QBiX-Pro-EHLA6412H-A2

QBiX-Pro-EHLA6412H-A2

QBiX-Pro Industrial Embedded System
Quick Start Guide

Copyright Notice

Acknowledgement

All other products' name or trademarks are properties of their respective owners.

- AMD is trademark of Advanced Micro Devices.
- Microsoft Windows is a registered trademark of Microsoft Corp.
- Intel, Pentium, Celeron, and Xeon are registered trademarks of Intel Corporation
- Core, Atom are trademarks of Intel Corporation
- ITE is a trademark of Integrated Technology Express, Inc.
- IBM, PC/AT, PS/2, and VGA are trademarks of International Business Machines Corporation.

All other product names or trademarks are properties of their respective owners.

Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
System kit	1
Screw I Head For 2.5" HDD M3x8L (25KSG-130081-K1R)	4
Thermal Pad for Memory (25ST3-200086-T5R)	1
SATA Cable (25CRI-150001-S9R)	1
Power Cord (May vary based on local distribution)	1
PSU ADP 19V 65W 100-240VAC (25EP1-100651-A3S)	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the GIGAIPC.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.

2. Make sure the power source matches the power rating of the device.

3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

4. Always completely disconnect the power before working on the system's hardware.

5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.

6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.

7. Always disconnect this device from any AC supply before cleaning.

8. While cleaning, use a damp cloth instead of liquid or spray detergents.

9. Make sure the device is installed near a power outlet and is easily accessible.

10. Keep this device away from humidity.

11. Place the device on a solid surface during installation to prevent falls

12. Do not cover the openings on the device to ensure optimal heat dissipation.

13. Watch out for high temperatures when the system is running.

14. Do not touch the heat sink or heat spreader when the system is running

15. Never pour any liquid into the openings. This could cause fire or electric shock.

16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device

18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning! This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

Table Contents

Chapter 3 – Hardware Information   26

Chapter 1

Chapter 1 - Product Specifications
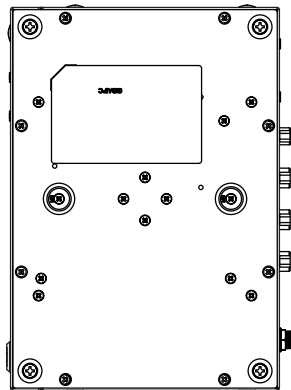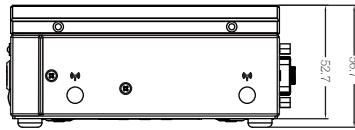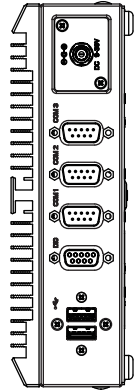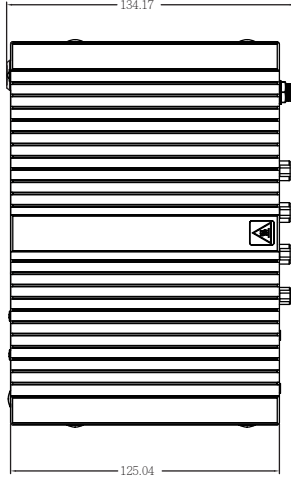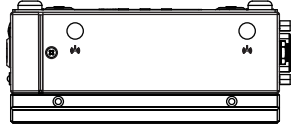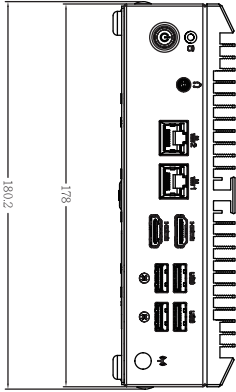
1.1 Specifications

System	QBiX-Pro-EHLA6412H-A2
Dimension	178W x 125D x 52.7H (mm)
CPU	Intel® Celeron® J6412 Processor 10nm, 4 cores, 4 threads, up to 2.60 GHz TDP 10W
Chipset	SoC
Memory	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB Support Dual Channel DDR4 3200 MHz memory modules
Ethernet	2 x GbE LAN Ports (Intel® I211AT)
Graphic support	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0 port, supporting a maximum resolution of 4096x2160 @60Hz (2 independent display outputs)
Audio	Realtek® Audio Codec
Storage	1 x 2.5" HDD/SSD (SATA 6Gb/s)
Expansion Slots	1 x 2280 M.2 M-Key (SATA 6Gb/s, support NVMe SSD) 1 x Full-size mini PCIe with SIM slot
Front I/O	2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1 2 x HDMI 1 x Power button with LED 1 x Headphone Jack
Rear I/O	2 x USB 2.0 1 x COM Port (RS-232/422/485 & RI/5V/12V) 1 x COM Port (RS-232/422/485) 1 x COM Port (RS-232) 1 x GPIO (8 bits) 1 x Screw Type DC Jack
Side I/O	2 x External Antenna Holes (Optional)
TPM	—
Power	+9V~36VDC (Adapter 19V/65W)

System	QBiX-Pro-EHLA6412H-A2
Operation temperature	Operating temperature: 0°C to 50°C Operating humidity: 0-90% (non-condensing) Non-operating temperature: -20°C to 70°C Non-operating humidity: 0%-95% (non-condensing) Use wide temperature range memory and storage
Vibration During Operation	Operation: IEC 60068-2-64, 3 Grms, random, 5 ~ 500 Hz, 1 hr / Per Axis, With SSD/M.2 2242 Non-operation: IEC 60068-2-6, 2 G, Sine, 10 ~ 500 Hz, 1 Oct/ min, 1 hr / Per Axis
Shock During Operation	Operation: IEC 60068-2-27, 50 G, half sine, 11 ms duration, With SSD
Packaging Content	Carton size: 505 x 333 x 231 (mm) Packing Capacity: 5pcs Including: Screw I Head For 2.5" HDD M3x8L x 4 (P/N: 25KSG-130081-K1R) Thermal Pad for Memory x 1 (P/N: 25ST3-200086-T5R) SATA Cable x 1 (P/N: 25CRI-150001-S9R) Power Cord : Optional (by region) PSU ADP 19V 65W 100-240VAC x 1 (P/N: 25EP1-100651-A3S)
Order Information	System : 6BQP6412AMR-SI (Box packing)

Chapter 2

Chapter 2 – QBiX-Pro-EHLA6412H-A2
Industrial Embedded System Kit

2.1   Dimension

GIGAIPC
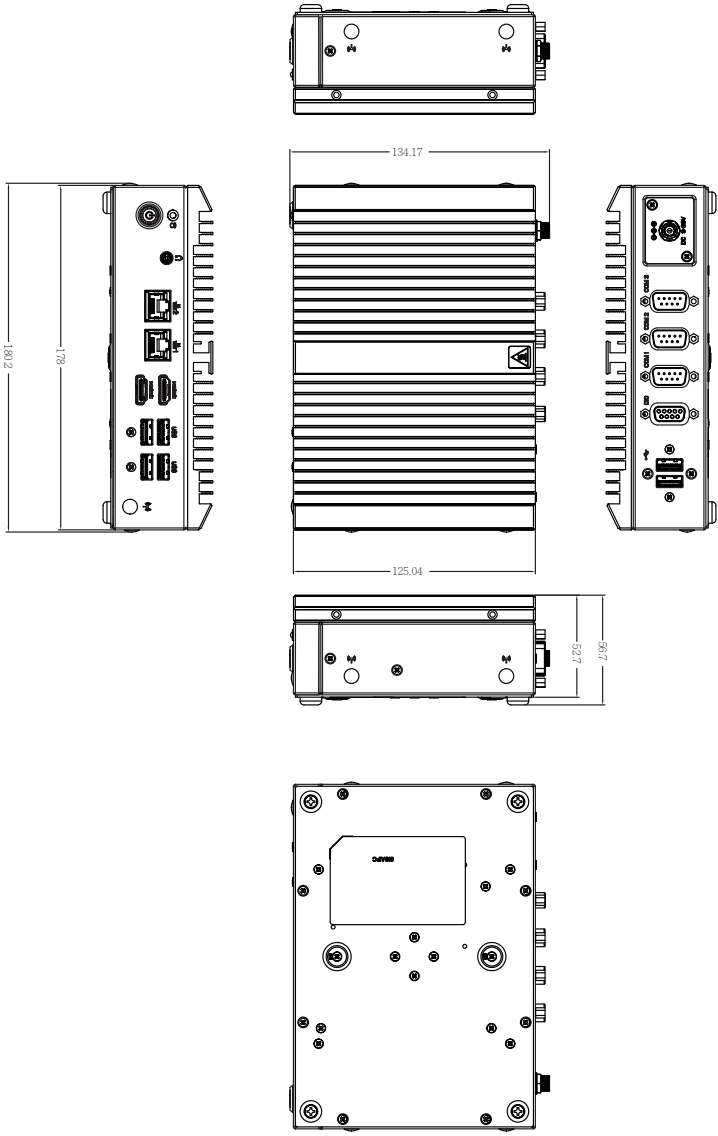
2.2 Getting Familiar with Your Unit

System - QBiX-Pro Series

QBiX-Pro-EHLA6412H-A2

[Front Side]

1 x HDD LED

2 x HDMI

4 x USB 3.2 Gen 1

1 x Antenna (Optional)

2 x RJ45 LAN Ports

1 x Headphone

Power button with LED

[Left Side]

2 x Antenna (Optional)

[Rear Side]

2 x USB 2.0

1 x COM Port (RS-232/422/485 & RI/5V/12V)
1 x COM Port (RS-232/422/485)
1 x COM Port (RS-232)

1 x Screw type
DC Jack

1 x GPIO
(8-bits)

[Right Side]

2 x Antenna (Optional)
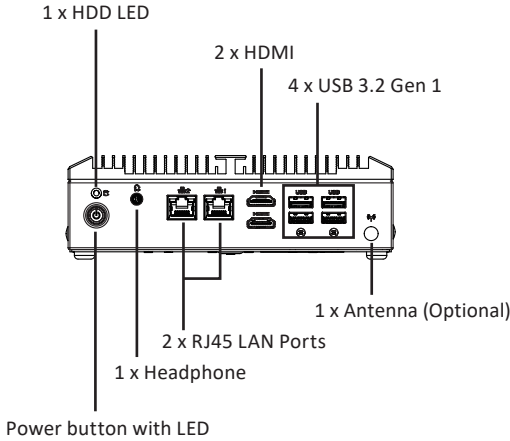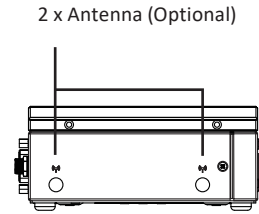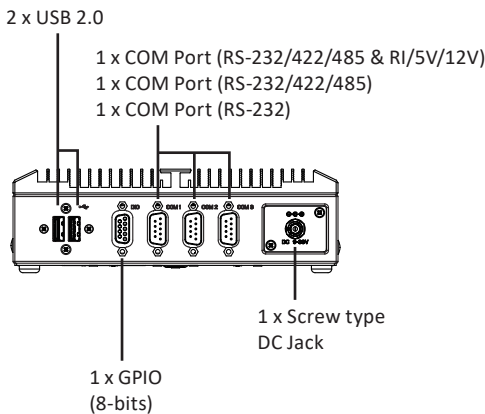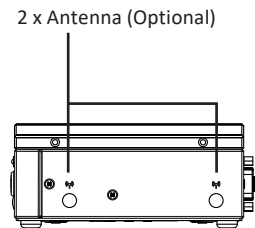
[Install]

* Before opening the case, make sure to unplug the power cord.
* Before Connecting the power, make sure to fasten the case securely.
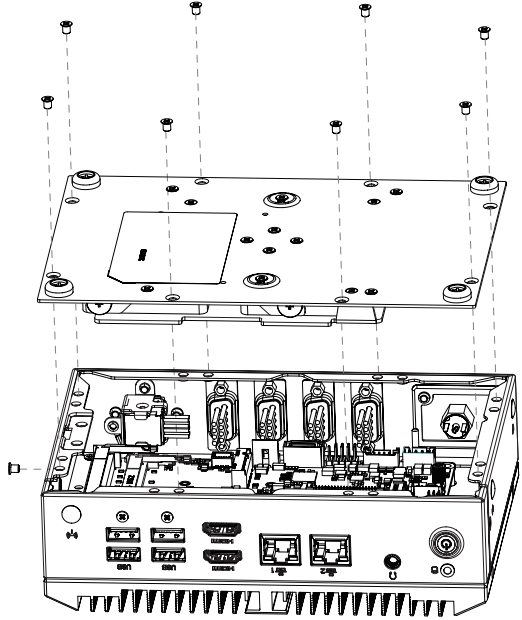
[Bottom PCB Side]

