

mITX-H310A (MH310AI-SI)

Thin Mini-ITX Motherboard

User's Manual 1st Ed

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Packing List

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

Item	Quantity
mITX-H310A MB	1
SATA power cable	1
I/O Bracket	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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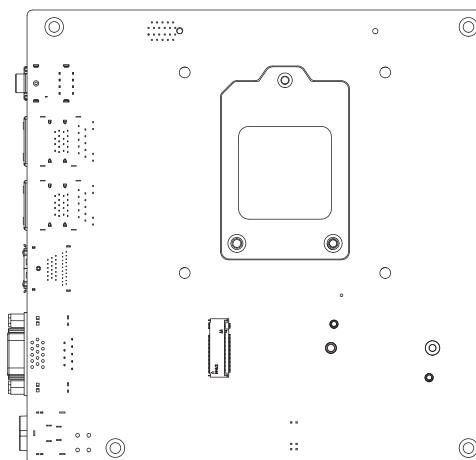
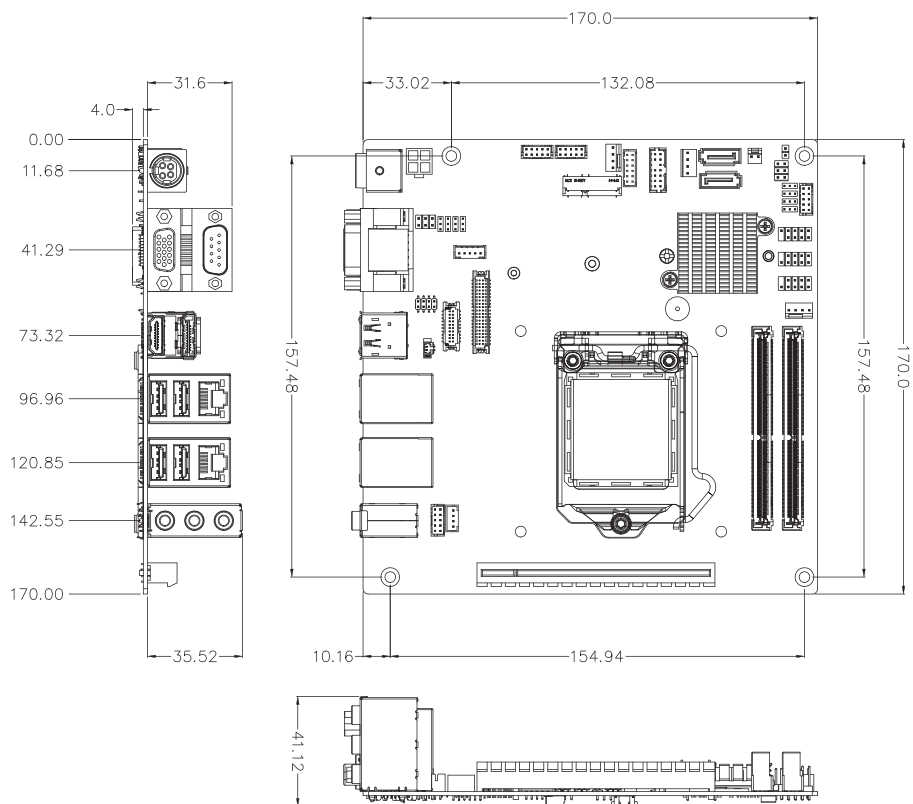
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Chapter 1

Product Specifications



1.1 Specifications

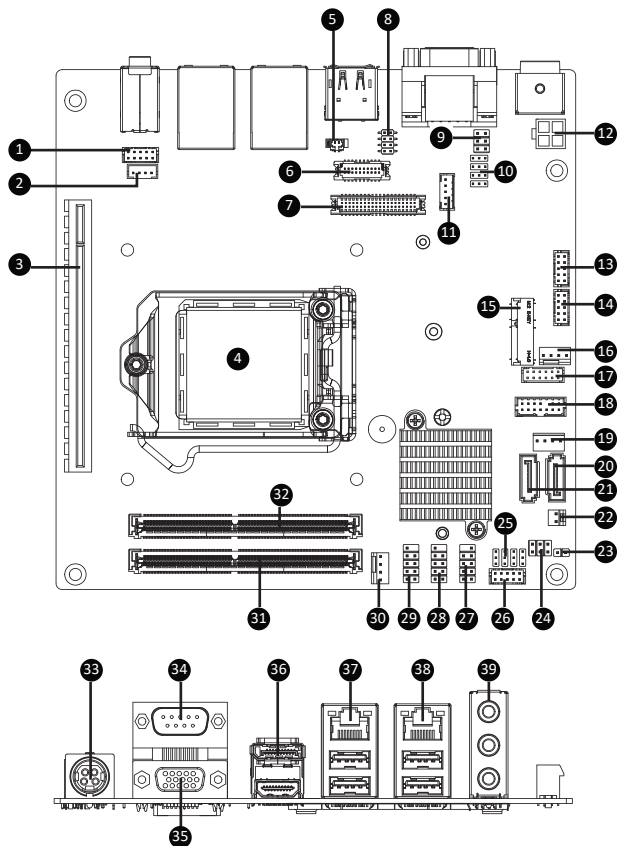
Motherboard	mITX-H310A (MH310AI-SI)
Form Factor	Mini-ITX 170W x 170D (mm)
CPU	Support for 8th/9th Generation Intel® Core™ i7 processors/ Intel® Core™ i5 processors/Intel® Core™ i3 processors/ Intel® Pentium®processors/Intel® Celeron® processors in the LGA1151 package, TDP under 65W L3 cache varies with CPU
Socket	1 x LGA 1151
Chipset	Intel® H310 Express Chipset
Memory	2 x DDR4 SO-DIMM sockets supporting up to 32 GB of system memory Dual channel memory architecture Support for DDR4 2666/2400 MHz memory modules
Ethernet	2 x GbE LAN ports (Intel® i219V and i211AT)
Video	Integrated Graphics Processor - Intel® HD Graphics support: 1 x HDMI port, supporting a maximum resolution of 4096 x 2160@30 Hz 1 x DP port, supporting a maximum resolution of 4096 x 2160@60 Hz 1 x D-Sub port, supporting a maximum resolution of 1920 x 1200@60 Hz 1 x eDP port, supporting a maximum resolution of 1920 x 1080 @60 Hz 1 x LVDS port, supporting a maximum resolution of 1920 x 1080@60Hz * Support up to 2 displays at the same time
Audio	Realtek ALC269 High Definition Audio
Storage	2 x SATA 6Gb/s ports (1 x support SATA DOM)
RAID	—
Expansion Slots	1 x PCIe x16 (Gen3 x16 bus) slot 1 x M.2 2230 E Key slot 1 x M.2 Slot 2242/2280 Storage SATA

Motherboard	mITX-H310A (MH310AI-SI)
Internal I/O	1 x 4-pin ATX main power connector 2 x SATA 6Gb/s connectors 1 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 4 x USB 2.0/1.1 headers 2 x COM header (RS-232) 1 x COM header (RS-232/422/485 and RI/5V/12V) 1 x Clear CMOS jumper 1 x GPIO (8 bits) & SMBUS header 1 x Backlight Control header 1 x eDP connector 1 x LVDS connector 1 x ATX control header
Rear I/O	3 x Audio jacks (Line in, Line out, Mic in) 1 x COM (RS-232/422/485 and RI/5V/12V) 1 x HDMI 1 x Display Port 1 x D-Sub 2 x RJ45 4 x USB3.0 1 x DC Jack (+12V/+19V/+24VDC)
TPM	1 x TPM Header
OS Compatibility	Windows 10 (x64)
PSU Connectors	1 x DC-in (+12V/+19V/+24VDC) 1 x 4-pin ATX power connector
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)
Packing Content	Bulk Packing Capacity: 20pcs Carton size: 550 x 451 x 330(mm) Content: IO Shield x 1 (12AIO-MCQ370-00R) SATA Power cable x 2 (25CRI-300B01-K1R)
Order Information	Motherboard: 9MH310AINR-SI
Optional kit:	TPM 1.2 module: 9CMUFLNR-00 TPM 2.0 module: 9CTM000NR-00

