X11DPU-Z+

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: October 13, 2017

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 X11DPU-Z+ motherboard.

About This Motherboard

The Super X11DPU-Z+ motherboard supports dual Intel® 81xx/61xx/51xx/41xx/31xx (Socket P) processors with a Thermal Design Power (TDP) of up to 205W, and three Ultra Path Interconnects (UPIs) with speeds of up to 10.4 GT/s (Note below). With the Intel® C621 PCH built-in, this motherboard supports up to 3 TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM/NV-DIMM DDR4 ECC 2666/2400/2133 MHz in 24 DIMM slots with four Non-volatile Memory Express (NVMe) slots onboard. The X11DPU-Z+ provides the maximum system performance and I/O expandability currently available on the market. This motherboard is optimized for PCI-E expansion with flexible I/O support and is ideal for use in High Performance Computing (HPC) and Enterprise Computing server platforms. Please note that this motherboard is intended to be installed and serviced by professional technicians only. For processor/memory updates, please refer to our website at http://www.supermicro.com/products/.

> **Note**: UPI/memory speeds are dependent on the processors installed in your system.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard, and provides detailed information on the C621 chipset.

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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Appendix A BIOS Codes

Appendix B Software Installation

Appendix C Standardized Warning Statements

Appendix D UEFI BIOS Recovery

Chapter 1

Introduction

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

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

1.1 Checklist

This motherboard was designed to be used in an SMCI-proprietary chassis as a part of an integrate server platform solution. This motherboard is not intended to be sold as a standalone, independent product. No shipping package will be provided in your shipment.

Important Links

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

• Supermicro product manuals: http://www.supermicro.com/support/manuals/

• Product drivers and utilities: ftp://ftp.supermicro.com

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

• If you have any questions, please contact our support team at: support@supermicro.com

This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.
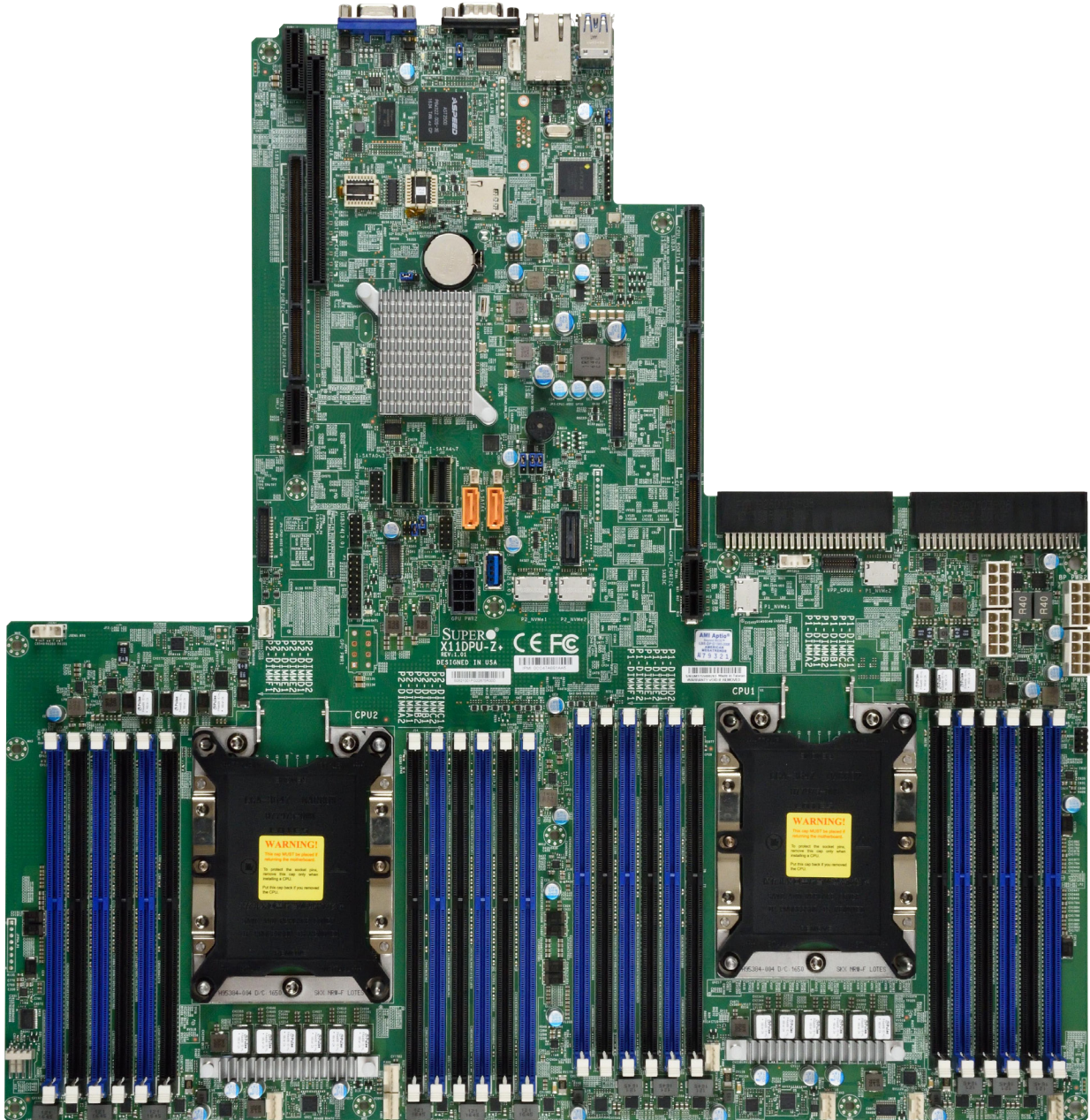
Figure 1-1. X11DPU-Z+ Motherboard Image

Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-2. X11DPU-Z+ Motherboard Layout
(not drawn to scale)
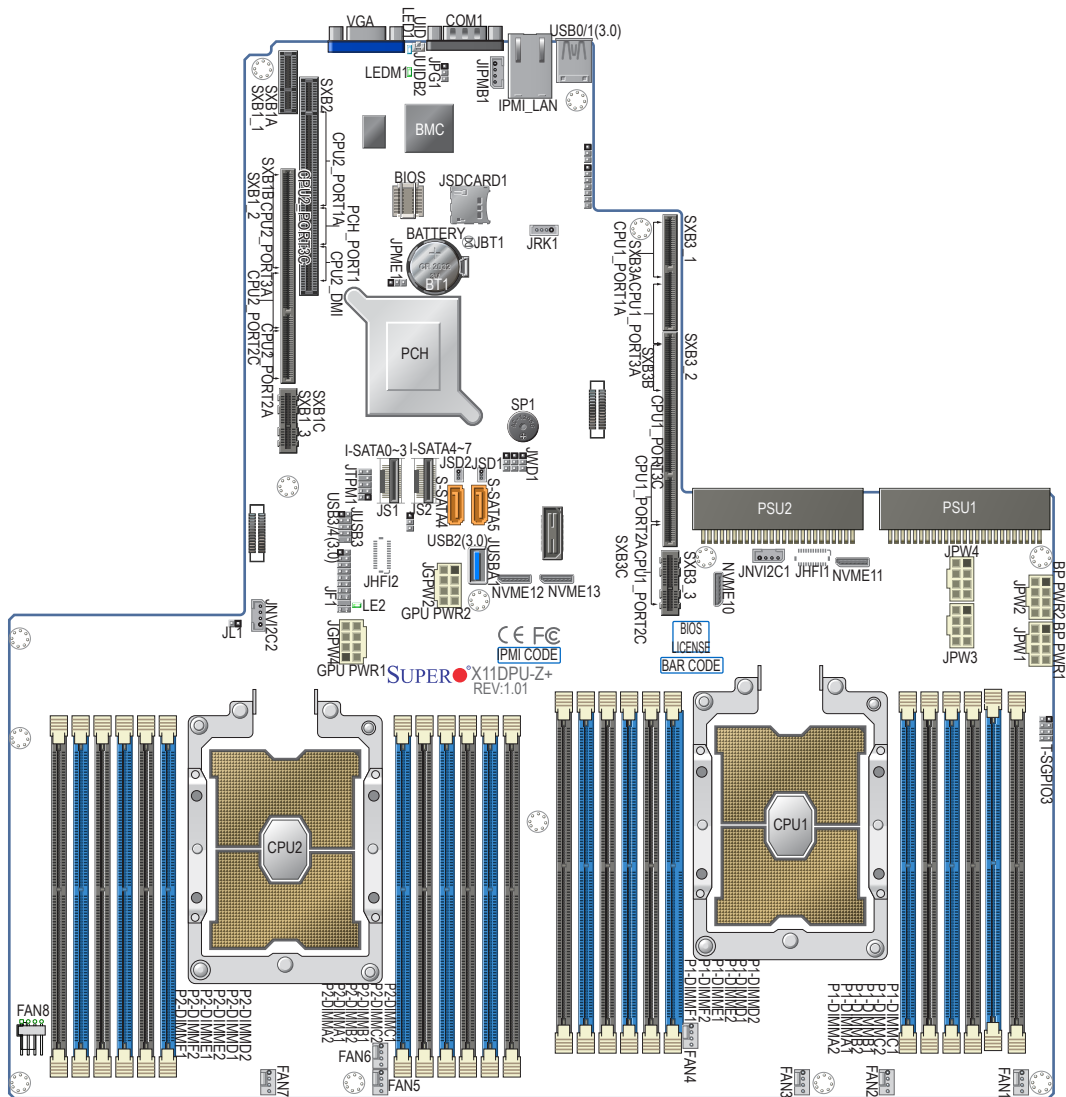
Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections.

- "▪" indicates the location of Pin 1.

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

- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Quick Reference

LEDM1
VGA
LED1
JUIDB2
JPG1
COM1
JIPMB1
IPMI LAN
USB 0/1 (3.0)

JSDCARD1
JBT1
JRK1 RAID KEY-1
JP2

SXB1A

SXB2
BIOS
Battery
JPME1
SXB1B
SP1
I-SATA4-7

I-SATA0~3

SXB1C
JTPM1 (TPM / PORT 80)

JUSB3 (USB3/4)
JHFI2
NVME13
JF1
LE2
JL1
JNVI2C2
JGPW4
JGPW2
NVME12

SXB3A
JSD2
JSD1
JVRM2
JVRM1
JWD1
SXB3B
S-SATA4
S-SATA5
USB2 (3.0)
SXB3C

JNVI2C1
PSU2
JHFI1
PSU1

NVME11
JPW4
JPW2
JPW1
JPW3
NVME10
T-SGPIO3

SUPER●®X11DPU-Z+ REV:1.01
IPMI CODE
CE FC
BIOS LICENSE BAR CODE

FAN8
FAN7
FAN6
FAN5
FAN4
FAN3
FAN2
FAN1

P2-DIMMF1
P2-DIMMF2
P2-DIMME1
P2-DIMME2
P2-DIMMD1
P2-DIMMD2
P2-DIMMA2
P2-DIMMA1
P2-DIMMB2
P2-DIMMB1
P2-DIMMC2
P2-DIMMC1
P1-DIMMF1
P1-DIMMF2
P1-DIMME1
P1-DIMME2
P1-DIMMD1
P1-DIMMD2
P1-DIMMA2
P1-DIMMA1
P1-DIMMB2
P1-DIMMB1
P1-DIMMC2
P1-DIMMC1

Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections.

- "▪" indicates the location of Pin 1.

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

- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal) (See Chapter 2)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPME1	Manufacture Mode Select (ME Mode Select)	Pins 1-2 (Normal)
JWD1	Watch Dog Timer Enable	Pins 1-2 (Reset to System)

Connector	Description
BT1 (Battery)	Onboard CMOS battery
COM1	Back panel COM port
FAN1-8	4-pin system/CPU cooling fan headers (FAN8: a 4-pin vertical fan header)
IPMI_LAN	Dedicated IPMI_LAN port
JF1	Front Panel Control header
JHFI1/JHFI2 (*Notes below)	Host Fabric Interface (HFI) sideband connection headers used for the HFI carrier cards (Available when F model processors are installed; JHFI1: for CPU1, JHFI2: for CPU2) (See Notes below.)
I-SATA0-3, I-SATA4-7	SATA 3.0 connections 0-3, 4-7 supported by the Intel PCH
JIPMB1	4-pin BMC external I^2C header (for an IPMI-supported card)
JL1	Chassis intrusion header
JNVI²C1/JNVI²C2	NVMe SMBus (I^2C) headers used for PCI-E hot-plug SMBus clock & data connections (an SMCI-proprietary NVMe add-on card and cable are required for the NVME I^2C header. This feature is available for a Supermicro complete system only.)
JP2	Complex Programmable Logical Device (CPLD) header
JGPW2/JGPW4	GPU power connectors (JGPW4: GPU Power Connector1/JGPW2: GPU Power Connector2)
JPW1/JPW2	8-pin power supply connectors for backplane devices
JPW3/JPW4	8-pin power supply connectors
JRK1	Intel RAID Key header used for NVMe Solid State Devices (SSD)
JSD1/JSD2	Power connectors used for SATA DOM (Disk_on-Module) devices
JSDCARD1	Solid State Device (SSD) add-on card header
JTPM1	Trusted Platform Module (TPM)/Port 80 connector
NVME10/JNVME11	NVMe Connector1/NVMe Connector2 for CPU1
NVME12/JNVME13	NVMe Connector1/NVMe Connector2 for CPU2
PSU1/PSU2	Power supply unit 1/power supply unit 2 reserved for Supermicro system use
SP1	Internal speaker/buzzer

Notes: 1. For the HFI sideband carrier cards to function properly, please install a Host Fabric Interface (HFI) card to an appropriate PCI-E slot of your choice, and install an F model processor to the corresponding socket (JHFI1: for CPU1, JHFI2: for CPU2. When one F model is used, be sure to install it on CPU Socket#1.) 2. Connect an HFI cable from the HFI card to JHFI (HFI header) and connect an IFP cable from HFI card to the processor. (See Pages 34 and 51 in Chapter 2 for more information.)

Connector	Description
S-SATA4/S-SATA5	Powered S-SATA ports 4/5 with power pins built-in and with support of Supermicro SuperDOM (Disk On Module) devices
SXB1A/SXB1B/SXB1C	PCI-Express 3.0 (x16+x16) slots supported by CPU2 for Supermicro proprietary riser card (w/left riser card support)
SXB2	PCI-Express 3.0 x8 (in x16) slot for center right riser card slot
SXB3A/SXB3B/SXB3C	PCI-Express 3.0 x16+x16+x8 slots far right ultra riser card w/support of SAS3 AOM and LAN options (via four NVMe ultra riser cards)
T-SGPIO3	Serial Link General Purpose I/O (GPIO) port
UID (JUIDB2)	Unit Identifier (UID) switch
USB0/1 (USB 3.0)	Back panel USB 3.0 ports
USB2 (USB 3.0)	Type A USB 3.0 header (JUSBA1)
USB3/4 (3.0)	USB header for two USB 3.0 connections 3/4 for front access (JUSB3)
VGA	VGA Port

LED	Description	Status
LED1	UID (Unit Identifier) LED	Solid Blue: Unit identified
LE2	Onboard Power LED	On: Onboard power on
LEDM1	BMC Heartbeat LED	Blinking Green: BMC normal

Motherboard Features

Motherboard Features
CPU
• This motherboard supports dual 81xx/61xx/51xx/41xx/31xx Socket P) socket processors which offer Intel UltraPath Interconnect (UPI) of up to 10.4 GT/s **Note:** Both CPUs need to be installed for full access to the PCI-E slots, DIMM slots, and onboard controllers. Refer to the block diagram on page 18 to determine which slots or devices may be affected.
Memory
• Integrated memory controller embedded in the processor supports up to 3 TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM/NV-DIMM DDR4 ECC 2666/2400/2133 MHz in 24 DIMM slots.
DIMM Size
• Up to 128 GB at 1.2V **Note 1:** Memory speed support depends on the processors used in the system. **Note 2:** For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.
Chipset
• Intel C621 PCH
Expansion Slots
• PCI-Express 3.0 (x16+x16) slots supported by CPU2 for left riser card use (SXB1A/SXB1B//SXB1C) • PCI-Express 3.0 x8 (in x16) slot for center right riser card slot (SXB2) • PCI-Express 3.0 x16+x16+x8 slots far right ultra riser card (used for SAS3 AOM expansion and LAN options via NVMe ultra riser card support) (SXB3A/SXB3B//SXB3C)
BaseBoard Management Controller (BMC)
• ASpeed AST 2500 Baseboard Controller (BMC) supports IPMI 2.0 • One (1) Dedicated IPMI LAN located on the rear IO back panel
Graphics
• Graphics controller via AST 2500 BMC (BaseBoard Management Controller)
Network Connection
• Intel C621 supports two Gigabit LAN (1 GbE) ports on the X11DPU-Z+ • One IPMI-dedicated LAN supported by the AST2500 BMC
I/O Devices

• Serial (COM) Port	• One (1) Fast UART 16550 port on the I/O back panel
• SATA 3.0	• Eight (8) SATA 3.0 ports supported by Intel PCH (I-SATA 0-3, I-SATA 4-7) • Two (2) SATA 3.0 ports with power-pins built-in, w/support of Supermicro SuperDOM (S-SATA4/S-SATA5)
• RAID	• RAID 0, 1, 5, and 10
• NVMe	• Four (4) NVMe (x4) PCI-E 3.0 slots

Motherboard Features
Peripheral Devices
- Two (2) USB 3.0 ports on the rear I/O panel (USB 0/1)   - One (1) Type A USB 3.O connection header (USB2)   - One (1) USB 3.0 header with two USB 3.0 connections (USB 3/4)
BIOS
32 MB SPI AMI BIOS® SM Flash UEFI BIOS   - ACPI 3.0/4.0, USB keyboard, Plug-and-Play (PnP), SPI dual/quad speed support, riser-card auto detection support, and SMBIOS 2.7 or later
Power Management
- Main switch override mechanism   - Power-on mode for AC power recovery   - Intel® Intelligent Power Node Manager 4.0 (available when the Supermicro Power Manager [SPM] is installed and a special power supply is used)   - Management Engine (ME)
System Health Monitoring
- Onboard voltage monitoring for +3.3V, 3.3V standby, +5V, +5V standby, +12V, CPU core, memory, chipset, BMC, PCH, and battery voltages   - CPU System LED and control   - CPU Thermal Trip support   - Status monitor for speed control   - Status monitor for on/off control   - CPU Thermal Design Power (TDP) support of up to 205W (See Note 1 on next page.)
Fan Control
- Fan status monitoring via IPMI connections   - Dual cooling zone   - Low-noise fan speed control   - Pulse Width Modulation (PWM) fan control
System Management
- Trusted Platform Module (TPM) support   - PECI (Platform Environment Control Interface) 2.0 support   - UID (Unit Identification)/Remote UID   - System resource alert via SuperDoctor® 5   - SuperDoctor® 5, Watch Dog, NMI   - Chassis intrusion header and detection
LED Indicators
- CPU/Overheating   - Fan Failure   - UID/remote UID   - LAN activity
Dimensions
17.0" (L) x 16.8" (W) (431.80 mm x 426.72 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/.

Note 3: It is strongly recommended that you change BMC log-in information upon initial system power-on. The manufacture default username is ADMIN and the password is ADMIN. For proper BMC configuration, please refer to http://www.supermicro.com.

Figure 1-3.
System Block Diagram
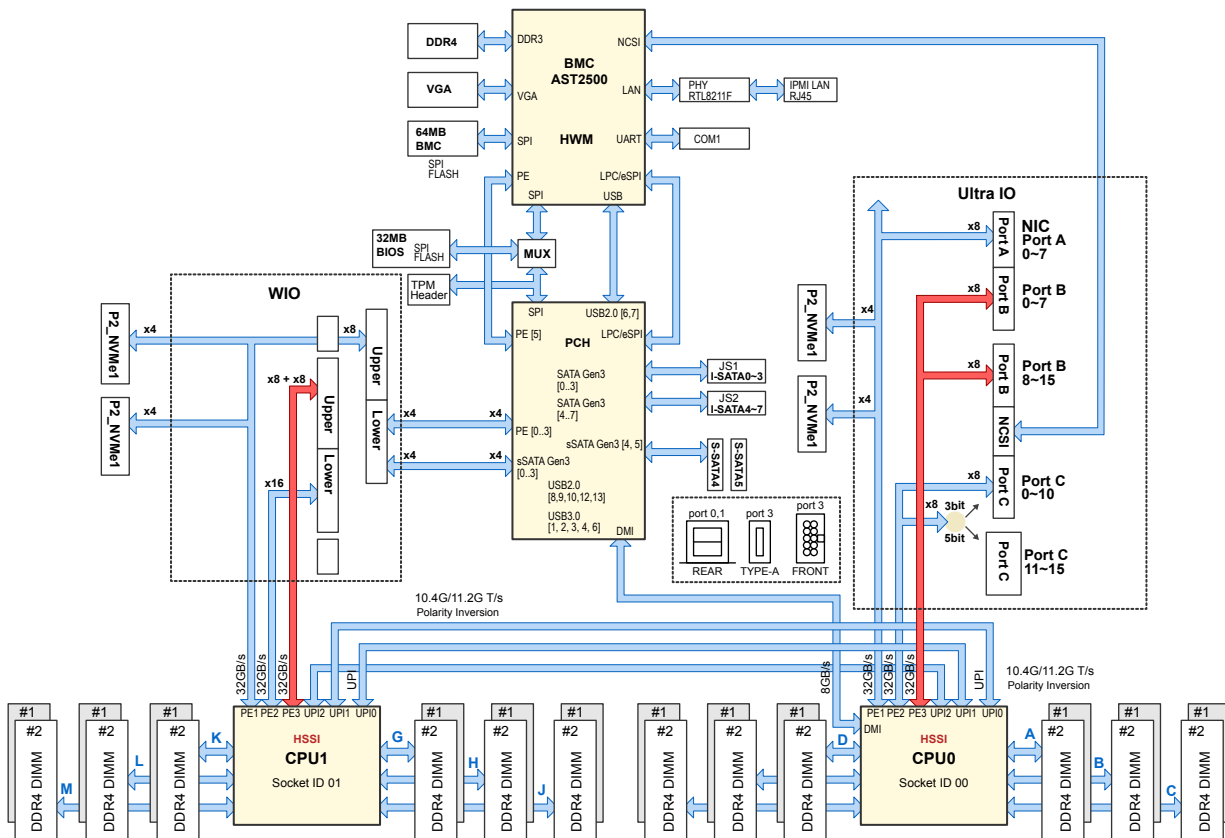
Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

1.2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel Xeon 81xx/61xx/51xx/41xx/31xx processors (Socket P) and the C621 chipset (Note below), this motherboard provides superb system performance, efficient power management, and a rich feature set based on cutting edge technology to address the needs of next-generation computer users. With support of Intel® UltraPath Interconnect (UPI) of up to 10.4 GT/s, and Intel® AVX-512 new instructions, this motherboard offers an innovative solution with maximum system performance to meet the ongoing demands of High Performance Computing (HPC) and Enterprise Computing servers. This motherboard is optimized for database, big data and MRP/ERP platforms.