	Information
A	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB
B	1 x M.2 slot (Supports NGFF-2280 SATA 6Gb/s)

	Information
C	1 x Min PCIe slot (PCIe x1 + USB2.0) with SIM Slot
D	support 2.5'' Hard drive/SSD
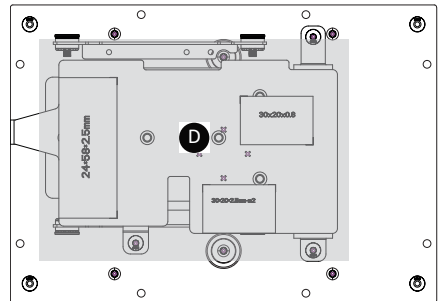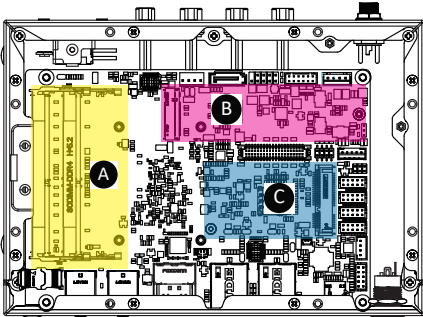
2.3   A) M.2 SSD Installation: How to safely install the M.2 2280 SSD

❶

Remove the screw from the screw hole (Location : MSO2)

❷
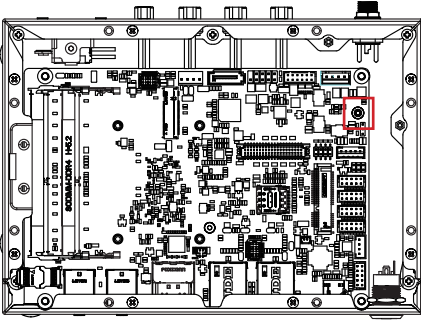
Carefully insert the M.2 SSD into the slot, and secure with the screw.
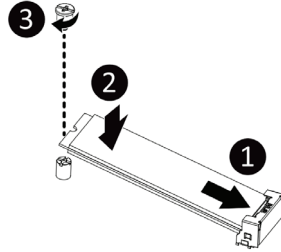
2.4 B) Memory Installation: DDR4 SO-DIMM

❶

Carefully insert SO-DIMM memory modules.
小心地由下至上將 SO-DIMM 記憶體安裝於記憶體插槽。
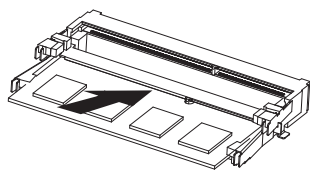
❷

Push down until the modules click into place.
當記憶體固定於插槽後，再輕輕下壓至定點。

❸
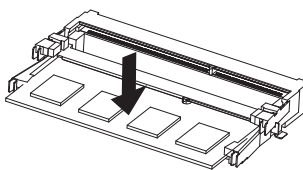
Carefully insert SO-DIMM memory modules.
安裝下層記憶體後，重覆前述動作安裝上層記憶體。

❹
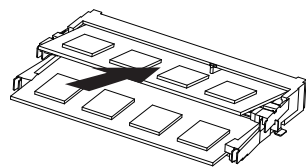
Push down until the modules click into place.
當記憶體固定於插槽後，再輕輕下壓至定點。
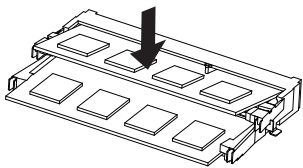
2.5   C) Mini PCIe Card Installation: How to safely install the Mini PCIe Card

❶

Remove the screw from the screw hole (Location : MSO1)

❷
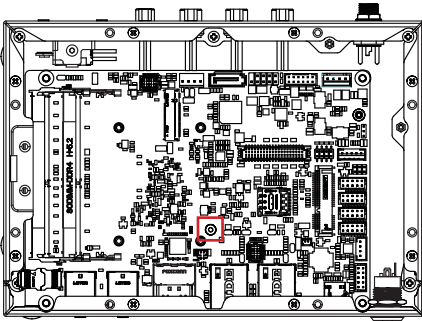
Carefully insert the Mini PCIe Card into the slot.

❸
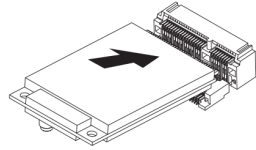
Secure the Mini PCIe Card with screw.
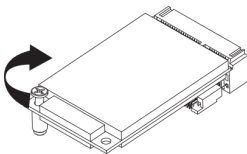
2.6 Antenna Installation (Antenna inclusion may vary based on local distribution)

❶

Carefully insert the antennas into the connectors.
小心地將天線插入天線插孔中。

❷
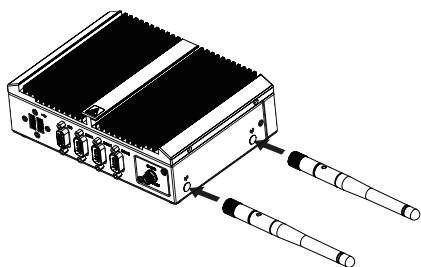
Turn the antennas clockwise until they are completely secure on the connectors.
握住天線接頭底端，按順時針方向將天線旋入插孔中牢牢固定。

❸
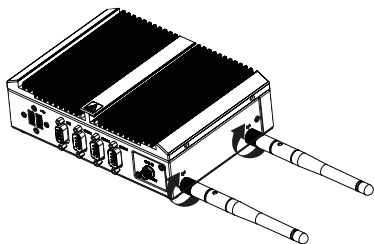
Flip up the antenna heads so that they are perpendicular to the machine.
栓緊後請將天線拉起朝上呈垂直狀。
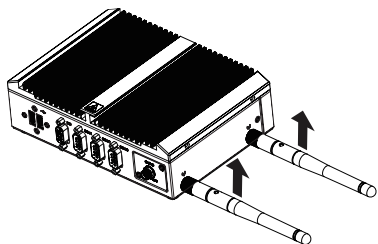
2.7　　Support

● For a list of tested memory, M.2, 2.5'' SSD, wireless adapters and OS supported, go to: http://www.gigaipc.com

● To download the latest drivers and BIOS updates, go to: http://www.gigaipc.com

● For product support, go to: http://www.gigaipc.com

2.8   Safety and Regulatory Information

Risk of explosion if the battery is replaced with an incorrect type. Batteries should be recycled where possible.
Disposal of used Batteries must be in accordance with local environmental regulations.
Failure to use the included Power Adapter may violate regulatory compliance and may expose the user to safety
hazards.

At the end of its serviceable life, this product should not be treated as household or general waste. It should be handed over to the applicable collection point for the recycling of electrical and electronic equipment, or returned to the supplier for disposal.

Chapter 3

Chapter 3 – Hardware Information

3.1　Jumpers and Connectors
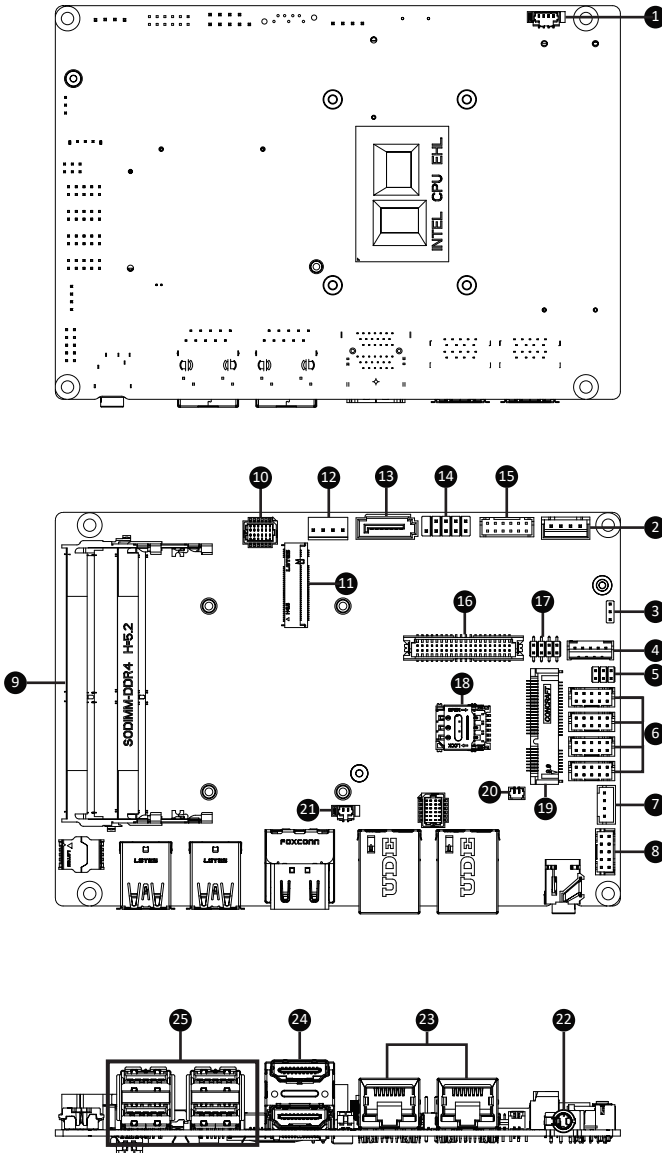
No	Code	Description
1	FAN	FAN connector
2	DC_IN	DC IN 1x4pin power connector
3	AT_CN	AT/ATX mode select jumper
4	BKL_CN	Backlight Control connector
5	JCOM1	RI# pin RI#/5V/12V Select jumper for COM1 port
6	COM1 COM2 COM3 COM4	Serial port header COM1 : RS-232/422/485 & RI/5V/12V COM2 : RS-232/422/485 COM3, COM4 : RS-232
7	SPKR	Speaker out connector
8	FP_AUDIO	Front panel audio header
9	SODIMMA SODIMMB	DDR4 SO-DIMM sockets x 2
10	SYS_PANEL	Front panel header
11	M2M	M.2 slot, SATA, NGFF2280
12	SATAPW	SATA power connector
13	SATAIII	SATA 6GB/s connector
14	FUSB20	USB 2.0 header
15	GPIO_CNT	General Purpose input/output header
16	LVDS	LVDS connector
17	LSW	LVDS resolution jumper
18	SIM_CARD	3G/4G Sim Slot
19	MPCIE	Mini-PCIe slot
20	BUZZER	Buzzer header
21	BATTERY	Battery cable connector

No	Code	Description
22	AUDIO	Line out connector
23	LAN1, LAN2	LAN connector
24	HDMI	HDMI connector
25	USB31_1, USB31_2	USB 3.2 Gen 1 connector x 4

3.2.1   FAN (FAN connector)

1

Pin1
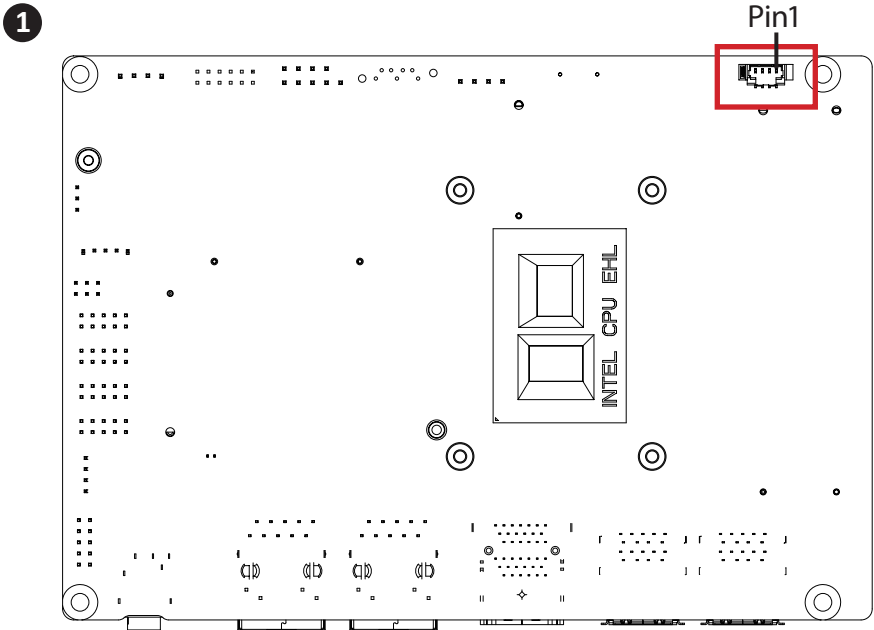
CPU/System FAN
4 3 2 1
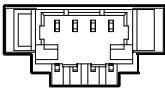
Connector PN	Vendor
85205-0470N	ACES
A1250WV-S-04PC	JOINT-TECH

