MX310HD

**Intel® H310 PCH
Supports Coffee Lake (8th Gen)/
Coffee Lake Refresh (9th Gen)
i7/i5/i3/Pentium processors
(Supports "up to 6 Cores" and "up to
TDP 65W" type processors only)
Mini-iTX Motherboard**

User's Manual

Edition 1.01 – July, 2019

FCC Statement

THIS DEVICE SUPPORTS PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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To receive the latest version of the user's manual; please visit our Web site at:
http://www.bcmcom.com.

If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your BCM products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from BCM engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

> **BCM Advanced Research**
> 11 Chrysler,
> Irvine, California, 92618
> USA
> Tel : +1-949-470-1888
> Fax : +1-949-470-0971
> http://www.bcmcom.com
> E-mail: support@bcmcom.com

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1. Collect all the information about the problem encountered. (For example, CPU type and speed, BCM products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Manual Objectives

This manual describes in detail the BCM MX310HD Main board.

We strongly recommend that you study this manual carefully before attempting to interface with this mainboard or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the mainboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Document Amendment History

Revision	Date	Comment
1st (1.00)	June, 2019	Initial Release
2nd (1.01)	July, 2019	Updated 4-pin ATX connector wide range info

Contents

Mainboard Specifications

Model	MX310HD
Processor	Intel® H310 PCH Supports Coffee Lake (8th Gen)/ Coffee Lake Refresh (9th Gen) i7/i5/i3/Pentium processors (Supports "up to 6 Cores" and "up to TDP 65W" type processors only)
Chipset	Intel® H310 PCH
Memory	2x 260-pins SODIMM sockets support 1.2V, Non-ECC, Un-buffered DDR4-2400 (PC4-19200) memory module, 2400 MHz up to 32GB (16GB maximum/slot)
Display	Intel® Integrated Graphic Engine
Maximum Resolution	DP: 4096 x 2304 @ 60Hz, 24bpp HDMI: 4096 x 2160 @ 30Hz, 24bpp LVDS: 1920x1200
SATA	2 x SATA III connectors 1 x SATA power connector
M.2	1x M.2 Type M 2242, 2280 Slot (with USB, PCIe x2 & SATA III) 1 x M.2 Type E 2230 (with USB & PCIe x1)
USB	4 x USB 2.0 ports (2@ 1x Header, 2@ Rear I/O) 4 x USB 3.0 ports (2@ 1x Header, 2@ Rear I/O)
TPM	1 x TPM 2.0 Security Device (Infineon® TPM Chip SLB9665)
Super I/O Controller	Nuvoton® NCT6106D
Serial Ports	2 x RS-232 2.0mm Locking Type Headers (with Voltage Selection)
PCIe	1 x PCIe x4 Slot
Watch Dog Timer	1sec ~ 255 min timer
HW Monitor	Yes
Audio	Realtek® ALC892 HD Audio Codec with auto jack sensing
LAN	Intel® i211-AT PCIe Gigabit LAN 1 x 10/100/1000 LAN Port Intel® i219-LM PHY Gigabit LAN 1 x 10/100/1000 LAN Port
DIO	8 Bit
BIOS	AMI® UEFI BIOS AMI BIOS with 128Mb SPI ROM

Onboard I/O Headers	
SATA	**2 x Std. SATA III Connectors**
	1 x SATA Power Header
USB	**1 x USB2.0 Header (2 ports/header)**
	1 x USB3.0 Header (2 ports/header)
RS232	**2 x Headers**
Front Audio	**1 x Header**
Amplifier	**1 x Header**
Front Panel	**1 x Header**
Fan Header	**2 x Headers (12V, 4-pins)**
LVDS	**1 x Header for LVDS Panel Connection**
	1 x Header for LVDS Panel Backlight Connector
SPI	**1 x Header**
I2S	**1 x Header**
I2C	**1 x Header**
GPIO	**1 x Header**
Chassis Intrusion	**1 x Header**
Onboard Jumpers	
COM Port Ring-In/ Power Select	**2 x Headers provides Selection of "Ring-In", or "12V" or "5V" on COM ports**
AT/ATX Select	**1 x Header**
Clear CMOS	**1 x Header**
LVDS Brightness Mode Select	**1 x Header**
LVDS PWM Backlight Power Select	**1 x Header**
Rear I/O Ports	
HDMI	**1 x HDMI Connector**
DP (Display Port)	**1 x DP Connector**
USB3.0	**1x Stack up USB3.0 Connector**
USB2.0	**1x Stack up USB2.0 Connector**
LAN	**2 x 10/100/1000 LAN Ports**
Audio	**1 x Line-Out**
	1 x Mic-In
Power	**1 x DC Connector**

Power & Connector	
	1 x 4 pin ATX Connector (12V-24V Wide Range, Max. current ~8A)
	1 x DC Connector (12V-24V Wide Range DC-In) For +12V AC adapter, Max. current ~8A. For +19V AC adapter, Max. current ~8A.
Form Factor	
	Mini-iTX 6.7" x 6.7"

Chapter 1: System Setup

This chapter describes the mainboard features and the new technologies it supports

1.1   Welcome!

The mainboard delivers a host of new features and latest technologies, making it another line of BCM long life mainboards! Before you start installing the mainboard, and hardware devices on it, check the items in your package with the list below.

If any of the items listed below is damaged of missing, please contact with your vendor.

1.2   Packing Contents

- **Mainboard**
    - **1 x MX310HD**

- **Cable**
    - **1 x SATA Power Cable**

- **Accessories**
    - **1 x MX310HD I/O Shield**

1.3　Before you proceed

Take note of the following precautions before you install mainboard components or change any mainboard settings.

- **Unplug the power cord from the wall socket before touching any component inside the system.**

- **Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.**

- **Hold components by the edges to avoid touching the ICs on them.**

- **Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.**

- **Before you install or remove any component, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the mainboard, peripherals, and/or components.**

1.4 Mainboard Overview

Before you install the mainboard, study the configuration of your chassis to ensure that the mainboard fits into it.

⚠ **Make sure to unplug the power cord before installing or removing the mainboard. Failure to do so can cause you physical injury and damage mainboard components.**

1.4.1 Mounting Holes

Place the screws into the mounting holes indicated by red squares to secure the mainboard to the chassis.

⚠ **Do not over-tighten the screws! Doing so may damage the mainboard.**
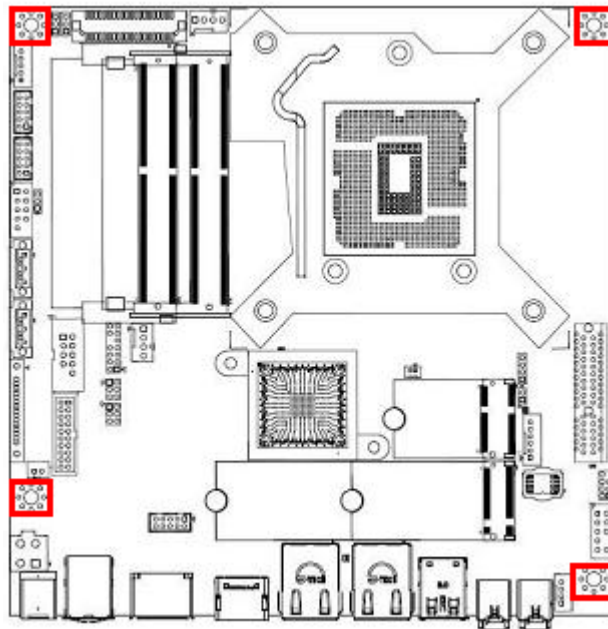
1.4.2   Mainboard Layout
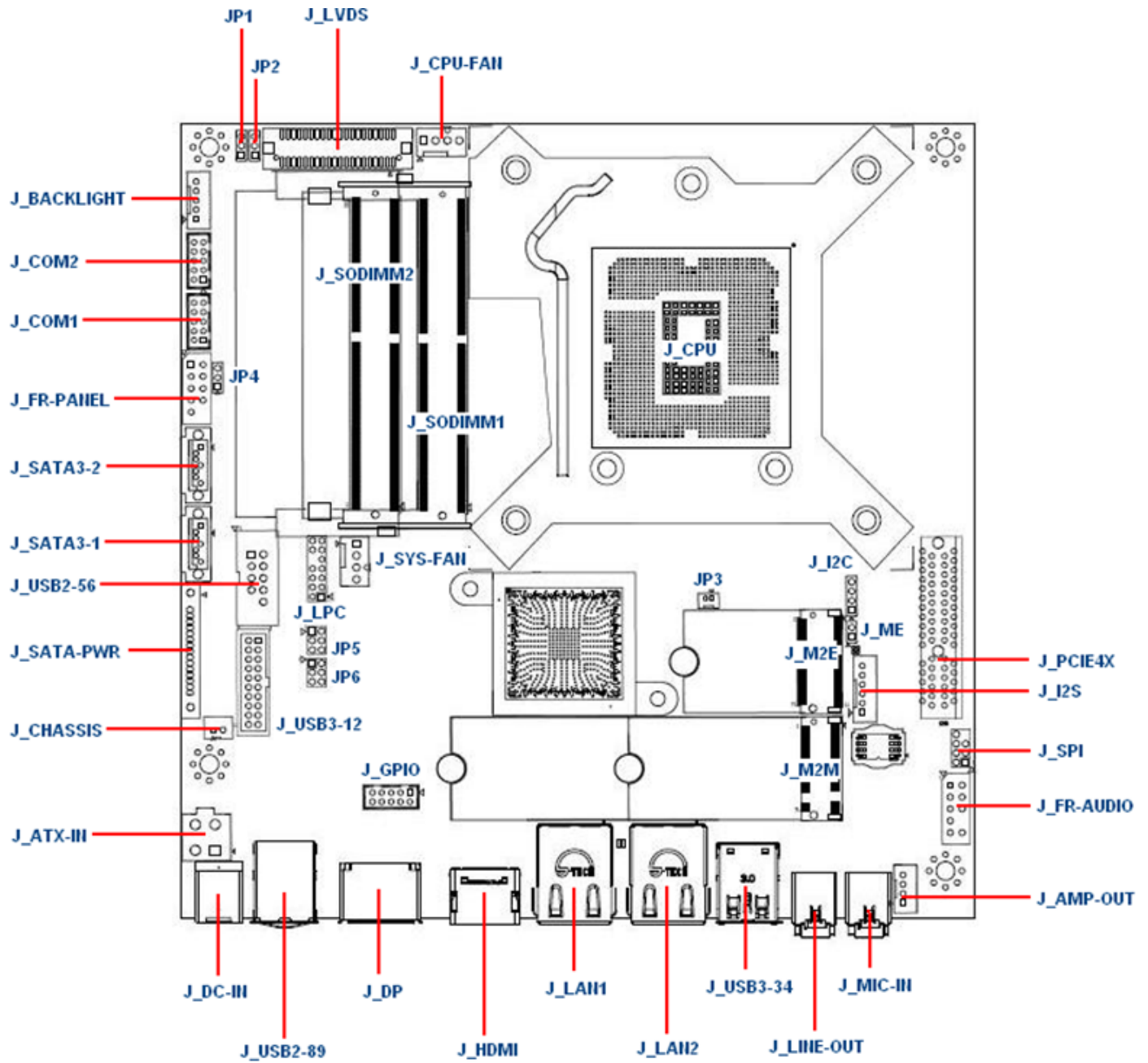
1.4.3   Layout Content List

• 1.4.3.1 Slots			
Label	**Function**	**Note**	**Page**
J_SODIMM1	**260-pin DDR4 SODIMM slot 1**		**20**
J_SODIMM2	**260-pin DDR4 SODIMM slot 2**		**20**
J_M2E	**M.2 E-Key**	**Supports WIFI Cards in 2230**	**39**
J_M2M	**M.2 M-Key**	**Supports SATA Type SSDs in 2242, or 2280**	**39**
J_PCIE4X	**PCIe x4 slot**		

• 1.4.3.2 Internal Jumpers			
Label	**Function**	**Note**	**Page**
JP1	**LVDS PWM Backlight Power Select (+3.3V (default) /+5V)**	**1 x 3 header, pitch 2.00mm**	
JP2	**LVDS Brightness Mode Select (PWM Mode (default) /DC Mode)**	**1 x 3 header, pitch 2.00mm**	
JP3	**Clear CMOS**	**1 x 3 header, pitch 2.00mm**	**36**
JP4	**ATX/AT Mode Select (ATX Mode (default) / AT Mode)**	**1 x 3 header, pitch 2.00mm**	
JP5	**COM1 Ring-In (default) / +12V/ +5V Select**	**2 x 3 header, pitch 2.00mm**	
JP6	**COM2 Ring-In (default) / +12V/ +5V Select**	**2 x 3 header, pitch 2.00mm**	

