

mITX-6412A (MEHLJAI-SI)

mITX-6412A Mini-ITX Motherboard

User's Manual 1st Ed

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Packing List

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

Item	Quantity
mITX-6412A MB	1
SATA power cable	3
I/O Shield	1

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

About this Document

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

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

Safety Precautions

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

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.

13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.
17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!



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

Caution:

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

Attention:

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

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量
GIGAIPC Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电 子组件	○	○	○	○	○	○
外部信号 连接器 及线材	○	○	○	○	○	○
○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。 备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。						

China RoHS Requirement (EN)

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

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	O	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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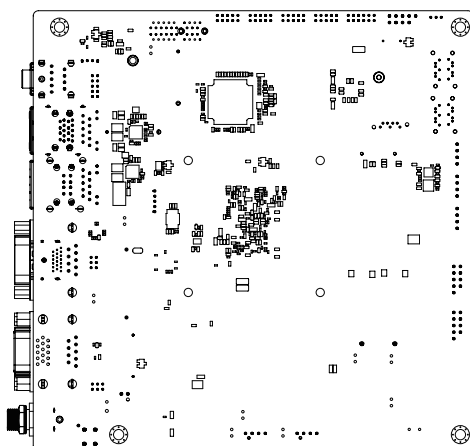
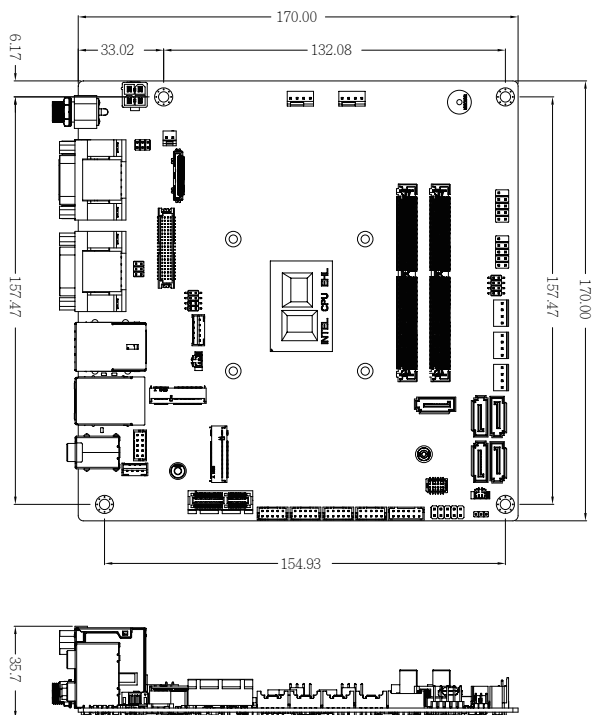
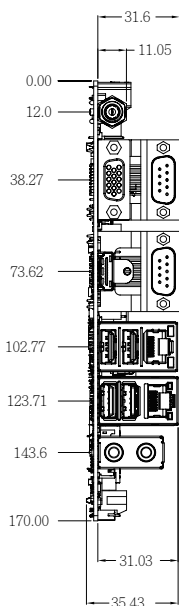
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Chapter 1

Chapter 1 - Product Specifications



1.1 Specifications

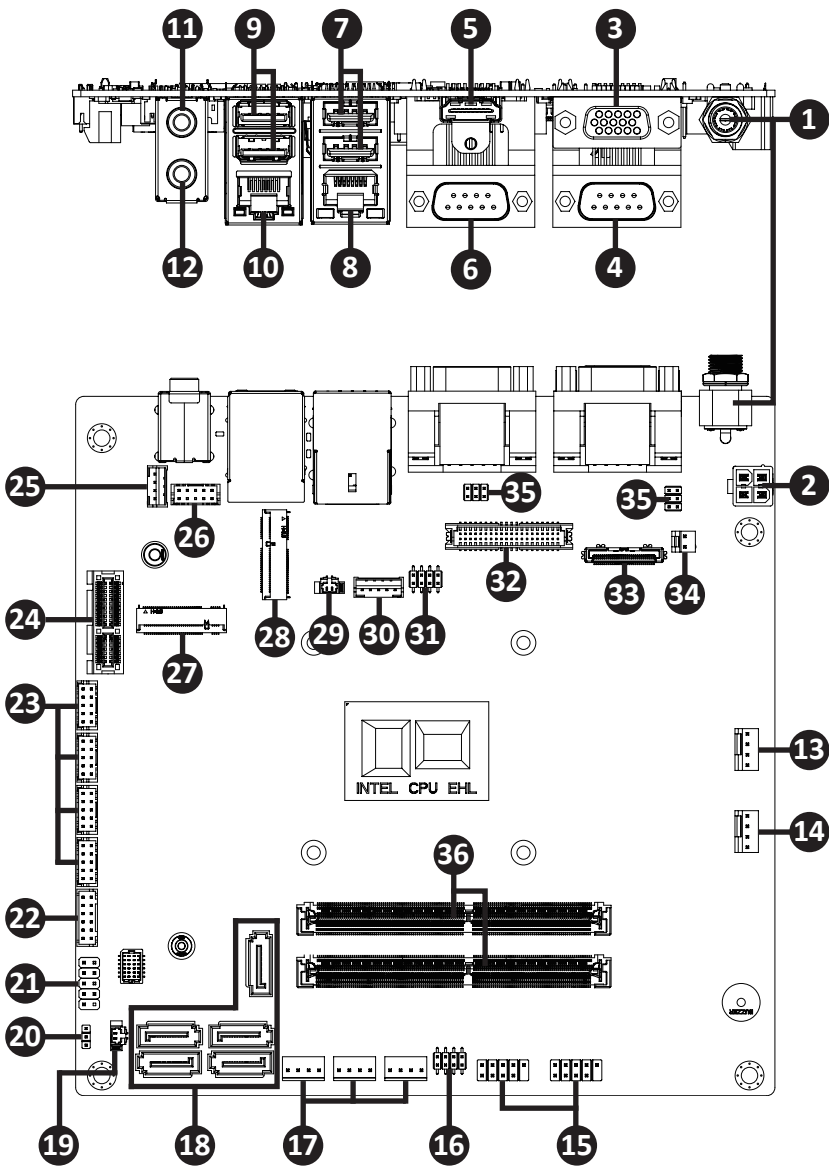
Motherboard	mITX-6412A (MEHLJAI-SI)
Form Factor	Mini-ITX 170W x 170D (mm)
CPU	Intel® Celeron® J6412 Processor 10nm, 4 cores, 4 threads, up to 2.60 GHz TDP 10W
Socket	1 x FCBGA1493
Memory	2 x DDR4 SO-DIMM sockets, Max. Capacity 64 GB Support Dual channel DDR4 3200 MHz memory modules
Ethernet	2 x GbE LAN Ports (Realtek® RTL8111H)
Video	Integrated Graphics Processor - Intel® UHD Graphics for 10th Gen Intel® Processors: 1 x HDMI 2.0 port, supporting a maximum resolution of 4096x2160 @60Hz 1 x VGA port, supporting a maximum resolution of 1920x1080 @60Hz 1 x LVDS port, supporting a maximum resolution of 1920x1200 @60Hz 1 x eDP port, supporting a maximum resolution of 3840x2160 @60Hz (3 independent display outputs)
Audio	Realtek® Audio codec
Storage	5 x SATA 6Gb/s Ports (4 x Asmedia ASM1064) (1 x supports SATA DOM)
Expansion Slots	1 x PCIe x1 (Gen 3x1) 1 x 2280 M.2 M-Key (SATA 6Gb/s) 1 x 2230 M.2 E-Key

Motherboard	mITX-6412A (MEHLJAI-SI)
Internal I/O	1 x 4-pin ATX main power connector 3 x SATA power connectors 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 4 x USB 2.0 headers 4 x COM headers (RS-232) 1 x GPIO (8 bits) & SMBus header 1 x Case open header 1 x AT/ATX mode select jumper 1 x Backlight Control header 1 x Buzzer 4 x SATA LED header 1 x ATX Control header
Rear I/O	2 x Audio Jacks (Line out, Mic in) 2 x COM Ports (RS-232/422/485 & RI/5V/12V) 1 x HDMI 1 x VGA 2 x RJ45 LAN Ports 2 x USB 2.0 2 x USB 3.2 Gen 1 1 x DC Jack (+12V/+19V~+24VDC)
TPM	Onboard TPM 2.0 security chip Infineon SLB9670VQ2.0
OS Compatibility	Windows® 10 (x64)
Operating Properties	Operating temperature: 0°C to 60°C Operating humidity: 0-90% (non-condensing) Non-operating temperature: -40°C to 85°C Non-operating humidity: 0%-95% (non-condensing)

Chapter 2

Chapter 2 – Hardware Information

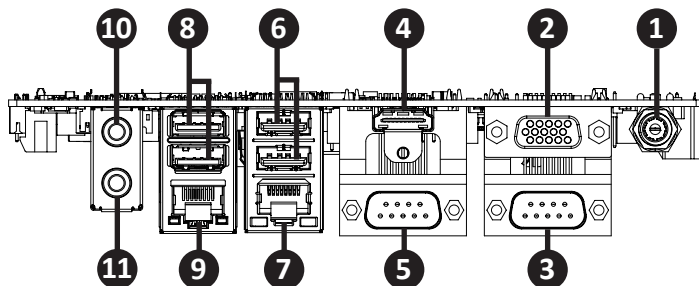
2.1 Jumpers and Connectors



No	Code	Description
1	DC_IN1	DC In Jack connector
2	DC_IN2	ATX 2x2 pin power Connector
3	VGA	VGA Port
4	COM1	Serial port connector (RS-232/422/485 & RI/5V/12V)
5	HDMI	HDMI Connector
6	COM2	Serial port connector (RS-232/422/485 & RI/5V/12V)
7	USB_LAN1	USB 2.0 Connector
8		GbE LAN port
9	USB31_LAN2	USB 3.2 Gen 1 Connector
10		GbE LAN port
11	MIC_IN	Mic in port (Pink)
12	LINE_OUT	Line Out port (Green)
13	CPU_FAN	CPU Fan Connector
14	SYS_FAN	System Fan Connector
15	F_USB2_1 F_USB2_2	USB 2.0 header
16	SATA_LED	SATA LED for SATA1~4 port
17	SATAPWR, SATAPWR1, SATAPWR2	SATA Power Connector
18	SATA0, SATA1, SATA2, SATA3, SATA4	SATA 6Gb/s connector SATA0 : support SATA DOM with pin 8 for 5V.
19	CASE_OPEN	chassis open intrusion alert header

No	Code	Description
20	AT_CN	AT/ATX mode select jumper
21	SYS_PANEL	System Panel header
22	GPIO_CNT	General purpose input/output header
23	COM3, COM4, COM5, COM6	Serial port header (RS-232)
24	PCIEX1	1 x PCIe x1 (Gen 3x1) slot
25	SPKR	Speaker out Connector
26	FP_AUDIO	Front Panel Audio header
27	M2M	M.2 Slot, 2280 M-Key
28	M2E	M.2 Slot, 2230 E-Key
29	BAT	Battery cable connector
30	BKL_CN	Backlight control header
31	LSW	LVDS resolution jumper
32	LVDS	LVDS Connector
33	EDP	Embedded Display Port connector
34	ATX_CTL	ATX Control header
35	JCOM1, JCOM2	RI# pin RI#/5V/12V Select jumper for COM1 & COM2 port
36	SODIMMA, SODIMMB	2 x DDR4 SO-DIMM Sockets

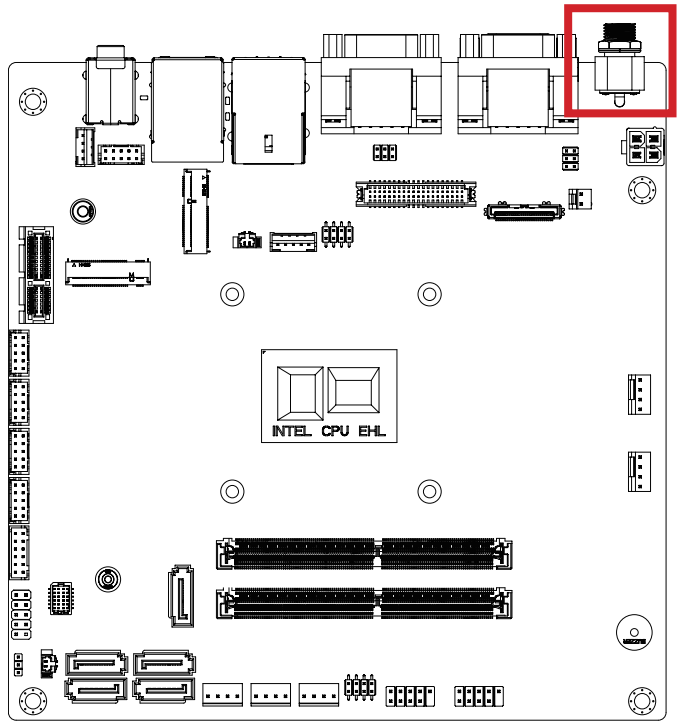
2.2.1 IO Connector Information



	Code	Description
1	DC_IN1	DC In Jack connector
2	VGA	VGA Port
3	COM1	Serial port connector (RS-232/422/485 & RI/5V/12V)
4	HDMI	HDMI Connector
5	COM2	Serial port connector (RS-232/422/485 & RI/5V/12V)
6	USB_LAN1	USB 2.0 Connector
7		GbE LAN port
8	USB31_LAN2	USB 3.2 Gen 1 Connector
9		GbE LAN port
10	MIC_IN	Mic in port (Pink)
11	LINE_OUT	Line Out port (Green)

