



# SUPERBLADE SERVER SBA-4119SG



USER'S MANUAL

Revision 1.0b

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# Preface

## About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of this blade server. Installation and maintenance should be performed by experienced technicians only.

Please refer to the SBA-4119SG specifications page on our website for updates on supported memory, processors and operating systems (<https://www.supermicro.com>).

## Notes

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: [www.supermicro.com/wdl/driver/AMD/SP3](http://www.supermicro.com/wdl/driver/AMD/SP3)
- Product safety info: [https://www.supermicro.com/about/policies/safety\\_information.cfm](https://www.supermicro.com/about/policies/safety_information.cfm)

If you have any questions, please contact our support team at:  
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This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.

## Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: [https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9\\_Secure\\_Data\\_Deletion\\_Utility/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/)

## Warnings

Special attention should be given to the following symbols used in this manual.



**Warning!** Indicates important information given to prevent equipment/property damage or personal injury.



**Warning!** Indicates high voltage may be encountered when performing a procedure.

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# Chapter 1

## Introduction

### 1.1 Overview

The SBA-4119SG blade is a compact self-contained server that connects into a pre-cabled enclosure that provides power, cooling, management and networking functions. One enclosure can hold up to twenty blades. Each blade contains one computing node.

In this manual, “blade” or “blade unit” refers to a single blade, and “blade enclosure” is the chassis that houses the blades, power supplies and other modules. “Blade system” refers to the enclosure, blades units, and various management and networking modules.

This chapter provides a brief outline of the functions and features of the SBA-4119SG blade server. Several important parts are listed below.

Main Parts List		
Description	Part Number	Quantity
Motherboard	BH12SSi-M25	1
Blade chassis	MCP-680-41007-0N	1
Riser card for GPU	AOM-BLG-L16X2A	1
Add-on card, front control I/O	AOM-BPNIO-FPE	1
Air Shroud	MCP-310-41007-0N	1
Heatsink, vapor chamber (optional)	SNK-P1043V	1
Network add-on card, Infiniband mezzanine (optional)	AOC-IBH-X4ES-O	1*
Network, add-on card, 2 port 25G mezzanine card (optional)	AOC-B25G-X4D	1*

\*Mutually exclusive; only one mezzanine card can be installed.

### Eligible Enclosures

- SBE-820C-XXX
- SBE-820J-XXX
- SBE-820L-XXX
- SBE-820H-XXX

## 1.2 System Features

The following is an overview of the main features of the SBA-4119SG blade server.

<b>System Features</b>
<b>Motherboard</b>
BH12SSi-M25
<b>CPU</b>
Single AMD EPYC 7002 Series processor (in Socket SP3); For the latest CPU/memory updates, refer to our website at <a href="http://Supermicro.com">Supermicro.com</a>
<b>Chipset</b>
System on Chip
<b>Memory</b>
Eight slots for up to 2 TB of 3DS RDIMM/LRDIMM), with speeds of up to 3200 MT/S; support for Non-Volatile DIMM (NVDIMM)
<b>Storage Drives</b>
M.2: One PCIe 4.0 NVMe or SATA
<b>BIOS</b>
128Mb SPI Flash EEPROM with AMI BIOS
<b>LAN Connections</b>
Two 25G onboard ( <i>Optional</i> ) Two 25GbE or one 100G EDR IB port with mezzanine card ( <i>Optional</i> ) One 200G HDR IB port with mezzanine card
<b>Form Factor</b>
(WxHxD) 1.75 x 6.5 x 23.5 in. (44.5 x 165 x 597 mm)

## 1.3 Control Panel

Power switches and status LEDs are located on the control panel on the front of the chassis.

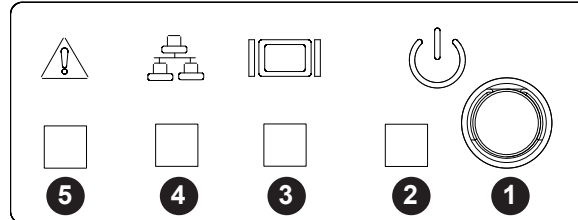


Figure 1-1. Control Panel

Control Panel Features			
Item	Feature	State	Description
1	Power button		The main power switch applies or removes primary power from the power supply to the server but maintains standby power.
2	Power LED	Green	Power on
		Amber, flashing	Before the BMC is ready, blinks until every node is ready
		Amber, steady	Power off
3	KVM/UID LED	Blue, steady	Indicates that KVM has been initialized
		Blue, flashing slowly	Unit IDentifier indicator (The UID function is activated with a management program.)
		Blue, flashing quickly	Firmware revision
4	NIC LED	Green, flashing	Indicates traffic (Tx and RX data) on the LAN connection to this blade module
		Orange, flashing	Indicates traffic over the network (when present in the system)
5	System Fail LED	Red	Indicates a fatal error. This may be a memory error, a VGA error or any other fatal error that prevents the operating system from booting.

## 1.4 Front View

The illustration below shows the features on the front of the blade unit.

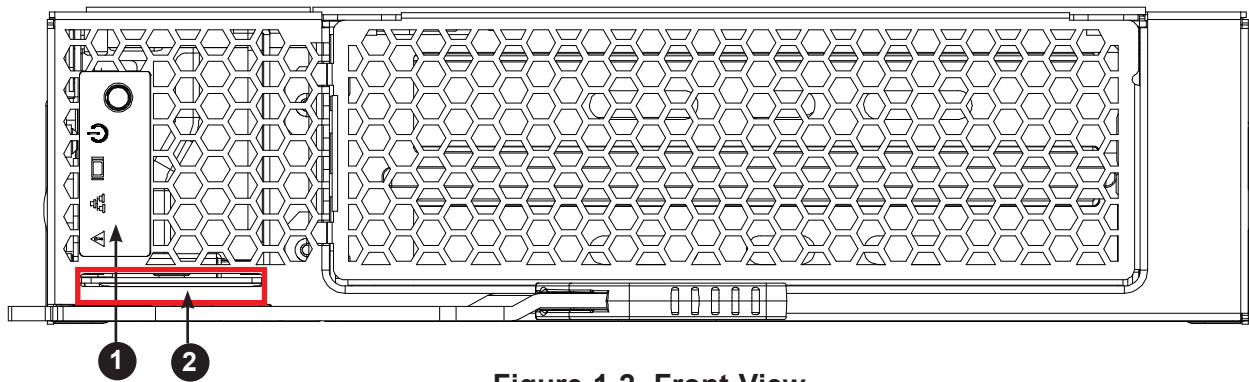


Figure 1-2. Front View

Chassis Front Features		
Item	Features	Description
1	Control Panel	Power button and status indicators
2	Service/Asset Tag	Pull-out identifier (with BMC ADMIN default password sticker)

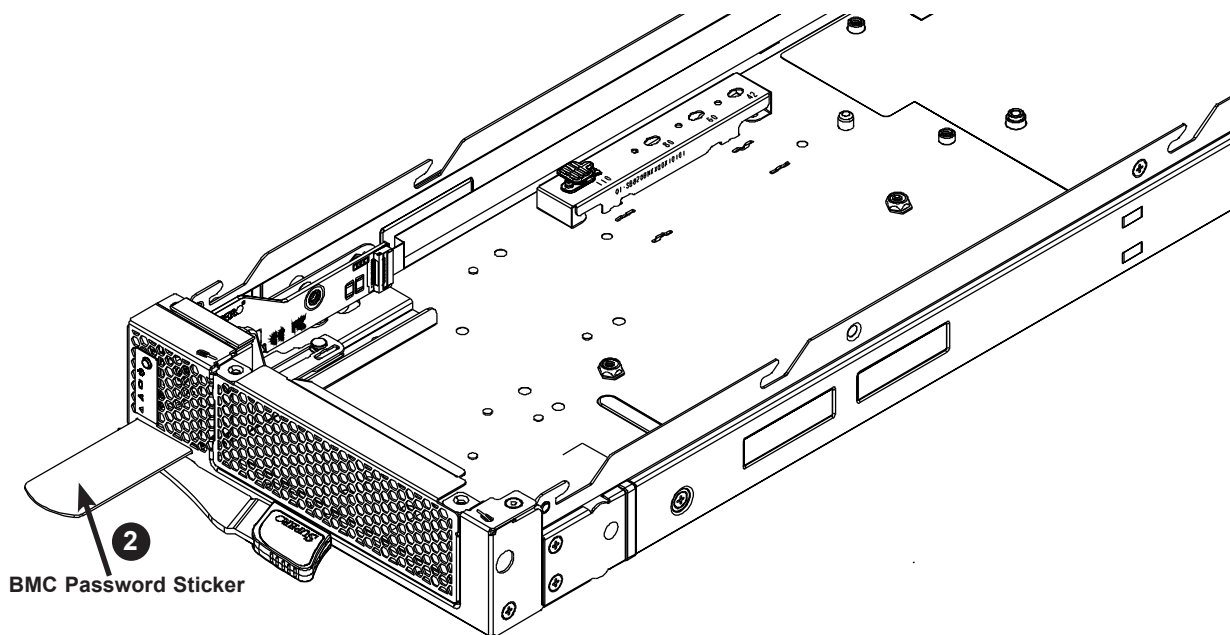


Figure 1-3. Location of the BMC Password Label

# 1.5 Components

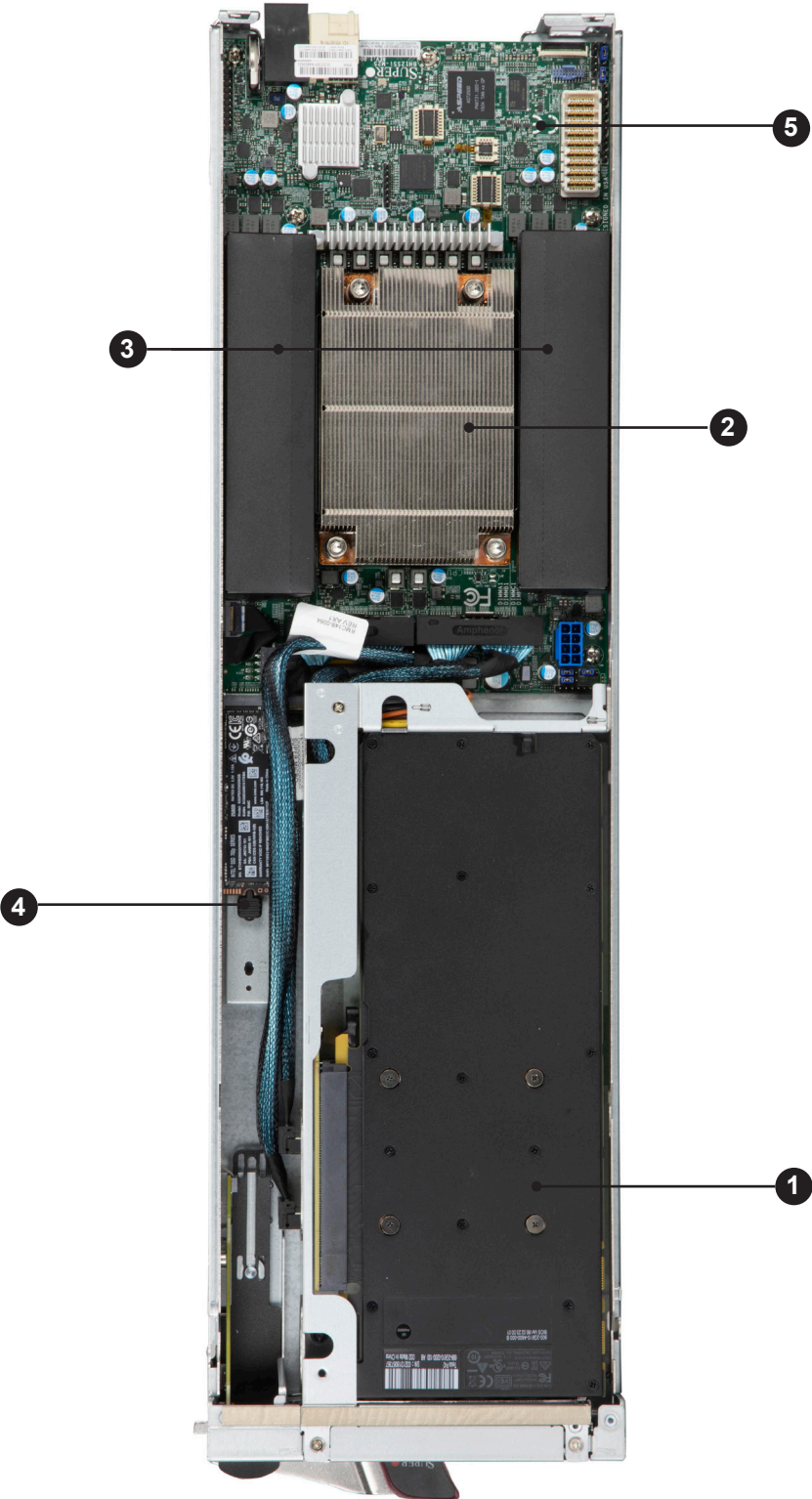


Figure 1-4. Components Labeled (see the next page)

Blade Components		
Item	Feature	Description
1	GPU	GPU bay
2	CPU	Processor and heatsink
3	Memory	DIMM slots (under air shrouds)
4	M.2 Slots	Slots and standoffs for M.2 storage cards
5	Mezzanine	Add-on card

