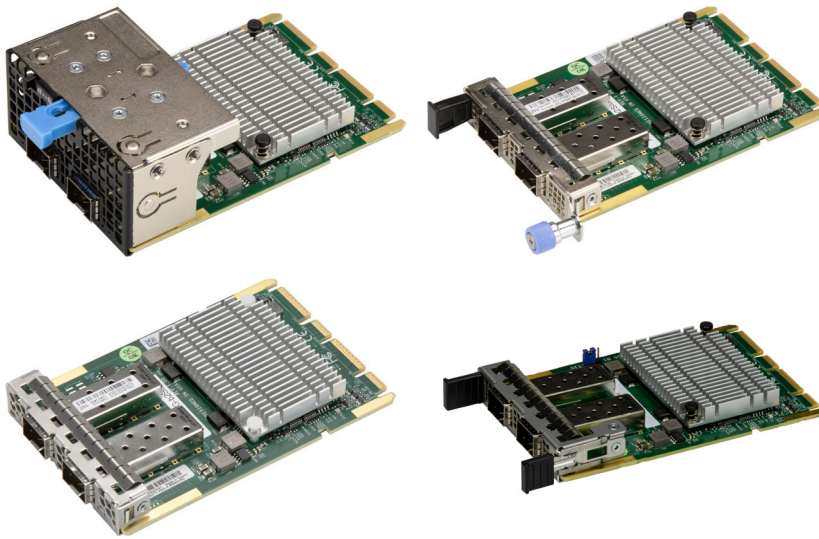
AOC-A25G-b2S
AOC-A25G-b2SM
AOC-A25G-b2SB
AOC-A25G-b2SG



User's Guide

Revision 1.0b

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User's Guide Revision 1.0b

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Preface

About this User's Guide

This user's guide is written for system integrators, PC technicians, and knowledgeable PC users. It provides information for the installation and use of the AOC-A25G-b2S(M/B/G) add-on card.

About this Add-on Card

Supermicro® Advanced I/O Modules (AIOM) is the latest form factor designed to provide a wide range of networking options and other I/O technologies. Based on the Broadcom® BCM57414 with features such as VXLAN, NVGRE, RoCE, and NIC Partitioning, this card provides unparalleled density, performance, and functionality. The Supermicro® AOC-A25G-b2S(M/B/G) is one of the market's most feature-rich and low-power consumption 25GbE controllers. As the 25GbE controller is the most versatile in the market, it is an excellent choice to enhance network connectivity in data centers and enterprise environments.

An Important Note to the User

All images and layouts shown in this user's guide are based upon the latest PCB revision available at the time of publishing. The 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 the add-on card to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is 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, you can also request an RMA authorization online http://www.supermicro.com/RmaForm/.

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

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

Conventions Used in the User's Guide

Pay special attention to the following symbols for proper system installation and for safety instructions to prevent damage to the system or injury to yourself:

Warning: Important information given to ensure proper system installation or to prevent damage to the components or injury to yourself.

Note: Additional information given for proper system setup.

Naming Convention for Standard Network Adapters

Naming Convention for Networking Adapters

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), 7: ConnectX-7
5th	Chipset Manufacturer	i: Intel, m: Mellanox, b: Broadcom, N: NVIDIA
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/QSFP56
8th	2nd 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 AIOM – None: 1U height bracket for Edge systems only, B: 0.5U height bracket (internal lock) for Blade systems only, G: 0.5U height for Grand Twin Front IO, M: 0.5U height bracket (Pull Tab) for all other systems.

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Table of Contents

Chapter 1

Overview

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, please refer to our website at http://www.supermicro.com/products/nfo/networking.cfm#adapter.

