AOC-MG-b2

User's Guide

Revision 1.0

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User's Guide Revision 1.0

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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-MG-b2 add-on card.

About this Add-on Card

The Supermicro AOC-MG-b2 features Broadcom's field-proven dual-port NetXtreme BCM5720 Ethernet controller to deliver lower power consumption and Energy Efficient Ethernet (EEE). In small form factor SIOM, this adapter is supported in Supermicro Twin and SuperStorage servers. The Supermicro AOC-MG-b2 provides a reliable, high-performance, energy-efficient 1 GbE connectivity solution.

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 a RMA authorization online (http://www.supermicro.com).

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.

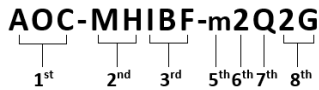
During the warranty period, contact your distributor first for any product problems.

Conventions Used in the User's Guide

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

Note: Additional information given to provide information for correct system setup.

Naming Convention



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
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), IBF: FDR IB (56Gb/s), IBQ: QDR IB (40Gb/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
7th	Connector Type (Optional)	S: SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28
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

SMC Networking Add-on Cards

Model	Type	Form Factor	Controller	Connection	Dimension (w/o Brackets) (L x H)	Power (W)
AOC-MGP-i2	GbE	SIOM	Intel® i350 AM2	2 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	3.7
AOC-MGP-i4	GbE	SIOM	Intel® i350 AM4	4 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	4.4
AOC-MTGN-i2S	10GbE	SIOM	Intel® 82599ES	2 SFP+ (10Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	7.2
AOC-MTG-i4S	10GbE	SIOM	Intel® XL710-BM1	4 SFP+ (10Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	7
AOC-MTG-b2T	10GbE	SIOM	Broadcom® BCM57416	2 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.08mm)	11
AOC-MTG-i2T	10GbE	SIOM	Intel® X550-AT2	2 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.08mm)	13
AOC-MTG-i4T	10GbE	SIOM	2x Intel® X550-AT2	4 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.08mm)	26
AOC-MHIBF-m1Q2G	FDR IB GbE	SIOM	Mellanox® ConnectX-3 Pro Intel® i350	1 QSFP (56Gb/port) 2 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	9
AOC-MHIBF-m2Q2G	FDR IB GbE	SIOM	Mellanox® ConnectX-3 Pro Intel® i350	2 QSFP (56Gb/port) 2 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	11
AOC-MHIBE-m1CG	EDR IB GbE	SIOM	Mellanox® ConnectX-4 VPI Intel® i210	1 QSFP28 (100Gb/port) 1 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	19
AOC-MH25G-b2S2G	25GbE	SIOM	Broadcom® BCM57414 Intel® i350	2 SFP28 (25Gb/port) 2 RJ45 (1Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	9
AOC-MH25G-m2S2T	25GbE	SIOM	Mellanox® ConnectX-4 Lx EN Intel® X550-AT2	2 SFP28 (25Gb/port) 2 RJ45 (10GBase-T)	3.622" (92mm) x 3.428" (87.08mm)	25
AOC-M25G-m4S	25GbE	SIOM	Mellanox® ConnectX-4 Lx EN	4 SFP28 (25Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	20
AOC-M25G-i2S	25GbE	SIOM	Intel® XXV710	2 SFP28 (25Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	11.8
AOC-MHFI-i1C	Omni-Path	SIOM	Intel® OP HFI ASIC (Wolf River WFR-B)	1 QSFP28 (100Gb/port)	3.622" (92mm) x 3.428" (87.08mm)	15

