



X11SDC-4C/8C/16C

USER 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 X11SDC-4C/8C/16C module board.

About This Motherboard

The Supermicro X11SDC-4C/8C/16C module board supports an Intel® Xeon D-2100 processor. This a high performance, proprietary form factor module board that is ideal for super compact servers requiring high computing power. The X11SDC-4C/8C/16C is designed based on the PICMG® COM-HPC form factor. This module board works together with the AOM-COMH-TEST carrier board. Please note that this module board 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/>.

Manual Organization

Chapter 1 describes the features, specifications and performance of the module board, and provides detailed information on the processor.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules, and other hardware components into the system.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory, and system setup stored in the CMOS.

Chapter 4 includes an introduction to the BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS Error Beep Codes.

Appendix B lists software program installation instructions.

Appendix C lists standardized warning statements in various languages.

Appendix D provides UEFI BIOS Recovery instructions.

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Chapter 1

Introduction

Congratulations on purchasing your computer module board from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your module board. If anything listed here is damaged or missing, contact your retailer. The following items are included in the retail box:

1.1 Checklist

Main Parts List (included in the retail box)		
Description	Part Number	Quantity
Supermicro Module Board	X11SDC-4C/8C/16C	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/about/policies/disclaimer.cfm?url=/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. X11SDC-4C/8C/16C Module Board Image

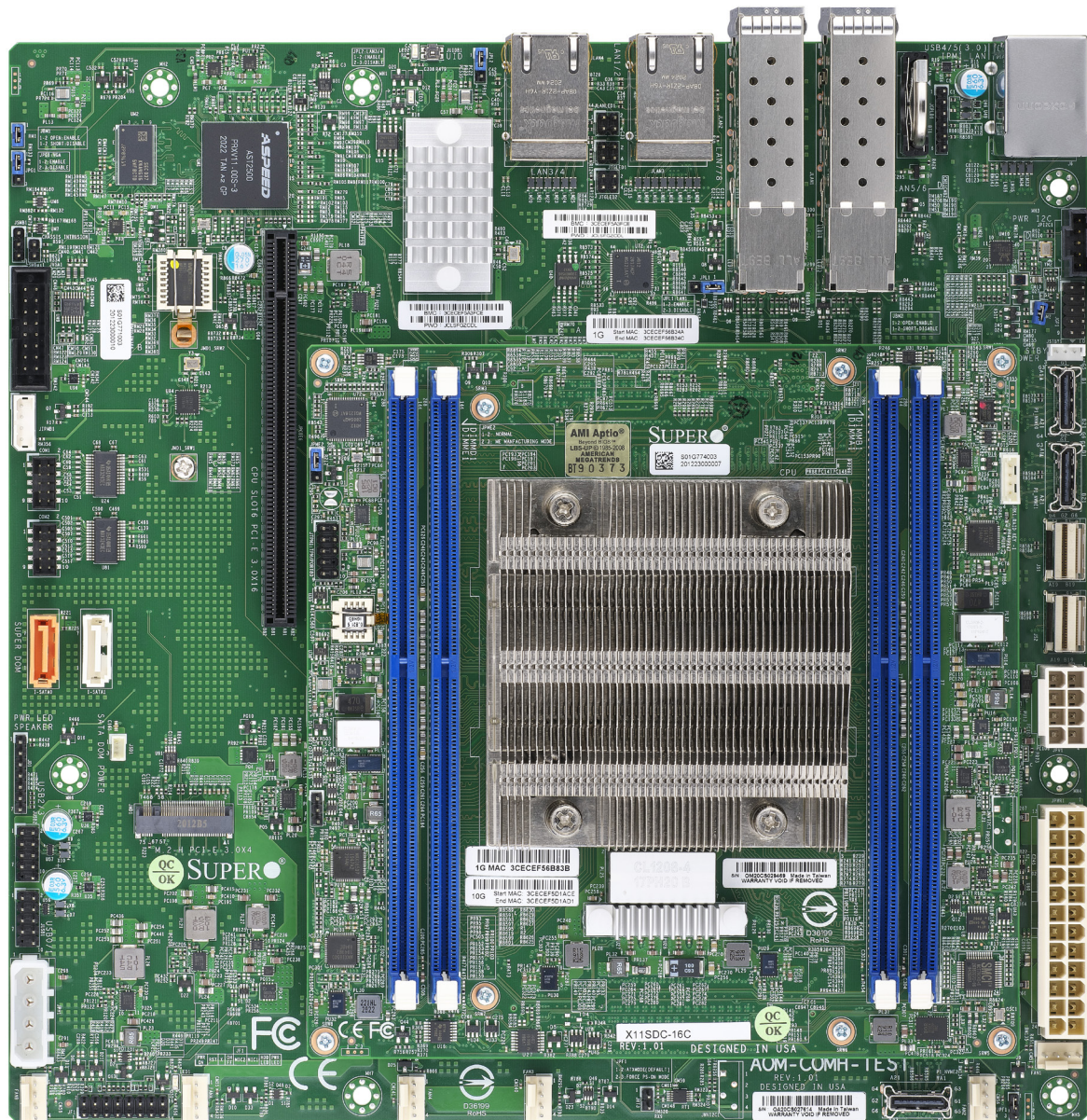


Figure 1-2. AOM-COMH-TEST Carrier Board Image

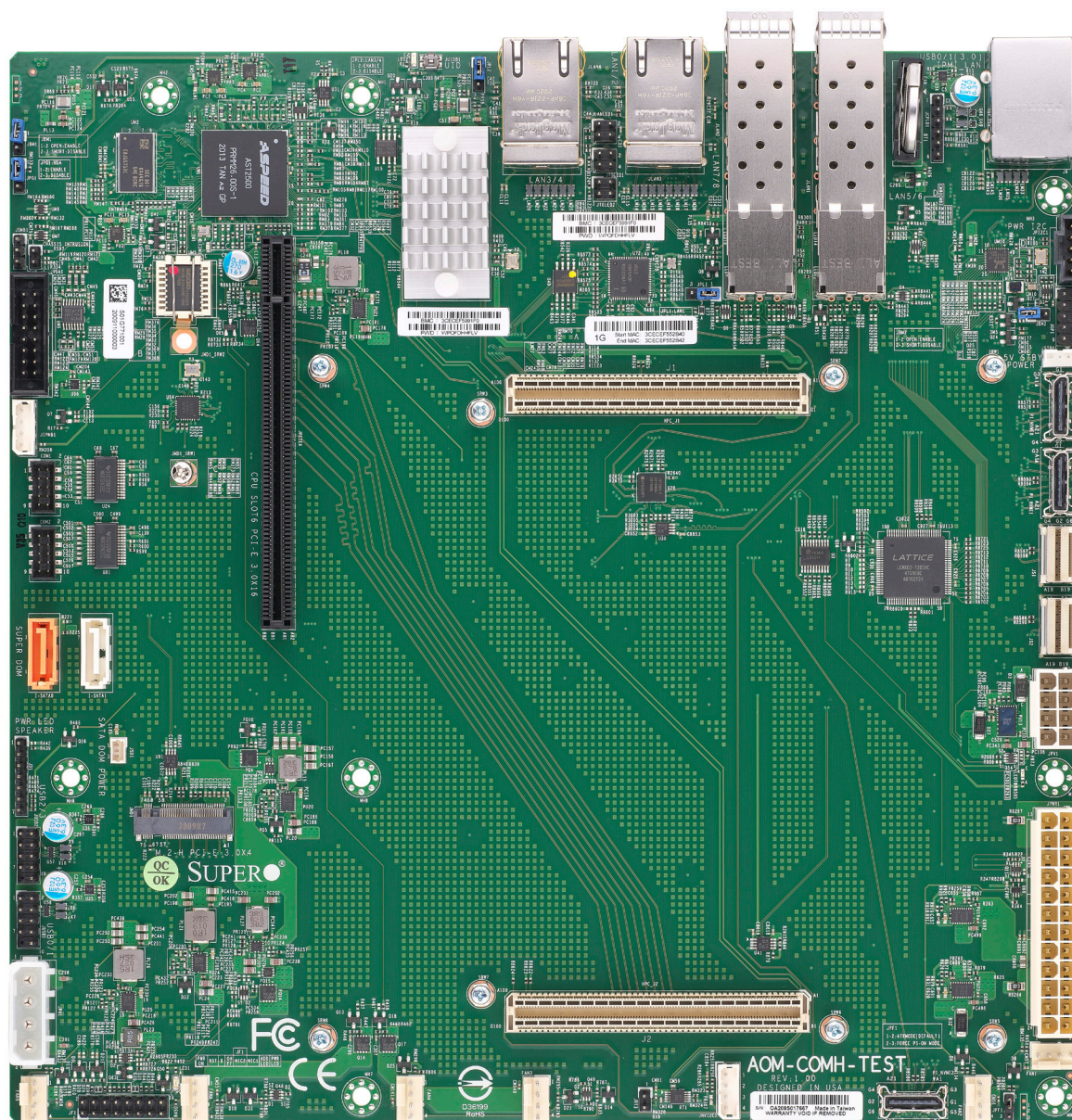
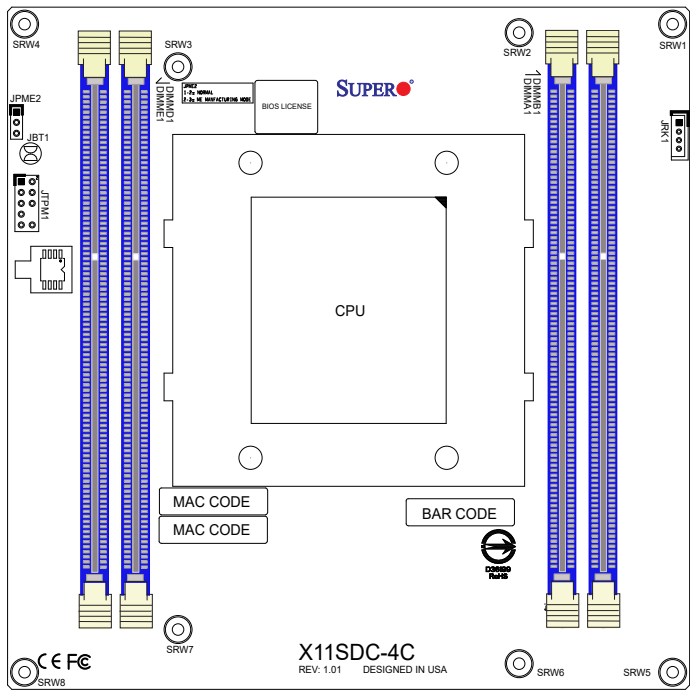
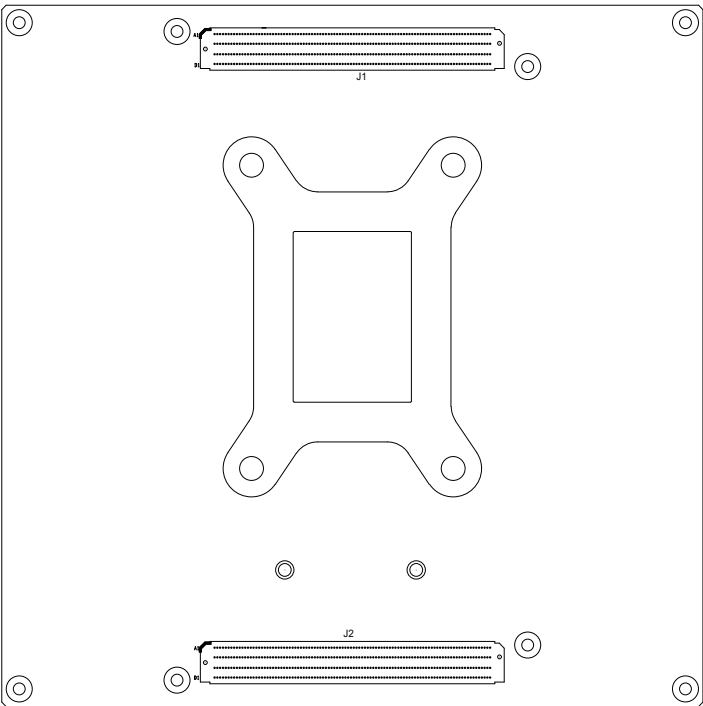


Figure 1-3. X11SDC-4C/8C/16C Module Board Layout
(not drawn to scale)

Top Layout



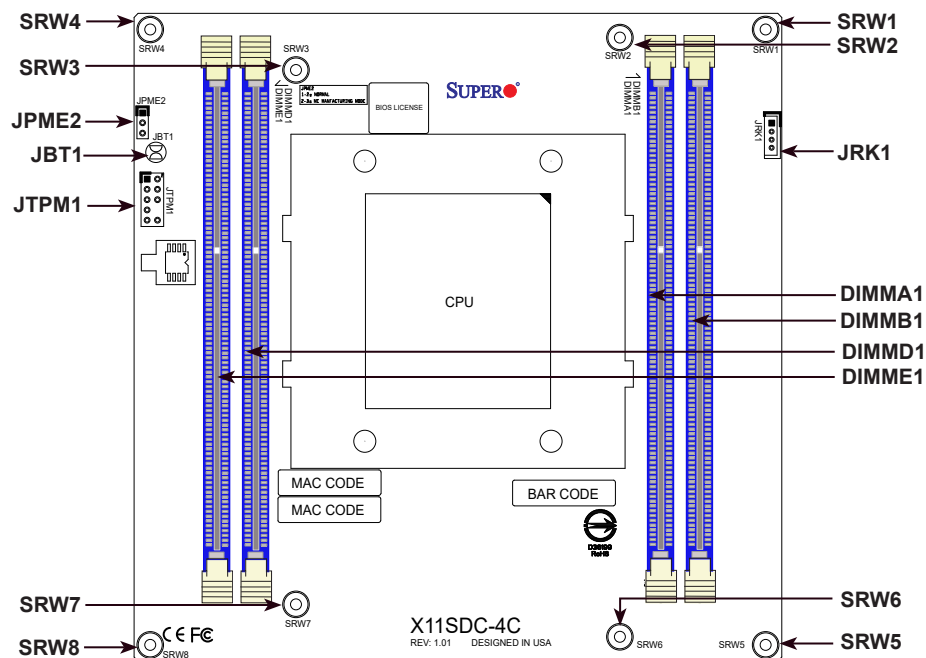
Bottom Layout



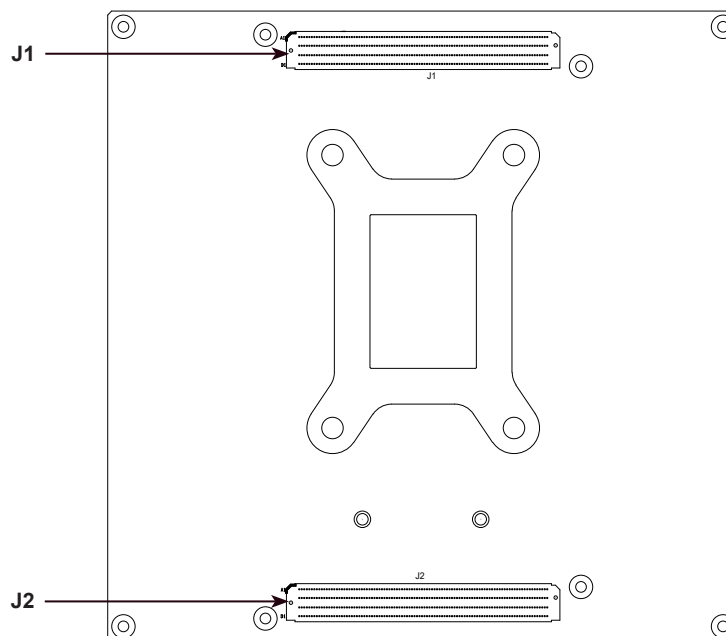
Note: Components not documented are for internal testing only.

Quick Reference

Top Layout



Bottom Layout



Notes:

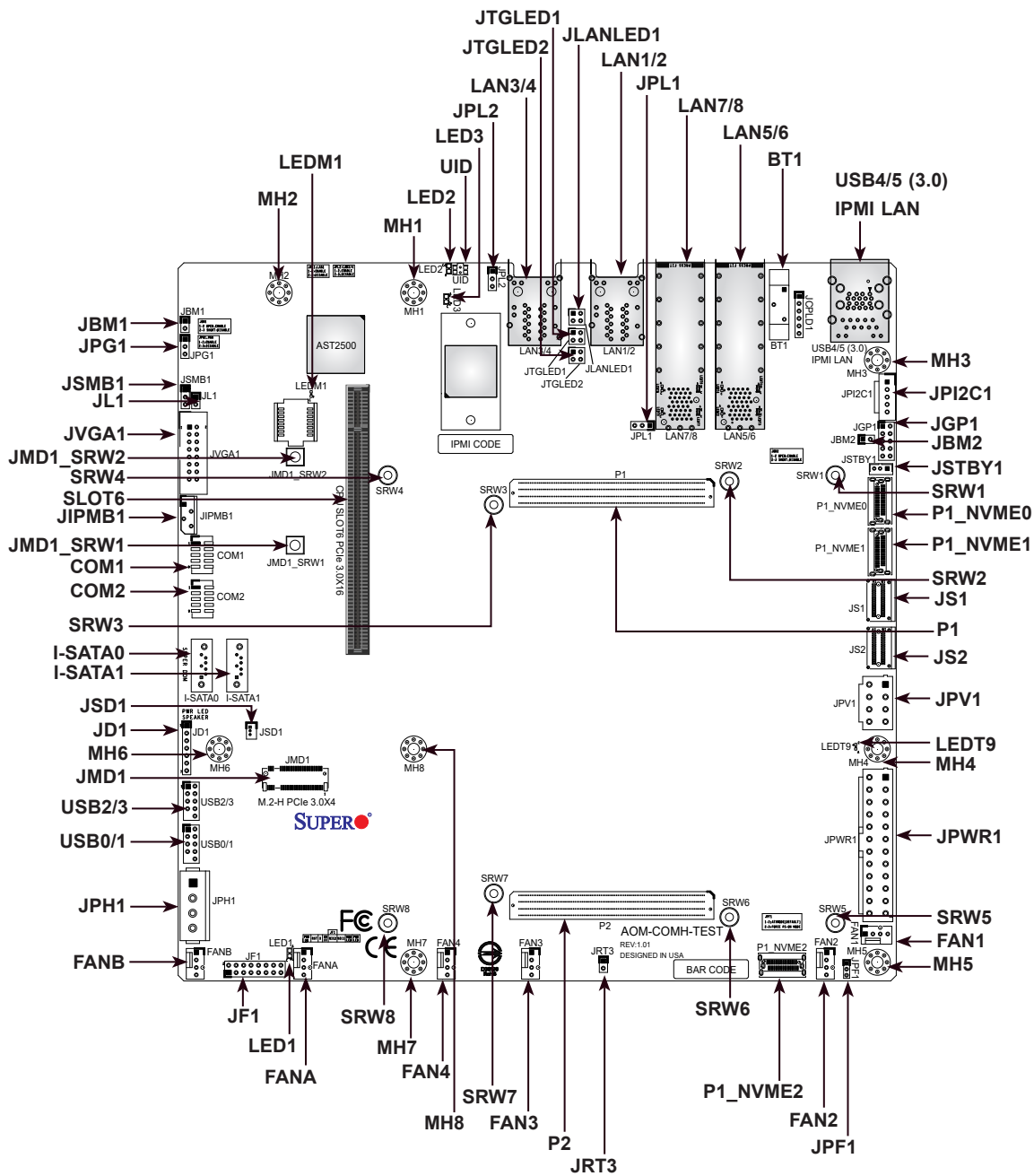
- See Chapter 2 for detailed information on jumpers, LED indicators, and I/O ports. Jumpers and LEDs not indicated are used for testing only.
- "■" indicates the location of Pin 1.

