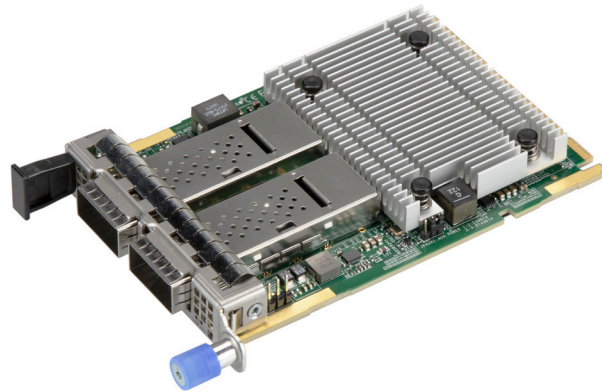




AOC-A100G-b2CM



AOC-A100G-b2CG



USER'S MANUAL

Revision 1.0c

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Manual Revision 1.0c

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# Preface

## About This Manual

This user's guide is written for system integrators, IT technicians, and knowledgeable end users. It provides information for the installation and use of the AOC-A100G-b2CM/-b2CG add-on card.

## About This Add-On Card

The Supermicro® Advanced I/O Module (AIOM) is the latest form factor designed to provide a wide range of networking options as well as other I/O technologies. The AOC-A100G-b2CM/-b2CG is one of the most feature-rich and low-power consumption 100 GbE controllers in the market. Based on the Broadcom® BCM57508 with features such as VXLAN, NVGRE, and RoCE, it provides unparalleled density, performance, and functionality. The Supermicro AOC-A100G-b2CM/-b2CG is the most versatile 100 GbE controller in the market and an excellent choice to enhance network connectivity in data centers and enterprise environments.

## An Important Note to the User

All graphic images and layout drawings shown in this user's guide are based upon the latest PCB revision available at the time of publishing this user's guide. The add-on card you have received may or may not look exactly the same as the graphics shown in this user's guide.

## Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse, or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

## Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury.



**Warning!** Indicates important information given to prevent equipment/property damage or personal injury.



**Warning!** Indicates high voltage may be encountered while performing a procedure.



**Important:** Important information given to ensure proper system installation or to relay safety precautions.



**Note:** Additional information given to differentiate various models or to provide information for proper system setup.

## Important Links

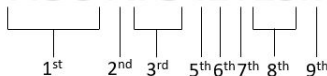
For your system to work properly, follow the links to download all necessary drivers/utilities and the user's manual for your server.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <https://www.supermicro.com/wdl/driver>
- Product safety info: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)
- A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: [https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9\\_Secure\\_Data\\_Deletion\\_Utility/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/)
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- If you have any feedback on Supermicro product manuals, contact our writing team at: [Techwriterteam@supermicro.com](mailto:Techwriterteam@supermicro.com)

This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

## Naming Convention

### AOC-ATG-i2T2SM



Character	Representation	Options
1st	Product Family	AOC: Add On Card
2nd	Form Factor	S: Standard, P: Proprietary, C: MicroLP, M: Super IO Module (SIOM), MH: SIOM Hybrid A: Advanced IO Module (AIOM), AH: AIOM Hybrid
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 25G: 25GbE (25Gb/s), 40G: 40GbE (40Gb/s), 50G: 50GbE (50Gb/s), 100G: 100GbE (100Gb/s), IBE: EDR IB (100Gb/s), HFI: Host Fabric Interface
4th	Chipset Model (Optional)	N: Niantec (82599), P: Powerville (i350), S: Sageville (X550), F: Fortville (XL710/X710), L: Lewisburg (PCH)
5th	Chipset Manufacturer	i: Intel, m: Mellanox, b: Broadcom
6th	Number of Ports	1: 1 port, 2: 2 ports, 4: 4 ports, 8: 8 ports
7th	Connector Type (Optional)	S: SFP/SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28
8th	2 <sup>nd</sup> Controller/Connector Type (Optional)	G: 1x GbE RJ45, 2G: GbE 2x RJ45, S: 1x 10G SFP+, T: 10GBase-T, 2T: 2x 10GBase-T, 2S: 2x SFP+
9th	Bracket	For SIOM – Non-M: swappable bracket for Storage systems, M: Internal bracket for Twin systems. For AIOM – Non-M: 1U height bracket for Edge systems, M: 0.5U height bracket for all other systems.

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# Chapter 1


## Introduction

### 1.1 Overview

Congratulations on purchasing your add-on card from an acknowledged leader in the industry. Supermicro products are designed with the utmost attention to detail to provide you with the highest standards of quality and performance. For product support and updates, refer to our website at <https://www.supermicro.com/en/products/networking/adapters>.