1-2 Key Features

- Advanced I/O Module (AIOM) form factor
- Broadcom® BCM57414 25GbE controller
- Support for 25GbE and 10GbE speeds
- Dual SFP28 connectors
- RDMA over Converged Ethernet (RoCE)
- Network overlay: VXLAN, NVGRE, and Geneve
- NIC Partitioning (NPAR)
- Broadcom® TruFlowTM flow processing engine
- Asset Management features with thermal sensor
- NC-SI for Remote Management
- RoHS compliant 6/6

1-3 Technical Specifications

General

- Advanced I/O Module (AIOM) form factor
- Broadcom® BCM57414 25GbE controller
- Dual SFP28 ports

Networking Features

- Jumbo frames (up to 9.6 KB)
- IEEE 802.3x flow control
- IEEE 1588 protocol and Time Sync
- IEEE 802.3ad Link Aggregation
- Virtual LANs- 802.1q VLAN tagging
- Configuring Flow Acceleration
- PXE, UEFI, iSCSI remote 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)
- Accelerate Received Flow Steering (RFS)

NIC Partitioning (NPAR)

- 16 Physical Functions
- QoS per partition
- Partitioning control via sideband communication
- Up to 64 MAC/VLAN filters per partition
- Per partition statistics support
- Stateless offloads configuration per partition
- VEB/VEPA support

Virtualization Features

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

RDMA over Converged Ethernet (RoCE)

- RoCEv1 and RoCEv2
- Data Center Bridging with RoCE

Flow Processing Features

- Exact/Wildcard Match Flow Lookup
- VLAN insertion/deletion
- NAT/NAPT/Mirroring

Data Center Bridging

- Priority-based Flow Control (PFC; IEEE 802.1Qbb)
- Enhanced Transmission Selected (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 802.1bb

Power Savings

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

Power Consumption

- Maximum 7.7W

Operating Conditions

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

Physical Dimensions

- Card PCB dimensions: 76mm x 115mm (W x D)

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

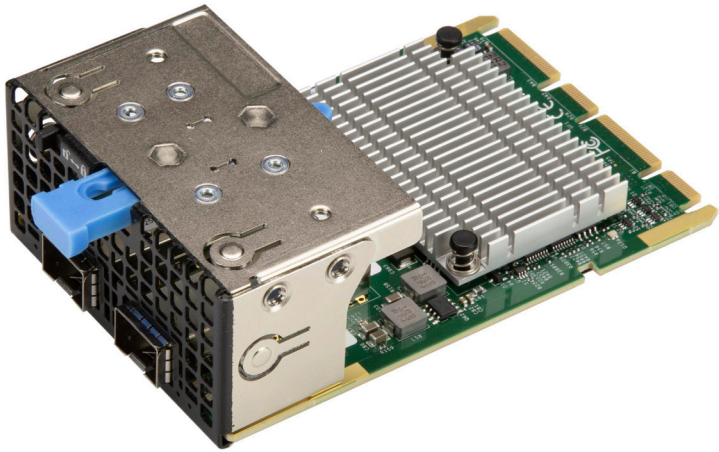
1-4 Available SKUs

SKUs	Part Number	Description
AOC-A25G-b2S	BKT-0165L	2-port 25 Gigabit Ethernet Adapter with a 1U height bracket
AOC-A25G-b2SM	BKT-0166L	2-port 25 Gigabit Ethernet Adapter with a 0.5U height bracket
AOC-A25G-b2SB	BKT-0180L	2-port 25 Gigabit Ethernet Adapter with a 0.5U height internal lock bracket (for Blade system only)
AOC-A25G-b2SG	BKT-0209L	2-port 25 Gigabit Ethernet Adapter with a 0.5U height Narrow bracket (for Grand Twin front IO system only)