Quick Reference Table for X11SDC-4C/8C/16C

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPME2	Manufacturing Mode Select	Pins 1-2 (Normal)

Connector	Description
J1, J2	Module Board Connector
JRK1	Intel RAID Key Header
JTPM1	Trusted Platform Module (TPM)/Port 80 Connector
SRW1 - SRW8	Module Holding Screws

Figure 1-4. AOM-COMH-TEST Carrier Board Layout
(not drawn to scale)



Quick Reference Table for AOM-COMH-TEST

Jumper	Description	Default Setting
JBM1	IPMI Share LAN Enable/Disable	Open (Enabled)
JBM2	IPMI Dedicated LAN Enable/Disable	Open (Enabled)
JPF1	Power Mode Selection	Pins 1-2 (ATX Mode)
JPG1	Onboard VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1 Enable/Disable	Pins 1-2 (Enabled)
JPL2	LAN3/4 Enable/Disable	Pins 1-2 (Enabled)

LED	Description	Status
LED1	Power LED	Solid Green: Power On
LED2	UID LED	Solid Blue: Unit Identified
LED3	Overheat/Power Fail/Fan Fail LED	Solid Red: Overheat Blinking Red: Power/Fan Fail
LEDM1	BMC Heartbeat LED	Blinking Green: Device Working

Connector	Description
BT1	Onboard Battery
COM1, COM2	COM Port Header
FAN1 - FAN4, FANA, FANB	CPU/System Fan Headers (FAN1: CPU Fan)
I-SATA0, I-SATA1	SATA 3.0 Ports
IPMI LAN	Dedicated IPMI LAN Port
JD1	Power LED/Speaker Header (Pins 1-3: Power LED, Pins 4-7: Speaker)
JF1	Front Control Panel Header
JGP1	General Purpose I/O Header
JIPMB1	System Management Bus Header (for IPMI only)
JL1	Chassis Intrusion Header
JLANLED1	LAN3/4 Activity LED Header
JMD1	M.2 Slot M-Key 2280/22110 (PCIe x4)
JMD1_SRW1, JMD1_SRW2	M.2 Mounting Screws for JMD1
JPH1	4-pin HDD Power Connector
JPI ² C1	Power I ² C System Management Bus (Power SMB) Header
JPWR1	24-pin ATX Power Connector (Required)
JPV1	8-pin CPU Power Connector (Required)
JRT3	Temperature Sensor Header
JS1, JS2	SlimSAS PCIe 3.0 x4 Connectors
JSD1	SATA DOM Power Connector
JSMB1	System Management Bus Header
JSTBY1	5V Standby Power Header



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

Connector	Description
JTGLED1	LAN5/6 Activity LED Header
JTGLED2	LAN7/8 Activity LED Header
JVGA1	VGA Header
LAN1/2, LAN3/4	1GbE LAN Ports
LAN5/6, LAN7/8	10GbE LAN Ports
MH1 - MH8	Mounting Holes
P1, P2	Carrier Board Connectors
P1_NVME0, P1_NVME1, P1_NVME2	OCulink PCIe 3.0 x4 Connectors
SLOT6	CPU SLOT6 PCIe 3.0 x16
SRW1 - SRW8	Module Holding Screws
UID	Unit Identifier Switch
USB0/1, USB2/3	Front Accessible USB 2.0 Headers
USB4/5	Back panel USB 3.0 Ports

Module Board Features

CPU
• Supports Intel® Xeon D-2100 SoC Series SoC with TDP of up to 100W
Memory
• Supports up to 256GB of RDIMM or 512GB of ECC LRDIMM DDR4 memory with speeds of up to 2400MHz
DIMM Size
• 4GB, 8GB, 16GB, 32GB, 64GB
Network
• Intel i210-IT
Baseboard Management Controller (BMC)
• ASpeed AST2500
BIOS
• 256Mb AMI BIOS® SPI Flash BIOS • Plug and Play (PnP), ACPI 6.2, UEFI 2.7, SMBIOS 2.8 and 3.2, PCI F/W 3.1
Power Management
• ACPI power management • CPU fan auto-off in sleep mode • Power button override mechanism • Power-on mode for AC power recovery
System Health Monitoring
• Onboard voltage monitors for CPU cores, +1.8V, +3.3V, +5V, +/-12V, +3.3V Stby, +5V Stby, VBAT, HT, Memory, PCH temperature, system temperature, and memory temperature • CPU phase switching voltage regulator • CPU/System overheat control • CPU Thermal Trip support
Other
• RoHS
Dimensions
• Proprietary form factor (160 mm x 160 mm)



Note 1: 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.

Note 2: For IPMI configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available at <http://www.supermicro.com/support/manuals/>.

Carrier Board Features

Expansion Slots

- One M.2 M-Key 2280/22110 (PCIe 3.0 x4)
- One PCIe 3.0 x16 Slot

I/O Devices

- | | |
|--|--|
| <ul style="list-style-type: none"> • SATA 3.0 • OCulink • SlimSAS | <ul style="list-style-type: none"> • Two SATA 3.0 Ports • Three PCIe 3.0 x4 OCulink connectors • Two PCIe 3.0 x4 slimSAS connectors |
|--|--|

Peripheral Devices

- Two Front Accessible USB 2.0 Headers (USB0/1, USB2/3)
- Two Back Panel USB 3.0 Ports (USB4/5)

System Health Monitoring

- Onboard voltage monitors for CPU cores, +1.8V, +3.3V, +5V, +/-12V, +3.3V Stby, +5V Stby, VBAT, HT, Memory, PCH temperature, system temperature, and memory temperature
- CPU phase switching voltage regulator
- CPU Thermal Trip support
- CPU/System overheat control
- Platform Environment Control Interface (PECI)/TSI

Fan Control

- Fan status monitoring with firmware
- Multi-speed fan control via BMC

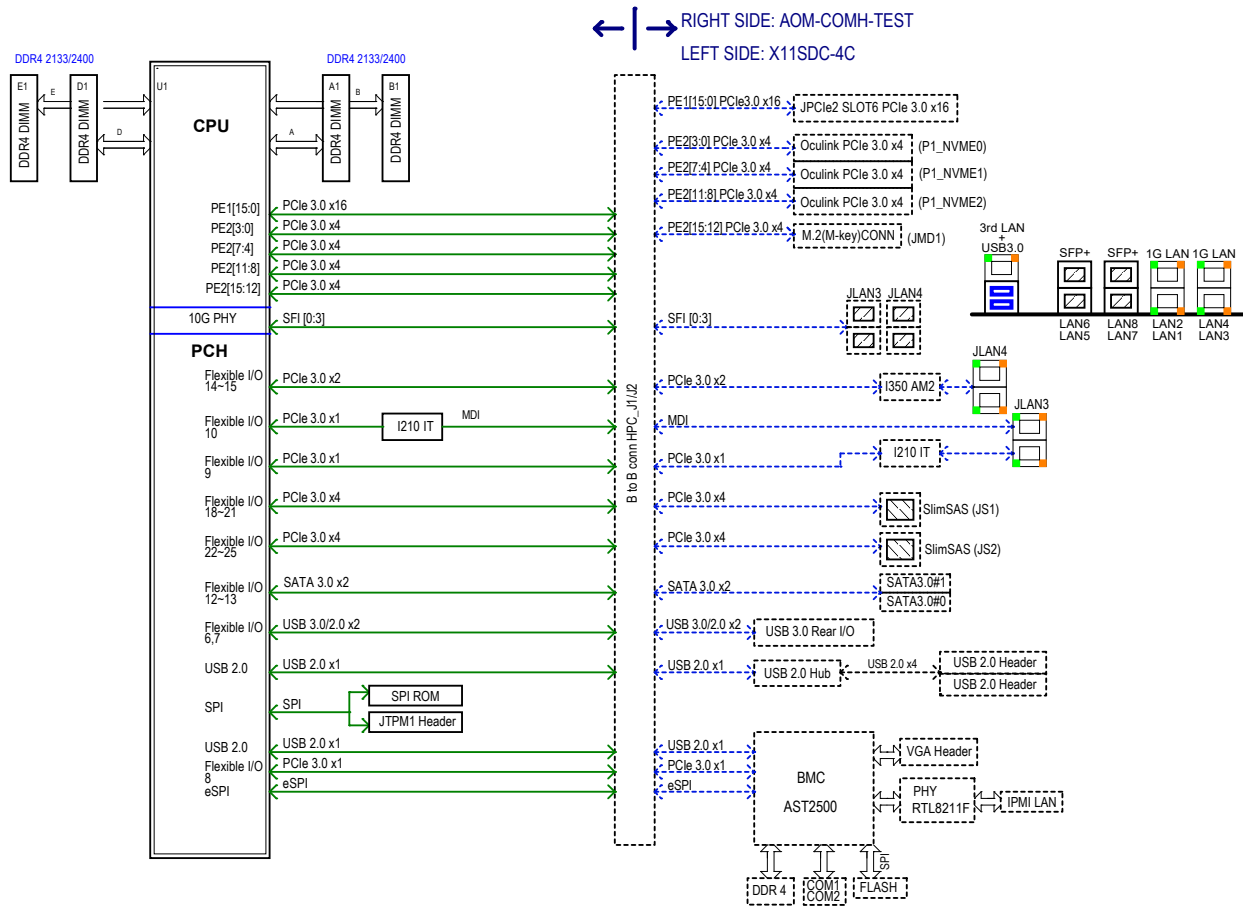
System Management

- Platform Environment Control Interface (PECI) 3.2 support
- Intel Node Manager
- IPMI 2.0 with KVM support
- SuperDoctor® 5
- Chassis Intrusion header and detection
- Power supply monitoring

LED Indicators

- CPU/System Overheat LED
- Power/Suspend State Indicator LED
- Fan Fail LED
- UID/Remote UID
- HDD Activity LED
- LAN Activity LED

**Figure 1-5.
Chipset Block Diagram**



Note: This is a general block diagram and may not exactly represent the features on your module board. See the previous pages for the actual specifications of your module board.

1.2 Processor Overview

The Intel Xeon D-2100 series SoC processor family, with up to 16 cores and up to 100W of power, offers performance, reliability, and high intelligence. As a low-power system-on-a-chip module board, the X11SDC-4C/8C/16C is optimized for a variety of workloads that requires high compute power in a compact form factor.

- ACPI Power Management Logic Support Rev. 4.0a
- Intel Turbo Boost Technology
- Adaptive Thermal Management/Monitoring
- PCIe 3.0, SATA 3.0, NVMe
- System Management Bus (SMBus) Specification Version 2.0
- Intel Trusted Execution Technology (Intel TXT)
- Intel Rapid Storage Technology
- Intel Virtualization Technology for Directed I/O (Intel VT-d)

1.3 Special Features

This section describes the health monitoring features of the module board. The module board 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 System Health Monitoring

The module board has an onboard Baseboard Management Controller (BMC) chip that supports system health monitoring.

Onboard Voltage Monitors

The onboard voltage monitor will continuously scan crucial voltage levels. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor. Real time readings of these voltage levels are all displayed in IPMI.

Fan Status Monitor with Firmware Control

The system health monitor chip can check the RPM status of a cooling fan. The CPU and chassis fans are controlled by BIOS Thermal Management through the BMC. Refer to the below table for available fan modes to choose the most appropriate one for nominal operation.

Environmental Temperature Control

System Health sensors monitor temperatures and voltage settings of onboard processors and the system in real time via the IPMI interface. Whenever the temperature of the CPU or the system exceeds a user-defined threshold, system/CPU cooling fans will be turned on to prevent the CPU or the system from overheating.

Figure 1-7. Fan Speed Modes

Fan Mode	Description
Full Speed	Use this mode to set fan speed at full speed for maximum system cooling
Standard	Use this mode to set fan speed for normal system cooling
Heavy I/O	Use this mode to set fan speed for higher PCIe add-on card area cooling



Note: To avoid possible system overheating, please provide adequate airflow to your system.

System Resource Alert

This feature is available when used with SuperDoctor 5® in the Windows OS or in the Linux environment. SuperDoctor is used to notify the user of certain system events. For example, you can configure SuperDoctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a predefined range.

1.5 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 CD-ROMs, 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 that is compatible with Windows 2012/R2 and 2016 Server operating systems.

1.6 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.

The module board supports an 8-pin 12V DC input power supply at JPV1 for custom system design. When used in conjunction with PN: AOM-COMH-TEST, the input power source will come from the AOM via the board to board connectors (P1, P2). Over current power usage may cause damage to the module board.

1.7 Serial Port

The X11SDC-4C/8C/16C supports two serial communication connections through AOM-COMH-TEST, either via the serial console connector or micro USB connector. COM Port can be used for input/output or console redirection. 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.

Chapter 2

Installation

2.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your module board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

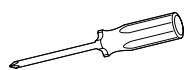
- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the module board and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the module board.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid possible explosion.

Unpacking

The module board is shipped in antistatic packaging to avoid static damage. When unpacking it, make sure that you are static protected.

2.2 Module Board Installation

All module boards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the module board and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the module board to the chassis. Make sure that the metal standoffs click in or are screwed in tightly.



Phillips Screwdriver (1)

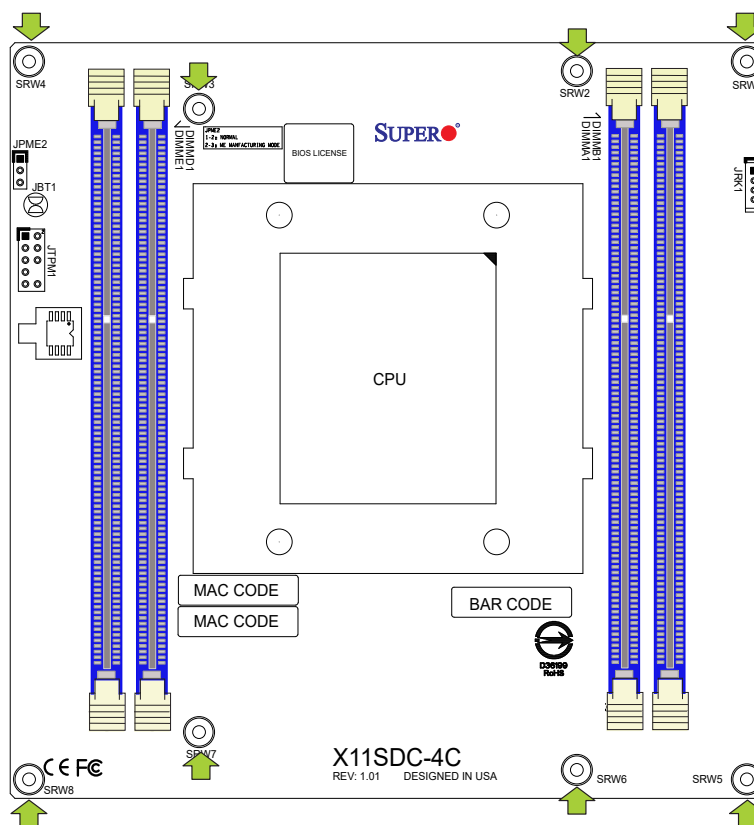


Phillips Screws (8)



Standoffs (8)
Only if Needed

Tools Needed



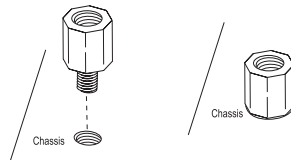
Location of Mounting Holes



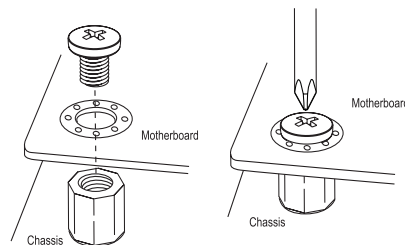
Note: 1) To avoid damaging the module board and its components, please do not use a force greater than 8 lb/inch on each mounting screw during module board installation.
2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components when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

Installing the Module Board

1. Locate the mounting holes on the module board. See the previous page for the location.



2. Locate the matching mounting holes on the chassis. Align the mounting holes on the module board against the mounting holes on the chassis.



3. Install standoffs in the chassis as needed.
4. Install the module board into the chassis carefully to avoid damaging other module board components.
5. Using the Phillips screwdriver, insert a Phillips head #6 screw into a mounting hole on the module board 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 module board 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 Population



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

Memory Support

The module board supports up to 256GB of RDIMM or 512GB of ECC LRDIMM DDR4 memory in four memory slots. Populating these DIMM slots with memory modules of the same type and size will result in interleaved memory, which will improve memory performance.

DIMM Module Population Configuration

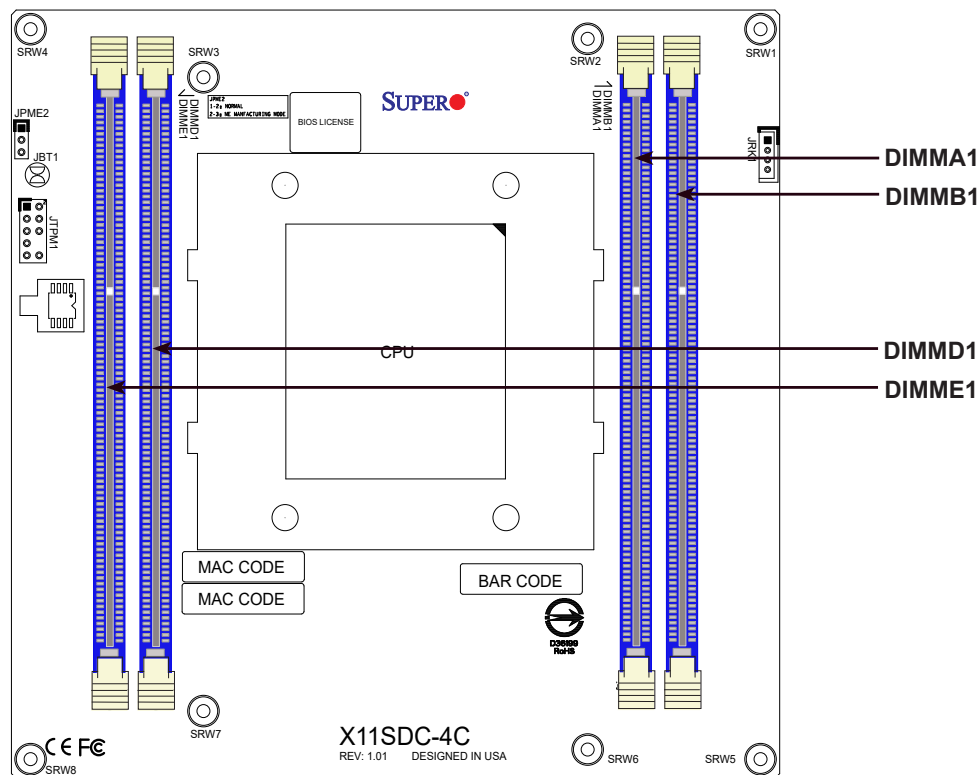
For optimal memory performance, follow the table below when populating memory.