Pin No.	Definition
1	GND
2	12V
3	Detect
4	Speed Control

3.2.2 DC_IN (DC IN 1x4pin power connector)

❷

Pin1

DC in Connector
DC_IN
1 ▢ ○ ○ ○ 4
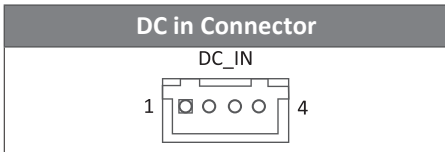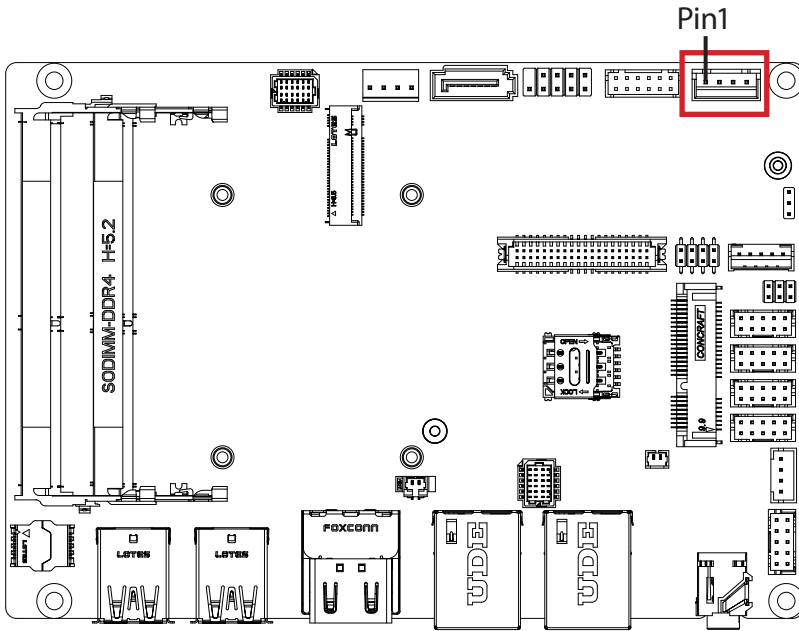
Connector PN	Vendor
753-81-04TW00	PINREX

Pin No.	Definition
1	GND
2	Power in
3	Power in
4	GND

3.2.3 AT_CN (AT/ATX mode select jumper)

3

Pin1
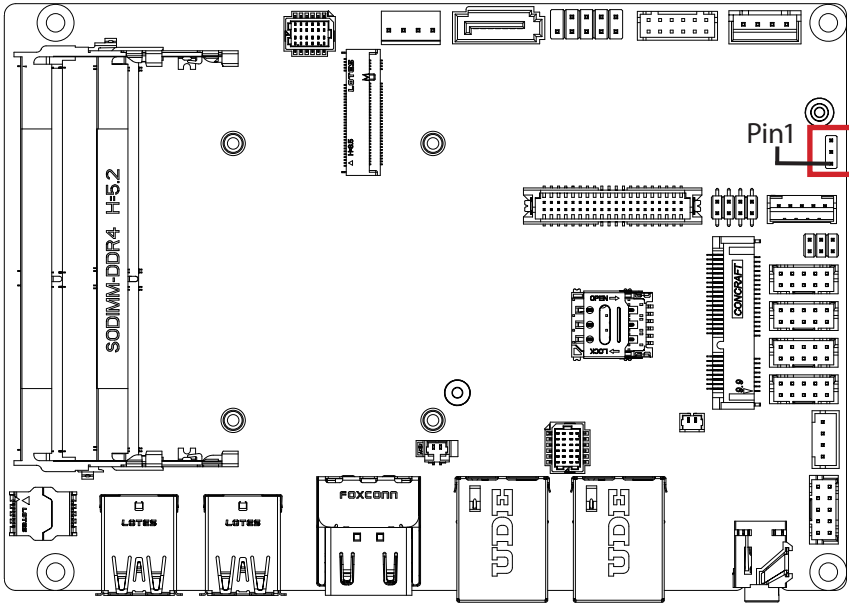
AT/ATX mode select jumper	
1-2 Close : AT mode.	
2-3 Close : ATX mode. (Default setting)	

Connector PN	Vendor
220-96-03GB01	PINREX
PH03N2-7BAN000	HORNGTONG

Pin No.	Definition
1	AT MODE
2	Detect
3	ATX MODE
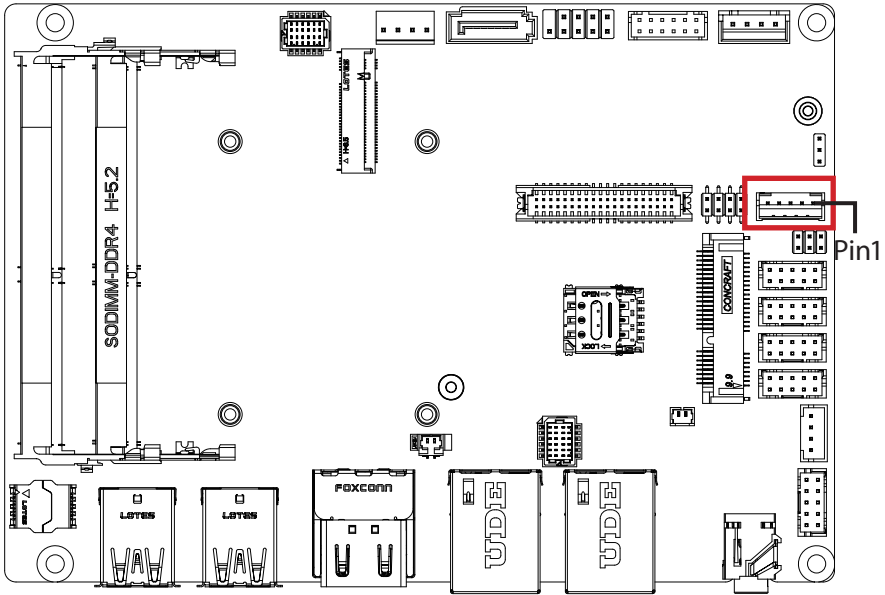
GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.4 BKL_CN (Backlight Control connector)

4

Pin1

Backlight Control connector
5 ⬚⬚⬚⬚⬚ 1

Connector PN	Vendor
721-81-05TW00	PINREX
A2001WV-05P146	JOINT-TECH

Pin No.	Definition
1	5V
2	PWM
3	Backlight Enable
4	GND
5	12V

3.2.5   JCOM1 (RI# pin RI#/5V/12V Select jumper for COM1 Port)

❺

Pin1
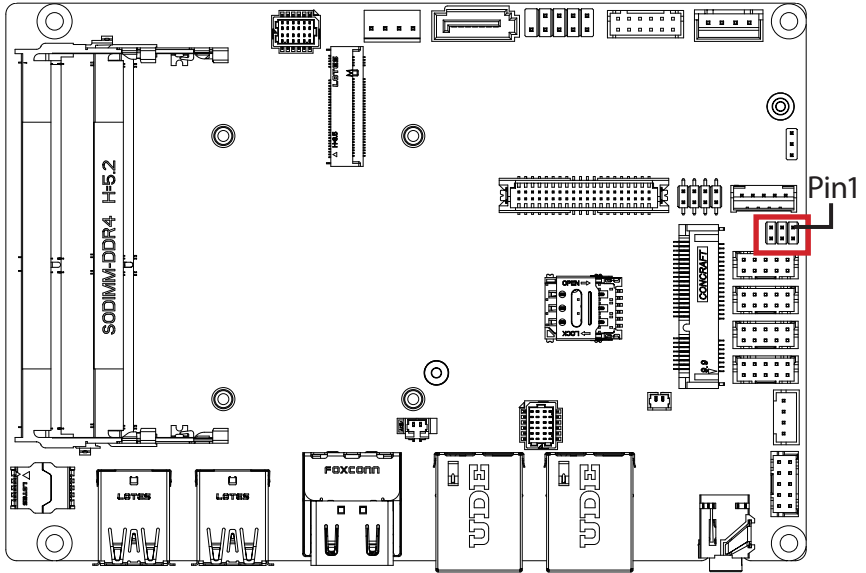
JCOM1 Jumper Select	
5 6 1 2	1-2 Close: 5V (Power COM)
5 6 1 2	3-4 Close: RI (Stand COM)
5 6 1 2	5-6 Close: 12V (Power COM)

Connector PN	Vendor
220-97-03GB01	PINREX
PH06N53BAZ000	HORNGTONG

3.2.6   COM1, COM2, COM3, COM4 (Serial port header)

6

Pin1
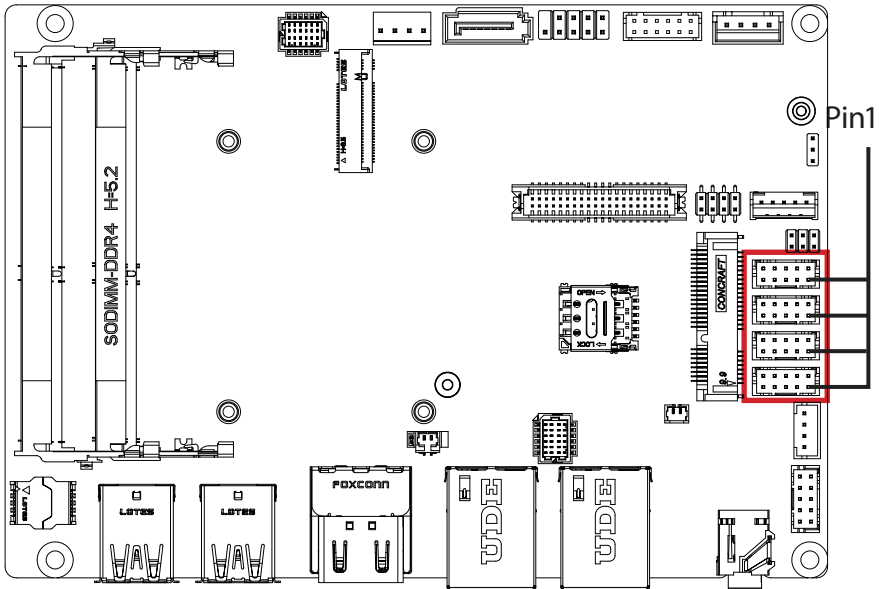
Serial Port Cable Connector

Pin No.	RS-232	RS-422 Full Duplex	RS-485 Half Duplex
1	RXD	TXD+	D+
2	DCD	TXD-	D-
3	DTR	RXD-	−
4	TXD	RXD+	−
5	DSR	−	−
6	GND	−	−
7	CTS	−	−
8	RTS	−	−
9	No Connect	−	−
10	RI/5V/12V	−	−

Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

Note :
COM1 : Support RS-232/422/485 & RI/5V/12V
For RI/5V/12V jumper setting, please see
P. 29
COM2 : Support RS-232/422/485
COM3, COM4 : Support RS-232 only

3.2.7 SPKR (Speaker out connector)

7
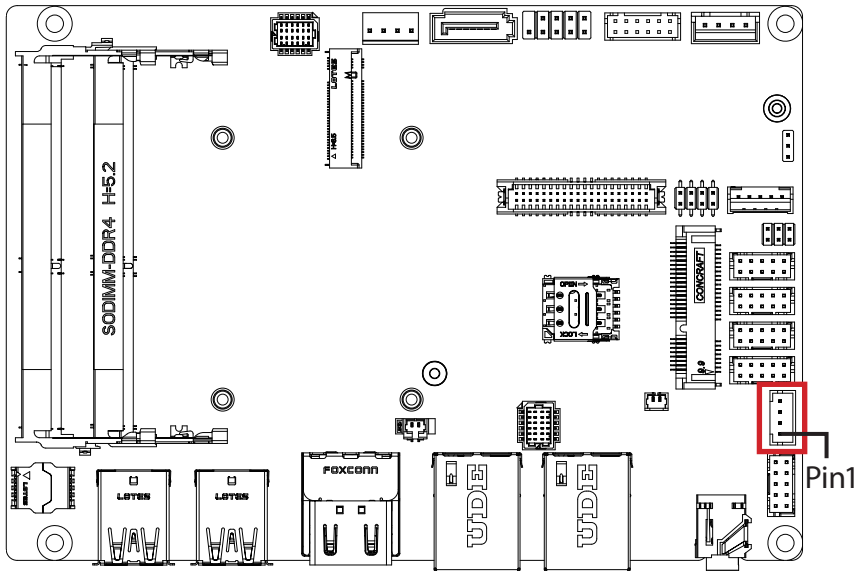
Pin1

Speaker out connector
4 1

Pin No.	Definition
1	Speaker Out L+
2	Speaker Out L-
3	Speaker Out R-
4	Speaker Out R+

