ESM-HRPL

Intel® 12/13/14th & Series 2 Gen Refresh Core™ Processors

COM-HPC® Client Size C Module

User's Manual

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Part No: E2047HRPL00R

Document Amendment History

Revision	Date	By	Comment
1st	March 2026	Avalue	Initial Release

Declaration of Conformity

This device complies with 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 installed 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.

CE statement

The product(s) described in this manual complies with all application European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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.

Copyright Notice

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows is registered trademark of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Disclaimer

This manual is intended to be used as a practical and informative guide only and is subject to change without notice. It does not represent a commitment on the part of Avalue. This

product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support and Assistance

1. Visit the Avalue website at https://www.avalue.com/ where you can find the latest information about the product.
2. Contact your distributor or our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

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

Product Warranty (Returns & Warranties policy)

1. Purpose

Avalue establishes the following maintenance specifications and operation procedures for providing the best quality of service and shortened repair time to our customers.

2. Warranty

2.1 Warranty Period

Avalue endeavors to offer customers the most comprehensive post-sales services and protection; besides offering a 2-year warranty for standard Avalue products, an extended warranty service can also be provided based on additional request from the customer. Within the warranty period, customers are entitled to receive comprehensive and prompt repair and warranty.

Standard products manufactured by Avalue are offered a 2-year warranty, from the date of delivery from Avalue. For ODM/OEM products manufactured by Avalue or PCBA with conformal coating, will follow up the define warranty of the agreement, otherwise will be offered 1-year warranty for ODM/OEM products but non-warranty for PCBA with conformal coating. For outsourcing parts kit by Avalue (ex: Motherboard, LCD touch panel, CPU, RAM, HDD) are offered a 6-month warranty, and Mobile/Tablet PC battery are offered a warranty of the half year, from the date of delivery by Avalue. Products before the mass production stage, i.e. engineering samples are not applied in this warranty or service policy. For extended warranty and cross-territory services, product defects resulting from design, production process or material are covered by the pre-set warranty period after the date of delivery from Avalue. For non-Avalue products, the product warranty and repair time shall be based on the service standards provided by the original manufacturer; in principle Avalue will provide these products a warranty service for no more than one year.

2.2 Maintenance services within the warranty period

In the case of Avalue product DOA (Defect-on-Arrival) when the customer finds any defect within 1 month after the delivery, Avalue will replace it with a new product in a soonest way. Except for custom products, once the customer is approved of a Cross-Shipment Agreement, which allows for delivery a new product to the customer before receiving the defective one, Avalue will immediately proceed with new product replacement for the said DOA case. On validation of the confirmed defect, Avalue is entitled to reserve the right whether to provide a new product for replacement. For the returned defective new product, it is necessary to verify that there shall be no bruise, alteration, scratch or marking to the appearance, and that none of the delivered accessories missing; otherwise, the customer will be requested to pay a processing fee. On the other hand, if the new product defect is resulting from incorrect configuration or erroneous use by the user instead of any problem of the hardware itself, the customer will also be requested to pay for relevant handling fees.

As for other conditions, Avalue will handle defects by way of repair. The customer will be requested to send the defective product to an Avalue authorized service center, and Avalue will return the repaired product back to the customer as soon as possible.

2.3 Ruling of an out-of-warranty defect

The following situations are not included in the warranty:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident or other causes. Avalue reserves the right for the ruling of the aforementioned situations.
- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules of non-Avalue products and accessories shall be in accordance with standards set up by the original manufacturer. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiration of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number.
- Products before the mass production stage, i.e. engineering samples.

3. Procedure for sending for repair

3.1 Attain a RMA number

A customer's rejected product returned for repair shall have a RMA (Return Merchandise Authorization) number. Without a RMA number, Avalue will not provide any repair service for the rejected product, and the product will be returned to the customer at customer's cost. Avalue will not issue any notice for the return of the product.

Each returned product for repair shall have a RMA number, which is simply the authorization of the return for repair; it is not a guarantee that the returned goods can be repaired or replaced. For applying for a RMA number, the customer may enter the eRMA webpage of Avalue https://www.avalue.com/en/member and log-in with an account number and a password authorized by Avalue. The system will then automatically issue a RMA number.

When applying for the RMA number, it is essential to fill in basic information of the customer and the product, together with detailed description of the problem encountered. If possible, avoid using ambiguous words such as "does not work" or "problematic". Without a substantial description of the problem, it is hard to start the repair and will cause prolonged repair time. Lacking detailed statement of fault steps also makes the problem hard to be identified, sometimes resulting in second-time repairs.

In case the customer can't define the cause of problem, please contact Avalue application engineers. Sometimes when the problem can be resolved even before the customer sends back the product.

On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

3.2 Return of faulty product for repair

It is recommended that the customer not to return the accessories (manual, connection cables, etc.) with the products for repair, devices such as CPU, DRAM, CF memory card, etc., shall also be removed from the faulty goods before return for repair. If these devices are relevant to described repair problems and necessary to be returned with the goods; please clearly indicate the items included in the eRMA application form. Avalue shall not be responsible for any item that is not itemized. Moreover, make sure the problem(s) are detailed in the "Problem Description" field.

In the list of delivery, the customer may fill-in a value which is lower than the actual value, to prevent customs levying a higher tax over the excessive value of the return goods. The customer shall be held responsible for extra fees caused by this. We strongly recommend that "Invoice for customs purpose only with no commercial value" be indicated on the delivery note. Also for the purpose of expedited handling, please printout the RMA number and put it in the carton, also indicate the number outside of the carton, with the recipient addressing to Avalue RMA Department.

When returning the defective product, please use an anti-static bag or ESD material to pack it properly. In case of improper packing resulting in damages in the transportation process, Avalue reserves the right to reject the un-repaired faulty good at the customer's costs. Furthermore, it is suggested that the faulty goods shall be sent via a door-to-door courier service. The customer shall be held responsible for any customs clearance fee or extra expenses if Air-Cargo is used for the delivery.

In case of a DOA situation of a new product, Avalue will be responsible for the product and the freight. If the faulty goods are within the warranty period, the sender will take responsibility for the freight. For an out-of-warranty case, the customer shall be responsible for the freight of both trips.

3.3 Maintenance Charge

Avalue will charge a moderate repair fee for the following conditions:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident

or other causes. Avalue reserves the right for the ruling of the aforementioned situations.

- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules for non-Avalue products and accessories shall be in accordance with standards set up by the original supplier. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiry of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number
- Products before the mass production stage, i.e. engineering samples.
- In case the products received are examined as NPF (No Problem Found) within the warranty period, the customer shall be responsible for the freight of both trips.
- Please contact your local distributor to examine in advance to prevent unnecessary freight cost.

For system failure of out-of-warranty products, Avalue will provide a quotation prior to repair service. When the customer applies for the cost, please refer to the Quotation number. In case the customer does not return the DOA product that has already been replaced by a new one, or the customer does not sign back the quotation of the out-of-warranty maintenance, Avalue reserves the right of whether or not to provide the repair service. In case the customer does not reply in 3 months, Avalue shall directly scrap or return the product back to customer at customer's cost without further notice to the customer.

3.4 Maintenance service of phased-out products

For servicing phased-out products, Avalue provides an extended period, starting the date of phase-out, as a guaranteed maintenance period of such products, for continuance of the maintenance service to meet customer's requirements. In case of unexpected factors causing Avalue to be unable to repair/replace a warranted but phased-out product, Avalue will, depending on the availability, upgrade the product (free of charge with continued warranty period as of the original product), or, give partial refund (based on the length of the remaining warranty period) to solve this kind of problem.

3.5 Maintenance Report

On completion of repair of a defective product, a Maintenance Report indicating the maintenance result and part(s) replaced (if any) will be sent to the customer together with the product. If the customer demands an additional maintenance analysis report, a service fee of various level will be charged depending on the warranty status. In case the analysis result shows that the defect attributes to Avalue's faulty design or process, the analysis fee will be exempted.

4. Service Products

Avalue provides service products to manage with different customer needs. Should you have any need, please consult to Avalue Sales Department.

Defect Analysis Report (DAR)

Avalue provides DAR (Defect Analysis Report) services aiming to elevating customer satisfaction. A DAR includes defect cause identification/verification/suggestion and improvement precautions, with instructions on correct usage for the avoidance of any reoccurrence.

Upgrade Service

Avalue is capable to provide system upgrade service for customization requirements. This upgrade service is applicable for main parts, such as CPU, memory, HDD, SSD, storage devices; also replacements motherboards of systems. Please contact Avalue sales for details to evaluate the possibility of system upgrade service and obtain information of lead time and price.

Safety Instructions

Safety Precautions

Before installing and using this device, please note the following precautions.

1. Read these safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Disconnected this equipment from any AC outlet before cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Use a power cord that has been approved for using with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to

avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel. If one 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 cannot get it work according to the user's manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

14. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
15. Equipment intended only for use in a RESTRICTED ACCESS AREA.

Explanation of Graphical Symbols

	Warning	A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Caution	A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.
	Note	A NOTE provides additional information intended to avoid inconveniences during operation.
		Direct current.
		Alternating current
		Stand-by, Power on
		FCC Certification
		CE Certification
		Follow the national requirements for disposal of equipment.
		Stacking layer limit
		This side up

		Fragile Packaging
		Beware of water damage, moisture-proof
		Carton recyclable
		Handle with care
		Follow operating instructions of consult instructions for use.
		**WARNING** • **INGESTION HAZARD**: This product contains a button cell or coin battery. • **DEATH** or serious injury can occur if ingested. • A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**. • **KEEP** new and used batteries **OUT OF REACH of CHILDREN**. • **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

Disposing of your old product

WARNING:
There is danger of explosion if the battery is mishandled or incorretly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or ther liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

CAUTION:
- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.
- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION
- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.
- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

Mise en garde!
AVERTISSEMENT : Il existe un risque d'explosion si la batterie est mal manipulée ou remplacée de manière incorrecte. Remplacez uniquement par le même type de batterie. Ne le démontez pas et ne tentez pas de le recharger en dehors du système. Ne pas écraser, percer, jeter au feu, court-circuiter les contacts externes ou exposer à l'eau ou à d'autres liquides. Jetez la batterie conformément aux réglementations locales et aux instructions de votre fournisseur de services.

MISE EN GARDE:
- Pile au lithium Attention : Danger d'explosion si la pile n'est pas remplacée correctement. Remplacer uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.
- L'élimination d'une BATTERIE dans le feu ou dans un four chaud, ou l'écrasement ou le découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION
- Laisser une BATTERIE dans un environnement à température extrêmement élevée pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.
- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

Content

1. Getting Started

1.1 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 CPU card. 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.

1.2 Packing List

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	ESM-HRPL COM-HPC Module	1

If any of the above items is damaged or missing, contact your retailer.

1.3 Manual Objectives

This manual describes in details Avalue Technology ESM-HRPL Single Board.

We have tried to include as much information as possible, but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up ESM-HRPL 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 regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.4 System Specifications

System	
CPU	Intel® 12/13/14th & Series 2 Gen Refresh Core™ i9/i7/i5/i3 Processor, supports LGA 1700 CPU Up to 65W Max, including P-core only SKU
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
System Chipset	Intel® R680E chipsets
I/O Chip	EC5782
System Memory	4 x 262-pin DDR5 SODIMM support up to 128GB, Max 3600MT/s, optional ECC support depending on selected PCH (R680E) & CPU
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec. and 1sec./step
H/W Status Monitor	• CPU temperature monitoring • Voltages monitoring • CPU fan speed control
RAID	Support RAID 0, 1
TPM	Onboard NuvoTon NPCT754AADYX supports TPM 2.0
iAMT	Yes, 1 of i226-LM is iAMT-supported by CPU w/ vPro (i9/i7/i5)
Onboard I/O	
CPU/System FAN	1 x 4pin connector for module FAN
Other	2 x 400-pin COM-HPC connector
I/O Interface (SOM)	
COM-HPC Rev.	COM-HPC Module Base Specification Rev. 1.2 PICMG release date: Oct. 3rd, 2023
PCI Express	• 1 x PCIex16 Gen5 or 2 x PCIex8 • 1 x PEGx4 Gen4 (from CPU) • 3 x PCIex4 Gen4 (from PCH) • 2 x PCIex4 Gen 3(from PCH) • 1 x PCIex1 Gen3 (from PCH) • 1 x PCIex1 Gen3 for BMC (the end customer design their own carrier board, BMC own by the customer) **The above PCIe signals are validated with EEV-HC10. (1 x PCIex16, 6 x PCIex4, and 2 x PCIex1)**
UART	2 x UART via EC5782
USB	• 4 x USB3.2 Gen2x2 • 8 x USB2.0
SATA	2 x SATAIII
System Memory	4 x 262-pin DDR5 SODIMM support up to 128GB, Max 3600MT/s, optional ECC support depending on selected PCH (R680E) & CPU