Model	Type	Form Factor	Interface	Controller	Connection	Dimension (w/o Brackets) (L x H)	Power (W)
AOC-SGP-i2	GbE	Standard LP	PCI-E x4	Intel® i350 AM2	2 RJ45 (1Gb/port)	3.9" (99mm) x 2.73" (69mm)	3.5
AOC-SGP-i4	GbE	Standard LP	PCI-E x4	Intel® i350 AM4	4 RJ45 (1Gb/port)	3.9" (99mm) x 2.73" (69mm)	5
AOC-STG-i2T	10GbE	Standard LP	PCI-E x8	Intel® X540-AT2	2 RJ45 (10GBase-T)	5.9" (150mm) x 2.73" (69mm)	13
AOC-STGS-i1T	10GbE	Standard LP	PCI-E x4	Intel® X550-AT	1 RJ45 (10GBase-T)	5.9" (150mm) x 2.73" (69mm)	9
AOC-STGS-i2T	10GbE	Standard LP	PCI-E x4	Intel® X550-AT2	2 RJ45 (10GBase-T)	5.9" (150mm) x 2.73" (69mm)	11
AOC-STG-b2T	10GbE	Standard LP	PCI-E x8	Broadcom® BCM57416	2 RJ45 (10GBase-T)	5.6" (142mm) x 2.73"(69mm)	13.1
AOC-STG-i4T	10GbE	Standard LP	PCI-E x8	Intel® XL710-BM1	4 RJ45 (10GBase-T)	5.9" (149mm) x 2.73"(69mm)	15.5
AOC-STGN-i1S	10GbE	Standard LP	PCI-E x8	Intel® 82598EN	1 SFP+ (10Gb/port)	4.0" (102mm) x 2.73" (69mm)	10
AOC-STGN-i2S	10GbE	Standard LP	PCI-E x8	Intel® 82599ES	2 SFP+ (10Gb/port)	4.0" (102mm) x 2.73" (69mm)	11.2
AOC-STGF-i2S	10GbE	Standard LP	PCI-E x8	Intel® X710-BM2	2 SFP+ (10Gb/port)	5.19" (132mm) x 2.73" (69mm)	5.6
AOC-STG-b4S	10GbE	Standard LP	PCI-E x8	Broadcom® BCM57840S	4 SFP+ (10Gb/port)	5.4" (137mm) x 2.73" (69mm)	14
AOC-STG-i4S	10GbE	Standard LP	PCI-E x8	Intel® XL710-BM1	4 SFP+ (10Gb/port)	5.9" (150mm) x 2.73" (69mm)	8
AOC-S25G-m2S	25GbE	Standard LP	PCI-E x8	Mellanox® CX-4 LX	2 SFP28 (25Gb/port)	5.6" (142mm) x 2.713" (69mm)	8.7
AOC-S25G-b2S	25GbE	Standard LP	PCI-E x8	Broadcom® BCM57414	2 SFP28 (25Gb/port)	5.6" (142mm) x 2.713" (69mm)	5.2
AOC-S25G-i2S	25GbE	Standard LP	PCI-E x8	Intel® XXV710	2 SFP28 (25Gb/port)	6.1" (155mm) x 2.713" (69mm)	7.2
AOC-S40G-i1Q	40GbE	Standard LP	PCI-E x8	Intel® XL710-BM1	1 QSFP+ (40Gb/port)	5.9" (150mm) x 2.73" (69mm)	6.5
AOC-S40G-i2Q	40GbE	Standard LP	PCI-E x8	Intel® XL710-BM2	2 QSFP+ (40Gb/port)	5.9" (150mm) x 2.73" (69mm)	7
AOC-S100G-m2C	100GbE	Standard LP	PCI-E x16	Mellanox® CX-4 EN	2 QSFP28 (100Gb/port)	6.6" (168mm) x 2.73" (69mm)	16.3
AOC-S100G-b1C	100GbE	Standard LP	PCI-E x16	Broadcom® BCM57454	2 QSFP28 (100Gb/port)	6.6" (168mm) x 2.73" (69mm)	17.8
AOC-CGP-i2	GbE	MicroLP	PCI-E x4	Intel® i350 AM2	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.54" (39mm)	4
AOC-CTG-i1S	10GbE	MicroLP	PCI-E x8	Intel® 82599EN	1 SFP+ (10Gb/port)	4.85" (123mm) x 1.54" (39mm)	10
AOC-CTG-i2S	10GbE	MicroLP	PCI-E x8	Intel® 82599ES	2 SFP+ (10Gb/port)	4.85" (123mm) x 1.54" (39mm)	11
AOC-CTG-i2T	10GbE	MicroLP	PCI-E x8	Intel® X540-AT2	2 RJ45 (10GBase-T)	4.8" (123mm) x 2.75" (77mm)	13
AOC-CTGS-i2T	10GbE	MicroLP	PCI-E x4	Intel® X550-AT2	2 RJ45 (10GBase-T)	4.45" (113mm) x 1.54" (39mm)	12
AOC-C25G-m1S	25GbE	MicroLP	PCI-E x8	Mellanox® CX-4 Lx EN	1 SFP28 (28Gb/port)	4.45" (113mm) x 1.54" (39mm)	8.5

