Starter Kit for COM-HPC-sIDH

User's Guide

COM-HPC™

Revision: Preliminary
Date: 2023-12-04
Part Number:

ADLINK LEADING EDGE COMPUTING

Revision History

Revision	Description	Date	Author

Preface

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Safety Instructions

For user safety, please read and follow all Instructions, **WARNING**s, **CAUTION**s, and **NOTE**s marked in this manual and on the associated equipment before handling/operating the equipment.

Read these safety instructions carefully.

- Keep this manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- Turn off power and unplug any power cords/cables when installing/mounting or un-installing/removing equipment.
- To avoid electrical shock and/or damage to equipment:
- Keep equipment away from water or liquid sources;
- Keep equipment away from high heat or high humidity;
- Keep equipment properly ventilated (do not block or cover ventilation openings);
- Make sure to use recommended voltage and power source settings;
- Always install and operate equipment near an easily accessible electrical socket outlet;
- Secure the power cord (do not place any object on/over the power cord);
- Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
- If the equipment will not be used for long periods of time, turn off the power source and unplug the equipment.

Conventions

The following conventions may be used throughout this manual, denoting special levels of information

Note: This information adds clarity or specifics to text and illustrations.

Caution: This information indicates the possibility of minor physical injury, component damage, data loss, and/or program corruption.

Warning: This information warns of possible serious physical injury, component damage, data loss, and/or program corruption.

Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

ADLINK Technology, Inc.
No. 66, Huaya 1st Rd., Guishan District, Taoyuan City 333411, Taiwan
Tel: +886-3-216-5088
Fax: +886-3-328-5706
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
6450 Via Del Oro, San Jose, CA 95119-1208, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-600-1189
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
300 Fang Chun Rd., Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai, 201203, China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology GmbH
Hans-Thoma-Strasse 11, D-68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

Please visit the Contact page at www.adlinktech.com for information on how to contact the ADLINK regional office nearest you.

Table of Contents

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1. Introduction

The Server Type Starter Kit is intended for testing and verification of COM-HPC systems based on selected Server Type modules and includes everything customers need to begin their own design and development. The Server Type Starter Kit includes the COM-HPC Server carrier board, an extended ATX size COM-HPC Server Type reference carrier board, a COM-HPC Server Type module (of your choice), memory (of your choice), thermal solution (heatsink, of your choice) and additional items such as 10GbE Ethernet adapter card and cabling

The complete kit allows customers to quickly emulate the functionality of their end product for software development and hardware verification. Carrier board design files (schematics, mechanical drawings), COM-HPC module drivers, BSP and user manual are offered, at product webpages, to assist customers in designing their own custom carrier board.

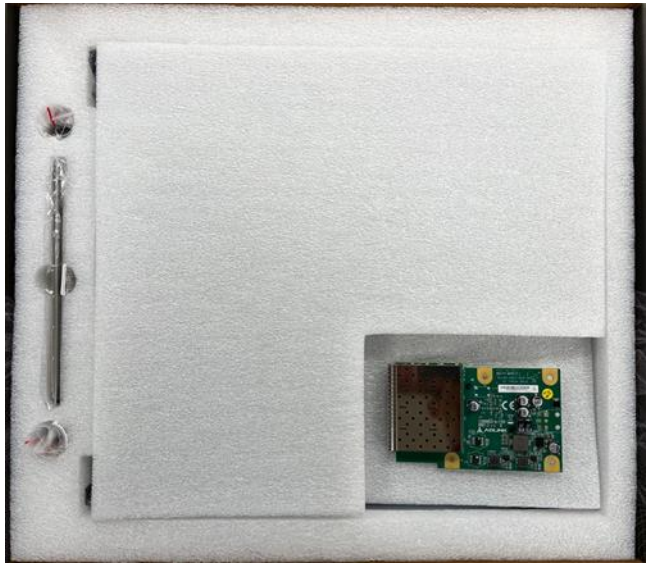
The Server Type Starter Kit also includes additional development cards, such as dedicated 10GbE Ethernet adapter card at OCP form-factor that converts 10G-KR signals to 10GbE SFP+ or 10GBASE-T signals

1.1 How to Order the Server Type Starter Kit

Follow above procedure allow you to get all necessary drivers/document for quick start

1.2 Unpacking

Check that the EPE foam layers contain the items shown below:



First Layer

In the first layer of kit, there're 10GbE adapter card, I/O bracket and screws/standoff

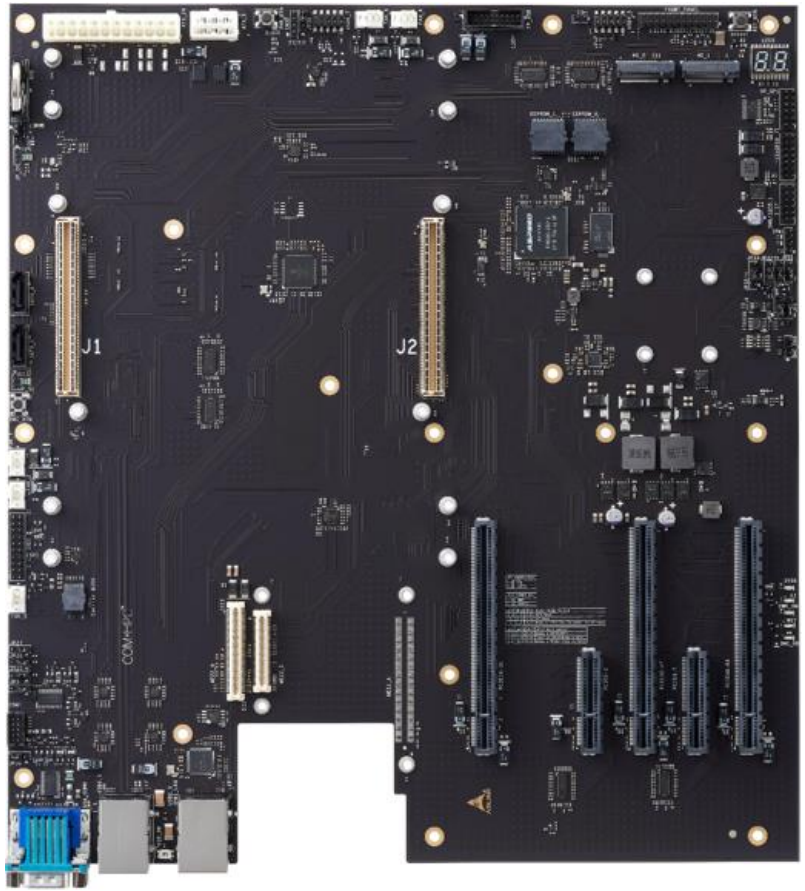
Second Layer

In the second layer of kit, there're COM-HPC Server Carrier board and several cables