Chapter 2

Chapter 2 – Hardware Information

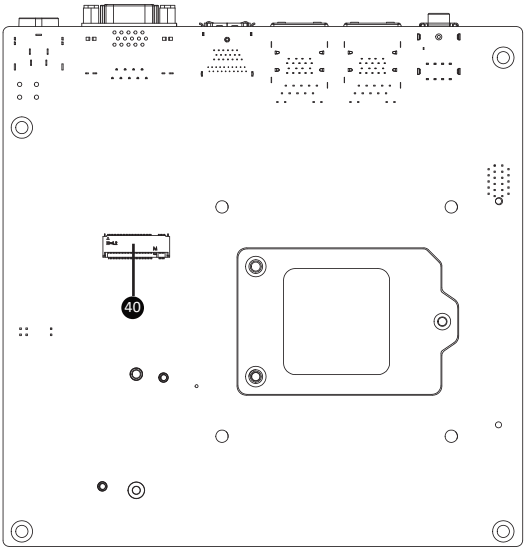
2.1 Jumpers and Connectors



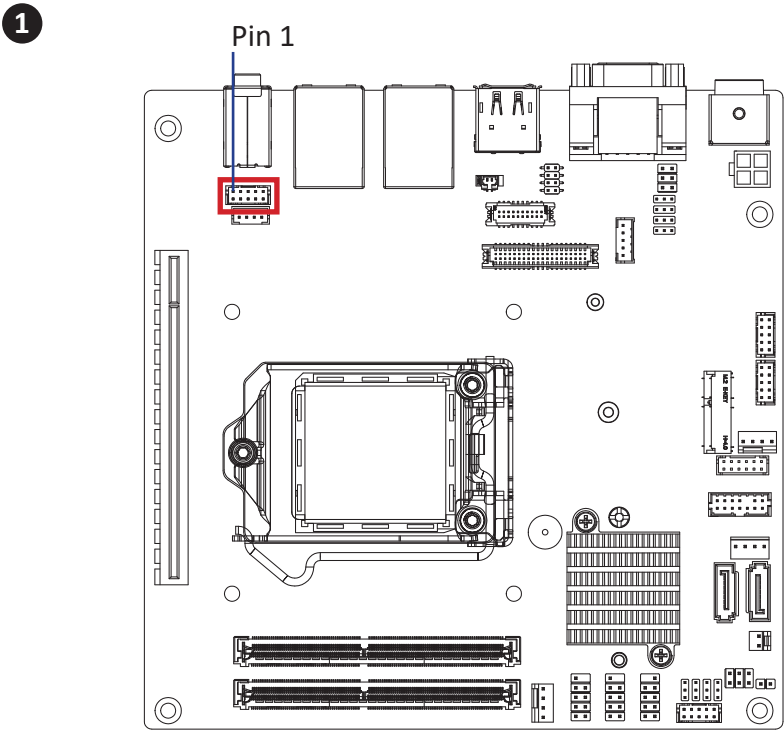
No	Code	Description
1	F_AUDIO	Front audio header
2	SPK_OUT	Speaker out connector
3	PCIE16X	PCIE x16 slot
4	U1	Intel® LGA1151 socket
5	BATTERY	Battery cable connector
6	EDP	Embedded Display Port connector

No	Code	Description
7	LVDS	LVDS connector
8	LSW	LVDS resolution jumper
9	JCOM11	COM1 RI pin RI/5V/12V select jumper
10	JRS11-14	COM1 JRS11-14 select jumper for serial port
11	BKL_CN	Back light brightness control connector
12	DC_IN2	ATX 2x2 pin power connector
13	COM4	Serial port header
14	COM3	Serial port header
15	M2_E Port	1 x M.2 2230 E Key slot
16	SYS_FAN	System fan connector
17	GPIO_CNT	General Purpose input/output header
18	TPM_LPC	TPM connector
19	SATAPW_1	SATA 6Gb/s power connector
20	SATAIII_0	SATA 6Gb/s connector
21	SATAIII_1	SATA 6Gb/s connector
22	ATX_CRL	ATX Control header
23	JCOM16	COM16 RI pin RI/5V/12V Select
24	CLR_CMOS	Clear CMOS jumper
25	JRS21-24	COM2 JRS21-24 select jumper for serial port
26	COM2	Serial port header
27	SYS_PANEL	Front panel header
28	FUSB2_1	USB 2.0 header
29	FUSB2_2	USB 2.0 header
30	CPU_FAN	CPU fan connector

No	Code	Description
31	SODIMM1	DDR4 SO-DIMM slot#1
32	SODIMM2	DDR4 SO-DIMM slot#2
33	DC_IN	DC In Jack
34	COM1 (TOP)	Serial port
35	D-Sub (Bottom)	D-Sub port
36	HDMI_DP	HDMI port & Display port
37	USB30_LAN2	2 USB 3.0 ports + GbE LAN port
38	USB30_LAN1	2 USB 3.0 ports + GbE LAN port
39	AUDIO JACK	3 x Audio jacks (Line in, Line out, Mic in)
40	M2_M Port	1 x M.2 Slot 2242/2280 Storage SATA



2.2.1 F_Audio (Front audio header)



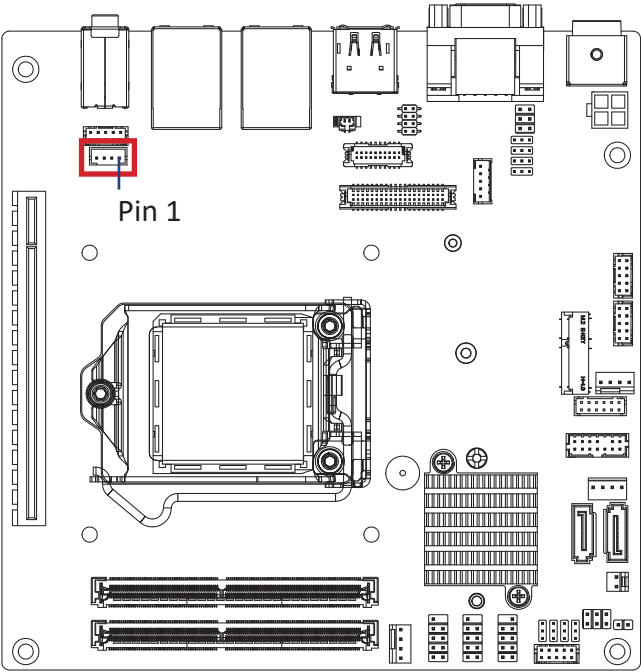
Front Audio Connector	

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

Pin No.	Definition	Pin No.	Definition
1	MIC_L	6	GND
2	GND	7	JD
3	MIC_R	8	No Connect
4	Detect	9	HPOUT_L
5	HPOUT_R	10	GND

