INTEL 3rd Generation Core i Series
Processor ATX Industrial Motherboard

SYM76999VGGA

User's Manual

GRANTECH CO., LTD.

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Revision History

Revision	Revision History	Date
V2.1	For PCB v2.x	2014/03

Safety Instructions

- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- Keep this equipment away from humidity.
- Lay this equipment on a reliable flat surface before setting it up.
- The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- Always Unplug the Power Cord before inserting any add-on card or module.
- All cautions and warnings on the equipment should be noted.
- Never pour any liquid into the opening that could damage or cause electrical shock.
- If any of the following situations arises, get the equipment checked by service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment does not work well or you can not get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 80°C (176°F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者:

這是甲類資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

廢電池請回收
For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

CE Conformity

Hereby, we declare that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

NOTICE 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE 2

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

This device complies with Part 15 of the 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.

WEEE Statement

ENGLISH

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.

DEUTSCH

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. Wir haben europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы.

ESPAÑOL

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida.

NEDERLANDS

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling. Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus.

SRPSKI

Po Direktivi Evropske unije (“EU”) o odbačenoj ekektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod “elektronsku i električnu opremu” ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja.

POLSKI

Zgodnie z Dyrektywą Unii Europejskiej (“UE”) dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. “produkty oraz wyposażenie elektryczne i elektroniczne “ nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia.

TÜRKÇE

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır.

ČESKY

Podle směrnice Evropské unie (“EU”) o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat “elektrické a elektronické výrobky” v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti.

MAGYAR

Az Európai Unió („EU”) 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén.

ITALIANO

In base alla Direttiva dell’Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita.

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Chapter 1
Overview

Thank you for choosing SYM76999VGGA, an excellent industrial computer board.

Based on the innovative **Intel® Panther Point** chipset for optimal system efficiency, SYM76999VGGA supports Ivy Bridge and Sandy Bridge processor series in socket LGA1155 and supports up to four DDR3 1066/1333/1600 UDIMM slots to provide the maximum of 32GB memory capacity.

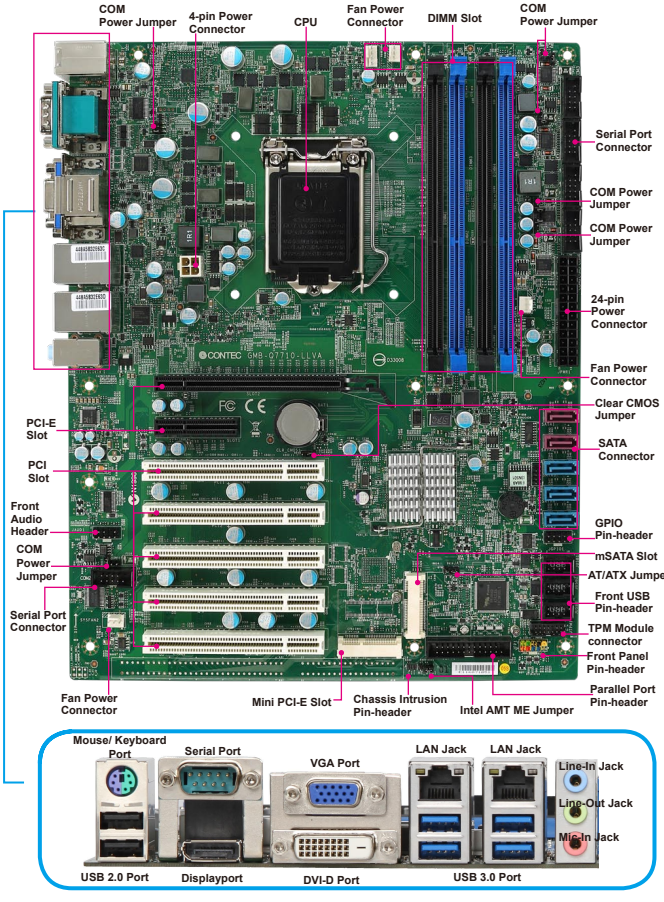
In the advanced-level and mid-range market segment, SYM76999VGGA provides a high-performance solution for today's front-end and general purpose workstation, as well as in the future.

