

A4SAP-H/-E/-L

USER'S MANUAL

Revision 1.0 (MNL-2701)

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Manual Revision 1.0

Release Date: November 15, 2024

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the A4SAP-H/-E/-L motherboard. Installation and maintenance should be performed by certified service technicians only.

Notes

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

- Supermicro product manuals: https://www.supermicro.com/support/manuals
- Product drivers and utilities: https://www.supermicro.com/wdl
- Product safety info: https://www.supermicro.com/about/policies/safety_information.cfm
- A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility
- Frequently Asked Questions: https://www.supermicro.com/FAQ/index.php
- If you still have questions after referring to our FAQs, contact our support team. Region-specific Technical Support email addresses can be found at: "Contacting Supermicro" on page 9
- If you have any feedback on Supermicro product manuals, contact our writing team at: Techwriterteam@supermicro.com

This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself.



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



Avertissement! Indique des informations importantes permettant d'éviter des dommages matériels ou des blessures corporelles.



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



Avertissement! Indique qu'une haute tension peut être rencontrée lors de l'exécution d'une procédure.

Important: Important information given to ensure proper system installation or to relay safety precautions.

Note: Additional Information given to differentiate various models or provides information for proper system setup.

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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.

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1.1 Quick Reference

For details on the A4SAP-H/-E/-L motherboard layout, features, and other quick reference information, refer to the content below.

In addition to the A4SAP-H/-E/-L motherboard, several important parts that are included in your shipment are listed below. If anything listed is damaged or missing, contact your retailer.

Checklist

Main Parts List (Retail Single Package)		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	A4SAP-H/-E/-L	1
Heatsink	SNK-C0115L	1
Audio Cable	CBL-OTHR-0986	1
COM Cable	CBL-CUSB-0984	1
SATA Power Cable (A4SAP-E/-L only)	CBL-PWEX-1030	1
USB Cable (A4SAP-E/-L only)	CBL-CUSB-0983	1
SATA Cable (A4SAP-E/-L only)	CBL-SAST-0538	1
DC IN Power Cable (A4SAP-E/-L only)	CBL-PWEX-1029	1
Quick Reference Guide	MNL-2701-QRG	1

Main Parts List (Bulk Package)		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	A4SAP-H/-E/-L	1
Screw bag with four M3L4.5 screws and four M4 standoff 11 mm in height (A4SAP-H only)	MCP-110-00096-0N	1
Heatsink (A4SAP-E/-L only)	SNK-C0115L	1
DC IN Power cable (A4SAP-E/-L only)	CBL-PWEX-1029	1

Optional Parts List		
Description	**Part Number**	**Quantity**
Power adapter 60 W 12 V 5 A, AC to DC lockable power adapter, HF	MCP-250-10134-0N	1
Power adapter 40 W 12 V 3.33 A, AC to DC lockable power adapter, HF	MCP-250-10135-0N	1

Optional Parts List		
Description	**Part Number**	**Quantity**
DC IN Power Cable (DC Jack)	CBL-PWEX-1110-15	1

Motherboard Layout

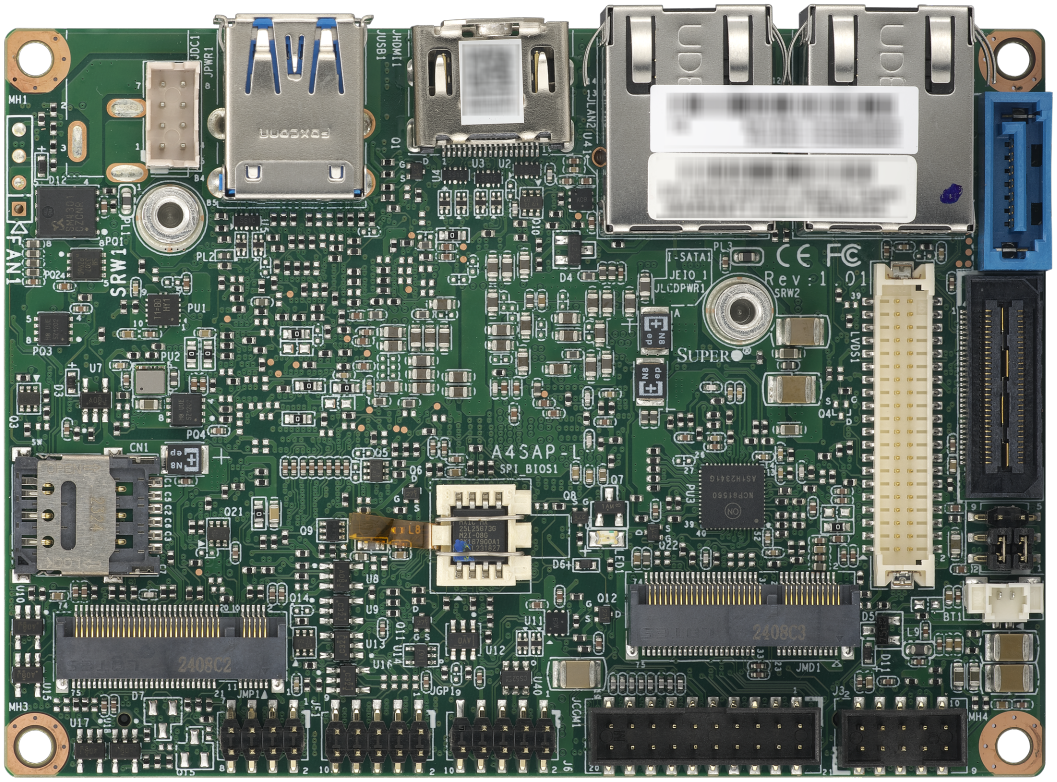


Figure 1-1. A4SAP-E/-L Motherboard Bottom Photo

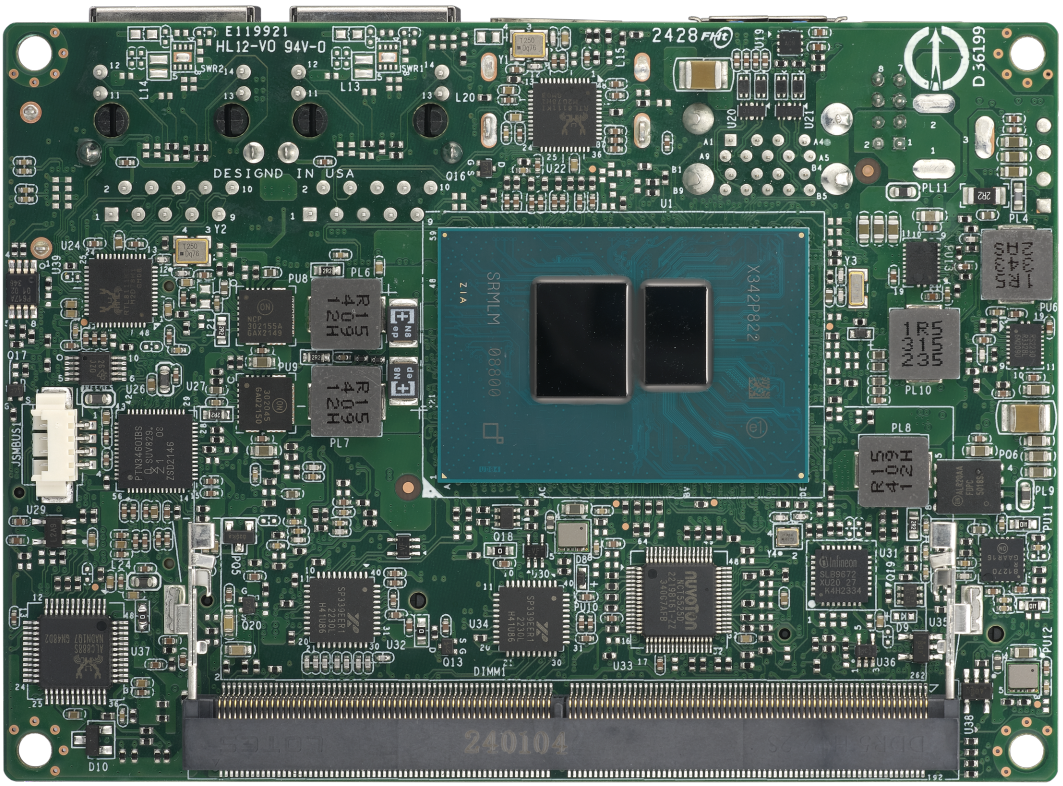


Figure 1-2. A4SAP-E/-L Motherboard Top Photo

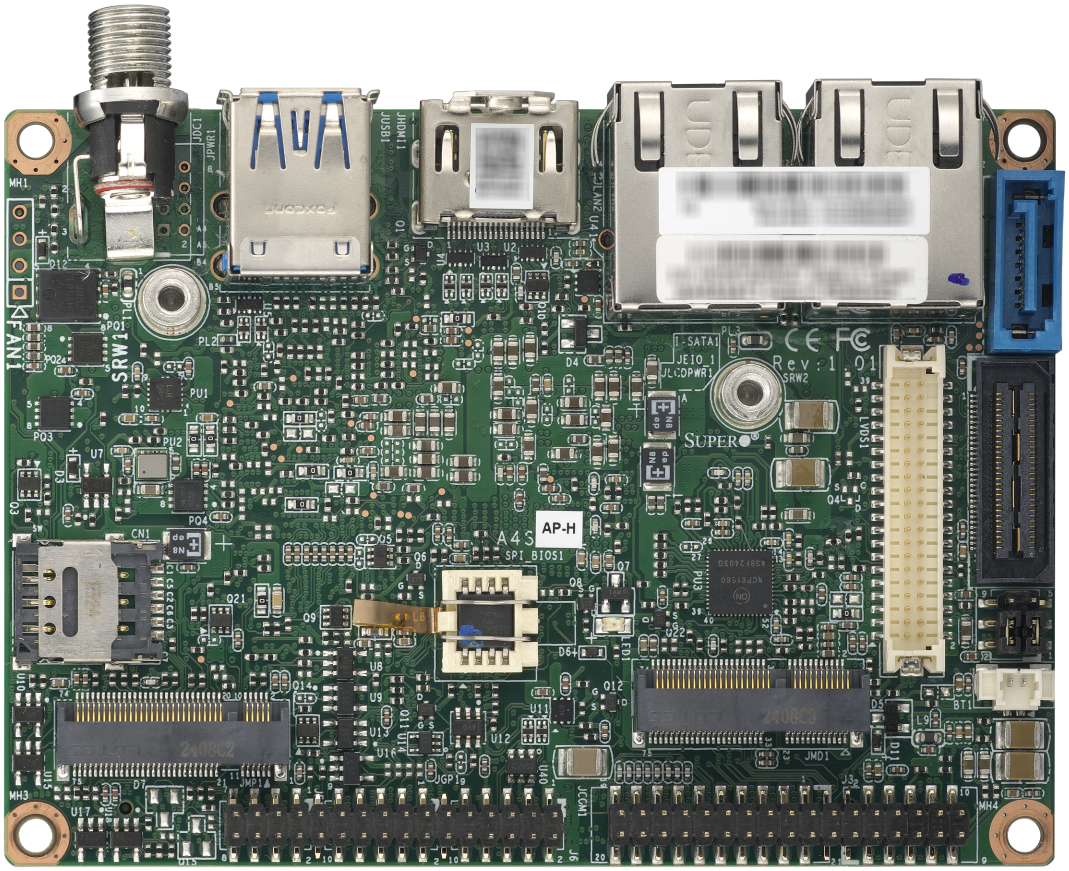


Figure 1-3. A4SAP-H Motherboard Bottom Photo

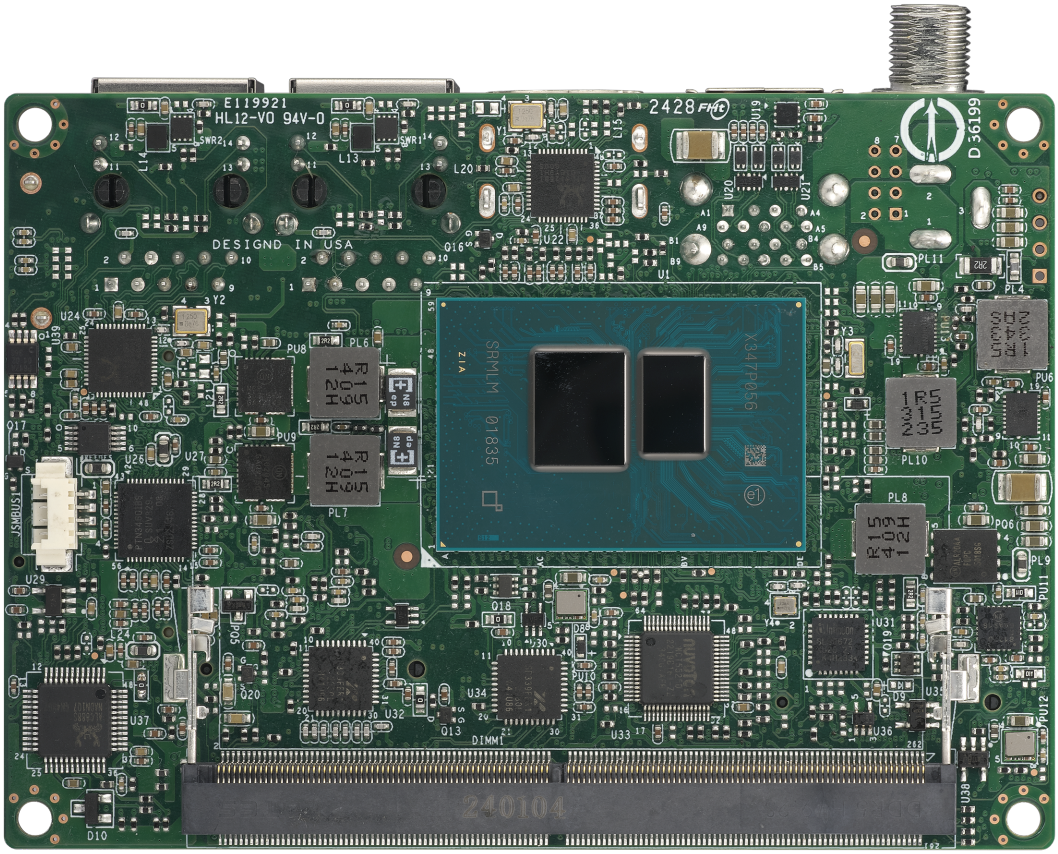


Figure 1-4. A4SAP-H Motherboard Top Photo

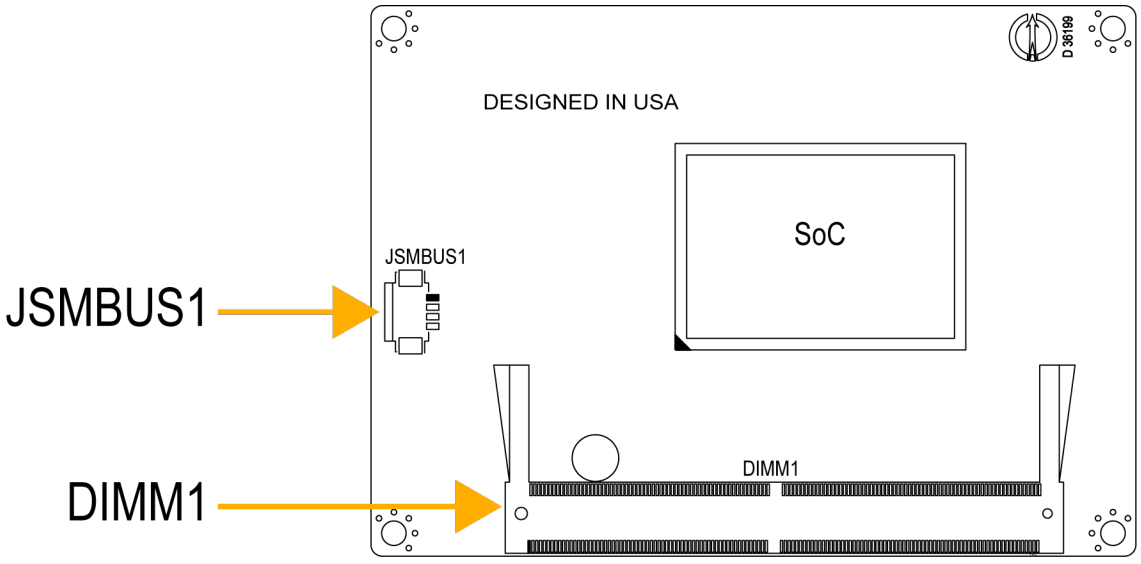


Figure 1-5. A4SAP-H/-E/-L Motherboard Top Layout

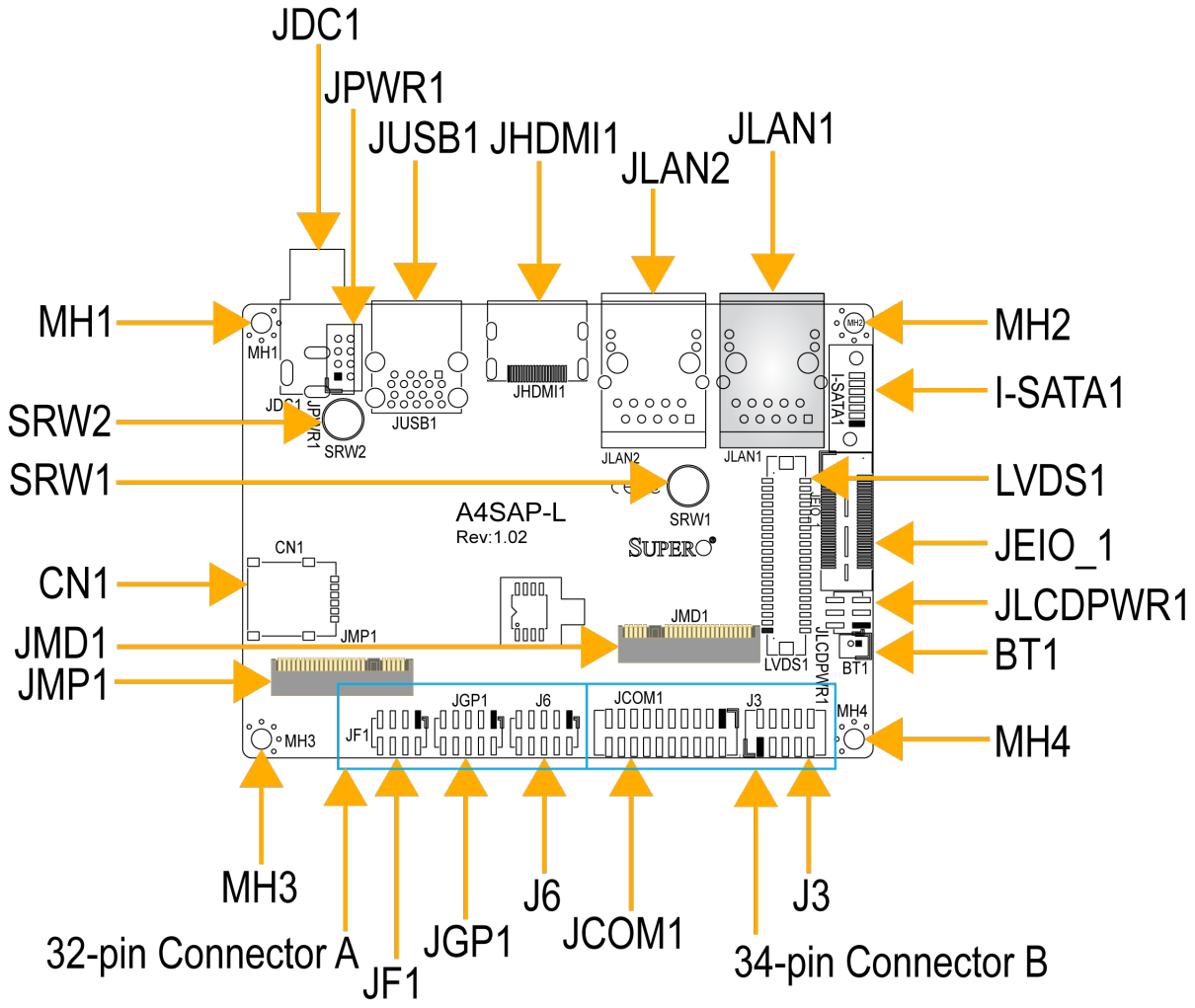


Figure 1-6. A4SAP-H/-E/-L Motherboard Bottom Layout

Notes:

- See "Component Installation" on page 28 for detailed information on jumpers, connectors, and LED indicators.
- "■" indicates the location of pin 1.
- Components not documented are for internal testing-purposes 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.