2.2.24 SPK_OUT (Speaker out Connector)

2



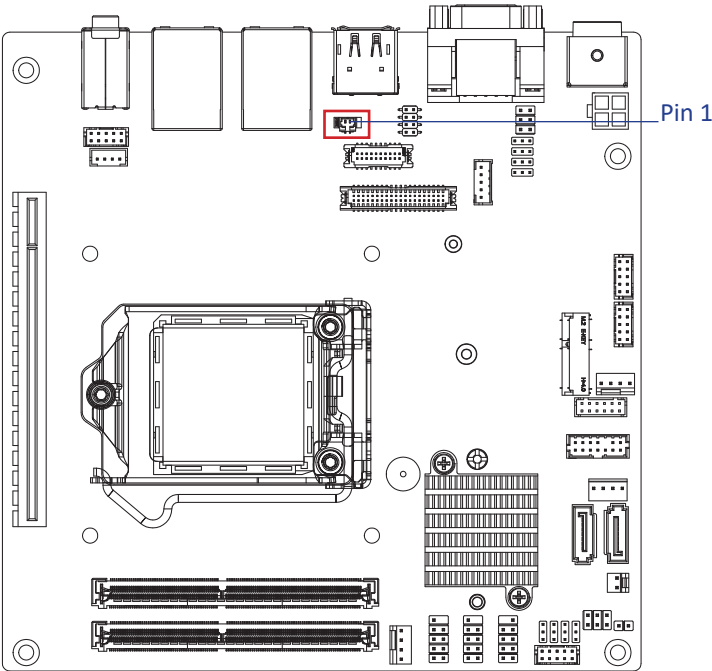
Audio Amplifie Connector	
4	1

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

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

2.2.3 Battery

5



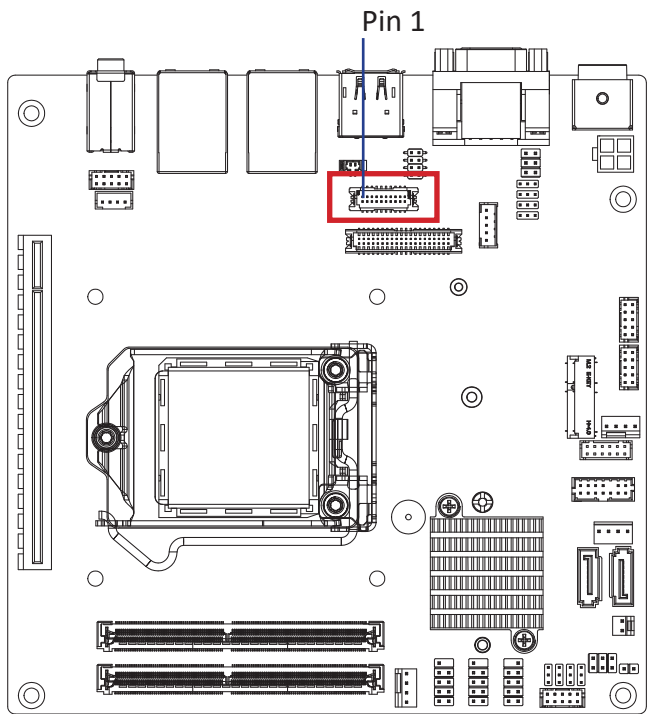
Battery Cable Connector	
2	1

Connector PN	Vendor
85205-0270L	ACES
A1250WV-S-02PC	JOINT-TECH

Pin No.	Definition
1	3.3V
2	GND

2.2.4 EDP (Embedded Display Port Connector)

6



Embedded Display Port connector

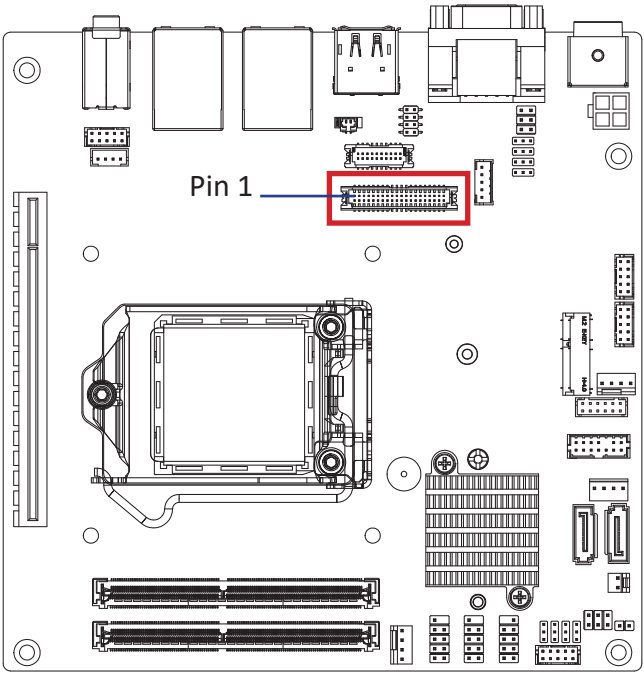
Pin No.	Definition	Pin No.	Definition
1	GND	11	eDP_1+
2	GND	12	eDPAUX-
3	eDP_0-	13	GND
4	eDP_3-	14	eDPAUX+
5	eDP_0+	15	eDP_2-
6	eDP_3+	16	GND
7	GND	17	eDP_2+
8	eDPSW *	18	HDP
9	eDP_1-	19	5V
10	GND	20	3.3V

Note: * Please ensure pin 8 is connected to Ground.

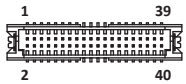
Connector PN	Vendor
A1252WV-SF-2X10PN6BG1G00L	JOINT-TECH
50286-02071-001	ACES

2.2.5 LVDS (LVDS connector)

7



LVDS Connector



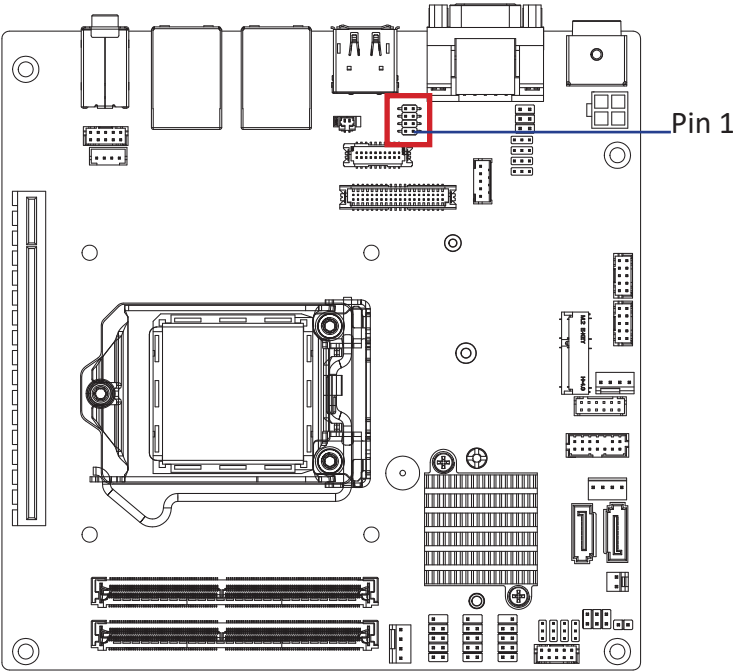
Pin No.	Definition	Pin No.	Definition
1	3.3V	21	A5+
2	5V	22	A4+
3	3.3V	23	A5-
4	5V	24	A4-
5	SPEC0	25	GND
6	SPED0	26	GND
7	GND	27	A7+
8	GND	28	A6+
9	A1+	29	A7-
10	A0+	30	A6-
11	A1-	31	GND
12	A0-	32	GND
13	GND	33	CLK2+
14	GND	34	CLK1+
15	A3+	35	CLK2-

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

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

2.2.6 LSW (LVDS resolution jumper)

8

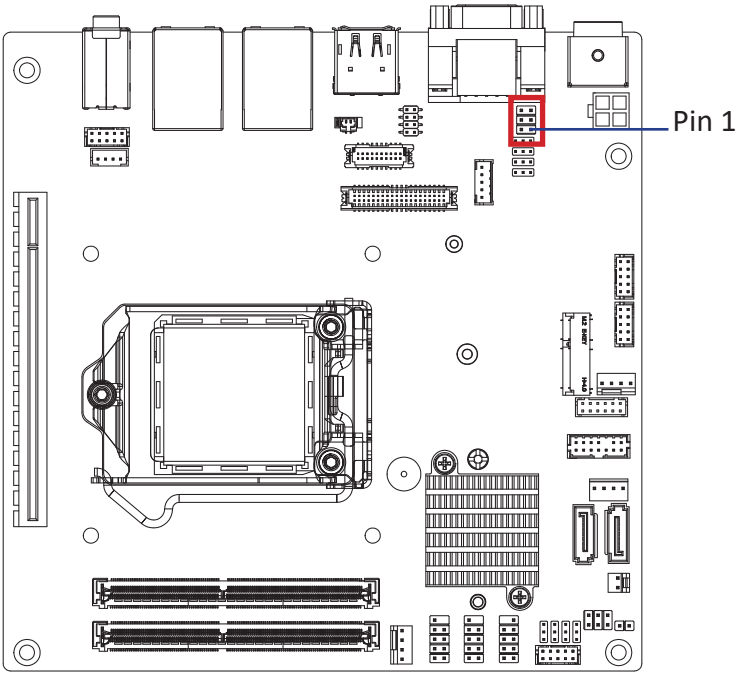


LVDS Resolution Jumper			
Jumper Setting	Resolution	Jumper Setting	Resolution
	800 x 600 18bit		1366 x 768 24bit
	1024 x 768 18bit		1440 x 900 24bit
	1024 x 768 24bit		1400 x 1050 24bit
	1024 x 600 18bit		1600 x 900 24bit
	1280 x 800 18bit		1680 x 1050 24bit
	1280 x 960 18bit		1600 x 1200 24bit
	1280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