Connector PN	Vendor
721-81-045W00	PINREX
A2001WV-04P146	JOINT-TECH

3.2.8 FP_AUDIO (Front panel audio header)

8

Pin1

Front panel audio Connector
9 10   1 2
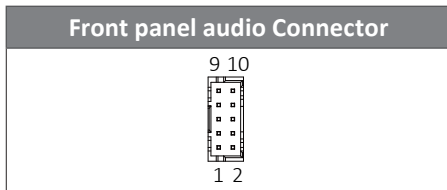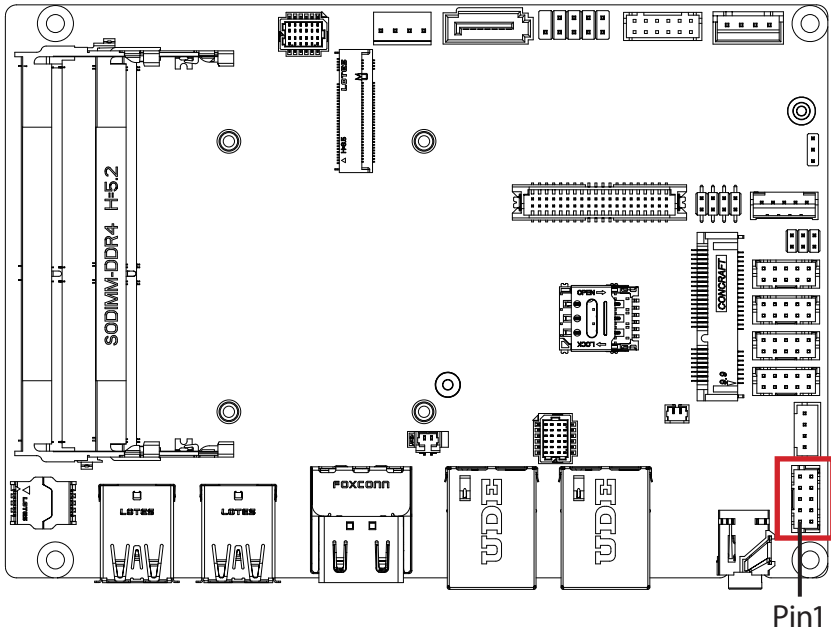
Pin No.	Definition
1	MIC-LEFT
2	GND
3	MIC-RIGHT
4	Detect
5	LINE-RIGHT
6	GND
7	JACKSENCE Detect
8	NC
9	LINE-LEFT
10	GND

Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

3.2.9 SODIMMA, SODIMMB (DDR4 SO-DIMM sockets)

9

GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.
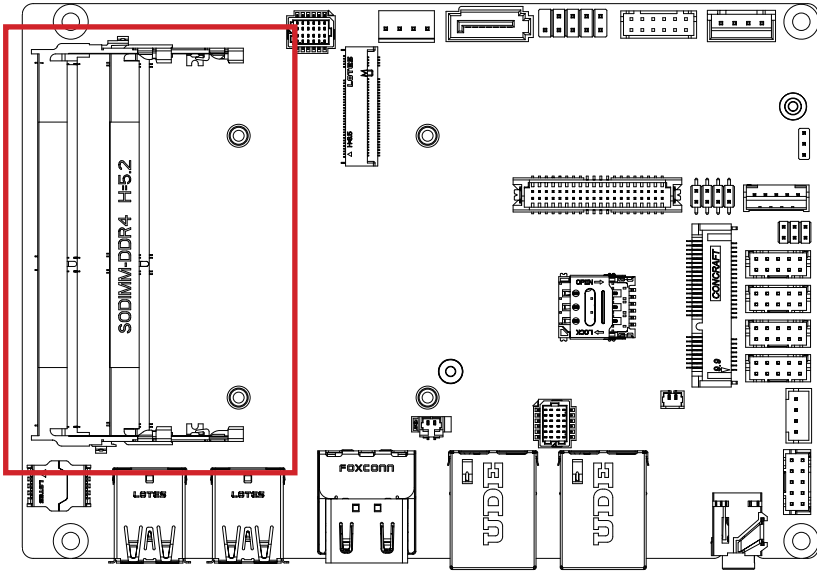
3.2.10 SYS_PANEL (Front panel header)

10 Pin1
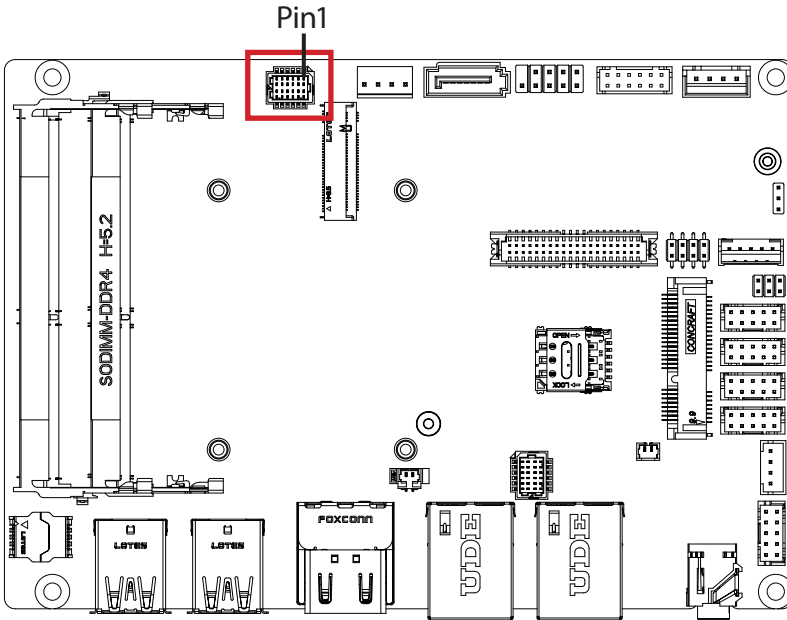
System Panel Header
11   1   12   2

Pin No.	Definition
1	HD-p
2	MPD-p
3	HD-n
4	MPD-n
5	GND
6	POWER-ON
7	Reset Button
8	GND
9	No Connect

Pin No.	Definition
10	No Connect
11	No Connect
12	No Connect

Connector PN	Vendor
87216-1206-06	ACES

3.2.11 M2M (M.2 Slot, SATA, NGFF2280)
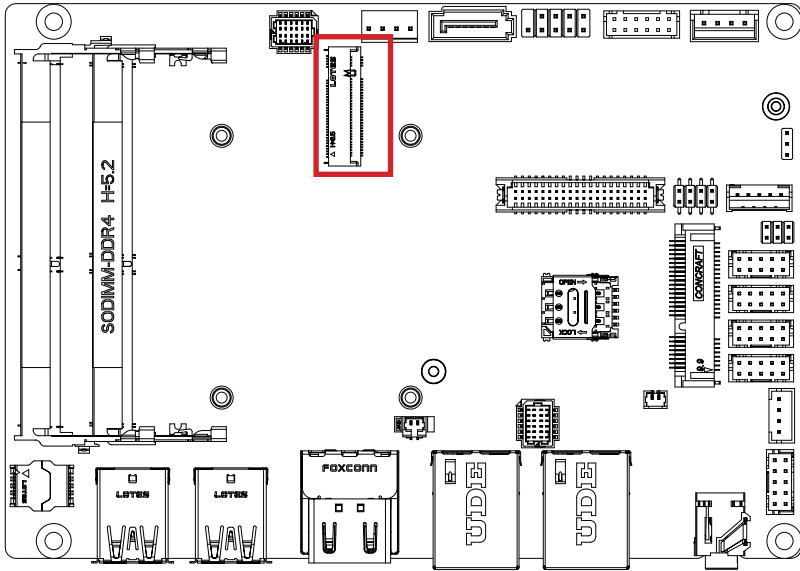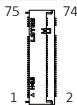
M.2 M Key Connector			
Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	GND	4	3.3V
5	NC	6	NC
7	NC	8	NC
9	GND	10	SSD LED
11	NC	12	3.3V
13	NC	14	3.3V
15	GND	16	3.3V
17	NC	18	3.3V
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE1 RXn	30	NC
31	PCIE1 RXp	32	NC
33	GND	34	NC

Pin No.	Definition	Pin No.	Definition
35	PCIE1 TXn	36	NC
37	PCIE1 TXp	38	NC
39	GND	40	NC
41	PCIE0 RXn/SATA Bp	42	NC
43	PCIE0 RXp/SATA Bn	44	NC
45	GND	46	NC
47	PCIE0 TXn/SATA An	48	NC
49	PCIE0 TXp/SATA Ap	50	PCI Reset
51	GND	52	PCIE Clock Request
53	PCIE Clock n	54	NC
55	PCIE Clock p	56	NC
57	GND	58	NC

Pin No.	Definition	Pin No.	Definition
67	NC	68	NC
69	Detect	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

Connector PN	Vendor
80159-8521	BELLWETHER

GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.12 SATAPW (SATA power connector)
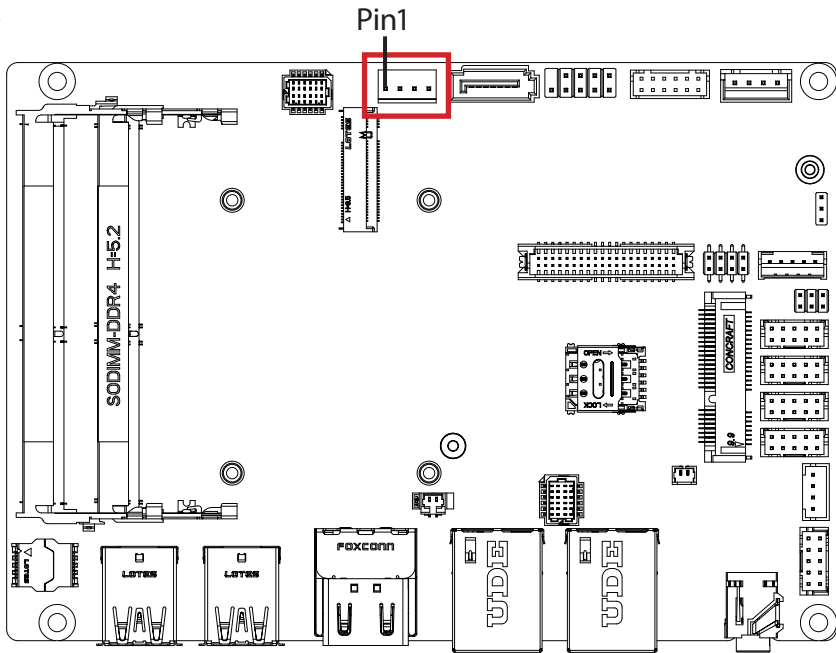
Hard Disk Power Connector
1 ▪ ▪ ▪ ▪ 4

Connector PN	Vendor
743-51-04TW03	PINREX
WF04Q2-3BJQ000	HORNGTONG

Pin No.	Definition
1	12V
2	GND
3	GND
4	5V

3.2.13 SATAIII (SATA 6GB/s Connector)

13

Pin1
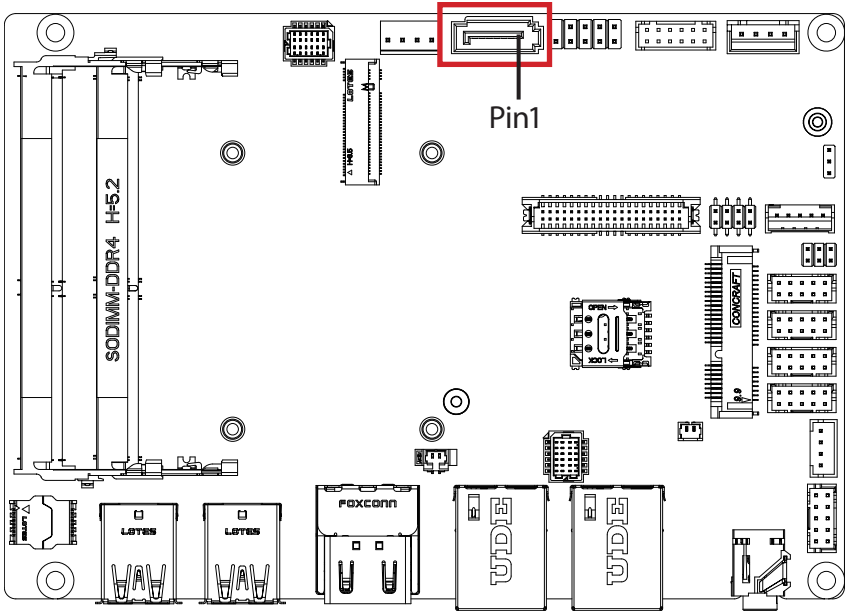
SATA 6GB/s Connector

SATAIII	
Connector PN	**Vendor**
WAT3M-07A1G3BU4W	WINWIN
ABA-SAT-054-S15	LOTES

Pin No.	Definition
1	GND
2	TXp
3	TXn
4	GND
5	RXn
6	RXp
7	GND

    GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.14   FUSB20 (USB 2.0 header)