• 1.4.3.3 Internal Headers

Label	Function	Note	Page
J_ATX-IN	12V ATX Power Connector	2x 2 header, 12V-24V Wide Range, Max. current ~8A	24
J_CPU-FAN	CPU Fan Connector	4 x 1 wafer, Pitch 2.54mm	29
J_SYS-FAN	System Fan Connector	4 x 1 wafer, Pitch 2.54mm	
J_SATA3-1 J_SATA3-2	Serial ATA 3.0 Connectors 1, 2	7-pin header	27
J_SATA-PWR	SATA Power Connector		
J_COM1 J_COM2	Serial Port 1, 2	2 x 5 wafer header, pitch 2.00mm	31
J_USB2-56	USB2.0 Port 5, 6	2 x 5 box header, pitch 2.54mm	31
J_USB3-12	USB3.0 Port 1, 2	2 x 10 box header, pitch 2.00mm	
J_FR-PANEL	System Panel Connector	2 x 5 header, pitch 2.54mm	32
J_FR-AUDIO	Front Panel Audio Connector	2 x 5 header, pitch 2.54mm	30
J_AMP-OUT	Amplifier Connector	4 x 1 wafer header, pitch 2.00mm	30
J_LVDS	LVDS Panel Connector	20 x 2 header, 1.25mm pitch wire to board connector (WTB)	33
J_BACKLIGHT	LVDS Panel Backlight Connector	1 x 5 wafer header, pitch 2.00mm	33
J_I2C	I2C Connector	1 x 4 header, 2.00mm	34
J_SPI	SPI Connector	2 x 4 header, 2.00mm	
J_I2S	I2S Connector	1 x 6 wafer header, 2.00mm	
J_LPC	LPC Connector	2 x 7 header, 2.00mm	
J_GPIO	GPIO Connector	2 x 5 wafer header, 2.00mm	
J_CHASSIS	Chassis Intrusion Connector	1 x 2 wafer header, 2.00mm	

• 1.4.3.4 Back Panel Connectors (Rear I/O)			
Label	**Function**	**Note**	**Page**
J-DC-IN	DC Adapter Connector	The port is for an AC adapter (12V-24V Wide Range DC-In) . For +12V AC adapter, Max. current ~8A. . For +19V AC adapter, Max. current ~8A. AC adapter connector dimension: Inner Diameter: 2.5 +/- 0.1mm Outer Diameter: 5.5 +/- 0.1mm	25
J_USB2-89	USB2.0 Ports		
J_DP	Display Port		25
J_HDMI	HDMI Port		25
J_LAN1	Gigabit LAN RJ-45 Connector		25
J_LAN2	Gigabit LAN RJ-45 Connector		25, 26
J_USB3-34	USB3.0 Ports		25
J_LINE-OUT	Line-out Port		26
J_MIC-IN	Microphone Port		26

1.5　Central Processing Unit (CPU)

This mainboard supports the Intel® LGA1151 socket for Intel® Core™ i5/i3/Pentium Coffee Lake processors in LGA-1151 package.

- Your boxed Intel® LGA1151 processor package should come with installation instructions for the CPU, fan, heatsink, and the retention assembly.
- Upon purchase of the mainboard, make sure that the PnP cap is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/mainboard components. BCM will shoulder the cost of repair only, if the damage is shipment/ transit-related.
- Keep the PnP cap after installing the mainboard. BCM will process Return Merchandise Authorization (RMA) requests only if the mainboard comes with the cap installed on the LGA1151 socket.
- The product warranty does not cover damage to the socket pins resulting from incorrect CPU installation/ removal, or misplacement/ loss/ incorrect removal of the PnP cap.

1. **Overheating: Overheating will seriously damage the CPU and mainboard. Always make sure the cooling fan can work properly to protect the CPU from overheating.**
2. **Make sure that you apply an even layer of thermal paste between the CPU and the heatsink to enhance heat dissipation.**
3. **Replacing the CPU: While replacing the CPU, always turn off the ATX power suppply or unplug the power supply's powr cord from the grounded outlet first in order to prevent damage to the system.**

1.5.1   Installing the CPU

The CPU installation related information.

1.   Locate the CPU socket (LGA1151 Socket) on the mainboard.
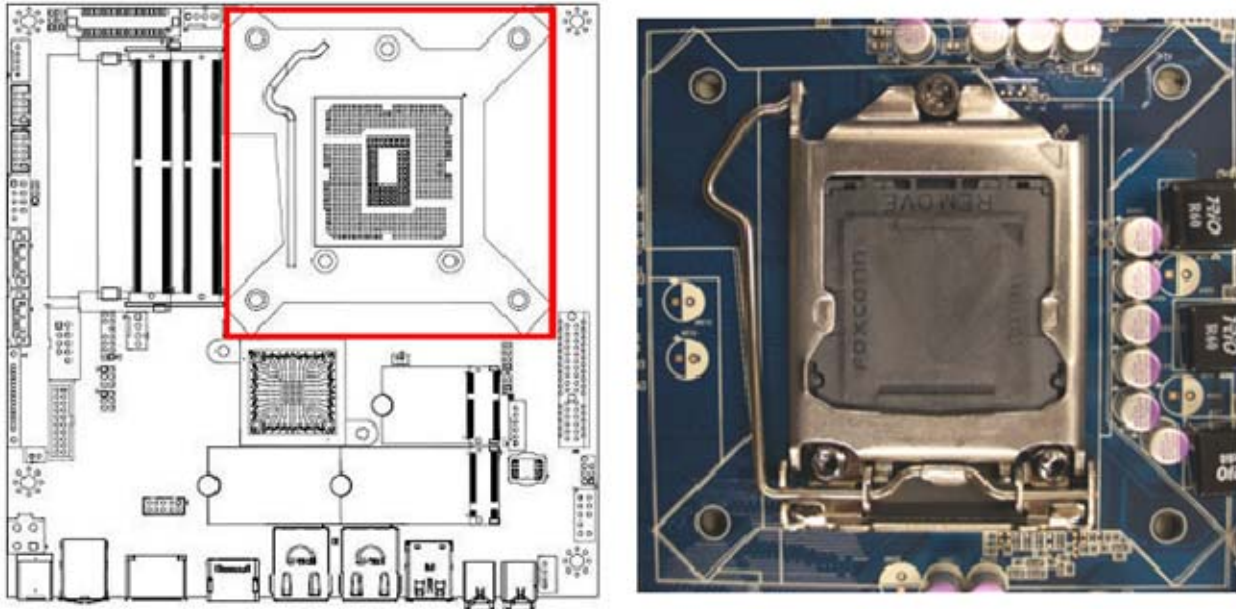
2.   Unlatch the "CPU Socket Lever" by pressing the lever down and move it away from the main structure of the socket.
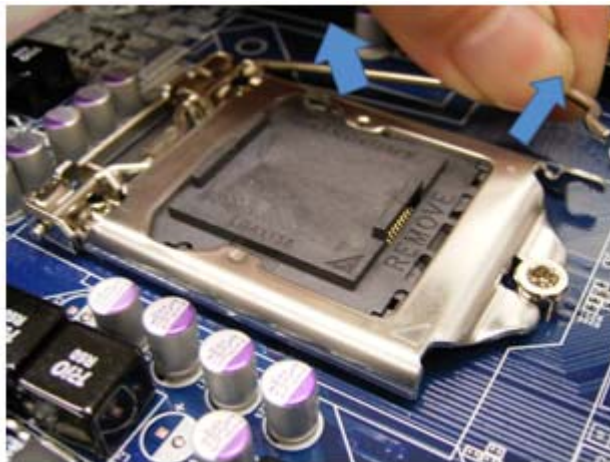
⚠️ **To prevent damage to the socket pins, do not remove the "CPU Socket Cover" (PnP cap) unless you are going to install a CPU.**

3. Lift the load lever up in the direction of the arrow to a 135° angle, so the metal "CPU Socket Cover" can also be lifted.
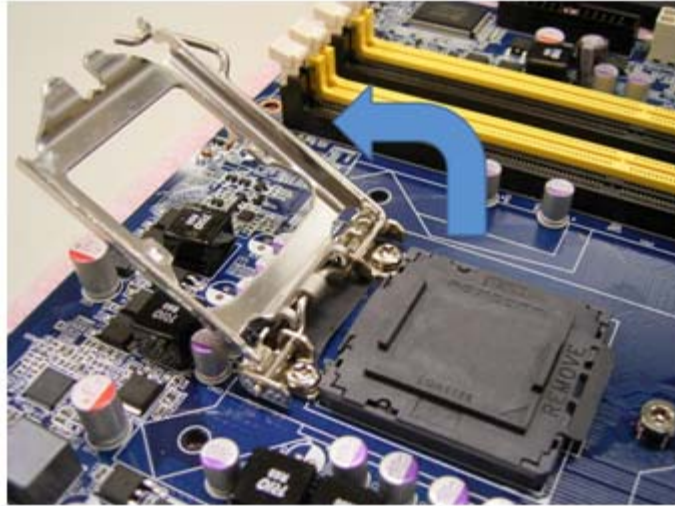
4. The CPU socket has a plastic protection cap installed on it (black color, a.k.a. "CPU Socket Cover", or "PnP cap") in order to protect the socket pins from damage. If you are going to install a CPU, remove the plastic protection cap away from the CPU socket by lifting it up

    (NOTE: Please do not discard this plastic protection cap. Just in case if you need to RMA this board in the future, you need to install this plastic protection cap in order to protect the CPU socket)
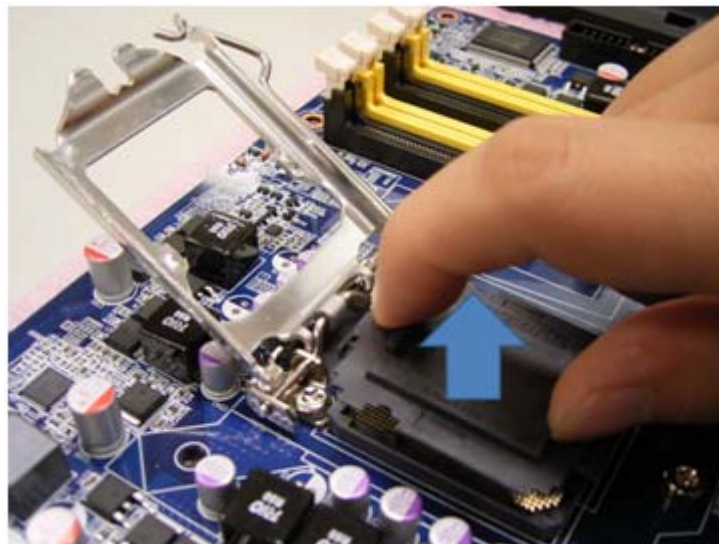
5. There are two notches on the CPU itself (one on each side), and there are two "Socket Alignment keys" on the CPU socket as well. Line up the two CPU notches with the "Socket Alignment Keys" on the socket, and insert the CPU into the CPU socket slowly.

