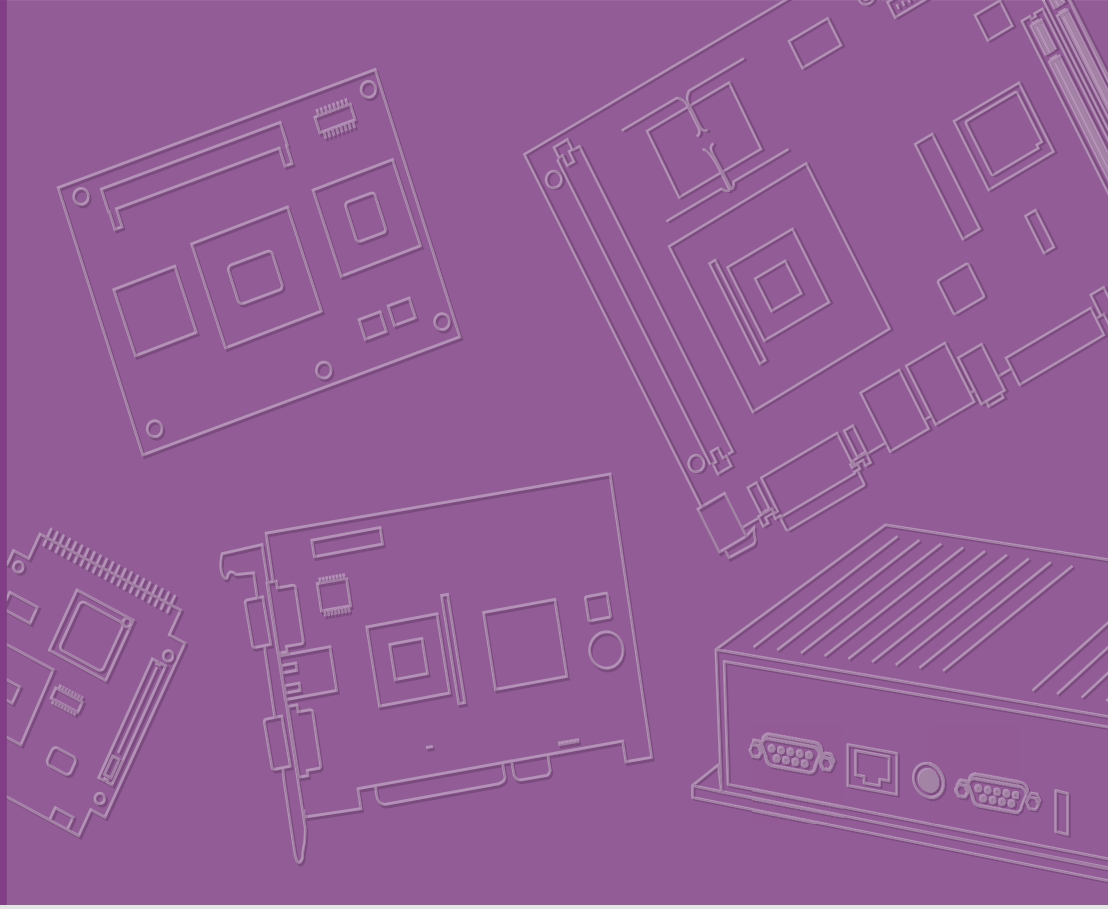

User Manual

SOM-3569

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (2 years)

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If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No. 2006356900 Edition 1

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

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

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

FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- SOM-3569 CPU module
- 1 x Heatspreader (1960083260N001 or 1960083261N001)

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter 1

General Information

This chapter gives background information on the SOM-3569 CPU Computer on Module

Sections include:

- Introduction
- Functional Block Diagram
- Product Specification

1.1 Introduction

SOM-3569 is equipped with Intel Atom®processor E3900 series, Celeron® & Pentium®N series platform, which are manufactured on Intel 14nm process technology. SOM-3569 non-ECC memory supports LPDDR4 2400MT/s with 1.2V power design, and up to 8GB dual channel. SOM-3569 is able to support 4 PCIex1 with Gen2 technology, as well as PCIe x1, x2, x4 configurations if requested. Most importantly, SOM-3569 adopts a 13.2mm heatsink passive thermal solution and supports CPU TDP up to 12 watt at 60°C ambient (option accessory) temp. This is suitable for multiple I/O designs for high performance applications, such as for in mobile, automation, HMI equipment, and control monitoring fields.

SOM-3569 offers over 30% growth in processor performance over previous platforms. It supports DX12, OpenGL 4.3, OGL ES 3.0, and OpenCL 2.0. In addition, dual displays are supported, as is HDMI/DisplayPort with 4K2K resolution, and dual channel LVDS at 1920x1200 full HD resolution is also available.

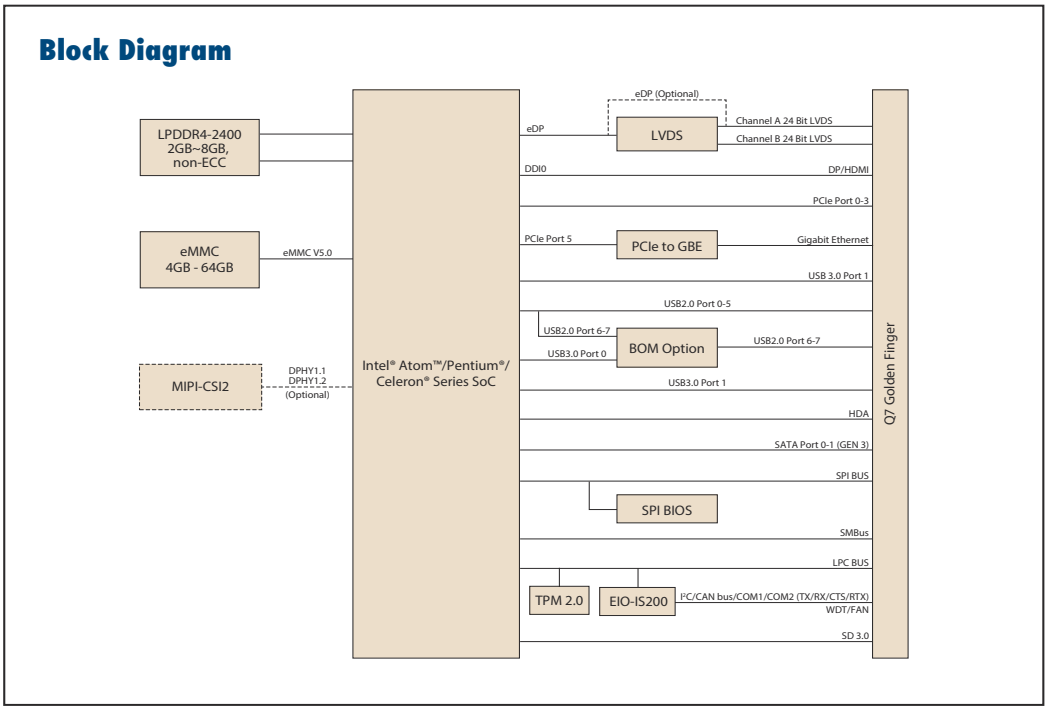
Advantech iManager & WISE-PaaS/RMM is designed to satisfy a lot of embedded application requirements such as multi-level watchdog timer, voltage and temperature monitoring, thermal protection and mitigation through processor throttling, LCD backlight on/off and brightness control, embedded storage for customized information, and more. Combining Advantech WISE-PaaS/RMM, it can remotely monitor and control devices through the internet. All Advantech Qseven modules integrate iManager and WISE-PaaS/RMM to benefit customer's applications.