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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 in 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

The key features of this add-on card include:

- Super I/O Module (SIOM) form factor
- Broadcom® BCM5720 1 GbE controller
- Energy Efficient Ethernet (EEE)
- Dual RJ45 connectors
- Optimized for virtualization
- Asset Management features
- RoHS compliant 6/6

1-3 Specifications

General

- Super I/O Module (SIOM) form factor
- Broadcom® BCM5720 1 GbE controller
  - Dual port with speeds up to 1Gbps per port
- Dual RJ45 connectors

Ethernet

- IEEE 802.3ad, 802.1AX link aggregation
- IEEE 802.1Q, 802.1P VLAN tags and priority
- IEEE 1588v2
- Jumbo frame support (9.6KB)

Enhanced Features

- Wake-on-LAN support
- Support for MSI/MSI-X mechanisms

Hardware-based I/O Virtualization

- Single root IOV
- Multi-function per port
- Multiple queues per virtual machine
- VMware NetQueue and Microsoft VMQ support

CPU Offloads

- TCP/UDP/IP checksum offload
- TCP Segmentation Offload (TSO)
- Large Receive Offload (LSO)
- Receive Side Scaling (RSS)
- Transmit Side Scaling (TSS)

Management Features

- Remote boot over iSCSI
- Preboot eXecution Environment (PXE) support
- NC-SI for remote management
- Asset Management – Monitoring model, PCB Rev., Serial number, MAC addresses with Supermicro management software

OS Support

- Windows
- Linux RedHat
- Linux SUSE
- VMware

Cables Support

- GbE: RJ45 category 5/5e up to 100m

Note: Please check Supermicro website for supported cable/transceiver part numbers.

Power Consumption

- Maximum 4.2W

Operating Conditions

- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -40°C to 65°C (-40°F to 149°F)
- Storage humidity: 90% non-condensing relative humidity at 35°C

Physical Dimensions

- Card PCB dimensions: 92mm (3.62in) x 87.1mm (3.43in) (WxD)

Supported Platforms

- Supermicro® motherboards with Super I/O Module slot
- Supermicro® server systems with Super I/O Module slot (see SIOM Compatibility Matrix online at *http://www.supermicro.com/support/resources/AOC/AOC_Compatibility_SIOM.cfm*)

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

1-6 Available SKUs

SKUs	Bracket Included	Description
AOC-MG-b2	BKT-0086L	Two-port Gigabit Ethernet Adapter with a swappable bracket for 2U+ chassis (Storage Servers)
AOC-MG-b2M	BKT-0085L	Two-port Gigabit Ethernet Adapter with an internal bracket for 1U chassis (Twin Servers)

