

User Manual

iEP(F)-9040V-Series



Version	Date	Description	Page
1.00	2026/09	Initial release	

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

ASRock Industrial Website: <https://www.ASRockInd.com>

Important Safety Instructions

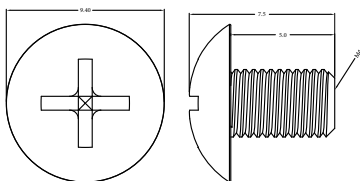
For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Read the Specifications section of this manual for detailed information on the recommended operating environment.
4. Disconnect the equipment from all AC outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or sprayed detergent.
5. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
6. Do not leave the equipment in an environment with a storage temperature of below -40 °C (-40 °F) or above 85 °C (185 °F) as this may cause damage. The equipment should be stored in a controlled environment.
7. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
8. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
9. If the equipment is not used for a long time, disconnect the equipment from the power source to avoid damage from transient over-voltage.
10. All cautions and warnings on the equipment should be noted.
11. To avoid electrical shock and/or damage to the device:
 - Keep the device away from water or liquid sources.
 - Keep the device away from high heat or humidity.
 - Keep device properly ventilated (do not block or cover ventilation openings).
 - Always use designated voltage and power source settings.
 - Always install and operate the device near an easily accessible electrical outlet.
 - Secure the power cord (do not place any object on/over the power cord).
 - Only install/attach and operate the device on stable surfaces and/or designated mountings.
 - The power cord must be connected to a socket or outlet with a ground connection.
12. If one of the following occurs, have 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 is malfunctioning or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.

13. Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools.
14. Any unverified component may cause unexpected damage. To ensure correct installation, always use the components (e.g., screws) provided in the accessory box.
15. This equipment is not suitable for use in locations where children are likely to be present.
16. The equipment should only be installed in a restricted access area.
17. Restricted Access Location:

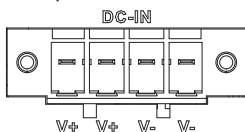
The device must be installed only in a server room or computer room where:

- Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.
- Leave enough clearance (25 inches in the front and 30 inches in the back of the rack) to allow the front door to be opened completely and to allow for sufficient airflow.
- This product is intended for installation only in a Restricted Access Location.
- This product is not suitable for use with visual display devices in the workplace according to §2 of "the German Ordinance for Work with Visual Display Units.
- Desk Mount: M4x5mm Screws (for securing the mounting brackets to the chassis)



18. The equipment is intended to be supplied by the external power source (UL listed/ IEC 60950-1/ IEC 62368-1 approved) whose output complies with ES1/SELV. To reduce potential safety issues, only the AC adapter provided with the product, a replacement AC adapter provided by ASRock Industrial or an agency, or an AC adapter purchased as an accessory from ASRock Industrial or an agency should be used with the product.
19. This power adapter (FSP330-AAAN3) is intended to be supplied based on a UL-certified and suitable for use at an operating/storage temperature of 0 °C (32 °F)~ 40 °C (104 °F)/ -20 °C (-4 °F)~80 °C (176 °F), and the current output is rated 24Vdc 13.75A. If you need further assistance, contact ASRock Industrial for additional information.
20. The ambient temperature of the iEP-9040VE series: 55 °C (131°F) max.; the ambient temperature of the iEPF-9040VS series: 55 °C (131°F) max.

21. The terminal block is suitable for V+V-, with 2 units each (16~18AWG), totaling 4 units. The torque value is 0.69Nm. Please ensure the use of copper conductors only. Kindly note that installation must be carried out by a professional.



22. This product has passed the CE test for environmental specifications when shielded cable are used for external wiring. Shielded interface cables must be used in order to comply with the emission limits.

Replaceable Batteries

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION

RISQUE D'EXPLOSION SI LA PILE EST REMPLACÉE PAR UNE D'UN TYPE INCORRECT. ÉLIMINEZ LES PILES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.



CAUTION (or Warning)

Hot surface.

Do not touch.

ATTENTION (ou Avertissement)

Surface chaude.

Ne pas touche.

BURN HAZARD

Hot surface! Do not touch! Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching.

CAUTION

The equipment is equipped with a battery-powered real-time clock circuit. There is a risk of explosion if a battery is incorrectly replaced. Replace only with the same or equivalent type as designated by the manufacturer. Discard all used batteries according to the manufacturer's instructions.

LITHIUM-METAL BATTERY WARNING

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type designated by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING

All interconnection to the EUT is intended for indoor locations, and as a result, the PoE network interconnected to the EUT is considered ES1/SELV, designed exclusively for connection to the PoE network without routing to the outside plant.

WARNING

Input voltage rated 9~36V, 30~18A.

Packing: The unit should be carried with both hands and handled with care.

Maintenance: Use only approved products or a dry applicator to clean and maintain the surfaces.



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Contact Information

If you need to contact ASRock Industrial or want to know more about ASRock Industrial, you're welcome to visit ASRock Industrial's website at <https://www.ASRockInd.com>; or you may contact your dealer for further information.

ASRock Industrial Incorporation

Email: Info_ipc@asrockind.com

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Chapter 1 Introduction

Thank you for purchasing iEPF-9040VS-EW2 / iEPF-9042VS-EW2 / iEP-9040VE / iEP-9042VE, a reliable barebone system produced under ASRock Industrial's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Industrial's commitment to quality and endurance.



*Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock Industrial's website without further notice. If you require technical support related to this product, please visit our website for specific information about the model you are using.
ASRock Industrial's Website: <https://www.ASRockInd.com>*



The illustrations shown in this manual are examples only. The actual system may differ depending on the product model you purchased.

1.1 Key Features

iEPF-9040VS-EW2

- Intel® Core™ Processors (Series 2) with R680E Chipset
- 2 x 262-pin DDR5 SO-DIMM up to 96GB (48GB per DIMM)
- 2 x PCIe x8 (PCIe Gen4)
- 1 x M.2 Key M
- 4 x USB 3.2 Gen2x1, 2 x Internal USB 3.2 Gen2x1 (optional)
- 2 x COM, 2 x SATA3, 4 x DI, 4 x DO
- 2 x Intel® 1G LAN (LAN1 supports vPro)
- 1 x Displayport, 2 x HDMI 2.0b
- With support for 192 mm (with optional system fans) x 148 mm x 60 mm; 221 mm (without optional system fans) x 148 mm x 60 mm (D x H x W) max. and up to 75W expansion card
- Optional Kit: PoE function card, 10BASE-T1S function card, OOB function card, Internal USB function, System fans (For enhanced thermal performance)

iEPF-9042VS-EW2

- Intel® Core™ Processors (Series 2) with H610 Chipset
- 2 x 262-pin DDR5 SO-DIMM up to 96GB (48GB per DIMM)
- 1 x PCIe x8 (PCIe Gen4)
- 4 x USB 3.2 Gen2x1
- 2 x COM, 2 x SATA3, 4 x DI, 4 x DO

- 2 x Intel® 1G LAN
- 1 x Displayport, 2 x HDMI 2.0b
- With support for 192 mm (with optional system fans) x 148 mm x 60 mm; 221 mm (without optional system fans) x 148 mm x 60 mm (D x H x W) max. and up to 75W expansion card
- Optional Kit: PoE function card, 10BASE-T1S function card, OOB function card, System fans (For enhanced thermal performance)

iEP-9040VE

- Intel® Core™ Processors (Series 2) with R680E Chipset
- 2 x 262-pin DDR5 SO-DIMM up to 96GB (48GB per DIMM)
- 1 x M.2 Key M
- 4 x USB 3.2 Gen2x1, 2 x Internal USB 3.2 Gen2x1 (optional)
- 2 x COM, 2 x SATA3, 4 x DI, 4 x DO
- 2 x Intel® 1G LAN (LAN1 supports vPro)
- 1 x Displayport, 2 x HDMI 2.0b
- Optional Kit: PoE function card, 10BASE-T1S function card, OOB function card, Internal USB function

iEP-9042VE

- Intel® Core™ Processors (Series 2) with H610 Chipset
- 2 x 262-pin DDR5 SO-DIMM up to 96GB (48GB per DIMM)
- 4 x USB 3.2 Gen2x1
- 2 x COM, 2 x SATA3, 4 x DI, 4 x DO
- 2 x Intel® 1G LAN
- 1 x Displayport, 2 x HDMI 2.0b
- Optional Kit: PoE function card, 10BASE-T1S function card, OOB function card

1.2 Package List

No.	Accessories	PN	Q'ty	Picture	Description
1	Rubber Foot	13G09P005000AI	4		Protect the device from damage while moving it.
2	M4x8 Screw for rubber foot	NA	4		To fix the rubber foot.
3	Desk Mount	13G02P133000AI	2		To attach the device to any horizontal surface.
4	M4x8 Screw for desk mount	NA	4		To fix the desk mount to chassis.
5	Terminal Block 1x4P ST 7.62m	12G082001040AI	1		For power supply.
6	M3x2.5 Screw	13G02P072010AK	1		To fix M.2 (iEP-9040VE & iEPF-9040VS-EW2 only).
7	4x4 EPE Bag	15G162200200AI	1		For QIG.
8	QIG	15G06M162000AI	1		Quick Installation Guide



1. If any items are missing or appear damaged, contact your authorized dealer.
2. Based on different configuration, package list may be different.

Note:

Please refer to the following for more information about the adapters:

330W Power adapter

- Input voltage: 100-240V AC
- Input frequency: 47-63 Hz (± 1 Hz)
- Rating output current: 13.75A
- Rating output voltage: 24.0 V $\pm 5\%$



1. Actual power consumption may differ based on different applications and different hardware configurations. Sufficient power for the entire system is required to meet these specifications. We recommend that 330W adapter (Certified adapter, Output: 24Vdc, 13.75A) is used on the systems. Users may use a DC source instead of the optional 330W adapter (Certified adapter, Output: 24Vdc, 13.75A) in an environment where the temperature is 40 °C.
2. External power source ratings:
330W Power adapter: 24V DC, 13.75A; Operating Temperature 40°C.



WARNING! Use ONLY approved NRTL LISTED ITE power supply with electrical ratings.

1.3 Order Information

Model Name	PN	Description
iEP-9040VE	90PXGFB0-00000000	Intel® Core™ Processors (Series 2) with R680E chipset, W/O CPU, RAM, SSD, ADAPTER
iEP-9042VE	90PXGGH0-00000000	Intel® Core™ Processors (Series 2) with H610 chipset, W/O CPU, RAM, SSD, ADAPTER
iEPF-9040VS-EW2	90PXGFB0-I0000000	Intel® Core™ Processors (Series 2) with R680E chipset, W/O CPU, RAM, SSD, ADAPTER
iEPF-9042VS-EW2	90PXGGH0-I0000000	Intel® Core™ Processors (Series 2) with H610 chipset, W/O CPU, RAM, SSD, ADAPTER

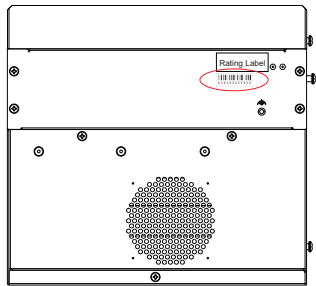
1.4 Optional Items

Model Name	PN	Description
ACPWR CORD EU+KR; L=1.8M (品頭)	14G110001800AK	立訊 /L72AC007-SD-R
AC POWER CORD CN L:1.8M (品頭)	14G110001300AK	I-SHENG/Y646B301912180Q
US PWR CORD, L:1.5M BLACK (品頭)	14G110001100AK	立訊 /L72AC001-SD-R
ADAPTER 330W 24V W/O CONN(PHX)	04G266001200AI	FSP/FSP330-AAAN3/9NA3300215

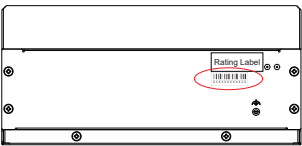
1.5 Serial Number Label

The serial number is printed below or above the bar code and can be found on the rear side of the chassis.

1.5.1 Serial Number Label Location



iEPF-9040VS Series



iEP-9040VE Series

1.5.2 Serial Number Label Illustration



1.6 Specifications

iEPF-9040VS-EW2

Processor System	CPU	Intel® Core™ Processors (Series 2)
	Chipset	Intel® R680E
	Socket	LGA 1700
Memory	Technology	Dual Channel DDR5 5600MHz (ECC memory supported by R680E + Selected CPU)
	Capacity	96 GB (48GB per DIMM)
	Socket	2 x 262-pin SO-DIMM
Graphics	Controller	Intel® UHD Graphics
	DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
	HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
Expansion Slot	PCIe	2 x PCIe Gen4 x8
Audio	Interface	Realtek ALC897, High Definition Audio
Ethernet	Controller/ Speed	1 x Intel® i219LM (vPro Support) 1 x Intel® i210IT
	Controller	2 x RJ-45
Storage	M.2	1 x M.2 (Key M, 2242/2260/2280/22110/25110) with Gen4 x4 for NVMe SSD
	SATA	2 x SATA3 (6Gb/s), support RAID 0/1
	CFast (Option)	1 x Type II socket (Shared with SATA3)
Front I/O	DisplayPort	1
	HDMI	2
	Ethernet	2 x Intel® 1G LAN
	USB	4 x USB 3.2 Gen2x1, 2 x Internal USB 3.2 Gen2x1 (optional)
	Audio	1 x Line-in, 1 x Line-out
	COM	2 x RS232/422/485
	DIO	4DIs/4DOs
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255sec
Power Requirements	Input PWR	9V~36V DC
Environment	Operating Temperature	45W CPU: - 40 °C ~ 55 °C (-40 °F ~ 131 °F) 65W CPU: - 40 °C ~ 50 °C (-40 °F ~ 122 °F) (without Add-on Card) (w/ air flow 0.5~0.8 m/s)
	Storage Temperature	-40°C~85°C (-40°F~185°F)
	Humidity	~95% @ 40°C (non-condensing)
	Shock	MIL-STD-810H, Method 516.8, Procedure I
	Vibration	MIL-STD-810H, Method 514.8
	ESD	Contact +/-4kV, Air +/-8kV
	EMC	EN61000-6-4/-2, CE & FCC Class A
	Safety	LVD

Mechanical	Construction	Aluminum heatsink + Metal chassis
	Mounting	Desk Mount
	Dimensions	187mm (W) x 231.1mm (D) x 200mm (H) (7.36" x 9.10" x 7.87")
	Net Weight	7.5kg
Others	OS Support	Windows 11 & Windows 10 & Linux
	TPM	TPM 2.0
	Real-Time Enablement	TSN, TCC support under YOCTO

iEPF-9042VS-EW2

Processor System	CPU	Intel® Core™ Processors (Series 2)
	Chipset	Intel® H610
	Socket	LGA 1700
Memory	Technology	Dual Channel DDR5 5600MHz
	Capacity	96 GB (48GB per DIMM)
	Socket	2 x 262-pin SO-DIMM
Graphics	Controller	Intel® UHD Graphics
	DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
	HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
Expansion Slot	PCIe	1 x PCIe Gen4 x8
Audio	Interface	Realtek ALC897, High Definition Audio
Ethernet	Controller/ Speed	1 x Intel® i219V 1 x Intel® i210IT
	Controller	2 x RJ-45
	SATA	2 x SATA3 (6Gb/s)
	CFast (Option)	1 x Type II socket (Shared with SATA3)
Front I/O	DisplayPort	1
	HDMI	2
	Ethernet	2 x Intel® 1G LAN
	USB	4 x USB 3.2 Gen2x1
	Audio	1 x Line-in, 1 x Line-out
	COM	2 x RS232/422/485
	DIO	4DIs/4DOs
Watchdog Timer	Output	From Super I/O to drag RESETCON#
	Interval	256 Segments, 0, 1, 2, ...255sec
Power Requirements	Input PWR	9V~36V DC
Environment	Operating Temperature	45W CPU: - 40 °C ~ 55 °C (-40 °F ~ 131 °F) 65W CPU: - 40 °C ~ 50 °C (-40 °F ~ 122°F)
	Storage Temperature	-40°C~85°C (-40°F~185°F)
	Humidity	~95% @ 40°C (non-condensing)
	Shock	MIL-STD-810H, Method 516.8, Procedure I
	Vibration	MIL-STD-810H, Method 514.8
	ESD	Contact +/-4kV, Air +/-8kV
	EMC	EN61000-6-4/-2, CE & FCC Class A
	Safety	LVD

Mechanical	Construction	Aluminum heatsink + Metal chassis
	Mounting	Desk Mount
	Dimensions	187mm (W) x 231.1mm (D) x 200mm (H) (7.36" x 9.10" x 7.87")
	Net Weight	7.5kg
Others	OS Support	Windows 11 & Windows 10 & Linux
	TPM	TPM 2.0
	Real-Time Enablement	TSN, TCC support under YOCTO

iEP-9040VE

Processor System	CPU	Intel® Core™ Processors (Series 2)
	Chipset	Intel® R680E
	Socket	LGA 1700
Memory	Technology	Dual Channel DDR5 5600MHz (ECC memory supported by R680E + Selected CPU)
	Capacity	96 GB (48 GB per DIMM)
	Socket	2 x 262-pin SO-DIMM
Graphics	Controller	Intel® UHD Graphics
	DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
	HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
Audio	Interface	Realtek ALC897, High Definition Audio
Ethernet	Controller/ Speed	1 x Intel® i219LM (vPro Support) 1 x Intel® i210IT
	Controller	2 x RJ-45
Storage	M.2	1 x M.2 (Key M, 2242/2260/2280/22110/25110) with Gen4 x4 for NVMe SSD
	SATA	2 x SATA3 (6Gb/s), support RAID 0/1
	CFast (Option)	1 x Type II socket (Shared with SATA3)
Front I/O	DisplayPort	1
	HDMI	2
	Ethernet	2 x RJ45
	USB	4 x USB 3.2 Gen2x1 2 x Internal USB 3.2 Gen2x1 (optional)
	Audio	1 x Line-in, 1 x Line-out
	COM	2 x RS232/422/485
	DIO	4DIs/4DOs
Watchdog Timer	Output	From Super I/O to drag RESETCON#
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Power Requirements	Input PWR	9V~36V DC
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	Storage Temperature	-40°C~85°C (-40°F~185°F)
	Humidity	~95% @ 40°C (non-condensing)
	Shock	MIL-STD-810H, Method 516.8, Procedure I
	Vibration	MIL-STD-810H, Method 514.8
	ESD	Contact +/-4kV, Air +/-8kV
	EMC	EN61000-6-4/-2, CE & FCC Class A
	Safety	LVD

Mechanical	Construction	Aluminum heatsink + Metal chassis
	Mounting	Desk Mount
	Dimensions	200mm (W) x 230mm (D) x 93mm (H) (7.87" x 9.06" x 3.66")
	Net Weight	6kg
Others	OS Support	Windows 11 & Windows 10 & Linux
	TPM	TPM 2.0
	Real-Time Enablement	TSN, TCC support under YOCTO

iEP- 9042VE

Processor System	CPU	Intel® Core™ Processors (Series 2)
	Chipset	Intel® H610
	Socket	LGA 1700
Memory	Technology	Dual Channel DDR5 5600MHz
	Capacity	96 GB (48 GB per DIMM)
	Socket	2 x 262-pin SO-DIMM
Graphics	Controller	Intel® UHD Graphics
	DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
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	Controller	2 x RJ-45
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	CFast (Option)	1 x Type II socket (Shared with SATA3)
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	HDMI	2
	Ethernet	2 x Intel® 1G LAN
	USB	4 x USB 3.2 Gen2x1
	Audio	1 x Line-in, 1 x Line-out
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	Humidity	~95% @ 40°C (non-condensing)
	Shock	MIL-STD-810H, Method 516.8, Procedure I
	Vibration	MIL-STD-810H, Method 514.8
	ESD	Contact +/-4kV, Air +/-8kV
	EMC	EN61000-6-4/-2, CE & FCC Class A
	Safety	LVD

Mechanical	Construction	Aluminum heatsink + Metal chassis
	Mounting	Desk Mount
	Dimensions	200mm (W) x 230mm (D) x 93mm (H) (7.87" x 9.06" x 3.66")
	Net Weight	6kg
Others	OS Support	Windows 11 & Windows 10 & Linux
	TPM	TPM 2.0
	Real-Time Enablement	TSN, TCC support under YOCTO

1.7 CPU Support List

iEPF-9040VS-EW2 / iEP-9040VE

The Performance of CPUs over 80W will be limited due to power design.