Socket Alignment Key
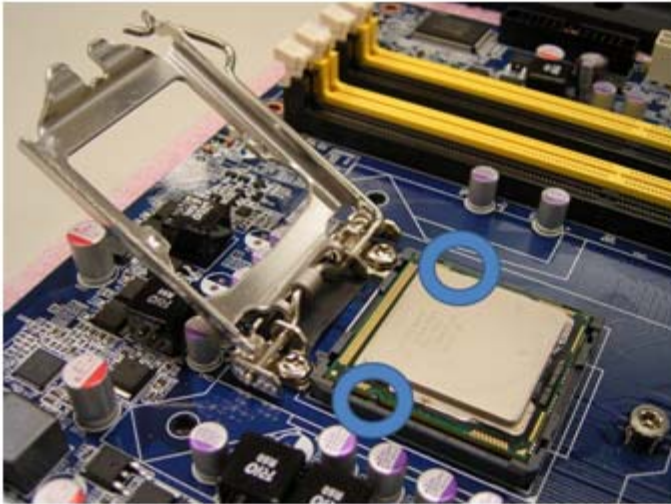
6. Visually inspect if the CPU is seated into the CPU socket evenly. The "Socket Alignment keys" should fit into the CPU notches.
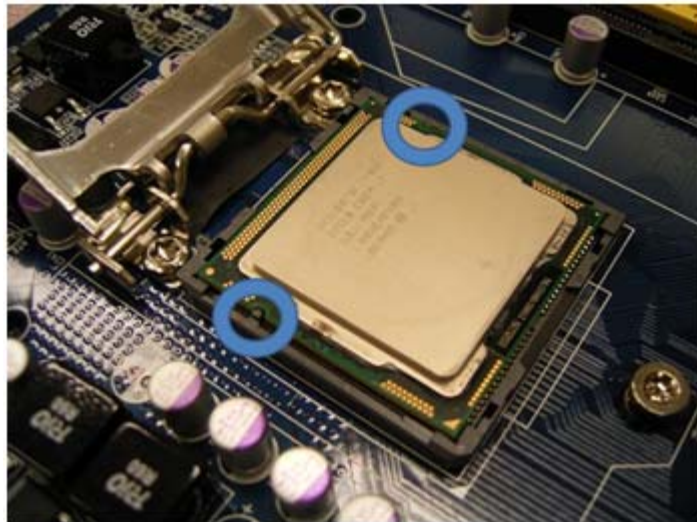
7. Close the "CPU Socket Cover" by lowering down the "CPU Socket Lever". Make sure the "CPU Socket Front Plates" are sliding underneath the "Shoulder Screw Cap".
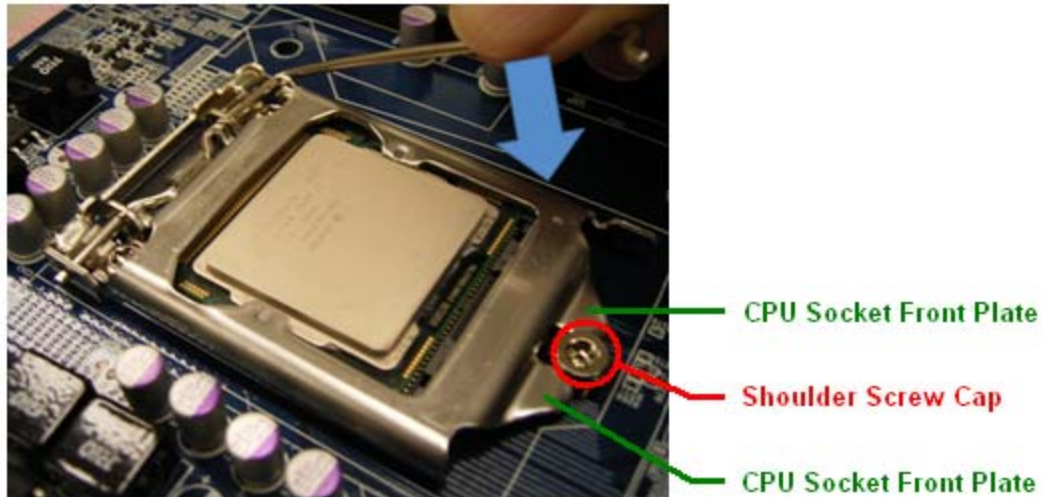
8. Secure the "CPU Socket Cover" by keep pressing down the "CPU Socket Lever" and move it toward and underneath the "Load Plate Tab".

The CPU fits in only one correct orientation, DO NOT force the CPU into the socket. Otherwise, it might damage the CPU and/or the CPU socket.

1.5.2 Installing the CPU Heatsink and Fan

The Intel LGA1151 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- When you purchase a boxed Intel® processor, the package includes the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use only Intel®-certified multi-directional heatsink and fan.
- The boxed Intel® LGA1151 heatsink and fan assembly comes in a push-pin design and requires no tool to install.
- If you purchased a separate CPU heatsink and fan assembly, make sure that:

   a. The CPU heatsink and fan assembly is designed to withstand the "TDP" (Thermal Dissipation Power) specified by Intel specification of corresponding CPU that you are going to install.

   b. You have properly applied an even layer of "Thermal Interface Material" to between the CPU heatsink and the top of CPU before you install the heatsink and fan assembly (please check with your CPU fan/heatsink vendor for details).

To install the CPU heatsink and fan:

1. Place the CPU heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the mainboard.
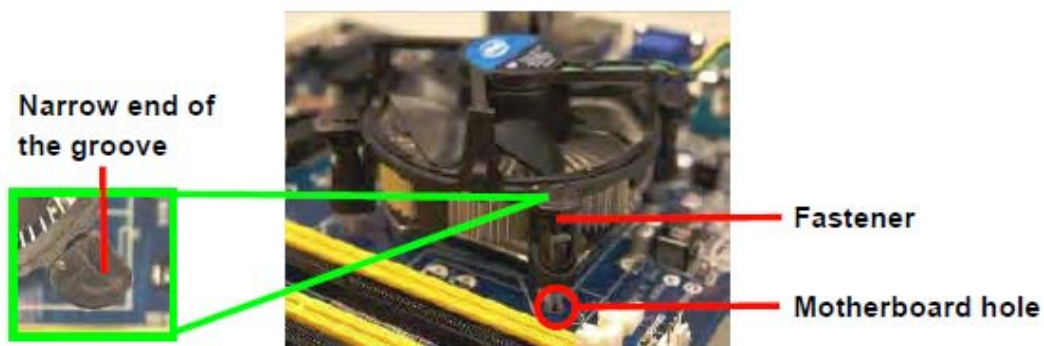
NOTE: Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector).

Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
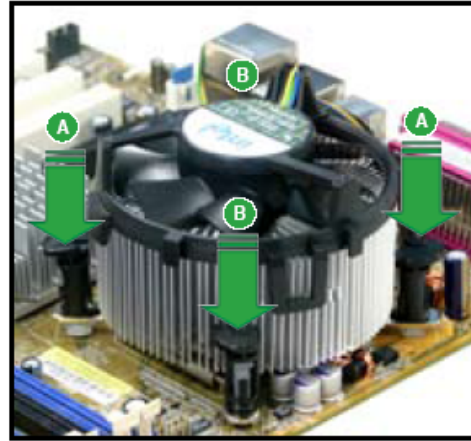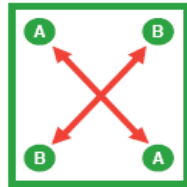
3. Connect the CPU fan cable to the connector on the mainboard labeled "J_CPU-FAN".

J_CPU-FAN

1 □ O O O
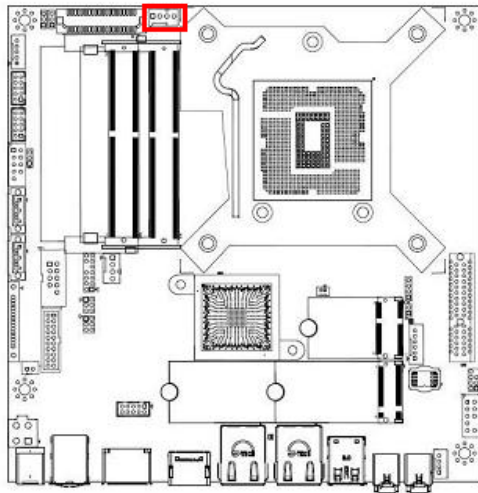
1. GND
2. +12V
3. FAN_Speed
4. FAN_PWM
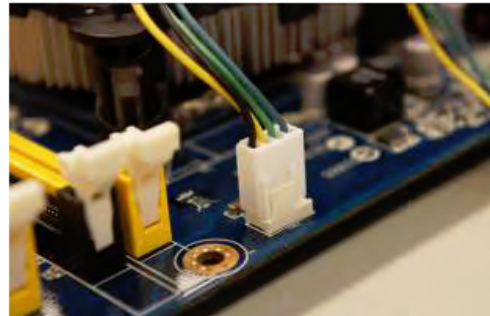
A. Do not forget to connect the CPU fan connector. Insufficient air flow inside the system chassis may damage the mainboard components. Hardware monitoring errors can occur if you fail to plug in this connector.

B. Do not install any pin connector on the header "J_CPU-FAN", doing so may damage the mainboard.

1.5.3   Uninstalling the CPU Heatsink and Fan.

To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the mainboard.

2. Rotate each fastener counterclockwise.
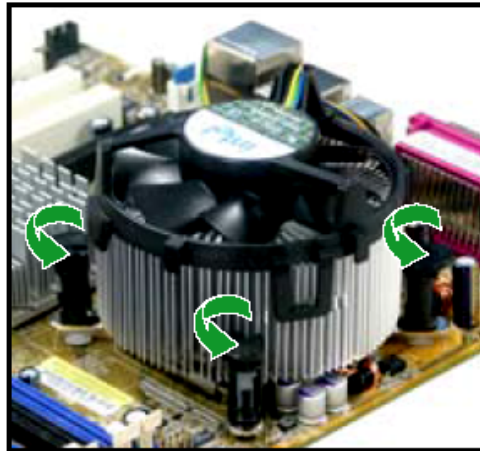
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the mainboard.
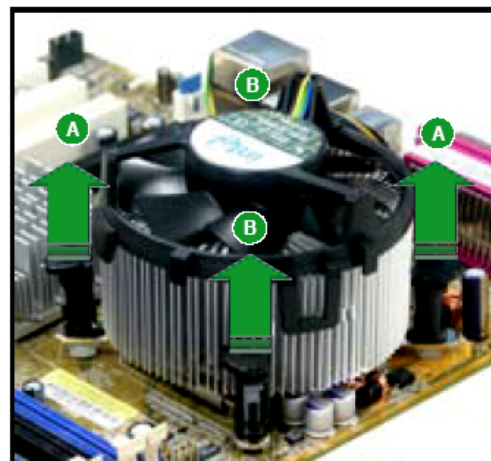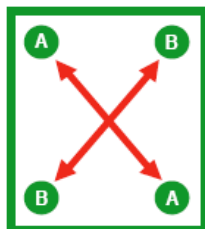
4. Rotate each fastener clockwise to ensure correct orientation when reinstalling.

Narrow end of the groove
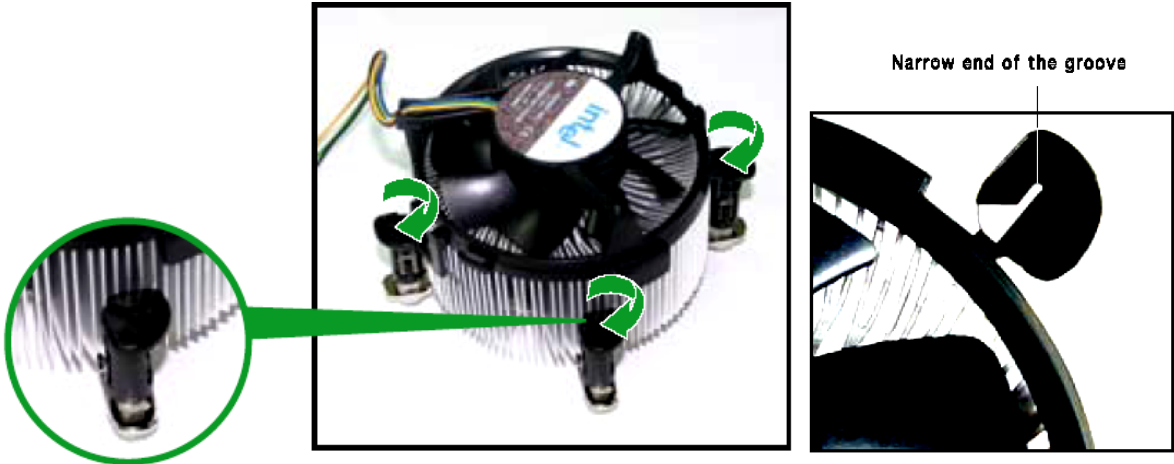
The narrow end of the groove should point outward after resetting.
(The photo shows the groove shaded for emphasis.)

1.6　　System Memory

1.6.1　　Overview

The mainboard comes with two 260-pin Double Data Rate 4 (DDR4) Dual Inline Memory Modules (SODIMM) sockets.

DDR4 SDRAM, an abbreviation for double data rate fourth generation synchronous dynamic random-access memory, is a type of synchronous dynamic random-access memory (SDRAM) with a high bandwidth ("double data rate") interface. The primary advantages of DDR4 over its predecessor, DDR3, include higher module density and lower voltage requirements, coupled with higher data rate transfer speeds.

The following figure illustrates the location of the sockets:
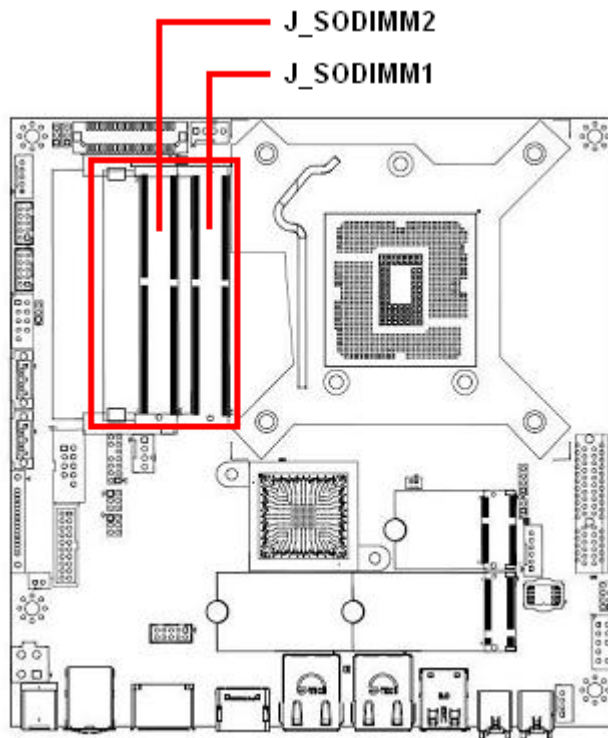
1.6.2   Memory Configurations

The MX310HD board supports 1.2V, Non-ECC, Un-buffered, 260-pins DDR4-2400 (PC4-19200, 2400MHz) SODIMM up to 32GB (16GB maximum/slot).