2.2.2 DC_IN1 (DC In Jack connector)

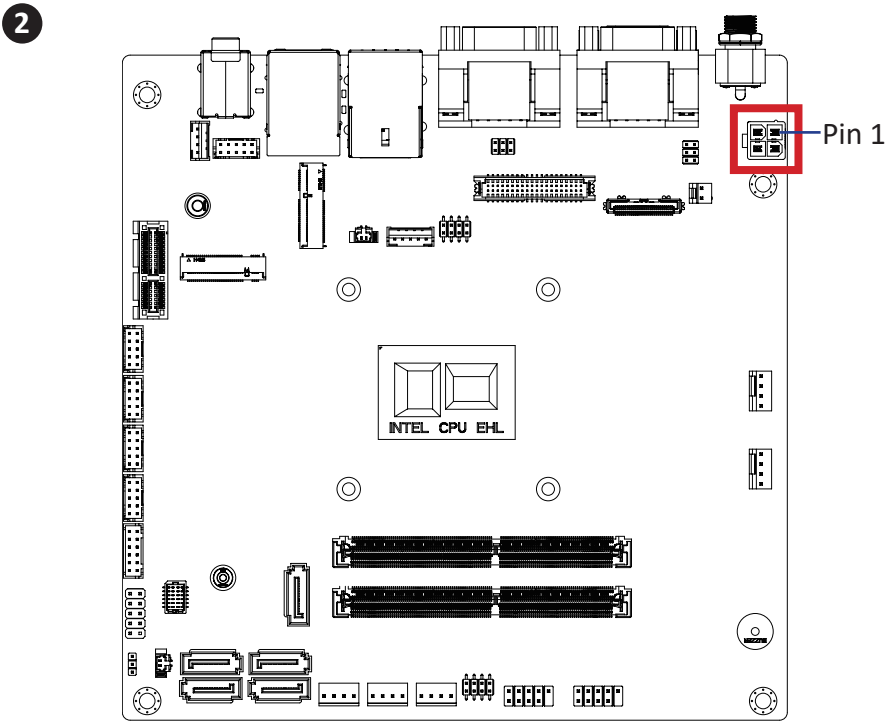
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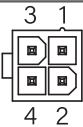
DC In Jack connector

Connector PN	Vendor
655-360-000	SHEN-MING

2.2.3 DC_IN2 (ATX 2x2 Pin Power Connector)



Power Connector



Connector PN

740-81-04TW56

Vendor

PINREX

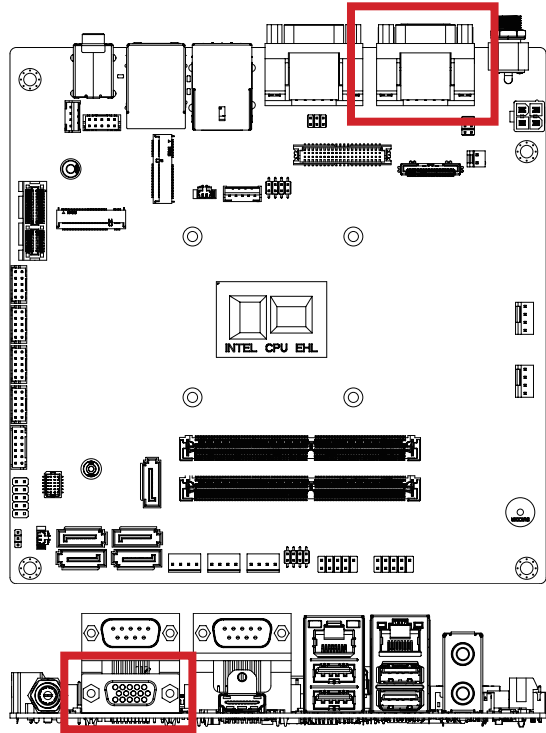
Connector type

2x2pin connector, pitch 4.2mm

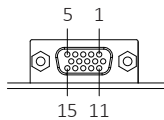
Pin No.	Definition
1	GND
2	GND
3	DC IN
4	DC IN

2.2.4 VGA (VGA Port)

3



D-sub Connector



Connector PN

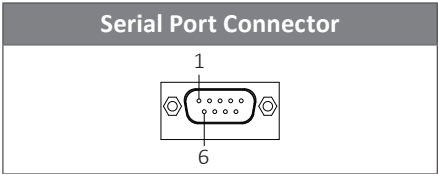
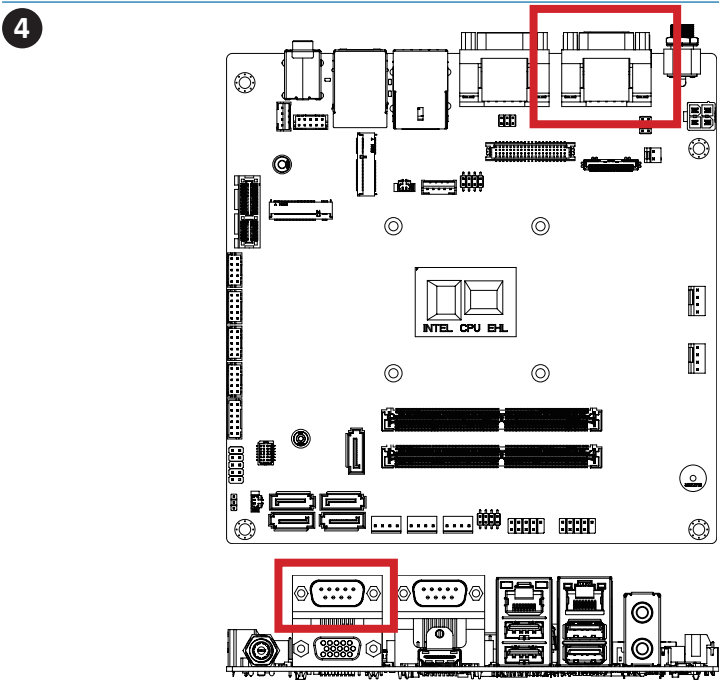
DZ11AA1-H5A7-4F
D11015S021126N

Vendor

FOXCONN
FENYING

Pin No.	Definition	Pin No.	Definition
1	Red	9	5V
2	Green	10	GND
3	Blue	11	NC
4	NC	12	DDCSDA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDCSCL
8	GND		

2.2.5 COM1 (Serial port connector (RS-232/422/485 & RI/5V/12V))

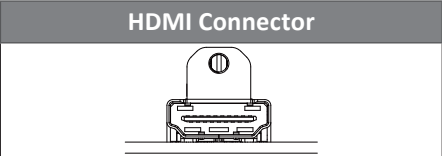
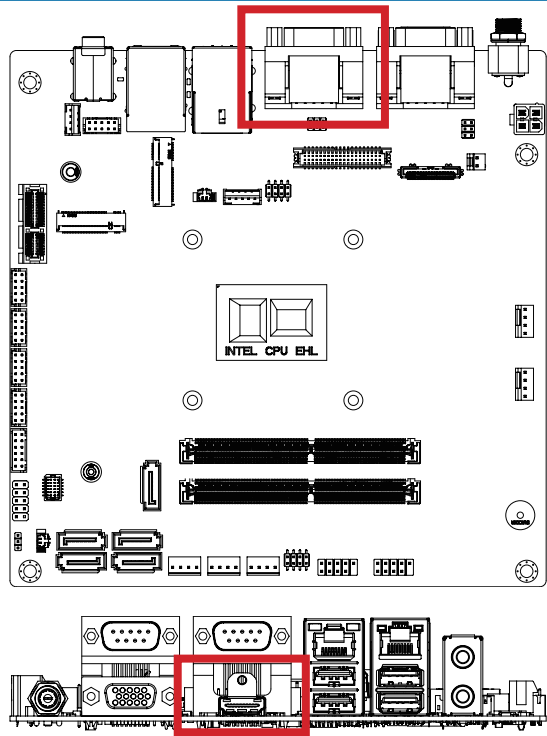


Connector PN	Vendor
DM10151-N5W3-4F	FOXCONN

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

2.2.6 HDMI (HDMI Connector)

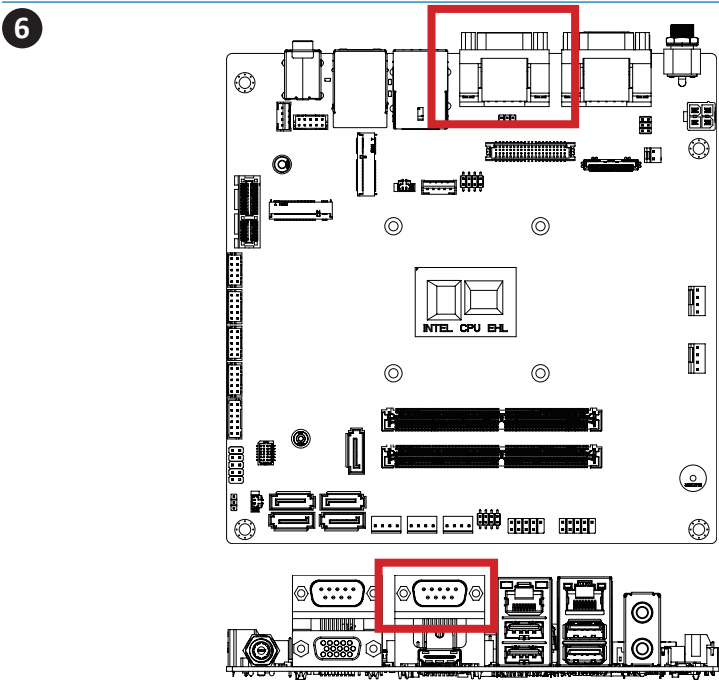
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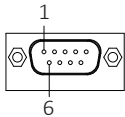
Pin No.	Definition	Pin No.	Definition
1	TX2p	11	GND
2	GND	12	CLKn
3	TX2n	13	NC
4	TX1p	14	NC
5	GND	15	SCL
6	TX1n	16	SDA
7	TX0p	17	GND
8	GND	18	5V
9	TX0n	19	Hot Plug Detect
10	CLKp		

Connector PN	Vendor
ABA-HDM-020-P05_A	LOTES

2.2.7 COM2 (Serial port connector (RS-232/422/485 & RI/5V/12V))



Serial Port Connector



Connector PN

DM10151-N5W3-4F

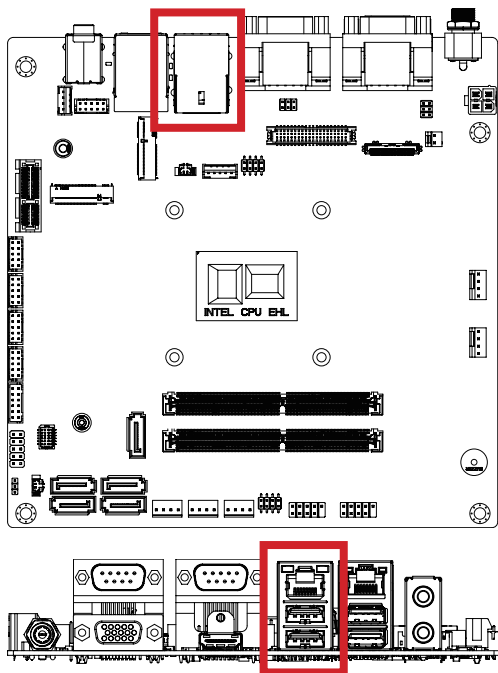
Vendor

FOXCONN

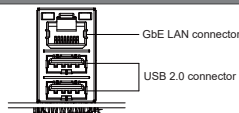
Pin No.	RS-232	RS-422 Full Duplex	RS-485 Half Duplex
1	DCD	TXD-	D-
2	RXD	TXD+	D+
3	TXD	RXD+	—
4	DTR	RXD-	—
5	GND		
6	DSR	—	—
7	RTS	—	—
8	CTS	—	—
9	RI	—	—