14

Pin1

USB 2.0 Header
9   1
10   2
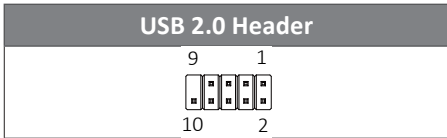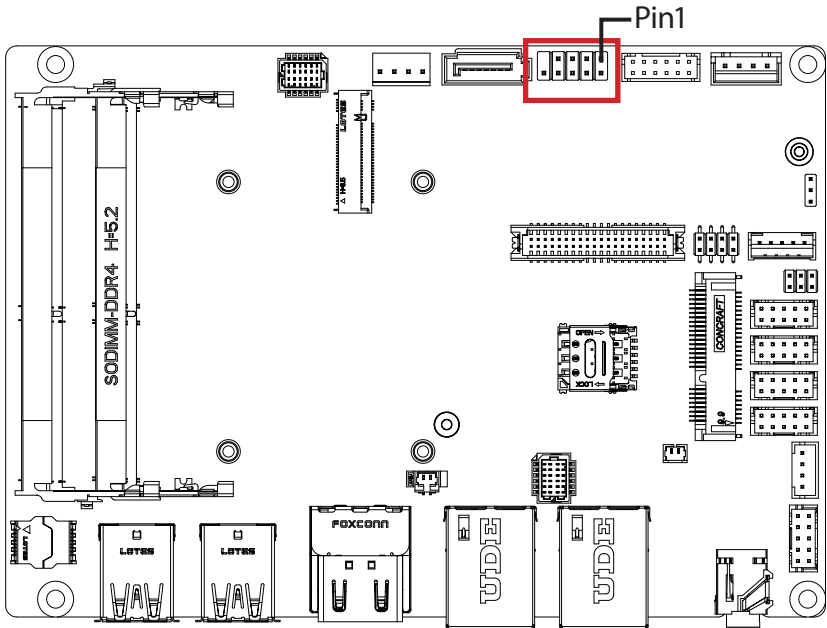
Connector PN	Vendor
210-92-05GB04	PINREX
PH10R53BAZ009	HORNGTONG

Pin No.	Definition
1	5V
2	5V
3	D2n
4	D1n
5	D2p
6	D1p
7	GND
8	GND
9	No Pin
10	No Connect

3.2.15 GPIO_CNT (General Purpose input/output header)

15
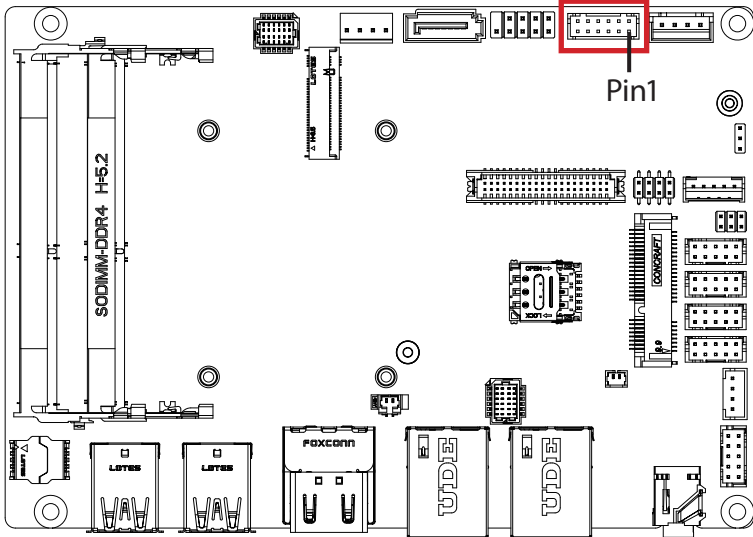
Pin1

GPIO Connector
12   2
11   1
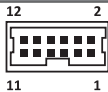
Connector PN	Vendor
725-81-12TW00	PINREX
A2004WV-2X06P46	JOINT-TECH

Pin No.	Definition
1	GPIO-output_1
2	GPIO-input_1
3	GPIO-output_2
4	GPIO-input_2
5	GPIO-output_3
6	GPIO-input_3
7	GPIO-output_4
8	GPIO-input_4
9	SMBus Clock
10	SMBus DATA
11	5V
12	GND

     GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.16 LVDS (LVDS connector)

16

Pin1

LVDS Connector
40 ... 2
39 ... 1
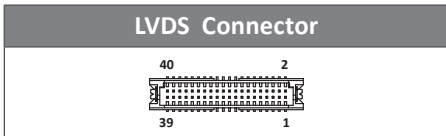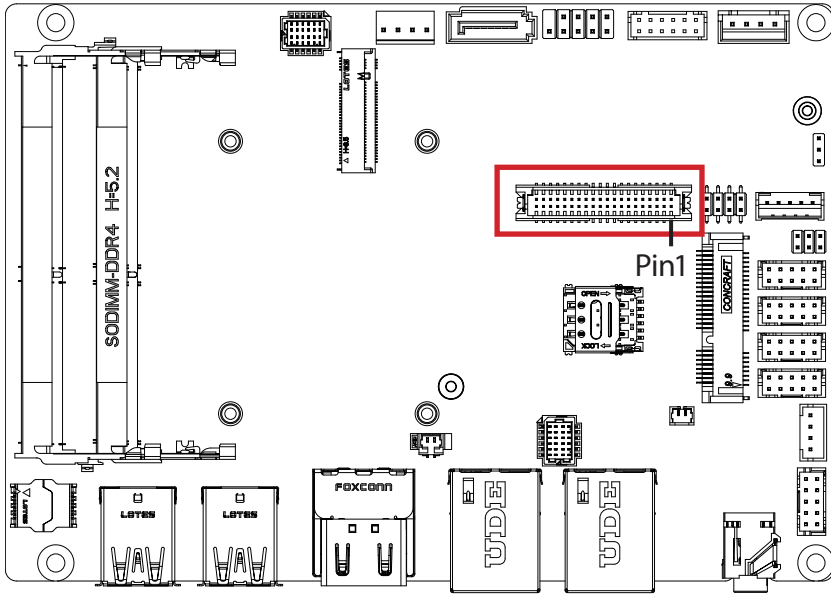
Pin No.	Definition	Pin No.	Definition
17	A3-	37	GND
18	A2-	38	GND
19	GND	39	12V
20	GND	40	12V

Pin No.	Definition	Pin No.	Definition
1	3.3V	21	A5+
2	5V	22	A4+
3	3.3V	23	A5-
4	5V	24	A4-
5	SPEC0	25	GND
6	SPED0	26	GND
7	GND	27	A7+
8	GND	28	A6+
9	A1+	29	A7-
10	A0+	30	A6-
11	A1-	31	GND
12	A0-	32	GND
13	GND	33	CLK2+
14	GND	34	CLK1+
15	A3+	35	CLK2-
16	A2+	36	CLK1-

For each model support LVDS function.
But below model no need to add.
A0~A3 is odd channel 0~3, A4~A7 is even channel.

Connector PN	Vendor
712-76-40GWE0	PINREX
A1252WV-SF-2X20PD01	JOINT-TECH

Note: *The LVDS output connector of the unit is only intended to be connected to an UL/IEC/EN approval equipment with fire enclosure.

3.2.17 LSW (LVDS resolution jumper)

17

Pin1
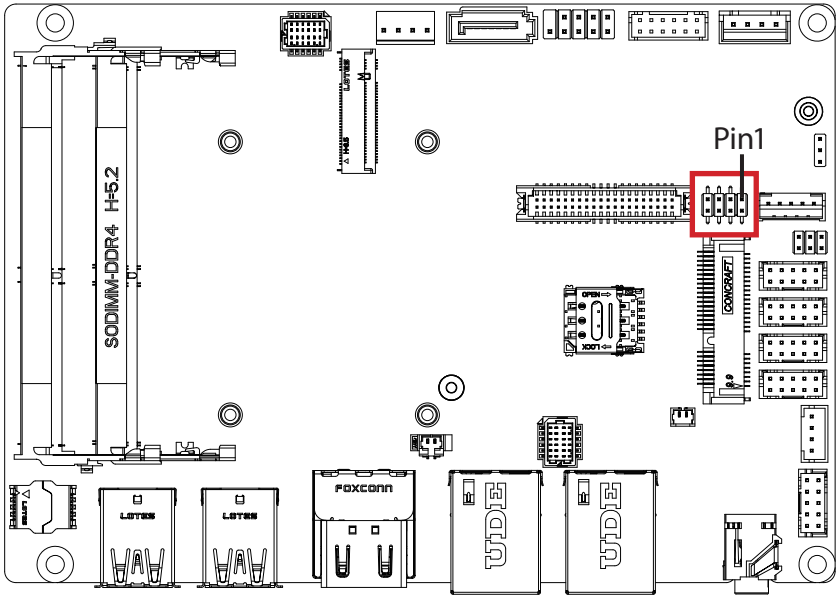
LVDS Resolution Jumper			
Jumper Setting	Resolution	Jumper Setting	Resolution
8 ▦ 1	800 x 600 18bit (default)	8 ▦ 1	1366 x 768 24bit
8 ▦ 1	1024 x 768 18bit	8 ▦ 1	1440 x 900 24bit
8 ▦ 1	1024 x 768 24bit	8 ▦ 1	1400 x 1050 24bit
8 ▦ 1	1024 x 600 18bit	8 ▦ 1	1600 x 900 24bit
8 ▦ 1	1280 x 800 18bit	8 ▦ 1	1680 x 1050 24bit
8 ▦ 1	1280 x 960 18bit	8 ▦ 1	1600 x 1200 24bit
8 ▦ 1	1280 x 1024 24bit	8 ▦ 1	1920 x 1080 24bit
8 ▦ 1	1366 x 768 18bit	8 ▦ 1	1920 x 1200 24bit

Connector PN	Vendor
222-97-04GBE1	PINREX

GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.18   SIM_CARD (3G/4G SIM Slot)

18
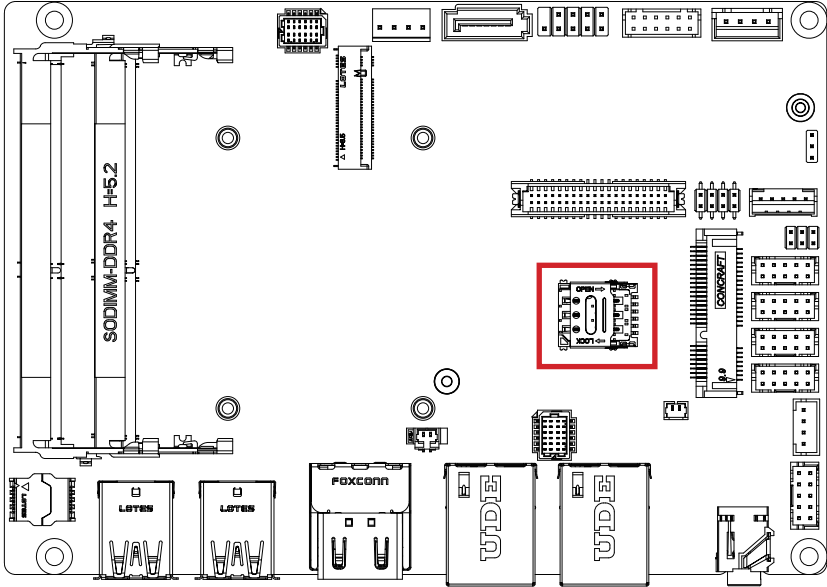
3.2.19 MPCIE (Mini PCIe slot)