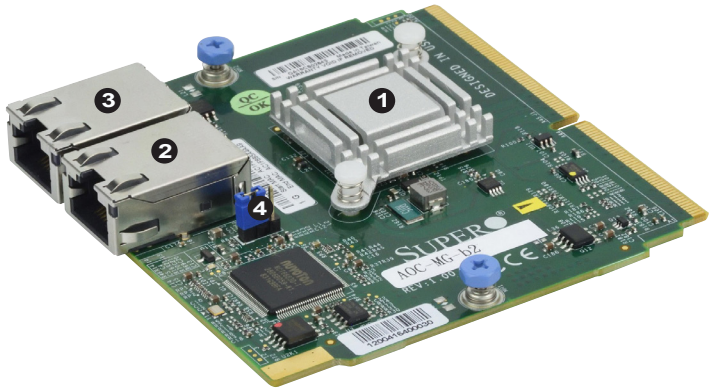
1-7 Similar Products

Model	Form Factor	Speed	Connector Type	Total Ports	Controller
AOC-MGP-i2	SIOM	1GbE	RJ45	2	Intel® i350
AOC-MGP-i4	SIOM	1GbE	RJ45	4	Intel® i350
AOC-MTGN-i2S	SIOM	10GbE	SFP+	2	Intel® 82599
AOC-MTG-i4S	SIOM	10GbE	SFP+	4	Intel® XL710
AOC-MTG-b2T	SIOM	10GbE	RJ45	2	Broadcom® BCM57416
AOC-MTG-i2T	SIOM	10GbE	RJ45	2	Intel® X550
AOC-MTG-i4T	SIOM	10GbE	RJ45	4	Intel® X550
AOC-MH25G-b2S2G	SIOM	25GbE 1GbE	SFP28 RJ45	2 2	Broadcom® BCM57414 Intel® i350
AOC-MH25G-m2S2T	SIOM	25GbE 10GbE	SFP28 RJ45	2 2	Mellanox® CX4 Lx EN Intel® X550
AOC-M25G-m4S	SIOM	25GbE	SFP28	4	Mellanox® CX4 Lx EN
AOC-M25G-i2S	SIOM	25GbE	SFP28	2	Intel® XL710
AOC-MHIBF-m2Q2G	SIOM	Infiniband FDR GbE	QSFP RJ45	2 2	Mellanox® ConnectX-3 Pro Intel® i350
AOC-MHIBF-m1Q2G	SIOM	Infiniband FDR GbE	QSFP RJ45	1 2	Mellanox® ConnectX-3 Pro Intel® i350
AOC-MHIBE-m1CG	SIOM	Infiniband FDR GbE	QSFP28 RJ45	1	Mellanox® ConnectX-4 VPI Intel® i210
AOC-MHFI-i1C	SIOM	Omni-Path	QSFP28	1	Intel® OP HFI ASIC

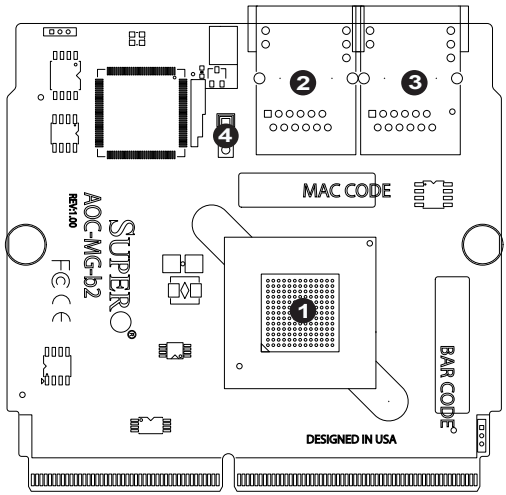
Chapter 2

Hardware Components

2-1 Add-On Card Image and Layout



The AOC-MG-b2 Image



The AOC-MG-b2 Layout

1. Broadcom® BCM5720 Controller
2. JLAN2: RJ45 Port2
3. JLAN1: RJ45 Port1
4. Jumper JP1: I2 Address Mode

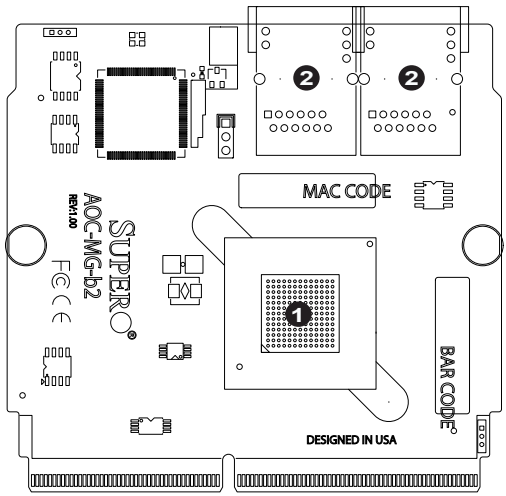
2-2 Jumpers and Major Components

The table below contains the jumper on the AOC-MG-b2:

Jumper	Description	Default Setting	Note
JP1	I2 Address Mode	1-2: ARP Mode	2-3: Fixed, 0x30

The following major components are installed on the AOC-MG-b2:

1. Broadcom® BCM5720 Controller
2. RJ45 LAN ports

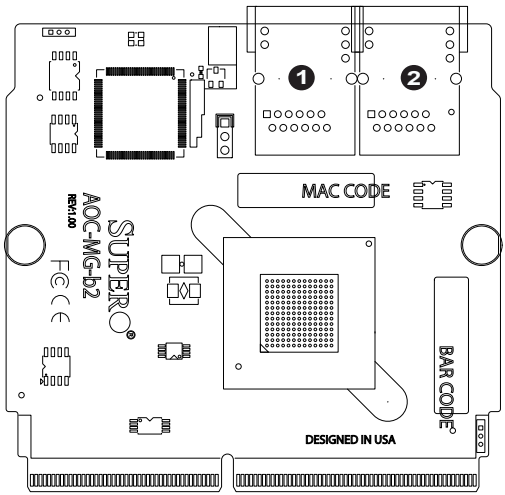


2-4 RJ45 LAN Ports

RJ45 LAN Ports (JLAN1 and JLAN2)

There are two RJ45 LAN ports (JLAN1 and JLAN2) on the AOC-MG-b2. The LAN ports support connection speed of 1Gbps. Use a direct-attach RJ45 type LAN cable. See the layout below for the location.

Note: Please refer to page 1-3 for recommended cables.



1. RJ45 LAN Port 2
2. RJ45 LAN Port 1

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 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

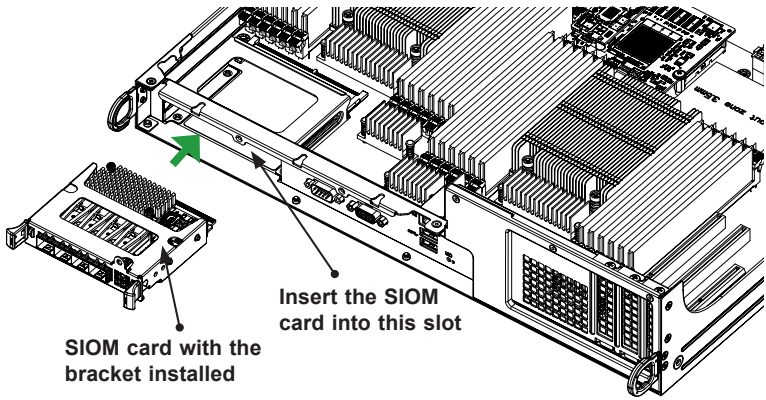
Before you install the add-on card, follow the instructions below.

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 Installing the Add-on Card

Follow the steps below to install the add-on card into your system.

1. Remove the server cover and, if any, set aside any screws for later use.
2. Remove the add-on card slot cover. If the slot cover has a screw, place it aside for later use.
3. Position the add-on card in front of the SIOM slot and gently push in both sides of the card until it slides into the slot.



Note: This add-on card does not support hot plug. Please turn off the AC power and remove the power cord from the wall socket before you install or remove the add-on card.

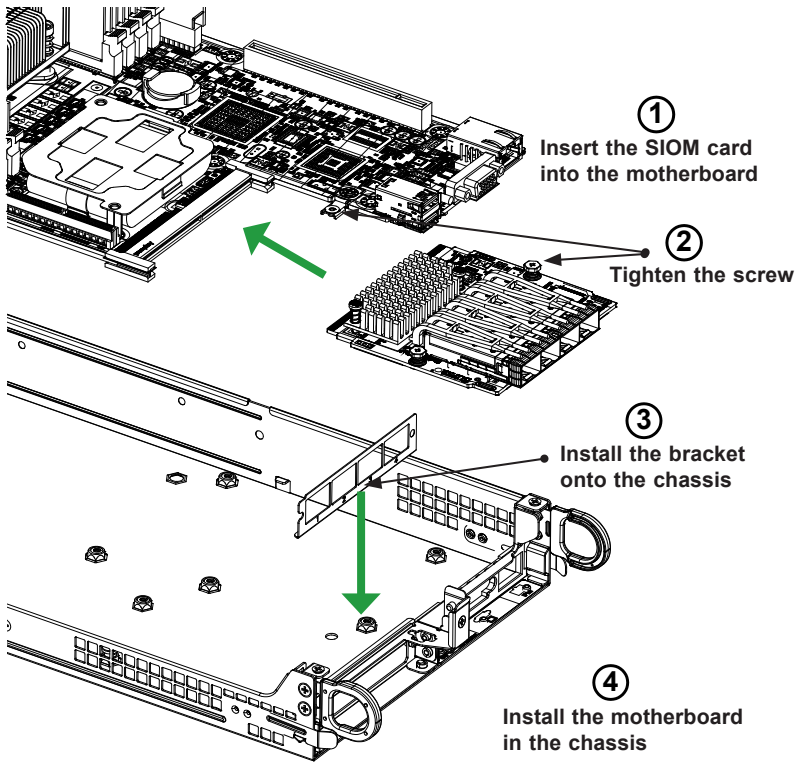
4. Secure the add-on card to the chassis. If required, use the screws that you previously removed.

