GIGAIPC

uATX-Q47EA (MQ47EAM)

Micro-ATX Motherboard
User's Manual 1st Ed

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
uATX-Q47EA (MQ47EAM)	1
IO Shield	1
CABLE SATA	2

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	○	○	○	○	○	○

○: 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

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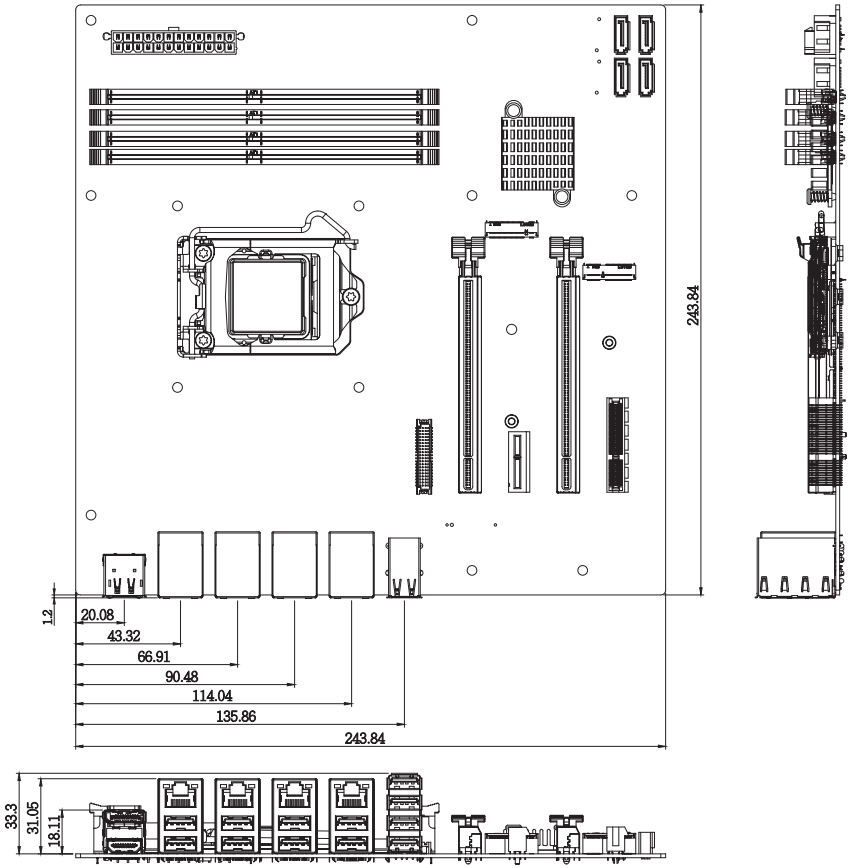
Chapter 1

Chapter1 - Product Specifications


243.84
1.2
20.08
43.32
66.91
90.48
114.04
135.86
243.84
33.3
31.05
18.11

1.1 Specifications

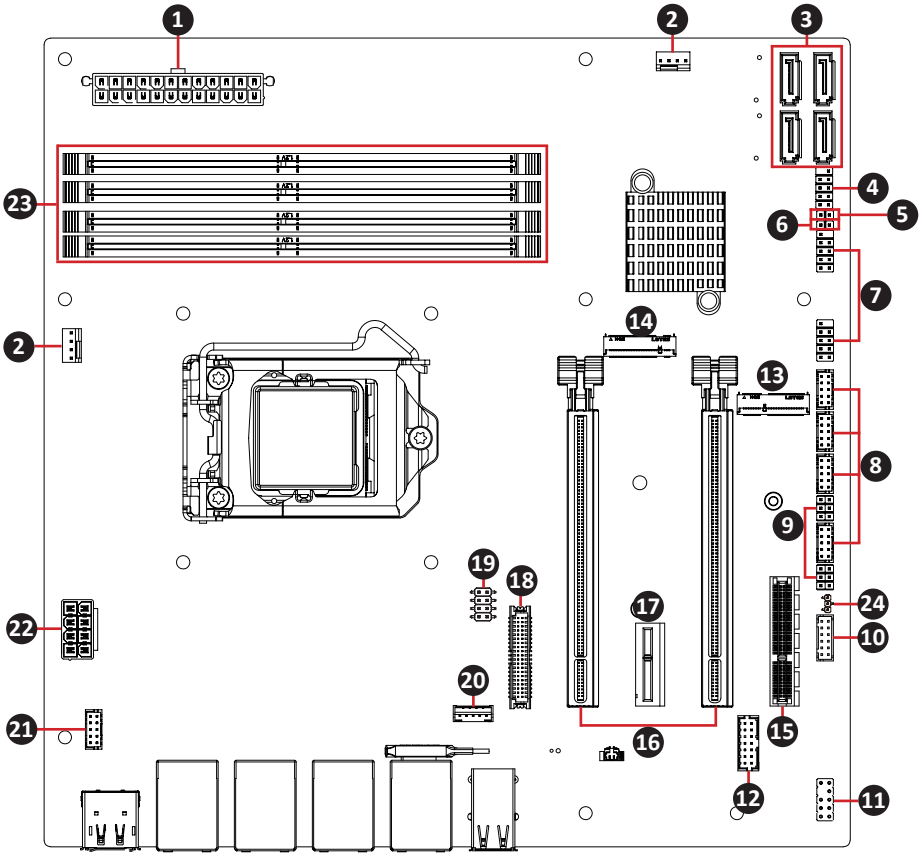
Motherboard	uATX-Q47EA (MQ47EAM)
Form Factor	Micro ATX 244W x 244D(mm)
CPU	Support for 11th/10th Generation Intel® Core™ i9/i7/i5/i3, Pentium® & Celeron® processors in the LGA1200 package TDP under 95W
Socket	1 x LGA 1200
Chipset	Intel® Q470E Express Chipset
Memory	4 x DDR4 DIMM sockets, Max. Capacity 128 GB Support Dual channel DDR4 2933/2666 MHz memory modules
Ethernet	4 x GbE LAN Ports (1 x Intel® I219LM and 3 x Intel® I211AT)
Video	Integrated Graphics Processor - depends on CPU: 1 x HDMI 1.4 port, supporting a maximum resolution of 4096x2160 @30Hz 1 x Display port, supporting a maximum resolution of 4096x2160 @60Hz 1 x VGA port, supporting a maximum resolution of 1920x1200 @60Hz 1 x LVDS port, supporting a maximum resolution of 1920x1080 @60Hz (3 independent display outputs)
Audio	Realtek® Audio Codec
Storage	4 x SATA 6Gb/s Ports
Raid	RAID 0/1/5/10
Expansion Slots	1 x PCIe x16 (Gen 3x16)(PCIEX16_A) * The PCIEX16_A slot shares bandwidth with the PCIEX16_B slot. * The PCIEX16_A slot operates at up to x8 mode when a device is installed in the PCIEX16_B slot. 1 x PCIe x16 (Gen 3x8)(PCIEX16_B) 1 x PCIe x4 (Gen3 x4) 1 x PCIe x1 (Gen3 x1) 1 x 2230 M.2 E-Key (PCIe x1 + USB 2.0) 1 x 2280/2242 M.2 M-Key (PCIe x4, SATA 6Gb/s)

Motherboard	uATX-Q47EA (MQ47EAM)
Internal I/O	1 x 24-pin ATX main power connector 1 x 8-pin ATX 12V 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 VGA header 1 x Backlight Control header 1 x AT/ATX mode select jumper 4 x USB 2.0 headers 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 Buzzer 1 x Clear CMOS jumper
Rear I/O	1 x HDMI 1 x Display Port 4 x RJ45 LAN Ports 8 x USB 3.2 Gen 1 4 x USB 2.0
TPM	1 x TPM header
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

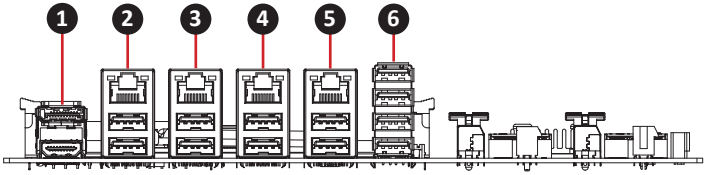
Chapter 2 – Hardware Information

2.1 Jumpers and Connectors



No	Code	Description
1	ATX	24-pin ATX main power connector
2	SYS_FAN, CPU_FAN	Fan connector
3	SATA2, SATA3 SATA4, SATA5	SATA 6 Gb/s Connector x 4
4	F_PANEL	Front panel header
5	CLR_CMOS	Clear CMOS jumper
6	ME_EN	ME Enable jumper
7	FUSB2_1, FUSB2_2	USB 2.0 header
8	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
9	JCOM1, JCOM2	RI pin RI/5V/12V Select jumper for COM1 & COM2 Port
10	GPIO_CNT	General Purpose input/output header
11	FP_AUDIO	Front panel audio header
12	LPC_CN	TPM header
13	M2E	M.2 2230 E Key slot
14	M2M	M.2 Slot 2242/2280 Storage SATA
15	PCIEX4	PCIe x4 (Gen3 x4) Slot
16	PCIEX16_A, PCIEX16_B	PCIe x16 Slot
17	PCIEX1	PCIe x1 (Gen3 x1) Slot
18	LVDS	LVDS connector
19	LSW	LVDS resolution jumper
20	BKL_CN	Backlight Control header
21	VGA	VGA header
22	ATX_12V	8-pin ATX 12V power connector (for CPU)
23	DDR4_1, DDR4_2 DDR4_3, DDR4_4	DDR4 DIMM Sockets x 4
24	ATX_SEL	AT/ATX mode select jumper