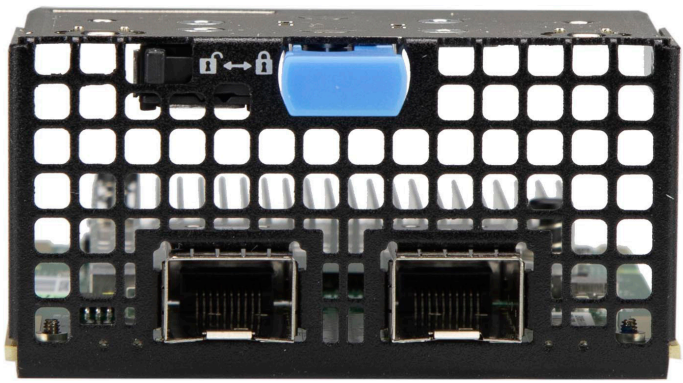
Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout

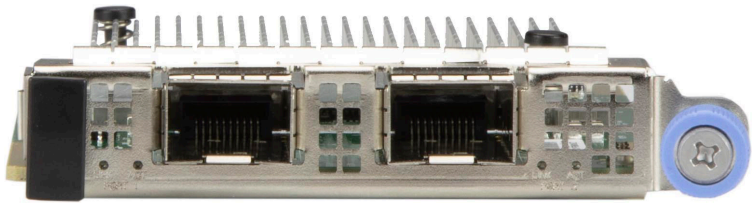


AOC-A25G-b2S Side View



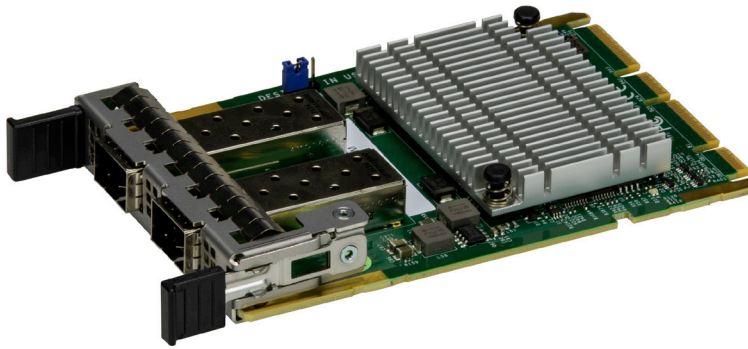
AOC-A25G-b2S Front View

AOC-A25G-b2SM Side View

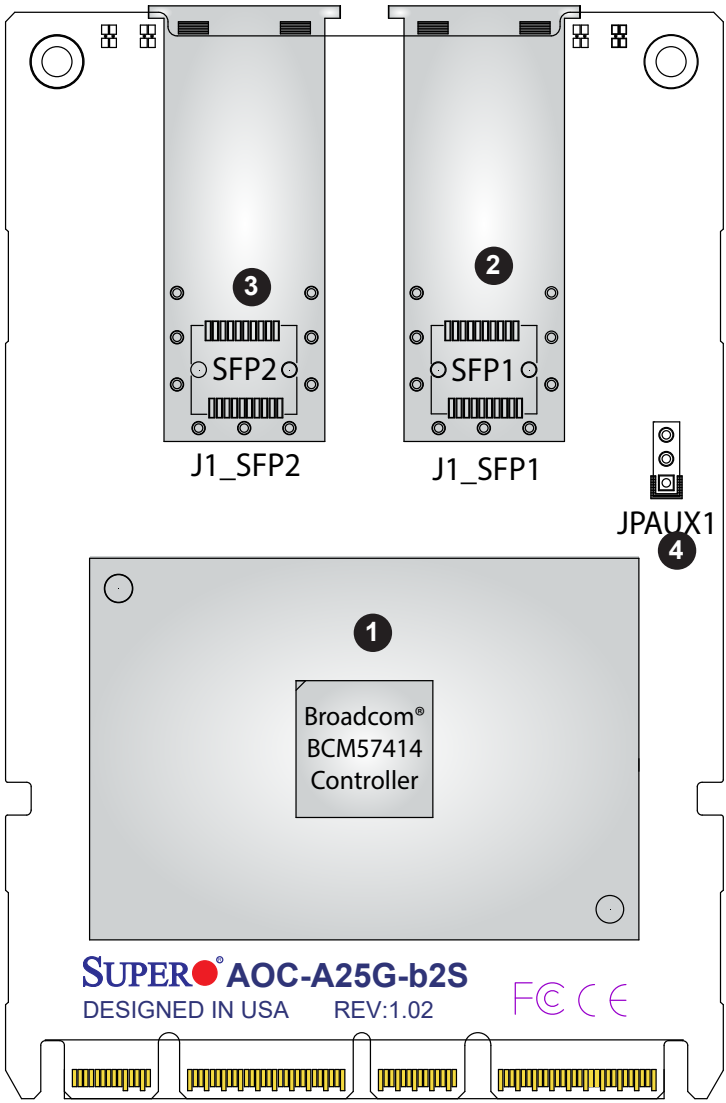


AOC-A25G-b2SM Front View

AOC-A25G-b2SB Side View



AOC-A25G-b2SG Side View



AOC-A25G-b2S Layout

2-2 Major Components

The following components are on the AOC-A25G-b2S(M/B/G).

AOC-A25G-b2S(M/B/G) Major Components		
No	**Component Name**	**Definition**
1	Broadcom® BCM57414	25GbE Controller
2	J1-SFP1/SFP1	SFP28 Port 1
3	J1-SFP2/SFP2	SFP28 Port 2
4	JPAUX1	1-2: Enable AUX Power
		3-4: Disable AUX Power (default)

2-3 SFP28 Ethernet Connections

SFP28 (SFP1/SFP2) Connectors

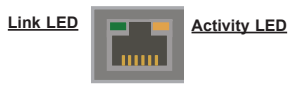
The AOC-A25G-b2S(M/B/G) has two network LAN (SFP28) ports. These LAN ports support connection speeds up to 1Gbps. Plug the Direct Attached Copper (DAC) cable into the SFP28 port for network connections.

Note: To make sure that the LAN port functions properly, be sure to use the following cable specified by the manufacturer.

LED	Color	Definition
Link (Left)	Amber	10 Gbps
	Green	25 Gbps
Activity (Right)	Green Flashing	Activity

LAN LED

Each SFP28 connector has two LEDs. The LED on the left indicates link speeds, and the LED on the right indicates the status of the activity of the connector. See the table above for more information.



2-4 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.