5. Attach any necessary external cables to the add-on card.

6. Replace the system cover.

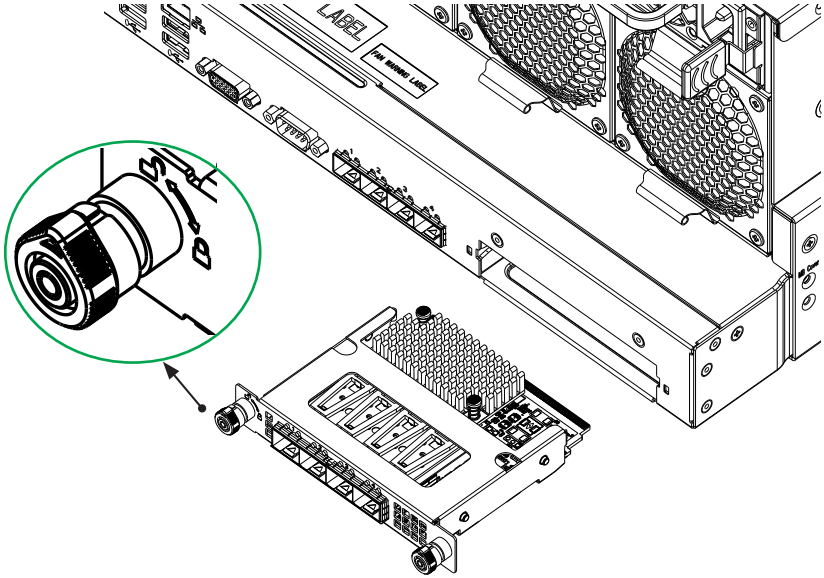
7. Plug in the power cord and power up the system.

Follow this step to install the add-on card if your system does not support a swappable bracket. Insert the SIOM card in the motherboard and then install the motherboard in the chassis. An internal bracket comes with the SIOM card 1U in the chassis SKU. It needs to be installed onto the chassis.



Note: Supermicro recommends that this SIOM card be installed by a system integrator or by the manufacturer.

Follow the steps below to install the add-on card into your system that supports a swappable bracket. The add-on card must be installed in the swappable bracket before it can be installed in your system.



1. Install the add-on card into the swappable bracket.

2. Position the add-on card in front of the SIOM slot and gently push in both sides of the card until it slides into the slot.

3. Once the card is in the slot, push both knobs in and turn to the right to lock the card in the system. The left knob has the unlock/lock symbols next to it. To ensure that the add-on is locked, make sure that the knob position indicator is pointing to the lock symbol.

3-4 Installing Drivers (for Broadcom® BCM5720)

To install both drivers and firmware for the AOC-MG-b2 add-on card for either Linux and Windows, please follow the instructions below.

Before Installing the Drivers for the Linux Operating System Only

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 to do so, please first download the following libraries:

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

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

Installing 1G Drivers for the Linux Operating System

Follow the steps below 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 Linux_Driver directory from the FTP site (https://www.supermicro.com/wftp/driver) or CDR-NIC LAN driver CD by going to the following directory: Broadcom > 1G > Linux > Linux_Driver.

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 with RoCE, please follow the additional steps below:

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 Linux_RoCE_Lib directory from the FTP site (https://www.supermicro.com/wftp/driver) or CDR-NIC LAN driver CD by going to the following directory: Broadcom > 1G > Linux > Linux_RoCE_Lib.

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 1G Drivers for the Windows Operating System

Follow the steps below 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 > 1G > 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.