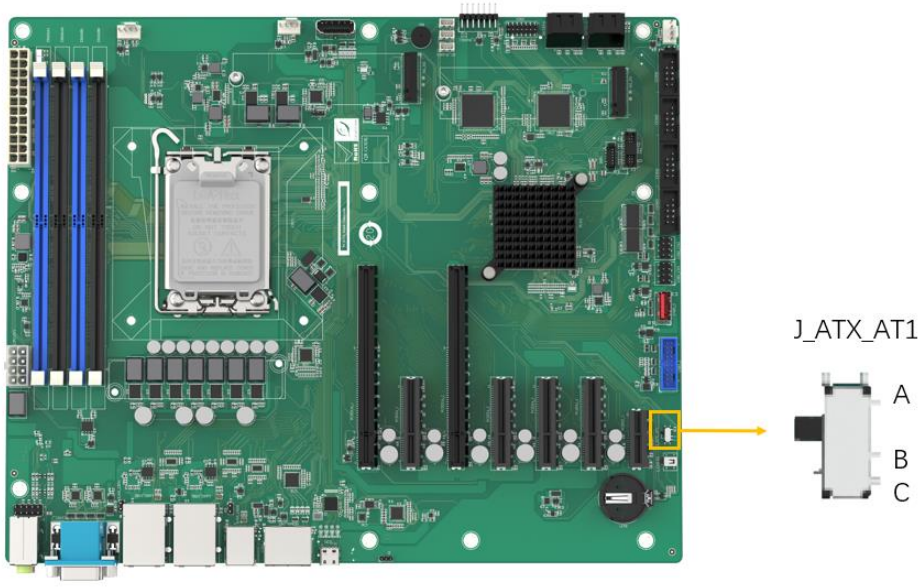


Figure 3-5: AT/ATX Power Mode Switch Locations

Pin	Description	Pin	Description
Short A - B	ATX Power Mode (default)	Short B - C	AT Power Mode

Table 3-6: AT/ATX Power Mode Switch Settings

3.2.5 Digital I/O Connector

CN Label: **DIO1**

CN Type: 14-pin header, p=2.0 mm

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The Digital I/O connector provides programmable input and output for external devices.

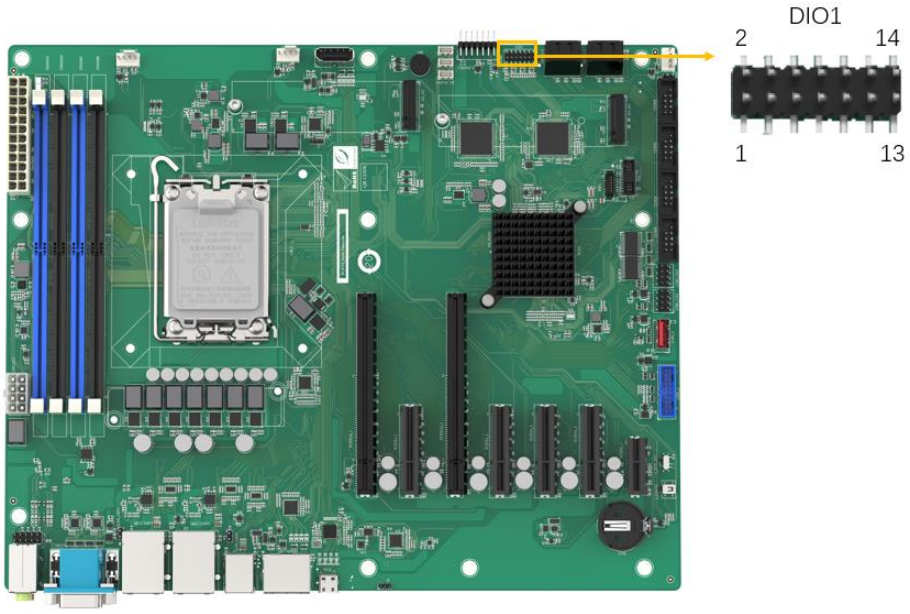


Figure 3-6: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	+5V
3	DOUT5	4	DOUT4
5	DOUT3	6	DOUT2
7	DOUT1	8	DOUT0
9	DIN5	10	DIN4
11	DIN3	12	DIN2
13	DIN1	14	DIN0

Table 3-7: Digital I/O Connector Pinouts

3.2.6 Clear CMOS Button

CN Label:	**J_CMOS1**
CN Type:	Button
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-8**

The J_CMOS1 is used to Clear CMOS Setup.

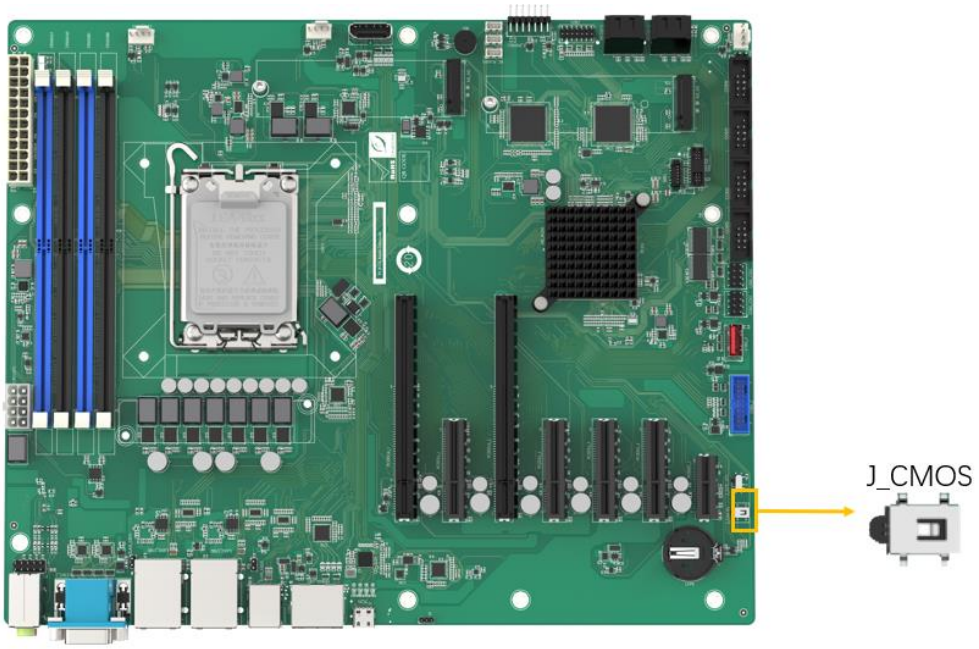


Figure 3-7: Clear CMOS Jumper Location

Pin	Description
NC	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

Table 3-8: Clear CMOS Jumper Pinouts

3.2.7 Fan Connector (CPU)

CN Label:	**CPU_FAN1**
CN Type:	4-pin wafer, p=2.54 mm
CN Location:	See **Figure 3-8**
CN Pinouts:	See **Table 3-9**

The fan connector attaches to a CPU cooling fan.

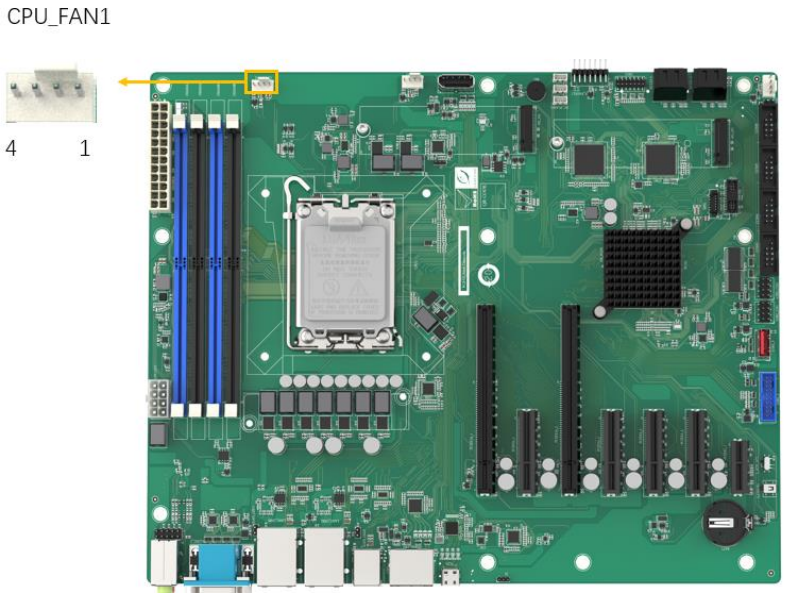


Figure 3-8: CPU Fan Connector Location

Pin	Description	Pin	Description
1	GND	2	+12V
3	FANIN	4	PWM (+5V)

Table 3-9: CPU Fan Connector Pinouts

3.2.8 Fan Connectors (System)

CN Label:	**SYS_FAN1, SYS_FAN2**
CN Type:	4-pin wafer, p=2.54 mm
CN Location:	See **Figure 3-9**
CN Pinouts:	See **Table 3-10**

Each fan connector attaches to a system cooling fan. The fan connector provides smart fan function.

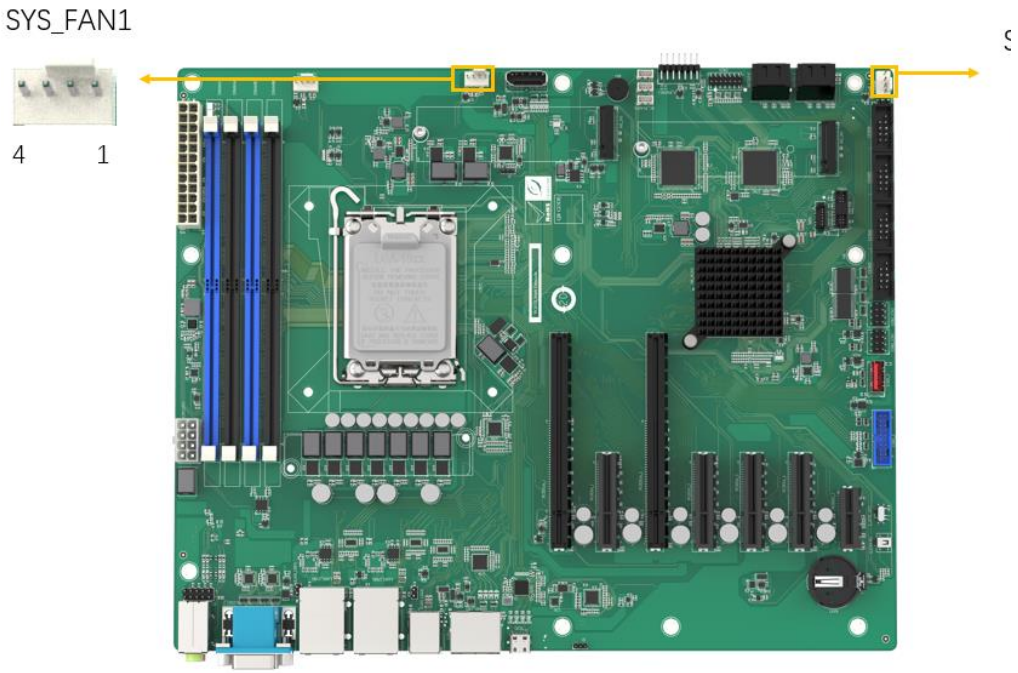


Figure 3-9: System Fan Connector Locations

Pin	Description	Pin	Description
1	GND	2	+12V
3	FANIN	4	PWM (+5V)

Table 3-10: System Fan Connector Pinouts

3.2.9 Audio Connector for iEi AC-KIT-888S kit

CN Label: **FRONT_PANEL1**

CN Type: 10-pin header, p=2.54 mm

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

This connector connects to speakers, a microphone and an audio input.

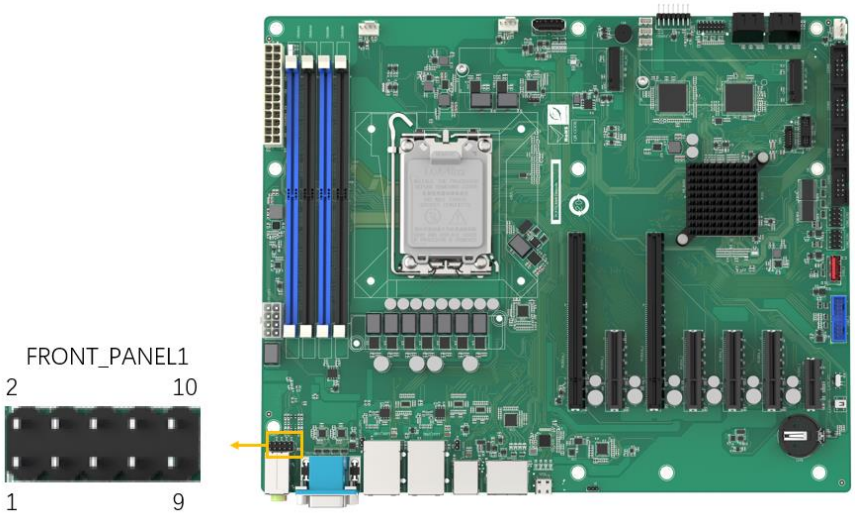


Figure 3-10: Audio Connector Location

Pin	Description	Pin	Description
1	LMIC2-L	2	GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	
9	LLINE2-L	10	GND

Table 3-11: Audio Connector Pinouts

3.2.10 Front Panel Connector

CN Label:	**F_PANEL1**
CN Type:	14-pin header, p=2.54 mm
CN Location:	See **Figure 3-11**
CN Pinouts:	See **Table 3-12**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

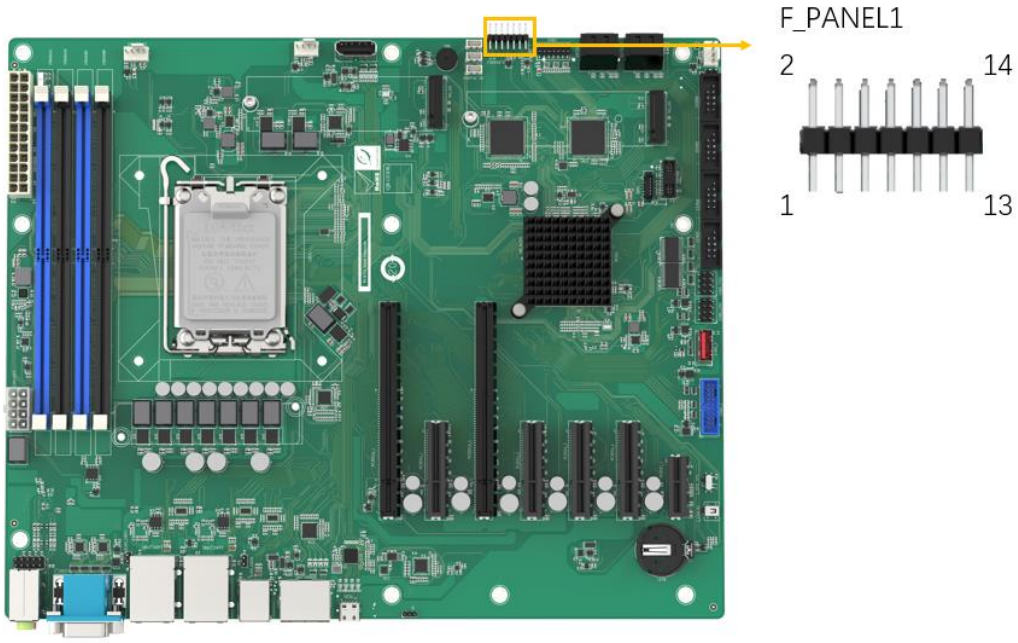


Figure 3-11: Front Panel Connector Location

Function	Pin	Description	Function	Pin	Description
PWR LED	1	+5V	SPKR	2	PC_BEEP_P
	3	NC	IPMI LED	4	NC
	5	GND		6	NC-
PWR BTN	7	PWR_BTN_N	SPKR	8	PC_BEEP_N
	9	GND		10	NC
HDD LED	11	HD_LED_P	RESET	12	PM_SYSRST_N
	13	HD_LED_N		14	GND

Table 3-12: Front Panel Connector Pinouts

3.2.11 I²C Connector

CN Label: **J_I2C1**

CN Type: 4-pin wafer, p=1.25 mm

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13**

The I²C connector is used to connect I²C-bus devices to the mainboard.

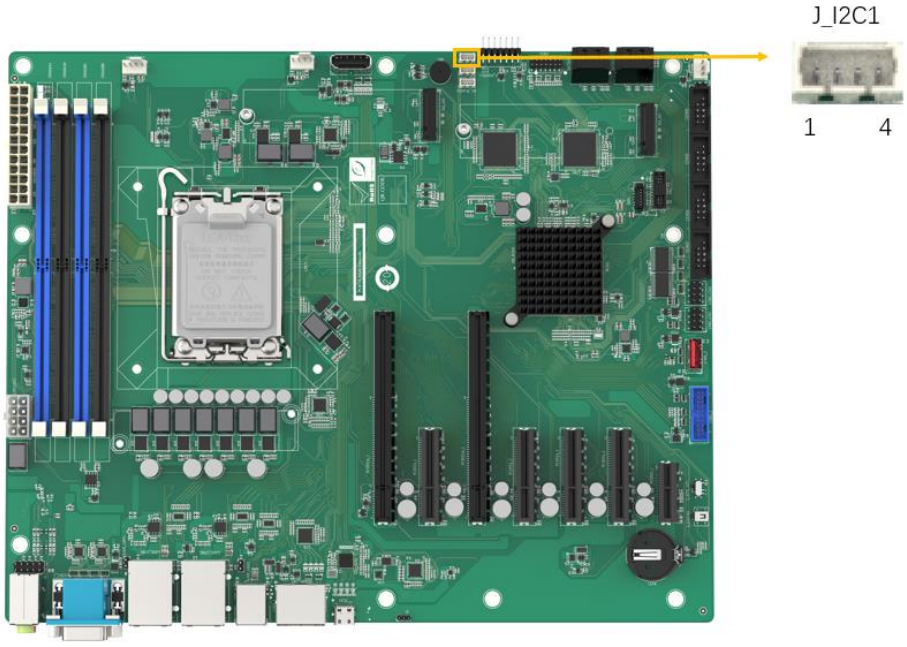


Figure 3-12: I²C Connector Location

Pin	Description	Pin	Description
1	GND	3	SMCLK0_EC
2	SMDAT0_EC	4	+5V

Table 3-13: I²C Connector Pinouts

3.2.12 SMBus Connector

CN Label: **J_SMB1**

CN Type: 4-pin wafer, p=1.25 mm

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

The SMBus (System Management Bus) connector provides low-speed system management communications.

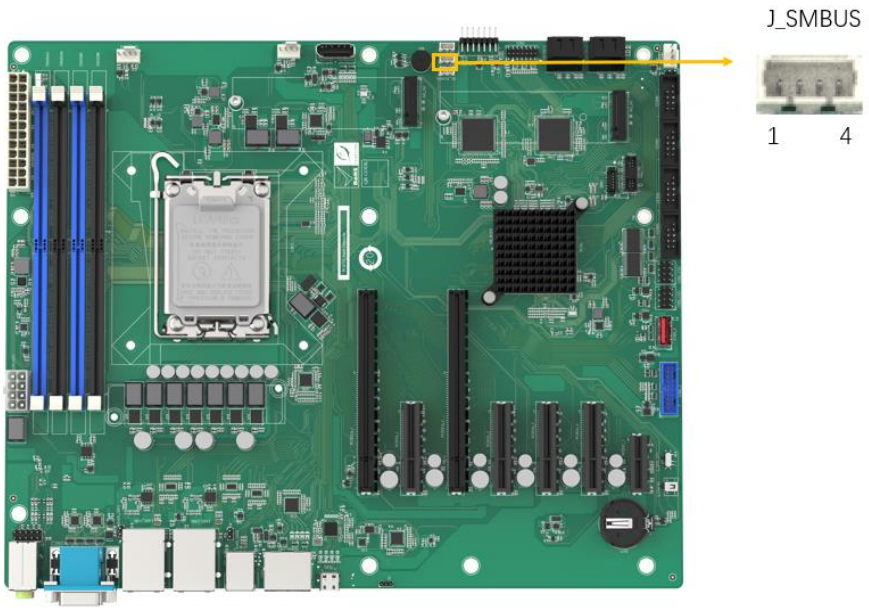


Figure 3-13: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA_MAIN
3	SMB_CLK_MAIN
4	+5V

Table 3-14: SMBus Connector Pinouts

3.2.13 LAN Link LED connector

CN Label: **JLAN_LED1, JLAN_LED2**

CN Type: 2-pin header, p=2.54 mm

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15** and **Table 3-16**

The LAN LED connectors are used to connect to the LAN LED indicators on the chassis to indicate users the link activities of the two LAN ports.

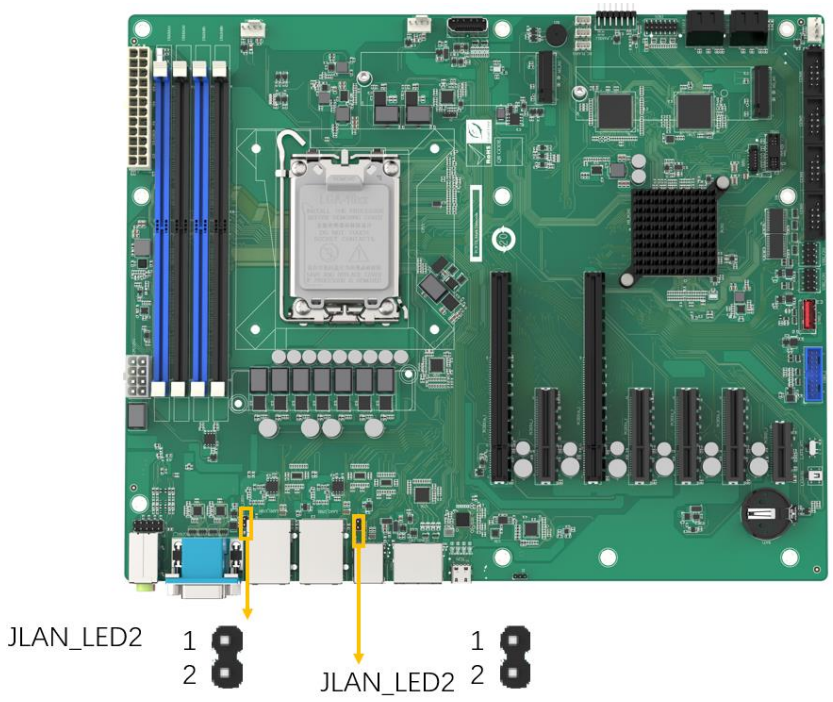


Figure 3-14: LAN LED Connector Locations

Pin	Description
1	+3.3V
2	I226_LINK_ACT_N

Table 3-15: LAN1 LED Connector (JLAN_LED1) Pinouts

Pin	Description
1	+3.3V
2	I226_LINK_ACT_N

Table 3-16: LAN2 LED Connector (JLAN_LED 2) Pinouts

3.2.14 M.2 M-key Slot

CN Label: **M2_M1**

CN Type: M-key slot

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-17**

The M.2 2280 slot is keyed in the M position.

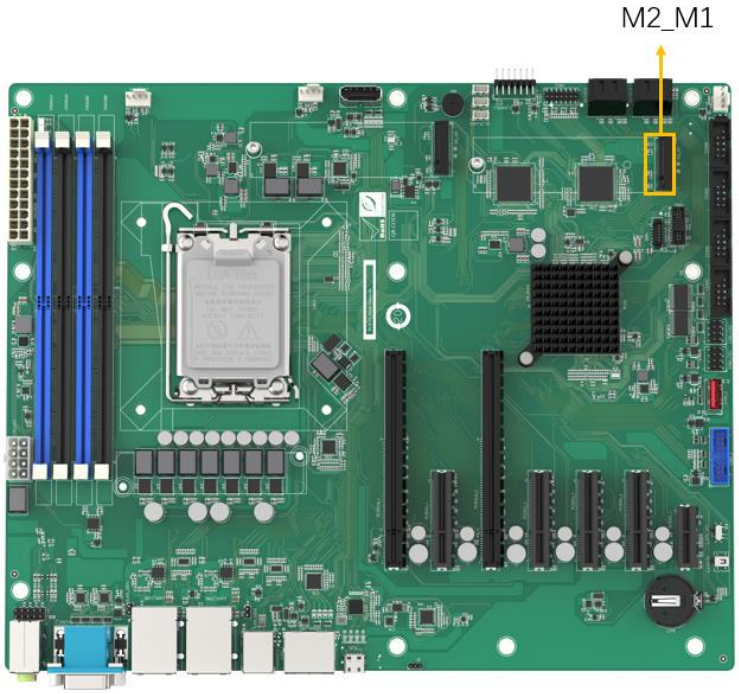


Figure 3-15: M.2 M-key Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	GND	4	+3.3V
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	NGFF1_ACT_N
11	N/C	12	+3.3V
13	N/C	14	+3.3V
15	GND	16	+3.3V
17	N/C	18	+3.3V
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C

Pin	Description	Pin	Description
29	PCIE_22_RX_DN	30	N/C
31	PCIE_22_RX_DP	32	N/C
33	GND	34	N/C
35	PCIE_22_TX_DN	36	N/C
37	PCIE_22_TX_DP	38	M_2_SSD_SLP
39	GND	40	N/C
41	PCIE_21_RX_DN	42	N/C
43	PCIE_21_RX_DP	44	N/C
45	GND	46	N/C
47	PCIE_21TX_DN1	48	N/C
49	PCIE_21TX_DP1	50	PLT_RST_N
51	GND	52	SRCCLKREQB_17_N
53	CLK_SRC3_DN	54	NC
55	CLK_SRC3_DP	56	N/C
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	N/C	64	N/C
65	N/C	66	N/C
67	N/C	68	NC
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		
N1	NC		
N2	NC		

Table 3-17: M.2 M-key Connector Pinouts

3.2.15 M.2 M-key Slot

CN Label: **M2_M2**

CN Type: M-key slot

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-17**

The M.2 2280 slot is keyed in the M position.

