

**MODEL:
KINO-ADL-P**

Mini-ITX SBC Supports Intel® Alder Lake-P SOC Processor, DDR4 SO-DIMM, HDMI, DP, iDPM, Triple 2.5GbE, M.2 E Key + B Key + M Key, USB 3.2 Gen 2, SATA 6Gb/s, COM, PCIe x4 Slot, 12~28V DC-in and RoHS

User Manual

Revision

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May 31, 2024	1.01	Updated product photos
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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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Chapter

1

Introduction

1.1 Introduction



Figure 1-1: KINO-ADL-P

The KINO-ADL-P is a Mini-ITX motherboard. It accepts onboard an Intel® Alder Lake-P Core™ i7/i5/i3 and Celeron® processor and supports dual-channel DDR4 3200MHz with 32GB memory, up to 64GB.

The KINO-ADL-P include one HDMI1.4 (up to 4096 x 2160 @30Hz) connectors, one DP1.4 (up to 4096 x 2160 @60Hz) connectors and IEI iDPM 3040 slot (only for IEI eDP/ LVDS/ VGA module) for triple independent display.

Expansion and I/O include one M.2 2230 E-key slot for Wi-Fi & Bluetooth expansion, one M.2 3042 B-key Slot with SIM holder for 5G module or NVMe storage expansions, one M.2 2280 M-key slot and one PCIe x4 slot. There are also four USB 3.2 Gen 2 connectors on the rear panel, four USB 2.0 connectors by pin header and two SATA 6Gb/s connector. Serial device connectivity is provided by two external RS-232/422/485 connectors and four internal RS-232 connectors. Three 2.5GbE RJ-45 connectors provide the system with smooth connections to an external LAN.

KINO-ADL-P SBC

1.2 Features

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

- 12th Gen. Intel® Alder Lake-P Core™ i7/i5/i3 and Celeron® processor onboard SoC
- One Intel® I225LM 2.5GbE port and two Intel® I225V 2.5GbE ports
- Four USB 3.2 Gen 2 (Type-A), four USB 2.0 pin header, two RS-232/422/485 pin header, four RS-232 pin header
- M.2 E key, M.2 B key, M.2 M key and PCIe x4 slot (PCIe x4 signal, x4 & x2+x2) expansions
- Support triple independent display via one HDMI 1.4 (up to 4096 x 2160 @ 30Hz), one DP 1.4 (up to 4096 x 2160 @ 60Hz) and IEI iDPM 3040 slot (only for IEI eDP/ LVDS/ VGA module)

1.3 Connectors

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

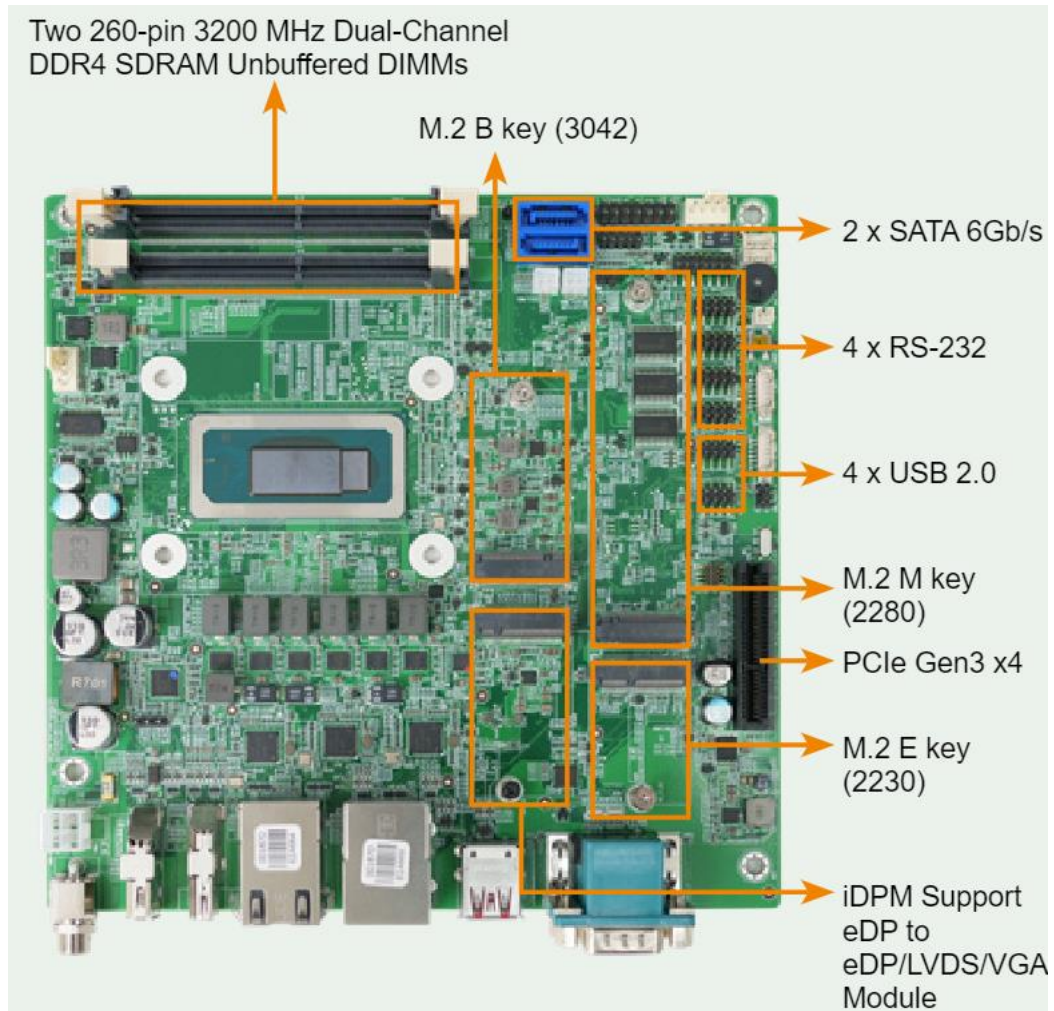


Figure 1-2: Connectors

KINO-ADL-P SBC

1.4 Dimensions

The dimensions of the board are listed below:

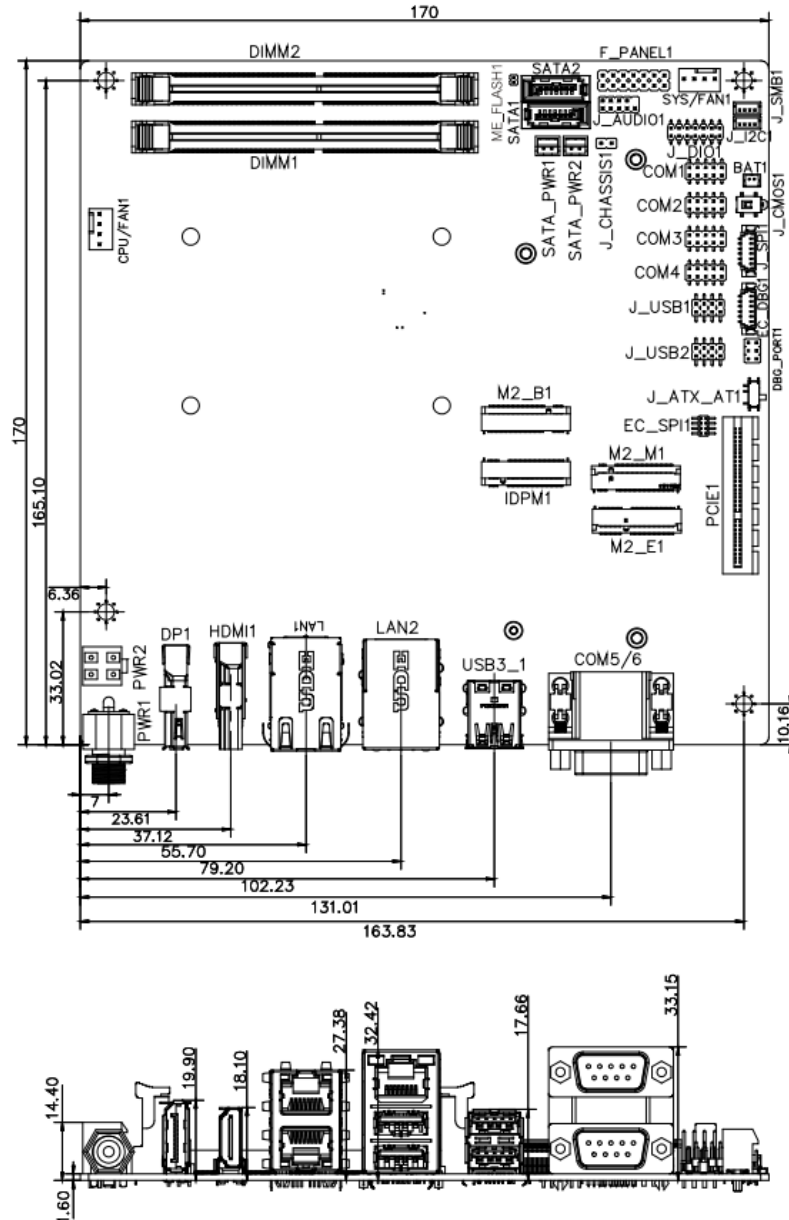


Figure 1-3: Dimensions (mm)

1.5 Data Flow

Shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

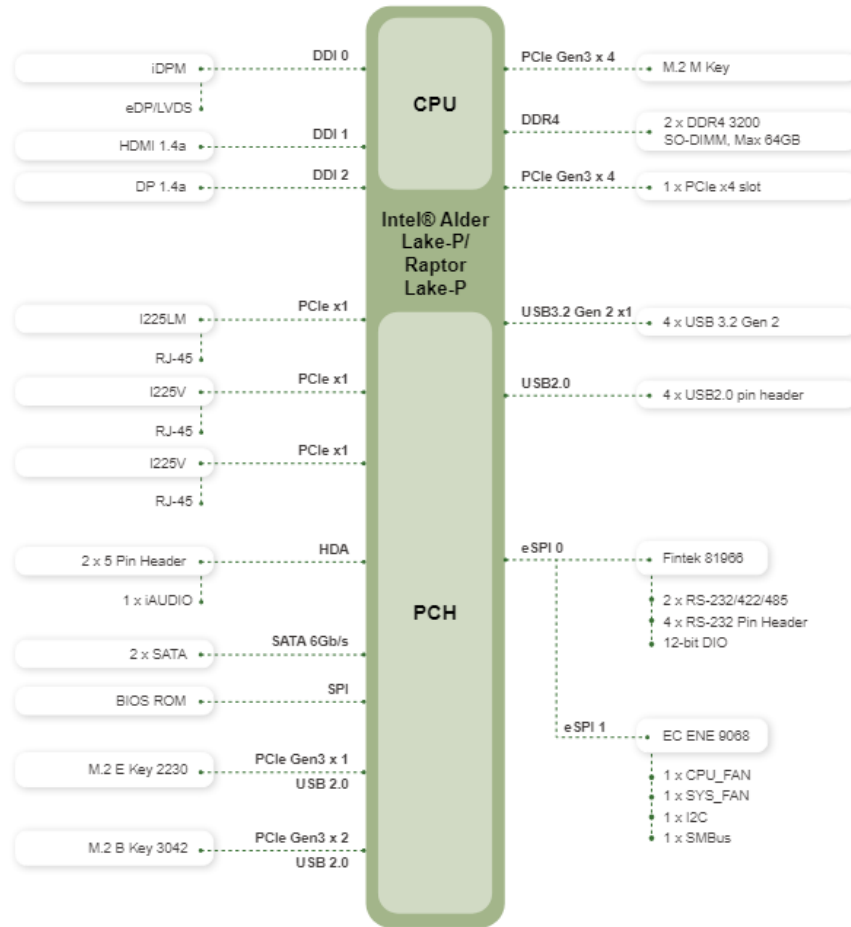


Figure 1-4: Data Flow Diagram

KINO-ADL-P SBC

1.6 Technical Specifications

KINO-ADL-P technical specifications are listed below.

Specification	KINO-ADL-P
SoC	12th Gen. Intel® Alder Lake-P Core™ i7/i5/i3 and Celeron® processor on board SoC
BIOS	AMI UEFI BIOS
Memory	2 x 260-pin 3200 MHz DDR4 SO-DIMM (system up to 64GB)
Graphics	Intel® UHD Graphics for Celeron® 7305 and Core™ i3-1220P Intel® Xe Graphics architecture for Core™ i5-1240P and Core™ i7-1260P
Display Output	Triple independent display 1 x HDMI 1.4 (up to 4096 x 2160 @30Hz) 1 x DP 1.4 (up to 4096 x 2160 @60Hz) 1 x IEI iDPM 3040 slot (only for IEI eDP/ LVDS/ VGA module)
Ethernet	LAN1: Intel® I225LM 2.5GbE controller LAN2: Intel® I225V 2.5GbE controller LAN3: Intel® I225V 2.5GbE controller
Digital I/O	1 x 12-bit Digital I/O (2x7 pin) header
Watchdog Timer	Software programmable support 1~255 sec. system reset
I/O Interface	
Audio Connector	1 x Analog audio (2x5 pin, p=2.0) supports 7.1 channel HD audio by IEI AC-KIT-888S audio kit
Serial Ports	2 x RS-232/422/485 on rear I/O 4 x RS-232 (2x5 pin, P=2.0) wafer
USB Ports	4 x USB 3.2 Gen 2 (Type-A) 4 x USB 2.0 by 8-pin (2x4 pin, P=2.0) header
Front Panel	1 x Front panel (2x7 pin, p=2.54; power LED, HDD LED, speaker, power button, reset button)
Fan	1 x CPU fan connector (1x4 pin) 1 x System fan connector (1x4 pin)

Specification	KINO-ADL-P
SMBus/I²C	1 x I ² C connector by 4-pin (1x4) wafer 1 x SMBus connector by 4-pin (1x4) wafer
Storage	2 x SATA 6Gb/s with 5V SATA power connectors
Expansions	1 x M.2 2230 E key for Wi-Fi & BT (PCIe Gen3 x1 & USB 2.0) 1 x M.2 3042 B key with SIM slot (PCIe x2 & USB 2.0) 1 x M.2 2280 M key (PCIe x4) 1 x PCIe Gen3 x4 slot (PCIe x4 signal, x4 & x2+x2)
Environmental and Power Specifications	
Power Supply	Input voltage range: 12V – 28V DC 1 x External DC power jack (Ø2.6mm) ErP/EuP compliant
Power Connector	1 x Internal power connector by 4-pin (2x2) connector
Power Consumption	12V@5.09A, 19V@3.25A, 24V@2.58A, 28V@2.23A, (12th Gen Intel® Core™ i7-1270PE CPU with 32 GB 3200 MHz DDR4 memory, max. loading, EuP mode disabled)
Operating Temperature	0°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Humidity	5% ~ 95%, non-condensing
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	900 g / 450 g

Table 1-1: Technical Specifications

Chapter

2

Unpacking

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-P is unpacked, please do the following:

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

The following are optional components which may be separately purchased:



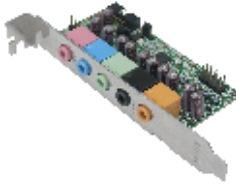



Item and Part Number	Image
Dual-port USB 2.0 cable, 210mm, P=2.0 mm (P/N : CB-USB02A-RS)	
RS-232/422/485 cable, 200 mm, p=2.0 mm (P/N: 32205-002700-200-RS)	
Audio kit, 7.1 Channel (P/N: AC-KIT-888S-R10)	
eDP to VGA converter board (for IEI iDPM connector) (P/N: iDPM-VGA-R10)	
eDP to eDP DisplayPort converter board (for IEI iDPM connector) (P/N: iDPM-eDP-R10)	
eDP to LVDS DisplayPort converter board (for IEI iDPM connector) (P/N: iDPM-LVDS-R10)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 KINO-ADL-P Layout

The figures below show all the connectors and jumpers.

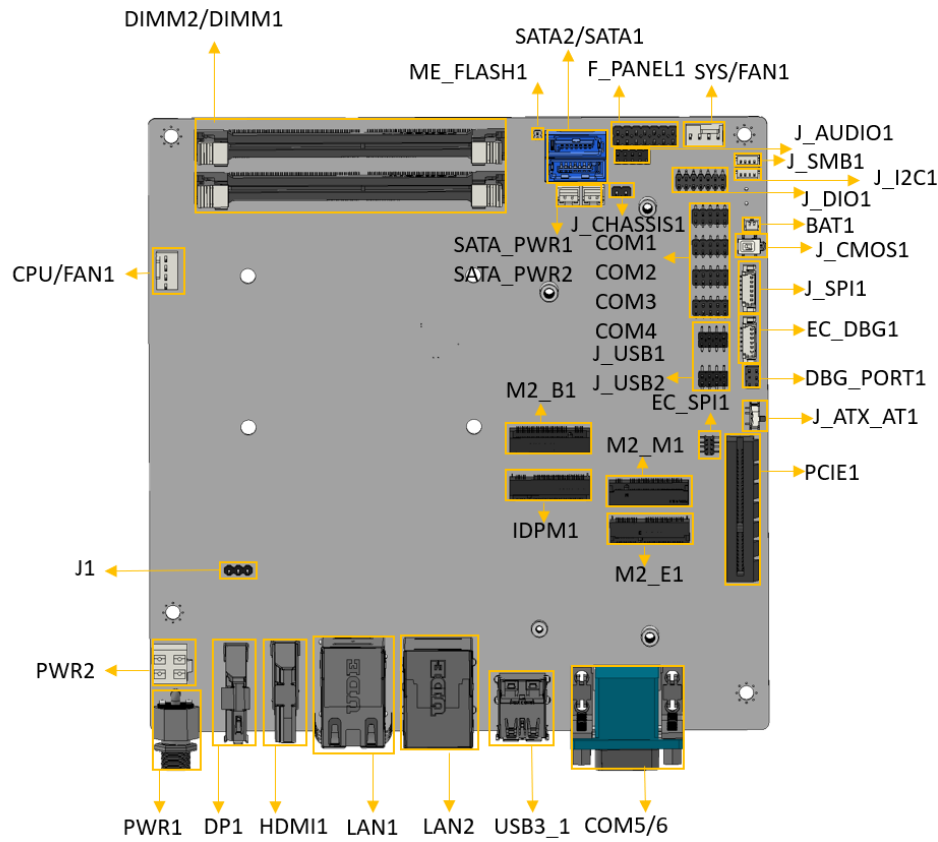


Figure 3-1: Connector And Jumper Locations

KINO-ADL-P SBC

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Clear CMOS button	4-pin switch	J_CMOS1
AT/ATX power mode switch	3-pin switch	J_ATX_AT1
Flash descriptor security override jumper	2-pin header	ME_FLASH1
Audio connector for IEI AC-KIT-888S kit	10-pin header	J_AUDIO1
12V power input connector	4-pin Molex	PWR2
RTC battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	J_CHASSIS1
DDR4 SO-DIM slots	Memory Connectors	DIMM1, DIMM2
Debug port connector	5-pin header	DBG_PORT1
Digital I/O connector	14-pin header	J_DIO1
EC debug connector	6-pin wafer	EC_DBG1
Fan connectors	4-pin wafer	CPU/FAN1, SYS/FAN1
Front panel connector	14-pin header	F_PANEL1
External power input jack	3-pin DC JACK	PWR1
IEI iDPM module slot	iDPM slot	IDPM1
RS-232 serial port connectors	10-pin header	COM1, COM2, COM3, COM4
SATA 6Gb/s connectors	7-pin SATA connector	SATA1, SATA2
SATA power connectors	2-pin wafer	SATA_PWR1, SATA_PWR2
I2C connector	4-pin wafer	J_I2C1
SMBus connector	4-pin wafer	J_SMB1
Flash SPI ROM connector	6-pin wafer	J_SPI1

Flash EC ROM connector	8-pin header	EC_SPI1
Internal USB 2.0 connectors	8-pin header	J_USB1, J_USB2
M.2 2230 E key slot	M.2 E-key slot	M2_E1
M.2 3042 B key slot	M.2 B-key slot	M2_B1
M.2 2280 M key slot	M.2 M-key slot	M2_M1
PCIe x4 slot	PCIe slot for riser card	PCIE1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

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

Connector	Type	Label
External dual 2.5GbE RJ-45 connector	RJ45	LAN1
External 2.5GbE RJ-45 connector and USB 3.2 Gen 2 connector	RJ45 & USB 3.2 Gen 2 Type-A	LAN2
External RS-232/422/485 serial ports	COM	COM5/6
External dual USB 3.2 Gen 2 connectors	USB 3.2 Gen 2 Type-A	USB3_1
External DP connector	DP	DP1
External HDMI connector	HDMI	HDMI1

Table 3-2: Rear Panel Connectors

KINO-ADL-P SBC

3.2 Internal Peripheral Connectors

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

3.2.1 Clear CMOS Button

- CN Label:** J_CMOS1
- CN Type:** Button
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-3**

To clear the CMOS Setup (for example if you have forgotten the password, you should clear the CMOS and then reset the password), you should disconnect the RTC battery and press the button for about 3 seconds. This will set back to normal operation mode.

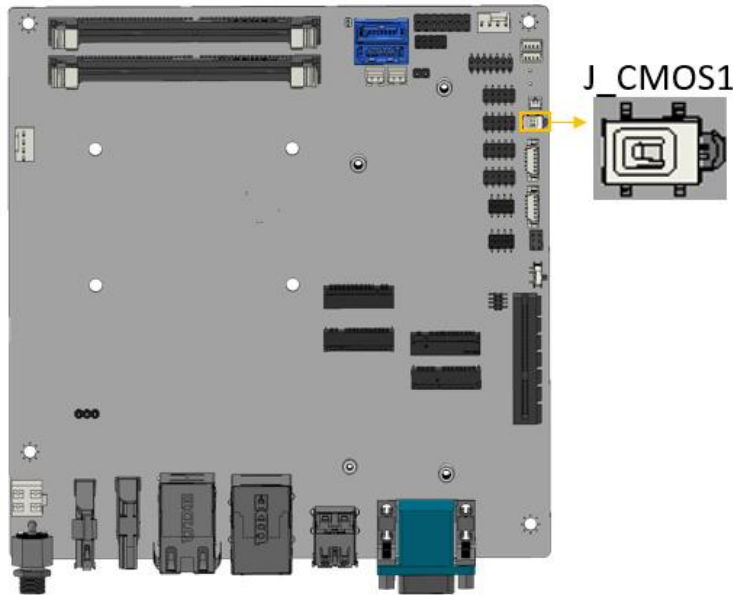


Figure 3-2: Clear CMOS Location

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

Table 3-3: Clear CMOS Pinouts

3.2.2 AT/ATX Power Mode Setting

- CN Label:** J_ATX_AT1
- CN Type:** Slide Switch
- CN Location:** See Figure 3-3
- CN Pinouts:** See Table 3-4

The AT/ATX power mode selection is made through the AT/ATX power mode switch which is shown in Figure3-3.

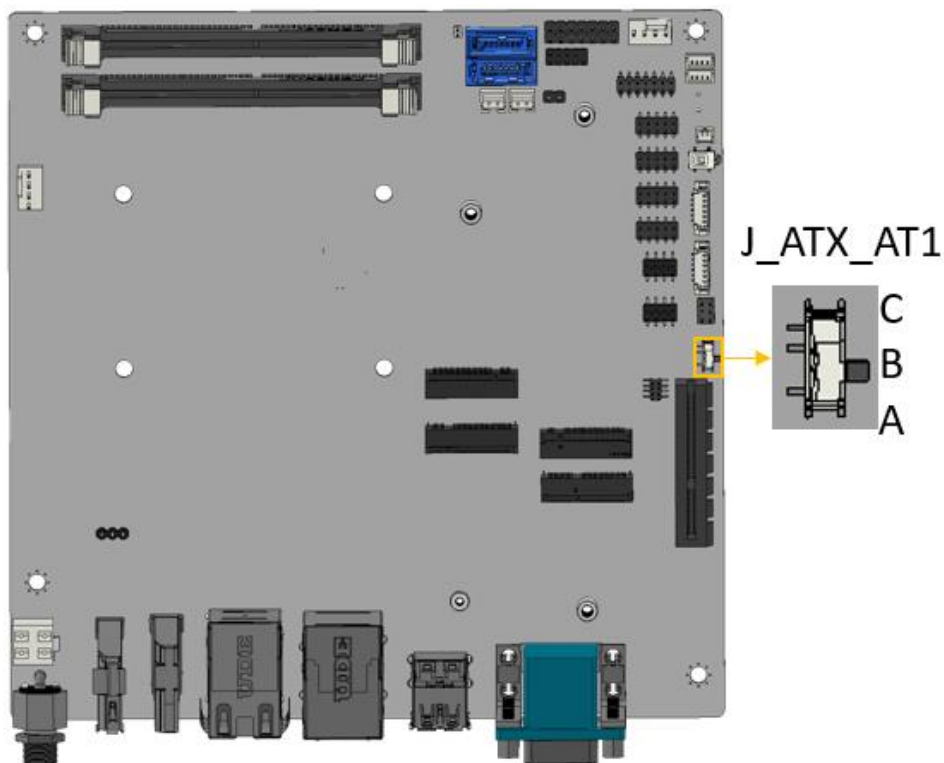


Figure 3-3: AT/ATX Power Mode Switch Locations

PIN NO.	DESCRIPTION
Short A - B	ATX Power Mode (default)
Short B - C	AT Power Mode

Table 3-4: AT/ATX Power Mode Switch Pinouts

KINO-ADL-P SBC

3.2.3 Chassis Intrusion Connector

- CN Label:** J_CHASSIS1
- CN Type:** 2-pin header, P=2.54mm
- CN Location:** See Figure 3-4
- CN Pinouts:** See Table 3-5

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

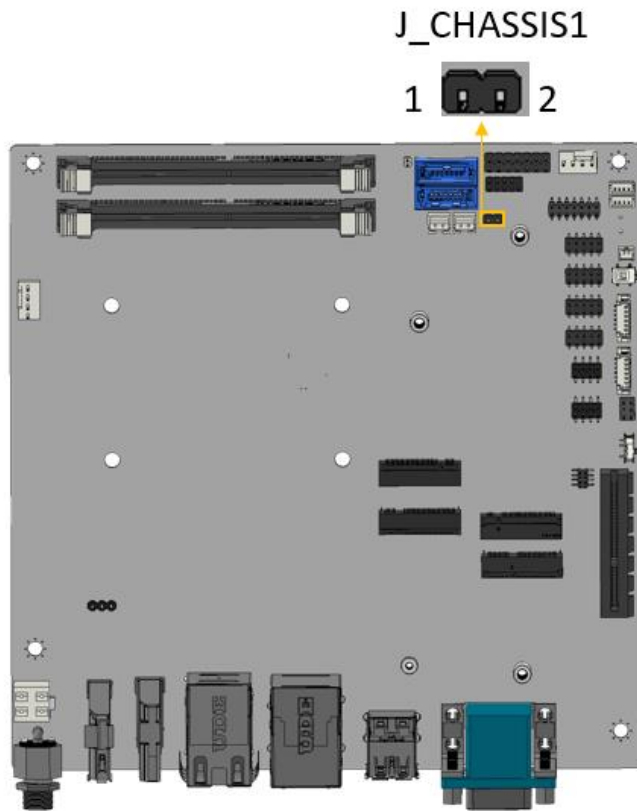


Figure 3-4: Chassis Intrusion Connector Location

PIN NO.	DESCRIPTION
1	CASEOPEN_N
2	GND

Table 3-5: Chassis Intrusion Connector Pinouts

3.2.4 Flash Descriptor Security Override Jumper

- CN Label:** ME_FLASH1
- CN Type:** 2-pin header, p=1.27mm
- CN Location:** See Figure 3-5
- CN Pinouts:** See Table 3-6

The ME_FLASH1 connector is used for Flash Descriptor Security Override.

