

iTXL-6412A

iTXL-6210A

Thin Mini-ITX Motherboard
User's Manual 1st Ed

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Packing List

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

Item	Quantity
iTXL-6412A or iTXL-6210A MB	1
SATA power cable	1
Low-Profile I/O Shield	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.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

GIGAIPC Main Board/ Daughter Board/ Backplane

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

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。
 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。
 备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products GIGAIPC Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	○	○	○	○	○	○
Wires & Connectors for External Connections	○	○	○	○	○	○
<p>○ : The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p>						

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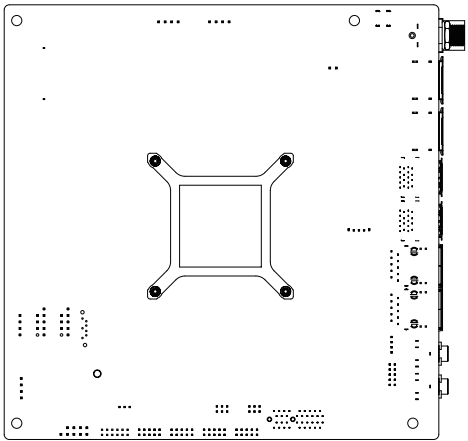
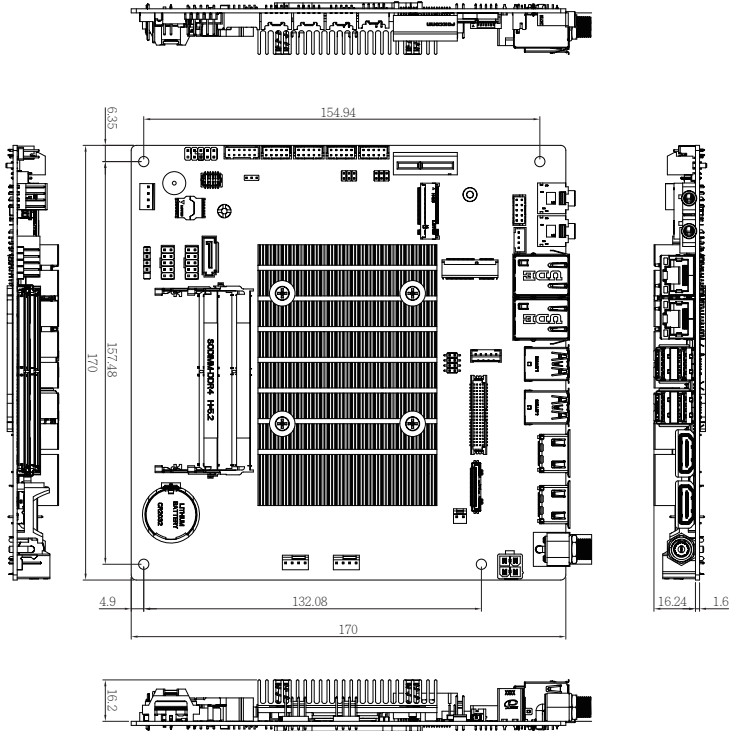
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Chapter 1

Chapter 1 - Product Specifications



1.1 Specifications

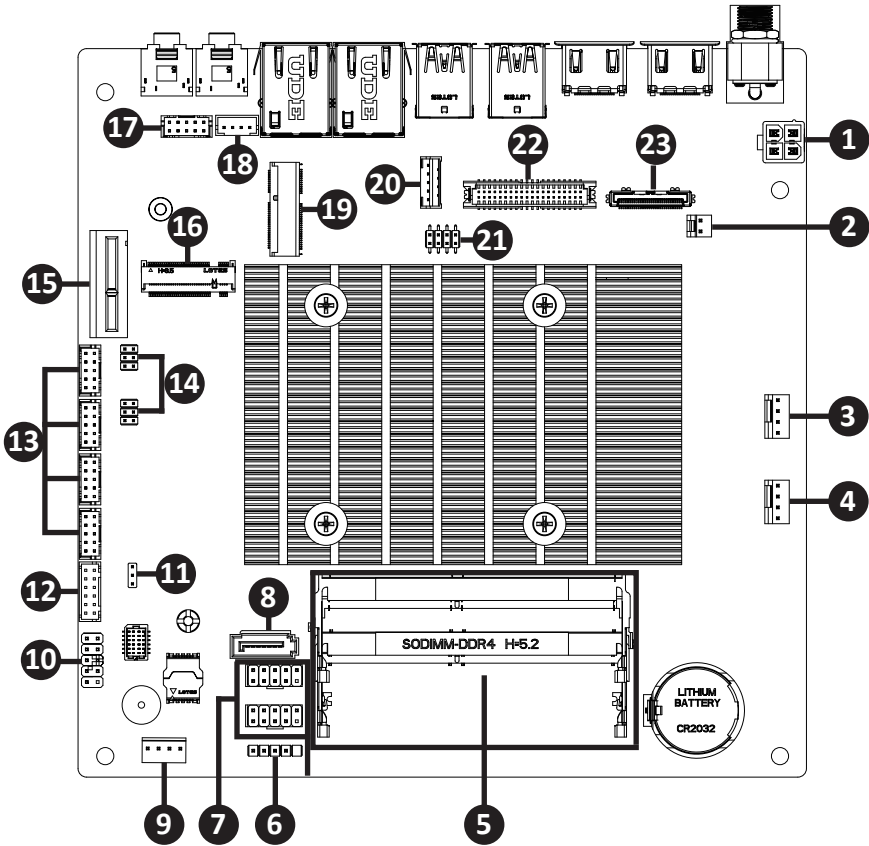
Motherboard	iTXL-6412A (MEHLJAT)	iTXL-6210A (MEHLNAT)
Form Factor	Thin Mini-ITX 170W x 170D (mm)	
CPU	Intel® Celeron® J6412 Processor 10nm, 4 cores, 4 threads, up to 2.60 GHz TDP 10W	Intel® Celeron® N6210 Processor 10nm, 2 cores, 2 threads, up to 2.60 GHz TDP 6.5W
Socket	1 x FCBGA1493	
Chipset	—	
Memory	2 x DDR4 SO-DIMM sockets, Max. Capacity 32 GB Support Dual channel DDR4 3200 MHz memory modules	
Ethernet	2 x GbE LAN Ports	
Video	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 2 x HDMI 2.0 port, supporting a maximum resolution of 4096x2160 @60Hz 1 x LVDS port, supporting a maximum resolution of 1920x1080 @60Hz 1 x eDP port, supporting a maximum resolution of 4096x2160 @60Hz * eDP connector is alternative with LVDS port, only one can be worked at the same time (3 independent display outputs)	
Audio	Realtek® ALC897	
Storage	1 x SATA 6Gb/s port	
Raid	—	
Expansion Slots	1 x PCIe x1 (Gen3 x1) 1 x 2280 M.2 M-Key (PCIe x2, SATA 6Gb/s) 1 x 2230 M.2 E-Key (PCIe x1, USB 2.0)	

Motherboard	iTXL-6412A (MEHLJAT)	iTXL-6210A (MEHLNAT)
Internal I/O	1 x 4-pin ATX main power connector 1 x SATA Power connector 1 x CPU fan header 1 x System fan header 1 x Front panel header 1 x Front panel audio header 1 x 2W Speaker out header 5 x USB 2.0 headers 1 x Buzzer 1 x COM header (RS-232/422/485 & RI/5V/12V) 1 x COM header (RS-232 & RI/5V/12V) 2 x COM headers (RS-232) 1 x GPIO (8 bits) & SMBus header 1 x Backlight Control header 1 x AT/ATX mode select jumper 1 x ATX control header	
Rear I/O	2 x Audio Jacks (Line out, Mic in) 2 x HDMI 2 x RJ45 LAN Ports 3 x USB 3.2 Gen 1 1 x USB 2.0 1 x DC Jack (+12V/19~24VDC)	
TPM	-	
OS Compatibility	Windows 10 (x64)	
Operating Properties	Operating temperature: 0°C to 60°C Operating humidity: 0-90% (non-condensing) Non-operating temperature: -40°C to 85°C Non-operating humidity: 0%-95% (non-condensing)	

Chapter 2

Chapter 2 – Hardware Information

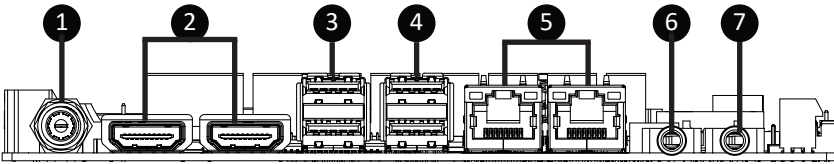
2.1 Jumpers and Connectors



No	Code	Description
1	DC_IN2	ATX 2x2 pin power connector
2	ATX_CTL	ATX control header
3	CPU_FAN	CPU fan connector
4	SYS_FAN	System fan connector
5	SODIMMA SODIMMB	DDR4 SO-DIMM Slot
6	F_USB2_3	USB 2.0 header
7	F_USB2_1 F_USB2_2	USB 2.0 headers
8	SATA0	SATA 6Gb/s connector
9	SATAPWR	SATA power connector
10	SYS_PANEL	Front panel header
11	AT_CN	AT/ATX mode select jumper
12	GPIO_CNT	General purpose input / output header
13	COM1,COM2 COM3,COM4	Serial port header COM1 : RS-232/422/485 & RI/5V/12V COM2 : RS-232 & RI/5V/12V COM3, COM4 : RS-232
14	JCOM1 JCOM2	RI# pin RI#/5V/12V Select jumper for COM1 & COM2 Port
15	PCIEX1	PCIe x1 (Gen3 x1) Slot
16	M2M	M.2 Slot, 2280 M-Key
17	FP_AUDIO	Front panel audio connector
18	SPKR	Speaker out connector
19	M2E	M.2 Slot, 2230 E-Key
20	BKL_CN	Backlight Control header
21	LSW	LVDS resolution jumper

No	Code	Description
22	LVDS	LVDS connector
23	EDP	Embedded Display Port connector

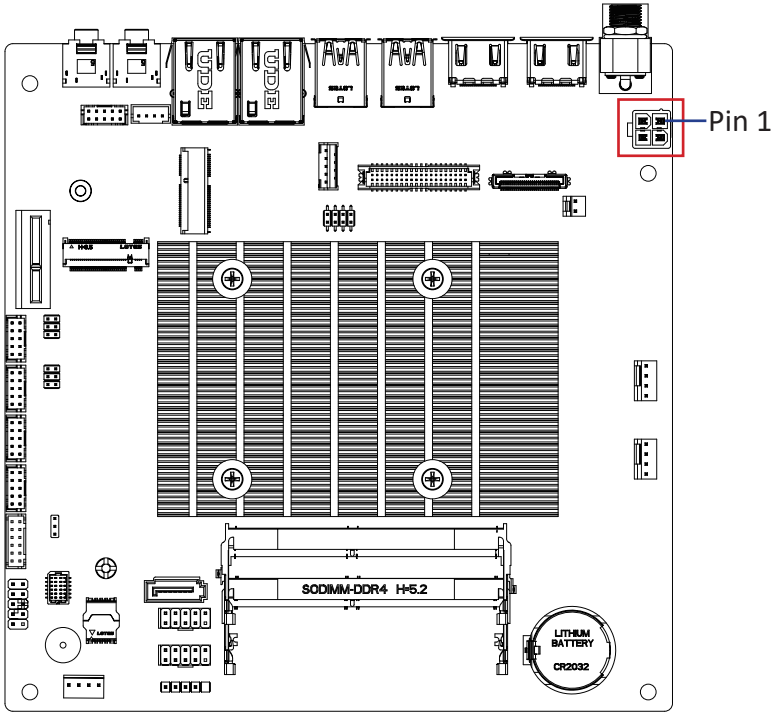
2.1.1 Rear I/O Connector



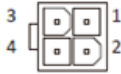
No	Code	Description
1	DC_IN1	DC IN (+12V/19~24VDC)
2	HDMI1 HDMI2	HDMI
3	USB31_1	USB 3.2 Gen 1
4	USB31_2	USB 2.0 (top) USB 3.2 Gen 1 (bottom)
5	LAN1 LAN2	RJ45 LAN Ports
6	HP_OUT	Audio jack (Line out)
7	MIC_IN	Audio jack (MIC in)