Memory Population (Balanced)				
DIMMA1	DIMMB1	DIMMD1	DIMME1	Total System Memory
4GB	4GB			8GB
4GB	4GB	4GB		16GB
8GB	8GB			16GB
4GB	4GB	4GB		16GB
8GB	8GB	8GB		24GB
8GB	8GB	8GB	8GB	32GB
16GB	16GB			32GB
16GB	16GB	16GB		48GB
16GB	16GB	16GB	16GB	64GB
32GB	32GB			64GB
32GB	32GB	32GB		96GB
32GB	32GB	32GB	32GB	128GB
64GB	64GB			128GB
64GB	64GB	64GB		192GB
64GB	64GB	64GB	64GB	256GB
128GB	128GB			256GB
128GB	128GB	128GB		384GB
128GB	128GB	128GB	128GB	512GB

DIMM Module Population Sequence

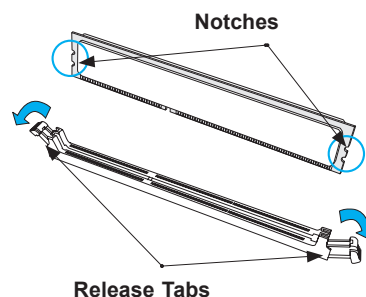
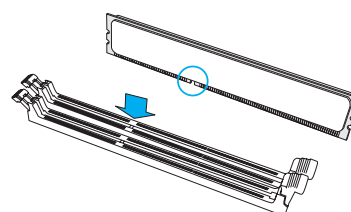
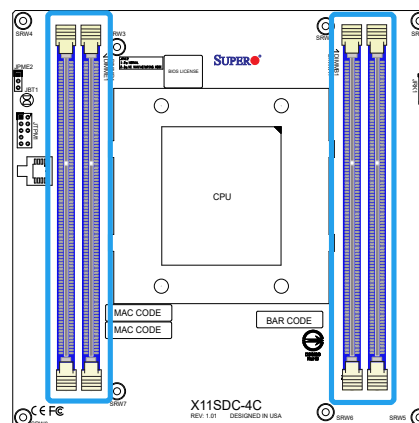
When installing memory modules, the DIMM slots should be populated in the following order: DIMMA1, DIMMB1, DIMMD1, DIMME1.

- Always use DDR4 DIMM modules of the same type and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The module board will support odd-numbered modules (one or three modules installed). However, for best memory performance, install DIMM modules in pairs to activate memory interleaving.



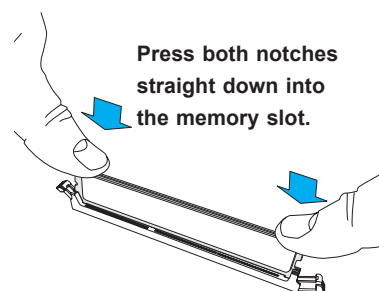
DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMMA1, DIMMB1, DIMMD1, DIMME1. For best performance, please use the 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. Press 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.

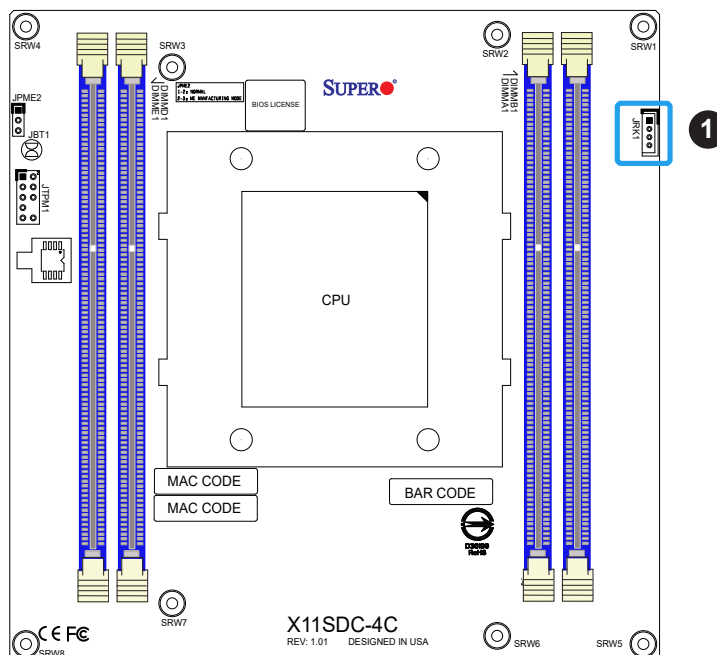


2.4 Connectors and Headers for X11SDC

Intel RAID Key Header

The JRK1 header allows you to enable RAID functions for NVMe connections. Refer to the table below for pin definitions.

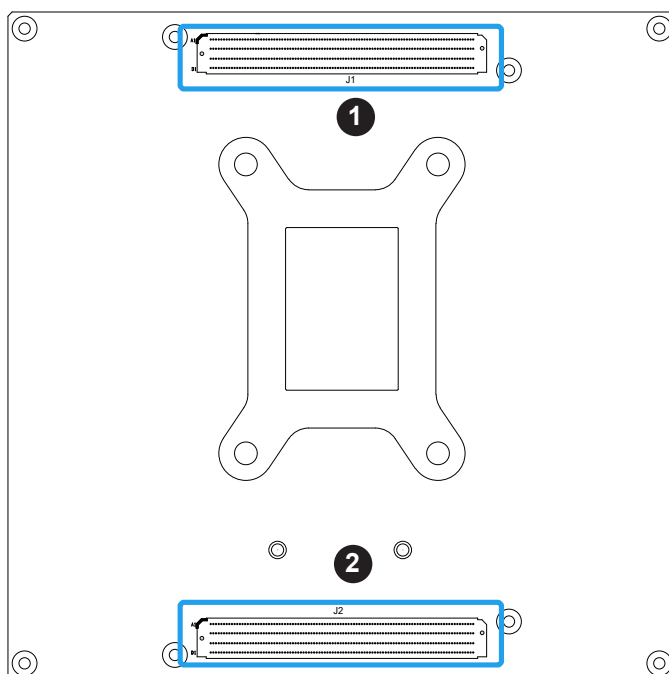
Intel RAID Key Header Pin Definitions	
Pin#	Definition
1	GND
2	PU 3.3V Stdbby
3	GND
4	PCH RAID KEY



1. Intel RAID Key Header

J1 and J2

Connect J1 and J2 to P1 and P2 of the AOM-COMH-TEST carrier board to form the module board. The pin definition table for J1 is on page 32 and the table for J2 is on page 33.



- 1. Module Board Connector
- 2. Module Board Connector

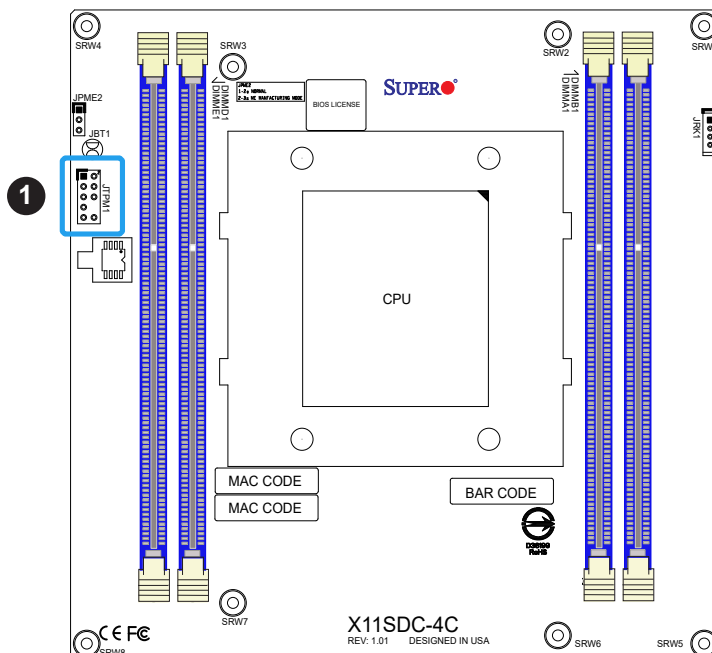
Primary (lower) Connector J1 Pin Definitions									
Pin#	Row A	Row B	Row C	Row D	Pin#	Row A	Row B	Row C	Row D
1	VCC	VCC	VCC	VCC	51	eSPI_IO1			GND
2	VCC	PWRBTN#	RSTBTN#	VCC	52	eSPI_IO2	eSPI_ALERT0#		SATA0_TX-
3	VCC	VCC	VCC	VCC	53	eSPI_IO3	eSPI_ALERT0#(RSVD)		SATA0_TX+
4	VCC	THERMTRIP#		VCC	54	eSPI_CLK	eSPI_CS0#		GND
5	VCC	VCC	VCC	VCC	55	GND	eSPI_CS1#(RSVD)	GND	SATA1_RX-
6	VCC	TAMPER#	VIN_PWROK	VCC	56	PCIe_CLKREQ0#(RSVD)	eSPI_RST#	PCIe_REFCLK0_HI-	SATA1_RX+
7	VCC	VCC	VCC	VCC	57	PCIe_CLKREQ1#(RSVD)	GND	PCIe_REFCLK0_HI-	GND
8	VCC	SUS_S3#	SUS_S4_S5#	VCC	58	GND	PCIe_BMC_RX-	GND	SATA1_TX-
9	VCC	VCC	VCC	VCC	59	PCIe_BMC_TX-	PCIe_BMC_RX+	PCIe_REFCLK0_LO-	SATA1_TX+
10	GND		GND	WAKE0#	60	PCIe_BMC_TX+	GND	PCIe_REFCLK0_LO+	GND
11				WAKE1#	61	GND	PCIe08_RX-	GND	PCIe00_TX-
12	PLTRST#	GND		GND	62	PCIe08_TX-	PCIe08_RX+	PCIe00_RX-	PCIe00_TX+
13	GND	USB5-	GND		63	PCIe08_TX+	GND	PCIe00_RX+	GND
14		USB5+	USB3-		64	GND	PCIe09_RX-	GND	PCIe01_TX-
15		GND	USB3+	GND	65	PCIe09_TX-	PCIe09_RX+	PCIe01_RX-	PCIe01_TX+
16	GND	USB4-	GND		66	PCIe09_TX+	GND	PCIe01_RX+	GND
17		USB4+	USB2-		67	GND	PCIe10_RX-	GND	PCIe02_TX-
18		GND	USB2+		68	PCIe10_TX-	PCIe10_RX+	PCIe02_RX-	PCIe02_TX+
19	GND	ETH0_I2C_CLK	GND	ETH0_RX-	69	PCIe10_TX+	GND	PCIe02_RX+	GND
20		ETH0_I2C_DAT	ETH0_TX-	ETH0_RX+	70	GND	PCIe11_RX-	GND	PCIe03_TX-
21			ETH0_TX+	GND	71	PCIe11_TX-	PCIe11_RX+	PCIe03_RX-	PCIe03_TX+
22	GND	VCC_5V_SBY	GND	ETH1_RX-	72	PCIe11_TX+	GND	PCIe03_RX+	GND
23		VCC_5V_SBY	ETH1_TX-	ETH1_RX+	73	GND	PCIe12_RX-	GND	PCIe04_TX-
24		VCC_5V_SBY	ETH1_TX+	GND	74	PCIe12_TX-	PCIe12_RX+	PCIe04_RX-	PCIe04_TX+
25	GND	USB67_OC#	GND	ETH2_RX-	75	PCIe12_TX+	GND	PCIe04_RX+	GND
26		USB45_OC#	ETH2_TX-	ETH2_RX+	76	GND	PCIe13_RX-	GND	PCIe05_TX-
27		USB23_OC#	ETH2_TX+	GND	77	PCIe13_TX-	PCIe13_RX+	PCIe05_RX-	PCIe05_TX+
28	GND	USB01_OC#	GND	ETH3_RX-	78	PCIe13_TX+	GND	PCIe05_RX+	GND
29	ETH1_I2C_CLK	SML1_CLK	ETH3_TX-	ETH3_RX+	79	GND	PCIe14_RX-	GND	PCIe06_TX-
30	ETH1_I2C_DAT	SML1_DAT	ETH3_TX+	GND	80	PCIe14_TX-	PCIe14_RX+	PCIe06_RX-	PCIe06_TX+
31	GND		GND	USB3_SSTX-	81	PCIe14_TX+	GND	PCIe06_RX+	GND
32	ETH2_I2C_CLK	SML0_CLK	USB3_SSRX-	USB3_SSTX+	82	GND	PCIe15_RX-	GND	PCIe07_TX-
33	ETH2_I2C_DAT	SML0_DAT	USB3_SSRX+	GND	83	PCIe15_TX-	PCIe15_RX+	PCIe07_RX-	PCIe07_TX+
34	GND		GND	USB2_SSTX-	84	PCIe15_TX+	GND	PCIe07_RX+	GND
35	ETH3_I2C_CLK		USB2_SSRX-	USB2_SSTX+	85	GND		GND	NBASET0_MDI0-
36	ETH3_I2C_DAT		USB2_SSRX+	GND	86	VCC_RTC		SMB_CLK	NBASET0_MDI0+
37	GND		GND		87	SUS_CLK		SMB_DAT	GND
38					88	GPIO_00		SMB_ALERT#(RSVD)	NBASET0_MDI1-
39				GND	89	GPIO_01		UART0_TX	NBASET0_MDI1+
40	GND		GND		90	GPIO_02		UART0_RX	GND
41					91	GPIO_03			NBASET0_MDI2-
42		GND		GND	92	GPIO_04			NBASET0_MDI2+
43	GND		GND		93	GPIO_05		I2C0_CLK	GND
44					94	GPIO_06		I2C0_DAT	NBASET0_MDI3-
45				GND	95	GPIO_07			NBASET0_MDI3+
46			GND		96	GPIO_08			GND
47					97	GPIO_09			NBASET0_LINK_MAX#
48				GND	98	GPIO_10			NBASET0_LINK_MID#
49	GND		GND		99	GPIO_11			NBASET0_LINK_ACT#
50	eSPI_IO0			SATA0_RX+	100	PINOUT_TYPE0		PINOUT_TYPE1	PINOUT_TYPE2

Secondary (upper) Connector J2 Pin Definitions									
Pin#	Row E	Row F	Row G	Row H	Pin#	Row E	Row F	Row G	Row H
1		ETH2_SDP			51	PCle18_TX-	PCle18_RX+	PCle26_RX-	PCle26_TX+
2	VCC	ETH3_SDP			52	PCle18_TX+	GND	PCle26_RX+	GND
3					53	GND	PCle19_RX-	GND	PCle27_TX-
4					54	PCle19_TX-	PCle19_RX+	PCle27_RX-	PCle27_TX+
5	GND				55	PCle19_TX+	GND	PCle27_RX+	GND
6					56	GND	PCle20_RX-	GND	PCle28_TX-
7					57	PCle20_TX-	PCle20_RX+	PCle28_RX-	PCle28_TX+
8	GND				58	PCle20_TX+	GND	PCle28_RX+	GND
9					59	GND	PCle21_RX-	GND	PCle29_TX-
10					60	PCle21_TX-	PCle21_RX+	PCle29_RX-	PCle29_TX+
11	GND				61	PCle21_TX+	GND	PCle29_RX+	GND
12					62	GND	PCle22_RX-	GND	PCle30_TX-
13					63	PCle22_TX-	PCle22_RX+	PCle30_RX-	PCle30_TX+
14	GND		GND		64	PCle22_TX+	GND	PCle30_RX+	GND
15					65	GND	PCle23_RX-	GND	PCle31_TX-
16					66	PCle23_TX-	PCle23_RX+	PCle31_RX-	PCle31_TX+
17	GND				67	PCle23_TX+	GND	PCle31_RX+	GND
18					68	GND	PCle48_RX-	GND	PCle56_TX-
19		GND		GND	69	PCle48_TX-	PCle48_RX+	PCle56_RX-	PCle56_TX+
20	GND	PCle32_RX-	GND	PCle40_TX-	70	PCle48_TX+	GND	PCle56_RX+	GND
21	PCle32_TX-	PCle32_RX+	PCle40_RX-	PCle40_TX+	71	GND		GND	
22	PCle32_TX+	GND	PCle40_RX+	GND	72				
23	GND	PCle33_RX-	GND	PCle41_TX-	73		GND		GND
24	PCle33_TX-	PCle33_RX+	PCle41_RX-	PCle41_TX+	74	GND		GND	
25	PCle33_TX+	GND	PCle41_RX+	GND	75				
26	GND	PCle34_RX-	GND	PCle42_TX-	76		GND		GND
27	PCle34_TX-	PCle34_RX+	PCle42_RX-	PCle42_TX+	77	GND		GND	
28	PCle34_TX+	GND	PCle42_RX+	GND	78				
29	GND	PCle35_RX-	GND	PCle43_TX-	79		GND		GND
30	PCle35_TX-	PCle35_RX+	PCle43_RX-	PCle43_TX+	80	GND		GND	
31	PCle35_TX+	GND	PCle43_RX+	GND	81				
32	GND	PCle36_RX-	GND		82		GND		GND
33	PCle36_TX-	PCle36_RX+			83	GND		GND	
34	PCle36_TX+	GND		GND	84				
35	GND	PCle37_RX-	GND		85		GND		GND
36	PCle37_TX-	PCle37_RX+			86	GND		GND	
37	PCle37_TX+	GND		GND	87				
38	GND	PCle38_RX-	GND		88		GND		GND
39	PCle38_TX-	PCle38_RX+			89	GND		GND	
40	PCle38_TX+	GND		GND	90				
41	GND	PCle39_RX-	GND		91		GND		GND
42	PCle39_TX-	PCle39_RX+			92	GND	PCle_REFCLK2-		
43	PCle39_TX+	GND		GND	93	PCle_REFCLK1-	PCle_REFCLK2+	PCle_REFCLK3-	
44	GND	PCle16_RX-	GND	PCle24_TX-	94	PCle_REFCLK1+	GND	PCle_REFCLK3+	GND
45	PCle16_TX-	PCle16_RX+	PCle24_RX-	PCle24_TX+	95	GND	PCle_CLKREQ3#(RSVD)	GND	
46	PCle16_TX+	GND	PCle24_RX+	GND	96	PCIE_CLKREQ2#(RSVD)			
47	GND	PCle17_RX-	GND	PCle25_TX-	97	PCIE_CLKREQ3#(RSVD)			GND
48	PCle17_TX-	PCle17_RX+	PCle25_RX-	PCle25_TX+	98				
49	PCle17_TX+	GND	PCle25_RX+	GND	99		ETH0_SDP		
50	GND	PCle18_RX-	GND	PCle26_TX-	100		ETH1_SDP		

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 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 Stdbby	10	SPI_IRQ#



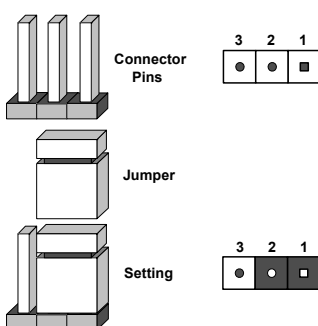
1. TPM Header

2.5 Jumper Settings for X11SDC

How Jumpers Work

To modify the operation of the module board, 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 module board layout page for jumper locations.

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



CMOS Clear

JBT1 is used to clear the CMOS. Instead of pins, this jumper consists of contact pads to prevent accidental clearing of the CMOS. To clear the CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection.

