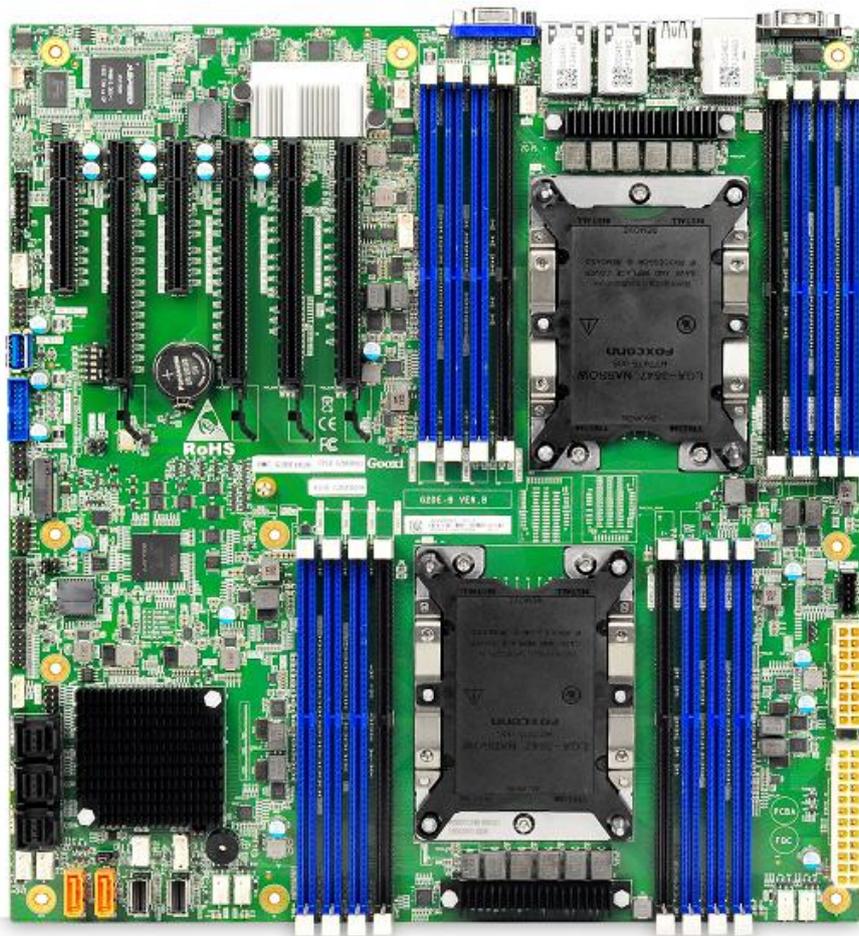


# Gooxi<sup>®</sup>

## G2DE-B

**Purley 16DIMM Dual Socket Standard Motherboard**



**User Manual**

Rev 1.1

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**Product Name: G2DE-B**

**Version: V1.1**

**Issue Date: Dec-2020**

# Preface

This manual is the technical manual of Gooxi® G2DE-B server Motherboard. It mainly introduces and illustrates the parameters, features, composition, installation mode and basic operation of this motherboard.

This manual is for reference and research of professional system integrator and technician. This product should only be installed and maintained by experienced technicians.

## About this manual

### **Chapter 1: Motherboard Introduction**

This chapter describes the classification, main parameters and features of Gooxi G2DE-B motherboard.

### **Chapter 2: Motherboard Port Details**

This chapter provides the detailed description of Gooxi G2DE-B motherboard port.

### **Chapter 3: Motherboard Installation**

This chapter introduces the installation steps of Gooxi G2DE-B motherboard and components on the motherboard, including the installation description of CPU, heatsink, memory, hard disk, etc.

### **Chapter 4: Description of BIOS Parameter Setting**

This chapter details each setting in the program of Gooxi G2DE-B motherboard BIOS.

### **Chapter 5: IPMI Deployment**

This chapter introduces how to deploy the IPMI of Gooxi G2DE-B motherboard.

### **Chapter 6: RAID Setting**

This chapter describes how to set RAID on Gooxi G2DE-B motherboard.

### **Chapter 7: Specifications**

This chapter introduces the technical specifications of Gooxi G2DE-B motherboard.

**Glossary:**

Name	Meaning
Intel® Xeon® Scalable Processors	
Platinum Efficiency Power Supply	Platinum Certified power supply is “80 PLUS Platinum” standard, that is, the conversion rate of 20% load is above 90%, that of 50% load is over 94%, and that of 100% load is over 91%
M.2	M. 2 port is a new generation port standard tailored for Ultrabook, which is Intel®’s new port specification to replace mSATA
C621/C622	Intel® chipset
RJ45	Standard 8-bay modular port
AST2500	Aspeed® BMC chip
Socket P	One of the Intel® processor port types
-F CPU	Refers to support for Intel® Omni-Path Host Fabric port CPU and Omni-Path high-speed optical cable interconnection technology can support end-to-end interconnection of up to 100Gbps
8038 fan	Fan’s size is 80x80x38mm
LGA3647	Land Grid Array, LGA3647 represents 3647 contacts
CR2032	3V CR2032 lithium manganese battery in the shape of button, which is referred to as button battery or lithium manganese button battery
RS-232	One of the communication ports on the computer, it is the asynchronous transmission standard port, which is called COM port
Jtag	Joint Test Action Group, mainly used for chip internal test
NC Pin	
XDP	Extend Debug Port, Intel® CPU debugging interface

## Abbreviation:

Abbreviation	English	Chinese
PCH	Platform Controller Hub	即之前统称的“南桥”
GbE	Gigabit Ethernet	千兆以太网
BMC	Baseboard Management Controller	基板管理控制器
IPMI	Intelligent Platform Management Interface	智能平台管理接口
CPU	Central Processing Unit	中央处理器
SATA	Serial Advanced Technology Attachment	串行 ATA 接口规范
SAS	Serial Attached SCSI	串行 SCSI
sSATA	secondary SATA	扩展 SATA 接口
LAN	Local Area Network	局域网
VGA	Video Graphics Array	视频传输标准
MB	Mother Board	主板
PCIE	Peripheral Component Interconnect Express	高速串行计算机扩展总线标准
USB	Universal Serial Bus	通用串行总线
FW	Firmware	固件
TPM	Trusted Platform Module	可信赖平台模块
IO	Input/Output	输入输出
BIOS	Basic Input-Output System	基本输入输出系统
CMOS	Complementary Metal Oxide Semiconductor	互补金属氧化物半导体
ME	Management Engine	管理引擎
DDR4	Double Data Rate 4 SDRAM	第四代双倍数据速率同步动态随机存储器
DIMM	Dual-Inline-Memory-Modules	双列直插式存储模块
RDIMM	Registered DIMM	带寄存器的双线内存模块
LRDIMM	Load-Reduced DIMM	低负载 DIMM
AEP	Apache Pass	Intel® 傲腾 DDR4 内存代号
MEZZ CONN	Mezzanine Connector	夹层/扣卡
KVM	Keyboard Video Mouse	通过直接连接键盘、视频、鼠标端口，能够访问和控制计算机
CPLD	Complex Programmable Logic Device	复杂可编程逻辑器件
ECC	Error Correcting Code	错误检查和纠正
CFM	Cubic Feet Per Minute	立方英尺每分钟
RPM	Revolution Per Minute	转每分

## Conventions:

 Caution: It is used to deliver equipment or environmental safety warning messages. If it is not avoided, it may lead to equipment replacement, data loss, equipment performance degradation or other unpredictable results.

 Warning: It is used to warn potential dangerous situations, which may lead to death or serious personal injury if unavoidable



Red arrow: point to a position



Blue arrow: action of pulling out or inserting downward or tilting in.



White arrow: represents the next action or result.



Dark blue rotation arrow 1: represents the action of turning the screw clockwise or pulling outward.



Dark blue rotation arrow 2: represents the action of turning the screw clockwise or turning it inward.

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# Chapter 1: Motherboard Introduction

## 1.1 Motherboard parameters

Gooxi® G2DE-B type is a standard E-ATX (12" \* 13") dual socket server motherboard, which is designed based on Intel X86 architecture and adopts Intel® Purley platform, based on Intel® PCH C621 (C622) chipset with Intel's latest generation Xeon® Scalable CPU, which supports 2 Xeon® Scalable CPUs. It supports 16\* DDR4 2133 / 2400 / 2666 / 2933MHz ECC RDIMM, and the single board supports 4TB memory at most.

### G2DE-B Parameters:

Model		G2DE-B/G2DE-TB
CPU		Gen1&2 Intel® Xeon® Scalable processor
Chipset		C621/ C622(G2DE-B/G2DE-TB)
MB Size		E-ATX
Features	BMC chip	ASPEED AST2500
	Fan temperature control	Supports
	Status alarm	Supports
Memory	Slot amount	16
	Total value	Up to 4056GB memory
	Memory type	Supports DDR4 3DS RDIMM/LRDIMM/RDIMM ECC Memory frequency supports 2133/2400/2666/2933MHz Supports Intel Optane
	Capacity	Single memory supports 8GB, 16GB, 32GB, 64GB, 128G, 256G (only DDR4 3DS RDIMM)
	PCI-E slot	6
Expansion Slot	Slot1	PCI-Express 3.0 x8 Slot from CPU1
	Slot2	PCI-Express 3.0 x16 Slot from CPU1
	Slot3	PCI-Express 3.0 x8 Slot from CPU1
	Slot4	PCI-Express 3.0 x4 Slot from CPU1
	Slot5	PCI-Express 3.0 x16 Slot from CPU0
	Slot6	PCI-Express 3.0 x16 Slot from CPU0
Network	LAN	2* 1GbE RJ45 LAN ports (2* 10GbE RJ45 LAN ports, only C622 chip supports) 1* dedicated BMC admin LAN ports
Storage	SATA controller	3* 8643 ports, 2* SATA 7PIN ports, RAID 0, 1, 5, 10
	BMC	IPMI 2.0
Display	VGA	Supports
TPM	TPM	Supports
Rear I/O Port	External USB port	2* USB3.0, 2* USB2.0 ports
	VGA port	1

	Serial port	1* DB-9
	RJ-45	2* 1GbE RJ45 LAN ports (2* 10GbE RJ45 LAN ports, only C622 chip supports) 1* dedicated BMC admin LAN ports
Monitoring	CPU temperature	Supports
	System status	Supports
	Fan speed	Supports
OS		Windows® Server 2012 R2 (64bit) Windows® Server 2016 (64bit) Redhat® Enterprise Linux Server 7.3(64bit) Suse® Enterprise Linux Server 12.2(64bit) Centos® Enterprise Linux Server 7.3(64bit) Ubuntu® Server 16.04(64bit) VMWare® ESXi Microsoft® Hyper-V® Citrix® Xen® Server Linux® Kernel Virtual Machine
Environment		Operating temperature: 10°C~40°C Non-operating temperature: -40°C ~70°C Operating humidity: 8%~90% (non condensation) Non-operating humidity 5%~90% (non condensation)

Table 1.2

If the specifications are changed, please visit our official website: [www.gooxi.com/](http://www.gooxi.com/)  
[www.gooxi.us](http://www.gooxi.us)

## 1.2 Motherboard features

Gooxi G2DE-B motherboards have the features of high performance, high reliability, high stability, low power consumption and high customizability:

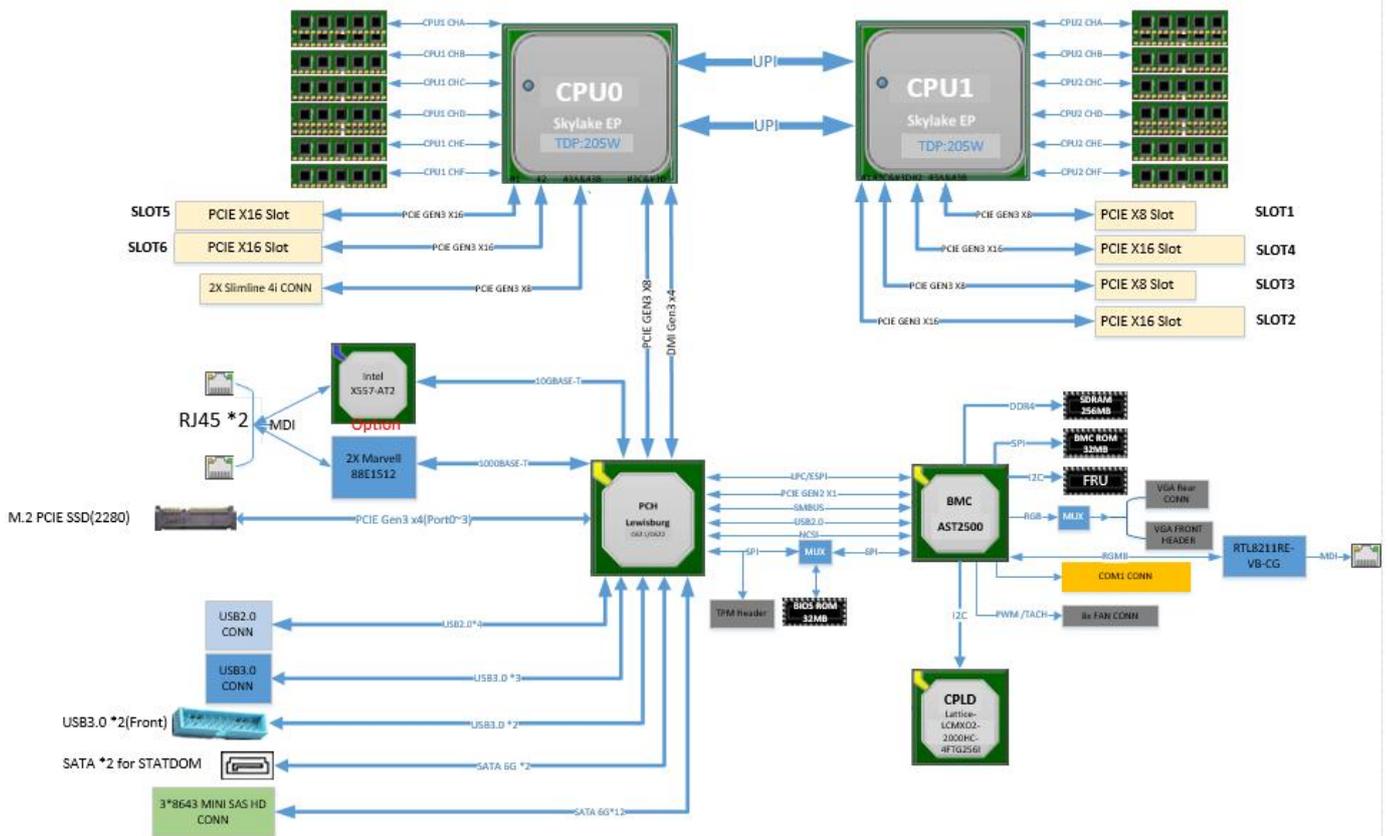
High performance: with Gen2 Intel Xeon Scalable CPU & Intel Lewisburg C621/C622 chipset.

High reliability: Gooxi, through professional constant temperature and humidity test equipment, simulates the test of various complex environments (high temperature, low temperature, high and low temperature cycle), etc.

High stability: through long-term full load pressure test under normal temperature and high temperature conditions.

Low power consumption: the power MOS transistor with ultra-low Rds (on) resistance and optimized DC-DC switching power supply design make the overall power conversion efficiency of the motherboard more than 90%. Customized BIOS, turn off unnecessary functions to reduce power consumption. BMC can save power by accurately adjusting the fan speed through temperature monitoring.

Gooxi G2DE-B Block Diagram



# Chapter 2: Motherboard Port Details

## 2.1 Overview

Motherboard, also known as Mainboard and Systemboard, which installed in the chassis and is one of the most basic and important components of server.

This chapter focuses on the port, LED lights and jumpers of G2DE-B motherboard.

Figure of G2DE-B

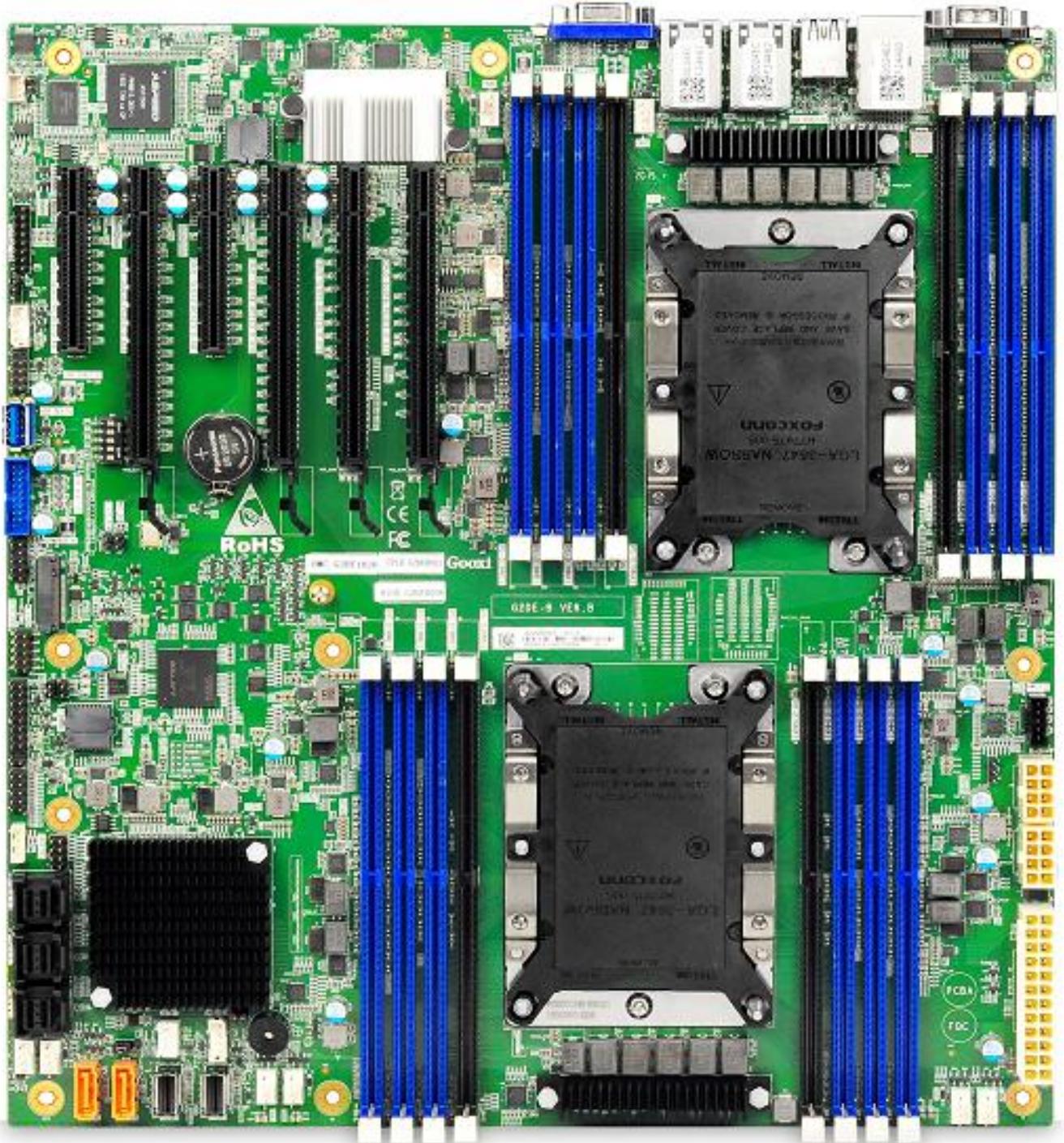


Fig. 2.1

## 2.1.1 G2DE-B motherboard port & definition

### 1. Diagram of motherboard port position:

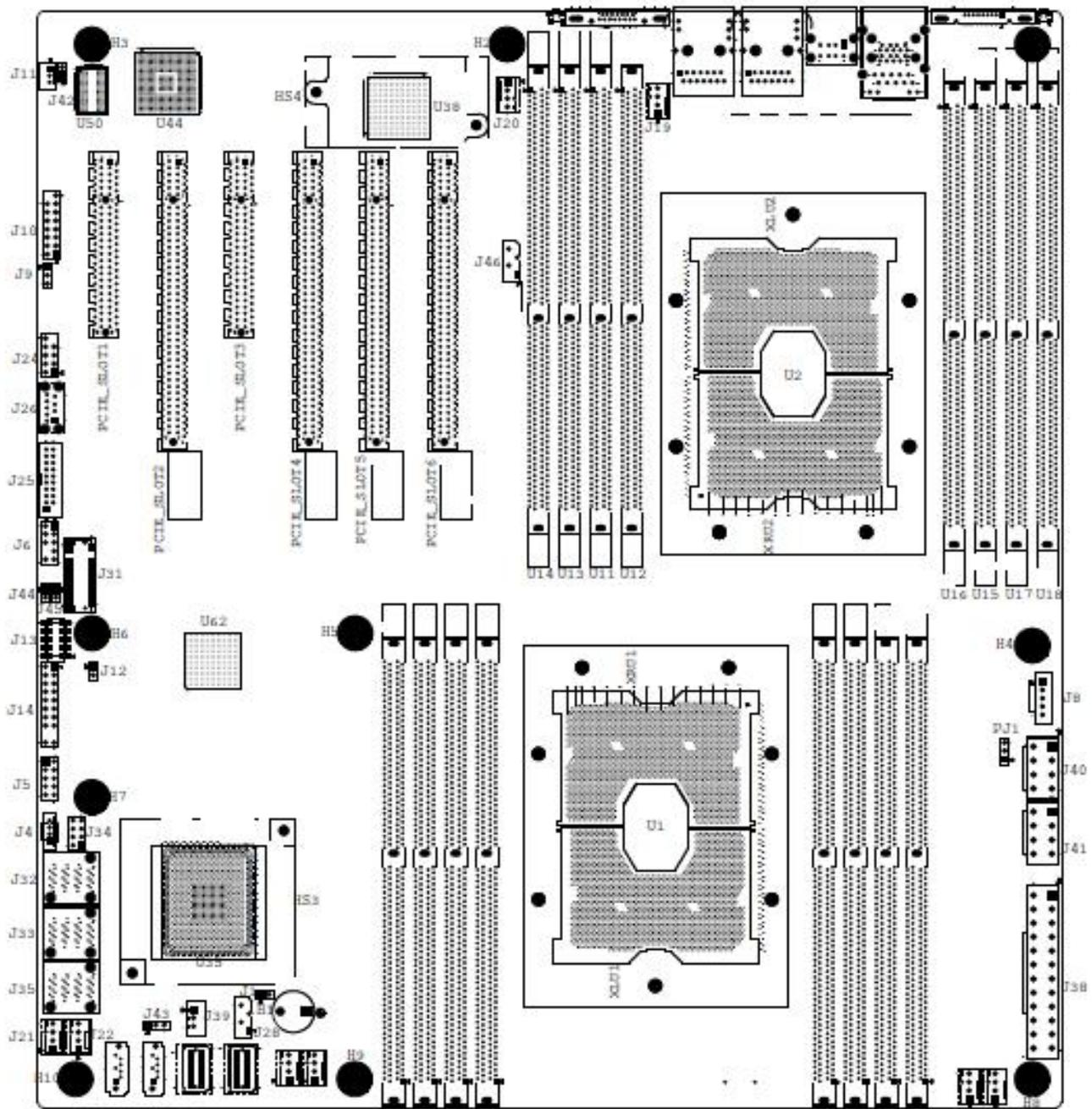


Fig.2.2

## 2. Motherboard port definition:

Connector Name	Function
J11 (BMC Debug Port)	BMC Debug Port, for developers to diagnose and debug BMC functions
J10	Onboard VGA Connector, it can be connected to the front panel by cable
J9	Front VGA /Real VGA option
J24	Two USB2.0 can be connected to the front panel with an adapter
J26	Vertical insertion onboard USB3.0 Connector
J25	Two USB3.0 can be connected to the front panel with an adapter
J6	Can be used to connect TPM module or 80Port Debug
J44	Watch-Dog Timer Enable
J45	FRONT UID BUTTON
J31	M.2 PCIE*4 CONN, supporting 2280 specifications
J13	CPLD JTAG, for burning CPLD program
J14	The front-end power on panel Connector is connected to the front-end panel through flat cable, such as power on / reset button and some LED states
J12	CPU Detect, jumper cap is not connected by default
J4	RAID key for CPU NVME SSD
J34	S-SGPIO, or SAS card hard disk drive LED connection
J33	S-SATA0~3, SATA 3.0 connection header
J32	I-SATA0~3, SATA 3.0 connection header
J35	I-SATA4~7, SATA 3.0 connection header
J15/J16/J17/J18/J19/J20/J21/J22	System cooling fan header
SATA1/2	SATA DOM CONN
J43	Flash Security Override, for ME upgrading header
J39	JSTBY, Wake On LAN header
J28/J46	JNVI2C, NVMe SMBus header used for PCIE hot-plug SMBus clock data connections.
J1	Onboard chassis intrusion pin: optional function. There is no jumping by default
J27/J29	Slimline X4 CONN
B1	Buzzer
U10/U9/U7/U8	CPU0 DIMMF1/E1/D1/D2
U4/U3/U5/U6	CPU0 DIMMA2/A1/B1/C1
J38	ATX PWR 24Pin Connector, for connecting power supply, in accordance with SSI specification
J40/J41	ATX PWR 8Pin Connector, for connecting power supply, in accordance with SSI specification
J8	Power Supply IC connector
PJ1	VR_PMBUS, for burning VR FW
U14/U13/U11/U12	CPU1 DIMMC1/B1/A1/A2
U16/U15/U17/U18	CPU1 DIMMD1/D1/E1/F1
SW1	BMC Reset button
COM1	Real COM port

CONN1	Dual USB3.0 & IPMI dedicated LAN port connector
J23	Dual USB2.0 connector
J36/J37	1GbE LAN port1/1GbE LAN port2
CN1	Real VGA CONN
SW2	Real UID button
PCIE_SLOT1	CPU1 PCI-E 3.0 X8 slot
PCIE_SLOT2	CPU1 PCI-E 3.0 X16 slot
PCIE_SLOT3	CPU1 PCI-E 3.0 X8 slot
PCIE_SLOT4	CPU1 PCI-E 3.0 X16 slot
PCIE_SLOT5	CPU0 PCI-E 3.0 X16 slot
PCIE_SLOT6	CPU0 PCI-E 3.0 X16 slot

Table 2.1

## 2.2 Motherboard I / O connector

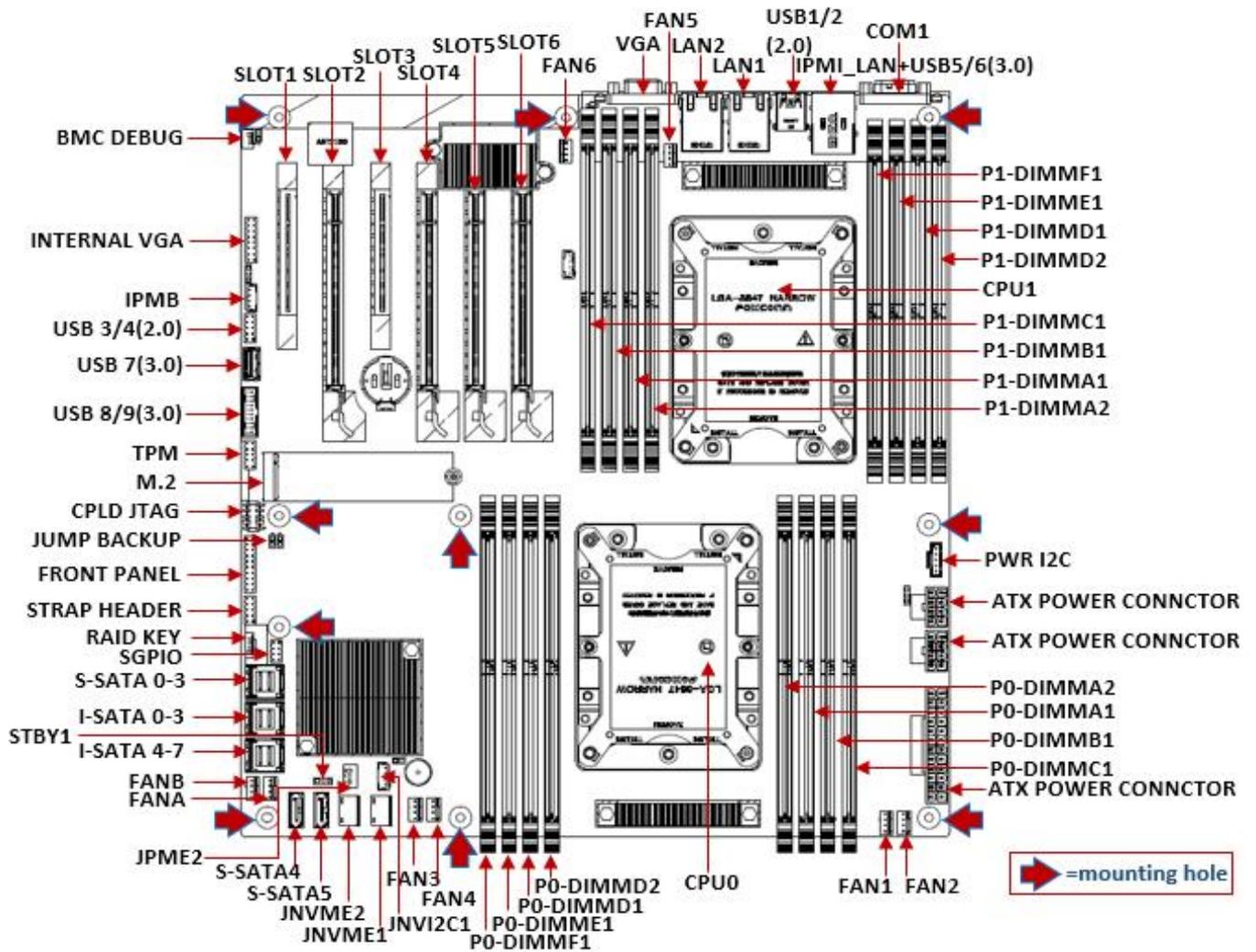


Fig.2.3

## 2.2.1 Front panel

The front panel of the motherboard has 2x10pin connectors in total. The connector is reserved, mainly connected to the LED and power switch on the front panel. The power on button is located at the 1st and 2nd pin of the front panel header.

The location diagram of front panel is as follows:

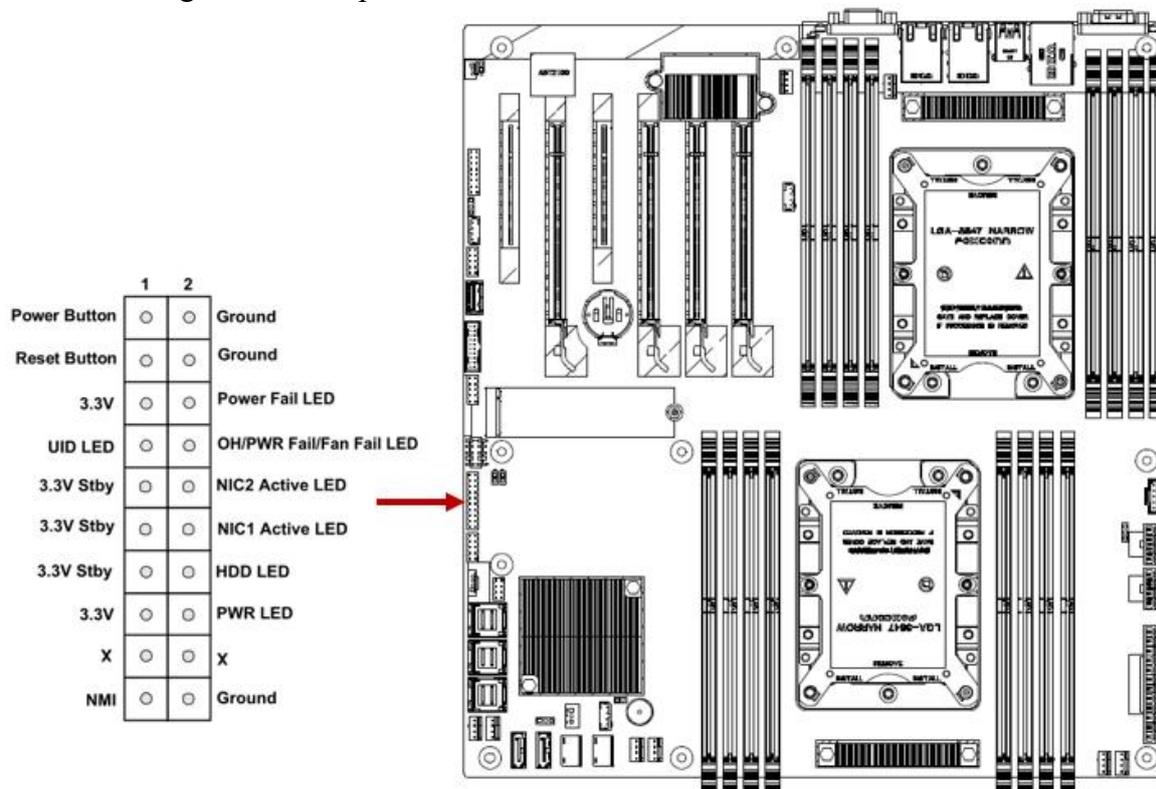


Fig.2.4

Front Panel definition as follows:

Front Panel Definition				
PIN	Definition	PIN	Description	Note
1	Power Button	2	Ground	Motherboard power-on button
3	Reset Button	4	Ground	Motherboard reset button
5	3.3V	6	Power Fail LED	The power status indicator on the motherboard lights up when PWROK is started
7	UID_LED	8	OH/PWR Fail/ Fan Fail LED	
9	3.3V Stby	10	NIC2 Active LED	The activity indicator of LAN port2 is synchronized with the indicator of LAN port2, and flashes when there is data access
11	3.3V Stby	12	NIC1 Active LED	The activity indicator of LAN port1 is synchronized with the indicator of LAN port1, and flashes when there is data access
13	3.3V Stby	14	HDD LED	The hard disk operating status indicator flashes when data is read, and other statuses are always off

15	3.3V	16	PWR LED	The power status indicator on the motherboard lights up when PWROK is started
17	X	18	X	
19	NMI	20	Ground	Connect the non-blocked interrupt button, which is not supported by the software

Table 2.2

### 2.2.2 LAN admin port

The LAN port is dedicated to IPMI and is used for remote admin of IPMI. CAT5 and above cables are used to access the switch, and can also be directly linked to the customer's host. It supports 1GB, 100MB and 10MB, and can be adjusted adaptively, but it can not be used as a data LAN port. The LED of LAN port is as follows: dedicated IPMI\_LAN port provides IPMI2.0 dedicated network connection.

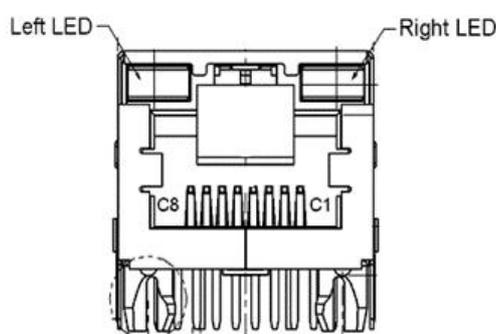


Fig.2.5

IPMI LAN Port LED	
LED	Description
Left LED	Green indicator on means 1GB; Yellow indicator on means 100MB. Yellow indicator off , green indicator off & 10MB
Right LED	The yellow indicator flashes when there is data activity This indicator does not light up when there is no data activity

Table 2.3

**Location as shown:**

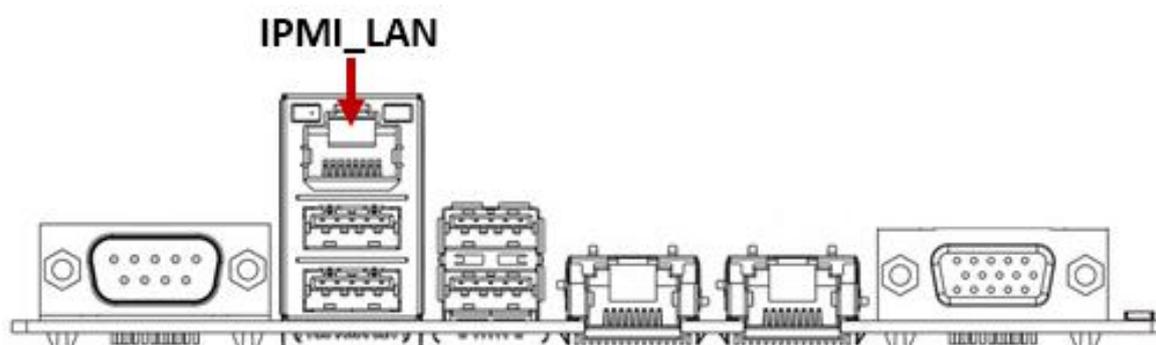


Fig.2.6

### 2.2.3 LAN port

2\* 1GbE LAN ports, chips adopt Marvell88E1512 and support 1000M to receive / send service data. CAT5 and the above cables are used to access the switch, and can also be directly linked to the customer's host.

#### Locations of LAN ports:

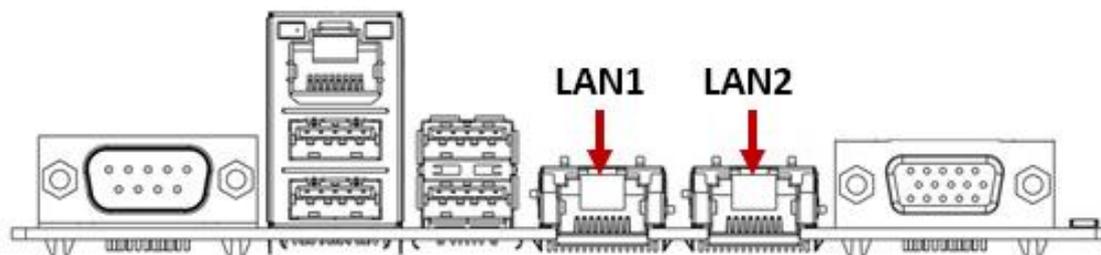


Fig.2.7

Data of LAN Port	
LED	Description
Left LED	Green indicator on means 1GB; Yellow indicator on means 1GB. Yellow indicator off , green indicator off &10MB
Right LED	The yellow indicator flashes when there is data activity This indicator does not light up when there is no data activity

Table 2.4

**Note: the indicators of each LAN port are the same.**

## 2.2.4 USB Connector

1. Four external USB ports to access USB3.0 and USB2.0 devices.

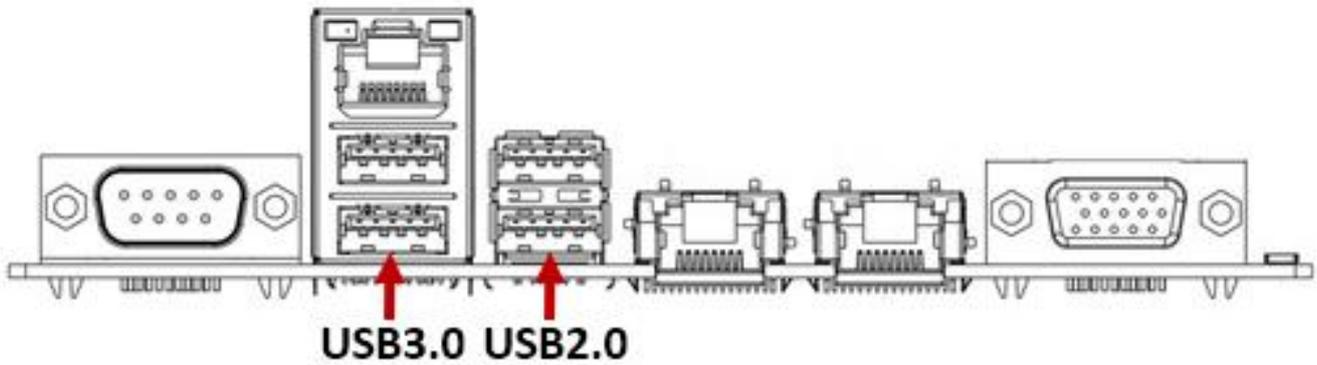


Fig.2.8

2. Two built-in headers USB2.0, USB3.0 Connector and an on-board TYPEA vertical USB3.0 port.

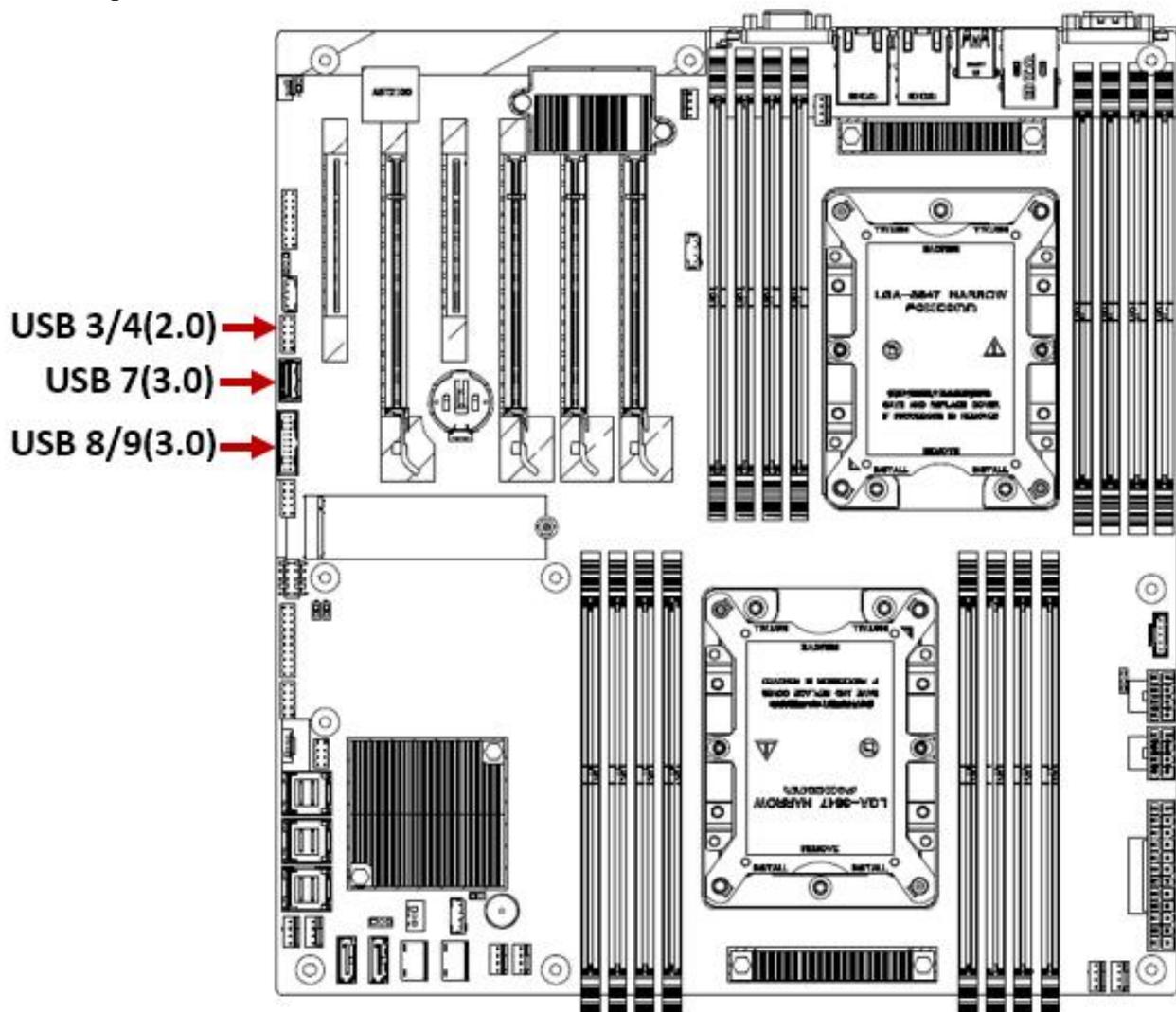


Fig.2.9

3. The definition of built-in header USB connector is as follows:

Built-in USB 3/4(2.0) Header			
PIN	Description	PIN	Description
1	VCC(5V)	2	VCC(5V)
3	USB P1N	4	USB P2N
5	USB P1P	6	USB P2P
7	Ground	8	Ground
		10	NC

Table 2.5

Built-in USB 8/9(3.0) Header			
PIN	Description	PIN	Description
1	VBUS	2	Power
3	Stda_SSRX-	4	USB3_RN
5	Stda_SSRX+	6	USB3_RP
7	Ground	8	Ground
9	Stda_SSTX-	10	USB3_TN
11	Stda_SSTX+	12	USB3_TP
13	Ground	14	Ground
15	D-	16	USB_N
17	D+	18	USB_P
19			

Table 2.6

4. Built-in vertical USB3.0 port is defined as follows:

Built-in TYPEA Vertical USB3.0 Connector			
PIN	Description	PIN	Description
1	VBUS	2	SSRX-
3	USB_N	4	SSRX+
5	USB_P	6	GND
7	Ground	8	SSTX-
		10	SSTX+

Table 2.7

## 2.2.5 VGA Connector

AST2500 built-in PCIE VGA Controller, one 15 pin VGA connector is used to access the VGA display and output the motherboard information.

Location shown as below:

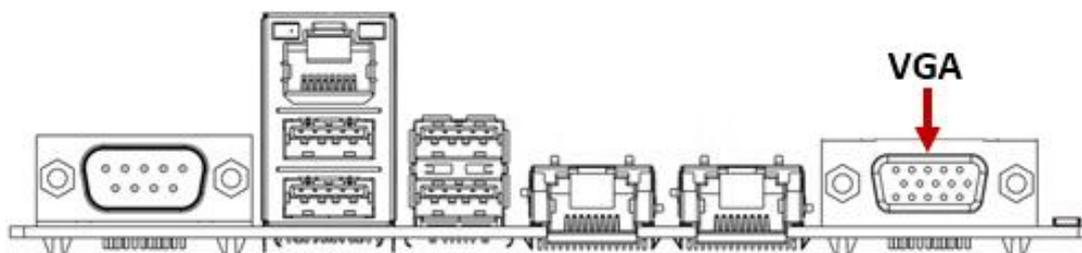


Fig. 2.10

## 2.2.6 COM Connector

One 9PIN COM Connector.