Motherboard Mechanical Drawings

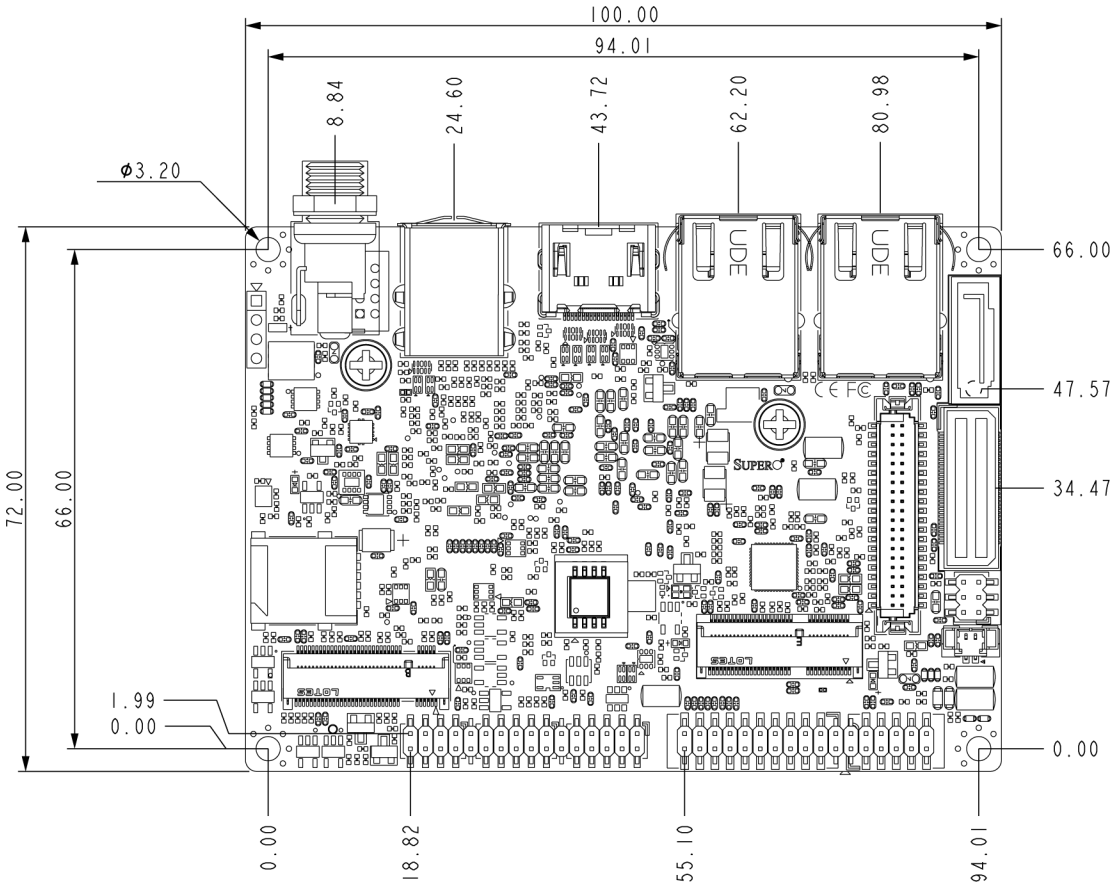


Figure 1-7. A4SAP-H Motherboard 2D Outline Drawing

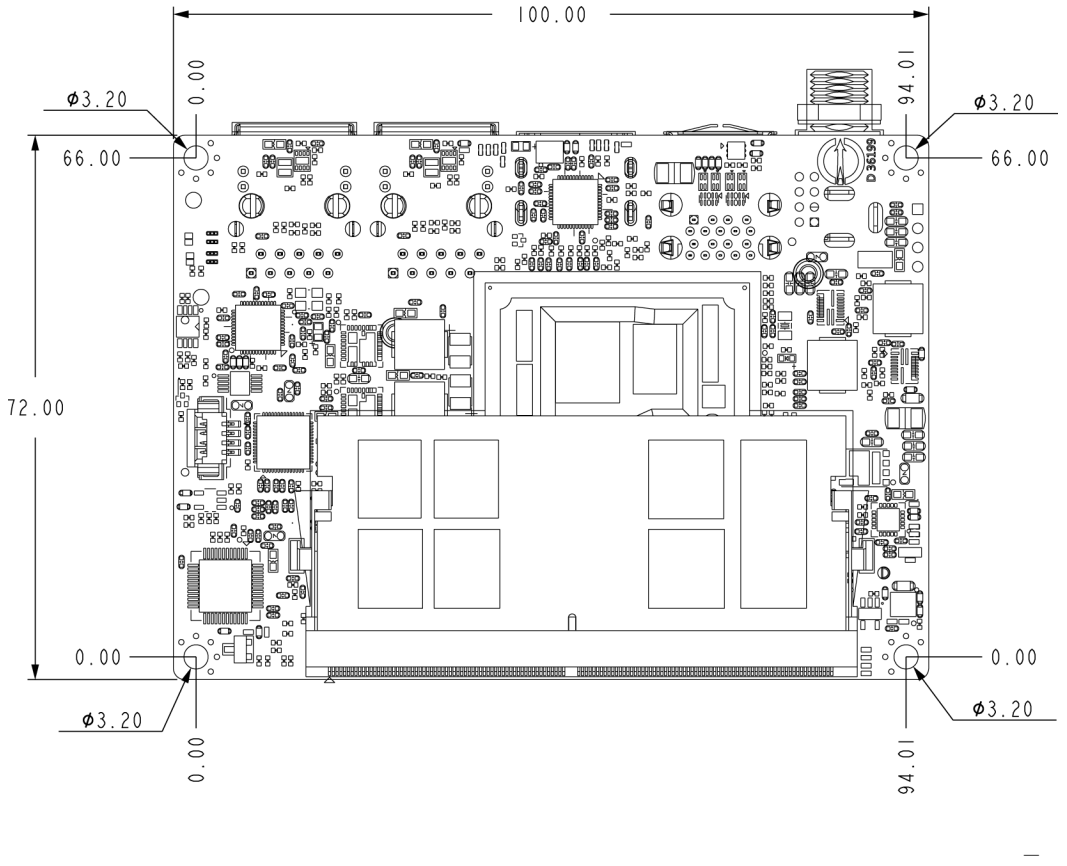


Figure 1-8. A4SAP-H Motherboard 2D Outline Drawing

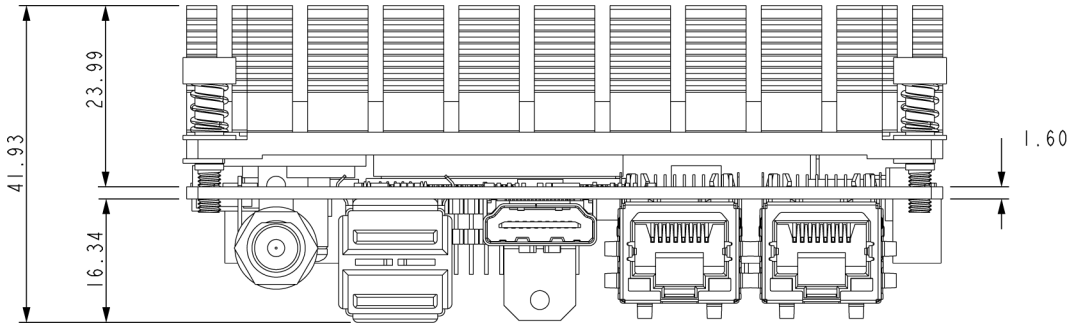


Figure 1-9. A4SAP-H Motherboard with Heatsink

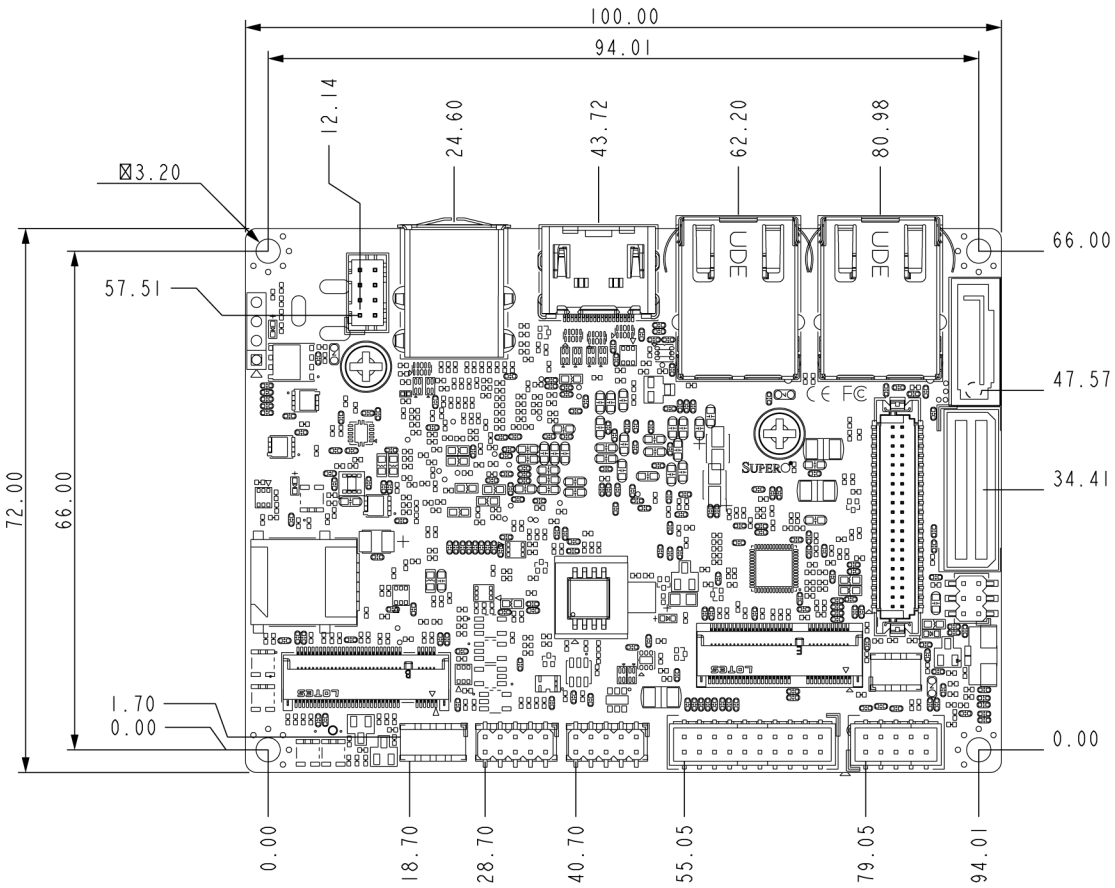


Figure 1-10. A4SAP-E/-L Motherboard 2D Outline Drawing

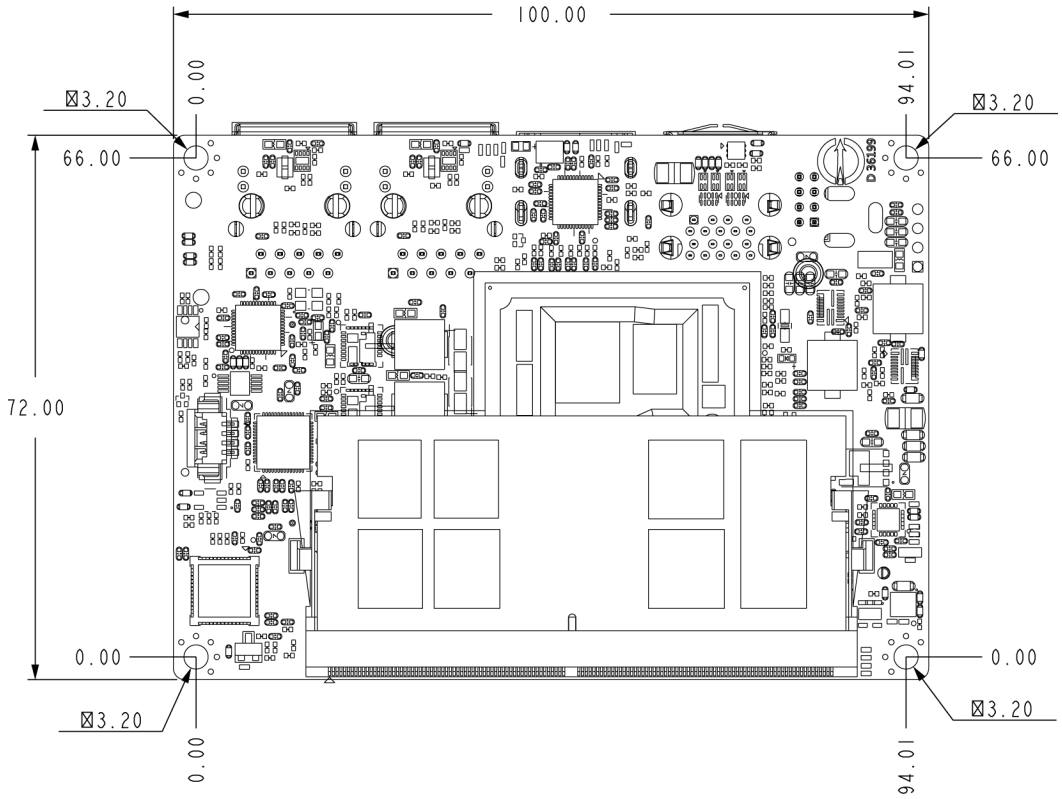


Figure 1-11. A4SAP-E/-L Motherboard 2D Outline Drawing

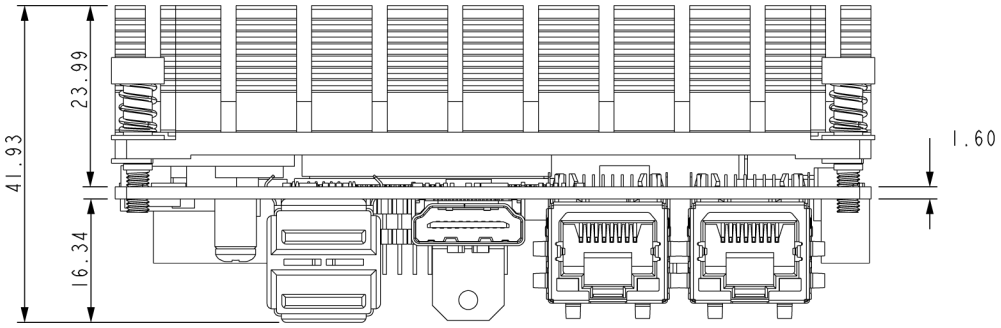


Figure 1-12. A4SAP-E/-L Motherboard with Heatsink

Notes:

- See "Component Installation" on page 28 for detailed information on jumpers, connectors, and LED indicators.
- "■" indicates the location of pin 1.
- Components not documented are for internal testing-purposes 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	Jumper Setting
JLCDPWR1	FORCE POWER ON	Pins 2–4 (FORCE POWER ON) Pins 4–6 (POWER BUTTON ON)
	LVDS VCC Power Selection	Pins 1–3 (+3.3 V) Pins 3–5 (+5 V)

Connector	Description
BT1	Battery Connector (to clear CMOS, remove the battery, short pins 1–2 for more than 30 seconds, and install the battery.)
CN1	Nano SIM Card Slot
I-SATA1	SATA 3.0 Port (A4SAP-E/-L only)
J3	Front Panel Audio Header (Line-out, Mic-in)
J6	USB 2.0 x2 Header
JCOM1	COM x2 Header
JDC1	+12 V DC Jack Power Connector (supports A4SAP-H only)
JEIO_1	Supermicro Extension I/O Header (DP/HDMI, one PCIe x1, two USB 2.0, eSPI, SATA (A4SAP-H only), SMBus, + 5 Vsb, +12 Vsb)
JF1	Front Control Panel Header
JGP1	General Purpose I/O Header
JHDMI1	High Definition Multimedia Interface (HDMI) Port
JLAN1, JLAN2	1G LAN Ports (A4SAP-E/-L) 2.5G LAN Ports (A4SAP-H)
JMD1	M.2 E-Key 2230 Slot (PCIe x1/USB 2.0)
JMP1	M.2 B-Key 2242/3042 Slot with Nano SIM (PCIe x1/SATA 3.0/USB 2.0/USB 3.2)
JPWR1	2x4-pin 12 V Power Connector (A4SAP-E/-L only)

Connector	Description
JSMBUS1	SMBus and 5 V/ 1 A SATA Power Box Header
JUSB1	Two USB 3.2 Ports
LVDS1	Dual Channel 48-bit LVDS Connector
MH1–MH4	Mounting Holes
SRW1, SRW2	M.2 Mounting Holes
32-Pin Connector A	Front panel, 8-bit GPIO and USB 2.0 x 2 (JF1 + JGP1 + J6) (A4SAP-H only)
34-Pin Connector B	RS232/422/485 x 2 and Audio (JCOM1 + J3) (A4SAP-H only)

Motherboard Features
CPU
• A4SAP-H/-L supports the Intel® Processor N97 • A4SAP-E supports the Intel® Atom™ Processor x7433RE
Memory
• Supports up to 16 GB of Non-ECC DDR5 SODIMM with speeds of up to 4800 MT/s in one memory slot
DIMM Size
• 16 GB
Expansion Slots
• One Nano SIM Slot • One M.2 B-Key 2242/3042 with Nano SIM support (PCIe x1/SATA 3.0/USB 2.0/USB 3.2) • One M.2 E-Key 2230 (PCIe x1/USB 2.0)
Network
• Dual Realtek RTL8125Bi 2.5 GbE RJ45 LAN Ports (A4SAP-H) • Dual Realtek RTL8111Ki 1 GbE RJ45 LAN Ports (A4SAP-E/-L)