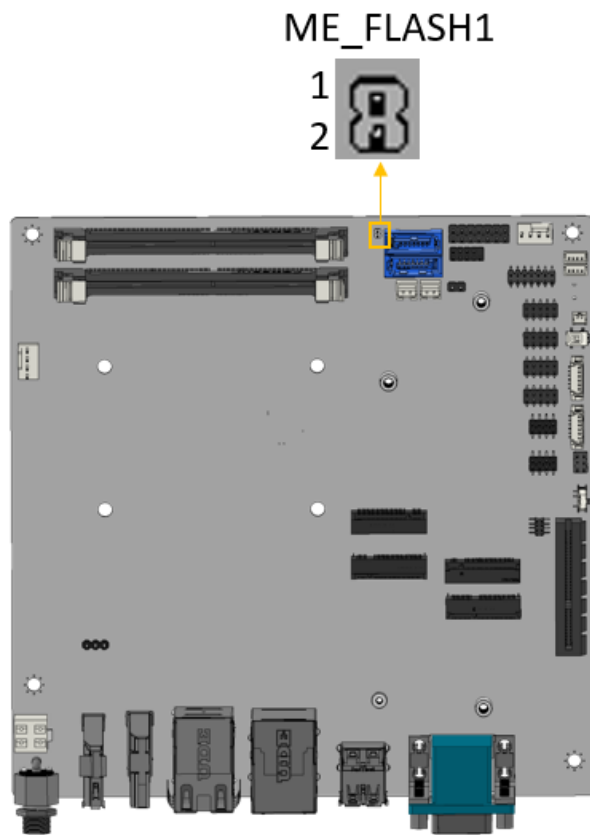


Figure 3-5: Flash Descriptor Override Setting Jumper Locations

PIN NO.	DESCRIPTION
Open	Disable (default)
Short	Enable

Table 3-6: Flash Descriptor Override Setting Jumper Pinouts

KINO-ADL-P SBC

To update the ME firmware, please follow the steps below.

- Step 1:** Before turning on the system power, short the Flash Descriptor Security Override jumper.
- Step 2:** Update the BIOS and ME firmware, and then turn off the system power.
- Step 3:** Remove the metal clip on the Flash Descriptor Security Override jumper to its default setting.
- Step 4:** Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

3.2.5 Audio Connector for IEI AC-KIT-888S kit

- CN Label:** J_AUDIO1
- CN Type:** 10-pin header, p=2.00 mm
- CN Location:** See **Figure 3-6**
- CN Pinouts:** See **Table 3-7**

The audio connector is connected to external audio devices (AC-KIT-888S-R10) including speakers and microphones for the input and output of audio signals to and from the system.

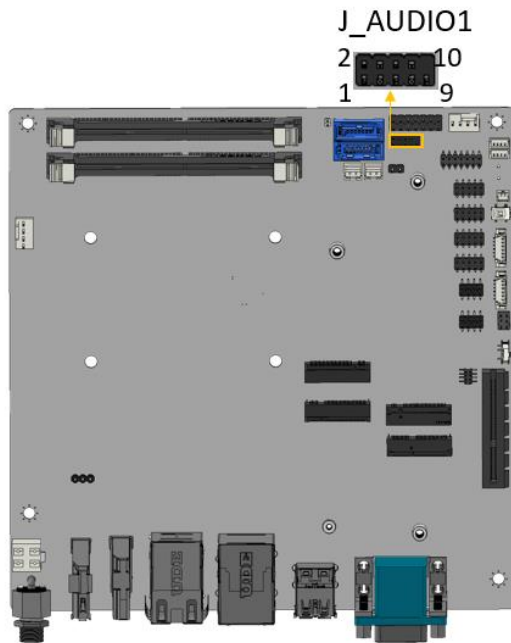


Figure 3-6: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDA_SYNC_R	2	HDA_BCLK_R
3	HDA_SDO_R	4	HDA_PCBEPEC
5	HDA_SDI_0_R	6	HDA_RST_R
7	+5V	8	GND
9	+12V	10	GND

Table 3-7: Audio Connector Pinouts

KINO-ADL-P SBC

3.2.6 12V Power Input Connector

- CN Label:** PWR2
- CN Type:** 4-pin Molex, p=4.2 mm
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-8**

The connector supports to 12V power supply.

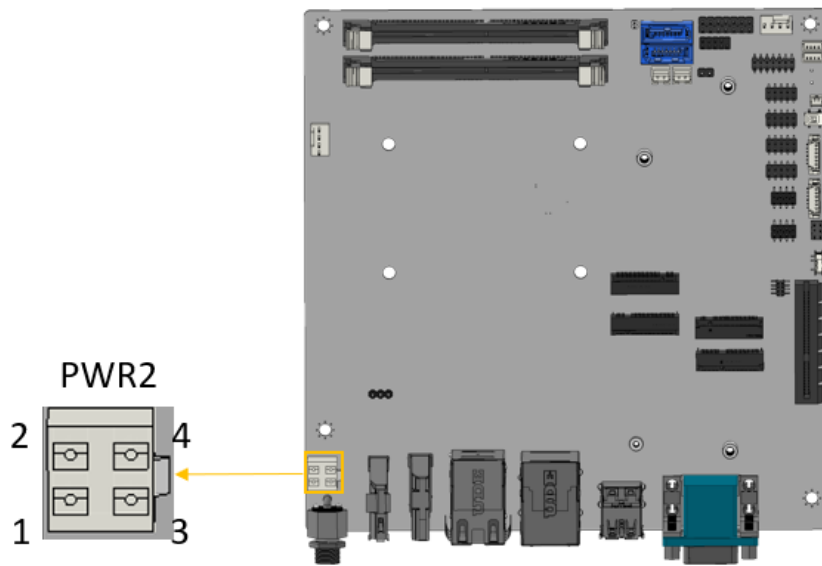


Figure 3-7: 12V Power Input Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	VIN	4	VIN

Table 3-8: 12V Power Input Connector

3.2.7 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-P is installed.

CN Label:	BAT1
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See Figure 3-8
CN Pinouts:	See Table 3-9

The battery connector is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

KINO-ADL-P SBC

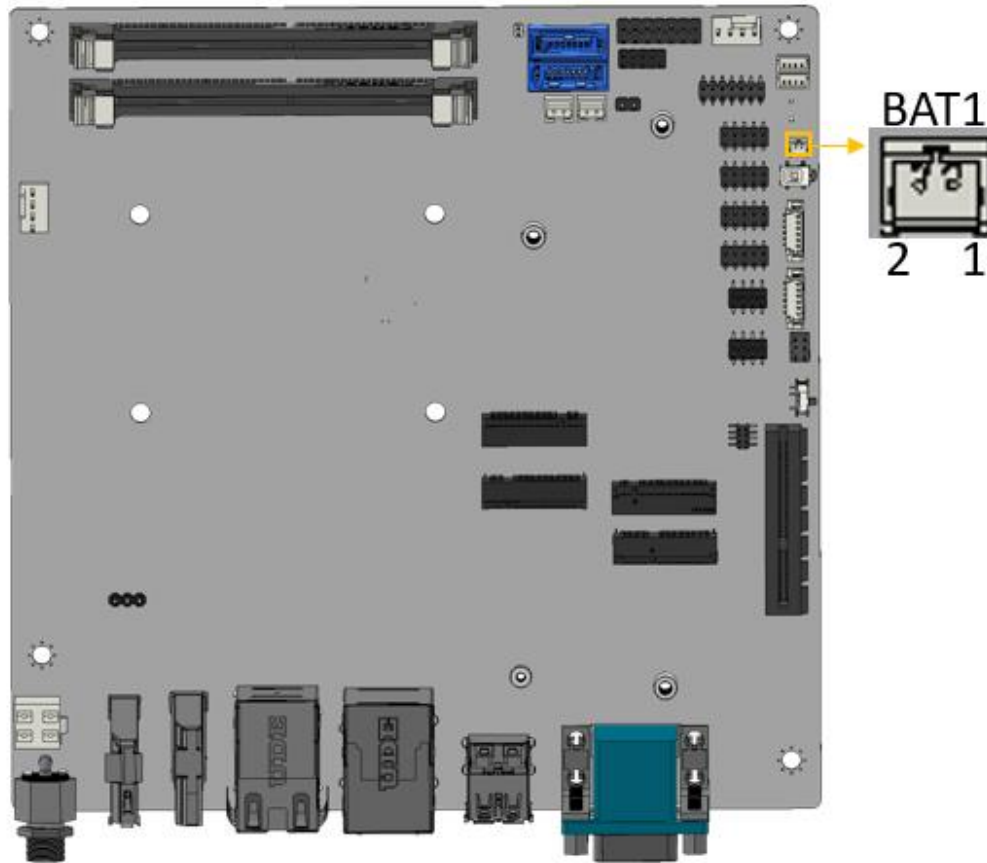


Figure 3-8: Battery Connector Location

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 3-9: Battery Connector Pinouts

3.2.8 Digital Input/ Output Connector

- CN Label:** J_DIO1
- CN Type:** 14-pin header, p=2.0 mm
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-10

The 12-bit digital I/O connector provides programmable input and output for external devices.

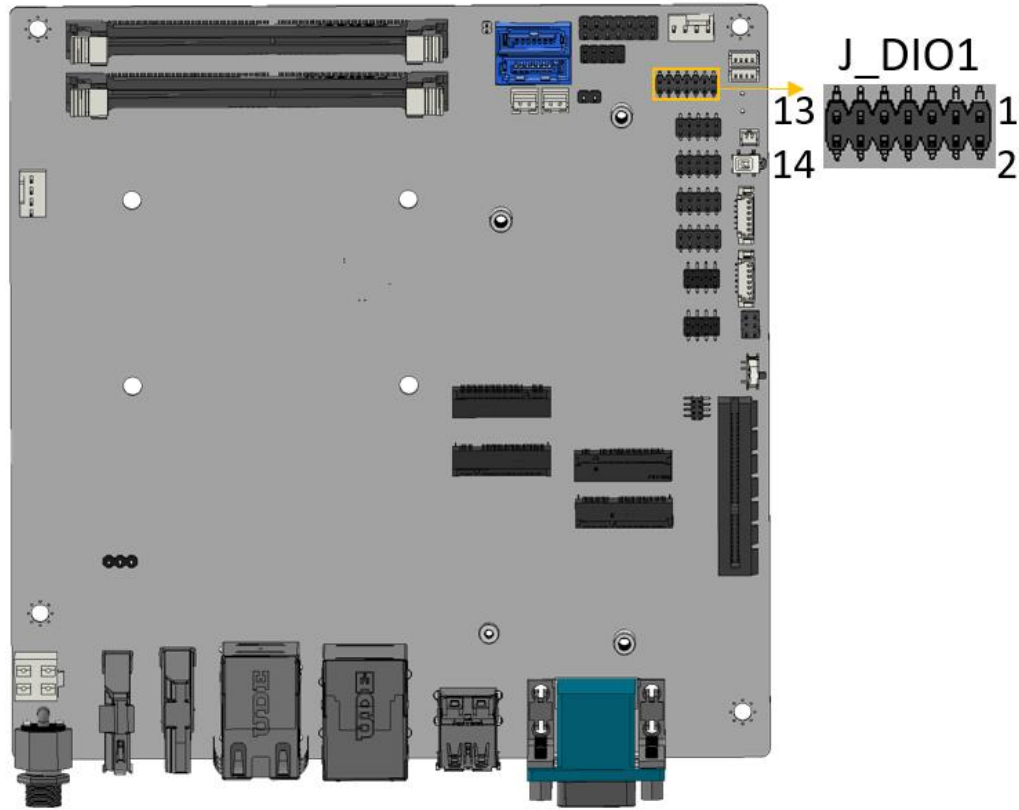


Figure 3-9: Digital I/O Connector Location

PIN NO.	DESCRIPTION	PIN NO.	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 3-10: Digital I/O Connector Pinouts

KINO-ADL-P SBC

3.2.9 CPU/System Fan Connectors

- CN Label:** CPU/FAN1, SYS/FAN1
- CN Type:** 4-pin wafer, p=2.54 mm
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-11

The fan connector attaches to a smart cooling fan.

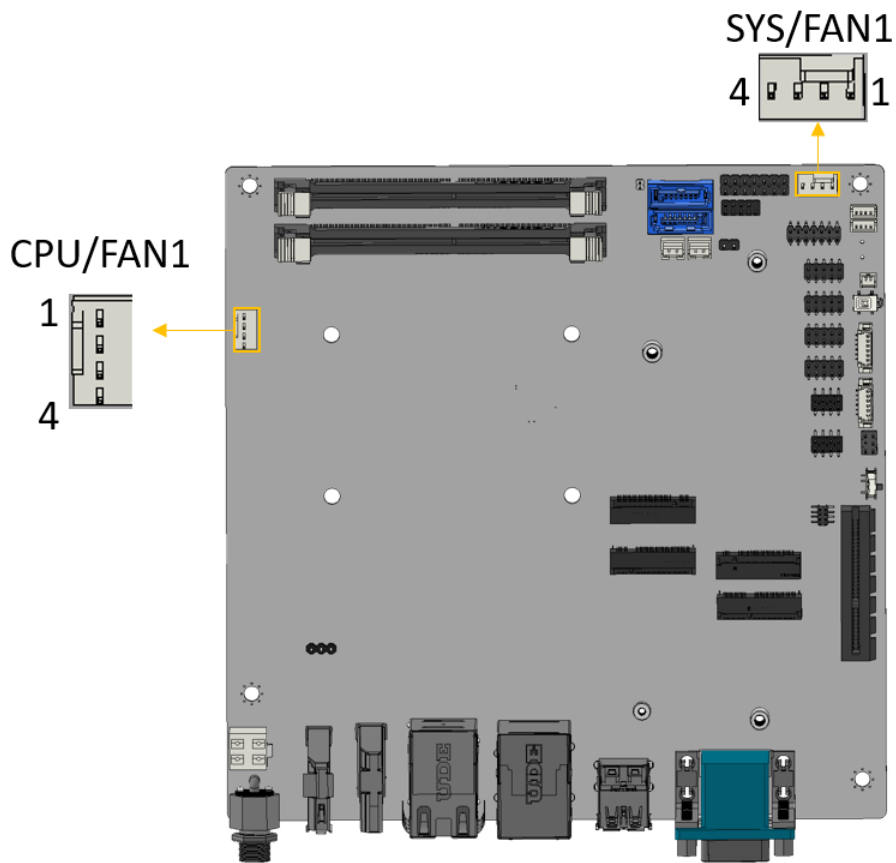


Figure 3-10: Fan Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM (+5V)

Table 3-11: Fan Connector Pinouts

3.2.10 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 14-pin wafer, p=2.00 mm
- CN Location:** See Figure 3-11
- CN Pinouts:** See Table 3-12

The front panel connector connects to the power LED indicator and HDD LED indicator on the system front panel.

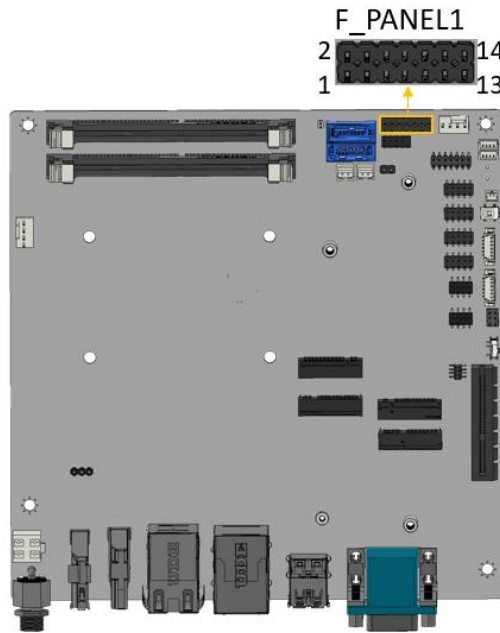


Figure 3-11: Front Panel Connector

	Pin	Description	Pin	Description	
PWR LED	1	PWR_LED+	2	SPKR+	SPKR
	3	NC	4	NC	
	5	PWR_LED-	6	NC	
PWR BTN	7	PWR_BTN+	8	SPKR-	
	9	PWR_BTN-	10	NC	
HDD LED	11	HDD_LED+	12	Reset+	RESET
	13	HDD_LED-	14	Reset-	

Table 3-12: Front Panel Connector

KINO-ADL-P SBC

3.2.11 Debug Port Connector

- CN Label:** **DBG_PORT1**
- CN Type:** 5-pin header, p=2.00 mm
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-13**

The DBG_PORT1 is used for monitoring the motherboard startup process with debug card.

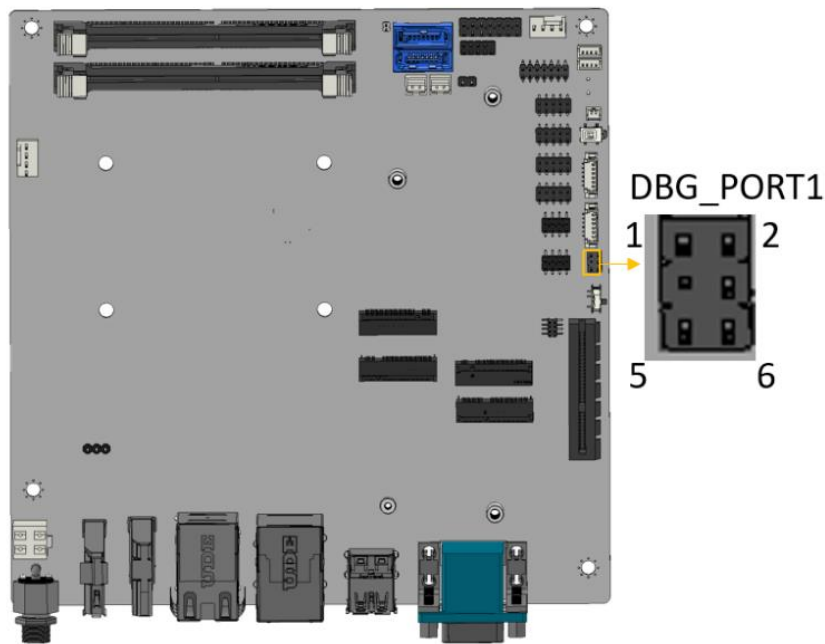


Figure 3-12: Debug Port Connector Location

PIN NO.	DESCRIPTION
1	+5V
2	SMCLK1_EC
3	N/C
4	SMDAT1_EC
5	GND
6	BUF_PLT_RST#

Table 3-13: Debug Port Connector Pinout

3.2.12 RS-232 Serial Port Connectors

- CN Label:** COM1, COM2, COM3, COM4
- CN Type:** 10-pin header, p=2.00mm
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-14

The serial connector provides RS-232 connection.

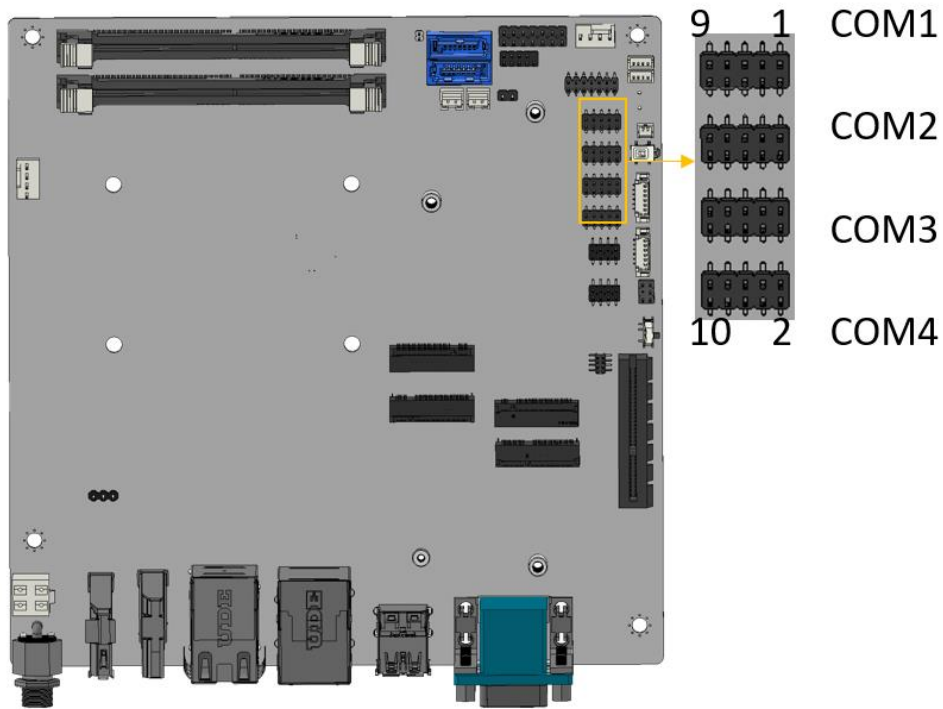


Figure 3-13: RS-232 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-14: RS-232 Serial Port Connector Pinouts

KINO-ADL-P SBC

3.2.13 SATA 6Gb/s Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA connector, p=1.7mm
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-15

The SATA 6Gb/s drive connector is connected to a SATA 6Gb/s drive. The SATA 6Gb/s drive transfers data at speeds as high as 6Gb/s.

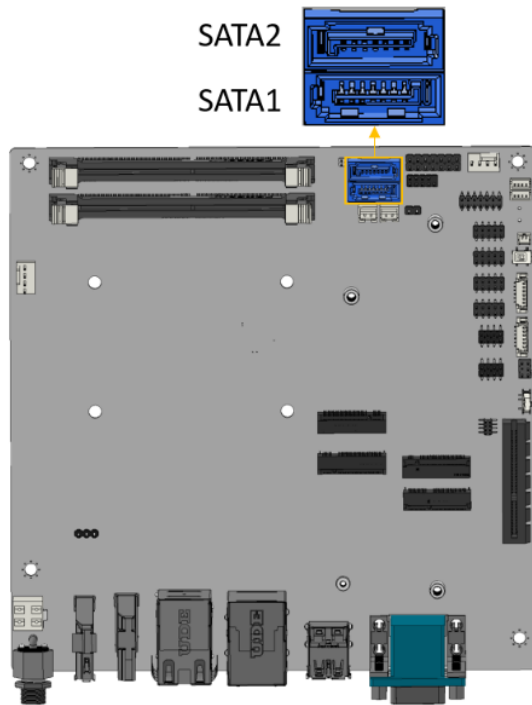


Figure 3-14: SATA 6Gb/s Drive Connectors Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND		

Table 3-15: SATA 6Gb/s Drive Connectors Pinouts

3.2.14 SATA Power Connectors

CN Label: SATA_PWR1, SATA_PWR2

CN Type: 2-pin wafer, p=2.00 mm

CN Location: See Figure 3-15

CN Pinouts: See Table 3-16

The SATA power connector provides +5 V power output to the SATA connector.

