OPEN

Industry Standard, Flexible Architecture

GREEN

Less Heat, Less Power Consumption

STABLE

Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation

Motherboard

SP2C741D16X-2T

User Manual

English

WARNING
THIS PRODUCT CONTAINS A BUTTOON BATTERY
If swallowed, a button battery can cause serious injury or death.
Please keep batteries out of sight or reach of children.

ASRock Rack's Website: www.ASRockRack.com

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CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate"

AUSTRALIA ONLY

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage caused by our goods. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. If you require assistance please call ASRock Rack Tel : +886-2-55599600 ext.123 (Standard International call charges apply)

Licensee's specific rights may vary from country to country.

FC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

C E

ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related Directives. Full text of EU declaration of conformity is available at: http://www.asrockrack.com

ASRock Rack follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASRock Rack product is in line with global environmental regulations. In addition, ASRock Rack disclose the relevant information based on regulation requirements.

Please refer to https://www.asrockrack.com/general/about.asp?cat=Responsibility for information disclosure based on regulation requirements ASRock Rack is complied with:

UKCA

ASRock Rack INC. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of related UKCA Directives. Full text of UKCA declaration of conformity is available at: http://www.asrockrack.com

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Contents

Chapter 3 UEFI Setup Utility 47

Chapter 1 Introduction

Thank you for purchasing ASRock Rack **SP2C741D16X-2T** motherboard, a reliable motherboard produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.

In this manual, chapter 1 and 2 contains introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contains the configuration guide to BIOS setup and information of the software support.

⚠️ *Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock Rack website without further notice. Find the latest memory and CPU support lists on ASRock Rack website as well. ASRock Rack's Website: www.ASRockRack.com*

About this motherboard technical support, please visit the website for specific information http://www.asrockrack.com/support/

1.1 Package Contents

- ASRock Rack SP2C741D16X-2T Motherboard
  (EEB-like Form Factor: 12.4-in x 14-in)
- Quick Installation Guide
- 1 x SATA3 Cable (60cm)
- 1 x Oculink to 4 SATA Cable (60cm)
- 1 x I/O Shield
- 1 x Screw for M.2 Socket
- 4 x CPU Non-Fabric Carriers (2xE1A, 2xE1B)

☆ *If any items are missing or appear damaged, contact the authorized dealer.*

English

1.2 Specifications

SP2C741D16X-2T	
Physical Status	
Form Factor	EEB like
Dimension	12.4" x 14" (314.96 x 355.6mm)
Processor System	
CPU	Supports 4th and 5th Gen Intel® Xeon® Scalable Processors
Socket	1+1 Socket E (LGA 4677)
Thermal Design Power (TDP)	350W
Chipset	Intel® C741
System Memory	
Supported DIMM Quantity	8+8 DIMM slots (1DPC)
Supported Type	288-pin DDR5 RDIMM / RDIMM-3DS
Max. Capacity per DIMM	RDIMM: 96GB RDIMM-3DS: 2H - 128GB / 4H - 256GB
Max. Frequency	5600 MT/s on 5th Gen Intel® Xeon® Scalable Processors 4800 MT/s on 4th Gen Intel® Xeon® Scalable Processors
Voltage	1.1V
Note: Memory support is to be validated.	
PCIe Expansion Slots	
SLOT0	PCIe5.0 / CXL1.1 x16 [CPU1]
SLOT1	PCIe5.0 x8 [CPU0]
SLOT2	PCIe5.0 / CXL1.1 x16 [CPU1]
SLOT3	PCIe5.0 / CXL1.1 x16 [CPU1]
SLOT4	PCIe5.0 / CXL1.1 x16 [CPU0]
SLOT5	PCIe5.0 / CXL1.1 x16 [CPU1]
SLOT6	PCIe5.0 / CXL1.1 x16 [CPU0]
Other PCIe Expansion Connectors	
M.2	1 M-key (PCIe5.0 x4), supports 2280/22110 form factor [CPU0]
MCIO	2 MCIO (PCIe5.0 x8) [CPU0]
OCulink	3 Oculink (PCIe3.0 x4 or 4 SATA 6Gb/s) [PCH]
SATA/SAS Storage	
PCH Built-in Storage	Intel® C741 (Up to 13 SATA 6Gb/s, support RAID 0/1/5/10): 3 Oculink for 12 SATA, 1 SATA 7-pin
Ethernet	
Additional GbE Controller	2 RJ45 (10GbE) by Intel® X710-AT2
Graphics	
Controller	ASPEED AST2600: 1 DB15 (VGA), 1 header
Rear I/O	
UID Button/LED	1 UID button w/ LED
VGA	1 DB15 (VGA)

USB	2 Type-A (USB2.0)
RJ45	2 RJ45 (10GbE), 1 dedicated IPMI
Hardware Monitor	
Temperature	CPU, PCH, MB, Card Side, RAM Temperature Sensing
Fan	Fan Tachometer
	CPU Quiet Fan (Allow Chassis Fan Speed Auto-Adjust by
	CPU Temperature)
	Fan Multi-Speed Control
Voltage	PSU +12V & +5VSB & +3.3V, +3VSB, PVNN_PCH, P1V05_
	PCH_STBY, P1V8_PCH_STBY, +BAT, PVCCIN_CPU0,
	PVCCIN_CPU1, PVCCINFAON_CPU0, PVCCINFAON_
	CPU1, PVCCFA_EHV_FIVRA_CPU0, PVCCFA_EHV_
	FIVRA_CPU1, PVCCD_HV_CPU0, PVCCD_HV_CPU1
Server Management	
BMC Controller	ASPEED AST2600: IPMI2.0 with iKVM and vMedia support
IPMI Dedicated	1 Realtek RTL8211F for dedicated management GLAN
GLAN	
System BIOS	
Type	AMI UEFI BIOS; 512Mb SPI Flash ROM
Features	Plug and Play (PnP), ACPI 4.0 and above compliance wake up
	events, SMBIOS 3.4 and above , ASRock Rack Instant Flash
Internal Connectors/Headers	
PSU Connectors	1 (24-pin, ATX main power), 2 (8-pin, ATX 12V)
	2 (8-pin, add-on card power & FAN))
Auxiliary Panel	1 (18-pin): chassis intrusion, system fault LED, LAN1/LAN2
Header	activity LED, locate, SMBus
System Panel	1 (9-pin): power switch, reset switch, system power LED, HDD
Header	activity LED
COM Header	1 (9-pin)
VGA Header	1 (15-pin)
Fan Header	8 (6-pin)
TPM Header	1 (13-pin, SPI)
VROC Header	1
SGPIO Header	2
HSBP	2
SMbus Header	2
PMbus Header	1
IPMB Header	1
Clear CMOS	1 (contact pads)
USB Header	1 header (19-pin, 2 USB3.2 Gen1)
NMI Header	1
LED Indicators	
Standby Power	1 (5VSB)
LED	

80 Debug Port LED	1
Fan Fail LED	8
BMC Heartbeat LED	1
Supported OS	
OS	Microsoft® Windows®
	- Server 2022 (64bit)
	Linux®
	- Red Hat Enterprise Linux Server 8.4 (64bit) / 8.5 (64bit) / 9.2 (64 bit)
	- SUSE Enterprise Linux Server 15 SP3 (64bit)
	- Ubuntu 21.10 (64bit) / 22.04 (64bit)
	Hypervisor
	- VMWare® ESXi 7.0 U3g / 8.0
	* On the Ubuntu system is not support Raid mode.
	* Please refer to the website for the latest OS support list.
Enviroment	
Operating Temperature	10 - 35°C (50 - 95degF)
Non-operating Temperature	-40 - 70°C (-40 - 158degF)

NOTE: Please refer to the website for the latest specifications.

> *This motherboard supports Wake from on Board LAN. To use this function, please make sure that the "Wake on Magic Packet from power off state" is enabled in Device Manager > Intel® Ethernet Connection > Power Management. And the "PCI Devices Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. After that, onboard LAN1&2 can wake up S5 under OS.*

> *Install Intel® LAN utility or Marvell SATA utility, this motherboard may fail Windows® Hardware Quality Lab (WHQL) certification tests. If installing the drivers only, it will pass the WHQL tests.*

1.3 Unique Features

ASRock Rack Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows user to update system BIOS without entering operating systems first like MS-DOS or Windows*. With this utility, press the <F6> key during the POST or the <F2> key to enter into the BIOS setup menu to access ASRock Rack Instant Flash. Just launch this tool and save the new BIOS file to the USB flash drive, floppy disk or hard drive, then update the BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

1.4 Motherboard Layout

SP2C741D16X-2T

35.6 cm (14 in)

31.5 cm (12.4 in)
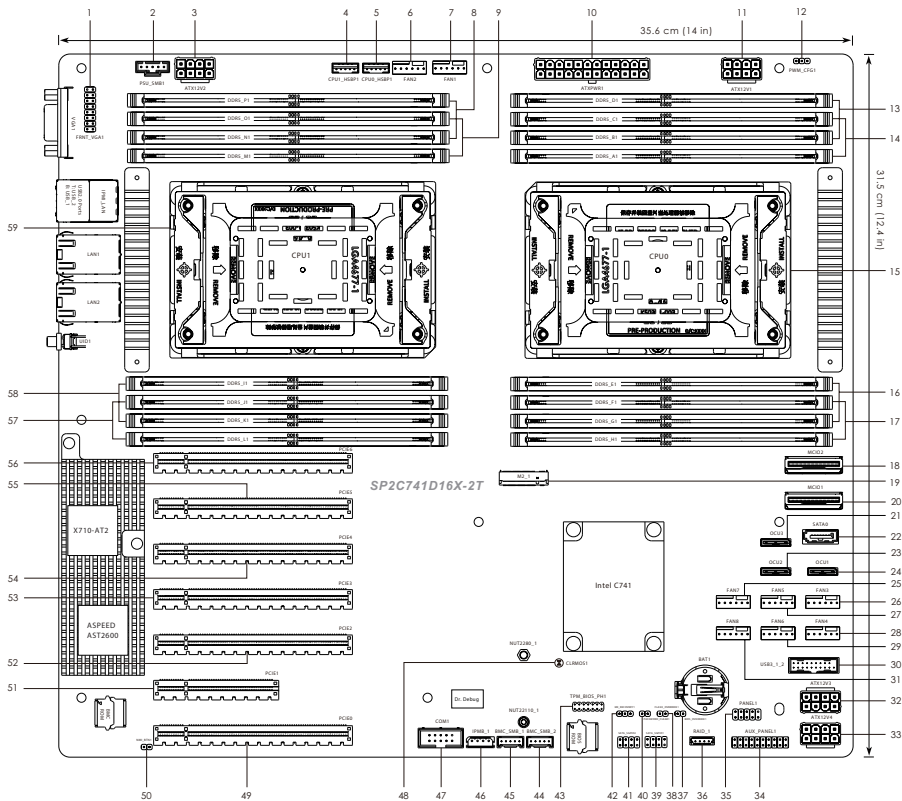
No.	Description
1	Front VGA Header (FRNT_VGA1)
2	PSU SMBus Header (PSU_SMB1)
3	ATX 12V Power Connector (ATX12V2)
4	Backplane PCI Express Hot-Plug Connector (CPU1_HSBP1)
5	Backplane PCI Express Hot-Plug Connector (CPU0_HSBP1)
6	System Fan Connector (FAN2)
7	System Fan Connector (FAN1)
8	2 x 288-pin DDR5 DIMM Slots (DDR5_N1, DDR5_P1)*
9	2 x 288-pin DDR5 DIMM Slots (DDR5_M1, DDR5_O1)*
10	ATX Power Connector (ATXPWR1)
11	ATX 12V Power Connector (ATX12V1)
12	PWM Configuration Header (PWM_CFG1)
13	2 x 288-pin DDR5 DIMM Slots (DDR5_B1, DDR5_D1)*
14	2 x 288-pin DDR5 DIMM Slots (DDR5_A1, DDR5_C1)*
15	LGA 4677 CPU Socket (CPU0)
16	2 x 288-pin DDR5 DIMM Slots (DDR5_E1, DDR5_G1)*
17	2 x 288-pin DDR5 DIMM Slots (DDR5_F1, DDR5_H1)*
18	Mini Cool Edge IO Connector (MCIO2)
19	M-key M.2 Socket (M2_1) (Type 2280/22110)
20	Mini Cool Edge IO Connector (MCIO1)
21	OCuLink Connector (4 SATA 6Gb/s) (OCU3)
22	SATA Connector (SATA0)
23	OCuLink Connector (4 SATA 6Gb/s) (OCU2)
24	OCuLink Connector (4 SATA 6Gb/s) (OCU1)
25	System Fan Connector (FAN7)
26	System Fan Connector (FAN3)
27	System Fan Connector (FAN5)
28	System Fan Connector (FAN4)
29	System Fan Connector (FAN6)
30	USB 3.2 Gen1 Header (USB3_1_2)
31	System Fan Connector (FAN8)
32	ATX 12V Power Connector (ATX12V3)
33	ATX 12V Power Connector (ATX12V4)
34	Auxiliary Panel Header (AUX_PANEL1)

English

No.	Description
35	System Panel Header (PANEL1)
36	Virtual RAID On CPU Header (RAID_1)
37	BIOS Swap Override Jumper (BIOS_OVERRIDE1)
38	Flash Override Jumper (FLASH_OVERRIDE1)
39	SATA SGPIO Connector (SATA_SGPIO1)
40	Password Reset Jumper (PASSWORD_CLEAR1)
41	SATA SGPIO Connector (SATA_SGPIO2)
42	ME Recovery Jumper (ME_RECOVERY1)
43	TPM-SPI Header (TPM_BIOS_PH1)
44	BMC SMBus Header (BMC_SMB_2)
45	BMC SMBus Header (BMC_SMB_1)
46	Intelligent Platform Management Bus Header (IPMB_1)
47	COM Header (COM1)
48	Clear CMOS Pad (CLRMOS1)
49	PCI Express 5.0 x16 Slot (PCIE0)
50	Non Maskable Interrupt Button (NMI_BTN1)
51	PCI Express 5.0 x8 Slot (PCIE1)
52	PCI Express 5.0 x16 Slot (PCIE2)
53	PCI Express 5.0 x16 Slot (PCIE3)
54	PCI Express 5.0 x16 Slot (PCIE4)
55	PCI Express 5.0 x16 Slot (PCIE5)
56	PCI Express 5.0 x16 Slot (PCIE6)
57	2 x 288-pin DDR5 DIMM Slots (DDR5_J1, DDR5_L1)*
58	2 x 288-pin DDR5 DIMM Slots (DDR5_I1, DDR5_K1)*
59	LGA 4677 CPU Socket (CPU0)

For DIMM installation and configuration instructions, please see p.21 (Installation of Memory Modules (DIMM)) for more details.

