

USER'S MANUAL

BCO-1000-ADLN-B_3L

Basic Fanless Embedded Computer



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Prefaces

Revision

Revision	Description	Date
1.0	Manual Released	2025/01/14

Disclaimer

All specifications and information in this User's Manual are believed to be accurate and up to date. C&T Solution Inc. does not guarantee that the contents herein are complete, true, accurate or non-misleading. The information in this document is subject to change without notice and does not represent a commitment on the part of C&T Solution Inc.

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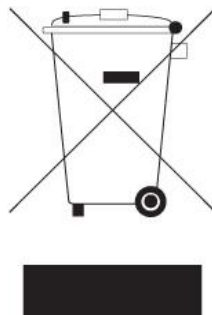
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Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. Please recycle to minimize pollution and ensure environment protection.



Safety Precautions

Before installing and using the equipment, please read the following precautions:

- Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- The power outlet shall be installed near the equipment and shall be easily accessible.
- Turn off the system power and disconnect the power cord from its source before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the equipment is properly grounded.
- When the power is connected, never open the equipment. The equipment should be opened only by qualified service personnel.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Disconnect this equipment from the power before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- Avoid the dusty, humidity and temperature extremes.
- Do not place heavy objects on the equipment.
- If the equipment is not used for long time, disconnect it from the power to avoid being damaged by transient over-voltage.
- The storage temperature shall be above -30°C and below 85°C.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- If one of the following situation arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well or it cannot work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.

Technical Support and Assistance

1. Visit the C&T Solution Inc website at <https://www.candtsolution.com> where you can find the latest information about the product.
2. Contact your distributor, our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:
 - Model name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Conventions Used in this Manual



WARNING

This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.



CAUTION

This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.



NOTE

This indication provides additional information to complete a task easily.

Package Contents

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

Item	Description	Q'ty
1	BCO-1000-ADLN-B_3L Basic Fanless Embedded Computer	1
2	Wall Mount Kit	1
3	Accessory Kit	1

Ordering Information

Model No.	Product Description
BCO-1000-ADLN-B_3L	Basic Fanless Embedded Computer with Intel 12th® CPU, 1x DP, 2x COM, 3x LAN, 1x 2.5" Drive Bay

Optional Accessories

Model No.	Product Description
1-E09A06008	Adapter AC/DC 12V 5A 60W with 3pin Terminal Block Plug 5.0mm Pitch
1-TPCD00005	Power Cord, 3-pin US Type, 180cm
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm
3-DINR-0004	Din Rail-2 Mounting Kit

Chapter 1

Product Introductions

1.1 Overview

C&T Basic Fanless Embedded Systems are designed for entry-level applications and basic needs. The BCO series can oversee connected devices and manage the collection, storage, and transmission of sensor data, and is capable of distilling unexplored value in data. It is not only robust and can withstand dust, shock, and vibration, but also can suitable for industrial automation, industrial control, kiosk & retail, and digital signage (without high demand in graphics).



Key Features

- Support Intel® IoTG Alder Lake-N N97/Intel® Atom® x7835RE Processors
- DDR5 SODIMM. Max. up to 16GB (Default: 8GB)
- Dual Independent Display by 1x Display Port, 1x HDMI
- 3x Intel® I225-V 2.5GbE LAN
- 1x 2.5" Drive Bay
- 1x M.2 (B Key, 2242/3042, support LTE/4G/5G/Storage Module)
- 1x Dual Nano SIM Socket (SIM1/ SIM2)
- 2x COM, 2x USB 3.2 Gen2, 2x USB 2.0
- 12 to 36VDC Wide Range Power Input Supporting AT/ATX Mode
- Wide Operating Temperature 0°C to 50°C (12W CPU)
- TPM 2.0 Supported
- CE, FCC Class A

1.2 Hardware Specification

System	
Processor 12th Gen Intel® IoTG Alder Lake-N Processor N97,4 cores, 12W • Intel Atom® x7835RE Processor, 8 cores, 12W	
System Chipset	SoC integrated
LAN Chipset	2x Intel® I225-V 2.5GbE LAN 1x Intel® I225-V 2.5GbE LAN (Co-lay I226-LM Support TSN, not verified in NPI)
Audio Codec	Realtek ALC897
System Memory	DDR5 4800MT/s SODIMM. Max. up to 16 GB (Default: 8GB)
Graphics	Intel® UHD Graphics
BIOS	AMI UEFI BIOS
Watchdog	Software Programmable Supports 1~255 sec. System Reset
TPM	TPM 2.0

Display	
DisplayPort	1x DisplayPort 1.4a Max Resolution 4096 x 2304 @60Hz
HDMI	1x HDMI 1.4b Max Resolution 3840 x 2160 @30Hz
Multiple Display	2x Independent Displays

I/O	
Audio	Line-in/Line-out/Mic-in
COM	2x DB9 COM1: RS232/422/485 COM2: RS232
DIO	8 GPIO
LAN	3x RJ45 (2.5GbE)
SIM	1x Dual Nano SIM Socket
USB	2x USB 3.2 Gen1 2x USB 2.0 Type-A
Others	2x Antenna Holes 1x Power button 1x HD LED 1x Power LED

Storage	
M.2	1x Internal 2.5" SATA SSD Bay (7mm or 9mm)

Expansion	
M.2	1x M.2 B Key (2242/3042, SATA/PCIe x1/USB3.0, support LTE/4G/5G/Storage Module) 1x M.2 E Key (2230, PCIe x1 & USB 2.0, support Wi-Fi & BT)

Operating System	
Windows	Windows 10/11
Linux	Linux kernel

Power	
Power Adapter	Optional AC/DC 24V/9.2A, 60W
Power Mode	AT, ATX (Default ATX)
Power Supply Voltage	12~36VDC
Power Connector	3-pin Terminal Block

Environment

Operating Temp.	0°C to 50°C (12W CPU) Tested according to: IEC60068-2-1:2007 (Cold test procedure) IEC60068-2-2:2007 (Dry heat test procedure) IEC60068-2-3:2007 (Damp heat, steady state, test procedure) IEC60068-2-14:2009 (Wide temperature range thermal shock)
Storage Temp.	-30°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Certification	EMC: • CE • FCC Class A (47 CFR part 15.109 and part 15.107) • ICES-003 • UKCA • UL 62368 Ed. 3 Green Product: • RoHS 3.0 (Directive 2015/863/EU) • REACH
Vibration	IEC60068-2-64:2008 With SSD: 5 Grms (5 - 500 Hz, 0.5 hr/axis) Designed to comply with MIL-STD-810G Method 514.7 Procedure I
Shock	IEC60068-2-27:2008 With SSD: 50G half-sin 11ms Designed to comply with MIL-STD-810G Method 514.7 Procedure I Package Drop Test: ISTA 2A

Physical

Construction	Extruded Aluminum with Heavy Duty Metal
Weights	1.5kg
Dimension	192(W) x 140(D) x 68(H) mm
Mounting	Wall Mounting DIN-Rail Mounting (Optional)

*All specifications and photos are subject to change without notice.

1.3 System I/O

Front Panel

LAN port

Used to connect the system to a local area network

USB 3.2 Gen 2 port (10 Gbps)

Used to connect USB 3.2 device

DisplayPort

Used to connect a DisplayPort monitor

HDMI port

Used to connect a HDMI monitor or connect optional split cable for dual display mode

Line-in / Line-out

Used to connect a speaker

Mic-in

Used to connect a microphone

Line-out

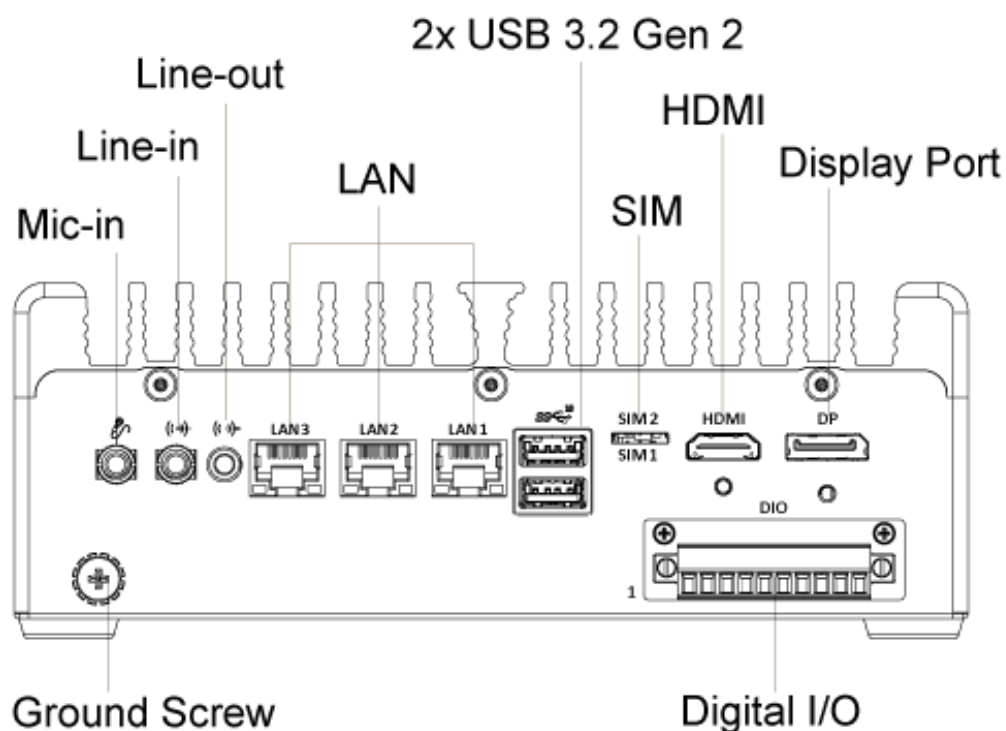
Used to connect a speaker

Digital I/O

The Digital I/O terminal block supports 8 digital input and 8 digital output

SIM card

Used to insert SIM card



Rear Panel

USB 2.0 port

Used to connect USB 2.0 device

COM port

COM1 ~ COM2 support RS232/422/485 serial device

Antenna hole

Used to connect an antenna for optional Mini-PCIe WiFi module

DC IN

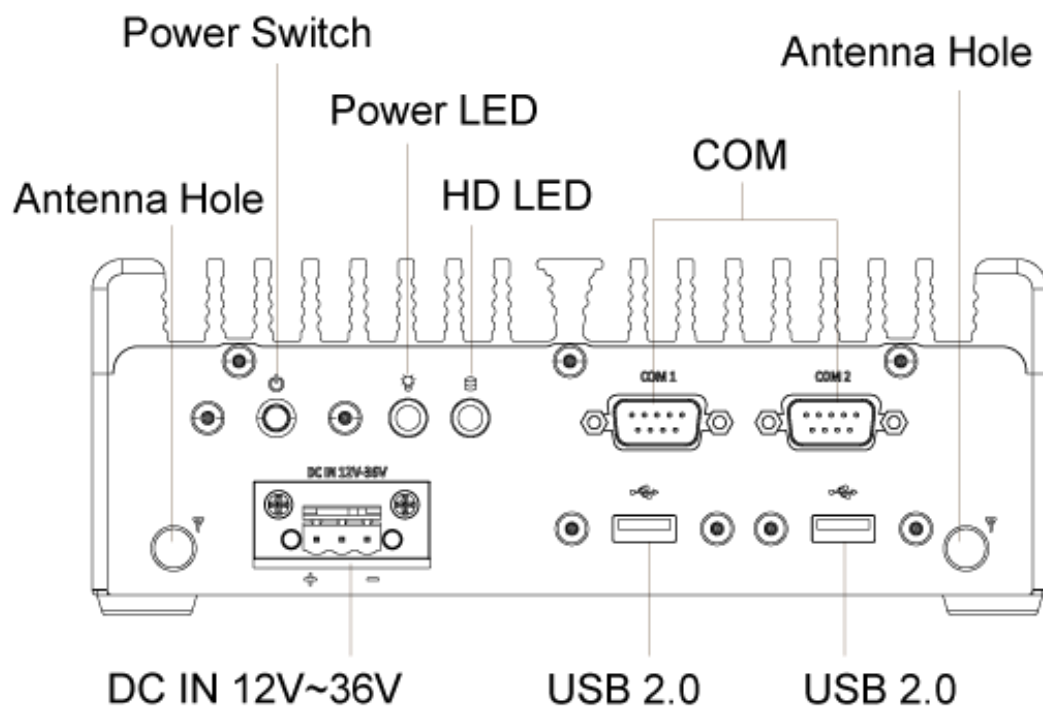
Used to plug a DC power input with terminal block

Power LED

Indicates the power status of the system

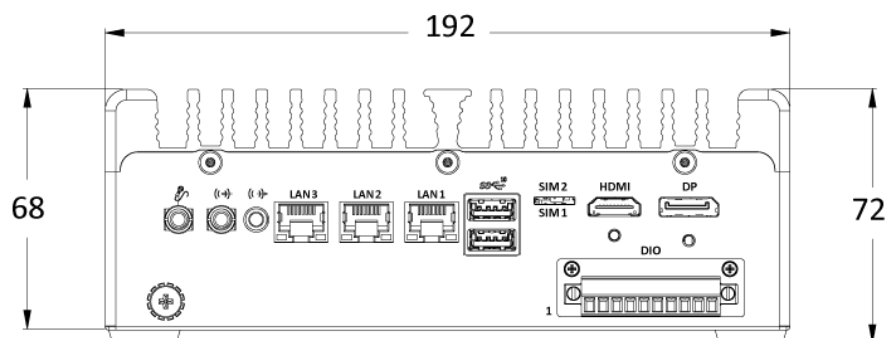
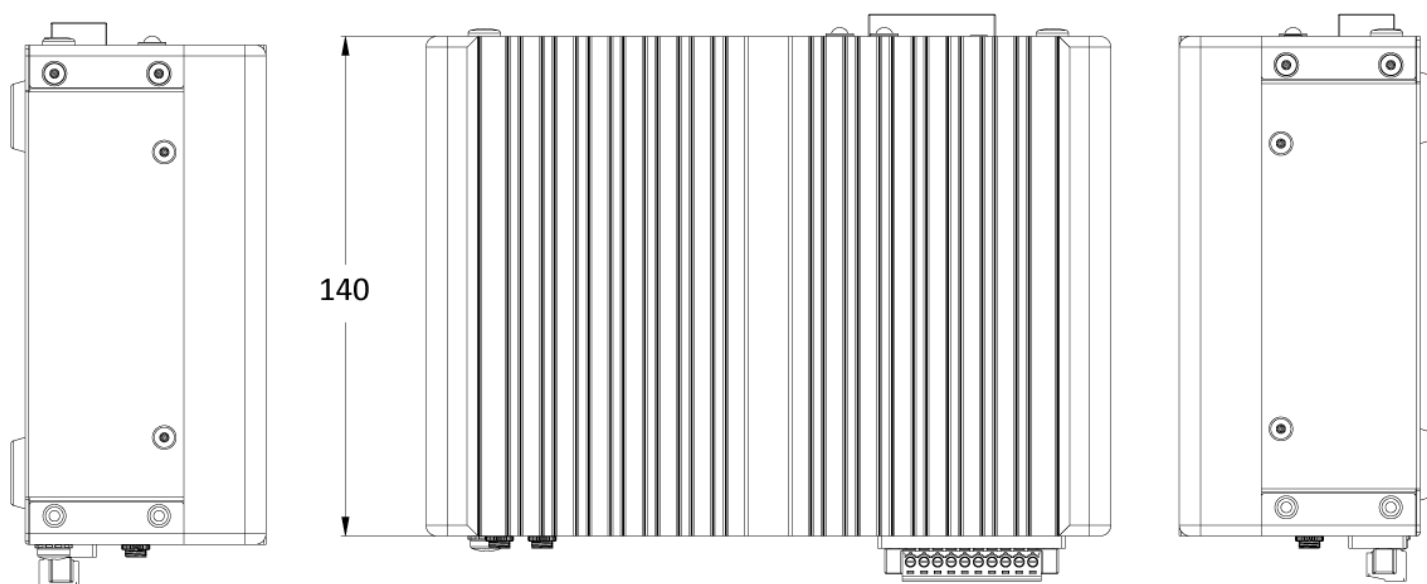
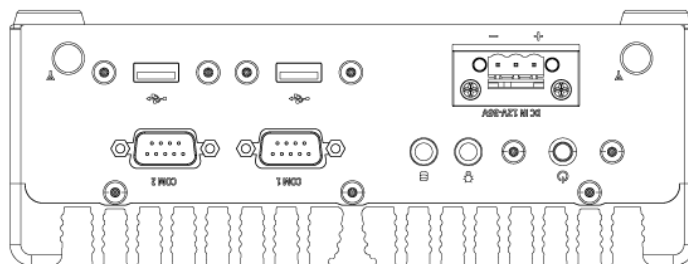
HDD LED