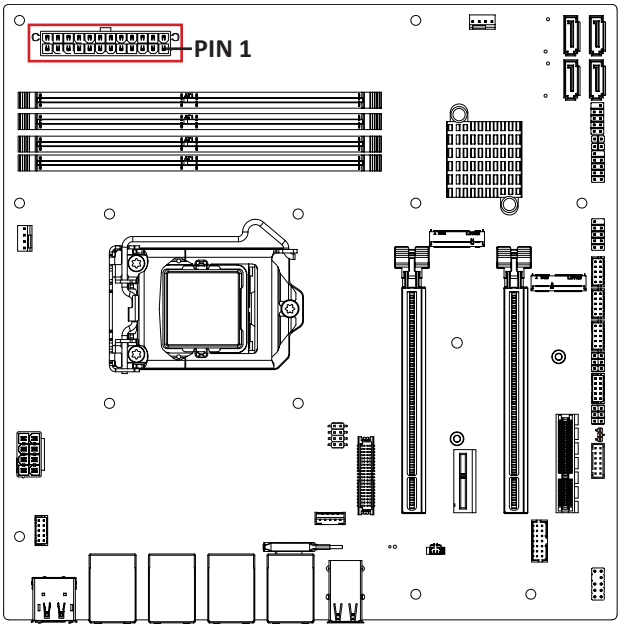
2.1.1 Rear I/O Connector

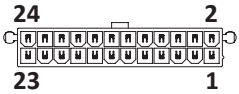


No	Code	Description
1	HDMI_DP	1 x Display Port (top) 1 x HDMI (bottom)
2	USB31_LAN4	1 x RJ45 LAN Port (top) 2 x USB 3.2 Gen 1 (bottom)
3	USB31_LAN3	1 x RJ45 LAN Port (top) 2 x USB 3.2 Gen 1 (bottom)
4	USB31_LAN2	1 x RJ45 LAN Port (top) 2 x USB 3.2 Gen 1 (bottom)
5	USB31_LAN1	1 x RJ45 LAN Port (top) 2 x USB 3.2 Gen 1 (bottom)
6	USB20	4 x USB 2.0 Ports

2.2.1 ATX (24 pin ATX main power connector)

1



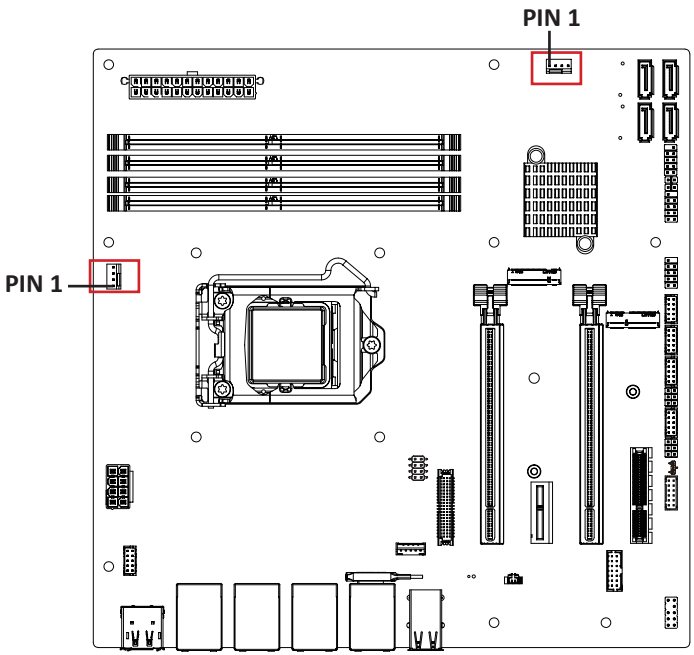
ATX power connector


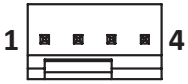
Connector PN	Vendor
740-41-24TW46	PINREX
ABA-POW-013-K08	LOTES

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

2.2.2 SYS_FAN, CPU_FAN (Fan connector)

❷



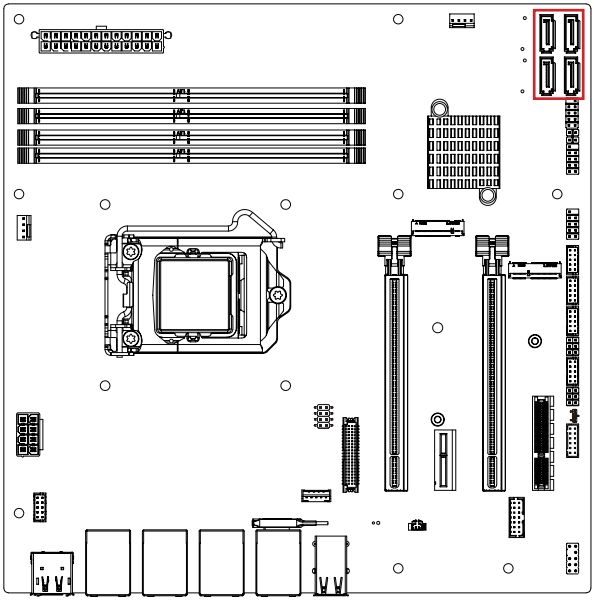
System FAN Connector


Connector PN	Vendor
744-81-045R11	PINREX
WF04R22RJQ105	HORNGTONG

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

2.2.3 SATA2, SATA3, SATA4, SATA5 (SATA 6Gb/s Connector)

3



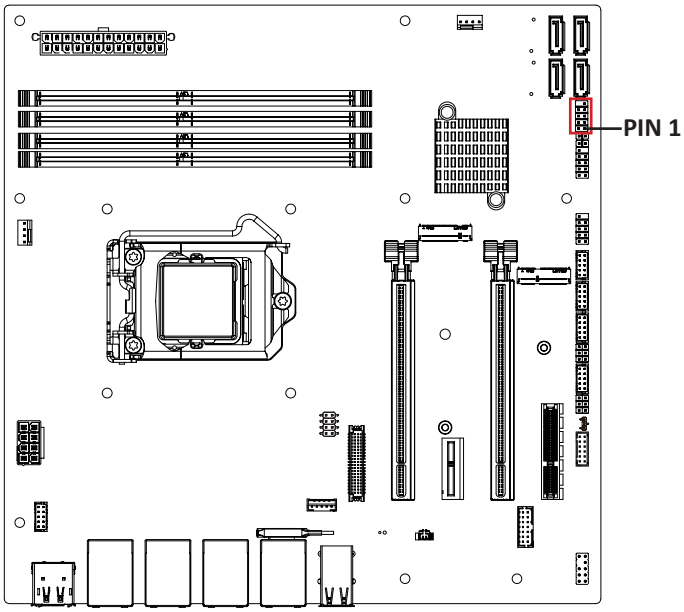
SATA 6Gb/s Connector


Connector PN	Vendor
WATM-07ABNB2BAUW3	WINWIN
770-83-07SW19	PINREX

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

2.2.4 F_PANEL (Front panel header)

4



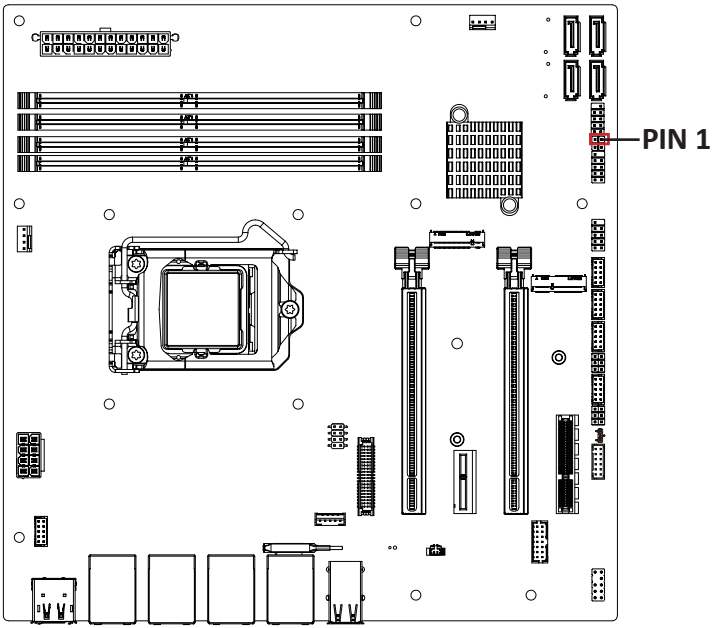
Front panel header
10 9 2 1

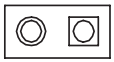
Connector PN	Vendor
210-92-05GB02	PINREX
PH10R53BAZ010	HORNGTONG