2.2.8 USB_LAN1 (USB 2.0 connector (Bottom) + GbE LAN port (Top))

7 8



USB & LAN Connector

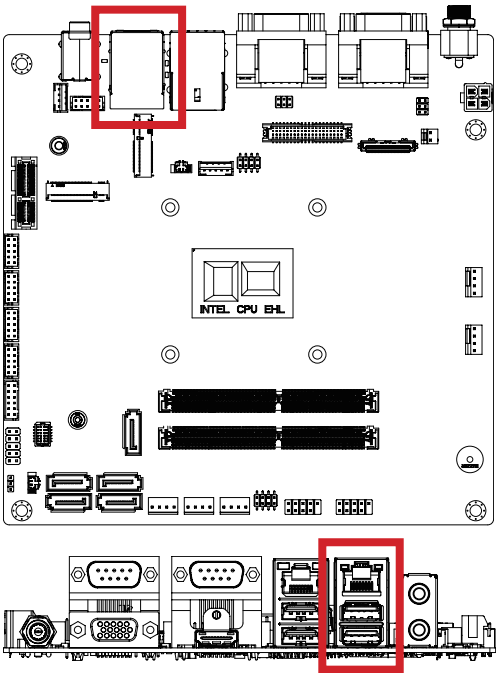


USB Connector	
Pin No.	Definition
1	5V
2	D1n
3	D1p
4	GND
5	5V
6	D2n
7	D2p
8	GND

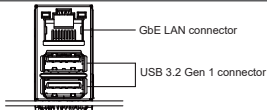
LAN Connector			
Pin No.	Definition	Pin No.	Definition
1	TX1+	4	TX3+
2	TX1-	5	TX3-
3	TX2+	7	TX4+
6	TX2-	8	TX4-
State		Description	
Orange On		1Gbps data rate	
Green On		100Mbps data rate	
Off		10Mbps data rate	

2.2.9 USB31_LAN2 (USB 3.2 Gen 1 connector (Bottom) + GbE LAN port (Top))

9 10



USB & LAN Connector



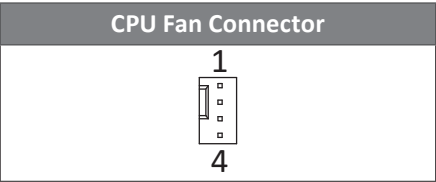
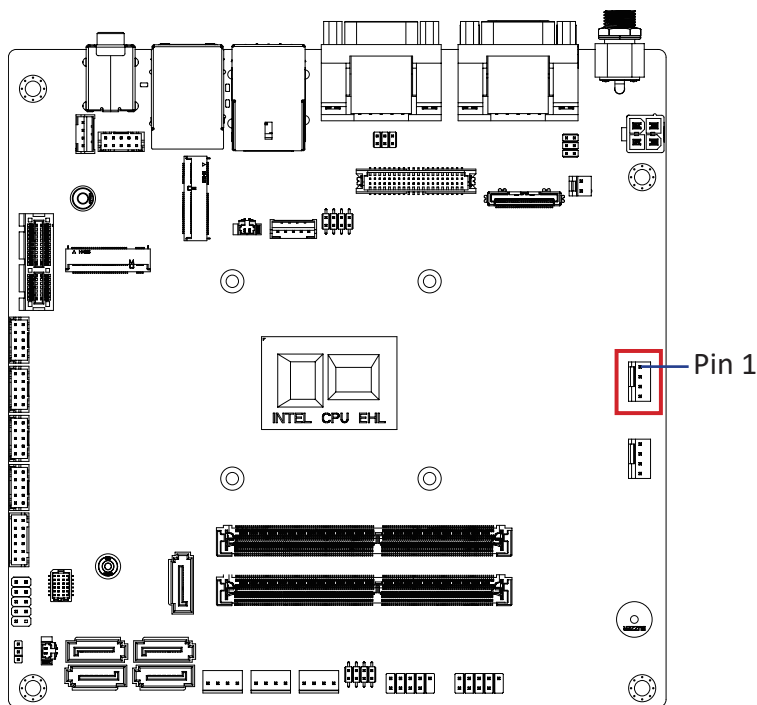
USB Connector			
Pin No.	Definition	Pin No.	Definition
1	5V	10	5V
2	D1n	11	D0n
3	D1p	12	D0p
4	GND	13	GND
5	USB3_RX1n	14	USB3_RX2n
6	USB3_RX1p	15	USB3_RX2p
7	GND	16	GND
8	USB3_TX1n	17	USB3_TX2n
9	USB3_TX1p	18	USB3_TX2p

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

2.2.10 CPU_FAN (CPU Fan Connector)

13



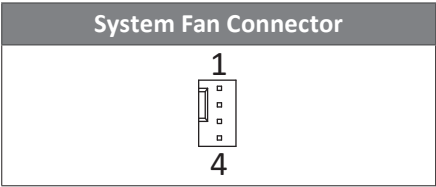
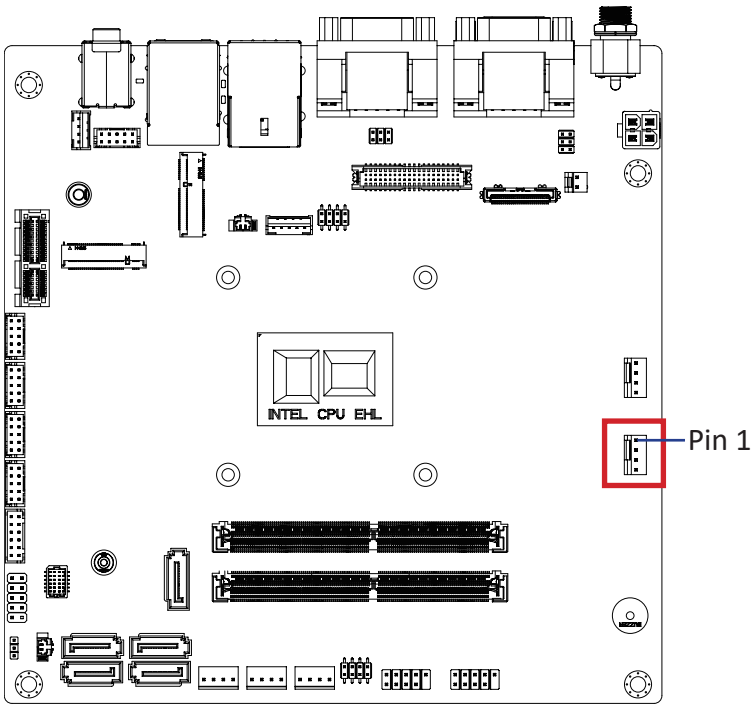
Pin No.	Definition
1	GND
2	12V
3	Detect
4	Speed Control

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

Connector type
1x4pin connector, pitch 2.54mm

2.2.11 SYS_FAN (System Fan Connector)

14



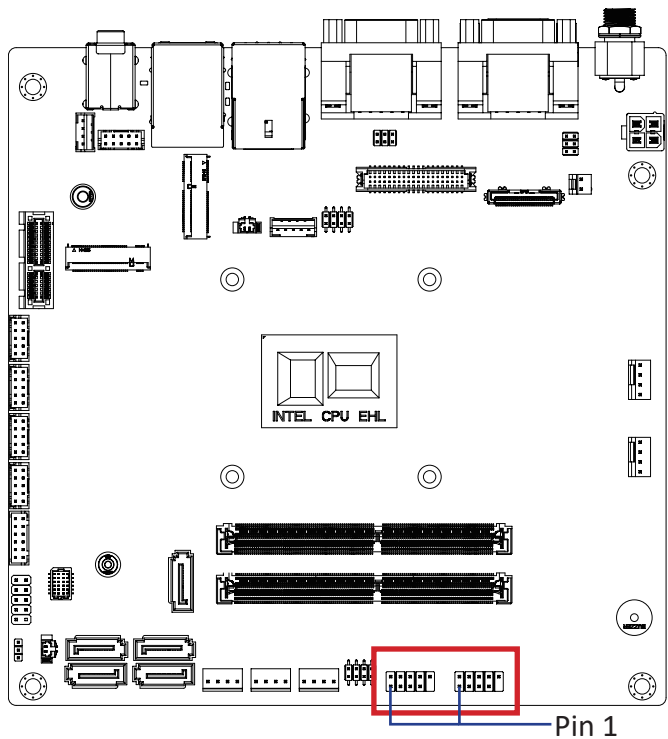
Connector PN	Vendor
744-81-045W11	PINREX
WF04R22WJQ195	HORNGTONG

Connector type
1x4pin connector, pitch 2.54mm

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

2.2.12 F_USB2_1, F_USB2_2 (USB 2.0 header)

15

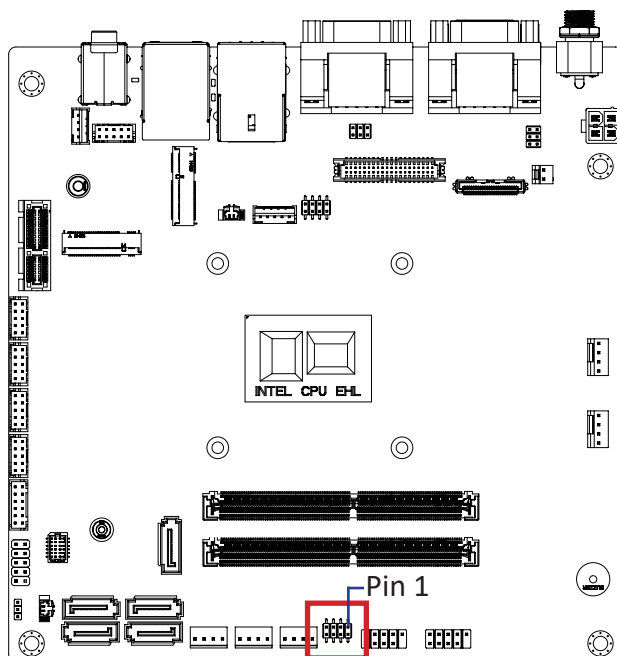


USB 2.0 Header	
2 10 1 9	
Pin No.	Definition
1	5V
2	5V
3	D2n
4	D1n
5	D2p
6	D1p
7	GND
8	GND
9	No Pin
10	NC

Connector PN	Vendor
210-92-05GB04	PINREX
PH10R53BAZ009	HORNGTONG
Connector type	
2x5pin connector, pitch 2.54mm	

2.2.13 SATA_LED (SATA LED for SATA1~4 port)

16



SATA LED select jumper



Pin No.	Definition
1	SATA1 LED
2	3.3V
3	SATA2 LED
4	3.3V
5	SATA3 LED
6	3.3V
7	SATA4 LED
8	3.3V

Connector PN

222-97-04GBE1

Vendor

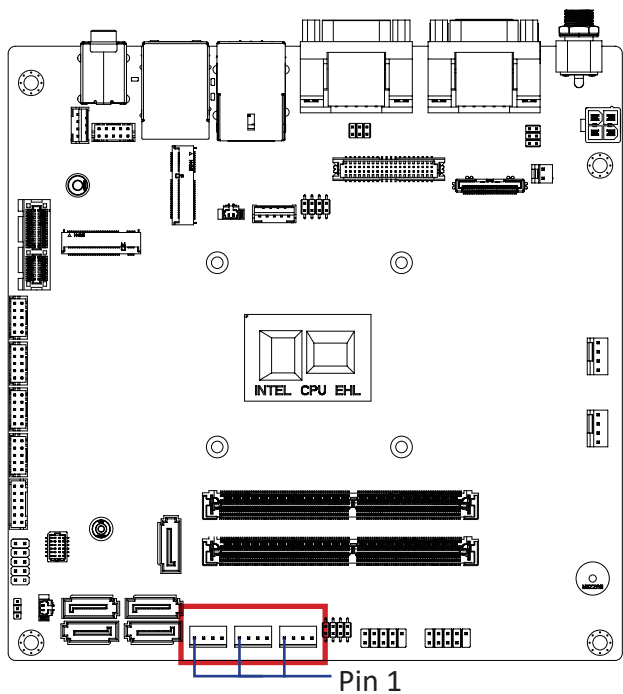
PINREX

Connector type

2x4pin connector, pitch 2.00mm

2.2.14 SATAPWR, SATAPWR1, SATAPWR2 (SATA Power Connector)

17



SATA Power Connector

1

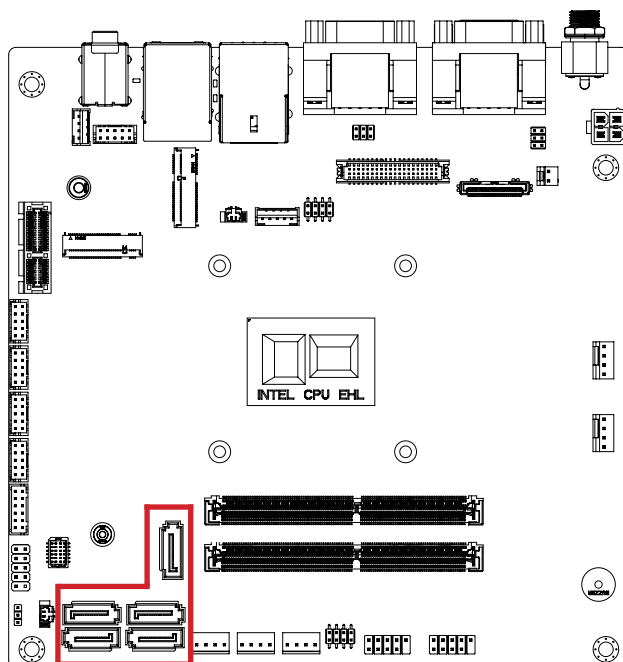
4

Connector PN	Vendor
743-91-045W00	PINREX
Connector type	
1x4pin connector, pitch 2.54mm	

