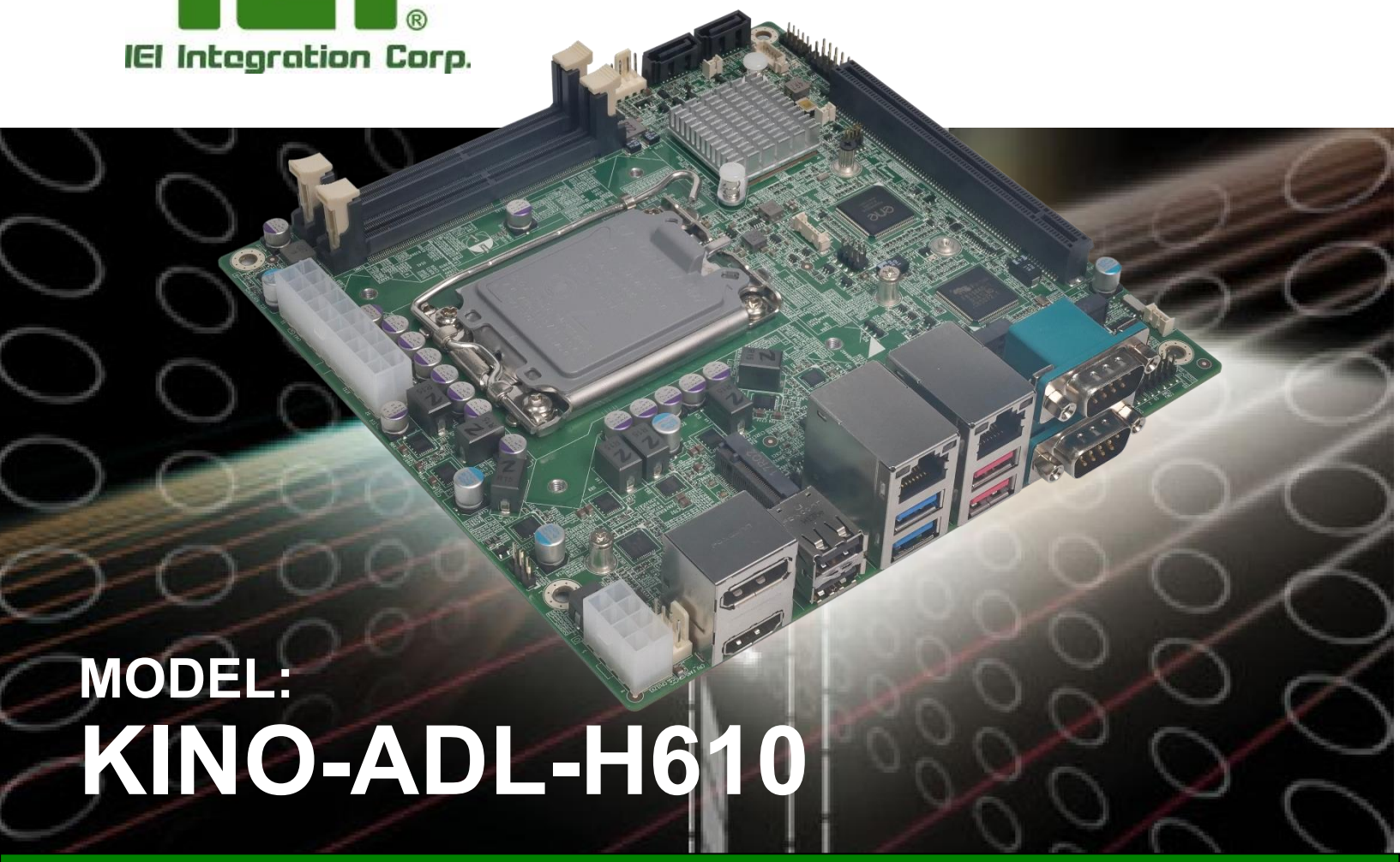
IEI Integration Corp.



MODEL:

KINO-ADL-H610

Mini-ITX SBC supports LGA1700 Intel® 12th/13th Generation Core™ i9/i7/i5/i3, Pentium® and Celeron® processor, DDR4, triple independent displays, dual 2.5GbE LAN, USB 3.2, SATA 6Gb/s and RoHS

User Manual

Rev. 1.00 – April 27, 2023

RoHS Lead Free

Revision

Date	Version	Changes
April 27, 2023	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

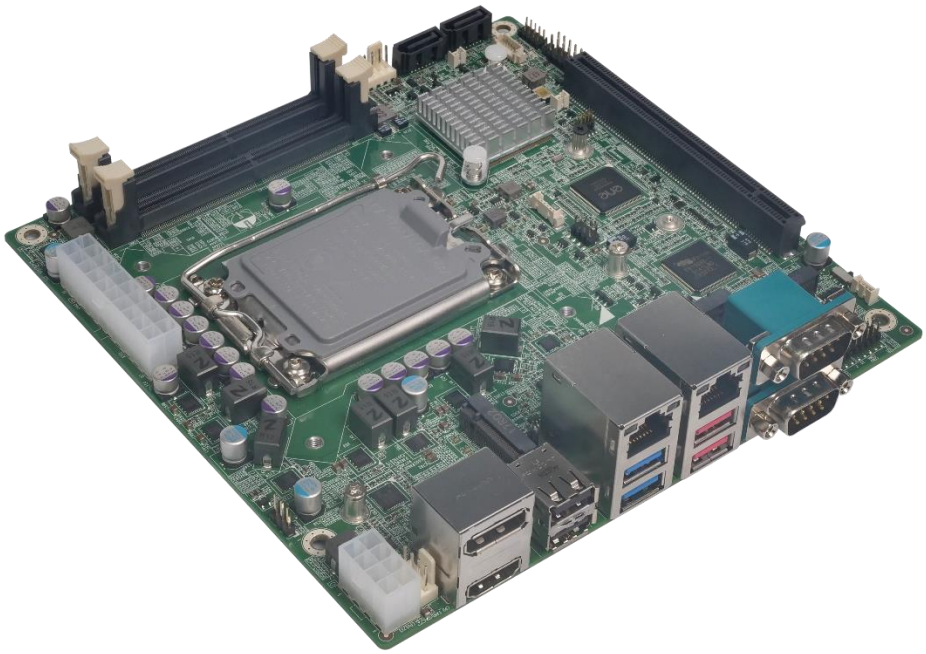


Figure 1-1: KINO-ADL-H610

The KINO-ADL-H610 is a Mini-ITX motherboard. It accepts a Socket LGA1700 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor and supports two 260-pin 3200 MHz dual-channel DDR4 SDRAM unbuffered SO-DIMM supporting up to 64GB.

The KINO-ADL-H610 provides two 2.5 GbE interfaces through the Intel® I225V PCIe 2.5 GbE controllers. The integrated Intel® H610/H610E chipset supports two SATA 6Gb/s drives, one M.2 (2242/2280) M key slot supporting PCIe x4 signal and one M.2 2230 A-key slot supporting PCIe x1 and USB 2.0 signals. In addition, the KINO-ADL-H610 includes one HDMI port, one DP port and one iDPM slot for triple independent displays.

Expansion and I/O include one PCIe Gen4 x16 slot, two USB 3.2 Gen2 two USB 3.2 Gen1 on the rear panel, two USB 2.0 ports on the rear I/O and two USB 2.0 by pin headers, two RS-232/422/485 DB-9 ports and four RS-232 pin headers. iAUDIO Supports 7.1 channel HD audio by IEI AC-KIT-888S kit module.

1.2 Features

Some of the KINO-ADL-H610 motherboard features are listed below:

- Mini-ITX form factor
- 12th generation LGA1700 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® processor supported
- Intel® H610/H610E chipset
- Two 260-pin 3200 MHz dual-channel unbuffered DDR4 SO-DIMMs supported (system max. 64 GB)
- Two 2.5 GbE connectors via Intel ® I225V PCIe 2.5GbE controllers
- Triplel independent display by one HDMI port, one DP port and iDPM slot
- Two SATA 6Gb/s connectors
- One M.2 (2242/2280) M-key slot supporting PCIe x4 signal; one M.2 2230 A-key slot supporting PCIe x1 and USB 2.0 signals
- One PCIe 4.0 x16 slot
- Two USB 3.2 Gen2 and two USB 3.2 Gen1 on the rear panel
- Two USB 2.0 ports on the rear I/O and two USB 2.0 by pin headers
- Two RS-232/422/485 serial ports on the rear I/O
- Four RS-232 serial ports via internal pin headers
- iDPM only for IEI eDP/LVDS/VGA module
- RoHS compliant

1.3 Connectors

The connectors on the KINO-ADL-H610 are shown in the figure below.

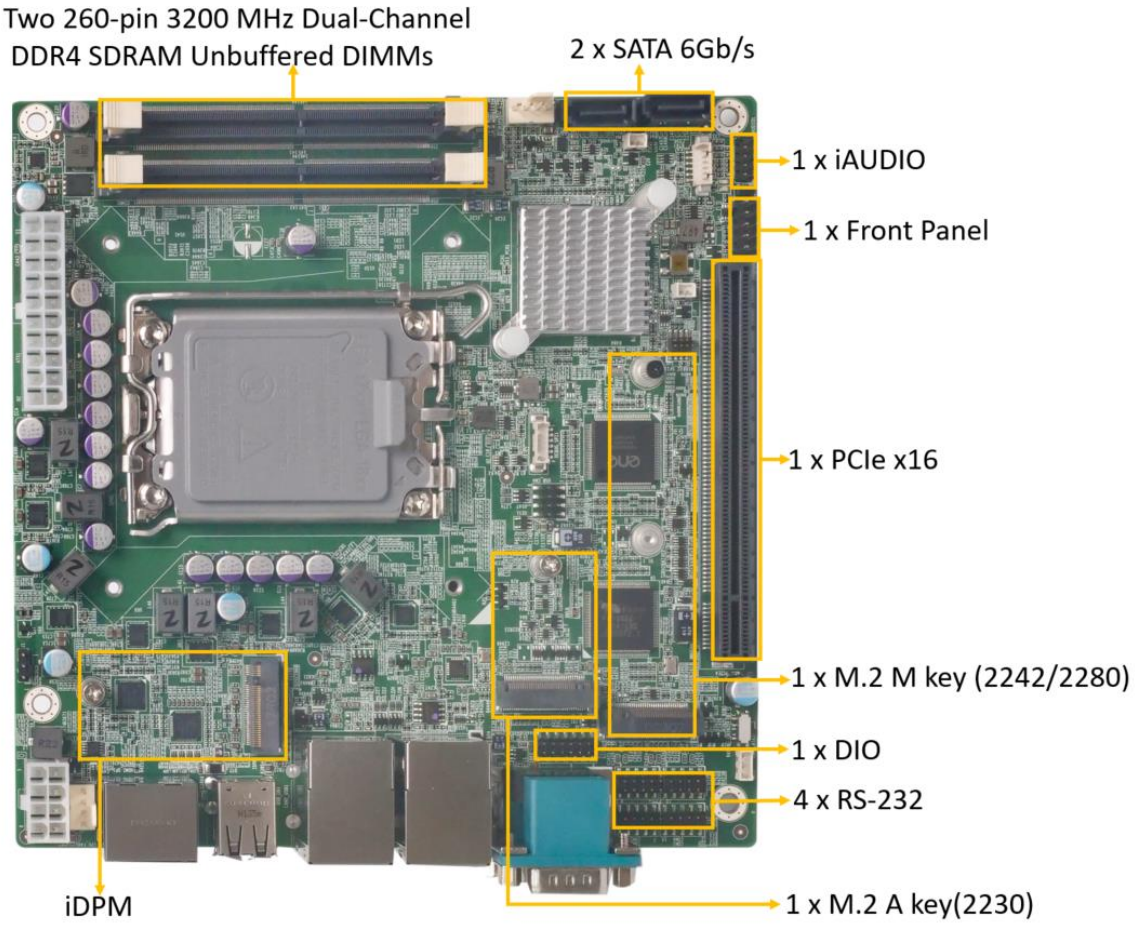


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the KINO-ADL-H610 are shown in the diagram below.

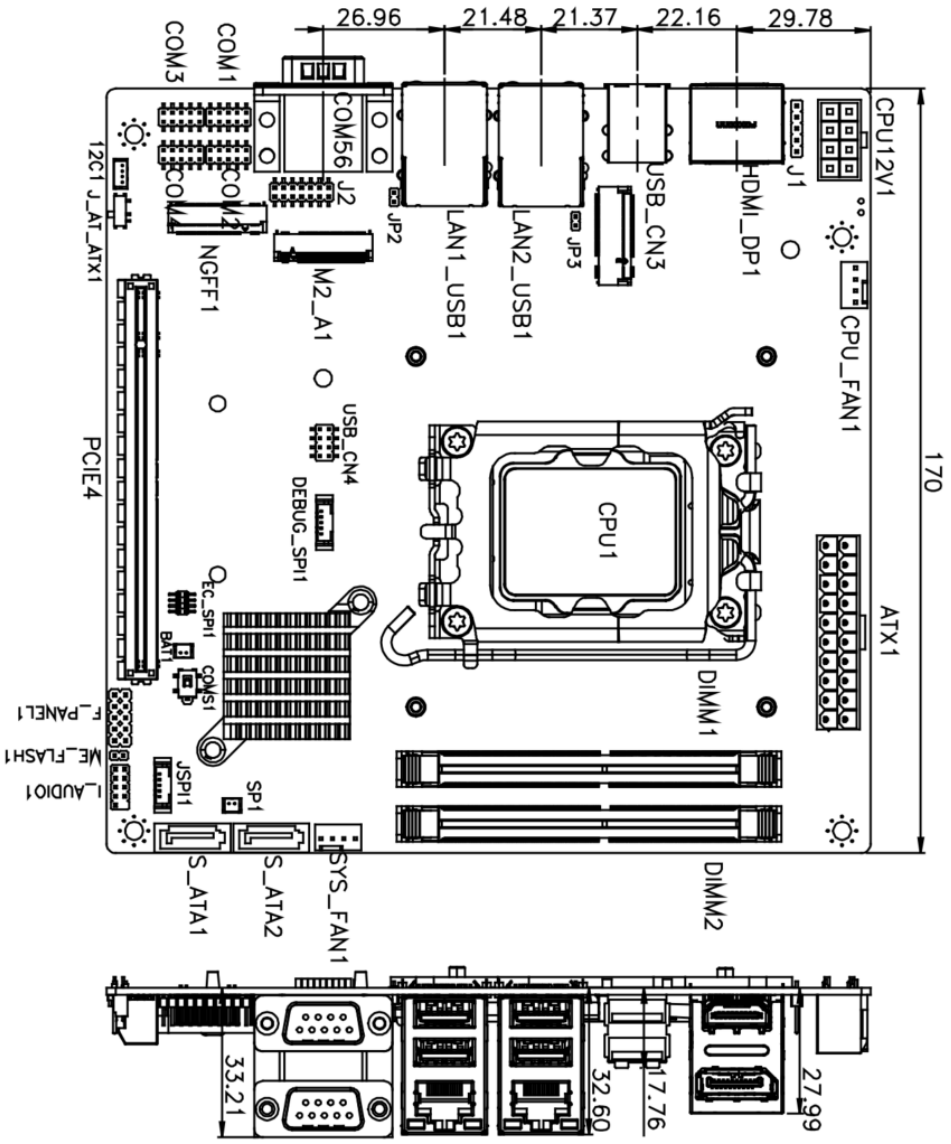


Figure 1-3: KINO-ADL-H610 Dimensions (mm)

1.5 Data Flow

The following diagram shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

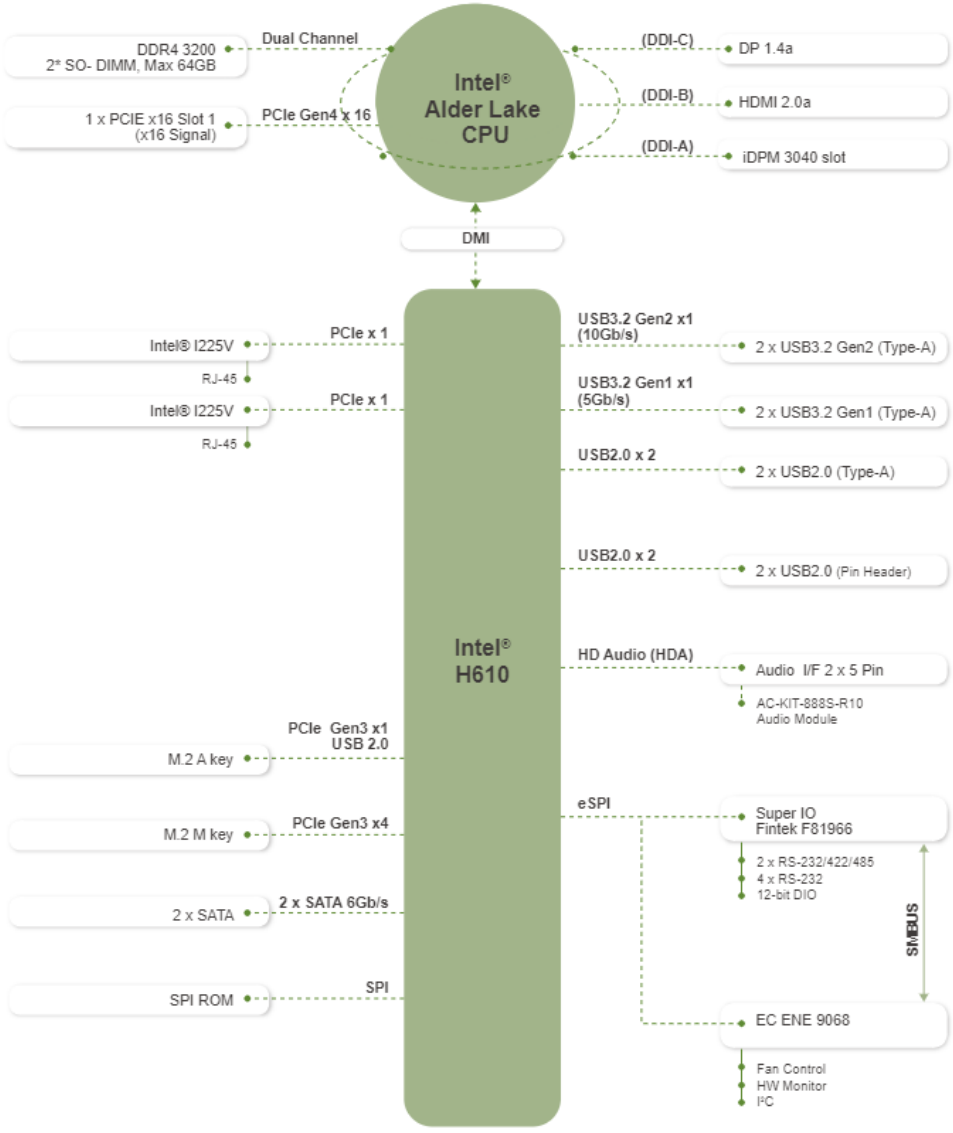


Figure 1-4: Data Flow

1.6 Technical Specifications

The KINO-ADL-H610 technical specifications are listed below.

Specification/Model	KINO-ADL-H610
Form Factor	Mini-ITX
CPU Supported	12th generation LGA1700 Intel® Core™ i9/i7/i5/i3, Pentium® or Celeron® CPU (up to 65 W)
PCH	Intel® H610/H610E
Memory	Two 260-pin 3200 MHz dual-channel unbuffered DDR4 SDRAM SO-DIMMs supported (system max. 64 GB)
Graphics Engine	Intel® UHD Graphics
Display Output	Supports triple independent displays One HDMI 2.0 port (up to 4096 x 2304@60Hz) One DP 1.4 port (up to 4096 x 2304 @60Hz) One iDPM slot (only for IEI eDP/LVDS/VGA module)
Ethernet Controllers	Two Intel ® I225V 2.5 GbE controller
Audio	1 x iAUDIO (2x5 pin,P=2.0) Support 7.1 channel HD audio by IEI AC-KIT-888S kit module
BIOS	AMI UEFI BIOS
Super I/O Controller	Fintek F81966D-I(D)
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansions	One PCIe x16 slot (Gen 4) One M.2 M key (2242/2280) w/ SIM holder (PCIe Gen 3 x4 signal) One M.2 A key (2230) (PCIe Gen 3 x1 and USB 2.0 signals)
I/O Interface Connectors	
Digital I/O	12-bit digital I/O
Ethernet	Two RJ-45 2.5 GbE ports

Fan	One 4-pin CPU smart fan and one 4-pin system smart fan connector
Front Panel	One 10-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, LAN2 LED
Serial ATA	Two SATA 6Gb/s connectors (no RAID)
Serial Ports	Two RS-232/422/485 DB-9 on rear panel Four RS-232 via internal 10-pin header
USB 2.0	Two USB 2.0 ports via internal pin headers Two USB 2.0 on rear panel
USB 3.2	Two USB 3.2 Gen1 (5Gb/s) and two USB 3.2 Gen2 (10Gb/s) ports on rear panel
Environmental and Power Specifications	
Power Supply	One internal ATX power connector (20-pin) One internal CPU power connector (8-pin) AT/ATX power support ErP/EuP compliant
Power Consumption	3.3V@0.96A, 5V@6.49A, 12V@5.95A, 5VSB@1.05A (Intel® Core™ i9-12900E CPU with two 16 GB 3200 MHz DDR4 memory, max. loading, EuP mode enabled)
Operating Temperature	0ºC ~ 60ºC
Storage Temperature	-30ºC ~ 70ºC
Operating Humidity	5% ~ 95% (non-condensing)
Safety	Compliant with CE/FCC certification
Physical Specifications	
Dimensions	170 mm x 170 mm

Weight (GW/NW)	900 g / 400 g

Table 1-1: KINO-ADL-H610 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 KINO-ADL-H610 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 KINO-ADL-H610 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

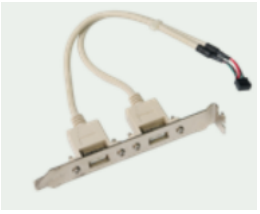
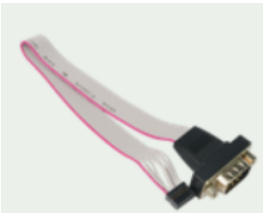
The KINO-ADL-H610 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-ADL-H610 single board computer	
1	SATA and power 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 USB cable (wo bracket) (**P/N**: CB-USB02A-RS)	
RS-232 cable (**P/N:** 32205-002700-200-RS)	
SATA power cable (**P/N**: 32102-000100-200-RS)	
High-performance LGA1700 cooler kit (1U chassis compatible, 65W) (**P/N**: 19100-000319-00-RS)	
LGA1700 cooler kit (125W) (**P/N**: 19100-000327-00-RS)	

Item and Part Number	Image
LGA1700 cooler kit (125W) (**P/N**: 19100-000328-00-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 KINO-ADL-H610 Layout

The figure below shows all the peripheral interface connectors.