1.5 Onboard LED Indicators
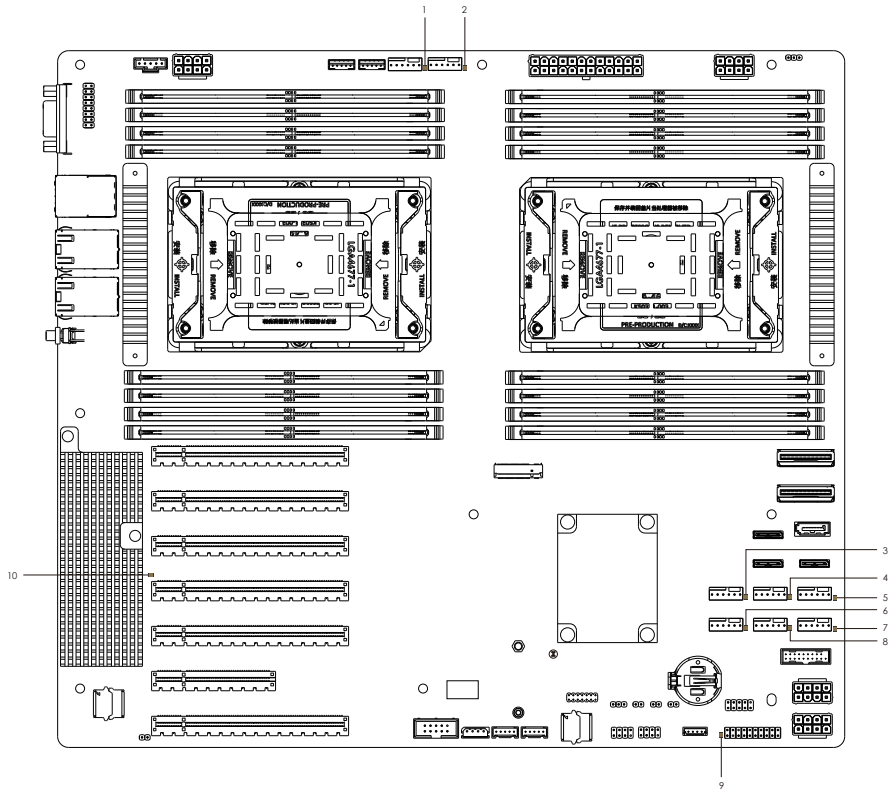
No.	Item	Status	Description
1	FAN_LED2	Red	FAN2 failed
2	FAN_LED1	Red	FAN1 failed
3	FAN_LED7	Red	FAN7 failed
4	FAN_LED5	Red	FAN5 failed
5	FAN_LED3	Red	FAN3 failed
6	FAN_LED8	Red	FAN8 failed
7	FAN_LED4	Red	FAN4 failed
8	FAN_LED6	Red	FAN6 failed
9	SB_PWR1	Green	STB PWR ready
10	BMC_LED1	Green	BMC heartbeat LED

1.6 I/O Panel
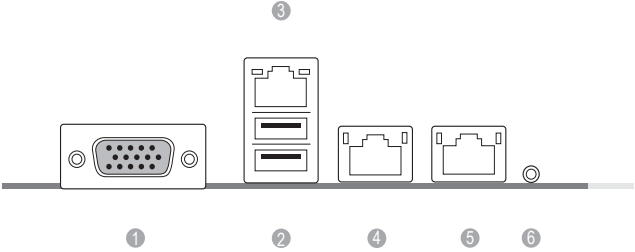
No.	Description	No.	Description
1	VGA Port (VGA1)	4	10G LAN RJ-45 Port (LAN1)**
2	USB 2.0 Ports (USB_1_2)	5	10G LAN RJ-45 Port (LAN2)**
3	LAN RJ-45 Port (IPMI_LAN)*	6	UID Switch (UID1)

IPMI LAN Port LED Indications

*There is an LED on each side of IPMI LAN port. Please refer to the table below for the LAN port LED indications.
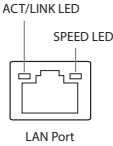
IPMI LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10Mbps connection or no link
Blinking Yellow	Data Activity	Yellow	100Mbps connection
On	Link	Green	1Gbps connection

English

**There is an LED on each side of 10G LAN port. Please refer to the table below for the LAN port LED indications.

ACT/LINK LED
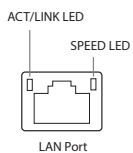
SPEED LED

LAN Port

10G LAN Port LED Indications

Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	100Mbps/10Mbps connection or no link
Blinking Yellow	Data Activity	Orange	1Gbps connection
On	Link	Green	10Gbps connection

English

1.7 Block Diagram
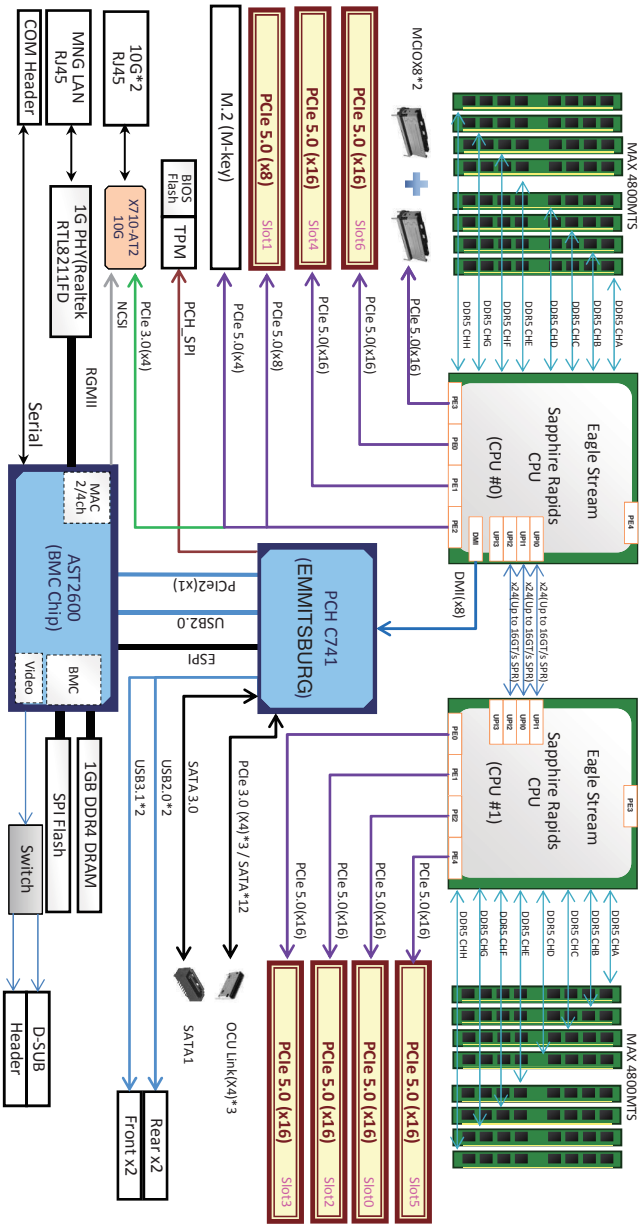
Chapter 2 Installation

This is an EEB-like form factor (12.4" x 14") motherboard. Before installing the motherboard, study the configuration of the chassis to ensure that the motherboard fits into it.

⚠ *Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries and damages to motherboard components.*

2.1 Screw Holes

Place screws into the holes indicated by circles to secure the motherboard to the chassis.

⚠ *Attention! Before installing this motherboard, be sure to unscrew and remove the standoff at the marked location, under the motherboard, from the chassis, in order to avoid electrical short circuit and damage the motherboard.*

⚠ *Do not over-tighten the screws! Doing so may damage the motherboard.*

2.2 Pre-installation Precautions

Take note of the following precautions before installing motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any components.
2. To avoid damaging the motherboard's components due to static electricity, NEVER place the motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before handling the components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
5. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard.

⚠ *Before installing or removing any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.*

English

2.3 Installing the CPU and Heatsink

> 1. *Unplug all power cables before installing the CPU.*
> 2. *Illustration in this documentation are examples only.*

Carrier Used

Carrier Type	Xeon® SP XCC	Xeon® SP MCC/LCC
Carrier Code	E1A	E1B
Shim	No	Yes
Carrier Height	16.70mm	17.55mm

XCC Carrier

No Shim

16.70mm

MCC Carrier

Shim Installed

17.55mm
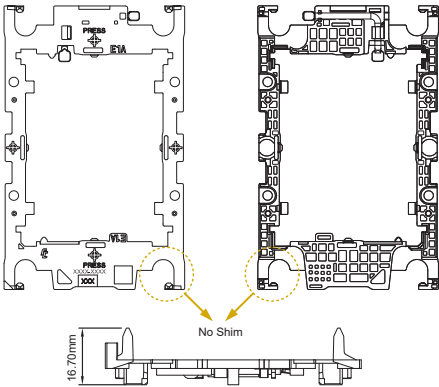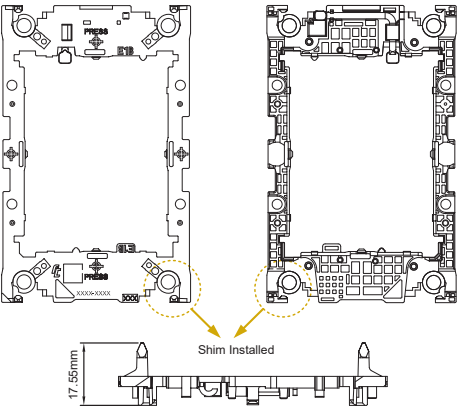
Follow the steps below to finish the CPU installation and please save the Socket Dust Cover when returning for service.

Socket Dust Cover

CPU Carrier

5

180°

6

7

CPU Carrier

8

Heatsink

CPU Carrier

Socket
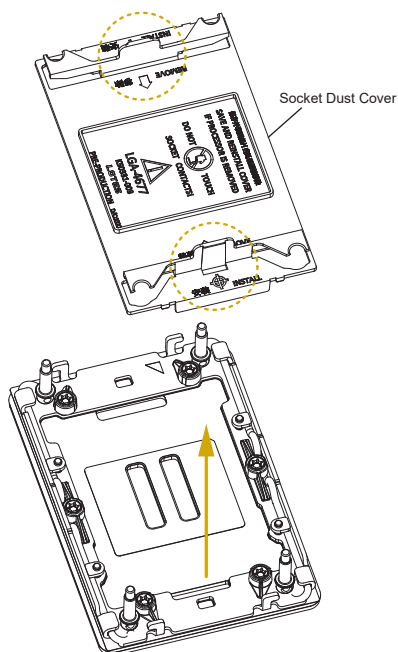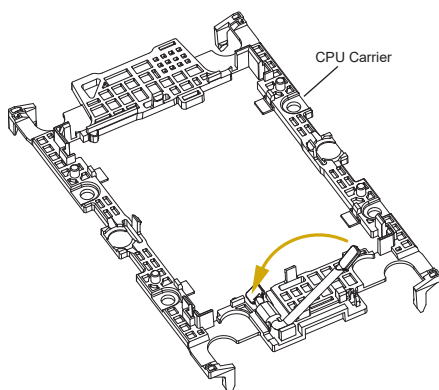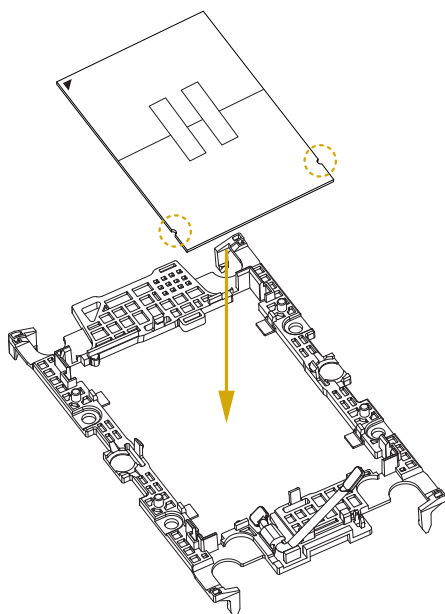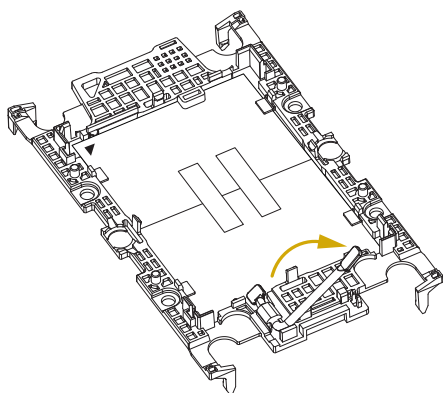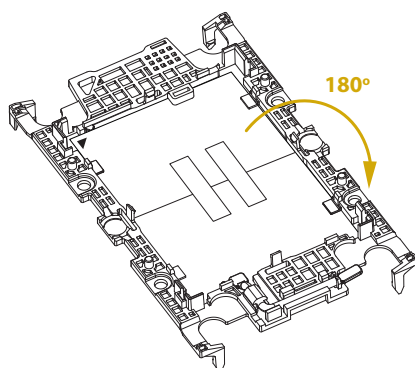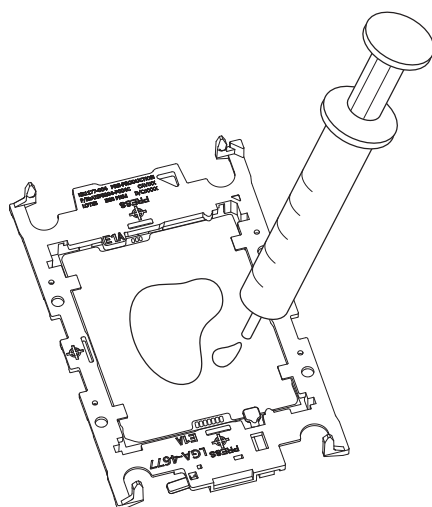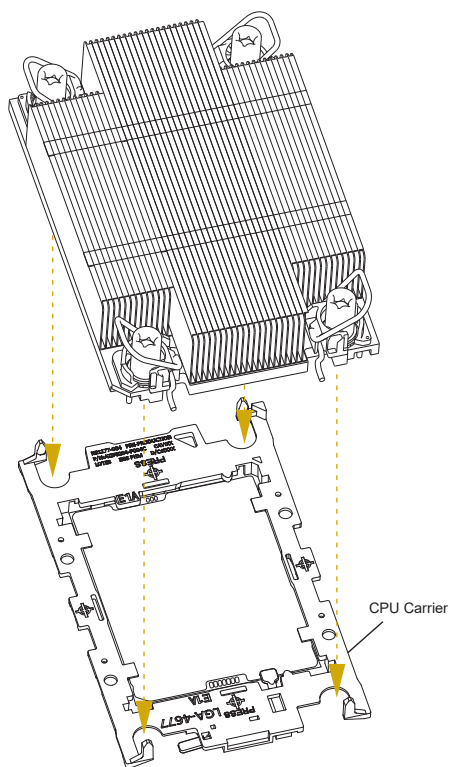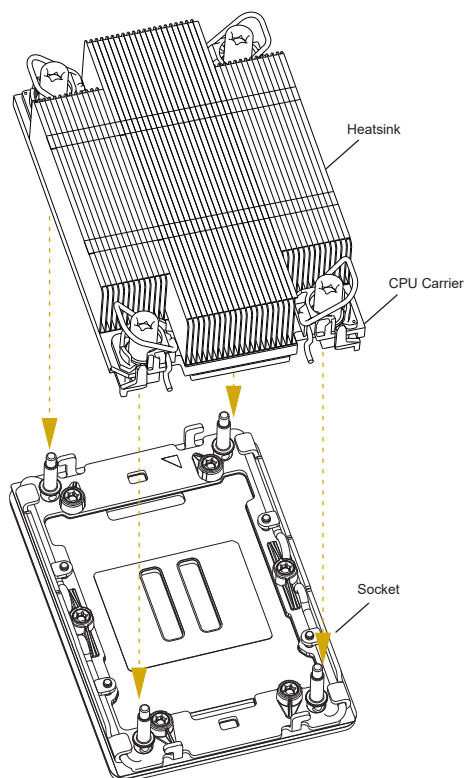
9
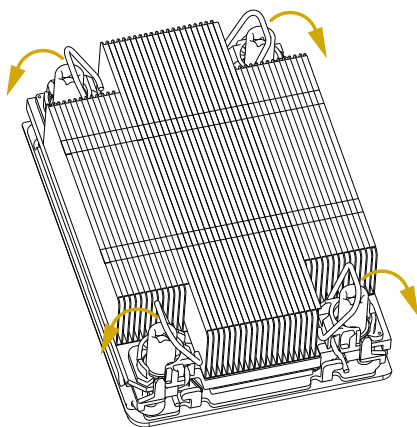
10
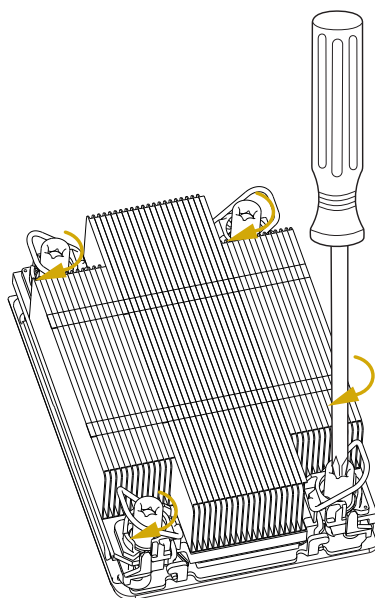
2.4 Installing Memory Modules (DIMM)

This motherboard provides sixteen 288-pin DDR5 (Double Data Rate 5) DIMM slots in two groups, and supports Single Channel Memory Technology.

CPU0	CPU1
DDR5_A1, B1, C1, D1, E1, F1, G1 H1	DDR5_I1, J1, K1, L1, M1, N1, O1, P1

1. Before installing a memory module, make sure to turn off the computer and unplug the powercord from the power outlet to prevent damage to the memory module.
2. For Eight channel configuration that needs to install identical (the same brand, speed, size and chip-type) DDR5 DIMM groups.
3. It is not allowed to install a DDR, DDR2, DDR3 or DDR4 memory module into a DDR5 slot; otherwise, this motherboard and DIMM may be damaged.

2.4.1 Memory Support

4th Gen Intel® Xeon® Scalable Processors - SP

Type	Ranks Per DIMM and Data Width	DRAM Density & DIMM Capacity			Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
					1DPC[1]	2DPC
		16GB	24GB[2]	32GB	1.1V	
RDIMM	SRx8 (RC D)	16GB	24GB	NA	4800	4400
	SRx4 (RC C)	32GB	48GB	NA		
	SRx4 (RC F) 9x4	32GB	NA	NA		
	DRx8 (RC E)	32GB	48GB	NA		
	DRx4 (RC A)	64GB	96GB	128GB		
	DRx4 (RC B) 9x4	64GB	NA	NA		
RDIMM-3DS	(4R/8R) x4 (RC A)	2H-128GB 4H-256GB	NA	NA		

Note1: 1DPC applies to 1 SPC or 2SPC implementations (SPC-Sockets Per Channel).
Note2: 24GB XCC only w/ limited configs: 1DPC all DIMM types, 2DPC 96GB only. Only 8 and 16 DIMM configs, no fallbacks.
Note3: The memory speed will be 4800 MT/s 1DPC and 4400 MT/s 2DPC.
Note4: The table is for reference only.