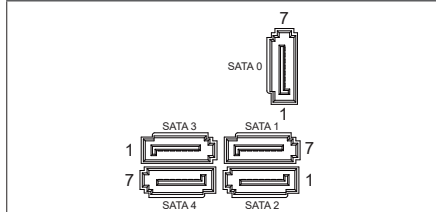
Pin No.	Definition
1	12V
2	GND
3	GND
4	5V

2.2.15 SATA0, SATA1, SATA2, SATA3, SATA4, SATA5 (SATA 6Gb/s Connector)

18



SATA 6Gb/s Connector

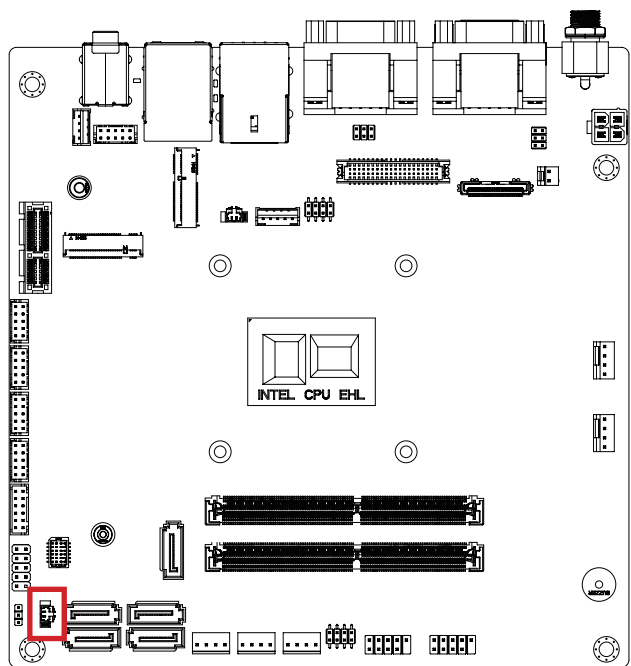


Pin No.	Definition
1	GND
2	TXp
3	TXn
4	GND
5	RXn
6	RXp
7	GND

NOTE : SATA0 port supports SATA DOM with pin 8 for 5V.

2.2.16 CASE_OPEN (chassis open intrusion alert header)

19



chassis open intrusion alert header

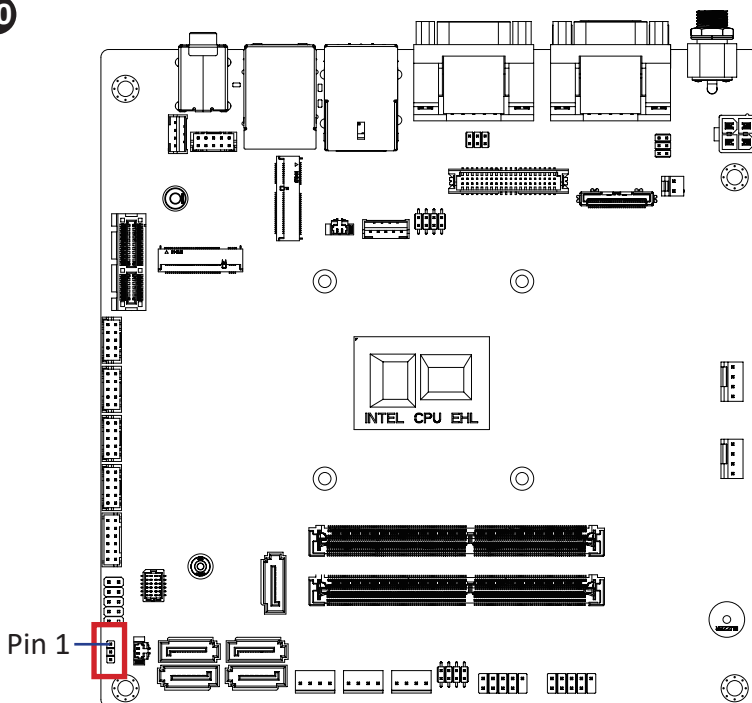


Pin No.	Definition
1	Detect
2	GND

Connector PN	Vendor
85205-0270L	ACES
A1250WV-S-02PC	JOINT-TECH
Connector type	
1x2pin header, pitch 1.25mm	

2.2.17 AT_CN (AT/ATX mode select jumper)

20



AT/ATX mode select jumper



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)	

Connector PN

Vendor

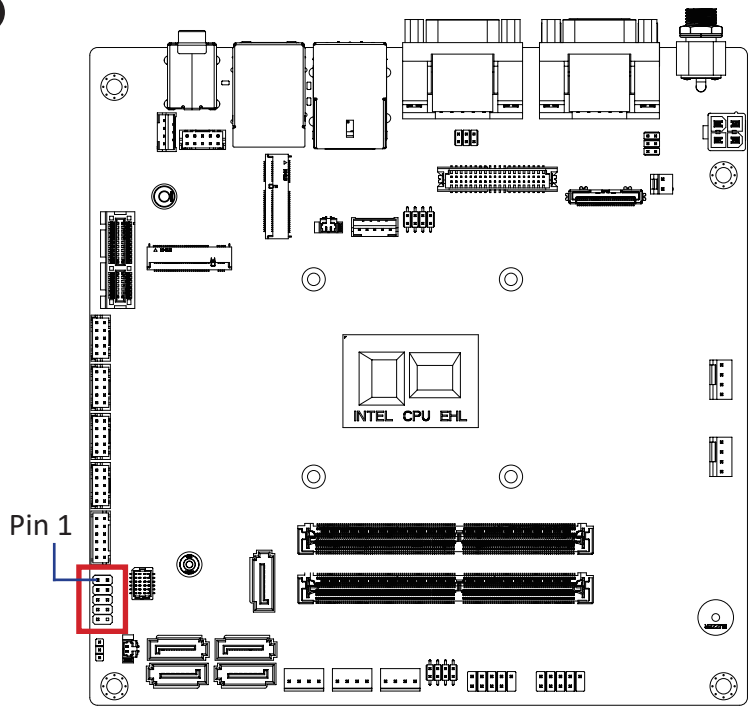
220-96-03GB01	PINREX
220-96-03GB001K	PINREX
PH03N2-7BAN000	HORNGTONG

Connector type

1x3pin header, pitch 2.0mm

2.2.18 SYS_PANEL (System Panel header)

21



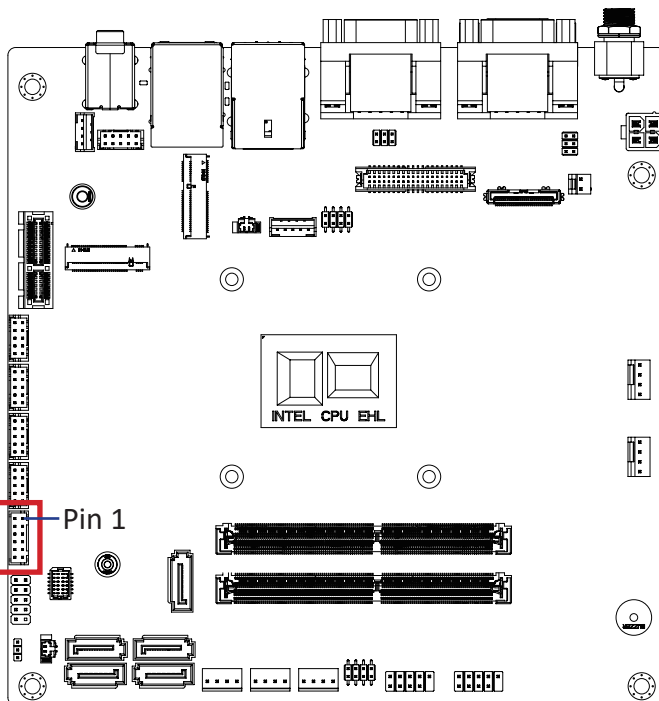
System Panel Header	
	12 910

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

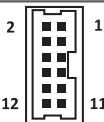
Connector PN	Vendor
210-92-05GW5W	PINREX
Connector type	
2x5pin header, pitch 2.54mm	

2.2.19 GPIO_CNT (General purpose input/out header)

22



GPIO Connector



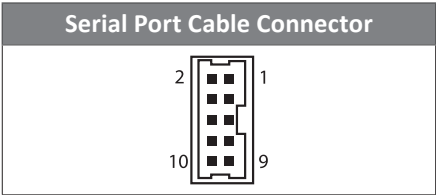
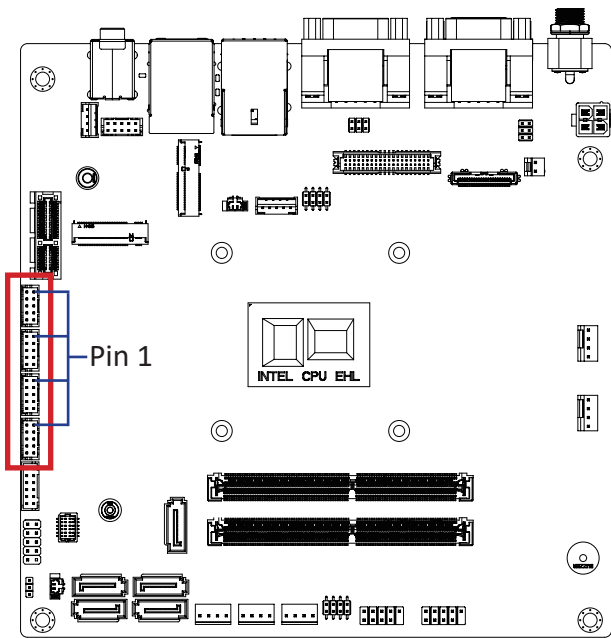
Pin No.	Definition
1	GPIO-output_1
2	GPIO-input_1
3	GPIO-output_2
4	GPIO-input_2
5	GPIO-output_3
6	GPIO-input_3
7	GPIO-output_4
8	GPIO-input_4
9	SMBus Clock

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	

2.2.20 COM3, COM4, COM5, COM6 (Serial port header (RS-232))

23



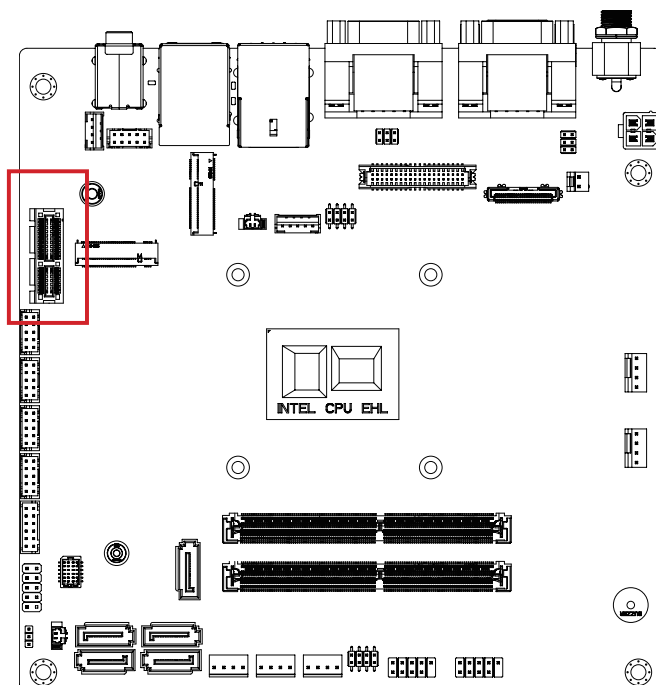
Pin No.	Definition
1	RXD
2	DCD
3	DTR
4	TXD
5	DSR
6	GND
7	CTS
8	RTS
9	No connect
10	RI