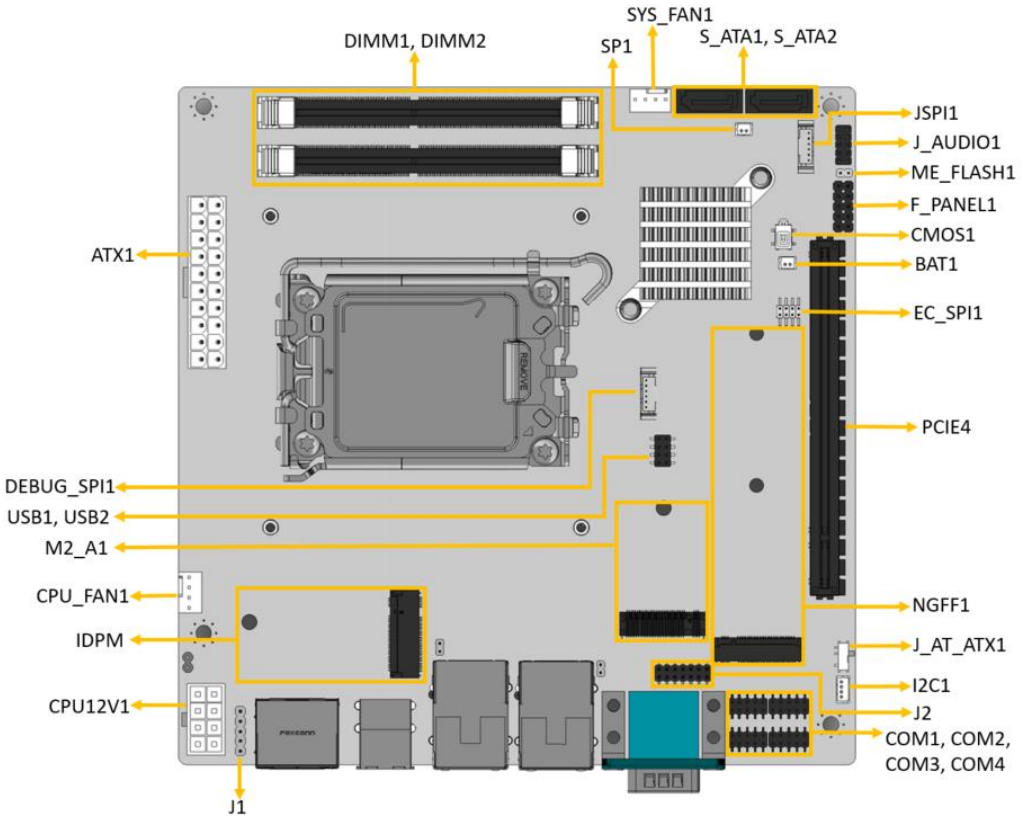


Figure 3-1: Peripheral Interface Connectors (Front Side)

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin header	AUDIO1
RTC battery connector	2-pin wafer	BAT1
Buzzer connector	2-pin wafer	SP1
DDR4 SO-DIMM sockets	260-pin DDR4 SO-DIMM	DIMM1, DIMM2
Digital I/O connector	14-pin header	J2
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	4-pin wafer	SYS_FAN1
Front panel connector	10-pin header	F_PANEL1
I2C connector	4-pin wafer	I2C1
Internal power connector	20-pin Molex	ATX1
Internal power connector	8-pin Molex	CPU12V1
LAN LED connectors	2-pin header	JP2, JP3
M.2 slot, A-key	M.2 A-key slot	M2_A1
M.2 slot, M-key	M.2 M-key slot	NGFF1
IEI iDPM slot	iDPM slot	IDPM
PCIe x16 slot	PCIe x16 slot	PCIE4
RS-232 serial port	10-pin header	COM1, COM2, COM3, COM4
SATA 6Gb/s drive connectors	7-pin SATA connector	S_ATA1, S_ATA2
Chassis intrusion connector	2-pin header	CHASSIS1
SPI flash connector	6-pin wafer	JSPI1
SPI flash connector, EC	8-pin wafer	EC_SPI1
EC debug	6-pin wafer	DEBUG_SPI1
VR power IC debug connector	5-pin header	J1

Connector	Type	Label
Flash descriptor security override jumper	2-pin header	ME_FLASH1
USB 2.0 connectors	8-pin header	USB1, USB2
Clear CMOS switch	switch	CMOS1
AT/ATX Power Mode switch	switch	J_AT_ATX1

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
Ethernet and USB 3.2 Gen2 ports	RJ-45 & USB 3.2 Gen2 combo	LAN1_USB1,
Ethernet and USB 3.2 Gen1 ports	RJ-45 & USB 3.2 Gen1 combo	LAN2_USB1
USB 2.0 ports	USB 2.0 combo	USB_CN3
HDMI and DP connectors	HDMI & DP	HDMI_DP1
RS-232/422/485 serial port	DB-9 male	COM56

Table 3-2: External Peripheral Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the KINO-ADL-H610.

3.2.1 Audio Connector

CN Label: **J_AUDIO1**

CN Type: 10-pin header, p=2.0 mm

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

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

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

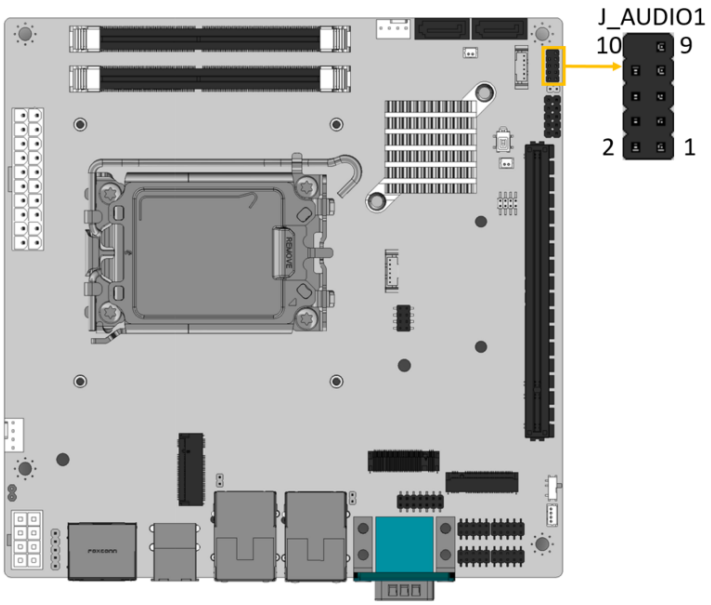


Figure 3-2: Audio Connector Location

Pin	Description	Pin	Description
1	HDA_SYNC_R	2	HDA_BCLK_R
3	HDA_SDO_R	4	HDA_PCBEEPC
5	HDA_SDI_0_R	6	HDA_RST_R
7	+5V	8	GND
9	+12V	10	GND

Table 3-3: Audio Connector Pinouts

3.2.2 RTC battery connector

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.

NOTE:

It is recommended to attach the RTC battery onto the system chassis in which the KINO-ADL-H610 is installed.

CN Label:	**BAT1**
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-3**
CN Pinouts:	See **Table 3-4**

A system battery is placed in the battery holder. The battery provides power to the system clock to retain the time when power is turned off.

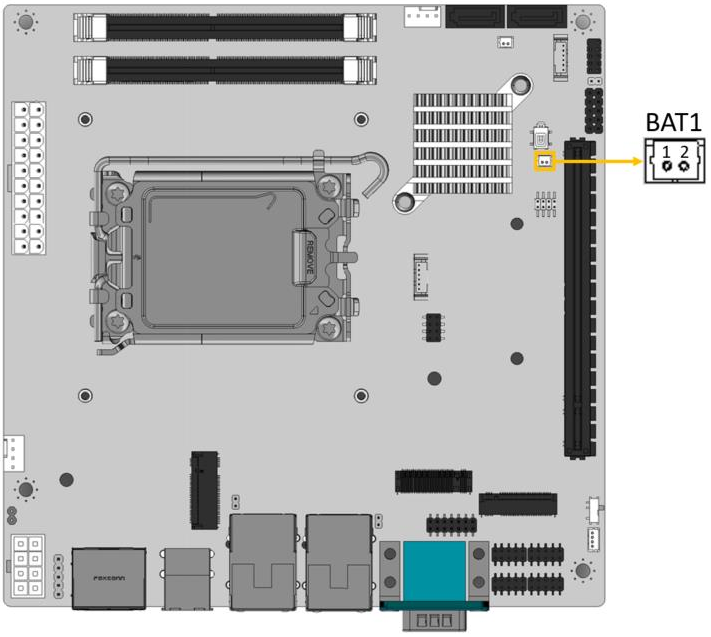


Figure 3-3: Battery Connector Location

Pin	Description
1	VBATT
2	Ground

Table 3-4: Battery Connector Pinouts

3.2.3 Buzzer Connector

NOTE:

If you cannot find a good place to put a buzzer on the KINO-ADL-H610, it is recommended to attach the buzzer onto the system chassis in which the KINO-ADL-H610 is installed.

CN Label:	**SP1**
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-4**
CN Pinouts:	See **Table 3-5**

The buzzer connector is connected to a buzzer.

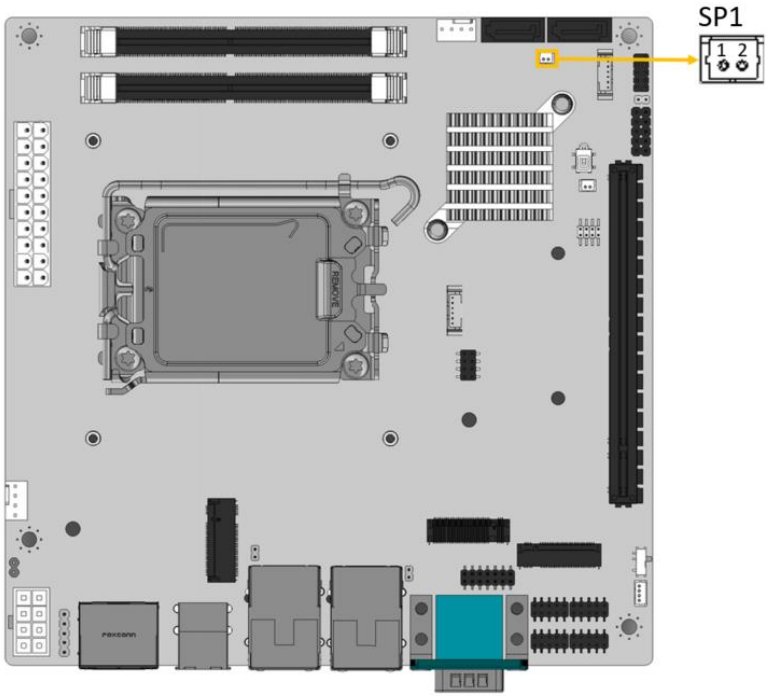


Figure 3-4: Buzzer Connector Location

Pin	Description
1	+5V
2	PC_BEEP_N

Table 3-5: Buzzer Connector Pinouts

3.2.4 DDR4 SO-DIMM Sockets

CAUTION:

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

CN Label:	**DIMM1, DIMM2**
CN Type:	260-pin DDR4 SO-DIMM socket
CN Location:	See **Figure 3-5**

The SO-DIMM slots are for installing the DDR4 SO-DIMMs.

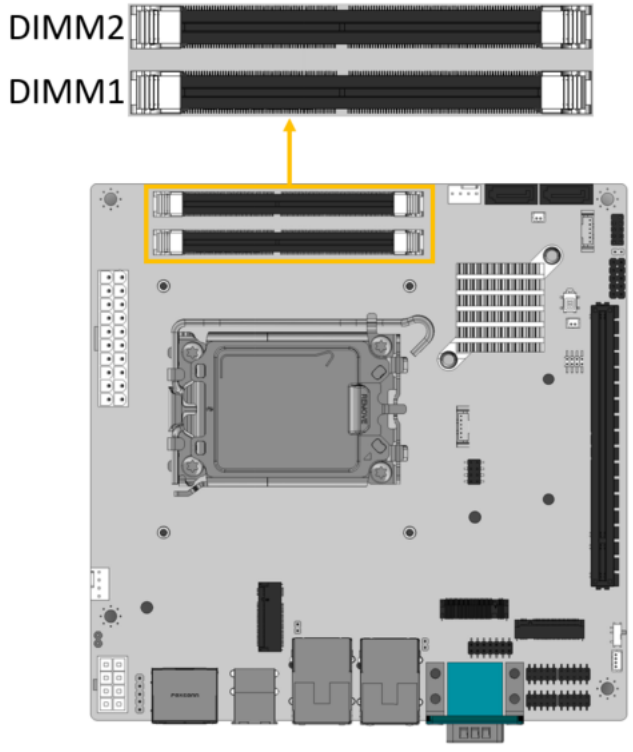


Figure 3-5: DDR4 SO-DIMM Socket Locations

3.2.5 Digital I/O Connector

CN Label: **J2**

CN Type: 14-pin header, p=2.00 mm

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

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

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

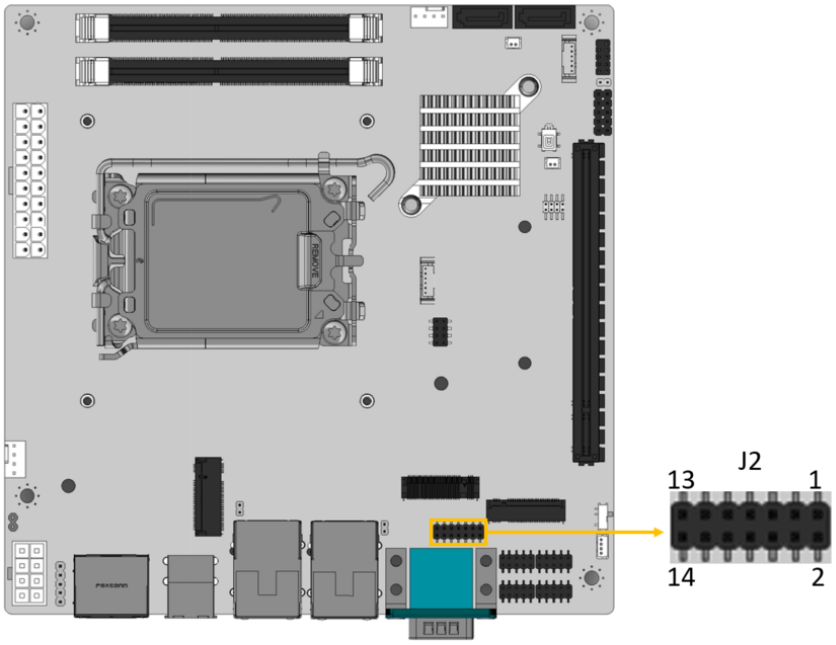


Figure 3-6: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 5	4	Output 4
5	Output 3	6	Output 2
7	Output 1	8	Output 0
9	Input 5	10	Input 4
11	Input 3	12	Input 2
13	Input 1	14	Input 0

Table 3-6: Digital I/O Connector Pinouts

3.2.6 Fan Connector (CPU)

CN Label:	**CPU_FAN1**
CN Type:	4-pin wafer, p=2.54 mm
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-7**

The fan connector attaches to a CPU cooling fan.

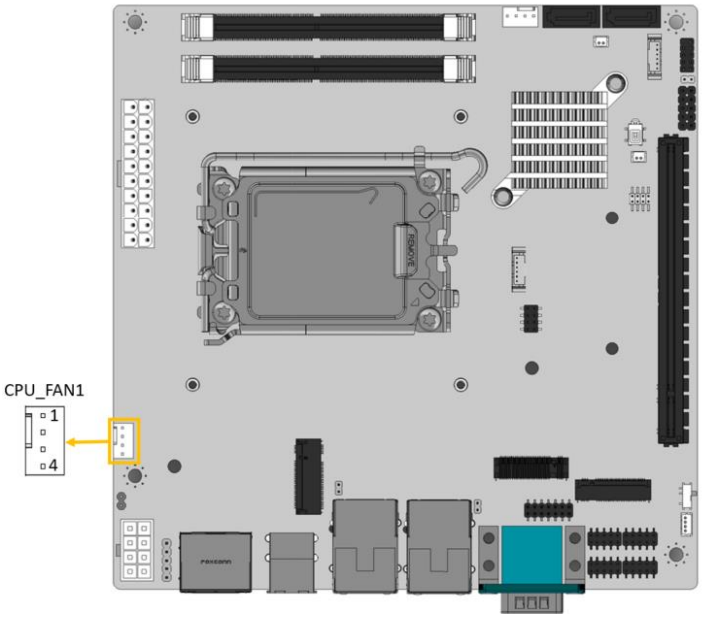


Figure 3-7: CPU Fan Connector Location

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

Table 3-7: CPU Fan Connector Pinouts

3.2.7 Fan Connector (System)

CN Label:	**SYS_FAN1**
CN Type:	4-pin wafer, p=2.54 mm
CN Location:	See **Figure 3-8**
CN Pinouts:	See **Table 3-8**

The fan connector attaches to a system cooling fan.

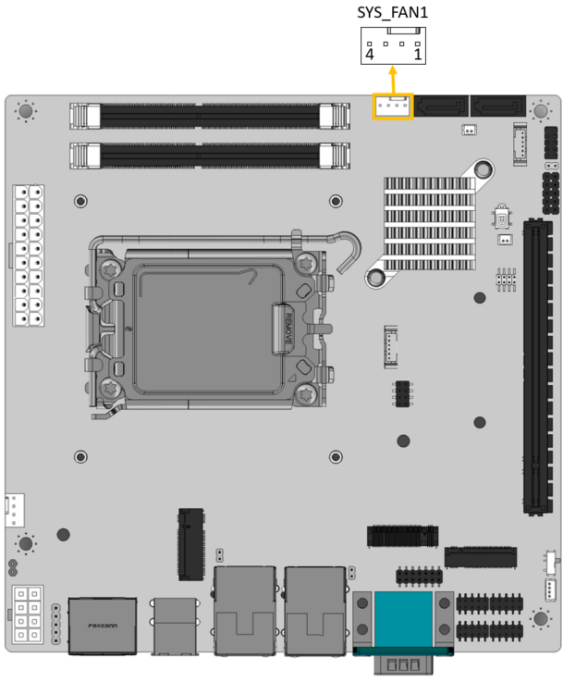


Figure 3-8: System Fan Connector Location

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

Table 3-8: System Fan Connector Pinouts

3.2.8 Front Panel Connector

CN Label: **F_PANEL1**

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

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

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

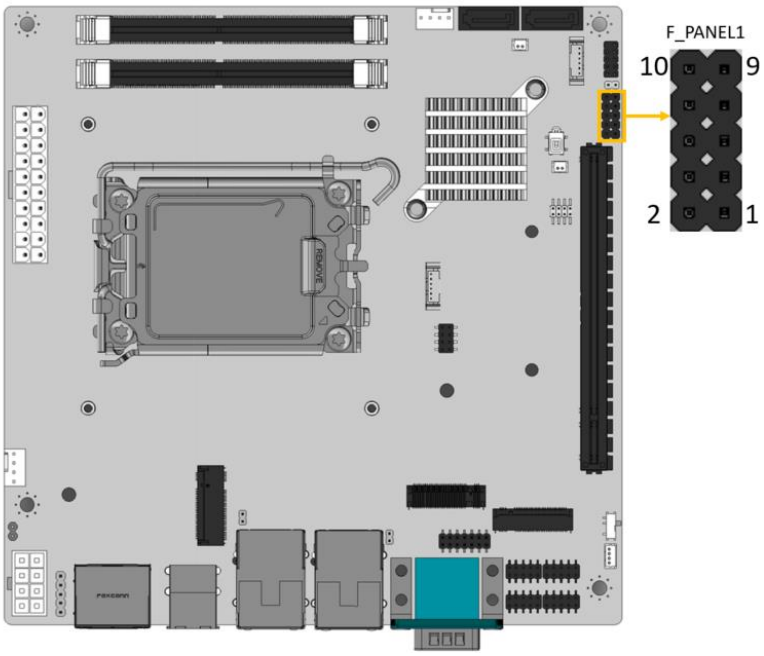


Figure 3-9: Front Panel Connector Location

Pin	Description	Pin	Description
1	PWR_BTN_N	2	GND
3	EXRST_N	4	GND
5	+5V	6	GND
7	+5V	8	SATA_LED#
9	BEEP_PWR	10	PC_BEEP_N

Table 3-9: Front Panel Connector

3.2.9 I²C Connector

CN Label: **I2C1**

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

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

CN Pinouts: See **Table 3-10**

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

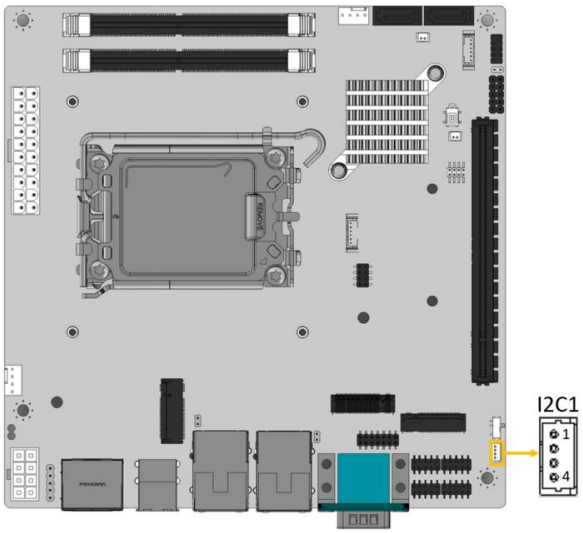


Figure 3-10: I²C/SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+5V

Table 3-10: I²C/SMBus Connector Pinouts

3.2.10 Internal Power Connector

CN Label: **ATX1**

CN Type: 20-pin Molex power connector, p=4.2 mm

CN Location: See **Figure 3-11**

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

This connector provides power to the system.