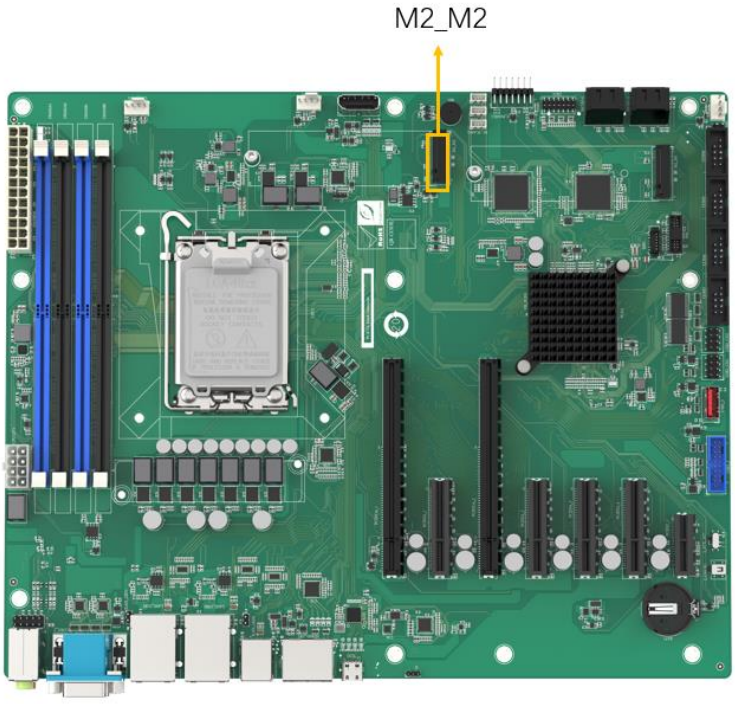


Figure 3-16: M.2 M-key Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	GND	4	+3.3V
5	N/C	6	N/C
7	N/C	8	N/C
9	GND	10	NGFF2_ACT_N
11	N/C	12	+3.3V

Pin	Description	Pin	Description
13	N/C	14	+3.3V
15	GND	16	+3.3V
17	N/C	18	+3.3V
19	N/C	20	N/C
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C
27	GND	28	N/C
29	PCIE_24_RX_DN	30	N/C
31	PCIE_24_RX_DP	32	N/C
33	GND	34	N/C
35	PCIE_24_TX_DN	36	N/C
37	PCIE_24_TX_DP	38	M_2_SATA_SLP
39	GND	40	N/C
41	PCIE_23_RX_DN	42	N/C
43	PCIE_23_RX_DP	44	N/C
45	GND	46	N/C
47	PCIE_23_TX_DN	48	N/C
49	PCIE_23_TX_DP	50	PERST_N
51	GND	52	SRCCLKREQB_15_N
53	CLK_SRC4_DN	54	NC
55	CLK_SRC4_DP	56	N/C
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	N/C	64	N/C
65	N/C	66	N/C
67	N/C	68	NC
69	N/C	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		
N1	N/C	G1	GND

Pin	Description	Pin	Description
N2	N/C	G2	GND

Table 3-18: M.2 M-key Connector Pinouts

3.2.16 PCIe x1 Slots

CN Label: **PCIEX1_1**

CN Type: PCIe x1 Slot

CN Location: See **Figure 3-17**

The PCI x1 slot enables a PCI x1 expansion module to be connected to the board.

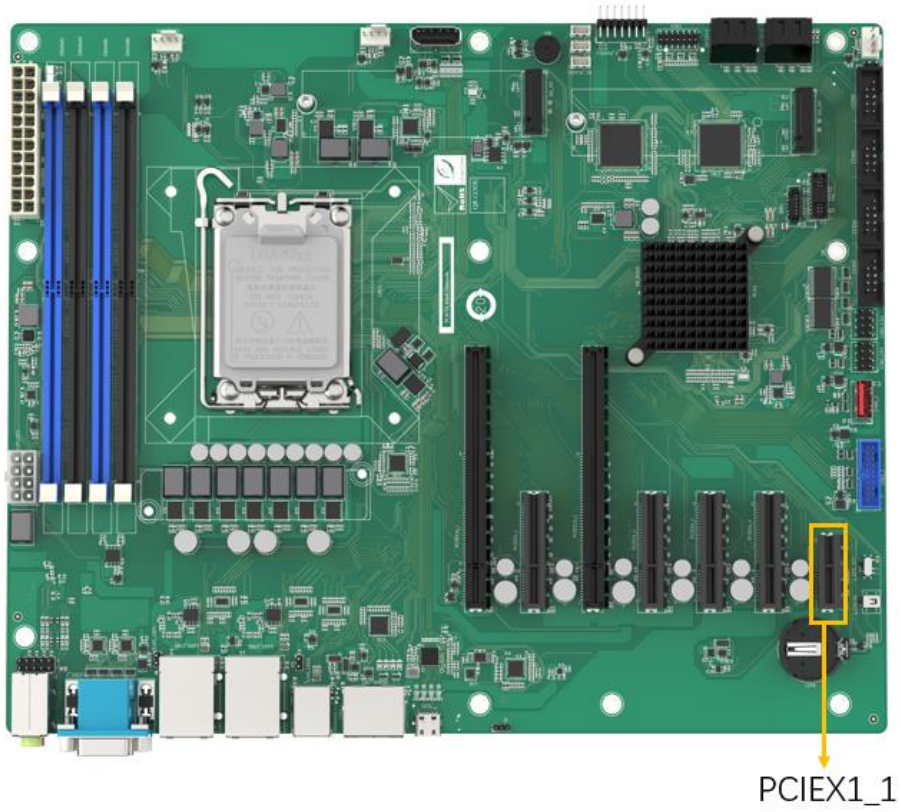


Figure 3-17: PCIe x1 Slot Locations

3.2.17 PCIe x4 Slots

CN Label:	**PCIEX4_1, PCIEX4_2, PCIEX4_3, PCIEX4_4**
CN Type:	PCIe x4 slot
CN Location:	See **Figure 3-18**

The PCIe x4 expansion card slots are for PCIe x4 expansion cards.

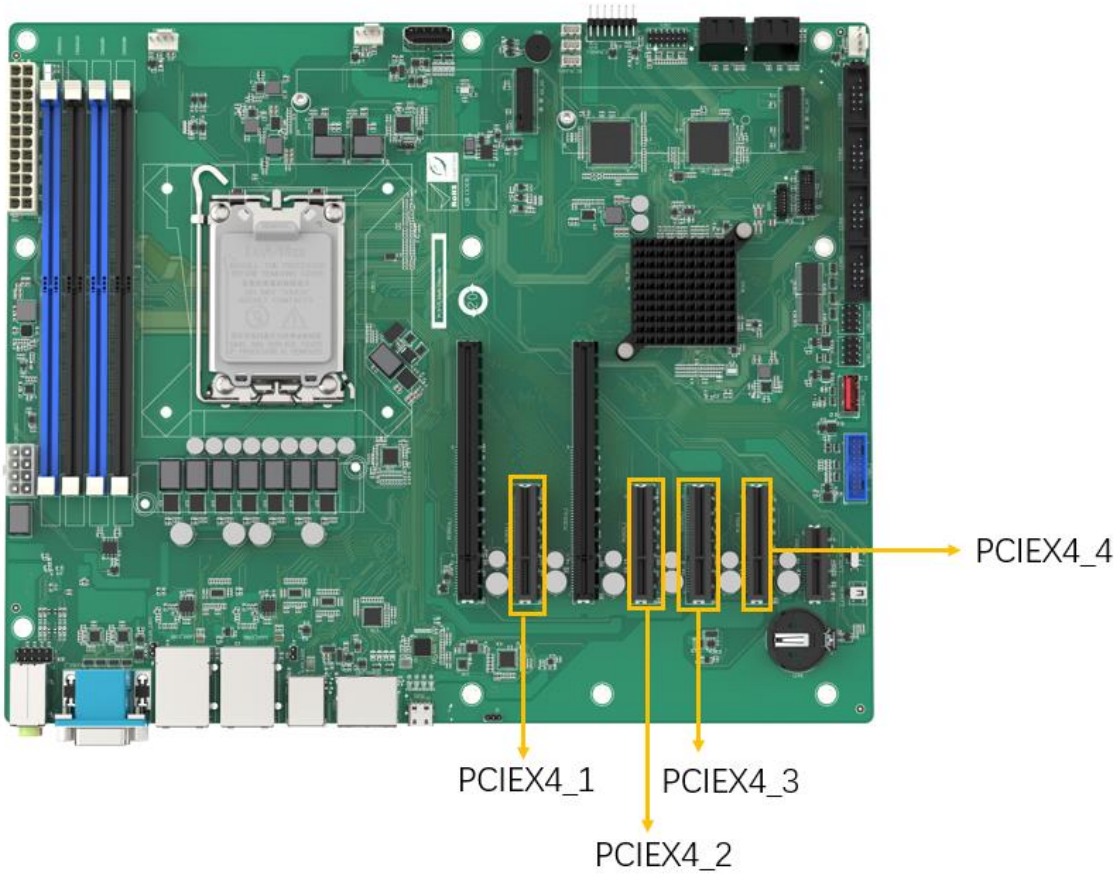


Figure 3-18: PCIe x4 Slot Locations

3.2.18 PCIe x16 slots

CN Label:	**PCIEX16_1, PCIEX16_2**
CN Type:	PCIe x16 slot
CN Location:	See **Figure 3-19**

The PCIe x16 expansion card slots are for PCIe x16 expansion cards.

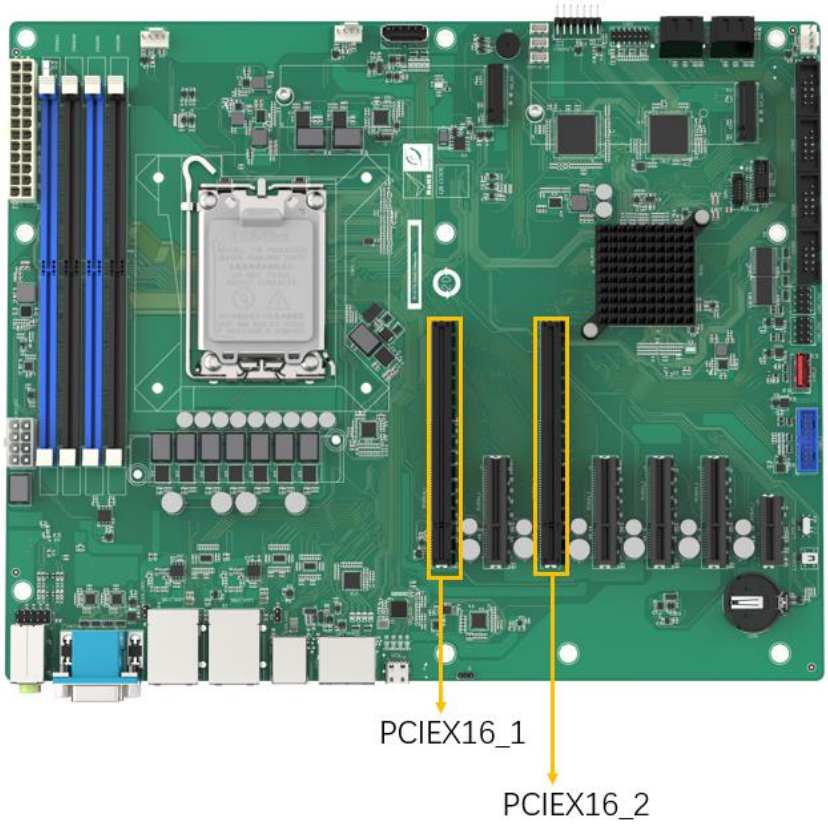


Figure 3-19: PCIe x16 Slot Locations

3.2.19 DDR5 DIMM sockets

CN Label: **DIMMA1, DIMMA0, DIMMB1, DIMMB0**

CN Type: 288-pin socket

CN Location: See **Figure 3-20**

The DIMM slots are for DDR5 DIMM memory modules

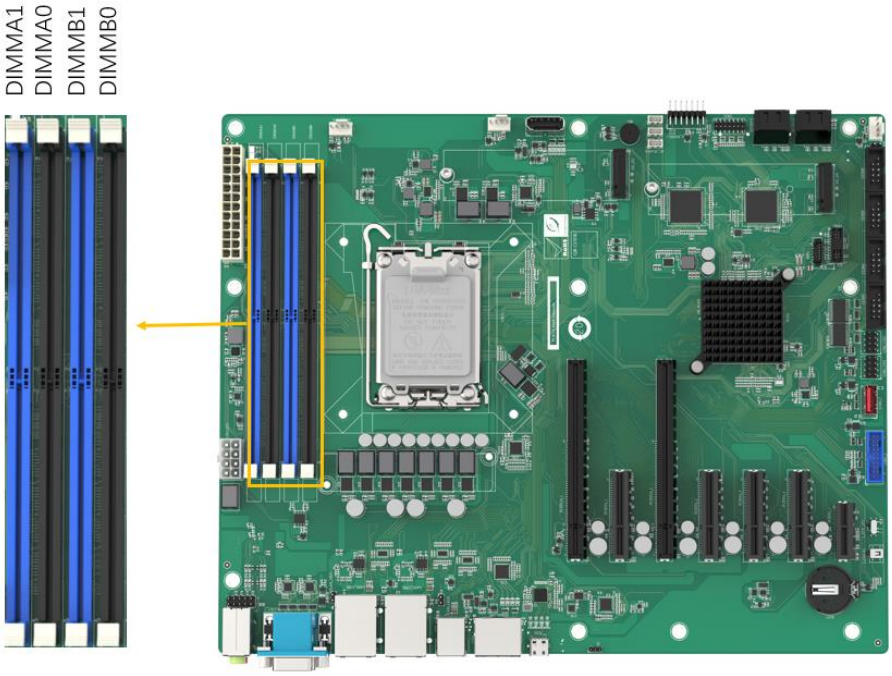


Figure 3-20: DDR5 DIMM Sockets Location

3.2.20 SATA 6Gb/s Connectors

CN Label:	**SATA1, SATA2, SATA3, SATA4**
CN Type:	8-pin SATA connector
CN Location:	See **Figure 3-21**
CN Pinouts:	See **Table 3-19**

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

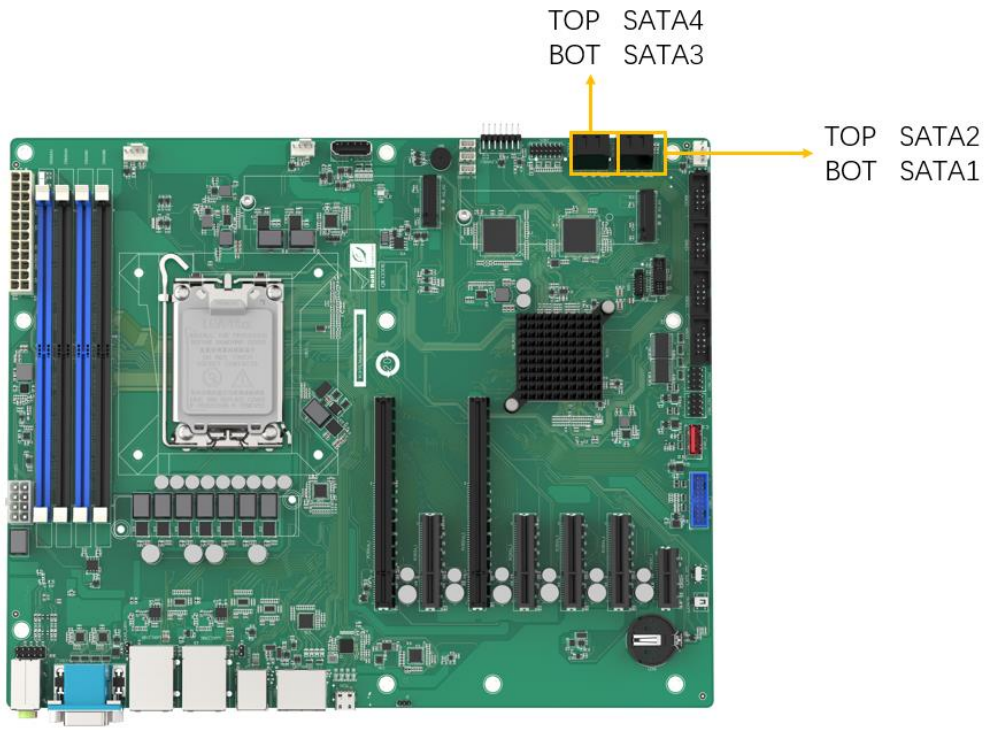


Figure 3-21: SATA 6Gb/s Connector Locations

Pin	Description	Pin	Description
1	GND	5	SATA_RXN_A
2	SATA_TXP_A	6	SATA_RXP_A
3	SATA_TXN_A	7	GND
4	GND	8	GND
9	SATA_TXP_B	10	SATA_TXN_B
11	GND	12	SATA_RXN_B

Pin	Description	Pin	Description
13	SATA_RXP_B	14	GND

Table 3-19: SATA 6Gb/s Connector Pinouts

3.2.21 RS-232 Serial Port Connectors

CN Label: **COM3, COM4, COM5, COM6**

CN Type: 10-pin box header, p=2.54 mm

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-20**

Each of these connectors provides RS-232 communications.

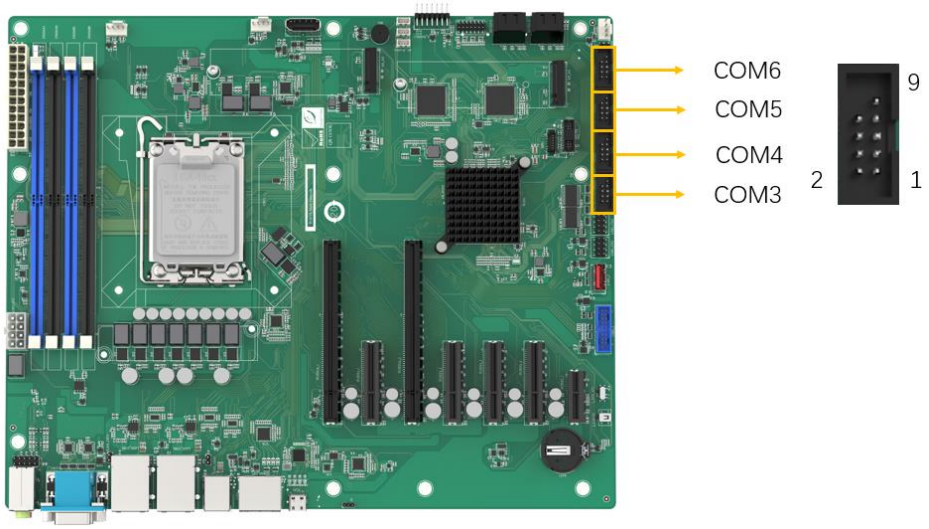


Figure 3-22: RS-232 Connector Location

Pin	Description	Pin	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-20: RS-232 Connector Pinouts

3.2.22 Flash SPI ROM Connector

CN Label:	**JSPI1**
CN Type:	6-pin header, p=1.25 mm
CN Location:	See **Figure 3-23**
CN Pinouts:	See **Table 3-21**

The Flash SPI ROM connector is used to flash the SPI ROM.

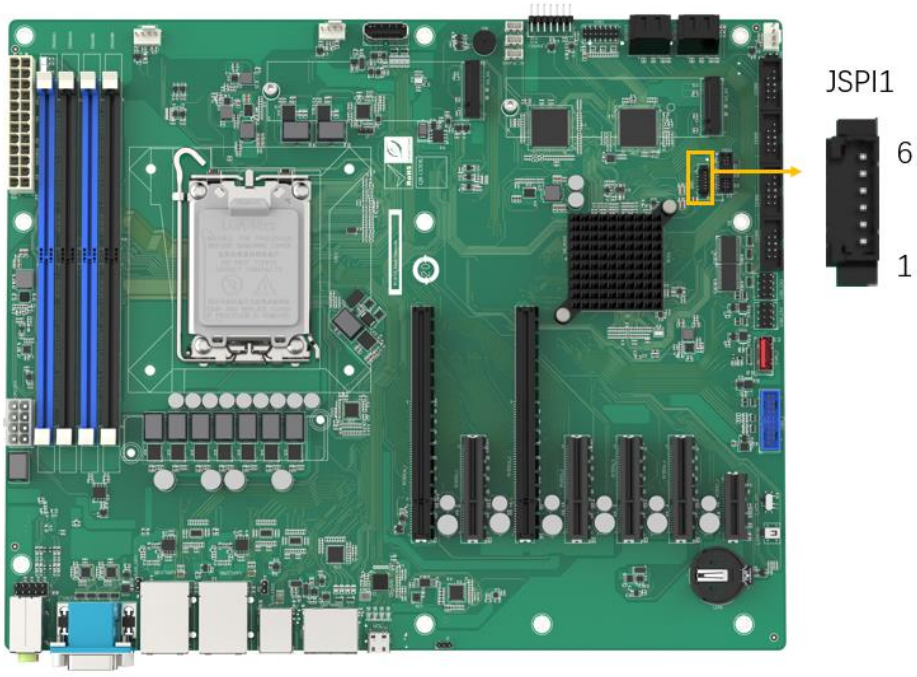


Figure 3-23: Flash SPI ROM Connector Location

Pin	Description	Pin	Description
1	+3.3V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

Table 3-21: Flash SPI ROM Connector Pinouts

3.2.23 Internal USB 2.0 Connectors

CN Label:	**USB2_CN1, USB2_CN2**
CN Type:	8-pin header, p=2.54 mm
CN Location:	See **Figure 3-24**
CN Pinouts:	See **Table 3-22**

The Internal USB 2.0 connectors connect to USB 2.0 devices. Each pin header provides two USB 2.0 ports.

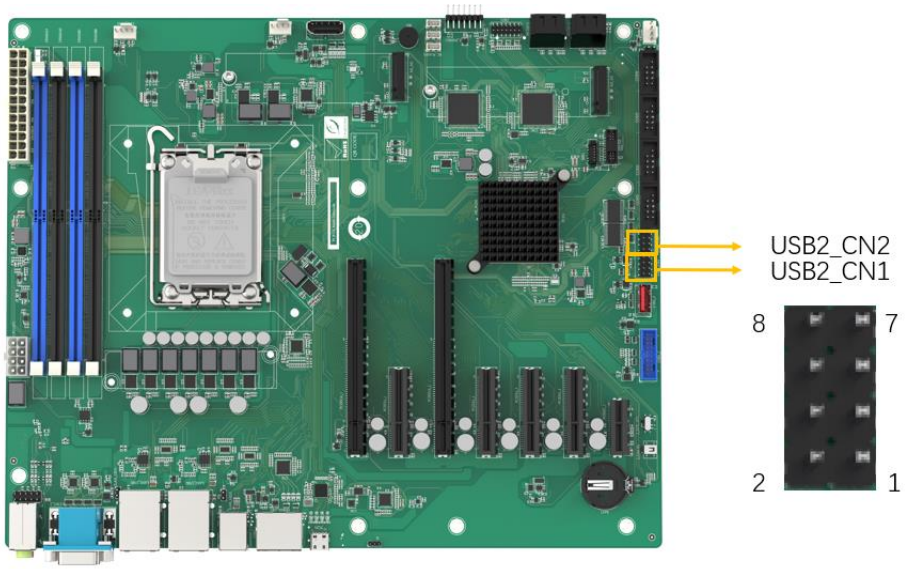


Figure 3-24: Internal USB 2.0 Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	USB_DN	4	USB_DP
5	USB_DP	6	USB_DN-
7	GND	8	VCC

Table 3-22: Internal USB 2.0 Connector Pinouts

3.2.24 Internal USB 3.2 Gen 1 Connector

CN Label: **USB3_2**

CN Type: 20-pin box header, p=2.00 mm

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-23**

The Internal USB 3.2 Gen 1 connector connects to USB 3.2 devices. This connector provides two USB 3.2 Gen 1 (5Gb/s) ports.

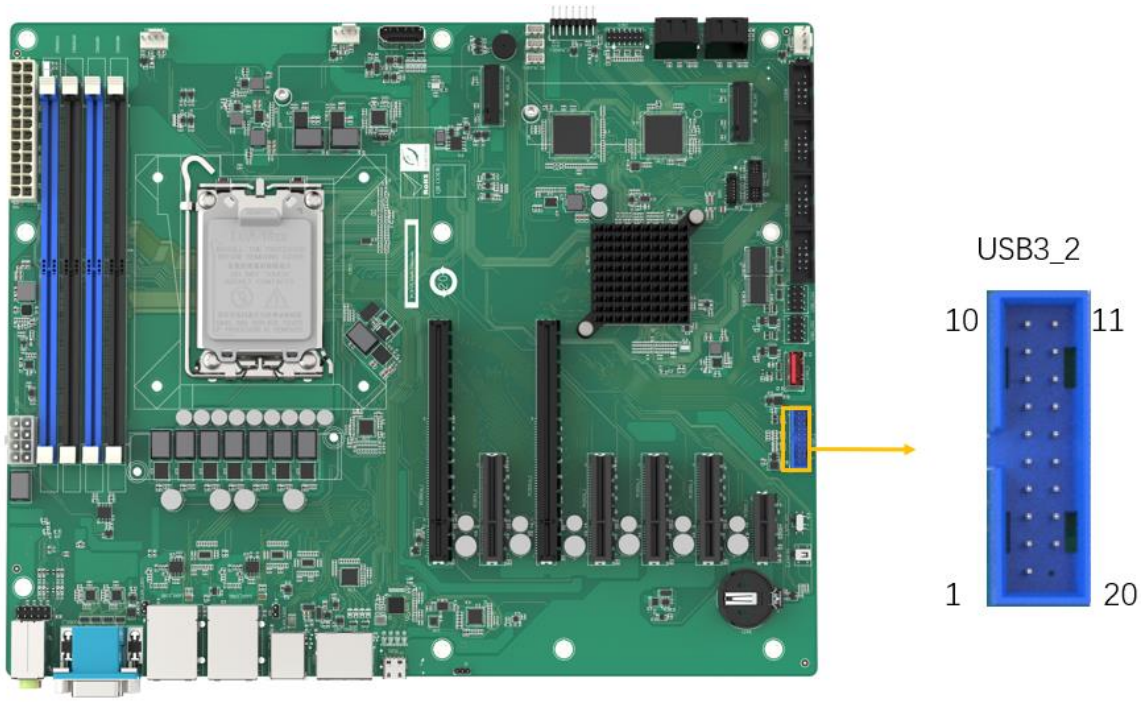


Figure 3-25: Internal USB 3.2 Gen 1 Connector Location

Pin	Description	Pin	Description
1	+5V	11	USB_D6P
2	USB3_RX5_N	12	USB_D6N
3	USB3_RX5_P	13	GND
4	GND	14	USB3_TX6_P
5	USB3_TX5_N	15	USB3_TX6_N
6	USB3_TX5_P	16	GND

Pin	Description	Pin	Description
7	GND	17	USB3_RX68_P
8	USB_D58N	18	USB3_RX6_N
9	USB_D5P	19	+5V
10	NC		

Table 3-23: Internal USB 3.2 Gen 1 Connector Pinouts

3.2.25 Internal USB 3.2 Gen 2 Connector

CN Label: **USB3_3**

CN Type: USB Type A

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-23**

The Internal USB 3.2 Gen 2 connector connects to USB 3.2 devices. This connector provides USB 3.2 Gen 2 (10Gb/s) ports.