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

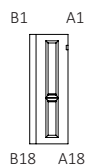
Connector type
2x5pin header, pitch 2.0mm

2.2.21 PCIEX1 (1 x PCIe x1 (Gen 3x1) Slot)

24

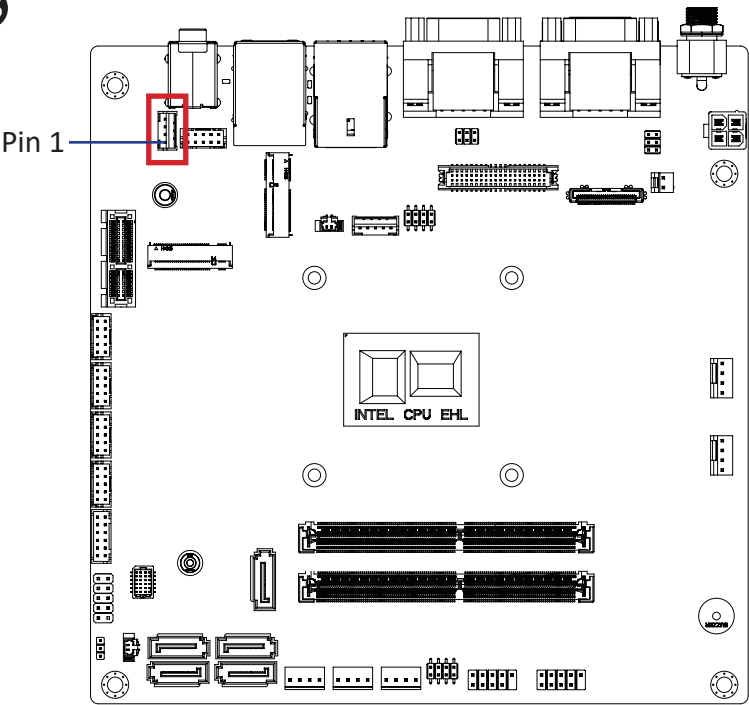


PCIEX1 connector

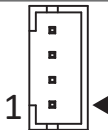


2.2.22 SPKR (Speaker Out Connector)

25



Speaker Out Connector

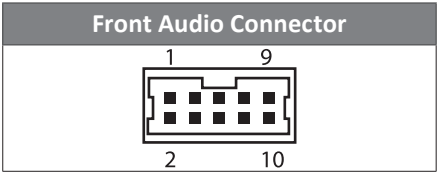
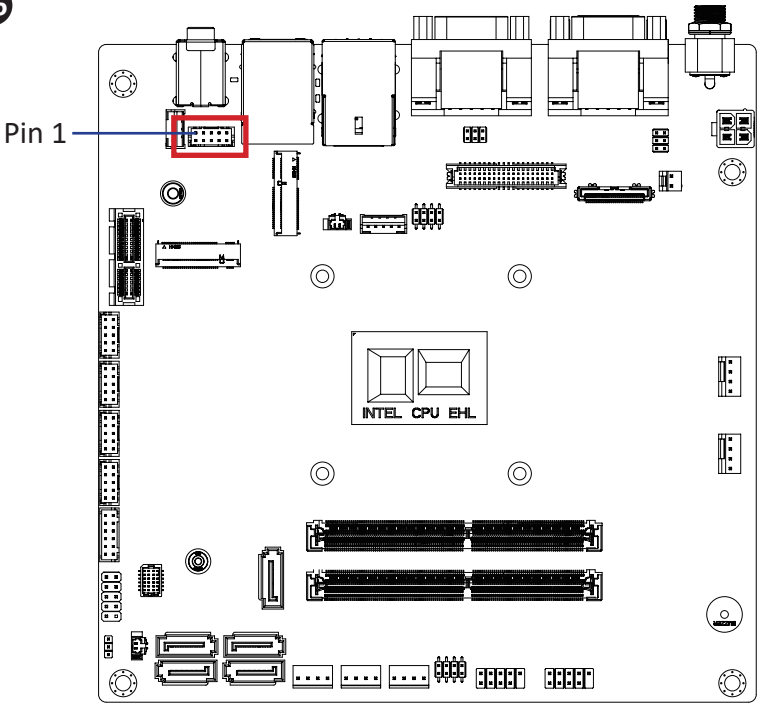


Pin No.	Definition
1	SPEAKER L+
2	SPEAKER L-
3	SPEAKER R-
4	SPEAKER R+

Connector PN	Vendor
721-81-045W00	PINREX
A2001WV-04P146	JOINT-TECH
Connector type	
1x4pin header, pitch 2.0mm	

2.2.23 FP_AUDIO (Front Panel Audio header)

26



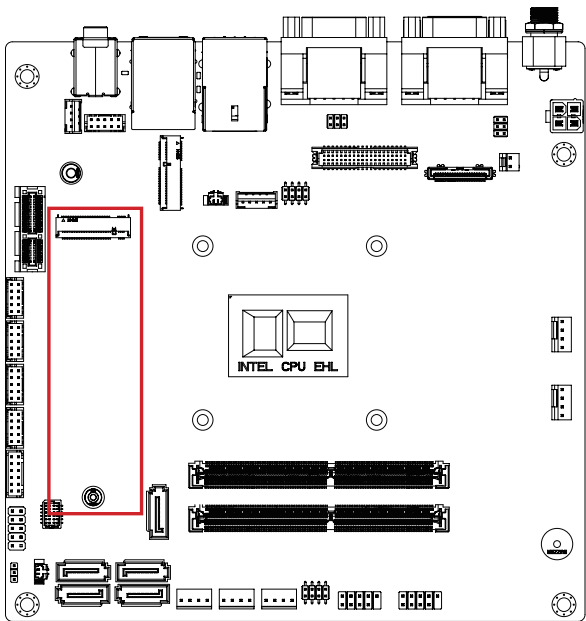
Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

Connector type
2x5pin header, pitch 2.0mm

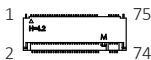
Pin No.	Definition	Pin No.	Definition
1	MIC-LEFT	6	GND
2	GND	7	JACKSENCE DELTECT
3	MIC-RIGHT	8	NC
4	DELTECT	9	LINE-LEFT
5	LINE-RIGHT	10	GND

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

27



M.2 M Key Connector



Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	GND	4	3.3V
5	NC	6	NC
7	NC	8	NC
9	GND	10	SSD LED
11	NC	12	3.3V
13	NC	14	3.3V
15	GND	16	3.3V
17	NC	18	3.3V
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC

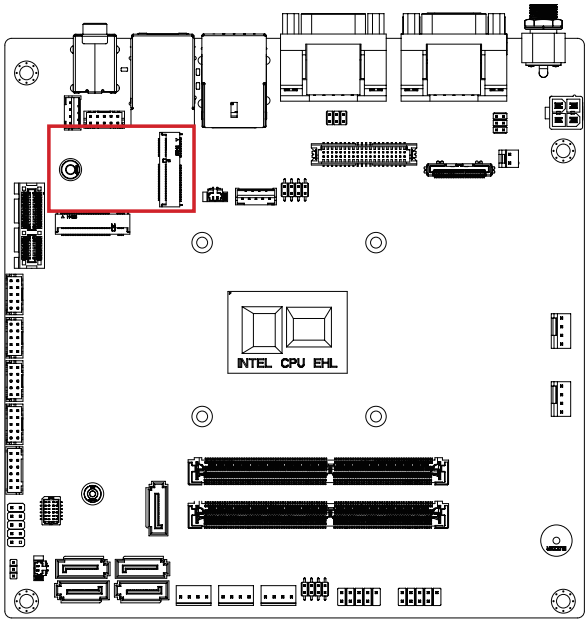
Pin No.	Definition	Pin No.	Definition
37	NC	38	DEVS LP
39	GND	40	NC
41	SATA RXp	42	NC
43	SATA RXn	44	NC
45	GND	46	NC
47	SATA TXn	48	NC
49	SATA TXp	50	PCI Reset
51	GND	52	PCI Clock Request
53	SATA Clockn	54	NC
55	SATA Clockp	56	NC
57	GND	58	NC

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

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

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

28



M.2 E Key Connector



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		

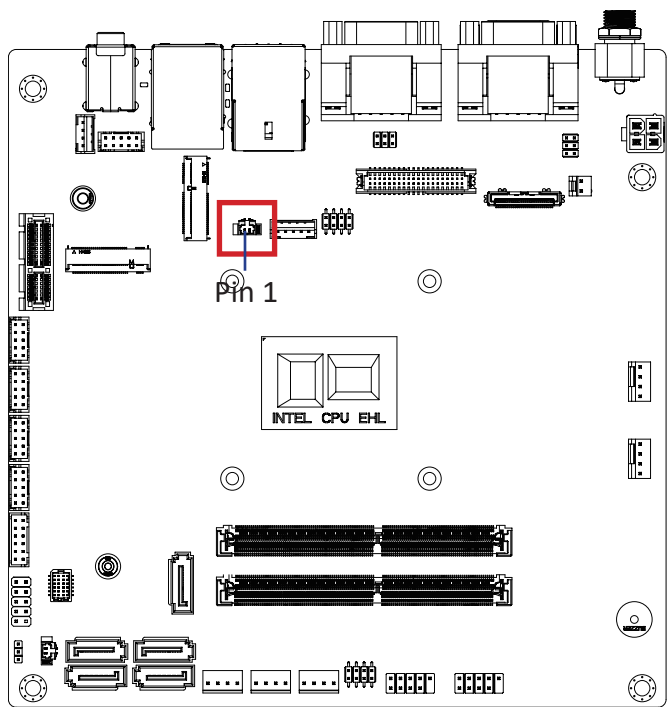
Pin No.	Definition	Pin No.	Definition
33	GND	32	NC
35	PCIE_TXp	34	NC
37	PCIE_TXn	36	NC
39	GND	38	NC

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

2.2.26 BATTERY (Battery Connector)

29



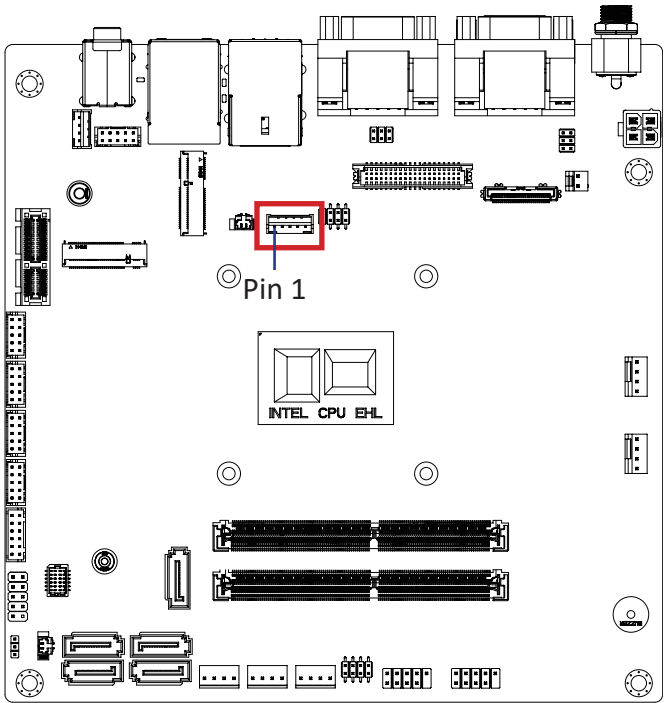
Battery Connector

A close-up diagram of the battery connector. It shows two pins. Pin 1 is on the left and pin 2 is on the right. The connector is a small, rectangular component with two distinct slots for the pins.