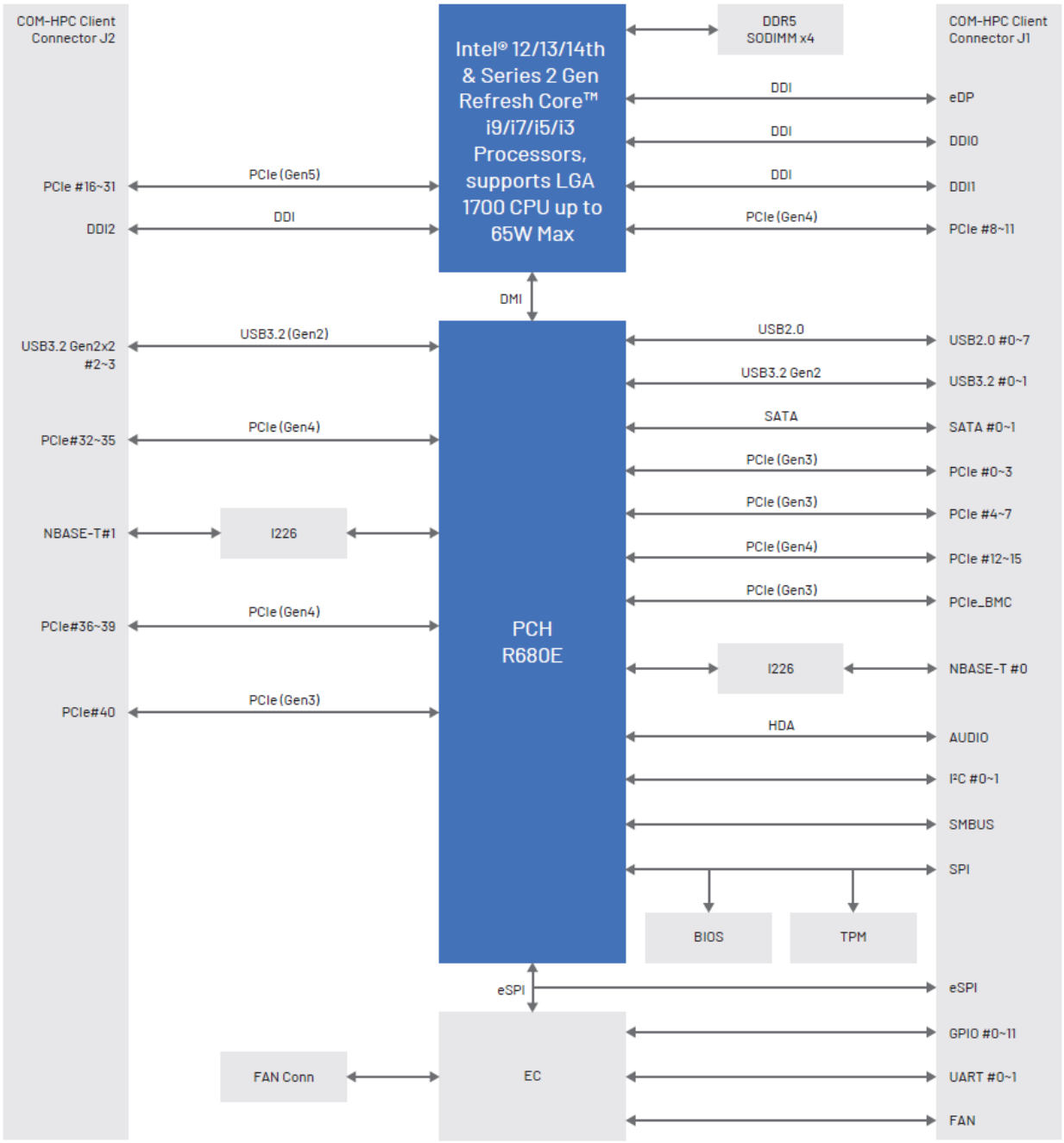
<table>
<tr><td>I²C Bus</td><td>1</td></tr>
<tr><td>SMBus</td><td>1</td></tr>
<tr><td>TPM</td><td>Onboard NuvoTon NPCT754AADYX supports TPM 2.0</td></tr>
<tr><td>SPI</td><td>1</td></tr>
<tr><td>Others</td><td>• 12-bit GPIO
• 1 x Audio</td></tr>
<tr><td colspan="2">Display</td></tr>
<tr><td>Graphic Chipset</td><td>• Intel® UHD Graphics 770 up to 32EUs</td></tr>
<tr><td>Spec. & Resolution</td><td>• 3 x DDI ports support configurable HDMI/DP:
✓ 3 x DP1.4a (max. 7680x 4320@60Hz), or HDMI2.1b
✓ 3 x HDMI 2.1b, 4096x2160@60Hz
• 1 x eDP1.4 3840x2160@60Hz
The above spec. follows Intel CPU, to be updated based on Avalue validation</td></tr>
<tr><td>Multiple Display</td><td>4 independent displays</td></tr>
<tr><td colspan="2">Audio</td></tr>
<tr><td>Audio Codec</td><td>Intel® HD Audio Integrated</td></tr>
<tr><td colspan="2">Ethernet</td></tr>
<tr><td>LAN Chipset</td><td>2 x Intel® i226-LM 2.5G Gigabit Ethernet Controller</td></tr>
<tr><td>LAN Spec.</td><td>10/100/1000/2500 Base-Tx GbE compatible</td></tr>
<tr><td>LED Indicator</td><td>
<table>
<tr><td colspan="4">Max. 2.5G LAN Port</td></tr>
<tr><td colspan="2">ACT/LINK</td><td>SPEED</td><td></td></tr>
<tr><td></td><td>Definition</td><td>LED</td><td>Definition</td></tr>
<tr><td>Light Off</td><td>No Link</td><td>Solid Orange</td><td>2.5G</td></tr>
<tr><td>Solid Yellow</td><td>Connection</td><td>Solid Green</td><td>1G/100M</td></tr>
<tr><td>Yellow Flashing</td><td>Activity</td><td>Light Off</td><td>10M</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Mechanical & Environmental Specification</td></tr>
<tr><td>Operating Temp.</td><td>0°C ~ 60°C (32°F ~ 140°F) with 0.5m/s air flow</td></tr>
<tr><td>Storage Temp.</td><td>-20°C ~ 75°C (-4°F ~ 167°F)</td></tr>
<tr><td>Operating Humidity</td><td>40°C @ 95% Relative Humidity, Non-condensing</td></tr>
<tr><td>Size (L x W)
(Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)</td><td>160 x 120mm (COM-HPC Client size C)</td></tr>
</table>

Weight	317g (with CPU)
Vibration Test	Package Vibration Test Reference IEC60068-2-64 Testing procedures Test Fh: Vibration broadband random Test 1. PSD: 0.026G²/Hz, 2.16 Grms 2. Non-operation mode 3. Test Frequency: 5-500Hz 4. Test Axis: X,Y and Z axis 5. 30 min. per each axis 6. IEC 60068-2-64 Test:Fh Random Vibration Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00454G²/Hz, 1.5 Grms 2. Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh Random Vibration Non Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.01818G²/Hz, 3.0 Grms 2. Non Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh
Drop Test	Packing Drop Reference ISTA 2A, Method: IEC-60068-2-32 Test: Ed Drop Test 1 One corner, three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
OS Information	• Windows 11 LTSC • Linux

Note: Specifications are subject to change without notice.

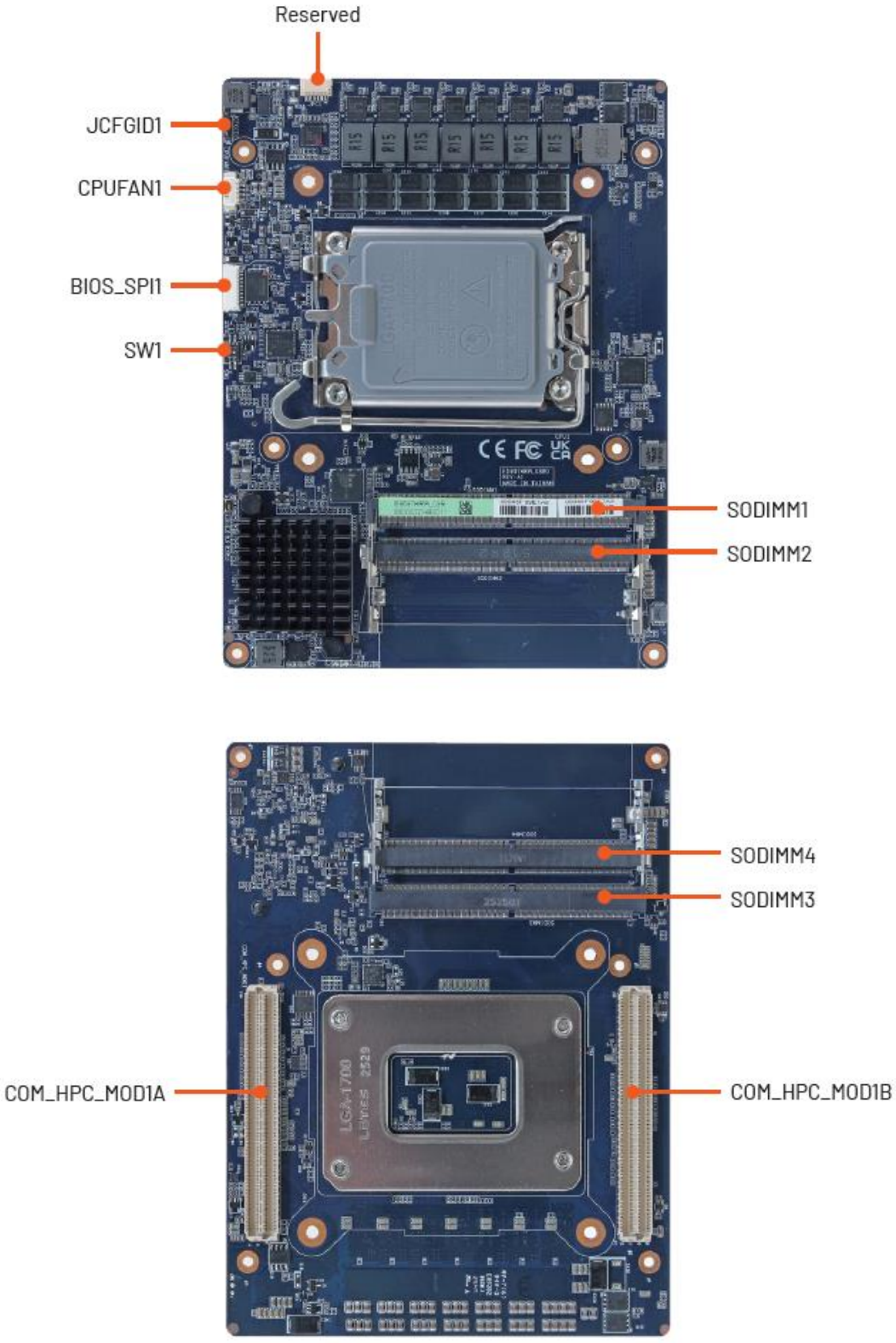
1.5 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of ESM-HRPL.

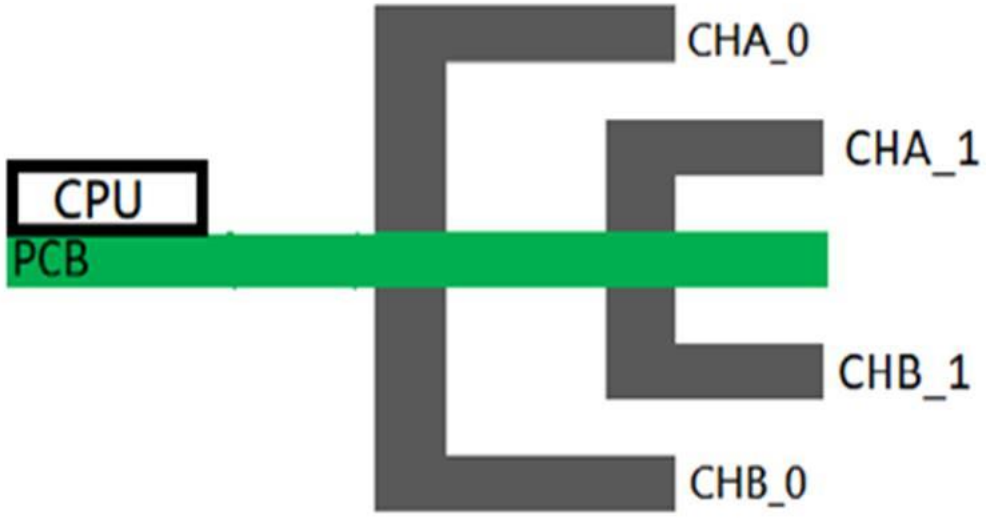


2. Hardware Configuration

2.1 Product Overview



2.2 Memory Configuration



BIOS frequency is locked at 3600MHz	CHA_0	CHA_1	CHB_0	CHB_1	Boot-Up Result
1 Memory		O			PASS
1 Memory				O	PASS

BIOS frequency is locked at 3600MHz	CHA_0	CHA_1	CHB_0	CHB_1	Boot-Up Result
2 Memory	O	O			PASS
2 Memory		O		O	PASS
2 Memory			O	O	PASS

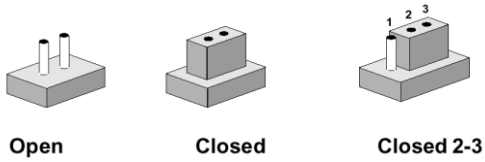
BIOS frequency is locked at 3600MHz	CHA_0	CHA_1	CHB_0	CHB_1	Boot-Up Result
3 Memory	O	O		O	PASS
3 Memory		O	O	O	PASS
3 Memory		O	O	O	PASS

BIOS frequency is locked at 3600MHz	CHA_0	CHA_1	CHB_0	CHB_1	Boot-Up Result
4 Memory	O	O	O	O	PASS