### 1.2 Key Features

The key features of this add-on card include the following:

- Advanced I/O Module (AIOM) form factor
- Broadcom BCM57508 100 GbE controller
- Host Interface: PCIe Gen 4.0 x16
- Support for 100 GbE, 50 GbE, and 40 GbE speeds
- Dual QSFP28 connectors
- RDMA over Converged Ethernet (RoCE)
- VXLAN, NVGRE, and Geneve
- Broadcom TruFlow flowing processing engine
- Asset management features with thermal power
- NC-SI for remote management
- RoHS compliant 6/6 

## 1.3 Specifications

### General

- Advanced I/O Module (AIOM) form factor
- Broadcom BCM57508 100 GbE controller
- Dual QSFP28 connectors

### Networking Features

- Jumbo frame (up to 9.6 KB)
- IEEE 802.3x flow control
- IEEE 802.3ad link aggregation
- Virtual LANs 802.1q VLAN tagging
- Configurable flow acceleration
- UEFI and iSCSI boot

### Stateless Offload Features

- TCP, UDP, and IP checksum offloads
- IPv4 and IPv6 offloads
- Large Send Offload (LSO)
- Receive Segment Coalescing (RSC)
- TCP Segmentation Offload (TSO)
- Large Receive Offload (LRO)
- Receive Side Scaling (RSS)
- Transmit Side Scaling (TSS)

## **Virtualization Features**

- NetQueue, VMQueue, and Multiqueue
- SR-IOV with up to 128 Virtual Functions (VFs)
- VXLAN, NVGRE, and Geneve
- Edge Virtual Bridging (EVB)

## **RDMA over Converged Ethernet (RoCE)**

- RoCEv1 and RoCEv2
- Data Center Bridging (DCB) with RoCE

## **Flow Processing**

- Exact/Wildcard match flow lookup
- VLAN insertion/deletion
- NAT/NAPT/Mirroring

## **Data Center Bridging**

- Priority-based Flow Control (PFC; IEEE 802.1Qbb)
- Enhanced Transmission Selection (ETS; IEEE 802.1Qau)
- Quantized Congestion Notification (QCN; IEEE 802.1Qau)
- Data Center Bridging Capability eXchange (DCBX; IEEE 802.1Qaz)
- 8 traffic classes per port; fully DCB compliant per 802.1Qbb

## **Power Savings**

- ACPI compliant power management
- PCI Express Active State Power Management (ASPM)
- Ultra-lower-power mode
- Pass-through Energy Efficient Ethernet (IEEE 802.3az-2010)

## Power Consumption

- Maximum power consumption: 20 W

## Storage Conditions

- Storage temperature: -40°C to 70°C (-40°F to 158°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C (95°F)

## Physical Dimensions

- Card PCB dimensions: 2.99" x 4.25" (76 mm x 108 mm) (W x D)

## 1.4 Available SKUs

Product Part Number	Bracket Included	Description
AOC-A100G-b2CM	BKT-0170L	2-port 100 Gigabit Ethernet Adapter with a 0.5U height
AOC-A100G-b2CG	BKT-0205L	2-port 100 Gigabit Ethernet Adapter with a 0.5U height narrow bracket for Grand Twin FIO system