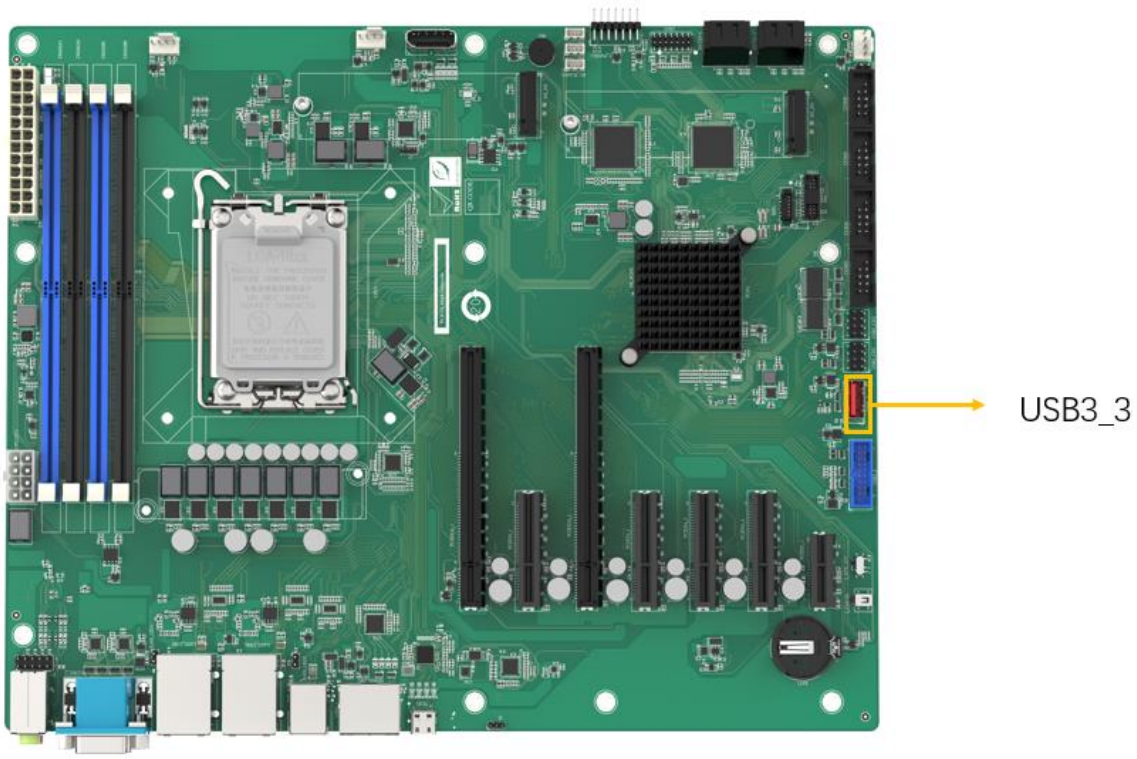


Figure 3-26: Internal USB 3.2 Gen 2 Connector Location

Pin	Description	Pin	Description
1	+5V	7	GND
2	USB_D9N	8	USB3_TX9_N
3	USB_D9P	9	USB3_TX9_P
4	GND	G1-4	GND

Pin	Description	Pin	Description
5	USB3_RX9_N		GND
6	USB3_RX9_P		GND

Table 3-24: Internal USB 3.2 Gen2 Connector Pinouts

3.2.26 DP Connector

CN Label: **DP1**

CN Type: DisplayPort

CN Location: See **Figure 3-27**

The DP1 connector connects to a display device with DisplayPort interface.

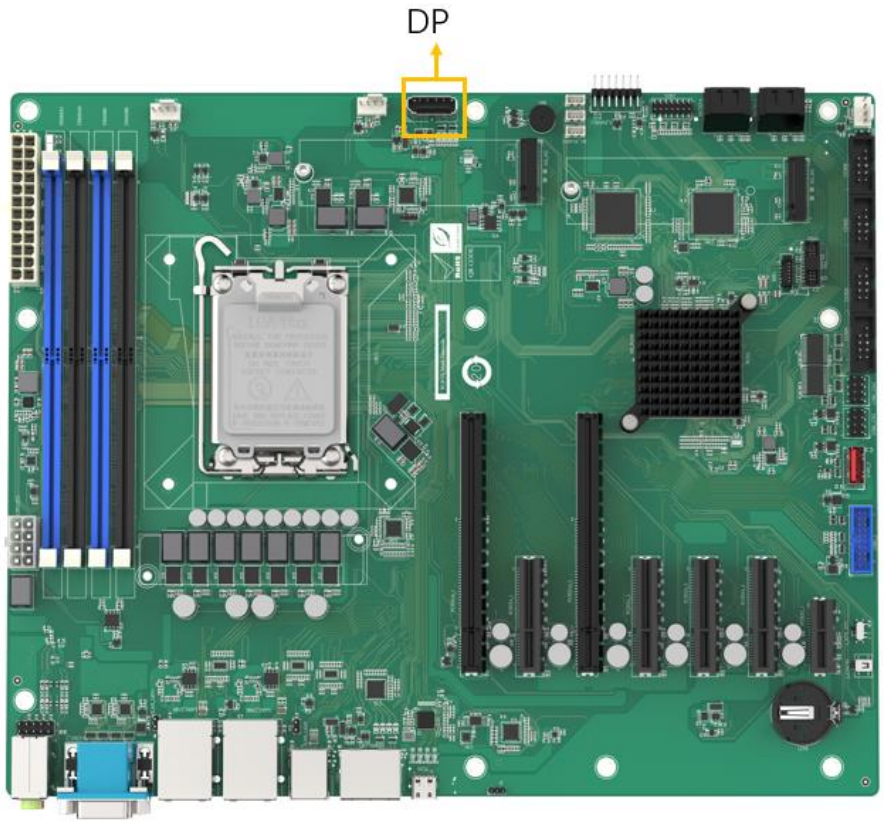


Figure 3-27: DP Connector Location

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

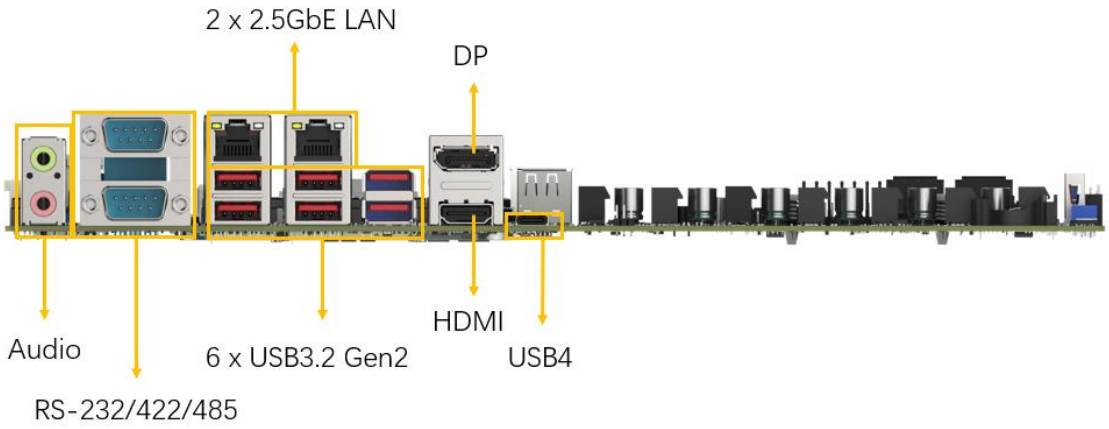


Figure 3-28: External Peripheral Interface Connector

3.3.1 External RS-232 /422/485 Connector

CN Label: **COM1_2**

CN Type: Dual DB-9

CN Pinouts: See **Table 3-25 and Table 3-26**

The COM connector connects to a serial device that supports RS-232/422/485 communication.

	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RXD	TXD422+	TXD485+
3	TXD	RXD422+	--
4	DTR	RXD422-	--
5	GND	--	--
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--

Table 3-25: External RS-232/422/485 Connector Pinouts

Use the optional RS-232/422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

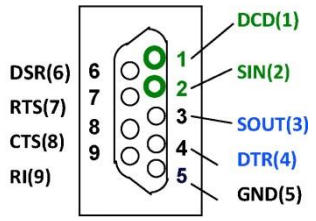
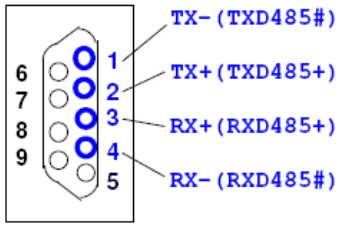
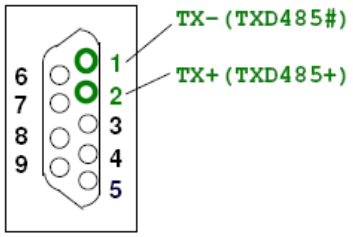
RS-232 Pinouts	RS-422 Pinouts	RS-485 Pinouts
		
D-SUB 9PIN MALE MODE 01	D-SUB 9PIN MALE MODE 00	D-SUB 9PIN MALE MODE 10/11

Table 3-26: DB-9 RS-232/422/485 Pinouts

3.3.2 External HDMI And DP Combo Connector

CN Label: **HDMI1_DP2**

CN Type: HDMI, DisplayPort

CN Location: See **Figure 3-30** and **Figure 3-29**

CN Pinouts: See **Table 3-28**and **Table 3-27**

The DP++ connector connects to a display device with DisplayPort interface.

Pin	Description	Pin	Description
1	LANE0P	11	GND
2	GND	12	LANE3N
3	LANE0N	13	AUX_CTRL_DET_C
4	LANE1P	14	GND
5	GND	15	AUXP
6	LANE1N	16	GND
7	LANE2P	17	AUXN
8	GND	18	HPD
9	LANE2N	19	GND
10	LANE3P	20	+5V

Table 3-27: DP++ Connector Pinouts

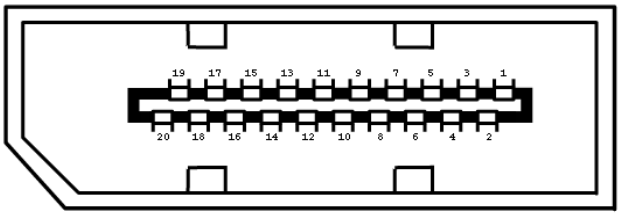


Figure 3-29: DP++ Connector

The HDMI connector can connect to an HDMI device.

Pin	Description	Pin	Description
21	HDMI_DATA2	33	N/C
22	GND	34	N/C
23	HDMI_DATA2#	35	HDMI_SCL
24	HDMI_DATA1	36	HDMI_SDA
25	GND	37	GND
26	HDMI_DATA1#	38	+5V
27	HDMI_DATA0	39	HDMI_HPD
28	GND		
29	HDMI_DATA0#		
30	HDMI_CLK		
31	GND		
32	HDMI_CLK#		

Table 3-28: HDMI Connector Pinouts

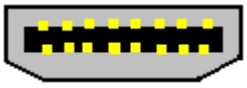


Figure 3-30: HDMI Connector

3.3.3 External USB4 connector

CN Label: **TCP1**

CN Type: USB4

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-29**

The external USB4 connectors on the IMBA-ARL-Q870.

Figure 3-31: USB4 Connector

Pin	Description	Pin	Description
A1	GND	B4	+VBUS_USBC0
A2	TCP0_CN_TX0_DP	B5	CC2_CN
A3	TCP0_CN_TX0_DN	B6	USB2_P10_L_DP
A4	+VBUS_USBC0	B7	USB2_P10_L_DN
A5	CC1_CN	B8	SUB2_CN
A6	USB2_P10_L_DP	B9	+VBUS_USBC0
A7	USB2_P10_L_DN	B10	TCP0_RT_TXRX0_C_DN
A8	SUB1_CN	B11	TCP0_RT_TXRX0_C_DP
A9	+VBUS_USBC0	B12	GND
A10	TCP0_RT_TXRX1_C_DN	G1	GND
A11	TCP0_RT_TXRX1_C_DP	G2	GND
A12	GND	G3	GND
B1	GND	G4	GND
B2	TCP0_RT_TX1_C_DP	N1	
B3	TCP0_RT_TX1_C_DN	N2	

Table 3-29: USB4 Port Pinouts

3.3.4 External 2.5GbE RJ-45 and dual USB 3.2 Gen 2 combo connector

CN Label: **LAN1_USB1, LAN2_USB2**

CN Type: USB 3.2, RJ45

CN Location: See **Figure 3-32**

CN Pinouts: See **Table 3-30**

The LAN2_USB2 connector includes dual USB 3.2 Gen 2 (10Gb/s) and one 2.5GbE RJ-45.

Figure 3-32: RJ-45 and dual USB 3.2 Connector

Pin	Description	Pin	Description
1	+5V	21	i225_MDI0_N_1
2	USB2_1_N	22	i225_MDI1_P_1
3	USB2_1_P	23	i225_MDI1_N_1
4	GND	24	i225_MDI2_P_1
5	USB3_RX1_N	25	i225_MDI2_N_1
6	USB3_RX1_P	26	i225_MDI3_P_1
7	GND	27	i225_MDI3_N_1
8	USB3_TX1_N	28	GND
9	USB3_TX1_P	29	+3.3V
10	+5V	30	I225_LINK_ACT_N_1
11	USB2_2_N	31	I225_SPEED_2500_N_1
12	USB2_2_P	32	I225_SPEED_1000_N_1
13	GND	G1	GND
14	USB3_RX2_N	G2	GND
15	USB3_RX2_P	G3	LAN1_GND
16	GND	G4	LAN1_GND

Pin	Description	Pin	Description
17	USB3_TX2_N	G5	LAN1_GND
18	USB3_TX2_P	G6	LAN1_GND
19	GND	G7	LAN1_GND
20	i225_MDI0_P_1	G8	LAN1_GND

Table 3-30: USB 3.2 Port and RJ45 Pinouts

3.3.5 External USB 3.2 Gen 2 connector

CN Label: **USB3_1**

CN Type: USB 3.2

CN Location: See **Figure 3-32**

CN Pinouts: See **Table 3-30**

The USB3_1 connector includes dual USB 3.2 Gen 2 (10Gb/s).

Figure 3-33: RJ-45 and dual USB 3.2 Connector

Pin	Description	Pin	Description
1	+5V	13	GND
2	USB_D7N	14	USB3_RX8_N
3	USB_D7P	15	USB3_RX8_P
4	GND	16	GND
5	USB3_RX7_N	17	USB3_TX8_N
6	USB3_RX7_P	18	USB3_TX8_P
7	GND	G1	GND
8	USB3_TX7_N	G2	GND
9	USB3_TX7_P	G3	GND

Pin	Description	Pin	Description
10	+5V	G4	GND
11	USB_D8N		
12	USB_D8P		

Table 3-31: USB 3.2 Port Pinouts

3.3.6 Audio Jack Connector

CN Label: **AUDIO1**

CN Type: Audio jacks

CN Location: See **Figure 3-34**

CN Pinouts: See **Table 3-32**

The audio jacks connect to external audio devices.

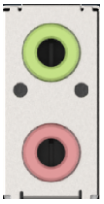


Figure 3-34: USB 3.2 Connector

Pin	Description
FRONT-OUT (Green)	Connect this port to headphone or speaker
MIC-IN (Pink)	Connect this port to microphone

Table 3-32: Audio jack Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-ARL-Q870 may result in permanent damage to the IMBA-ARL-Q870 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-ARL-Q870. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-ARL-Q870 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IMBA-ARL-Q870, place it on an anti-static pad. This reduces the possibility of ESD damaging the IMBA-ARL-Q870.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.2 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.2.1 SATA Drive Connection

The IMBA-ARL-Q870 is shipped with two SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-1**.

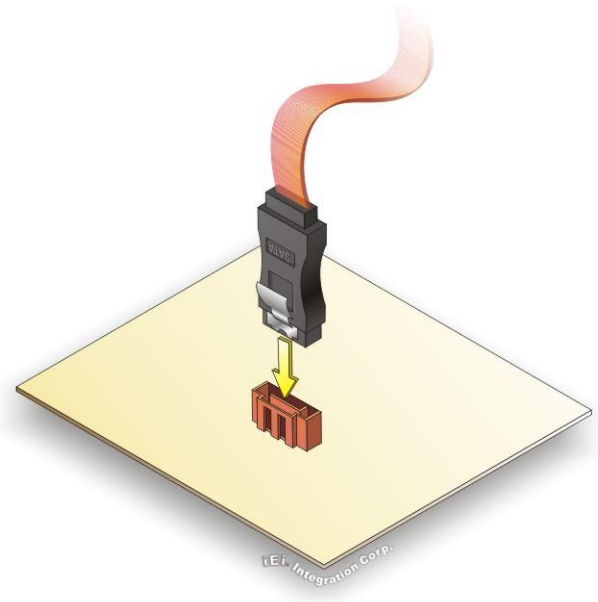


Figure 4-1: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-2**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-2**.

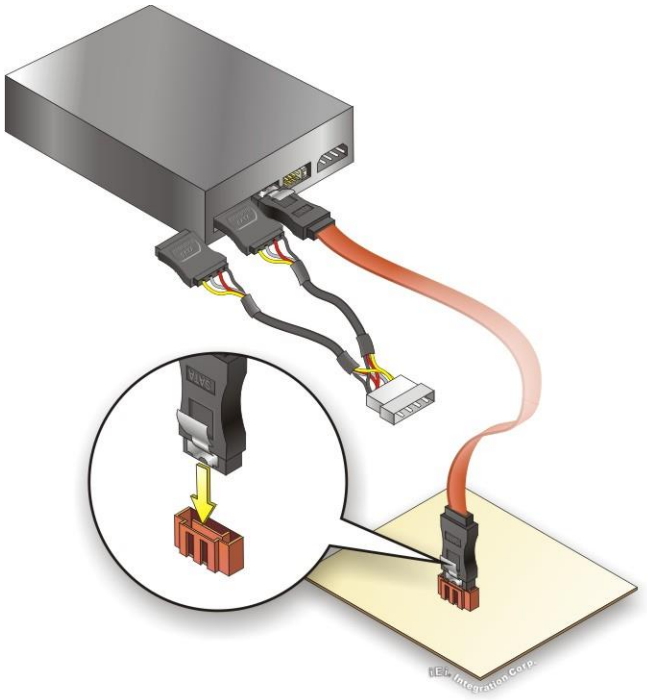


Figure 4-2: SATA Power Drive Connection

The SATA power cable can be bought from IEI. See Optional Items in Section 2.4.

4.3 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the IMBA-ARL-Q870 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-ARL-Q870 on an anti-static pad:
  - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-ARL-Q870 off:
  - When working with the IMBA-ARL-Q870, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-ARL-Q870, **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.4 Socket LGA1851 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

To install the CPU, follow the steps below.

Step 1: **Disengage the load lever** by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-3.**

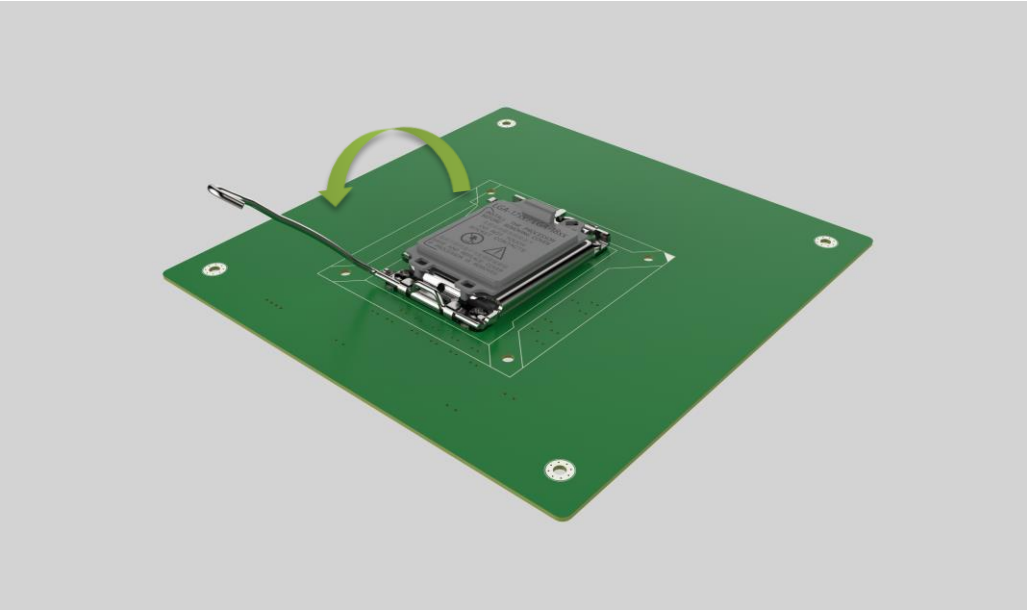


Figure 4-3: Disengage the CPU Socket Load Lever

Step 2: **Open the socket and remove the protective cover.** The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-4**.

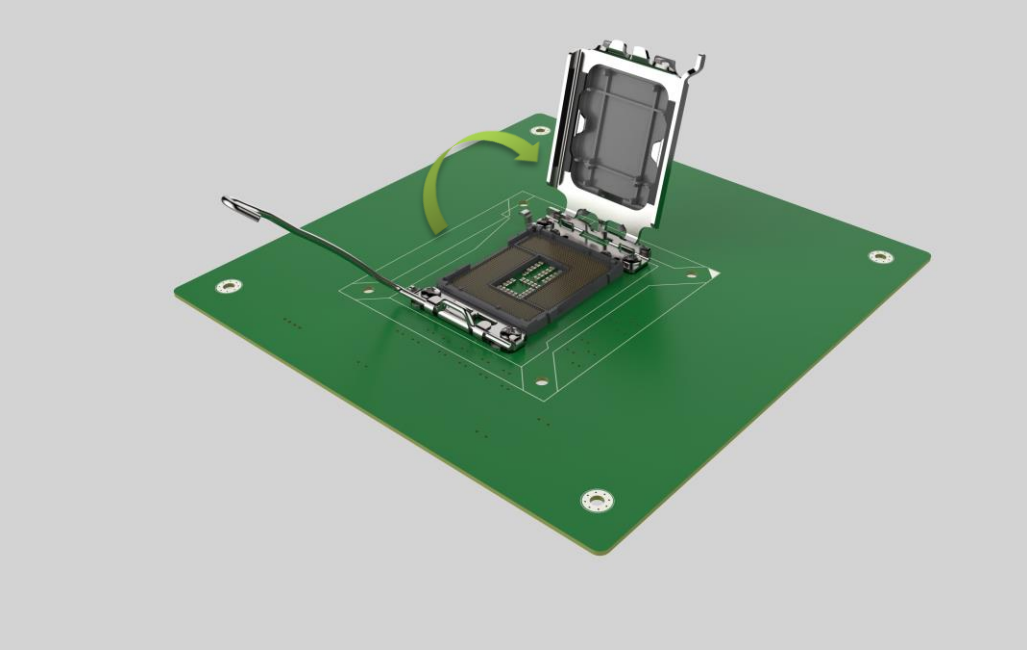


Figure 4-4: Remove Protective Cover

Step 3: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly.** The contact array should be facing the CPU socket.

WARNING:

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-5.**

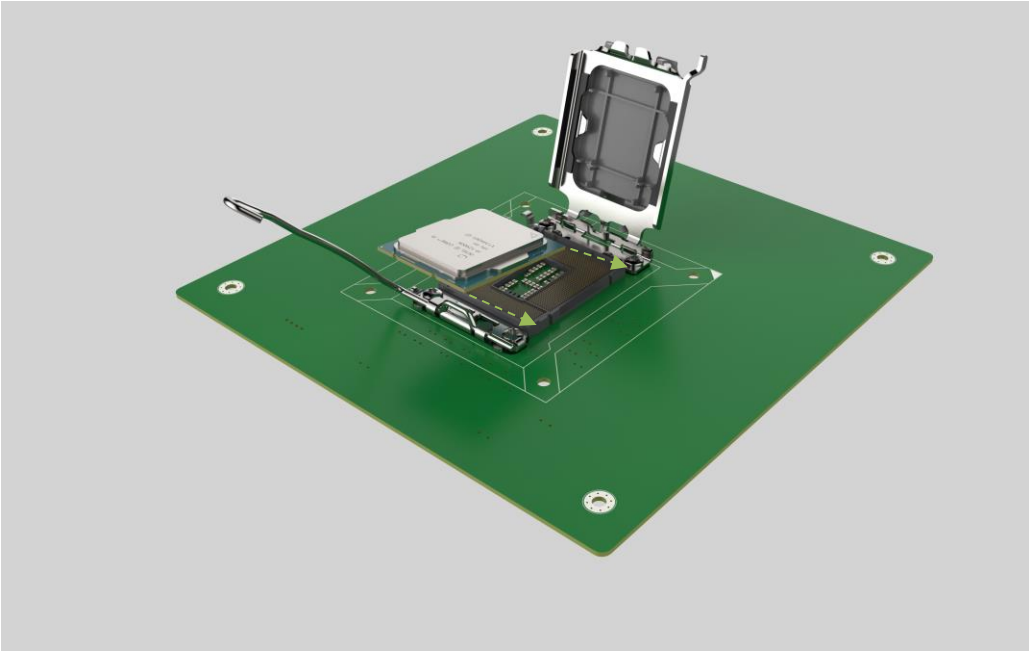


Figure 4-5: Insert The Socket LGA1851 CPU

Step 8: **Close the CPU socket.** Close the load plate and pull the load lever back a little to have the load plate be able to secure to the knob. Engage the load lever by pushing it back to its original position (**Figure 4-6**). There will be some resistance, but will not require extreme pressure.