Motherboard Features
Graphics
• Intel Gen12 UHD Graphics: up to 32 EUs, GFX SR-IOV, 4K at 60Hz, Open GL 4.6, DirectX 12.1, Vulkan 1.2, Mesa 3D, Open GL 4.6 • Hardware Accelerated Video Decode: MPEG2, WMV9 (VC1), AVC/H264, JPEG/MJPEG, HEVC/H265, VP9, AV1 • Hardware Accelerated Video Encode: MPEG2, AVC/H264, JPEG, HEVC/H265, VP9 • Display Interface: One HDMI 1.4b (resolution up to 4096 x 2160 at 24 Hz), LVDS (dual channel 48-bit, resolution up to 1920 x 1080 at 60 Hz)
I/O Devices
• One COM Header (supports two RS232/422/485 ports) • Two USB 3.2 Gen2 x1 Type-A ports and one USB Header (supports two USB 2.0 ports) • One SATA 3.0 Port (A4SAP-E/-L only) • One HD Audio Header with Line-out and Mic-in
BIOS
• 256 Mb SPI AMI BIOS® • ACPI 6.2, Plug and Play (PnP), SPI dual/quad speed support, Real Time Clock (RTC) wakeup
Power Management
• ACPI Power Management • S3, S4, S5 • Power Button Override Mechanism • Power-on Mode for AC Power Recovery • Wake-on-LAN
System Health Monitoring
• Onboard voltage monitoring for +3.3 V, +12 V, +3.3 V Standby, +5 V Standby, Vcore, VDD2, Vbat, CPU Temperature, Peripheral Temperature, and System Temperature • CPU Thermal Trip
LED Indicators
• Power/Suspend-state Indicator LED • Power/HDD Activity LED (from JF1) • LAN Activity LED

Motherboard Features
Dimensions
• 3.9" x 2.8" (100 mm x 72 mm)
Environment
• Operating Temperature Range: A4SAP-H/-L supports 0°C to 60°C (32°F to 140°F) with passive heatsink and 1.0 (m/s) airflow A4SAP-E supports -40°C to 65°C (-40°F to 149°F) with passive heatsink and 1.0 (m/s) airflow • Non-Operating Temperature Range: -40°C to 85°C (-40°F to 185°F) • Operating Relative Humidity Range: 8% to 90% (non-condensing) • Non-Operating Relative Humidity Range: 10% to 95% (non-condensing)

System Block Diagram

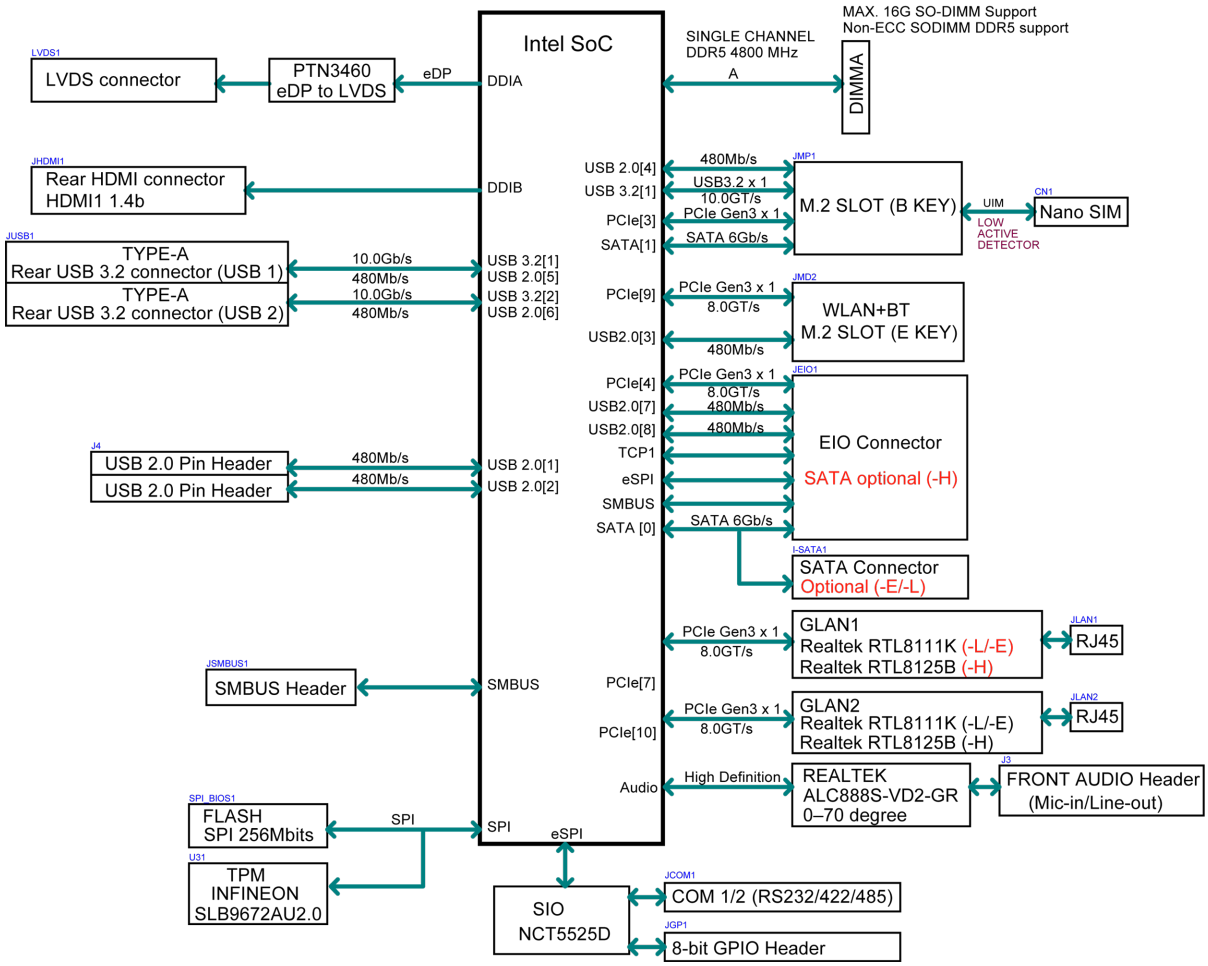


Figure 1-13. A4SAP System Block Diagram

A4SAP Series Specification Chart

Model	A4SAP-E	A4SAP-L	A4SAP-H
CPU	X7433RE QC	N97 QC	
Turbo Frequency	3.4 GHz	3.6 GHz	
CPU TDP	9 W	12 W	
Function	One HDMI 1.4B One 48-bit LVDS Two 1 GbE LAN Port Two USB 3.2 Gen2 x1 Two USB 2.0 Two COM RS232/422/485 One 8-bit GPIO One Line-out/Mic-in One SATA (6 Gb/s)		One HDMI 1.4B One 48-bit LVDS Two 2.5 GbE LAN Ports Two USB 3.2 Gen2 x1 32-pin Connector A: two USB 2.0 and one 8-bit GPIO 34-pin Connector B: two COM RS232/422/485 One Line-out/Mic-in One SATA (6 Gb/s) from EI/O
Power Connector	2x4P Box Header		DC Jack
JEIO_1	No		Yes
Temperature	-40°C to 65°C	0°C to 60°C	
Thermal Solution	Passive 25 mm		

1.2 Special Features

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 Advanced Setup Configurations under "UEFI BIOS" on page 64 for this setting. The default setting is **Last State**.

1.3 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, 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 IoT Enterprise (LTSC).

Chapter 2:

Component Installation

This chapter provides instructions on installing and replacing main system components for the A4SAP-H/-E/-L motherboard. To prevent compatibility issues, only use components that match the specifications and/or part numbers given.

Installation or replacement of most components require that power first be removed from the system. Follow the procedures given in each section.

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2.1 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the motherboard 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 computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners, and the motherboard.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid 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.

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.

Tools Needed

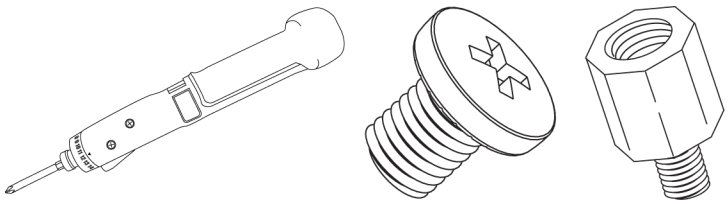


Figure 2-1. Torque Driver (1), Phillips Screws (4), Standoffs (4, only if needed)

Notes:

- To avoid damaging the motherboard and its components, do not use a force greater than 8 lbf-in on each mounting screw during motherboard installation.
- Some components are very close to the mounting holes. Take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Installing the Motherboard

1. Locate the mounting holes on the motherboard.

   For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

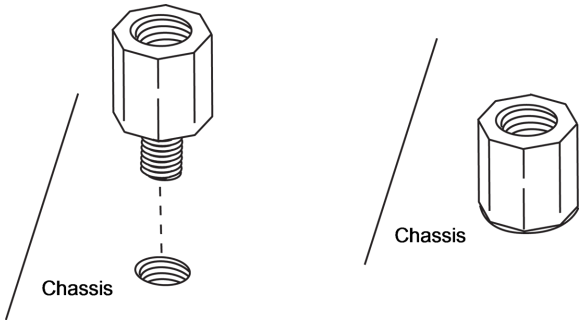


Figure 2-2. Locate the Mounting Holes

2. Install the standoffs in the chassis.
3. Install the memory.
4. After the memory installation is complete, install the heatsink.

5. The thermal solution kit that comes with the motherboard includes one heatsink with thermal grease and four copper standoffs that are 19 mm in height. The copper standoff type is determined by the customer's chassis design. The copper standoffs that are 19 mm in height are recommended only.
6. To install the heatsink, remove the plastic cover on the bottom of the heatsink to expose the thermal grease. Then place the heatsink on the CPU and make sure the thermal grease is in contact with the CPU.
7. Turn the motherboard over and tighten the standoffs on the chassis with the corresponding screws by using a Torque driver. Install the motherboard into the chassis carefully to avoid damaging other motherboard components.

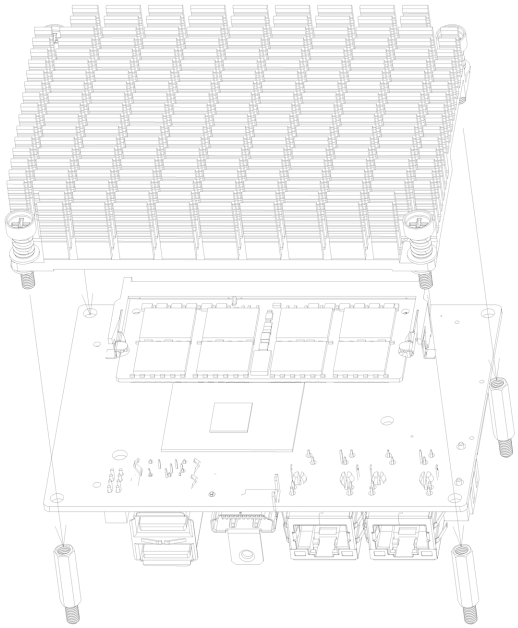


Figure 2-3. Heatsink Installation

Note: Images displayed are for illustration only. The components installed in your system may or may not look exactly the same as the graphics shown in the manual.

2.2 Memory Support and Installation

Warning! Exercise extreme care when installing or removing memory modules to prevent any damage.

Avertissement! Soyez extrêmement prudent lors de l'installation ou du retrait des modules de mémoire pour éviter tout dommage.

Note: Check the Supermicro website for recommended memory modules.

Memory Support

Note: Check the Supermicro website for recommended memory modules.

Warning! Exercise extreme care when installing or removing memory modules to prevent any damage.

The A4SAP-H/-E/-L motherboard supports up to 16 GB of Non-ECC DDR5 SODIMM memory with speeds of up to 4800 MT/s in one slot.

SODIMM Installation

1. Position the SO-DIMM module's key so it aligns with the receptive point on the slot.

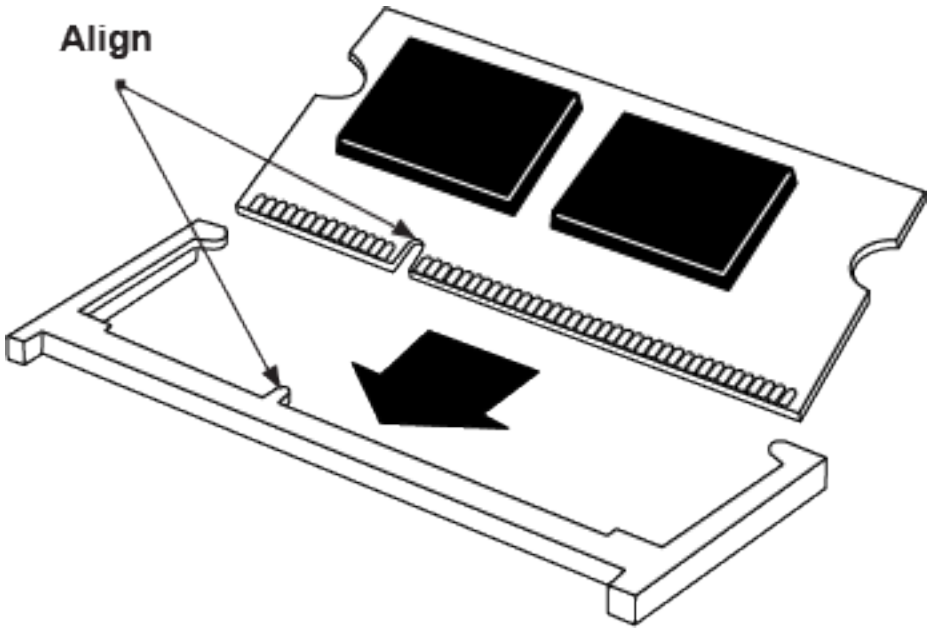


Figure 2-4. Insert the SO-DIMM

2. Insert the SO-DIMM module vertically at about a 45 degree angle. Press down until the module locks into place.

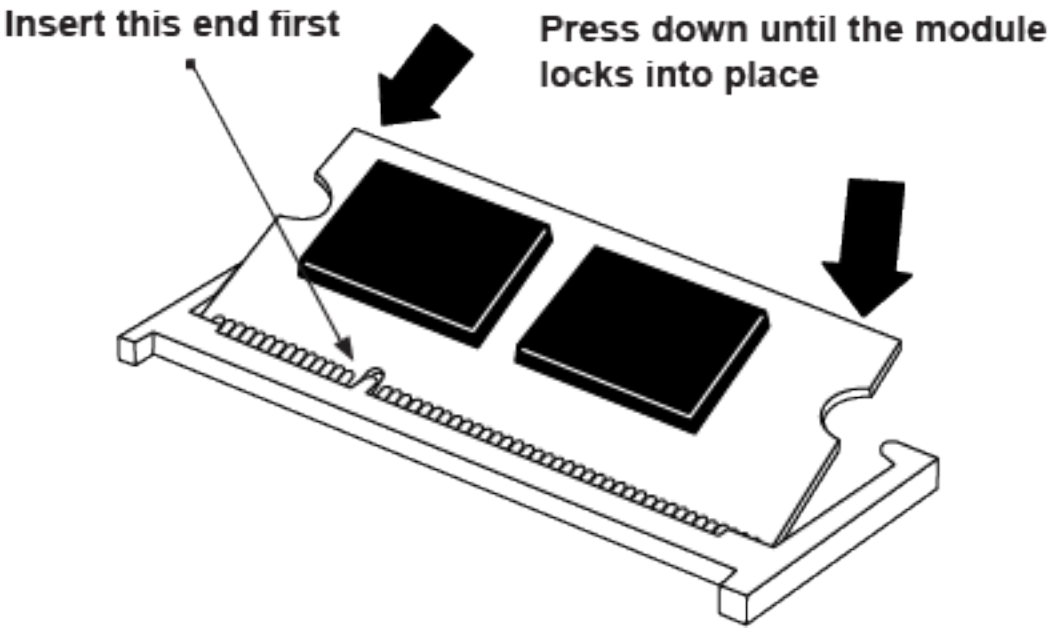


Figure 2-5. Insert at a 45 degree angle

3. The side clips will automatically secure the SO-DIMM module, locking it into place.

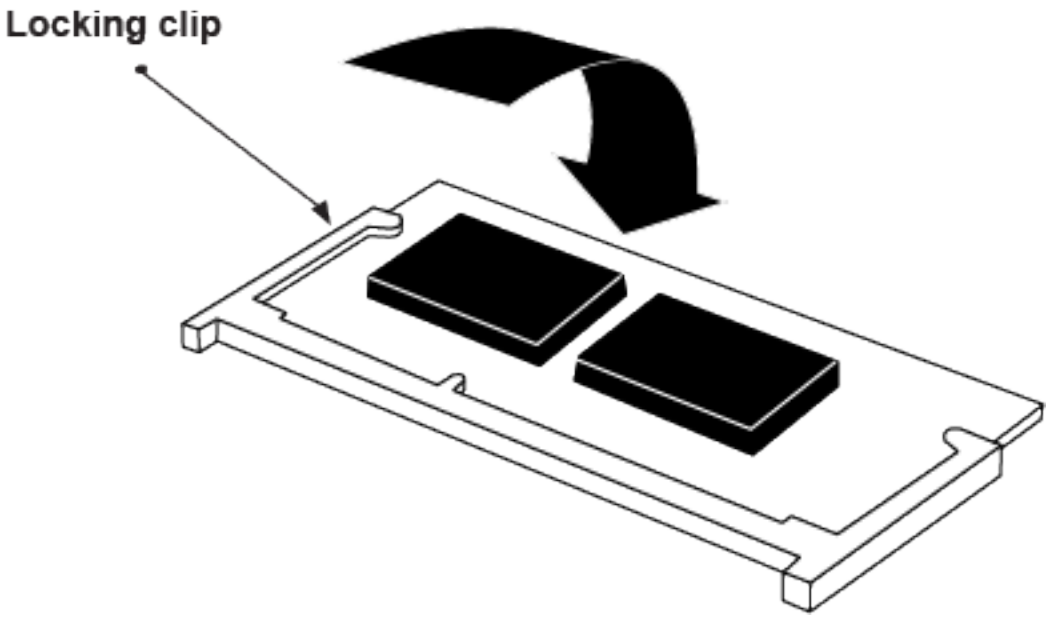


Figure 2-6. Secure the SO-DIMM

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Warning! Do not use excessive force when pressing the release tabs on the ends of the DIMM socket to avoid causing any damage to the memory module or the DIMM socket. Handle memory modules with care. Carefully follow all the instructions given in "Static-Sensitive Devices" on page 30 to avoid ESD-related damages done to your memory modules or components.

