A3SPI-4C/8C-LN6PF
A3SPI-4C/8C-HLN4F

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the A3SPI-4C/8C-LN6PF/HLN4F motherboard.

About This Motherboard

The A3SPI-4C/8C-LN6PF/HLN4F motherboard supports the Intel® Atom® System-on-Chip (SoC) C5000 series processor with up to eight cores and a thermal design power (TDP) of up to 41W. It comes in a mini-ITX form factor and supports both DC12V and ATX power input, and up to 128GB of DDR4 ECC RDIMM memory with speeds of up to 2933 MT/s in two DIMM slots. Its I/O expandability and high-speed connections include one PCIe 3.0 x4 slot, M.2 M-key/B-key connections, one SuperDOM SATA 3.0 port, Oculink with support for PCIe/SATA/NVMe, quad GbE LAN ports, dual 10G SFP ports (LN6PF), and 1GbE Base-T ports. It also offers the most advanced remote system management and data protection capability with a dedicated BMC LAN port and a Trusted Platform Module (TPM).

The motherboard is built upon advanced technologies such as Intel Virtualization to improve security and reliabity of systems, and Thermal Monitoring to reduce power consumption. Optimized for high-performance, high-end computing platforms that require small form factor hardware, it is ideal for the next generation of embedded storage systems, uCPE, and Edge network infrastructure.

Please note that this motherboard is intended to be installed and serviced by professional technicians only. For processor/memory updates, please refer to our website at http://www.supermicro.com/products/.

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 to yourself:

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

Warning! Indicates high voltage may be encountered when 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 information for correct system setup.

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Table of Contents

Appendix C Standardized Warning Statements

Appendix D UEFI BIOS Recovery

Chapter 1

Introduction

Congratulations on purchasing your computer motherboard from an industry leader. Supermicro boards are designed to provide you with the highest standards in quality and performance.

In addition to the motherboard, several important parts that are included with the system are listed below. If anything listed is damaged or missing, please contact your retailer.

1.1 Checklist

Main Parts List (Retail Single Package)		
Description	**Part Number**	**Quantity**
Motherboard	A3SPI-4C/8C-LN6PF/HLN4F	1
Quick Reference Guide	MNL-2467-QRG	1
Oculink to SATA Cable	CBL-SAST-0933	1
I/O Shield	MCP-260-00173-0N	1
SATA Cable	CBL-0044L	1

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: https://www.supermicro.com/wdl/driver/

- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm

- A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: https://www.supermicro.com/wdl/utility/Lot9_Secure_Data_Deletion_Utility/

- 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.

Figure 1-1. A3SPI-4C-HLN4F Motherboard Image
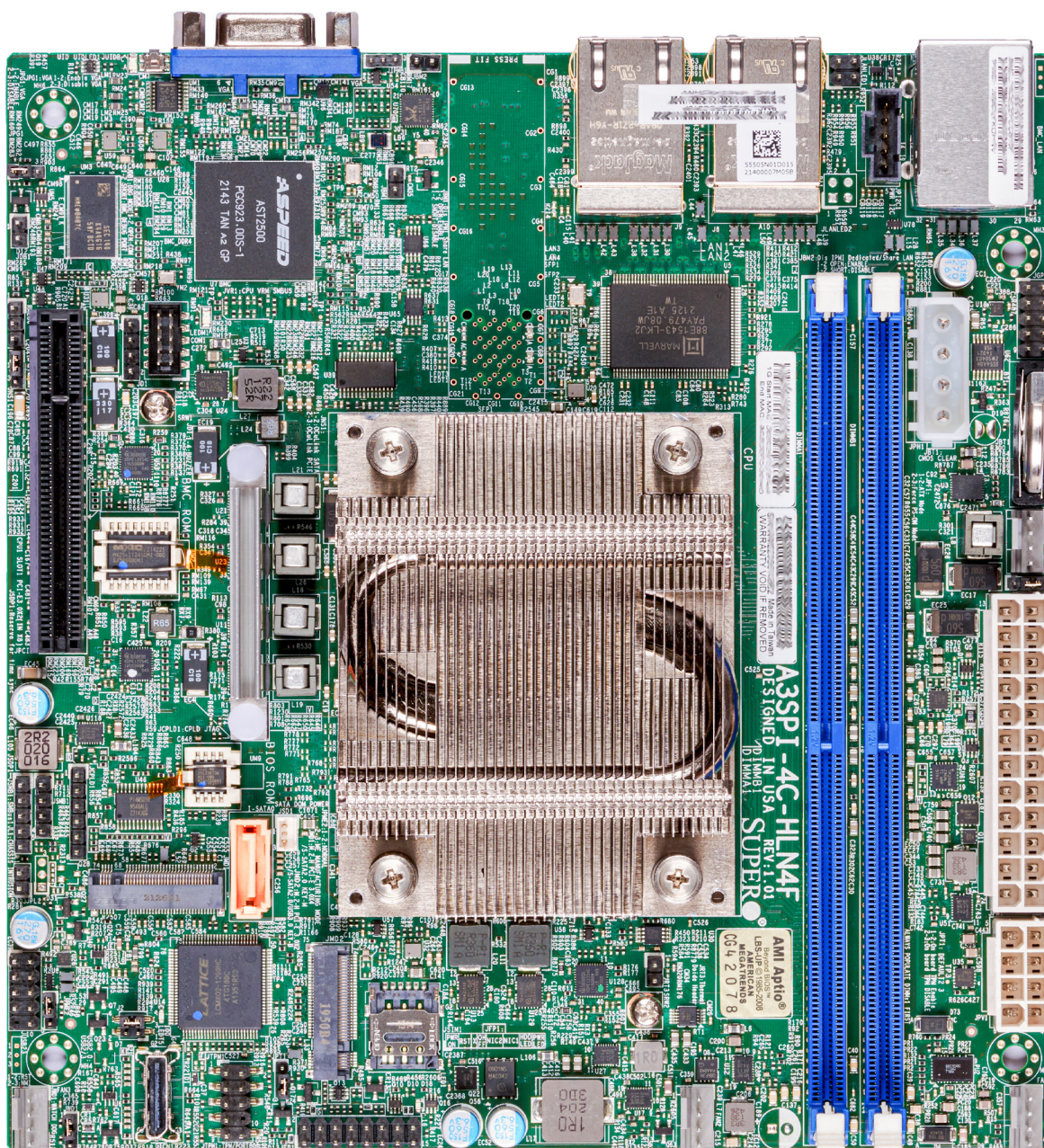
Figure 1-2. A3SPI-8C-LN6PF Motherboard Image
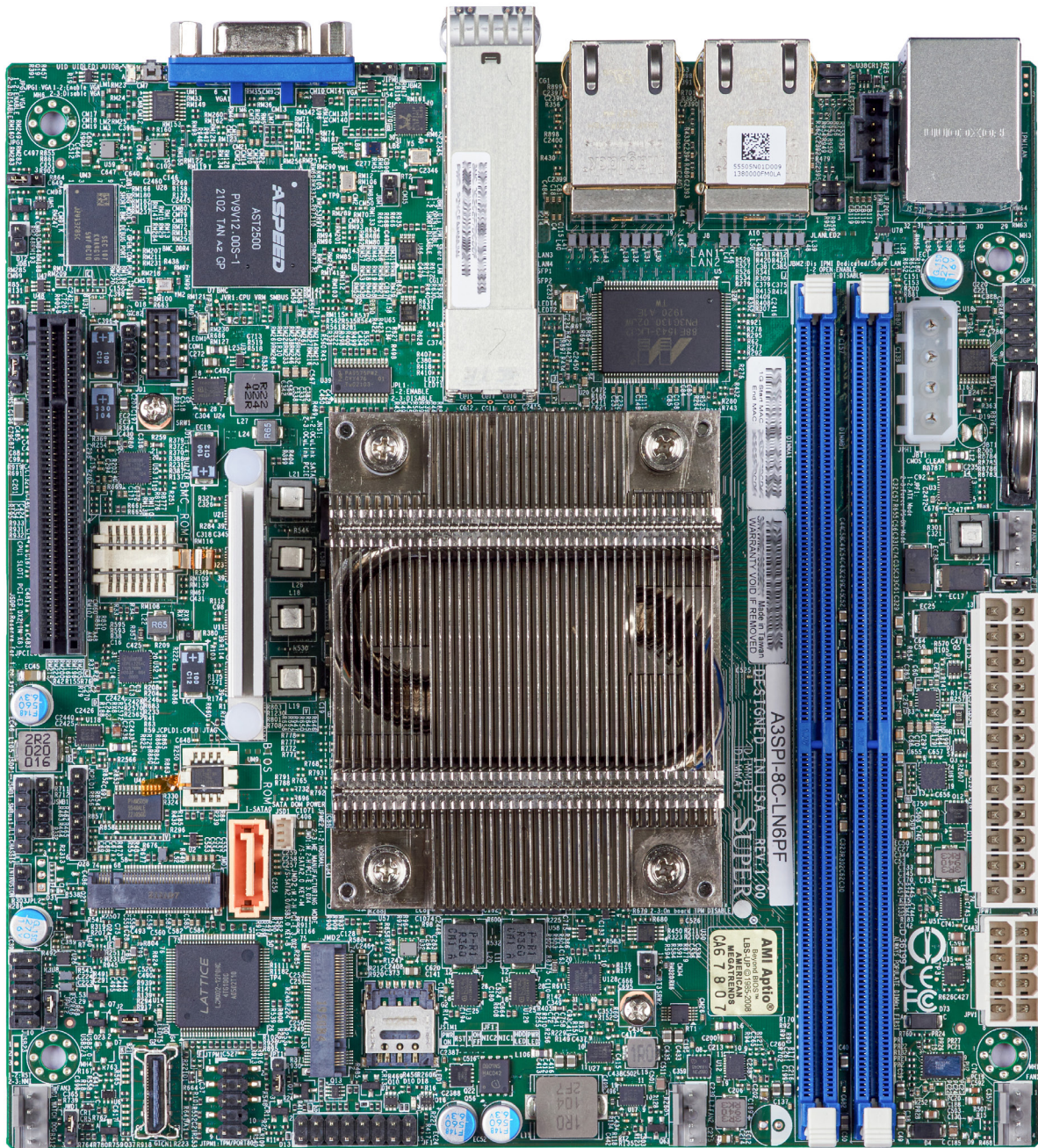
Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-3. Motherboard Layout

(not drawn to scale)
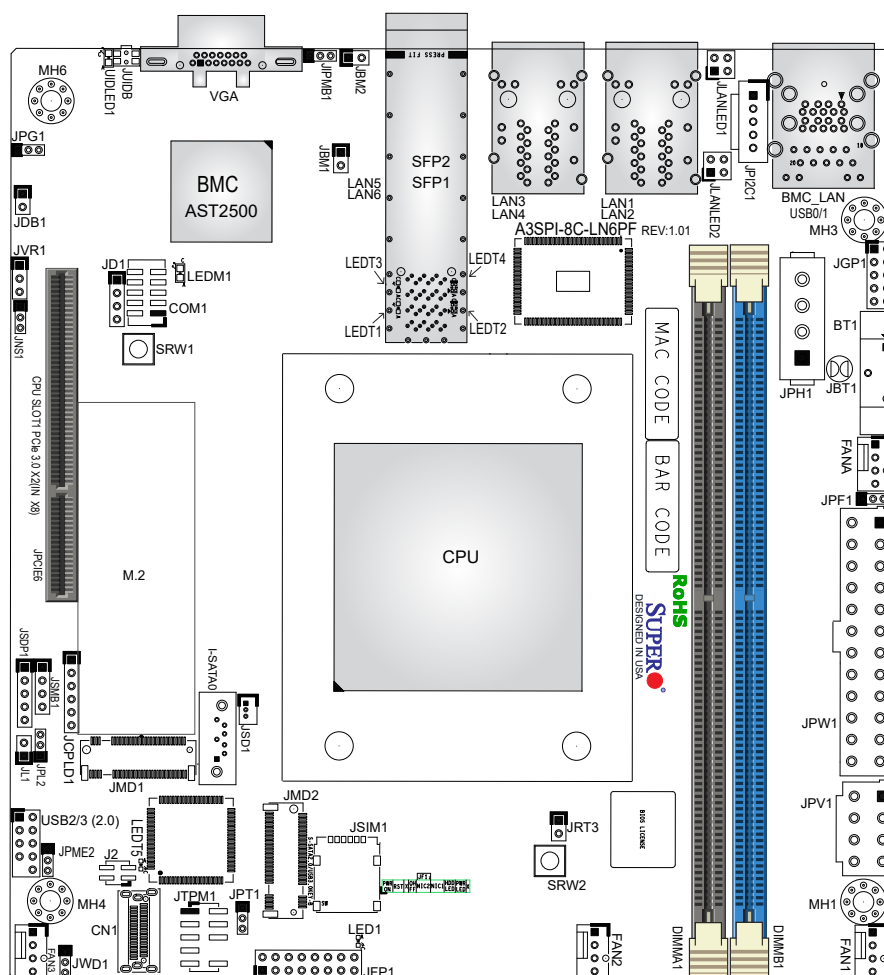
Note: Components not documented are for internal testing only.

Quick Reference
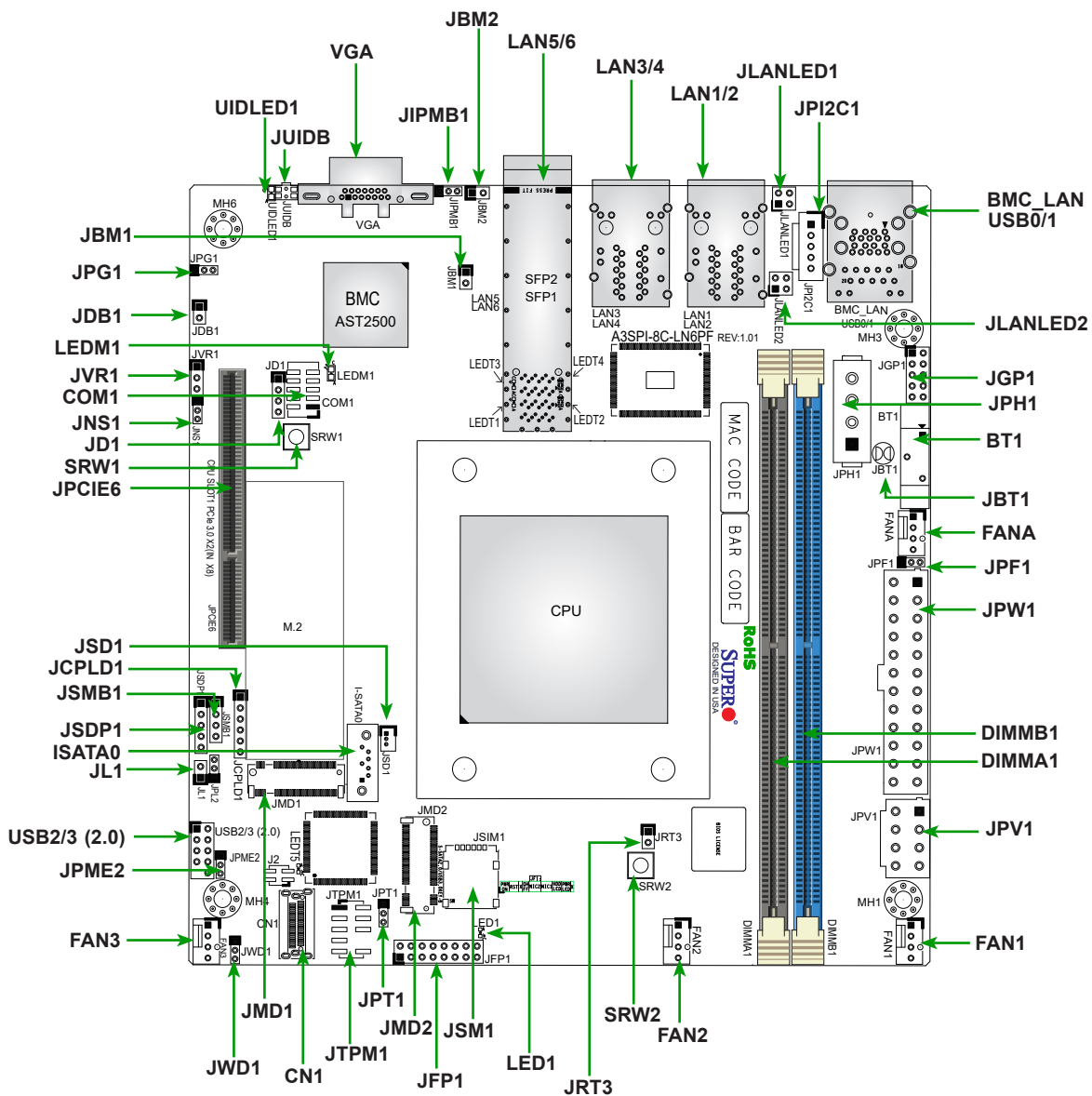
Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JFP1 front panel connections.

- "◾" indicates the location of Pin 1.

- Jumpers/LED indicators not indicated are used for testing only.

- Use only the correct type of onboard CMOS battery as specified by the manufacturer.

Quick Reference Table

Jumper	Description	Default Setting
JBM1	Disable IPMI Shared LAN	Pins 1-2 Open: Enable
JBM2	Disable IPMI Dedicated LAN	Pins 1-2 Open: Enable
JBT1	CMOS Clear	Open: Normal
JDB1	COM Port or BMC Debug Port Select	Open: COM PORT
JNS1	OCuLink to SATA or PCIe Mode Selection	Pins 1-2: SATA (Default) Pins 2-3: NVMe
JPF1	ATX or Force PS-ON Mode	Pins 1-2: ATX Mode Pins 2-3: Force PS-ON Mode
JPG1	Onboard VGA Enable/Disable	Pins 1-2: Enabled (Default) Pins 2-3: Disable VGA
JPME2	ME Manufacturing Mode	Pins 1-2: Normal
JPT1	Onboard TPM Enable/Disable	Pins 1-2: Enabled
JWD1	Watch Dog	Pins 1-2: Reset

LED	Description	Status
LED1	Power LED	Solid Green: Power On
LEDM1	BMC Heartbeat	Blinking Green: BMC Normal
UIDLED1	UID LED	Solid Blue: Unit Identified

Connector	Description
CN1	OCuLink Connector (to PCIe x4/SATA or NVMe)
BMC_LAN	BMC LAN Port
BT1	Onboard Battery
COM1	COM Header
FAN1/2/3, FANA	System Fan Headers
I-SATA0	SATA 3.0 Port (I-SATA0: SuperDOM)
JCPLD1	Complex-Programmable Logical Device (CPLD) header
JD1	Speaker Header
JFP1	Front Control Panel Header
JGP1	General Purpose I/O Header
JIPMB1	System Management Bus Header (for IPMI card)
JL1	Chassis Intrusion Header
JLANLED1	LAN1/LAN2 Activity LED Header (LN6PF) LAN3/LAN4 Activity LED Header (HLN4F) (LAN1 and LAN2 Activity LED for HLN4F goes to JFP1)
JLANLED2	LAN3/LAN4 Activity LED Header (LN6PF)
JMD1	M.2 Slot (PCIe 3.0 x4, M-Key 2280) (For 4C SKU with C5315 CPU, only M.2 or OCuLink is available)
JMD2	M.2 Slot (PCIe 3.0 x2 / USB 3.0 / SATA3, B-Key 3052) (*SATA mux with I-SATA0)
JPCIE6	PCIe 3.0 x2 (IN x8)

Connector	Description
JPH1	4-pin HDD and NVMe HDD Power Connector
JPI²C1	Power Supply SMBus I²C Header (if the power supply has the PMbus 1x5 (male) pin)
JPV1	8-pin 12V DC Power Connector
JPW1	24-pin ATX Power Connector
JRT3	Thermal Diode Header
JSD1	SATA DOM Power Connector
JSDP1	Software Defined Pins
JSIM1	Nano SIM Card Slot
JSMB1	System Management Bus Header
JTPM1	Trusted Platform Module (TPM)/Port80 Header
JUIDB	UID Switch
JVR1	VRM Programming Header (Manufacturing Use Only)
LAN1–LAN4	Gigabit Ethernet RJ45 Ports
LAN5–LAN6	SFP LAN Ports (LAN5: SFP1, LAN6: SFP2)
SRW1, SRW2	M.2 Mounting Screws
USB0/1	Back Panel USB 3.0 Ports
USB2/3	USB 2.0 Headers
VGA	VGA Port

Motherboard Features

Motherboard Features
CPU
• Intel Atom SoC C5000 series processor (FCBGA2106)
Memory
• Supports up to 128GB of DDR4 ECC RDIMM memory with speeds of up to 2400 MT/s for 4C SKU and 2933 MT/S for 8C SKU
DIMM Size
• 4GB, 8GB, 16GB, 32GB, 64GB
Expansion Slots
• One PCIe 3.0 x2 (IN x8) • One M.2 (PCIe 3.0 x2 / USB 3.0 / SATA3, B-Key 3052) • One M.2 (PCIe 3.0 x4, M-Key 2280) • One OCuLink supports PCIe x4/SATA/NVMe
Network
• Quad Gigabit Ethernet LAN Ports with RJ45 • Dual 10G SFP Ports (LN6PF)
Baseboard Management Controller (BMC)
• ASPEED AST2500 BMC
Graphics
• VGA support via ASPEED AST2500 BMC
I/O Devices
• COM Header   • One COM Header (COM1) • SATA Port   • One SATA 3.0 (I-SATA0) • PMBus Header   • One SMBus header
Peripheral Devices
• Two USB 3.0 ports on the rear I/O panel (USB0/1) • Two USB 2.0 ports via headers (USB2/3)
BIOS
• 256Mb SPI AMI BIOS® • ACPI 3.0 or later, SMBIOS 2.7 or later, PCI F/W 3.0, BIOS rescue hot-key, Real Time Clock (RTC) wakeup, UEFI BIOS
Operating System
• Linux (RHEL 8.3 and Kernel 4.18.0-240 or above)

Note: The table above is continued on the next page.

