



AOC-S25G6-M2S



USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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Preface

About This Manual

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-S25G6-M2S add-on card.

About This Add-On Card

The Supermicro® AOC-S25G6-M2S add-on card provides a PCIe Gen 4 Ethernet solution based on the low-power consumption NVIDIA® ConnectX-6 Lx controller with advanced feature enhancements, including VXLAN, NVGRE, and RDMA. It is a feature-rich adapter that offers unparalleled performance and functionality to your cloud service, telecommunication applications, and enterprise data-center deployments. Supermicro systems with integrated asset management features are the most versatile 25GbE solution in the market. To order, contact your distributor as this product is only available through Supermicro.

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.

An Important Note to the User

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

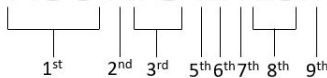
For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your server.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <ftp://ftp.supermicro.com>
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- If you have any questions, please contact our support team at: support@supermicro.com

This manual may be periodically updated without notice. Please 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 nd 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 the highest standards in quality and performance.

1.2 Key Features

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

- NVIDIA ConnectX-6 Lx 25GbE controller
- Support for 25GbE and 10GbE Speed
- Dual SFP28 connectors
- RDMA over Converged Ethernet
- VXLAN, NVGRE, and Geneve
- Asset Management Features with thermal sensor
- Network Controller Sideband Interface (NC-SI) for Remote Management

General

- NVIDIA ConnectX-6 Lx 25GbE controller
- Dual SFP28 ports

Storage Accelerations

- NVMe over Fabric offloads for target
- Storage protocols: iSER, NFSoRDMA,
- SMB Direct, NVMe-oF, and more

RDMA over Converged Ethernet

- RoCE v1/v2
- Zero-Touch RoCE: no ECN, no PFC
- RoCE over overlay networks
- IPsec over RoCE
- Selective repeat
- GPUDirect®
- Dynamically Connected Transport (DCT)
- Burst buffer offload

Management and Control

- Network Controller Sideband Interface (NC-SI)
- NC-SI, MCTP over SMBus, and MCTP over PCIe – Baseboard Management Controller interface
- PLDM for Monitor and Control DSP0248
- PLDM for Firmware Update DSP026

Remote Boot

- Remote boot over Ethernet
- Remote boot over iSCSI
- UEFI support for x86 and ARM servers
- PXE boot

Standards

- IEEE 802.3ae 10 Gigabit Ethernet
- IEEE 802.3by 25G supporting all FEC modes
- IEEE 802.3ad, 802.1AX Link Aggregation

- IEEE 802.3az Energy Efficient Ethernet (supports only “Fast-Wake” mode)
- IEEE 802.3ap based auto-negotiation and KR startup
- IEEE 802.1Q, 802.1P VLAN tags and priority
- IEEE 802.1Qaz (ETS)
- IEEE 802.1Qbb (PFC)
- IEEE 802.1Qbg
- IEEE 1588v2
- IEEE 1149.1 and IEEE 1149.6 JTAG
- PCI-E 3.0 and 4.0

Power Consumptions

- Maximum power consumption: 15W

Operating 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)