Indicates the status of the hard drive



1.4 Mechanical Dimensions

Unit: mm

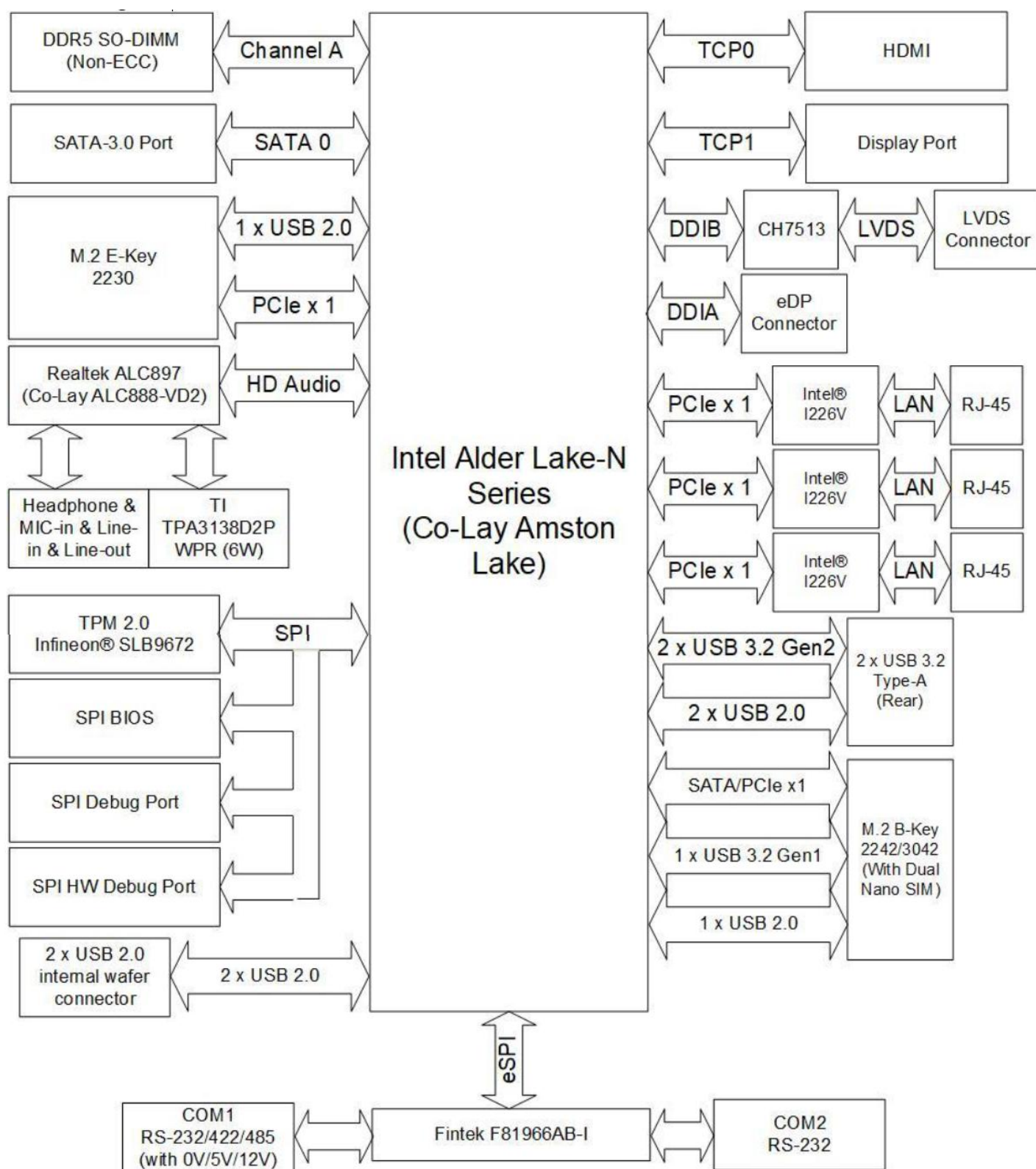


Chapter 2

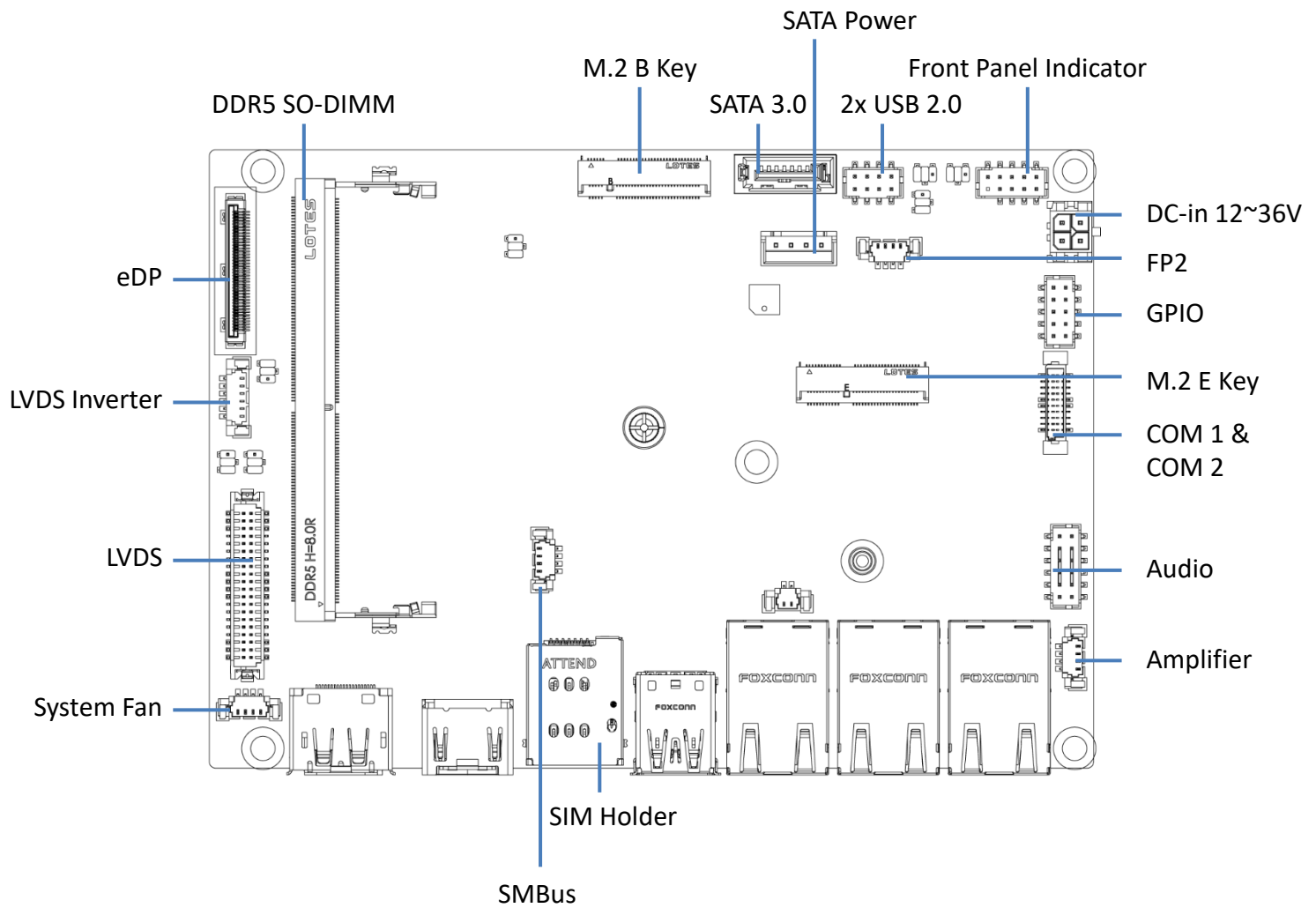
Mechanical Specifications

2.1 Motherboard Overview

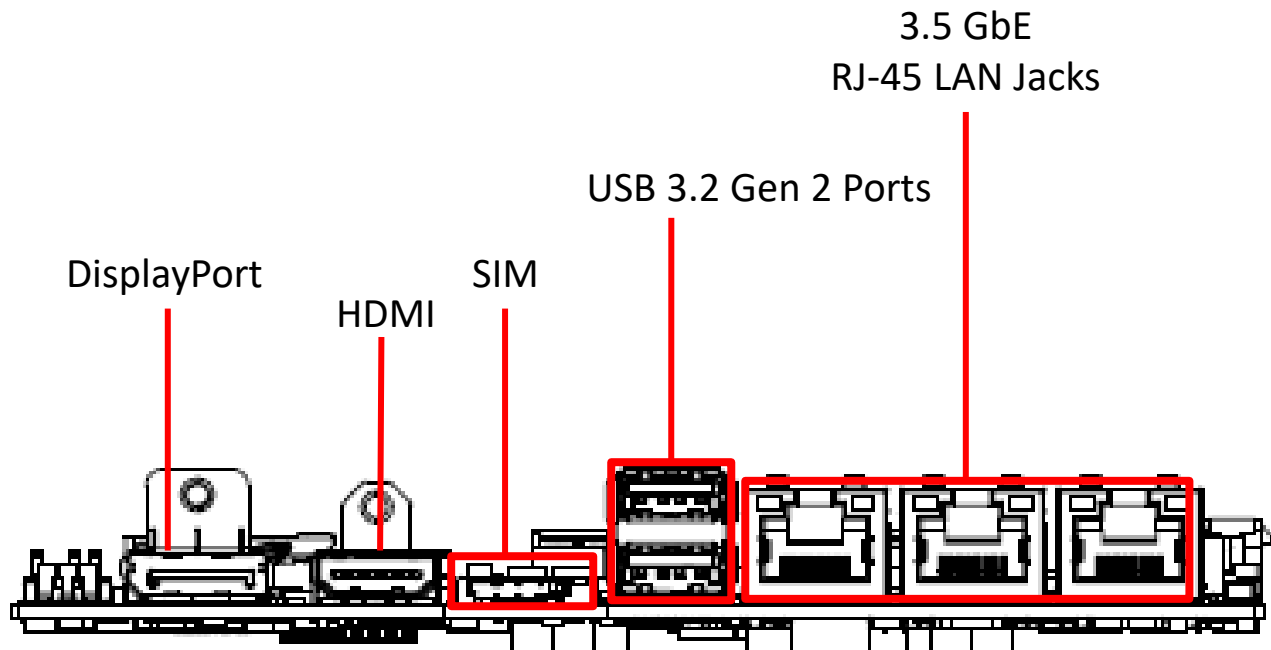
2.1.1 Block Diagram



2.1.2 Top View



2.1.3 Rear I/O Panel



DisplayPor

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

USB 3.2 Gen 2 Port

USB 3.2 Gen 2, the SuperSpeed USB 10Gbps, delivers high-speed data transfer for various devices, such as storage devices, hard drives, video cameras, etc.

LAN port

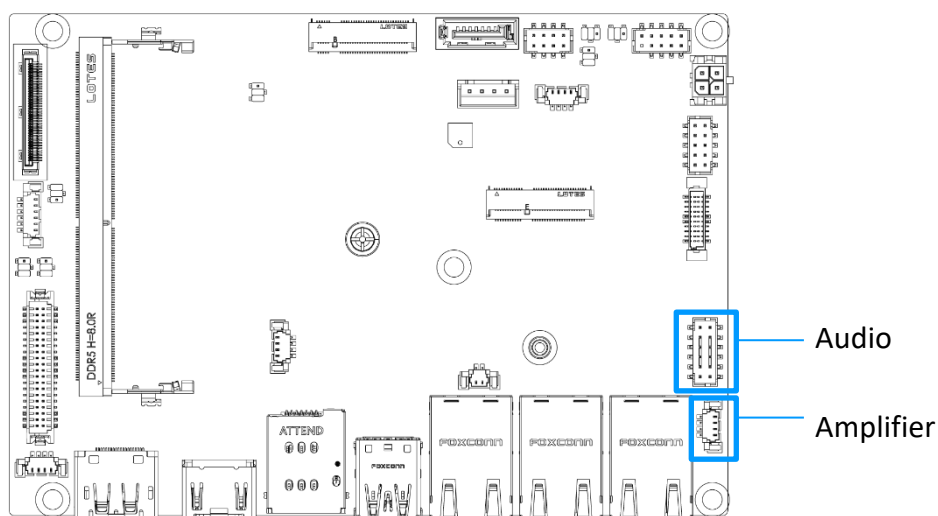
Used to connect the system to a local area network

SIM

Used to insert SIM card

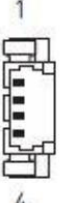
2.2 Pin Define

2.2.1 Amplifier



JAMP1: Audio Amplifier Header

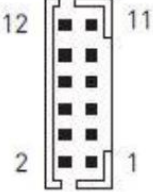
The connector is used to connect audio amplifiers to enhance audio performance.

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

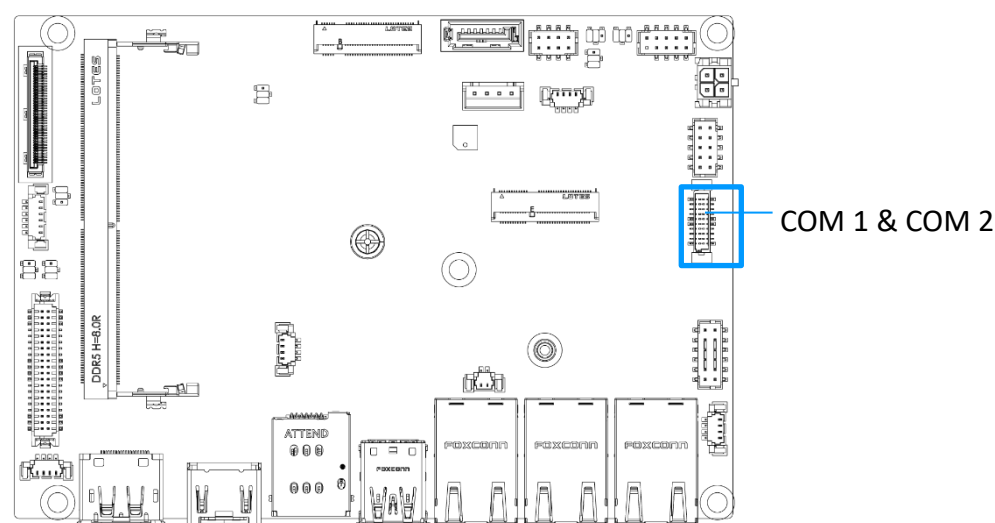
2.2.2 Front Audio

JAUD1: Front Audio Header

This connector allows you to connect front panel audio.

