SUPERMICRO®

AOC-MTG-b2T

User's Guide

Revision 1.0a

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Manual Revision 1.0a

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Preface

About this User's Guide

This user's guide is written for system integrators, IT professionals, and knowledgeable end users. It provides information for the installation and use of the AOC-MTG-b2T add-on card.

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 of 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 the motherboard 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/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 to prevent damage to the system or injury to yourself:
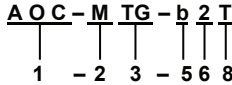
⚠ **Warning:** Important information given to ensure proper system installation or to prevent damage to the components or injury to yourself.

✎ **Note:** Additional information given to differentiate between various models or provides information for correct system setup.

Naming Convention

$$\underline{A\ O\ C} - \underline{M}\ \underline{TG} - \underline{b}\ \underline{2}\ \underline{T}$$

$$1\quad -\ 2\quad 3\ -\ 5\ 6\ 8$$

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)
5th	Chipset Manufacturer (Optional)	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: GbE RJ45, S: 10G SFP+, T: 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-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) 2 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 QSFP (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)	9
AOC-STG-i4T	10GbE	Standard LP	PCI-E x8	Intel® XL710-BM1	4 RJ45 (10GBase-T)	5.9" (14.99cm) x 2.73"(6.9cm)	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-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-CGP-i2	GbE	MicroLP	PCI-E x4	Intel® i350 AM2	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.54" (39mm)	4
AOC-CG-i2	GbE	MicroLP	PCI-E x4	Intel® 82580	2 RJ45 (1Gb/port)	4.45" (113mm) x 1.3" (34mm)	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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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 in quality and performance.

1-2   About this Add-on Card

Supermicro AOC-MTG-b2T features latest Broadcom NetXtreme BCM57416 Ethernet controller that is designed for today's rapid growing datacenter and cloud-scale applications. In small form factor SIOM, it features VXLAN, NVGRE, and Geneve along with Broadcom TruFlow technology that enables users to reduce CPU loads and increases VM densities. In addition, NPAR (NIC Partitioning) technology provides flexible connectivity for different networking requirements. The Supermicro AOC-MTG-b2T is a truly exceptional 10GbE Ethernet Adapter for your continuously growing cloud applications and datacenters.

1-3   Key Features

The product highlights of this add-on card include the following:

- Super I/O Module (SIOM) Form Factor

- Broadcom® BCM57416 10GbE controller

- Dual RJ45 Connectors

- TruFlow

- NPAR (NIC Partitioning)

- VXLAN and NVGRE

- Low latency RDMA over Converged Ethernet (RoCE)

- Asset Management Features with thermal sensor

- RoHS compliant 6/6

1-4   Technical Specifications

General

- Super I/O Module (SIOM) Form Factor

- Broadcom BCM57416 dual-port 10Gbps controller

- Dual RJ45 connectors

- TruFlow Technology

Host Interface

- PCI-E 3.0 (8GT/s)

- MCTP over SMBus

- Function Level Rest (FLR) support

- Message Signal Interrupt (MSI-X)

Networking Features

- Jumbo Frames (up to 9600-byte)

- 802.3x flow control

- Link Aggregation (802.3ad)

- Virtual LANs 802.1q VLAN tagging

- Configurable Flow Acceleration

- IEEE 1588 and Time Sync

- RDMA over Converged Ethernet (RoCE)

Stateless Offload Features

- TCP, UDP, IPv4, IPv6 checksum offload

- Large Send Offload

- Receive Segment Coalescing

- TCP Segmentation Offload

- Large Receive Offload

- Receive Side Scaling (RSS)

- Transmit Side Scaling (TSS)

NIC partitioning (NPAR)

- 16 Physical Functions

- QoS per partition

- Partitioning control via sideband communication

- Up to 64MAC/VLAN filters per partition

- Stateless offload configuration per partition

- VEB/VEPA support

Virtualization Features

- NetQueue, VMQueue, and Multiqueue

- Support for 128 Virtual Functions

- VXLAN

- NVGRE

- Geneve

- Edge Virtual Bridging (EVB)

Manageability

- Network Controller Sideband Interface (NC-SI)

- PXE and iSCSI boot

- Asset Management with Thermal Sensors

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; IEEE802.1Qau)

- Quantized Congestion Notification (QCN; IEEE802.1Qau)

- Data Center Bridging Capability eXchange (DCBX; IEEE802.1Qaz)

- 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 low-power mode

- Pass-through Energy Efficient Ethernet (IEEE802.3az-2010)

Power Consumption

- Maximum power consumption: 11W

Physical Dimensions

- Card PCB dimensions: 14.224cm x 6.89cm (5.6in x 2.71in) (LxW)

- Height of end brackets: standard – 12cm (4.725in), low-profile – 8cm (3.15in)

Operating Conditions

- Operating temperature: 0°C to 55°C (32°F to 131°F)

- Storage temperature: -40°C to 70°C (-40°F to 158°F)

- Storage humidity: 90% non-condensing relative humidity at 35°C

    ✐ **Note**: This product is intended to be used with Supermicro server systems or motherboards as an integrated solution package.