2.2.1 DC_IN2 (ATX 2x2 pin power connector)

1



Power Connector



Pin No.	Definition
1	GND
2	GND
3	DC IN
4	DC IN

Connector PN	Vendor
740-81-04TW56	PINREX

NOTE : if having special/additional request to use ATX Power supply to boot up the system :

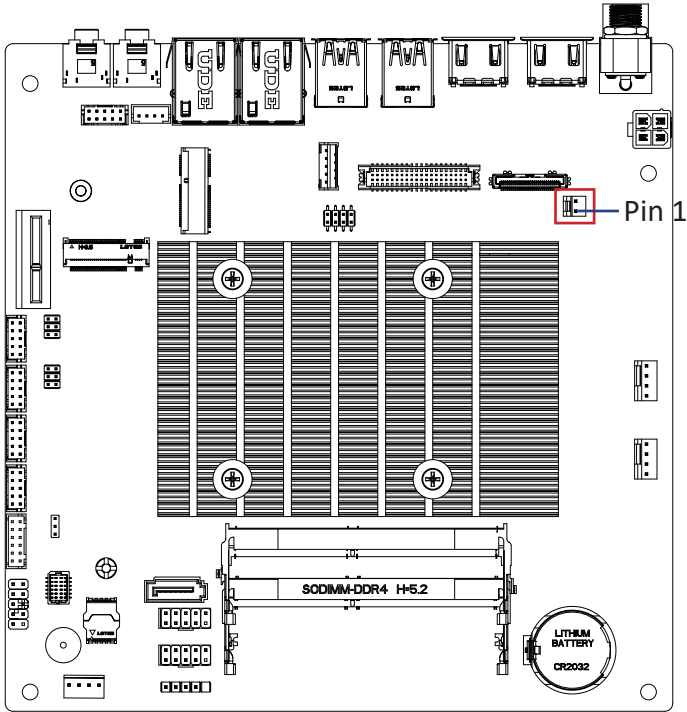
a). please plug in +12V/19~24V adapter to boot up. Enter into BIOS mode, choose "chipset" menu, and select "ATX control" item to be enabled (refer P.66), shut down the system after save the changes.


b). Connect ATX Control cable (1x2pin ATX Control + 2x2pin power cable, PN : 25CRI-200004-S9R) with ATX Power supply to boot up the system.

※ For ATX Control cable information, please contact with your sales representative.

2.2.2 ATX_CTL (ATX control header)

2



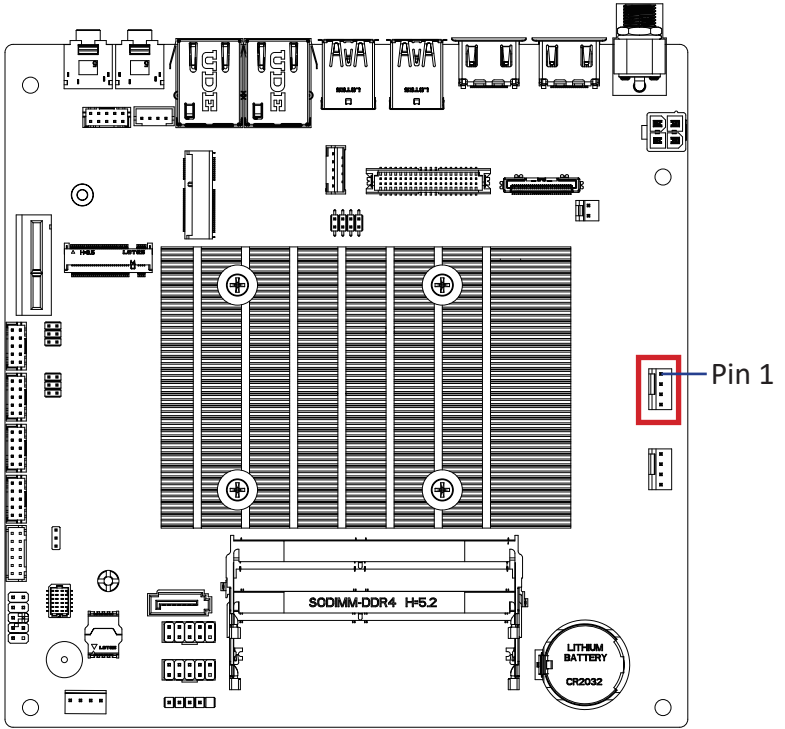
ATX control header
2  1

Connector PN	Vendor
744-81-02TW10	PINREX

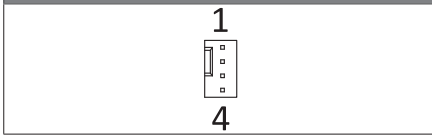
Pin No.	Definition
1	PS_ON#
2	5V

2.2.3 CPU_FAN (CPU fan connector)

3



CPU FAN connector

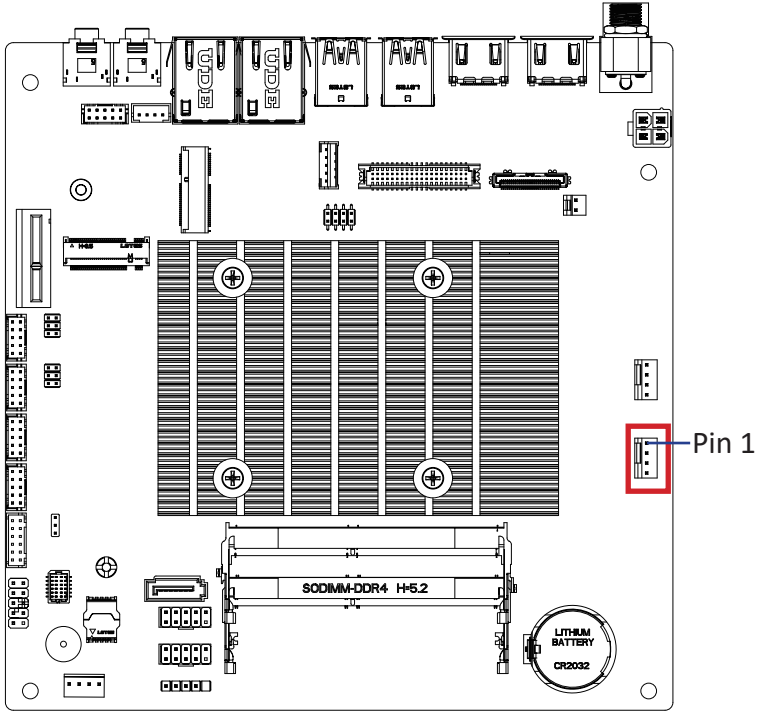


Connector PN	Vendor
744-81-045W11	PINREX
WF04R22WJQ195	HORNGTONG

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

2.2.4 SYS_FAN (System fan connector)

4



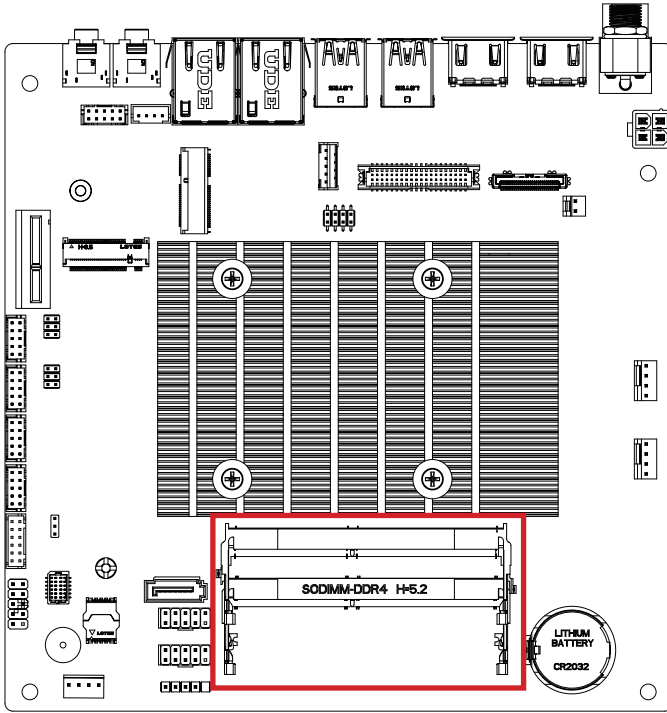
System FAN connector	

Connector PN	Vendor
744-81-045W11	PINREX
WF04R22WJQ195	HORNGTONG

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

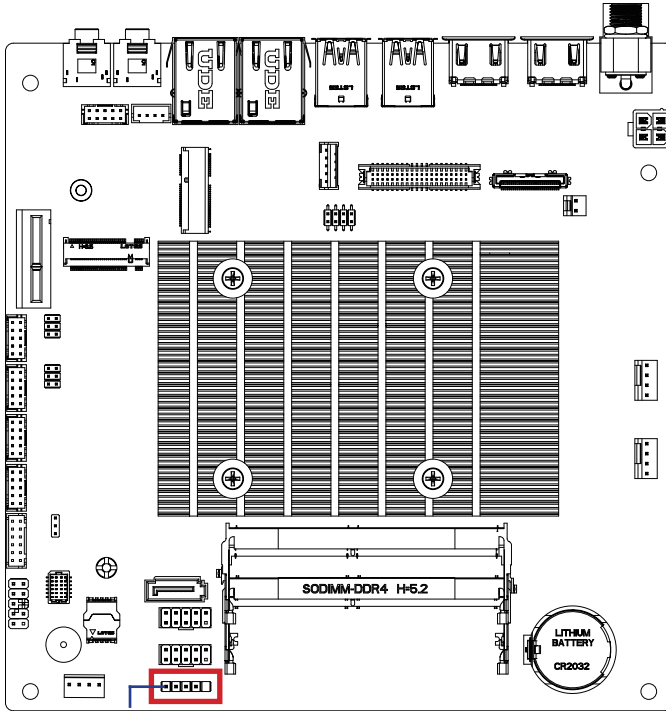
2.2.5 SODIMMA, SODIMMB (DDR4 SO-DIMM Slot)

5



2.2.6 F_USB2_3 (USB 2.0 header)

6



Pin 1

USB 2.0 header

1

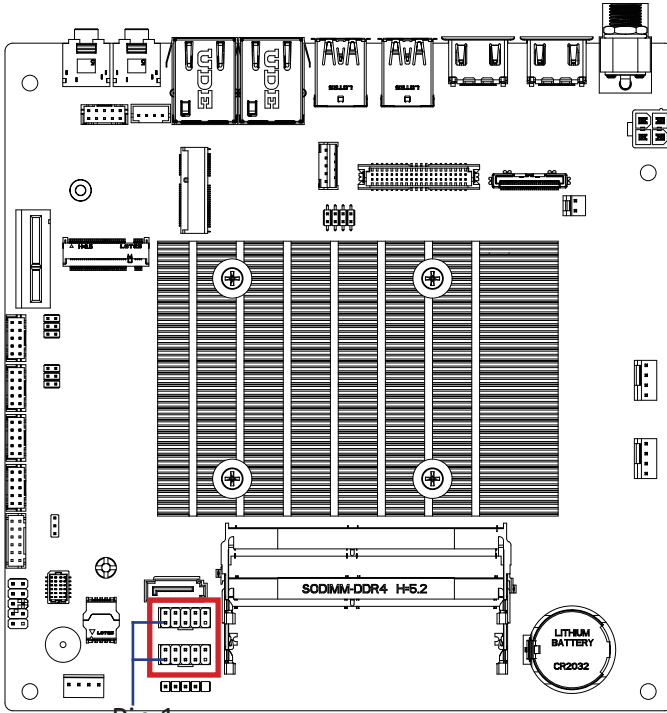


Pin No.	Definition
1	5V
2	D+
3	D-
4	GND
5	NC

Connector PN	Vendor
210-92-05GB02	PINREX
PH05R23BAZ005	HORNGTONG

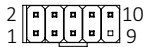
2.2.7 F_USB2_1, F_USB2_2 (USB 2.0 headers)