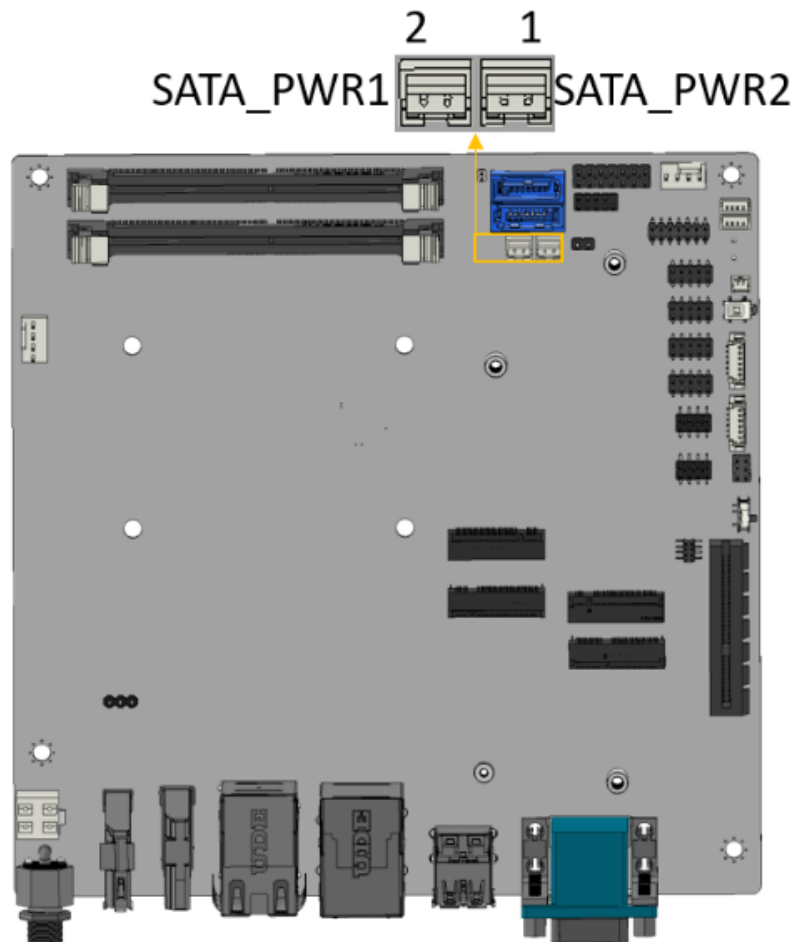


Figure 3-15: SATA Power Connector Location

PIN NO.	DESCRIPTION
1	VCC5V
2	GND

Table 3-16: SATA Power Connector Pinouts

KINO-ADL-P SBC

3.2.15 I²C Connector

- CN Label:** J_I2C1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-17**

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

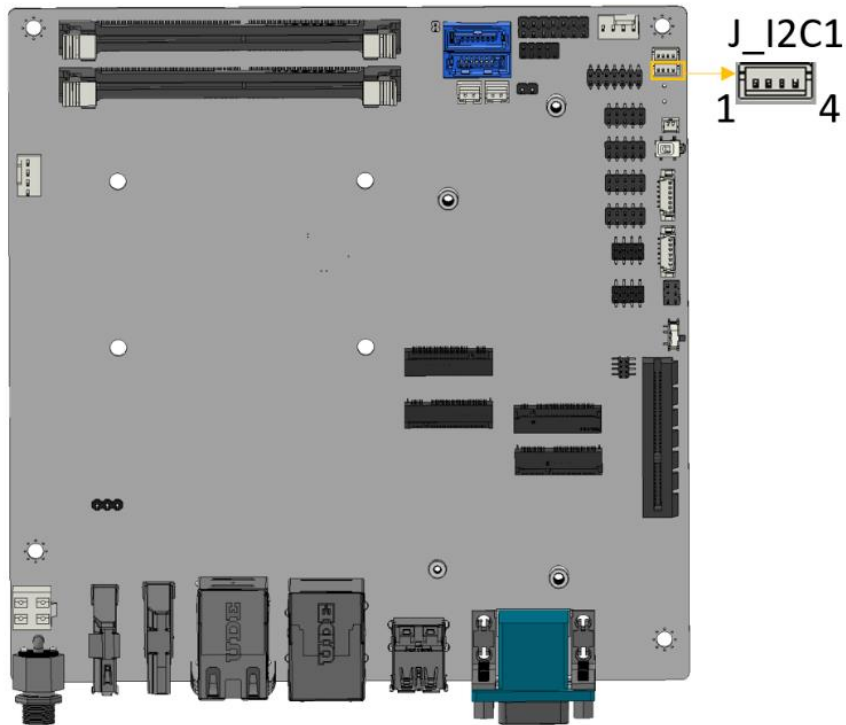


Figure 3-16: I²C Connector Location

Pin	Description
1	GND
2	SMB_DATA_EC
3	SMB_CLK_EC
4	+5V

Table 3-17: I²C Connector Pinouts

3.2.16 SMBus Connector

- CN Label:** J_SMB1
- CN Type:** 4-pin wafer, p=1.25 mm
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-18**

The SMBus is a two-wire bus used for communication with low bandwidth devices on a motherboard such as power related chips and temperature sensors.

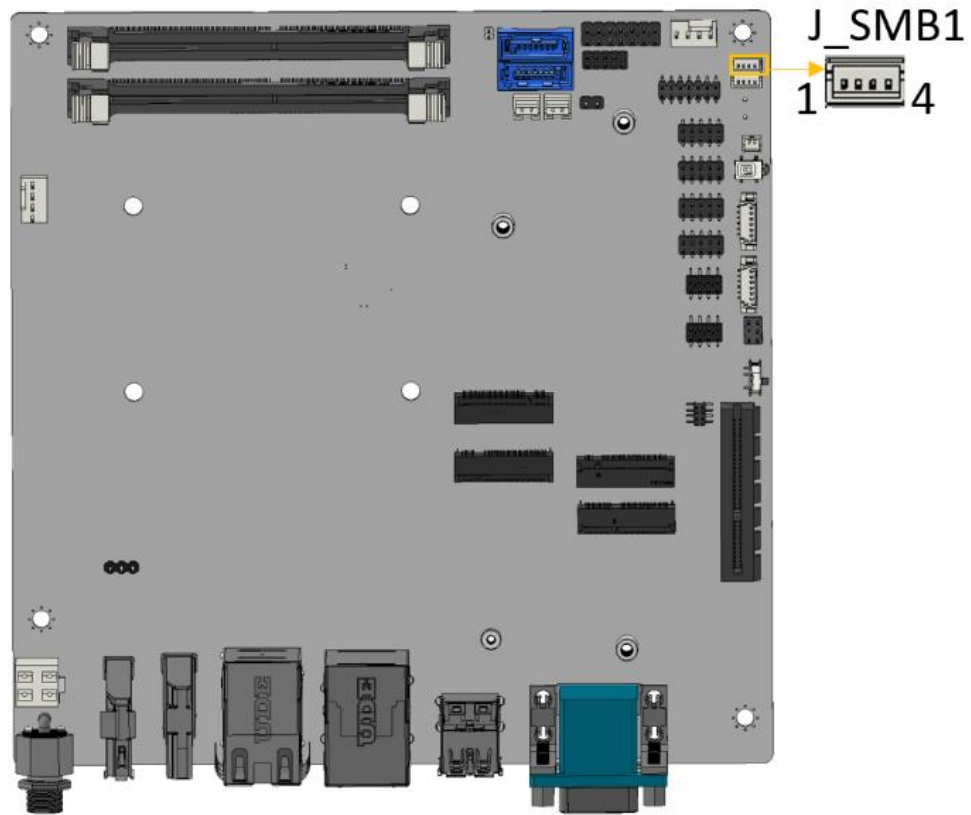


Figure 3-17: SMBus Connector Location

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

Table 3-18: SMBus Connector Pinouts

KINO-ADL-P SBC

3.2.17 Flash SPI ROM Connector

- CN Label:** J_SPI1
- CN Type:** 6-pin wafer, p=1.25 mm
- CN Location:** See Figure 3-18
- CN Pinouts:** See Table 3-19

The 6-pin Flash SPI ROM connector is used to flash the BIOS.

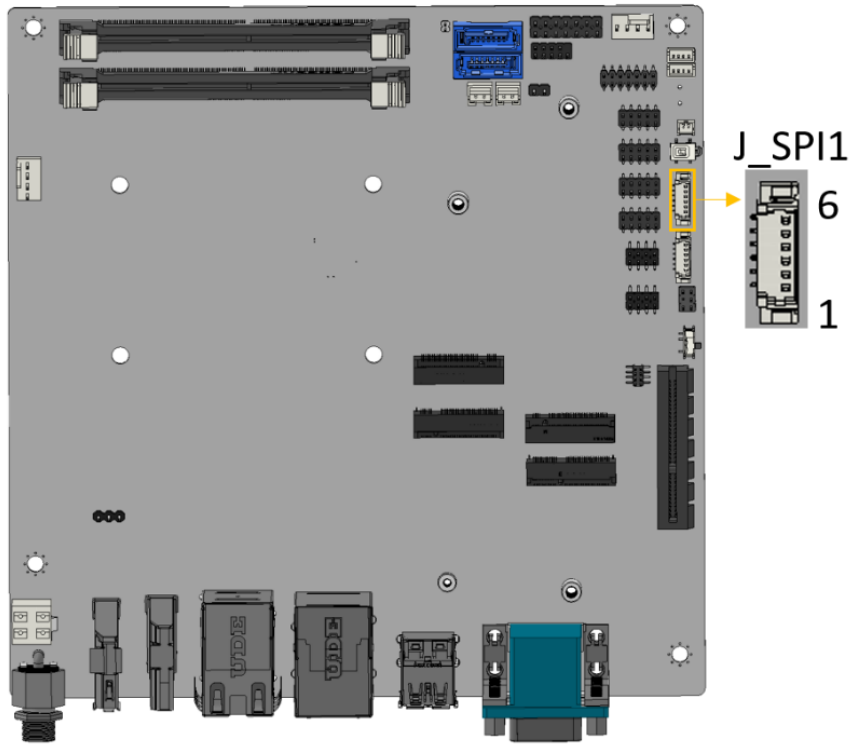


Figure 3-18: Flash SPI ROM Connector Location

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

Table 3-19: Flash SPI ROM Connector Pinouts

3.2.18 Flash EC ROM Connector

- CN Label:** EC_SPI1
- CN Type:** 8-pin header, p=1.27 mm
- CN Location:** See **Figure 3-19**
- CN Pinouts:** See **Table 3-20**

The 6-pin Flash EC ROM connector is used to flash the EC internal ROM.

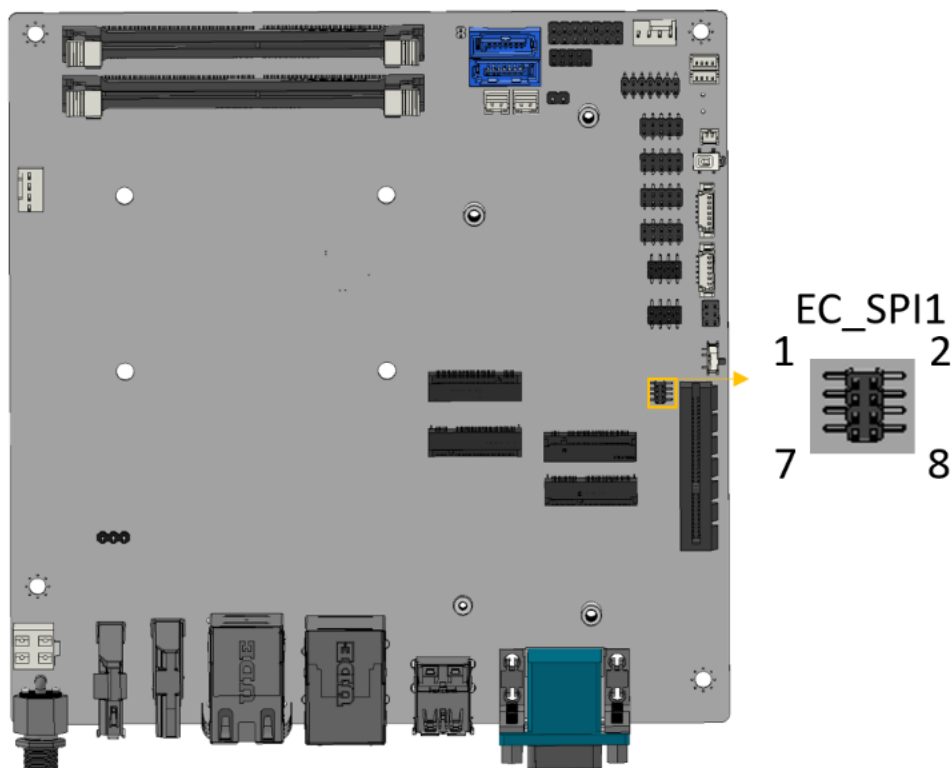


Figure 3-19: Flash EC ROM Connector Location

Pin	Description	Pin	Description
1	CS#_EC	2	VCC3.3V
3	SO_EC	4	HOLD#_EC
5	EC_DET_FLASH	6	SCLK_EC
7	GND	8	SIO_EC

Table 3-20: Flash EC ROM Connector Pinouts

KINO-ADL-P SBC

3.2.19 EC Debug Connector

- CN Label:** EC_DBG1
- CN Type:** 6-pin wefer, p=1.25 mm
- CN Location:** See **Figure 3-20**
- CN Pinouts:** See **Table 3-21**

The EC_DBG1 connector is used for EC debug (with SPI protocol).

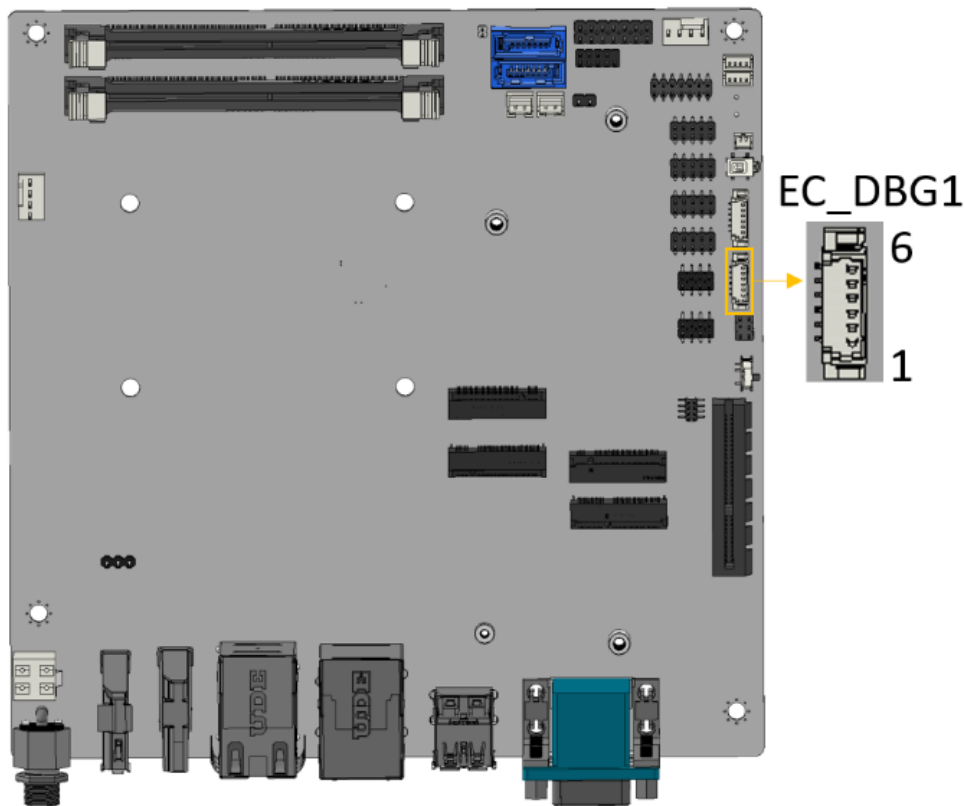


Figure 3-20: EC Debug Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	EDICLK
3	EDICS	4	EDIDI
5	EDIDO	6	GND

Table 3-21:EC Debug Connector Pinouts

3.2.20 Internal USB 2.0 Connectors

- CN Label:** J_USB1, J_USB2
- CN Type:** 8-pin header, p=2.00 mm
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-22**

Each USB connector provides two USB 2.0 ports by dual-port USB cable.

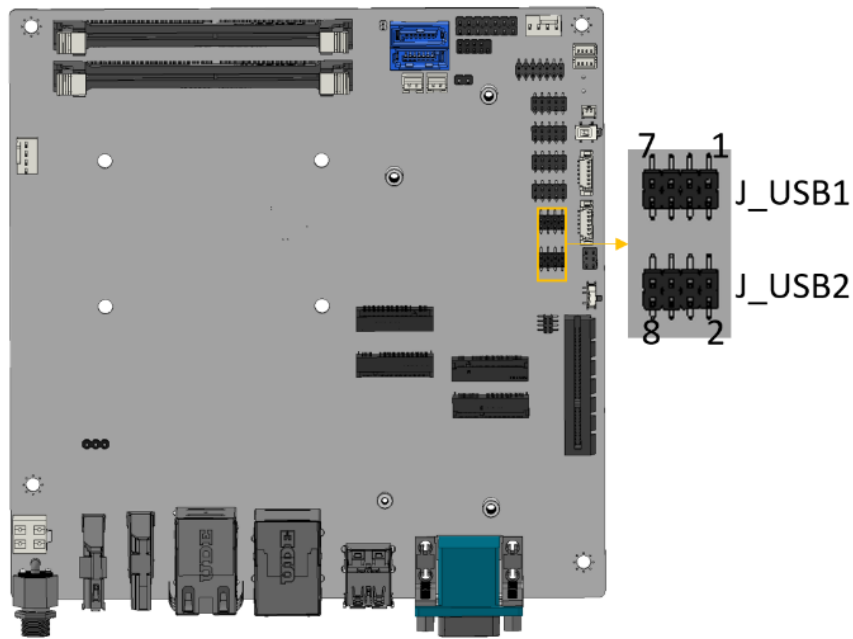


Figure 3-21: Internal USB 2.0 Connectors Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

Table 3-22: Internal USB 2.0 Connectors Pinouts

KINO-ADL-P SBC

3.2.21 M.2 2230 E Key Slot

- CN Label:** M2_E1
- CN Type:** M.2 E-key slot
- CN Location:** See Figure 3-23
- CN Pinouts:** See Table 3-24

The M.2 slot is keyed in the E position and accepts 2230 size of M.2 modules. The M.2 slot supports PCIe Gen3 x1 and USB 2.0 signals.

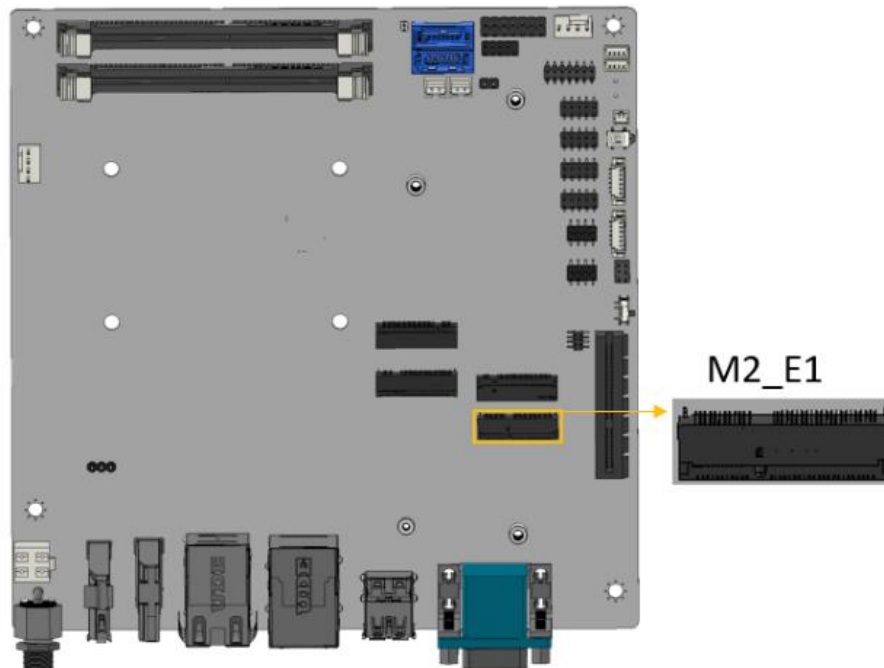


Figure 3-22: M.2 E-key Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	USB2_DP	4	+3.3V
5	USB2_DN	6	NC
7	GND	8	NC
9	CNV_WR_D1_R_DN	10	CNV_RF_RESET_N
11	CNV_WR_D1_R_DP	12	NC
13	GND	14	MODEM_CLKREQ_R

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
15	CNV_WR_D0_R_DN	16	NC
17	CNV_WR_D0_R_DP	18	GND
19	GND	20	UART_WAKE_N
21	CNV_WR_CLK_R_DN	22	UART_RX/BRI_RSP
23	CNV_WR_CLK_R_DP	24	Module Key
25	Module Key	26	Module Key
27	Module Key	28	Module Key
29	Module Key	30	Module Key
31	Module Key	32	RGI_DT/UART2_TXD
33	GND	34	RGI_RSP/UART2_CTS_N
35	PCIE_TX_DP	36	BRI_DT/UART2_RTS_N
37	PCIE_TX_DN	38	WLAN_CL_RST_N
39	GND	40	WLAN_CL_DATA
41	PCIE_RX_DP	42	WLAN_CL_CLK
43	PCIE_RX_DN	44	NC
45	GND	46	NC
47	PCIE_CLK+	48	NC
49	PCIE_CLK-	50	BTWIFI_SUS_CLK
51	GND	52	SLOT_RST
53	NC	54	BT_RF_KILL_N
55	M.2_A_WAKE	56	WFI_RF_KILL_N
57	GND	58	NC
59	CNV_WT_D1_R_DN	60	NC
61	CNV_WT_D1_R_DP	62	NC
63	GND	64	NC
65	CNV_WT_D0_R_DN	66	NC
67	CNV_WT_D0_R_DP	68	NC
69	GND	70	NC
71	CNV_WT_CLK_R_DN	72	+3.3V
73	CNV_WT_CLK_R_DP	74	+3.3V
75	GND		

Table 3-23: M.2 E-Key Slot Pinouts

KINO-ADL-P SBC

3.2.22 M.2 3042 B key Slot

- CN Label:** M2_B1
- CN Type:** M.2 B-key slot
- CN Location:** See Figure 3-23
- CN Pinouts:** See Table 3-24

The M.2 B key (3042/2242) slot with PCIe Gen3 x2 and USB 2.0 signal supports NVMe storage or 5G module with SIM holder

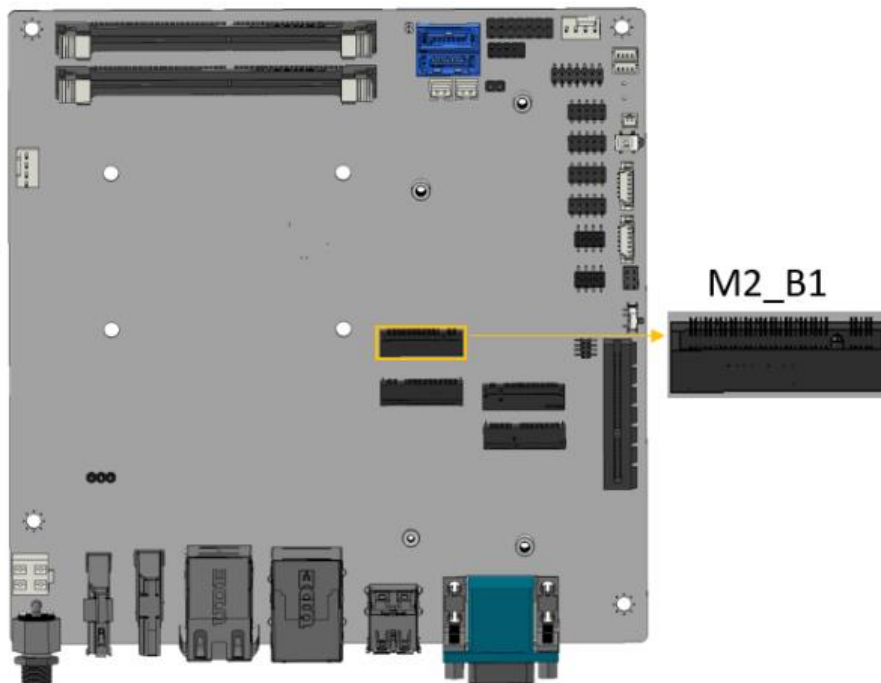


Figure 3-23: M.2 B-key Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V3.3
3	GND	4	+V3.3
5	GND	6	NC
7	USB2_DP	8	W_DISABLE_N
9	USB2_DN	10	NC
11	GND	12	Module Key
13	Module Key	14	Module Key

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
15	Module Key	16	Module Key
17	Module Key	18	Module Key
19	Module Key	20	NC
21	GND	22	NC
23	M.2_B_WAKE	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE_1_RX_DN	30	NC
31	PCIE_1_RX_DP	32	NC
33	GND	34	NC
35	PCIE_1_TX_DN	36	NC
37	PCIE_1_TX_DP	38	NC
39	GND	40	SMB_CLK
41	PCIE_0_RX_DN	42	SMB_DATA
43	PCIE_0_RX_DP	44	NC
45	GND	46	NC
47	PCIE_0_TX_DN	48	NC
49	PCIE_0_TX_DP	50	SLOT_RST
51	GND	52	NC
53	PCIE_CLK_DN	54	M.2_B_WAKE
55	PCIE_CLK_DP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	NC	70	+V3.3
71	GND	72	+V3.3
73	GND	74	+V3.3
75	GND		

Table 3-24: M.2 B-Key Slot Pinouts

KINO-ADL-P SBC

3.2.23 M.2 2280 M key Slot

- CN Label:** M2_M1
- CN Type:** M.2 M-key slot
- CN Location:** See Figure 3-24
- CN Pinouts:** See Table 3-25

The M.2 slot is keyed in the M position. The M.2 slot supports PCIe Gen3 x4 signals.