**Note:** This product is sold only as part of an integrated solution with Supermicro server systems.

## Chapter 2

### Hardware Components

#### 2.1 Add-On Card Image and Layout

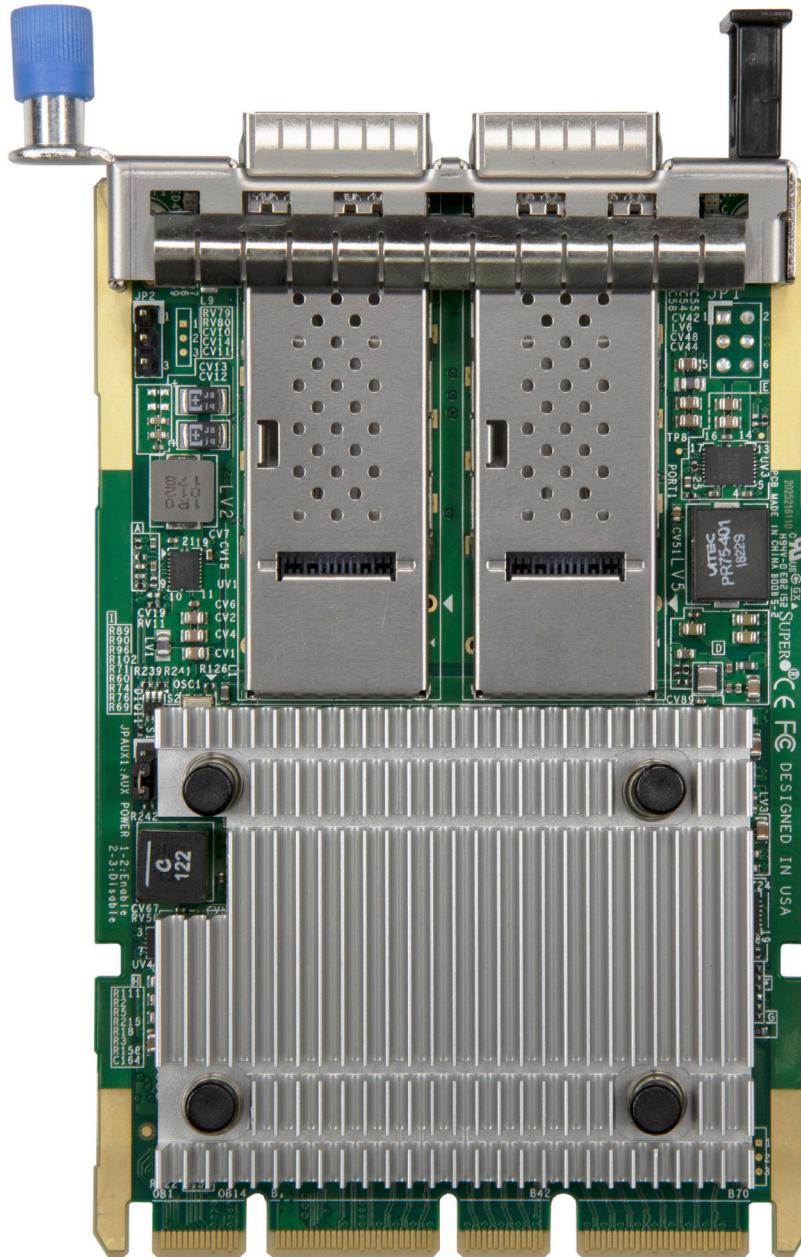


Figure 2-1: AOC-A100G-b2CM/-b2CG Image