The Intel Xeon 81xx/61xx/51xx/41xx/31xx processor and the C621 chipset support the following features:

- Intel® AVX-512 support with memory bandwidth increase to 6 channels (x1.5 from the previous generation)

- High availability interconnect between multiple nodes

- Rich set of available I/Os, full flexibility in usage model, and software stack

- Dedicated subsystems for customer innovation

- Increased platform security with Intel® Boot Guard for hardware-based boot integrity protection; prevention of buffer overflow class security threads

- Integrated solution for real-time compression, streaming write & read performance increases from gen-to-gen

- Hot plug and enclosure management with Intel Volume Management Device (Intel VMD)

- Single standard server development (Accelerate NFV transition) consolidating application, control, and data plane workloads, reducing total platform investment needs

1.3 Special Features

This section describes the health monitoring features of the X11DPU-Z+ motherboard. The motherboard has an onboard ASpeed AST2500 Baseboard Management Controller (BMC) 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

This section describes the health monitoring features of the X11DPU-Z+. The motherboard has an onboard Baseboard Management Controller (BMC) chip that supports system health monitoring. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

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. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor. Real time readings of these voltage levels are all displayed in BIOS.

Fan Status Monitor with Firmware Control

The system health monitor embedded in the BMC chip can check the RPM status of the cooling fans. The CPU and chassis fans are controlled via IPMI.

Environmental Temperature Control

System Health sensors in the BMC monitor the 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.

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

System Resource Alert

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

1.5 ACPI Features

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

In addition to enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows 10, and Windows 2012 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.

1.7 Super I/O

The Super I/O (ASpeed AST2500 chip) provides a high-speed, 16550 compatible serial communication port (UART), which supports serial infrared communication. The UART includes send/receive FIFO, a programmable baud rate generator, complete modem control capability, and a processor interrupt system. The UART provides legacy speed with 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, supporting higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

1.8 Advanced Power Management

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

Intel® Intelligent Power Node Manager (IPNM)

Available when the Supermicro Power Manager (SPM) is installed, Intel's Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 2.0/3.0 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Management Engine (ME) firmware installed to use this feature.

Note: Support for IPNM 2.0/3.0 support is dependent on the power supply used in the system.

Management Engine (ME)

The Management Engine, which is an ARC controller embedded in the IOH (I/O Hub), provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

Chapter 2

Installation

2.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your motherboard and your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing the board from the antistatic bag.

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

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

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

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

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

Unpacking

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

2.2 Motherboard Installation

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

Phillips Screwdriver (1)

Phillips Screws (14)

Standoffs (14) Only if Needed

Tools Needed
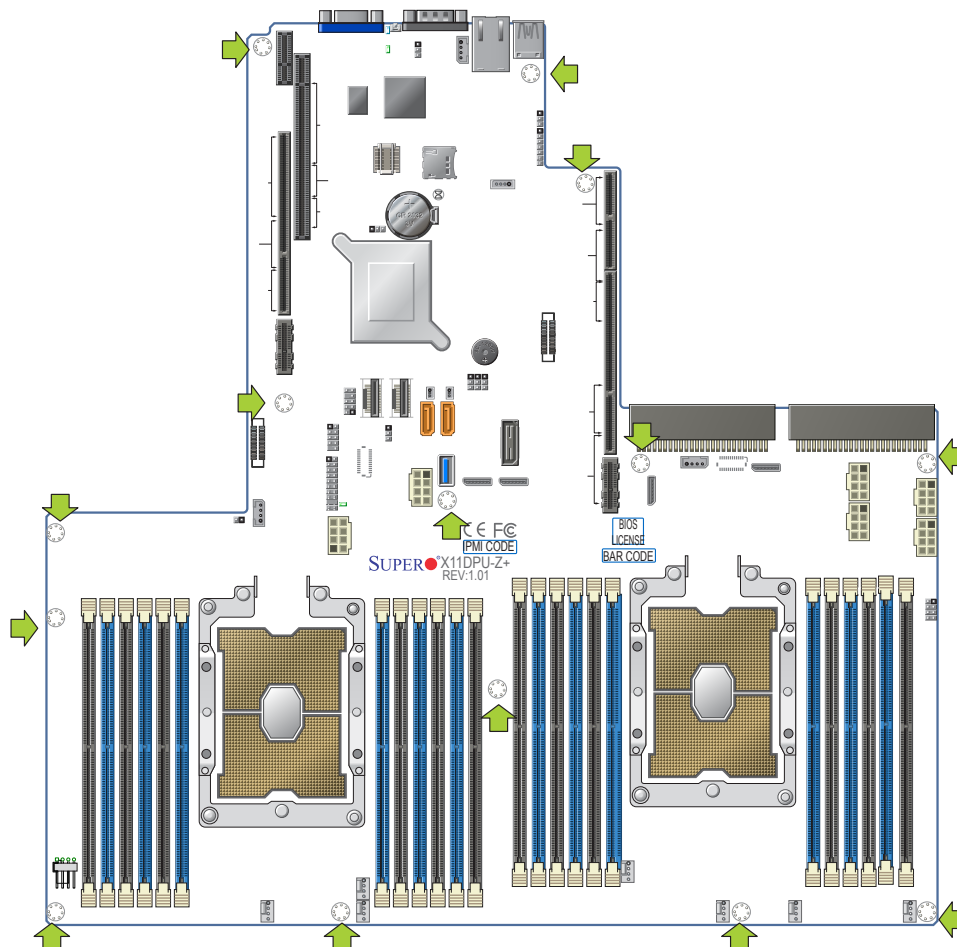
Location of Mounting Holes

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

Installing the Motherboard

1. Install the I/O shield into the back of the chassis.
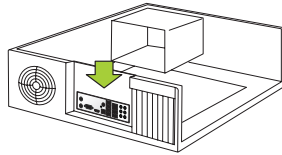
2. Locate the mounting holes on the motherboard. See the previous page for the location.
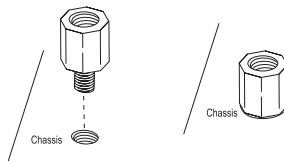
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
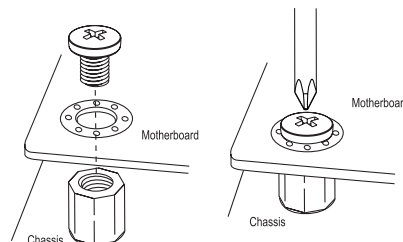
4. Install standoffs in the chassis as needed.

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

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

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

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

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

2.3 Processor and Heatsink Installation

Warning: When handling the processor package, avoid placing direct pressure on the label area of the CPU or CPU socket. Also, improper CPU installation or socket misalignment can cause serious damage to the CPU or motherboard which may result in RMA repairs. Please read and follow all instructions thoroughly before installing your CPU and heatsink.

Notes:

- Always connect the power cord last, and always remove it before adding, removing, or changing any hardware components. Please note that the processor and heatsink should be assembled together first to form the Processor Heatsink Module (PHM), and then install the entire PHM into the CPU socket.

- When you receive a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and that none of the socket pins are bent; otherwise, contact your retailer immediately.

- Refer to the Supermicro website for updates on CPU support.

- Please follow the instructions given in the ESD Warning section on the first page of this chapter before handling, installing, or removing system components.

The Intel 81xx/61xx/51xx/41xx/31xx Series Processors

Note: The 81xx/61xx/51xx/41xx/31xx processors contain two models-the F model processors and the Non-F model processors. The installation instructions for the F model processors differ from the installation instructions for the Non-F model processors. For this reason, two sets of instructions (one for the F model, and the other, for the Non-F model) are provided in this section.
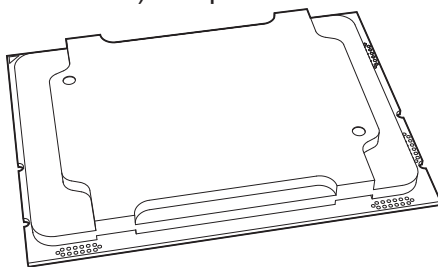
Intel Processor (Non-F Model)   **Intel Processor (F Model)**
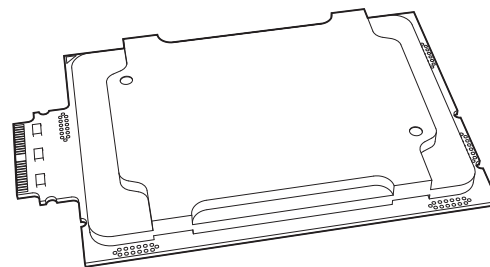
Note: All graphics, drawings, and pictures shown in this manual are for illustration only. The components that came with your machine may or may not look exactly the same as those shown in this manual.

Overview of the Processor Socket Assembly

The processor socket assembly contains 1) the Intel 81xx/61xx/51xx/41xx/31xx processor, 2) the narrow processor clip, 3) the dust cover, and 4) the CPU socket.

1. The 81xx/61xx/51xx/41xx/31xx Processor
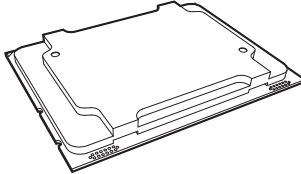
(The 81xx/61xx/51xx/41xx/31xx Processor)

2. Narrow processor clip (the plastic processor package carrier used for the CPU)
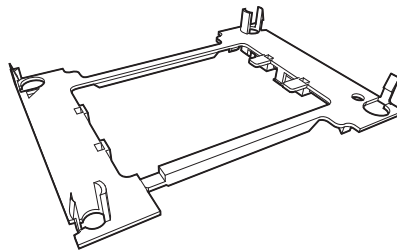
(for the non-F Model)

3. Dust Cover
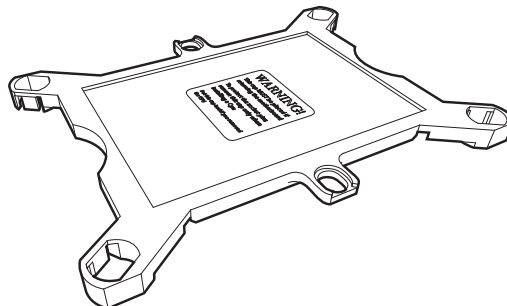
4. CPU Socket
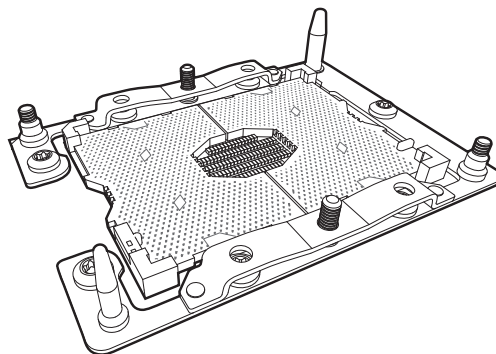
Note: Be sure to cover the CPU socket with the dust cover when the CPU is not installed.

Overview of the Processor Heatsink Module (PHM)

The Processor Heatsink Module (PHM) contains 1) a heatsink, 2) a narrow processor clip, and 3) the 81xx/61xx/51xx/41xx/31xx processor.

1. Heatsink
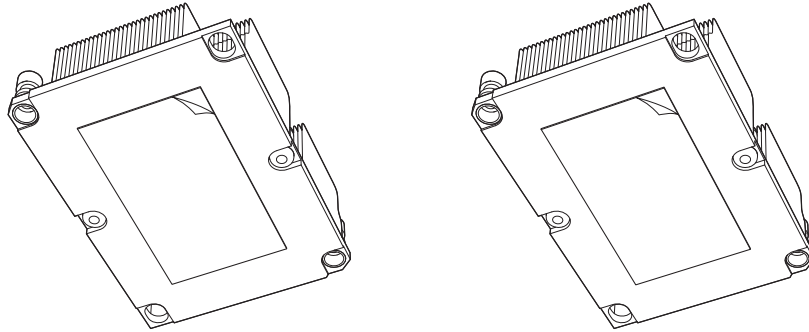
2. Narrow processor clip
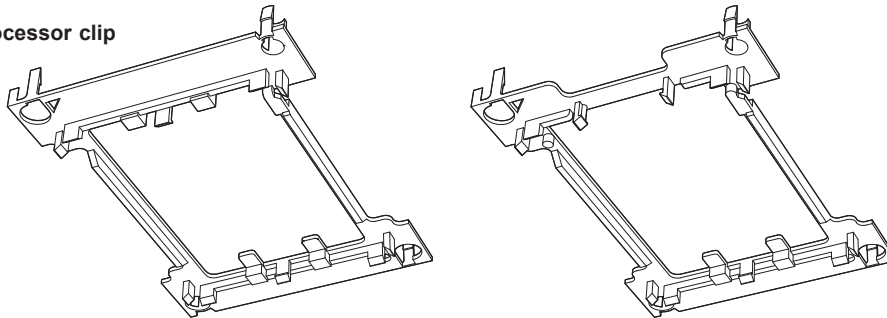
3. Intel Processor
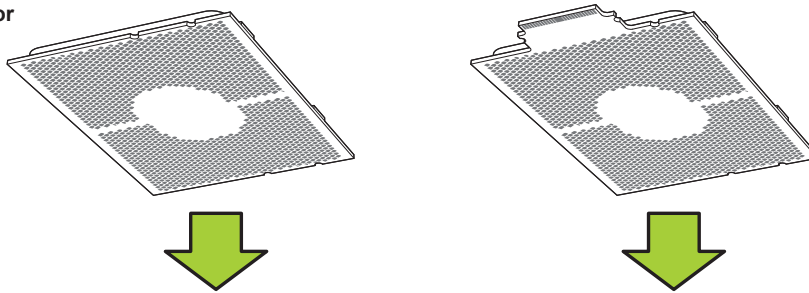
Processor Heatsink Module (PHM)
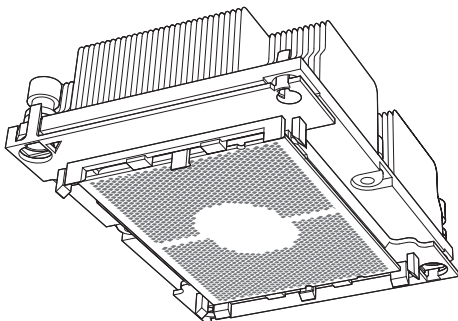
(Bottom View for the non-F Model)   **(Bottom View for the F Model)**
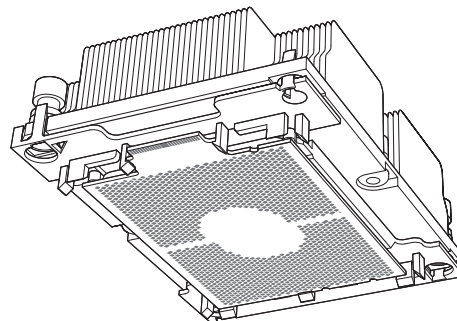
Attaching the Non-F Model Processor to the Narrow Processor Clip to Create the Processor Package Assembly

To properly install the CPU into the narrow processor clip, please follow the steps below.

1. Locate pin 1 (notch A), which is the triangle located on the top of the narrow processor clip. Also locate notch B and notch C on the processor clip.

2. Locate pin 1 (notch A), which is the triangle on the substrate of the CPU. Also, locate notch B and notch C on the CPU as shown below.

3. Align pin 1 (the triangle on the substrate) of the CPU with pin 1 (the triangle) of the narrow processor clip. Once they are aligned, carefully insert the CPU into the processor clip by sliding notch B of the CPU into notch B of the processor clip, and sliding notch C of the CPU into notch C of the processor clip.

4. Examine all corners of the CPU to ensure that it is properly seated on the processor clip. Once the CPU is securely attached to the processor clip, the processor package assembly is created.

> **Note:** Please exercise extreme caution when handling the CPU. Do not touch the CPU LGA-lands to avoid damaging the LGA-lands or the CPU. Be sure to wear ESD gloves when handling components.

Processor Package Carrier (w/CPU mounted on the Processor Clip)

Attaching the F Model Processor to the Narrow Processor Clip to Create the Processor Package Assembly

To properly install the CPU into the narrow processor clip, please follow the steps below.

1. Locate pin 1 (notch A), which is the triangle located on the top of the narrow processor clip. Also locate notch B and notch C on the processor clip.

2. Locate pin 1 (notch A), which is the triangle on the substrate of the CPU. Also, locate notch B and notch C on the CPU as shown below.

3. Align pin 1 (the triangle on the substrate) of the CPU with pin 1 (the triangle) of the narrow processor clip. Once they are aligned, carefully insert the CPU into the processor clip by sliding notch B of the CPU into notch B of the processor clip, and sliding notch C of the CPU into notch C of the processor clip.

4. Examine all corners of the CPU to ensure that it is properly seated on the processor clip. Once the CPU is securely attached to the processor clip, the processor package assembly is created.

Note: Please exercise extreme caution when handling the CPU. Do not touch the CPU LGA-lands to avoid damaging the LGA-lands or the CPU. Be sure to wear ESD gloves when handling components.

CPU (Upside Down) w/CPU LGA Lands up

Align Notch D of the CPU and Notch D of the Processor Clip

Align Notch C of the CPU and Notch C of the Processor Clip

Align Notch B of the CPU and Notch B of the Processor Clip

Align CPU Pin 1

Pin 1

CPU/Heatsink Package (Upside Down)

Allow Notch D to latch on to CPU

Allow Notch C to latch on to CPU

Allow Notch B to latch on to CPU

Processor Package Carrier (w/CPU mounted on the Processor Clip)

Attaching the Non-F Model Processor Package Assembly to the Heatsink to Form the Processor Heatsink Module (PHM)

After you have made a processor package assembly by following the instructions on the previous page, please follow the steps below to mount the processor package assembly onto the heatsink to create the Processor Heatsink Module (PHM).

1. Locate "1" on the heatsink label and the triangular corner next to it on the heatsink. With your index finger pressing against the screw at this triangular corner, carefully hold and turn the heatsink upside down with the thermal-grease side facing up. Remove the protective thermal film if present, and apply the proper amount of the thermal grease as needed. (Skip this step if you have a new heatsink because the necessary thermal grease is pre-applied in the factory.)

2. Holding the processor package assembly at the center edge, turn it upside down. With the thermal-grease side facing up, locate the hollow triangle located at the corner of the processor carrier assembly ("a" in the graphic). Note a larger hole and plastic mounting clicks located next to the hollow triangle. Also locate another set of mounting clicks and a larger hole at the diagonal corner of the same (reverse) side of the processor carrier assembly ("b" in the graphic).

3. With the back of heatsink and the reverse side of the processor package assembly facing up, align the triangular corner on the heatsink ("A" in the graphic) against the mounting clips next to the hollow triangle ("a") on the processor package assembly.

4. Also align the triangular corner ("B") at the diagonal side of the heatsink with the corresponding clips on the processor package assembly ("b").

5. Once the mounting clips on the processor package assembly are properly aligned with the corresponding holes on the back of heatsink, securely attach the heatsink to the processor package assembly by snapping the mounting clips at the proper places on the heatsink to create the processor heatsink module (PHM).

Non-Fabric CPU and Processor Clip (Upside Down)

Triangle on the CPU

Triangle on the Processor Clip

Heatsink (Upside Down)

On Locations of (C, D), the notches snap onto the heat sink's mounting holes

On Locations (A, B), the notches snap onto the heatsink's sides

Make sure Mounting Notches snap into place

Attaching the F Model Processor Package Assembly to the Heatsink to Form the Processor Heatsink Module (PHM)

After you have made a processor package assembly by following the instructions on the previous page, please follow the steps below to mount the processor package assembly onto the heatsink to create the Processor Heatsink Module (PHM).

1. Locate "1" on the heatsink label and the triangular corner next to it on the heatsink. With your index finger pressing against the screw at this triangular corner, carefully hold and turn the heatsink upside down with the thermal-grease side facing up. Remove the protective thermal film if present, and apply the proper amount of the thermal grease as needed. (Skip this step if you have a new heatsink because the necessary thermal grease is pre-applied in the factory.)

2. Holding the processor package assembly at the center edge, turn it upside down. With the thermal-grease side facing up, locate the hollow triangle located at the corner of the processor carrier assembly ("a" in the graphic). Note a larger hole and plastic mounting clicks located next to the hollow triangle. Also locate another set of mounting clicks and a larger hole at the diagonal corner of the same (reverse) side of the processor carrier assembly ("b" in the graphic).

3. With the back of heatsink and the reverse side of the processor package assembly facing up, align the triangular corner on the heatsink ("A" in the graphic) against the mounting clips next to the hollow triangle ("a") on the processor package assembly.

4. Also align the triangular corner ("B") at the diagonal side of the heatsink with the corresponding clips on the processor package assembly ("b").

5. Once the mounting clips on the processor package assembly are properly aligned with the corresponding holes on the back of heatsink, securely attach the heatsink to the processor package assembly by snapping the mounting clips at the proper places on the heatsink to create the processor heatsink module (PHM).

Fabric CPU and Processor Clip (Upside Down)

Triangle on the CPU

Triangle on the Processor Clip

Heatsink (Upside Down)

On Locations of (C, D), the notches snap onto the heat sink's mounting holes

On Locations (A, B), the notches snap onto the heatsink's sides

Make sure Mounting Notches snap into place

Preparing the CPU Socket for Installation

This motherboard comes with the CPU socket pre-assembled in the factory. The CPU socket contains 1) a dust cover, 2) a socket bracket, 3) the CPU (P0) socket, and 4) a back plate. These components are pre-installed on the motherboard before shipping.
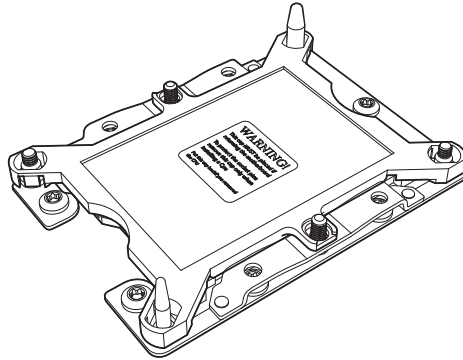
CPU Socket w/Dust Cover On

Removing the Dust Cover from the CPU Socket

Remove the dust cover from the CPU socket, exposing the CPU socket and socket pins as shown on the illustration below.

Note: Do not touch the socket pins to avoid damaging them, causing the CPU to malfunction.

Dusk Cover

Remove the dust cover from the CPU socket. Do not touch the socket pins!