2.3 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

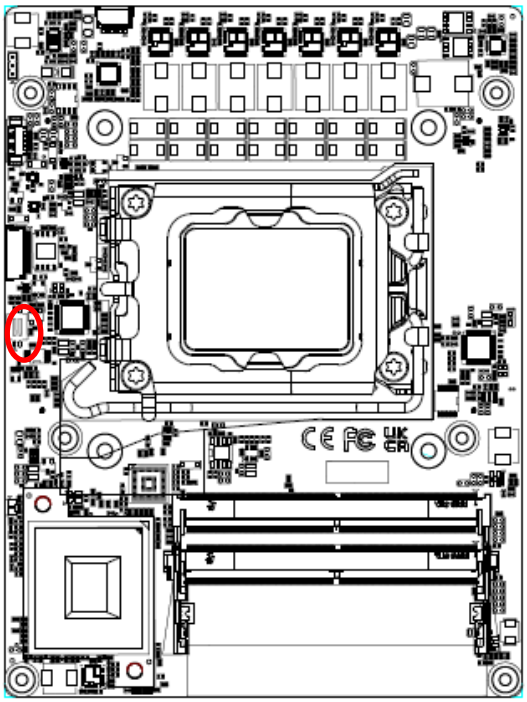
Label	Function	Note
SW1	AT/ATX mode selector	
JCFGID1	CPU TDP (Watts)	3 x 1 header, pitch 2.00mm

Connectors

Label	Function	Note
BIOS_SPI1	BIOS SPI programming connector	10 x 1 wafer, pitch 1.00mm
CPUFAN1	CPU Fan connector	4 x 1 wafer, pitch 1.25mm
COM_HPC_MOD1A	COM-HPC connector 1	
COM_HPC_MOD1B	COM-HPC connector 2	
SODIMM1/2/3/4	4 x 262-pin DDR5 SDRAM DIMM socket	

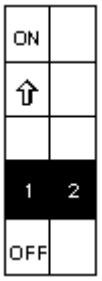
2.4 Setting Jumpers & Connectors

2.4.1 AT/ATX mode selector (SW1)

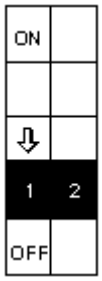


AT/ATX mode

AT mode*



ATX mode

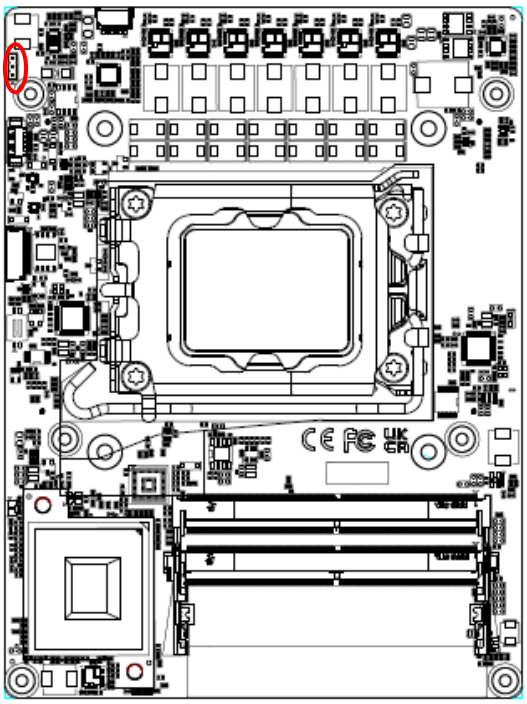


*Default

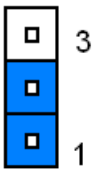
2.4.1.1 Signal Description –AT/ATX mode selection

AT/ATX mode	Description
AT mode on  12	Auto-power on, no need to press Power button to enable power on/off
ATX mode on  12	Press the power button to enable power on/off

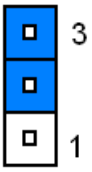
2.4.2 CPU TDP (Watts) (JCFGID1)



Config ID0*

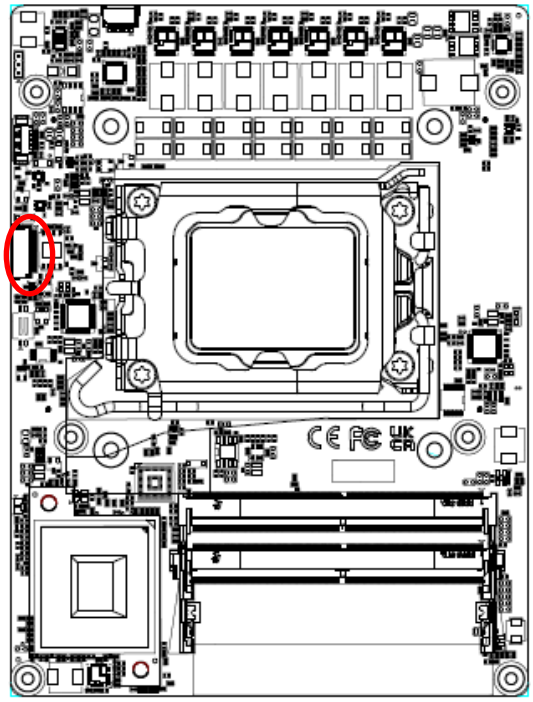


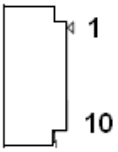
Config ID1



*** Default**

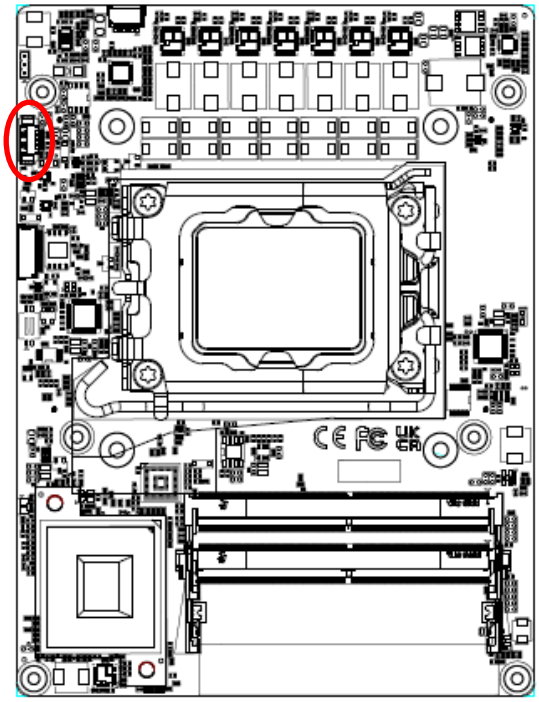
2.4.3 BIOS SPI programming connector (BIOS_SPI1)





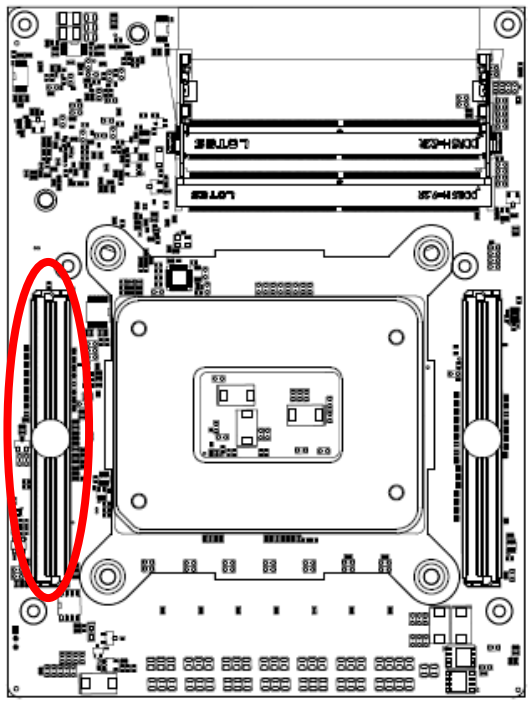
Signal	PIN
EC_SMDAT_DEBUG	1
EC_SMCLK_DEBUG	2
SPI_WP#	3
SPI_HOLD#	4
SPI0_BIOS_MOSI	5
SPI0_BIOS_MISO	6
SPI0_BIOS_CLK	7
ROM_CS#	8
GND	9
+3.3VSB	10

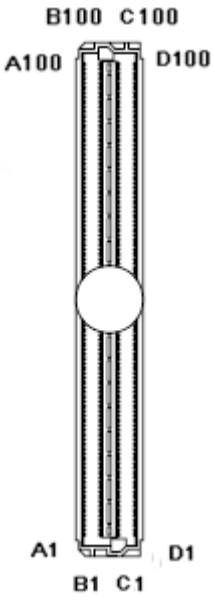
2.4.4 CPU Fan connector (CPUFAN1)



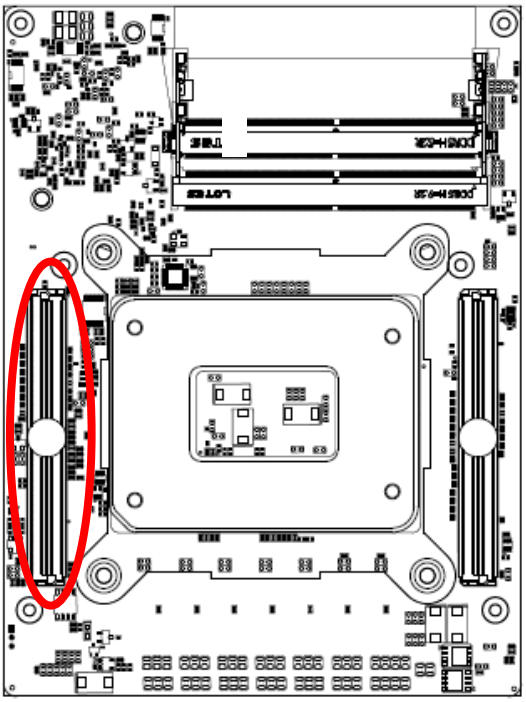
Signal	PIN
GND	1
+VIN_12V	2
CPUFANIN	3
CPUFANOUT	4

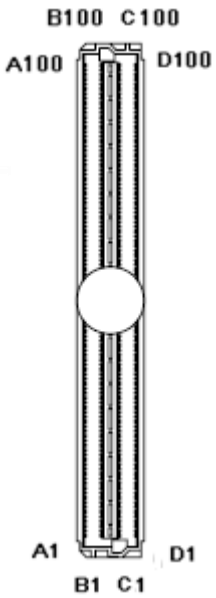
2.4.5 COM-HPC Connector 1 (COM_HPC_MOD1A)



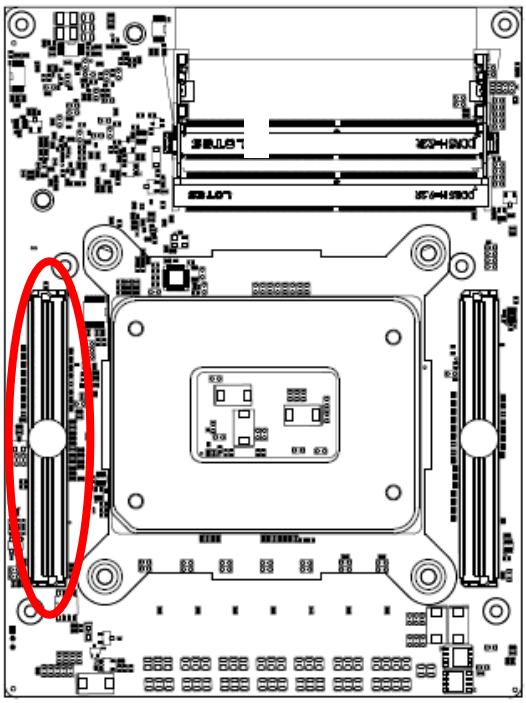


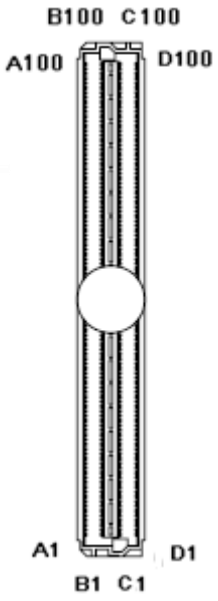
Signal	PIN	PIN	Signal
TYPE0	A100	B100	GPSPI_ALERT#
GPIO_11	A99	B99	GPSPI_CLK
GPIO_10	A98	B98	NC
GPIO_09	A97	B97	NC
GPIO_08	A96	B96	NC
GPIO_07	A95	B95	GPSPI_CS0#
GPIO_06	A94	B94	GPSPI_MISO
GPIO_05	A93	B93	GPSPI_MOSI
GPIO_04	A92	B92	NC
GPIO_03	A91	B91	NC
GPIO_02	A90	B90	UART1_CTS#
GPIO_01	A89	B89	UART1_RTS#
GPIO_00	A88	B88	UART1_RX
SUS_CLK	A87	B87	UART1_TX
VCC_RTC	A86	B86	RSMRST_OUT#
GND	A85	B85	NC
PCIe15_TX+	A84	B84	GND
PCIe15_TX-	A83	B83	PCIe15_RX+
GND	A82	B82	PCIe15_RX-
PCIe14_TX+	A81	B81	GND