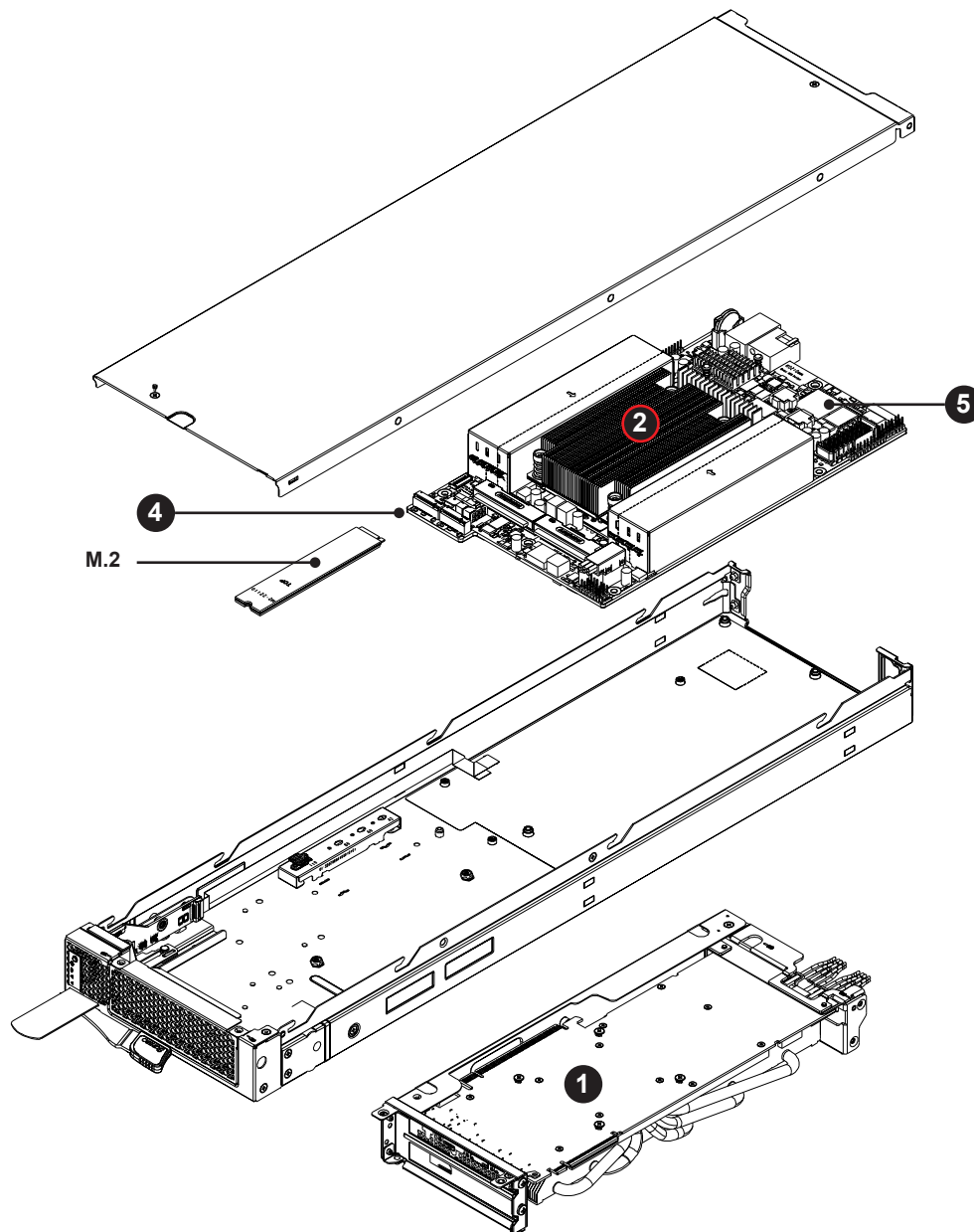


Figure 1-5. Exploded View

## 1.6 System Block Diagram

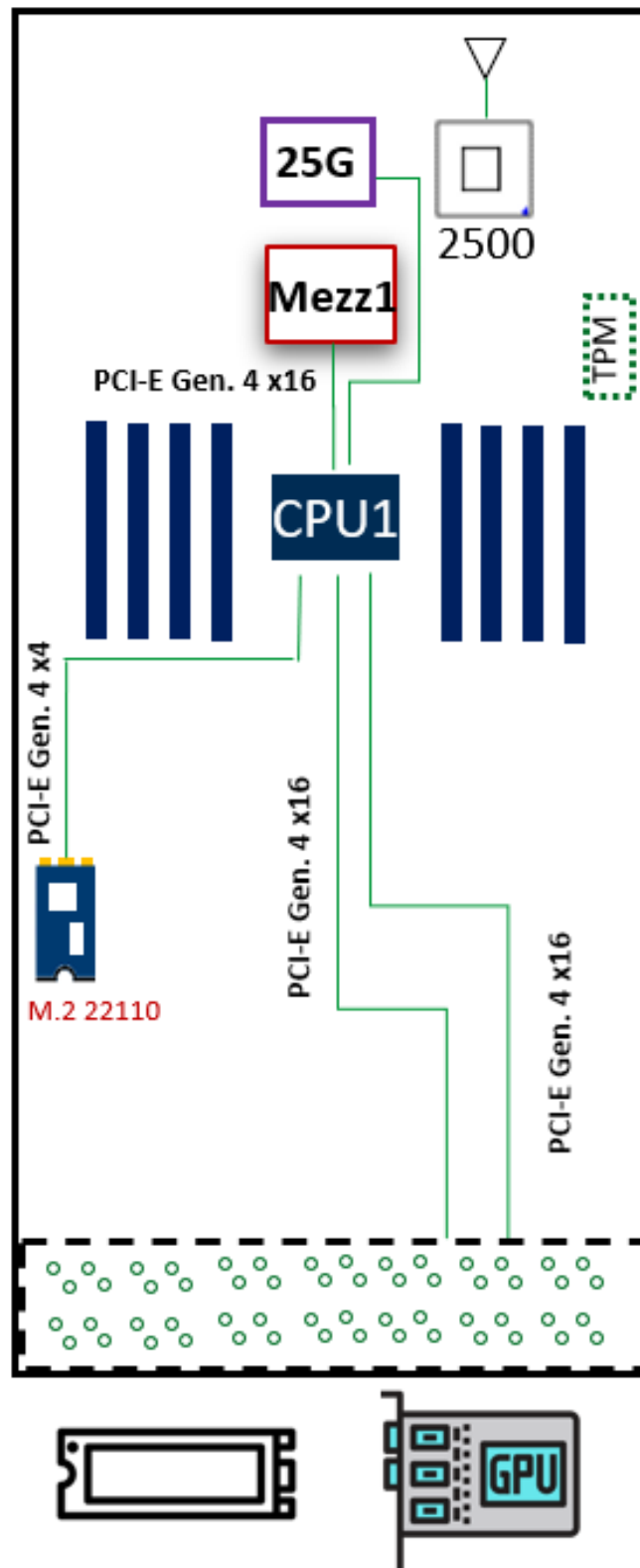


Figure 1-6. System Block Diagram

## 1.7 Motherboard Block Diagram

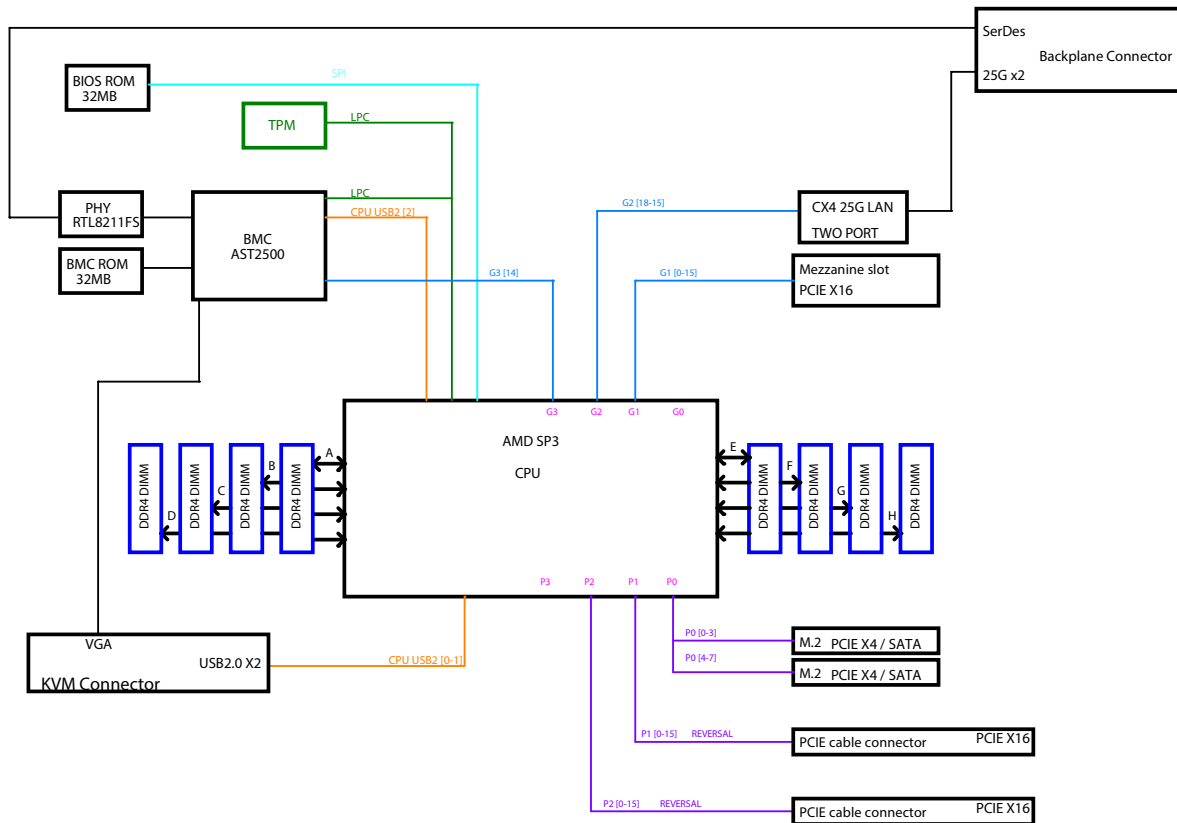


Figure 1-6. Motherboard Block Diagram

# Chapter 2

## Installation and Setup

This chapter provides instructions on installing and replacing main system components. To prevent compatibility issues, only use components that match the specifications or part numbers.

Up to twenty blade modules may be installed into a blade enclosure, depending upon your enclosure and blade. Blade modules with Windows and Linux operating systems may be mixed together in the same blade enclosure.

### 2.1 Unpacking the System

Inspect the box the system was shipped in and note if it was damaged in any way. If any equipment appears damaged, please file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the enclosure. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. It will also require a grounded AC power outlet nearby. Be sure to read the precautions and considerations noted in Appendix B.

## 2.2 Installing or Accessing the Blade Unit

### Installing a Blade Unit into the Enclosure

Make sure the cover of the blade unit is on before insertion.

#### *Installing a Blade Unit into the Enclosure*

1. Pull open the blade locking handle and slowly push the blade into its bay as pictured below.
2. When the blade stops, push the handle into its locked position, making sure the notch in the handle catches the lip of the enclosure.

**Caution:** Insert the blade carefully to avoid damaging the connectors in the enclosure bay.

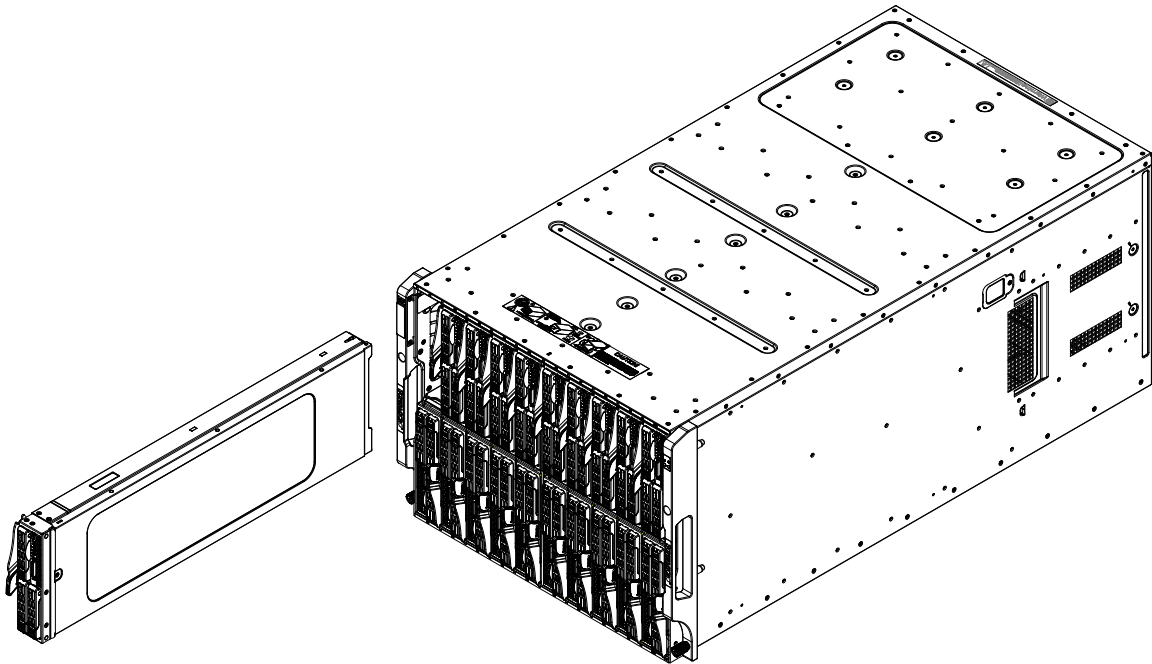


Figure 2-1. Installing the a Blade into the Enclosure

### Removing a Blade Unit from the Enclosure

A blade can be removed from the enclosure while other blades continue to operate.

#### *Removing a Blade Unit from the Enclosure*

1. Power down the blade unit.
2. Lift the handle completely and use it to pull the blade unit from the enclosure.

## Removing and Replacing the Blade Cover

The blade cover can be removed to access the mainboard and install processors, memory modules, the onboard battery, etc.

- To remove the cover, remove the screws as illustrated below. Slide the cover toward the rear and lift it off.
- To replace the cover, fit the six studs on the inside of the cover into the slots of the chassis, then slide the cover toward the front of the blade to lock it into place. Replace the locking screw.

