

USER'S MANUAL



CT-MBL01 Series
MicroATX Industrial Motherboard

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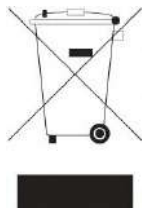
Safety Information

Electrical Safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operational Safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.



The symbol of the crossed out wheeled bin indicates that the product (Electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Safety Declaration

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

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

- **Chapter 2: BIOS setup**

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **Technical Support**

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor.

2. **Optional documentation**

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Instructions that you **MUST** follow to complete a task.



NOTE: Tips and additional information to help you complete a task.

Revision History

Revision	Revision History	Date
1.0	Manual Released	2026/06/11

Package Contents

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	CT-MBL01 MicroATX Industrial Motherboard	1
2	SATA cable	1
3	I/O port bracket	1

Ordering Information

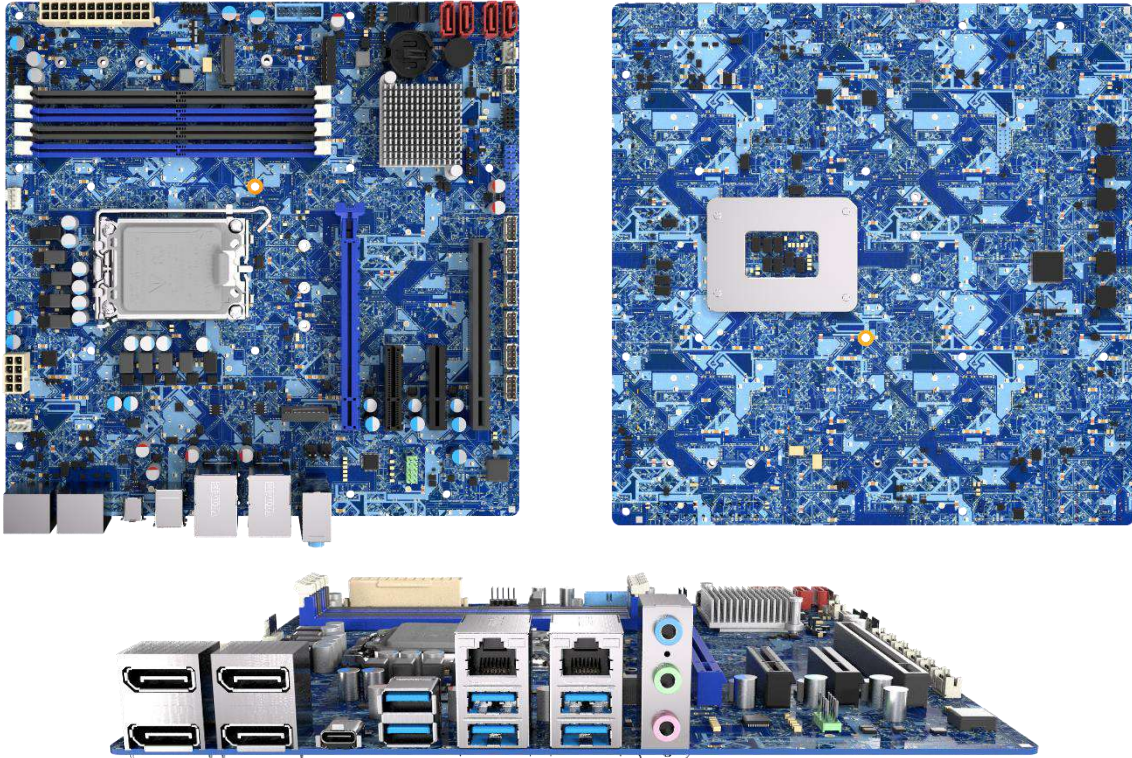
Model No.	Product Description
CT-MBL01	MicroATX Industrial Motherboard with LGA 1700 for Intel® Core™ Series 2/14th/13th/12th Gen Processors, Q670E PCH

Chapter 1

Product Introductions

1.1 Overview

Powered by Intel® Core™ processors, the CT-MBL01 features a hybrid architecture that balances performance and efficiency for edge computing.



Key Features

- Support Intel® Core™ Series 2/14th/13th/12th Gen Processors
- Intel® Q670E chipset
- 4x DDR5 4400 MT/s UDIMM, up to 128GB
- 1x 1GbE, 1x 2.5GbE (Support Wake-on-LAN and PXE)
- 4 independent display supported DP++
- 1x PCIe x16 (Gen 5), 2x PCIe x4 (Gen4, Gen3), 1x PCIe x16 (Gen 4)
- 2x M.2 (M Key, NVMe PCIe x4, SATA, 2242/2260/2280);
1x M.2 (E Key, PCIe x2, USB 2.0, 2230)
- 6x RS-232/422/485, 2x USB 3.0 Gen 1, 4x USB 2.0 Internal header, 6x USB 3.1
- 4x SATA 6.0Gb/s
- TPM 2.0

1.2 Hardware Specification

System	
Intel® Core™ Series 2 (Bartlett Lake-S) and 12 th /13 th /14 th Gen Intel® Core™ i9/i7/i5/i3 processors (LGA1700, up to 65W TDP)	
System Chipset	Intel® Q670E Chipset
LAN Chipset	GbE1: Intel® I226LM, 1GbE (Support Wake-on-LAN and PXE) GbE2: Intel® I226-V, 2.5GbE (Support Wake-on-LAN and PXE)
Audio Codec	Realtek ALC888S HD Audio Codec, support 5.1 channel
System Memory	4x DDR5 4400 MT/s UDIMM, up to 128GB
Graphics	Intel® Integrated Iris Xe Graphic (CPU Dependent)
BIOS	AMI uEFI 256MB SPI flash
Watchdog	Software Programmable Supports 1~255 sec. System Reset
iAMT	Intel® AMT 12.0 supported
TPM	TPM 2.0
Display	
DisplayPort	4x DP++ (4096 x 2304)
Multiple Display	Quad Display
Storage	
M.2	1x M.2 M/ NVMe PCIe x4 Gen 4/ 2242, 2260, 2280 1x M.2 M/ NVMe PCIe x4 Gen 4/ SATA/ 2242, 2260, 2280 1x M.2 E/ PCIe x2 Gen 3/ USB 2.0/ 2230
SATA	4x SATA
Expansion	
PCIe	1x PCIe x16 Slot (Gen 5) 1x PCIe x16 Slot (Gen 4, 4-Lane) 1x PCIe x4 Slot (Gen 4, Open End) 1x PCIe x4 Slot (Gen 3, Open End)
I/O	
Audio	1x Mic-in, 1x Line-in, 1x Line-out
USB	6x USB 3.1 Gen 2 (10 Gbps) 1x USB 3.2 Gen 2x2 (20 Gbps) Type C

Internal I/O

Audio	1x Front panel audio
COM	6x RS-232
DIO	1x 8-bit DIO (4-in/4-out)
SATA	4 x SATA Gen 3, support RAID 0/1/5/10)
USB	2x USB 3.0 Gen 1 4x USB 2.0
Others	1x SPI header 1x Front panel 1x CPU fan 2x System fan

Operating System

Windows	Windows 10/11 IoT Enterprise LTSC
Linux	Linux Kernel 5.X

Power

Power Adapter	ACPI 5.0 compliant
Power Mode	ATX Power
Power Connector	2x12-pin and 2x2-pin power connector

Mechanical & Environment

Form Factor	MicroATX
Operating Temperature	0 °C to 60 °C
Storage Temperature	-40 °C to 85 °C
Relative Humidity	10% ~ 90% relative humidity, non-condensing
Certification	CE, FCC Class B

Physical

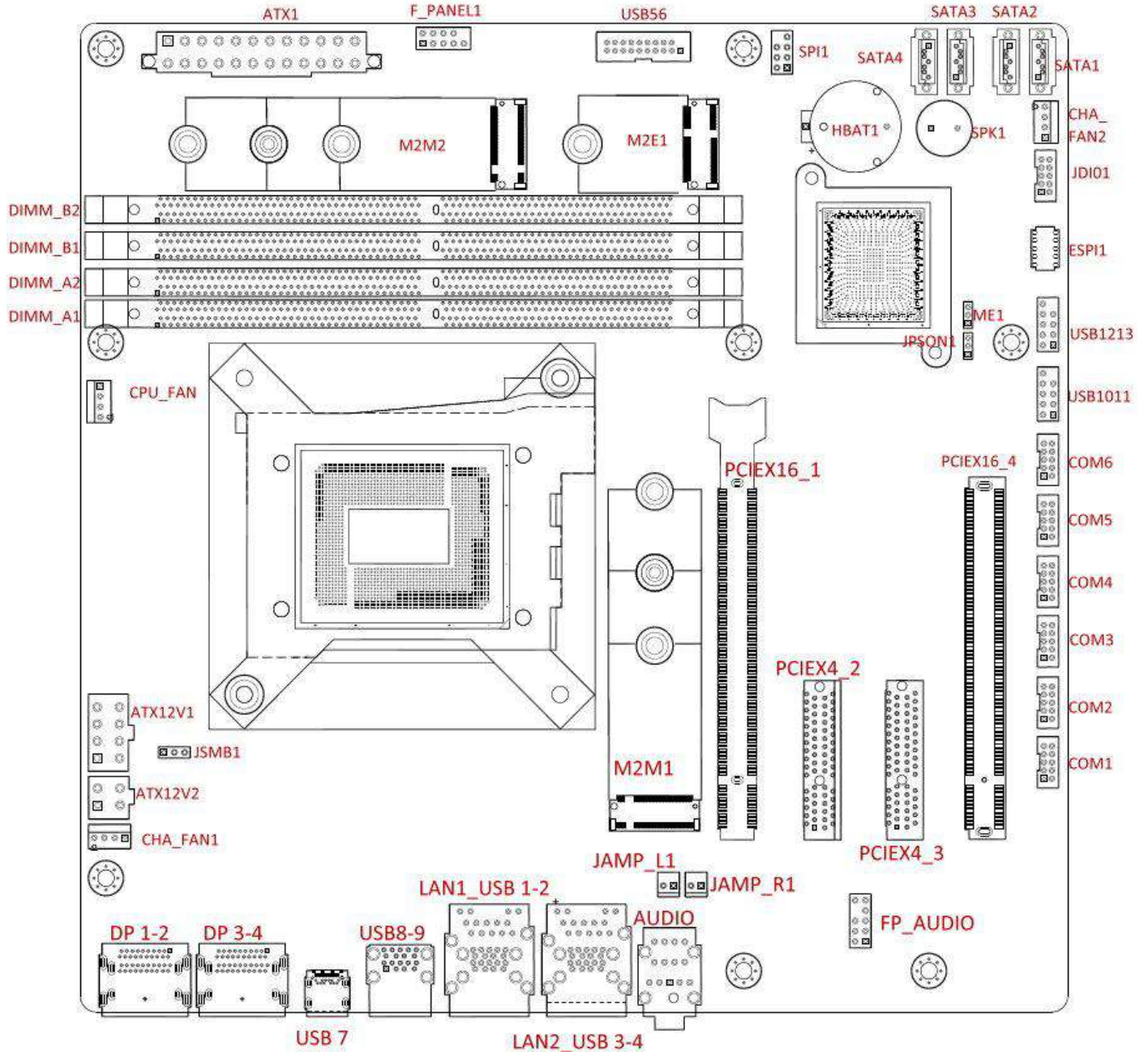
Dimensions	244mm x 244mm
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Chapter 2

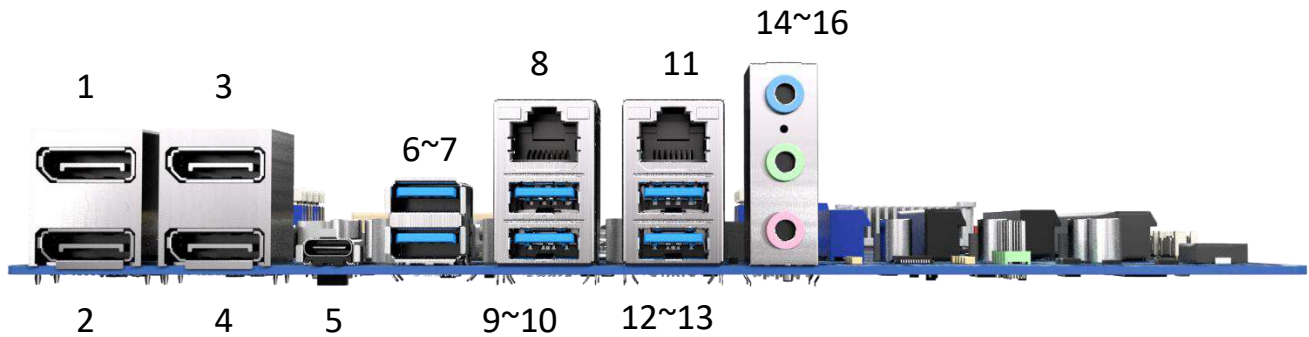
Switches and Connectors

2.1 Motherboard Layout

2.1.1 Top View



2.1.2 Back Panel Connectors



External IO Connector

Item	Definition	Remarks
1	DP1	
2	DP2	
3	DP3	
4	DP4	
5	USB3.2 Gen2x2 Type-C	(USB only)
6~7	USB3.2 Gen2x1 Port9 (lower), port 10 (upper)	
8	NIC Port 1	
9~10	USB3.2 Gen2x1 Port 2 (lower), port 1 (upper)	
11	NIC Port 2	
12~13	USB3.2 Gen2x1 Port 4 (lower), port 3 (upper)	
14~16	Line-In, Line-Out Port, MIC-In Port (lower)	

2.2 Definition of Connectors

2.2.1 Clear CMOS (JCMOS1)

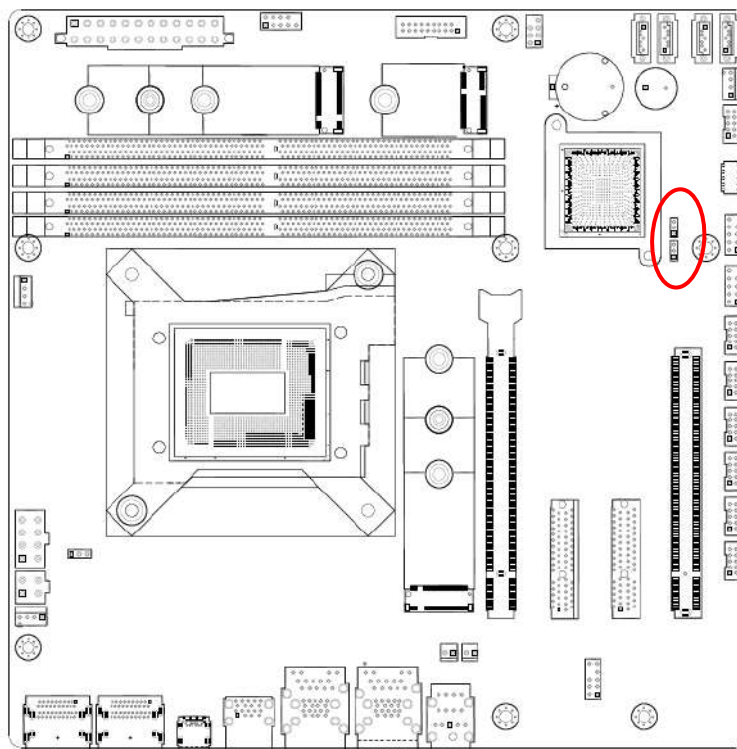
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

To erase the RTC RAM:

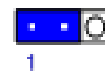
1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter data.



Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



Normal (Default)



1

Clear CMOS



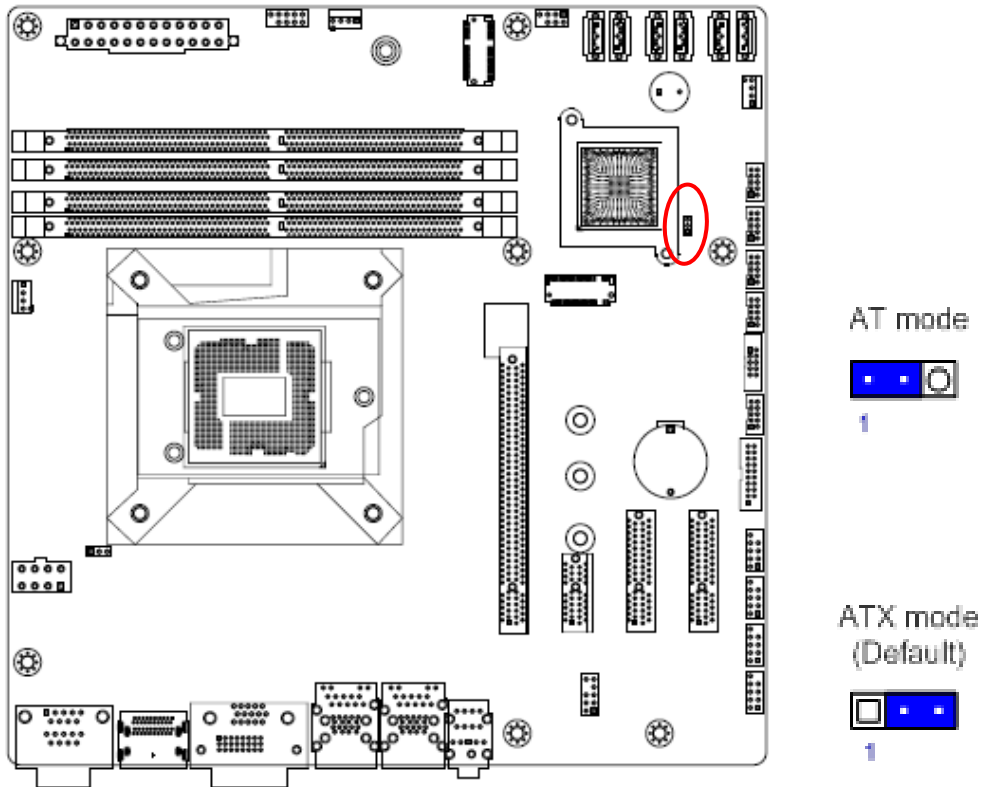
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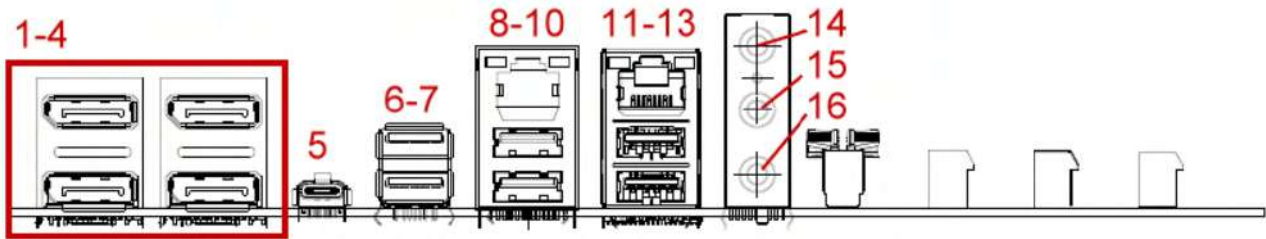
You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

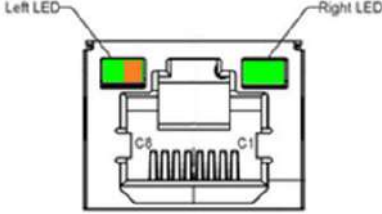
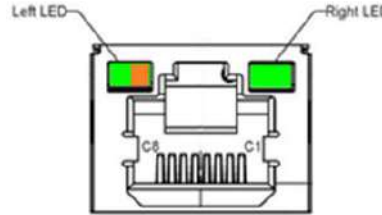
2.2.2 AT/ATX Power Mode Select (JPSON1)

This jumper allows you to select ATX Mode or AT mode



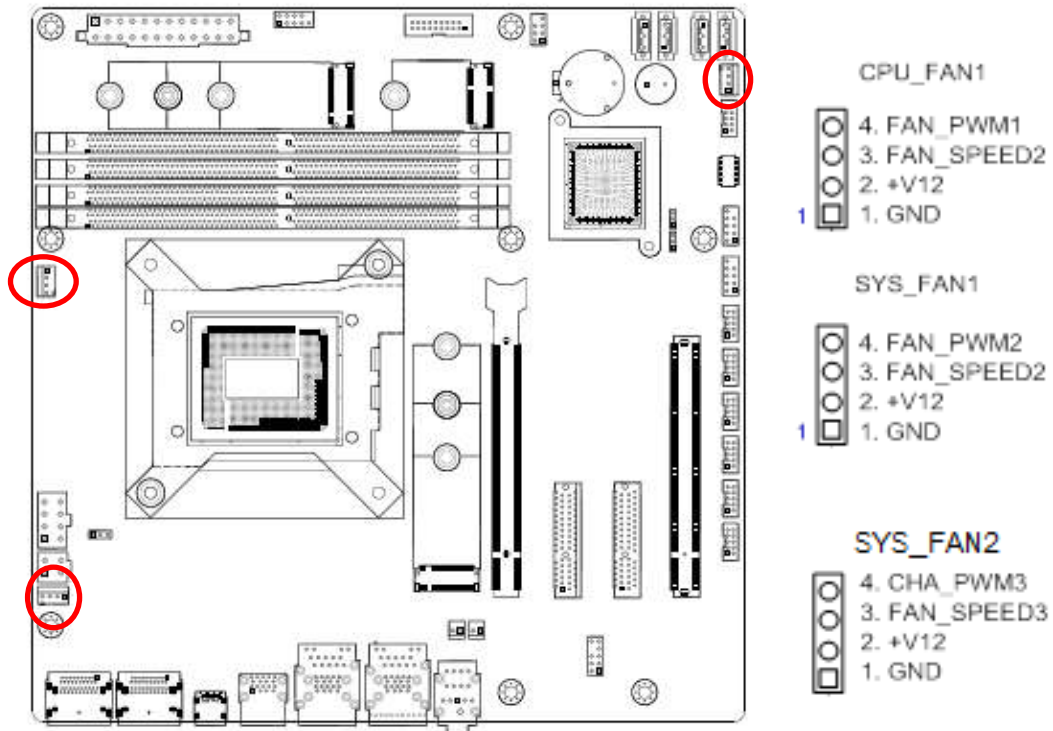
2.2.3 Rear panel connectors



Item	Name	Function	Description
1-4	DP1-4	Display Port	The DP port connector
5	USB-C	USB 3.2 Gen 2x2	Type-C Connector (Optional)
6-7	USB	USB 3.1 Gen 2x1	Type-A Connectors
8	LAN1	Gigabit LAN (RJ-45) Connectors	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. 
9-10	USB1-2	USB 3.1 Gen2	Two port USB3.1 Gen2 Connectors
11	LAN2	Gigabit LAN (RJ-45) Connectors	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. 
12-13	USB3-4	USB 3.1 Gen2	Two port USB3.1 Gen2 Connectors
14	AUDIO1	Line-in port (Light blue)	This port connects a tape, CD, DVD player, or other audio sources.
15	AUDIO1	Line-out port (Lime)	This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.
16	AUDIO1	Microphone port (Pink)	This port connects a microphone.

2.2.4 CPU and System fan connectors (CPU_FAN1, SYS_FAN1, SYS_FAN2)

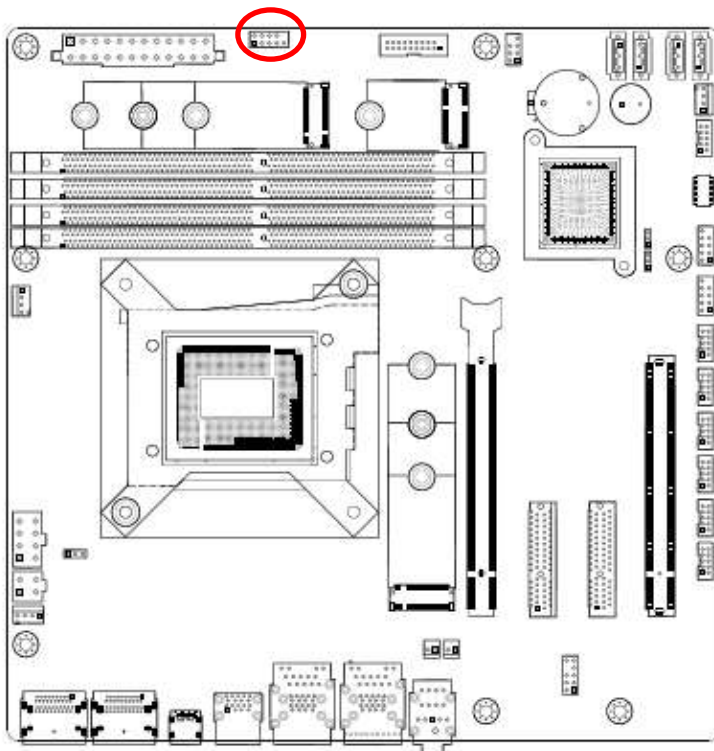
The fan connectors support cooling fans of 280mA (3.36 W max.) at 4800rpm or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.



Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! **DO NOT** place jumper caps on the fan connectors.

2.2.5 System Panel (F_PANEL1)

This connector is for a chassis-mounted front panel. The functions are as following.



1.Key	2.NC↵
3.GND	4.FP_RESET#↵
5.PANSWIN#	6.GND↵
7.SUP_LED	8.HDD_Act_LED↵
9.PWR_LED	10.HDD_PWR_LED↵

● ATX Power Button/Soft-off Button (Pin 3-5)

This 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch and holding it for more than four seconds while the system is ON turns the system OFF.

● Reset Button (Pin 4-6)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

● Power LED (Pin 7-9)

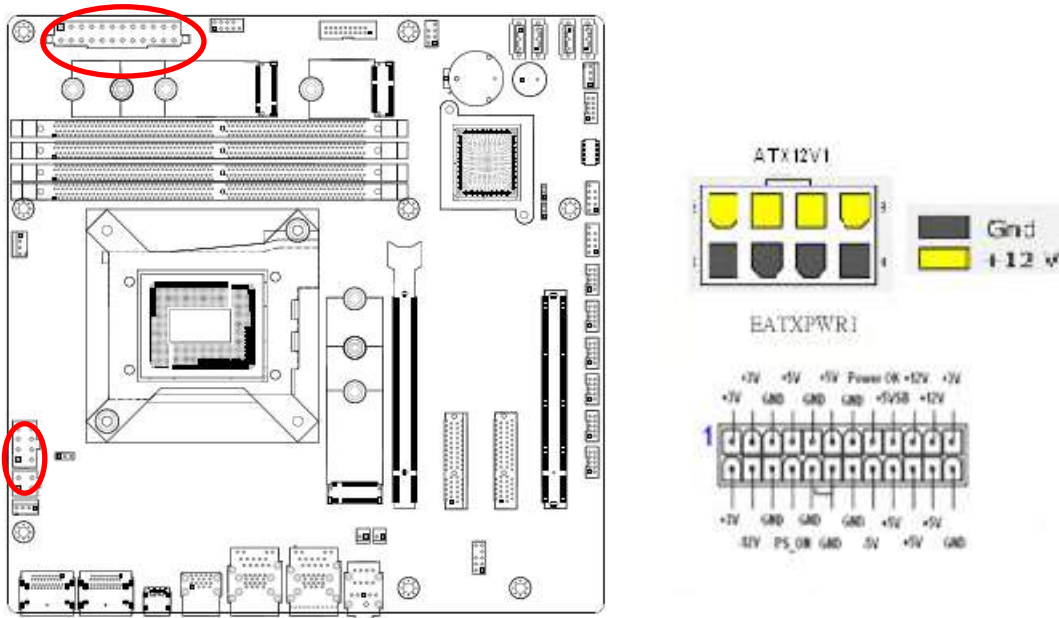
This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

● Hard Disk Drive Activity LED (Pin 8-10)

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

2.2.6 ATX power connectors (EATXPWR1 & ATX12V1)

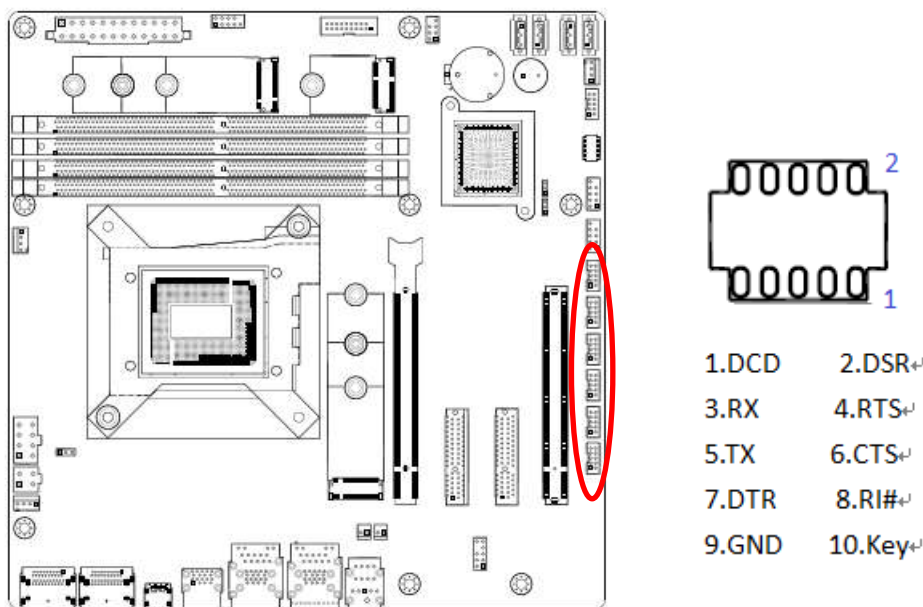
The connector is for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.



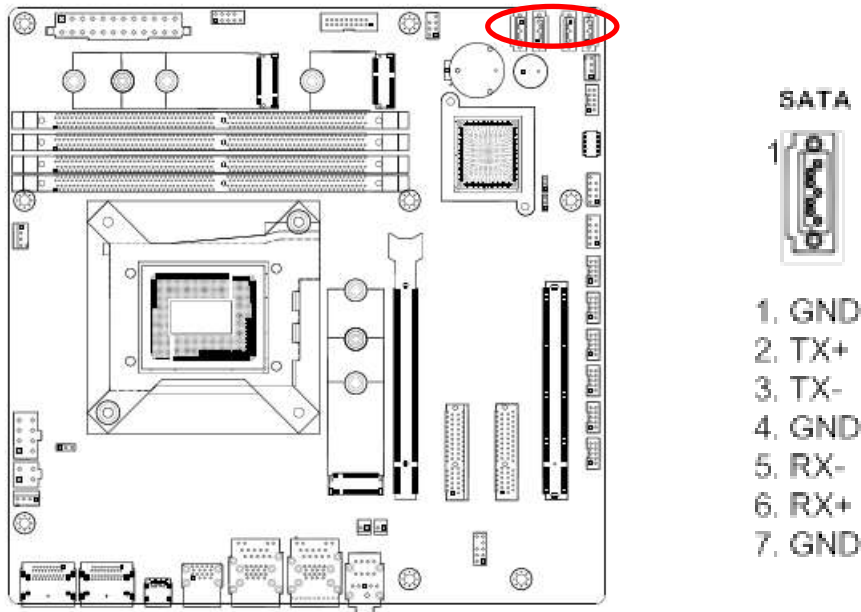
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.

2.2.7 Serial Port connectors (COM3~6)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.

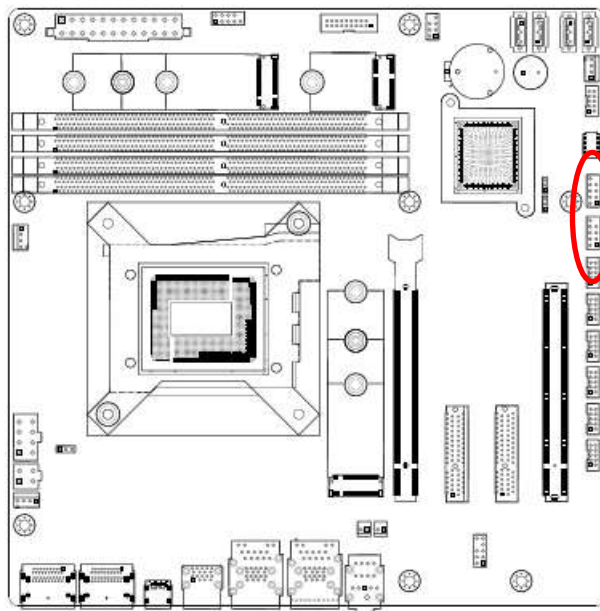


2.2.8 Serial ATA Connector (SATA1~4)



2.2.9 USB Connectors (USB10~13)

These connectors are for USB 2.0 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



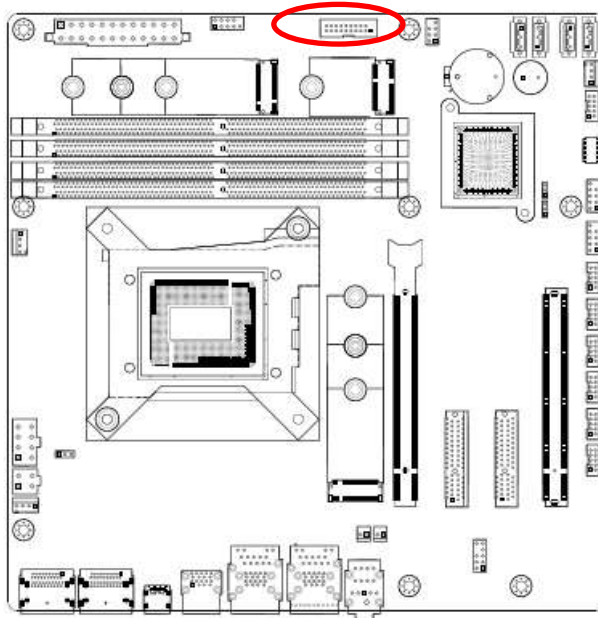
Never connect a 1394 cable to the USB connectors.
Doing so will damage the motherboard!



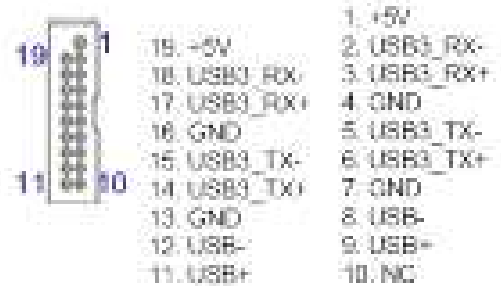
The USB module is purchased separately.