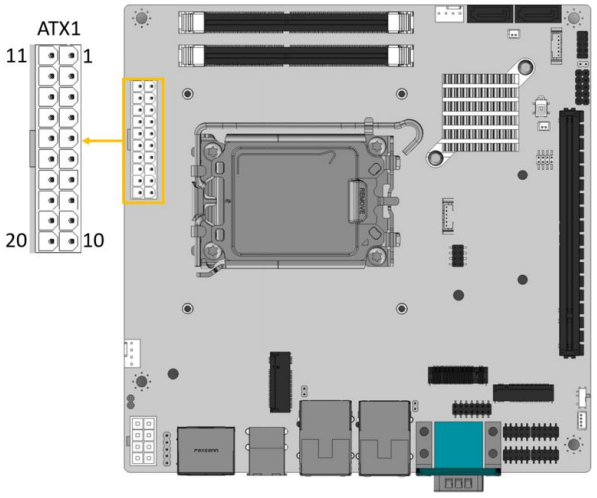


Figure 3-11: Internal Power Connector Pinout Location

Pin	Description	Pin	Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power good	18	NC
9	5VSB	19	+5V
10	+12V	20	+5V

Table 3-11: Internal Power Connector Pinouts

3.2.11 Internal Power Connector

CN Label:	**CPU12V1**
CN Type:	8-pin Molex power connector, p=4.2 mm
CN Location:	See **Figure 3-12**
CN Pinouts:	See **Table 3-12**

This connector provides power to the CPU.

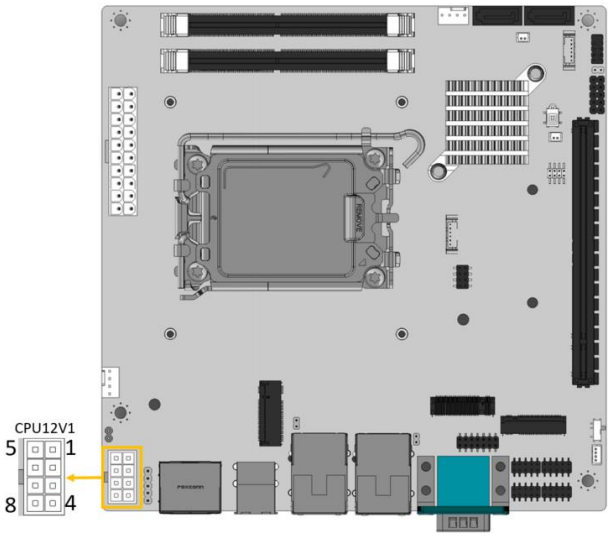


Figure 3-12: Internal Power Connector Pinout Location

Pin	Description	Pin	Description
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

Table 3-12: Internal Power Connector Pinouts

3.2.12 LAN LED Connectors

CN Label:	**JP2, JP3**
CN Type:	2-pin header, p=2.0 mm
CN Location:	See **Figure 3-13**
CN Pinouts:	See **Table 3-13**

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

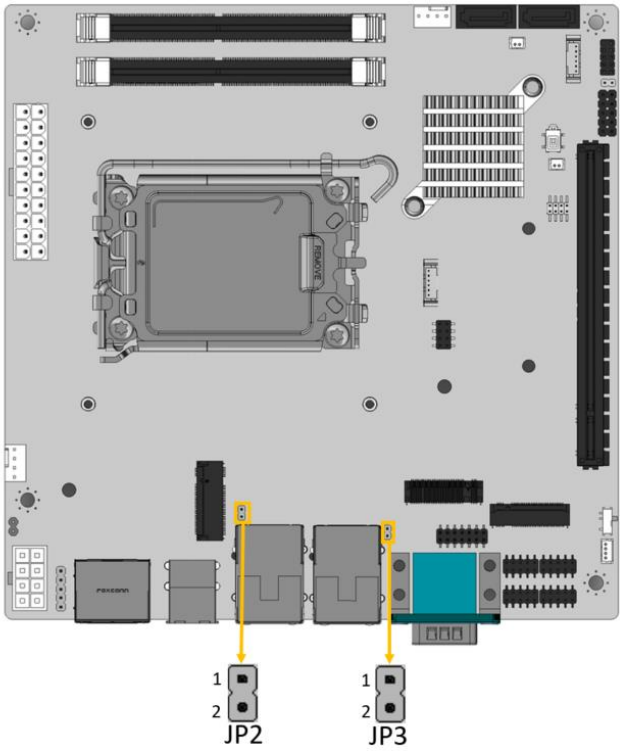


Figure 3-13: LAN LED Connector Locations

Pin	Description
1	+3.3V
2	LAN_LED_LINK#_ACT

Table 3-13: LAN LED Connector Pinouts

3.2.13 M.2 Slot, A-key

CN Label:	**M2_A1**
CN Type:	M.2 A-key slot
CN Location:	See **Figure 3-14**
CN Pinouts:	See **Table 3-14**

The M.2 slot is keyed in the A position and accepts 2230 size of M.2 modules. The M.2 slot supports PCIe x1 and USB 2.0 signals.

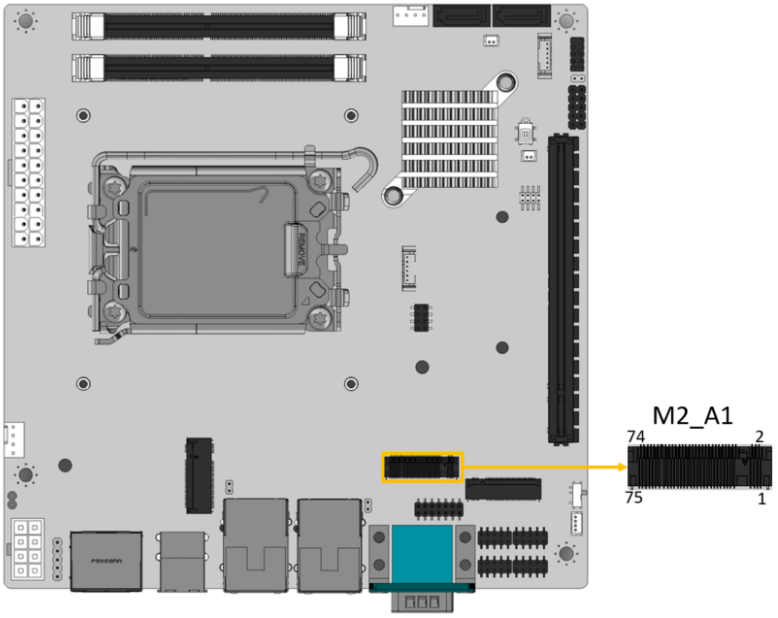


Figure 3-14: M.2 A-key Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	USB2_DP	4	+3.3V
5	USB2_DN	6	NC
7	GND	8	Module Key
9	Module Key	10	Module Key
11	Module Key	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	NC

17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	NC	24	GND
25	NC	26	NC
27	NC	28	NC
29	NC	30	GND
31	NC	32	NC
33	GND	34	NC
35	PCIE_TX_DP5	36	GND
37	PCIE_TX_DN5	38	NC
39	GND	40	NC
41	PCIE_RX_DP5	42	NC
43	PCIE_RX_DN5	44	NC
45	GND	46	NC
47	PCIE_CLK+	48	NC
49	PCIE_CLK-	50	NC
51	GND	52	PLT_RST
53	SRCCLKREQB_15#	54	BT_ON
55	PCH_WAKE_N	56	WLAN_OFF
57	GND	58	M2_DAT
59	NC	60	M2_CLK
61	NC	62	NC
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+3.3V
73	NC	74	+3.3V
75	GND		

Table 3-14: M.2 A-Key Slot Pinouts

3.2.14 M.2 Slot, M-key

CN Label: **NGFF1**

CN Type: M.2 M-key slot

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

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

The M.2 slot is keyed in the M position and accepts 2242/2280 size of M.2 modules. The M.2 slot supports PCIe x4 signals.

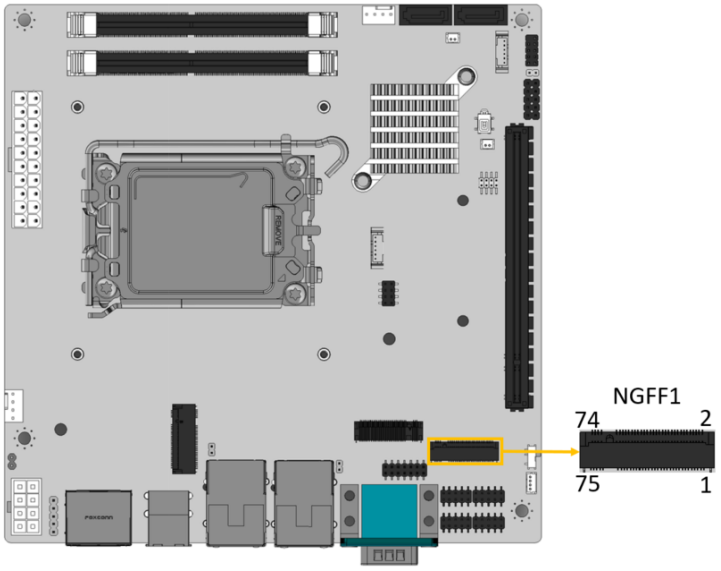


Figure 3-15: M.2 M-key Slot Location

Pin	Description	Pin	Description
1	GND	2	+V3P3S_SSD
3	GND	4	+V3P3S_SSD
5	PCIE_4_RX_DN	6	NC
7	PCIE_4_RX_DP	8	NC
9	GND	10	NGFF1_ACT_N
11	PCIE_TX_DN4	12	+V3P3S_SSD
13	PCIE_TX_DP4	14	+V3P3S_SSD
15	GND	16	+V3P3S_SSD
17	PCIE_3_RX_DN	18	+V3P3S_SSD

Pin	Description	Pin	Description
19	PCIE_3_RX_DP	20	NC
21	GND	22	NC
23	PCIE_3_TX_DN	24	NC
25	PCIE_3_TX_DP	26	NC
27	GND	28	NC
29	PCIE_2_RX_DN	30	NC
31	PCIE_2_RX_DP	32	NC
33	GND	34	NC
35	PCIE_2_TX_DN	36	NC
37	PCIE_2_TX_DP	38	M_1_SSD_SLP
39	GND	40	M.2_SMCLK
41	PCIE_1_RX_DN	42	M.2_SMDAT
43	PCIE_1_RX_DP	44	NC
45	GND	46	NC
47	PCIE_1_TX_DN	48	NC
49	PCIE_1_TX_DP1	50	PLT_RST_N
51	GND	52	SRCCLKREQB_13_N
53	PCIE_CLK_DN13	54	NC
55	PCIE_CLK_DP13	56	NC
57	GND	58	NC
59	Module Key	60	Module Key
61	Module Key	62	Module Key
63	Module Key	64	Module Key
65	Module Key	66	Module Key
67	NC	68	NC
69	PEDET	70	+V3P3S_SSD
71	GND	72	+V3P3S_SSD
73	GND	74	+V3P3S_SSD
75	GND		

Table 3-15: M.2 M-Key Slot Pinouts

3.2.15 IEI iDPM slot

CN Label: **IDPM**

CN Type: iDPM slot

CN Location: See **Figure 3-16**

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

The iDPM slot only use for IEI eDP/LVDS/VGA module

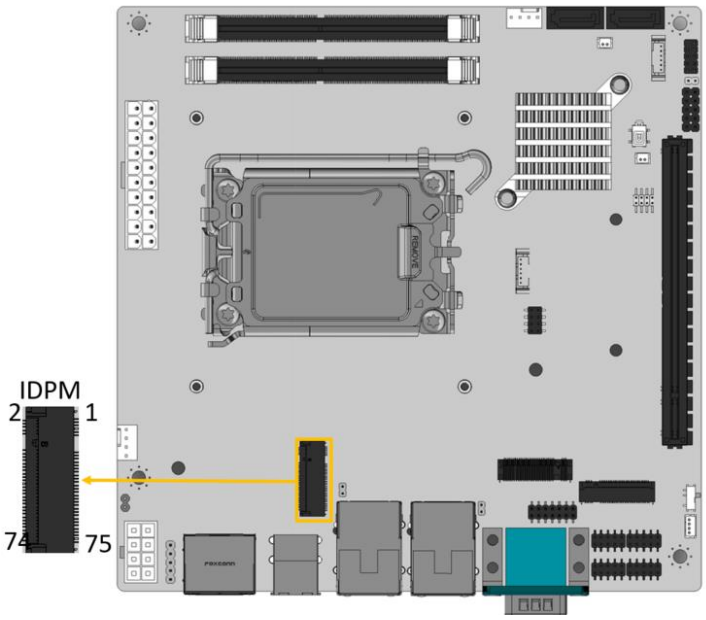


Figure 3-16: IDPM Slot Location

Pin	Description	Pin	Description
1	GND	2	+3.3V
3	GND	4	+3.3V
5	GND	6	+3.3V
7	GND	8	+3.3V
9	GND	10	+3.3V
11	+5V	12	Module Key
13	Module Key	14	Module Key
15	Module Key	16	Module Key
17	Module Key	18	Module Key

Pin	Description	Pin	Description
19	Module Key	20	+3.3VS
21	DISPLAY_DETECT_PIN21	22	+3.3VS
23	DISPLAY_DETECT_PIN23	24	+3.3VS
25	GND	26	+3.3VS
27	GND	28	GND
29	EDP_TX3_DN	30	+12VS
31	EDP_TX3_DP	32	+12VS
33	GND	34	+12VS
35	EDP_TX2_DN	36	+12VS
37	EDP_TX2_DP	38	GND
39	GND	40	SMB_CLK
41	EDP_TX1_DN	42	SMB_DATA
43	EDP_TX1_DP	44	GND
45	GND	46	EC_BKLT_CTRL
47	EDP_TX0_DN	48	EDP1_BKLT_CTRL
49	EDP_TX0_DP	50	EDP1_BKLT_EN
51	GND	52	EDP1_VDD_EN #
53	EDP_AUX_DN	54	EDP_HPD_R
55	EDP_AUX_DP	56	BUF_PLT_RST#
57	GND	58	LVDS_EN
59	GND	60	+V5S
61	GND	62	+V5S
63	GND	64	+V5S
65	GND	66	+V5S
67	GND	68	+12VA
69	GND	70	+12VA
71	GND	72	+12VA
73	GND	74	+12VA
75	GND		

Table 3-16: iDPM Connector Pinouts

3.2.16 PCIe x16 Slot

CN Label: **PCIE4**

CN Type: PCIe x16 slot

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

The PCIe x16 expansion card slot is for PCIe x16 expansion card.

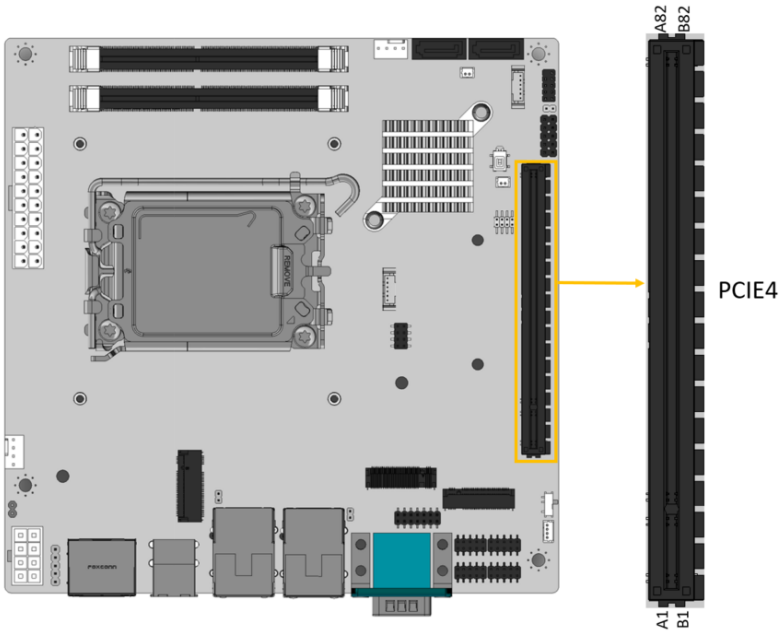


Figure 3-17: PCIe x16 Slot Location

3.2.17 RS-232 Serial Port Connector

CN Label: **COM1, COM2, COM3, COM4**

CN Type: 10-pin header, p=2.00 mm

CN Location: See **Figure 3-18**

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

Each of these connectors provides RS-232 connections.

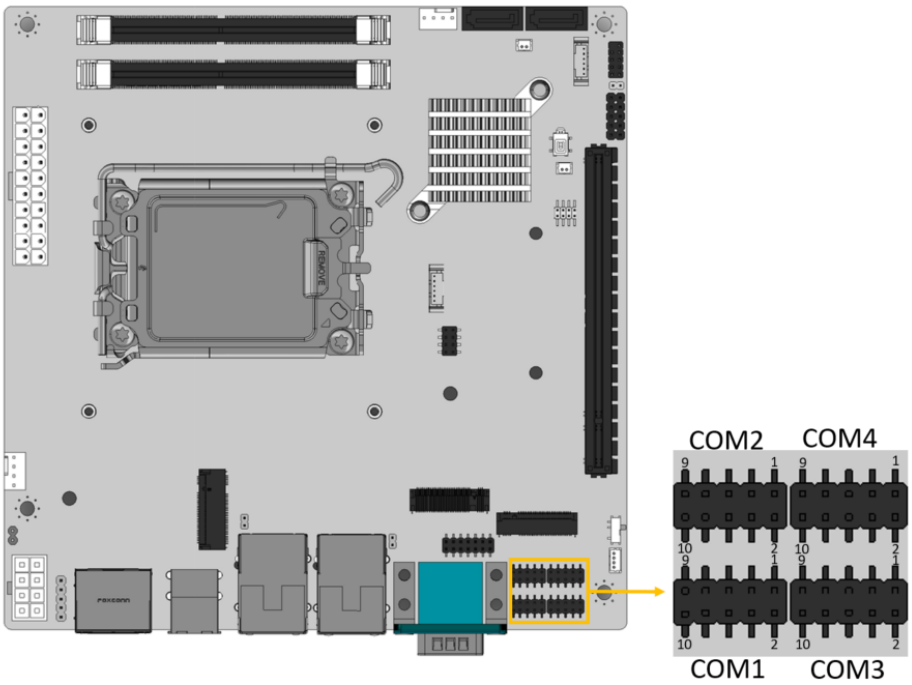


Figure 3-18: RS-232 Serial Port Connector Location

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 3-17: RS-232 Serial Port Connector Pinouts

3.2.18 SATA 6Gb/s Drive Connectors

CN Label: **S_ATA1, S_ATA2**

CN Type: 7-pin SATA drive connector

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-18**

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

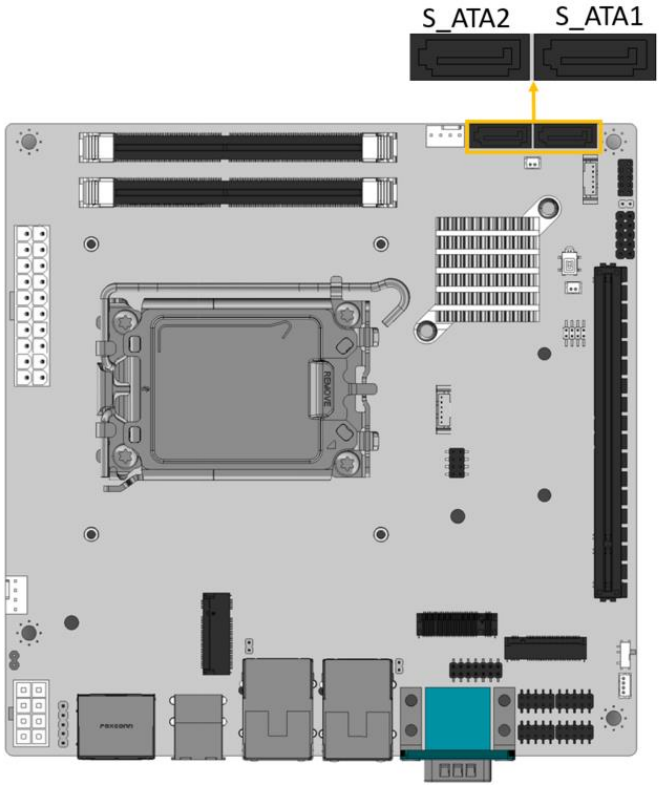


Figure 3-19: SATA 6Gb/s Drive Connector Locations

Pin	Description	Pin	Description
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND		

Table 3-18: SATA 6Gb/s Drive Connector Pinouts

3.2.19 Chassis Intrusion Connector

CN Label:	**CHASSIS1**
CN Type:	2-pin header, p=2.54 mm
CN Location:	See **Figure 3-20**
CN Pinouts:	See **Table 3-19**

The CHASSIS1 (Chassis Intrusion Connector)

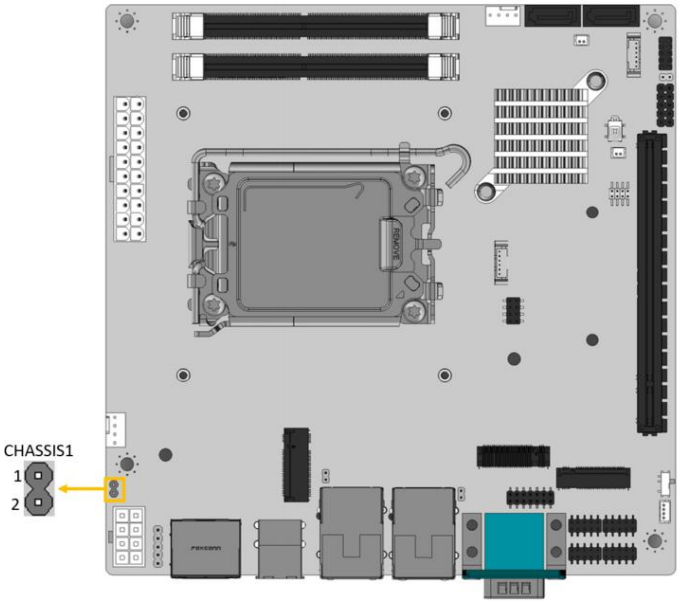


Figure 3-20: Chassis Intrusion Connector Location

Pin	Description
1	CASEOPEN_N
2	GND

Table 3-19: Chassis Intrusion Pinouts

3.2.20 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 6-pin wafer, p=1.25 mm