	1	LINE_IN_RA	2	MIC1_RA
	3	LINE_IN_LA	4	MIC1_LA
	5	LOUT_RA	6	MIC1_JD
	7	LOUT_LA	8	LINE_IN_JD
	9	FRONT_JD	10	GND
	11	GND	12	GND

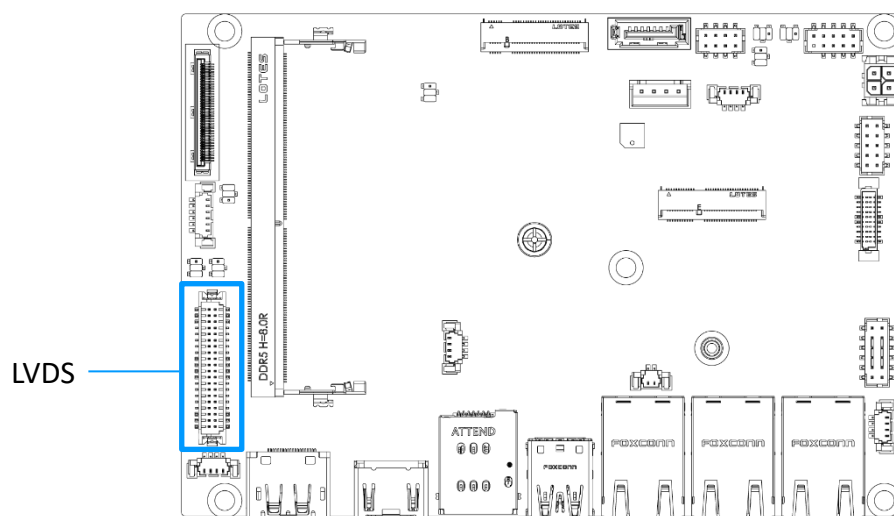
2.2.3 COM Ports (COM 1~2)



COM 1 and COM 2

JCOM1_2								
191 202								
RS232			RS422			RS485		
1	2	DCD	1	2	TXD-	1	2	TXD-
3	4	RXD	3	4	TXD+	3	4	TXD+
5	6	TXD	5	6	RXD+	5	6	NC
7	8	DTR	7	8	RXD-	7	8	NC
9	10	GND	9	10	GND	9	10	GND
11	12	DSR	11	12	NC	11	12	NC
13	14	RTS	13	14	NC	13	14	NC
15	16	CTS	15	16	NC	15	16	NC
17	18	POWER	17	18	NC	17	18	NC
19	20	NC	19	20	NC	19	20	NC

2.2.4 LVDS



JLVDS1: LVDS Wafer Connector

This connector is designed for use with LVDS interface flat panels. When connecting your flat panel to this connector, be sure to check the panel datasheet to ensure that you set the **LVDS power select jumper (JVDD1)** to the appropriate power voltage.

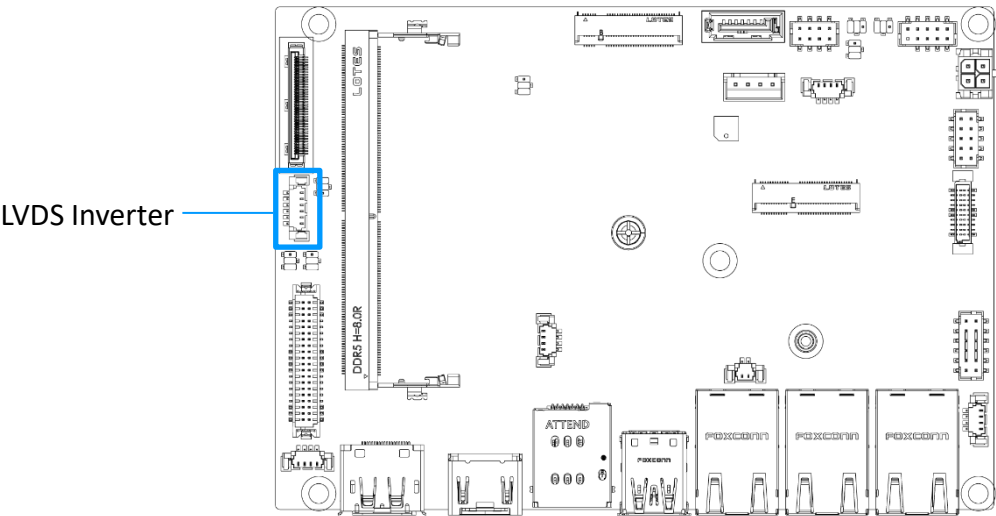
	1	12V	2	12V
	3	LCD_VDD	4	12V
	5	LCD_VDD	6	LCD_VDD
	7	DDC_CLK	8	DDC_DATA
	9	L_BKLT_CTRL#	10	LCDEN
	11	INV_ON	12	LVDS_DETECT#_C
	13	LVDSA_DATA1	14	LVDSA_DATA0
	15	LVDSA_DATA#1	16	LVDSA_DATA#0
	17	GND	18	GND
	19	LVDSA_DATA3	20	LVDSA_DATA2
	21	LVDSA_DATA#3	22	LVDSA_DATA#2
	23	GND	24	GND
	25	LVDSB_DATA1	26	LVDSB_DATA0
	27	LVDSB_DATA#1	28	LVDSB_DATA#0
	29	GND	30	GND
	31	LVDSB_DATA3	32	LVDSB_DATA2
	33	LVDSB_DATA#3	34	LVDSB_DATA#2
	35	GND	36	GND
	37	LVDSB_CLK	38	LVDSA_CLK
	39	LVDSB_CLK#	40	LVDSA_CLK#



Important

Pin 12 is a detect pin. When using a customized LVDS cable, pin 12 should be a signal ground with a low impedance. Otherwise, LVDS will not function.

2.2.5 LVDS Inverter

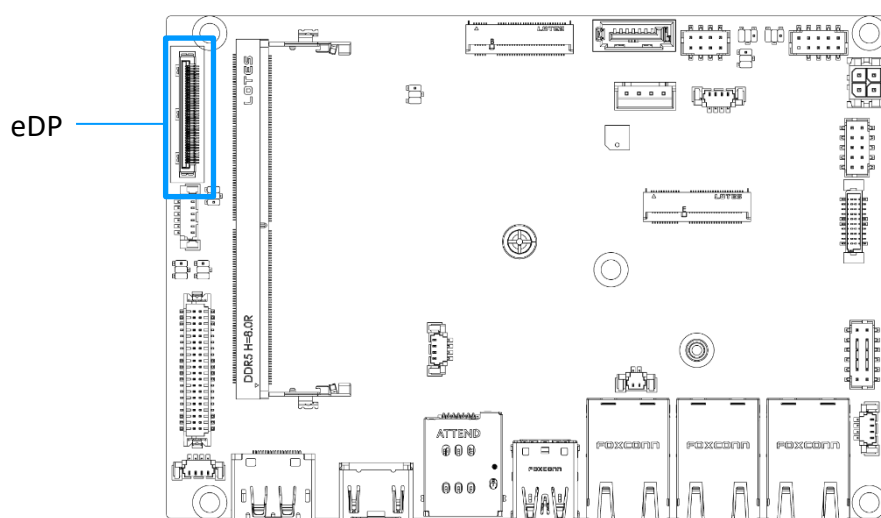


JINVDD1: LVDS Inverter Box Header

The connector is provided for LCD backlight options, be sure to check the panel datasheet to ensure that you set the **LVDS Inverter Power Select Jumper (JINV1)** to the appropriate power voltage (5V/12V).

JINVDD1 1 6	1	5V/12V	2	5V/12V
	3	BKLT_EN	4	BKLT_CTRL
	5	GND	6	GND

2.2.6 eDP

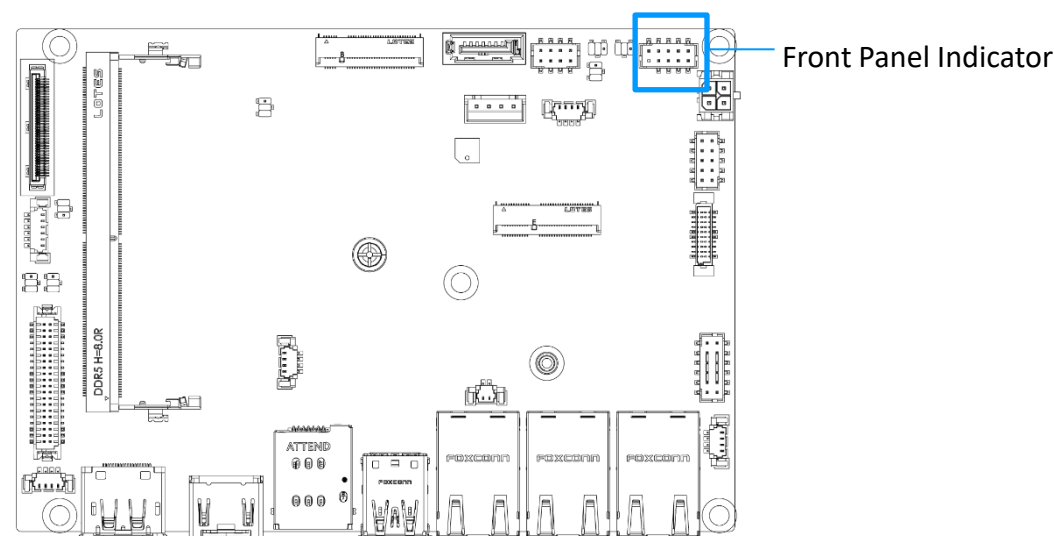


JEDP1: eDP Connector

This connector is designed for use with eDP interface flat panels. When connecting your flat panel to this connector, be sure to check the panel datasheet to ensure that you set the **eDP power select jumper (JEDP_VDD1)** to the appropriate power voltage.

JEDP1	1	LCD_VDD1	2	LCD_VDD1
	3	LCD_VDD1	4	LCD_VDD1
	5	LCD_VDD1	6	VCC3
	7	SMB_CLK	8	SMB_DATA
	9	GND	10	HPD
	11	N/C	12	N/C
	13	GND	14	DPC_LINE3_DN
	15	DPC_LINE3_DP	16	GND
	17	DPC_LINE2_DN	18	DPC_LINE2_DP
	19	GND	20	DPC_LINE1_DN
	21	DPC_LINE1_DP	22	GND
	23	DPC_LINE0_DN	24	DPC_LINE0_DP
	25	GND	26	DSP_DDPC_AUXP
	27	DSP_DDPC_AUXN	28	GND
	29	VCC3	30	GND
	31	+12V	32	GND
	33	GND	34	VCC5
	35	GND	36	BKLTCTL
	37	BKLT_EN	38	+12V
	39	VCC3	40	GND

2.2.7 Front Panel

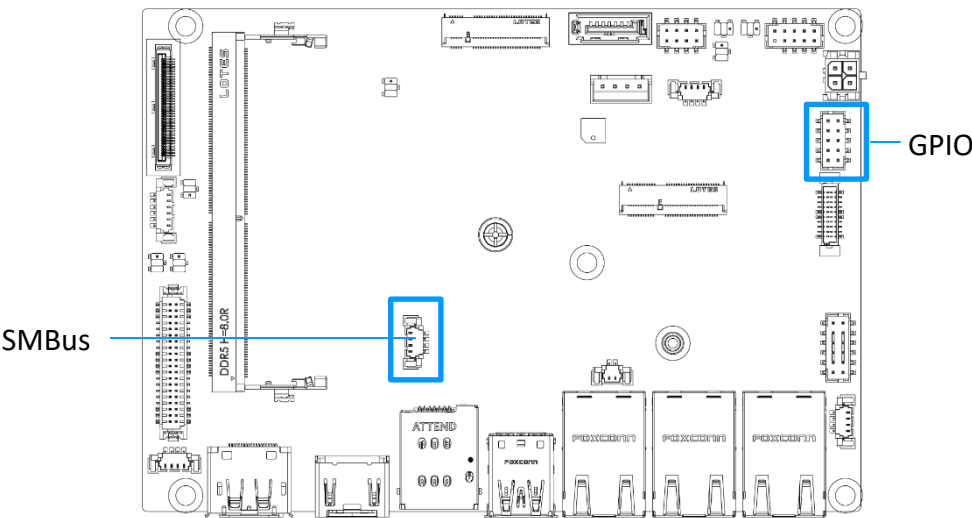


JFP1: Front Panel Connector

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

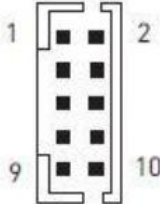
JFP1 2 1 9	1	HDD LED+	2	POWER LED
	3	HDD LED-	4	SUS LED
	5	GND	6	POWER SWITCH+
	7	RESET SWITCH+	8	POWER SWITCH-
	9	NC	10	No pin

2.2.8 GPIO



JGPIO1: GPIO (DIO) Box Header

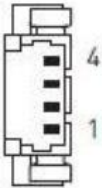
This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.

JGPIO1 	1	GND	2	VCC5
	3	GP00	4	GP10
	5	GP01	6	GP11
	7	GP02	8	GP12
	9	GP03	10	GP13

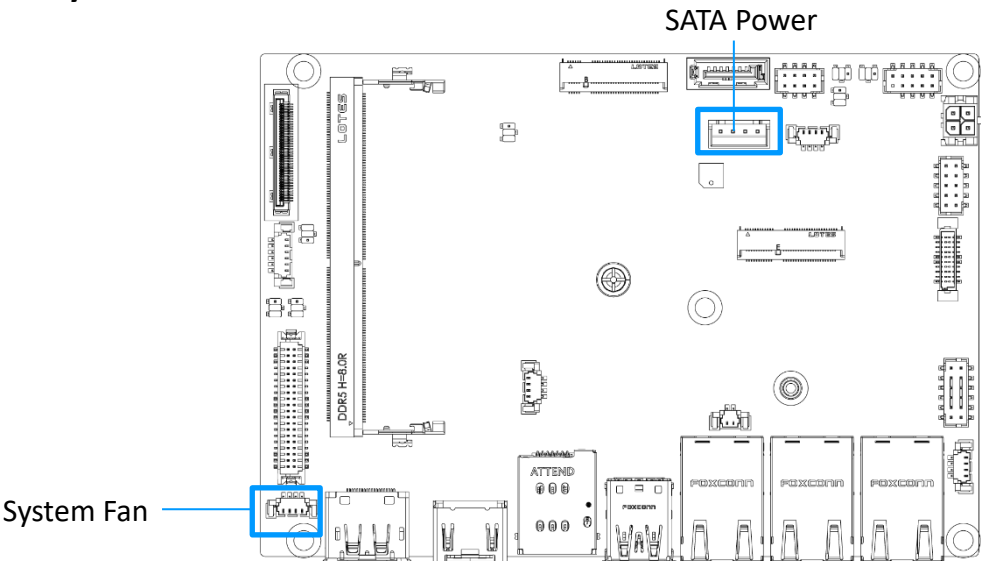
2.2.9 SMBus

JSMB1: SMBus Box Header

This connector, known as I2C, is for users to connect System Management Bus (SMBus) interface.

JSMB1 	1	5VSB	2	SMBCLK
	3	SMBDATA	4	GND

2.2.10 System Fan



SYSFAN1: PWM System Fan Box Header

The fan power connector supports system cooling fans with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND.