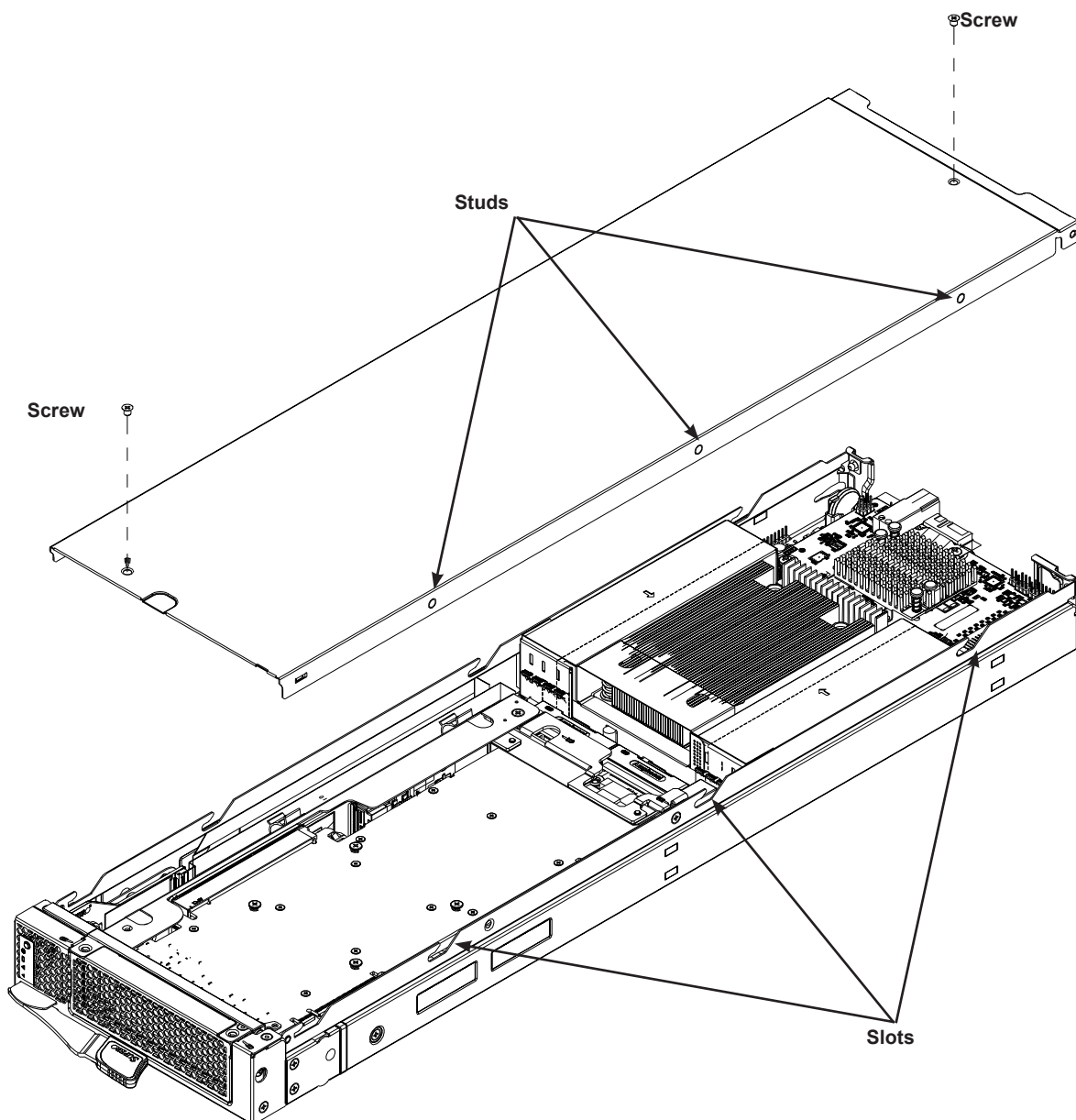


Figure 2-2. Removing the Cover

## 2.3 Powering Up or Down

### Powering Up a Blade Unit

Each blade unit may be powered on and off independently from the rest of the blades installed in the same enclosure. A blade unit may be powered up in two ways:

- Press the power button on the blade unit.
- Use IPMIView or the web-browser based management utility to apply power using either a CMM module, or by the use of the onboard BMC chip in the blade module.

### Powering Down a Blade Unit

A blade unit may be powered down in any of the following ways:

- Press the power button on the blade unit.
- Use IPMIView or the web-browser based management utility to power down; requires Operator or Admin privileges on the CMM.
- Use SMCIPMItool when connected to the CMM to power down; requires Operator or Admin privileges on the CMM.
- Use IPMIview or a browser connected to the onboard BMC chip to power down.
- Use SMCIPMItool to use a Command Line Interface to the onboard BMC chip; requires Operator or Admin privileges.

## 2.4 Installing the Processor and Heatsink

### Cautions:

- When handling the processor (CPU) package, avoid placing direct pressure on the label area of the CPU or CPU socket.
- Improper CPU installation or socket misalignment can cause serious damage to the CPU or motherboard which may result in RMA repairs.
- Take all standard precautions to avoid electrostatic discharge (ESD) which can damage components.

Assemble the processor (CPU) and heatsink together first then install that assembly onto the CPU socket.

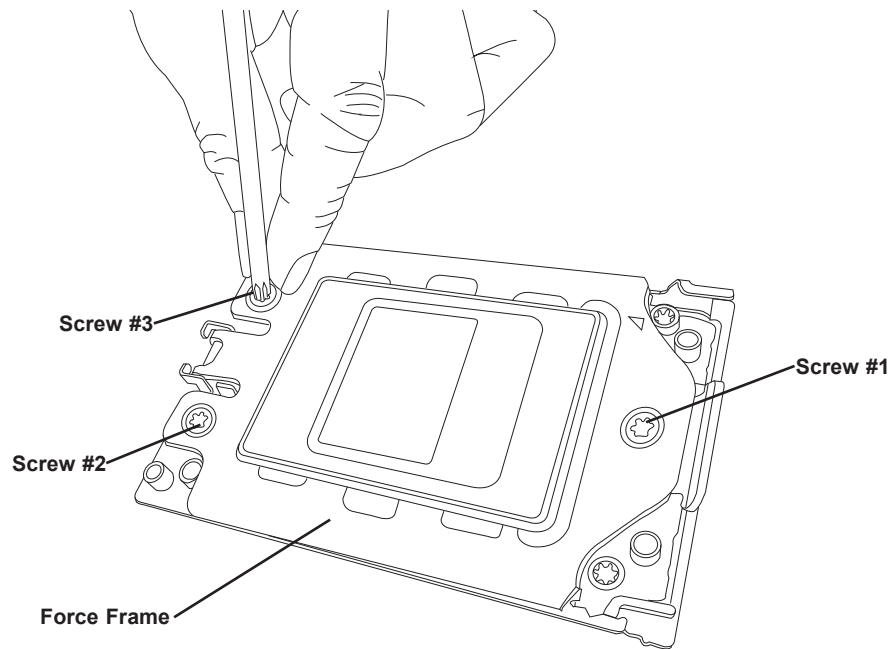
### Notes:

- The motherboard should be installed into the chassis first and the processor should be installed into the CPU socket before you install a CPU heatsink.
- If you bought a CPU separately, use a certified multi-directional heatsink only.
- When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the [SuperMicro web site](#) for updates on CPU support.

### ***Installing the Processor and Heatsink***

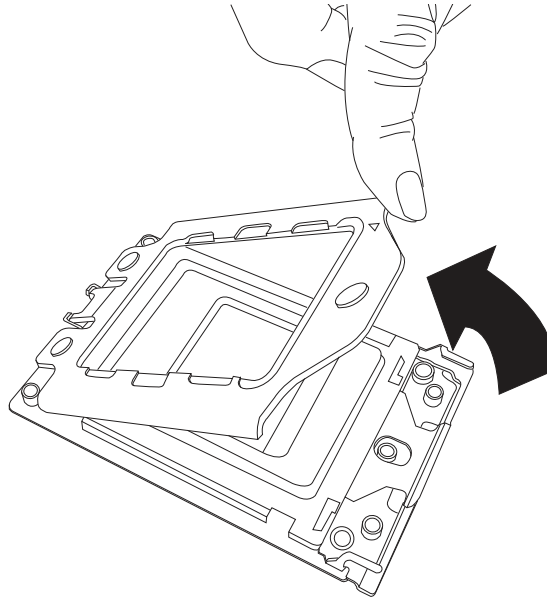
Begin by removing power from the system as described in Section 2.3.

1. Use a Torx T20 driver to loosen the screws holding down Force Frame in the sequence of 3-2-1. The screws are numbered on the Force Frame next to each screw hole. Tighten to 16.1 kgf-cm (14 lbf-in) of torque.



**Figure 2-3. Removing the Processor Force Frame**

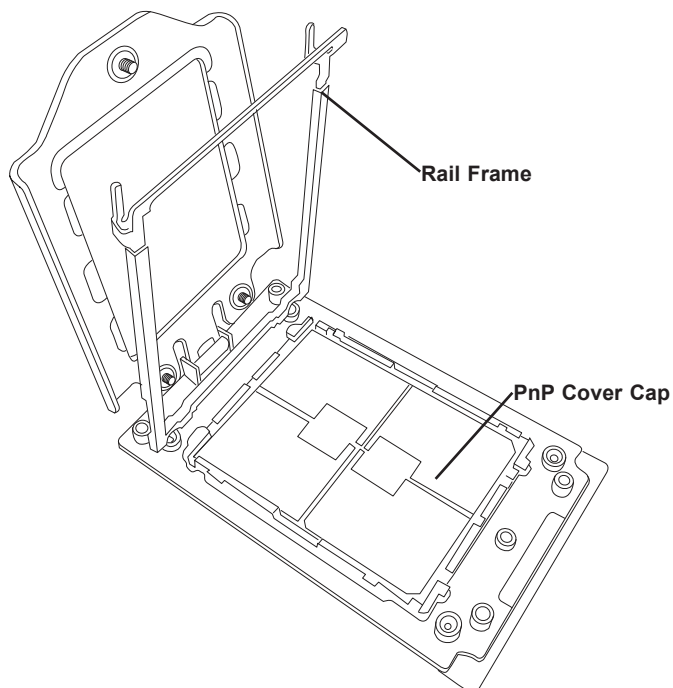
2. The spring-loaded Force Frame will raise up after the last screw (#1) is removed. Gently allow it to lift up to its stopping position.



**Figure 2-4. Raising the Force Frame**

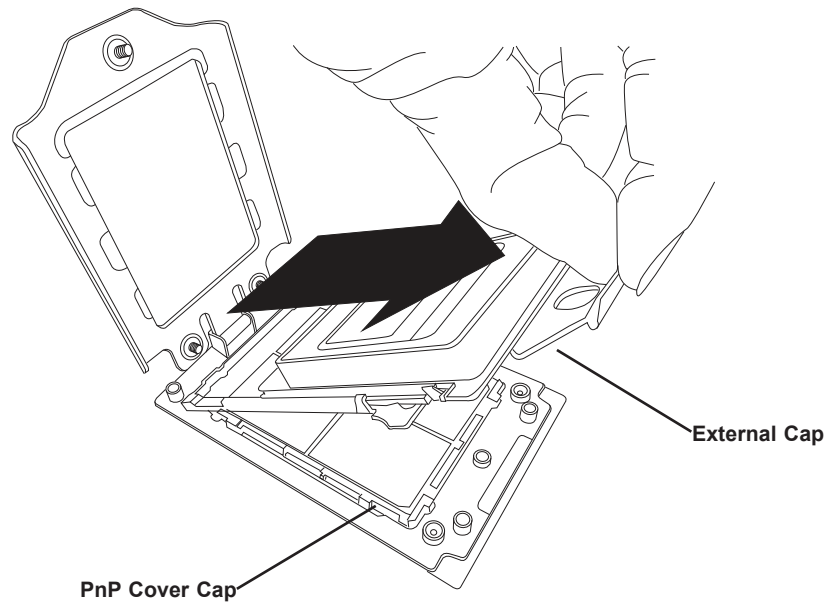
3. Lift the Rail Frame up by gripping the lift tabs near the front end of the rail frame. While keeping a secure grip of the Rail Frame, lift it to a position so you can do the next step of removing the External Cap.

**Note:** The Rail Frame is spring loaded, so keep a secure grip on it as you lift it so it does not snap up.



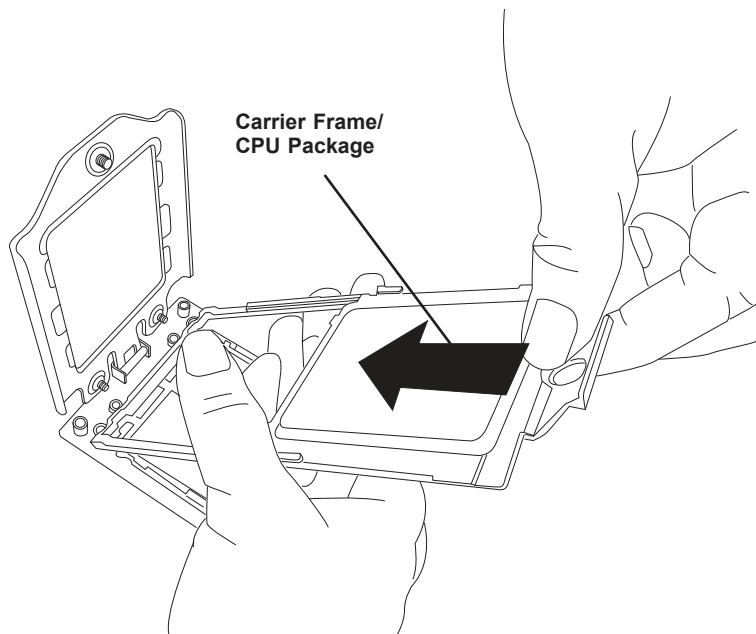
**Figure 2-5. Lifting the Rail Frame**

4. Remove the External Cap from the Rail Frame by pulling it upwards through the rail guides on the Rail Frame.



**Figure 2-6. Removing the External Cap**

5. The CPU Package is shipped from the factory with the blue Carrier Frame pre-assembled. Grip the handle of the Carrier Frame/CPU Package assembly from its shipping tray, and while gripping the handle, align the flanges of the Carrier Frame onto the rails of the Rail Frame so its pins will be at the bottom when the Rail Frame is lowered later.
6. Slide the Carrier Frame/CPU Package downwards to the bottom of the Rail Frame. Ensure the flanges are secure on the rails as you lower it downwards.