Motherboard Features
Power Management
• ACPI power management
• S4, S5
• Power button override mechanism
• Power-on mode for AC power recovery
• TXE Management Engine
• RTC Battery (typical voltage: 3.0V, normal discharge capacity: 220mAh)
System Health Monitoring
• Onboard voltage monitoring for +3.3V, +5V, +12V, 3.3V standby, VCPU (PVCCIN), Vmem, 5V standby, VBAT, PVPP, P1V2_AUX_BMC, P1V15_AUX_BMC
• CPU switching phase voltage regulator
• CPU thermal trip support
Fan Control
• 4-pin fan headers
• Dual Zone Fan Control
System Management
• Trusted Platform Module (TPM) 2.0 support
• SuperDoctor® 5, Watch Dog, RoHS
LED Indicators
• Power LED
• UID LED
• BMC Heartbeat LED
• LAN LEDs
Mechanical Specification
• Mini ITX, Dimensions: 6.7" (L) x 7.1" (W) (170.18mm x 180.34mm)
Environment
• Operating Temperature Range: 0°C - 60°C

Note: The CPU maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

Figure 1-4.
System Block Diagram
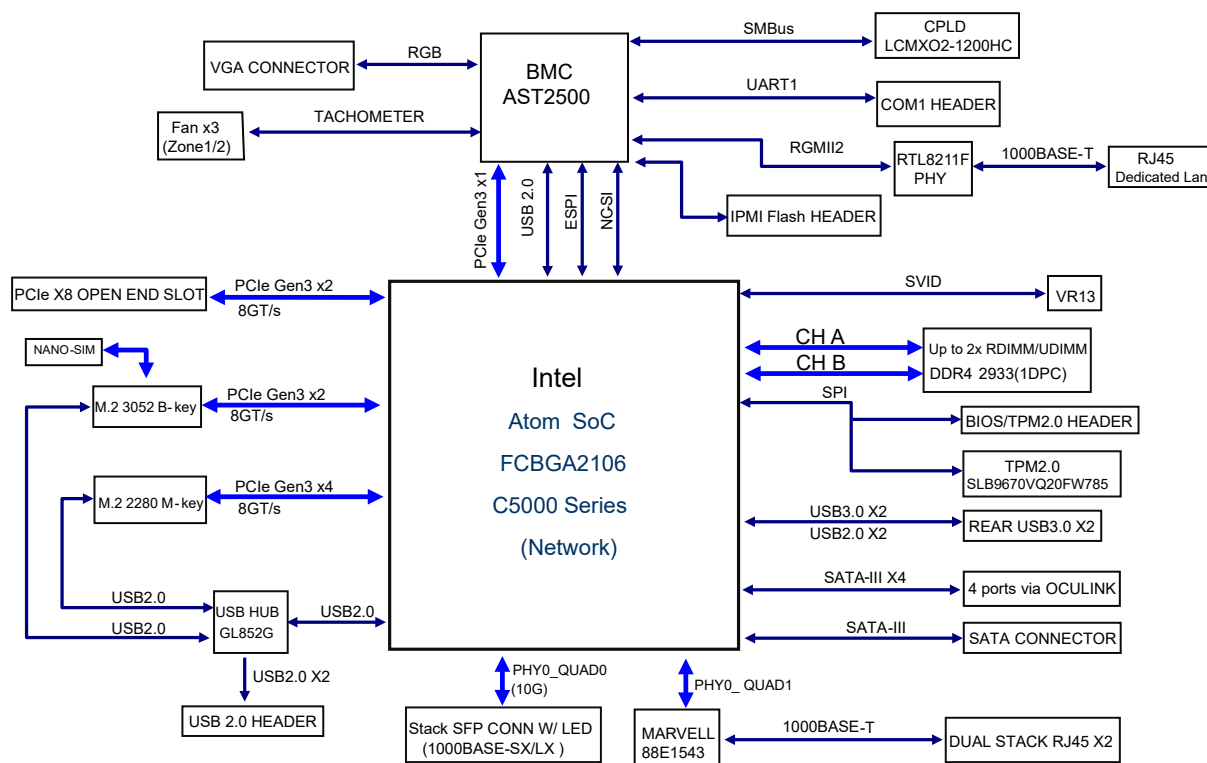
> **Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

1.2 Processor Overview

Built upon the functionality and capability of the Intel Atom SoC C5000 series processor, the motherboard offers maximum I/O expandability, energy efficiency, and data reliability in a 10-nm process architecture. It is optimized for next generation of embedded storage solutions, networking applications, or cloud-computing platforms.

The Intel Atom SoC C5000 series processor supports the following features:

- Intel Virtualization Technology for Directed I/O (Intel VT-d)

- Adaptive Thermal Management/Monitoring

- Gen3 SATA ports with transfer rates of up to 6Gb/s

- System Management Bus (SMBus) Specification, Version 2.0

- M.2 slot with B-Key 3052 and M-Key 2280 modules

- TPM 2.0 (header and onboard)

1.3 Special Features

This section describes the health monitoring features of the motherboard. The motherboard has an onboard System Hardware Monitor chip that supports system health monitoring.

Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on), or for it to automatically return to the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Last State**.

1.4 ACPI Features

The Advanced Configuration and Power Interface (ACPI) specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation.

1.5 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1.6 Serial Port

This motherboard supports one serial communication connection. COM1 can be used for input/output. The UART provides legacy speeds with a baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support high-speed serial communication devices.

1.7 Advanced Power Management

The following new advanced power management features are supported by the motherboard.

Management Engine (ME)

The Management Engine, which is the general purpose controller that resides in the SoC, provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

Chapter 2

Installation

2.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your motherboard, 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 board from the antistatic bag.

- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the motherboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure that your chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

- Use only the correct type of CMOS onboard battery as specified by the manufacturer. Do not install the CMOS battery upside down, which may result in a possible explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the motherboard, make sure that the person handling it is static protected.

2.2 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly.
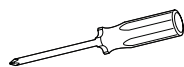
Phillips Screwdriver (1)   **Phillips Screws (4)**   **Standoffs (4) Only if Needed**

Tools Needed
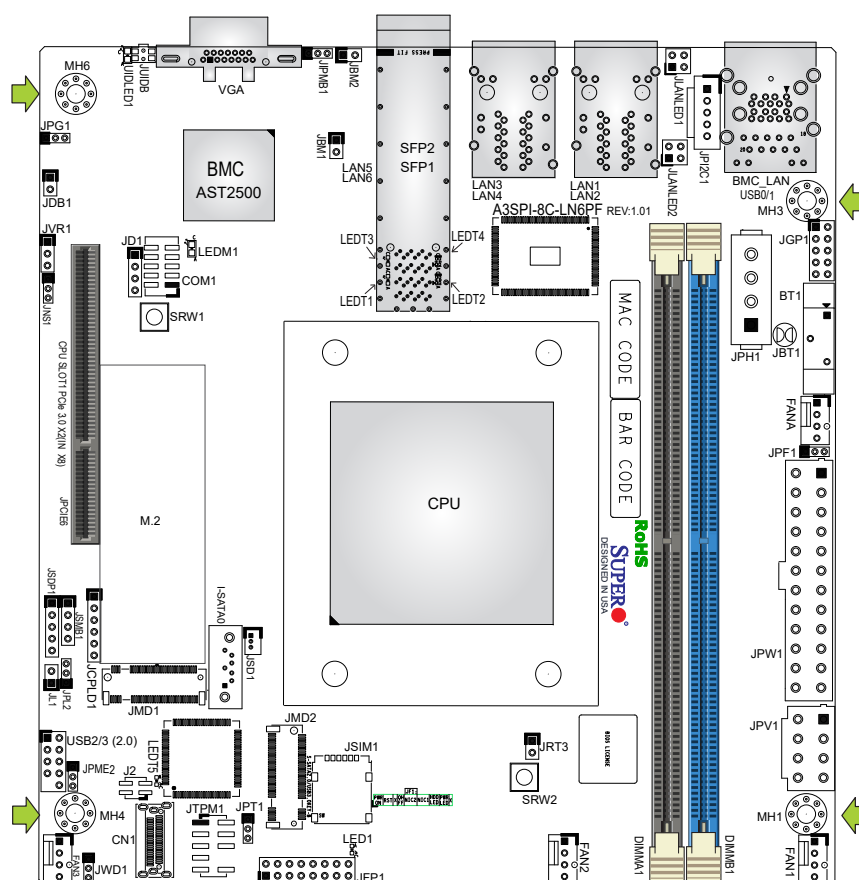
Location of Mounting Holes

Notes: 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

Installing the Motherboard

1. Locate the mounting holes on the motherboard. See the previous page for the location.
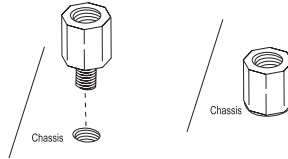
2. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
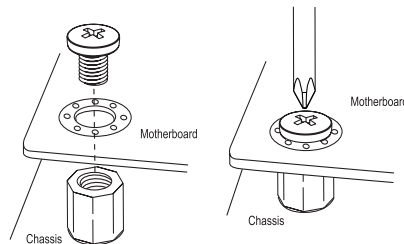
3. Install standoffs in the chassis as needed.

4. Install the motherboard into the chassis carefully to avoid damaging other motherboard components.

5. Using the Phillips screwdriver, insert a Phillips head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.

6. Repeat Step 5 to insert #6 screws into all mounting holes.

7. Make sure that the motherboard is securely placed in the chassis.

   Note: Images displayed are for illustration only. Your chassis or components might look different from those shown in this manual.

2.3 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

Important: Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

The A3SPI-4C/8C-LN6PF/HLN4F motherboard supports up to 128GB of DDR4 ECC RDIMM with speeds of up to 2933 MT/s in two DIMM slots.

Recommended Population (Balanced)		
DIMMA1	DIMMB1	Total System Memory
4GB	4GB	8GB
8GB	8GB	16GB
16GB	16GB	32GB
32GB	32GB	64GB
64GB	64GB	128GB

General Guidelines for Optimizing Memory Performance

• The blue slot must be populated first.

• It is recommended to use DDR4 memory of the same type, size, and speed.

• Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.

• The motherboard will support odd-numbered modules. However, to achieve the best memory performance, a balanced memory population is recommended.
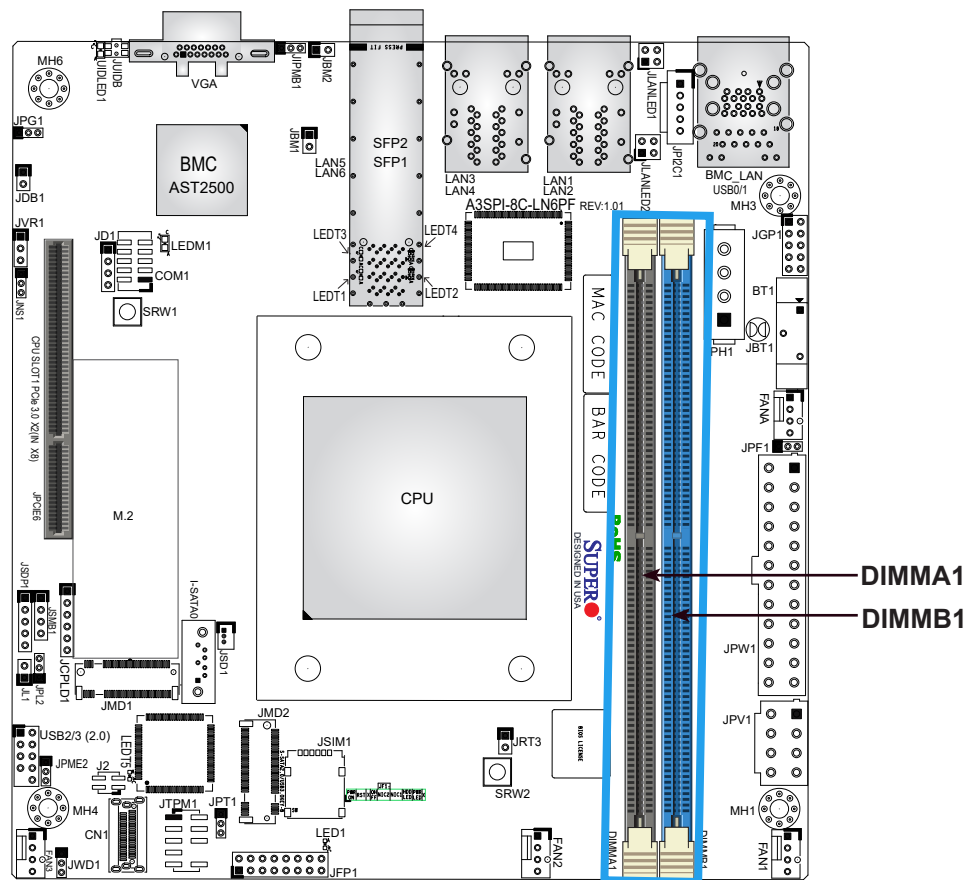
DIMM Installation

1. Insert DIMM modules in the following order: DIMMA1, DIMMB1. For the system to work properly, please use memory modules of the same type and speed.

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

3. Align the key of the DIMM module with the receptive point on the memory slot.

4. Align the notches on both ends of the module against the receptive points on the ends of the slot.

5. Push both ends of the module straight down into the slot until the module snaps into place.

6. Press the release tabs to the lock positions to secure the DIMM module into the slot.
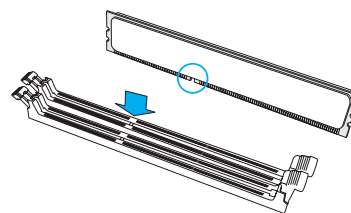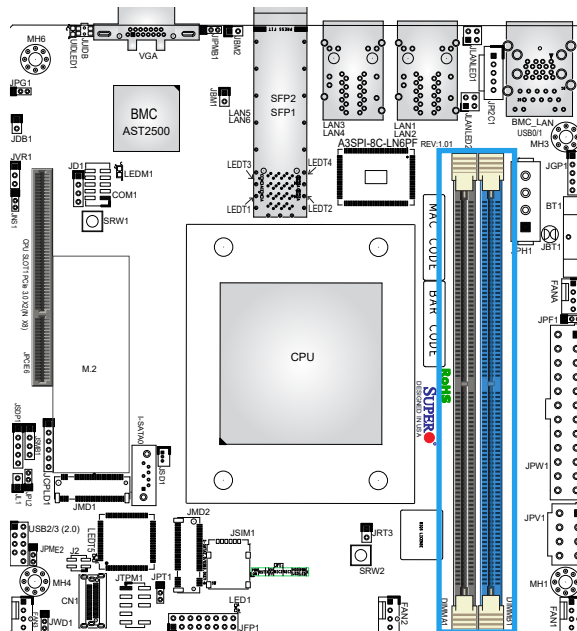
DIMM Removal

Press both release tabs on the ends of the DIMM module to unlock it. Once the DIMM module is loosened, remove it from the memory slot.

Notches

Release Tabs

Push both ends straight down into the memory slot.
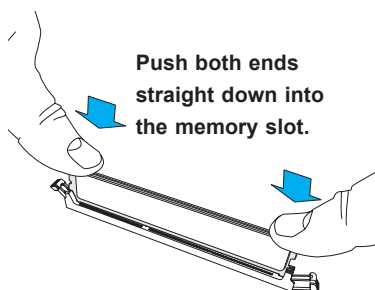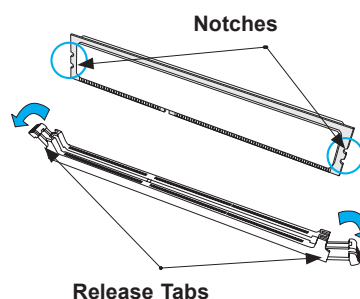
2.4 Rear I/O Ports

See Figure 2-1 below for the locations and descriptions of the various I/O ports on the rear of the motherboard.
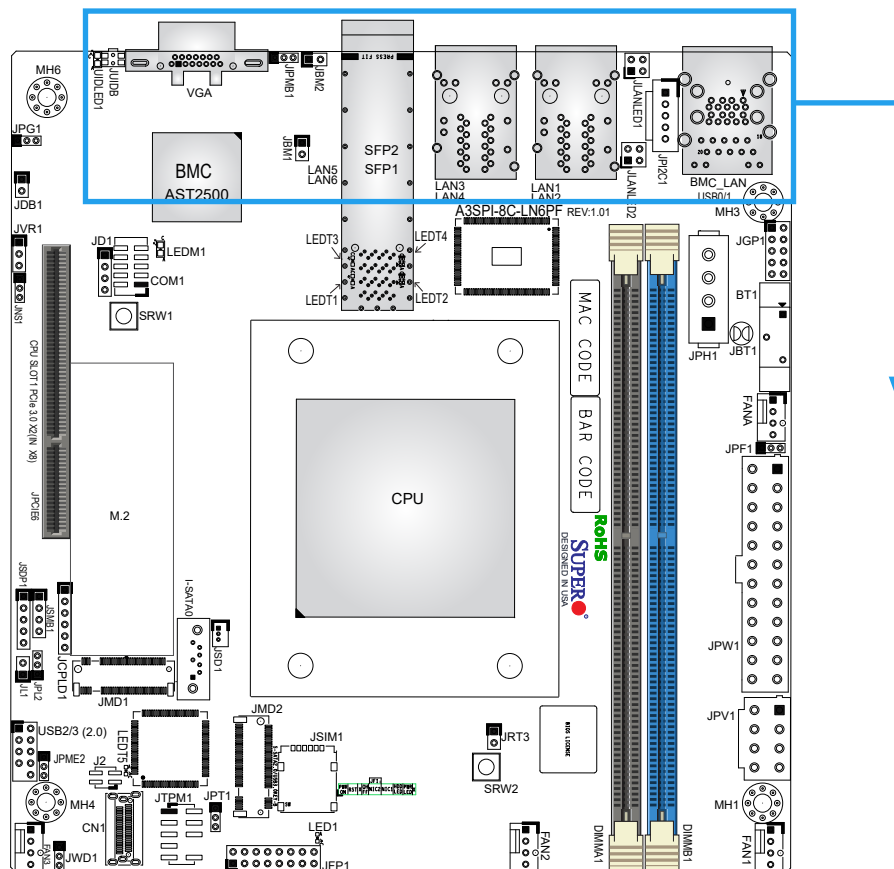
Figure 2-1. I/O Port Locations and Definitions
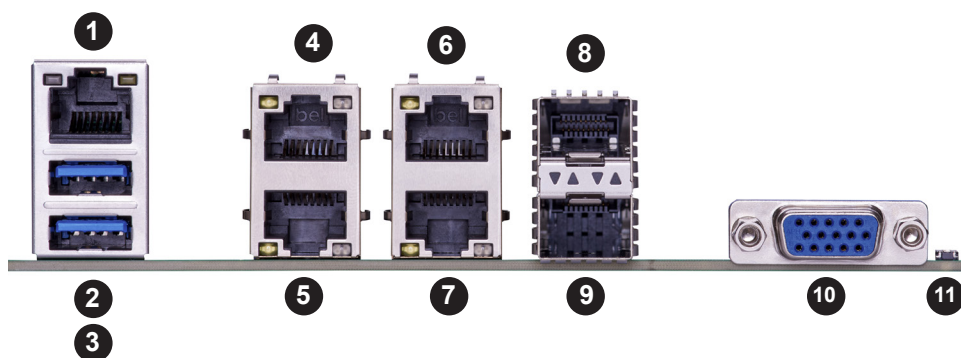
Rear I/O Ports					
#	Description	#	Description	#	Description
1	BMC_LAN	5	LAN1 (Share NIC)	9	LAN5 (LN6PF)
2	USB1	6	LAN4	10	VGA
3	USB0	7	LAN3	11	UID Switch
4	LAN2	8	LAN6 (LN6PF)		

VGA Port

A video (VGA) port is located on the I/O back panel. Refer to the board layout below for the location.

Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED Indicator are located on the motherboard. The UID switch is located at JUIDB1 on the back panel. The UID LED (UIDLED1) is located next to the UID switch. When you press the UID switch, the UID LED will be turned on. Press the UID switch again to turn off the LED indicator. The UID Indicator provides easy identification of a system unit that may be in need of service.

> **Note:** UID can also be triggered via IPMI on the motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our website at https://www.supermicro.com/support/manuals/.

UID Switch Pin Definitions	
Pin#	**Definition**
1	Ground
2	Ground
3	Button In
4	Button In

UID LED Pin Definitions	
Color	**Status**
Blue: On	Unit Identified
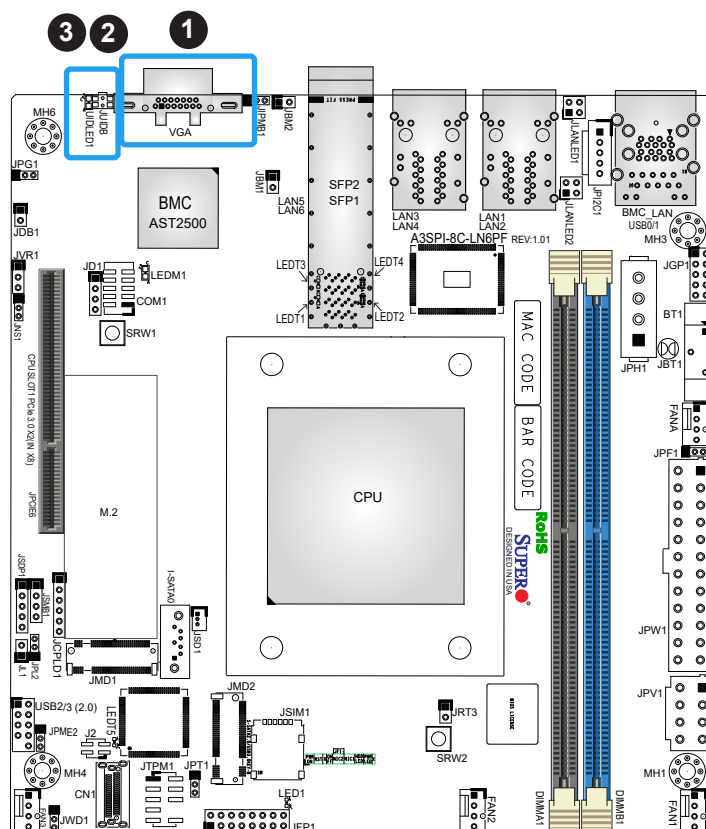
1. VGA Port
2. UID Switch
3. UID LED

LAN Ports

There are six LAN ports on the -LN6PF motherboard and four LAN ports on the -HLN4F motherboard. The -LN6PF supports four RJ45 connectors on LAN1–LAN4 and two SFP connectors on LAN5–LAN6. The -HLN4F supports four RJ45 connectors on LAN1–LAN4. The motherboard also offers a BMC LAN port.

Top LAN Port Pin Definition			
Pin#	Definition	Pin#	Definition
B1	TRD0-	B11	YEL+
B2	TRD0+	B12	YEL-
B3	TRD1-	B13	GRE+/ORG-
B4	TRD1+	B14	GRE-/ORG+
B5	TRD2-		
B6	TRD2+		
B7	TRD3-		
B8	TRD3+		
B9	COMMCT		
B10	GND		

Bottom LAN Port Pin Definition			
Pin#	Definition	Pin#	Definition
A1	TRD0-	A11	YEL+
A2	TRD0+	A12	YEL-
A3	TRD1-	A13	GRE+/ORG-
A4	TRD1+	A14	GRE-/ORG+
A5	TRD2-	A15	CG1
A6	TRD2+	A16	CG2
A7	TRD3-	A17	CG3
A8	TRD3+	A18	CG4
A9	COMMCT		
A10	GND		

BMC LAN Pin Definition			
Pin#	Definition	Pin#	Definition
20	TX1+	31	YEL+
21	TX1-	32	YEL-
22	TX2+	29	ORG-/GRN+
23	TX2-	30	ORG+/GRN-
24	TX3+	37	CG5
25	TX3-	38	CG6
26	TX4+	39	CG7
27	TX4-	40	CG8
19	VCC		
28	GND		
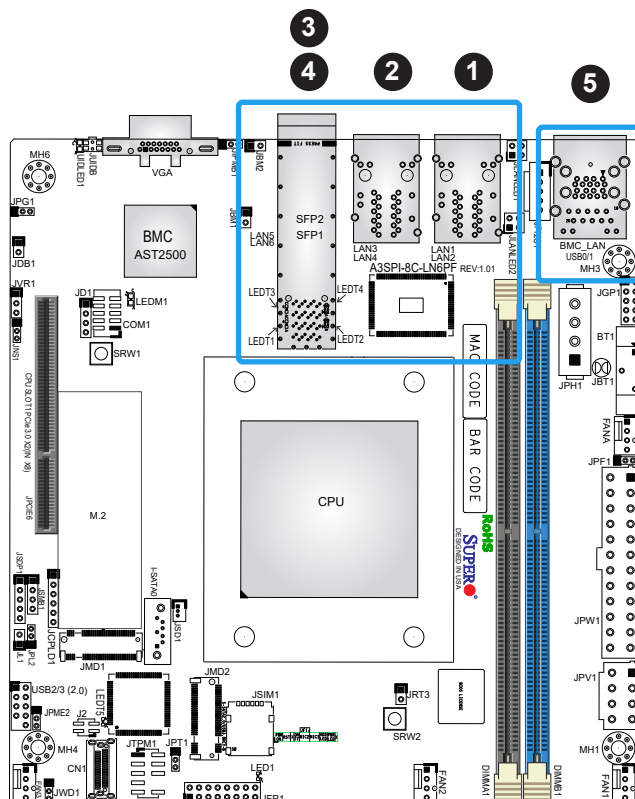
1. LAN1/LAN2
2. LAN3/LAN4
3. LAN5 (SFP1)
4. LAN6 (SFP2)
5. BMC LAN

Universal Serial Bus (USB) Ports

There are two USB 3.0 ports (USB0/1) on the I/O back panel. The motherboard also has one USB 2.0 header that provides two USB connections (USB2/3). The onboard USB header can be used to provide front side USB access with a cable.

Back Panel USB 3.0 (USB0/1) Pin Definitions			
Pin#	Definition	Pin#	Definition
14	STDA_SSRX2N	10	VBUS
15	STDA_SSRX2P	11	D2-N
16	GND_DRAIN	12	D2-P
17	STDA_SSTX2N	13	Ground
18	STDA_SSTX2P		
5	STDA_SSRX1N	1	VBUS1
6	STDA_SSRX1P	2	D1N
7	GND_DRAIN	3	D1P
8	STDA_SSTX1M	4	GND
9	STDA_SSTX1P	33	CG1
		34	CG2
		35	CG3
		36	CG4

Front Panel USB 2.0 (USB2/3) Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	USB_PWR	2	USB_PWR
3	USB_CON_N3	4	USB_CON_N4
5	USB_CON_P3	6	USB_CON_P4
7	GND	8	GND
9		10	GND
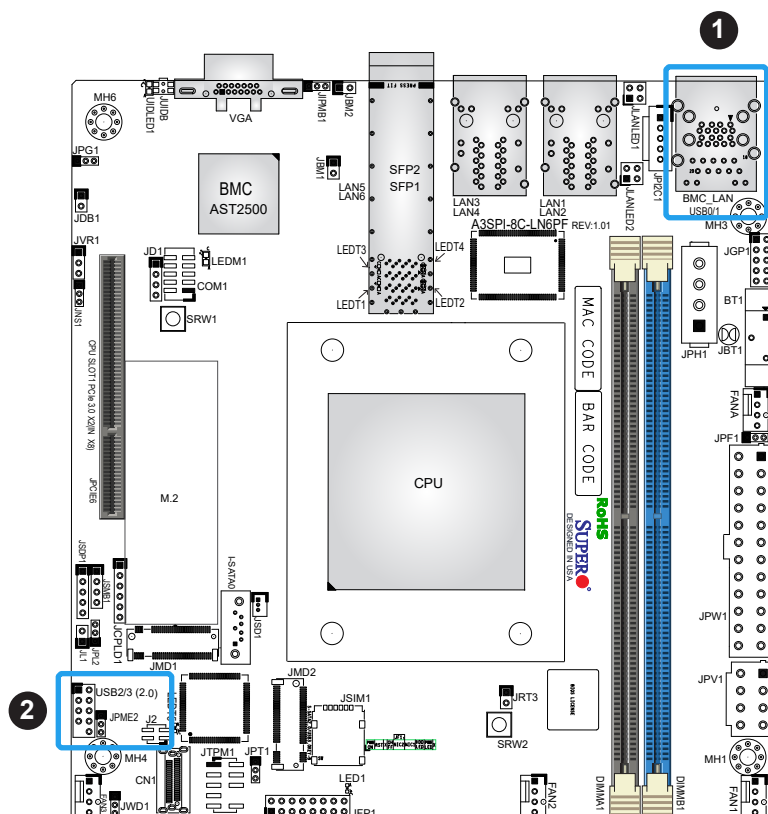
1. USB0/1
2. USB2/3

2.5 Front Control Panel

JFP1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.
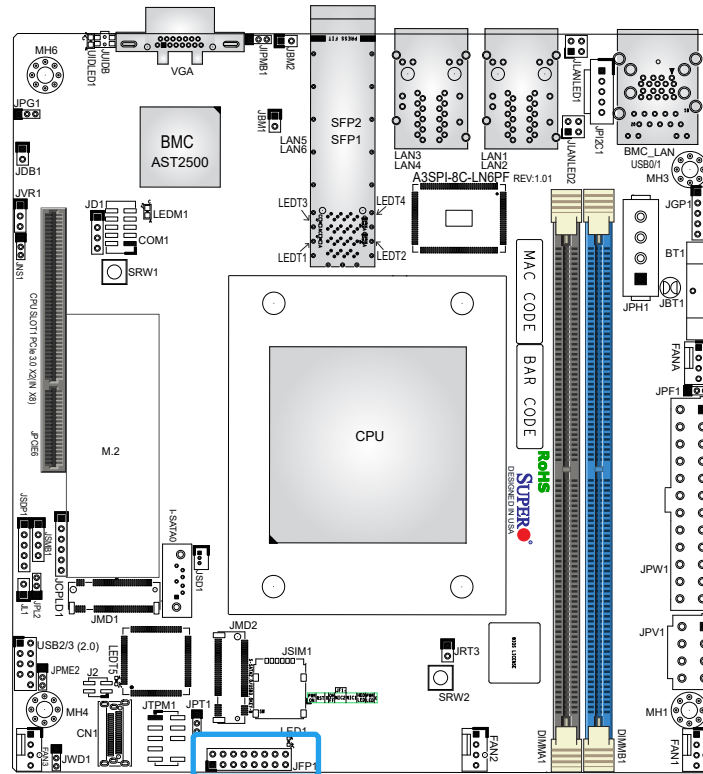
Figure 2-2. JFP1 Header Pins

	1	2	
Power Button	○	○	**Ground**
Reset Button	○	○	**Ground**
X	○	○	**X**
3.3V	○	○	**OH/Fan Fail LED**
3.3V Stby	○	○	**NIC2 Active LED**
3.3V Stby	○	○	**NIC1 Active LED**
3.3V	○	○	**HDD LED**
3.3V Stby	○	○	**PWR LED**
	15	16	

Power Button

The Power Button connection is located on pins 1 and 2 of JFP1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS–see Chapter 4). To turn off the power in the suspend mode, press the button for at least 4 seconds. See the table below for pin definitions.

Power Button Pin Definitions (JFP1)	
Pin#	Definition
1	Power Button
2	GND

Reset Button

The Reset Button connection is located on pins 3 and 4 of JFP1. Attach it to a hardware reset switch on the computer case to reset the system. See the table below for pin definitions.

Reset Button Pin Definitions (JFP1)	
Pin#	Definition
3	Reset
4	Ground

1. Power Button

2. Reset Button

	1	2	
1 Power Button	○	○	Ground
2 Reset Button	○	○	Ground
X	○	○	X
3.3V	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
3.3V	○	○	HDD LED
3.3V Stby	○	○	PWR LED
	15	16	

Overheat (OH)/Fan Fail

Connect an LED cable to pins 7 and 8 of the Front Control Panel to use the Overheat/Fan Fail LED connections. The LED on pin 8 provides warnings of overheating or fan failure. Refer to the tables below for pin definitions.

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

OH/Fan Fail LED Pin Definitions (JFP1)	
Pin#	Definition
7	3.3V
8	OH/Fan Fail LED

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JFP1, and LAN port 2 is on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table below for pin definitions.

NIC1/NIC2 LED Pin Definitions (JFP1)	
Pin#	Definition
9	3.3V Stby
10	NIC 2 Link LED
11	3.3V Stby
12	NIC 1 Link LED

1. Overheat/Fan Fail
2. NIC1 LED
3. NIC2 LED

	1	2	
Power Button	○	○	Ground
Reset Button	○	○	Ground
X	○	○	X
3.3V	○	○	OH/Fan Fail LED ①
3.3V Stby	○	○	NIC2 Active LED ③
3.3V Stby	○	○	NIC1 Active LED ②
3.3V	○	○	HDD LED
3.3V Stby	○	○	PWR LED
	15	16	

HDD LED

The HDD LED connection is located on pins 13 and 14 of JFP1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

HDD LED Pin Definitions (JFP1)	
Pins	**Definition**
13	3.3V
14	HDD Active

Power LED

The Power LED connection is located on pins 15 and 16 of JFP1. Refer to the table below for pin definitions.

Power LED Pin Definitions (JFP1)	
Pins	**Definition**
15	3.3 Stby
16	PWR LED

1. HDD LED

2. Power LED

	1	2	
Power Button	○	○	**Ground**
Reset Button	○	○	**Ground**
X	○	○	**X**
3.3V	○	○	**OH/Fan Fail LED**
3.3V Stby	○	○	**NIC2 Active LED**
3.3V Stby	○	○	**NIC1 Active LED**
3.3V	○	○	**HDD LED** ❶
3.3V Stby	○	○	**PWR LED** ❷
	15	16	

2.6 Connectors

Power Connections

ATX Power Supply Connector

The 24-pin power supply connector (JPW1) meets the ATX SSI EPS 24-pin specification.

ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin#	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	Ground	3	Ground
16	PS_ON	4	+5V
17	Ground	5	Ground
18	Ground	6	+5V
19	Ground	7	Ground
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	Ground	12	+3.3V
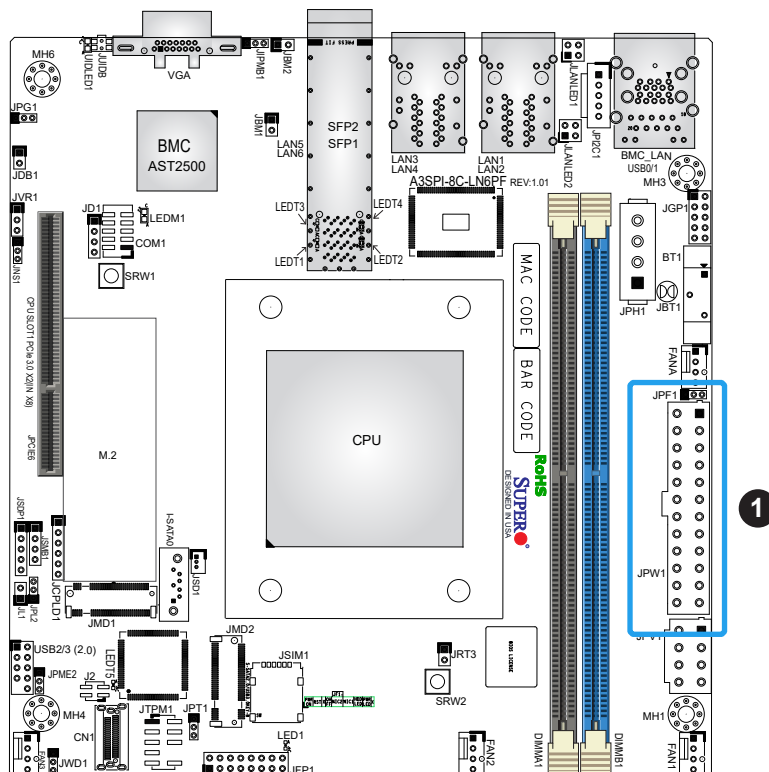
1. 24-pin ATX Power

HDD Power Connector

The 4-pin HDD power connector JPH1 provides power to onboard HDD devices. See the table below for pin definitions.

4-pin HDD Power Pin Definitions	
Pin#	**Definition**
1	12V
2	Ground
3	Ground
4	5V

8-pin 12V Power Connector

JPV1 is a 8-pin 12V DC power input for alternative single power source for special enclosure when 24-pin ATX power is not in use. See the table below for pin definitions.