Socket Pins
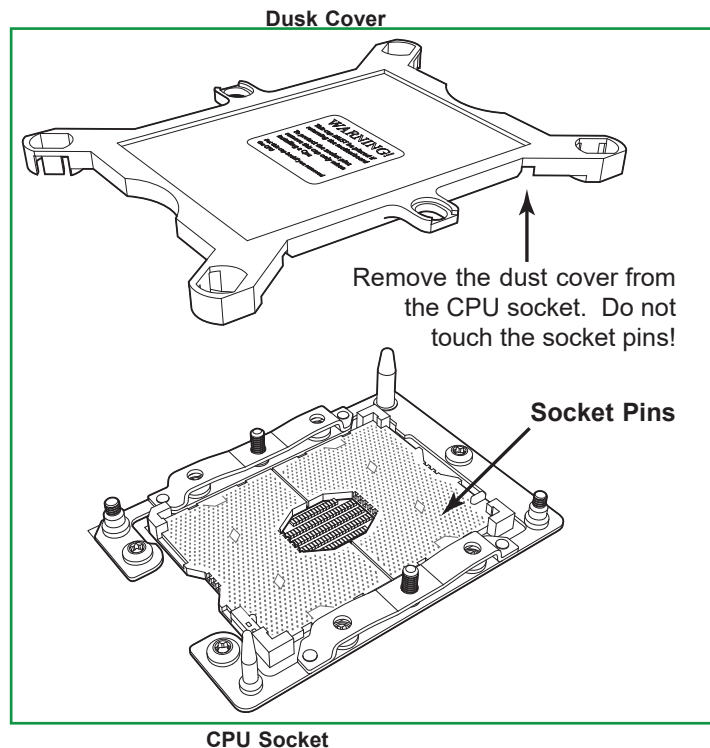
CPU Socket

Installing the Processor Heatsink Module (PHM)

1. Once you have assembled the processor heatsink module (PHM) by following the instructions listed on page 30 or page 31, you are ready to install the processor heatsink module (PHM) into the CPU socket on the motherboard. To install the PHM into the CPU socket, follow the instructions below.

2. Locate the triangle (pin 1) on the CPU socket, and locate the triangle (pin 1) at the corner of the PHM that is closest to "1." (If you have difficulty locating pin 1 of the PHM, turn the PHM upside down. With the LGA-lands side facing up, you will note the hollow triangle located next to a screw at the corner. Turn the PHM right side up, and you will see a triangle marked on the processor clip at the same corner of hollow triangle.)

3. Carefully align pin 1 (the triangle) on the the PHM against pin 1 (the triangle) on the CPU socket.

4. Once they are properly aligned, insert the two diagonal oval holes on the heatsink into the guiding posts.

5. Using a T30 Torx-bit screwdriver, install four screws into the mounting holes on the socket to securely attach the PHM onto the motherboard starting with the screw marked "1" (in the sequence of 1, 2, 3, and 4).

   Note: Do not use excessive force when tightening the screws to avoid damaging the LGA-lands and the processor.

Mounting the Processor Heatsink Module into the CPU socket (on the motherboard)

Tighten the screws in the sequence of 1, 2, 3, 4 (top 3 quarter view)
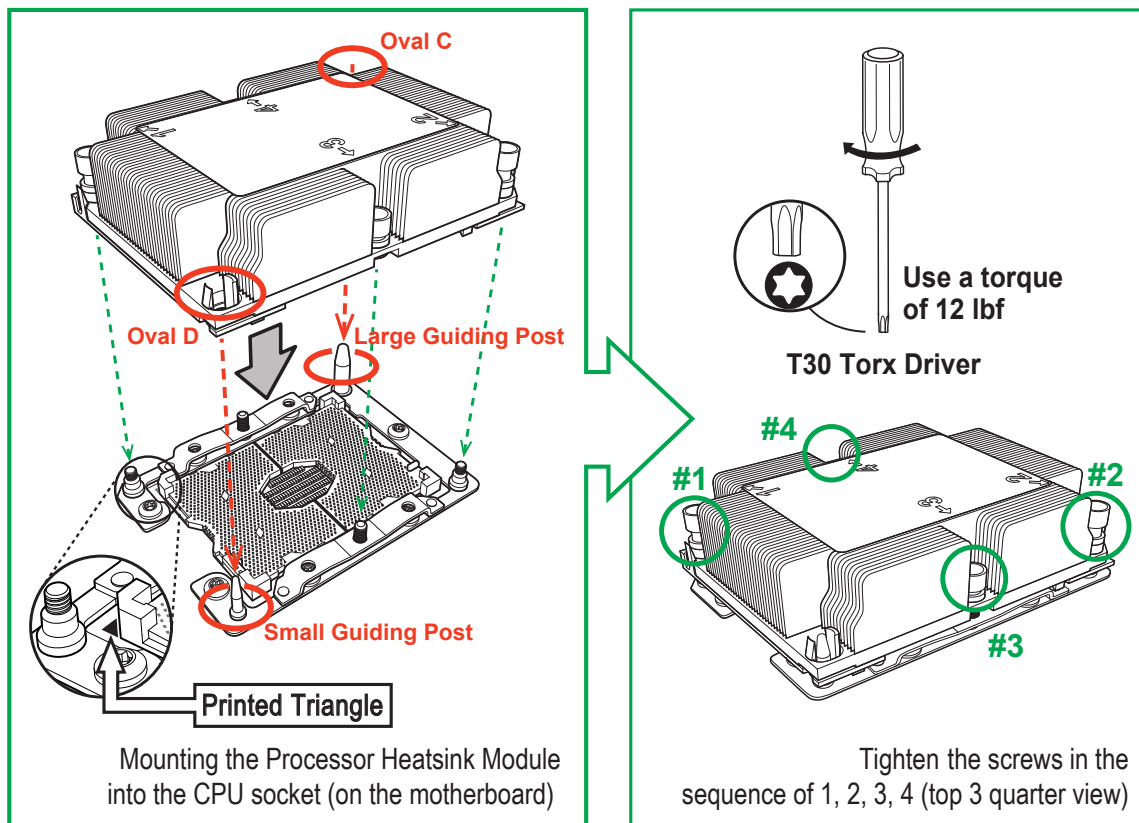
Installing an HFI Carrier Card for Host Fabric Interface (HFI) Support as Needed (Available when an F Model CPU is Used)

Note: Two host fabric interface carrier card headers (JHFI1/JHFI2) are located on the motherboard. JHFI1 is used for CPU1; JHFI2, for CPU2. If one F model CPU is used, install it on CPU Socket#1 first. Following the steps below to enable HFI support for CPU1. If needed, repeat the same steps to enable HFI support for CPU2. (For more information on the JHFI1/JFHI2 headers, please refer to page 51.)

Installation Instructions

1. Locate CPU Socket#1 on the motherboard. Install an F model CPU on CPU Socket#1. (For CPU2 HFI support, install an F model CPU on Socket#2.)

2. Locate the PCI-E slots the motherboard. Install a Host Fabric Interface (HFI) card on a PCI-E slot supported by CPU1. (For CPU2 HFI support, install an HFI card on a PCI-E slot supported by CPU2.)

3. Connect the HFI connector on the HFI cable to the onboard JHFI1 header as show below (marked 3 below.) (Connect the HFI cable to JHFI2 for CPU2 HFI support.)

4. Connect the other end of the HFI cable to the connector (marked **Ⓐ**) on the HFI card as shown below. (Marked 4 below.)

5. Connect the plug (marked 5) on one end of the Internal_Faceplate_to_the_Processor (IFP) cable to the connector (marked **Ⓑ**) on the HFI card as shown below.

6. Connect the other end of IFP cable (marked 6) to the F model CPU installed in the CPU as shown below. Repeat the same steps to enable HFI support for CPU2.

IFP Cable (Optional)

6. Connect the other end of the IFP cable to the F model CPU.

Install an F model CPU on Socket#1 (and another F model CPU on Socket#2 if needed. Then repeat Step 1 to Step 6 for HFI support for CPU2.)

F Model Processor

5. Connect one end of the IFP cable to the connector (B) of the HFI card.

3. Connect the HFI connector on the HFI cable to the onboard JHFI1 header.

HFI Carrier Card

2. Install an HFI card to a PCI-E slot

JHFI1 Header (for CPU1)

4. Connect another end of the HFI cable to the connector (A) of the HFI card.

JHFI2 Header (for CPU2)

JHFI1

HFI (Host Fabric Interface) Sideband Cable

Removing the Processor Heatsink Module (PHM) from the Motherboard

Before removing the processor heatsink module (PHM), unplug power cord from the power outlet.

1. Using a T30 Torx-bit screwdriver, turn the screws on the PHM counterclockwise to loosen them from the socket, starting with screw marked #4 (in the sequence of 4, 3, 2, 1).

2. After all four screws are removed, wiggle the PHM gently and pull it up to remove it from the socket.

   Note: To properly remove the processor heatsink module, be sure to loosen and remove the screws on the PHM in the sequence of 4, 3, 2, 1 as shown below.

Removing the screws in the sequence of 4, 3, 2, 1

#4

#1

#2

#3

Printed Triangle on Motherboard

CPU Socket

After removing the screws, lift the Processor Heatsink Module off the CPU socket.
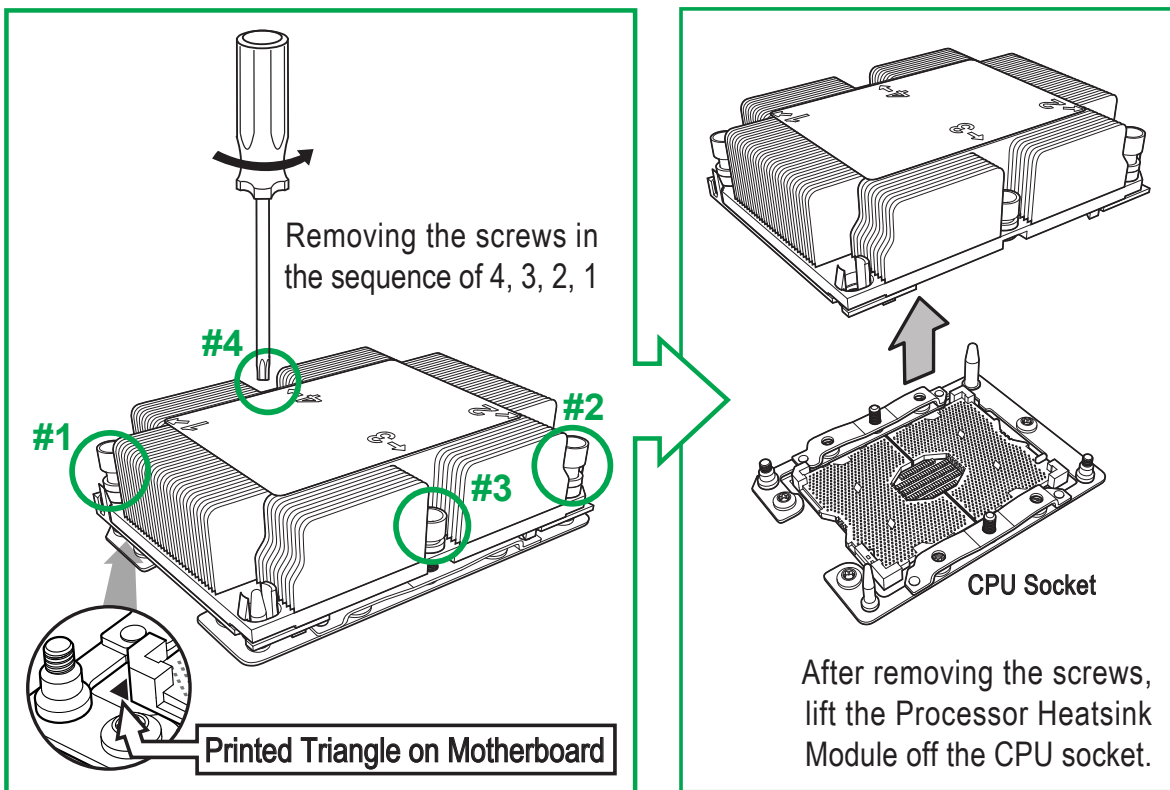
2.4 Memory Support and Installation

Notes: Check the Supermicro website for recommended memory modules. Exercise extreme care when installing or removing DIMM modules to prevent any damage.

Memory Support

The motherboard supports up to 3 TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM/NV-DIMM DDR4 ECC 2666/2400/2133 MHz in 24 DIMM slots. The black DIMM slots are reserved for future NVDIMM support. Populating the DIMM slots in a 2DPC (two DIMMs per channel) configuration with pairs of memory modules of the same type, speed and size will result in interleaved memory, which improves performance.

Notes: 1. When installing DIMMs in a 2DPC memory configuration, first populate the blue memory slot, which is the first slot of a channel, followed by the black slot. 2. Using an unbalanced memory topology by installing two DIMMs in one channel while installing one DIMM in another channel will result in reduced memory performance. 3. Memory speed is dependent on the type of processors used in your system.

DDR4 Memory Support (for 2-Slot Per-Channel Configuration)					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC)	
				2 Slots per Channel	
				1DPC (1-DIMM per Channel)	2DPC (2-DIMM per Channel)
		4 Gb	8 Gb	1.2 V	1.2 V
RDIMM	SRx4	8 GB	16 GB	2666	2666
RDIMM	SRx8	4 GB	8 GB	2666	2666
RDIMM	DRx8	8 GB	16 GB	2666	2666
RDIMM	DRx4	16 GB	32 GB	2666	2666
RDIMM 3Ds	QRX4	N/A	2H-64GB	2666	2666
RDIMM 3Ds	8RX4	N/A	4H-128GB	2666	2666
LRDIMM	QRx4	32 GB	64 GB	2666	2666
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2666	2666
	8Rx4	N/A	4H-128 GB	2666	2666

DDR4 Memory Support (for 1-Slot Per-Channel Configuration)				
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC)
				1 Slot per Channel
				1DPC (1-DIMM per Channel)
		4 Gb	8 Gb	1.2 V
RDIMM	SRx4	8 GB	16 GB	2666
RDIMM	SRx8	4 GB	8 GB	2666
RDIMM	DRx8	8 GB	16 GB	2666
RDIMM	DRx4	16 GB	32 GB	2666
RDIMM 3Ds	QRX4	N/A	2H-64GB	2666
RDIMM 3Ds	8RX4	N/A	4H-128GB	2666
LRDIMM	QRx4	32 GB	64 GB	2666
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2666
	8Rx4	N/A	4H-128 GB	2666

DIMM Population Requirements for the 81xx/61xx/51xx/41xx/31xx Processors

For optimal memory performance, follow the tables below when populating memory modules.

Key Parameters for DIMM Configurations	
Parameters	**Possible Values**
Number of Channels	1, 2, 3, 4, 5, or 6
Number of DIMMs per Channel	1DPC (1 DIMM Per Channel) or 2DPC (2 DIMMs Per Channel)
DIMM Type	RDIMM (w/ECC), LRDIMM, 3DS-LRDIMM
DIMM Construction	• non-3DS RDIMM Raw Cards: A/B (2RX4), C (1RX4), D (1RX8), E (2RX8) • 3DS RDIMM Raw Cards: A/B (4RX4) • non-3DS LRDIMM Raw Cards: D/E (4RX4) • 3DS LRDIMM Raw Cards: A/B (8RX4)

General Population Requirements
DIMM Mixing Rules
• Please populate all memory modules with DDR4 DIMMs only. • X4 and X8 DIMMs can be mixed in the same channel. • Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets. • Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.

Mixing of DIMM Types within a Channel			
DIMM Types	**RDIMM**	**LRDIMM**	**3DS LRDIMM**
RDIMM	Allowed	Not Allowed	Not Allowed
LRDIMM	Not Allowed	Allowed	Not Allowed
3DS LRDIMM	Not Allowed	Not Allowed	Allowed

DIMM Installation

1. Insert DIMM modules in the following order: P1-DIMMA1, P1-DIMMD1, P1-DIMMB1, P1-DIMME1, and P1-DIMMC1, P1-DIMMF1. For the system to work properly, please use memory modules of the same type and speed on the motherboard.

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. Use two thumbs together to press the notches on 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.

Notches

Release Tabs
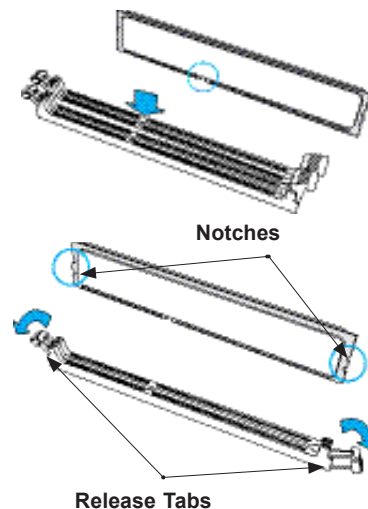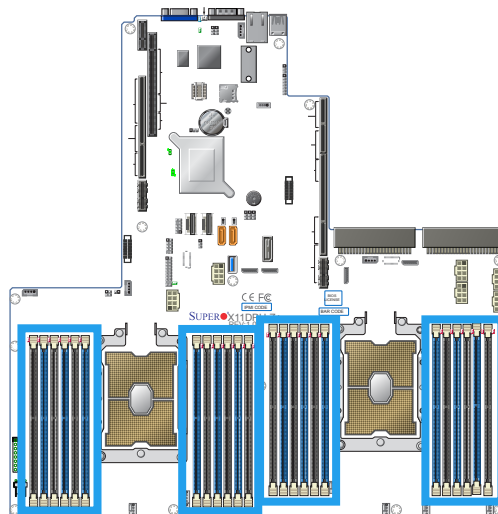
DIMM Removal

Reverse the steps above to remove the DIMM modules from the motherboard.

Press both notches straight down into the memory slot.
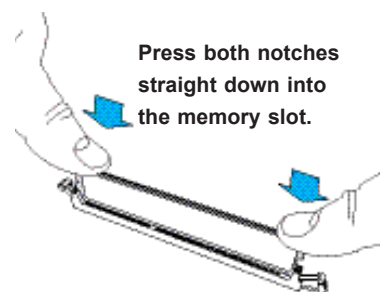
2.5 Rear I/O Ports

See the layout below for the locations and descriptions of the various I/O ports on the rear of the motherboard.
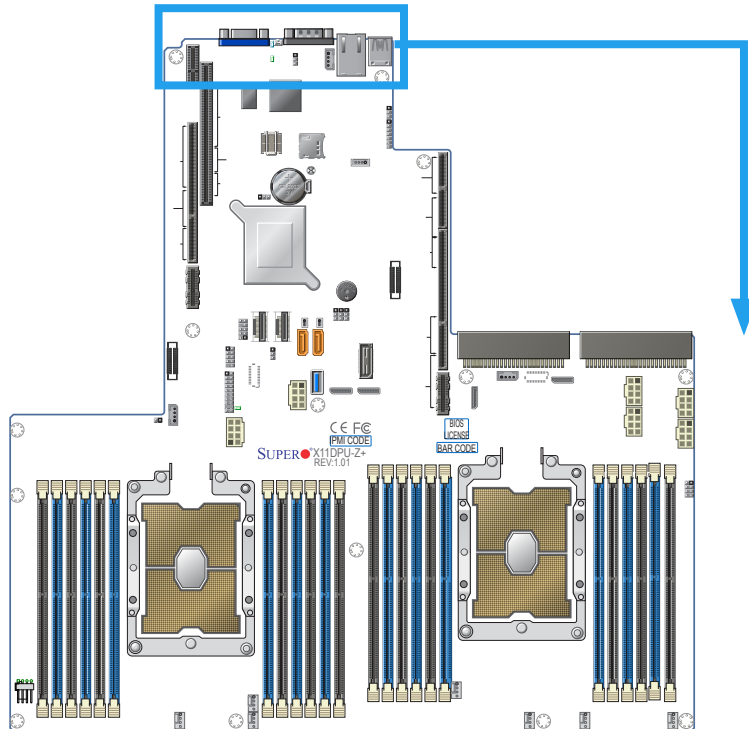
Back panel I/O Port Locations and Definitions
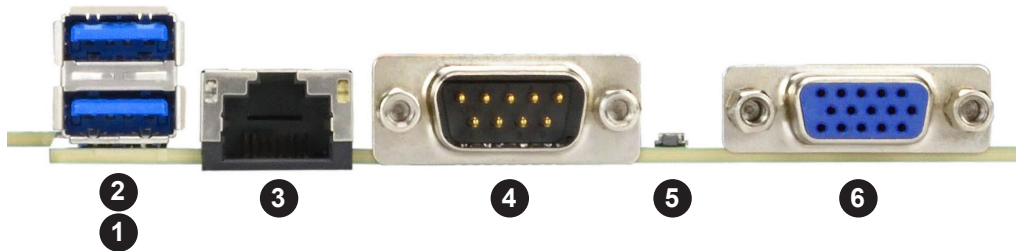
No.	Description	No.	Description
1.	USB 0 (USB 3.0)	4.	COM1
2.	USB 1 (USB 3.0)	5.	Unit Identifier Switch (UID)
3.	IPMI LAN	6.	VGA

VGA Port

The onboard VGA port is located next to the COM port on the I/O back panel. Use this connection for VGA display.

Serial Port

There is one COM port (COM1) located next to the IPMI_LAN port on the I/O back panel. The COM port provides serial communication support.

1. VGA Port

2. COM1
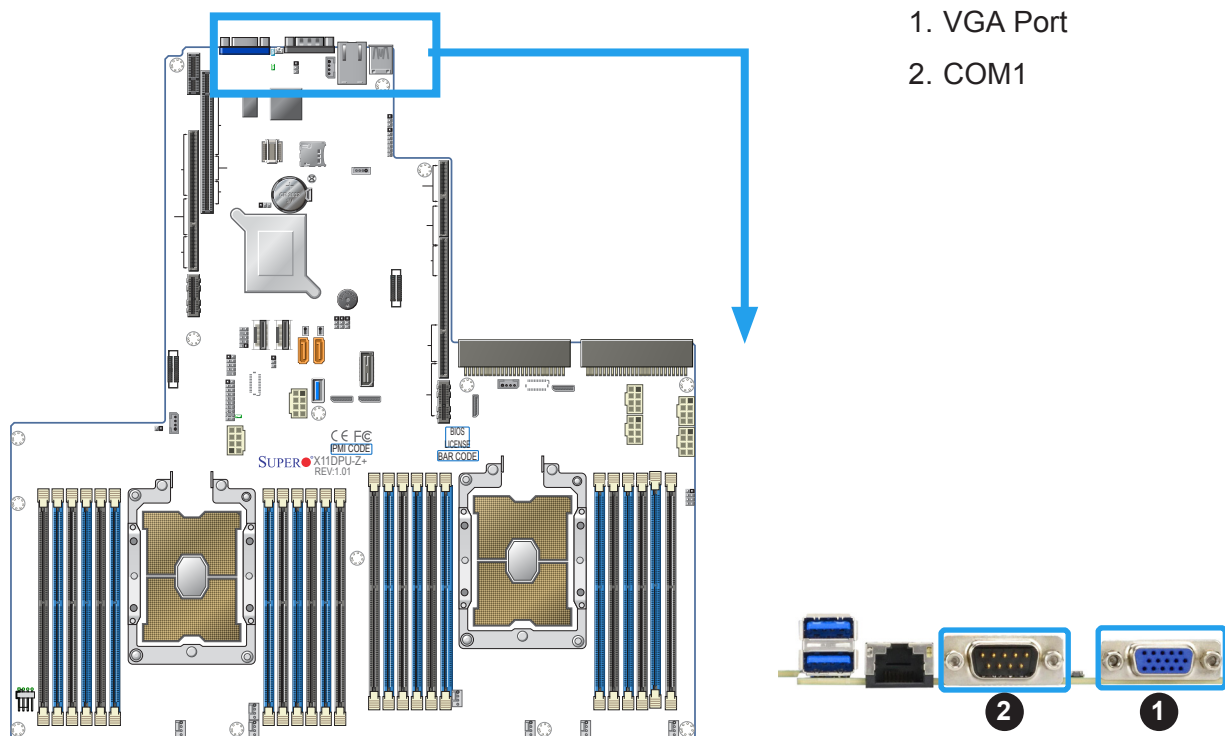
Universal Serial Bus (USB) Ports

There are two USB 3.0 ports (USB0/1) on the I/O back panel. A USB header, located next to the front control panel (JF1), provides two USB 3.0 connections (USB3/4) for front access. USB2, a Type A USB header, also provides front USB 3.0 support. The onboard headers can be used for front side USB access with appropriate cables (not included).