Location shown as below:

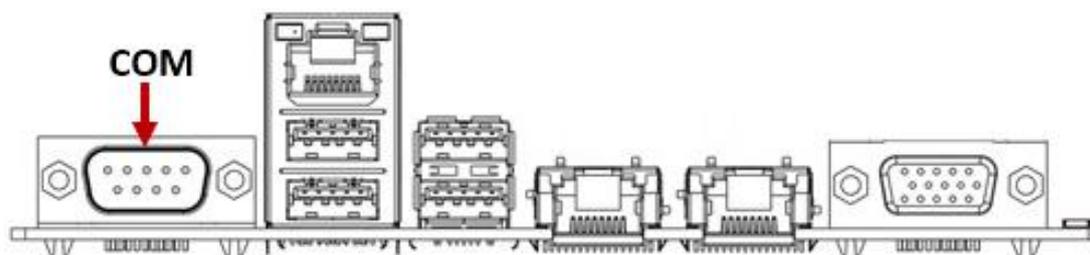


Fig.2.11

## 2.2.7 Chassis Intrusion & ME Update

### Chassis Intrusion:

Optional function, it means that it will detect and warn when someone opens the chassis.

### ME Update Jumper:

Management Engine (ME) is the chipset management software developed by Intel. When updating the BIOS with ME FW, you need to jump to the 2<sup>nd</sup> and 3<sup>rd</sup> pin, and return to the 1<sup>st</sup> and 2<sup>nd</sup> pin after the update. In other cases, jumping cap is not required.

Locations of Chassis Intrusion & ME Update:

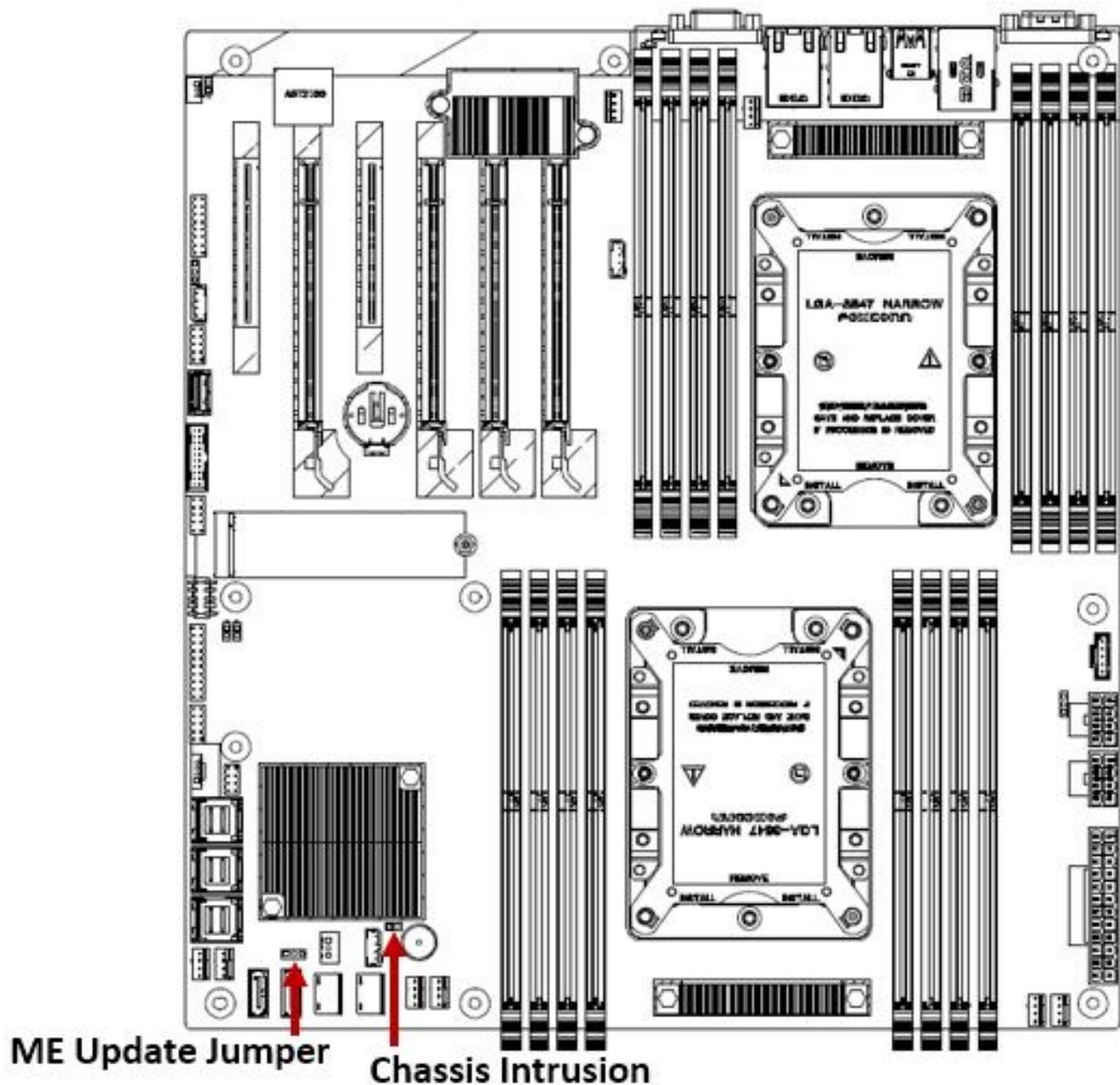


Fig.2.12

## 2.2.8 SATA for SATA DOM Connector

The motherboard is designed with two SATAs for SATA DOM connectors, all from Intel PCH.

Location of SATA Connector :

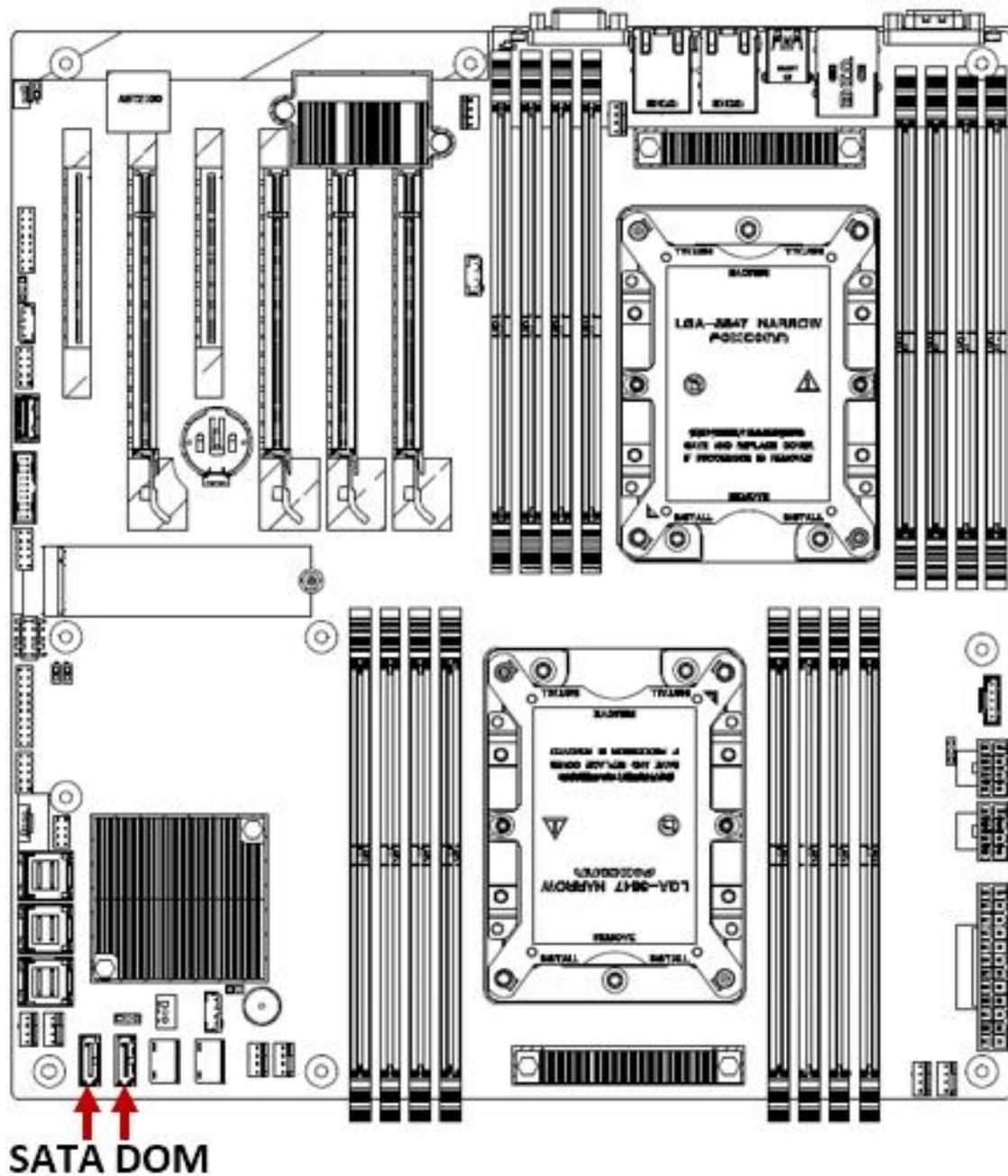


Fig.2.13

## 2.2.9 PCIE Slot

The motherboard has 4 PCIE3.0 X16 slots and 2 PCIE3.0 X8 slots. SLOT1, SLOT2, SLOT3 and SLOT4 PCIE slots are from CPU1; SLOT5 and SLOT6 PCI-E slots are from CPU0.

Location shown as below:

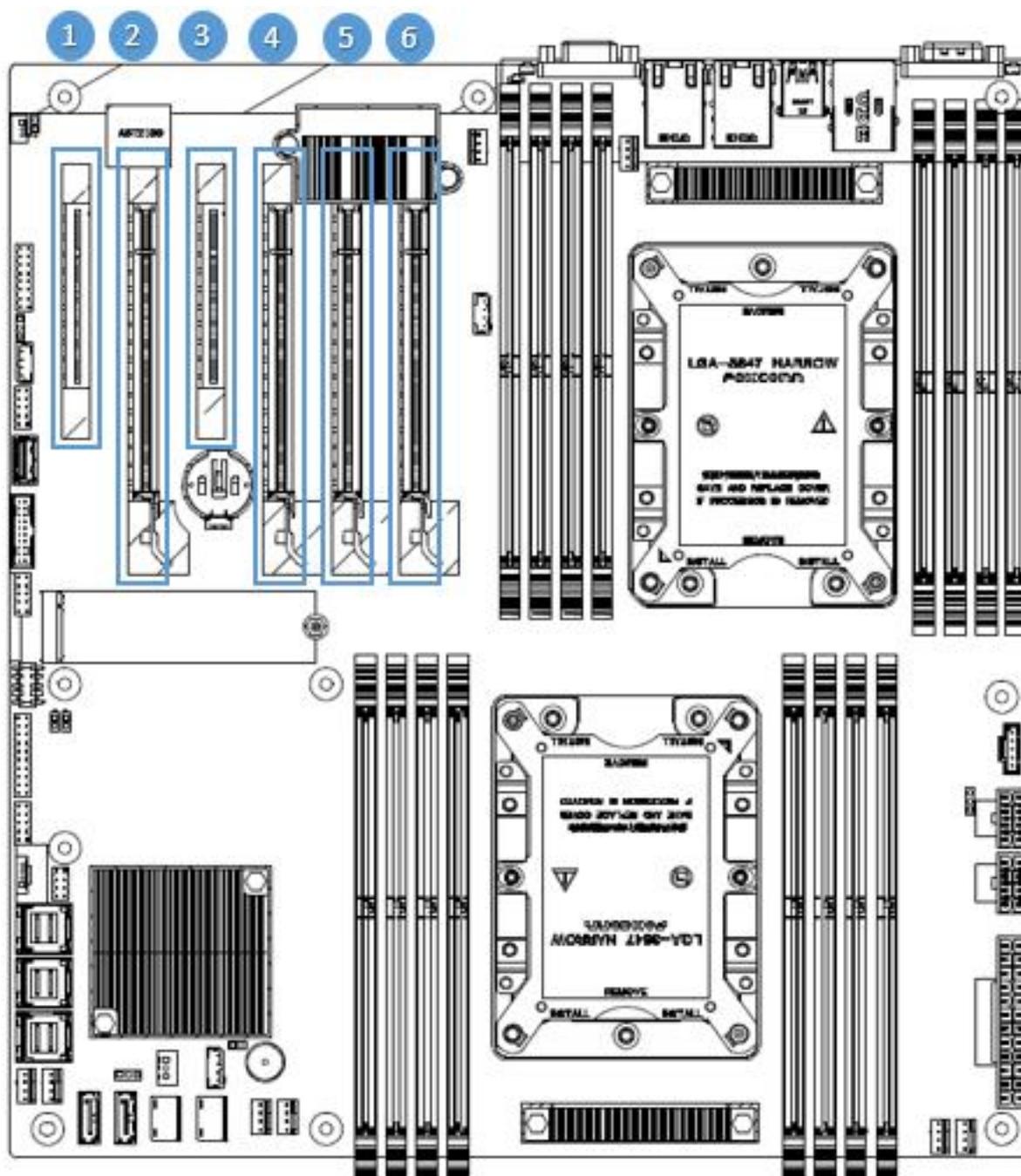


Fig.2.14

### 2.2.10 ATX 24 PIN POWER Connector

ATX 24PIN POWER Connector, connect to the motherboard via the 24PIN power cable. The location diagram is as follows:

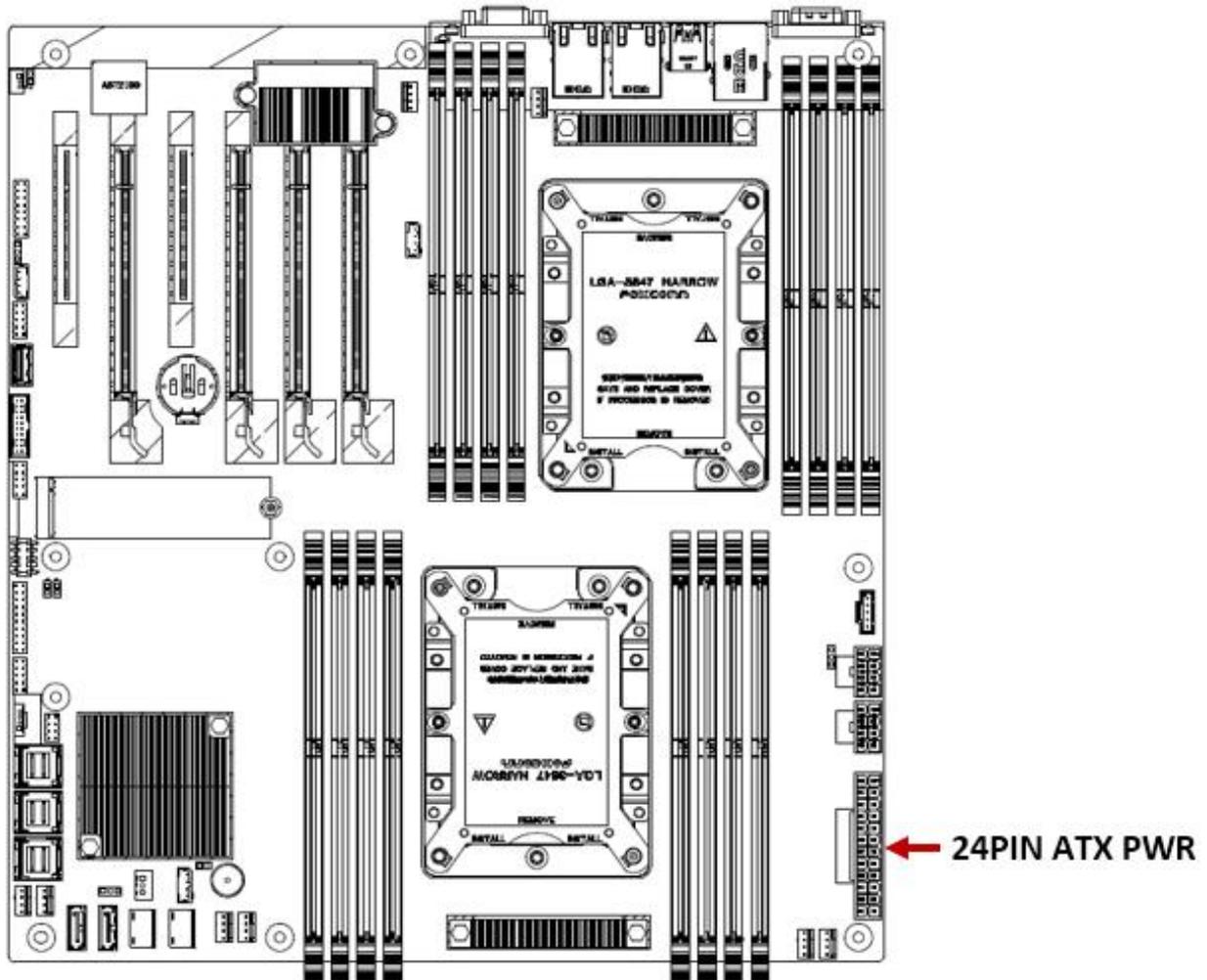


Fig.2.15

### 2.2.11 ATX 8 PIN POWER Connector

ATX 8PIN POWER Connector is connected to the motherboard through the 8PIN power cable. The location diagram is as follows:

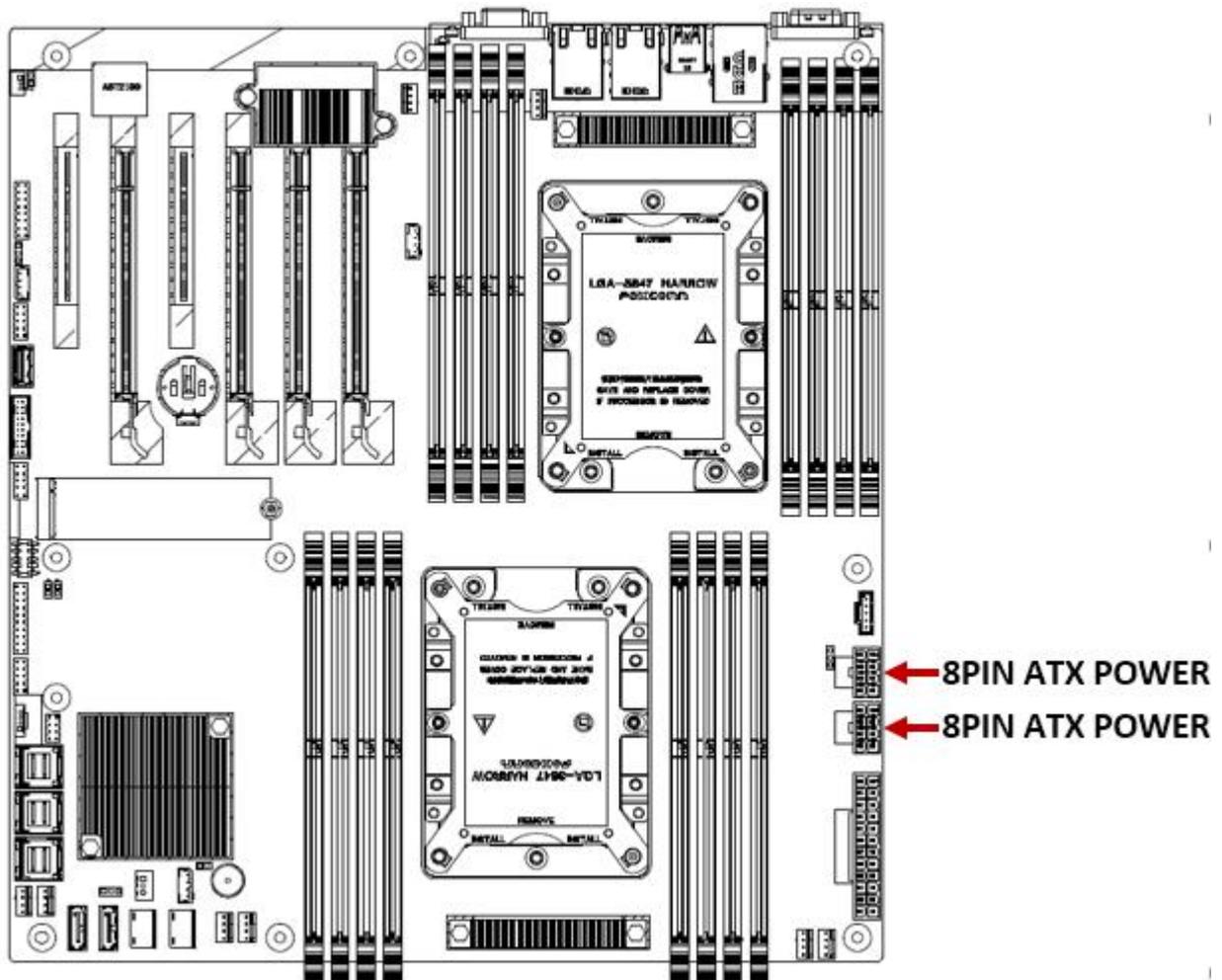


Fig.2.16

## 2.2.12 DIMM SLOT

The G2DE-B single board supports 2 CPUs. Each CPU supports 6 channels, including 2 DIMMs in channel A / D and 16 DIMMs in the whole board. It is divided into 2 groups according to the CPU type, CPU0 and CPU1. **Note:** when only one memory is inserted, the slot in the red box is preferentially inserted.

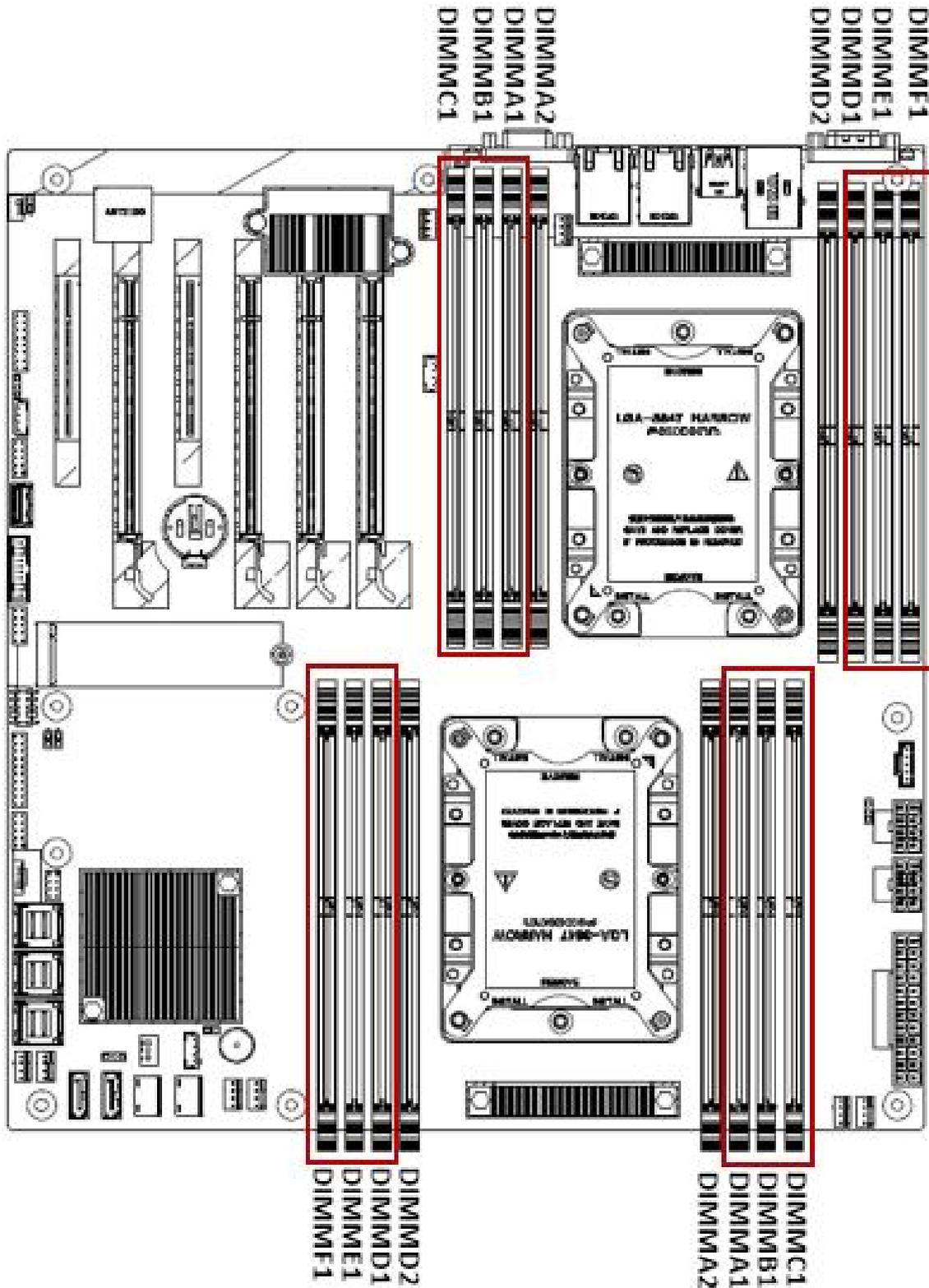


Fig.2.17

### 2.2.13 CPU SOCKET

The motherboard has 2 LGA3647 CPU Sockets, which are used to load the CPU of LGA3647. During CPU installation, note that the installation of the 1<sup>st</sup> pin. The 1<sup>st</sup> pin is as follows: the red circle in the figure below shows the 1<sup>st</sup> pin, which is indicated by a triangular arrow corresponding to the triangular arrow of the CPU.

The location diagram of CPU socket is as follows:

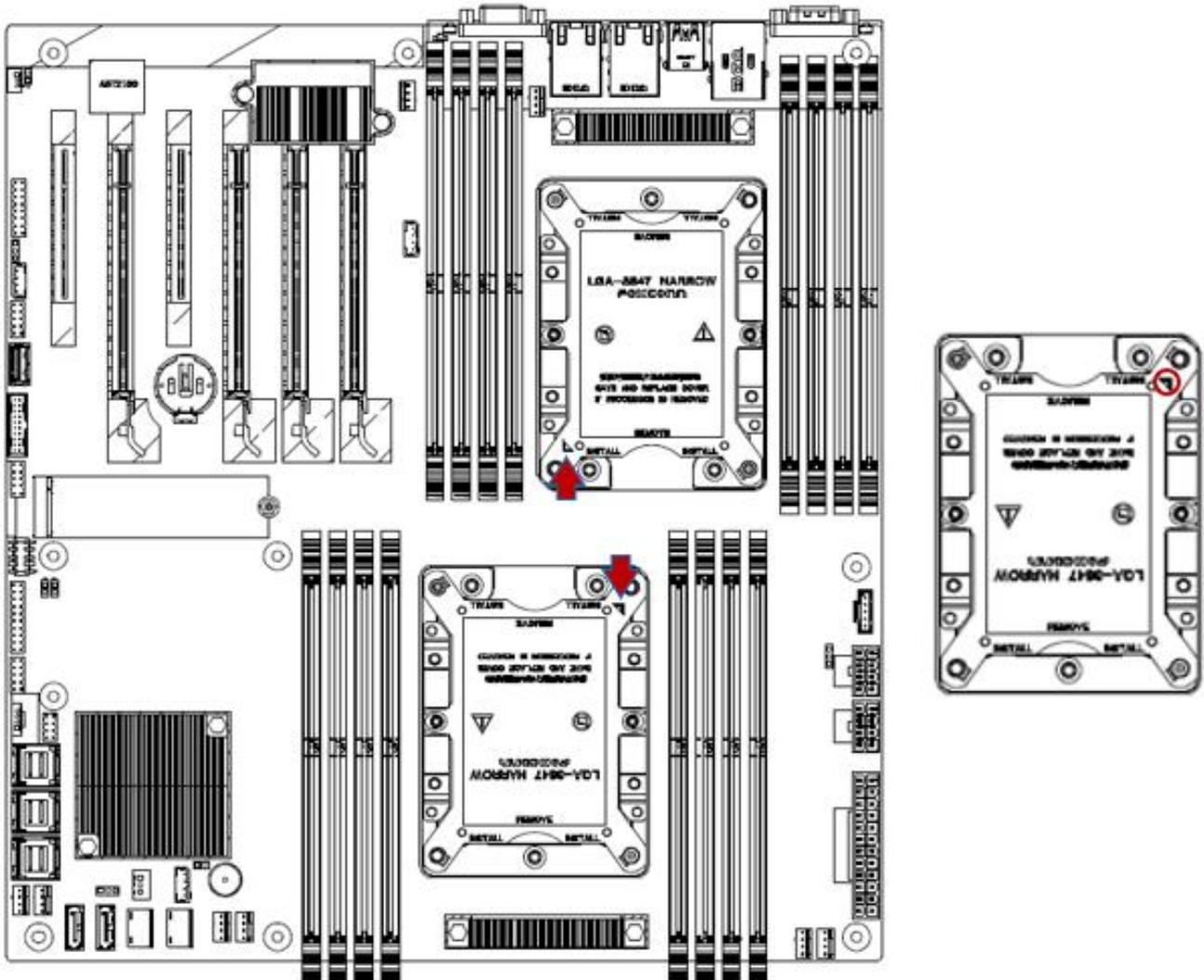


Fig.2.18

## 2.2.14 SATA SGPIO Header

SATA SGPIO Header location is shown as below:

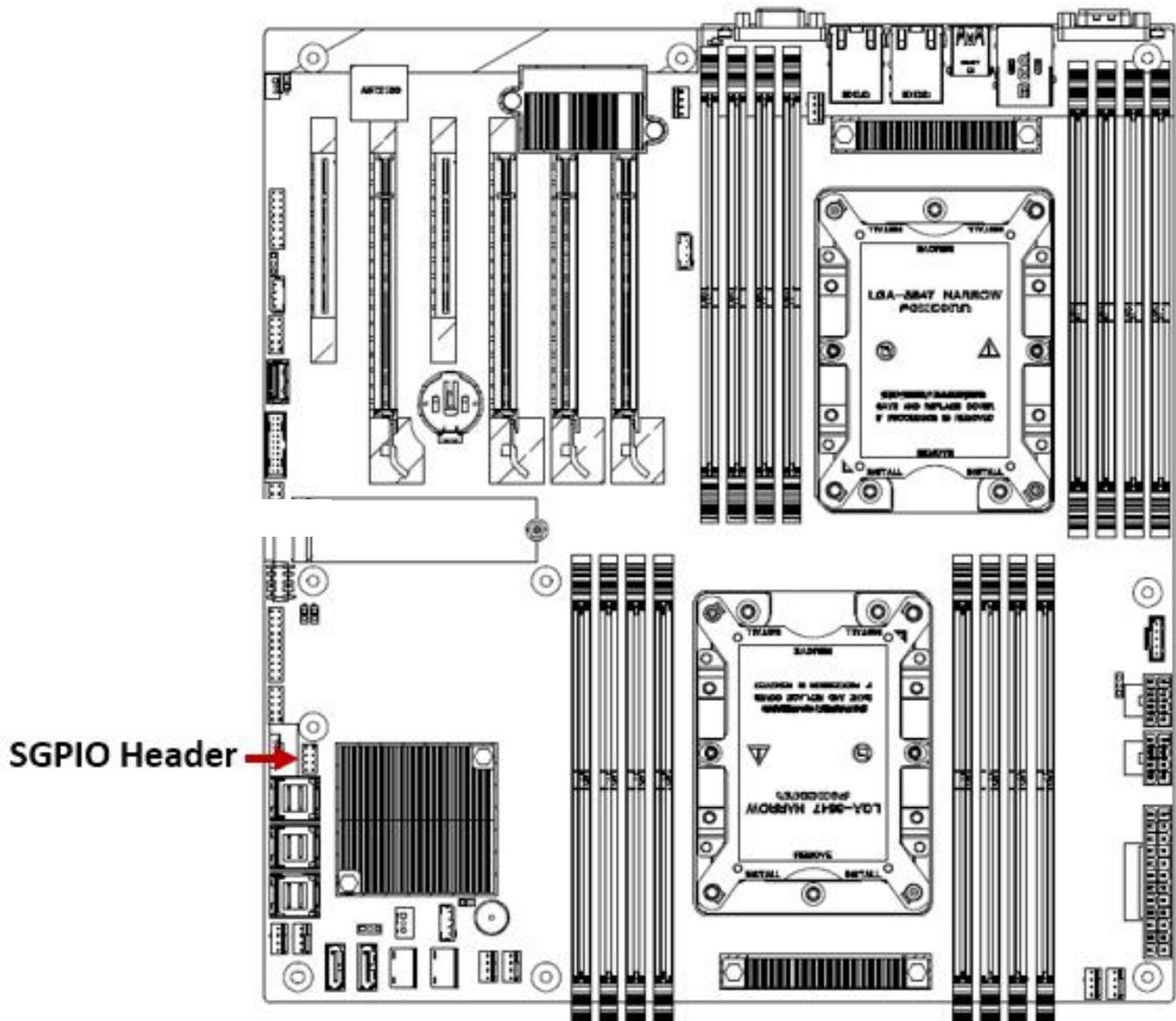


Fig.2.19

## 2.2.15 4PIN FAN HEADER

The motherboard has eight 4Pin fans as onboard fan connectors, in which the system fan positions are Fan1 - Fan6, Fan A and Fan B, which can be adjusted by PWM. Fan A/B is the port of external card, and the position diagram of fan connector is as follows:

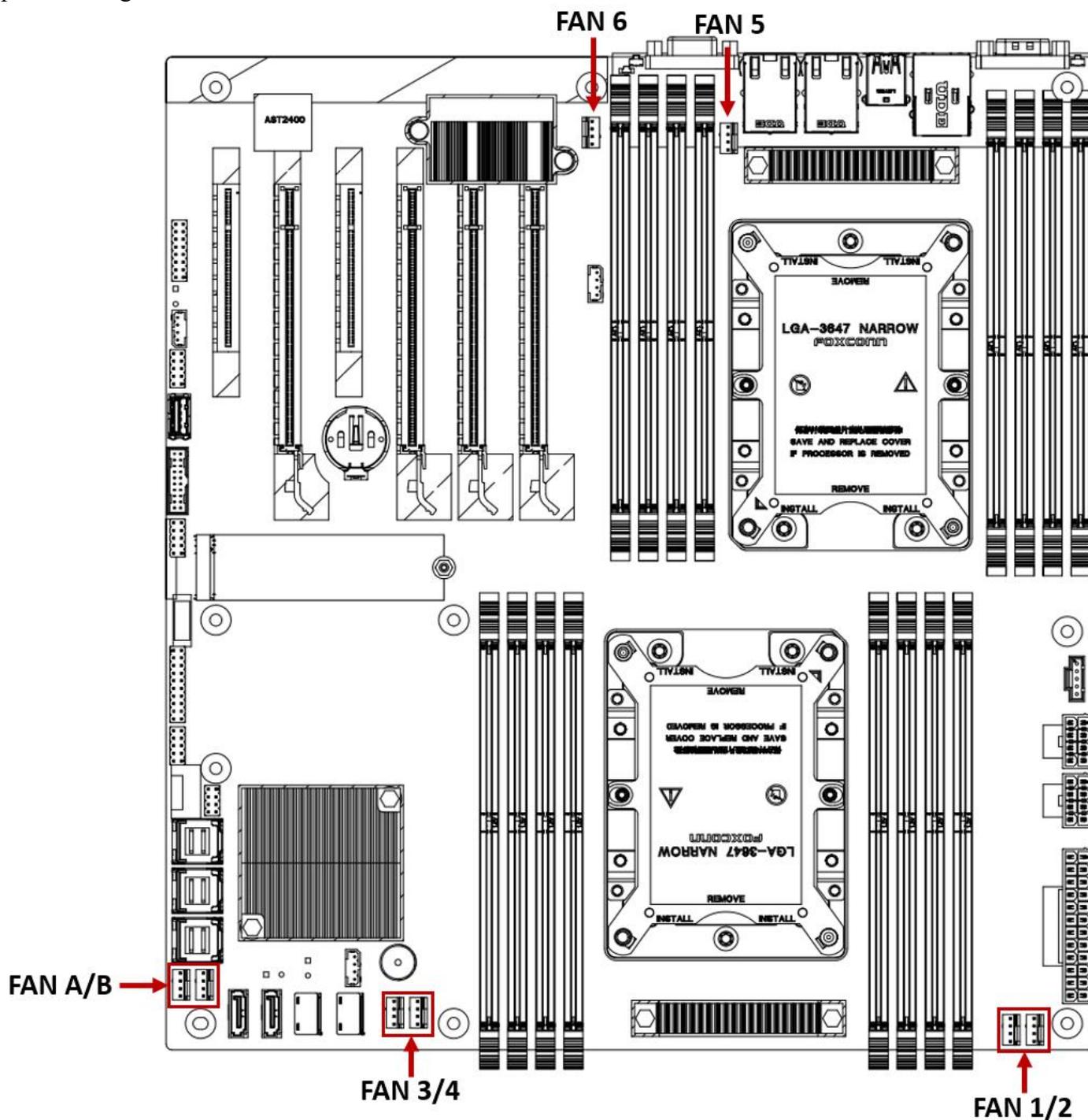


Fig.2.20

## 2.2.16 CR2032 BATTERY SOCKET

The location diagram of lithium battery on the motherboard is as follows:

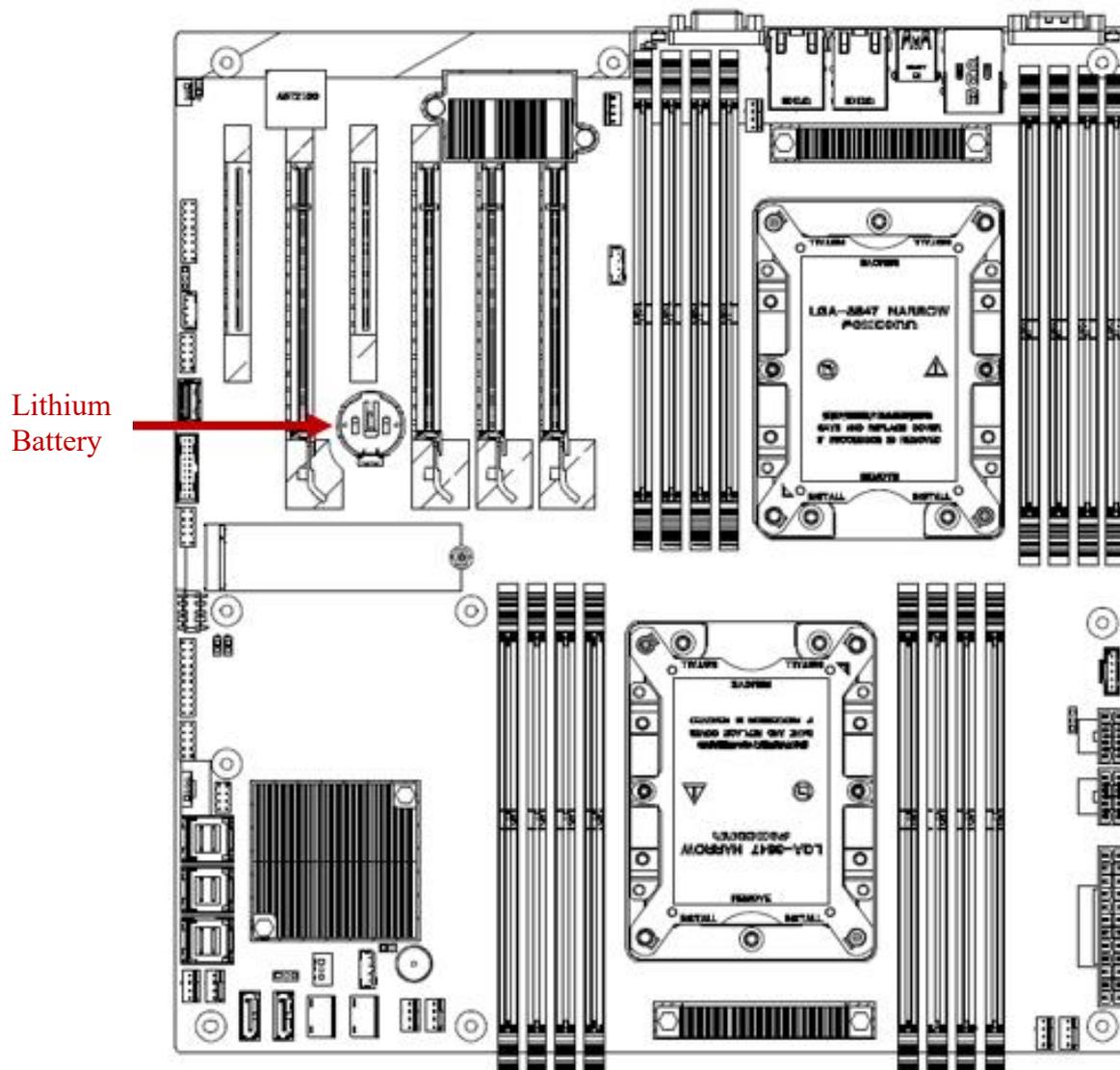


Fig.2.21

## 2.2.17 LED in motherboard

8\* LEDs in G2DE-B motherboard, which are respectively used to display various functional states of the motherboard, as shown in the table below:

Item	Location	Description	Colour
1	D2	BMC heartbeat LED	GREEN
2	D24	CPLD heartbeat LED	GREEN
3	D25	PCH SATA device active LED	GREEN
4	D23	ATX Power OK LED	GREEN
5	D26	UID LED	BLUE
6	D21	Standbyte Power OK LED	YELLOW
7	D22	PLTRST Active	GREEN
8	D30	M.2 Active	GREEN

Table 2.8

Location of LED in motherboard:

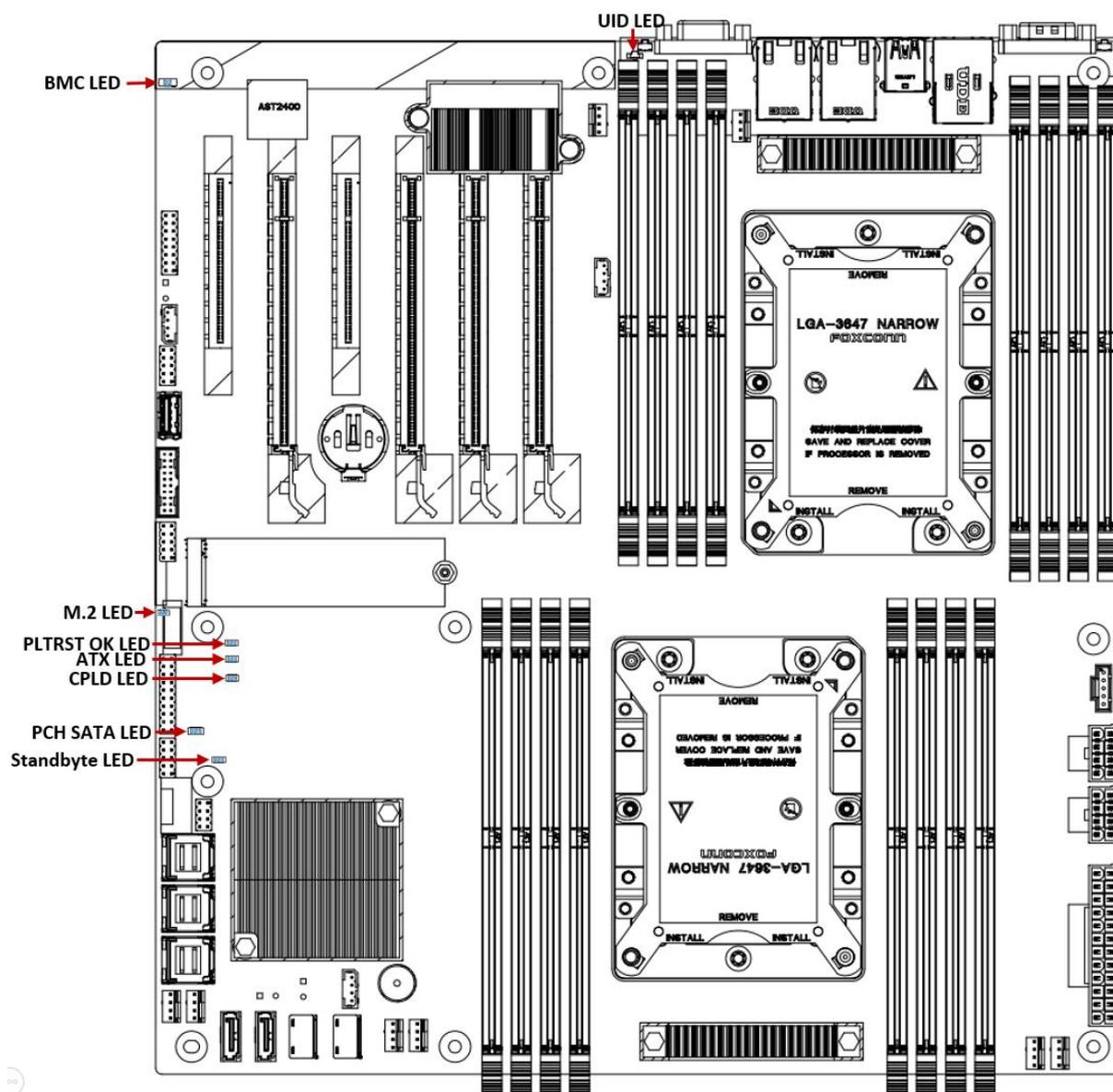


Fig.2.22

2.2.17.1 BMC Heartbeat LED

BMC Heartbeat LED		
Status	Description	Location
BMC Firmware Initialization completed	The green indicator flashes at 1Hz	D2
BMC Firmware Initialization not completed	The green indicator is off	

Table 2.9

2.2.17.2 UID LED

UID LED		
Status	Description	Location
Blue UID LED lights up	The user-defined indicator used to identify a specific motherboard. This LED can be turned on or off via the IPMI remote control web interface	D26

Table 2.10

2.2.17.3 PCH SATA device active LED

PCH SATA device active LED		
Status	Description	Location
SATA HDD present but without data activity	Green indicator on	D25
SATA HDD has data activity	Green indicator blinking	
SATA HDD not present	Green indicator off	

Table 2.11

2.2.17.4 ATX Power OK LED5.

ATX Power OK LED		
Status	Description	Location
ATX PSU OK	Green indicator on	D23
ATX PSU not OK	Green indicator off	

Table 2.12

2.2.17.5 CPLD Heartbeat LED.

CPLD Heartbeat LED		
Status	Description	Location
CPLD abnormal	The green indicator flashes at 1Hz	D24
CPLD Unburned or abnormal	Green indicator off	

Table 2.13

2.2.17.6 Standby Power OK LED

Standby Power OK LED		
Status	Description	Location
Standby PSU OK	Yellow indicator on	D21
Standby PSU not OK	Yellow indicator off	

Table 2.14

2.2.17.7 PLTRST OK LED

PLTRST OK LED		
Status	Description	Location
MB Reset OK	Green indicator on	D22
MB Reset not OK	Green indicator off	

Table 2.15

2.2.17.8 M.2 Active

M.2 activates the LED located at D30. When this LED lights up and flashes, M.2 is activated.