AOC JPAUX1 set to Disabled	**When system/MB goes into a standby mode**		
	IPMI Support	**FailOver Support**	**WoL Support**
	No	No	No
	When system/MB is NOT in the standby mode		
	IPMI Support	**FailOver Support**	**WoL Support**
	Yes	Yes	N/A
AOC JPAUX1 set to Enabled	**When system/MB goes into a standby mode**		
	IPMI Support	**FailOver Support**	**WoL Support**
	Yes	Yes	Yes
	When system/MB is NOT in the standby mode		
	IPMI Support	**FailOver Support**	**WoL Support**
	Yes	Yes	N/A

JPAUX1 for Standby Power	Function	Notes
Disable = No standby power to AOC NIC	Disable jumper to disconnect the standby power	Default
Enable = Standby power to AOC NIC	Enable jumper to connect standby power to AOC NIC	WoL is supported on all four ports but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Please consult Supermicro before enabling it.

2-5 Major Components of AIOM Module

The major components of the Supermicro® Advanced I/O Modules (AIOM) are the card and bracket. Before a computer system can operate, all slots are required to be populated. If an AIOM module is used, this means the bracket must be firmly installed into the chassis. This will ensure that the card that is installed to the bracket is seated securely in the motherboard connector. For instructions on how to install and uninstall an AIOM module please refer to chapter 3.

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.
- 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 that 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

Before you install the add-on card, follow the instructions below.