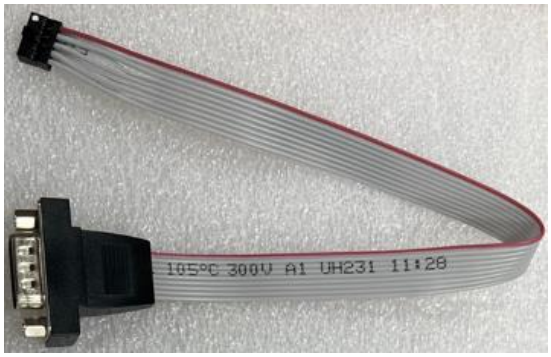
Note: all the boards are with ESD bag, just not shown on picture above

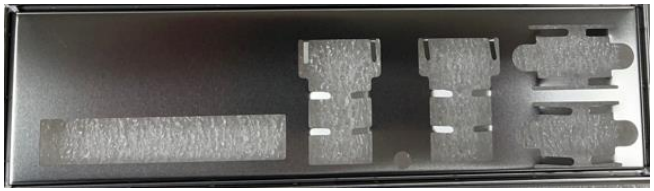
1.3 What's included in the Kit

1.3.1 Standard Items

No.	Photo	Part Number	Description
1.		**91-77106-0010**	**COM-HPC Server Base** COM-HPC Server Type reference carrier board

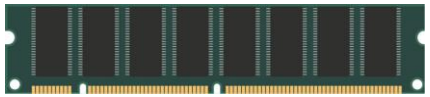
2.		**91-79024-0020**	**10GbE SFP+ Ethernet adapter card** (OCP-C827-4x10G-SFP+) Converts 4x 10GBASE-KR to 4x 10GbE SFP+ signals via Intel C827 PHY Dedicated for COM-HPC-sIDH Heatsink is pre-assembled. Just not shown on this picture Depends on the Kit you selected
3		**91-79025-0020**	**10GBASE-T Ethernet adapter card** (OCP-X557-AT4-4x10GBASE-T) Converts 4x 10GBASE-KR to 4x 10GBASE-T signals via Intel X557-AT4 PHY Dedicated for COM-HPC-sIDH Heatsink is pre-assembled. Just not shown on this picture Depends on the Kit you selected

4		**30-20893-0010**	**Flat Cable, 2x5P(2.0) to DB9P** Can be used to connect the COM1 pin header on COM-HPC Server Base
5		**30-23201-0000**	**Wire Canle, 2x10P(2.0) to USB3.0 Type-A(F)x2** Can be used to connect the FP_USB connector on COM-HPC Server Base

6	 	**34-25330-1000**	**The I/O bracket shield** The I/O shield is a matel material, It protects the motherboard against EMI and static discharge. It also blocks off any dust or moiture that might be getting into your PC. 32-25330-1000 is for the kit ship with 10GbE SFP+ Ethernet adapter card The other one is for the kit ship with 10GBASE-T Ethernet adapter card Depends on the kit selected
7		**33-03334-0050** **33-70074-N000**	**Standoff A, M3, H11.2 and Screw M3, I-head, L5** These standoffs and screws are used to assemble the 10GbE Ethernet adapter card to COM-HPC Server Base Quantity : 4pcs
8		**33-10210-6P30**	**Screw, P-head,L6.35, BZn** Screws for assemble the COM-HPC Server Base to a chassis if required Quantity : 18pcs

9		**33-39021-0000**	**Guide pin D2.65, H37** These four guide pins used for install and uninstall of module on the carrier. Quantity : 4pcs
10		**33-01224-0200**	**Screw M2.5,P-head,L20, Clean(SW+PW)** These screws used for assemble COM-HPC module and COM-HPC Server Base Bottom mounting type Quantity : 12pcs
11		**33-71015-0010**	**Standoff B,M2.5,H10,Ni** These standoff used for assemble COM-HPC module (four corner side) and COM-HPC Server Base Quantity : 4pcs

1.3.2 Optional Items

No.	Photo	Part Number	Description
1.		**91-73103-XXXX**	**COM-HPC-sIDH COM-HPC Server Type module** of your choice
2.			**Memory module(s)** of your choice

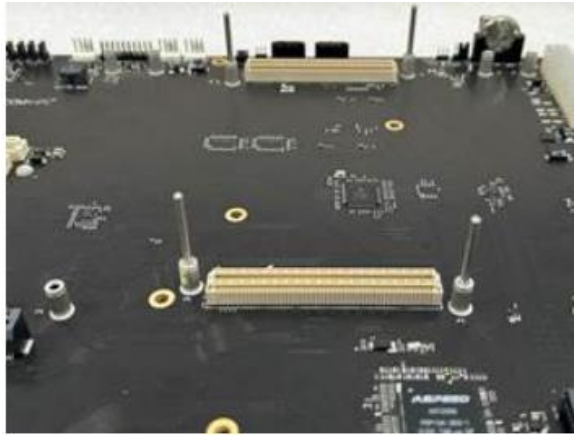
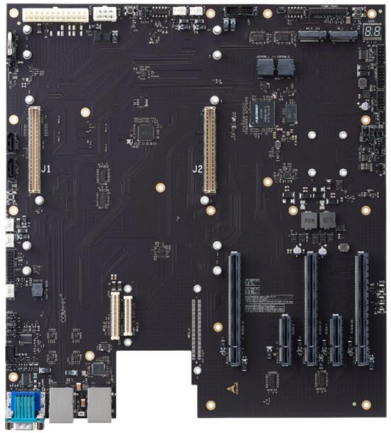
3		**91-95329-0010**	**Thermal solution** of your choice Heatsink with Fan with bottom mounting, dedicated for COM-HPC-sIDH module There're 4pcs screws for assembling the FAN cover to heatsink

2. Getting Started

2.1 Board Installation

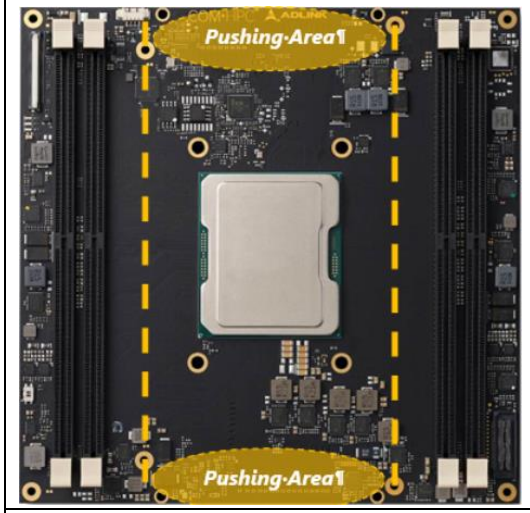
<table>
<tr><th>Procedure</th><th>Required Items</th></tr>
<tr><td>Step 1
Take out the module, boards from ESD bag, put it on the EPE foam for further installation is advised
4 guide pin must be used for proper installation of the module to carrier (or uninstallation)
Place the COM-HPC Server Base on a leveled surface

Take out the 4 guide pins and place them into the 4 holes on the COM-HPC Server Base as indicated

   </td><td rowspan="2"> 
 
  </td></tr>
<tr><td>Step 2
Align the module with the installed guide pins and put it gently onto the COM-HPC Server Base, as illustrated below.</td></tr>
</table>

Step 3

Using the pushing area indicated, firmly press down the module to secure it onto the COM-HPC Server Base.