Mainboard Specifications

CPU (Optional)	■ Intel Ivy Bridge series and Sandy Bridge series processor in socket LGA1155
Chipset	■ Intel Q77 PCH ■ Support iAMT 8.0
Memory	■ 4 DDR3 1066/1333/1600 UDIMM slots ■ Supports the maximum of 32GB
LAN	■ Gigabit Fast Ethernet by Intel 82579LM PHY & 82583V GbE controllers
SATA	■ 3 SATA 3Gb/s ports by Intel Cougar Point ■ 2 SATA 6Gb/s ports by Intel Cougar Point
RAID	■ SATA1~5 support Intel Rapid Storage Technology (AHCI/ RAID 0/ 1/ 5/ 10) by Intel Panther Point
Audio	■ HDA Codec by Realtek® ALC887 ■ Compliant with Azalia 1.0 specs
Graphics	■ Support by the installed processor - Support 3 independent displays by Ivy Bridge series - Support 2 independent displays by Sandy Bridge series
Back Panel I/O	■ 1 PS/2 mouse/ keyboard port ■ 1 VGA port ■ 1 DVI-D port ■ 1 Serial port ■ 1 Displayport ■ 2 Gigabit LAN jacks ■ 2 USB 2.0 ports ■ 4 USB 3.0 ports ■ 1 Line-In audio jack ■ 1 Line-Out audio jack ■ 1 Mic-In audio jack

Onboard Connectors/ Pinheaders	■ 3 USB 2.0 pin-headers ■ 5 Serial port connectors ■ 1 GPIO pin-header ■ 1 Front Audio pin-header ■ 1 Chassis Intrusion pin-header ■ 1 Parallel Port pin-header ■ 1 TPM Module connector (optional) ■ 1 Front Panel pin-header
Slot	■ 1 PCIe x16 slot ■ 1 PCIe x4 slot ■ 1 Mini-PCIe slot ■ 1 mSATA slot ■ 5 PCI slots ■ 1 ISA slot (optional)
Form Factor	■ ATX: 305mm x 244mm
Environ-mental	■ Operating Temperature: 0°C to 60°C ■ Storage Temperature: -20°C to 80°C ■ Humidity: 5% ~ 95% RH, Non-Condensing

Mainboard Layout



Chapter 2
Hardware Setup

This chapter provides you with the information on mainboard hardware configurations. Incorrect setting of jumpers and connectors may damage your mainboard. Please pay special attention not to connect these headers in wrong direction. DO NOT adjust any jumper while the mainboard is powered on.

Components Reference Guide

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CPU (Central Processing Unit)

When you are installing the CPU, make sure that you install the cooler to prevent overheating. If you do not have the CPU cooler, consult your dealer before turning on the computer.

Important

Overheating

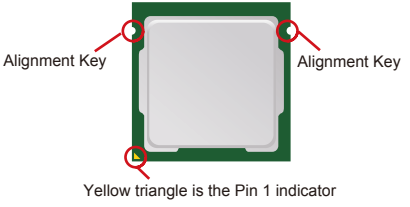
Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

Replacing the CPU

While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

Introduction to LGA 1155 CPU

The surface of LGA 1155 CPU. Remember to apply some thermal paste on it for better heat dispersion.

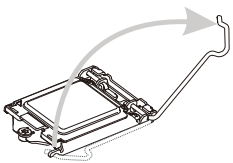


CPU & Cooler Installation

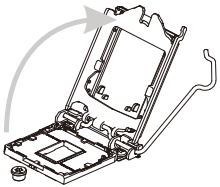
When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating**. Meanwhile, do not forget to apply some thermal paste on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause damage to your CPU & mainboard.

