SUPERMICRO AOC-CTG-b2T Add-on Card-Module User Guide

AOC-CTG-b2T Add-on Card-Module User Guide

AOC-CTG-b2T

AOM-CTG-b2TM

Revision 1.0

Contents

AOC-CTG-b2T Add-on Card-Module

The information in this User's Guide has been carefully reviewed and is believed to be accurate.
The vendor assumes no responsibility for any inaccuracies that may be contained in this document, and makes no commitment to update or to keep current the information in this user's guide, or to notify any person or organization of the updates. Please Note: For the most up-to-date version of this user's guide, please see our Website at www.supermicro.com.
Super Micro Computer, Inc. ("Supermicro") reserves the right to make changes to the product described in this user's guide at any time and without notice. This product, including software and documentation, is the property of Supermicro and/or its licensors, and is supplied only under a license. Any use or reproduction of this product is not allowed, except as expressly permitted by the terms of said license.
IN NO EVENT WILL SUPER MICRO COMPUTER, INC. BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, SPECULATIVE OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR INABILITY TO USE THIS PRODUCT OR DOCUMENTATION, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN PARTICULAR, SUPER MICRO COMPUTER, INC.
SHALL NOT HAVE LIABILITY FOR ANY HARDWARE, SOFTWARE, OR DATA STORED OR USED WITH THE PRODUCT, INCLUDING THE COSTS OF REPAIRING, REPLACING, INTEGRATING, INSTALLING OR RECOVERING SUCH HARDWARE, SOFTWARE, OR DATA.
Any disputes arising between the manufacturer and the customer shall be governed by the laws of Santa Clara County in the State of California, USA. The State of California, County of Santa Clara shall be the exclusive venue for the resolution of any such disputes. Supermicro's total liability for all claims will not exceed the price paid for the hardware product.
FCC Statement: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential

area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.
California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See **www.dtsc.ca.gov/hazardouswaste/perchlorate**”.
WARNING: This product can expose you to chemicals including lead, known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to **www.P65Warnings.ca.gov**.

User’s Guide Revision 1.0
Release Date: October 5, 2022

Printed in the United States of America

Preface

About this Users Guide
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-CTG-b2T and AOM-CTG-b2TM add-on cards.

About this Add-on Card
The AOC-CTG-b2T and AOM-CTG-b2TM 10 Gigabit Ethernet Adapters are the most compact and scalable 10GBase-T adapters for today’s demanding data center environments. Based on the Broadcom⁻ network controller BCM57416. they address the demanding needs of the next-generation data center. Both AOC-CTG-b2T and AOM-CTG-b2TM are designed in a proprietary and small IWcroLP form factor to fit Supermicro’s MicroCloud 8-node and 12-node systems.

An Important Note to the User
All images and layouts shown in this users 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 users 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 compete. For faster service. you can also request a RMA authorization online (**httplAwArtsupermicro.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.

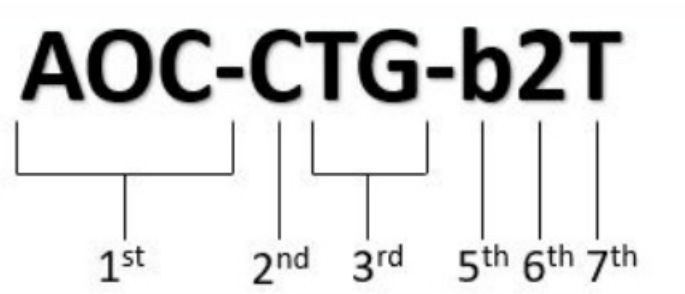
Conventions Used in the User’s Guide
Pay special attention to the following symbols for proper system installation and to prevent damage to the system or injury to yourself:

 **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 the correct system setup.

Naming Convention

Naming Convention for Network Adapters



Character	Representation	Options
1st	Product Family	AOC: Add On Card, AOM: Add On Card module
2nd	Form Factor	S: Standard, P: Proprietary, C: MicroLP, M:Super 10 Module (SIOM), MH: SIOM Hybrid A: Advanced 10 Module (ATOM), AH: AIOM Hybrid
3rd	Product Type/Speed	G: GbE (1Gb/s), TG: 10GbE (10Gb/s), 256: 25GbE (25Gb/s), 406: 40GbE (40Gb/s), SOG: SOGbE (SOGb/s), 100G: 100GbE (100Gb/s), IBE: EDR IB (100Gb/s), HFI: Host Fabric Interface
4th	Chipset Model (Optional)	N:Niantec (82599), P: Powerville (i350), 5: Sageville (X550), F: Fortville (XL710/X710), 7: ConnectX-7
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)	5: SFP/SFP+/SFP28, T: 10GBase-T, Q: QSFP+, C: QSFP28/QSFPS6
8th	AOC Module	M: MicroLP module for MicroCloud 12node.

Contacting Supermicro

Headquarters	
Address:	Super Micro Computer, Inc. 980 Rock Ave. San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008

Email:	marketing@supermicro.com (General Information) Sales-USA@supermicro.com (Sales Inquiries) Government_Sales-USA@supermicro.com (Gov. Sales Inquiries) support@supermicro.com (Technical Support) RMA@supermicro.com (RMA Support) Webmaster@supermicro.com (Webmaster)
Website:	www.supermicro.com
Europe	
Address:	Super Micro Computer B.V. Het Sterrenbeeld 28, 5215 ML 's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	Sales_Europe@supermicro.com (Sales Inquiries) Support_Europe@supermicro.com (Technical Support) RMA_Europe@supermicro.com (RMA Support)
Website:	www.supermicro.nl
Asia-Pacific	
Asia-Pacific	Super Micro Computer, Inc. 3F, No. 150, Jian 1st Rd. Zhonghe Dist., New Taipei City 235 Taiwan (R.O.C)
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3992

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 Product Highlights

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

- Dual 10GbE RJ45 Connectors
- MicroLP Form Factor
- Broadcom® BCM57416 Ethernet Controller
- PCI-E 3.0 x4 interface
- Asset Management feature with thermal sensor
- NC-SI for remote management

1-3 Technical Specifications
General

- MicroLP Form Factor for Supermicro Micro Cloud systems
- Broadcom® BCM57416 dual-port 10Gbps controller
- PCI-E 3.0 x4 (8GT/s) interface

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)
- TruFlow Technology

Stateless Offload Features

- TCP, UDP, IPv4, and IPv6 checksum offload
- Large Send Offload (LSO)
- Receive Segment Coalescing (RSC)
- TCP Segmentation Offload (TSO)
- Large Receive Offload (LRO)
- 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 filter per partition
- Stateless offload configuration per partition
- VEB/VEPA support

Flow Processing

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

Virtualization Features

- NetQueue, VMQueue, and Multiqueue
- Support for 128 virtual functions
- VXLAN
- NVGRE
- Geneve
- Edge Virtual Bridging (EVB)

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

Manageability

- Network Controller Sideband Interface (NC-SI)
- PXE boot
- Asset Management with thermal sensors

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

- PCB dimensions: 11.3cm (4.46”) x 3.9cm (1.54”)