Step 4

Once the module has been installed, remove the guide pins from the COM-HPC Server Base to finish

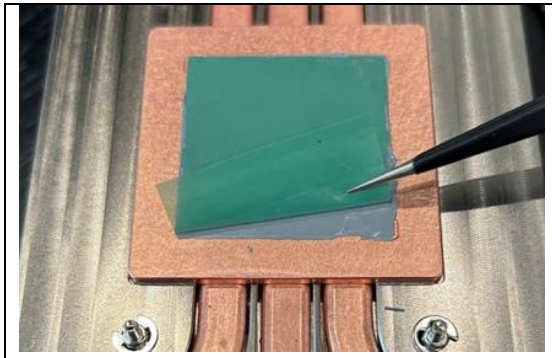
Step 5

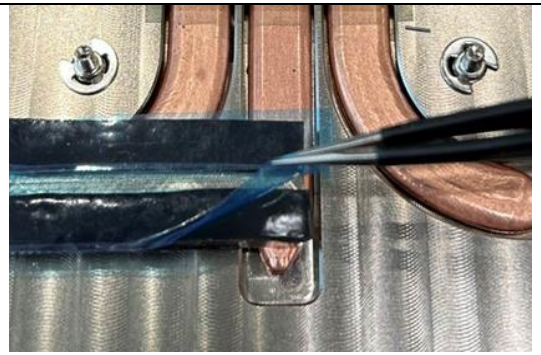
Take out and separate the thermal part as left, there is heatsink and dual FAN component.

Bottom mounting style heatsink

Step 6

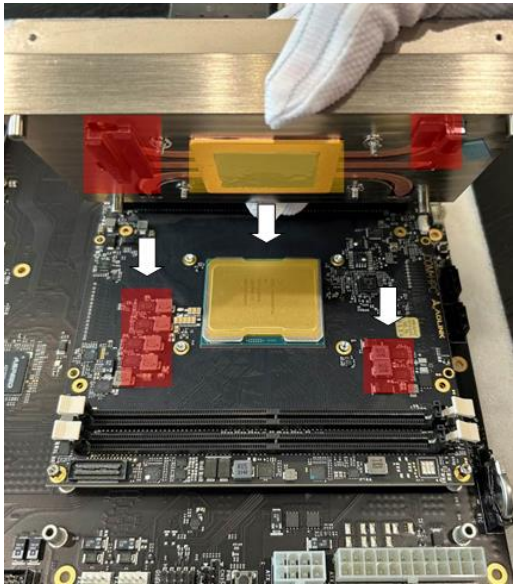
Turn the heatsink back to front, and remove the release paper of emboss for processor. Also, remove the release paper of emboss of power parts.





Step 7

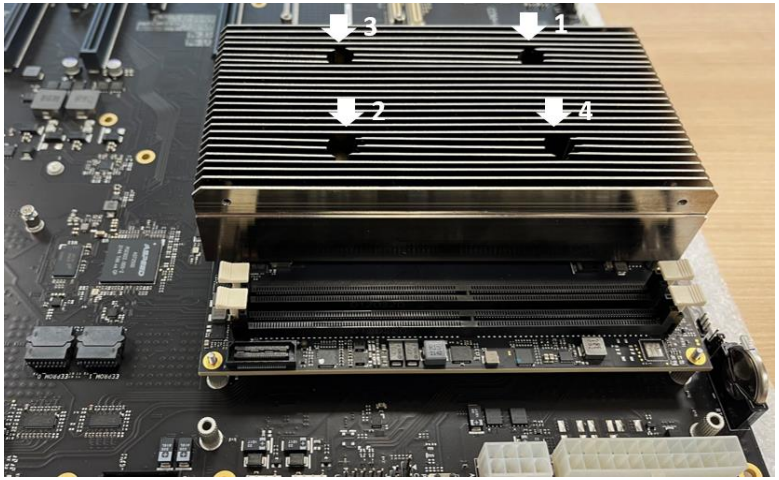
Take the heatsink above of the module and to ensure that direction is correctly for embossment of heatsink to the processor and power parts as figure shown in the left.



Yellow: Processor part **Red: Power parts**

Step 8

Once heatsink installed appropriately, lock up screws diagonally as no listed in the left figure.



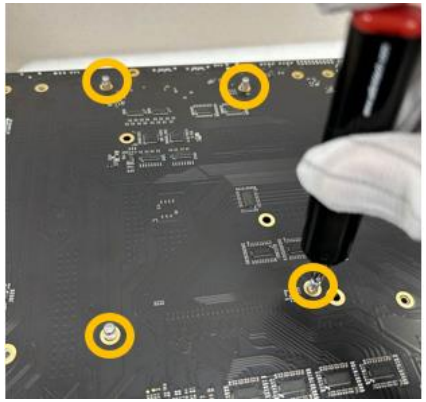
Step 9

Take out the screw parts as listed in right column, be ready to lock up the thermal solution.

Step 10

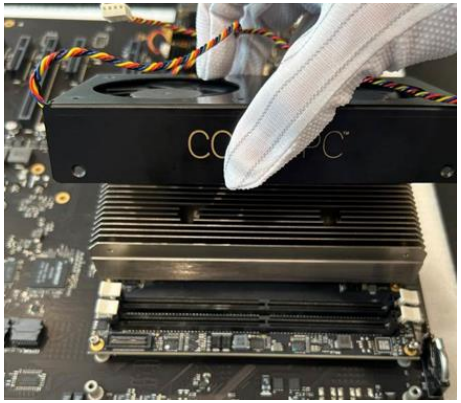
Turning the pre-assemblied COM-HPC module/COM-HPC Server Base, showing the back side of COM-HPC Server Base, to Lock up the thermal soultion from bottom.

That screw position (as yellowed cyrcle) same to the guide pin installation position, once thermal solution installed and could be used to lock up the carrier, moudle and thermal solution.



Step 11

Back to front side, covering the dual fan component onto the heatsink, make sure that fan cables in the front side for connecting to FAN connector



Bottom mounting style heatsink

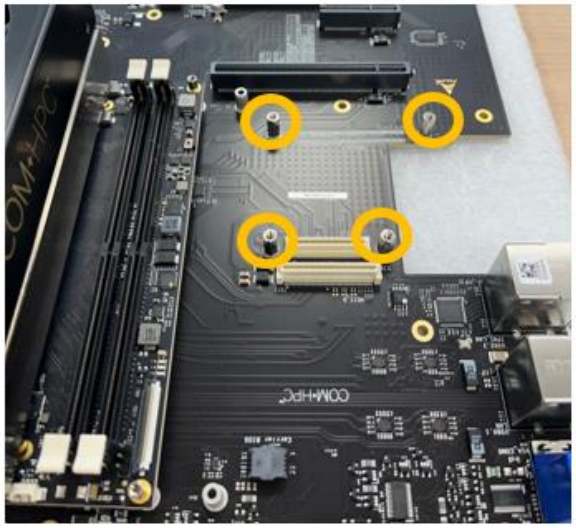
Step 12

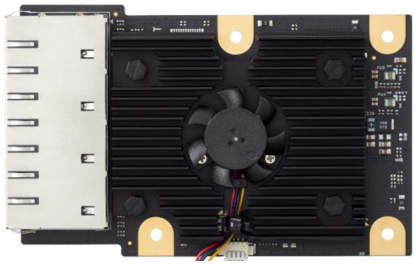
Take out of the small black screws, it used for lock up the dual fan component and heatsink.

