iTXL-N97B

Thin Mini-ITX Motherboard

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
iTXL-N97B MB	1
SATA power cable	1
Standard I/O Shield	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

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	○	○	○	○	○	○

O : 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

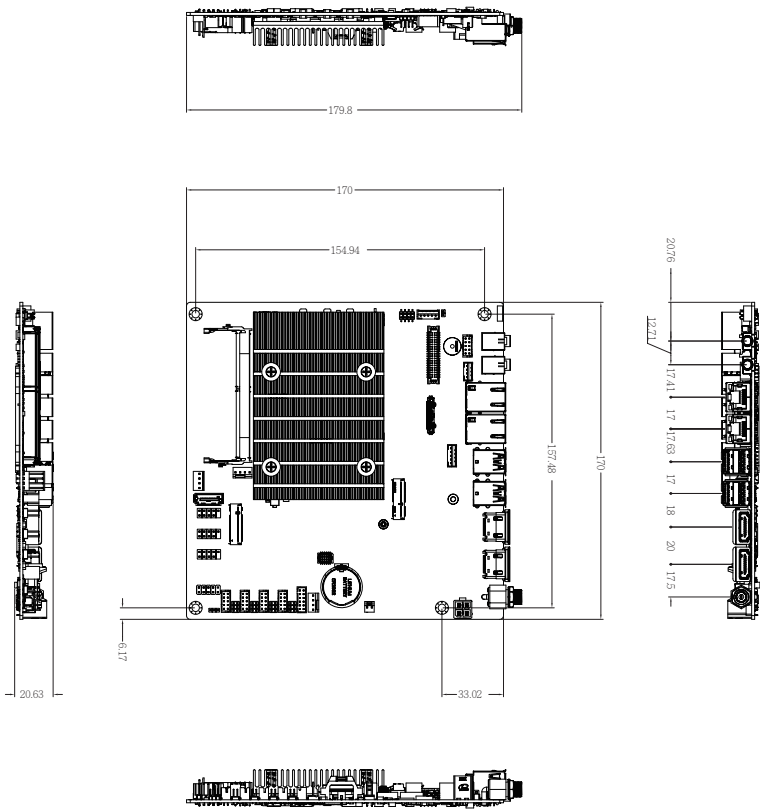
Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	O	O	O	O	O	○
Wires & Connectors for External Connections	O	O	O	O	O	O

O : 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.
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.
Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

Table Contents

Chapter 1

Chapter 1 - Product Specifications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1.1 Specifications

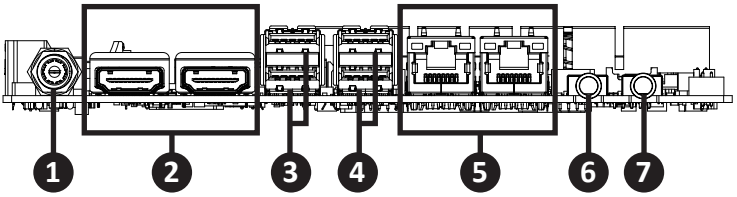
Motherboard	iTXL-N97B (MADN9BT)
Form Factor	Thin Mini-ITX form factor 170W x 170D (mm)
CPU	Intel Processor N97 Intel 7, 4 cores, up to 3.60 GHz TDP 12W
Socket	1 x FCBGA1264
Memory	1 x DDR5 SO-DIMM socket, Max. Capacity 16 GB Support Single Channel DDR5 4800 MHz memory modules
Ethernet	2 x GbE LAN Ports (Realtek® RTL8111H)
Video	Integrated Graphics Processor - Intel® UHD Graphics: 2 x HDMI 2.0 ports, supporting a maximum resolution of 4096x2160 @60Hz 1 x eDP port, supporting a maximum resolution of 3840x2160 @60Hz 1 x LVDS port, supporting a maximum resolution of 1920x1200 @60Hz (3 independent display outputs)
Audio	Realtek® ALC269
Storage	1 x SATA 6Gb/s Port
Expansion Slots	1 x 2280 M.2 M-Key (PCIe Gen 3x1, SATA 6Gb/s) 1 x 2230 M.2 E-key

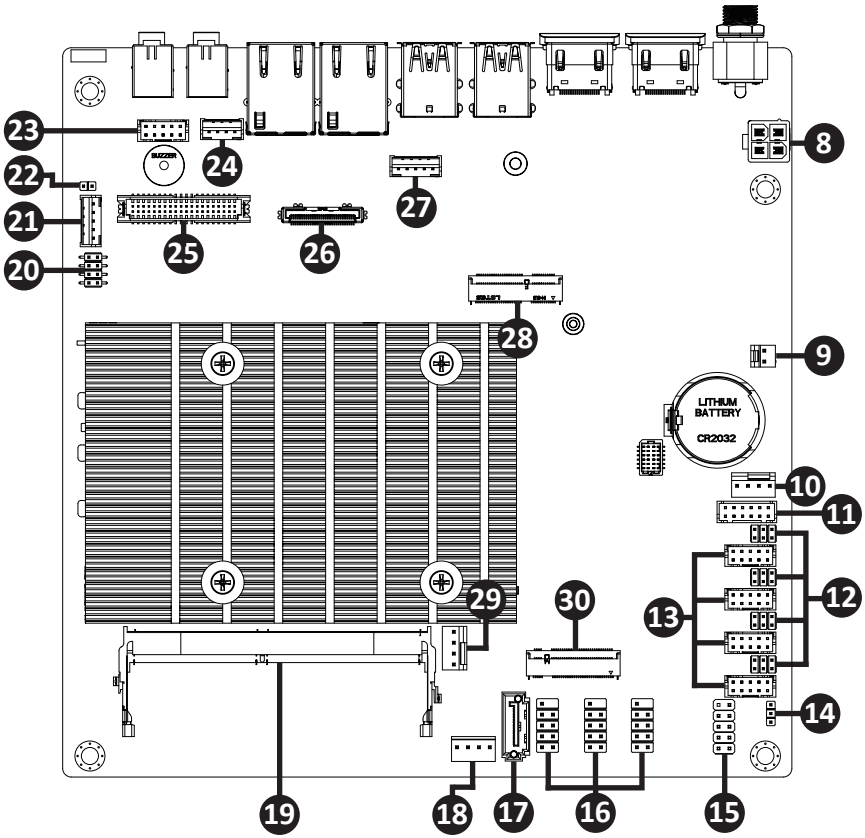
Motherboard	iTXL-N97B (MADN9BT)
Internal I/O	1 x 4-pin ATX main power connector 1 x SATA Power connector 1 x CPU fan header 1 x System fan header 1 x Front panel header 1 x Front panel audio header 1 x 2W Speaker out header 6 x USB 2.0 headers 4 x COM headers (RS-232/422/485 & RI/5V/12V) 1 x GPIO (8 bits) & SMBus header 1 x Backlight Control header for eDP 1 x Backlight Control header for LVDS 1 x AT/ATX mode select jumper 1 x ATX control header
Rear I/O	2 x Audio Jacks (Headphone out, Mic in) 2 x HDMI 2 x RJ45 LAN Ports 4 x USB 3.2 Gen 1 1 x DC Jack (+12V~24VDC)
TPM	Onboard TPM 2.0 security chip INFINEON SLB9672VU2.0
OS Compatibility	Windows 11 IoT Enterprise LTSC 2024(24H2) 64bits Windows 10 IoT Enterprise LTSC 2021(21H2) 64bits
Operating Properties	Operating temperature: 0°C to 60°C Operating humidity: 60°C @ 20-95% (non-condensing) Non-operating temperature: -40°C to 85°C Non-operating humidity: 85°C @ 95% (non-condensing)

Chapter 2

Chapter 2 – Hardware Information

2.1 Jumpers and Connectors

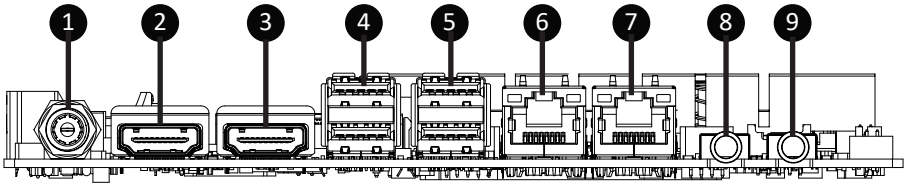




No	Code	Description
1	DC_IN1	DC In Jack
2	HDMI2_1 HDMI2_2	HDMI connector
3	USB31_1	USB 3.2 Gen 1 connector
4	USB31_2	USB 3.2 Gen 1 connector
5	LAN1 LAN2	2 x RJ45 LAN Ports
6	HP_OUT	1 x Audio jack (Headphone out)
7	MIC	1 x Audio jack (Mic in)
8	DC_IN2	ATX 2x2 pin power connector
9	ATX_CTL	ATX control header
10	SYS_FAN	System fan connector
11	GPIO_CNT	General Purpose input/output header
12	JCOM1 JCOM2 JCOM3 JCOM4	RI# pin RI#/5V/12V Select for COM1, COM2, COM3, COM4 ports
13	COM1 COM2 COM3 COM4	COM headers (RS-232/422/485 & RI/5V/12V)
14	AT_CN	AT/ATX mode select jumper
15	SYS_Panel	Front panel header
16	F_USB2_1 F_USB2_2 F_USB2_3	USB 2.0 header
17	SATA	SATA 6Gb/s connector

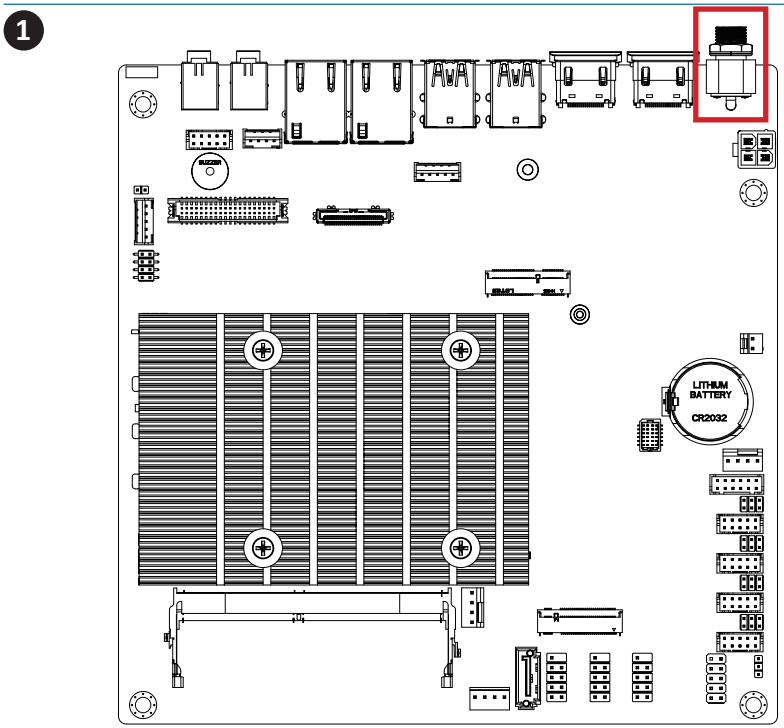
No	Code	Description
18	SATAPWR	SATA power connector
19	SODIMM1	1 x DDR5 SO-DIMM Socket
20	LSW	LVDS resolution jumper
21	BKL_LVDS	Backlight Control header for LVDS
22	ME	ME Enable jumper
23	FP_AUDIO	Front panel audio header
24	SPKR	Speaker out connector
25	LVDS	LVDS connector
26	EDP	Embedded Display Port connector
27	BKL_EDP	Backlight Control header for EDP
28	M2E	M.2 Slot, 2230 E-Key
29	CPU_FAN	CPU fan connector
30	M2M	M.2 Slot, 2280 M-Key

2.1.1 Rear I/O Connector



No	Code	Description
1	DC_IN1	1 x DC IN (+12~24VDC)
2	HDMI2_1	HDMI connector
3	HDMI2_2	HDMI connector
4	USB31_1	USB 3.2 Gen 1 connector
5	USB31_2	USB 3.2 Gen 1 connector
6	LAN1	1 x GbE LAN Port
7	LAN2	1 x GbE LAN Port
8	HP_OUT	1 x Audio jacks (Headphone out)
9	MIC	1 x Audio jacks (MIC in)