English

5th Gen Intel® Xeon® Scalable Processors - SP

Type	Ranks Per DIMM and Data Width	DRAM Density & DIMM Capacity			Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
					1DPC[1]	2DPC
		16GB	24GB	32GB	1.1V	
RDIMM	SRx8 (RC D)	16GB	24GB[2]	NA	5600[3]	4400[3]
	SRx4 (RC C)	32GB	48GB[2]	NA		
	SRx4 (RC F) 9x4	NA	NA	NA		
	DRx8 (RC E)	32GB	48GB[2]	NA		
	DRx4 (RC A)	64GB	96GB	128GB		
	DRx4 (RC B) 9x4	NA	NA	NA		
RDIMM-3DS	(4R/8R) x4 (RC A)	H-128GB 4H-256GB	NA	NA	5600[4]	

Note1: 1DPC applies to 1 SPC or 2SPC implementations (SPC-Sockets Per Channel).
Note2: 24GB 2DPC not POR w/ 24GB and 48GM DIMMs.
Note3: DDR5-5600 RDIMMs will be limited to 5600 MT/s 1DPC and 4400 MT/s 2DPC. DDR5-4800 DIMMs will be limited to 4800 MT/s 1DPC and 4400 MT/s 2DPC.
Note4: DDR5-5600 DIMM are required for 5600 and 5200 1DPC speeds.
Note5: EE LCC DDR5 memory support POR is 16GB/24GB/32GB at 4400 for 1DPC and 2DPC.
Note6: The table is for reference only.

2.4.2 Memory Configurations

1 CPU Configurations (Single P)

DIMM Slot		DIMM Number											
		1	1	1	1	2	2	4	6	6	6	6	8
CPU0	A1	V				V		V	V	V		V	V
	B1			V						V	V	V	V
	C1						V	V	V	V	V		V
	D1								V		V	V	V
	E1		V				V	V	V	V	V		V
	F1				V				V		V	V	V
	G1					V		V	V	V		V	V
	H1									V	V	V	V

The symbol V indicates the slot is populated.

2 CPU Configurations (Dual P)

DIMM Slot		DIMM Number											
		1	1	1	1	2	2	4	6	6	6	6	8
CPU0	A1	V				V		V	V	V		V	V
	B1			V						V	V	V	V
	C1					V	V	V	V	V			V
	D1								V		V	V	V
	E1		V				V	V	V	V			V
	F1				V				V		V	V	V
	G1					V		V	V	V		V	V
	H1									V	V	V	V

DIMM Slot		DIMM Number											
		1	1	1	1	2	2	4	6	6	6	6	8
CPU1	I1	V				V		V	V	V		V	V
	J1			V						V	V	V	V
	K1					V	V	V	V	V			V
	L1								V		V	V	V
	M1		V				V	V	V	V			V
	N1				V				V		V	V	V
	O1					V		V	V	V		V	V
	P1									V	V	V	V

The symbol V indicates the slot is populated.
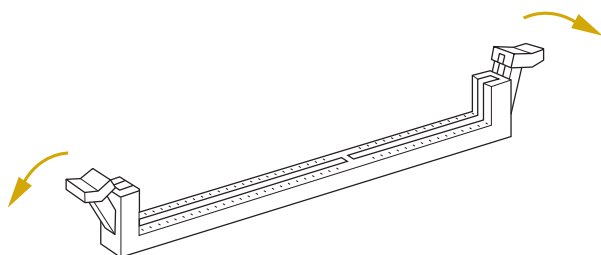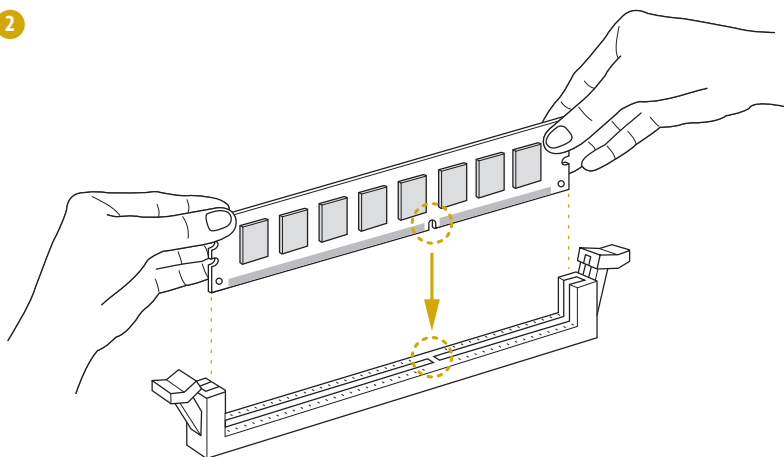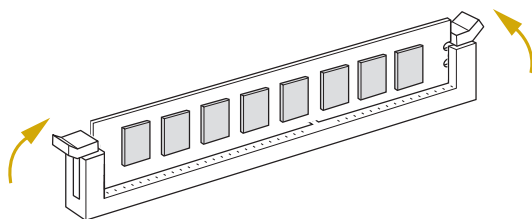
2.5 Expansion Slots (PCI Express Slots)

There are 7 PCI Express slots on this motherboard.

PCIE slots:

PCIE0 (PCIE 5.0 x16 slot, from CPU1) is used for PCI Express x16 lane width cards.
PCIE1 (PCIE 5.0 x8 slot, from CPU0) is used for PCI Express x8 lane width cards.
PCIE2 (PCIE 5.0 x16 slot, from CPU1) is used for PCI Express x16 lane width cards.
PCIE3 (PCIE 5.0 x16 slot, from CPU1) is used for PCI Express x16 lane width cards.
PCIE4 (PCIE 5.0 x16 slot, from CPU0) is used for PCI Express x16 lane width cards.
PCIE5 (PCIE 5.0 x16 slot, from CPU1) is used for PCI Express x16 lane width cards.
PCIE6 (PCIE 5.0 x16 slot, from CPU0) is used for PCI Express x16 lane width cards.

Slot	Generation	Mechanical	Electrical	Source
PCIE0	5.0	x16	x16	CPU1
PCIE1	5.0	x8	x8	CPU0
PCIE2	5.0	x16	x16	CPU1
PCIE3	5.0	x16	x16	CPU1
PCIE4	5.0	x16	x16	CPU0
PCIE5	5.0	x16	x16	CPU1
PCIE6	5.0	x16	x16	CPU0

Installing an expansion card

Step 1.   Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before starting the installation.

Step 2.   Remove the system unit cover (if the motherboard is already installed in a chassis).

Step 3.   Remove the bracket facing the slot that intending to use. Keep the screws for later use.

Step 4.   Align the card connector with the slot and press firmly until the card is completely seated on the slot.

Step 5.   Fasten the card to the chassis with screws.

Step 6.   Replace the system cover.

2.6 Jumper Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins.

Short   Open
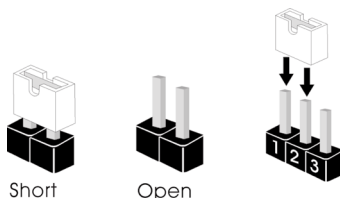
| ME Recovery Jumper (3-pin ME_RECOVERY1) (see p.6, No. 42) | **1_2** Normal Mode (Default) | **2_3** ME Recovery Mode |

The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open".

Short   Open
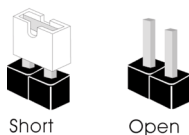
BIOS Swap Override Jumper (BIOS_OVERRIDE1) (see p.6, No. 37)	**1_2** 2-pin Jumper	Open: Disable Override (Default) Short: Enable Override
Flash Override Jumper (FLASH_OVERRIDE1) (see p.6, No. 38)	**1_2** 2-pin Jumper	Open: Disable Override (Default) Short: Enable Override
Password Reset Jumper (2-pin PASSWORD_ CLEAR1) (see p.6, No. 40)	**1_2** 2-pin Jumper	Open: Normal Mode (Default) Short: Password Clear

English

27

2.7 Onboard Headers and Connectors

⚠️ *Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard.*

System Panel Header
(9-pin PANEL1)
(see p.6, No. 35)

PLED+
PLED-
PWRBTN#
GND

1

GND
RESET#
GND
HDLED-
HDLED+
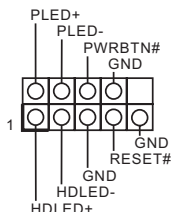
Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments. Particularly note the positive and negative pins before connecting the cables.

⊕ **PWRBTN (Power Switch):**
Connect to the power switch on the chassis front panel. Configure the way to turn off the system using the power switch.

RESET (Reset Switch):
Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):
Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):
Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting the chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Auxiliary Panel Header
(18-pin AUX PANEL1)
(see p.6, No. 34)
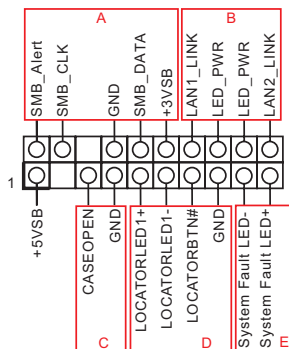
This header supports multiple functions on the front panel, including the front panel SMB, internet status indicator and chassis intrusion pin.

A
SMB_Alert
SMB_CLK
GND
SMB_DATA
+3VSB

B
LAN1_LINK
LED_PWR
LED_PWR
LAN2_LINK

1

+5VSB
CASEOPEN
GND
LOCATORLED1+
LOCATORLED1-
LOCATORBTN#
GND
System Fault LED-
System Fault LED+

C
D
E

A. Front panel SMBus connecting pin (6-1 pin FPSMB)
This header allows user to connect SMBus (System Management Bus) equipment. It can be used for communication between peripheral equipment in the system, which has slower transmission rates, and power management equipment.

B. Internet status indicator (2-pin LAN1_LED, LAN2_LED)
These two 2-pin headers allow user to use the Gigabit internet indicator cable to connect to the LAN status indicator. When this indicator flickers, it means that the internet is properly connected.

C. Chassis intrusion pin (2-pin CHASSIS)
This header is provided for host computer chassis with chassis intrusion detection designs. In addition, it must also work with external detection equipment, such as a chassis intrusion detection sensor or a microswitch. When this function is activated, if any chassis component movement occurs, the sensor will immediately detect it and send a signal to this header, and the system will then record this chassis intrusion event. The default setting is set to the CASEOPEN and GND pin; this function is off.

D. Locator LED (4-pin LOCATOR)
This header is for the locator switch and LED on the front panel.

E. System Fault LED (2-pin LOCATOR)
This header is for the Fault LED on the system.

English

29

PWM Configuration
Header
(3-pin PWM_CFG1)
(see p.6, No. 12)

SMB_CLK_VSB
SMB_DATA_VSB
GND
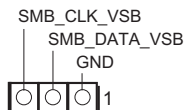
The header is used for PWM
configurations.

Non Maskable Interrupt
Button Header
(NMI_BTN1)
(see p.6, No. 50)

GND
CONTROL

Please connect a NMI device
to this header.

TPM-SPI Header
(13-pin TPM_BIOS_PH1)
(see p.6, No. 43)

SPI_DQ3
SPI_PWR
Dummy
CLK
SPI_MOSI
RST#
TPM_PIRQ

SPI_TPM_CS#
GND
RSMRST#
SPI_MISO
SPI_CS0
SPI_DQ2
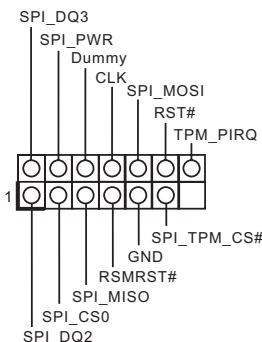
This connector supports SPI
Trusted Platform Module
(TPM) system, which can
securely store keys, digital
certificates, passwords, and
data. A TPM system also helps
enhance network security,
protects digital identities, and
ensures platform integrity.

SATA SGPIO Connectors
(7-pin SATA_SGPIO1)
(see p.6, No. 39)
(7-pin SATA_SGPIO2)
(see p.6, No. 41)

SCLOCK
SLOAD
GND

SDATAOUT
GND
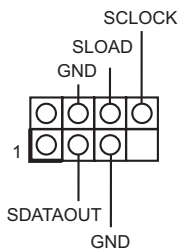
The header supports Serial
Link interface for onboard
SATA connections.

Mini Cool Edge IO x8
Connectors
(MCIO1)
(see p.6, No. 20)
(MCIO2)
(see p.6, No. 18)

This motherboard supports
8 Mini Cool Edge IO 8x
Connectors. Please connect
these connectors to the HDD
backplane board.

MCIO1 Pin Definition

Pin	Defeinition	Pin	Defeinition
A1	GND	B1	GND
A2	RX_DP15	B2	TX_DP15
A3	RX_DN15	B3	TX_DN15
A4	GND	B4	GND
A5	RX_DP14	B5	TX_DP14
A6	RX_DN14	B6	TX_DN14
A7	GND	B7	GND
A8	MCIO1_BP_TYPE	B8	MCIO1_SCL1
A9	MCIO1_2WIRE_RST_N	B9	MCIO1_SDA1
A10	GND	B10	GND
A11	MCIO1A_CLKP	B11	MCIO1_PERST_BUF1_N
A12	MCIO1A_CLKN	B12	MCIO1_PRSNT1_N
A13	GND	B13	GND
A14	RX_DP13	B14	TX_DP13
A15	RX_DN13	B15	TX_DN13
A16	GND	B16	GND
A17	RX_DP12	B17	TX_DP12
A18	RX_DN12	B18	TX_DN12
A19	GND	B19	GND
A20	RX_DP11	B20	TX_DP11
A21	RX_DN11	B21	TX_DN11
A22	GND	B22	GND
A23	RX_DP10	B23	TX_DP10
A24	RX_DN10	B24	TX_DN10
A25	GND	B25	GND
A26	TP38	B26	MCIO1_SCL2
A27	TP39	B27	MCIO1_SDA2
A28	GND	B28	GND
A29	MCIO1B_CLKP	B29	MCIO1_PERST_BUF2_N
A30	MCIO1B_CLKN	B30	MCIO1_PRSNT2_N
A31	GND	B31	GND
A32	RX_DP9	B32	TX_DP9
A33	RX_DN9	B33	TX_DN9
A34	GND	B34	GND
A35	RX_DP8	B35	TX_DP8
A36	RX_DN8	B36	TX_DN8
A37	GND	B37	GND
75	NP_NC_1	76	NP_NC_2
77	PGND_1	78	PGND_3
79	PGND_2	80	PGND_4

English

31

MCIO2 Pin Definition

Pin	Defeinition	Pin	Defeinition
A1	GND	B1	GND
A2	RX_DP7	B2	TX_DP7
A3	RX_DN7	B3	TX_DN7
A4	GND	B4	GND
A5	RX_DP6	B5	TX_DP6
A6	RX_DN6	B6	TX_DN6
A7	GND	B7	GND
A8	MCIO2_BP_TYPE	B8	MCIO2_SCL1
A9	MCIO2_2WIRE_RST_N	B9	MCIO2_SDA1
A10	GND	B10	GND
A11	MCIO2A_CLKP	B11	MCIO2_PERST_BUF1_N
A12	MCIO2A_CLKN	B12	MCIO2_PRSNT1_N
A13	GND	B13	GND
A14	RX_DP5	B14	TX_DP5
A15	RX_DN5	B15	TX_DN5
A16	GND	B16	GND
A17	RX_DP4	B17	TX_DP4
A18	RX_DN4	B18	TX_DN4
A19	GND	B19	GND
A20	RX_DP3	B20	TX_DP3
A21	RX_DN3	B21	TX_DN3
A22	GND	B22	GND
A23	RX_DP2	B23	TX_DP2
A24	RX_DN2	B24	TX_DN2
A25	GND	B25	GND
A26	TP40	B26	MCIO2_SCL2
A27	TP41	B27	MCIO2_SDA2
A28	GND	B28	GND
A29	MCIO2B_CLKP	B29	MCIO2_PERST_BUF2_N
A30	MCIO2B_CLKN	B30	MCIO2_PRSNT2_N
A31	GND	B31	GND
A32	RX_DP1	B32	TX_DP1
A33	RX_DN1	B33	TX_DN1
A34	GND	B34	GND
A35	RX_DP0	B35	TX_DP0
A36	RX_DN0	B36	TX_DN0
A37	GND	B37	GND
75	NP_NC_1	76	NP_NC_2
77	PGND_1	78	PGND_3
79	PGND_2	80	PGND_4

Backplane PCI Express Hot-Plug Connectors
(5-pin CPU0_ HSBP1)
(see p.6, No. 5)
(5-pin CPU1_ HSBP1)
(see p.6, No. 4)

+3V
CPU_HP_SCL
CPU_HP_SDA
P0_HP_ALERT_L
GND
1
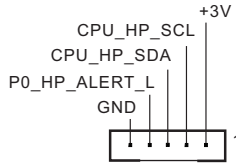
These headers are used for the hot plug feature of HDDs on the backplane.