Avertissement! N'exercez pas de force excessive lorsque vous appuyez sur les languettes de dégagement situées aux extrémités du support DIMM afin d'éviter d'endommager le module de mémoire ou le support DIMM. Manipulez les modules de mémoire avec précaution. Suivez attentivement toutes les instructions fournies dans « Static-Sensitive Devices » en page 30 afin d'éviter tout dommage lié aux décharges électrostatiques sur les modules ou composants de mémoire.

SODIMM Removal

Push the side clips at the end of the slot to release the SO-DIMM module. Pull the SO-DIMM module up to remove it from the slot.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

2.3 Battery Removal and Installation

Battery Removal

To remove the battery, follow the steps below:

1. Power off your system and unplug your power cable.
2. Remove the battery cable at the BT1 connector on the board.
3. Remove the battery.

Proper Battery Disposal



Warning! 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. Comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.



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

Battery Installation

To install the battery, follow steps 1 and 2 above and continue below:

1. Connect the battery cable into the battery connector (BT1) and push it down until you hear a click to ensure that the cable is securely locked.
2. Use the foam tape on the back side of the battery to secure it to a flat surface on the bottom of the motherboard or a proper location in the system. Do not place the battery on the heatsink.



2.4 I/O Ports

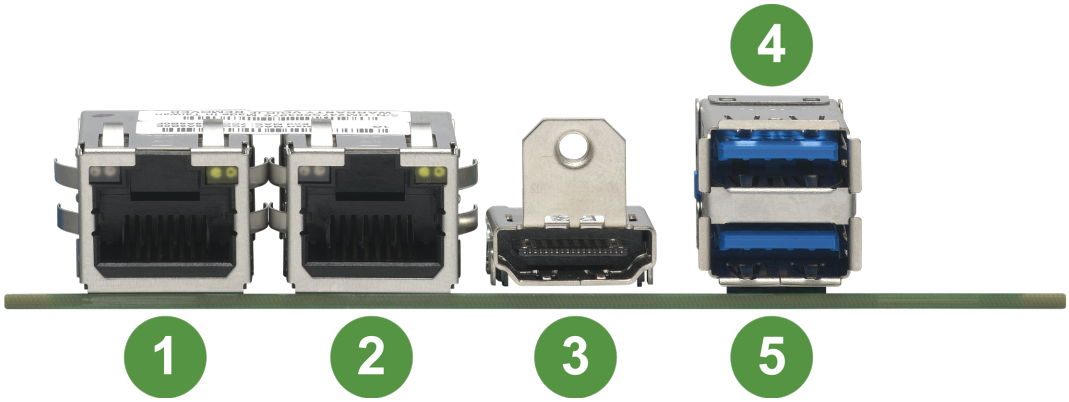


Figure 2-7. A4SAP-E/-L I/O Ports

I/O Ports			
#	Description	#	Description
1	LAN1	4	USB2 (3.2)
2	LAN2	5	USB1 (3.2)
3	HDMI		

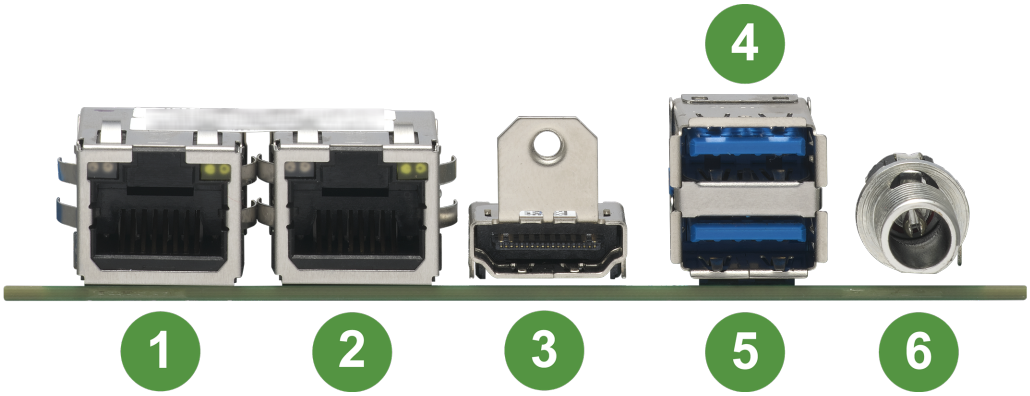


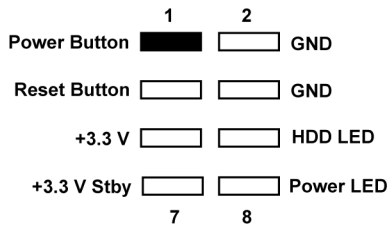
Figure 2-8. A4SAP-H I/O Ports

I/O Ports			
#	Description	#	Description
1	LAN1	4	USB2 (3.2)
2	LAN2	5	USB1 (3.2)
3	HDMI	6	DC Jack

2.5 Front Control Panel

JF1 on the A4SAP-H/-E/-L motherboard 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 the Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.



Power Button

The Power Button connection is located on pins 1 and 2 of JF1 on the A4SAP-H/-E/-L motherboard. 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). To turn off the power when the system is in suspend mode, press the button for four seconds or longer.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

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

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 on the A4SAP-H/-E/-L motherboard. Attach it to a hardware reset switch on the computer case to reset the system.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Reset Button Pin Definitions (JF1)	
Pin#	**Definition**
3	Reset
4	GND

HDD LED

The HDD LED connection is located on pins 5 and 6 of JF1 on the A4SAP-H/-E/-L motherboard.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

HDD LED Pin Definitions (JF1)	
Pin#	**Definition**
5	+3.3 V
6	HDD LED

Power LED

The Power LED connection is located on pins 7 and 8 of JF1 on the A4SAP-H/-E/-L motherboard.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Power LED Pin Definitions (JF1)	
Pin#	**Definition**
7	+3.3 V Stby
8	PWR LED

2.6 Connections

Power Connections

12 V DC Jack Power Connector

JDC1 is the 12 V DC power connector.

Headers

CMOS Battery

BT1 is a 2-pin header for an external battery. This connector is also used to clear the CMOS. To clear the CMOS, remove the battery, short pins 1–2 for more than 10 seconds and then install the battery.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

CMOS Battery Pin Definitions	
Pin#	**Description**
1	P3V_BATTERY
2	GND

COM Header

The motherboard has one COM header (JCOM1) on the motherboard.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

COM Header Pin Definitions: 19 Total			
Pin#	**RS232**	**RS422/485**	**RS485**
1	SP_DCD1	TX-1	Data-1
2	SP_DSR1		
3	SP_RXD1	TX+1	Data+1
4	SP_RTS1		
5	SP_TXD1	RX+1	

COM Header Pin Definitions: 19 Total			
Pin#	**RS232**	**RS422/485**	**RS485**
6	SP_CTS1		
7	SP_DTR1	RX-1	
8	SP_R11		
9	GND		
10	No Connection		
11	SP_DCD2	TX-2	Data-2
12	SP_DSR2		
13	SP_RXD2	TX+2	Data+2
14	SP_DTS2		
15	SP_TXD2	RX+2	
16	SP_CTS2		
17	SP_DTR2	RX-2	
18	SP_RI2		
19	SP_GND		

Extended I/O Header

The extended I/O header at JEIO_1 provides flexibility support for the following functions: DP/HDMI, one PCIe 3.0 x1, two USB 2.0, eSPI, SATA, SMBus, and Power, so that it allows you to make your own I/O module to fit different kinds of vertical market I/O demands.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Extended I/O Pin Definitions: Total 60				
Pin#	**Definition**		**Pin#**	**Definition**
1	No Connection		2	No Connection
3	No Connection		4	No Connection
5	GND		6	GND
7	PCIe_EIO_RX_DP1		8	PCIe_EIO_TX_DP1
9	PCIe_EIO_RX_DN1		10	PCIe_EIO_TX_DN1

Extended I/O Pin Definitions: Total 60				
Pin#	**Definition**		**Pin#**	**Definition**
11	GND		12	GND
13	CLK_100M_EIO_DP		14	USB_P7_DP
15	CLK_100M_EIO_DN		16	USB_P7_DN
17	GND		18	USB_P8_DP
19	DDI1_TXP0		20	USB_P8_DN
21	DDI1_TXN0		22	GND
23	GND		24	DDI1_TXP3
25	DDI1_TXP1		26	DDI1_TXN3
27	DDI1_TXN1		28	GND
29	GND		30	DDI_HPD
31	DDI1_TXP2		32	SOC_WAKE_EIO_N
33	DDI1_TXN2		34	DDI1_DDC_P1V8_DAT
35	GND		36	DDI1_DDC_P1V8_CLK
37	DDI1_AUXP		38	SOC_SMB_CLK
39	DDI1_AUXN		40	SOC_SMB_DAT
41	P5VSB		42	P3VSB
43	P5VSB		44	ESPI_CS#
45	P12VSB		46	ESPI_IO3
47	ESPI_CLK		48	ESPI_IO2
49	PLTRST#		50	ESPI_IO1
51	ESPI_ALERT0#		52	ESPI_IO0
53	P3V3		54	P5V
55	PS_ON_N		56	GND
57	EIO_SATA_TXP0		58	EIO_SATA_RXP0
59	EIO_SATA_TXN0		60	EIO_SATA_RXN0

Front Panel Audio Header

A 10-pin front panel audio header located at J3 on the motherboard allows you to use the onboard sound for audio playback. Connect an audio cable to the header to use this feature.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Audio Header Pin Definitions: Total 10			
Pin#	**Definition**	**Pin#**	**Definition**
1	Microphone_Left	2	Audio_Ground
3	Microphone__Right	4	Audio_Detect
5	Line_2_Right	6	GND
7	Jack_Detect	8	Key
9	Line_2_Left	10	GND

General Purpose Header

The General Purpose Input/Output header (JGP1) is an 8-bit general purpose I/O expander on a pin header via the SMBus. The base address is 0xF040.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

GPIO Header Pin Defintions: Total 10			
Pin#	**Definition**	**Pin#**	**Definition**
1	P3V3SB	2	GND
3	GP_P3V3_GP0	4	GP_P3V3_GP4
5	GP_P3V3_GP1	6	GP_P3V3_GP5
7	GP_P3V3_GP2	8	GP_P3V3_GP6
9	GP_P3V3_GP3	10	GP_P3V3_GP7

HDMI Port

One High Definition Multimedia Interface (HDMI) port is on the rear I/O panel. This connector is used to display both high definition and digital sound through an HDMI-capable display.

LVDS Connector

The Low Voltage Differential Signaling (LVDS) connector at LVDS1 is a high-speed digital interface that operates at low power. It is a type of connection that is used with a LVDS LCD panel. The connector combines LCD VCC power (pins 9–10), LVDS high speed digital interface, backlight power +3.3 V (pin 7) and +12 V (pins 1–5), backlight enable (pin 15), and

dimming control (pin 13). Select the correct LCD VCC power according to the LCD specification by JLCDPWR1 (short pins 1–3 for +3.3 V, short pins 3–5 for +5 V) before enabling the LVDS panel. To choose the LCD VCC power, short JLCDPWR1 pins 1–3 for +3.3 V or short pins 3–5 for +5 V. Refer to the table below for vendor part number, mating, and crimping contact connector information before making the LVDS/backlight cable.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

LVDS Connector			
Connector	**Vendor**	**Manufacture P/N**	**Description**
Onboard LVDS Connector	HIROSE	DF13E-40DP-1.25 V (52)	BOX HEADER, BOARD TO WIRE, 2X20, PITCH 1.25 MM, VERT, 1 A/PIN, WHITE, 0.2 UM GOLD, PA9T, MATING HEIGHT 5.8 MM
Mating Connector	HIROSE	DF13-40DS-1.25 C	Headers and Wire Housings 1.25 MM RECEPT HSNG 40P DUAL ROW CRIMP
Crimping Contact Connector	HIROSE	DF13G-2630SCFA	Headers and Wire Housings SOCKET CONTACT/REEL AWG26–30

LVDS Connector Pin Defintions: Total 40			
Pin#	**Definition**	**Pin#**	**Definition**
39	GND	40	GND
37	LVDSB D3N	38	LVDSB D3P
35	LVDSB CLKN	36	LVDSB CLKP
33	LVDSB D2N	34	LVDSB D2P
31	LVDSB D1N	32	LVDSB D1P
29	LVDSB D0N	30	LVDSB D0P
27	GND	28	GND
25	LVDSA D3N	26	LVDSA D3P
23	LVDSA CLKN	24	LVDSA CLKP
21	LVDSA D2N	22	LVDSA D2P
19	LVDSA D1N	20	LVDSA D1P
17	LVDSA D0N	18	LVDSA D0P

LVDS Connector Pin Defintions: Total 40			
Pin#	**Definition**	**Pin#**	**Definition**
15	BKLTEN	16	GND
13	BKLTCLT	14	PVCCEN
11	DDC CLK	12	DDC DATA
9	LCDVCC	10	LCDVCC
7	+5 V	8	GND
5	+12 V	6	GND
3	+12 V	4	+12 V
1	+12 V	2	+12 V

M.2 Slots

Two M.2 slots are located JMP1 (M.2 B-Key) and JMD1 (M.2 E-Key) on the A4SAP-H/-E/-L motherboard. M.2 was formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 B-Key slot supports PCIe x1/SATA 3.0/USB 2.0/USB 3.2 devices in a 2242/3042 form factor. The M.2 E-Key slot supports PCIe x1/USB 2.0 devices in a 2230 form factor.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Nano SIM Card Slot

The CN1 slot supports a Nano SIM card.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

SATA Port

The motherboard has one SATA 3.0 port at I-SATA1.

System Management Bus Header and SATA Power

A System Management Bus header for additional slave devices or sensors is located at JMBUS1. This header also serves as a +5 V/1 A SATA power box header.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

SMBus Header Pin Definitions	
Pin #	**Definition**
1	SMB_CLK
2	SMB_DATA
3	GND
4	P5V

USB Header

The motherboard has one front-accessible USB 2.0 header at J6. The onboard header provides front-side access with a cable.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

USB 2.0 Header Pin Definitions: Total 10			
Pin#	**Definition**	**Pin#**	**Definition**
1	+5 V	2	+5 V
3	USB_N	4	USB_N
5	USB_P	6	USB_P
7	GND	8	GND
9	Key	10	NC

USB 3.2 Port

There are two USB 3.2 ports in the rear I/O panel.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

Back Panel USB 3.2 Gen 1 Pin Definitions: Total 18			
Pin#	**Definition**	**Pin#**	**Definition**
A1	VBUS	B1	VBUS
A2	USB_N	B2	USB_N
A3	USB_P	B3	USB_P

Back Panel USB 3.2 Gen 1 Pin Definitions: Total 18			
Pin#	**Definition**	**Pin#**	**Definition**
A4	GND	B4	GND
A5	Stda_SSRX-	B5	Stda_SSRX-
A6	Stda_SSRX+	B6	Stda_SSRX+
A7	GND	B7	GND
A8	Stda_SSTX-	B8	Stda_SSTX-
A9	Stda_SSTX+	B9	Stda_SSTX+

32-Pin Connector A

The A4SAP-H combines JF1, JGP1 and J6 into a 32-pin, 2.0 mm pitch pin header, including the front panel (power/HDD LED, power/reset button), 8-bit GPIO, and two USB 2.0 connections. Refer to the table below for pin definitions and the female mating connector information. The distance between the board-to-board stack is 11 mm in height while using the male pin header (PINREX P/N:225-97-16GBEW) to stack onto the female mating connector (PINREX P/N: 620-92-16GB00).

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

32-Pin Connector A				
Connector	**P/N**	**Vendor**	**Manufacture P/N**	**Description**
Male Pin Header on A4SAP-H	HDR-0208L-0000-PRX	PINREX	225-97-16GBEW	CNT, PIN/HEADER, 2X16 PIN, PITCH 2 MM, VERT, 1 A/PIN, BLACK, GF, NY6T, SMD, CM (-30–75C), ROHS
Female Mating Connector	HDR-0210L-0000-PRX	PINREX	620-92-16GB00	CNT, PIN FEMALE HEADER, 2X16 PIN, PITCH 2 MM, VERT, 1 A/PIN, BLACK, GF, TL2.3 MM, NY6T, DIP, EX (-40–105C), ROHS

32-Pin Connector A Pin Definitions: 32 Total						
Function	**Pin#**	**Silkscreen Pin#**	**Definition**	**Pin#**	**Silkscreen Pin#**	**Definition**
Two USB 2.0 (J6: USB0/1)	1	1	P5V_DUAL_F	2	2	P5V_DUAL_F
	3	3	USBCON_N0	4	4	USBCON_N1
	5	5	USBCON_P0	6	6	USBCON_P1
	7	7	GND	8	8	GND
	9	9	N/A	10	10	N/A
N/A	11	N/A	N/A	12	N/A	N/A
8-bit GPIO (JGP1)	13	1	P3V3SB	14	2	GND
	15	3	GPIO_1	16	4	GPIO_5
	17	5	GPIO_2	18	6	GPIO_6
	19	7	GPIO_3	20	8	GPIO_7
	21	9	GPIO_4	22	10	GPIO_8
N/A	23	N/A	N/A	24	N/A	N/A
Front Panel (JF1)	25	1	Power Button	26	2	GND
	27	3	Reset Button	28	4	GND
	29	5	3.3 V	30	6	SATA HDD LED
	31	7	3.3 Vstby	32	8	PWR LED

34-Pin Connector B

The A4SAP-H combines JCOM1 and J3 into a 34-pin, 2.0 mm pitch pin header, including two RS-232/422/485 connections and an audio (Mic-in/Headphone-out) connection. Refer to the table below for pin definitions and the female mating connector information. The distance between board-to-board stack is 11 mm in height while using male pin header (PINREX P/N:225-97-17GBEW) to stack onto female mating connector (PINREX P/N:620-92-17GB00).