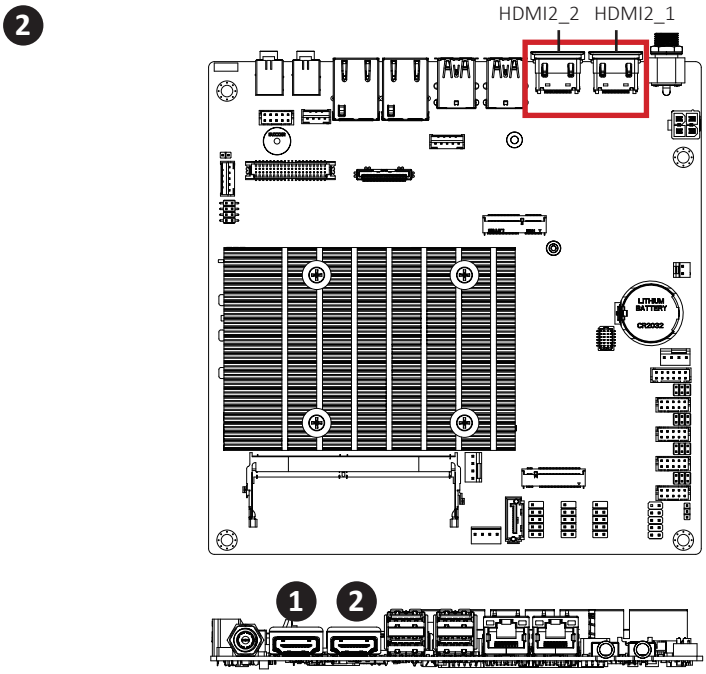
2.2.1 DC_IN1 (DC In Jack)



Power Connector


Connector PN	Vendor
655-360-000	SHEN-MING

2.2.2 HDMI2_1, HDMI2_2 (HDMI connector)



HDMI Connector


Connector PN	Vendor
1165-2CG04-24P	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		

2.2.3 USB31_1 (USB 3.2 Gen 1 connector)

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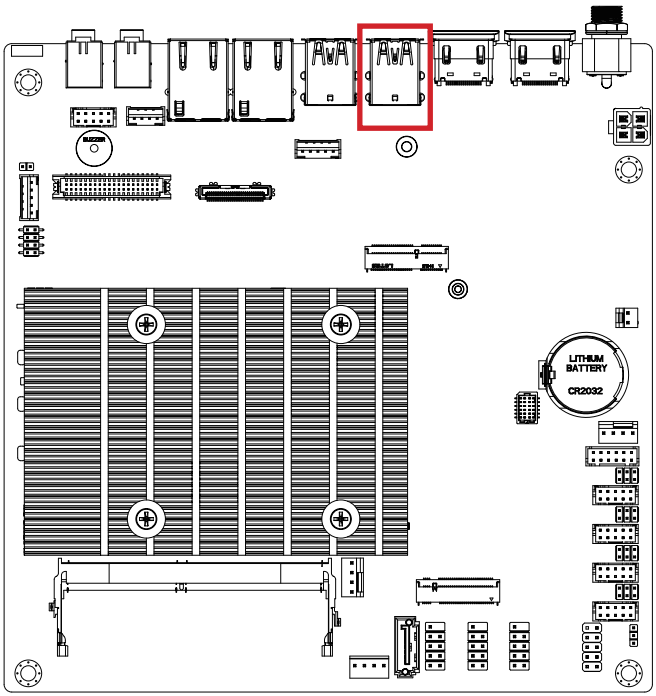


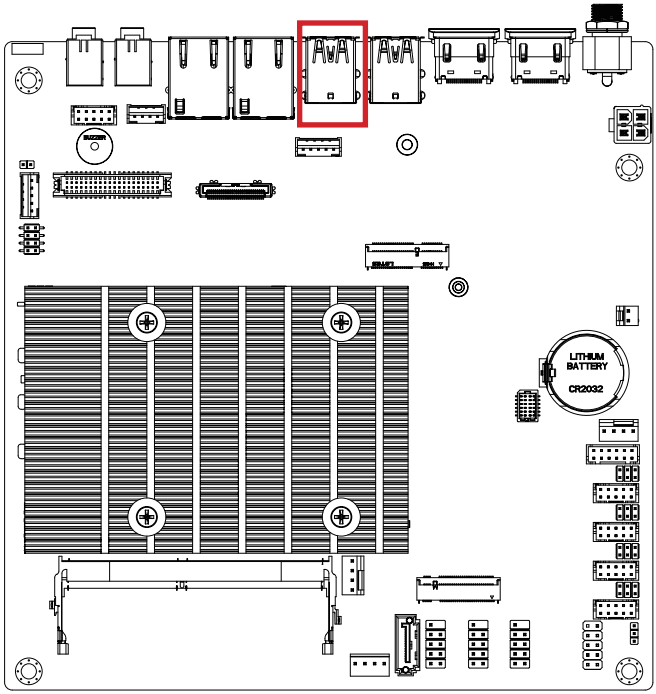
USB 3.2 Gen 1 Connector

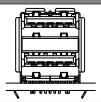

Connector PN	Vendor
UEA11121-8FS6-4F	FOXCONN
ABA-USB-079-K01	LOTES

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

2.2.4 USB31_2 (USB 3.2 Gen 1 connector)

4



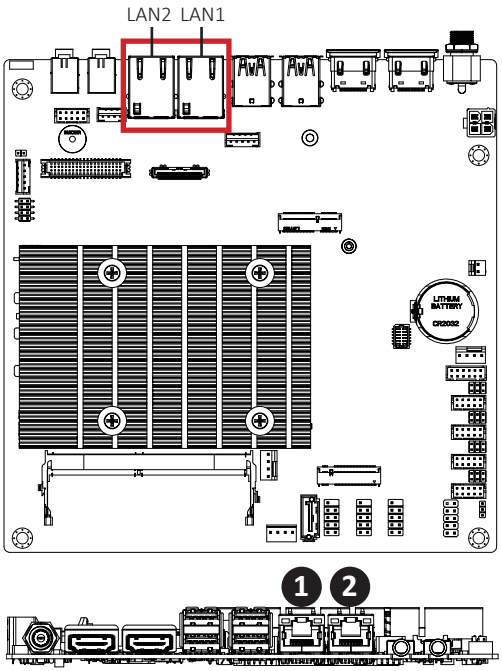
USB 3.2 Gen 1 connector


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

Connector PN	Vendor
UEA11121-8FS6-4F	FOXCONN
ABA-USB-079-K01	LOTES

2.2.5 LAN1, LAN2 (GbE LAN connectors)

5



GbE LAN Connector
 1

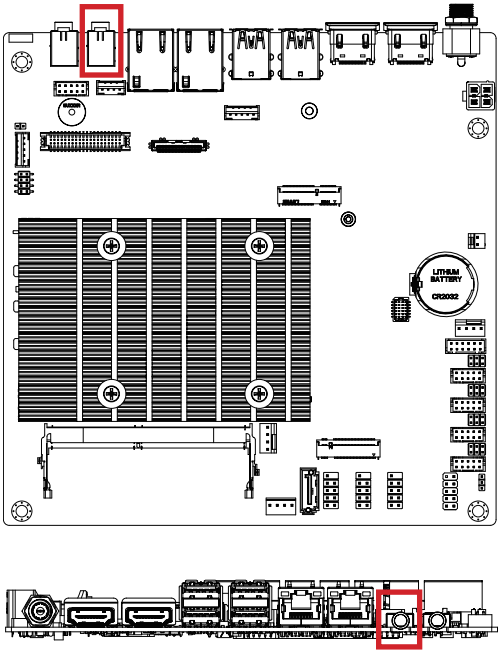
State	Description
Orange On	1Gbps data rate
Green On	100Mbps data rate
Off	10Mbps data rate

Pin No.	Definition
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

Connector PN	Vendor
RT7-GB-0003	UDE

2.2.6 HP_OUT (Headphone out connector)

6



2.2.7 MIC (Mic in connector)

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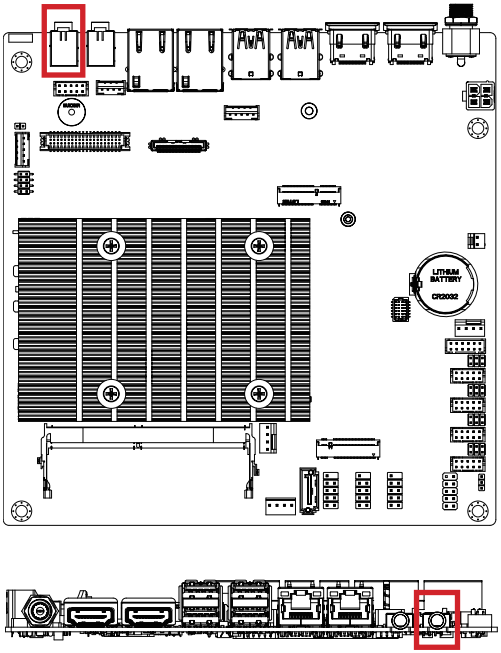
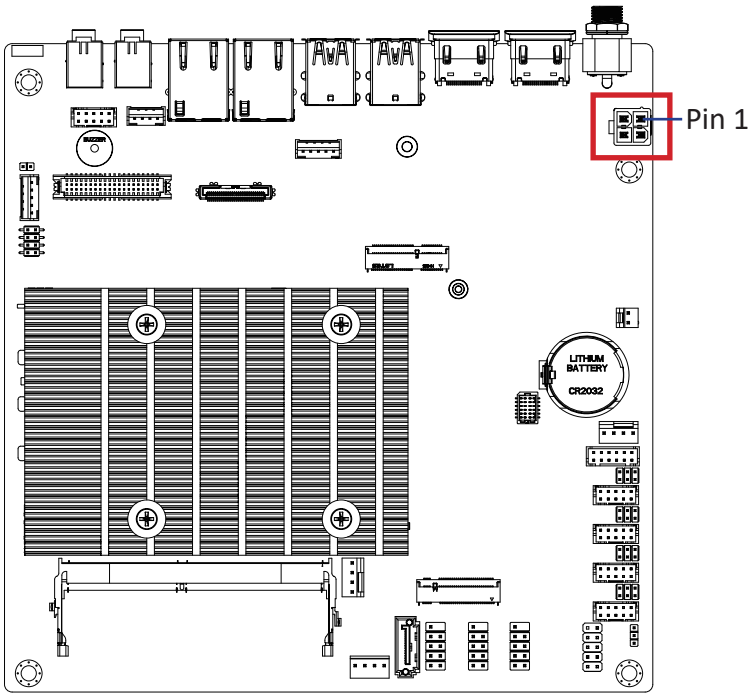


2.2.8 DC_IN2 (ATX 2x2 pin power connector)

8



power Connector
3 1 4 2

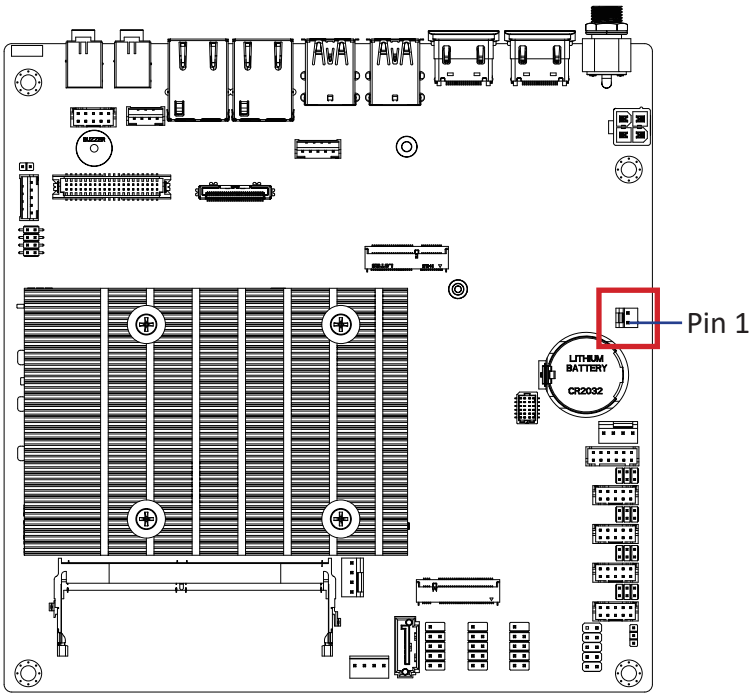
Connector PN	Vendor
740-81-04TW56	PINREX

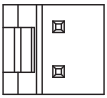
Connector type
2x2pin header, pitch 4.2mm