Connector PN	Vendor
222-97-04GBE1	PINREX

2.2.7 JCOM11 (COM1 RI pin RI/5V/12V Select jumper)

9

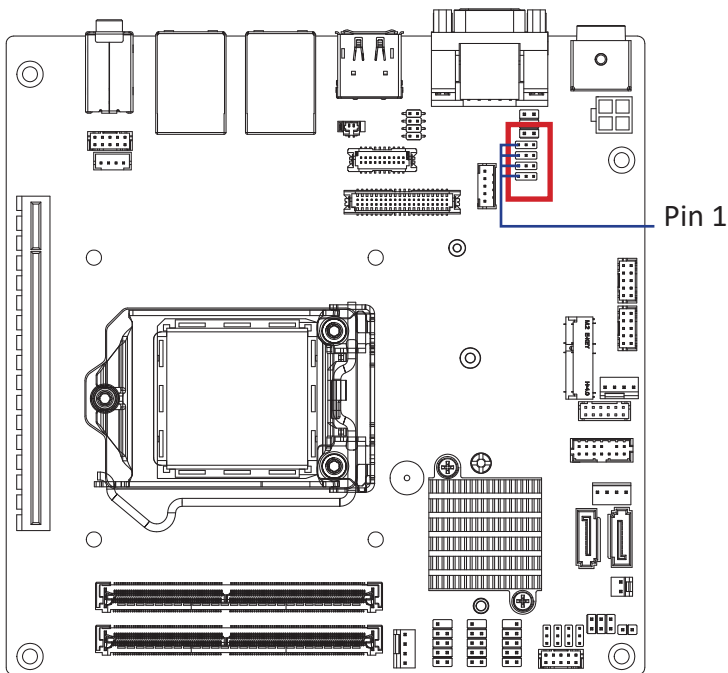


JCOM11 Jumper	
	1-2 Close: 5V (Power COM)
	3-4 Close: RI (Stand COM)(Default)
	5-6 Close: 12V (Power COM)

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

2.2.8 JRS 11-14 (COM1 JRS11-14 select jumper for serial port)

10



JRS 11-14 Jumper
123 □ JRS13 □ JRS14 □ JRS12 □ JRS11
RS-232 (Dafult-setting)

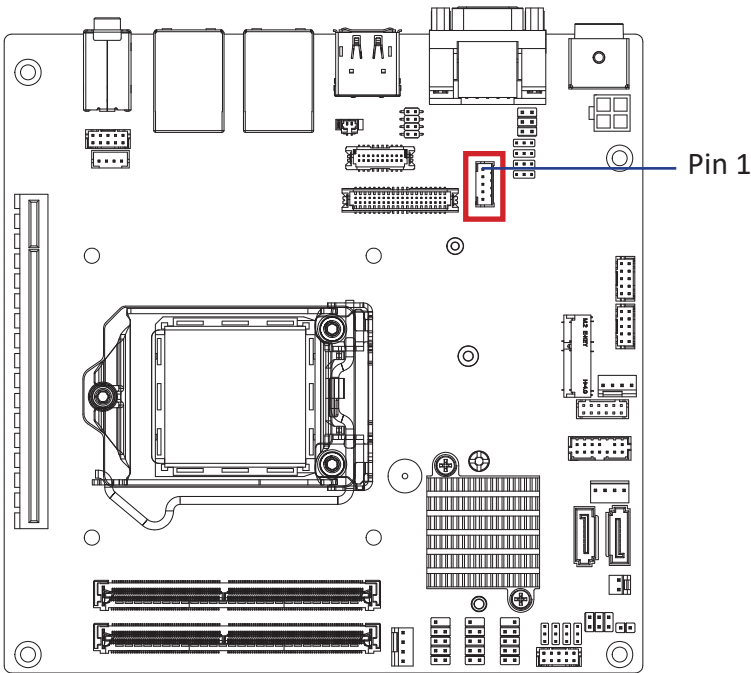
Connector PN	Vendor
220-96-03GB01	PINREX
PH03N2-7BAN000	HORNGTONG

HW jump Configuration
Pin1, Pin2 Close is 1, Pin2, Pin3 Close is 0. JRS11=M0, JRS12=M1, JRS13=M2, JRS14=SLEW (Default 1)

M0 (JRS11)	M1 (JRS12)	M2 (JRS13)	SLEW (JRS14)	Mode	Status
0	0	0	1	RS-422 Full Duplex	1T/1R RS-422
0	0	1	1	Pure RS-232	3T/5R RS-232 (Default)
0	1	0	1	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE Low Active
0	1	1	1	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE High Active
1	0	0	1	RS-422 Full Duplex	1T/1R RS-422 with termination resistor and bias resistor.
1	1	0	1	RS-485 Half Duplex	1T/1R RS-485 with termination resistor and bias resistor. TX ENABLE Low Active

2.2.9 BKL_CN (Back light brightness control connector)

11



Back light brightness control connector



Connector PN

85205-0270L

A1250WV-S-02PC

Vendor

ACES

JOINT-TECH

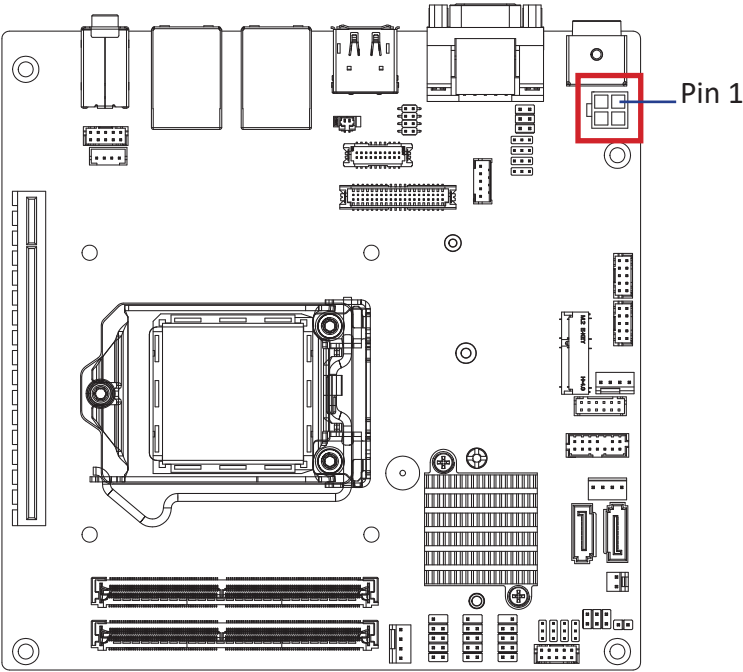
Pin No.

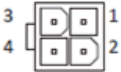
Definition

1	5V
2	PWM
3	Back Light Enable
4	GND
5	12V

2.2.10 DC_IN2 (ATX 2x2 pin power connector)

12



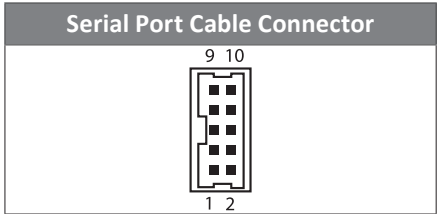
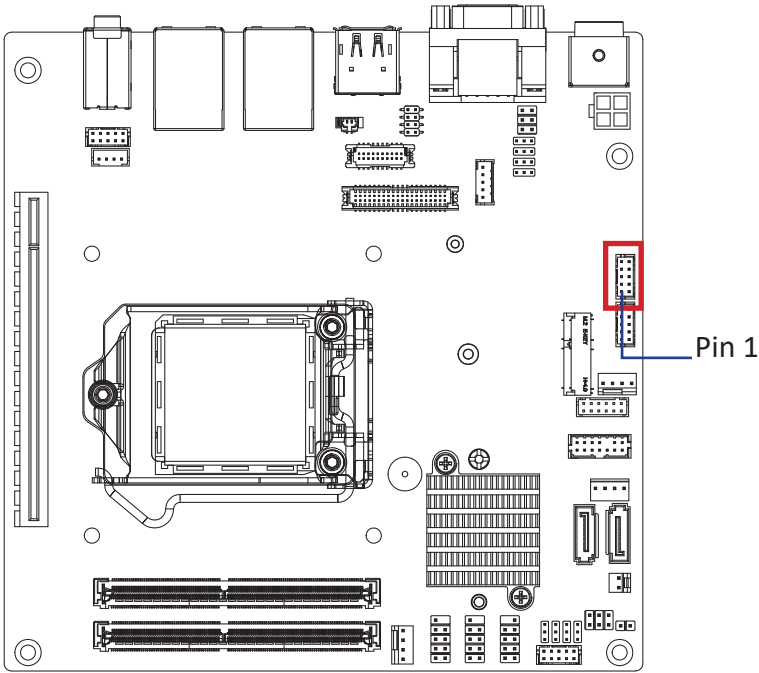
Power Connector	
	