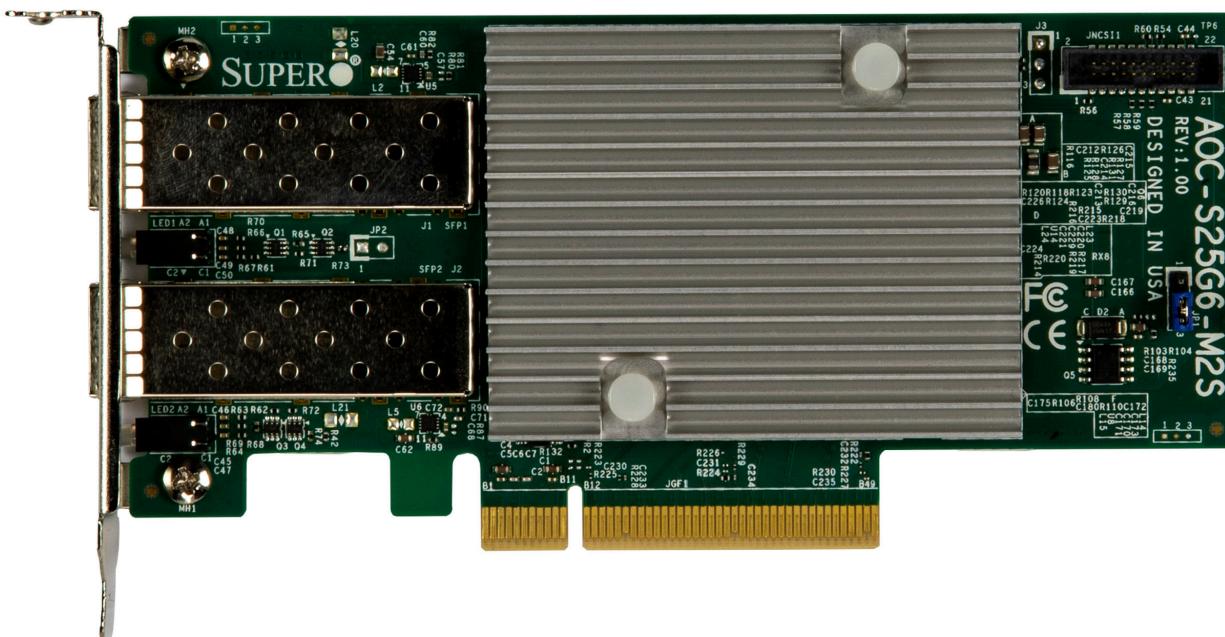
Physical Dimensions

- PCB dimensions: 5.600 inches (L) x 2.712 inches (W)