19
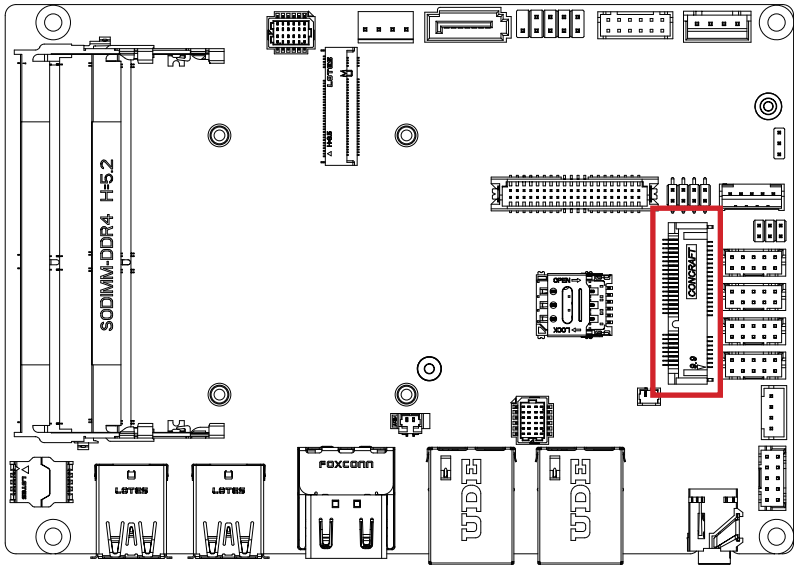
Mini PCIe Connector
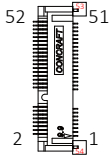
Pin No.	Definition	Pin No.	Definition
1	PCIE WAKE	2	3.3V
3	NC	4	GND
5	NC	6	NC
7	PCIE Clock Request	8	SIM VCC
9	GND	10	SIM DATA
11	PCIE Clock n	12	SIM Clock
13	PCIE Clock p	14	SIM Reset
15	GND	16	UIM VPP3
17	NC	18	GND
19	NC	20	WLAN_DISABLE
21	GND	22	Reset
23	PCIE RXn	24	3.3V
25	PCIE RXp	26	GND
27	GND	28	NC
29	GND	30	SMB Clock

Pin No.	Definition	Pin No.	Definition
31	PCIE TXn	32	SMB DATA
33	PCIE TXp	34	GND
35	GND	36	USB Dn
37	GND	38	USB Dp
39	3.3V	40	GND
41	3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	3.3V
53	GND	54	GND

Connector PN	Vendor
AS0B221-S99Q-7H	FOXCONN

www.gigaipc.com   GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.20 BUZZER (Buzzer header)

20
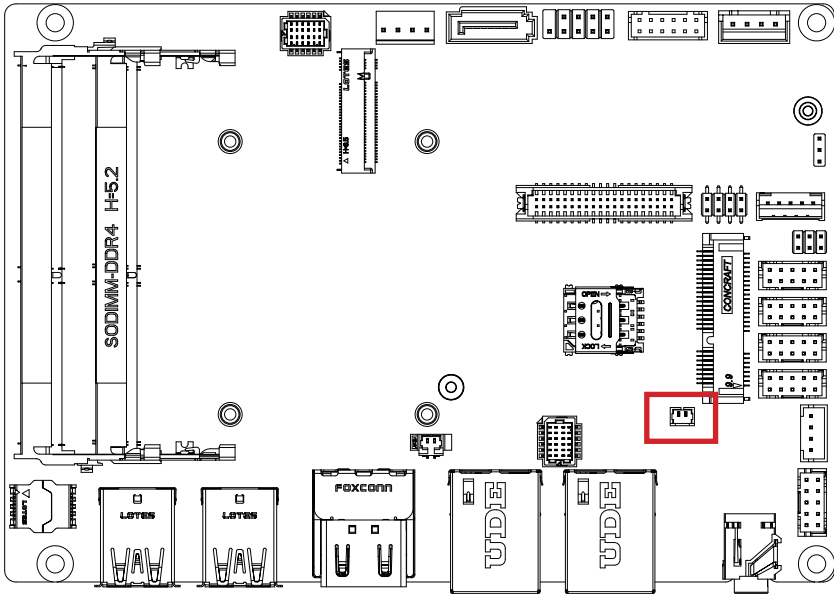
Buzzer header

Connector PN	Vendor
712-71-02TW01	PINREX
A1250WV-02P	JOINT-TECH

Pin No.	Definition
1	Buzzer
2	5V

3.2.21 BATTERY

21
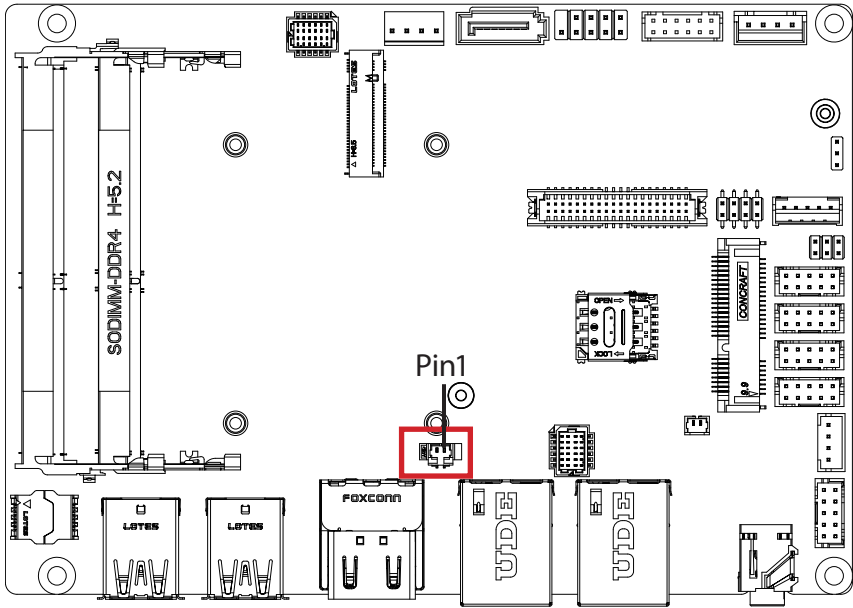
Pin1

Battery Cable Connector
2 ▭ 1
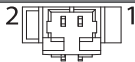
Connector PN	Vendor
85205-0270L	ACES
A1250WV-S-02PC	JOINT-TECH

Pin No.	Definition
1	3V
2	GND

GIGAIPC reserves the right to modify or revise the content at anytime without prior notice.

3.2.22 LAN1, LAN2 (LAN connector)

23
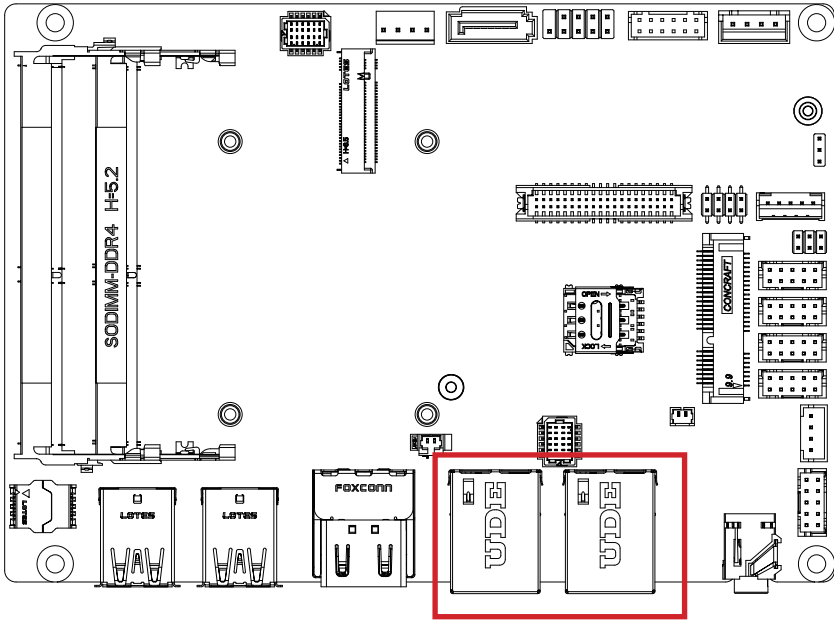
LAN Connector

Status	Description
Orange On	1Gbps data rate
Green On	100Mbps data rate
Off	10Mbps data rate

Pin No.	Definition
1	TX1+
2	TX1-
3	TX2+
6	TX2-
4	TX3+
5	TX3-
7	TX4+
8	TX4-

3.2.23   HDMI (HDMI connector)

24
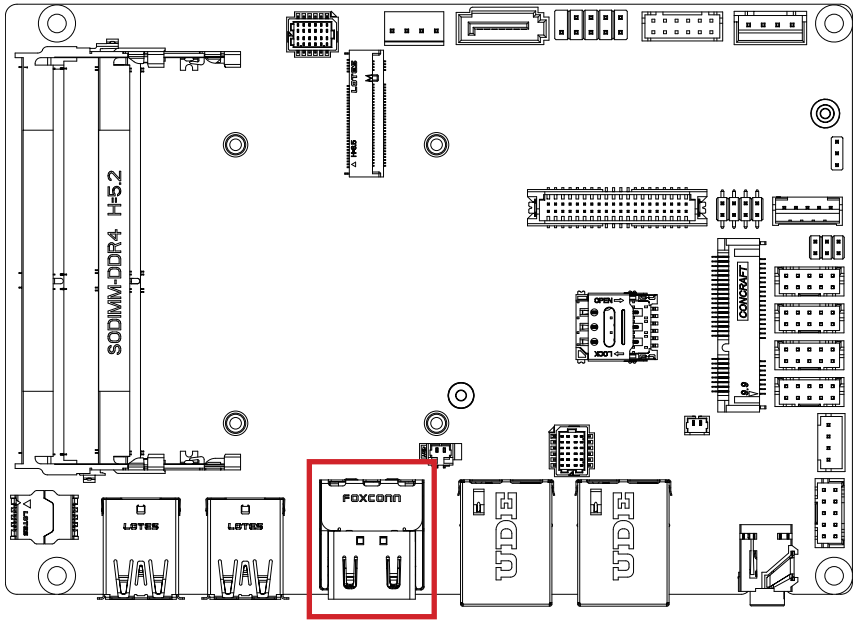
HDMI Connector
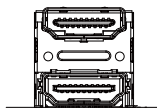
Pin No.	Definition	Pin No.	Definition
1	TX2p	20	TX2p
2	GND	21	GND
3	TX2n	22	TX2n
4	TX1p	23	TX1p
5	GND	24	GND
6	TX1n	25	TX1n
7	TX0p	26	TX0p
8	GND	27	GND
9	TX0n	28	TX0n
10	CLKp	29	CLKp
11	GND	30	GND

Pin No.	Definition	Pin No.	Definition
12	CLKn	31	CLKn
13	NC	32	NC
14	NA	33	NA
15	DDC Clock	34	DDC Clock
16	DDC Data	35	DDC Data
17	GND	36	GND
18	5V	37	5V
19	Hot Plug Detect	38	Hot Plug Detect

www.gigaipc.com

3.2.24 USB31_1, USB31_2 (USB 3.2 Gen 1 connector)

25
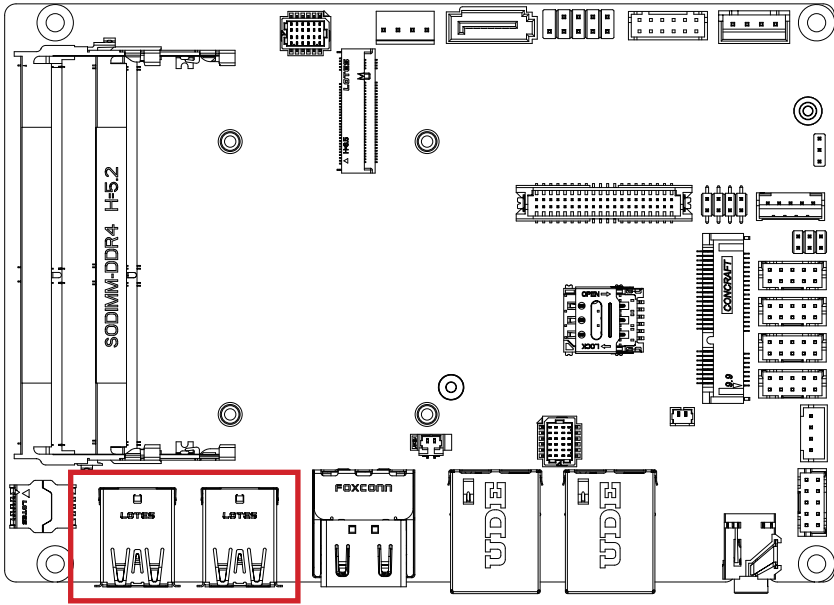
USB Connector
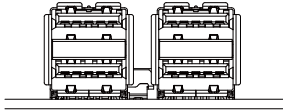
Pin No.	Definition
1	5V
2	D1n
3	D1p
4	GND
5	USB3_RX1n
6	USB3_RX1p
7	GND
8	USB3_TX1n
9	USB3_TX1p
10	5V

Pin No.	Definition
11	D0n
12	D0p
13	GND
14	USB3_RX2n
15	USB3_RX2p
16	GND
17	USB3_TX2n
18	USB3_TX2p

Chapter 4

Chapter 4 – BIOS

4.1   Introduction

BIOS (Basic input/output system) provides hardware detailed information and boot-up options, which include firmware to control, set-up and test all hardware settings. Therefore, BIOS is the communication bridge between OS/application software and hardware.