BMC SMB Headers
(5-pin BMC_SMB_1)
(see p.6, No. 45)
(5-pin BMC_SMB_2)
(see p.6, No. 44)

BMC_SMB_PRESENT_1_N
Power
BMC_SMBCLK
GND
BMC_SMBDATA
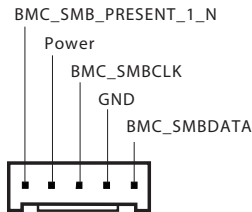
These headers are used for the SM BUS devices.

PSU SMBus Header
(5-pin PSU_SMB1)
(see p.6, No. 2)

PSU_ALT#
PSU_CLK   +3V
1
PSU_DAT
GND
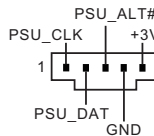
PSU SMBus monitors the status of the power supply, fan and system temperature.

Intelligent Platform Management Bus Header
(4-pin IPMB_1)
(see p.6, No. 46)

GND
No connect
IPMB_SCL
IPMB_SDA
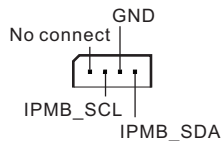
This 4-pin connector is used to provide a cabled base-board or front panel connection for value added features and 3rd-party add-in cards, such as Emergency Management cards, that provide management features using the IPMB.

OCuLink Connectors
(OCU1)
(see p.6, No. 24)
(OCU2)
(see p.6, No. 23)
(OCU3)
(see p.6, No. 21)

Please connect PCIE SSDs to the connector.

English

33

System Fan Connectors
(6-pin FAN1)
(see p.6, No. 7)
(6-pin FAN2)
(see p.6, No. 6)
(6-pin FAN3)
(see p.6, No. 26)
(6-pin FAN4)
(see p.6, No. 28)
(6-pin FAN5)
(see p.6, No. 27)
(6-pin FAN6)
(see p.6, No. 29)
(6-pin FAN7)
(see p.6, No. 25)
(6-pin FAN8)
(see p.6, No. 31)

```
6  5  4  3  2  1
            GND
         FAN_VOLTAGE
      FAN_SPEED_SENSOR1
   FAN_SPEED_CONTROL
  FAN_SPEED_SENSOR2
NC
```
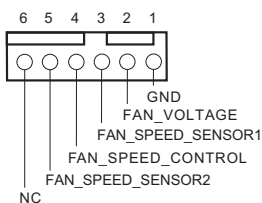
Please connect fan cables to the fan connectors and match the black wire to the ground pin. All fans support Fan Control.

USB 3.2 Gen1 Header
(19-pin USB3_1_2)
(see p.6, No. 30)

```
                IntA_PA_SSTX-
  IntA_PA_SSTX+      GND
      GND            IntA_PA_SSRX+
  IntA_PA_D-         IntA_PA_SSRX-
IntA_PA_D+           Vbus

  1
  Dummy            Vbus
  IntA_PB_D+       IntA_PB_SSRX-
    IntA_PB_D-     IntA_PB_SSRX+
          GND    GND
      IntA_PB_SSTX+  IntA_PB_SSTX-
```
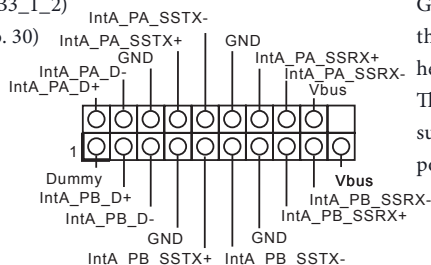
Besides two default USB 3.2 Gen1 ports on the I/O panel, there is one USB 3.2 Gen1 header on this motherboard. This USB 3.2 Gen1 header can support two USB 3.2 Gen1 ports.

Serial Port Header
(9-pin COM1)
(see p.6, No. 47)

```
RRXD1
  DDTR#1
    DDSR#1
      CCTS#

  1
            RRI#1
          RRTS#1
        GND
      TTXD1
DDCD#1
```
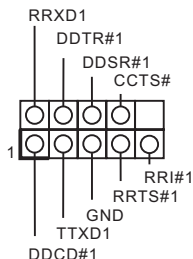
This COM1 header supports a serial port module.

ATX Power Connector
(24-pin ATXPWR1)
(see p.6, No. 10)

PWROK_PS
3V
3V
GND
5V
GND
5V
GND
5VSB
12V
12V
3V

1   12

13   24

3V
-12V
GND
PSON#
GND
GND
GND
N/A
5V
5V
5V
GND
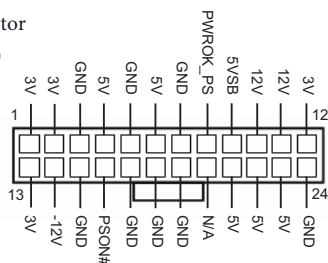
This motherboard provides a
24-pin ATX power connector.
To use a 20-pin ATX power
supply, please plug it along
Pin 1 and Pin 13.

Front VGA Header
(15-pin FRNT_VGA1)
(see p.6, No. 1)

V_SYNC
DDC_DATA
GND
GND
GND
Green

DDC_CLK
H_SYNC

+5V
GND
GND
Blue
Red

1
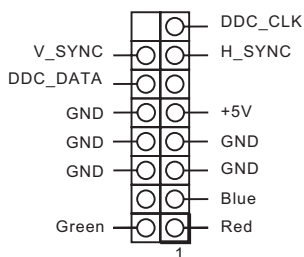
Please connect either end
of VGA_2X8 cable to VGA
header.

Clear CMOS Pad
(CLRMOS1)
(see p.6, No. 48)

This allows user to clear
the data in CMOS. To clear
CMOS, take out the CMOS
battery and short the Clear
CMOS Pad.

ATX 12V Power
Connectors
(8-pin ATX12V1)
(see p.6, No. 11)
(8-pin ATX12V2)
(see p.6, No. 3)
(8-pin ATX12V4)
(see p.6, No. 33)

GND

1   4

5   8

12V
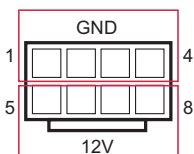
This motherboard provides
four 8-pin ATX 12V power
connectors.

*Note: If the total power of PCIe, FAN,
USB or other additional devices is
within 268W, it is recommended to
connect the third power connector
and if it exceeds, please connect the
fourth one.*

(8-pin ATX12V3)
(see p.6, No. 32)

12V

8   5

4   1

GND
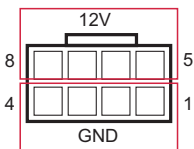
SATA Connector (SATA0) (see p.6, No. 22)		The SATA connector support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.
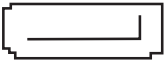
Virtual RAID On CPU Header (4-pin RAID_1) (see p.6, No. 36)	GND +3VSB GND VROC RAID KEY 1	This connector supports Intel® Virtual RAID on CPU and NVME/AHCI RAID on CPU PCIE.
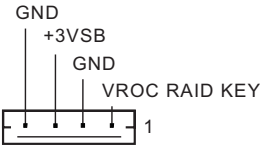
With the introduction of the Intel VROC product, there are three modes of operation:

SKU	HW key required	Key features
Pass-thru	Not needed	• Pass-thru only (no RAID) • LED Management • Hot Plug Support • RAID 0 support for Intel Fultondale NVMe SSDs
Standard	VROCSTANMOD	• Pass-thru SKU features • RAID 0, 1, 10
Premium	VROCPREMMOD	• Standard SKU features • RAID 5 • RAID 5 Write Hole Closure
ISS	VROCISSDMOD	

*Only Intel SSDs are supported.

*For further details on VROC, please refer to the official information released by Intel.

2.8 Unit Identification purpose LED/Switch

With the UID button, user can locate the server working on from behind a rack of servers.

Unit Identification purpose LED/Switch (UID1)

When the UID button on the front or rear panel is pressed, the front/rear UID blue LED indicator will be turned on. Press the UID button again to turn off the indicator.

2.9 Dr. Debug

Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes.

Code	Description
0x10	PEI_CORE_STARTED
0x11	PEI_CAR_CPU_INIT
0x15	PEI_CAR_NB_INIT
0x19	PEI_CAR_SB_INIT
0x31	PEI_MEMORY_INSTALLED
0x32	PEI_CPU_INIT
0x33	PEI_CPU_CACHE_INIT
0x34	PEI_CPU_AP_INIT
0x35	PEI_CPU_BSP_SELECT
0x36	PEI_CPU_SMM_INIT
0x37	PEI_MEM_NB_INIT
0x3B	PEI_MEM_SB_INIT
0x4F	PEI_DXE_IPL_STARTED
0x60	DXE_CORE_STARTED
0x61	DXE_NVRAM_INIT

0x62	DXE_SBRUN_INIT
0x63	DXE_CPU_INIT
0x68	DXE_NB_HB_INIT
0x69	DXE_NB_INIT
0x6A	DXE_NB_SMM_INIT
0x70	DXE_SB_INIT
0x71	DXE_SB_SMM_INIT
0x72	DXE_SB_DEVICES_INIT
0x78	DXE_ACPI_INIT
0x79	DXE_CSM_INIT
0x90	DXE_BDS_STARTED
0x91	DXE_BDS_CONNECT_DRIVERS
0x92	DXE_PCI_BUS_BEGIN
0x93	DXE_PCI_BUS_HPC_INIT
0x94	DXE_PCI_BUS_ENUM
0x95	DXE_PCI_BUS_REQUEST_RESOURCES
0x96	DXE_PCI_BUS_ASSIGN_RESOURCES
0x97	DXE_CON_OUT_CONNECT

English

0x98	DXE_CON_IN_CONNECT
0x99	DXE_SIO_INIT
0x9A	DXE_USB_BEGIN
0x9B	DXE_USB_RESET
0x9C	DXE_USB_DETECT
0x9D	DXE_USB_ENABLE
0xA0	DXE_IDE_BEGIN
0xA1	DXE_IDE_RESET
0xA2	DXE_IDE_DETECT
0xA3	DXE_IDE_ENABLE
0xA4	DXE_SCSI_BEGIN
0xA5	DXE_SCSI_RESET
0xA6	DXE_SCSI_DETECT
0xA7	DXE_SCSI_ENABLE
0xA8	DXE_SETUP_VERIFYING_PASSWORD
0xA9	DXE_SETUP_START
0xAB	DXE_SETUP_INPUT_WAIT
0xAD	DXE_READY_TO_BOOT

0xAE	DXE_LEGACY_BOOT
0xAF	DXE_EXIT_BOOT_SERVICES
0xB0	RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN
0xB1	RT_SET_VIRTUAL_ADDRESS_MAP_END
0xB2	DXE_LEGACY_OPROM_INIT
0xB3	DXE_RESET_SYSTEM
0xB4	DXE_USB_HOTPLUG
0xB5	DXE_PCI_BUS_HOTPLUG
0xB6	DXE_NVRAM_CLEANUP
0xB7	DXE_CONFIGURATION_RESET
0xF0	PEI_RECOVERY_AUTO
0xF1	PEI_RECOVERY_USER
0xF2	PEI_RECOVERY_STARTED
0xF3	PEI_RECOVERY_CAPSULE_FOUND
0xF4	PEI_RECOVERY_CAPSULE_LOADED
0xE0	PEI_S3_STARTED
0xE1	PEI_S3_BOOT_SCRIPT

0xE2	PEI_S3_VIDEO_REPOST
0xE3	PEI_S3_OS_WAKE
0x50	PEI_MEMORY_INVALID_TYPE
0x53	PEI_MEMORY_NOT_DETECTED
0x55	PEI_MEMORY_NOT_INSTALLED
0x57	PEI_CPU_MISMATCH
0x58	PEI_CPU_SELF_TEST_FAILED
0x59	PEI_CPU_NO_MICROCODE
0x5A	PEI_CPU_ERROR
0x5B	PEI_RESET_NOT_AVAILABLE
0xD0	DXE_CPU_ERROR
0xD1	DXE_NB_ERROR
0xD2	DXE_SB_ERROR
0xD3	DXE_ARCH_PROTOCOL_NOT_AVAILABLE
0xD4	DXE_PCI_BUS_OUT_OF_RESOURCES
0xD5	DXE_LEGACY_OPROM_NO_SPACE
0xD6	DXE_NO_CON_OUT

0xD7	DXE_NO_CON_IN
0xD8	DXE_INVALID_PASSWORD
0xD9	DXE_BOOT_OPTION_LOAD_ERROR
0xDA	DXE_BOOT_OPTION_FAILED
0xDB	DXE_FLASH_UPDATE_FAILED
0xDC	DXE_RESET_NOT_AVAILABLE
0xE8	PEI_MEMORY_S3_RESUME_FAILED
0xE9	PEI_S3_RESUME_PPI_NOT_FOUND
0xEA	PEI_S3_BOOT_SCRIPT_ERROR
0xEB	PEI_S3_OS_WAKE_ERROR

English

2.10 M.2 SSD Module Installation Guide

The M.2 Socket (M2_1, Key M) supports type 2280/22110 M.2 PCI Express module up to Gen5 x4 (32GT/s x4).

Installing the M.2 SSD Module
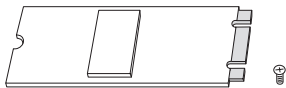
Step 1

Prepare a M.2_SSD module and the screw.
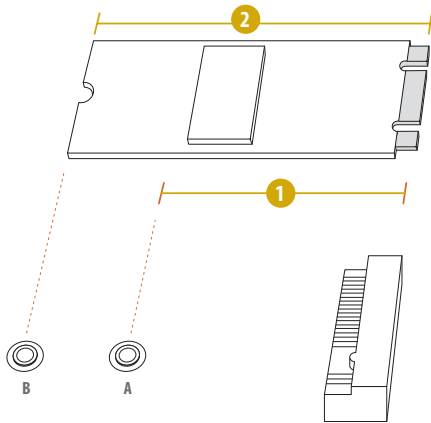
Step 2

Depending on the PCB type and length of the M.2 SSD module, find the corresponding nut location to be used.

No.	1	2
Nut Location	A (NUT2280_1)	B (NUT22110_1)
PCB Length	8cm	11cm
Module Type	Type2280	Type 22110
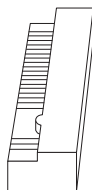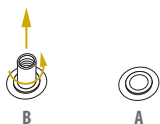
Step 3

Move the standoff based on the module type and length.
Skip Step 3 and 4 and go straight to Step 5 when using the default nut. Otherwise, release the standoff by hand.

B **A**
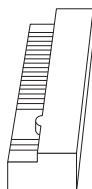
Step 4

Peel off the yellow protective film on the nut to be used. Hand tighten the standoff into the desired nut location on the motherboard.

B **A**
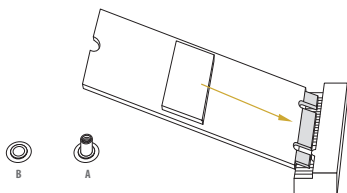
Step 5

Align and gently insert the M.2 SSD module into the M.2 slot. Please be aware that the M.2 SSD module only fits in one orientation.

B **A**

B **A** 20°
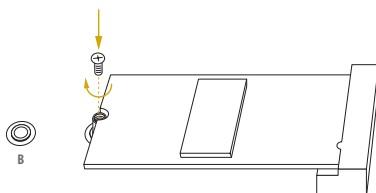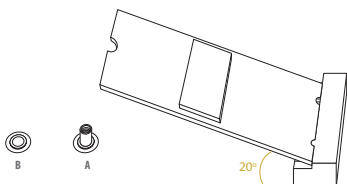
Step 6

Tighten the screw with a screwdriver to secure the module into place. Please do not overtighten the screw as this might damage the module.

B

2.11 Dual LAN and Teaming Operation Guide

Dual LAN with Teaming enabled on this motherboard allows two single connections to act as one single connection for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant images. Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.

> ⚠️ *The speed of transmission is subject to the actual network environment or status even with Teaming enabled.*

Before setting up Teaming, please make sure whether the Switch (or Router) supports Teaming (IEEE 802.3ad Link Aggregation). Specify a preferred adapter in Intel PROSet. Under normal conditions, the Primary adapter handles all non-TCP/IP traffic. The Secondary adapter will receive fallback traffic if the primary fails. If the Preferred Primary adapter fails, but is later restored to an active status, control is automatically switched back to the Preferred Primary adapter.

Step 1

From **Device Manager**, open the properties of a team.

Step 2

Click the **Settings** tab.

Step 3

Click the **Modify Team** button.

Step 4

Select the adapter that want to be the primary adapter and click the **Set Primary** button.

The software will choose an adapter of the highest capability (model and speed) to act as the default primary upon not specify a preferred primary adapter. If a failover occurs, another adapter becomes the primary. The adapter will, however, rejoin the team as a non-primary.