2.2.10 USB3.1 Connector (USB5-6)

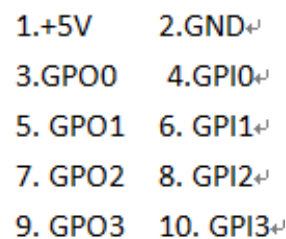
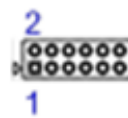
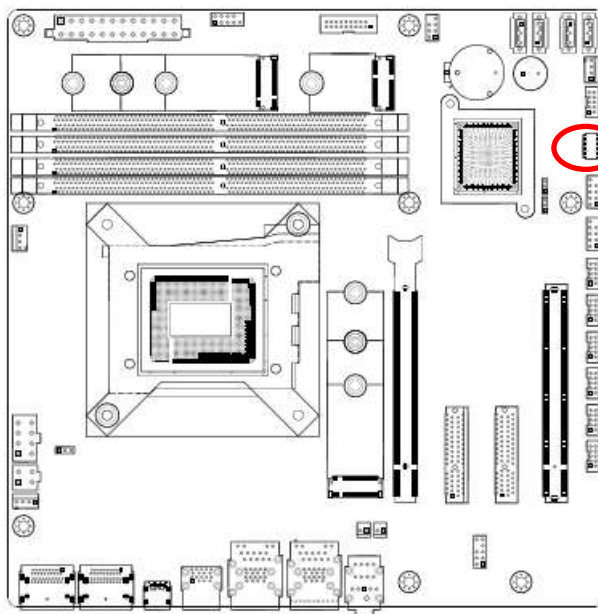
This connector provides 2 port USB3.1 Gen1 port. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 3.1 Gen1 specification that supports up to 5Gbps connection speed.



USB56

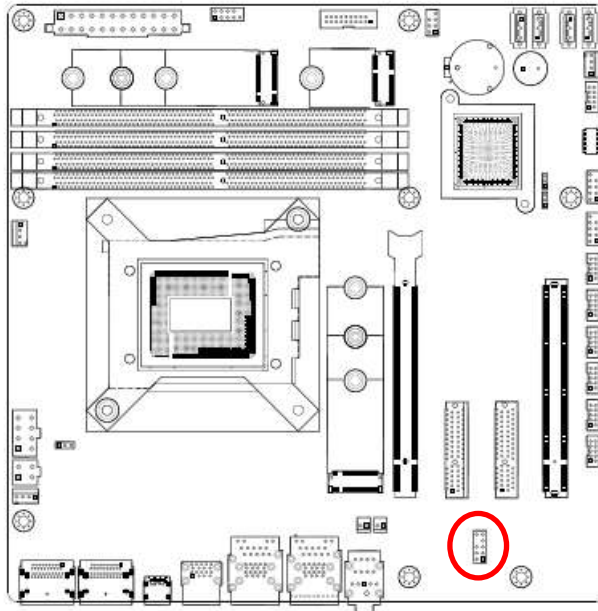


2.2.11 8 bit GPIO Header (JDIO1)

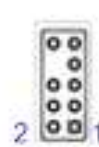


2.2.12 Front Audio Connector (FP_AUDIO1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC '97 (optional) audio standard.



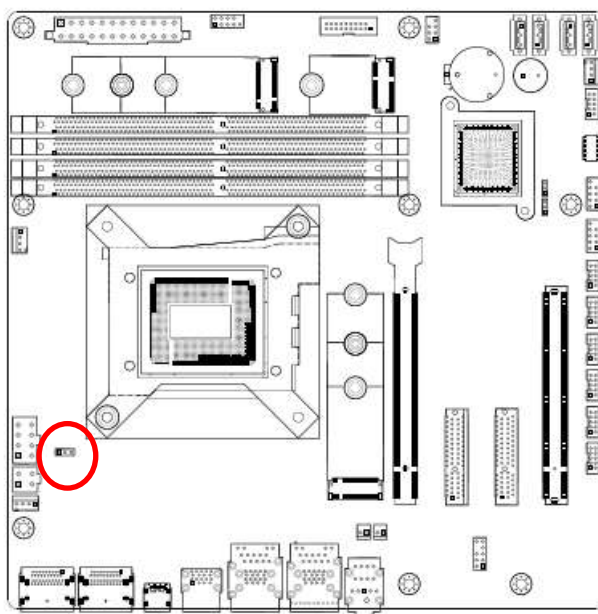
FP_AUDIO1



- | | |
|--------------|-----------|
| 10. LINE2-JD | 9. LINE2L |
| 8. NC | 7. SENSEB |
| 6. MIC2-JD | 5. LINE2R |
| 4. +3.3 | 3. MIC2R |
| 2. GND | 1. MIC2L |

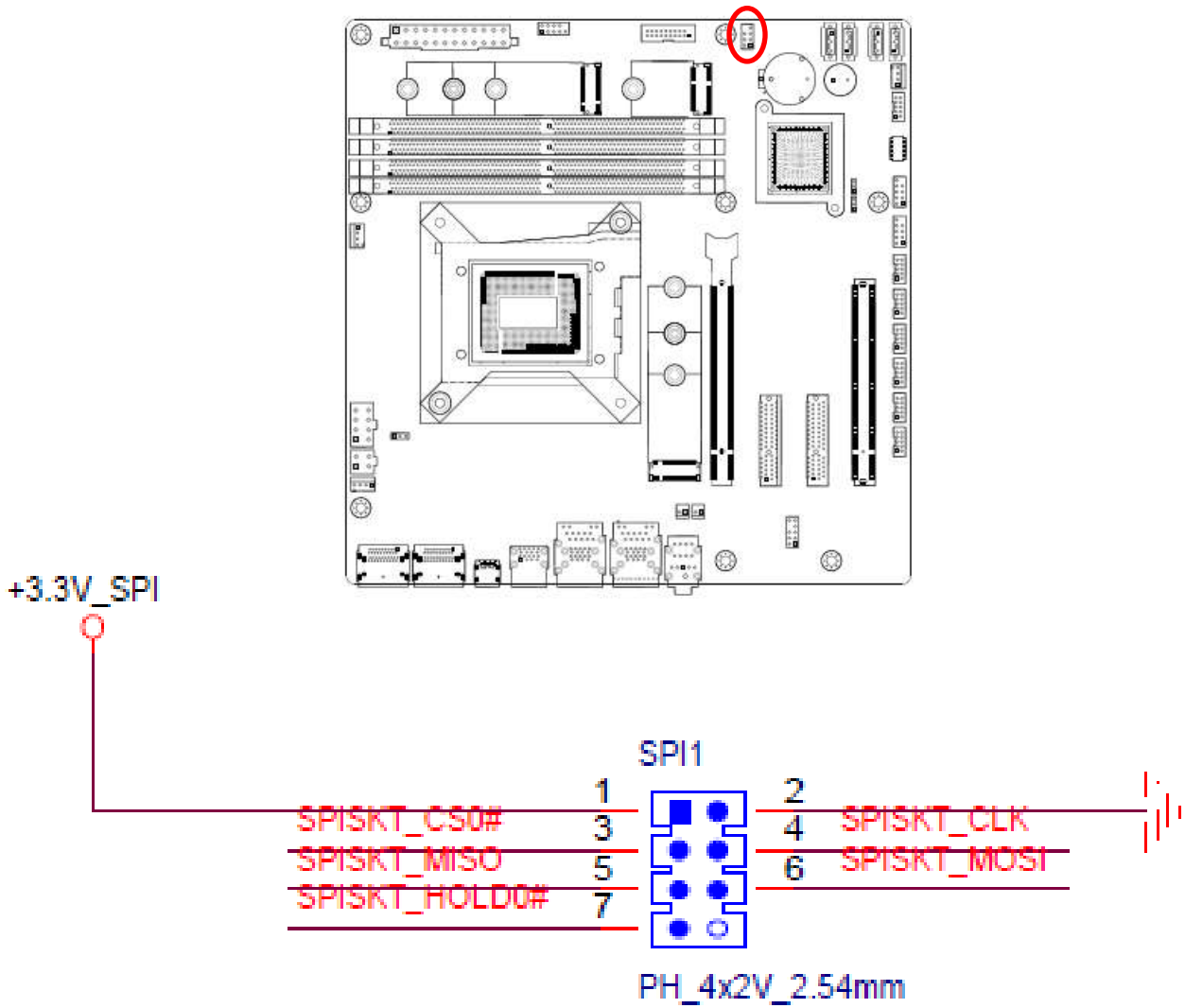
2.2.13 SM Bus Connector (JSMB1)

For RD develop use only.



- 1. SMBCLK
- 2. SMBDATA
- 3. GND

2.2.14 SPI Connector (SPI1)



Chapter 3

BIOS Setup

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

3.1 General Features

General Features		
Item	Description	Remarks
BIOS Sign On	**** CT-MBL01 BIOS VX. XX (MM/DD/YYYY) ****	
Boot Block	<p>BIOS Boot Block function support When BIOS is crash, BIOS can be recovered according below steps.</p> <ol style="list-style-type: none"> 1. Put the original BIOS file in the USB disk, and install the USB disk into the system. 2. Boot the system, and system will boot to recovery page. 3. Choose recovery item to start BIOS recovery action. 4. BIOS recover name is "BIOS.BIN". 	This feature is used to update a BIOS image without the need to boot to an operating system
Flash Utility	BIOS update through Flash utility in UEFI	
Onboard Devices Control	Enable/Disable onboard devices (VGA, NIC, Audio, USB, SATA, and COM, LPT) with BIOS Setup options.	
System Info	System information (File name, BIOS release date, product name) display in BIOS Setup	
Debug mode	Support LPC 80 port for debug	
PLED	PLED S0:Light S3:Blinking Delay4s,S4,S5,DOS off :Dark for single color LED	
Clear CMOS	Show warning message and stop at post screen until press <F1> skip, or <ESC> enter setup.	

3.2 POST Error Beep Requirements

POST Error Beep Requirements		
Item	Description	Remarks
System	System is OK (After enable VGA at post)	One short beep
Memory	System memory error/not installed.	One long beep
VGA	Graphics card error/not installed graphics card	Five long beeps then still boot
USB	When plug device in USB port or plug out.	One short beep
Boot Block	When run boot block.	Two short beep

3.3 BIOS Hotkey Requirements

The table below lists the BIOS hotkey requirements.

BIOS Hotkey Requirements	
	Hot Key
Enter BIOS Setup	DEL / ESC

3.4 South Bridge Features

POST Error Beep Requirements		
Item	Description	Remarks
PCI Express	<ul style="list-style-type: none"> • PCIE LAN by root port control enable/disable. • PCIE RAID, LAN onboard devices must included option ROM and add control item in BIOS 	
SATA & RAID	<ul style="list-style-type: none"> • Supports RAID and AHCI configuration and can operate in both legacy and native modes. • Support over 2T capacity HDD. 	
PCI Bus Interface	<ul style="list-style-type: none"> • Onboard PCI LAN can enable/disable by BIOS. • PCI RAID, LAN onboard devices must included option ROM and add control item in BIOS 	
USB Interface	<ul style="list-style-type: none"> • Support USB 2.0 (High Speed) • Support USB 3.0 (Super High Speed) • Per-Port-Disable /Enable Capability • Support Keyboard/Mouse wake-up from sleeping S3/S4 by OS. • Support legacy Keyboard/Mouse software • Support legacy Keyboard Hot-Plug function • Support maximal 8 USB devices in Boot Option Priority. 	
Real-Time Clock	<ul style="list-style-type: none"> • System can be wake up from S5 by RTC. • User can set day and time to active RTC function. • RTC time can't be clear when short RTCRST# • RTC works even power has been loss. 	

3.5 ACPI function

Wake-up Devices and Events		
These devices/events can wake up the computer...	from this state	Remarks
PCIE LAN	S3, S4, S5	<ul style="list-style-type: none"> The LAN adapter monitors network traffic at the Media Independent Interface Supports LAN wake capabilities with ACPI by Ping or Magic Packet S3-S4 by OS S5 by BIOS item control
Intel GBE	S3, S4, S5	<ul style="list-style-type: none"> S3-S5 BIOS control.
PME# signal	S3, S4, S5	<ul style="list-style-type: none"> PME# signal on the PCI bus S3-S4 by OS control S5 by BIOS item control
Wake# signal	S3, S4, S5	<ul style="list-style-type: none"> WAKE# signal on the PCI Express bus S3-S4 by OS control S5 by BIOS item control
Power switch	S3, S4, S5	
RTC alarm	S5	
USB	S3, S4	<ul style="list-style-type: none"> Press any key or move can wake up system S3, S4 by OS control
Notes:		
<ul style="list-style-type: none"> Does not apply to shutdown system by delay 4 seconds. 		

Sleep Wake State Source	S1	S3	S4	S5
PCIE LAN	x	⊙	⊙	△
Gbe LAN	x	△	△	△
PME#/WAKE#	x	⊙	⊙	△
Power Button	x	⊙	⊙	⊙
RTC Alarm	x	x	x	△/⊙
USB	x	⊙	⊙	x

x : No Support. △ : Controlled by BIOS Item. ⊙ : Controlled by OS/Driver.

3.6 OEM full screen logo

BIOS support the following format OEM full screen logo and user can insert it by utility that provided from BIOS vendor.

BMP :800x600 24bits, JPEG:800x600 24bits, PCX:800x600 24bits

3.7 SuperIO Feature Support

SuperIO Feature Support		
Item	Description	Remarks
Serial Port	<ul style="list-style-type: none"> Each UART includes a 128-byte send/receive FIFO, a programmable baud rate generator, complete modem-control capability, and a processor interrupt system. The UART supports legacy speeds up to 115.2K bps as well as even higher baud rates of 460K, or 921K bps to support higher speed modems. Default COM1=3F8/IRQ4,COM2=2F8/IRQ3,COM3=3E8/IRQ5,COM4=2E8/IRQ 5,COM5=2E0/IRQ10,COM6=3E0/IRQ10 	
Case Open	<ul style="list-style-type: none"> The purpose of Case open function is used to detect whether the computer case is opened. This feature must be able to function even when there is no 3VSB power. Once the case is opened, the beep will be active at next boot. The buzzer works and show error message will stop at post screen by press Del until user disables the function in BIOS setup. 	
Watchdog	<ul style="list-style-type: none"> BIOS provide 0 to 255 seconds or minutes watchdog reset function. If user set to 0, it will disable watchdog function. If user writes any non-zero value to this register causes the counter to load this value into the Watchdog Timer counter and start counting down. System will be reset if Watch Dog Timer counts down to zero. 	
Brightness Control	<ul style="list-style-type: none"> BIOS provide DC output to control panel brightness. The brightest DC output generally. But it still dependent on hardware design or inverter of panel. 	
Smart Fan	<ul style="list-style-type: none"> BIOS provide CPU and System smart fan function for noise consideration. Depend on Super IO support Manual, Thermal Cruise, SMART FAN IV and Disable mode. 	

3.8 Boot Option

Boot Option		
Item	Description	Remarks
Setup Prompt Timeout	The item controls the delay time (in seconds) in the POST screen until user press DEL / ESC key to enter BIOS setup menu. The range for the value is from 1 to 65535.	
Quiet Boot	When Quiet Boot is Disabled, the BIOS information will be shown in the POST screen. When Quiet Boot is Enabled, the Black Logo will be shown in the POST screen.	

3.9 Trust Computing

Trust Computing		
Item	Description	Remarks
TCG/TPM Support	<ul style="list-style-type: none"> Support TPM/TCG 2.0 This is the main item to control whether the TPM function is supported or not. 	
Execute TPM Command	<ul style="list-style-type: none"> Activate or Deactivate command to TPM Three commands are supported, Don't Change, Enabled, and Disabled. 	
Clearing the TPM	<ul style="list-style-type: none"> Clearing the TPM is the process of returning the TPM to factory defaults. It is possible the platform owner will change when in this state. 	