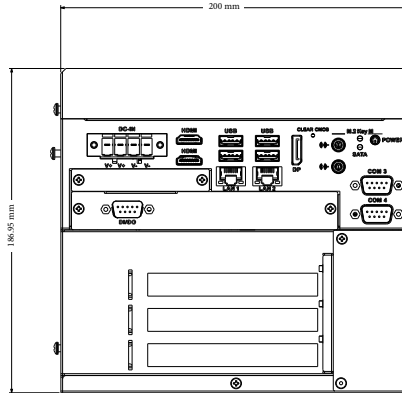
Socket	Family	Number	Core	Frequency	Cache	Power	Since BIOS
1700	Core 9	273PE(A0)	Bartlett Lake-S	2.3GHz	36MB	65W	P1.00
1700	Core 9	273PQE(A0)	Bartlett Lake-S	3.4GHz	36MB	125W	P1.00
1700	Core 9	273PTE(A0)	Bartlett Lake-S	1.4GHz	36MB	45W	P1.00
1700	Core 7	253PE(A0)	Bartlett Lake-S	2.5GHz	33MB	65W	P1.00
1700	Core 7	253PQE(A0)	Bartlett Lake-S	3.5GHz	33MB	125W	P1.00
1700	Core 7	253PTE(A0)	Bartlett Lake-S	1.8GHz	33MB	45W	P1.00
1700	Core 7	251E(B0)	Bartlett Lake-S	2.1GHz	36MB	65W	P1.00
1700	Core 7	251TE(B0)	Bartlett Lake-S	1.4GHz	36MB	45W	P1.00
1700	Core 5	223PE(A0)	Bartlett Lake-S	2.9GHz	24MB	65W	P1.00
1700	Core 5	223PQE(A0)	Bartlett Lake-S	4.0GHz	24MB	125W	P1.00
1700	Core 5	223PTE(A0)	Bartlett Lake-S	2.3GHz	24MB	45W	P1.00
1700	Core 5	213PE(A0)	Bartlett Lake-S	2.7GHz	24MB	65W	P1.00
1700	Core 5	221E(C0)	Bartlett Lake-S	2.7GHz	24MB	65W	P1.00
1700	Core 5	221TE(C0)	Bartlett Lake-S	1.8GHz	24MB	45W	P1.00
1700	Core 5	211E(B0)	Bartlett Lake-S	2.7GHz	20MB	65W	P1.00
1700	Core 5	211TE(C0)	Bartlett Lake-S	1.7GHz	20MB	45W	P1.00
1700	Core 3	201E(H0)	Bartlett Lake-S	3.6GHz	12MB	60W	P1.00
1700	Core 3	201TE(H0)	Bartlett Lake-S	2.9GHz	12MB	45W	P1.00

iEPF-9042VS-EW2 / iEP-9042VE

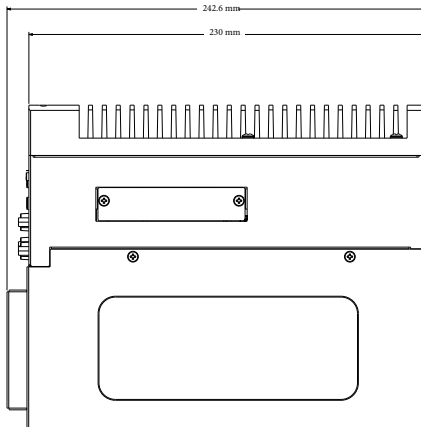
The Performance of CPUs over 80W will be limited due to power design.

Socket	Family	Number	Core	Frequency	Cache	Power	Since BIOS
1700	Core 9	273PE(A0)	Bartlett Lake-S	2.3GHz	36MB	65W	P1.20
1700	Core 9	273PQE(A0)	Bartlett Lake-S	3.4GHz	36MB	125W	P1.20
1700	Core 9	273PTE(A0)	Bartlett Lake-S	1.4GHz	36MB	45W	P1.20
1700	Core 7	253PE(A0)	Bartlett Lake-S	2.5GHz	33MB	65W	P1.20
1700	Core 7	253PQE(A0)	Bartlett Lake-S	3.5GHz	33MB	125W	P1.20
1700	Core 7	253PTE(A0)	Bartlett Lake-S	1.8GHz	33MB	45W	P1.20
1700	Core 7	251E(B0)	Bartlett Lake-S	2.1GHz	36MB	65W	P1.20
1700	Core 7	251TE(B0)	Bartlett Lake-S	1.4GHz	36MB	45W	P1.20
1700	Core 5	223PE(A0)	Bartlett Lake-S	2.9GHz	24MB	65W	P1.20
1700	Core 5	223PQE(A0)	Bartlett Lake-S	4.0GHz	24MB	125W	P1.20
1700	Core 5	223PTE(A0)	Bartlett Lake-S	2.3GHz	24MB	45W	P1.20
1700	Core 5	213PE(A0)	Bartlett Lake-S	2.7GHz	24MB	65W	P1.20
1700	Core 5	221E(C0)	Bartlett Lake-S	2.7GHz	24MB	65W	P1.20
1700	Core 5	221TE(C0)	Bartlett Lake-S	1.8GHz	24MB	45W	P1.20
1700	Core 5	211E(B0)	Bartlett Lake-S	2.7GHz	20MB	65W	P1.20
1700	Core 5	211TE(C0)	Bartlett Lake-S	1.7GHz	20MB	45W	P1.20
1700	Core 3	201E(H0)	Bartlett Lake-S	3.6GHz	12MB	60W	P1.20
1700	Core 3	201TE(H0)	Bartlett Lake-S	2.9GHz	12MB	45W	P1.20

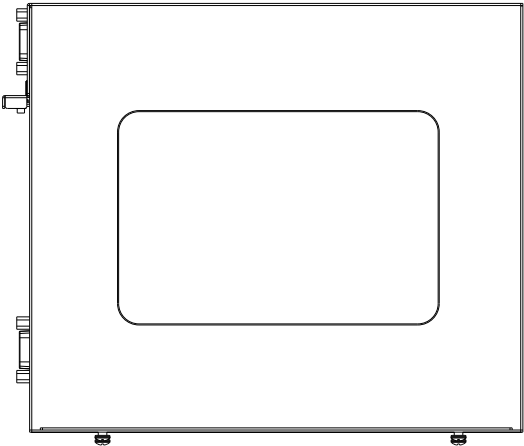
Front View



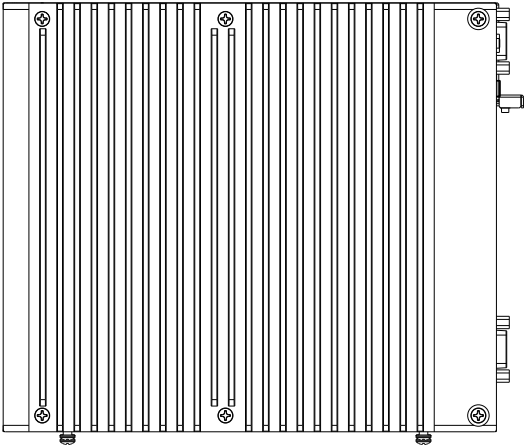
Top View



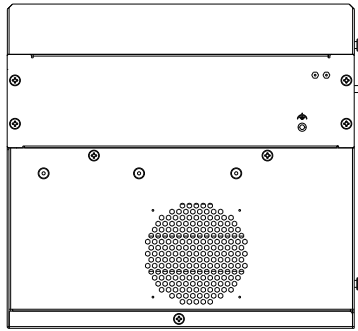
Right-Side View



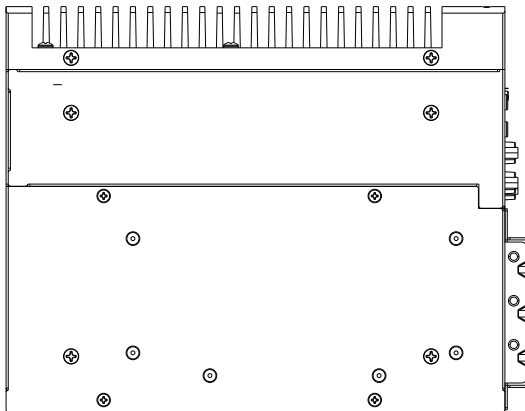
Left-Side View



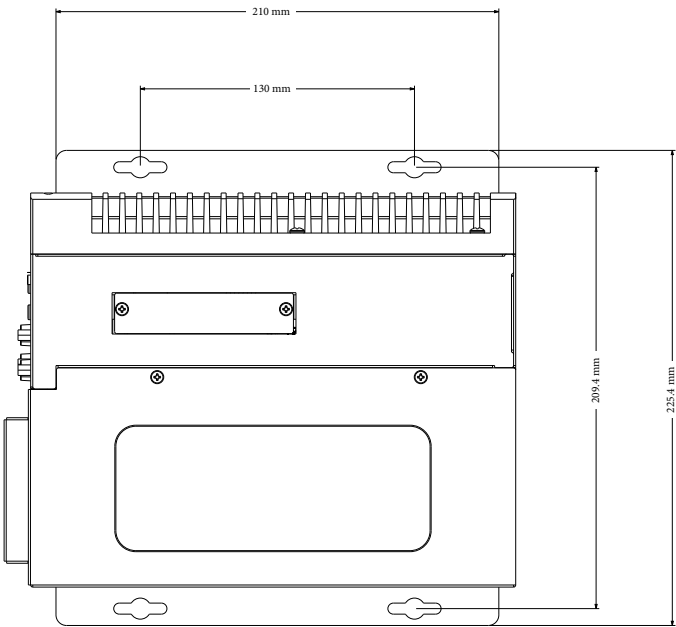
Rear-Side View



Bottom View

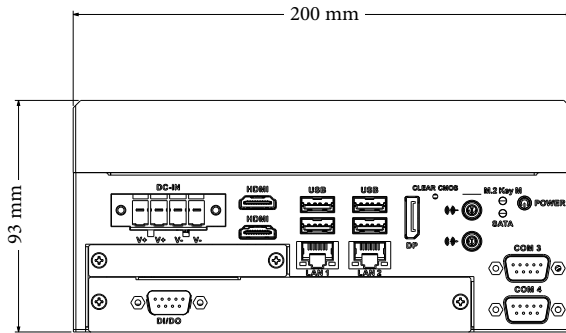


Desk Mounting Bracket

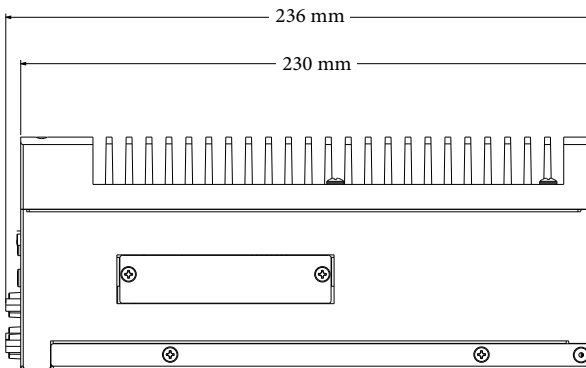


iEP-9040VE/iEP-9042VE

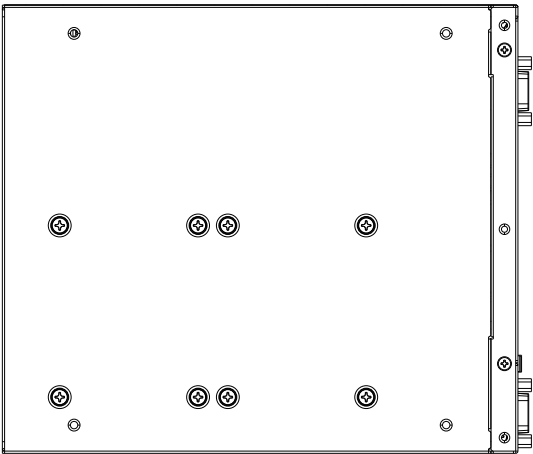
Front View



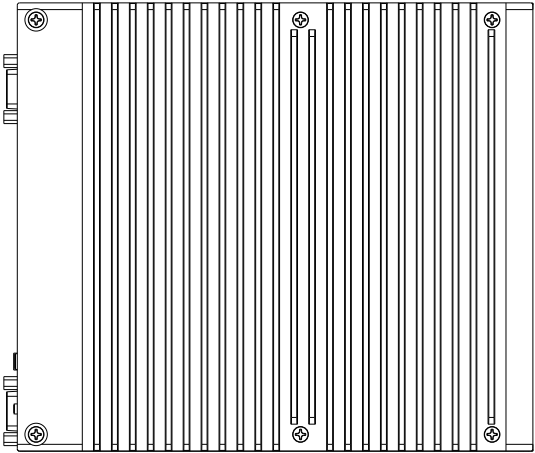
Top View



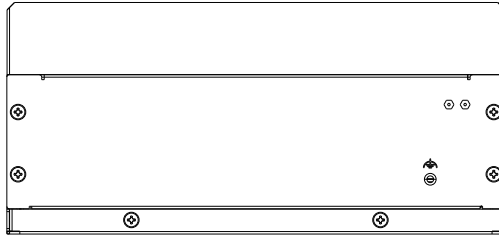
Right-Side View



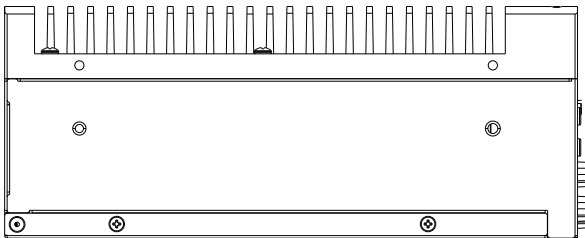
Left-Side View



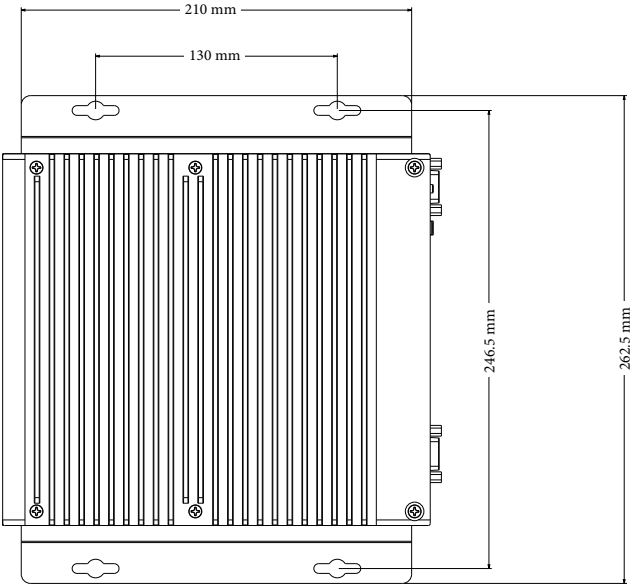
Rear-Side View



Bottom View

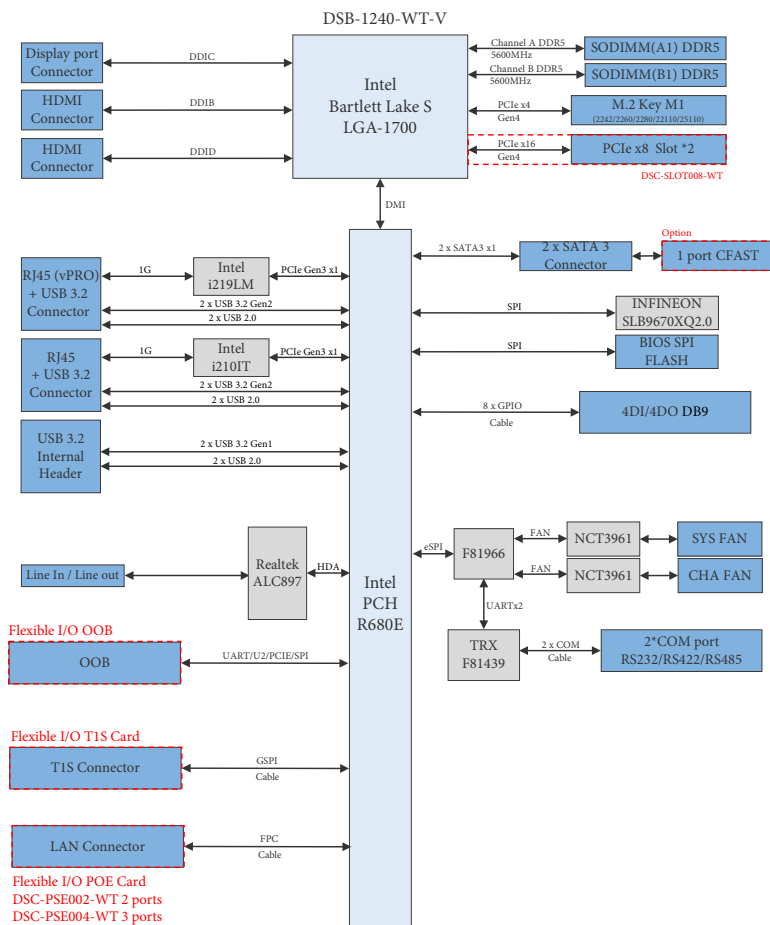


Desk Mounting Bracket

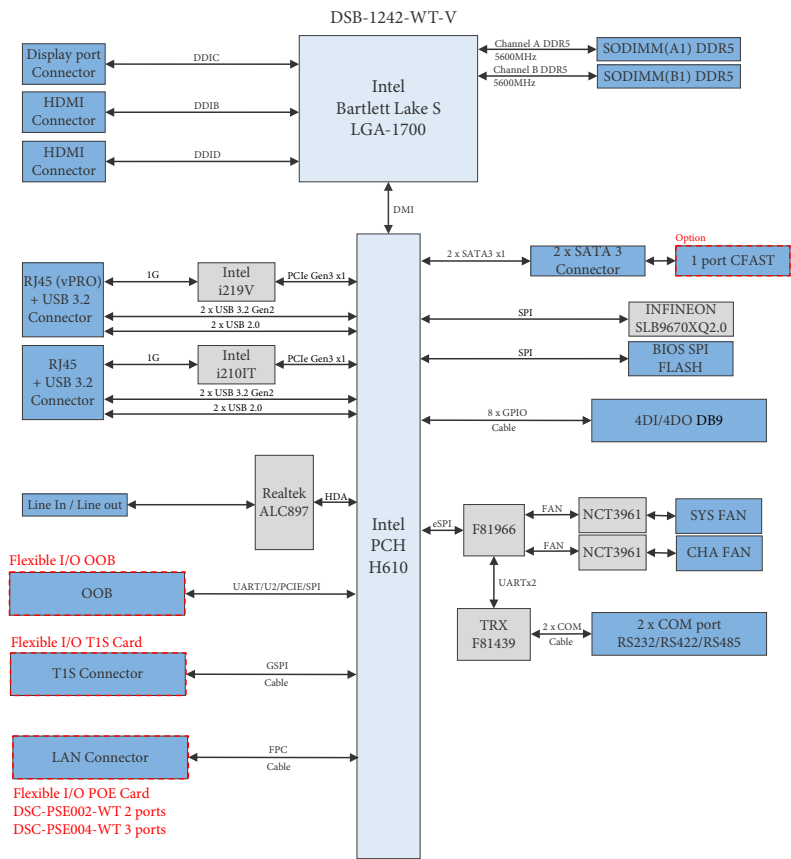


1.9 Block Diagram

iEP(F)-9040V Series



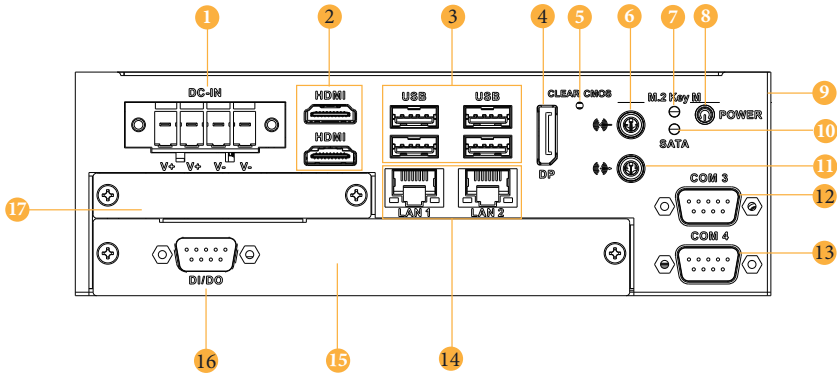
iEP(F)-9042V Series



Chapter 2 Product Overview

This chapter provides diagrams that display the location of important components of the system.