8-pin 12V Power Pin Definitions	
Pins	**Definition**
1-4	Ground
5-8	+12V
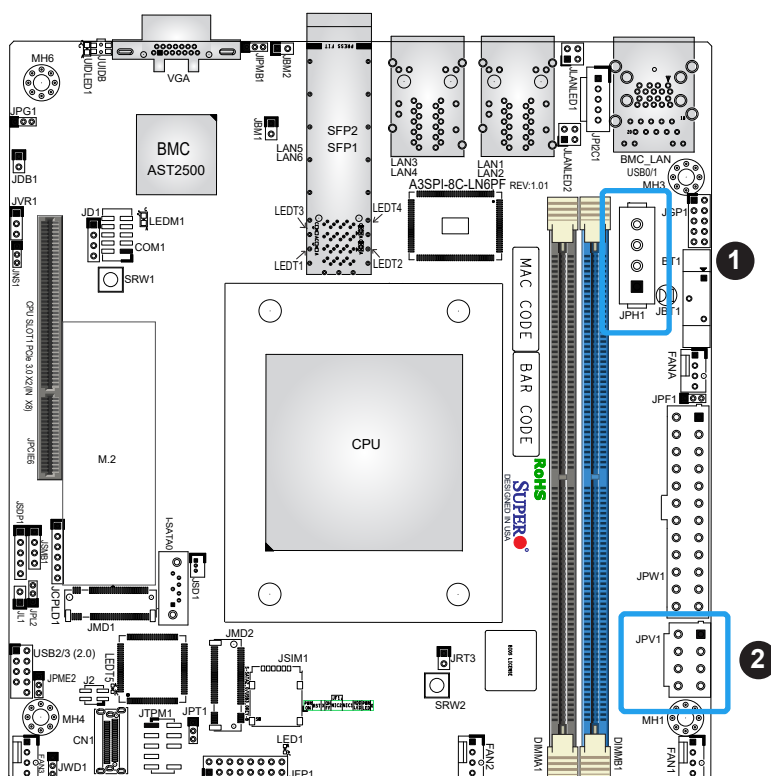
1. 4-pin HDD Power
2. 8-pin 12V Power

Headers

Fan Headers

There are four 4-pin fan headers on the motherboard. These 4-pin fans are backward compatible with traditional 3-pin fans. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) in the BIOS. When using the Thermal Management setting, please use all 3-pin fans or all 4-pin fans.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Software Defined Pins

Software Defined Pins (JSDP1) can be used to connect to auxiliary devices, enable or disable devices, and for other miscellaneous hardware or software-control purposes. These pins can be individually configured to act as either standard inputs, General-Purpose Interrupt (GPI) inputs or output pins, as well as the default value of all pins configured as outputs. See the table below for the pin definitions.

JSDP1 Header Pin Definitions	
Pin#	Definition
1	B_SDP2_0
2	B_SDP2_1
3	B_SDP2_2
4	B_SDP2_3
5	GND
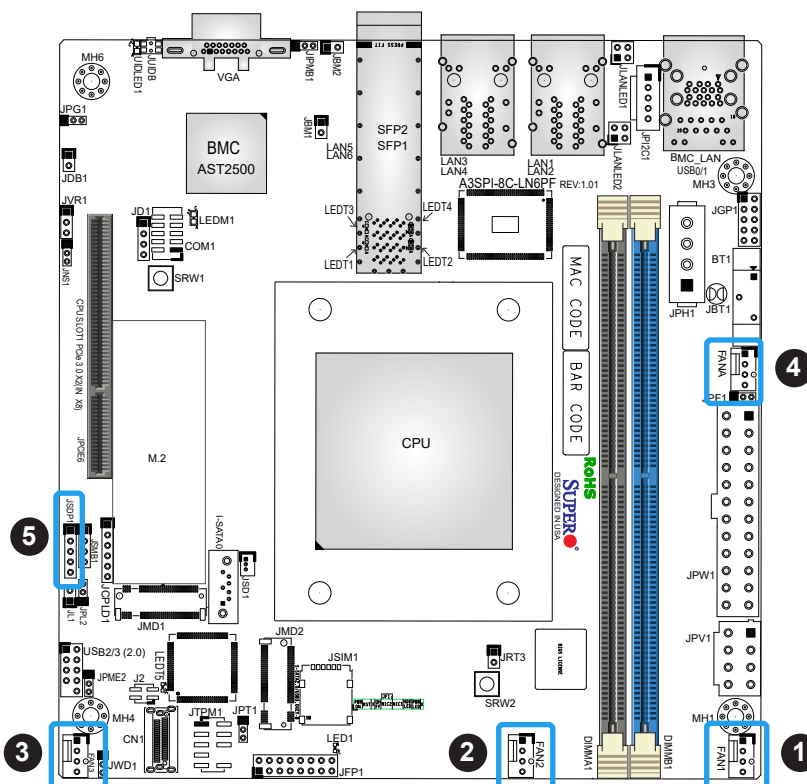
1. FAN1
2. FAN2
3. FAN3
4. FANA
5. JSDP1

OCuLink Connector

The motherboard features one internal OCuLink connector (CN1) for high-performance storage connectivity via the NVMe interface or for additional SATA storage.

Depending on the setting via jumper JNS1, the OCuLink connector can be utilized as PCIe x4/SATA ports or a single U.2 NVMe port. NVMe provides lower data latency for increased efficiency and storage performance.

System Management Bus Header

A System Management Bus header for additional slave devices or sensors is located at JSMB1 on the bottom side of the motherboard. See the table below for pin definitions.

SMBus Header Pin Definitions	
Pin#	Definition
1	SMB_DATA
2	GND
3	SMB_CLK

1. OCuLink Connector
2. SMBus Header
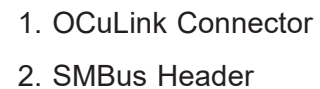
COM Header

The motherboard has one COM header (COM1) that provides serial connections and supports RS-232 COM connections. Refer to the table below for pin definitions.

COM Port Pin Definitions			
Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

Thermal Diode Headers

JRT3 is the thermal diode header. This header that provides additional system temperature monitoring.

Thermal Diode Header Pin Definitions	
Pin#	Definition
1	TD1_P
2	TD1_N
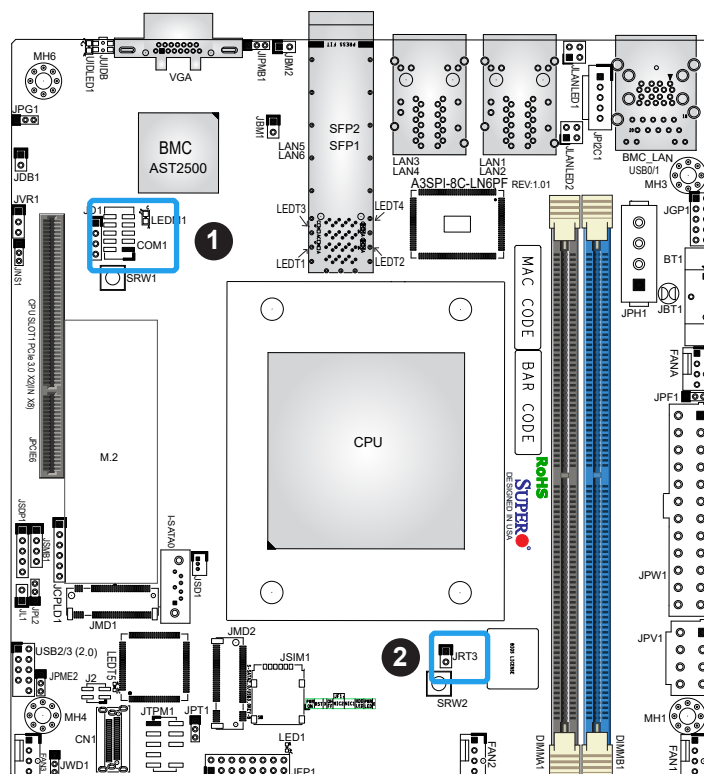
1. COM Header

2. Thermal Diode Header

TPM/Port 80 Header

A Trusted Platform Module (TPM)/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. Please go to the following link for more information on the TPM: http://www.supermicro.com/manuals/other/TPM.pdf.

Trusted Platform Module/Port80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	3.3V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK#	6	GND
7	SPI_MOSI	8	NC
9	+3.3V Stdby	10	SPI_IRQ#

1. TPM Header
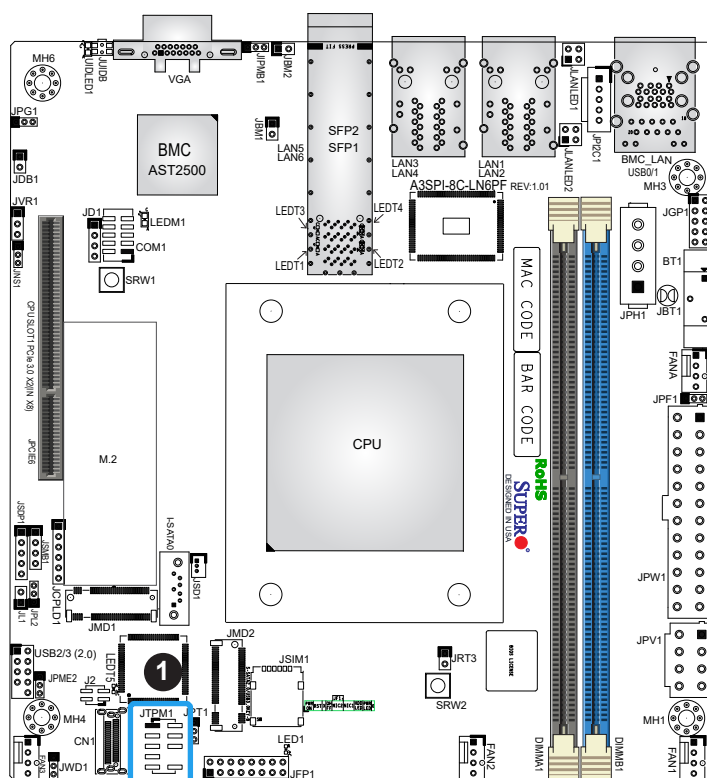
General Purpose I/O Header

The JGP1 (General Purpose Input/Output) header is a general purpose I/O expander on a pin header via the SMBus. Each pin can be configured to be an input pin or output pin in 2.54mm pitch. The GPIO is controlled via the PCA9554APW 8-bit GPIO expansion from PCH SMBus. The base address is 0xEFA0. The expander slave address is 0x70 for WRITE and 0x71 for READ. See the table below for pin definitions.

JGP1 Header Pin Definitions	
Pin#	Definition
1	P5V
2	GND
3	JGP1_0
4	JGP1_1
5	JGP1_2
6	JGP1_3
7	JGP1_4
8	JGP1_5
9	JGP1_6
10	JGP1_7
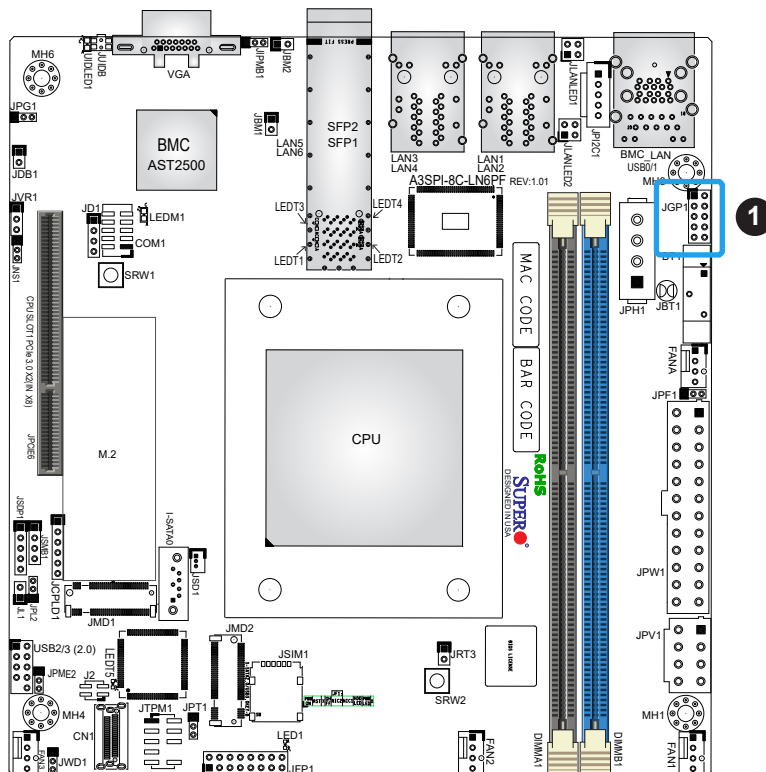
1. General Purpose Header

Disk-On-Module Power Connector

One power connector for SATA DOM (Disk-On-Module) devices is located at JSD1. Connect appropriate cables here to provide power support for your Serial Link DOM devices.

DOM Power Pin Definitions	
Pin#	Definition
1	5V
2	Ground
3	Ground

LAN Port Activity LED

JLANLED1 is the activity LED for LAN1/LAN2 (LN6PF) and LAN3/LAN4 (HLN4F), and JLANLED2 is the activity LED for LAN3/LAN4 (LN6PF).

LAN Activity LED Pin Definitions	
Pin#	Definition
1	3V3 Stby
2	LAN_ACT_N
3	3V3 Stby
4	LAN_ACT_N
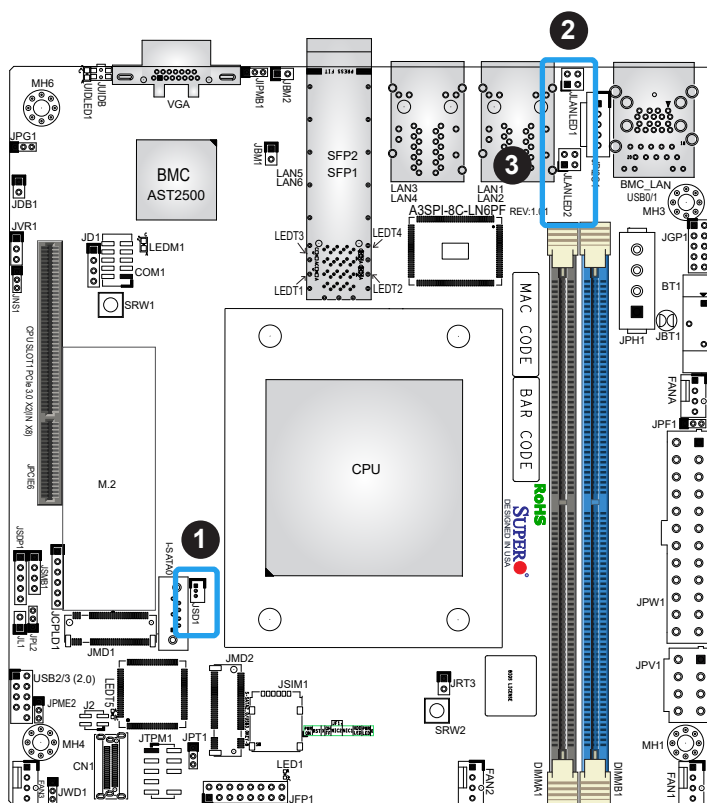
1. SATA DOM Power Connector
2. JLANLED1
3. JLANLED2

M.2 Slots

The motherboard has two M.2 slots (JMD1 and JMD2). M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. JMD1 supports an M-Key PCIe 3.0 x4 device in the 2280 form factor, whereas JMD2 supports a B-Key PCIe 3.0 x2/SATA3.0/USB 3.0 device in the 3052 form factor. The JMD1 pin definition table is on this page and the JMD2 table is on the next page.

1. JMD1

2. JMD2
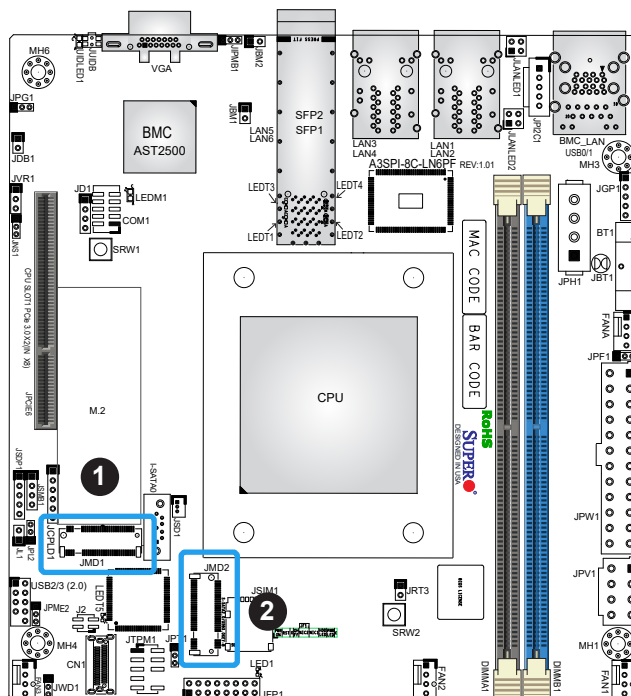
M.2 Slot Pin Definitions (JMD1 M-Key)			
Pin#	Definition	Pin#	Definition
1	GND	2	P3V3_DUAL
3	USB_JMD2_DP	4	P3V3_DUAL
5	USB_JMD2_DN	6	
7	GND	8	
9		10	
11		12	
13		14	
15		16	
17		18	GND
19		20	UART_BT_WAKE_R_N
21		22	
23		24	
25		26	
27		28	
29		30	
31		32	
33	GND	34	
35	PE_PCH_TX_C_P0	36	
37	PE_PCH_TX_C_N0	38	
39	GND	40	
41	PE_M2E_RX_DP	42	
43	PE_M2E_RX_DN	44	M2E_WLAN_COEX3
45	GND	46	M2E_WLAN_COEX2
47	CLK_100M_M2E_DP	48	M2E_WLAN_COEX1
49	CLK_100M_M2E_DN	50	M2E_SUSCLK_R
51	GND	52	PLTRST_M2E_R
53	CLKREQ_M2E_R_N	54	M2E_W_DISABLE2_N_R
55	PE_WAKE_M2E_R_N	56	M2E_W_DISABLE1_N_R
57	GND	58	M2E_I2C_DAT_R
59		60	M2E_I2C_CLK_R
61		62	
63	GND	64	
65		66	
67		68	
69	GND	70	
71		72	P3V3_DUAL
73		74	P3V3_DUAL
75	GND		

M.2 Slot Pin Definitions (JMD2 B-Key)			
Pin#	Definition	Pin#	Definition
1	NC	2	P3V3SB
3	GND	4	P3V3SB
5	GND	6	FULL_CARD_POW-ER_OFF#(PU to P1V8SB only)
7	USB_D+	8	W_DISABLE1#(PU to P3V3SB only)
9	USB_D-	10	NC
11	GND	12	
13		14	
15		16	
17		18	
19		20	NC
21	NC	22	NC
23	WWAN_WAKE_N(PU to P1V8SB only)	24	NC
25	NC	26	RF_KILL_GPS_1P8_N(PU to P1V8SB only)
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	DEVSLP (reserved)
39	GND	40	SMB_CLK (reserved)
41	PERn0/SATARX+	42	SMB_DATA (reserved)
43	PERp0/SATARX-	44	ALERT(PU to P1V8SB only)
45	GND	46	NC
47	PETn0/SATATX-	48	NC
49	PETn0/SATATX+	50	PERST (PLTRST)
51	GND	52	CLK_REQ_N
53	REFCLK-	54	PE_WAKE_N
55	REFCLK+	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	SYSCLK (reserved)
69	PE_DET	70	P3V3SB
71	GND	72	P3V3SB
73	GND	74	P3V3SB
75	NC		

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened. Refer to the table below for pin definitions.

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

Speaker/Buzzer

On the JD1 header, pins 1-4 are for the speaker and pins 3-4 are for the buzzer. If you wish to use an external speaker, connect its cable to pins 1-4.