With extreme performance, embedded platform power consumption, and various extensions and I/O interfaces, SOM-3569 is suitable for computing intensive designs, thermal sensitive designs, graphics/media sensitive designs, and all I/O demanding applications.

Acronyms

Term	Define
AC'97	Audio CODEC (Coder-Decoder)
ACPI	Advanced Configuration Power Interface – standard to implement power saving modes in PC-AT systems
BIOS	Basic Input Output System – firmware in PC-AT system that is used to initialize system components before handing control over to the operating system
CAN	Controller-area network (CAN or CAN-bus) is a vehicle bus standard designed to allow micro controllers to communicate with each other within a vehicle without a host computer
DDI	Digital Display Interface – containing DisplayPort, HDMI/DVI, and SDVO
EAPI	Embedded Application Programmable Interface Software interface for COM Express® specific industrial function ■ System information ■ Watchdog timer ■ I2C Bus ■ Flat Panel brightness control ■ User storage area ■ GPIO
GbE	Gigabit Ethernet
HDA	Intel High Definition Audio (HD Audio) refers to the specification released by Intel in 2004 for delivering high definition audio that is capable of playing back more channels at higher quality than AC'97
I2C	Inter Integrated Circuit – 2 wire (clock and data) signaling scheme allowing communication between integrated circuit, primarily used to read and load register values
ME	Management Engine
PC-AT	"Personal Computer – Advanced Technology" – an IBM trademark term used to refer to Intel based personal computer in 1990s
PEG	PCI Express Graphics
RTC	Real Time Clock – battery backed circuit in PC-AT systems that keeps system time and date as well as certain system setup parameters
SPD	Serial Presence Detect – refers to serial EEPROM on DRAMs that has DRAM Module configuration information
TPM	Trusted Platform Module – chip to enhance the security features of a computer system
UEFI	Unified Extensible Firmware Interface
WDT	Watch Dog Timer

1.2 Functional Block Diagram



1.3 Product Specification

1.3.1 Compliance

- PICMG Seven Revision 2.1
- Basic Size - 70 x707mm
- Pin-out Seven R2.1 compatible

1.3.2 Feature List

Seven Features R2.1			SOM-3569	
System I/O Interface	x86 Based Minimum Configuration	Maximum Configuration	Default	Option
PCI Express Lanes	1 (x1 link)	4	4	-
Serial ATA Channels	0	2	2	-
USB2.0 ports	4	8	6	8
USB3.0 ports	0	3	2	1
LVDS channels/ embedded DisplayPort	0 0	Dual Channel 24-bit 2	Dual Cannel 24-bit 0	0 1
DisplayPort/ TMDS	0	1	1	-
HD Audio/AC'97/I2S	0	1	1 (HD Audio)	-
Ethernet (10/100/Gigabit)	0	1 (Gigabit Ethernet)	1	-
UART	0	1	1	2
LPC	0	1	1	-
SDIO 4-bit for SD/MMC Card	0	1	1 (4-bit)	-
SMBus	1	1	1	-
I2C Bus	1	1	1	-
SPI Bus	0	1	1	-
CAN Bus	0	1	1	-
Watchdog Trigger	1	1	1	-
Power Button	1	1	1	-
Power Good	1	1	1	-
Reset Button	1	1	1	-
LID Button	0	1	1	-
Sleep Button	0	1	1	-
Suspend to RAM (S3 mode)	0	1	1	-
Wake	0	1	1	-
Battery Low Alarm	0	1	1	-
Thermal Control	0	1	1	-
FAN Control	0	1	1	-

1.3.3 Processor System

CPU	Std. Free.	Max. Turbo Free.	Core	Cache (MB)	TDP(W)
Pentium N4200	1.1GHz	2.5GHz	4	2	6
Celeron N3350	1.1GHz	2.4GHz	2	2	6
Atom X7-E3950	1.6GHz	2.0GHz	4	2	12
Atom X5-E3940	1.6GHz	1.8GHz	4	2	9
Atom X5-E3930	1.3GHz	1.8GHz	2	2	6

1.3.4 Memory

Dual channels onboard LPDDR4 2400MHz up to 8GB (non-ECC).

1.3.5 Graphics / Audio

Graphic Core: Intelligent 9.0 LP Graphic supports DX9.3/10/11.3/12; OpenGL 4.3; OGL ES 3.0; OpenCL 2.0, HEVC/H265, VC1/WMV9 HW decode/encode acceleration.

CPU	Graphic Core	Base Free.	Max Free.
Pentium N4200	Gen9 HD Graphic	200MHz	750MHz
Celeron N3350	Gen9 HD Graphic	200MHz	650MHz
Atom X7-E3950	Gen9 HD Graphic	500MHz	650MHz
Atom X5-E3940	Gen9 HD Graphic	400MHz	600MHz
Atom X5-E3930	Gen9 HD Graphic	400MHz	550MHz

1.3.6 Expansion Interface

1.3.6.1 PCIe x1

PCI Express x1: Supports default 4 ports PCIe x1 compliant to PCIe Gen2 (5.0 GT/s) specification, configurable to PCIe x4 or PCIe x2 upon request. Several configurable combinations may need BIOS modifications. Please contact Advantech sales or FAE for more details.

So	P0	P1	P2	P3	P4	P5
Default	X1	X1	X1	X1		GBE
Option	X4					GBE
Other 1	X2		X2			GBE
Other 2	X2		X1	X1		GBE

1.3.6.2 LPC

Supports Low Pin Count (LPC) 1.1 specification, without DMA or bus mastering. Allows connection to Super I/O, embedded controller, or TPM. LPC clock is 25MHz.

1.3.7 Serial Bus

1.3.7.1 SMBus

Supports SMBus 2.0 specification.

1.3.7.2 I2C Bus

Supports I2C bus 7-bit and 10-bit address modes, up to 400KHz.

1.3.8 I/O

1.3.8.1 Gigabit Ethernet

Ethernet: Intel I211AT Gigabit LAN supports 100/1000 Mbps Speed.