CN Location: See **Figure 3-21**

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

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

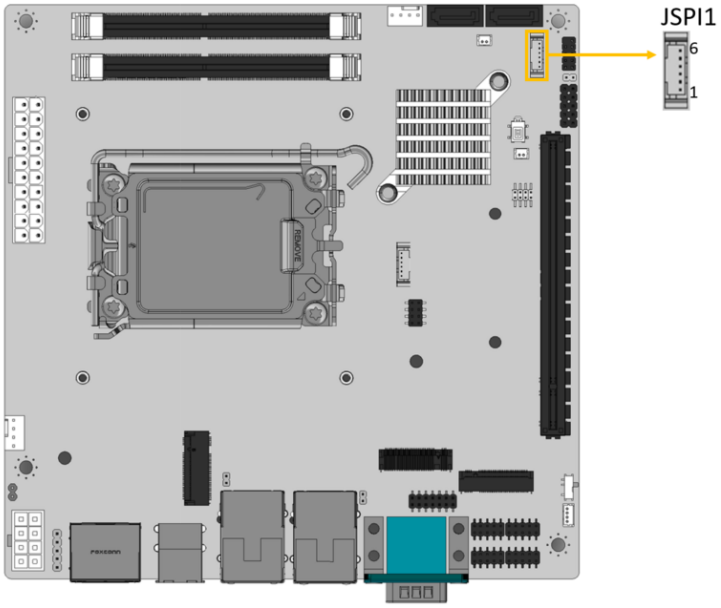


Figure 3-21: SPI Flash Connector Location

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

Table 3-20: SPI Flash Connector Pinouts

3.2.21 SPI Flash Connector, EC

CN Label:	**EC_SPI1**
CN Type:	8-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-22**
CN Pinouts:	See **Table 3-21**

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

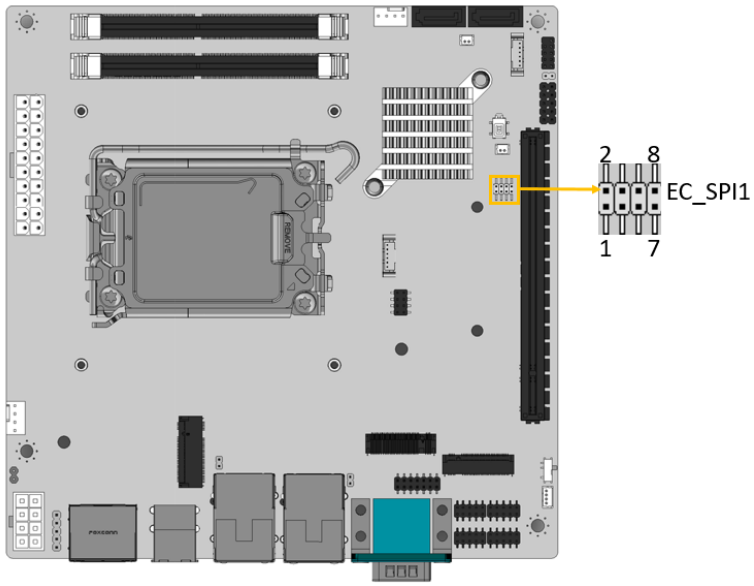


Figure 3-22: SPI EC Flash Connector Location

Pin	Description
1	EC_SPI_CS#_R
2	+3.3V
3	EC_SPI_MISO_R
4	NC
5	EC_DET_FLASH
6	EC_SPI_CLK_R
7	GND
8	EC_SPI_MOSI_R

Table 3-21: SPI EC Flash Connector Pinouts

3.2.22 EC Debug Connector

CN Label:	**DEBUG_SPI1**
CN Type:	6-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-23**
CN Pinouts:	See **Table 3-22**

The EC Debug Connector is used to debug the EC.

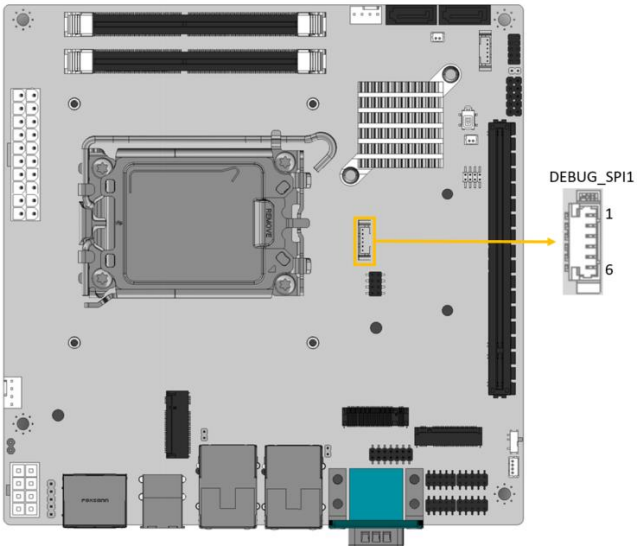


Figure 3-23: EC Debug Connector Location

Pin	Description	Pin	Description
1	NC	4	EDICLK
2	EDICS	5	EDIDI
3	EDIDO	6	GND

Table 3-22: EC Debug Connector Pinouts

3.2.23 VR Power IC Debug Connector

CN Label: **J1**

CN Type: 5-pin header, p=2.54 mm

CN Location: See **Figure 3-24**

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

The VR power IC debug connector is used to debug the VR power IC.

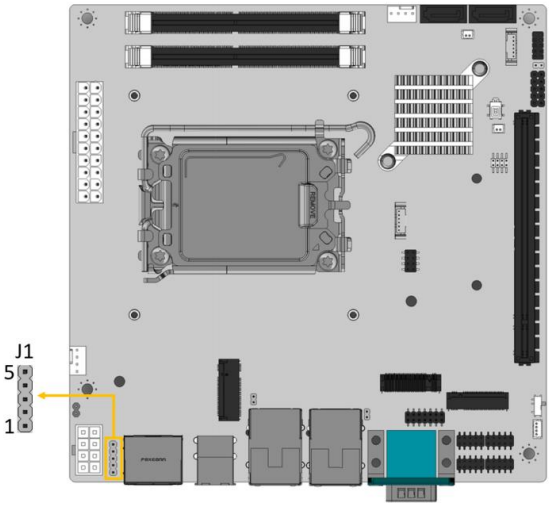


Figure 3-24: VR Power IC Debug Connector Location

Pin	Description	Pin	Description
1	MP2960_SCL	4	MP2940_SDA
2	MP2960_SDA	5	MP2940_SCL
3	GND		

Table 3-23: VR Power IC Debug Connector Pinouts

3.2.24 Flash Descriptor Jumper

CN Label:	**ME_FLASH1**
CN Type:	2-pin header, p=2.0 mm
CN Location:	See **Figure 3-25**
CN Pinouts:	See **Table 3-24**

The Flash Descriptor Jumper is used to flash the security override jumper.

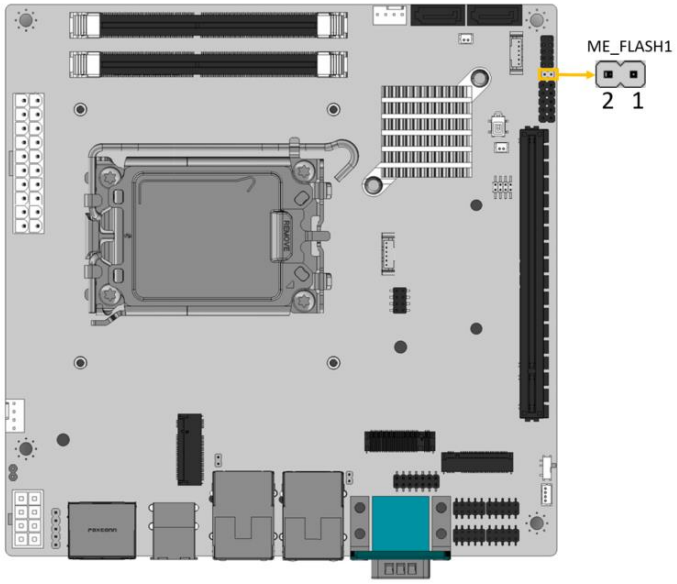


Figure 3-25: Flash descriptor jumper Location

Status	DESCRIPTION
Open	Disabled (default)
Short	Enabled

Table 3-24: Flash descriptor jumper Pinouts

3.2.25 USB 2.0 Connectors

CN Label: **USB_CN4**

CN Type: 8-pin header, p=2.00 mm

CN Location: See **Figure 3-26**

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

The USB 2.0 connectors connect to USB 2.0/1.1 devices. Each pin header provides two USB 2.0 ports.

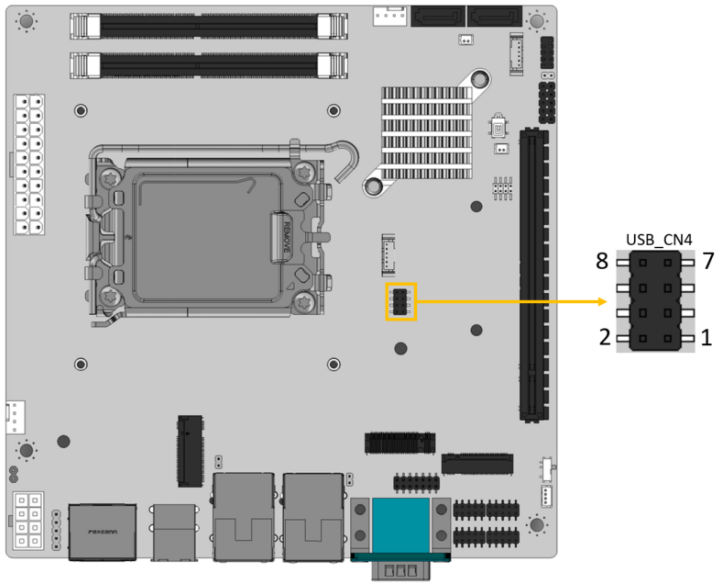


Figure 3-26: USB 2.0 Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

Table 3-25: USB 2.0 Connector Pinouts

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:

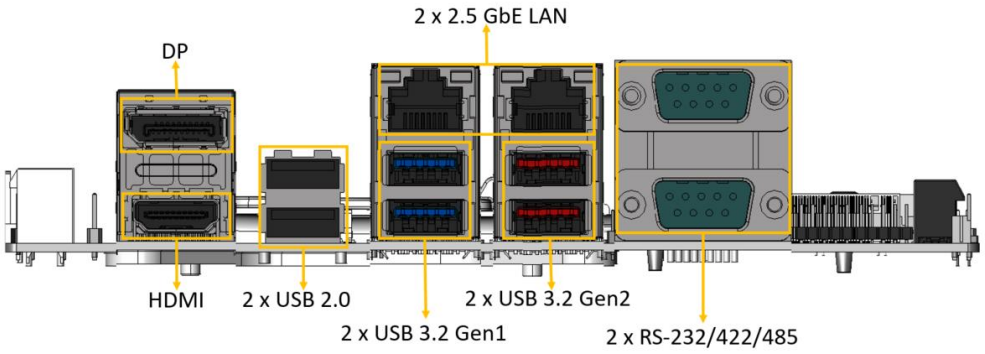


Figure 3-27: External Peripheral Interface Connector

3.3.1 Ethernet and USB 3.2 Gen2 Connectors

CN Label: **LAN1_USB1**

CN Type: RJ-45 and USB 3.2 Gen2 combo

CN Location: See **Figure 3-28** and **Figure 3-29**

CN Pinouts: See **Table 3-26** and **Table 3-27**

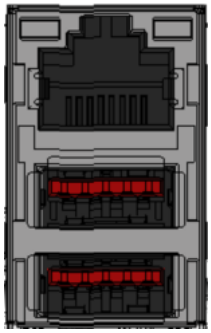


Figure 3-28: USB 3.2 Gen2 and LAN Connector

There are two external USB 3.2 Gen2 (10Gb/s) connectors on the KINO-ADL-H610.

Pin	Description	Pin	Description
1	VCC	10	VCC

2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_ DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_ RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-26: USB 3.2 Gen2 Port Pinouts

Each LAN connector connects to a local network.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MD0+	26	LAN1_MD3+
21	LAN1_MD0-	27	LAN1_MD3-
22	LAN1_MD1+	29	VCC
23	LAN1_MD1-	30	ACT
24	LAN1_MD2+	31	100-
25	LAN1_MD2-	32	1000-

Table 3-27: LAN Port Pinouts

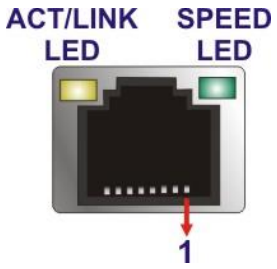


Figure 3-29: LAN Connector

3.3.2 Ethernet and USB 3.2 Gen1 Connectors

CN Label: **LAN2_USB1**

CN Type: RJ-45 and USB 3.2 Gen1 combo

CN Location: See **Figure 3-30** and **Figure 3-31**

CN Pinouts: See **Table 3-28** and **Table 3-29**

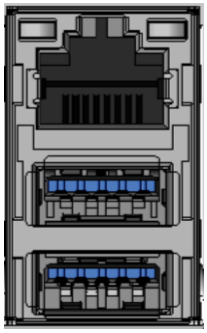


Figure 3-30: USB 3.2 Gen1 and LAN Connector

There are two external USB 3.2 Gen1 (5Gb/s) connectors on the KINO-ADL-H610.

Pin	Description	Pin	Description
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_ DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_ RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-28: USB 3.2 Gen1 Port Pinouts

Each LAN connector connects to a local network.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MD0+	26	LAN1_MD3+

21	LAN1_MD0-	27	LAN1_MD3-
22	LAN1_MD1+	29	VCC
23	LAN1_MD1-	30	ACT
24	LAN1_MD2+	31	100-
25	LAN1_MD2-	32	1000-

Table 3-29: LAN Port Pinouts

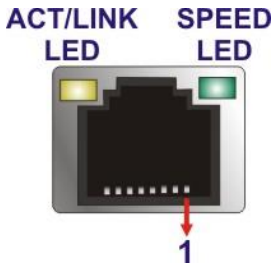


Figure 3-31: LAN Connector

3.3.3 USB 2.0 Connectors

CN Label: **USB_CN3**

CN Type: USB 2.0 combo

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

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

There are two external USB 2.0 connectors on the KINO-ADL-H610.

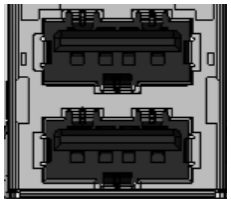


Figure 3-32: Ethernet and USB 2.0 Connector

Pin	Description	Pin	Description
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-

3	USB_DATA+	7	USB_ DATA+
4	GND	8	GND

Table 3-30: USB 2.0 Port Pinouts

3.3.4 DP and HDMI Connectors

CN Label: **HDMI_DP1**

CN Type: HDMI and DP

CN Location: See **Figure 3-33** and **Figure 3-34**

CN Pinouts: See **Table 3-31** and **Table 3-32**

The KINO-ADL-H610 has one HDMI and one DP port. They can connect to HDMI and DP devices.

The HDMI connector can connect to an HDMI device.

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

Table 3-31: HDMI Connector Pinouts

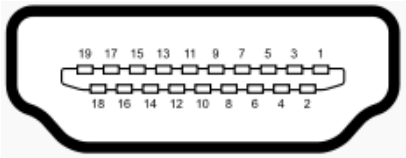


Figure 3-33: HDMI Connector

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	LANE1N	15	AUXP
6	GND	16	GND
7	LANE2P	17	AUXN
8	GND	18	HPD
9	LANE2N	19	GND
10	LANE3P	20	+5V

Table 3-32: DP Connector Pinouts

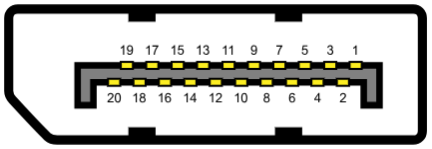


Figure 3-34: DP Connector

3.3.5 RS-232/422/485 Connectors

CN Label: **COM1, COM2**

CN Type: DB-9 male

CN Location: See **Figure 3-35**

CN Pinouts: See **Table 3-33**

The COM connectors (COM1and COM2) connect to a serial device that supports RS-232/422/485 communication.

Pin	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RXD	TXD422+	TXD485+
3	TXD	RXD422+	

Pin	RS-232	RS-422	RS-485
4	DTR	RXD422-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

Table 3-33: RS-232/422/485 Connector Pinouts

Figure 3-35: Serial Port Pinout Locations

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the KINO-ADL-H610 may result in permanent damage to the KINO-ADL-H610 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-ADL-H610. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-ADL-H610 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 KINO-ADL-H610, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-ADL-H610.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.2 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 KINO-ADL-H610 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 KINO-ADL-H610 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 KINO-ADL-H610 off:
  - When working with the KINO-ADL-H610, 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 KINO-ADL-H610, **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.

4.3 Socket LGA1700 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 4-1**.

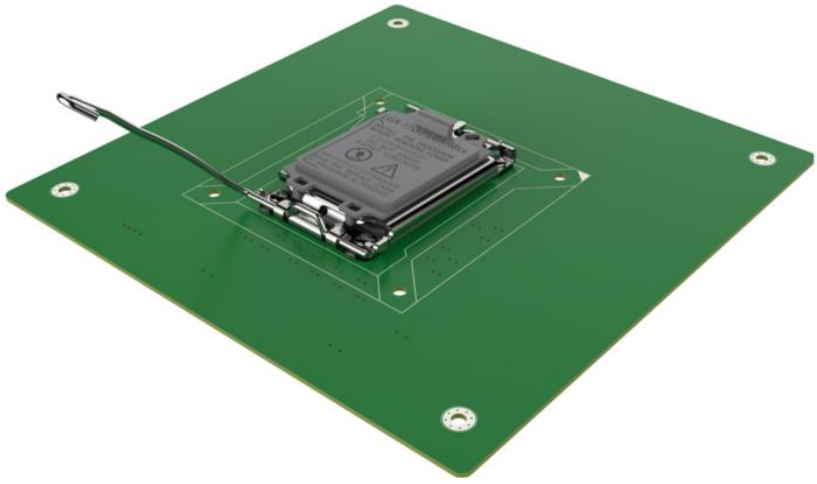


Figure 4-1: Disengage the CPU Socket Load Lever

Step 2: **Open the socket.** See **Figure 4-2**.

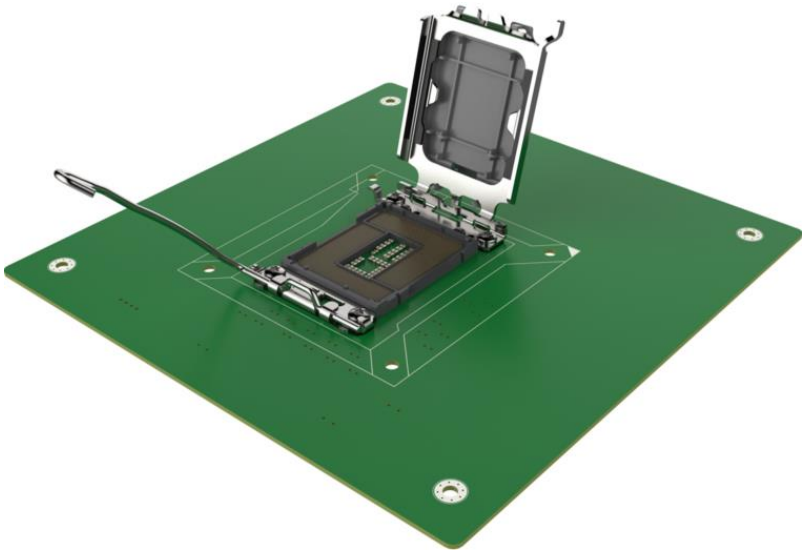


Figure 4-2: Remove Protective Cover

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 4-3**.

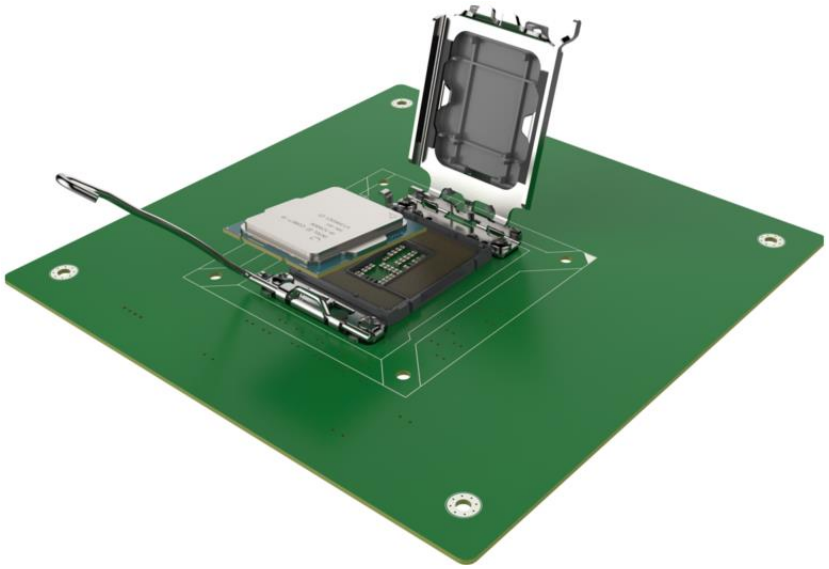


Figure 4-3: Insert the Socket LGA1700 CPU

Step 8: **Close the CPU socket.** Close the load plate, the CPU cover will be popped out naturally. See **Figure 4-4**

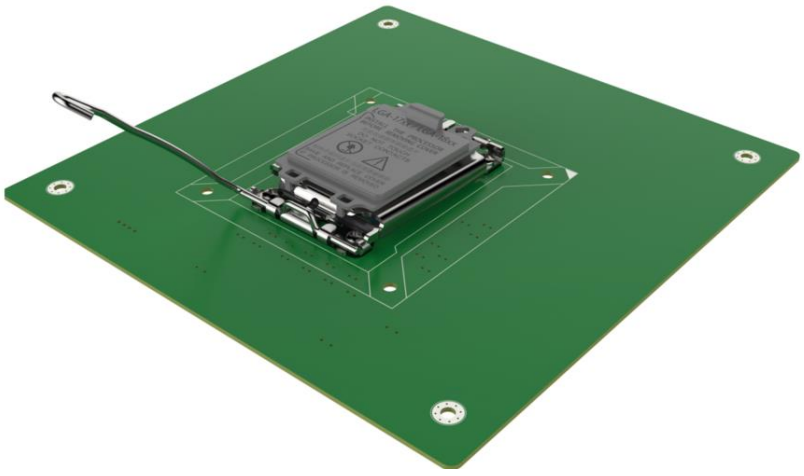


Figure 4-4: Close The Load Plate

Step 9: **Engage** the load lever by pushing it back to its original position. There will be some resistance, but will not require extreme pressure. See **Figure 4-5**.