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

2.2.5 CLR_CMOS (Clear CMOS jumper)

5



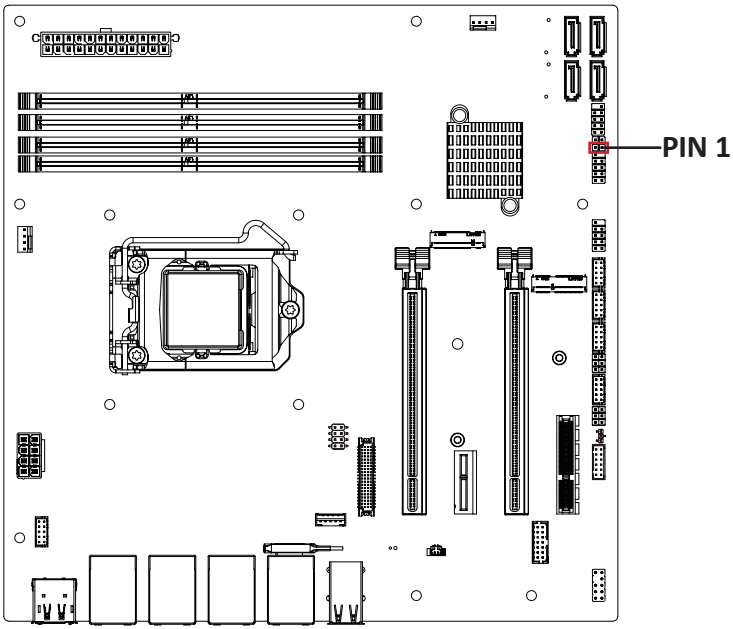
Clear CMOS connector


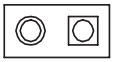
Clear CMOS Jumper	
	Disable
	Enable

Connector PN	Vendor
210-91-02GBK2	PINREX
PH02R23BAZE11	HORNGTONG

2.2.6 ME_EN (ME Enable jumper)

6



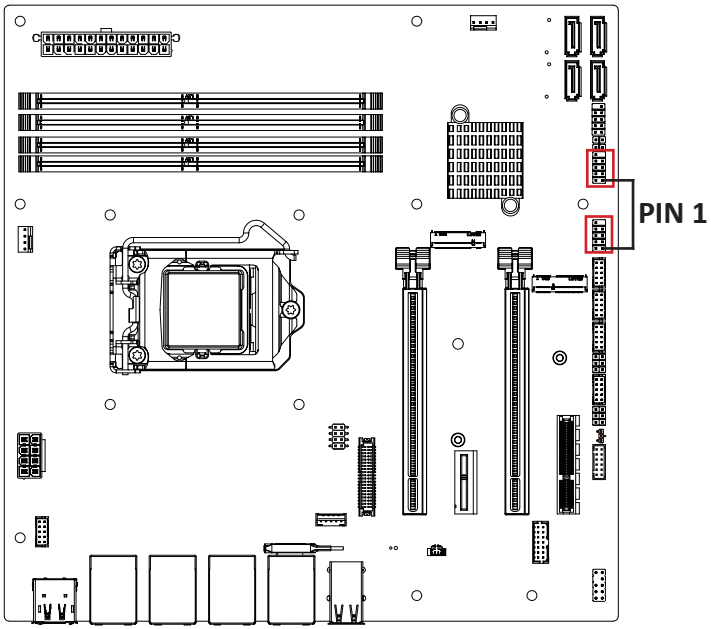
ME Enable connector


Connector PN	Vendor
210-91-02GBK2	PINREX
PH02R23BAZE11	HORNGTONG

ME Enable Jumper	
	Enable
	Disable

2.2.7 FUSB2_1, F_USB2_2 (USB 2.0 header)

7



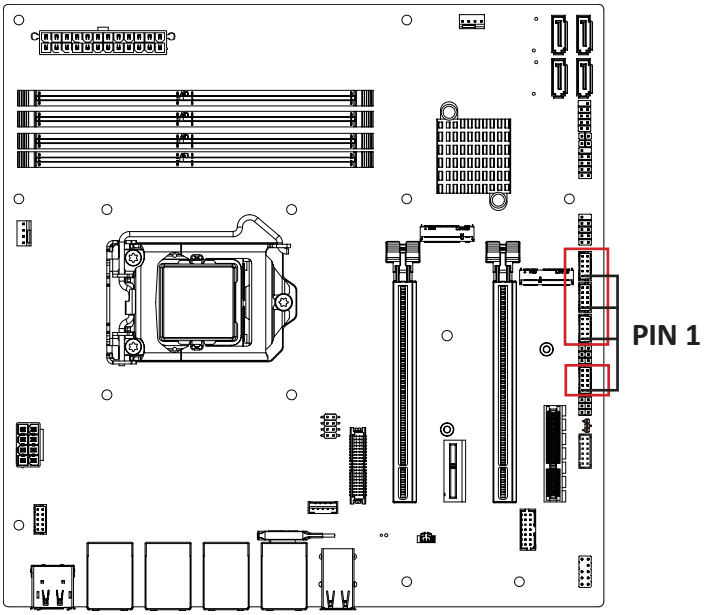
USB2.0 Header
10 9 2 1

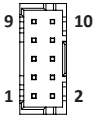
Connector PN	Vendor
210-92-05GB04	PINREX
PH10R53BAZ009	HORNGTONG

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 COM1, COM2, COM3, COM4 (Serial Port header)

8



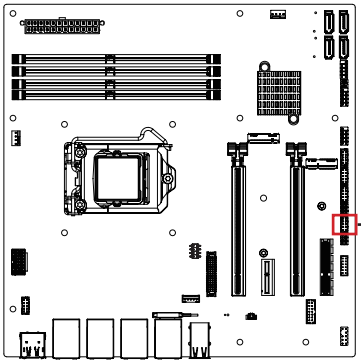
Serial port Header


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

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	–	–

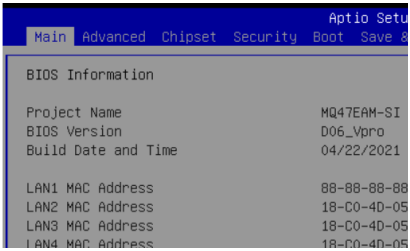
Note :

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. 30**
COM3, COM4 : Support RS-232 only

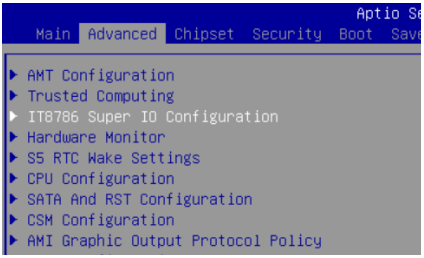


RS-422, RS-485 Select steps for COM1 port

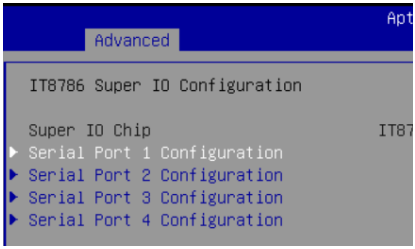
Step 1 :
Press “DEL” button to enter BIOS menu



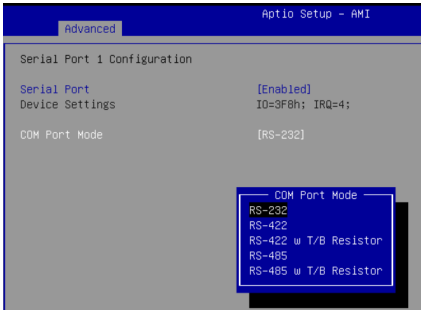
Step 2 :
Select “Advanced” menu, and
Choose “IT8786 Super IO Configuration”



Step 3 :
Select “Serial Port 1 Configuration”

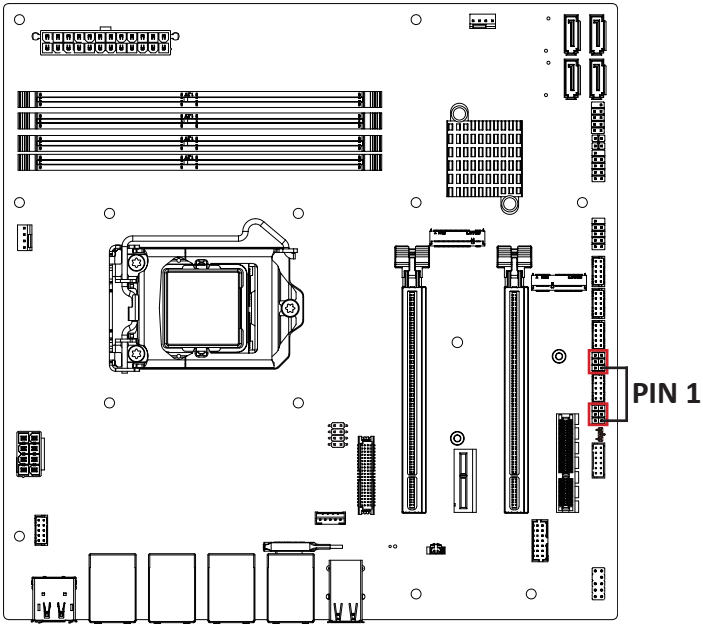


Step 4 :
Choose “COM Port Mode” for
RS-422, RS-485 function setting



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

9



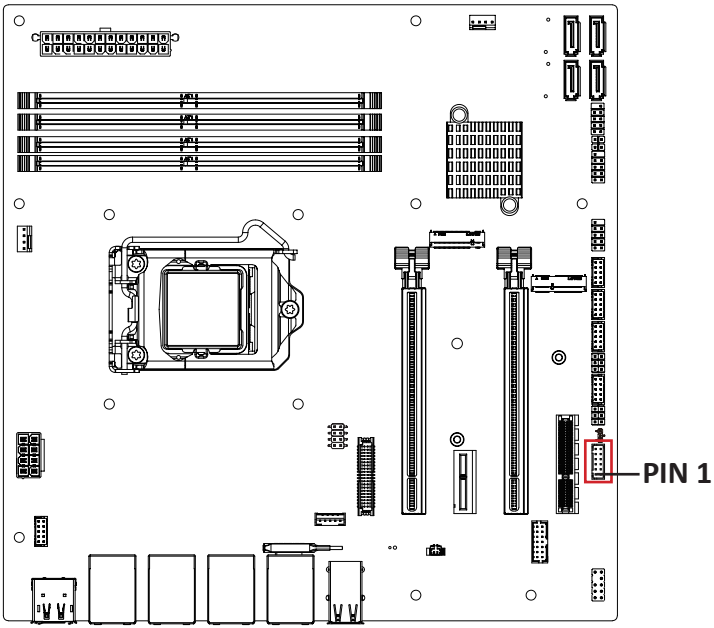
JCOM1, JCOM2 connector

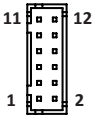

Connector PN	Vendor
210-92-03GB01	PINREX
PH06R53BAZ000	HORNGTONG

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

2.2.10 GPIO_CNT (General Purpose input/output header)

10



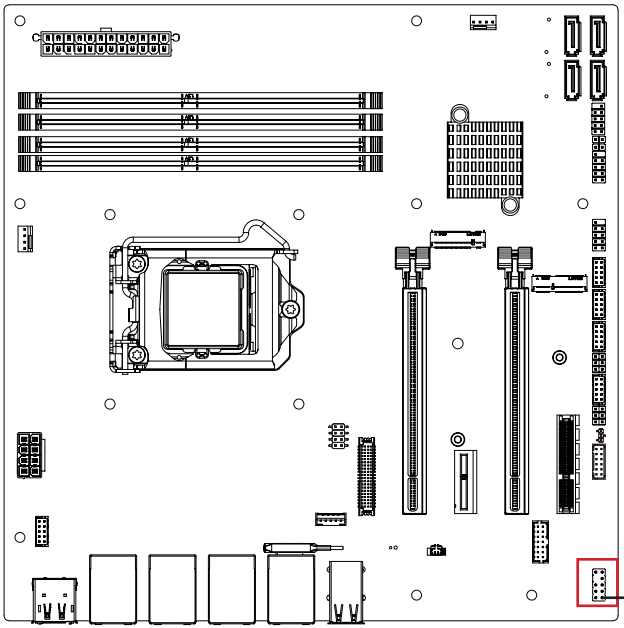
GPIO header


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

2.2.11 FP_AUDIO (Front panel audio header)

11



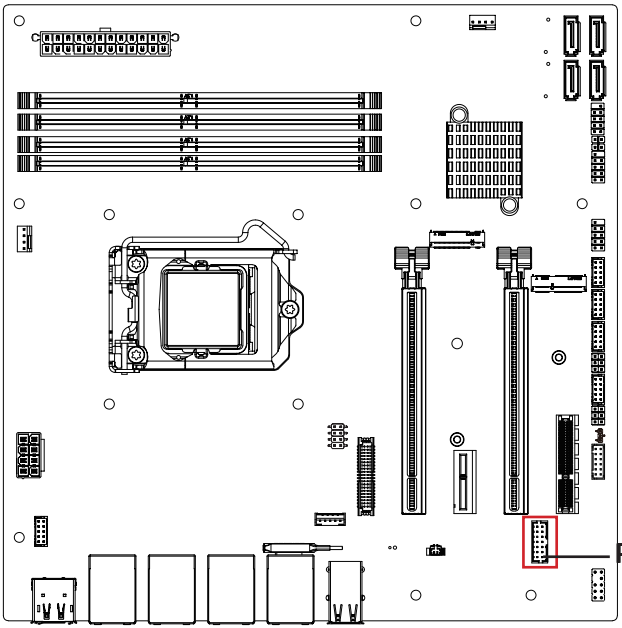
Front panel audio header


Connector PN	Vendor
210-92-05GE05	PINREX

Pin No.	Definition
1	MIC_LEFT
2	GND
3	MIC_RIGHT
4	Detect
5	LINE_RIGHT
6	GND
7	JACKSENSE Detect
8	No connect
9	LINE_LEFT
10	GND