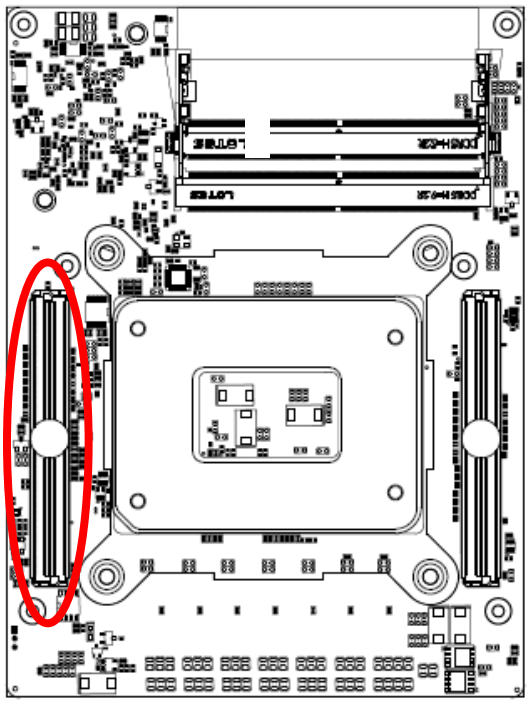


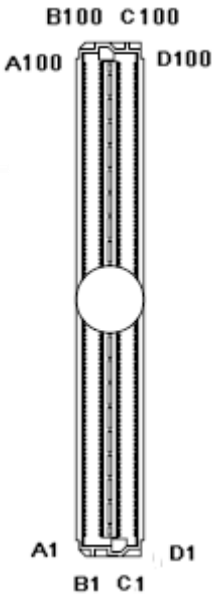
Signal	PIN	PIN	Signal
PCIe14_TX-	A80	B80	PCIe14_RX+
GND	A79	B79	PCIe14_RX-
PCIe13_TX+	A78	B78	GND
PCIe13_TX-	A77	B77	PCIe13_RX+
GND	A76	B76	PCIe13_RX-
PCIe12_TX+	A75	B75	GND
PCIe12_TX-	A74	B74	PCIe12_RX+
GND	A73	B73	PCIe12_RX-
PCIe11_TX+	A72	B72	GND
PCIe11_TX-	A71	B71	PCIe11_RX+
GND	A70	B70	PCIe11_RX-
PCIe10_TX+	A69	B69	GND
PCIe10_TX-	A68	B68	PCIe10_RX+
GND	A67	B67	PCIe10_RX-
PCIe09_TX+	A66	B66	GND
PCIe09_TX-	A65	B65	PCIe09_RX+
GND	A64	B64	PCIe09_RX-
PCIe08_TX+	A63	B63	GND
PCIe08_TX-	A62	B62	PCIe08_RX+
GND	A61	B61	PCIe08_RX-
PCIe_BMC_TX+	A60	B60	GND
PCIe_BMC_TX-	A59	B59	PCIe_BMC_RX+
GND	A58	B58	PCIe_BMC_RX-
PCIe_CLKREQ0_HI#	A57	B57	GND
PCIe_CLKREQ0_LO#	A56	B56	eSPI_RST#
GND	A55	B55	eSPI_CS1#
eSPI_CLK	A54	B54	eSPI_CS0#
eSPI_IO3	A53	B53	eSPI_ALERT1#
eSPI_IO2	A52	B52	eSPI_ALERT0#
eSPI_IO1	A51	B51	BSEL2



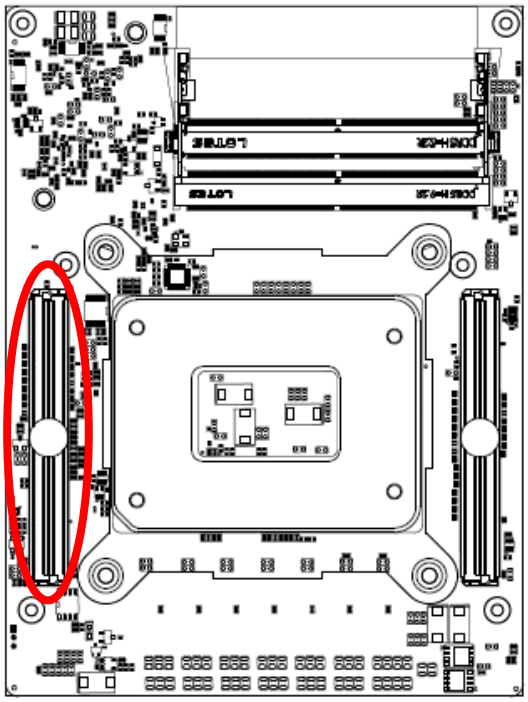


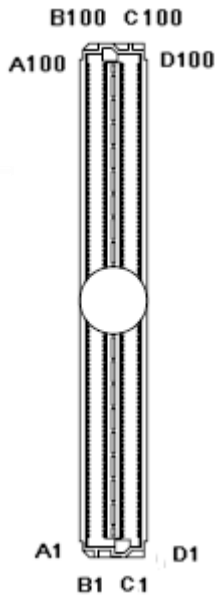
Signal	PIN	PIN	Signal
eSPI_IO0	A50	B50	BSEL1
GND	A49	B49	BSEL0
eDP_TX3+	A48	B48	BOOT_SPI_CS#
eDP_TX3-	A47	B47	VCC_BOOT_SPI
GND	A46	B46	SLEEP#
eDP_TX2+	A45	B45	LID#
eDP_TX2-	A44	B44	NC
GND	A43	B43	NC
eDP_TX1+	A42	B42	GND
eDP_TX1-	A41	B41	NC
GND	A40	B40	NC
eDP_TX0+	A39	B39	NC
eDP_TX0-	A38	B38	NC
GND	A37	B37	USB_RT_ENA
eDP_AUX+	A36	B36	USB_PD_I2C_DAT
eDP_AUX-	A35	B35	USB_PD_I2C_CLK
GND	A34	B34	USB_PD_ALERT#
DDI1_PAIR3+	A33	B33	SML0_DAT
DDI1_PAIR3-	A32	B32	SML0_CLK
GND	A31	B31	PMCALERT#
DDI1_PAIR2+	A30	B30	SML1_DAT
DDI1_PAIR2-	A29	B29	SML1_CLK
GND	A28	B28	USB01_OC
DDI1_PAIR1+	A27	B27	USB23_OC
DDI1_PAIR1-	A26	B26	USB45_OC
GND	A25	B25	USB67_OC
DDI1_PAIR0+	A24	B24	VCC_5V_SBY
DDI1_PAIR0-	A23	B23	HDA_BCLK
GND	A22	B22	HDA_SDI
DDI1_SCL_AUX+	A21	B21	HDA_RST#



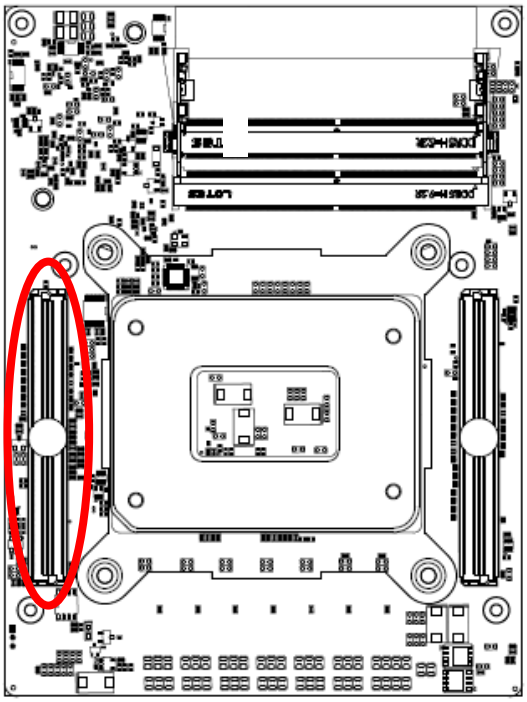


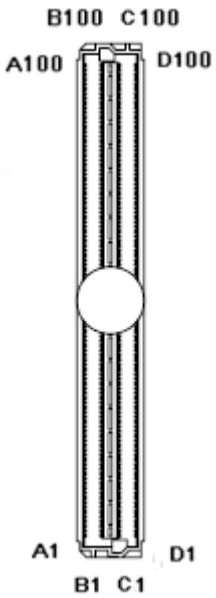
Signal	PIN	PIN	Signal
DDI1_SDA_AUX-	A20	B20	HDA_SDO
GND	A19	B19	HDA_SYNC
USB6+	A18	B18	GND
USB6-	A17	B17	USB4+
GND	A16	B16	USB4-
USB7+	A15	B15	GND
USB7-	A14	B14	USB5+
GND	A13	B13	USB5-
PLTRST#	A12	B12	GND
BATLOW#	A11	B11	WD_OUT
GND	A10	B10	WD_STROBE#
VCC	A9	B9	VCC
VCC	A8	B8	SUS_S3#
VCC	A7	B7	VCC
VCC	A6	B6	TAMPER#
VCC	A5	B5	VCC
VCC	A4	B4	THERMTRIP#
VCC	A3	B3	VCC
VCC	A2	B2	PWRBTN#
VCC	A1	B1	VCC



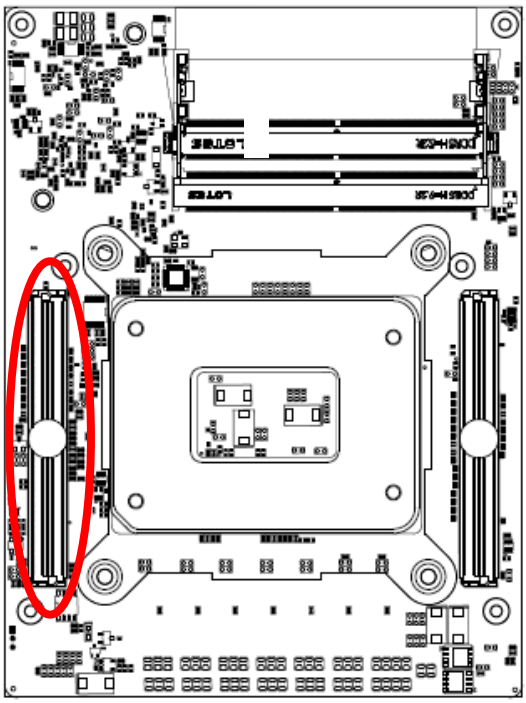


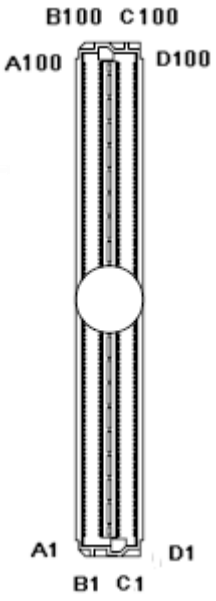
Signal	PIN	PIN	Signal
TYPE1	C100	D100	TYPE2
NBASET0_CTREF	C99	D99	NBASET0_LINK_ACT#
NBASET0_SDP	C98	D98	NBASET0_LINK_MID#
I2C1_DAT	C97	D97	NBASET0_LINK_MAX#
I2C1_CLK	C96	D96	GND
I2C0_ALERT#	C95	D95	NBASET0_MDI3+
I2C0_DAT	C94	D94	NBASET0_MDI3-
I2C0_CLK	C93	D93	GND
UART0_CTS#	C92	D92	NBASET0_MDI2+
UART0_RTS#	C91	D91	NBASET0_MDI2-
UART0_RX	C90	D90	GND
UART0_TX	C89	D89	NBASET0_MDI1+
SMB_ALERT#	C88	D88	NBASET0_MDI1-
SMB_DAT	C87	D87	GND
SMB_CLK	C86	D86	NBASET0_MDI0+
GND	C85	D85	NBASET0_MDI0-
PCIe07_RX+	C84	D84	GND
PCIe07_RX-	C83	D83	PCIe07_TX+
GND	C82	D82	PCIe07_TX-
PCIe06_RX+	C81	D81	GND



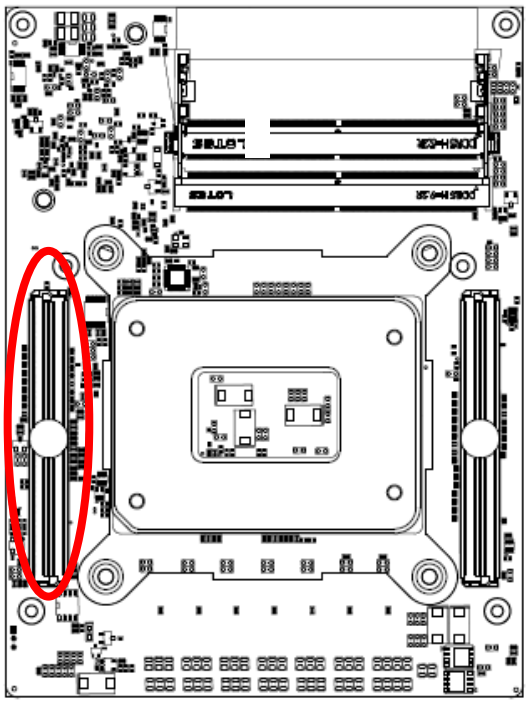


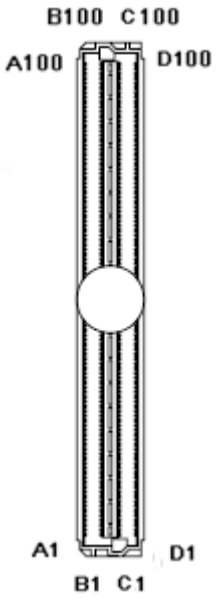
Signal	PIN	PIN	Signal
PCIe06_RX-	C80	D80	PCIe06_TX+
GND	C79	D79	PCIe06_TX-
PCIe05_RX+	C78	D78	GND
PCIe05_RX-	C77	D77	PCIe05_TX+
GND	C76	D76	PCIe05_TX-
PCIe04_RX+	C75	D75	GND
PCIe04_RX-	C74	D74	PCIe04_TX+
GND	C73	D73	PCIe04_TX-
PCIe03_RX+	C72	D72	GND
PCIe03_RX-	C71	D71	PCIe03_TX+
GND	C70	D70	PCIe03_TX-
PCIe02_RX+	C69	D69	GND
PCIe03_RX-	C68	D68	PCIe02_TX+
GND	C67	D67	PCIe02_TX-
PCIe01_RX+	C66	D66	GND
PCIe01_RX-	C65	D65	PCIe01_TX+
GND	C64	D64	PCIe01_TX-
PCIe00_RX+	C63	D63	GND
PCIe00_RX-	C62	D62	PCIe00_TX+
GND	C61	D61	PCIe00_TX-
PCIe_REFCLK0_LO+	C60	D60	GND
PCIe_REFCLK0_LO-	C59	D59	SATA1_TX+
GND	C58	D58	SATA1_TX-
PCIe_REFCLK0_HI+	C57	D57	GND
PCIe_REFCLK0_HI-	C56	D56	SATA1_RX+
GND	C55	D55	SATA1_RX-
BOOT_SPI_CLK	C54	D54	GND
BOOT_SPI_IO3	C53	D53	SATA0_TX+
BOOT_SPI_IO2	C52	D52	SATA0_TX-
BOOT_SPI_IO1	C51	D51	GND