1.3.8.2 SATA

Support 2 ports SATA Gen3 (6.0 Gb/s), backward compliant to SATA Gen2 (3.0 Gb/s) and Gen1 (1.5 Gb/s). Maximum data rate is 600 MB/s. Supports AHCI 1.3.1 mode.

1.3.8.3 USB3.0/USB2.0

1 ports USB3.0 (5.0 Gaps) and 8 ports USB2.0 (480 Mbps) which are backward compatible to USB1.x.

1.3.8.4 USB3.0

Seven	P0	P1
So	P0	P1
Schematics	USB_0_1_OC	
SoC USB_OC#	OC0#	

1.3.8.5 USB2.0

Qseven	P0	P1	P2	P3	P4
SoC	P0	P1	P2	P3	P4
Schematics	USB_0_1_OC		USB_2_3_OC		USB_4_5_OC
SoC USB_OC#	OC0#		OC1#		

1.3.8.6 HDA

Supports HD-Audio and LPE Audio for DDI[1:0] (DisplayPort and HDMI), 1.8V signal level, up to 24 MHz serial data clock.

1.3.8.7 SPI Bus

Supports Master SPI operation only. SPI clock can be 50MHz, 33MHz, or 20MHz, capacity up to 16MB.

1.3.8.8 eMMC

eMMC v5.0 HS400 DDR Mode. Supports transfer the data in 1-bit, 4-bit, and 8-bit modes. Maximum HS400 Dual Rate 400 MB/s (200 MHz).

1.3.8.9 SD

SD Memory Card Specification v3.01. SD clock frequency at 25, 50, 100, and 200 MHz. Data Rate up to 104 MB/s using 4 parallel data lines (SDR104 mode).

1.3.8.10 SDIO

Supports one SDIO 3.0 interface

1.3.8.11 TXE

Trusted Execution Engine 3.0 (TXE3.0).

1.3.8.12 SMBus

SMBus 2.0 specification. Supports SMBALERT# signal. Signal level 3.3V or 1.8V selectable.

1.3.8.13 Serial port

2 ports 4-wire HSUART signal interface using RTS/CTS control only

- Programmable FIFO enable/disable
- 64B iDMA FIFO per channel with up to 32B burst capability
- Even, odd, or no parity bit selectable
- 1, 1.5, or 2 stop bit selectable

1.3.8.14 MIPI

Supports CSI2 image sensors connected using both D-PHY 1.1 and D-PHY 1.2. SoC has 4 dedicated DPHY1.2 lanes and 2 differential clock lanes, supporting peak transfer rates of 2.5Gb/s per lane.

1.3.8.15 TPM

Supports TPM 2.0 module by default.

1.3.8.16 BIOS

BIOS chip is on module by default. Also allows users to place a BIOS chip on the carrier board with appropriate design and a pull-down to GND on BIOS_DISABLE# pin.

Note! If the system COMS is cleared, we strongly suggest to go to the BIOS setup menu and load default settings on first boot up.

1.3.9 Power Management

1.3.9.1 Power Supply

Supports both ATX and AT power modes. VSB is for suspend power and can be option if not require standby (suspend-to-RAM) support. RTC Battery may be option if keep time/date is not require.

- VCC: 5V +/- 5%
- VSB: 5V +/- 5% (Suspend power)
- RTC Battery Power: 2.0V - 3.3V

1.3.9.2 PWROK

Power OK from main power supply. A high value indicates that the power is good. This signal can be used to hold off Module startup to allow Carrier based FPGAs or other configurable devices time to be programmed.

1.3.9.3 Power Sequence

Refer to Qseven R2.1 electrical specification

1.3.9.4 Wake Event

Various wake-up events supporting allow user to apply into different scenario.

Wake-on-LAN(WOL): Wake to S0 from S3/S4/S5

USB Wake: Wake to S0 from S3

PCIe Device Wake: depends on user inquiry and may need customized BIOS

LPC Wake: depends on user inquiry and may need customized BIOS

1.3.9.5 Advantech S5 ECO Mode (Deep Sleep Mode)

Advantech iManager provides additional feature to allow system enter a very low suspend power mode - S5 ECO mode. In this mode, Module will cut all power including suspend and active power into chipset and keep an on-module controller active. Therefore, only an under 50mW power will consume which means user's battery pack can last longer time. While this mode enable in BIOS, system (or module) only allow a power button to boot rather than others such as WOL.

1.3.10 Environment

1.3.10.1 Temperature

Operating: 0 ~ 60°C (32 ~ 140°F), Storage: -40°C~ 85°C(-40 ~ 185°F)

Extended temperature support: -40~85°C(-40 ~ 185°F)

1.3.10.2 Humidity

Operating: 40°C@95% relative humidity, non-condensing

Storage: 60°C@95% relative humidity, non-condensing

1.3.10.3 Vibrations

3.5G, 5~500Hz X/Y/Z Axis

1.3.10.4 Drop Test (Shock)

Federal Standard 101 Method 5007 test procedure with standard packing

1.3.10.5 EMC

CE EN55022 Class B and FCC Certifications: validate with standard development boards in Advantech chassis

1.3.11 MTBF

Please refer Advantech SOM-3569 Series Reliability Prediction Report No: TBD. (estimated date is 2018,January.)

1.3.12 OS Support (duplicate with SW chapter)

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft Windows embedded technology." We enable Windows Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows Embedded Software solutions easily and widely available to the embedded computing community.

To install the drivers, please connect to internet and browse the website http:// support.advantech.com.tw to download the setup file.

1.3.13 Advantech iManager

Support APIs for GPIO, smart fan control, multi-stage watchdog timer and output, temperature sensor, hardware monitor, etc. Follow by PICMG EAPI 1.0 specification that provides backward compatibility.

1.3.14 Power Consumption

Power Consumption Table (Watt.)						
VCC=12V, VSB=5V	Active Power Domain			Suspend Power Domain		Mechanical off
Power State	S0 Max. Load	S0 Burn-in	S0 Idle	S5	S5 Deep Sleep	RTC (uA)
SOM-3569CN0C-S2A1	8.22W	5.89W	3.71W	0.73W	-	-

Hardware Configurations:

1. MB: SOM-3569CN0C-S2A1 (PCB_A101-2)
2. DRAM: 8Gb LPDDR4 2400MHz *4 (4GB)
3. Carrier board: SOM-DB3520-00A1E

Test Condition:

1. Test temperature: room temperature (about 25°C)
2. Test voltage: rated voltage DC +12.0V
3. Test loading:

3.1 Maximum load mode: According to Intel thermal/power test tools

3.2 Burn-in mode: Burn-In Test V8.1 Pro(1013)(CPU, RAM, 2D&3D Graphics and Disk

with 100%)

3.3 Idle mode: DUT power management off and no running any program.

4. OS: Windows 10 Enterprise

1.3.15 Performance

For reference performance or benchmark data that compare with other module, please refer to "Advantech COM Performance & Power Consumption Table".