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

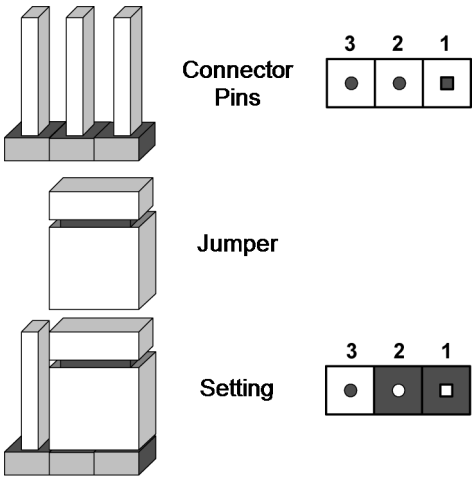
34-Pin Connector B				
Connector	**P/N**	**Vendor**	**Manufacture P/N**	**Description**
Male Pin Header on A4SAP-H	HDR-0209L-0000-PRX	PINREX	225-97-17GBEW	CNT, PIN/HEADER, 2X17 PIN, PITCH 2 MM, VERT, 1 A/PIN, BLACK, GF, NY6T, SMD, CM (-30–75C), ROHS
Female Mating Connector	HDR-0211L-0000-PRX	PINREX	620-92-17GB00	CNT, PIN FEMALE HEADER, 2X17 PIN, PITCH 2 MM, VERT, 1 A/PIN, BLACK, GF, TL2.3 MM, NY6T, DIP, EX (-40–105C), ROHS

34-Pin Connector B Pin Definitions: 34 Total						
Function	**Pin#**	**Silk screen Pin#**	**Definition**	**Pin#**	**Silk screen Pin#**	**Defini-tion**
AUDIO (J3: Audio FP)	1	10	LINE2_JD	2	9	LINE2_Left
	3	8	NC	4	7	Front AUDIO_LD
	5	6	MIC2_JD	6	5	LINE2_Right
	7	4	AUDIO_Detect	8	3	MIC_Right
	9	2	AUDIO_GND	10	1	MIC_Left
N/A	11	N/A	N/A	12	N/A	N/A
N/A	13	N/A	N/A	14	N/A	N/A

34-Pin Connector B Pin Definitions: 34 Total						
Function	**Pin#**	**Silk screen Pin#**	**Definition**	**Pin#**	**Silk screen Pin#**	**Defini-tion**
Two RS-232/ 422/485 (JCOM1: COM1/ COM2)	15	1	DCD, or one of the following: RS-485/422_COM1_TX- (Full Duplex) RS-485_COM1_Data- (Half Duplex)	16	2	DSR
	17	3	RXD, or one of the following: RS-485/422_COM1_TX- (Full Duplex) RS-485_COM1_Data- (Half Duplex)	18	4	RTS
	19	5	TXD, or: RS-485/422_COM1_RX+ (Full Duplex)	20	6	CTS
	21	7	DTR, or: RS-485/422_COM1_RX- (Full Duplex)	22	8	RI_N
	23	9	GND	24	10	N/A
	25	11	DCD, or one of the following: RS-485/422_COM2_TX- (Full Duplex) RS-485_COM2_Data- (Half Duplex)	26	12	DSR
	27	13	RXD, or one of the following: RS-485/422_COM2_TX+ (Full Duplex) RS-485_COM2_Data+ (Half Duplex)	28	14	RTS
	29	15	TXD, or: RS-485/422_COM2_RX+ (Full Duplex)	30	16	CTS
	31	17	DTR, or: RS-485/422_COM2_RX- (Full Duplex)	32	18	RI_N
	33	19	GND	34	20	N/A

Jumper Settings

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



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

LVDS VCC Power Source Selection

Use the JLCDPWR1 jumper to select the power voltage for the LVDS panel. Make sure that the specifications of the cable are compatible with the panel to prevent damage. Set the jumper to pins 1–3 for +3.3 V or pins 3–5 for +5 V. You can also use this jumper to select the FORCE POWER On function when the AC power cord is plugged in. When enabling force power on and AC power recovery, the system will boot up automatically without pressing the power button.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

LVDS VCC Power Source Selection Jumper Settings	
Jumper Settings	**Definition**
Pins 1–3	+3.3 V (Default)
Pins 3–5	+5 V

FORCE POWER ON Jumper Settings	
Jumper Settings	**Definition**
Pins 2–4	FORCE POWER ON (Default) (when the AC power cord is plugged)
Pins 4–6	POWER BUTTON ON (when the AC power is plugged)

2.7 LED Indicators

LAN Port LEDs

Two LAN ports (JLAN1, JLAN2) are located on the I/O panel of the A4SAP-H/-E/-L motherboard. Each LAN port has two LEDs. The green LED indicates activity, while the other Link LED may be green, yellow, or off to indicate the speed of the connection.

For a detailed diagram of the A4SAP-H/-E/-L motherboard, see the layout under "Quick Reference" on page 11.

LAN1/2 Link LED (Left) LED State	
LED Color	**Definition**
Solid Amber	1G (A4SAP-H)
Solid Green	2.5G (A4SAP-H)
Solid Amber	100M (A4SAP-E/-L)
Solid Green	1G (A4SAP-E/-L)

LAN1/2 Activity LED (Right) LED State		
Color	**Status**	**Definition**
Yellow	Flashing	Active

Chapter 3:

Troubleshooting

The following content contains information on common issues and how to resolve them.

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Losing the System's Setup Configuration 57
When the System Becomes Unstable 57
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3.3 Motherboard Battery **60**
3.4 Where to Get Replacement Components **61**
3.5 Returning Merchandise for Service **62**
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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" on page 59 or "Returning Merchandise for Service" on page 62 section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components. If the below steps do not fix the setup configuration problem, contact your vendor for repairs.

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install the processor (making sure it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that the power connectors are properly connected.
3. Check that the 115 V/230 V switch, if available, on the power supply is properly set.
4. Turn the power switch on and off to test the system, if applicable.
5. Check the processor socket for bent pins and make sure the processor is fully seated.
6. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you do not have video, remove all add-on cards and cables.
2. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory, or try a different one).

System Boot Failure

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

1. Check the screen for an error message.
2. Clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper. Restart the system. Refer to CMOS Clear.
3. Remove all components from the motherboard and turn on the system with only one DIMM installed. If the system boots, turn off the system and repopulate the components back into the system to retest. Add one component at a time to isolate which one may have caused the system boot issue.

Memory Errors

When suspecting faulty memory is causing the system issue, check the following:

1. Make sure that the memory modules are compatible with the system and are properly installed. See "Component Installation" on page 28 for installation instructions. (For memory compatibility, refer to the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.)
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of DIMMs recommended by the manufacturer.
4. Check for bad DIMMs or slots by swapping a single module among all memory slots and check the results.

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 "Introduction" on page 10 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one.

When the System Becomes Unstable

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

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

2. Memory support: Make sure that the memory modules are supported. Refer to the product page on our website at https://www.supermicro.com. Test the modules using memtest86 or a similar utility.

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

3. Storage Drive support: Make sure that all storage drives work properly. Replace the failed storage drives with good ones.
4. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to our website for more information on the minimum power requirements.
5. 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 a USB flash or media device.
2. Cable connection: Check to make sure that all cables are connected and working properly.
3. Use the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with the processor and a memory module installed) to identify the trouble areas. Refer to the steps listed above in this section for proper troubleshooting procedures.
4. Identify bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.
5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.
6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

3.2 Technical Support Procedures

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

1. Refer to Troubleshooting Procedures or see the FAQs on our website (https://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website (https://www.supermicro.com/support/resources/bios_ipmi.php).
3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (This can be seen on the initial display when your system first boots up.)
   - System configuration
4. An example of a Technical Support form is on our website at https://webpr3.supermicro.com/SupportPortal.
5. Distributors: For immediate assistance, have your account number ready when placing a call to our Technical Support department. For Supermicro contact information, refer to "Contacting Supermicro" on page 9.

3.3 Motherboard Battery

For information on removing, disposing of, and replacing the motherboard battery of your system, refer to Motherboard Battery Removal and Installation.

3.4 Where to Get Replacement Components

If you need replacement parts for your A4SAP-H/-E/-L motherboard, to ensure the highest level of professional service and technical support, purchase exclusively from our Supermicro Authorized Distributors/System Integrators/Resellers. A list can be found on the Supermicro website:

https://www.supermicro.com

Under the "Buy" menu, click the "Where to Buy" link.

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 the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is 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 can be requested online at the following page:

https://www.supermicro.com/RmaForm

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

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

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

3.6 Feedback

Supermicro values your feedback as we strive to improve our customer experience in all facets of our business. Email us at Techwriterteam@supermicro.com to provide feedback on our manuals.

Chapter 4:

UEFI BIOS

The following content contains information on BIOS configuration with the A4SAP-H/-E/-L motherboard.

4.1 Introduction **65**
4.2 Main Setup **67**
4.3 Advanced Setup Configurations **70**
4.4 Event Logs **106**
4.5 Thermal & Fan **108**
4.6 Security **110**
4.7 Boot **112**
4.8 Save & Exit **114**

4.1 Introduction

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

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

Updating BIOS



Warning! Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure! Read the motherboard README file carefully before you perform the BIOS update.



Avertissement! N'éteignez pas et ne réinitialisez pas le système pendant la mise à jour du BIOS afin d'éviter un éventuel échec de redémarrage du système ! Lisez attentivement le fichier *readme* de la carte mère avant d'effectuer la mise à jour du BIOS.

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 the following page:

https://www.supermicro.com/support/resources/bios_ipmi.php

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.

Unzip the BIOS file onto a bootable USB device and then boot into the built-in UEFI Shell and type "flash.nsh <BIOS filename>" to start the BIOS update. The flash script will invoke the (EFI) tool automatically to perform the BIOS update. After uploading the firmware, the system will reboot to continue the process. The process will take 3–5 minutes.

Starting the Setup Utility

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

this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message 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 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

The Main setup screen appears when the AMI BIOS Setup utility is first entered. To return to the Main setup screen, select the Main tab at the top of the screen. The Main BIOS setup screen is shown below.



Figure 4-1. Main Setup

System Date/System Time

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

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

Supermicro A4SAP-H

BIOS Version

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

Build Date

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

Memory Information

Total Memory

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

4.3 Advanced Setup Configurations

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

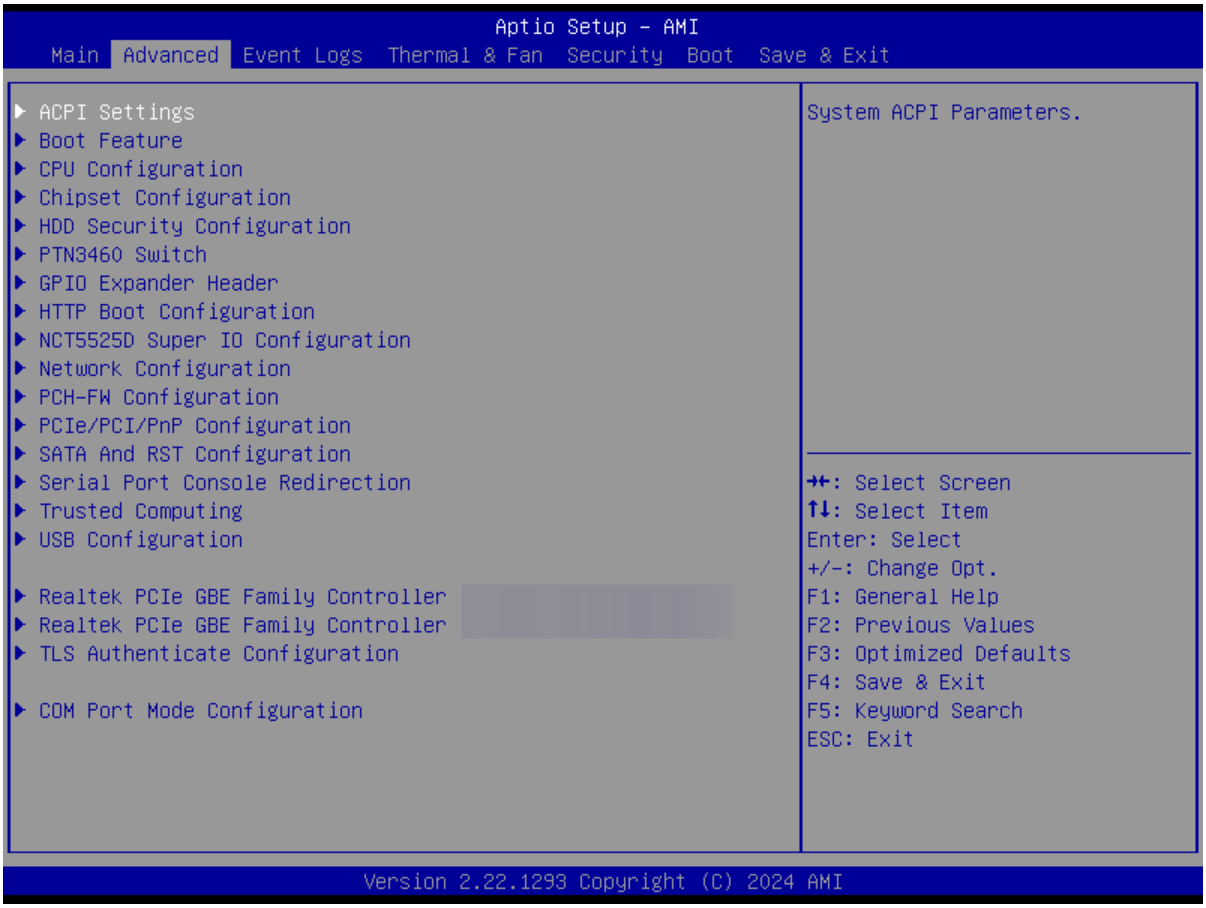


Figure 4-2. Advanced Setup Configurations

Warning! Use caution when changing the Advanced settings. An incorrect value, an improper DRAM frequency, or a wrong BIOS timing setting may cause the system to malfunction. When this occurs, revert the setting to the manufacture default settings.

Avertissement! Soyez prudent lorsque vous modifiez les paramètres avancés. Une valeur incorrecte, une fréquence de mémoire vive dynamique non conforme ou un mauvais réglage de synchronisation du BIOS peuvent entraîner un dysfonctionnement du système. Dans ce cas, rétablissez les paramètres de valeur par défaut du fabricant.

ACPI Settings Menu

►ACPI Settings

ACPI Sleep State

Use this feature to select the ACPI Sleep State that the system will enter into when the suspend button is activated. The options are Suspend Disabled and **S3 (Suspend to RAM)**.

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 Event Timer

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

Native PCIe Enable

Enable this feature to grant control of PCI Express Native hot plug, PCI Express Power Management Events, and PCI Express Capability Structure Control. The options are Disabled and **Enabled**.

Native ASPM

Select Enabled for the operating system to control the ASPM, or Disabled for the BIOS to control the ASPM. The options are Auto, Enabled, and **Disabled**.

Smart Battery Support

Use this feature to enable or disable the BIOS Smart Battery polling. The options are **Disabled** and Enabled.

Wake System From S5

Use this feature to enable or disable the system wake on an alarm event. If enabled, the system will wake on the time specified. The options are **Disabled** and Enabled

Boot Feature Menu

►Boot Feature

Fast Boot

Enable this feature to reduce the time the computer takes to boot up. The computer will boot with a minimal set of required devices. This feature does not have an effect on BBS boot options in the Boot tab. The options are Disabled and **Enabled**.

Quiet Boot

Use this feature to select the screen between displaying the Power-on Self Test (POST) messages or the OEM logo upon bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Disabled and **Enabled**.

Note: BIOS POST messages are always displayed regardless of the setting of this feature.

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.

Re-try Boot

If this feature is set to Enabled, the system BIOS will automatically reboot the system from an Extensible Firmware Interface (EFI) boot device after an initial boot failure. 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 five minutes. The options are **Disabled** and Enabled.

Restore on AC Power Loss

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

Power Button Function

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

DeepSx Power Policies

Use this feature to configure the Advanced Configuration and Power Interface (ACPI) settings for the system. Enable S4 to use Hibernation mode (Suspend to Disk) so that all data stored in the main memory can be saved in a non-volatile memory area such as in a hard drive and then power down the system. Enable S5 to power off the whole system except the power supply unit (PSU) and keep the power button alive so that you can wake up the system by using a USB keyboard or mouse. The options are **Disabled**, Enabled In S4-S5, and Enabled in S5.

CPU Configuration Menu

►CPU Configuration

Warning! Setting the wrong values for the features included in the following sections may cause the system to malfunction.

The following processor information is displayed.

- Processor Model
- CPU Signature
- Microcode Patch
- Max CPU Speed
- Min CPU Speed
- CPU Speed
- Number of Performance-cores
- Number of Efficient-cores
- Hyper Threading Technology
- VMX
- SMX/TXT
- 64-bit

- EIST Technology
- CPU C3 state
- CPU C6 state

  CPU C7 state
- CPU C8 state
- CPU C9 state
- CPU C10 state
- Performance L1 Data Cache
- Performance L1 Instruction Cache
- Performance L2 Cache
- Performance L3 Cache
- Efficient L1 Data Cache
- Efficient L1 Instruction Cache
- Efficient L2 Cache
- Efficient L3 Cache

C6DRAM

Use this feature to enable or disable the moving of DRAM contents to PRM memory when the CPU is in the C6 state. The options are Disabled and **Enabled**.

Hardware Prefetcher

If this feature is set to Enabled, the hardware prefetcher will prefetch data from the main system memory to Level 2 cache to help expedite data transaction to enhance memory performance. The options are **Enabled** and Disabled.

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

Adjacent Cache Line Prefetch

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

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

Intel (VMX) Virtualization Technology

Select Enabled to enable the Intel Vanderpool Technology for Virtualization platform support, which allows multiple operating systems to run simultaneously on the same computer to maximize system resources for performance enhancement. The options are Disabled and **Enabled**. Changes take effect after you save settings and reboot the system.

Notes:

- This feature is NOT available when "TXT Support" is set to Enabled.
- This feature is NOT available when "Workload Profile" is set to Virtualization, Telco NFVI, Telco NFVI-FP, or Telco FlexRAN.

Active Efficient-cores

This feature determines how many efficient cores will be activated for each processor package. When all is selected, all cores in the processor will be activated. The options are **All**, 3, 2, 1, and 0.

Boot Performance Mode

This feature allows you to select the performance state that the BIOS will set before the operating system handoff. The options are **Max Non-Turbo Performance** and Turbo Performance.

Intel® SpeedStep™

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

Intel® Speed Shift Technology

Use this feature to enable or disable Intel Speed Shift Technology support. When this feature is enabled, the Collaborative Processor Performance Control (CPPC) version 2 interface will be available to control CPU P-States. The options are Disabled and **Enabled**.

Turbo Mode (Available when "SpeedStep (P-States)" is set to Enabled and when "Workload Profile" is set to Disabled)

Select Enabled to allow the CPU to operate at the manufacturer-defined turbo speed by increasing CPU clock frequency. This feature is available when it is supported by the processors used in the system. The options are Disabled and **Enabled**.

Power Limit 1 Override

Select Enabled to support average power limit (PL1) override. The options are **Disabled** and Enabled.

Power Limit 1

Use this feature to configure the value for Power Limit 1. The value is in milliwatts, and the step size is 125 mW. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting. If the value is 0, the BIOS will set PL2 as 1.25* TDP.

Power Limit 1 Time Window

This feature determines how long the time window over which the TDP value is maintained. Use the number key on your keyboard to enter the value. The default setting is **8**. This value can be between 0–128.

Power Limit 2 Override

Select Enabled to support rapid power limit (PL2) override. The options are Disabled and **Enabled**.

Power Limit 2

Use this feature to configure the value for Power Limit 2. The value is in milliwatts and the step size is 125 mW. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting. If the value is 0, the BIOS will set PL2 as 1.25* TDP.

C-States

Use this feature to enable the C-State of the CPU. The options are Disabled and **Enabled**.

Enhanced C-States

Use this feature to enable the enhanced C-State of the CPU. The options are Disabled and **Enabled**.

C-State Auto Demotion

Use this feature to prevent unnecessary excursions into the C-states to improve latency. The options are Disabled and **C1**.

C-State Un-Demotion

Use this feature to prevent unnecessary excursions into the C-states to improve latency. The options are Disabled and **C1**.

Package C-State Un-Demotion

Use this feature to enable or disable the Package C-State un-demotion. The options are Disabled and **Enabled**.