2.1 System Front Panel



No.	Item	Description
1	DC Power Input (DC-IN)	Insert a power cable to this connector for power supply.
2	HDMI	For high-definition video and audio connections.
3	USB 3.2 Gen2x1 Ports	This system provides four USB 3.2 Gen2 ports on the I/O panel.
4	DisplayPort	DisplayPort supports channel dual mode and up to 4096x2160 resolution at 60 Hz.
5	Clear CMOS Button	Use this button to manually reset the system, Press and hold the reset switch for a few seconds to reboot the system without shutting it off.
6, 11	Audio Line-in & Line-out	The Mic-in audio connector on the I/O panel supports 5.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. Connect stereo speakers to the Mic-out connector for better sound quality.
7	M.2 Slot (Key M) Status LED (R680E chipset only)	If M.2 slot is populated with M.2 module and working, it will show a blinking green.

No.	Item	Description
8	Power Switch	Press the power switch button to toggle the system power-on and power-off modes. The power button is a non-latched push button with a blue LED indicator. The system is turned on when the button is depressed, and the power LED lights up. If the system hangs, depress the button for 5 seconds to turn off the system completely. To remove power from the system completely, disconnect the power cord from the system.
9	T1S function Port or AIOOB function Port or None	This position can be populated with the T1S function card, the AIOOB function card, or the cover panel.
10	HDD SATA Status LED	If HDD SATA is populated and working, it will show a blinking green.
12, 13	Serial Port COM3, 4	This system provides six COM ports through D-sub 9-pin connectors. Serial ports COM3 and COM4 can support RS232/RS422/RS485.
14	LAN RJ-45 Port	There are two types of LEDs on the LAN port. Please refer to the "Ethernet Ports LED" section.
15	PoE function card or Cover Panel	This position can be populated with the PoE function card (2 ports or 3 ports), or the cover panel.
16	Digital Input, Digital Output	This system provides non-isolated digital input/output circuits for the customer's device. The electrical contacts send or receive digital signals.
17	Internal USB 3.2 Gen 2x1 Port or Cover Panel	This position can be used to route an internal USB 3.2 Gen 2x1 port to the exterior, or be covered with the cover panel.

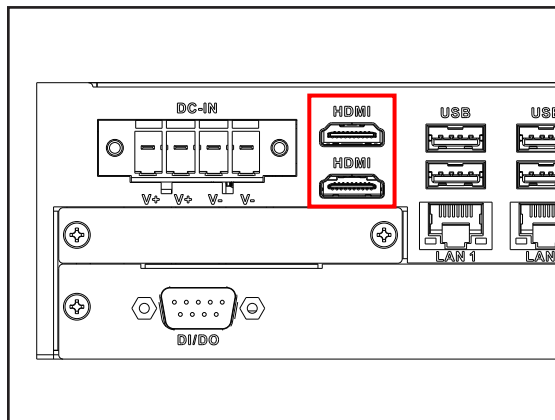
- The PoE ports on the system are only be linked to the PoE networks in the indoor environment. They would be not connected the networks in the outdoor space.

2.1.1 System Front Panel I/O Functions

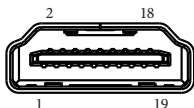
HDMI2.0b Port

(1) [No. 2 : HDMI2.0b Port](#)

(2) System front panel location



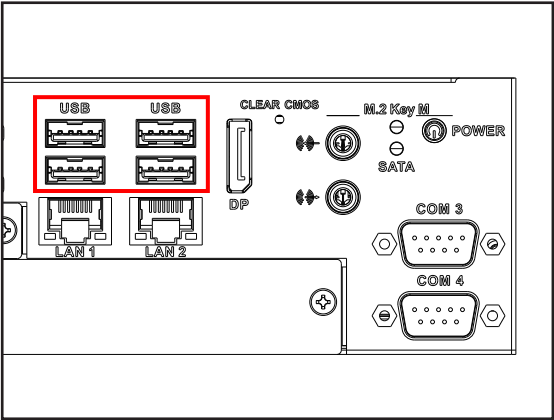
(3) Icon / Pin definition:



Pin	Signal	Pin	Signal
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock-
3	TMDS Data2-	13	NA
4	TMDS Data1+	14	Reserved
5	TMDS Data1 Shield	15	DDC Clock
6	TMDS Data1-	16	DDC Data
7	TMDS Data0+	17	DDC
8	TMDS Data0 Shield	18	+5V Power
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+	20	

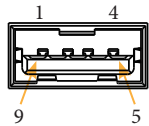
USB 3.2 Gen2 Ports

- (1) [No. 3 : USB 3.2 Gen2x1 Ports](#)
- (2) System front panel location



- (3) Icon / Pin definition:

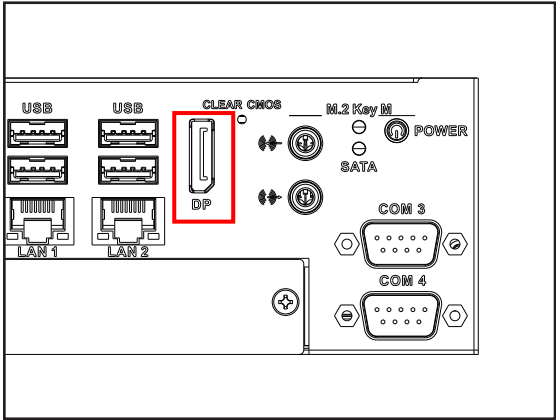
USB 3.2 Gen2x1



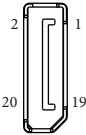
Pin	Signal	Pin	Signal
1	+5V_USB_PWR	6	SSRX+
2	USB_D-	7	GND
3	USB_D+	8	SSTX-
4	GND	9	SSTX+
5	SSRX		

Display Ports 1.4a

- (1) [No. 4 : Display Port](#)
- (2) System front panel location



- (3) Icon / Pin definition:



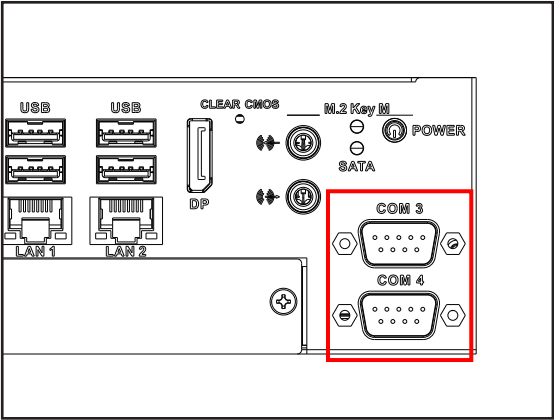
Pin	Signal	Pin	Signal
1	ML_Lane 0(p)	11	GND
2	GND	12	ML_Lane 3(n)
3	ML_Lane 0(n)	13	GND
4	ML_Lane 1(p)	14	GND
5	GND	15	AUX_CH(p)
6	ML_Lane 1(n)	16	GND
7	ML_Lane 2(p)	17	AUX_CH(n)
8	GND	18	Hot Plug
9	ML_Lane 2(n)	19	DP_PWR Return
10	ML_Lane 3(p)	20	DP_PWR

Serial Ports (COM1~COM6)

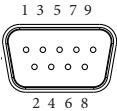
(1) [No. 12 : COM3](#)

[No. 13 : COM4](#)

(2) System front panel location



(3) Icon / Pin definition:

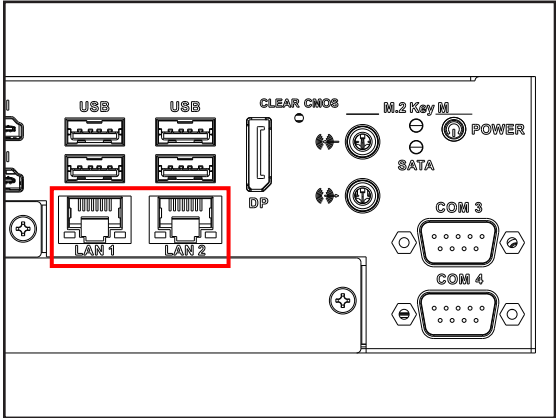


Pin	RS232	RS422	RS485
1	DCD, Data Carrier Detect	TX-	RTX-
2	RXD, Receive Data	TX+	RTX+
3	TXD, Transmit Data	RX+	N/A
4	DTR, Data Terminal Ready	RX-	N/A
5	GND	GND	GND
6	DSR, Data Set Ready	N/A	N/A
7	RTS, Request To Send	N/A	N/A
8	CTS, Clear To Send	N/A	N/A
9	N/A	N/A	N/A

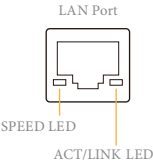
Ethernet Ports LED

- (1) [No. 14 : LAN RJ-45 Port \(LAN1, supports vPro, R680E chipset only\);
LAN RJ-45 Port \(LAN2\)](#)

- (2) System front panel location



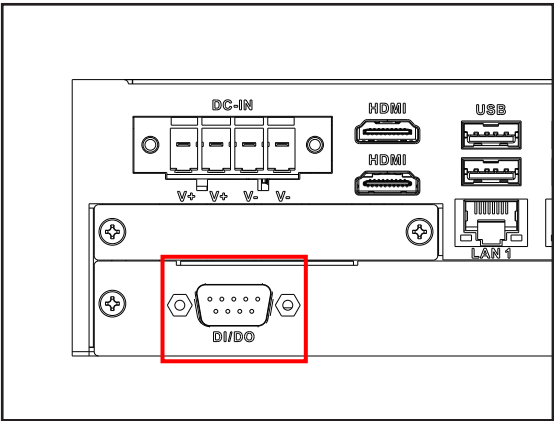
- (3) Icon / Pin definition:



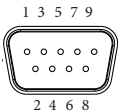
Port	LED Type	LED Color	10Mbps	100Mbps	1000Mbps	2500Mbps
LAN1~ LAN2	ACT/LINK LED	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow
	SPEED LED	Green/ Orange	Off	Off	Solid Orange	Solid Green

Digital Input/Output

- (1) [No. 16 : Digital Input, Digital Output](#)
- (2) System front panel location



- (3) Icon / Pin definition:

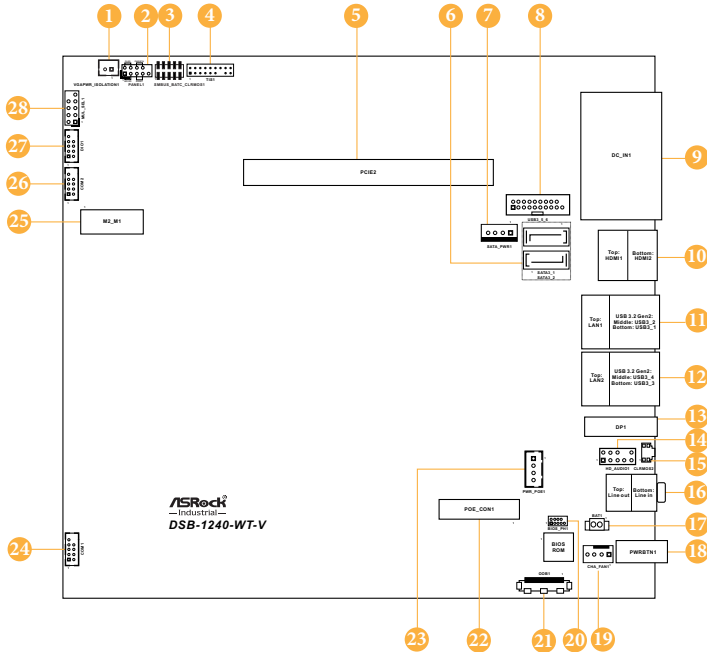


Pin	Signal
1	DI0
2	DI1
3	DI2
4	DI3
5	GND
6	DO0
7	DO0
8	DO2
9	DO3

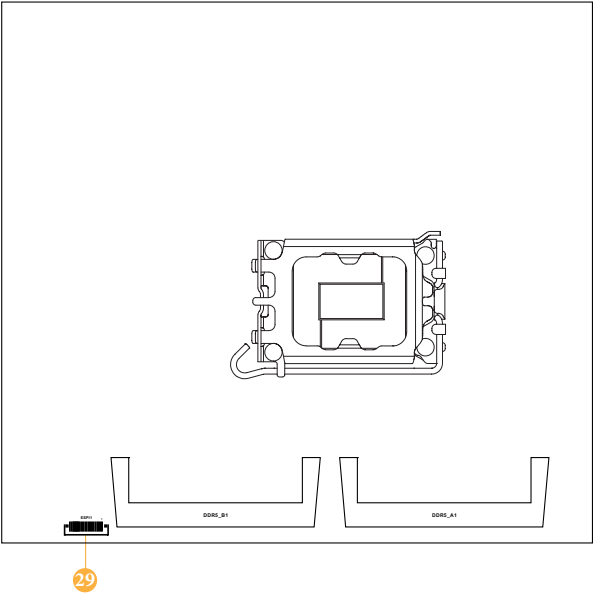
2.2 Motherboard

2.2.1 Motherboard Layout for iEP(F)-9040V Series

Top Side



Bottom Side

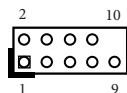


1 : VGAPWR_ISOLATION1



Pin	Signal Name
1	PSON#
2	GND

2 : System Panel Header (PANEL1)



Pin	Signal Name	Pin	Signal Name
1	HDLED+	2	PLED+
3	HDLED-	4	PLED-
5	GND	6	PWRBTN#
7	RESET#	8	GND
9	GND	10	

This header accommodates several system front panel functions.

Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is

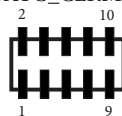
in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

3 : SMBUS_BATC_CLRMOSE1



Pin	Signal Name	Pin	Signal Name
1	SMBUS GPIO	2	+BAT_CH_R
3	SMBUS_CLK	4	+BAT_CH
5	SMBUS_DATA	6	RTCRST#
7	NA	8	GND
9	DACC	10	GND

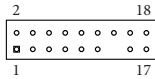
SMBUS_CLRMOSE1:24 BAT charge

SMBUS_CLRMOSE1:68 Clear CMOS

SMBUS_CLRMOSE1:910 DACC

NOTE: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finished updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile will be cleared only if the CMOS battery is removed.