1.3.16 Selection Guide w/ P/N

Part No.	CPU	Freq.	Core	CPU TDP	Memory	eMMC	Thermal Solution	Operating Temperature
SOM-3569CN0C-S2A1	Pentium N4200	1.1GHz	4C	6W	4GB	N/A	Passive	0 ~ 60 °C
SOM-3569CN0C-S1A1	Celeron N3350	1.1GHz	2C	6W	4GB	N/A	Passive	0 ~ 60 °C
SOM-3569CNBC-S7A1	Atom E3950	1.6GHz	4C	12W	4GB	32GB	Passive	0 ~ 60 °C
SOM-3569CN0C-S6A1	Atom E3940	1.6GHz	4C	9W	4GB	N/A	Passive	0 ~ 60 °C
SOM-3569CN0C-S3A1	Atom E3930	1.3GHz	2C	6W	4GB	N/A	Passive	0 ~ 60 °C

1.3.17 Packing list

Part No.	Description	Quantity
-	SOM-3569 Qseven CPU Module	1
1960083260N001	SOM-3569 non-I-APL Heatspreader (N4200 & N3350)	1
1960083261N001	SOM-3569 I-APL Heatspreader (E3930, E3940 & E3950)	1

1.3.18 Development Board

Part No.	Description
SOM-DB3520-00A1E	Qseven Development Board

1.3.19 Optional Accessory

Part No.	Description
1960058145N001	Semi-Heatsink, 70L x 63W x 13.2H (0 ~ 60 °C)
1960061089N001	Semi-Heatsink, 70L x 63W x 34H (-40 ~ 85 °C)

1.3.20 Pin Description

Advantech provides useful checklists for schematic design and layout routing. A schematic checklist will specify details about each pin's electrical properties and how to connect for different applications. The layout checklist will specify the layout constrains and recommendations for trace length, impedance, and other necessary information during design and development. Please contact your nearest Advantech branch office or call to request design documents and further advanced support.

Chapter 2

Mechanical Information

This chapter gives mechanical information on the SOM-3569 CPU Computer on Module

Sections include:

- Board Information
- Mechanical Drawing
- Assembly Drawing

2.1 Board Information

The figures below indicate the main chips on SOM-3569 Computer-on-Module.

Be aware of these positions while designing a carrier board to avoid mechanical and thermal issues for the best thermal dispassion performance.

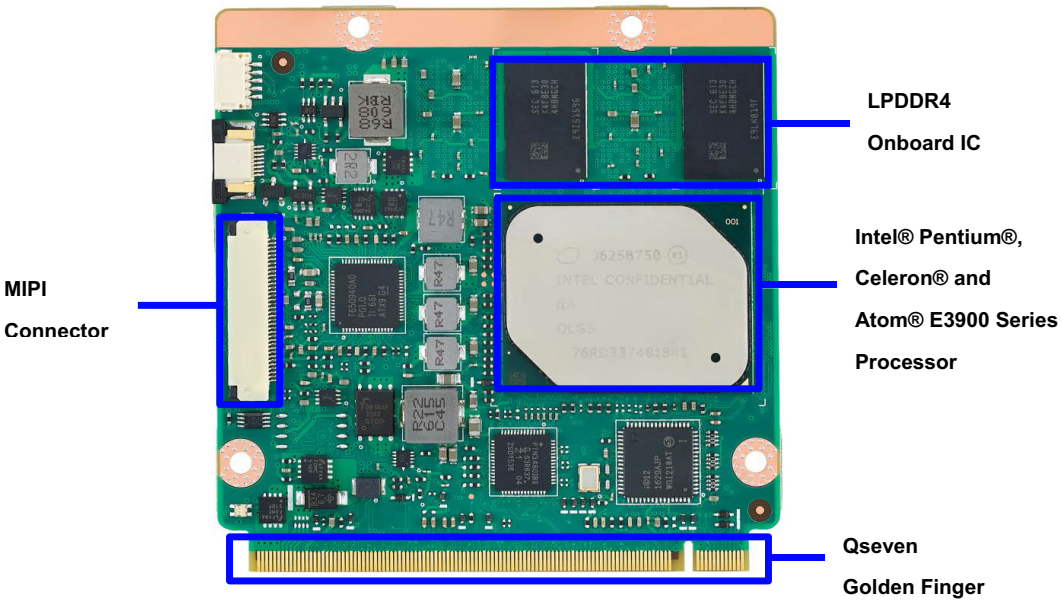


Figure 2.1 Board chips identify - Front

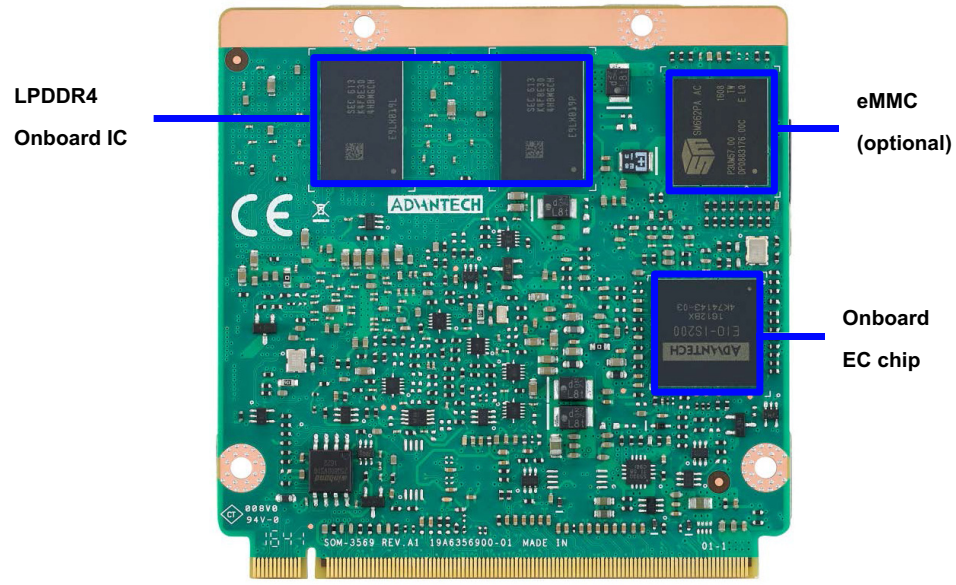


Figure 2.2 Board chips identify - Rear

2.2 Mechanical Drawing

For more details about 2D/3D models, please look on the Advantech COM support service website http://com.advantech.com.