2.2.12 LPC_CN (TPM header)

12



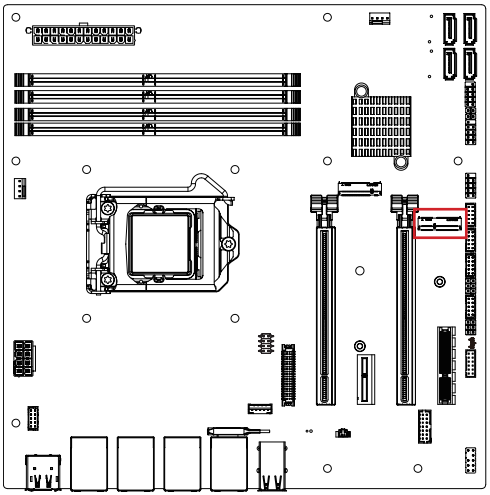
TPM header


Connector PN	Vendor
52M-90-14GBE7	PINREX

Pin No.	Definition
1	LPCCLK
2	3.3V
3	PFM RST
4	VCC3
5	LAD0
6	IRQ_SERIAL
7	LAD1
8	TPM_DET
9	LAD2
10	No connect
11	LAD3
12	GND
13	LFRAME
14	GND

2.2.13 M2E (M.2 2230 E Key slot)

13



M.2 E Key Connector	
1	75
2	74

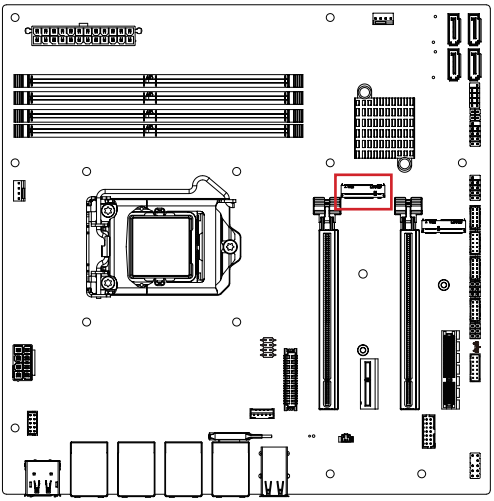
Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	D1p	4	3.3V
5	D1n	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	GND	14	NC
15	NC	16	NC
17	NC	18	GND
19	GND	20	NC
21	NC	22	NC
23	NC		

Pin No.	Definition	Pin No.	Definition
33	GND	32	NC
35	PCIE_TXp	34	NC
37	PCIE_TXn	36	NC
39	GND	38	CL_Reset
41	PCIE_RXp	40	CL_DATA
43	PCIE_RXn	42	CL_Clock
45	GND	44	NC
47	PCIE CLOCKp	46	NC
49	PCIE CLOCKn	48	NC
51	GND	50	SUSCLK
53	PCIE Clock Request	52	Reset
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
2E0BC21-S85BE-7H	FOXCONN
80152-8521	BELLWETHER

2.2.14 M2M (M.2 Slot 2242/2280 Storage SATA x 1)

14



M.2 M Key Connector	
1	75
2	74

Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	GND	4	3.3V
5	PCIE3 RXn	6	NC
7	PCIE3 RXp	8	NC
9	GND	10	NC
11	PCIE3 TXn	12	3.3V
13	PCIE3 TXp	14	3.3V
15	GND	16	3.3V
17	PCIE2 RXn	18	3.3V
19	PCIE2 RXp	20	NC
21	GND	22	NC
23	PCIE2 TXn	24	NC
25	PCIE2 TXp	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

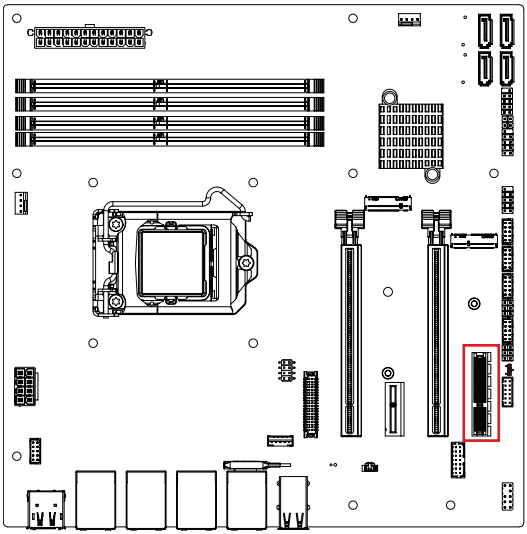
Pin No.	Definition	Pin No.	Definition
37	PCIE1 TXp	38	DEVSLP
39	GND	40	SMB Clock
41	PCIE0 RXn	42	SMB DATA
43	PCIE0 RXp	44	SMB ALT
45	GND	46	NC
47	PCIE0 TXn	48	NC
49	PCIE0 TXp	50	PCI Reset
51	GND	52	PCIE Clock Request
53	PCIE Clock-	54	PCIE Wakeup
55	PCIE Clock+	56	NC
57	GND	58	NC

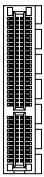
Pin No.	Definition	Pin No.	Definition
67	NC	68	SUSCLK
69	Detect	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

Connector PN	Vendor
80159-8521	BELLWETHER
APCI0096-P002A	LOTES
AS0BC21-S85BM-7H	FOXCONN

2.2.15 PCIEX4 (PCIe x4 (Gen3 x4) Slot)

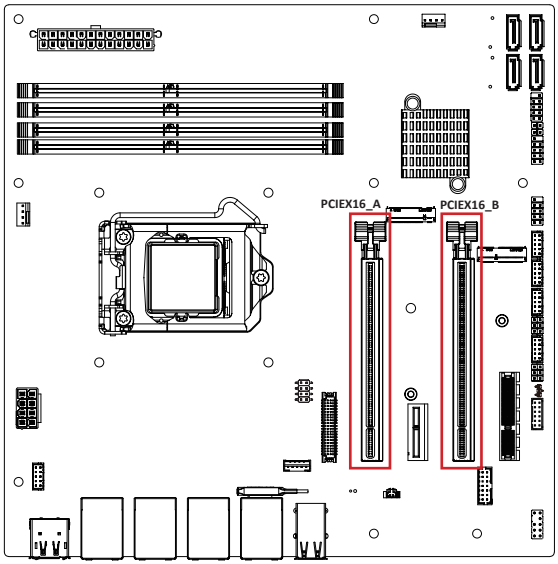
15



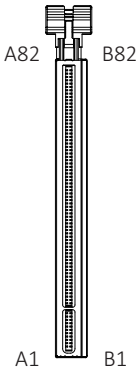
PCIe x4 connector
A49 B49  A1 B1

2.2.16 PCIEX16_A, PCIEX16_B (PCIe x16 Slot)

16



PCIe x16 connector

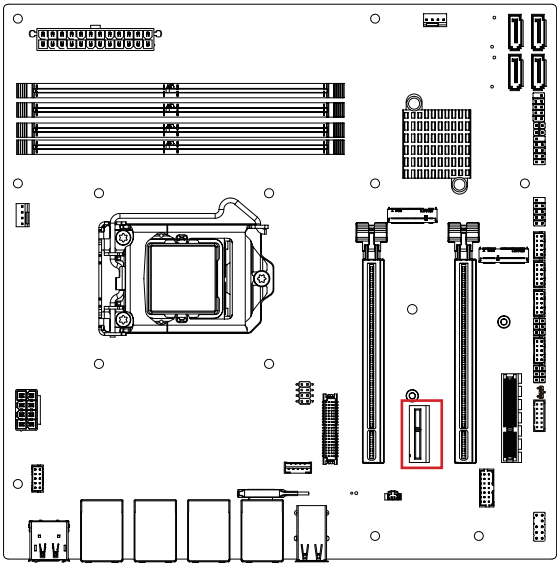


* Below are the possible configurations :

code name	PCIEX16_A	PCIEX16_B
Config. 1	Signal at x16	0
Config. 2	Signal at x8	Signal at x8

2.2.17 PCIEX1 (PCIe x1 (Gen3 x1) Slot)

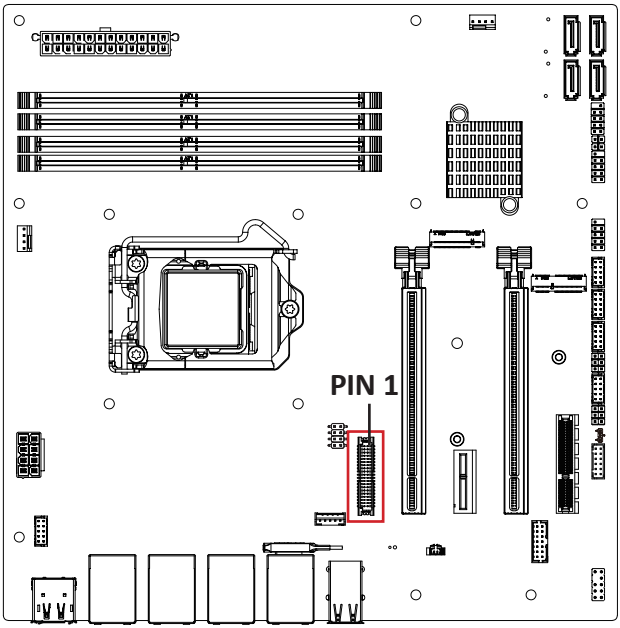
17



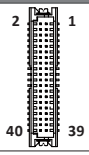
PCIe x1 connector
A18 B18 A1 B1

2.2.18 LVDS (LVDS connector)

18



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	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

Pin No.	Definition	Pin No.	Definition
12	A0-	32	GND
13	GND	33	CLK2+
14	GND	34	CLK1+
15	A3+	35	CLK2-
16	A2+	36	CLK1-
17	A3-	37	GND
18	A2-	38	GND
19	GND	39	12V
20	GND	40	12V

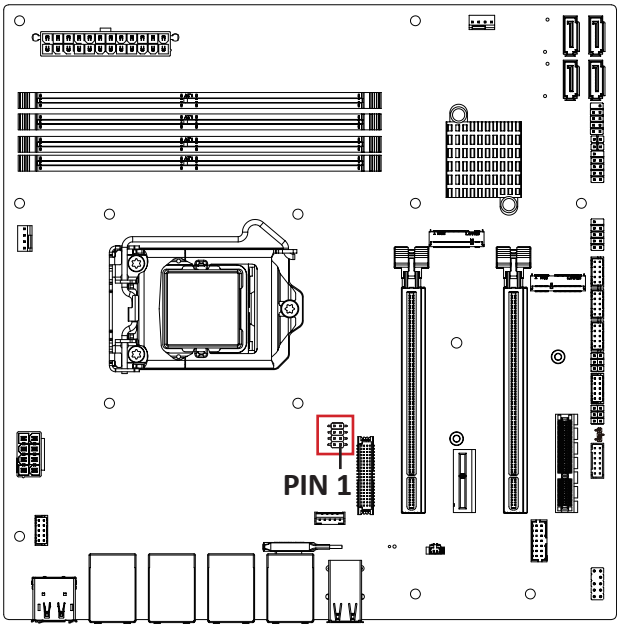
Connector PN	Vendor
712-76-40GWE0	PINREX
A1252WV-SF-2X20PD01	JOINT-TECH

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.