M.2 Active LED		
Status	Description	Location
M.2 has data transmission	Green indicator blinking	D30
M.2 without data transmission	Green indicator off	

Table 2.16

2.2.17.9 LAN Port 100/1000M Link LED

LAN Port 100/1000M Link LED		
Status	Description	Location
LAN Port connected to 1000M Link(G2DE-TB Link 10G)	Green indicator on	On RJ45 connector
LAN Port connected to 100M Link(G2DE-TB Link 1G)	Yellow indicator on	
LAN Port connected to 10M Link	Yellow indicator off, green indicator off	

Table 2.17

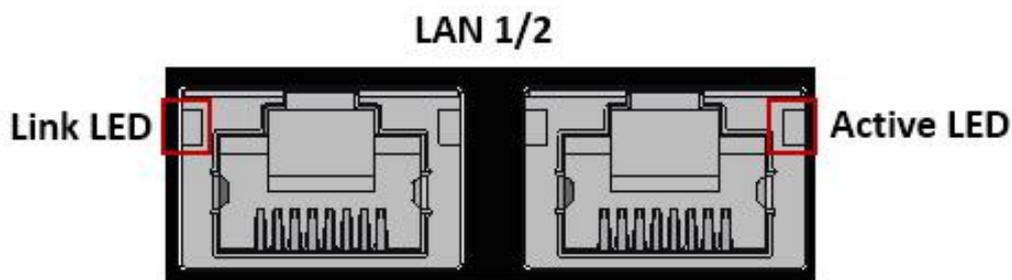


Fig.2.23

2.2.17.10 LAN Port Active LED

LAN Port Active LED		
Status	Description	Location
LAN Port with data activity	The yellow indicator flashes when there is data activity	On RJ45 connector
LAN Port without data activity	This indicator does not flash when there is no data activity	

Table 2.18

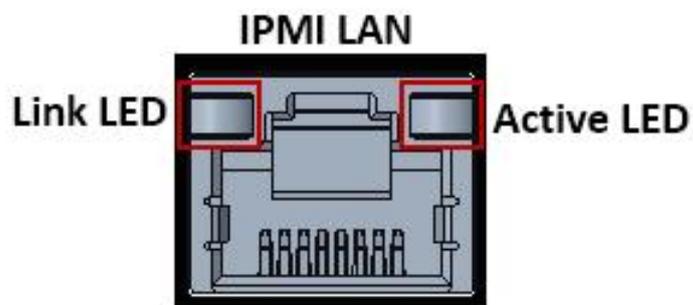


Fig.2.24

## 2.2.18 M.2 Connector

The motherboard is designed to provide one M.2 key M SSD slot, which only supports 2280 size and PCIe signal.

SATA Connector's location is shown as below:

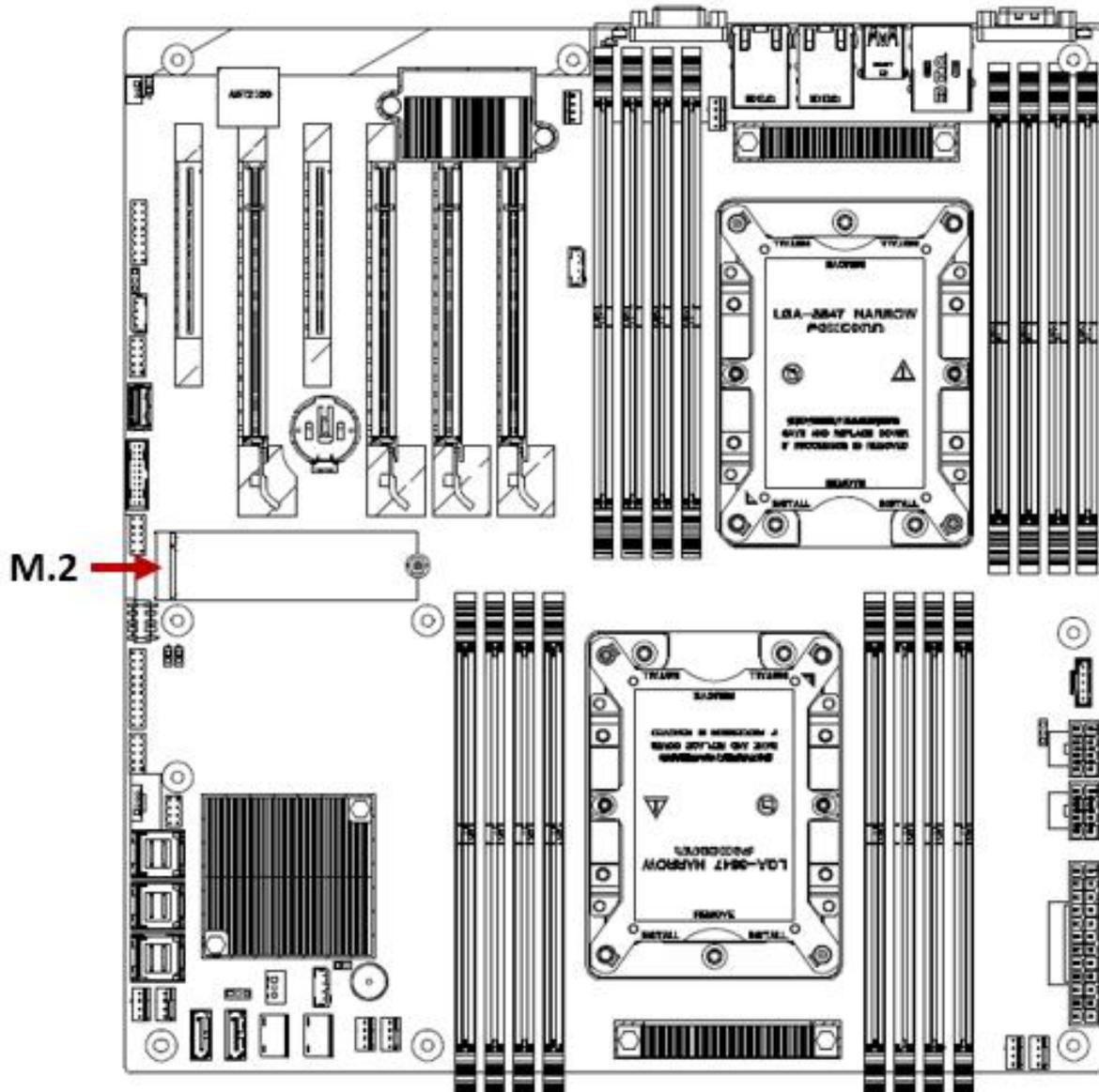


Fig.2.25

## 2.2.19 RAID key for CPU NVME SSD

G2DE-B onboard RAID key for CPU NVME SSD jumper port. Install RAID key on this jumper to support NVME RAID.

Jumper position is shown in the figure below:

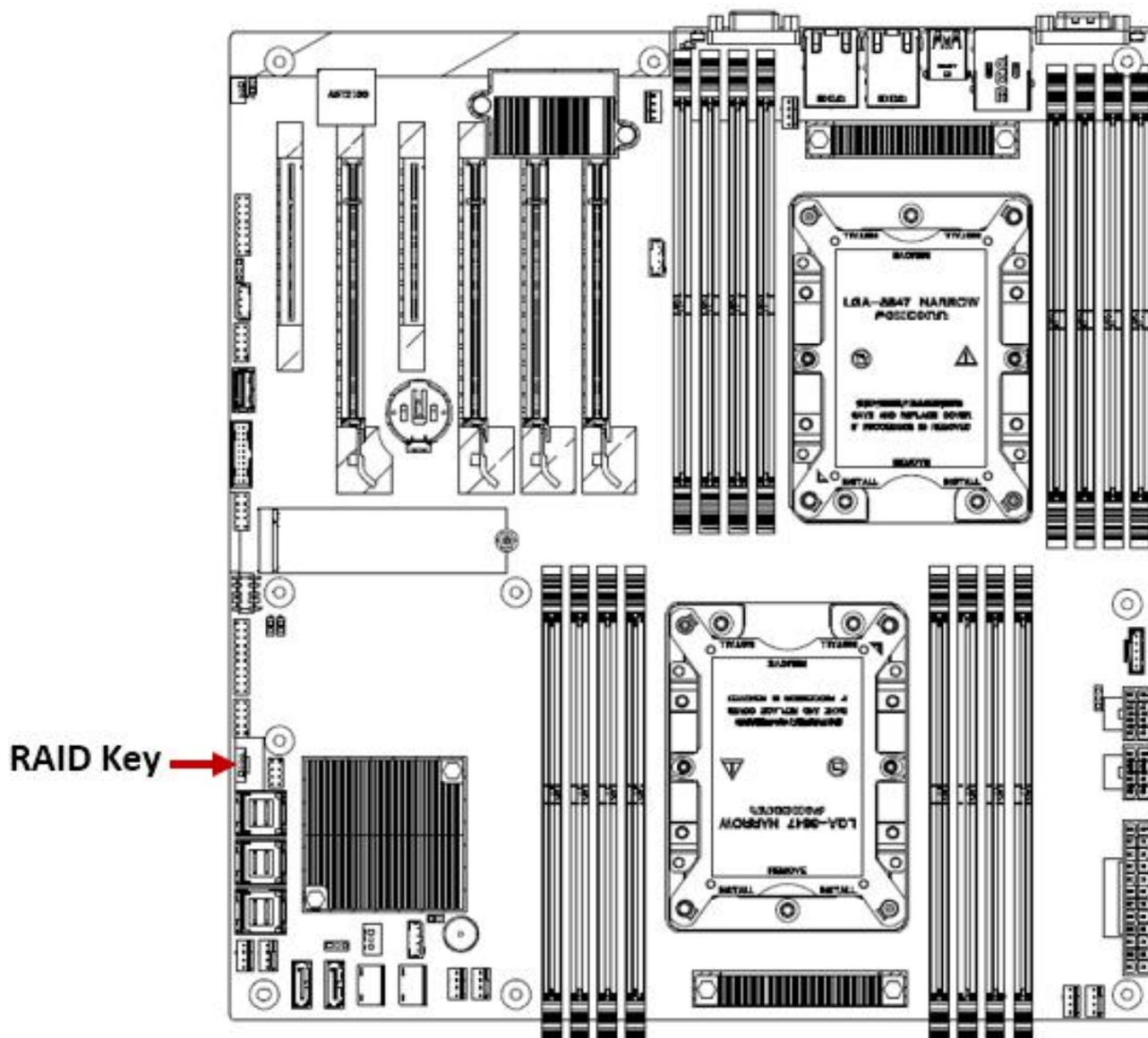


Fig.2.26

Definition of RAID key for CPU NVME SSD jumper Pin:

RAID key for CPU NVME SSD		
PIN sequence	Description	Remarks
PIN1	Ground	
PIN2	3.3V Standby	
PIN1	Ground	
PIN2	PCH RAID Key	

Table 2.19

## 2.2.20 NVMe SMBus Headers

NVMe SMBus (I2C) connector (JNVI2C1/2) is used for PCI-E SMBus clock and data connection, and provides hot-plug support through a dedicated SMBus port. This feature applies only to systems with SMCI dedicated NVMe add-on cards and cables installed. The port position is shown in the figure below:

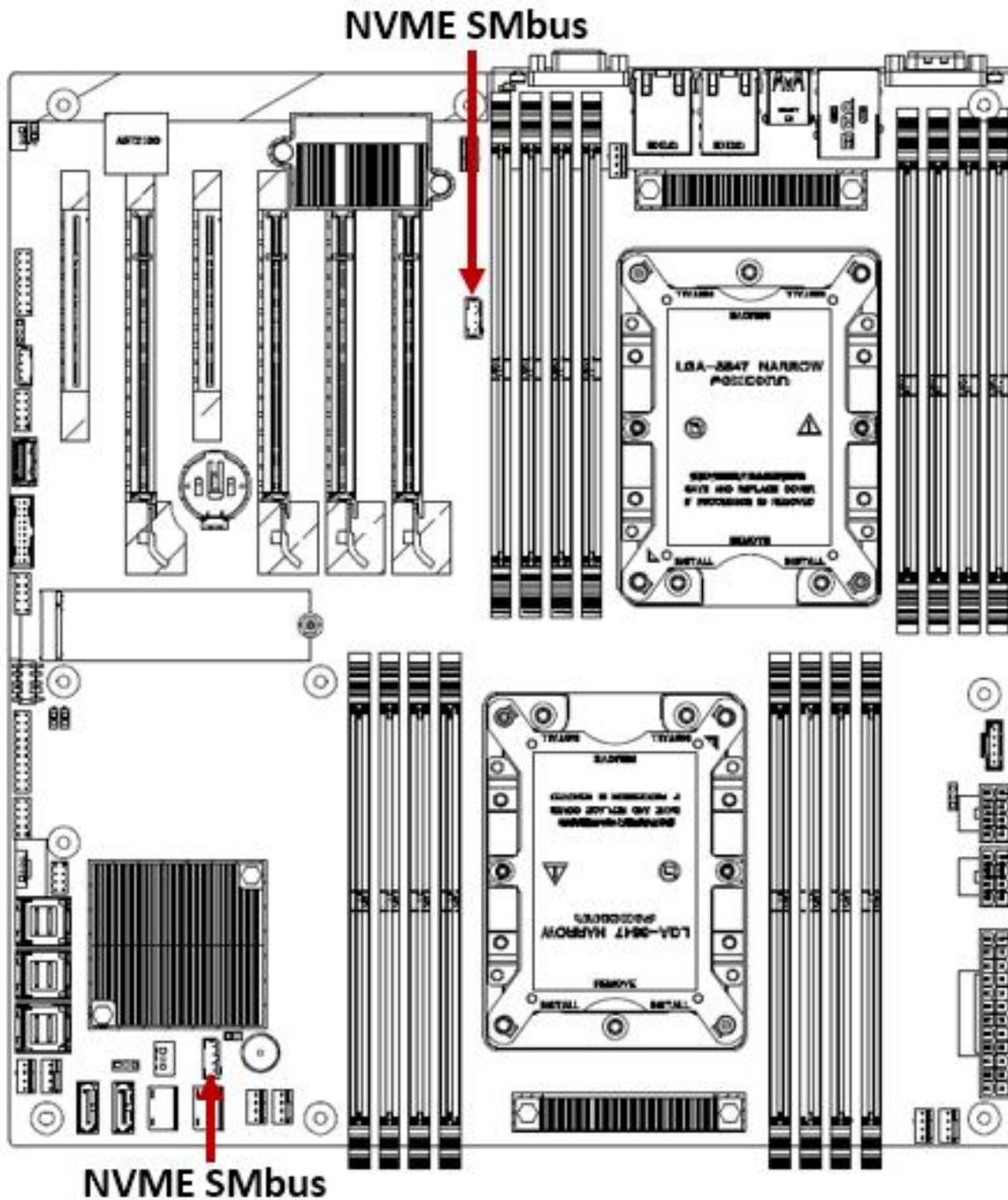


Fig.2.27

## 2.2.21 NVMe Connector

G2DE-B has 2 NVMe connector ports onboard, and uses 2 NVMe connectors (NVMe1 and NVMe2) to connect high-speed PCI-E storage devices.

**Note:** when installing NVMe equipment on the motherboard, be sure to connect NVMe1 (J29) first to ensure the normal operation of the system.

The position of NVMe connector is shown in the figure below:

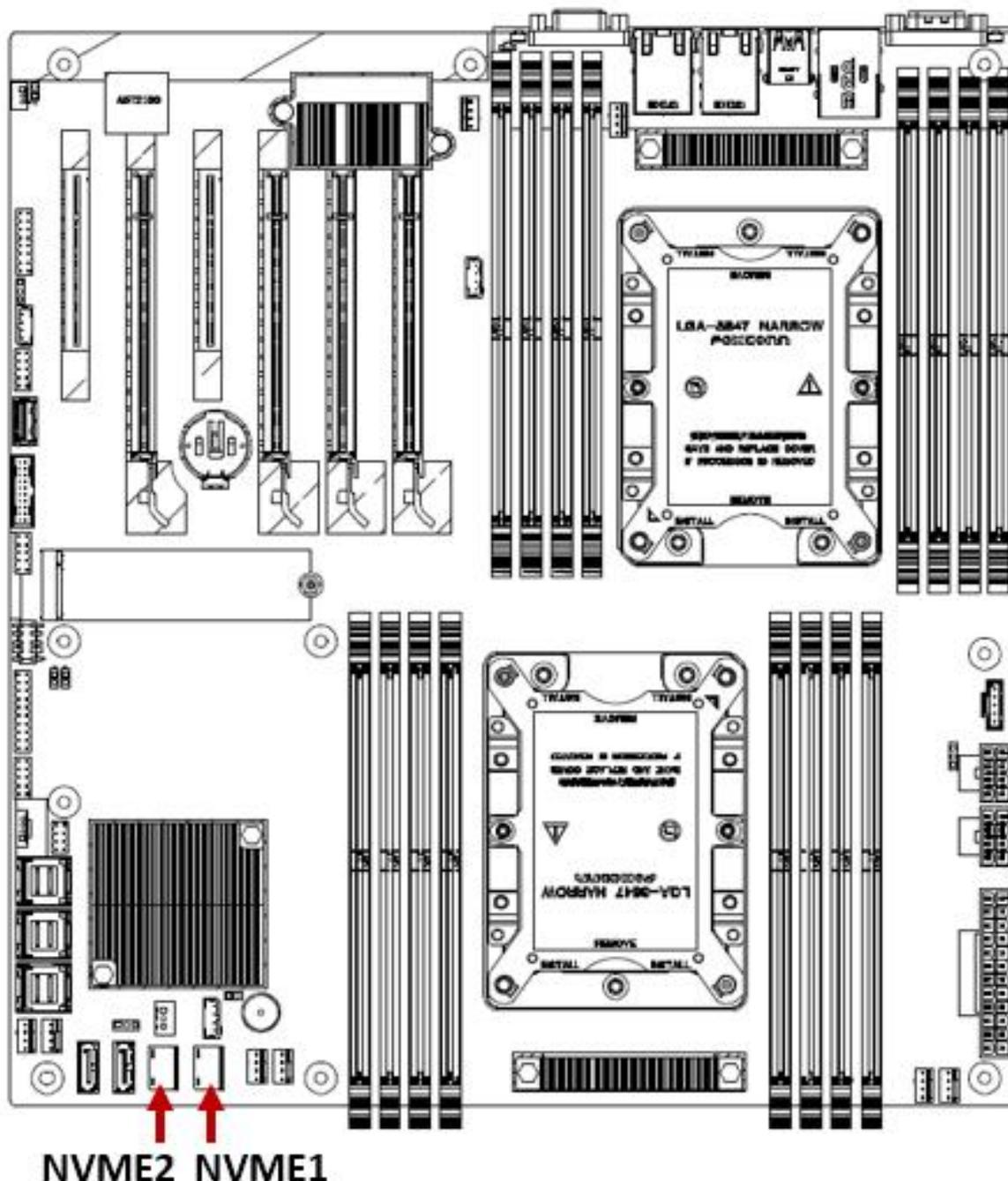


Fig.2.28

## 2.2.22 TPM Header

The TPM Header is used to connect from the trusted platform module (TPM) / Port 80.

The TPM / Port 80 connector is a security device that supports encryption and authentication in the hard disk drive. If the TPM associated with the hard drive is not installed in the system, it allows the motherboard to deny access.

The location of TPM header is shown in the following figure:

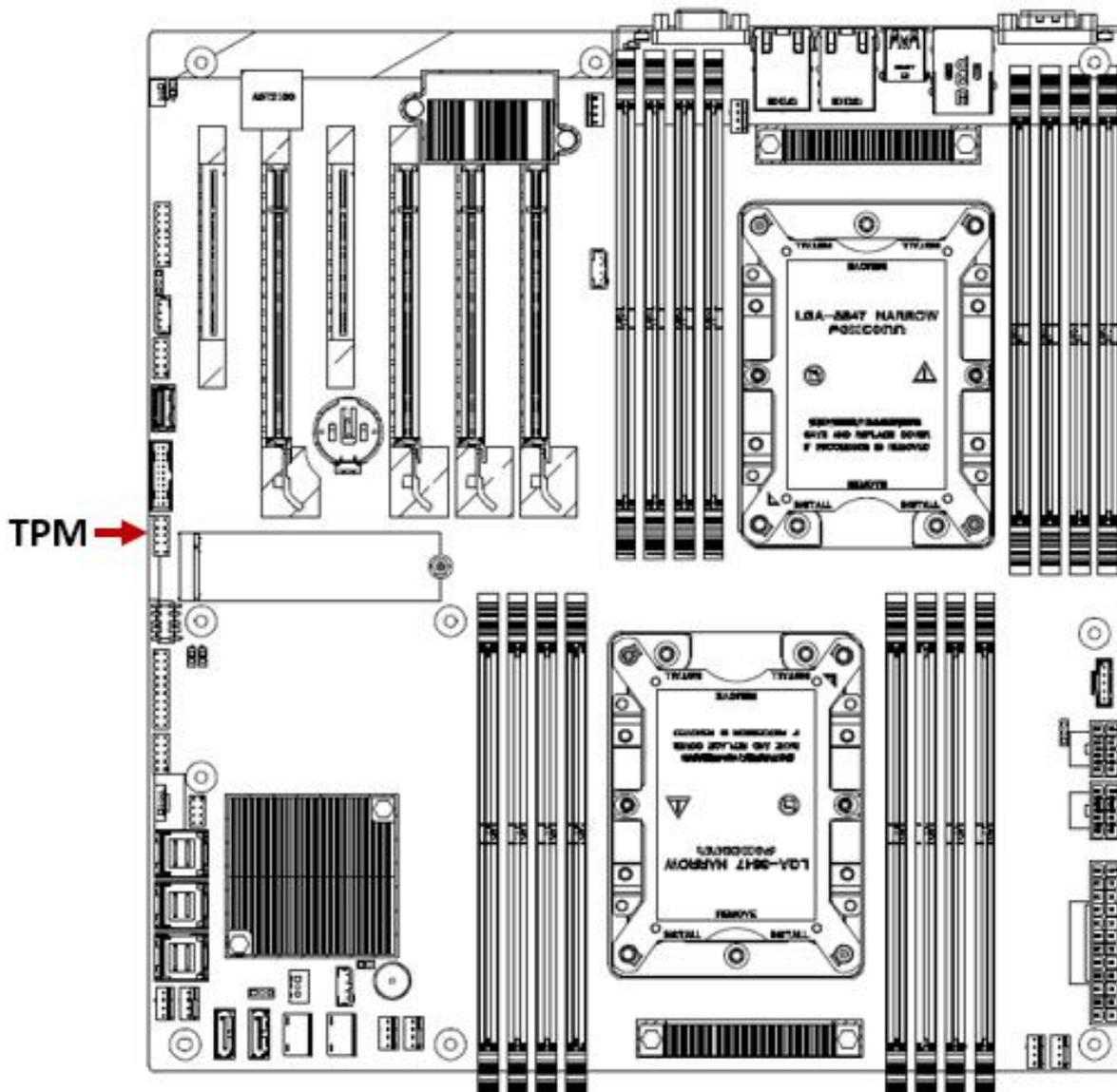


Fig.2.29

### 2.2.23 SATA 3.0 Connection Header

G2DE-B board contains 8x I-SATA 3.0 ports (I-Sata 0-3, I-Sata 4-7) and 6x S-SATA (S-SATA 0-3, S-SATA 4, S-SATA 5). These SATA ports are provided by the C621 / C622 chipset.

SATA 3.0 connector location is shown in the figure below:

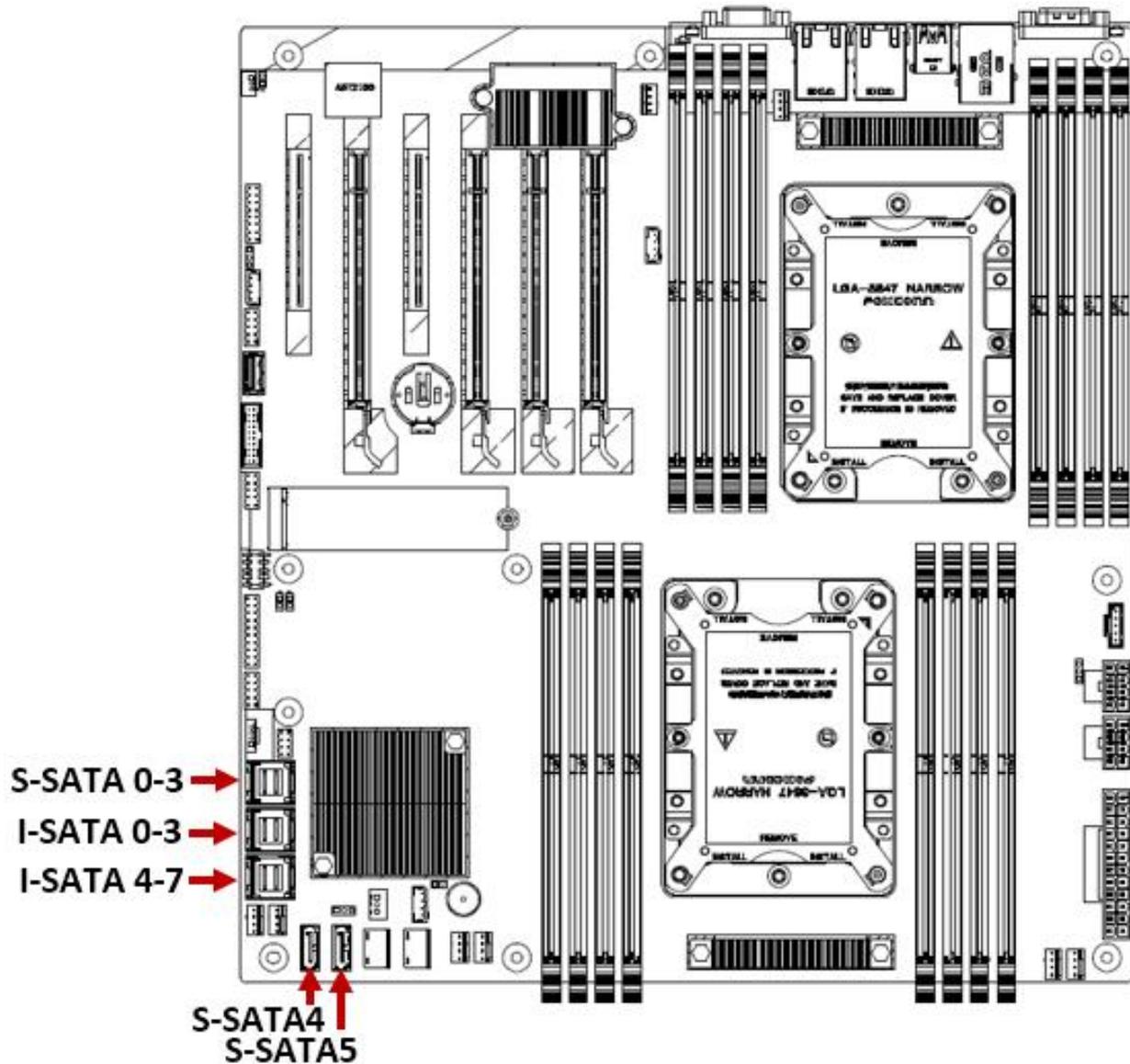


Fig.2.30

### 2.2.24 Front VGA / Real VGA option

G2DE-B integrated 2 VGA ports. When 2 ports are connected to the monitor at the same time, front VGA is preferentially displayed. VGA interface is shown in the figure below:

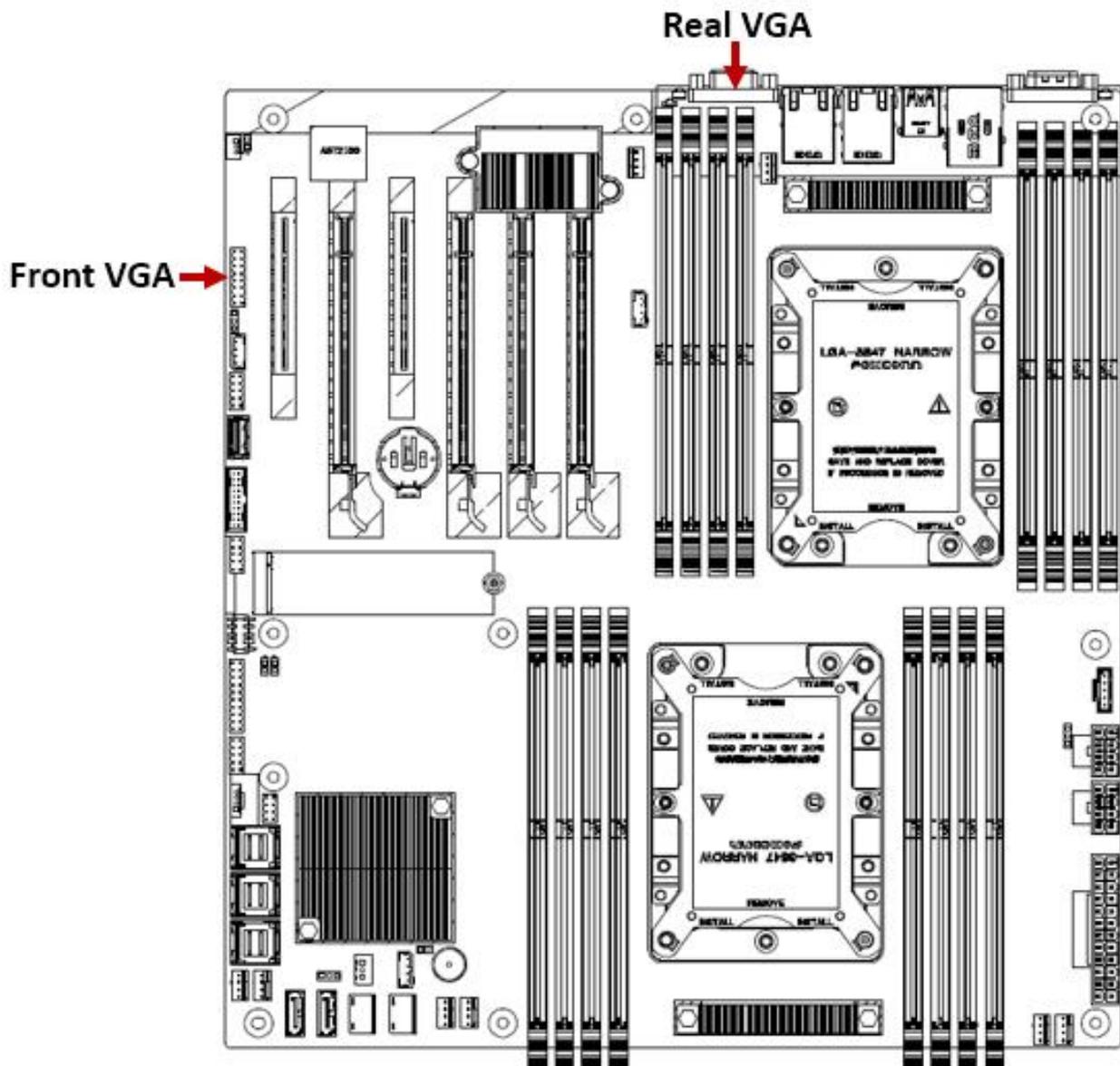


Fig.2.31

# Chapter 3: Motherboard Installation

This chapter introduces the installation steps of Gooxi G2DE-B motherboard and its components, including the installation description of CPU, heatsink, memory, hard disk, etc.

## 3.1 Motherboard Installation

1. Confirm the screw hole position of the motherboard, as shown in the circle in the following schematic diagram.

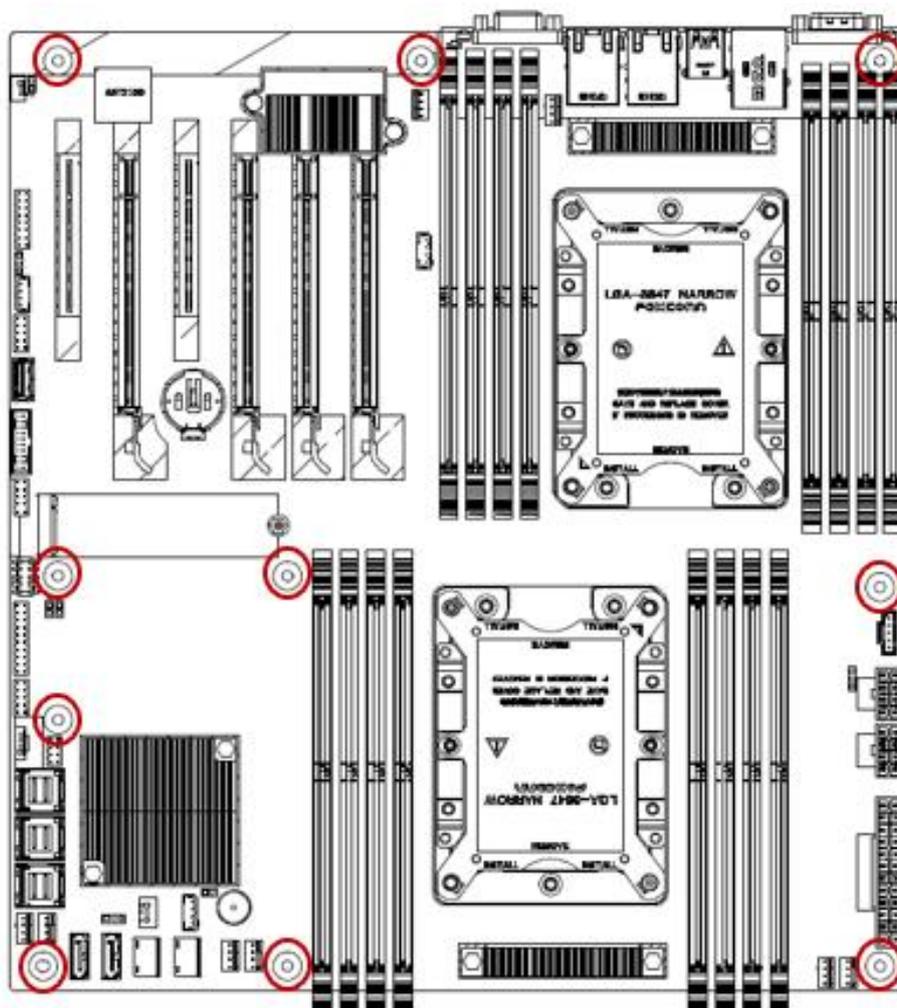


Fig. 3.1

2. Align the holes of MB and the stud holes, and install the screws fixing the MB with a cross screwdriver.

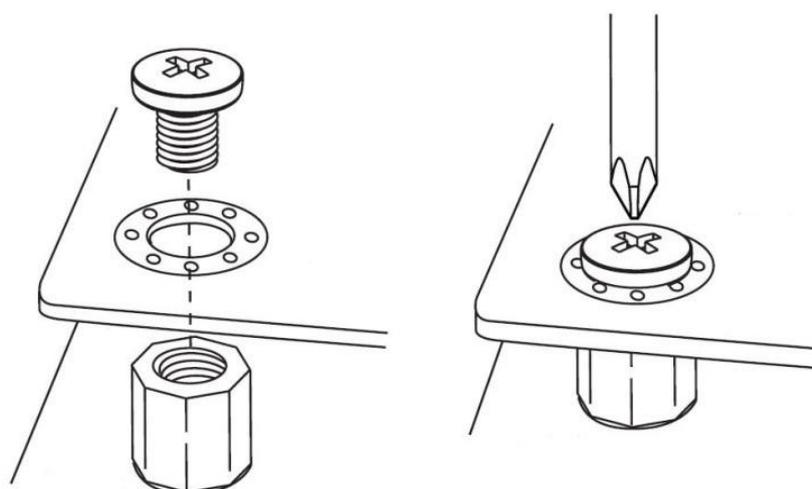


Fig. 3.2

## 3.2 Disassembly and assembly of CPU



### Note:

1. Please purchase Intel CPU through authorized channels.
2. Please make sure that the processor purchased belongs to the support type of this motherboard.
3. Please ensure that your CPU uses a Gooxi certified heatsink.
4. When only one CPU is installed on the motherboard, it needs to be installed at CPU1 position, otherwise it cannot be started.
5. The protective cover on the CPU socket is used to protect the headers on the socket, so it can be removed only when the CPU is installed.

### Detailed steps for installing LGA3647 processor:

#### Step 1: installing CPU

1-1. Tilt the CPU angle as shown in Fig. 3.3, align the A1 angle (triangle mark), and clamp it on one end of the clamping sheet.

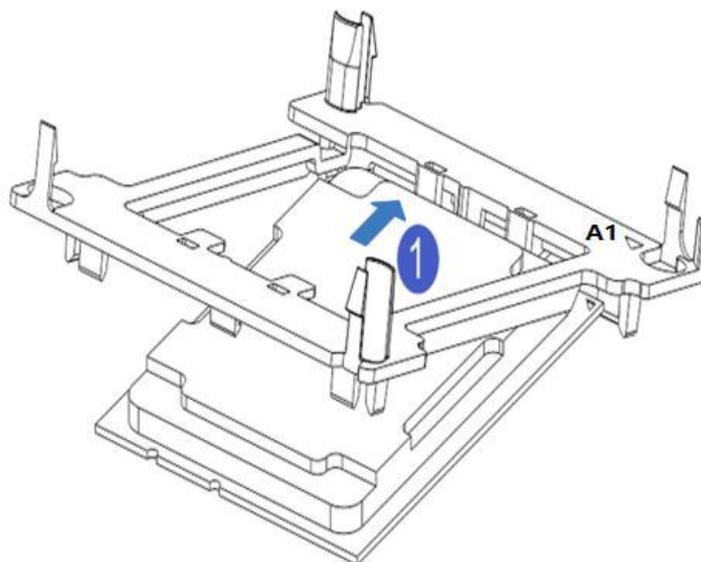


Fig. 3.3

1-2. Press the other end of the clamping sheet in the direction of the arrow in Fig. 3.4 to fix the CPU to the clamping piece.

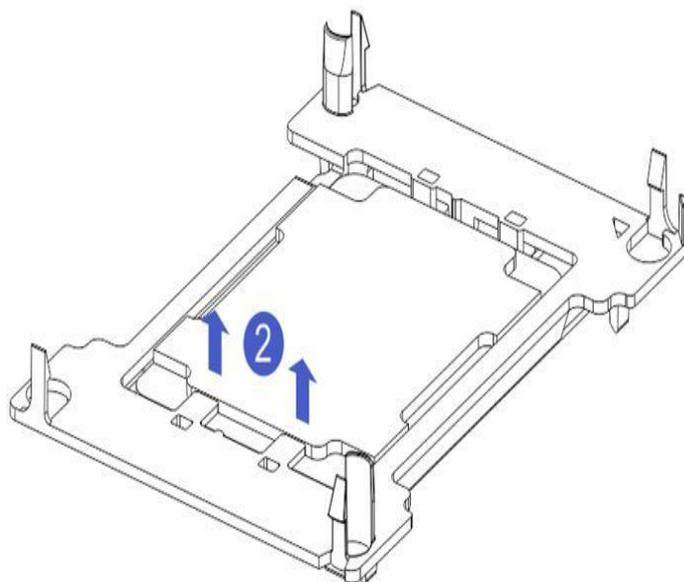


Fig. 3.4

Step 2: install the CPU on the heatsink to ensure that the surfaces are clean, free of oil.

2-1. Apply about 0.4ml thermal conductive silicone grease on the CPU and smooth it evenly (this step is for the heatsink that is not coated with this grease).

2-2. Align the A1 angle (triangle mark) and buckle the CPU on the heatsink, as shown in Fig.

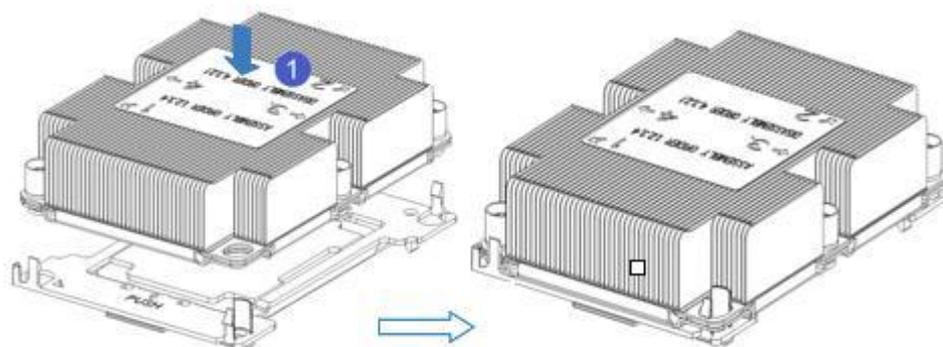


Fig. 3.5

Step 3: installation of CPU heatsink

Installation steps:

3-1. Remove the processor idle bezel (as shown in Fig. 3.6)

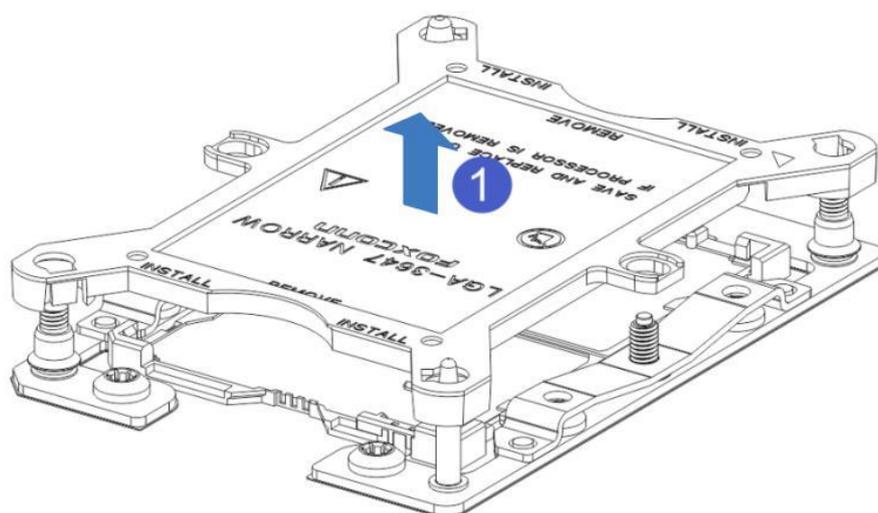


Fig. 3.6

3-2. Align the heatsink with the heatsink-fixing studs on the CPU base, and tighten the fixing screws in sequence according to the instructions. (as shown in Fig. 3.7)

 **Note:** the headers on the motherboard are extremely fragile and easy to be damaged. To avoid damaging the motherboard, do not touch the processor or processor socket contacts

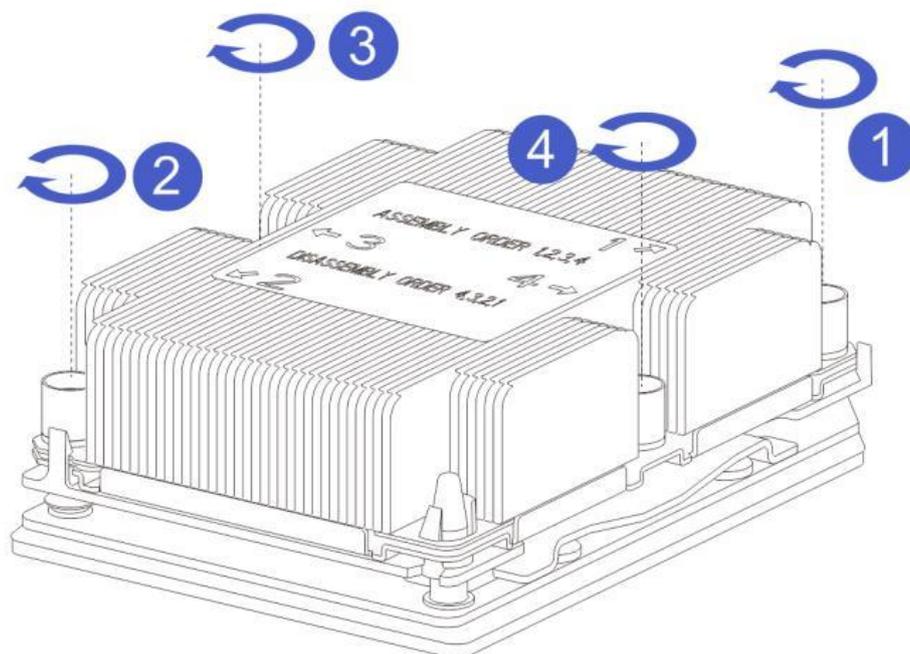


Fig. 3.7

## 3.3 Disassembly and assembly of memory

### 3.3.1 Memory support specifications

The motherboard supports 8GB / 16GB / 32GB R-DIMM, 32GB / 64GB LR-DIMM, 128GB 3DS LRDIMM and 256GB DDR4 memory of 3DS RDIMM. It can support up to 2933MHz (2933MT / s can only be reached when there is a single memory per channel, depending on the CPU SKU).