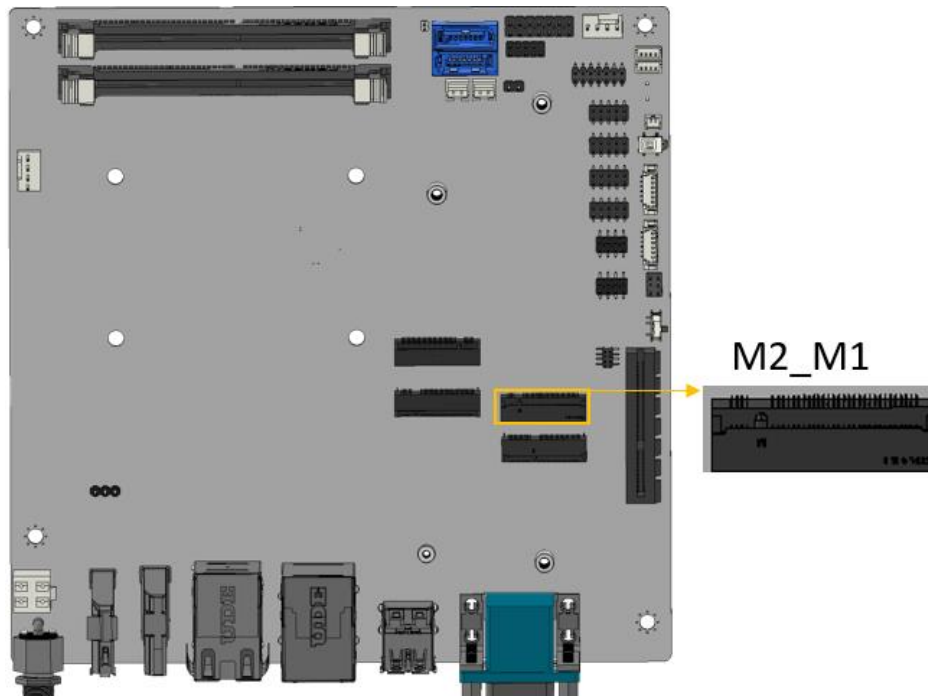


Figure 3-24: M.2 M-key Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V3.3
3	GND	4	+V3.3
5	PCIE_3_RX_DN	6	NC
7	PCIE_3_RX_DP	8	NC
9	GND	10	NC
11	PCIE_3_TX_DN	12	+V3.3
13	PCIE_3_TX_DP	14	+V3.3
15	GND	16	+V3.3

17	PCIE_2_RX_DN	18	+V3.3
19	PCIE_2_RX_DP	20	NC
21	GND	22	NC
23	PCIE_2_TX_DN	24	NC
25	PCIE_2_TX_DP	26	NC
27	GND	28	NC
29	PCIE_1_RX_DN	30	NC
31	PCIE_1_RX_DP	32	NC
33	GND	34	NC
35	PCIE_1_TX_DN	36	NC
37	PCIE_1_TX_DP	38	GND
39	GND	40	SMB_CLK
41	PCIE_0_RX_DN	42	SMB_DATA
43	PCIE_0_RX_DP	44	NC
45	GND	46	NC
47	PCIE_0_TX_DN	48	NC
49	PCIE_0_TX_DP	50	SLOT_RST
51	GND	52	NC
53	PCIE_CLK_DN	54	M2_WAKE_N
55	PCIE_CLK_DP	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	NC	70	+V3.3
71	GND	72	+V3.3
73	GND	74	+V3.3
75	GND		

Table 3-25: M.2 M-key Slot Pinouts

KINO-ADL-P SBC

3.3 External Peripheral Interface Connector Panel

Figure 3-25 shows the KINO-ADL-P external peripheral interface connector (EPIC) panel.

The EPIC panel consists of the following:

- 1 x DC power jack
- 1 x HDMI connector
- 1 x DP connector
- 3 x 2.5GbE RJ-45 connector
- 4 x USB 3.2 Gen 2 connector
- 2 x RS-232/422/485

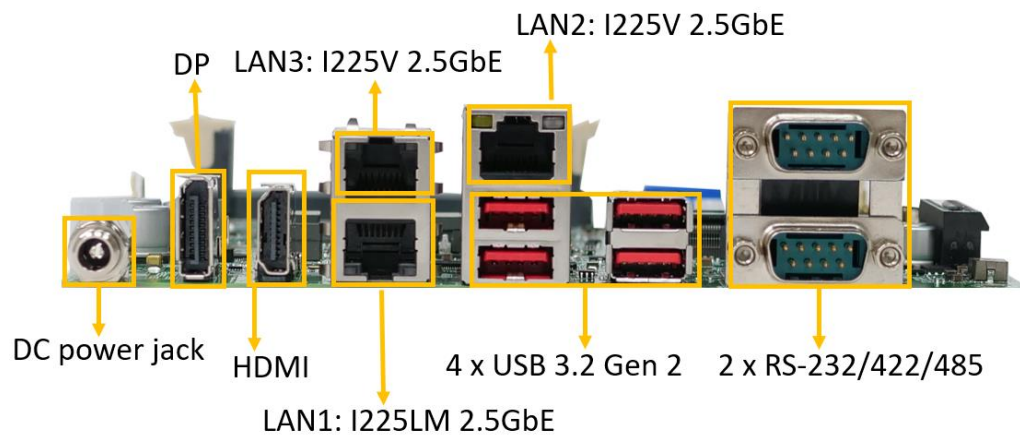


Figure 3-25: External Peripheral Interface Connector

3.3.1 Dual 2.5GbE RJ-45 Connectors

CN Label:	LAN1
CN Type:	RJ-45
CN Location:	See Figure 3-25
CN Pinouts:	See Table 3-26

The LAN connector connects to a local network.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LAN1_MD0+	5	LAN1_MD2+
2	LAN1_MD0-	6	LAN1_MD2-
3	LAN1_MD1+	7	LAN1_MD3+
4	LAN1_MD1-	8	LAN1_MD3-

Table 3-26: External 2.5GbE RJ-45 Connectors Pinouts

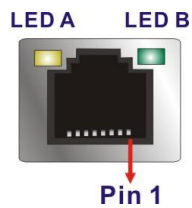


Figure 3-26: LAN LED Location

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 100 Mb/s orange: 1000 Mb/s green: 2500 Mb/s

Table 3-27: LAN LED Pinouts

KINO-ADL-P SBC

3.3.2 External 2.5GbE RJ-45 And Dual USB 3.2 Gen 2 Connector

- CN Label:** LAN2
- CN Type:** 2.5GbE RJ-45 and USB 3.2 Gen 2 Type A
- CN Location:** See **Figure 3-25**
- CN Pinouts:** See **Table 3-26**

The LAN2_USB2 connector supports dual USB 3.2 Gen 2(10Gb/s) and LAN 2.5GbE RJ45. The red connector is USB 3.2 Gen 2.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MD0+	5	MD2+
2	MD0-	6	MD2-
3	MD1+	7	MD3+
4	MD1-	8	MD3-

Table 3-28: External 2.5GbE RJ-45 Connectors Pinouts

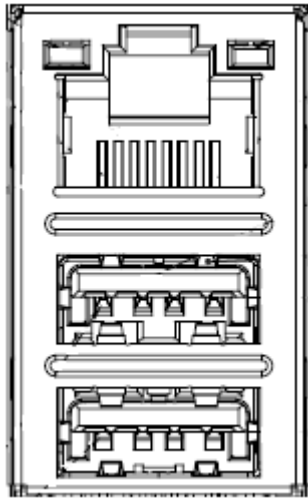


Figure 3-27: External LAN 2.5GbE Connector and USB 3.2 Gen 2 Type A

3.3.3 External DP Connector

- CN Label:** DP1
- CN Type:** External DP connector
- CN Location:** See **Figure 3-28**
- CN Pinouts:** See **Table 3-29**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ML_LANE0_+	11	GND3
2	GND	12	ML_LANE3_-
3	ML_LANE0_-	13	CONFIG1
4	ML_LANE1_+	14	CONFIG2
5	GND1	15	AUX_CH_+
6	ML_LANE1_-	16	GND6
7	ML_LANE2_+	17	AUX_CH_-
8	GND2	18	HOT_PLUG
9	ML_LANE2_-	19	DP_PWR_RETURN
10	ML_LANE3_-	20	DP PWR

Table 3-29: External DisplayPort Connector Location

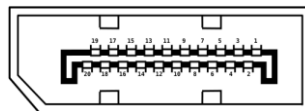


Figure 3-28: External DP Connector Pinouts

KINO-ADL-P SBC

3.3.4 External HDMI Connectors

- CN Label:** HDMI1
- CN Type:** HDMI connector
- CN Location:** See **Figure 3-29**
- CN Pinouts:** See **Table 3-30**

The HDMI connectors can connect to HDMI devices.

Pin	Description	Pin	Description
1	D2+	2	D2 Shield
3	D2-	4	D1+
5	D1 Shield	6	D1-
7	D0+	8	D0 Shield
9	D0-	10	CK+
11	CK Shield	12	CK-
13	CE Remote	14	NC
15	DDC CLK	16	DDC DATA
17	GND	18	+5V
19	HP DET		

Table 3-30: External HDMI Connector Pinouts

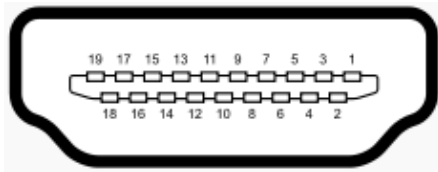


Figure 3-29: External HDMI Connector Location

3.3.5 External USB 3.2 Gen 2 Connectors

- CN Label:** USB3_1
- CN Type:** USB 3.2 Gen 2 port Type-A
- CN Location:** See **Figure 3-30**
- CN Pinouts:** See **Table 3-31**

The USB 3.2 Gen 2 connector can be connected to a USB 2.0 or USB 3.2 device. The pinouts of USB 3.2 Gen 2 connectors are shown below.

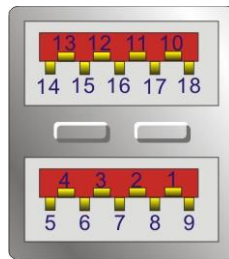


Figure 3-30: External USB 3.2 Gen 2 Connectors Location

Pin	Description	Pin	Description
1	VCC	10	VCC
2	USB_DATA0-	11	USB_DATA1-
3	USB_DATA0+	12	USB_DATA1+
4	GND	13	GND
5	USB3_RX0-	14	USB3_RX1-
6	USB3_RX0+	15	USB3_RX1+
7	GND	16	GND
8	USB3_TX0-	17	USB3_TX1-
9	USB3_TX0+	18	USB3_TX1+

Table 3-31: External USB 3.2 Gen 2 Connectors Pinouts

KINO-ADL-P SBC

3.3.6 External RS-232/422/485 Connectors

- CN Label:** COM5/6
- CN Type:** COM
- CN Location:** See **Figure 3-30**
- CN Pinouts:** See **Table 3-31**

The KINO-ADL-P has two external COM connectors. The COM connector can be connected to a RS232/422/485 device. The pinouts of COM connectors are shown below.

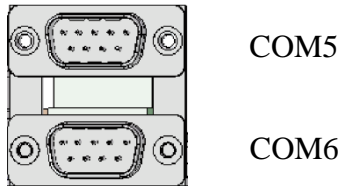


Figure 3-31: External RS-232/422/485 Connectors Location

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

Table 3-32: External USB 3.2 Gen 2 Connectors Pinouts

Chapter

4

Installation

KINO-ADL-P SBC

4.1 Anti-static Precautions



WARNING:

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-ADL-P. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-ADL-P 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-P, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-ADL-P.
- **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 KINO-ADL-P, KINO-ADL-P 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-P 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-P on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the KINO-ADL-P off:
 - When working with the KINO-ADL-P, 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-P **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.

KINO-ADL-P SBC

4.3 M.2 Module Installation

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

- Step 1:** Locate the M.2 module slot. See **Chapter 3**.
- Step 2:** Remove the retention screw secured on the motherboard.
- Step 3:** Line up the notch on the module with the notch on the slot. Slide the M.2 module into the socket at an angle of about 20° (**Figure 4-1**).

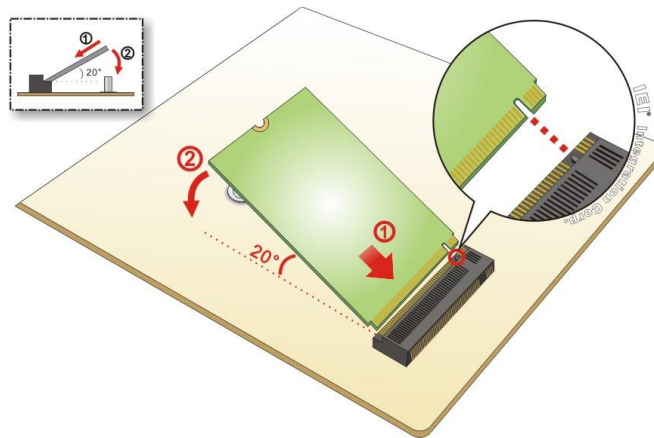


Figure 4-1: Inserting The M.2 Module Into The Slot At An Angle

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

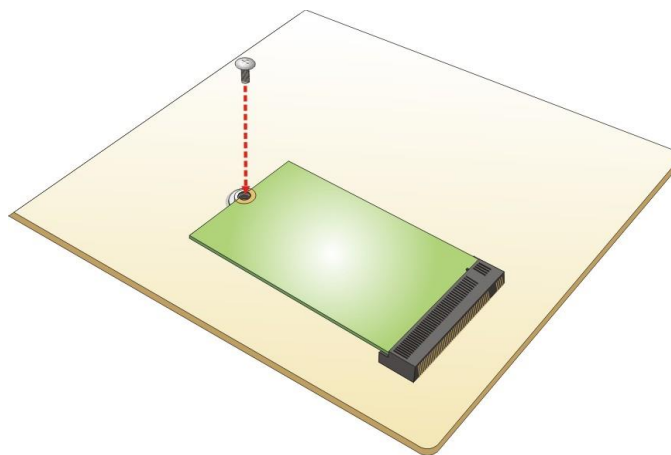


Figure 4-2: Securing The M.2 Module

4.4 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the on-board connectors

4.4.1 AT Power Connection

Follow the instructions below to connect the KINO-ADL-P to an AT power supply.



WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the KINO-ADL-P.

Step 1: **Locate the power cable.** The power cable is shown in the packing list in Chapter 2.

Step 2: **Connect the power cable to the motherboard.** Connect the 4-pin (2x2) Molex type power cable connector to the power connector on the motherboard. See

Figure 4-3

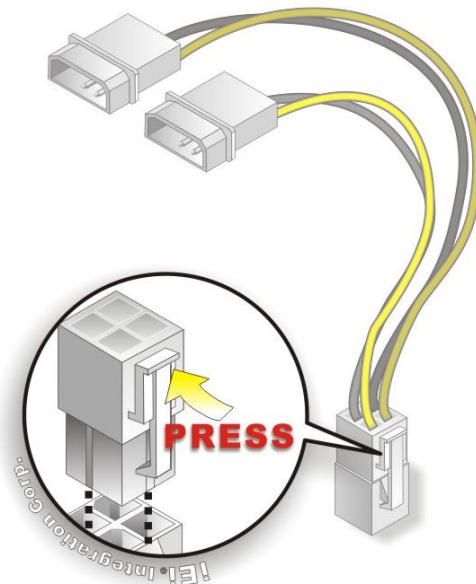


Figure 4-3: Power Cable to Motherboard Connection

KINO-ADL-P SBC

Step 3: Connect power cable to power supply. Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT power supply. See **Figure 4-4**

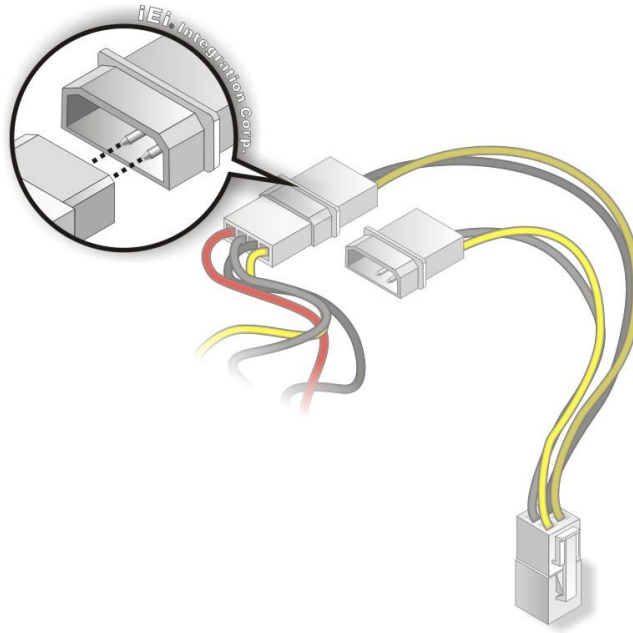


Figure 4-4: Connect Power Cable to Power Supply

4.4.2 7.1 Channel Audio Kit Installation



NOTE:

This item must be ordered separately, and connects to the audio connector. For further information please contact the nearest distributor, reseller or vendor or contact an IEI sales representative directly.

The audio kit attaches to the audio connector. The audio kit provides 7.1 channel audio. To install the audio kit, please refer to the steps below:

Step 1: Connect the cable to the audio kit. Connect the included cable to the audio kit. Make sure pin 1 aligns with the marked pin.

Step 2: Connect the cable to the board. Connect the other end of the cable to the board. Make sure to line up the marked pin 1.

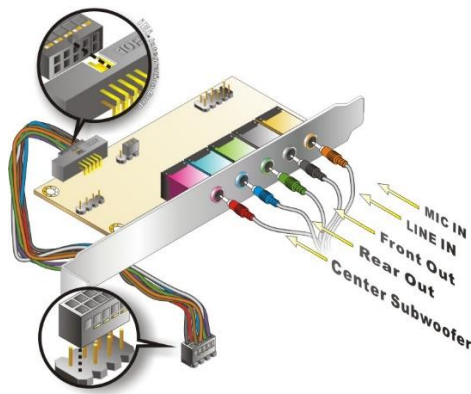


Figure 4-5: 7.1 Channel Audio Kit

- Step 3:** **Mount the audio kit onto the chassis.** Once the audio kit is connected to the board, secure the audio kit bracket to the system chassis.
- Step 4:** **Connect the audio devices.** Connect speakers and external audio sources to the audio jacks on the audio kit.
- Step 5:** **Install the driver.** Install the 7.1 channel audio driver included with the board.

4.4.3 SATA Drive Connection

The KINO-ADL-P is shipped with a SATA drive cable. To connect the SATA drive to the connector, please follow the steps below.

- Step 1:** **Locate the SATA connector and the SATA power connector.** The locations of the connectors are shown in **Chapter 3**.
- Step 2:** **Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-6**.

KINO-ADL-P SBC

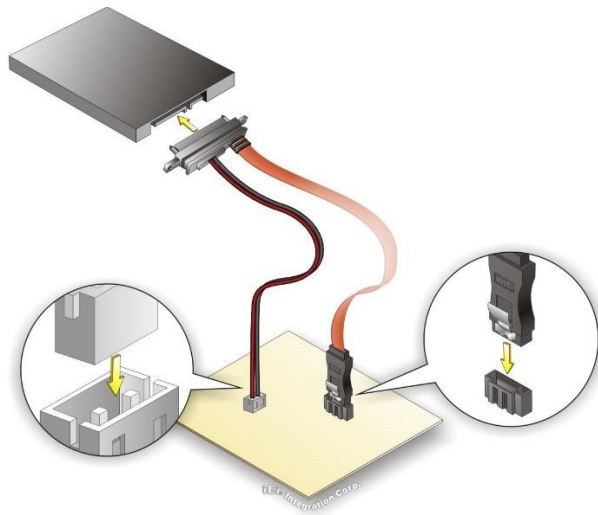


Figure 4-6: SATA Drive Cable Connection

- 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.
- Step 4:** To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

4.5 Software Drivers

4.5.1 Available Drivers

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

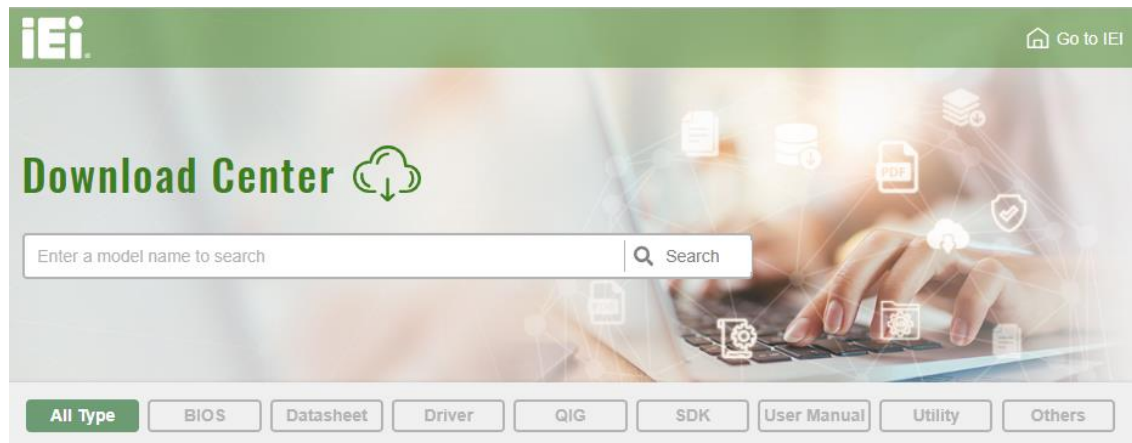
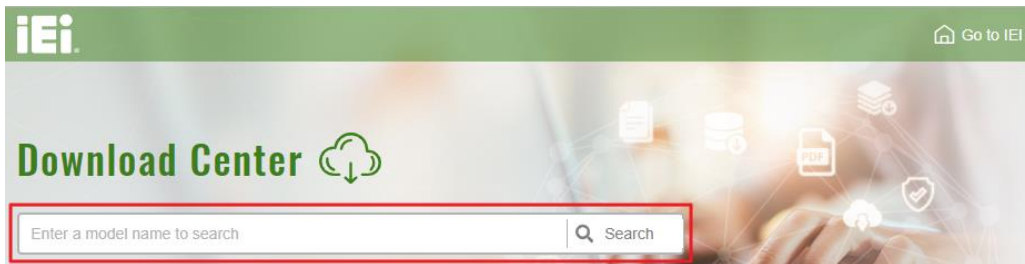


Figure 4-7: IEI Resource Download Center

4.5.2 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-P and press Enter.



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

KINO-ADL-P SBC

Keyword: "WAFER-ULT5", Searching Result : 6 Records.

WAFER-ULT5 Product Info ▶

Embedded Computer ▶ Single Board Computer ▶ Embedded Board

3.5" SBC supports Intel® 8th Generation Whiskey Lake processor with DDR4 SO-DIMM, Triple display with dual HDMI 1.4, LVDS, Triple GbE, USB 3.1 Gen2, M.2 A key, mPCIe with mSATA support, SATA 6Gb/s, COM and RoHS

File Name	Published	Version	File Checksum
WAFER-ULT5-R10_V1.1.iso (1.97 GB)	2020/07/07	1.10	475FD74C87A309D22A0265218DD3B37E

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

WAFER-ULT5-R10_V1.1.iso

Click here to download entire ISO file. (1.97 GB)

* Download individual file *

- Docs
- 1. Chipset
- 10.1.18019.8144.zip (3.26 MB)
- 2. VGA
- 3. LAN
- 4. Audio
- 5. ME
- 6. RST
- 7. SIO
- 8. Manual
- Thumbs.db (19.5 KB)



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content.

Chapter

5

BIOS

KINO-ADL-P SBC

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.

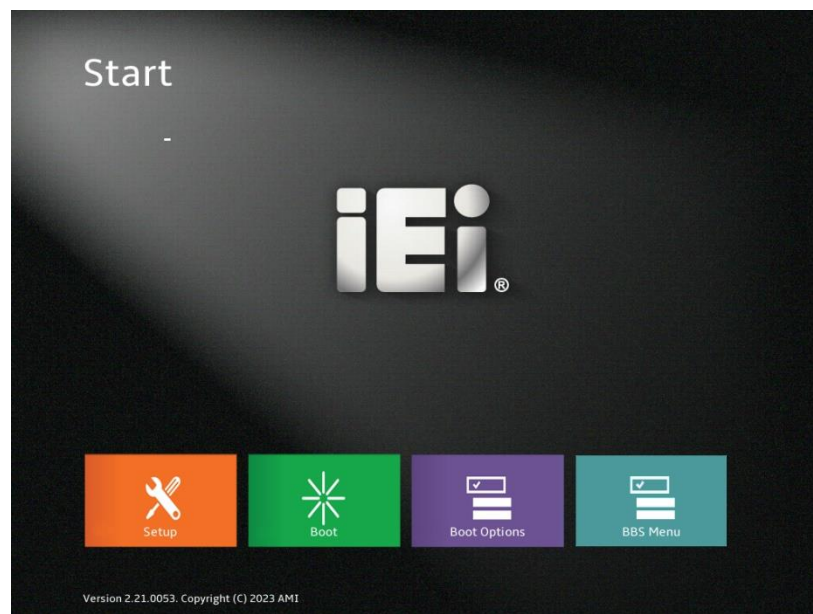


Figure 5-1: BIOS Starting Menu

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**.