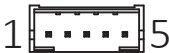
Pin No.	Definition
1	3V
2	GND

2.2.27 BKL_CN (Backlight Control header)

30



Backlight Control Connector



Connector PN

721-81-05TW00

Vendor

PINREX

A2001WV-05P146

JOINT-TECH

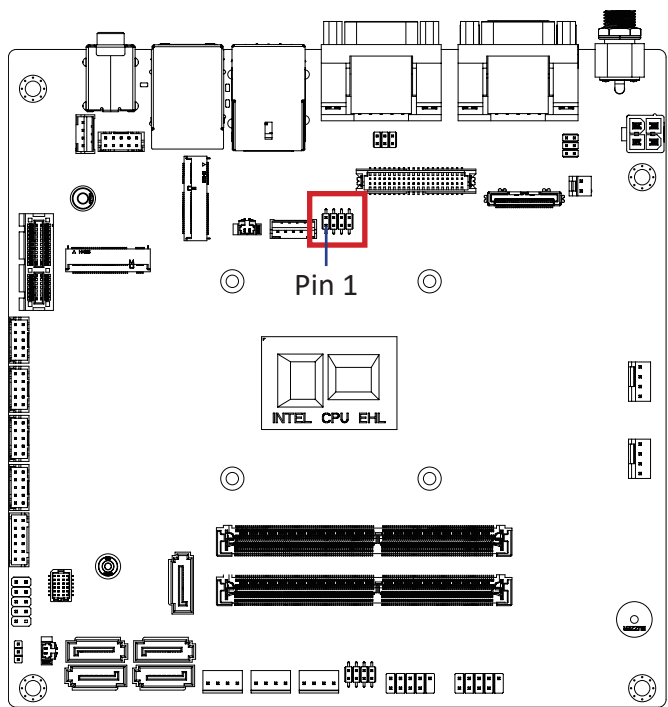
Connector type

1x5pin header, pitch 2.0mm

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

2.2.28 LSW (LVDS resolution jumper)

31

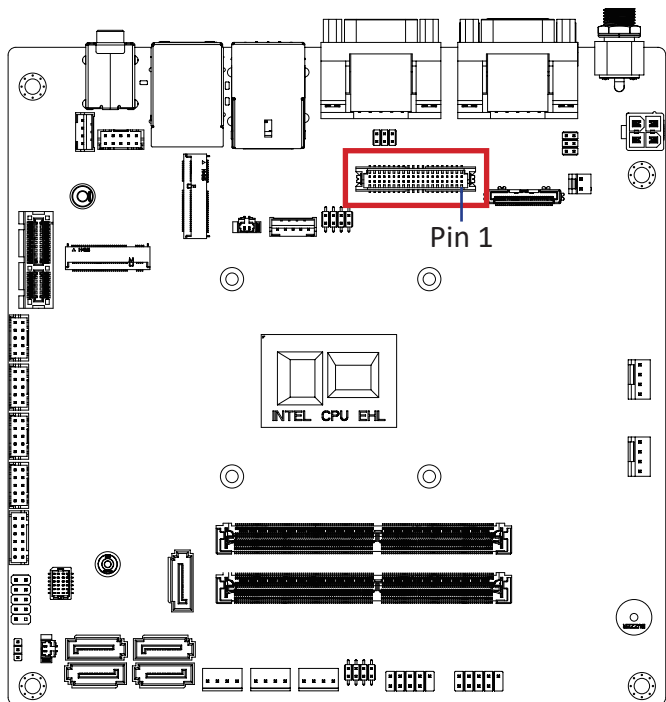


LVDS Resolution Jumper			
Jumper Setting	Resolution	Jumper Setting	Resolution
1 8 8 8 8	800 x 600 18bit	1 8 8 8 8	1366 x 768 24bit
1 8 8 8 8	1024 x 768 18bit	1 8 8 8 8	1440 x 900 24bit
1 8 8 8 8	1024 x 768 24bit	1 8 8 8 8	1400 x 1050 24bit
1 8 8 8 8	1024 x 600 18bit	1 8 8 8 8	1600 x 900 24bit
1 8 8 8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

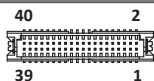
Connector PN	Vendor
222-97-04GBE1	PINREX
Connector type	
2x4pin header, pitch 2.0mm	

2.2.29 LVDS (LVDS Connector)

32



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	SPE00	25	GND
6	SPE00	26	GND
7	GND	27	A7+
8	GND	28	A6+
9	A1+	29	A7-
10	A0+	30	A6-
11	A1-	31	GND
12	A0-	32	GND
13	GND	33	CLK2+
14	GND	34	CLK1+
15	A3+	35	CLK2-
16	A2+	36	CLK1-
17	A3-	37	GND

Pin No.	Definition	Pin No.	Definition
18	A2-	38	GND
19	GND	39	12V
20	GND	40	12V

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

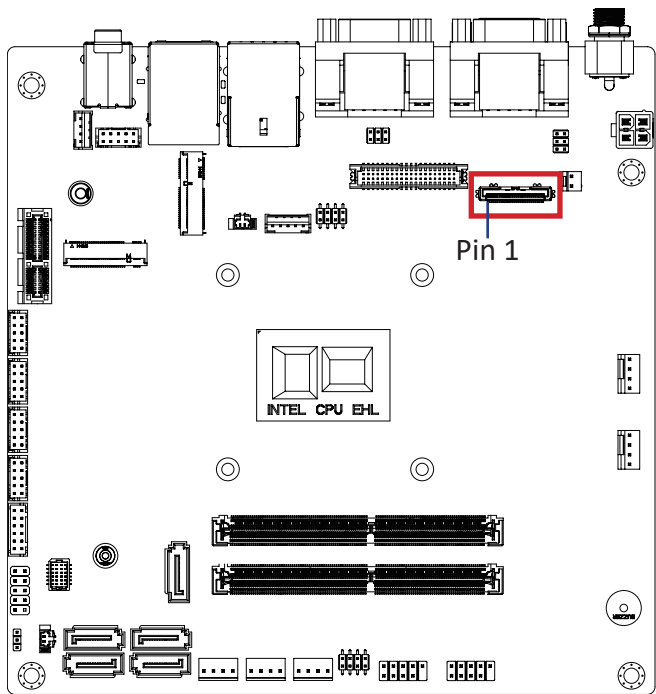
Connector type
2x20pin header, pitch 1.25mm

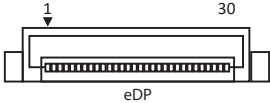
For each model support LVDS function.
But below model no need to add.
A0~A3 is odd channel 0~3, A4~A7 is even channel.

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

2.2.30 EDP (Embedded Display Port connector)

33



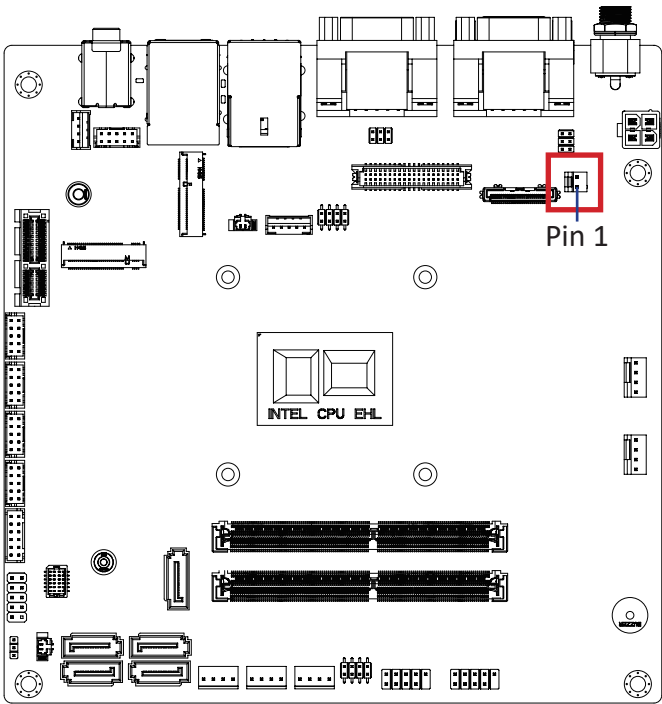
Embedded Display Port connector			
			
Pin No.	Definition	Pin No.	Definition
1	GND	16	GND
2	TX0n	17	Hot Plug Detect
3	TX0p	18	Backlight Enable
4	GND	19	GND
5	TX1n	20	Backlight controll
6	TX1p	21	GND
7	GND	22	3.3V
8	TX2n	23	3.3V
9	TX2p	24	3.3V

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	

2.2.31 ATX_CTL (ATX Control header)

34



ATX Control Header



Connector PN
744-81-02TW10

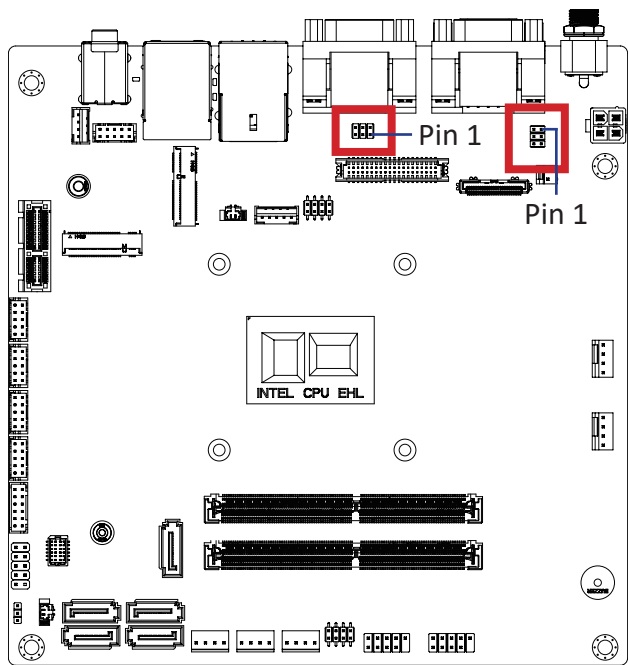
Vendor
PINREX

Connector type
1x2pin header, pitch 2.54mm

Pin No.	Definition
1	PSON#
2	5V

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

35

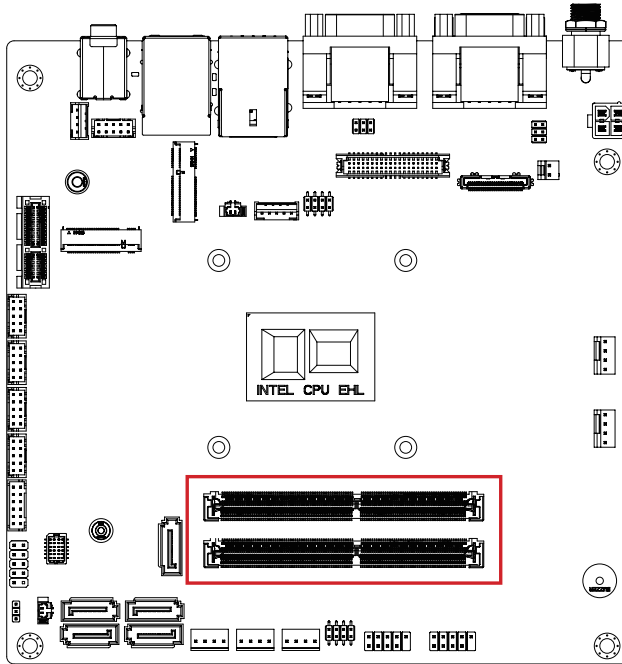


JCOM1, JCOM2 Jumper Select	
6 5 8 2 1 JCOM2 2 1 6 5 JCOM1	1-2 Close: 5V (Power COM)
6 5 8 2 1 JCOM2 2 1 6 5 JCOM1	3-4 Close: RI (Stand COM)
6 5 8 2 1 JCOM2 2 1 6 5 JCOM1	5-6 Close: 12V (Power COM)

Connector PN	Vendor
220-97-03GB01	PINREX
PH06N53BAZ000	HORNGTONG
Connector type	
2x3pin header, pitch 2.0mm	

2.2.33 SODIMMA, SODIMMB (2 x DDR4 SO-DIMM Sockets)

36



Chapter 3

Chapter 3 – BIOS

3.1 Introduction

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

3.1.1 How to Entering into BIOS menu

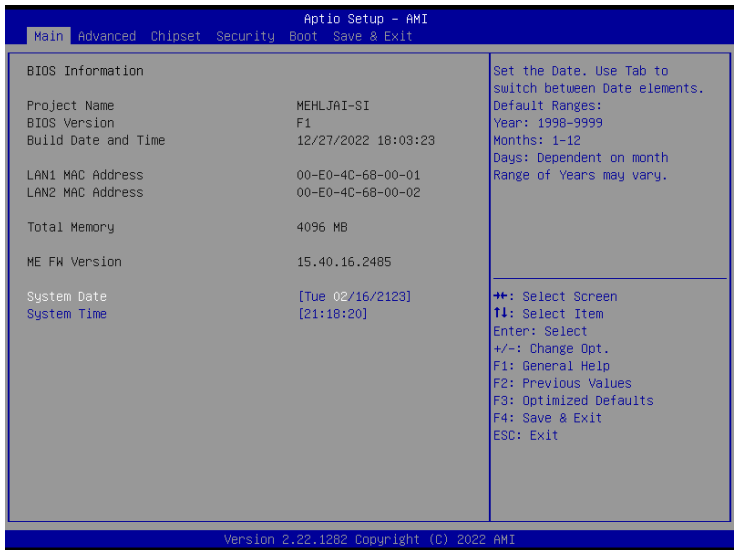
Once the system is power on, press the key as soon as possible to access into BIOS Setup program.