3.10 BIOS Setup Menu

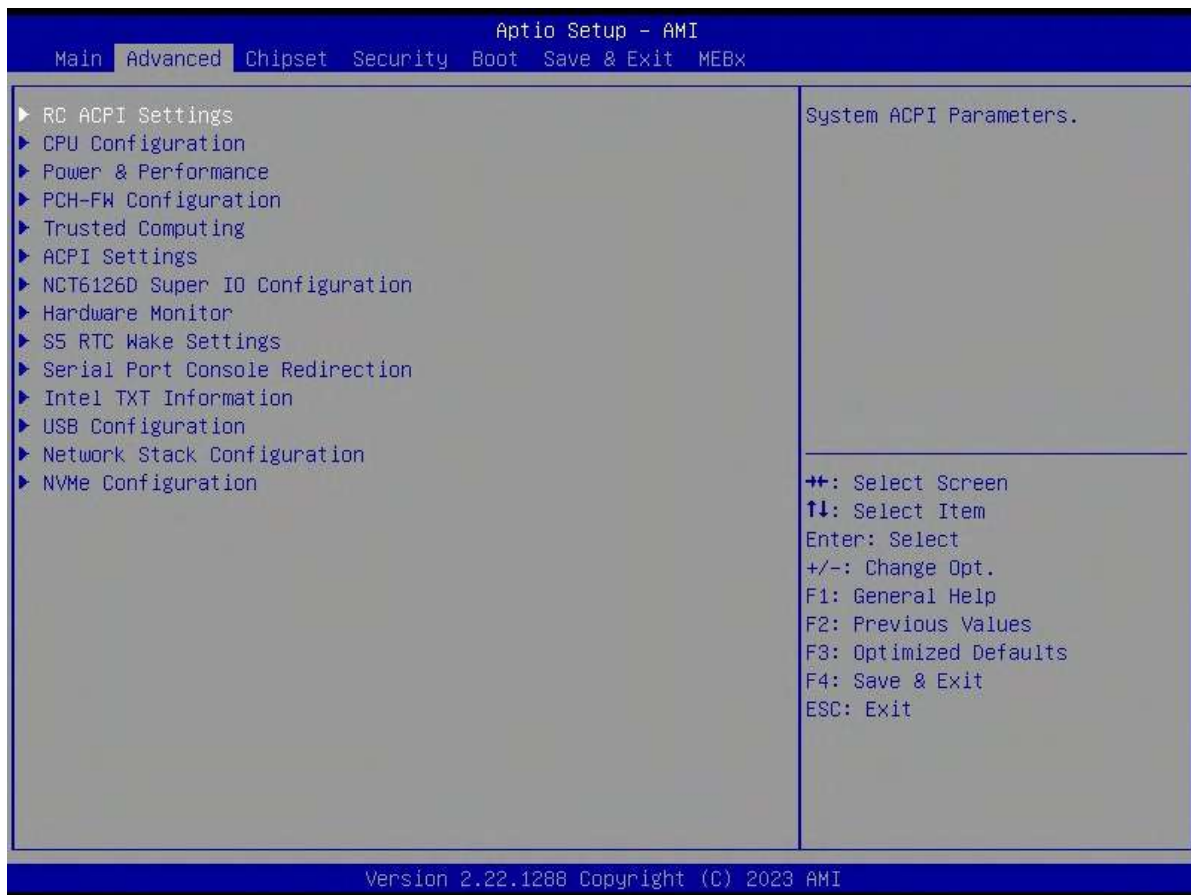
Title Menu

Setup Menu	Note
Main	
Advanced	
Chipset	
Security	
Boot	
Save & Exit	

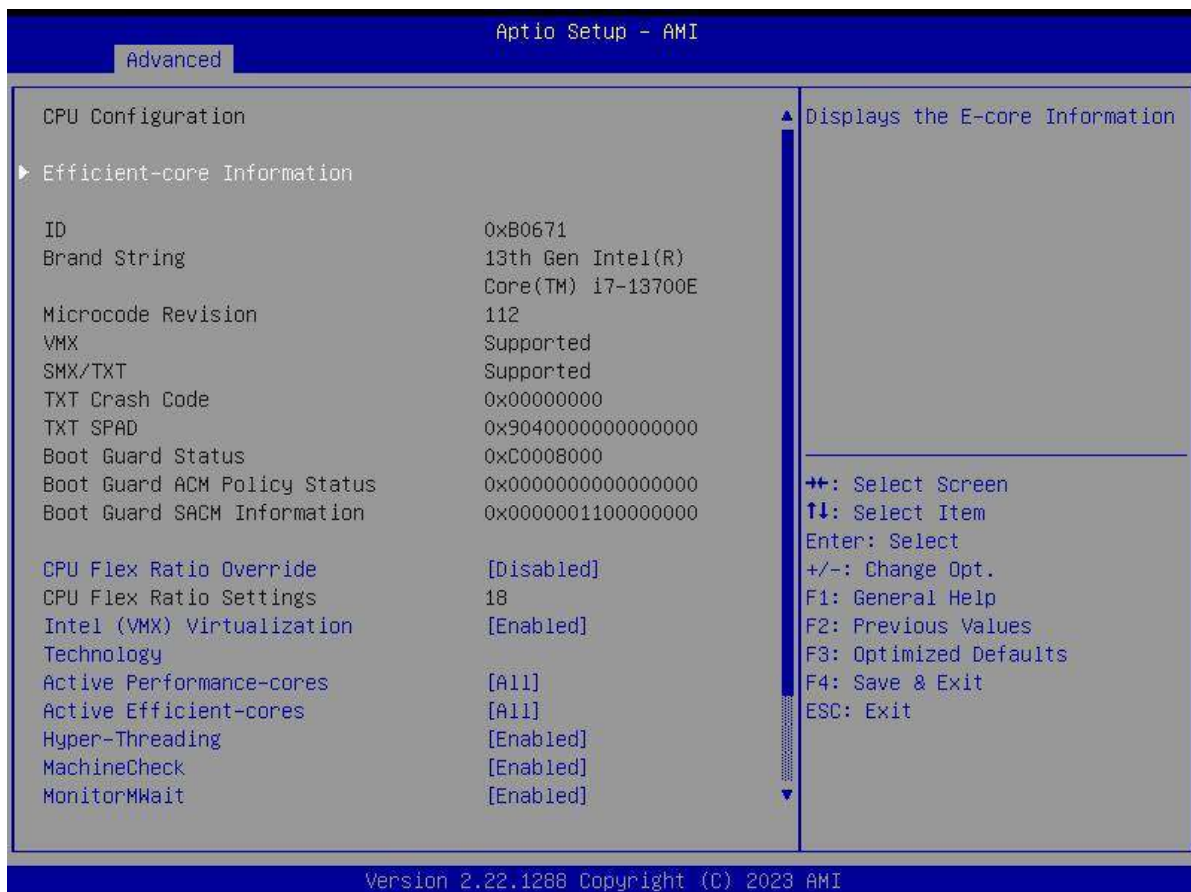
Main Menu



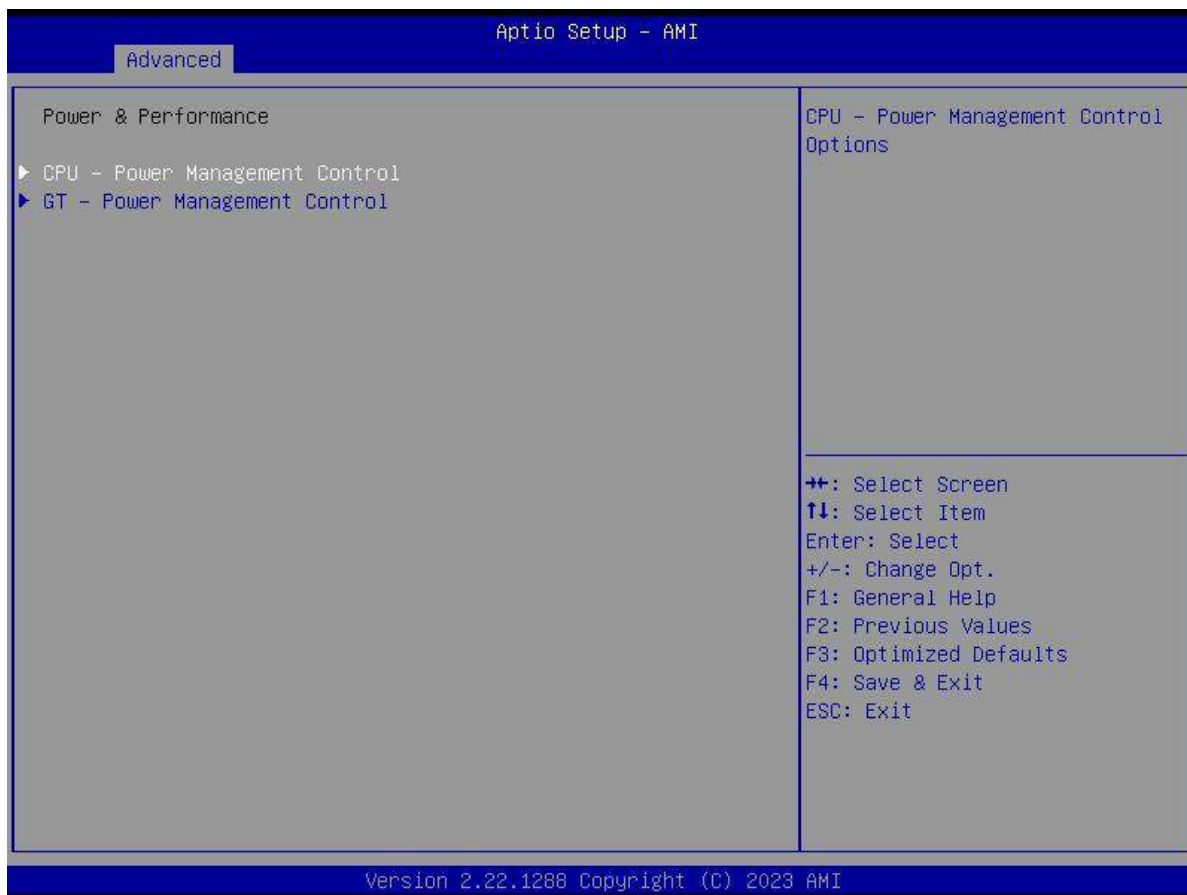
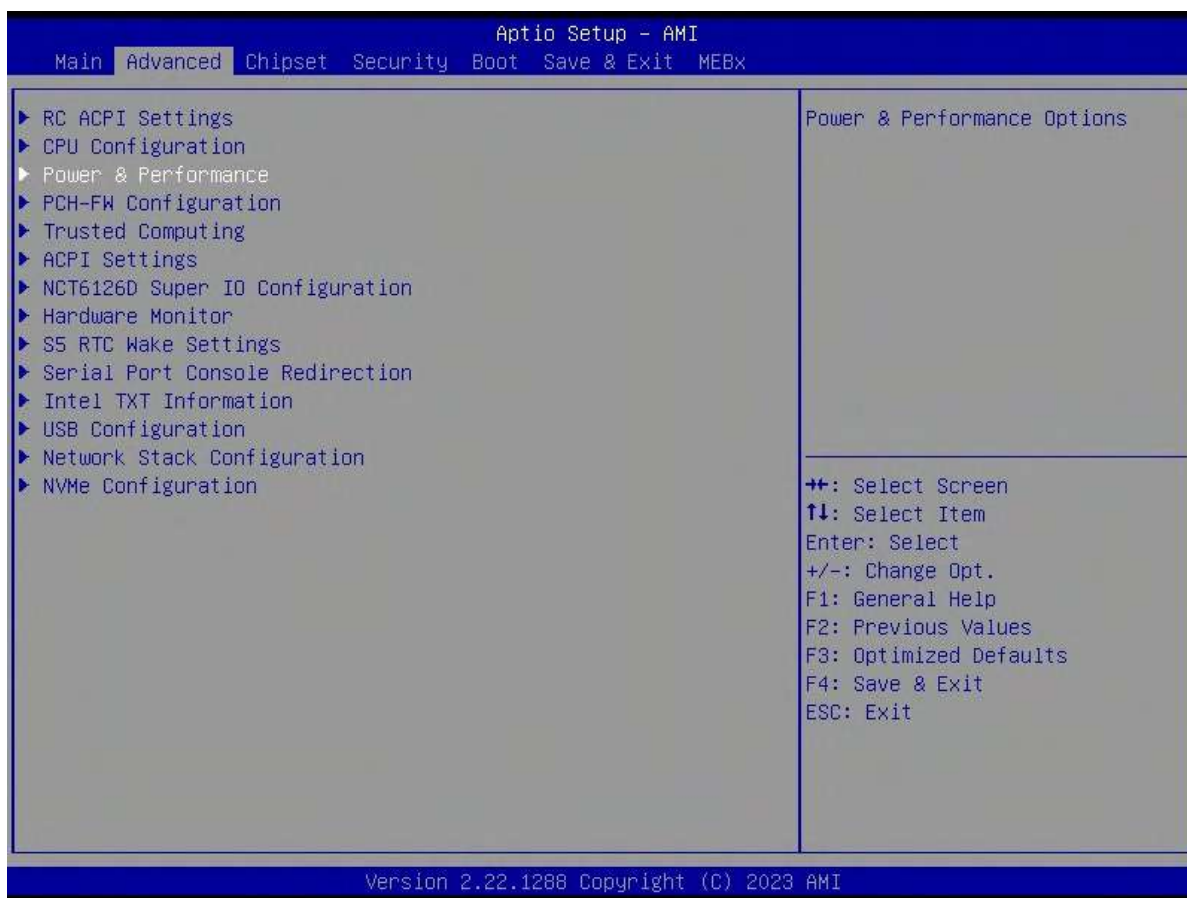
3.11 Advanced Menu