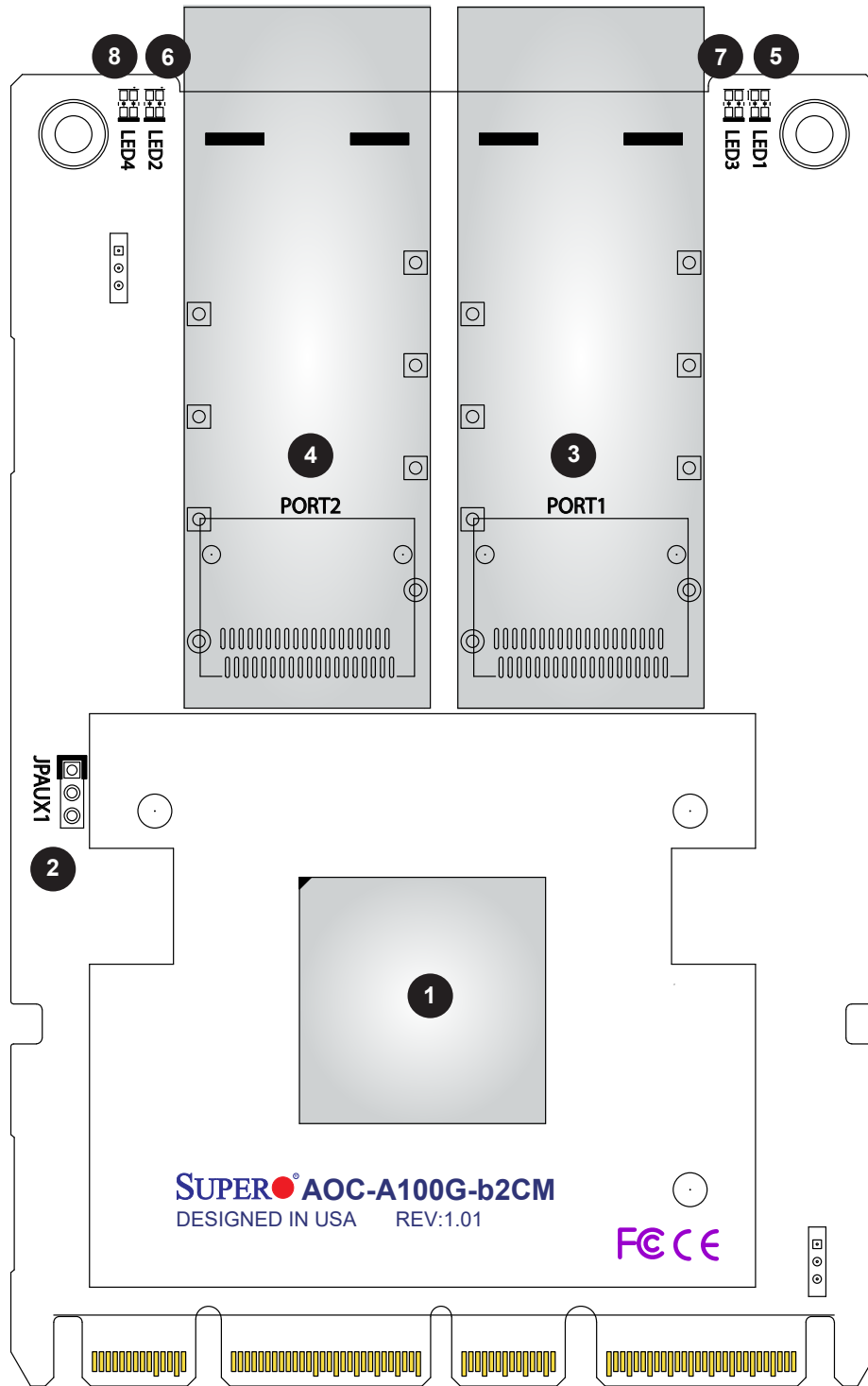


Figure 2-2: AOC-A100G-b2CM/-b2CG Layout

## 2.2 Major Components

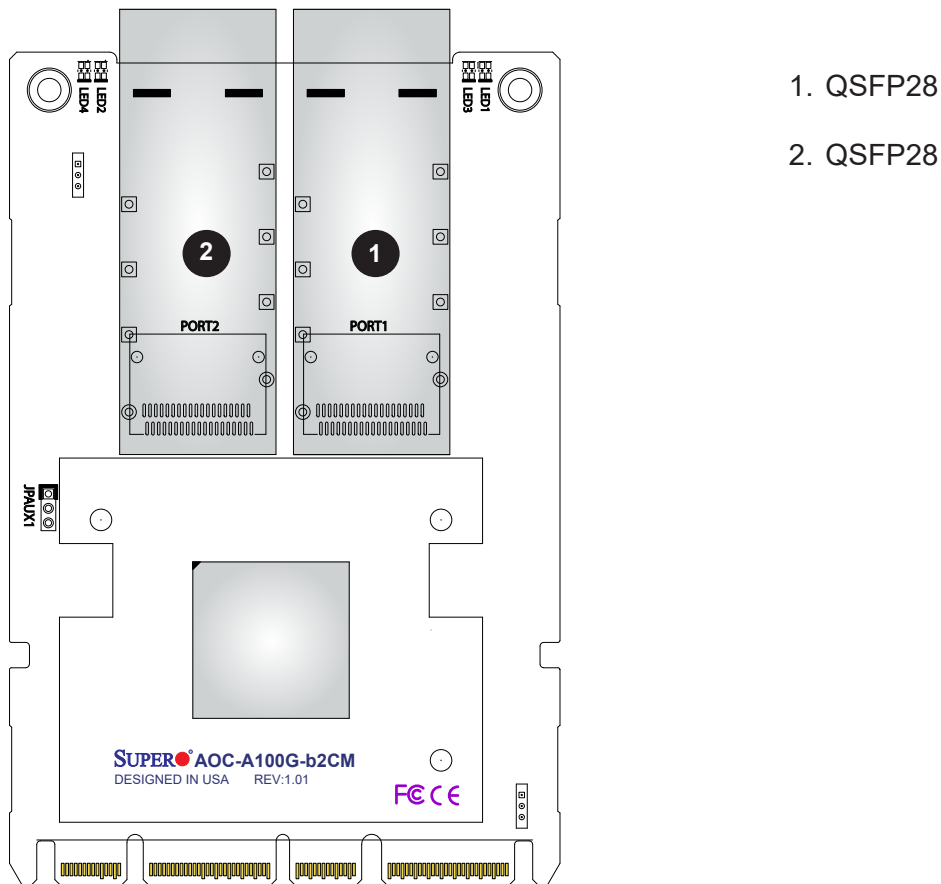
The following major components are installed on the AOC-A100G-b2CM/-b2CG:

<b>AOC-A100G-b2CM/-b2CG Major Components</b>		
<b>No</b>	<b>Component Name</b>	<b>Definition</b>
1	Broadcom BCM57508	100 Gb/s Ethernet LAN controllers
2	JPAUX1	1–2: Enable AUX Power
		2–3: Disable AUX Power
3	Port 1	Quad Small Form-Factor Pluggable 28
4	Port 2	Disabled Quad Small Form-Factor Pluggable 28
5	LED1	QSFP28 Port 1 Link LED
6	LED2	Disabled QSFP28 Port 2 Link LED
7	LED3	QSFP28 Port 1 Active LED
8	LED4	Disabled QSFP28 Port 2 Active LED

## 2.3 QSFP28 Ethernet Connections

### QSFP28 Port

AOC-A100G-b2CM/-b2CG has dual Quad-Small-Form-Factor-Pluggable 28 (QSFP28) connectors located on the add-on card. The QSFP28 ports operate at up to 100 GbE. Plug the Direct Attached Copper (DAC) cable into the QSFP28 ports for network connections. See the layout for the locations.



## 2.4 Ports and Port LEDs

### QSFP28 Ports

The QSFP28 adapter ports are located on the AIOM form factor card. Connect a Direct Attach Copper cable or an LC Fiber-Optic cable to the ports to provide 100 Gigabit Ethernet communication. Refer to the AIOM form factor card layout on [page 13](#) for the location of the QSFP28 ports.

### QSFP28 Port LEDs

There are four LEDs located below the dual QSFP28 ports to indicate the link speed and activity of each port. See the table at right for more information.

<b>QSFP28 Port LEDs</b>		
<b>LED</b>	<b>Color</b>	<b>Definition</b>
<b>Activity</b>	Blinking Green	Activity
<b>Link</b>	Amber	< 100 Gbps Link Speed
	Green	100 Gbps Link Speed

## 2.5 Jumper Settings

### Explanation of Jumpers

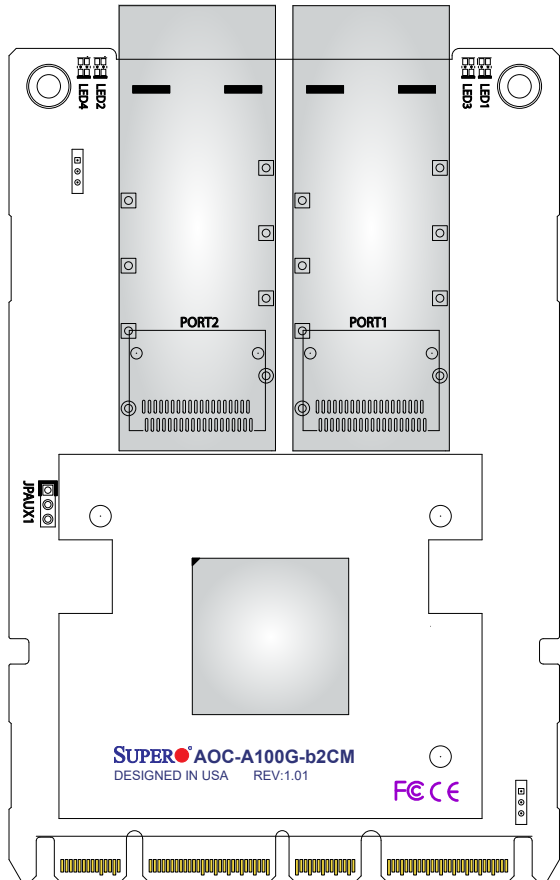
To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board.

<b>AOC JPAUX1 set to Disabled</b>	<b>When system/motherboard goes into standby mode</b>		
	<b>IPMI Support</b>	<b>FailOver Support</b>	<b>WoL Support</b>
	No	No	No
	<b>When system/motherboard is NOT in standby mode</b>		
	<b>IPMI Support</b>	<b>FailOver Support</b>	<b>WoL Support</b>
	Yes	Yes	N/A
<b>AOC JPAUX1 set to Enabled</b>	<b>When system/motherboard goes into standby mode</b>		
	<b>IPMI Support</b>	<b>FailOver Support</b>	<b>WoL Support</b>
	Yes	Yes	Yes
	<b>When system/motherboard is NOT in standby mode</b>		
	<b>IPMI Support</b>	<b>FailOver Support</b>	<b>WoL Support</b>
	Yes	Yes	N/A

<b>JPAUX1 for Standby Power</b>	<b>Function</b>	<b>Notes</b>
Disable <i>No standby power to AOC NIC</i>	Disable jumper to disconnect the standby power	Default
Enable <i>Standby power to AOC NIC</i>	Enable jumper to connect standby power to AOC NIC	WoL is supported on port 1 ONLY, but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Consult Supermicro before enabling it.