7



Pin 1

USB 2.0 header

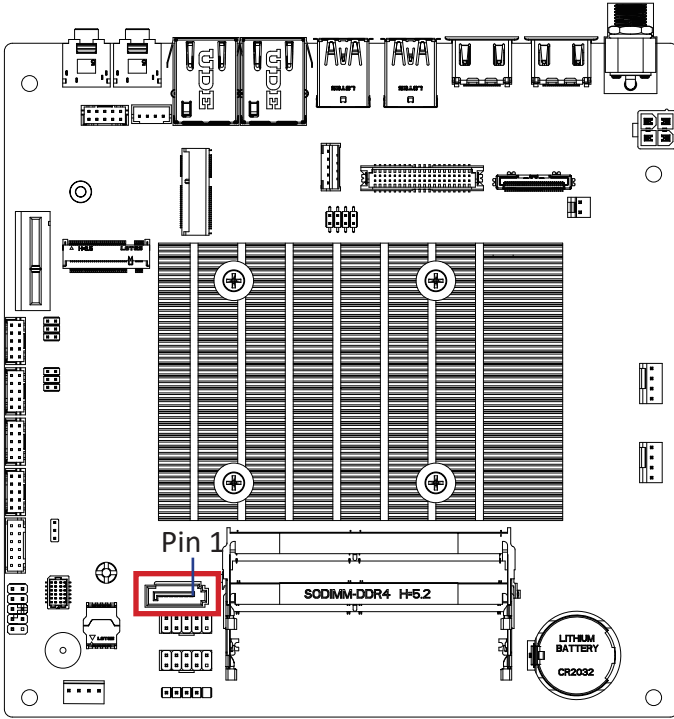


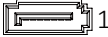
Connector PN	Vendor
210-92-05GB04	PINREX
PH10R53BAZ009	HORNGTONG

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

2.2.8 SATA0 (SATA 6Gb/s connector)

8



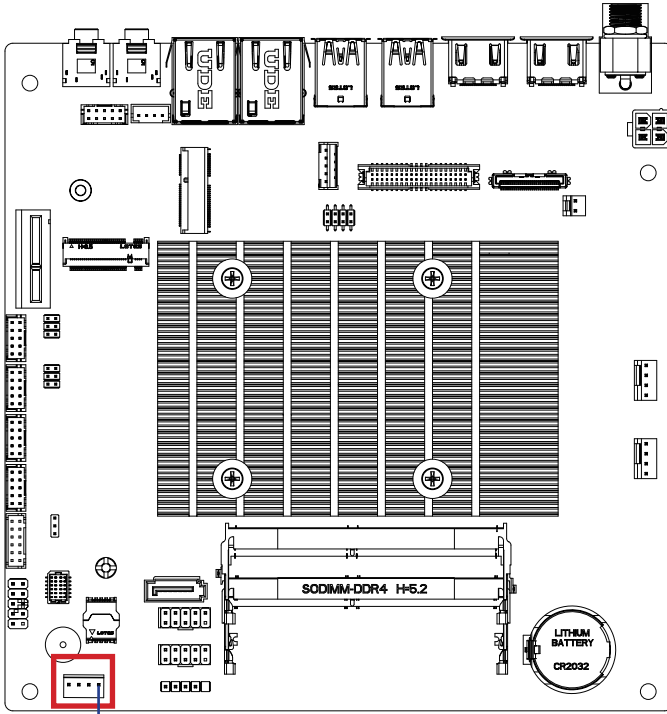
SATA connector	
7	 1

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

2.2.9 SATAPWR (SATA power connector)

9



Pin 1

Hard Disk Power Connector



Connector PN

743-81-04TW00
WF04Q2-3BJQ000

Vendor

PINREX
HORNGTONG

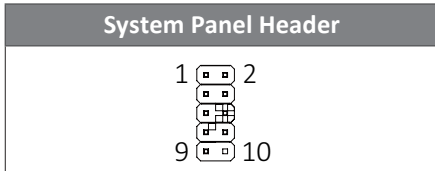
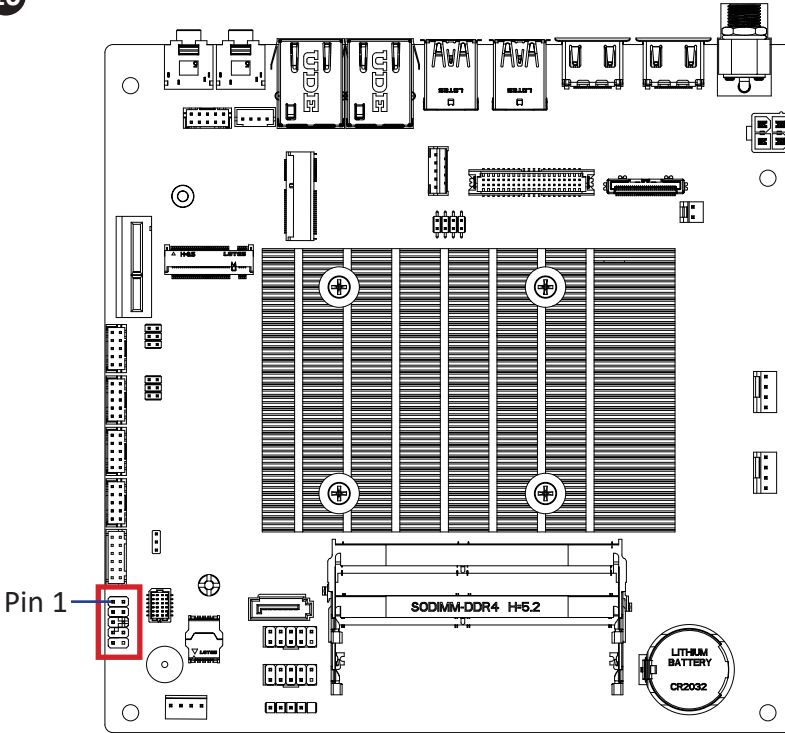
Pin No.

Definition

1	12V
2	GND
3	GND
4	5V

2.2.10 SYS_PANEL (Front panel header)

10

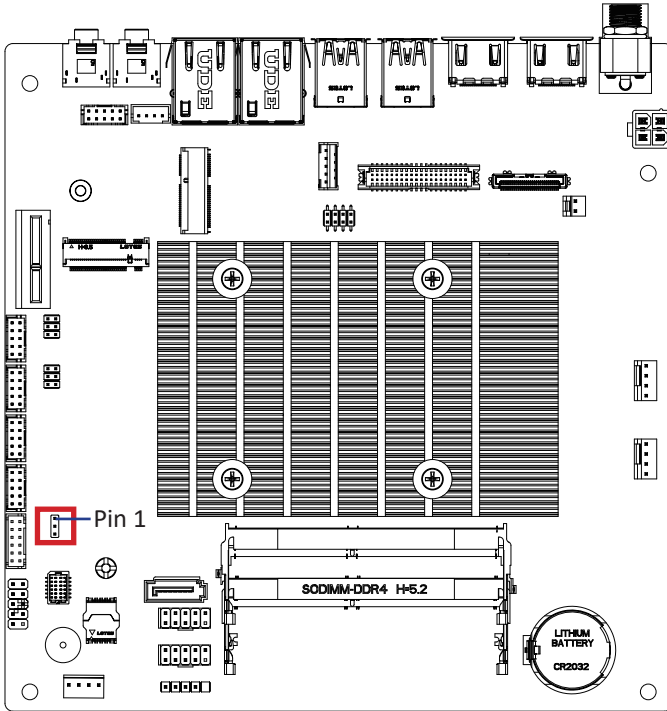


Connector PN	Vendor
210-92-05GW5W	PINREX

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

2.2.11 AT_CN (AT/ATX mode select jumper)

11



AT/ATX mode select jumper



Connector PN

220-96-03GB01
PH03N2-7BAN000

Vendor

PINREX
HORNGTONG

Pin No.	Definition
1	AT MODE
2	Detect
3	ATX MODE

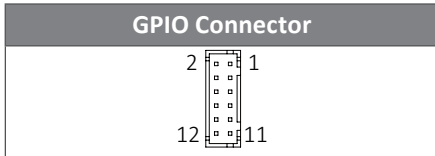
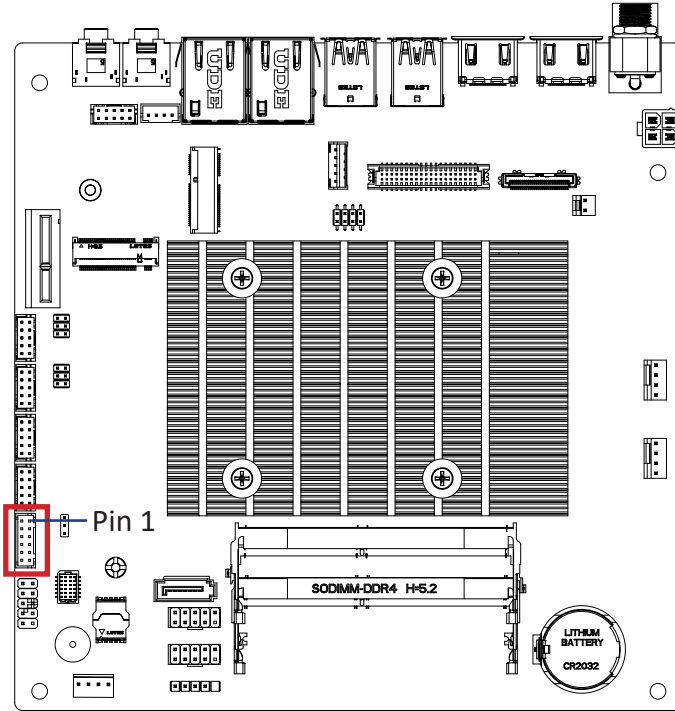
Jumper setting

1-2 Close : AT mode.