SYSFAN1		1	GND	2	FAN POWER
		3	FAN SENSE	4	FAN_PWM

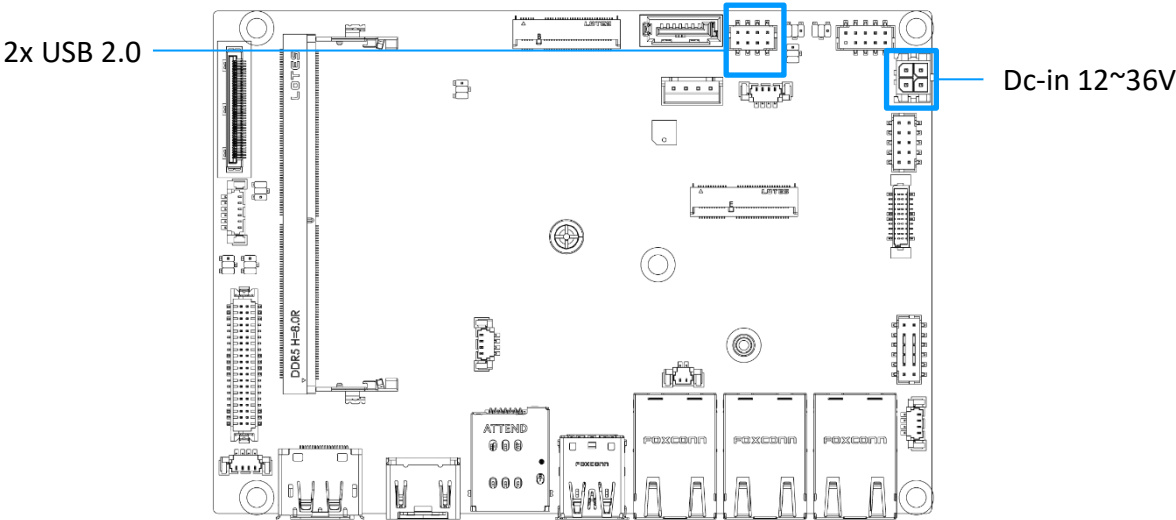
2.2.11 SATA Power

JPW1: 4-Pin SATA Power Connector

This connector is used to provide power to SATA devices.

JPW1		1	5V	2	GND
		3	GND	4	12V

2.2.12 USB 2.0



USB 2.0 Box Headers

These connectors are ideal for connecting USB devices such as keyboard, mouse, or other USB-compatible devices.

JUSB1 JUSB2 28 17 1 8	1	5V	2	GND
	3	USB_0-	4	USB_1+
	5	USB_0+	6	USB_1-
	7	GND	8	5V

2.2.13 DC in 12~36V

1 2 3 4	Pin	Signal
	1	GND
	2	GND
	3	DC_IN
	4	DC_IN

Chapter 3

System Setup

3.1 Set torque force to 3.5 kgf-cm to screw or unscrew system parts.

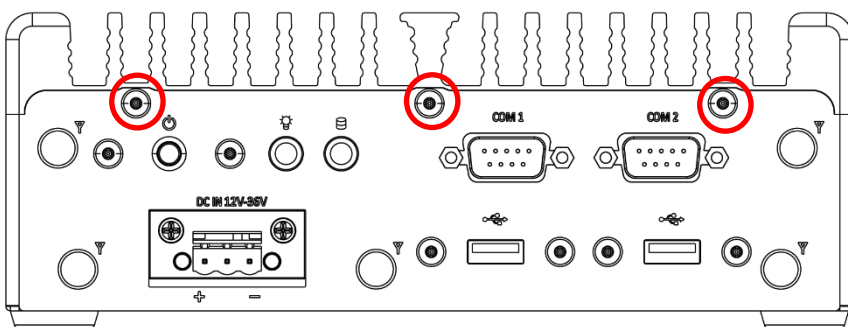
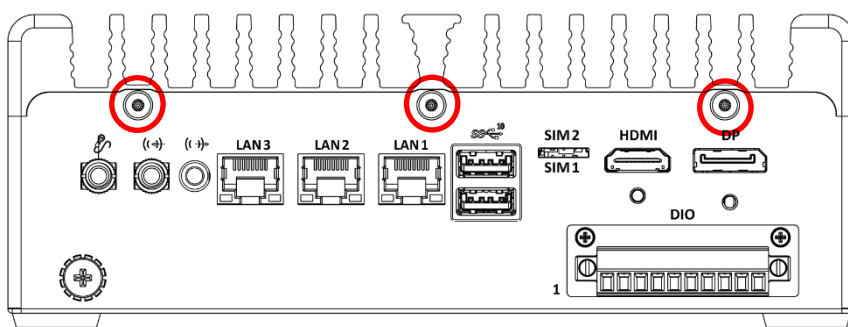
3.2 Before installing the system, separate the top and the bottom covers



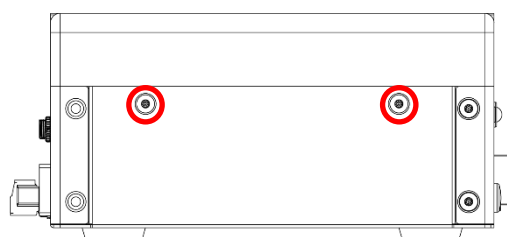
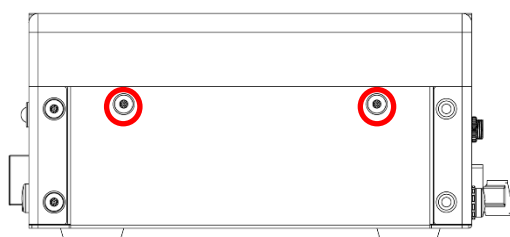
WARNING

To ensure safety and prevent system damage, before disassembly, please switch off the system and disconnect the unit from its power source.

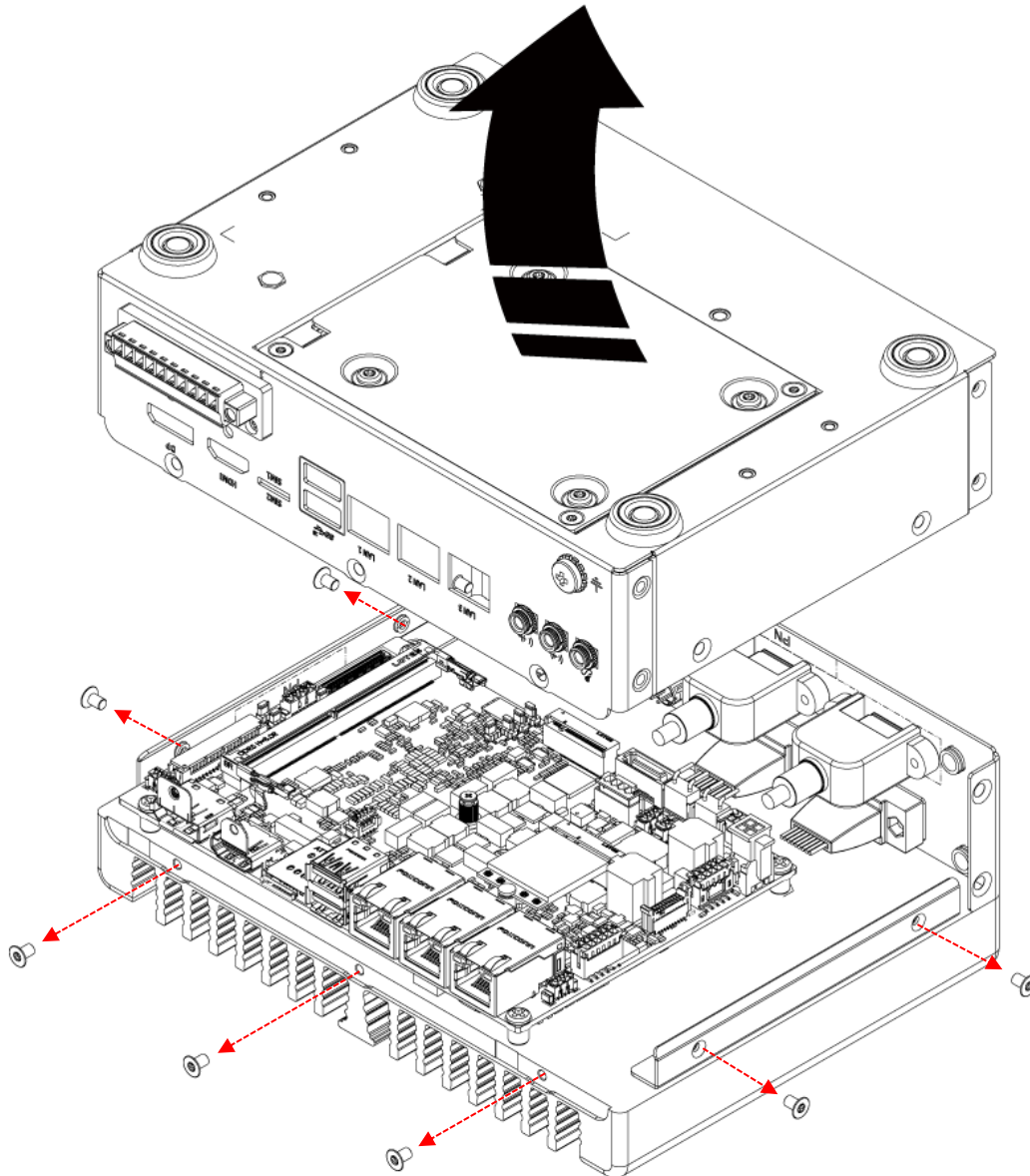
1. Remove the 3 screws on the front and rear side of the system as highlighted in the pictures below.



2. Remove the 2 screws on the left and right side of the system as highlighted in the pictures below

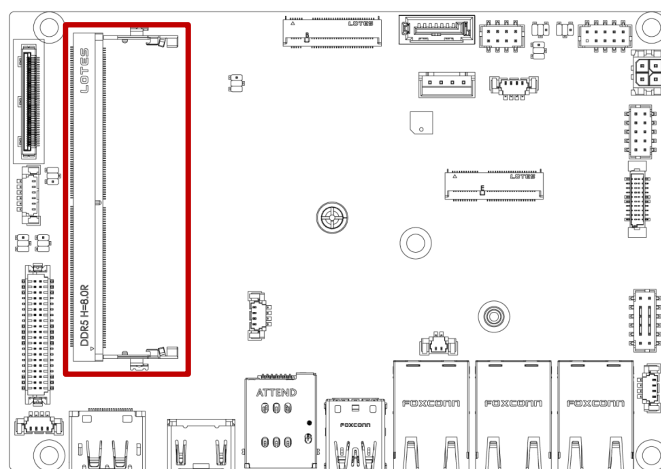


3. After opening the bottom cover, remove the top and bottom cable covers to facilitate the installation of hard drives and memory.

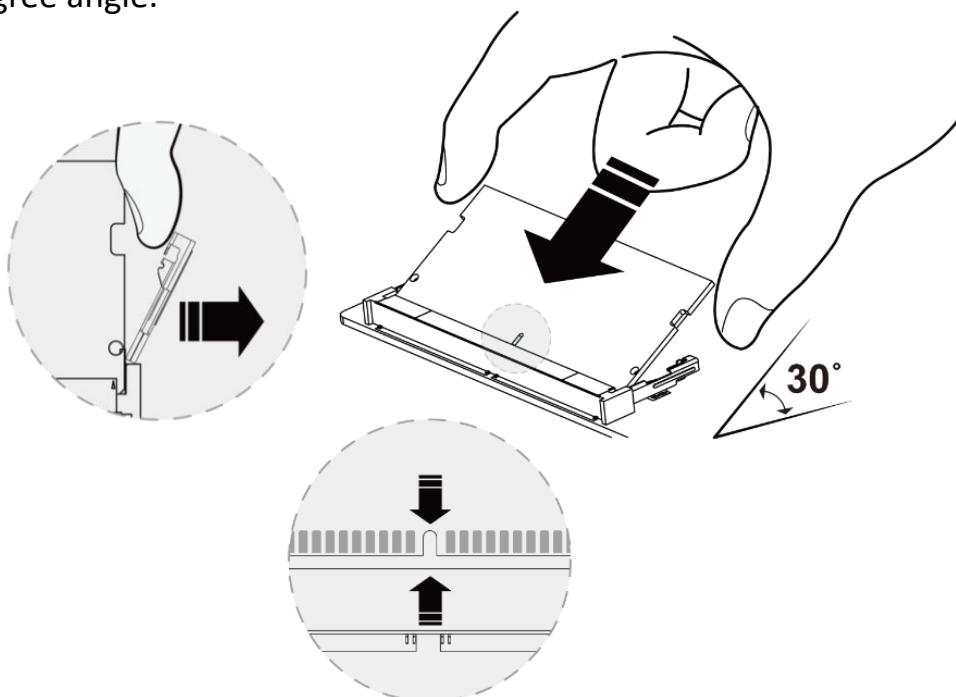


3.3 Install RAM

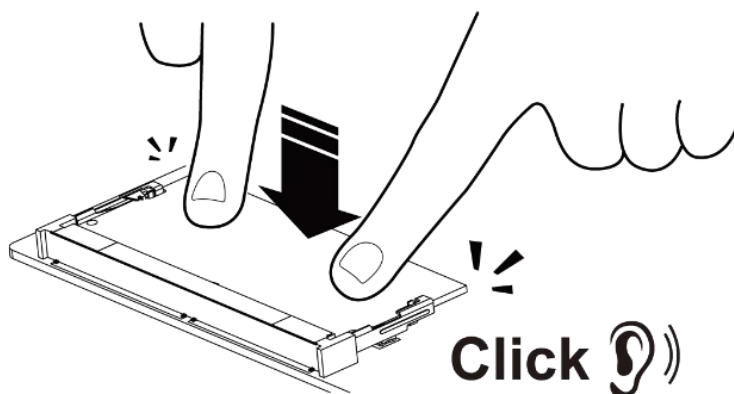
The RAM slot, as highlighted in the picture below.



1. Gently pull the locking tabs on either side of the RAM slot. Insert the RAM module at a 30-degree angle.

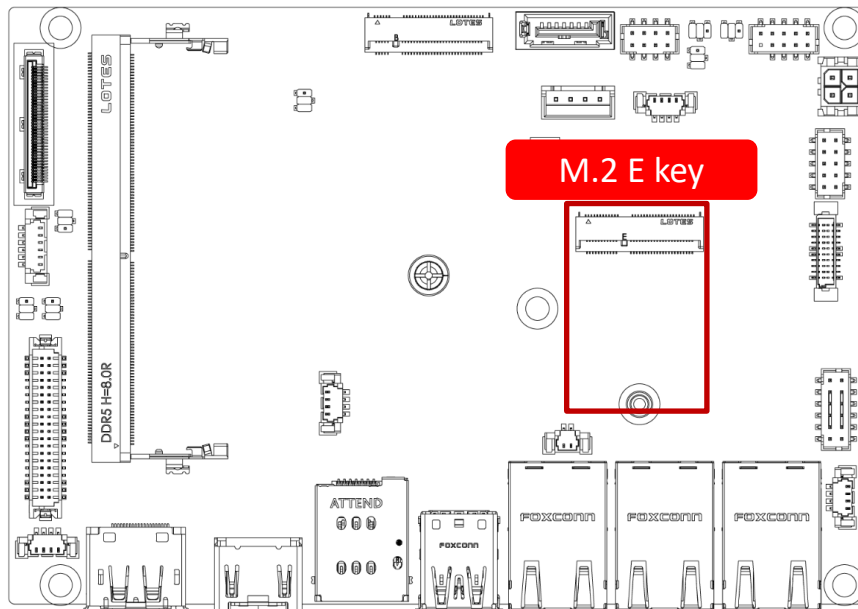


2. Press down gently until you hear a "click" sound and the tabs lock it into place.

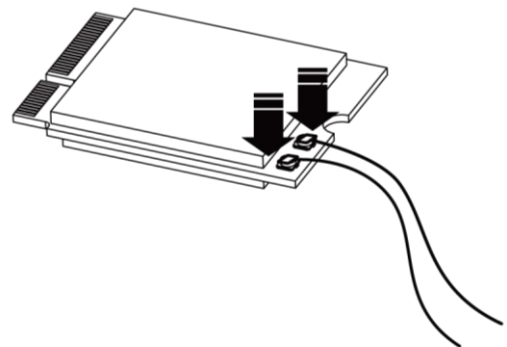


3.4 Install M.2 E Key Wifi and Antenna

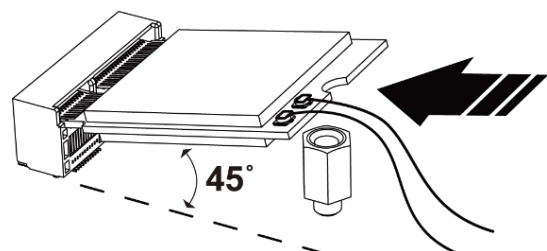
1. The M.2 E-Key supports Wi-Fi module, , as highlighted in the picture below.