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

2.2.9 ATX_CTL (ATX control header)

9



ATX Control Header


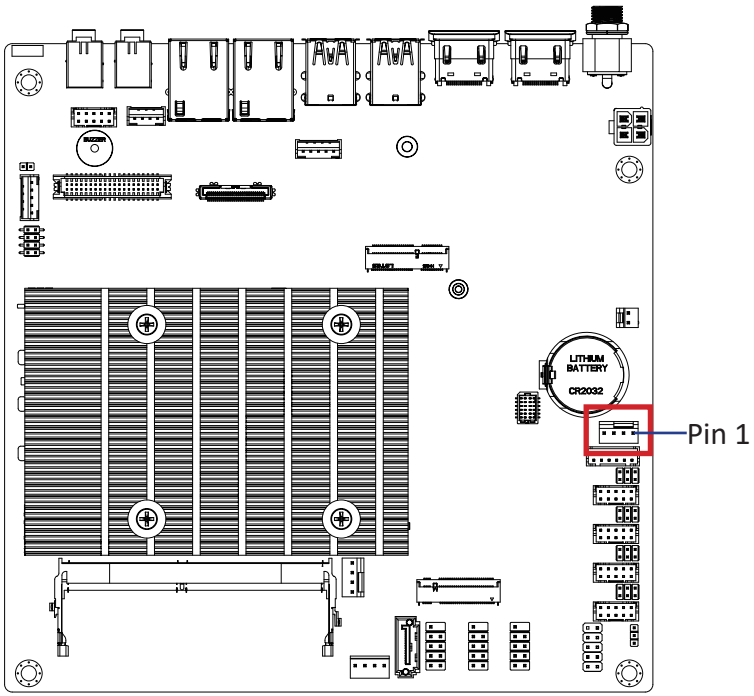
Pin No.	Definition
1	PSON#
2	5V

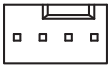
Connector PN	Vendor
744-81-02TW10	PINREX

Connector type
1x2pin header, pitch 2.54mm

2.2.10 SYS_FAN (System fan connector)

10



System FAN connector
4  1

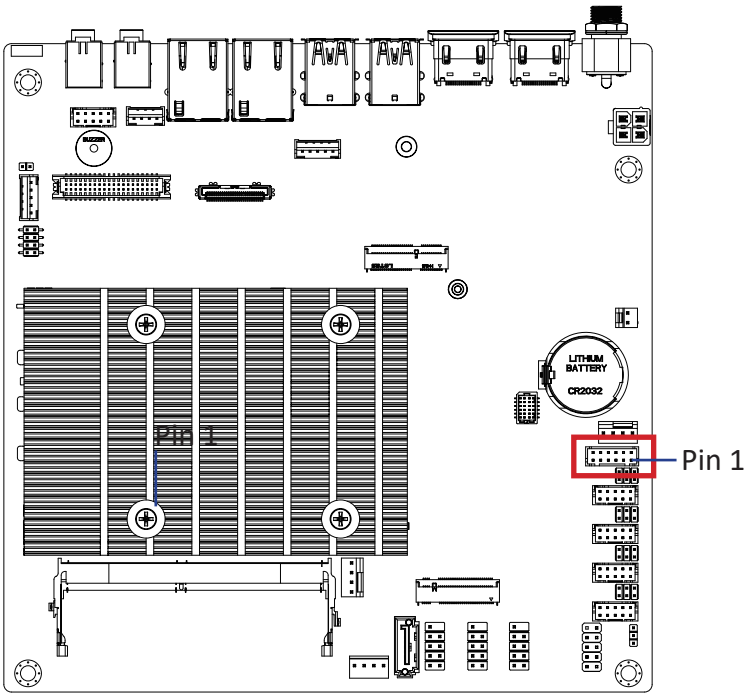
Pin No.	Definition
1	GND
2	12V
3	Detect
4	Speed Control

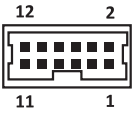
Connector PN	Vendor
744-81-045R11	PINREX

Connector type
1x4pin header, pitch 2.54mm

2.2.11 GPIO_CNT (General Propose input/output header)

11



GPIO Connector


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

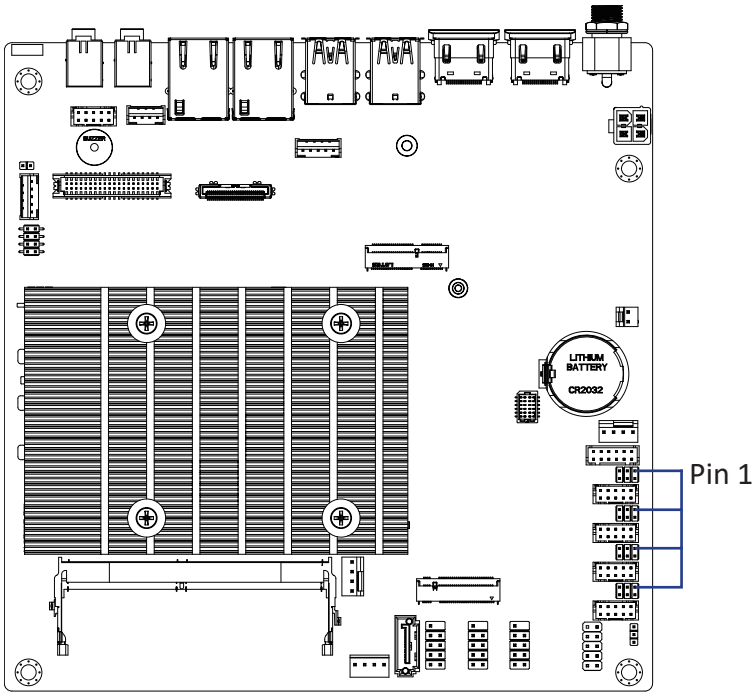
Pin No.	Definition
10	SMBus DATA
11	5V
12	GND

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

Connector type
2x6pin header, pitch 2.0mm

2.2.12 JCOM1, JCOM2, JCOM3, JCOM4 (RI# pin RI#/5V/12V Select for COM1, COM2, COM3, COM4 port)

12



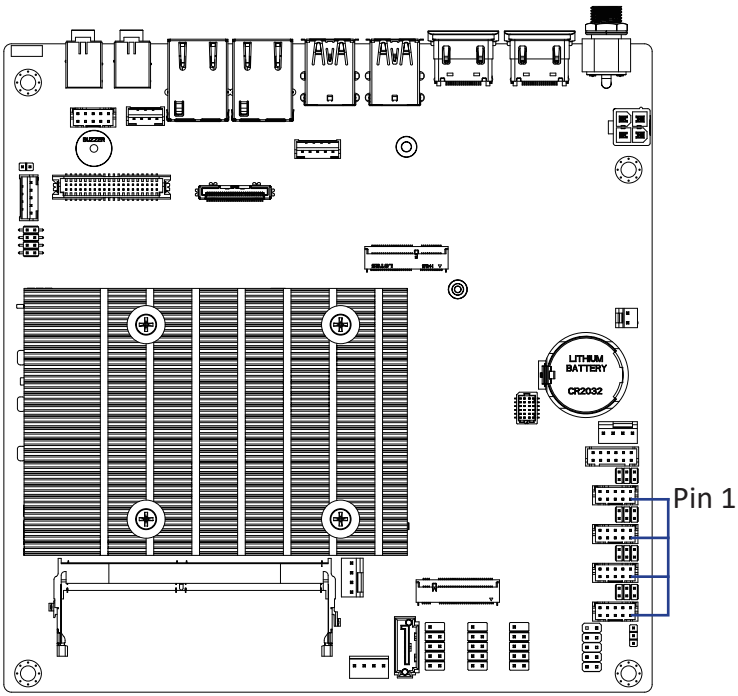
JCOM1, JCOM2, JCOM3, JCOM4 Jumper	
5 6 1 2	1-2 Close: 5V (Power COM)
5 6 1 2	3-4 Close: RI (Stand COM)
5 6 1 2	5-6 Close: 12V (Power COM)

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

Connector type
2x3pin header, pitch 2.0mm

2.2.13 COM1~4 (COM header (RS-232/422/485 & RI/5V/12V)

13



Serial Port Cable Connector
10 2 9 1

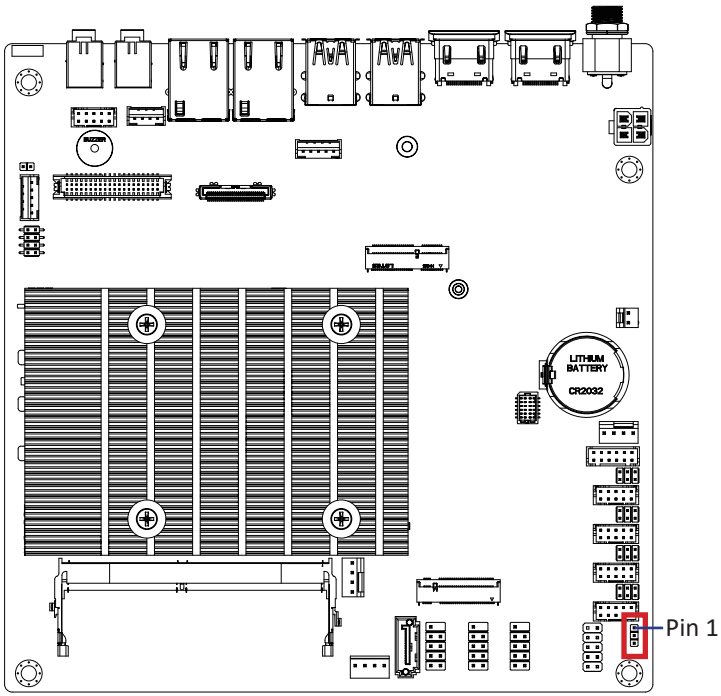
Pin No.	RS-232	RS-422 Full Duplex	RS-485 Half Duplex
1	RXD	TXD+	D+
2	DCD	TXD-	D-
3	DTR	RXD-	–
4	TXD	RXD+	–
5	DSR	–	–
6	GND	–	–
7	CTS	–	–
8	RTS	–	–
9	No Connect	–	–
10	RI	–	–

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

Connector type
2x5pin header, pitch 2.0mm

2.2.14 AT_CN (AT/ATX mode select jumper)

14



AT/ATX mode select jumper
1 

Connector PN	Vendor
220-96-03GB001K	PINREX

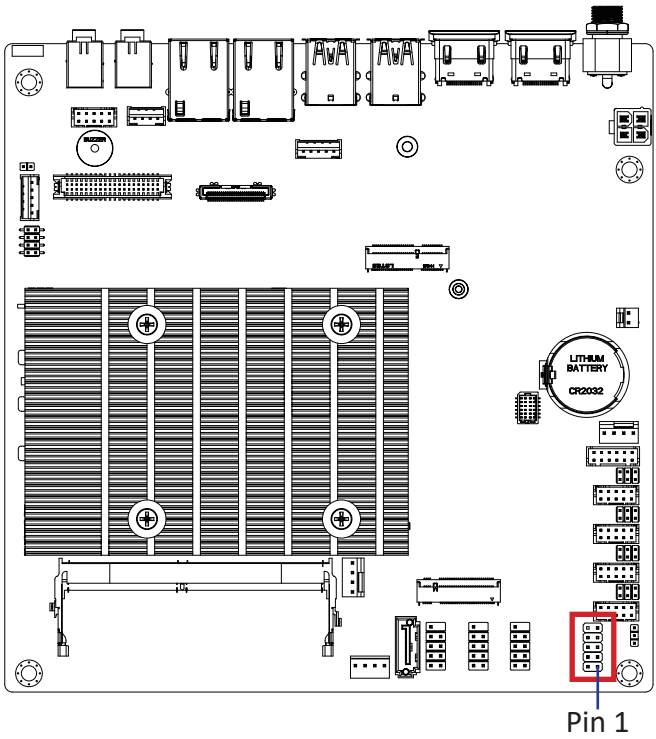
Connector type
1x3pin header, pitch 2.0mm

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)