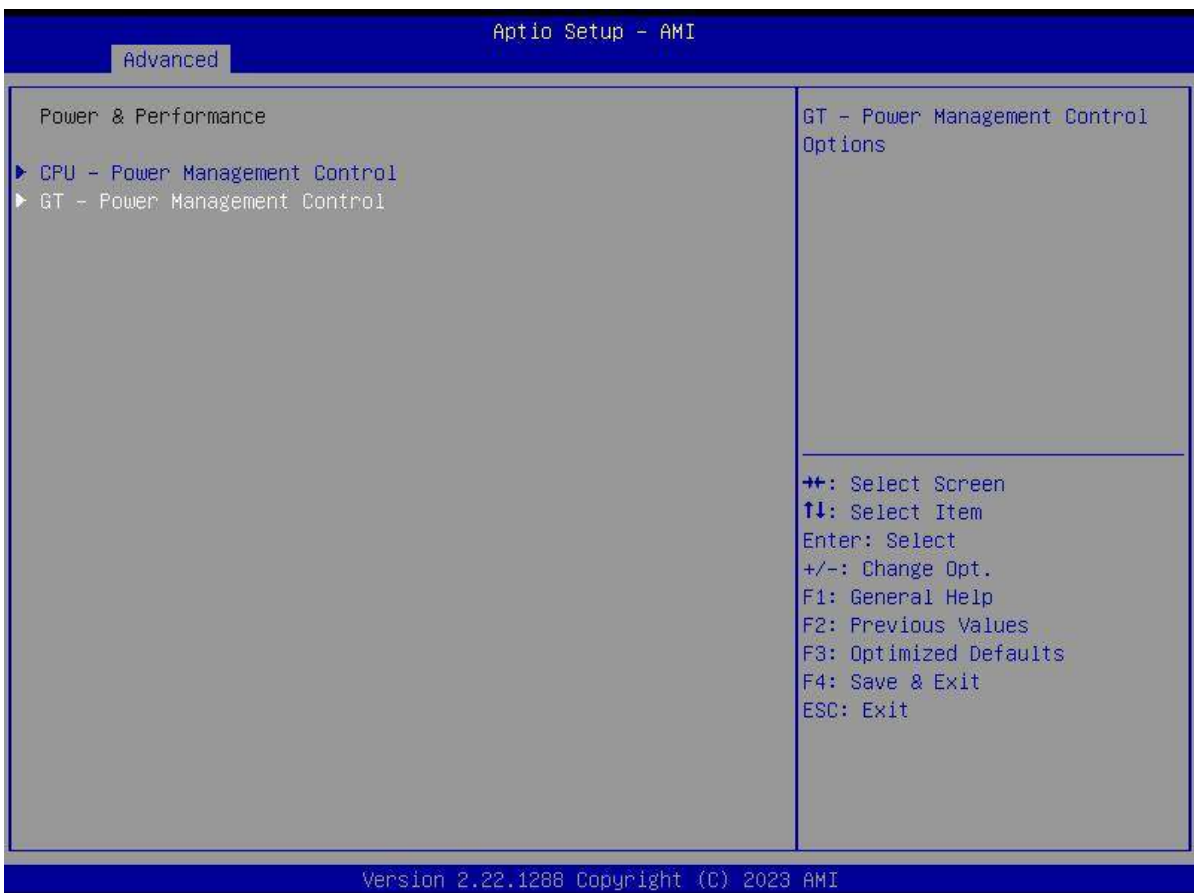


3.11.1 CPU Configuration



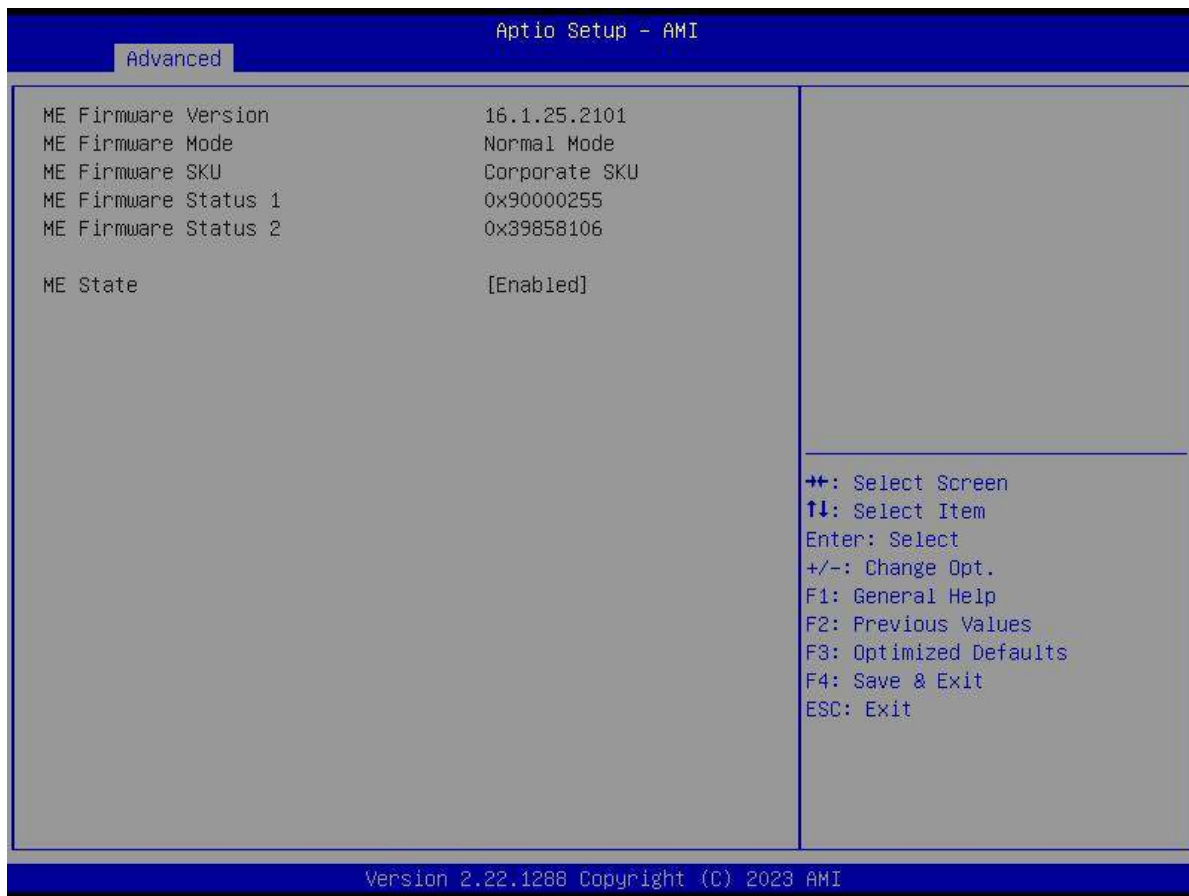
3.11.2 Power & Performance



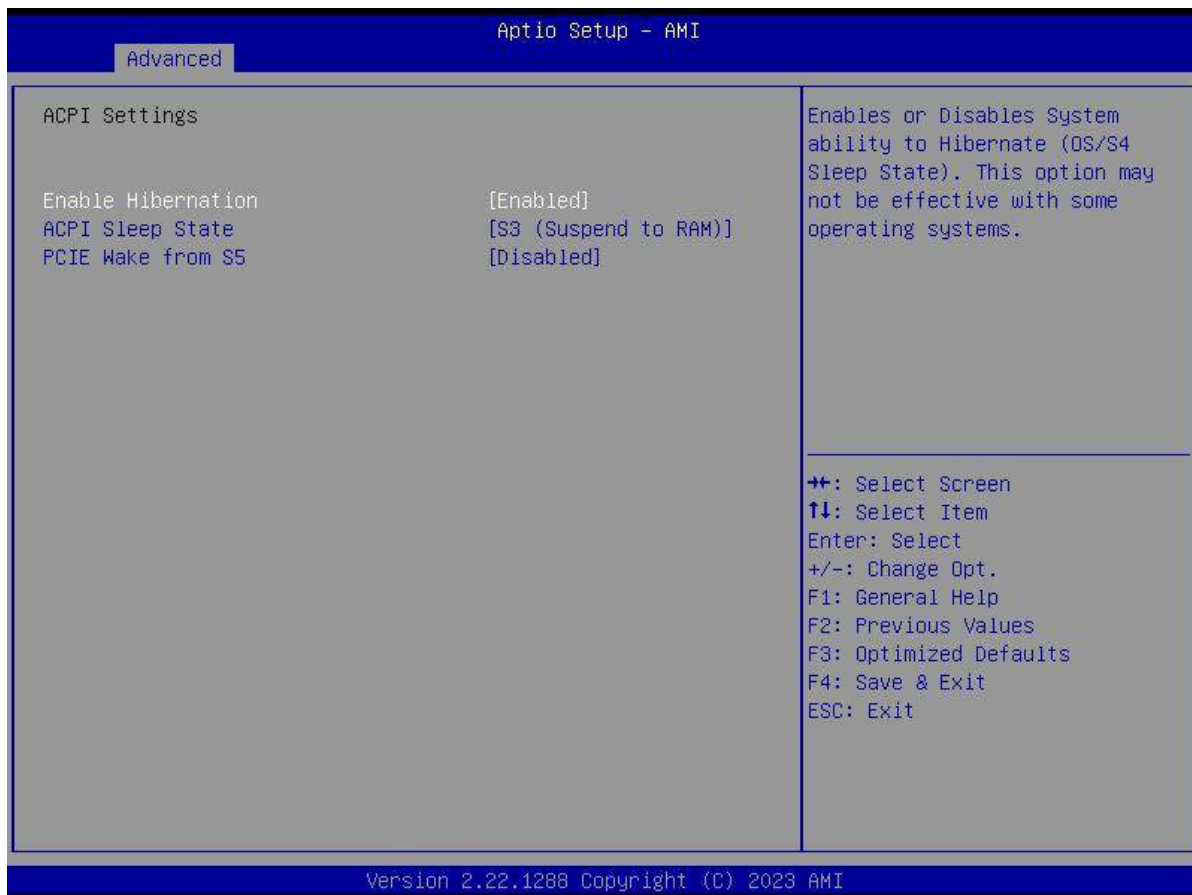




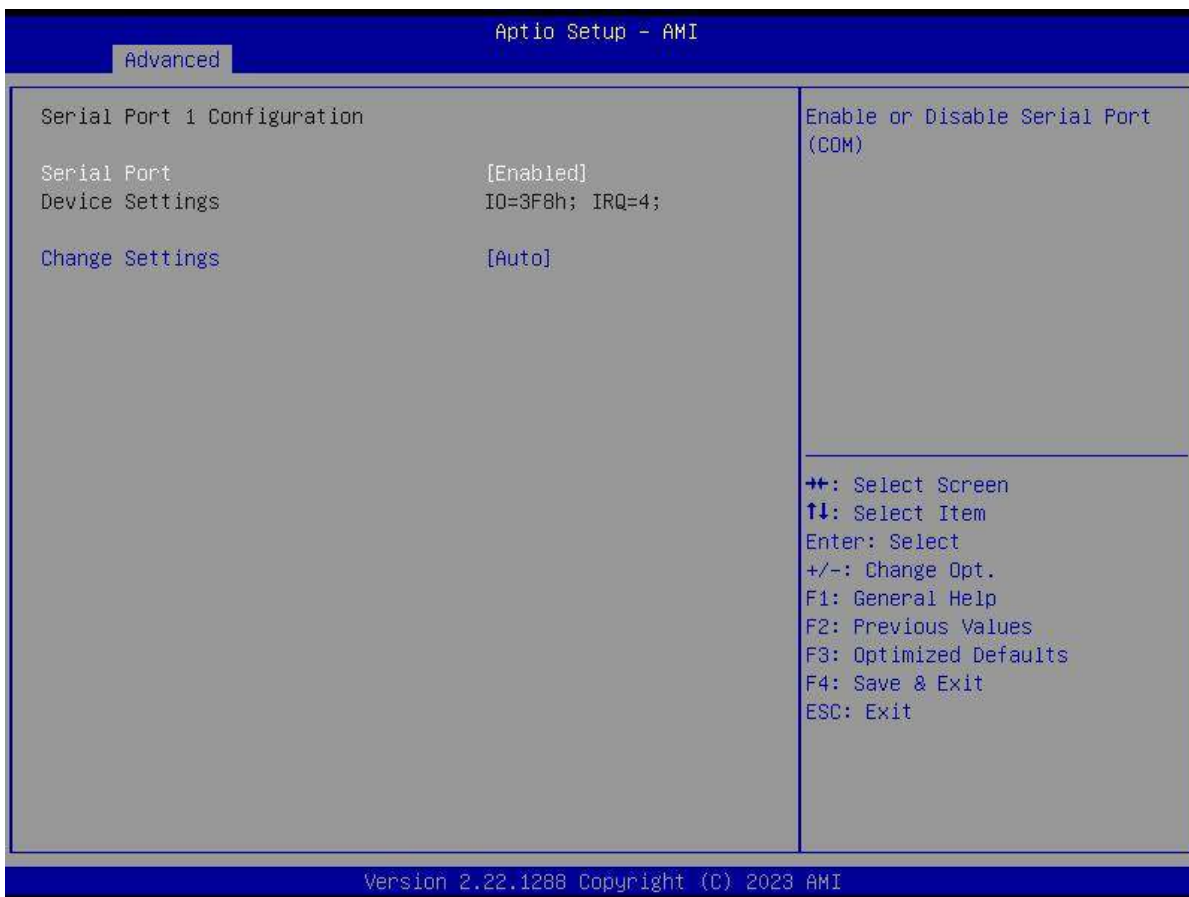
3.11.3 PCH-FW Configuration

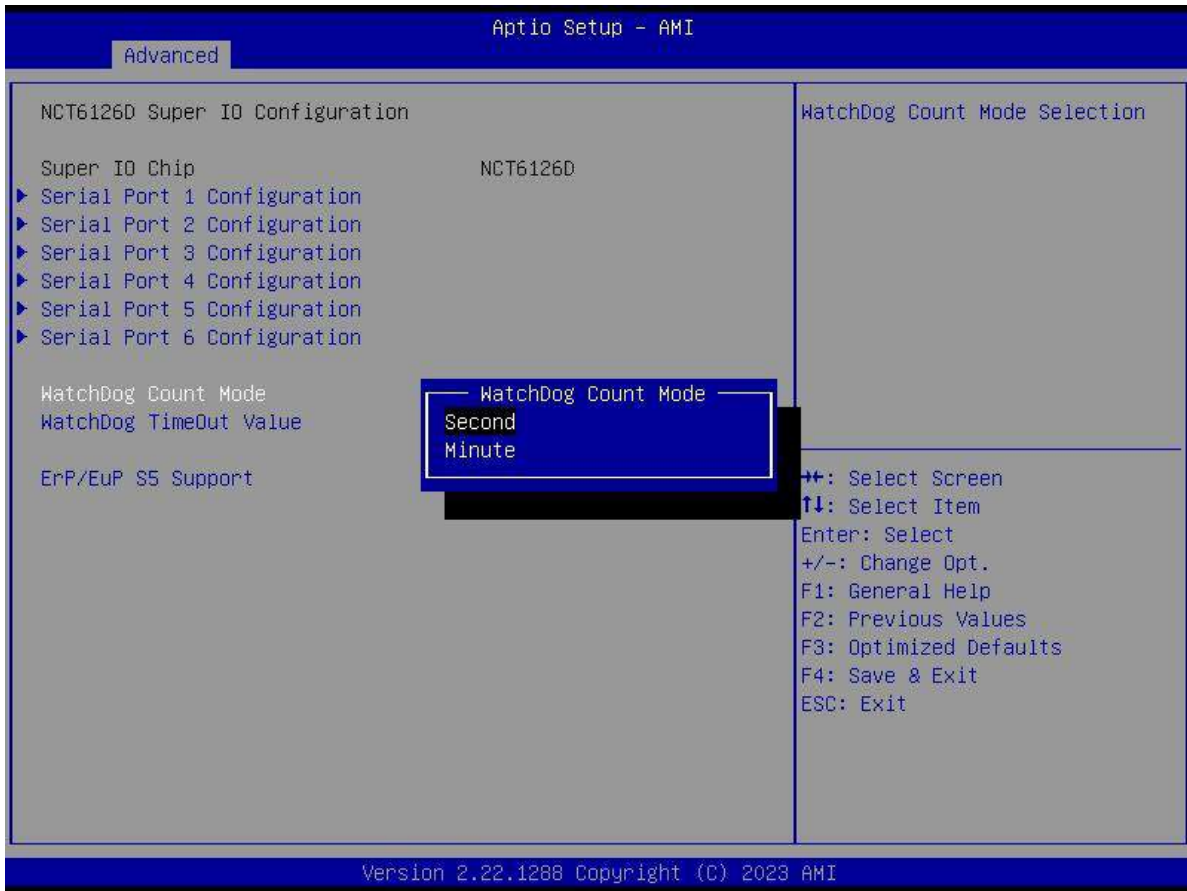


3.11.4 ACPI Settings



3.11.5 NCT6106D Super IO Configuration





3.11.6 NCT6106D HW Monitor

Aptio Setup - AMI

Advanced

PC Health Status ▶ Smart Fan CPU Temperature (PECI) : +35°C/ +95°F SYS Temperature : +29°C/ +84°F CHA_FAN1 Speed : 0 RPM CPU_FAN1 Speed : 1597 RPM CHA_FAN2 Speed : 0 RPM VCORE : +0.768 V +5VSB : +5.030 V +5V : +4.978 V +12V : +11.904 V 3VSB : +3.312 V 3VCC : +3.280 V VBAT : +3.120 V AVSB : +3.312 V	Smart Fan function page ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
---	---

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3.11.7 Trusted Computing

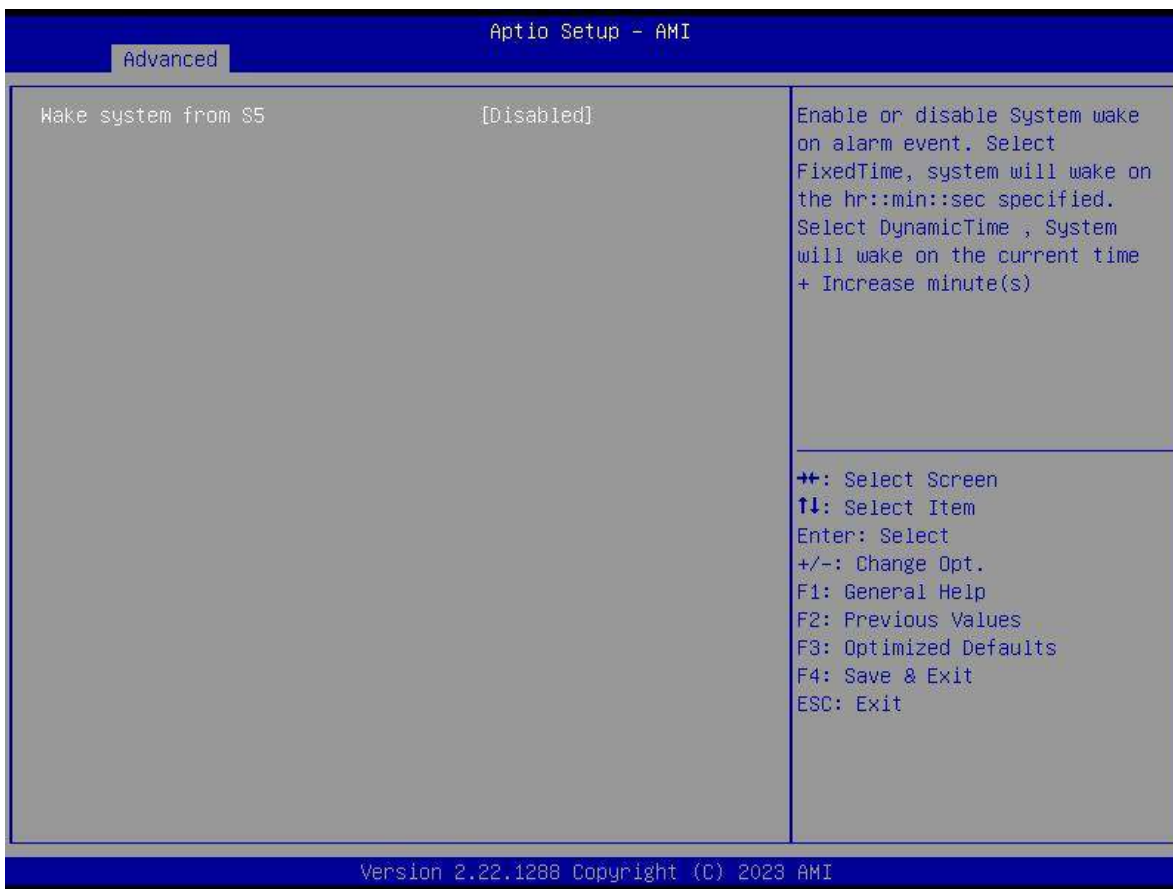
Aptio Setup - AMI

Advanced

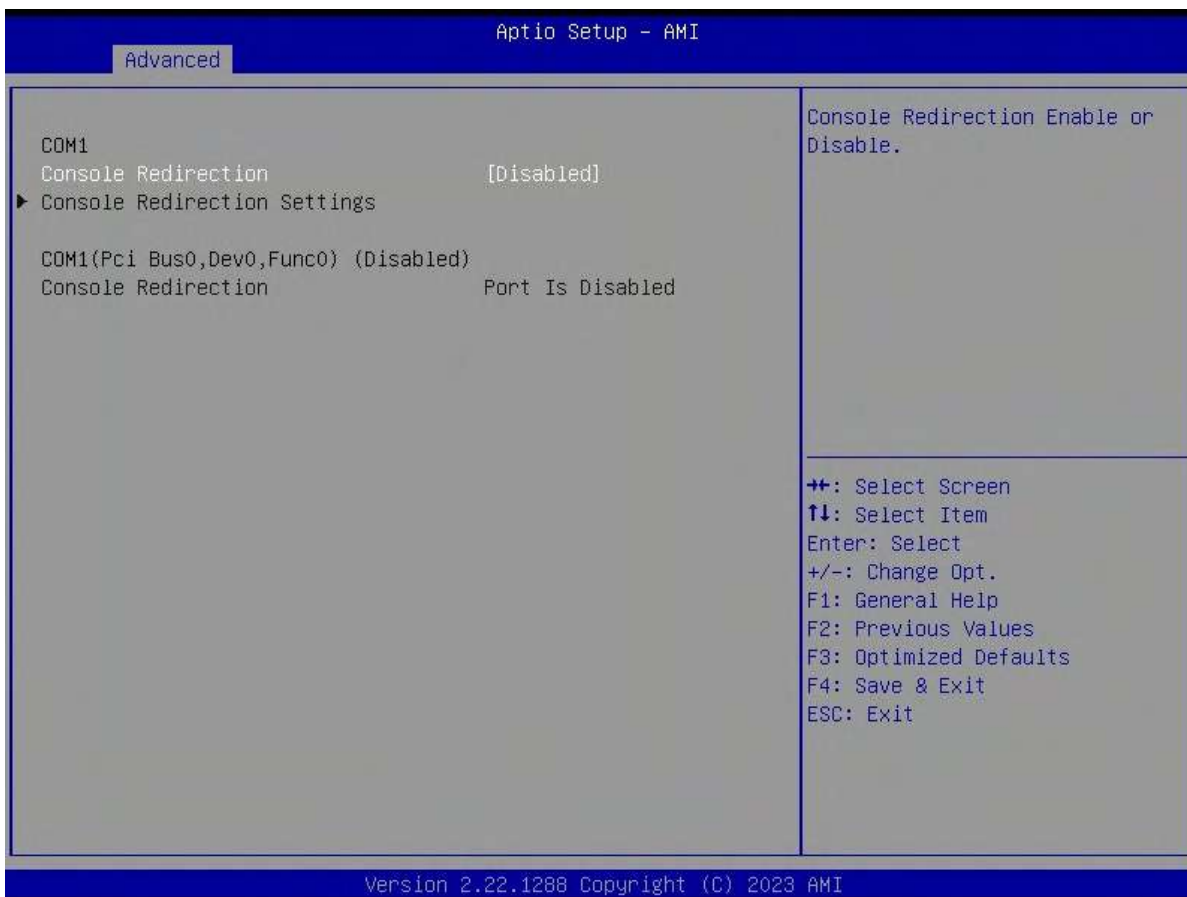
TPM Device Selection [dTPM] TPM 2.0 Device Found Firmware Version: 7.85 Vendor: IFX Security Device Support [Enable] Active PCR banks SHA256 Available PCR banks SHA256 SHA256 PCR Bank [Enabled] Pending operation [None] Platform Hierarchy [Enabled] Storage Hierarchy [Enabled] Endorsement Hierarchy [Enabled] Physical Presence Spec Version [1.3] TPM 2.0 InterfaceType [TIS]	Selects TPM device: fTPM or dTPM. fTPM - Enables fTPM. dTPM - Disables fTPM and Enable dTPM. Warning ! fTPM/dTPM will be disabled and all data saved on it will be lost. ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
---	--