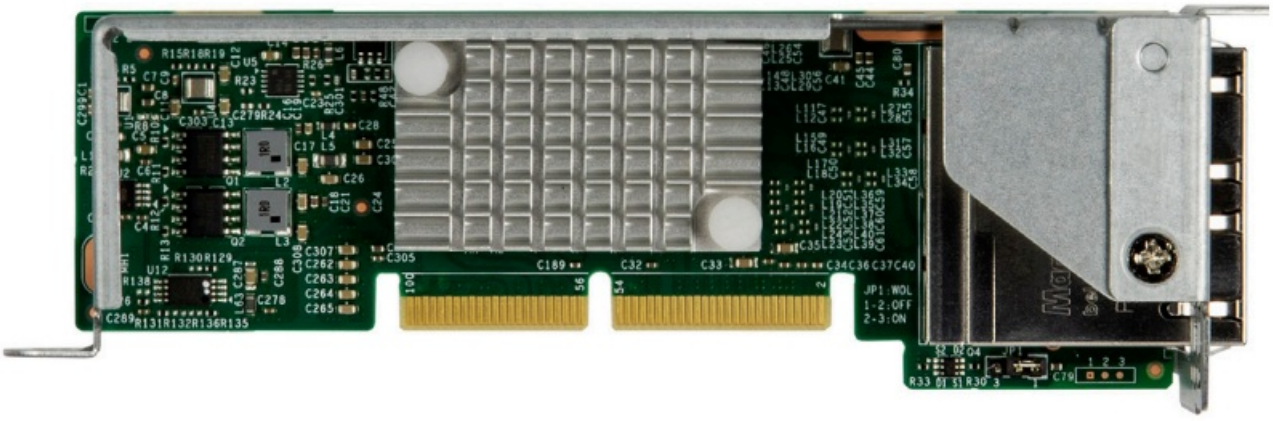
Supported Platforms

- AOC-CTG-b2T on MicroCloud 8-node systems
- AOM-CTG-b2TM on MicroCloud 12-node systems

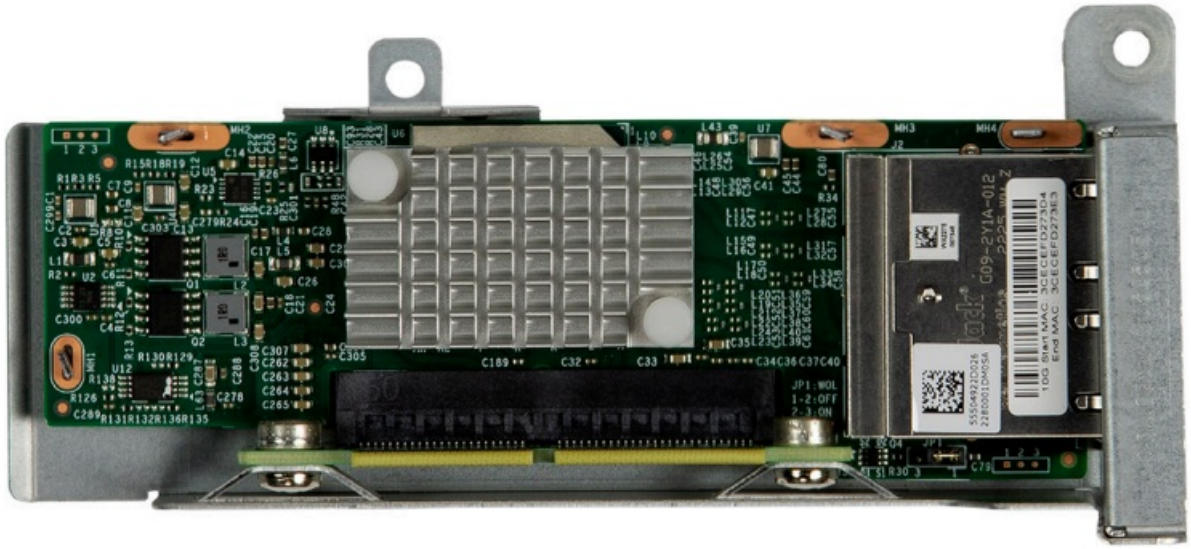
SKU	Bracket/Riser included	Description
AOC-CTG-b2T	BKT-0051L & BKT-0054L	MicroLP 2-Port 10GbE RJ45 adapter for MicroCloud 8-node systems
AOM-CTG-b2TM	MCP-240-93907-ON & RSC-MLP-E8R	MicroLP 2-Port 10GbE RJ45 adapter for MicroCloud 12-node systems