4.1.1 How to Entering into BIOS menu

Once the system is power on, press the <DEL> key as soon as possible to access into BIOS Setup program.

4.1.2 Function Keys to setup in BIOS Setup program

Function keys	Description
→←	Select Screen
↑↓	Select Item
Enter	Execute command or enter the submenu
+	Increase the numeric value or make changes
—	Decrease the numeric value or make changes
F1	General Help
F2	Previous Values
F3	Load Optimized Defaults Settings
F4	Save changes & Exit the BIOS Setup program
ESC	Exit the BIOS Setup program

GIGAIPC

4.2   The Main Menu

The main menu shows the basic system information.
Use arrow keys to move among the items.

```
                          Aptio Setup - AMI
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                        Set the Date. Use Tab to
                                                           switch between Date elements.
    Project Name                QBiX-Pro-EHLA6412H-A1       Default Ranges:
    BIOS Version                F1                          Year: 1998-9999
    Build Date and Time         05/31/2022 14:38:39         Months: 1-12
                                                           Days: Dependent on month
    LAN1 MAC Address            D8-5E-D3-8C-1F-D8           Range of Years may vary.
    LAN2 MAC Address            D8-5E-D3-8C-1F-D9

    Total Memory               4096 MB

    ME FW Version              15.40.16.2485

    System Date                [Thu 09/08/2022]            →←: Select Screen
    System Time                [13:24:12]                  ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


                        Version 2.22.1282 Copyright (C) 2022 AMI
```

Items	Description
Project Name	Shows Project name information
BIOS Version	Shows the BIOS version of the system
Build Date and Time	Shows the Build Date and Time when the BIOS was created.
LAN1 MAC Address	Shows LAN1 MAC Address information
LAN2 MAC Address	Shows LAN2 MAC Address information
Total Memory	Shows the total memory size of the installed memory
ME FW version	Shows ME firmware version
System Date	Set the Date for the system (Format : Week - Month - Day - Year)
System Time	Set the time for the system (Format : Hour - Minute - Second)

4.3　　Advanced

The Advanced menu is to configure the functions of hardware settings through submenu. Use arrow keys to move among the items, and press <Enter> to access into the related submenu.

```
                          Aptio Setup - AMI
         Main  Advanced  Chipset  Security  Boot  Save & Exit

  ▶ TPM Configuration                              TPM Configuration
  ▶ IT8786 Super IO Configuration
  ▶ Hardware Monitor
  ▶ S5 RTC Wake Settings
  ▶ CPU Configuration
  ▶ SATA Configuration
  ▶ Network Stack Configuration
  ▶ NVMe Configuration
  ▶ Offboard SATA Controller Configuration
  ▶ Digital IO Port Configuration


                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit



                   Version 2.22.1282 Copyright (C) 2022 AMI
```

4.3.1 TPM Configuration

Use TPM Configuration submenu to choose TPM interface.

```
                              Aptio Setup - AMI
    Advanced

    TPM Configuration                              Trusted Computing Settings

    TPM Device Selection             [PTT]
  ▶ Trusted Computing




                                               →←: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit



                      Version 2.22.1282 Copyright (C) 2022 AMI
```
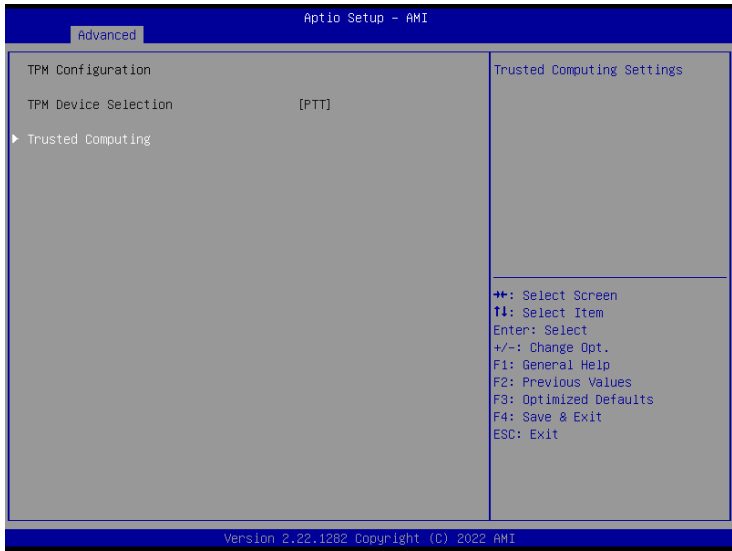
Item	Description
TPM Device Selection	**PTT : Internal TPM (Default setting)**

Trusted Computing : Shows TPM information, and TPM module configuration setting.

```
                              Aptio Setup - AMI
        Advanced

     TPM 2.0 Device Found                              Enables or Disables BIOS
                                                       support for security device.
     Security Device Support        [Enable]           O.S. will not show Security
     Pending operation              [None]             Device. TCG EFI protocol and
                                                       INT1A interface will not be
                                                       available.




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



                        Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Security Device support	**Enabled : Enables TPM feature (Default setting)** **Disabled : Disables TPM feature**

Item	Description
Pending operation	**None : No execution will be conducted (Default setting)** **TPM clear : Set to clear data on TPM**

4.3.2   IT8786 Super IO Configuration

Item	Description
Super IO Chip	Shows Super I/O chip model
Serial Port 1 Configuration	Press [Enter] to configure advanced items : Serial Port : **Enabled : Enables allows you to configure the serial port settings** **Disabled : if Disabled, displays no configuration for the serial port**
Serial Port 2 Configuration	Device settings : Display the specified Serial Port base I/O address and IRQ COM Port Mode : Choose RS-232, RS-422, or RS-485 feature
Serial Port 3 Configuration	Press [Enter] to configure advanced items : Serial Port : **Enabled : Enables allows you to configure the serial port settings** **Disabled : if Disabled, displays no configuration for the serial port** Device settings : Display the specified Serial Port base I/O address and IRQ

4.3.3　Hardware Monitor

```
                              Aptio Setup – AMI
        Advanced

     Hardware Monitor

     CPU Temperature               : +35 %
     System Temperature            : +36 %
     VCORE                         : +1.650 V
     DDR                           : +1.210 V
     12V                           : +12.276 V
     5V                            : +5.032 V
     3.3V                          : +3.337 V


                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/–: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



                        Version 2.22.1282 Copyright (C) 2022 AMI
```
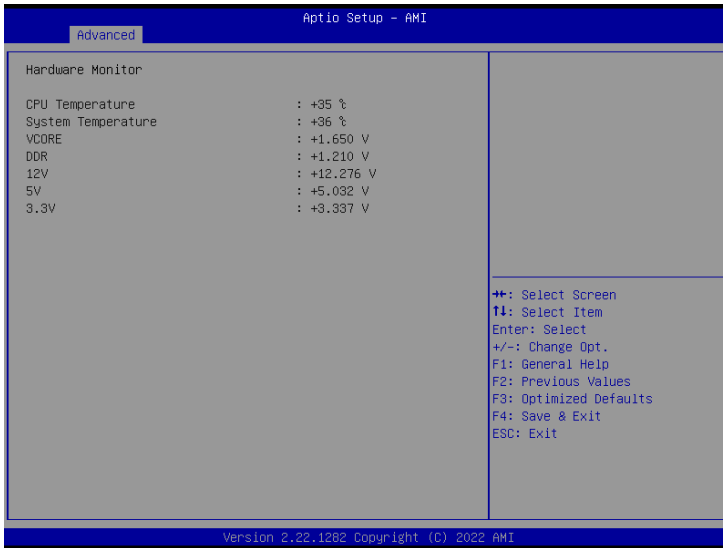
Item	Description
CPU Temperature	Shows current CPU temperature
System temperature	Shows current system temperature

4.3.4   S5 RTC Wake Settings

Item	Description
Wake system from S5	Enable or Disable System to wake on a specific time. **Disabled : Disables system to wake on a specific time (Default setting)** **Fixed Time : Enables system to wake on a specific time** (Format : hr : min : sec)

4.3.5 CPU Configuration

This submenu shows detailed CPU informations.

```
                          Aptio Setup - AMI
      Advanced

  CPU Configuration                                    When enabled, a VMM can
                                                       utilize the additional
    Type                         Intel(R) Celeron(R)   hardware capabilities provided
                                 J6412 @ 2.00GHz       by Vanderpool Technology.
    ID                           0x90661
    L1 Data Cache                32 KB x 4
    L1 Instruction Cache         32 KB x 4
    L2 Cache                     1536 KB
    L3 Cache                     4 MB
    VMX                          Supported

    Intel Virtualization Technology   [Enabled]
    EIST                              [Enabled]
    Turbo Mode                        [Enabled]        ++: Select Screen
    CPU C states                      [Enabled]        ↑↓: Select Item
    CPU P states                      [Enabled]        Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit



                     Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Intel Virtualization Technology	Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. **Enabled : Enables Intel Virtualization Technology (Default setting)** **Disabled : Disables Intel Virtualization Technology**
EIST	According to System loading, Enhanced Intel SpeedStep Technology (EIST)will automatically adjust the CPU voltage and core frequency to decrease heat and power consumption for power saving. **Enabled : Enables EIST Technology (Default setting)** **Disabled : Disables EIST Technology**
Turbo Mode	**Enabled : Enables Turbo Mode (Default setting)** **Disabled : Disables Turbo Mode**
CPU C states	Command CPU to enter into low power consumption mode when CPU is under idle mode. **Enabled : Enables C states (Default setting)** **Disabled : Disables C states**
CPU P states	CPU will adjust frequency depends on it's loading. **Enabled : Enables CPU P states function (Default setting)** **Disabled : Disables CPU P states function**

4.3.6 SATA Configuration

```
                              Aptio Setup - AMI
     Advanced

    SATA Configuration

    SATA Mode Selection            [AHCI]

    Serial ATA Port 0              Empty
    M.2 Port                       Empty

                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit

                    Version 2.22.1282 Copyright (C) 2022 AMI
```
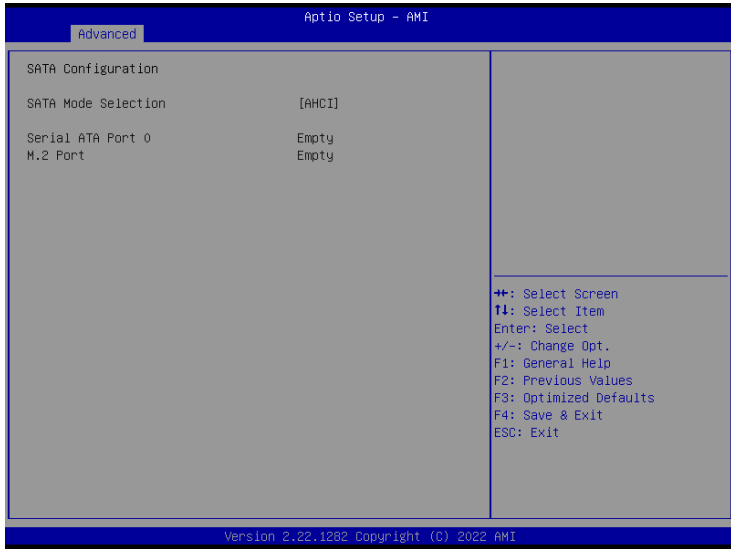
Item	Description
SATA Mode Selection	**AHCI : Configures the SATA controllers to AHCI mode. (Default setting)**
Serial ATA Port 0	shows 2.5" SATA HDD/SSD information
M.2 Port	shows M.2 SATA interface SSD information

4.3.7 Network Stack Configuration
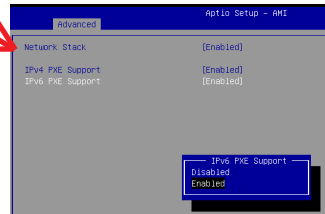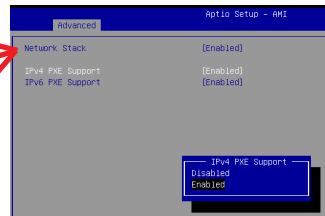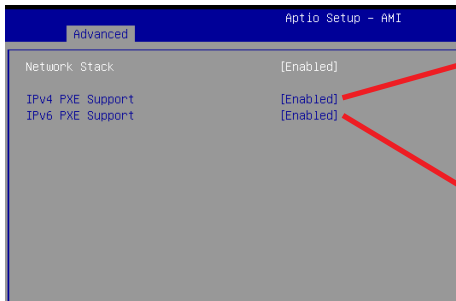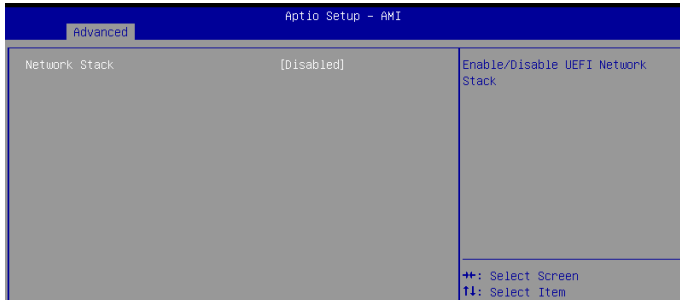
Item	Description
Network Stack	When system is power on, install LAN driver under UEFI mode **Disabled : Disables UEFI Network Stack (Default setting)** **Enabled : Enables UEFI Network Stack**
Ipv4 PXE Support	When Network stack is enabled : **Disabled : Disables Ipv4 PXE Support** **Enabled : Enables Ipv4 PXE Support**
Ipv6 PXE Support	When Network stack is enabled : **Disabled : Disables Ipv6 PXE Support** **Enabled : Enables Ipv6 PXE Support**

4.3.8 NVMe Configuration

NVMe Configuration shows information when your M.2 NVMe PCIe SSD is installed.