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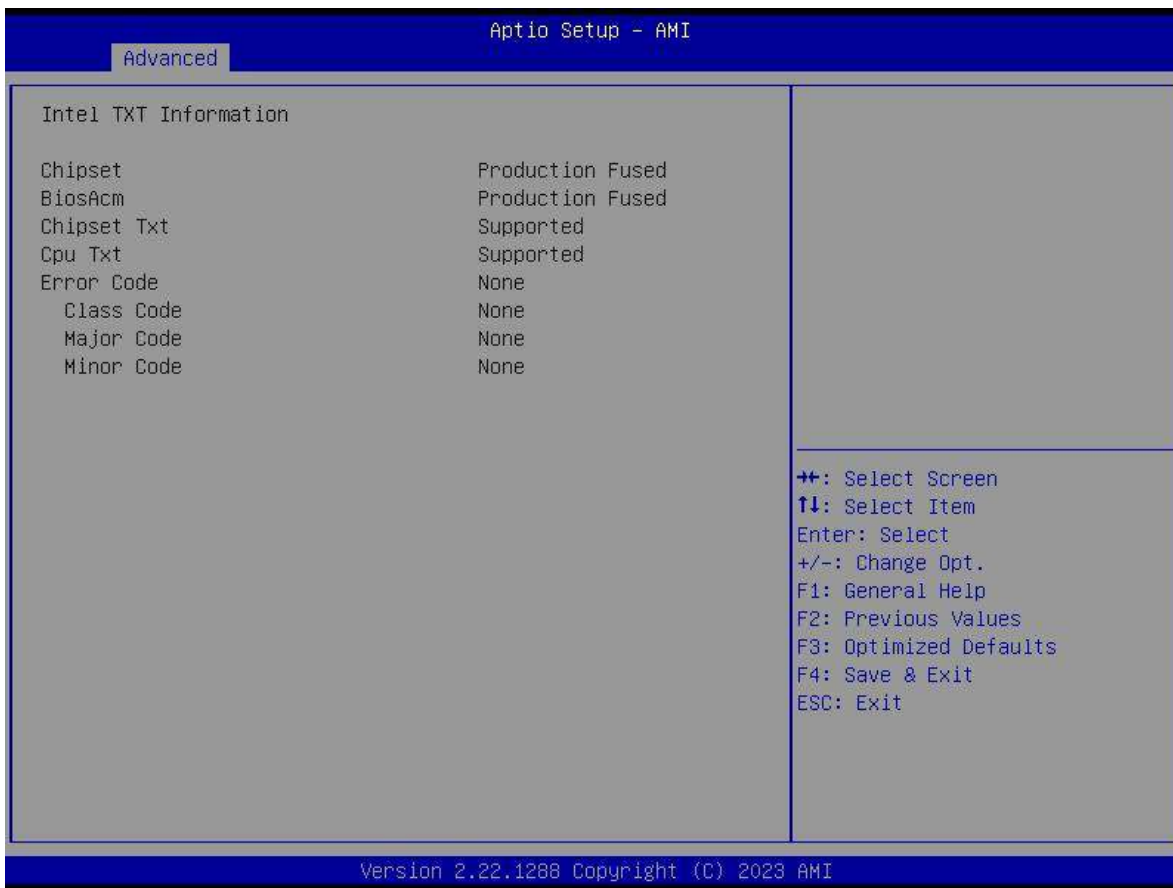
3.11.8 S5 RTC Wake Setting



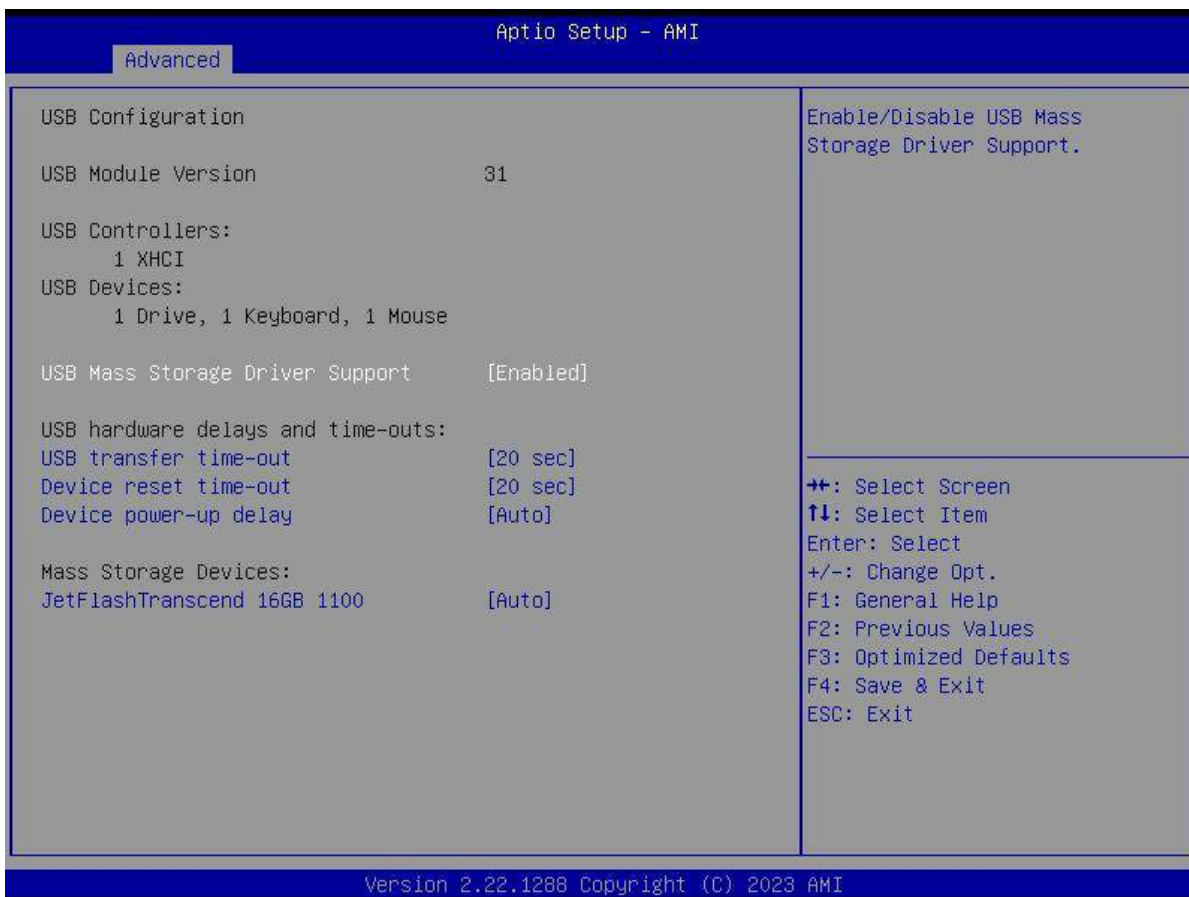
3.11.9 Serial Port Console Redirection



3.11.10 Intel TXT Information



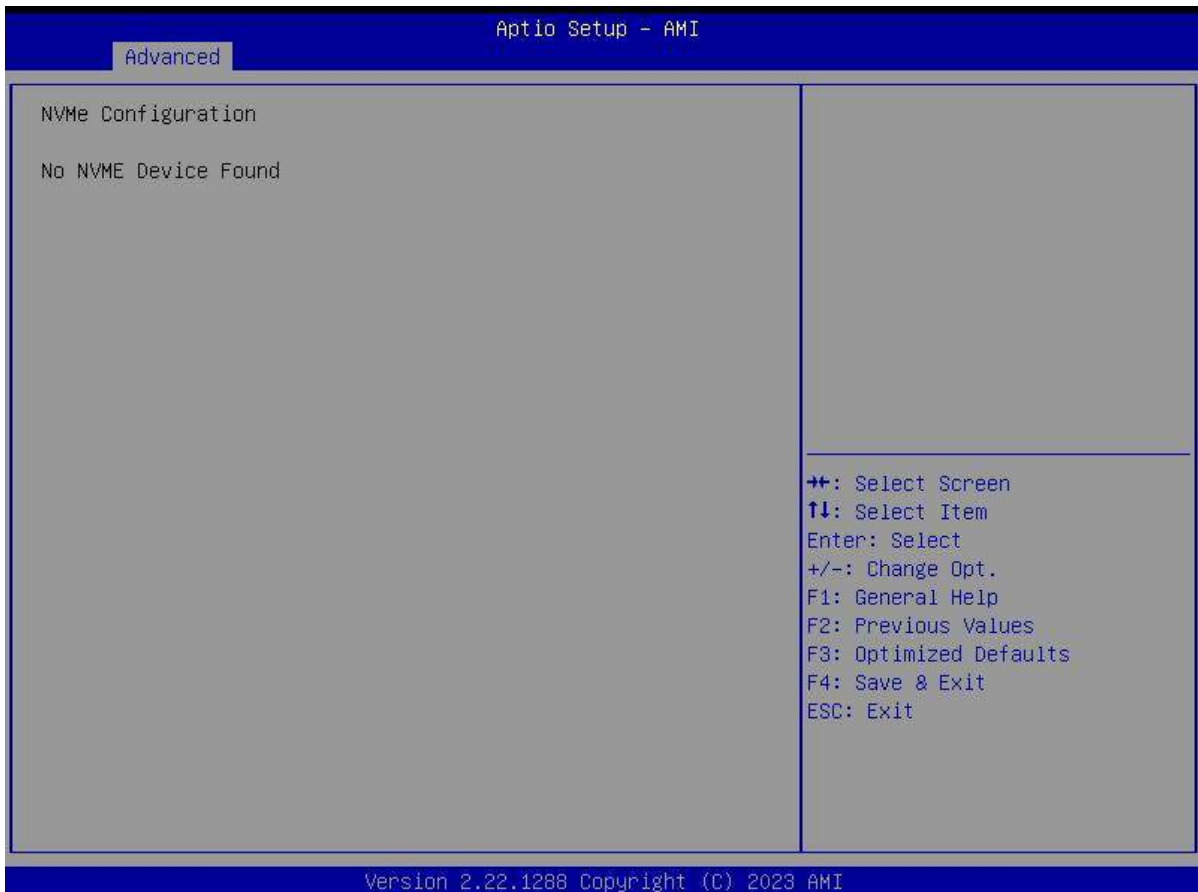
3.11.11 USB Configuration



3.11.12 Network Stack Configuration



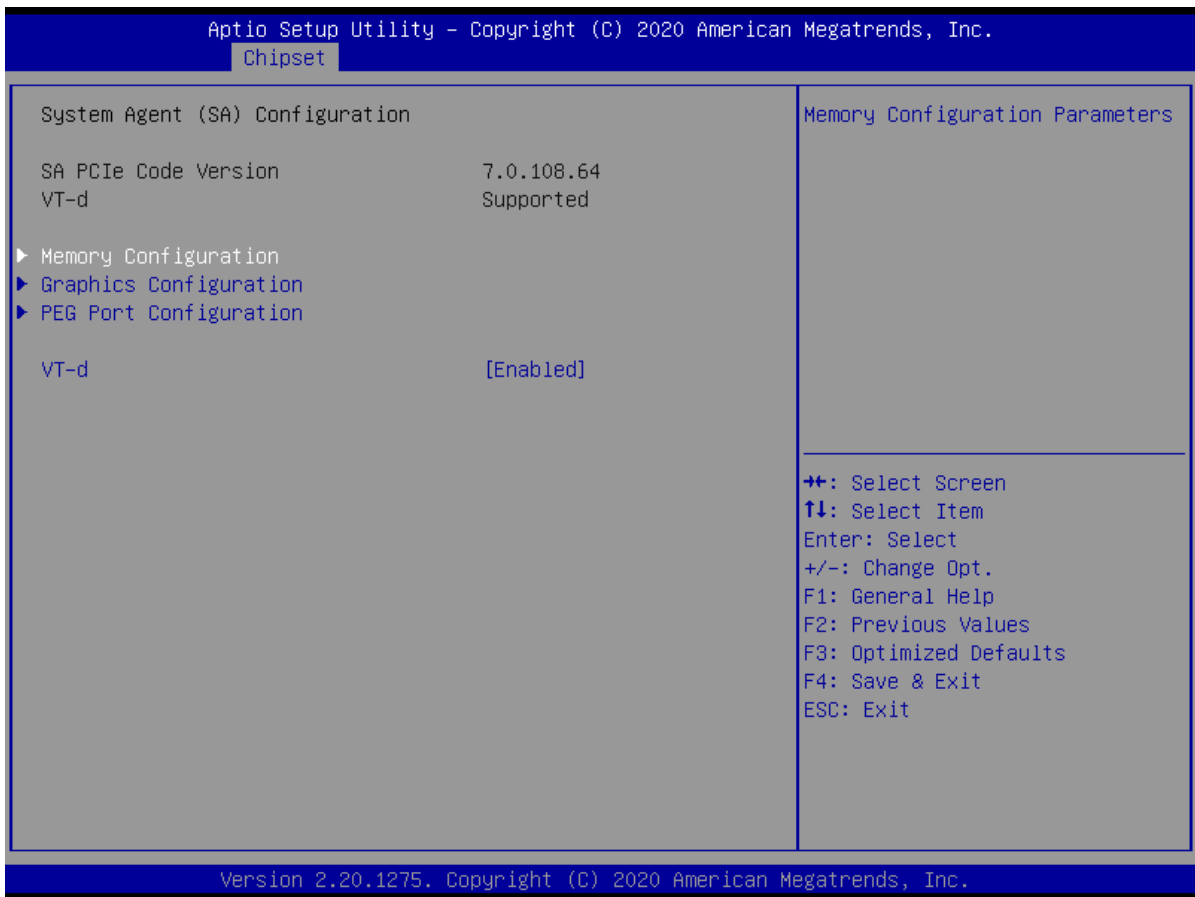
3.11.13 NVME Configuration



3.12 Chipset Menu



3.12.1 System Agent (SA) Configuration



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Chipset

<p>Memory Configuration</p> <p>Memory RC Version 0.7.1.111</p> <p>Memory Frequency 2400 MHz</p> <p>Memory Timings (tCL-tRCD-tRP-tRAS) 16-16-16-39</p> <p>DIMM_A1 Populated & Enabled</p> <p> Size 4096 MB (DDR4)</p> <p> Number of Ranks 1</p> <p> Manufacturer Crucial Technology</p> <p>DIMM_A2 Not Populated / Disabled</p> <p>DIMM_B1 Not Populated / Disabled</p> <p>DIMM_B2 Not Populated / Disabled</p> <p>Max TOLUD [Dynamic]</p>	<p>Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller</p> <hr/> <p>↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
---	--