3.1.2 Function Keys to setup in BIOS Setup program

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

3.2 The Main Menu

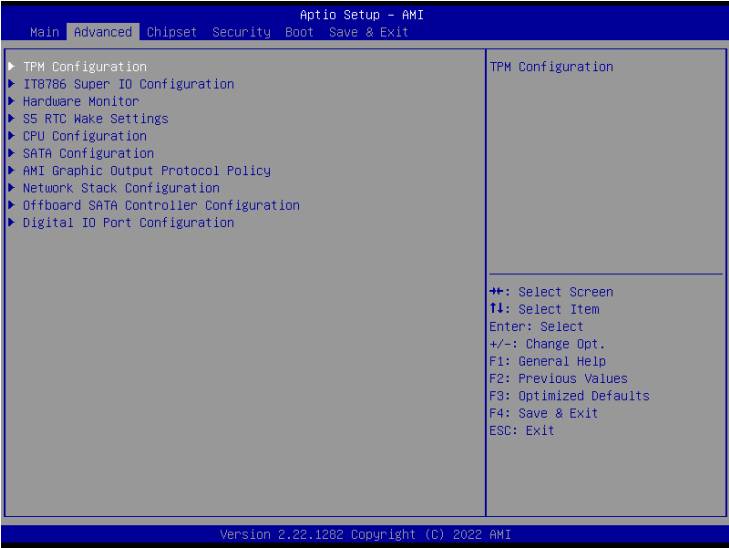
The main menu shows the basic system information.
Use arrow keys to move among the items.



Items	Description
Project Name	Shows Project name information
BIOS Version	Shows the BIOS version of the system
Build Date and Time	Shows the Build Date and Time when the BIOS was created.
LAN1 MAC Address	Shows LAN 1 MAC Address information
LAN2 MAC Address	Shows LAN 2 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)

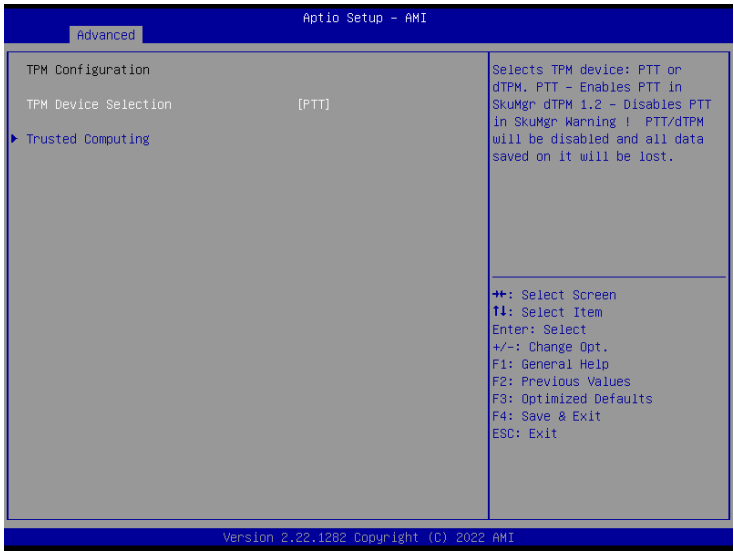
3.3 Advanced

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.



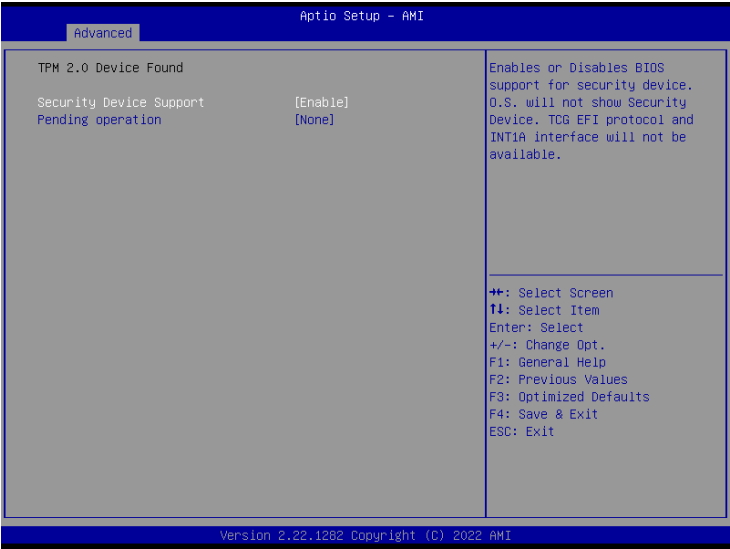
3.3.1 TPM Configuration

Use TPM Configuration submenu to choose TPM interface.



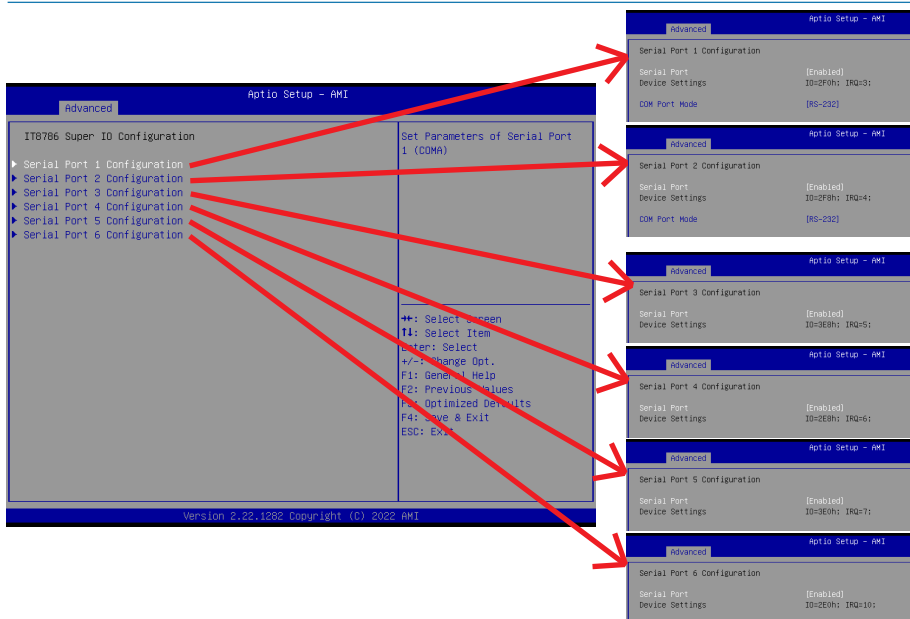
Item	Description
TPM Device Selection	PTT : Internal TPM (Default setting) dTPM : External TPM (When using External TPM module or having TPM chip on MB)

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



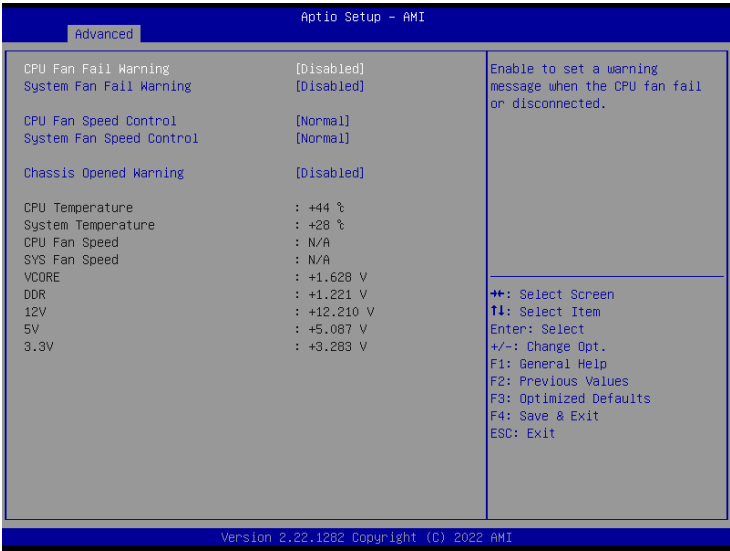
Item	Description
Security Device Support	Enabled : Enables TPM feature (Default setting) Disabled : Disables TPM feature
Pending operation	None : No execution will be conducted (Default setting) TPM clear : Set to clear data on TPM

3.3.2 IT8786 Super IO Configuration



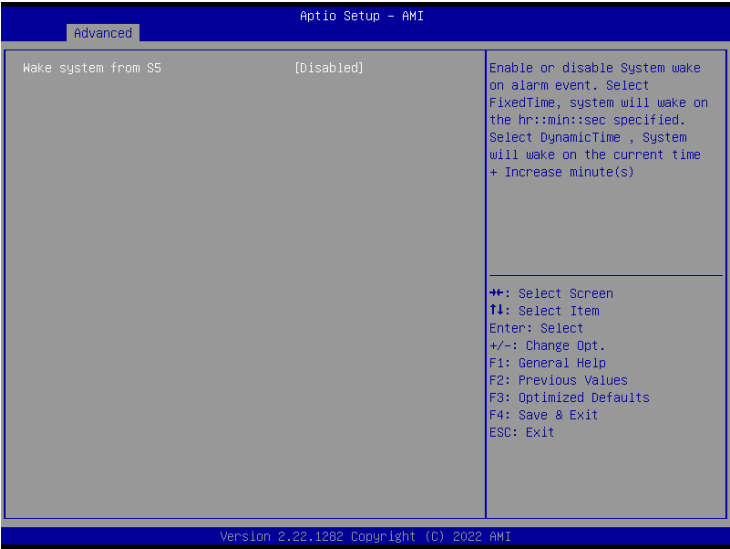
Item	Description
Serial Port 1 Configuration Serial Port 2 Configuration	Press [Enter] to configure advanced items : Serial Port : Enabled : Enables allows you to configure the serial port settings Disabled : if Disabled, displays no configuration for the serial port Device settings : Display the specified Serial Port base I/O address and IRQ COM Port Mode : Choose RS-232, RS-422, or RS-485 feature
Serial Port 3 Configuration Serial Port 4 Configuration Serial Port 5 Configuration Serial Port 6 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 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
Chassis opened Warning	Enables or Disables to set a warning message when the system chassis opened. Disabled : Disables warning message (Default setting) Enabled : Enables warning message Clear : Clear the chassis intrusion status record
CPU Temperature	Shows current CPU temperature
System Temperature	Shows current system temperature
CPU Fan Speed	Shows current CPU fan Speed
SYS Fan Speed	Shows current System fan Speed

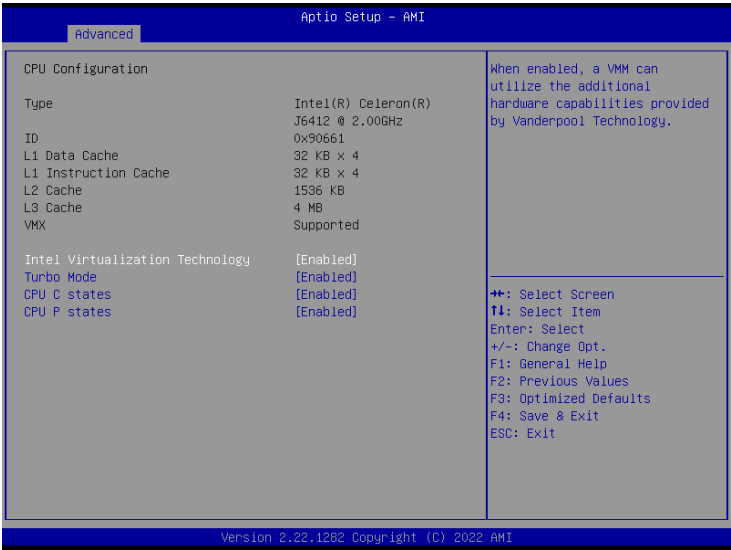
3.3.4 S5 RTC Wake Settings



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)

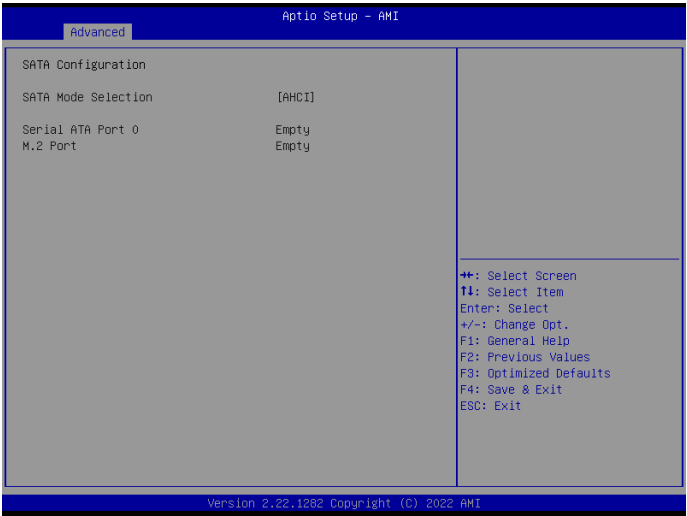
3.3.5 CPU Configuration

This submenu shows detailed CPU informations.