Speaker Connector Pin Definitions	
Pin #	Definition
1-4	Speaker
3-4	Buzzer
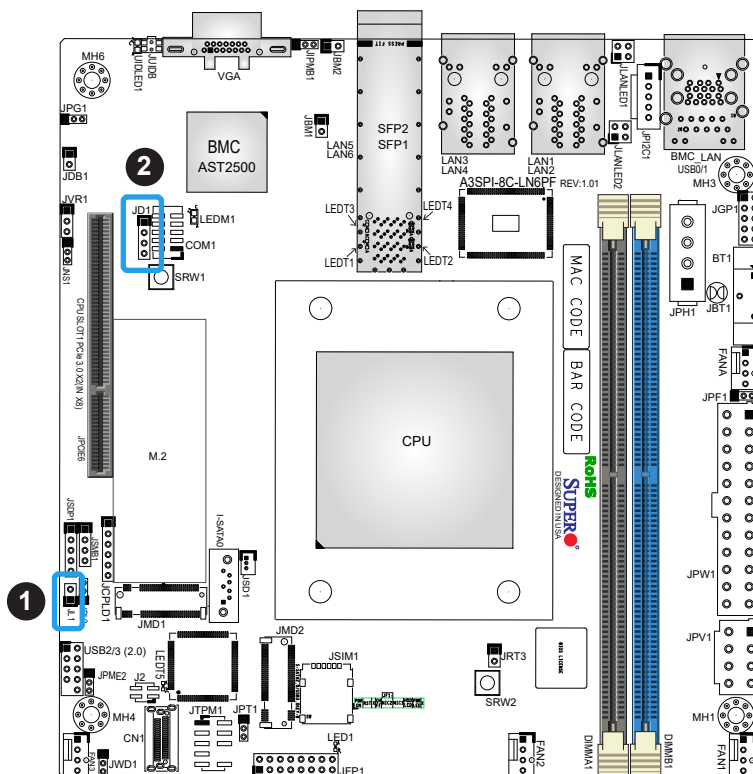
1. Chassis Intrusion
2. Speaker Buzzer

I-SATA 3.0 Port

The motherboard has one I-SATA 3.0 port (I-SATA0). I-SATA0 can be used with Supermicro SuperDOMs that are yellow SATA DOM connectors with power pins built in, and do not require external power cables. Supermicro SuperDOMs are backward compatible with regular SATA HDDs or SATA DOMs that need external power cables.

SATA 3.0 Port Pin Definitions	
Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

Nano SIM Slot

The JSIM1 slot supports a Nano SIM card. Please refer to jumper JP1 for additional settings.
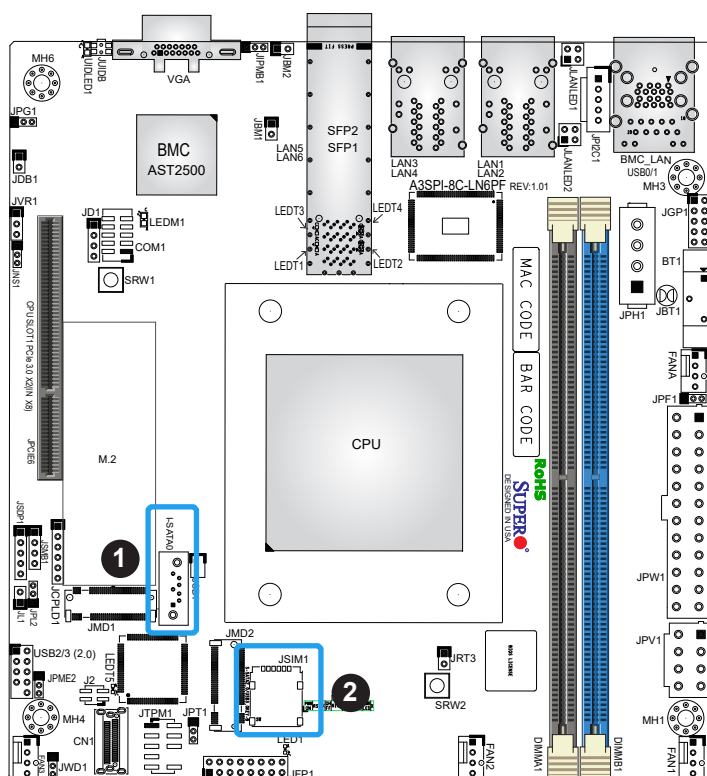
1. I-SATA0
2. Nano SIM Slot

Power SMB (I²C) Header

The Power System Management Bus (I²C) connector (JPI²C1) monitors the power supply, fan, and system temperatures. Refer to the table below for pin definitions.

Power SMB Header Pin Definitions	
Pin#	**Definition**
1	SCL4_BMC
2	SDA4_BMC
3	PWRFAIL_N
4	GND
5	NC

System Management Bus Header

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system. Refer to the table below for pin definitions.

External I²C Header Pin Definitions	
Pin#	**Definition**
1	SDA6_BMC
2	Ground
3	SCL6_BMC
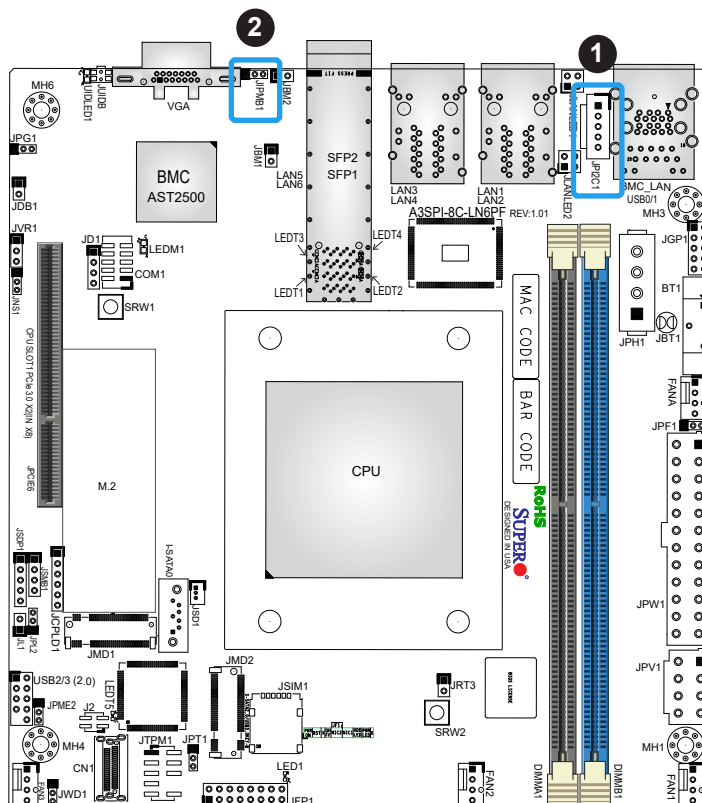
1. Power SMB Header

2. System Management Bus Header

2.7 Jumper Settings

How Jumpers Work

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram below for an example of jumping pins 1 and 2. Refer to the motherboard layout page for jumper locations.

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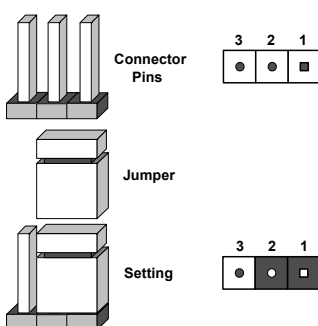
CMOS Clear

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.

Note: Clearing CMOS will also clear all passwords.

JBT1 contact pads
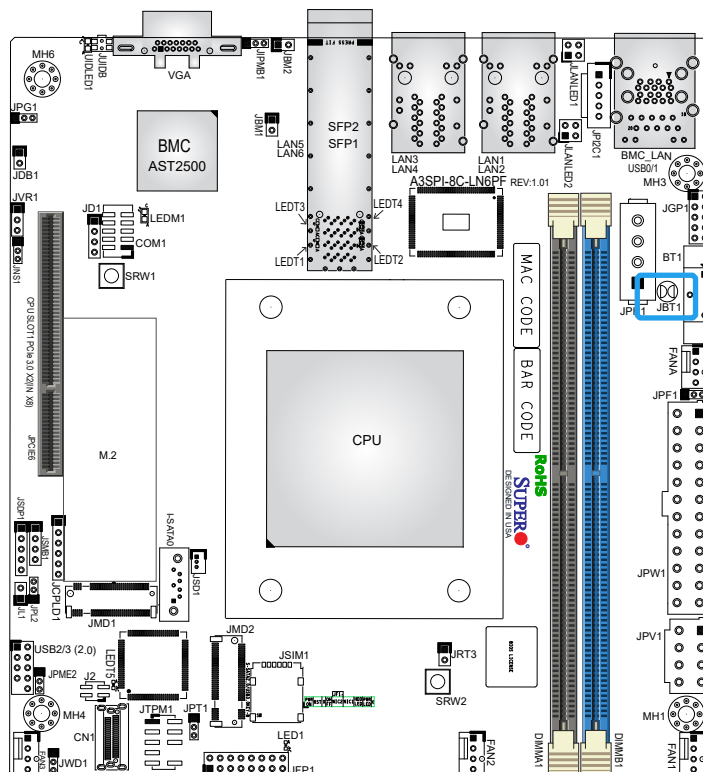
1. CMOS Clear

Onboard TPM Enable/Disable

Use JPT1 to enable or disable support for the onboard TPM 2.0 module. See the table below for jumper settings.

TPM Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enable (Default)
Pins 2-3	Disable

Manufacturing Mode Select

Close JPME2 to bypass SPI flash security and force the system to use the Manufacturing Mode, which will allow you to flash the system firmware from a host server to modify system settings. See the table below for jumper settings.

Manufacturing Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacturing Mode
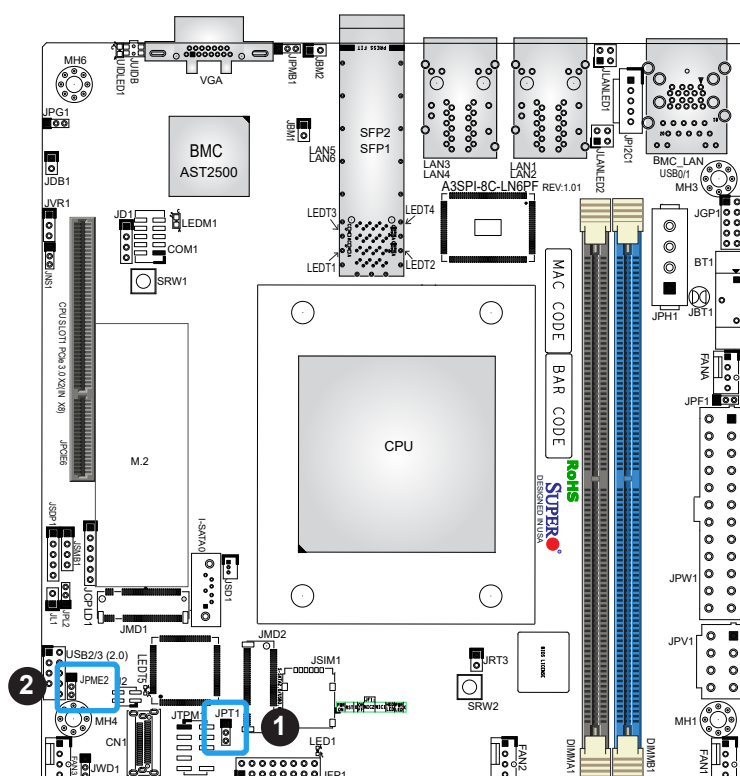
1. TPM Enable

2. Manufacturing Mode

VGA Enable/Disable

Use jumper JPG1 to enable or disable the onboard VGA connector. Refer to the table below for jumper settings.

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

ATX/Force PS-ON Mode Select

Use jumper JPF1 to select ATX or Force PS-ON Mode (default). Refer to the table below for pin definitions.

ATX/Force PS-ON Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	ATX Mode
Pins 2-3	Force PS-ON Mode
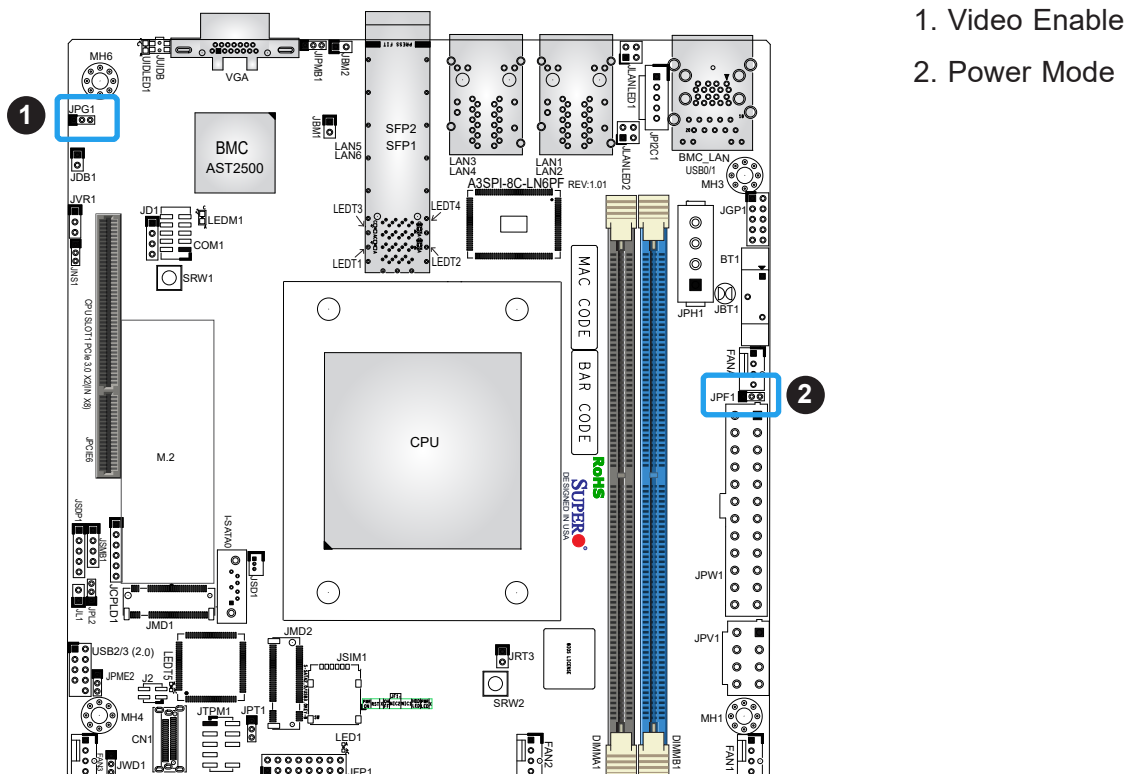
1. Video Enable

2. Power Mode

Watch Dog

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, users need to 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
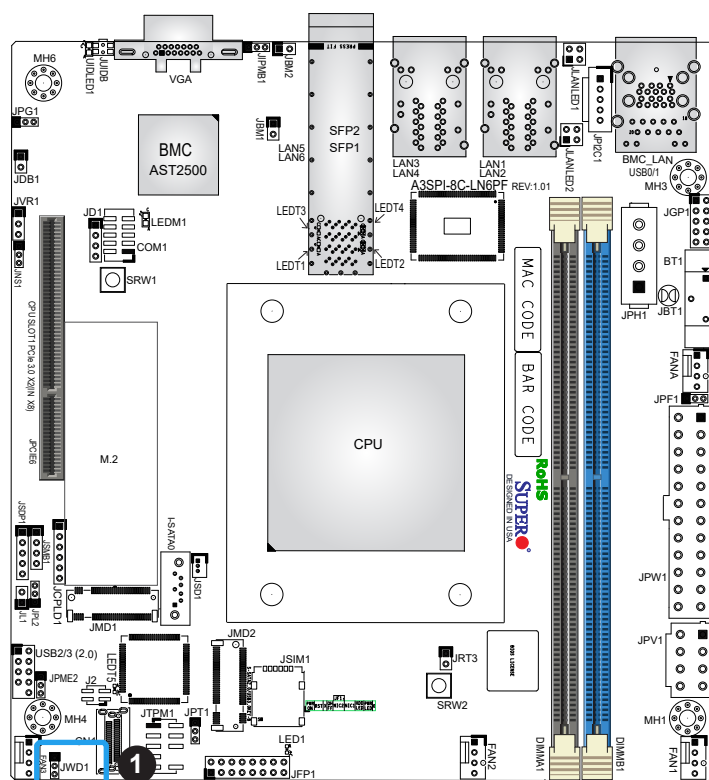
1. Watch Dog

IPMI Shared LAN Enable/Disable

Set the JBM1 jumper to enabled to share LAN1 with IPMI.

IPMI Share LAN Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2 (Open)	Enabled (Default)
Pins 1-2 (Short)	Disabled

IPMI Dedicated/Shared LAN Enable/Disable

Use JBM2 to enable or disable the dedicated IPMI LAN port. Refer to the table below for jumper settings.

IPMI Dedicated/Share LAN Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2 (Open)	Enabled (Default)
Pins 1-2 (Short)	Disabled
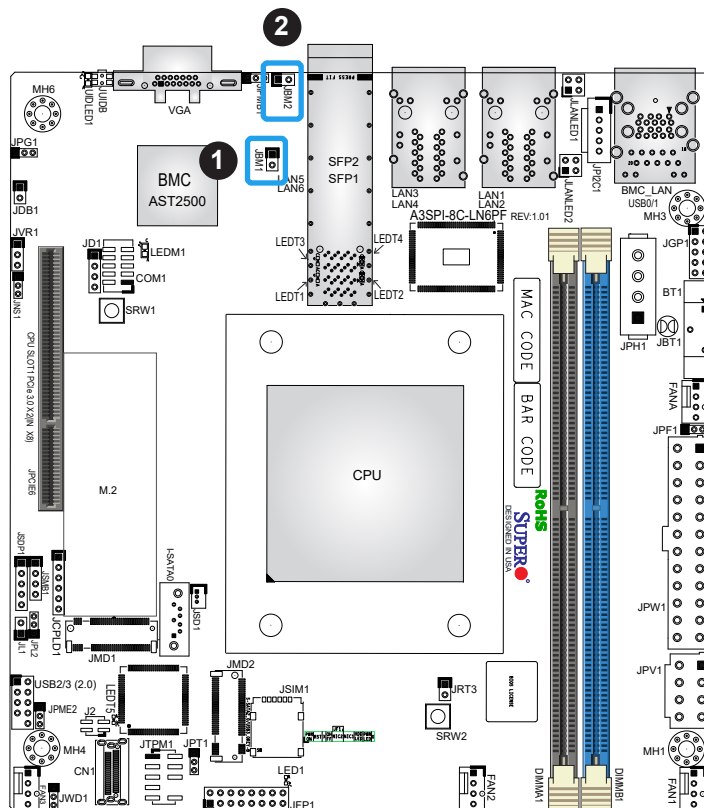
1. IPMI Share
2. IPMI Dedicated/Share

SATA/PCIe Mode Select

Use jumper JNS1 to select SATA or PCIe mode. Refer to the table below for jumper settings definition.

SATA/PCIe Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	SATA (Default)
Pins 2-3	PCIe

COM Port/BMC Debug Port Select

Use jumper JDB1 to select COM Port or BMC Debug Port. Refer to the table below for jumper settings.