 **Note:**

1. Visit Gooxi® official website for AVL Memory List.
2. On this motherboard, please use the memory module with the same CAS Memory latency. It is recommended to use the memory with the same capacity and frequency produced by the same manufacturer.
3. To install a memory module under a CPU setting, install the memory module in socket A1 or D1. The recommended settings are shown in Table 3.1:

Memory Module Access Principle: (1 CPU)																		
CPU	Memory Channel	Memory Location	Memory Amount (recommend: √ not recommend: ○)															
			√	√	√	√	○	√	○	√								
			1	2	3	4	5	6	7	8								
CPU1	A	CPU1 DIMM A1	X	X	X	X	X	X	X	X	X	X	X	X	X			
		CPU1 DIMM A2										X	X					
	B	CPU1 DIMM B1		X	X	X	X	X	X	X	X	X	X	X	X			
	C	CPU1 DIMM C1			X		X	X	X	X	X	X	X	X	X			
	D	CPU1 DIMM D1				X	X	X	X	X	X	X	X	X	X			
		CPU1 DIMM D2													X			
	E	CPU1 DIMM E1				X	X	X	X	X	X	X	X	X	X			
	F	CPU1 DIMM F1							X	X	X	X	X	X	X			
Memory Module Access Principle: (2 CPUs)																		
CPU	Memory Channel	Memory Location	Memory Amount (recommend: √ not recommend: ○)															
			○	√	○	√	○	√	○	√	○	○	○	√	○	○	○	√
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CPU1	A	CPU1 DIMM A1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		CPU1 DIMM A2												X	X	X	X	
	B	CPU1 DIMM B1			X	X	X	X	X	X	X	X	X	X	X	X	X	
	C	CPU1 DIMM C1					X	X	X	X	X	X	X	X	X	X	X	
	D	CPU1 DIMM D1							X	X	X	X	X	X	X	X	X	
		CPU1 DIMM D2														X	X	
	E	CPU1 DIMM E1									X	X	X	X	X	X	X	
	F	CPU1 DIMM F1										X	X	X	X	X	X	
CPU2	A	CPU2 DIMM A1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		CPU2 DIMM A2													X	X	X	
	B	CPU2 DIMM B1				X	X	X	X	X	X	X	X	X	X	X	X	
	C	CPU2 DIMM C1					X	X	X	X	X	X	X	X	X	X	X	
	D	CPU2 DIMM D1							X	X	X	X	X	X	X	X	X	
		CPU2 DIMM D2															X	
	E	CPU2 DIMM E1									X	X	X	X	X	X	X	
	F	CPU2 DIMM F1										X	X	X	X	X	X	

Table 3.1

### 3.3.2 How to install the memory?

The eight memory sockets controlled by the motherboard CPU 1 are DIMMA1, A2, DIMMB1, DIMM C1 and DIMM D1, D2, DIMM E1 and DIMM F1. The eight memory sockets controlled by CPU 2 are DIMMA1, A2, DIMMB1, DIMM C1, DIMM D1, D2, DIMM E1 and DIMM F1. Note that the memory gap is consistent with the gap of DIMM slot (see Fig. 3.8 below). Clip each DIMM module vertically in place to prevent incorrect installation.

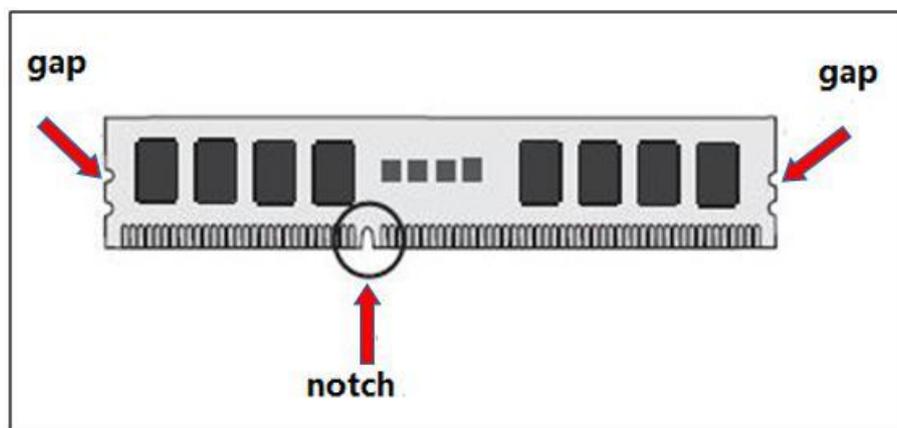


Fig. 3.8

**⚠ Note: when installing or removing a DIMM memory module, be careful to prevent any possible damage to the DIMM or its respective socket.**

Installation: insert the memory module vertically and press the memory socket snap position, noting that it is aligned with the bottom of the notch. The demonstration of simulating inserting a memory module is shown in the following figure:

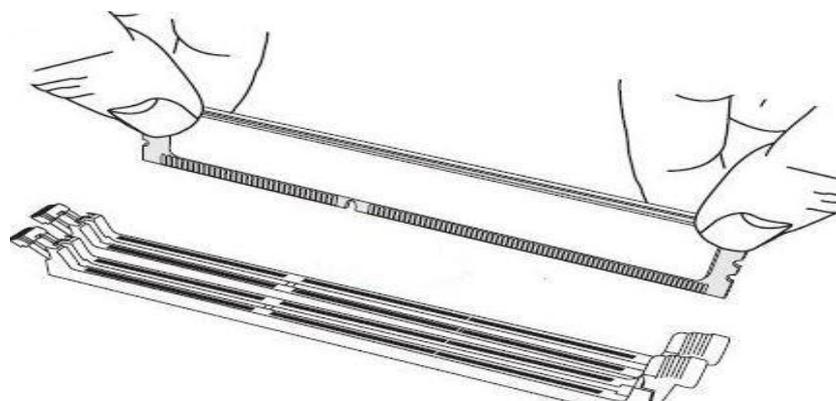


Fig. 3.9

Push the latches near both ends of the memory module socket inward with your thumb to secure the memory in the socket. See Fig. 3.10 below:



Fig. 3.10

Removal: gently push the latches near both ends of the memory module socket with your thumb. Release the memory from the socket. The demonstration of simulated disassembly of memory module is shown in Fig. 3.11:

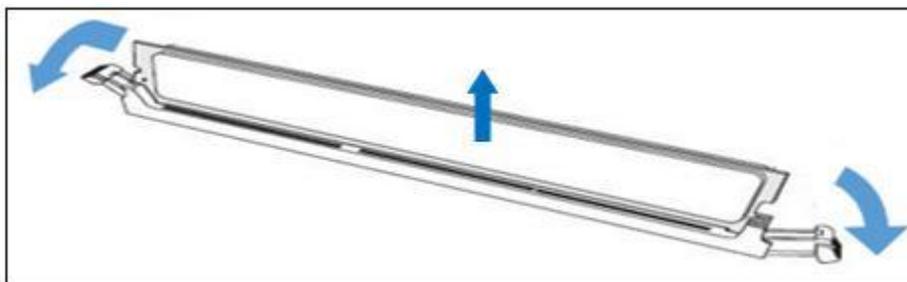


Fig. 3.11

### 3.4 M.2 installation

Step 1: install locating stud A according to the length of M.2 card.

Step 2: install the M.2 card

Insert the M.2 card connector end into the motherboard connector, as shown in Fig. 3.12:

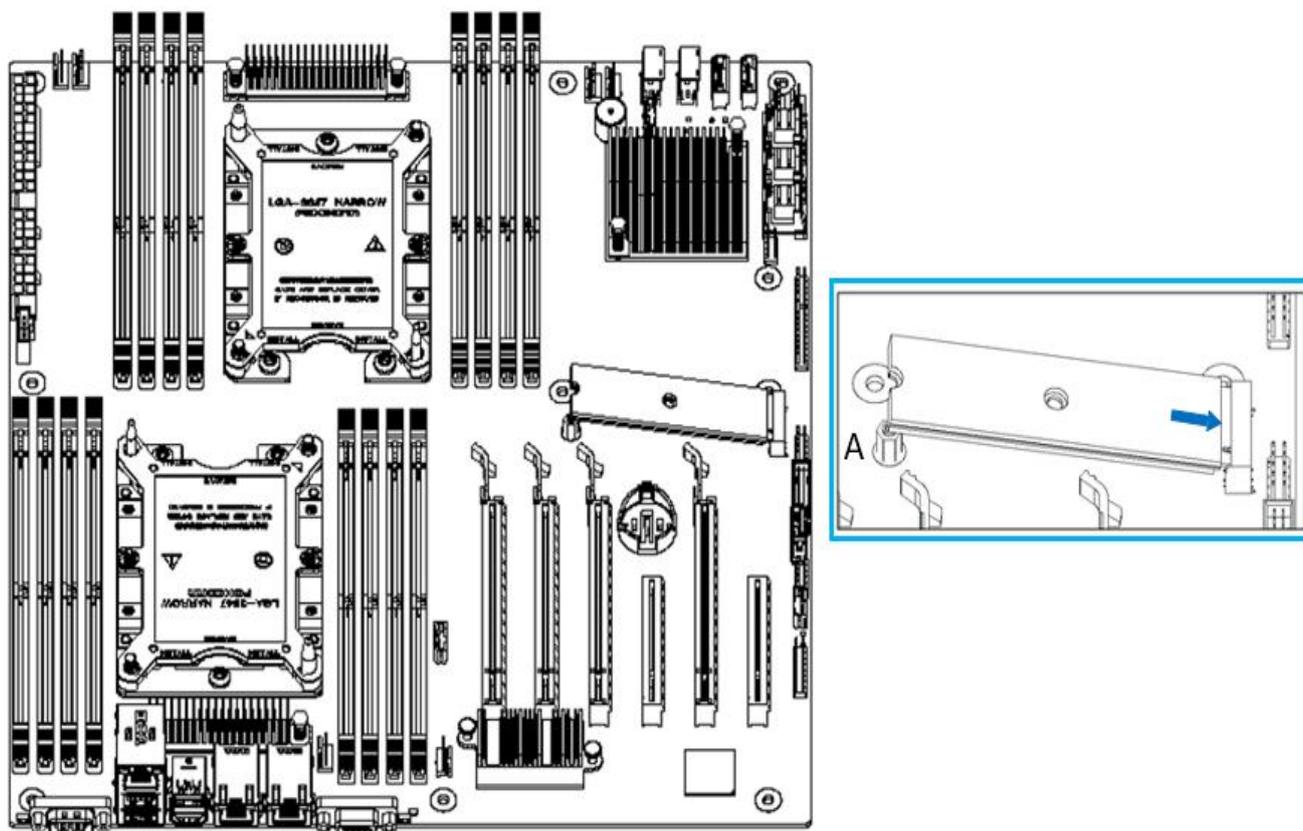
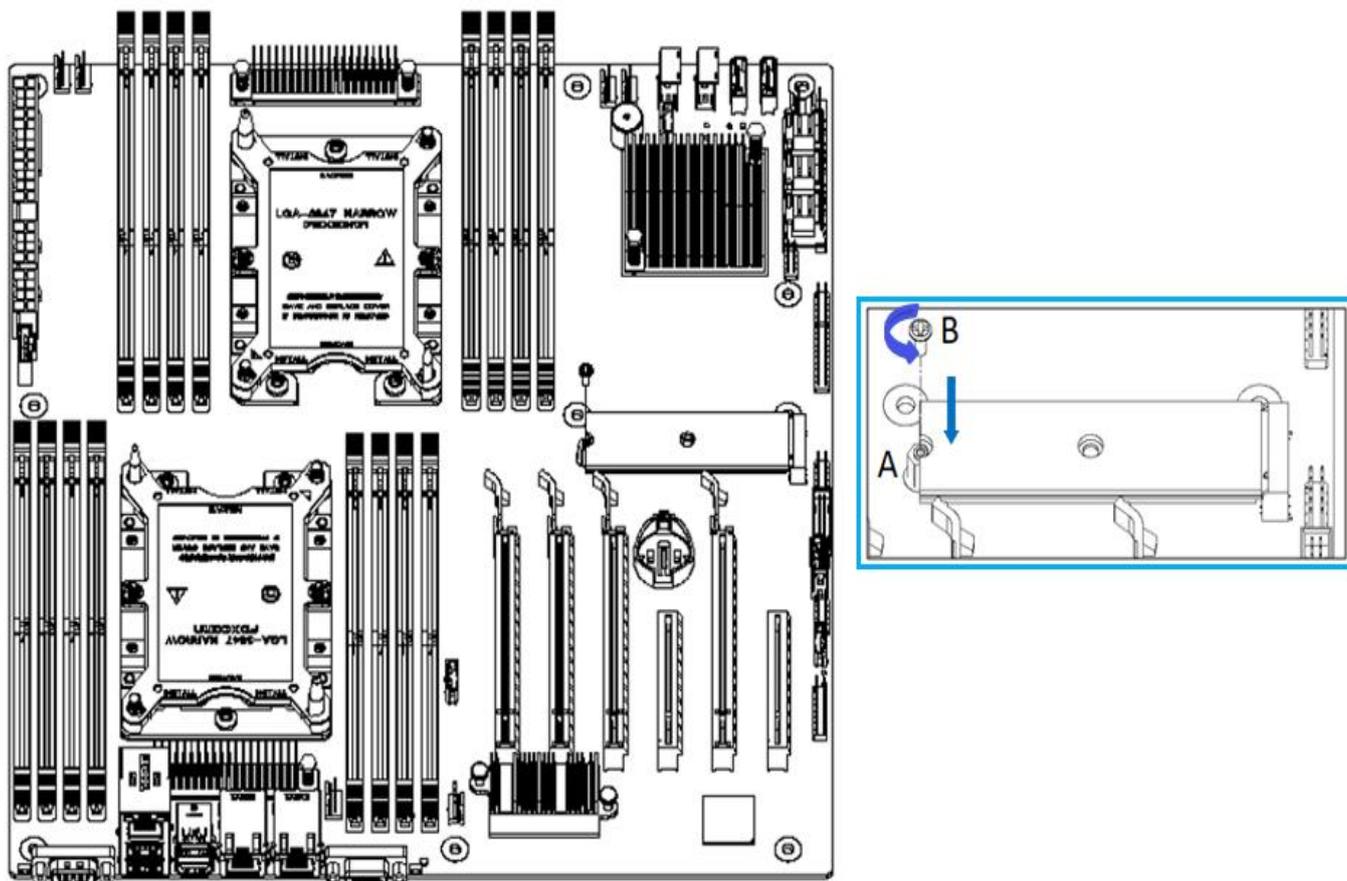


Fig. 3.12

2-2. Press the other end of the M.2 card to the locating stud in step 1, and fix the screw B, as shown in Fig. 3.13:



The installation completion diagram is shown in Fig. 3.14:

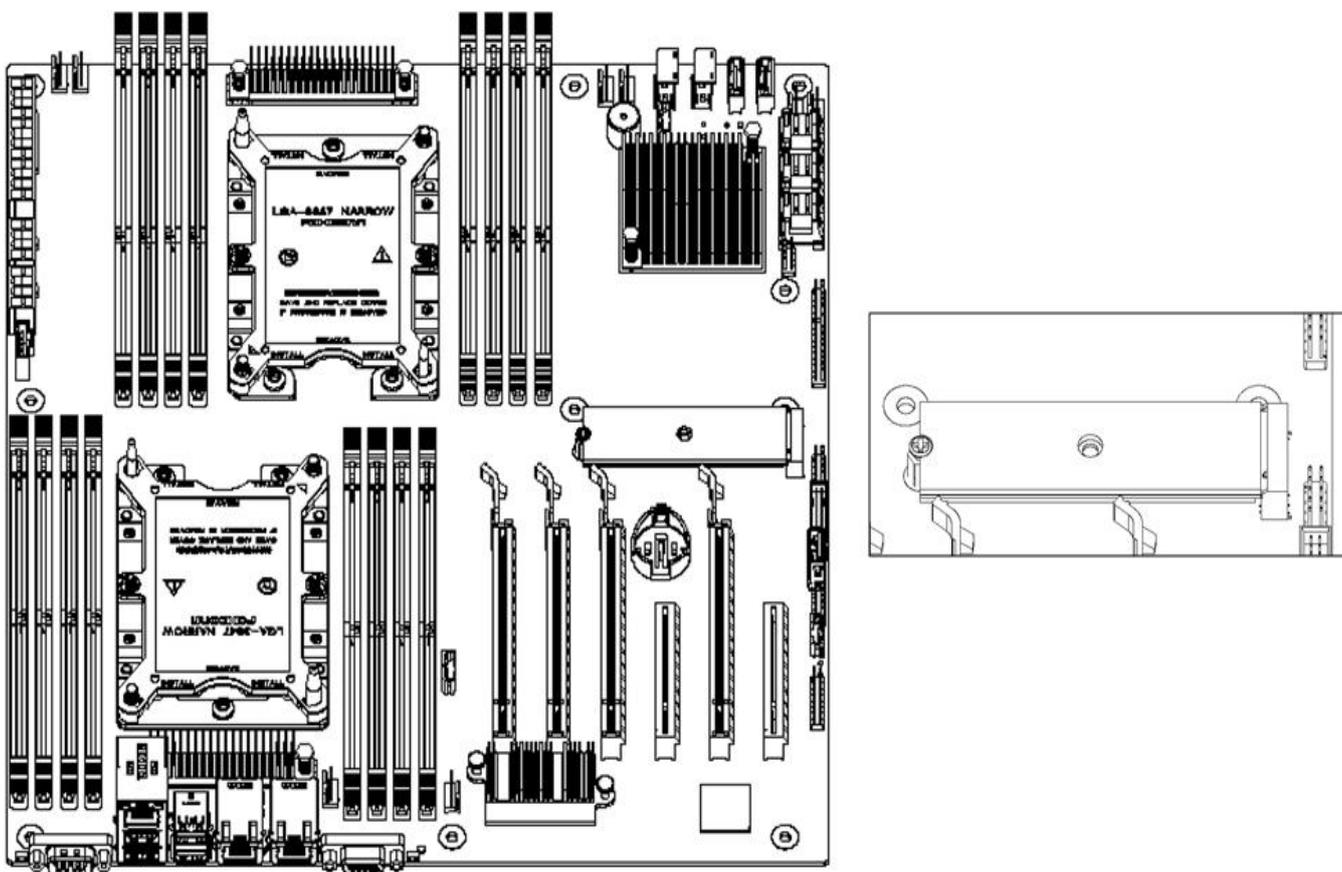


Fig. 3.14

# Chapter 4: BIOS Parameter Settings

## 4.1 Enter the BIOS setup interface

Operation steps:

1. Power on the server motherboard and connect the keyboard;
2. In the process of POST, pay attention to the prompt of entering BIOS Setup interface at the bottom left of LOGO picture, “Press <DEL> or <ESC> to enter setup, <F7> to enter Boot Menu.”;
3. Press the <DEL> or <ESC> keyboard to enter the BIOS Setup interface.

## 4.2 Setup menu parameters

### 4.2.1 Navigation key

→←: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Reset

ESC: Exit

### 4.2.2 Main menu description

Main interface contains the basic information of BIOS system, such as BIOS version number, CPU model, memory capacity, and the system time that can be set.

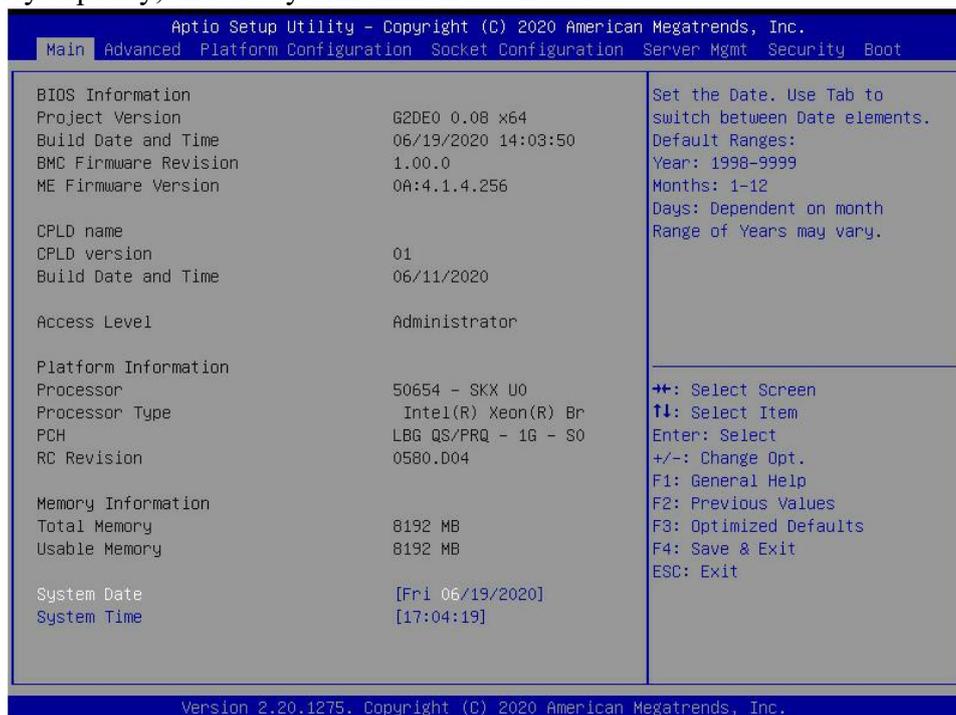


Fig. 4. 1

## BIOS Information

### Project Version:

Displays the version information of the single board BIOS.

### Build Date and Time:

Displays the compilation date and time of the single board BIOS.

### BMC Firmware Revision:

Displays the version information of single board BMC.

### ME Firmware Version:

Displays the version information of single board ME.

### CPLD Name:

Displays the name information of single board CPLD.

### CPLD Version:

Displays the CPLD information of single board CPLD.

### Build Date and Time:

Displays the compilation date and time of the single board CPLD.

### Access Level:

Displays the permissions of the current user of the single board.

## Platform Information

### Processor:

CPUID and step information.

### Processor Type:

CPU type information.

### PCH:

PCH SKU and step information.

### RC Revision:

Displays the version information of single board RC.

## Memory information

### Total Memory:

Displays the total memory capacity of the system.

### Usable Memory:

Displays the available memory capacity of the system.

### System Language:

Select the current system language.

### System Date:

Display and set the current system date. The format of the system date is "week, month, day, year". Press "Enter" to switch between month, day and year. You can change the value in the following ways:

- Press "+": The value is increased by 1.
- Press "-": The value decreased by 1.
- Press the number key to change the value directly.

**System Time:**

Display and set the current system time. The system time is 24-hour, and the format is "hour: minute: second". Press "Enter" to switch between hours, minutes and seconds. You can change the value in the following ways:

- Press "+": The value is increased by 1
- Press "-": The value decreased by 1
- Press the number key to change the value directly.

### 4.2.3 Advanced Menu description

Advanced menu contains advanced configuration items of BIOS system.

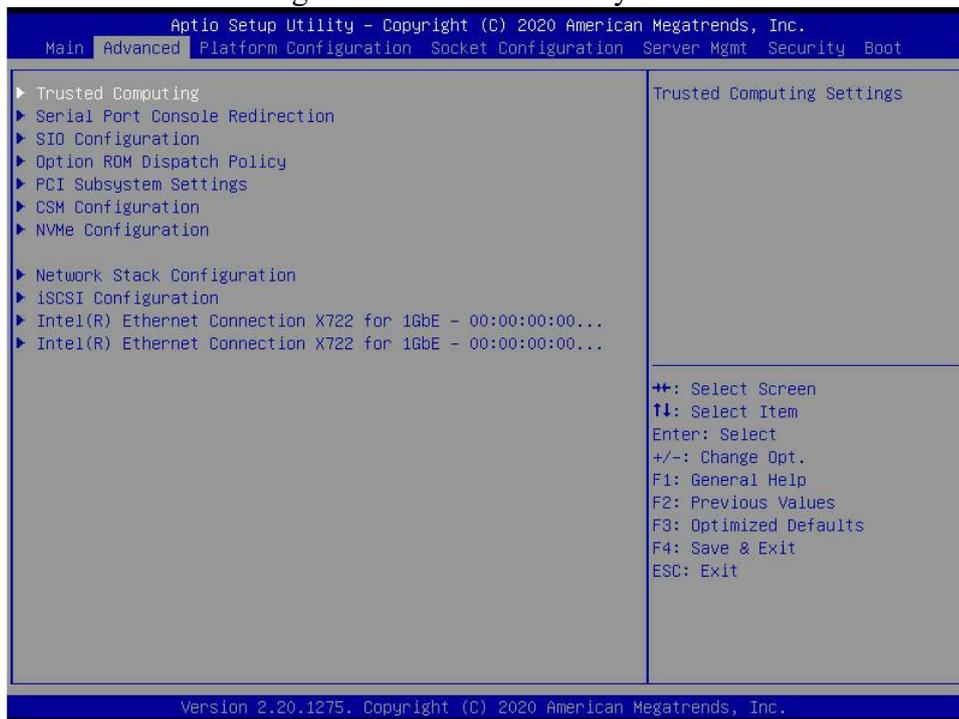


Fig. 4. 2

- Trusted Computing  
Trusted execution module configuration.
- Serial Port Console Redirection
- SIO Configuration
- Option ROM Dispatch Policy
- PCI Subsystem Settings
- CSM Configuration
- NVMe Configuration
  
- Network Stack Configuration
- iSCSI Configuration
- Intel Enthernet Connection X722 for xGbE - XX:XX:XX:XX:XX:XX

## 4.2.4 Trusted Computing

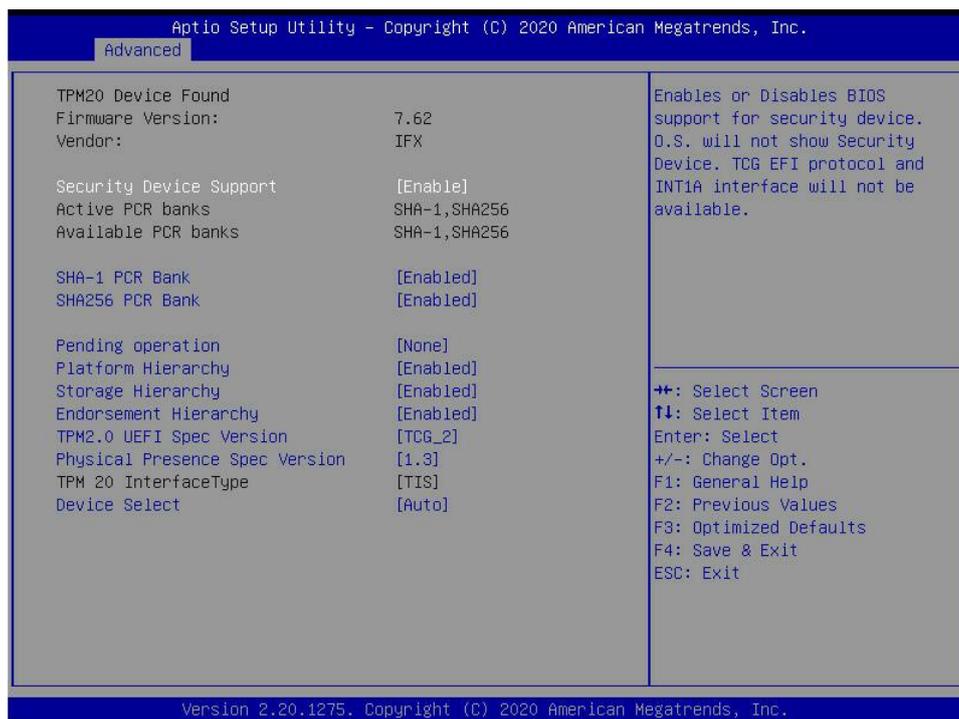


Fig. 4. 3

Display and set TCM / TPM module information. Different module options are set differently. Users can set according to Setup help.

## 4.2.5 Serial Port Console Redirection

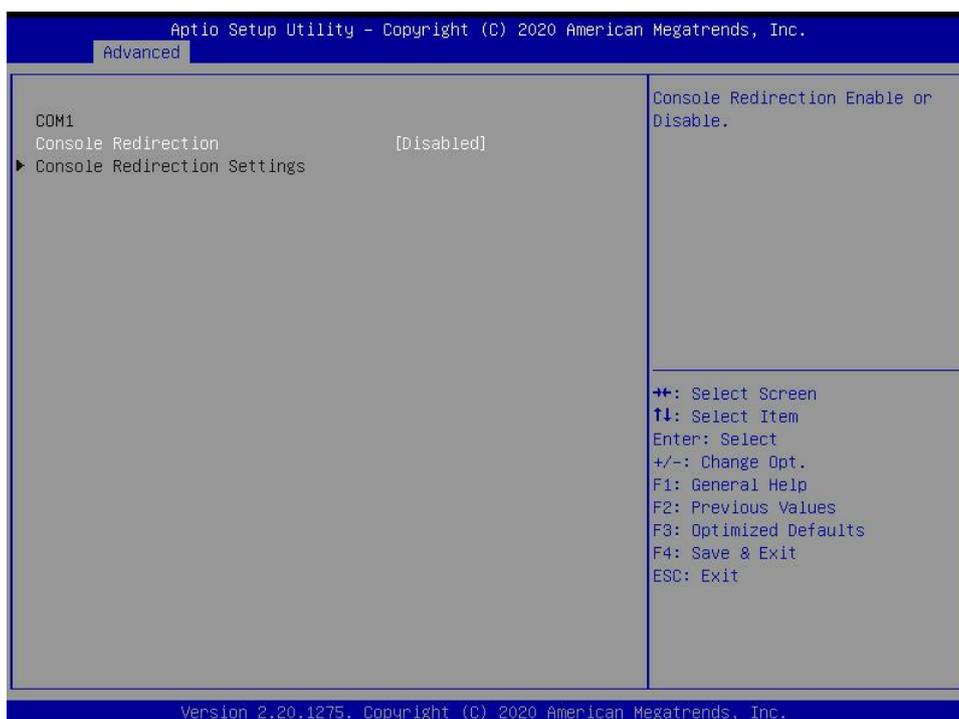


Fig. 4. 4

Console Redirection:

The console redirection switch redirects the information output from the console (such as graphics card) to the display to the serial port.

- Disable the redirection function.
- Enabled the redirection function.

Default: Disable

## 4.2.6 Console Redirection Settings

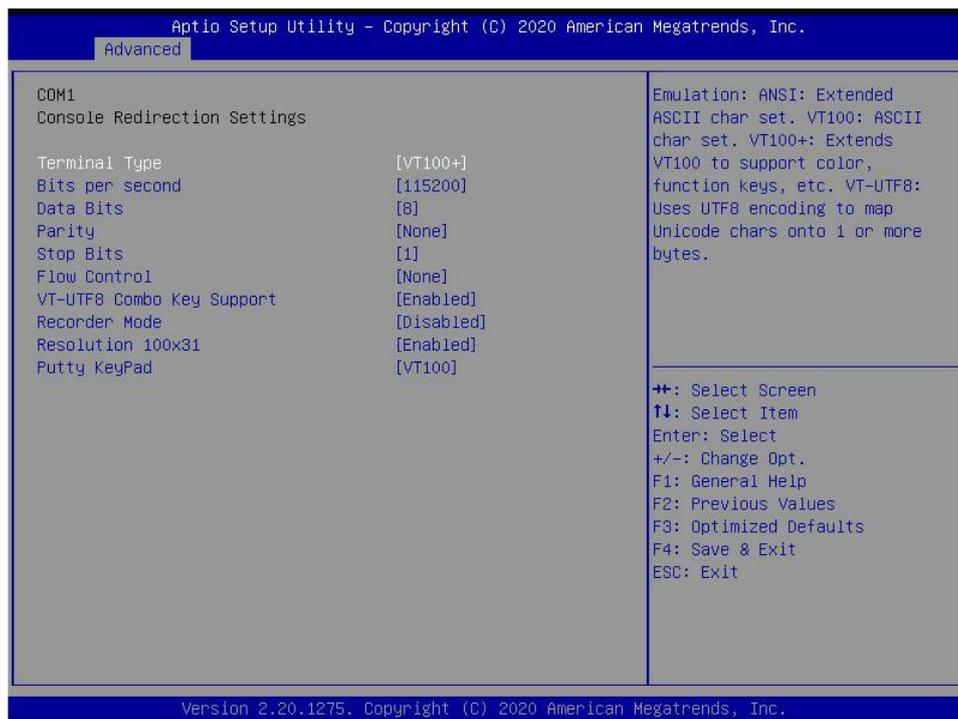


Fig. 4. 5

### Terminal Type

This option allows you to select the emulation type. The BIOS emulation type must match the mode selected in the terminal program. The menu options are:

- VT100
- VT100+
- VT-UTF8
- ANSI

Default: VT100+

### Bits per second

Serial port redirection rate, the value range is 9600~115200

Default: 115200

### Data Bits

Serial port redirection data bit length, menu options are:

- 8
- 7

Default: 8

## Parity

Serial port redirection checking switch, menu options are:

- None: no check
- Even: even check
- Odd: odd check
- Mark: the check bit is always 1
- Space: the check bit is always 0

Default: None



Checks of Mark and Space are not allowed for error detection.

## Stop Bits

The end of a serial data packet, menu options are:

- 1
- 2

Default: 1

## Flow Control

Serial port redirection control flow selecting switch, menu options are:

- None: turn off the serial port redirection control flow
- Hardware RTS/CTS: request to send / request to clear

Default: None

## VT-UTF8 Combo key support

ANSI/VT100 End VT-UTF8 combination key supporting switch, and the menu options are:

- Disable ANSI/VT100 End VT-UTF8 combination key support
- Enabled ANSI/VT100 End VT-UTF8 combination key support

Default: Enable

## Recorder Mode

Record mode switch, turn on this function, only text information will be sent, and the menu options are:

- Enabled
- Disable

Default: Disable

## 4.2.7 SIO Configuration

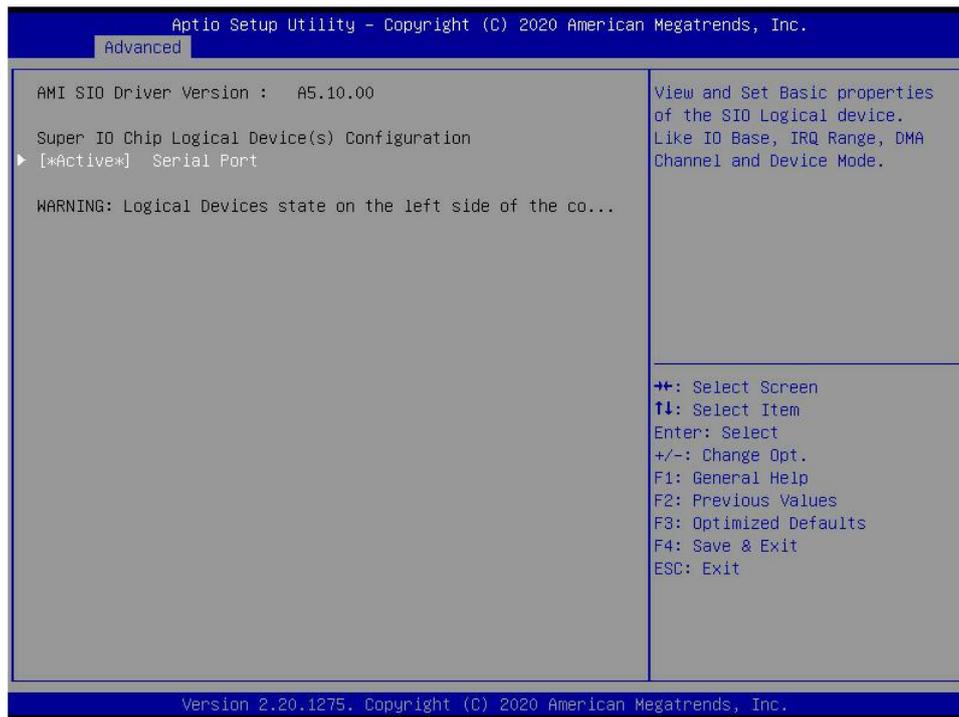


Fig. 4. 6

## 4.2.8 [\*Active\*] Serial Port

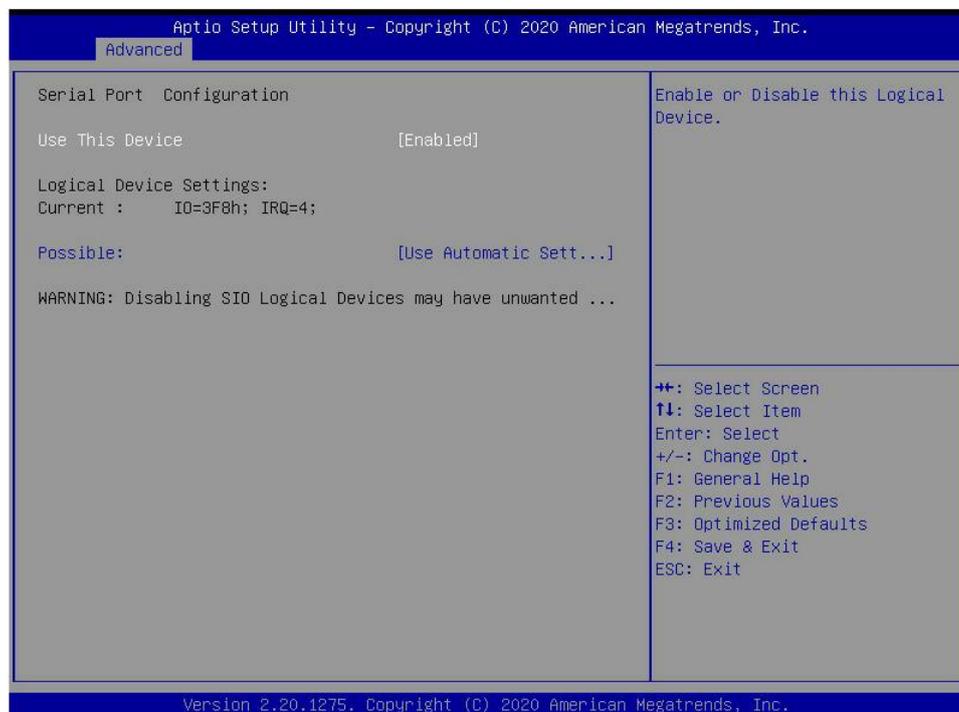


Fig. 4. 7

Use This Device

Use this device, and the menu options are:

- Enabled
- Disable

Default: Enable

Possible

Select the optimal settings for the serial port based on the requirements. The menu options are:

- Use Automatic Settings
  - IO=3F8h; IRQ=4; DMA;
  - IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;
  - IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;
  
  - IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;
  - IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;
- Default: Use Automatic Settings

## 4.2.9 Option ROM Dispatch Policy

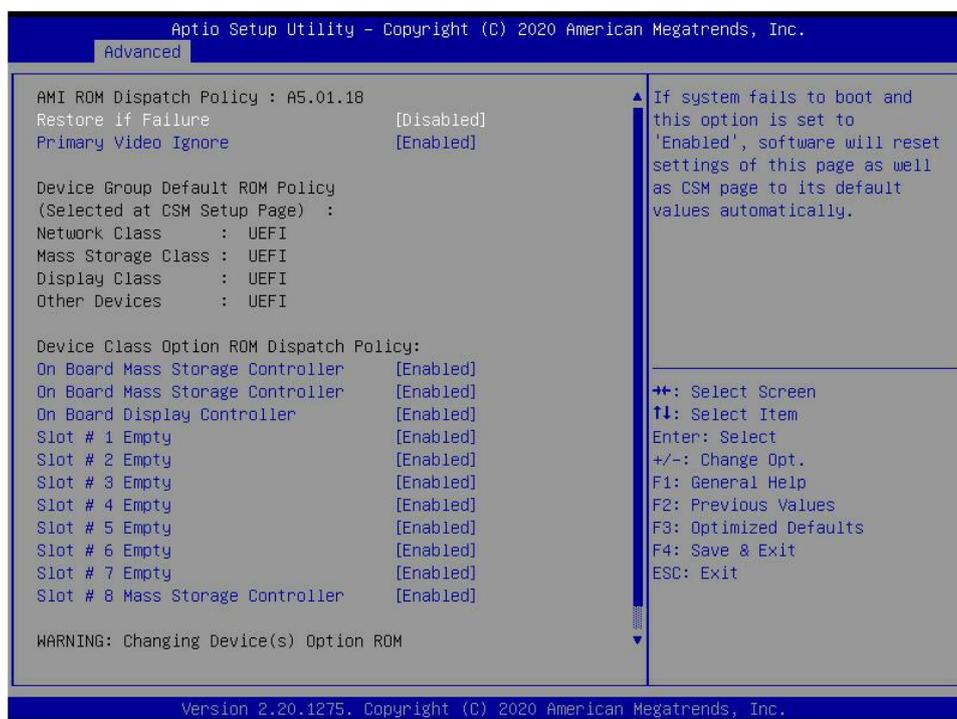


Fig. 4. 8

### Administer Option ROM Dispatch Policy

Restore if Failure

The menu options are:

- Enabled
- Disable

Default: Disable

Primary Video Ignore

Ignore the basic graphics card, and the menu options are:

- Enabled
- Disable

Default: Enable

On Board Mass Storage Controller

Onboard or external equipment controller, menu options are:

- Enabled
- Disable

Default: Enable

On Board Mass Storage Controller

Onboard or external equipment controller, menu options are:

- Enabled
- Disable

Default: Enable

On Board Display Controller

Onboard or external equipment controller, menu options are:

- Enabled
- Disable

Default: Enable

Slot # 1 Empty

Onboard or external equipment controller, menu options are:

- Enabled
- Disable

Default: Enable

...

Slot # 8 Empty

Onboard or external equipment controller, menu options are:

- Enabled
- Disable

Default: Enable

## 4.2.10 PCI Subsystem Settings

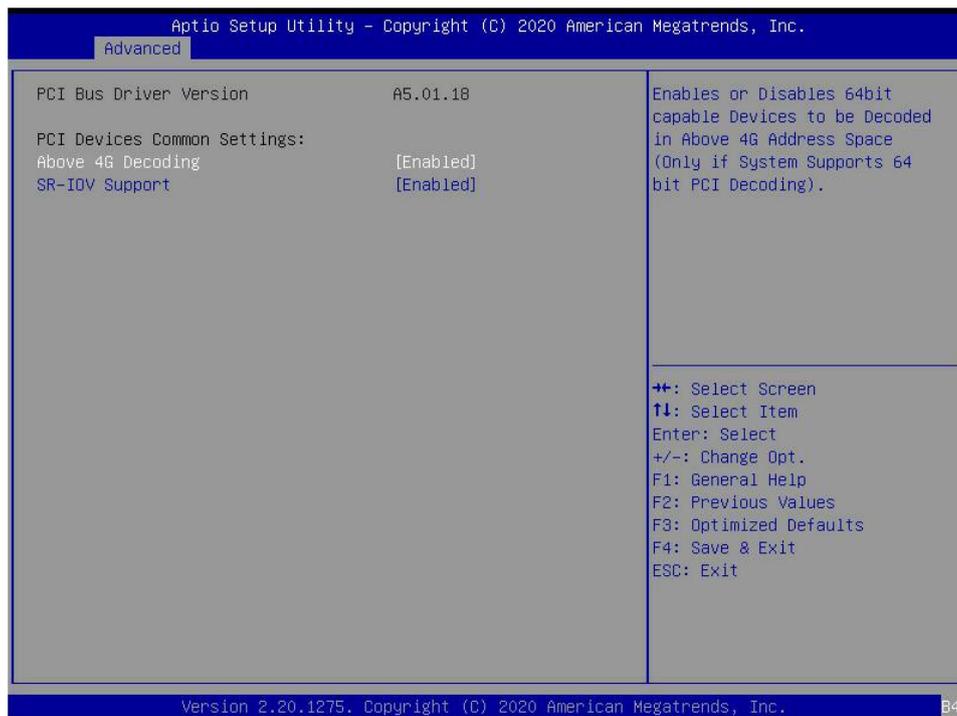


Fig. 4. 9

### Above 4G Decoding

The decoding control switch of memory space resources above 4G, and the menu options are:

- Enabled
  - Disable
- Default: Enable

SR-IOV Support

SR-IOV Support switch setting, and the menu options are:

- Enabled
  - Disable
- Default: Enable

### 4.2.11 CSM Configuration

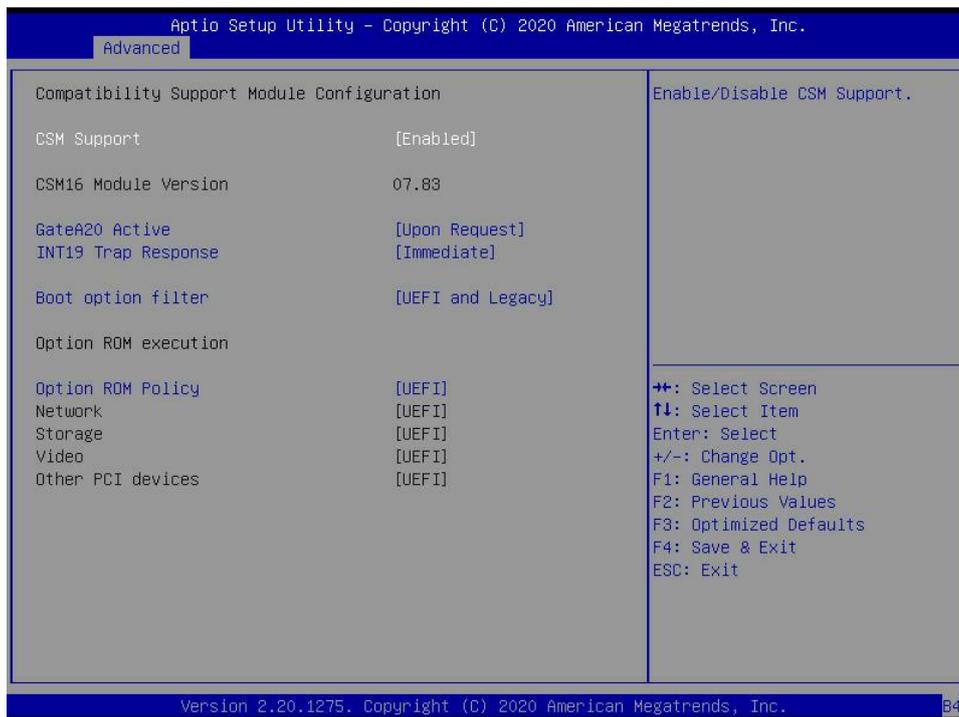


Fig. 4. 10

CSM Support

Turn on or off the compatible support module. The menu options are:

- Disable
  - Enable
- Default: Enable

GateA20 Active

Control mode setting of A20 address line, menu options are:

- Upon Request
  - Always
- Default: Upon Request

INT19 Trap Response

Interrupt and capture signal response settings, menu options are:

- Immediate: immediate response
- Postponed: postponed response

Default: Immediate

Boot option filter

Start the option control switch, and the menu options are:

- UEFI and Legacy: UEFI and Legacy startup items
- UEFI only: UEFI startup item
- Legacy only: Legacy startup item

Default: UEFI and Legacy

Option ROM Policy

Select Option ROM execution mode, and the menu options are:

- UEFI: UEFI mode
- Legacy: Legacy mode

Default: UEFI

## 4.2.12 NVMe Configuration



Fig. 4. 11



Fig. 4. 12

Displays the details of the NVMe hard drive.

### 4.2.13 Network Stack Configuration



Fig. 4. 13

Network Stack

Network stack control switch, menu options are:

- Enabled
- Disable

Default: Disable

## Ipv4 PXE Support

Ipv4 UEFI PXE Function control switch, menu options are:

- Enabled
- Disable

Default: Disable

## Ipv4 HTTP Support

Ipv4 HTTP Function control switch, menu options are:

- Enabled
- Disable

Default: Disable

## Ipv6 PXE Support

Ipv6 UEFI PXE Function control switch, menu options are:

- Enabled
- Disable

Default: Disable

## Ipv6 HTTP Support

Ipv6 HTTP Function control switch, menu options are:

- Enabled
- Disable

Default: Disable

## PXE boot wait time

Boot waiting time: the user can enter this, during the waiting process, you can press "ESC" to give up PXE boot, which is 0 by default.