## 2.6 PCIe 4.0 x16 AIOM Form Factor Connector

Insert the PCIe 4.0 x16 AIOM form factor connector into a PCIe 4.0 x16 AIOM form factor slot on a motherboard to use this AIOM form factor card. See the layout for the location.



1. PCIe 4.0 x16 AIOM form factor connector

# Chapter 3

## Installation

### 3.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your add-on card, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

#### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the add-on card from the antistatic bag.
- Handle the add-on card by its edges only; do not touch its components or peripheral chips.
- Put the add-on card back into the antistatic bags when not in use.
- For grounding purposes, make sure that your system chassis provides excellent conductivity between the power supply, the case, the mounting fasteners, and the add-on card.

#### Unpacking

The add-on card is shipped in antistatic packaging to avoid static damage. When unpacking your component or system, make sure you are static protected.



**Note:** To avoid damaging your components and to ensure proper installation, always connect the power cord last, and always unplug it before adding, removing, or changing any hardware components.

## 3.2 Before Installation

To install the add-on card properly, be sure to follow the instructions:

1. Power down the system.
2. Remove the power cord from the wall socket.
3. Use industry-standard antistatic equipment (such as gloves or a wrist strap) and follow the instructions listed on [page 19](#) to avoid damage caused by ESD.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that your operating system includes the latest updates and hot fixes.

### 3.3 Installing the Add-on Card (with a 0.5U Bracket)

Follow the steps to install an add-on card into your system. If the system is fixed onto a rack, the removal of the server top cover is not required. If the system is not anchored to a fixed structure, it is recommended to remove the system's top cover for ease of installation.

#### Uninstalling an AIOM Module

1. Unscrew the blue knob from the system.
2. Pull on the tab and knob evenly on both sides of the card to disengage the AIOM module from the motherboard connector.
3. Gently slide the AIOM module out.