Back Panel USB 0/1 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	VBUS	B1	Power
A2	D-	B2	USB_N
A3	D+	B3	USB_P
A4	GND	B4	GND
A5	Stda_SSRX-	B5	USB3_RN
A6	Stda_SSRX+	B6	USB3_RP
A7	GND	B7	GND
A8	Stda_SSTX-	B8	USB3_TN
A9	Stda_SSTX+	B9	USB3_TP

Front Panel USB 3/4 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	19	Power
2	Stda_SSRX-	18	USB3_RN
3	Stda_SSRX+	17	USB3_RP
4	GND	16	GND
5	Stda_SSTX-	15	USB3_TN
6	Stda_SSTX+	14	USB3_TP
7	GND	13	GND
8	D-	12	USB_N
9	D+	11	USB_P
10		x	

Type A USB 2 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	5	SSRX-
2	USB_N	6	SSRX+
3	USB_P	7	GND
4	Ground	8	SSTX-
		9	SSTX+
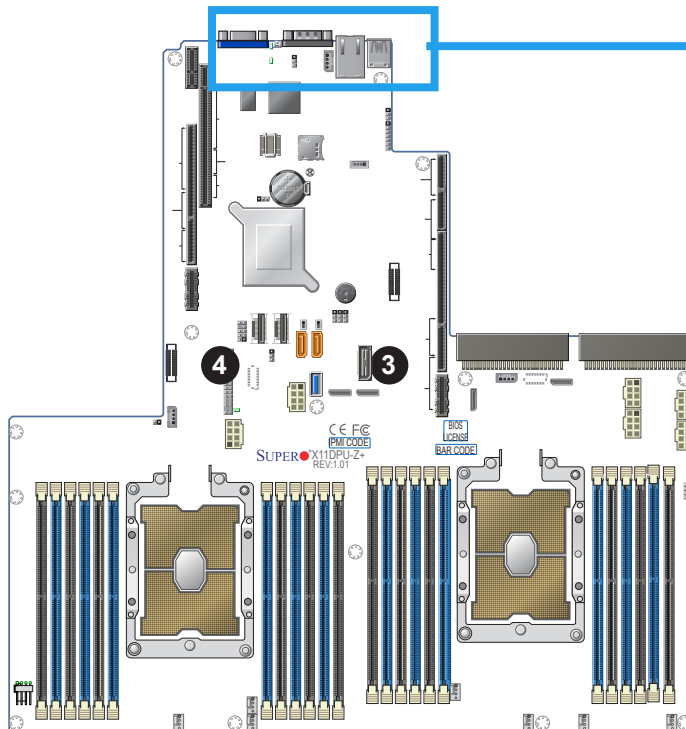
1. USB0 (3.0)
2. USB1 (3.0)
3. USB2: Type A (3.0)
4. USB3/4 (3.0)

Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and a rear UID LED (LED1) are located on the I/O back panel. A front UID switch is located on pins 7 & 8 of the front panel control (JF1). When you press the front or the rear UID switch, both front and rear UID LEDs will be turned on. Press the UID switch again to turn off the LED indicators. The UID indicators provide easy identification of a system that may be in need of service. (**Note:** UID can also be triggered via IPMI on the motherboard. For more information, please refer to the IPMI User's Guide posted on our website at http://www.supermicro.com.)

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

UID LED Pin Definitions	
Color	Status
Blue: On	Unit Identified

PWR	Power Button	○ ○	Ground	
Reset	Reset Button	○ ○	Ground	
	3.3V	○ ○	Power Fail LED	
3	UID LED	○ ○	OH/Fan Fail LED	
	3.3V Stby	○ ○	NIC2 Active LED	
	3.3V Stby	○ ○	NIC1 Active LED	
	3.3V Stby	○ ○	HDD LED	
	3.3V	○ ○	PWR LED	
	X	○ ○	X	
	NMI	○ ○	Ground	
		19 20		
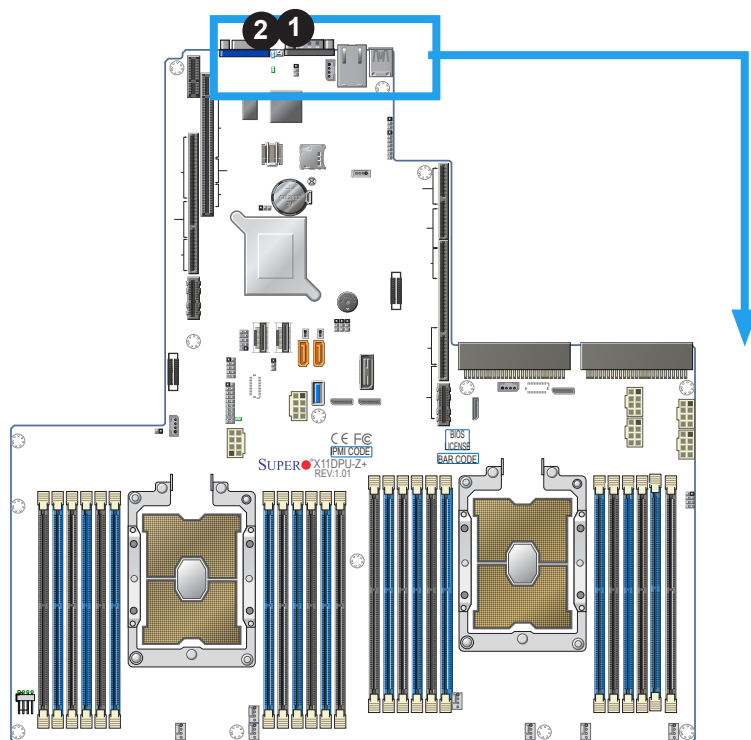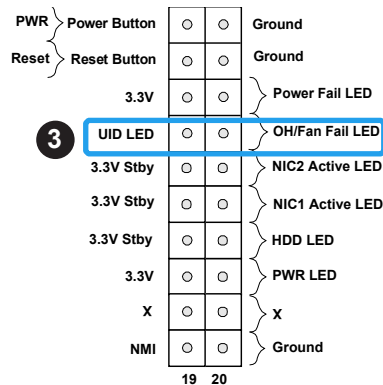
1. UID Indicator

2. Rear UID LED (next to UID Switch)

3. Front UID LED (on JF1)

4. IPMI LAN

2.6 Front Control Panel

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 Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.
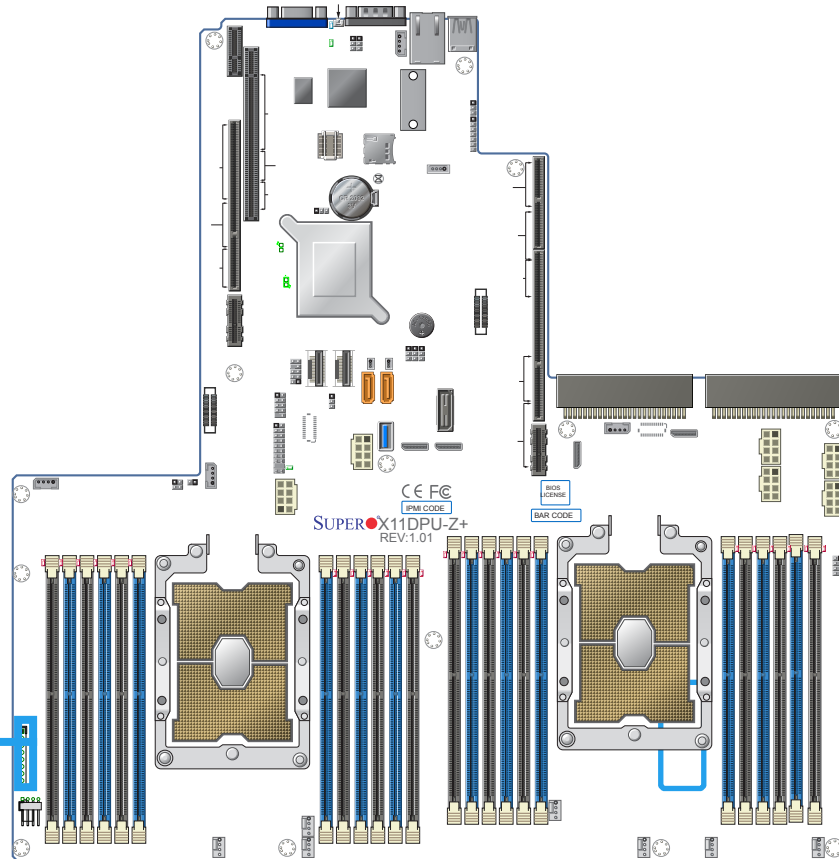
Figure 2-3. JF1 Header Pins

	1	2	
PWR > Power Button	○	○	Ground
Reset > Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID LED	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
3.3V Stby	○	○	HDD LED
3.3V	○	○	PWR LED
X	○	○	X
NMI	○	○	Ground
	19	20	

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)	
Pins	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)	
Pins	Definition
3	Reset
4	Ground

		1	2		1. PWR Button
1 PWR	Power Button	○	○	Ground	2. Reset Button
2 Reset	Reset Button	○	○	Ground	
	3.3V	○	○	Power Fail LED	
	UID LED	○	○	OH/Fan Fail LED	
	3.3V Stby	○	○	NIC2 Active LED	
	3.3V Stby	○	○	NIC1 Active LED	
	3.3V Stby	○	○	HDD LED	
	3.3V	○	○	PWR LED	
	X	○	○	X	
	NMI	○	○	Ground	
		19	20		
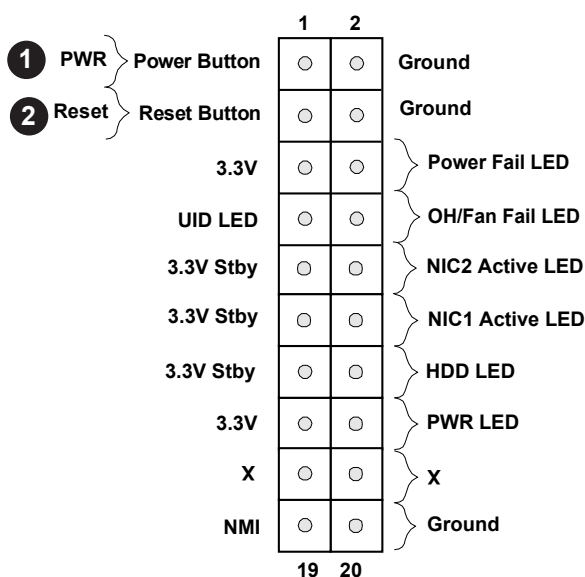
Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table below for pin definitions.

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

Overheat/Fan Fail and UID LED

Connect an LED cable to pins 7 and 8 of the Front Control Panel to use the UID/Overheat/ Fan Fail LED. UID LED indicates a unit that might need service is identified; while the OH/ FanFail LE provides warnings when an overheating or fan failure occurs. Refer to the tables below for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Blue LED (UID)
8	OH/Fan Fail LED

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail
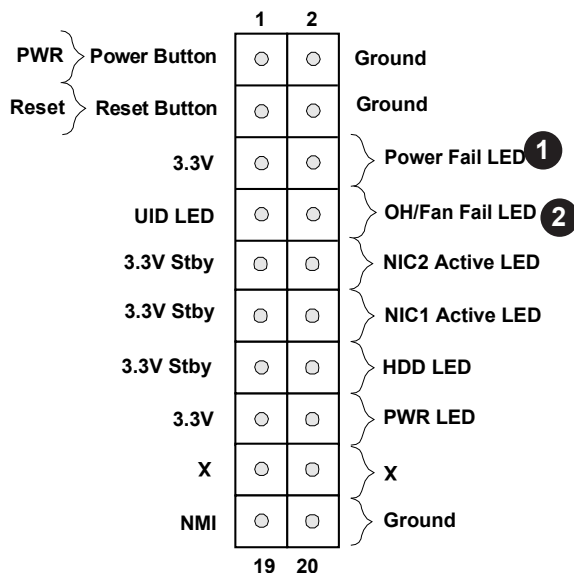
1. Front UID LED

2. OH/Fan Fail LED

	1	2	
PWR ⟩ Power Button	○	○	Ground
Reset ⟩ Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED ❶
UID LED	○	○	OH/Fan Fail LED ❷
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
3.3V Stby	○	○	HDD LED
3.3V	○	○	PWR LED
X	○	○	X
NMI	○	○	Ground
	19	20	

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	NIC 2 Activity LED
11	NIC 1 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 Stdby
14	HDD Active

	1	2	
PWR — Power Button	○	○	Ground
Reset — Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID LED	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED ❶
3.3V Stby	○	○	NIC1 Active LED ❷
3.3V Stby	○	○	HDD LED ❸
3.3V	○	○	PWR LED
X	○	○	X
NMI	○	○	Ground
	19	20	

1. NIC2 LED
2. NIC1 LED
3. HDD LED
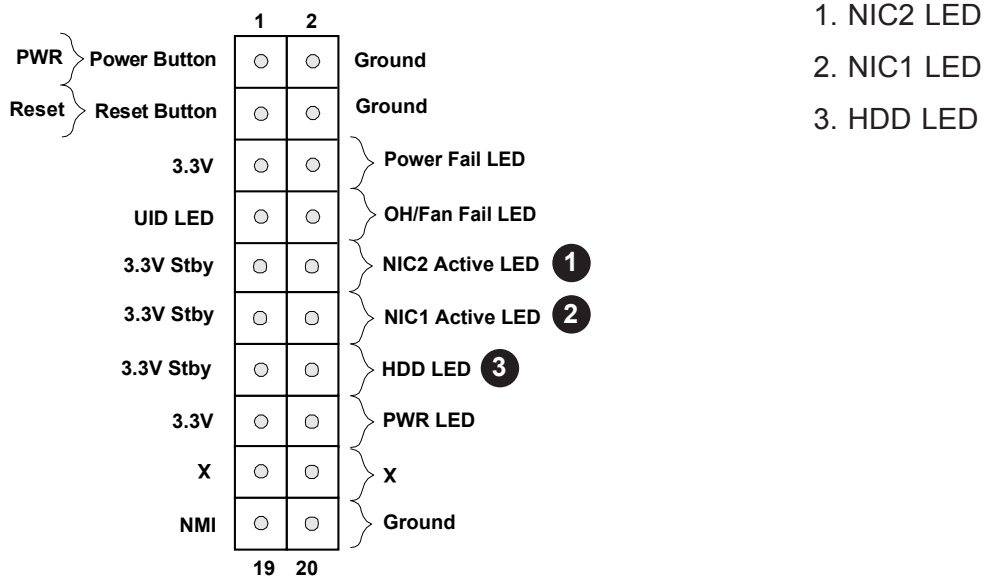
Power LED

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
16	PWR LED

NMI Button

The non-maskable interrupt (NMI) button header is located on pins 19 and 20 of JF1. Refer to the table below for pin definitions.

NMI Button Pin Definitions (JF1)	
Pins	**Definition**
19	Control
20	Ground

	1	2	
PWR > Power Button	○	○	Ground
Reset > Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID LED	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
3.3V Stby	○	○	HDD LED
3.3V	○	○	PWR LED ❶
X	○	○	X
❷ NMI	○	○	Ground
	19	20	
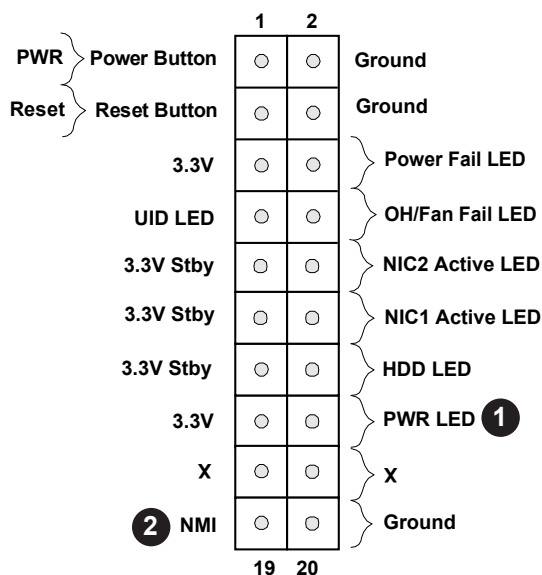
1. PWR LED

2. NMI

2.7 Connectors

Power Connector

SMCI-Proprietary Power Connectors

Two SMCI-proprietary Power Supply Unit connectors, located at PSU1/PSU2, provide main power to your system. Please note that these power connectors are reserved for Supermicro system use only.

GPU Power Connectors

JGPW2/JGPW4 are 8-pin power connectors used for onboard GPU (Graphics Processing Unit) and video devices. Connect appropriate power cables here to provide power to your GPU/VGA devices
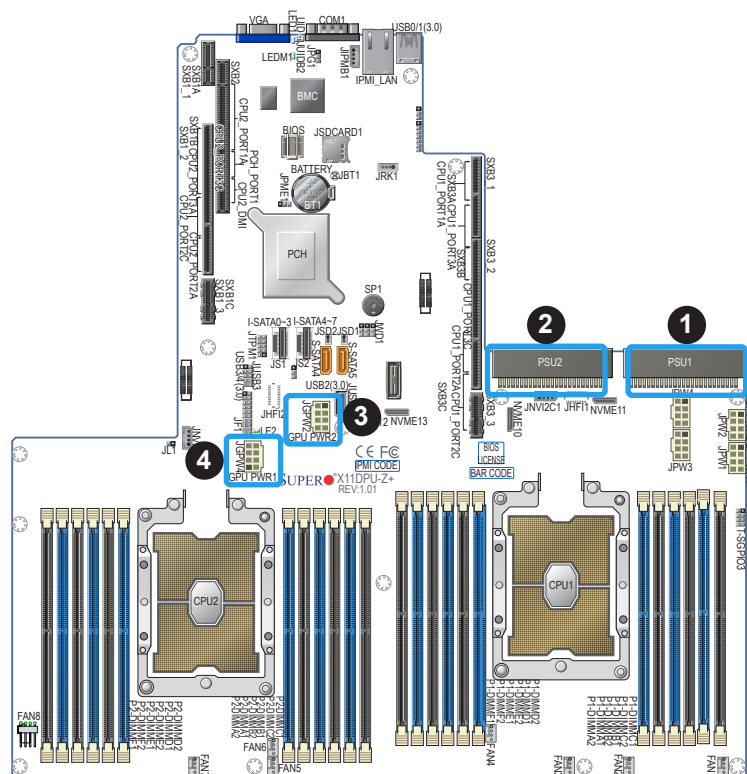
1. PSU1
2. PSU2
3. JGPW2
4. JGPW4

12V 8-pin Power Connectors

Four 12V 8-pin power connectors (JPW1/JPW2 and JPW3/JPW4) are located on the motherboard. JPW1 and JPW2 are used for backplane devices. Refer to the table below for pin definitions.

12V 8-pin Power Pin Definitions	
Pin#	Definition
1 - 4	Ground
5 - 8	+12V
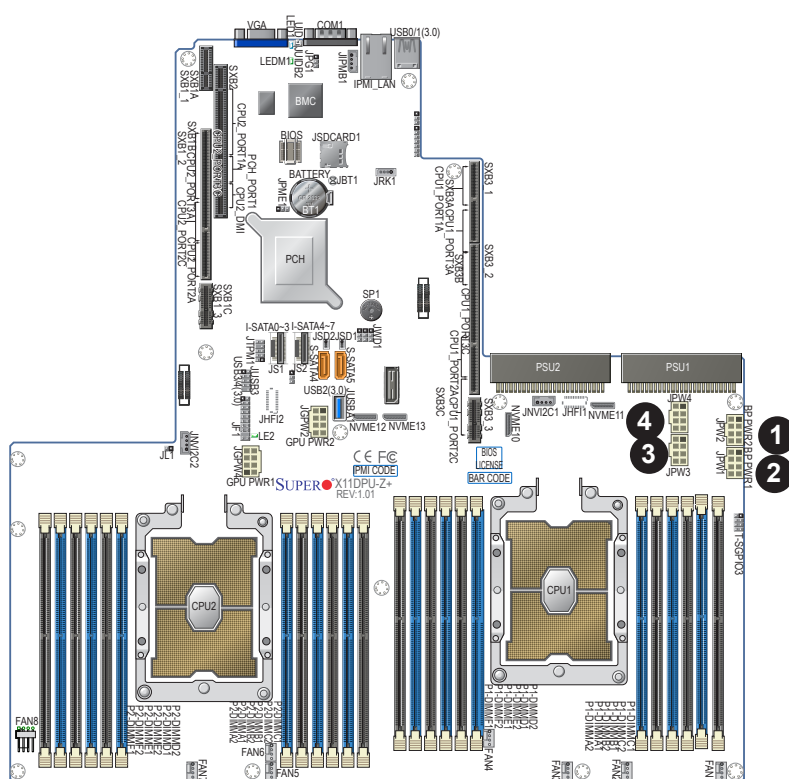
1. JPW1
2. JPW2
3. JPW3
4. JPW4

Headers

Onboard Fan Header

This motherboard has eight system fan headers (FAN1~7 & FAN8). All these 4-pin fan headers are backward-compatible with traditional 3-pin fans. However, onboard fan speed control is available only when all 4-pin fans are used on the motherboard. Fan speed control is supported by Thermal Management via IPMI 2.0 interface. See the table below for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control
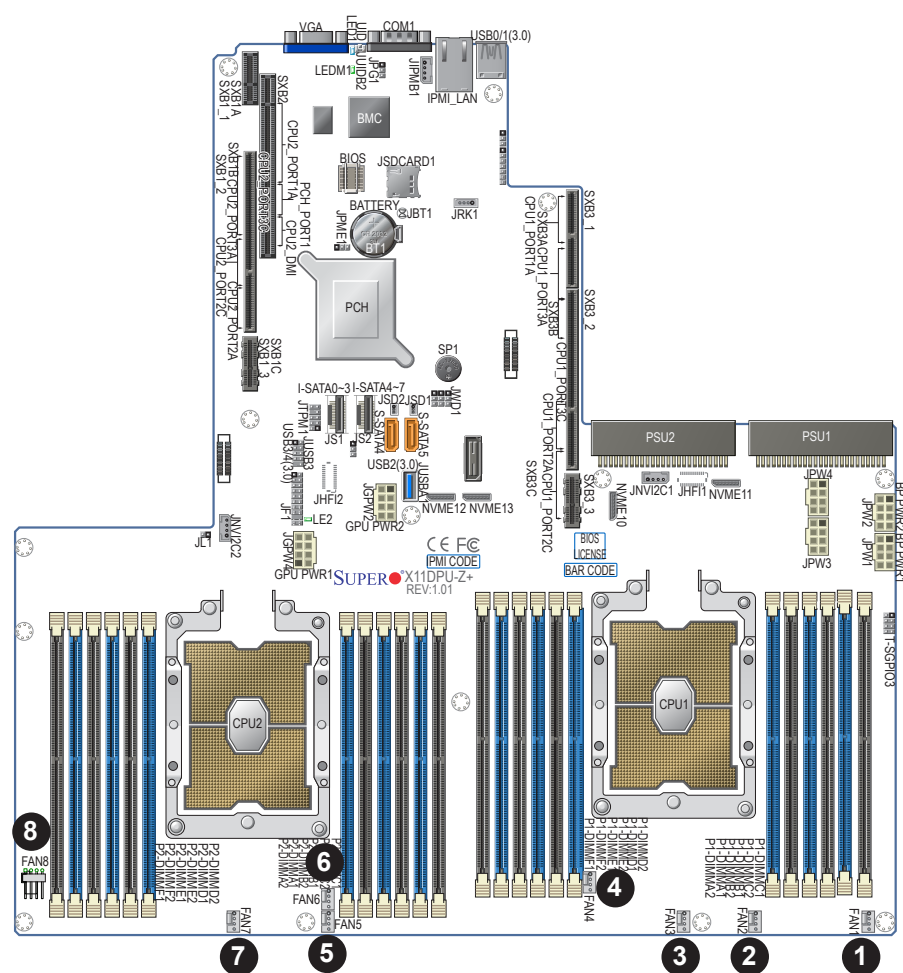
1. FAN1
2. FAN2
3. FAN3
4. FAN4
5. FAN5
6. FAN6
7. FAN7
8. FAN8 (Vertical)

Host Fabric Interface (HFI) Carrier Card Sideband Headers (for the F Model CPU Only)

Two Host Fabric Interface (HFI) carrier card headers are located at JHFI1/JHFI2 on the motherboard. These JHFI1/JHFI2 headers are used when F model processors are installed on the motherboard. Please note that JHFI1 is used for the F model processor installed in CPU Socket#1, and JHFI2, used for the processors in CPU Socket#2. When only one processor is used, please install it on CPU Socket#1 first. Then, use an HFI sideband cable to connect the carrier card to the JHFI header, and use an appropriate IFP (Internal-Faceplate-to-Processor) cable (optional) to connect the carrier card to the F model processor in CPU Socket #1 for system performance enhancement. Please follow the same steps above to enable Host Fabric Interface support for CPU2. See the table on the next page for JHFI1/JHFI2 pin-out definitions, and also refer to Page 34 for the installation instructions.