2.2.15 SYS_PANEL (Front panel header)

15



System Panel Header
10 9  2 1

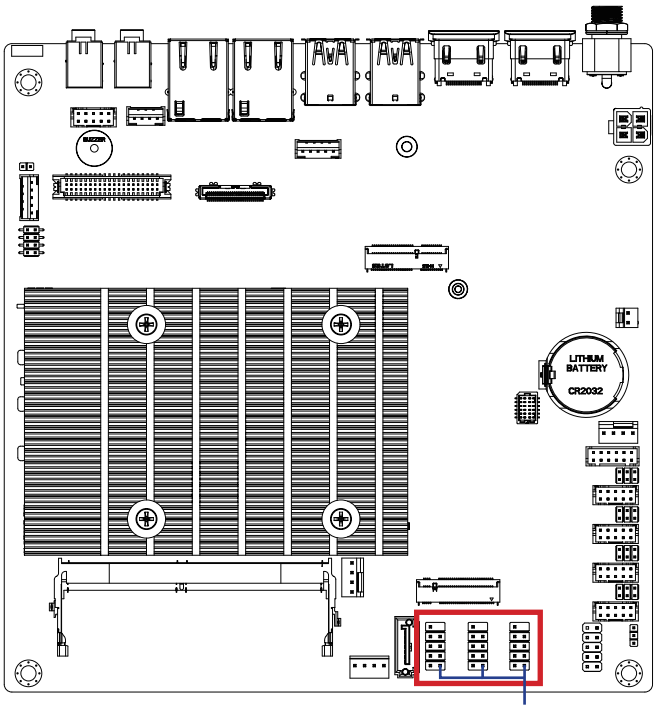
Connector PN	Vendor
210-92-05GW5W	PINREX

Connector type
2x5pin header, pitch 2.54mm

Pin No.	Definition
1	HDD LED+
2	Power LED+
3	HDD LED-
4	Power LED-
5	GND
6	Power Button+
7	Reset Button
8	Power Button-
9	No Connect
10	No Pin

2.2.16 F_USB2_1, F_USB2_2, F_USB2_3 (USB 2.0 header)

16



USB 2.0 Header
10 9 2 1

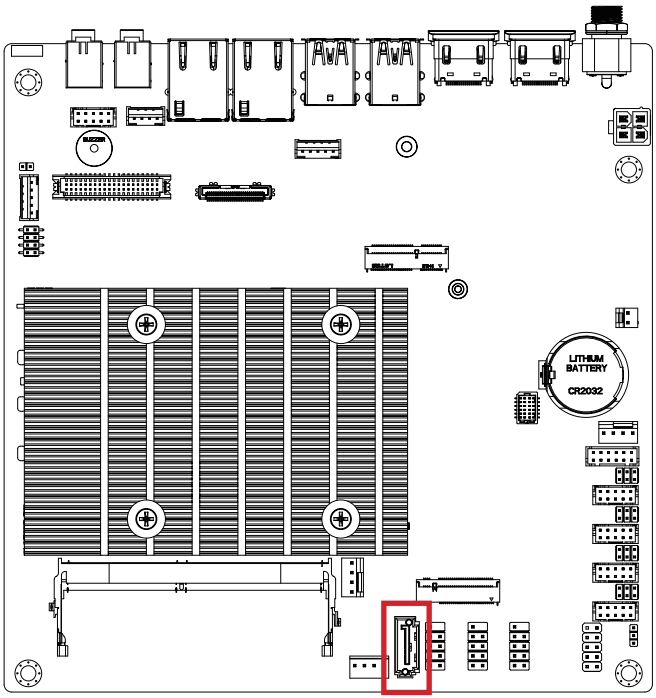
Pin No.	Definition
1	5V
2	5V
3	D2n
4	D1n
5	D2p
6	D1p
7	GND
8	GND
9	No Pin
10	NC

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

Connector type
2x5pin header, pitch 2.54mm

2.2.17 SATA (SATA 6Gb/s connector)

17



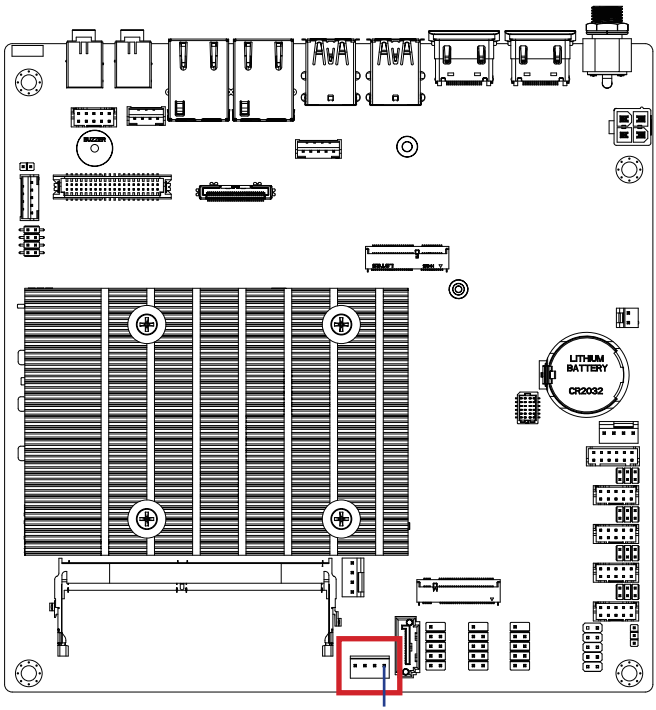
SATA 6Gb/s Connector
7  1

Connector PN	Vendor
WATF-07DBLBA1UW	WINWIN

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

2.2.18 SATAPWR (SATA power connector)

18



Hard Disk Power Connector
4 ■■■■ 1

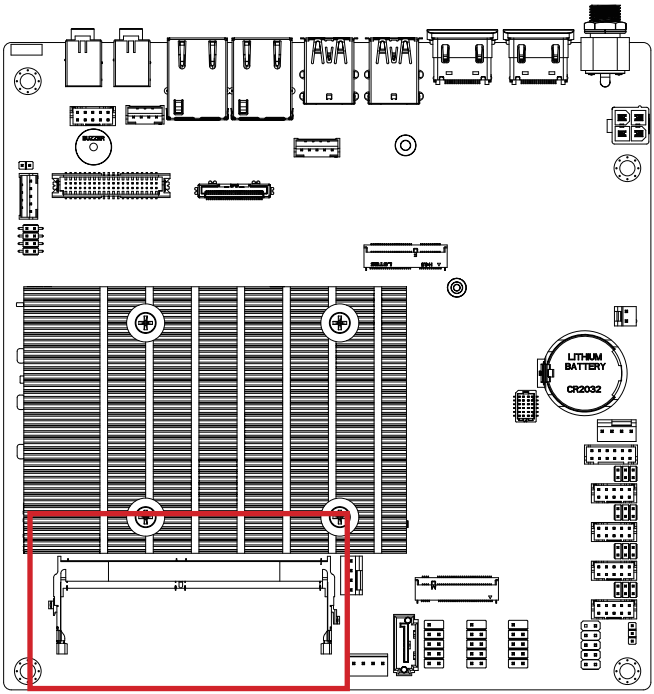
Pin No.	Definition
1	12V
2	GND
3	GND
4	5V

Connector PN	Vendor
743-91-045W00	PINREX

Connector type
1x4pin header, pitch 2.54mm

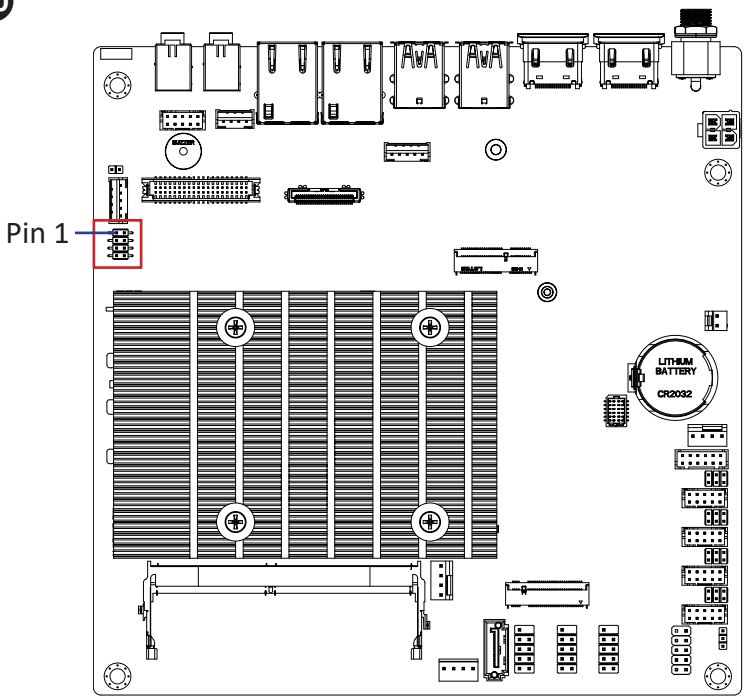
2.2.19 SODIMM1 (1 x DDR5 SO-DIMM Slot)

19



2.2.20 LSW (LVDS resolution jumper)

20



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

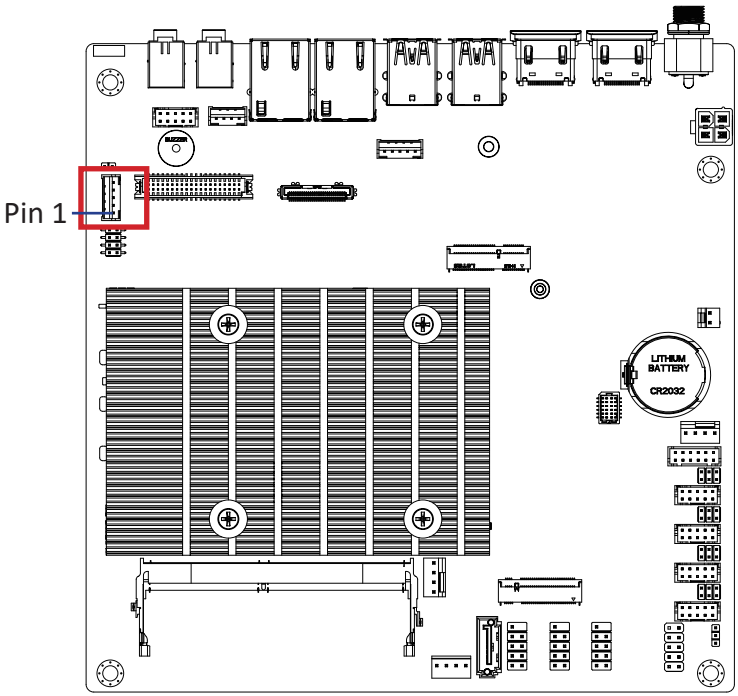
LVDS Resolution Jumper			
	1366 x 768 18bit		1920 x 1200 24bit

Connector PN	Vendor
222-97-04GBE1	PINREX

Connector type
2x4pin header, pitch 2.0mm

2.2.21 BKL_LVDS (Backlight Control header for LVDS)

21



Backlight control connector
5 1

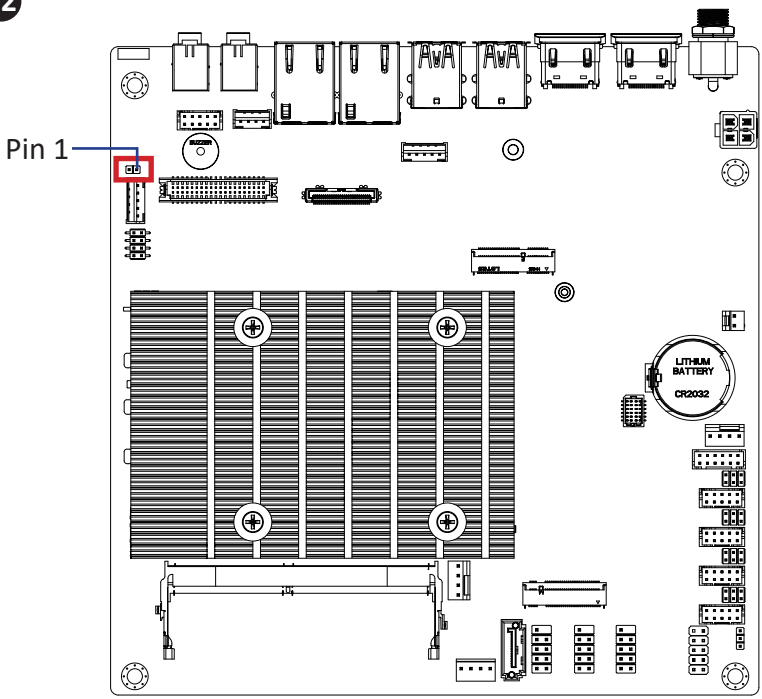
Connector PN	Vendor
721-81-05TW00	PINREX
A2001WV-05P146	JOINT-TECH