- **When there is only one DDR4 memory module being installed, it is recommended to install it on "J_SODIMM1" slot.**

- **When two SODIMMs being populated, only install identical (same type, same size, same CAS latency) DDR4 SODIMMs.**

- **For optimum compatibility, it is recommended to obtain the exact same model (and same batch) of memory modules from the same SODIMM manufacturer.**

1.6.3   Installing the DDR4 SODIMM

Make sure to unplug the power supply before installing or removing SODIMMs, or other peripherals from the system. Failure to do so may cause severe damage to both the mainboard and the peripherals.

1.   Locate the SODIMM socket onboard.

2.   Hold two edges of the SODIMM module carefully, and keep away of touching its connectors.

3.   Align the notch key on the SODIMM module with the rib on the slot.

4.   Firmly press the SODIMM module into the socket which will be snapped into the mounting notch automatically. Do not force the SODIMM module in with extra force as the SODIMM module can only fits in one direction.
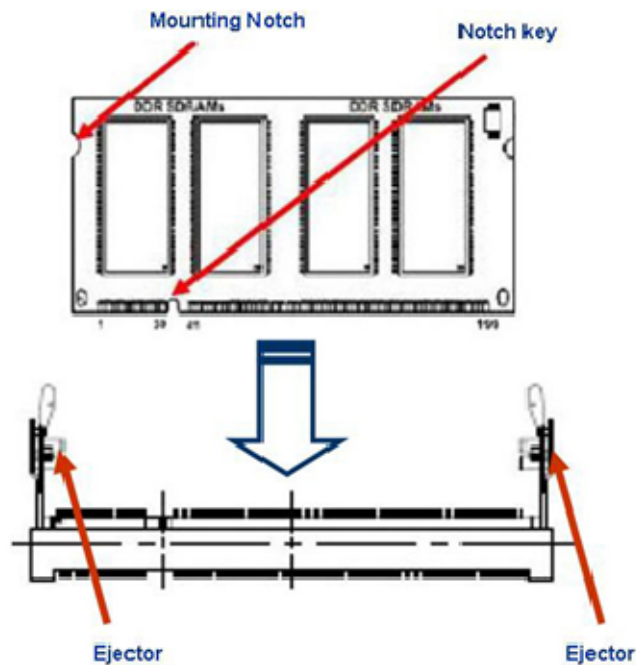
1.   **A DDR4 memory module is keyed with a notch so that it fits in only one direction.**
2.   **DO NOT force the memory module into the socket in order to avoid damaging the memory module and the slot.**
3.   **DDR4 memory modules are not interchangeable with DDR or DDR2, or DDR3. Do not install DDR, DDR2, or DDR3 SODIMMs to the DDR4 SODIMM sockets.**

1.6.4   Removing the DDR4 SODIMM

Follow these steps to remove a SODIMM.

1. Press the two ejector tables on the slot outward simultaneously

2. Remove the SODIMM module from the socket.
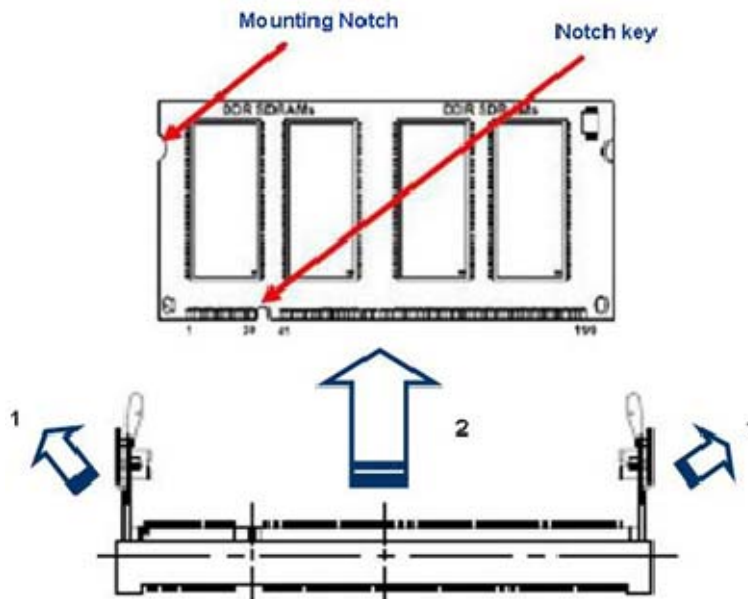
> ⚠ **Hold the SODIMM module gently when pressing the ejector tabs. The SODIMM might get damaged when it flips out with extra force.**

1.7   Power Supply

1.7.1   12V-24V Wide Range DC-In Power Connector: J_ATX-IN (4-Pin)

This connector is for ATX power supply plug. The power supply plug is designed to fit the connector in only one orientation. Find the proper orientation and push down firmly until the connector is completely fit.
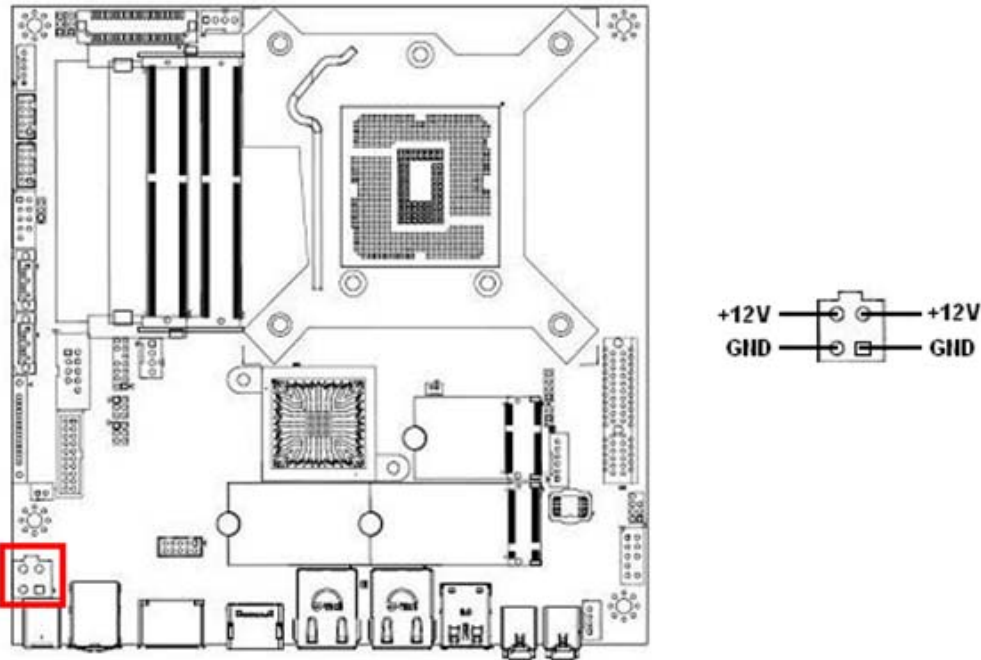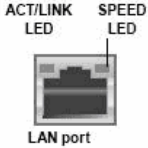
1. It is recommended that you use an industrial type ATX power supply unit (PSU) that complies with ATX 12V specification 2.0 (or later version) and provides a power of ~96W (Maximum Current Limit: 8A on this header).

2. Use of a PSU with adequate power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot if the power supply wattage is inadequate.

3. The MX310HD board can be power on EITHER through:

    A. Use 4-pin ATX power connector with an industrial type ATX power supply and connect it with "J_ATX-IN" header.

    B. Use an AC power adapter and connect it to "J_DC-IN" connector on the rear I/O of MX310HD board ("J_DC-IN" header accepts 12V-24V wide range. For +12V AC adapter, Max. current ~8A.   For +19V AC adapter, Max. current ~8A).

1.8   Back Panel   (Rear I/O Ports)

1.8.1   Back Panel Connectors

Item	Name	Function	Description
1	J_DC-IN	AC adapter Connector	This port is for an AC adapter (12V-24V Wide Range DC-In) For +12V AC adapter, Max. current ~8A. For +19V AC adapter, Max. current ~8A. AC adapter connector dimension: Inner Diameter: 2.5 +/- 0.1mm Outer Diameter: 5.5 +/- 0.1mm
2	J_USB2-89	USB2.0 Ports	The USB2.0 Port Connectors
3	J_DP	Display Port	The Display Port Connector.
4	J_HDMI	HDMI Port	The HDMI Port Connector.
5	J_LAN1	Gigabit LAN (RJ-45) Connectors	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

ACT/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Orange	Linked	Green	100Mbps connection
Blinking	Data activity	Orange	1Gbps connection

Item	Name	Function	Description
6	J_LAN2	Gigabit LAN (RJ-45) Connectors	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
7	J_USB3-34	USB3.0 Ports	The USB3.0 Port connectors.
8	J_LINE-OUT	Line-out port (Lime)	This port connects a headphone or a speaker.
9	J_MIC-IN	Microphone port (Pink)	This port connects a microphone.

Table within Description of item 6:

ACT/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Orange	Linked	Green	100Mbps connection
Blinking	Data activity	Orange	1Gbps connection

1.9   Connectors/ Headers

1.9.1   Front Panel Connectors: J_FR-PANEL

These connectors are for electrical connections to the front panel switches and LEDs. The "J_FR-PANEL" connector is compliant with Intel® Front Panel I/O Connectivity Design Guide.
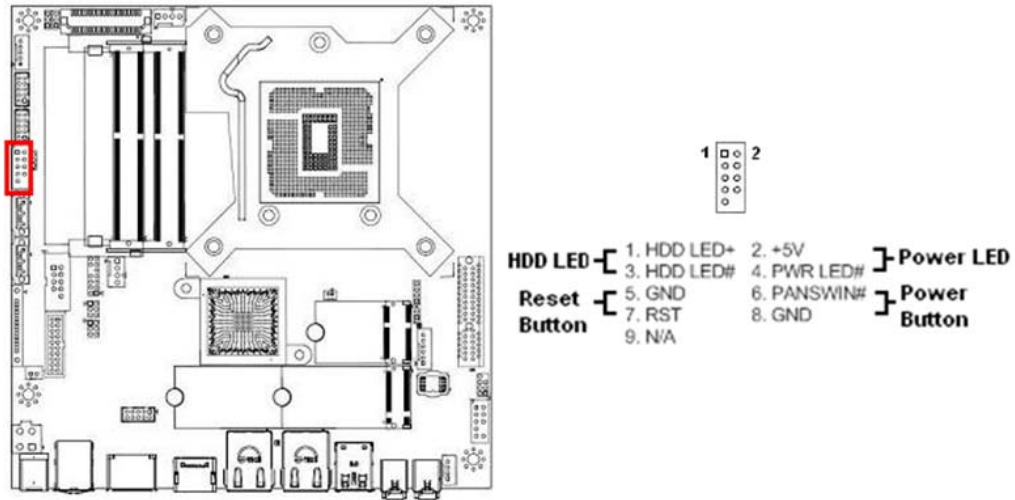
1.9.2   Serial ATA 3.0 Connectors: J_SATA3-1,   J_SATA3-2

SATA ports "J_SATA3-1" and "J_SATA3-2" support SATA3.0 standard.
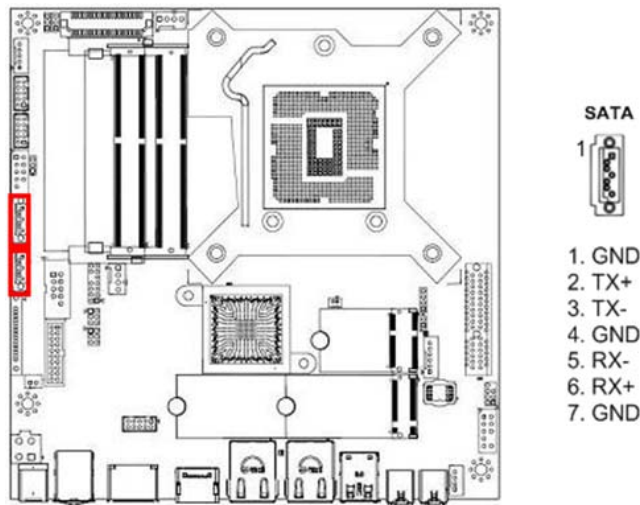
Do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during data transmission.