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

Connector PN	Vendor
740-81-04TW56	PINREX
25104A0400B3-93LF	ATRC

2.2.11 COM4 (Serial Port header)

13

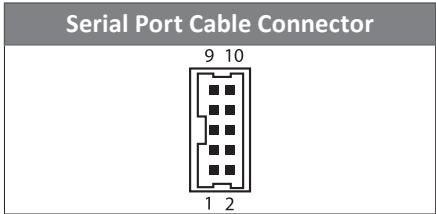
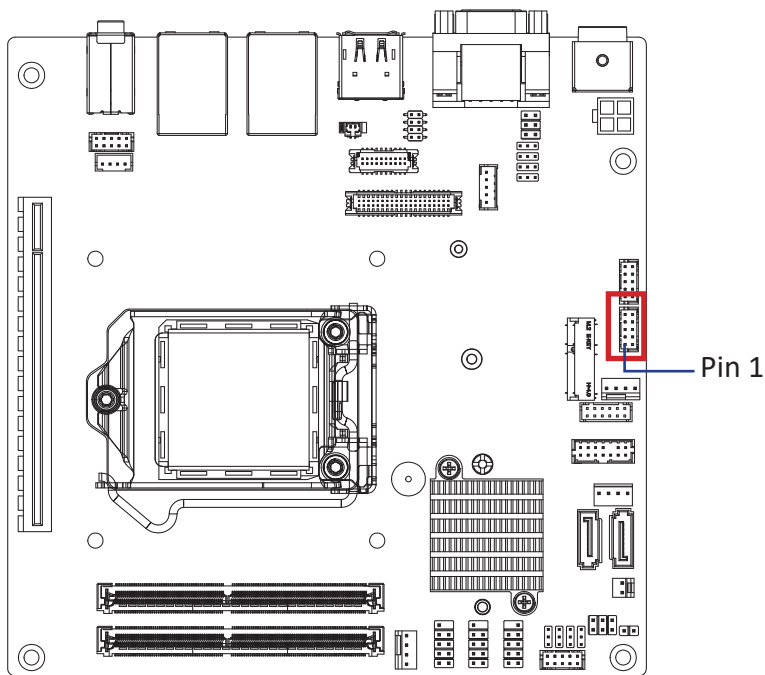


Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

Pin No.	Definition	Pin No.	Definition
1	RX	6	GND
2	DCD	7	CTS
3	DTR	8	RTS
4	TX	9	No Connect
5	DSR	10	RI/ 5V/ 12V

2.2.12 COM3 (Serial Port header)

14

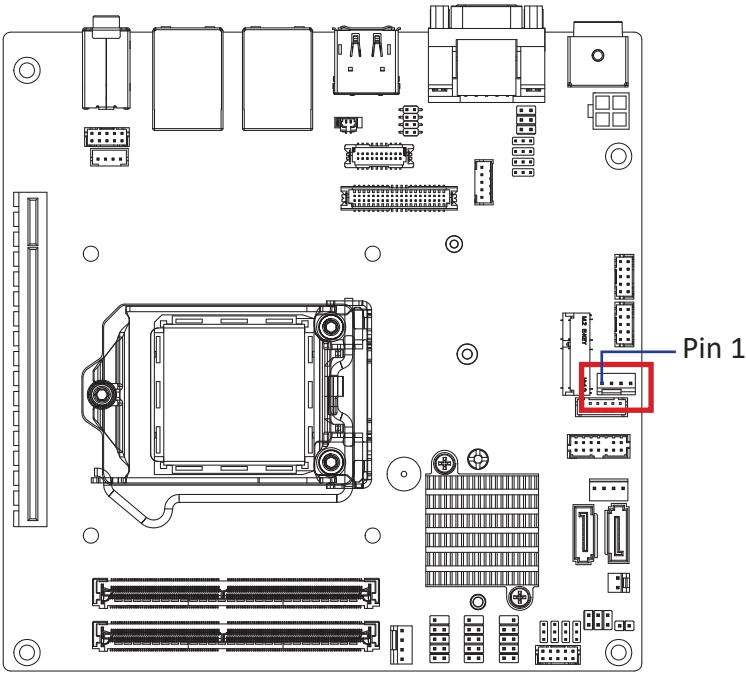


Connector PN	Vendor
725-81-10TW00	PINREX
A2004WV-2X05P46	JOINT-TECH

Pin No.	Definition	Pin No.	Definition
1	RX	6	GND
2	DCD	7	CTS
3	DTR	8	RTS
4	TX	9	No Connect
5	DSR	10	RI/ 5V/ 12V

2.2.13 SYS_FAN (System Fan Connector)

16



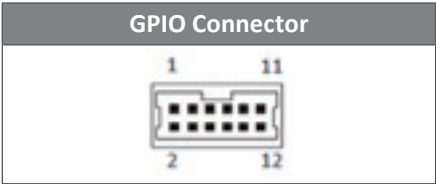
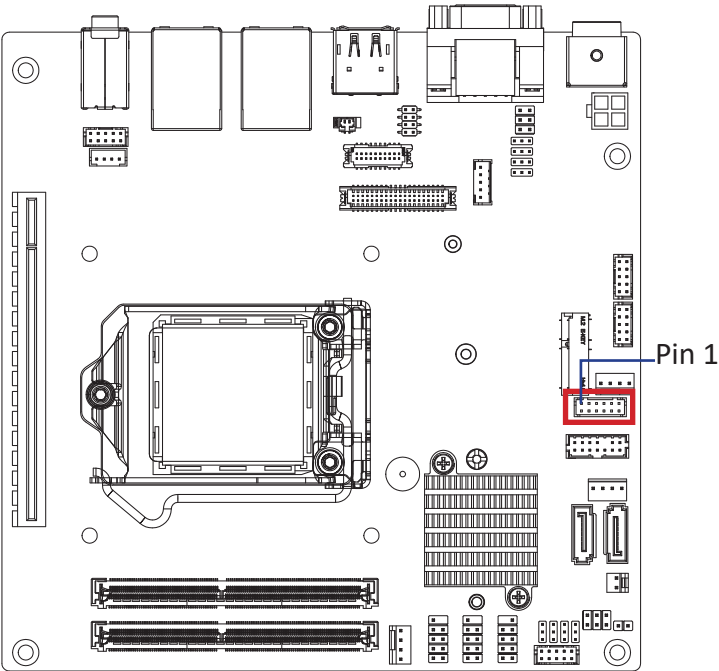
System FAN	
1	4

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

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

2.2.14 GPIO_CNT (GPIO Connector)

17



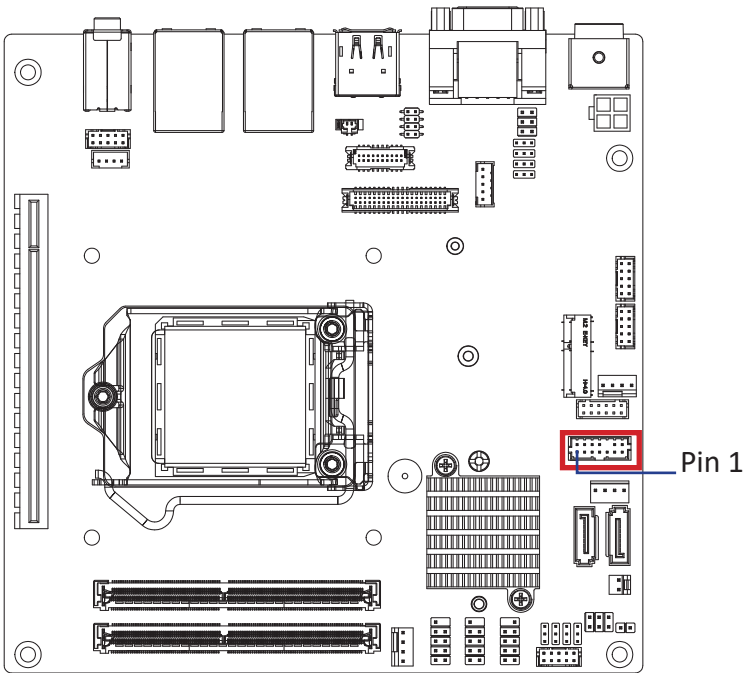
Pin No.	Definition
1	GPO1
2	GPI1
3	GPO2
4	GPI2
5	GPO3
6	GPI3
7	GPO4
8	GPI4