## Media detect count

Device-in-place detection times. You can enter the device detection times of the device LAN card. The default is 1

## 4.2.14 iSCSI Configuration

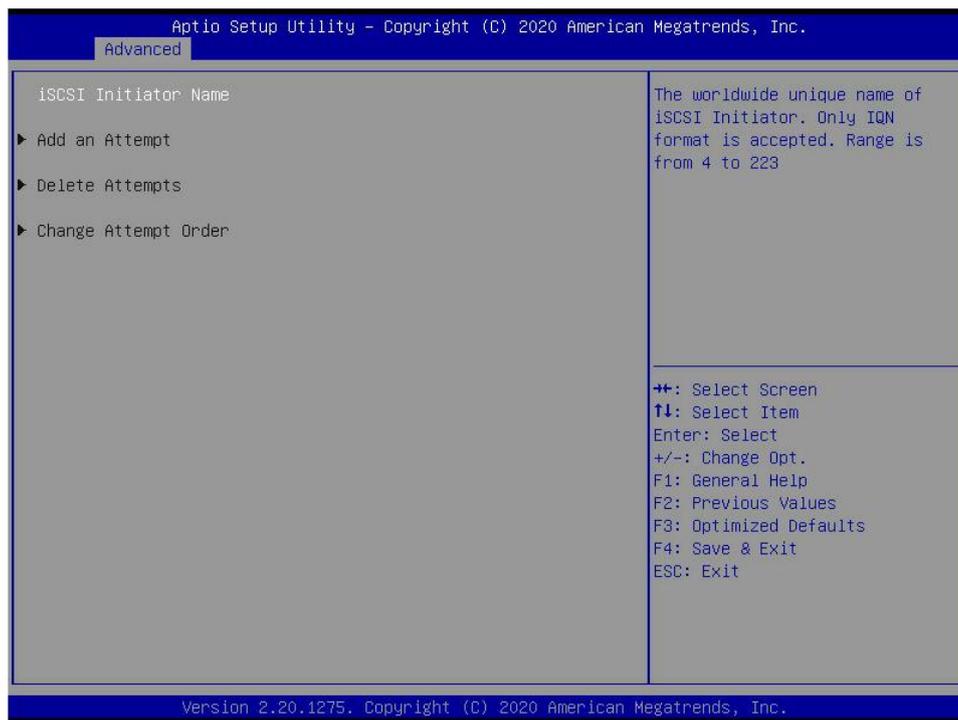


Fig. 4. 14

## 4.2.15 Platform Configuration menu

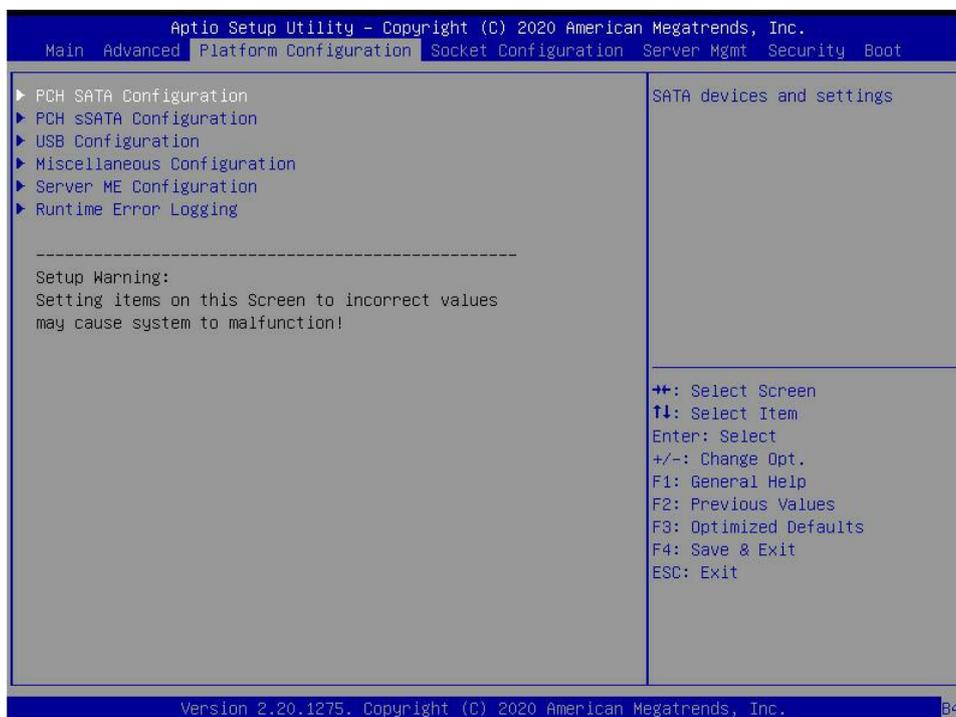


Fig. 4. 15

- PCH SATA Configuration
- PCH sSATA Configuration

- USB Configuration
- Miscellaneous Configuration
- Server ME Configuration
- Runtime Error Logging

#### 4.2.16 PCH SATA Configuration

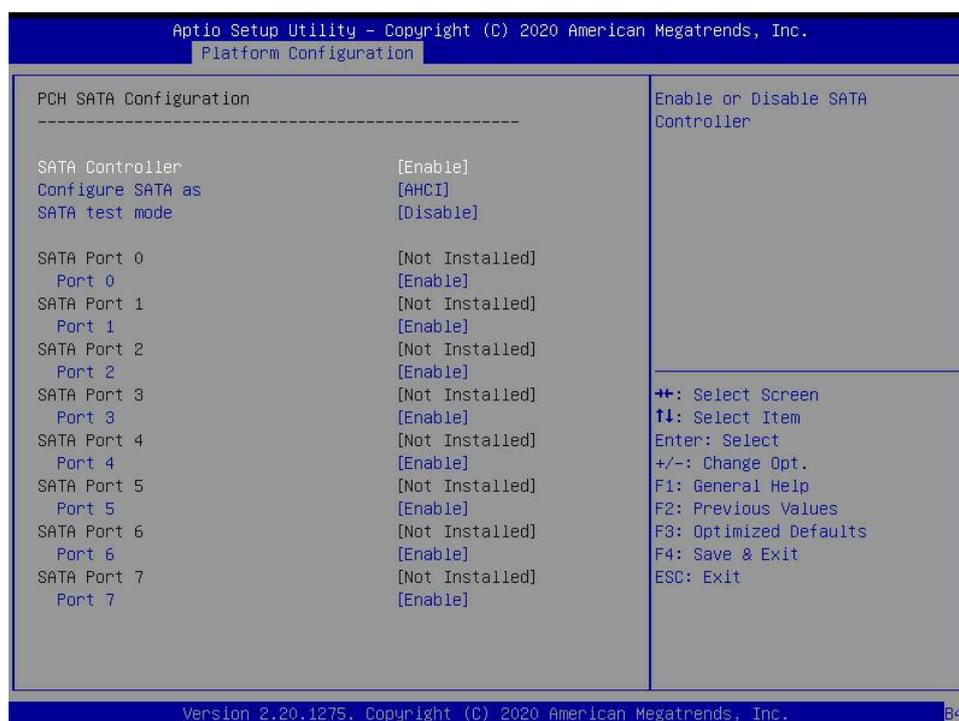


Fig. 4. 16

##### SATA Controller

SATA Controller Switch controls the opening and closing of SATA controller. The menu options are:

- Disable SATA Controller
- Enabled SATA Controller

Default: Enable

##### Configure SATA as

SATA Mode selection, menu options are:

- AHCI: select SATA mode as AHCI mode
- RAID: select SATA mode as RAID mode.

Default: AHCI

##### SATA test mode

SATA Test mode switch, menu options are:

- Disable
- Enable

Default: Disable

##### SATA Port X

Display SATA Port 0~7 device information. When the device is not connected, it is displayed as Not Installed.

**Port X**

Control turning off/on SATA Port X, menu options are:

- Disable SATA Port X.
- Enabled SATA Port X.

Default: Enable

**Hot Plug**

Control turning off/on the hot plug function of SATA port x device. The menu options are:

- Disable SATA Port X hot plug function
- Enabled SATA Port X hot plug function

Default: Enable

### 4.2.17 PCH sSATA Configuration

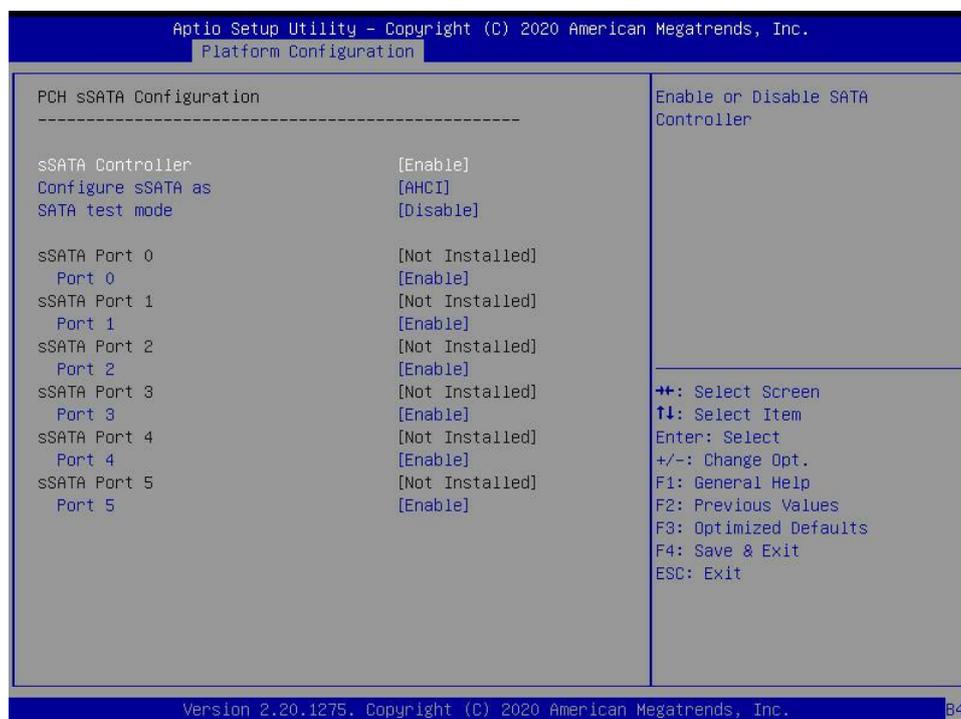


Fig. 4. 17

**sSATA Controller**

sSATA Controller switch to control turning on/off sSATA controller, menu options are:

- Disable sSATA Controller
- Enabled sSATA Controller

Default: Enable

**Configure sSATA as**

sSATA Mode selection, menu options are:

- AHCI: select sSATA mode as AHCI mode
- RAID: select sSATA mode as RAID mode

Default: AHCI

SATA test mode

SATA Test mode switch, menu options are:

- Disable
- Enable

Default: Disable

sSATA Port X

Display sSATA Port 0~7 device information. When the device is not connected, it is displayed as Not Installed.

Port X

Control sSATA Port X turning on/off, menu options are:

- Disable sSATA Port X
- Enabled sSATA Port X

Default: Enable

### 4.2.18 USB Configuration

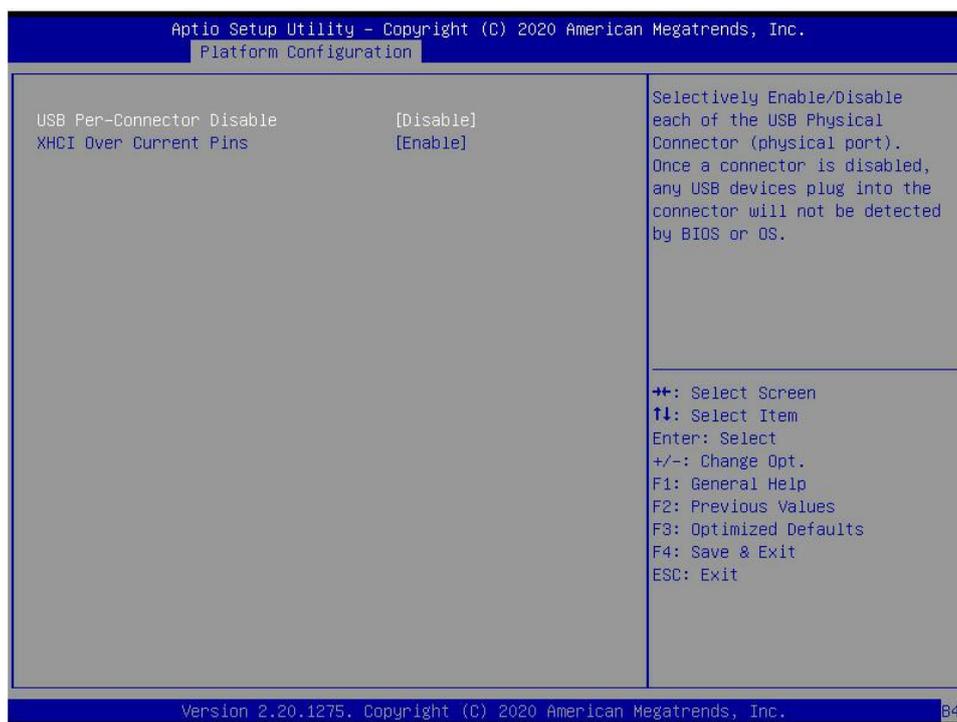


Fig. 4. 18

USB Per-Connector Disable

For each USB connector switch, the menu options are:

- Enable
- Disable

Default: Disable

XHCI Over Current Pins

The menu options are:

- Enable
- Disable

Default: Enable

## 4.2.19 Miscellaneous Configuration

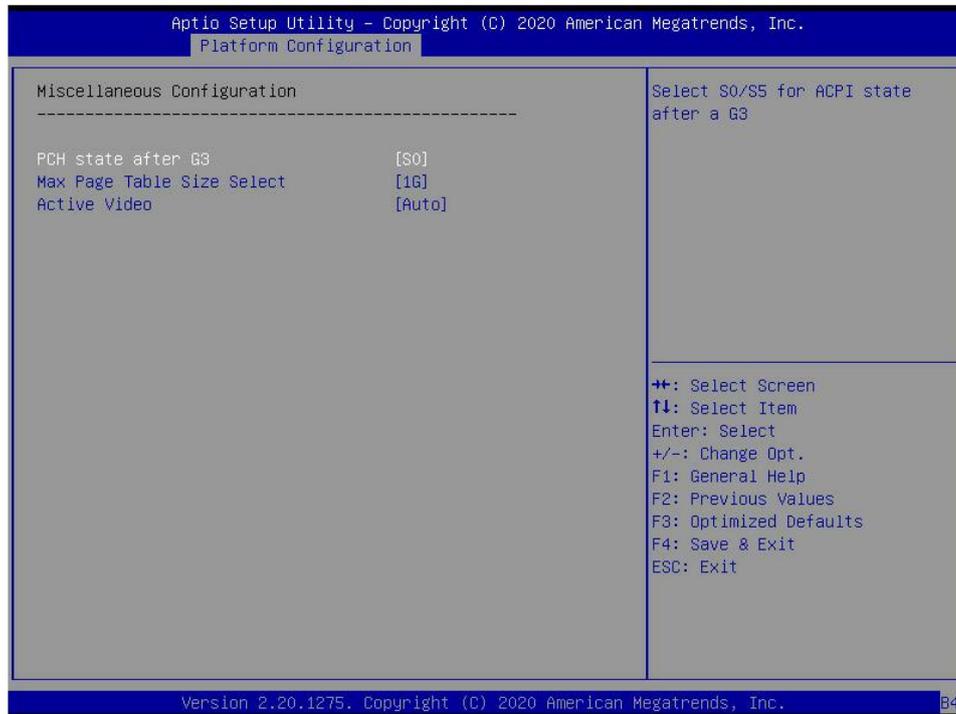


Fig. 4. 19

### PCH state after G3

PCH state after G3 Status setting, menu options are:

- S0: power on directly
- S5: press the power button to power on
- leave power state unchanged: keep the power state unchanged

Default: S0

### Max Page Table Size Select

The menu options are:

- 2M
- 1G

Default: 1G

### Active Video

Select the active display device type, and the menu options are:

- Auto
- Onboard Device
- PCIE Device

Default: Auto

## 4.2.20 Server ME Configuration

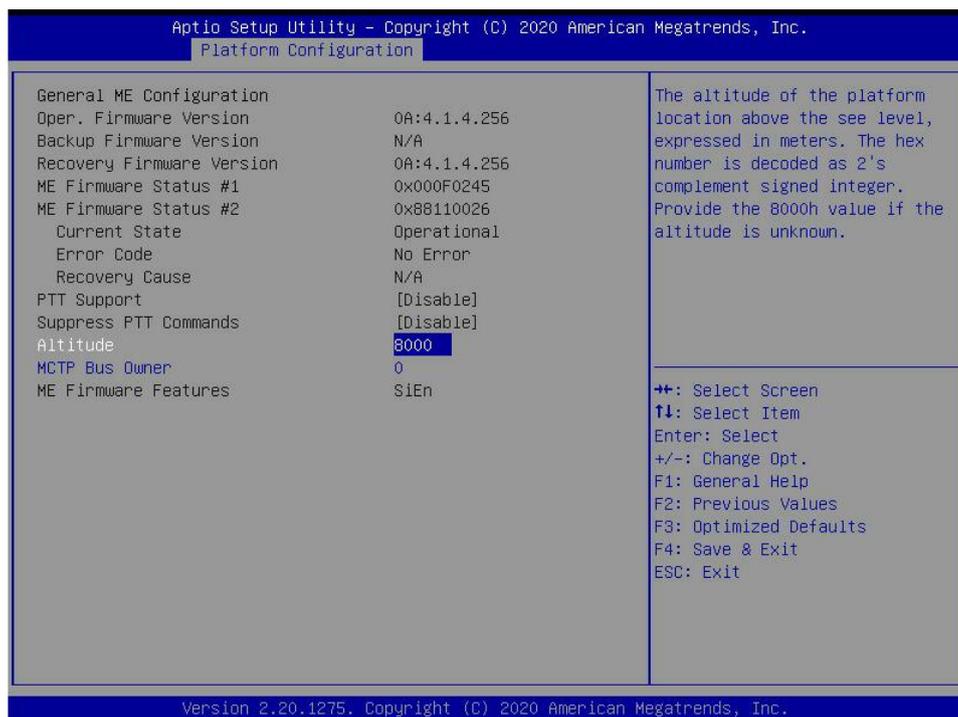


Fig. 4. 20

Display Server ME version, features, status and other information

## 4.2.21 Runtime Error Logging

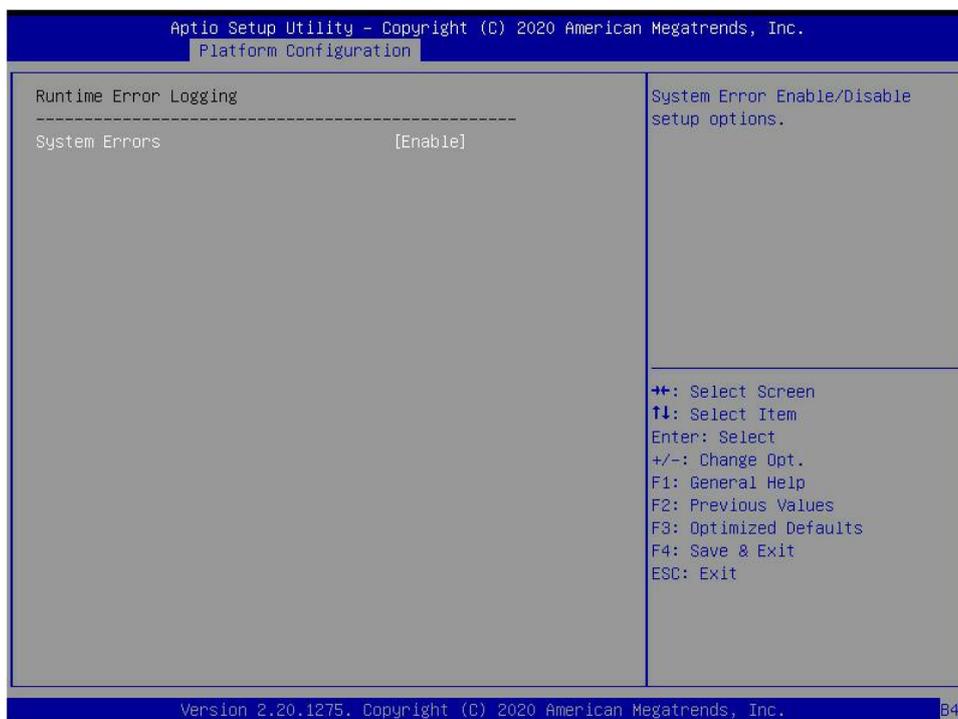


Fig. 4. 21

### System Errors

Turn on/off the system error function. The menu options are:

- Disable

- Enable
- Default: Enable

#### 4.2.22 Socket Configuration menu

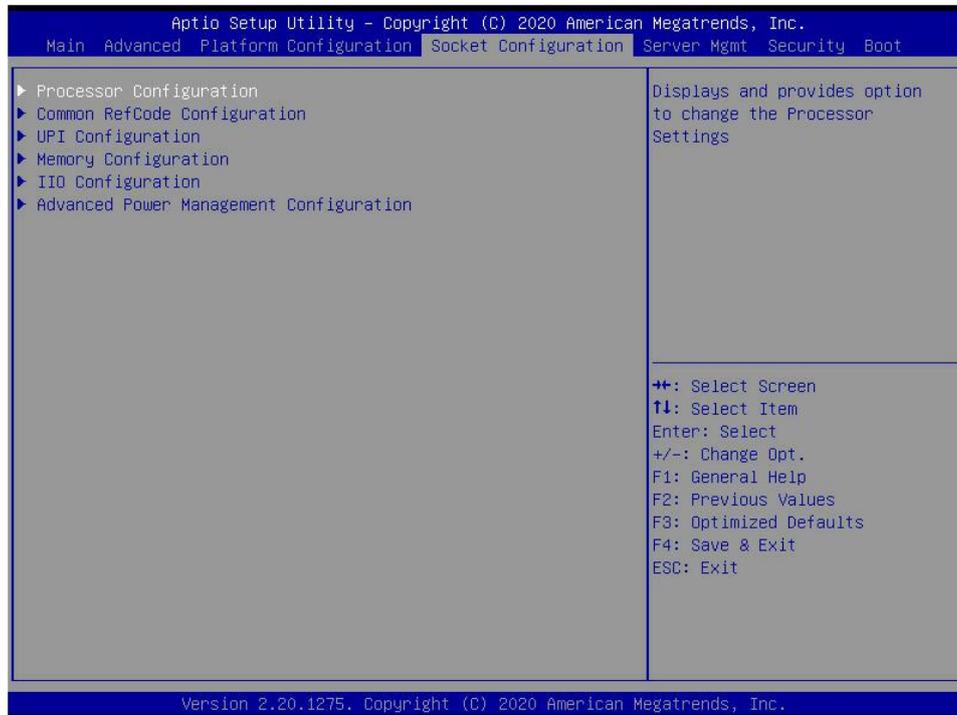


Fig. 4. 22

- Processor Configuration
- Common RefCode Configuration
- UPI Configuration
- Memory Configuration
- IIO Configuration
- Advanced Power Management Configuration

## 4.2.23 Processor Configuration

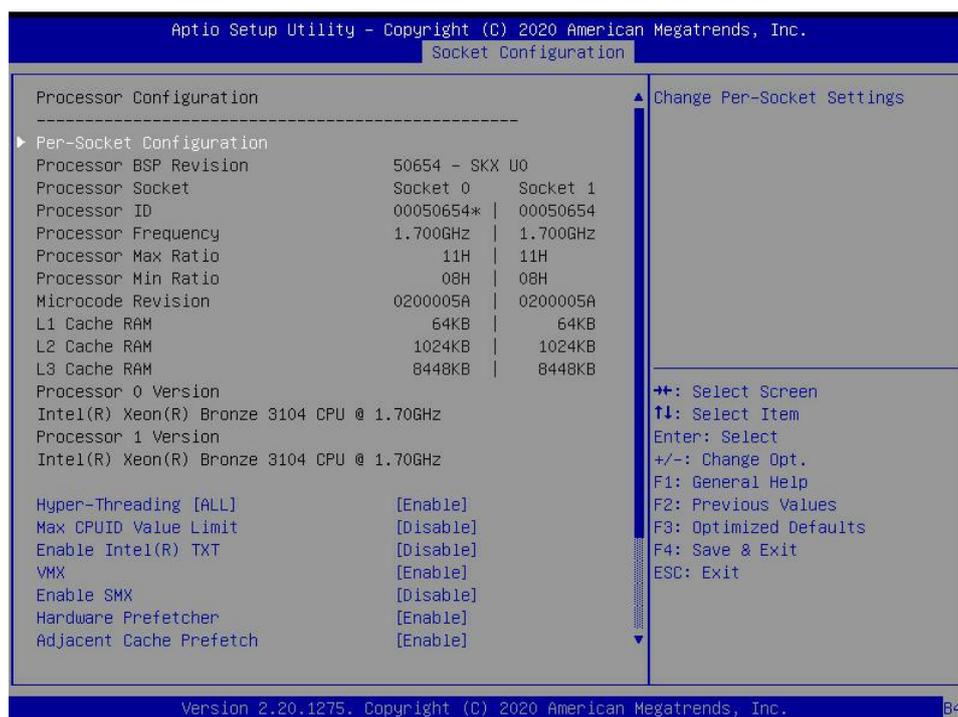


Fig. 4. 23

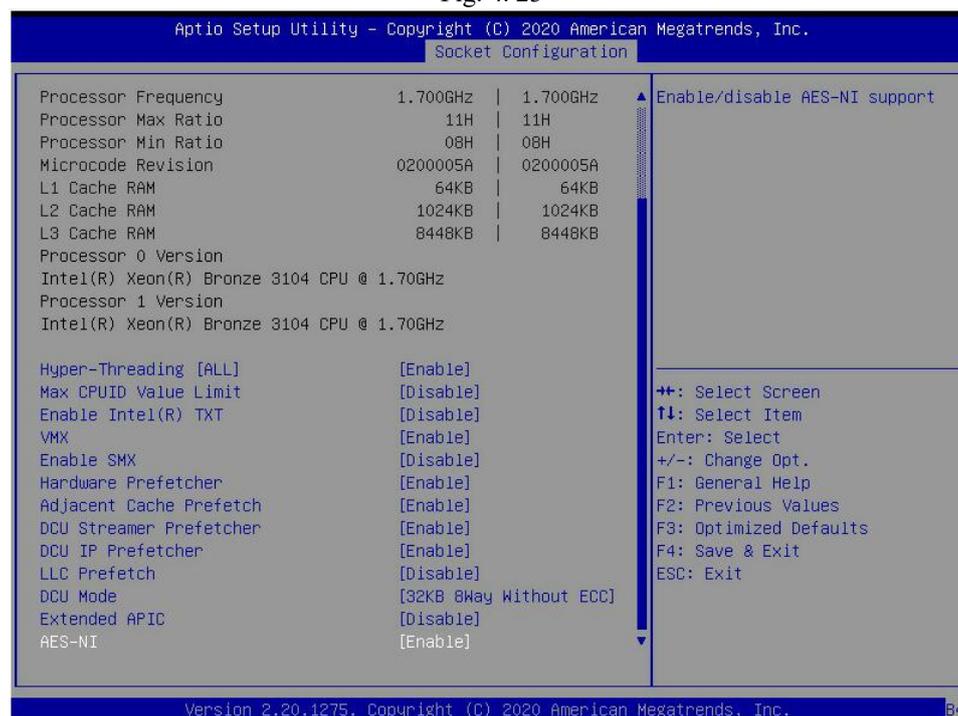


Fig. 4. 24

Display information of CPU Type\ID\Speed\Cache, etc, configuring CPU functions.

### ●Pre-Socket Configuration

#### Hyper-Threading

Hyper-Threading control switch, which enables or disables the hyper-threading function of Intel CPU. When enabling this function, each physical processor core is equivalent to 2 logical processor cores; When this function is Disable, each physical processor core is equivalent to only 1 logical processor core. Enabling this function will bring higher processor core count and improve the overall performance

of the application. The menu options are:

- Enable
- Disable

Default: Enable

#### Max CPUID Value Limit

When starting a traditional operating system that cannot support extended CPUID, the menu options are:

- Enable
- Disable

Default: Disable

#### Enable Intel(R) TXT

Intel TXT function switch, menu options are:

- Enable
- Disable

Default: Disable

#### VMX

CPU Virtualization technology switch. If this option is enabled, the virtualization layer or OS supporting this option can use the hardware capabilities of Intel virtualization technology. Some virtualization layers require Intel virtualization technology to be enabled. If you do not use a virtualization layer or OS that supports this option, you can keep it enabled. The menu options are:

- Enable
- Disable

Default: Enable

#### Enable SMX

Extended safety mode function switch, menu options are:

- Enable
- Disable

Default: Disable

#### Hardware Prefetcher

It means before the CPU processes instructions or data, it prefetches these instructions or data from memory to L2 cache, so as to reduce the time of memory reading and help eliminate potential bottlenecks, and improve system performance. The menu options are:

- Enable
- Disable

Default: Enable

#### Adjacent Cache Prefetch

After the Adjacent Cache Prefetch function is enabled, when reading data, the computer will intelligently think that the data next to or adjacent to the data to be read is also needed, so these adjacent data will be read out in advance during processing, which can accelerate the reading speed. When the application scenario is sequential memory access, enabling this function will improve performance. When the application scenario is random access memory, it is recommended to disable this option. The menu options are:

- Enable
- Disable

Default: Enable

#### DCU Streamer Prefetcher

Menu options are:

- Enable
- Disable

Default: Enable

DCU IP Prefetcher

Menu options are:

- Enable
- Disable

Default: Enable

LLC Prefetcher

Menu options are:

- Enable
- Disable

Default: Disable

DCU Mode

Menu options are:

- 32KB 8Way Without ECC: 32KB 8 way without ECC
- 16KB 4Way With ECC: 16KB 4way with ECC

Default: 32KB 8Way Without ECC

Extended APIC

Turn on / off extended APIC support. The menu options are:

- Enable
- Disable

Default: Disable

AES-NI

Turn on and off AES (Advanced Encryption Standard). The menu options are:

- Enable
- Disable

Default: Enable

## 4.2.24 Common RefCode Configuration

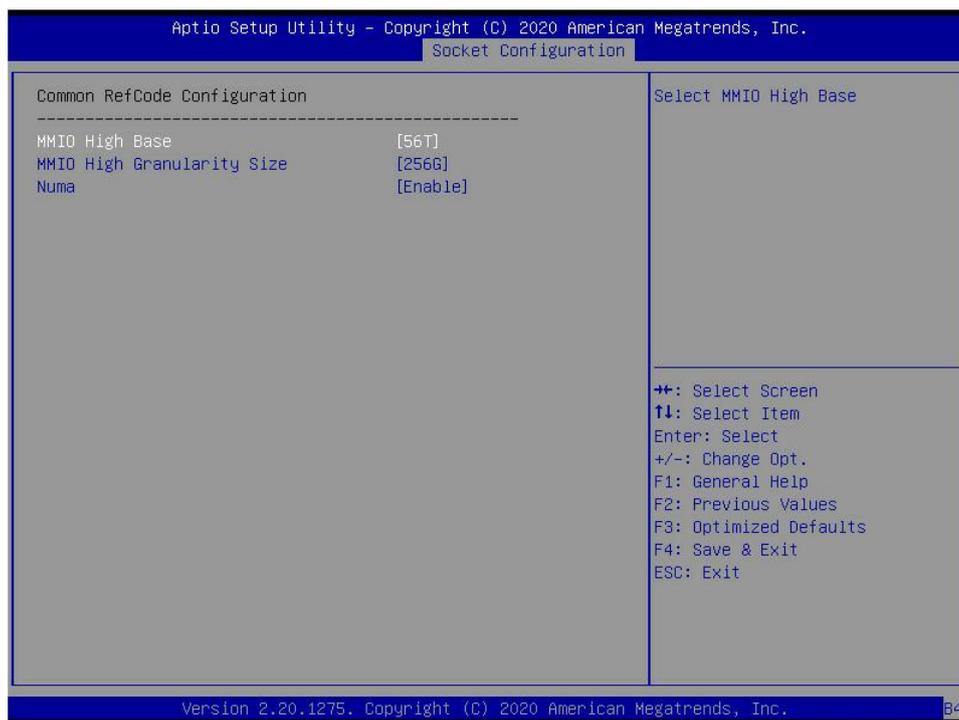


Fig. 4. 25

### MMIO High Base

Select MMIO High Base. The menu options are:

- 56T
- 40T
- 24T
- 16T
- 4T
- 1T

Default: 56T

### MMIO High Granularity Size

Select MMIO High Granularity Size. The menu options are:

- 1G
- 4G
- 16G
- 64G
- 256G
- 1024G

Default: 256G

### Numa

To turn on/off inconsistent memory access, the menu options are:

- Enable
- Disable

Default: Enable

## 4.2.25 UPI Configuration

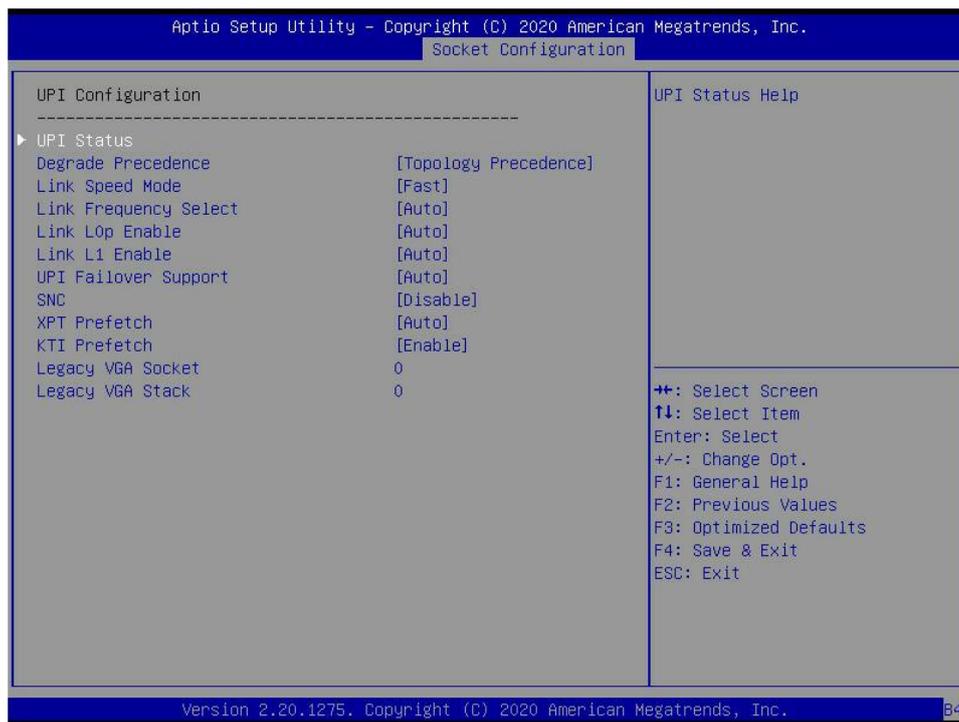


Fig. 4. 26

- UPI Status: UPI link status submenu, which displays the current UPI link status

### Degraded Precedence

When the system settings conflict, set Topology Precedence to down feature, or by setting Feature Precedence to down Topology, the menu options are:

- Topology Precedence
- Feature Precedence

Default: Topology Precedence

### Link Speed Mode

The menu options are:

- Slow: slow speed
- Fast: fast speed

Default: Fast

### Link L0p Enable

The menu options are:

- Disable
- Enable
- Auto

Default: Auto

### Link L1 Enable

The menu options are:

- Disable
- Enable
- Auto

Default: Auto

### UPI Failover Support

The menu options are:

- Disable
- Enable
- Auto

Default: Auto

SNC

Sub NUMA cluster settings, menu options are:

- Disable
- Enable
- Auto

Default: Disable

XPT Prefetch

XPT Prefetch, menu options are:

- Disable
- Enable
- Auto

Default: Auto

KTI Prefetch

KTI Prefetch, menu options are:

- Disable
- Enable
- Auto

Default: Enable

- Legacy VGA Socket: legacy VGA amount setting, valid values range from 0 to 1.
- Legacy VGA Stack: legacy VGA stack amount setting, valid values range from 0~6.

## 4.2.26 Memory Configuration

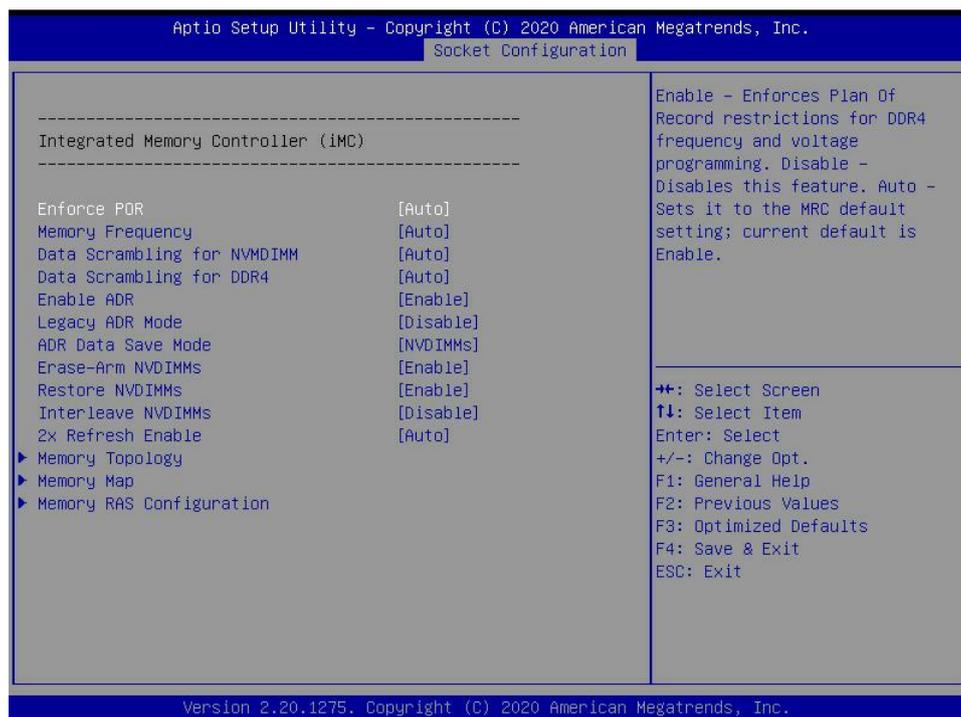


Fig. 4. 27

### Enforce POR

To enforce POR settings, the menu options are:

- Auto
- POR: enforce POR
- Disable

Default: Auto

### Memory Frequency

The menu options are:

- Auto
- 800
- 1000
- 1066
- 1200
- 1333
- 1400
- 1600

.....

Default: Auto

### Data Scrambling for NVDIMM

The menu options are:

- Auto
- Disable
- Enable

Default: Auto

### Data Scrambling for DDR4

The menu options are:

- Auto

- Disable
  - Enable
- Default: Auto

## Enable ADR

The menu options are:

- Disable
- Enable

Default: Enable

## Legacy ADR Mode

The menu options are:

- Disable
- Enable

Default: Enable

## ADR Data Save Mode

The menu options are:

- Disable
- Batterybacked DIMMs
- NVDIMMs

Default: NVDIMMs

## Erase-ARM NVDIMMs

The menu options are:

- Disable
- Enable

Default: Enable

## Restore NVDIMMs

The menu options are:

- Disable
- Enable
- Auto

Default: Auto

## Interleave NVDIMMs

The menu options are:

- Disable
- Enable

Default: Disable

## 2x Refresh Enable

The menu options are:

- Disable
- Enable

Default: Disable

## Memory Topology:

Memory topology submenu, displaying in-place memory details;

## Memory Map:

Memory Map submenu;

Memory RAS Configuration:  
 Memory RAS Configuration submenu.

#### 4.2.27 Memory Topology

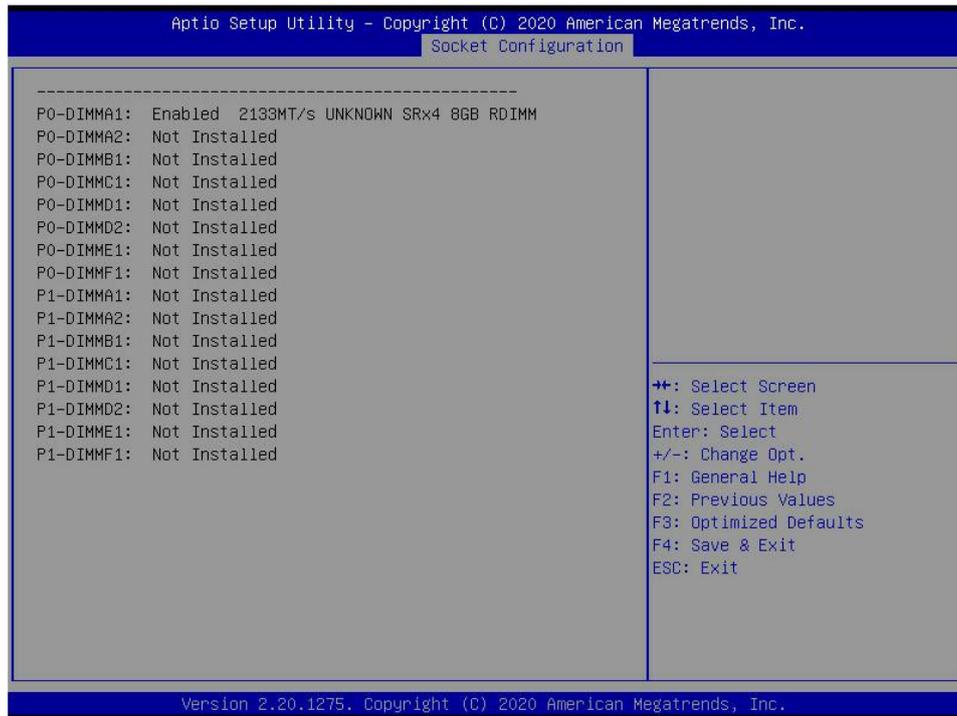


Fig. 4. 28

Displays the current in-place memory details

## 4.2.28 Memory Map

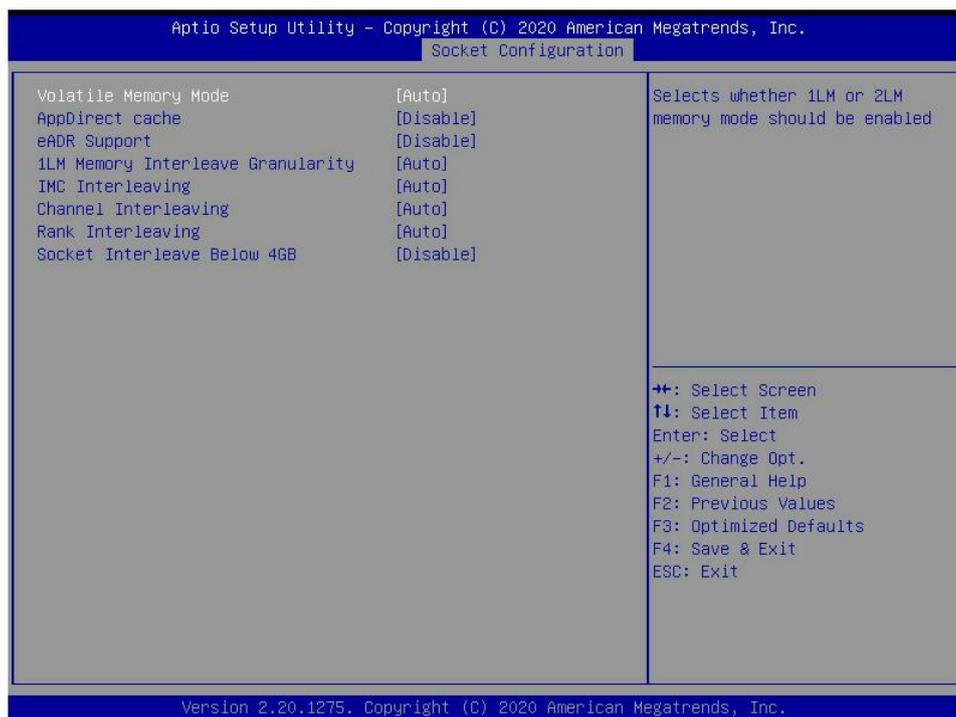


Fig. 4. 29

### Volatile Memory Mode

Volatile memory mode setting, menu options are:

- 1LM
- 2LM
- Auto

Default: Auto

### 1LM Memory Interleave Granularity

The menu options are:

- Auto
- 256B Target, 256B Channel
- 64B Target, 64B Channel

Default: Auto

### IMC Interleaving

The menu options are:

- Auto
- 1-way Interleavel
- 2-way Interleavel

Default: Auto

### Channel Interleaving

The menu options are:

- Auto
- 1-way Interleavel
- 2-way Interleavel
- 3-way Interleavel

Default: Auto

### Rank Interleaving

The menu options are:

- Auto
- 1-way Interleavel
- 2-way Interleavel
- 4-way Interleavel
- 8-way Interleavel

Default: Auto

Socket Interleave Below 4GB

The menu options are:

- Enable
- Disable

Default: Disable

## 4.2.29 Memory RAS Configuration



Fig. 4. 30

Static Virtual Lockstep Mode

The menu options are:

- Enable
- Disable

Default: Disable

Mirror Mode

The menu options are:

- Disable
- Enable Mirror Mode (1LM)

Default: Disable

UEFI ARM Mirror

The menu options are:

- Enable
- Disable

Default: Disable

## Memory Rank Sparing

The menu options are:

- Enable
- Disable

Default: Disable

Correctable Error Threshold: The valid values are 0x01-0x7fff, and the default value is 0x7FFF.

## SDDC

SDDC switch setting. **Note: not supported when AEP DIMM exists** The menu options are:

- Enable
- Disable

Default: Disable

## ADDDC Sparing

The menu options are:

- Enable
- Disable

Default: Disable

## Set NGN Die Sparing

The menu options are:

- Enable
- Disable

Default: Enable

## Patrol Scrub

The menu options are:

- Enable
- Disable

Default: Enable

Patrol Scrub Interval : Patrol Scrub Interval setting, unit: hour, range: 1-24, default value: 24.