Chapter 3 UEFI Setup Utility

3.1 Introduction

This section explains how to use the UEFI SETUP UTILITY to configure the system. The UEFI chip on the motherboard stores the UEFI SETUP UTILITY. Run the UEFI SETUP UTILITY when starting up the computer. Please press <F2> or <Del> during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY; otherwise, POST will continue with its test routines.

Restart the system by pressing <Ctrl> + <Alt> + <Delete> to enter the UEFI SETUP UTILITY after POST, or by pressing the reset button on the system chassis. This allows user to restart by turning the system off and then back on.

> ⚠ *Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what seeing on the screen.*

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Item	Description
Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
Server Mgmt	To manage the server
Security	To set up the security features
Boot	To set up the default system device to locate and load the Operating System
Event Logs	For event log configuration
Exit	To exit the current screen or the UEFI SETUP UTILITY

Use < ← > key or < → > key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

English

3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Tab>	Switch to next function
<Enter>	To bring up the selected screen
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the UEFI SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

3.2 Main Screen

Once entering the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. The Main screen provides system overview information and allows user to set the system time and date.

```
                              Aptio Setup - AMI
      Main  Advanced  Server Mgmt  Security  Event Logs  Boot  Exit

    Board Product                SP2C741D16X-2T           Mother Board Information
    UEFI Version                 1.02
    BMC Version                  1.12.00
    CPLD_MB Version              1.03

  ▶ Mother Board Information
  ▶ Processor Information
  ▶ Memory Information

    System Date                  [Wed 07/15/2099]
    System Time                  [09:48:31]

                                                         �: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Option
                                                         F1: General Help
                                                         F7: Discard Changes
                                                         F9: Load UEFI Defaults
                                                         F10: Save and Exit
                                                         ESC: Exit



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```

3.2.1 Motherboard Information

Press [Enter] to view the information of the motheboard.

```
                              Aptio Setup - AMI
   Main

   Mother Board Information
   MotherBoard                    SP2C741D16X-2T

   BIOS Information
   BIOS Vendor                    American Megatrends
   Core Version                   5.29
   Compliancy                     UEFI 2.8; PI 1.7
   Project Version                A3031 1.02 x64
   Build Date and Time            03/27/2023 12:09:53
   Intel RC Revision              9409.P09
   AMI RC Revision                0ACOR 0.73
   BIOS ACM                       1.1.2
   SINIT ACM                      1.1.2
   ACPI Version                   62                     ↔: Select Screen
   SMBIOS Version                 3.5.0                  ↑↓: Select Item
                                                         Enter: Select
   Platform Information                                  +/-: Change Option
   Platform                       TypeArcherCityRP       F1: General Help
   Processor                      806F8 - SPR-SP E5      F7: Discard Changes
   PCH                            EBG A0/A1/B0/B1 SKU - B1  F9: Load UEFI Defaults
                                                         F10: Save and Exit
                                                         ESC: Exit




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```

3.2.2 Processor Information

Press [Enter] to view the information of the processor.

```
                              Aptio Setup - AMI
   Main

   Processor Socket               CPU1  |  CPU2
   Processor ID                   000806F8  |  000806F8
   Processor Frequency            2.400GHz  |  2.400GHz
   Processor Core                 48-Core  |   48-Core
   Processor TDP                  330W  |      330W
   Memory Channel                   8  |        8
   Processor Max Ratio            18H  |       18H
   Processor Min Ratio            08H  |       08H
   Microcode Revision             2B000181  |  2B000181
   L1 Cache RAM                   80KB  |     80KB
   L2 Cache RAM                   2048KB  |   2048KB
   L3 Cache RAM                   99840KB  |  99840KB
   CPU1 Version                   Intel(R) Xeon(R)
                                  Platinum 8468V         ↔: Select Screen
   CPU2 Version                   Intel(R) Xeon(R)       ↑↓: Select Item
                                  Platinum 8468V         Enter: Select
                                                         +/-: Change Option
   Intel Turbo Boost              Support                F1: General Help
   Intel VT-d Technology          Support                F7: Discard Changes
                                                         F9: Load UEFI Defaults
                                                         F10: Save and Exit
                                                         ESC: Exit




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```

3.2.3 Memory Information

Press [Enter] to view the information of the memory.

```
                              Aptio Setup - AMI
   Main

   Total Memory                     512 GB                          ▲
   Total DCPMM                      None

   Memory Present Number            16
   Memory Not Present Number        0
   Memory Channel Mode              Octuple-Channel Memory
                                    Mode

   DDR5_A1                          DDR5-4800 SRx4 32GB
                                    R-DIMM
   DDR5_B1                          DDR5-4800 SRx4 32GB
                                    R-DIMM
   DDR5_C1                          DDR5-4800 SRx4 32GB
                                    R-DIMM            ↔: Select Screen
   DDR5_D1                          DDR5-4800 SRx4 32GB  ↑↓: Select Item
                                    R-DIMM            Enter: Select
   DDR5_E1                          DDR5-4800 SRx4 32GB  +/-: Change Option
                                    R-DIMM            F1: General Help
   DDR5_F1                          DDR5-4800 SRx4 32GB  F7: Discard Changes
                                    R-DIMM            F9: Load UEFI Defaults
   DDR5_G1                          DDR5-4800 SRx4 32GB  F10: Save and Exit
                                    R-DIMM            ESC: Exit
   DDR5_H1                          DDR5-4800 SRx4 32GB
                                    R-DIMM                             ▼

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```

3.3 Advanced Screen

In this section, set the configurations for the following items: CPU Configuration, Platform Power Configuration, DRAM Configuration, Chipset Configuration, Storage Configuration, NVMe Configuration, ACPI Configuration, USB Configuration, Super IO Configuration, Serial Port Console Redirection, H/W Monitor, Runtime Error Logging, Intel SPS Configuration, Network Stack Configuration, Intel VMD Technology, Drive Health, Tls Auth Configuration and Instant Flash.

```
                        Aptio Setup – AMI
       Main  Advanced  Server Mgmt  Security  Event Logs  Boot  Exit

 ▶ CPU Configuration                        ▲ CPU Configuration Parameters
 ▶ Platform Power Configuration
 ▶ DRAM Configuration
 ▶ Chipset Configuration
 ▶ Storage Configuration
 ▶ NVMe Configuration
 ▶ ACPI Configuration
 ▶ USB Configuration
 ▶ Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ H/W Monitor
 ▶ Runtime Error Logging
 ▶ Intel SPS Information
 ▶ Network Stack Configuration            ↔: Select Screen
 ▶ Intel VMD technology                   ↑↓: Select Item
 ▶ Driver Health                          Enter: Select
                                          +/-: Change Option
 ▶ Tls Auth Configuration                 F1: General Help
 ▶ Intel(R) Ethernet Controller X710 for 10GBASE-T –  F7: Discard Changes
   00:00:00:00:01:00                      F9: Load UEFI Defaults
 ▶ VLAN Configuration (MAC:000000000100)  F10: Save and Exit
 ▶ MAC:000000000100-IPv6 Network Configuration  ESC: Exit
 ▶ MAC:000000000100-IPv4 Network Configuration
 ▶ Intel(R) Ethernet Controller X710 for 10GBASE-T –
   00:00:00:00:01:01                      ▼

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```

⚠ *Setting wrong values in this section may cause the system to malfunction.*

3.3.1 CPU Configuration

```
                                    Aptio Setup - AMI
           Advanced

       CPU Configuration                                      Core Disable Bitmap (Hex)
                                                              0: Enable all cores. 0xffff:
       CPU 1 Available Bitmap:  0AFBF57FFBBF6FBD              Disable all cores
       CPU 2 Available Bitmap:  0DBFBDBEF5DFDF3F
       Active Processor 1 Cores            0
       Active Processor 2 Cores            0

       Intel Hyper Threading Technology   [Enabled]

       Enable Intel TXT Support           [Disabled]
       Intel Virtualization Technology    [Enabled]
       Enable SMX                         [Disabled]

       Memory Encryption (TME)            [Disabled]          ↔: Select Screen
       SW Guard Extensions (SGX)          [Disabled]          ↑↓: Select Item
                                                              Enter: Select
       DCU Streamer Prefetcher            [Enabled]           +/-: Change Option
       Hardware Prefetcher                [Enabled]           F1: General Help
       Adjacent Cache Line Prefetch       [Enabled]           F7: Discard Changes
       AES-NI                             [Enabled]           F9: Load UEFI Defaults
                                                              F10: Save and Exit
                                                              ESC: Exit


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```

Active Processor 1/2 Cores

Select the number of cores to enable in each processor package.

Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Enable Intel TXT Support

Enables Intel Trusted Execution Technology Configuration.

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Enable SMX

Use this item to enable Safer Mode Extensions.

Memory Encryption (TME)

Use this item to enable or disable Memory Encryption (TME).

SW Guard Extensions (SGX)

Use this item to enable or disable Software Guard Extensions (SGX).

DCU Streamer Prefetcher

DCU streamer prefetcher is an L1 data cache prefetcher (MSR 1A4h [2]).

Hardware Prefetcher

Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch

Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance.

AES-NI

Use this item to enable or disable AES-NI support.

3.3.2 Platform Power Configuration

```
                              Aptio Setup - AMI
        Advanced

Platform Power Configuration                        Enable/Disable EIST (P-States)

CPU P State Control
Intel SpeedStep Technology          [Enabled]
Intel Turbo Boost Technology        [Enabled]
AVX P1                              [Nominal]
Intel SST-PP                        [Auto]
Dynamic SST-PP                      [Disabled]
--------------------------------------------------------
SST-PP          Core    P1     Package
Level  Capable  Count   Ratio  TDP (W)  TjMax
--------------------------------------------------------
   0      Yes    048     24      330      097
   3      Yes    048     21      300      091      ↔: Select Screen
   4      Yes    048     18      270      085      ↑↓: Select Item
--------------------------------------------------------        Enter: Select
                                                    +/-: Change Option
Activate SST-BF                     [Disabled]      F1: General Help
Configure SST-BF                    [Enabled]       F7: Discard Changes
                                                    F9: Load UEFI Defaults
CPU Hardware PM State Control                       F10: Save and Exit
Hardware P-States                   [Native Mode]   ESC: Exit

Frequency Prioritization
SST-CP                              [Disabled]

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```

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology set Disabled and Intel Turbo Boost Technology set Enabled.

⚠ *Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.*

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state.

AVX P1

Select this item to configure AVX P1 level.

Intel SST-PP

Select this item to configure hardware supported level.

Dynamic SST-PP

Select this item to enable or disable the Dynamic SST-PP.

Activate SST-BF

Select this item to enable or disable the SST-BF.

Configure SST-BF

Select this item to enable or disable the BIOS to configure SST-BF High Priority Cores so that SW does not have to configure.

Hardware P-States

This item supports below selections:
Disable: Hardware chooses a P-state based on OS Request (Legacy P-States).
Native Mode: Hardware chooses a P-state based on OS guidance.
Out of Band Mode: Hardware autonomously chooses a P-state (no OS guidance)
Native Mode with No Legacy Support: Hardware autonomously chooses a P-state based on OS guidance with no legacy support.

SST-CP

Select this item to enable or disable the SST-CP feature.

Enable Monitor MWAIT

Select this item to configure Monitor and MWAIT instructions whether Auto maps to enable.

CPU C6 State Support

Select this item to configure the CPU C6 (ACPI C3) report to OS.

Enhanced Halt State (C1E)

This item specific the Core C1E auto promotion Control whether takes effect after reboot.

Package C State Support

This item specific the Package C State limit, the state Auto maps is program specific.

CPU Thermal Throttling

Select this item to enable or disable Thermal Monitor.

Power Performance Tuning

This allows user to decides which controls EFB.
OS Controls EPB: Specifies IA32_ENERGY_PERF_BIAS is used.
BIOS Controls EPB: Specifies ENERGY_PERF_BIAS_CONFIG is used.
PECI Controls EPB: Specifies PCS53 is used.

ENERGY_PERF_BIAS_CFG mode

This allows user to use input from ENERGY_PERF_BIAS_CONFIG mode seletion. PERF/Balanced, Perf/Bananced or Power/Power.

Long Duration Power Limit

Select this item to configure the Long Duration Power Limit. PL1 Power Limit is in Watts and the value may vary from 0 to Fused Value. If the value is 0, the fused value will be programmed. A value greater than fused TDP value will not be programmed.

Long Duration Maintained

Select this item to configure the Long Duration Maintained value. PL1 value is in seconds. The value may vary from 0 to 448. Indicates the time window over which TDP value should be maintained.

Short Duration Power Limit

Select this item to configure the Short Duration Power Limit. PL2 Power Limit in Watts. The value may vary from 0 to Fused Value. If the value is 0, BIOS programs 120% * TDP.

Short Duration Maintained

Select this item to configure the Short Duration Maintained value. PL2 value is in seconds. The value may vary from 0 to 0.438. Indicates the time window over which TDP value should be maintained.

English

3.3.3 DRAM Configuration

```
                            Aptio Setup - AMI
        Advanced

   DRAM Configuration                                    Enforces Plan Of Record
                                                         restrictions for DDR frequency
   Enforce DDR Memory Frequency POR    [Enforce POR]     programming.
   DRAM Frequency                      [Auto]
   Numa                                [Enabled]

   Volatile Memory Mode                [1LM]
   DIMM Interleaving                   [Enabled]
   3-Way Channel Interleaving          [Enabled]
   Max Rank Interleaving in IMC        [8-way Interleave]
   Mirror Mode                         [Disabled]
   ADDDC Sparing                       [Disabled]
   Patrol Scrub                        [Enable at End of POST]
   Data Scrambling for DDR4/5          [Enabled]         ↔: Select Screen
   Data Scrambling for PMem            [Auto]            ↕: Select Item
                                                         Enter: Select
                                                         +/-: Change Option
                                                         F1: General Help
                                                         F7: Discard Changes
                                                         F9: Load UEFI Defaults
                                                         F10: Save and Exit
                                                         ESC: Exit


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```

Enforce DDR Memory Frequency POR

Enable to enforce POR restrictions for DDR frequency and voltage programming.

DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

Numa

Use this item to enable or disable Non Uniform Memory Access (NUMA).

Volatile Memory Mode

Select 1LM or 2LM mode for Volatile memory. For 2LM memory mode, BIOS will try to configure 2LM but if BIOS is unable to configure 2LM, volatile memory mode will fail back to 1LM.

DIMM Interleaving

Enable this item to allow interleaving to be performed at the highest posible MC * Channel interleaving ways. Or disable this item to enforce interleaving to only 1-way.

3-Way Channel Interleaving

Enable this item to allow 3-way channel interleaving. Or disable this item to default to number of channels available per MC when DIMM interleaving is enabled.

Max Rank Interleaving in IMC

This item allows to select Rank Interleaving setting.

Mirror Mode

Mirror Mode will set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half. Mirror Enable will disable XPT Prefetch.

ADDDC Sparing

Enable or disable Memory Rank Sparing.

Patrol Scrub

Patrol Scrub is a background activity initiated by the processor to seek out and fix memory errors.

Data Scrambling for DDR4/5

Enable - Enables data scrambling for DDR4 and DDR5.
Disable - Disables this feature.
Auto - Sets it to the MRC default setting; current default is Enable.

Data Scrambling for PMem

Enable - Enables data scrambling for PMem.
Disable - Disables this feature.
Auto - Sets it depending on stepping.