Connector type
1x5pin header, pitch 2.0mm

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

2.2.22 ME (ME Enable Jumper)

22

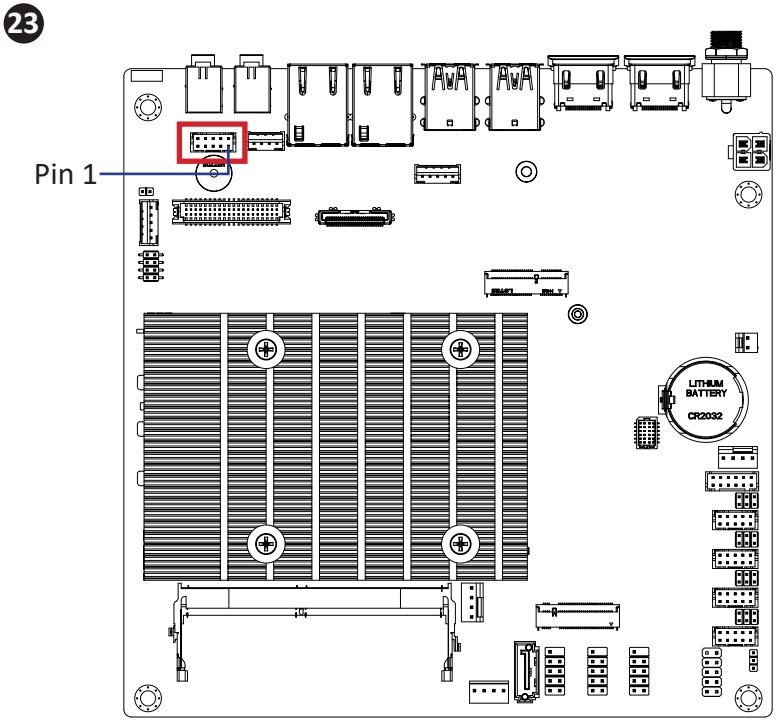


ME Enable Jumper
1 

Connector type
1x2pin header, pitch 2.0mm

ME Enable Jumper	
	Enable (Default setting)
	Disable

2.2.23 FP_AUDIO (Front panel audio header)



Front Audio Connector
10 2 9 1

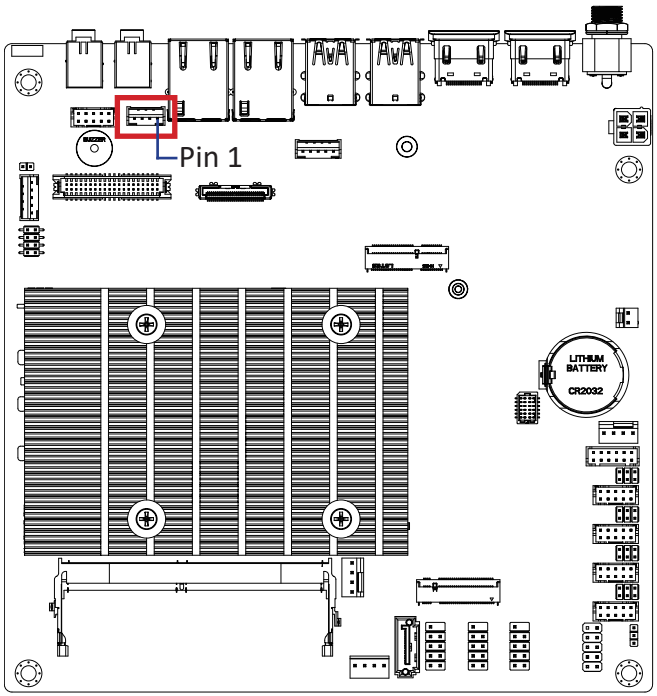
Pin No.	Definition	Pin No.	Definition
1	MIC_Left	6	GND
2	GND	7	FAUDIO_JD
3	MIC_Right	8	No Connect
4	Detect	9	HPOUT_Left
5	HPOUT_ Right	10	GND

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

Connector type
2x5pin header, pitch 2.0mm

2.2.24 SPKR (Speaker out connector)

24



Speaker out Connector
4 [connector] 1

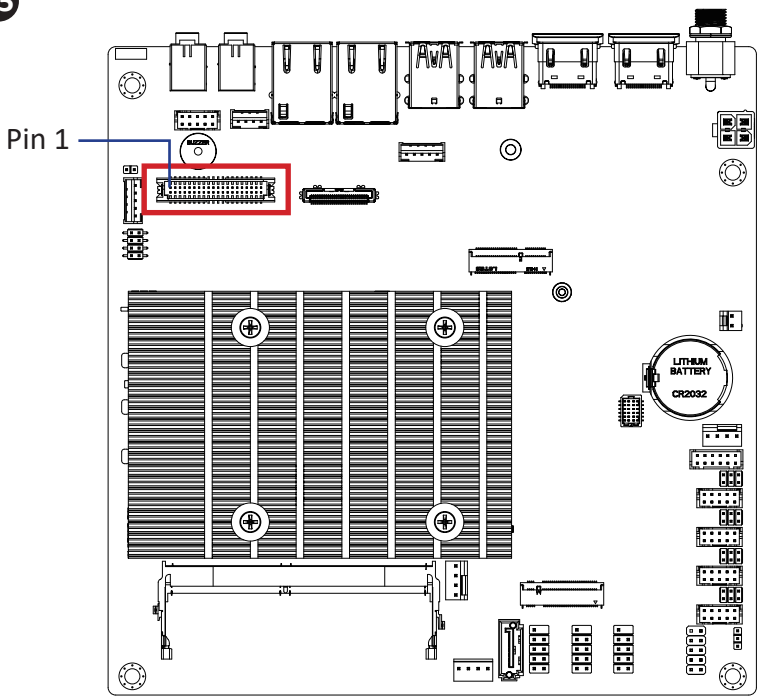
Pin No.	Definition
1	Speaker Out L+
2	Speaker Out L-
3	Speaker Out R-
4	Speaker Out R+

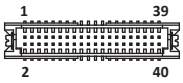
Connector PN	Vendor
721-81-045W00	PINREX
A2001WV-04P146	JOINT-TECH

Connector type
1x4pin header, pitch 2.0mm

2.2.25 LVDS (LVDS connector)

25



LVDS Connector			
			
Pin No.	Definition	Pin No.	Definition
1	3.3V	21	A5p
2	5V	22	A4p
3	3.3V	23	A5n
4	5V	24	A4n
5	SPEC0	25	GND
6	SPED0	26	GND
7	GND	27	A7p
8	GND	28	A6p
9	A1p	29	A7n
10	A0p	30	A6n
11	A1n	31	GND
12	A0n	32	GND
13	GND	33	CLK2p
14	GND	34	CLK1p

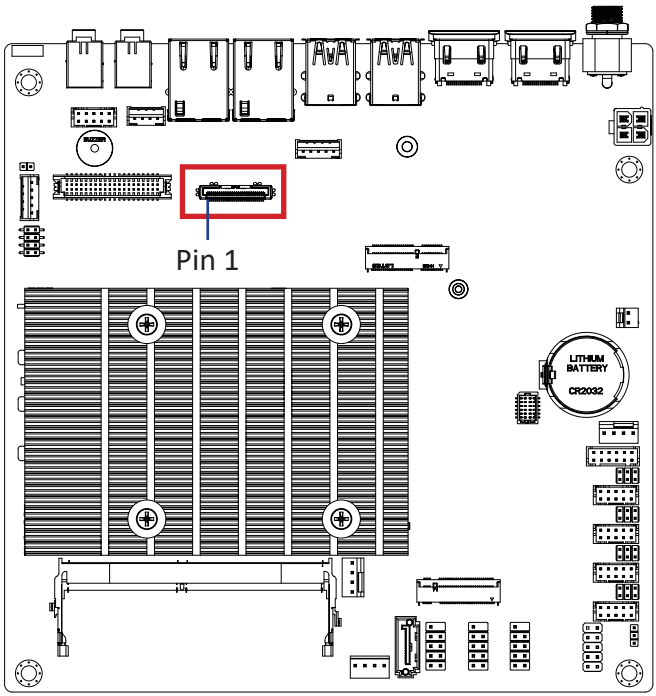
Pin No.	Definition	Pin No.	Definition
15	A3p	35	CLK2n
16	A2p	36	CLK1n
17	A3n	37	GND
18	A2n	38	GND
19	GND	39	12V
20	GND	40	12V

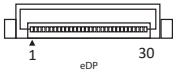
Connector PN	Vendor
712-76-40GWE0	PINREX
A1252WV-SF-2X20PD01	JOINT-TECH

Connector type
2x20pin header, pitch 1.25mm

2.2.26 EDP (Embedded Display Port Connector)

26



Embedded Display Port connector


Pin No.	Definition	Pin No.	Definition
1	GND	16	GND
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

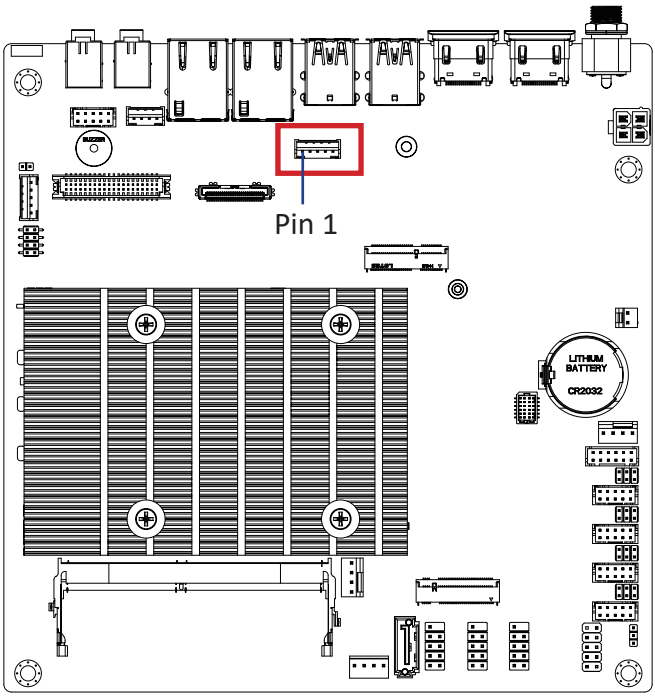
Pin No.	Definition	Pin No.	Definition
10	GND	25	3.3V
11	TX3n	26	GND
12	TX3p	27	5V
13	GND	28	5V
14	AUXn	29	5V
15	AUXp	30	5V

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

Connector type
1x30pin header, pitch 0.5mm

2.2.27 BKL_EDP (Backlight control header for EDP)

27



Backlight control connector
1 5

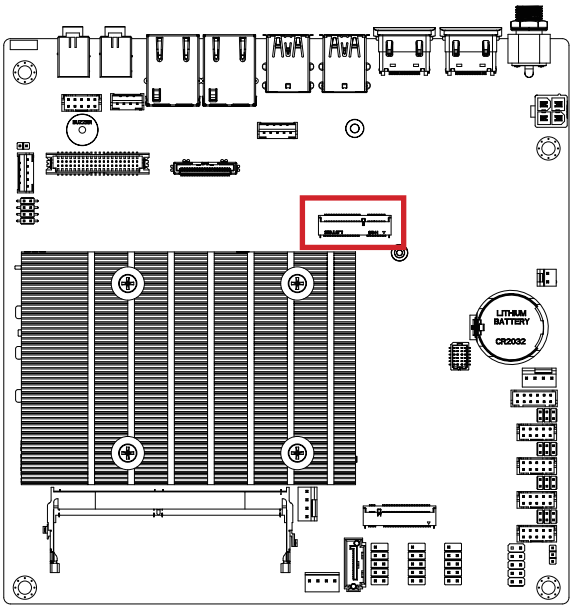
Pin No.	Definition
1	5V
2	PWM
3	Backlight Enable
4	GND
5	12V