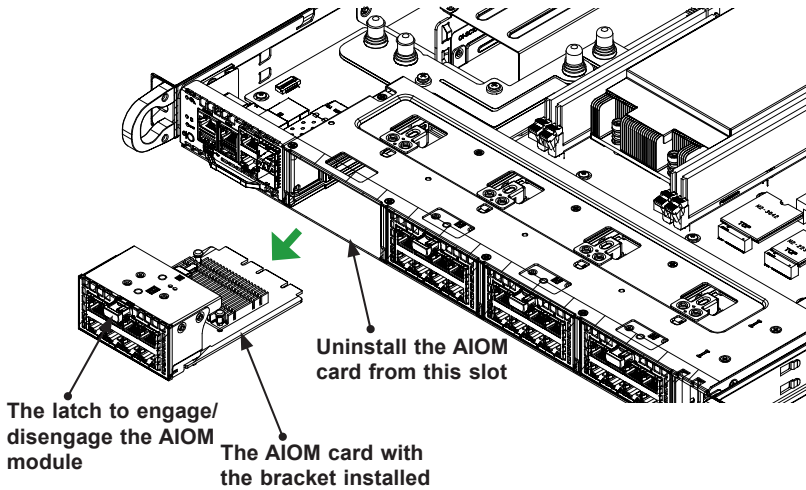
1. Power down the system.
2. Unplug the power cord.
3. Use industry-standard anti-static equipment such as gloves or a wrist strap and follow the precautions on page 3-1 to avoid damage caused by ESD.
4. Familiarize yourself with the server, motherboard, and/or chassis documentation.
5. Confirm that your operating system includes the latest updates and hotfixes.

3-3 Uninstalling and Installing the AOC-A25G-b2S (with 1U bracket)

Follow the steps below 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 top cover for ease of installation.)

A. Uninstalling an AIOM Module

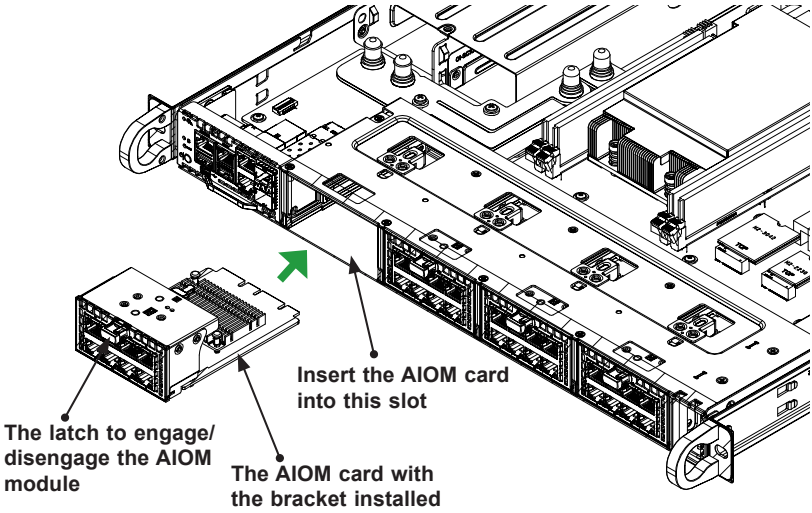
1. Slide the black latch to the left to "unlock" the position.
2. Disengage the AIOM module from the chassis structure by pushing the blue latch once to extend it outward.
3. Pull the blue latch to disengage the AIOM module from the motherboard connector.
4. Gently slide the AIOM module out.



B. Installing an AIOM Module

1. Position the AIOM module in front of the empty slot.
2. Gently push onto the metal bracket (do not use the blue latch). The AIOM module should slide into the chassis until the card securely seated in the connector.
3. Press the blue latch to properly secure it onto the chassis.
4. Move the black latch to the right to "lock" the position.