## Patrol Scrub Address Mode

The menu options are:

- Reverse address
- System Physical Address

Default: System Physical Address

## 4.2.30 IIO Configuration

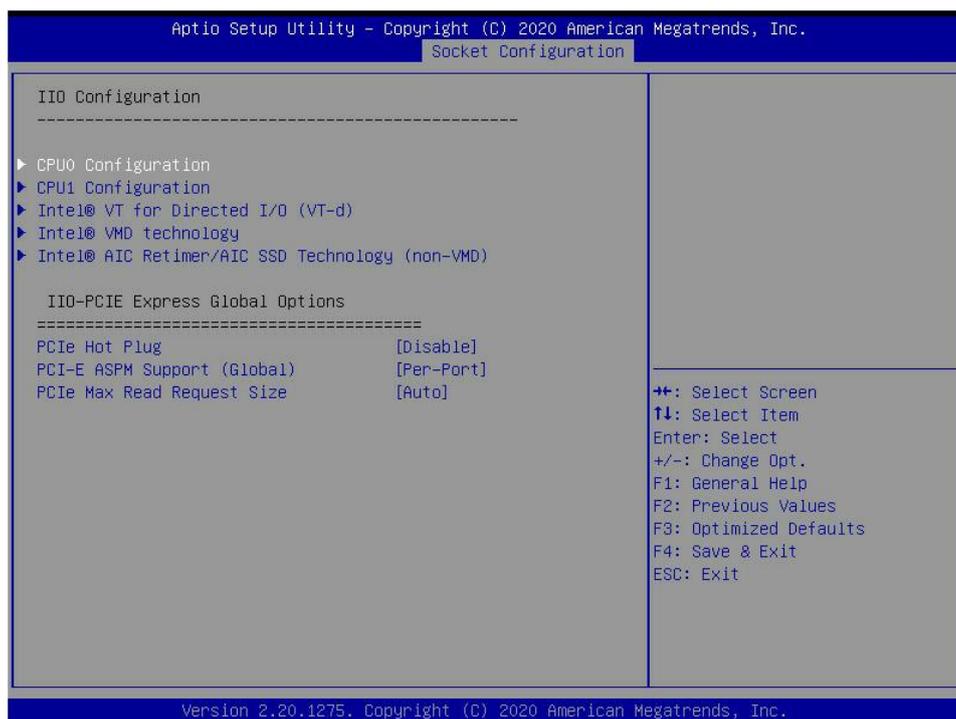


Fig. 4. 31

### SocketN Configuration

Use to set the Link speed, Max Payload Size, ASPM and other settings on the PCIe of CPU0, and display the link status, maximum link, current link rate, etc. of the current PCIe port.

### Intel(R) VT for Directed I/O(VT-d)

Intel VT-d Technology related setting submenu, Intel vt-d technology switch setting;

### Intel(R) VMD Technology

Intel VMD Technology related setting submenu, switch setting of VMD on each PStack of each CPU;

### Intel(R) AIC Retimer/AIC SSD Technology(non-VMD)

Intel AIC Retimer/AIC SSD Technology related setting submenu, the switch setting of AIC Retimer / AIC SSD technology on each PStack of each CPU.

### PCIe Hot Plug

The menu options are:

- Enable
- Disable

Default: Disable

### PCI-E ASPM Support(Global)

PCI-E ASPM Global switch setting, the menu options are:

- Disable
- Per-Port
- L1 Only

Default: Per-Port

### PCI-E Max Read Request Size

The menu options are:

- Auto
  - 128B
  - 256B
  - 512B
  - 1024B
  - 2048B
  - 4096B
- Default: Auto

### 4.2.31 Advanced Power Management Configuration

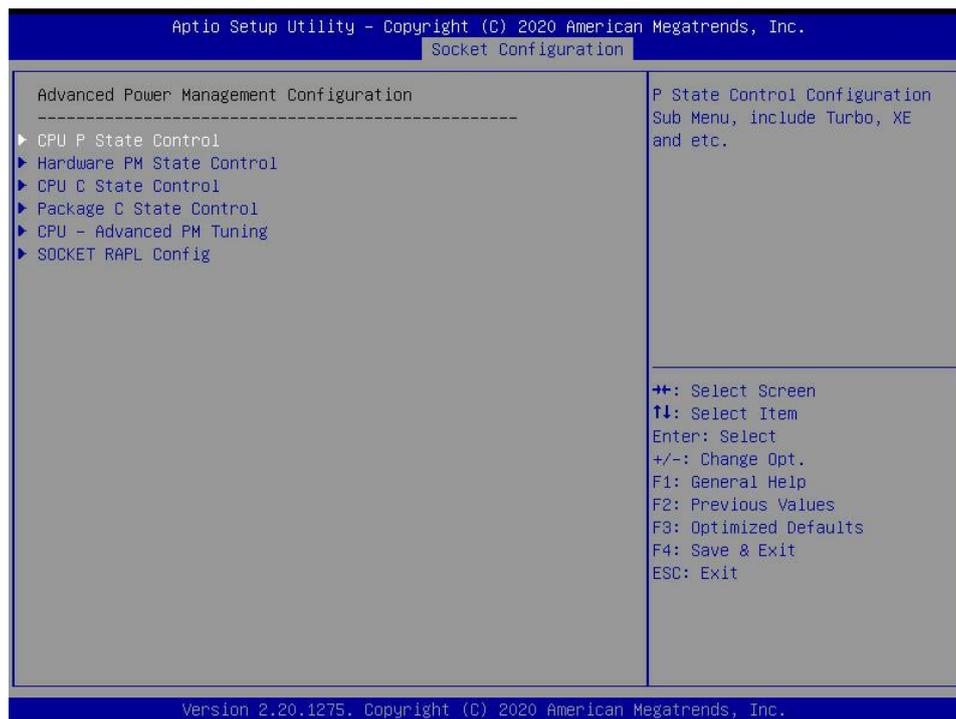


Fig. 4.32

CPU P State Control

Hardware PM State Control

CPU C State Control

Package C State Control

CPU-Advanced PM Tuning

Socket RAPL Configuration

## 4.2.32 CPU P State Control

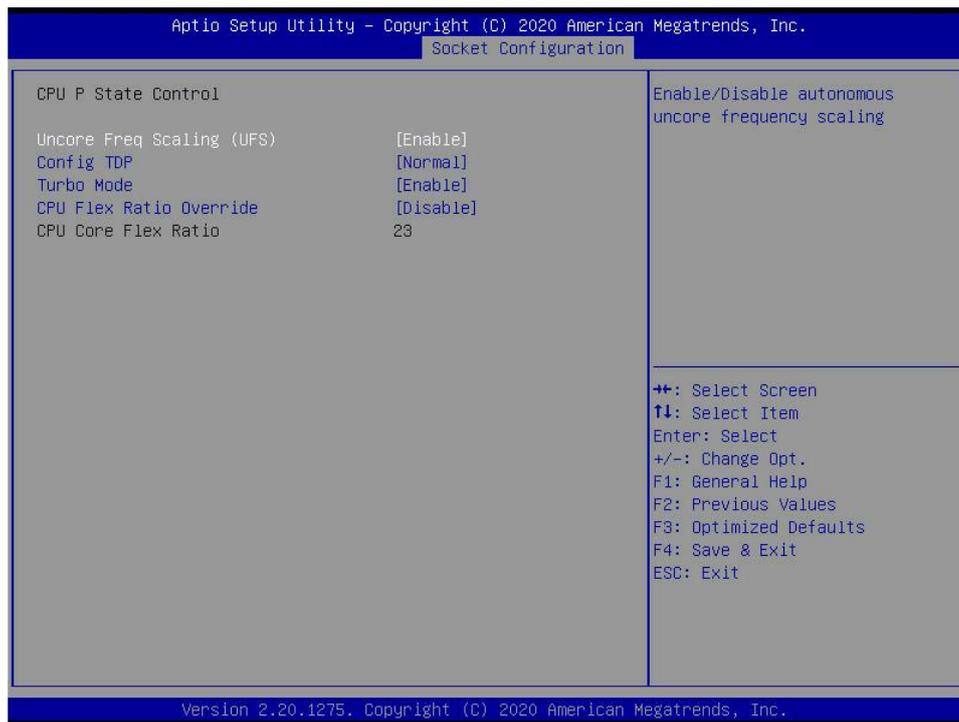


Fig. 4. 33

### Uncore Freq Scaling(UFS)

The menu options are:

- Enable
- Disable

Default: Enable

### Config TDP

The menu options are:

- Normal
- Level 1
- Level 2

Default: Normal

### Turbo Mode

The menu options are:

- Enable
- Disable

Default: Enable

## 4.2.33 Hardware PM State Control

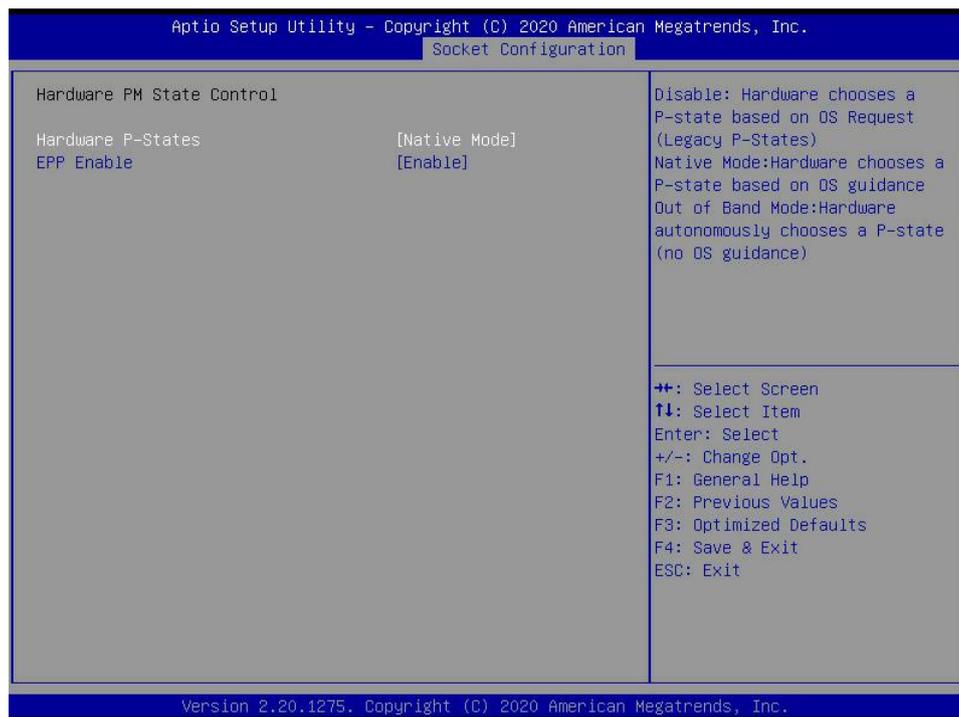


Fig. 4. 34

### Hardware P-State

Hardware selects whether the P-State is set actively by OS. The default value is determined on the actual test. The menu options are:

- Disable: Hardware selection P-States based on traditional OS requests
- Native Mode: Hardware selection P-State based on traditional OS guide
- Out of Band Mode: automatic hardware selection, no OS boot required
- Native Mode with No Legacy Support

Default: Native Mode

### EPP Enable

The menu options are:

- Enable
- Disable

Default: Enable

## 4.2.34 CPU C State Control

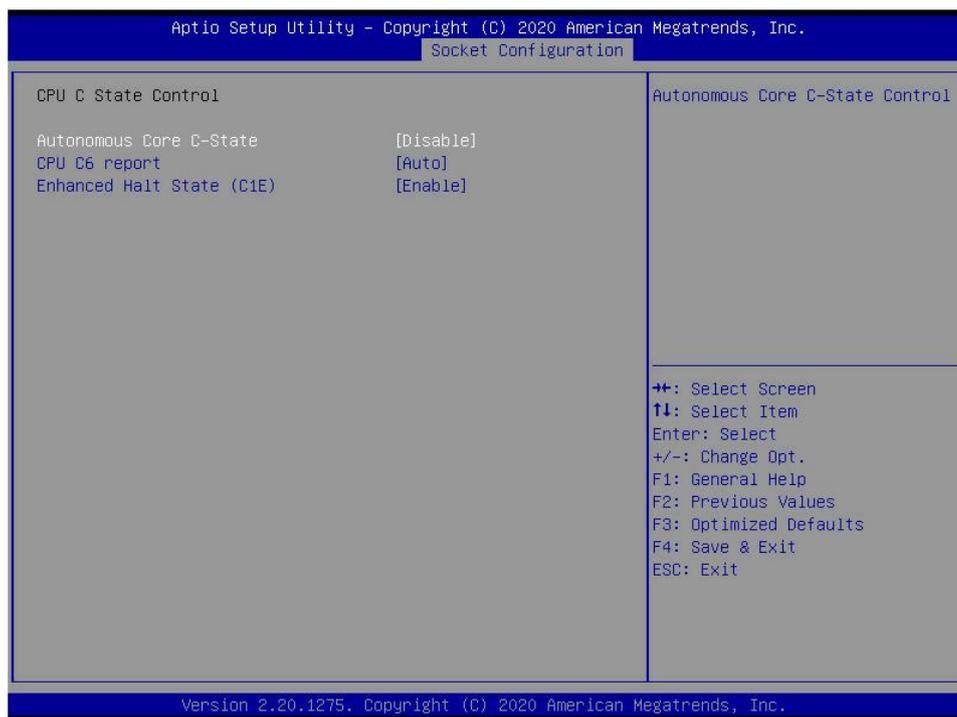


Fig. 4. 35

### Autonomous Core C-State

The menu options are:

- Enable
- Disable

Default: Disable

### CPU C6 report

Report the C6 status switch settings to the OS, and the menu options are:

- Disable
- Enable
- Auto

Default: Auto

### Enhanced Halt State(C1E)

The menu options are:

- Disable
- Enable

Default: Enable

## 4.2.35 Package C State Control

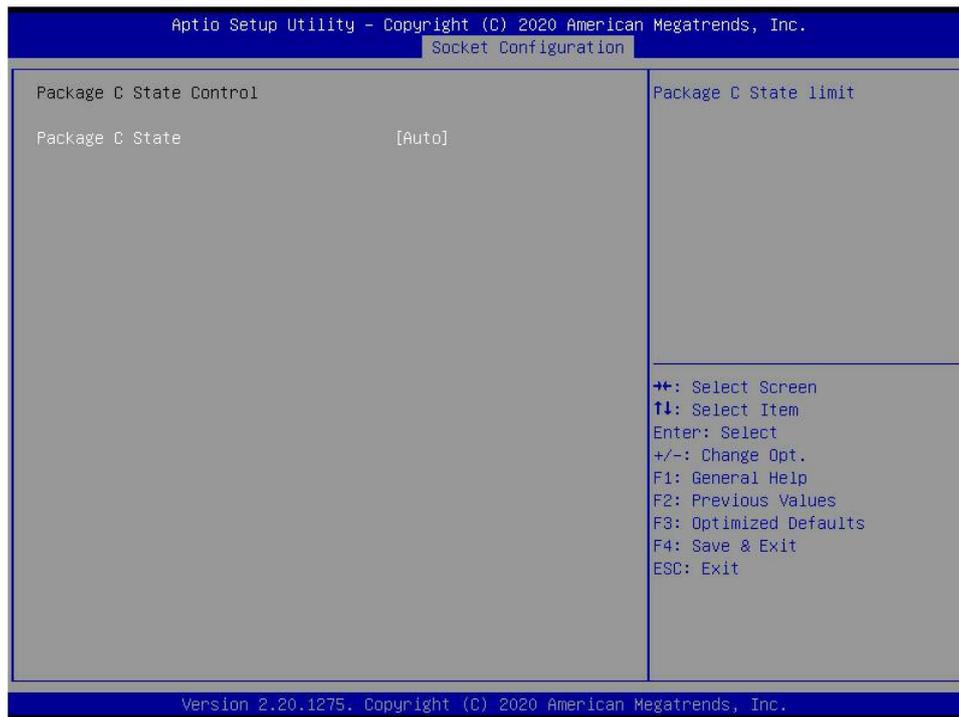


Fig. 4. 36

**Package C State**

The menu options are:

- C0/C1 state
- C2 state
- C6(non Retention) state
- C6(Retention) state
- No Limit

Default: Auto

## 4.2.36 CPU-Advanced PM Tuning

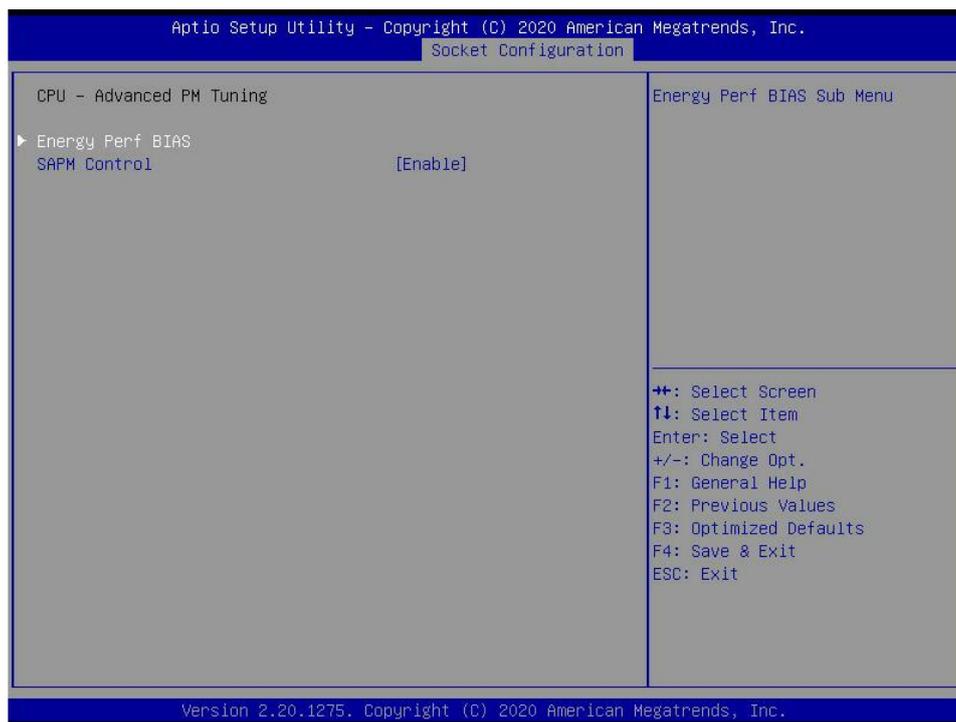


Fig. 4. 37

Energy Perf BIAS:  
CPU power-saving performance related option settings

## 4.2.37 Energy Perf BIAS

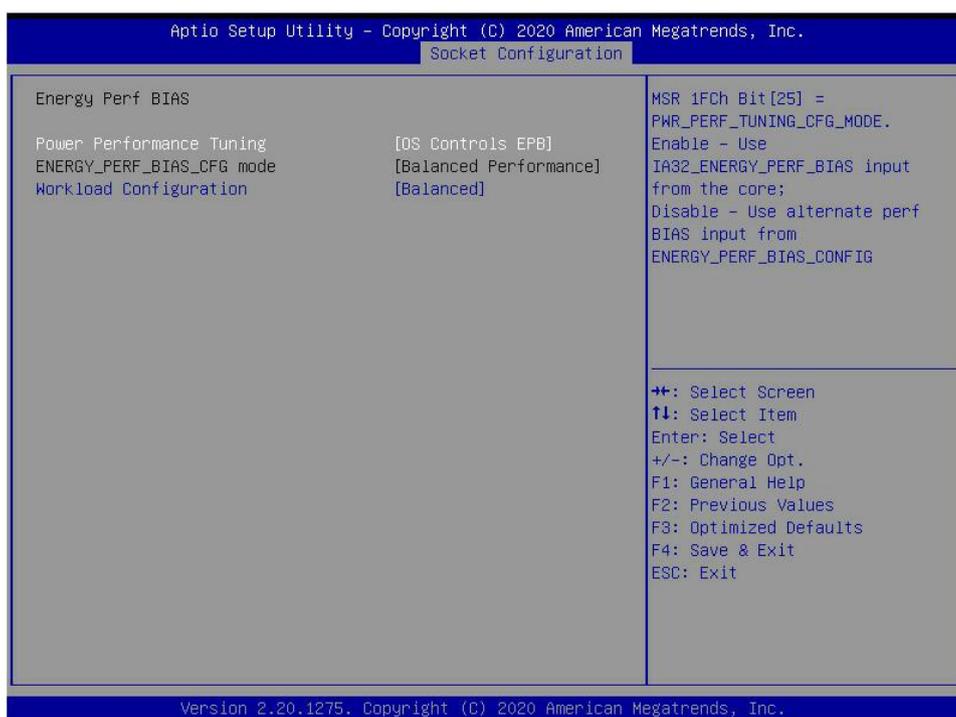


Fig. 4. 38

### Power Performance Tuning

Power-saving performance adjustment settings, menu options are:

- OS Controls EPB: OS controls power-saving performance adjustment
- BIOS Controls EPB: BIOS controls power-saving performance adjustment

Default: OS Controls EPB

### ENERGY\_PERF\_BIAS\_CFG Mode

Power-saving performance management settings. When power performance tuning is set to BIOS Control EPB, this item can be set. The menu options are:

- Performance
- Balanced Performance
- Balanced Power
- Power

Default: Balanced Performance

### Workload Configuration

For the optimization settings of workload characteristics, the menu options are:

- Balanced
- I/O Sensitive

Default: Balanced

## 4.2.38 Server Mgmt menu

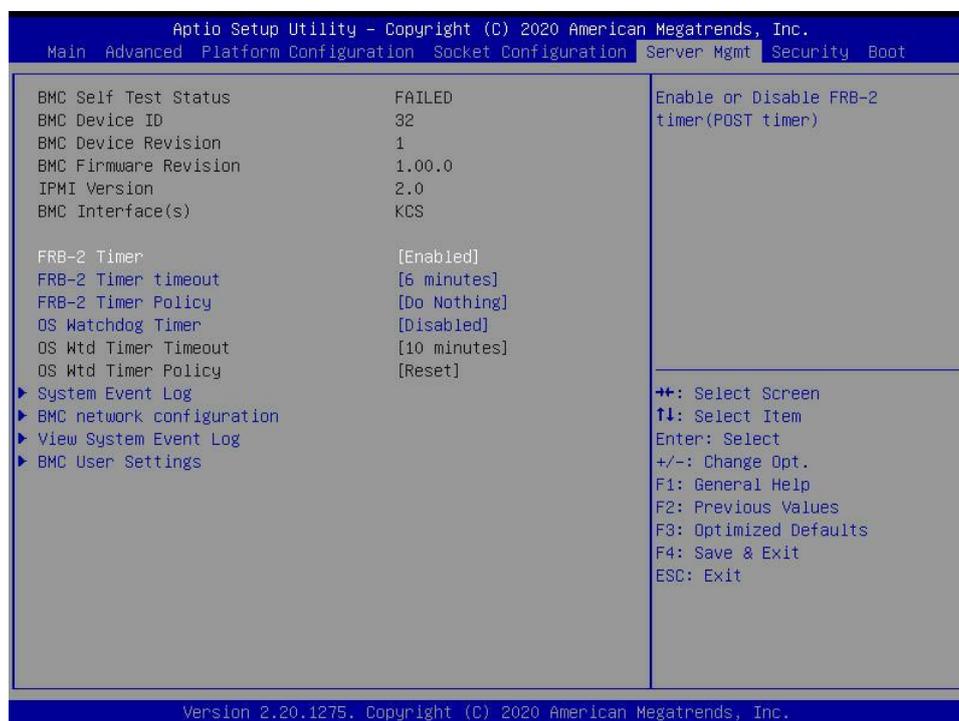


Fig. 4. 39

Display BMC self-test status, device ID, device version, BMC software version & IPMI specification version.

### FRB-2 Timer

FRB-2 timer switch setting, menu options are:

- Enabled

- Disable

Default: Enable

FRB-2 Timer timeout

FRB-2 Timer timeout setting, menu options are:

- 3 minutes

- 4 minutes

- 5 minutes

- 6 minutes

Default: 6 minutes

FRB-2 Timer Policy

For the policy setting after FRB-2 timer timeout, the menu options are:

- Do Nothing

- Reset

- Power Down

- Power Cycle

Default: Do Nothing

OS Watchdog Timer

The menu options are:

- Enabled

- Disable

Default: Disable

OS Wtd Timer timeout

The menu options are:

- 5 minutes

- 10 minutes

- 15 minutes

- 20 minutes

Default: 10 minutes

OS Wtd Timer Policy

The menu options are:

- Do Nothing

- Reset

- Power Down

- Power Cycle

Default: Reset

- System Event Log menu

- BMC network configuration menu

- View System Event Log menu

- BMC User Settings menu

## 4.2.39 System Event Log menu

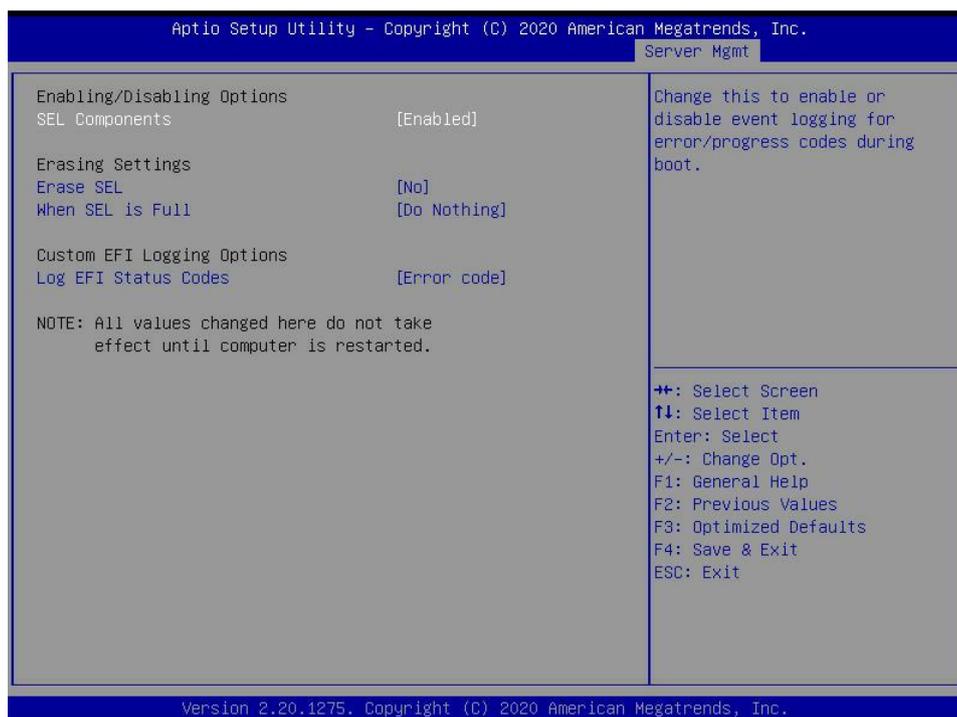


Fig. 4. 40

### SEL Components

Start the process system event recording function control switch, menu options:

- Enabled
- Disable

Default: Enable

### Erase SEL

Clear the system event recording control switch, menu options:

- No
- Yes, On next reset
- Yes, On every reset

Default: No

### When SEL is Full

When the storage space of system event record is full, operate the control switch, menu options:

- Do Nothing
- Erase Immediately

Default: Do Nothing

### Log EFI Status Codes

Record EFI Status Codes, menu options:

- Disable: do nothing
- Both: record Error code & Progress code
- Error code: record only Error code
- Progress code: record only Progress code

Default: Error code

### 4.2.40 BMC network configuration menu

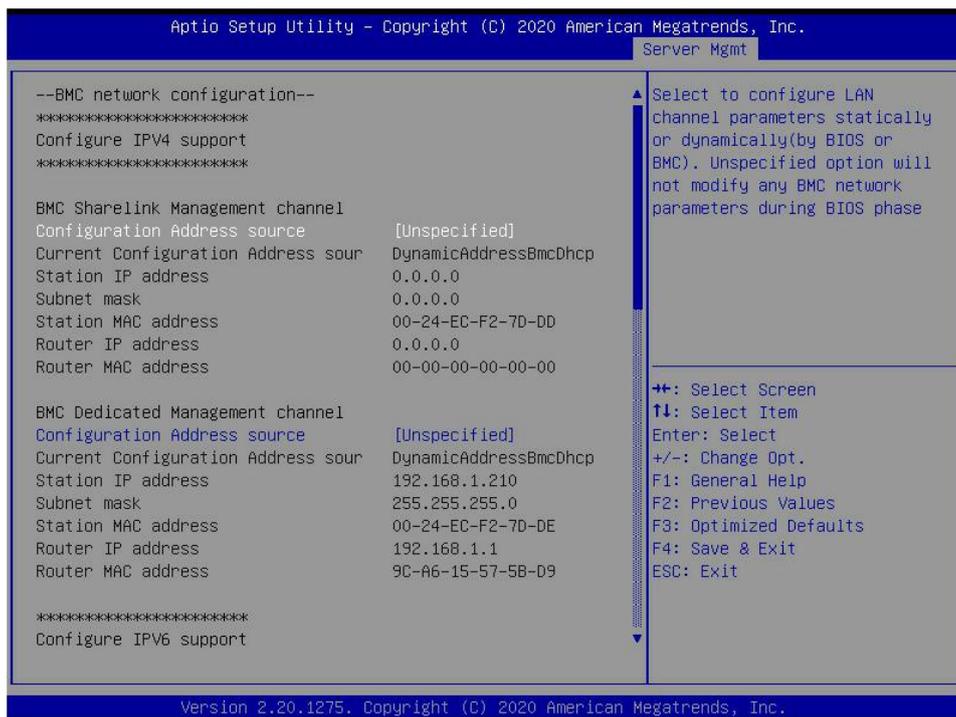


Fig. 4. 41

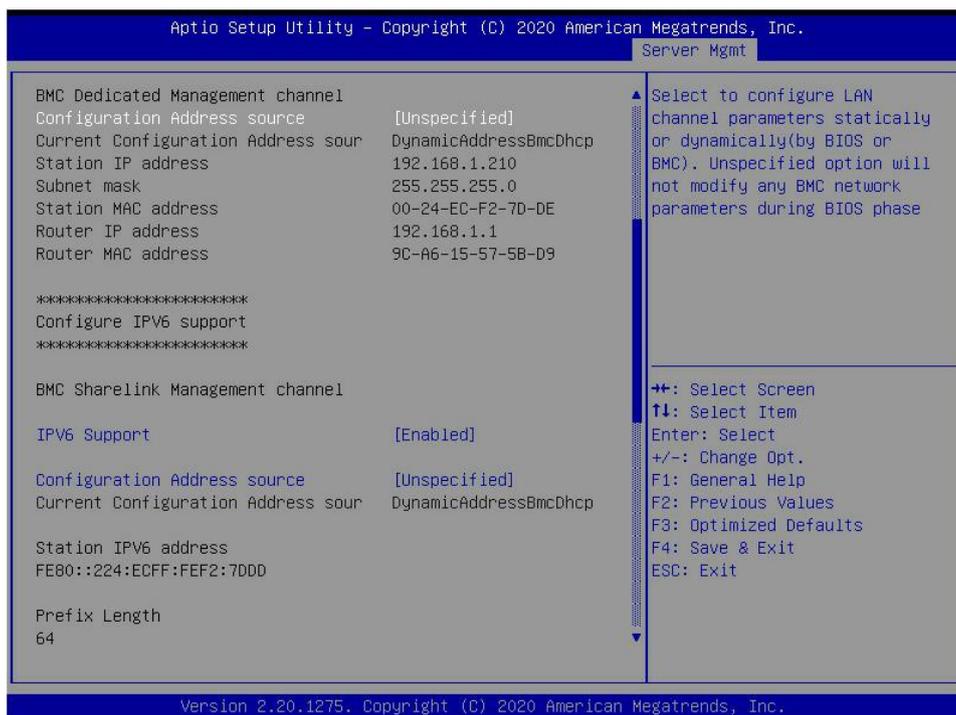


Fig. 4. 42

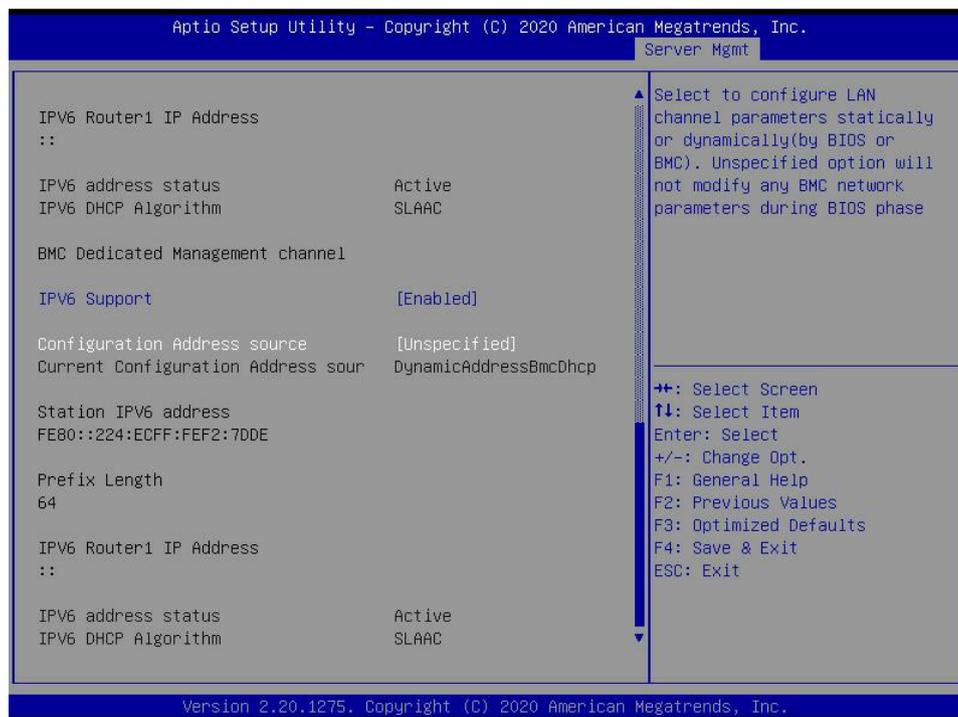


Fig. 4. 43

### Configure IPV4 support

#### BMC sharelink Management Channel

#### Configuration Address source

Configure BMC IP address allocation mode, and the menu options are:

- Unspecified: do not change BMC Parameters
- Static: BIOS static IP configuration
- DynamicBmcDhcp: BMC runs DHCP to dynamically allocate IP
- DynamicBmcNonDhcp: BMC runs Non-DHCP Protocol dynamic allocation IP

Default: Unspecified

 Change from Unspecified to other parameters. After saving and restarting, the option will restore the Unspecified value without configuring BMC IP every startup process.

When the Configuration Address source option is Unspecified, the LAN parameter information (IPV4) of the system's dedicated LAN port, current IP configuration mode, BMC IP, subnet mask, MAC address, routing IP and routing MAC will be displayed.

### BMC Dedicated Management Channel

#### Configuration Address source

Configure BMC IP address allocation mode, and the menu options are:

- Unspecified: do not change BMC parameters
- Static: BIOS static IP settings
- DynamicBmcDhcp: BMC runs DHCP to dynamically allocate IP
- DynamicBmcNonDhcp: BMC runs non DHCP protocol to dynamically allocate IP

Default: Unspecified

 Change from Unspecified to other parameters. After saving and restarting, the option will restore the Unspecified value without configuring BMC IP every startup process.

When the Configuration Address source option is Unspecified, the network parameter information (IPV4) of the system's private LAN port, current IP configuration mode, BMC IP, subnet mask, MAC address, routing IP and routing Mac will be displayed;

#### Configure IPV6 support

##### BMC Sharelink Management Channel

##### IPV6 Support

Select whether to support IPv6. The menu options are:

- Enabled: support IPV6
- Disable: not support IPV6

Default: Enable

 Change from Unspecified to other parameters. After saving and restarting, the option will restore the Unspecified value without configuring BMC IP every startup process.

When the Configuration Address source option is Unspecified, the network parameter information (IPV6) of the system shared LAN port will be displayed.

##### BMC Dedicated Management Channel

##### IPV6 Support

Select whether to support IPV6. The menu options are:

- Enabled: support IPV6
- Disable: not support IPV6

Default: Enable

 Change from the Unspecified to other parameters. After saving and restarting, the option will restore the Unspecified value without configuring BMC IP every startup process.

When the Configuration Address source option is Unspecified, the network parameter information (IPV6) of the system shared LAN port will be displayed.

### 4.2.41 View System Event Log menu

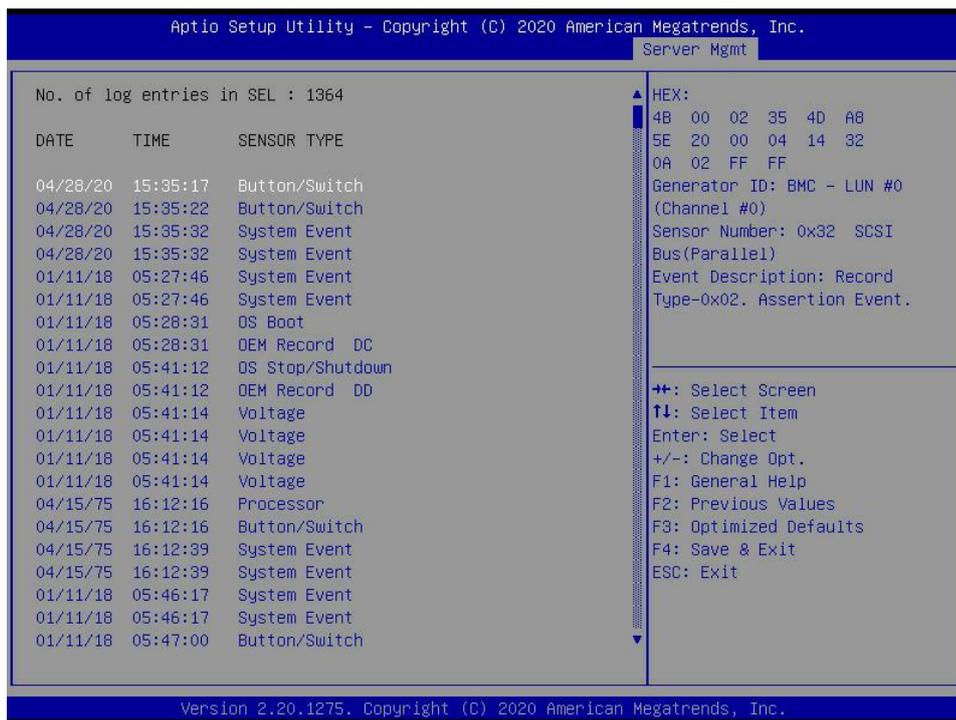


Fig. 4. 44

 View system event log information.

Note that when entering this menu, BIOS needs to read SEL data and wait for a period of time.

### 4.2.42 BMC User Setting



Fig. 4. 45

- Add User:  
Add user submenu
  
- Delete User:  
Delete user submenu
  
- Change User Setting:  
Change user setting submenu

#### 4.2.43 Add User

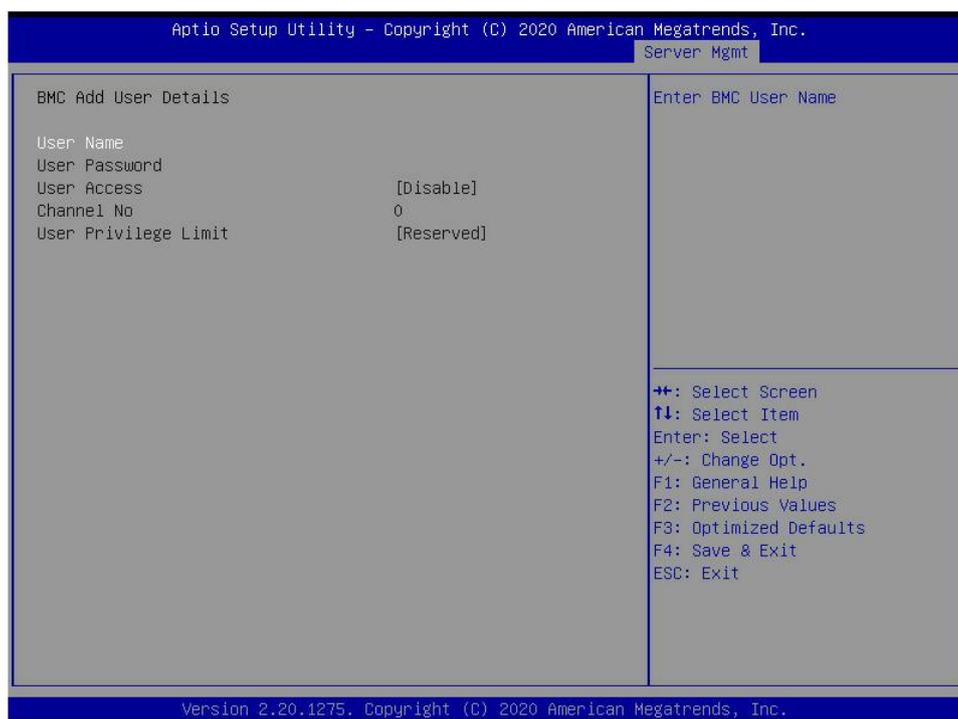


Fig. 4. 46

User Name: user name setting. The maximum number of characters supported is 16.

User Password: user password setting. Password characters must include uppercase and lowercase letters, special characters and numbers, with a minimum of 8 characters and a maximum of 20 characters.

Channel No: BMC channel setting, enter 1 or 8

User Privilege Limit

User Privilege Limit settings, menu options are:

- Reserved
- Callback
- User
- Operator
- Administrator

After the setting is successful, it will be prompted with“Set User Access Command Passed”, BMC User will take effect immediately.

## 4.2.44 Delete User



Fig. 4. 47

User Name: enter the user name to be deleted.

User Password: enter the password of the user to be deleted. After the password is entered correctly, a prompt "User Delete!!!" will show. The user who is successfully deleted will take effect in BMC immediately, and the user will not be able to log in to BMC web interface.

## 4.2.45 Change User Setting



Fig. 4. 48

User Name: enter the user name to be modified.

User Password : enter the user password to be modified. The following options can be modified only if the name and password are entered correctly.

User

User permission switch settings, menu options are:

- Enabled
- Disable

Default: Disable

Change User Password: modify the user password. The password characters must include upper and lower case letters, special characters and numbers, with a minimum of 8 characters and a maximum of 20 characters.

Channel NO: BMC channel setting, enter 1 or 8.

User Privilege Limit

Channel NO: BMC channel setting, enter 1 or 8.

- Reserved
- Callback
- User
- Operator
- Administrator

## 4.2.46 Security menu

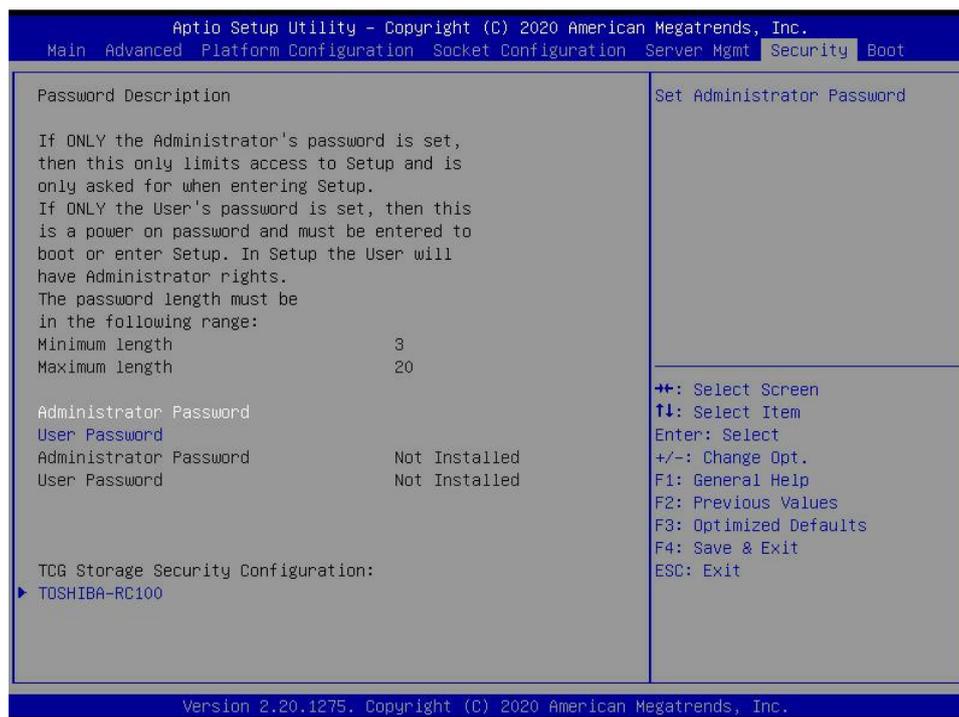


Fig. 4. 49

**Administrator Password:**  
Select this option to set the administrator password;

**User Password:**  
Select this option to set the user password;

**Administrator Password:**  
Display status of administrator password. If there is an administrator password in the system, it displays Installed. If there is no administrator password, it displays Not Installed;

**User Password:**  
Display user password status. If the system has a user password, it displays Installed. If there is no user password, it displays Not Installed;

**HDD Security Configuration:**  
The hard disk list is displayed dynamically. The hard disks connected to SATA and sSATA controllers will be displayed here. Enter the hard disk interface to set the hard disk password. If there is no hard disk connection, it will not be displayed.