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

Connector type
1x5pin header, pitch 2.0mm

2.2.28 M2E (M.2 Slot, 2230 E-key)

28



M.2 E Key Connector

74 2
75 1

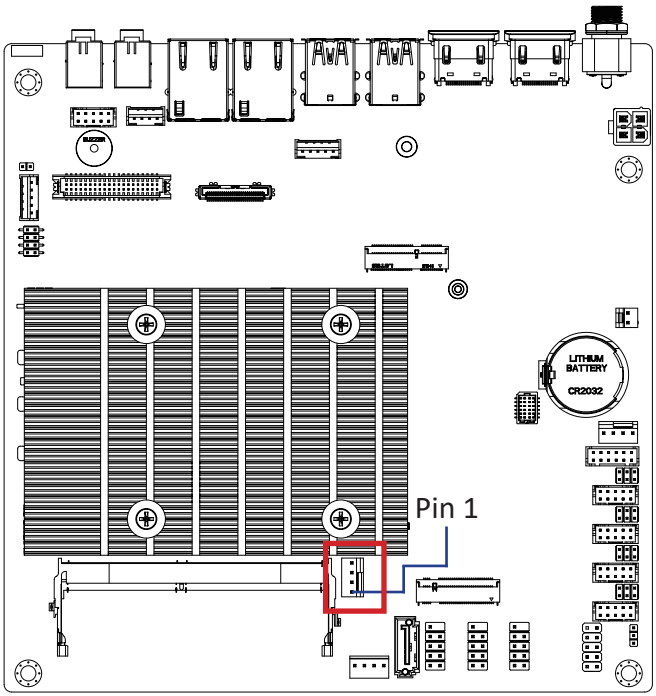
Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	D1p	4	3.3V
5	D1n	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	GND	14	NC
15	NC	16	NC
17	NC	18	GND
19	GND	20	NC
21	NC	22	NC
23	NC		

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	PCIE CLOCKp	46	NC
49	PCIE CLOCKn	48	NC
51	GND	50	SUSCLK
53	PCIE Clock Request	52	PCIRST
55	PCIE wake up	54	BT_Disable
57	GND	56	WLAN_DISABLE
59	NC	58	NC
61	NC	60	NC
63	GND	62	NC
65	NC	64	NC
67	NC	66	NC
69	GND	68	NC
71	NC	70	NC
73	NC	72	3.3V
75	GND	74	3.3V

Connector PN	Vendor
80152-8521	BELLWETHER
APCI0095-P002A	LOTES

2.2.29 CPU_FAN (CPU fan connector)

29



CPU FAN connector
4  1

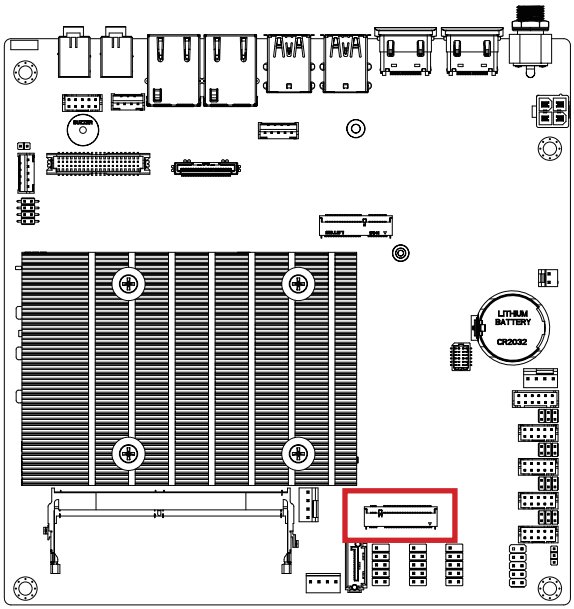
Pin No.	Definition
1	GND
2	12V
3	Detect
4	Speed Control

Connector PN	Vendor
744-81-045W1Z	PINREX

Connector type
1x4pin header, pitch 2.54mm

2.2.30 M2M (M.2 Slot, 2280 M-key)

30



M.2 M Key Connector	
74	2
75	1

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	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC

Pin No.	Definition	Pin No.	Definition
37	NC	38	DEVSLP
39	GND	40	SMB Clock
41	PCIE0 RXn/SATA Bp	42	SMB Data
43	PCIE0 RXp/SATA Bn	44	SMB Alert
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	PCIe Wake#
55	PCIE Clock p	56	NC
57	GND	58	NC

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

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

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

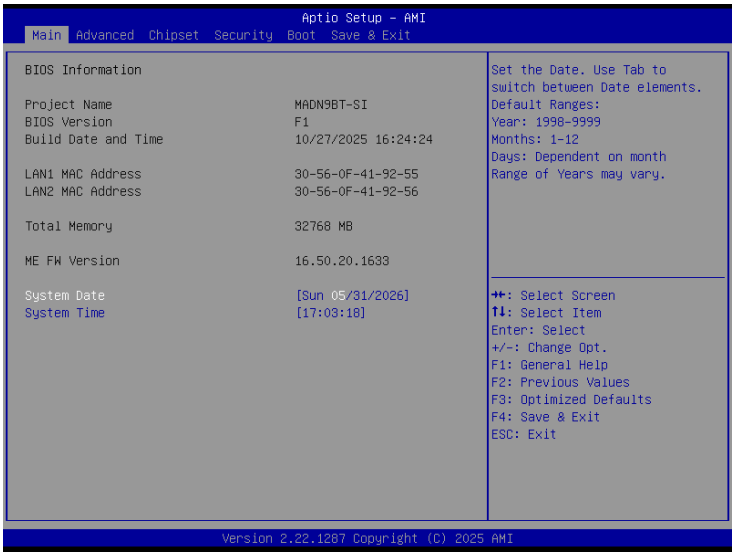
Once the system is power on, press the <DEL> key as soon as possible to access into BIOS Setup program.

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

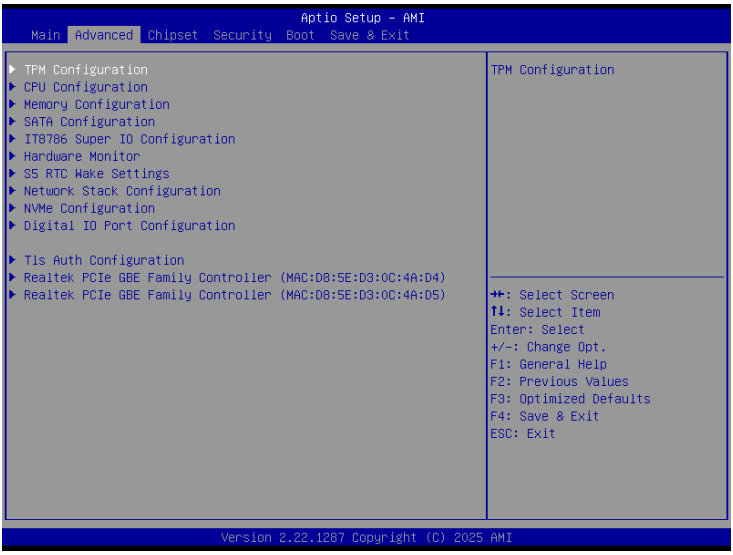
The main menu shows the basic system information.
Use arrow keys to move among the items.



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)

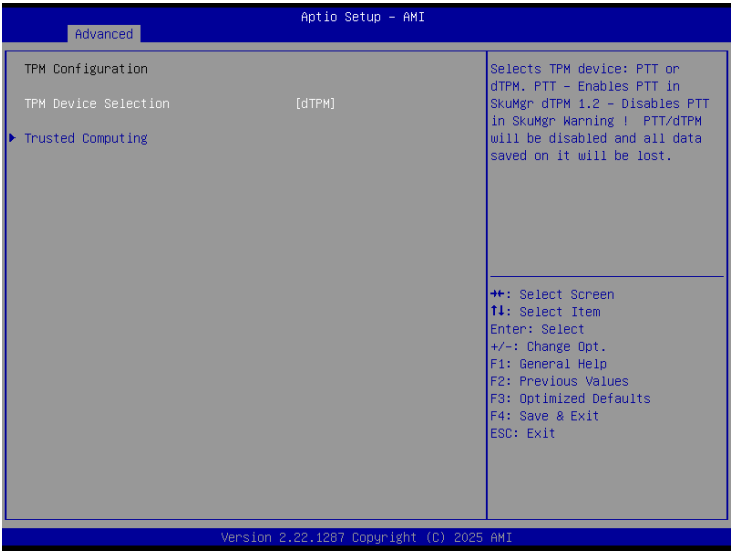
3.3 Advanced

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.



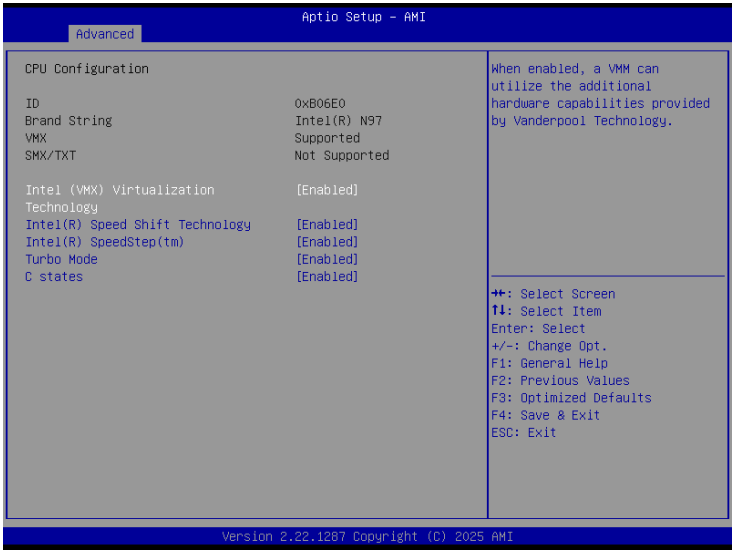
Item	Description
TPM Device Selection	**PTT : Internal TPM** **dTPM : External TPM (When using External TPM module or having TPM chip on MB) (Default setting)**

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

3.3.2 CPU Configuration

This submenu shows detailed CPU informations.

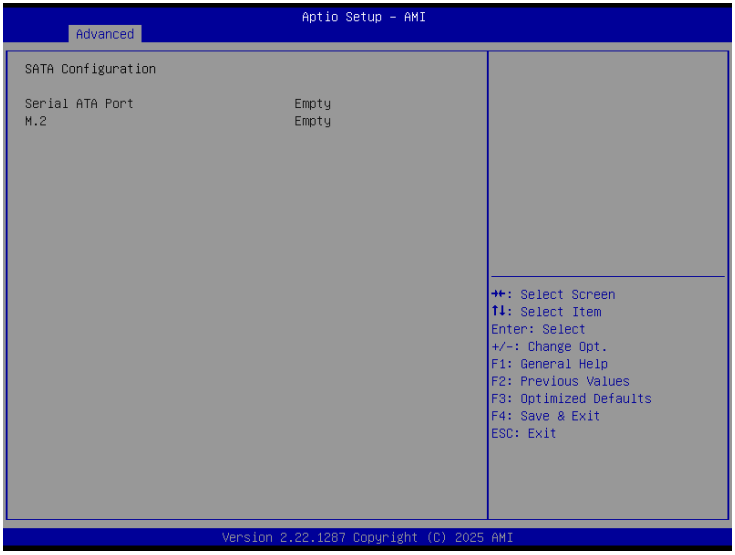


Item	Description
Intel (VMX) Virtualization Technology	Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. **Enabled : Enables Intel Virtualization Technology (Default setting)** **Disabled : Disables Intel Virtualization Technology**
Intel(R) Speed Shift Technology	To speed up CPU frequency transition time from basic frequency to maximum frequency. **Enabled : Enables Intel(R) Speed Shift Technology Interrupt control (Default setting)** **Disabled : Disables Intel(R) Speed Shift Technology Interrupt control**
Intel(R) SpeedStep(tm)	According to Intel CPU loading, Intel SpeedStep Technology will automatically adjust the CPU voltage and core frequency to decrease heat and power consumption for power saving. **Enabled : Enables Intel SpeedStep Technology (Default setting)** **Disabled : Disables Intel SpeedStep Technology**
Turbo Mode	**Enabled : Enables Turbo Mode (Default setting)** **Disabled : Disables Turbo Mode**
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**