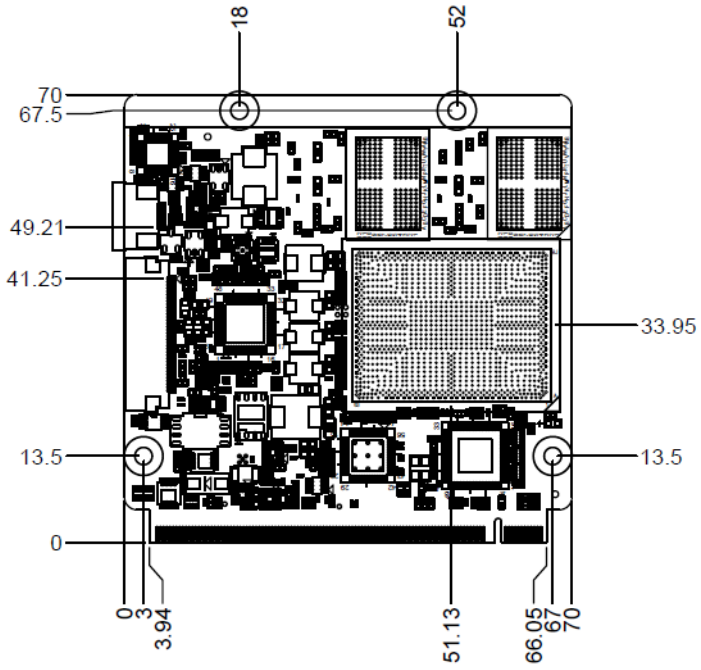


Figure 2.3 Board Mechanical Drawing - Front

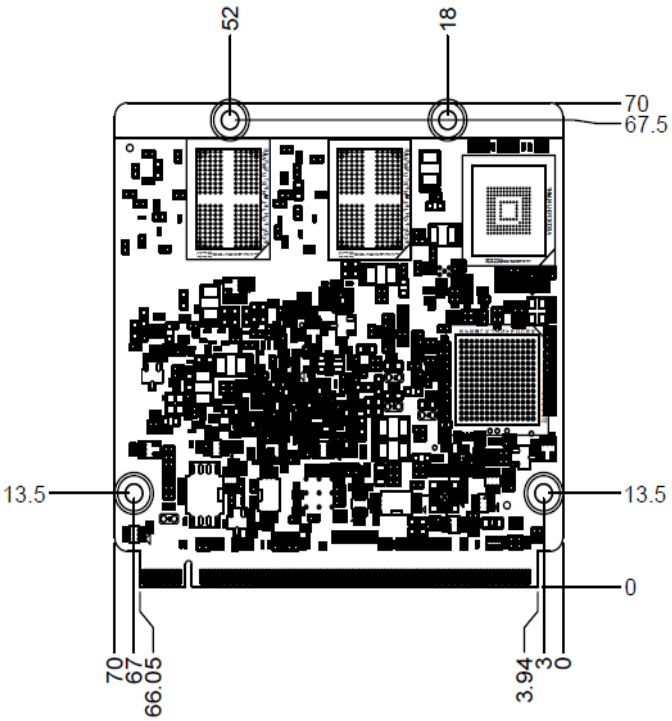


Figure 2.4 Board Mechanical Drawing - Rear

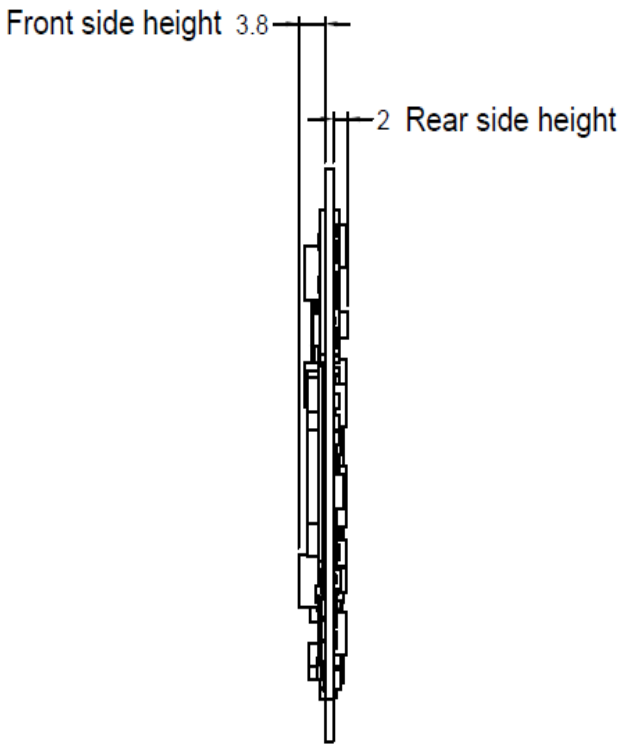


Figure 2.5 Board Mechanical Drawing - Side

2.3 Assembly Drawing

These figures demonstrate the assembly order from the thermal module and COM module to the carrier board.

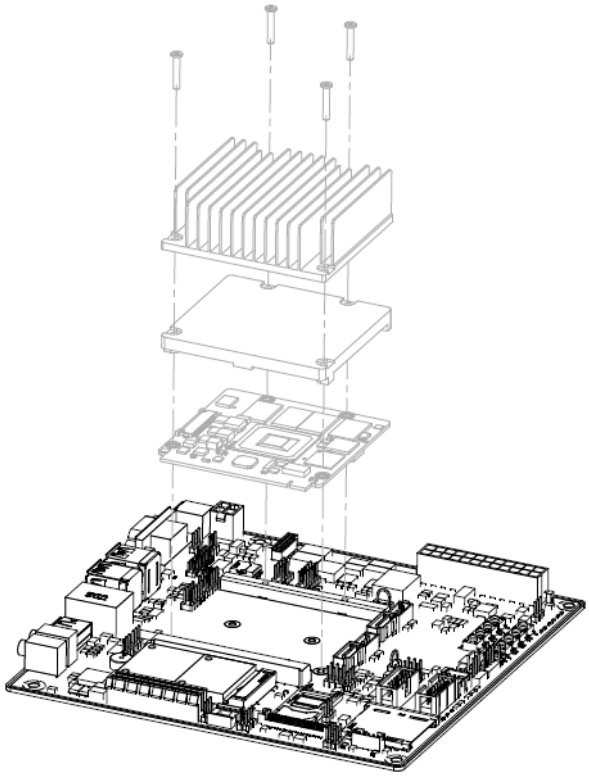
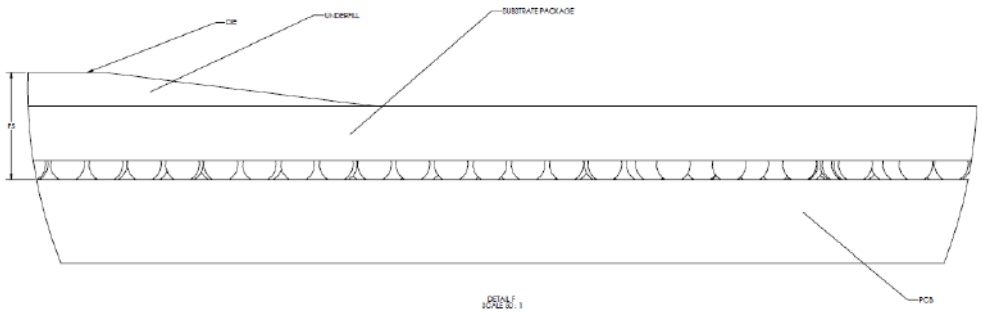


Figure 2.6 Assembly Drawing

There are 4 reserved screw holes for SOM-3569 to be pre-assembled with the heat spreader.