1-5   Compliance/Operating Environment

The AOC-MTG-b2T add-on card is compliant with the following environmental regulations:

- RoHS Compliant 6/6, Pb Free

- AOC-MTG-b2T for Storage Systems, AOC-MTG-b2TM for Twin Systems.

- Please check SIOM Compatibility Matrix online http://www.supermicro.com/support/resources/AOC/AOC_Compatibility_SIOM.cfm
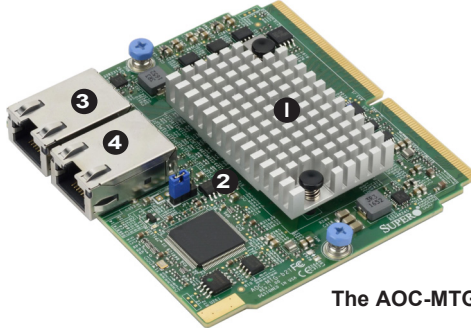
1-6   Available SKUs

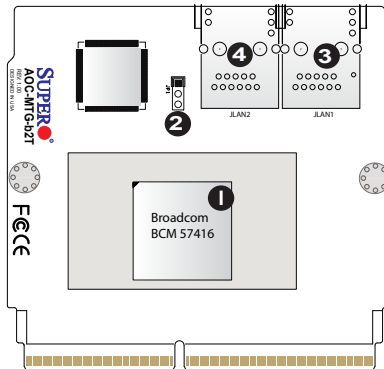| SKUs	Part Number	Description
AOC-MTG-b2T	AOC-MTG-b2T	2-port 10 Gigabit Ethernet Adapter
	BKT-0086L	Swappable bracket for 2U+ chassis
AOC-MTG-b2TM	AOC-MTG-b2TM	2-port 10 Gigabit Ethernet Adapter
	BKT-0085L	Internal Bracket

Notes

Chapter 2

Hardware Components

2-1   Add-On Card Image and Layout

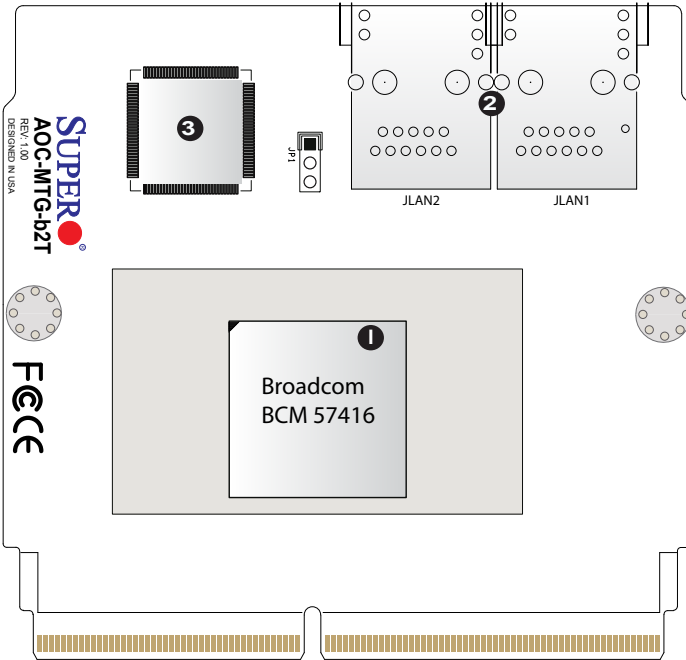**The AOC-MTG-b2T Image**

The AOC-MTG-b2T Layout

1. Broadcom BCM 57416	3. LAN1 RJ45 Port1
2. Jumper JP1	4. LAN2 RJ45 Port2

2-2   Jumpers and Connectors

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-MTG-b2T:

1. Broadcom BCM57416 10GbE Controller

2. Dual RJ45 LAN (LAN 1/LAN 2) Ports

3. Super IO Module Networking Card

2-3 LAN Ports and LAN LED Indicators

LAN Ports

There are two LAN ports on the AOC-MTG-b2T. These LAN ports support connection speeds of 10Gbps. Use RJ45 type LAN cables.