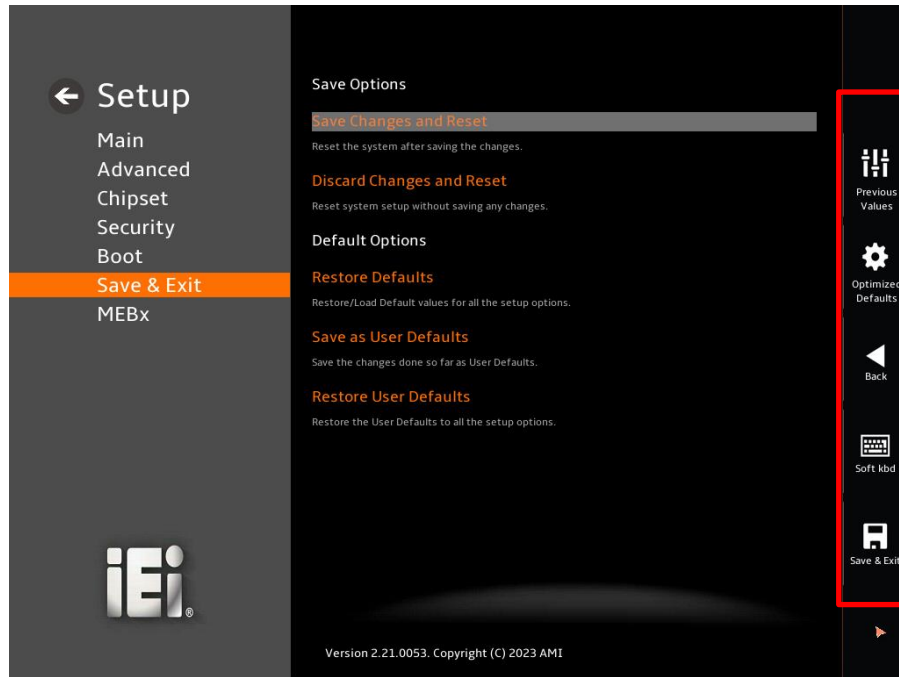
Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up	Move to the previous page
Page 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

KINO-ADL-P SBC

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:

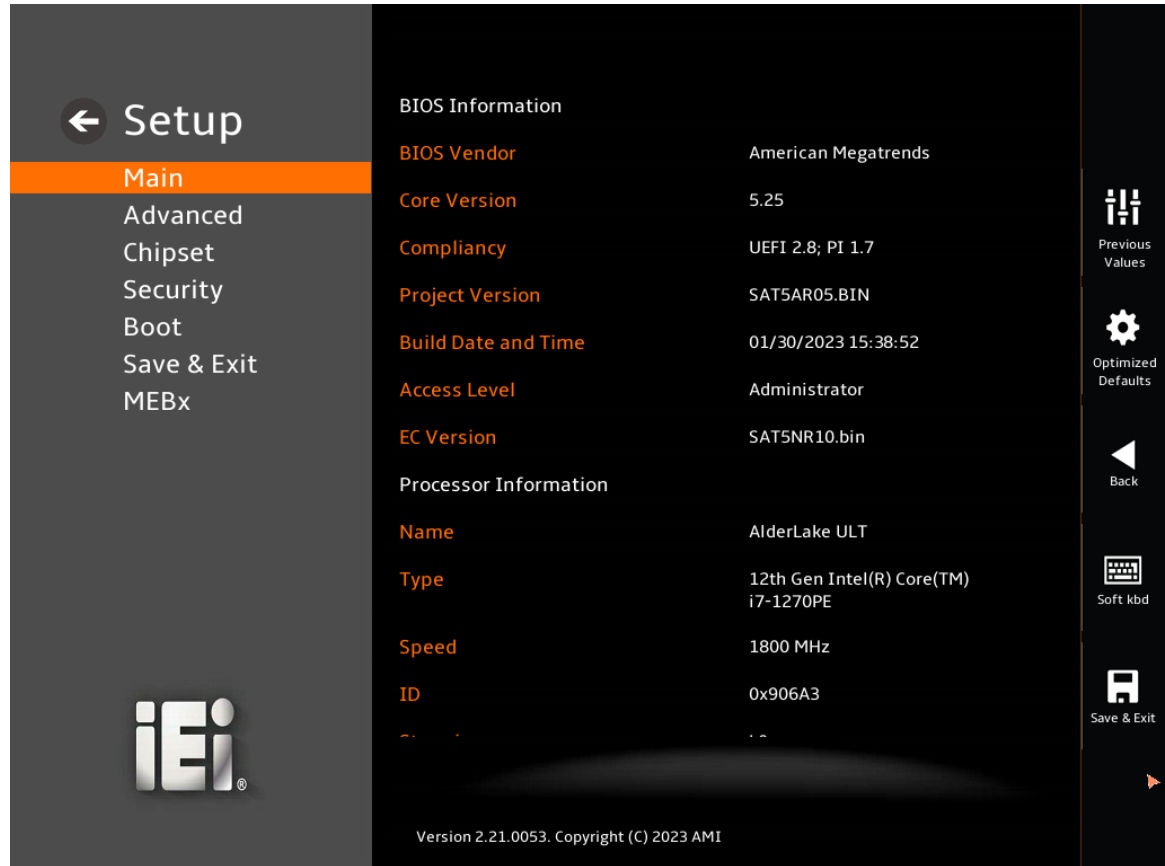
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings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

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

KINO-ADL-P SBC

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1 & BIOS Menu 2 & BIOS Menu 3**) 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)

← Setup

- Main
- Advanced
- Chipset
- Security
- Boot
- Save & Exit
- MEBx

iEi

Speed	1800 MHz
ID	0x906A3
Stepping	L0
Package	Not Implemented Yet
Number of Efficient-cores	8Core(s) / 8Thread(s)
Number of Performance-cores	4Core(s) / 8Thread(s)
Microcode Revision	416
IGFX GOP Version	21.0.1046
Total Memory	16384 MB
Memory Frequency	2133 MHz
PCH Information	
Name	PCH-P
PCH SKU	P Premium
Stepping	A1

Version 2.21.0053. Copyright (C) 2023 AMI

Previous Values
Optimized Defaults
Back
Soft kbd
Save & Exit

BIOS Menu 2: Main (2/3)

← Setup

- Main
- Advanced
- Chipset
- Security
- Boot
- Save & Exit
- MEBx

iEi

PCH Information	
Name	PCH-P
PCH SKU	P Premium
Stepping	A1
TXT Capability of Platform/PCH	Supported
Production Type	Production
ME FW Version	16.0.15.1662
ME Firmware SKU	Corporate SKU
PMC FW Version	160.1.0.1019
System Date	06/20/2023
Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005-2099 Months: 1-12 Days: Dependent on month Range of Years may vary.	
System Time	23:46:20
Set the Time. Use Tab to switch between Time elements.	

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Previous Values
Optimized Defaults
Back
Soft kbd
Save & Exit

BIOS Menu 3:Main(3/3)

KINO-ADL-P SBC

→ 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
- **Compliance:** Current UEFI & PI version
- **Project Version:** the board version
- **Build Date and Time:** Date the current BIOS version was made
- **Access Level:** Current BIOS Level
- **EC Version:** Current EC version
- BIOS Information

→ 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
- **Stepping:** Displays the Processor Stepping
- **Package:** Displays the Processor Package
- **Number of Efficient-cores:** Displays number of Efficient-cores cores
- **Number of Performance-cores:** Displays number of Performance-cores
- **Microcode Revision:** CPU Microcode Revision
- **IGFX GOP Version:** Displays the IGFX GOP Version
- **Total Memory:** Total Memory in the System
- **Memory Frequency:** Displays the Data Rate of Memory

→ 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 of Platform/PCH
- **Production Type:** Displays the PCH 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

The System Overview field also has two user configurable fields:

→ **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.

KINO-ADL-P SBC

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 4 & BIOS Menu 5**) to configure the CPU and peripheral devices through the following sub-menus:

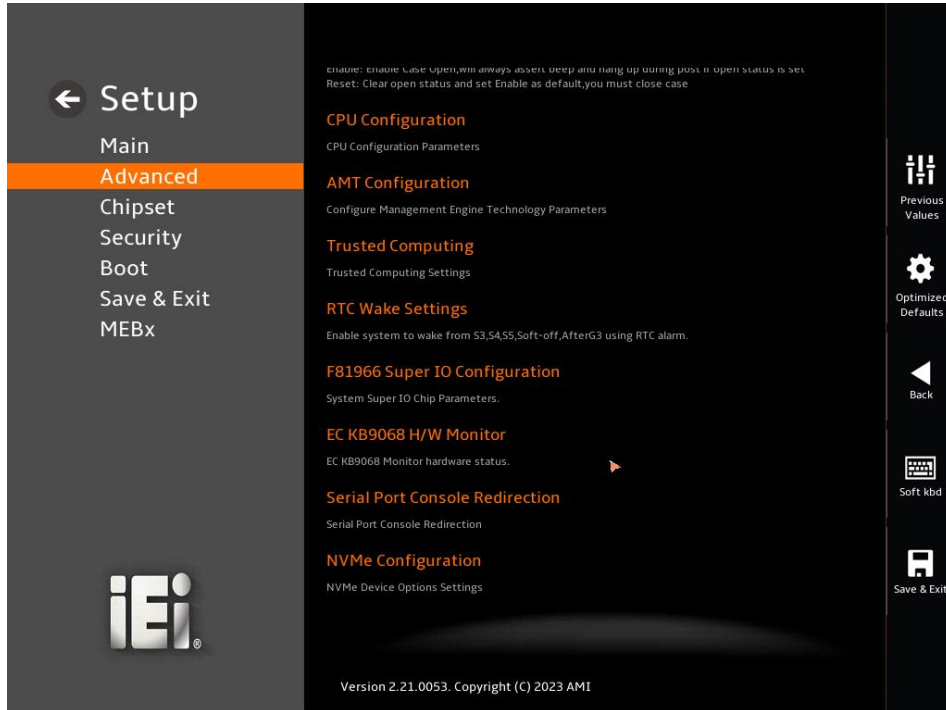


WARNING!

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



BIOS Menu 4: Advanced (1/2)



BIOS Menu 5:Advanced (2/2)

➔ **Case Open Detection [Disable]**

Use the **Case Open Detection** function to check whether the unpacking is abnormal. Will always assert beep and hang up during post if open status is set.

- ➔ **Disabled** **DEFAULT** Disable Case Open Function.
- ➔ **Enabled** Enable Case Open Function.
- ➔ **Reset** Clear open status and set enable as default, you must close case.

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5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6 & BIOS Menu 7**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



BIOS Menu 6: CPU Configuration (1/2)

KINO-ADL-P SBC

→ Active Performance-cores [All]

Use the **Active Performance-cores** BIOS option to enable numbers of cores in the performance package. Number of cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

→	All	DEFAULT	Enable all cores in the processor package.
→	1		Enable one core in the processor package.
→	2		Enable two cores in the processor package.
→	3		Enable three cores in the processor package.

→ Active Efficient-cores [All]

Use the **Active Efficient-cores** BIOS option to enable numbers of cores in the performance package. Number of cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

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

→ Hyper-Threading [Enabled]

Use the **Hyper-Threading** enables simultaneous batch processing of multiple tasks, allowing a single processor to use thread-level parallel computing while multitasking, thus making it compatible with multithreaded operating systems and software.

→	Disabled	Disables the Hyper-Threading Technology.
---	----------	--

→ **Enabled** **DEFAULT** Enables the Hyper-Threading Technology.

→ **Intel® SpeedStep™ [Disabled]**

Use the **Intel® SpeedStep™** to reduce cpu operating frequency to achieve reduced power consumption technology. Allows more than two frequency ranges to be supported.

→ **Disabled** Disables the Intel® SpeedStep™.

→ **Enabled** **DEFAULT** Enables the Intel® SpeedStep™.

→ **C states [Disabled]**

Use the **C states** option to enable or disable the CPU Power Management.

→ **Disabled** **DEFAULT** Disables CPU to go to C states when it's not 100% utilized.

→ **Enabled** Enables CPU to go to C states when it's not 100% utilized.

→ **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

→ **Power Limit 1**

Use the **Power Limit 1** to set Power Limit in Milli Watts. BIOS will round to the nearest 1/8W when programming. 0 = no custom override. For 12.50W, enter 12500. Overclocking SKU: Value must be between Max and Min Power Limits. Other SKUs: This value must be between Min Power limit and TDP Limit. If value is 0, BIOS will program TDP value.

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→ Power Limit 1 Time Window

Power Limit 1 Time Window value in second. The value may vary from 0 to 128.0, 0 = default value (28 sec for mobile and 8 sec for desktop). Defines time window which TDP value should be maintained.

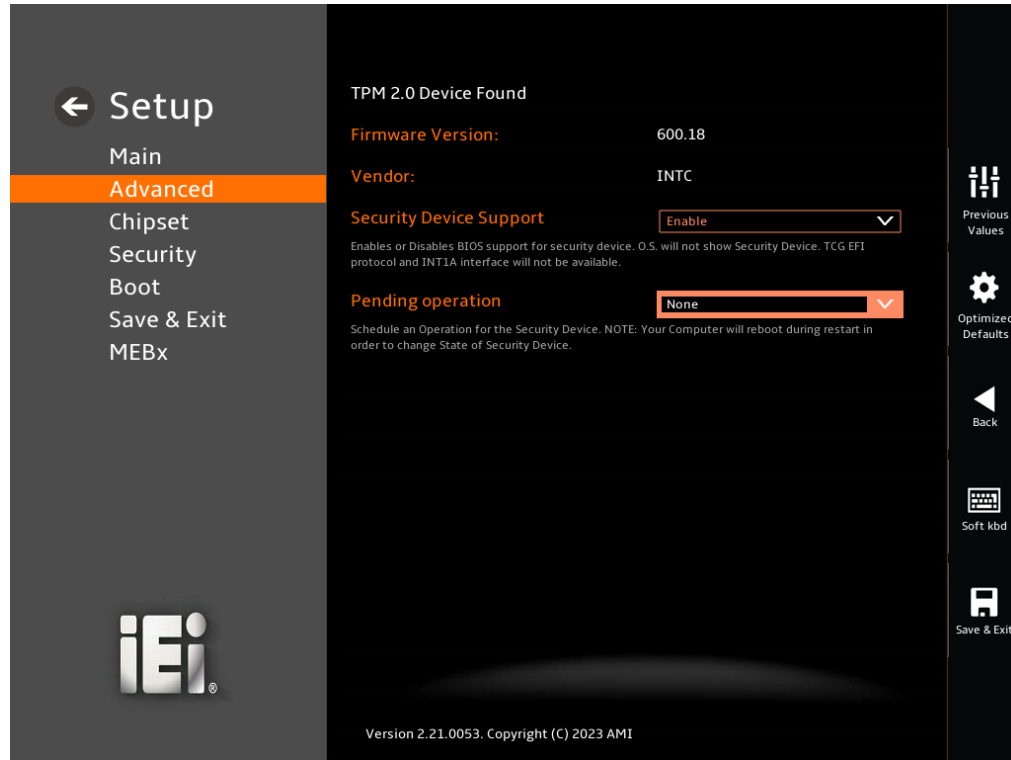
→ Power Limit 2

Use the **Power Limit 2** to set Power Limit in Milli Watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as $1.25 * TDP$. For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

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5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 9**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 9: Trusted Computing

➔ Security Device Support [Enable]

Use the **Security Device Support** option to configure support for the TCG EFI Protocol and INT1A.

- ➔ **Disable** Security Device support is disabled.
- ➔ **Enable** **DEFAULT** Security Device 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.
- ➔ **TPM Clear** TPM information is cleared

5.3.4 RTC Wake Set

Use the **RTC Wake Set** menu (**BIOS Menu 10**) enable system to wake from S3, S4, S5, Soft-off, AfterG3 using RTC alarm.



BIOS Menu 10:RTC Wake Set

→ Wake system with Fixed Time [Disabled]

Use the **RTC Wake Settings** Enable or disable System wake on alarm event.

- ➔ **Disabled** **DEFAULT** RTC Wake Settings support is disabled
- ➔ **Enabled** RTC Wake Settings support is enabled

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→ Wake up every day [Disabled]

Use the **Wake up every day** to select Enable or disable RTC Wake every day on the hour:minute:second: specified.

- **Disabled** **DEFAULT** RTC Wake Settings support is disabled
- **Enabled** RTC Wake Settings support is enabled

→ Wake up date [1]

Use the **Wake up date** select 1-31 for which day of the month that you would like the system to wake up.

→ Wake up hour [0]

Use the **Wake up hour** select 0-23 For example enter 3 for 3am and 15 for 3pm.

→ Wake up minute [0]

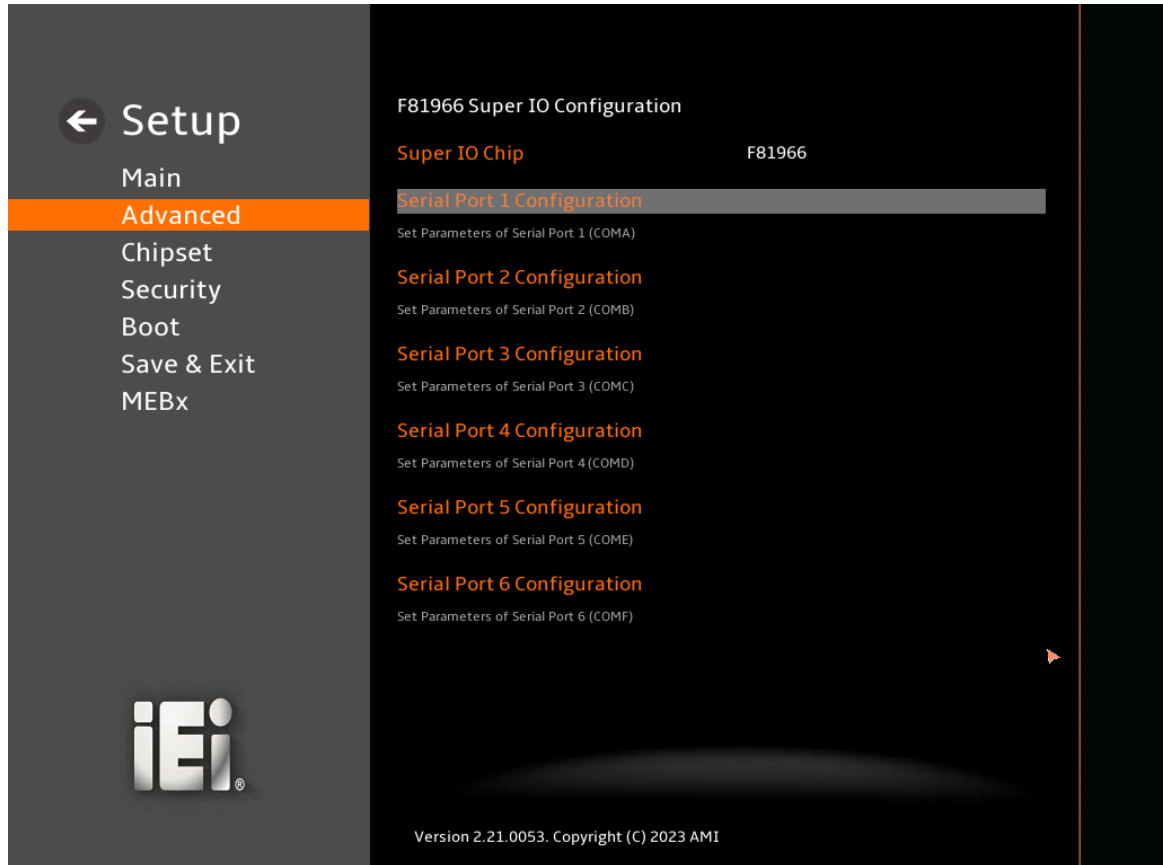
Use the **Wake up minute** select 0-59 for which minute that you would like the system to wake up.

→ Wake up second [0]

Use the **Wake up second** select 0-59 for which second that you would like the system to wake up.