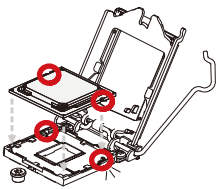
1. Open the load lever.



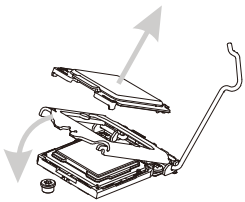
2. Lift the load lever up to fully open position.



3. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



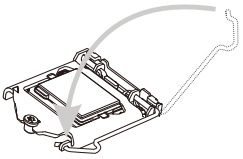
4. Remove the plastic cap. Engage the load lever while pressing down lightly onto the load plate.



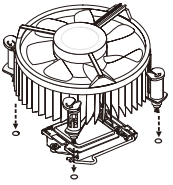
Important

Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.

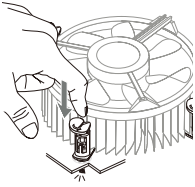
5. Secure the lever near the hook end under the retention tab.



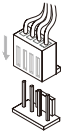
6. Make sure the four hooks are in proper position before you install the cooler. Align the holes on the mainboard with the cooler. Push down the cooler until its four clips get wedged into the holes of the mainboard.



7. Press the four hooks down to fasten the cooler. Turn over the mainboard to confirm that the clip-ends are correctly inserted.



8. Finally, attach the CPU Fan cable to the CPU fan connector on the mainboard.

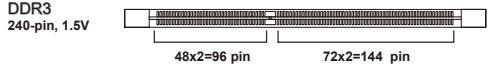


Important

- *Confirm if your CPU cooler is firmly installed before turning on your system.*
- *Do not touch the CPU socket pins to avoid damaging.*
- *Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered to avoid damaging.*
- *Please refer to the documentation in the CPU cooler package for more details about the CPU cooler installation.*

Memory

These DIMM slots are intended for memory modules.

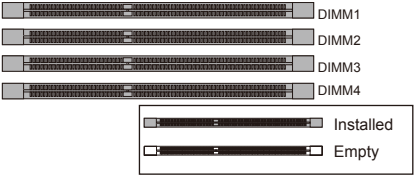


Dual-Channel mode Population Rule

In Dual-Channel mode, the memory modules can transmit and receive data with two data bus lines simultaneously. Enabling Dual-Channel mode can enhance the system performance. The following illustrations explain the population rules for Dual-Channel mode.

1

2



Installing Memory Modules

1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot. **You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.**
3. The plastic clip at each side of the DIMM slot will automatically close.

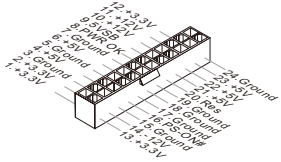
Important

- *DDR3 memory modules are not interchangeable with DDR2 and the DDR3 standard is not backwards compatible. You should always install DDR3 memory modules in the DDR3 DIMM slots.*
- *To enable successful system boot-up, always insert the memory modules into the DIMM1 first.*

Power Supply

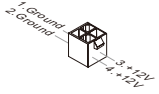
24-Pin Power Connector: JPWR1

This connector allows you to connect an 24-pin power supply. To connect the 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.



4-Pin Power Connector: JPWR2

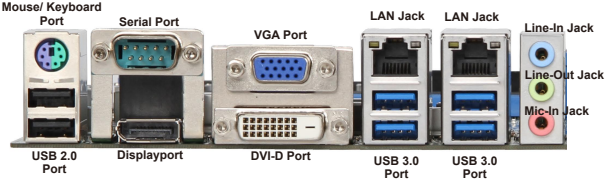
This 12V power connector is used to provide power to the CPU.



Important

Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.

Back Panel I/O



- **Mouse/Keyboard Port**

The standard PS/2 mouse/keyboard DIN connector is for a PS/2 mouse/ keyboard.

- **VGA Port**

The DB15-pin female connector is provided for monitor.