Step 13

Lock up small black screws on four corners of dual fan cover.

Step 13 Screw the 4pcs standoffs and 4pcs screws for the COM-HPC module and COM-HPC Server Base (as yellow circle) 	
Step 14 Take out the standoff and screw parts as listed in right column, also take the 10GbE Ethernet adapter card Procedure below will take 10GBASE-T Ethernet adapter card as example (10GbE card depends on your selection) Screws the 4pcs standoff on the COM-HPC Server Base, nearby the MEZZ connector (as yellow circle)	



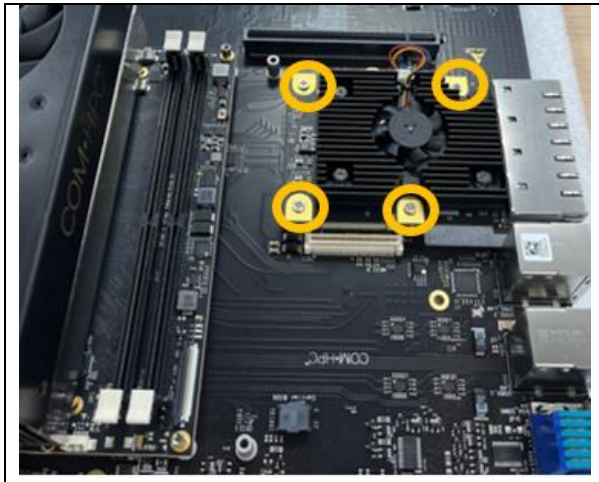


Step 15

Assmble the 10GbE Ethernet adapter card on the MEZZ connector on COM-HPC Server Base

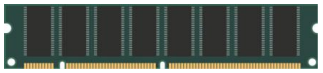
Step 16

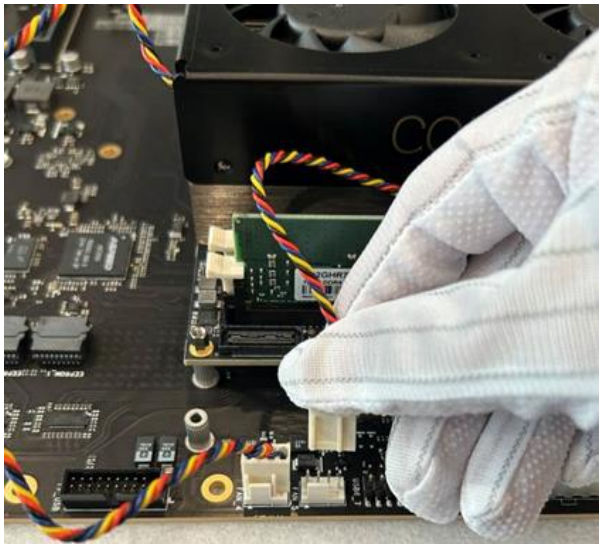
Screw the 4pcs screws on the 4pcs standoff (as yellow circle)

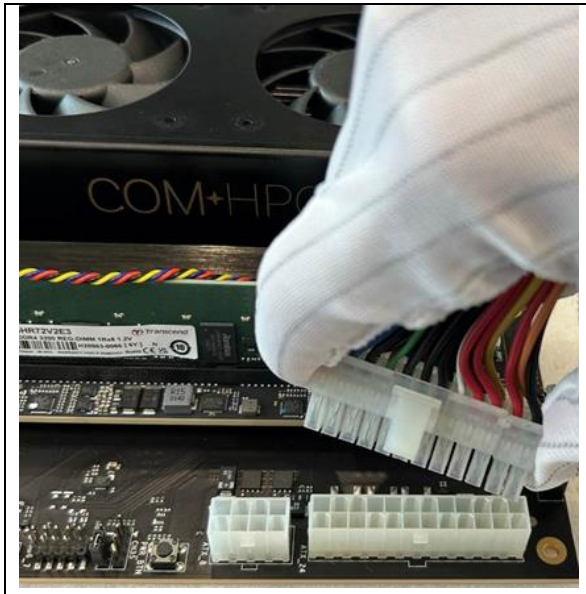


Step 17

Inserting of DIMM memory into the COM-HPC module's DIMM socket.



Step 18 Connecting of FAN cable on FAN4 and FAN5 for 100% operating full time. Or user can connect the FAN cable to FAN connector 1 and 2 of carrier for a dynamically operating by actual temperatures. For more details, please refer to **chapter 4, Thermal Controlling.** 	
Step 19 Preparing of least 400W ATX power supply, and connecting the 24 pins power cable onto the ATX connector of Server carrier.	



Step 20

Then install the 8 pins power cable onto the 8 pins connector of server carrier.

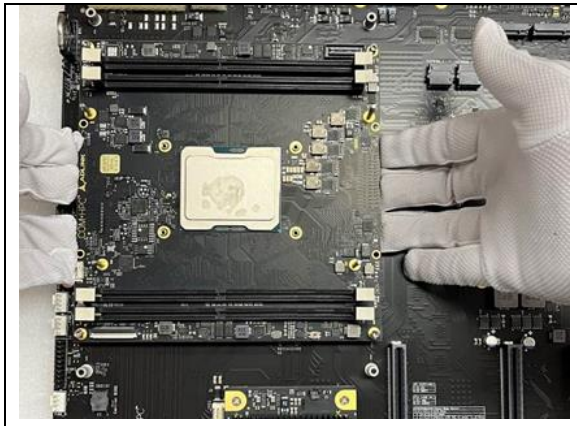
Step 21

All installed and ready for power on by connecting the power cord to power supply or press the switch on switch on power supply

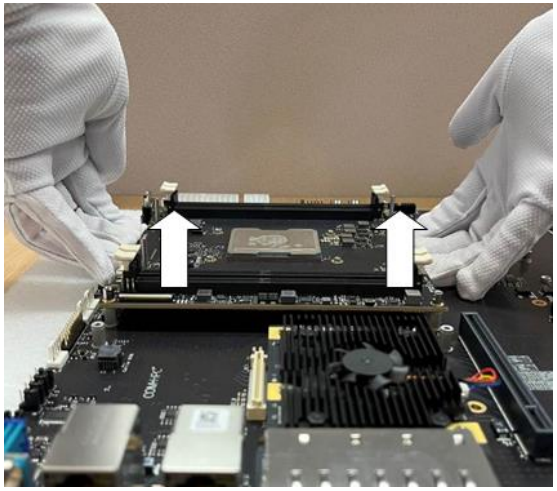
Note: the power up jumpers setting of COM-HPC Server Base is AT mode in default. See JP 35/33/31 setting on carrier board manual or the indication printed on COM-HPC Server Base or check section 6.4

2.2 Module Uninstallation if required

COM-HPC Module Uninstaling	
Step 1 For any case that need to uninstall the module from carrier, please reverse steps as above, removing all of screws which has assembled, then to install the guide pins. 	
Step 2 Holding the upper and down bottom of the board, then pull the module up straightly.	