Package C-State Demotion change

Use this feature to enable or disable the Package C-State demotion. The options are Disabled and **Enabled**.

C-State Pre-Wake

This feature allows you to enable or disable the C-State Pre-Wake. The options are Disabled and **Enabled**.

Package C-State Limit

Use this feature to set the Package C-State limit. The options are C0/C1, C2, C3, C6, C7, C7S, C8, C9, C10, Cpu Default, and **Auto**.

MonitorMWAIT

Select Enabled to support Monitor and Mwait, which are two instructions in Streaming SIMD Extension 3 (SSE3) to improve synchronization between multiple threads for CPU performance enhancement. The options are Disabled and **Enabled**.

Note: This feature is NOT available when "Workload Profile" is set to Telco NFVI, Telco NFVI-FP, or Telco FlexRAN.

Intel® TCC Mode

Use this feature to enable or disable the Intel Time Coordinated Computing (TCC) Mode. When enabled, this feature will modify the system settings to improve the real-time performance. The options are **Disabled** and Enabled.

Chipset Configuration Menu

►System Agent (SA) Configuration

Warning! Setting the wrong values in this section may cause system to malfunction.

System Agent (SA) Configuration

VT-d Supported

VT-d

Select Enabled to activate Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM 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 options are **Enabled** and Disabled.

GNA Device (B0:D8:F0)

Use this feature to enable SA GNA device. The options are Enabled and **Disabled**.

Memory Configuration Menu

►Memory Configuration

This submenu allows you to configure the Integrated Memory Controller (iMC) settings.

Enforce DDR Memory Frequency POR

Select Enforce POR to enforce Plan of Record (POR) restrictions for DDR memory frequency and voltage programming. The options are Disabled and **POR**.

Maximum Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000, 3200, 3600, 4000, 4200, 4400, 4600, and 4800.

Max TOLUD

This feature sets the maximum TOLUD value, which specifies the "Top of Low Usable DRAM" memory space to be used by internal graphics devices, GTT Stolen Memory, and TSEG, respectively, if these devices are enabled. The options are **Dynamic**, 1 GB, 1.25 GB, 1.5 GB, 1.75 GB, 2 GB, 2.25 GB, 2.5 GB, 2.75 GB, 3 GB, 3.25 GB, and 3.5 GB.

Memory Scrambler

Use this feature to enable or disable memory scrambler support. The options are Disabled and **Enabled**.

Force ColdReset

Use this feature to enable or disable a cold boot during a MRC execution. The options are Enabled and **Disabled**.

Force Single Rank

Select enabled to use only Rank 0 in each DIMM. The options are **Disabled** and Enabled.

Memory Remap

Use this feature to enable or disable memory remap above 4 GB. The options are **Enabled** and Disabled.

MRC Fast Boot

Use this feature to enable or disable fast path through the memory reference code. The options are Disabled and **Enabled**.

In-Band ECC Support

Use this feature to enable or disable In-Band ECC. The options are **Disabled** and Enabled.

In-Band ECC Operation Mode (Available when In-Band ECC Support is Enabled)

Use this feature to select the In-Band ECC Operation Mode. The options are 0, 1, and **2**.

Graphics Configuration Menu

►Graphics Configuration

This submenu allows you to configure the graphics configuration settings.

Graphics Configuration

IGFX GOP Version

Graphics Turbo IMON Current

Use this feature to set the graphics turbo IMON value. The default is **31**.

Skip Scanning of External Gfx Card

If this feature is enabled, the system will not scan for an external graphics card on PEG and PCIe slots. The options are **Disabled** and Enabled.

Primary Display

Use this feature to select the primary video display. The options are **Auto**, IGFX, and PCH PCI.

Internal Graphics

Select Auto to keep an internal graphics device installed on an expansion slot supported by the CPU to be automatically enabled. The options are **Auto**, Disabled, and Enabled.

GTT Size

Use this feature to set the memory size to be used by the graphics translation table (GTT). The options are 2MB, 4MB, and **8MB**.

Aperture Size

Use this feature to set the Aperture size, which is the size of system memory reserved by the BIOS for graphics device use. The options are 128MB, **256MB**, 512MB, 1024MB, and 2048MB.

DVMT Pre-Allocated

Dynamic Video Memory Technology (DVMT) allows dynamic allocation of system memory to be used for video devices to ensure best use of available system memory based on the DVMT 5.0 platform. The options are 0M, 32M, 64M, 96M, 128M, 160M, 4M, 8M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M, and **60M**.

PM Support

Enable this feature to activate Power Management BIOS support. The options are **Enabled** and Disabled.

PAVP Enable

Use this feature to enable or disable PAVP support. The options are Disabled and **Enabled**.

Cdynmax Clamping Enable

Enable this feature to activate Cdynmax Clamping. The options are Enabled and **Disabled**.

Graphics Clock Frequency

Use this feature to set the internal graphics clock frequency. The options are 192 Mhz, 307.2 Mhz, 556.8 Mhz, 652.8 MHZ, and **Max CdClock freq based on Reference Clk**.

DMI/OPI Configuration Menu

►DMI/OPI Configuration

This submenu allows you to configure the DMI/OPI configuration settings.

DMI Gen3 ASPM

Use this feature to set the Active State Power Management (ASPM) state on the System Agent (SA) side of the DMI Link. The options are Disabled, Auto, ASPM L0s, **ASPM L1**, and ASPM L0sL1.

GT - Power Management Control

RC6(Render Standby)

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

Maximum GT frequency

Use this feature to define the Maximum GT frequency. Choose between 33MHz (RPN) and 1200Mhz (RP0). Any value beyond this range will be clipped to its min/max supported by the CPU. The options are **Default Max Frequency**, 100Mhz, 150Mhz, 200Mhz, 250Mhz, 300Mhz, 350Mhz, 400Mhz, 450Mhz, 500Mhz, 550Mhz, 600Mhz, 650Mhz, 700Mhz, 750Mhz, 800Mhz, 850Mhz, 900Mhz, 950Mhz, 1000Mhz, 1050Mhz, 1100Mhz, 1150Mhz, and 1200Mhz.

Disable Turbo GT frequency

Use this feature to disable Turbo GT frequency. If set to Enabled, Turbo GT frequency becomes disabled. If set to Disabled, GT frequency limiters will be removed. The options are Enabled and **Disabled**.

PCH-IO Configuration

The following information is displayed.

- PCH SKU
- Stepping

►PCI Express Configuration

PCI Express Configuration

►PCIe EID

PCIe EIO ASPM

Use this feature to activate the Active State Power Management (ASPM) level for a PCIe device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are Disabled, **L1**, and Auto.

PCIe EIO Substates

Use this feature to set the PCI Express L1 Substates. The options are Disabled, L1.1, and **L1.1 & L1.2**.

PCIe EIO Speed

Use this feature to select the PCI Express port speed. The options are **Auto**, Gen1, Gen2, and Gen3.

PCIe EIO Peer Memory Write Enable

Use this feature to enable or disable Peer Memory Write. The options are **Disabled** and Enabled.

►PCIe M.2-E

PCIe M.2-E ASPM

Use this feature to activate the Active State Power Management (ASPM) level for a PCIe device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are Disabled, **L1**, and Auto.

PCIe M.2-E L1 Substates

Use this feature to set the PCI Express L1 Substates. The options are Disabled, L1.1, and **L1.1 & L1.2**.

PCIe M.2-E Speed

Use this feature to select the PCI Express port speed. The options are **Auto**, Gen1, Gen2, and Gen3.

PCIe M.2-E Peer Memory Write Enable

Use this feature to enable or disable Peer Memory Write. The options are **Disabled** and Enabled.

►PCIe M.2-B

PCIe M.2-B ASPM

Use this feature to activate the Active State Power Management (ASPM) level for a PCIe device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are Disabled, **L1**, and Auto.

PCIe M.2-B L1 Substates

Use this feature to set the PCI Express L1 Substates. The options are Disabled, L1.1, and **L1.1 & L1.2**.

PCIe M.2-B Speed

Use this feature to select the PCI Express port speed. The options are **Auto**, Gen1, Gen2, and Gen3.

PCIe M.2-B Peer Memory Write Enable

Use this feature to enable or disable Peer Memory Write. The options are **Disabled** and Enabled.

HDD Security Configuration

The settings in this submenu are configurable if media drives are detected.

PTN3460 Switch

LVDS Panel Support

Use this feature to select the supported IGFX graphics device ouput to the LVDS panel. The options are **Disabled** and Non-EDID Panel.

Panel select (Available when LVDS Panel Support is set to Non-EDID Panel)

Use this feature to select the panel resolution. The options are **Replaceable EDID in SPI ROM**, 800x 600, 1024x 768, 1280x1024, 1366x 768, 800x 480, 1920x1080, and OEM Define.

Dual/Single LVDS mode

Use this feature to select the LVDS bus mode. The options are **Disabled**, Single LVDS Bus mode, and Dual LVDS Bus mode.

Panel Channel Type

Use this feature to select the panel channel type. The options are **Disabled**, Odd Channel, Even Channel, and Both Channel.

Panel Color Depth

Use this feature to select the LFP panel color depth. The options are **Disabled**, VESA and JEIDA18 bpp, VESA 24 bpp, and JEIDA 24 bpp.

Backlight Brightness

Use this feature to select panel backlight brightness. The options are from 7% to **100%**.

GPIO Expander Header

GPIO Expander Header Control

Use this feature enable or disable the General Purpose I/O expander header. The options are **Disabled** and Enabled.

Pin 1 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 1 to low or high. The options are Output Low, Output High, and **Input**.

Pin 2 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 2 to low or high. The options are Output Low, Output High, and **Input**.

Pin 3 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 3 to low or high. The options are Output Low, Output High, and **Input**.

Pin 4 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 4 to low or high. The options are Output Low, Output High, and **Input**.

Pin 5 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 5 to low or high. The options are Output Low, **Output High**, and Input.

Pin 6 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 6 to low or high. The options are Output Low, **Output High**, and Input.

Pin 7 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 7 to low or high. The options are Output Low, **Output High**, and Input.

Pin 8 (Available when "GPIO Expander Header Control" is set to Enabled)

Use this feature to set the output for Pin 8 to low or high. The options are Output Low, **Output High**, and Input.

HTTP Boot Configuration Menu

►HTTP Boot Configuration

HTTP Boot Policy

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

HTTP Boot Checks Hostname

Enable this feature for HTTPS boot to check the hostname of the TLS certificates to see if it matches the host name provided by the remote server. The options are **Enabled** and Disabled (WARNING: Security Risk!).



Warning! Disabling "HTTP Boot Checks Hostname" is a violation of RFC 6125 and may expose you to Man-in-the-Middle Attacks. Supermicro is not responsible for any and all security risks incurred by you disabling this feature.

Priority of HTTP Boot

Instance of Priority 1: (Available when your motherboard supports this feature)

This feature sets the rank target port. The default setting is **1**.

Select IPv4 or IPv6

This feature specifies which connection the target LAN port should boot from. The options are **IPv4** and IPv6.

Boot Description

Use this feature to enter a boot description, which cannot be longer than 75 characters. Please be sure to enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI

Enter a Boot Uniform Research Identifier (URI) with 128 characters or shorter. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created. This feature is only supported on Dual or EFI Boot Mode.

Instance of Priority 2: (Available when "HTTP Boot Policy" is set to Apply to each LAN or Boot Priority #1 instantly)

This feature sets the rank target port. The default setting is **0**.

NCT55250 Super IO Configuration

NCT55250 Super IO Configuration

The following information is displayed.

- Super IO Chip

Serial Port 1 Configuration Menu

►Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable serial port 1. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 1" above is set to Enabled)

This feature shows the base I/O port address and the Interrupt Request address of serial port 1. The option is IO=3F8h; IRQ=4;.

Change Settings (Available when "Serial Port 1" above is set to Enabled)

Use this feature to specify 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 serial port 1. The options 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 Menu

►Serial Port 2 Configuration

Serial Port 2

Select Enabled to enable serial port 2. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 2" above is set to Enabled)

This feature shows the base I/O port address and the Interrupt Request address of serial port 2. The option is IO=2F8h; IRQ=3;.

Change Settings (Available when "Serial Port 2" above is set to Enabled)

Use this feature to specify 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 serial port 2. The options 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 3 Configuration Menu

►Serial Port 3 Configuration (not available on A4SAP-L)

Serial Port 3

Select Enabled to enable serial port 3. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 3" above is set to Enabled)

This feature shows the base I/O port address and the Interrupt Request address of serial port 3. The option is IO=3E8h; IRQ=6;.

Change Settings (Available when "Serial Port 3" above is set to Enabled)

Use this feature to specify the base I/O port address and the Interrupt Request address of serial port 3. Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 3. The options 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 4 Configuration Menu

►Serial Port 4 Configuration (not available on A4SAP-L)

Serial Port 4

Select Enabled to enable serial port 4. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 4" above is set to Enabled)

This feature shows the base I/O port address and the Interrupt Request address of serial port 4. The option is IO=2E8h; IRQ=7;.

Change Settings (Available when "Serial Port 4" above is set to Enabled)

Use this feature to specify the base I/O port address and the Interrupt Request address of serial port 4. Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 4. The options 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;).

Network Stack Configuration Menu

►Network Configuration

Network Stack

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

IPv4 PXE Support (Available when "Network Stack" is set to Enabled)

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 (Available when "Network Stack" is set to Enabled)

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 (Available when "Network Stack" is set to Enabled)

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 (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv6 HTTP boot support. If this feature is disabled, it will not create the IPv6 HTTP boot optiont. The options are **Disabled** and Enabled.

PXE Boot Wait Time (Available when "Network Stack" is set to Enabled)

Use this feature to set the wait time (in seconds) upon which the system BIOS will wait for you to press the <ESC> key to abort PXE boot instead of proceeding with PXE boot by connecting to a network server immediately. Press the <+> or <-> key on your keyboard to change the value. The default setting is **0**.

Media Detect Count (Available when "Network Stack" is set to Enabled)

Use this feature to set the wait time (in seconds) for the BIOS ROM to detect the presence of a LAN media either via the Internet connection or via a LAN port. Press the <+> or <-> key on your keyboard to change the value. The default setting is **1**.

MAC:(MAC address)-IPv4 Network Configuration Menu

►MAC:(MAC address)-IPv4 Network Configuration

Configured

Enable this feature to configure network addresses for DHCP, local IP address, local netmask, local gateway, and local DNS server. The options are **Disabled** and Enabled.

Enable DHCP (Available when "Configured" is set to Enabled)

Select Enabled to support Dynamic Host Configuration Protocol (DHCP), which allows the BIOS to search for a DHCP server attached to the network and request the next available IP address for this computer. The options are **Disabled** and Enabled.

Local IP Address (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to enter an IP address for the local machine.

Local NetMask (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the netmask for the local machine.

Local Gateway (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the gateway address for the local machine.

Local DNS Servers (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the Domain Name System (DNS) server address for the local machine.

Save Changes and Exit

Press <Enter> to save changes and exit.

MAC:(MAC address)-IPv6 Network Configuration Menu

►MAC:(MAC address)-IPv6 Network Configuration

►Enter Configuration Menu

The following information is displayed.

- Interface Name
- Interface Type
- MAC address
- Host address
- Route Table
- Gateway addresses
- DNS addresses

Interface ID

Use this feature to change/enter the 64-bit alternative interface ID for the device. The string format is colon separated. The default setting is the MAC address above.

DAD Transmit Count

Use this feature to set the number of consecutive neighbor solicitation messages have been sent while performing duplicate address detection on a tentative address. The default setting is **1**.

Policy

Use this feature to select how the policy is to be configured. The options are **Automatic** and Manual.

►Advanced Configuration

Note: This submenu is available when "Policy" is set to manual.

New IPv6 Address - Use this feature to enter the IPv6 address for the local machine.

New Gateway Addresses - Use this feature to set the gateway address for the local machine.

New DNS Addresses - Use this feature to set the DNS server address for the local machine.

Commit Changes And Exit - Press <Enter> to save changes and exit.

Discard Changes And Exit - Press <Enter> to discard changes and exit.

Save Changes and Exit

Press <Enter> to save changes and exit.

PCH-FW Configuration Menu

The following information is displayed.

- ME Firmware Version
- ME Firmware Mode
- ME Firmware SKU

ME FW Image Re-Flash

Use this feature to update the Management Engine firmware. The options are **Disabled** and Enabled.

TPM Device Selection

Use this feature to select dTPM or PTT for the TPM device. dTPM is discrete Trusted Platform Module and PTT is Platform Trusted Technology. The options are **dTPM** and PTT.

PCIe/PCI/PnP Configuration Menu

Option ROM execution

Video

Use this feature to select the execution of the video OpROM. The options are Do Not Launch and **EFI**.

PCI PERR/SERR Support

Use this feature to enable or disable the runtime event for PCI errors. The options are **Disabled** and Enabled.

Above 4G MMIO BIOS Assignment (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 **Enabled** and Disabled.

Re-Size BAR Support

Use this feature to enable the Resizable BAR support. Resizable BAR is a PCIe interface technology that allows the CPU to access to the entire frame buffer. With this technology, your system will be able to handle multiple CPU to GPU transfers simultaneously rather than queuing, which can improve the frame rate performance. The options are **Disabled** and Enabled.

SR-IOV Support

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

BME DMA Mitigation

Enable this feature to help block DMA attacks. The options are **Disabled** and Enabled.

NVMe Firmware Source

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

Consistent Device Name Support

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

SMBus/I2C Selection

Use this feature to select the SMBus or I2C on the PCIe bus. The options are **SMBus** and I2C.

PCIe/PCI/PnP Configuration

PCI / PCIX / PCIe slots are not available on A4SAP-L

PCI / PCIX / PCIe Slot 1 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 1 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 2 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 2 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 3 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 3 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 4 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 4 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 5 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 5 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 6 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 6 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 7 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 7 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 8 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 8 OPROM option. The options are Disabled and **EFI**.

PCI / PCIX / PCIe Slot 9 OPROM

Use this feature to enable or disable the PCI/PCIX/PCIe slot 9 OPROM option. The options are Disabled and **EFI**.

M.2-B OPROM

Use this feature to enable or disable the M.2-B OPROM option. The options are Disabled and **EFI**.

EIO OPROM

Use this feature to enable or disable the EIO OPROM option. The options are Disabled and **EFI**.

M.2-E OPROM

Use this feature to enable or disable the M.2-E OPROM option. The options are Disabled and **EFI**.

Onboard LAN1 Support

Use this feature to enable or disable LAN1. The options are Disabled and **Enabled**.

Onboard LAN2 Support

Use this feature to enable or disable LAN2. The options are Disabled and **Enabled**.

Onboard LAN1 Option ROM

Use this feature to select which firmware function to be loaded for LAN1 used for system boot. The options are Disabled and **EFI**.

Wake On LAN

Use this feature to enable or disable the wake on LAN function. The options are Disabled and **Enabled**.

SATA and RST Configuration Menu

SATA And RST Configuration

SATA Controller(s)

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

Storage Option ROM/UEFI Driver

Select UEFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Do Not Launch and **EFI**.