- **DVI-D Port**

The DVI-D (Digital Visual Interface-Digital) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computer and its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)

- **DisplayPort**

DisplayPort is a digital display interface standard. This connector is used to connect a monitor with DisplayPort inputs.

- **USB 2.0 Port**

The USB 2.0 port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices. Supports data transfer rate up to 480Mbit/s (Hi-Speed).

- **USB 3.0 Port**

USB 3.0 port is backward-compatible with USB 2.0 devices. It supports data transfer rate up to 5 Gbit/s (SuperSpeed).

▸ RS-232/422/485 Serial Port Connector

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

RS-232

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage select setting by J1

RS-422

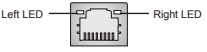
PIN	SIGNAL	DESCRIPTION
1	422 TXD-	Transmit Data, Negative
2	422 RXD+	Receive Data, Positive
3	422 TXD+	Transmit Data, Positive
4	422 RXD-	Receive Data, Negative
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

RS-485

PIN	SIGNAL	DESCRIPTION
1	485 TXD-	Transmit Data, Negative
2	NC	No Connection
3	485 TXD+	Transmit Data, Positive
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

LAN

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.



		Left LED (Active LED)	Right LED (100M/1000M Speed LED)
LED Color		Orange	Green/Yellow
10M Cable Plug-in	**No Transmission**	Orange (Lighting)	OFF
	Transmission	Orange (Blinking)	OFF
100M Cable Plug-in	**No Transmission**	Orange (Lighting)	Green (Lighting)
	Transmission	Orange (Blinking)	Green (Lighting)
1000M Cable Plug-in	**No Transmission**	Orange (Lighting)	Yellow (Lighting)
	Transmission	Orange (Blinking)	Yellow (Lighting)
In S3/S4/S5 Standby State		Orange (Lighting)	OFF

Audio Jack

- **Line-In (Blue)** - for external CD player or other audio devices.
- **Line-Out (Green)** - for speakers or headphones.
- **Mic-In (Pink)** - for microphones.

Connector

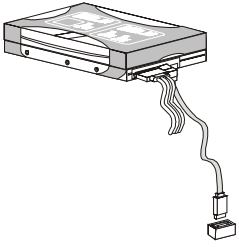
Chassis Intrusion Pinheader: CI1

This connector is provided to connect the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

Serial ATA Connector: SATA1 ~ SATA5

This connector is a high-speed Serial ATA interface port. Each connector can connect one Serial ATA device.

SATA1~2 (6Gb/s)
SATA3~6 (3Gb/s)

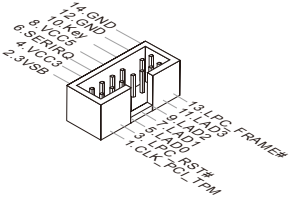


Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

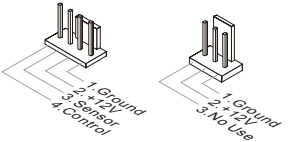
TPM Module Connector: JTPM1

This connector connects to a TPM (Trusted Platform Module). Please refer to the TPM security platform manual for more details and usages.



Fan Power Connector: CPUFAN1, SYSFAN1, SYSFAN2, SYSFAN3

The fan power connector supports system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



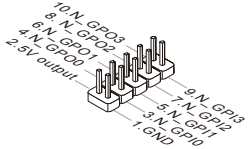
CPUFAN1 SYSFAN1~3

Important

Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.

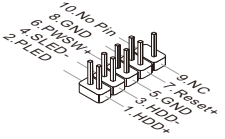
GPIO Pin-header: JGPIO1

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.



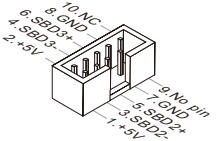
Front Panel Pin-header: JFP1

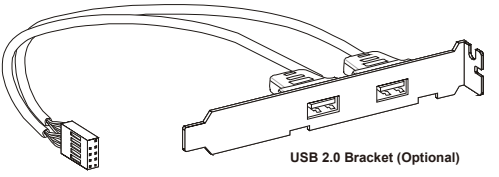
This front panel connector is provided for electrical connection to the front panel switches & LEDs and is compliant with Intel Front Panel I/O Connectivity Design Guide.