4 : T1S1



Pin	Signal Name	Pin	Signal Name
1	NA	2	NA
3	NA	4	NA
5	GSPI3_ CS0#_+3V	6	NA
7	GSPI3_ MISO_+3V	8	NA
9	GSPI3_ MOSI_+3V	10	+1.8VSB
11	GSPI3_ CLK_+3V	12	+1.8VSB
13		14	+3VSB
15	T1S_0_RST_ N	16	+3VSB
17	BUF_PLT_ RST#	18	+3VSB

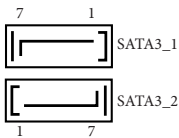
5 : PCIE2

Pin	Signal Name	Pin	Signal Name
A1	GND	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	X16_ CLKREQ#_ R	B4	GND
A5	PCH_ ECLK_X8	B5	SMB_CLK_ MAIN
A6	PCH_ ECLK_X8#	B6	SMB_ MAIN_ MAIN
A7	SMB_CLK	B7	GND
A8	SMB_DATA	B8	+3V
A9	+3V	B9	RESERVED
A10	+3V	B10	+3VSB
A11	BUF_PLT_ RST#	B11	WAKE#
A12	GND	B12	RESERVED
A13	PCH_ ECLK_X16_ R	B13	GND
A14	PCH_ ECLK_ X16#_ R	B14	PEG_TXP0_ R
A15	GND	B15	PEG_ TXN0_ R
A16	PEG_RXP0	B16	GND
A17	PEG_RXN0	B17	RESERVED
A18	SLOT_SEL0	B18	GND

A19	SLOT_SEL1	B19	PEG_TXP1_ R
A20	SLOT_SEL2	B20	PEG_ TXN1_ R
A21	PEG_RXP1	B21	GND
A22	PEG_RXN1	B22	GND
A23	GND	B23	PEG_TXP2_ R
A24	GND	B24	PEG_ TXN2_ R
A25	PEG_RXP2	B25	GND
A26	PEG_RXN2	B26	GND
A27	GND	B27	PEG_TXP3_ R
A28	GND	B28	PEG_ TXN3_ R
A29	PEG_RXP3	B29	GND
A30	PEG_RXN3	B30	CFG_X8
A31	GND	B31	RESERVED
A32	SLOT_SEL1	B32	GND
A33	SLOT_SEL2	B33	PEG_TXP4_ R
A34	GND	B34	PEG_ TXN4_ R
A35	PEG_RXP4	B35	GND
A36	PEG_RXN4	B36	GND
A37	GND	B37	PEG_TXP5_ R
A38	GND	B38	PEG_ TXN5_ R
A39	PEG_RXP5	B39	GND
A40	PEG_RXN5	B40	GND
A41	GND	B41	PEG_TXP6_ R
A42	GND	B42	PEG_ TXN6_ R
A43	PEG_RXP6	B43	GND
A44	PEG_RXN6	B44	GND
A45	GND	B45	PEG_TXP7_ R
A46	GND	B46	PEG_ TXN7_ R
A47	PEG_RXP7	B47	GND
A48	PEG_RXN7	B48	X8_ CLKREQ#
A49	GND	B49	GND
A50	SLOT_SEL3	B50	PEG_TXP8_ R
A51	GND	B51	PEG_ TXN8_ R
A52	PEG_RXP8	B52	GND
A53	PEG_RXN8	B53	GND
A54	GND	B54	PEG_TXP9_ R
A55	GND	B55	PEG_ TXN9_ R
A56	PEG_RXP9	B56	GND
A57	PEG_RXN9	B57	GND

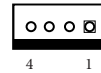
A58	GND	B58	PEG_TXP10_R
A59	GND	B59	PEG_TXN10_R
A60	PEG_RXP10	B60	GND
A61	PEG_RXN10	B61	GND
A62	GND	B62	PEG_TXP11_R
A63	GND	B63	PEG_TXN11_R
A64	PEG_RXP11	B64	GND
A65	PEG_RXN11	B65	GND
A66	GND	B66	PEG_TXP12_R
A67	GND	B67	PEG_TXN12_R
A68	PEG_RXP12	B68	GND
A69	PEG_RXN12	B69	GND
A70	GND	B70	PEG_TXP13_R
A71	GND	B71	PEG_TXN13_R
A72	PEG_RXP13	B72	GND
A73	PEG_RXN13	B73	GND
A74	GND	B74	PEG_TXP14_R
A75	GND	B75	PEG_TXN14_R
A76	PEG_RXP14	B76	GND
A77	PEG_RXN14	B77	GND
A78	GND	B78	PEG_TXP15_R
A79	GND	B79	PEG_TXN15_R
A80	PEG_RXP15	B80	GND
A81	PEG_RXN15	B81	+5VSB
A82	GND	B82	+5VSB

6 : SATA3 Connectors
(SATA3_1, SATA3_2)



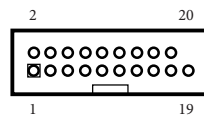
Pin	Signal Name
1	GND
2	SATA-A+
3	SATA-A-
4	GND
5	SATA-B-
6	SATA-B+
7	GND

7 : SATA Power Output Connector
(SATA_PWR1)



Pin	Signal Name
1	+5V
2	GND
3	GND
4	+12V

8 : USB 3.2 Gen1 Header (USB3_5_6)



Pin	Signal Name	Pin	Signal Name
1	DUMMY	2	IntA_PA_D+
3	IntA_PB_D+	4	IntA_PA_D-
5	IntA_PB_D-	6	GND
7	GND	8	IntA_PA_SSTX+
9	IntA_PB_SSTX+	10	IntA_PA_SSTX-
11	IntA_PB_SSTX-	12	GND
13	GND	14	IntA_PA_SSRX+
15	IntA_PB_SSRX+	16	IntA_PA_SSRX-
17	IntA_PB_SSRX-	18	Vbus
19	Vbus	20	

9 : DC Input Connector (DC_IN1)

10 : HDMI Ports

Top : HDMI1

Bottom : HDMI2

11 : Top : RJ45 LAN Port (LAN1)

(supports vPro)

Middle : USB 3.2 Gen2 Port (USB_2)

Bottom : USB 3.2 Gen2 Port (USB_1)

12 : Top : RJ45 LAN Port (LAN2)

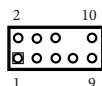
Middle : USB 3.2 Gen2 Port (USB3_4)

Bottom : USB 3.2 Gen2 Port (USB3_3)

13 : DisplayPort (DP1)

14 : Front Panel Audio Header

(HD_AUDIO1)



Pin	Signal Name	Pin	Signal Name
1	MIC2_L	2	GND
3	MIC2_R	4	NA
5	OUT2_R	6	MIC_RET
7	J_SENSE	8	
9	OUT2_L	10	OUT_RET

This is an interface for front panel audio cable that allows convenient connection and control of audio devices.

15 : Push button - Clear CMOS

(CLRMOS2)

16 : Audio Jacks

Top : Green - Line out

Bottom : Blue - Line in

17 : Battery Connector (BAT1)

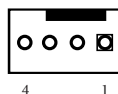


Pin	Signal Name
1	+BAT
2	GND

18 : Power Button (PWRBTN1)

19 : Chassis FAN Connector (+12V)

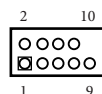
(CHA_FAN1)



Pin	Signal Name
1	GND
2	+12V
3	CHA_FAN_SPEED
4	FAN_SPEED_CONTROL

The board offers three 4-pin chassis fan (Smart Fan) connectors which are compatible with 3-pin chassis fan. If you connect a 3-pin chassis fan to the chassis fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

20 : BIOS_PH1



Pin	Signal Name	Pin	Signal Name
1	FLASH_SPI_CS0#	2	+3VSB
3	FLASH_SPI_MISO	4	FLASH_SPI_HOLD
5	FLASH_SPI_WP	6	FLASH_SPI_CLK
7	SIO_RSMRST#	8	FLASH_SPI_MOSI
9	GND	10	

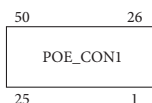
21 : OOB1



Pin	Signal Name
1	+5VSB
2	OOB_RXDB
3	TXDB_ISO
4	SLP_S3#
5	SLP_S4#
6	RESETCON#
7	SIO_PSIN#
8	CPU0_OOB_SPI_SEL
9	SIO_SDA
10	SIO_SCL
11	OOB_MOSI
12	OOB_CS#
13	OOB_SCLK
14	OOB_MISO
15	CASEOPEN#

16	RTCRST#
17	GND
18	MPU_RESET
19	BOOT_SOURCE
20	P-7
21	P+7
22	BUF_PLT_RST#
23	PCIE7_TXP_C
24	PCIE7_TXN_C
25	PCIE7_RXP
26	PCIE7_RXN
27	OOB_DETECT
28	OOB_PCIE_CLK10
29	OOB_PCIE_CLK10#
30	GND

22 : POE_CON1



Pin	Signal Name	Pin	Signal Name
1	BUF_PLT_RST#	26	GND
2	WAKE#	27	POE1_CLKREQ#
3	GND	28	POE2_CLKREQ#
4	GND	29	GND
5	SMB_POE_CLK	30	POE_SEL0
6	SMB_POE_DATA	31	POE_SEL1
7	GND	32	GND
8	GND	33	RESERVED
9	POE1_CLKP_R	34	RESERVED
10	POE1_CLKN_R	35	RESERVED
11	GND	36	RESERVED
12	PCH_POE1_RXP	37	RESERVED
13	PCH_POE1_RXN	38	RESERVED
14	GND	39	RESERVED
15	PCH_POE1_TXP	40	RESERVED

16	PCH_POE1_TXN	41	RESERVED
17	GND	42	RESERVED
18	PCH_POE2_TXP	43	POE1_DISABLE_N
19	PCH_POE2_TXn	44	POE2_DISABLE_N
20	GND	45	RESERVED
21	PCH_POE2_RXP	46	RESERVED
22	PCH_POE2_RXN	47	RESERVED
23	GND	48	RESERVED
24	POE2_CLKP	49	RESERVED
25	POE2_CLKN	50	RESERVED

*Supported by DSC-POE Card.

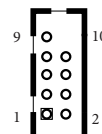
23 : PWR_POE1



Pin	Signal Name
1	+12V
2	+12V
3	GND
4	+3VSB

24 : COM Port Headers (RS232/422/485)*

(COM1)



Pin	Signal Name	Pin	Signal Name
1	DDCD#	2	RRXD
3	TTXD	4	DDTR#
5	GND	6	DDSR#
7	RRTS#	8	CCTS#
9	NA	10	

This motherboard supports RS232/422/485 on COM1 port. Please refer to below table for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

COM1 Port Pin Definition

Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	NA	NA	NA

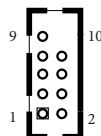
25 : M.2 Key-M Socket (M2_M1)

Pin	Signal Name	Pin	Signal Name
1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERn3	6	NA
7	PERp3	8	NA
9	GND	10	SATA_LED
11	PETn3	12	+3.3V
13	PETp3	14	+3.3V
15	GND	16	+3.3V
17	PERn2	18	+3.3V
19	PERp2	20	NA
21	GND	22	NA
23	PETn2	24	NA
25	PETp2	26	NA
27	GND	28	NA
29	PERn1	30	NA
31	PERp1	32	NA
33	GND	34	NA
35	PETn1	36	NA
37	PETp1	38	NA
39	GND	40	SMB_CLK
41	PERn0/ SATA-B+	42	SMB_DATA
43	PERp0/ SATA-B-	44	NA
45	GND	46	NA
47	PETn0/ SATA-A-	48	NA
49	PETp0/ SATA-A+	50	PERST#
51	GND	52	CLKREQ#
53	PEFCLKn	54	WAKE#
55	PEFCLKp	56	NA

57	GND	58	NA
67	NA	68	NA
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

26 : COM Port Headers (RS232/422/485)*

(COM2)



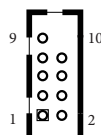
Pin	Signal Name	Pin	Signal Name
1	DDCD#	2	RRXD
3	TTXD	4	DDTR#
5	GND	6	DDSR#
7	RRTS#	8	CCTS#
9	NA	10	

This motherboard supports RS232/422/485 on COM2 port. Please refer to below table for the pin definition. In addition, COM2 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

COM2 Port Pin Definition

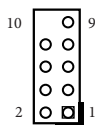
Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	NA	NA	NA

27 : Digital Input/Output (DIO1)



Pin	Signal Name	Pin	Signal Name
1	GPP_F1	2	GPP_F2
3	GPP_F7	4	GPP_F16
5	GND	6	GPP_E2
7	GPP_E4	8	GPP_I10
9	GPP_H23	10	

28 : MUL_SEL1



Pin	Signal Name	Pin	Signal Name
1	AT_ATX_MODE	2	CASEOPEN#
3	GND	4	GND
5	GND	6	NA
7	RTCRST2#	8	NA
9	RTCRST#	10	

MUL_SEL1:13 AT MODE
MUL_SEL1:79 CLRCMOS2
MUL_SEL1:24 CASEOPEN

15	GND
16	+3VSB
17	NA
18	NA
19	C_ESPI_ALERT#
20	GND

The header is reserved for Port 80 code display and debugging purposes.

Backside:

29 : ESPI Header (ESPI1)

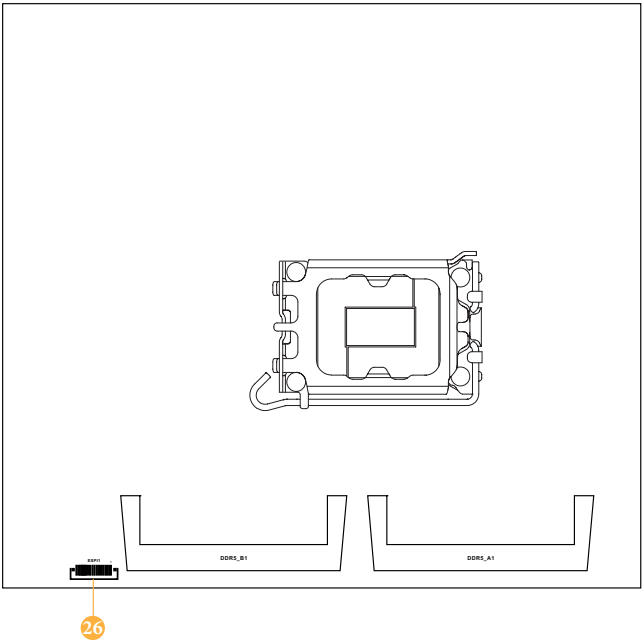


Pin	Signal Name
1	GND
2	C_ESPI_CLK
3	GND
4	C_ESPI_CS#
5	DEBUG_RESET
6	GND
7	+3V
8	GND
9	SMB_CLK_MAIN
10	SMB_DATA_MAIN
11	C_ESPI_IO0
12	C_ESPI_IO1
13	C_ESPI_IO2
14	C_ESPI_IO3

Top Side



Bottom Side

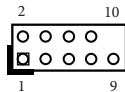


1 : VGAPWR_ISOLATION1



Pin	Signal Name
1	PSON#
2	GND

2 : System Panel Header (PANEL1)



Pin	Signal Name	Pin	Signal Name
1	HDLED+	2	PLED+
3	HDLED-	4	PLED-
5	GND	6	PWRBTN#
7	RESET#	8	GND
9	GND	10	

This header accommodates several system front panel functions.

Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is

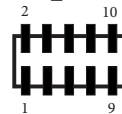
in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

3 : SMBUS_BATC_CLRMOS1



Pin	Signal Name	Pin	Signal Name
1	SMBUS GPIO	2	+BAT_CH_R
3	SMBUS_CLK	4	+BAT_CH
5	SMBUS_DATA	6	RTCST#
7	NA	8	GND
9	DACC	10	GND

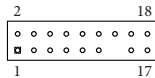
SMBUS_CLRMOS1:24 BAT charge

SMBUS_CLRMOS1:68 Clear CMOS

SMBUS_CLRMOS1:910 DACC

NOTE: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finished updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile will be cleared only if the CMOS battery is removed.

4 : T1S1



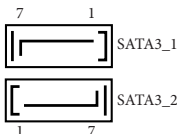
Pin	Signal Name	Pin	Signal Name
1	NA	2	NA
3	NA	4	NA
5	GSPI3_ CS0#_+3V	6	NA
7	GSPI3_ MISO_+3V	8	NA
9	GSPI3_ MOSI_+3V	10	+1.8VSB
11	GSPI3_ CLK_+3V	12	+1.8VSB
13		14	+3VSB
15	T1S_0_RST_ N	16	+3VSB
17	BUF_PLT_ RST#	18	+3VSB

5 : SATA Power Output Connector (SATA_PWR1)



Pin	Signal Name
1	+5V
2	GND
3	GND
4	+12V

6 : SATA3 Connectors (SATA3_1, SATA3_2)



Pin	Signal Name
1	GND
2	SATA-A+
3	SATA-A-
4	GND
5	SATA-B-
6	SATA-B+
7	GND

7 : DC Input Connector (DC_IN1)

8 : HDMI Ports

Top : HDMI1

Bottom : HDMI2

9 : Top : RJ45 LAN Port (LAN1) (supports

vPro, iEP(F)-9040V Series only)

Middle : USB 3.2 Gen2 Port (USB3_2)

Bottom : USB 3.2 Gen2 Port (USB_1)

10 : Top : RJ45 LAN Port (LAN2)

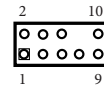
Middle : USB 3.2 Gen2 Port (USB3_4)

Bottom : USB 3.2 Gen2 Port (USB3_3)

11 : DslpayPort (DP1)

12 : Front Panel Audio Header

(HD_AUDIO1)



Pin	Signal Name	Pin	Signal Name
1	MIC2_L	2	GND
3	MIC2_R	4	NA
5	OUT2_R	6	MIC_RET
7	J_SENSE	8	
9	OUT2_L	10	OUT_RET

This is line out/microphone interface for front panel audio cable that allows jack detection, convenient connection and control of audio devices.

13 : Push button - Clear CMOS

(CLRMOS2)

14 : Audio Jacks

Top : Green - Line out

Bottom : Blue - Line in

15 : Battery Connector (BAT1)



Pin	Signal Name
1	+BAT
2	GND

16 : Power Button (PWRBTN1)

17 : Chassis FAN Connector (+12V)

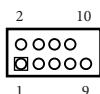
(CHA_FAN1)



Pin	Signal Name
1	GND
2	+12V
3	CHA_FAN_SPEED
4	FAN_SPEED_CONTROL

The board offers three 4-pin chassis fan (Smart Fan) connectors which are compatible with 3-pin chassis fan. If you connect a 3-pin chassis fan to the chassis fan connector on this motherboard, please connect it to pin 1-3. The maximum current is 1A.

18 : BIOS_PH1



Pin	Signal Name	Pin	Signal Name
1	FLASH_SPI_CS0#	2	+3VSB
3	FLASH_SPI_MISO	4	FLASH_SPI_HOLD
5	FLASH_SPI_WP	6	FLASH_SPI_CLK
7	SIO_RSMRST#	8	FLASH_SPI_MOSI
9	GND	10	

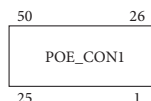
19 : OOB1



Pin	Signal Name
1	+5VSB
2	OOB_RXDB
3	TXDB_ISO
4	SLP_S3#
5	SLP_S4#
6	RESETCON#
7	SIO_PSIN#

8	CPU0_OOB_SPI_SEL
9	SIO_SDA
10	SIO_SCL
11	OOB_MOSI
12	OOB_CS#
13	OOB_SCLK
14	OOB_MISO
15	CASEOPEN#
16	RTCRST#
17	GND
18	MPU_RESET
19	BOOT_SOURCE
20	P-7
21	P+7
22	BUF_PLT_RST#
23	PCIE7_TXP_C
24	PCIE7_TXN_C
25	PCIE7_RXP
26	PCIE7_RXN
27	OOB_DETECT
28	OOB_PCIE_CLK10
29	OOB_PCIE_CLK10#
30	GND

20 : POE_CON1



Pin	Signal Name	Pin	Signal Name
1	BUF_PLT_RST#	26	GND
2	WAKE#	27	POE1_CLKREQ#
3	GND	28	POE2_CLKREQ#
4	GND	29	GND
5	SMB_POE_CLK	30	POE_SEL0
6	SMB_POE_DATA	31	POE_SEL1
7	GND	32	GND
8	GND	33	RESERVED
9	POE1_CLKP_R	34	RESERVED
10	POE1_CLKN_R	35	RESERVED
11	GND	36	RESERVED
12	PCH_POE1_RXP	37	RESERVED

13	PCH_POE1_RXN	38	RESERVED
14	GND	39	RESERVED
15	PCH_POE1_TXP	40	RESERVED
16	PCH_POE1_TXN	41	RESERVED
17	GND	42	RESERVED
18	PCH_POE2_TXP	43	POE1_DISABLE_N
19	PCH_POE2_TXn	44	POE2_DISABLE_N
20	GND	45	RESERVED
21	PCH_POE2_RXP	46	RESERVED
22	PCH_POE2_RXN	47	RESERVED
23	GND	48	RESERVED
24	POE2_CLKP	49	RESERVED
25	POE2_CLKN	50	RESERVED

*Supported by DSC-POE Card.