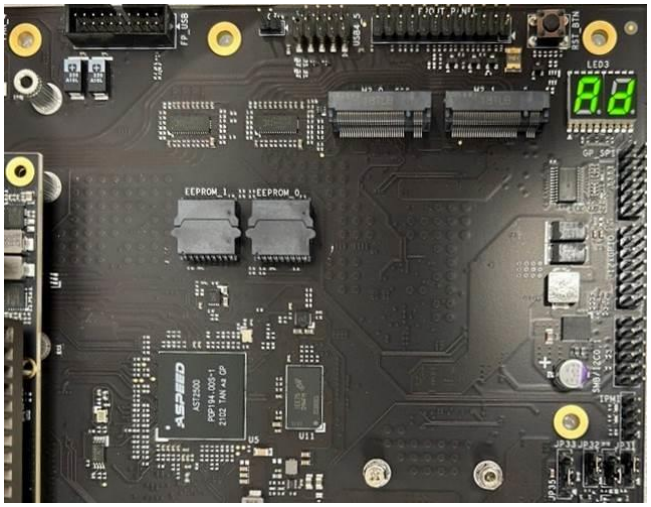
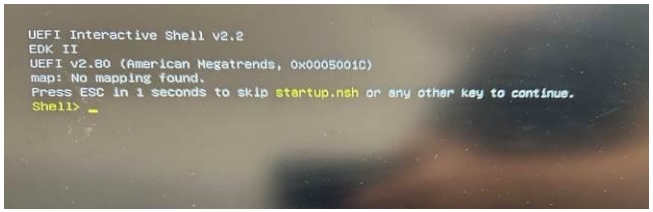


(top view)



(side view)

2.3 Powering the COM-HPC Server System

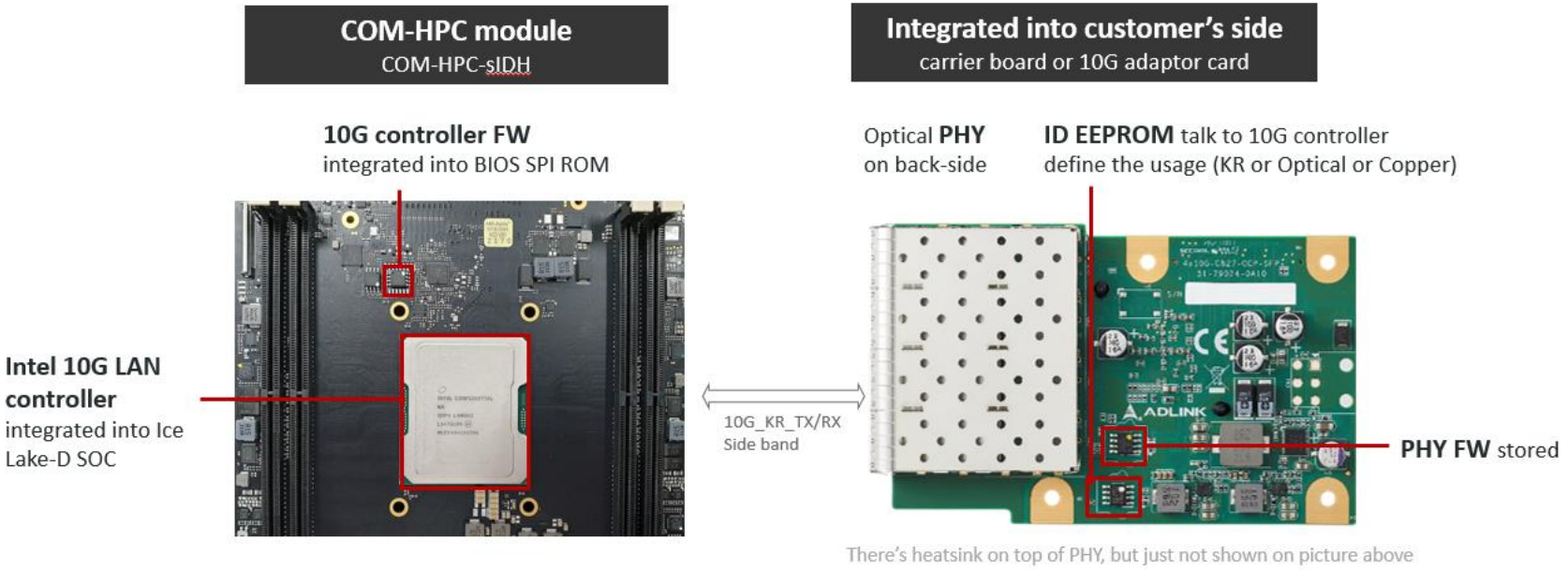
Powering up the COM-HPC Server system	Required Items
 The POST LEDs on the COM-HPC Server carrier will display the bootup status – "Ad" indicates a successful boot.  If no operating system is installed on the system, then the monitor will display the UEFI shell after the first boot up.	

3. 10GbE Ethernet Adapter Cards at OCP Form Factor

ADLINK 10GbE Ethernet adapter cards provide access to the COM-HPC Server module's 10GBASE-KR interface plus its sideband signals and then convert to 10GbE SFP+ or 10GBASE-T signals. The Ethernet adapter card leverage the OCP form factor in dimension and connector style. The COM-HPC Server module requires dedicated 10GbE Ethernet adaptor card as platform specified by vendors, and below are two qualified PHY implemented.

The installation of 10GbE Ethernet adapter cards are as shown on section 2.1

10GbE FW spread into COM-HPC Server module and 10GbE Ethernet adapter card, high level illustration as picture below



3.1 10GbE SFP+ Ethernet Adapter Card

OCP-C827-4x10G-SFP+

Dedicated for COM-HPC-sIDH module usage. It converts 4x 10GBASE-KR & related sideband signals to 4x 10GbE SFP+ signals and can connect to SFP+ transceiver through Intel C827 PHY. Please check the User's Manual from ADLINK website for more detailed information. If FW updated required, please contact your ADLINK local presentative for detail update procedure SOP.