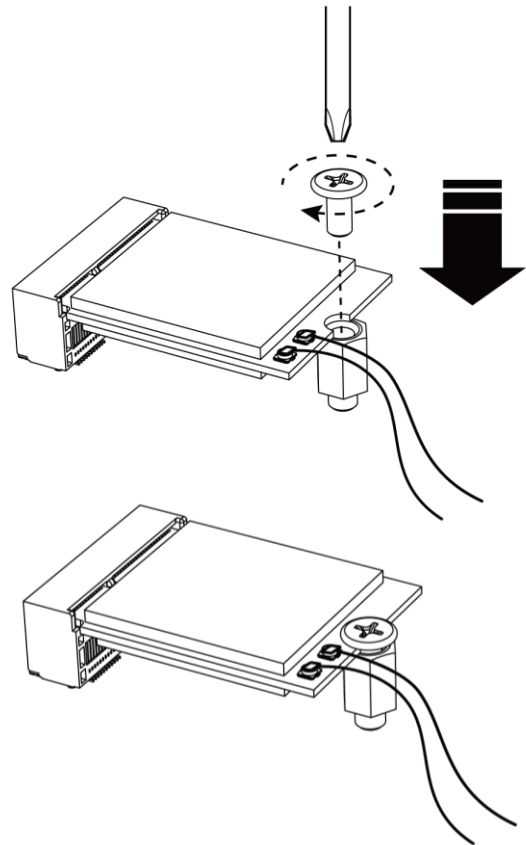
2. Connect the SMA cables to the Wi-Fi module.



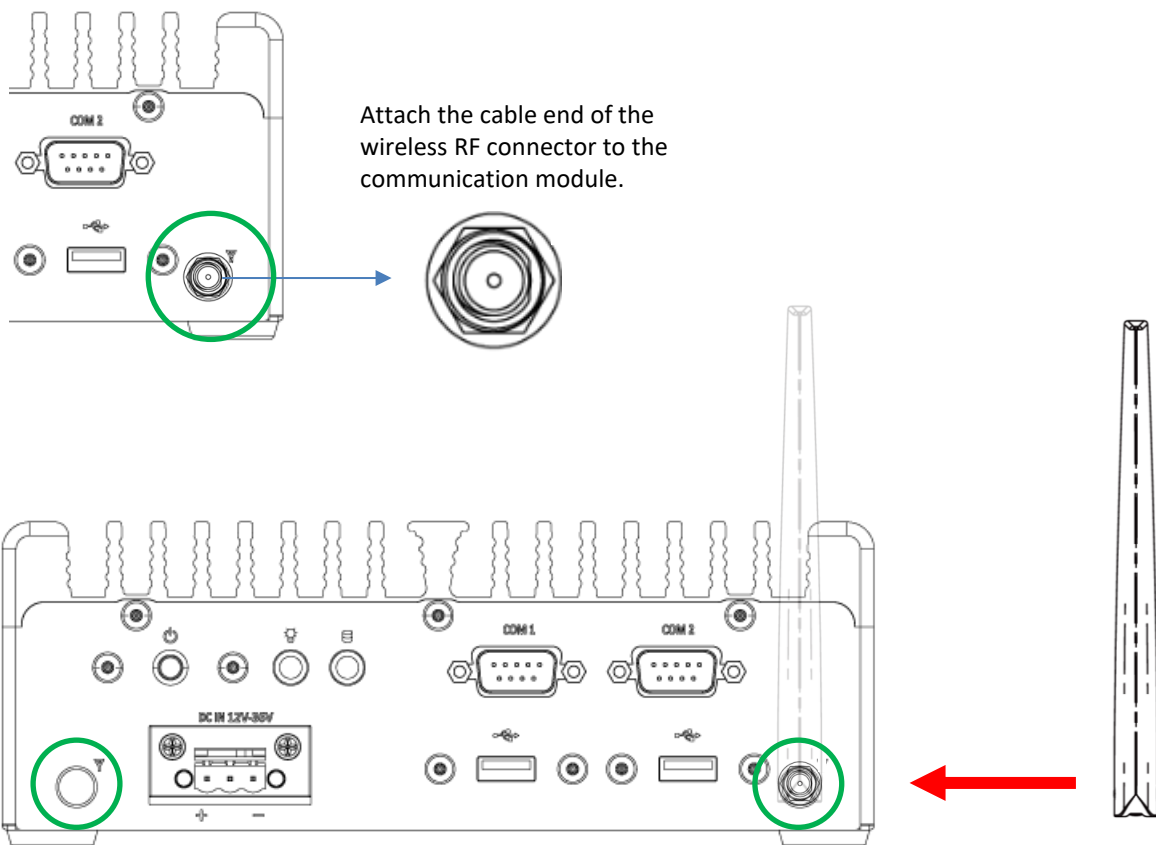
3. Insert the Wi-Fi module at a 45-degree angle.



4. Press the Wi-Fi module down and secure it with one screw.

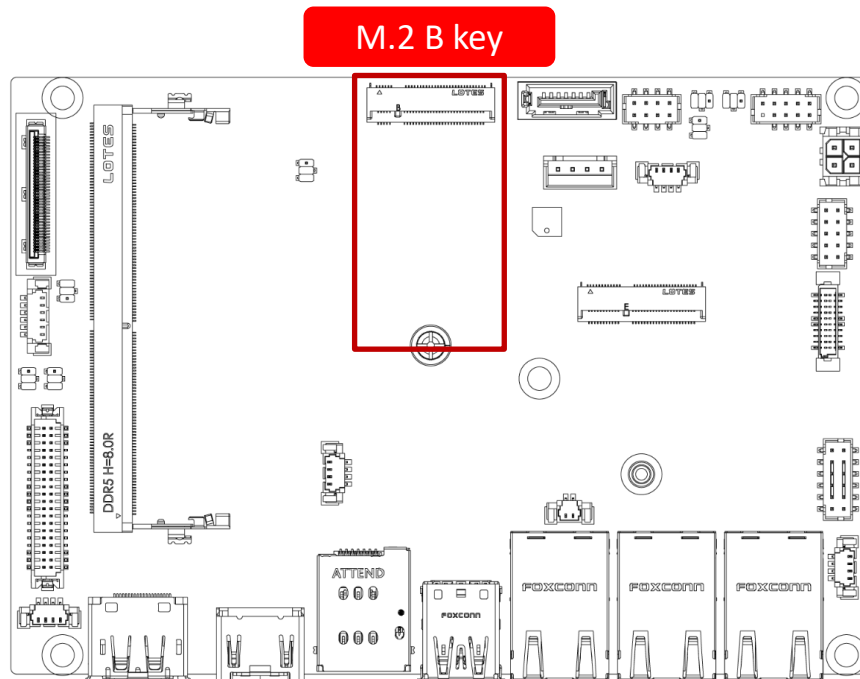


5. Attach the external antenna to the SMA jack by securely threading them together.

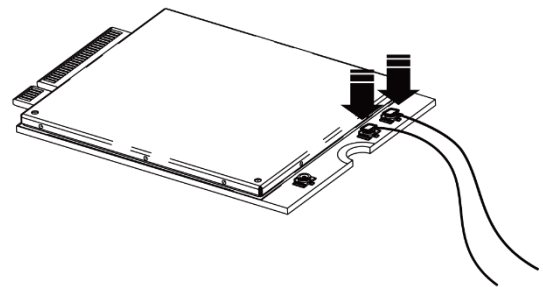


3.5 Install M.2 B Key Communication Module and Antenna

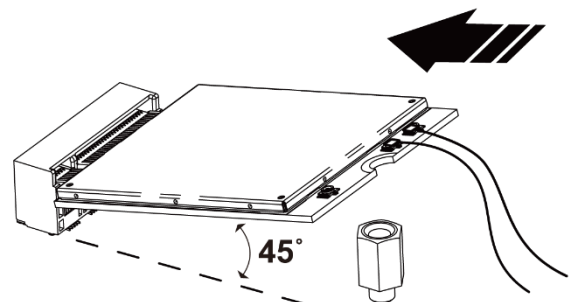
1. The M.2 B-Key supports communication (4G/5G) module, as highlighted in the picture below.



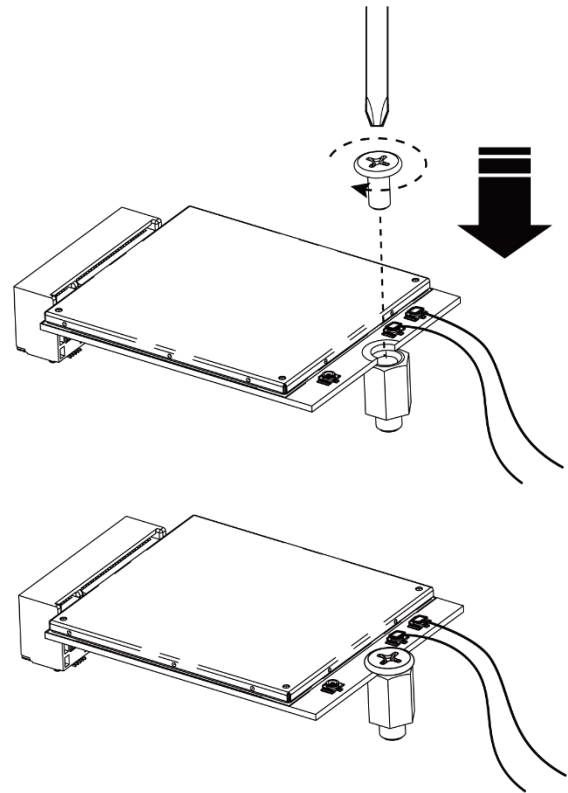
2. Connect the SMA cables to the communication (4G/5G) module.



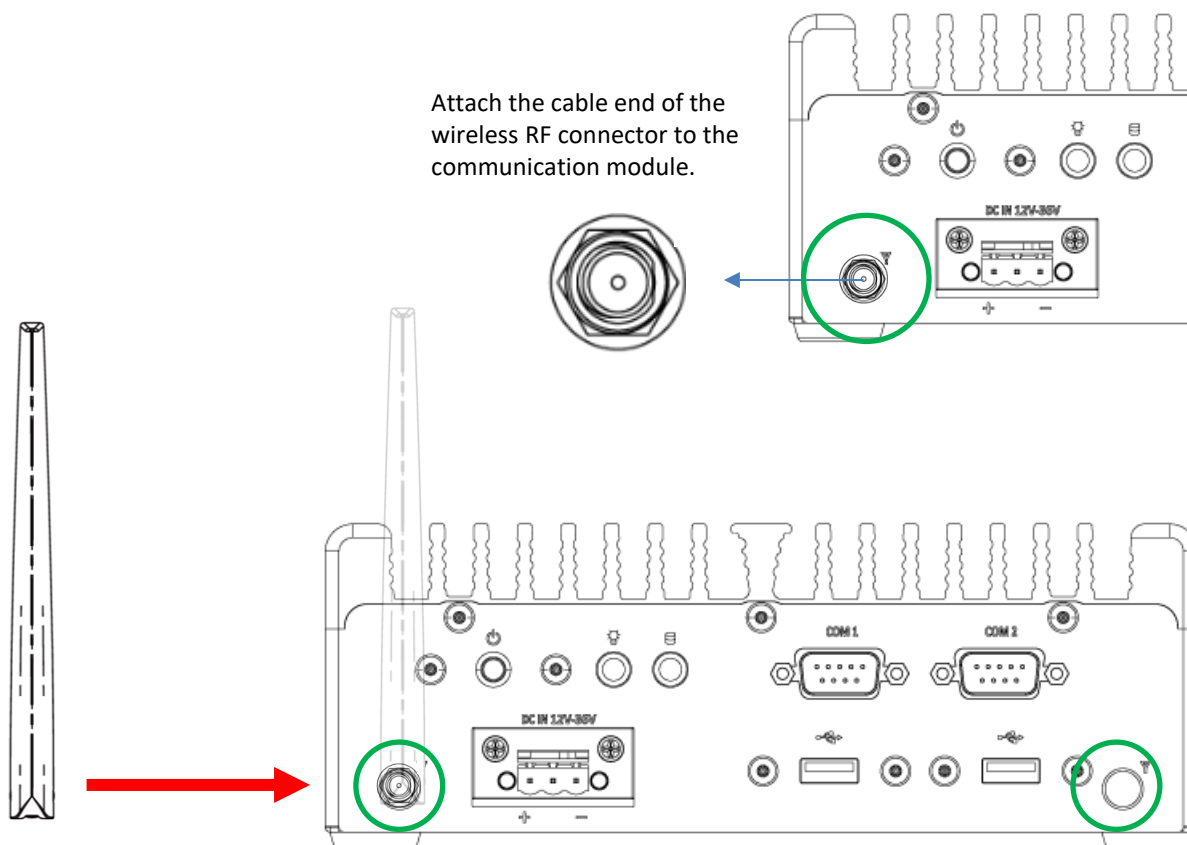
3. Insert the communication (4G/5G) module at a 45-degree angle.