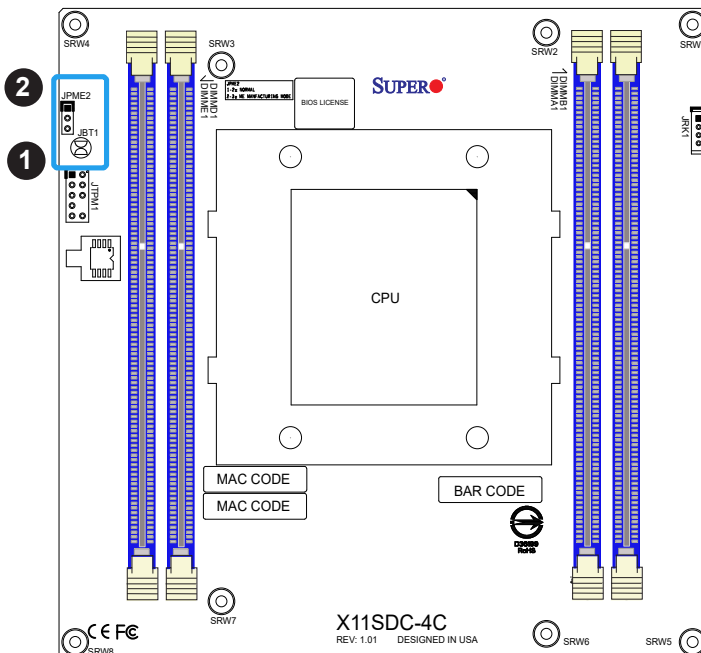


Note: Shut down the system and then short JBT1 to clear the CMOS.

Manufacturing Mode Select

Close pins 2-3 of jumper JPME2 to bypass SPI flash security and force the system to operate in the manufacturing mode, which will allow you to flash the system firmware from a host server for system setting modifications. Refer to the table below for jumper settings.

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



1. CMOS Clear
2. Manufacturing Mode

2.6 Rear I/O Ports for AOM-COMH-TEST

See Figure 2-1 below for the locations and descriptions of the various I/O ports on the rear of the carrier board.

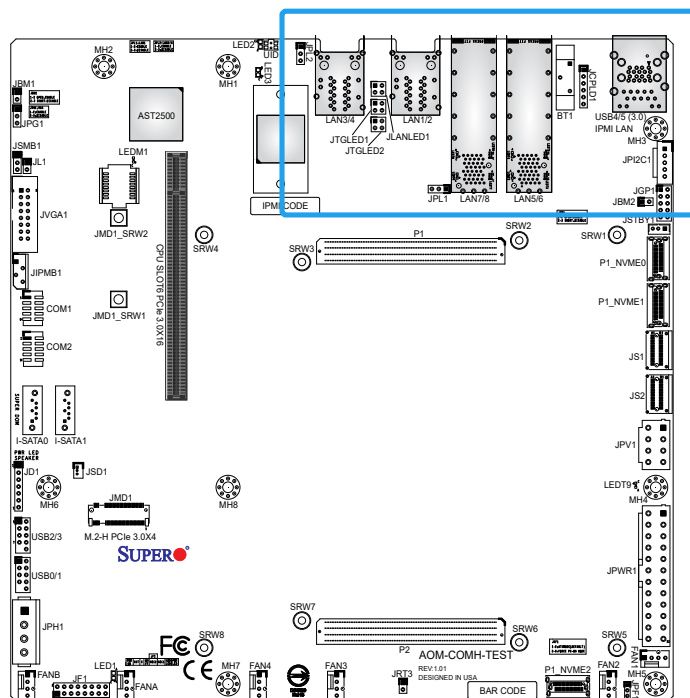
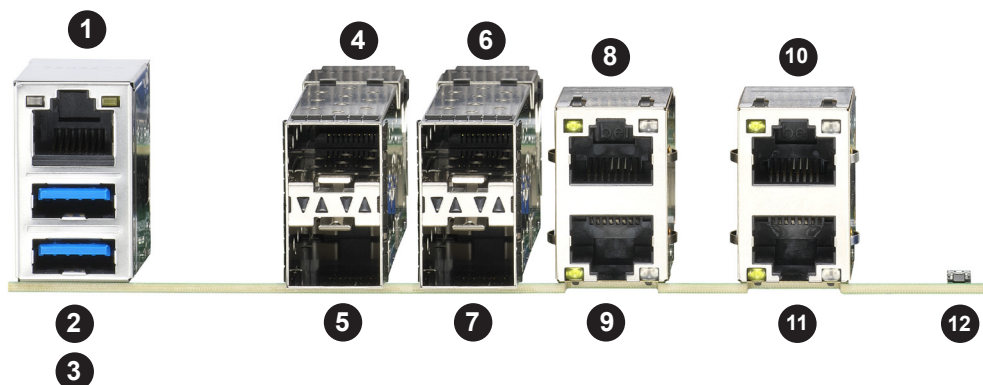


Figure 2-1. I/O Port Locations and Definitions

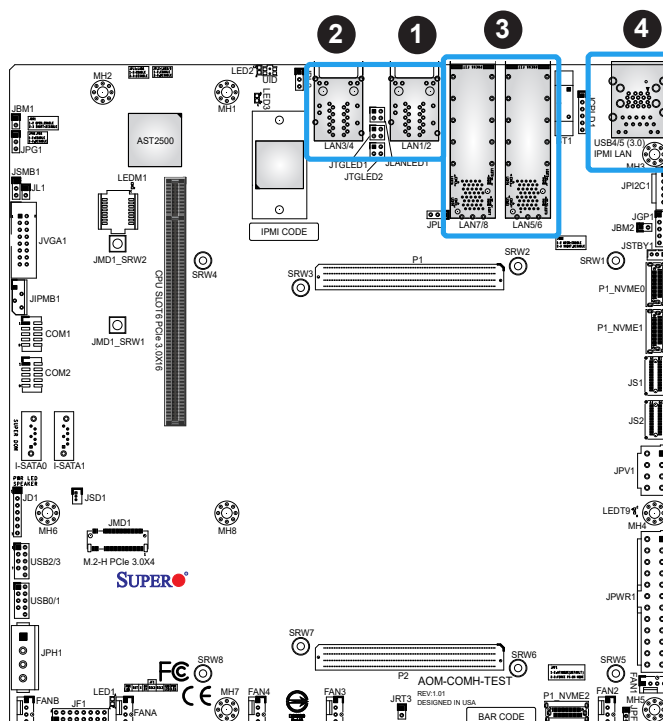


I/O Back Panel Description					
#	Description	#	Description	#	Description
1.	IPMI LAN	6.	LAN8	11.	LAN3
2.	USB5 (USB3.0)	7.	LAN7	12.	UID Switch
3.	USB4 (USB3.0)	8.	LAN2		
4.	LAN6	9.	LAN1		
5.	LAN5	10.	LAN4		

LAN Ports

The carrier board has 8 LAN ports. LAN1 – LAN4 are 1G ports, and LAN5 - LAN8 are 10G SFP+ ports. In addition to the LAN ports, the carrier board offers a dedicated IPMI LAN port. Refer to the table below for the pin definitions.

LAN Port Pin Definition			
Pin#	Definition	Pin#	Definition
1	TX_D1+	5	BI_D3-
2	TX_D1-	6	RX_D2-
3	RX_D2+	7	BI_D4+
4	BI_D3+	8	BI_D4-



1. LAN1/2 (1G RJ45 Type)
2. LAN3/4 (1G RJ45 Type)
3. LAN5/6/7/8 (10G SFP+)
4. IPMI LAN

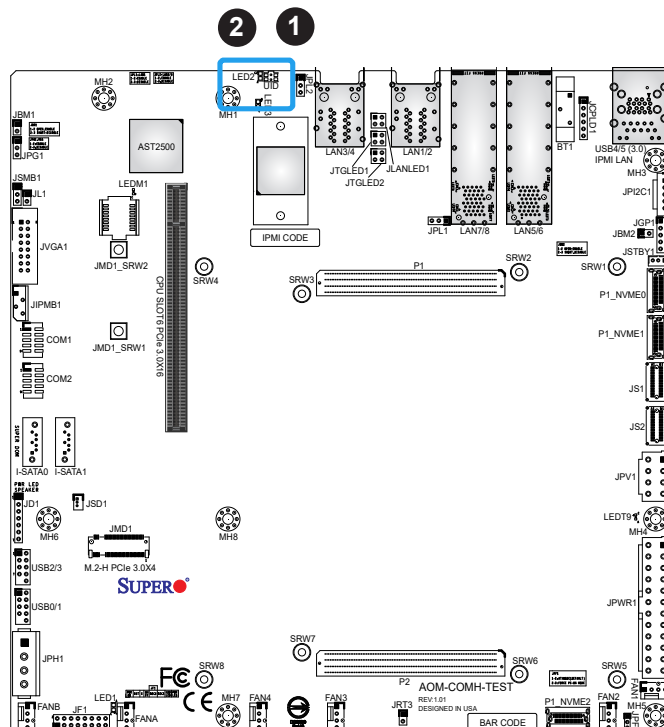
Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED indicator are located on the carrier board. The UID switch is located at UID and the UID LED is at LED2. When you press the UID switch, the 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 module board. For more information on IPMI, please refer to the IPMI User's Guide posted on our website at <http://www.supermicro.com/support/manuals/>.

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

UID LED Pin Definitions	
Color	Status
Blue: On	Unit Identified



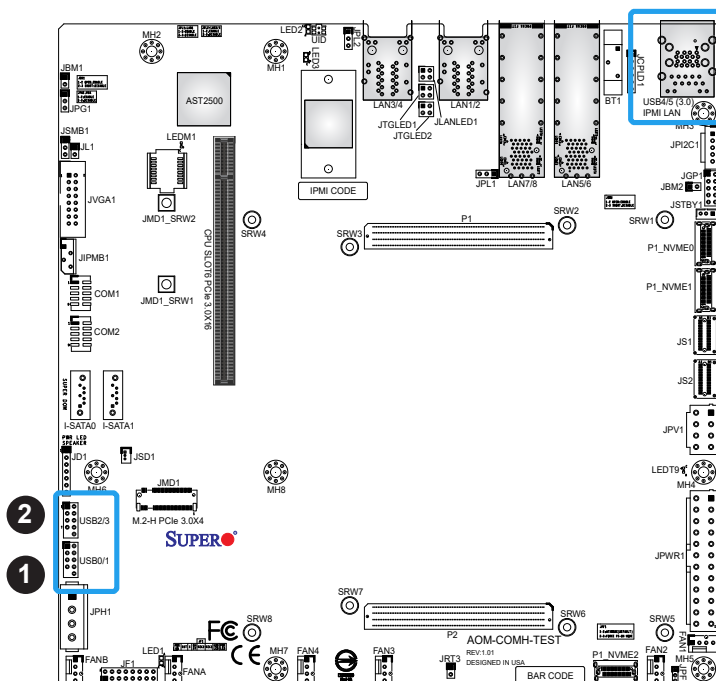
1. UID Switch
2. UID LED

Universal Serial Bus (USB) Ports

The carrier board has two USB 3.0 Gen 1 ports (USB4/5) on the I/O back panel. There are two USB 2.0 headers (USB0/1, USB2/3). These onboard headers can be used to provide front side USB access with a cable (not included).

Back Panel USB 3.0 Ports (USB4/5) Pin Definitions	
Pin#	Definition
A1	VBUS
A2	D-
A3	D+
A4	GND
A5	StdA_SSRX-
A6	StdA_SSRX+
A7	GND
A8	StdA_SSTX-
A9	StdA_SSTX+

Front Panel USB 2.0 Header (USB0/1, USB2/3) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	NC



1. USB0/1
2. USB2/3
3. USB4/5

2.7 Front Control Panel for AOM-COMH-TEST

JF1 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 a Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.

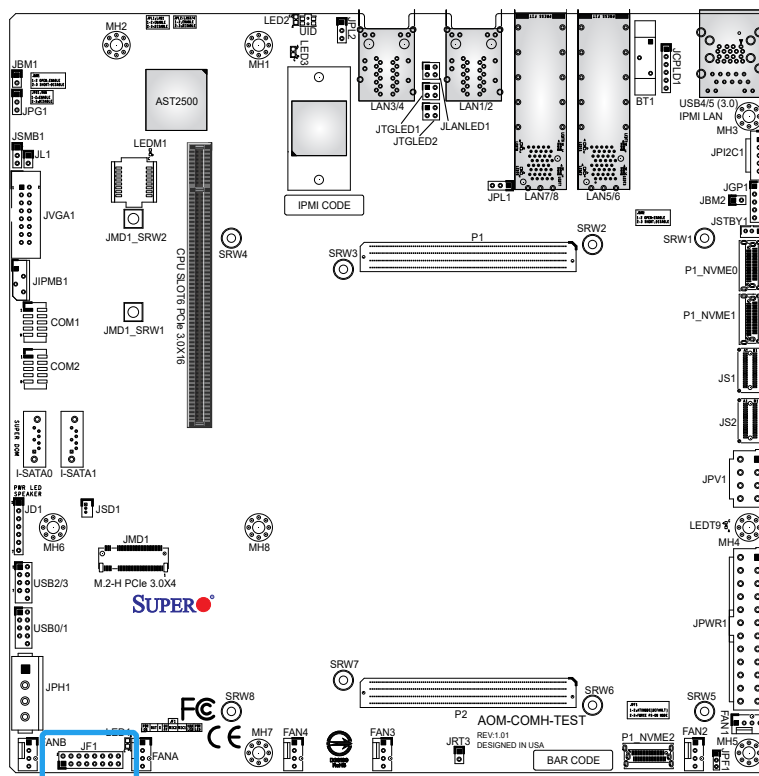


Figure 2-2. JF1 Header Definitions

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

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. 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 when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table below for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	Ground

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case to reset the system. Refer to the table below for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

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

1. PWR Button
2. Reset Button

Power Fail LED

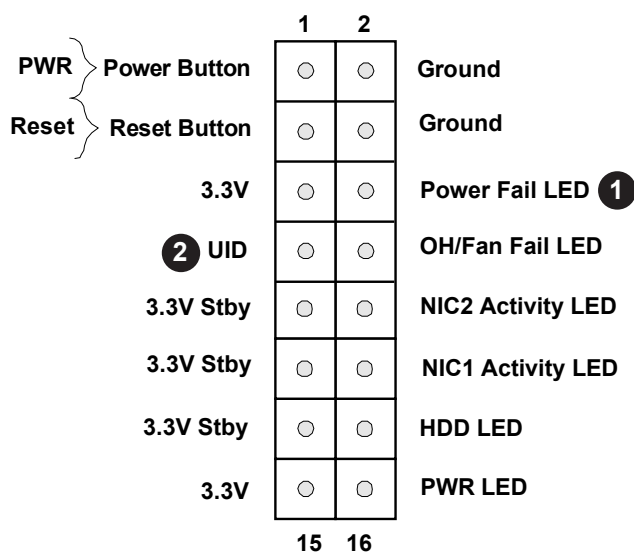
The Power Fail LED connection is located at pins 5 and 6. Refer to the table below for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	Power Fail LED

UID LED

The UID LED connection is on pins 7 and 8. Connect a cable here to show the UID activity. Refer to the table below for pin definitions.

UID LED Pin Definitions (JF1)	
Pin#	Definition
7	UID LED Cathode
8	UID LED Anode



1. Power Fail LED
2. UID LED

Overheat (OH)/Fan Fail

Connect an LED cable to pins 7 and 8 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.

UID LED Pin Definitions (JF1)	
Pin#	Definition
7	UID LED Cathode
8	UID LED Anode

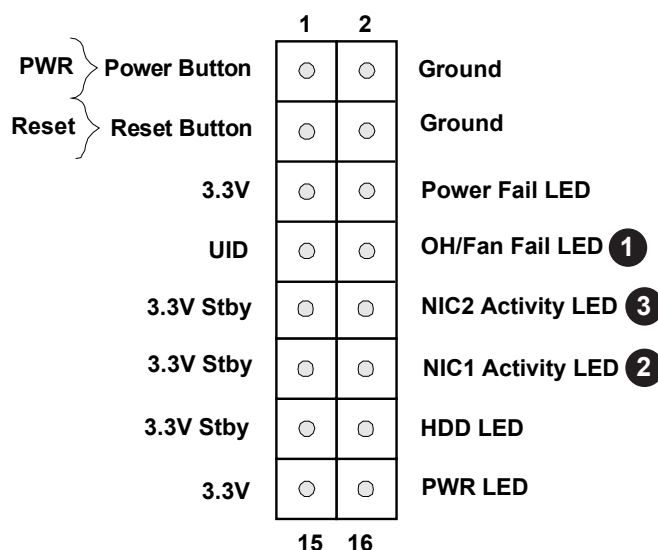
OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	+3.3V
8	OH/Fan Fail LED

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

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, 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.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	3.3V Stby
10/12	NIC Activity LED



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

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

HDD LED Pin Definitions (JF1)	
Pins	Definition
13	3.3V
14	HDD LED

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table below for pin definitions.

Power LED Pin Definitions (JF1)	
Pins	Definition
15	+3.3V Stby
16	PWR LED

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

1. HDD LED
2. Power LED

2.8 Connectors and Headers For AOM-COMH-TEST

ATX and 12V Power Connector

JPWR1 is the ATX power connector and JPV1 is the 12V DC power connector. They provide power to the carrier board.

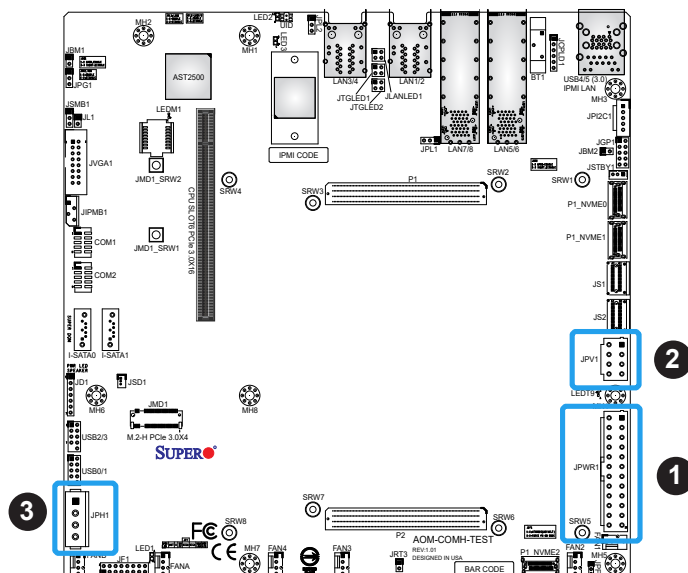
8-pin 12V Power Pin Definitions	
Pins	Definition
1 - 4	Ground
5 - 8	+12V

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

4-pin HDD Connector

JPH1 is a 4-pin HDD power connector that provides power to onboard hard disk drives.