10G-KR and sideband Input

(Through OCP connector, back side)

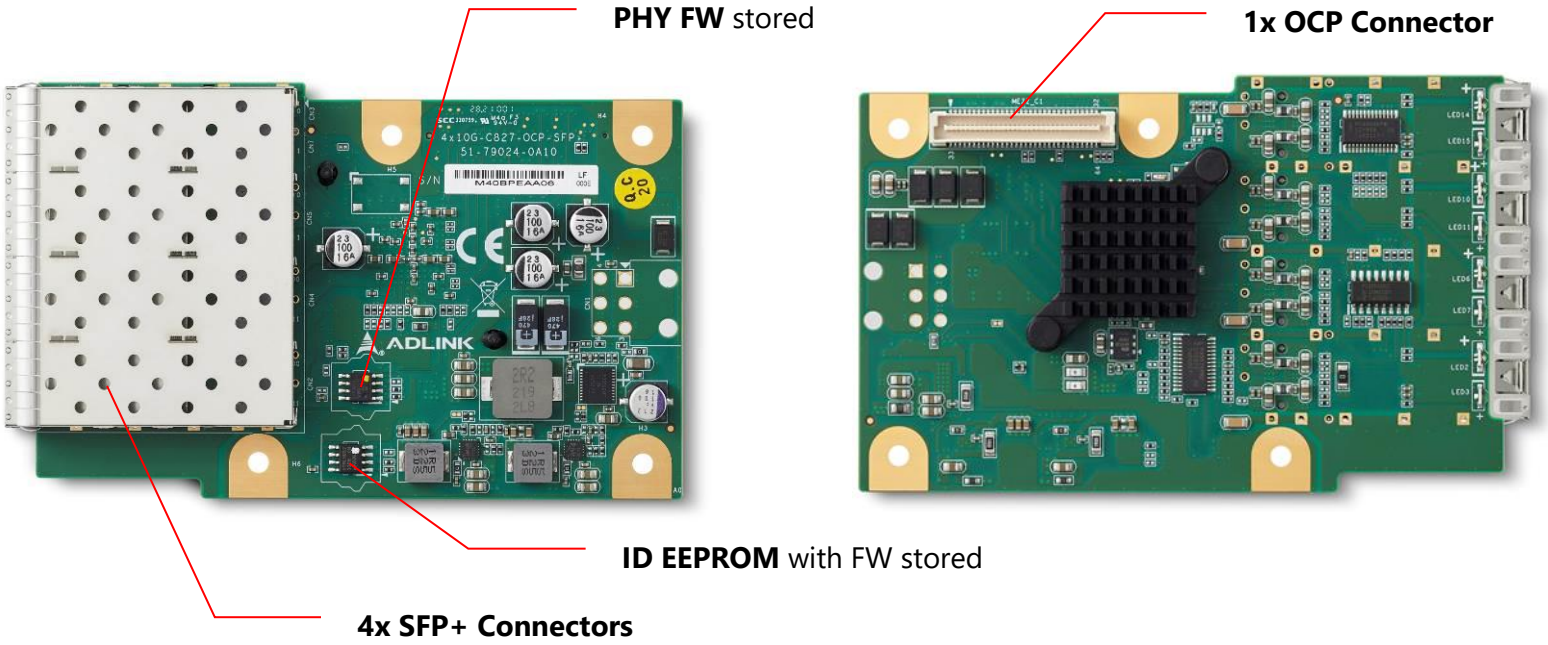


Figure – OCP feature locations

3.2 10GBASE-T Ethernet Adapter Card

OCP-X557-AT4-4x10GBASE-T

Dedicated for COM-HPC-sIDH module usage. It converts 4x 10GBASE-KR & related sideband signals to 4x 10GBASE-T ports through Intel X557-AT4 PHY. Please check the User's Manual from ADLINK website for more detailed information. If FW updated required, please contact your ADLINK local presentative for detail update procedure SOP.

10G-KR and sideband Input

(Through OCP connector, back side)