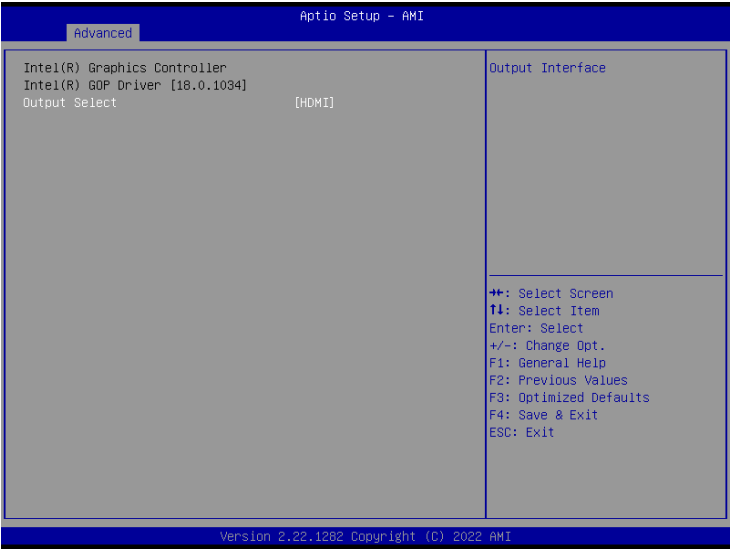
Item	Description
Intel Virtualization Technology	Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. Enabled : Enables Intel Virtualization Technology (Default setting) Disabled : Disables Intel Virtualization Technology
Turbo Mode	Enabled : Enables Turbo Mode (Default setting) Disabled : Disables Turbo Mode
CPU C states	Command CPU to enter into low power consumption mode when CPU is under idle mode. Enabled : Enables 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 (Default setting) Disabled : Disables CPU P states function

3.3.6 SATA Configuration



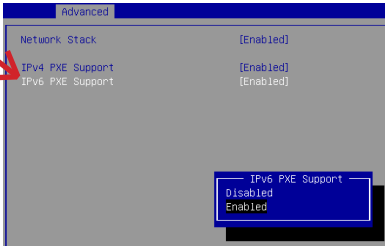
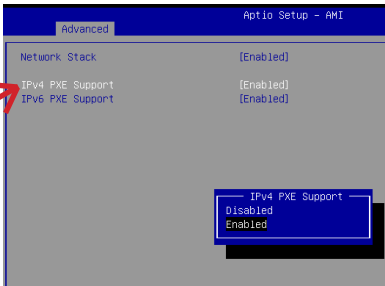
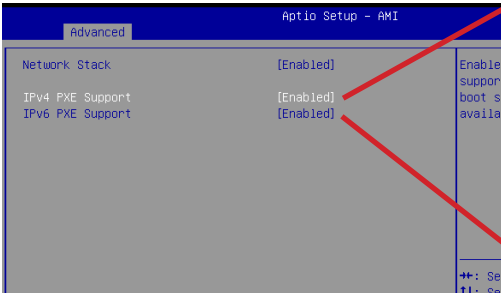
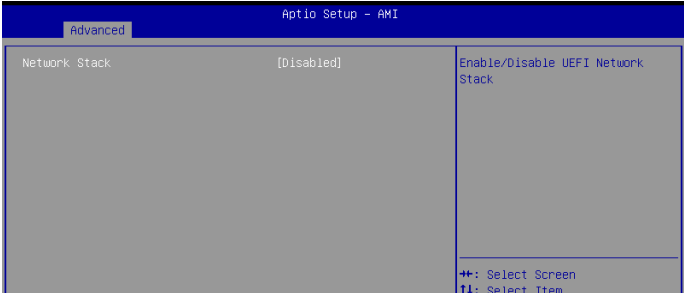
Item	Description
SATA Mode Selection	Set SATA controller to AHCI mode
Serial ATA Port 0	shows HDD/SSD information of SATA 0 port
M.2 Port	shows M.2 SSD information

3.3.7 AMI Graphic Output Protocol Policy



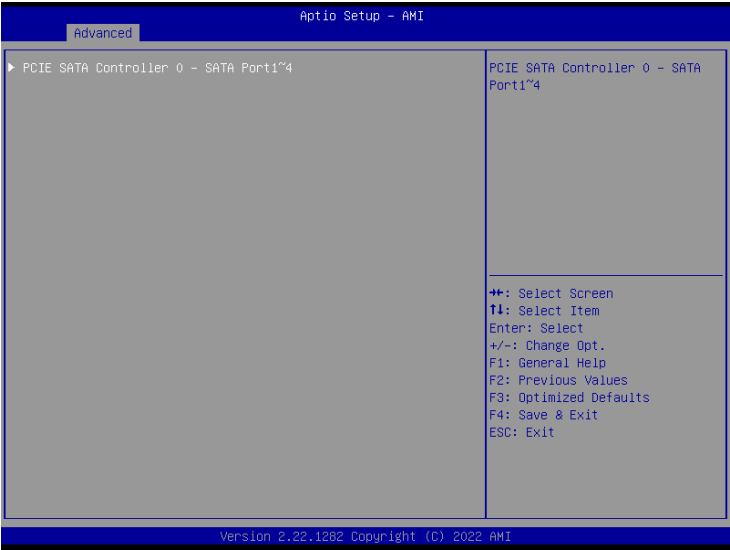
Item	Description
Output Select	Choose default monitor output when there are more than one monitor plugged on the motherboard.

3.3.8 Network Stack Configuration



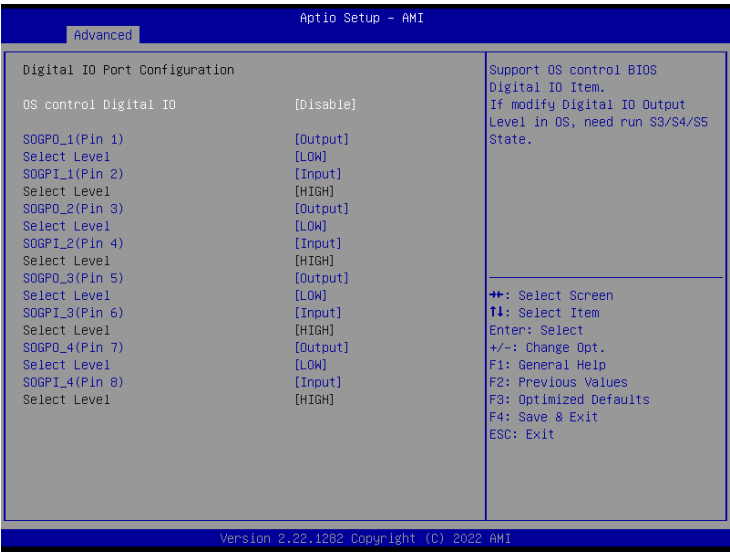
Item	Description
Network Stack	When system is power on, install LAN driver under UEFI mode Disabled : Disables UEFI Network Stack (Default setting) Enabled : Enables UEFI Network Stack
Ipv4 PXE Support	When Network stack is enabled : Disabled : Disables Ipv4 PXE Support Enabled : Enables Ipv4 PXE Support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

3.3.9 Offboard SATA Controller Configuration



Item	Description
PCIE SATA Controller 0 - SATA Port 1~4	shows HDD/SSD information of SATA 1 ~ 4 port

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.

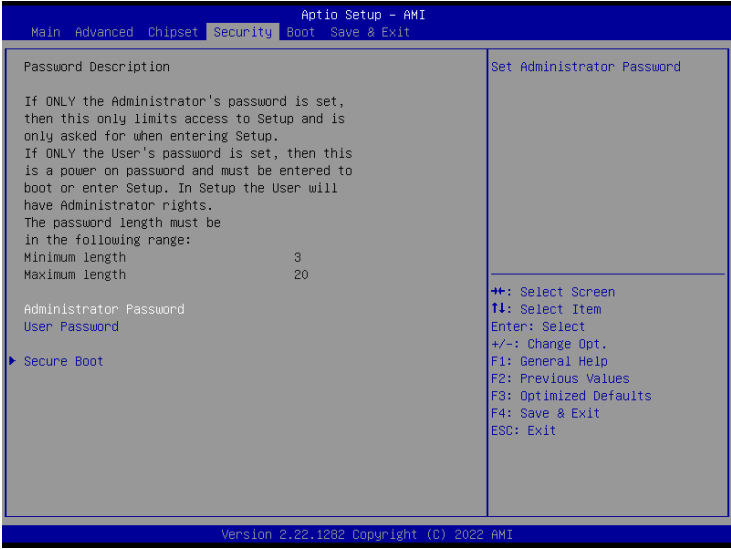
3.4 Chipset



Item	Description
VT-d	Enabled : Enables VT-d function (Default setting) Disabled : Disables VT-d function
DVMT Pre-Allocated	Use DVMT Pre-Allocated to set the amount of system memory which is installed to the integrated graphics processor Option items : 32M , 64M (Default setting), 128M, 256M
HD Audio	Enable/Disable onboard audio controller Enabled : Enables onboard audio controller (Default setting) Disabled : Disables onboard audio controller
Onboard LAN1 Onboard LAN2	Enable/Disable onboard LAN controller Enabled : Enables onboard LAN controller (Default setting) Disabled : Disables onboard LAN controller
ATX control	To choose whether if to use ATX PSU to boot up. Enabled : Enables if needed to use ATX PSU to boot up. Disabled : Disables ATX control function (Default setting)

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

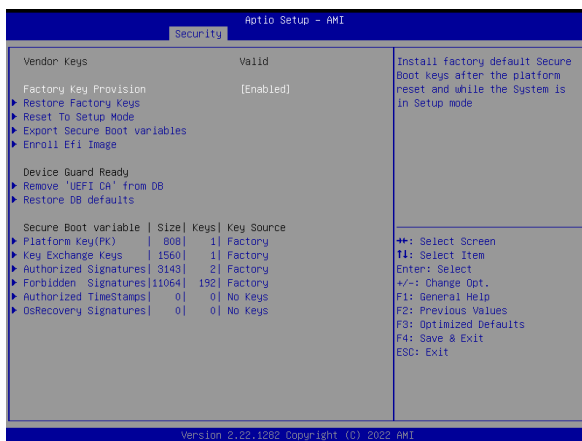
3.5 Security



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

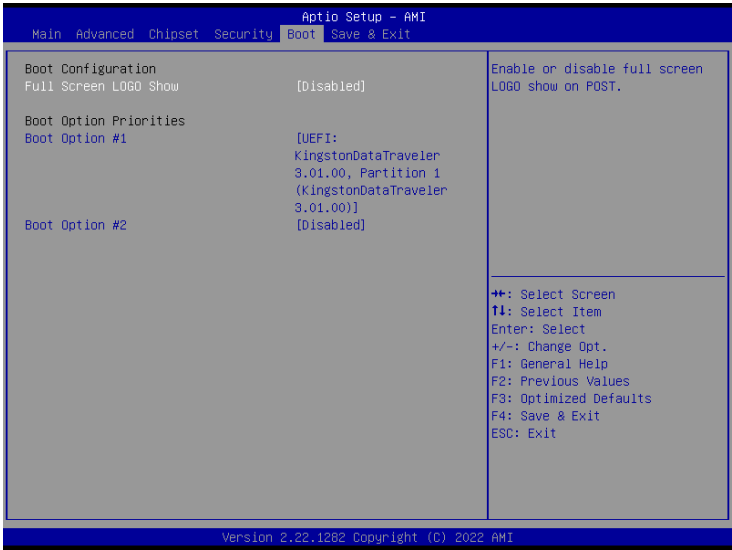


Item	Description
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode. Enabled : Enables Factory Key Provision (Default setting) Disabled : Disables Factory Key Provision
Restore Factory Keys	To restore factory settings Yes : Agree 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 Disabled : Disables Full screen LOGO Show on POST screen (Default setting)
Boot Option #1 Boot Option #2	Shows the information of the storage that be installed in the system Choose/set the boot priority

3.7 Save & Exit



Item	Description
Save Changes and Reset	After configuring all the options that you wish to change, choose this option to save all the changes and reboot the system Yes : Agree to save and reset No : Cancel to save and reset
Discard Changes and Reset	Choose this option to reboot the system without saving any changes Yes : Agree to discard changes and reset No : Cancel to discard changes and reset
Restore Defaults	Restore/Load default values for all the setup options Yes : Agree to load optimized defaults No : Cancel to load optimized defaults
Me FW Image Re-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)