COM Port/BMC Debug Port Select Jumper Settings	
Jumper Setting	Definition
Open	COM Port/VRM I2C for BMC monitoring (Default)
Close	BMC Debug Port/VRM I2C for PCH programming
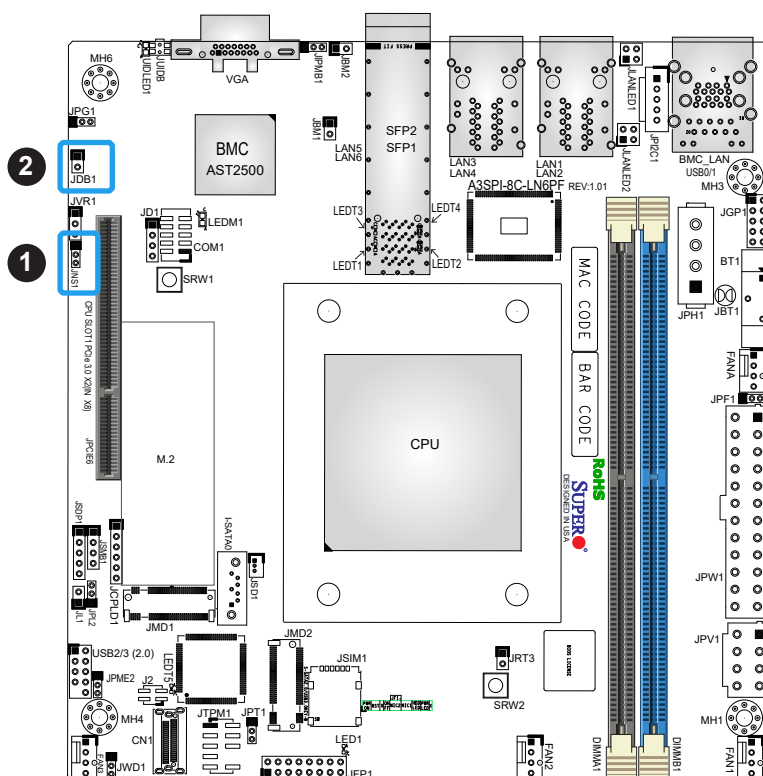
1. SATA/PCIe Mode Select
2. COM/BMC Debug

2.8 LED Indicators

LAN LEDs

Four RJ45 LAN ports (LAN1–LAN4) and two SFP LAN ports (LAN5–LAN6) are located on the I/O back panel. Each Ethernet LAN port has two LEDs. One LED indicates activity, while the other Link LED may be green, amber, or off to indicate the speed of the connection. Refer to the tables below for more information. When the system is in the S1/S3/S4/S5 states, the LAN Link LED will be in the solid on state.

Activity Indicator		
Color	Status	Definition
Off	No Connection	
Yellow	Flashing	Active

1G RJ45 LAN Link	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

10G SFP LAN Link LED (LAN5 - LAN6)	
LED Color	Definition
Off	No Connection
Amber	10G

Activity Indicator		
Color	Status	Definition
Off	No Connection	
Yellow	Flashing	Active
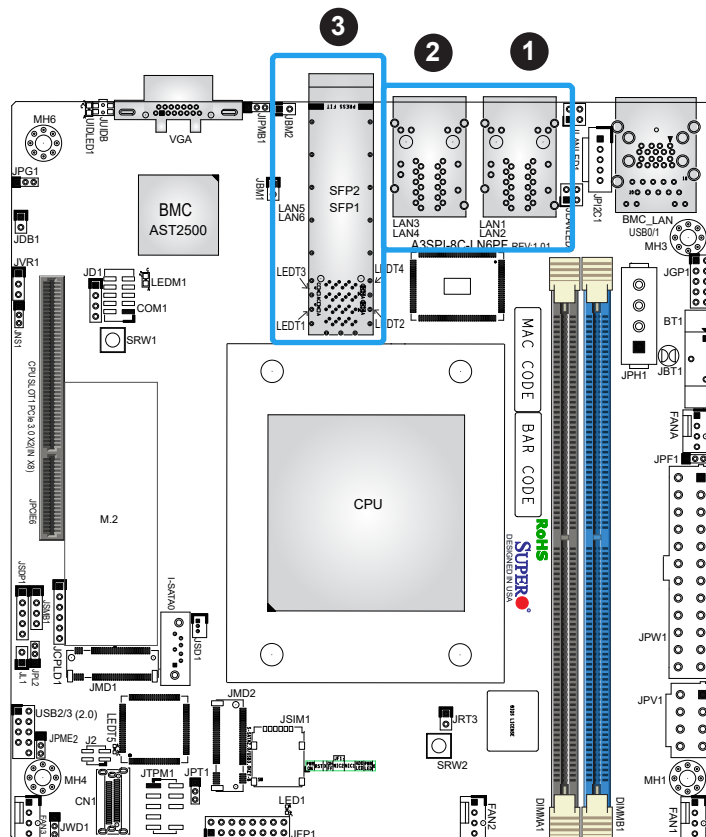
1. LAN1/LAN2 LEDs
2. LAN3/LAN4 LEDs
3. LAN5/LAN6 LEDs

Power LED

LED1 is an onboard Power LED. When this LED is lit, it means power is present on the motherboard. In suspend mode, this LED will blink on and off. Turn off the system and unplug the power cord before removing or installing components.

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

BMC Heartbeat LED

LEDM1 is the BMC heartbeat LED. When the LED is blinking green, BMC is working. Refer to the table below for the LED status.

Onboard Power LED Indicator	
LED Color	**Definition**
Blinking Green	BMC Normal
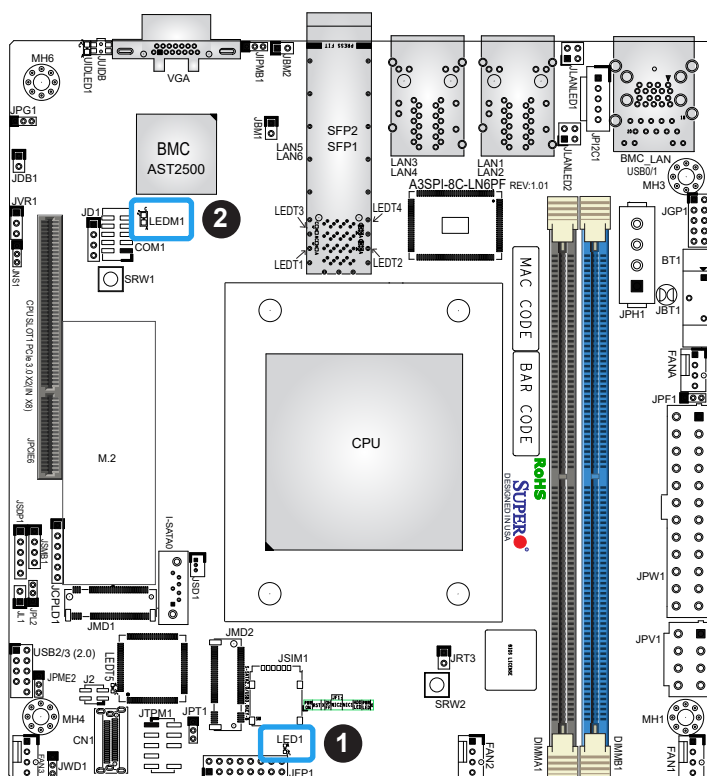
1. Power LED
2. BMC Hearbeat LED

Chapter 3

Troubleshooting

3.1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/ or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components.

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.

2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.

3. Remove all add-on cards.

4. Install the CPU (making sure it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.

2. Make sure that the ATX power connectors are properly connected.

3. Check that the 115V/230V switch, if available, on the power supply is properly set.

4. Turn the power switch on and off to test the system, if applicable.

5. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all add-on cards and cables.

2. Use the speaker to determine if any beep codes are present. Refer to Appendix A for details on beep codes.

3. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory or try a different one).

System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the motherboard speaker.

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, replace the motherboard.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper (JBT1). (Refer to Section 2-8 in Chapter 2.)

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system power is on and that memory error beeps are activated.

3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Memory Errors

When a no-memory beep code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMMs are properly and fully installed. Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.

2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.

3. Make sure that you are using the correct type of DIMM modules recommended by the manufacturer.

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-4 in Chapter 2.

6. Please follow the instructions given in the DIMM population tables listed in Section 2-4 to install your memory modules.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-7 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3VDC. If it does not, replace it with a new one.If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

When the System Becomes Unstable

A. If the system becomes unstable during or after OS installation, check the following:

1. CPU/BIOS support: Make sure that your CPU is supported and that you have the latest BIOS installed in your system.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   Note: Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check the system cooling to make sure that all heatsink fans and CPU/ system fans, etc., work properly. Check the hardware monitoring settings in the IPMI to make sure that the CPU and system temperatures are within the normal range. Also check the front panel Overheat LED and make sure that it is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all appropriate power connectors are connected. Please refer to our website for more information on the minimum power requirements.

6. Proper software support: Make sure that the correct drivers are used.

B. If the system becomes unstable before or during OS installation, check the following:

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as USB flash or media drives.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Use the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with the CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identify bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

3.2 Technical Support Procedures

<u>Before contacting Technical Support, please take the following steps.</u> Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. Please go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/FAQ/index.php) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number

- BIOS release date/version (This can be seen on the initial display when your system first boots up.)

- System configuration

4. An example of a Technical Support form is on our website at https://webpr3.supermicro.com/SupportPortal/.

- Distributors: For immediate assistance, please have your account number ready when placing a call to our Technical Support department. We can be reached by email at support@supermicro.com.

3.3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The motherboard supports up to 128GB ECC/non-ECC UDIMM/RDIMM DDR4 memory with speeds of up to 2400 MT/s for 4C SKU and 2933 MT/S for 8C SKU in two DIMM slots. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-3 in Chapter 2.

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format FLASH.BAT filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

Warning: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!

> **Note**: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, please refer to the AMI BIOS Recovery Instructions posted at http://www.supermicro.com/support/manuals/.

Question: Why does the A3SPI-4C-HLN4F and A3SPI-8C-HLN4F show eight LAN ports in the operation system?

Answer: Because of the Intel SoC limitation (QUAD) cannot be disabled as an architecture limitation. This limitation causes eight LAN ports to show in the operating system even though there are four LAN ports on the motherboard.

Question: How to select OCuLink and M.2 M-Key in the A3SPI-4C-HLN4F/LN6PF BIOS setup menu.

Answer: Access the Flexible I/O selection in the BIOS setup menu to select Oculink or M.2 M-Key.

Question: Why is the 180-degree angled TPM module recommended instead of the 90-degree angled module?

Answer: Use the 180 degree angled TPM module (e.g., AOM-TPM-9760V) instead of the 90 degree angled module to prevent interference with other devices in the system.

Question: Why doesn't the Front Panel HDD LED blink when there is activity with the M.2 PCIe SSD?

Answer: The HDD LED in the front panel is designed to blink when there is activity with the SATA SSD and not with the M.2 PCIe SSD.

3.4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.

2. Locate the onboard battery as shown below.

3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.

4. Remove the battery.

Proper Battery Disposal

Please 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.

Battery Installation

1. To install an onboard battery, follow steps 1 and 2 above and continue below:

2. Identify the battery's polarity. The positive (+) side should be facing up.

3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

Important: When replacing a battery, be sure to only replace it with the same type.

LITHIUM BATTERY

BATTERY HOLDER

OR

LITHIUM BATTERY

BATTERY HOLDER
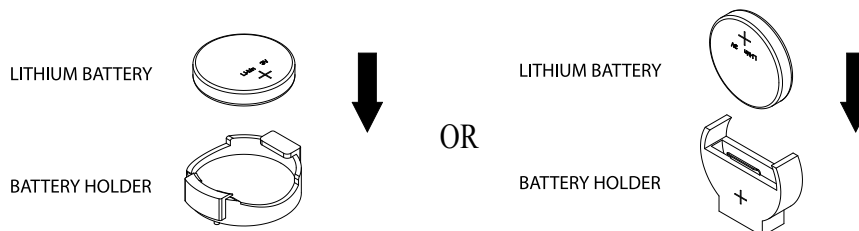
3.5 Returning Merchandise for Service

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 (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.

Chapter 4

UEFI BIOS

4.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the motherboard. The BIOS is stored on a chip and can be easily upgraded using a flash program.

> **Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our website for any changes to the BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that the BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A " ▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F2>, <F3>, <F4>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

4.2 Main Setup

You will see the Main setup screen when you first enter the AMI BIOS setup utility. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS setup screen is shown below and the following items will be displayed:

```
                          Aptio Setup - AMI
    Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

                                                  Set the Date. Use Tab to
    System Date                [Fri 08/12/2022]   switch between Date
    System Time                [14:12:35]         elements.
                                                  Default Ranges:
    Supermicro A3SPI                              Year: 1998-9999
    BIOS Version               1.0                Months: 1-12
    Build Date                 08/04/2022         Days: Dependent on month
    CPLD Version               04.A3.03           Range of Years may vary.

    Memory Information
    Total Memory               8192 MB



                                                  ++: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

                  Version 2.21.1278 Copyright (C) 2022 AMI
```

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 the BIOS build date after RTC reset.

Supermicro A3SPI

BIOS Version

This feature displays the version of the BIOS ROM used in the system.

Build Date

This feature displays the date when the version of the BIOS ROM used in the system was built.

Memory Information

Total Memory

This feature displays the total size of memory available in the system.