2-3 Close : ATX mode.(Default setting)

2.2.12 GPIO_CNT (General Purpose input/output header)

12



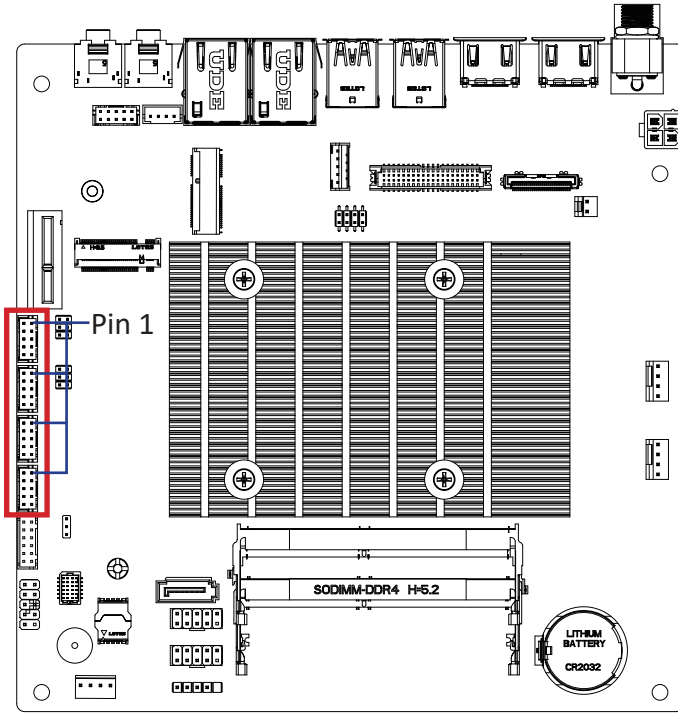
Pin No.	Definition
1	GPIO-output_1
2	GPIO-input_1
3	GPIO-output_2
4	GPIO-input_2
5	GPIO-output_3
6	GPIO-input_3
7	GPIO-output_4
8	GPIO-input_4
9	SMBus Clock

Pin No.	Definition
10	SMBus DATA
11	5V
12	GND

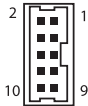
Connector PN	Vendor
725-81-12TW00	PINREX
A2004WV-2X06P46	JOINT-TECH

2.2.13 COM1, COM2, COM3, COM4 (Serial port)

13



Serial Port Cable Connector



Pin No.	RS-232	RS-422/485 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

725-81-10TW00

A2004WV-2X05P46

Vendor

PINREX

JOINT-TECH

Note :

COM1 : Support RS-232/422/485 & RI/5V/12V

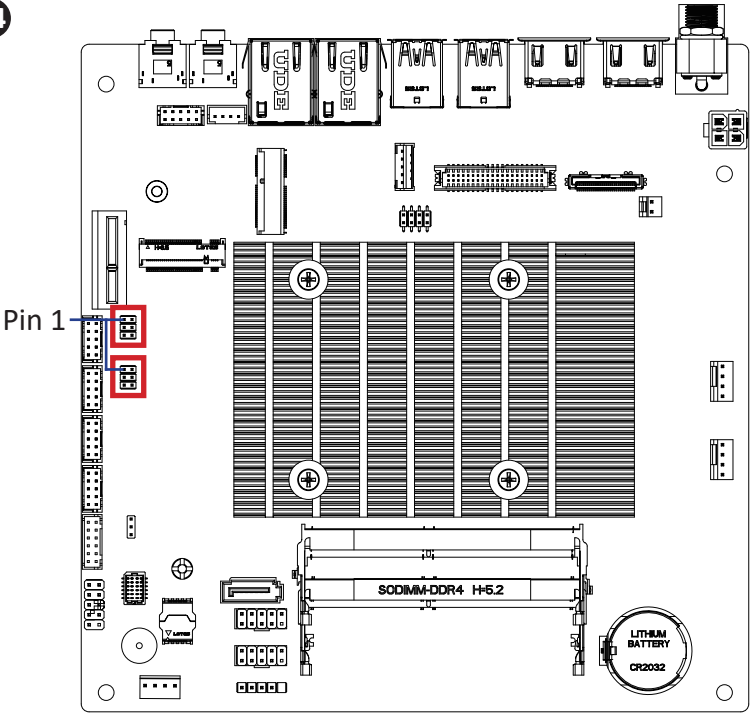
COM2 : Support RS-232 & RI/5V/12V

For RI/5V/12V jumper setting, please see **P. 35**

COM3, COM4 : Support RS-232 only

2.2.14 JCOM1, JCOM2 (RI# pin RI#/5V/12V Select jumper for COM1 & COM2 Port)

14

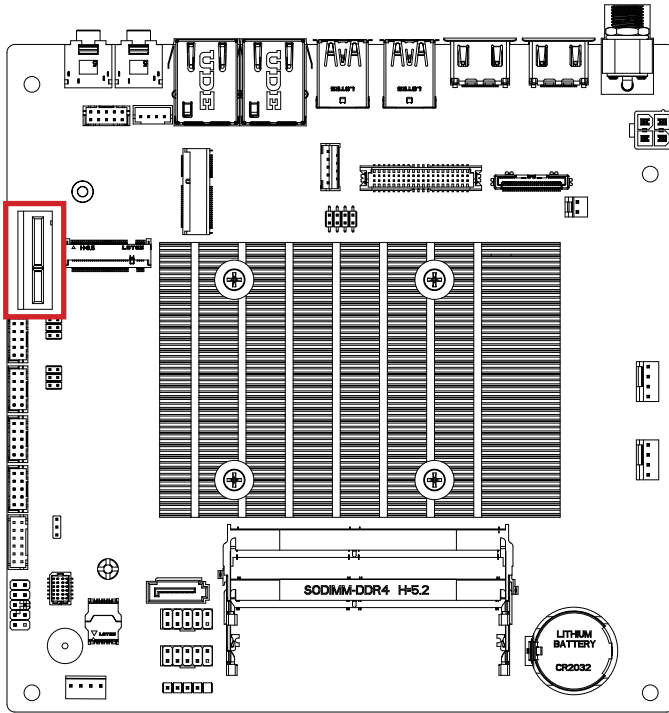


JCOM1, JCOM2 Jumper	
	1-2 Close: 5V (Power COM)
	3-4 Close: RI (Stand COM)
	5-6 Close: 12V (Power COM)

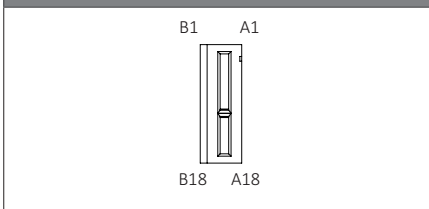
Connector PN	Vendor
220-97-03GB01	PINREX
PH06N53BAZ000	HORNGTONG

2.2.15 PCIEX1 (PCIe x1 (Gen3 x1) slot)

15

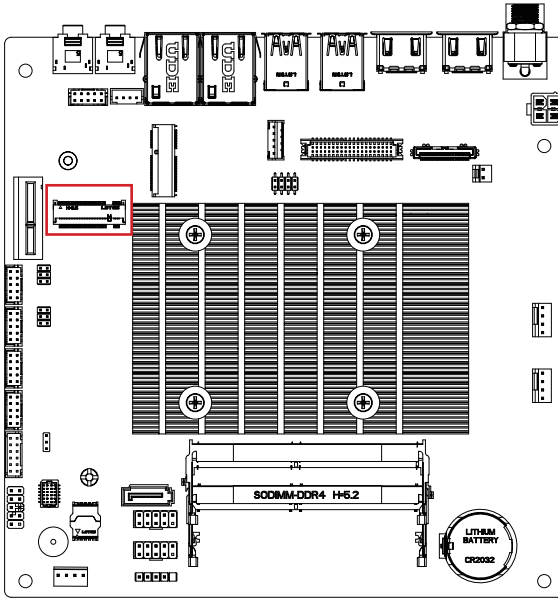


PCIEX1 connector



2.2.16 M2M (M.2 Slot, 2280 M-Key)

16



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
35	PCIe1 TXn	36	NC
37	PCIe1 TXp	38	GND

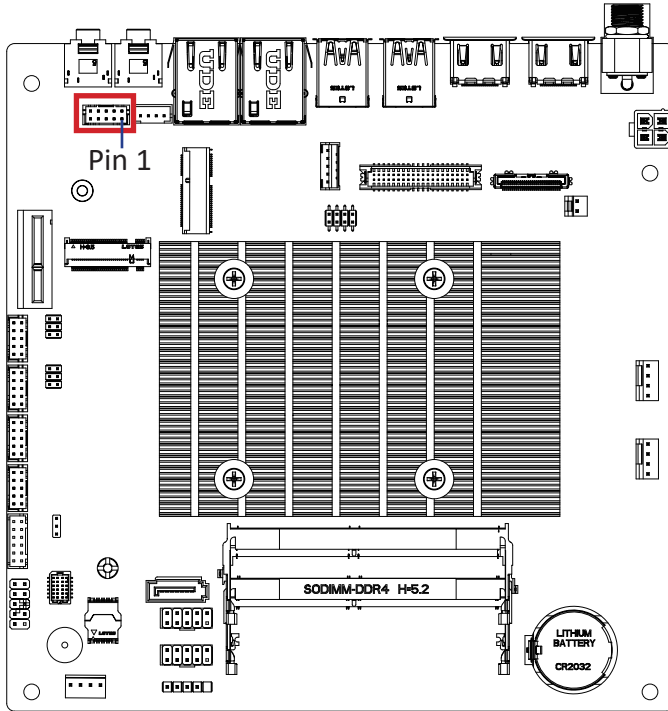
Pin No.	Definition	Pin No.	Definition
39	GND	40	NC
41	PCIe0 RXp/ SATA_p	42	NC
43	PCIe0 Rxn/ SATA_n	44	NC
45	GND	46	NC
47	PCIe0 TXn/ SATA_n	48	NC
49	PCIe0 TXp/ SATA_p	50	Reset
51	GND	52	Clock request
53	Clockn	54	NC
55	Clockp	56	NC
57	GND	58	NC

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

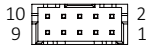
Connector PN	Vendor
80159-8521	BELLWETHER
2E0BC21-S85BM-7H	FOXCONN
APCI0096-P002A	LOTES

2.2.17 FP_AUDIO (Front panel audio connector)

17



Front Audio Connector



Connector PN

725-81-10TW00
A2004WV-2X05P46

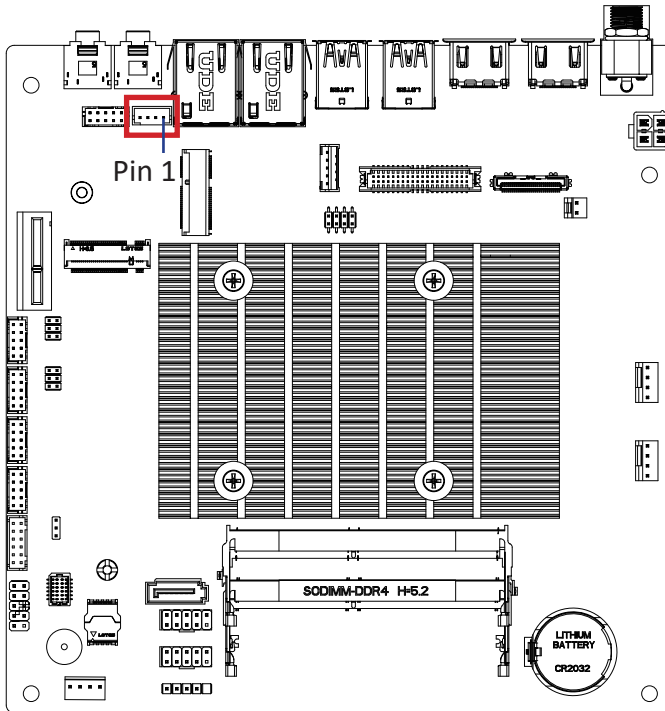
Vendor

PINREX
JOINT-TECH

Pin No.	Definition	Pin No.	Definition
1	MIC_Left	6	GND
2	GND	7	Jacksense Detect
3	MIC_Right	8	No Connect
4	Detect	9	LINE-LEFT
5	LINE_Right	10	GND

2.2.18 SPKR (Speaker out connector)

18



Audio Amplifier Connector

4  1

Connector PN

721-81-045W00

A2001WV-04P146

Vendor

PINREX

JOINT-TECH

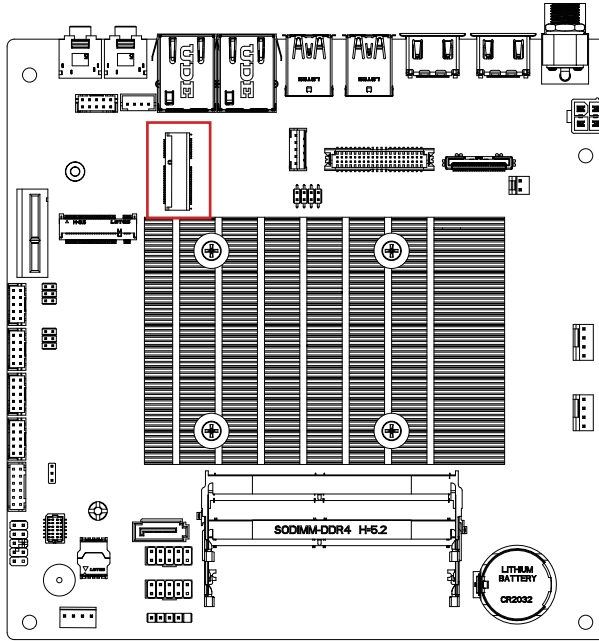
Pin No.