Notes: For the HFI carrier card to function properly, please purchase the appropriate IFP cable(s) from Supermicro. Please refer to Supermicro's website at www.supermicro.com for the part number of the IFP cable specified for your system.

Notes: 1. IFP Cable (*See Note above) 2. Please repeat Step 1 to Step 6 to enable HFI support for CPU2.

IFP Cable (Optional)

Install an F model CPU on Socket#1 (and another F model CPU on Socket#2 if needed. Then repeat Step 1 to Step 6 for HFI support for CPU2.)

⑥ 6. Connect the other end of the IFP cable to the F model CPU.

① F Model Processor

⑤ 5. Connect one end of the IFP cable to the connector (B) of the HFI card.

3. Connect the HFI connector on the HFI cable to the onboard JHFI1 header.

A

HFI Carrier Card

B

JHFI1 Header (for CPU1)

② 2. Install an HFI card to a PCI-E slot

4. Connect another end of the HFI cable to the connector (A) of the HFI card.

④

JHFI2 Header (for CPU2)

③

HFI (Host Fabric Interface) Sideband Cable

CPU Socket #2   CPU Socket #1

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HFI Header Pin Definitions			
Pin#	Description	Pin#	Description
1	Ground	2	SMB-HFI-0-SCL
3	HFI0-MODPRST-N	4	SMB-HFI-0-SDA
5	LED-HFI0-N	6	HFI0-RESET-N
7	Ground	8	HFI0-INT-N
9	Ground	10	SMB-HFI-1-SCL
11	HFI1-MODPRST-N	12	SMB-HFI-1-SDA
13	LED-HFI1-N	14	HFI1-RESET-N
15	Ground	16	HFI1-INT-N
17	reserved	18	P3V3
19	P2V5-PWRGD	20	P3V3
21	P2V5	22	PCIe-SMBCLK
23	Ground	24	PCIe-SMBDAT
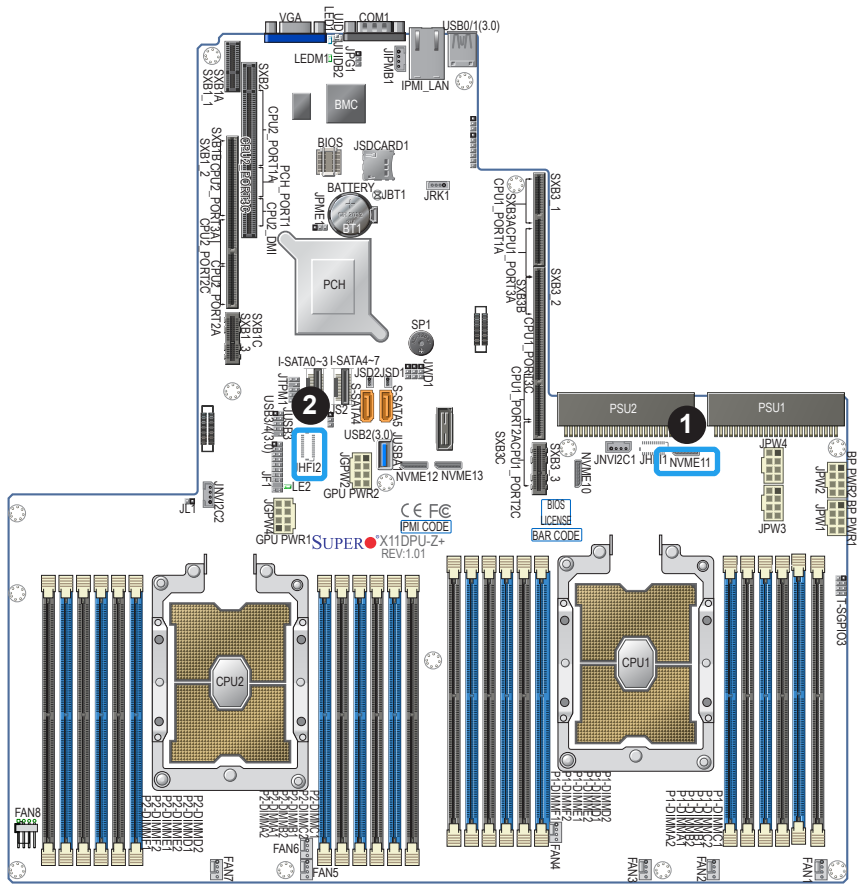
1. JHFI1 (for CPU1)
2. JHFI2 (for CPU2)

TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from a third-party vendor. A TPM/Port 80 connector is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the layout below for the location of the TPM header.

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK	14	SMB_DAT
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)
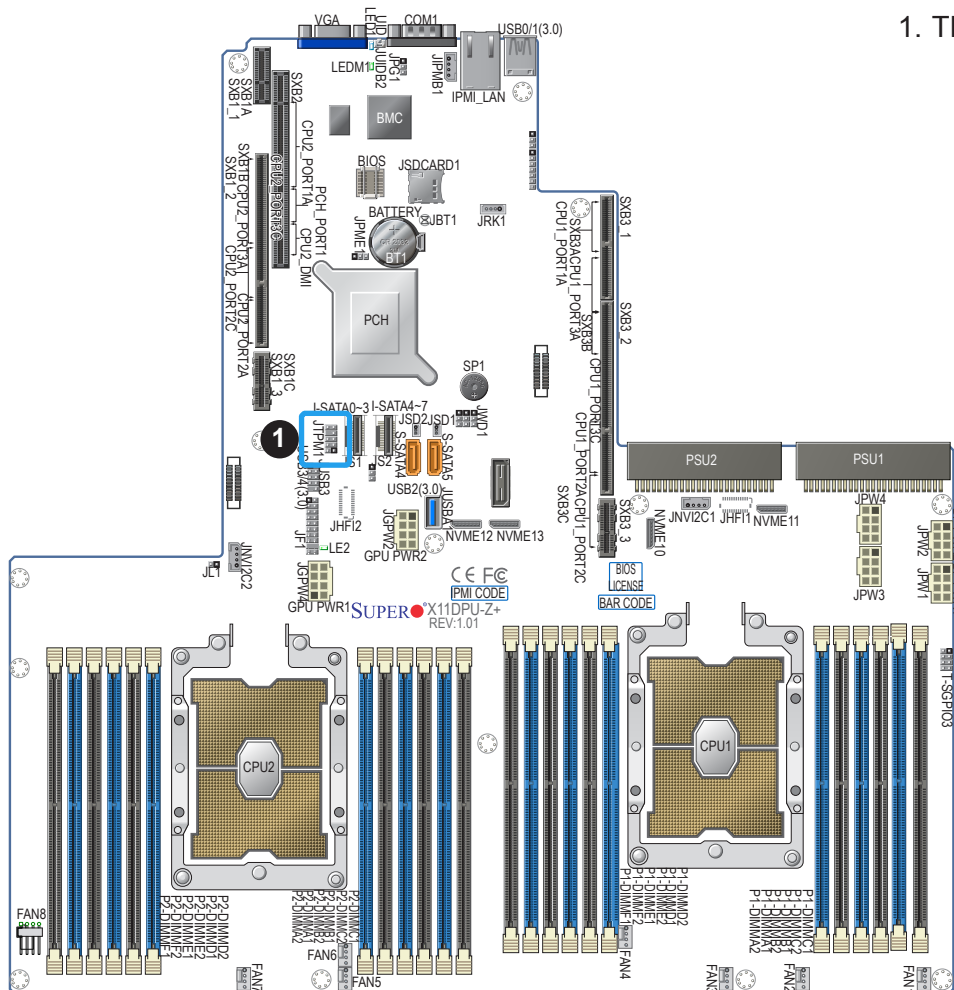
1. TPM/Port 80 Header

RAID Key Header

A RAID Key header is located at JRK1 on the motherboard. The RAID key is used to support NVMe Solid State Device (SSD).

Intel RAID Key Pin Definitions	
Pin#	Definition
1	Ground
2	3.3V Standby
3	Ground
4	PCH RAID Key

SGPIO Header

The T-SGPIO3 (Serial-Link General Purpose Input/Output) header is used for the SATA devices to communicate with the enclosure management chip on the backplane.

SGPIO Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection
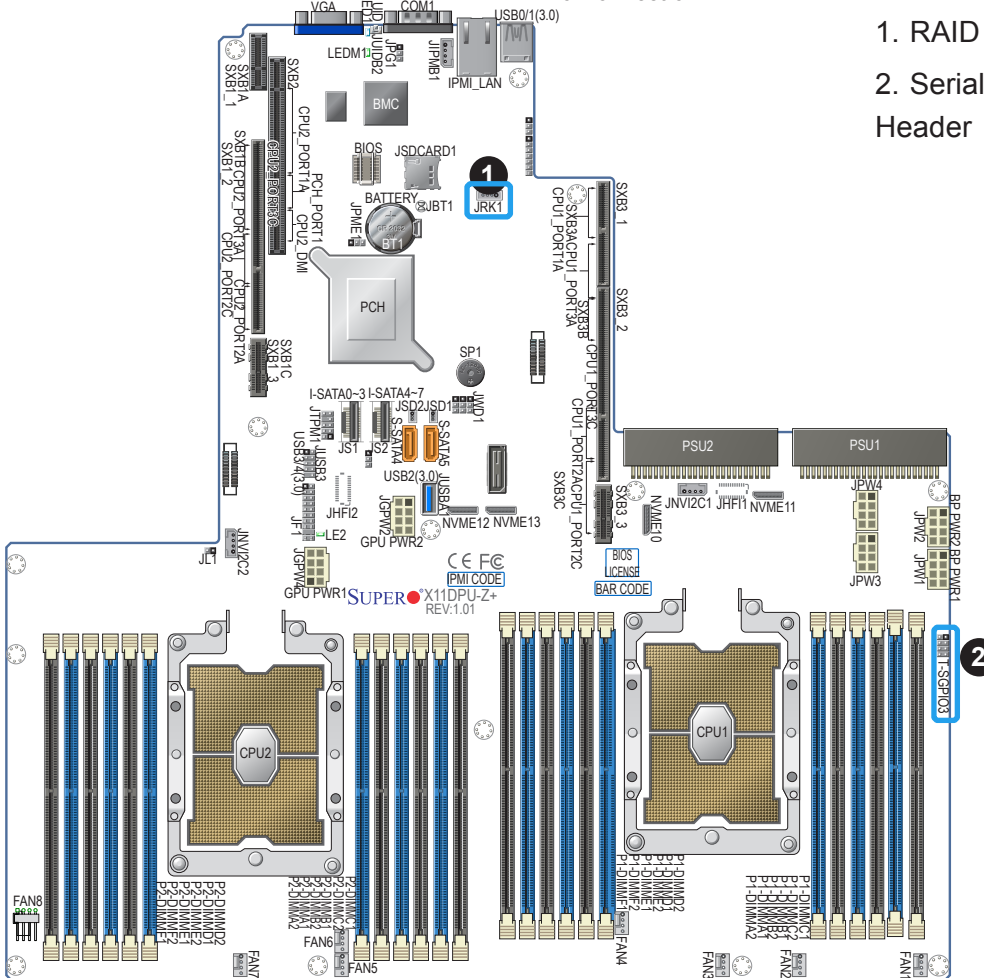
1. RAID Key

2. Serial General Purpose Header

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CPLD Header

The Complex Programmable Logical Device (CPLD) header is located on JP2 on the motherboard. Connect an appropriate cable to use this feature.

BMC SMB (I²C) Header

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

External I²C Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection
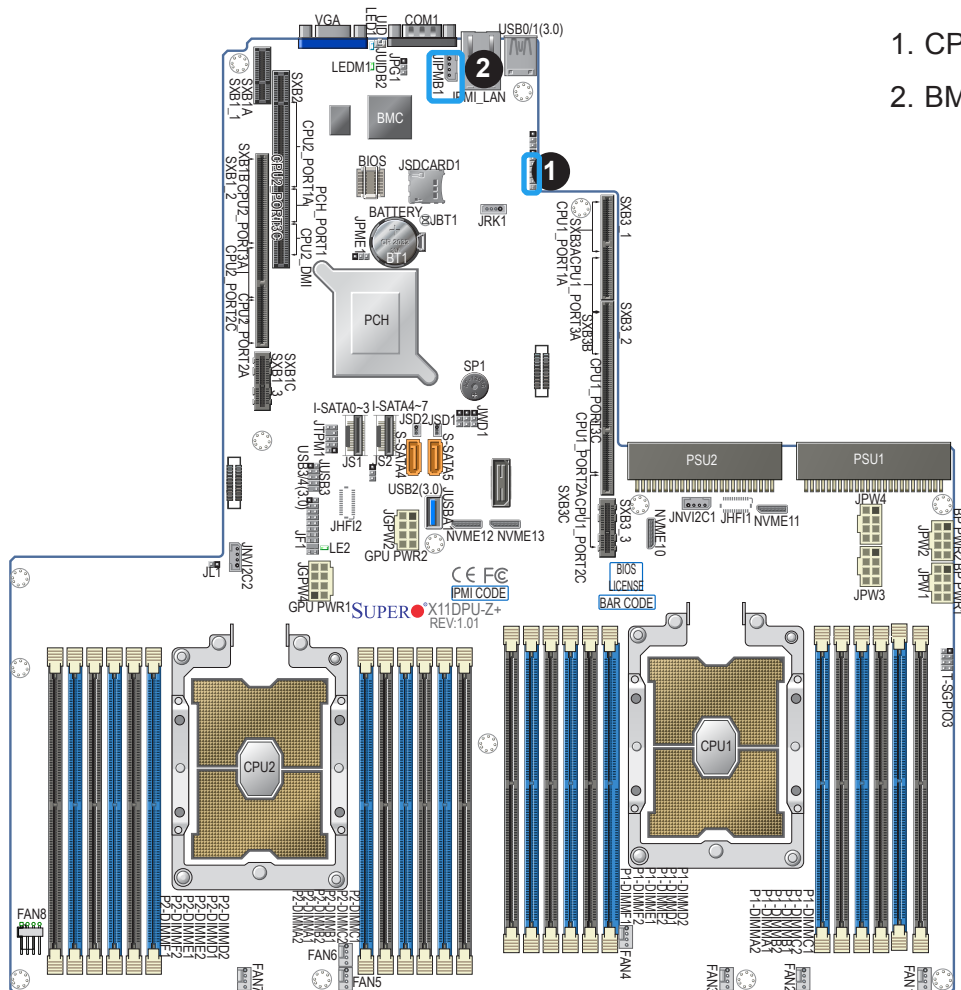
1. CPLD Header
2. BMC SMBus Header

Internl Speaker/Buzzer Header

An internal speaker/buzzer header is located on SP1. Close SP1 to use the onboard speaker to provide audio warnings when a system error or memory error occurs. See the layout below for location.

Chassis Intrusion

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

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

1. Internal Speaker Header
2. Chassis Intrusion

NVMe SMBus Headers

NVMe SMBus (I^{2}C) headers (JNVI^{2}C1/2), used for PCI-E SMBus clock and data connections, provide hot-plug support via a dedicated SMBus interface. This feature is only available for a Supermicro complete system with an SMCI-proprietary NVMe add-on card and cable installed. See the table below for pin definitions.

NVMe SMBus Header Pin Definitions	
Pin#	**Definition**
1	Data
2	Ground
3	Clock
4	VCCIO

NVMe Connectors

Four NVMe connectors (NVME10/NVME11 & NVME12/NVME13) are used for high-speed PCI-E storage devices. NVME10/NVME11 are supported by CPU1, and NVME12/NVME13 are for CPU2.
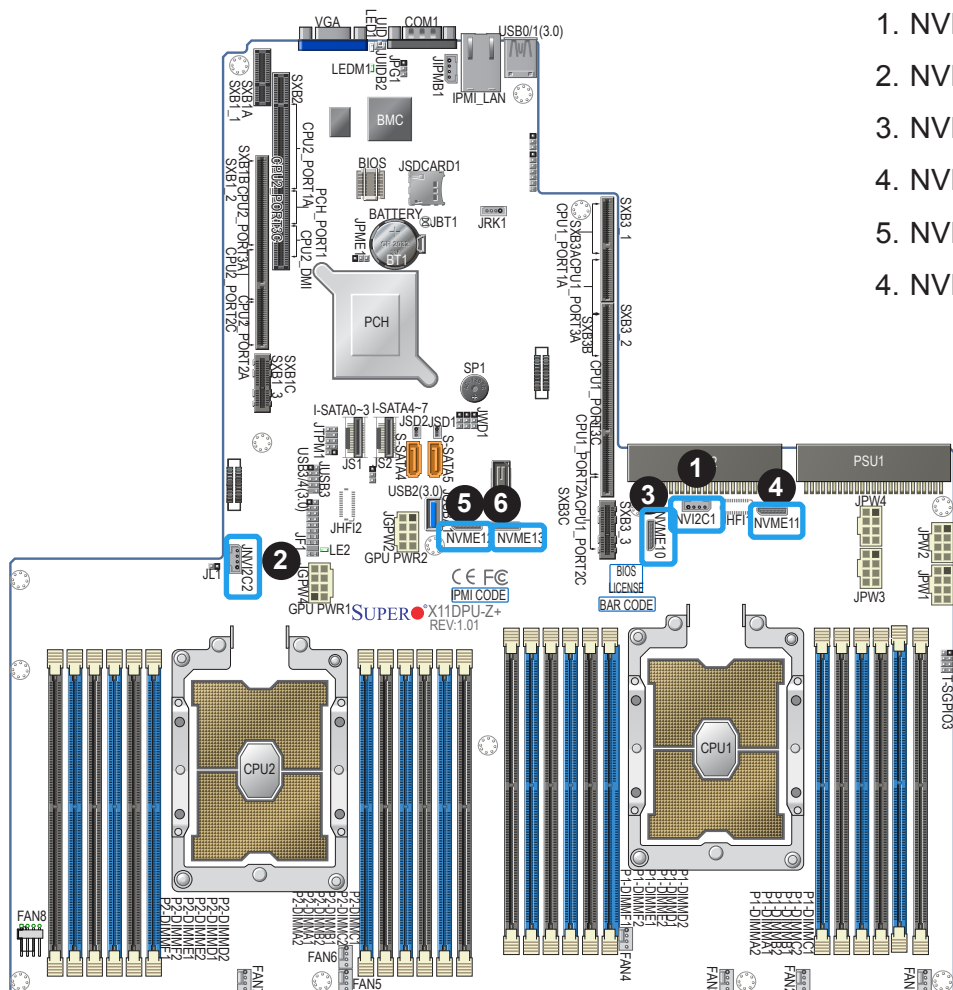
1. NVMe I^{2}C Header 1
2. NVMe I^{2}C Header 2
3. NVMe Connector 10
4. NVMe Connector 11
5. NVMe Connector 12
4. NVMe Connector 13

SATA DOM Power Connector

The SATA Disk-On-Module (DOM) power connectors at JSD1 and JSD2 provide 5V power to solid-state storage devices connected to the SATA ports. See the table below for pin definitions.