3.3.3 Memory Configuration

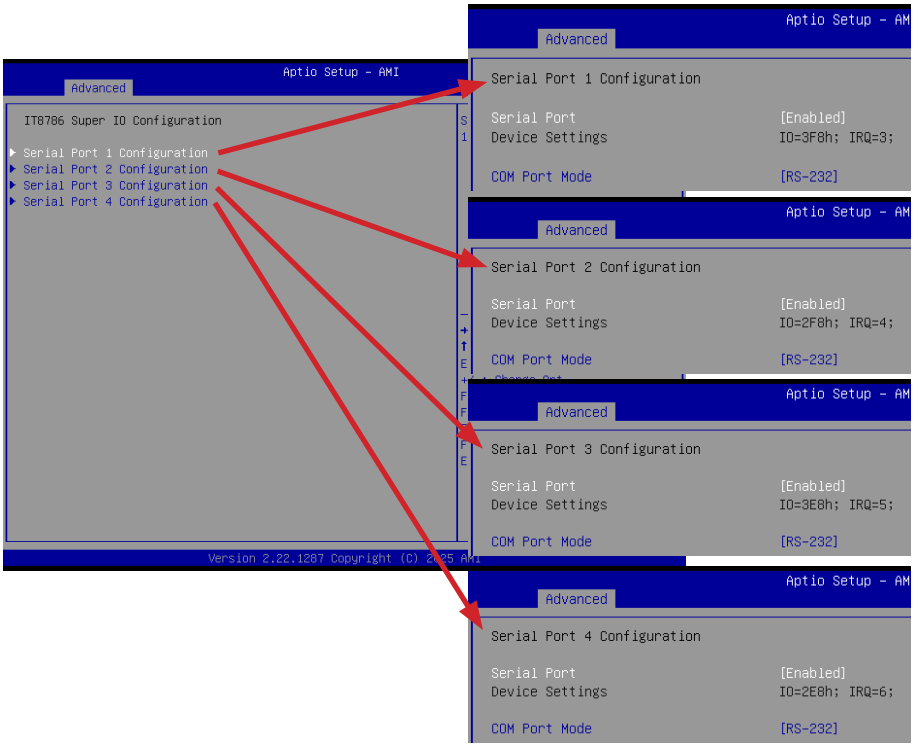
Item	Description
In-Band ECC Support	Enable or Disable In-Band ECC Support function. **Disabled : Disables In-Band ECC Support (Default setting)** **Enabled : Enables In-Band ECC Support**

3.3.4 SATA Configuration



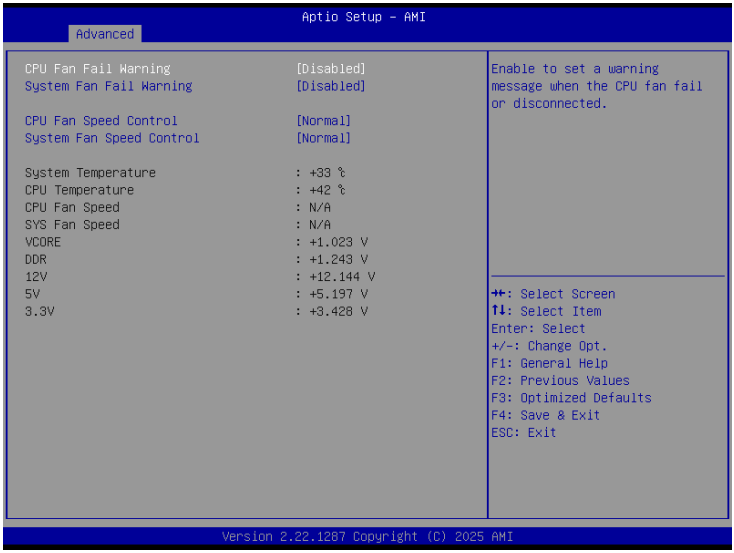
Item	Description
Serial ATA Port	shows 2.5" SATA HDD/SSD information
M.2	shows M.2 SATA interface SSD information

3.3.5 IT8786 Super IO Configuration



Item	Description
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** 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 2 Configuration	
Serial Port 3 Configuration	
Serial Port 4 Configuration	

3.3.6 Hardware Monitor

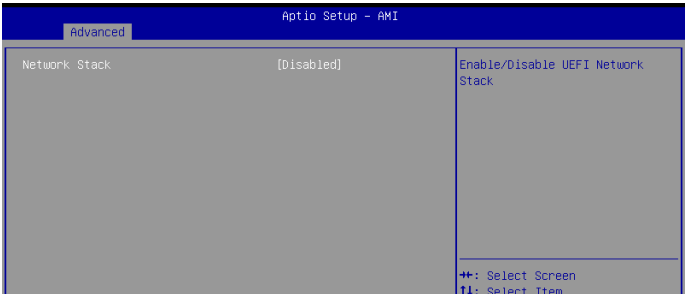


Item	Description
CPU Fan Fail Warning	**Enabled : Enables CPU FAN Fail warning alert function** **Disabled : Disables CPU FAN Fail warning alert function (Default setting)**
System Fan Fail Warning	**Enabled : Enables System FAN Fail warning alert function** **Disabled : Disables System FAN Fail warning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

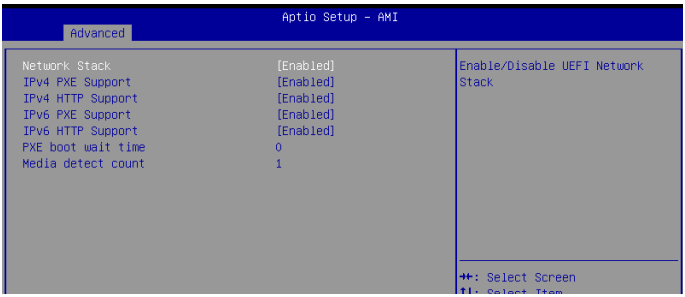
3.3.7 S5 RTC Wake Settings

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)**

3.3.8 Network Stack Configuration



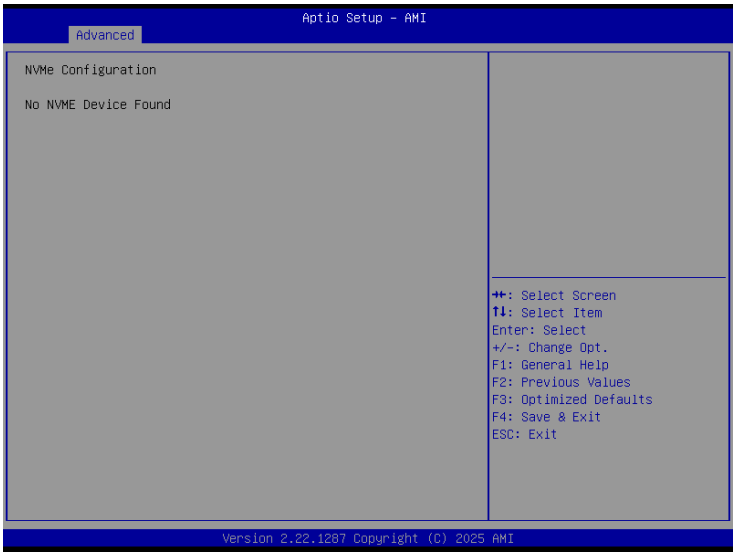
When Network stack is enabled :



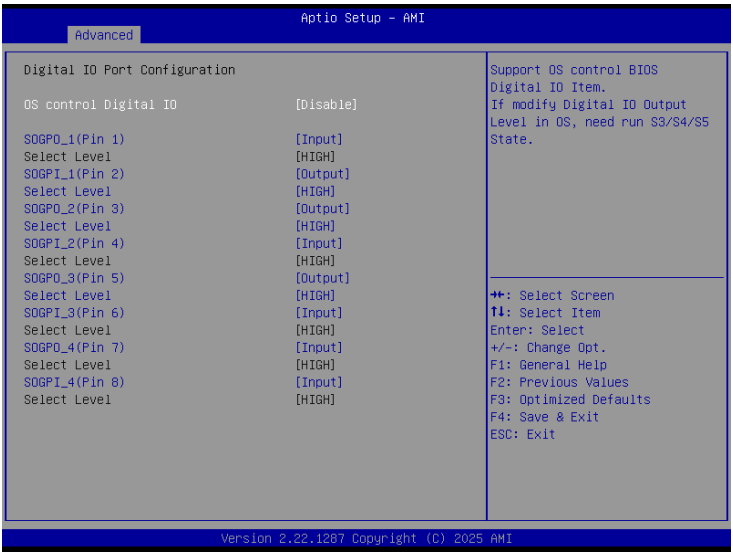
Item	Description
Network Stack	When system is power on, install LAN driver under UEFI mode **Disabled : Disables UEFI Network Stack (Default setting)** **Enabled : Enables UEFI Network Stack**
IPv4 PXE Support	When Network stack is enabled : **Disabled : Disables IPv4 PXE Support** **Enabled : Enables IPv4 PXE Support**
IPv4 HTTP Support	When Network stack is enabled : **Disabled : Disables IPv4 HTTP Support** **Enabled : Enables IPv4 HTTP Support**
IPv6 PXE Support	When Network stack is enabled : **Disabled : Disables IPv6 PXE Support** **Enabled : Enables IPv6 PXE Support**
IPv6 HTTP Support	When Network stack is enabled : **Disabled : Disables IPv6 HTTP Support** **Enabled : Enables IPv6 HTTP Support**
PXE boot wait time	Wait time in seconds, or use ESC key to abort the PXE boot.
Media detect count	Number of times the presence of media will be checked.

3.3.9 NVMe Configuration

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

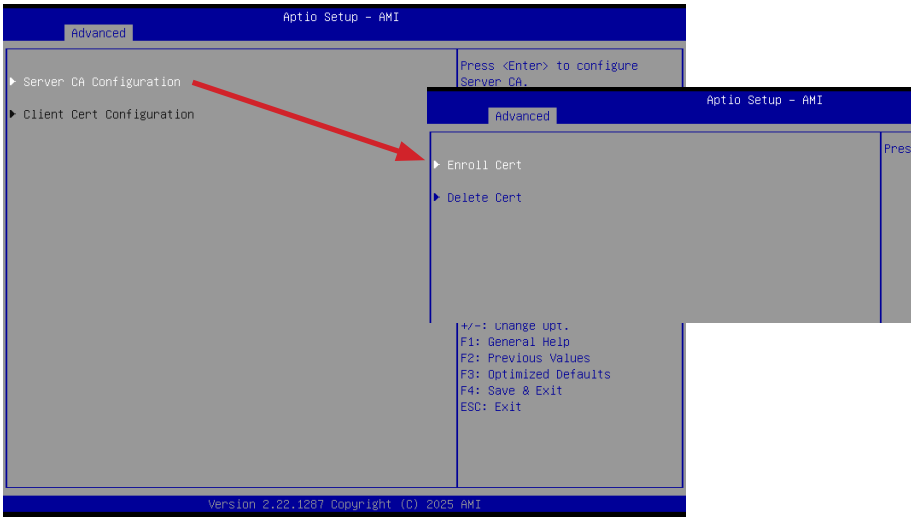


3.3.10 Digital IO Port Configuration



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.

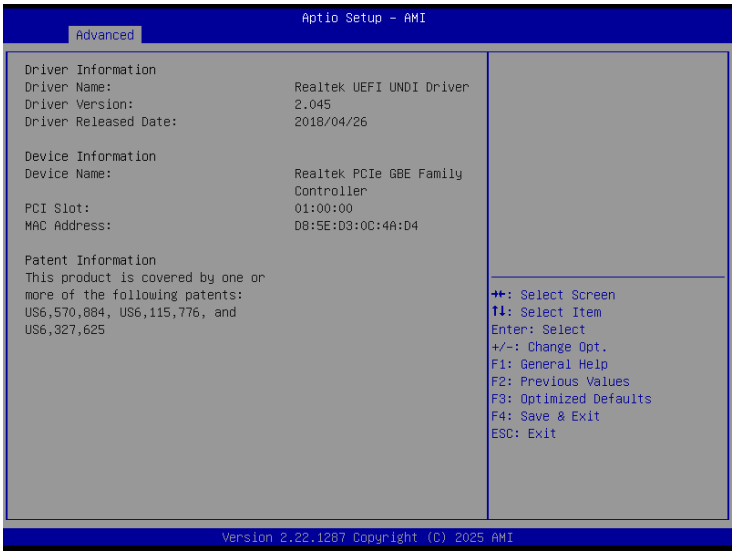
3.3.11 Tls Auth Configuration



Item	Description
Enroll Cert	Press [Enter] to configure advanced items : **Server CA Configuration :** Enroll Cert : 1. Enroll Cert Using File 2. Cert GUID : Input digit character in 11111111-2222-3333-4444-1234567 890ab format. 3. Commit Changes and Exit 4. Discard Changes and Exit

3.3.12 Realtek PCIe GBE Family Controller (MAC:D8:5E:D3:0C:4A:D4) (MAC address may varied based on different motherboard)