4. Press the communication module down and secure it with one screw.

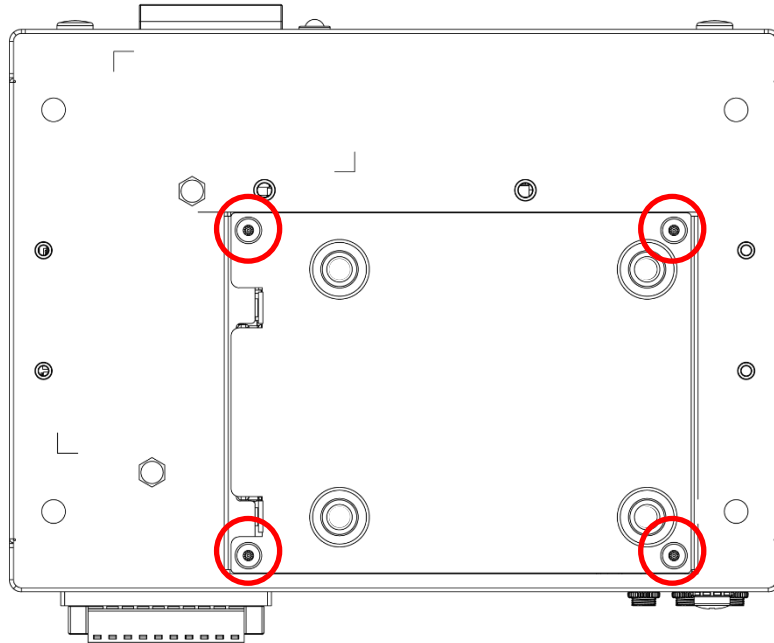


5. Assemble the antenna and SMA jack together, the outcome should resemble the picture below.

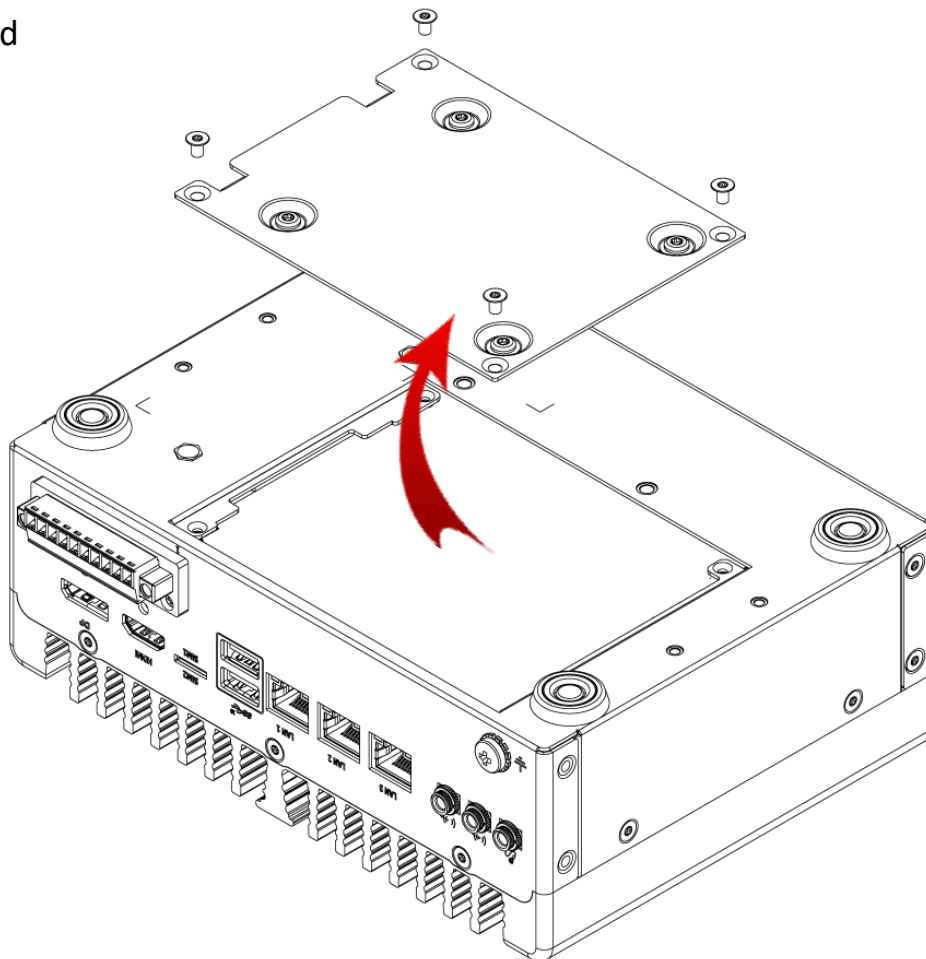


3.6 Install 2.5-inch SSD

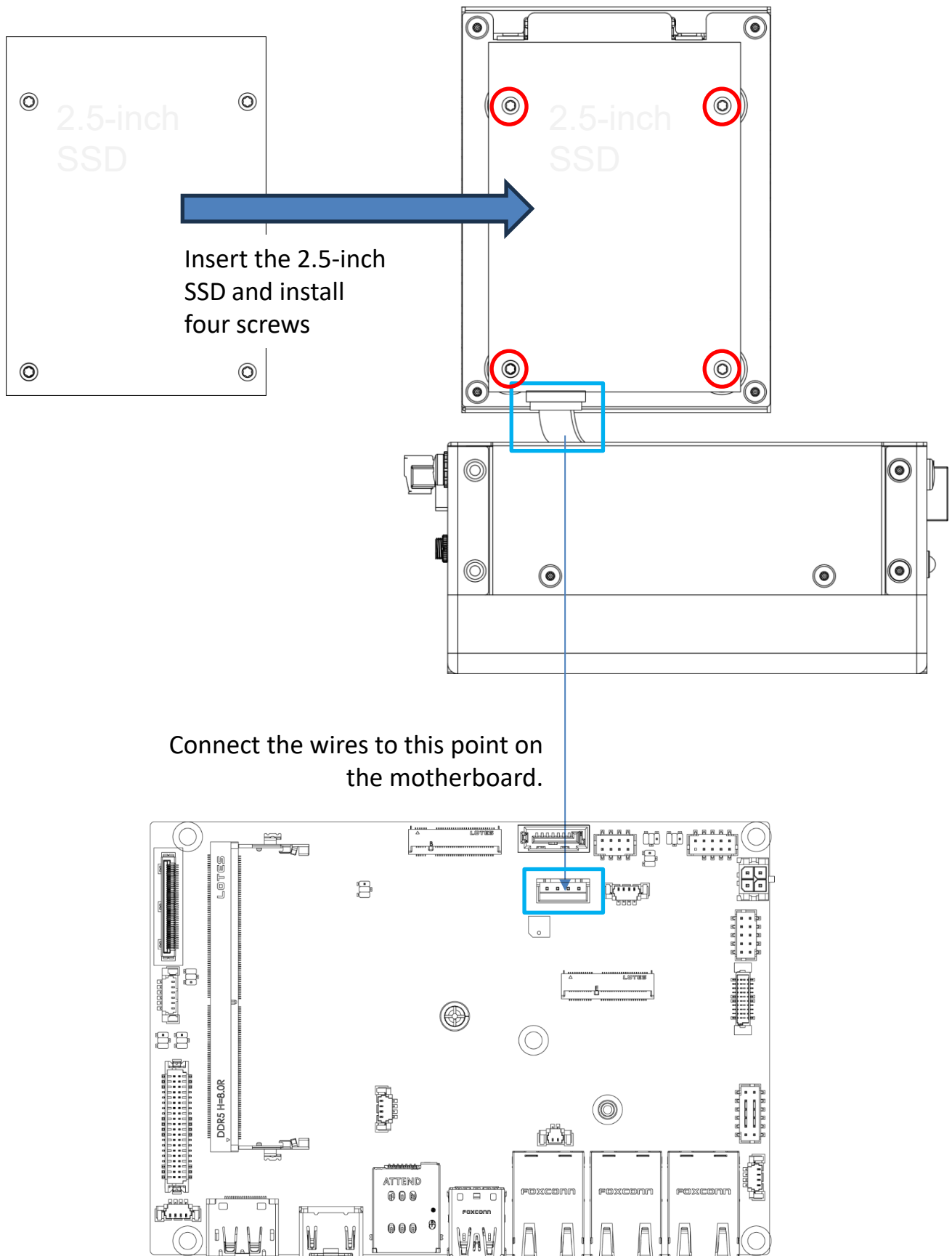
1. Remove the screws



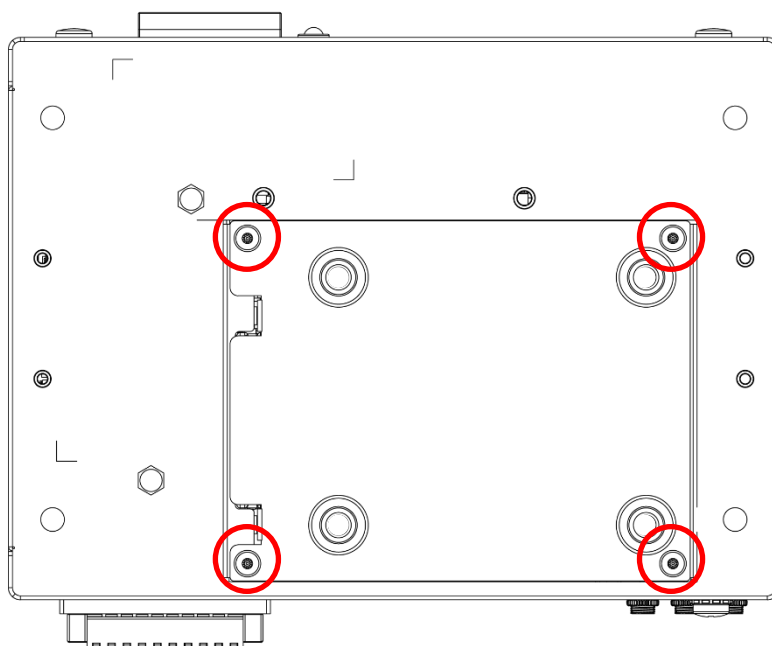
2. Open the lid



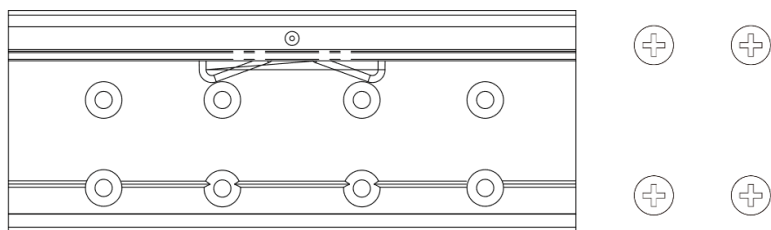
3. Install the 2.5-inch hard drive



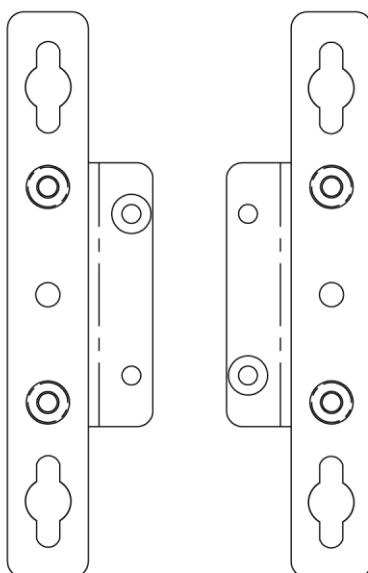
4. Lock the screws



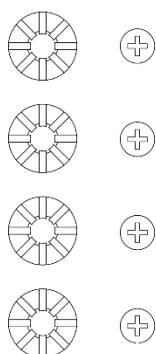
Din Rail



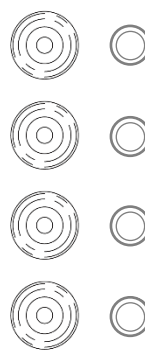
Wall Mount



Wall Mount Pads



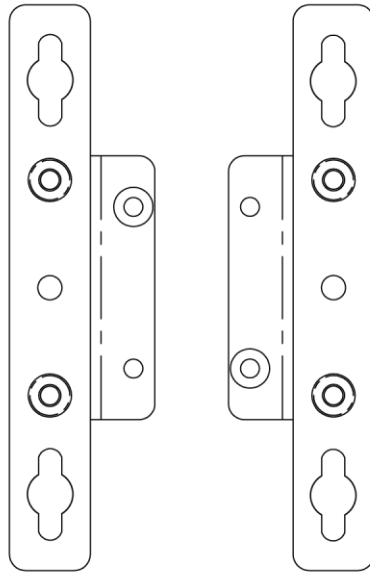
Foot Pads



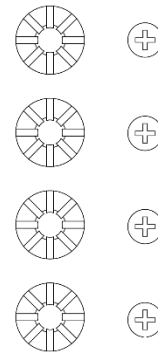
3.7 Installing wall mount kit

1. Wall mount kit is available for BCO-1000-ADLN included in the standard package.

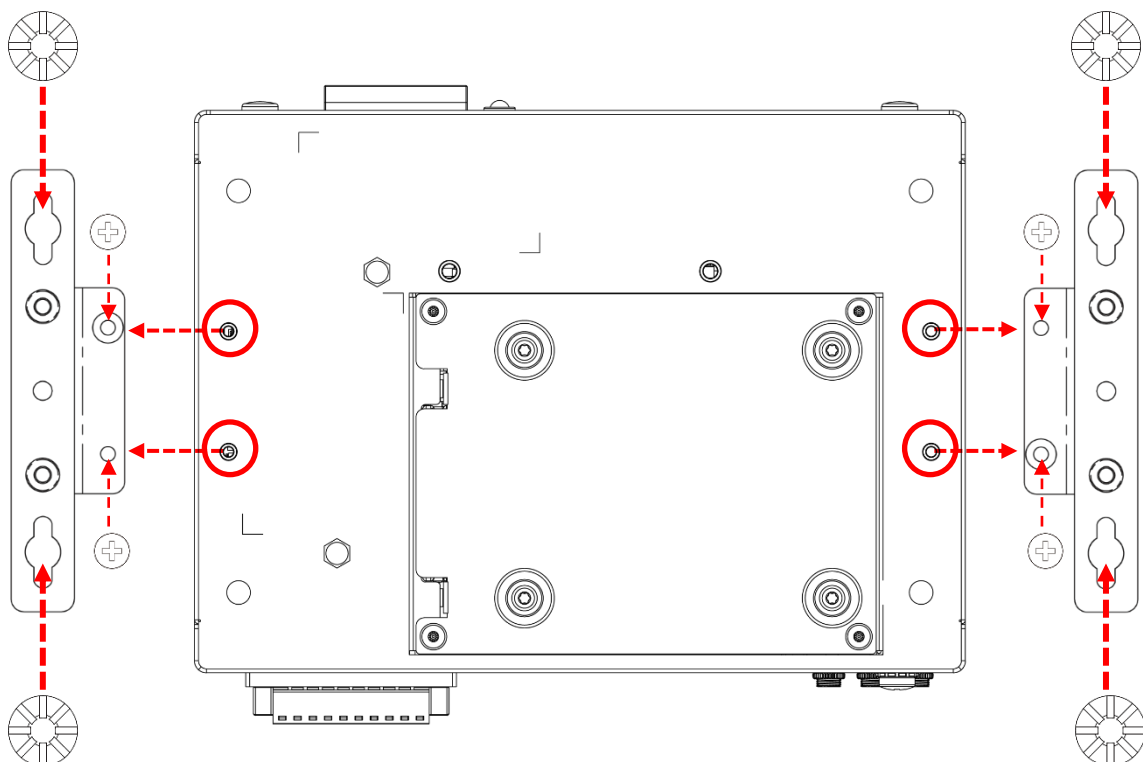
Wall Mount



Wall Mount Pads



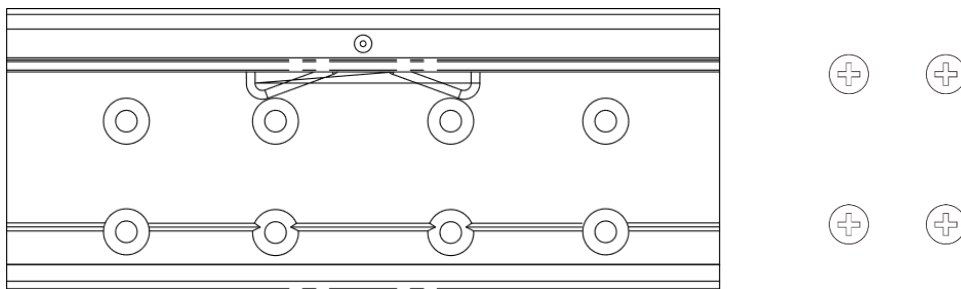
2. Assemble the anti-vibration grommets and screws together.