Front USB Pin-header: JUSB1 ~ JUSB3

This connector, compliant with Intel I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.





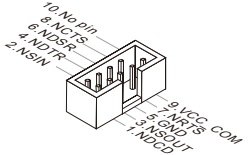
USB 2.0 Bracket (Optional)

Important

Note that the pins of +5V and GND must be connected correctly to avoid possible damage.

Serial Port Connector: COM2 ~ COM6

This connector is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial device to it through an optional serial port bracket.



RS-232

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM1	Voltage select setting by J1

PIN	SIGNAL	DESCRIPTION
1	NDCD	Data Carrier Detect
2	NSIN	Receive Data
3	NSOUT	Transmit Data
4	NDTR	Data Terminal Ready
5	GND	Signal Ground
6	NDSR	Data Set Ready
7	NRTS	Request To Send
8	NCTS	Clear To Send
9	VCC_COM	12V or 5V power output, selected by jumper

RS-422

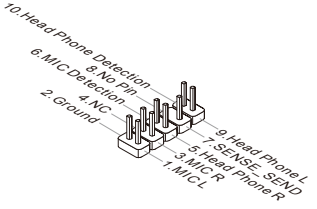
PIN	SIGNAL	DESCRIPTION
1	422 TXD-	Transmit Data, Negative
2	422 RXD+	Receive Data, Positive
3	422 TXD+	Transmit Data, Positive
4	422 RXD-	Receive Data, Negative
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

RS-485

PIN	SIGNAL	DESCRIPTION
1	485 TXD-	Transmit Data, Negative
2	NC	No Connection
3	485 TXD+	Transmit Data, Positive
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

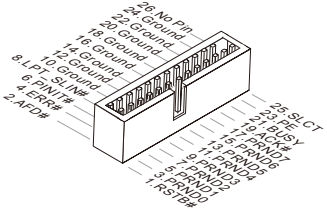
Front Audio Pin-header: JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel Front Panel I/O Connectivity Design Guide.



Parallel Port Header: JLPT1

The mainboard provides a 26-pin header for connection to an optional parallel port bracket. The parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



Jumper

Clear CMOS Jumper: CLR_CMOS1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.

CLR_CMOS1

Clear CMOS

Keep CMOS

Important

You can clear CMOS by shorting 1-2 pin while the system is off. Then return to 2-3 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

ME Jumper: ME_DIS1

This jumper is used to disable/ enable the Intel AMT ME technology.

ME_DIS1

Enabled

Disabled

AT/ATX Select Jumper: JAT1

This jumper allows users to select between AT and ATX power.

JAT1

AT Power

ATX Power

Back Panel COM Port Power Jumper: JCOMP1

This jumper specifies the operation voltage of the serial ports on the back panel.

JCOMP1

Ring (Default)

VCC5

+12V

On-board COM Port Power Jumper: JCOMP2 ~ JCOMP6

These jumpers specify the operation voltage of the onboard serial ports.

JCOMP2~6

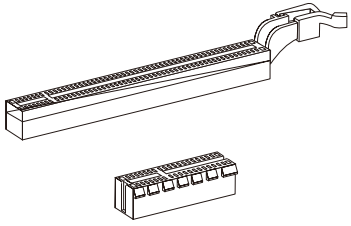
+5V

+12V

Slot

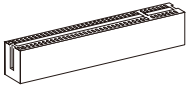
PCI-E (Peripheral Component Interconnect Express) Slot

The PCIE slot supports the PCIE interface expansion card.



PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.



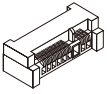
32-bit PCI Slot

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Mini PCI-E Slot

The Mini PCI-E slot is provided for wireless LAN card, TV tuner card, and Robson NAND Flash card.



mSATA Slot

The mSATA slot is provided for mSATA SSD device.