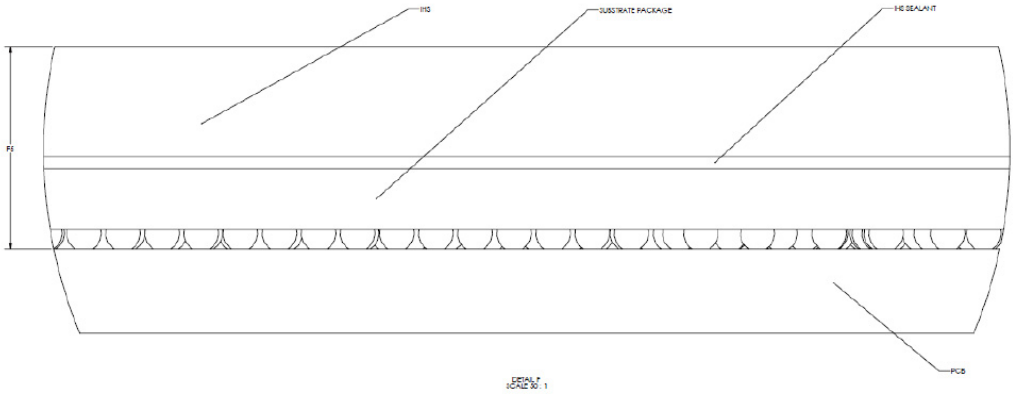
2.4 CPU Mechanical Drawing

Carefully consider the CPU and chip height tolerance when designing your thermal solution.



Intel® Pentium and Celeron N and J Series Processors

Figure 2.7 Main Chip Height and Tolerance



Intel® Pentium and Celeron N and J Series Processors

Figure 2.8 Main Chip Height and Tolerance

Chapter 3

AMI BIOS

This chapter gives BIOS setup information for the SOM-3569 CPU computer-on module

Sections include:

- Introduction
- Entering Setup
- Hot/Operation Key
- Exit BIOS Setup Utility

3.1 Introduction

AMI BIOS has been integrated into many motherboards for over a decade. With the AMI BIOS Setup Utility, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the BIOS Setup Utility.

Figure 3.1 Setup program initial screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains the Setup information when the power is turned off.

3.2 Entering Setup

Turn on the computer and then press <DEL> or <ESC> to enter the Setup menu.

3.3 Main Setup

When users first enter the BIOS Setup Utility, users will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

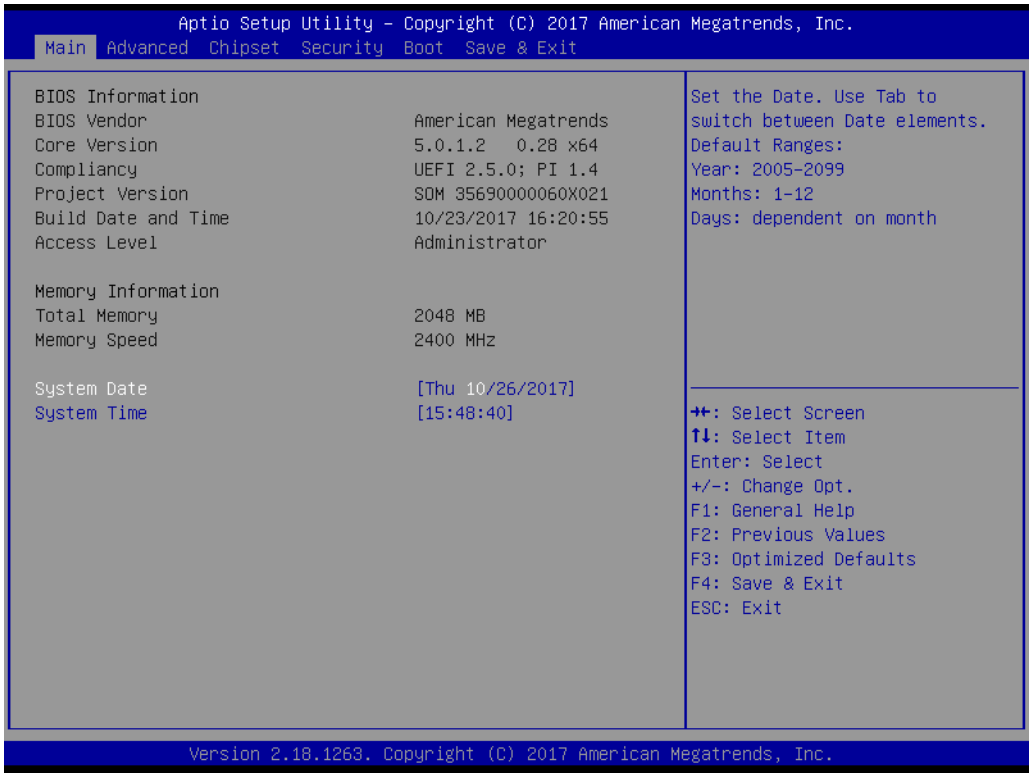


Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

System time / System date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.4 Advanced BIOS Features Setup

Select the Advanced tab from the SOM-3569 setup screen to enter the Advanced BIOS Setup screen. Users can select any item in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. Users can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