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

2.2.19 LSW (LVDS resolution jumper)

19

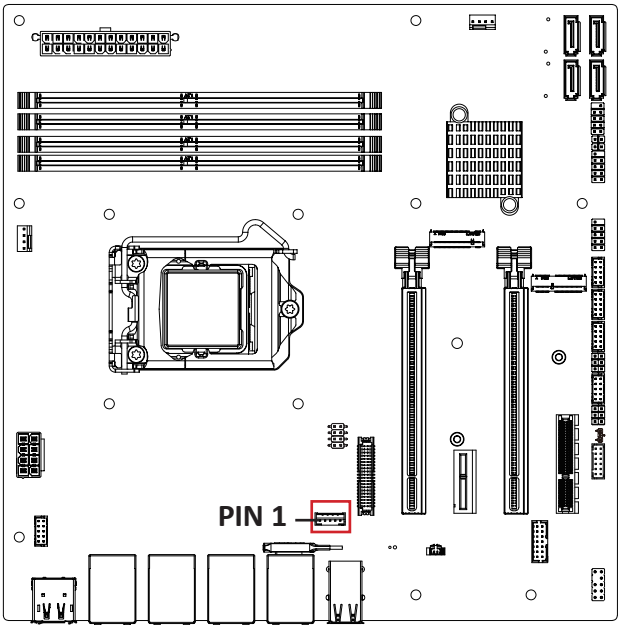


LVDS Resolution jumper			
Jumper setting	Resolution	Jumper setting	Resolution
	800 x 600 18bit		1366 x 768 24bit
	1024 x 768 18bit		1440 x 900 24bit
	1024 x 768 24bit		1400 x 1050 24bit
	1024 x 600 18bit		1600 x 900 24bit
	1280 x 800 18bit		1680 x 1050 24bit
	1280 x 960 18bit		1600 x 1200 24bit
	1280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

Connector PN	Vendor
222-97-04GBE1	PINREX

2.2.20 BKL_CN (Backlight Control connector)

20



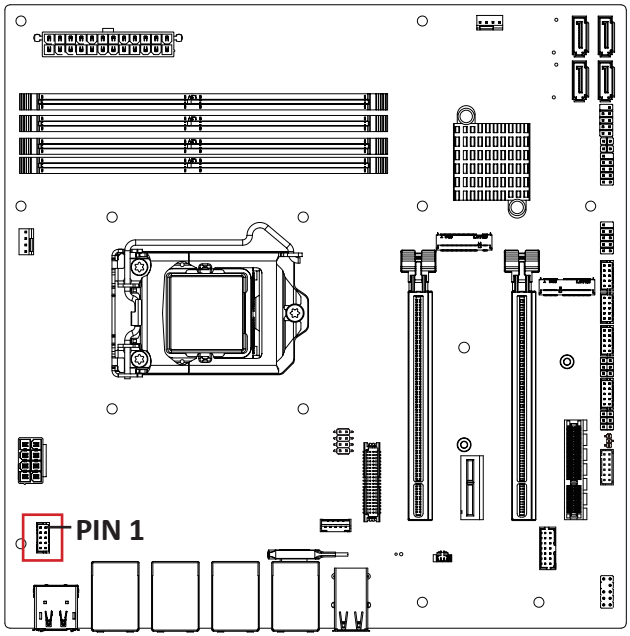
Backlight control Connector
1 5

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

2.2.21 VGA (VGA connector)

21



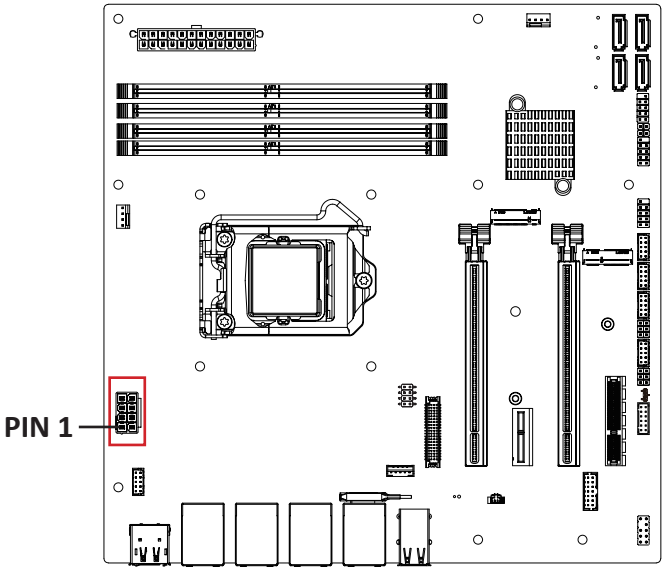
VGA Connector
2 1 10 9

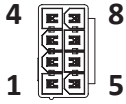
Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

Pin No.	Definition
1	VSYNC
2	HSYNC
3	GND
4	GND
5	Red
6	GND
7	Green
8	DDCSCL
9	Blue
10	DDCSDA

2.2.22 ATX_12V (8 pin ATX 12V power connector (for CPU))

22



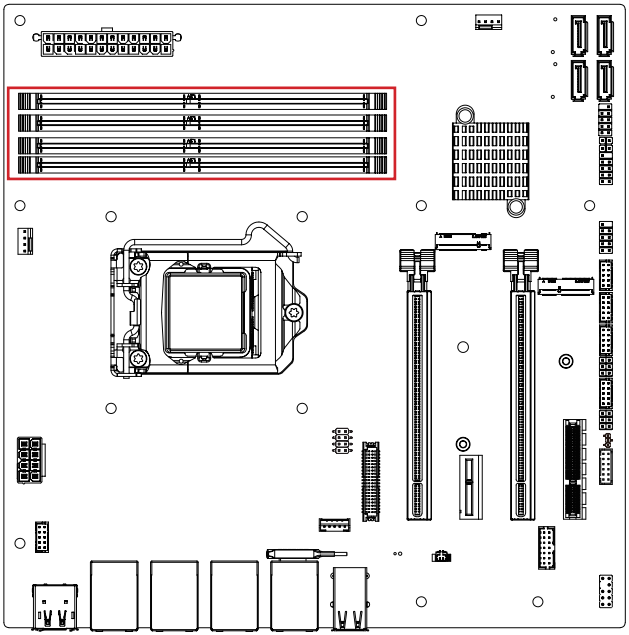
ATX 12V Connector


Connector PN	Vendor
740-41-08TWIB	PINREX
25114A0800B3-9LF	ATRC

Pin No.	Definition
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V

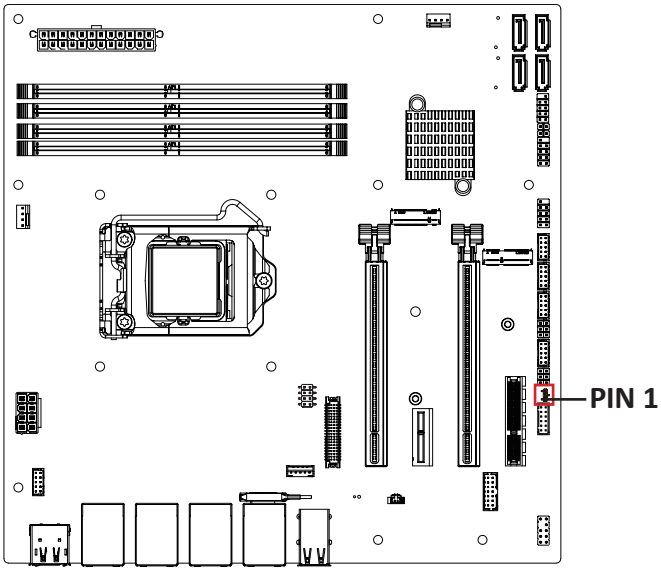
2.2.23 DDR4_1, DDR4_2, DDR4_3, DDR4_4 (DDR4 DIMM Sockets)

23



2.2.24 ATX_SEL (AT/ATX mode select jumper)

24



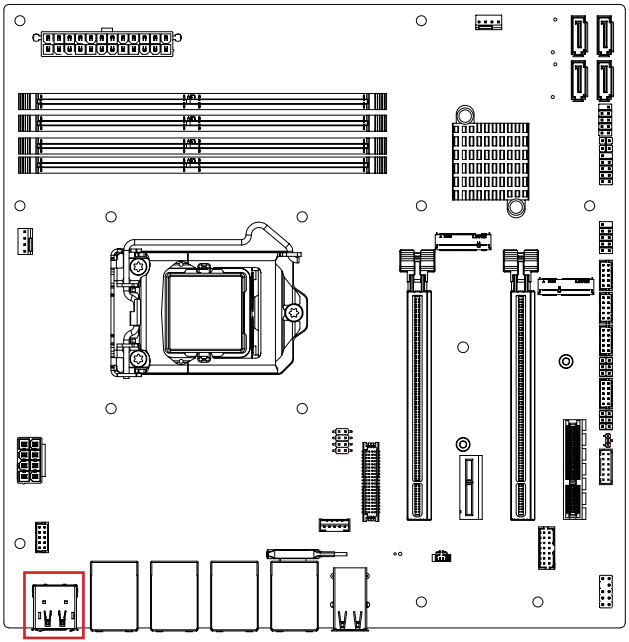
AT/ATX mode select jumper
 1

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

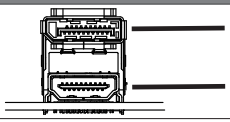
Pin No.	Definition
1	AT MODE
2	Detect
3	ATX MODE
Jumper setting 1-2 Close : AT mode. 2-3 Close : ATX mode.(Default setting)	