## 4.2.47 Boot menu

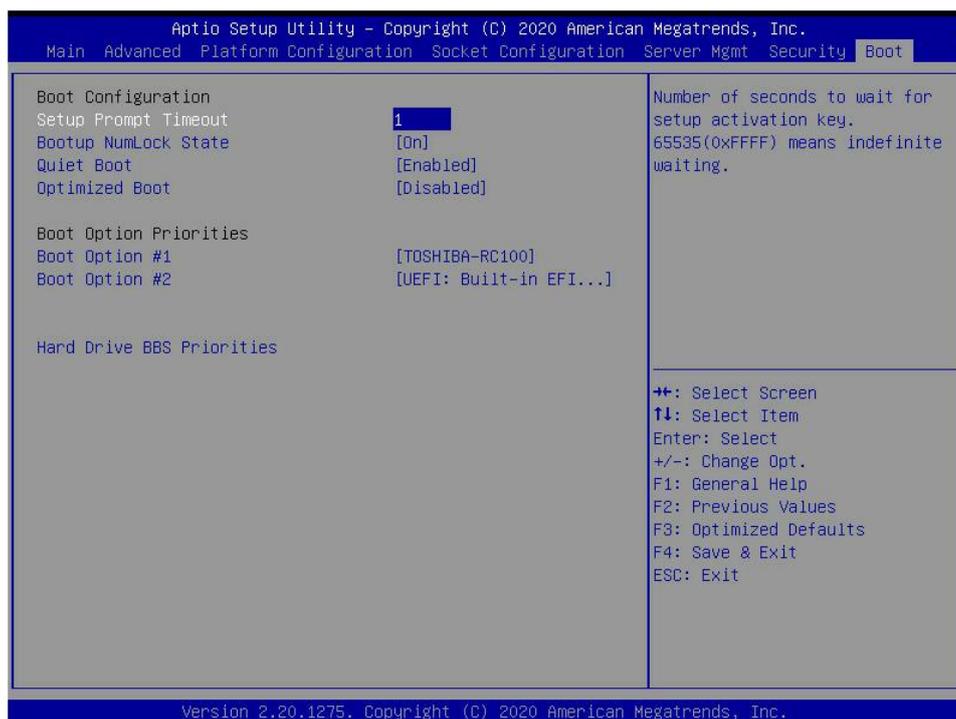


Fig. 4. 50

**Setup Prompt Timeout:** Setup prompts timeout setting. Set the time to wait for the Setup activation key. The maximum value is 65535 seconds. The default value is 1.

### Bootup Numlock State

During startup, the keyboard NumLock indicator status switch is set, and the menu options are

- On
- OFF

Default: On

### Quiet Boot

Turn on and turn off the function of Quiet Boot, and the menu options are:

- Disable Quiet Boot, now shows the information of POST
- Enable Quiet Boot, now shows OEM Logo

Default: Enable

### Optimized Boot

Turn on and turn off the function of Optimized Boot, and the menu options are:

- Disable Quiet Boot
- Enable Quiet Boot, CSM support will be Disable and connecting network devices will reduce startup time

Default: Disable

### Boot Option Priorities

Boot option list, which is dynamically displayed and is determined by the number of boot options in the system. When there is no boot item, it will not be displayed.

### XXXX Driver BBS Priorities

## 4.2.48 Save &amp; Exit menu

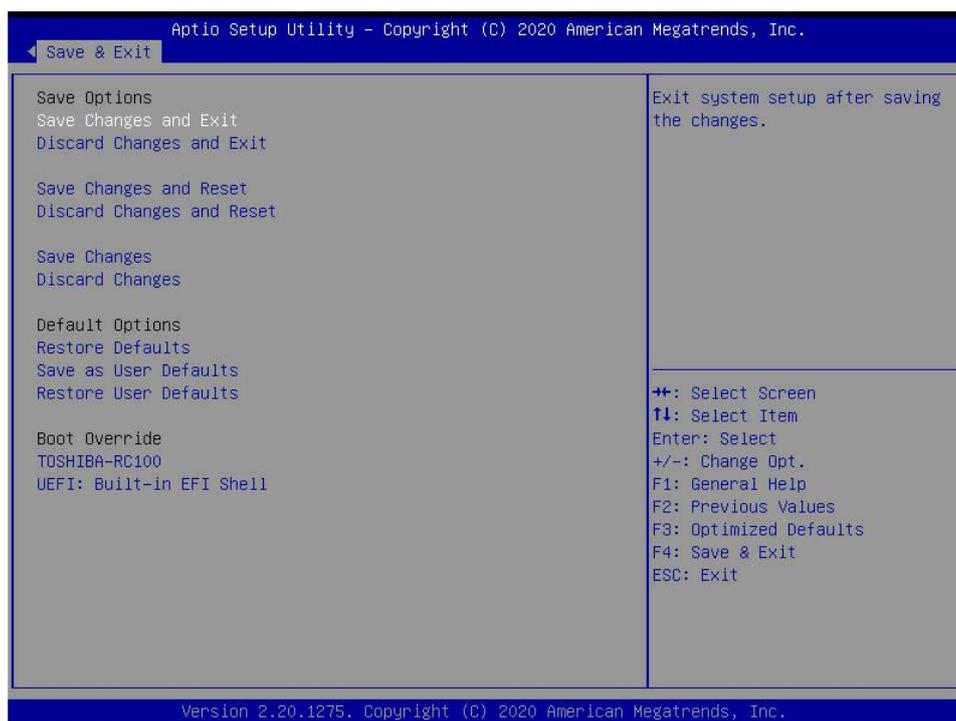


Fig. 4. 51

**Save Changes and Exit:**

Save the settings and exit the BIOS Setup menu;

**Discard Changes and Exit:**

Discard the save settings and exit the BIOS Setup menu;

**Save Changes and Reset:**

Save the settings and restart the system;

**Discard Changes and Reset:**

Discard the saved settings and restart the system;

**Save Changes****Discard Changes****Restore Defaults:**

Load BIOS factory settings;

**Save as user Defaults****Restore user Defaults****Boot Override:**

List of startup options, where you can select startup options.

### 4.3 User action reminder

1. With  option, when user operation is required, understand the operation specification in detail.
2. When operating the option, please understand the meaning of the option in combination with the operation manual and the option description of BIOS Setup interface.

# Chapter 5 IPMI Deployment

## 5.1 Fast development of IPMI

How to fast deploy the IPMI function of the server is shown in Figure 5-1.

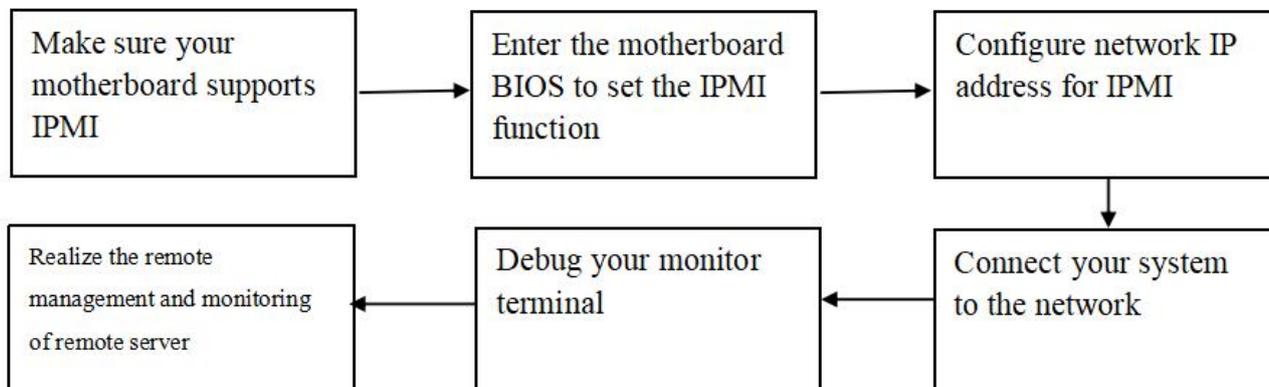


Fig5.1

### 5.1.1 Confirm the motherboard supports IPMI function

Check your motherboard manual and confirm that your motherboard supports IPMI, and then find the dedicated IPMI network port of the motherboard, or select the shared LAN port, as shown in Figure 5.2

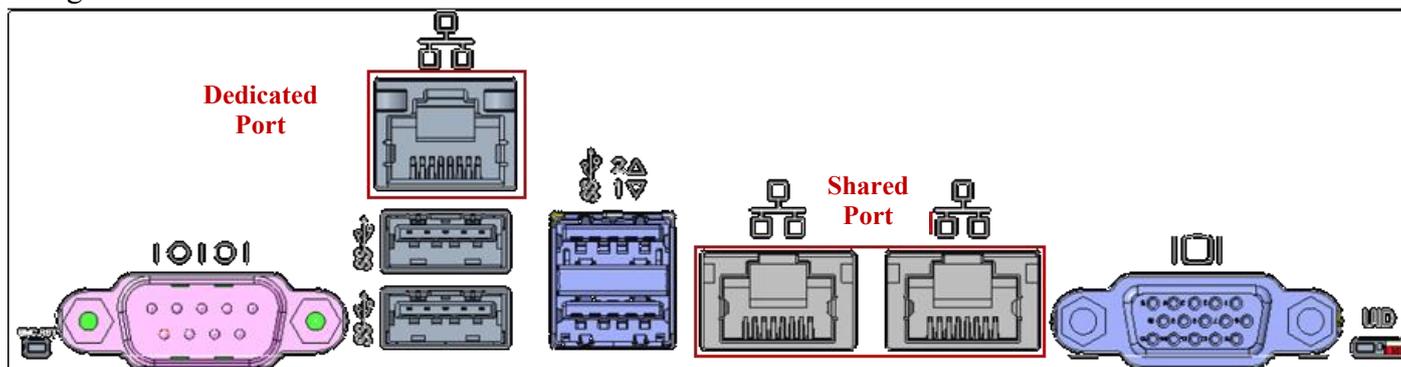


Fig5.2

### 5.1.2 Enter BIOS to set IPMI function

Restart your system. Press ESC or DEL to enter the BIOS system of the motherboard while the device is started. The BIOS setting interface is shown in Fig. 5.3

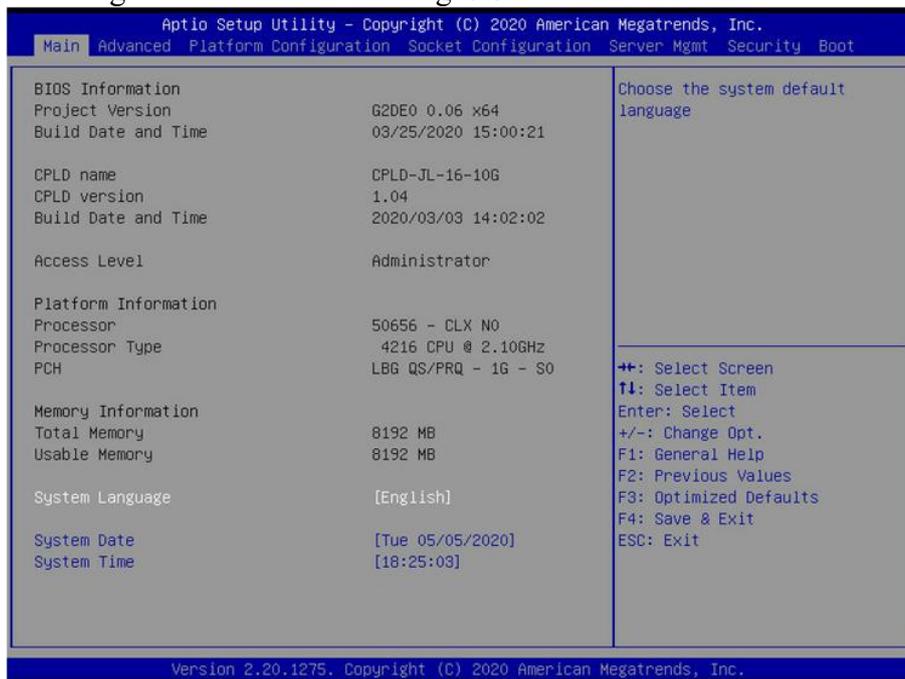


Fig5.3

After entering the interface, switch the menu item to the Server Mgmt through the left and right keys.

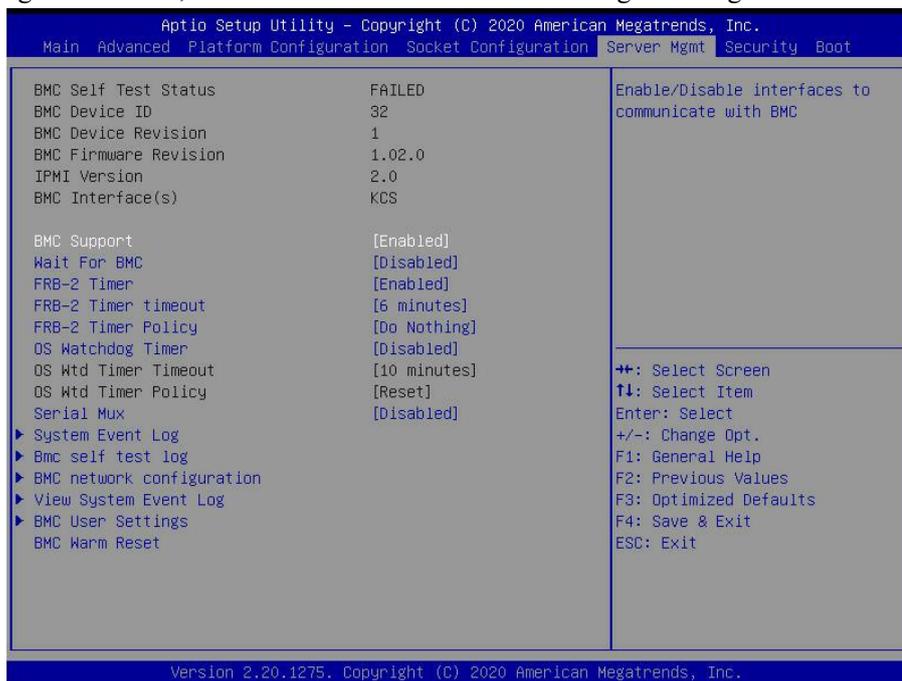


Fig5.4

Enter the BMC network configuration option through the keyboard, and the following interface will be entered, as shown in Fig. 5.5

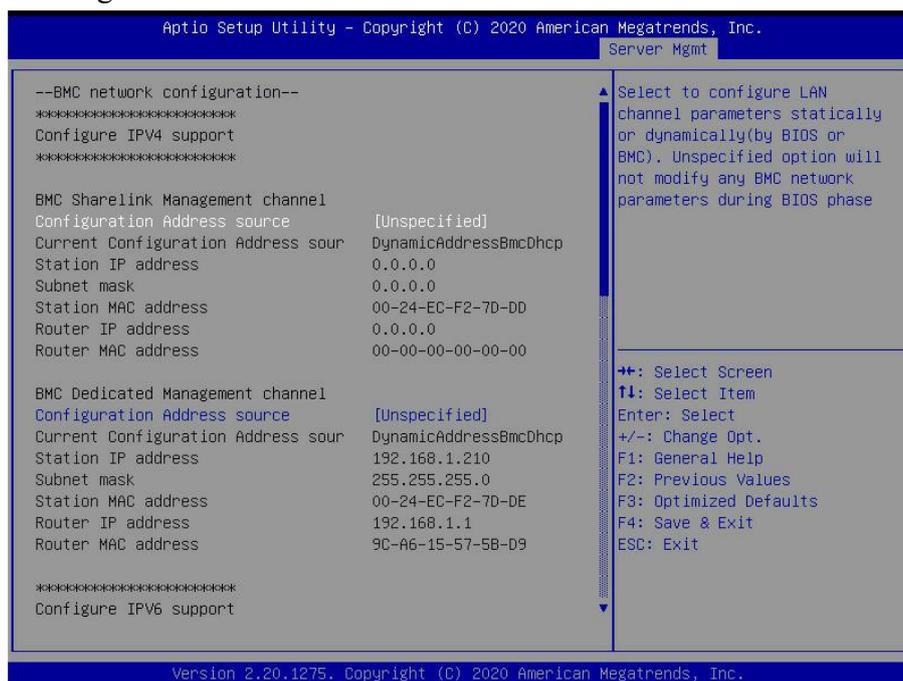


Fig5.5

On this page, you can see two configurable LAN ports, one dedicated LAN port and the other as Sharelink shared LAN port. Take the shared LAN port as an example. If you connect a dedicated LAN port, the setting method is the same as that of the shared LAN port. Switch to the configuration address source option and press Enter to set the network mode of the LAN port, as shown in Fig. 5.6.

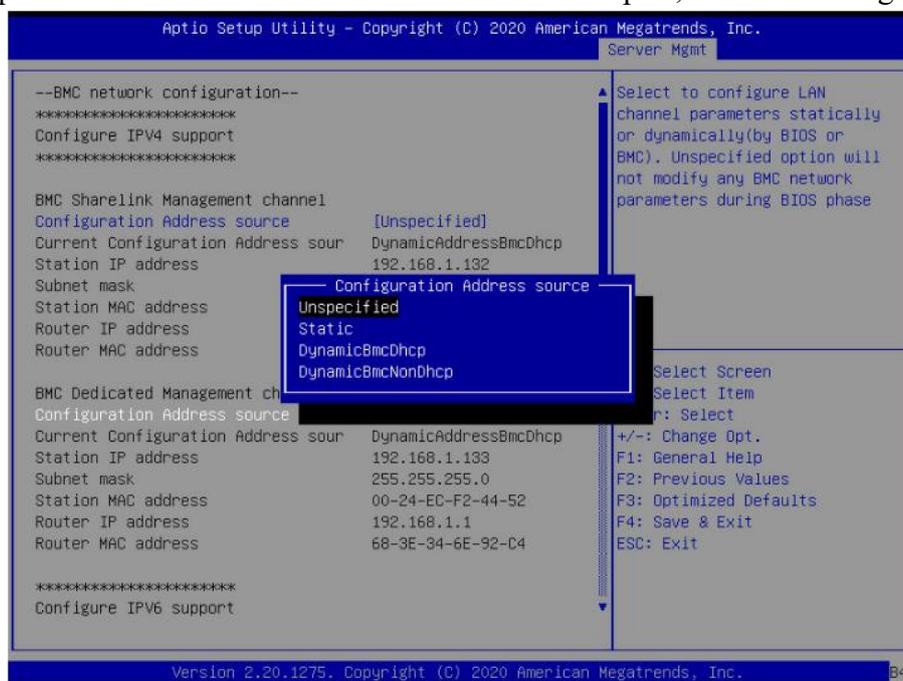


Fig5.6

There are four network modes that can be configured on this interface, namely, Unspecified, Static, DynamicBMCDHCP, DynamicBMCNonDHCP. Static is the static mode. You can manually set the IP address. DHCP is the dynamic mode. Setting this item allows BMC to automatically obtain the IP address from the DHCP server.

### 5.1.3 IPMI interface configuring Static mode

If you choose to configure Static mode for IPMI interface, you should pay attention to the following problems:

- (1) If there are multiple IPMI devices in your LAN, you should pay attention to the IP address between devices can not be repeated, otherwise communication can not be established.
- (2) If the IP address of your IPMI device is an intranet address, the terminal device communicating with it must be in the same network segment as the IP address of the IPMI device.
- (3) IP address of IPMI device can be mapped to WAN by routing device to realize remote management.
- (4) IPMI port has the function of obtaining IP address through DHCP.
- (5) IPMI supports TCP / IPV4 and TCP / IPV6.

Configure the IP address and subnet mask. For example, here we set the IP address to 192.168.1.178 and the subnet mask to 255.255.252.0, as shown in Figure 5.7 below. After setting, press F4 to save and exit the BIOS interface.

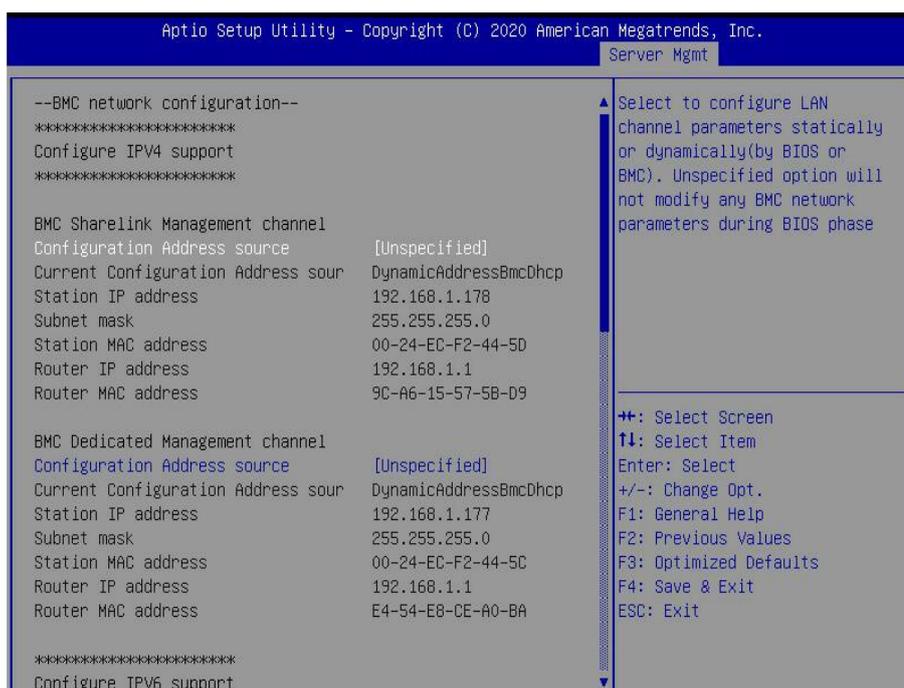


Fig5.7

We have finished the operation of configuring IPMI function.

### 5.1.4 IPMI configuring Java SOL

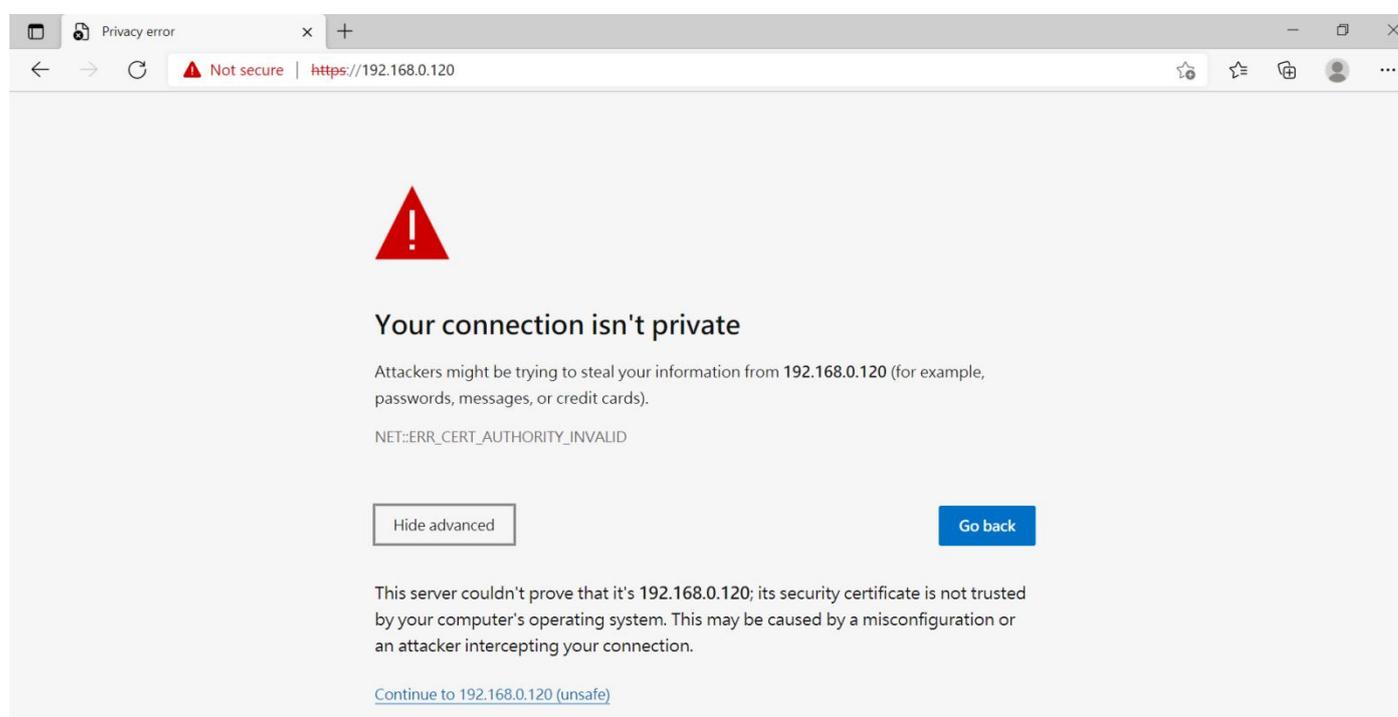
1. When the system starts up, press the <Del> key to enter the BIOS Setup interface.
2. Switch to the Advanced menu, select Serial Port Console Redirection, and press the < ENTER > key.
3. Make sure that the Console Redirection of COM0 is in [Enabled] state. If not, select Console Redirection and press < ENTER > to set the state to [Enabled]. In order to ensure the normal operation of IBMC, this option has been set to [Enabled] by default.

## 5.2 IPMI quick introduction of functions

After completing the previous configuration steps, we can start to log in to the IPMI management interface. The IPMI management interface can be accessed by using a standard web browser. Here, we recommend using Google Chrome, Firefox and IE browser (IE11 or above) to obtain the best browsing experience. Since the new version of the operation interface is based on HTML5 and costs a lot of computer resources, we recommend that users configure more than 8G of memory on the client when using KVM.

### 5.2.1 Enter the operation interface

Take Google Chrome as an example. Enter the IPMI access address in the address bar of the browser and press enter to access the IPMI management interface. Since all HTTP links have been converted to HTTPS encrypted links, the privacy setting error page shown in Fig. will be entered, and the contents of other browsers may be different. On this page, click "advanced" >> continue to "to normally access the IPMI management page and enter the login page.



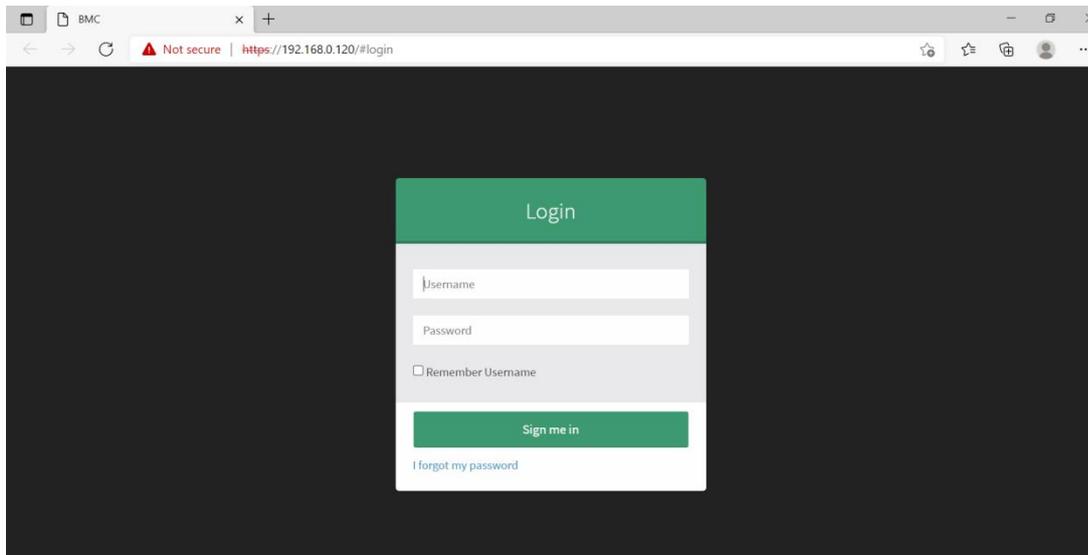


Fig5.9

**Default user name and password**

Factory default user name: admin

Factory default password: admin

When you log in with this user name, you will get all the privileges of the administrator. It is recommended that you modify your password after logging in.

**5.2.2 IPMI Management system content**

When you log in to the IPMI management system correctly, you can see the page as shown in Figure.

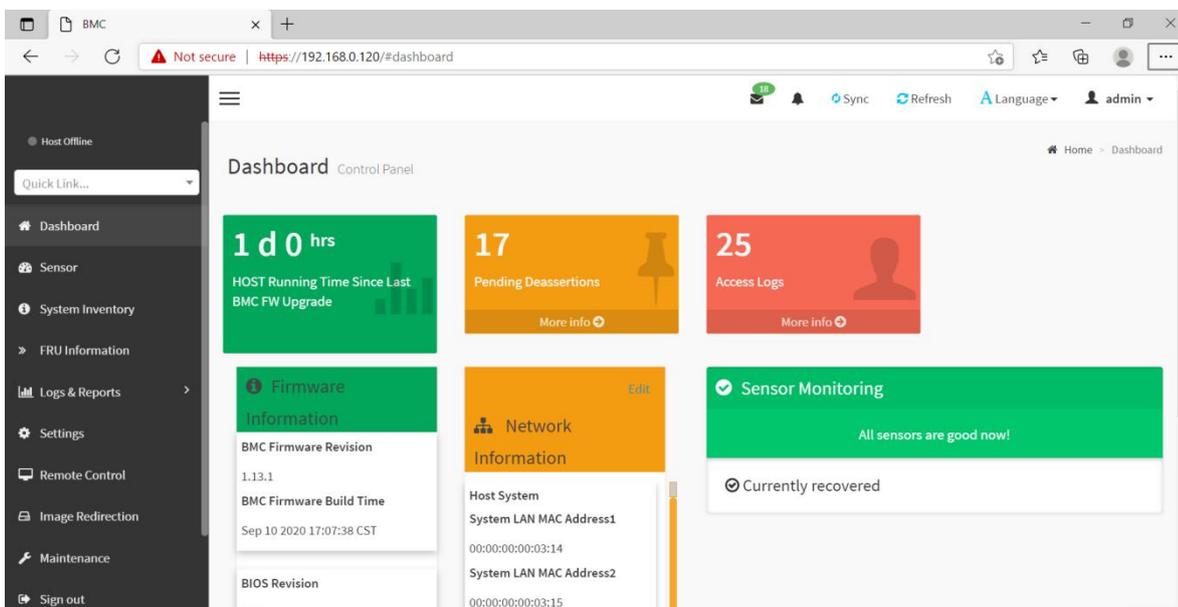


Fig5.10

**IPMI Management interface menu description**

**(1) Instrument panel**

On this page, users can view the basic information of IPMI management system. Including firmware information, network information and sensor monitoring information.

Firmware information includes BMC firmware version information, BIOS version information, motherboard CPLD version information, backplane CPLD version information and BMC firmware compilation time information.

Network information includes MAC address of system network and BMC network information. You can choose to view the shared network port or private network port of BMC. BMC network information includes BMC network MAC address information, IPV4 network mode information, IPV4 address information, IPV6 network mode information and IPV6 address information.

Sensor monitoring information will display the current alarm sensor information in real time, including sensor name, sensor read value, real-time curve change of sensor read value and alarm status.

#### (2) Sensors

This page displays the status of all sensors. When there is a sensor alarm, the sensor will be displayed in the key sensor field. When the alarm is released, the sensor will be automatically removed from the key sensor field.

#### (3) System list

This page can view the server CPU and memory information. In the block diagram, click the CPU block to view the CPU information. If the memory block is green, it means that the memory exists. Click the memory block to view the memory information.

#### (4) Hard disk information

For the backplane with Expander, the green box indicates that the hard disk is in place, otherwise it is not. The status of the hard disk can be viewed on the right or under the hard disk box. Left click the green box to view the details of the hard disk, right click to locate the hard disk.

#### (5) Power consumption

In this menu, the power consumption can be capped and the latest power consumption can be viewed.

#### (6) FRU information

Select this menu to view the basic information of FRU.

#### (7) Log & Report

In this menu, you can view IPMI time log, audit log and video log.

#### (8) Settings

BMC can be configured in this menu. Including BSOD, date & time, network, etc.

#### (9) Remote control

On this page, you can start KVM and sol, as well as power control and UID control.

#### (10) Image redirection

On this page, you can get the latest image file on the remote storage device.

#### (11) Maintenance

Basic maintenance operations can be performed on the server, such as BMC firmware update and BIOS firmware update.

#### (12) Log off

Click to log off the current user's login.

## 5.2.3 KVM remote management

### Boot KVM remote management

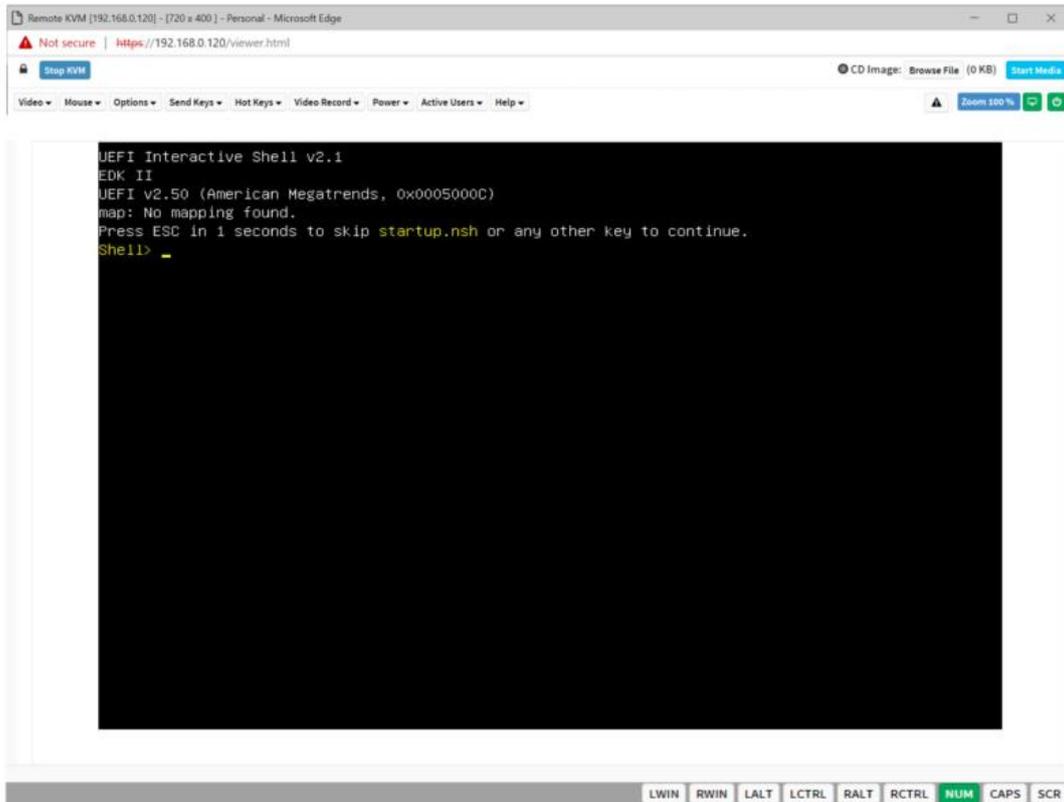


Fig5.11

As shown in Fig. 5.12, KVM can be started under the remote control menu KVM & Java SOL.

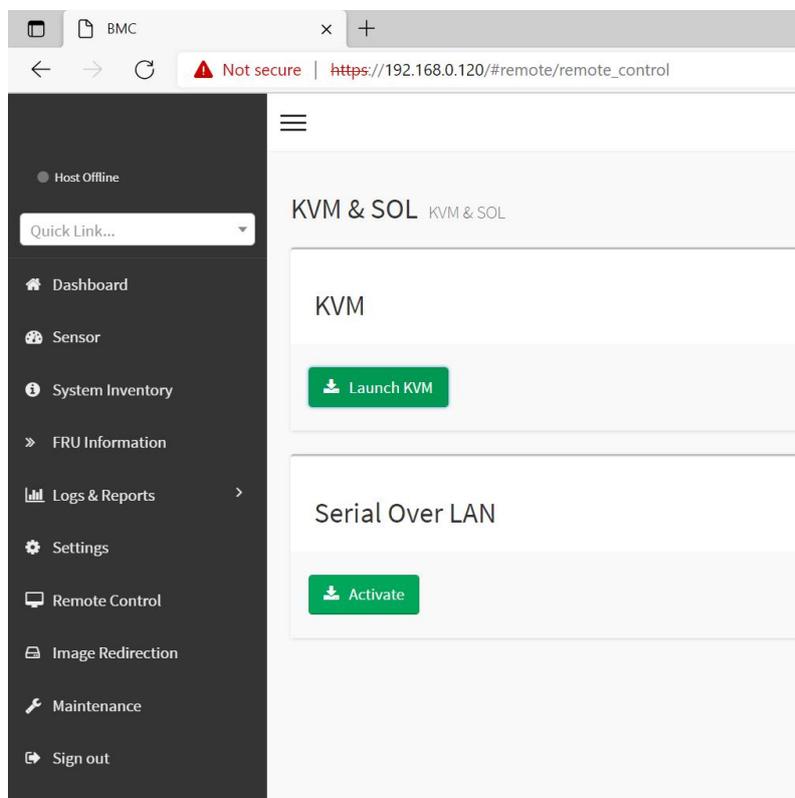


Fig5.12



### Remote control shortcut operation

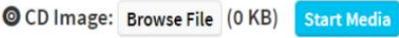
	Stop KVM
	On CD image, usually used for remote installation of operating system
	Host displays unlocking and server on / off

Table5.1

### 5.2.4 SOL introduction

Click Java SOL on the page shown in Fig. 5.12 to open the interface shown in Fig. 5.15.

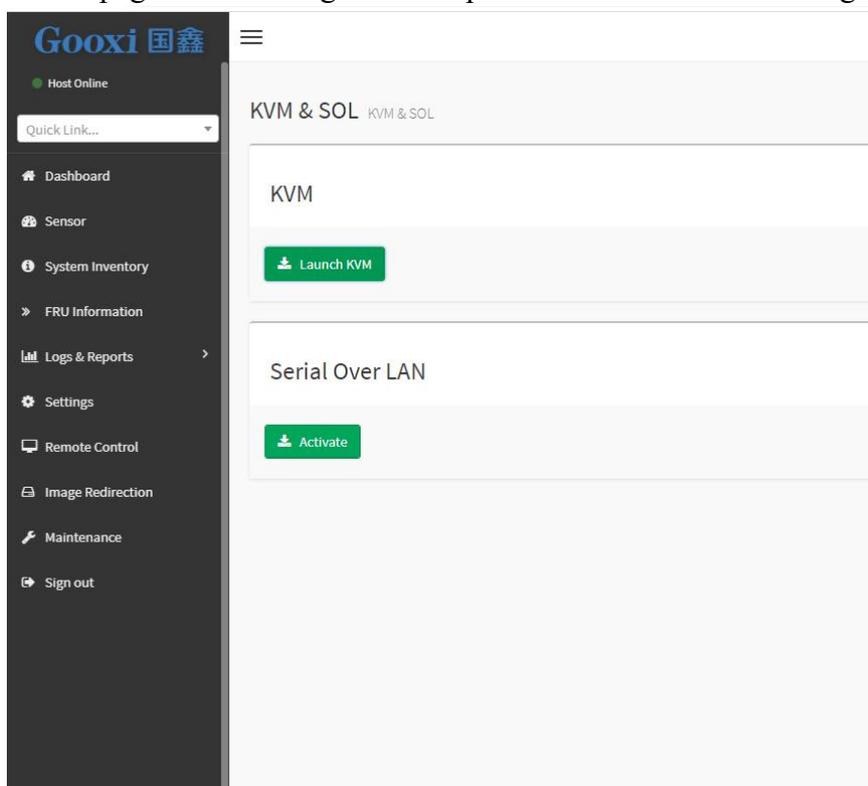


Fig5.15

Save the file and open it. You will see the SOL login interface shown in Fig. 5.16 below.

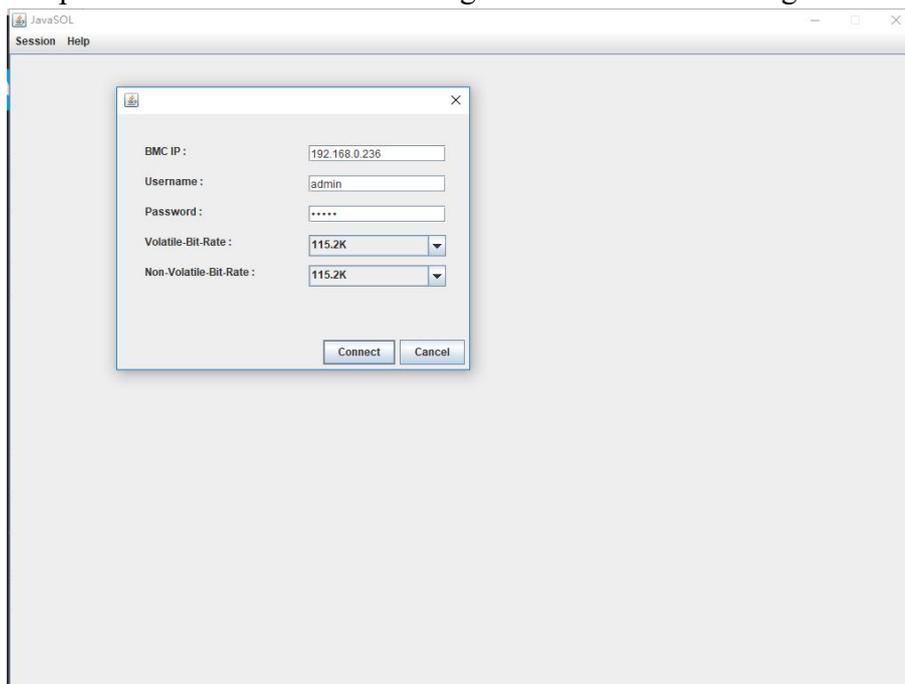


Fig5.16

On this interface you need to enter parameters related to BMC IP, Username, Password and baud rate. BMC IP is the IPMI IP configured above for you. Username and Password are both by default. Baud rate is 115.2k. Click Connect to enter the SOL operation interface. Fig. 5.17 below shows.

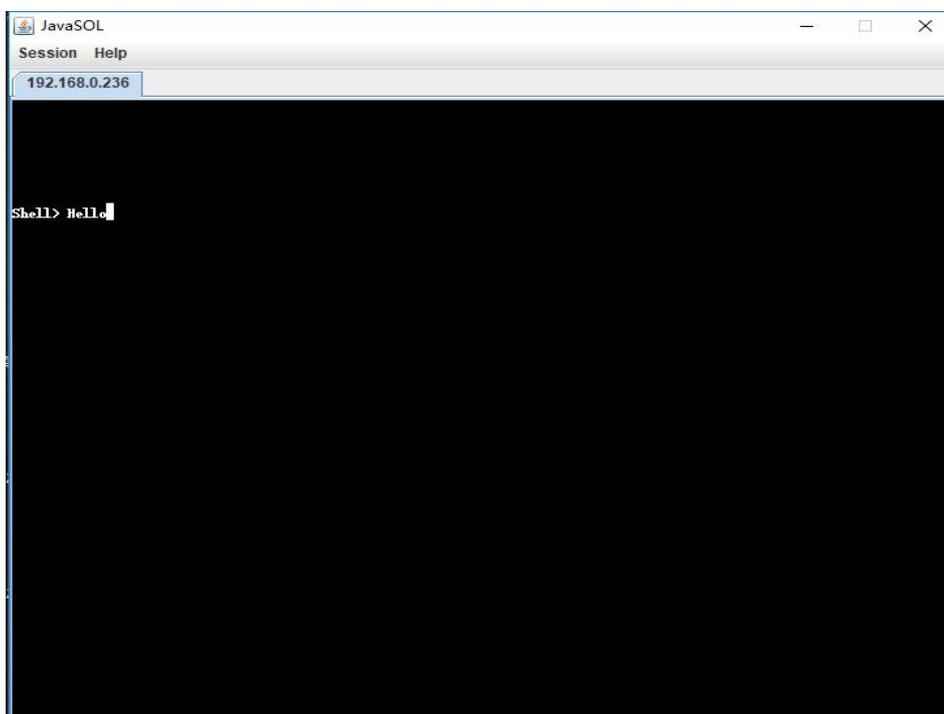


Fig5.17

## 5.3 Other ways to connect to IPMI

AST2500 firmware complies with the IPMI 2.0 specification, so users can use standard IPMI drivers assigned by the operating system.

### 5.3.1 IPMI driver

AST2500 supports Intel referenced drivers, which can be obtained from the following website: <https://www.intel.com/content/www/us/en/servers/ipmi/ipmi-technical-resources.html> through Windows Server 2003 R2, Microsoft also provides the IPMI driver package. You can also use the open IPMI driver in the system. AST2500 supports the open IPMI driver of Linux kernel. Use the following command to load the IPMI driver: "modprobe ipmi\_devintf" "modprobe ipmi\_si" If you are using an older version of the Linux kernel, you need to use "ipmi\_kcs" replace "ipmi\_si" component.

### 5.3.2 IPMI tools and other open source software

AST2500 supports open source IPMI tools. You can also use other software, such as Open IPMI, IPMI Utility, etc. The above documents are intended to help you quickly understand and deploy the IPMI functions of the system. We will provide other documents for the detailed IPMI function operation manual.