Signal	PIN	PIN	Signal
BOOT_SPI_IO0	C50	D50	SATA0_RX+
GND	C49	D49	SATA0_RX-
USB0_SSRX1+	C48	D48	GND
USB0_SSRX1-	C47	D47	USB0_SSTX1+
GND	C46	D46	USB0_SSTX1-
USB0_SSRX0+	C45	D45	GND
USB0_SSRX0-	C44	D44	USB0_SSTX0+
GND	C43	D43	USB0_SSTX0-
USB1_SSRX1+	C42	D42	GND
USB1_SSRX1-	C41	D41	USB1_SSTX1+
GND	C40	D40	USB1_SSTX1-
USB1_SSRX0+	C39	D39	GND
USB1_SSRX0-	C38	D38	USB1_SSTX0+
GND	C37	D37	USB1_SSTX0-
NC	C36	D36	GND
NC	C35	D35	RSVD
GND	C34	D34	AC_PRESENT
eDP_BKLTCTL	C33	D33	GND
eDP_BKLT_EN	C32	D32	DDI0_PAIR3+
eDP_VDD_EN	C31	D31	DDI0_PAIR3-
eDP_HPD	C30	D30	GND
DDI1_HPD	C29	D29	DDI0_PAIR2+
DDI0_HPD	C28	D28	DDI0_PAIR2-
DDI1_DDC_AUX_SEL	C27	D27	GND
DDI0_DDC_AUX_SEL	C26	D26	DDI0_PAIR1+
GND	C25	D25	DDI0_PAIR1-
SNDW_DMIC_DAT0	C24	D24	GND
SNDW_DMIC_CLK0	C23	D23	DDI0_PAIR0+
GND	C22	D22	DDI0_PAIR0-
SNDW_DMIC_DAT1	C21	D21	GND





Signal	PIN	PIN	Signal
SNDW_DMIC_CLK1	C20	D20	DDI0_SCL_AUX+
GND	C19	D19	DDI0_SDA_AUX-
USB2+	C18	D18	GND
USB2-	C17	D17	USB0+
GND	C16	D16	USB0-
USB3+	C15	D15	GND
USB3-	C14	D14	USB1+
GND	C13	D13	USB1-
FAN_TACHIN	C12	D12	GND
FAN_PWMOUT	C11	D11	WAKE1#
GND	C10	D10	WAKE0#
VCC	C9	D9	VCC
SUS_S4_S5#	C8	D8	VCC
VCC	C7	D7	VCC
VIN_PWR_OK	C6	D6	VCC
VCC	C5	D5	VCC
CARRIER_HOT#	C4	D4	VCC
VCC	C3	D3	VCC
RSTBTN#	C2	D2	VCC
VCC	C1	D1	VCC

2.4.5.1 Signal Description – COM-HPC Connector 1 (COM_HPC_MOD1A)

2.4.5.1.1 DDI Signals

Signal	Signal Description
DDI[0:1]_PAIR[0:3]+ DDI[0:1]_PAIR[0:3]-	DDI 0 to 2 Pair[0:3] differential pairs
DDI[0:1]_SDA_AUX-	DP AUX- function if DDI[0:2]_DDC_AUX_SEL is no connect HDMI/DVI I2C data if DDI[0:2]_DDC_AUX_SEL is pulled high
DDI[0:1]_SCL_AUX+	DP AUX+ function if DDI[0:2]_DDC_AUX_SEL is a no connect or driven to GND on the Carrier. HDMI/DVI I2C clock if DDI[0:2]_DDC_AUX_SEL is pulled or driven high on the Carrier.
DDI[0:1]_DDC_AUX_SEL	Selects the function of DDI[0:2]_SCL_AUX+ and DDI[0:2]_SDA_AUX-. This pin shall have a 1M pull-down to logic ground on the Module. If this input is unconnected on the Carrier, the AUX pair is used for the DP AUX+/- signals. If pulled or driven high on the Carrier, the AUX pair contains the HDMI[0:2] I2C CRTL_CLK and CTRL_DAT signals.
DDI[0:1]_HPD	DDI Hot-Plug Detect

2.4.5.1.2 eDP Signals

Signal	Signal Description
eDP_TX0+ eDP_TX0-	eDP / DSI differential data pairs
eDP_TX1+ eDP_TX1-	eDP / DSI differential data pairs
eDP_TX2+ eDP_TX2-	eDP differential data pairs or DSI differential clock pairs
eDP_TX3+ eDP_TX3-	eDP / DSI differential data pairs
eDP_AUX+ eDP_AUX-	eDP AUX channel differential pair or DSI differential data pair
eDP_VDD_EN	eDP / DSI power enable
eDP_BKLT_EN	eDP / DSI backlight enable
eDP_BKLT_CTRL	EDP / DSI backlight brightness control
eDP_HPD	eDP: Detection of Hot Plug / Unplug and notification of the link layer DSI: Tearing Effect Input: this is an optional signal from the DSI display (that has it's own display controller and frame buffer) coordinating with the host display controller

2.4.5.1.3 I2S/Soundwire/HD Audio Signals (HDA is default support.)

Signal	Signal Description
I2S_CLK/SNDW_CLK2/HDA_BCLK	I2S Clock Alternative use as Soundwire 2 clock or HDA serial data clock
I2S_DIN/SNDW_DAT2/HDA_SDI	I2S Data In This pin is an input in I2S mode Alternative use as bi-directional Soundwire 2 data lane or HDA serial TDM data input
I2S_DOUT/SNDW_DAT3/HDA_SDO	I2S Data Out This pin is an output in I2S mode Alternative use as bi-directional Soundwire 3 data lane or HDA serial TDM data output
I2S_LRCLK/SNDW_CLK3/HDA_SYNC	I2S L/R Clock Alternative use as Soundwire 3 clock or HDA sample synchronization signal
I2S_MCLK/HDA_RST#	I2S Master Clock Alternative use as HDA reset output

2.4.5.1.4 Soundwrie/DMIC Audio Signals

Signal	Signal Description
SNDW_DMIC_DAT[0:1]	Bi-directional PCM audio data
SNDW_DMIC_CLK[0:1]	Clock for Soundwire transactions

2.4.5.1.5 PCI Express Signals

Signal	Signal Description
PCIe[00:15]_TX+/-	PCI Express Differential Transmit Pairs 0-15 PCIe Group 0 Low and Group 0 High
PCIe[00:15]_RX+/-	PCI Express Differential Receive Pairs 0-15 PCIe Group 0 Low and Group 0 High
PCIe_BMC_TX+ PCIe_BMC_TX-	PCI Express Differential Transmit Pair for Carrier BMC (Board Management Controller); part of PCIe Group 0
PCIe_BMC_RX+ PCIe_BMC_RX-	PCI Express Differential Receive Pairs for Carrier BMC (Board Management Controller); part of PCIe Group 0
PCIe_CLKREQ0_LO#	PCIe reference clock request signals from Carrier devices for PCIe_REFCLK0_LO clock pair
PCIe_CLKREQ0_HI#	PCIe reference clock request signals from Carrier devices for PCIe_REFCLK0_HI clock pair
PCIe_REFCLK0_LO- PCIe_REFCLK0_LO+	Reference clock pair for PCIe lanes [0:7], also referred to PCIe Group 0 Low and for the PCIe_BMC link

PCIe_REFCLK0_HI- PCIe_REFCLK0_HI+	Reference clock pair for PCIe lanes [8:15], also referred to PCIe Group 0 High

2.4.5.1.6 USB Signals

Signal	Signal Description
USB[0:7] +/-	USB 2.0 differential pairs, channels 0 through 7. USB0 may be configured as a USB client or as a host, or both at the Module designer's discretion. All other USB ports, if implemented, shall be host ports. If any SuperSpeed ports are implemented, then they must be supported by a USB 2.0 port, using one of the USB[0:3] ports from this pool.
USB01_OC# USB23_OC# USB45_OC# USB67_OC#	USB over-current sense, USB channels 0,1; channels 2,3; channels 4,5 and channels 6,7 respectively. A pull-up for each of these lines to the 3.3V Suspend rail shall be present on the Module. The pull-up should be 10K. An open drain driver from USB current monitors on the Carrier Board may drive this line low. The Carrier Board shall not pull these lines up. Note that the over-current limits for USB 2.0 and USB 3.0 are different; this is a Carrier board implementation item.
RSMRST_OUT#	USB devices that are to be powered in the S5 / S4 / S3 Suspend states should not have their 5V VBUS power enabled before RSMRST_OUT# transitions to the hi state. RSMRST_OUT# is also described in Power and System Management section.
USB[0:1]_SSTX[0:1]+ USB[0:1]_SSTX[0:1]-	Four sets of SuperSpeed transmit pairs, used to realize the transmit side of two USB 3.2 Gen 2x2 ports. Alternatively, USB 3.2 Gen 1 or Gen 2 ports (single TX pair, single RX pair per port) may be implemented using a portion of this interface. These ports shall be used in conjunction with the corresponding USB 2.0 port pair (e.g. USB0_SSxxx+/- shall be used with the USB0 USB 2.0 pair and so on, USB1_SSxxx+/- with the USB1 USB 2.0 pair).
USB[0:1]_SSRX[0:1]+ USB[0:1]_SSRX[0:1]-	Four sets of SuperSpeed receive pairs, used to realize the transmit side of two USB 3.2 Gen 2x2 ports. Alternatively, USB 3.2 Gen 1 or Gen 2 ports (single TX pair, single RX pair per port) may be implemented using a portion of this interface. These ports shall be used in conjunction with the corresponding USB 2.0 port pair (e.g. USB0_SSxxx+/- shall be used with the USB0 USB 2.0 pair and so on, USB1_SSxxx+/- with the USB1 USB 2.0 pair).

2.4.5.1.7 USB_PD_I2C Signals

Signal	Signal Description
USB_PD_I2C_DAT	I2C data line between Module based Embedded Controller master and Carrier based USB Power Delivery Controller slave.
USB_PD_I2C_CLK	I2C clock line between Module based Embedded Controller master and Carrier based USB Power Delivery Controller slave.

2.4.5.1.8 Asynchronous Serial Port Signals

Signal	Signal Description
UART[0:1]_TX	Logic level asynchronous serial port transmit signal
UART[0:1]_RX	Logic level asynchronous serial port receive signal
UART[0:1]_RTS#	Logic level asynchronous serial port Request to Send signal, active low
UART[0:1]_CTS#	Logic level asynchronous serial port Clear to Send input, active low

2.4.5.1.9 General Purpose SPI Signals

Signal	Signal Description
GP_SPI_MISO	Serial data into the COM-HPC Module from the Carrier GP_SPI device ("Master In Slave Out")
GP_SPI_MOSI	Serial data from the COM-HPC Module to the Carrier GP_SPI device ("Master Out Slave In")
GP_SPI_CLK	Clock from the Module to Carrier GP_SPI device
GP_SPI_CS[0:3]#	GP_SPI chip selects, active low
GP_SPI_ALERT#	Alert (interrupt) from a Carrier GP_SPI device to the Module

2.4.5.1.10 General Purpose Input Outputs Signals

Signal	Signal Description
GPIO_[00:11]	General-purpose input / output pins. Upon a hardware reset, these pins should be configured as inputs. As inputs, these pins should be able to generate an interrupt to the Module host.

2.4.5.1.11 Thermal Protection Signals

Signal	Signal Description
THERMTRIP#	Active low output indicating that the CPU has entered thermal shutdown.
CARRIER_HOT#	Input from off-Module temp sensor indicating an over-temp situation.

2.4.5.1.12 eSPI Signals

Signal	Signal Description
eSPI_IO[0:3]	eSPI Master Data Input / Outputs. These are bi directional input/output pins used to transfer data between master and slaves.
eSPI_CS[0:1]#	eSPI Master Chip Select Outputs. A low selects a particular eSPI slave for the transaction. Each of the eSPI slaves is connected to a dedicated Chip Select pin. If an eSPI_CSx# pins is not in use, it shall be either pulled high or actively driven high.
eSPI_CLK	eSPI Master Clock Output. This pin provides the reference timing for all the serial input and output operations.
eSPI_ALERT[0:1]#	eSPI pins used by eSPI slave to request service from the eSPI master.
ESPI_RST#	eSPI Reset - resets the eSPI interface for both master and slaves. eSPI_RST# is typically driven from the eSPI master to eSPI slaves.