Chapter 2 Hardware Components

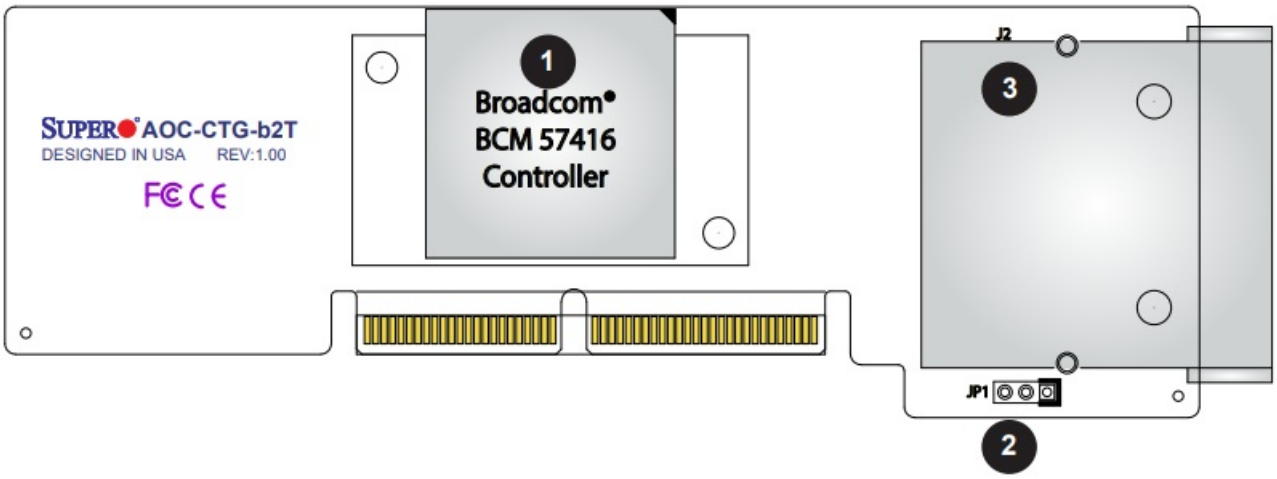
2-1 Add-On Card Image and Layout



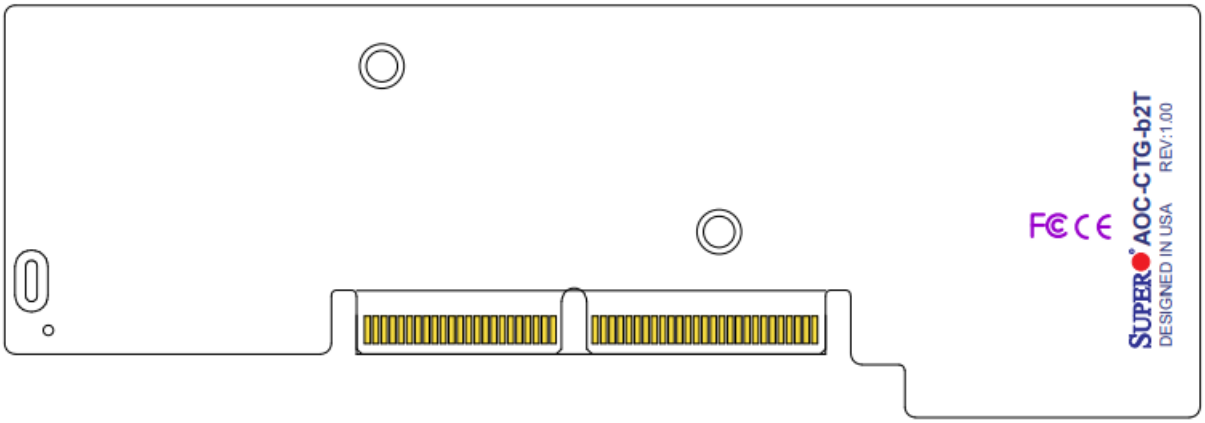
AOC-CTG-b2T Image



AOM-CTG-b2TM Image



AOC-CTG-b2T Top Layout



AOC-CTG-b2T Bottom Layout

2-2 Major Components

The following major components are installed on AOC-CTG-b2T and AOM-CTG-b2TM:

AOC-CTG-b2T and AOM-CTG-b2TM Major Components		
No	Component Name	Definition
1	Broadcom BCM57416	Ethernet LAN controllers
2	JP1	1-2: Wake on LAN Disable (Default)
		2-3: Wake on LAN Enable
3	J2	10GbE RJ45 Pods

2-3 Ports

There are two RJ45 ports located on the add-on card. Connect a Category 6 or 6A RJ45 cable to provide 10 Gigabit Ethernet communication. Refer to the add-on card layout on page 2-1 for the locations of the ports.

2-4 Connectors

For more information about the RJ45 Port LED signals, see the table below.