Support Aggressive Link Power Management

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

M.2-M1 – M.2-B1

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

- Software Preserve Support

Hot Plug

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

Spin Up Device

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

SATA Device Type

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

Serial Port Console Redirection Menu

COM1

COM1 Console Redirection

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

►COM1 Console Redirection Settings

COM1 Console Redirection Settings

COM1 Console Redirection Settings (Available if "COM1 Console Redirection" is set to Enabled.)

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

COM1 Terminal Type

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

COM1 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).

COM1 Data Bits

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

COM1 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.

COM1 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.

COM1 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.

COM1 VT-UTF8 Combo Key Support

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

COM1 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.

COM1 Resolution 100x31

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

COM1 Putty KeyPad

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

COM1 Redirection After BIOS POST

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

COM2

COM2 Console Redirection

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

►COM2 Console Redirection Settings

COM2 Console Redirection Settings

COM2 Console Redirection Settings (Available if "COM2 Console Redirection" is set to Enabled.)

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

COM2 Terminal Type

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

COM2 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).

COM2 Data Bits

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

COM2 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.

COM2 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.

COM2 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.

COM2 VT-UTF8 Combo Key Support

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

COM2 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.

COM2 Resolution 100x31

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

COM2 Putty KeyPad

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

COM2 Redirection After BIOS POST

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

COM3 (not available on A4SAP-L)

COM3 Console Redirection

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

►Console Redirection Settings

COM3 Console Redirection Settings

COM3 Console Redirection Settings (Available if "COM1 Console Redirection" is set to Enabled.)

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

COM3 Terminal Type

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

COM3 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).

COM3 Data Bits

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

COM3 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.

COM3 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.

COM3 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.

COM3 VT-UTF8 Combo Key Support

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

COM3 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.

COM3 Resolution 100x31

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

COM3 Putty KeyPad

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

COM3 Redirection After BIOS POST

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

COM4 (not available on A4SAP-L)

COM4 Console Redirection

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

►COM4 Console Redirection Settings

COM4 Console Redirection Settings

COM4 Console Redirection Settings (Available if "COM1 Console Redirection" is set to Enabled.)

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

COM4 Terminal Type

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

COM4 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).

COM4 Data Bits

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

COM4 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.

COM4 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.

COM4 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.

COM4 VT-UTF8 Combo Key Support

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

COM4 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.

COM4 Resolution 100x31

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

COM4 Putty KeyPad

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

COM4 Redirection After BIOS POST

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

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

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

Console Redirection EMS

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

►Console Redirection Settings

Note: This submenu is available when "Console Redirection EMS" is set to Enabled.

Terminal Type

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

Bits Per Second

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

Flow Control

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

The following information is displayed.

- **Data Bits**
- **Parity**
- **Stop Bits**

Trusted Computing Menu

►Trusted Computing

When the TPM 2.0 (either onboard or external) is detected by your system, the following information is displayed.

- TPM 2.0 Device Found
- Firmware Version:
- Vendor:

Note: This submenu is available when the TPM 2.0 (either onboard or external) is detected by the BIOS.

Security Device Support

Select Enabled to enable BIOS support for onboard security devices, which are not displayed in the OS. If this feature is set to Enabled, TCG EFI protocol and INT1A interface will not be available. The options are Disabled and **Enabled**.

When "Security Device Support" is set to Enabled and the TPM 2.0 (either onboard or external) is detected by the BIOS, the following information is displayed.

- Active PCR banks
- Available PCR banks

* The following features are available when the TPM 2.0 (either onboard or external) is detected by the BIOS.

SHA-1 PCR Bank (Available when "Security Device Support" is set to Enabled) (not available on A4SAP-L)

Select Enabled to enable SHA-1 PCR Bank support to enhance system integrity and data security. The options are Disabled and **Enabled**.

SHA256 PCR Bank (Available when "Security Device Support" is set to Enabled)

Select Enabled to enable SHA256 PCR Bank support to enhance system integrity and data security. The options are Disabled and **Enabled**.

SHA384 PCR Bank (Available when "Security Device Support" is set to Enabled)

Select Enabled to enable SHA384 PCR Bank support to enhance system integrity and data security. The options are **Disabled** and Enabled.

Pending Operation (Available when "Security Device Support" is set to Enabled)

Use this feature to schedule a TPM-related operation to be performed by the security TPM (either onboard or external) at the next system boot to enhance system data integrity. The options are **None** and TPM Clear.

Note: If this feature is used, your system will reboot to carry out a pending TPM operation.

Platform Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for TPM Platform Hierarchy support, which allows 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. These early boot codes are shipped with the platform and are included in the list of "public keys." During system boot, the platform firmware uses the trusted public keys to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via the TPM (either onboard or external). The options are Disabled and **Enabled**.

Storage Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by a 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 Disabled and **Enabled**.

Endorsement Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address the user's privacy concerns because the primary keys in the hierarchy are certified by the TPM key or by a manufacturer with restrictions on how an authentic TPM (either onboard or external) that is attached to an authentic platform can be accessed and used. A primary key

can be encrypted and certified with a certificate created by using TPM2_ActivateCredential, which allows the user to independently enable "flag, policy, and authorization values" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications, permitting the platform software to use the TPM. The options are Disabled and **Enabled**.

PH Randomization

Select Enabled for Platform Hierarchy (PH) 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.

USB Configuration Menu

The following information is displayed.

- USB Module Version
- USB Controllers:
- USB Devices:

XHCI Hand-off

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

USB Mass Storage Driver Support

Select Enabled for USB mass storage device support. The options are Disabled and **Enabled**.

USB S5 Wakeup Support

Use this feature to enable or disable USB S5 Wakeup support. The options are Disabled and **Enabled**.

Intel(R) Ethernet Controller Menu

►Intel(R) Ethernet Controller (I226-IT) - (XX:XX:XX:XX:XX:XX)

Notes:

- The Ethernet controller and MAC addresses shown above are based on you system features.

The following information is displayed.

- UEFI Driver
- Device Name
- Link Status
- MAC Address
- Link Auto-Negotiation Timeout

Realtek PCIe GBE Family Controller Menu

►Realtek PCIe GBE Family Controller - (XX:XX:XX:XX:XX:XX)

Notes:
- The Ethernet controller and MAC addresses shown above are based on you system features.

The following information is displayed.

- Driver Information
- Device Name
- Driver Version
- Driver Release Date
- Device Information
- Device Name
- PCI Slot
- MAC Address

TLS Authenticate Configuration Menu

►TLS Authenticate Configuration

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

►Server CA Configuration

This feature allows you to configure the client certificate that is to be used by the server.

►Enroll Certification

This feature allows you to enroll the certificate in the system.

►Enroll Certification Using File

This feature allows you to enroll the security certificate in the system by using a file.

Certification GUID

Press <Enter> and input the certification Global Unique Identifier (GUID).

►Commit Changes and Exit

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

►Discard Changes and Exit

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

►Delete Certification

This feature is used to delete the certificate if a certificate has been enrolled in the system.

►Client Certification Configuration

Driver Health Menu

►Driver Health

This feature displays the health information of the drivers installed in your system, including LAN controllers, as detected by the BIOS. Select one and press <Enter> to see the details.

Note: This section is provided for reference only, for the driver health status will differ depending on the drivers installed in your system. It's also based on your system configuration and the environment that your system is operating in.

COM Port Mode Configuration Menu

COM1/COM2 Mode Selection

COM1 Mode

Use this feature to select the serial mode standard. The options are **RS-232**, RS-485/422 Full Duplex, RS-485 Half Duplex.

COM2 Mode

Use this feature to select the serial mode standard. The options are **RS-232**, RS-485/422 Full Duplex, RS-485 Half Duplex.

4.4 Event Logs

Use this menu to configure Event Logs settings.

Note: After making any changes in this section, please be sure to reboot the system for the changes to take effect.



Figure 4-3. Event Logs

►Change SMBIOS Event Log Settings

Note: Reboot the system for the changes in this section to take effect.

Enabling/Disabling Options

SMBIOS Event Log

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

Erasing Settings

Erase Event Log (Available when "SMBIOS Event Log" is set to Enabled)

Select No to keep the event log without erasing it upon next system bootup. Select (Yes, Next reset) to erase the event log upon next system reboot. The options are **No**, (Yes, Next reset), and (Yes, Every reset).

When Log is Full (Available when "SMBIOS Event Log" is set to Enabled)

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 (Available when "SMBIOS Event Log" is set to Enabled)

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

MECI (Available when "SMBIOS Event Log" is set to Enabled)

Enter the increment value for the multiple event counter. Enter a number between 1 and 255. The default setting is **1**. (MECI is the abbreviation for Multiple Event Count Increment.)

METW (Available when "SMBIOS Event Log" is set to Enabled)

Use this feature to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 and 99. The default value is **60**. (METW is the abbreviation for Multiple Event Count Time Window.)

►View SMBIOS Event Log

Use this feature to view the event in the system event log. Select this feature and press <Enter> to view the status of an event in the log. The following information is displayed: DATE / TIME / ERROR CODE / SEVERITY.

4.5 Thermal & Fan

Use this menu to configure Fan settings.

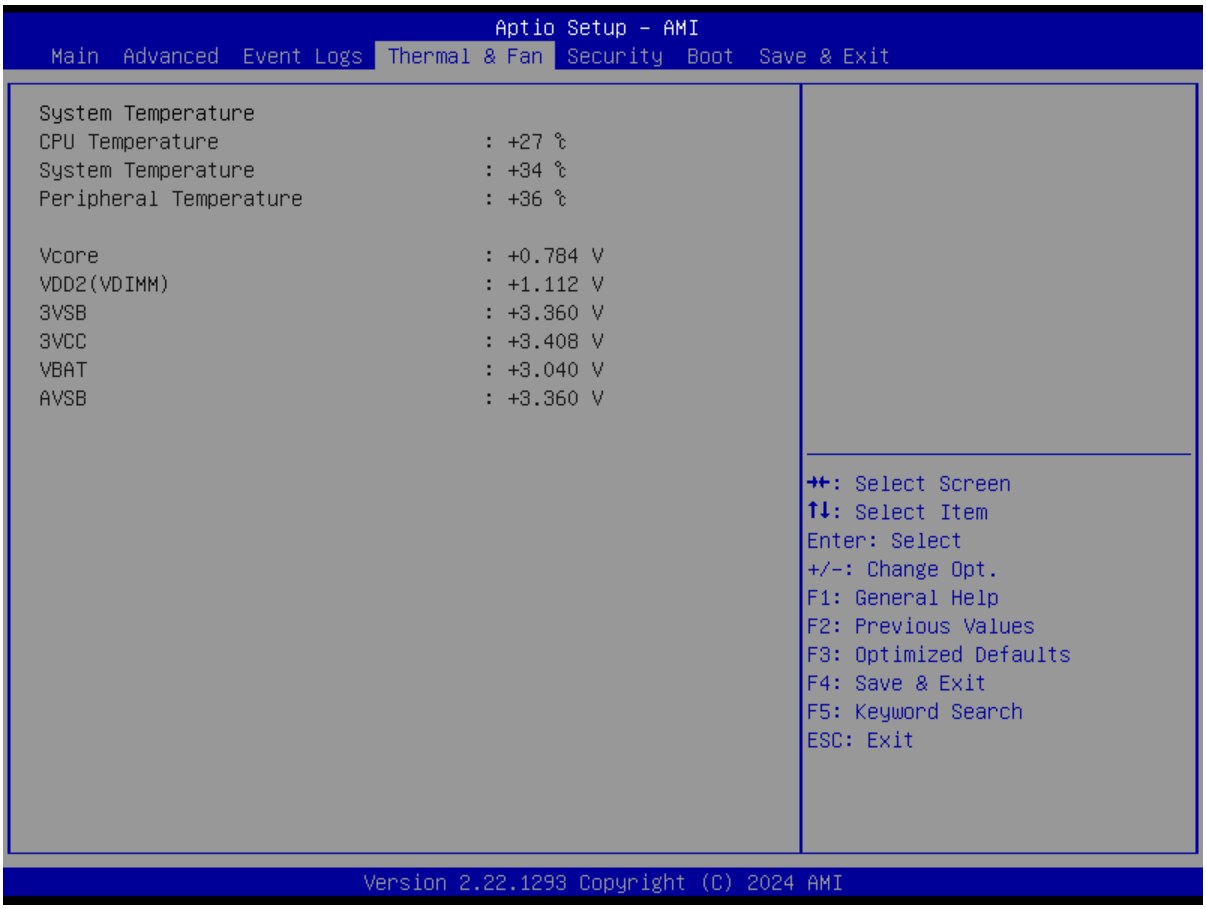


Figure 4-4. Thermal & Fan

The following information is displayed.

- System Temperature
- CPU Temperature
- System Temperature
- Peripheral Temperature
- P5VSB
- Vcore
- VDD2(VDIMM)
- 3VSB

- 3VCC
- VBAT
- ASVB

4.6 Security

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

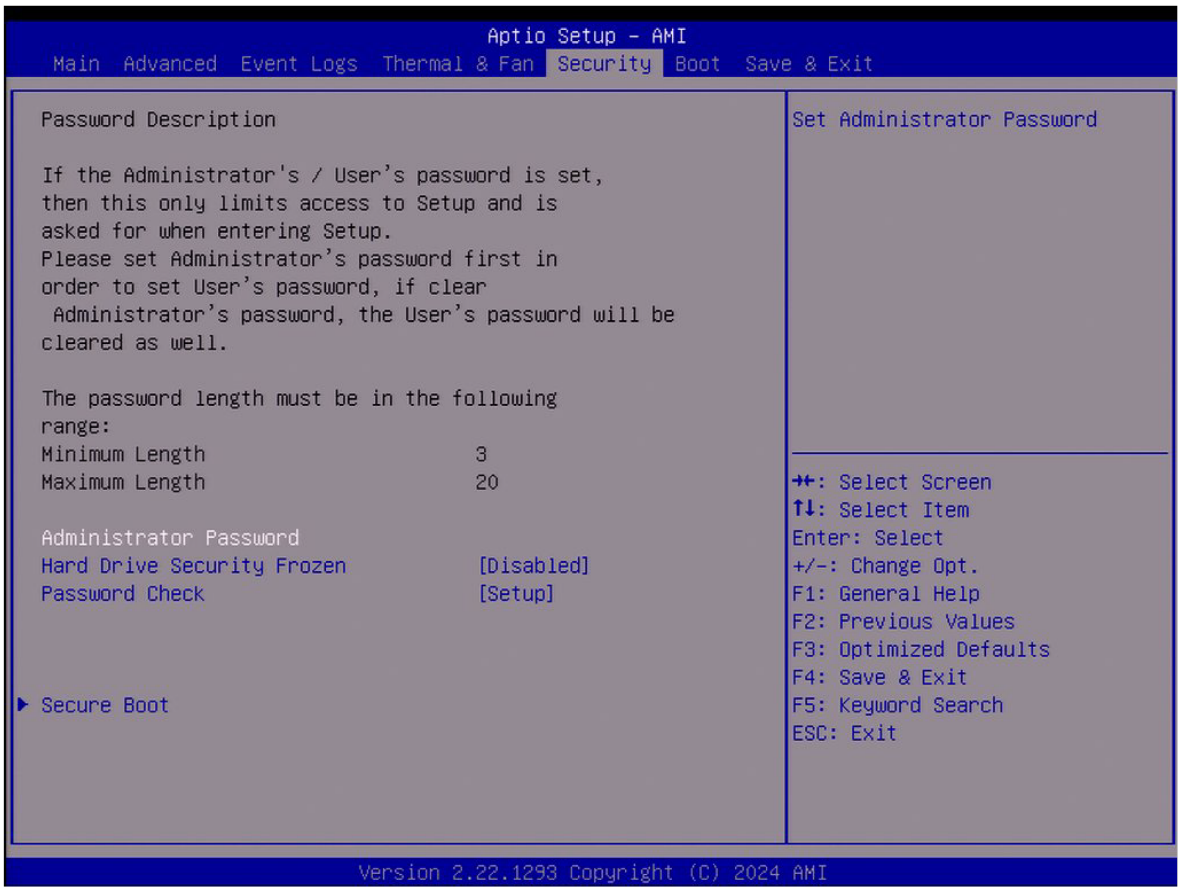


Figure 4-5. Security

Disable Block Sid and Freeze Lock (Available when your storage devices support TCG)

Select Enabled to allow SID authentication to be performed in TCG storage devices. The options are **Disabled** and Enabled.

The following information is displayed:

- Administrator Password
- User Password
- Password Description

Administrator Password

This feature indicates if an administrator password has been installed. Use this feature to set the administrator password, which is required to enter the BIOS Setup utility. The length of the password can be between three and 20 characters long.

User Password (Available when "Administrator Password" has been set)

This feature indicates if a user password has been installed. Use this feature to set the user password which is required to enter the BIOS Setup utility. The length of the password can be between three and 20 characters long.

Hard Drive Security Frozen

Select Enabled to freeze the Lock Security feature for HDD to protect key data in hard drives from being altered. The options are **Disabled** and Enabled.

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 and upon entering the BIOS Setup utility. The options are **Setup** and Always.

4.7 Boot

Use this menu to configure Boot settings.

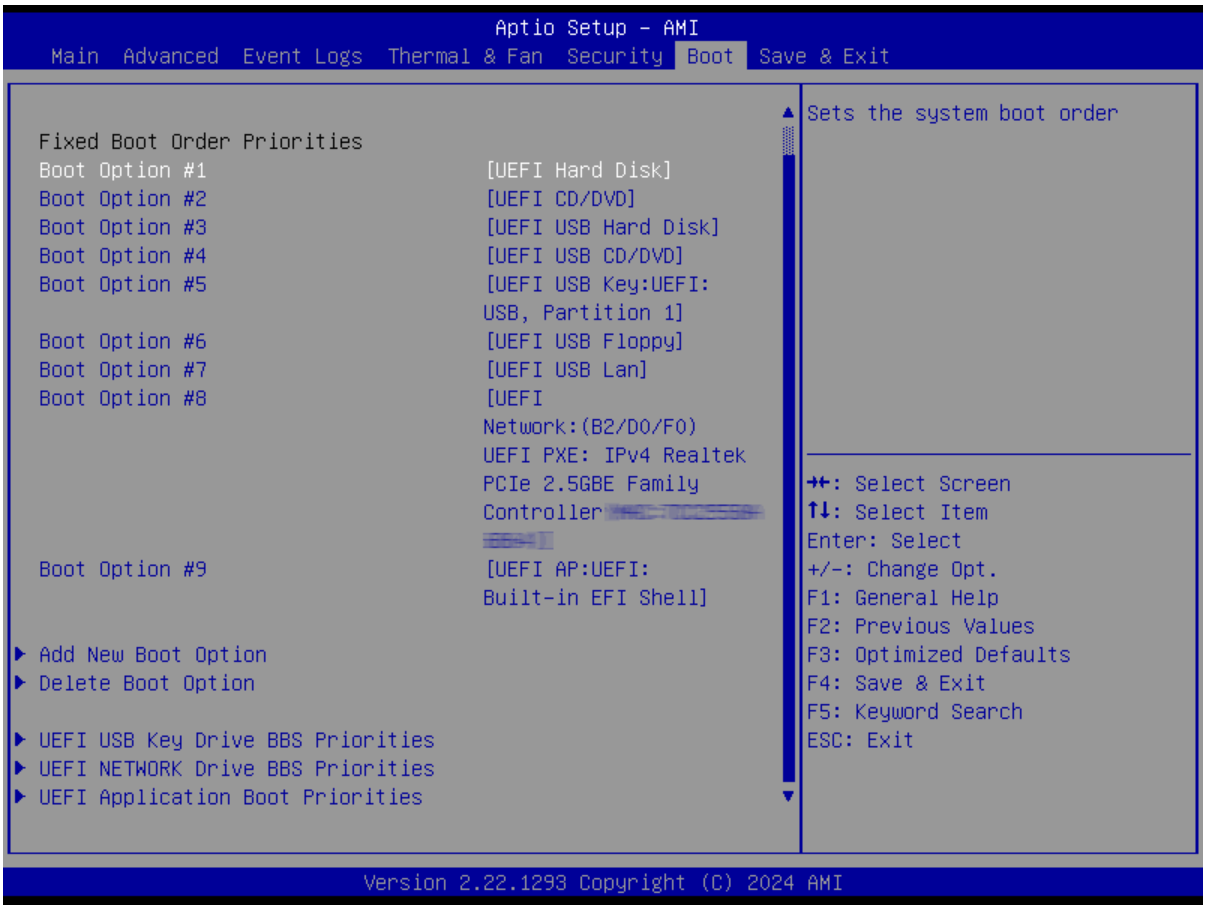


Figure 4-6. Boot

FIXED BOOT ORDER Priorities

Use this feature to prioritize the order of a bootable device from which the system will boot. Press <Enter> on each item sequentially to select the device.