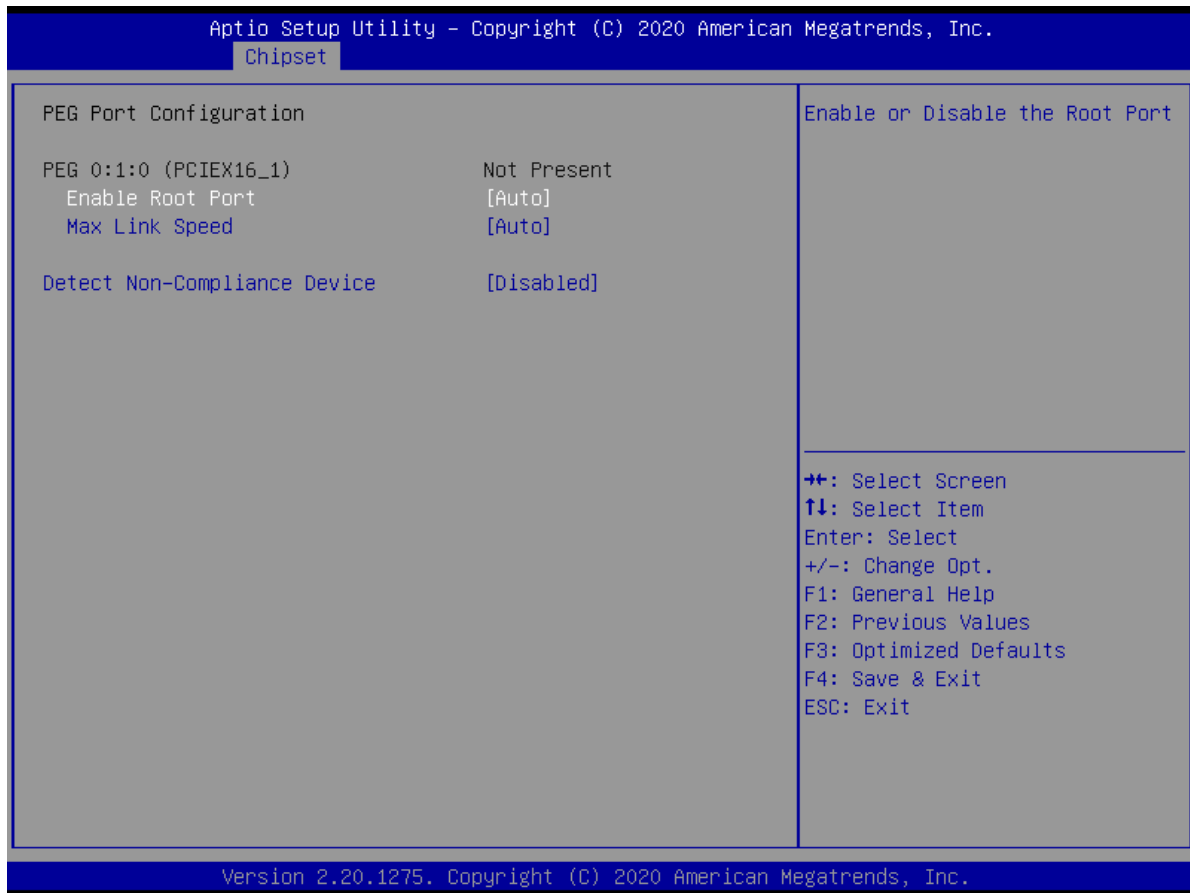
Version 2.20.1275. Copyright (C) 2020 American Megatrends, Inc.

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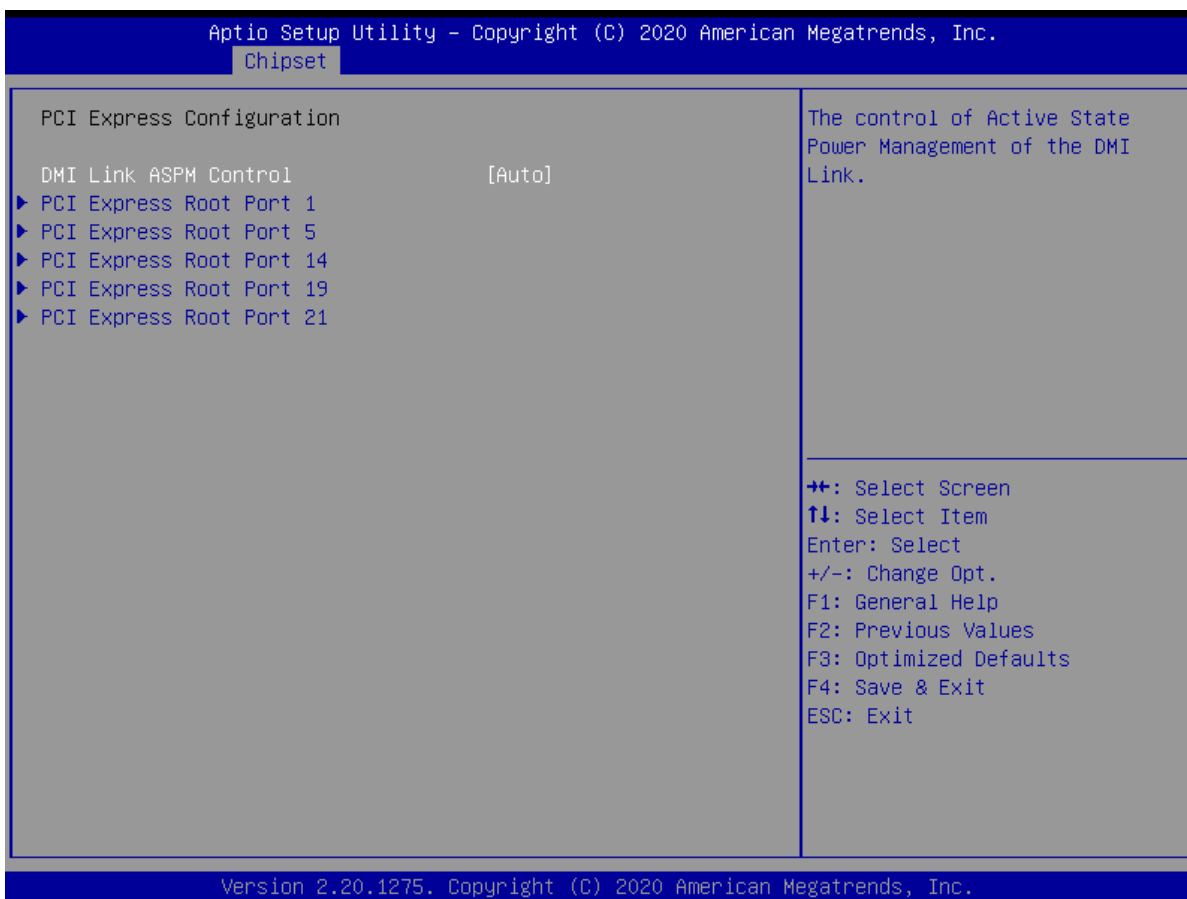
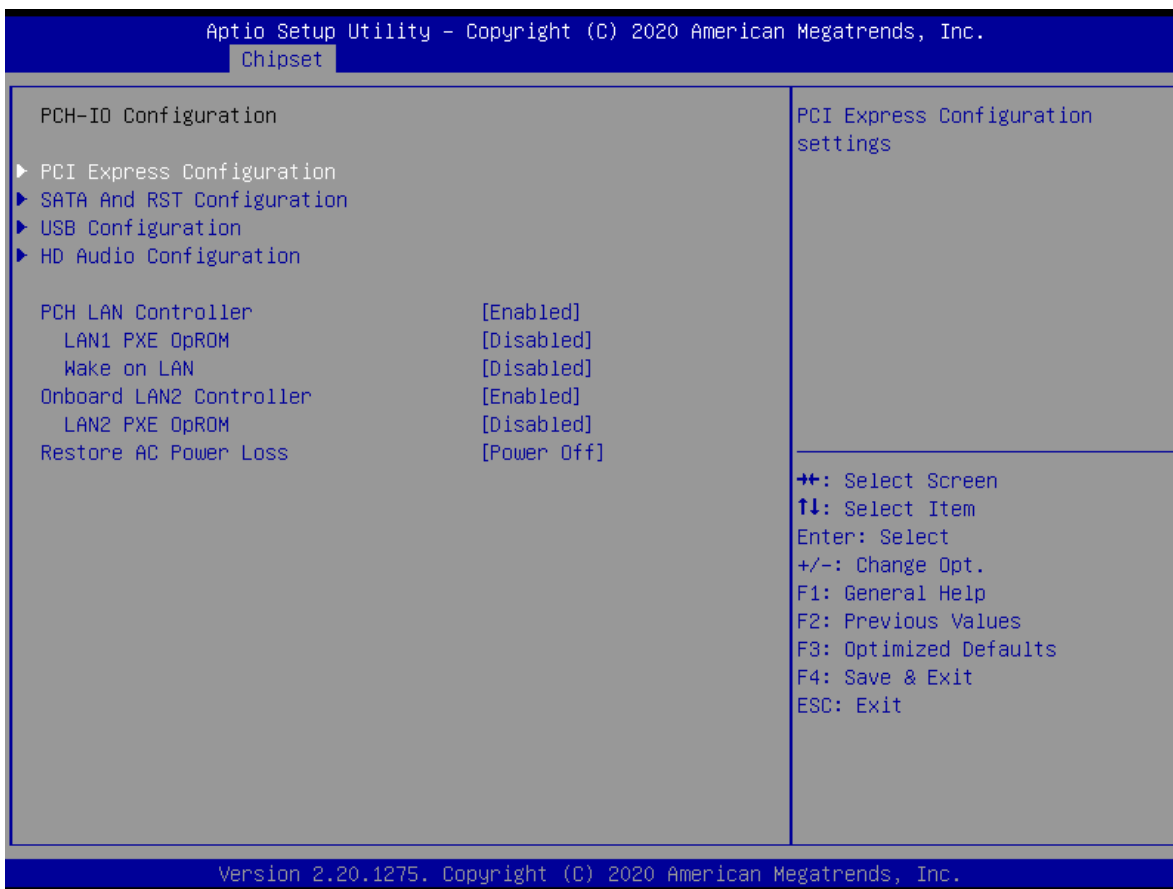
Chipset

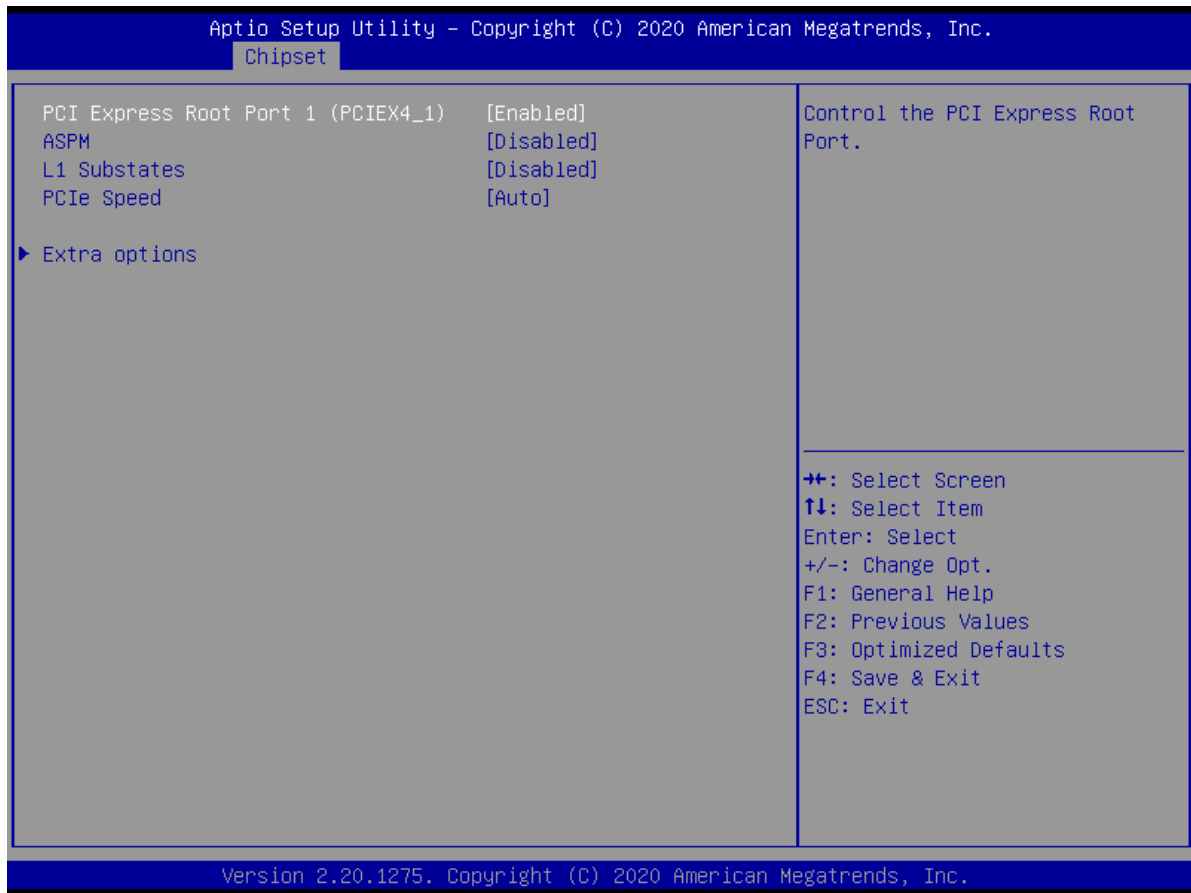
<p>Graphics Configuration</p> <p>Primary Display [Auto]</p> <p>Internal Graphics [Auto]</p> <p>DVMT Pre-Allocated [32M]</p> <p>DVMT Total Gfx Mem [256M]</p>	<p>Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.</p> <hr/> <p>↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
--	---

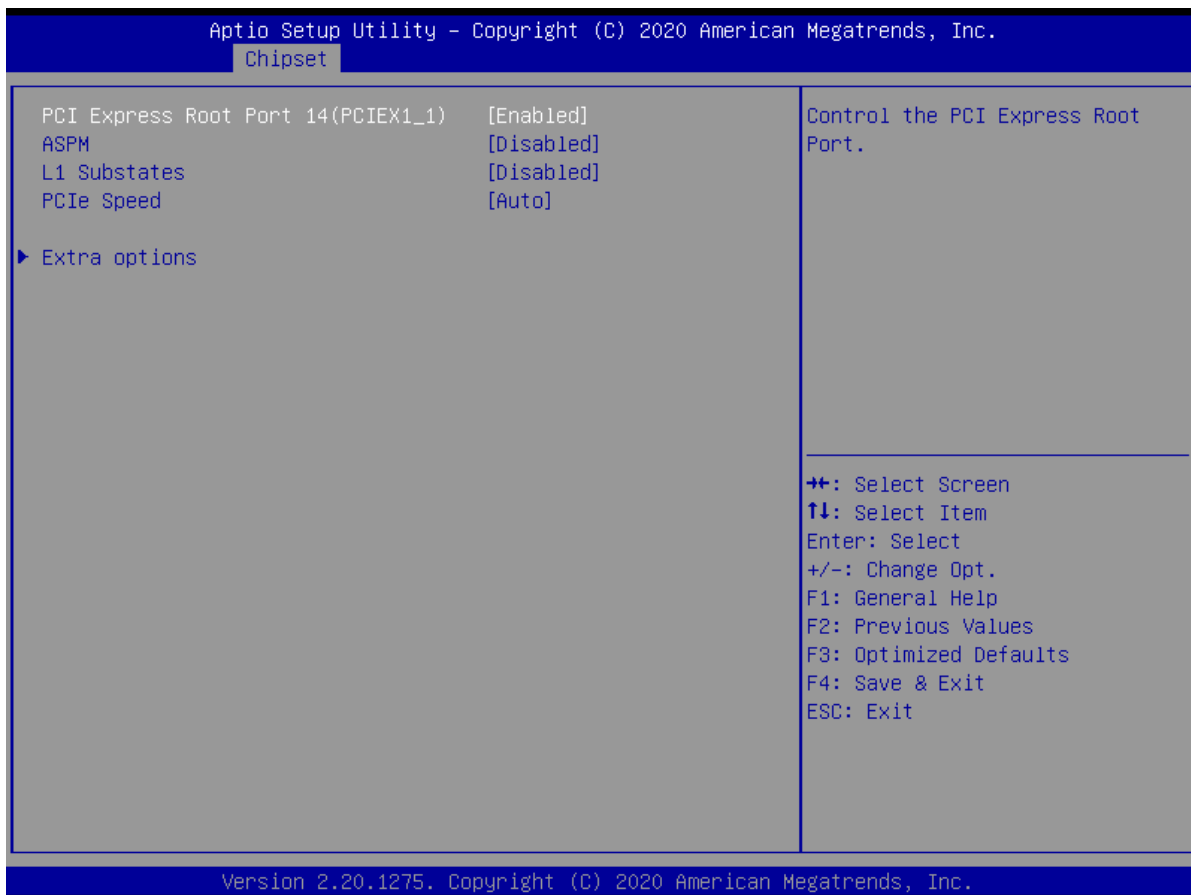
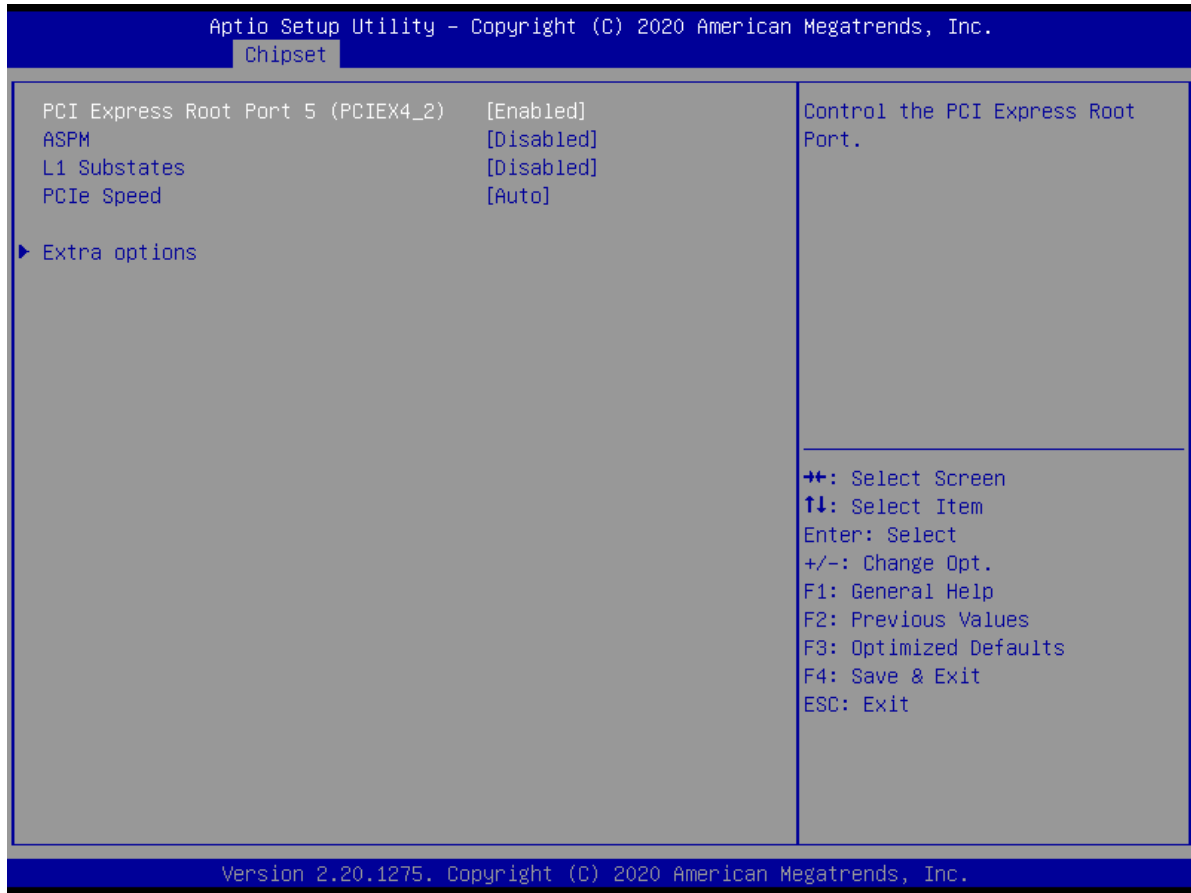
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3.12.2 PCH-IO Configuration