Pin No.	Definition
9	SMB_CLK
10	SMB_DATA
11	5V
12	GND

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

2.2.15 TPM_LPC (Trusted Platform Module Connector)

18



TPM Module Connector		
2		14
1		13

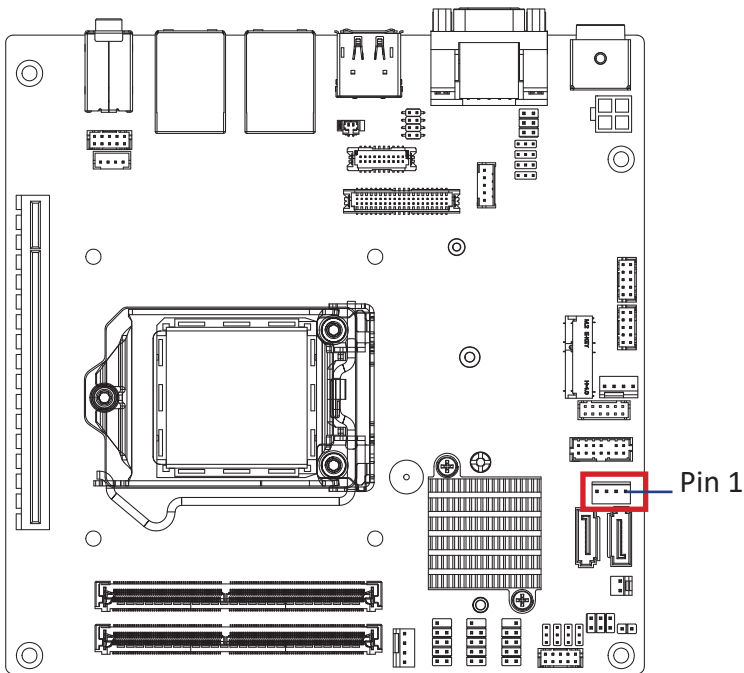
Pin No.	Definition
1	LPCCCLK
2	3VDUAL
3	PFM_RST
4	VCC3
5	LAD0
6	IRQ_SERIAL
7	LAD1

Pin No.	Definition
8	TPM_DET
9	LAD2
10	NC
11	LAD3
12	GND
13	LFRAME
14	GND

Connector PN	Vendor
52M-90-14GBE7	PINREX

2.2.16 SATAPW (SATA 6Gb/s Power Connector)

19

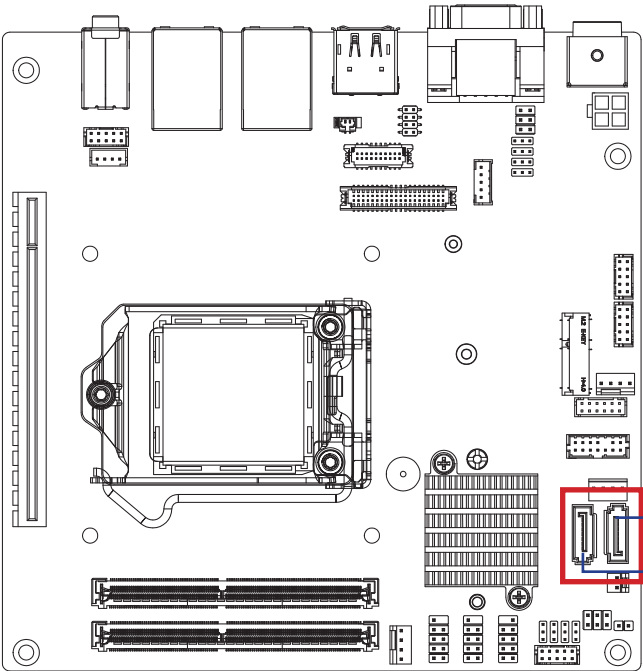


Hard Disk Power Connector	
4  1	
Pin No.	Definition
1	12V
2	GND
3	GND
4	5V

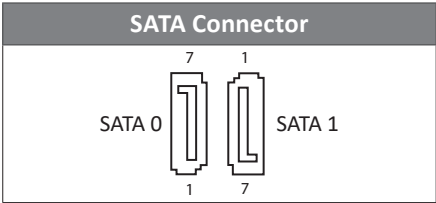
Connector PN	Vendor
743-81-04TW00	PINREX
WF04Q2-3BJQ000	HORNGTONG

2.2.17 SATAIII_0, SATAIII_1 (SATA 6Gb/s Connector)

20 21



Pin 1

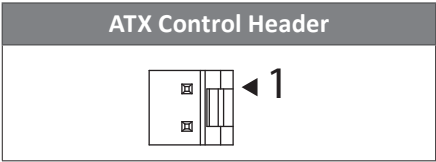
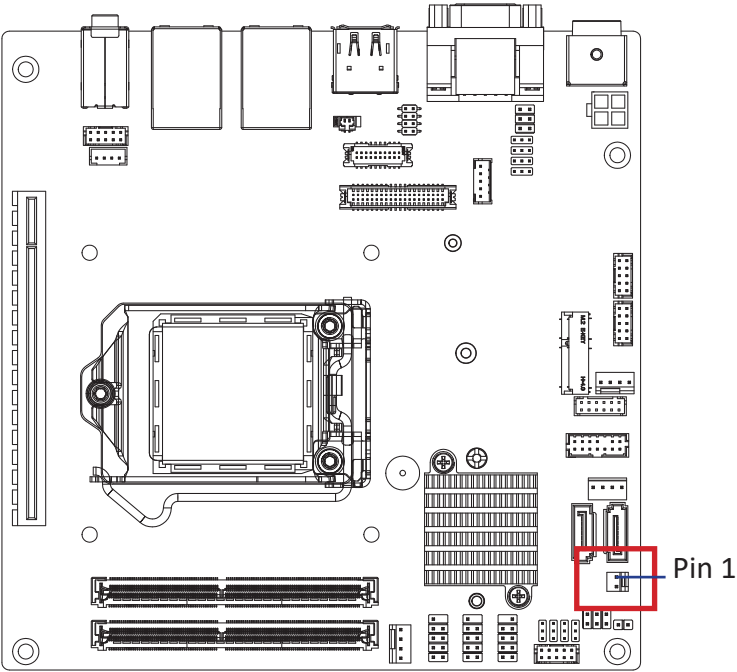


SATAIII_1, SATAIII_0	
Connector PN	Vendor
WATM-07ABNB2BAUW3	WINWIN
770-83-07SW19	PINREX