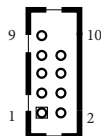
21 : POE Power Connector (PWR_POE1)



Pin	Signal Name
1	+12V
2	+12V
3	GND
4	+3VSB

22 : COM Port Header (COM1)

(RS232/422/485)



Pin	Signal Name	Pin	Signal Name
1	DDCD#	2	RRXD
3	TTXD	4	DDTR#
5	GND	6	DDSR#
7	RRTS#	8	CCTS#
9	NA	10	

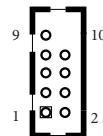
* This motherboard supports RS232/422/485 on COM1 port. Please refer to below table for the pin definition. In addition, COM1 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

COM1 Port Pin Definition

Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	NA	NA	NA

23 : COM Port Header (COM2)

(RS232/422/485)



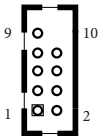
Pin	Signal Name	Pin	Signal Name
1	DDCD#	2	RRXD
3	TTXD	4	DDTR#
5	GND	6	DDSR#
7	RRTS#	8	CCTS#
9	NA	10	

* This motherboard supports RS232/422/485 on COM2 port. Please refer to below table for the pin definition. In addition, COM2 port (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

COM2 Port Pin Definition

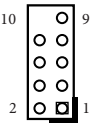
Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	TX+	RTX+
3	TXD	RX+	NA
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	NA	NA	NA

24 : Digital Input/Output (DIO1)



Pin	Signal Name	Pin	Signal Name
1	GPP_F1	2	GPP_F2
3	GPP_F7	4	GPP_F16
5	GND	6	GPP_E2
7	GPP_E4	8	GPP_I10
9	GPP_H23	10	

25 : MUL_SEL1

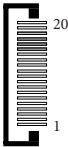


Pin	Signal Name	Pin	Signal Name
1	AT_ATX_MODE	2	CASEOPEN#
3	GND	4	GND
5	GND	6	NA
7	RTCRST2#	8	NA
9	RTCRST#	10	

MUL_SEL1:13 AT MODE
MUL_SEL1:79 CLRCMOS2
MUL_SEL1:24 CASEOPEN

Backside

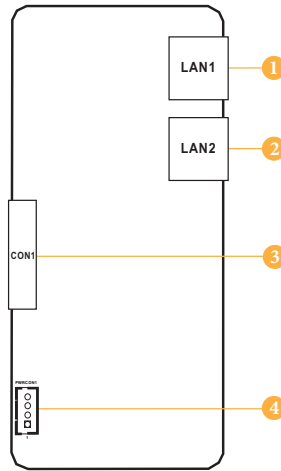
26 : ESPI Header (ESPI1)



Pin	Signal Name
1	GND
2	C_ESPI_CLK
3	GND
4	C_ESPI_CS#
5	DEBUG_RESET
6	GND
7	+3V
8	GND
9	SMB_CLK_MAIN
10	SMB_DATA_MAIN
11	C_ESPI_IO0
12	C_ESPI_IO1
13	C_ESPI_IO2
14	C_ESPI_IO3
15	GND
16	+3VSB
17	NA
18	NA
19	C_ESPI_ALERT#
20	GND

2.3 Other Boards

2.3.1 DSC-PSE002-WT Layout and I/O Connectors (Optional)



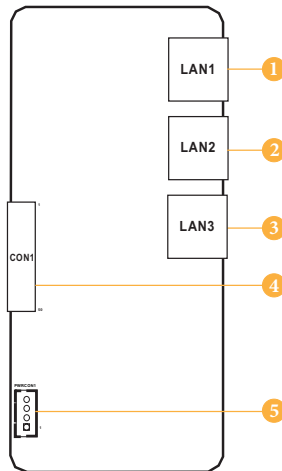
1 : LAN1 (I226IT with PSE function)

2 : LAN2 (I226IT with PSE function)

3 : CON1 (FPC Connector)

4 : PWRCON1 (Power connector)

2.3.2 DSC-PSE004-WT Layout and I/O Connectors (Optional)



1 : LAN1 (I226IT with PSE function)

2 : LAN2 (I226IT with PSE function)

3 : LAN3 (I226IT)

4 : CON1 (FPC connector)

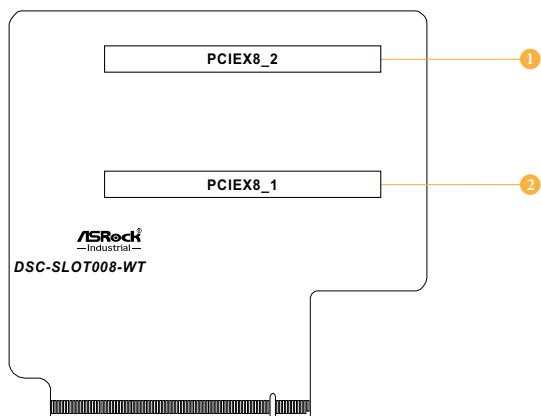
Pin	Signal Name
1	LAN_PWR_GOOD3
2	LAN_PWR_GOOD2
3	LAN_PWR_GOOD1
4	GND
5	UPE_CLKREQN2
6	LAN3_DISABLE_N
7	LAN2_DISABLE_N
8	LAN1_DISABLE_N
9	GND
10	UPE_CLKN2
11	UPE_CLKP2
12	GND
13	UPE_RXN2
14	UPE_RXP2
15	GND
16	UPE_TXN2
17	UPE_TXP2
18	GND
19	POE_SEL2
20	POE_SEL1
21	POE_SEL0

22	GND
23	UPE_CLKREQN1
24	UPE_CLKREQN0
25	GND
26	UPE_CLKN1
27	UPE_CLKP1
28	GND
29	UPE_RXN1
30	UPE_RXP1
31	GND
32	UPE_TXN1
33	UPE_TXP1
34	GND
35	UPE_TXN0
36	UPE_TXP0
37	GND
38	UPE_RXN0
39	UPE_RXP0
40	GND
41	UPE_CLKN0
42	UPE_CLKP0
43	GND
44	GND
45	SMB_DATA
46	SMB_CLK
47	GND
48	GND
49	WAKE#
50	BUF_PLT_RST#

5. PWRCON1 (Power connector)

Pin	Signal Name
1	+12V
2	+12V
3	GND
4	+3VSB

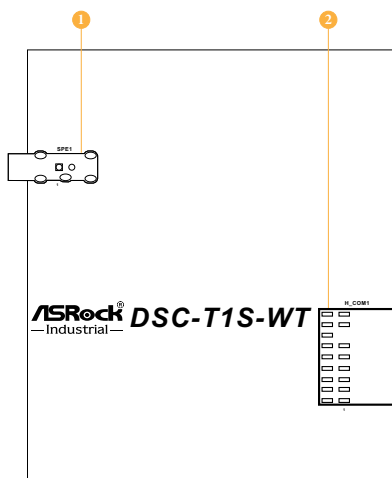
2.3.3 DSC-SLOT008-WT Layout and I/O Connectors (Support PCIe Gen4, 9040VS/9042VS Only)



1 : PCIEX8_2 (PCIe x8 slot)

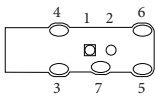
2 : PCIEX8_1 (PCIe x8 slot)

2.3.4 DSC-T1S-WT Layout and I/O Connectors (Optional)



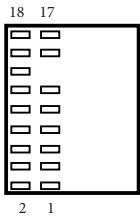
1 : SPE1

* Support DC+12V~+DC+36V Input



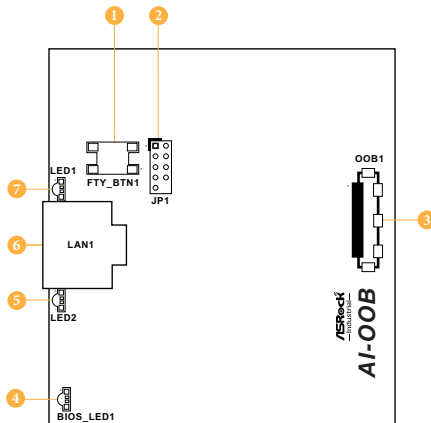
Pin	Signal Name
1	T1S_0_DP
2	T1S_0_DN
3	GND
4	GND
5	GND
6	GND
7	GND

2 : H_COM1



Pin	Signal Name	Pin	Signal Name
1	GND	2	GND
3	NA	4	NA
5	NA	6	T1S_0_INT_N
7	NA	8	T1S_0_RST_N
9	NA	10	BUF_PLT_RST#
11	+1.8VSB	12	GSPI3_CS0#
13	NIC	14	GSPI3_MISO
15	+3VSB	16	GSPI3_MOSI
17	+3VSB	18	GSPI3_CLK

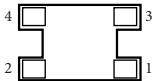
2.3.5 AI-OOB Layout and I/O Connectors (Optional)



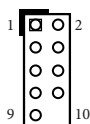
Specification

Input Interface/Power	• +3VSB • RJ45 (MDI) • PCIe x1 • SPI
Output Interface/Power	• Remote Power Control • UART • I2C • SPI • GPIO

1 : FTY_BTN1



2 : JP1



1-3: M2-OOB1 SPI power level is +1.8V (Default)

3-5: M2-OOB1 SPI power level is +3.3V

2-4: MPU boot from SPI mode (Default)

4-6: MPU boot from USB mode

7-8: Factory Reset

3 : OOB1



Pin	Signal Name
1	+3VSB
2	+3VSB
3	PWROK
4	RESETCON#
5	PWRBTN#
6	SPI_MUX_SEL
7	SPI_MISO
8	SPI_CLK
9	SPI_CS#
10	SPI_MOSI
11	CASEOPEN#
12	CLRCMOS#
13	FW_DETECT
14	HEARTBEAT
15	MPU_RESET
16	BOOT_SOURCE
17	I2C_SDA
18	I2C_SCL
19	UART_RX
20	UART_TX
21	USB_D-
22	USB_D+
23	PCIE_CLKP
24	PCIE_CLKN
25	PCIE_TXP

26	PCIE_TXN
27	PCIE_RXP
28	PCIE_RXN
29	PLT_RST#
30	GND

4 : BIOS_LED1



Status	Description
Blue	BIOS Backup
Red	BIOS Recovery

5 : LED2



RJ45 - Speed LED

6 : RJ45 1G LAN Port (LAN1)

7 : LED1



RJ45 - Activity/Link LED

Chapter 3 Hardware Installation and Maintenance

This chapter helps you disassemble the system and install components.

Before You Begin

Before you work with the system, pay close attention to the “Important Safety Instructions” at the beginning of this manual.

1. Make sure the system is powered off.

Power down the system if it is still running.

- (1) Press the Power button to shut down the system. The Power LED turns from solid green to dark.

- (2) Disconnect the power cord first from the AC outlet and then from the system. The power LED turns off.

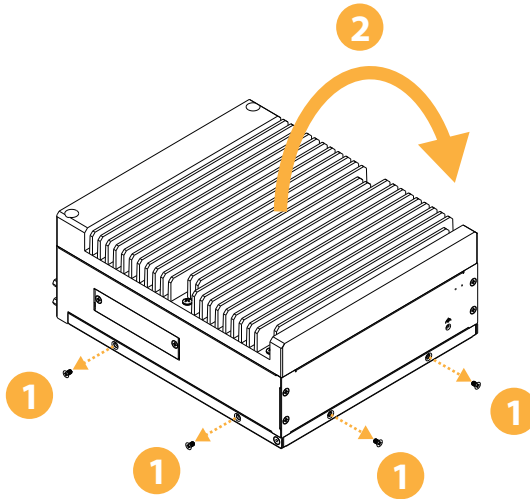
2. Ensure you have a clean and stable working environment. Avoid dust and dirt because contaminants may cause malfunctions.
3. Ground yourself properly before touching any system component. A discharge of static electricity may damage components. Wear a grounded wrist strap if available.

Screw Driver Recommended Torque Value	
Items secured to Chassis	Value (Kgf-cm)
Chassis & Top Case/Heatsink	3.0 + / - 0.5
Rubber Foot	3.0 + / - 0.5
Desk Mount	3.0 + / - 0.5
CPU Socket	3.0 + / - 0.5
Items secured to PCBA	Value (Kgf-cm)
Device : M.2 Module	2.0 + / - 0.5
Phoenix DC in	2.0 + / - 0.5
CPU Socket	3.0 + / - 0.5

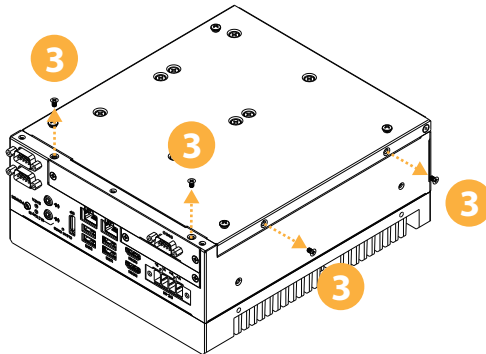
3.1 How to Disassemble the System

iEP-9040VE Series

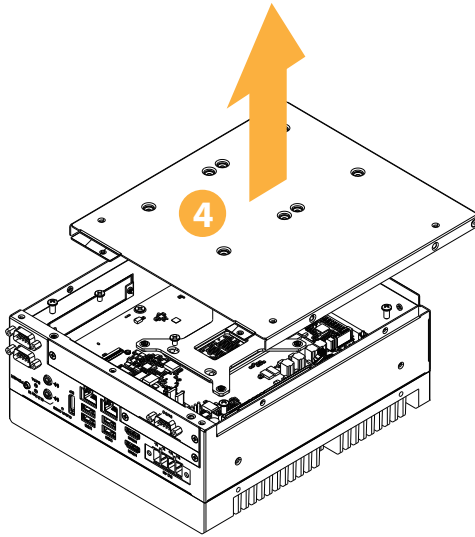
1. Remove the four screws securing the bottom cover.
2. Turn the system over.



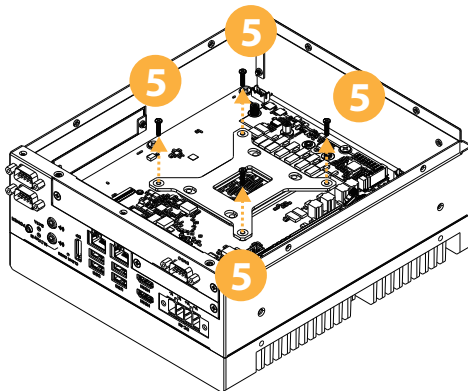
3. Remove the remaining four screws securing the bottom cover, and then remove the bottom cover.



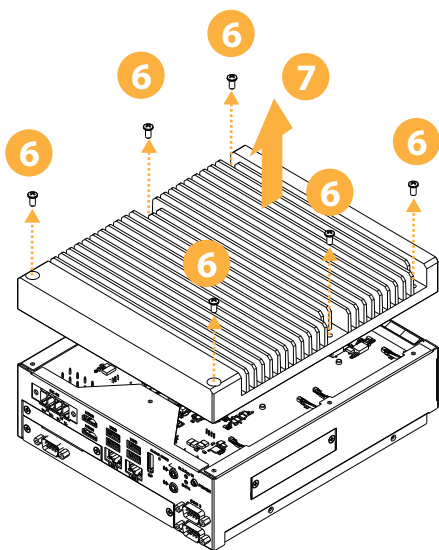
4. Lift up and remove the bottom cover.



5. Remove the screws securing the CPU socket backplate.

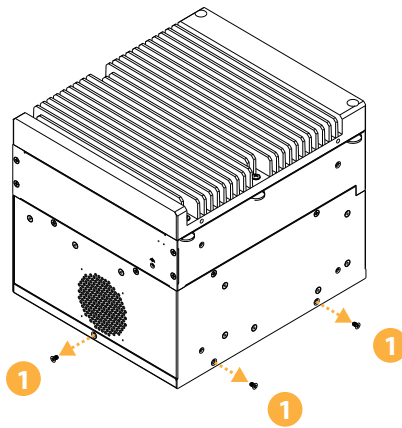
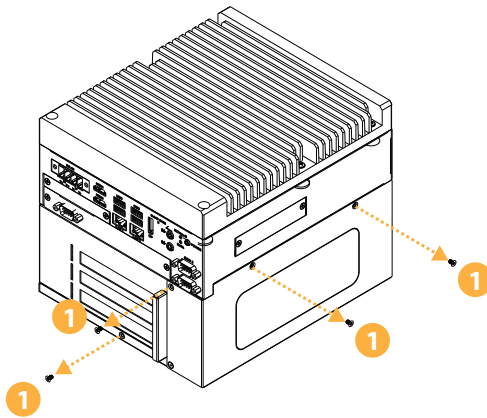


6. Remove the screws securing the top heatsink.
7. Lift up and remove the top heatsink.

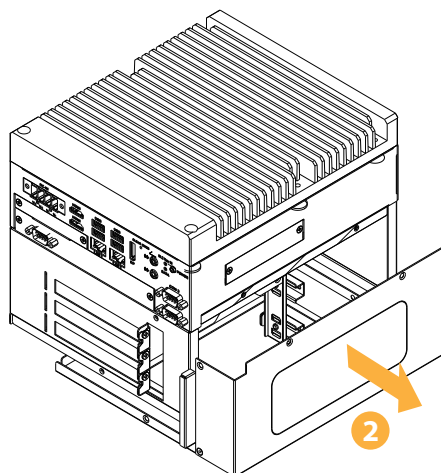


iEPF-9040VS Series

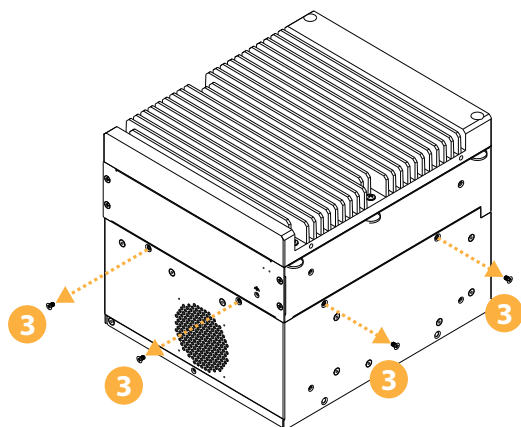
1. Remove the screws securing the side covers.



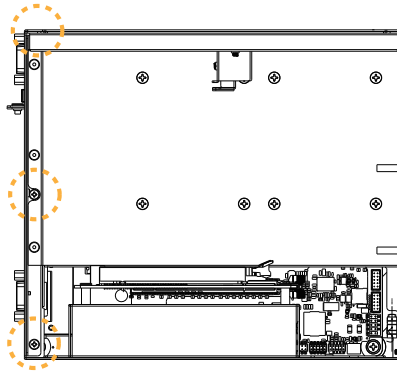
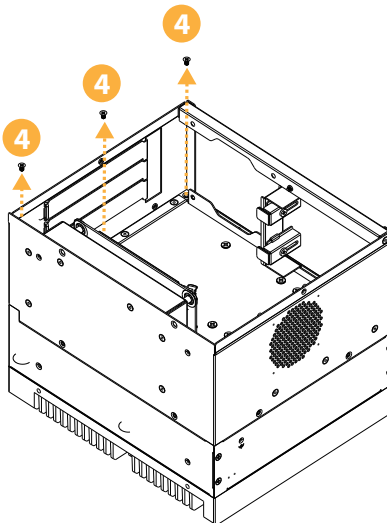
2. Slide the side cover outward and remove it from the system.



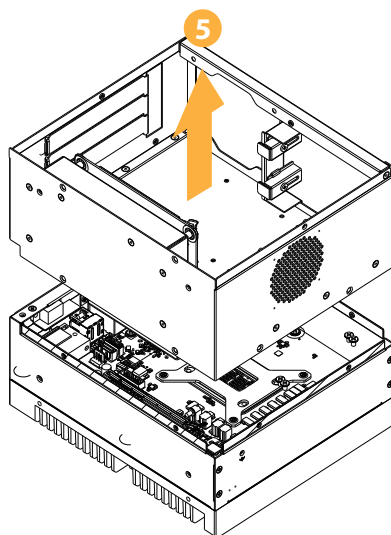
3. Remove the outer screws securing the lower chassis.