4.3 Advanced

Use the arrow keys to select the Advanced menu and press <Enter> to access the menu features.

```
                        Aptio Setup - AMI
     Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

▶ Boot Feature                                      Boot Feature Configuration
▶ CPU Configuration                                 Page
▶ Chipset Configuration
▶ Server ME Information
▶ PCH SATA Configuration
▶ PCH sSATA Configuration
▶ Network Configuration
▶ PCIe/PCI/PnP Configuration
▶ Super IO Configuration
▶ Serial Port Console Redirection
▶ ACPI Settings
▶ Trusted Computing
▶ HTTP Boot Configuration

▶ Intel(R) Ethernet Connection E822-L for SFP - 3C:EC:EF:D0:85:38
▶ Intel(R) Ethernet Connection E822-L for SFP - 3C:EC:EF:D0:85:39
▶ Intel(R) Ethernet Connection E822-L 1GbE - 3C:EC:EF:D0:85:10
▶ Intel(R) Ethernet Connection E822-L 1GbE - 3C:EC:EF:D0:85:11   ↔: Select Screen
▶ Intel(R) Ethernet Connection E822-L 1GbE - 3C:EC:EF:D0:85:12   ↑↓: Select Item
▶ Intel(R) Ethernet Connection E822-L 1GbE - 3C:EC:EF:D0:85:13   Enter: Select
▶ TLS Authenticate Configuration                    +/-: Change Opt.
                                                    F1: General Help
▶ Driver Health                                     F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```

Warning: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing setting may make the system unstable. When this occurs, revert to default manufacturer settings.

▶Boot Feature

Quiet Boot

Use this feature to select the screen display between the POST messages and the OEM logo upon boot up. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Disabled and **Enabled**.

Bootup NumLock State

Use this feature to set the power on state for the <Numlock> key. The options are **On** and Off.

Wait For "F1" If Error

Use this feature to force the system to wait until the "F1" key is pressed if an error occurs. The options are **Disabled** and Enabled.

Re-try Boot

If this feature is enabled, the BIOS will automatically reboot the system from a specified boot device after its initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reset or generate NMI based on jumper settings when it is expired for more than five minutes. The options are **Disabled** and Enabled.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay Off for the system power to remain off after a power loss. Select Power On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The options are Stay Off, Power On, and **Last State**.

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override to power off the system after pressing and holding the power button for four seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are **Instant Off** and 4 Seconds Override.

►CPU Configuration

The following CPU information will display:

- Processor BSP Revision

- Processor Socket

- Processor ID

- Processor Frequency

- Processor Max Ratio

- Processor Min Ratio

- Microcode Revision

- L1 Cache RAM (Per Core)

- L2 Cache RAM (Per Package)

- L3 Cache RAM (Per Package)

- Processor 0 Version

▶CPU1 Core Disable Bitmap

CPU1 Core Disable Bitmap

Core Disable Bitmap(Hex)

Select 0 to enable all cores or FFFFFFFFFFF to disable all cores. One core must be enabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are **Enable** and Disable.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enable to enable the Data Cache Unit (DCU) Streamer Prefetcher, which streams and prefetches data and sends it to the Level 1 data cache to improve data processing and system performance. The options are **Enable** and Disable.

DCU IP Prefetcher (Available when supported by the CPU)

Select Enable for Data Cache Unit (DCU) IP Prefetcher support, which prefetches IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

Extended APIC

Select Enable to activate Advanced Programmable Interrupt Controller (APIC) support. The options are **Disable** and Enable.

Intel (VMX) Virtualization Technology

Use this feature to enable the Vanderpool Technology. This technology allows the system to run several operating systems simultaneously. The options are Disable and **Enable**.

Enable SMX

Use this feature to enable or disable Safer Mode Extensions. The options are **Disable** and Enable**.**

PPIN Control

Select Unlock/Enable to use the Protected Processor Inventory Number (PPIN) in the system. The options are **Lock/Disable** and Unlock/Enable.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are Disable and **Enable**.

▶Advanced Power Management Configuration

▶CPU P State Control

SpeedStep (P-States)

Intel SpeedStep Technology allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disable and **Enable**.

Config TDP Lock

Use this feature to enable or disable the TDP Control Lock Bit. The options are Disable and **Enable**.

EIST PSD Function

This feature allows you to choose between Hardware and Software to control the processor's frequency and performance (P-state). In HW_ALL mode, the processor hardware is responsible for coordinating the P-state, and the OS is responsible for keeping the P-state request up to date on all Logical Processors. In SW_ALL mode, the OS Power Manager is responsible for coordinating the P-state, and must initiate the transition on all Logical Processors. In SW_ANY mode, the OS Power Manager is responsible for coordinating the P-state and may initiate the transition on any Logical Processors. The options are **HW_ALL** and SW_ALL.

Turbo Mode

This feature enables dynamic control of the processor, allowing it to run above stock frequency. The options are Disable and **Enable**.

▶CPU C State Control

Enable Monitor MWAIT

Select Enabled to enable the Monitor/Mwait instructions. The Monitor instructions monitors a region of memory for writes, and MWait instructions instruct the CPU to stop until the monitored region begins to write. The options are Disable and **Enable**.

CPU C6 Report

Select Enable to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are Disable, Enable, and **Auto**.

Enhanced Halt State (C1E)

Select Enable to use Enhanced Halt State technology, which significantly reduces the CPU's power consumption by reducing its clock cycle and voltage during a Halt-state. The options are Disable and **Enable**.

▶**CPU T State Control**

Software Controlled T-States

Use this feature to enable Software Controlled T-States. The options are **Disable** and Enable.

If the feature above is set to Enable, the next feature is available for configuration:

T-State Throttle Level

Use this feature to enable or disable CPU throttling, which reduces power consumption. The options are **Disable**, 6.25%, 12.5%, 18.75%, 25.0%, 31.25%, 37.5%, 43.75%, 50.0%, 56.25%, 62.5%, 68.75%, 75.0%, 81.25%, 87.5%, and 93.75%.

▶Chipset Configuration

Warning: Setting the wrong values in the following features may cause the system to malfunction.

▶North Bridge

▶Uncore Configuration

Uncore Configuration

- Number of CPU

- Number of IIO

- Current UPI Link Speed

- Current UPI Link Frequency

- Global MMIO Low Base / Limit

- Global MMIO High Base / Limit

- PCIe Configuration Base / Size

XPT Remote Prefetch

Use this feature to enable or disable Extended Prediction Table (XPT) Remote Prefetch. The options are Disable, Enable, and **Auto**.

PCIe Remote P2P Relaxed Ordering

Enable peer-to-peer relaxed ordering to optimize system performance. The options are **Disable** and Enable.

Stale AtoS

Use this feature to enable or disable Stale A to S optimization. There are three states in the in-memory directory: invalid (I), snoopAll (A), and shared (S). Data in the I state is clean and does not exist in other sockets. Data in the A state may exist in another exclusive or modified socket. Data in the S state is clean and may be shared across one or more sockets. The options are Disable, Enable, and **Auto**.

LLC Dead Line Alloc

Select Enable to opportunistically fill dead lines in the LLC. Select Disable to never fill dead lines in LLC. The options are Disable, **Enable**, and Auto.

▶**Memory Configuration**

Enforce POR

Select Plan of Record (POR) to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **POR** and Disable.

PPR Type

Use this feature to select the Post Package Repair (PPR) type. The options are PPR Disabled, **Hard PPR**, and Soft PPR.

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 2133, 2200, 2400, 2600, 2666, 2800, 2933, 3000, and 3200.

Data Scrambling for DDR4

Use this feature to enable or disable data scrambling for DDR4 memory. The options are Disable and **Enable**.

2x Refresh Enable

Use this feature to enable 2x memory refresh support to enhance memory performance. The options are **Auto**, Disable, and Enable.

▶Memory Topology

This feature displays the information of memory modules detected by the BIOS.

▶Memory RAS Configuration Setup

Correctable Error Threshold

Use this feature to specify the threshold value for correctable memory-error logging, which sets a limit on the maximum number of events that can be logged in the memory error log at a given time. The default setting is **512**.

Partial Cache Line Sparing PCLS

Use this feature to enable or disable Partial Cache Line Sparing (PCLS). The options are Disabled and **Enabled**.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this feature is set to Enable, the IO hub reads and writes back one cache line every 16K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub is scrubbed every day. The options are **Disabled**, Enabled, and Enable at End of POST.

▶IIO Configuration

▶IOAT Configuration

Disable TPH

Transparent Huge Pages (TPH) is a Linux memory management system that enables communication in larger blocks (pages). Enabling this feature increases performance. The options are **No** and Yes.

If the feature above is set to No, the feature below is available for configuration:

Prioritize TPH

Use this feature to enable Prioritize TPH support. The options are Enable and **Disable.**

Relaxed Ordering

Select Yes to enable Relaxed Ordering support, which allows certain transactions to violate the strict-ordering rules of PCI bus for a transaction to be completed prior to other transactions that have already been enqueued. The options are **No** and Yes.

▶Intel(R) VT for Directed I/O (VT-d)

Intel® VT for Directed I/O (VT-d)

Select Enable to use Intel Virtualization Technology for Direct I/O VT-d support by reporting the I/O device assignments to the Virtual Machine Monitor (VMM) through the DMAR ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data sharing. The options are **Enable** and Disable.

ACS Control

Select Enable to program Access Control Services (ACS) to the chipset PCIe root port bridge. Select No to program ACS to all PCIe root port bridges. The options are **Enable** and Disable.

Interrupt Remapping

Use this feature to enable Interrupt Remapping support, which detects and controls external interrupt requests. The options are **Auto**, Enable, and Disable.

PCIe ASPM Support (Global)

Use this feature to enable or disable ASPM support for all donwstream devices. The options are **Disable** and Auto.

▶South Bridge

The following USB information is displayed:

- USB Module Version

- USB Devices

Legacy USB Support

This feature enables support for USB 2.0 and older. The options are **Enabled,** Disabled, and Auto.

XHCI Hand-off

When this feature is disabled, the motherboard will not support USB 3.0. The options are **Enabled** and Disabled.

PCIe PLL SSC

Use this feature to enable or disable PCIe PLL SSC. The options are **Disabled** and Enabled.

M.2 (B-Key) I/O Selection

Use this feature to select the I/O type for the M.2 device. The options are SATA/USB and **PCIe**.

▶Server ME Information

The following General ME Configuration will display:

- General ME Configuration

- Oper. Firmware Version

- Backup Firmware Version

- Recovery Firmware Version

- ME Firmware Status #1

- ME Firmware Status #2

- Current State

- Error Code

▶PCH SATA Configuration

SATA Controller

This feature enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enabled** and Disabled.

Aggressive LPM Support

When this feature is set to Enable, the SATA AHCI controller manages the power usage of the SATA link. The controller puts the link in a low power mode during extended periods of I/O inactivity, and returns the link to an active state when I/O activity resumes. The options are Disabled and **Enabled**.

OCuLink SATA P1-P4 Hot Plug

Set this feature to Enable for hot plug support, which allows you to replace a SATA drive without shutting down the system. The options are Disable and **Enable**.

OCuLink SATA P1-P4 Spin Up Device

Set this feature to enable or disable the PCH to initialize the device. The options are **Disable** and Enable.

OCuLink SATA P1-P4 SATA Device Type

Use this feature to specify if the SATA port specified should be connected to a Solid State Drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

M.2 KEY-M

This section displays information if a device is detected by the system.

▶PCH sSATA Configuration

sSATA Controller

This feature enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enable** and Disable.

Aggressive LPM Support

When this feature is set to Enable, the SATA AHCI controller manages the power usage of the SATA link. The controller puts the link in a low power mode during extended periods of I/O inactivity, and returns the link to an active state when I/O activity resumes. The options are **Disable** and Enable.

I-SATA0 Hot Plug

Set this feature to Enable for hot plug support, which allows you to replace a SATA drive without shutting down the system. The options are Disabled and **Enabled**.

I-SATA0 Spin Up Device

Set this feature to enable or disable the PCH to initialize the device. The options are **Disabled** and Enabled.

I-SATA0 SATA Device Type

Use this feature to specify if the SATA port specified should be connected to a Solid State Drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

M.2 KEY-B

This section displays information if a device is detected by the system.

▶Network Configuration

Network Stack

Select Enabled to enable Preboot Execution Environment (PXE) or Unified Extensible Firmware Interface (UEFI) for network stack support. The options are Disabled and **Enabled**.

IPv4 PXE Support

Select Enabled to enable IPv4 PXE boot support. The options are Disabled and **Enabled**.

IPv4 HTTP Support

Select Enabled to enable IPv4 HTTP boot support. The options are **Disabled** and Enabled.

IPv6 PXE Support

Select Enabled to enable IPv6 PXE boot support. The options are Disabled and **Enabled**.

IPv6 HTTP Support

Select Enabled to enable IPv6 HTTP boot support. The options are **Disabled** and Enabled.

PXE Boot Wait Time

Use this option to specify the wait time to press the ESC key to abort the PXE boot. Press "+" or "-" on your keyboard to change the value. The default setting is **0**.

Media Detect Count

Use this option to specify the number of times media is checked. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**

▶**Enter Configuration Menu**

Interface Name

Interface Type

MAC Address

Host addresses

Route Table

Gateway addresses

DNS addresses

Interface ID

Use this feature to set the 64-bit alternative interface ID for the device.

DAD Transmit Count

If this set feature is set to 0, the Duplication Address Detection is not performed. Set the value to a preferred selection.

Policy

Use this feature to set the policy to automatic or manual. The options or **automatic** and manual.

Save Changes and Exit

Select this feature to save the changes for the features above and exit.

▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**

Configured

Use this feature to indicate whether the network address is configured successfully or not. The options or **Disabled** and Enabled.

If the feature above is set to Enabled, the next four features are available for configuration:

Enable DHCP

Use this feature to enable or disable DHCP. The options or **Disabled** and Enabled.

Local IP Address

Use this feature to enter the IP address in dotted-decimal notation.

Local NetMask

Use this feature to enter the NetMask in dotted-decimal notation.

Local Gateway

Use this feature to enter the Gateway IP address in dotted-decimal notation.

Save Changes and Exit

Select this feature to save the changes for the features above and exit.

▶PCIe/PCI/PnP Configuration

PCI Bus Driver Version

PCI Devices Common Settings:

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Disabled and **Enabled**.

SR-IOV Support

Use this feature to enable or disable Single Root IO Virtualization Support. The options are Disabled and **Enabled**.

Bus Master Enable

Use this feature to enable the Bus Master, which enables the Bus Master Attribute for DMA transaction. The options are Disabled and **Enabled**.

Consistent Device Name Support

This feature controls the device naming for network devices and slots. The options are **Disabled** and Enabled.

Maximum Read Request

Use this feature to select the Maximum Read Request size of the PCIe device, or select Auto to allow the System BIOS to determine the value. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

NVMe Firmware Source

The feature determines which type of NVMe firmware should be used in your system. The options are **Vendor Defined Firmware** and AMI Native Support.

VGA Priority

Use this feature to select VGA priority when multiple VGA devices are detected. Select Onboard to give priority to your onboard video device. Select Offboard to give priority to your graphics card. The options are **Onboard** and Offboard.

Onboard Video Option ROM

Enable this feature to select which onboard video firmware type to be loaded. The options are Disabled and **EFI**.

CPU SLOT1 PCIe 3.0 X2 (IN X8) OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

KEY-M PCIe 3.0 x4/S-SATA 2.0 OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

KEY-B PCIe 3.0 X2/S-SATA 2.0/USB 3.0 OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

OCuLink U.2 OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

Onboard LAN Option ROM

Use this feature to select which firmware function to be loaded for LAN 1 used for system boot. The options are Disabled and **EFI**.

▶Super IO Configuration

The following Super IO information is displayed:

• Super IO Chip AST2500

▶Serial Port 1 Configuration

This submenu allows you to configure the settings of Serial Port 1.

Serial Port 1

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

This feature displays the I/O and IRQ addresses.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of the serial port. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options are **Auto**, (IO=3F8h; IRQ=4;), (IO=2F8h; IRQ=4;), (IO=3E8h; IRQ=4;), and (IO=2E8h; IRQ=4;).

▶Serial Port 2 Configuration

This submenu allows you to configure the settings of Serial Port 2.

Serial Port 2

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

This feature displays the I/O and IRQ addresses.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of the serial port. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options are **Auto**, (IO=3F8h; IRQ=3;), (IO=2F8h; IRQ=3;), (IO=3E8h; IRQ=3;), and (IO=2E8h; IRQ=3;).

Serial Port 2 Attribute (Available for Serial Port 2 only)

Select SOL to use COM Port 2 as a Serial Over LAN (SOL) port for console redirection. The options are **SOL** and COM.

▶Serial Port Console Redirection

Console Redirection

Select Enabled to enable console redirection support for a serial port. The options are Enabled and **Disabled**.

If the feature above is set to Enabled, the following features are available for configuration:

▶Console Redirection Settings

Use this feature to specify how the host computer will exchange data with the client computer, which is the remote computer.

Terminal Type

This feature allows you to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Disabled and **Enabled.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty KeyPad

This feature selects the settings for Function Keys and KeyPad used for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

Redirection After BIOS POST

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to Bootloader, legacy console redirection is disabled before booting the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

Console Redirection

Select Enabled to enable console redirection support for the specified serial port. The options are **Disabled** and Enabled**.**

If the feature above is set to Enabled, the following features are available for configuration:

►Console Redirection Settings

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Disabled and **Enabled.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS POST

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When set to Bootloader, legacy Console Redirection is disabled before booting the OS. When set to Always Enable, legacy Console Redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

Serial Port for Out-Of-Band Management/Windows Emergency Management Services (EMS)

Console Redirection EMS

Select Enabled to enable console redirection support for the specified serial port. The options are **Disabled** and Enabled**.**

If the feature above is set to Enabled, the following features are available for configuration:

▶Console Redirection Settings

This feature allows you to specify how the host computer will exchange data with the client computer, which is the remote computer.

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL/COM2.

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per Second EMS

This feature sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

Flow Control EMS

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

Data Bits EMS, Parity EMS, Stop Bits EMS

▶ACPI Settings

NUMA

Use this feature to enable or disable Non-Uniform Memory Access (NUMA), a feature that improves memory-to-processor communication and performance. The options are Disabled and **Enabled**.

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are Disabled and **Enabled**.

Headless Support

Enable this feature for the system to function without a keyboard, monitor or mouse attached. The options are **Disabled** and Enabled.

▶Trusted Computing

The motherboard supports TPM 1.2 and 2.0. The following Trusted Platform Module (TPM) information displays if a TPM 2.0 module is detected:

- Firmware Version

- Vendor

Security Device Support

If this feature and the TPM jumper on the motherboard are both set to Enabled, onboard security devices will be enabled for Trusted Platform Module (TPM) support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are Disabled and **Enabled**.

- Active PCR Banks

- Available PCR Banks

If the feature above is set to Enabled, the next five features are available for configuration:

SHA-1 PCR Bank

Use this feature to disable or enable the SHA-1 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

SHA256 PCR Bank

Use this feature to disable or enable the SHA256 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

Pending Operation

Use this feature to schedule a TPM-related operation to be performed by a security device for system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **None** and TPM Clear.

Platform Hierarchy

Use this feature to disable or enable platform hierarchy for platform protection. The options are Disabled and **Enabled**.

Storage Hierarchy

Use this feature to disable or enable storage hieararchy for cryptographic protection. The options are Disabled and **Enabled**.

Endorsement Hierarchy

Use this feature to disable or enable endorsement hierarchy for privacy control. The options are Disabled and **Enabled**.

PH Randomization

Use this feature to disable or enable Platform Hiearchy (PH) Randomization. The options are **Disabled** and Enabled.

Disable Block Sid

Use this feature to disable or enable Block SID. The options are Enabled and **Disabled**.

SMCI BIOS-Based TPM Provision Support

Use this feature to enable Supermicro TPM Provision support. The options are **Disabled** and Enabled.

TXT Support

Intel Trusted Execution Technology (TXT) helps protect against software-based attacks and ensures protection, confidentiality, and integrity of data stored or created on the system. Use this feature to enable or disable TXT Suppport. The options are **Disabled** and Enabled.

▶HTTP Boot Configuration

HTTP Boot Configuration

HTTP Boot Policy

Use this feature to select the boot policy. The options are Apply to all LANs, **Apply to each LAN**, and Boot Priority #1 instantly.

HTTP Boot Checks Hostname

Use this feature to select whether the HTTPS Boot checks the hostname of the TLS certificates to match the hostname provided by the remote server. The options are **Enabled** and Disabled (WARNING: Security Risk!!).

Priority of HTTP Boot:

Instance of Priority 1:

Use this feature to set the rank target port. The default value is **1**.

Select IPv4 or IPv6

Use this feature to select which LAN port to boot from. The options are **IPv4** and IPv6.

Boot Description

Highlight the feature and press enter to create a boot description. The description cannot be more than 75 characters.

Boot URI

Highlight the feature and press enter to create a boot URI.

Instance of Priority 2:

Use this feature to set the rank target port. The default value is **0**.

Instance of Priority 3:

Use this feature to set the rank target port. The default value is **0**.

Instance of Priority 4:

Use this feature to set the rank target port. The default value is **0**.

Instance of Priority 5:

Use this feature to set the rank target port. The default value is **0**.

Instance of Priority 6:

Use this feature to set the rank target port. The default value is **0**.

▶Intel(R) Ethernet Connection E822-L for SFP - xx:xx:xx:xx:xx:xx
▶Intel(R) Ethernet Connection E822-L for SFP - xx:xx:xx:xx:xx:xx
▶Intel(R) Ethernet Connection E822-L 1GbE - xx:xx:xx:xx:xx:xx
▶Intel(R) Ethernet Connection E822-L 1GbE - xx:xx:xx:xx:xx:xx
▶Intel(R) Ethernet Connection E822-L 1GbE - xx:xx:xx:xx:xx:xx
▶Intel(R) Ethernet Connection E822-L 1GbE - xx:xx:xx:xx:xx:xx

▶Firmware Image Properties

Option ROM version

Unique NVM/EEPROM ID

NVM Version

▶NIC Configuration

Wake On LAN

Select Enabled for wake on LAN support, which allows the system to wake up when an onboard LAN device receives an incoming signal. The options are Disabled and **Enabled**.

LLDP Agent

Use this feature to enable or disable the firmware's Link Layer Dsicovery Protocol (LLDP) agent. This protocol is used by networks to advertise their information to other devices on the network. The options are **Disabled** and Enabled.

▶Device Level Configuration

▶Port Option Configuration

Port Option

Use this feature to configure the port option of the device. The option is **Option 0: -4x16**.

Blink LEDs

Use this feature to identify the physical network port by blinking the associated LED. Use the keyboard to select a value.

UEFI Driver

Adapter PBA

Device Name

Chip Type

PCI Device ID

PCI Address

Link Status

MAC Address

Virtual MAC Address

▶TLS Authentication Configuration

This submenu allows you to configure Transport Layer Security (TLS) settings.

▶Server CA Configuration

▶Enroll Certification

Enroll Certification Using File

Use this feature to enroll certification from a file.

Certification GUID

Use this feature to input the certification GUID.

Commit Changes and Exit

Use this feature to save all changes and exit TLS settings.

Discard Changes and Exit

Use this feature to discard all changes and exit TLS settings.

▶Delete Certification

Use this feature to delete certification.

▶Driver Health

This feature provides the health status for the network drivers and controllers.

▶Intel(R) 100GbE 4.0.12

Intel(R) Ethernet Connection E822-L for SFP

Intel(R) Ethernet Connection E822-L for SFP

▶Intel(R) 100GbE 4.0.12

Intel(R) Ethernet Connection E822-L for SFP

Intel(R) Ethernet Connection E822-L for SFP

▶**Intel(R) 100GbE 4.0.12**

Intel(R) Ethernet Connection E822-L 1GbE

Intel(R) Ethernet Connection E822-L 1GbE

▶**Intel(R) 100GbE 4.0.12**

Intel(R) Ethernet Connection E822-L 1GbE

Intel(R) Ethernet Connection E822-L 1GbE

▶**Intel(R) 100GbE 4.0.12**

Intel(R) Ethernet Connection E822-L 1GbE

Intel(R) Ethernet Connection E822-L 1GbE

▶**Intel(R) 100GbE 4.0.12**

Intel(R) Ethernet Connection E822-L 1GbE

Intel(R) Ethernet Connection E822-L 1GbE

4.4 BMC

Use this menu to configure BMC settings.

```
                         Aptio Setup – AMI
    Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

   BMC Firmware Revision              01.01.23         Press <Enter> to change the
   IPMI STATUS                        Working          SEL event log configuration.

 ▶ System Event Log
 ▶ BMC Network Configuration




                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

                  Version 2.21.1278 Copyright (C) 2022 AMI
```

BMC Firmware Revision

This feature displays the IPMI firmware revision used in your system.

IPMI STATUS

This feature displays the status of the IPMI firmware installed in your system.

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at boot up. The options are Disabled and **Enabled**.

Erasing Settings

Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot. Select Yes, On every reset to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No,** Yes, On next reset, and Yes, On every reset.

When SEL is Full

This feature allows you to decide what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

> **Note**: All values changed here do not take effect until the computer is restarted.

▶BMC Network Configuration

BMC Network Configuration

Update BMC LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes at the next system boot. The options are **No** and Yes.

*If the feature above is set to Yes, Configuration Address Source, VLAN, and IPv6 Support are available for configuration:

Configure IPv4 Support

BMC LAN Selection

BMC Network Link Status

Configuration Address Source

This feature allows you to select the source of the IP address for this computer. If Static is selected, you need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS searches for a Dynamic Host Configuration Protocol (DHCP) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP** and Static.

*If the feature above is set to Static, the following features are available for configuration:

Station IP Address

This feature displays the Station IP address for this computer. The address can be manually entered. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask

This feature displays the sub-network that this computer belongs to. The address can be manually entered. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address

This feature displays the MAC address that this computer belongs to.

Gateway IP Address

This feature displays the Gateway IP address for this computer. The address can be manually entered. This should be in decimal and in dotted quad form (i.e., 172.31.0.1).

VLAN

Use this feature to enable or disable the IPMI VLAN function. The options are **Disable** and Enable.

VLAN ID

This feature is enabled if VLAN is enabled. Enter a VLAN ID. The ID range is from 1 to 4094.

Configure IPv6 Support

IPv6 Address Status

IPv6 Support

Use this feature to enable IPv6 support. The options are **Enabled** and Disabled.

Configuration Address Source

Use this feature to configure the LAN channel parameters. The options are Static and **DHCP**.

Station IPv6 Address

This feature displays the IPv6 address.

Prefix Length

This feature displays the prefix length

IPv6 Router1 IP Address

This feature displays the IP address of the IPv6 router.

4.5 Event Logs

Use this menu to configure Event Log settings.