Definition

1	Speaker Out L+
2	Speaker Out L-
3	Speaker Out R-
4	Speaker Out R+

2.2.19 M2E (M.2 Slot, 2230 E-Key)

19



M.2 E Key Connector



Pin No.	Definition	Pin No.	Definition
1	GND	2	3V
3	USB_Dp	4	3V
5	USB_Dn	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	GND	14	NC
15	NC	16	NC
17	NC	18	GND
19	GND	20	NC
21	NC	22	NC
23	NC		

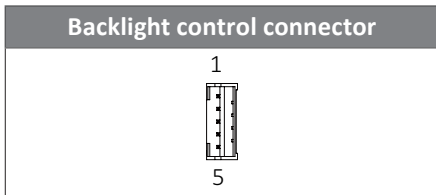
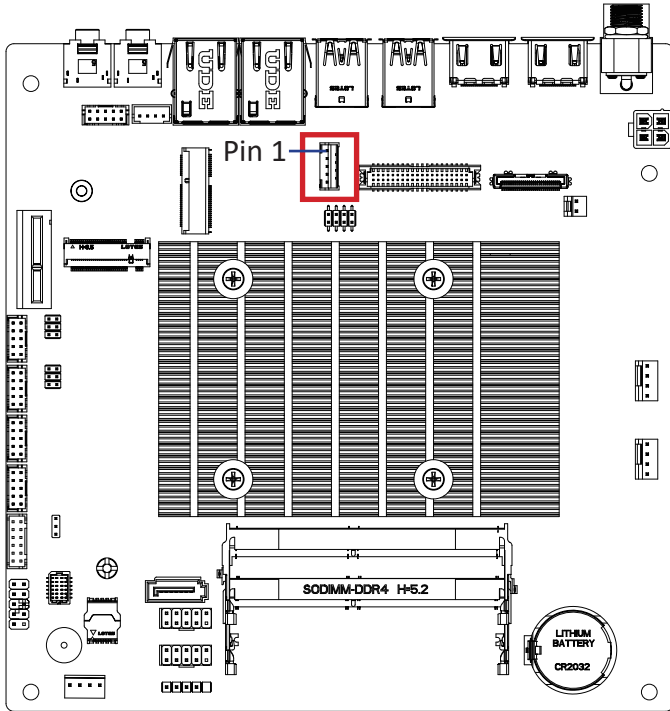
Pin No.	Definition	Pin No.	Definition
33	GND	32	NC
35	PCIe TXp	34	NC
37	PCIe TXn	36	NC

39	GND	38	NC
41	PCIe RXp	40	NC
43	PCIe RXn	42	NC
45	GND	44	NC
47	CLK_Dp	46	NC
49	CLK_Dn	48	NC
51	GND	50	SUSCLK
53	CLK_REQ	52	Reset
55	PCI_WAKE	54	BT_Disable#
57	GND	56	WIFI_Disable#
59	NC	58	NC
61	NC	60	NC
63	GND	62	NC
65	NC	64	NC
67	NC	66	PE Reset
69	GND	68	NC
71	NC	70	NC
73	NC	72	3V
75	GND	74	3V

Connector PN	Vendor
2E0BC21-S85BE-7H	FOXCONN
80152-8521	BELLWETHER
APCI0095-P002A	LOTES

2.2.20 BKL_CN (Backlight Control header)

20

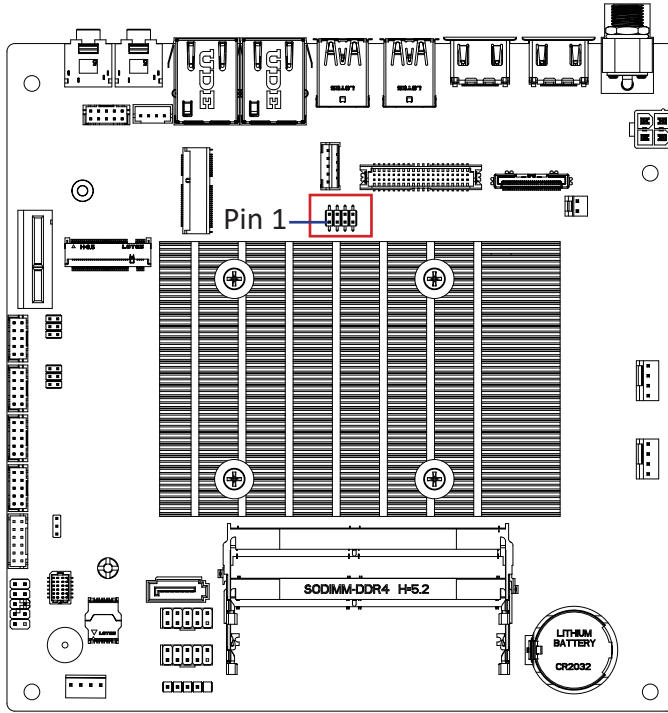


Connector PN	Vendor
721-81-05TW00	PINREX
A2001WV-05P146	JOINT-TECH

Pin No.	Definition
1	12V (5V for optional)
2	PWM
3	Backlight Enable
4	GND
5	12V

2.2.21 LSW (LVDS resolution jumper)

21

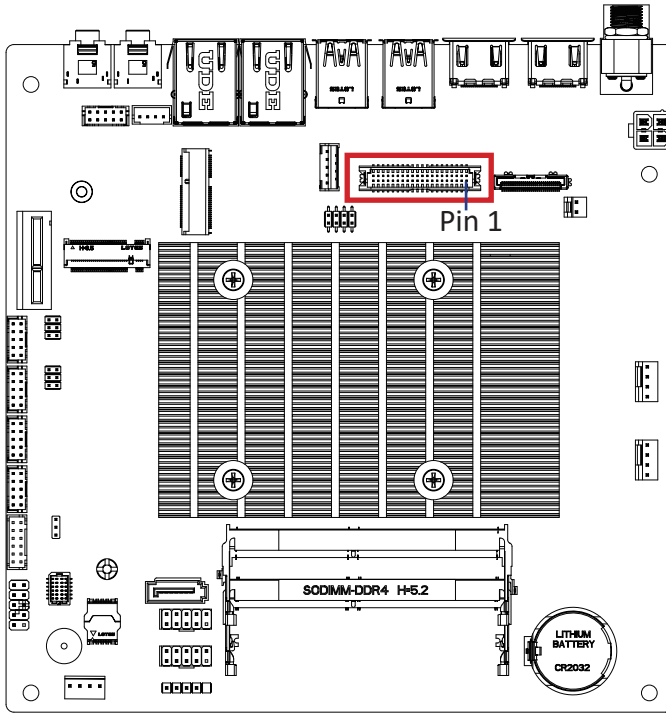


LVDS Resolution Jumper			
Jumper Setting	Resolution	Jumper Setting	Resolution
1	800 x 600 18bit	1	1366 x 768 24bit
1	1024 x 768 18bit	1	1440 x 900 24bit
1	1024 x 768 24bit	1	1400 x 1050 24bit
1	1024 x 600 18bit	1	1600 x 900 24bit
1	1280 x 800 18bit	1	1680 x 1050 24bit
1	1280 x 960 18bit	1	1600 x 1200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

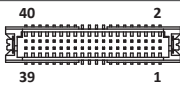
Connector PN	Vendor
222-97-04GBE1	PINREX

2.2.22 LVDS (LVDS connector)

22



LVDS Connector



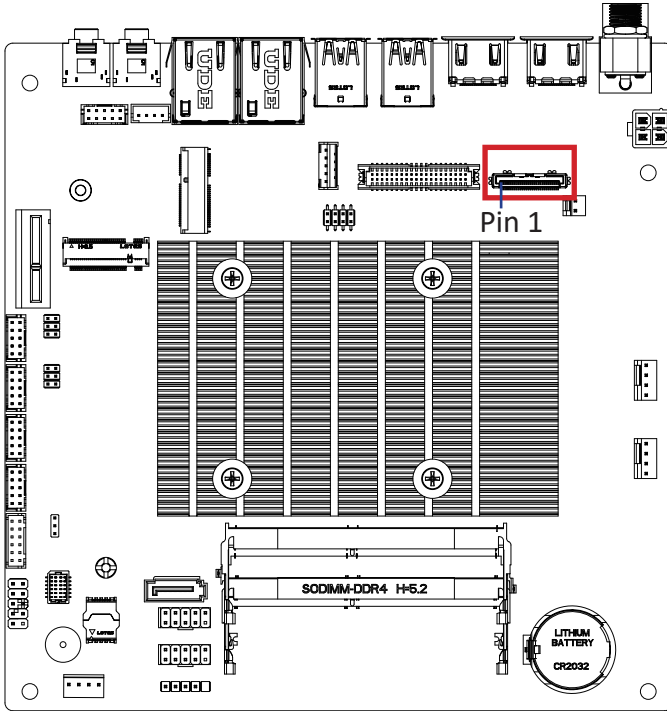
Pin No.	Definition	Pin No.	Definition
1	3.3V	21	A5+
2	5V	22	A4+
3	3.3V	23	A5-
4	5V	24	A4-
5	SPECO	25	GND
6	SPEDO	26	GND
7	GND	27	A7+
8	GND	28	A6+
9	A1+	29	A7-
10	A0+	30	A6-
11	A1-	31	GND
12	A0-	32	GND
13	GND	33	CLK2+
14	GND	34	CLK1+
15	A3+	35	CLK2-

Pin No.	Definition	Pin No.	Definition
16	A2+	36	CLK1-
17	A3-	37	GND
18	A2-	38	GND
19	GND	39	12V
20	GND	40	12V

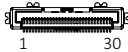
Connector PN	Vendor
712-76-40GWE0	PINREX
A1252WV-SF-2X20PD01	JOINT-TECH

2.2.23 EDP (Embedded Display Port Connector)

23



Embedded Display Port connector



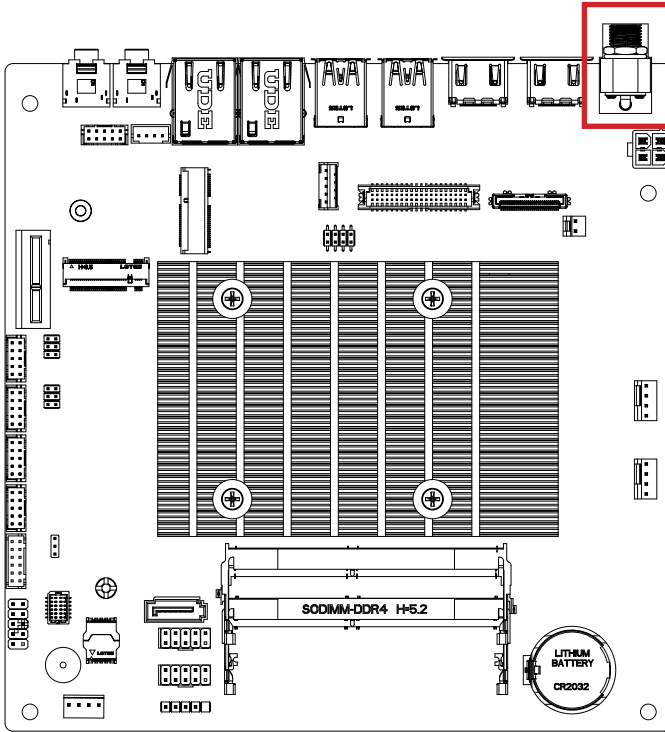
Pin No.	Definition	Pin No.	Definition
1	GND	16	eDP SW
2	TX0N	17	Hot Plug Detect
3	TX0P	18	Backlight Enable
4	GND	19	GND
5	TX1N	20	Backlight control
6	TX1P	21	GND
7	GND	22	3.3V
8	TX2N	23	3.3V
9	TX2P	24	3.3V