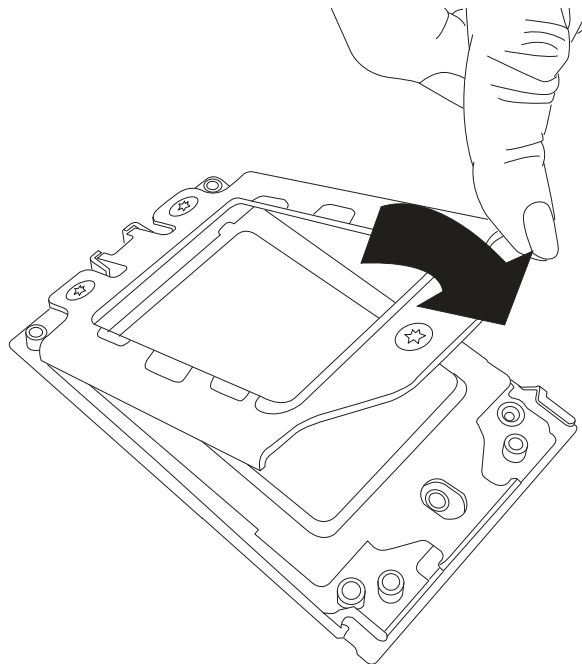
**Figure 2-7. Inserting the Carrier Frame/CPU Package**

**Note:** You can only install the CPU inside the socket in one direction with the handle at the top. Make sure that it is properly inserted into the CPU socket before closing the Rail Frame plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the Rail Frame plate again, and double-check that the CPU is aligned properly.

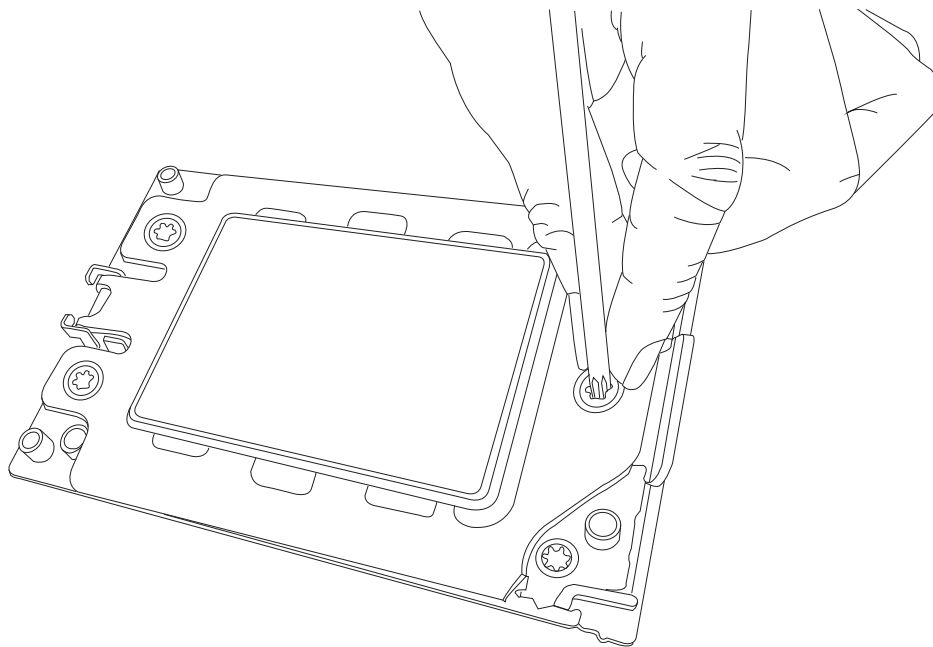
7. Lift up the Rail Frame till it securely rests in upright position. Then remove the PnP Cover Cap from the CPU socket below. Grip the two lift tabs marked "Remove" at the middle of the cap and pull vertically upwards to remove the PnP Cover Cap.

**Caution:** The exposed socket contacts are extremely vulnerable and can be damaged easily. Do not touch or drop objects onto the contacts and be careful removing the PnP Cover Cap and when placing the Rail Frame over the socket.

8. Gently lower the Rail Frame down onto the socket until the latches on the Rail Frame engage with the Socket housing. and it rests in place. Do not force it into place!
9. Gently lower the Force Frame down onto the Rail Frame and hold it in place until it is seated in the Socket housing. Note that the Force Frame is spring loaded and has to be held in place before it is secured.



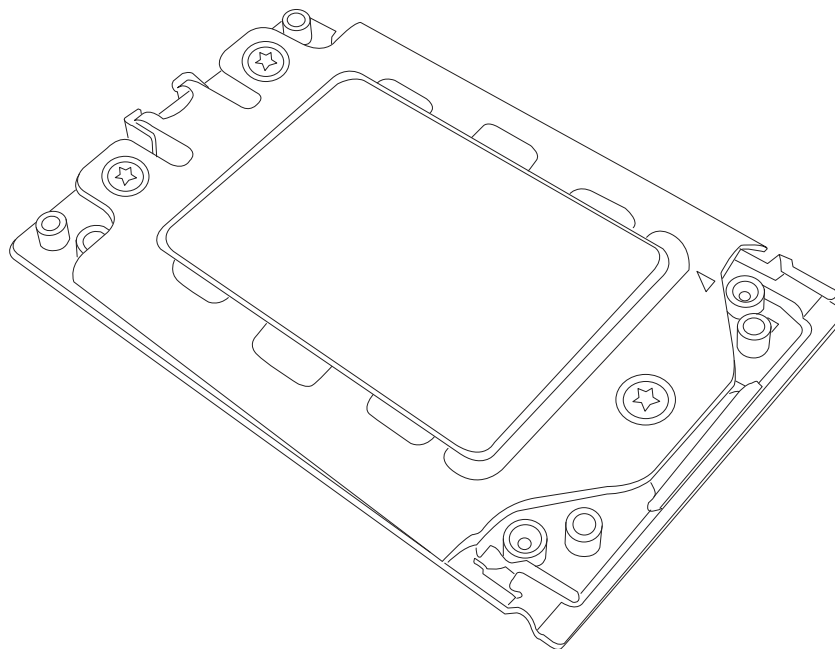
**Figure 2-8. Lowering the Force Frame**



**Figure 2-9. Securing the Force Frame**

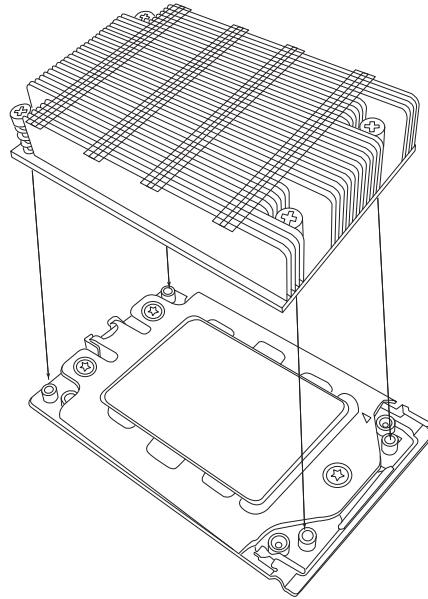
10. Replace the screws in the order 1-2-3, tightening to 16.1 kgf-cm (14 lbf-in) of torque. The Force Frame secures both the Rail Frame and CPU Package.

**Caution:** Tightening must be executed in proper 1-2-3 sequence to avoid causing catastrophic damage to the socket or CPU Package.



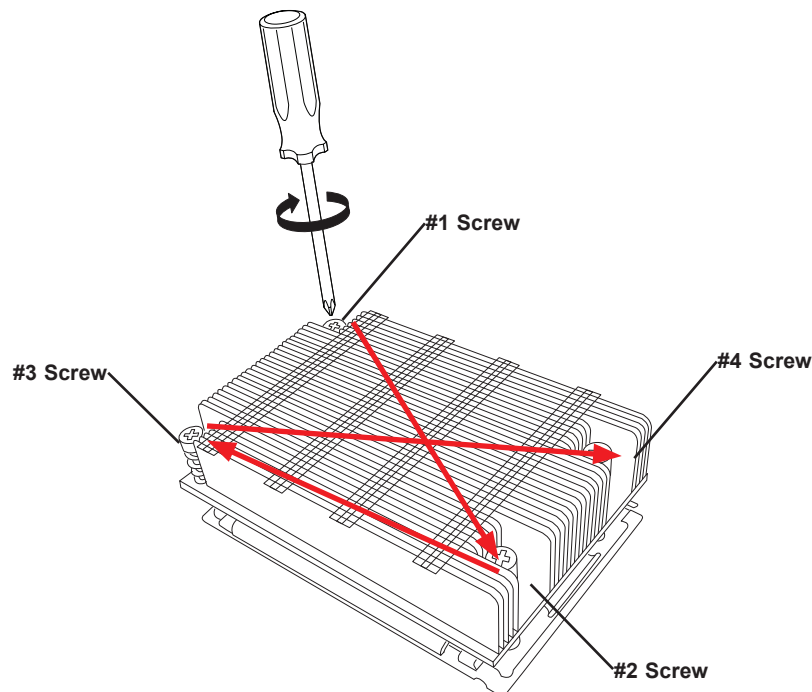
**Figure 2-10. The Force Frame Secured**

11. Lower the heatsink down till it rests securely on CPU Package over the four screw holes on the socket frame.



**Figure 2-11. Mounting the Heatsink**

12. Using a Torx T20 driver in a diagonal pattern as below, tighten the four heatsink screws halfway and then tighten them evenly to 16.1 kgf-cm (14.0 lbf-in) of torque.



**Figure 2-12. Securing the Heatsink**

The processor and heatsink installation is complete. Repeat this procedure for any remaining CPU sockets on the motherboard.

### ***Removing a Heatsink***

We do not recommend removing the heatsink. If necessary, please follow the instructions below to prevent damage to the CPU or the CPU socket.

**Note:** Wait for the heatsink to cool down before removing it.

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the figure above.
2. Hold and gently pivot the heatsink back and forth to loosen it from the CPU. (Do not use excessive force when dislodging the heatsink!)
3. Once the heatsink is loose, remove it from the CPU.
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease to the surface before you re-install the heatsink.

## 2.5 Memory

### Memory Support

The BH12SSi-M25 supports up to 2TB of 3DS ECC DDR4 3200 MHz speed, RDIMM/LRDIMM/3DS/NVDIMM memory in eight slots. Refer to the table below for additional memory information.

Check the [SuperMicro web site](#) for possible updates to memory support.

Populating RDIMM/RDIMM 3DS/LRDIMM/LRDIMM 3DS DDR4 Memory Modules					
Type	DIMM Population	Maximum DIMM Capacity (GB)			Maximum Frequency (MHz)
		1 Channel	4 Channels	8 Channels	
RDIMM	1R	32GB	128GB	256GB	3200
	2R	64GB	256GB	512GB	3200
LRDIMM	4R	128GB	512GB	1TB	3200
	2S4R	256GB	1TB	2TB	3200
LRDIMM 3DS	2S2R (4 Ranks)	128GB	512GB	1TB	3200
	2S4R (8 Ranks)	256GB	1TB	2TB	3200

### DIMM Module Population

When populating the motherboard with DIMM modules, please keep in mind the following:

- Always use DDR4 DIMM modules of the same type, size and speed.
- All eight memory channels per CPU socket should be populated with each channel having equal capacity. This enables the memory subsystem to operate in eight-way interleaving mode, which should provide the best performance in most cases.
- In most configurations, populating fewer than eight channels is supported, but not recommended.

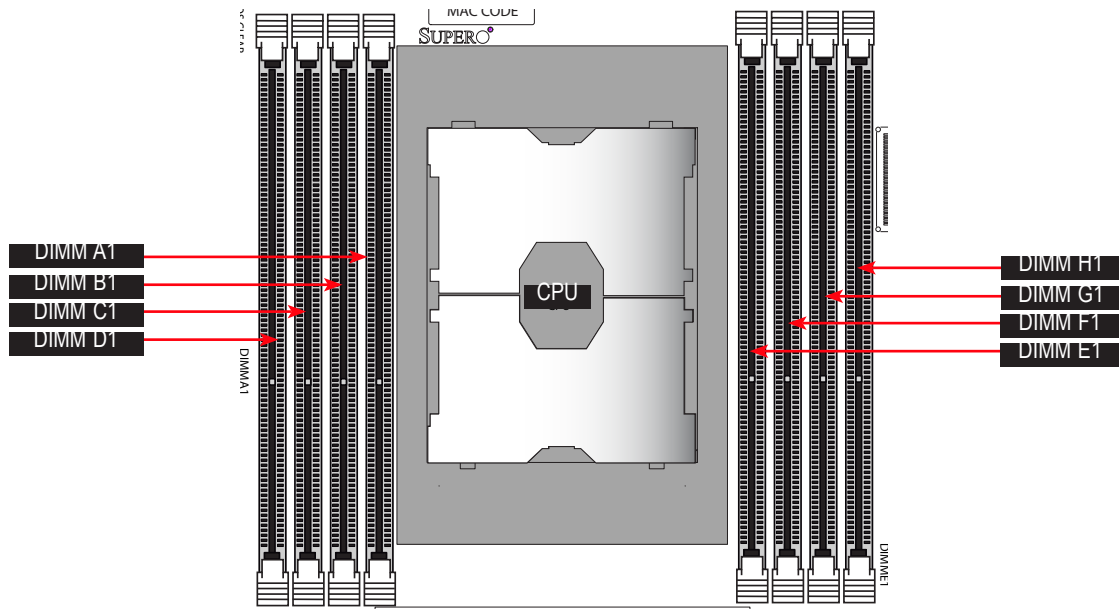


Figure 2-13. DIMM Numbering

Memory Module Distribution							
Channel							
D1	C1	B1	A1	E1	F1	G1	H1
1 DIMM (Supported, Not Recommended)							
	✓						
2 DIMMs (Supported, Not Recommended)							
✓	✓						
4 DIMMs							
✓	✓					✓	✓
6 DIMMs							
Unbalanced, not recommended							
8 DIMMs							
✓	✓	✓	✓	✓	✓	✓	✓

**\*Note:** Most configurations populating fewer than eight channels are supported, but not recommended.

## Installing Memory

### *ESD Precautions*

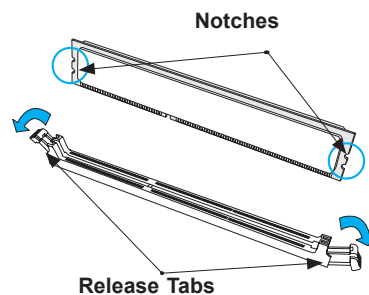
Electrostatic Discharge (ESD) can damage electronic components including memory modules. To avoid damaging DIMM modules, it is important to handle them carefully. The following measures are generally sufficient.