1.9.3　Serial ATA Power Connector:　J_SATA-PWR

This connector provides power connection to SATA device attached at connectors "J_SATA3-1" or "J_SATA3-2".
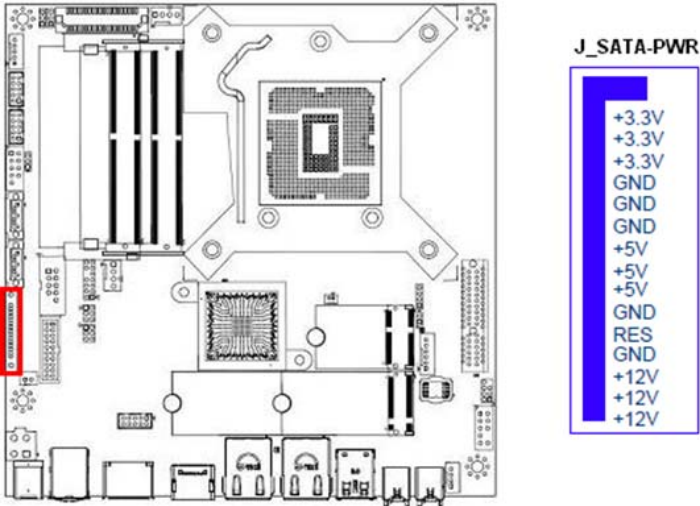
1.9.4　CPU & System Fan Connectors:　J_CPU-FAN,　J_SYS-FAN

The 4-pins fan power connector supports system cooling fan with +12V. In order to take the advantage of System Hardware Monitor and Smartfan feature, be sure to use the fan which is specifically designed with speed sensor and with the connector signal arrangement same as the picture below illustrates.
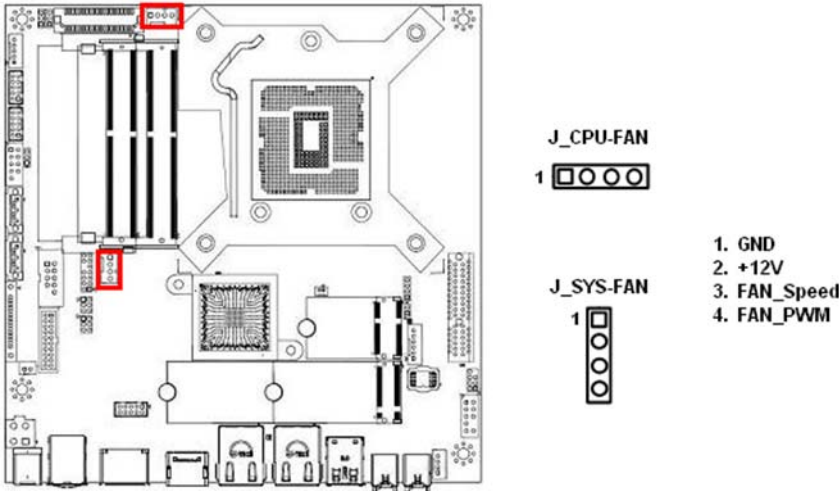
1.9.5 Front Panel Audio Connector: J_FR-AUDIO

This connector is prepared for a chassis-mounted front panel audio I/O module that supports HD Audio standard. Connect one end of the front panel audio I/O module cable to this connector.
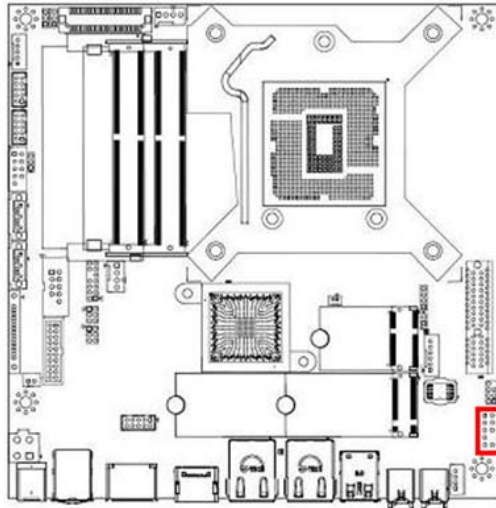
1. MIC2-L	2. GND
3. MIC2-R	4. +3.3V
5. Line2-R	6. MIC2-JD
7. SENSEB	8. NC
9. Line2-L	10. Line2-JD

1.9.6 Amplifier Connector: J_AMP-OUT

This header provides amplified audio signals to external speakers (2-channels). The dB level can be adjusted under BIOS.
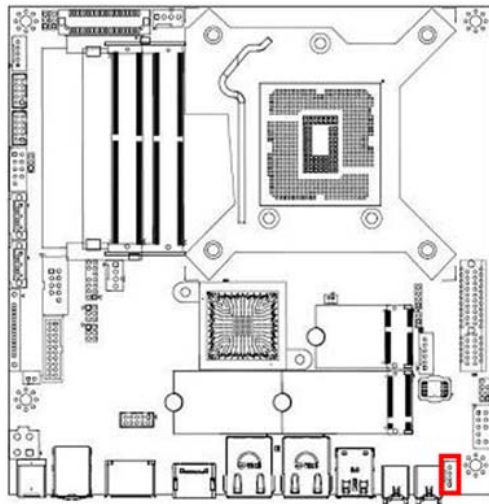
J_AMP-OUT

4. AMP_L-
3. AMP_L+
2. AMP_R-
1. AMP_R+

1.9.7 Front USB3.0 Headers: J_USB3-12

This header provides two USB3.0 connections (An USB3.0 cable required).

J_USB3-12

20. NC	1. +5V
19. +5V	2. USB3_RXN-1
18. USB3_RXN-2	3. USB3_RXP-1
17. USB3_RXP-2	4. GND
16. GND	5. USB3_TXN-1
15. USB3_TXN-2	6. USB3_TXP-1
14. USB3_TXP-2	7. GND
13. GND	8. USB2_1-
12. USB2_2-	9. USB2_1+
11. USB2_2+	10. USB2_ID
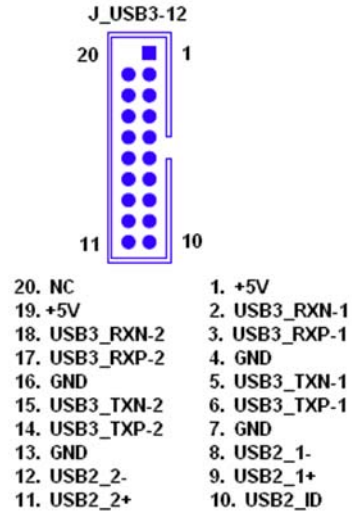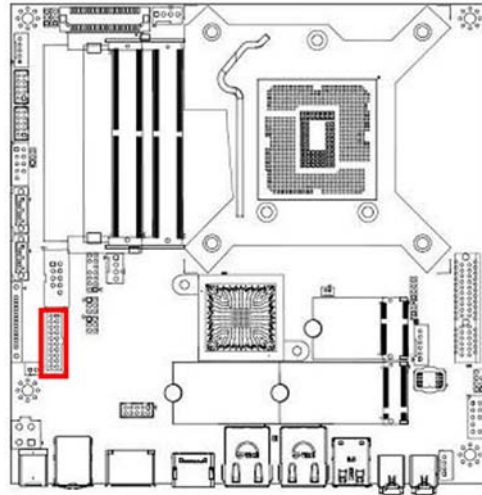
1.9.8 Front USB2.0 Headers: J_USB2-56

This header provides two USB2.0 connections (An USB2.0 cable required).

J_USB2-56

1.USB+5V	2.USB+5V
3.USB -	4.USB -
5.USB +	6.USB +
7.GND	8. GND
	9. NC
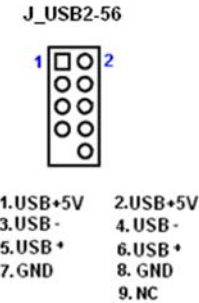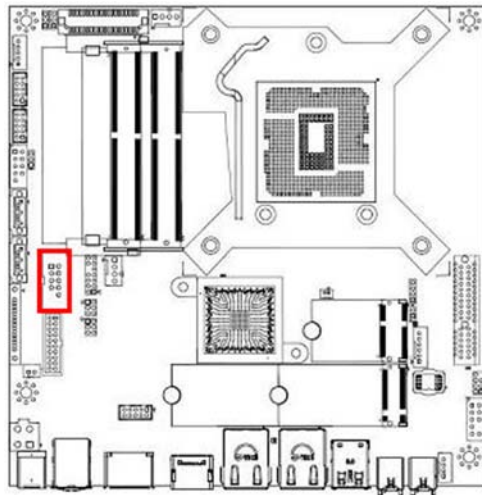
Be sure the pins of USB+5V and GND signals are connected to the corresponding USB2.0 correctly. Otherwise, it may cause damage to the USB port and/or the connected USB device.

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1.9.9   Serial Port Connector: J_COM1,   J_COM2

These headers provide serial connections on COM1, COM2 respectively.
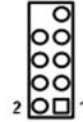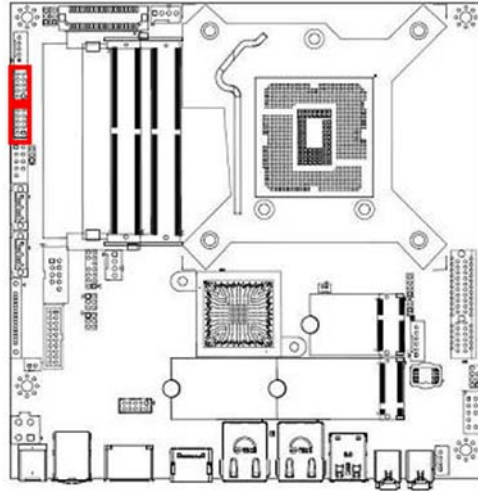
1. DCD#   2. RX
3. TX   4. DTR#
5. GND   6. DSR#
7. RTS#   8. CTS#
9. RI3xPOWERxJMP

1.9.10   LVDS Header: J_LVDS

This header provides connection to LVDS type panels (800x600 18-bit Single channel to 1920x1200 24-bit dual channel).

Pin	Signal	Pin	Signal
2	+5V_LVDS	1	+3.3V_LVDS
4		3	
6	LVDS_EDID_DAT	5	LVDS_EDID_CLK
8	EDP_HPC	7	
10	LVDSA_P0	9	LVDSA_P1
12	LVDSA_N0	11	LVDSA_N1
14		13	
16	LVDSA_P2	15	LVDSA_P3
18	LVDSA_N2	17	LVDSA_N3
20		19	
22	LVDSB_P0	21	LVDSB_P1
24	LVDSB_N0	23	LVDSB_N1
26		25	
28	LVDSB_P2	27	LVDSB_P3
30	LVDSB_N2	29	LVDSB_N3
32		31	
34	LVDSA_CLK_P	33	LVDSB_CLK_P
36	LVDSA_CLK_N	35	LVDSB_CLK_N
38		37	
40	+12V_LVDS	39	+12V_LVDS

42
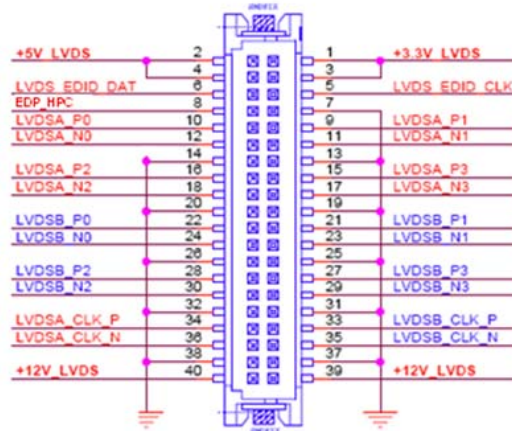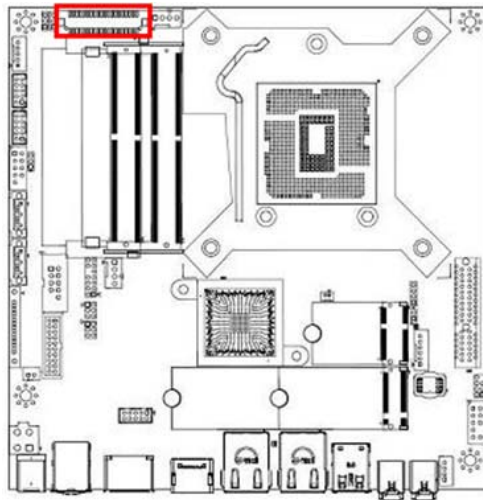
1.9.11   LVDS Panel Backlight Connector: J_BACKLIGHT

This header provides connection for LVDS panel backlight control connections.
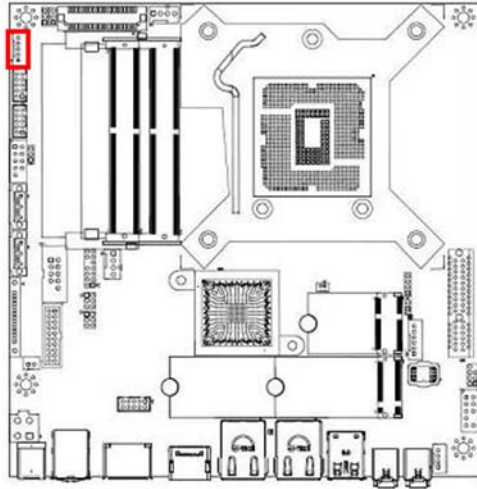
J_BACKLIGHT