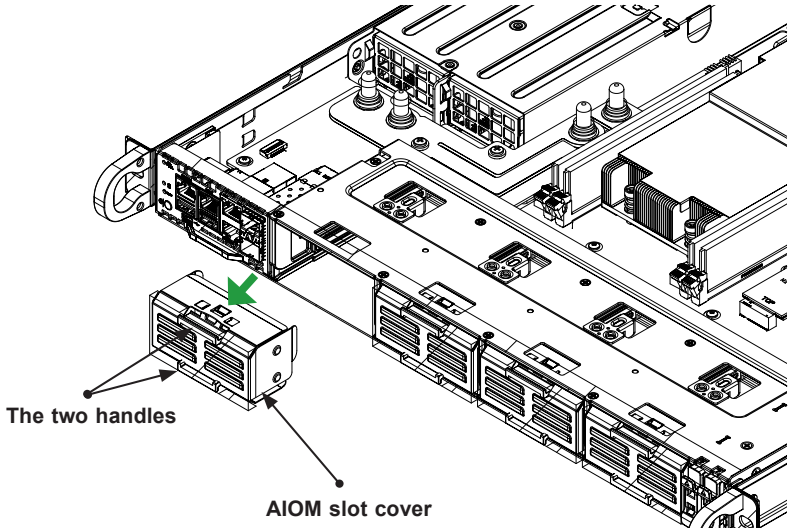
Black Latch



Note: A computer system should not be operating with an empty AIOM slot. All slots should be populated with AIOM modules, AIOM slot covers, or combinations of both.

C. Installing an AIOM Module (with an AIOM Slot Cover)

1. Remove the AIOM slot cover by pulling it with two handles.
2. Position the AIOM module in front of the empty slot.
3. Gently push onto the metal bracket (do not use the blue latch). The AIOM module should slide into the chassis until the card is fully seated inside the connector.
4. Press the blue latch to secure it onto the chassis structure.



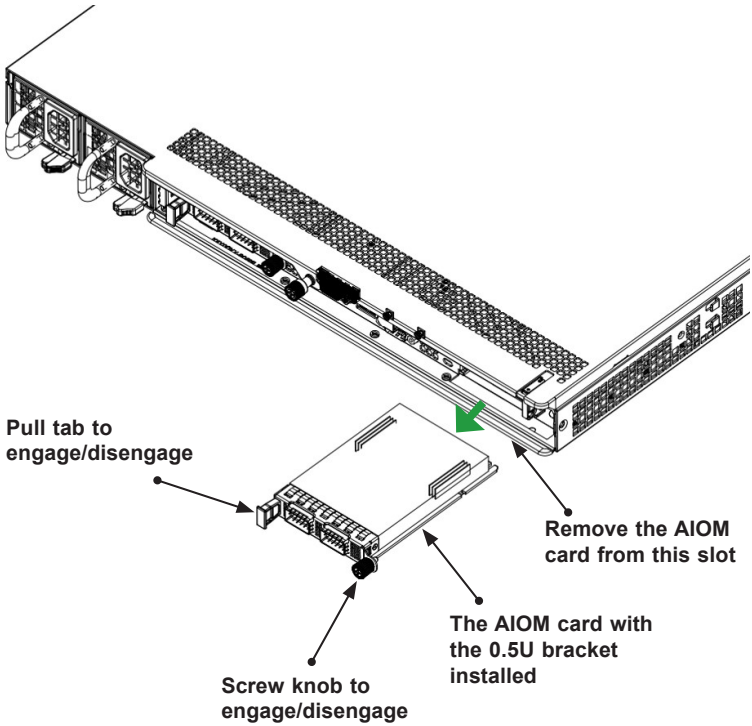
Note: This AIOM module does not support hot plug. Please turn off the AC power and remove the power cord from the wall socket before installing or removing an AIOM module.

3-4 Uninstalling and Installing the AOC-A25G-b2SM (with 0.5U bracket)

Follow the steps below 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 top cover for ease of installation.)