5.3.5 F81966 Super IO Configuration

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

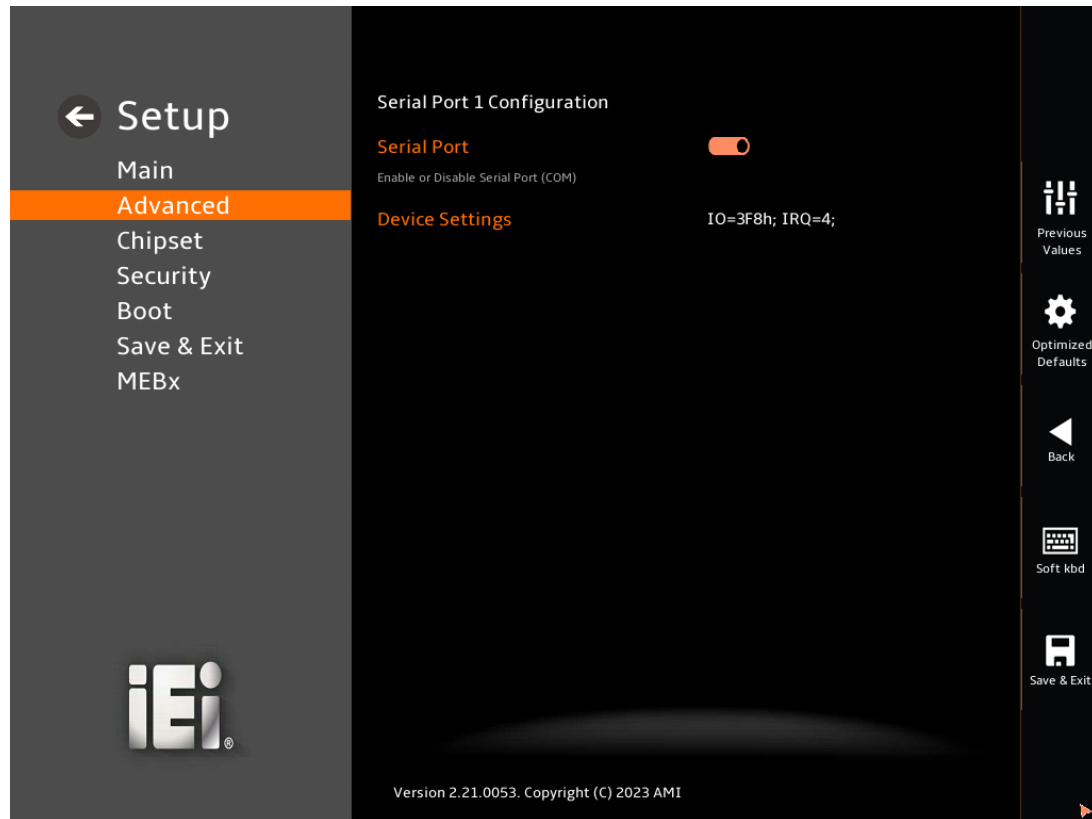


BIOS Menu 11: F81966 Super IO Configuration

KINO-ADL-P SBC

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

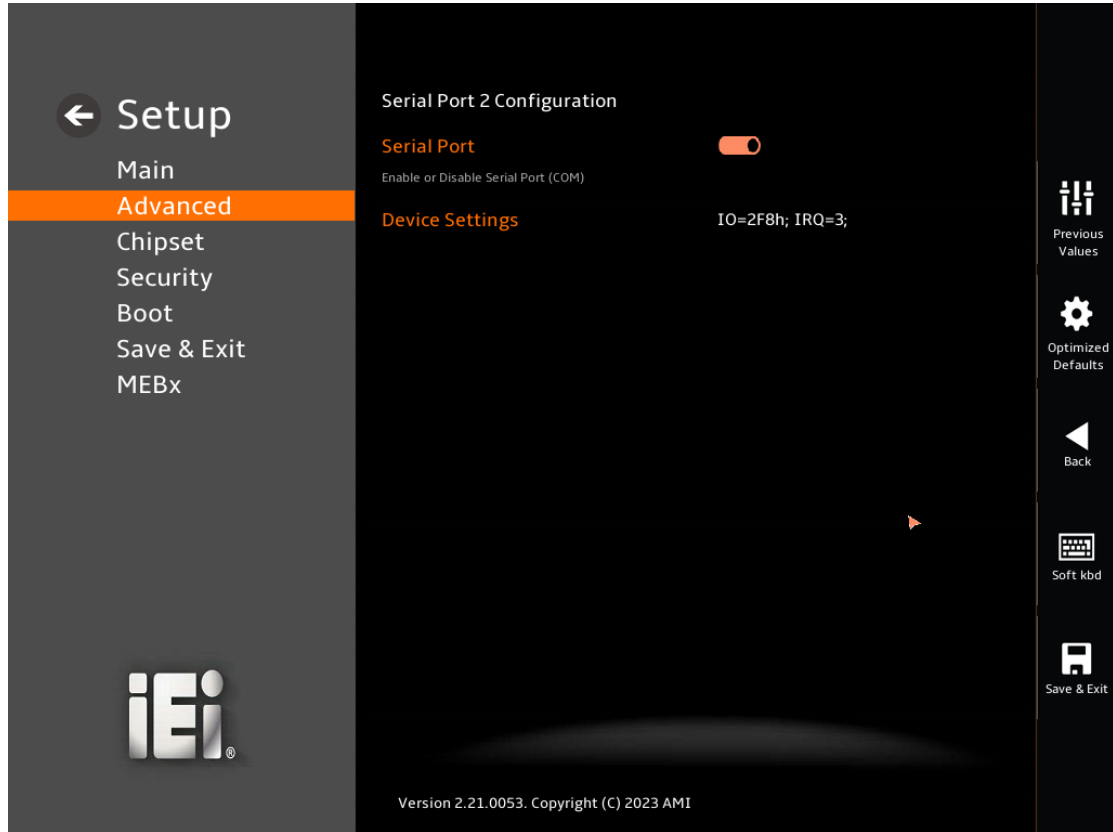
→ Device Settings

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

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

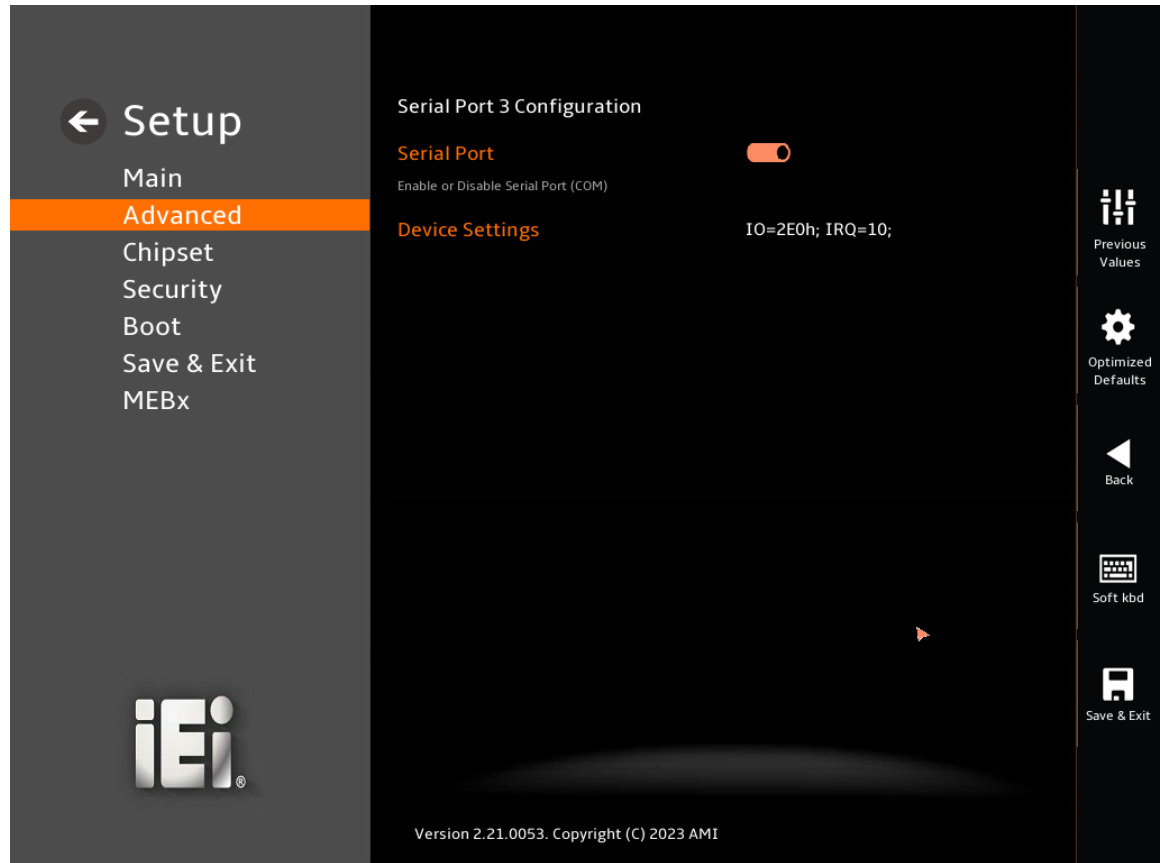
➔ Device Settings

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

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

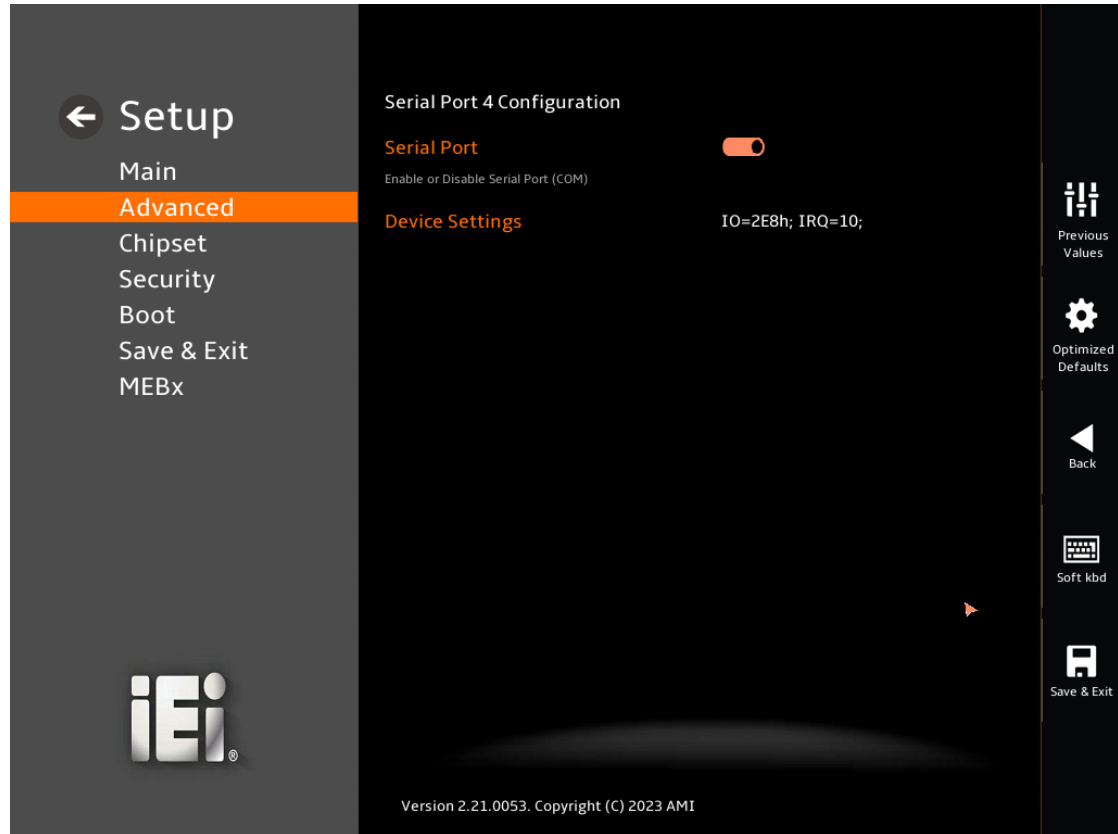
➔ Device Settings

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

- ➔ **IO=2E0h;** Serial Port I/O port address is 2E0h and the interrupt
IRQ=10; 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;** Serial Port I/O port address is 2E8h and the interrupt
IRQ=10; 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**

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

→ RS232
RS422
RS485

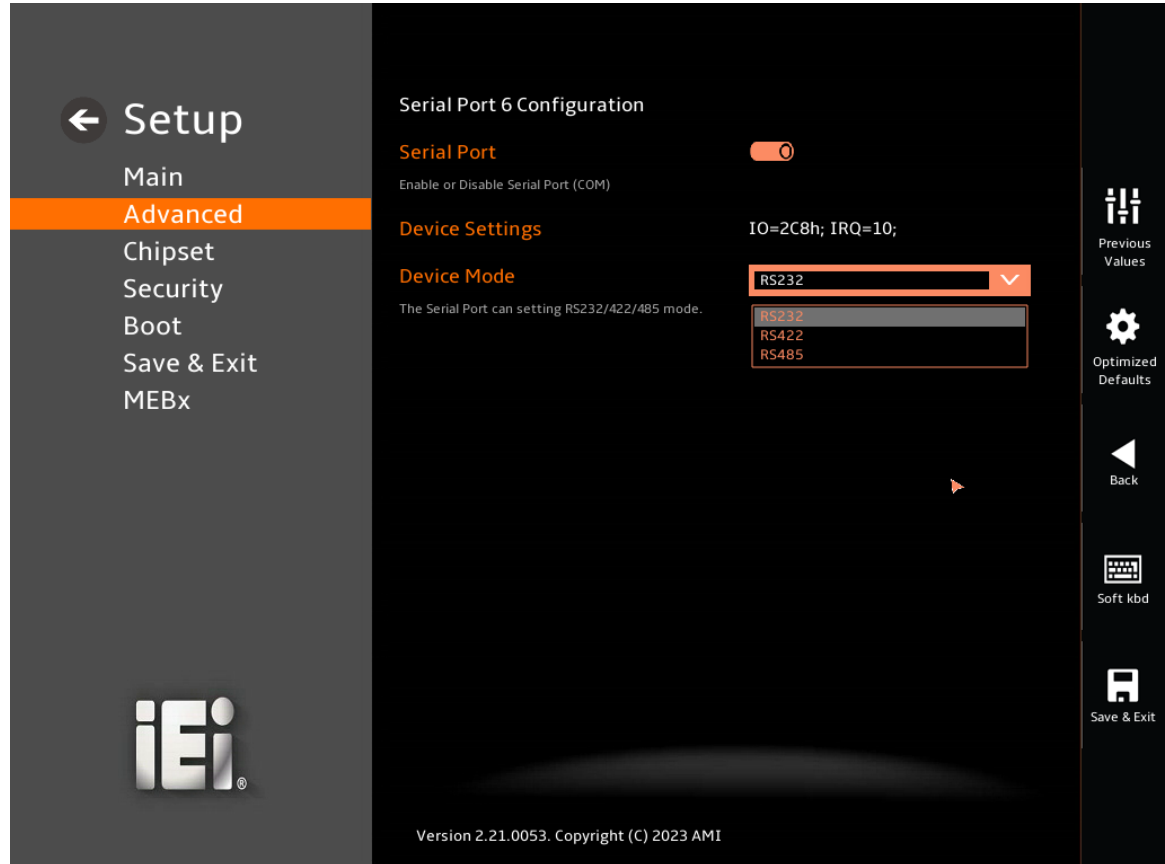
The serial port mode is RS-232

The serial port mode is RS-422

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=2C8h;
IRQ=10;

Serial Port I/O port address is 2C8h and the interrupt address is IRQ10

→ **Device Mode**

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

→ RS232
RS422
RS485

The serial port mode is RS-232

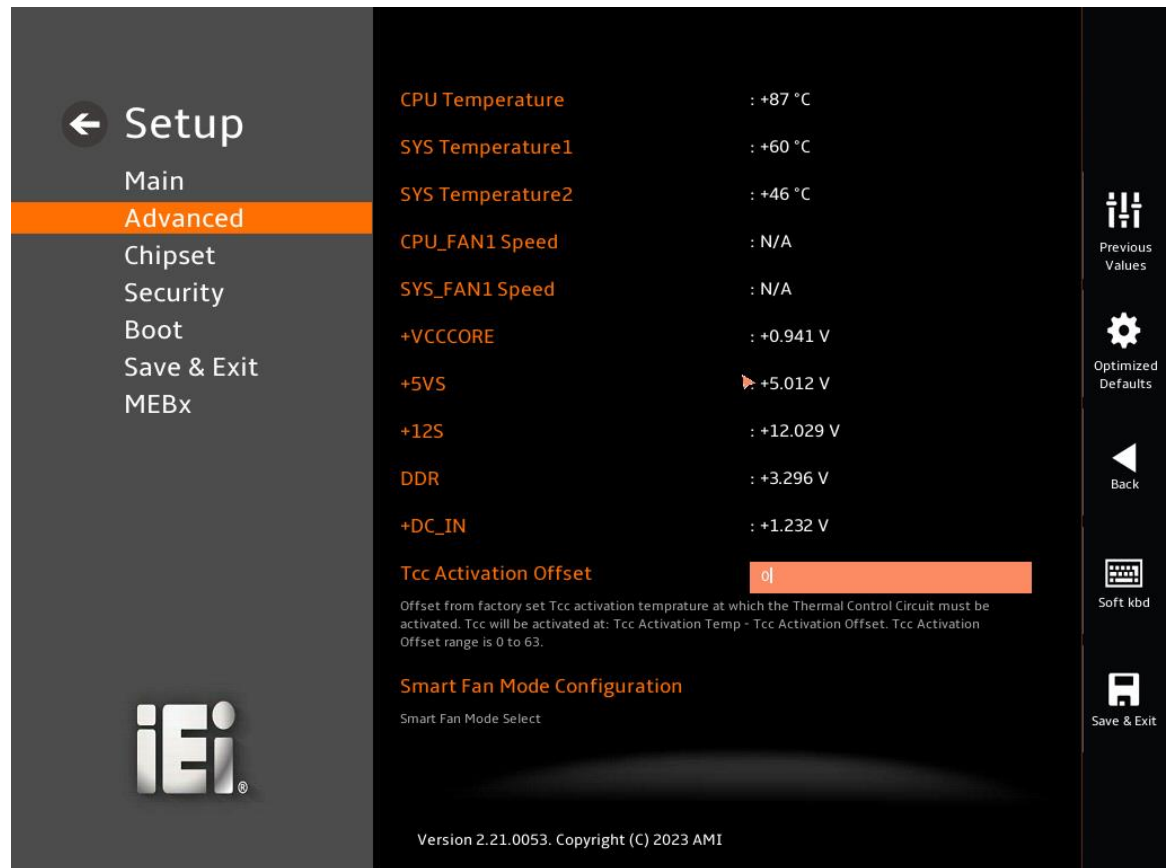
The serial port mode is RS-422

The serial port mode is RS-485

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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
 - System Temperature2

- Fan Speeds:
 - CPU_Fan1 Speed
 - SYS_Fan1 Speed
- Voltages:
 - VCCCORE
 - 5VS
 - +12S
 - DDR
 - +DC_IN

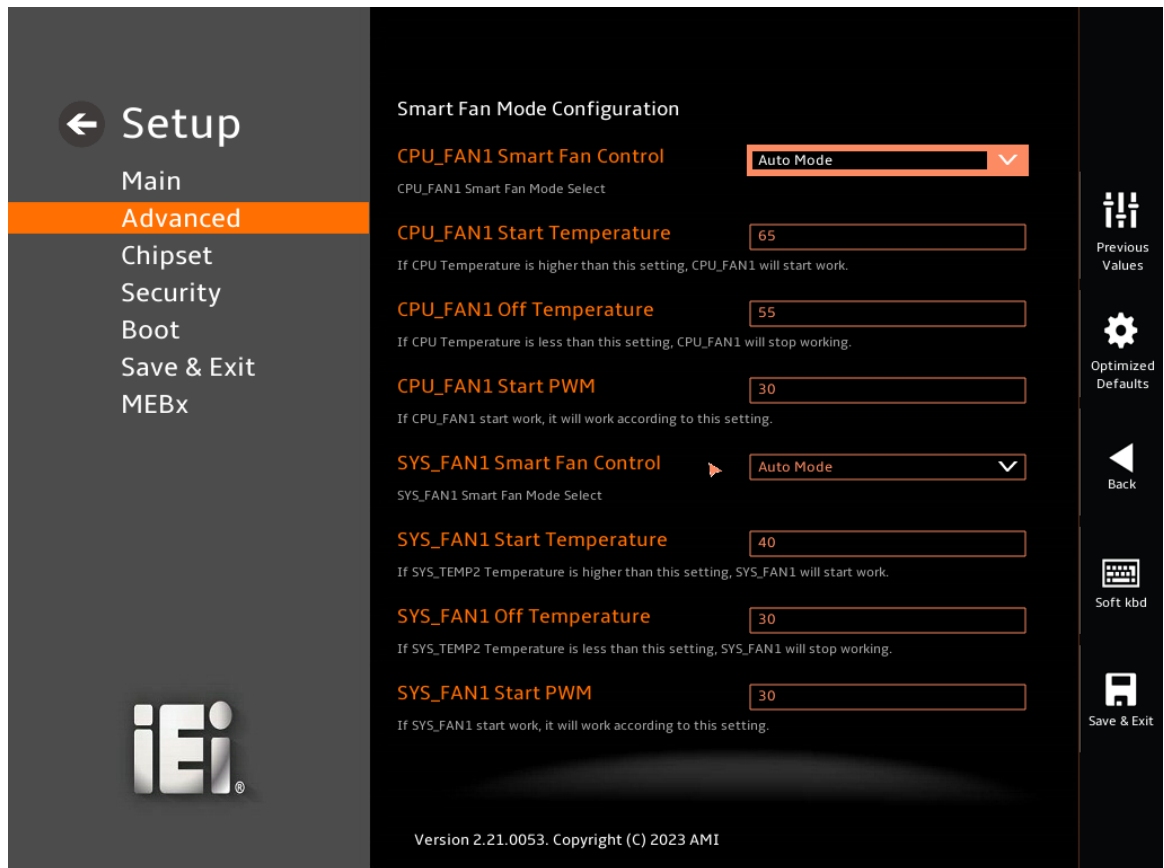
➔ **Tcc Activation Offset [0]**

Use the **Tcc Activation Offset** option to configure the Tcc activation temp. Tcc Activation Offset range is 0 to 63.

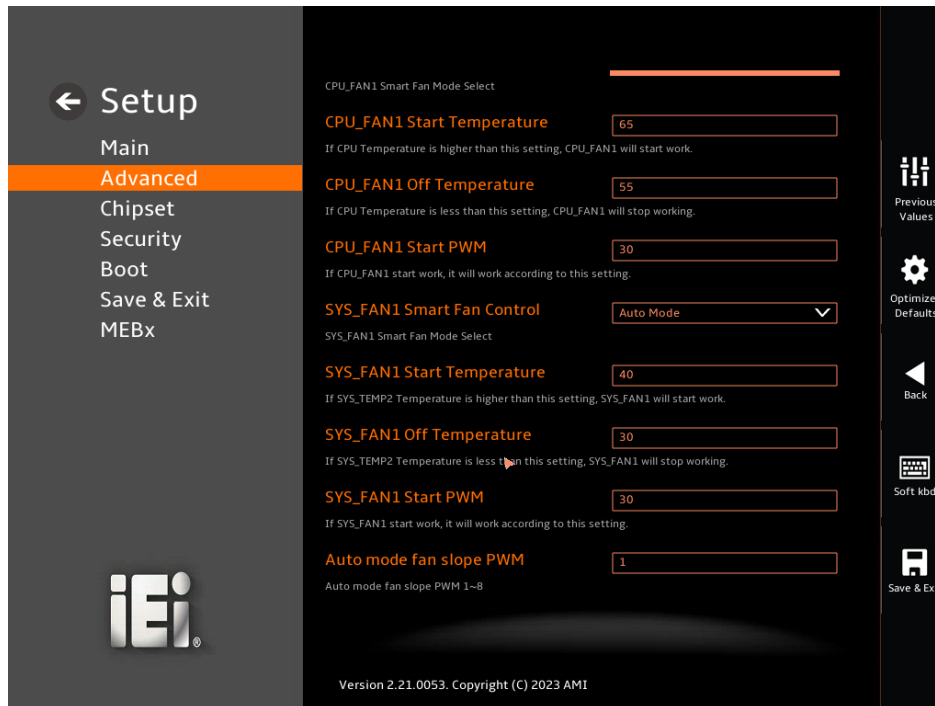
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5.3.6.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 19 & BIOS Menu 20**) to configure the CPU/system fan start/off temperature and control mode.



BIOS Menu 19: Smart Fan Mode Configuration (1/2)



BIOS Menu 20:Smart Fan Mode Configuration (2/2)

→ CPU_FAN1 Smart Fan Control [Auto Mode]

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

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

→ CPU_FAN1 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.

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→ CPU_FAN1 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_FAN1 Start PWM

Use the **CPU_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.

→ 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_FAN1 Start PWM

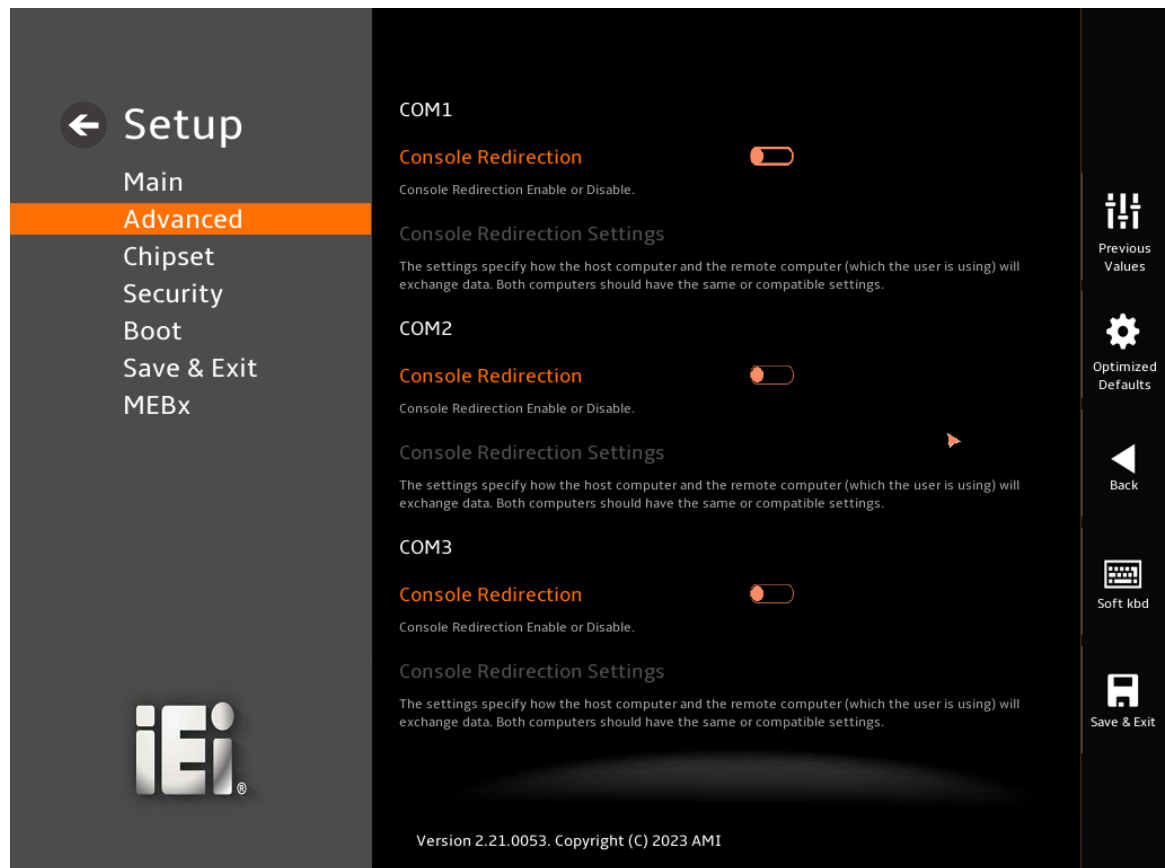
Use the **SYS_FAN1 Start PWM** option to set the PWM start value. Use the + or – key to change the value or enter a decimal number between 1 and 100.

➔ **Auto mode fan slope PWM**

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

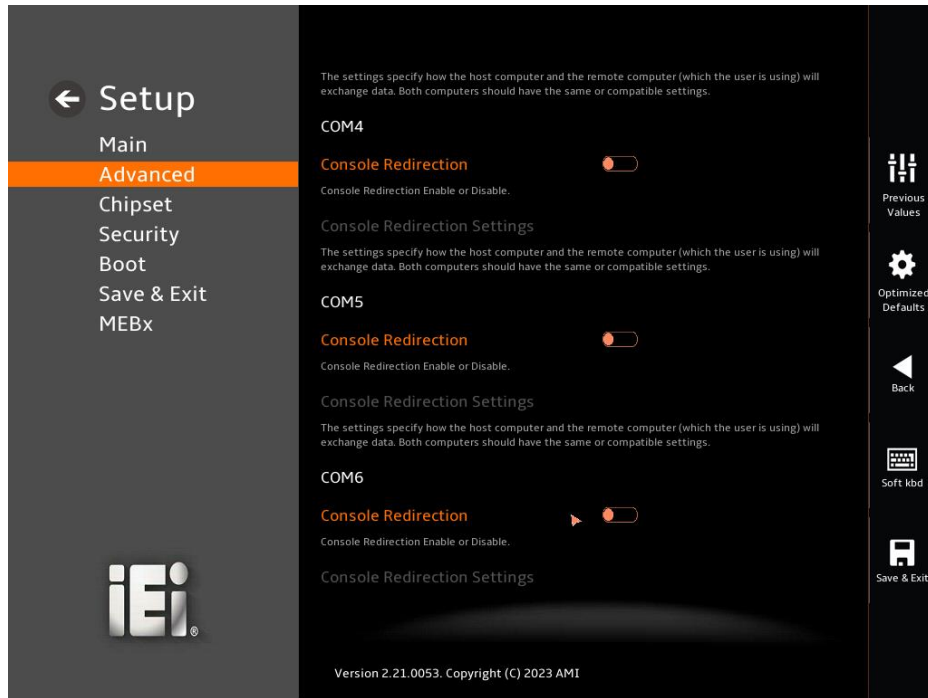
5.3.7 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 21 & BIOS Menu 22 & BIOS Menu 23**) 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.

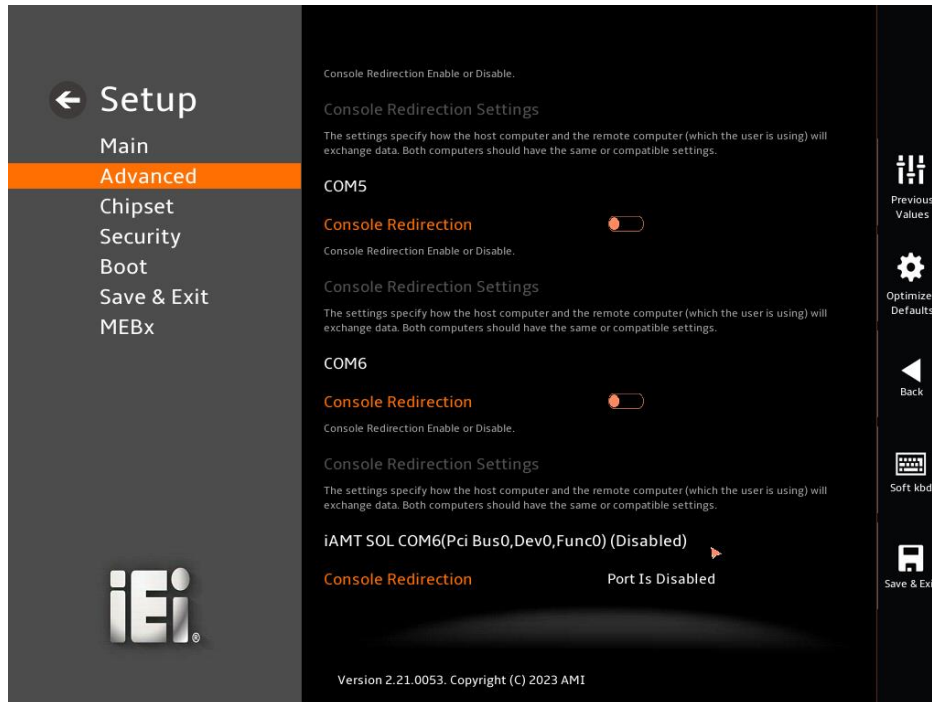


BIOS Menu 21: Serial Port Console Redirection (1/3)

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BIOS Menu 22:Serial Port Console Redirection (2/3)



BIOS Menu 23:Serial Port Console Redirection (3/3)

→ **Console Redirection [Disabled]**

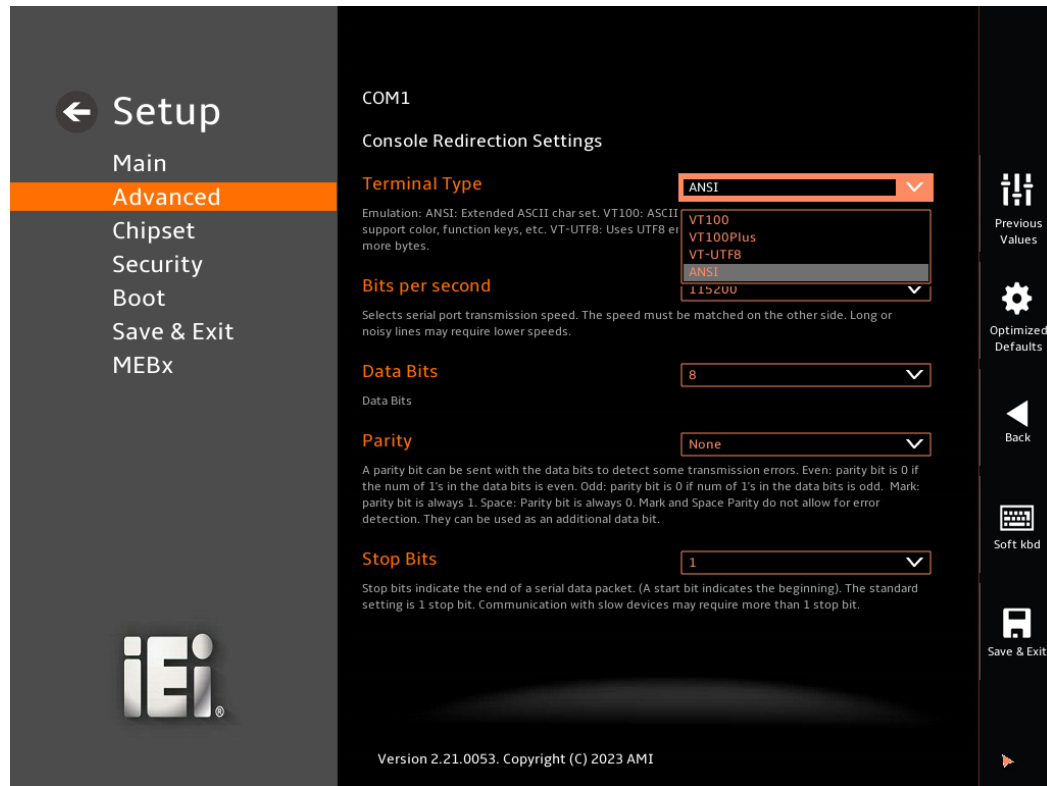
Use **Console Redirection** option to enable or disable the console redirection function.