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



1. 24-pin ATX Power
2. 8-Pin 12V Power
3. 4-pin HDD Power

Fan Headers

The AOM-COMH-TEST has six 4-pin fan headers (FAN1 - FAN4, FANA, FANB). These headers are backwards-compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only by the Thermal Management via the IPMI 2.0 interface. Refer to the table below for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	2.5A/+12V (Red)
3	Tachometer
4	PWM_Control

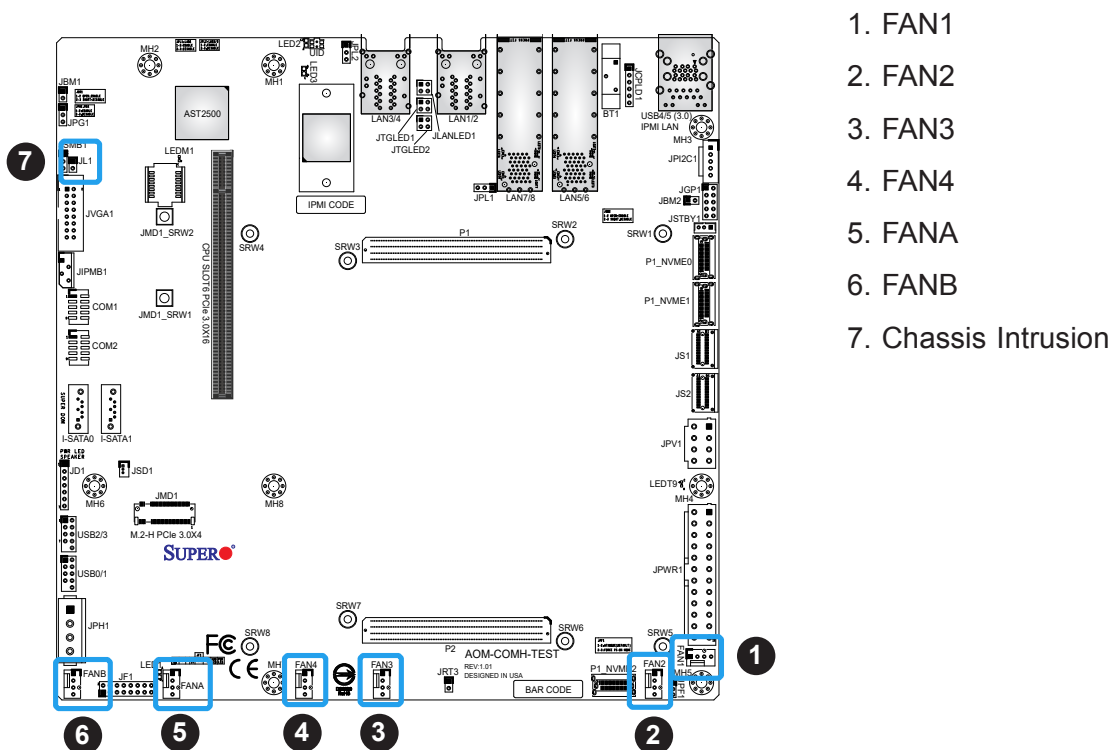
Zone 1: FAN1/2/3/4

Zone 2: FANA/B

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the carrier board. 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



1. FAN1
2. FAN2
3. FAN3
4. FAN4
5. FANA
6. FANB
7. Chassis Intrusion

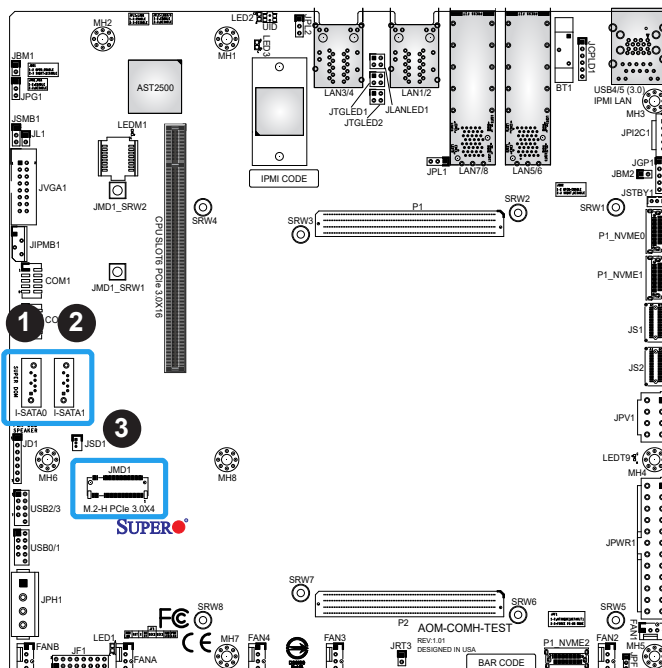
SATA Ports

The carrier board has two I-SATA 3.0 ports. SATA ports provide serial link signal connections, which are faster than the connections of Parallel ATA. Refer to the tables below for pin definitions.

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

M.2 Slot

The carrier board has one M.2 slot. M.2 was formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot at JMD1 is an M-Key that supports PCIe 3.0 x4 in 2280 and 22110 form factors.



1. I-SATA0
2. I-SATA1
3. JMD1 - M.2 M-Key

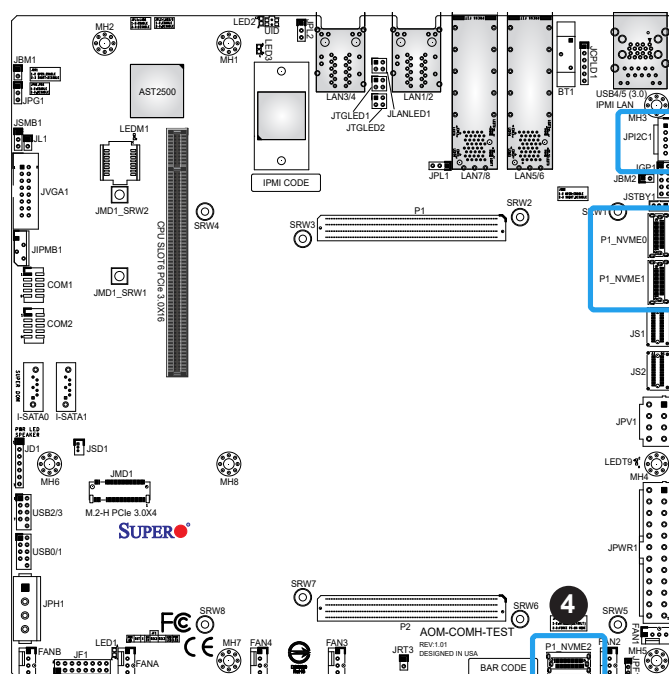
Power SMB (I²C) Header

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	Clock
2	Data
3	PMBUS_Alert
4	Ground
5	NC

OCulink Connectors

The carrier board has three OCulink connectors. Use these connectors to attach an OCulink device.



1. Power SMB Header
2. P1_NVME0
3. P1_NVME1
4. P1_NVME2

VGA Header

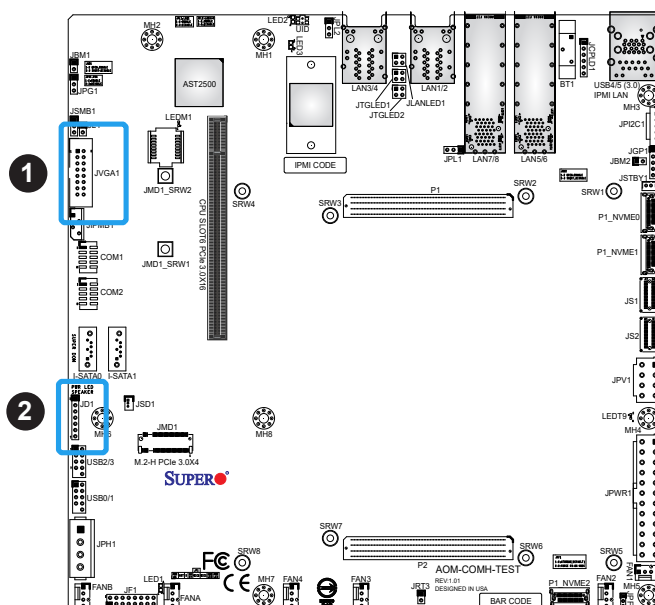
Connect an IDC 16-pin VGA extension cable to JVGA1 for a VGA connection (PN: CBL-CDAT-0850).

SATA 3.0 Port Pin Definitions			
Pin#	Signal	Pin#	Signal
1	VGA_RED	2	VGA_GRE
3	VGA_BLE	4	N/C
5	GND	6	VGA_DET (GND)
7	GND	8	GND
9	5V	10	GND
11	N/C	12	DDCSDA
13	HSYNC	14	VSYNC
15	DDCSCL	16	N/C

Power LED/Speaker Header

Pins 1-3 are for the power LED and pins 4-7 are for the speaker. Please note that the speaker connector pins (4-7) are used with an external speaker. Refer to the table below for pin definitions.

Speaker Connector Pin Definitions	
Pin#	Signal
1-3	Power LED
4-7	Speaker



1. VGA Header

2. Power LED/Speaker Header

5V Standby Power Header

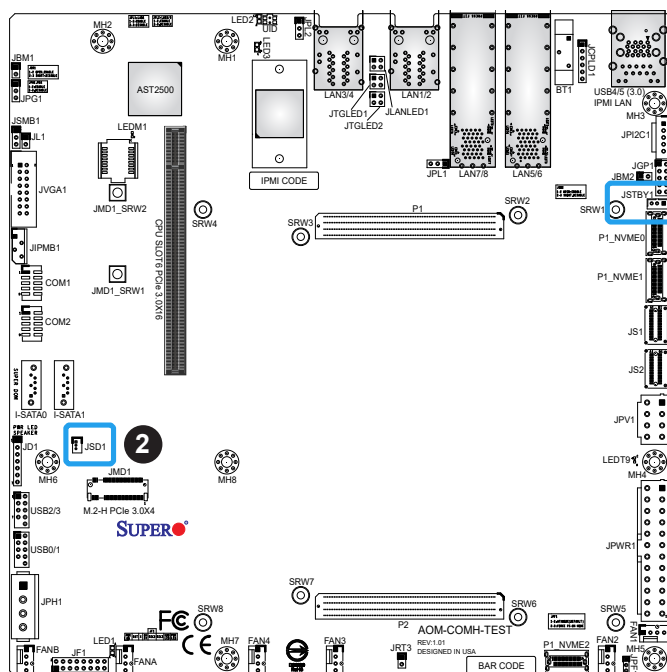
The Standby Power header is located at JSTBY1. You must have a card with a Standby Power connector and a cable to use this feature. Refer to the table below for pin definitions.

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	No Connection

Disk-On-Module Power Connector

The Disk On Module (DOM) power connector at JSD1 provides 5V power to a solid-state DOM storage device connected to one of the SATA ports. Refer to the table below for pin definitions.

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



1. 5V Standby Power Header
2. SATA DOM

System Management Bus Header

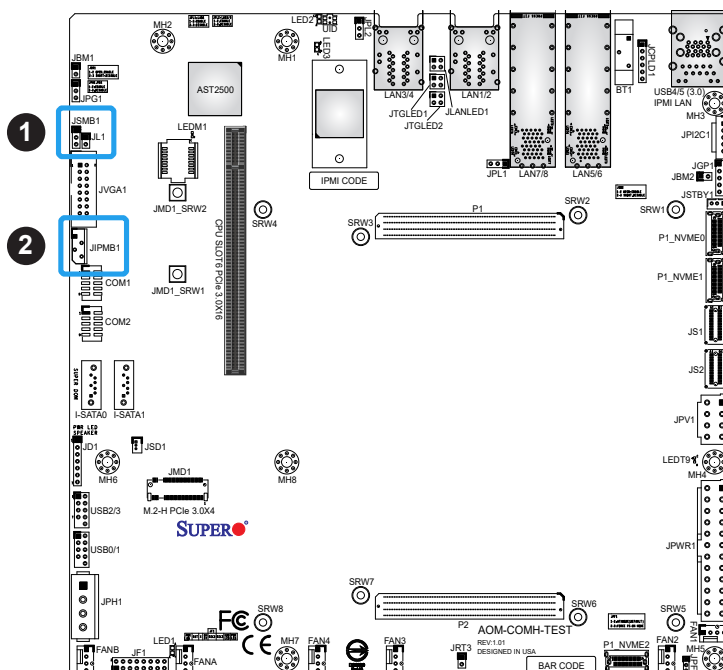
A System Management Bus header for additional slave devices or sensors is located at JSMB1. Refer to the table below for pin definitions.

SMBus Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock

4-pin BMC External I²C 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 I ² C Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection



1. SMBus Header
2. BMC External I2C Header

COM Port Headers

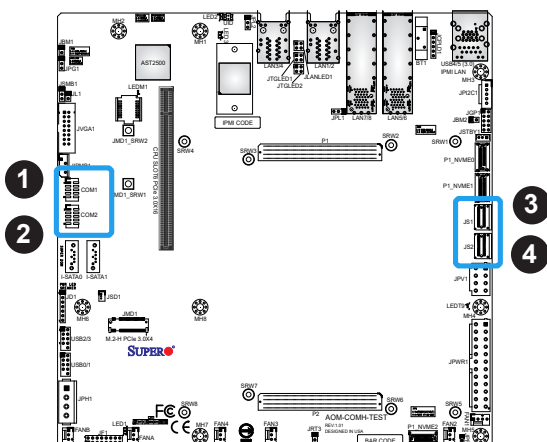
The carrier board has two COM headers to provide serial connections.

COM Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	SP_DCDA	6	SP_DSRA
3	SP_RXDA	7	SP_RTSA
5	SP_TXDA	8	SP_STSA
7	SP_DTRA	9	SP_RIA
9	GND	10	NC

SlimSAS Connectors

JS1 and JS2 are the SlimSAS PCIe 3.0 x4 connectors.

SlimSAS Connector Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	GND	B1	GND
A2	RX0P	B2	TX0P
A3	RX0N	B3	TX0N
A4	GND	B4	GND
A5	RX1P	B5	TX1P
A6	RX1N	B6	TX1N
A7	GND	B7	GND
A8	SB7	B8	SB0
A9	SB4	B9	SB1
A10	GND	B10	GND
A11	SB+	B11	SB5
A12	SB-	B12	SB6
A13	GND	B13	GND
A14	RX2P	B14	TX2P
A15	RX2N	B15	TX2N
A16	GND	B16	GND
A17	RX3P	B17	TX3P
A18	RX3N	B18	TX3N
A19	GND	B19	GND

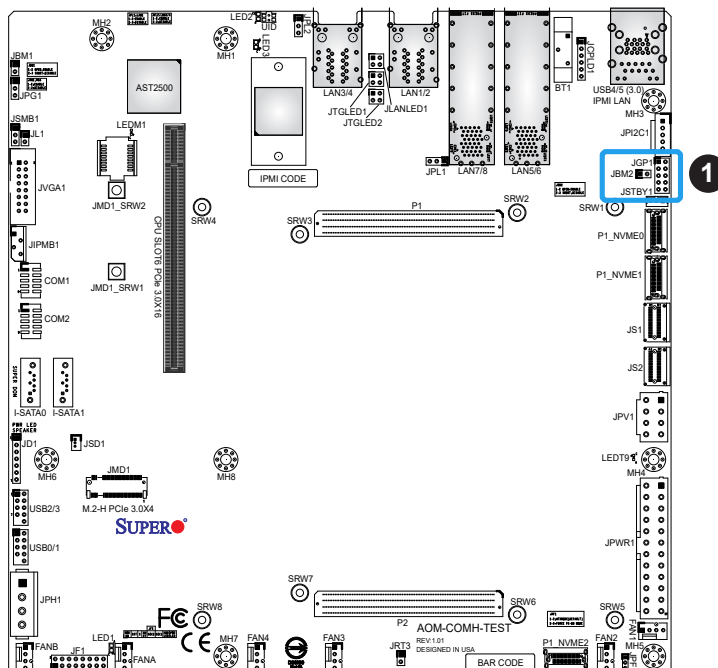


1. COM Port 1 Header
2. COM Port 2 Header
3. JS1 - SlimSAS
4. JS2 - SlimSAS

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. Refer to the table below for pin definitions.

JGP1 Header Pin Definitions	
Pin#	Definition
1	P3V3_DUAL
2	Ground
3	GP1_0
4	GP1_4
5	GP1_1
6	GP1_5
7	GP1_2
8	GP1_6
9	GP1_3
10	GP1_7



1. General Purpose Header

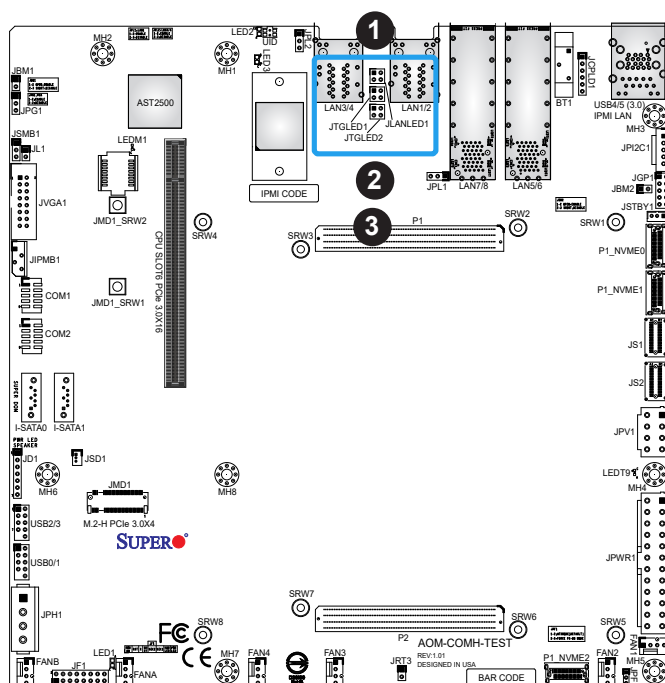
LAN Port Activity LED

JLANLED1 is the activity LED for LAN3/4, JTGLED1 is the activity LED for LAN5/6, and JTGLED2 is the activity LED for LAN7/8.

JLANLED1 Header Pin Definitions	
Pin#	Definition
1	P3V3_DUAL
2	LINK3_ACT_N
3	P3V3_DUAL
4	LINK4_ACT_N

JTGLED1 Header Pin Definitions	
Pin#	Definition
1	P3V3_DUAL
2	10G_P0_ACT_N
3	P3V3_DUAL
4	10G_P1_ACT_N

JTGLED2 Header Pin Definitions	
Pin#	Definition
1	P3V3_DUAL
2	10G_P2_ACT_N
3	P3V3_DUAL
4	10G_P3_ACT_N



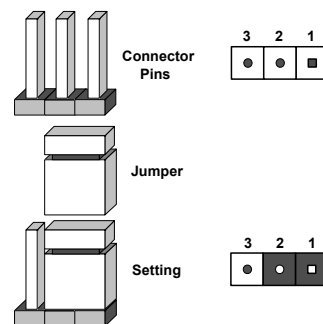
1. JLANLED1
2. JTGLED1
3. JTGLED2

2.9 Jumper Settings for AOM-COMH-TEST

How Jumpers Work

To modify the operation of the carrier board, 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 carrier board layout page for jumper locations.

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



Onboard VGA Enable/Disable

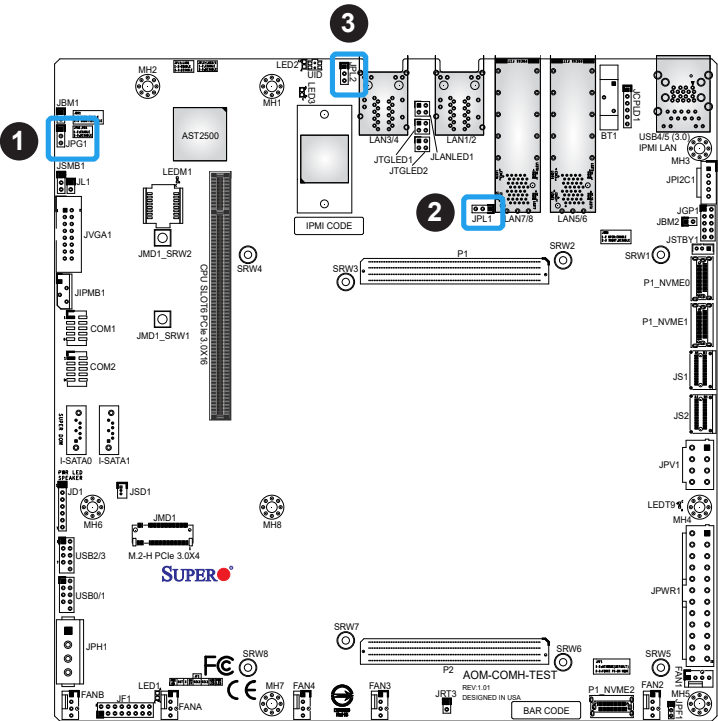
JPG1 allows you to enable or disable the VGA port using the onboard graphics controller. The default setting is Enabled.