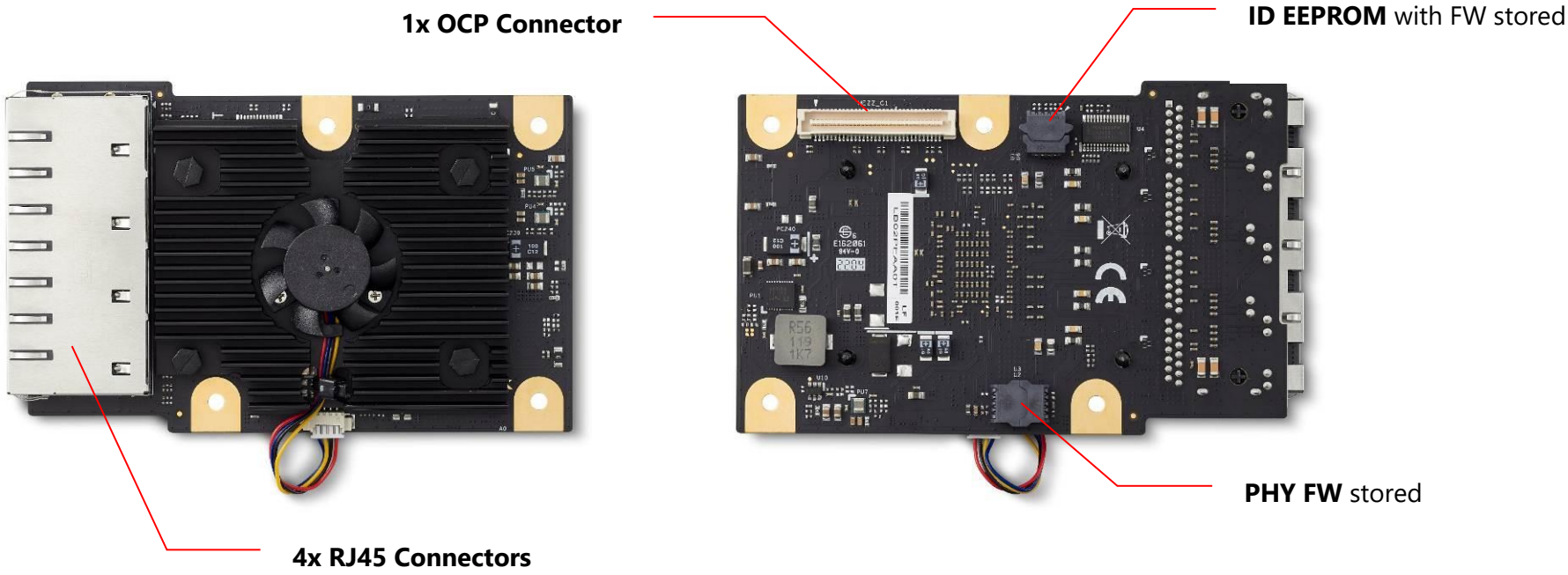
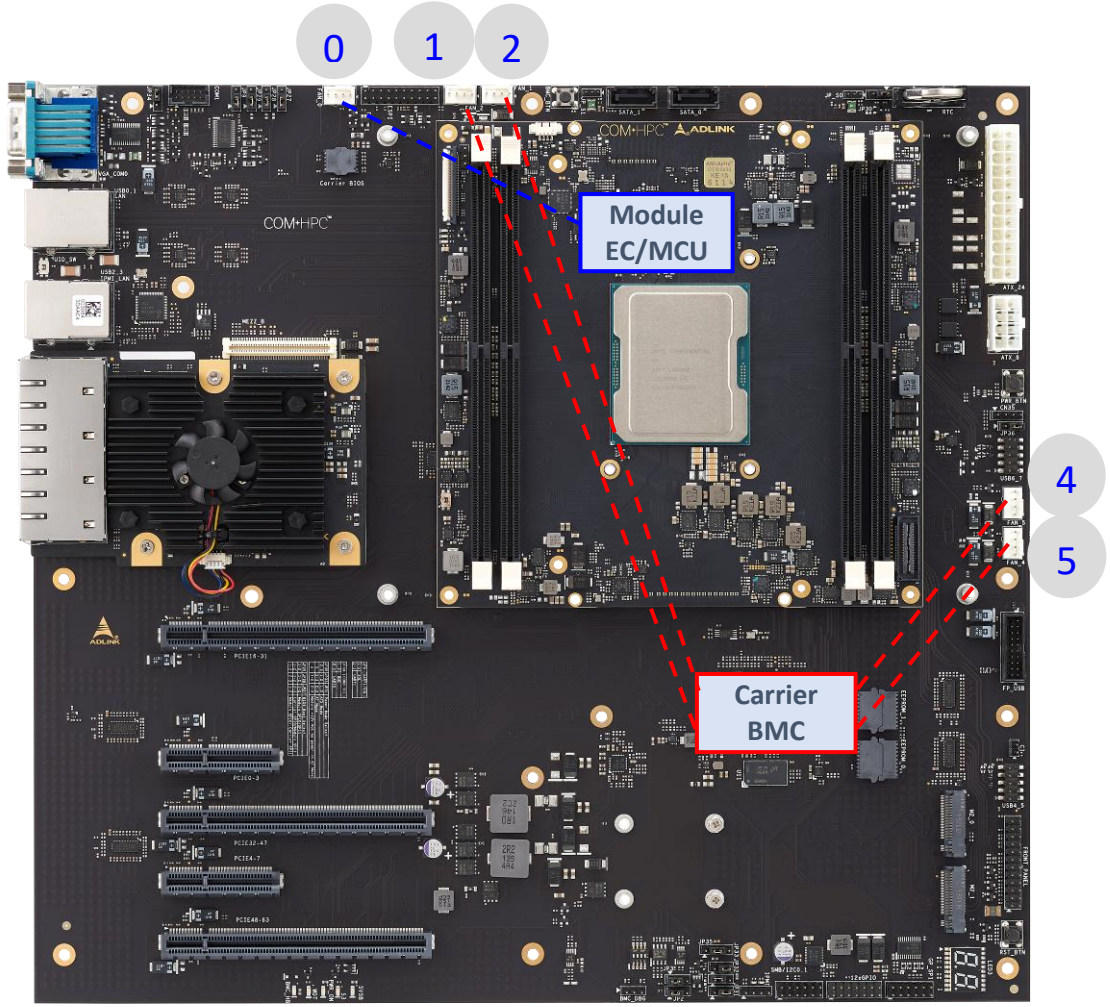


Figure – OCP feature locations

4. Thermal Controlling



FAN_0 Thermal table (EC or MCU)

Control level	CPU Tj	PWM duty (%)
1	25	25%
2	40	50%
3	55	75%
4	70	100%

FAN_1, FAN_2 Thermal table (Carrier BMC)

Control level	CPU Tj	PWM duty (%)
1	<30	40%
2	30	50%
3	35	60%
4	40	70%
5	45	80%
6	50	90%
7	56	100%

FAN_4, FAN_5 Thermal table

Control level	CPU Tj	PWM duty (%)
1	N/A	100%

5. Secondary BIOS

The COM-HPC Server-BASE supports Secondary BIOS, using Boot Serial Peripheral Interface (SPI) for COM-HPC modules.

Secondary BIOS solutions can be used as an alternative to the on-module BIOS and provide support for the following:

- Testing new BIOS versions
- Development of firmware modifications
- Recovery if soldered BIOS on module is corrupted

To use the BIOS on the module;
short pins 1-2 on **JP27, JP28, JP29**

To use the BIOS on the carrier board;
Short pins 2-3 on **JP27**, and keep pin 1-2 on JP28, JP29

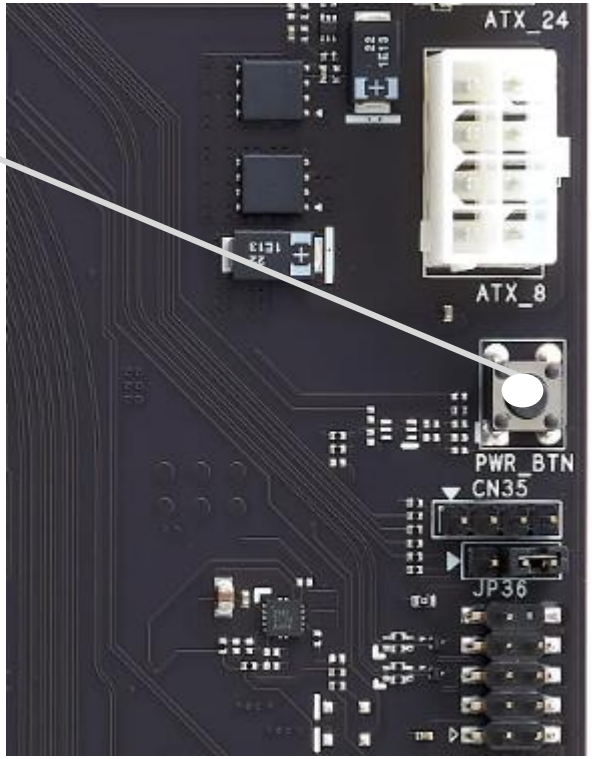
Ensure the **secondary BIOS flash chip** has been installed into the Carrier BIOS socket before BOOT BIOS adjusting.