Port LEDs			
Port	LED	Color	Definition
RJ45	Link	Solid Green	10Gbps Link Speed
		Solid Amber	1Gbps Link Speed
	Activity	Blink Yellow	Activity

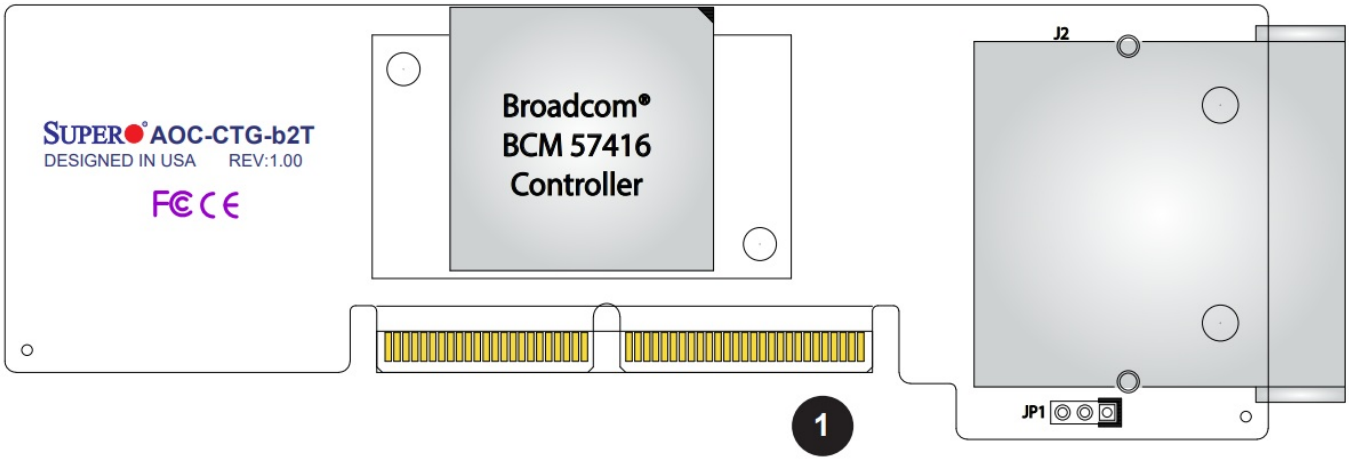
2-5 NC-SI and PCI-E 3.0 x4 in MicroLP Interface

NC-SI

For remote management, Network-Controller Sideband Interface (NC-SI) will provide an out-of-band (sideband) connection between the onboard Broadcom® BCM57416 controller and the onboard BMC.

MicroLP Interface

Insert the MicroLP interface into a MicroLP slot on a motherboard to use this add-on card. See the layout below for the location.



Chapter 3 Installation

3-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic com ponents. 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 your system, make sure that you are static protected.

Note: To avoid damaging your components and to ensure proper installation, be sure to always connect the power cord last, and always remove 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 below.

1. Power down the system.
2. Remove the power cord from the wall socket.
3. Use industry standard anti-static equipment (such as gloves or wrist strap) and follow the instructions listed 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.