2.4.5.1.13 Boot SPI Signals

Signal	Signal Description
BOOT_SPI_CS#	Chip select for Carrier Board SPI. See Table 20 "BIOS Select Options: Module eSPI and SPI Chip Select Routing" for implementation details. If the BOOT_SPI_CS# pin is not in use, it shall be either pulled high or actively driven high.
VCC_BOOT_SPI	Power supply for Carrier Board SPI – sourced from Module – nominally either 1.8V or 3.3V. The Module shall provide a minimum of 100mA on VCC_BOOT_SPI. Carriers shall use less than 100mA from this power source. VCC_BOOT_SPI shall only be used to power SPI devices on the Carrier Board. The Module vendor may choose what power domains the BOOT_SPI is active in.
BSEL2 BSEL1 BSEL0	Boot Select pins. These pins distinguish between a SPI or eSPI BIOS boot and between an on—Module or off-Module BIOS. Details are in Table 20: BIOS Select Options: Module eSPI and SPI Chip Select Routing. Pulled up on Module to vendor specific power rail
BOOT_SPI_IO[0:3]	Bidirectional 4 bit data path out of and into a Carrier SPI flash operating in Serial Quad Interface (SQI) mode. If the flash memory device is operating in traditional Serial Peripheral Interface (SPI) mode, then signal BOOT_SPI_IO0 is used for getting serial data into the flash device (referred to as SI or MOSI in SPI Flash data sheets) and signal BOOT_SPI_IO1 is used to get serial data from the flash device (referred to as SO or MISO in flash data sheets)
BOOT_SPI_CLK	Clock from Module chipset to Carrier SPI

2.4.5.1.14 Power & System Management

Signal	Signal Description
PWRBTN#	A falling edge creates a power button event. Power button events can be used to bring a system out of S5 soft off and other suspend states, as well as powering the system down.
PLTRST#	Platform Reset: output from Module to Carrier Board. Active low. Issued by Module chipset and may result from a low RSTBTN# input, a low VIN_PWR_OK input, a VCC power input that falls below the minimum specification, a watchdog timeout, or may be initiated by the Module software.
SUS_S3#	Indicates system is in Suspend to RAM state. Active low output. An inverted copy of SUS_S3# on the Carrier Board should be used to enable the non-standby power on a typical ATX supply.
SUS_CLK	32.768 kHz +/- 100 ppm clock used by Carrier peripherals such as M.2 cards in their low power modes.
BATLOW#	Indicates that external battery is low. This port provides a battery-low signal to the Module for orderly transitioning to power saving or power cut-off ACPI modes.
TAMPER#	Tamper or Intrusion detection line on VCC_RTC power well. Carrier hardware pulls this low on a Tamper event.
RSMRST_OUT#	This is a buffered copy of the internal Module RSMRST# (Resume Reset, active low) signal. The internal Module RSMRST# signal is an input to the chipset or SOC and when it transitions from low to high it indicates that the suspend well power rails are stable. USB devices on the Carrier that are to be active in S5 / S3 / S0 should not have their 5V supply applied before RSMRST_OUT# goes high. RSMRST_OUT# shall be a 3.3V CMOS Module output, active in all power states.
RSTBTN#	Reset button input. Active low request for Module to reset and reboot. May be falling edge sensitive. For situations when RSTBTN# is not able to reestablish control of the system, VIN_PWR_OK or a power cycle may be used.
VIN_PWR_OK	Power OK from main power supply. A high value indicates that the power is good.
SUS_S4_S5#	Indicates system is in Suspend to Disk (S4) or Soft Off (S5) state. Active low output.
WAKE0#	PCI Express wake up signal.
WAKE1#	General purpose wake up signal. May be used to implement wake-up on PS2 keyboard or mouse activity.

2.4.5.1.15 Module Type Definition

<table>
<tr><th>Signal</th><th>Signal Description</th></tr>
<tr><td>TYPE[0:2]</td><td>The TYPE pins indicate to the Carrier Board the Pin-out Type that is implemented on the Module. The pins are tied on the Module to either ground (GND) or are no-connects (NC). These pins shall be pulled up on the Carrier, to Carrier standby voltage rail of 5V or less. Carrier hardware reads the level on these straps.
<table>
<tr><th></th><th colspan="3">Module Connections</th><th>Meaning</th></tr>
<tr><th>Ref</th><th>TYPE2</th><th>TYPE1</th><th>TYPE0</th><th></th></tr>
<tr><td>7</td><td>NC</td><td>NC</td><td>NC</td><td>Mini Module – Wide Range 8V to 20V input</td></tr>
<tr><td>6</td><td>NC</td><td>NC</td><td>GND</td><td>Reserved</td></tr>
<tr><td>5</td><td>NC</td><td>GND</td><td>NC</td><td>Reserved</td></tr>
<tr><td>4</td><td>NC</td><td>GND</td><td>GND</td><td>Server Module – Fixed 12V input</td></tr>
<tr><td>3</td><td>GND</td><td>NC</td><td>NC</td><td>Reserved</td></tr>
<tr><td>2</td><td>GND</td><td>NC</td><td>GND</td><td>Reserved</td></tr>
<tr><td>1</td><td>GND</td><td>GND</td><td>NC</td><td>Client Module - Wide Range 8V to 20V input</td></tr>
<tr><td>0</td><td>GND</td><td>GND</td><td>GND</td><td>Client Module – Fixed 12V input</td></tr>
</table>
The Module shall implement all three TYPE[x] pins per the table above.

The Carrier Board should implement combinatorial logic that monitors the Module TYPE pins and keeps power off (e.g deactivates the ATX PS_ON# signal to an ATX power supply or otherwise deactivates VCC to the COM-HPC Module) if an incompatible Module pin-out type is detected. All three TYPE[x] pins should be monitored by the Carrier. The Carrier Board logic may also implement a fault indicator such as an LED.</td></tr>
</table>

2.4.5.1.16 Power and Ground

Signal	Signal Description
VCC	Primary power input: fixed +12V on the Client Type 0; wide range +8V to +20V on the Client Type 1; fixed +12V on the Server. All available VCC pins on the connector shall be used.
VCC_RTC	Real-time clock circuit-power input. Nominally +3.0V. Refer to Section 8 "Module Input Power Specifications" for details.
GND	Ground - DC power and signal and AC signal return path. All available GND connector pins shall be used and tied to Carrier Board GND plane(s).
FAN_PWMOUT	Fan speed control for a secondary system fan. The primary fan control signals for

	CPU thermal management are on the Module, along with a vendor specific connector. Fan controls use the Pulse Width Modulation (PWM) technique to control the fan's RPM. CMOS output; Carrier designers should buffer this signal with an open drain FET and pullup or other robust Carrier device(s).
FAN_TACHIN	Fan tachometer input for a fan with a two pulse output for the secondary fan.
RSVD	Reserved pins. These may be assigned functions in future versions of this specification. Reserved pins shall not be connected to anything, and shall not be connected to each other.

2.4.5.1.17 NBASE-T_0

<table>
<tr><th>Signal</th><th>Signal Description</th></tr>
<tr><td>NBASET0_MDI[0:3]+
NBASET0_MDI[0:3]-</td><td>Ethernet Controller 1: Media Dependent Interface Differential Pairs 0,1,2,3. The MDI can operate in 10Gbps, 1Gbps, 100Mbps and 10 Mbps modes. Some pairs are unused in some modes, per the following:
<table>
<tr><th></th><th>10000B-T/1000B-T</th><th>100B-T</th><th>10B-T</th></tr>
<tr><td>MDI[0]+/-</td><td>B1_DA+/</td><td>TX+/-</td><td>TX+/-</td></tr>
<tr><td>MDI[1]+/</td><td>B1_DB+/</td><td>RX+/-</td><td>RX+/-</td></tr>
<tr><td>MDI[2]+/</td><td>B1_DC+/</td><td>X</td><td>X</td></tr>
<tr><td>MDI[3]+/</td><td>B1_DD+/</td><td>X</td><td>X</td></tr>
</table></td></tr>
<tr><td>NBASET0_LINK_ACT#</td><td>NBASE-T Ethernet Controller activity indicator, active low.
20 mA or more current sink capability at VOL of 0.4V max.
20 mA or more current source capability at VOH of 2.4V min.</td></tr>
<tr><td>NBASET0_LINK_MAX#</td><td>NBASE-T Ethernet Controller MAX Speed Link indicator, active low. If active, the link is at the maximum speed that the Ethernet controller is capable of (which may be 10G, 5G, 2.5G, etc).
20 mA or more current sink capability at VOL of 0.4V max.
20 mA or more current source capability at VOH of 2.4V min.</td></tr>
<tr><td>NBASET0_LINK_MID#</td><td>NBASE-T Ethernet Controller MID Speed Link indicator, active low. If active, the link is established but at a speed lower than what the maximum speed that the Ethernet controller is capable of.
20 mA or more current sink capability at VOL of 0.4V max.
20 mA or more current source capability at VOH of 2.4V min.</td></tr>
</table>

2.4.5.1.18 SATA Signals

Signal	Signal Description
SATA0_TX+ SATA0_TX-	Serial ATA Channel 0 transmit differential pair.
SATA0_RX+	Serial ATA Channel 0 receive differential pair.

SATA0_RX-	
SATA1_TX+ SATA1_TX-	Serial ATA Channel 1 transmit differential pair.
SATA1_RX+ SATA1_RX-	Serial ATA Channel 1 receive differential pair.

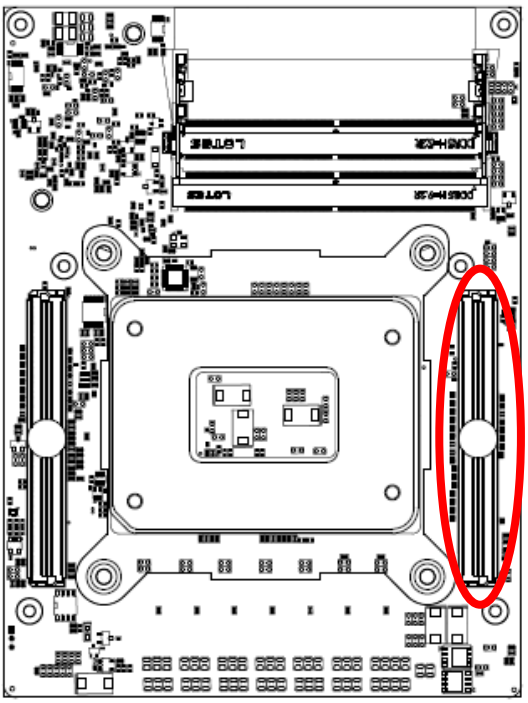
2.4.5.1.19 I2C Signals

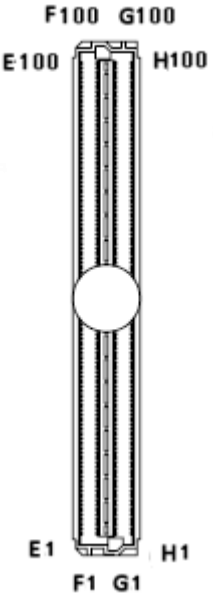
Signal	Signal Description
I2C0_CLK	Clock I/O line for the general purpose I2C0 port
I2C0_DAT	Data I/O line for the general purpose I2C0 port
I2C0_ALERT#	Alert input / interrupt for I2C0
I2C1_CLK	Clock I/O line for the general purpose I2C1 port
I2C1_DAT	Data I/O line for the general purpose I2C1 port

2.4.5.1.20 SMBus Signals

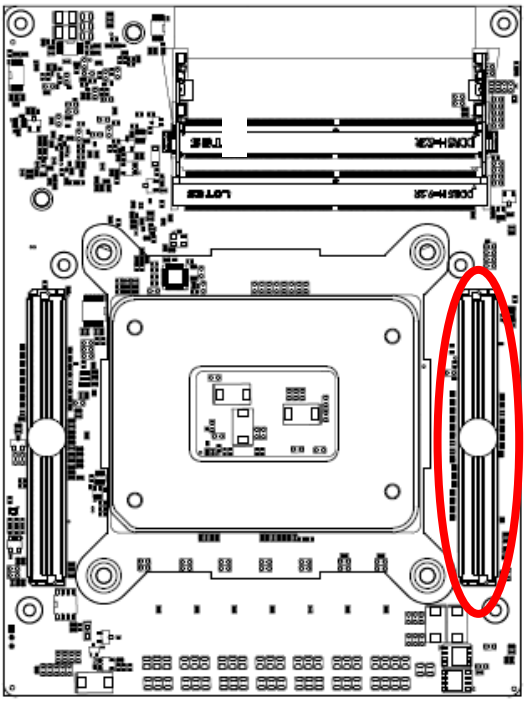
Signal	Signal Description
SMB_CLK	System Management Bus bidirectional clock line.
SMB_DAT	System Management Bus bidirectional data line.
SMB_ALERT#	System Management Bus Alert – active low input can be used to generate an SMI# (System Management Interrupt) or to wake the system.