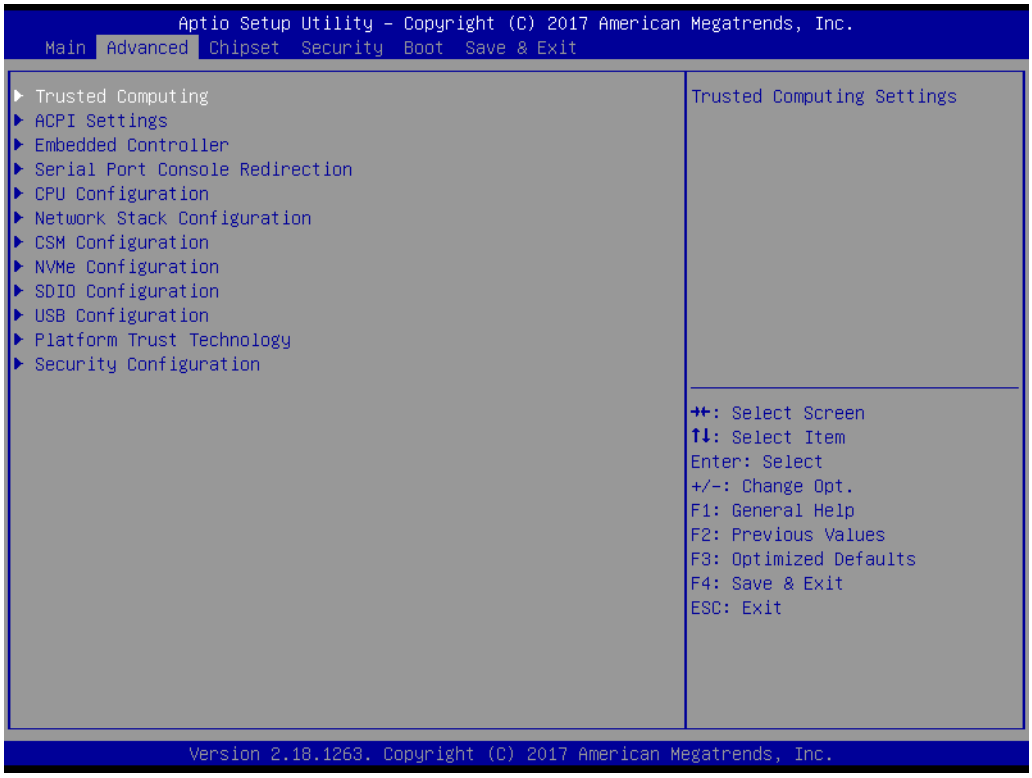


Figure 3.3 Advanced BIOS features setup screen

Trusted Computing

Trusted Computing Settings

ACPI Settings

System ACPI Parameters

Embedded Controller

Embedded Controller Parameters

Serial Port Console Redirection

Serial Port Console Redirection

CPU Configuration

CPU Configuration Parameters

Network Stack Configuration

Network Stack Settings

CSM Configuration

CSM configuration: Enable/Disable, Option ROM execution settings, etc.

NVMe Configuration

NVMe Device Options Settings

SDIO Configuration

SDIO Configuration Parameters

USB Configuration

USB Configuration Parameters

Platform Trust Technology

Platform Trust Technology

Security Configuration

Intel(R) Anti-Theft Technology Configuration

3.4.1 Trusted Computing

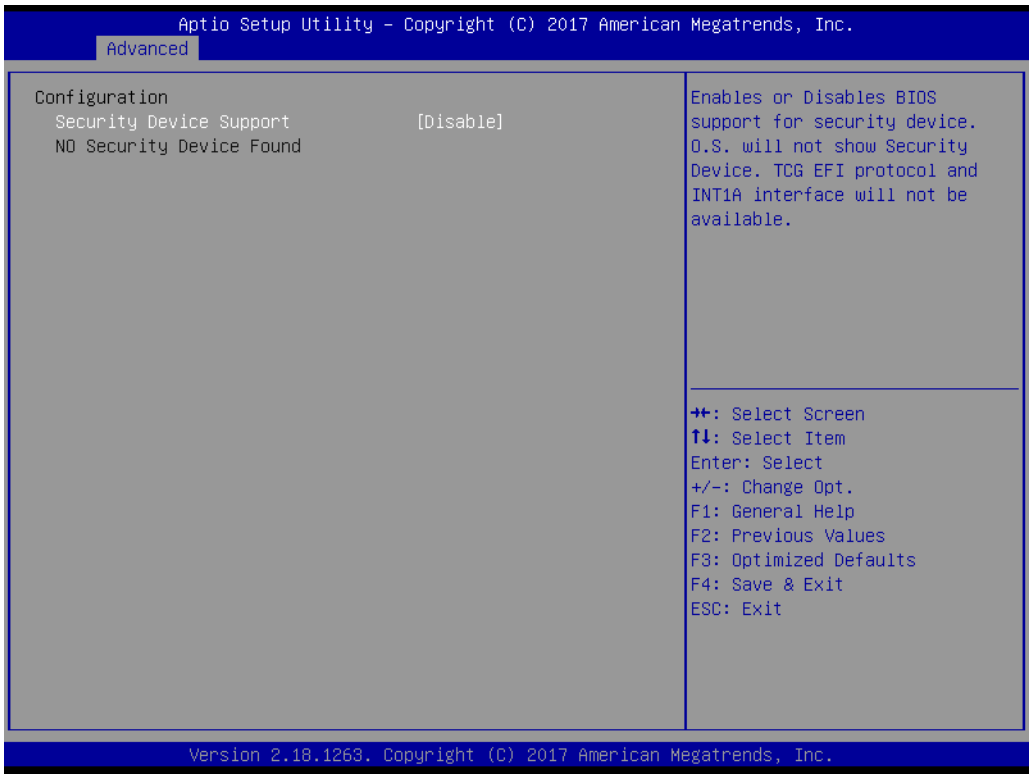


Figure 3.4 Trusted Computing

Security Device Support

Enables or Disables BIOS support for security device. The OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.4.2 ACPI Settings

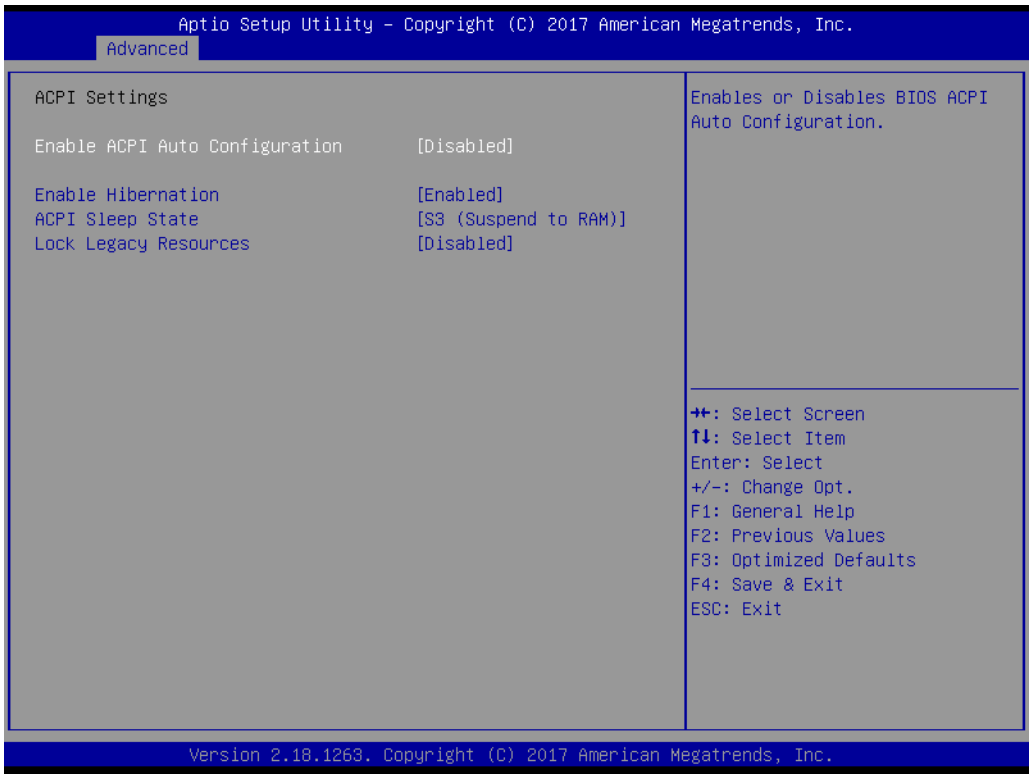


Figure 3.5 ACPI Settings

Enable ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration.