## Chapter 6: RAID Setting

### 6.1 Configuring RAID in UEFI boot mode

➤ **Operation before configuring RAID**

- a) During server startup, press Delete / ESC to enter the BIOS Setup interface
- b) Move to PlatForm interface-->PCH Configuration-->PCH SATA Configuration-->Configure SATA as. Configure SATA to RAID mode, as shown in figure 6.1

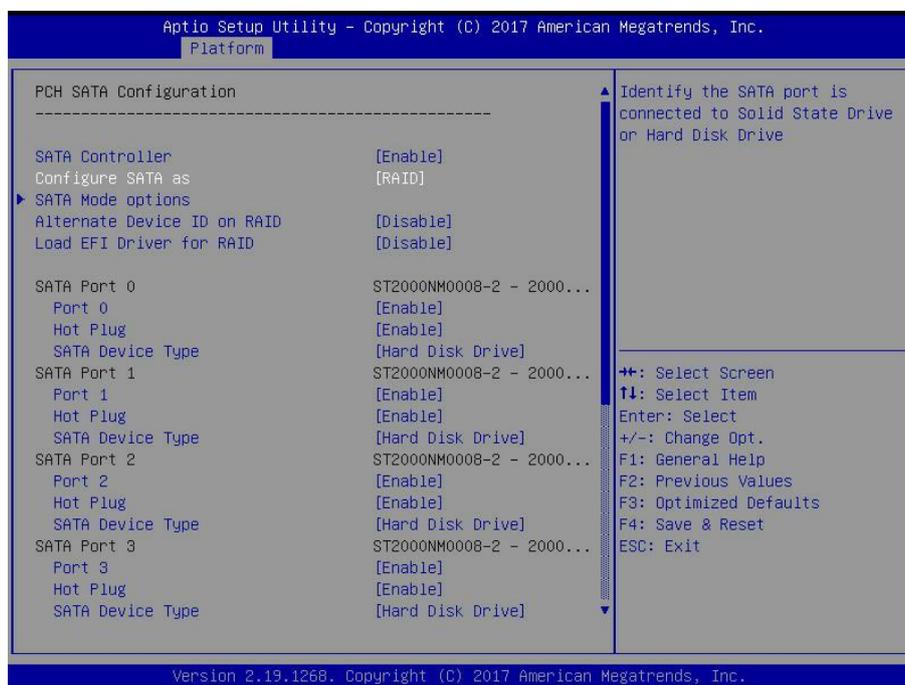


Fig.6.1

- c) Ensure that storage and video in CSM configuration are in UEFI mode, as shown in Fig. 6.2
- d) Fig. 6.2 Set storage and video to UEFI mode

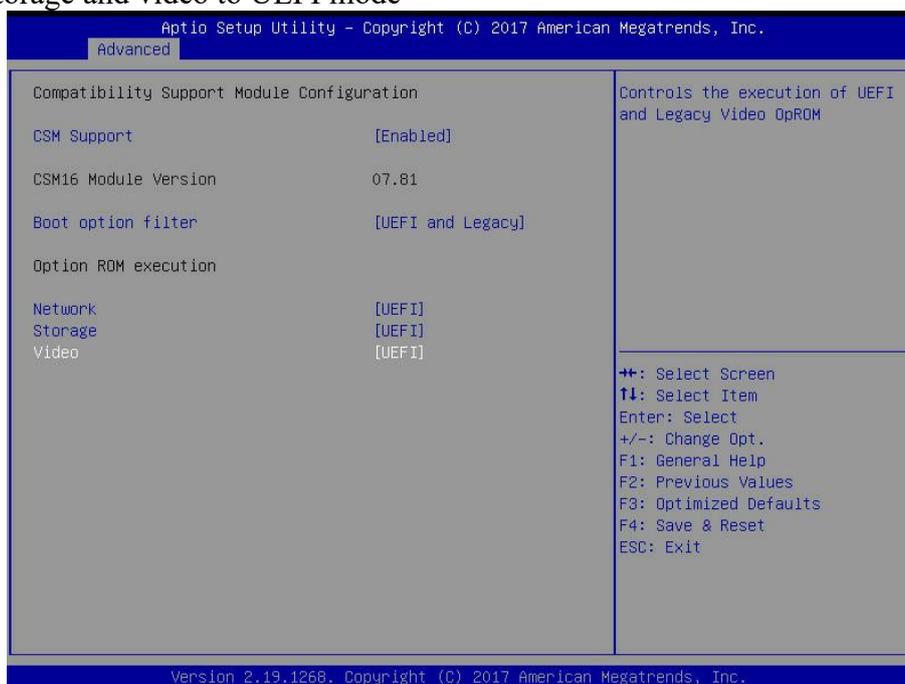


Fig.6.2

- e) Restart the server, enter the BIOS Setup interface, move to the advance page, and you will see Intel (R) RSTe SATA Controller, press enter to configure RAID, such as Fig. 6.3

✧ Fig. 6.3 Intel RSTe SATA Controller

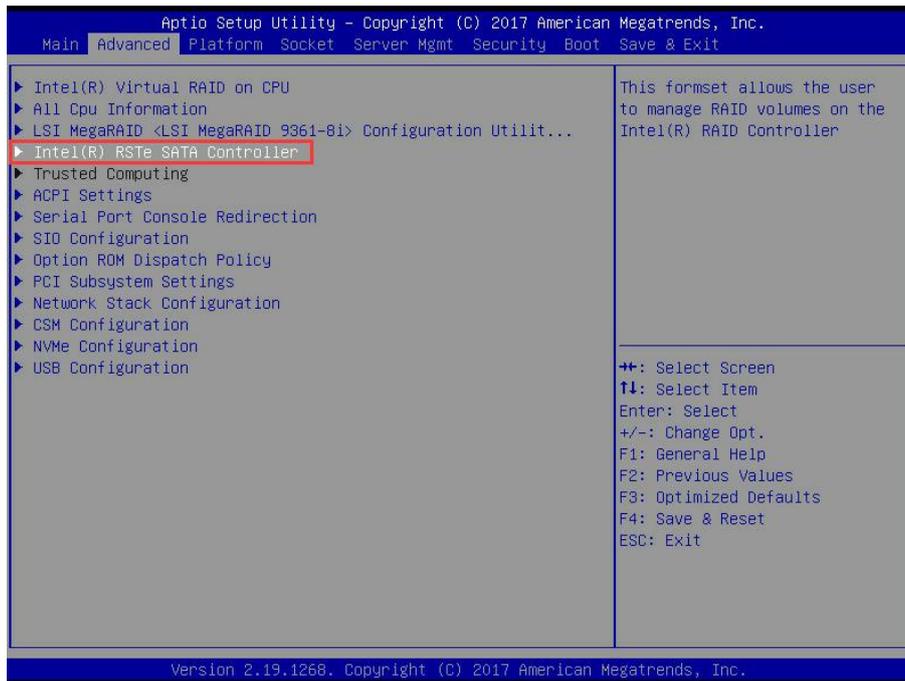


Fig.6.3

➤ **Crate RAID**

a) Select Create RAID Volume, and press enter.

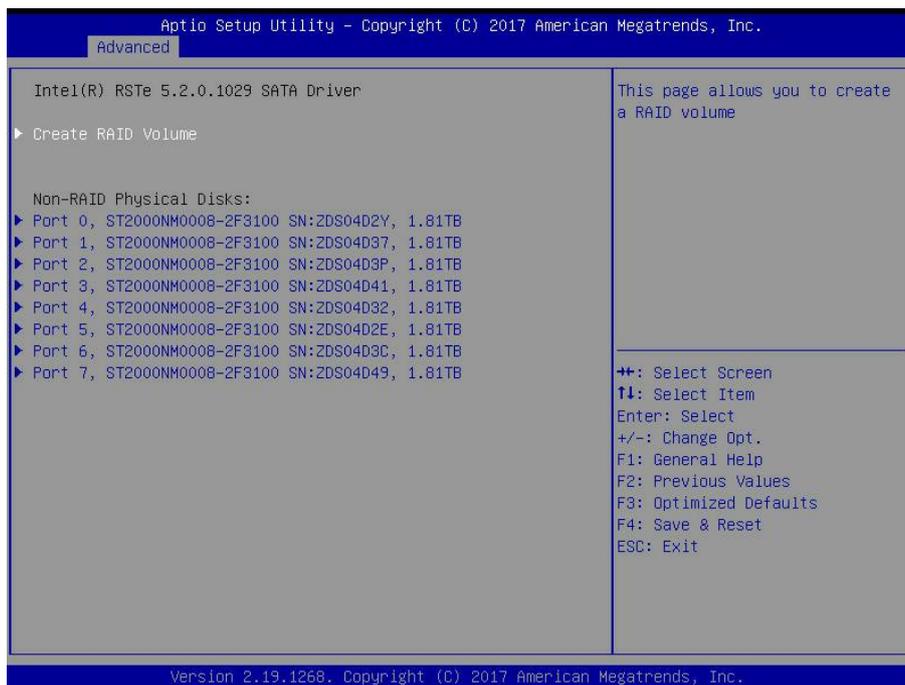


Fig.6.4

b) Change the name of RAID to be created. Note it cannot contain special characters. As shown in Fig. 6.5

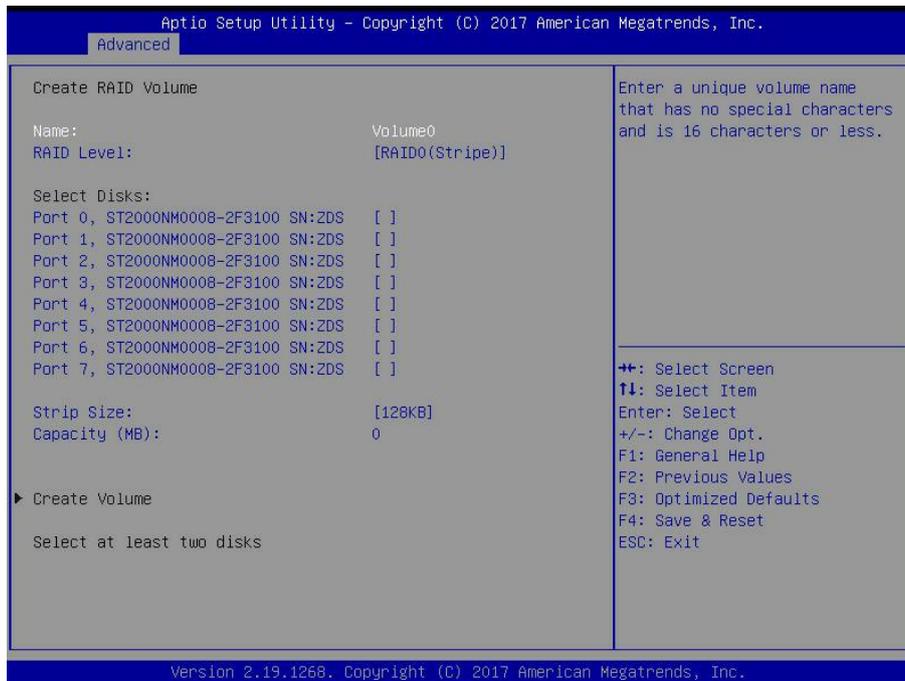


Fig.6.5

c) RAID Level: select the RAID level, as shown in Fig. 6.6

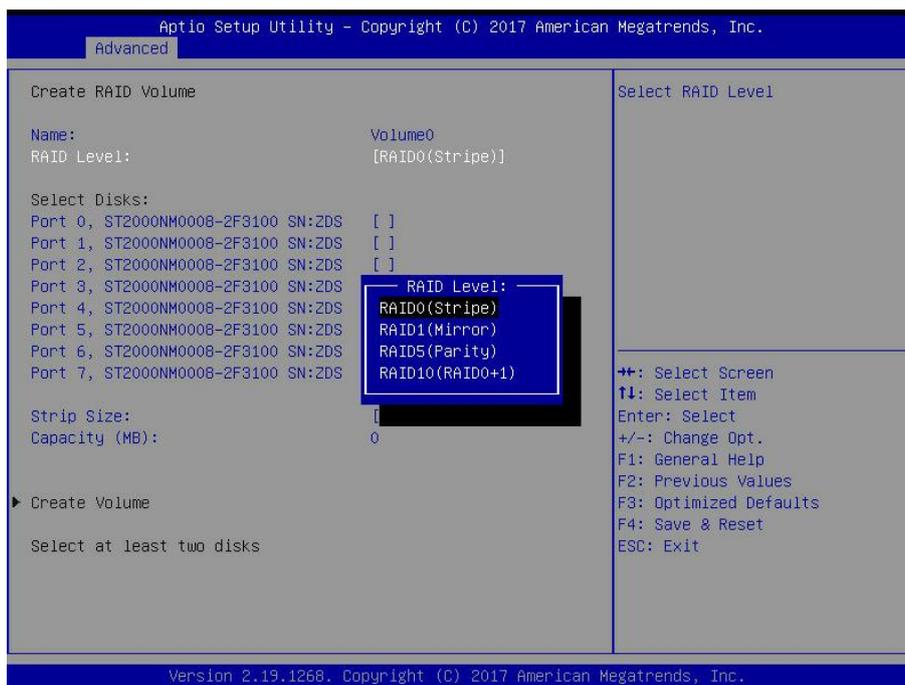


Fig.6.6

d) Select Disks: press the spacebar to select the disks that need to participate in configuring RAID. As shown in Fig. 6.7

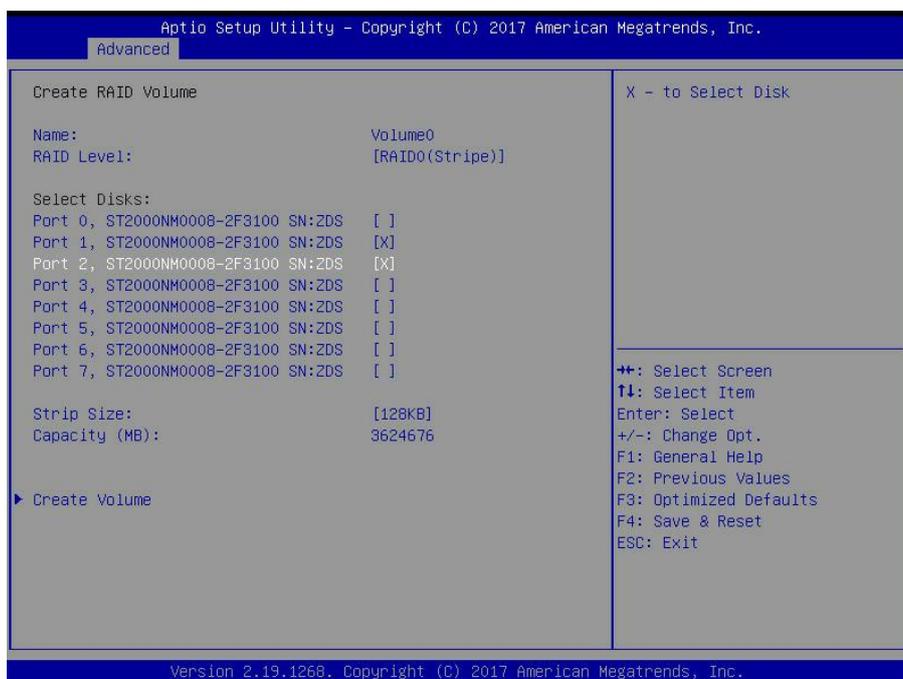


Fig.6.7

e) Select Create Volume and press enter to configure the RAID.

✧ Description of parameters is shown in Table 6.1:

Parameters	Description
Name	Name of RAID.
RAID Level	It determines the performance, fault tolerance and capacity of logical disk.
Select Disks	Select the member disks that make up the RAID. Available disks are displayed under the select disks column. Press enter to select a disk, [x] indicates that the disk has been selected.
Strip Size	Size of stripe data blocks written on each disk.
Capacity	The capacity of the logical disk.

Table 6.1

When RAID is created, it will be displayed in the RAID volumes directory. Select a RAID and press enter to view the details of the RAID (including RAID name, level, disk information, etc.).

➤ **Configuring a hot spare**

a) As shown in Fig. 6.8, select the disk to be configured as a hot spare and press Enter.

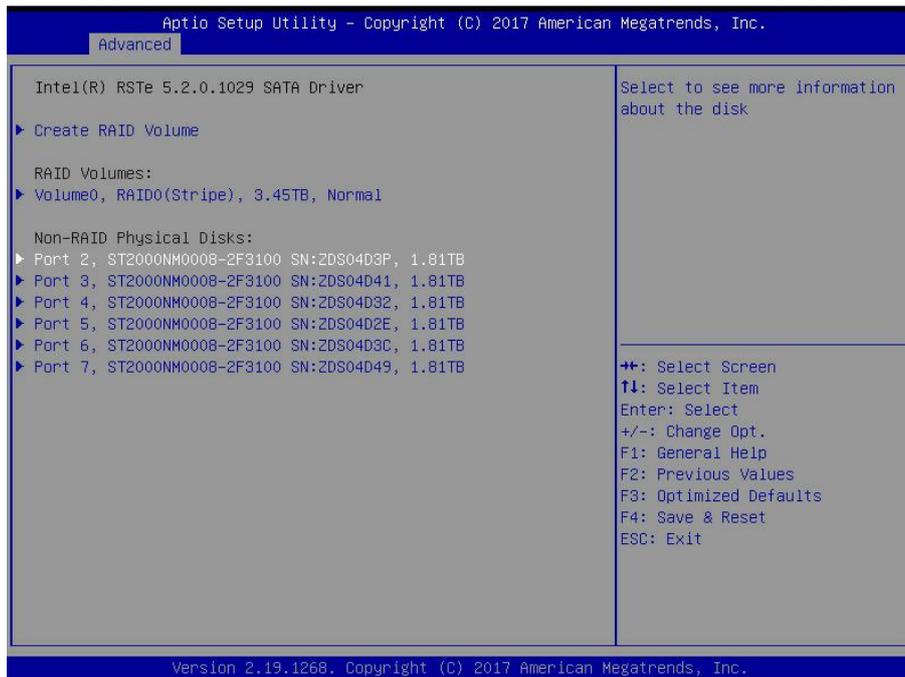


Fig.6.8

b) Enter the interface shown in Fig. 6.9, select "Mark as Spare" and press enter.

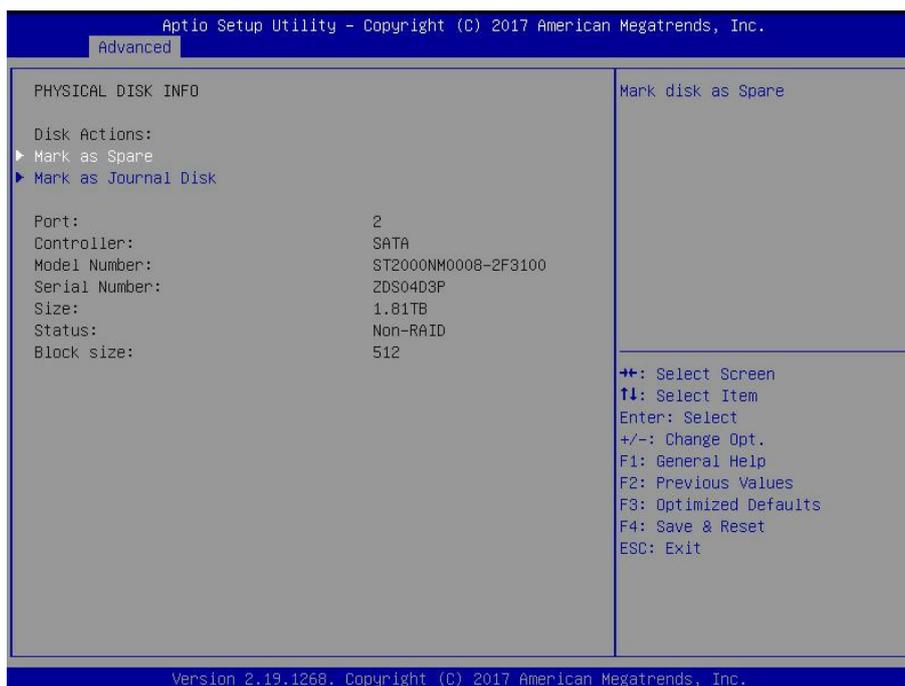


Fig.6.9

c) Enter the interface shown in Fig. 6.0, select "Yes", and press Enter to complete the hot spare configuration.

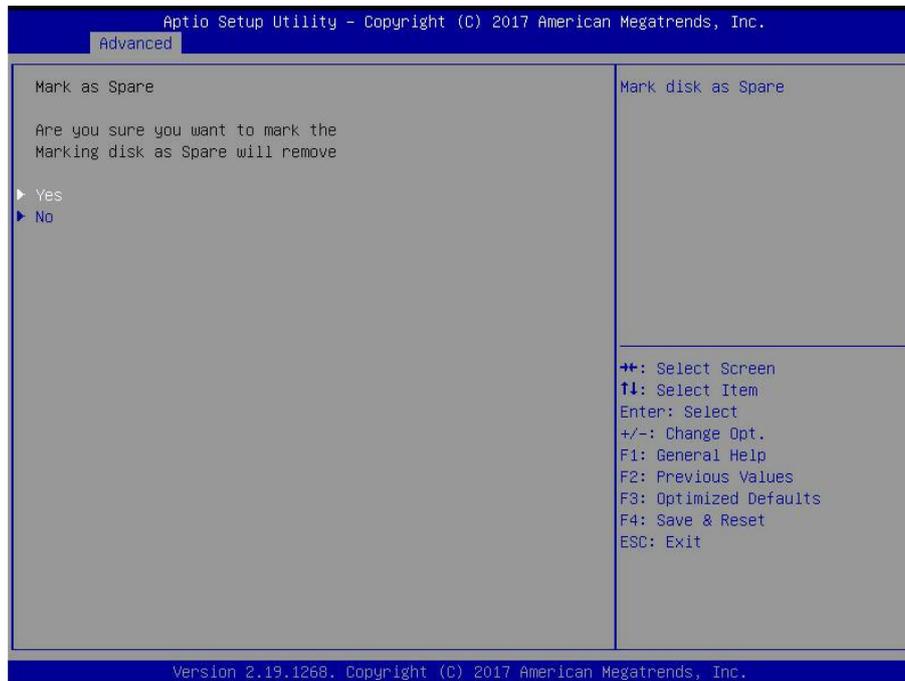


Fig.6.10

➤ **Delete RAID**

- a) Enter RSTe configuration interface.
- b) As shown in Fig. 6.11, select the RAID to be deleted under the RAID volumes directory and press enter.

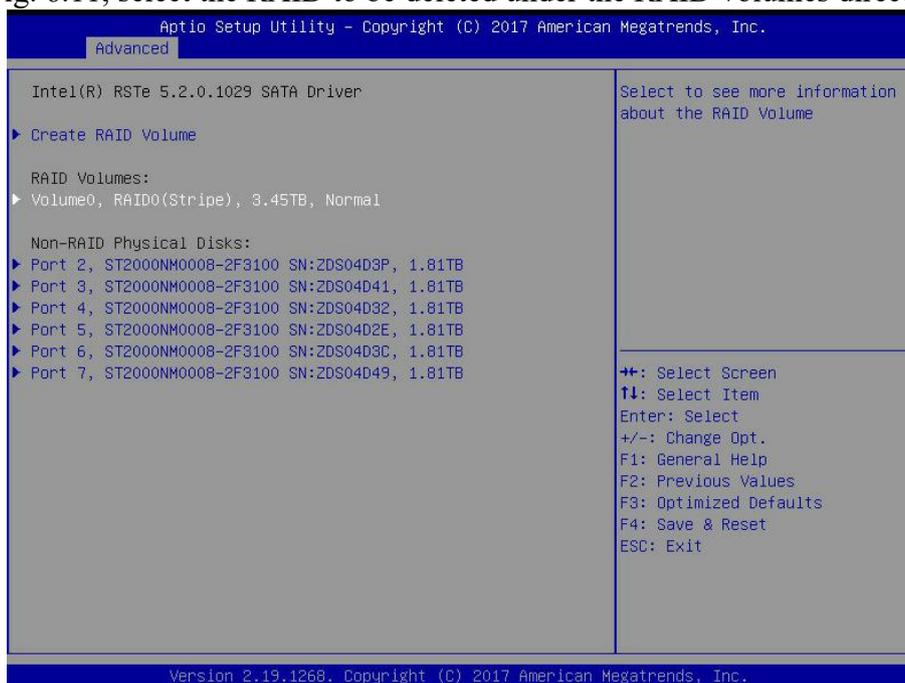


Fig.6.11

- c) Enter the RAID information interface shown in Fig. 6.12, select Delete and press Enter to delete RAID.

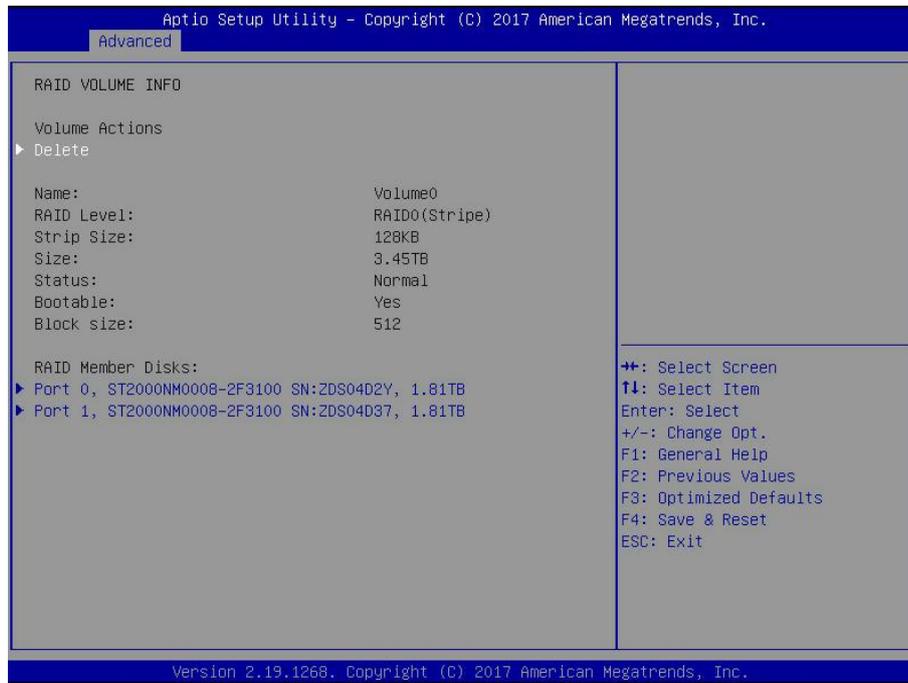


Fig.6.12

## 6.2 Configuring RAID in Legacy startup mode

### ➤ Set up RSTe work mode

- a) Enter BIOS Setup interface.
- b) Move to PlatForm interface-->PCH Configuration-->PCH Sata Configuration

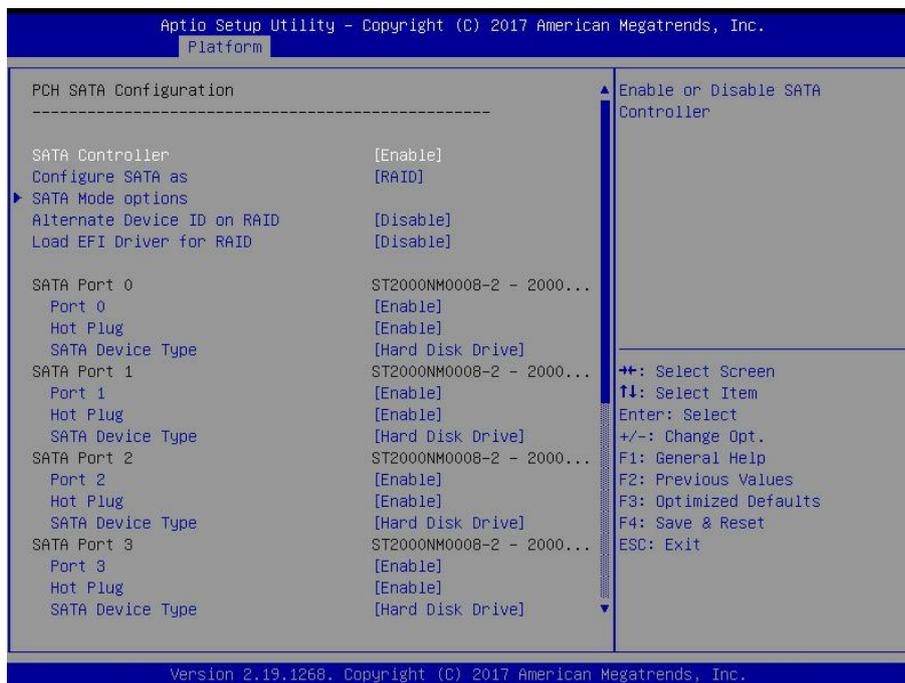


Fig.6.13



RSTe onboard soft RAID has SATA and sSATA controllers, which respectively manage the disks connected to the two interfaces of the RAID card. The SATA controller supports up to 8 disks, and the SATA controller supports up to 6 disks.

- c) Enter the interface shown in Fig. 6.14, select Configure SATA As, press Enter, and select the working mode of RSTe onboard soft RAID.

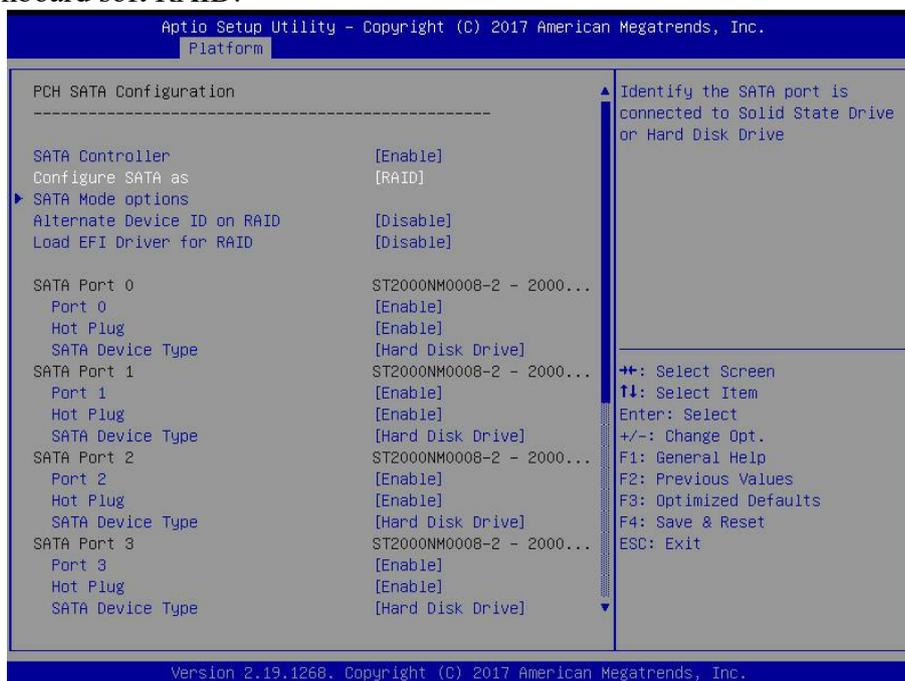


Fig.6.14

### ➤ Enter RSTe configuration interface

- a) Power up or restart the server. After the interface shown in Fig. 6.15 appears during BIOS startup, press Ctrl+I.



Fig.6.15



If the working mode of both sSATA and SATA controllers is set to RAID, the prompt "Press <CTRL-I> to enter Configuration Utility" will appear twice during BIOS startup, corresponding to sSATA and SATA controllers in turn. Please select the controller according to the disks required to configure RAID.

- b) Enter the RSTe configuration interface shown in Fig. 6.16 (see table 6.2 for interface description). Please refer to the key operation tips of the interface to navigate and modify settings in the interface.

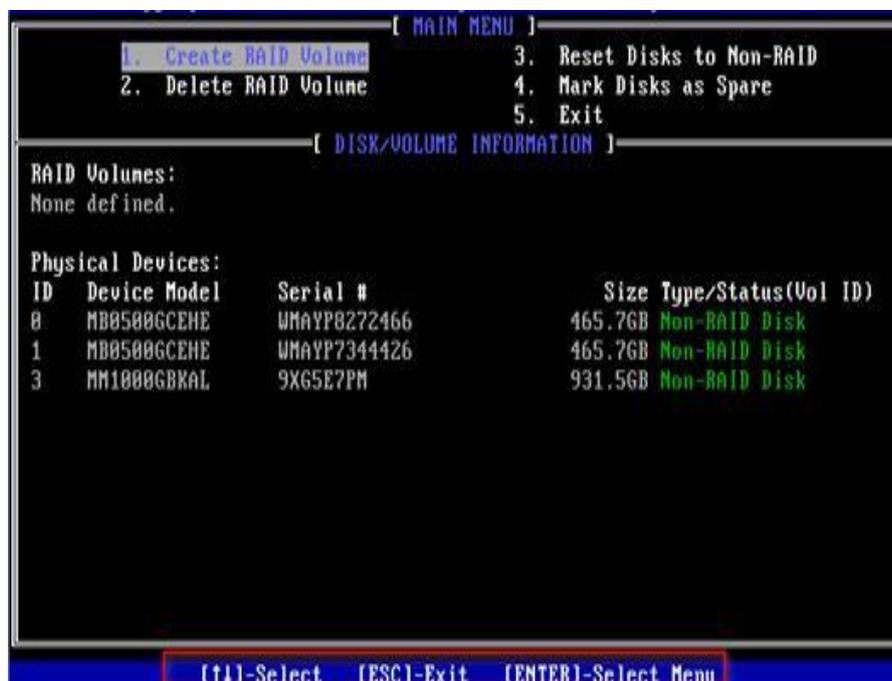


Fig.6.16

❖ Table 6.2 RSTe configuration interface description

Option	Description
MAIN MENU	Located on the upper side of the interface, you can perform the following tasks: Create RAID Volume Delete RAID Volume Reset Disks to Non-RAID Mark Disks as Spare Exit
DISK/VOLUME INFORMATION	Located on the lower side of the configuration interface, you can view the summary information of the created RAID and physical disks.

Table 6.2

➤ **Common task**

**Configure RAID:**

- a) Enter RSTe configuration interface.
- b) As shown in Fig. 6.17, select Create RAID Volume from RSTe, and press Enter.

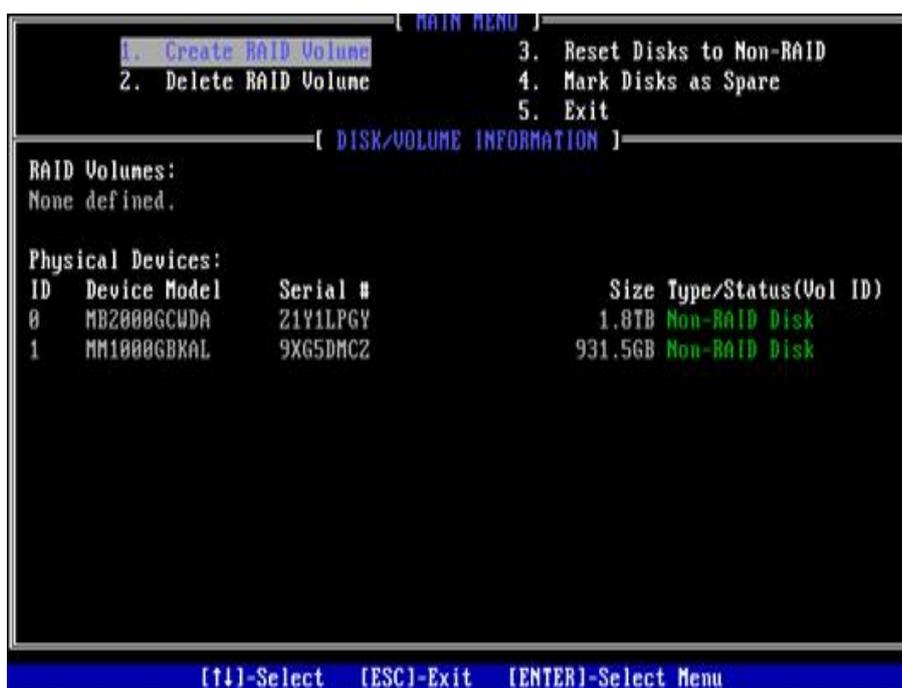


Fig.6.17

- c) Enter Fig. 6.18, configure in Name, RAID Level, Disks, Strip Size and Capacity column (parameters description seen table6.3), then select Create Volume, press Enter.
- ❖ Fig. 6.18 Create RAID Volume interface

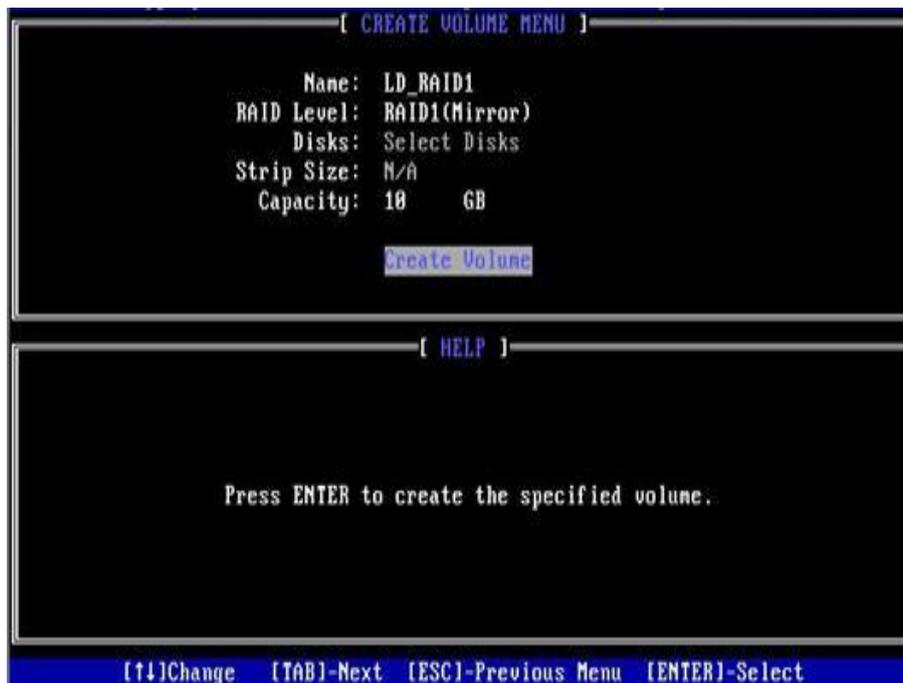


Fig.6.18

✧ Table 6.3 Parameter Description

Parameter	Description
Name	Name of RAID.
RAID Level	It determines the performance, fault tolerance and capacity of logical disk.
Disks	Select the member disks that make up the RAID. After selecting the disks column, press Enter and press Space to select the disk.
Strip Size	Size of stripe data blocks written on each disk.
Capacity	The capacity of the logical disk.

Table 6.3

- d) Enter the interface shown in Fig. 6.19 to view the details of RAID (including RAID name, level, disk information, etc.).



Fig.6.19

**Configure a hot spare:**

- a) Enter RSTe configuration interface.  
 b) As shown in Fig. 6.20, select Mark Disks as Spare from RSTe configuration interface, press Enter.

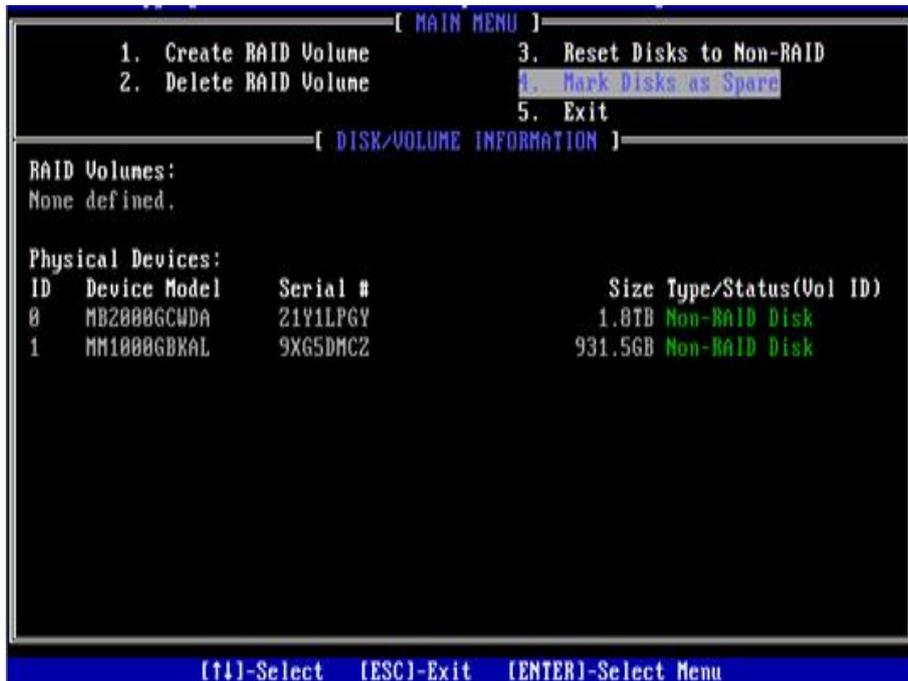


Fig.6.20

- c) Enter interface shown in Fig. 6.21, select disks to be configured as hot spare and press SPACE, then press Enter. In the prompt bar that appears, enter y and press Enter to complete the hot spare configuration.

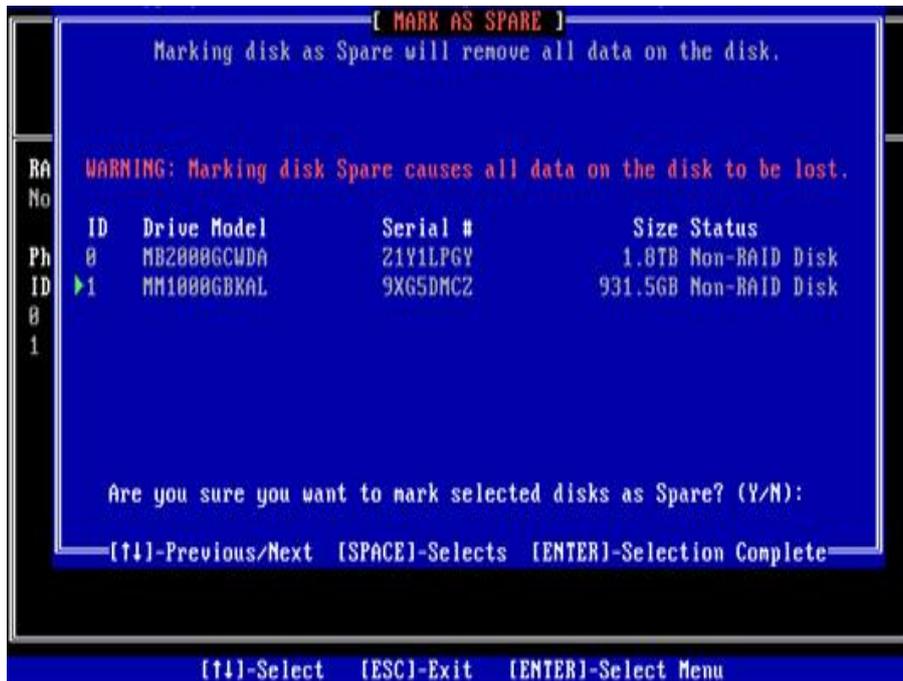


Fig.6.21

d) On the RSTe configuration interface, you can see the hot spare information, as shown in Fig. 6.22.



Fig.6.22

**Delete RAID:**

- a) Enter RSTe configuration interface.
- b) As Fig. 6.23 shown, select Delete RAID Volume from RSTe, and press Enter.



Fig.6.23

- c) Enter the interface shown in Fig. 6.24, select the RAID to be deleted, and press Delete to complete the deletion.

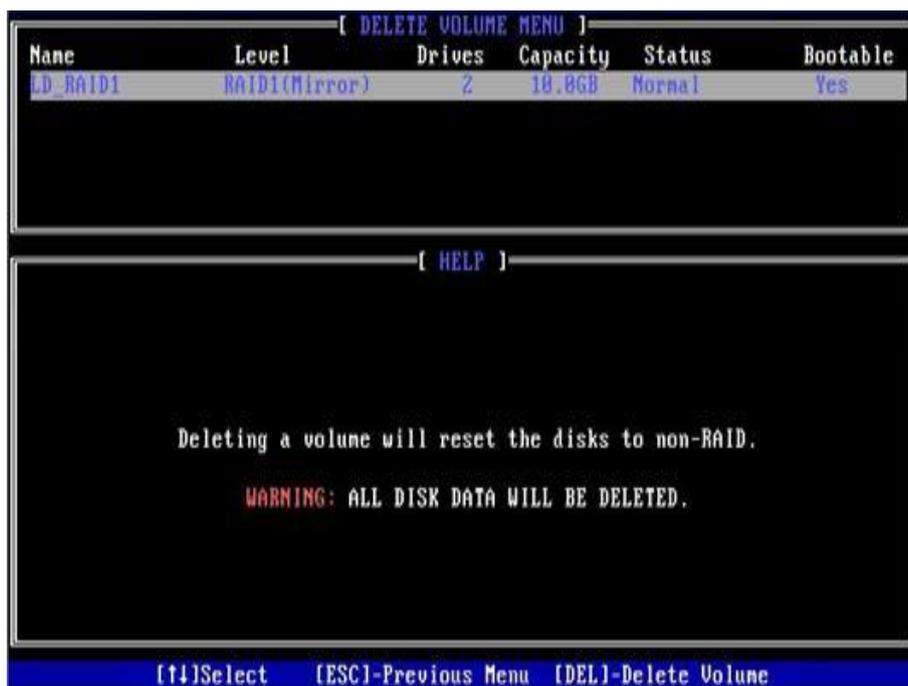


Fig.6.24

## Chapter 7: Specifications

Model		G2DE-B/G2DE-TB
CPU		Gen1 & Gen2 Intel® Xeon® Scalable processors
Chipset		C621/ C622(G2DE-B/G2DE-TB)
Motherboard Size		E-ATX
Features	BMC chip	ASPEED AST2500
	Fan Temperature Control	Supports
	Status Alarm	Supports
Memory	Slot Amount	16
	Total Capacity	Up to 4056GB
	Memory Type	Supports DDR4 3DS RDIMM/LRDIMM/RDIMM ECC Memory frequency supports 2133/2400/2666/2933MHz Intel Optane®
	Memory Capacity	Per DIMM supports 8GB, 16GB, 32GB, 64GB, 128G, 256G (only DDR4 3DS RDIMM)
	PCI-E Slot	6
Expansion Slot	Slot1	PCI-Express 3.0 x8 Slot from CPU1
	Slot2	PCI-Express 3.0 x16 Slot from CPU1
	Slot3	PCI-Express 3.0 x8 Slot from CPU1
	Slot4	PCI-Express 3.0 x4 Slot from CPU1
	Slot5	PCI-Express 3.0 x16 Slot from CPU0
	Slot6	PCI-Express 3.0 x16 Slot from CPU0
Network	LAN	2* GbE RJ45 LAN port (2* 10GbE RJ45 LAN port, only C622 chip supports ) 1* dedicated BMC management LAN port
Storage	SATA Controller	3* 8643 ports, 2* SATA 7PIN ports, RAID 0, 1, 5, 10
	BMC	IPMI 2.0
Display	VGA	Supports
TPM	TPM	Supports
Rear I/O Port	External USB port	2* USB3.0, 2*USB2.0 ports
	VGA port	1
	Serial port	1* DB-9
	RJ-45	2* 1GbE RJ45 LAN port (2* 10GbE RJ45 LAN port, only C622 chip support), 1* dedicated BMC admin LAN port)
Monitoring	CPU temperature	Supports
	System status	Supports
	Fan speed	Supports

OS	Windows® Server 2012 R2 (64bit) Windows® Server 2016 (64bit) Redhat® Enterprise Linux Server 7.3(64bit) Suse® Enterprise Linux Server 12.2(64bit) Centos® Enterprise Linux Server 7.3(64bit) Ubuntu® Server 16.04(64bit) VMWare® ESXi Microsoft® Hyper-V® Citrix® Xen® Server Linux® Kernel Virtual Machine
Environment	Operating temperature: 10°C~40°C Non-operating temperature:-40°C ~70°C Operating humidity: 8%~90% (non condensation) Non-operating humidity: 5%~90% (non condensation)

Table 7. 1