Pin No.	Definition	Pin No.	Definition
1	GND	2	A+
3	A-	4	GND
5	B-	6	B+
7	GND		

2.2.18 ATX_CRL (ATX Control header)

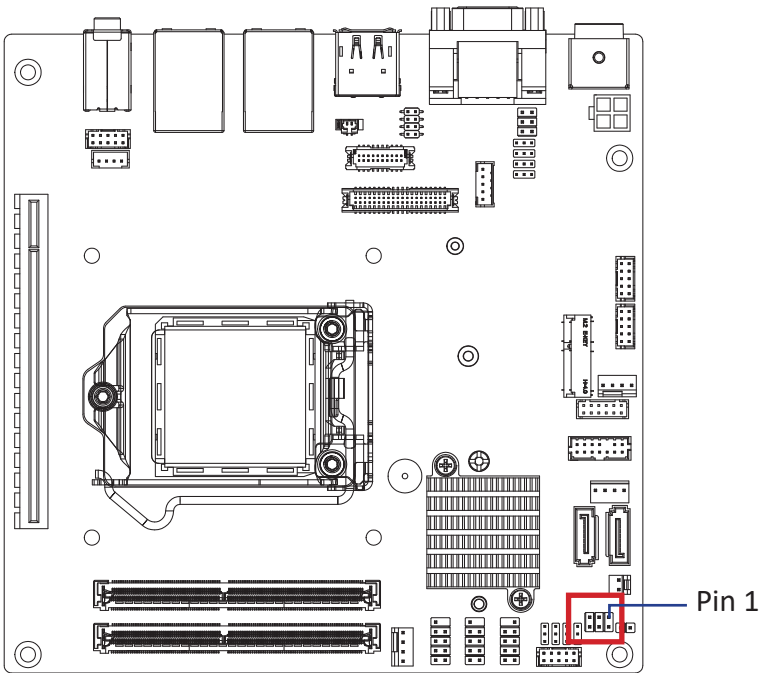
22



Pin No.	Definition
1	ATX_PSON
2	ATX_5VSB

2.2.19 JCOM16 (COM2 RI pin RI/5V/12V Select)

23

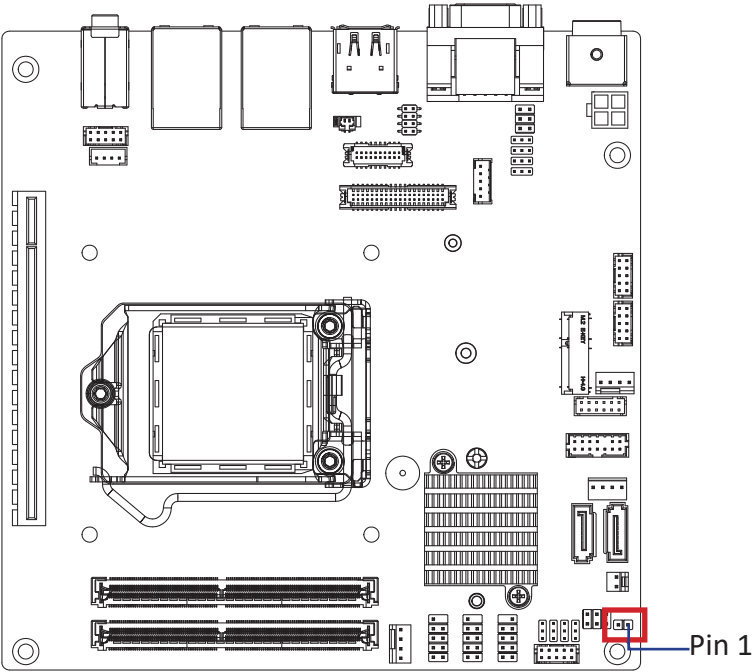


JCOM16 Jumper	
	1-2 Close: 5V (Power COM)
	3-4 Close: RI (Stand COM)(Default)
	5-6 Close: 12V (Power COM)

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

2.2.20 CLR_CMOS (Clear CMOS Jumper)

24



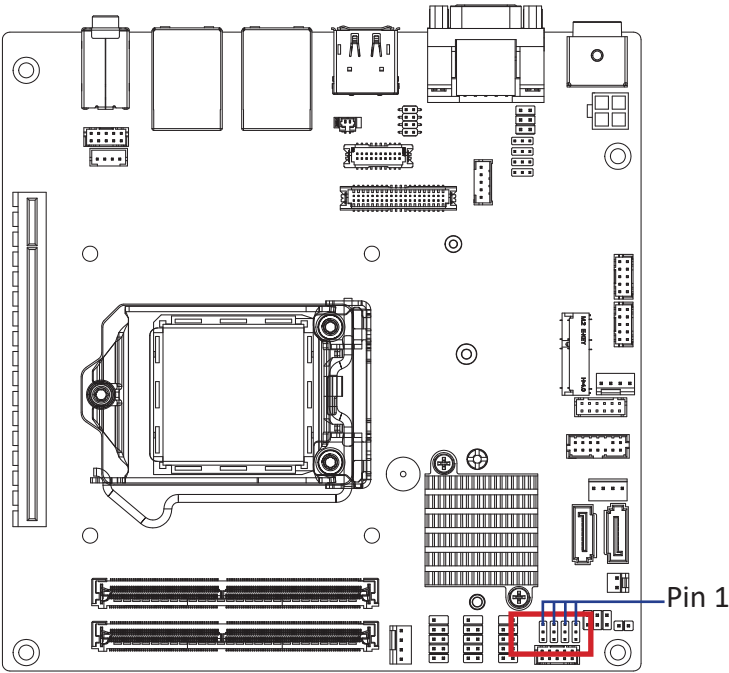
Clear COMS Jumper
2  1

Connector PN	Vendor
210-91-02GB01	PINREX
PH02R23BAZ000	HORNGTONG

Pin No.	Definition
1	Clear CMOS
2	GND
Open: Normal Operation (Default setting) Close: Clear COMS data.	

2.2.21 JRS21-24 (COM2 JRS21-24 select jumper for serial port)

25



JRS 21-24 Jumper



RS-232 (Dafult-setting)

Connector PN

220-96-03GB01
PH03N2-7BAN000

Vendor

PINREX
HORNGTONG

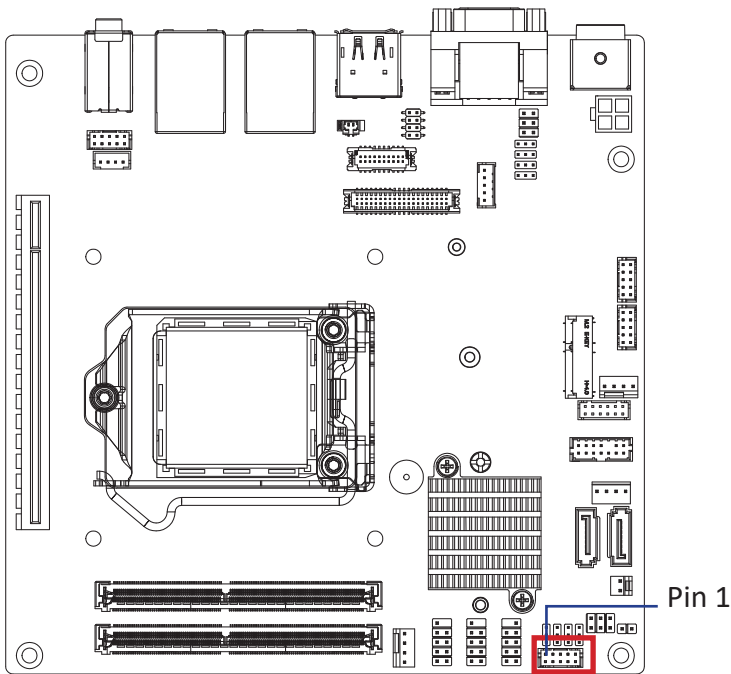
HW jump Configuration

Pin1, Pin2 Close is 1,
Pin2, Pin3 Close is 0.
JRS21=M0, JRS22=M1, JRS23=M2,
JRS24=SLEW (Default 1)

M0 (JRS21)	M1 (JRS22)	M2 (JRS23)	SLEW (JRS24)	Mode	Status
0	0	0	1	RS-422 Full Duplex	1T/1R RS-422
0	0	1	1	Pure RS-232	3T/5R RS-232 (Default)
0	1	0	1	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE Low Active
0	1	1	1	RS-485 Half Duplex	1T/1R RS-485, TX ENABLE High Active
1	0	0	1	RS-422 Full Duplex	1T/1R RS-422 with termination resistor and bias resistor.
1	1	0	1	RS-485 Half Duplex	1T/1R RS-485 with termination resistor and bias resistor. TX ENABLE Low Active