- Use a grounded wrist strap designed to prevent static discharge.
- Handle the memory module by its edges only.
- Put the memory modules into the antistatic bags when not in use.

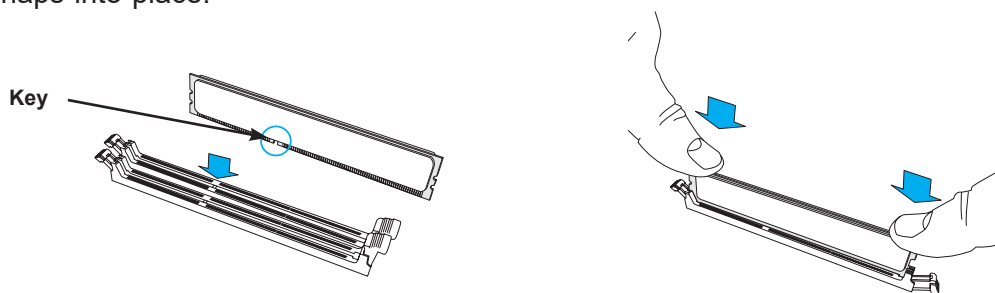
### *Installing Memory*

Begin by removing power from the system as described in Section 3.1. Follow the memory population sequence in the table above.

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it.



2. Align the key of the DIMM with the receptive point on the memory slot and with your thumbs on both ends of the module, press it straight down into the slot until the module snaps into place.



3. Press the release tabs to the locked position to secure the DIMM module into the slot.

**Caution:** Exercise extreme caution when installing or removing memory modules to prevent damage to the DIMMs or slots.

### *Removing Memory*

To remove a DIMM, unlock the release tabs then pull the DIMM from the memory slot.

## 2.6 Storage Drives

The blade supports one internal storage drive, an M.2 solid state drive.

### M.2 Solid State Drive

One M.2 solid state drive (SSD) can be installed, supporting PCIe. Several lengths are supported—42mm, 60mm 80mm or 110mm. For each length, there is an hole in the mounting platform for a plastic clasp.

#### *Installing an M.2 SSD*

**Caution:** Use industry-standard anti-static equipment, such as gloves or wrist strap, and follow precautions to avoid damage caused by ESD.

1. Insert the SSD into the socket on the riser card. Then push it flat against the mounting platform.
2. Secure the SSD by firmly inserting the plastic plug.

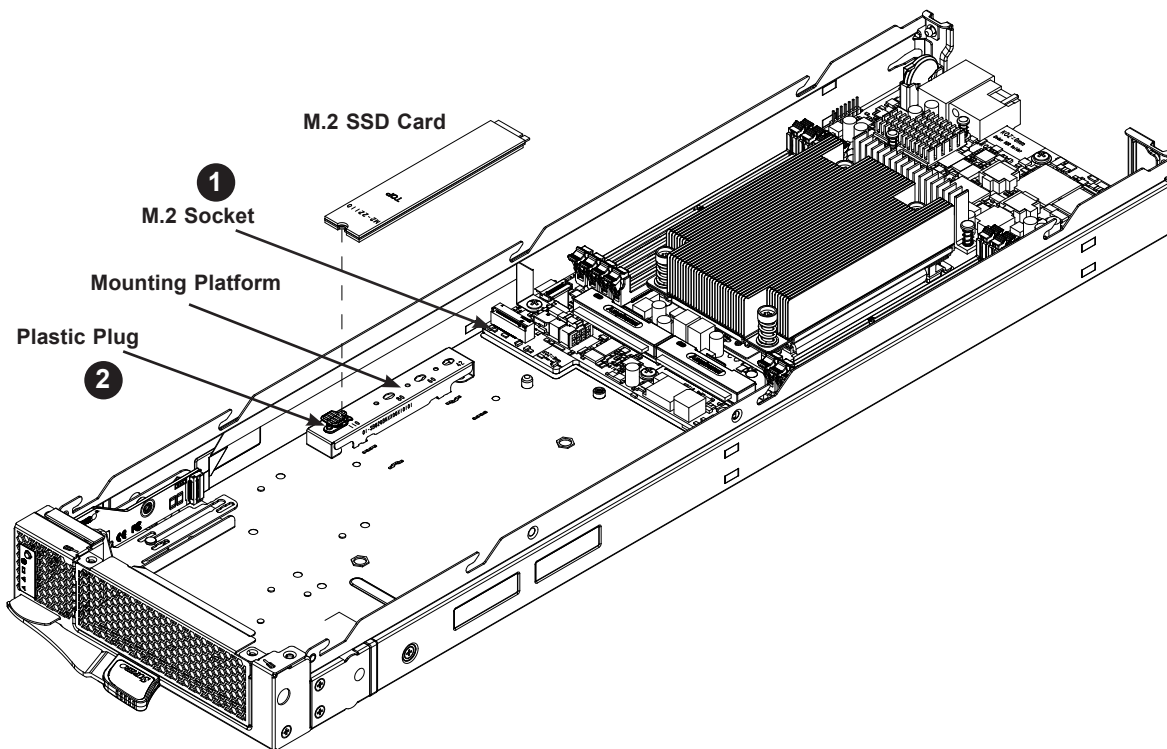


Figure 2-14. Installing M.2 SSD

## 2.7 Installing the Mezzanine Card

1. Install the three standoffs as pictured below.
2. Align the mezzanine card with the connector on the motherboard and slip it in.
3. Secure it with three screws.

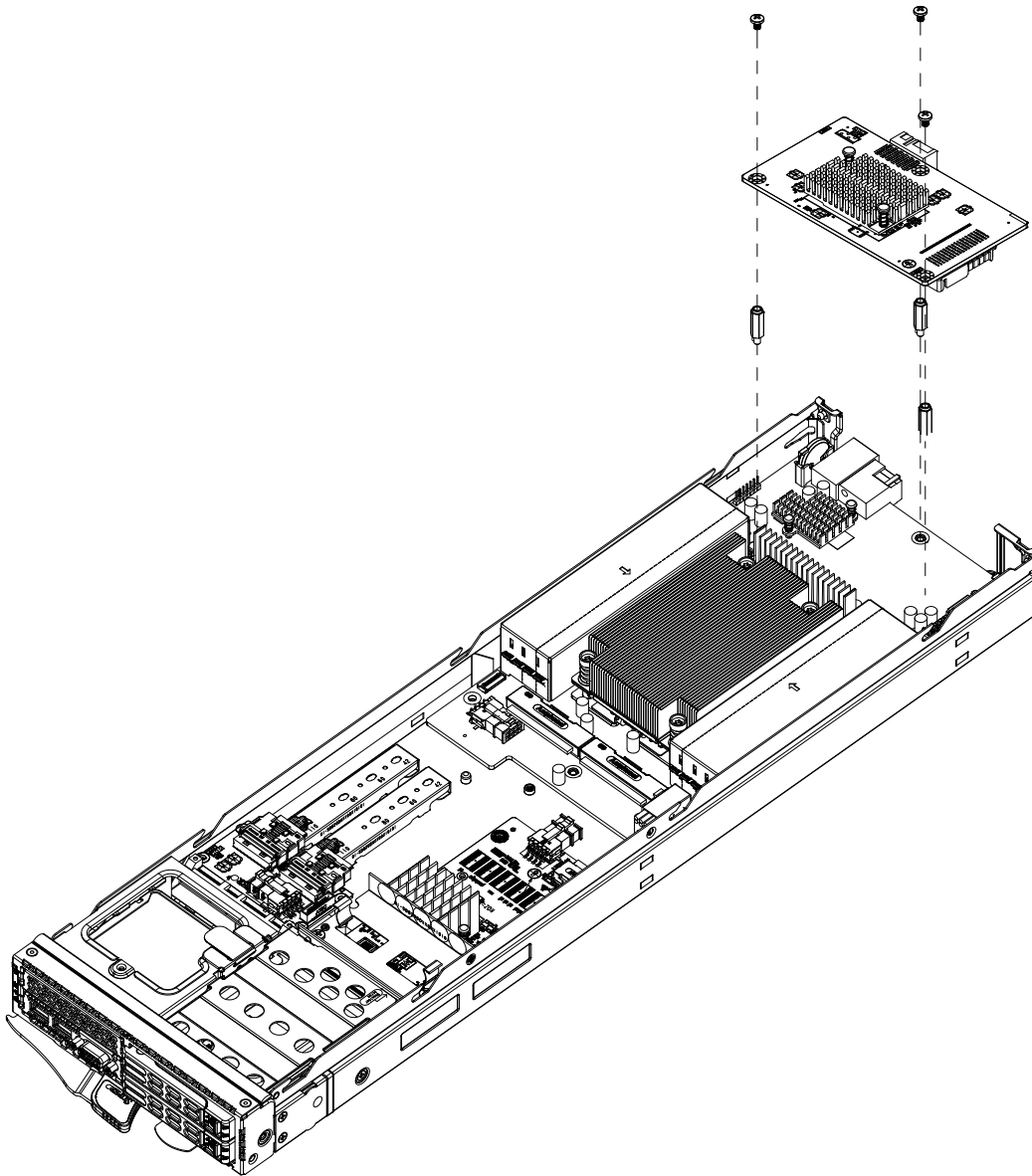


Figure 2-15. Installing the Mezzanine Card

## 2.8 Installing the GPU

1. Remove the power cable and MCIO cables that connect to the motherboard to allow the riser card bracket to be removed.
2. Remove the riser card bracket by removing the four screws that secure it to the chassis.
3. Insert GPU(s) into the riser card slots and secure them with screws.
4. If the GPU requires more than 75W power, install the optional power cable to the motherboard connector, JPWR1 (see Section 4.1 for the location).
5. Replace riser card bracket into the chassis, replace the screws, and replace the power cable and MCIO cables.

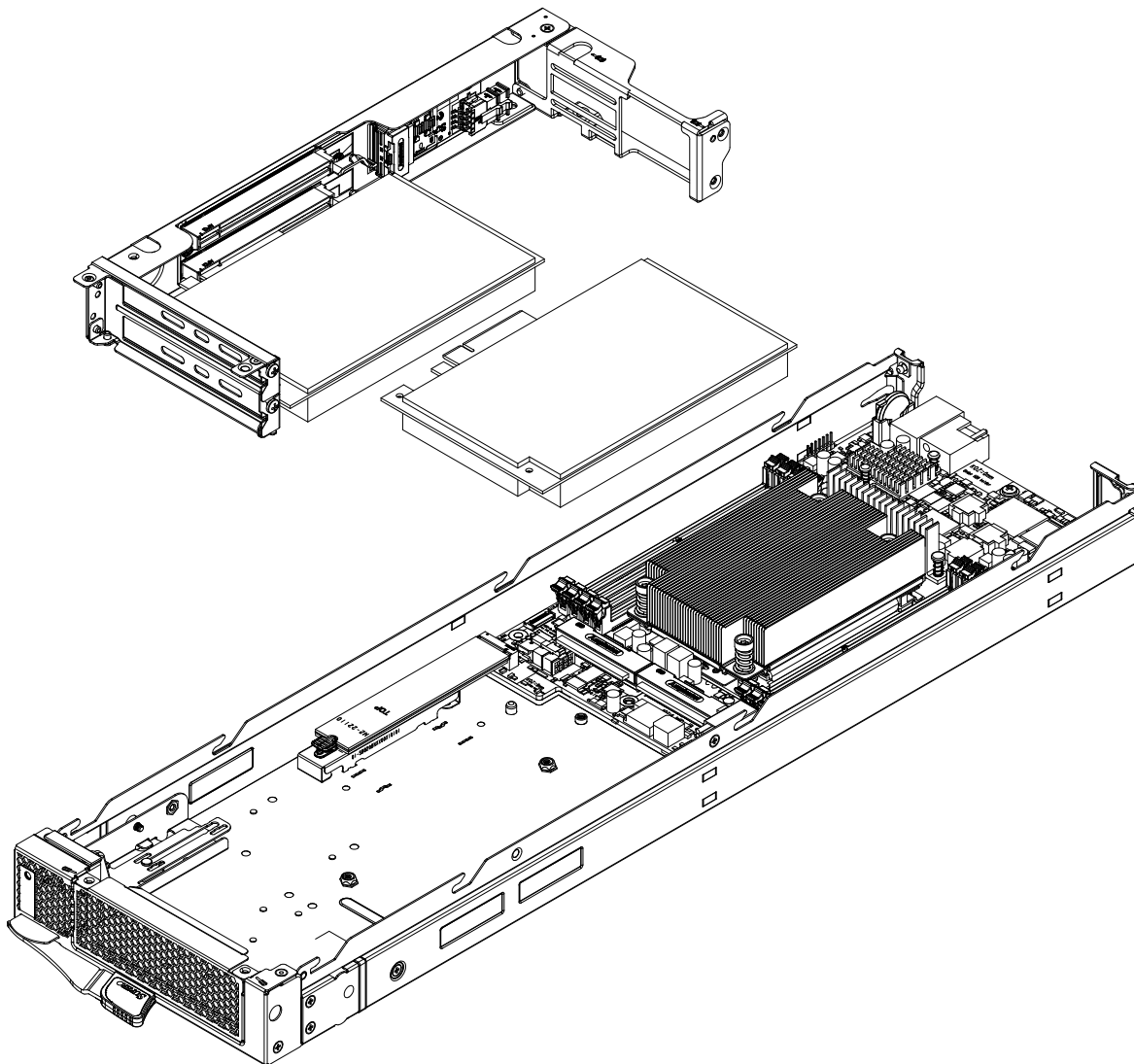
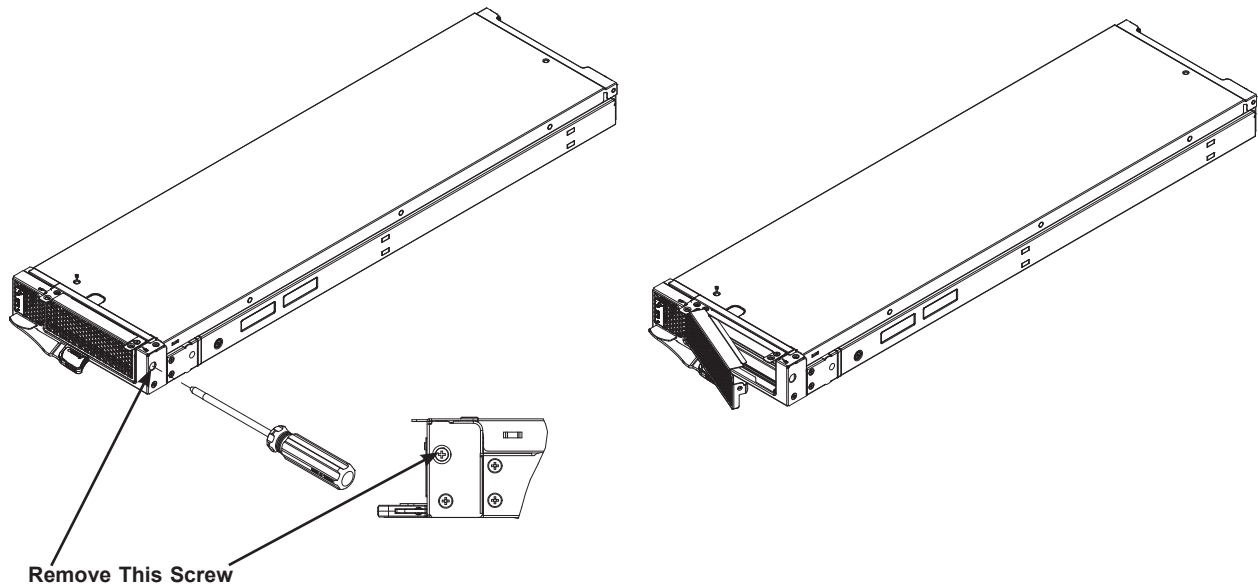