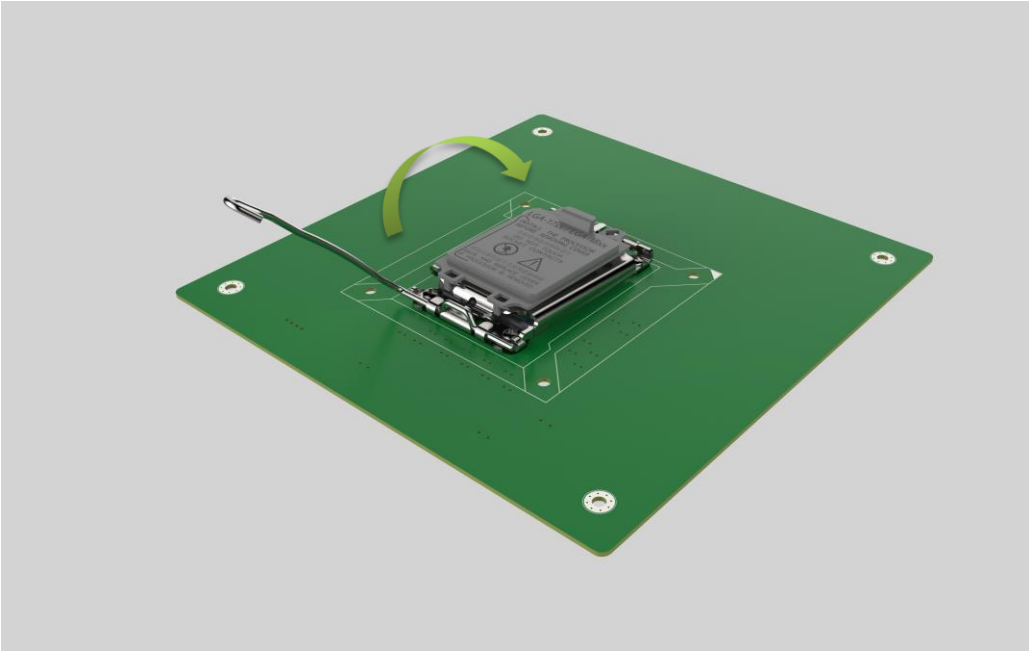


Figure 4-6: Close the Socket LGA1851

Step 9: **Connect the 12 V power to the board.** Connect the 12 V power from the power supply to the board.

4.5 Socket LGA1851 Cooling Kit Installation

WARNING:

DO NOT attempt to install a push-pin cooling fan.

The pre-installed support bracket prevents the board from bending and is ONLY compatible with captive screw type cooling fans.

The cooling kit can be bought from IEI. The cooling kit has a heat sink and fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-7.**

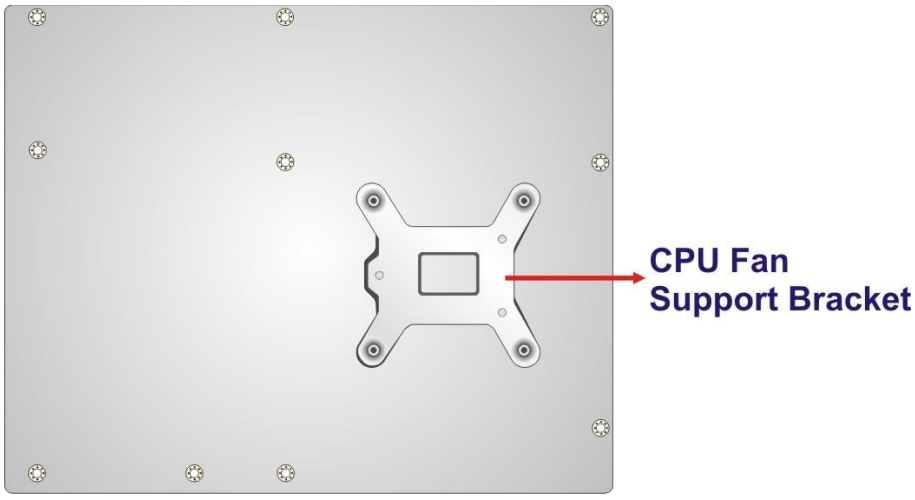


Figure 4-7: Cooling Kit Support Bracket

Step 2: **Place the cooling kit onto the socket LGA1700 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.

Step 4: **Tighten the screws**. Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the CPU fan connector on the IMBA-ARL-Q870. Carefully route the cable and avoid heat generating chips and fan blades.

4.6 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-8**.

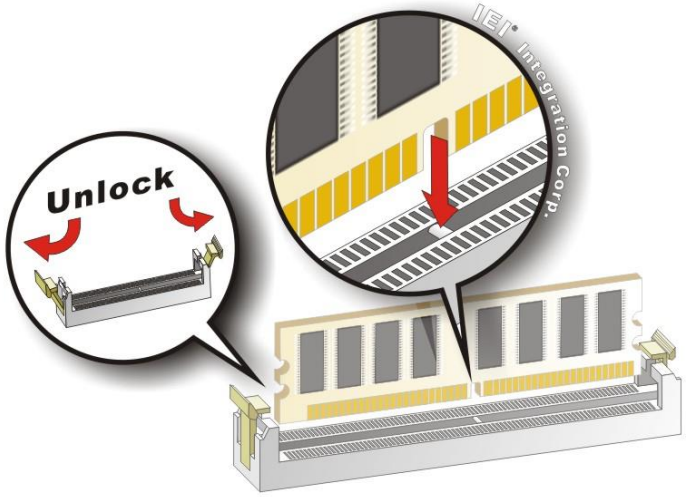


Figure 4-8: DIMM Installation

Step 1: **Open the DIMM socket handles**. Open the two handles outwards as far as they can. See **Figure 4-8**.

Step 2: **Align the DIMM with the socket**. Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-8**.

Step 3: **Insert the DIMM**. Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-8**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

CAUTION:

For quad channel configuration, install four identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

4.7 M.2 Module Installation

The IMBA-ARL-Q870 provide two ways to install the M.2 expansion card. One is using screw, and the other is using the retainer. Please follow the steps below.

Using screw

Step 1: Locate the M.2 module slot.

Step 2: Remove the retention screw secured on the motherboard.

Step 3: Line up the notch on the module with the notch on the slot. Slide the M.2 module into the socket at an angle of about 20º (**Figure 4-9**).

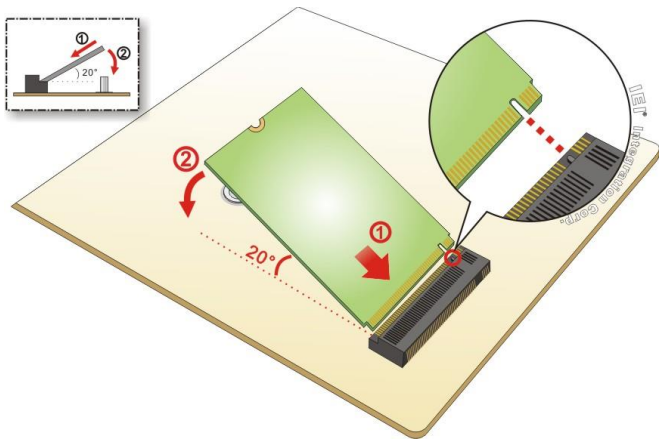


Figure 4-9: Inserting the M.2 Module into the Slot at an Angle

Step 4: Secure the M.2 module with the previously removed retention screw (**Figure 4-10**).

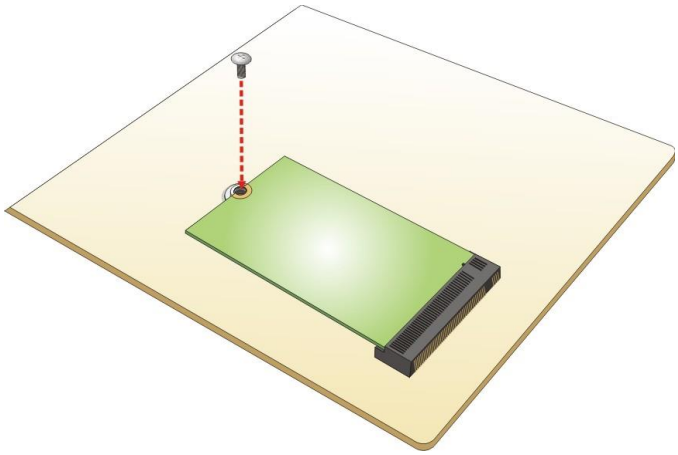


Figure 4-10: Securing the M.2 Module

4.8 Software Installation

All the drivers for the IMBA-ARL-Q870 are available on IEI Resource Download Center (https://download.ieiworld.com). Type IMBA-ARL-Q870 and press Enter to find all the relevant software, utilities, and documentation.

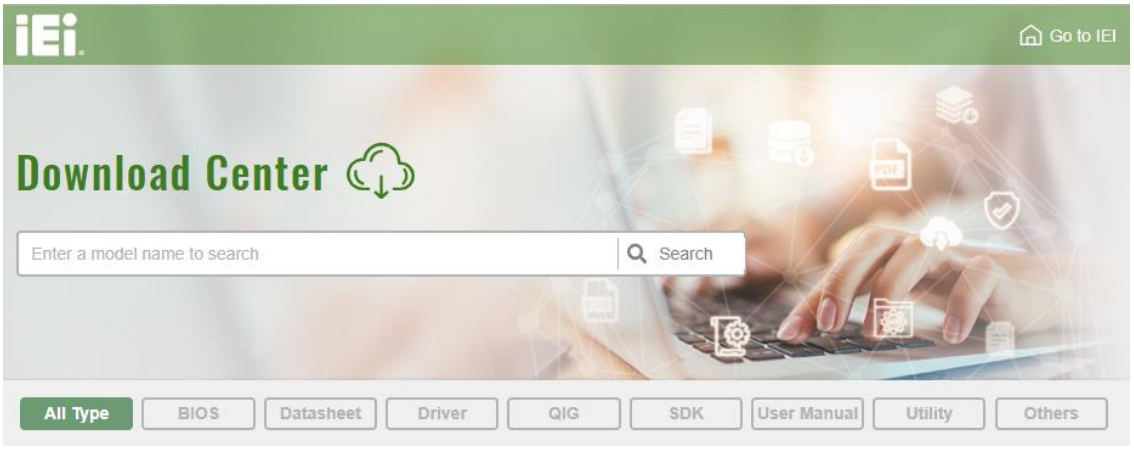
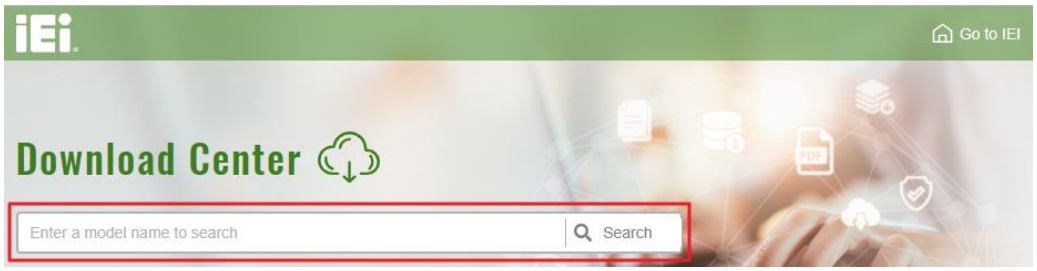


Figure 4-11: IEI Resource Download Center

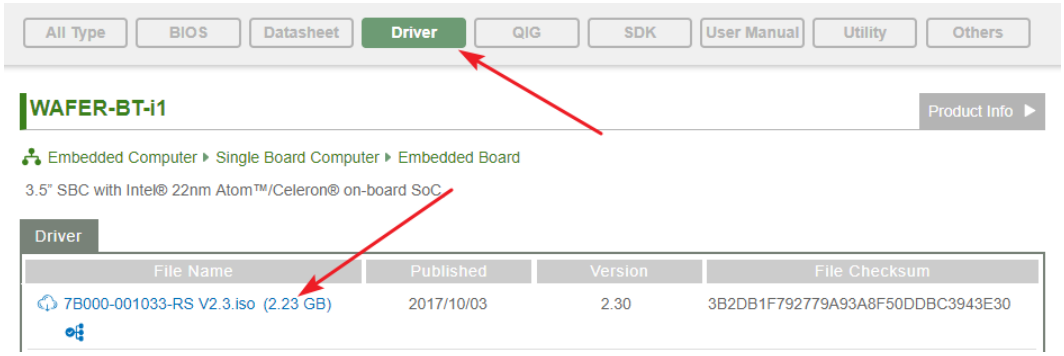
4.9 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

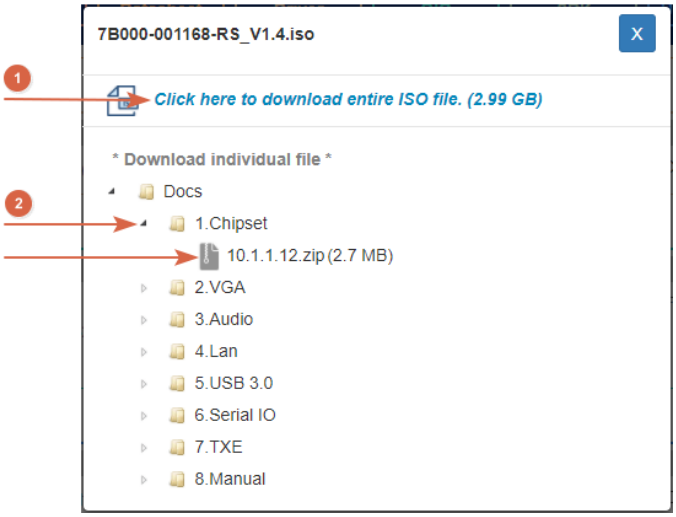
Step 1: Go to https://download.ieiworld.com. Type IMBA-ARL-Q870 and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. **Using keyboard**: Press the **DEL** or **F2** as soon as the system is turned on.
2. **Using touchscreen**: Press the **Setup** button on the upper right corner of the BIOS Starting Menu.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again, then the BIOS Starting Menu will appear. Select "Setup" and press Enter to get into the BIOS Setup.

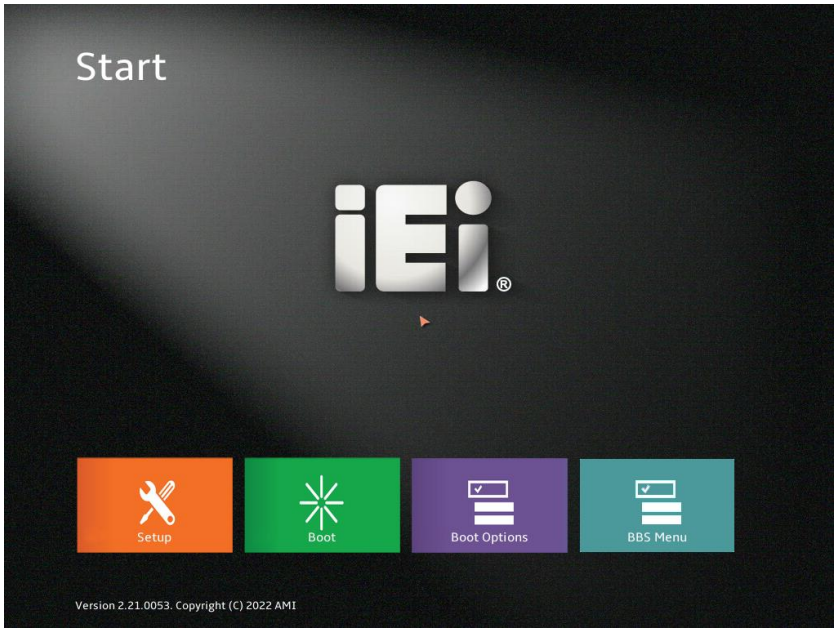


Figure 5-1: BIOS Starting Menu

5.1.2 Using Setup

The BIOS Setup menu can be navigated by using a keyboard or a touchscreen.

5.1.2.1 Keyboard Navigation

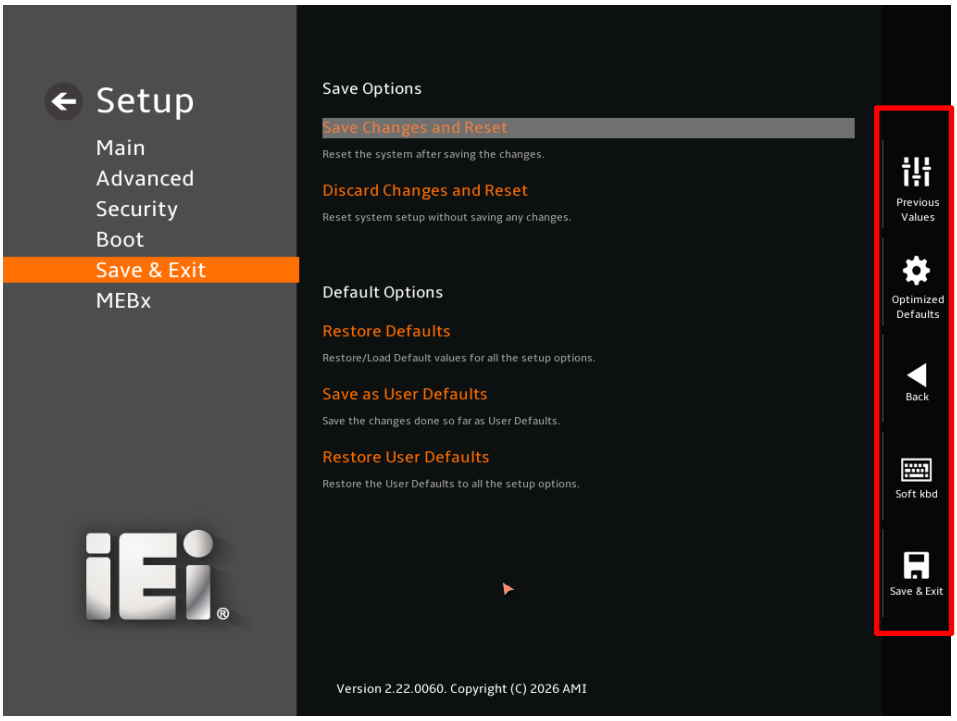
For keyboard navigation, use the navigation keys shown in **Table 5-1**.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up	Move to the previous page
Page Dn	Move to the next page
Esc	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS
<K>	Scroll help area upwards
<M>	Scroll help area downwards

Table 5-1: BIOS Navigation Keys

5.1.2.2 Touch Navigation

For touchscreen navigation, use the on-screen navigation keys shown below.



On-screen Button	Function
Previous Values	Load the last value you set.
Optimized Defaults	Load the factory default values in order to achieve the best performance.
Back	Return to the previous menu.
Soft kbd	Display the on-screen keyboard.
Save & Exit	Save the changes made to the BIOS options and reset the system.

Table 5-2: BIOS On-screen Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window, press the **Esc** key.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the clear CMOS button described in **Chapter 4**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

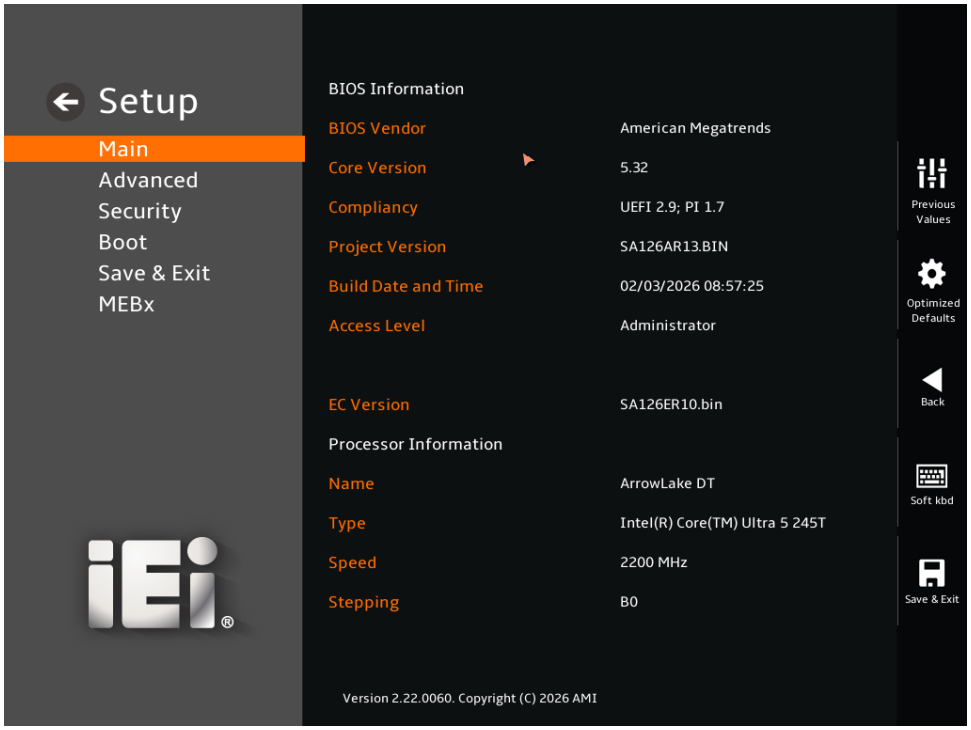
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main (1/2)

BIOS Menu 2: Main (2/2)

BIOS Menu 3: Main (3/3)

➔ **BIOS Information**

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliancy:** Current UEFI & PI version
- **Project Version:** the board version
- **Build Date and Time:** Date the current BIOS version was made
- **Access Level:** Current Access Level
- **EC Version:** Current EC version

➔ **Processor Information**

The **Processor Information** lists a brief summary of the Processor. The fields in **Processor Information** cannot be changed. The items shown in the system overview include:

- **Name:** Displays the Processor Details
- **Type:** Displays the Processor Type
- **Speed:** Displays the Processor Speed
- **Stepping:** Displays the Processor Stepping
- **Microcode Revision:** Displays the Processor Microcode Revision
- **Memory Frequency:** Displays the Processor Memory Frequency

➔ **PCH Information**

The **PCH Information** lists a brief summary of the PCH. The fields in **PCH Information** cannot be changed. The items shown in the system overview include:

- **Name:** Displays the PCH Name
- **PCH SKU:** Displays the PCH SKU
- **Stepping:** Displays the PCH Stepping
- **ME FW Version:** Displays the ME Firmware Version
- **ME Firmware SKU:** Displays the ME Firmware SKU

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

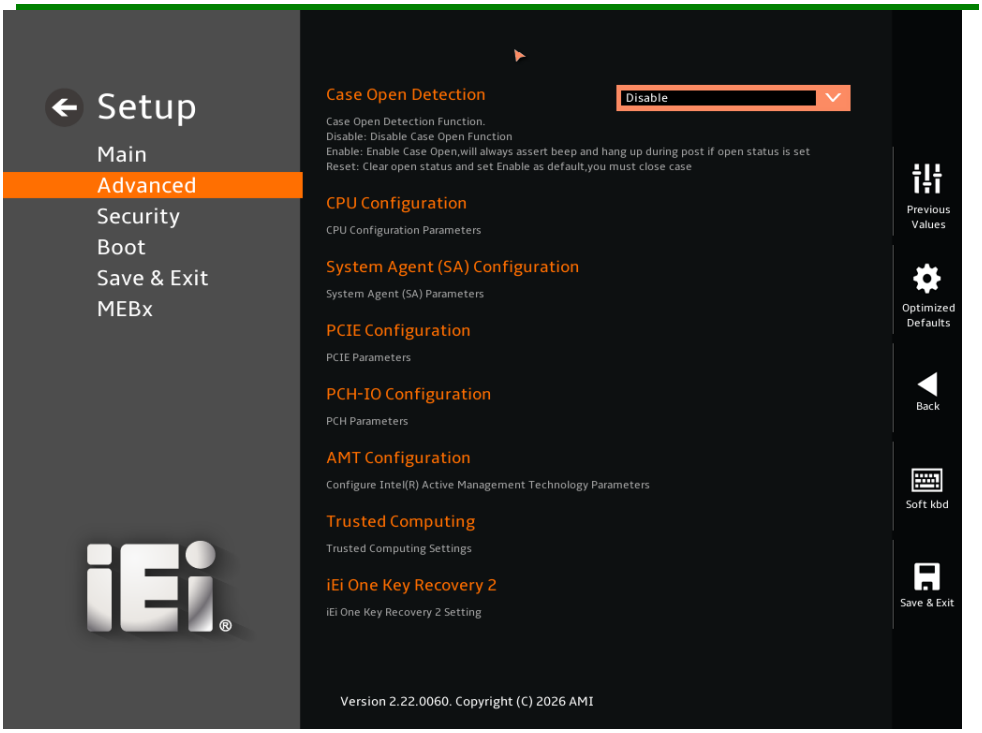
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

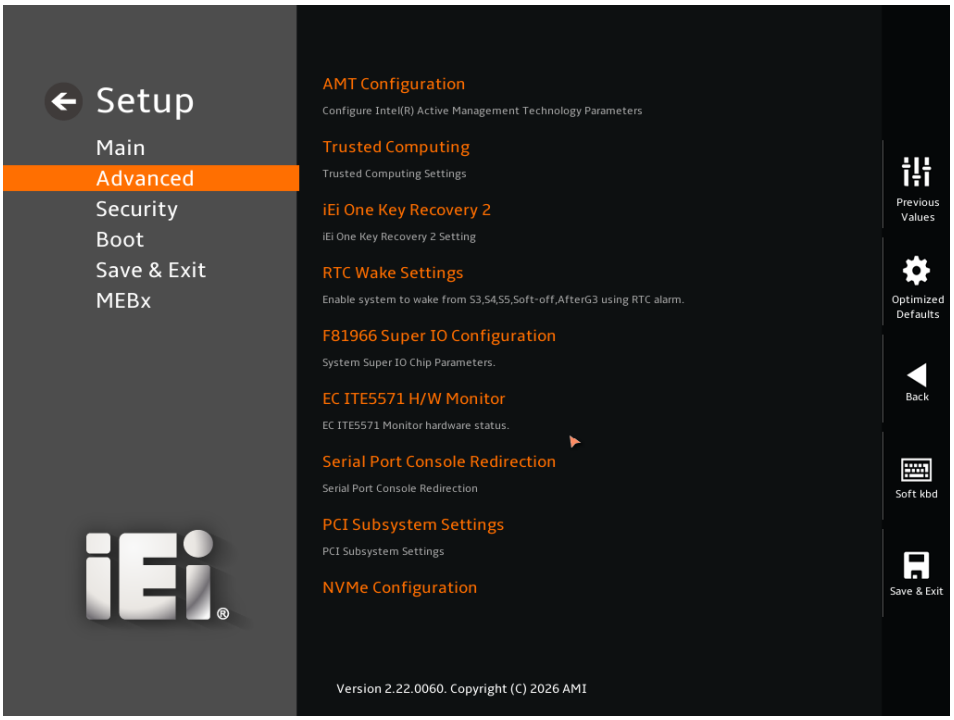
Use the **Advanced** menu (**BIOS Menu 4**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