1. +12V_BL
2. GND
3. BL_EN
4. BRIGHT1
5. +5V_BL

1.9.12   SPI Header: J_SPI

This header provides SPI signal connections.
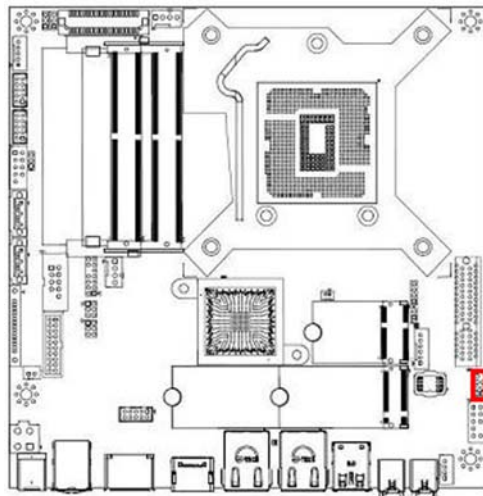
J_SPI

8. SPI_WP#   7. NC
6. SPI_MOSI   5. SPI_MISO
4. SPI_CLK   3. SPI_CS#
2. GND   1. Vcc

1.9.13 I2S Header: J_I2S

This header provides I2S signal connections.

```
J_I2S
    6. GND
    5. RXD
    4. RESET#
    3. SCLK
1   2. TXD
    1. +3.3V
```
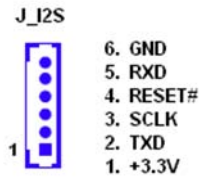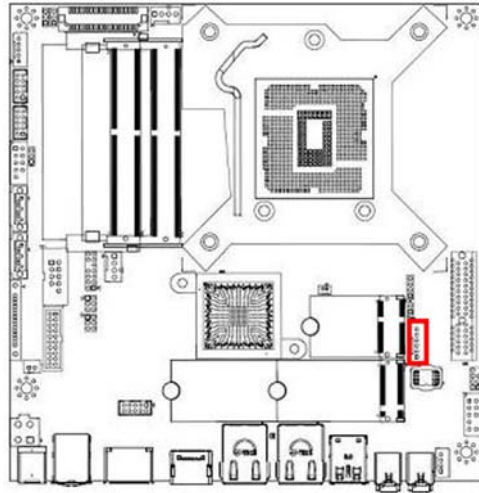
1.9.14 I2C Header: J_I2C

This header provides I2C signal connections.

```
J_I2C
    4. GND
    3. SDA
    2. SCL
1   1. +3.3V
```
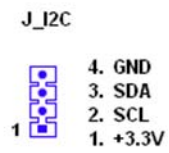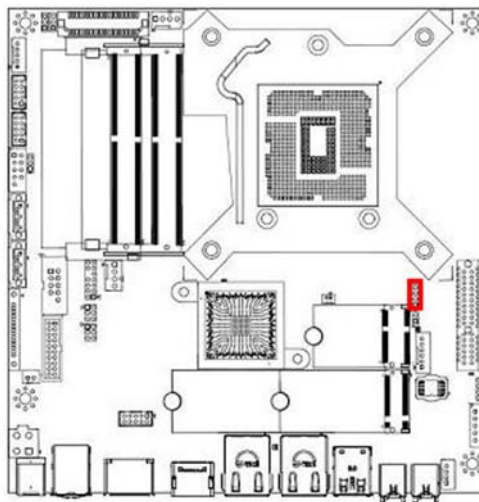
1.9.15 GPIO Header: J_GPIO

This header provides 8-bit general purpose I/O (GPIO) connections to external device. Customer can write their own monitoring program to monitor the status of external device connected with this header.
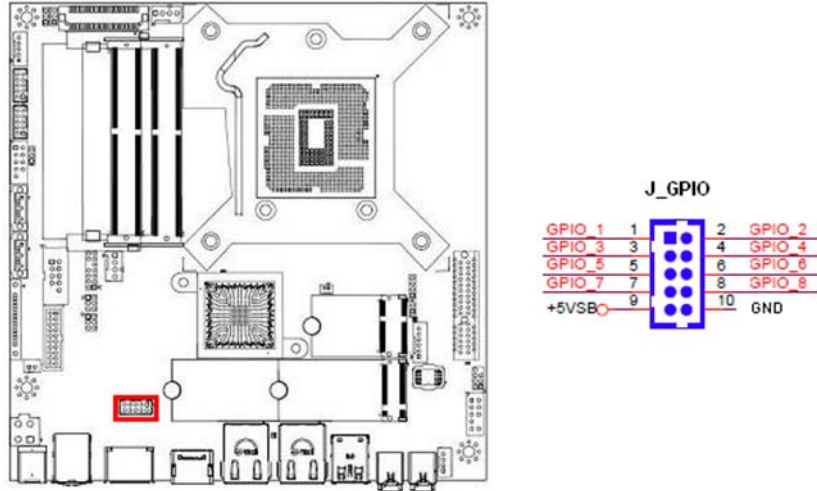
1.9.16 Chassis Intrusion Header: J_CHASSIS

This 2-pins header provides chassis intrusion warning connection.
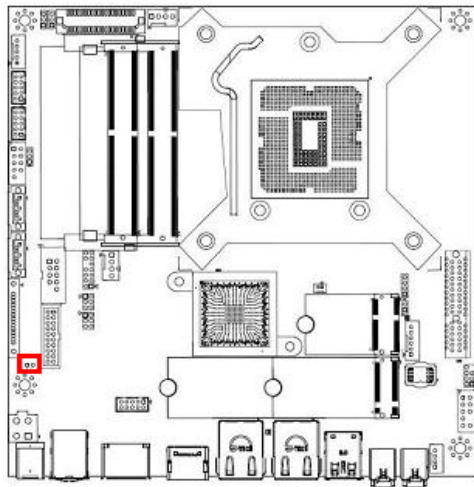
1.10 Jumpers

1.10.1 ATX/AT Mode Selection: JP4

This header provides the option to boot the system in the form of ATX mode (default) or AT mode. When the system is set in AT mode, the system power on/off will be controlled directly by the power switch on the power supply. And some of the power saving modes will not function as ATX mode provided.

AT Mode (Pin 2-3)

ATX Mode (Pin 1-2)
(Default)
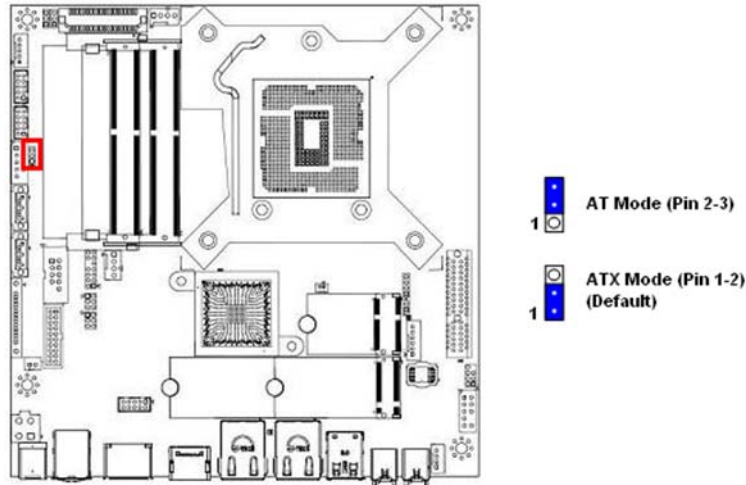
1.10.2 LVDS PWM Backlight Power Select: JP1

This header provides the options for selecting the PWM backlight control power in "+3.3V" (default) or "+5V".

JP1

+5V (Pin 2-3)

+3.3V (Pin 1-2)
(Default)
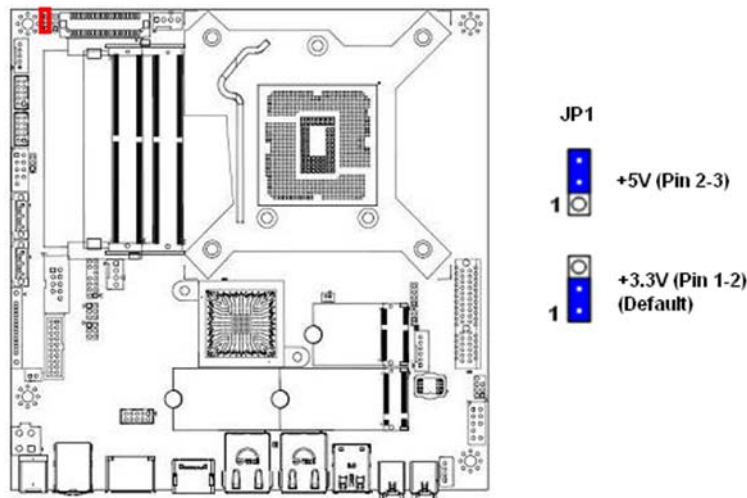
1.10.3   COM1 Ring-In/ +12V/ +5V Select: JP5

This header provides the options of selecting the COM port function as "Ring-in" (default), or "+5V", or "+12V".

Ring-In (Pin 1-2)
(Default)

+5V (Pin 3-4)

+12V (Pin 5-6)
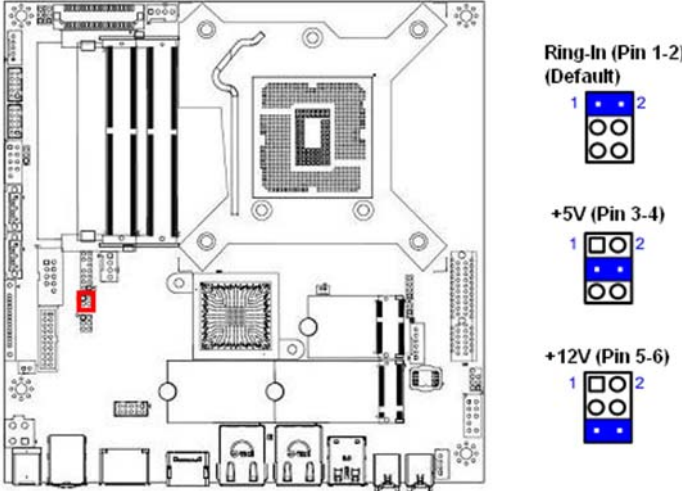
1.10.4   COM2 Ring-In/ +12V/ +5V Select: JP6

This header provides the options of selecting the COM port function as "Ring-in" (default), or "+5V", or "+12V".

Ring-In (Pin 1-2)
(Default)

+5V (Pin 3-4)

+12V (Pin 5-6)
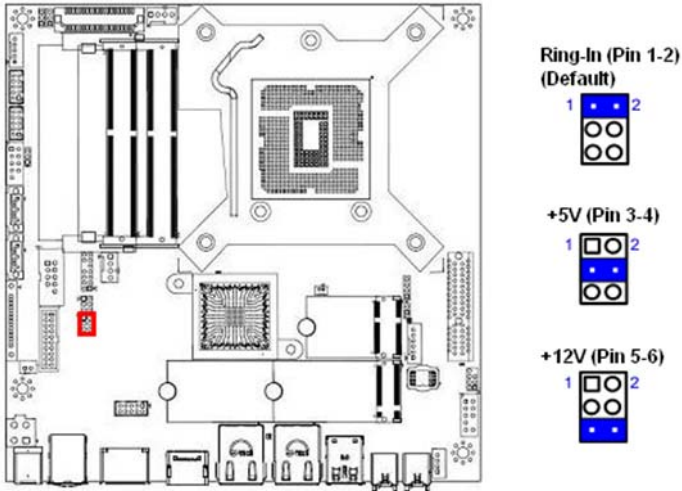
1.10.5   LVDS Brightness Mode Select: JP2

This header provides the options of selecting the connected LVDS panel brightness mode either in "PWM mode" (default) or "DC mode". (The mode selected is depending on the type of LVDS panel inverter used).

DC Mode (Pin 2-3)

PWM Mode (Pin 1-2)
(Default)
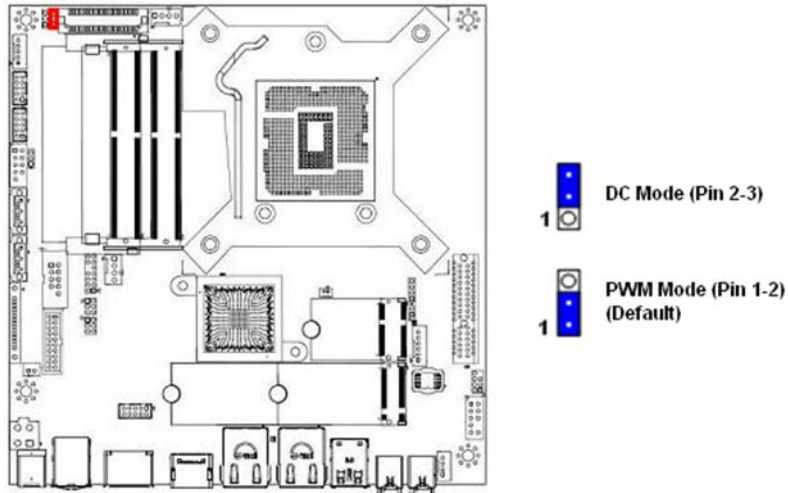
NOTE: It also requires to make the same settings under BIOS option "Chipset" ->"Graphics Configuration"->"LCD Control"->"LCD Brightness Control" at the same time.