Pin No.	Definition	Pin No.	Definition
10	GND	25	3.3V
11	TX3N	26	GND
12	TX3P	27	5V
13	GND	28	5V
14	AUXN	29	5V
15	AUXP	30	5V

Connector PN	Vendor
115B30-000040-G4-R	STARCONN

2.2.24 DC_IN1 (DC IN Jack connector)

24



DC IN Jack Connector



Connector PN

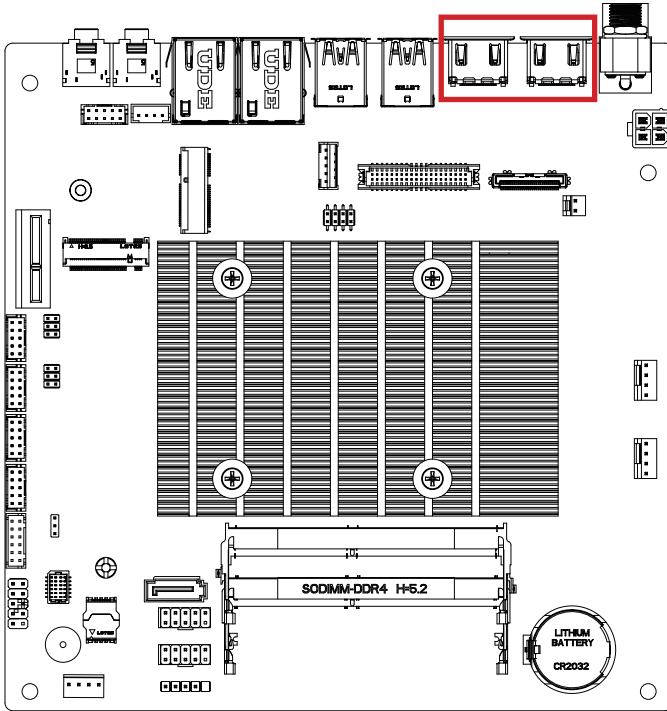
655-360-000

Vendor

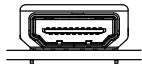
SHEN-MING

2.2.25 HDMI1, HDMI2 (HDMI connector)

25



HDMI connector



Connector PN

1165-2CG04-24P

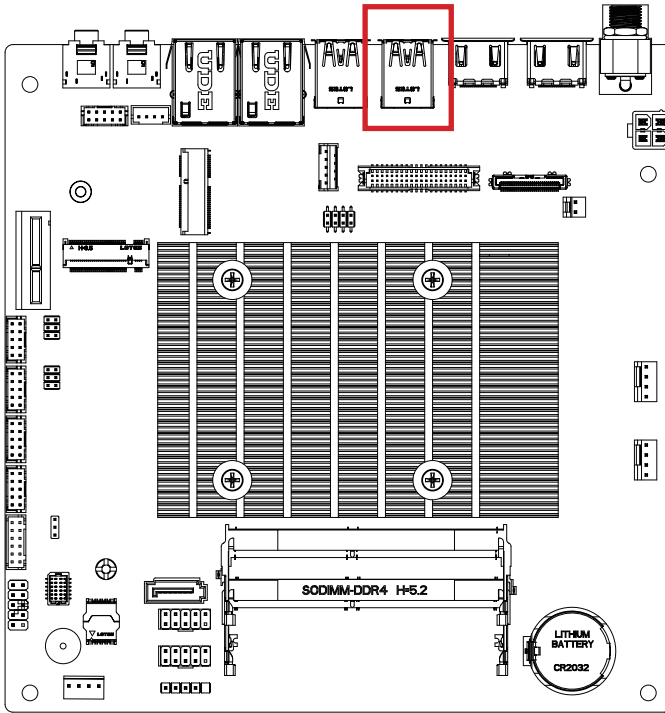
Vendor

TCONN

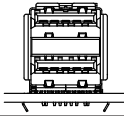
Pin No.	Definition	Pin No.	Definition
1	TX2p	11	GND
2	GND	12	CLKn
3	TX2n	13	NC
4	TX1p	14	NC
5	GND	15	SCL
6	TX1n	16	SDA
7	TX0p	17	GND
8	GND	18	5V
9	TX0n	19	Hot Plug Detect
10	CLKp		

2.2.26 USB31_1 (USB 3.2 Gen 1 connector)

26



USB Connector



Connector PN

UEA11121-8FS6-4F
ABA-USB-079-K01

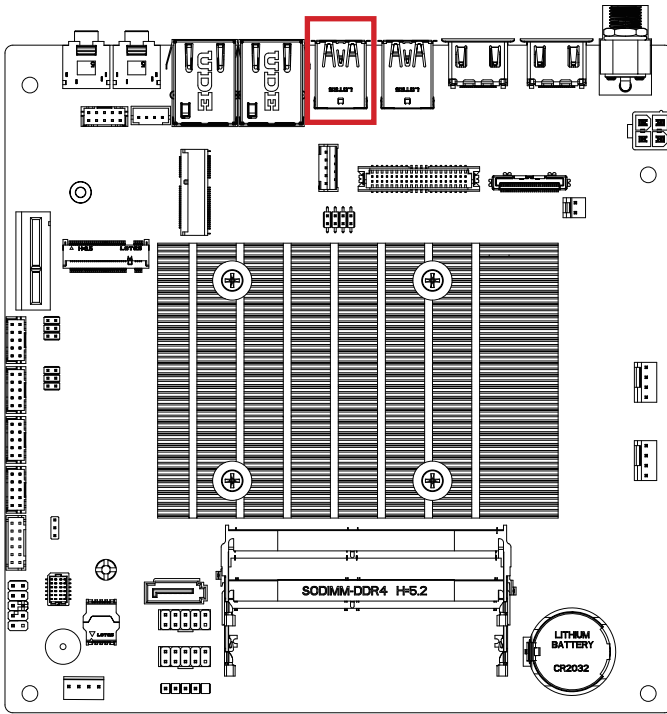
Vendor

FOXCONN
LOTES

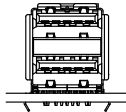
Pin No.	Definition	Pin No.	Definition
1	5V	10	5V
2	D1n	11	D0n
3	D1p	12	D0p
4	GND	13	GND
5	USB3_RX1n	14	USB3_RX2n
6	USB3_RX1p	15	USB3_RX2p
7	GND	16	GND
8	USB3_TX1n	17	USB3_TX2n
9	USB3_TX1p	18	USB3_TX2p

2.2.27 USB31_2 (USB 2.0 (top) + USB 3.2 Gen 1 (bottom) connector)

27



USB connector



Connector PN

UEA11121-UHS6-4F

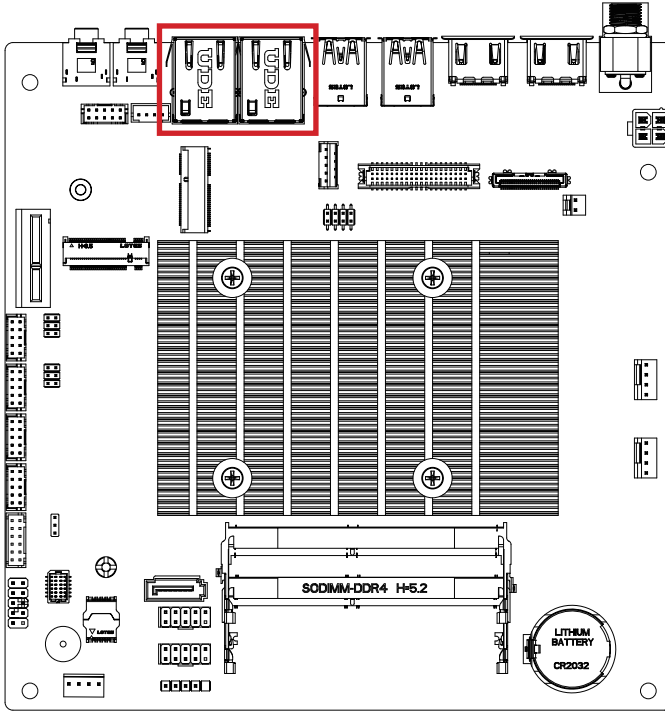
Vendor

FOXCONN

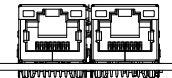
USB 2.0 Connector		USB 3.2 Gen 1 Connector	
Pin No.	Definition	Pin No.	Definition
1	5V	1	5V
2	D1n	2	D1n
3	D1p	3	D1p
4	GND	4	GND
		5	USB3_RX1n
		6	USB3_RX1p
		7	GND
		8	USB3_TX1n
		9	USB3_TX1p

2.2.28 LAN1, LAN2 (RJ45 LAN ports)

28



LAN Connector



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

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

Connector PN	Vendor
RT7-GB-0003	UDE

Chapter 3

Chapter 3 – BIOS

3.1 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.

3.1.1 How to Entering into BIOS menu

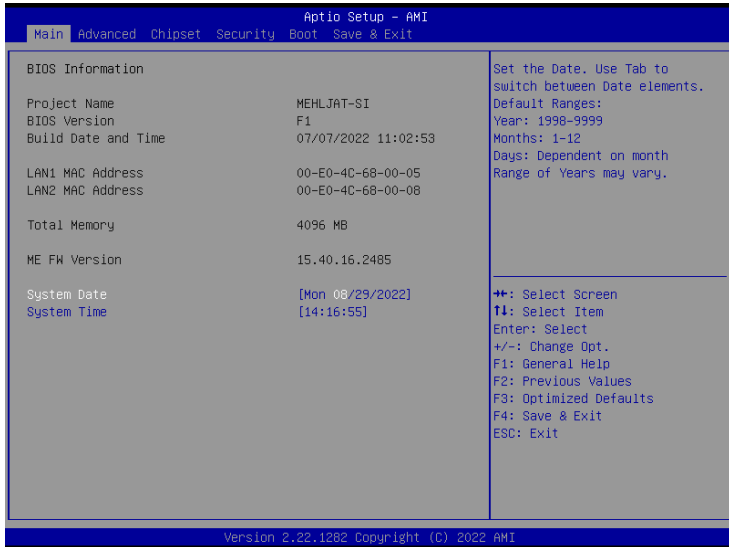
Once the system is power on, press the key as soon as possible to access into BIOS Setup program.

3.1.2 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

3.2 The Main Menu

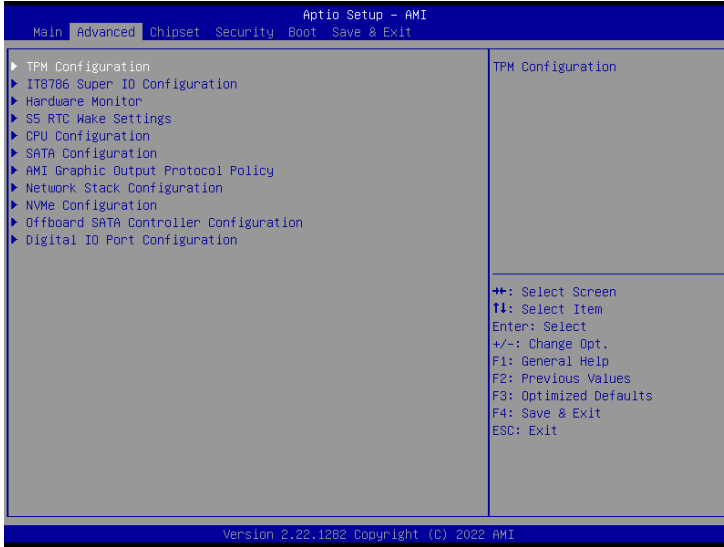
The main menu shows the basic system information. Use arrow keys to move among the items.