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

LAN Port Enable/Disable

Use JPL1 to enable or disable LAN1, and JPL2 to enable or disable LA3/4. The default setting is Enabled.

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



- 1. Onboard VGA Enable/Disable
- 2. LAN1 Enable/Disable
- 3. LAN3/4 Enable/Disable

IPMI Share LAN Enable/Disable

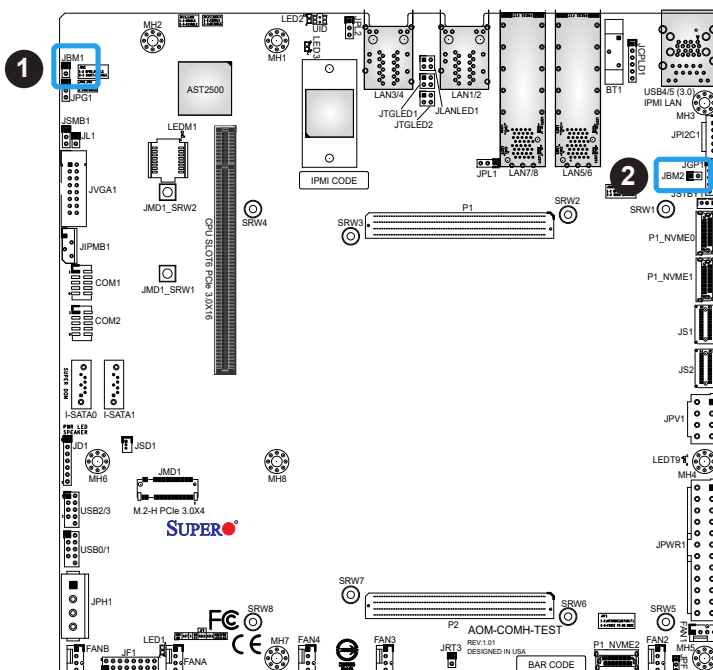
Set the JBM1 jumper to enabled to share i210 LAN with IPMI.

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

IPMI Dedicated LAN Enable/Disable

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

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

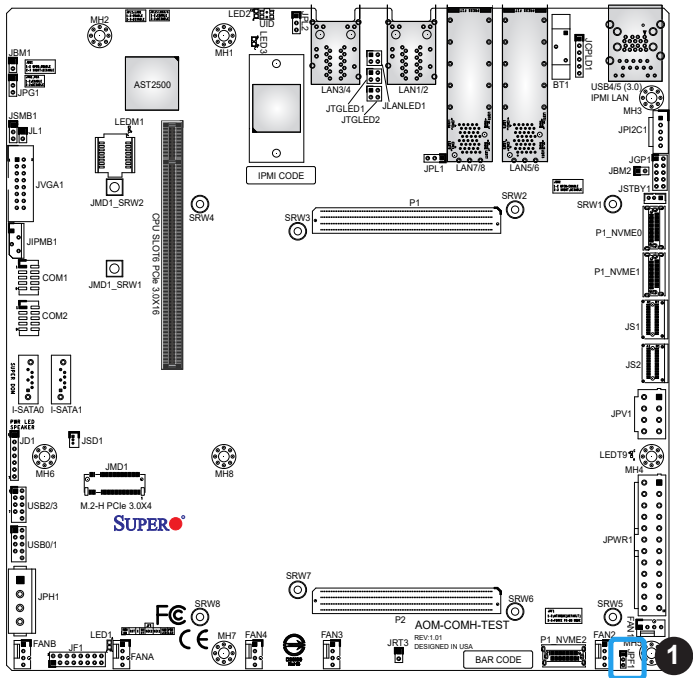


1. IPMI Share LAN Enable/Disable
2. IPMI Dedicated LAN Enable/Disable

Power Mode Selection

Use jumper JPF1 to do a force-turn-on with the power supply.

Power Mode On Jumper Settings	
Jumper Setting	Definition
Pins 1-2	ATX (Default)
Pins 2-3	Force PS-ON Mode



1. Power Mode Selection

2.10 LED Indicators for AOM-COMH-TEST

BMC Heartbeat LED

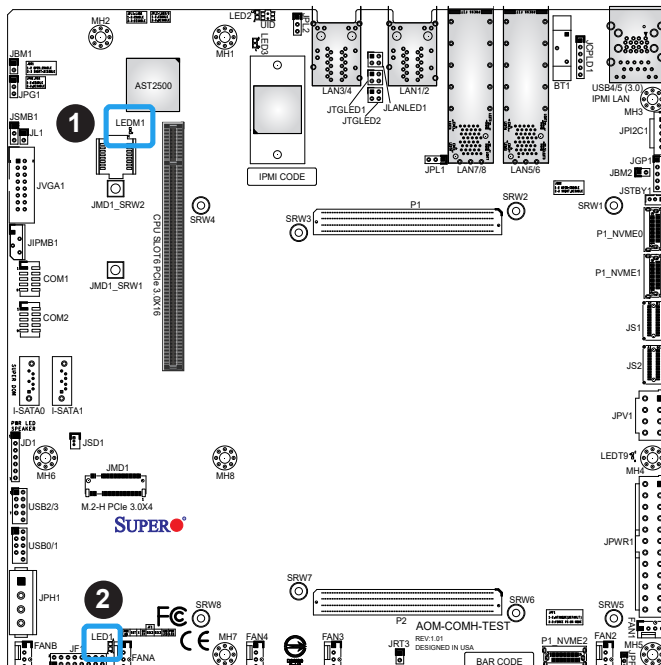
LED1 is the BMC heartbeat LED. When the LED is blinking green, BMC is working. Refer to the table below for the LED status.

Onboard Power LED Indicator	
LED Color	Definition
Blinking Green	BMC Normal

Power LED

LED1 is the Power LED. When this LED is lit, it means power is present on the carrier board. In suspend mode, this LED will blink on and off. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

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

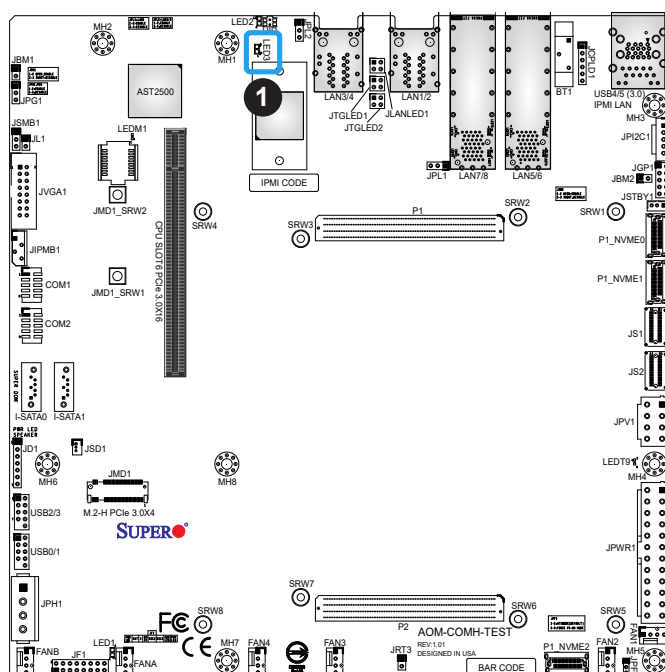


1. BMC Heartbeat LED
2. Power LED

Overheat/ Power Fail/ FAN Fail LED

When the light for LED3 is solid red, it means overheating. When the LED is blinking red, it means a power failure or fan failure.

Overheat/Power Fail/Fan Fail LED Indicator	
LED Color	Definition
Solid Red	Overheat
Blinking Red	Power Failure/ Fan Failure



1. Overheat/Power Fail/FAN Fail 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 module board and chassis.
2. Disconnect all ribbon/wire cables from the module board, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Connect the front panel connectors to the module board.

No Power

1. Make sure that there are no short circuits between the module board and the chassis.
2. Make sure that the 12V DC and/or 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 module board may be old. Check to verify that it still supplies ~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 module board 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 module board.
 - 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 2-7 in Chapter 2.)
2. Remove all components from the module board, 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 module board 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 ECC DDR4 RDIMM 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 2-3 in Chapter 2.
6. Please follow the instructions given in the DIMM population tables listed in Section 2-3 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 module board may be old. Check to verify that it still supplies ~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 module board 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 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 CD/DVD.
2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using 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. Identifying 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

Before contacting Technical Support, please take the following steps. Also, please note that as a module board manufacturer, Supermicro also sells module boards 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:
 - Module board 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 <http://www.supermicro.com/RmaForm/>.
 - 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 module board support?

Answer: The module board supports up to 256GB of RDIMM or 512GB of ECC LRDIMM DDR4 memory. 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 module board 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. Unzip the BIOS file onto a bootable USB device in the UEFI shell. Run the batch file using the format FLASH.NSH filename.rom from your bootable USB device in the UEFI shell 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 module board cannot be removed. Send your module board 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/>.

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

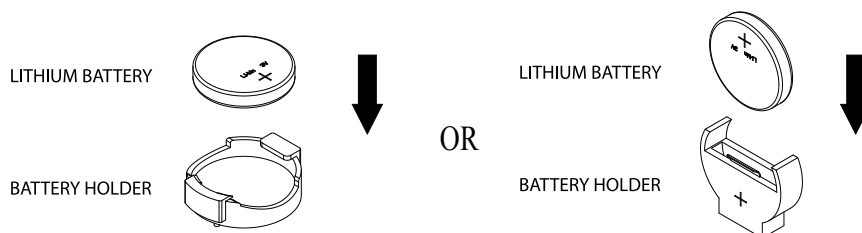
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency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



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 X11SDC-4C/8C/16C module board. 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 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.

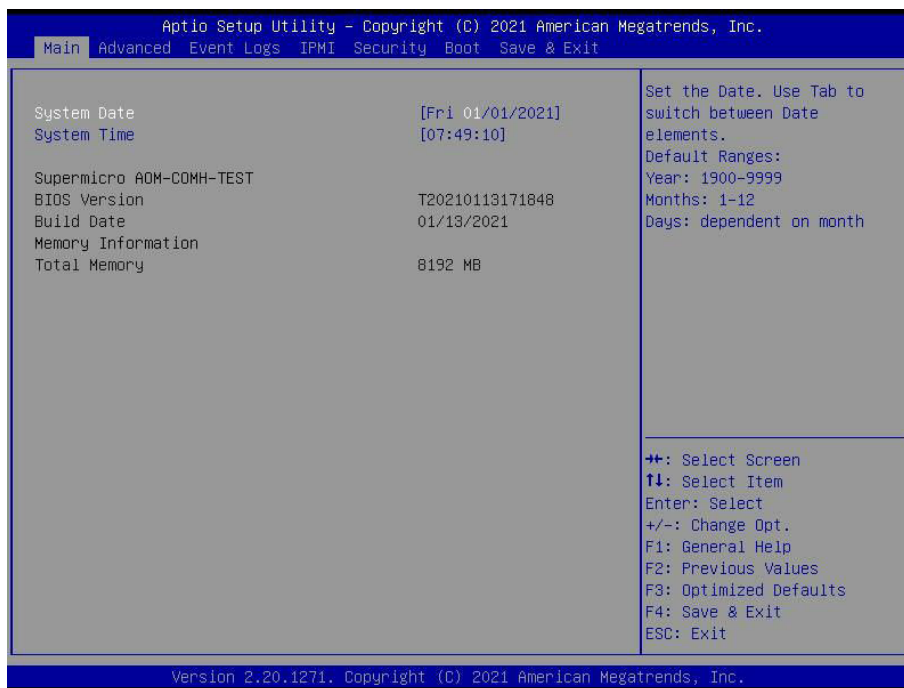
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that 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>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

4.2 Main Setup

When you first enter the AMI BIOS setup utility, you will enter the Main setup screen. 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 features will be displayed:



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 AOM-COMH-TEST

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.

CPLD Version

This feature displays the CPLD version.

Memory Information**Total Memory**

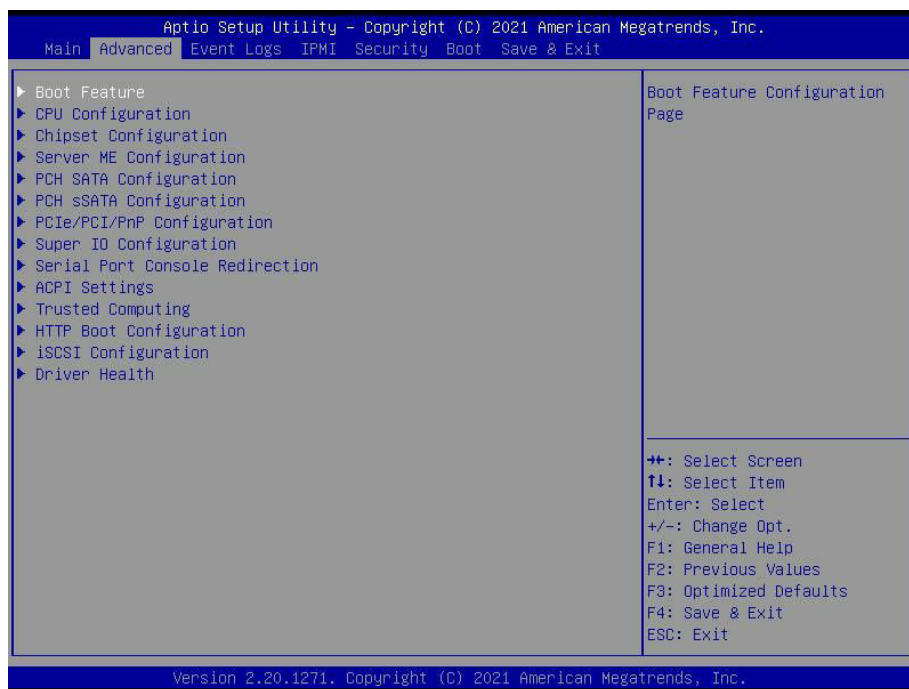
This feature displays the total size of memory available in the system.

Memory Speed

This feature displays the speed of the memory detected by the system.

4.3 Advanced

Use this menu to configure advanced settings.



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

► Boot Feature

Quiet Boot

Use this feature to select the screen display between POST messages or the OEM logo at bootup. 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**.

Option ROM Messages

Use this feature to set the display mode for the Option ROM. The options are **Force BIOS** and Keep Current.

Bootup NumLock State

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Wait For "F1" If Error

This feature forces the system to wait until the F1 key is pressed if an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Trap Response

Interrupt 19 is the software interrupt that handles the boot disk function. When this feature is set to Immediate, the ROM BIOS of the host adapters will "capture" Interrupt 19 at bootup immediately and allow the drives that are attached to these host adapters to function as bootable disks. If this feature is set to Postponed, the ROM BIOS of the host adapters will not capture Interrupt 19 immediately and allow the drives attached to these adapters to function as bootable devices at bootup. The options are **Immediate** and Postponed.

Re-try Boot

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

Port 61h bit-4 Emulation

Select Enabled to enable the emulation of Port 61h bit-4 toggling in SMM (System Management Mode). The options are **Disabled** and Enabled.

Power Configuration

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 you press the power button. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power 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**.

►CPU Configuration

The following CPU information is displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio

- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version

Hyper-Threading (ALL)

Select Enabled to support Intel Hyper-threading Technology to enhance CPU performance. The options are Disable and **Enable**.

Cores Enabled

Set a numeric value to enable the number of cores. Refer to Intel's website for more information. Enter **0** to enable all cores.

Execute Disable Bit (Available if supported by the OS & the CPU)

Set to Enable for Execute Disable Bit support, which allows the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during a virus attack. The options are Disable and **Enable**.

Intel 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**.

PPIN Control

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

Hardware Prefetcher (Available when supported by the CPU)

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

Adjacent Cache Prefetch (Available when supported by the CPU)

The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to Enable. 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.

LLC Prefetch

If set to Enable, the hardware prefetcher prefetches streams of data and instructions from the main memory to the L3 cache to improve CPU performance. The options are **Disable** and Enable.

Extended APIC

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

This feature allows you to configure CPU power management settings. The options are Disable, **Energy Efficient**, and Custom.

****If the feature above is set to Custom, the following feature is available for configuration:***

Power Performance Tuning

This feature allows you to set whether the operating system or the BIOS controls the Energy Performance BIAS (EPB). The options are **OS Controls EPB** and BIOS Controls EPB.

****If the feature above is set to BIOS Controls EPB, the following feature is available for configuration:***

ENERGY_PERF_BIAS_CFG Mode

The Energy Performance BIAS (EPB) feature allows you to configure CPU power and performance settings. Select Maximum Performance to set the highest performance. Select Performance to optimize performance over energy efficiency. Select Balanced Performance to prioritize performance optimization while conserving energy. Select Balanced Power to prioritize energy conservation while maintaining good performance. Select Power to optimize energy efficiency over performance. The options are Maximum Performance, Performance, **Balanced Performance**, Balanced Power, and Power.

►CPU P State Control

Use this submenu to configure the following CPU power settings:

Uncore Freq Scaling (UFS)

Use this feature to enable or disable autonomous uncore frequency. The options are **Enable** and Disable.

SpeedStep (Pstates)

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**. This feature must be set to Enable to be able to configure the next two features.

Config TDP

Use this feature to select the TDP level. The options are **Nominal**, Level 1, and Level 2.

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**, SW_ALL, and SW_ANY.

Energy Efficient Turbo

Use this feature to enable energy efficient turbo mode. The options are **Enable** and Disable.

Turbo Mode

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

► Hardware PM State Control

Hardware P-States

This setting allows you to select between OS and hardware-controlled P-states. Selecting Native Mode allows the OS to choose a P-state. Selecting Out of Band Mode allows the hardware to autonomously choose a P-state without OS guidance. Selecting Native Mode with No Legacy Support functions as Native Mode with no support for older hardware. The options are **Disable**, Native Mode, Out of Band Mode, and Native Mode with No Legacy Support.

► CPU C State Control

Autonomous Core C-State

Enabling this setting allows the hardware to autonomously choose to enter a C-state based on power consumption and clock speed. The options are **Disable** and Enable. This feature must be set to Disable to be able to configure the next two features.

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**.

► Package C State Control

Package C State

This feature allows you to set the limit on the C State package register. The options are C0/C1 State, C2 State, C6 (Non Retention) State, C6 (Retention) State, No Limit, and **Auto**.

► CPU T State Control

Software Controlled T-States

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

► Chipset Configuration

Warning: Setting the wrong values in the sections below may cause the system to malfunction.

► North Bridge Configuration

► Memory Configuration

Enforce POR

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

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 2133, 2400, and 2666.

Refresh Watermarks

Use this feature to select Low or High Watermarks. Low Watermarks mitigate power delivery issues with 128GB and larger DIMMS, while High Watermarks provide better performance when power delivery and row hammer are not a concern. The options are **Auto**, High WM, and Low WM.

Data Scrambling for DDR4

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

tCCD_L Relaxation

Select Auto to get TCDD settings from Serial Presence Detect (SPD) into memory RC code to improve system reliability. Select Disable for TCCD to follow Intel POR. The options are Disable and **Auto**.