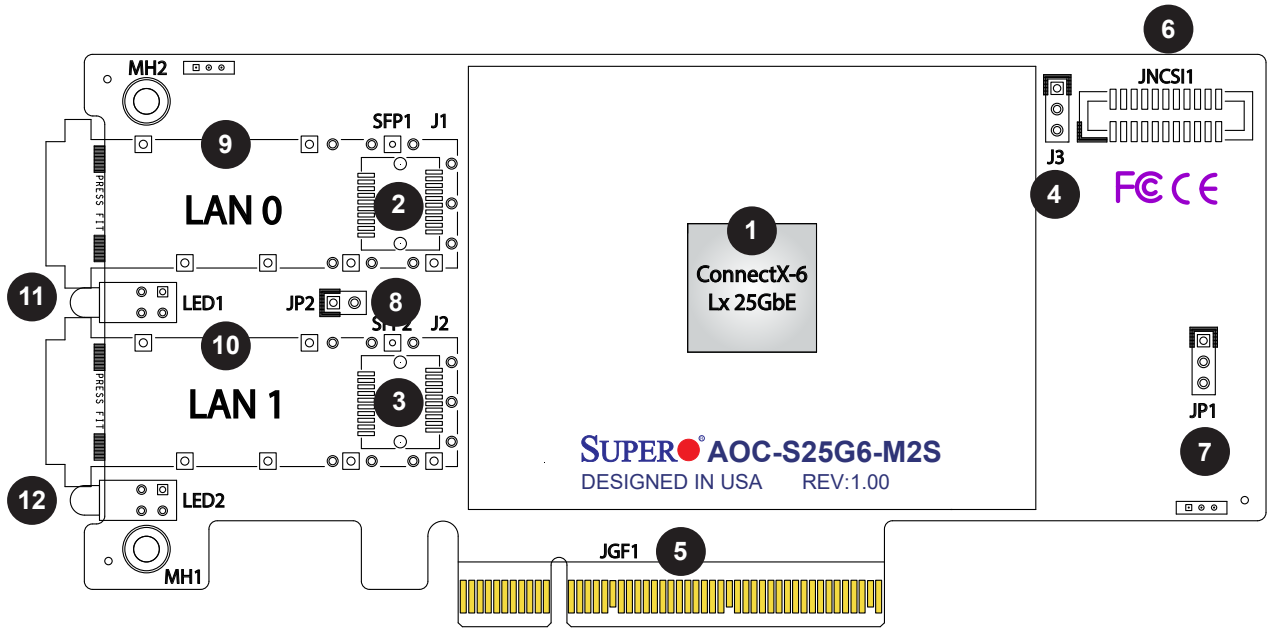
Chapter 2

Hardware Components

2.1 Add-On Card Image and Layout



AOC-S25G6-M2S View



AOC-S25G6-M2S Layout

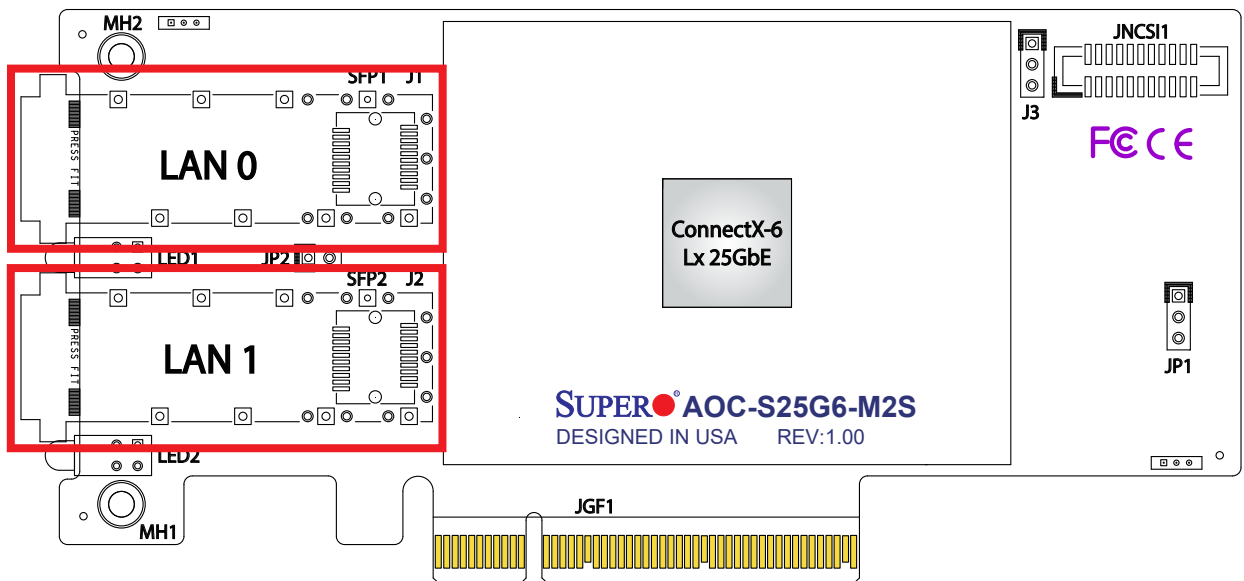
2.2 Major Components

The following major components are installed on the AOC-S25G6-M2S:

| AOC-S25G6-M2S Major Components | | |
|--------------------------------|----------------------|---------------------------------------|
| No | Component Name | Definition |
| 1 | NVIDIA ConnectX-6 Lx | Ethernet 25Gb controller |
| 2 | LAN0/J1 | LAN 0 Port |
| 3 | LAN1/J2 | LAN 1 Port |
| 4 | J3 | Debug Header |
| 5 | JGF1 | PCIe Gen 4 x8 slot |
| 6 | JNCSI1 | NC-SI header |
| 7 | JP1 | 1-2: Standby Power Enabled |
| | | 2-3: Standby Power Disabled (Default) |
| 8 | JP2 | Flash Bypass |
| 9 | SFP1 | SFP28 Port 1 |
| 10 | SFP2 | SFP28 Port 2 |
| 11 | LED1 | SFP LAN0 LED indicators |
| 12 | LED2 | SFP LAN1 LED indicators |

2.3 Ports

There are two SFP28 connector ports (LAN0 and LAN1) located on the AOC-S25G6-M2S add-on card. Connect a Direct Attach Copper Twin Axial cable or an LC fiber-optic cable to the ports to provide Gigabit Ethernet communication. Refer to the add-on card layout on page 13 for the locations of the ports.