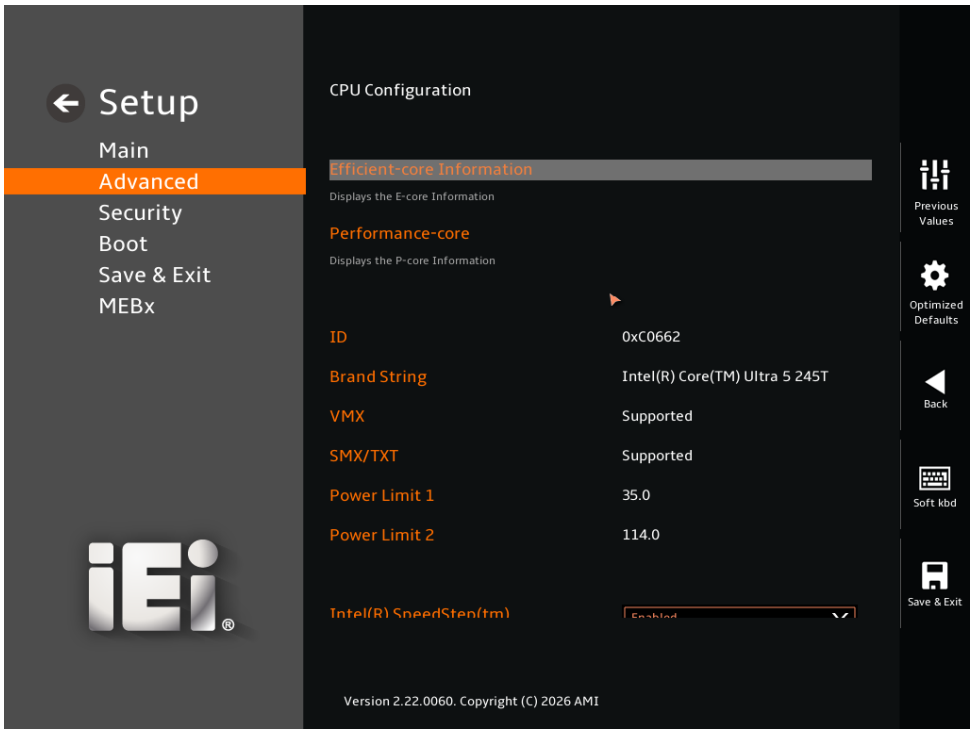
BIOS Menu 4: Advanced (1/2)



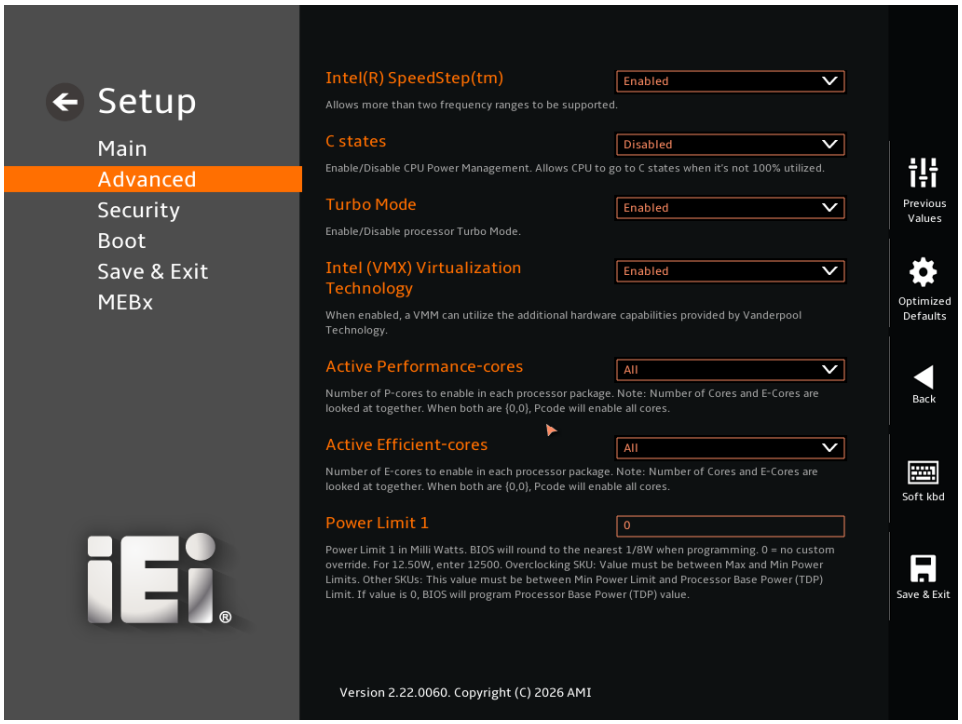
BIOS Menu 5: Advanced (2/2)

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



BIOS Menu 6: CPU Configuration (1/3)



BIOS Menu 7: CPU Configuration (2/3)

BIOS Menu 8: CPU Configuration (3/3)

➔ **Intel(R) SpeedStep(tm) [Enabled]**

Use the **Intel(R) SpeedStep(tm)** option to enable or disable the Intel® SpeedStep Technology which allows more than two frequency ranges to be supported.

➔	**Disabled**		Disables Intel® SpeedStep Technology
➔	**Enabled**	**DEFAULT**	Enables Intel® SpeedStep Technology

➔ **C states [Disabled]**

Use the **C states** option to enable or disable CPU power management which allows CPU to go to C states when it is not 100% utilized.

➔	**Disabled**	**DEFAULT**	Disables CPU power management
➔	**Enabled**		Enables CPU power management

➔ **Turbo Mode [Enabled]**

Use the **Turbo Mode** option to enable or disable Turbo Mode which requires Intel Speed Step or Intel Speed Shift to be available and enabled.

➔	**Disabled**		Disables Turbo Mode Technology
➔	**Enabled**	**DEFAULT**	Enables Turbo Mode Technology

➔ **Intel (VMX) Virtualization Technology [Enabled]**

Use the **Intel (VMX) Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔	**Disabled**		Disables Intel Virtualization Technology.
➔	**Enabled**	**DEFAULT**	Enables Intel Virtualization Technology.

➔ **Active Performance Cores [All]**

Use the **Active Performance Cores** BIOS option to enable numbers of P-cores in the processor package.

➔	**All**	**DEFAULT**	Enable all P-cores in the processor package.

➔	**1**		Enable one P-core in the processor package.

➔ **Active Efficient Cores [All]**

Use the **Active Efficient Cores** BIOS option to enable numbers of E-cores in the processor package.

➔	**All**	**DEFAULT**	Enable all E-cores in the processor package.
➔	**0**		Enable zero E-core in the processor package.
➔	**1**		Enable one E-cores in the processor package.
➔	**2**		Enable two E-cores in the processor package.
➔	**3**		Enable three E-cores in the processor package.
➔	**4**		Enable four E-cores in the processor package.
➔	**5**		Enable five E-cores in the processor package.
➔	**6**		Enable six E-cores in the processor package.
➔	**7**		Enable seven E-cores in the processor package.

➔ **Power Limit 1 [0]**

Use the + or – key to change the **Power Limit 1** value. BIOS will program the default values for Limit 1 and Power Limit 1 Time Window. For 12.50W, enter 12500.

➔ **Power Limit 1 Time Window [0]**

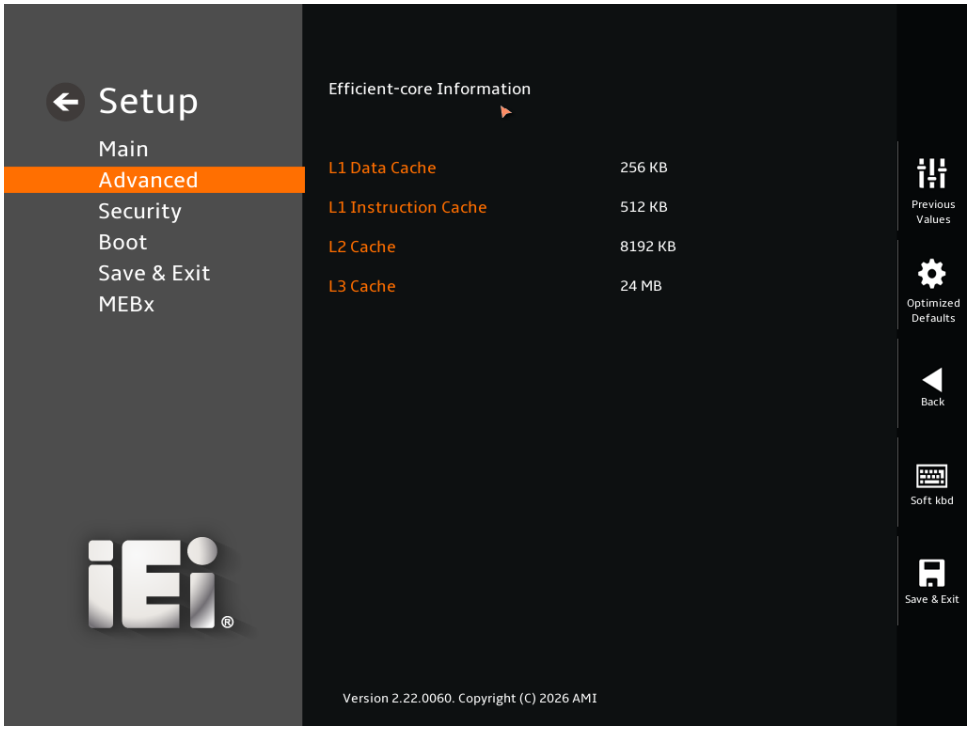
Use the **Power Limit 1 Time Window** option to select the PL1 time duration. The value may vary from 0 to 128. For 0 is the default value

➔ **Power Limit 2 [0]**

Use the + or – key to change the **Power Limit 2** value. BIOS will round to the nearest 1/8W when programming. 0 = no custom override. For 12.50W, enter 12500.

5.3.1.1 Efficient-core Information

Use the **Efficient-core Information menu** (**BIOS Menu 9**) to view detailed Efficient-core Information.



BIOS Menu 9: Efficient-core Information

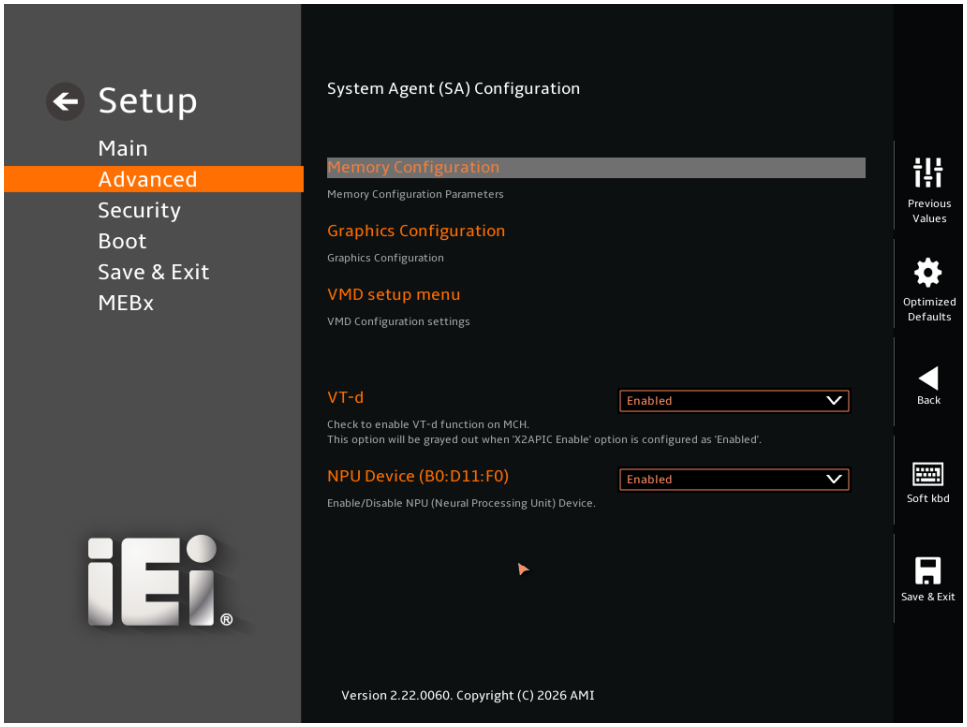
5.3.1.2 Performance-core Information

Use the **Performance-core Information** (**BIOS Menu 10**) to view detailed Performance-core Information.

BIOS Menu 10: Performance-core Information

5.3.2 System Agent (SA) Configuration

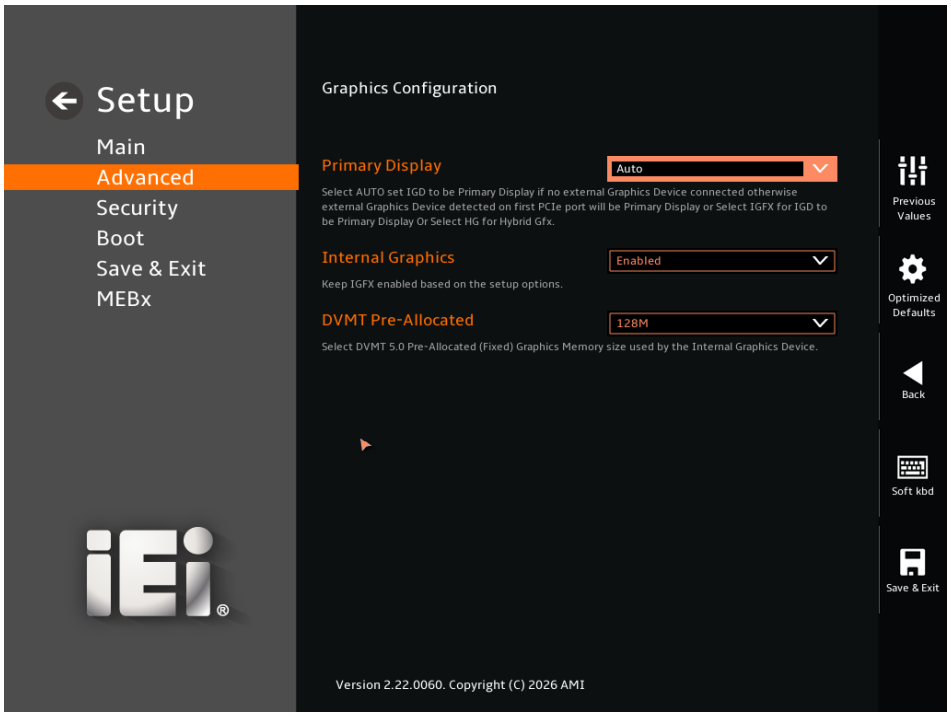
Use the **System Agent (SA) Configuration** menu (**BIOS Menu 11**) to configure the System Agent (SA) parameters.



BIOS Menu 11: System Agent (SA) Configuration

5.3.2.1 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 12**) menu to configure the video device connected to the system.



BIOS Menu 12: Graphics Configuration

➔ **Primary Display [Auto]**

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto **Default**
- IGFX
- PEG
- PCI
- SG

➔ **Internal Graphics [Enabled]**

Use the **Internal Graphics** option to configure whether to keep IGFX enabled. If user wants to support dual display by internal graphics and external graphics, this Internal Graphics

option should be set to Enabled and the above Primary Display option should be set to IGFX.

➔	**Auto**		Auto mode
➔	**Disabled**		Disables IGFX.
➔	**Enabled**	**Default**	Enables IGFX.

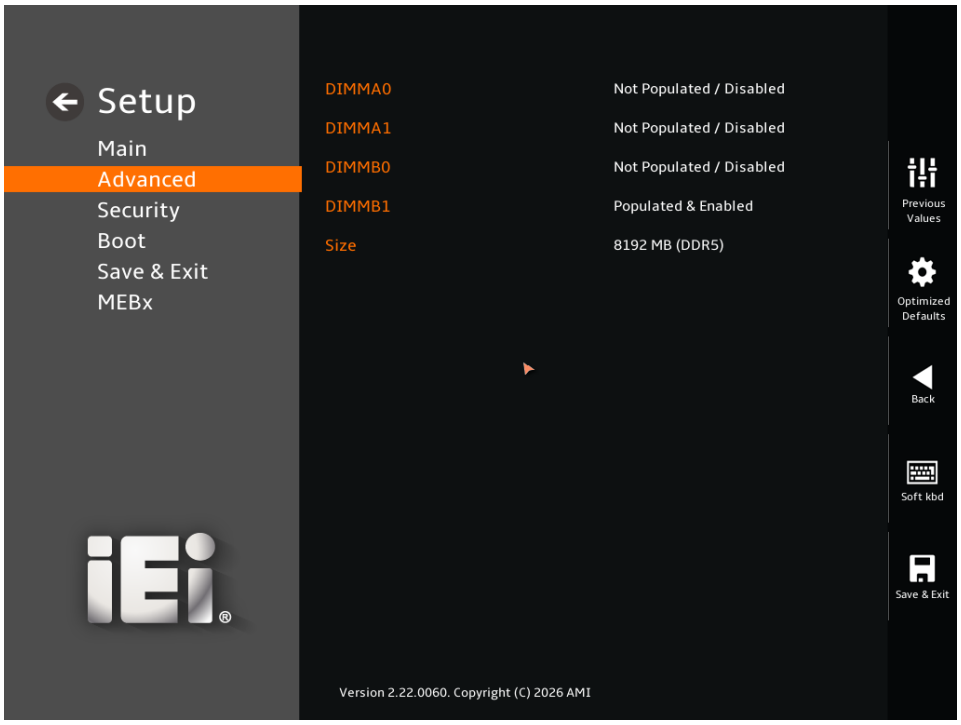
➔ **DVMT Pre-Allocated [128M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 0M
- 32M
- 64M
- 96M
- 128M **Default**
- 4M
- 8M
- 12M
- 16M
- 20M
- 16 GB
- 18 GB

5.3.2.2 Memory Configuration

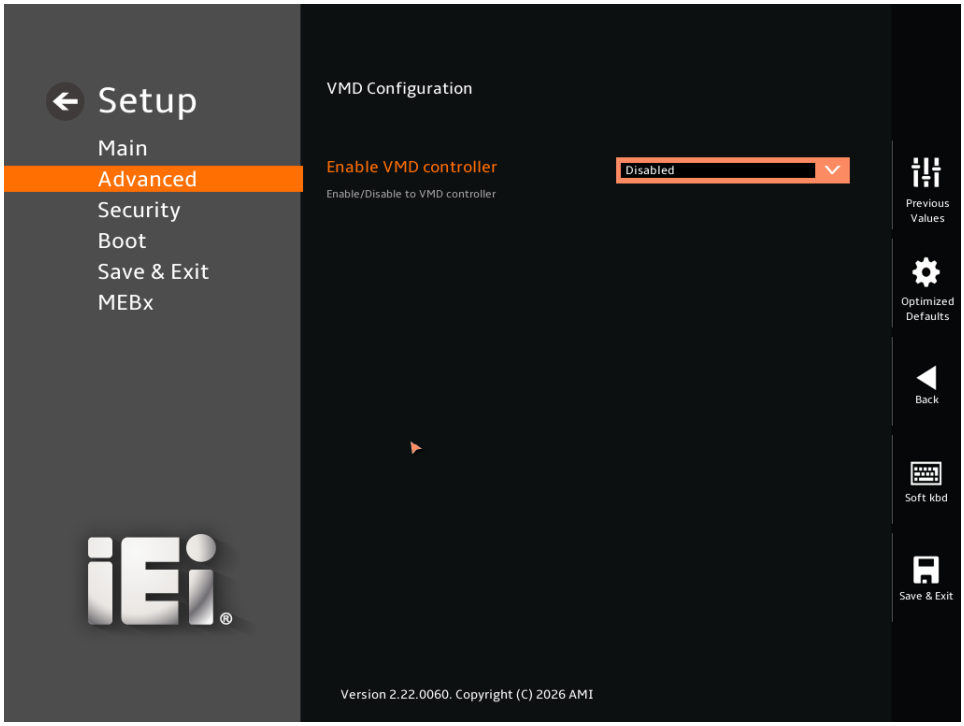
Use the **Memory Configuration** submenu (**BIOS Menu 13**) to view memory information.



BIOS Menu 13: Memory Configuration

5.3.2.3 VMD Configuration

Use the **VMD Configuration** submenu (**BIOS Menu 14** to enable or disable VMD controller.



BIOS Menu 14: VMD Configuration

➔ **Enable VMD controller [Disabled]**

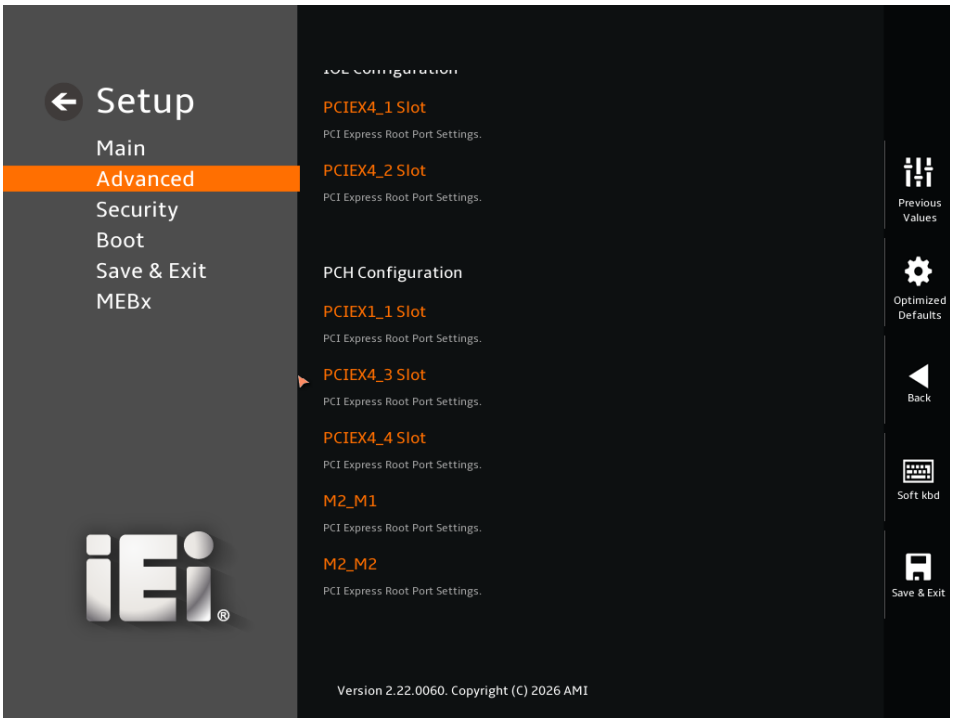
Use the **Enable VMD controller** option to enable or disable VMD controller.

➔ **Disabled**	**Default**	Disable VMD controller.
➔ **Enabled**		Enable VMD controller.

5.3.3 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 15**) to configure the PCI Express slots.

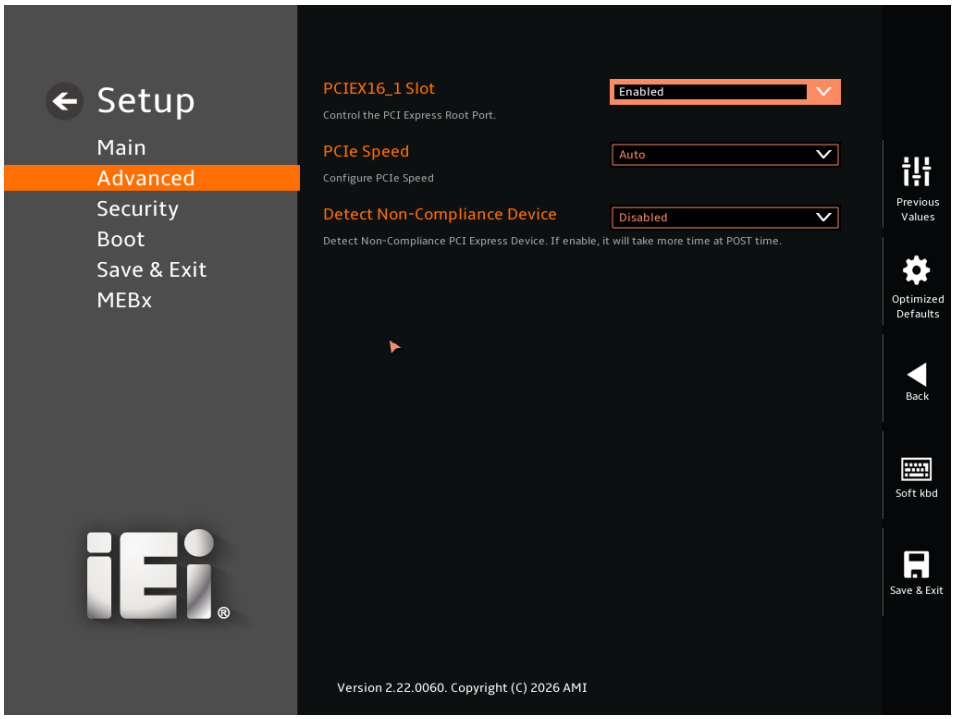
BIOS Menu 15: PCI Express Configuration (1/2)



BIOS Menu 16: PCI Express Configuration (2/2)

5.3.3.1 PCIe Root Port Setting

Use the **M2_M1, PCIEX16_1, PCIEX16_2, PCIEX4_1, PCIEX4_2, PCIEX1_1, PCIEX4_3, PCIEX4_4, M2_M2** submenu (**BIOS Menu 17**) to configure the PCI Root Port Setting.



BIOS Menu 17: PCIe Slot Configuration Submenu

➔ **PCIe Speed [Auto]**

Use the **PCIe Speed** option to specify the PCI Express port speed. Configuration options are listed below.

➔ **Auto**	**DEFAULT**	Auto mode.
➔ **Gen1**		Configure PCIe Speed to Gen1.
➔ **Gen2**		Configure PCIe Speed to Gen2.
➔ **Gen3**		Configure PCIe Speed to Gen3.