6. Switches, POST and LEDs

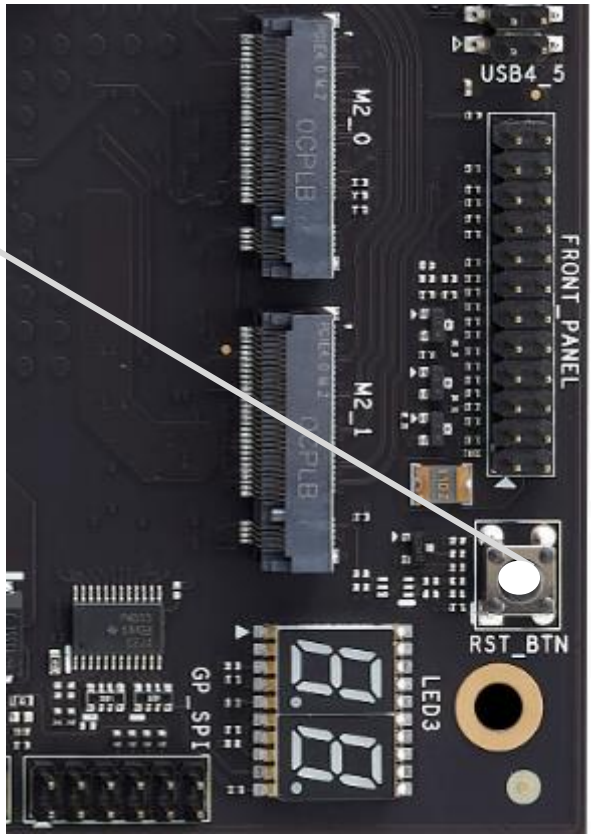
6.1 Switches (S0-S5)

There are two switches at the center and low of right side of the carrier.

As **PWR_BTN** triggering
for get into S0 from S5 of system.

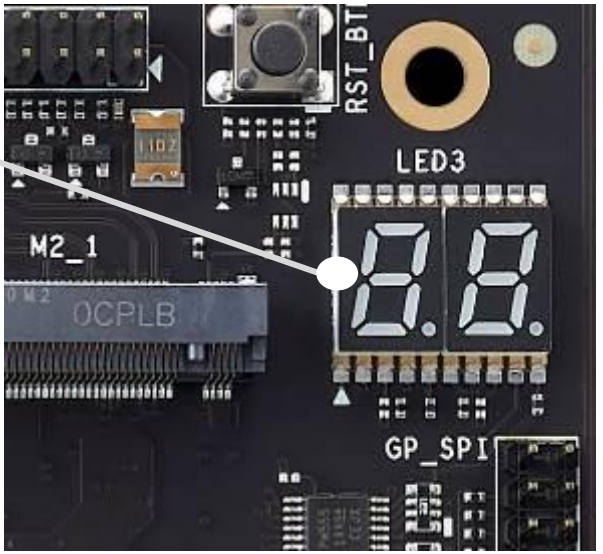


And the **RST_BTN** triggering for resetting of the system.



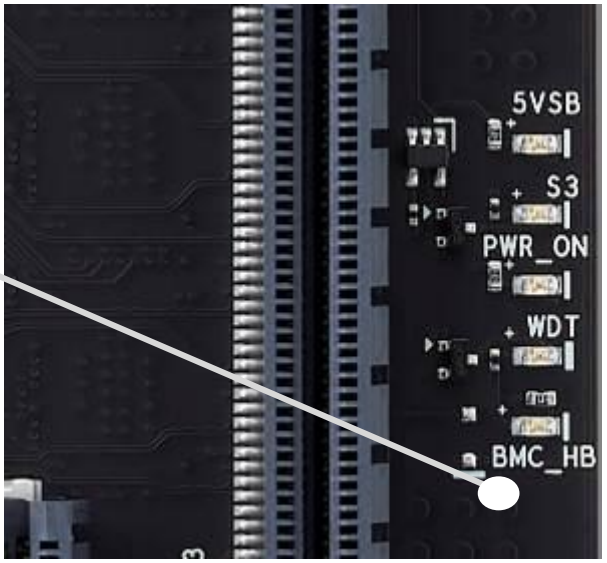
6.2 POST and inductors LEDs

An eSPI based POST display is added for debugging.
The two 7-SEG LEDs shows the actual **POST data.**



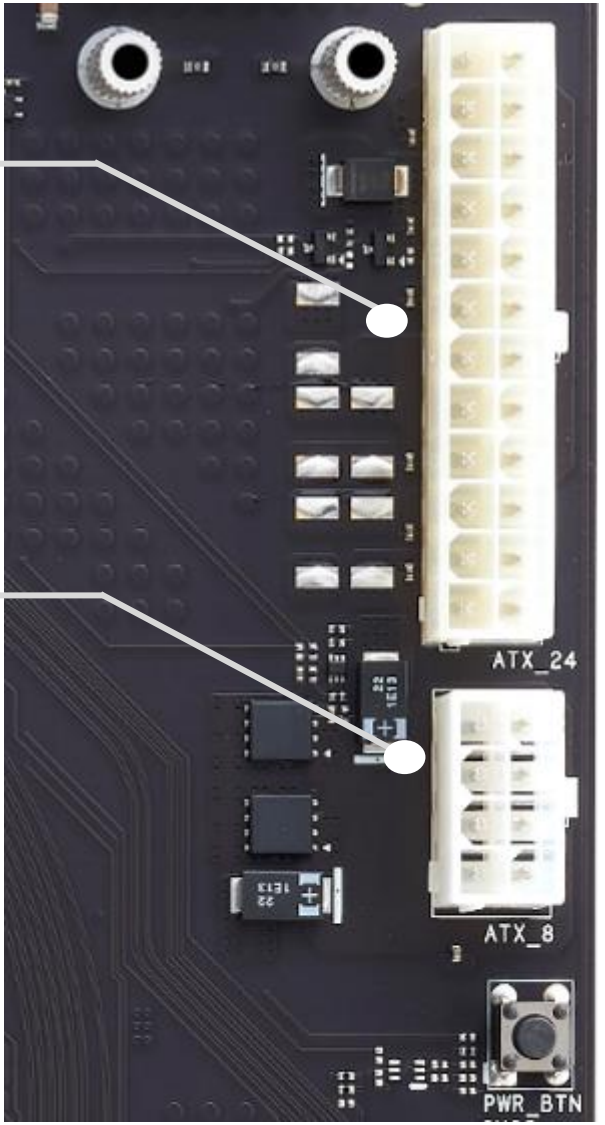
A row of mini-LEDs to below of the POST display indicates the following:

5VSB: ATX power attached on standby or active
S3: Indicates S3 status
PWR_ON: Indicates power on
WDT: Indicates WDT timer activity
BMC_HB: Heart beat LED indicator output



6.3 ATX Power Connectors

The COM-HPC Server BASE has one **ATX 24-pin connector** to supply power to the carrier board and one **ATX 12V 8-pin connector** to supply power to the COM Express module.



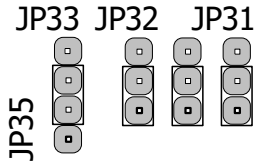
The system will not power on unless an ATX 12V 8-pin connector is connected.
If your power supply has a 24-pin ATX connector, then attach the connectors as shown.

6.4 AT Power Mode

To operate the system in AT Mode with an ATX power supply,
Refer to chapter 6.24 jumpers setting for more details, or follow instruction below.

Jumpers Setting for **ATX mode**

JP31	JP32	JP33	JP35	POWER MODE
1-2	1-2	1-2	2-3	ATX Mode



Jumper Setting for **AT mode**

JP31	JP32	JP33	JP35	POWER MODE
2-3	2-3	2-3	3-4	AT Mode