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)

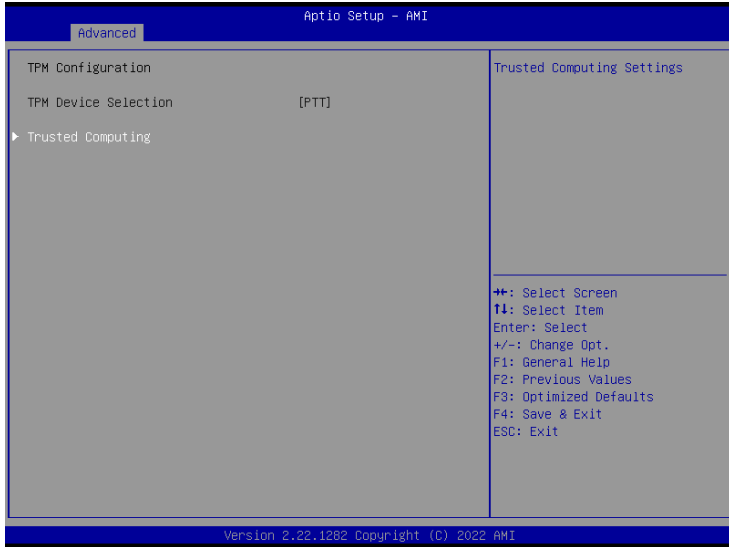
3.3 Advanced

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.



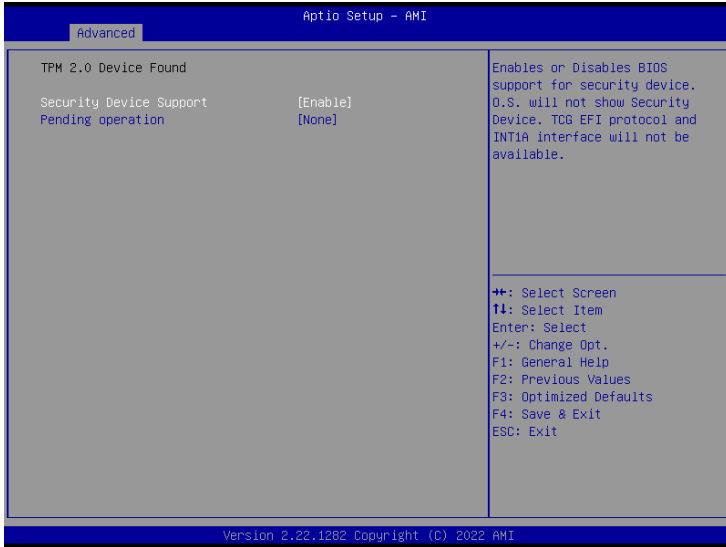
3.3.1 TPM Configuration

Use TPM Configuration submenu to choose TPM interface.



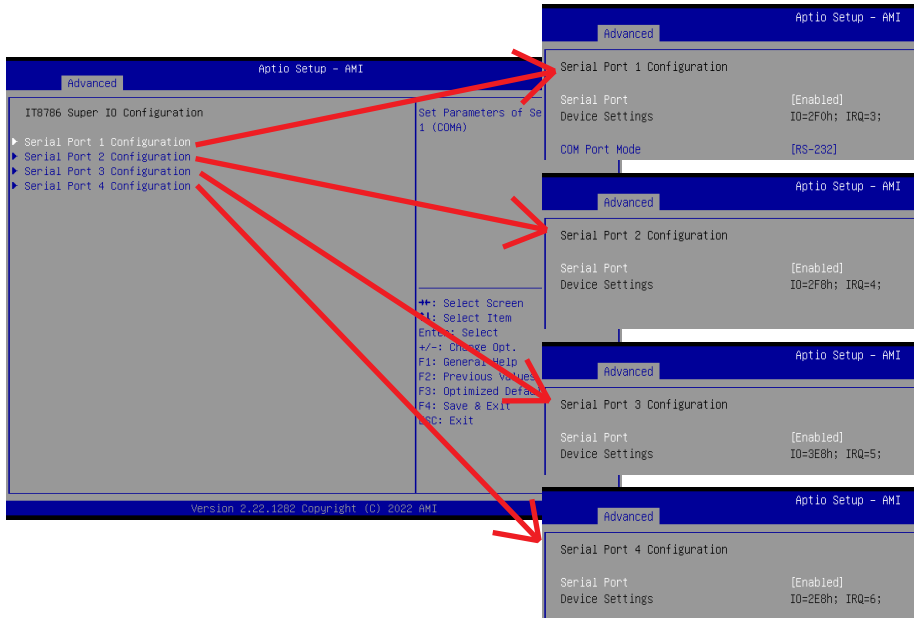
Item	Description
<p>TPM Device Selection</p>	<p>PTT : Internal TPM (Default setting)</p>

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



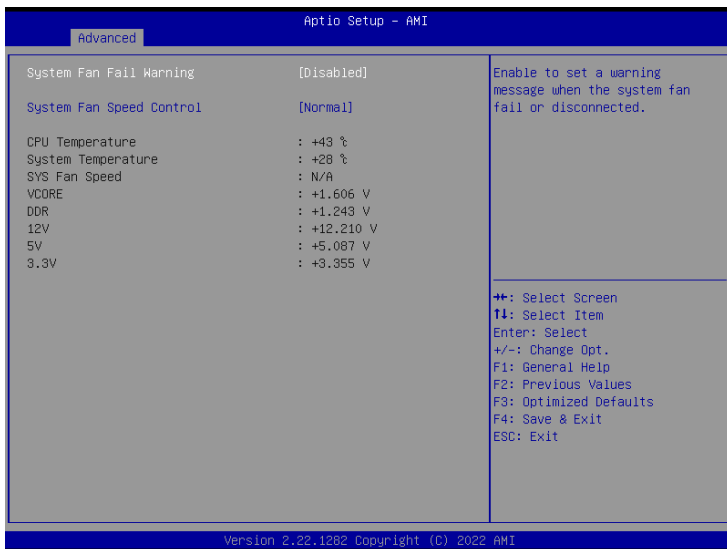
Item	Description
Security Device support	Enabled : Enables TPM feature (Default setting) Disabled : Disables TPM feature
Item	Description
Pending operation	None : No execution will be conducted (Default setting) TPM clear : Set to clear data on TPM

3.3.2 IT8786 Super IO Configuration



Item	Description
Serial Port 1 Configuration	<p>Press [Enter] to configure advanced items :</p> <p>Serial Port : Enabled : Enables allows you to configure the serial port settings Disabled : if Disabled, displays no configuration for the serial port</p> <p>Device settings : Display the specified Serial Port base I/O address and IRQ</p> <p>COM Port Mode : Choose RS-232, RS-422, or RS-485 feature</p>
Serial Port 2 Configuration	<p>Press [Enter] to configure advanced items :</p> <p>Serial Port : Enabled : Enables allows you to configure the serial port settings Disabled : if Disabled, displays no configuration for the serial port</p>
Serial Port 3 Configuration	<p>Device settings : Display the specified Serial Port base I/O address and IRQ</p>
Serial Port 4 Configuration	<p>Device settings : Display the specified Serial Port base I/O address and IRQ</p>

3.3.3 Hardware Monitor



Item	Description
System Fan Fail Warning	Enabled : Enables System FAN Fail warning alert function Disabled : Disables System FAN Fail warning alert function (Default setting)
System Fan Speed Control	Normal : Fan speed set by BIOS default (Default setting) Full Speed : Set Fan operates at full speed
CPU temperature	Shows current CPU temperature
System temperature	Shows current system temperature
SYS Fan Speed	Shows current CPU fan Speed

3.3.4 S5 RTC Wake Settings



Item	Description
<p>Wake system from S5</p>	<p>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)</p>

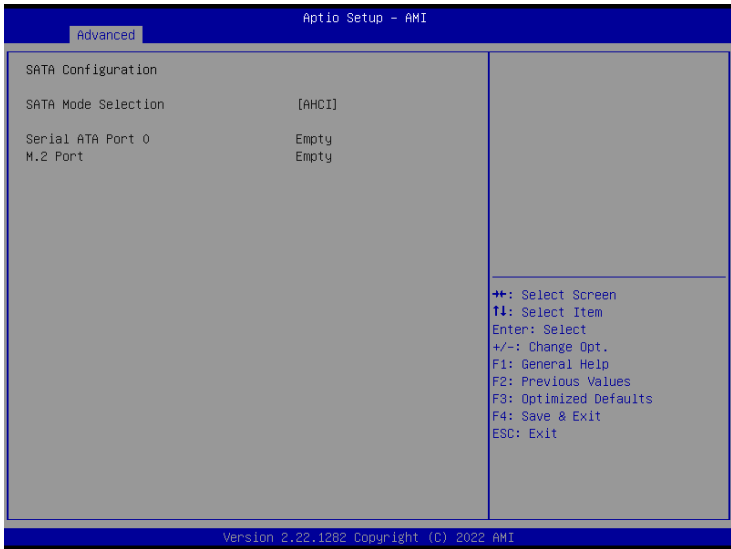
3.3.5 CPU Configuration

This submenu shows detailed CPU informations.



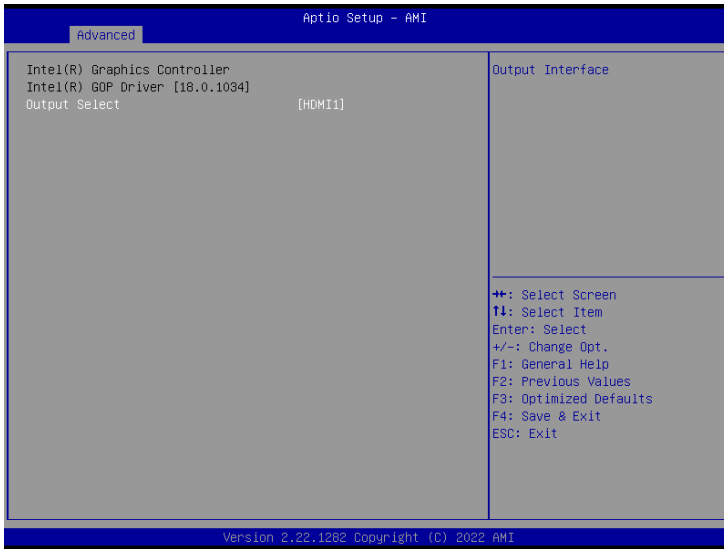
Item	Description
Intel Virtualization Technology	Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. Enabled : Enables Intel Virtualization Technology (Default setting) Disabled : Disables Intel Virtualization Technology
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

3.3.6 SATA Configuration



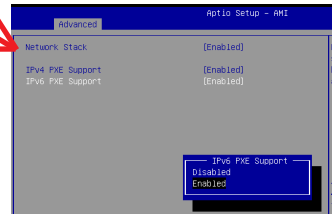
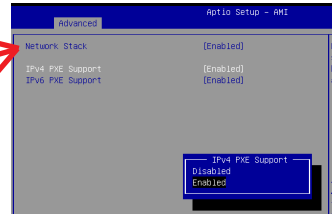
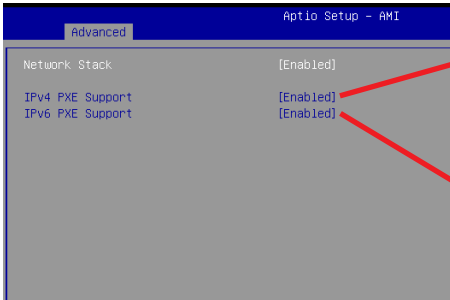
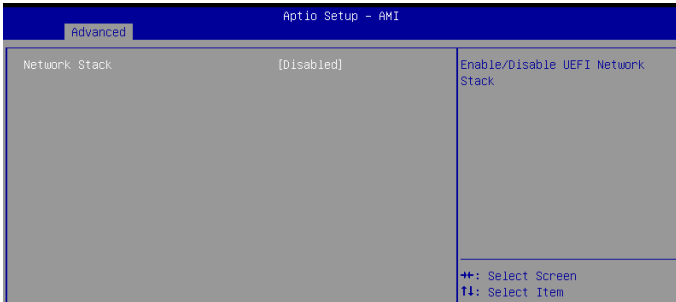
Item	Description
SATA Mode Selection	AHCI : Configures the SATA controllers to AHCI mode. (Default setting)
Serial ATA Port 0	shows 2.5" SATA HDD/SSD information
M.2	shows M.2 SATA interface SSD information

3.3.7 AMI Graphic Output Protocol Policy



Item	Description
Output Select	Choose default monitor output when there are more than one monitor plugged on the motherboard.