1.10.6   Clear CMOS Jumper: JP3

There is a CMOS RAM onboard that has the power supplied from an external battery to maintain the registry settings of system configuration.

For normal state (default), the jumper is set on pin location 1 and 2.

To clear the CMOS, disconnect all power connections to MX310HD first, then set the JP3 jumper to pin location 2 and 3 for **at least 30 seconds while the system is disconnected from the power**.
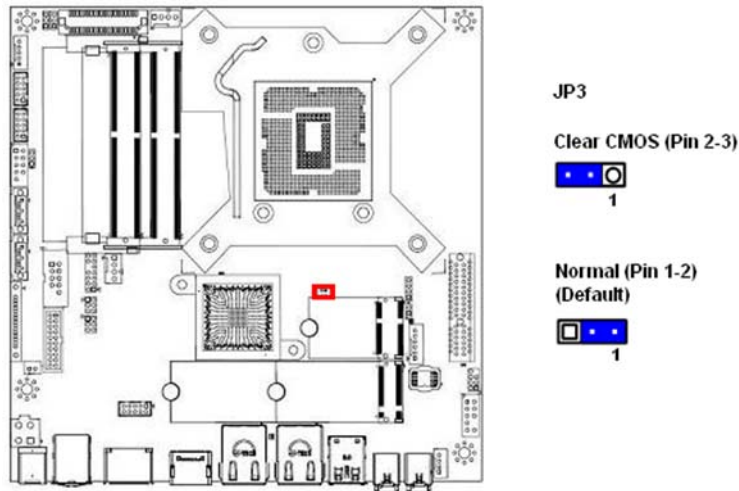
> 1. **You can clear CMOS by shorting pin 2-3 for at least 30 seconds (while the system is OFF), then place the jumper back to pin 1-2 for normal operation.**
> 2. **Avoid clearing the CMOS while the system is ON; this may damage the mainboard.**

1.11　The Expansion Slots

In the future, you may need to install expansion cards. The following sub-sections describe the expansion slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards.

Fail to do so may cause injury and damage mainrboard

1.11.1　Installation of Expansion Card

To install an expansion Card:

1. Before install the expansion card, read the documentation that came with it and make the necessary hardware setting for the card.

2. Remove the chassis cover (if the mainboard is installed in a chassis).

3. Remove the expansion slot bracket from the chassis on the slot that you intend to use. Keep the screw for later use.

4. Align the card connector with the slot and press it firmly until the card is completely seated on the slot.

5. Secure the card to the chassis with the screw that have been removed earlier (in step 3).

6. Place the chassis cover back on.

1.11.2　Setup An Expansion Card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the BIOS settings if necessary. See Chapter 2 for information on BIOS setup.

2. Assign an IRQ to the card if necessary.

3. Install the software drivers for the expansion card.

1.11.3   PCIe x4 Slot: J_PCIE4X

The PCIe x4 slot supports PCIe x1, PCIe x4 cards (e.g. PCIe LAN cards), or some of the

PCIe x16 video cards.
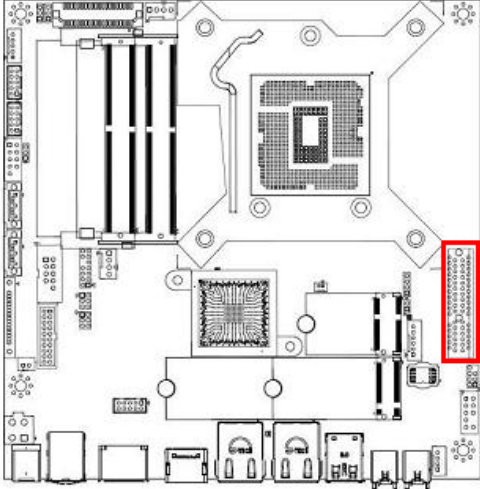
1.11.4   M.2 Sockets

1.11.4.1   M.2 Socket (M-Key):   J_M2M

The "J_M2M" socket supports "M-Key", SATA type SSDs in 2242 or 2280.
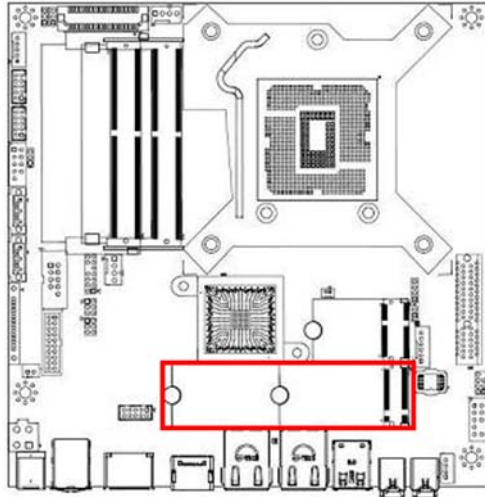
M.2 (M-Key)
(Supports 2242, or 2280)

1.11.4.2   M.2 Socket (E-Key):   J_M2E

The "J_M2E" socket supports "E-Key", WIFI cards in 2230.
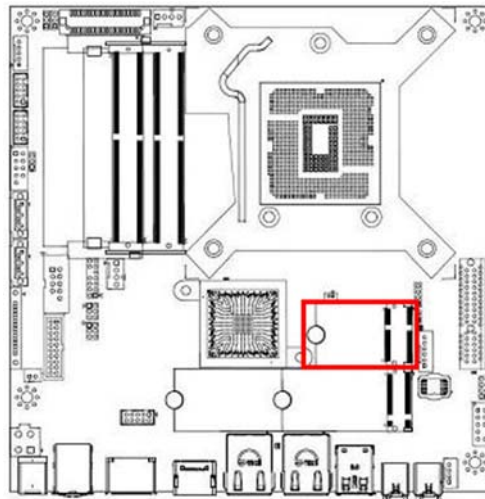
M.2 (E-Key)
(Supports 2230 Only)

Chapter 2: Starting Up the System

2.1　　　Starting Up Your System

1.　After all connections are made, close your computer case cover.

2.　Be sure all the switches are off, and check that the power supply input voltage is set to the local voltage, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.

3.　Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.

4.　Turn on your peripheral in following order:

   a.　Your monitor.
   b.　Other external peripheral (Printer, Scanner, External Modem etc…)
   c.　Your system power.　For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.

5.　The power LED on the front panel of the system case will light.　The LED on the monitor may light up or switch between orange and green after the system is on.　If it complies with green standards or if it is has a power standby feature.　The system will then run power-on test.　While the test are running, the BIOS will alarm beeps or additional message will appear on the screen.

   If you do not see any thing within 30 seconds from the time you turn on the power.　The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM install or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

6.　During power-on, press <Del> key to enter BIOS setup.　Follow the instructions in BIOS SETUP.

7.　If you wish to boot from a different bootable device other than the default arrangement under the BIOS, you may press <F11> key during the system power-on (post); a menu with all detected bootable

devices which are attached to the system will be displayed. Then you may select the desired first bootable device from this menu.

8. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch. If you use Windows Operating Systems, click **"Start"** button, click **"Shut down"** and then click **"Shut down the computer"** The power supply should turn off after windows shut down.

Chapter 3: BIOS Setup

3.1   BIOS Flash Related Procedure

1.   **After the BIOS is flashed, shut down the system.**

2.   **Disconnect all power connections from power supply to the mainboard.**

3.   **Clear the CMOS (For at least 30 seconds).**

4.   **Reconnect all power connections from power supply to the mainboard.**

5.   **When the system is booting at first time after the new BIOS is flashed, it is recommended to enter the BIOS; load the option "Load Optimized Defaults", and then "Save and Exit Setup".**

⚠️   **IF ANY OF THE ABOVE STEPS IS NOT FOLLOWED, IT MAY CAUSE THE FLASHED BIOS NOT FUNCTION PROPERLY.**

3.2   Introducing BIOS

The BIOS is a program located on a Flash Memory on the motherboard.   This program is a bridge between motherboard and operating system.   When you start the computer, the BIOS program gains control.   The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization.   Only when these tasks are completed done it gives up control of the computer to operating system (OS).   Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

In the BIOS Setup main menu of Figure 3-1, you can see several options.   We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

●   Press <Esc> to quit the BIOS Setup.

●   Press ↑↓←→ (up, down, left, right) to choose, in the main menu, the option you want to confirm or to modify.

●   Press <F10> when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.

●   Press Page Up/Page Down or +/– keys when you want to modify the BIOS parameters for the active option.

3.3 Entering BIOS Setup Menu

Power on the computer and by pressing <DEL> immediately allows you to enter BIOS Setup Menu.

If you are not able to enter the BIOS menu but you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case.   You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.

> **The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.**

3.4 Getting Help

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub- Menu

If you find a right pointer symbol (as shown in the picture below) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <ESC>.

```
▶ Primary IDE Master
▶ Primary IDE Slave
▶ Secondary IDE Master
▶ Secondary IDE Slave
```

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

3.5 BIOS Menu Screen

When entering the BIOS, the following screen appears. The BIOS menu screen displays the items that allow user to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to access the specific menu.

```
                 Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Boot  Security  Save & Exit

   BIOS Information                                          Set the Date. Use Tab to
   BIOS Vendor                   American Megatrends         switch between Data elements.
   Core Version                  4.6.4.0    0.01 x64
   Compliency                    UEFI 2.0
   BIOS Version                  1.01
   Build Date and Time           08/18/2011 15:12:38

   Memory Information
   Total Memory                  2048 MB (DDR3 1067)

   System Date                   [Sun 01/02/2005]
   System Time                   [08:42:18]

   Access Level                  Administrator
                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit


                 Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.    B4
```

```
              ┌──────────── General Help ────────────┐
              │                                        │
              │  ↑↓→←      : Move                      │
              │  Enter     : Select                    │
              │  +/-       : Value                     │
              │  ESC       : Exit                      │
              │  F1        : General Help              │
              │  F2        : Previous Values           │
              │  F3        : Optimized Defaults        │
              │  F4        : Save & Exit Setup         │
              │                                        │
              │                                        │
              │               Ok                       │
              │                                        │
              └────────────────────────────────────────┘
```

3.6 Main Menu

This menu gives user an overview of the general system specifications, such as time, date etc.
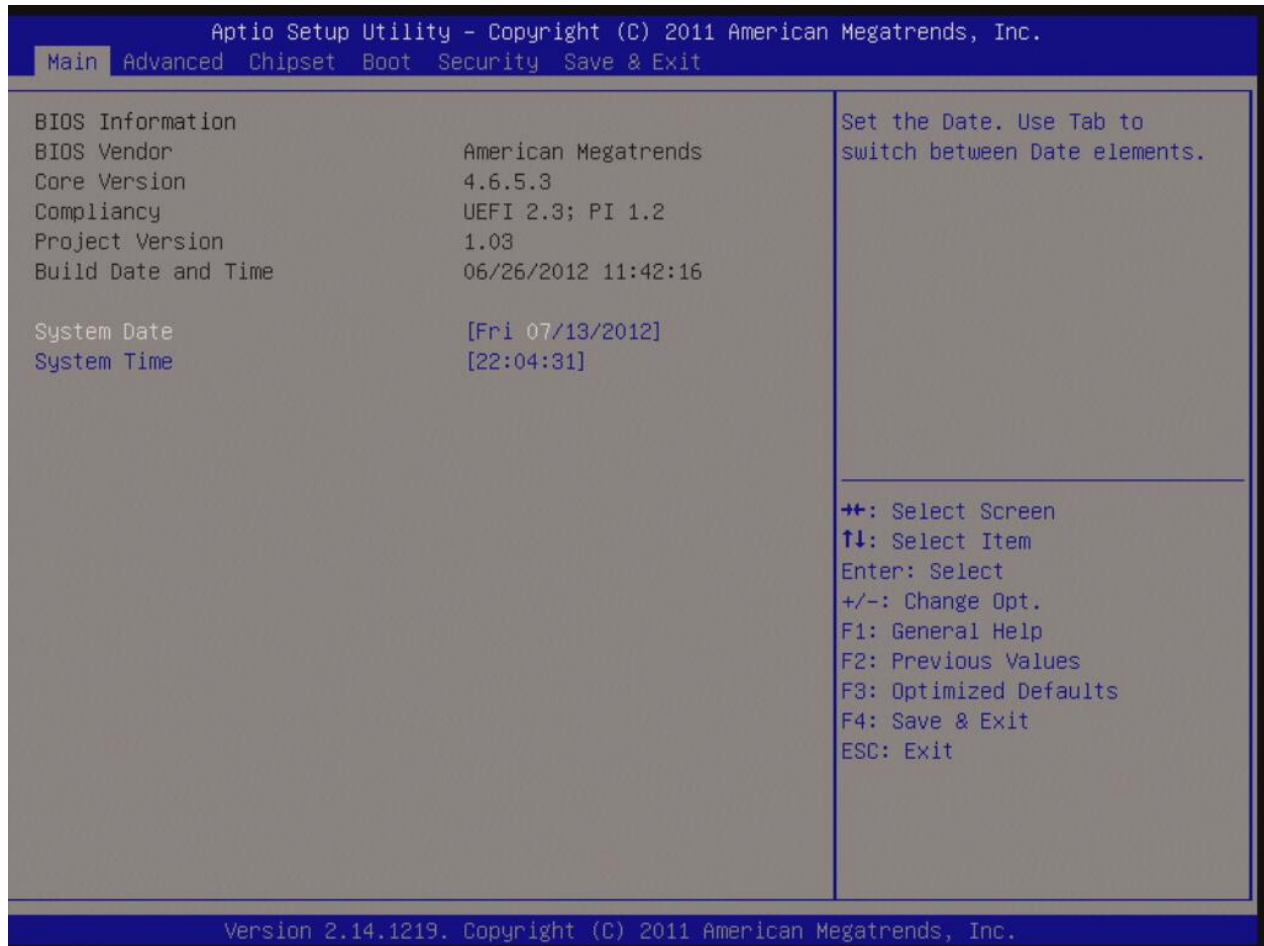
• **BIOS Information**

Displays the auto-detected BIOS information.