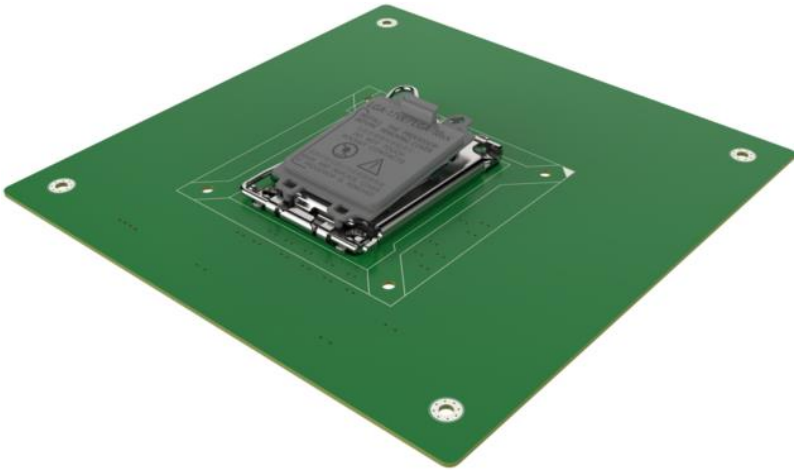


Figure 4-5: Engage The Load Lever

4.4 Socket LGA1700 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 4-6.**

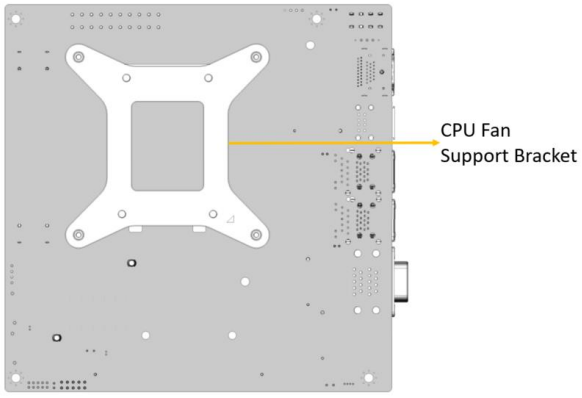


Figure 4-6: Cooling Kit Support Bracket

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 KINO-ADL-H610. Carefully route the cable and avoid heat generating chips and fan blades.

4.5 SO-DIMM Installation

CAUTION:

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

To install a SO-DIMM, please follow the steps below and refer to Figure 4-7.

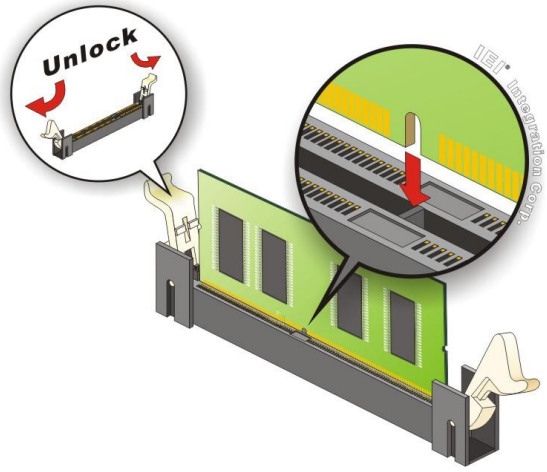


Figure 4-7: SO-DIMM Installation (DDR4)

Step 1: **Open the SO-DIMM socket handles**. Open the two handles outwards as far as they can. See Figure 4-7.

Step 2: **Align the SO-DIMM with the socket**. Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket. See Figure 4-7.

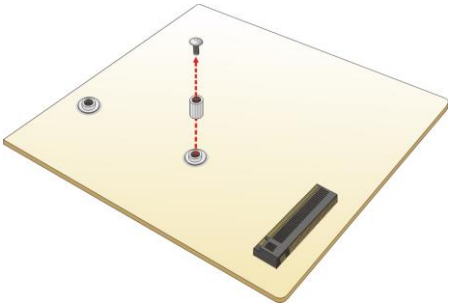
Step 3: **Insert the SO-DIMM**. Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See Figure 4-7.

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

4.6 M.2 Module Installation

CAUTION:

The standoff and screw pre-installed for the M.2 2242 module must be removed before installing an M.2 2280 module. Failing to do so may cause short circuit or other damges to the motherboard.



To install an M.2 module, please follow the steps below.

Step 1: Locate the M.2 module slot. See **Chapter 3**.

Step 2: Remove the on-board retention screw.

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 4-8**).

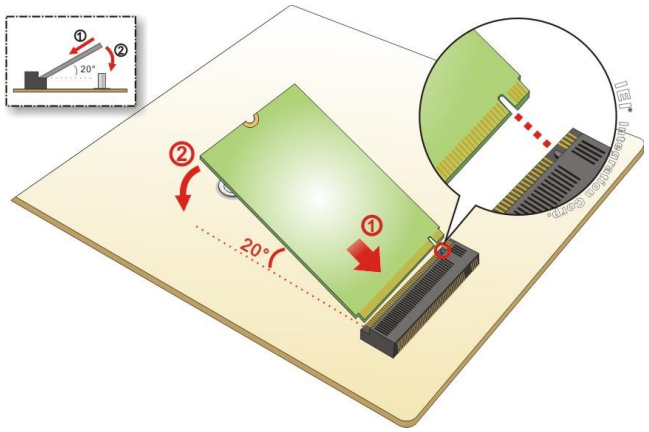


Figure 4-8: Inserting the M.2 Module into the Slot at an Angle

Step 4: Secure the M.2 module with an M2*3 retention screw (**Figure 4-9**).

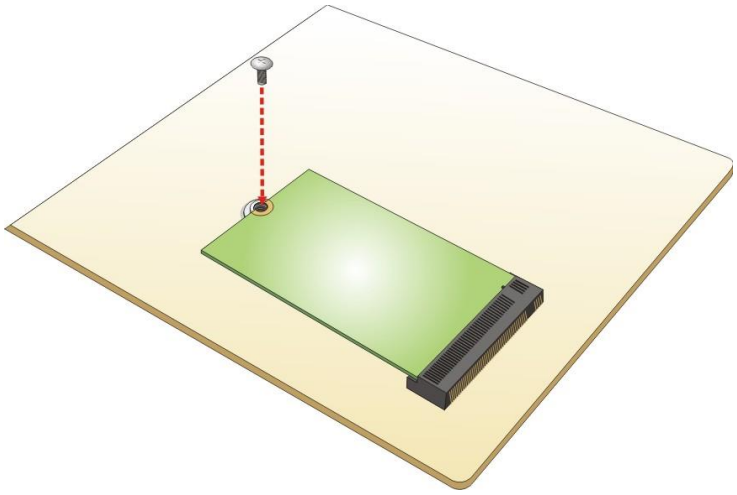


Figure 4-9: Securing the M.2 Module

4.7 System Configuration

The system configuration should be performed before installation.

4.7.1 AT/ATX Power Mode Setting

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-10**.

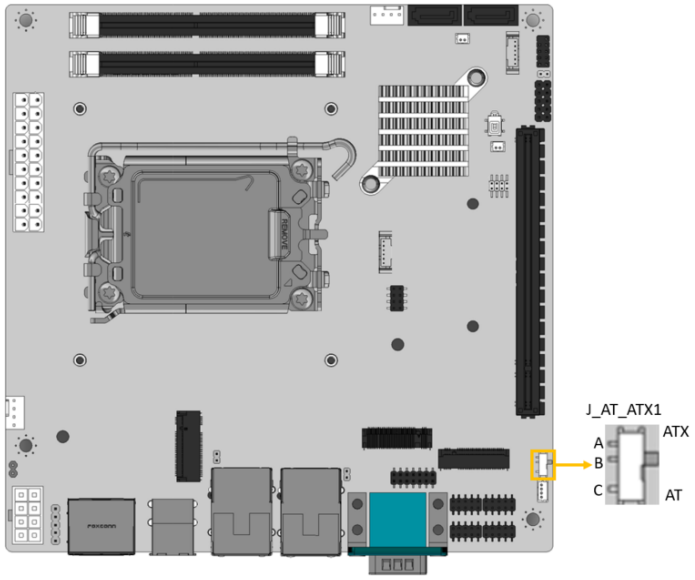


Figure 4-10: AT/ATX Power Mode Switch Location

Setting	Description
Short A-B	ATX power mode (default)
Short B-C	AT power mode

Table 4-1: AT/ATX Power Mode Switch Settings

4.7.2 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-11**.

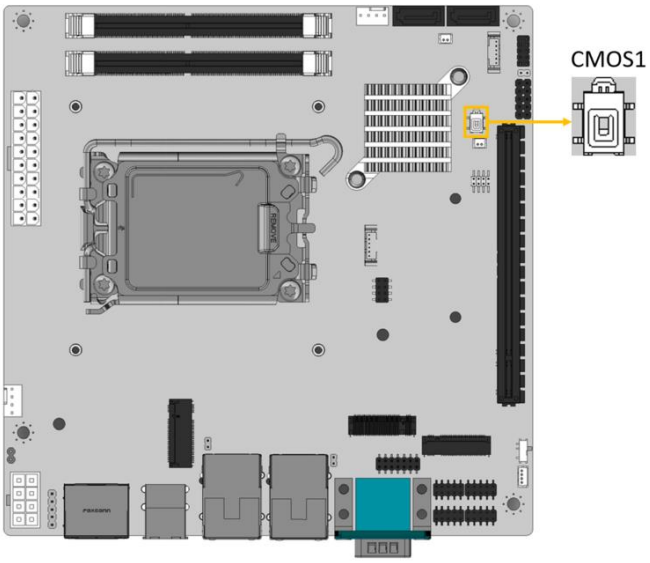


Figure 4-11: Clear CMOS Button Location

Status	DESCRIPTION
NC	Keep CMOS Setup (Normal Operation)
Press	Clear CMOS Setup

Table 4-2: Clear CMOS Button Settings

4.8 Internal Peripheral Device Connections

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

4.8.1 SATA Drive Connection

The KINO-ADL-H610 is shipped with one SATA drive cable. 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 4-12**.

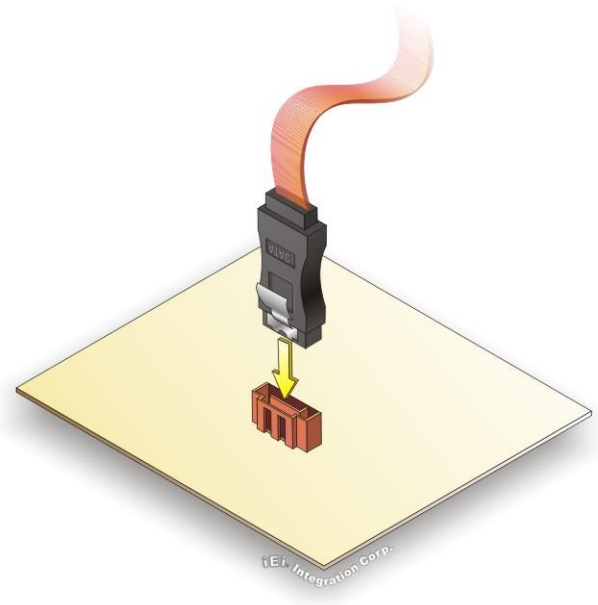


Figure 4-12: SATA Drive Cable Connection

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 4-13**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-13**.

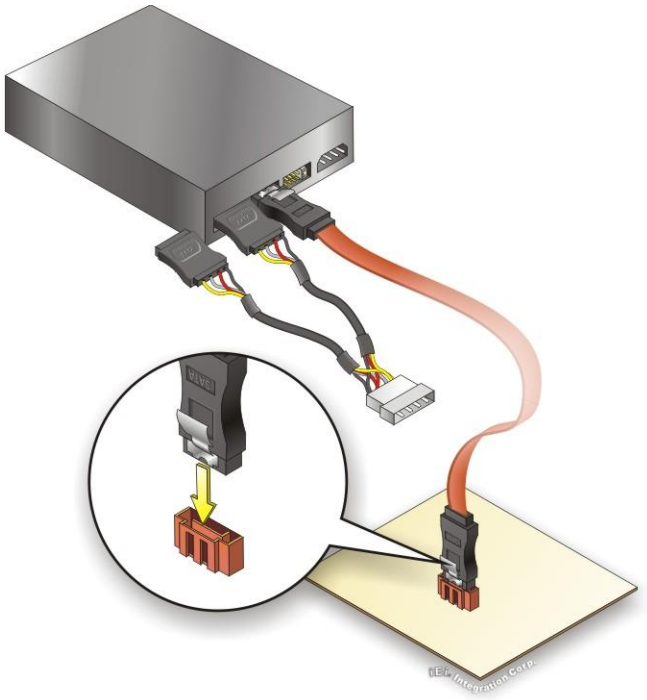


Figure 4-13: SATA Power Drive Connection

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

4.9 Available Drivers

All the drivers for the KINO-ADL-H610 are available on IEI Resource Download Center (https://download.ieiworld.com). Type KINO-ADL-H610 and press Enter to find all the relevant software, utilities, and documentation.

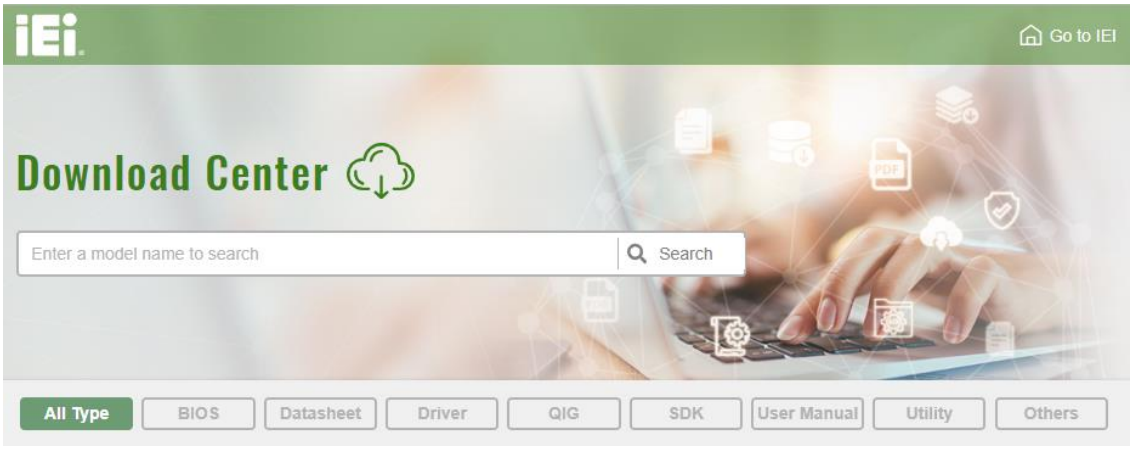
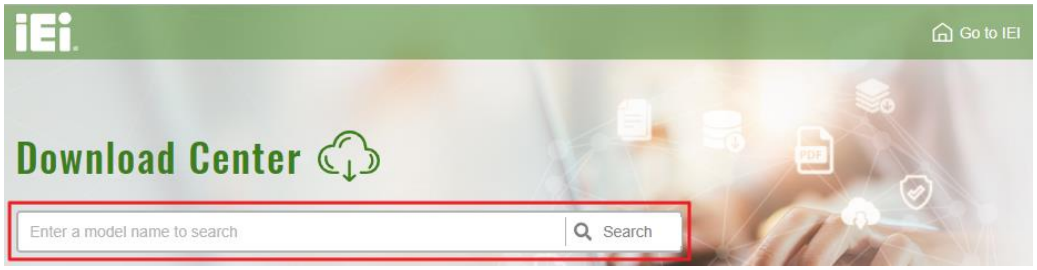


Figure 4-14: IEI Resource Download Center

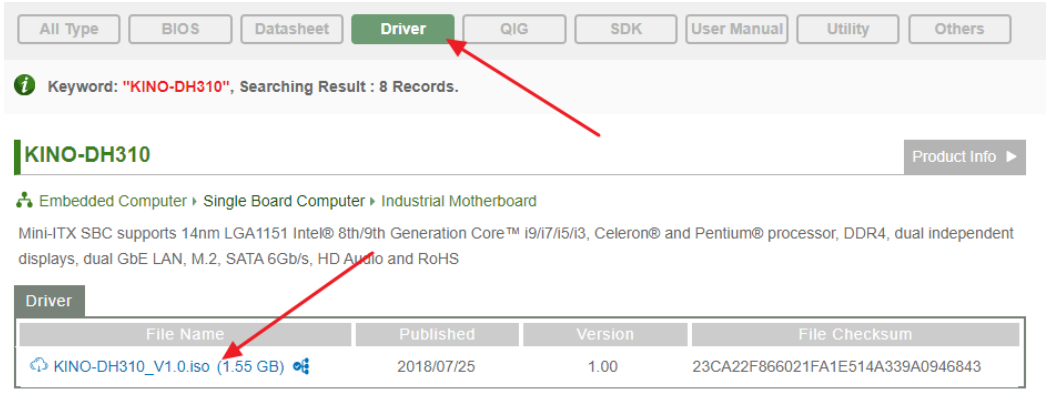
4.9.1 Driver Download

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

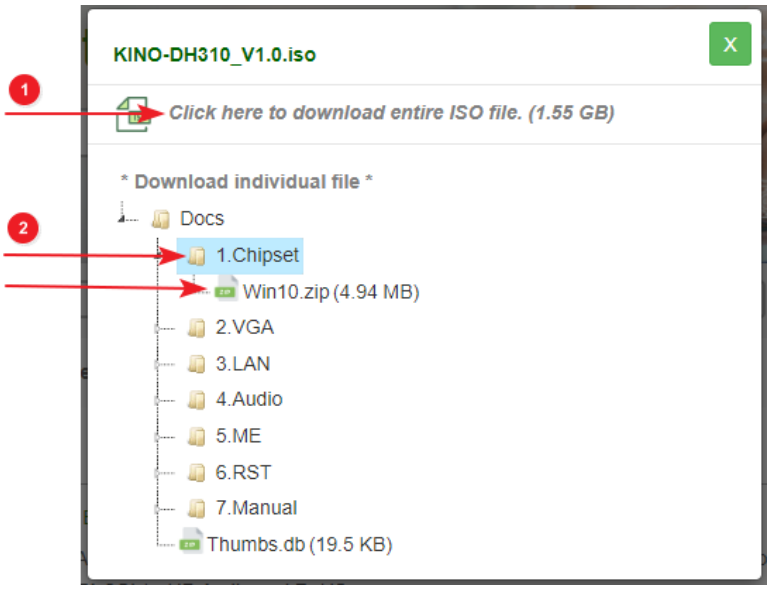
Step 1: Go to https://download.ieiworld.com. Type KINO-ADL-H610 and press Enter.



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 double click an individual item to find its driver file and click the file name to download (❷).



NOTE:

To install software from the downloaded ISO image file in Windows 10, double-click the ISO file to mount it as a virtual drive to view its content.

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.

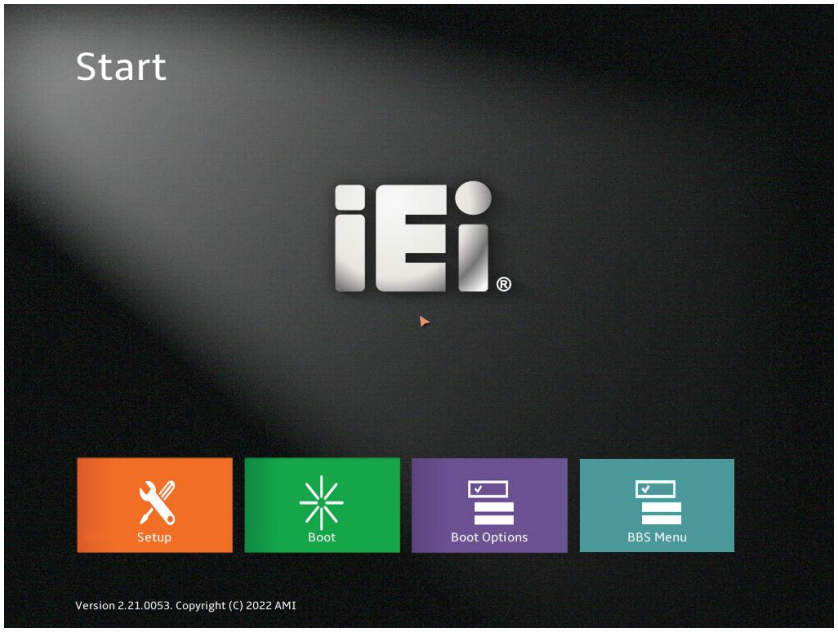


Figure 5-1: BIOS Starting Menu

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

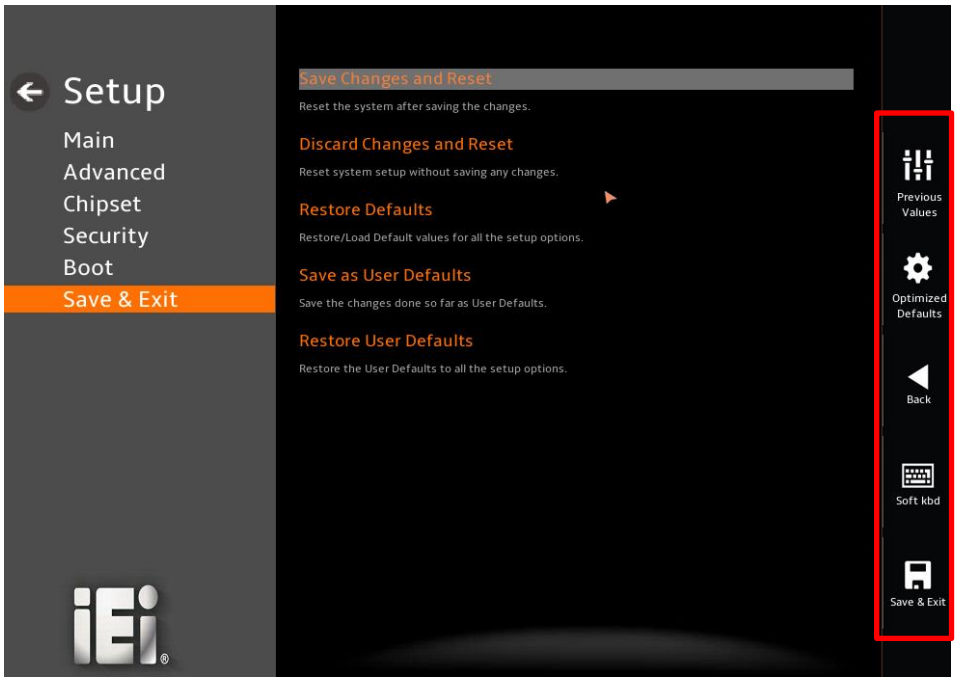
For keyboard navigation, use the navigation keys shown in **Table 5-1**.