DOM PWR Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground
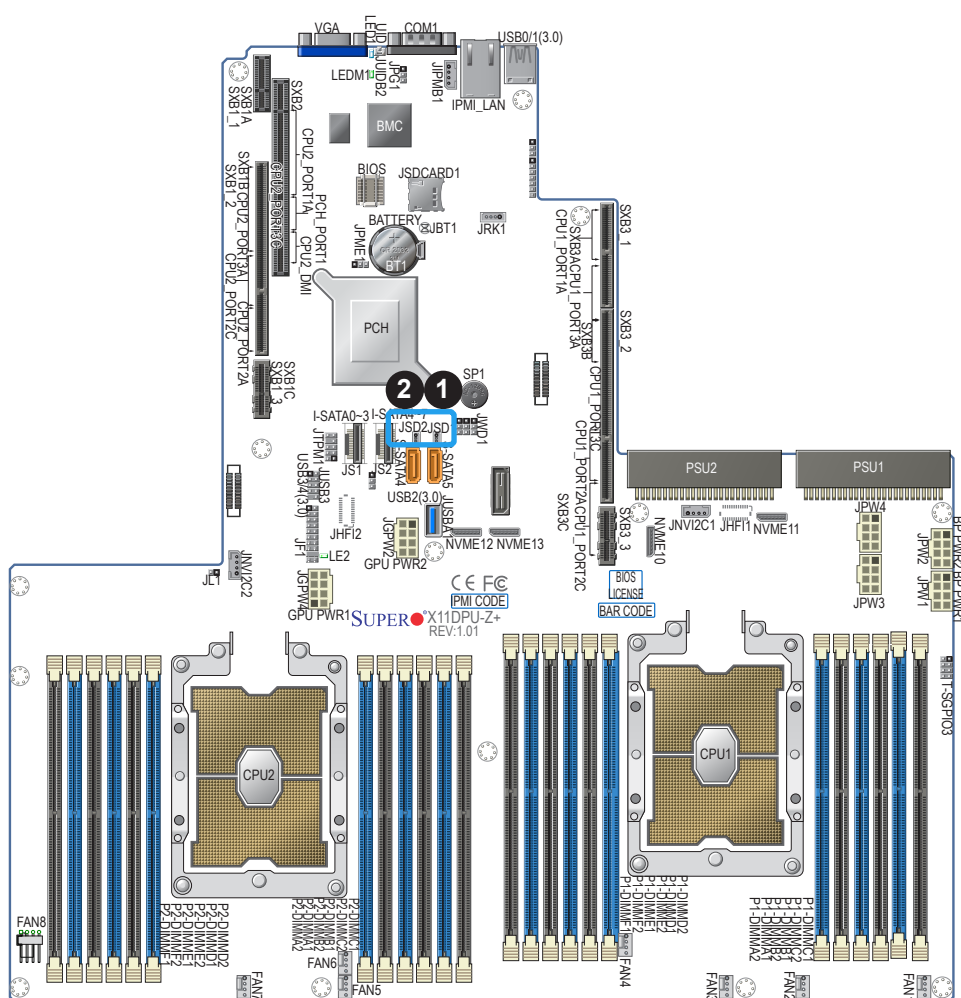
1. JSD1
2. JSD2

I-SATA 3.0 and S-SATA 3.0 Ports

The X11DPU-Z+ has eight I-SATA 3.0 ports (I-SATA0-3, I-SATA4-7) and two S-SATA (S-SATA4, S-SATA5) on the motherboard. These SATA ports are supported by the Intel PCH (C621). S-SATA4/S-SATA5 support Supermicro SuperDOMs (Disk_on_Modules), which are yellow SATA DOM connectors with power pins built in, and do not require external power cables. Supermicro SuperDOMs are backward-compatible with regular SATA HDDs or SATA DOMs that need external power cables. All these SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

1. I-SATA0-3
2. I-SATA4-7
3. S-SATA4
4. S-SATA5
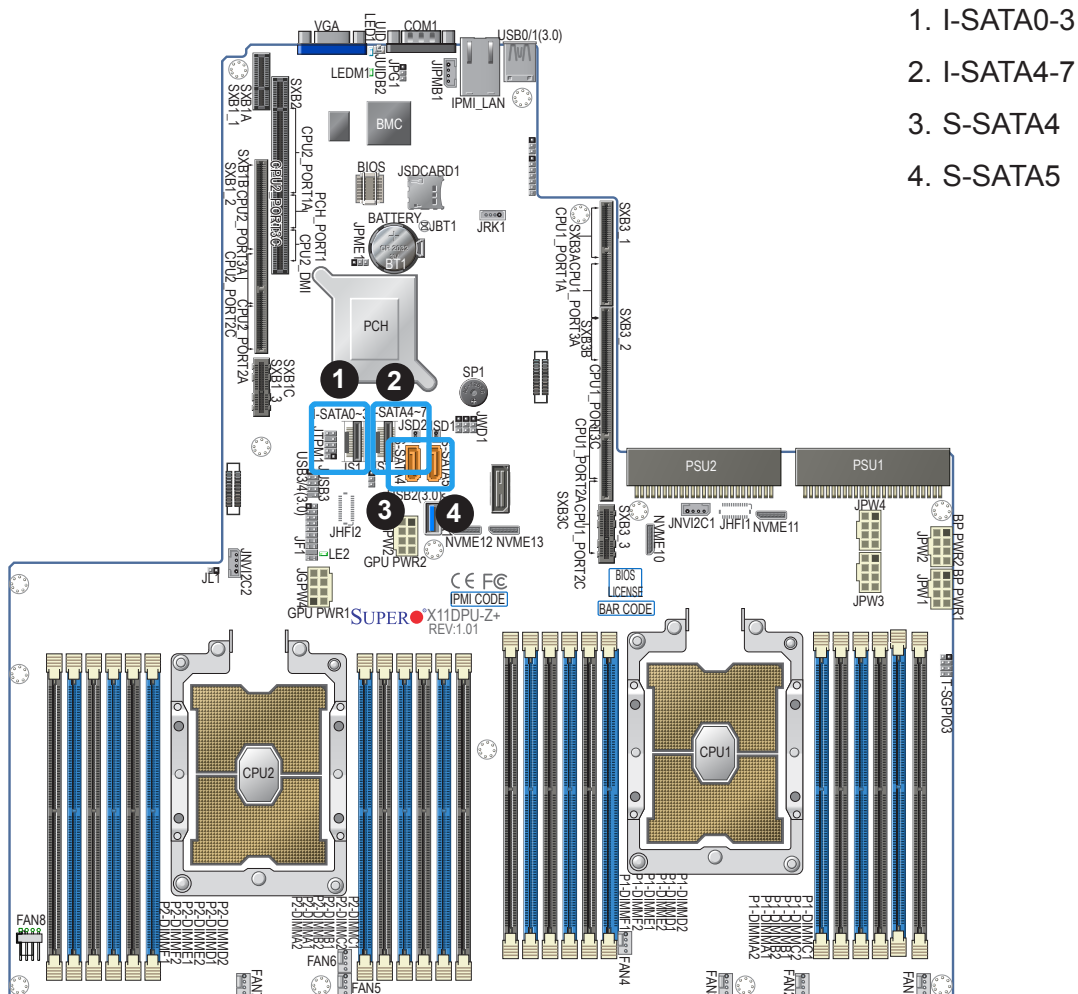
2.7 Jumper Settings

How Jumpers Work

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

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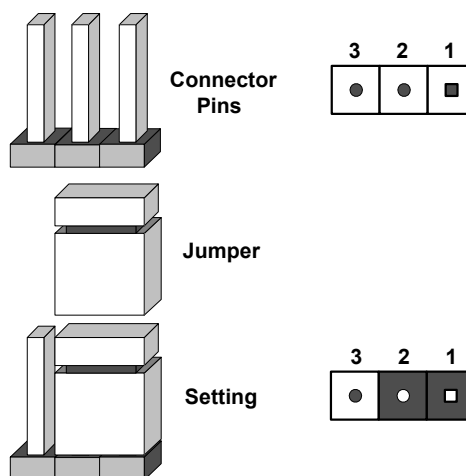
VGA Port Enable/Disable

Jumper JPG1 is used to enable or disable the VGA port on the I/O back panel. Close pin 1 and pin 2 for VGA support. The default setting is Enabled.

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled
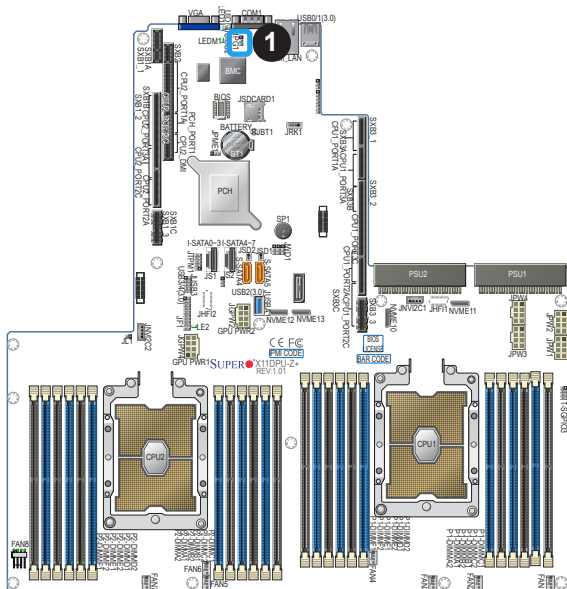
1. VGA Enable/Disable

CMOS Clear

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

To Clear CMOS

1. First power down the system and unplug the power cord(s).

2. Remove the cover of the chassis to access the motherboard.

3. Remove the onboard battery from the motherboard.

4. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.

5. Remove the screwdriver (or shorting device).

6. Replace the cover, reconnect the power cord(s), and power on the system.

Note: Clearing CMOS will also clear all passwords.

Do not use the PW_ON connector to clear CMOS.

JBT1 contact pads

1. Clear CMOS
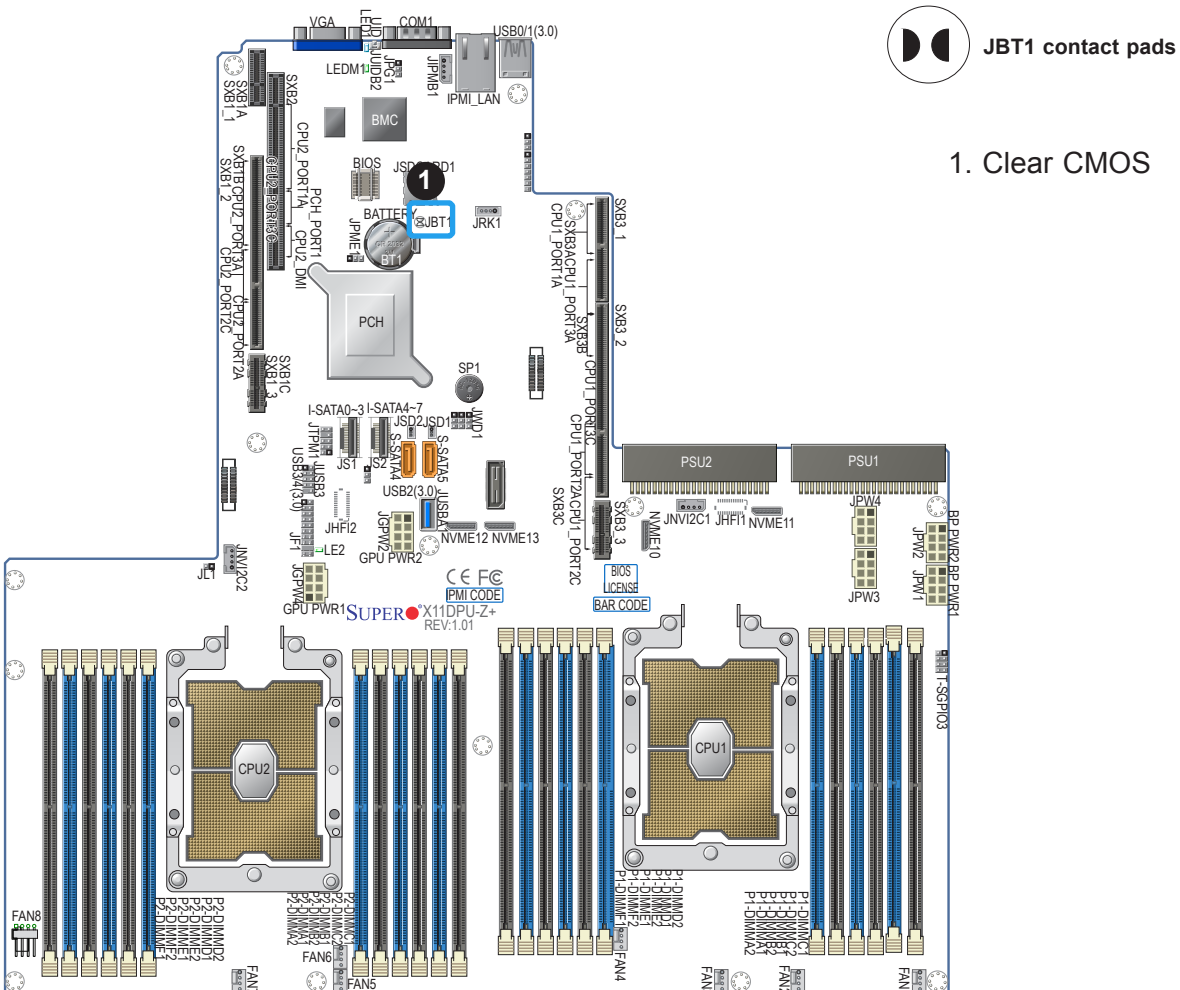
Manufacturing Mode Select

Close JPME1 to bypass SPI flash security and force the system to use the Manufacturing Mode, which will allow you to flash the system firmware from a host server to modify system settings. See the table below for jumper settings.

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

1. Manufacturing Mode Select

Watch Dog Timer

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

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

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

1. Watch Dog

2.8 LED Indicators

IPMI-Dedicated LAN LEDs

An IPMI-dedicated LAN is located on the I/O Backplane of the motherboard. The LED indicator on the right indicates activity, while the yellow LED on the left indicates the status of the IPMI LED connection. See the tables below for more information.

IPMI LAN

Link LED   Activity LED
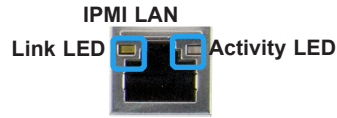
IPMI LAN Link LED (Left)	
LED Color	**Definition**
Link	Solid: Yellow

IPMI LAN Activity LED (Right)		
LED	**Color/State**	**Definition**
Activity (Right)	Green: Blinking	100 Mbps
Activity (Right)	Amber: Blinking	1G
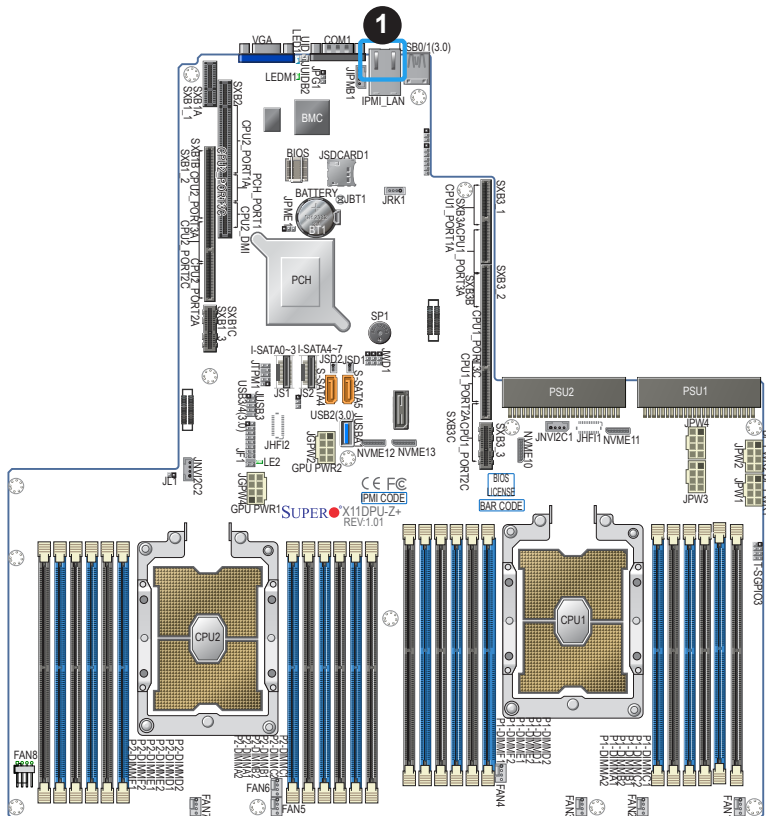
1. IPMI LAN LEDs

BMC Heartbeat LED

LEDM1 is the BMC heartbeat LED. When the LED is blinking green, BMC is functioning normally. See the table below for the LED status.

Onboard Power LED Indicator	
LED Color	**Definition**
Green: Blinking	BMC Normal

Onboard Power LED

The Onboard Power LED is located at LE2 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. Refer to the table below for more information.

Onboard Power LED Indicator	
LED Color	**Definition**
Off	System Off (power cable not connected)
Green	System On
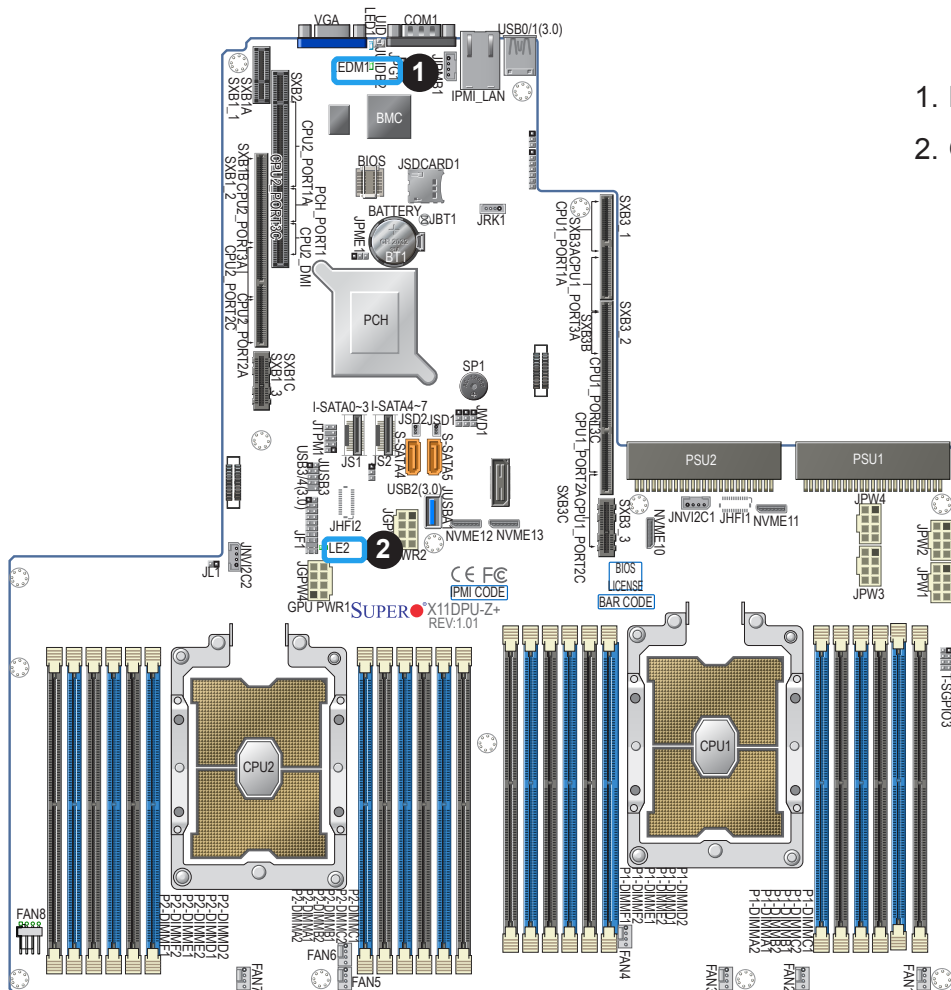
1. BMC Heartbeat LED
2. Onboard Power LED

Unit ID LED

A rear UID LED indicator at LED1 is located next to the UID switch on the motherboard. This UID indicator provides easy identification of a system unit that might be in need of service.

UID LED LED Indicator	
LED Color	**Definition**
Blue: On	Unit Identified

1. UID LED
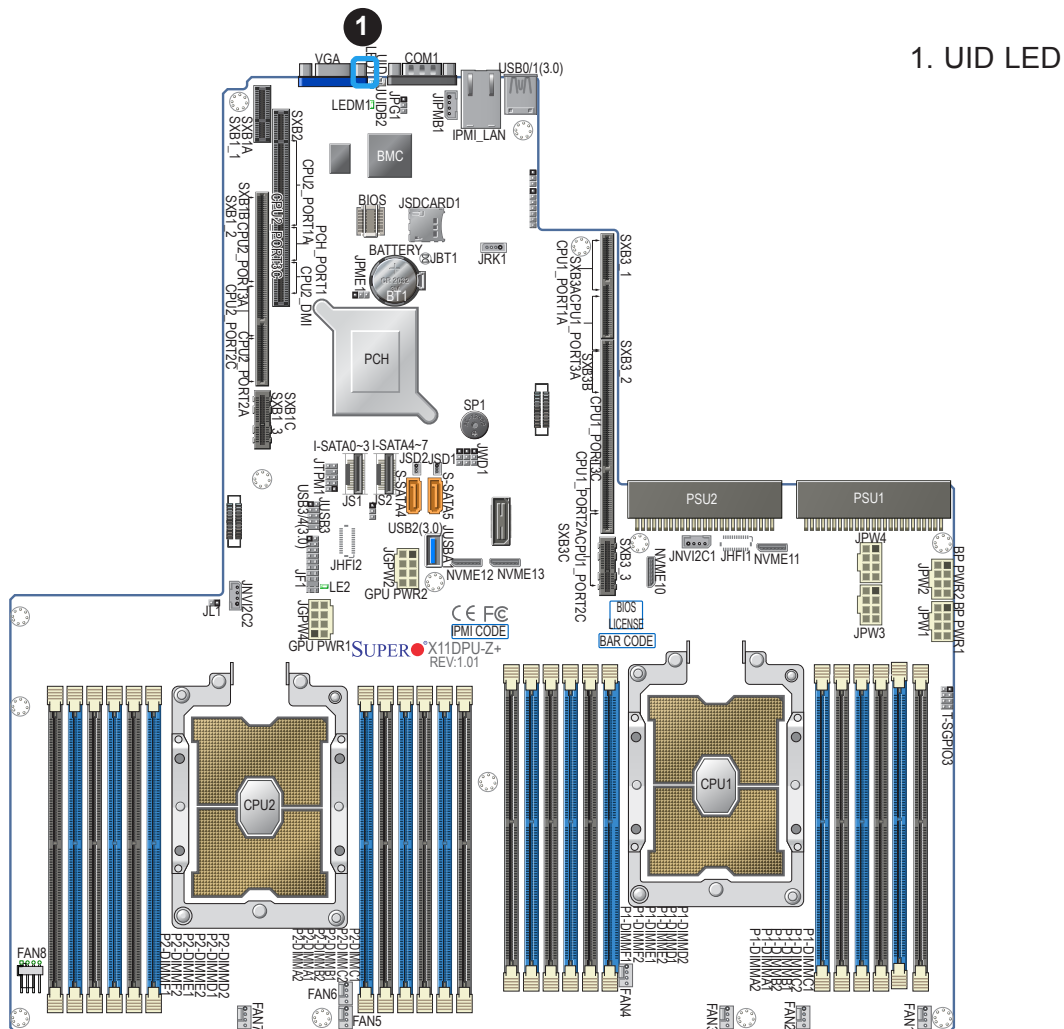
Chapter 3

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. <u>Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components</u>.