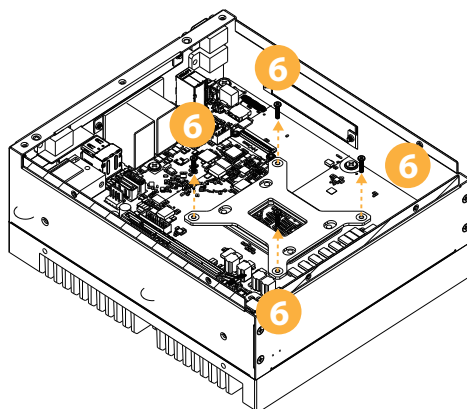
4. Remove the three screws securing the lower chassis at the indicated locations.



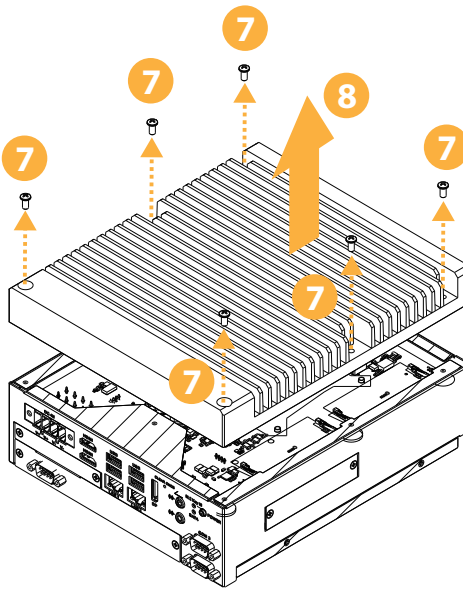
5. Lift the lower chassis upward and remove it from the system.



6. Remove the screws securing the CPU socket backplate.



7. Remove the screws securing the top heatsink.
8. Lift up and remove the top heatsink.

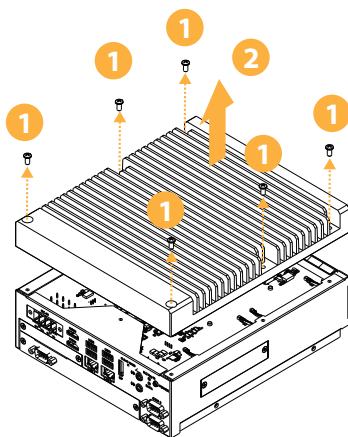


3.2 How to Install the CPU

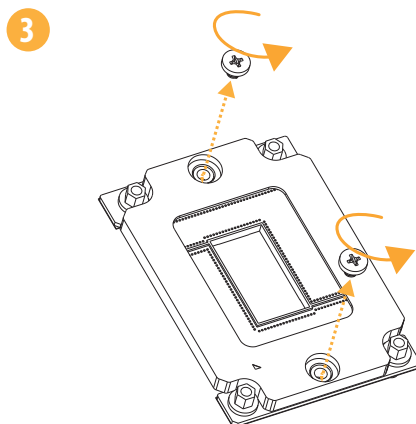


1. Before you insert the 1700-Pin CPU into the socket, please check if the CPU surface is unclean, or if there are any **bent pins** in the socket. Do not force to insert the CPU into the socket if any of the situations above is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power cables before installing the CPU.

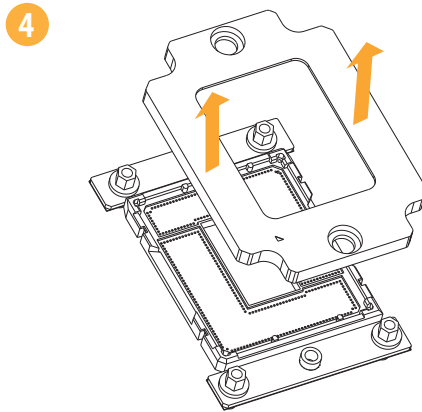
1. Remove the screws securing the top heatsink.
2. Lift up and remove the top heatsink



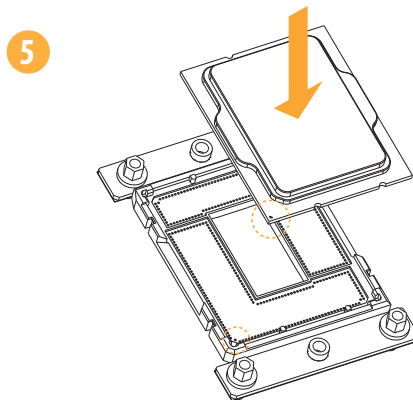
3. Remove the two screws.



4. Lift the socket.



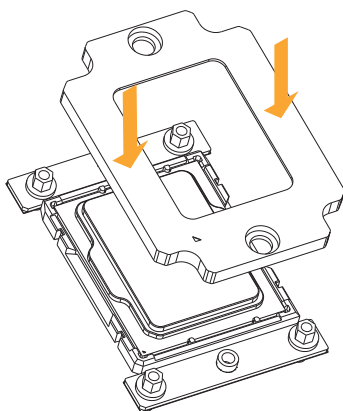
5. Align the triangle marks on both CPU and socket (marked in the below illustration), and install the CPU onto the socket.



The CPU can only fit in one way. CPU misalignment will damage the motherboard.

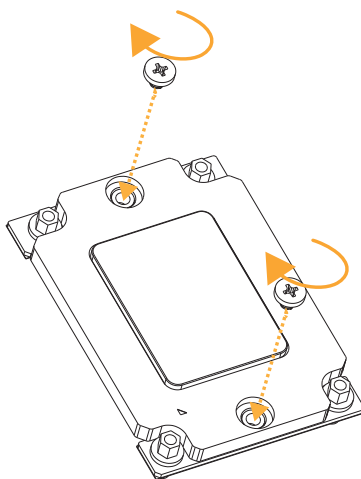
6. Put back the socket.

6



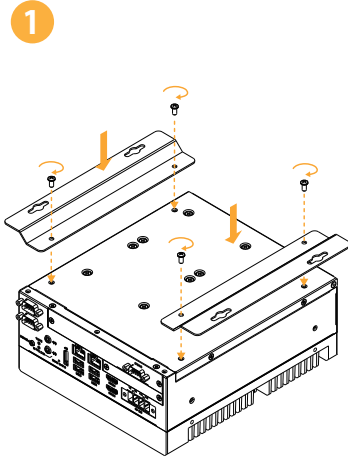
7. Tighten the screws to secure the CPU.

7

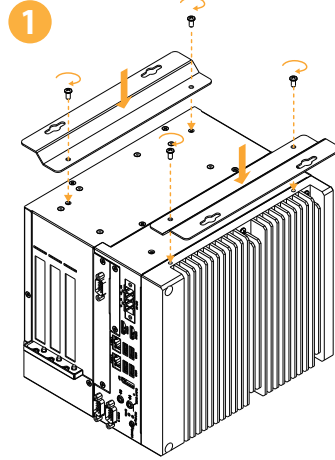


3.3 How to Install the Desk Mount Bracket

1. Attach the two desk mount brackets to the iEP-9040VE Series or iEPF-9040VS Series.
Then secure them with four screws.

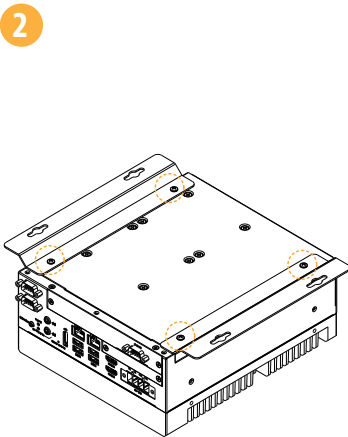


iEP-9040VE Series

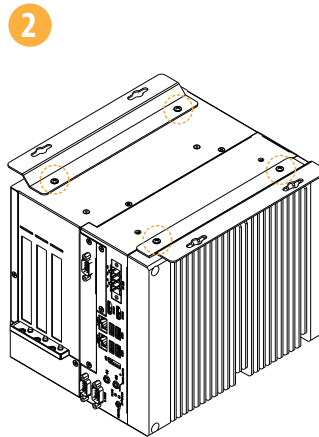


iEPF-9040VS Series

2. You can then attach the iEP-9040VE Series or iEPF-9040VS Series to any horizontal surface with the rest of the four screws.



iEP-9040VE Series

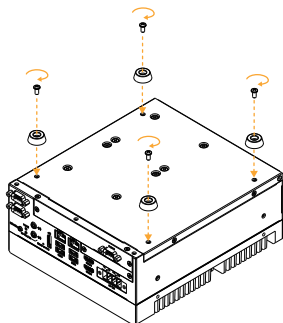


iEPF-9040VS Series

3.4 How to Install the Rubber Foot

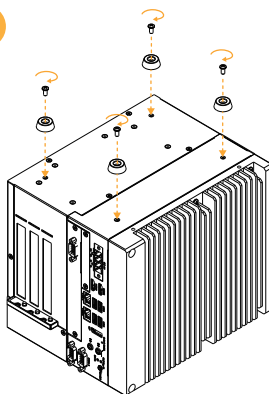
1. Attach four rubber feet to the iEP-9040VE Series or iEPF-9040VS Series. Then secure them with four screws.

1



iEP-9040VE Series

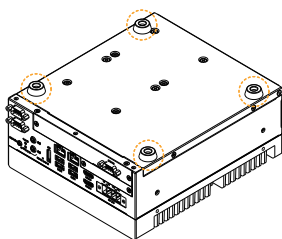
1



iEPF-9040VS Series

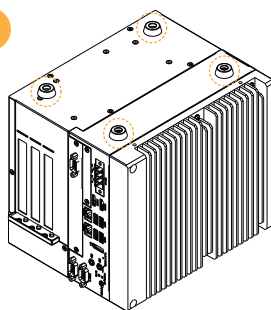
2. Place the iEP-9040VE Series or iEPF-9040VS Series to any horizontal surface.

2



iEP-9040VE Series

2



iEPF-9040VS Series

3.5 How to Install the Memory Module

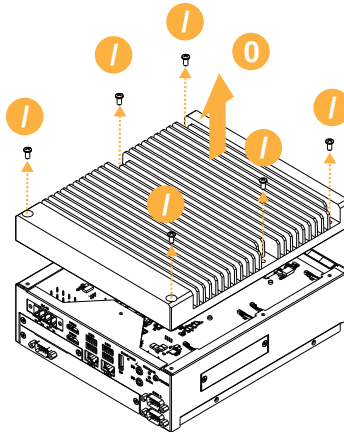


For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR5 SO-DIMM pairs.

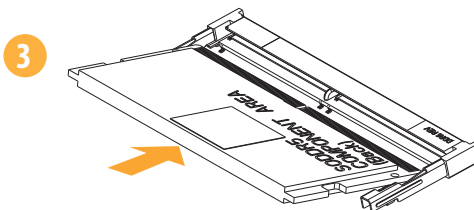


The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

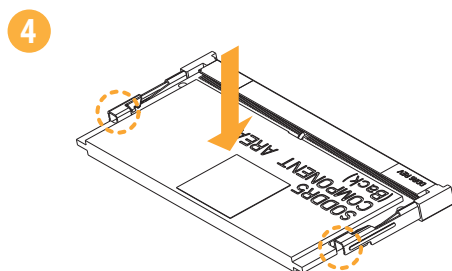
1. Remove the screws securing the top heatsink.
2. Lift up and remove the top heatsink



3. Carefully insert the SO-DIMM memory modules into the slot at a 30-degree angle.



4. Push down until the modules snap into place.



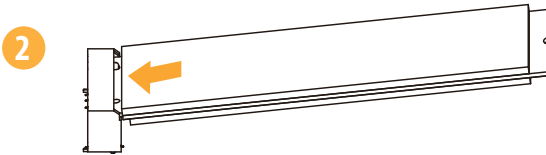
3.6 How to Install the M.2 SSD with Heatsink

Installing the M.2 SSD

1. Locate the M.2 slot on the motherboard.



2. Carefully insert the M.2 SSD into the slot at a 30-degree angle.

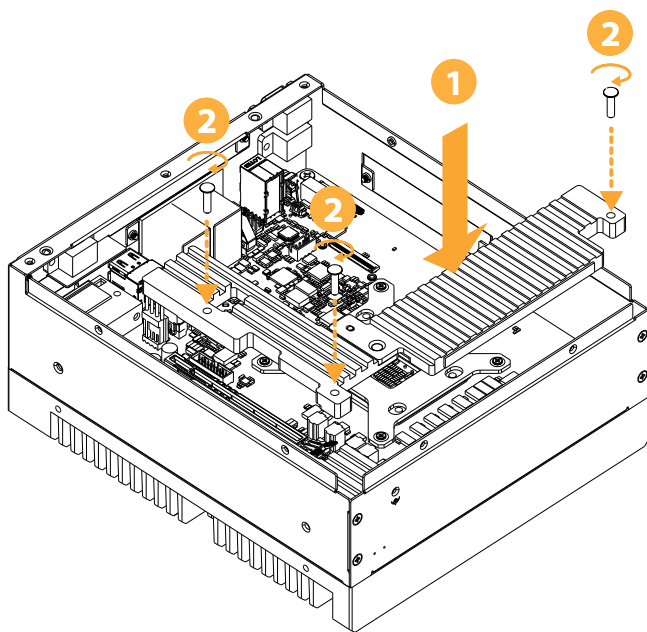


3. Tighten the screw to secure the M.2 SSD to the motherboard.



Installing the M.2 Heatsink

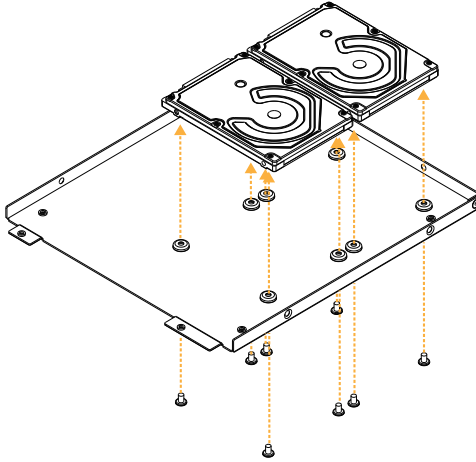
1. Place the M.2 heatsink onto the M.2 module and align it with the screw holes.
2. Fasten the screws to secure the M.2 heatsink in place.



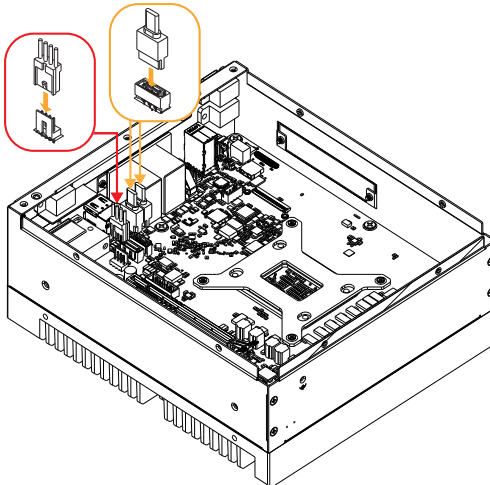
3.7 How to Install the HDD

iEP-9040VE Series

1. Remove the bottom cover.
2. Secure the HDD to the bottom cover with screws.

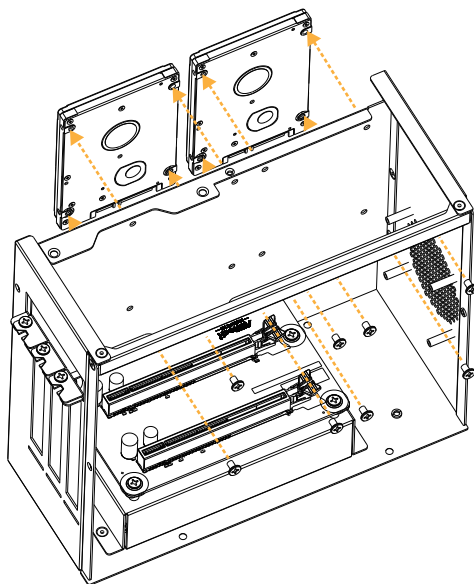


3. Connect the SATA cable connector to the corresponding connector on the PCB.

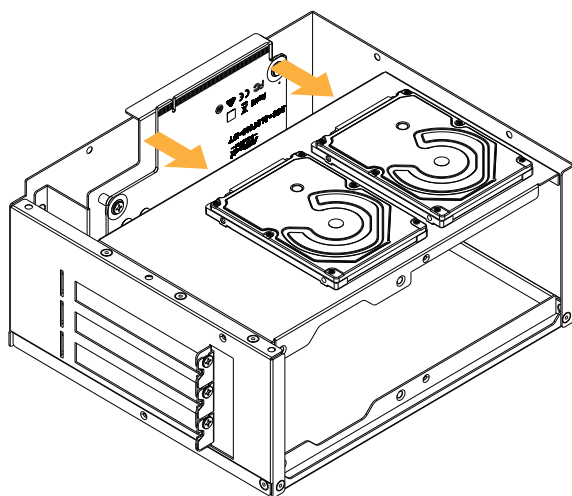


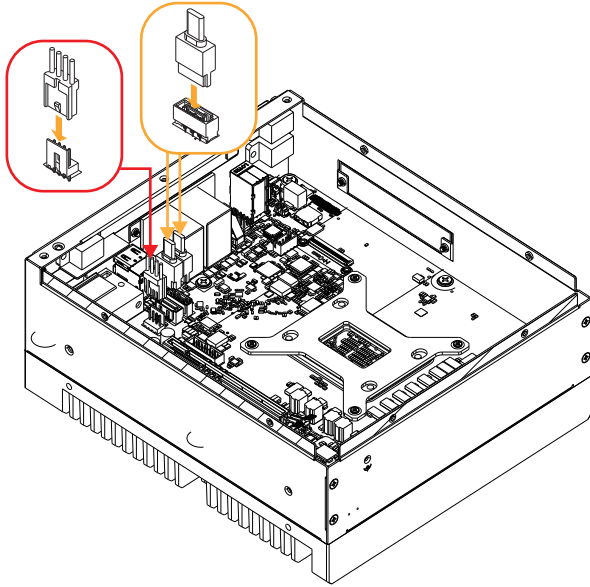
iEPF-9040VS Series

1. Remove the bottom cover.
2. Secure the HDD to the bottom cover with screws.



3. Connect the SATA cable connector to the corresponding connector on the PCB.





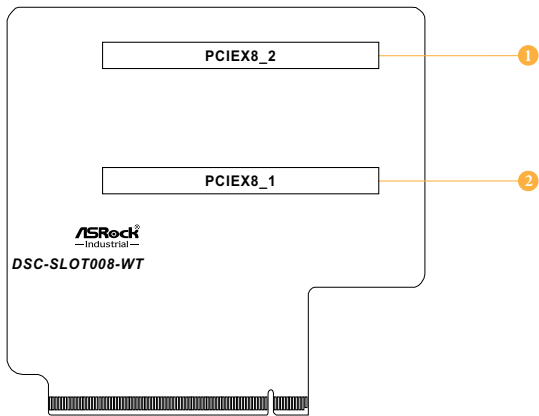
3.8 How to Install the Expansion Card

There are four PCI Express slots on the board.



Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and ensure necessary hardware settings for the card before you start the installation.