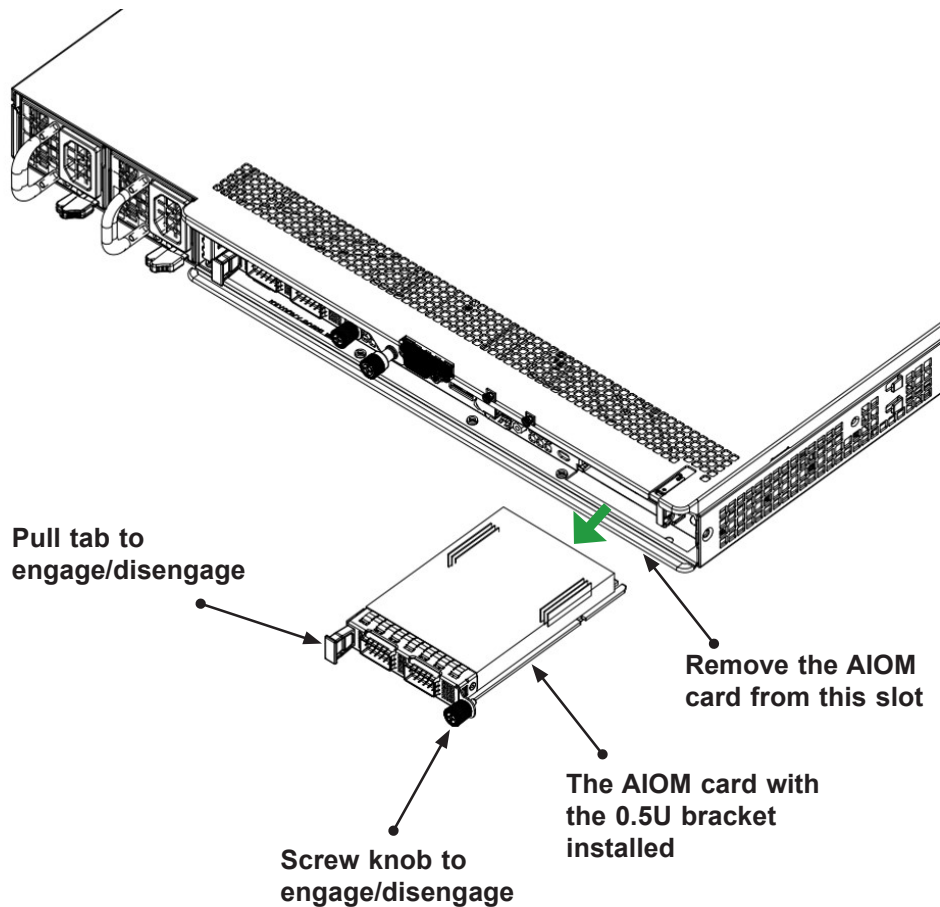


Figure 3-1: Uninstalling the AIOM Module

## Installing an AIOM Module

1. Position the AIOM module in front of the empty slot and gently push it onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
2. Press the blue knob and secure it onto the chassis by turning the knob clockwise.

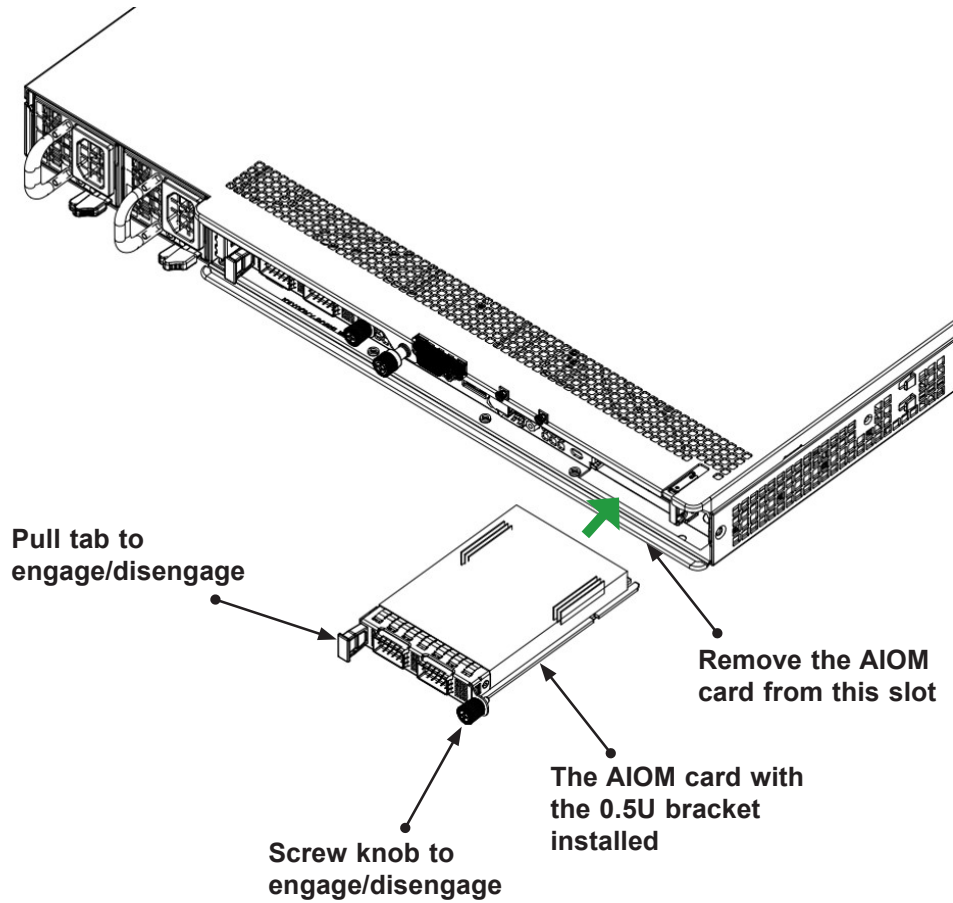
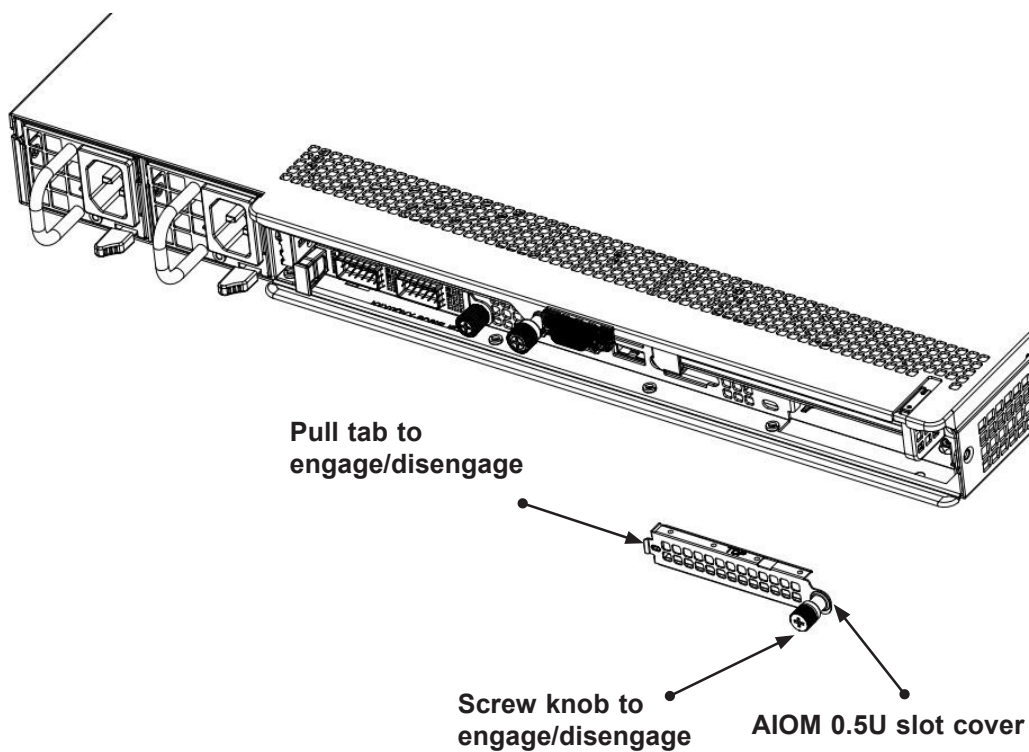