```
                              Aptio Setup – AMI
        Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

 ▶ Change SMBIOS Event Log Settings            Press <Enter> to change the
 ▶ View SMBIOS Event Log                       SMBIOS Event Log
                                               configuration.




                                               ↔: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit

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```

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Change this feature to enable or disable all features of the SMBIOS Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log

If No is selected, data stored in the event log will not be erased. Select Yes, Next Reset, data in the event log will be erased upon next system reboot. Select Yes, Every Reset, data in the event log will be erased upon every system reboot. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately for all messages to be automatically erased from the event log when the event log memory is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are **Disabled** and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of occurences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

The Multiple Event Time Window (METW) defines the number of minutes that must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is **60**.

> **Note**: All values changed here do not take effect until the computer is restarted.

▶View SMBIOS Event Log

Select this submenu and press enter to see the contents of the SMBIOS event log. The following categories will be displayed: Date/Time/Error Codes/Severity.

4.6 Security

Use this menu to configure the security settings for the system.

```
                           Aptio Setup — AMI
     Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit
                                              ▲ Set Administrator Password

     Administrator Password            Not Installed
     User Password                     Not Installed

     Password Description

     If the Administrator's / User's password is set,
     then this only limits access to Setup and is
     asked for when entering Setup.
     Please set Administrator's password first in order
     to set User's password, if clear Administrator's
     password, the User's password will be cleared as well.

     The password length must be
     in the following range:
     Minimum length                    3
     Maximum length                    20             ←→: Select Screen
                                                       ↑↓: Select Item
     Administrator Password                            Enter: Select
     Password Check                    [Setup]         +/-: Change Opt.
     Hard Drive Security Frozen        [Enabled]       F1: General Help
     Lockdown Mode                     [Disabled]      F2: Previous Values
                                                       F3: Optimized Defaults
                                              ▼        F4: Save & Exit
                                                       ESC: Exit

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```

Administrator Password

Press Enter to create a new, or change an existing, Administrator password.

User Password

Press Enter to create a new, or change an existing, user password.

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at boot up or upon entering the BIOS Setup utility. The options are **Setup** and Always.

Hard Drive Security Frozen

Use this feature to enable or disable the BIOS security frozen command for SATA and NVMe devices. The options are **Enabled** and Disabled.

▶SMCI Security Erase Configuration

This section displays information if a storage device is detected by the system.

- HDD Name

- HDD Serial Number

- Security Mode

- TCG Device Type

- Estimated Time

- Admin Pwd Status

Security Function

Use this feature to enable or disable the BIOS security frozen command for SATA and NVMe devices. The options are **Disable**, Set Password, Security Erase - Password, Security Erase - PSID, and Security Erase - Wtihout Password.

Password

Use this feature to set a password for the Supermicro HDD Security Function.

Lockdown Mode

Use this feature to put the BIOS into lockdown mode. The options are Enabled and **Disabled**.

▶**Secure Boot**

This section displays the contents of the following secure boot features:

- System Mode

- Vendor Keys

- Secure Boot

Secure Boot

Use this feature to enable secure boot. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this feature to configure Secure Boot variables without authentication. The options are Standard and **Custom**.

▶**Enter Audit Mode**

This submenu can only be used if current System Mode is set to User (refer to Exit Deployed Mode). The PK variable will be erased on transition to Audit Mode.

▶**Key Management**

Vendor Keys

Provision Factory Defaults

Use this feature to install the factory default secure boot keys after the platform reset and while the system is in setup mode. The options are **Disabled** and Enabled.

▶**Restore Factory Keys**

Force System to User Mode. Install factory default Secure Boot key databases. The options are **Yes** and No.

▶**Reset to Setup Mode**

This feature deletes all Secure Boot key databases from NVRAM. The options are **Yes** and No.

▶**Export Secure Boot variables**

This feature allows you to copy NVRAM content of Secure boot variables to files in a root folder on a file system device.

▶**Enroll EFI Image**

This feature allows the image to run in Secure Boot Mode. Enroll SHA256 Hash Certificate of the image into the Authorized Signature Database.

Device Guard Ready

▶**Remove 'UEFI CA' from DB**

This feature allows you to decide if all secure boot variables should be saved.

▶**Restore DB defaults**

Select Yes to restore the DB defaults.

Secure Boot Variable

▶**Platform Key (PK)**

Details

Select this feature to view PK information.

Export

Select this feature to export the PK from a file system.

Update

Select Yes to load the PK from factory default or No to load from a file or external media.

Delete

Select ok to remove the PK. Reset the system for it to enter Setup/Audit Mode.

▶**Key Exchange Key**

Details

Select this feature to view KEK information.

Export

Select this feature to export the KEK from a file system.

Update

Select Yes to load the KEK from factory default or No to load from a file or external media.

Append

Select Yes to load the KEK from factory default or No to load from a file or external media.

Delete

Select Yes to delete the variable or No to delete a certificate from the key database.

▶**Authorized Signatures**

Details

Select this feature to view authorized signatures information.

Export

Select this feature to export the db from a file system.

Update

Select Yes to load the db from factory default or No to load from a file or external media.

Append

Select Yes to load the db from factory default or No to load from a file or external media.

Delete

Select Yes to delete the variable or No to delete a certificate from the key database.

▶Forbidden Signatures

Details

Select this feature to view forbidden signatures information.

Export

Select this feature to export the dbx from a file system.

Update

Select Yes to load the dbx from factory default or No to load from a file or external media.

Append

Select Yes to load the dbx from factory default or No to load from a file or external media.

Delete

Select Yes to delete the variable or No to delete a certificate from the key database.

▶Authorized TimeStamps

Details

Select this feature to view authorized time stamp information.

Export

Select this feature to export the dbt from a file system.

Update

Select Yes to load the dbt from factory default or No to load from a file or external media.

Append

Select Yes to load the dbt from factory default or No to load from a file or external media.

Delete

Select Yes to delete the variable or No to delete a certificate from the key database.

▶OsRecovery Signature

Details

Select this feature to view authorized time stamp information.

Export

Select this feature to export the dbr from a file system.

Update

Select Yes to load the dbr from factory default or No to load from a file or external media.

Append

Select Yes to load the dbr from factory default or No to load from a file or external media.

Delete

Select Yes to delete the variable or No to delete a certificate from the key database. Select Yes to add the dbr from the manufacturer's defaults list to the existing dbr. Select No to load the dbr from a file. The options are Yes and No.

4.7 Boot

Use this menu to configure Boot settings.

```
                              Aptio Setup - AMI
          Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

   Boot Configuration                                     ▲ Sets the system boot order


   FIXED BOOT ORDER Priorities
   Boot Option #1                    [UEFI AP:UEFI:
                                     Built-in EFI Shell]
   Boot Option #2                    [UEFI CD/DVD]
   Boot Option #3                    [UEFI USB Hard Disk]
   Boot Option #4                    [UEFI USB CD/DVD]
   Boot Option #5                    [UEFI USB Key]
   Boot Option #6                    [UEFI USB Floppy]
   Boot Option #7                    [UEFI USB Lan]
   Boot Option #8                    [UEFI
                                     Network:(B244/D0/F0)
                                     UEFI PXE IPv4:
                                     Intel(R) Ethernet
                                     Connection E822-L
                                     for                   ➡➡: Select Screen
                                     SFP(MAC:3cecefd08538) ↑↓: Select Item
                                     ]                     Enter: Select
   Boot Option #9                    [UEFI Hard Disk]      +/-: Change Opt.
                                                           F1: General Help
 ▶ Delete Boot Option                                      F2: Previous Values
                                                           F3: Optimized Defaults
 ▶ UEFI NETWORK Drive BBS Priorities                     ▼ F4: Save & Exit
                                                           ESC: Exit

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```

- Boot Option #1

- Boot Option #2

- Boot Option #3

- Boot Option #4

- Boot Option #5

- Boot Option #6

- Boot Option #7

- Boot Option #8

- Boot Option #9

▶Delete Boot Option

This feature allows you to select a boot device to delete from the boot priority list.

Delete Boot Option

Use this feature to remove an EFI boot option from the boot priority list.

▶**UEFI NETWORK Drive BBS Priorities**

This feature sets the system boot order of detected devices.

▶**UEFI Application Boot Priorities**

This feature sets the system boot order of detected devices.

- Boot Option #1

4.8 Save & Exit

Use this menu to save settings and exit from the BIOS.

```
                          Aptio Setup - AMI
      Main  Advanced  BMC  Event Logs  Security  Boot  Save & Exit

    Save Options                              ▲ Exit system setup without
    Discard Changes and Exit                    saving any changes.
    Save Changes and Reset
    Save Changes
    Discard Changes

    Default Options
    Restore Optimized Defaults
    Save as User Defaults
    Restore User Defaults

    Boot Override
    UEFI: Built-in EFI Shell
    (B244/D0/F0) UEFI PXE IPv4: Intel(R) Ethernet Connection
    E822-L for SFP(MAC:3cecefd08538)
    (B244/D0/F1) UEFI PXE IPv4: Intel(R) Ethernet Connection
    E822-L for SFP(MAC:3cecefd08539)
    (B244/D0/F0) UEFI PXE IPv6: Intel(R) Ethernet Connection  →←: Select Screen
    E822-L for SFP(MAC:3cecefd08538)                          ↑↓: Select Item
    (B244/D0/F1) UEFI PXE IPv6: Intel(R) Ethernet Connection  Enter: Select
    E822-L for SFP(MAC:3cecefd08539)                          +/-: Change Opt.
    (B244/D0/F4) UEFI PXE IPv4: Intel(R) Ethernet Connection  F1: General Help
    E822-L 1GbE(MAC:3cecefd08510)                             F2: Previous Values
    (B244/D0/F5) UEFI PXE IPv4: Intel(R) Ethernet Connection  F3: Optimized Defaults
    E822-L 1GbE(MAC:3cecefd08511)                           ▼ F4: Save & Exit
                                                              ESC: Exit

                     Version 2.21.1278 Copyright (C) 2022 AMI
```

Save Options

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>.

Save Changes and Reset

After completing the system configuration changes, select this option to save the changes you have made. This will not reset (reboot) the system.

Save Changes

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect. Select Save Changes from the Save & Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS utility program.

Default Options

Restore Optimized Default

To set this feature, select Restore Defaults from the Save & Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

To set this feature, select Save as User Defaults from the Save & Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

Restore User Defaults

To set this feature, select Restore User Defaults from the Save & Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

Boot Override

Listed in this section are other boot options for the system (i.e., Built-in EFI shell). The options may vary on each system. Select an option, press <Enter>, and your system will boot to the selected boot option.

UEFI: Built-in EFI Shell

(B244/D0/F0) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L for SFP (MAC:xxxxxxxxxxxx)

(B244/D0/F1) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L for SFP (MAC:xxxxxxxxxxxx)

(B244/D0/F0) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L for SFP (MAC:xxxxxxxxxxxx)

(B244/D0/F1) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L for SFP (MAC:xxxxxxxxxxxx)

(B244/D0/F4) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F5) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F6) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F7) UEFI PXE IPv4: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F4) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F5) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F6) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

(B244/D0/F7) UEFI PXE IPv6: Intel(R) Ethernet Connection E822-L 1GbE (MAC:xxxxxxxxxxxx)

Launch EFI Shell from filesystem device

Appendix A

BIOS Codes

A.1 BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at http://www.supermicro.com/support/manuals/ ("AMI BIOS POST Codes User's Guide").

For information on AMI updates, please refer to http://www.ami.com/products/.

Appendix B

Software Installation

B.1 Supermicro SuperDoctor 5

The Supermicro SuperDoctor 5 is a hardware monitoring program that functions in a command-line or web-based interface in Linux operating systems. The program monitors system health information, such as CPU temperature, system voltages, system power consumption, and fan speed, and provides alerts via email or the 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 the SuperDoctor 5 Management Server (SSM Server), you can remotely control the power status and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

> **Note:** The SuperDoctor 5 program and user's manual can be downloaded from the Supermicro website at http://www.supermicro.com/products/nfo/sms_sd5.cfm.
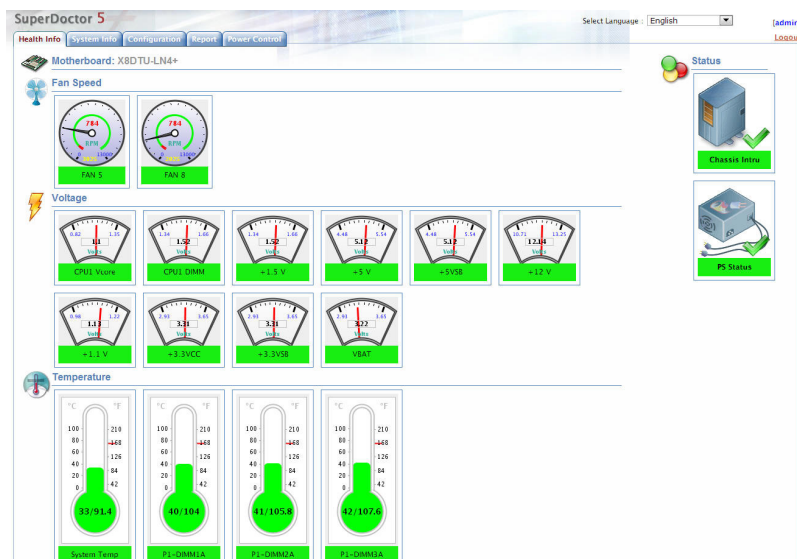
Figure B-1. SuperDoctor 5 Interface Display Screen (Health Information)

Appendix C

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 section in its entirety before installing or configuring components.

These warnings may also be found on our website at http://www.supermicro.com/about/policies/safety_information.cfm.

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

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

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 النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة 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.

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.

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

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 D

UEFI BIOS Recovery

Warning: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

D.1 Overview

The Unified Extensible Firmware Interface (UEFI) provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism that will allow the UEFI OS loader stored in an add-on card to boot the system. The UEFI offers clean, hands-off management to a computer during system boot.

D.2 Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is first turned on, the boot block codes execute first. Once this process is completed, the main BIOS code will continue with system initialization and the remaining Power-On Self-Test (POST) routines.

Note 1: Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS block crashes.

Note 2: When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (For a RMA request, please see section 3.5 for more information).

D.3 Recovering the BIOS Block with a USB Device

This feature allows the user to recover the main BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB flash or media drive can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by the recovery block is FAT (including FAT12, FAT16, and FAT32), which is installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below:

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" directory of a USB flash or media drive.

    Note 1: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

    Note 2: Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB port and reset the system until the following screen appears:

3. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below:

```
                Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Main  Advanced  Event Logs  IPMI  Recovery  Security  Boot  Save & Exit

  Please select blocks you want to update               Set this option to reset
  Reset NVRAM                          [Enabled]         NVRAM to default values
  Boot Block Update                    [Enabled]

  ▶ Proceed with flash update




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

                Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

Note: At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below:

Note: *Do not interrupt the BIOS flashing process until it has completed*.

```
                Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                                        Recovery

  WARNING! System firmware is being updated.
  Keyboard is locked.
  DO NOT TURN THE POWER OFF !!!
  Once firmware update is completed
  press any key to reboot the system



                        ┌──────── Program new data ────────┐
                        │                                   │
                        │         Write new boot block...   │
                        │                                   │
                        │ ──────────17%──────────           │
                        │ ████████                          │
                        └───────────────────────────────────┘

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```
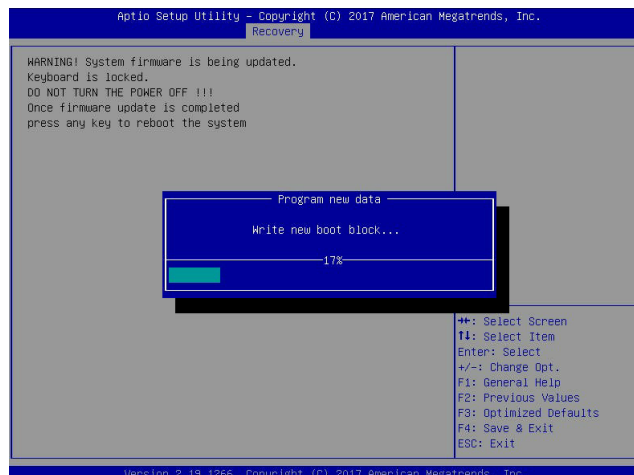
5. After the BIOS recovery process is completed, press any key to reboot the system.

6. Using a different system, extract the BIOS package into a USB flash drive.
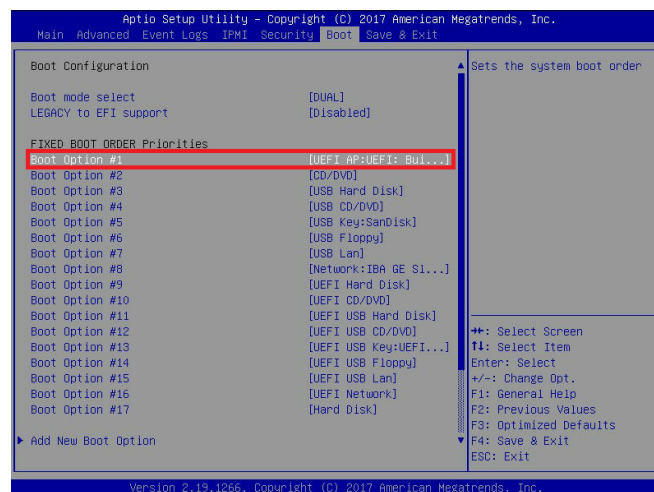
```
              Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                               Recovery

   WARNING! System firmware is being updated.
   Keyboard is locked.
   DO NOT TURN THE POWER OFF !!!
   Once firmware update is completed
   press any key to reboot the system



                         ─── Flash update ───
                  Flash update completed. Press any key to
                             reset the system


                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/−: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

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```

7. Press <Del> during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.

8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.

   Note: *Do not interrupt this process* until the BIOS flashing is complete.

```
              Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
      Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

   Boot Configuration                                   ▲ Sets the system boot order

   Boot mode select                  [DUAL]
   LEGACY to EFI support             [Disabled]

   FIXED BOOT ORDER Priorities
   Boot Option #1                    [UEFI AP:UEFI: Bui...]
   Boot Option #2                    [CD/DVD]
   Boot Option #3                    [USB Hard Disk]
   Boot Option #4                    [USB CD/DVD]
   Boot Option #5                    [USB Key:SanDisk]
   Boot Option #6                    [USB Floppy]
   Boot Option #7                    [USB Lan]
   Boot Option #8                    [Network:IBA GE S1...]
   Boot Option #9                    [UEFI Hard Disk]
   Boot Option #10                   [UEFI CD/DVD]
   Boot Option #11                   [UEFI USB Hard Disk]
   Boot Option #12                   [UEFI USB CD/DVD]      →←: Select Screen
   Boot Option #13                   [UEFI USB Key:UEFI...] ↑↓: Select Item
   Boot Option #14                   [UEFI USB Floppy]      Enter: Select
   Boot Option #15                   [UEFI USB Lan]         +/−: Change Opt.
   Boot Option #16                   [UEFI Network]         F1: General Help
   Boot Option #17                   [Hard Disk]            F2: Previous Values
                                                            F3: Optimized Defaults
   ▶ Add New Boot Option                                 ▼ F4: Save & Exit
                                                            ESC: Exit

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```

9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.

10. Press <Del> to enter the BIOS Setup utility.

11. Press <F3> to load the default settings.

12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.