English

3.3.4 Chipset Configuration

```
                              Aptio Setup - AMI
         Advanced

    Chipset Configuration                                    Select MMCFG Base, Auto - Auto
                                                             decides based on Si
    MMCFG Base                        [2G]                   Compatibility.
    MMCFG Size                        [512M]
    MMIO High Base                    [2T]
    MMIO High Granularity Size        [256G]
    SR-IOV Support                    [Enabled]
    Re-Size BAR Support               [Disabled]

    OnBoard VGA                       [Enabled]
    OnBoard LAN                       [Enabled]

    VT-d                              [Enabled]
                                                             ↔: Select Screen
  ▶ OCU Mode Selection                                       ↑↓: Select Item
  ▶ PCIE Link Width                                          Enter: Select
  ▶ PCIE Link Speed                                          +/-: Change Option
  ▶ PCIE Hot Plug                                            F1: General Help
  ▶ PCIE ASPM                                                F7: Discard Changes
                                                             F9: Load UEFI Defaults
    Onboard Debug Port LED            [Auto]                 F10: Save and Exit
                                                             ESC: Exit




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```

MMCFG Base

Use this item to select MMCFG Base.

MMCFG Size

Use this item to select MMCFG Size.

NOTE: To ensure sufficient resource for usage, it is recommended for users to disable hot-plug option when set-ting this option to 128M

MMIO High Base

Use this item to select MMIO High Base.

MMIO High Granularity Size

Use this item to select MMIO Granularity Size.

SR-IOV Support

If system has SR-IOV capable PCIE Devices, this option Enables or Disables Single Root IO Virtualization Support.

Re-Size BAR Support

Enable or disable this item to Re-Size BAR supported upon the sysem has resizable BAR capable PCIE Devices.

Onboard VGA

Use this to enable or disable the Onboard VGA function. The default value is [Auto].

Onboard LAN

Use this to enable or disable the Onboard LAN function.

VT-d

Intel Virtualization Technology for Directed I/O helps the virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

OCU Mode Selection

Select this item to configure SATA or PCIE in OCU port.

OCU1/2/3 Mode Selection
Select SATA or PCIe work in OCU port.

PCIE Link Width

Select this item to configure PCIE Link Width.

PCIE0/1/2/3/4/5/6 Link Width
Select PCIe port Bifurcation for PCIE0/1/2/3/4/5/6.

MCIO1/2 Link Width
Select MCIO1/2 Link Width.

PCIE Link Speed

Select PCIE Link Speed.

OCU1/2/3 Link Speed
 Configure PCIe Speed.

PCIE0/1/2/3/4/5/6 Link Speed
Select Link Speed for PCIE0/1/2/3/4/5/6.

M2_1 Link Speed
Select Link Speed for M2_1.

MCIO1-1/1-2/2-1/2-2 Link Speed
Select Link Speed for MCIO1-1/1-2/2-1/2-2.

PCIE Hot Plug

Select this item to configure PCIE Hot Plug globally.

OCU1/2/3 Hot Plug
Enable or disable PCIE Hot Plug.

English

61

PCIE0/1/2/3/4/5/6, MCIO1-1/1-2/2-1/2-2 Hot Plug
Enable or disable PCIE and MCIO Hot Plug.

PCIE0/1/2/3/4/5/6, MCIO1-1/1-2/2-1/2-2 Surprise Hot Plug
Enable or disable PCIE and MCIO Surprise Hot Plug.

PCIE ASPM

Selec this item to configure the PCIE ASPM.

PCI-E ASPM Support (Global)
Select this item to disable ASPM Support in all PCIe root ports.

OCU1/2/3 ASPM Support
Select this item to configure PCIE Active State Power Management settings.

PCIE0/1/2/3/4/5/6 ASPM Support
Enables or disables the ASPM support for all CPU downstream devices. Select [Auto] for the default value.

MCIO1-1/1-2/2-1/2-2 ASPM Support
Enables or disables the ASPM support for all CPU downstream devices.

Onboard Debug Port LED

Enable or disable the onboard Dr. Debug LED.

3.3.5 Storage Configuration

```
                              Aptio Setup - AMI
         Advanced

     Storage Configuration                              S.M.A.R.T stands for
                                                        Self-Monitoring, Analysis, and
     Hard Disk S.M.A.R.T            [Disabled]          Reporting Technology. It is a
                                                        monitoring system for computer
     SATA Controller 0             [Enabled]            hard disk drives to detect and
     SATA Controller 0 Mode Selection   [AHCI]          report on various indicators
     SATA Controller 0 ALPM        [Enabled]            of reliability.

   ▶ OCU1(SATA0_0) : Not Detected
   ▶ OCU1(SATA0_1) : Not Detected
   ▶ OCU1(SATA0_2) : Not Detected
   ▶ OCU1(SATA0_3) : Not Detected
   ▶ OCU2(SATA0_4) : Not Detected
   ▶ OCU2(SATA0_5) : Not Detected                       ↔: Select Screen
   ▶ OCU2(SATA0_6) : Not Detected                       ↑↓: Select Item
   ▶ OCU2(SATA0_7) : Not Detected                       Enter: Select
                                                        +/-: Change Option
     SATA Controller 1             [Enabled]            F1: General Help
     SATA Controller 1 Mode Selection   [AHCI]          F7: Discard Changes
     SATA Controller 1 ALPM        [Enabled]            F9: Load UEFI Defaults
                                                        F10: Save and Exit
   ▶ SATA1_2 : Not Detected                             ESC: Exit
   ▶ OCU3(SATA1_4) : Not Detected
   ▶ OCU3(SATA1_5) : Not Detected
   ▶ OCU3(SATA1_6) : Not Detected

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```

Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

SATA Controller 0/1

Use this item to enable or disable SATA Controllers.

SATA Controller 0/1 Mode Selection

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive. Press <Ctrl+I> to enter RAID ROM during UEFI POST process.

SATA Controller 0/1 ALPM

Use this item to enable or disable Aggressive Link Power Management.

OCU1 (SATA0_0/SATA0_1/SATA0_2/SATA0_3), OCU2 (SATA0_4/SATA0_5/ SATA0_6/SATA0_7), OCU3 (SATA1_4/SATA1_5/SATA1_6/SATA1_7), SATA1_2

Select this item to configure the External SATA, Hot Plug, Spin Up Device and SATA Device Type.

3.3.6 NVMe Configuration

```
                          Aptio Setup - AMI
   Advanced

 NVMe Configuration                                   Launch NVMe driver

 Launch NVMe driver              [Enabled]

 No NVME Device Found



                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Option
                                                      F1: General Help
                                                      F7: Discard Changes
                                                      F9: Load UEFI Defaults
                                                      F10: Save and Exit
                                                      ESC: Exit


                    Version 2.22.1287 Copyright (C) 2023 AMI
```
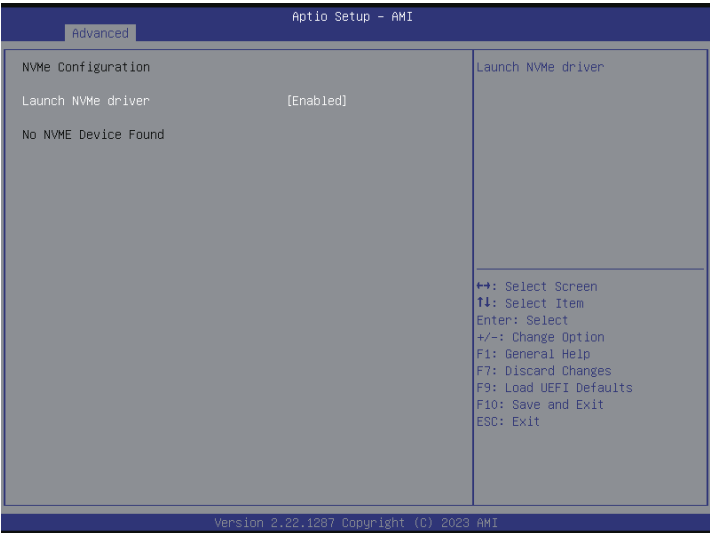
Launch NVMe driver

Select this item to enable or disable launch NVMe driver.

3.3.7 ACPI Configuration

```
                                    Aptio Setup — AMI
        Advanced

  ACPI Configuration                                      Allow the system to be waked
                                                          up by a PCIE device and enable
  PCIe Devices Power On           [Disabled]              wake on LAN.
  Ring-In Power On                [Disabled]
  RTC Alarm Power On              [By OS]




                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit



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```

PCIe Devices Power On

Allow the system to be waked up by a PCIE device and enable wake on LAN.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

3.3.8 USB Configuration

```
                          Aptio Setup - AMI
        Advanced

      USB Configuration

      USB Controllers:
            1 XHCI
      USB Devices:
            3 Drives, 2 Keyboards, 3 Mice, 2 Hubs




                                                    ↔: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit


                     Version 2.22.1287 Copyright (C) 2023 AMI
```
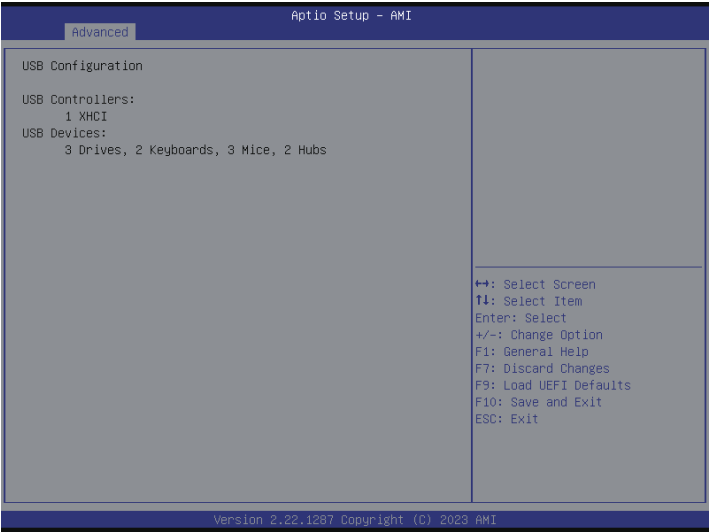
USB Configuration

The USB Configuration displays the USB Controllers and USB Devices informations.

3.3.9 Super IO Configuration
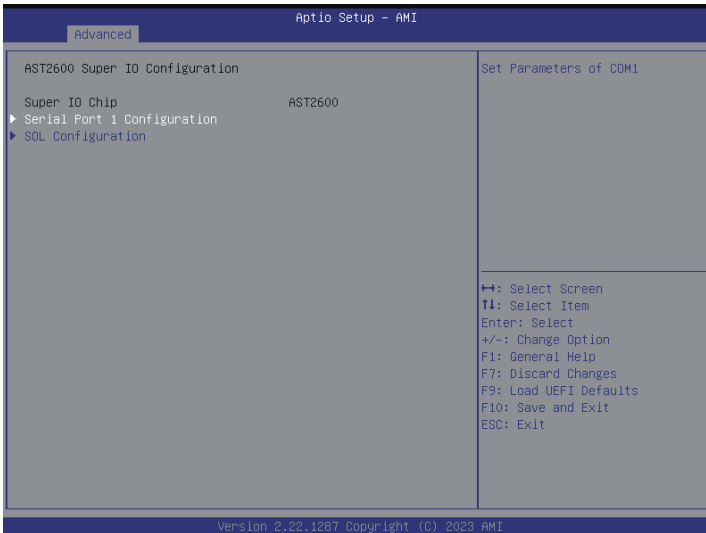
Serial Port 1 Configuration

Use this item to set parameters of Serial Port 1.

Serial Port

Use this item to enable or disable the serial port.

Change Settings

Use this item to select an optimal setting for Super IO device.

SOL Configuration

Use this item to set parameters of SOL.

SOL Port

Use this item to set parameters of SOL.

Change Settings

Use this item to select an optimal setting for Super IO device.

3.3.10 Serial Port Console Redirection
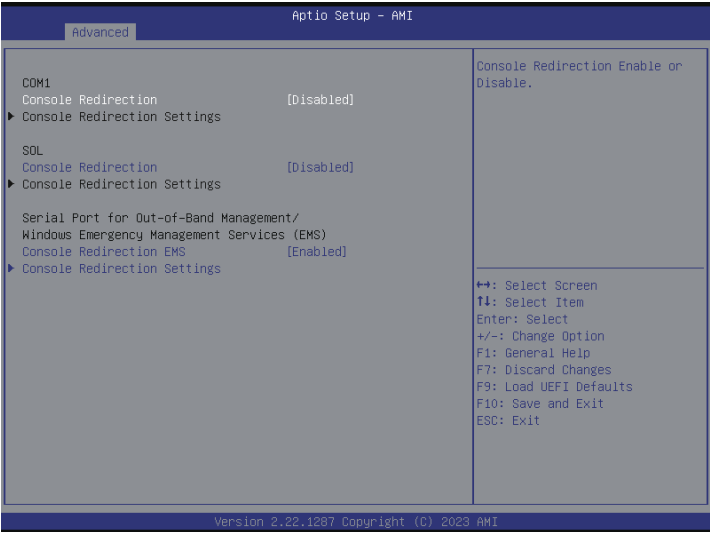
COM1 / SOL

Console Redirection

Use this option to enable or disable Console Redirection. If this item is set to Enabled, it allows user to select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how the computer and the host computer to which are connected exchange information. Both computers should have the same or compatible settings.

Terminal Type
Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [38400], [57600] and [115200].

Data Bits

Use this item to set the data transmission size. The options include [7] and [8] (Bits).

Parity

Use this item to select the parity bit. The options include [None], [Even], [Odd], [Mark] and [Space].

Stop Bits

The item indicates the end of a serial data packet. The standard setting is [1] Stop Bit. Select [2] Stop Bits for slower devices.

Flow Control

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None] and [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable or disable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.

Recorder Mode

Use this item to enable or disable Recorder Mode to capture terminal data and send it as text messages.

Resolution 100x31

Use this item to enable or disable extended terminal resolution support.

Putty Keypad

Use this item to select Function Key and Keypad on Putty.

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

Console Redirection EMS

Use this option to enable or disable Console Redirection. If this item is set to Enabled, it allows user to select a COM Port to be used for Console Redirection.

Console Redirection Settings

Use this option to configure Console Redirection Settings, and specify how the computer and the host computer to which are connected exchange information.

English

Out-of-Band Mgmt Port

Microsof t Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

Terminal Type EMS

Use this item to select the preferred terminal emulation type for out-of-band management. It is recommended to select [VT-UTF8].

Option	Description
VT100	ASCII character set
VT100+	Extended VT100 that supports color and function keys
VT-UTF8	UTF8 encoding is used to map Unicode chars onto 1 or more bytes
ANSI	Extended ASCII character set

Bits Per Second EMS

Use this item to select the serial port transmission speed. The speed used in the host computer and the client computer must be the same. Long or noisy lines may require lower transmission speed. The options include [9600], [19200], [57600] and [115200].

Flow Control EMS

Use this item to set the flow control to prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to restart the flow. Hardware flow uses two wires to send start/stop signals. The options include [None], [Hardware RTS/CTS], and [Software Xon/Xoff].

Data Bits EMS

Parity EMS

Stop Bits EMS

3.3.12 Runtime Error Logging
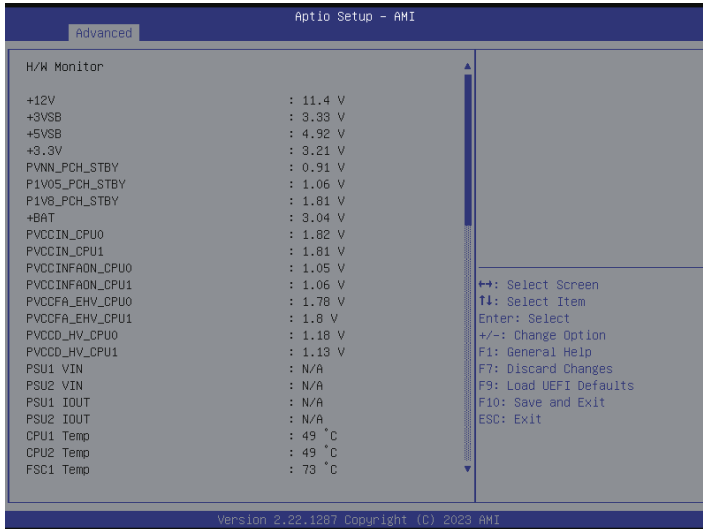

```
                              Aptio Setup - AMI
    Advanced

 Runtime Error Logging                              System Error Enable/Disable
                                                    setup options
 System Error                      [Enabled]
 WHEA Support                      [Enabled]
 EMCA Logging Support              [Enabled]
 IIO/PCH Global Error Support      [Enabled]

 Memory Corrected Error            [Enabled]
  Memory Correctable Error         FF
 Threshold

 PCIe Corrected Error Enable       [Enabled]
  PCIe Corrected Error Threshold   1
 PCIe Uncorrected Error            [Enabled]      ↔: Select Screen
 PCIe Fatal Error Enable           [Enabled]      ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Option
                                                  F1: General Help
                                                  F7: Discard Changes
                                                  F9: Load UEFI Defaults
                                                  F10: Save and Exit
                                                  ESC: Exit




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```
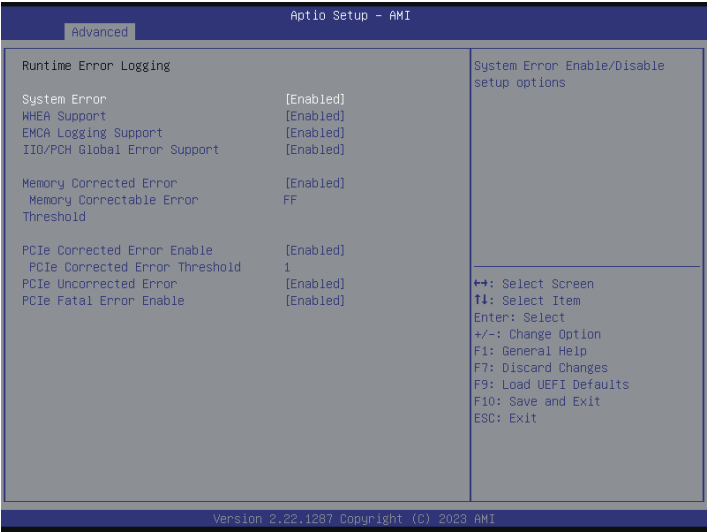
System Error

Use this item to enable or disable System Error feature. When it is set to [Enabled], it allows user to configure Memory Error and PCIE Error log features.