Figure 2-16. Installing the GPU

## Opening the Front Cover

If you need to access the GPU from the front of the blade, remove the front cover.

1. Remove the blade from the enclosure.
2. Remove the top screw on the side of the blade unit.
3. Swing out the front cover.



**Figure 2-17. Removing the Blade Front Cover**

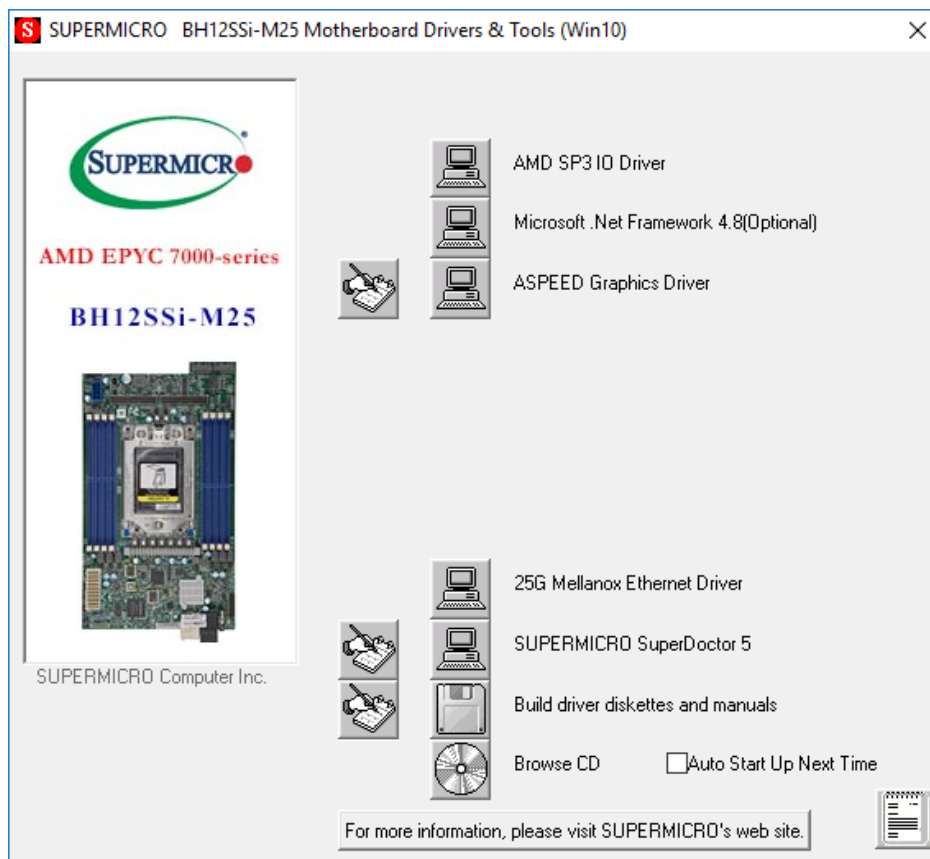
## 2.9 Driver Installation

The Supermicro website contains drivers and utilities for your system at <https://www.supermicro.com/wftp/driver>. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR\_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash drive or save as an ISO file on local storage. (You may also use a utility to extract the ISO file if preferred.) Then mount with virtual media at BMC console redirect with USB or ISO file to install.

Another option is to go to the Supermicro website at <http://www.supermicro.com/products/>. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

Mount with virtual media and the screenshot shown below should appear.



**Figure 2-20. Driver & Tool Installation Screen**

**Note:** Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents.

## 2.10 Installing the Operating System

An operating system (OS) must be installed on each blade module. Blades with Microsoft Windows OS and blades with Linux OS can operate within the same blade enclosure. Refer to the [SuperMicro web site](#) for a list of supported operating systems.

### *Installing by using PXE Boot*

Preboot Execution Environment (PXE) is used to boot a computer over a network. To install the OS using PXE, the following conditions must be met:

- The PXE BOOT option in BIOS must be enabled.
- A PXE server has been configured; this can be another blade in the system.
- The PXE server must be connected over a network to the blade to be booted.
- The blade has only non-partitioned/unformatted hard drives installed and no bootable devices attached to it.

Once these conditions are met, make sure the PXE server is running. Then turn on the blade on which you wish to install the OS. The BIOS in the blade will look at all bootable devices and finding none, will connect to the PXE server to begin the boot/install.

### *Installing by using Virtual Media (Drive Redirection)*

You can install the OS via Virtual Media through either the IPMIview (Java-based client utility), SuperBladeTool or the Web-based Management Utility. With this method, the OS is installed from an ISO image that resides on another system.

Refer to the manuals on the [SuperMicro web site](#) for further details on the Virtual Media (CD-ROM or Drive Redirection) sections of these two utility programs.

### **Linux Installation with Two Storage Drives—Note**

When installing Linux with two storage drives on the SBA-4119S-T2N you may encounter a situation where one drive is recognized as HDA and the other drive is recognized as SDA. This is normal since in this case the connection for SATA HDDs is from two different controllers.

Under Native IDE mode (which is the default), your Linux OS will see one drive as HDA and the other as SDA. If the SATA controller mode operation is changed to AMD\_AHCI in the BIOS, then the HDDs will appear as SDA and SDB.

## 2.11 Configuring RAID

For RAID setup, see <http://www.supermicro.com/support/manuals/> under RAID Installation Guides.

## Chapter 3

# Management and Maintenance

This chapter provides instructions for managing the blade unit and performing maintenance on components.

See Chapter 2 for:

- Installing or removing the blade unit
- Powering up or down a blade unit
- Removing or replacing a storage drive
- Removing or installing the processor, heatsink, or memory

### 3.1 Management Software

System management may be performed with any of three software packages: IPMIview, IPMItool or a Web-based Management Utility. These are designed to provide an administrator with a comprehensive set of functions and monitored data to keep tabs on the system and perform management activities.

#### **BMC**

The motherboard provides remote access, monitoring and management through the baseboard management controller (BMC) and other management controllers distributed among different system modules. There are several BIOS settings that are related to BMC. For general documentation and information on BMC, visit our website at:

[www.supermicro.com/en/solutions/management-software/bmc-resources](http://www.supermicro.com/en/solutions/management-software/bmc-resources)

#### ***BMC ADMIN User Password***

For security, each system is assigned a unique default BMC password for the ADMIN user. This can be found on a sticker on the chassis (see Figure 1-3) and a sticker on the motherboard. The sticker also displays the BMC MAC address.

For more information, refer to:

[https://www.supermicro.com/en/support/BMC\\_Unique\\_Password](https://www.supermicro.com/en/support/BMC_Unique_Password).



Figure 3-1. BMC Password Label

## 3.2 SuperDoctor® 5

The Supermicro SuperDoctor 5 is a program that functions in a command-line or web-based interface for Windows and Linux operating systems. The program monitors such system health information as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

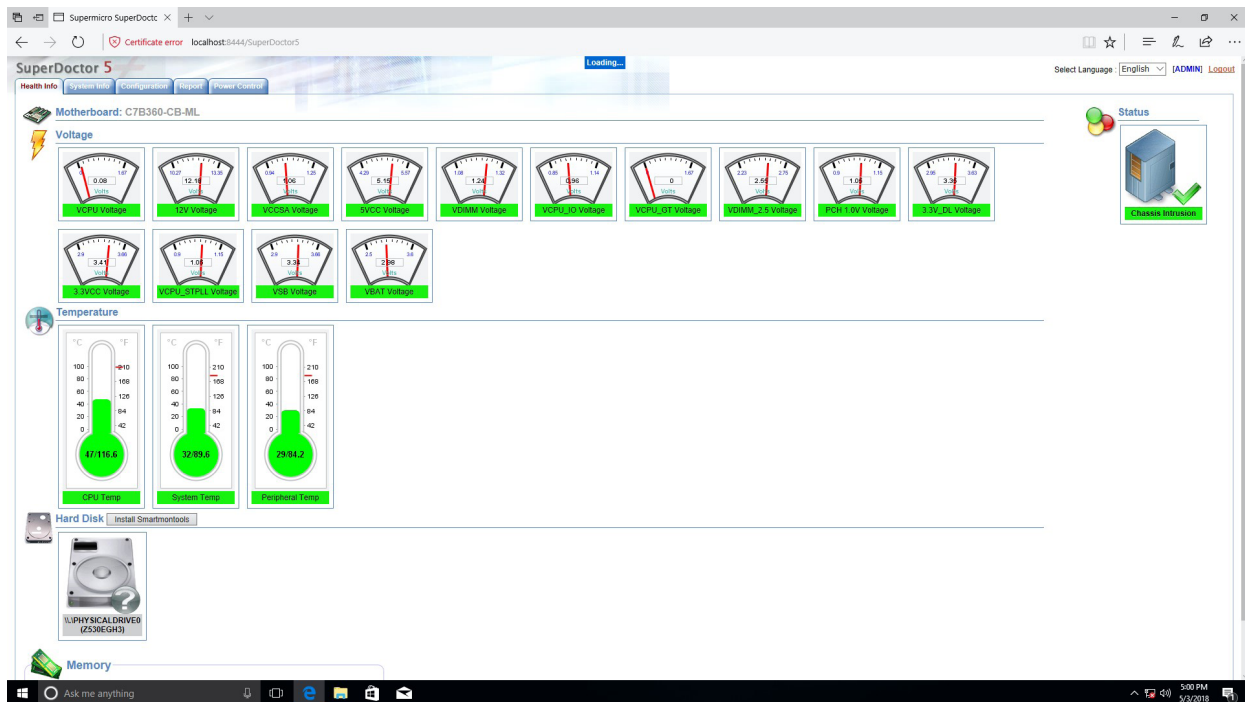


Figure 3-2. SuperDoctor 5 Interface Display Screen (Health Information)

### 3.3 Motherboard Battery

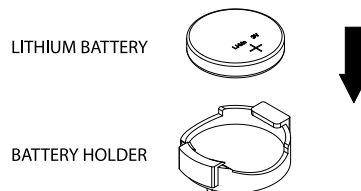
The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

#### ***Replacing the Battery***

Begin by removing power from the system as described in section 2.3.

1. Push aside the small clamp that covers the edge of the battery. When the battery is released, lift it out of the holder.
2. To insert a new battery, slide one edge under the lip of the holder with the positive (+) side facing up. Then push the other side down until the clamp snaps over it.

**Note:** Handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.



**Figure 3-3. Installing the Onboard Battery**

**Warning:** There is a danger of explosion if the onboard battery is installed upside down (which reverses its polarities). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032).

## 3.4 System Cooling

### Installing the Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. These do not require screws to install.

#### *Installing the Air Shrouds*

- Position the air shrouds as illustrated in the figure below, sliding the front notch over the pin on the fan tray.