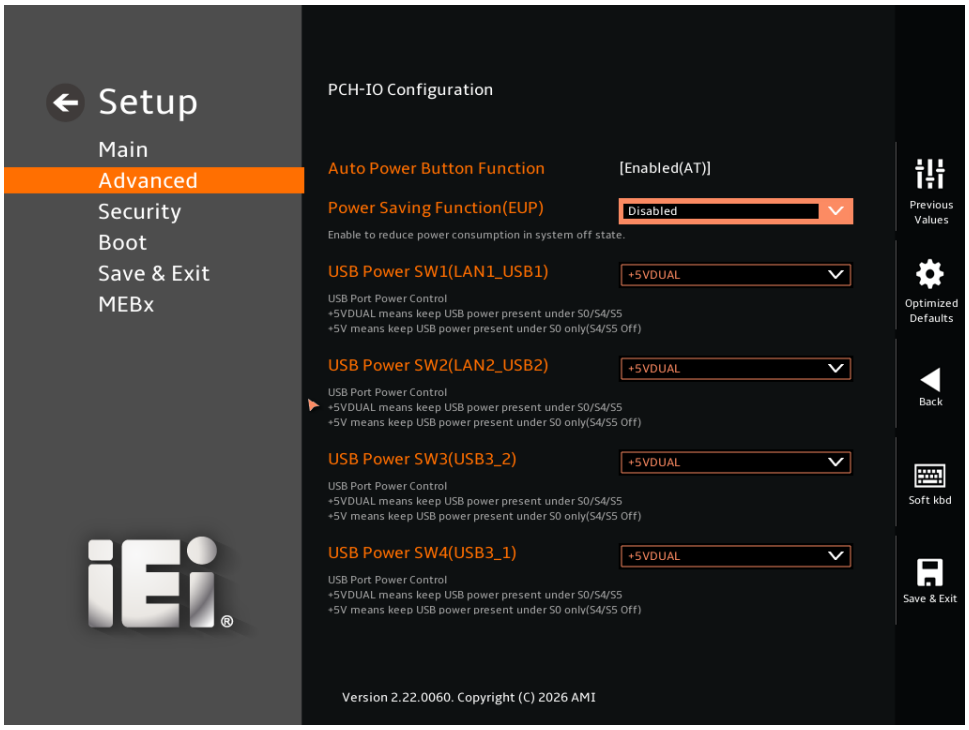
➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to configure whether to detect if a non-compliance PCI Express device is connected to the PCI Express port.

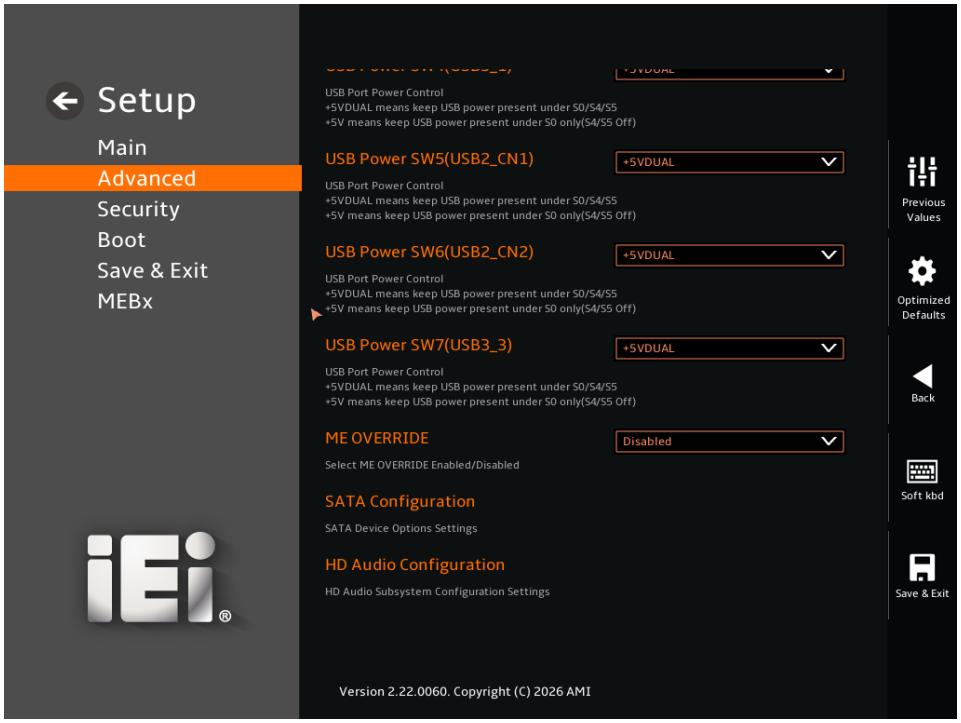
➔	**Disabled**	**DEFAULT**	Do not detect if a non-compliance PCI Express device is connected to the PCI Express port.
➔	**Enabled**		Detect if a non-compliance PCI Express device is connected to the PCI Express port.

5.3.4 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 18**) to configure the PCH parameters.



BIOS Menu 18: PCH-IO Configuration (1/2)



BIOS Menu 19: PCH-IO Configuration (2/2)

➔ **Auto Power Button Function [Enabled (AT)]**

Use the **Auto Power Button Function** BIOS option to show the power mode state. Use the **J_ATX_AT1** to switch the AT/ATX power mode.

➔ **Enabled (AT)** The system power mode is AT.

➔ **Power Saving Function (EUP) [Disabled]**

Use the **Power Saving Function (EUP)** BIOS option to enable or disable the power saving function.

➔ **Disabled** **DEFAULT** Power saving function is disabled.

➔ **Enabled** Power saving function is enabled. It will reduce power consumption when the system is off.

➔ **USB Power Control [+5VDUAL]**

Use the **USB Power state option** to enable or disable the USB Power.

➔ **+5VDUAL** **DEFAULT** USB Power is on.

➔ **+5V** USB Power is off.

➔ **ME OVERRIDE [Disabled]**

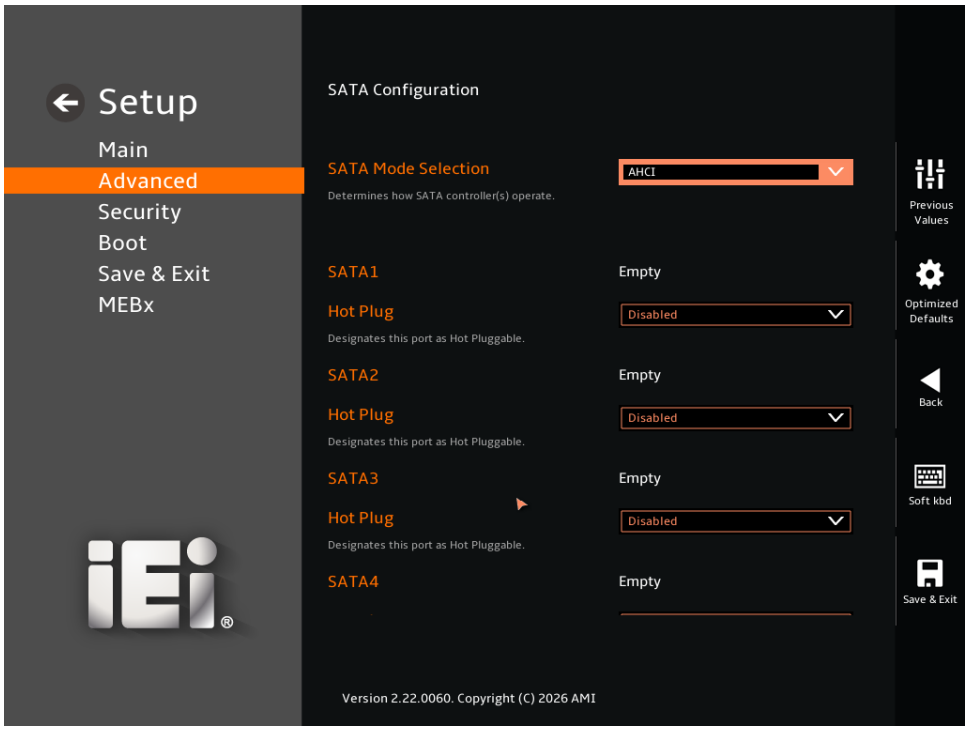
Use the **ME OVERRIDE** BIOS option to enable me override.

➔ **Disabled** **DEFAULT** The me override is disabled

➔ **Enabled** The me override is enabled

5.3.4.1 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 20**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 20: SATA Configuration

➔ **Hot Plug [Disabled]**

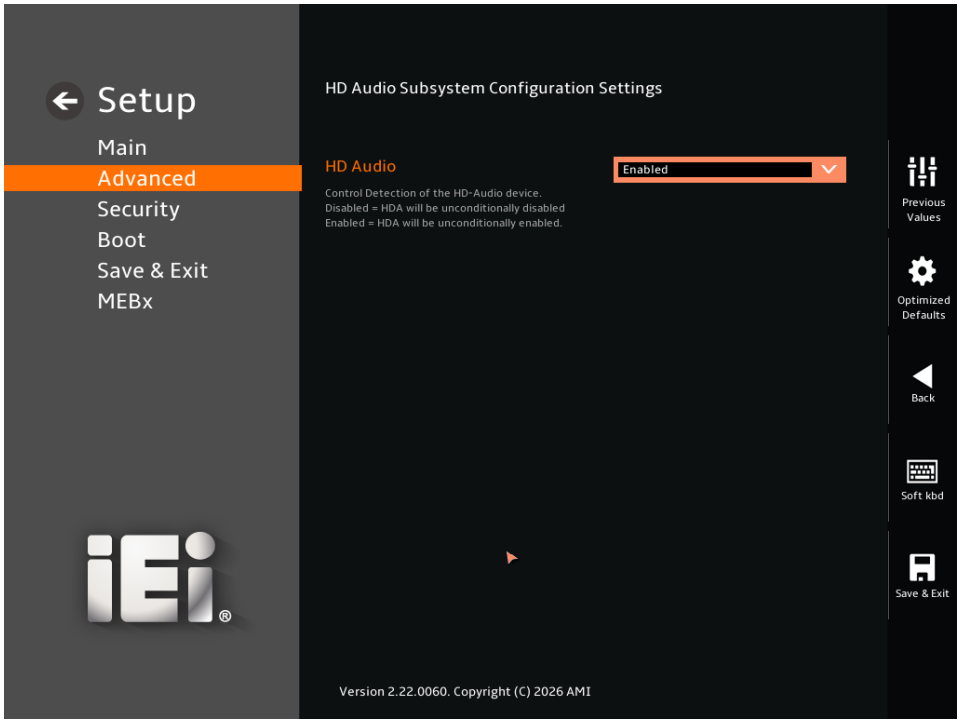
Use the **Hot Plug** BIOS option to allow the SATA port to support hot-plug capability.

➔ **Disabled** **DEFAULT** The Hot Plug is disabled

➔ **Enabled** The Hot Plug is enabled

5.3.4.2 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 21**) to configure the PCH Azalia settings.



BIOS Menu 21: HD Audio Configuration

➔ **HD Audio [Enabled]**

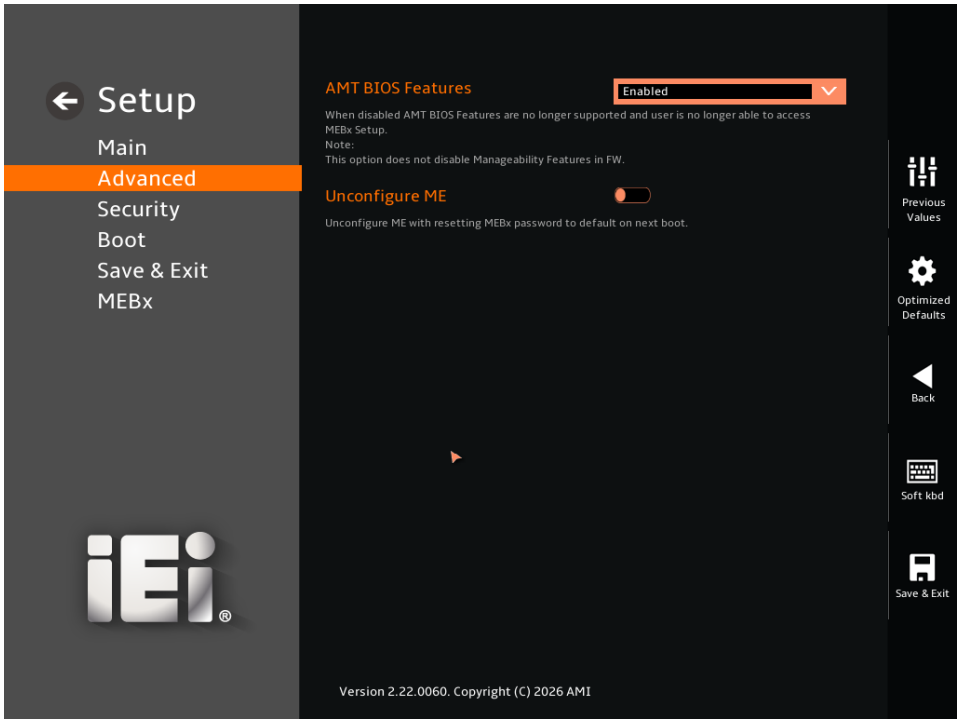
Use the **HD Audio** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled.

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller is enabled.

5.3.5 AMT Configuration

Use the **AMT Configuration** menu (**BIOS Menu 22**) to access the MEBx setup to configure remote management features.



BIOS Menu 22: AMT Configuration

➔ **AMT BIOS Features [Enabled]**

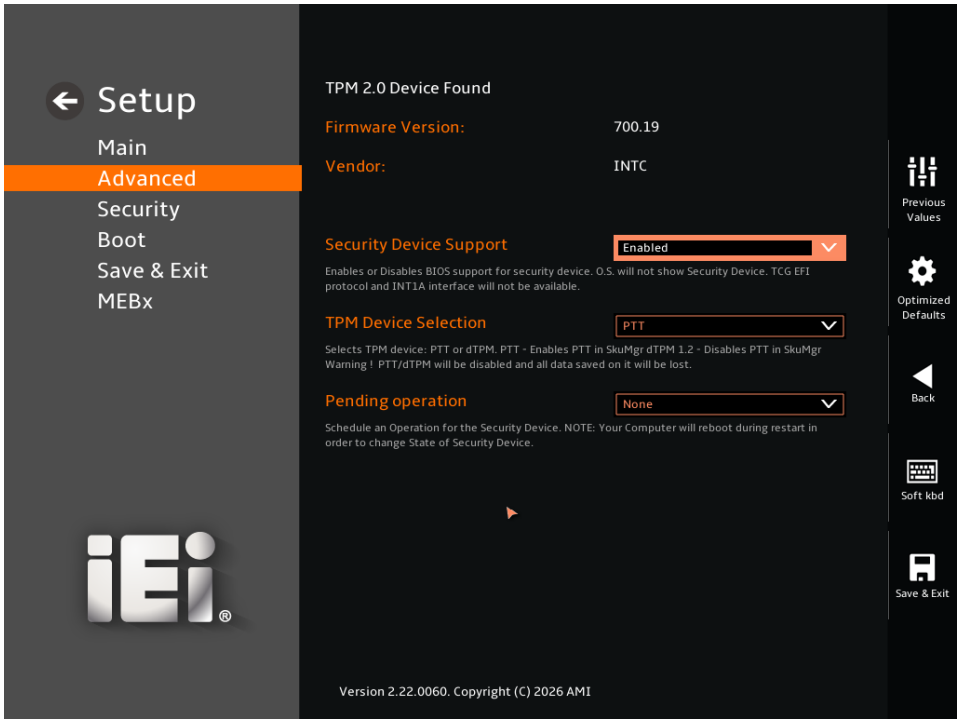
Use the **AMT BIOS Features** option to enable or disable AMT BIOS Features.

➔ **Disabled** The AMT BIOS Features is disabled.

➔ **Enabled** **DEFAULT** The AMT BIOS Features is enabled.

5.3.6 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 23**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 23: Trusted Computing

➔ **Security Device Support [Enabled]**

Use the **Security Device Support** option to enable or disable BIOS support for security device.

- ➔ **Disable** — TPM support is disabled.
- ➔ **Enable** **DEFAULT** — TPM support is enabled.

➔ **TPM Device Selection [PTT]**

Use the **Security Device Support** option to select TPM Device.

- ➔ **dTPM** — TPM Device is dTPM.
- ➔ **PTT** **DEFAULT** — TPM Device is PTT.

➔ **Pending Operation [None]**

Use the **Pending Operation** option to schedule an operation for the security device.

➔ **None** **DEFAULT** TPM information is previous.S

➔ **TPM Clear** TPM information is cleared

5.3.7 iEi One Key Recovery 2

Use the **iEi One Key Recovery 2** menu (**BIOS Menu 24**) to enable watch dog function. When OS crashes, it will automatically recover system.

BIOS Menu 24: iEi One Key Recovery 2 Configuration

➔ **Auto Recovery Function [Disablde]**

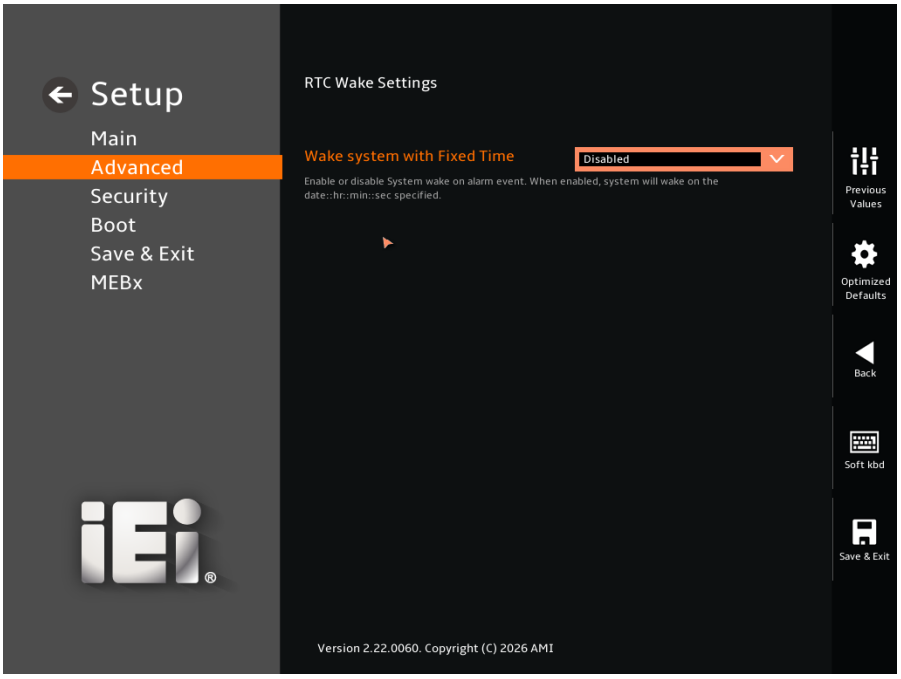
Use the **Auto Recovery Function** option to enable watch dog function

➔ **Disable** **DEFAULT** Watch dog function is disabled.

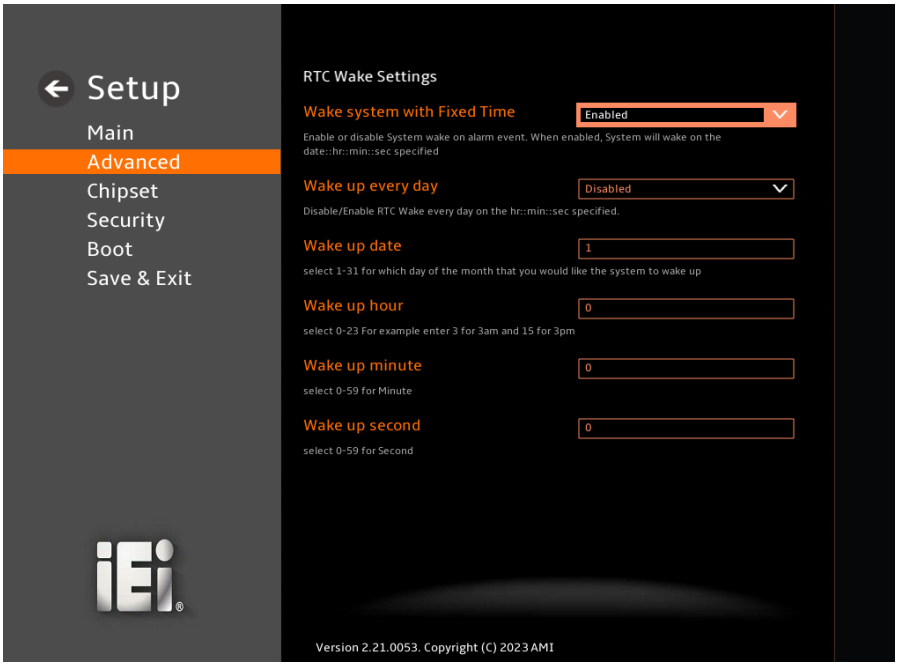
➔ **Enable** Watch dog function is enabled.

5.3.8 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 25**) configures RTC wake event.



BIOS Menu 25: RTC Wake Settings (1/2)



BIOS Menu 26: RTC Wake Settings (2/2)

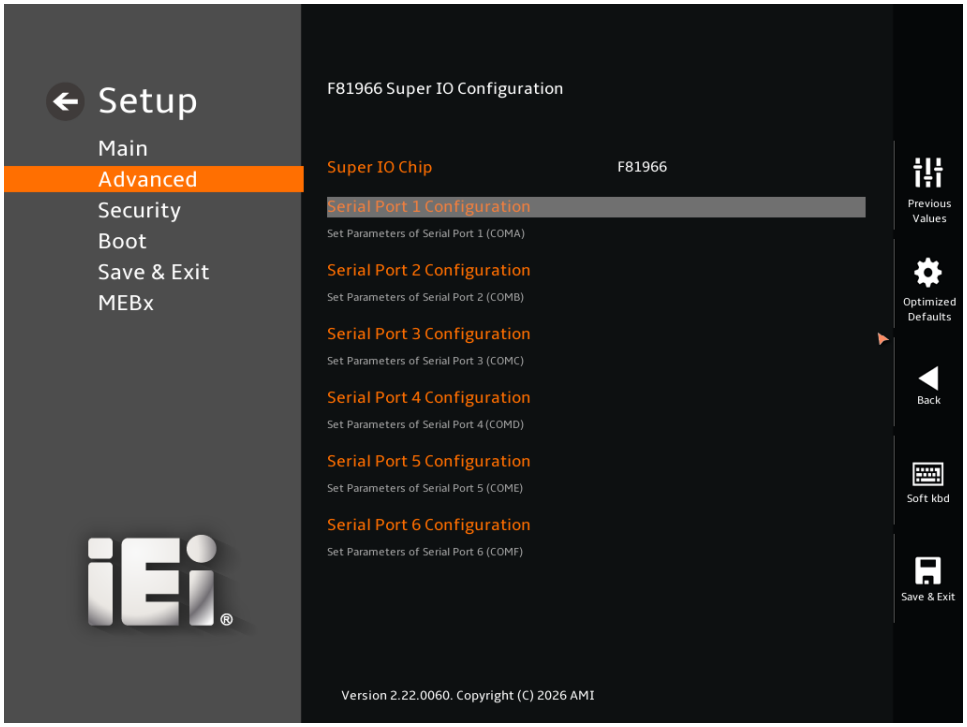
➔ **Wake system with Fixed Time [Enabled]**

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

➔ **Disabled**		The real time clock (RTC) cannot generate a wake event
➔ **Enabled**	**DEFAULT**	If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected: Wake up date Wake up hour Wake up minute Wake up second After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.9 F81966 Super IO Configuration

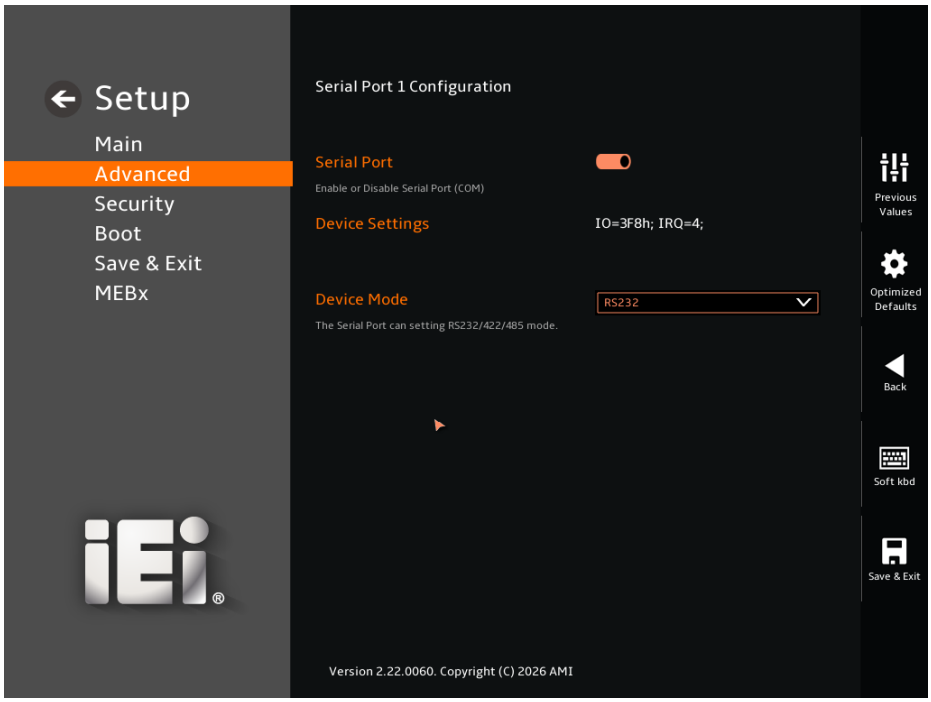
Use the **F81966 Super IO Configuration** menu (**BIOS Menu 27**) to set or change the configurations for serial ports.



BIOS Menu 27: F81966 Super IO Configuration

5.3.9.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 28**) to configure the serial port n.