2.4 SFP28 Ethernet Connections

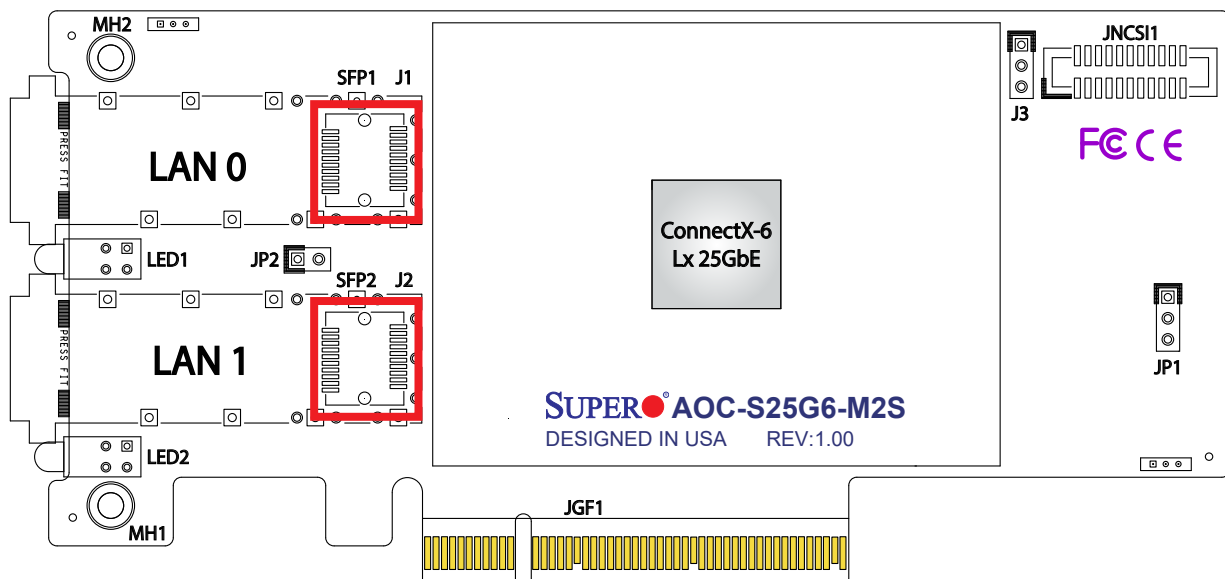
SFP28 Connectors

Two small form-factor pluggable (SFP28) optical transceiver connectors (SFP1/SFP2) are located on the add-on card. These SFP28 ports provide Ethernet 10GbE/25GbE network connections. See the layout below for the locations.

SFP28 Link/Activity LED Indicators

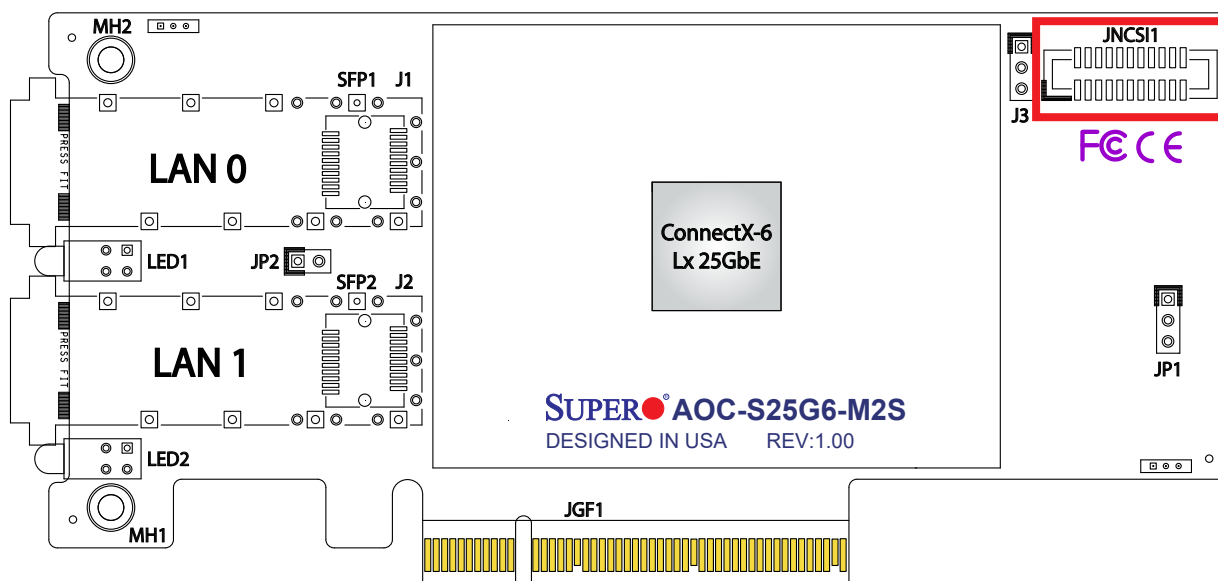
Two LAN Link/Activity LED indicators are located at LED1 and LED2 on the add-on card. LED1 is used for the LAN0 connector, and LED2 is used for the for LAN1 connector. See the tables below for the LED states.