1. PCIe slots:

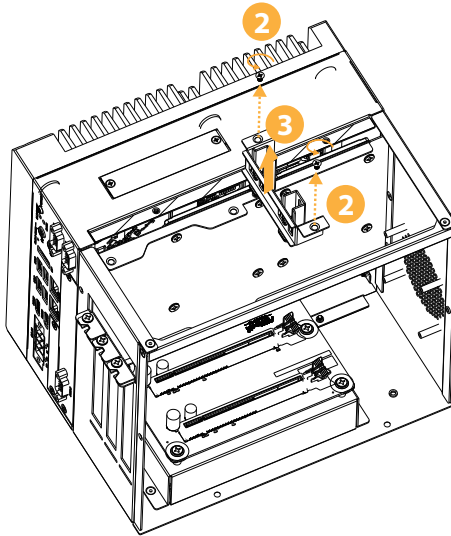


No.	Description
1	PCIe Gen4 x8 slots support PCIe x8 lane width cards.
2	PCIe Gen4 x8 slots support PCIe x8 lane width cards.

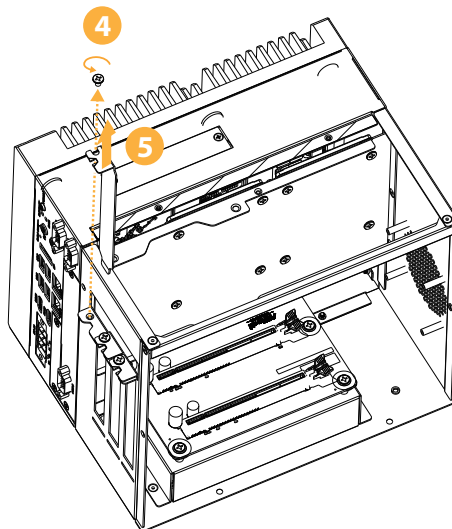
2. With the default card holder assembled in the system for enhanced reliability, the dimensions of the expansion card is limited to 192 (with optional system fans) x 100~114 x 60 mm; 221 (without optional system fans) x 100~114 x 60 mm. If the card holder is removed, the dimensions of the expansion card are limited to 192 (with optional system fans) x 148 x 60 mm; 221 (without optional system fans) x 148 x 60 mm.

Assembling the Expansion Card

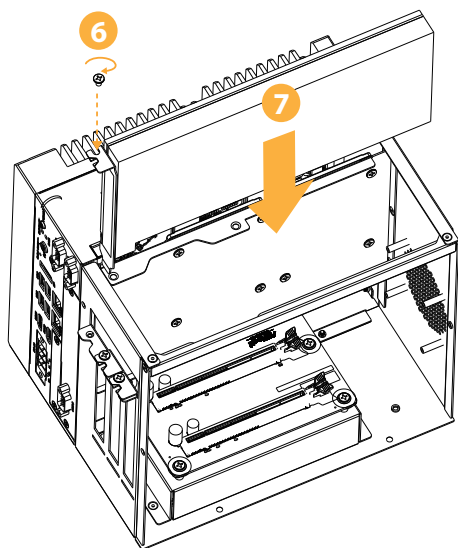
1. Remove the side cover.
2. Remove the screws securing the card holder.
3. Lift up and remove the card holder.



4. Remove the screw securing the PCIe slot cover.
5. Remove the PCIe slot cover.



6. Install the expansion card into the PCIe slot.
7. Secure the expansion card with the screw.



Chapter 4 UEFI Setup Utility

4.1 Introduction

ASRock Industrial UEFI (Unified Extensible Firmware Interface) is a BIOS utility which offers tweak-friendly options in an advanced viewing interface. The UEFI system works with a USB mouse and offers users a faster and sleeker experience.

This BIOS utility can perform the Power-On Self-Test (POST) during system startup, record hardware parameters of the system, load operating system, and so on. The battery on the motherboard supplies the power needed to the CMOS when the system power is turned off, and the values configured in the UEFI utility are kept in the CMOS.

Please note that inadequate BIOS settings may cause system instability, malfunction or boot failure. We strongly recommend that you do not alter the UEFI default configurations or change the settings only with the assistance of a trained service person.

If the system becomes unstable or fails to boot after you change the setting, try to clear the CMOS values and reset the board to default values. See your motherboard manual for instructions.

4.1.1 Entering BIOS Setup

You may run the UEFI SETUP UTILITY by pressing <F2> or <Delete> right after you power on the computer; otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

This setup guide explains how to use the UEFI SETUP UTILITY to configure all the supported system. The screenshots in this manual are for reference only. UEFI Settings and options may vary owing to different BIOS release versions or CPU installed. Please refer to the actual BIOS version of the motherboard you purchased for detailed screens, settings and options.

4.1.2 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
Advanced	For advanced system configurations
H/W Monitor	Displays current hardware status
Security	For security settings
Boot	For configuring boot settings and boot priority
Exit	Exit the current screen or the UEFI Setup Utility



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions for reference purpose only, and may vary from the latest BIOS and do not exactly match what you see on your screen.

4.1.3 Navigation Keys

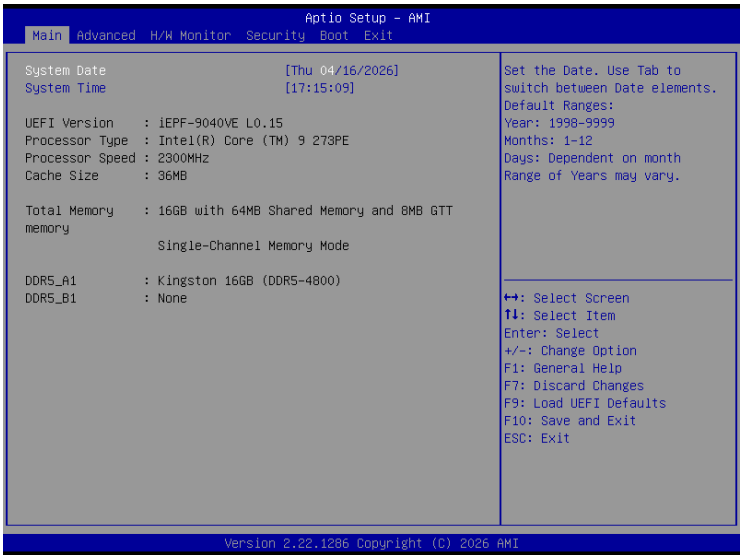
Use <←> key or <→> key to choose among the selections on the menu bar, and use <↑> key or <↓> key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
+ / -	To change option for the selected items
<Tab>	Switch to next function
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

4.2 Main Screen

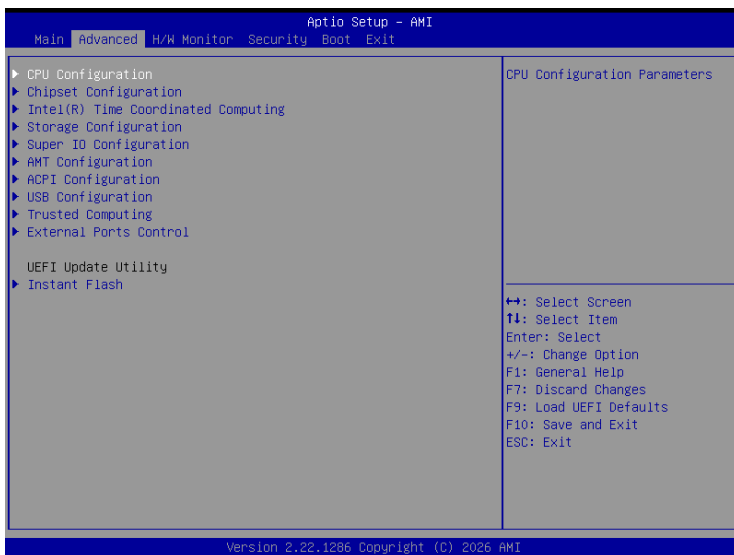
When you enter the UEFI SETUP UTILITY, the main screen will appear and display the system overview.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.

4.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Intel(R) Time Coordinated Computing, Storage Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, Trusted Computing, and External Ports Control.

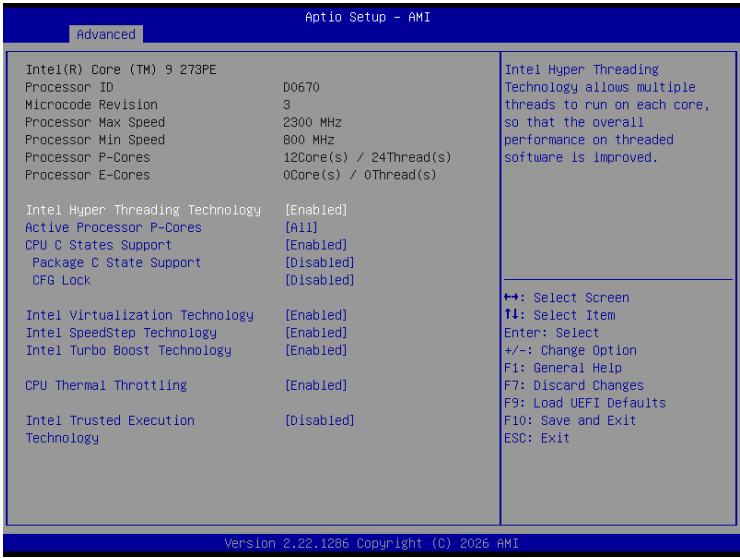


Setting wrong values in this section may cause the system to malfunction.

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like Windows*. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, and then you can update your UEFI in only a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

4.3.1 CPU Configuration



Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Active Processor P-Cores

Select the number of cores to enable in each processor package.

CPU C States Support

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Package C State Support

Allows you to enable CPU, PCIe, Memory, Graphics C State Support for power saving.

Configuration options: [Auto] [Enabled] [Disabled]

CFG Lock

The option allows you to enable or disable the CFG Lock.

Configuration options: [Enabled] [Disabled]

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Configuration options: [Enabled] [Disabled]

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled].

Configuration options: [Enabled] and [Disabled].

If you install Windows® OS and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

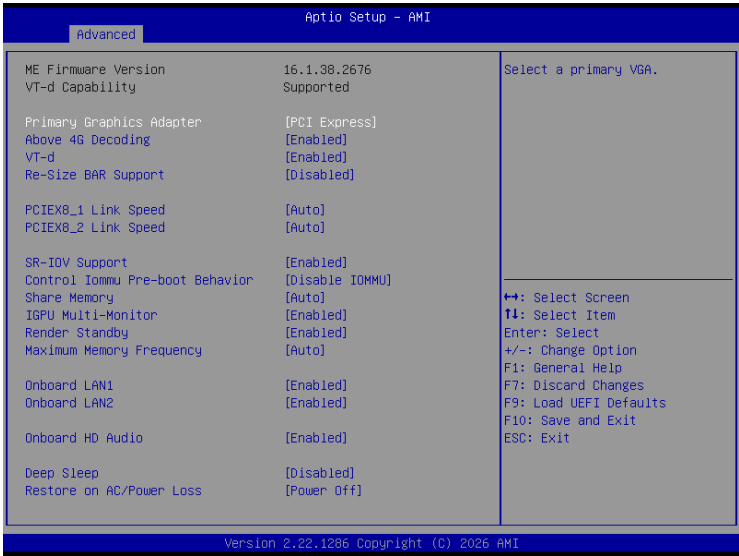
CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

Intel Trusted Execution Technology

The item enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology. Changes require a full power cycle to take effect.

4.3.2 Chipset Configuration



Primary Graphics Adapter

Select a primary VGA.

Above 4G Decoding

Enable or disable 64bit capable Devices to be decoded in Above 4G Address Space (only if the system supports 64 bit PCI decoding).

VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

Configuration options: [Enabled] [Disabled]

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR Support.

PCIEX8_1 Link Speed

Configure the PCIe x8 slot 1 link speed.

PCIEX8_2 Link Speed

Configure the PCIe x8 slot 2 link speed.

SR-IOV Support

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

Configuration options: [Enabled] [Disabled]

Control Iommu Pre-boot Behavior

Control IOMMU behavior during pre-boot.

Share Memory

Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

IGPU Multi-Monitor

This allows you to enable or disable IGPU Multi-Monitor. The default value is [Disabled].

Render Standby

Power down the render unit when the GPU is idle for lower power consumption.

Maximum Memory Frequency

The maximum operating frequency of the memory controller, adjustable within the BIOS settings.

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

vPro Function (For iEP(F)-9040V Series only)

Enable/Disable vPro SMLink of LAN port. Select Enabled if you would like to utilize LAN port with vPro. Select Disabled if you would like to utilize LAN port as DHCP Server. Please turn off the computer and unplug the power cord from the power supply after the setting has been changed.

Onboard HD Audio

Onboard HD Audio allows you to enable or disable the onboard HD audio controller. Set this item to [Auto] to enable the onboard HD and automatically disable it when a sound card is installed.

Configuration options: [Enabled] [Disabled]

Deep Sleep

Enable or disable Deep Sleep mode. When enabled, the system enters a lower power state during S5 (soft-off).

Configuration options: [Auto] [Disabled]

Restor on AC/Power Loss

The option allows you to select the power state after a power failure.

[Power Off] sets the power to remain off when the power recovers.

[Power On] sets the system to start to boot up when the power recovers.

4.3.3 Intel(R) Time Coordinated Computing



#AC Split Lock

Enable or Disable Alignment Check Exception (#AC). When enabled, this will assert an #AC when any atomic operation has an operand that crosses two cache lines.

#GP Fault UC Lock

Enable or Disable GP Fault Exception (GP#). When enabled, this will assert an GP# when encountering a Lock to un-cacheable memory before the bus is locked.

IFU Enable

Enable or Disable Instruction Fetch Unit(IFU). When enabled, Instructions will be prefetch to the cache.

Intel(R) TCC Authentication Menu

Press Enter to configure Intel(R) TCC Authentication Menu options.



Intel(R) TCC Mode

Enable or Disable Intel(R) TCC Mode. When enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel(R) TCC mode is enabled.

L2 QOS Enumeration

Enable or Disable L2 QOS Enumerate. When Enable CPUID Enumeration for L2 QOS gets enabled.

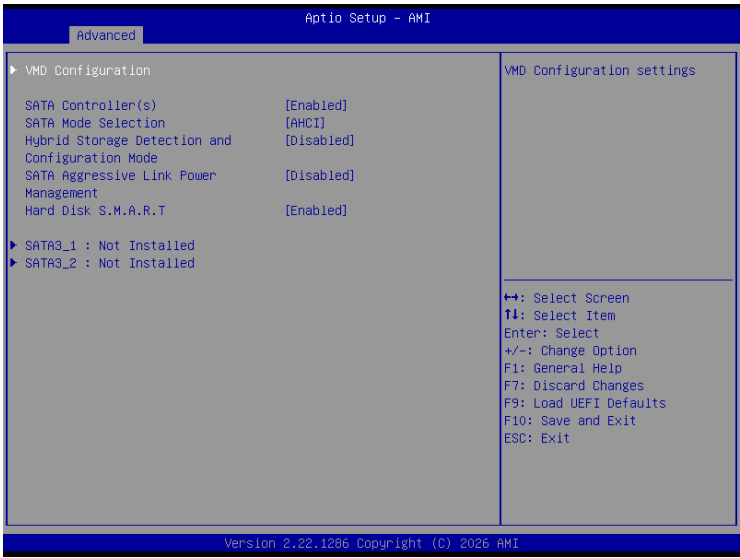
IO Fabric Low Latency

Enable or Disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported.

GT CLOS

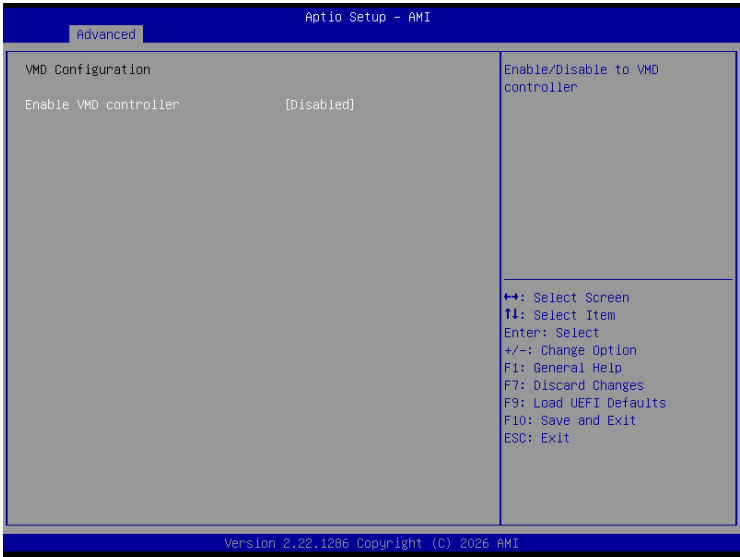
Enable or Disable Graphics Technology(GT) Class of Service. Enable will reduce Gfx LLC allocation to minimize impact of Gfx workload on LLC.

4.3.4 Storage Configuration



VMD Configuration

This item allows you to enable or disable the Intel VMD support function.



Enable VMD controller

Enable or disable VMD controller.

SATA Controller(s)

The option allows you to enable or disable the SATA controllers.

Configuration options: [Enabled] [Disabled]

SATA Mode Selection

AHCI supports new features that improve performance.

Configuration option: [AHCI]



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance.

Hybrid Storage Detection and Configuration Mode

The option allows you to select Hybrid Storage Detection and Configuration Mode.

Configuration options: [Dynamic Configuration for Hybrid Storage Enable] [Disabled]

SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is supported only by AHCI mode.

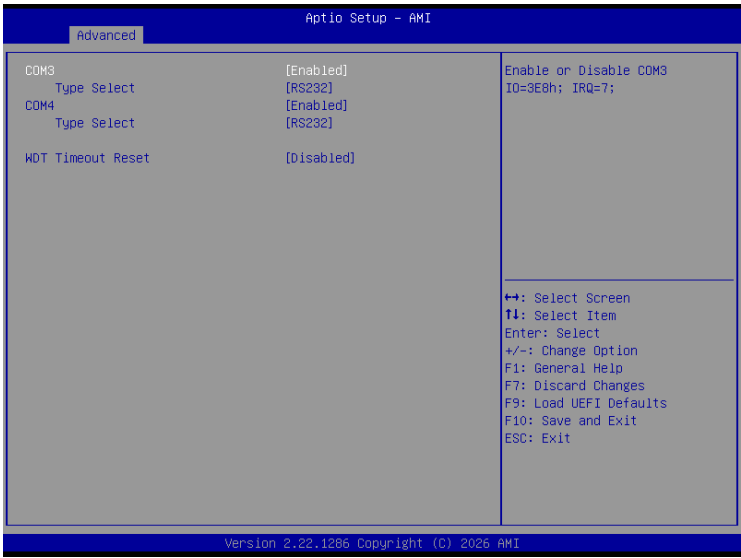
Configuration options: [Enabled] [Disabled]

Hard Disk S.M.A.R.T

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

4.3.5 Super IO Configuration



COM3

Use this to set parameters of COM3.

Type Select

Use this to select COM3 port type: [RS232], [RS422] or [RS485].

COM4

Use this to set parameters of COM4.