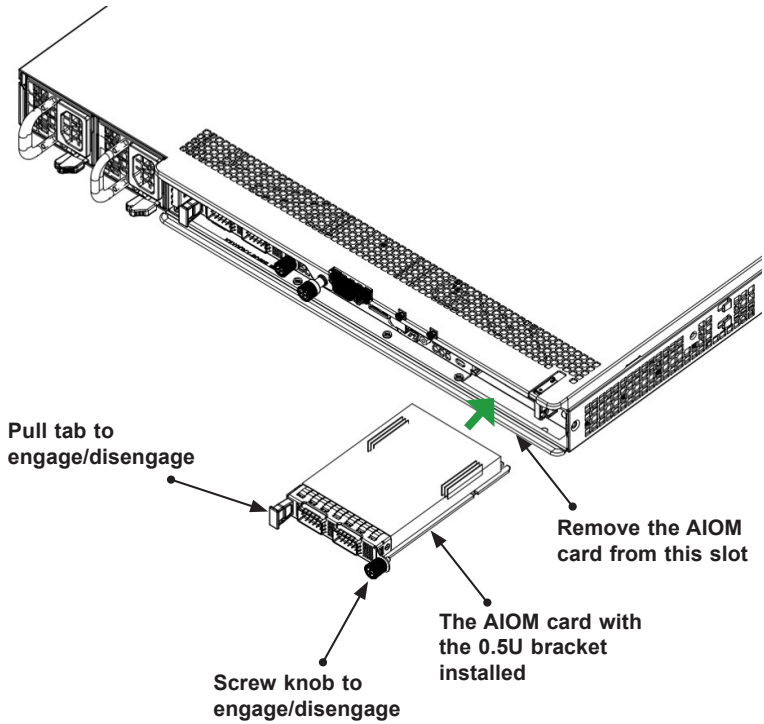
A. Uninstalling an AIOM Module

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.



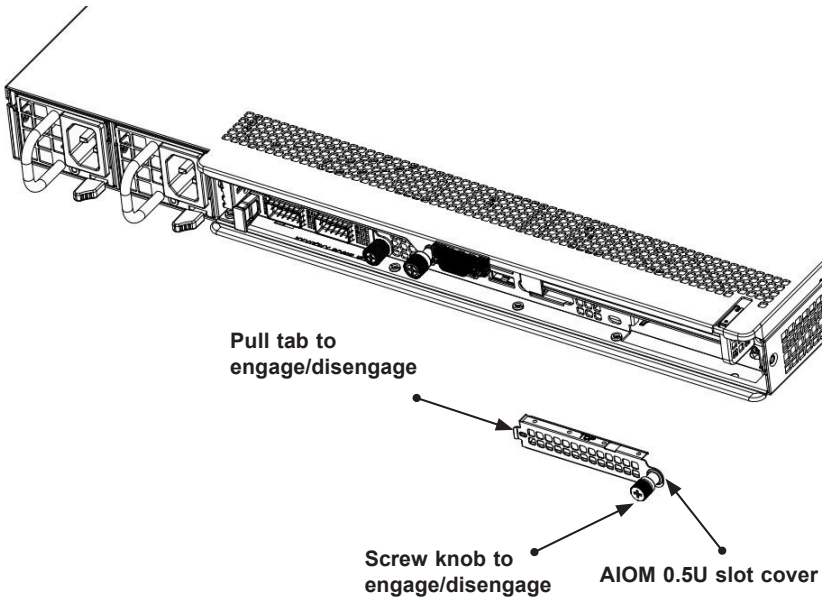
B. Installing an AIOM Module

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



C. Installing an AIOM Module (with an AIOM Slot Cover)

1. Remove the AIOM slot cover by unscrewing the knob and screw 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.
4. Gently push it onto the metal bracket. The AIOM module should slide into the chassis until the card is securely seated in the connector.
5. Press the blue knob and secure it onto the chassis by turning the knob clockwise.