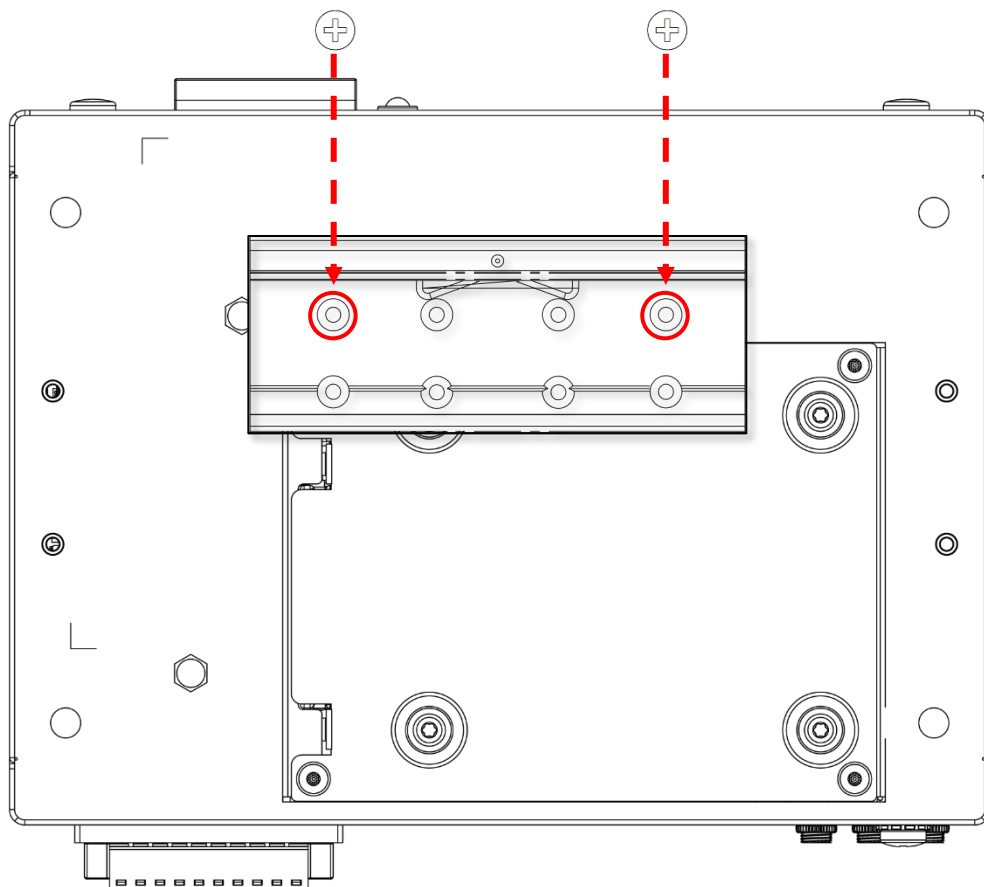
3.8 Installing DIN rail holder

1. Din Rail holder is available for BCO-1000-ADLN series.

Din Rail

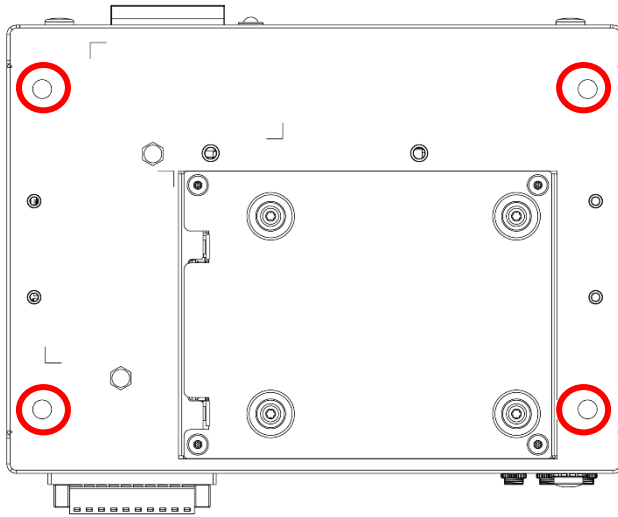


2. Place Din rail holder on the back of computer and secure it with four screws.

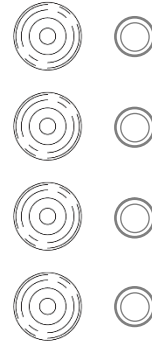


3.9 Installing Foot Pads

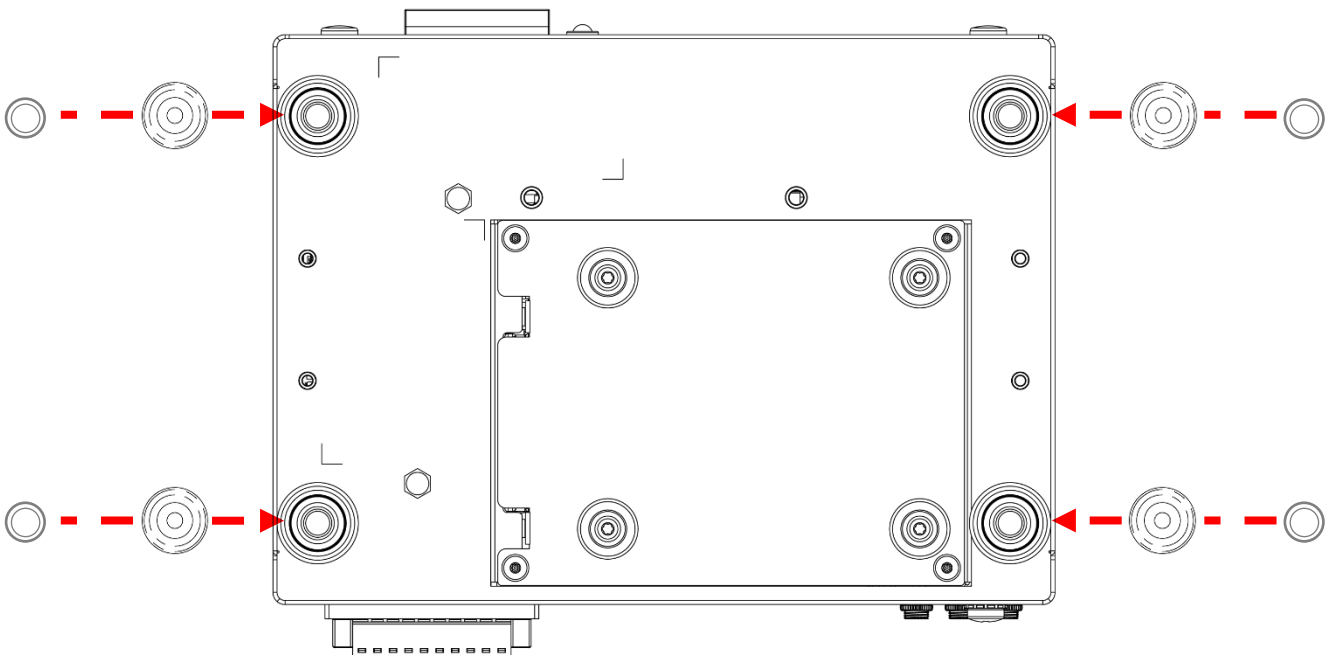
1. Below is the rubber foot accessory.



Rubber Foot



2. Assemble the rubber foots and screws together



Chapter 4

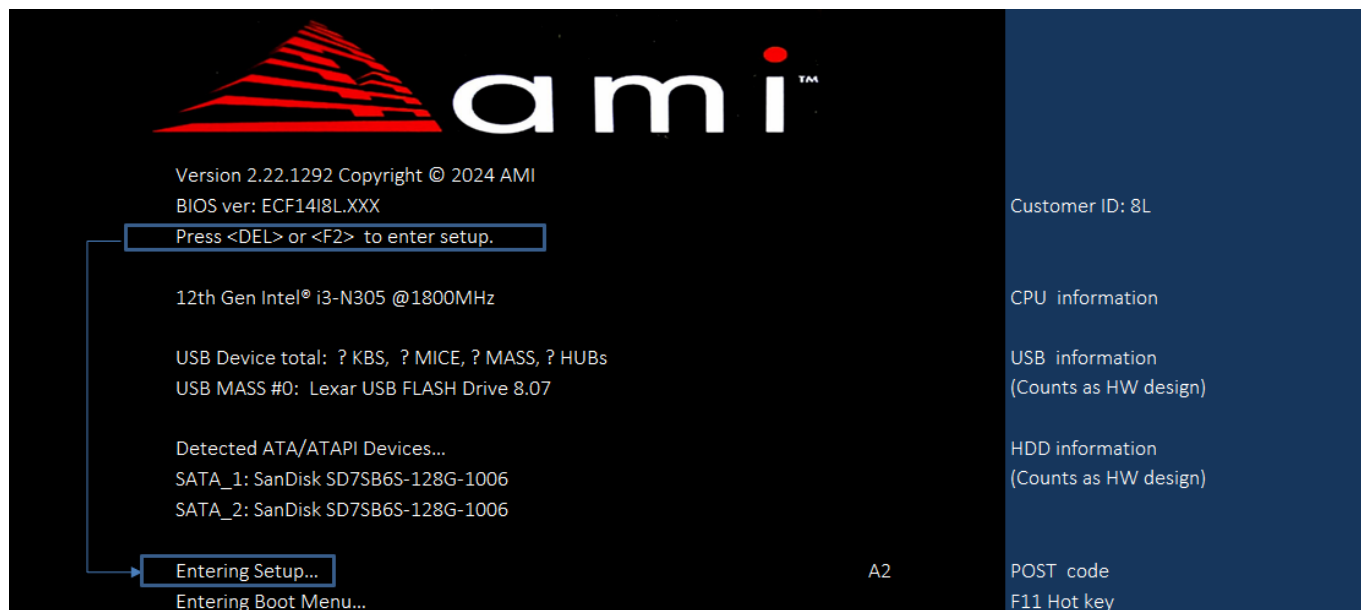
BIOS Setup

4.1 BIOS Setup

Versions

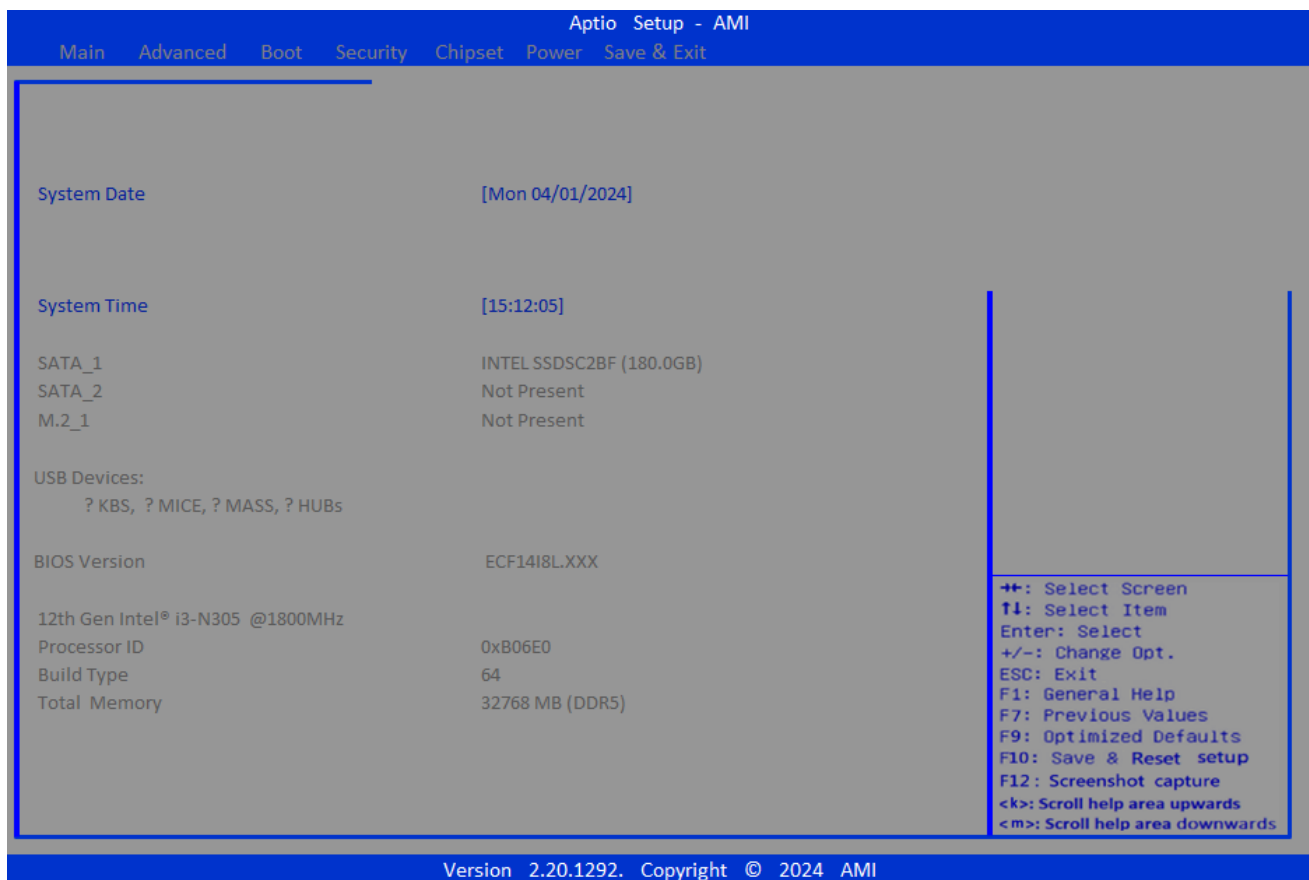
Date	Ver.	Note	Phase
2024/5/10	0.1	Initial release	MVT
2024/5/15	0.2	1. Modify some typo words for all sheet 2. Modify ASPM M2_M1 to M2_B1 3. add Data bit and Stop bit option	MVT
2024/5/27	0.3	1. Modify AC power loss default from power off to Last State. 2. Remove LVDS(via cable auto detect)	MVT
2024/6/4	0.4	1. Add item "M.2 B key Peripheral" for B key de specific B key device with USB. 2. Clean DMI DATA type 1/2 Manufacturer	MVT
2024/7/4	0.5	1. Remove item "M.2 B key Peripheral" for B key de specific B key device with USB. (default: enabled) 2. Add Backlight ctrl item in chipset page	MVT
2024/8/28	0.6	1. Add Key B USB3 interface 2. Add Intel VT-d in setup if CPU /PCH/platform support 3. Gray out panel related function when no panel detected. 4. Gray out Restore AC power loss when in AT mode. 5. Add Buzzer Beeps rule when ME disabled in BIOS Design rule sheet	MVT

POST



POST Hotkey	
Special Feature	Hot Key
Into BSU	"DEL", "F2"
boot oder menu	F11
PXE boot	F12

4.2 System Status

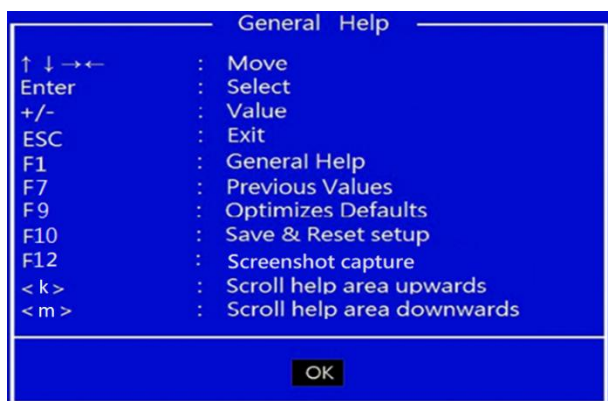


Fn Hotkey			
Special Feature	Location		Note
General Help	Hot Key"F1"		
Load Previous Values	Hot Key"F7"		
Load Optimizes Defaults	Hot Key"F9"		
Save & Reset setup	Hot Key"F10"		
Screenshot	Hot Key"F12"		

- Set the Date. Use Tab to switch between Date elements
- Default Ranges:
 - Year:2000-2099
 - Month: 1-12
 - Days: Dependent on month
Range of Years may vary.