Before Power On

1. Check that the power LED on the motherboard is on.

2. Make sure that the power connector is connected to your power supply.

3. Make sure that no short circuits exist between the motherboard and chassis.

4. Disconnect all cables from the motherboard, including those for the keyboard and mouse.

5. Remove all add-on cards.

6. Install a CPU, a heatsink*, and connect the internal speaker and the power LED to the motherboard. Check all jumper settings as well. (Make sure that the heatsink is fully seated.)

7. Use the correct type of onboard CMOS battery as recommended by the manufacturer. To avoid possible explosion, do not install the CMOS battery upside down.

No Power

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

2. Verify that all jumpers are set to their default positions.

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

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

5. The battery on your motherboard 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 the add-on cards and cables.

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

System Boot Failure

If the system does not display POST (Power-On-Self-Test) or does not respond after the power is turned on, check the following:

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

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

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS Clear Jumper (JBT1). Refer to chapter 2.

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

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

Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.

2. Confirm that you are using the correct memory. Also, it is recommended that you use the same memory type and speed for all DIMMs in the system. See Section 2.4 for memory details.

3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.

4. Check the power supply voltage 115V/230V switch.

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 1.6 for details on recommended power supplies.

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

3. 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**: Refer to the product page on our website at http://www.supermicro.com for memory and CPU support and updates.

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.

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 a 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, note that as a motherboard manufacturer, we do not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please review the 'Troubleshooting Procedures' and 'Frequently Asked Questions' (FAQs) sections in this chapter or see the FAQs on our website before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website. **Note:** Not all BIOS can be flashed depending on the modifications to the boot block code.

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

- Motherboard model and PCB revision number

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

- System configuration

An example of a Technical Support form is posted on our website.

Distributors: For immediate assistance, please have your account number ready when contacting our technical support department by e-mail.

3.3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The X11DPU-Z+ motherboard supports up to 3TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM/NV-DIMM DDR4 ECC 2666/2400/2133 Mhz in 24 DIMM slots. See Section 2.4 for details on installing memory.

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. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format FLASH.BAT filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

Question: Why can't I turn off the power using the momentary power on/off switch?

Answer: The instant power off function is controlled in BIOS by the Power Button Mode setting. When the On/Off feature is enabled, the motherboard will have instant off capabilities as long as the BIOS has control of the system. When the Standby or Suspend feature is enabled or when the BIOS is not in control such as during memory count (the first screen that appears when the system is turned on), the momentary on/off switch must be held for more than four seconds to shut down the system. This feature is required to implement the ACPI features on the motherboard.

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. 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.

3. 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 the steps 1 & 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.

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

LITHIUM BATTERY

BATTERY HOLDER

OR

LITHIUM BATTERY

BATTERY HOLDER
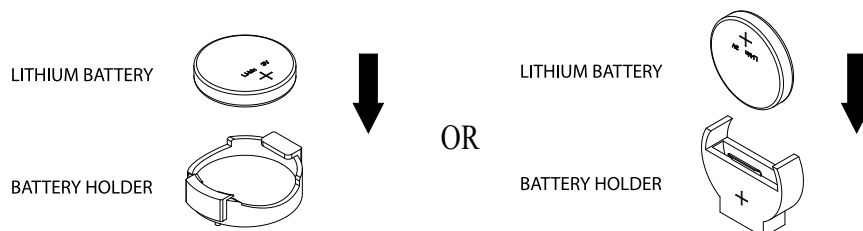
3.5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4

BIOS

4.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the X11DPU-Z+ motherboards. 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, press 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>, <F10>, <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. The following Main menu items will be displayed:

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

                                                          Set the Date. Use Tab to
        System Date                    [Fri 08/18/2017]   switch between Date
        System Time                    [15:38:21]         elements.
                                                          Default Ranges:
        Supermicro X11DPU-Z+                              Year: 2005-2099
        BIOS Version                   1.0                Months: 1 12
        Build Date                     07/25/2017         Days: dependent on month
        CPLD Version                   03.B1.04

        Memory Information
        Total Memory                   16384 MB




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

              Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

System Date/System Time

Use this item 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 Day MM/DD/YYYY format. The time is entered in HH:MM:SS format.

> **Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is 01/01/2014 after RTC reset.

Supermicro X11DPU-Z+

BIOS Version

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

Build Date

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

CPLD Version

This item displays the version of the CPLD (Complex-Programmable Logical Device) used in the system.

Memory Information

Total Memory

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

4.3 Advanced Setup Configurations

Use the arrow keys to select the Advanced submenu and press <Enter> to access the submenu items:

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

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

  ▶ Boot Feature                                    Boot Feature Configuration
  ▶ CPU Configuration                               Page
  ▶ Chipset Configuration
  ▶ Server ME Configuration
  ▶ PCH SATA Configuration
  ▶ PCH sSATA Configuration
  ▶ PCIe/PCI/PnP Configuration
  ▶ Super IO Configuration
  ▶ Serial Port Console Redirection
  ▶ ACPI Settings
  ▶ Trusted Computing
  ▶ iSCSI Configuration
  ▶ Intel(R) Virtual RAID on CPU


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

          Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

▶Boot Feature

Quiet Boot

Use this feature to select the screen between displaying 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 **Enabled** and Disabled.

Note: POST message is always displayed regardless of the item setting.

Option ROM Messages

Use this feature to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. 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 **On** and Off.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

INT19 Trap Response

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

Re-try Boot

When EFI (Expansible Firmware Interface) Boot is selected, the system BIOS will automatically reboot the system from an EFI boot device after an initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after an initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Install Windows 7 USB support

EHCI needs to be supported in order for USB 2.0 to work properly during the installation of Windows 7; however, EHCI support was removed from Intel Skylake Platforms. When enabled, this feature will allow USB keyboard and mouse to work properly during installation of Windows 7. After installation of Windows 7 and all the drivers please **disable** this feature. The options are Disabled and Enabled.

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

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are **Disabled** and Enabled.

Restore on AC Power Loss

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

Power Button Function

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

Throttle on Power Fail

When enabled, this feature decreases system power by throttling CPU frequency when power supply has failed. The options are **Disabled** and Enabled.

▶CPU Configuration

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

▶Processor Configuration

The following CPU information will be 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

- Processor 1 Version

Hyper-Threading (ALL)

Select Enable to use Intel Hyper-Threading Technology to enhance CPU performance. The options are Disable and **Enable**.

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

Select Enable to enable Execute Disable Bit support which will allow 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, damaging the system during a virus attack. The options are Disable and **Enable**. (Refer to Intel and Microsoft websites for more information.)

Intel Virtualization Technology

Select Enable to use Intel Virtualization Technology which will allow the I/O device assignments to be directly reported to the VMM (Virtual Memory Management) through the DMAR ACPI tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings 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 this feature is set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the Level 2 (L2) cache to improve CPU performance. The options are **Enable** and Disable.

Adjacent Cache Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are **Enable** and Disable.

> **Note:** Please power off and reboot the system for the changes you've made to take effect. Please refer to Intel's website for detailed information.

DCU Streamer Prefetcher (Available when supported by the CPU)

If this item is set to Enable, the DCU (Data Cache Unit) streamer prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing for CPU performance enhancement. The options are **Enable** and Disable.

DCU IP Prefetcher

If this item is set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

LLC Prefetch

If this feature is set to Enable, LLC (hardware cache) prefetching on all threads will be supported. The options are **Disable** and Enable.

Extended APIC (Extended Advanced Programmable Interrupt Controller)

Based on the Intel Hyper-Threading technology, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will be expanded from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. 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 for switching between stored CPU Power Management profiles. The options are Disable, Energy Efficient and **Custom**.

Power Performance Tuning

The options are OS Controls EPB and BIOS controls EPB.

ENERGY_PERF_BIAS_CFG mode

This feature is made available if BIOS Controls EPB is selected in Power Configuration Tuning. The options are Maximum Performance, Performance, **Balanced Performance**, Balanced Power, Power and Extreme Performance.

▶CPU P State Control

SpeedStep (PStates)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel's website for detailed information. The options are Disable and **Enable**.

EIST PSD Function (Available when SpeedStep is set to Enable)

Use this item to configure the processor's P-State coordination settings. During a P-State, the voltage and frequency of the processor will be reduced when it is in operation. This makes the processor more energy efficient, resulting in further energy gains. The options are **HW_ALL**, SW_ALL and SW-ANY.

Turbo Mode (Available when SpeedStep is set to Enable)

Select Enable for processor cores to run faster than the frequency specified by the manufacturer. The options are Disable and **Enable**.

▶Hardware PM (Power Management) State Control

Hardware P-States

If this feature is set to Disable, hardware will choose a P-state setting for the system based on an OS request. If this feature is set to Native Mode, hardware will choose a P-state setting based on OS guidance. If this feature is set to Native Mode with No Legacy Support, hardware will choose a P-state setting independently without OS guidance. 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

Select Enable to support Autonomous Core C-State control which will allow the processor core to control its C-State setting automatically and independently. The options are **Disable** and Enable.

CPU C6 Report

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

Enhanced Halt State (C1E)

Select Enable to enable "Enhanced Halt State" support, which will significantly reduce the CPU's power consumption by minimizing CPU's clock cycles and reduce voltage during a "Halt State." The options are **Disable** and Enable.

▶Package C State Control

Package C State

Use this feature 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

Select Enable to support Software Controlled Throttling states for CPUs installed on the motherboard. Such throttling states control the running time of CPUs with the goal of cooling down CPUs and preventing them from burning out. The options are **Disable** and Enable.

▶Chipset Configuration

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

▶North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

▶UPI (Ultra Path Interconnect) Configuration

This section displays the following UPI General Configuration information:

- Number of CPU

- Number of IIO

- Current UPI Link Speed

- Current UPI Link Frequency

- UPI Global MMIO Low Base/Limit

- UPI Global MMIO High Base/Limit

- UPI PCI-E Configuration Base/Size

Degrade Precedence

Use this feature to select the degrading precedence option for Ultra Path Interconnect connections. Select Topology Precedent to degrade UPI features if system options are in conflict. Select Feature Precedent to degrade UPI topology if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

Link L0p Enable

Select Enable to enable Link L0p. The options are Disable, Enable, and **Auto**.

Link L1 Enable

Select Enable to enable Link L1 (Level 1 link). The options are Disable, Enable, and **Auto**.

IO Directory Cache (IODC)

Select Enable for the IODC (I/O Directory Cache) to generate snoops instead of generating memory lockups for remote IIO (InvIToM) and/or WCiLF (Cores). Select Auto for the IODC to generate snoops (instead of memory lockups) for WCiLF (Cores). The options are Disable, **Auto**, Enable for Remote InvItoM Hybrid Push, InvItoM AllocFlow, Enable for Remote InvItoM Hybrid AllocNonAlloc and Enable for Remote InvItoM and Remote WViLF.

SNC

Sub NUMA Clustering (SNC) is a feature that breaks up the Last Level Cache (LLC) into clusters based on address range. Each cluster is connected to a subset of the memory controller. Enabling SNC improves average latency and reduces memory access congestion to achieve higher performance. Select Auto for 1-cluster or 2-clusters depending on IMC interleave. Select Enable for Full SNC (2-clusters and 1-way IMC interleave). The options are **Disable**, Enable, and Auto.

XPT Prefetch

XPT Prefetch speculatively makes a copy to the memory controller of a read request being sent to the LLC. If the read request maps to the local memory address and the recent memory reads are likely to miss the LLC, a speculative read is sent to the local memory controller. The options are **Disable** and Enable.

KTI Prefetch

KTI Pretech enables memory read to start early on a DDR bus, where the KTI Rx path will directly create a Memory Speculative Read command to the memory controller. The options are Disable and **Enable**.

Local/Remote Threshold

This feature allows the user to set the threshold for the Interrupt Request (IRQ) signal, which handles hardware interruptions. The features are Disable, Enable, **Auto**, Low, Medium, and High.

Stale AtoS

This feature optimizes A to S directory. When all snoop responses found in directory A are found to be RspI, then all data is moved to directory S and is returned in S-state. The options are **Disable**, Enable, and Auto.

LLC dead line alloc

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

Isoc Mode

Select Enable to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for Virtualization Technology. The options are Disable, Enable, and **Auto**.

▶**Memory Configuration**

Enforce POR

Select POR to enforce POR restrictions for DDR4 memory 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**, 1866, 2000, 2133, 2200, 2400, 2600, and 2666.

Data Scrambling for NVDIMM

Select Enable to enable data scrambling for onboard NVDIMM memory to enhance system performance and security. The options are **Auto**, Disable, and Enable.

Data Scrambling for DDR4

Select Enable to enable data scrambling for DDR4 memory to enhance system performance and security. The options are **Auto**, Disable, and Enable.

tCCD_L Relaxation

If this feature is set to Enable, SPD (Serial Presence Detect) will override tCCD_L ("Column to Column Delay-Long", or "Command to Command Delay-Long" on the column side.) If this feature is set to Disable, tCCD_L will be enforced based on the memory frequency. The options are Disable and **Auto**.

Enable ADR

Select Enable for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are **Disable** and Enable.

2X Refresh

This option allows the user to select 2X refresh mode. The options are **Auto**, Enabled, and Disabled.

Page Policy

This feature allows the user to determine the desired page mode for IMC. When **Auto** is selected, the memory controller will close or open pages based on the current operation. Closed policy closes that page after reading or writing. Adaptive is similar to open page policy, but can be dynamically modified. The default is **Auto**.

IMC Interleaving

This feature allows the user to configure Integrated Memory Controller (IMC) Interleaving settings.The options are **Auto**, 1-way Interleave, and 2-way Interleave.

►**Memory Topology**

This item displays the information of onboard memory modules as detected by the BIOS.

►**Memory RAS (Reliability_Availability_Serviceability) Configuration**

Use this submenu to configure the following Memory RAS settings.

Static Virtual Lockstep Mode

Select Enable to support Static Virtual Lockstep mode to enhance memory performance. The options are **Disable** and Enable.

Mirror Mode

Select Enable to set all 1LM/2LM memory installed in the system on the mirror mode, which will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity into half. The options are **Disable**, Mirror Mode 1LM and Mirror Mode 2LM.

UEFI ARM Mirror

Select Enable to support the UEFI-based address range mirroring with setup option. The options are **Disable** and Enable.

Memory Rank Sparing

Select Enable to support memory-rank sparing to optimize memory performance. The options are **Disable** and Enable.

Note: This item will not be available when memory mirror mode is enabled.

Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors. The default setting is **1**.

SDDC Plus One

Select Enable for SDDC (Single Device Data Correction) Plus One support, which will increase the reliability and serviceability of your system memory. The options are **Disable** and Enable.

ADDDC (Adaptive Double Device Data Correction) Sparing

Select Enable for ADDDC sparing support to enhance memory performance. The options are **Disable** and Enable.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected in a memory module and send the corrections to the requestor (the original source). When this item is set to Enable, the IO hub will read and write 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 will be scrubbed every day. The options are Disable and **Enable**.

Patrol Scrub Interval

Use this item to specify the number of hours (between 0 to 24) required for the system to complete a full patrol scrubbing. Enter 0 for patrol scrubbing to be performed automatically. The default setting is **24**.

> **Note:** This item is hidden when Patrol Scrub item is set to Disable.

▶IIO Configuration

EV DFX (Device Function On-Hide) Features

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

▶CPU1 Configuration

IOU0 (IIO PCIe Br1)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIe Br2)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU2 (IIO PCIe Br3)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

MCP0 (IIO PCIe Br4)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

MCP1 (IIO PCIe Br5)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

▶CPU2 Configuration

IOU0 (IIO PCIe Br1)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIe Br2)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU2 (IIO PCIe Br3)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

MCP0 (IIO PCIe Br4)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

MCP1 (IIO PCIe Br5)

This item configures the PCI-E Bifuraction setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

▶IOAT Configuration

Disable TPH (TLP Processing Hint)

TPH is used for data-tagging with a destination ID and a few important attributes. It can send critical data to a particular cache without writing through to memory. Select No in this item for TLP Processing Hint support, which will allow a "TPL request" to provide "hints" to help optimize the processing of each transaction occurred in the target memory space. The options are **No** and Yes.

Prioritize TPH (TLP Processing Hint)

Select Yes to prioritize the TPL requests that will allow 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 will allow certain transactions to violate the strict-ordering rules of PCI and 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 support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) 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.

Interrupt Remapping

Select Enable for Interrupt Remapping support to enhance system performance. The options are **Enable** and Disable.

PassThrough DMA

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

ATS

Select Enable to enable ATS (Address Translation Services) support for the Non-Iscoh VT-d engine to enhance system performance. The options are **Enable** and Disable.

Posted Interrupt

Select Enable to support VT_D Posted Interrupt which will allow external interrupts to be sent directly from a direct-assigned device to a client machine in non-root mode to improve virtualization efficiency by simplifying interrupt migration and lessening the need of physical interrupts. The options are **Enable** and Disable.

Coherency Support (Non-Isoch)

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

▶Intel® VMD Technology

▶Intel® VMD for Volume Management Device on CPU1

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 item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be dislayed:

CPU SLOT6 PCI-E 3.0 X8 VMD (Available when the device is 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.

CPU SLOT4 PCI-E 3.0 X8 VMD (Available when the device is 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.

Hot Plug Capable (Available when the device is detected by the system)

Use this feature to enable hot plug support for PCIe root ports 1A~1D. 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 item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be dislayed:

CPU SLOT5 PCI-E 3.0 X16 VMD (Available when the device is 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.

Hot Plug Capable (Available when the device is detected by the system)

Select Enable to enable hot plug support for PCIe root ports 2A~2D. The options are **Disable** and Enable.

VMD Config for PStack2

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 item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be dislayed:

CPU SLOT2 PCI-E 3.0 X8 VMD (Available when the device is 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.

CPU SLOT1 PCI-E 3.0 X4 VMD (Available when the device is 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.

Hot Plug Capable (Available when the device is detected by the system)

Select Enable to enable hot plug support for PCIe root ports 3A~3D. This will allow the user to replace the components without shutting down the system. The options are **Disable** and Enable.

▶**Intel® VMD for Volume Management Device on CPU2**

VMD Config for PStack2

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 item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be dislayed:

CPU SLOT3 PCI-E 3.0 X16 VMD (Available when the device is detected by the system)

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

Hot Plug Capable (Available when the device is detected by the system)

Use this feature to enable hot plug support for PCIe root ports 3A~3D. The options are **Disable** and Enable.

IIO-PCIE Express Global Options

PCI-E Completion Timeout Disable

Select Enable to enable PCI-E Completion Timeout support for electric tuning. The options are Yes, **No**, and Per-Port.

▶**South Bridge**

The following South Bridge information will display:

• 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 work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The options are Enabled and **Disabled**.

Port 60/64 Emulation

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

▶Server ME (Management Engine) Configuration

This feature displays the following General ME Configuration settings.

Operational 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 items:

SATA Controller

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

Configure SATA as (Available when the item above: SATA Controller is set to enabled)

Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are AHCI and **RAID**. (**Note:** This item is hidden when the sSATA Controller is Disabled.)

SATA HDD Unlock

Select Enable to unlock SATA HDD password in the OS. The options are Disable and **Enable**.

Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Disable** and Enable.

SATA RAID Option ROM/UEFI Driver (Available when the item "Configure SATA as" is set to "RAID")

Select EFI 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 - SATA Port 7

Hot Plug

Select Enable to support Hot-plugging for the device installed on a selected SATA port which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Enable** and Disabled.

Spin Up Device

On an edge detect from 0 to 1, set this item to allow the SATA device installed on the SATA port specified by the user to start a COMRESET initialization. The options are Enable and **Disable**.

SATA Device Type

Use this item to specify if the device installed on the SATA port selected by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶PCH sSATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the sSATA devices that are supported by the sSATA controller and displays the following items:

sSATA Controller

This item enables or disables the onboard sSATA controller supported by the Intel SCU. The options are **Enable** and Disable.

Configure sSATA as

Select AHCI to configure an sSATA drive specified by the user as an AHCI drive. Select RAID to configure an sSATA drive specified by the user as a RAID drive. The options are AHCI and **RAID**. (**Note:** This item is hidden when the sSATA Controller item is set to Disabled.)

SATA HDD Unlock

Select Enable to unlock sSATA HDD password in the OS. The options are Disable and **Enable**.

sSATA RSTe Boot Info (Available when the item "Configure SATA as" is set to "RAID")

This feature allows the user to decide which controller should be used for system boot. The options are None, SATA Controller, **sSATA Controller**, and Both.

Support Aggressive Link Power Management

When this item is set to Enable, the sSATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Disable** and Enable.

sSATA RAID Option ROM/UEFI Driver (Available when the item "Configure SATA as" is set to "RAID")

Select EFI 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**.

sSATA Port 0 - sSATA Port 5

Hot Plug

Select Enable to support Hot-plugging for the device installed on an sSATA port selected by the user which will allow the user to replace the device installed in the slot without shutting down the system. The options are Disable and Enabled.

Spin Up Device

On an edge detect from 0 to 1, set this item to allow the sSATA device installed on the sSATA port specified by the user to start a COMRESET initialization. The options are Enable and **Disable**.

sSATA Device Type

Use this item to specify if the device installed on the sSATA port specified by the user 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 PCI information will be 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 (Available if the system supports Single-Root Virtualization)

Select Enabled for Single-Root IO Virtualization support. The options are **Disabled** and Enabled.

MMIO High Base

Use this item to select the base memory size according to memory-address mapping for the IO hub. The base memory size must be between 4032G to 4078G. The options are **56T**, 40T, 24T, 16T, 4T, and 1T.

MMIO High Granularity Size

Use this item 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.

PCI PERR/SERR Support

Use this feature to enable or disable the runtime event for SERR (System Error)/ PERR (PCI/ PCI-E Parity Error). The options are **Disabled** and Enabled.

Maximum Read Request

Select Auto for the system BIOS to automatically set the maximum size for a read request for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

MMCFG Base

This feature determines the lowest MMCFG (Memory-Mapped Configuration) base assigned to PCI devices. The options are 1G, 1.5G, 1.75G. **2G**, 2.25G, and 3G.

NVMe Firmware Source

This feature determines the lowest MMCFG (Memory-Mapped Configuration) base assigned to PCI devices. The options are **Vendor Defined Firmware** and AMI Native Support.

VGA Priority

Use this item to select the graphics device to be used as the primary video display for system boot. The options are Auto, **Onboard** and Offboard.

RSC-R2UW-4RE8 SLOT(1-4) PCI-E X8 OPROM

Select Disabled to deactivate the selected slots, Legacy to activate the slot in legacy mode, and EFI to activate the slot in EFI mode. The options are Disabled, **Legacy**, and EFI.

Onboard LAN Option ROM Type

Use this to select firmware type to be loaded for onboard LANs. The options are **Legacy** and EFI.

Onboard NVME1/NVME2/NVME3/NVME4 Option ROM

Select EFI to allow the user to boot the computer using an EFI (Expansible Firmware Interface) device installed on the NVME connector specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the NVME connector specified by the user. The options are Disabled, Legacy and **EFI**.

Onboard Video Option ROM

Use this feature to select the Onboard Video Option ROM type. The options are Disabled, **Legacy** and EFI.