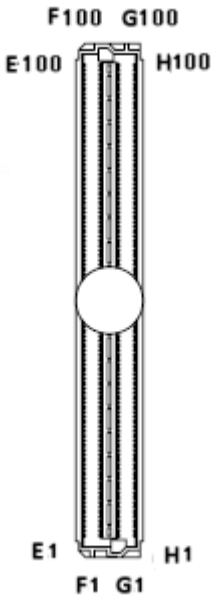
2.4.6 COM-HPC Connector 2 (COM_HPC_MOD1B)



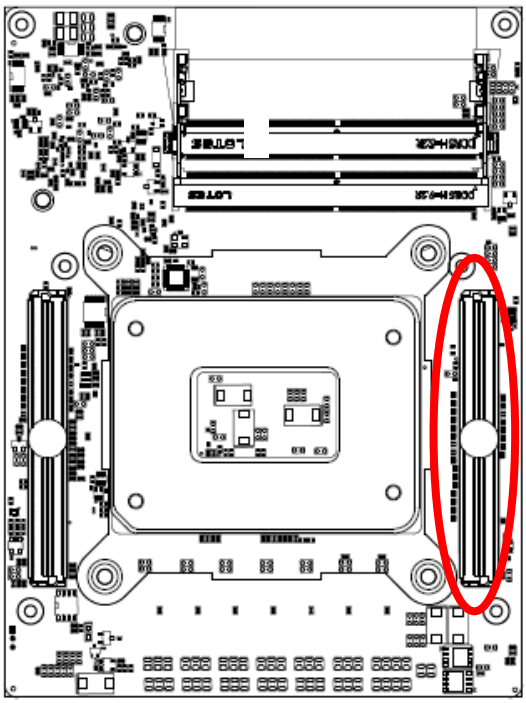


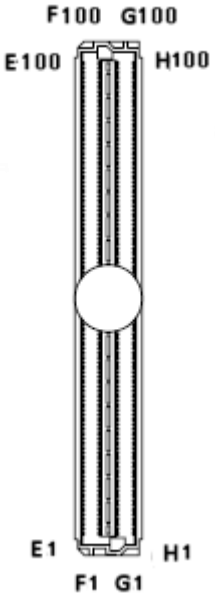
Signal	PIN	PIN	Signal
NC	E100	F100	NC
NC	E99	F99	NC
NC	E98	F98	NC
PCIe_CLKREQ2#	E97	F97	NC
PCIe_CLKREQ1#	E96	F96	NC
GND	E95	F95	NC
PCIe_REFCLK1+	E94	F94	GND
PCIe_REFCLK1-	E93	F93	PCIe_REFCLK2+
GND	E92	F92	PCIe_REFCLK2-
NC	E91	F91	GND
NC	E90	F90	NC
GND	E89	F89	NC
NC	E88	F88	GND
NC	E87	F87	NC
GND	E86	F86	NC
NC	E85	F85	GND
NC	E84	F84	NC
GND	E83	F83	NC
NBASET1_LINK_MAX#	E82	F82	GND
NBASET1_LINK_ACT#	E81	F81	NBASET1_MDI3+



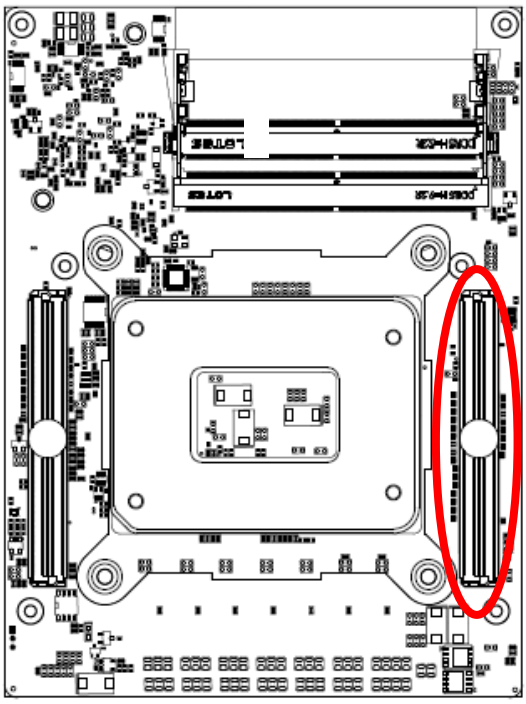


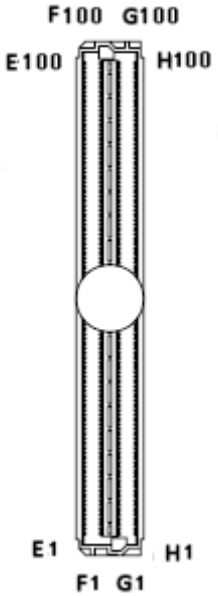
Signal	PIN	PIN	Signal
NBASET1_LINK_MID#	E80	F80	NBASET1_MDI3-
NBASET1_SDP	E79	F79	GND
NBASET1_CTREF	E78	F78	NBASET1_MDI2+
NC	E77	F77	NBASET1_MDI2-
NC	E76	F76	GND
NC	E75	F75	NBASET1_MDI1+
NC	E74	F74	NBASET1_MDI1-
NC	E73	F73	GND
NC	E72	F72	NBASET1_MDI0+
NC	E71	F71	NBASET1_MDI0-
NC	E70	F70	GND
NC	E69	F69	NC
GND	E68	F68	NC
PCIe23_TX+	E67	F67	GND
PCIe23_TX-	E66	F66	PCIe23_RX+
GND	E65	F65	PCIe23_RX-
PCIe22_TX+	E64	F64	GND
PCIe22_TX-	E63	F63	PCIe22_RX+
GND	E62	F62	PCIe22_RX-
PCIe21_TX+	E61	F61	GND
PCIe21_TX-	E60	F60	PCIe21_RX+
GND	E59	F59	PCIe21_RX-
PCIe20_TX+	E58	F58	GND
PCIe20_TX-	E57	F57	PCIe20_RX+
GND	E56	F56	PCIe20_RX-
PCIe19_TX+	E55	F55	GND
PCIe19_TX-	E54	F54	PCIe19_RX+
GND	E53	F53	PCIe19_RX-
PCIe18_TX+	E52	F52	GND
PCIe18_TX-	E51	F51	PCIe18_RX+



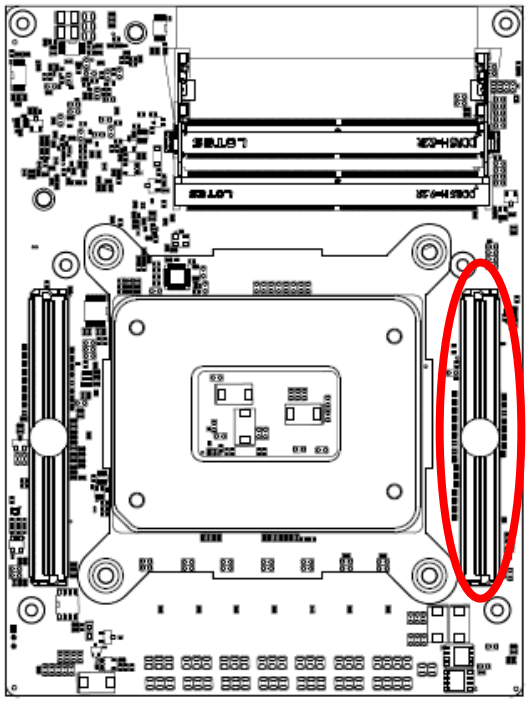


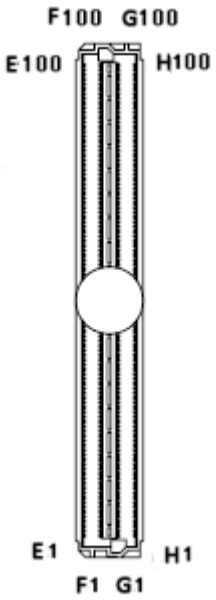
Signal	PIN	PIN	Signal
GND	E50	F50	PCIe18_RX-
PCIe17_TX+	E49	F49	GND
PCIe17_TX-	E48	F48	PCIe17_RX+
GND	E47	F47	PCIe17_RX-
PCIe16_TX+	E46	F46	GND
PCIe16_TX-	E45	F45	PCIe16_RX+
GND	E44	F44	PCIe16_RX-
PCIe39_TX+	E43	F43	GND
PCIe39_TX-	E42	F42	PCIe39_RX+
GND	E41	F41	PCIe39_RX-
PCIe38_TX+	E40	F40	GND
PCIe38_TX-	E39	F39	PCIe38_RX+
GND	E38	F38	PCIe38_RX-
PCIe37_TX+	E37	F37	GND
PCIe37_TX-	E36	F36	PCIe37_RX+
GND	E35	F35	PCIe37_RX-
PCIe36_TX+	E34	F34	GND
PCIe36_TX-	E33	F33	PCIe36_RX+
GND	E32	F32	PCIe36_RX-
PCIe35_TX+	E31	F31	GND
PCIe35_TX-	E30	F30	PCIe35_RX+
GND	E29	F29	PCIe35_RX-
PCIe34_TX+	E28	F28	GND
PCIe34_TX-	E27	F27	PCIe34_RX+
GND	E26	F26	PCIe34_RX-
PCIe33_TX+	E25	F25	GND
PCIe33_TX-	E24	F24	PCIe33_RX+
GND	E23	F23	PCIe33_RX-
PCIe32_TX+	E22	F22	GND
PCIe32_TX-	E21	F21	PCIe32_RX+



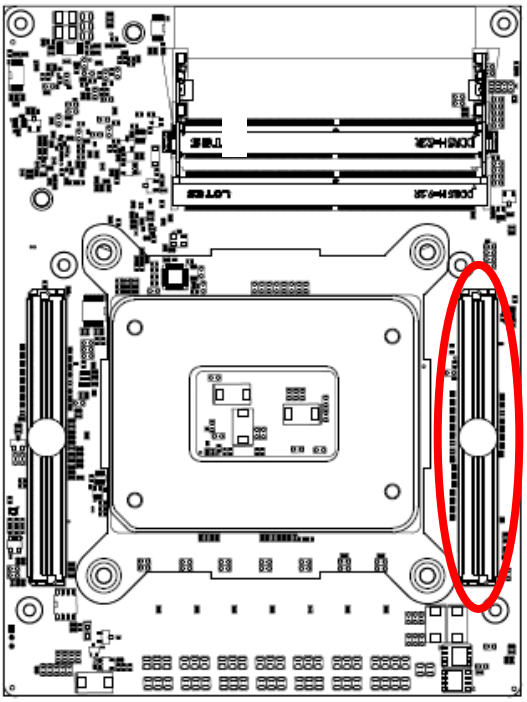


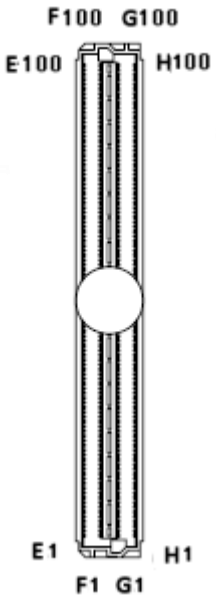
Signal	PIN	PIN	Signal
GND	E20	F20	PCIe32_RX-
DDI2_HPD	E19	F19	GND
DDI2_DDC_AUX_SEL	E18	F18	NC
GND	E17	F17	NC
DDI2_PAIR3+	E16	F16	NC
DDI2_PAIR3-	E15	F15	NC
GND	E14	F14	NC
DDI2_PAIR2+	E13	F13	NC
DDI2_PAIR2-	E12	F12	NC
GND	E11	F11	CATERR#
DDI2_PAIR1+	E10	F10	PROCHOT#
DDI2_PAIR1-	E9	F9	NC
GND	E8	F8	NC
DDI2_PAIR0+	E7	F7	NC
DDI2_PAIR0-	E6	F6	NC
GND	E5	F5	NC
DDI2_SDA_AUX+	E4	F4	NC
DDI2_SDA_AUX-	E3	F3	NC
GND	E2	F2	NC
RAPID_SHUTDOWN	E1	F1	NC



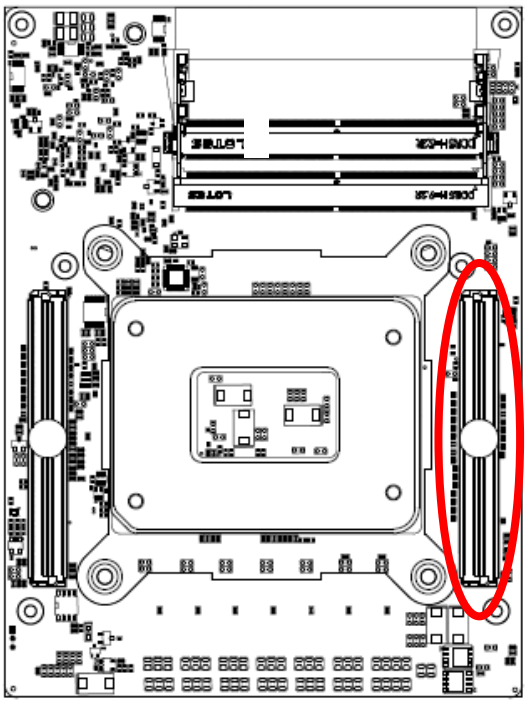


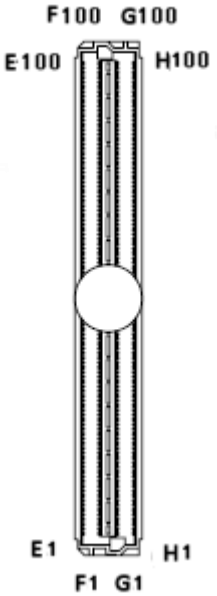
Signal	PIN	PIN	Signal
NC	G100	H100	NC
NC	G99	H99	NC
NC	G98	H98	NC
NC	G97	H97	GND
NC	G96	H96	NC
GND	G95	H95	NC
NC	G94	H94	GND
NC	G93	H93	NC
GND	G92	H92	NC
NC	G91	H91	GND
NC	G90	H90	NC
NC	G89	H89	NC
NC	G88	H88	NC
NC	G87	H87	NC
GND	G86	H86	NC
NC	G85	H85	GND
NC	G84	H84	NC
GND	G83	H83	NC
NC	G82	H82	GND
NC	G81	H81	NC