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

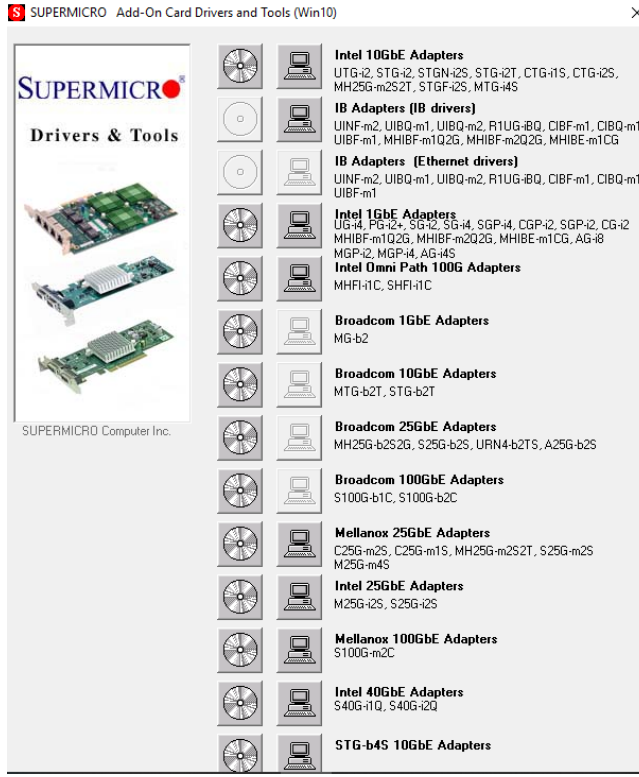
Note 2: Pictures shown above are for illustration purposes only. Actual products may vary due to product enhancement.

3-5 Installing Drivers on Windows

Follow the steps below to install the drivers for the Windows operating systems. Download the drivers from Intel Download Center or the Supermicro site at https://www.supermicro.com/wftp/Networking_Drivers.

1. Run CDR-NIC.

2. When the SUPERMICRO window appears, click on the computer icon next to the product model.



Note: If the *FOUND NEW HARDWARE WIZARD* screen displays on your system, click CANCEL.

3. Click on INSTALL DRIVERS AND SOFTWARE.

4. Follow the prompts to complete the installation.

3-6 Installing Drivers (for Broadcom® BCM57414)

Use the procedures below to install both drivers and firmware for the AOC-A25G-b2S(M/B/G) add-on card for both Linux and Windows.

Linux Drivers

Use the following procedures to install drivers on the Linux operating system. Download the drivers from ftp://ftp.supermicro/Networking_Drivers/

Installing 25G Drivers for the Linux Operating System

1. Prerequisites: Install the following:

   ```
   yum –y install libibverbs* infiniband-diags perftest
   qperf librdmacm-utils

   yum –y install groupinstall “InfiniBand Support”
   ```

2. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 25G > Linux_Driver.

3. Download the Linux driver package file netxtreme-bnxt_en-<ver>.tar.gz.

4. Install the driver by entering the following commands:

   ```
   tar xzvf nextreme-bnxt_en–<ver>.tar.gz

   cd nextreme-bnxt_en–<ver>

   make build

   make install
   ```

5. You will need to install RoCE library if you want to use RoCE.

6. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 25G > Linux_RoCE_Lib.

7. Download libbnxtre-<ver>.tar.gz.

8. Install the library by entering the following commands:

```
tar xvzf libbnxtre-<ver>.tar.gz

cd libbnxtre-<ver>.tar.gz

./configure

make

make install

cp bnxtre.driver /etc/libibverbs.d/

echo "/usr/local/lib" >> /etc/ld.so.conf

ldconfig -v
```

Windows Drivers

Use the following procedures to install drivers on the Windows operating system.

Installing 25G Drivers for the Windows Operating System

1. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 25G > Windows.
2. Choose the desired Windows driver package folder.
3. Drivers are in .inf format. You can install the driver from Device Manager.

(Disclaimer Continued)

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