▶Network Stack Configuration

Network Stack

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

  *If "Network Stack" is set to Enabled, the following items will display:

Ipv4 PXE Support

Select Enabled to enable Ipv4 PXE boot support. If this feature is disabled, it will not create the Ipv4 PXE boot option. The options are Disabled and **Enabled**.

Ipv4 HTTP Support

Select Enabled to enable Ipv4 HTTP boot support. If this feature is disabled, it will not create the Ipv4 HTTP boot option. The options are **Disabled** and Enabled.

Ipv6 PXE Support

Select Enabled to enable Ipv6 PXE boot support. If this feature is disabled, it will not create the Ipv6 PXE boot option. The options are Disabled and **Enabled**.

Ipv6 HTTP Support

Select Enabled to enable Ipv6 HTTP boot support. If this feature is disabled, it will not create the Ipv6 HTTP boot option. The options are **Disabled** and Enabled.

PXE Boot Wait Time

Use this feature to select the wait time to press the <ESC> key to abort the PXE boot. The default is **0**.

Media Detect Count

Select this to assign the number of times presence of media will be checked. The default is **1**.

►Super IO Configuration

Super IO Chip AST2500

►Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable the onboard serial port specified by the user. The options are Disabled and **Enabled**.

Device Settings

This item displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

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 for Serial Port 1 are **Auto**, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12); (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

►Serial Port 2 Configuration

Serial Port 2

Select Enabled to enable the onboard serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This item displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

Note: This item is hidden when Serial Port 2 is set to Disabled.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 2. Select Auto for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified. The options for Serial Port 2 are **Auto**, (IO=2F8h; IRQ=3), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12); (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

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

COM 1 Console Redirection

Select Enabled to enable COM Port 1 for Console Redirection, which will allow a client machine to be connected to a host machine at a remote site for networking. The options are Disabled and **Enabled**.

If the item above set to Enabled, the following items will become available for configuration:

▶Console Redirection Settings (for COM1)

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

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

Redirection After BIOS Post

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

SOL (Serial-Over-LAN) Console Redirection

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

If the item above set to Enabled, the following items will become available for user's configuration:

▶**Console Redirection Settings (for SOL)**

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

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

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

Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When this feature is set to Bootloader, legacy Console Redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy Console Redirection remains enabled upon OS boot. The options are **Always Enable** and Bootloader.

▶Legacy Console Redirection

Legacy Serial Redirection Port

Use the feature to select the COM port to display redirection of Legacy OS and Legacy OPROM messages. The default setting is **COM1** and SOL.

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

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

Select Enabled to use a COM port selected by the user for EMS Console Redirection. The options are **Disabled** and Enabled.

If the item above set to Enabled, the following items will become available for user's configuration:

▶Console Redirection Settings (EMS)

Out-of-Band Management Port

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

This feature sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in both 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 data-sending when the receiving buffer

is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None**, Hardware RTS/CTS and Software Xon/Xoff.

- Data Bits: 8

- Parity: None

- Stop Bits: 1

▶ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

NUMA Support (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are Disabled and **Enabled**.

WHEA Support

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

High Precision 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 (Available when a TPM device is installed and detected by the BIOS)

When a TPM (Trusted-Platform Module) device is detected in your machine, the following information will be displayed.

- TPM2.0 Device Found

- Vendor

- Firmware Version
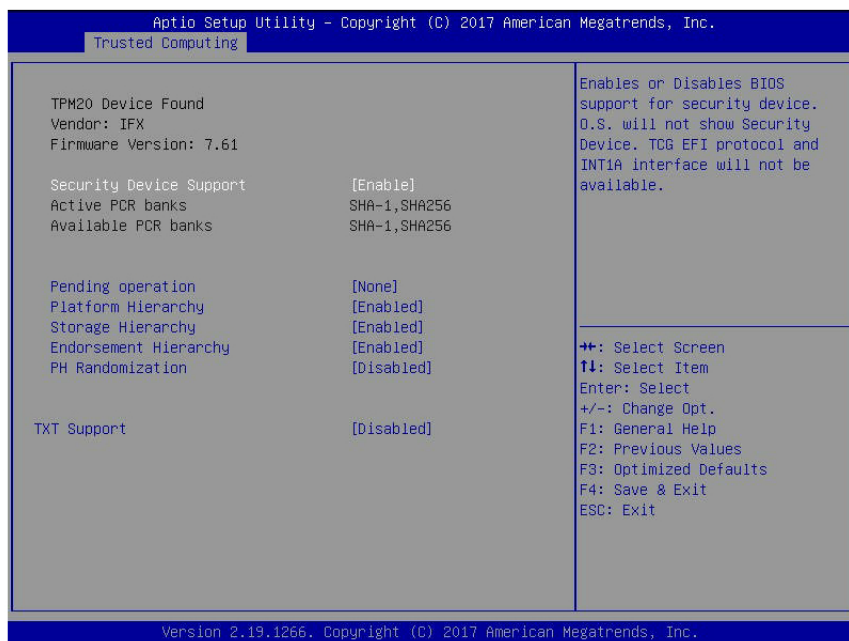
Security Device Support

If this feature and the TPM jumper (JPT1) on the motherboard are both enabled, the onboard security (TPM) device will be enabled in the BIOS to enhance data integrity and system security. Please note that the OS will not show the security device. Neither TCG EFI protocol nor INT1A interaction will be made available for use. If you have made changes on the setting on this item, be sure to reboot the system for the change to take effect. The options are Disable and **Enable**. If this option is set to Enable, the following screen and items will display:

- Active PCR Banks

- Available PCR Banks

Pending Operation

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

　　Note: Your system will reboot to carry out a pending TPM operation.

Platform Hierarchy (for TPM Version 2.0 and above)

Select Enabled for TPM Platform Hierarchy support which will allow the manufacturer to utilize the cryptographic algorithm to define a constant key or a fixed set of keys to be used for initial system boot. This early boot code is shipped with the platform and is included in the list of "public keys". During system boot, the platform firmware uses this trusted public key to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via a TPM device. The options are **Enabled** and Disabled.

Storage Hierarchy

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by the platform owner such as an IT professional or the end user. Storage Hierarchy has an owner policy and an authorization value, both of which can be set and are held constant (-rarely changed) through reboots. This hierarchy can be cleared or changed independently of the other hierarchies. The options are **Enabled** and Disabled.

Endorsement Hierarchy

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address the user's privacy concerns because the primary keys in this hierarchy are certified by the TPM or a manufacturer to be constrained to an authentic TPM device that is attached to an authentic platform. A primary key can be an encrypted, and a certificate can be created using TPM2_ ActivateCredential. It allows the user to independently enable "flag, policy, and authorization value" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications and permitting the platform software to use the TPM. The options are **Enabled** and Disabled.

PH (Platform Hierarchy) Randomization (for TPM Version 2.0 and above)

Select Enabled for Platform Hierarchy Randomization support, which is used only during the platform developmental stage. This feature cannot be enabled in the production platforms. The options are **Disabled** and Enabled.

TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system security and data integrity. The options are **Disabled** and Enabled.

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system security and data integrity. The options are **Disabled** and Enabled.

> **Note 1:** If the option for this item (TXT Support) is set to Enabled, be sure to disable EV DFX (Device Function On-Hide) support for the system to work properly. (EV DFX is under "IIO Configuration" in the "Chipset/North Bridge" submenu).

> **Note 2:** For more information on TPM, please refer to the TPM manual at http://www. supermicro.com/manuals/other.

▶iSCSI Configuration

iSCSI Initiator Name

This feature allows the user 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 items.

> ▶**Add an Attempt**

> ▶**Delete Attempts**

> ▶**Change Attempt Order**

▶Intel® Virtual RAID on CPU

When this submenu is selected and the RAID devices are detected, the BIOS screen displays the following items:

Intel® VROC with VMD Technology 5.2.0.1029

4.4 Event Logs

Use this feature to configure Event Log settings.

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

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














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

              Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are Disabled. and **Enabled**.

Erasing Settings

Erase Event Log

Select Enabled to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are No; Yes, Next Reset; Yes, Every Reset.

When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

Select Enabled to log system boot events. The options are Enabled and **Disabled**.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item is used to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

> **Note:** Please reboot the system for the changes to take effect.

▶View SMBIOS Event Log

This item allows the user to view the event in the system event log. Select this item and press <Enter> to view the status of an event in the log. The following categories are displayed:

Date/Time/Error Code/Severity

4.5 IPMI

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

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

   BMC Firmware Revision              1.28                Press <Enter> to change the
   IPMI STATUS                        Working             SEL event log configuration.

 ▶ System Event Log
 ▶ BMC Network Configuration










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

            Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

When you select this submenu and press the <Enter> key, the following information will display:

- IPMI Firmware Revision: This item indicates the IPMI firmware revision used in your system.

- Status of BMC: This item indicates the status of the BMC (Baseboard Management Controller) 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; Yes, On every reset.

When SEL is Full

This feature allows the user 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:** After making changes on a setting, be sure to reboot the system for the changes to take effect.

▶BMC Network Configuration

BMC Network Configuration

Configure IPV4 Support

This section displays configuration features for IPV4 support.

IPMI LAN Selection

This item displays the IPMI LAN setting. The default setting is **Failover**.

IPMI Network Link Status

This item displays the IPMI Network Link status. The default setting is **Shared LAN**.

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 item above is set to Yes, the following item will become available for configuration:

Configuration Address Source

This feature allows the user 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 **DHCP** and Static.

If the item above is set to Static, the following items will become available for configuration:

Station IP Address

This item 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 item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address

This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Gateway IP Address

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

VLAN

This item displays the virtual LAN settings. The options are Disable and Enable.

Configure IPV6 Support

This section displays configuration features for IPV6 support.

LAN Channel 1

IPV6 Support

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

Configuration Address Source

This feature allows the user 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 **Unspecified**, Static, and DHCP.

If the item above is set to Static, the following items will become available for configuration:

- Station IPV6 Address

- Prefix Length

- IPV6 Router1 IP Address

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 this option is set to Yes, the following items will activate:

Configuration Address Source

Use this item to select the IP address source 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. Entry fields for Station IP Address, Subnet Mask and Gateway IP Address will be activated. If DHCP is selected, AMI BIOS will search for a DHCP (Dynamic Host Configuration Protocol)

4.6 Security Settings

This menu allows the user to configure the following security settings for the system.

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

   Administrator Password                  Not Installed        Set Administrator Password
   User Password                           Not Installed

   Password Description

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

   The password length must be
   in the following range:
   Minimum length                          3
   Maximum length                          20

   Administrator Password                               ↔: Select Screen
   Password Check                          [Setup]      ↑↓: Select Item
                                                        Enter: Select
 ▶ Secure Boot                                          +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

              Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

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 3 characters to 20 characters long.

User Password

Use this feature to set the user password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters 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.

▶Secure Boot

When you select this submenu and press the <Enter> key, the following items will display:

- System Mode

- Secure Boot

- Vendor Keys

Secure Boot

If this item is set to Enabled, Secure Boot will be activated when a Platform Key (PK) is entered. A Platform Key is a security key used to manage the security settings of the platform firmware used in your system. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this feature to select the desired secure boot mode for the system. The options are Standard and **Custom**.

CSM Support

Use this feature to select the desired secure boot mode for the system. The options are **Disabled** and Enabled.

▶Key Management

Provision Factory Defaults

Select Enabled to install all manufacturer default keys for the following system security settings. The options are **Disabled** and Enabled.

▶Enroll all Factor Default Keys

Select Yes to install all manufacturer defaults for the following system security settings. The options are **Yes** and No.

▶Enroll EFI Image

Select this item and press <Enter> to select an EFI (Extensible Firmware Interface) image for the system to operate in Secure Boot mode.

▶Save All Secure Boot Variables

This feature allows the user to set and save the secure boot key variables specified by the user.

Secure Boot Variable/Size/Key#/Key Sources

▶Platform Key (PK)

This feature allows the user to enter and configure a set of values to be used as a platform firmware key for the system. This set of values also indicate the size, the keys numbers, and the key source of the Platform Key. The options are **Save to File**, Set New, and Erase.

▶Key Exchange Keys

This feature allows the user to enter and configure a set of values to be used as a Key-Exchange-Keys for the system. This set of values also indicate the size, the keys numbers, and the key source of the Key-Exchange-Keys. The options are **Save to File**, Set New, and Erase.

▶Authorized Signatures

This feature allows the user to enter and configure a set of values to be used as Authorized Signatures for the system. This set of values also indicate the size, the keys numbers, and the key source of the Authorized Signatures. The options are **Set New** and Append.

Secure Boot Variable/Size/Key#/Key Sources The options are **Save to File**, Set New, and Erase.

▶Forbidden Signatures

This feature allows the user to enter and configure a set of values to be used as Forbidden Signatures for the system. This set of values also indicate the size, the keys numbers, and the key source of the Forbidden Signatures. The options are **Save to File**, Set New, and Erase.

▶Authorized TimeStamps

This feature allows the user to set and save the timestamps for Authorized Signatures to indicate when these signatures were entered into the system. The options are **Save to File**, Set New, and Erase.

▶OsRecovery Signatures

This feature allows the user to set and save the Authorized Signatures used for OS recovery. The options are **Save to File**, Set New, and Erase.

4.7 Boot Settings

Use this feature to configure Boot Settings:

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

  Boot Configuration                                         ▲ Select boot mode LEGACY/UEFI

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

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

              Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

Boot Mode Select

Use this feature to select the type of devices that the system is going to boot from. The options are Legacy, UEFI (Unified Extensible Firmware Interface), and **Dual**.

Legacy to EFI support

The options are **Disabled** and Enabled.

Fixed Boot Order Priorities

This feature prioritizes the order of a bootable device from which the system will boot. Press <Enter> on each entry from top to bottom to select devices. When the item above -"Boot Mode Select" is set to **Dual** (default), the following items will be displayed for configuration:

• Boot Option #1 - Boot Option #17

When the item above -"Boot Mode Select" is set to Legacy, the following items will be displayed for configuration:

• Boot Option #1 - Boot Option #8

When the item above -"Boot Mode Select" is set to UEFI, the following items will be displayed for configuration:

• Boot Option #1 - Boot Option #9

▶Delete Boot Option

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

Delete Boot Option

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

▶UEFI Application Boot Priorities

Use this feature to organize system boot order.

Boot Option #1

Enable/Disable this boot option.

4.8 Save & Exit

Select the Save & Exit tab from the BIOS setup screen to configure the settings below.

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

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

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

        Boot Override
        UEFI: Built-in EFI Shell

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

                    Version 2.19.1268. Copyright (C) 2017 American Megatrends, Inc.
```

Save Options

Discard Changes and Exit

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

Save Changes and Reset

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

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

Default Options

Restore Optimized Defaults

To set this feature, select Restore Defaults from the Exit menu and press <Enter> to load manufacturer default settings which are intended 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 the user to save any changes to the BIOS setup for future use.

Restore User Defaults

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

Boot Override

UEFI: Built-in EFI Shell

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified by the user instead of the one specified in the boot list. This is a one-time override.

Appendix A

BIOS Codes

A.1 BIOS Error POST (Beep) Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

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

Fatal errors are those which will not allow the system to continue the boot-up procedure. 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 numbers on the fatal error list (on the following page) correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

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 AOC-LPC80-20).

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

Appendix B

Software Installation

B.1 Installing Software Programs

The Supermicro FTP site contains drivers and utilities for your system at ftp://ftp.supermicro.com. Some of these must be installed, such as the chipset driver.

After accessing the FTP site, go into the CDR_Images directory and locate the ISO file for your motherboard. 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 motherboard 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 OS, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.
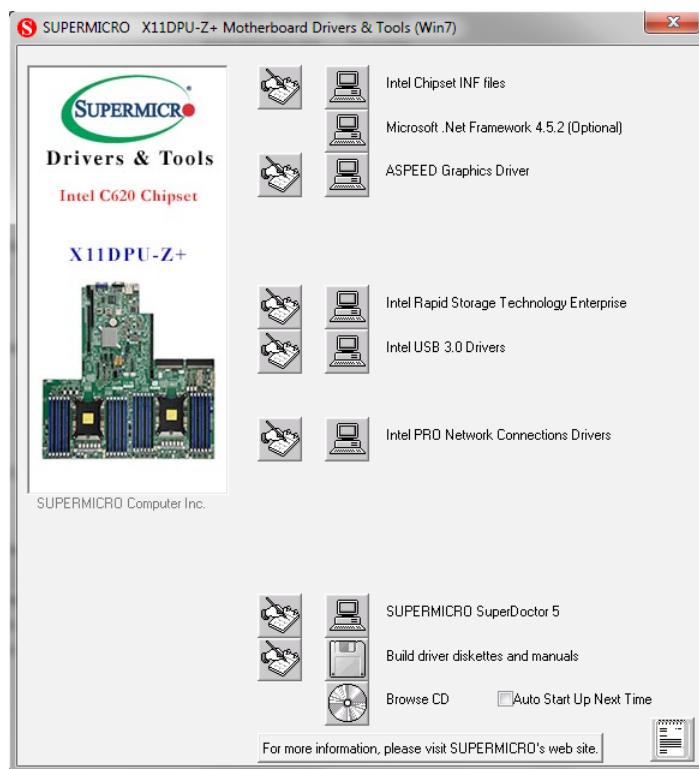
Figure B-1. Driver/Tool Installation Display Screen

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 the 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 diskette 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 diskette, 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.

Note: The default Username and Password for SuperDoctor 5 is ADMIN / ADMIN.
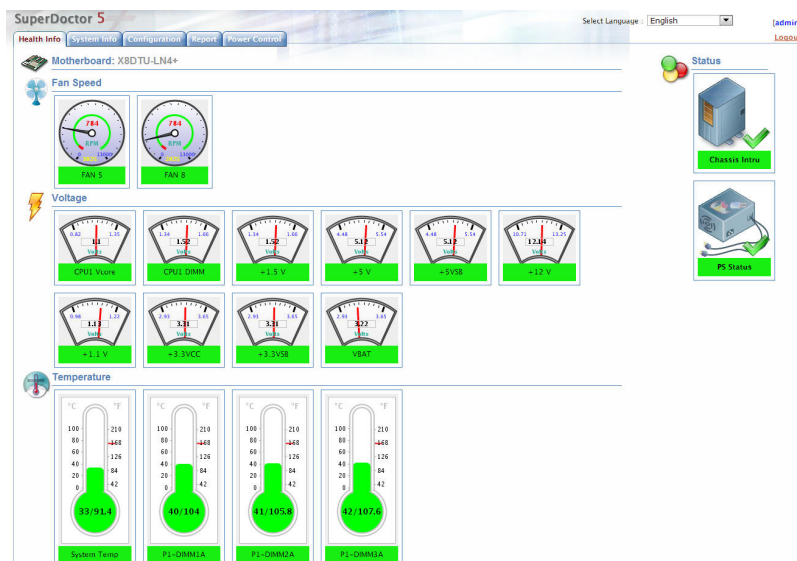
Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)

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

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

Product Disposal

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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

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

경고!

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

Waarschuwing

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

Appendix 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.

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

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

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

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

   ▶ Proceed with flash update




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

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

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.

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

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



                    ┌──────── Program new data ────────┐
                    │                                  │
                    │        Write new boot block...   │
                    │                                  │
                    │ ─────────────17%──────────────── │
                    │ ▆▆▆▆                             │
                    └──────────────────────────────────┘
                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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

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.

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

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


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



                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit
              Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

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.

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

 Boot Configuration                                 Sets the system boot order

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

 FIXED BOOT ORDER Priorities
 Boot Option #1                    [UEFI AP:UEFI: Bui...]
 Boot Option #2                    [CD/DVD]
 Boot Option #3                    [USB Hard Disk]
 Boot Option #4                    [USB CD/DVD]
 Boot Option #5                    [USB Key:SanDisk]
 Boot Option #6                    [USB Floppy]
 Boot Option #7                    [USB Lan]
 Boot Option #8                    [Network:IBA GE S1...]
 Boot Option #9                    [UEFI Hard Disk]
 Boot Option #10                   [UEFI CD/DVD]
 Boot Option #11                   [UEFI USB Hard Disk]
 Boot Option #12                   [UEFI USB CD/DVD]        ↔: Select Screen
 Boot Option #13                   [UEFI USB Key:UEFI...]   ↑↓: Select Item
 Boot Option #14                   [UEFI USB Floppy]        Enter: Select
 Boot Option #15                   [UEFI USB Lan]           +/-: Change Opt.
 Boot Option #16                   [UEFI Network]           F1: General Help
 Boot Option #17                   [Hard Disk]              F2: Previous Values
                                                            F3: Optimized Defaults
 ▶ Add New Boot Option                                      F4: Save & Exit
                                                            ESC: Exit
              Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```
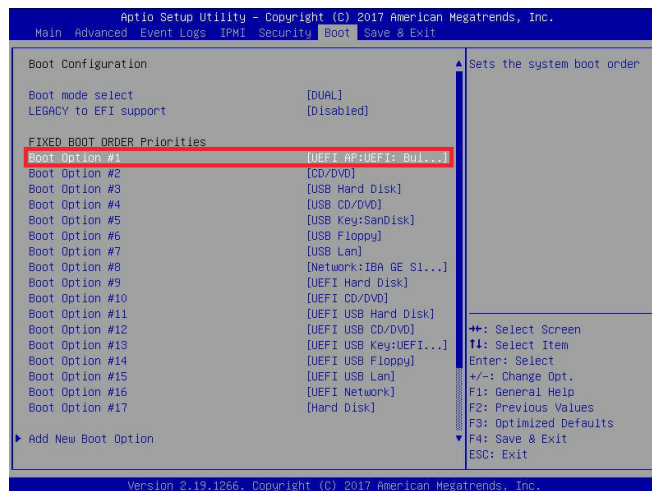
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.

```
UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
        FS0: Alias(s):HD0r0b::BLK1:
            PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x37901D72,0x800,0x1
CA3592)
        BLK0: Alias(s):
            PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd AFUDOS
FS0:\AFUDOS\> cd SWJPME2_03162017
FS0:\AFUDOS\SWJPME2_03162017\> flash.nsh X11DPU7.314_
```

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

```
Done.
[ Access Cmos Port Ex ]
<Read>
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 (0%)
```

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.

```
Verifying NCB Block ......... done
- Update success for FDR
- Update success for IE. -
- Successful Update Recovery Loader to OPRx!!
- Successful Update MFSB!!-
- Successful Update FTPR!!-
- Successful Update MFS, IVB1 and IVB2!!
- Successful Update FLOG and UTOK!!
- ME Entire Image update success !!
WARNING : System must power-off to have the changes take effect!
Moving FS0:\AFUDOS\SWJPME2_03162017\fdtx64.efi -> FS0:\AFUDOS\SWJPME2_03162017\f
dt.smc
- [ok]
Moving FS0:\AFUDOS\SWJPME2_03162017\afuefix64.efi -> FS0:\AFUDOS\SWJPME2_0316201
7\afuefi.smc
- [ok]
****************************************************************************
*
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*
****************************************************************************
Deleting '
Delete successful.
FS0:\> _
```

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.