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

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

5.3.7.1 Console Redirection Settings

The following options are available in the **Console Redirection Settings** submenu (**BIOS Menu 24**) when the **COM Console Redirection** (for COM1 to IAMT SOL COM6) option is enabled.



BIOS Menu 24: 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. |

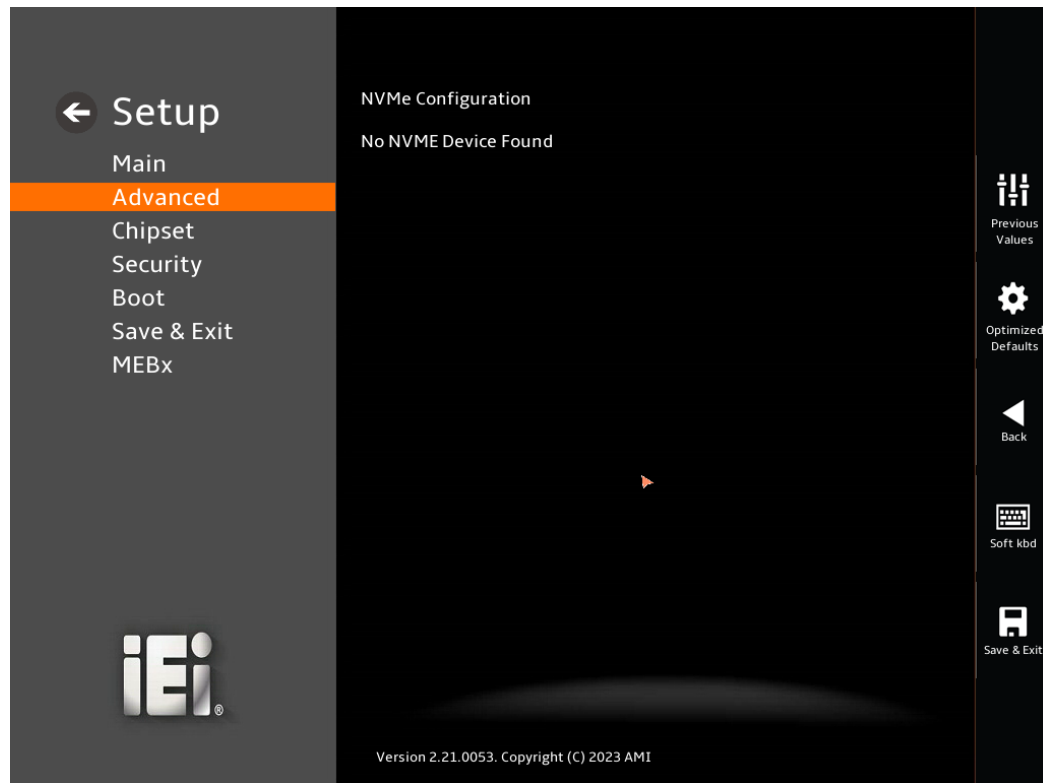
→ Parity [None]

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. This option does not allow for error detection. |

5.3.8 NVMe Configuration

Use the **NVMe Configuration (BIOS Menu 25)** menu to display the NVMe controller and device information.



BIOS Menu 25: NVMe Configuration

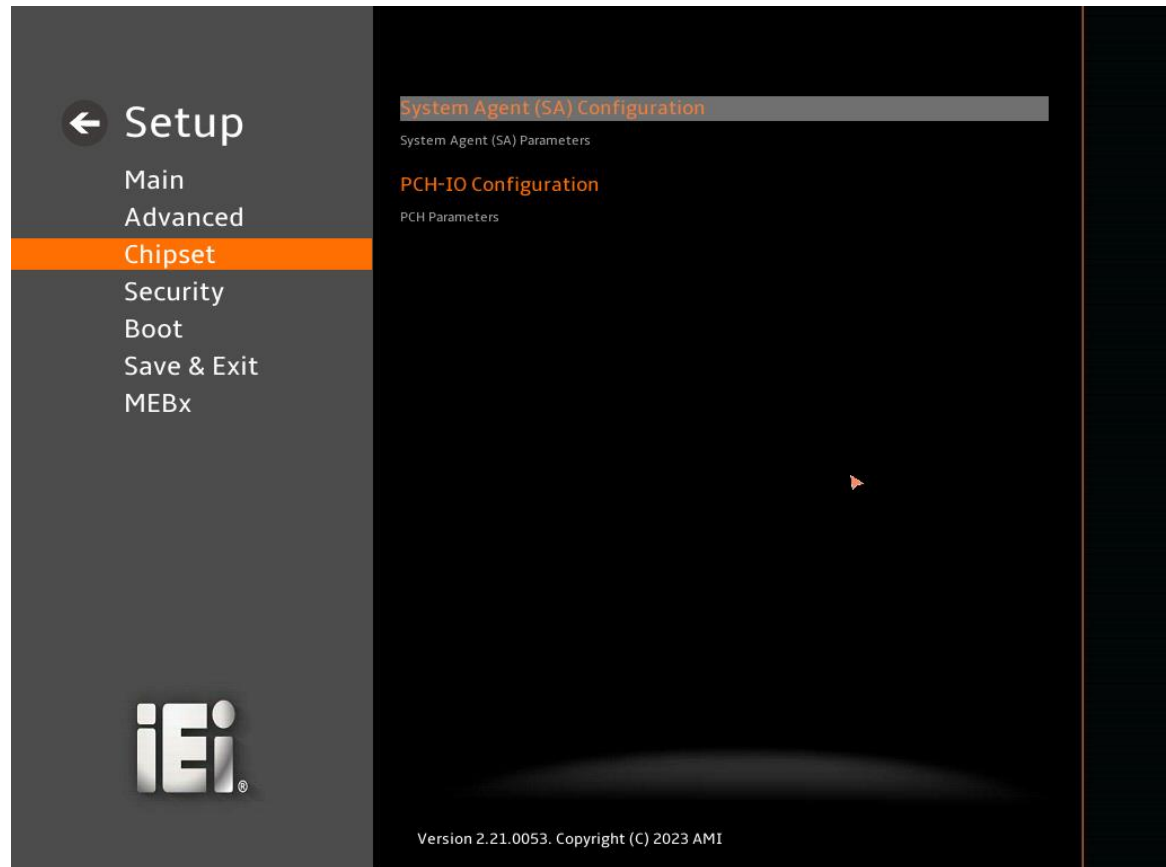
5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 26**) to access the PCH IO and System Agent (SA) configuration menus.



WARNING!

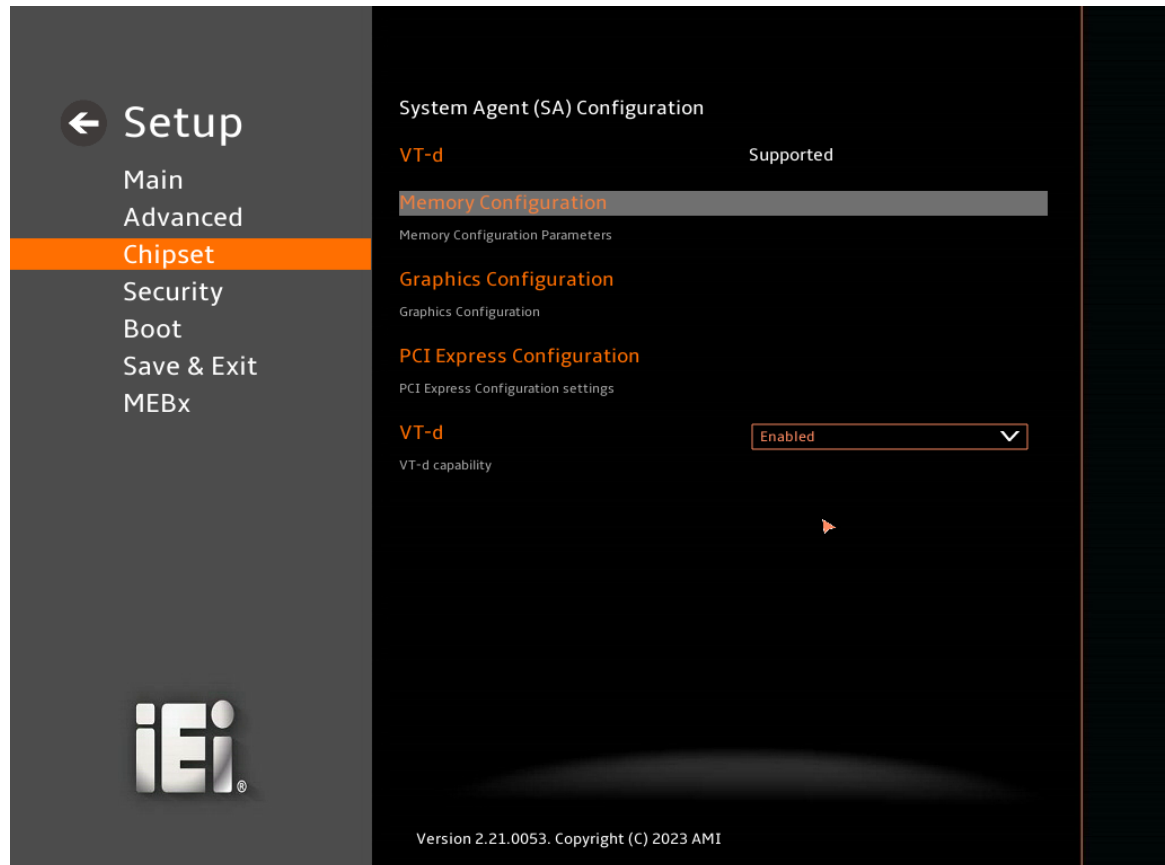
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 26: Chipset

5.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 27**) to configure the System Agent (SA) parameters.



BIOS Menu 27: System Agent (SA) Configuration

➔ **VT-d [Enabled]**

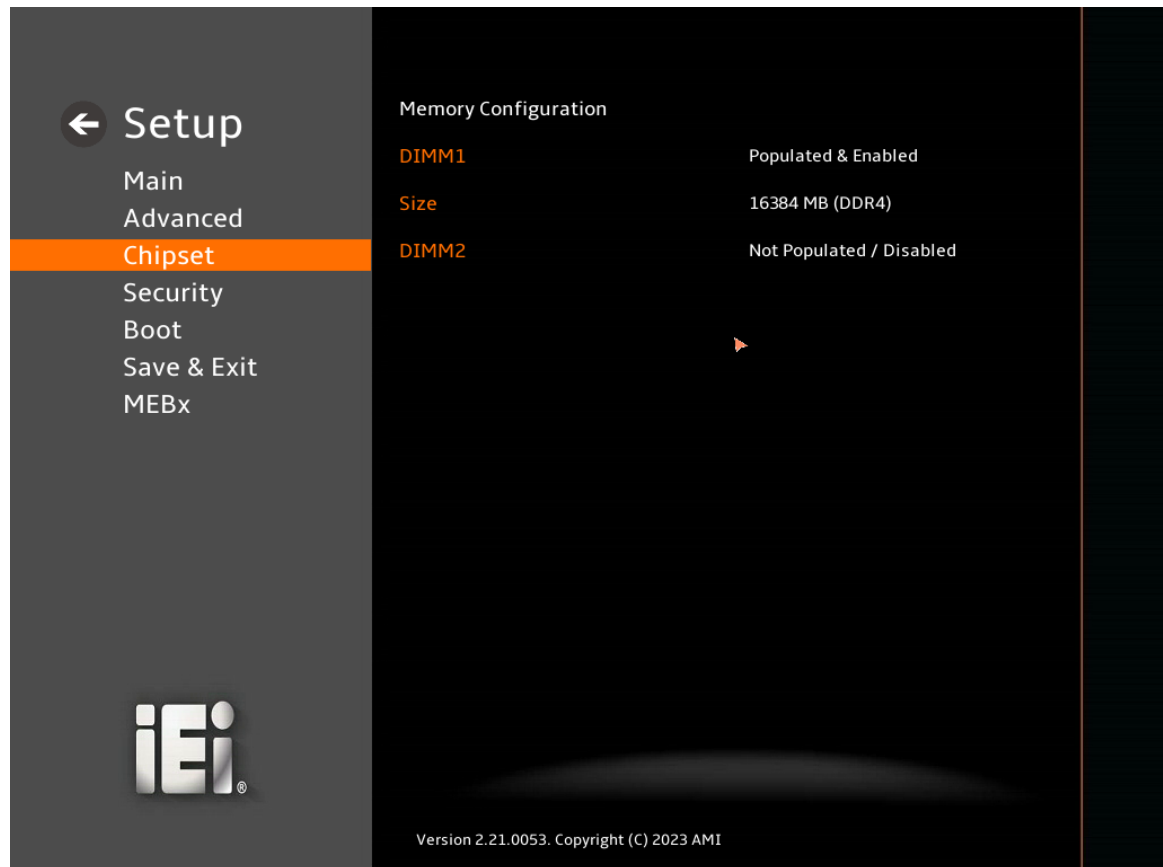
Use the **VT-d** option to enable or disable the VT-d capability.

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

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5.4.1.1 Memory Configuration

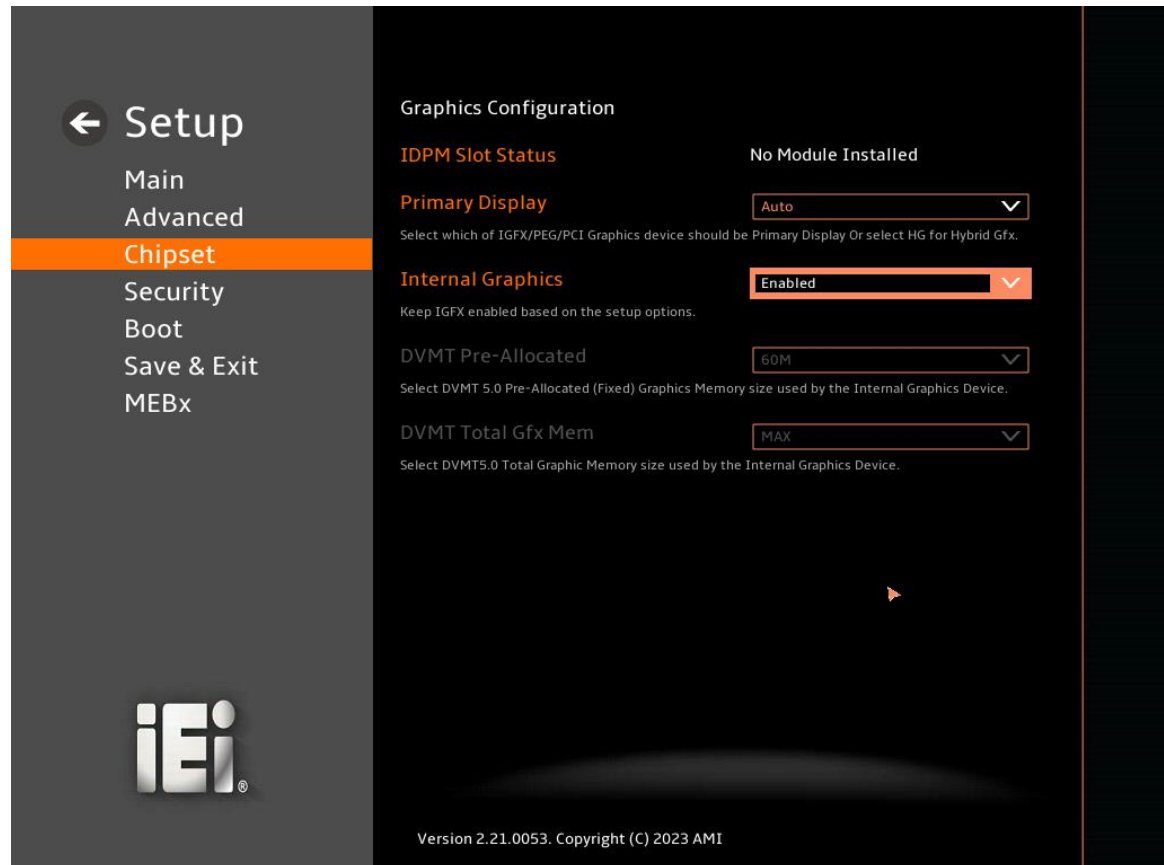
Use the **Memory Configuration** submenu (**BIOS Menu 28**) to view memory information.



BIOS Menu 28: Memory Configuration

5.4.1.2 Graphics Configuration

Use the **Graphics Configuration (BIOS Menu 29)** menu to configure the video device connected to the system.



BIOS Menu 29: 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 Slot
- PCI PCI
- HG

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→ 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 [60M]

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:

- | | | |
|---|-----|----------------|
| ▪ | 60M | Default |
|---|-----|----------------|

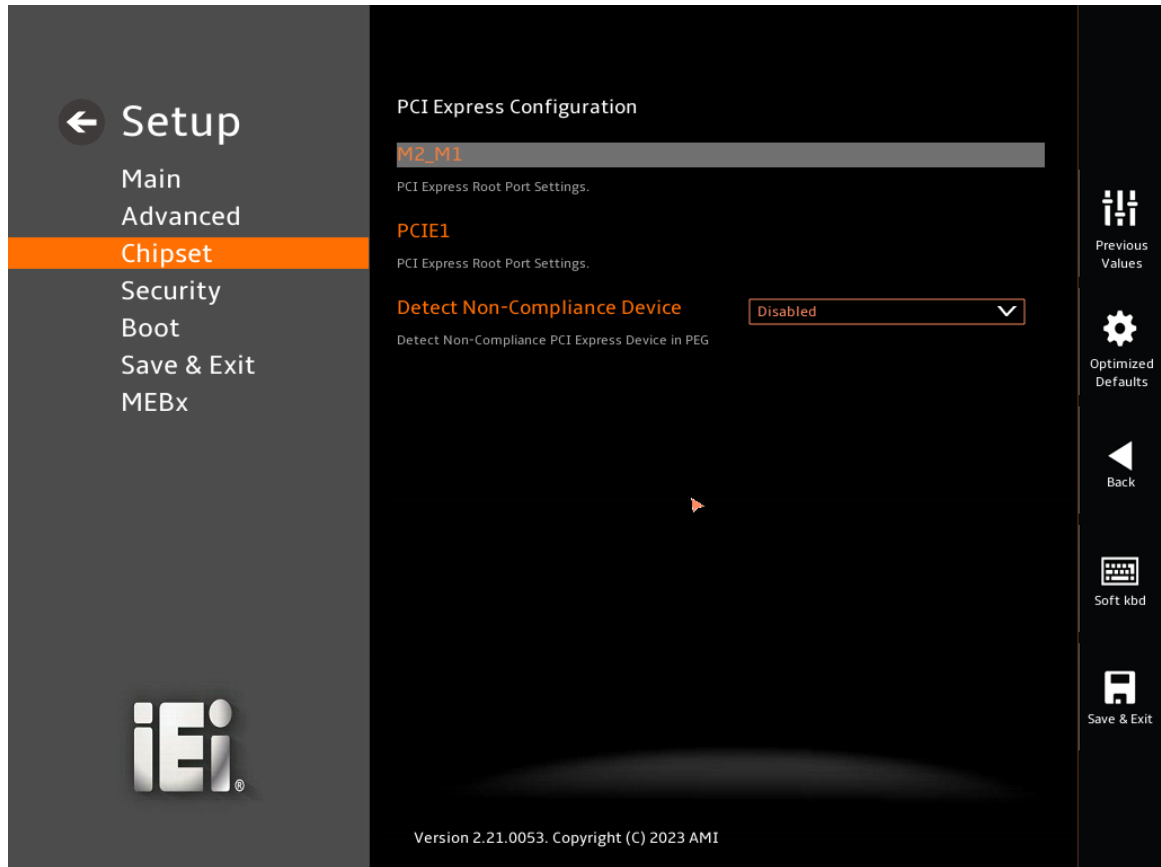
→ DVMT Total Gfx Mem [MAX]

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 PCI Express Configuration

Use the **PCI Express Configuration (BIOS Menu 30)** menu to configure PCI Express root port settings.



BIOS Menu 30:PCI Express Configuration

➔ Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to Detect Non-Compliance PCI Express Device in PEG. The PCI Express Configuration (for M2_M1 to PCIE1) option is enabled.

- ➔ **Disabled** **DEFAULT** Set to Detect Non-Compliance Device Disabled.
- ➔ **Enabled** Set to Detect Non-Compliance Device Enabled.

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5.4.1.3.1 M2_M1

Use the **M2_M1**(BIOS Menu 31) menu to configure PCI Express root port settings.



BIOS Menu 31:M2_M1

→ M2_M1 [Enabled]

Use the **M2_M1** option to control the PCI Express root port.

- **Disabled** Set to M2_M1 Disabled.
- **Enabled** **DEFAULT** Set to M2_M1 Enabled.

→ PCIe Speed [Auto]

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

- **Auto** **DEFAULT** Auto mode.

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5.4.1.3.2 PCIE1

Use the **PCIE1(BIOS Menu 31)** menu to configure PCI Express root port settings.



BIOS Menu 32:PCIE1

→ PCIE1 [Enabled]

Use the **PCIE1** option to control the PCI Express root port.

- **Disabled** Set to PCIE1 Disabled.
- **Enabled** **DEFAULT** Set to PCIE1 Enabled.

→ PCIe Speed [Auto]

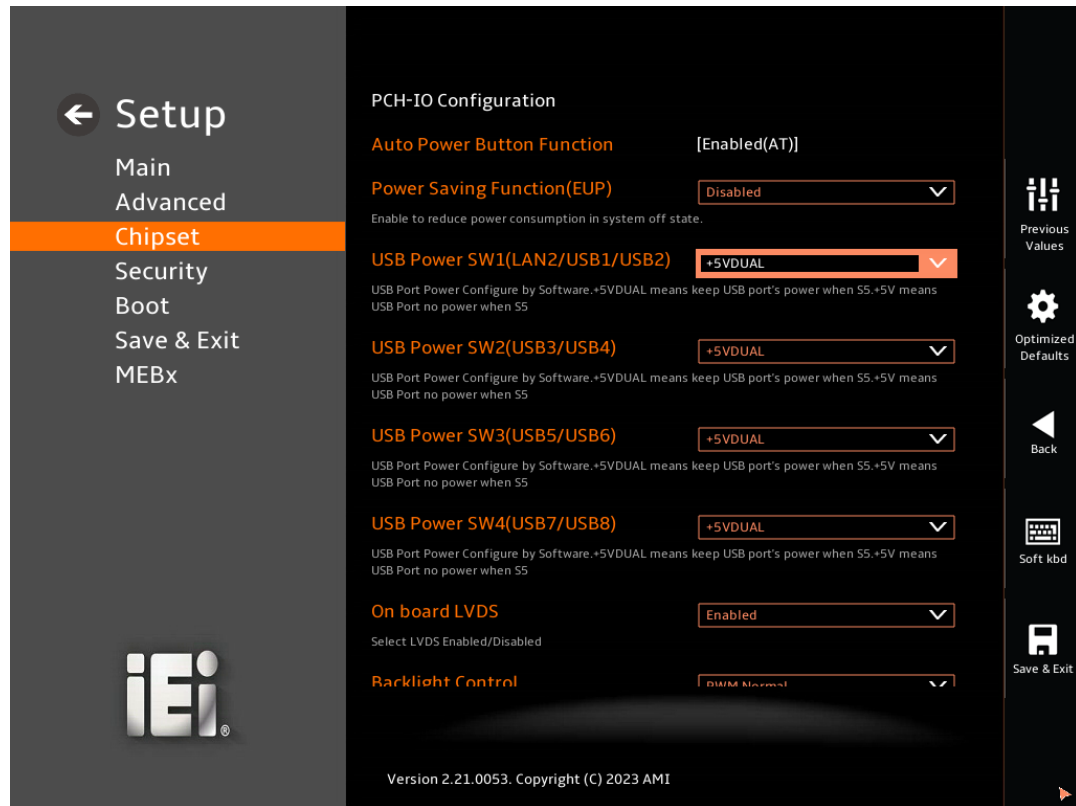
Use the **PCIe Speed** option to specify the PCI Express port speed. Configuration options are listed below.