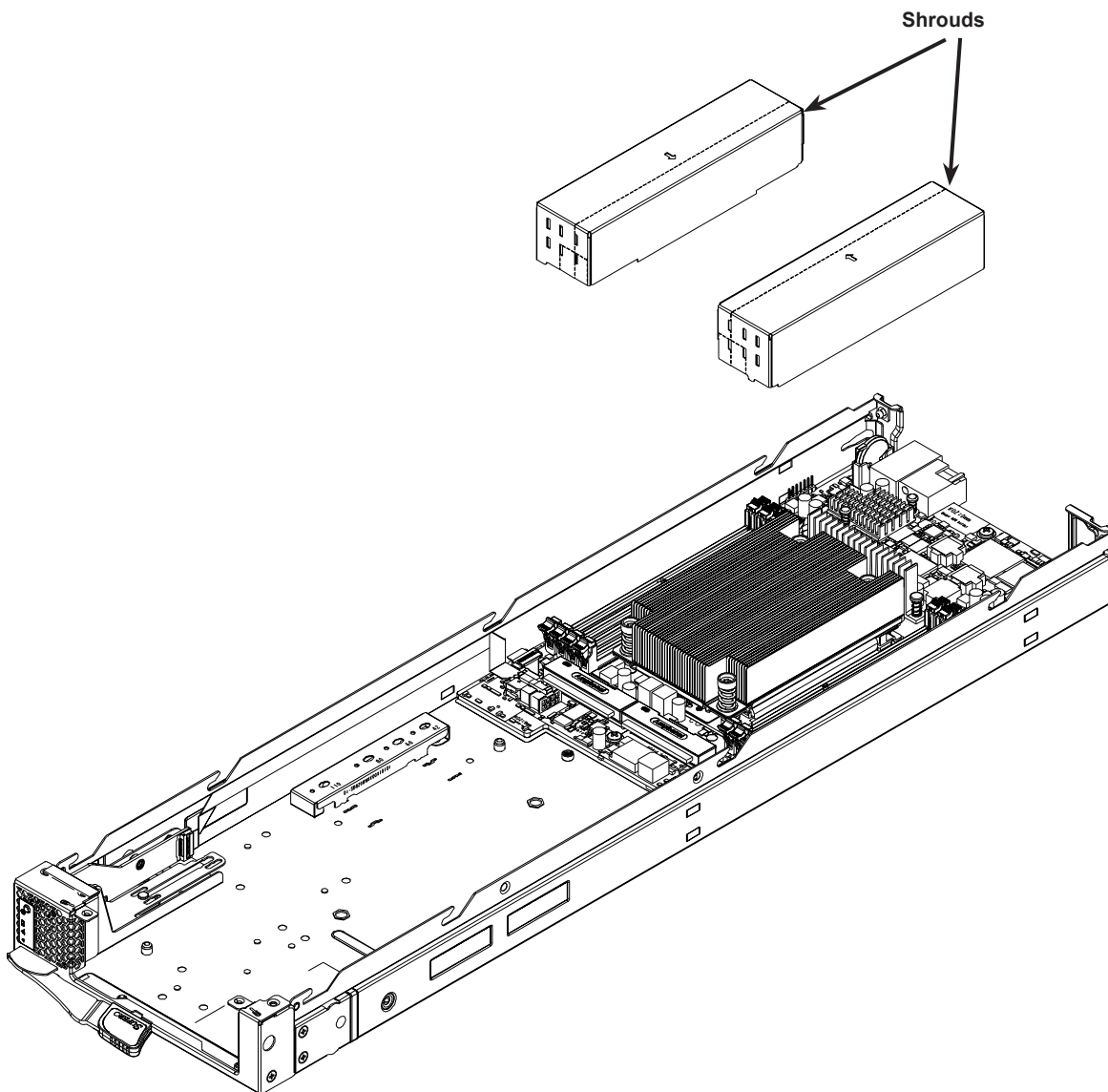


Figure 3-4. Installing the Standard Air Shrouds

## Checking the Server Air Flow

- Make sure there are no objects to obstruct airflow in and out of the server.
- Do not operate the server without drives or drive carriers in the drive bays.
- Use only recommended server parts.
- Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

The control panel LEDs display system heat status. See “Control Panel” in Chapter 1 for details.

## Overheating

There are several possible responses if the system overheats.

- Use the LEDs to determine the nature of the overheating condition.
- Confirm that the chassis covers are installed properly.
- Make sure all fans are present and operating normally.
- Check the routing of the cables.
- Verify that the heatsinks are installed properly.

### 3.5 Where to Get Replacement Components

If you need replacement parts for your system, to ensure the highest level of professional service and technical support, purchase exclusively from our Supermicro Authorized Distributors/System Integrators/Resellers. A list can be found at: [www.supermicro.com](http://www.supermicro.com). Click the menu icon > **Buy** > **Where to Buy** link.

### 3.6 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 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 (<https://www.supermicro.com/support/rma/>).

Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

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.

## Chapter 4

# Motherboard Connections

This section describes the jumpers, connectors, and status LEDs on the motherboard and provides pinout definitions. Depending on how the system is configured, not all connections are required.

Please review the [Safety Precautions](#) in Appendix B before installing or removing components.

### Main Connectors



**A.** 2X PCIe Gen 4 x16 connector for MCIO cable

**B.** 2X M.2 Connector (PCIe Gen 4 x4 or 2 SATA support)

**C.** Front panel control connector (LED and power button)

**D.** PCIe Gen 4 x16 Mezzanine card connector

**E.** For factory debug only (KVM)

**F.** IPMI and on-board LAN connector to enclosure (middle plane)

**G.** Motherboard power connector to middle plane

## 4.1 Motherboard Layout

Below is a layout of the BH12SSi-M25 with jumper, connector and LED locations shown. See the table on the following page for descriptions.

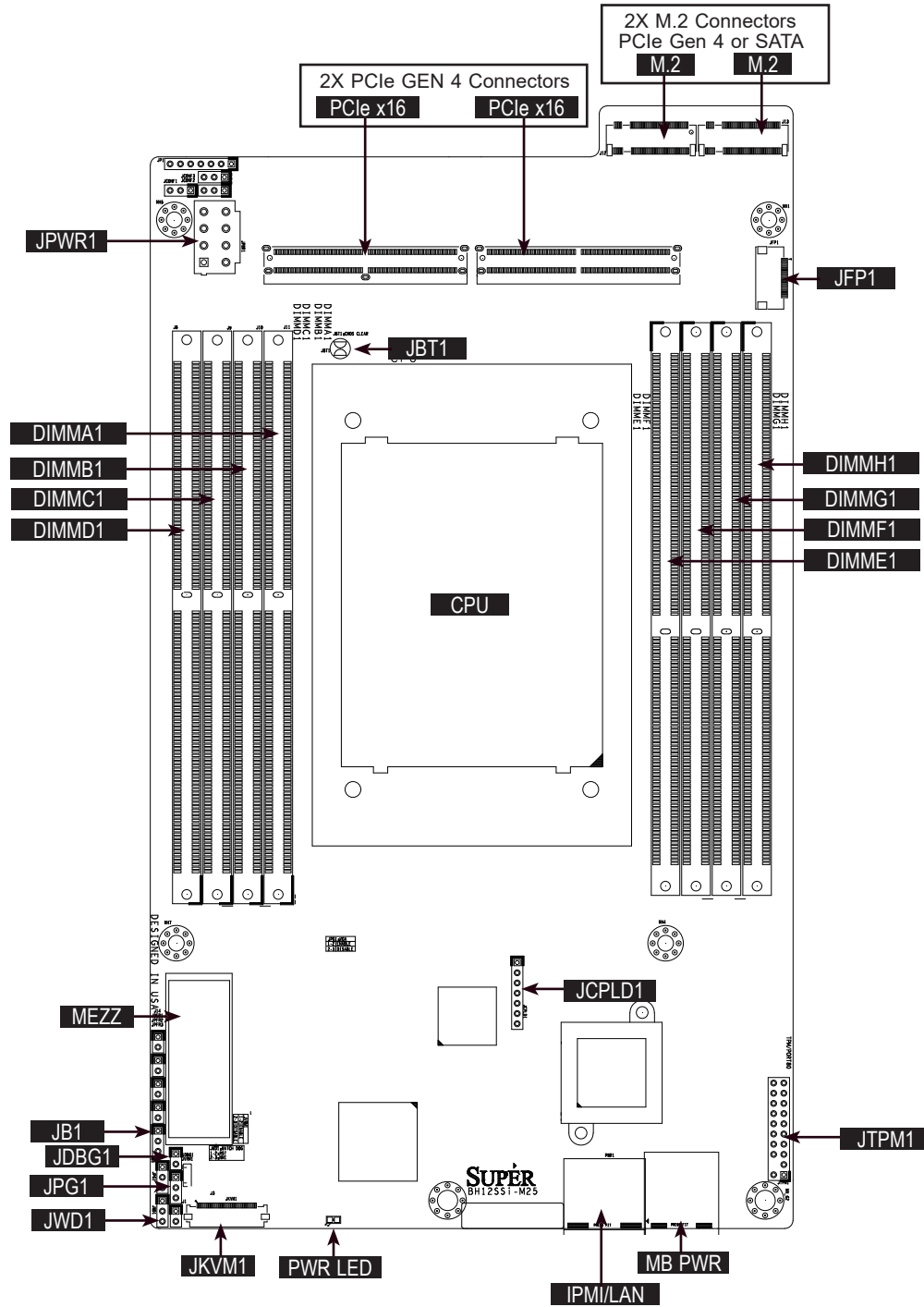


Figure 4-1. Motherboard Layout

## Quick Reference

Jumper	Description	Default Setting
JDBG1	Debug Mode	Pins 1-2 (Enabled)
JBT1	Clear CMOS	Open (Normal)
JWD1	Watch Dog Timer control	Pins 1-2 (Reset)
JPG1	Onboard Video Disable/Enable	Pins 1-2 (Enabled)

Connector	Description
JB1	External speaker/buzzer connector
JCPLD1	Complex-Programmable Logical Device (CPLD) header
JKVM1	Connector for external keyboard, video and mouse
JFP1	Front control panel connector for LED and Power Button
IPMI/LAN	IPMI/LAN connector
JTPM1	Trusted Platform Module (TPM)/Port 80 connector
2x PCIe x16	2x PCIe Gen 4 x16 connectors for MCIO cable
2x M.2	2x M.2 Connector (PCIe Gen 4 x4 or 2X SATA support)
MEZZ	PCIe Gen 4 x16 Mezzanine card connector
MB PWR	Motherboard power connector to middle plane
DIMMA1~DIMMH1	DIMM memory slots
JPWR1	12V 8-pin ATX CPU power connector

LED	Description	Status
PWR LED	Power LED	On: Power On

**Note:** Jumpers, connectors, switches, and LED indicators that are not described in the preceding tables are for manufacturing testing purposes only, and are not covered in this manual.

**Note:** A system block diagram is displayed in Chapter 1.

## 4.2 Headers and Connectors

### 12V 8-pin Power Connector (JPWR1)

JPWR1 is an 8-pin ATX power input to provide power to the motherboard.

12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

### TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Supermicro. A TPM/Port 80 connector is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the storage drive is not installed in the system.

For more information on TPM: <http://www.supermicro.com/manuals/other/TPM.pdf>.

Trusted Platform Module/Port 80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	P3V3	2	SPI_TPM_CS_N
3	PCI-E_RESET_N#	4	SPI_PCH_MISO
5	SPI_PCH_CLK#	6	Ground
7	SPI_PCH_MOSI	8	N/A
9	JTPM1_P3V3A	10	IRQ_TPM_SPIN_N

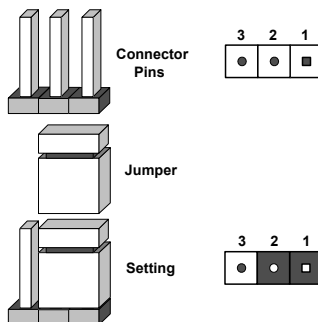
### M.2 Connectors

The PCIe M.2 supports M-Key (PCIe x2) storage cards. M.2-C1 can support a speed of PCIe x4, when one M.2 device is installed.

## 4.3 Jumpers

To modify the operation of the motherboard, jumpers are used to choose between optional settings. Jumpers create shorts between two pins to change the function associated with it. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

**Note:** On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" indicates the jumper is either on only one pin or has been completely removed.



### CMOS Clear

JBT1 is used to clear CMOS, which will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

#### To Clear CMOS

1. First power down the system and unplug the power cord(s).
2. Remove the cover of the chassis to access the motherboard.
3. Remove the onboard battery from the motherboard.
4. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.
5. Remove the screwdriver (or shorting device).
6. Replace the cover, reconnect the power cord(s) and power on the system.

**Notes:** Clearing CMOS will also clear all passwords.

Do not use the PW\_ON connector to clear CMOS.



JBT1 contact pads

### Watch Dog (JWD1)

JWD1 controls the Watch Dog function. Watch Dog is a monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause Watch Dog to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. Watch Dog must also be enabled in BIOS. The default setting is Reset.

**Note:** When Watch Dog is enabled, the user must write their own application software to disable it.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset (Default)
Pins 2-3	NMI
Open	Disabled

### Debug Mode Enable/Disable (JDBG1)

Jumper JDBG1 will enable or disable Debug Mode on the motherboard. The default setting is Normal Mode.

Debug Mode Enable/Disable Jumper Settings (JDBG1)	
Jumper Setting	Definition
Pins 1-2	Normal Mode (default)
Pins 2-3	Debug Mode

### VGA Enable/Disable (JPG1)

JPG1 allows you to enable or disable the VGA port. The default position is Enabled.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled (default)
Pins 2-3	Disabled

## 4.4 LED Indicators

### Onboard Power LED (PWR LED)

When the PWR LED is illuminated, the system is turned on and all the system power rails are ready. When the system is turned off, or any one of the system power rails fails, this LED will turn off.

Onboard Power LED Indicator	
LED Color	Definition
Off	System Off (power cable not connected)
Green	System On, Power OK

# Chapter 5

## UEFI BIOS

### 5.1 Introduction

This chapter describes the AMI UEFI BIOS setup utility for the BH12SSi-M25 and provides the instructions on navigating the setup screens. The BIOS is stored in a Flash EEPROM and can be updated.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted since this manual was published.

#### Starting BIOS Setup Utility

To enter the BIOS setup utility screens, press the <Delete> key while the system is booting up. (There are a few cases when other keys are used, such as <F1>, <F2>, etc.)

The BIOS screens have three main frames. The large left frame displays options can be configured by the user. These are blue. When an option is selected, it is highlighted in white. Settings printed in **Bold** are the default values.

In the left frame, a " ►" indicates a submenu. Highlighting such an item and pressing the <Enter> key opens the list of settings in that submenu.