The AOC-MTG-b2T Image

LAN Port LED Indicators

Each LAN port has two LEDs to indicate speed and data activity. Refer to the table below for LED color and definition.

RJ45 LAN Port Link LED (Left) LED State	
LED Color	Definition
Green	10 Gbps
Amber	1 Gbps
Amber	100 Mbps

RJ45 LAN Port Link LED (Right) LED State		
LED Color	Status	Definition
Off	Off	No Connection
Green	Solid	Link
Green	Flashing	Active

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 remove 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 documenta-
    tion.

5. Confirm that your operating system includes the latest updates and hotfixes.
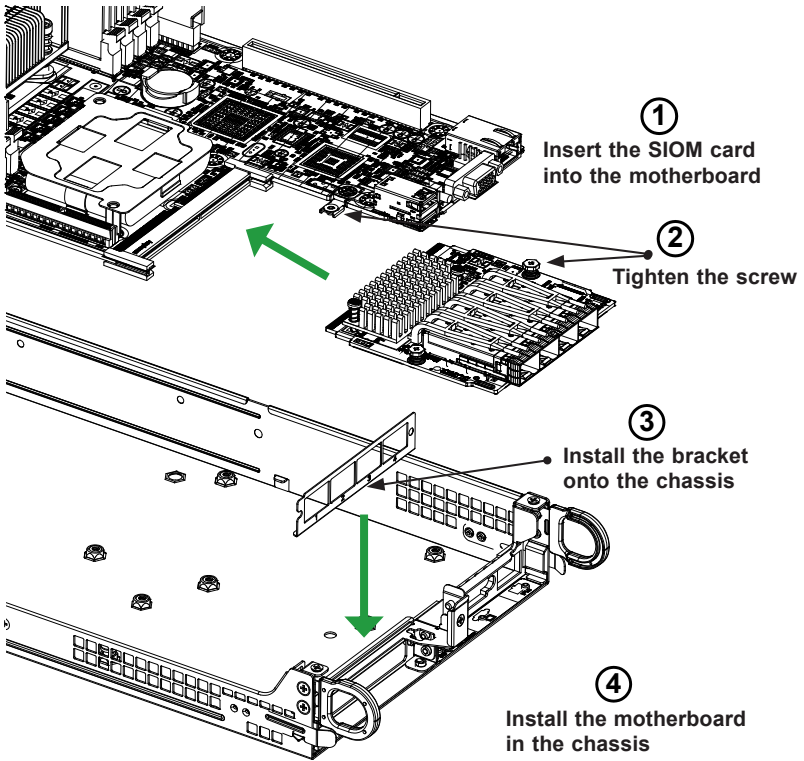
3-3   Installing the Add-on Card

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.

**Insert the SIOM
card into this slot**

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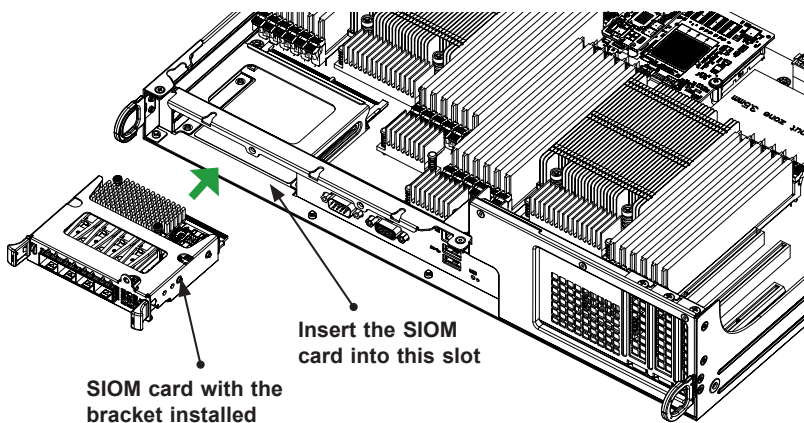
✎ **Note**: This add-on card does not support hot plug. Please turn off the AC
power and remove the power cord from the wall socket before you install
or remove the add-on card.

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 chassis SKU. It needs to be installed onto the chassis.