| LAN Port LEDs | | |
|---------------|----------------|----------------------------|
| LED | Color | Definition |
| Link | Solid Green | 25Gbe Link Speed |
| | Solid Amber | Less than 25GbE Link speed |
| Activity | Blinking Green | Activity |



2.5 NC-SI Header

A Network-Controller Sideband Interface (NC-SI) header is located at JNCSI1 on the add-on card. Connect an appropriate cable from this header to a motherboard to provide the out-of-band (sideband) connection between the onboard Baseboard Management Controller (BMC) and a Network Interface Controller (NIC) for remote management. For the network sideband interface to work properly, you will need to use a motherboard that supports NCSI and also need to have a special cable. Please contact Supermicro at www.supermicro.com to purchase the cable for this header. See the layout below for the location of the JNCSI1 header.



2.6 Jumpers

To modify the operation of the add-on card, a jumper can be used to choose between optional settings. A jumper creates shorts between two pins to change the function of the connector. See the add-on card layouts on page 13 for the jumper locations. If the standby power is disabled, the available system IPMI shared LAN/failover support will be turned/powerd on. AOC-S25G6-M2S does not support WoL.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

| JP1 for Standby Power | IPMI Shared LAN Support | FailOver Support | WoL Support |
|---------------------------------------|-----------------------------|-----------------------------|-------------|
| Disable = No standby power to AOC NIC | Yes (with system turned on) | Yes (with system turned on) | No |
| Enable = Standby power to AOC NIC | Yes | Yes | No |

| JP1 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 | IPMI Shared LAN is supported but limited to platforms with sufficient airflow when it is in standby mode (S5 state). Please consult Supermicro before enabling it. |

Chapter 3

Installation

Your system came with the AOC-S25G6-M2S add-on card to be used as a part of an integrated solution. We do not recommend that any part of your system components be removed and reinstalled. However, if you do need to remove or reinstall a system component, including this add-on card, please follow the instructions below to ensure proper system setup. Also, be sure to remove the power cord first before adding, removing, or changing any hardware components to avoid damaging the system or components.

3.1 Major Components

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 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 hot fixes.

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 on the motherboard, and gently push down on both sides of the card until it slides into the PCI connector.
4. Secure the add-on card/motherboard 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 (NVIDIA® ConnectX-6 Lx)

Use the procedures below to install the driver for the AOC-S25G6-M2S add-on card on both Linux and Windows.

Linux Drivers

1. Use the following procedures to install the 25GbE driver on the Linux operating system.
2. We recommend downloading the latest Nvidia Driver directly from the Nvidia website: https://network.nvidia.com/products/infiniband-drivers/linux/mlnx_ofed/.
3. Download and extract /untar from the Nvidia Linux OFED.tgz package.
4. Change to the appropriate directory where your newly extracted package is located.
5. Install the driver by entering the following command:

```
./mlnxofedinstall --without-fw-update
```

This installs the Linux drivers to your system. You might be prompted to install kernel dependencies for Linux, in which case you would need to follow on-screen instructions.

Windows Drivers

Use the following procedures to install a 25GbE driver on the Windows operating system.

1. We recommend that you download the latest Nvidia Driver directly from the Nvidia website: <https://network.nvidia.com/products/adapter-software/ethernet/windows/winof-2/>.
2. Once the driver is downloaded, run the .exe file to install the driver

(Disclaimer Continued)

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