Figure 3-2: Installing the AIOM Module

## Installing an AIOM Module (with an AIOM Slot Cover)

1. Remove the AIOM slot cover by unscrewing the screw and knob that attaches the bracket to the chassis.
2. Pull the bracket away and set it aside.
3. Position the AIOM module in front of the empty slot and gently push it onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
4. Press the blue knob and secure it onto the chassis by turning the knob clockwise.



**Figure 3-3: Installing the AIOM Module**



**Note 1:** This AIOM module does not support the hot plug. Turn off the AC power and remove the power cord from the wall socket before installing or removing an AIOM module.

**Note 2:** Graphics shown above are for illustration purposes only. Actual products may vary due to product enhancement.

## 3.4 Installing Drivers (for Broadcom BCM57508)

To install drivers for the AOC-A100G-b2CM/-b2CG add-on card for either Linux or Windows, follow the instructions:

### Before Installing the Drivers for the Linux Operating System

Infiniband-diags is a set of utilities designed to help configure, debug, and maintain infiniband fabrics. Installing them from the Linux library is necessary prior to driver installation. To do so, first download the following libraries:

```
yum -y install libibverbs* infiniband-diags perftest qperf librd-  
macm-utils
```

```
yum -y install groupinstall "InfiniBand Support"
```

### Installing 100 GbE Drivers for the Linux Operating System

Follow the steps to install the drivers on the Linux operating system:

1. Download the Linux driver package file:

```
netxtreme-bnxt_en-<ver>.tar.gz
```



**Note:** This driver can be found on either the Supermicro website, or by going to the [Broadcom website](#).

2. Install the driver by entering the following commands:

```
tar xvzf netextreme-bnxt_en-<ver>.tar.gz  
cd netextreme-bnxt_en-<ver>  
make build  
make install
```

**RDMA over Converged Ethernet (RoCE)** is a network protocol that allows remote direct memory access (RDMA) over an Ethernet network. This feature is optional, but if you would like to install it with RoCE, follow the additional steps:

1. Download the Linux driver package file:

```
libbnxt_re-<ver>.tar.gz
```



**Note:** This driver can be found on either the Supermicro website, or by going to the [Broadcom website](#).

2. Install the library by entering the following commands:

```
tar xvzf libbnxt_re-<ver>.tar.gz
cd libbnxt_re-<ver>
./configure
make
make install
cp bnxt_re.driver/etc/libibverbs.d
echo "/usr/local/lib">>/etc/ld.so.conf
ldconfig -v
```

## Installing 100 GbE Drivers for the Windows Operating System

Follow the steps to install the drivers on the Windows operating system:

1. From the FTP site or CDR-NIC LAN driver CD, go to the following directory: Broadcom > 100G > Windows.
2. Choose the desired Windows driver package folder.
3. As the drivers are in .inf format, you can install the driver from the Device Manager.

(Disclaimer Continued)

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