① Insert the SIOM card into the motherboard

② Tighten the screw

③ Install the bracket onto the chassis

④ Install the motherboard in the chassis

✎ **Note**: It is recommended that the SIOM card installation above be completed by a system integrator or the manufacturer.

4. Secure the add-on card to the chassis. If required, use the screw 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 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
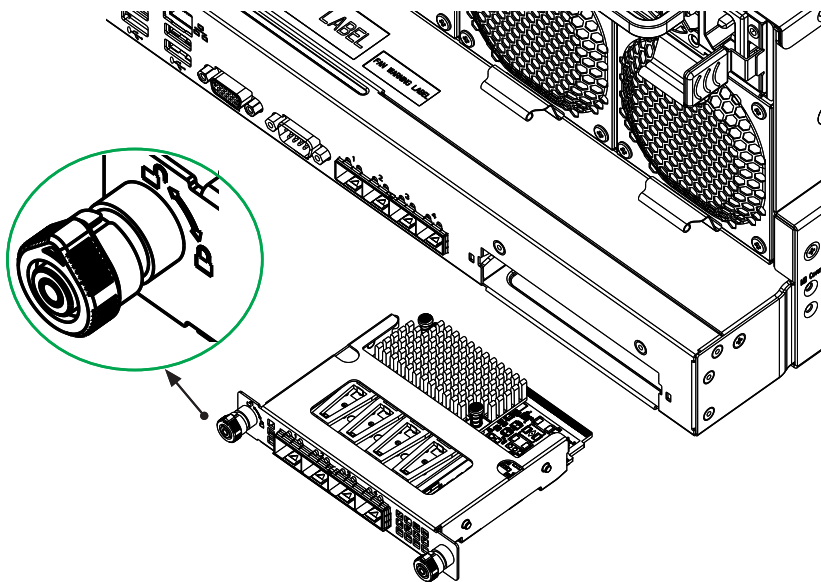

1. Install the add-on card into the swappable bracket.

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 on Windows OS

Follow the steps below to install the drivers needed for your Windows OS support. The controller comes with a driver on the CD-ROM CDR-NIC.

1. Run the CDR-NIC. (If you do not have a product CD-ROM, download drivers from the Supermicro Support Website and then transfer them to your system.)

2. When the SUPERMICRO window appears, click on the computer icon next to the product model.
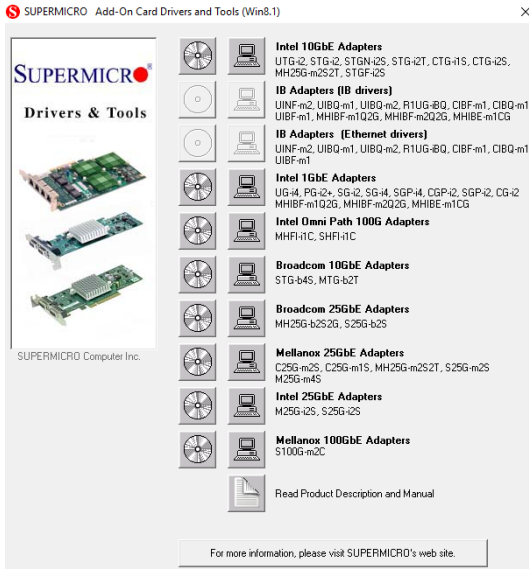
🖉 **Note:** If the FOUND NEW HARDWARE WIZARD screen displays on your system, click CANCEL.

3. Click on INSTALL DRIVERS AND SOFTWARE.

4. Follow the prompts to complete the installation.

3-5 Installing Drivers on Linux (for Broadcom BCM57416)

Linux Drivers

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

Installing InfiniBand 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 > 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 xvzf netxtreme-bnxt_en-<ver>.tar.gz
    cd netxtreme-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-.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 (ftp://ftp.supermicro.com/Networking_Drivers) or CDR-NIC LAN driver CD by going to the following directory: Broadcom > 25G > Linux > Linux_RoCE > RoCE_Lib.

5. Download libbnxt_re-<ver>.tar.gz

6. Install the library by entering following commands:

    ```
    tar xvzf libbnxt_re-<ver>.tar.gz
    cd libbnxt_re-<ver>
    sh autogen.sh
    ./configure –sysconfdir=/etc
    make
    make install
    cp bnxt_re.driver /etc/libibverbs.d
    ```

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

ldconfig -v
```

For more driver installation information, please refer to Intel Support website.

Windows Drivers

Follow the steps below to install the drivers on the Windows operating system.

Installing Drivers for the Windows Operating System

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

Notes