BIOS Menu 28: Serial Port 1 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ **IO=3F8h; IRQ=4**	Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

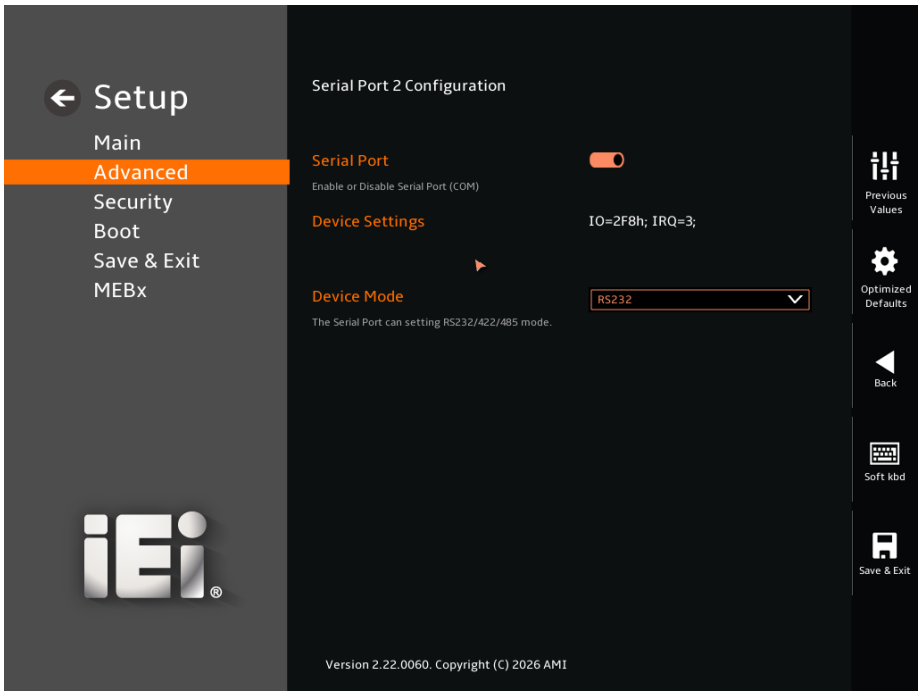
➔ **Device Mode [RS232]**

Use the **Device Mode** option to change the serial port mode.

➔ **RS232**	**DEFAULT**	The serial port mode is RS-232
RS422 with Register		The serial port mode is RS-422
RS485 with Register		The serial port mode is RS-485

5.3.9.2 Serial Port 2 Configuration

Use the **Serial Port 2 Configuration** menu (**BIOS Menu 29**) to configure the serial port n.



BIOS Menu 29: Serial Port 2 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ **IO=2F8h; IRQ=3** Serial Port I/O port address is 2F8h and the interrupt address is IRQ3

➔ **Device Mode [RS232]**

Use the **Device Mode** option to change the serial port mode.

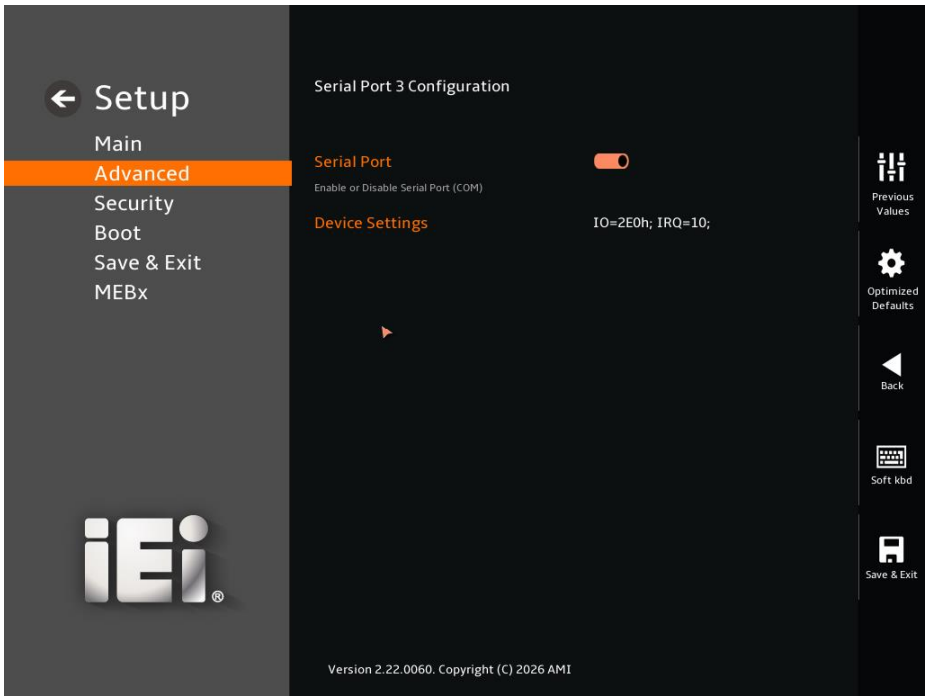
➔ **RS232** **DEFAULT** The serial port mode is RS-232

RS422 with Register The serial port mode is RS-422

RS485 with Register The serial port mode is RS-485

5.3.9.3 Serial Port 3 Configuration

Use the **Serial Port 3 Configuration** menu (**BIOS Menu 30**) to configure the serial port 3.



BIOS Menu 30: Serial Port 3 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

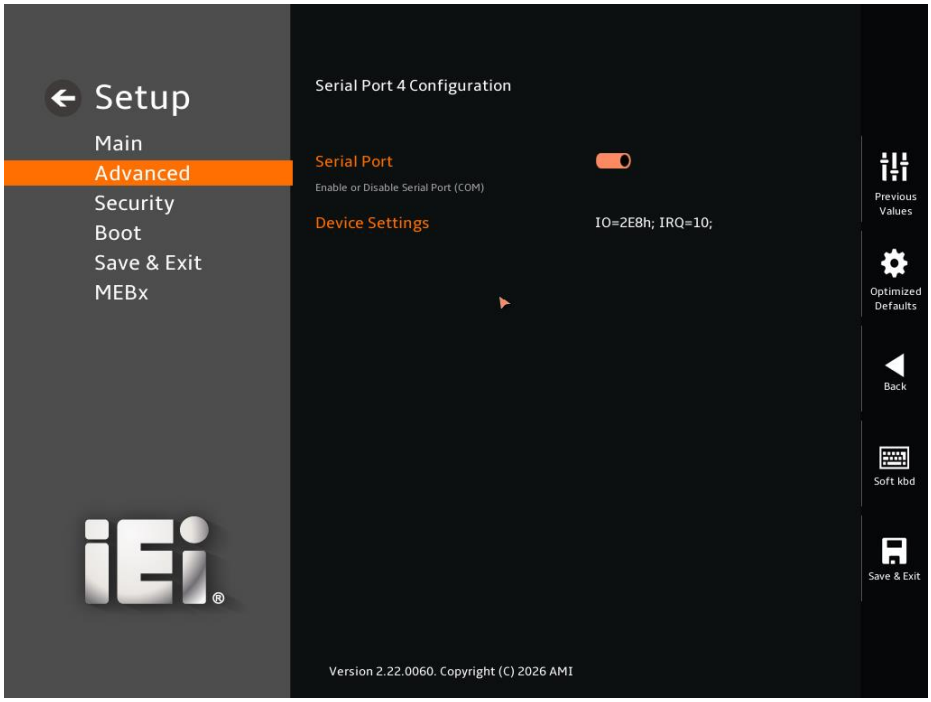
➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ **IO=2E0h; IRQ=10** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10

5.3.9.4 Serial Port 4 Configuration

Use the **Serial Port 4 Configuration** menu (**BIOS Menu 31**) to configure the serial port 4.



BIOS Menu 31: Serial Port 4 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

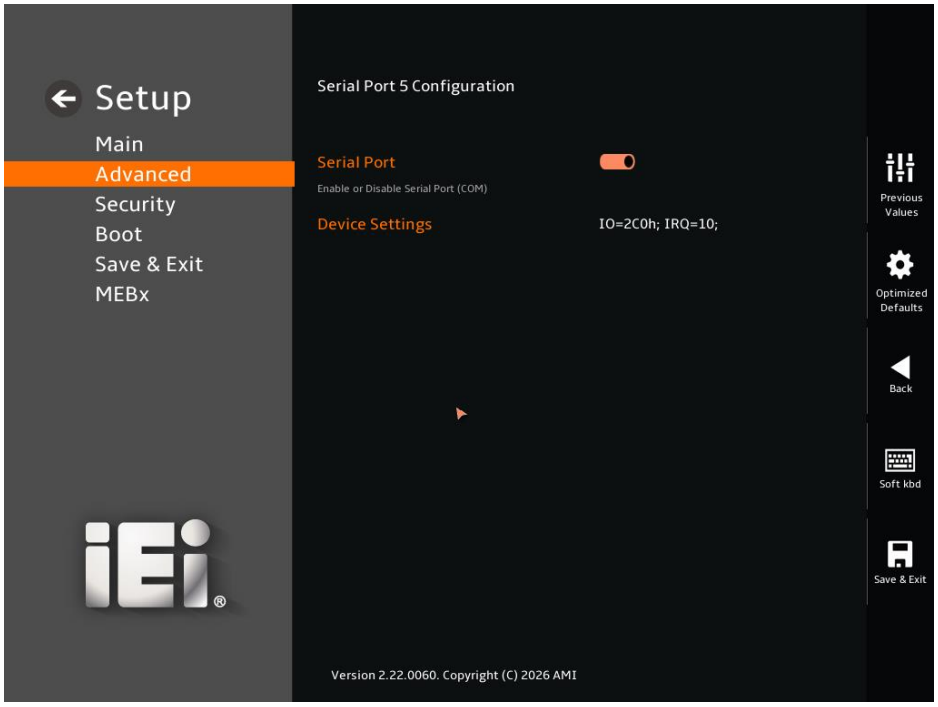
➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ **IO=2E8h; IRQ=10** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10

5.3.9.5 Serial Port 5 Configuration

Use the **Serial Port 5 Configuration** menu (**BIOS Menu 32**) to configure the serial port 5.



BIOS Menu 32: Serial Port 5 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

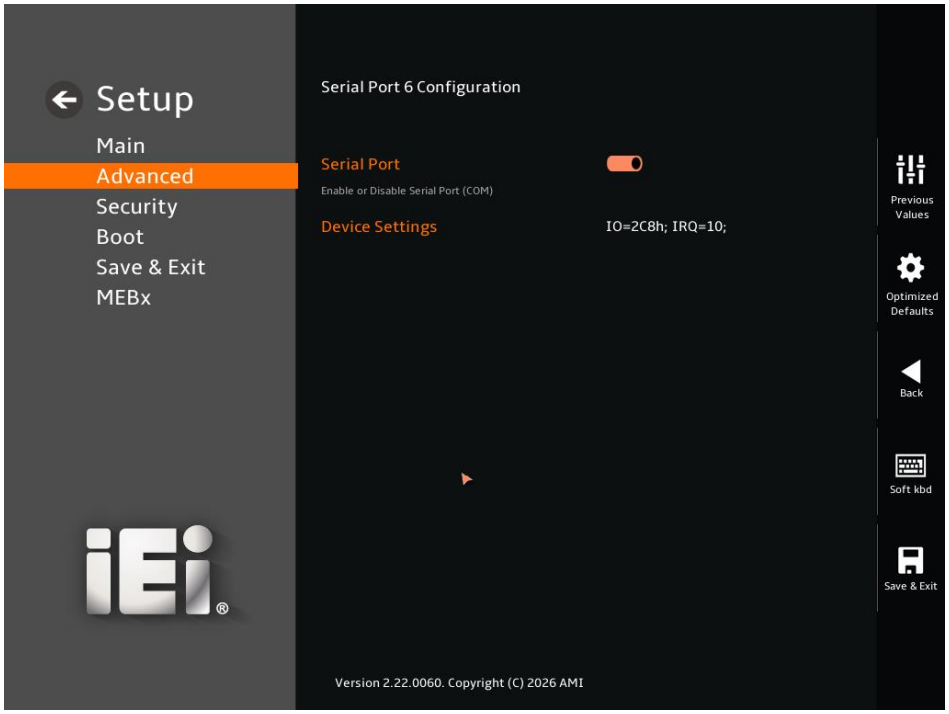
➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

➔ **IO=2C0h; IRQ=10** Serial Port I/O port address is 2C0h and the interrupt address is IRQ10

5.3.9.6 Serial Port 6 Configuration

Use the **Serial Port 6 Configuration** menu (**BIOS Menu 33**) to configure the serial port 6.



BIOS Menu 33: Serial Port 6 Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

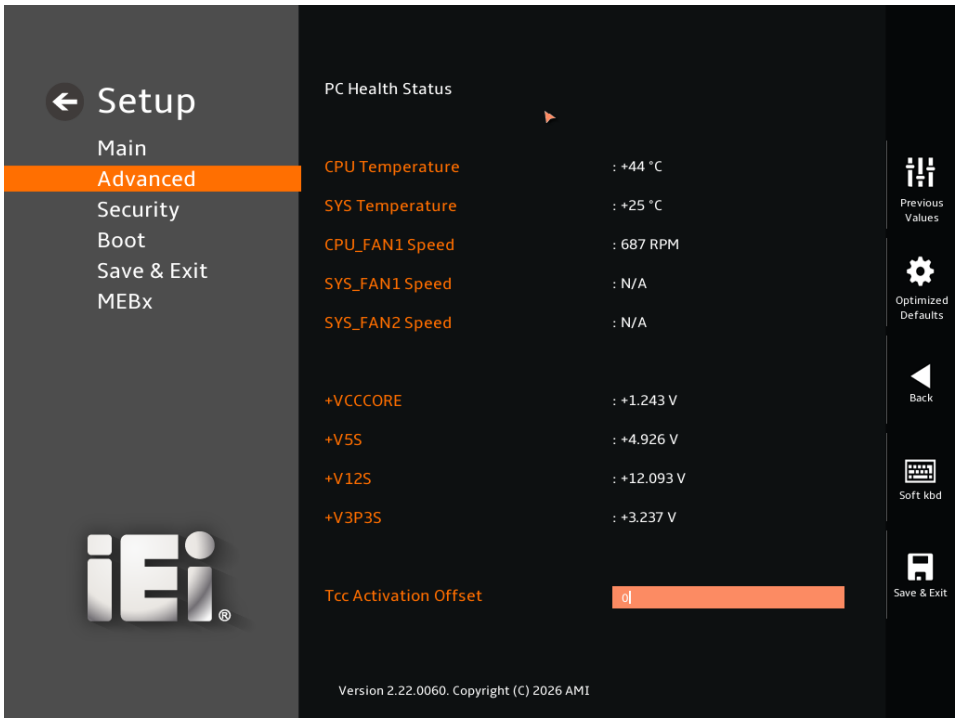
➔ **Device Settings**

The **Device Settings** option shows the serial port IO port address and interrupt address.

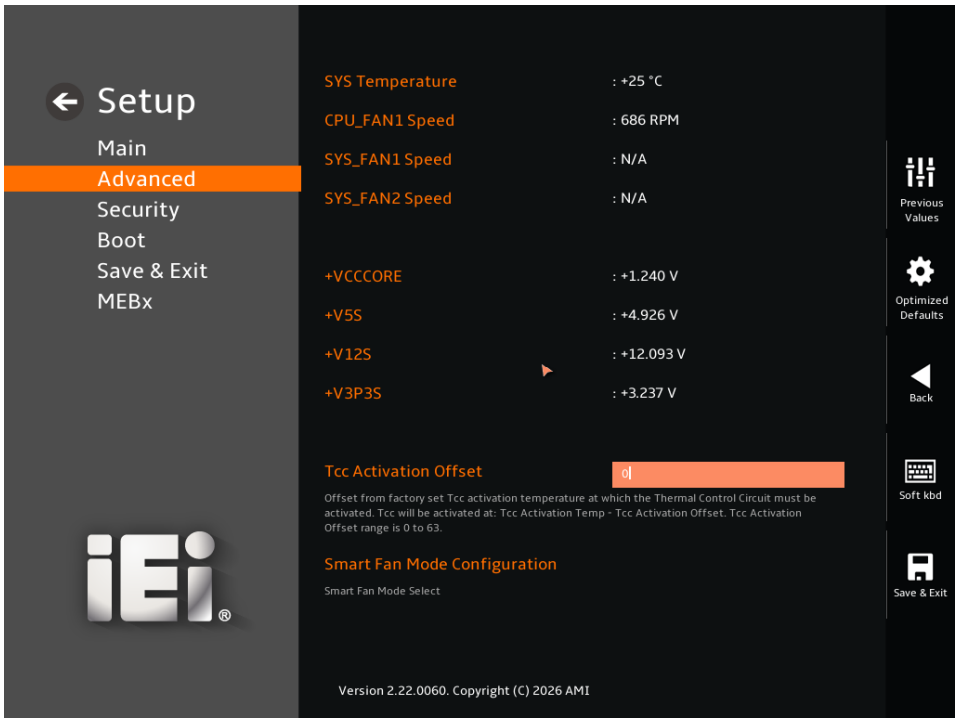
➔ **IO=2C8h; IRQ=10** Serial Port I/O port address is 2C8h and the interrupt address is IRQ10

5.3.10 EC ITE5571 Monitor

The **EC ITE5571 Monitor** menu (**BIOS Menu 34**) contains the smart fan mode configuration submenu and shows the state of H/W real-time operating temperature, fan speeds and system voltages.



BIOS Menu 34: EC ITE5571 H/W Monitor (1/2)



BIOS Menu 35: EC ITE5571 H/W Monitor (2/2)

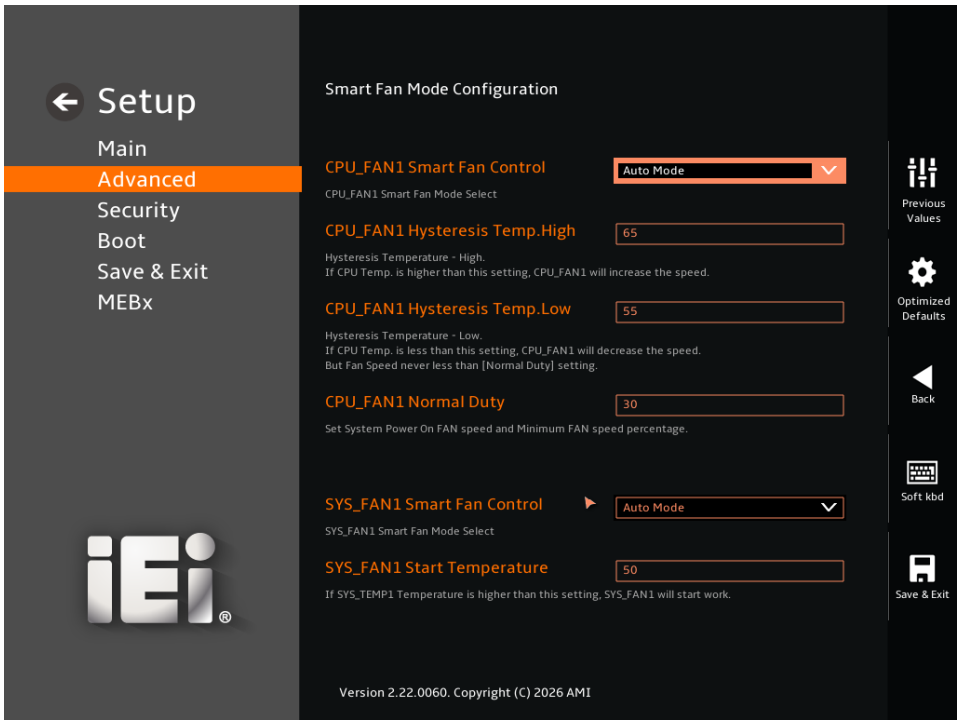
➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

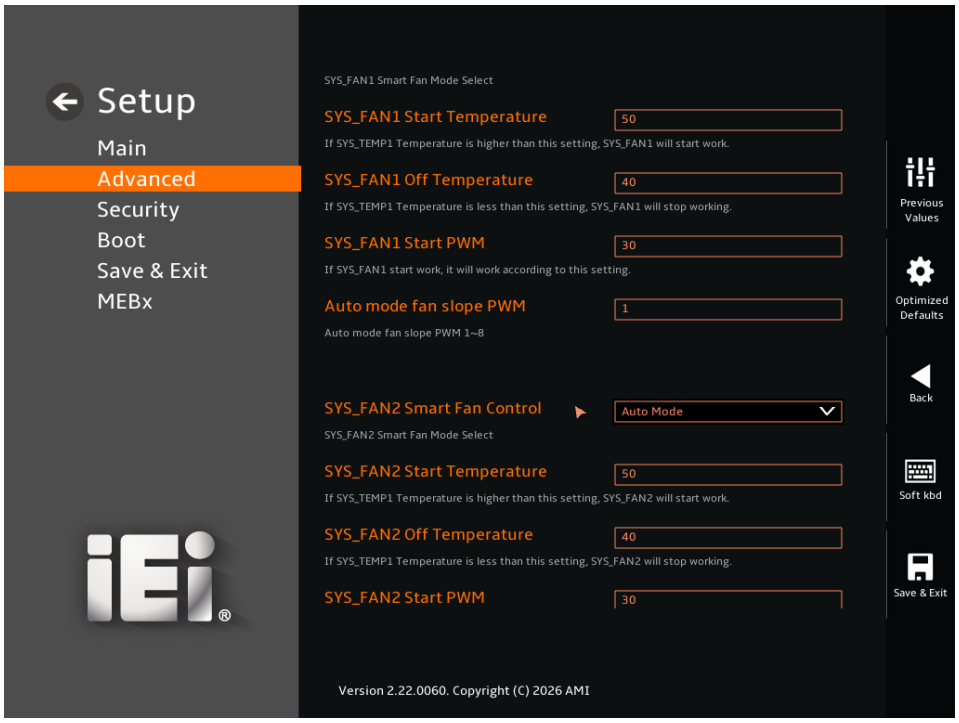
- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU_Fan1 Speed
  - SYS_Fan1 Speed
  - SYS_Fan2 Speed
- Voltages:
  - VCCCORE
  - +V5S
  - V12S
  - V3P3S

5.3.10.1 Smart Fan Mode Configuration

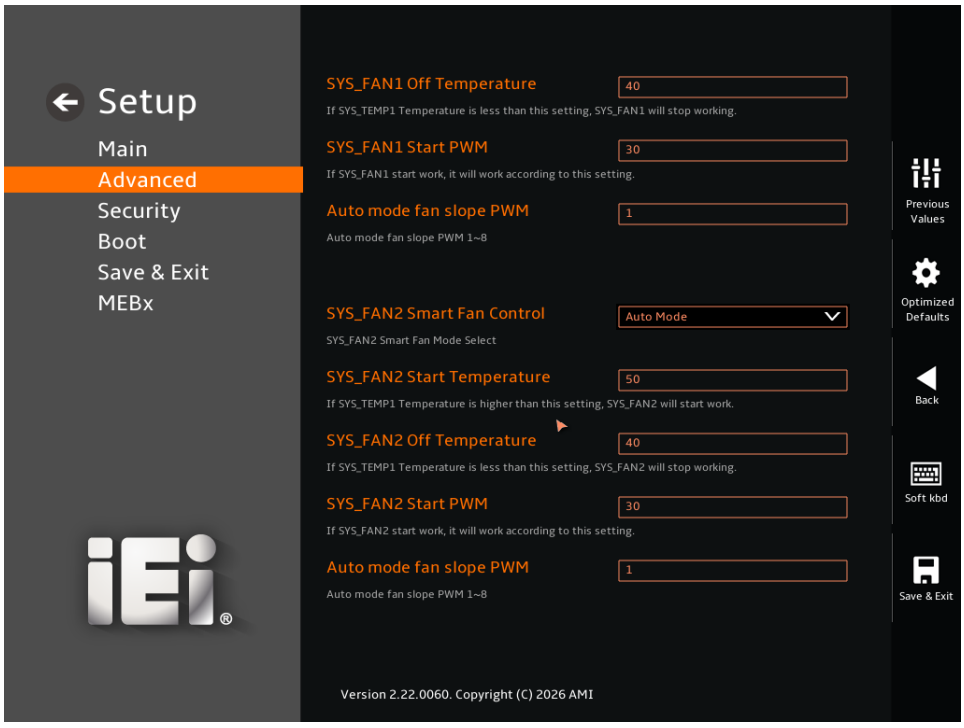
Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 36**) to configure the CPU/system fan start/off temperature and control mode.



BIOS Menu 36: Smart Fan Mode Configuration (1/3)



BIOS Menu 37: Smart Fan Mode Configuration（2/3)



BIOS Menu 38: Smart Fan Mode Configuration（3/3)

➔ **CPU_FAN1 Smart Fan Control [Auto Mode]**

Use the **CPU_FAN1 Smart Fan Control** option to configure the CPU Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings.
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto Mode settings.

➔ **CPU_FAN1 Hysteresis Temp.High [65]**

If the current CPU temperature is higher than this setting, CPU_FAN1 will increase the speed.

➔ **CPU_FAN1 Hysteresis Temp.Low [55]**

If the current CPU temperature is lower than this setting, CPU_FAN1 will decrease the speed. But fan speed never less than [Normal Duty] setting.

➔ **CPU_FAN1 Normal Duty [30]**

Use the **CPU_FAN1 Start PWM** option to set the system power on fan speed and minimum fan speed percentage. Use the + or – key to change the value or enter a decimal number .

➔ **SYS_FAN1 Smart Fan Control [Auto Mode]**

Use the **Smart Fan Control** option to configure the System Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings.
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto Mode settings.

➔ **SYS_FAN1 Start Temperature [50]**

If the System temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **SYS_FAN1 Off Temperature [40]**

If the System temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **SYS_FAN1 Start PWM [30]**

Use the **SYS_FAN1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan slop PWM [1]**

Use the **Auto mode fan slop PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 8.

➔ **SYS_FAN2 Smart Fan Control [Auto Mode]**

Use the **SYS_FAN1 Smart Fan Control** option to configure the System Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings.
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto Mode settings.