WHEA Support

Use this item to enable or disable Windows Hardware Error Architecture.

EMCA Logging Support

Use this item to enable or disable EMCA Logging.

IIO/PCH Global Error Support

Use this item to enable or disable IIO/PCH Error Support.

Memory Corrected Error

Use this item to enable or disable Memory Corrected Error.

Memory Correctable Error Threshold

Correctable Error Threshold (0 - 0x7FFF) used for sparing, tagging, and leaky bucket.

PCIE Corrected Error Enable

Use this item to enable or disable PCIe Correctable errors.

PCIE Corrected Error Threshold

PCIE Correctable Error Threshold (0x01-0xFF) used for sparing, tagging, and leaky bucket.

PCIE Uncorrected Error

Use this item to enable or disable PCIe Uncorrectable errors.

PCIE Fatal Error Enable

Use this item to enable or disable PCIe Ftal errors.

3.3.13 Intel SPS Configuration

```
                              Aptio Setup - AMI
      Advanced

 Intel SPS Information

 SPS Version                    6.0.4.25
 SPS FW State                   Operational

                                                    ↔: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Option
                                                    F1: General Help
                                                    F7: Discard Changes
                                                    F9: Load UEFI Defaults
                                                    F10: Save and Exit
                                                    ESC: Exit

                       Version 2.22.1287 Copyright (C) 2023 AMI
```
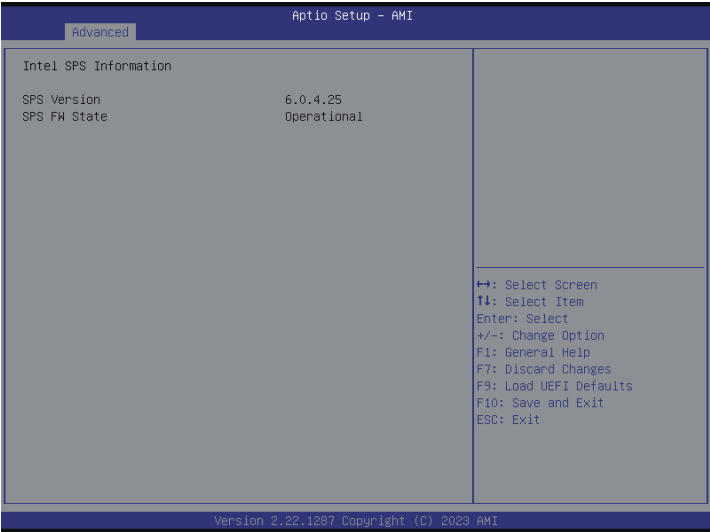
SPS screen displays the Intel SPS Configuration information, such as Operational Firmware Version and Firmware State.

3.3.14 Network Stack Configuration

```
                              Aptio Setup - AMI
        Advanced

   Network Stack Configuration                          Enable/Disable UEFI Network
                                                        Stack
   Network Stack                    [Enabled]
   IPv4 PXE Support                 [Disabled]
   IPv4 HTTP Support                [Disabled]
   IPv6 PXE Support                 [Disabled]
   IPv6 HTTP Support                [Disabled]
   PXE boot wait time               0
   Media detect count               1


                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Option
                                                        F1: General Help
                                                        F7: Discard Changes
                                                        F9: Load UEFI Defaults
                                                        F10: Save and Exit
                                                        ESC: Exit


                       Version 2.22.1287 Copyright (C) 2023 AMI
```

Network Stack

Enable UEFI network stack can prevents to perform from the single-user network boots and network installation. If disabled, the host does not use the network interface.

IPv4 PXE Support

Enable IPv4 PXE Boot support. If disabled, IPv4 PXE Boot Option is not supported.

IPv4 HTTP Support

Enable IPv4 HTTP Boot support. If disabled, IPv4 HTTP Boot Option is not supported.

IPv6 PXE Support

Enable IPv6 PXE Boot support. If disabled, IPv6 PXE Boot Option is not supported.

IPv6 HTTP Support

Enable IPv6 HTTP Boot support. If disabled, IPv6 HTTP Boot Option is not supported.

PXE Boot Wait Time

Specifies the wait time and press the ESC key to abort the PXE boot.

Media Detect Count

Specifies the number of times the presence of physical storage device are verified on a system reset or power cycle.

3.3.15 Intel VMD technology

```
                          Aptio Setup - AMI
        Advanced

   Intel VMD technology

 ▶ VMD Config for PCH ports
 ▶ Intel VMD for Volume Management Device on Socket 0
 ▶ Intel VMD for Volume Management Device on Socket 1

                                              ↔: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Option
                                              F1: General Help
                                              F7: Discard Changes
                                              F9: Load UEFI Defaults
                                              F10: Save and Exit
                                              ESC: Exit

                   Version 2.22.1287 Copyright (C) 2023 AMI
```
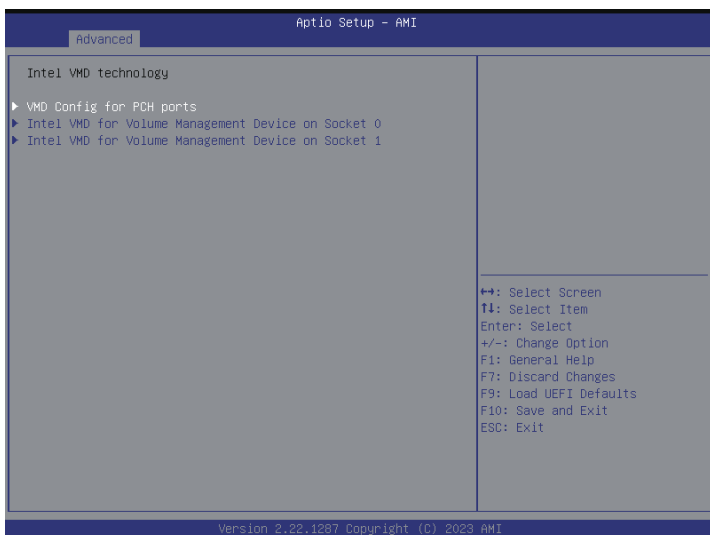
Press <Enter> to bring up the Intel VMD for Volume Management Device Configuration
menu.

VMD Config for PCH ports

Use this item to enable or disable Intel Volume Management Device Technology in specific
Stack.
When [Enabled], users are allowed to configure the options below.

PCH Root Port X (OCU1/2/3)

Use this item to enable or disable Intel Volume Management Device Technology on specific
root port.

Hot Plug Capable

Use this item to enable or disable Hot Plug for specific Ports.

Intel VMD for Volume Management Device on Socket 0/1

Use this item to enable or disable Intel Volume Management Device Technology in specific
Stack.

3.3.16 Driver Health

```
                                    Aptio Setup - AMI
        Advanced

  ▶ Intel(R) 40GbE 4.5.05      Healthy                    Provides Health Status for the
  ▶ Intel(R) 40GbE 4.5.05      Healthy                    Drivers/Controllers




                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit



                          Version 2.22.1287 Copyright (C) 2022 AMI
```
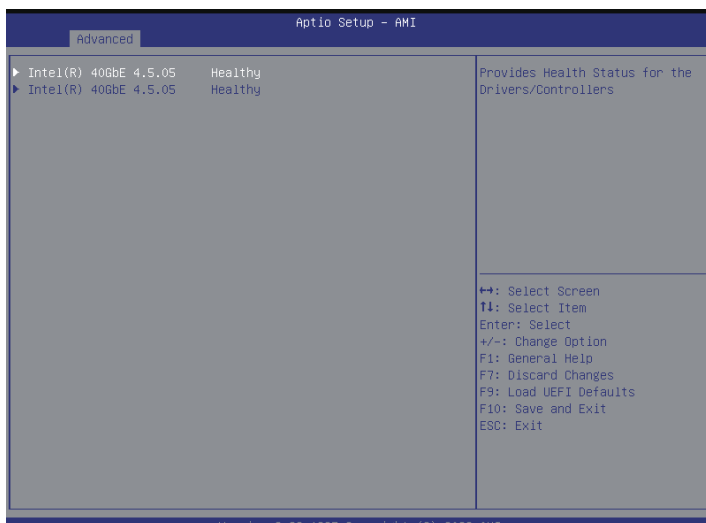
Inter (R) Ethernet Controller X710 for 10GBASE-T Healthy

Provides Health Status for the Drivers/Controllers

3.3.17 Tls Auth Configuration

```
                          Aptio Setup - AMI
      Advanced

 ▶ Server CA Configuration                      Press <Enter> to configure
                                                Server CA.
 ▶ Client Cert Configuration




                                                ↔: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Option
                                                F1: General Help
                                                F7: Discard Changes
                                                F9: Load UEFI Defaults
                                                F10: Save and Exit
                                                ESC: Exit



                   Version 2.22.1287 Copyright (C) 2023 AMI
```
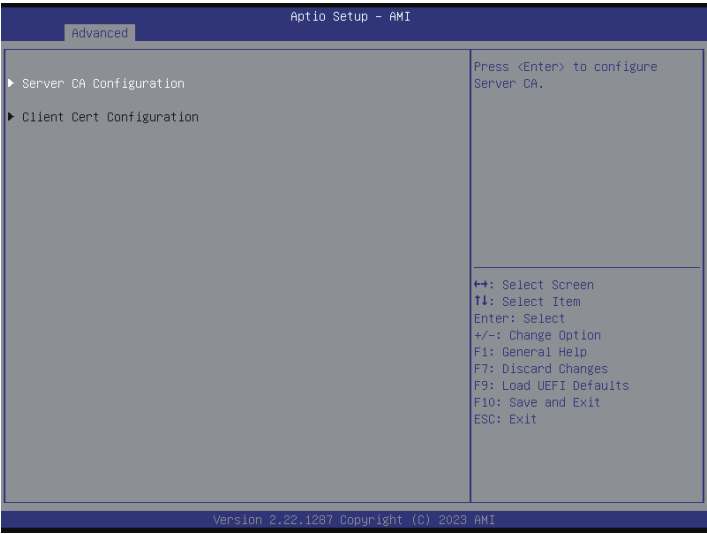
Server CA Configuration

Press <Enter> to configure Server CA.

Client Cert Configuration

Press <Enter> to configure Client Cert.

Enroll Cert
Press <Enter> to enroll cert.

Delete Cert
Press <Enter> to delete cert.

3.3.18 Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows user to update system UEFI without entering operating systems first like MS-DOS or Windows[*]. Just save the new UEFI file to the USB flash drive, floppy disk or hard drive and launch this tool, then update the UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. Execute the Instant Flash utility, the utility will show the UEFI files and the respective information. Select the proper UEFI file to update UEFI, and reboot the system after the UEFI update process is completed.

English

3.4 Server Mgmt
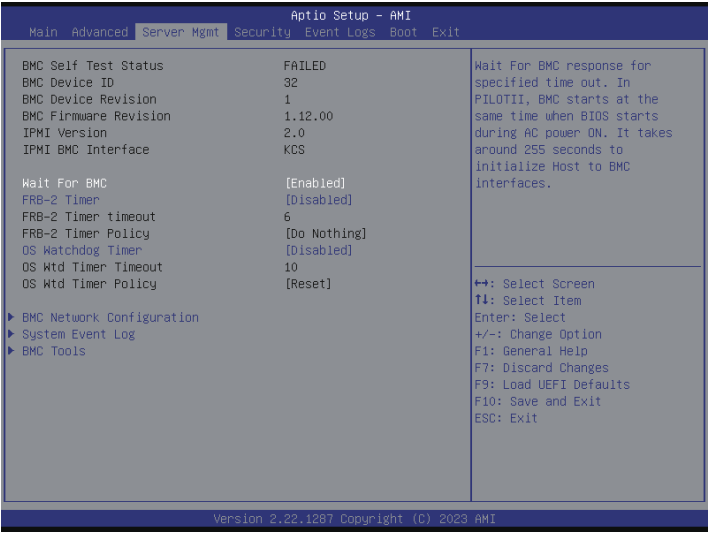
Wait For BMC

Wait For BMC response for specified time out. BMC starts at the same time when BIOS starts during AC power ON. It takes around 90 seconds to initialize Host to BMC interfaces.

FRB-2 Timer

Select this item to enable or disable FRB-2 timer (POST timer)

FRB-2 Timer Timeout

Select this item to define the FRB-2 Time Expiration between 1 to 30 value.

FRB-2 Timer Policy

Configure how the system should respond. If the FRB-2 Timer expires is disabled, this item is not available.

OS Watchdog Timer

Select this item to enable or disable OS Watchdog Timer. If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads.

OS Wtd Timer Timeout

Configure the OS Boot Watchdog Timer Expiration between 1 to 30 min value. If the OS Boot Watchdog Timer is disabled, this item is not available.

OS Wtd Timer Policy

Configure how the system should respond if the OS Boot Watchdog Timer expires. If the OS Boot Watchdog Timer is disabled, this item is not available.

BMC Network Configuration

Select this item to configure BMC network parameters.

System Event Log

Press <Enter> to change the SEL event log configuration.

BMC Tools

Select this item to configure about KCS control, restore AC power loss and load BMC default setings.

3.4.1 BMC Network Configuration

```
                        Aptio Setup - AMI
          Server Mgmt

  BMC Network Configuration                          ▲  Enable/Disable bonding, if you
                                                        want to enable bonding please
▶ Bonding Setting                                       enable all Lan channel first
    Bonding Status                    Enabled
▶ Bond0 enable setting
    Bond0 status                      Enabled

  ************************
  Configure IPV4 support
  ************************
  Lan channel   (Failover)
  Manual setting IPMI LAN            [No]
  Configuration address source       DHCP
  Station IP address                 0.0.0.0
  Current subnet mask                0.0.0.0               ↔: Select Screen
  Current MAC address                06-68-71-BF-8A-3A     ↑↓: Select Item
  Current router IP address          0.0.0.0              Enter: Select
  VLAN                               [Disabled]           +/-: Change Option
                                                          F1: General Help
  ************************                                 F7: Discard Changes
  Configure IPV6 support                                  F9: Load UEFI Defaults
  ************************                                 F10: Save and Exit
  Lan channel   (Failover)                                ESC: Exit
  IPV6 Support                       [Enabled]
  Manual setting IPMI LAN(IPV6)      [No Change]       ▼

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```

Bonding Setting

Select this item to enabled or disabled bonding. Please enable all lan channel first when want to enable bonding.

Lan Channel (Failover)

Manual Setting IPMI LAN

If [No] is selected, the IP address is assigned by DHCP. Using a static IP address, toggle to [Yes], and the changes take effect after the system reboots. The default value is [No].

Configuration Address Source

Select to configure BMC network parameters statically or dynamically(by BIOS or BMC). Configuration options: [Static] and [DHCP].

Static: Manually enter the IP Address, Subnet Mask and Gateway Address in the BIOS for BMC LAN channel configuration.
DHCP: IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server.

⚠️ *When [DHCP] or [Static] is selected, do NOT modify the BMC network settings on the IPMI web page.*

🔍 *The default login information for the IPMI web interface is:*
   Username: admin
   Password: admin

For more instructions on how to set up remote control environment and use the IPMI management platform, please refer to the IPMI Configuration User Guide or go to the Support website at: http://www.asrockrack.com/support/ipmi.asp

VLAN

Enabled or disabled Virtual Local Area Network. If [Enabled] is selected, configure the items below.

IPV6 Support

Enable or disable LAN1 IPV6 Support.

Manual Setting IPMI LAN(IPV6)

Select to configure LAN channel parameters statically or dynamucally(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

English

83

3.4.2 System Event Log

```
                          Aptio Setup - AMI
              Server Mgmt

 Enabling/Disabling Options                        Change this to enable or
 SEL Components                     [Enabled]      disable event logging for
                                                   error/progress codes during
 Erasing Settings                                  boot.
 Erase SEL                          [No]
 When SEL is Full                   [Do Nothing]

 Custom EFI Logging Options
 Log EFI Status Codes               [Error code]

 PCIe Device Degrade ELog Support   [Disabled]

 NOTE: All values changed here do not take
       effect until computer is restarted.        ↔: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Option
                                                  F1: General Help
                                                  F7: Discard Changes
                                                  F9: Load UEFI Defaults
                                                  F10: Save and Exit
                                                  ESC: Exit


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```

SEL Components

Change this to enable ro disable event logging for error/progress codes during boot.

Erase SEL

Use this to choose options for earsing SEL.

When SEL is Full

Use this to choose options for reactions to a full SEL.

Log EFI Status Codes

Use this item to disable the logging of EFI Status Codes or log only error code or only progress code or both.

PCIe Device Degrade ELog Support

Use this item to enable or disable PCIe Device Degrade Error Logging Support.