4.3.9 Offboard SATA Controller Configuration

```
                               Aptio Setup — AMI
        Advanced

 No PCIe SATA Controllers / PCIe SSDs are Present



                                                    ↔: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


                        Version 2.22.1282 Copyright (C) 2022 AMI
```

4.3.10 Digital IO Port Configuration

```
                            Aptio Setup - AMI
    Advanced

Digital IO Port Configuration                    Support OS control BIOS
                                                 Digital IO Item.
OS control Digital IO          [Disable]         If modify Digital IO Output
                                                 Level in OS, need run S3/S4/S5
SOGPO_1(Pin 1)                 [Output]          State.
Select Level                   [LOW]
SOGPI_1(Pin 2)                 [Input]
Select Level                   [HIGH]
SOGPO_2(Pin 3)                 [Output]
Select Level                   [LOW]
SOGPI_2(Pin 4)                 [Input]
Select Level                   [HIGH]
SOGPO_3(Pin 5)                 [Output]
Select Level                   [LOW]             ++: Select Screen
SOGPI_3(Pin 6)                 [Input]           ↑↓: Select Item
Select Level                   [HIGH]            Enter: Select
SOGPO_4(Pin 7)                 [Output]          +/-: Change Opt.
Select Level                   [LOW]             F1: General Help
SOGPI_4(Pin 8)                 [Input]           F2: Previous Values
Select Level                   [HIGH]            F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


                    Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
OS control Digital IO	Disabled : If Digital IO Output value/level is modified in OS, they will not be memorized and kept. (Default setting) Enabled : If Digital IO Output value/level is modified in OS, they will be memorized and kept.
SOGPO_1 (Pin 1) SOGPI_1 (Pin 2) SOGPO_2 (Pin 3) SOGPI_2 (Pin 4) SOGPO_3 (Pin 5) SOGPI_3 (Pin 6) SOGPO_4 (Pin 7) SOGPI_4 (Pin 8)	Configure Digital IO Input or Output values for each pin.

4.4　　Chipset

```
                                  Aptio Setup – AMI
         Main  Advanced  Chipset  Security  Boot  Save & Exit

         VT-d                              [Enabled]            VT-d capability
         DVMT Pre-Allocated               [64M]

         HD Audio                         [Enabled]
         Onboard LAN1                     [Enabled]
         Onboard LAN2                     [Enabled]

         Restore AC Power Loss            [Power Off]
         Watchdog Timer                   [Disabled]

         XHCI Hand-off                    [Enabled]
         BIOS Lock                        [Enabled]


                                                               →←: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit




                              Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
VT-d	**Enabled : Enables VT-d function (Default setting)** **Disabled : Disables VT-d function**
DVMT Pre-Allocated	Use DVMT Pre-Allocated to set the amount of system memory which is installed to the integrated graphics processor **Option items : 32M , 64M(Default setting) , 128M , 256M**
HD Audio	Enable/Disable onboard audio controller **Enabled : Enables onboard audio controller (Default setting)** **Disabled : Disables onboard audio controller**
Onboard LAN1 Onboard LAN2	Enable/Disable onboard LAN controller **Enabled : Enables onboard LAN controller (Default setting)** **Disabled : Disables onboard LAN controller**
Restore AC Power Loss	To set which option the system should returns if a sudden power loss occured **Power off : Do not power on when the power is back (Default setting)** **Power on : System power on when the power is back** **Last state : Restore the system to the state before power loss occures**
Watchdog Timer	Enable/Disable Watchdog Timer function **Enabled : Enables Watchdog Timer function** **Disabled : Disabled Watchdog Timer function (Default setting)**
XHCI Hand-off	Enable/Disable XHCI Hand-off function **Enabled : Enables XHCI Hand-off function (Default setting)** **Disabled : Disables XHCI Hand-off function**
BIOS Lock	Enable/Disable BIOS Lock function **Enabled : Enables BIOS Lock function (Default setting)** **Disabled : Disabled BIOS Lock funtion**

4.5   Security
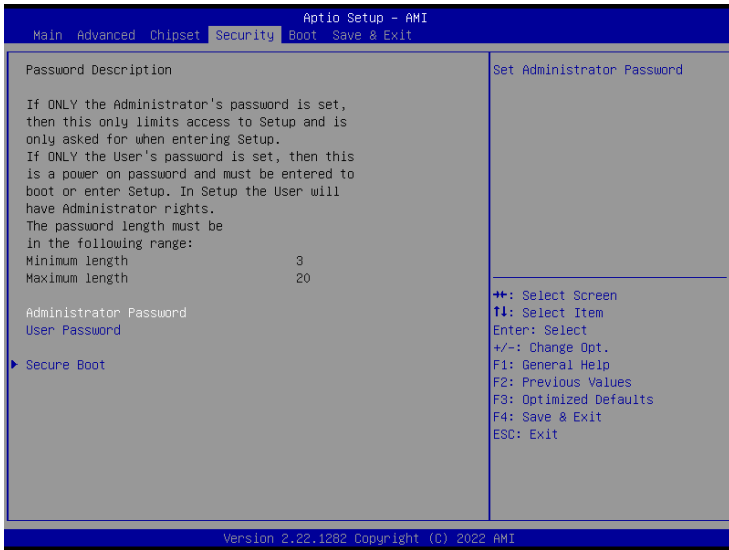
Item	Description
Administrator Password	To set up Administrator's password **Minimum length : 3** **Maximum length : 20**
User Password	To set up User's password **Minimum length : 3** **Maximum length : 20**
Secure Boot	Press <Enter> to configure the advanced items

```
                              Aptio Setup - AMI
                    Security

     System Mode                 User                    Secure Boot feature is Active
                                                         if Secure Boot is Enabled,
     Secure Boot                 [Disabled]              Platform Key(PK) is enrolled
                                 Not Active              and the System is in User mode.
                                                         The mode change requires
     Secure Boot Mode            [Custom]                platform reset
   ▶ Restore Factory Keys
   ▶ Reset To Setup Mode

   ▶ Key Management

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


                       Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Secure Boot	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates **Enabled : Enables Secure Boot function** **Disabled : Disables Secure Boot function (Default setting)**
Secure Boot Mode	**Standard : Standard mode** **Custom : Custom mode (Default setting)**
Restore Factory Keys	To restore factory settings **Yes : Agree to restore factory settings** **No : Cancel to restore factory settings**
Reset To Setup Mode	**Yes : Agree to setup mode** **No : Cancel to setup mode**
Key Management	Enables expert users to modify Secure boot policy variables without full authentication Press <Enter> to configure the advanced items

```
                           Aptio Setup - AMI
                 Security

      Vendor Keys                        Valid               Install factory default Secure
                                                             Boot keys after the platform
      Factory Key Provision             [Enabled]            reset and while the System is
    ▶ Restore Factory Keys                                   in Setup mode
    ▶ Reset To Setup Mode
    ▶ Export Secure Boot variables
    ▶ Enroll Efi Image

      Device Guard Ready
    ▶ Remove 'UEFI CA' from DB
    ▶ Restore DB defaults

      Secure Boot variable | Size| Keys| Key Source
    ▶ Platform Key(PK)      |  808|   1| Factory          ↔: Select Screen
    ▶ Key Exchange Keys     | 1560|   1| Factory          ↑↓: Select Item
    ▶ Authorized Signatures | 3143|   2| Factory          Enter: Select
    ▶ Forbidden  Signatures |11064| 192| Factory          +/-: Change Opt.
    ▶ Authorized TimeStamps |    0|   0| No Keys           F1: General Help
    ▶ OsRecovery Signatures |    0|   0| No Keys           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


                  Version 2.22.1282 Copyright (C) 2022 AMI
```

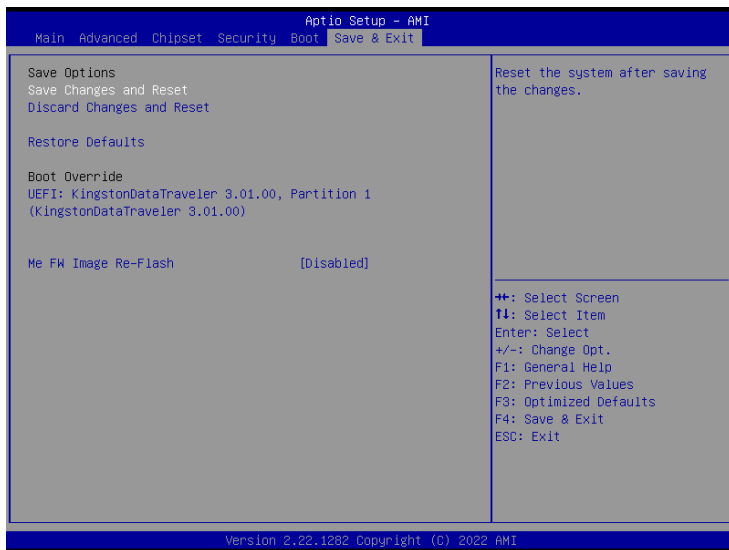| Item	Description
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode **Enabled : Enables Factory Key Provision (Default setting)** **Disabled : Disables Factory Key Provision**
Restore Factory Keys	To restore factory settings **Yes : Agree to restore factory settings** **No : Cancel to restore factory settings**
Reset To Setup Mode	**Yes : Agree to setup mode** **No : Cancel to setup mode**
Export Secure Boot variables	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device
Enroll Efi Image	Allow the image to run in Secure Boot mode
Remove 'UEFI CA' from DB	To remove 'UEFI CA' from database **Yes : Agree to remove 'UEFI CA' from database** **No : Cancel to remove 'UEFI CA' from database**
Restore DB defaults	Restore DB variables to factory defaults **Yes : Agree to restore DB defaults** **No : Cancel to restore DB defaults**

Item	Description
Platform Key (PK)	These items allows you to enroll factory defaults or load Certificates from a file.
Key Exchange Keys	
Authorized Signatures	
Forbidden Signatures	
Authorized TimeStamps	
OsRecovery Signatures	

4.6   Boot

This Boot menu allows you to set/change system boot options

Item	Description
Full Screen LOGO Show	Enable/Disable full screen LOGO show on POST screen **Enabled : Enables Full screen LOGO Show on POST screen** **Disabled : Disables Full screen LOGO Show on POST screen (Default setting)**
Boot Option #1 Boot Option #2	Shows the information of the storage that be installed in the system **Choose/set the boot priority**

4.7   Save & Exit

Item	Description
Save Changes and Reset	After configuring all the options that you wish to change, choose this option to save all the changes and reboot the system **Yes : Agree to save and reset** **No : Cancel to save and reset**
Discard Changes and Reset	Choose this option to reboot the system without saving any changes **Yes : Agree to discard changes and reset** **No : Cancel to discard changes and reset**
Restore Defaults	Restore/Load default values for all the setup options **Yes : Agree to load optimized defaults** **No : Cancel to load optimized defaults**
Me FW Image Re-Flash	Enable/Disable Me FW image re-flash function **Enabled : Enables Me FW image re-flash function** **Disabled : Disables Me FW image re-flash function (Default setting)**