2.2.25 HDMI_DP (HDMI + DP Connector)

25



HDMI & DP Connector

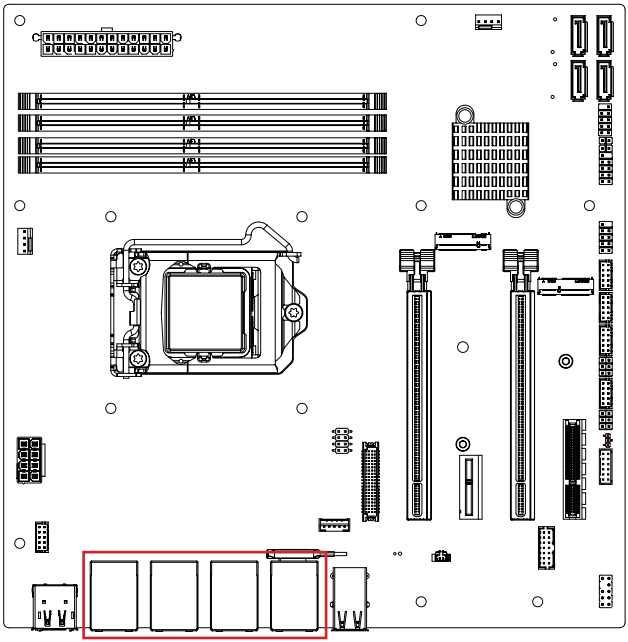


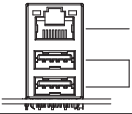
HDMI Connector			
Pin No.	Definition	Pin No.	Definition
1	TX2p	11	GND
2	GND	12	CLKn
3	TX2n	13	NC
4	TX1p	14	NC
5	GND	15	SCL
6	TX1n	16	SDA
7	TX0p	17	GND
8	GND	18	5V
9	TX0n	19	Hot Plug Detect
10	CLKp		

DP Connector			
Pin No.	Definition	Pin No.	Definition
1	TX0p	11	GND
2	GND	12	TX3n
3	TX0n	13	GND
4	TX1p	14	GND
5	GND	15	AUXp
6	TX1n	16	GND
7	TX2p	17	AUXn
8	GND	18	Hot Plug Detect
9	TX2n	19	3.3V
10	TX3p	20	3.3V

2.2.26 USB31_LAN1, USB31_LAN2, USB31_LAN3, USB31_LAN4 (USB + LAN Connector)

26



USB & LAN Connector


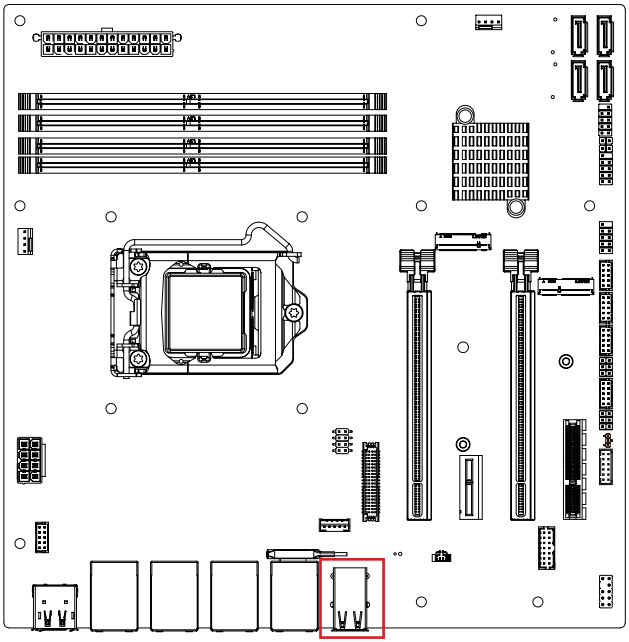
USB Connector			
Pin No.	Definition	Pin No.	Definition
1	5V	10	5V
2	D1n	11	D0n
3	D1p	12	D0p
4	GND	13	GND
5	USB3_RX1n	14	USB3_RX2n
6	USB3_RX1p	15	USB3_RX2p
7	GND	16	GND
8	USB3_TX1n	17	USB3_TX2n
9	USB3_TX1p	18	USB3_TX2p

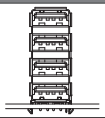
LAN Connector			
Pin No.	Definition	Pin No.	Definition
1	TX1+	4	TX3+
2	TX1-	5	TX3-
3	TX2+	7	TX4+
6	TX2-	8	TX4-

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

2.2.27 USB20 (USB 2.0 Connector)

27



USB 2.0 Connector


Pin No.	Definition
1	5V
2	D1n
3	D1p
4	GND
5	5V
6	D0n
7	D0p
8	GND

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

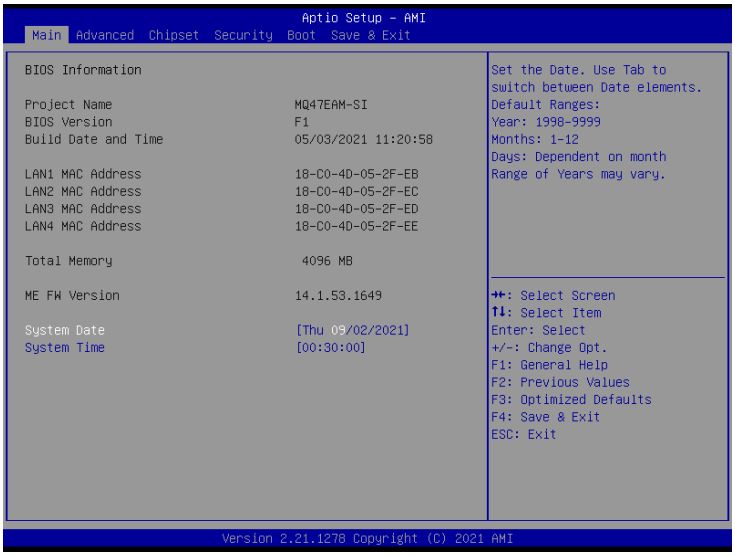
Once the system is power on, press the <DEL> key as soon as possible to access into BIOS Setup program.

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

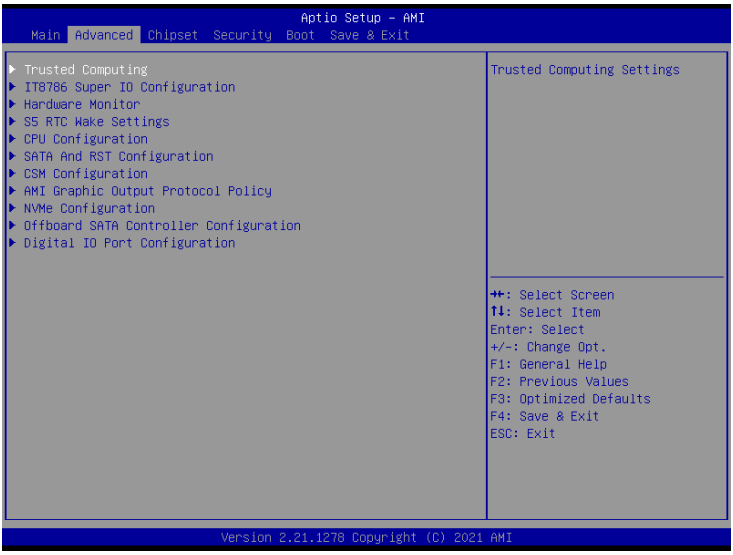
The main menu shows the basic system information.
Use arrow keys to move among the items.



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
LAN3 MAC Address	Shows LAN3 MAC Address information
LAN4 MAC Address	Shows LAN4 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)

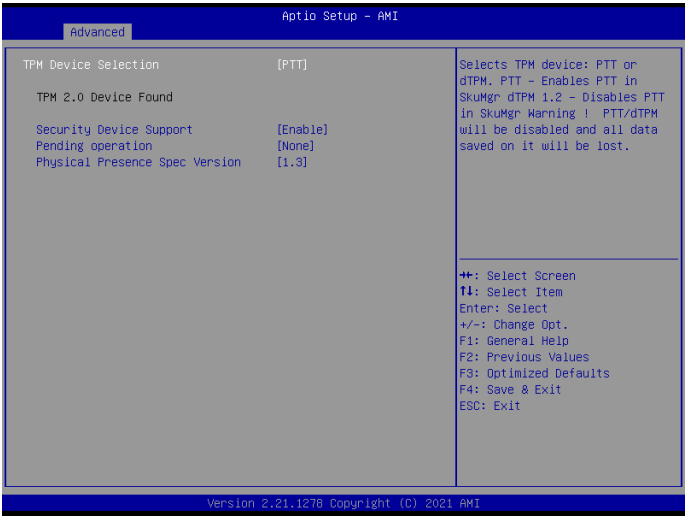
3.3 Advanced

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.



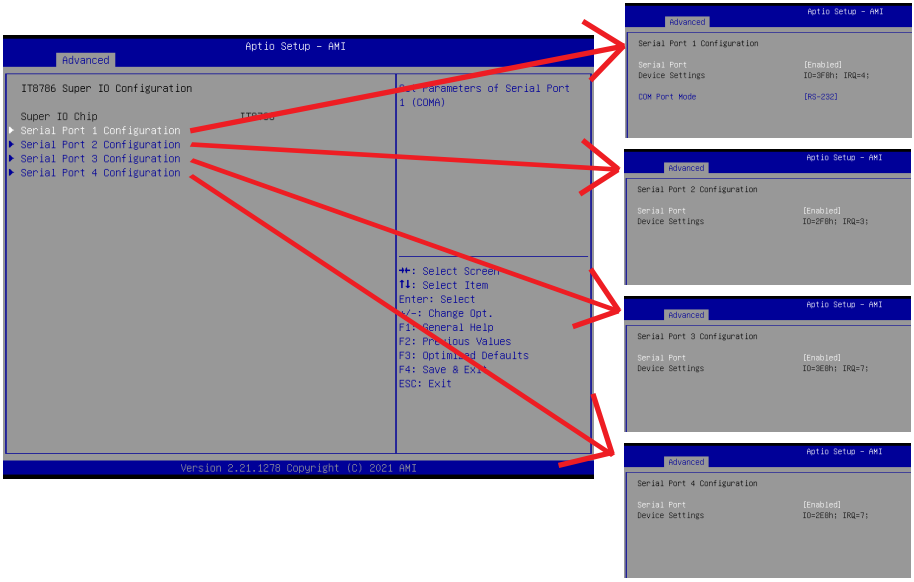
3.3.1 TPM Configuration

Use TPM Configuration submenu to choose TPM interface.