➔ **SYS_FAN2 Start Temperature**

If the System temperature is between **fan off** and **fan start**, the fan speed change to **fan start PWM**. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **SYS_FAN2 Off Temperature**

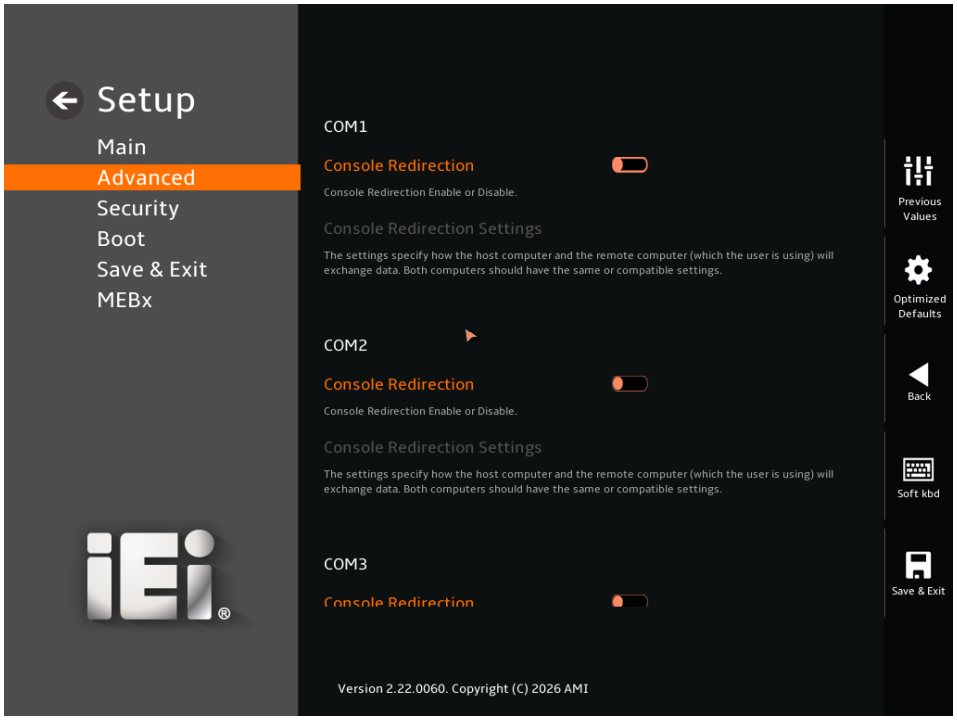
If the System temperature is lower than the value set this option, the fan speed change to be lowest. To set a value, Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **SYS_FAN2 Start PWM**

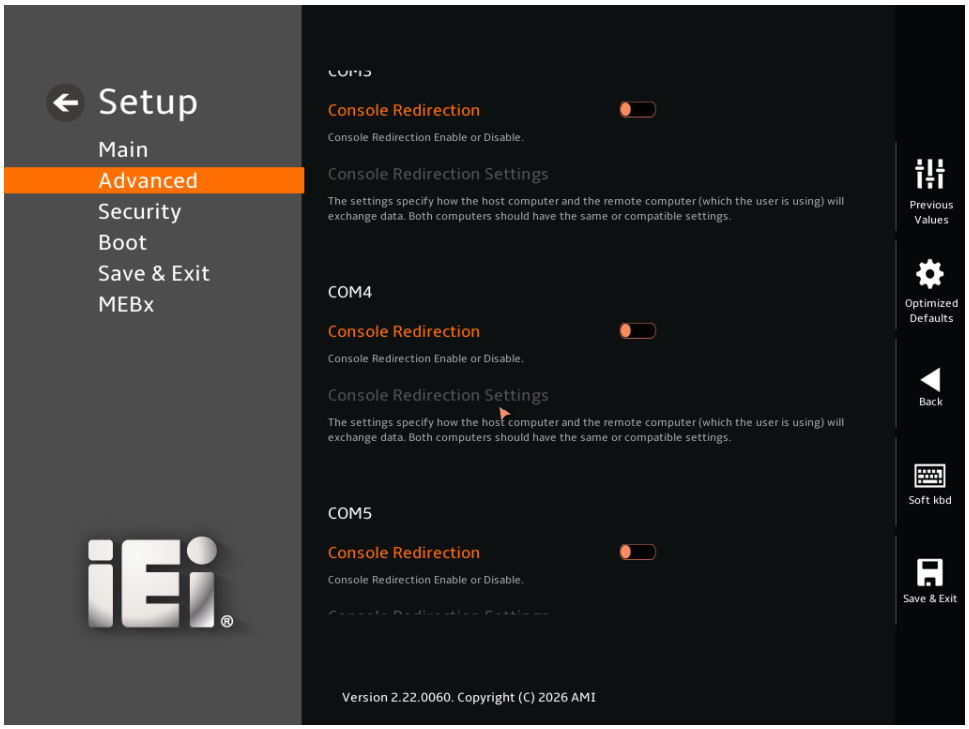
Use the **SYS_Fan1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

5.3.11 Serial Port Console Redirection

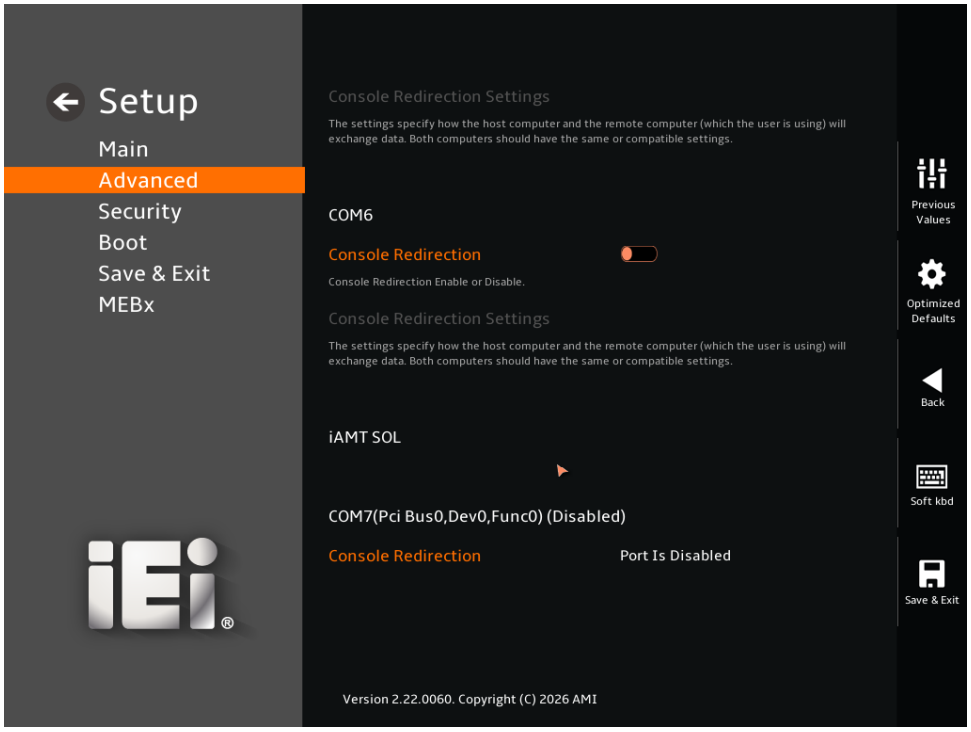
The **Serial Port Console Redirection** menu (**BIOS Menu 39**) allows the console redirection options to be configured. Console Redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 39: Serial Port Console Redirection (1/3)



BIOS Menu 40: Serial Port Console Redirection (2/3)



BIOS Menu 41: Serial Port Console Redirection (3/3)

➔ **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled**	**DEFAULT**	Disabled the console redirection function
➔ **Enabled**		Enabled the console redirection function

The **Console Redirection Settings** submenu will be available when the **Console Redirection** option is enabled.

5.3.11.1 Console Redirection Settings

The following options are available in the **Console Redirection Settings** submenu (**BIOS Menu 42**) when the **COM Console Redirection** (for COM1 to COM6) option is enabled.

BIOS Menu 42: COM Console Redirection Settings

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** option to specify the remote terminal type.

- ➔ **VT100** — The target terminal type is VT100
- ➔ **VT100+** — The target terminal type is VT100+
- ➔ **VT-UTF8** — The target terminal type is VT-UTF8
- ➔ **ANSI** **DEFAULT** — The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match on the other side. Long or noisy lines may require lower speeds.

- ➔ **9600** — Sets the serial port transmission speed at 9600.
- ➔ **19200** — Sets the serial port transmission speed at 19200.
- ➔ **38400** — Sets the serial port transmission speed at 38400.
- ➔ **57600** — Sets the serial port transmission speed at 57600.
- ➔ **115200** **DEFAULT** — Sets the serial port transmission speed at 115200.

➔ **Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

- ➔ **7** — Sets the data bits at 7.
- ➔ **8** **DEFAULT** — Sets the data bits at 8.

➔ **Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- ➔ **None** **DEFAULT** — No parity bit is sent with the data bits.
- ➔ **Even** — The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** — The parity bit is 0 if the number of ones in the data bits is odd.

➔ **Mark**		The parity bit is always 1. This option does not allow for error detection.
➔ **Space**		The parity bit is always 0. T This option does not allow for error detection.

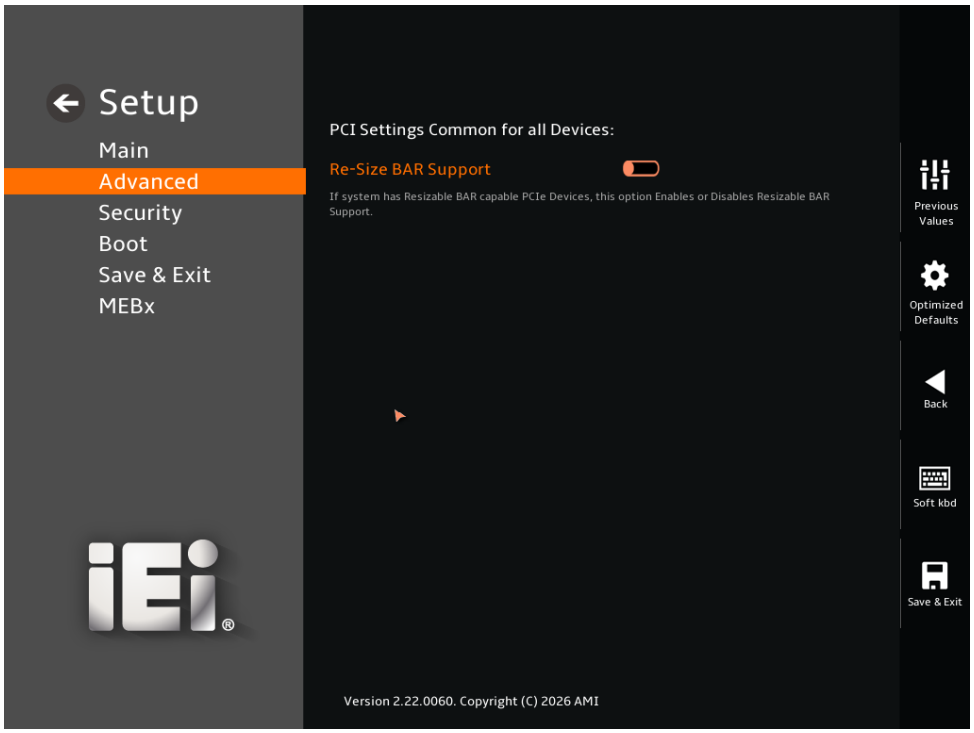
➔ **Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

➔ **1**	**DEFAULT**	Sets the number of stop bits at 1.
➔ **2**		Sets the number of stop bits at 2.

5.3.12 PCI Subsystem Settings

Use the **Subsystem Settings** (**BIOS Menu 43**) menu to enable resizable BAR support.



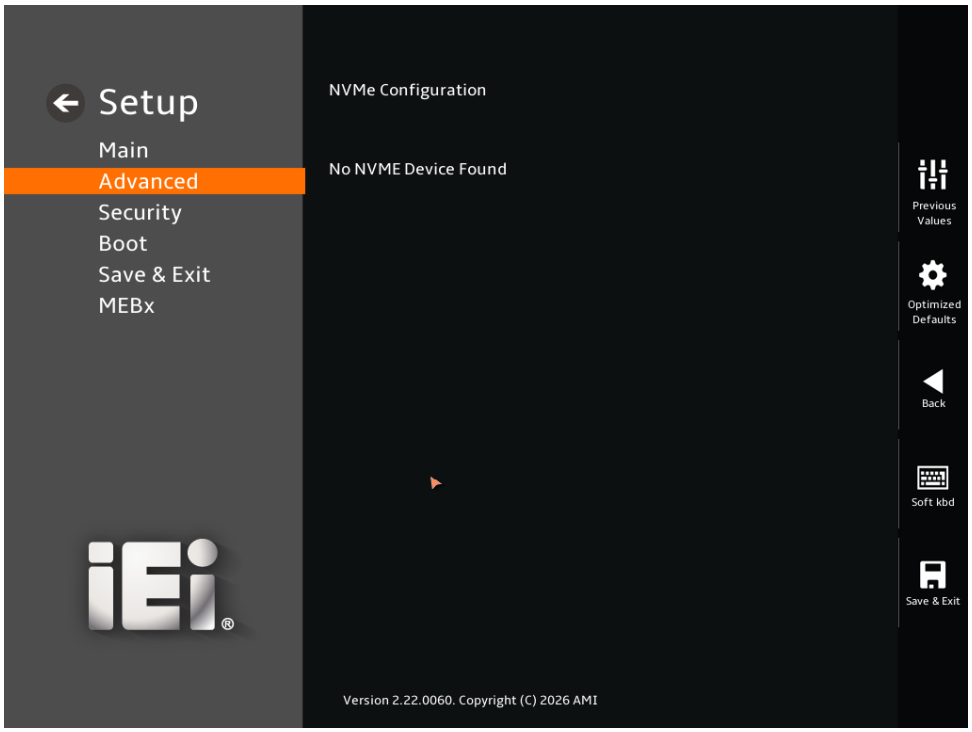
BIOS Menu 43: PCI Subsystem Settings

➔ **Re-Size BAR Support**

Use the **Re-Size BAR Support** option to enable or disable Resizable BAR support for PCIe devices that support this feature.

5.3.13 NVMe Configuration

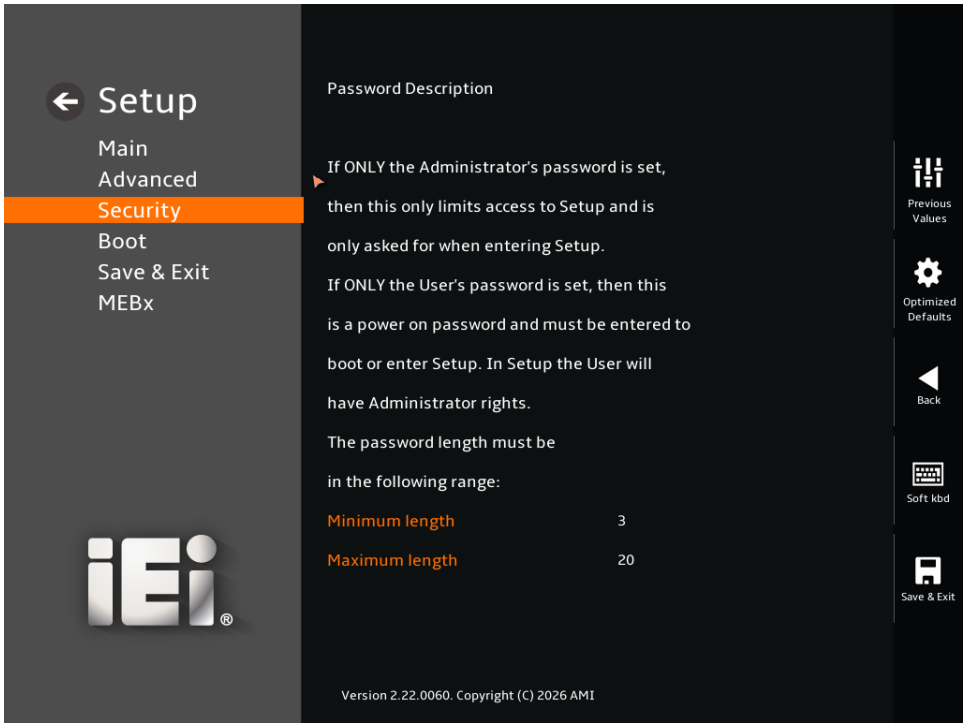
Use the **NVMe Configuration** (**BIOS Menu 44**) menu to display the NVMe controller and device information.



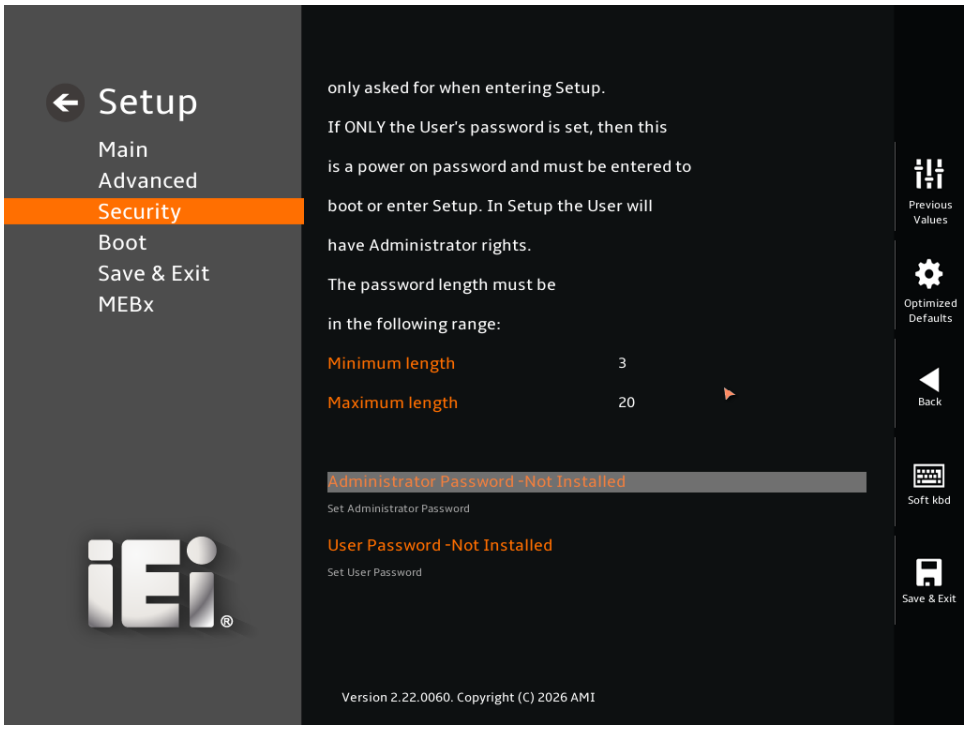
BIOS Menu 44: NVMe Configuration

5.4 Security

Use the **Security** menu (**BIOS Menu 45**) to set system and user passwords.



BIOS Menu 45: Security (1/2)



BIOS Menu 46: Security (2/2)

➔ **Administrator Password**

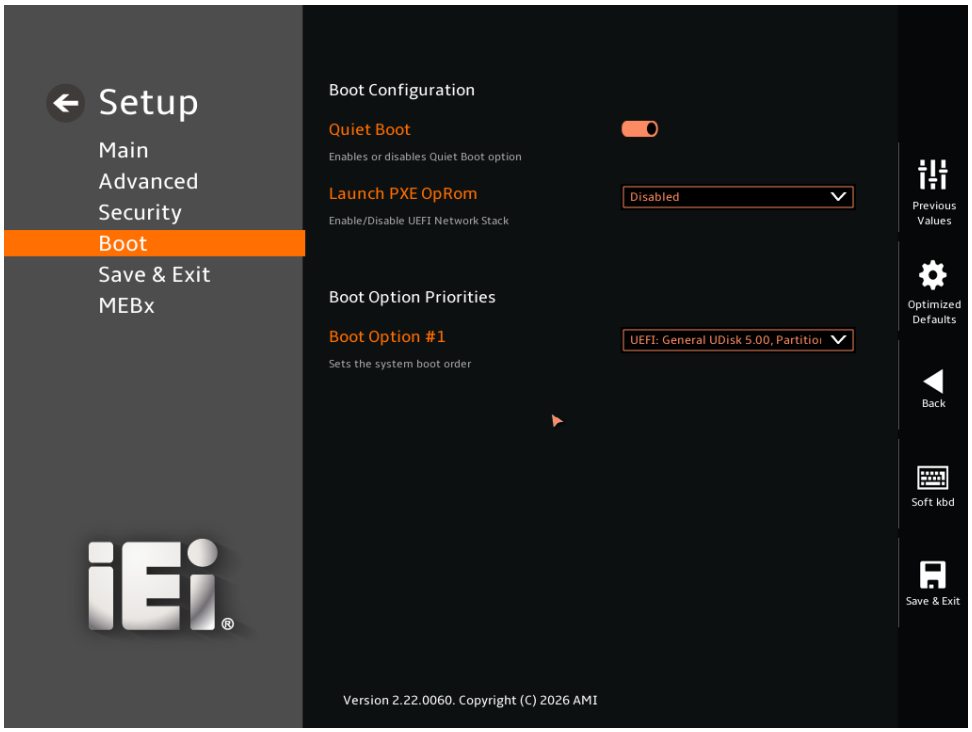
Use the **Administrator Password** to set or change an administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

5.5 Boot

Use the **Boot** menu (**BIOS Menu 47**) to configure system boot options.



BIOS Menu 47: Boot

5.5.1 Boot Configuration

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔	**Disabled**		Normal POST messages displayed
➔	**Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- ➔ **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- ➔ **Enabled** Load PXE Option ROMs.

➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

- ➔ **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- ➔ **Keep Current** Sets display mode to current.

5.5.2 Boot Option Priorities

Use the Boot Option # N to choose the system boots from the peripherals you selected. The following Boot Options are listed as an example.

➔ **Boot Option #1**

Sets the system boot order **ADATA SP580** as the first priority.

- ➔ **Windows Boot Manager (P1: ADATA SSD SP580 240GB)**
- ➔ **Disabled**

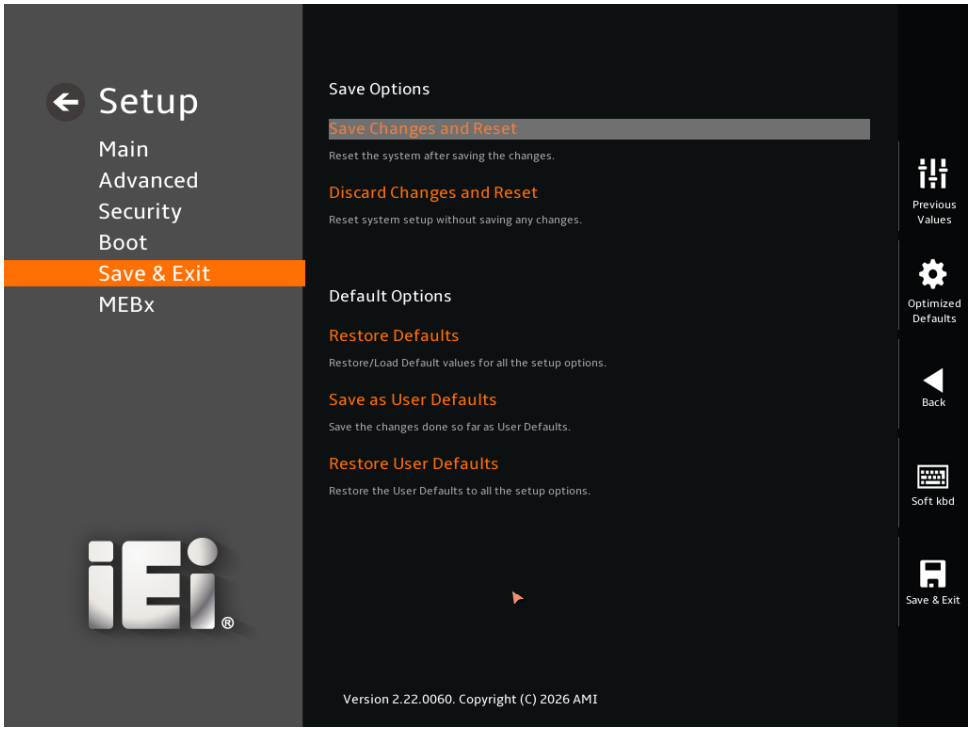
➔ **Boot Option #2**

Sets the system boot order **USB Partition 1** as the second priority.

- ➔ **UEFI: USB, Partition 1**
- ➔ **Disabled**

5.6 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 48**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 48: Save & Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

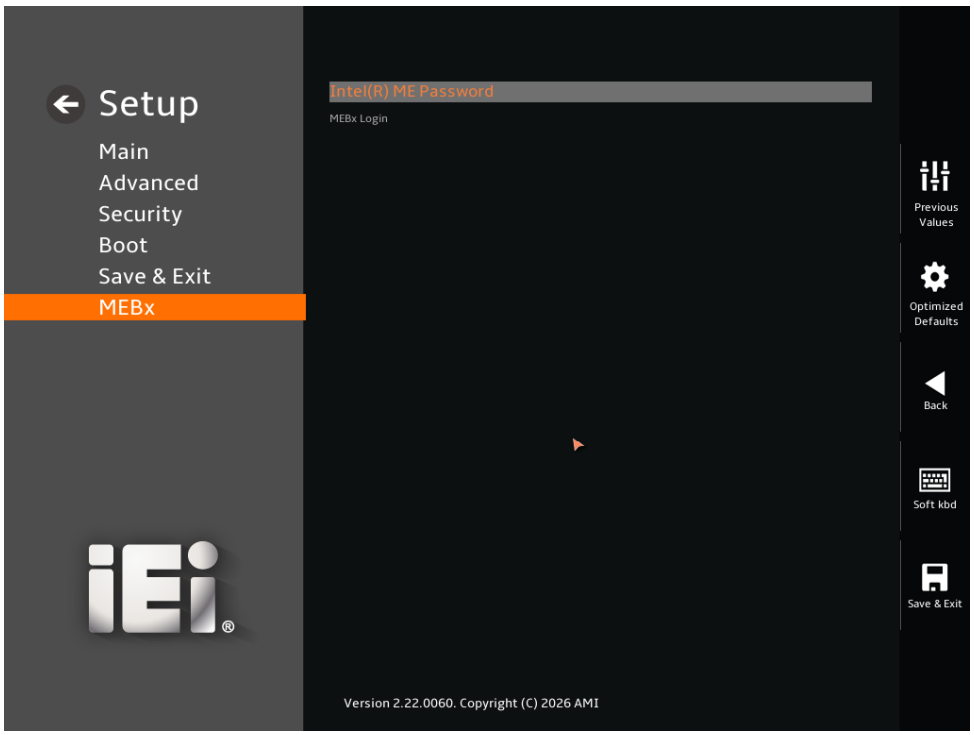
Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

5.7 MEBX

Use the **MEBX** menu (**BIOS Menu 49**) to login MEBx.



BIOS Menu 49: MEBX

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

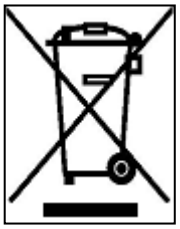
Product Disposal

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

E

Error Beep Code

E.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

E.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

F

Hazardous Materials Disclosure

F.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.

F.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

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)
壳体	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。

5.8

5.9