- 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 NETWORK Drive BBS Priorities

Use this feature to set the system boot order of detected devices.

►UEFI Application Boot Priorities

Use this feature to set the system boot order of detected devices.

4.8 Save & Exit

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

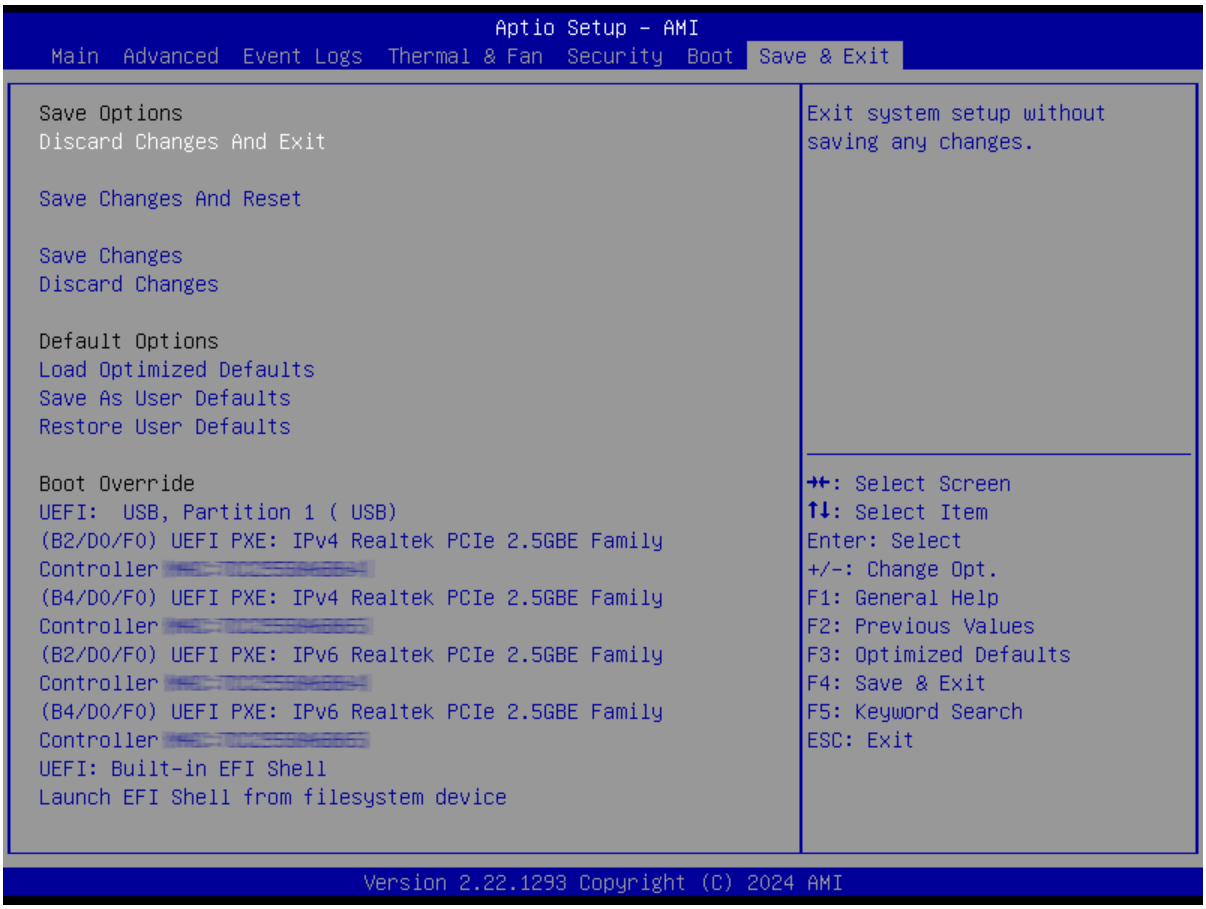


Figure 4-7. Save & Exit

Save Options

Discard Changes and Exit

Use this feature to exit from the BIOS Setup utility without making any permanent changes to the system configuration and reboot the computer.

Save Changes and Reset

On completing the system configuration changes, use this feature to exit the BIOS Setup utility and reboot the computer for the new system configuration parameters to take effect.

Save Changes

On completing the system configuration changes, use this feature to save all changes made. This will not reset (reboot) the system.

Discard Changes

Select this feature and press <Enter> to discard all changes made and return to the BIOS Setup utility.

Default Options

Load Optimized Defaults

Select this feature and press <Enter> to load manufacturer optimized default settings, which are intended for maximum system performance but not for maximum stability.

Note: Please reboot the system for the changes to take effect, which ensures that this system has the optimized default settings.

Save As User Defaults

Select this feature and press <Enter> to save all changes as the default values specified to the BIOS Setup utility for future use.

Restore User Defaults

Select this feature and press <Enter> to retrieve user-defined default settings that have been saved previously.

Boot Override

Note: Use this section to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified here instead of the one specified in the boot list. This is a one-time boot override.

Launch EFI Shell from filesystem device

Use this feature to launch the EFI shell application (Shell.efi) from one of the available filesystem devices. A filesystem is a virtual, logical, or physical system for organizing, managing, and accessing the files and directories on devices such as SSDs, HDDs, or other storage devices.

Appendix A:

BIOS Codes

For information about BIOS codes for the A4SAP-H/-E/-L motherboard, refer to the following content.

Additional BIOS POST Codes

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

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

Appendix B:

Software

After the A4SAP-H/-E/-L motherboard has been installed, you can install the Operating System (OS), configure RAID settings and install the drivers.

Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver. Refer to the RAID Configuration User Guides posted on our website at https://www.supermicro.com/support/manuals.

Installing the OS

1. Create a method to access the Microsoft Windows installation ISO file. That can be a USB flash or media drive.
2. Retrieve the proper drivers. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities," select the proper driver, and copy it to a USB flash drive.
3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing <F11> during the system bootup.

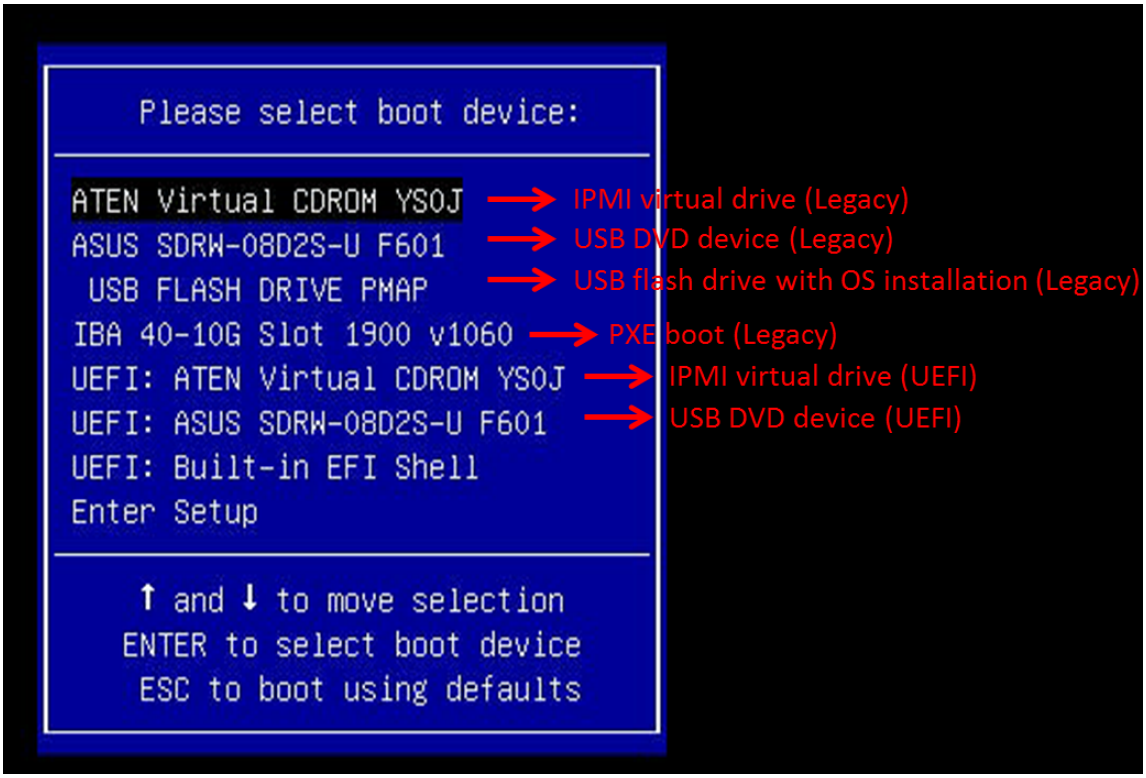


Figure B-1. Select Boot Device

4. During Windows Setup, continue to the dialog box where you select the drives on which to install Windows. If the disk you want to use is not listed, click on the “Load driver” link at the bottom left corner.

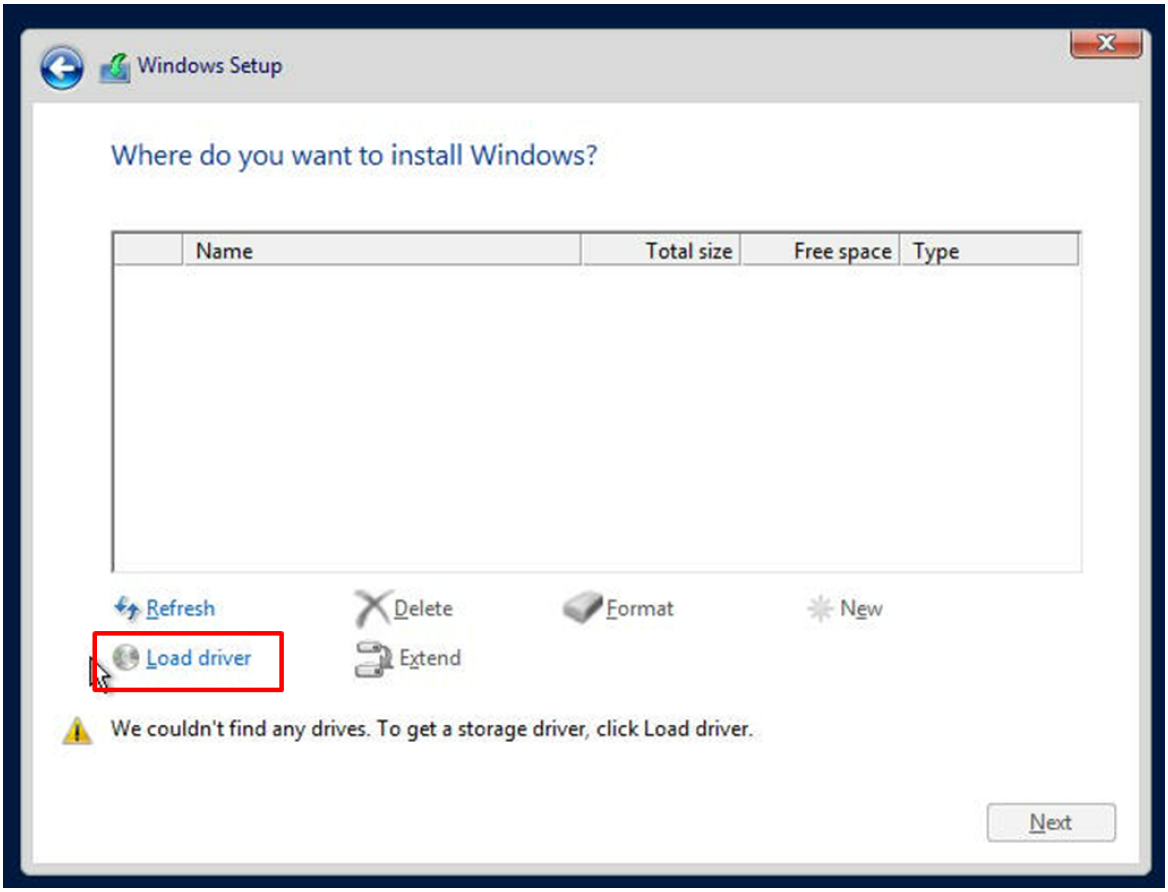


Figure B-2. Load Driver Link

To load the driver, browse the USB flash drive for the proper driver files.

5. Once all devices are specified, continue with the installation.
6. After the Windows OS installation has completed, the system will automatically reboot multiple times for system updates.

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

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash or media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website at https://www.supermicro.com. Find the product page for your motherboard and download the latest drivers and utilities.

Insert the flash drive or disk, and the screenshot shown below should appear.

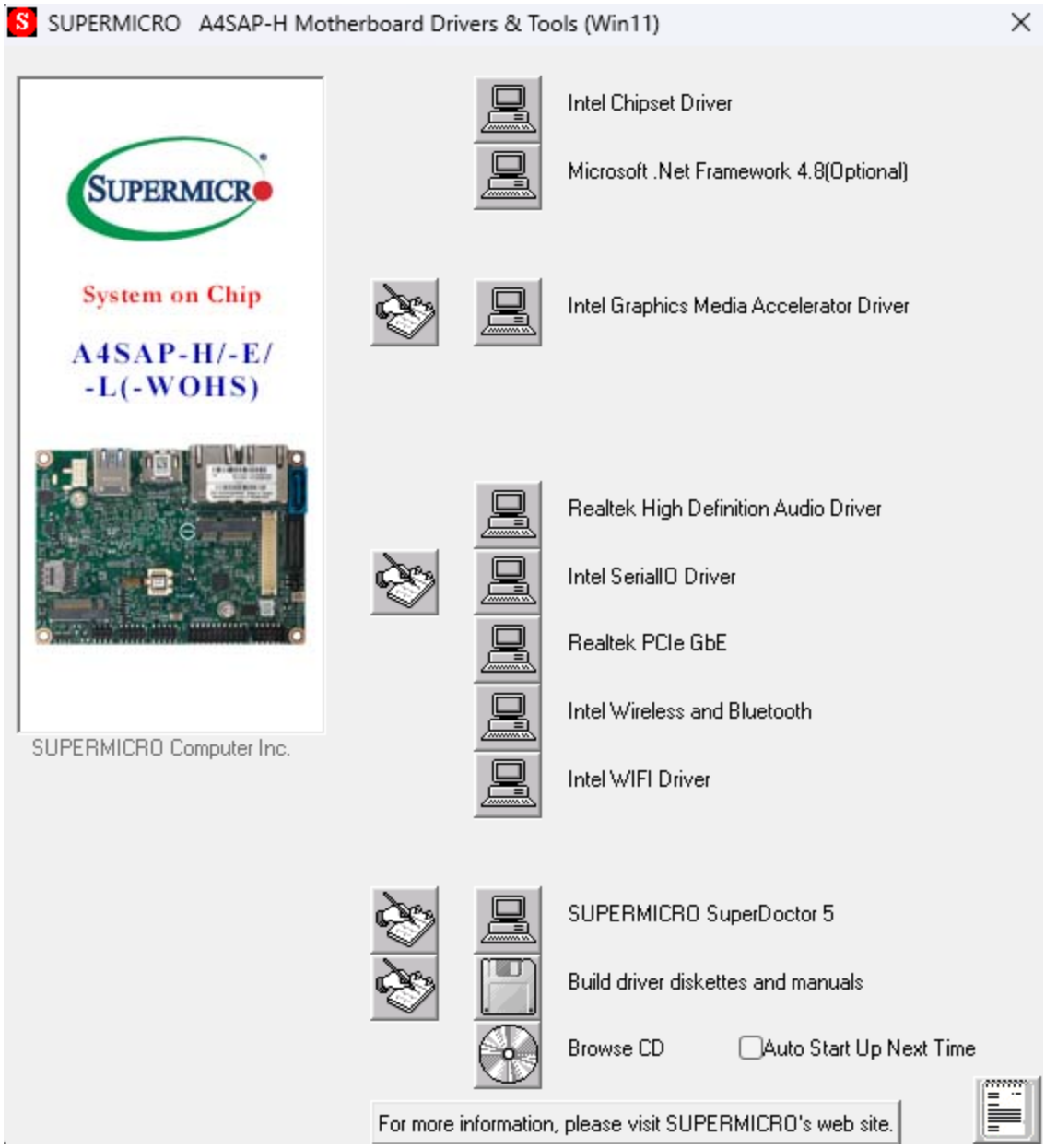


Figure B-3. A4SAP-H/-E/-L Driver Installation Screenshot

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

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 in the Supermicro A4SAP-H/-E/-L motherboard.

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

Battery Handling



CAUTION There is risk of explosion if the battery is replaced by an incorrect type. 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

バッテリーを間違ったタイプに交換すると爆発の危険があります。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

如果更换的电池类型不正确。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

如果更換的電池類型不正確。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

Es besteht Explosionsgefahr, wenn die Batterie durch einen falschen Typ ersetzt wird. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

ADVERTENCIA

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

ATTENTION

Il existe un risque d'explosion si la batterie est remplacée par un type incorrect. 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.

אזהרה!

קיימת סכנת פיצוץ אם הסוללה תוחלף בסוג שגוי. יש להחליף

את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

.هناك خطر الانفجار إذا تم استبدال البطارية بنوع غير صحيح

اسحبذال البطارية

فقط بنفس النىع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

배터리를 잘못된 종류로 교체하면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

WAARSCHUWING

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

Product Disposal



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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القانين واللائح البطنية

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.