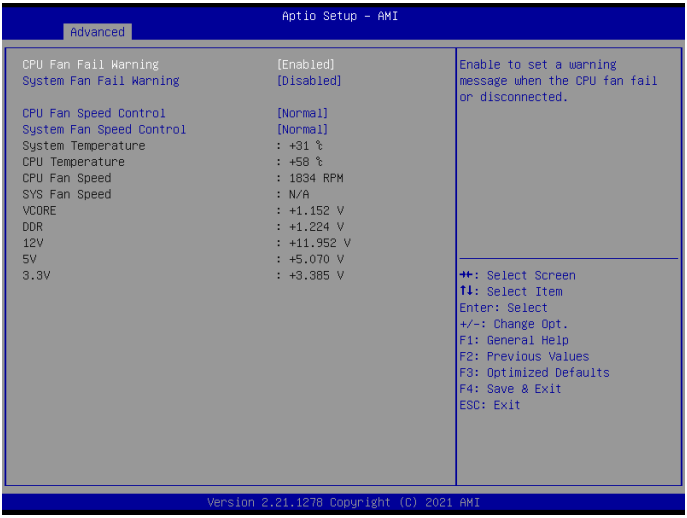
Item	Description
TPM Device Selection	PTT : Internal TPM (Default setting) dTPM : External TPM (When using External TPM module or having TPM chip on MB)
Security Device Support	Enabled : Enables TPM feature (Default setting) Disabled : Disables TPM feature
Pending operation	None : No execution will be conducted (Default setting) TPM clear : Set to clear data on TPM
Physical Presence Spec Version	

3.3.2 IT8786 Super IO Configuration



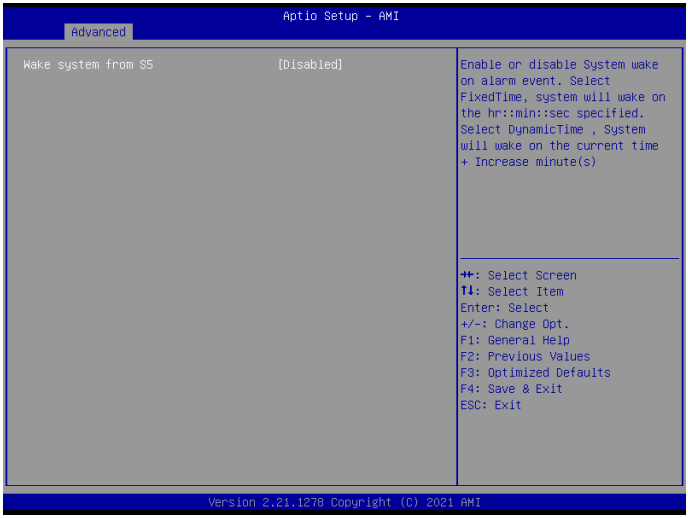
Item	Description
Super IO Chip	Shows Super I/O chip model
Serial Port 1 Configuration	Press [Enter] to configure advanced items : Serial Port : **Enabled : Enables allows you to configure the serial port settings** **Disabled : if Disabled, displays no configuration for the serial port** Device settings : 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**	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

3.3.3 Hardware Monitor



Item	Description
CPU Fan Fail Warning	**Enabled : Enables CPU FAN Fail warning alert function (Default setting)** **Disabled : Disables CPU FAN Fail warning alert function**
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

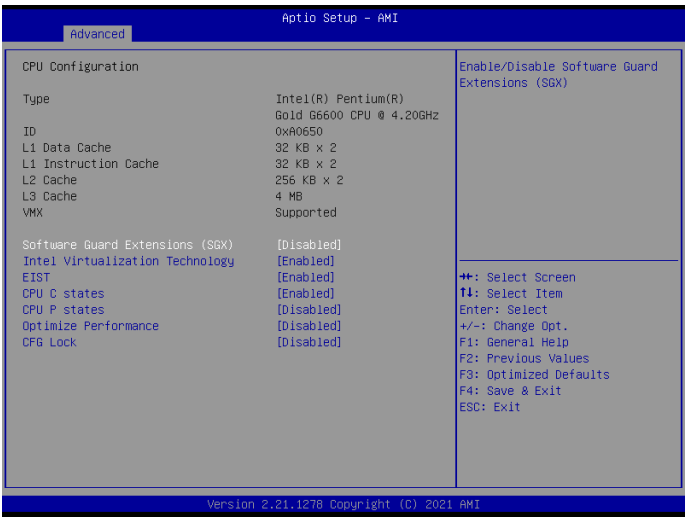
3.3.4 S5 RTC Wake Settings



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)**

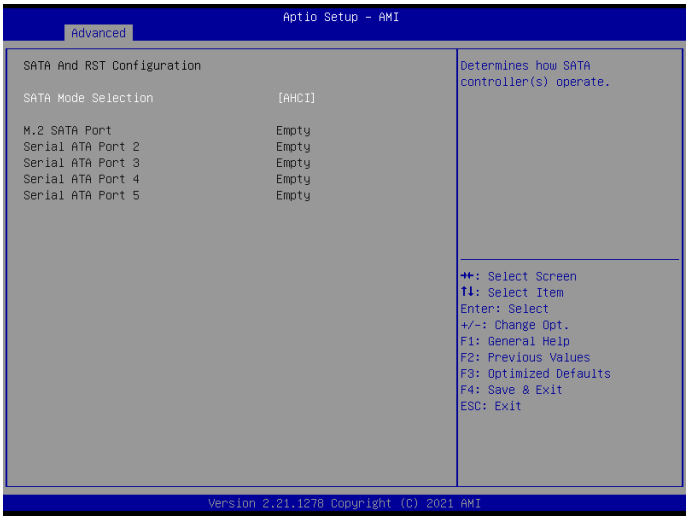
3.3.5 CPU Configuration

This submenu shows detailed CPU informations.



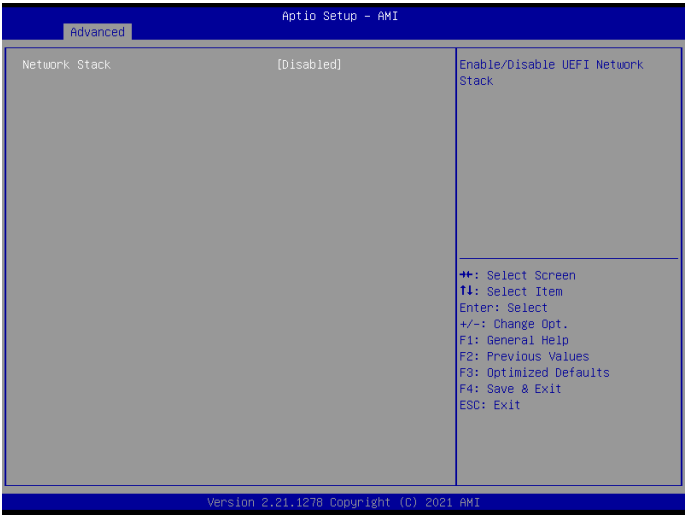
Item	Description
Software Guard Extensions (SGX)	**Disabled : Disables Software Guard Extensions (SGX) (Default seeting)** **Enabled : Enables Software Guard Extensions (SGX)** **Software Controlled : If this item is selected, SGX will be controlled by SGX application for UEFI boot OS**
Intel Virtualization 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**
CPU C states	Command CPU to enter into low power consumption mode when CPU is under idle mode. **Enabled : Enables CPU C states function (Default setting)** **Disabled : Disables CPU C states function**
CPU P states	CPU will adjust frequency depends on it's loading. **Enabled : Enables CPU P states function** **Disabled : Disables CPU P states function (Default setting)**
Optimize Performance	To optimize CPU performance. **Enabled : Enables optimize performance function** **Disabled : Disables optimize performance function (Default setting)**
CFG Lock	

3.3.6 SATA And RST Configuration



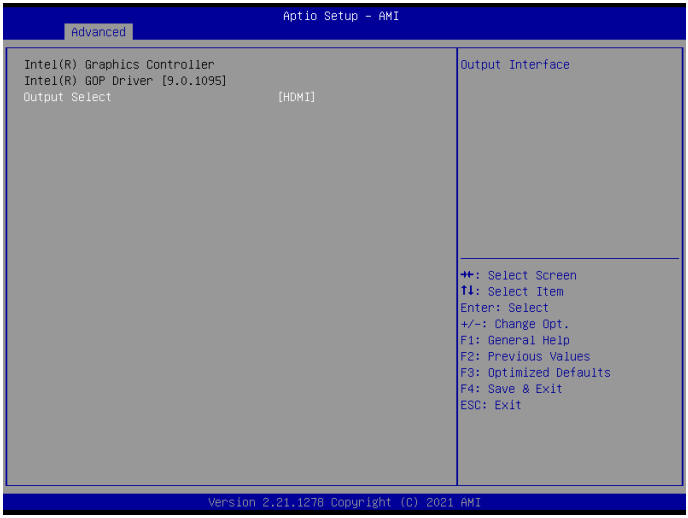
Item	Description
SATA Mode Selection	Set SATA controller to AHCI mode
M.2 SATA Port	shows M.2 SSD information
Serial ATA Port 2	shows 2.5" SATA HDD/SSD information
Serial ATA Port 3	
Serial ATA Port 4	
Serial ATA Port 5	

3.3.7 CSM 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**

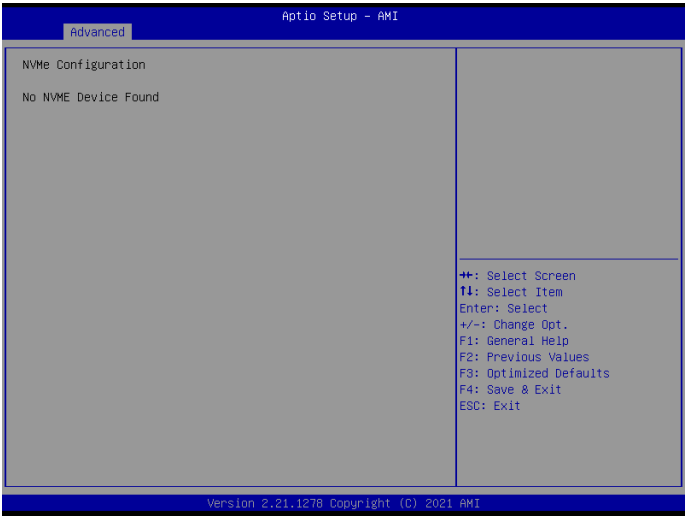
3.3.8 AMI Graphic Output Protocol Policy