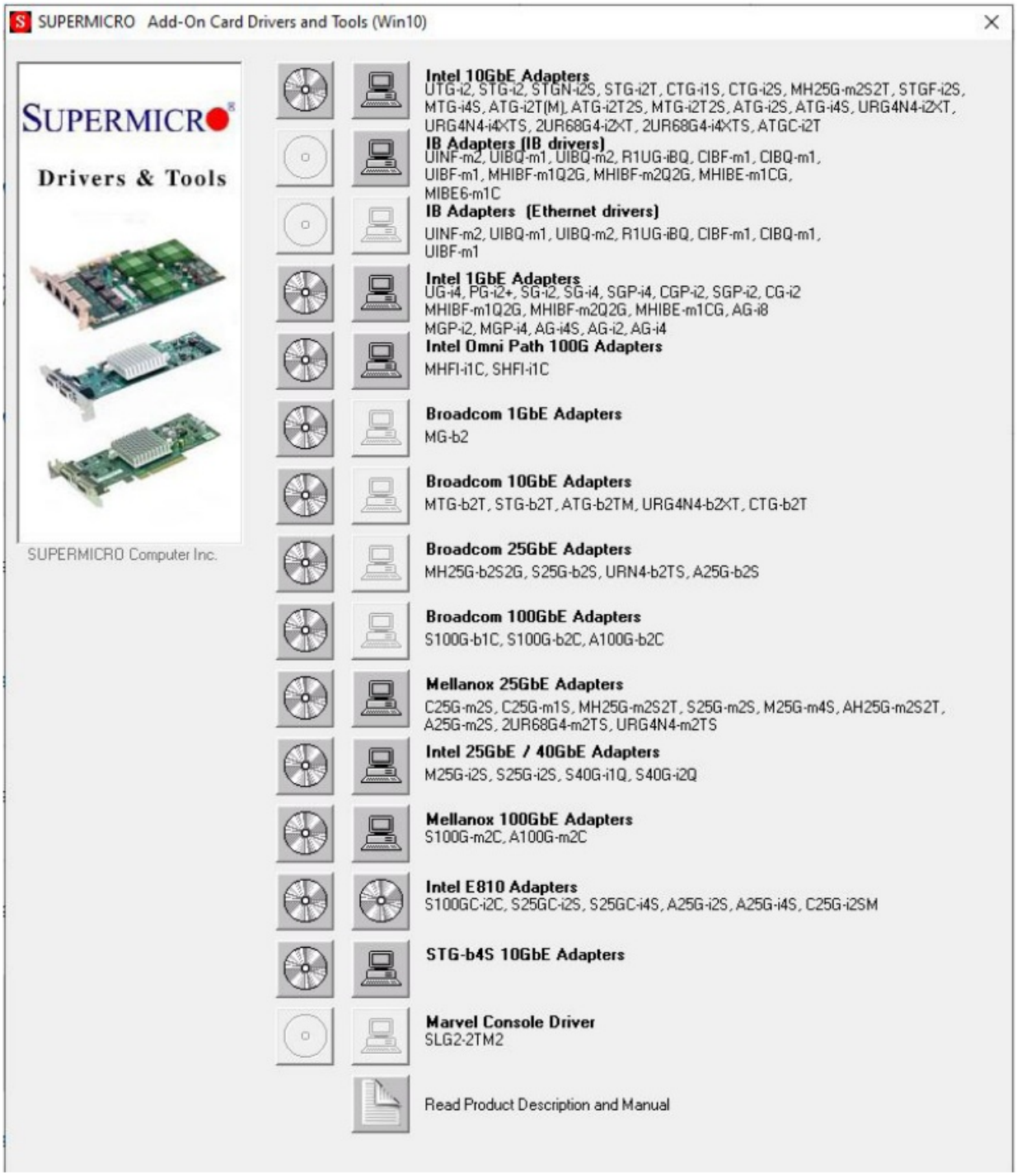
1. Remove the server cover and, if necessary, set aside any screws for later use.
2. Remove the add-on card slot cover. If the case requires a screw, place the screw aside for later use.
3. Position the add-on card in the slot directly over the connector, and gently push down on both sides of the card until it slides into the PCI connector.
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 chassis cover.
7. Plug the power cord into the wall socket, and power up the system.

3-4 Installing Drivers for Windows

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 (for Broadcom® BCM57416)

Use the procedures below to install both drivers and firmware for the AOC-CTG-b2T and AOM-CTG-b2TM add-on cards 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 10G Drivers for the Linux Operating System

1. Prerequisites: Install the following: yum –y install libibverbs* infiniband-diags perftestqperf 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 > 10G > 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 > 10G > 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 10G Drivers for the Windows Operating System

1. From the CDR-NIC LAN driver CD or FTP site, go to the following directory: Broadcom > 10G > 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)
The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous ap- plications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.

Documents / Resources

	SUPERMICRO AOC-CTG-b2T Add-on Card-Module [pdf] User Guide AOC-CTG-b2T, AOM-CTG-b2TM, AOC-CTG-b2T Add-on Card-Module, Add-on Card-Module, Card-Module

References

- dtsc.ca.gov/hazardouswaste/perchlorate
- P65Warnings.ca.gov
- Supermicro Data Center Server, Blade, Data Storage, AI System
- Supermicro Data Center Server, Blade, Data Storage, AI System
- Supermicro Data Center Server, Blade, Data Storage, AI System

- Supermicro Data Center Server, Blade, Data Storage, AI System