2X REFRESH

Use this feature to select the memory controller refresh rate to 2x refresh mode. The options are **Auto** and Enable.

► Memory Topology

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

►Memory RAS Configuration

Static Virtual Lockstep Mode

Select Enable to run the system's memory channels in lockstep mode to minimize memory access latency. The options are **Disable** and Enable.

Mirror Mode

This feature allows memory to be mirrored between two channels, providing 100% redundancy. The options are **Disable** and Enable Mirror Mode (1LM).

****If the feature above is set to Enable Mirror Mode, Multi Rank Sparing and ADDDC Sparing are available for configuration:***

Memory Rank Sparing

Select Enable to enable memory-sparing support for memory ranks to improve memory performance. The options are **Disable** and Enable.

****If the feature above is set to Enable, Multi Rank Sparing is available for configuration:***

Multi Rank Sparing

Use this feature to indicate how many memory ranks to reserve in case of memory failure. The options are One Rank and **Two Rank**.

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 **100**.

SDDC

Single device data correction +1 (SDDC Plus One) organizes data in a single bundle (x4/x8 DRAM). If any or all of the bits become corrupted, corrections occur. The x4 condition is corrected on all cases. The x8 condition is corrected only if the system is in Lockstep Mode. The options are **Disable** and Enable.

ADDDC Sparing

Adaptive Double Device Data Correction (ADDDC) Sparing detects when the predetermined threshold for correctable errors is reached, copying the contents of the failing DIMM to spare memory. The failing DIMM or memory rank is then disabled. The options are **Disable** and Enable.

Patrol Scrub

Patrol Scrub 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 Disable and **Enable**.

****If the feature above is set to Enable, Patrol Scrub Interval is available for configuration:***

Patrol Scrub Interval

This feature allows you to decide how many hours the system should wait before the next complete patrol scrub is performed. Use the keyboard to enter a value from 0-24. The default setting is **24**.

Patrol Scrub

Use this feature to downgrade patrol scrubbing uncorrectable errors to correctable errors. The options are Disable and **Enable**.

► IIO Configuration

EV DFX Features

When this feature is set to Enable, the EV_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

► CPU Configuration

IOU0 (IIO PCIe Br1)

Use this feature to configure the PCIe port Bifurcation setting for the specified PCIe port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIe Br2)

Use this feature to configure the PCIe port Bifurcation setting for the specified PCIe port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU2 (IIO PCIe Br3)

Use this feature to configure the PCIe port Bifurcation setting for the specified PCIe port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

- ▶ **CPU1 PcieBr1D00F0 - Port 1A**
- ▶ **CPU1 PcieBr1D00F0 - Port 2A**
- ▶ **CPU1 PcieBr1D01F0 - Port 2B**
- ▶ **CPU1 PcieBr1D02F0 - Port 2C**
- ▶ **CPU1 PcieBr1D03F0 - Port 2D**

Link Speed

Use this feature to select the link speed for this port. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCIe Port Link Status

This feature shows the status of the device plugged into this slot.

PCIe Port Link Max

This feature shows the status of the device plugged into this slot.

PCIe Port Link Speed

This feature shows the status of the device plugged into this slot.

PCIe Port Max Payload Size

Use this feature to select the maximum payload size for this port. The options are 128B, 256B, and **Auto**.

▶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, Relax Ordering is available for configuration:***

Prioritize TPH

Select Yes to prioritize TPL requests that allows the hints to be sent to help facilitate and optimize the processing of certain transactions in the system memory. The options are Enable and **Disable**.

Relaxed Ordering

Select Enable 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 **Disable** and Enable.

►Intel® 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.

****If the feature above is set to Enable, the five features below are available for configuration:***

Interrupt Remapping

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

PassThrough DMA

Use this feature to allow devices such as network cards to access the system memory without using a processor. Select Enable to use the Non-Isoch VT-d Engine Pass Through Direct Memory Access (DMA) support. The options are **Enable** and Disable.

ATS

Use this feature to enable Non-Isoch VT-d Engine Address Translation Services (ATS) support. ATS translates virtual addresses to physical addresses. The options are **Enable** and Disable.

Posted Interrupt

Use this feature to enable VT-d Posted Interrupt. The options are **Enable** and Disable.

Coherency Support (Non-Isoch)

Use this feature to maintain setting coherency between processors or other devices. Select Enable for the Non-Isoch VT-d engine to pass through DMA to enhance system performance. The options are **Enable** and Disable.

►Intel® VMD Technology

Note: After you've enabled VMD on a PCIe slot of your choice, this PCIe slot is dedicated for NVMe storage devices use only, and it will no longer support PCIe devices of other functionalities. To re-activate this slot for PCIe use, please disable VMD.

►Intel® VMD for Volume Management Device on CPU

VMD Config for PStack0

Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and Enable.

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

VMD port 1A - 1D (Available when detected by the system)

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and Enable.

VMD Config for PStack1

Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and Enable.

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

VMD port 2A - 2D (Available when detected by the system)

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and Enable.

PCIe Completion Timeout Disable

Use this feature to enable PCIe Completion Timeout support for electric tuning. The options are Yes, **No**, and Per-Port.

►South Bridge Configuration

The following South Bridge information is displayed:

- USB Module Version
- USB Devices

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable to have all USB devices available for EFI applications only. The options are **Enabled**, Disabled, and Auto.

XHCI Hand-off

This is a workaround solution for operating systems that do not support Extensible Host Controller Interface (XHCI) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The settings are Enabled and **Disabled**.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support, which in turn provides complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are Disabled and **Enabled**.

►Server 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

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following features:

SATA Controller

Use this feature to enable or disable the onboard SATA controller supported by the Intel PCH chip. The options are Disable and **Enable**.

****If the feature above is set to Enable, SATA HDD Unlock is available for configuration:***

SATA HDD Unlock

Select enabled to unlock the HDD with a password. The options are Disable and **Enable**.

Aggressive Link Power Management

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.

►PCH sSATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following features:

sSATA Controller

Use this feature to enable or disable the onboard SATA controller supported by the Intel PCH chip. The options are Disable and **Enable**.

****If the feature above is set to Enable, the next two features are available for configuration:***

Configure sSATA as

Select AHCI to configure an sSATA drive as an AHCI drive. Select RAID to configure an sSATA drive as a RAID drive. The options are **AHCI** and RAID.

****If the feature above is set to RAID, SATA RSTe Boot Into and SATA RAID Option ROM/UEFI Driver are available for configuration:***

SATA HDD Unlock

This feature allows you to remove any password-protected SATA disk drives. The options are **Enable** and Disable.

SATA RSTe Boot Info

Select Enable to provide full int13h support for the devices attached to the SATA controller. The options are Disable and **Enable**.

Aggressive Link Power Management

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.

sSATA RAID Option ROM/UEFI Driver

Select UEFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Disable, EFI, and **Legacy**.

SATA Port 0/1

This feature displays the information detected on the installed SATA drive on the particular SATA port.

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**.

Spin Up Device

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

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**.

►PCIe/PCI/PnP Configuration

The following information is displayed:

- 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**.

BME DMA Mitigation

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

MMIO High Base

Use this feature to select the base memory size according to memory-address mapping for the IO hub. The options are **56T**, 40T, 24T, 16T, 4T, and 1T.

MMIO High Granularity Size

Use this feature to select the high memory size according to memory-address mapping for the IO hub. The options are 1G, 4G, 16G, 64G, **256G**, and 1024G.

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.

MMCFG Base

Use this feature to select the low base address for PCIe adapters to increase base memory. The options are 1G, 1.5G, 1.75G, **2G**, 2.25G, and 3G.

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.

Consistent Device Name Support

Use this feature to enable ACPI_DSM device name support for onboard devices. The options are **Disabled** and Enabled.

CPU SLOT6 PCIe 3.0 X16 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

CPU P1_NVME0 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

CPU P1_NVME1 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

CPU P1_NVME2 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

CPU M.2-H PCIe 3.0 X4 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

PCH JS1 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

PCH JS2 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 **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

Onboard LAN Option ROM Type

Use this feature to select which firmware type to be loaded for onboard LAN devices. The options **Legacy** and **EFI**.

Onboard LAN1 OPROM

Use this feature to select which firmware function to be loaded for the specified LAN port used for system boot. The options are Disabled, **PXE**, and iSCSI.

Onboard LAN2 - LAN8 OPROM

Use this feature to select which firmware function to be loaded for the specified LAN port used for system boot. The options are **Disabled** and **PXE**.

Onboard Video Option ROM

Use this feature to select which firmware function to be loaded for LAN1 used for system boot. The options are Disabled and **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

► Network Stack Configuration

Network Stack

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

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

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

Media detect count

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

► Super IO Configuration

Super IO Chip AST2500

► Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable the specified onboard serial port. The options are Disabled and **Enabled**. Enable this feature for the next two features to display and only the Change Settings feature is available for configuration.

Device Settings

This feature displays the base I/O port address and the Interrupt Request address of the serial port.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. 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

Serial Port 2

Select Enabled to enable the specified onboard serial port. The options are Disabled and **Enabled**. Enable this feature for the next two features to display and only the Change Settings feature is available for configuration.

Device Settings

This feature displays the base I/O port address and the Interrupt Request address of the serial port.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. The options are **Auto**, (IO=2F8h; IRQ=3); (IO=3F8h; IRQ=3); (IO=3E8h; IRQ=3); and (IO=2E8h; IRQ=3).

Serial Port 2 Attribute

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

COM1

Console Redirection

Select Enabled to enable COM Port 1 for Console Redirection, which allows a client machine to be connected to a host machine at a remote site for networking. 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

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**.

Data Bits

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

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**.

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.

COM2/SOL**Console Redirection**

Select Enabled to use the SOL port for Console Redirection. The options are Disabled and **Enabled**.

****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 exchanges data with the client computer, which is the remote computer.

COM2/SOL**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**.

Data Bits

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

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**.

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.

Legacy Console Redirection

Redirection COM Port

Use this feature to select a COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are **COM1** and COM2/SOL.

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

This submenu allows you to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection

Select Enabled to use a COM port for EMS Console Redirection. 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 exchanges 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

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

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**Parity****Stop Bits****►ACPI Settings****Headless Support**

Select Enabled for the system to run without a keyboard or mouse detected. 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 in order to reduce system crashes and enhance system recovery and health monitoring. The options are Disabled and **Enabled**.

High Precision Event Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Disabled and **Enabled**.

►Trusted Computing

The module board supports TPM 2.0. The following Trusted Platform Module (TPM) information is display if a TPM 2.0 module is detected:

- Vendor Name
- Firmware Version

Security Device Support

If this feature and the TPM jumper on the module board are both set to Enabled, onboard security devices are enabled for Trusted Platform Module (TPM) support to enhance data integrity and network security. Reboot the system for changes to take effect. The options are Disable and **Enable**.

- Active PCR Bank
- Available PCR banks

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 reboots 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 hierarchy 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**.

TPM 20 Interface Type

PH Randomization

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

SMCI BIOS-Based TPM Provision Support

Use this feature to enable the 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. 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**.

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 - Priority 8:

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

► iSCSI Configuration

► Attempt Priority

Attempt Priority

Use this feature to set the attempt priorities. The options are **Host Attempt**, **Redfish Attempt**, and **Rsd Attempt**.

Commit Changes and Exit

Select this feature to save the changes and exit.

► Host iSCSI Configuration

iSCSI Initiator Name

This feature allows you to enter the unique name of the iSCSI Initiator in IQN format. Once the name of the iSCSI Initiator is entered into the system, configure the proper settings for the following features.

► Add an Attempt

► Delete Attempts

► Change Attempt Order

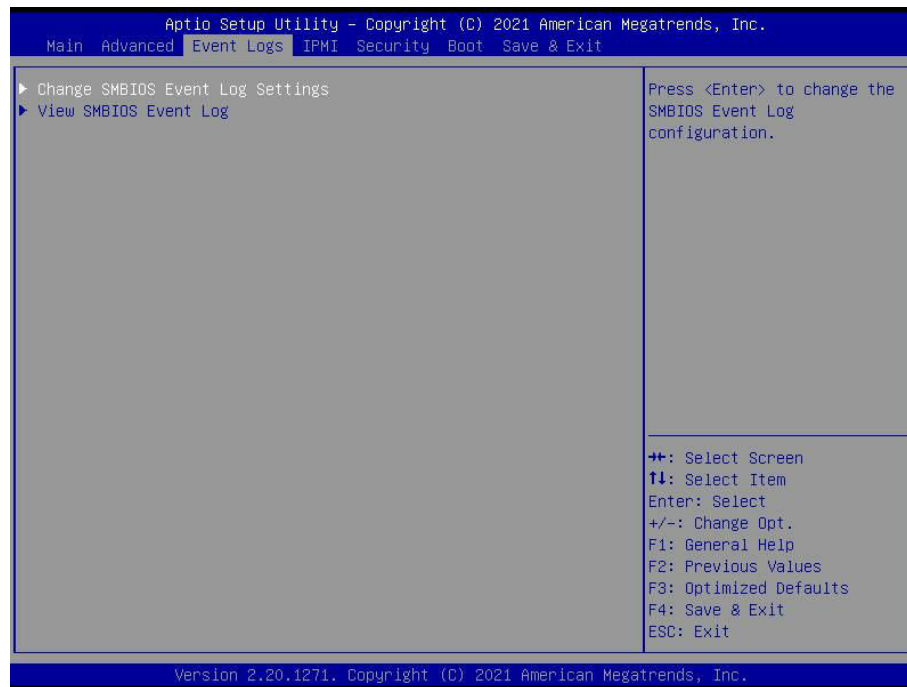
► Driver Health

This submenu provides the health status for the network drivers and controllers, and all UEFI drivers detected by the system.

► Apache Pass 1.0.0.1970 Driver

4.4 Event Logs

Use this menu to configure Event Log settings.



► 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 occurrences 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: After making changes on a setting, reboot the system for the changes to take effect.

►View SMBIOS Event Log

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

4.5 IPMI

Use this menu to configure Intelligent Platform Management Interface (IPMI) settings.



IPMI Firmware Revision

This feature displays the IPMI firmware revision in your system.

Status of BMC

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 bootup. 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 determine 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: Reboot the system for the changes to take effect.

► BMC Network Configuration

Update IPMI 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:***

- IPMI LAN Selection
- IPMI Network Link Status

Configuration Address Source

Use this feature to select the source of the IP address for this computer. If Static is selected, you will 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 will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are Static and **DHCP**.

****If the feature above is set to Static, the Station IP Address/Subnet Mask/Gateway IP Address features are available for configuration:***

Station IP Address

This feature displays the Station IP address for this computer. 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 value of each three-digit number separated by dots should not exceed 255.

Gateway IP Address

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

VLAN

This feature is configurable if the Update IPMI LAN Configuration feature is set to Yes. Use this feature to enable or disable the IPMI VLAN function. The options are **Disable** and Enable.

****If the feature above is set to Enable, the VLAN ID feature below is available for configuration:***

VLAN ID

Use this feature to select a value for VLAN ID.

IPMI LAN Selection

Use this feature to select the IPMI LAN mode. The options are Dedicated LAN, **Share LAN**, and Failover.

Configure IPV6 support

IPV6 Support

Use this feature to enable IPV6 support. The options are **Enabled** and Disabled.

****If the feature above is set to Enable, the features below are available for configuration:***

Configuration Address Source

Use this feature to select the source of the IP address for this computer. If Static is selected, you will 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 will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that it is attached to and request the next available IP address for this computer. The options are Unspecified, Static, and **DHCP**.

****If the feature above is set to Static, the Station IP Address/Prefix Length/IPV6 Router1 IP Address features are available for configuration:***

Station IPV6 Address

Use this feature to enter the IPV6 address.

Prefix Length

Use this feature to change the prefix length.

IPV6 Router1 IP Address

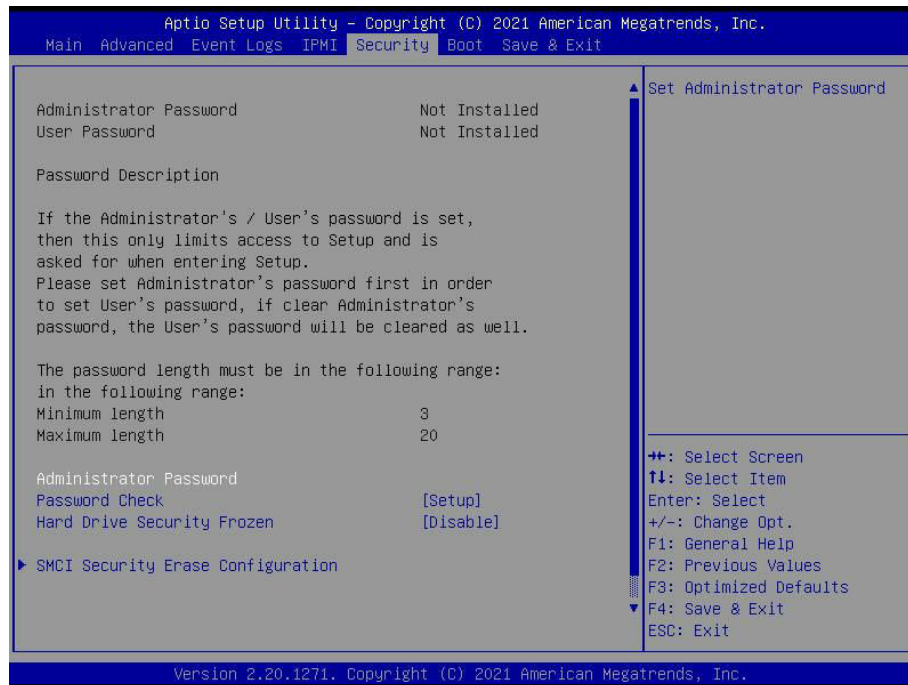
Use this feature to change the IPV6 Router1 IP address.

IPMI Extended Instruction

The options of this feature are **Enabled** and Disabled. When this feature is Disabled, the system powers on quickly by removing BIOS support for IPMI extended instruction features. The bootup time is faster when the option is Disabled. When this feature is disabled, you cannot use Supermicro Update Manager (SUM) out of band (OOB) to update the BIOS, nor utilize the extended IPMI features such as AOC and PCIe sensor readings, and the BMC network configuration in the BIOS setup is also disabled. The general BMC function like fan control and module board health monitor that offer the basic sensor reading of the CPU, system memory, and some onboard devices still function. You can use Supermicro IPMI utilities such as IPMICFG and IPMIVIEW for sensor readings and to know what the normal sensor output information is. You need to wait for one minute after the system powers on completely to obtain readings from those two sensors.

4.6 Security

Use this menu to configure the security settings.



Administrator Password

Use this feature to set the administrator password which is required to enter the BIOS setup utility. The length of the password should be from three to 20 characters long.

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 bootup 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 **Enable** and **Disable**.

► SMC 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 - Without 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

System Mode

Secure Boot

Select Enable for secure boot support to ensure system security at bootup. The options are **Disabled** and Enabled.

Secure Boot Mode

This feature allows you to select the desired secure boot mode for the system. The options are Standard and **Custom**.

****If Secure Boot Mode is set to Custom, Key Management features are available for configuration:***

CSM Support

This feature is for manufacturing debugging purposes.

► Restore Factory Keys

Select Yes to restore all factory keys to the default settings. The options are Yes and No.

► Reset to Setup Mode

Select Yes to delete all Secure Boot key databases and force the system to Setup Mode. The options are Yes and No.

► Key Management

This submenu allows you to configure the following Key Management settings.