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

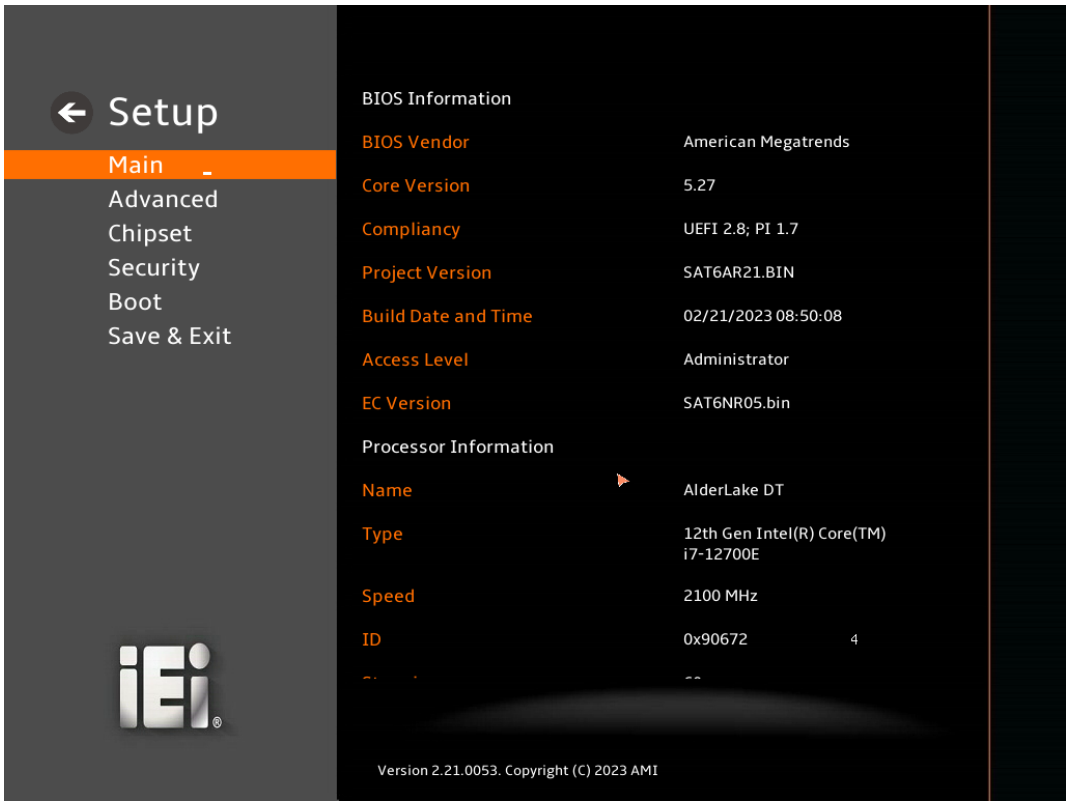
The **menu bar** on top of the BIOS screen has the following main items:

- 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

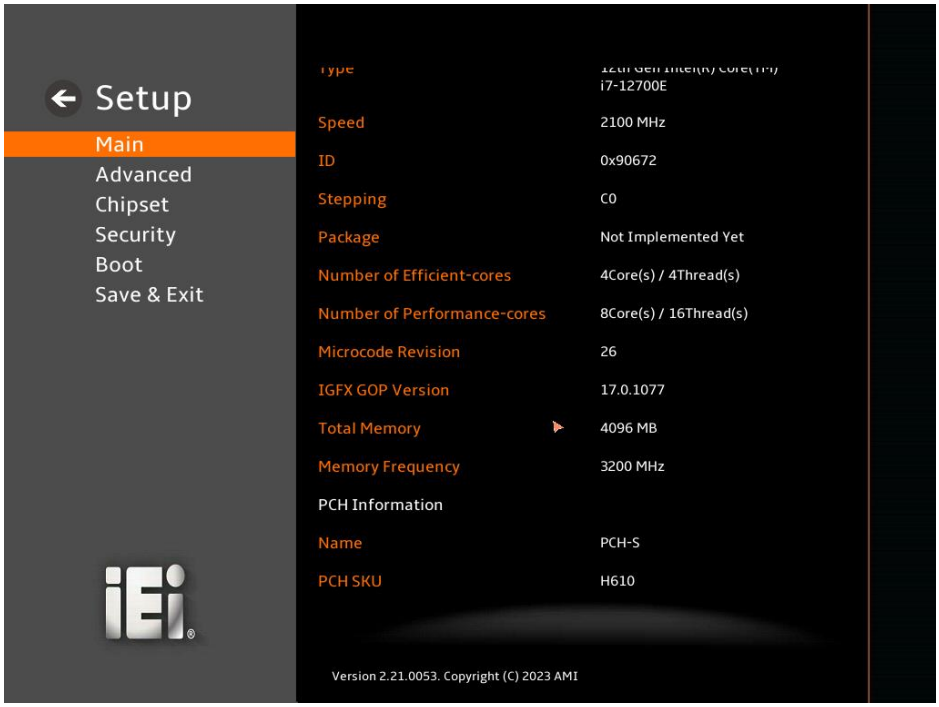
The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main (1/3)



BIOS Menu 2: Main (2/3)

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
- **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
- **ID:** Displays the Processor ID

➔ **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
- **TXT Capability of Platform/PCH:** Displays the TXT Capability
- **Production Type:** Displays the Production Type
- **ME FW Version:** Displays the ME Firmware Version
- **ME Firmware SKU:** Displays the ME Firmware SKU
- **PMC FW Version:** Displays the PMC Firmware Version

➔ **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]**

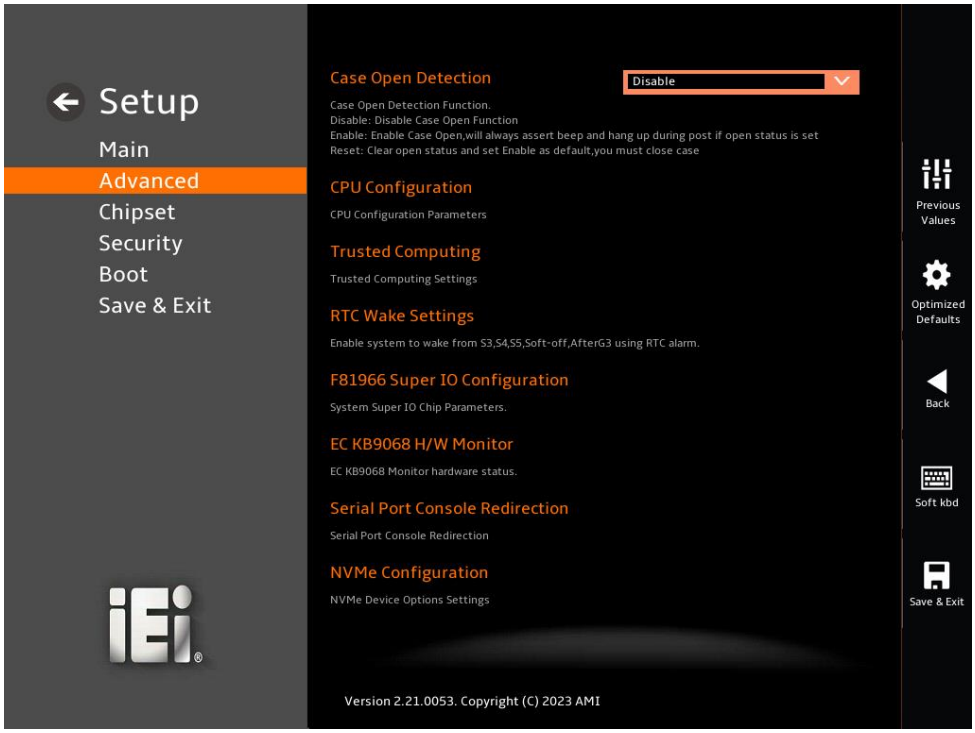
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

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

5.3.1 Case Open Detection

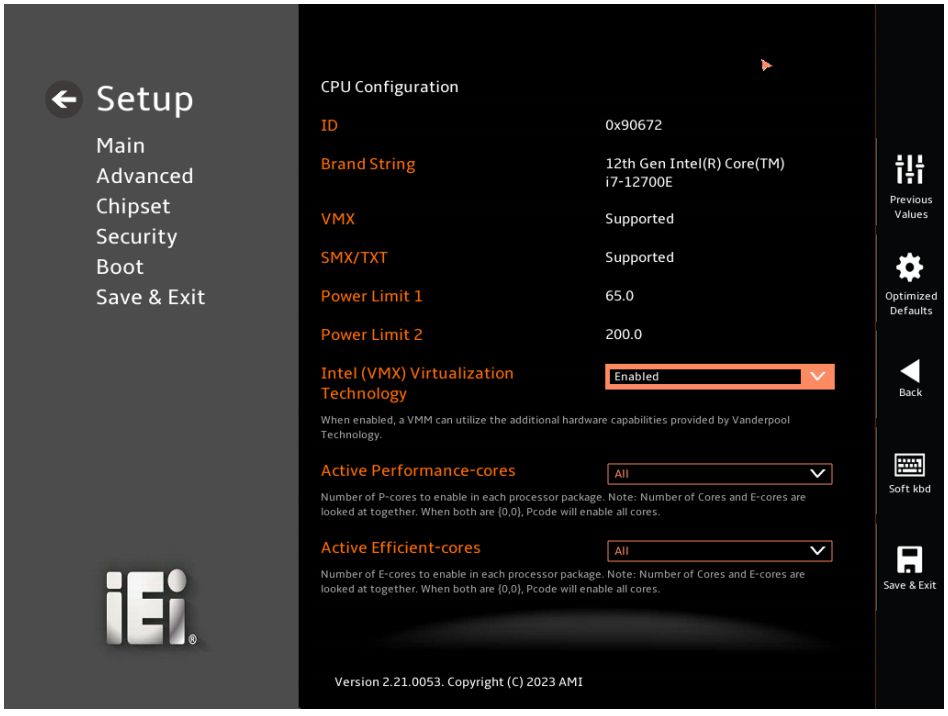
➔ **Case Open Detection [Disabled]**

When the **Case Open Detection** is enabled, if anyone opens the computer's chassis, or case, Windows will notify the user with a pop-up message the next time he turns on his computer.

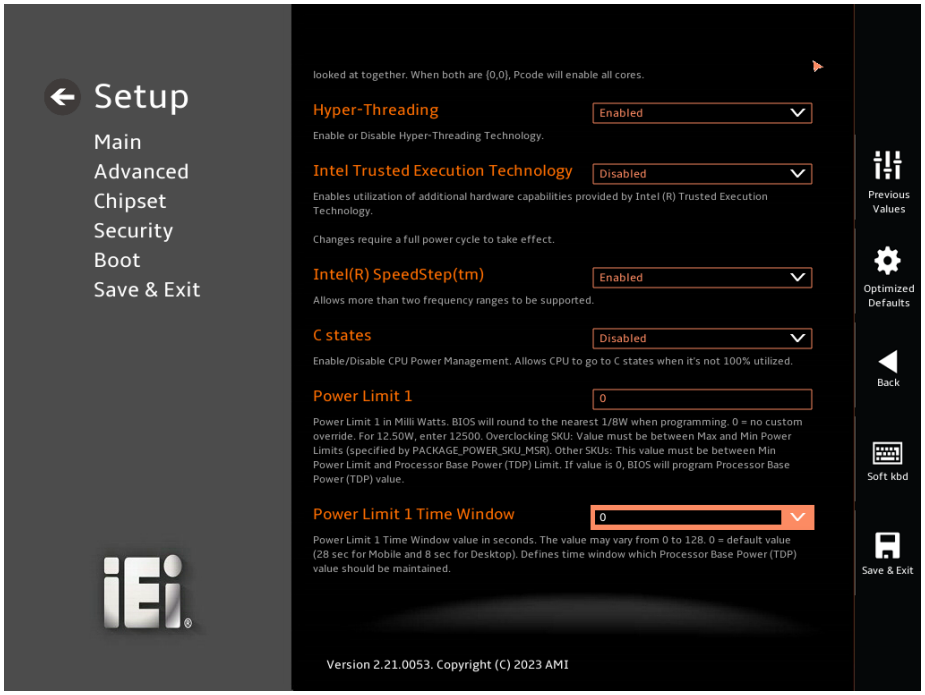
➔	**Disabled**	**DEFAULT**	Disables Case Open Detection.
➔	**Enabled**		Enables Case Open Detection.

5.3.2 CPU Configuration

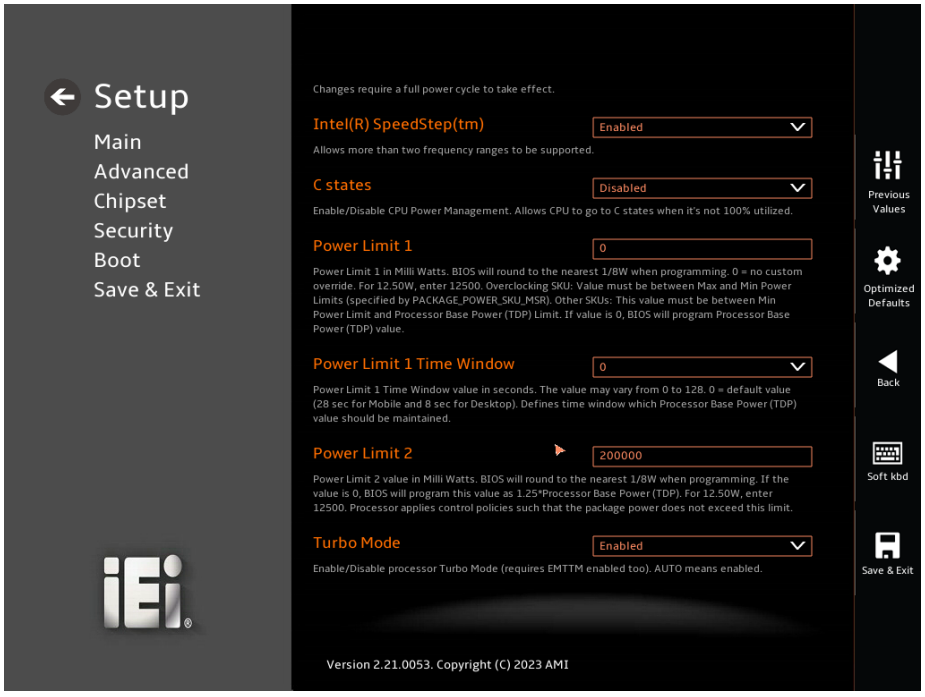
Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



BIOS Menu 5: CPU Configuration (1/3)



BIOS Menu 6: CPU Configuration (2/3)



BIOS Menu 7: CPU Configuration (3/3)

➔ **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.

➔ **Hyper-Threading [Enabled]**

Use the **Hyper-Threading** option to enable or disable the **Hyper-Threading** Technology.

➔ **Disabled**		Disables Hyper-Threading Technology
➔ **Enabled**	**DEFAULT**	Enables Hyper-Threading Technology

➔ **Intel(R) Trusted Execution Technology [Disabled]**

Use the **Intel(R) Trusted Execution Technology** option to enable or disable the utilization of additional hardware capabilities provided by Intel(R)Trusted Execution Techinology.

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

➔ **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

➔ **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 [200000]**

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.

➔ **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

5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 8**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

BIOS Menu 8: Trusted Computing Configuration

➔ **Security Device Support [Enable]**

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.

➔ **Pending Operation [None]**

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

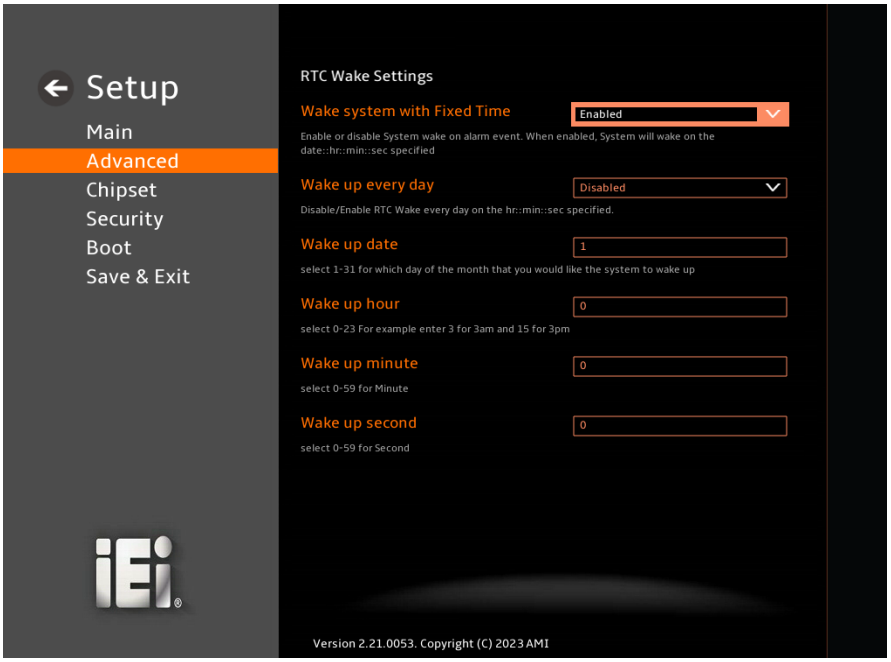
➔ **None** **DEFAULT** TPM information is previous.S

➔ **TPM Clear** TPM information is cleared

5.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 9**) configures RTC wake event.

BIOS Menu 9: RTC Wake Settings (1/2)



BIOS Menu 10: 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.

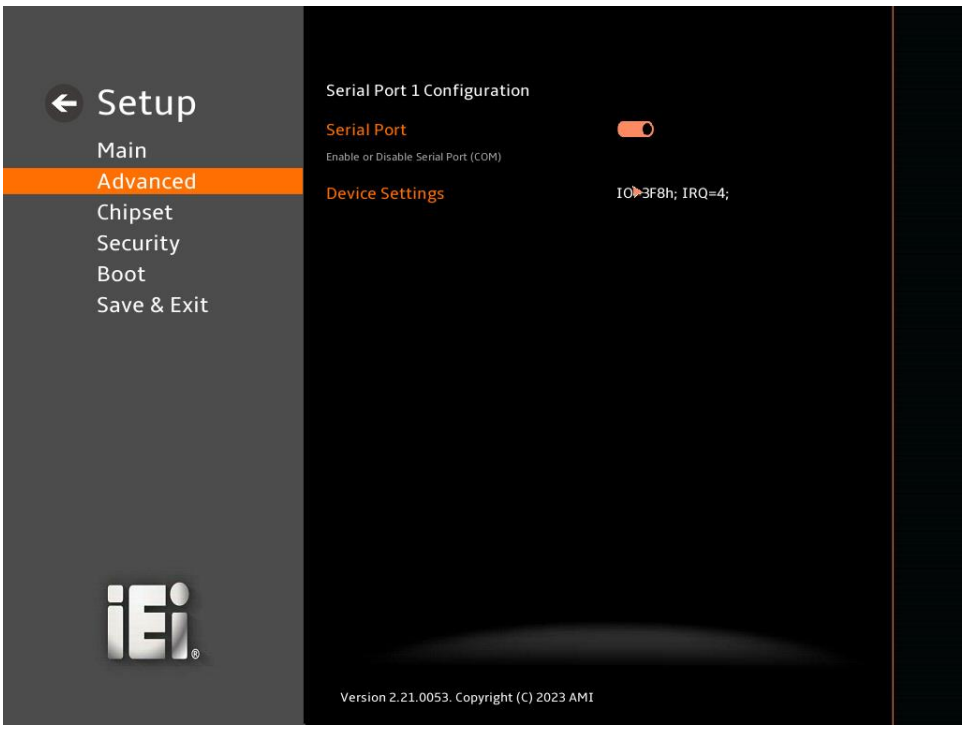
5.3.5 F81966 Super IO Configuration

Use the **F81966 Super IO Configuration** menu (**BIOS Menu 11**) to set or change the configurations for serial ports.

BIOS Menu 11: F81866 Super IO Configuration

5.3.5.1 Serial Port 1 Configuration

Use the **Serial Port 1 Configuration** menu (**BIOS Menu 12**) to configure the serial port.