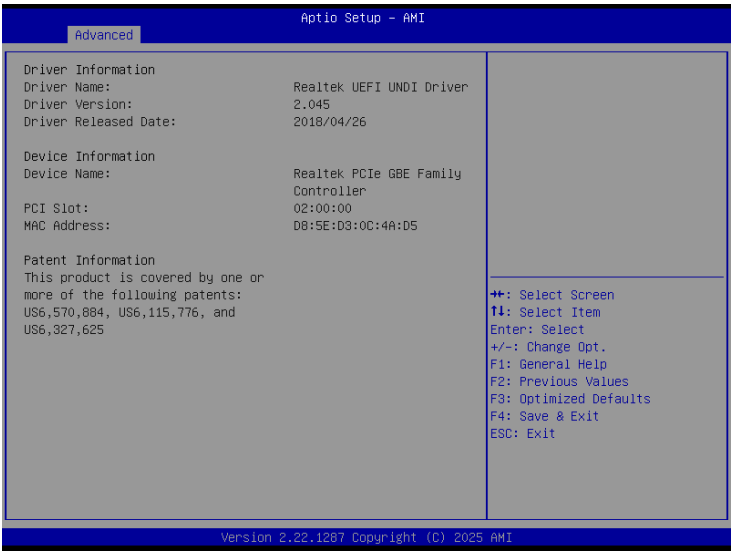
Shows Realtek Ethernet controller information



NOTE：MAC address may varied based on different motherboard

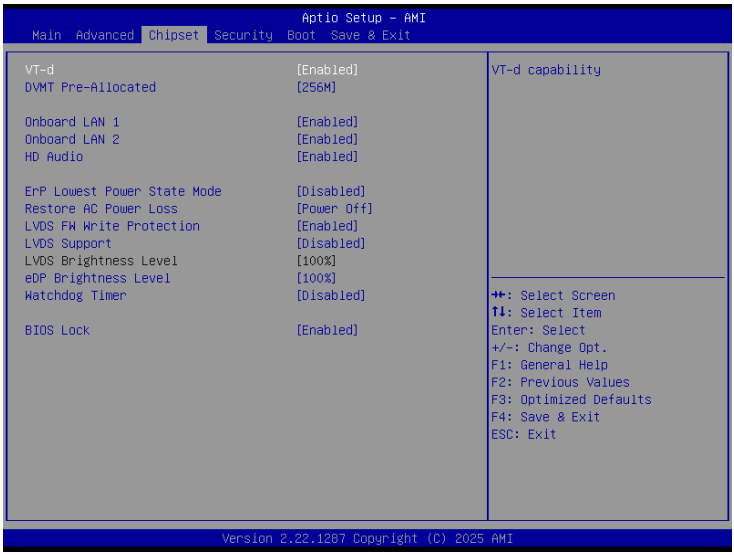
3.3.13 Realtek PCIe GBE Family Controller (MAC:D8:5E:D3:0C:4A:D5) (MAC address may varied based on different motherboard)

Shows Realtek Ethernet controller information



NOTE：MAC address may varied based on different motherboard

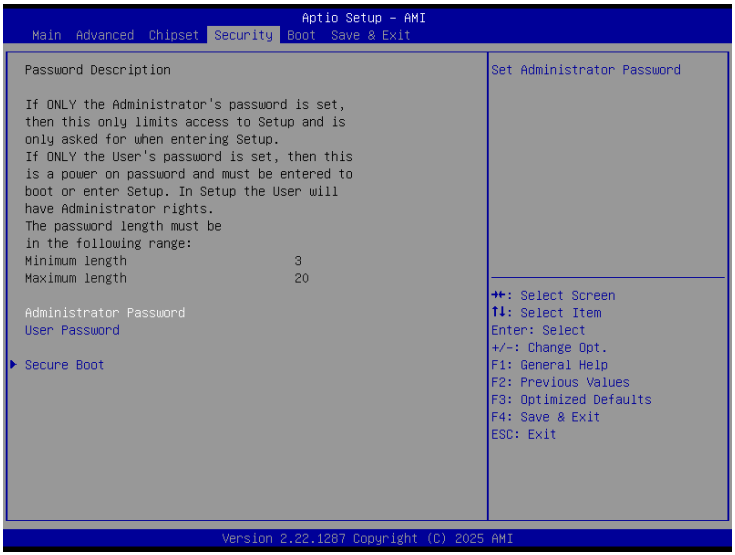
3.4 Chipset



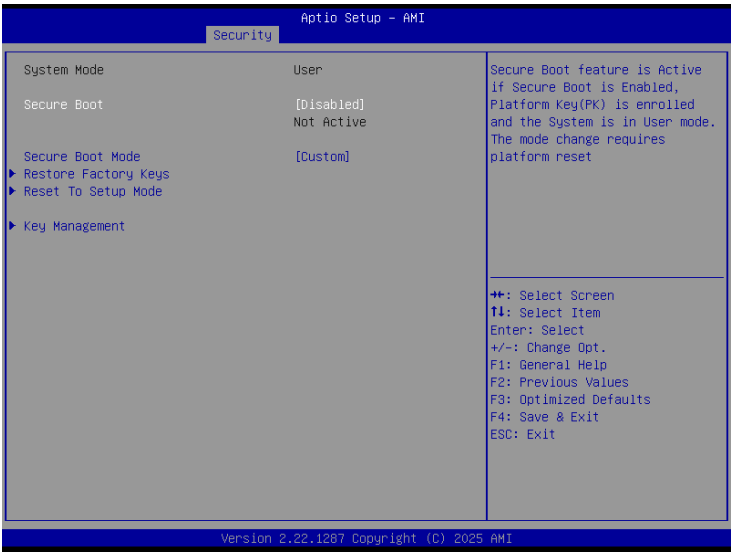
Item	Description
VT-d	**Enabled : Enables VT-d function (Default setting)** **Disabled : Disables VT-d function**
DVMT Pre-Allocated	Use DVMT Pre-Allocated to set the amount of system memory which is installed to the integrated graphics processor **Option items : 32M , 64M, 128M, 256M (Default setting)**
Onboard LAN 1 **Onboard LAN 2**	Enable/Disable onboard LAN controller **Enabled : Enables onboard LAN controller (Default setting)** **Disabled : Disables onboard LAN controller**
HD Audio	Enable/Disable onboard audio controller **Enabled : Enables onboard audio controller (Default setting)** **Disabled : Disables onboard audio controller**
ErP Lowest Power State Mode	Enable/Disable power saving funtion **Enabled : Enables ERP Lowest Power State Mode** **Disabled : Disabled ERP Lowest Power State Mode (Default setting)**

Restore AC Power Loss	To set which option the system should returns if a sudden power loss occured **Power on : System power on when the power is back** **Power off : Do not power on when the power is back (Default setting)** **Last state : Restore the system to the state before power loss occures**
LVDS FW Write Protection	**Disabled : Disables LVDS FW Write Protection (Default setting)** **Enabled : Enables LVDS FW Write Protection**
LVDS Support	**Disabled : Disables LVDS Support (Default setting)** **Enabled : Enables LVDS Support**
LVDS Brightness Level	When LVDS Support is enabled : To modified the backlight brightness of the LVDS panel **Option items : 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% (Default Setting)**
eDP Brightness Level	To modified the backlight brightness of the LVDS panel **Option items : 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% (Default Setting)**
Watchdog Timer	Enable/Disable Watchdog Timer function **Enabled : Enables Watchdog Timer function** **Disabled : Disabled Watchdog Timer function (Default setting)**
BIOS Lock	Enable/Disable BIOS Lock function **Enabled : Enables BIOS Lock function (Default setting)** **Disabled : Disabled BIOS Lock funtion**

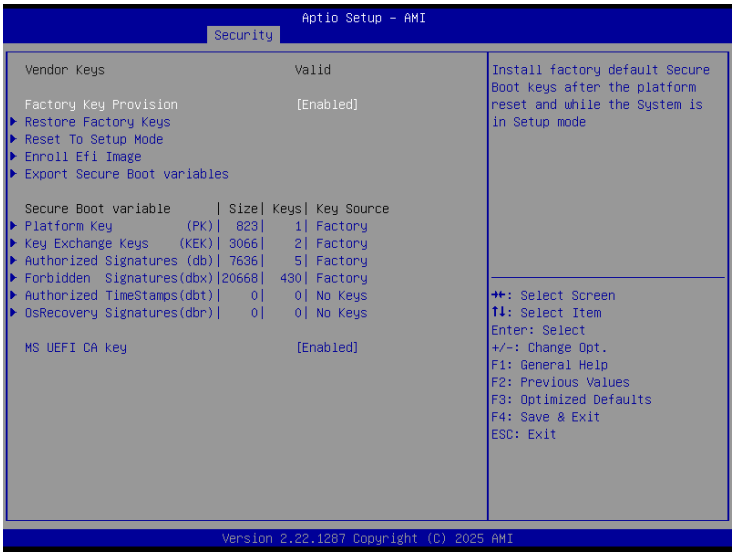
3.5 Security



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

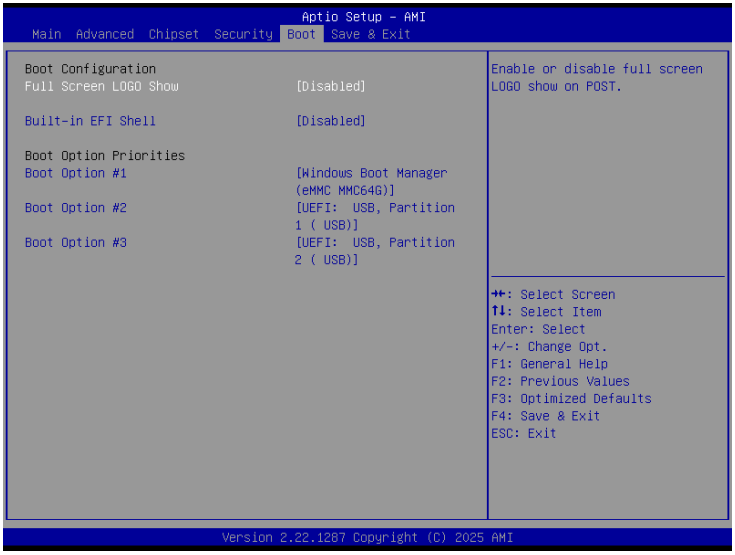


Item	Description
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode **Enabled : Enables Factory Key Provision (Default setting)** **Disabled : Disables Factory Key Provision**
Restore Factory Keys	To restore factory settings **Yes : 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**
Enroll Efi Image	Allow the image to run in Secure Boot mode
Export Secure Boot variables	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device

Item	Description
Platform Key (PK)	These items allows you to enroll factory defaults or load Certificates from a file.
Key Exchange Keys (KEK)	
Authorized Signatures (db)	
Forbidden Signatures (dbx)	
Authorized TimeStamps (dbt)	
OsRecovery Signatures (dbr)	
MS UEFI CA Key	Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database(db)

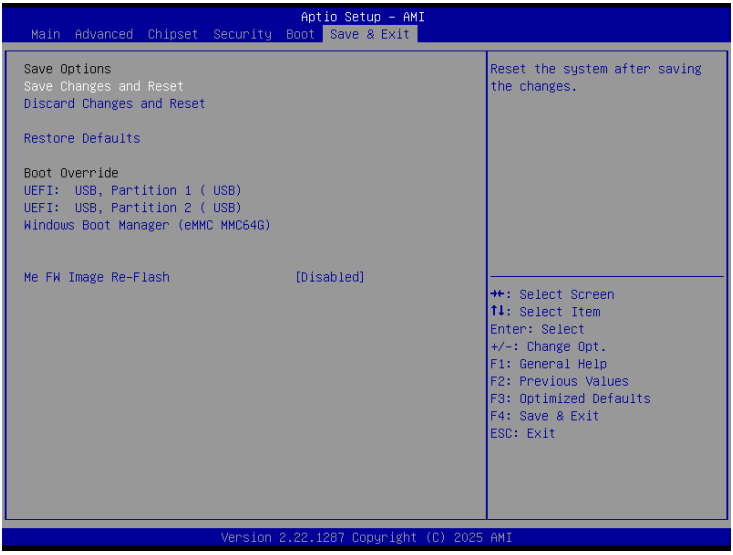
3.6 Boot

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)**
Built-in EFI Shell	Enable/Disable Built-in EFI Shell **Enabled : Enables Built-in EFI Shell** **Disabled : Disables Built-in EFI Shell (Default setting)**
Boot Option Priorities	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-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)**