Factory Key Provision

Select Enabled to install the default Secure Boot keys set by the manufacturer. The options are **Disabled** and Enabled.

****If the feature above is set to Enabled, all features below are available for configuration:***

► Restore Factory Keys

Select Yes to restore all factory keys to the default settings. The options are Yes and No.

► Reset to Setup Mode

Select Yes to delete all Secure Boot key databases and force the system to Setup Mode. The options are Yes and No.

► Export Secure Boot variables

Use this feature to copy the NVRAM contents of the secure boot variables to a file.

► Enroll Efi Image

This feature allows the image to run in Secure Boot mode.

Device Guard Ready

► Remove 'UEFI CA' from DB

Use this feature to remove the Microsoft UEFI CA certificate from the database. The options are Yes and No.

► Restore DB defaults

Select Yes to restore the DB defaults.

► Platform Key (PK)

Update

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

► Key Exchange Keys (KEK)

Update

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

Append

Select Yes to add the KEK from the manufacturer's defaults list to the existing KEK. Select No to load the KEK from a file. The options are Yes and No.

► Authorized Signatures

Update

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

Append

Select Yes to add the db from the manufacturer's defaults list to the existing db. Select No to load the db from a file. The options are Yes and No.

► Forbidden Signatures

Update

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

Append

Select Yes to add the dbx from the manufacturer's defaults list to the existing dbx. Select No to load the dbx from a file. The options are Yes and No.

► Authorized TimeStamps

Update

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

Append

Select Yes to add the dbt from the manufacturer's defaults list to the existing dbt. Select No to load the dbt from a file. The options are Yes and No.

► OsRecovery Signatures

Update

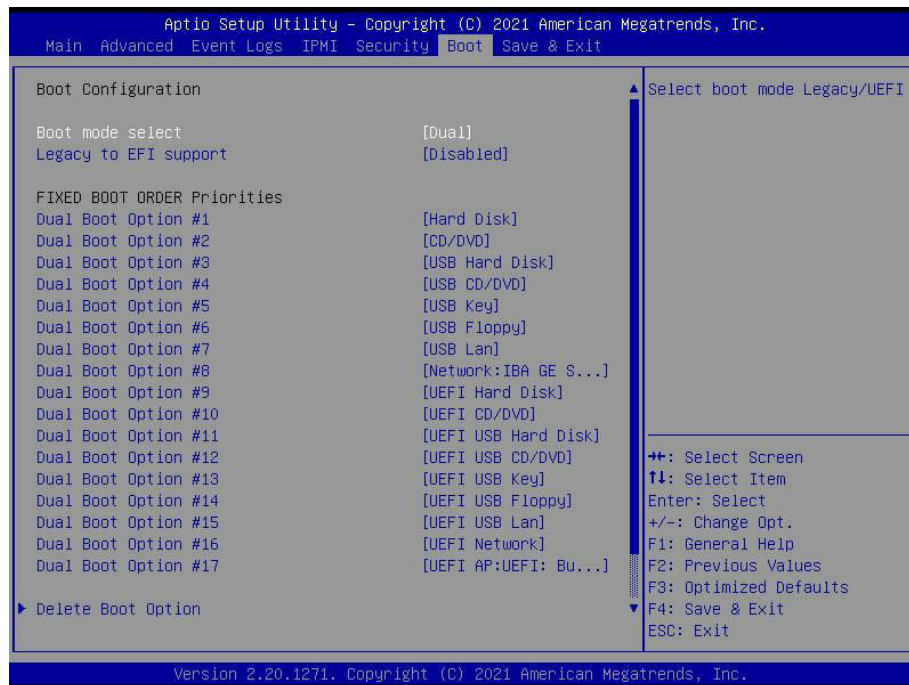
Select Yes to load a factory default dbr or No to load from a file on an external media.

Append

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:



Boot mode select

Use this feature to select the boot mode. The options are Legacy, UEFI, and **Dual**.

LEGACY to EFI Support

Select Enabled to boot EFI OS support after Legacy boot order has failed. The options are **Disabled** and Enabled.

Fixed BOOT ORDER Priorities

This option prioritizes the order of bootable devices that the system will boot from. Press <Enter> on each entry from top to bottom to select devices.

- 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
- Boot Option #10
- Boot Option #11
- Boot Option #12
- Boot Option #13
- Boot Option #14
- Boot Option #15
- Boot Option #16
- Boot Option #17

► **Delete Boot Option**

Use this feature to select a boot device to delete from the boot priority list.

► **UEFI Application Boot Priorities**

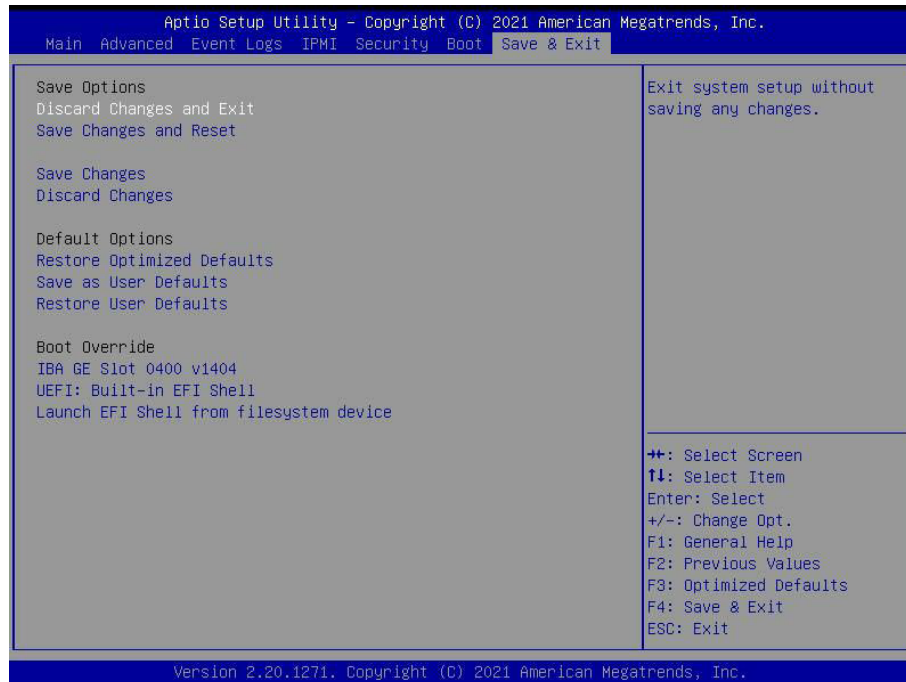
- Boot Option # - This feature sets the system boot order of detected devices. The options are **[the list of detected boot device(s)]** and Disabled.

► **NETWORK Drive BBS Priorities**

- Boot Option # - This feature sets the system boot order of detected devices. The options are **[the list of detected boot device(s)]** and Disabled.

4.8 Save & Exit

Use this menu to configure save and exit settings.



Save Options

Discard Changes and Exit

Select this feature 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 Exit menu and press <Enter>.

Save Changes and Reset

When you have completed the system configuration changes, select this option to save all changes made and reset the system.

Save Changes

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

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Default Options

Restore Optimized Defaults

To set this feature, select Restore Optimized Defaults and press <Enter>. These are factory settings designed for maximum system performance but not for maximum stability.

Save as User Defaults

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

Restore User Defaults

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

Boot Override

Other boot options are listed in this section. The system will boot to the selected option.

IBA GE Slot 0400 v1404

UEFI: Built-in EFI Shell

Launch EFI Shell from filesystem device

Appendix A

BIOS Codes

A.1 BIOS Error POST (Beep) Codes

During the POST (Power-On Self-Test) routines, which are performed upon each system boot, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue to boot. These error messages normally appear on the screen.

Fatal errors will not allow the system to continue with bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The table below lists some common errors and their corresponding beep codes encountered by users.

BIOS Beep (POST) Codes		
Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset (Ready to power up)
5 short, 1 long	Memory error	No memory detected in system
5 long, 2 short	Display memory read/write error	Video adapter missing or with faulty memory
1 long continuous	System OH	System overheat condition

A.2 Additional 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").

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, a diagnostic card can be attached to the computer to read I/O port 0080h (Supermicro p/n AOM-SPI80-V).

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

Appendix B

Software Installation

B.1 Installing Software Programs

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

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your module board. Download this file to create a DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

After creating a DVD with the ISO files, insert the disk into the DVD drive on your system and the display shown in Figure B-1 should appear.

Another option is to go to the Supermicro website at <http://www.supermicro.com/products/>. Find the product page for your module board here, where you may download individual drivers and utilities to your hard drive or a USB flash drive and install from there.

 **Note:** To install the Windows operating system, please refer to the instructions posted on our website at <http://www.supermicro.com/support/manuals/>.

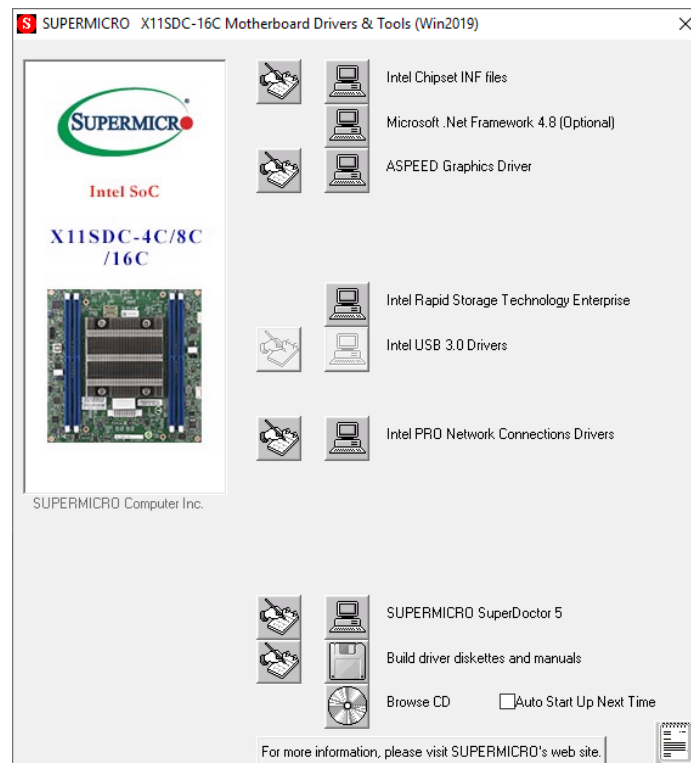


Figure B-1. Driver/Tool Installation Display Screen

Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a DVD on it allows you to view the entire contents of the DVD.

When making a storage driver disk by booting into a driver DVD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver disk, be sure to change the SATA settings back to your original settings.

B.2 SuperDoctor® 5

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

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

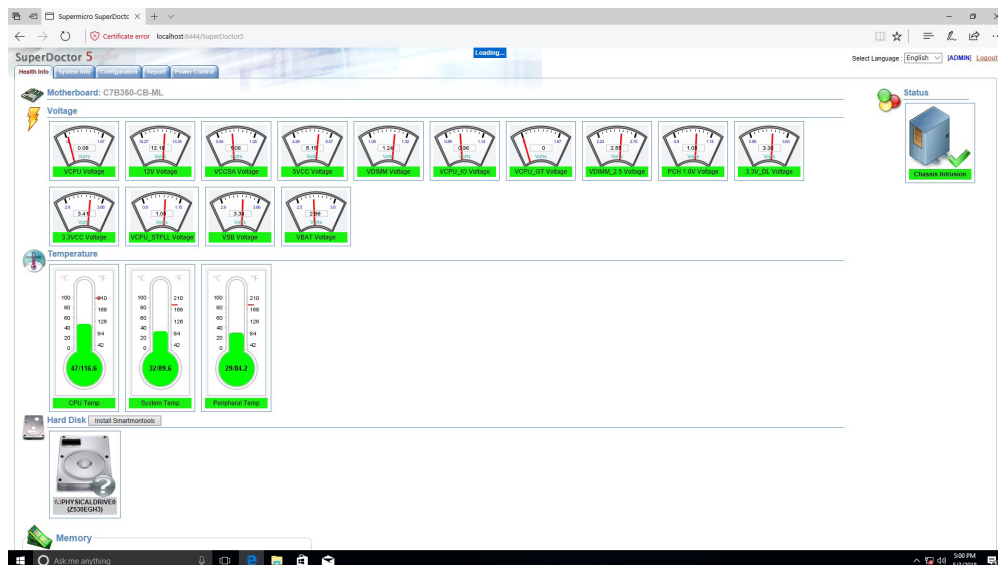


Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)

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.

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

電池更換不當會有爆炸危險。請只使用同類電池或制造商推荐的功能相当的電池更換原有電池。請按制造商的說明處理廢舊電池。

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

هناك خطر من انفجار في حالة اسبدال البطارية بطريقة غير صحيحة فاعلil

اسبدال البطارية

فقط بنفس النوع أو ما يعادلها مما أوصت به الشركة المصنعة

جخلص من البطاريات المسحمة وفقا لعليمات الشركة الصانعة

경고!

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

Waarschuwing

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

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 turned on, the recovery block codes execute first. Once this process is complete, the main BIOS code will continue with system initialization and the remaining POST (Power-On Self-Test) 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). Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (OOB) (https://www.supermicro.com.tw/products/nfo/SMS_SUM.cfm) to reflash the BIOS.

D.3 Recovering the Main 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 Drive, or a USB CD/DVD ROM device 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.

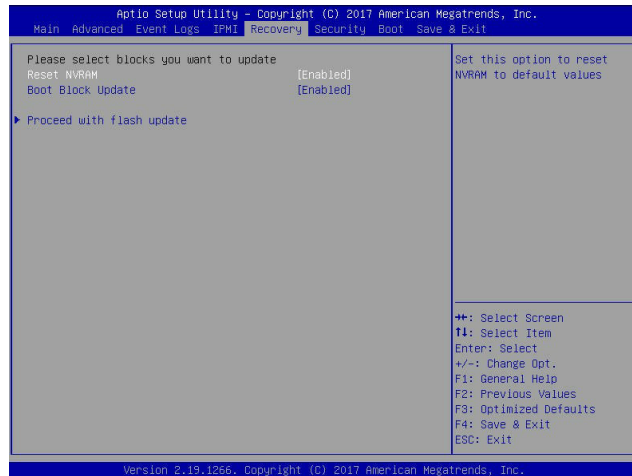
To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the Root "\\" directory of a USB device or a writable CD/DVD.

 **Note 1:** If you cannot locate the "Super.ROM" file in your drive 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.

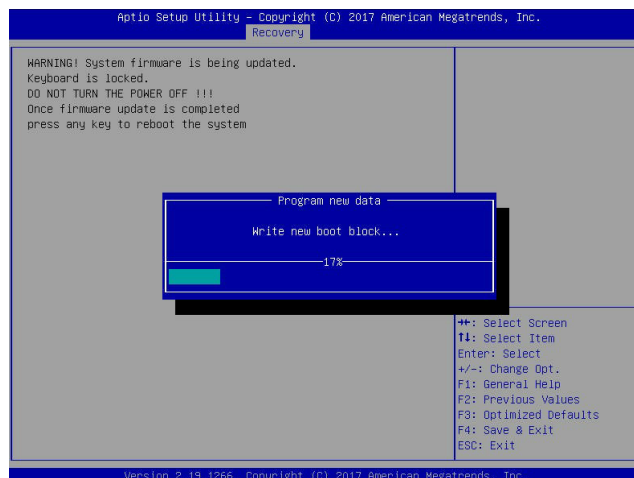
Note 2: Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your module board.



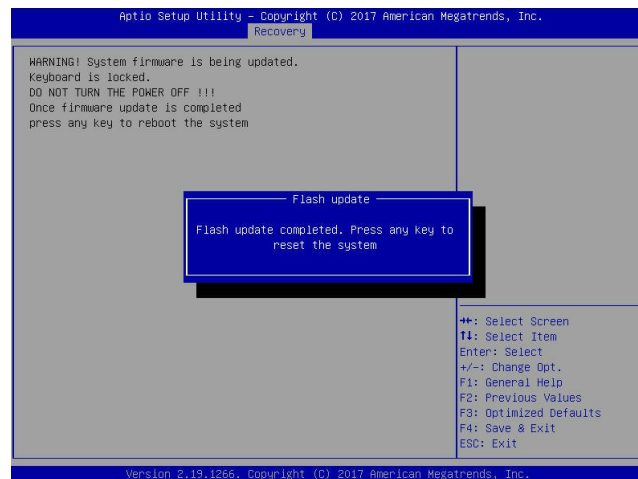


2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

 **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.

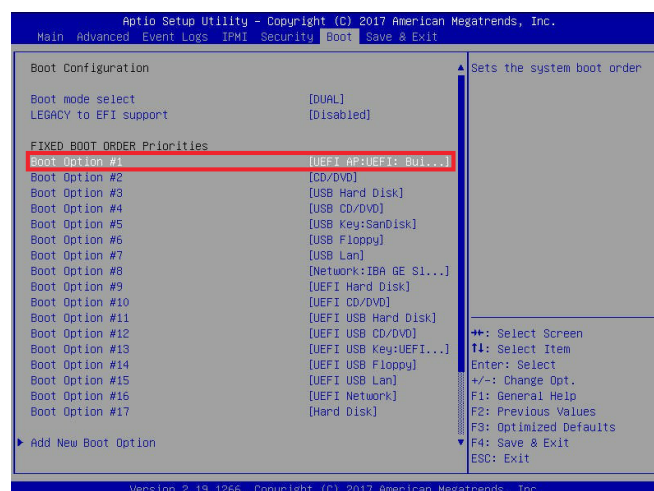


4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.



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

5. After the BIOS recovery process is complete, press any key to reboot the system.
6. Using a different system, extract the BIOS package into a USB flash drive.
7. Press <Del> continuously 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.

```

UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
  FS0: Alias(s):HD(0)MB:BLK1:
      PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x37901072,0x800,0x1
CR3592)
  BLK0: Alias(s):
      PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press F8 in 1 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\AFUDOS> cd SNJPME2_03162017
FS0:\AFUDOS\SNJPME2_03162017> flash.nsh X10PU7.314

```



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

```

Done.
[ Access Cmos Port Ex ]
CRead
Index 0x51: 0x18

Done.
*****
*
* Program BIOS and ME (including FDT) regions...
*****
-----
| AMI Firmware Update Utility v5.09.01.1317 |
| Copyright (C)2017 American Megatrends Inc. All Rights Reserved. |
-----
CPUID = 50652

Reading flash ..... done
- ME Data Size checking . ok
- FFS checksums ..... ok
- Check RomLayout ..... ok.
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... 0x00132000 (0X)

```

```

Verifying MBR Block ..... done
- Update success for FDR
- Update success for IE
- Successful Update Recovery Loader to GPRX!!
- Successful Update MFSB!!
- Successful Update FTR!!
- Successful Update MFS, IVB1 and IVB2!!
- Successful Update FLOG and UTDK!!
- ME Entire image update success !!
WARNING : System must power-off to have the changes take effect!
Moving FS0:\AFUDOS\SNJPME2_03162017\fdt\64.efi -> FS0:\AFUDOS\SNJPME2_03162017\fdt\64.efi
dt.smc
- [ok]
Moving FS0:\AFUDOS\SNJPME2_03162017\afuefi\64.efi -> FS0:\AFUDOS\SNJPME2_03162017\afuefi\64.efi
- [ok]
*****
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*****
Deleting 'FS0:\AFUDOS\SNJPME2_03162017\afuefi\64.efi'
Delete successful.
FS0:\>

```

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> continuously 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.