- SATA_2 for M.2 SATA
- M2_1 for PCIE x1

F1 screen



F10 screen



4.3 Advanced

Item String	Optimized Default	Option Name
Full Screen Logo Display	[Disabled]	Disabled/Enabled
Bootup NumLock State	[On]	On/Off
Key B USB3 interface	[Disabled]	Disabled/Enabled
>CPU Configuration		sub-menu
>Super IO Configuration		sub-menu
>H/W Monitor		sub-menu
>Smart Fan Configuration		sub-menu
>PCI/PCIE Device Configuration		sub-menu
>Network Stack Configuration		sub-menu
>GPIO Group Configuration		sub-menu
>PCIE ASPM Settings		sub-menu
>Engineer Mode		sub-menu

- Please be informed rule as below:
- 1. DO NOT adjust any items from this entry on executing formal test
- 2. Item should be hidden after MP candidate BIOS.

CPU Configuration

Item String	Optimized Default	Option Name
CPU Configuration		
12th Gen Intel ® i3-N305		
Porcessor ID	0xB06E0h	
Porcessor Speed	1800MHz	
E-Core Information		
L1 Data Cache	32 KB X 8	
L1 Instruction Cache	64 KB X 8	
L2 Cache	2048 KB X 2	
L3 Cache	6 MB	
VT-d	[Enabled]	Disabled/Enabled
Intel Virtualization Technology	[Enabled]	Disabled/Enabled
Active Efficient-cores	[All]	All/1/2/3 (Base on counts of E-core)
Intel ® SpeedStep(tm)	[Enabled]	Disabled/Enabled
Intel ® Speed Shift Technology	[Enabled]	Disabled/Enabled
C states	[Enabled]	

Displayed base on supported CPU
There is mechanism to display
item for support CPU

Super IO Configuration

Item String	Optimized Default	Option Name
Super IO Configuration		
Serial Port 1 Device Settings	[Enabled] IO=3F8h; IRQ=4;	Disabled/Enabled
Change Settings	[Auto]	Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;
Mode Select	[RS232]	RS232 RS422 RS485 RS422 with TR RS485 with TR
Serial Port 2 Device Settings	[Enabled] IO=2F8h; IRQ=3;	Disabled/Enabled
Change Settings	[Auto]	Auto IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;

Device Settings

Serial Port 1	Display STD IO port (3F8h,2F8h,3E8h,2E8h)
Serial Port 2	Display STD IO port (3F8h,2F8h,3E8h,2E8h)

Item String	Optimized Default	Option Name
Mode Select	[RS232]	RS232 RS422 RS485 RS422 with TR RS485 with TR
FIFO Mode	[128-byte]	16/32/64/128
Watch Dog Timer	[Disabled]	Disabled/Enabled
Set Watch Dog Timer (Sec)	30	1-255(sec)

Mode Select	Item for MVT only. Hidden and default RS232 before MP candidate BIOS
Watch Dog Timer	Displayed when Watch Dog Timer enable

H/W Monitor

Item String	Optimized Default	Option Name
PC Health Status		
Thermal Shutdown	[Disabled]	Disabled/Enabled
CPU Temperature	: +36°C	
System Temperature	: +24°C	
SYSFAN	: N/A	
VCC_CORE	: +0.736 V	
VCC3	: +3.279 V	
VCC5	: +5.003 V	
+12V	: +12.144 V	
VS3V	: +3.280 V	
VS5V	: +4.992 V	
VBAT	: +3.040 V	

As Project type after MP candidate BIOS release

Motherboard (MS-98XX, MS-CFXX): Hidden

System (MS-C9XX): Display

Smart Fan Configuration

Item String	Optimized Default	Option Name
Configuration Smart Fan		
SYSFAN	[Disabled]	Disabled/40-70°C (per class 5 °C)
Min. Speed (%)	[50.0%]	0~87.5% (per class 12.5%)

PCI/PCIE Device Configuration

Item String	Optimized Default	Option Name
Audio Controller	[Enabled]	Disabled/Enabled

Network Stack Configuration

Item String	Optimized Default	Option Name
Network Stack	[Disabled]	Disabled/Enabled
Ipv4 PXE Support	[Disabled]	Disabled/Enabled
Ipv4 HTTP Support	[Disabled]	Disabled/Enabled
Ipv6 PXE Support	[Disabled]	Disabled/Enabled
Ipv6 HTTP Support	[Disabled]	Disabled/Enabled
PXE boot wait time	0	
Media detect count	1	

GPIO Group Configuration

Item String	Optimized Default	Option Name
GPIO Group Configuration		
GPO0	[Low]	Low/High
GPO1	[Low]	Low/High
GPO2	[Low]	Low/High
GPO3	[Low]	Low/High
GPO Status		
GPO0	: 1	
GPO1	: 1	
GPO2	: 1	
GPO3	: 1	
GPI Status		
GPI0	: 1	
GPI1	: 1	
GPI2	: 1	
GPI3	: 1	

1. Status as setting
2. item must be hidden after MP candidate BIOS.

PCIE ASPM settings

Item String	Optimized Default	Option Name
M2_B1	[Disabled]	Option Defined:
M2_E1	[Disabled]	PCH : Disabled/ L1/ Auto

Displayed as HW design when config as PCIE

4.4 Boot

Item String	Optimized Default
Boot Option Priorities	
Boot Option #1	[Windows Boot Manager (P0: WDC WD3200BPVT-22JJ5T0)]
Boot Option #2	[UEFI: Built-in EFI Shell]

SUT will return BIOS Setup when no disabled all boot option

4.5 Security

	Item String	Optimized Default	Option Name
	Administrator Password		
	User Password		
	Disabled Block Sid	[Disabled]	Disabled/Enabled
	>PCH-FW Configuration		sub-menu
	>Trusted Computing		sub-menu
	>Serial Port Console Redirection		sub-menu
	>Secure boot		sub-menu

Item only support for NVMe Device (TCG support)

PCH-FW Configuration

	Item String	Optimized Default	Option Name
	ME Firmware Version	16.X.XX.XXXX	
	ME Firmware Mode	Normal Mode	
	ME Firmware SKU	Consumer SKU	
	ME State	[Enabled]	Disabled/Enabled
	Comms Hub Support	[Disabled]	Disabled/Enabled
	JHI Support	[Disabled]	Disabled/Enabled
	Core BIOS Done Message	[Enabled]	Disabled/Enabled
	>Firmware Update Configuration		sub-menu
	>PTT Configuration		sub-menu
	>ME Debug Configuration		sub-menu
	>Anti-Rollback SVN Configuration		sub-menu

Displayed when ME
state enabled

Trust Computing

Item String	Optimized Default	Option Name
TPM2.0 Device Found		
Firmware Version:	7.85	
Vendor	IFX	
Security Device Support	[Enabled]	Disabled/Enabled
Active PCR Banks	SHA256	
Available PCR Banks	SHA256,SHA384,SM3	
SHA256 PCR Bank	[Enabled]	Disabled/Enabled
SHA384 PCR Bank	[Disabled]	Disabled/Enabled
Pending operation	[None]	None/TPM Clear
Platform Hierarchy	[Enabled]	Disabled/Enabled
Storage Hierarchy	[Enabled]	Disabled/Enabled
Endorsement Hierarchy	[Enabled]	Disabled/Enabled
Physical Presence Spec Version	[1.3]	1.2/1.3
TPM 2.0 Interfacetype	[TIS]	
PH Randomization	[Enabled]	Disabled/Enabled
Device Select	[TPM 2.0]	TPM 1.2/ TPM 2.0/ Auto

Information as your chosen TPM displayed(dTPM/fTPM)

Serial Port Console Redirection

Item String	Optimized Default	Option Name
COM1		
Console Redirection	[Disabled]	Disabled/Enabled
>Console Redirection Settings		sub-menu

Unlock when Console Redirection enabled

Secure boot

Item String	Optimized Default	Option Name
System Mode	Setup	
Secure boot	[Disabled]	Disabled/Enabled
Secure boot Mode	Not Active	
	[Custom]	Custom/Standard
>Restore Factory Keys		
>Reset To setup Mode		
>Key Management		

All secure boot function is by AMI Default, but keep customer request.

No OEM Key roll in default.(reserve once customizing chance)

Default Key need to roll in via clicking "Restore Factory keys"

Default

Secure boot: Disabled

Secure boot Mode: Custom

Firmware Update Configuration

	Item String	Optimized Default	Option Name
	Me FW Image Re-Flash	[Disabled]	Disabled/Enabled
	Local FW Update	[Enabled]	Disabled/Enabled

PTT Configuration

	Item String	Optimized Default	Option Name
	PTT Capability / State	1 / 0	
	TPM Device Selection	[dTPM]	dTPM/PTT

ME Debug Configuration

	Item String	Optimized Default	Option Name
	HECI Timeouts	[Enabled]	Disabled/Enabled
	Force ME DID Init Status	[Disabled]	Disabled 0 - Success 1 - No memory in Channels 2 - Memory Init Error
	CPU Replaced Polling Disable	[Disabled]	Disabled/Enabled
	HECI Message Check Disable	[Disabled]	Disabled/Enabled
	MBP HOB Skip	[Disabled]	Disabled/Enabled
	HECI2 Interface Communication	[Disabled]	Disabled/Enabled
	KT Device	[Enabled]	Disabled/Enabled
	End of Post Message	[Send in DXE]	Disabled/Send in DXE
	D0I3 Settig for HECI Disable	[Disabled]	Disabled/Enabled
	MCTP Broadcast Cycle	[Disabled]	Disabled/Enabled

Anti-Rollback SVN Configuration

	Item String	Optimized Default	Option Name
	Minimal Allowed Anti-Rollback SVN	0	
	Executing Anti-Rollback SVN	1	
	Automatic HW-Enforced Anti-Rollback SVN	[Disabled]	Disabled/Enabled
	Set HW-Enforced Anti-Rollback for current SVN	[Disabled]	Disabled/Enabled

Displayed when Automatic HW-Enforced Anti-Rollback SVN Disabled

As CRB define and Mechanism

Console Redirection Settings (COM1)

	Item String	Optimized Default	Option Name
	COM1		
	Console Redirection Settings		
			VT100
			VT100+
			VT-UTF8
	Terminal Type	[ANSI]	ANSI
			9600
			19200
	Bits per second	[115200]	38400
			57600
			115200
	Data Bits	[8]	7,8
			None
	Parity	[None]	Even
			odd
			Mark
			Space
	Stop Bits	[1]	1,2
	Flow Control	[None]	None
			Hardware RTS/CTS
	VT-UTF8 Combo Key Support	[Enabled]	Disabled/Enabled
	Recorder Mode	[Disabled]	Disabled/Enabled
	Resolution 100X31	[Disabled]	Disabled/Enabled
			VT100
			Intel Linux
	Putty KeyPad	[VT100]	XTERMR6
			SCO
			ESCN
			VT400

4.6 Chipset

Item String	Optimized Default	Option Name
DVMT Total Gfx Mem	[256M]	128M/256M/MAX
DVMT Pre-allocated	[64M]	64M/128M/256M/512M/1024M
LVDS Panel Type	1024 X 768 & 24bit	640 x 480 & 18bit
		640 x 480 & 24bit
		800 x 480 & 18bit
		800 x 480 & 24bit
		800 x 600 & 18bit
		800 x 600 & 24bit
		1024 x 600 & 18bit
		1024 x 600 & 24bit
		1024 x 768 & 18bit
		1024 x 768 & 24bit
		1280 x 768 & 18bit
		1280 x 768 & 24bit
		1280 x 800 & 18bit
		1280 x 800 & 24bit
		1280 x 960 & 18bit
		1280 x 960 & 24bit
		1280 x 1024 & 18bit
		1280 x 1024 & 24bit
		1366 x 768 & 18bit
		1366 x 768 & 24bit
		1440 x 900 & 18bit
		1440 x 900 & 24bit
		1400 x 1050 & 18bit
		1400 x 1050 & 24bit
		1600 x 900 & 18bit
		1600 x 900 & 24bit
		1680 x 1050 & 24bit
		1600 x 1200 & 24bit
Backlight Control	[Level 3]	Level 1-5

- DVMT Pre-allocated
2048 as platform supporting
- LVDS Panel Type
Gray out when no panel connected

4.7 Power

Item String	Optimized Default	Option Name	Remark
Restore AC power Loss	[Last State]	Power on Power off Last State	Function will work on ATX mode only Gray out in AT mode
Deep Sleep Mode	[S4+S5]	Disabled S4+S5	
Advanced Resume Events Control			
OnChip USB	[Enabled]	Disabled/Enabled	
LAN/PCIE PME	[Disabled]	Disabled/Enabled	
RTC	[Disabled]	Disabled Daily Dynamic Weekly	
wake up hour	0	0-23	When RTC set to Daily
wake up minute	0	0-59	
wake up second	0	0-59	
wake up minute increase	1	1-- 5	When RTC set to Dynamic
Monday	[Disabled]	Disabled/Enabled	When RTC set to Weekly
Tuesday	[Disabled]	Disabled/Enabled	
Wednesday	[Disabled]	Disabled/Enabled	
Thursday	[Disabled]	Disabled/Enabled	
Friday	[Disabled]	Disabled/Enabled	
Saturday	[Disabled]	Disabled/Enabled	
Sunday	[Disabled]	Disabled/Enabled	
Wake up hour	0	0-23	EX: When weekly's sub items set to Enabled
Wake up minute	0	0-59	
Wake up second	0	0-59	

4.8 Save&Exit

Item String	Optimized Default
Save Changes and Reset	
Discard Changes and Exit	
Discard Changes	
Load Optimized Defaults	
Save as user Defaults	
Restore User Defaults	
Launch EFI Shell from filesystem device	

Build-in SHELL is necessary

4.9 DMI Data

	Data	Related SW
BIOS Information (Type 0)		
BIOS Vendor	American Megatrends International Inc.	
BIOS Version	ECF14I8L.XXX	
Release Date	4/1/2024	
ROM Size	As platform	
System Information (Type 1)		
Manufacturer		
Product Name	MS-CF14	SW Utility
Version	As M/B version	
Serial Number		
UUID	Generated at factory	
SKU Number		
Family		
Base Board Information (Type 2)		
Manufacturer		
Product Name	MS-CF14	SW Utility
Version	As M/B version	
Serial Number	Default String	
Asset Tag Number	Default String	

4.10 BIOS Design Rule

Admin/User PW

	OEM request		CRB Default			
	Admin	User	Admin	User		
Entry	Follow CRB default		BSU	POST	Into BSU/Before POST	
Length			20		<=20 characters	
A–Z			Yes		Case Sensitive or Not	
0–9			Yes		Yes or No	
PW state after clean CMOS	Follow CRB default		Clean		Keep or Clean	
Retry limited	Follow CRB default		3		Request by ODM	
	Restrict Page (Items)					
System Status	Follow CRB default		No restrict		Request by ODM and MSI estimate	
Advanced						
Boot						
Security						
Chipset						
Power						
Save&exit						

Buzzer

Event	Sounds
POST detect	1 short beep
No Con in/out Device detect	No beeps
Disabled ME	No beeps
Others	As AMI Default

ASPM

	Add-on	onBoard
Default Vaule	Disabled	Enabled
Items	Display	Hidden

DMI Data Preserve

	Preserve
FPT tool flash (F32M.NSH)	NO
AFU tool flash (FLASH.NSH)	Yes
Clear CMOS	Yes