• **System Date**

The date format is <Date>,<Month>,<Day>,<Year>.

• **System Time**

The time format is <Hour>,<Minute>,<Second>.

3.7   Advanced Menu

Select the "Advanced" tab from the BIOS menu screen to enter the Advanced BIOS Setup screen.

> NOTE: Take caution when change the settings of the Advanced menu items.
> Incorrect field values can cause the system not to function properly.

3.7.1   CPU Configuration

This menu provides CPU related information and settings.

3.7.1.1   Intel (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by

Vanderpool Technology.

3.7.1.2   Active Processor Cores

Number of cores to enable in each processor package.

3.7.1.3   Hyper-Threading

Enabled for Windows and Linux (OS optimized for Hyper-Threading Technology). Disabled

for other OS (OS not optimized for Hyper-Threading Technology).

3.7.1.4   Intel® SpeedStep™

Allows more than two frequency ranges to be supported.

3.7.1.5   C States

Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100%

utilized.

3.7.1.6   Enhanced C-States

Enable/Disable C1E. When enabled, CPU will switch to minimum speed whn all cores enter

C-State.

3.7.1.7   Package C State Limit

Maximum Package C State limit setting.

  CPU Default: Leaves to factory default value.

  Auto: Initializes to deepest available package C State limit.

3.7.2 PCH-FW Configuration

Configure management engine (ME) technology related parameters.

3.7.3 Trusted Computing

Trusted computing (TPM) settings. By combining the onboard TPM 2.0 with TPM security software (provided by the third party), it will enhance the security level of the system.

• PRECAUTION: When TPM is enabled and utilized through TPM software, there is possibility that the encrypted data will not be accessible, or recoverable if one of the following situations occurred:

1. Lost of TPM password.

2. System or board failure, or being replaced.

3. Hard Drive failure.

Note: 1. Once BIOS option "Load Optimized Default" is loaded, the "Trusted Computing" option under the BIOS menu will be disappeared, which is normal. Just save and exit the BIOS, and then enter the BOIS again, the "Trusted Computing" BIOS option will be available again.

3.7.4 ACPI Settings

System ACPI Parameters.

3.7.4.1 Enable Hibernation

Enables or diables system ability to Hibernate (OS/S4 Sleep state). This option may not be effective with some operating systems.

3.7.4.2 ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

3.7.4.3 PCIe# Wake from S5 (Wake on LAN2)

Enable/disable Wake on LAN2 from S5 state (Wake on LAN2 from S3/S4 states are controlled by the driver under OS).

3.7.5   Super IO Configuration
System Super IO chip parameters.

3.7.5.1   Serial Port 1 Configuration
Set parameters of serial port 1 (COM1).

3.7.5.2   Serial Port 2 Configuration
Set parameters of serial port 2 (COM2).

3.7.5.3   WatchDog Count Mode
Set the WatchDog Count in minutes or seconds.

3.7.5.4   WatchDog TimeOut Value
Fill WatchDog TimeOut value. 0 means disabled.

3.7.5.5   Chassis Opened Warning
Enable/disable the chassis intrusion feature (It requires 2 wires connection from the chassis to header "J_CHASSIS").
If chassis tamper occurs, you can only enter BIOS to clear this error.

3.7.5.6   ErP/EuP S5 Support
When user enabled this item, super IO will turn off most power on this motherboard to reduce power consumption. This is for the requirement of Erp/EuP standard.

3.7.6　　　HW Monitor

Monitor hardware status.

3.7.6.1　　Smart Fan

Smart Fan function page.

3.7.6.1.1　Smart Fan Function

Smart Fan function enable/disable.

3.7.6.1.2　Smart Fan Mode Configuration

Setup the desired target temperatures for fans connected to fan headers "J_CPU-FAN"

and/or "J_SYS-FAN".

3.7.7　　　Intel TXT Information

Display Intel TXT Information.

3.7.8   USB Configuration

USB configuration parameters.

3.7.8.1   Legacy USB Support

Enable legacy USB support.

AUTO: Disables legacy support if no USB devices are connected.

Disabled: Will keep USB devices available only for EFI applications.

3.7.8.2   XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

3.7.8.3   USB Mass Storage Driver Support

Enable/Disable USB mass storage driver support.

3.7.9 Network Stack Configuration

Network Stack Settings.

3.7.9.1 Network Stack

Enable/Disable UEFI Network Stack.

3.7.9.2 IPv4 PXE Support

Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be
available.

Note: Here is the procedure to setup the PXE with onboard LAN1 or LAN2.

1. **Enter BIOS option "BIOS advanced"->"Network Stack Configuration";**
    set "Network
    Stack" set to "Enabled".
2. **Set "IPv4 PXE Support" to "Enabled".**
3. **Save and Exit BIOS.**
4. **Enter BIOS menu after reboot. Enter "Boot"->"UEFI Network Drive BBS Priorities";**
    choose the desired boot LAN (LAN1 or LAN2).

3.7.9.3 IPv6 PXE Support

Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be
available.

3.7.9.4 PXE boot wait time

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys
to set the value.

3.7.10　CSM Configuration

Enable/Disable, option ROM execution settings, etc.

3.7.10.1　CSM Support

Enable/Disable CSM Support

3.7.10.2　Boot Option Filter

This option controls Legacy/UEFI ROMs priority.

3.8   Chipset

3.8.1   System Agent (SA) Configuration
System Agent (SA) Parameters

3.8.1.1   Memory Configuration
Memory Configuration Parameters.

3.8.1.1.1 Max TOLUD
TOLUD is Top of Lower Usable DRAM, this item is to select the max. TOLUD, can reserve enough MMIO manually.

3.8.1.2   Graphics Configuration
Graphics related settings.

3.8.1.2.1 Primary Display
Select which of IGFX (Internal Graphic from CPU) / PCIE (The PCIe graphic card installed on "J_PCIE4X" slot.

3.8.1.2.2 Internal Graphics
Keep IGFX enabled based on the setup options.

3.8.1.2.3 DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) graphic memory size used by the internal graphics device.

3.8.1.2.4 DVMT Total Gfx Mem
Select DVMT 5.0 total graphic memory size used by internal graphic device.

3.8.1.3   LCD Control
LVDS related settings.

3.8.1.3.1 LVDS Control
Enable/Disable LVDS.

3.8.1.3.2 LVDS Panel Type
Select LCD panel type.

3.8.1.3.3 LCD Brightness Control
Select LCD brightness control mode (The onboard jumper "JP4" also needs to be adjusted at the corresponding setting).

3.8.1.3.4 LVDS PWM Brightness Control
Adjust Brightness of LVDS (from 1~ 255).

3.8.1.3 VT-d
VT-d capability.

3.8.2 PCH-IO Configuration
PCH parameters.

3.8.2.1 PCI Express Configuration
PCI Express designations for onboard M.2 sockets "J_M2M", "J_M2E", and "LAN1", "LAN2".

3.8.2.2 SATA And RST Configuration
SATA Device Options Settings.

3.8.2.3 USB Configuration
USB Configuration settings.

3.8.2.4 HD Audio Configuration
HD Audio subsystem Configuration settings.

3.8.2.5 LAN1 Controller
Enable/Disable onboard LAN1 (Intel i219LM PHY (located next to HDMI connector).

3.8.2.6 Wake on LAN1 from S3/S4/S5
Enable/Disable integrated LAN1 to wake the system.

3.8.2.7 LAN2 Controller
Enable/Disable onboard LAN2 (Intel i211-AT LAN (located next to USB3.0 connectors).

3.8.2.8   Restore AC Power Loss

Specify what state to go to when power is re-applied after a power failure (G3 state).

3.8.2.9   GPIO Group Control

Configure the digital GPIO pins.

3.8.2.10   Amplifier GAIN (db)

Select Amplifier GAIN value. The volume through onboard header "J_AMP-OUT".

3.9 Security

Setup the administrator or user passwords, and secure boot related settings.

3.10   Boot

Boot related configurations.

3.10.1   Setup Prompt Timeout

Number of seconds to wait for setup activation key. (system post time).

3.10.2   Bootup NumLock State

Select the keyboard NumLock state.

3.10.3   Quiet Boot

Enable or disable quiet boot option.

3.10.4   Boot Mode

Automatically set CSM's item to Legacy or UEFI.

3.10.5   FIXED BOOT ORDER Priorities

Setup the desired boot sequence of attached boot devices.

3.10.6   UEFI Hard Disk Drive BBS Priorities

Specifies the boot device priority sequence from available UEFI hard disk drives.

3.11   Save & Exit

Save & Exit BIOS settings.

3.11.1   Save Changes and Exit

Exit system setup after saving the changes.

3.11.2   Discard Changes and Exit

Exit system setup without saving any changes.

3.11.3   Save Changes and Reset

Reset the system after saving the changes.

3.11.4   Load Optimized Default

Load Optimized Default values for all the setup options.

Chapter 4: Application Note

Please read the following application notes before proceed with the system setup and/or OS installation:

4.1   Windows 10 Drivers Installation

It is recommended to load the MX310HD drivers with the following sequence:

1. **Update Win10 to the latest version through Windows Update by connecting Ethernet cable to MX310HD onboard i211 LAN (Located next to the rear I/O USB3.0 ports (blue color USB ports)).**
2. Install "Intel LAN Driver" first.
3. Install "Intel INF Driver".
4. Install "Intel Video Driver".
5. Install "Realtek Audio Driver".
6. Install "Intel ME Driver".
7. Install "Intel Serial IO Driver".
8. Install "Intel RST Driver".
9. Make sure there is no exclimation mark shown for any device under Windows "Device Manager".

4.2   Display through PCIe video card (installed on "J_PCIEX4" slot)

1. **Enter BIOS.**
2. **Enter BIOS option "Chipset"->"Graphics Configuration"; change "Primary Display" to "IGFX".**
3. **Enter BIOS option "Chipset"->"Graphics Configuration"; change "Internal Graphics" to "Enabled".**
4. **Save & exit BIOS.**
5. **Power off system.**
6. **Keep the HDMI or DP port connected to the monitor A.**
7. **Install a PCIe video card on PCIe 4x slot (J_PCIE4X), and connect its video output to monitor B.**
8. **Boot the system into Windows 10 desktop.**
9. **Check under "Device Manager", and make sure the installed PCIe video card is being detected. (NOTE: If the installed PCIe video card is not being detected under device manager, it means this PCIe card is not compatible with MX310HD board).**
10. **Install the PCIe video card Win10 driver provided by PCIe video card manufacturer.**
11. **Reboot the system.**
12. **After the system rebooted and entered Win10 desktop. There should be no exclamation mark shown for the installed PCIe video card. And there will be video output shown on monitor B (the one connected to PCIe video card).**

4.3   PXE Boot

1. **Enter BIOS.**
2. **Enter BIOS option "Advanced"->"Network Stack Configuration"; Enable "Network Stack".**
3. **Set "Ipv4 PXE Support" to "Enabled".**
4. **Save and Exit BIOS.**
5. **Reboot the system.**
6. **Enter BIOS option "Boot"->"UEFI Network Drive BBS Priorities"; choose the desired boot LAN. (The chosen LAN device will also be displayed under "Fixed Boot Order Priorities" list.**
7. **Save and Exit BIOS.**