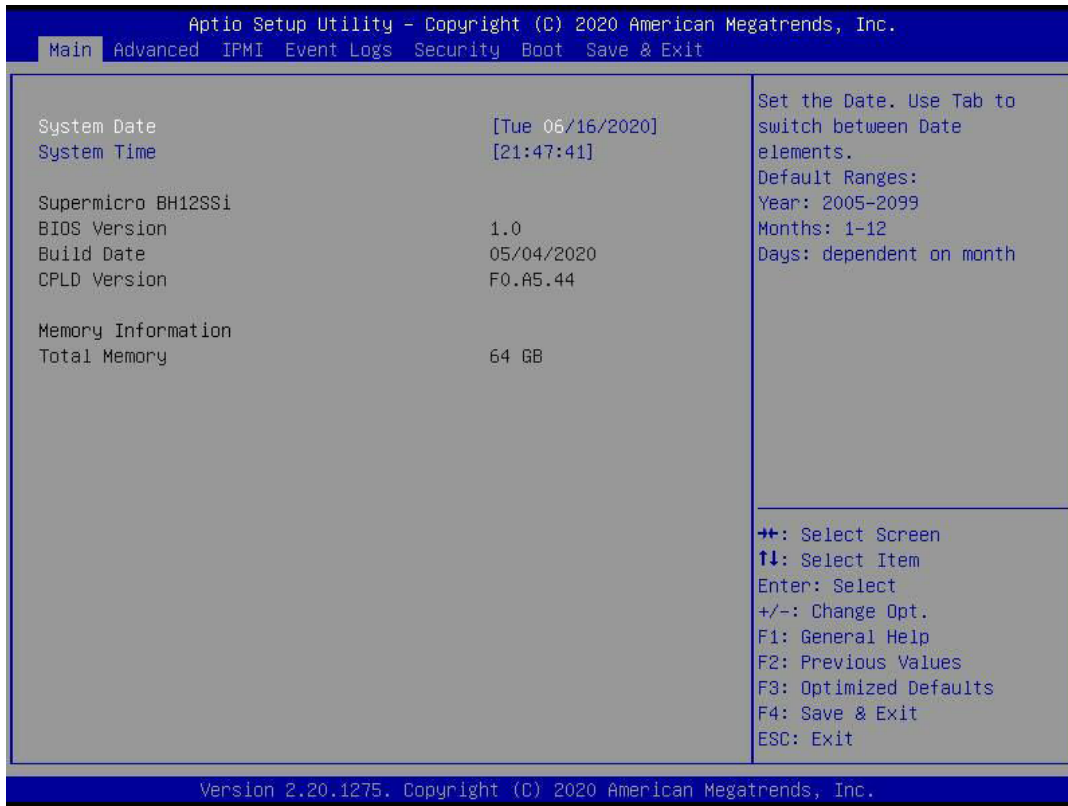
The upper right frame displays helpful information for the user. The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The lower right frame lists navigational methods. The AMI BIOS setup utility uses a key-based navigation system called *hot keys*. Most of these hot keys can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

Some system parameters may be changed.

### 5.2 Main Setup

When running the BIOS setup utility, it starts with the Main screen. You can always return to it by selecting the Main tab on the top of the screen.



The Main tab page allows you to set the date and time, and it displays system information.

### System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format.

**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is 01/01/2016 after RTC reset.

### Supermicro BH12SSi-M25 (Motherboard model)

#### BIOS Version

#### Build Date (of the BIOS)

**CPLD (Complex Programmable Logic Device) Version:** This item displays the CPLD version used in the system.

#### Memory Information

#### Total Memory (for the system)

## 5.3 Tab Pages

### Advanced

- Boot Function
- Trusted Computing
- PSP Firmware Versions
- Super IO Configuration
- Serial Port Console Redirection
- CPU Configuration
- NB Configuration
- AMI Graphic Output Protocol Policy
- PCIe/PCI/PnP Configuration
- USB Configuration
- SATA Configuration
- HTTP BOOT Configuration
- Network Configuration
- iSCSI Configuration
- TLS Authenticate Configuration
- RAM Disk Configuration
- Avago MegaRAID Configuration Utility
- Driver Health

### IPMI

- Update IPMI LAN Configuration
- IPv4 Support: Configuration Address Source, VLAN
- IPv6 Support: Configuration Address Source

### Event Logs

- Change SMBIOS Event Log Settings
- ViewSMBOIS Event Log

### Security

- Administrator Password
- Password Check
- Secure Boot

### Boot

- Boot Mode Select
- Legacy to EFI Support
- Boot Priorities

**Save & Exit**

Save Options

Default Options

Boot Override

# Appendix A

## BIOS POST Codes

### A.1 BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

BIOS POST Messages	
BIOS Message	Description
Failure Fixed Disk	Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.
Stuck key	Stuck key on keyboard.
Keyboard error	Keyboard not working.
Keyboard Controller Failed	Keyboard controller failed test. May require replacing keyboard controller.
Keyboard locked - Unlock key switch	Unlock the system to proceed.
Monitor type does not match CMOS - Run SETUP	Monitor type not correctly identified in Setup
Shadow Ram Failed at offset: nnnn	Shadow RAM failed at offset nnnn of the 64k block at which the error was detected.
System RAM Failed at offset: nnnn	System RAM failed at offset nnnn of in the 64k block at which the error was detected.
Extended RAM Failed at offset: nnnn	Extended memory not working or not configured properly at offset nnnn.
System battery is dead - Replace and run SETUP	The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.
System CMOS checksum bad - Default configuration used	System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.
System timer error	The timer test failed. Requires repair of system board.
Real time clock error	Real-Time Clock fails BIOS hardware test. May require board repair.
Check date and time settings	BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

<b>BIOS POST Messages</b>	
<b>BIOS Message</b>	<b>Description</b>
Previous boot incomplete - Default configuration used	Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of wait states, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.
Memory Size found by POST differed from CMOS	Memory size found by POST differed from CMOS.
Diskette drive A error	
Diskette drive B error	Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.
Incorrect Drive A type - run SETUP	Type of floppy drive A: not correctly identified in Setup.
Incorrect Drive B type - run SETUP	Type of floppy drive B: not correctly identified in Setup.
System cache error - Cache disabled	RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.
CPU ID:	CPU socket number for Multi-Processor error.
EISA CMOS not writeable	ServerBIOS2 test error: Cannot write to EISA CMOS.
DMA Test Failed	ServerBIOS2 test error: Cannot write to extended DMA (Direct Memory Access) registers.
Software NMI Failed	ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).
Fail-Safe Timer NMI Failed	ServerBIOS2 test error: Fail-Safe Timer takes too long.
device Address Conflict	Address conflict for specified device.
Allocation Error for: device	Run ISA or EISA Configuration Utility to resolve resource conflict for the specified device.
CD ROM Drive	CD ROM Drive identified.
Entering SETUP...	Starting Setup program
Failing Bits: nnnn	The hex number nnnn is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
Fixed Disk n	Fixed disk n (0-3) identified.
Invalid System Configuration Data	Problem with NVRAM (CMOS) data.
I/O device IRQ conflict	I/O device IRQ conflict error.
PS/2 Mouse Boot Summary Screen:	PS/2 Mouse installed.

BIOS POST Messages	
BIOS Message	Description
nnnn kB Extended RAM Passed	Where nnnn is the amount of RAM in kilobytes successfully tested.
nnnn Cache SRAM Passed	Where nnnn is the amount of system cache in kilobytes successfully tested.
nnnn kB Shadow RAM Passed	Where nnnn is the amount of shadow RAM in kilobytes successfully tested.
nnnn kB System RAM Passed	Where nnnn is the amount of system RAM in kilobytes successfully tested.
One or more I2O Block Storage Devices were excluded from the Setup Boot Menu	There was not enough room in the IPL table to display all installed I2O block-storage devices.
Operating system not found	Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.
Parity Check 1 nnnn	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ?????. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.
Parity Check 2 nnnn	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ?????.
Press <F1> to resume, <F2> to Setup, <F3> for previous	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an Option ROM, i.e., an add-on card). Write down and follow the information shown on the screen.
Press <F2> to enter Setup	Optional message displayed during POST. Can be turned off in Setup.
PS/2 Mouse:	PS/2 mouse identified.
Run the I2O Configuration Utility	One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).
System BIOS shadowed	System BIOS copied to shadow RAM.
UMB upper limit segment address: nnnn	Displays the address nnnn of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.
Video BIOS shadowed	Video BIOS successfully copied to shadow RAM.

## A.2 BIOS POST Codes

This section lists the POST (Power-On Self-Test) codes for the AMI BIOS. POST codes are divided into two categories: recoverable and terminal.

### Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

One long and two short beeps – video configuration error

One repetitive long beep – no memory detected

## Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.

The following is a list of codes that may be written to port 80h.

Terminal POST Errors	
Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
28h	Auto size DRAM

<b>Terminal POST Errors</b>	
<b>Code</b>	<b>Description</b>
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line xxxx*
2Eh	1-3-4-3 RAM failure on data bits xxxx* of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices

<b>Terminal POST Errors</b>	
<b>Code</b>	<b>Description</b>
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.

<b>Terminal POST Errors</b>	
<b>Code</b>	<b>Description</b>
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
98h	1-2 Search for option ROMs. One long, two short beeps on check-sum failure
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.

<b>Terminal POST Errors</b>	
<b>Code</b>	<b>Description</b>
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

Terminal POST Errors	
Code	Description

The following are for the boot block in Flash ROM:

Boot Block Flash ROM Terminal POST Errors	
Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video

<b>Boot Block Flash ROM Terminal POST Errors</b>	
<b>Code</b>	<b>Description</b>
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the low order byte of the error. It repeats this sequence continuously.

## Appendix B

# Standardized Warning Statements for AC Systems

### About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our website at [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

### Warning Definition



**Warning!** This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

#### 警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危險。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

## Warnung

### WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

### INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

## תקנון הזהרות אזהרה

הזהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

اَكْ ف حالة وُكي اَي تتسبب ف اصابة جسدهُ هذا الزهز عُ خطر! تحذُرُ .  
 قبل اَي تعول على اَي هعدات، كي على علن بالوخاطز ال اُجوة عي الذوائر  
 الكهزبائِة  
 وكي على دراةُ بالووارسات النقااِة لو عُ وقع اَي حادث  
 استخدم رقن الب اِى الو صُص ف هاةُ كل تحذُرُ للعشر تزجوتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

## BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

## Installation Instructions



**Warning!** Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

### Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

### ¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

### Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

### Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

## Circuit Breaker



**Warning!** This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

### サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

### 警告

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

### 警告

此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

#### Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

#### ¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

#### Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250VDC, 20A

هذا المنتج يعتمد على معدات الحماية مه الدوائر القصيرة التي تم تثبيتها في المبنى  
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

#### 경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

#### Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 250V, 20A.

## Equipment Installation



**Warning!** Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

### 機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されていません。

### 警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

### 警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

### Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

### ¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

### Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

### אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للمظفيه المؤهليه

### 경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

### Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

## Restricted Area



**Warning!** This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

### アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

### 警告

此部件应安装在限制进出的场所。限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

### 警告

此裝置僅限安裝於進出管制區域。進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

### Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

### ¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

### Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת 'כלי אבטחה בלבד' (מפתח, מנעול וכד.).

تخصيص هذه النحذة نترك بُها ف مناطق محظورة تم .  
ممكن انصلل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت  
أو أ وس هُت أخري نلالأما ققم ومفتاح

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

## Battery Handling



**Warning!** There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions

### 電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

### 警告

電池更換不當會有爆炸危險。請只使用同類電池或制造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

### 警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

### Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

### Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

### ¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת. סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل  
اسحبذال البطارية  
فقط بنفس النوع أو ما يعادلها مما أوصت به الشركة المصنعة  
جخلص من البطاريات المسحمة وفقا لعمليات الشركة الصانعة

#### 경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

#### Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

## Backplane Voltage



**Warning!** Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה!

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أو الطاقة المخزنة على اللوحة عندما يكن النظام يعمل كهذا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다.  
서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

## Comply with Local and National Electrical Codes



**Warning!** Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمثل للقوايه المحلية والبطية المتعلقة  
بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

## Product Disposal



**Warning!** Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية عند

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

# Appendix C

## Specifications and Compliance

**Processors**

AMD EPYC 7002 Series in a SP3 type socket

**Chipset**

System on Chip

**Memory**

Eight slots for up to 2 TB of 3DS RDIMM/LRDIMM), with speeds of up to 3200 MHz; support for Non-Volatile DIMM (NVDIMM)

**BIOS**

128 Mb SPI AMI BIOS SM Flash UEFI BIOS

**Motherboard**

BH12SSI-M25

**Chassis**

MCP-680-41007-0N; (WxHxD) 4.64 x 1.2 x 23.2 in. (125.5 x 30.5 x 589 mm)

**Storage Drives**

M.2: One PCIe 4.0 NVMe or SATA

**Operating Environment**

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5% to 95% (non-condensing)

## Regulatory Compliance

FCC, ICES, CE, VCCI, RCM, NRTL, CB

## Applied Directives, Standards

EMC/EMI: 2014/30/EU (EMC Directive)

FCC Part 15

ICES-003

VCCI 32-1

AS/NZS CISPR 32

EN55032

EN55035

CISPR 24

EN 61000-3-2

EN 61000-3-3

EN 61000-4-2

EN 61000-4-3

EN 61000-4-4

EN 61000-4-5

EN 61000-4-6

EN 61000-4-8

EN 61000-4-11

Green Environment:

2011/65/EU (RoHS Directive)

EC 1907/2006 (REACH)

2012/19/EU (WEEE Directive)

Product Safety: 2014/35/EU (LVD Directive)

## Perchlorate Warning

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](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI — A

## General Data Center Environmental Specifications

Particulate contamination specifications

Air filtration: Data centers must be kept clean to Class 8 of ISO 14644-1 (ISO 2015). The air entering the data center should be filtered with a MERV 11 filter or better. The air within the data center should be continuously filtered with a MERV 8 filter or better.

Conductive dust: Air should be free of conductive dust, zinc whiskers, or other conductive particles.

Corrosive dust: Air should be free of corrosive dust.

Gaseous\* contamination specifications

Copper coupon corrosion rate: <300 Å/month per class G1 as defined by ANSI/ISA71.04-2013, reference by ASHRAE TC 9.9

Silver coupon corrosion rate: <200 Å/month per class G1 as defined by ANSI/ISA71.04-2013, reference by ASHRAE TC 9.9

\*If testing with silver or copper coupons results in values less than 200 Å/month or 300 Å/month, respectively, then operating up to 70% relative humidity (RH) is acceptable. If the testing shows corrosion levels exceed these limits, then catalyst-type pollutants are probably present and RH should be driven to 50% or lower.