BIOS Menu 12: 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

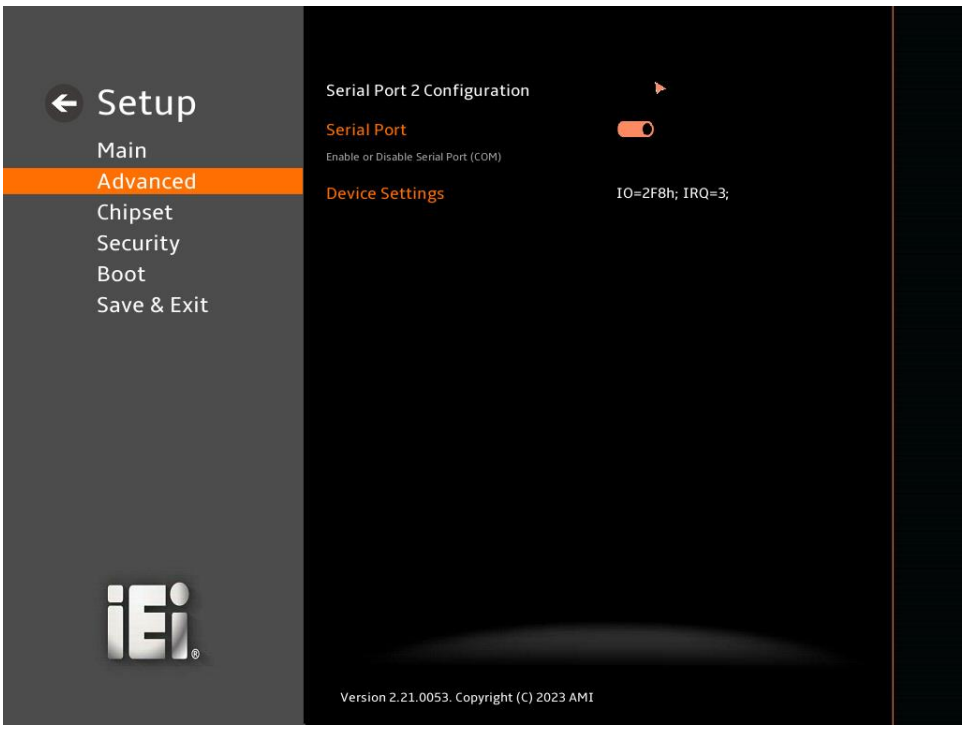
➔ **Device Settings**

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

5.3.5.2 Serial Port 2 Configuration

Use the **Serial Port 2 Configuration** menu (**BIOS Menu 13**) to configure the serial port.



BIOS Menu 13: 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

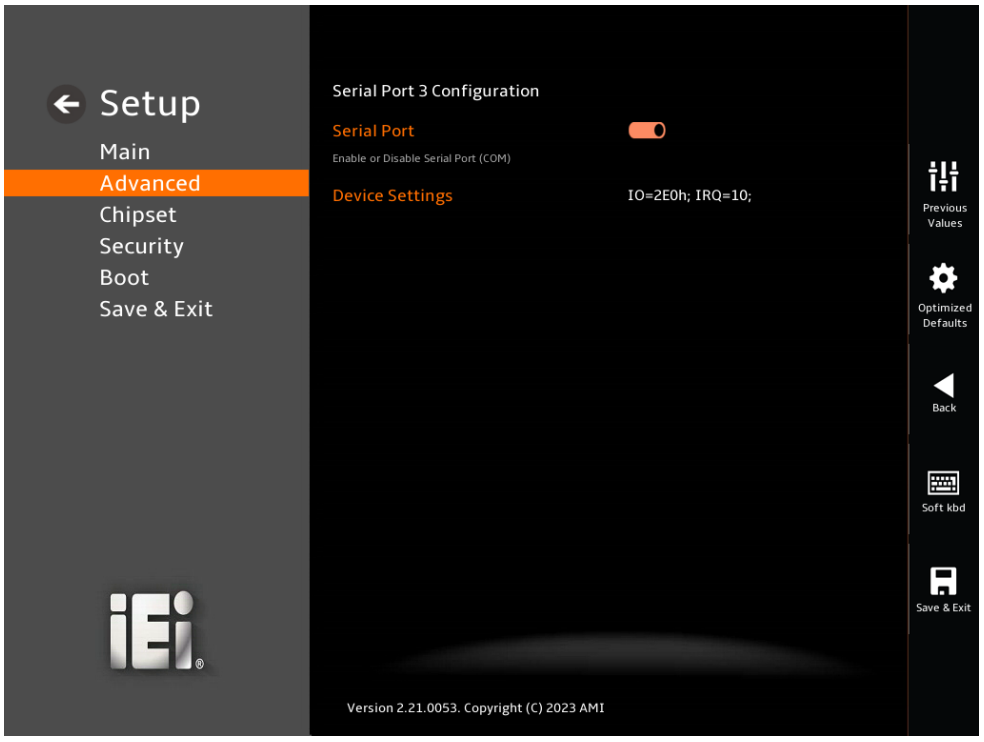
➔ **Device Settings**

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

5.3.5.3 Serial Port 3 Configuration

Use the **Serial Port 3 Configuration** menu (**BIOS Menu 14**) to configure the serial port.



BIOS Menu 14: 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

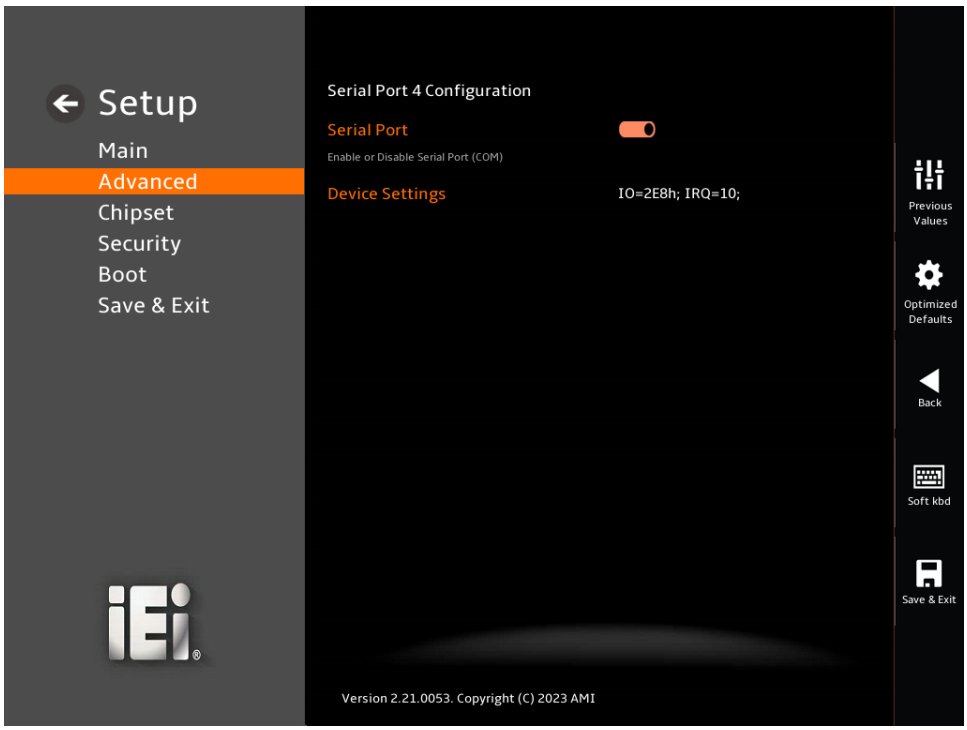
➔ **Device Settings**

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

5.3.5.4 Serial Port 4 Configuration

Use the **Serial Port 4 Configuration** menu (**BIOS Menu 15**) to configure the serial port.



BIOS Menu 15: 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

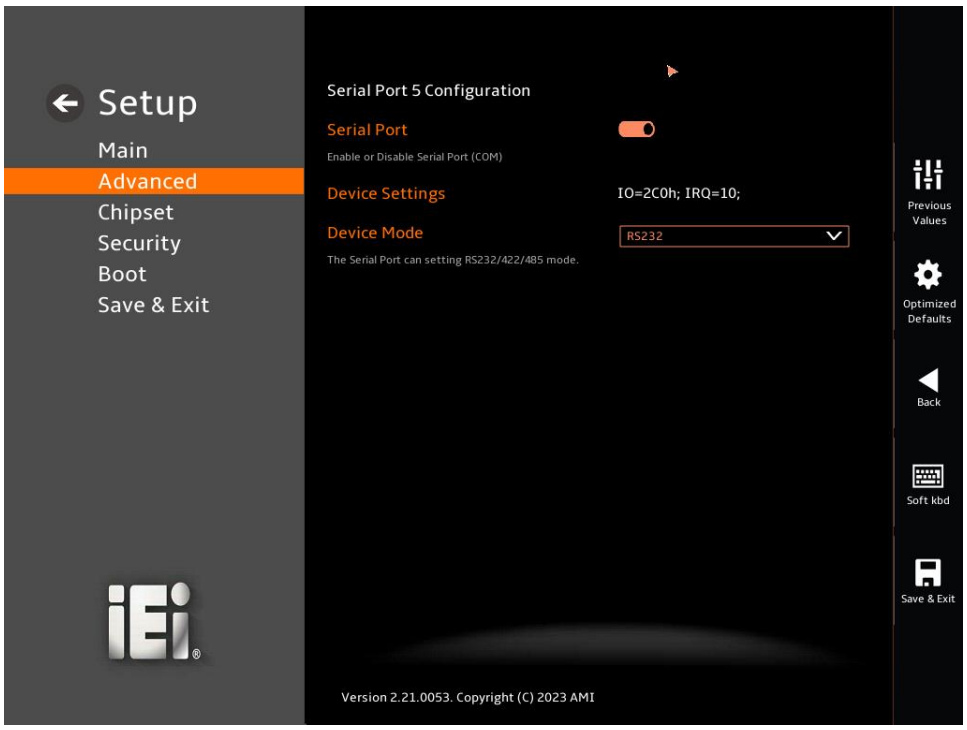
➔ **Device Settings**

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

5.3.5.5 Serial Port 5 Configuration

Use the **Serial Port 5 Configuration** menu (**BIOS Menu 16**) to configure the serial port.



BIOS Menu 16: 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

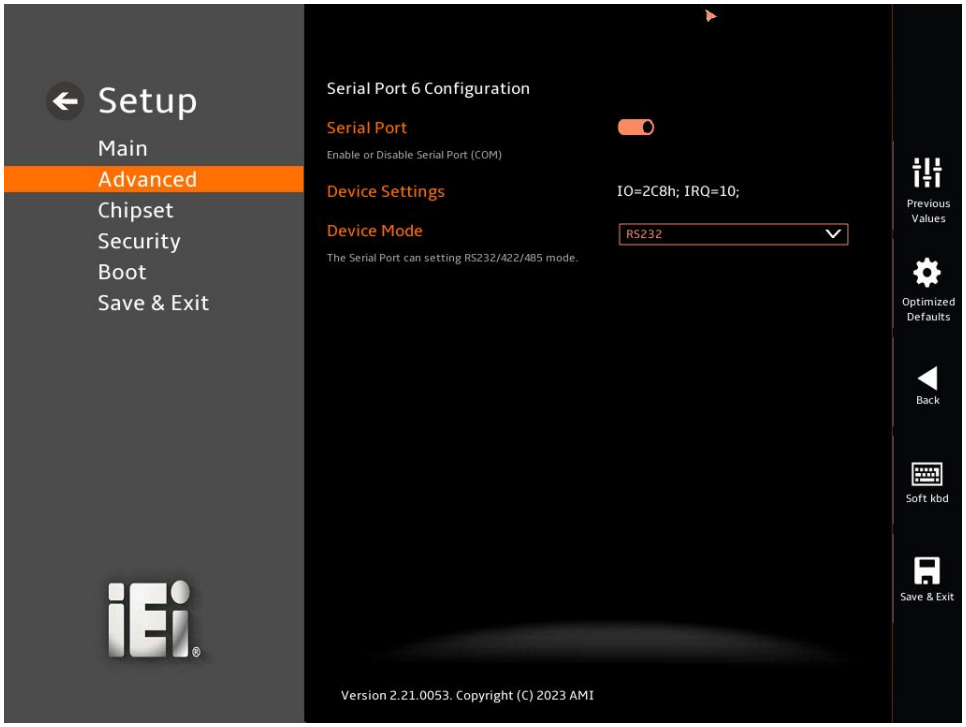
➔ **Device Mode [RS232]**

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

5.3.5.6 Serial Port 6 Configuration

Use the **Serial Port 6 Configuration** menu (**BIOS Menu 17**) to configure the serial port.



BIOS Menu 17: 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=2C0h;** **IRQ=10**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10

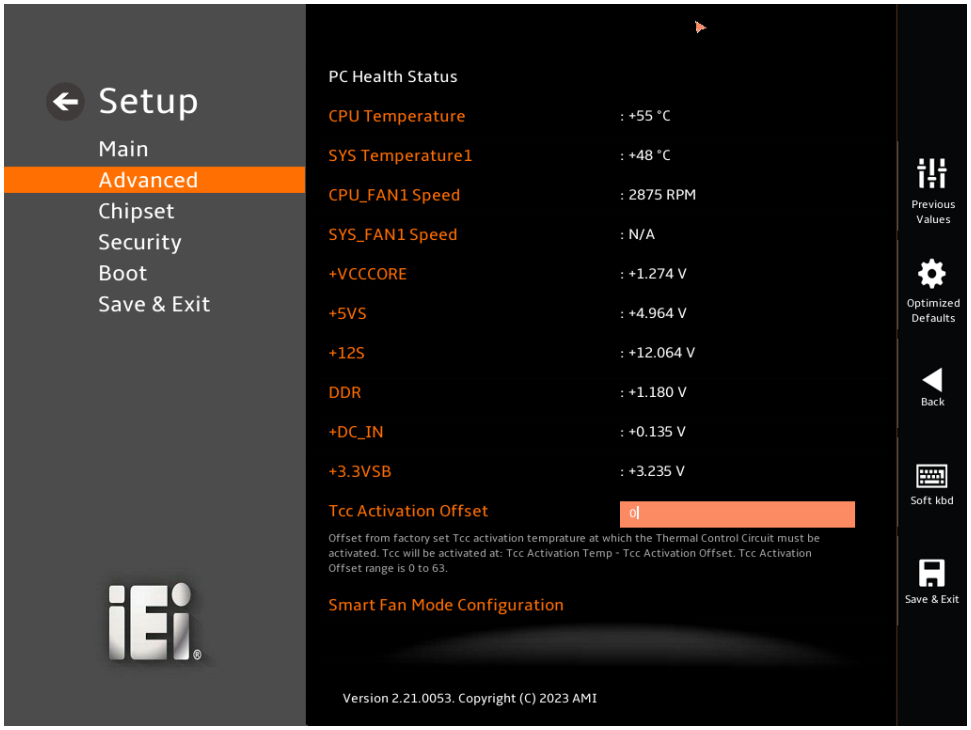
➔ **Device Mode [RS232]**

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

5.3.6 EC KB9068 H/W Monitor

The **EC KB9068 H/W Monitor** menu (**BIOS Menu 18**) 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 18: EC KB9068 H/W Monitor

➔ **PC Health Status**

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

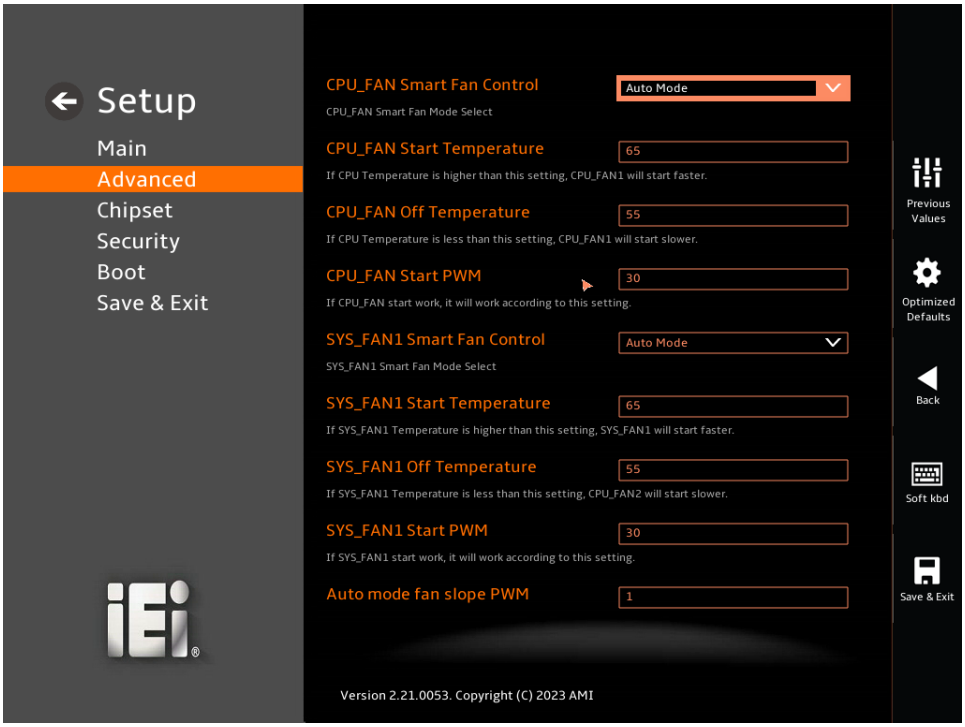
- System Temperatures:
  - CPU Temperature
  - System Temperature1
- Fan Speeds:
  - CPU_Fan1 Speed
  - SYS_Fan1 Speed
- Voltages:
  - +VCCCORE
  - +5VS
  - +12S
  - DDR
  - +DC_IN
  - +3.3VSB

➔ **Tcc Activation Offset [0]**

Offset from factoryset Tcc activation temprature at which the Thermal Control Circuit must be activated. Tcc will be activated at: Tcc Activation Temp-Tcc Activation Offset.Tcc Activation Offset range is 0 to 63.

5.3.6.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 19**) to configure the CPU/system fan start/off temperature and control mode.



BIOS Menu 19: Smart Fan Mode Configuration

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

Use the **CPU_FAN 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_FAN Start Temperature**

If the CPU 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.

➔ **CPU_FAN Off Temperature**

If the CPU 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.

➔ **CPU_FAN Start PWM**

Use the **CPU_FAN 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.

➔ **SYS_FAN1 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_FAN1 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_FAN1 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_FAN Start PWM**

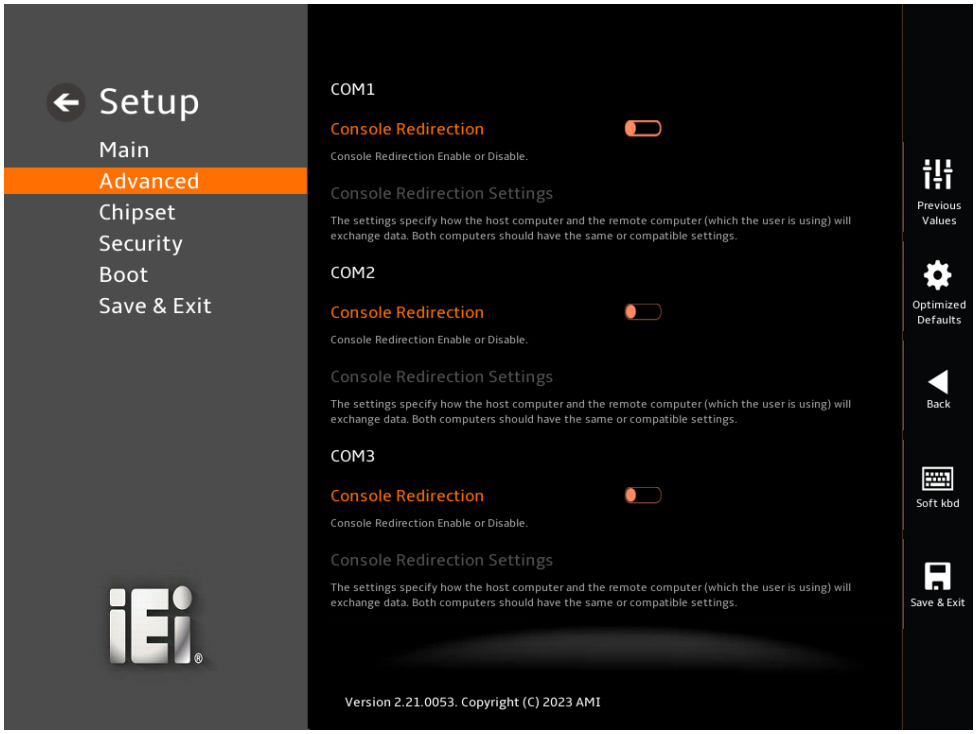
Use the **SYS_Fan1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan slope PWM**

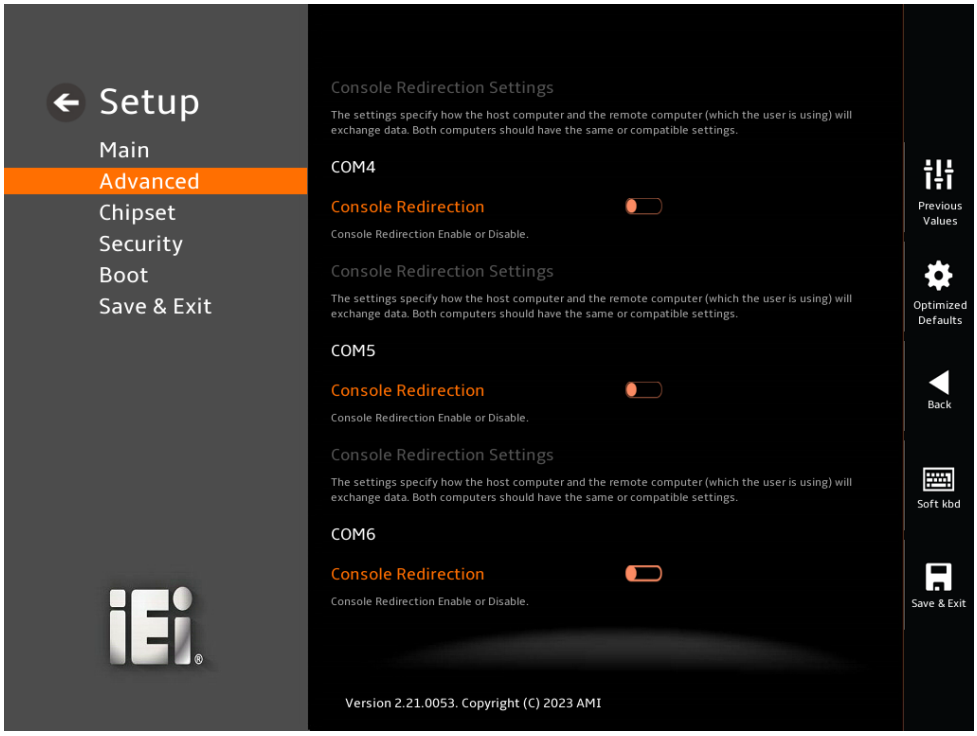
The PWM slope refers to the ratio relationship between the fan speed and the temperature. When the temperature rises or falls by 1°C, the fan speed increases or decreases accordingly. Changing the slope requires entering a number between 1 and 8.

5.3.7 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 20**) 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 20: Serial Port Console Redirection (1/2)



BIOS Menu 21: Serial Port Console Redirection (2/2)

➔ **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.

5.3.7.1 Console Redirection Settings

The following options are available in the **Console Redirection Settings** submenu (**BIOS Menu 22**) when the **COM Console Redirection** (for COM1 to COM6) option is enabled.