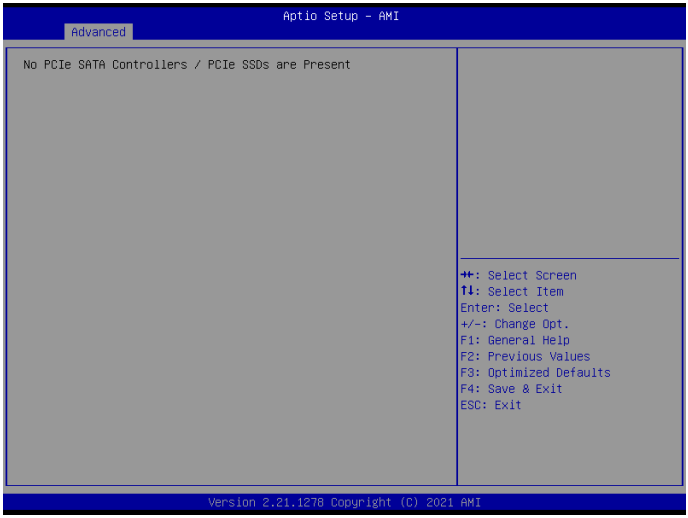
Item	Description
Output Select	Choose default monitor output when there are more than one monitor plugged on the motherboard.

3.3.9 NVMe Configuration

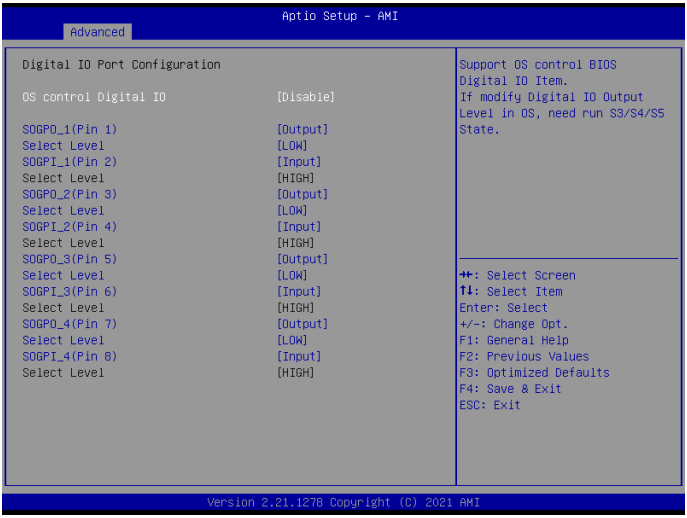
NVMe Configuration shows information when your M.2 NVMe PCIe SSD is installed.



3.3.10 Offboard SATA Controller Configuration

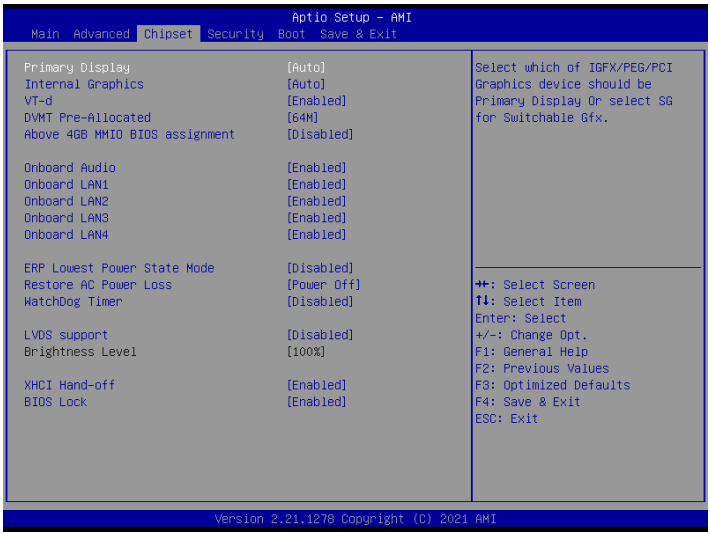


3.3.11 Digital IO Port Configuration



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.

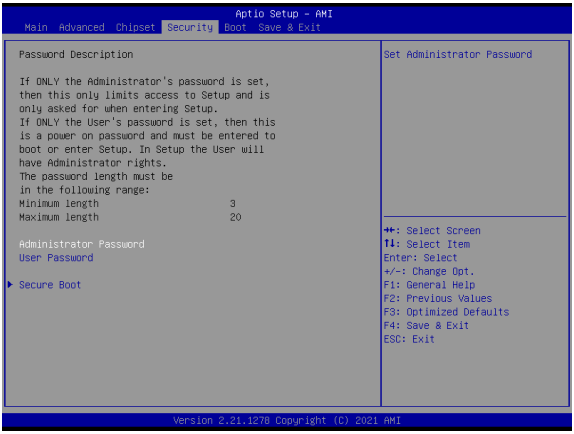
3.4 Chipset



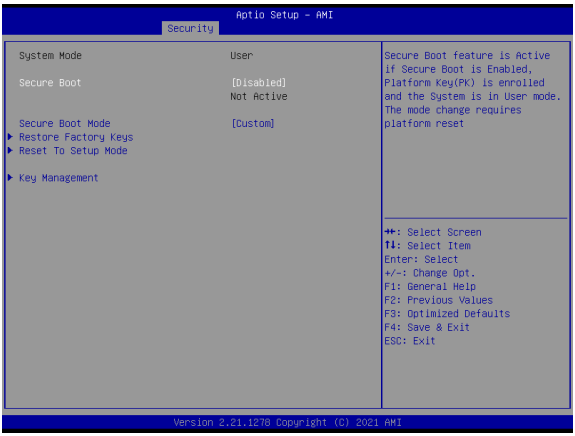
Item	Description
Primary Display	**Auto : When detects PCIe Graphic card, primary display will set to PCIe (Default setting)** **IGFX : Force IGFX Graphic card as the primary display device** **PEG : Force PEG Graphic card as the primary display device**
Internal Graphics	Enables or disables the onboard graphics function **Auto : Detects display device automatically (Default setting)** **Enabled : Enables onboard graphics** **Disabled : Disables onboard graphics**
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**
Above 4GB MMIO BIOS assignment	Enable or disable to re-allocate memory space for device cards when more than one external graphic cards installed. (This function could be only used under 64 bit operating system with above 4 GB address space) **Enabled : Enables Above 4GB MMIO BIOS assignment function** **Disabled : Disables Above 4GB MMIO BIOS assignment function (Default setting)**
Onboard Audio	Enable/Disable onboard audio controller **Enabled : Enables onboard audio controller (Default setting)** **Disabled : Disables onboard audio controller**

Onboard LAN1 Onboard LAN2 Onboard LAN3 Onboard LAN4	Enable/Disable onboard LAN controller **Enabled : Enables onboard LAN controller (Default setting)** **Disabled : Disables onboard LAN 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 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 **Disabled : Disabled Watchdog Timer function (Default setting)** **30s : delay watchdog for 30 seconds.** **60s : delay watchdog for 60 seconds.**
LVDS Support	**Disabled : Disables LVDS Support (Default setting)** **Enabled : Enables LVDS Support**
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)**
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**

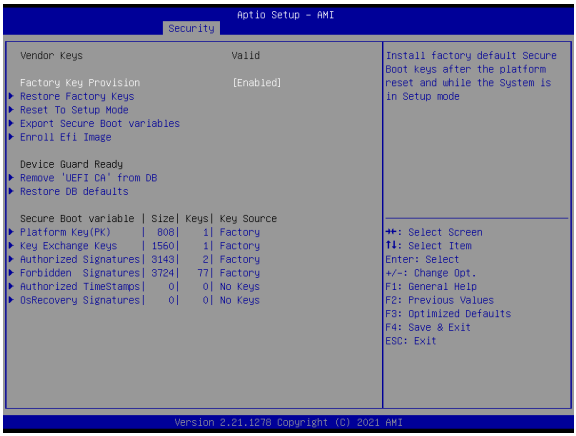
3.5 Security



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

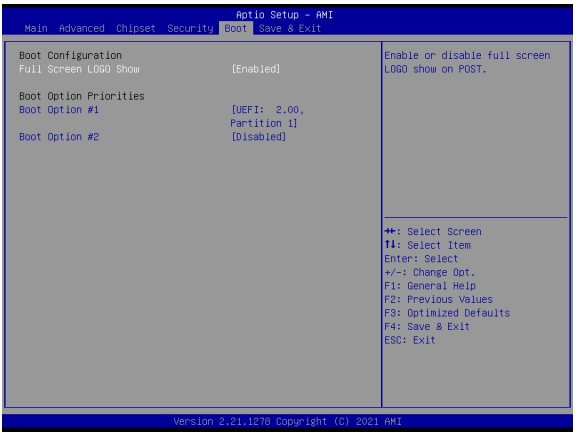


Item	Description
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode **Enabled : Enables Factory Key Provision (Default setting)** **Disabled : Disables Factory Key Provision**
Restore Factory Keys	To restore factory settings **Yes : 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	

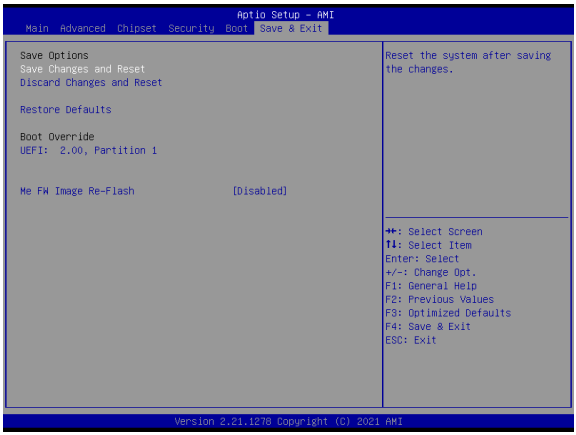
3.6 Boot

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 (Default setting)** **Disabled : Disables Full screen LOGO Show on POST screen**
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-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)**