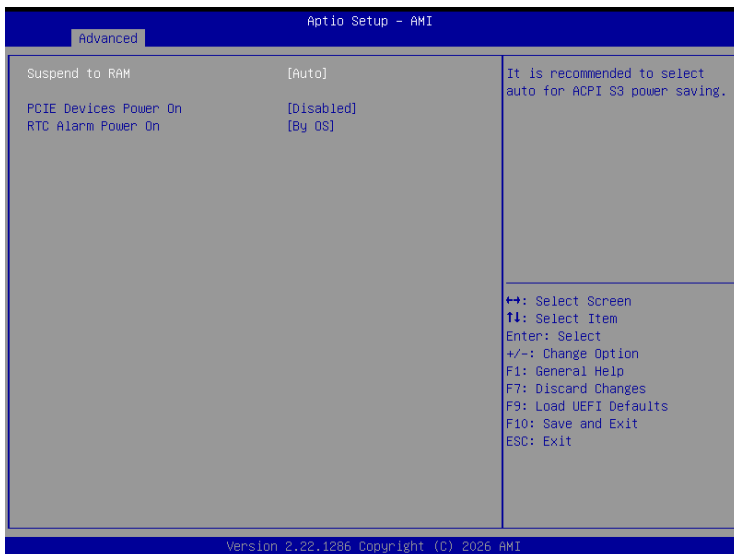
Type Select

Use this to select COM4 port type: [RS232], [RS422] or [RS485].

WDT Timeout Reset

Use this to set the Watch Dog Timer.

4.3.6 ACPI Configuration



Suspend to RAM

Suspend to RAM allows you to select [Disabled] for ACPI suspend type S1. It is recommended to select [Auto] for ACPI S3 power saving.

Configuration options: [Auto] [Disabled]

PCIE Devices Power On

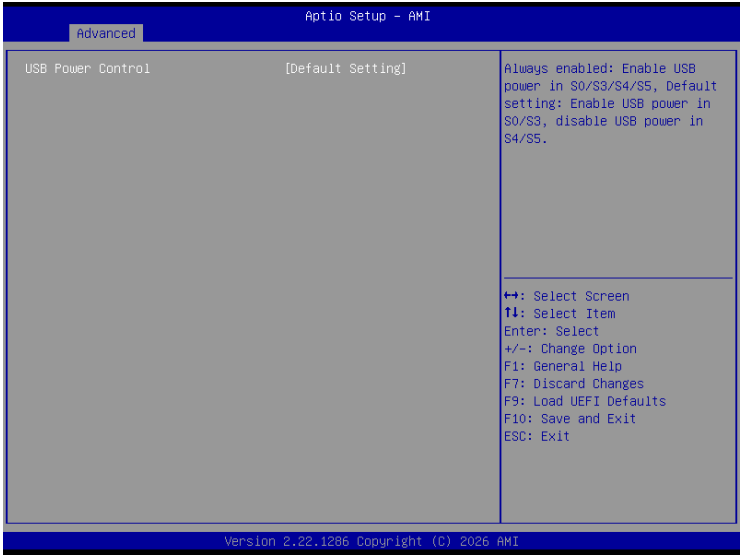
Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

RTC Alarm Power On

RTC Alarm Power On allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

Configuration options: [Enabled] [Disabled] [By OS]

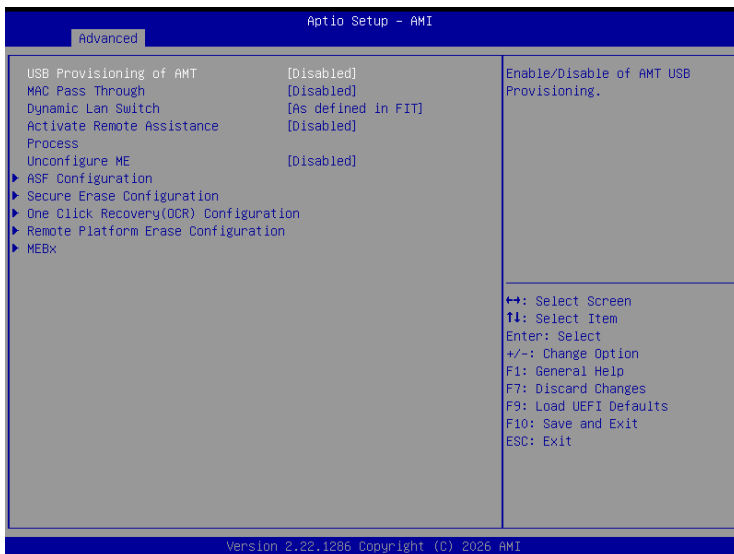
4.3.7 USB Configuration



USB Power Control

Use this option to control USB power.

4.3.8 AMT Configuration



USB Provisioning of AMT

Enable/Disable of AMT USB Provisioning.

MAC Pass Through

Enable/Disable MAC Pass Through function.

Dynamic Lan Switch

Allow switching AMT support from Integrated LAN to Discrete LAN.

Activate Remote Assistance Process

Trigger CIRA boot.

Unconfigure ME

Unconfigure ME with resetting MEBx password to default on next boot.

ASF Configuration

Configure Alert Standard Format parameters.

Secure Erase Configuration

Secure Erase configuration menu.

One Click Recovery(OCR) Configuration

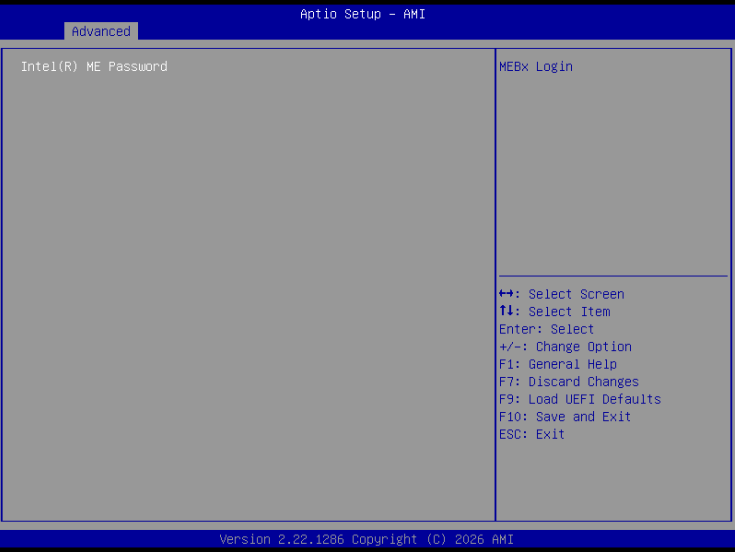
Configuration setting for One Click Recovery. This allows access for AMT to boot a recovery OS application.

Remote Platform Erase Configuration

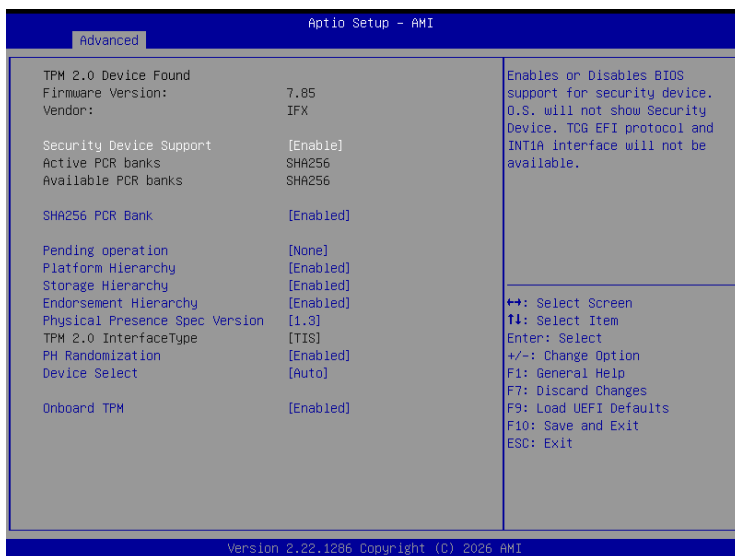
Remote Platform Erase configuration menu.

MEBx

This Formset contains forms for configuring MEBx.



4.3.9 Trusted Computing



Security Device Support

Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Configuration options: [Enabled] [Disabled]

Active PCR banks

This item displays active PCR Banks.

Available PCR Banks

This item displays available PCR Banks.

SHA256 PCR Bank

SHA256 PCR Bank allows you to enable or disable SHA256 PCR Bank.

Configuration options: [Enabled] [Disabled]

Pending Operation

Pending Operation allows you to schedule an Operation for the Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Configuration options: [None] [TPM Clear]

Platform Hierarchy

This item allows you to enable or disable Platform Hierarchy.

Configuration options: [Enabled] [Disabled]

Storage Hierarchy

This item allows you to enable or disable Storage Hierarchy.

Configuration options: [Enabled] [Disabled]

Endorsement Hierarchy

This item allows you to enable or disable Endorsement Hierarchy.

Configuration options: [Enabled] [Disabled]

Physical Presence Spec Version

Select this item to tell OS to support PPI spec version 1.2 or 1.3. Please note that some HCK tests might not support version 1.3.

Configuration options: [1.2] [1.3]

TPM 2.0 InterfaceType

This item allows you to view the Communication Interface to TPM 2.0 Device: CRB or ITS.

PH Randomization

The item enables or disables Platform Hierarchy randomization.

Device Select

This item allows you to select the TPM device to be supported.

[TPM 1.2] restricts support to TPM 1.2 devices.

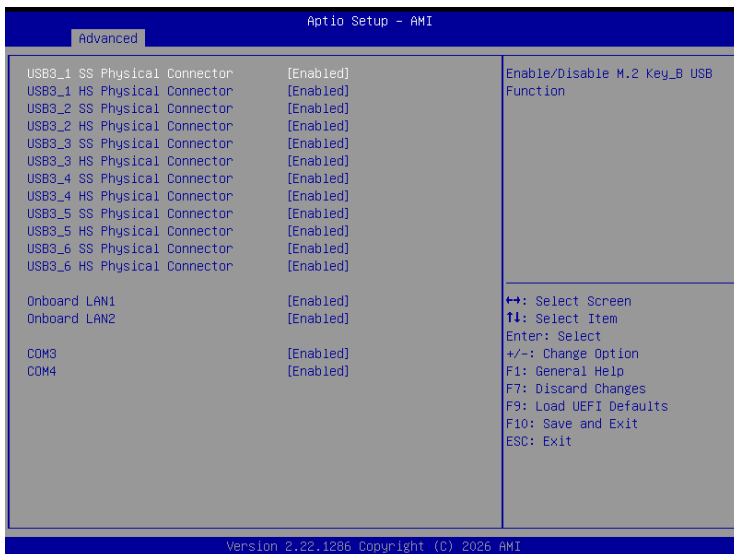
[TPM 2.0] restricts support to TPM 2.0 devices.

[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

Onboard TPM

The option enables or disables Intel PTT in ME. Disable this option to use discrete TPM Module.

4.3.10 External Ports Control



USB3_1 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 1.

USB3_1 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 1.

USB3_2 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 2.

USB3_2 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 2.

USB3_3 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 3.

USB3_3 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 3.

USB3_4 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 4.

USB3_4 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 4.

USB3_5 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 5.

USB3_5 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 5.

USB3_6 SS Physical Connector

Use this to enable or disable the USB 3.0 Super-speed function of physical connector 6.

USB3_6 HS Physical Connector

Use this to enable or disable the USB 2.0 High-speed function of physical connector 6.

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

COM3

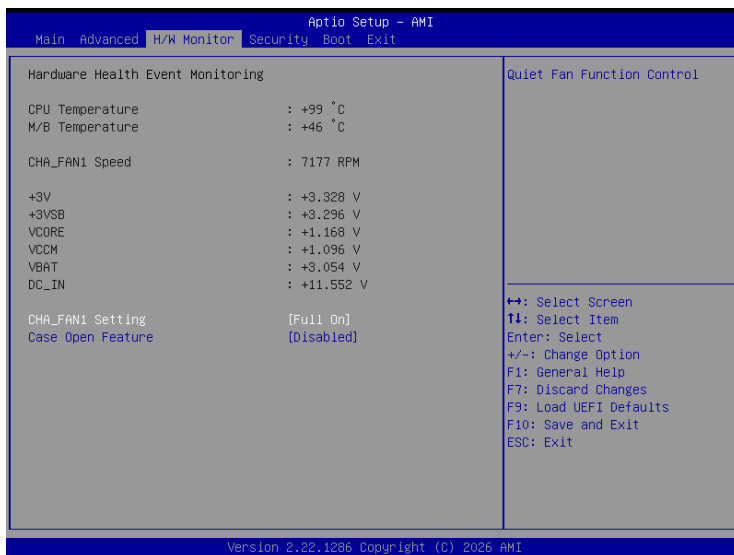
Use this to set parameters of COM3.

COM4

Use this to set parameters of COM4.

4.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, chassis fan speed, and the critical voltage.



CHA_FAN1 Setting

Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

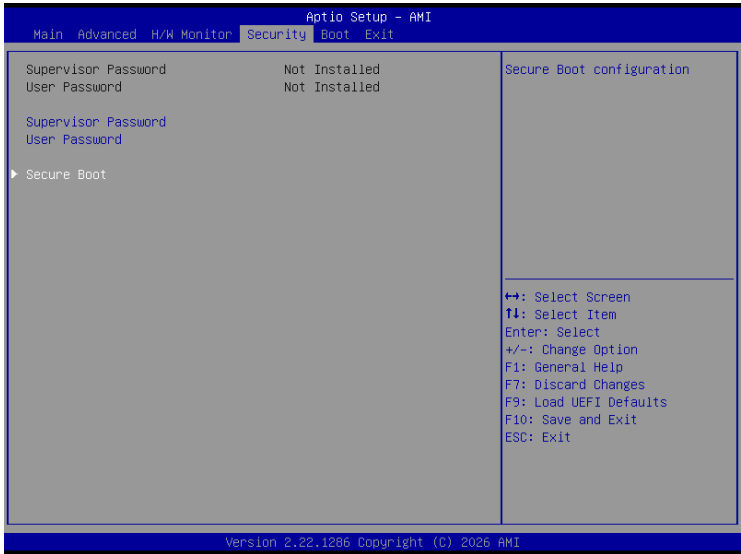
Case Open Feature

Enable or disable Case Open Feature to detect whether the chassis cover has been removed.

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

4.5 Security Screen



Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

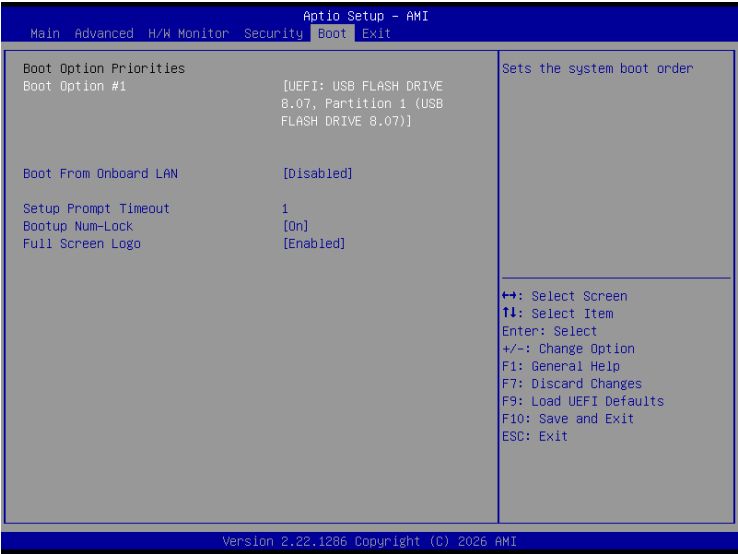
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Enable to support Windows Secure Boot.

4.6 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Boot From Onboard LAN

The item allows the system to be waked up by the onboard LAN.

Configuration options: [Enabled] [Disabled]

Setup Prompt Timeout

The item allows you to configure the number of seconds to wait for the UEFI setup utility. 65535(0xFFFF) means indefinite waiting.

Configuration options: [1] - [65535]

Bootup Num-Lock

The item allows you to select whether Num Lock should be turned on or off when the system boots up.

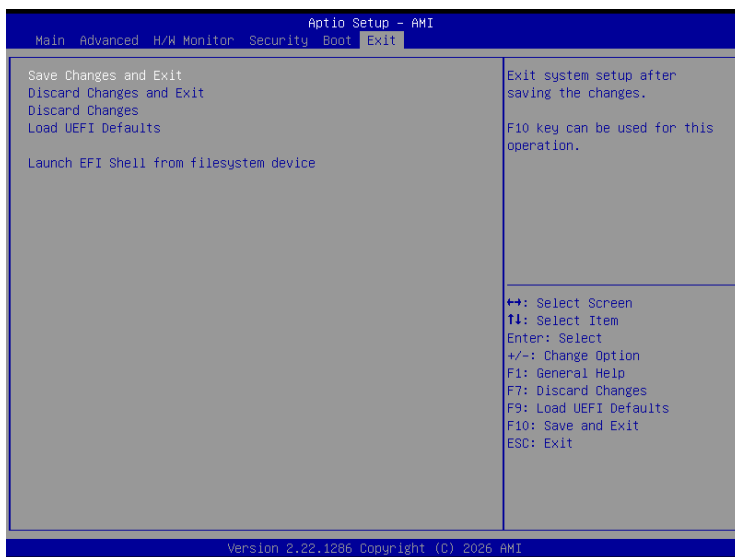
Configuration options: [On] [Off]

Full Screen Logo

[Enabled] Select this item to display the boot logo.

[Disabled] Select this item to show normal POST messages.

4.7 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message “Discard changes and exit setup?” will pop out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, the following message “Discard changes?” will pop out. Select [Yes] to discard all the changes.

Load UEFI Defaults

The item allows you to load UEFI default values for all options. The F9 key can be used for this operation.

Launch EFI Shell from filesystem device

The item allows you to copy shellx64.efi to the root directory to launch EFI Shell.

Chapter 5 Appendix

Appendix 1 Power Consumption

The power consumption (W)= voltage (V) x current (A)

The system's full loading means it is populated with such as DRAM, M.2 Module, and so on. The iEPF-9040VS Series also includes riser cards.

The following information is for reference only. Actual power consumption will vary with different attached devices and operating system.

iEP-9040VE Series

CPU (Run with PL2: 124W)	System's Full Loading	Total Power Consumption	Recommended Power Supply
45W	112.5W	236.5W	330W
65W	112.5W	236.5W	330W

iEPF-9040VS Series

CPU (Run with PL2: 124W)	System's Full Loading (w/ Riser Card)	Total Power Consumption	Recommended Power Supply
45W	174.5W	298.5W	330W
65W	174.5W	298.5W	330W

iEP-9042VE Series

CPU (Run with PL2: 124W)	System's Full Loading (w/ Riser Card)	Total Power Consumption	Recommended Power Supply
45W	102W	226W	330W
65W	102W	226W	330W

iEPF-9042VS Series

CPU (Run with PL2: 124W)	System's Full Loading (w/ Riser Card)	Total Power Consumption	Recommended Power Supply
45W	164W	288W	330W
65W	164W	288W	330W

Appendix 2 Link to the API Library

If you need the link to the API library, feel free to contact us at IPC_TSD@asrockind.com

Appendix 3 How to Install Power Supply or Power Adapter

The V+ and V- pins provide DC power input and the chassis ground pin allows connection of the chassis to ground for better EMC compatibility. The DC power input for the iEP(F)-9040V Series supports a voltage input range from 9V to 36V DC.

Pin	Definition	Pin	Definition
1	V+	3	V-
2	V+	4	V-

3.1 330W Power Adapter (FSP330-AAAN3)