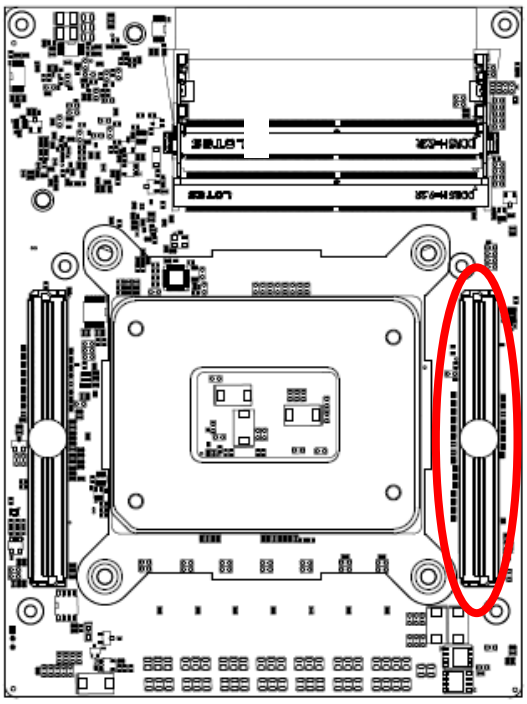


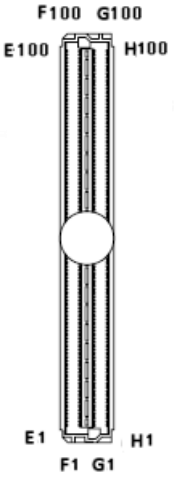
Signal	PIN	PIN	Signal
GND	G80	H80	NC
NC	G79	H79	GND
NC	G78	H78	NC
GND	G77	H77	NC
NC	G76	H76	GND
NC	G75	H75	NC
GND	G74	H74	NC
NC	G73	H73	GND
NC	G72	H72	NC
GND	G71	H71	NC
NC	G70	H70	GND
NC	G69	H69	NC
GND	G68	H68	NC
PCIe31_RX+	G67	H67	GND
PCIe31_RX-	G66	H66	PCIe31_TX+
GND	G65	H65	PCIe31_TX-
PCIe30_RX+	G64	H64	GND
PCIe30_RX-	G63	H63	PCIe30_TX+
GND	G62	H62	PCIe30_TX-
PCIe29_RX+	G61	H61	GND
PCIe29_RX-	G60	H60	PCIe29_TX+
GND	G59	H59	PCIe29_TX-
PCIe28_RX+	G58	H58	GND
PCIe28_RX-	G57	H57	PCIe28_TX+
GND	G56	H56	PCIe28_TX-
PCIe27_RX+	G55	H55	GND
PCIe27_RX-	G54	H54	PCIe27_TX+
GND	G53	H53	PCIe27_TX-
PCIe26_RX+	G52	H52	GND
PCIe26_RX-	G51	H51	PCIe26_TX+





Signal	PIN	PIN	Signal
GND	G50	H50	PCIe26_TX-
PCIe25_RX+	G49	H49	GND
PCIe25_RX-	G48	H48	PCIe25_TX+
GND	G47	H47	PCIe25_TX-
PCIe24_RX+	G46	H46	GND
PCIe24_RX-	G45	H45	PCIe24_TX+
GND	G44	H44	PCIe24_TX-
NC	G43	H43	GND
NC	G42	H42	NC
GND	G41	H41	NC
NC	G40	H40	GND
NC	G39	H39	NC
GND	G38	H38	NC
NC	G37	H37	GND
NC	G36	H36	NC
GND	G35	H35	NC
NC	G34	H34	GND
NC	G33	H33	NC
GND	G32	H32	NC
NC	G31	H31	GND
NC	G30	H30	NC
GND	G29	H29	NC
NC	G28	H28	GND
NC	G27	H27	NC
GND	G26	H26	NC
NC	G25	H25	GND
NC	G24	H24	NC
GND	G23	H23	NC
PCIe40_RX+	G22	H22	GND
PCIe40_RX-	G21	H21	PCIe40_TX+





Signal	PIN	PIN	Signal
GND	G20	H20	PCIe40_TX-
PEG_LANE_REV#	G19	H19	GND
NC	G18	H18	NC
NC	G17	H17	NC
NC	G16	H16	GND
NC	G15	H15	NC
GND	G14	H14	NC
USB3_SSRX1+	G13	H13	GND
USB3_SSRX1-	G12	H12	USB3_SSTX1+
GND	G11	H11	USB3_SSTX1-
USB3_SSRX0+	G10	H10	GND
USB3_SSRX0-	G9	H9	USB3_SSTX0+
GND	G8	H8	USB3_SSTX0-
USB2_SSRX1+	G7	H7	GND
USB2_SSRX1-	G6	H6	USB2_SSTX1+
GND	G5	H5	USB2_SSTX1-
USB2_SSRX0+	G4	H4	GND
USB2_SSRX0-	G3	H3	USB2_SSTX0+
GND	G2	H2	USB2_SSTX0-
VCC_5V_SBY	G1	H1	GND

2.4.6.1 Signal Description – COM-HPC Connector 2 (COM_HPC_MOD1B)

2.4.6.1.1 DDI Signals

Signal	Signal Description
DDI2_PAIR[0:3]+ DDI2_PAIR[0:3]-	DDI 0 to 2 Pair[0:3] differential pairs
DDI2_SDA_AUX-	DP AUX- function if DDI[0:2]_DDC_AUX_SEL is no connect HDMI/DVI I2C data if DDI[0:2]_DDC_AUX_SEL is pulled high
DDI2_SCL_AUX+	DP AUX+ function if DDI[0:2]_DDC_AUX_SEL is a no connect or driven to GND on the Carrier. HDMI/DVI I2C clock if DDI[0:2]_DDC_AUX_SEL is pulled or driven high on the Carrier.
DDI2_DDC_AUX_SEL	Selects the function of DDI[0:2]_SCL_AUX+ and DDI[0:2]_SDA_AUX-. This pin shall have a 1M pull-down to logic ground on the Module. If this input is unconnected on the Carrier, the AUX pair is used for the DP AUX+/- signals. If pulled or driven high on the Carrier, the AUX pair contains the HDMI[0:2] I2C CRTL_CLK and CTRL_DAT signals.
DDI2_HPD	DDI Hot-Plug Detect

2.4.6.1.2 PCI Express Signals

Signal	Signal Description
PCIe[16:31]_TX+/-	PCI Express Differential Transmit Pairs 16-31 PCIe Group 1
PCIe[16:31]_RX+/-	PCI Express Differential Receive Pairs 16-31 PCIe Group 1
PCIe[32:47]_TX+/-	PCI Express Differential Transmit Pairs 32-47 PCIe Group 2
PCIe[32:47]_RX+/-	PCI Express Differential Receive Pairs 32-47 PCIe Group 2
PCIe_REFCLK1- PCIe_REFCLK1+	Reference clock pair for PCIe lanes [16:31], also referred to PCIe Group 1
PCIe_REFCLK2- PCIe_REFCLK2+	Reference clock pair for PCIe lanes [32:47], also referred to PCIe Group 2
PCIe_CLKREQ1#	PCIe reference clock request signals from Carrier devices for PCIe_REFCLK1 clock pair
PCIe_CLKREQ2#	PCIe reference clock request signals from Carrier devices for PCIe_REFCLK2 clock pair

2.4.6.1.3 USB Signals

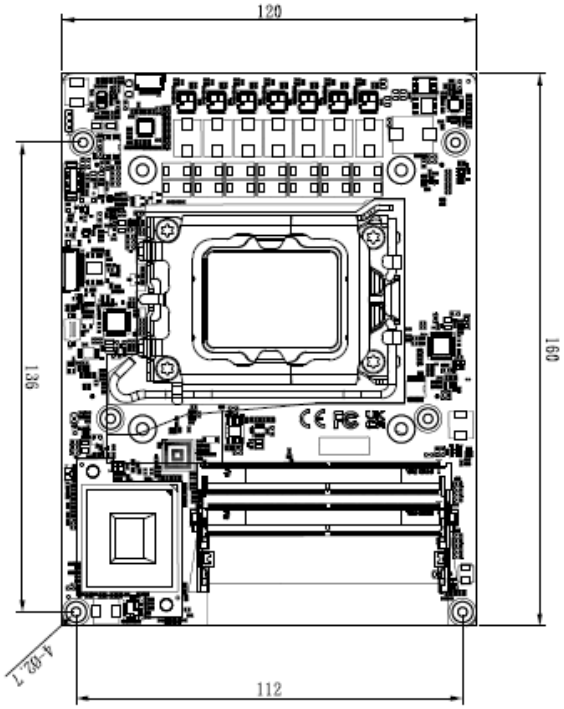
Signal	Signal Description
USB[2:3]_SSTX[0:1]+ USB[2:3]_SSTX[0:1]-	Four sets of SuperSpeed receive pairs, used to realize the transmit side of two USB 3.2 Gen 2x2 ports. Alternatively, USB 3.2 Gen 1 or Gen 2 ports (single TX pair, single RX pair per port) may be implemented using a portion of this interface. These ports shall be used in conjunction with the corresponding USB 2.0 port pair (e.g. USB0_SSxxx+/- shall be used with the USB0 USB 2.0 pair and so on, USB1_SSxxx+/- with the USB1 USB 2.0 pair).
USB[2:3]_SSRX[0:1]+ USB[2:3]_SSRX[0:1]-	Four sets of SuperSpeed receive pairs, used to realize the transmit side of two USB 3.2 Gen 2x2 ports. Alternatively, USB 3.2 Gen 1 or Gen 2 ports (single TX pair, single RX pair per port) may be implemented using a portion of this interface. These ports shall be used in conjunction with the corresponding USB 2.0 port pair (e.g. USB0_SSxxx+/- shall be used with the USB0 USB 2.0 pair and so on, USB1_SSxxx+/- with the USB1 USB 2.0 pair).

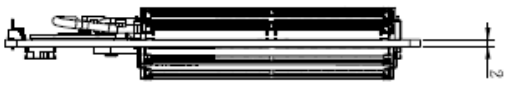
2.4.6.1.4 NBASE-T_1

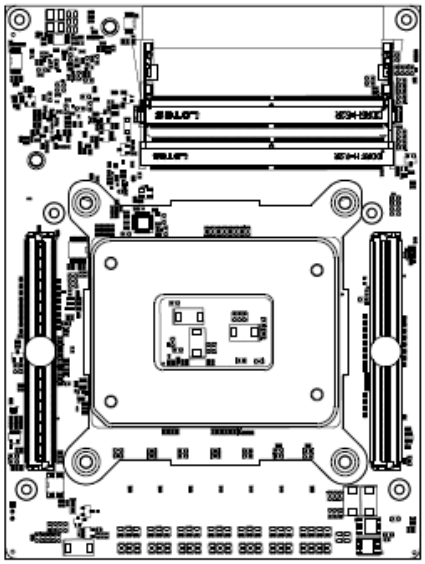
<table>
<tr><th>Signal</th><th>Signal Description</th></tr>
<tr><td>NBASET1_MDI[0:3]+
NBASET1_MDI[0:3]-</td><td>Ethernet Controller 1: Media Dependent Interface Differential Pairs 0,1,2,3. The MDI can operate in 10Gbps, 1Gbps, 100Mbps and 10 Mbps modes. Some pairs are unused in some modes, per the following:
<table>
<tr><th></th><th>10000B-T/1000B-T</th><th>100B-T</th><th>10B-T</th></tr>
<tr><td>MDI[0]+/-</td><td>B1_DA+/</td><td>TX+/-</td><td>TX+/-</td></tr>
<tr><td>MDI[1]+/</td><td>B1_DB+/</td><td>RX+/-</td><td>RX+/-</td></tr>
<tr><td>MDI[2]+/</td><td>B1_DC+/</td><td>X</td><td>X</td></tr>
<tr><td>MDI[3]+/</td><td>B1_DD+/</td><td>X</td><td>X</td></tr>
</table></td></tr>
<tr><td>NBASET1_LINK_ACT#</td><td>NBASE-T Ethernet Controller activity indicator, active low.
20 mA or more current sink capability at VOL of 0.4V max.
20 mA or more current source capability at VOH of 2.4V min.</td></tr>
<tr><td>NBASET1_LINK_MAX#</td><td>NBASE-T Ethernet Controller MAX Speed Link indicator, active low. If active, the link is at the maximum speed that the Ethernet controller is capable of (which may be 10G, 5G, 2.5G, etc).
20 mA or more current sink capability at VOL of 0.4V max.
20 mA or more current source capability at VOH of 2.4V min.</td></tr>
<tr><td>NBASET1_LINK_MID#</td><td>NBASE-T Ethernet Controller MID Speed Link indicator, active low. If active, the link is established but at a speed lower than what the maximum speed that the Ethernet controller is capable of.</td></tr>
</table>

	20 mA or more current sink capability at VOL of 0.4V max. 20 mA or more current source capability at VOH of 2.4V min.
NBASET1_CTREF	NBASE-T Ethernet Controller MAX Speed Link indicator, active low. If active, the link is at the maximum speed that the Ethernet controller is capable of (which may be 10G, 5G, 2.5G, etc). 20 mA or more current sink capability at VOL of 0.4V max. 20 mA or more current source capability at VOH of 2.4V min.
NBASET1_SDP	NBASE-T Ethernet Controller MID Speed Link indicator, active low. If active, the link is established but at a speed lower than what the maximum speed that the Ethernet controller is capable of. 20 mA or more current sink capability at VOL of 0.4V max. 20 mA or more current source capability at VOH of 2.4V min.

3. Mechanical Drawing







Unit: mm