- **Auto** **DEFAULT** Auto mode.

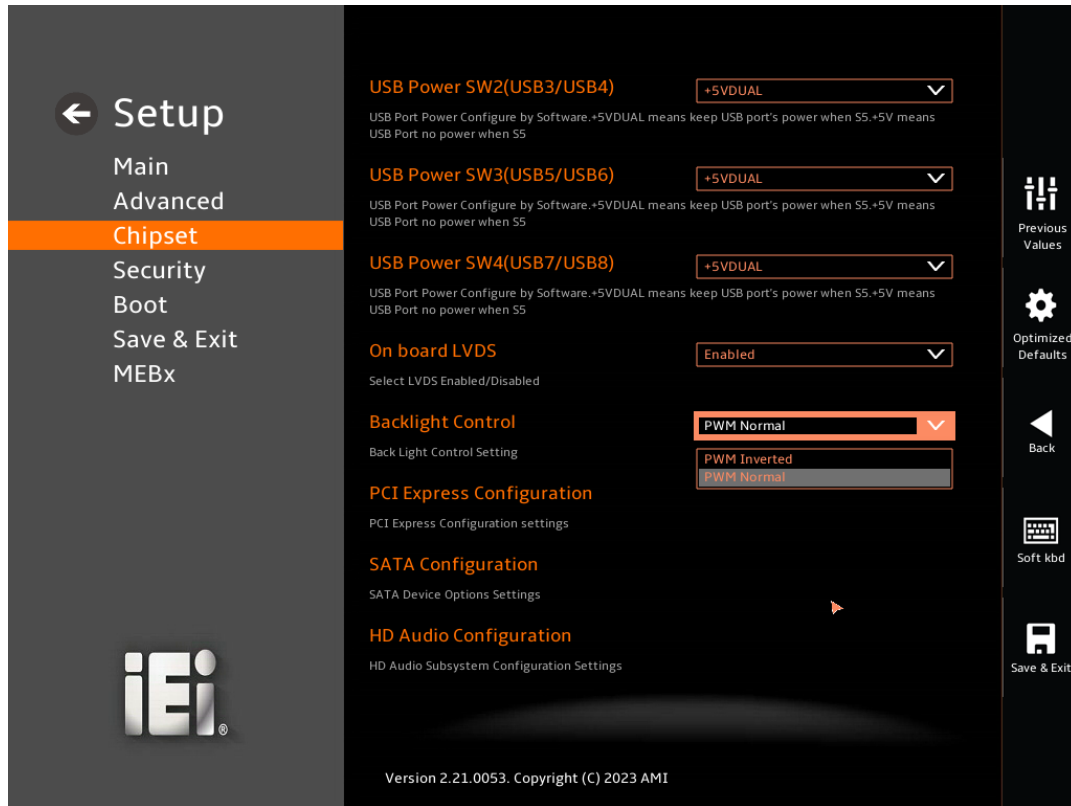
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5.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 33 & BIOS Menu 34**) to configure the PCH parameters.



BIOS Menu 33: PCH-IO Configuration (1/2)



BIOS Menu 34:PCH-IO Configuration (2/2)

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

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

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

→ **On board LVDS [Enabled]**

Use **On board LVDS** to select LVDS Enabled/Disabled.

- **Enabled** **DEFAULT** Sets On board LVDS Enabled.
- **Disabled** Sets On board LVDS Disabled.

→ **Backlight Control [PWM Normal]**

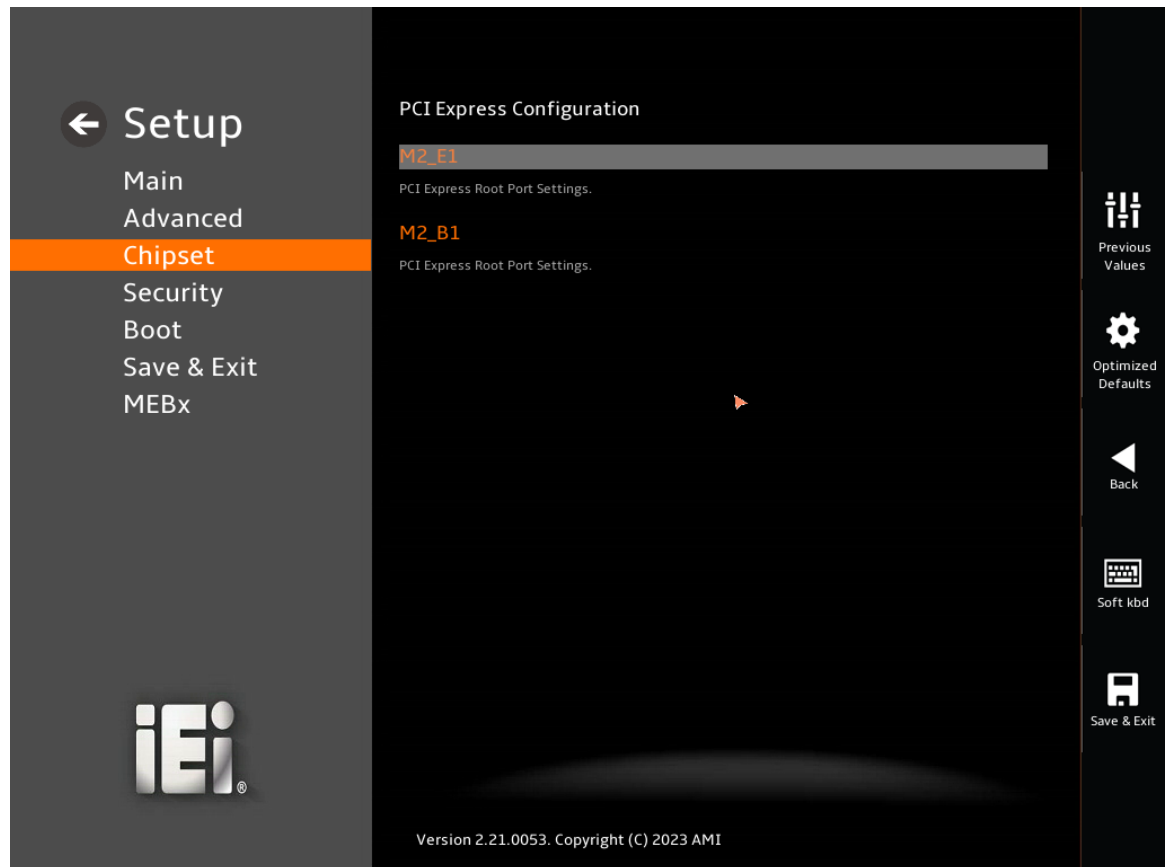
Use the **Backlight Control** to set Backlight.

- **PWM** **DEFAULT** Sets to Backlight Control PWM Normal.
Normal
- **PWM** Sets to Backlight Control PWM Inverted.
Inverted

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5.4.2.1 PCI Express Configuration

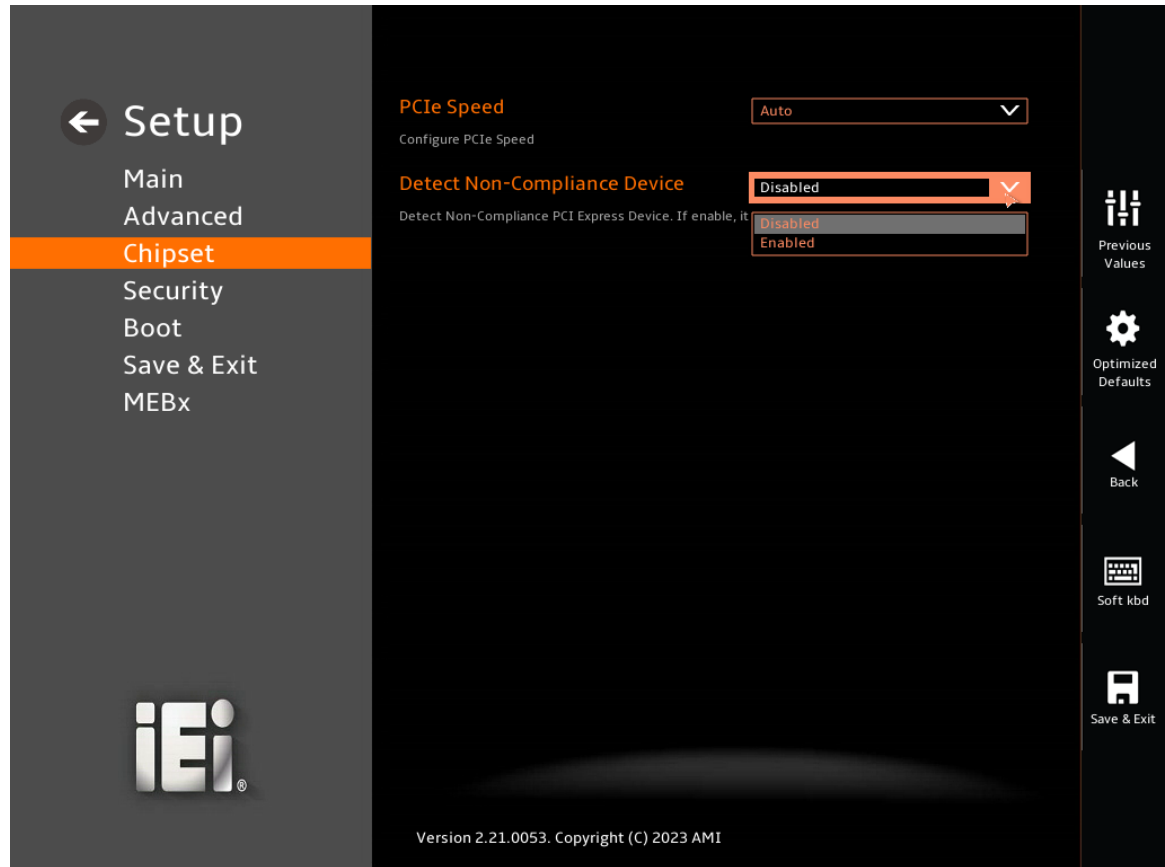
Use the **PCI Express Configuration** submenu (**BIOS Menu 35**) to configure the PCI Express slots.



BIOS Menu 35: PCI Express Configuration

5.4.2.1.1 PCIe Root Port Setting

Use the **M2_E1, M2_B1** submenu (**BIOS Menu 36**) to configure the PCI Root Port Setting.



BIOS Menu 36:M2_E1

→ 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. |

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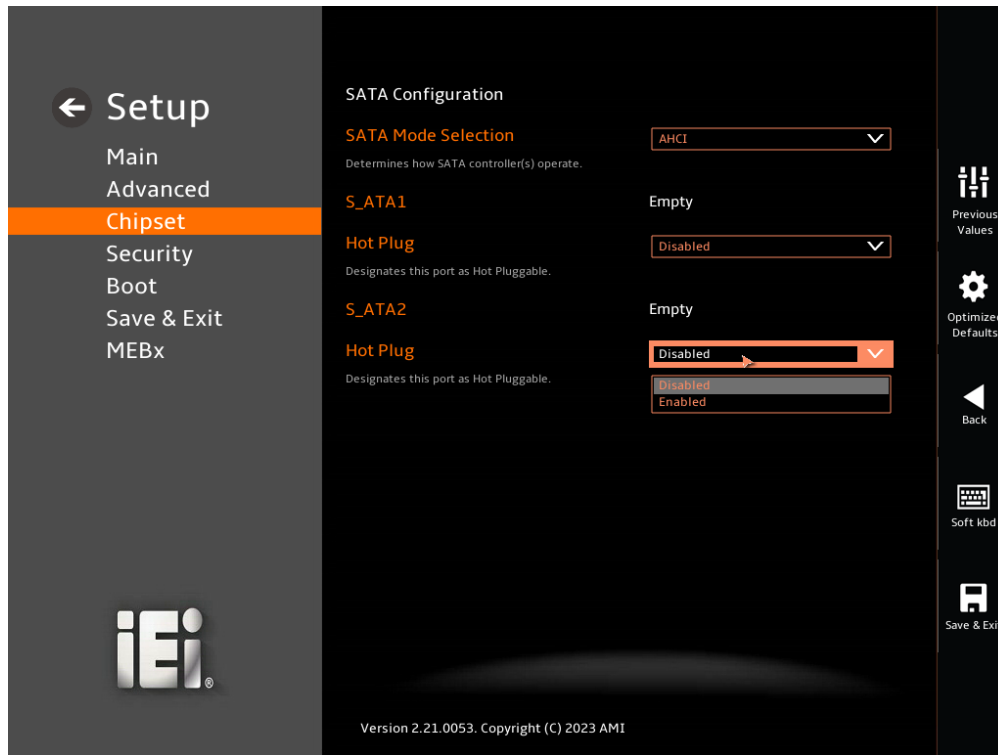
→ Detect Non-Compliance Device [Disabled]

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 37**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 37: 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.

➔ Hot Plug [Disabled]

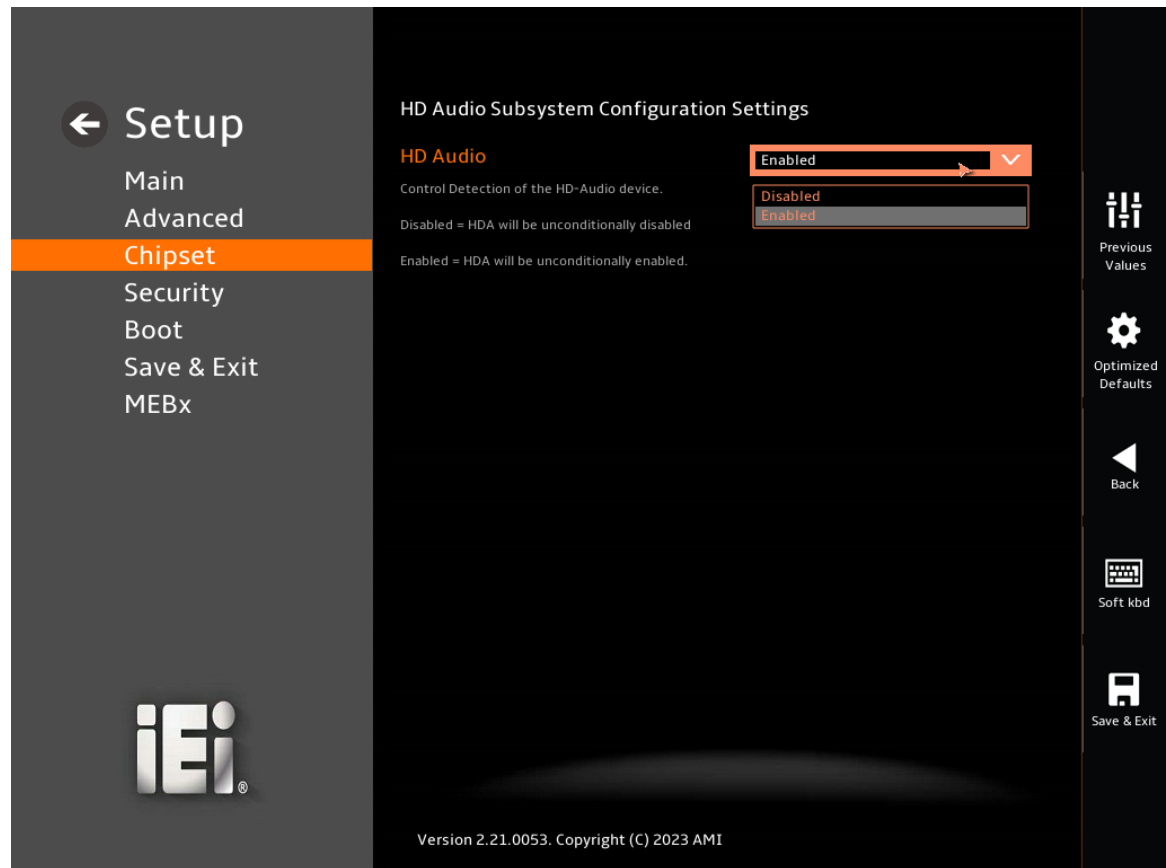
Use the **Hot Plug** option (for S_ATA1 to S_ATA2) to designate the correspondent port as hot-pluggable.

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

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5.4.2.3 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 38**) to configure the PCH Azalia settings.



BIOS Menu 38: HD Audio Configuration

→ HD Audio [Auto]

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 39 & BIOS Menu 40**) to set system and user passwords.



BIOS Menu 39: Security (1/2)



BIOS Menu 40:Security (2/2)

→ Administrator Password

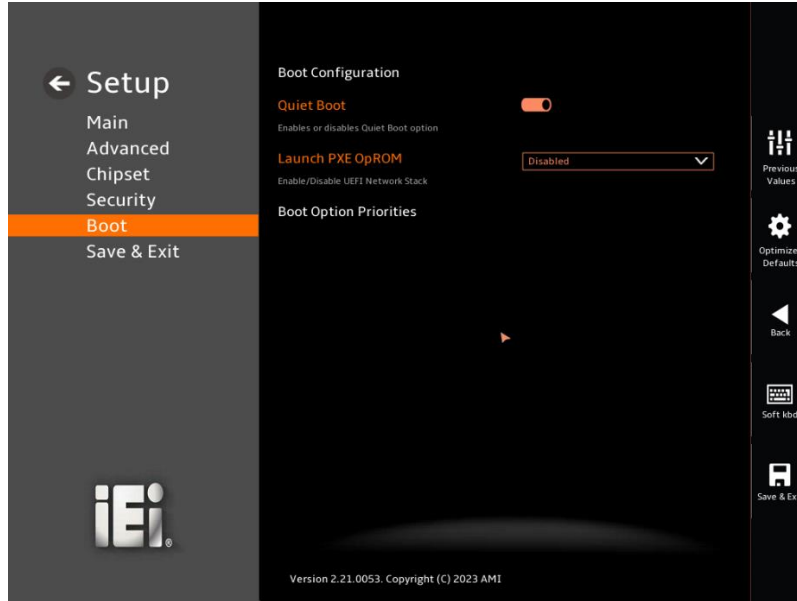
Use the **Administrator Password** to set or change a administrator password.

→ User Password

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

5.6 Boot

Use the **Boot** menu (**BIOS Menu 41**) to configure system boot options.



BIOS Menu 41: 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]

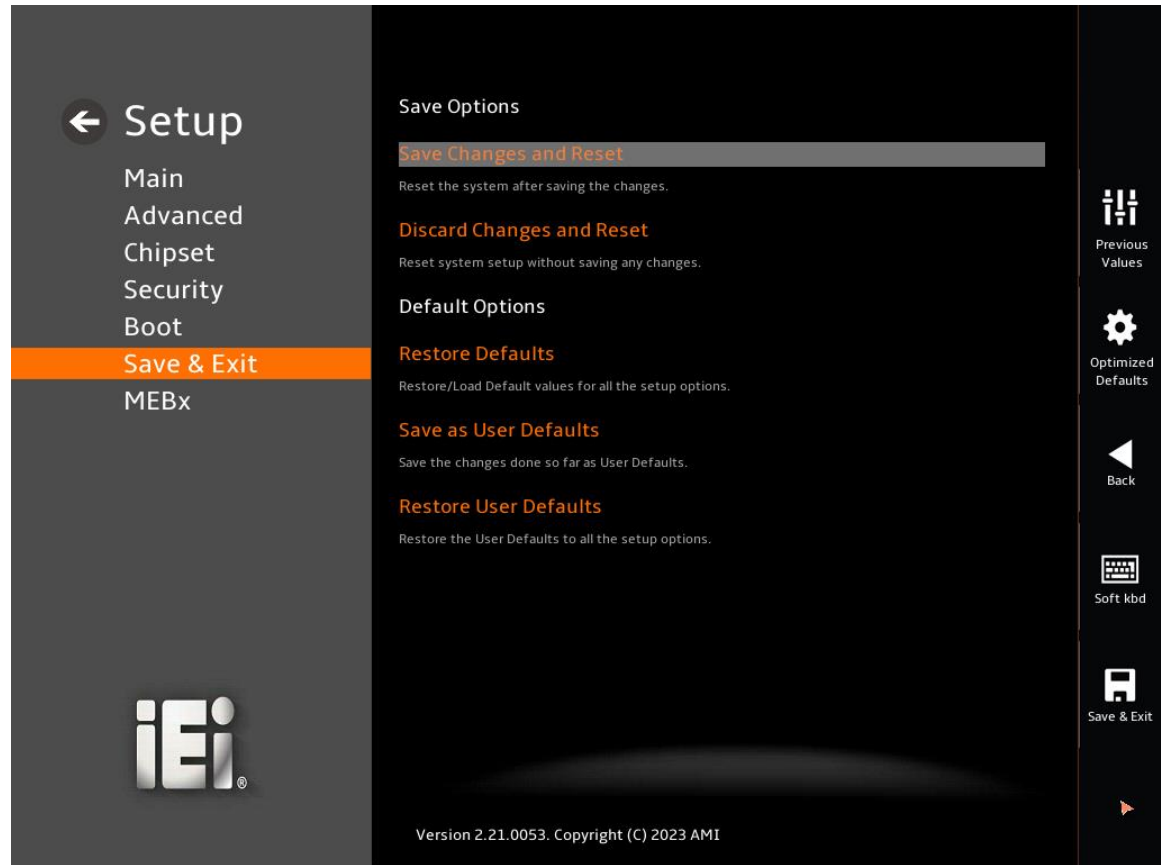
Use the **Launch PXE OpRom** option to enable or disable boot option for legacy network devices.

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

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5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 42**) to load default BIOS values, optimal failsafe values and to save configuration changes.

**BIOS Menu 42: 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.

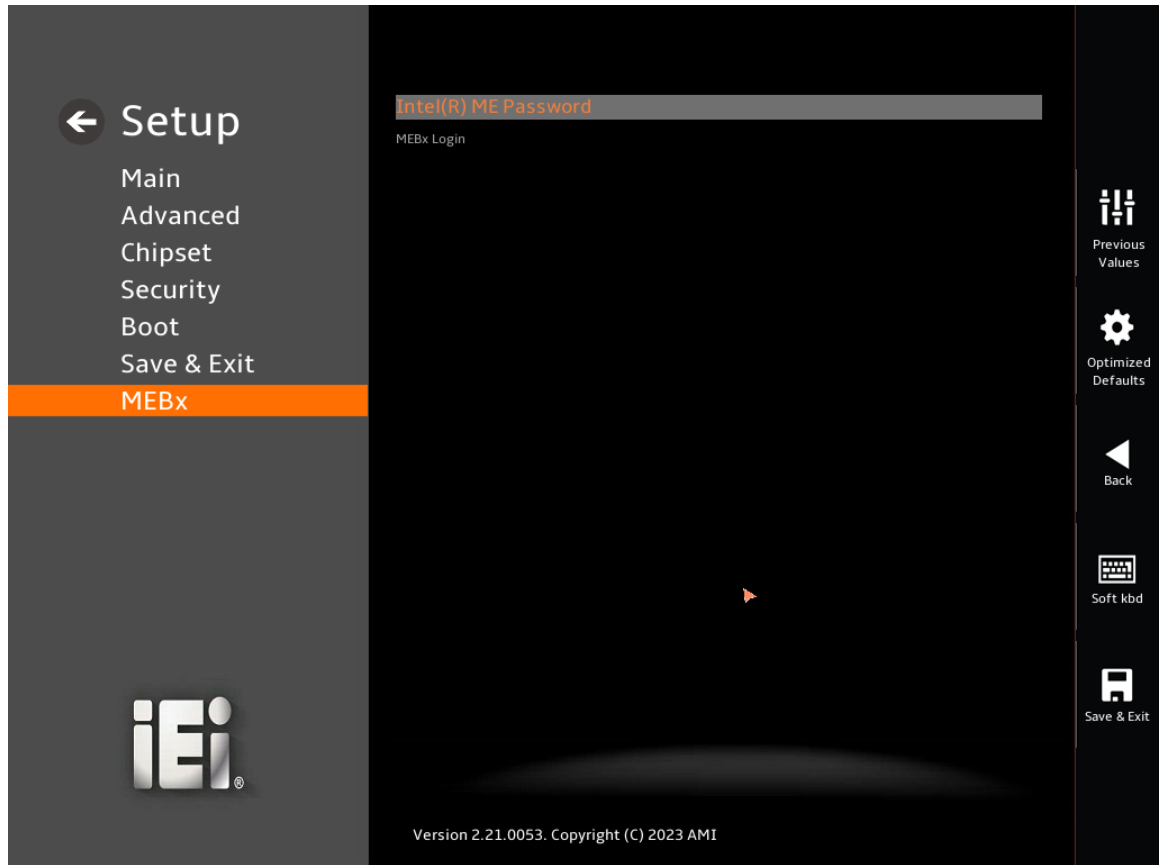
→ Restore User Defaults

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

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5.8 MEBx

Use the **MEBx** menu (**BIOS Menu 43**) to enter the current password to log in to the MEBx page.



BIOS Menu 43: MEBx

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

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

FCC WARNING

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

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

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

Appendix

B

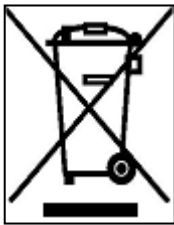
Product Disposal

KINO-ADL-P SBC**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

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Appendix

D

Watchdog Timer

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**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
4	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL 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	Polybrominated Diphenyl Ethers	Bis(2-ethylhexyl) phthalate	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
<p>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.</p> <p>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.</p>										

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

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。