BIOS Menu 22: 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.

5.3.8 NVMe Configuration

Use the **NVMe Configuration** (**BIOS Menu 23**) menu to display the NVMe controller and device information.

BIOS Menu 23: NVMe Configuration

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 24**) to access the PCH IO and System Agent (SA) configuration menus.

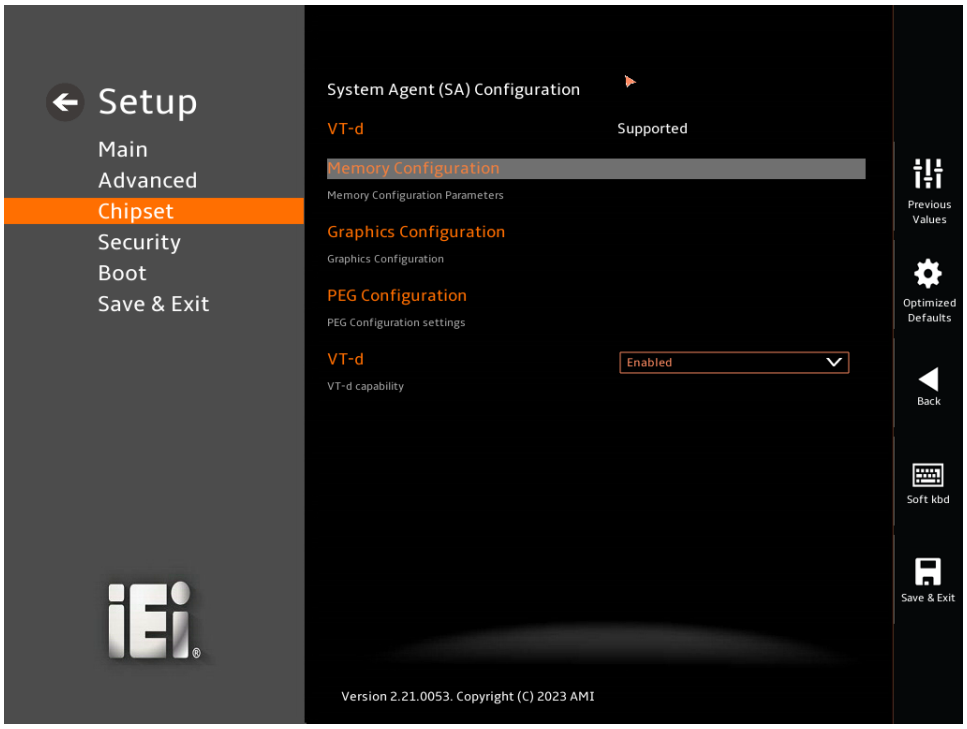
WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

BIOS Menu 24: Chipset

5.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 25**) to configure the System Agent (SA) parameters.



BIOS Menu 25: System Agent (SA) Configuration

➔ **VT-d [Enabled]**

Use the **VT-d** option to enable or disable the VT-d capability.

➔ **Disabled** Disable the VT-d capability

➔ **Enabled** **DEFAULT** Enable the VT-d capability

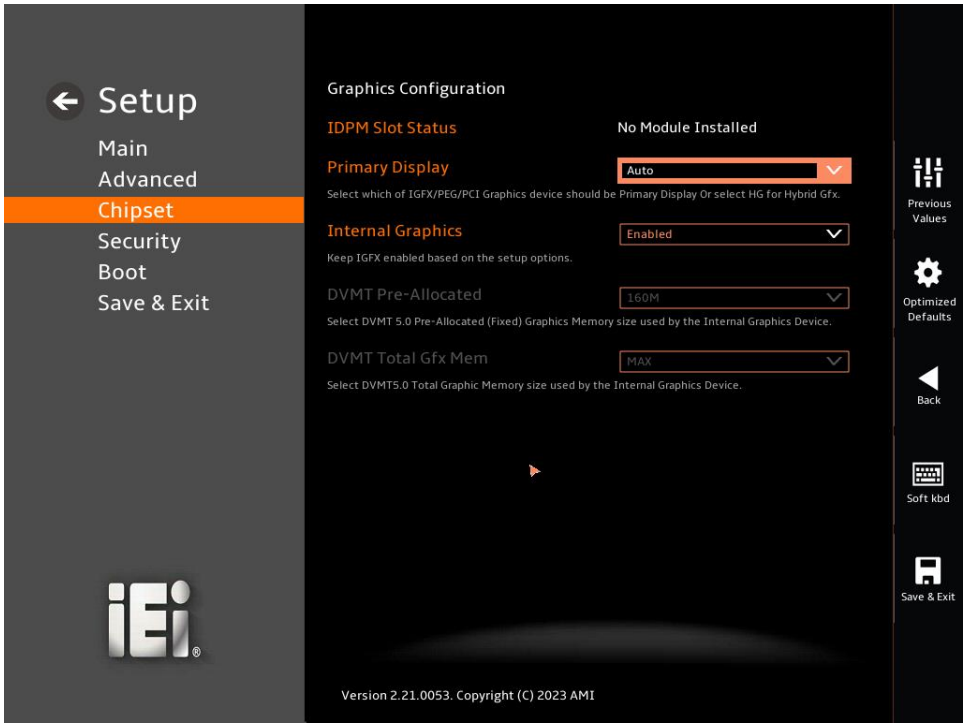
5.4.1.1 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 26**) to view memory information.

BIOS Menu 26: Memory Configuration

5.4.1.2 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 27**) menu to configure the video device connected to the system.



BIOS Menu 27: 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 [160M]**

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:

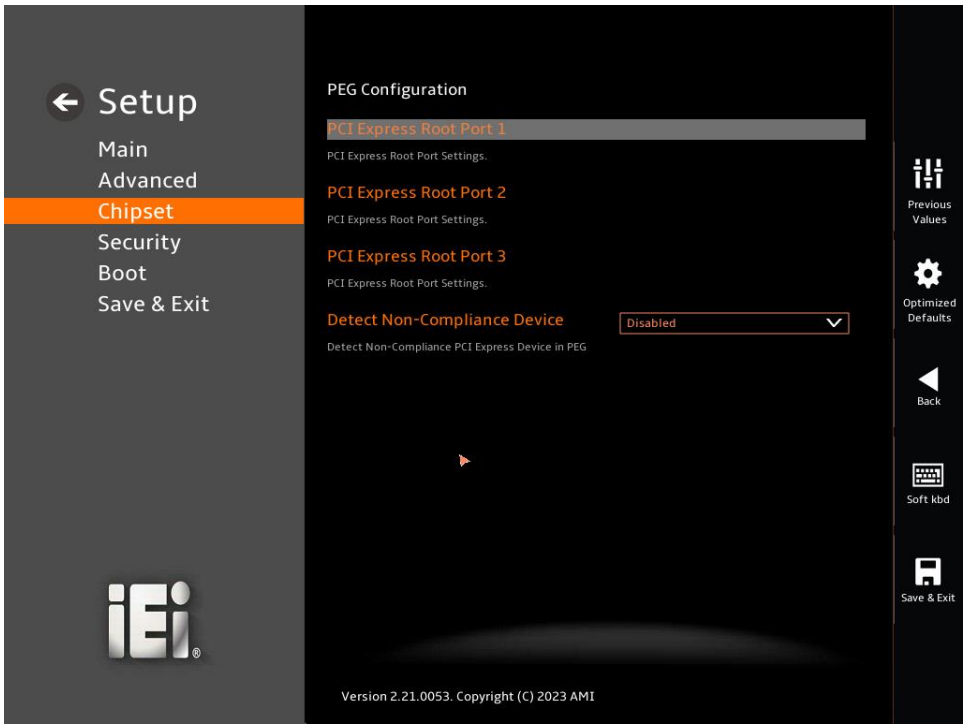
- 80M
- 160M **Default**

➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

5.4.1.3 PEG Port Configuration



BIOS Menu 28: PEG Port Configuration

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

Use the **Detect Non-Compliance Device** option to detect non-compliance PCIe device in PEG.

➔	**Disabled**	**DEFAULT**	Do not detect non-compliance PCIe device in PEG
➔	**Enabled**		Detect non-compliance PCIe device in PEG

5.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 29**) to configure the PCH parameters.

BIOS Menu 29: PCH-IO Configuration

➔ **Auto Power Button Function [Disabled (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)**	**DEFAULT**	The system power mode is AT.
➔ **Disabled (ATX)**		The system power mode is ATX.

➔ **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 SW1(LAN1/LAN2_USB1B) [+5VDUAL]**

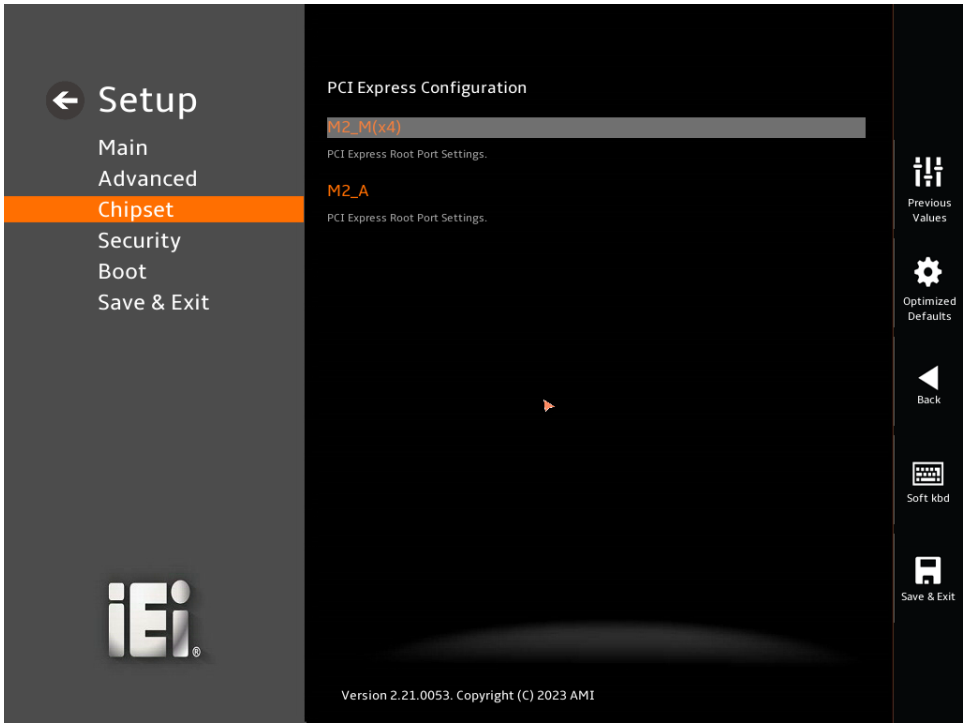
Use the **USB Power SW1** to enable or disable the USB Power. +5VDUAL means keep USB port's power when S5. +5V means USB Port no power when S5.

➔ **+5VDUAL** **DEFAULT** keep USB port's power when S5.

➔ **+5V** USB Port no power when S5.

5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 30**) to configure the PCI Express slots.



BIOS Menu 30: PCI Express Configuration

5.4.2.1.2 PCIe Root Port Setting

Use the **M2_M(x4), M2_A** submenu (**BIOS Menu 31**) to configure the PCI Root Port Setting.

BIOS Menu 31: 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.
➔ **Gen4**		Configure PCIe Speed to Gen4.

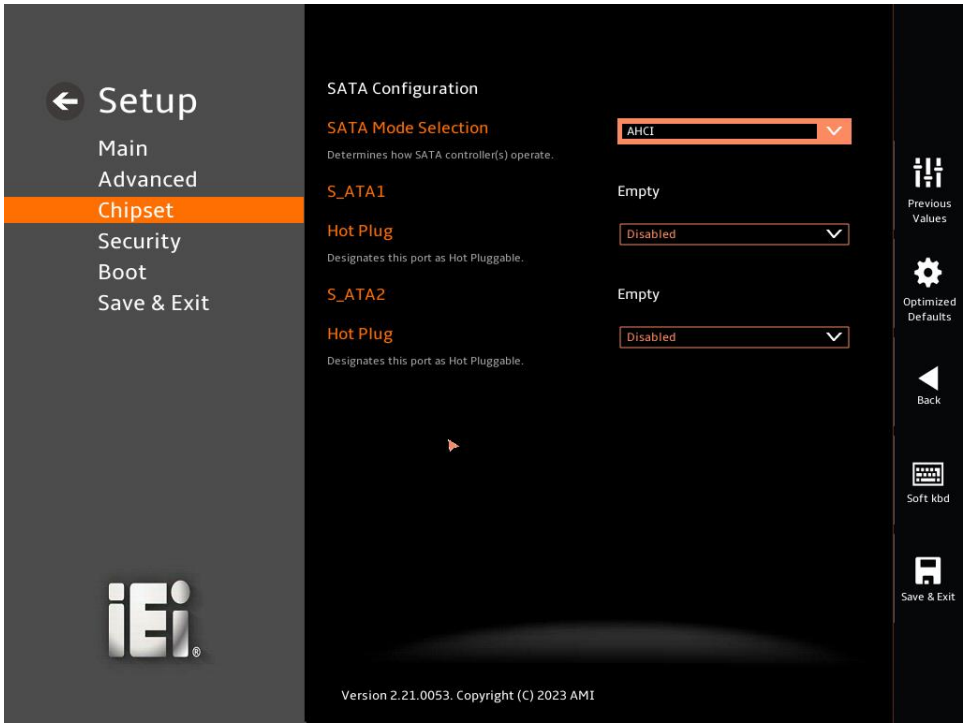
➔ **Detect Non-Compliance Device [Disabled]**

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.

5.4.2.2 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 32**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 32: SATA Configuration

➔ **SATA Mode Selection [AHCI]**

Use the **SATA Mode Selection** option to determine how the SATA devices operate.

➔ **AHCI**	**DEFAULT**	Configures SATA devices as AHCI device.
➔ **Intel RST Premium With Intel Optane System Acceleration**		Configures SATA devices to the Intel RST Premium With Intel Optane System Acceleration mode.

➔ **Hot Plug [Disabled]**

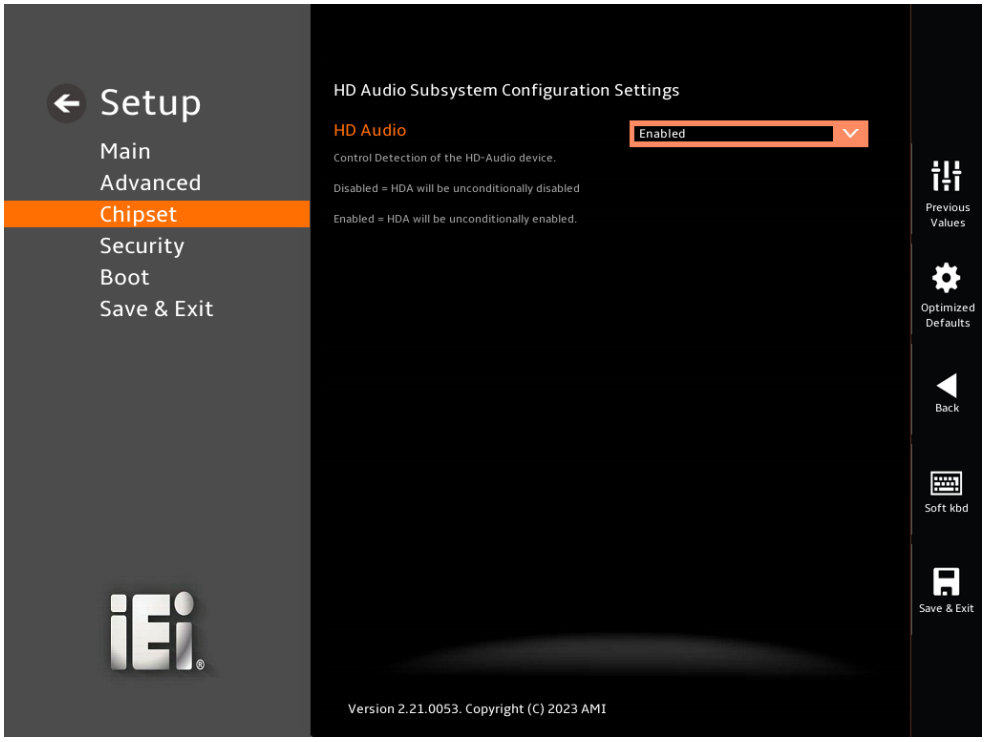
Use the **Hot Plug** option to designate the correspondent port as hot-pluggable.

➔ **Disabled**	**DEFAULT**	Disables the hot-pluggable function of the SATA port.

➔ **Enabled** Designates the SATA port as hot-pluggable.

5.4.2.3 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 33**) to configure the PCH Azalia settings.



BIOS Menu 33: 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.

5.5 Security

Use the **Security** menu (**BIOS Menu 35**) to set system and user passwords.

BIOS Menu 34: Security (1/2)

BIOS Menu 35: Security (2/2)

➔ **Administrator Password**

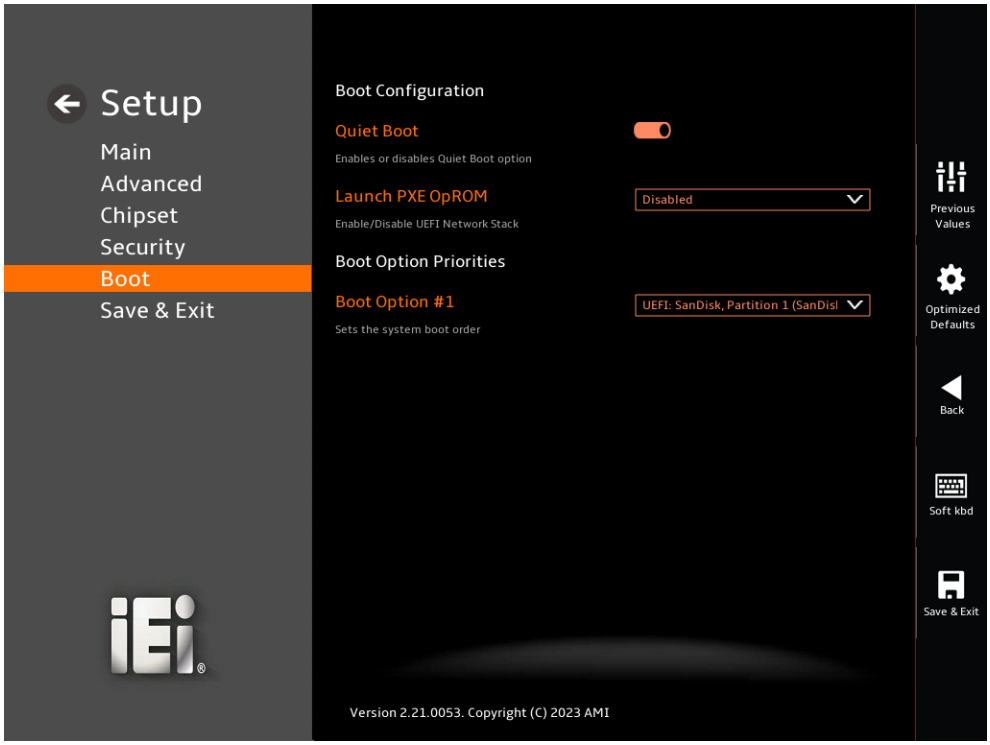
Use the **Administrator Password** to set or change an administrator password.

➔ **User Password**

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

5.6 Boot

Use the **Boot** menu (**BIOS Menu 36**) to configure system boot options.



BIOS Menu 36: Boot

5.6.1 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]**

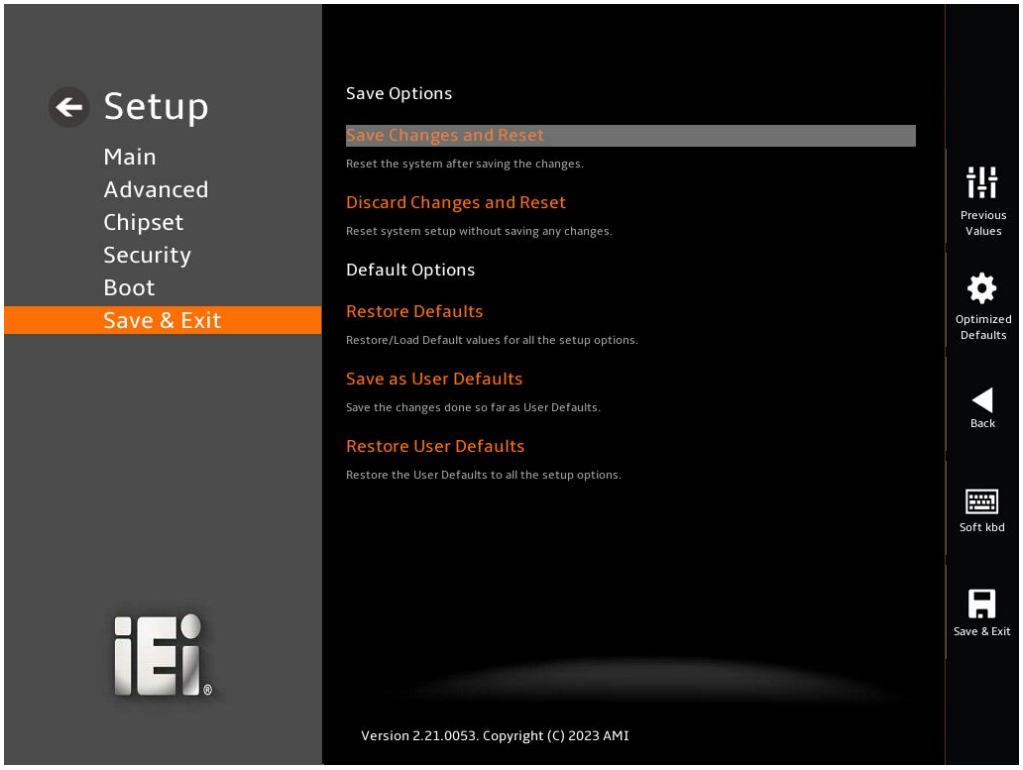
Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled** **DEFAULT** Ignore all PXE Option ROMs

➔ **Enabled** Load PXE Option ROMs.

5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 37**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 37: 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.

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

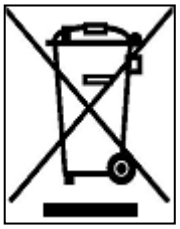
Product Disposal

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。