3.4.3 BMC Tools

```
                              Aptio Setup - AMI
              Server Mgmt

    BMC Tools                                         Select the KSC interface state
                                                      after POST end. If [Enabled]
    KCS control                      [No change]      is selected, the BMC will
     KCS control Current State       Enabled          remain KCS interface after
                                                      POST stage. If [Disabled] is
    Restore AC Power Loss            [No change]      selected, the BMC will disable
     Restore AC Power Current State  Last State       KCS interface after POST stage

  ▶ Load BMC Default Settings



                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Option
                                                      F1: General Help
                                                      F7: Discard Changes
                                                      F9: Load UEFI Defaults
                                                      F10: Save and Exit
                                                      ESC: Exit


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```

KCS control

Select the KSC interface state after POST end. If [Enabled] is selected, the BMC will remain KCS interface after POST stage. If [Disabled] is selected, the BMC will disable KCS interface after POST stage.

Restore AC Power Loss

This allows user to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers. If [Last State] is selected, it will recover to the state before AC/power loss.

Load BMC Default Settings

Use this item to load BMC default settings.

English

3.5 Security

This section allows user to set or change the supervisor/user password for the system. For the user password item is allowed user to clear it.
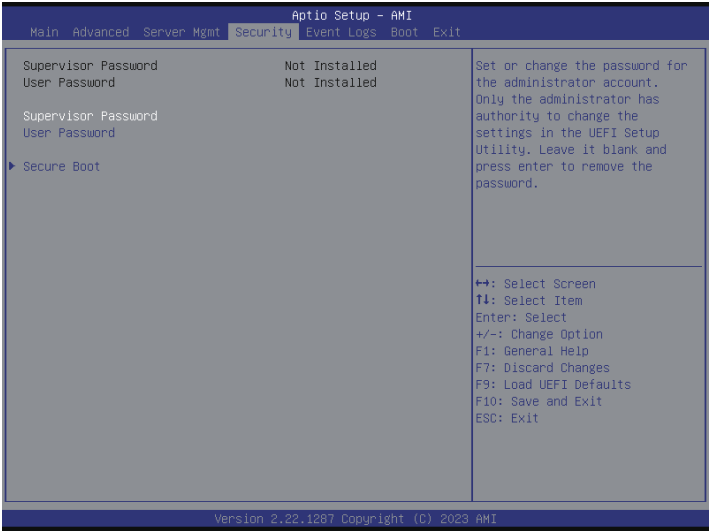
Supervisor Password

Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Use this to enable or disable Secure Boot Control. The default value is [Disabled]. Enable to support Windows Server 2012 R2 or later versions Secure Boot.

Secure Boot Mode

Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

3.5.1 Key Management

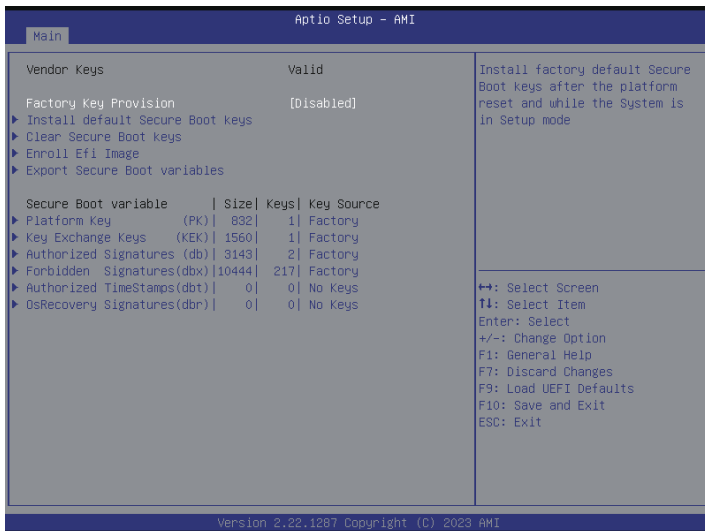In this section, expert users can modify Secure Boot Policy variables without full authentication.

```
                              Aptio Setup - AMI
   Main

   Vendor Keys                       Valid                   Install factory default Secure
                                                             Boot keys after the platform
   Factory Key Provision             [Disabled]              reset and while the System is
 ▶ Install default Secure Boot keys                          in Setup mode
 ▶ Clear Secure Boot keys
 ▶ Enroll Efi Image
 ▶ Export Secure Boot variables

   Secure Boot variable    | Size| Keys| Key Source
 ▶ Platform Key       (PK)|  832|    1| Factory
 ▶ Key Exchange Keys  (KEK)| 1560|    1| Factory
 ▶ Authorized Signatures (db)| 3143|    2| Factory
 ▶ Forbidden  Signatures(dbx)|10444|  217| Factory
 ▶ Authorized TimeStamps(dbt)|    0|    0| No Keys    ↔: Select Screen
 ▶ OsRecovery Signatures(dbr)|    0|    0| No Keys    ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Option
                                                      F1: General Help
                                                      F7: Discard Changes
                                                      F9: Load UEFI Defaults
                                                      F10: Save and Exit
                                                      ESC: Exit



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```

Factory Key Provision

Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

Install Default Secure Boot Keys

Please install default secure boot keys if it's the first time using the secure boot.

Clear Secure Boot Keys

Force System to Setup Mode - clear all Secure Boot Variables. Change takes effect after reboot.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db).

Export Secure Boot Variables

Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

Platform Key(PK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Key Exchange Keys(KEK)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized Signatures(db)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Forbidden Signatures(dbx)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

Authorized TimeStamps(dbt)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

OsRecovery Signatures(dbr)

Enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate in:

a) EFI_SIGNATURE_LIST
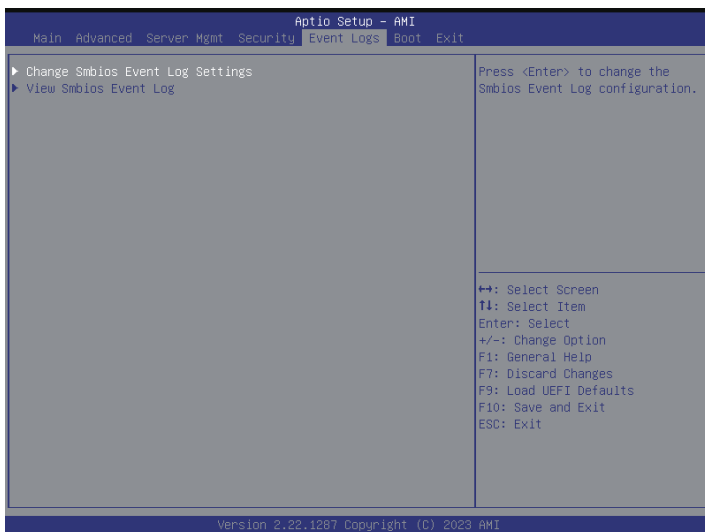
English

b) EFI_CERT_X509 (DER)

c) EFI_CERT_RSA2048 (bin)

d) EFI_CERT_SHAXXX

2. Authenticated UEFI Variable

3. EFI PE/COFF Image(SHA256)

Key Source: Factory, Modified, Mixed

3.6 Event Logs

```
                          Aptio Setup - AMI
      Main  Advanced  Server Mgmt  Security  Event Logs  Boot  Exit

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









                                                  ↔: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Option
                                                  F1: General Help
                                                  F7: Discard Changes
                                                  F9: Load UEFI Defaults
                                                  F10: Save and Exit
                                                  ESC: Exit




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```

Change Smbios Event Log Settings

Select this item to configure the Smbios Event Log Settings.

When entering the item, the screen displays following sub-items:

Smbios Event Log

Use this item to enable or disable all features of the SMBIOS Event Logging during system boot.

Erase Event Log

The options include [No], [Yes, Next reset] and [Yes, Every reset]. If Yes is selected, all logged events will be erased.

When Log is Full

Use this item to choose options for reactions to a full Smbios Event Log. The options include [Do Nothing] and [Erase Immediately].

Log System Boot Event

Choose option to enable or disable logging of System boot event.
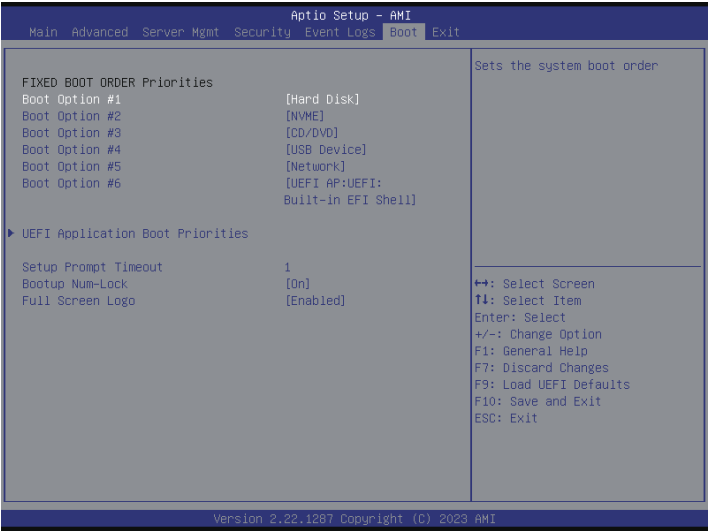
View Smbios Event Log

Press <Enter> to view the Smbios Event Log records.

> ⚠ *All values changed here do not take effect until computer is restarted.*

English

91

3.7 Boot Screen

In this section, it displays the available devices on the system and allows user to configure the boot settings and the boot priority.

```
                              Aptio Setup - AMI
     Main   Advanced   Server Mgmt   Security   Event Logs   Boot   Exit

                                                         Sets the system boot order
     FIXED BOOT ORDER Priorities
     Boot Option #1               [Hard Disk]
     Boot Option #2               [NVME]
     Boot Option #3               [CD/DVD]
     Boot Option #4               [USB Device]
     Boot Option #5               [Network]
     Boot Option #6               [UEFI AP:UEFI:
                                  Built-in EFI Shell]

   ▶ UEFI Application Boot Priorities

     Setup Prompt Timeout         1                       ↔: Select Screen
     Bootup Num-Lock              [On]                     ↑↓: Select Item
     Full Screen Logo             [Enabled]               Enter: Select
                                                          +/-: Change Option
                                                          F1: General Help
                                                          F7: Discard Changes
                                                          F9: Load UEFI Defaults
                                                          F10: Save and Exit
                                                          ESC: Exit



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```

Boot Option #1/#2/#3/#4/#5/#6

Use this item to set the system boot order.

UEFI Application Boot Priorities

Specifies the Boot Device Priority sequence from available UEFI Application.

Setup Prompt Timeout

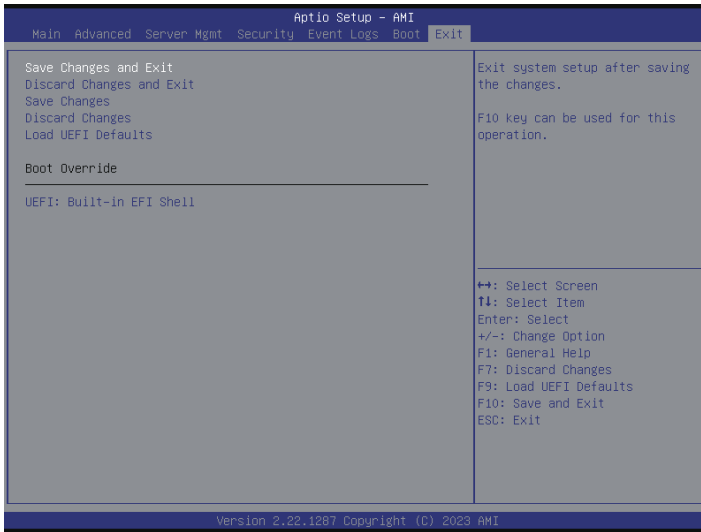Configure the number of seconds to wait for the UEFI setup utility.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

Full Screen Logo

Use this item to enable or disable OEM Logo. The default value is [Enabled].

English

92

3.8 Exit Screen

```
                              Aptio Setup - AMI
        Main  Advanced  Server Mgmt  Security  Event Logs  Boot  Exit

    Save Changes and Exit                          Exit system setup after saving
    Discard Changes and Exit                       the changes.
    Save Changes
    Discard Changes                                F10 key can be used for this
    Load UEFI Defaults                             operation.

    Boot Override

    UEFI: Built-in EFI Shell




                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Option
                                                   F1: General Help
                                                   F7: Discard Changes
                                                   F9: Load UEFI Defaults
                                                   F10: Save and Exit
                                                   ESC: Exit


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```

Save Changes and Exit

When selecting this option, the following message "Save configuration changes and exit setup?" will pop-out. Press <F10> key or select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When selecting this option, the following message "Discard changes and exit setup?" will pop-out. Press <ESC> key or select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Save Changes

When selecting this option, the following message "Save changes?" will pop-out. Press <F7> key or select [Yes] to save all changes.

Discard Changes

When selecting this option, the following message "Discard changes?" will pop-out. Press <F7> key or select [Yes] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

English

Chapter 4 Software Support

After all the hardware has been installed, it suggests to go to the offical website at http://www.ASRockRack.com and make sure if there are any new updates of the BIOS / BMC firmware for the motherboard.

4.1 Download and Install Operating System

This motherboard supports various Microsoft® Windows® Server / Linux compliant operating systems. Please download the operating system from the OS manufacturer. Please refer to the OS documentation for more instructions.

* Please download the Intel® SATA Floppy Image driver from the ASRock Rack's website (www.asrockrack.com) to the USB drive while installing OS in SATA RAID mode.

4.2 Download and Install Software Drivers

This motherboard supports various Microsoft® Windows® compliant drivers. Please download the required drivers from the website at http://www.ASRockRack.com.

To download necessary drivers, go the the product page, click on the "Download" tab, choose the operating system that is used, and then download the using driver.

4.3 Contact Information

Contact ASRock Rack or want to know more about ASRock Rack, welcome to visit ASRock Rack's website at http://www.ASRockRack.com; or contact the dealer for further information.

Chapter 5 Troubleshooting

5.1 Troubleshooting Procedures

Follow the procedures below to troubleshoot the system.

> ⚠ *Always unplug the power cord before adding, removing or changing any hardware components. Failure to do so may cause physical injuries and damages to motherboard components.*

1. Disconnect the power cable and check whether the PWR LED is off.
2. Unplug all cables, connectors and remove all add-on cards from the motherboard. Make sure that the jumpers are set to default settings.
3. Confirm that there are no short circuits between the motherboard and the chassis.
4. Install a CPU and fan on the motherboard, then connect the chassis speaker and power LED.

If there is no power...
1. Confirm that there are no short circuits between the motherboard and the chassis.
2. Make sure that the jumpers are set to default settings.
3. Check the settings of the 115V/230V switch on the power supply.
4. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.

If there is no video...
1. Try replugging the monitor cables and power cord.
2. Check for memory errors.

If there are memory errors...
1. Verify that the DIMM modules are properly seated in the slots.
2. Use recommended DDR5 RDIMM/RDIMM-3DS
3. Install more than one DIMM modules that should be identical with the same brand, speed, size and chip-type.
4. Try inserting different DIMM modules into different slots to identify faulty ones.
5. Check the settings of the 115V/230V switch on the power supply.

English

Unable to save system setup configurations...
1. Verify if the battery on the motherboard provides ~3VDC. Install a new battery if it does not.
2. Confirm whether the power supply provides adaquate and stable power.

Other problems...
1. Try searching keywords related to the related problem on ASRock Rack's FAQ page: http://www.asrockrack.com/support

5.2 Technical Support Procedures

If the problems are still unsolved, please contact ASRock Rack's technical support with the following information:

1. Contact information
2. Model name, BIOS version and problem type.
3. System configuration.
4. Problem description.

Contact ASRock Rack's technical support at:
http://www.asrockrack.com/support/tsd.asp

5.3 Returning Merchandise for Service

For warranty service, the receipt or a copy of the invoice marked with the date of purchase is required. By calling the vendor or going to RMA website (http://event. asrockrack.com/tsd.asp) to obtain a Returned Merchandise Authorization (RMA) number.

The RMA number should be displayed on the outside of the shipping carton which is mailed prepaid or hand-carried when returning the motherboard to the manufacturer. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty does not cover damages incurred in shipping or from failure due to alteration, misuse, abuse or improper maintenance of products.

Contact the distributor first for any product related problems during the warranty period.

English

Contact Information

If it needs to contact ASRock Rack or want to know more about ASRock Rack, you're welcome to visit ASRock Rack's website at http://www.asrockrack.com; or contact the dealer for further information. For technical questions, please submit a support request form at https://event.asrockrack.com/tsd.asp

ASRock Rack Incorporation

e-mail: ASRockRack_sales@asrockrack.com

ASRock Rack EUROPE B.V.

Bijsterhuizen 11-11
6546 AR Nijmegen
The Netherlands
Phone: +31-24-345-44-33

ASRock Rack America, Inc.

13848 Magnolia Ave, Chino, CA91710 U.S.A.
Phone: +1-909-590-8308
Fax: +1-909-590-1026