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Chipset

PCI Express Root Port 19(M2_2) [Enabled] ASPM [Disabled] L1 Substates [Disabled] PCIe Speed [Auto]	Control the PCI Express Root Port.
▶ Extra options	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Chipset

PCI Express Root Port 21(M2_1) [Enabled] ASPM [Disabled] L1 Substates [Disabled] PCIe Speed [Auto]	Control the PCI Express Root Port.
▶ Extra options	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Chipset

SATA And RST Configuration		Enable/Disable SATA Device.
SATA Controller(s)	[Enabled]	
SATA Mode Selection	[AHCI]	
SATA Controller Speed	[Default]	
Serial ATA Port 1/M.2	Phison SSMP064 (64.0GB)	
Software Preserve	SUPPORTED	
Port 1/M.2	[Enabled]	
SATA Device Type	[Solid State Drive]	
Serial ATA Port 2	Empty	
Software Preserve	Unknown	
Port 2	[Enabled]	
SATA Device Type	[Hard Disk Drive]	++: Select Screen
Serial ATA Port 3	Empty	↑↓: Select Item
Software Preserve	Unknown	Enter: Select
Port 3	[Enabled]	+/-: Change Opt.
SATA Device Type	[Hard Disk Drive]	F1: General Help
Serial ATA Port 4	Empty	F2: Previous Values
Software Preserve	Unknown	F3: Optimized Defaults
Port 4	[Enabled]	F4: Save & Exit
SATA Device Type	[Hard Disk Drive]	ESC: Exit
Serial ATA Port 5	Empty	
Software Preserve	Unknown	
Port 5	[Enabled]	

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Chipset

USB Configuration		Option to enable Compliance Mode. Default is to disable Compliance Mode. Change to enabled for Compliance Mode testing.
XHCI Compliance Mode	[Disabled]	
USB1/2 Standby Power	[Enabled]	
USB3/4 Standby Power	[Enabled]	
USB5/6 Standby Power	[Enabled]	
USB7/8 Standby Power	[Enabled]	
USB9/10 Standby Power	[Enabled]	
USB11/12 Standby Power	[Enabled]	
USB13/14 Standby Power	[Enabled]	
USB Port Disable Override	[Disabled]	

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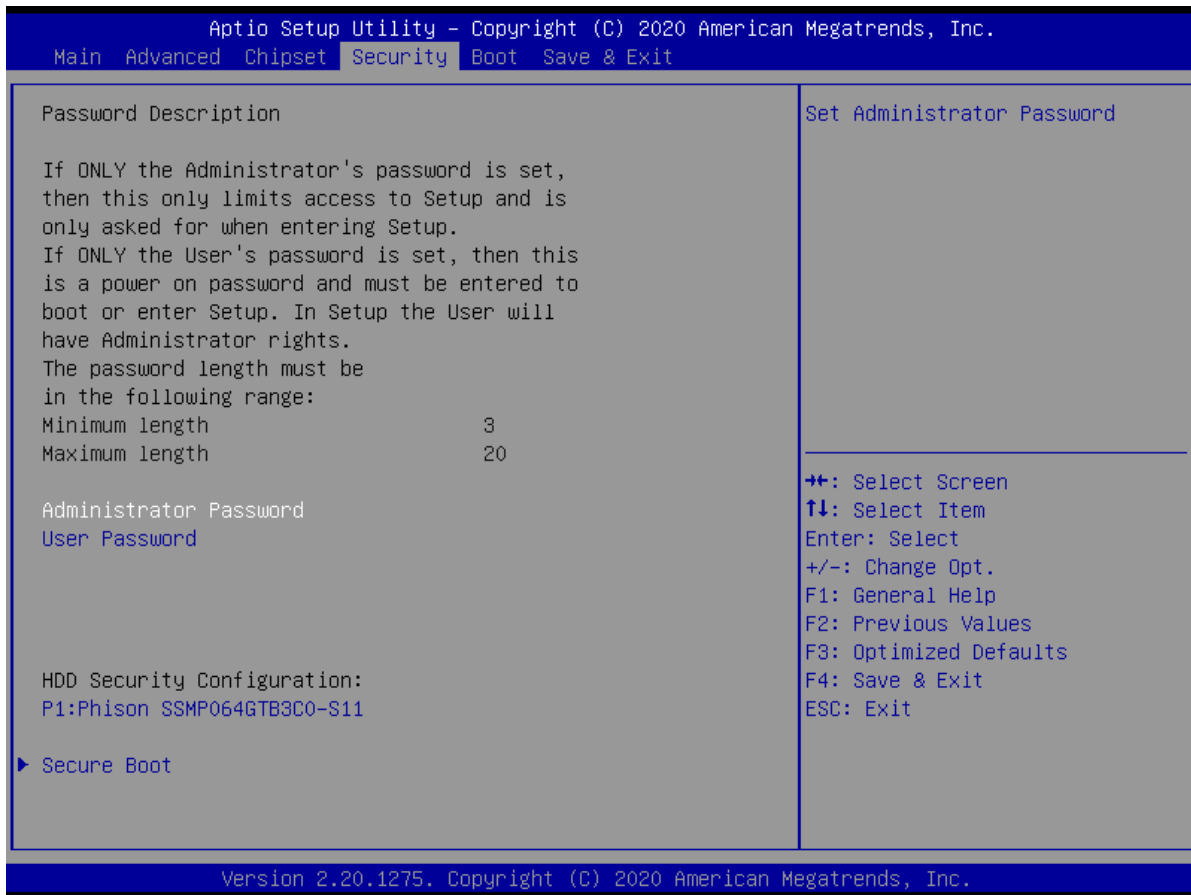
Chipset

HD Audio Subsystem Configuration Settings		Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.
HD Audio	[Enabled]	
Amplifier GAIN(db)	[15.3db]	

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

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3.13 Security Menu



3.13.1 System Agent (SA) Configuration



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Security

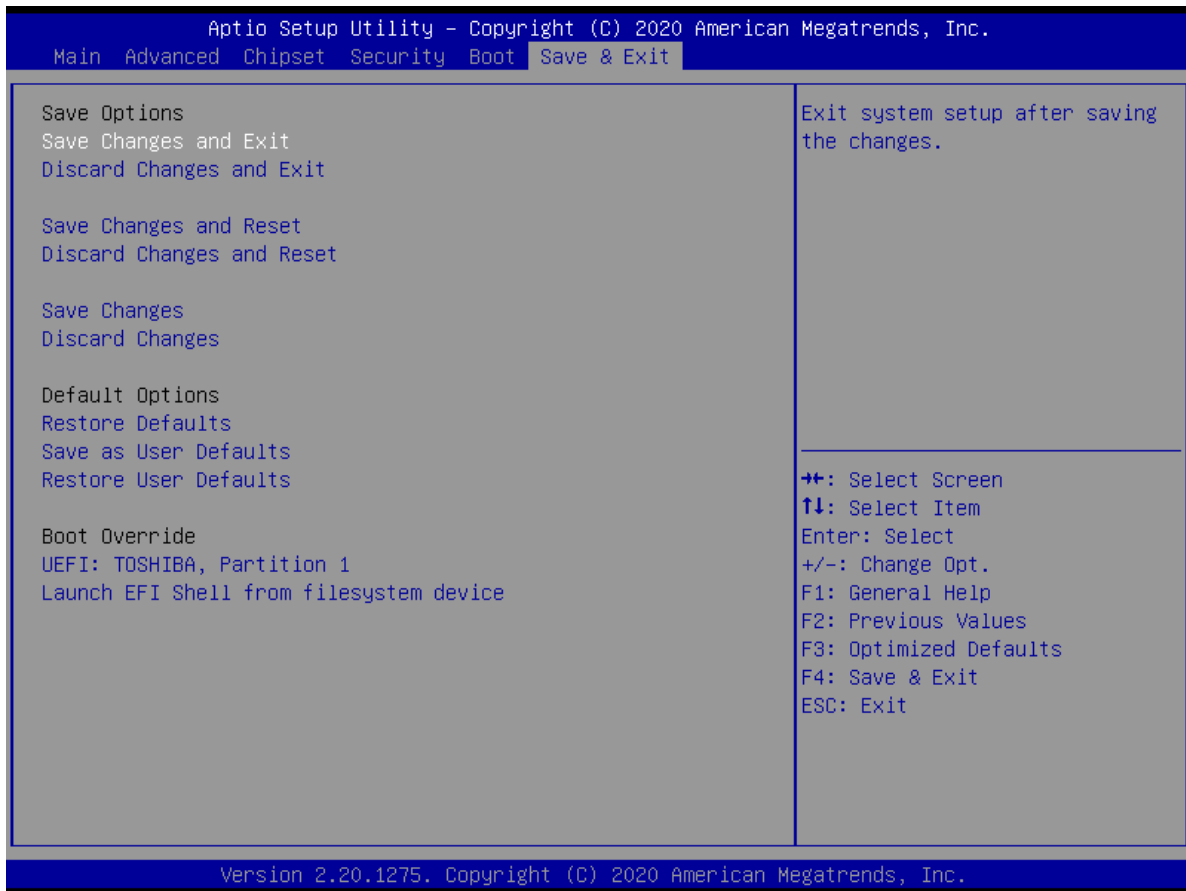
<p>Vendor Keys Valid</p> <p>Factory Key Provision [Disabled]</p> <ul style="list-style-type: none"> ▶ Restore Factory Keys ▶ Reset To Setup Mode ▶ Export Secure Boot variables ▶ Enroll Efi Image <p>Device Guard Ready</p> <ul style="list-style-type: none"> ▶ Remove 'UEFI CA' from DB ▶ Restore DB defaults <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">Secure Boot variable</th> <th style="text-align: left;">Size</th> <th style="text-align: left;">Keys</th> <th style="text-align: left;">Key Source</th> </tr> </thead> <tbody> <tr> <td>▶ Platform Key(PK)</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> <tr> <td>▶ Key Exchange Keys</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> <tr> <td>▶ Authorized Signatures</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> <tr> <td>▶ Forbidden Signatures</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> <tr> <td>▶ Authorized TimeStamps</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> <tr> <td>▶ OsRecovery Signatures</td> <td>0</td> <td>0</td> <td>No Keys</td> </tr> </tbody> </table>	Secure Boot variable	Size	Keys	Key Source	▶ Platform Key(PK)	0	0	No Keys	▶ Key Exchange Keys	0	0	No Keys	▶ Authorized Signatures	0	0	No Keys	▶ Forbidden Signatures	0	0	No Keys	▶ Authorized TimeStamps	0	0	No Keys	▶ OsRecovery Signatures	0	0	No Keys	<p>Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode</p> <hr/> <p> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
Secure Boot variable	Size	Keys	Key Source																										
▶ Platform Key(PK)	0	0	No Keys																										
▶ Key Exchange Keys	0	0	No Keys																										
▶ Authorized Signatures	0	0	No Keys																										
▶ Forbidden Signatures	0	0	No Keys																										
▶ Authorized TimeStamps	0	0	No Keys																										
▶ OsRecovery Signatures	0	0	No Keys																										

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3.14 Boot

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Main Advanced Chipset Security Boot Save & Exit		
Boot Configuration		
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	[Off]	
Quiet Boot	[Disabled]	
Fast Boot	[Disabled]	
Boot mode select	[UEFI]	
FIXED BOOT ORDER Priorities		
Boot Option #1	[Hard Disk]	
Boot Option #2	[NVME]	
Boot Option #3	[CD/DVD]	
Boot Option #4	[USB Hard Disk]	
Boot Option #5	[USB CD/DVD]	
Boot Option #6	[USB Key:UEFI: TOSHIBA, Partition 1]	
Boot Option #7	[USB Floppy]	
Boot Option #8	[Network]	
▶ UEFI Hard Disk Drive BBS Priorities		
▶ UEFI USB Key Drive BBS Priorities		
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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3.15 Save & Exit Menu



Appendix

GPIO & WDT

This appendix provides the sample codes of WDT (Watch Dog Timer) and GPIO (General Purpose Input/ Output).

General Purpose Input Output

GPI and GPO pins may be implemented as GPIO.

Signal	I/O	Description
GPO[0:3]	O	General purpose output pins. Upon a hardware
GPI[0:3]	I	General purpose input pins. Pulled high

GPIO Configuration

Board Design

SIO 6126D GPIO Header

Pin	Buffer Type	Function
GP86	O	Flash overiden (default:0)
GP31	I	AT/ATX mode detect (ATX:0 / AT:1)
GP32	O	COM3 RS232/422/485 mode0 (default:1)
GP33	O	COM3 RS232/422/485 mode1 (default:0)
GP40	O	COM3 Enable (default:0)
GP41	O	COM3 RS422/485 receiver termination Enable (default:1)

Watchdog Timer

Board Design

The Watchdog Timer (WDT) is implemented by Nuvoton NCT6126D..

Pseudo Code

```
#include<dos.h>
#include<stdio.h>
void main(void){
    // for 2E
    int x,pre_rd,rd,status;
    clrscr();
    outportb(0x2E,0x87);
    outportb(0x2E,0x87);
    outportb(0x2E,0x30); //CR30 bit1=1 pin77 select WDTO#
    outportb(0x2F,0x01);
    outportb(0x2E,0x07);
    outportb(0x2F,0x08); //Logic Device8 (LD8)
    outportb(0x2E,0x30);
    outportb(0x2F,0x01); //Enable WDTO#

    // Reset WDTO# and clear WDTO# timeout event
    outportb(0x2E,0xF6);
    outportb(0x2F,0x00); //Reset WDTO# Timer
    outportb(0x2E,0xF7); //Logic Device 8, CRF7
    outportb(0x2F,0x00); //Write Bit4=0 to clear WDTO# event!

    // Input Timer value
    printf("Enter WDTO# Timer(second):");
    scanf("%d",&x);
    pre_rd = x + 1;
    // Set Timer and Start count
    outportb(0x2E,0xF6); //LD8,CRF6h Set WDTO# Timer
    outportb(0x2F,x);

    // Check the timeout event
    // LDN8 CRF7[4] = 1 (Timeout occur)
    do{
        // Read Count
        outportb(0x2E,0xF6); //LD8,CRF6h Set WDTO# Timer
        rd = inportb(0x2F);
        // Read Timeout event
        outportb(0x2E,0xF7); //Logic Device 8, CRF7
        status = inportb(0x2F);
        // check pre-status
        if (rd < pre_rd){
            printf("Timer = %d\n",rd);
            pre_rd = rd;
        }
    }while(status != 0x10);
    printf("Timer Timeout.\n");

    printf("Input any key to reset timeout event\n");
    getch();

    // Reset WDTO# and clear WDTO# timeout event
    outportb(0x2E,0xF6);
    outportb(0x2F,0x00); //Reset WDTO# Timer
    outportb(0x2E,0xF7); //Logic Device 8, CRF7
    outportb(0x2F,0x00); //Write Bit4=0 to clear WDTO# event!
```