2.2.22 COM2 (Serial Port header)

26



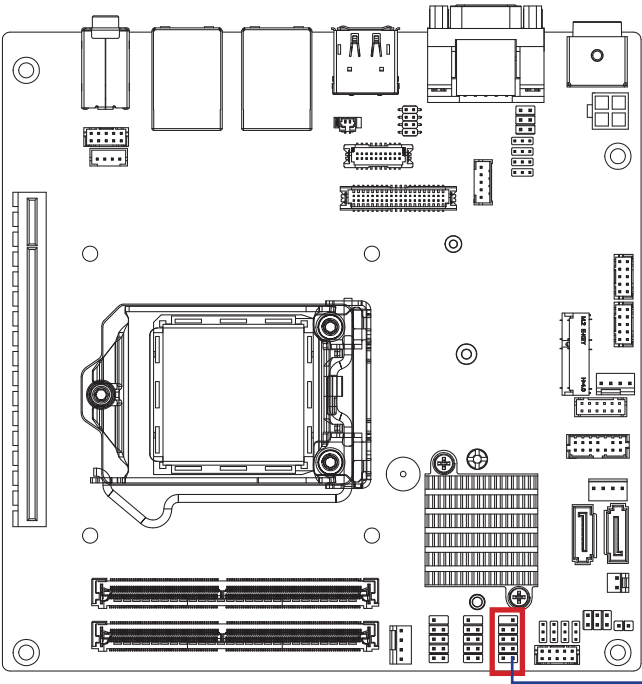
Serial Port Cable Connector	
1 2	9 10

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

Pin No.	Definition	Pin No.	Definition
1	RX	6	GND
2	DCD	7	CTS
3	DTR	8	RTS
4	TX	9	No Connect
5	DSR	10	RI/ 5V/ 12V

2.2.23 SYS_PANEL (Front Panel header)

27



Pin 1

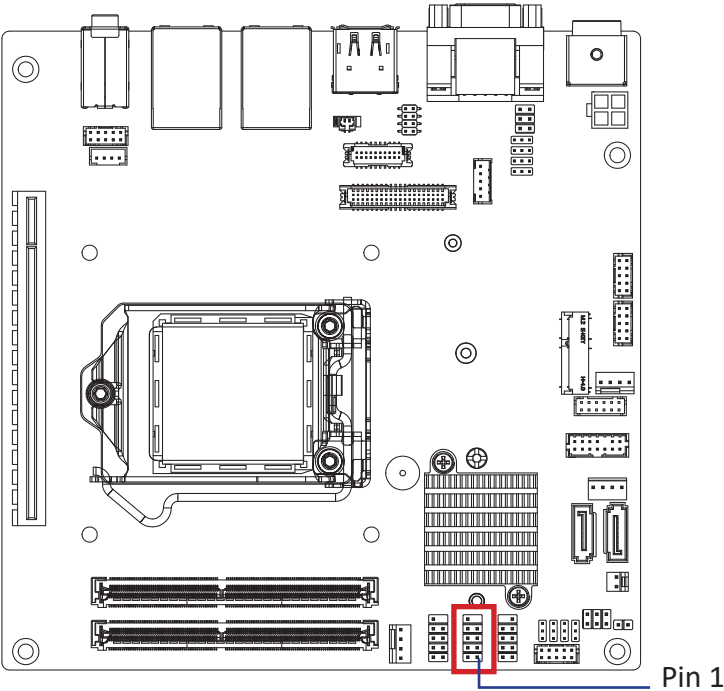
System Panel Header	
	10 9 8 7 6 5 4 3 2 1

Connector PN	Vendor
210-92-05G111	PINREX

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

2.2.24 F_USB 2_1 (USB 2.0 header)

28



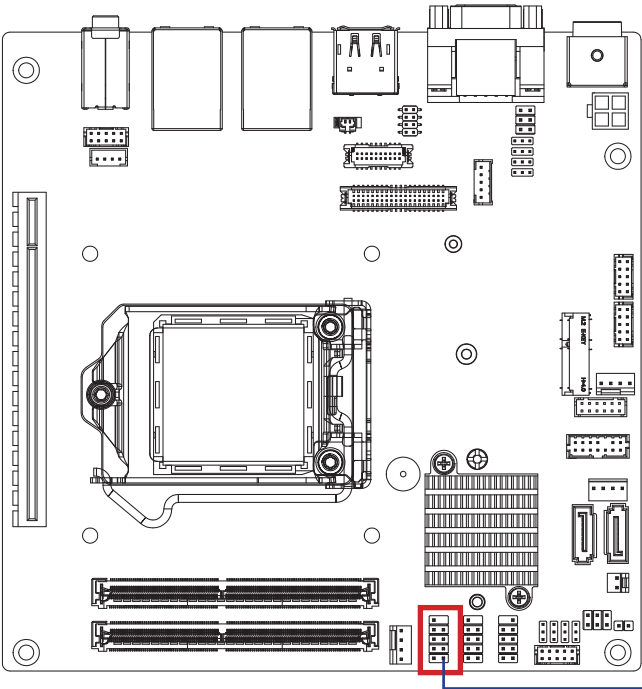
USB 2.0 Header	

Pin No.	Definition
1	5V
2	5V
3	DX-
4	DY-
5	DX+
6	DY+
7	GND
8	GND
9	No Pin
10	No Connect

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

2.2.25 F_USB 2_2 (USB 2.0 header)

29



Pin 1

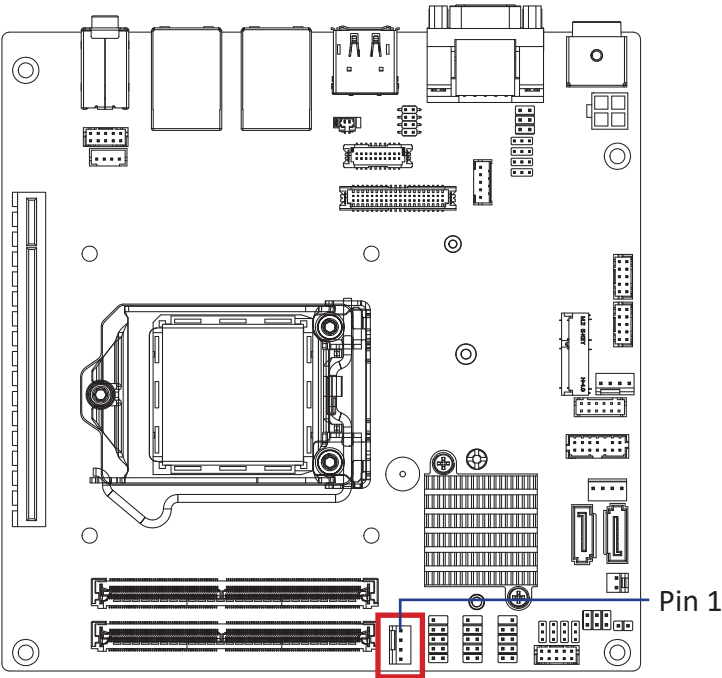
USB 2.0 Header	

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

Pin No.	Definition
1	5V
2	5V
3	DX-
4	DY-
5	DX+
6	DY+
7	GND
8	GND
9	No Pin
10	No Connect

2.2.26 CPU_FAN (CPU fan connector)

30



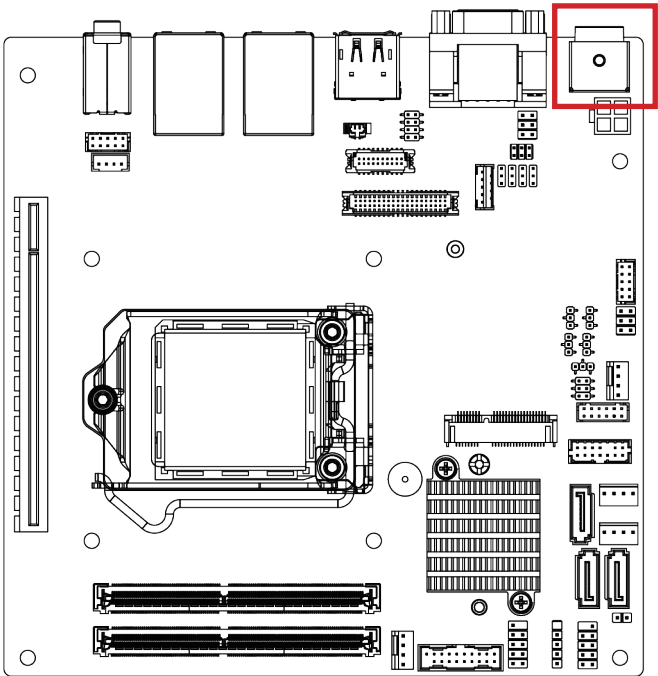
CPU FAN
1 4

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

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

2.2.27 DC_IN (DC In JACK Connector)

32



DC JACK Connector



Connector PN

2MJ-3422A1I0

Vendor

SINGATRON

Mouser Electronics

Authorized Distributor

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