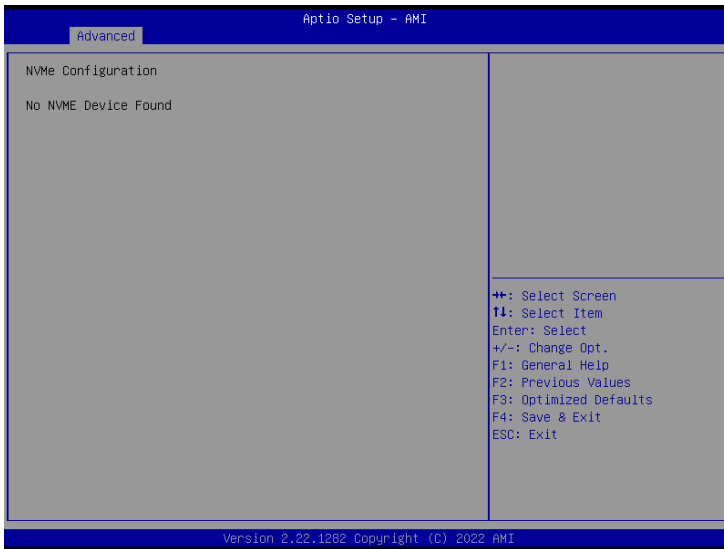
3.3.8 Network Stack Configuration



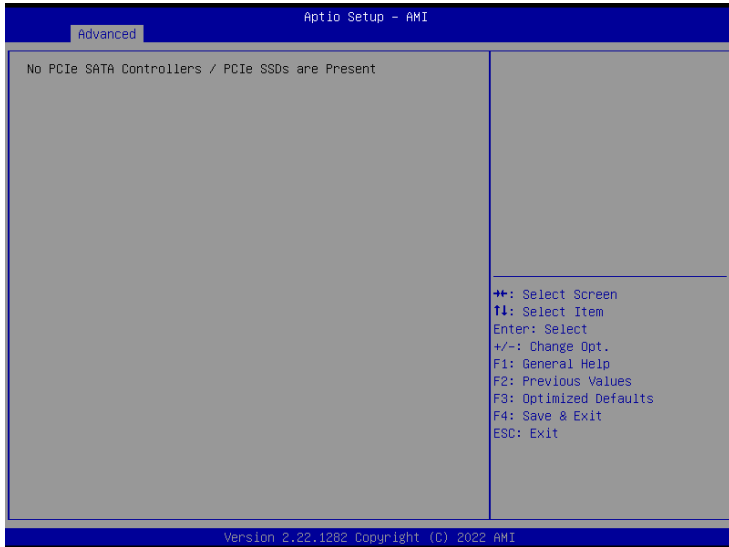
Item	Description
Network Stack	When system is power on, install LAN driver under UEFI mode Disabled : Disables UEFI Network Stack (Default setting) Enabled : Enables UEFI Network Stack
Ipv4 PXE Support	When Network stack is enabled : Disabled : Disables Ipv4 PXE Support Enabled : Enables Ipv4 PXE Support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

3.3.9 NVMe Configuration

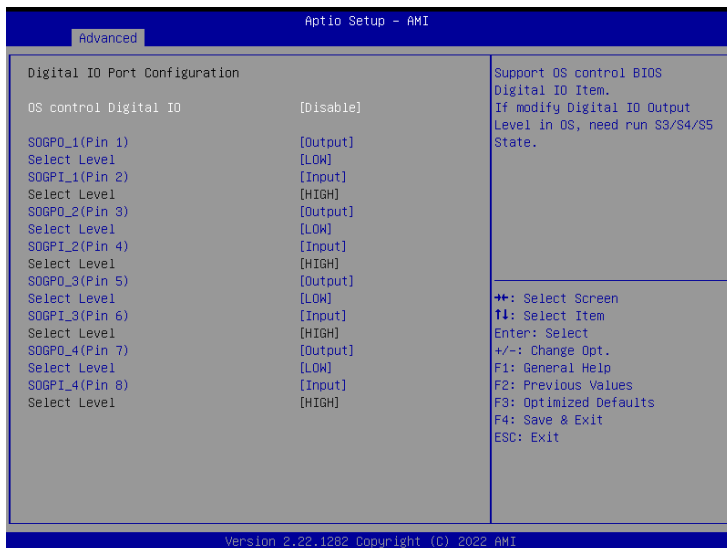
NVMe Configuration shows information when your M.2 NVMe PCIe SSD is installed.



3.3.10 Offboard SATA Controller Configuration



3.3.11 Digital IO Port Configuration



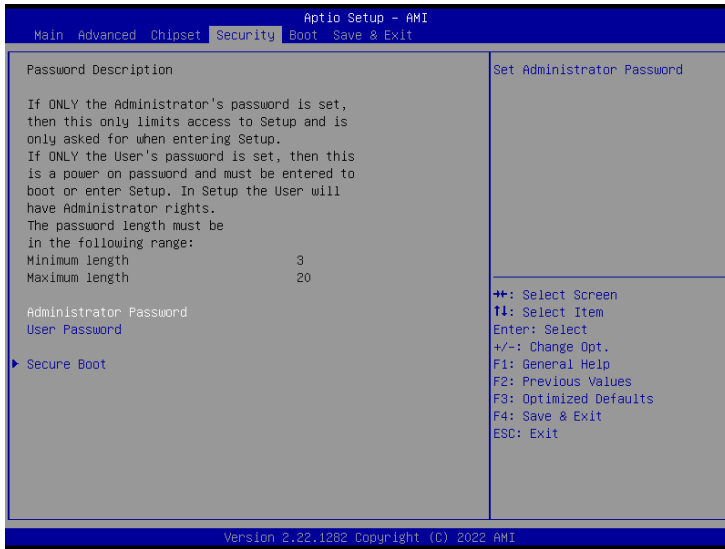
Item	Description
OS control Digital IO	Disabled : If Digital IO Output value/level is modified in OS, they will not be memorized and kept. (Default setting) Enabled : If Digital IO Output value/level is modified in OS, they will be memorized and kept.
SOGPO_1 (Pin 1) SOGPI_1 (Pin 2) SOGPO_2 (Pin 3) SOGPI_2 (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.

3.4 Chipset

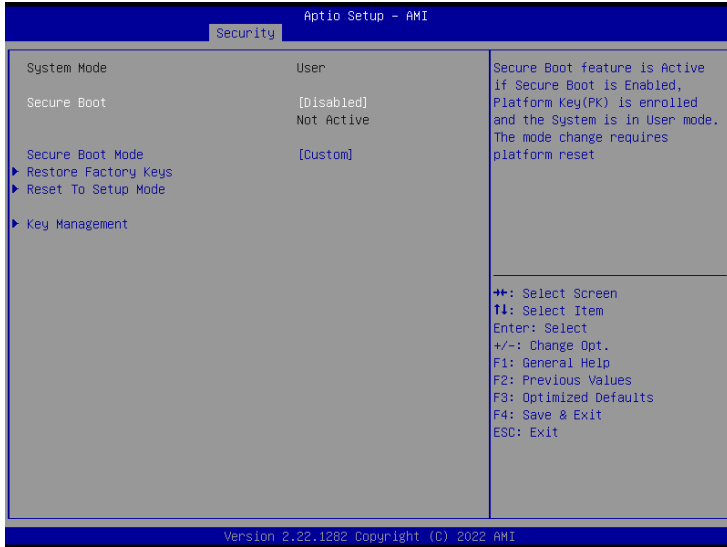


Item	Description
VT-d	Enabled : Enables VT-d function (Default setting) Disabled : Disables VT-d function
DVMT Pre-Allocated	Use DVMT Pre-Allocated to set the amount of system memory which is installed to the integrated graphics processor Option items : 32M , 64M(Default setting) , 128M , 256M
HD Audio	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
ATX control	To choose whether if to use ATX PSU to boot up. Enabled : Enables if needed to use ATX PSU to boot up. Disabled : Disables ATX control function (Default setting)
Restore AC Power Loss	To set which option the system should returns if a sudden power loss occurred 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 occurs
Watchdog Timer	Enable/Disable Watchdog Timer function Enabled : Enables Watchdog Timer function Disabled : Disabled Watchdog Timer function (Default setting)
LVDS Support	Disabled : Disables LVDS Support (Default setting) Enabled : Enables LVDS Support
Brightness Level	To modified the backlight brightness of the LVDS/eDP panel Option items : 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% (Default Setting)
BIOS Lock	Enable/Disable BIOS Lock function Enabled : Enables BIOS Lock function (Default setting) Disabled : Disabled BIOS Lock function

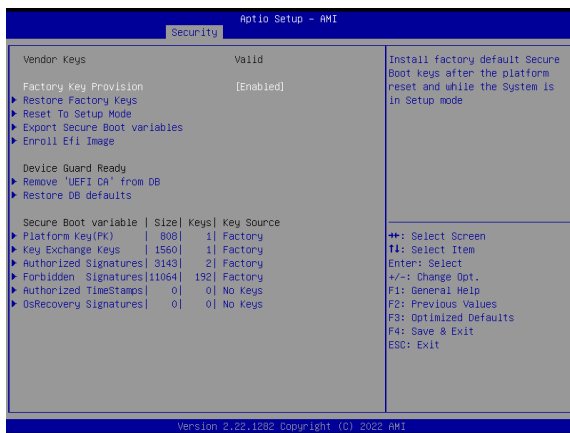
3.5 Security



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



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



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	

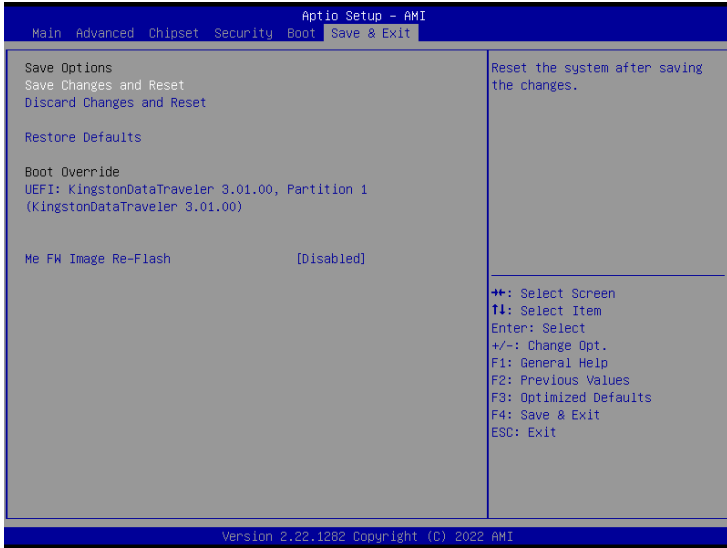
3.6 Boot

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

3.7 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-Flahs	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)