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Lock Legacy Resources

Enables or Disables Lock of Legacy Resources

3.4.3 Embedded Controller

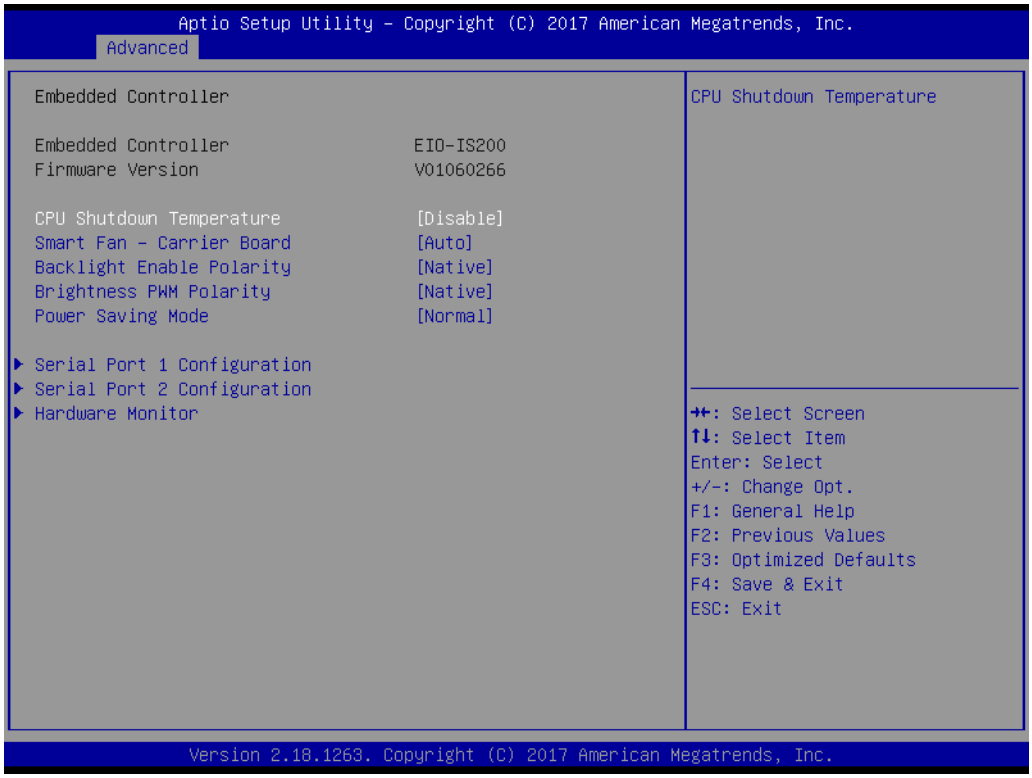


Figure 3.6 Embedded Controller

CPU Shutdown Temperature

CPU Shutdown Temperature

Smart Fan - Carrier Board

Control Carrier Board Smart FAN function. Get value from EC and only set value when Save Changes.

Backlight Enable Polarity

Switch Backlight Enable Polarity for Native or Invert

Brightness PWM Polarity

Backlight Control Brightness PWM Polarity for Native or Invert

Power Saving Mode

Select Power Saving Mode

Serial Port 1 Configuration

Set Parameters of Serial Port 1 (COMA)

Serial Port 2 Configuration

Set Parameters of Serial Port 2 (COMB)

Hardware Monitor

Monitor hardware status

3.4.3.1 Serial Port 1 Configuration

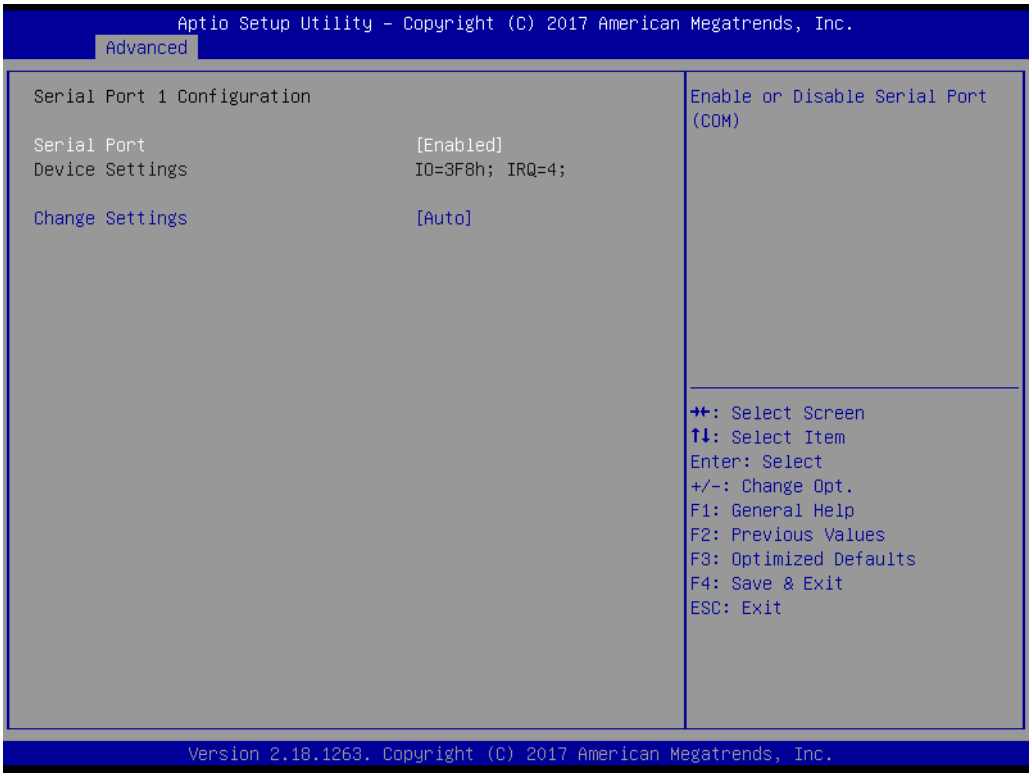


Figure 3.7 Serial Port 1 Configuration

Serial Port

Enable or Disable Serial Port (COM)

Device Settings

Set Parameters of Serial Port 1 (COMA)

Change Settings

Select an optimal settings for Super IO Device

3.4.3.2 Serial Port 2 Configuration

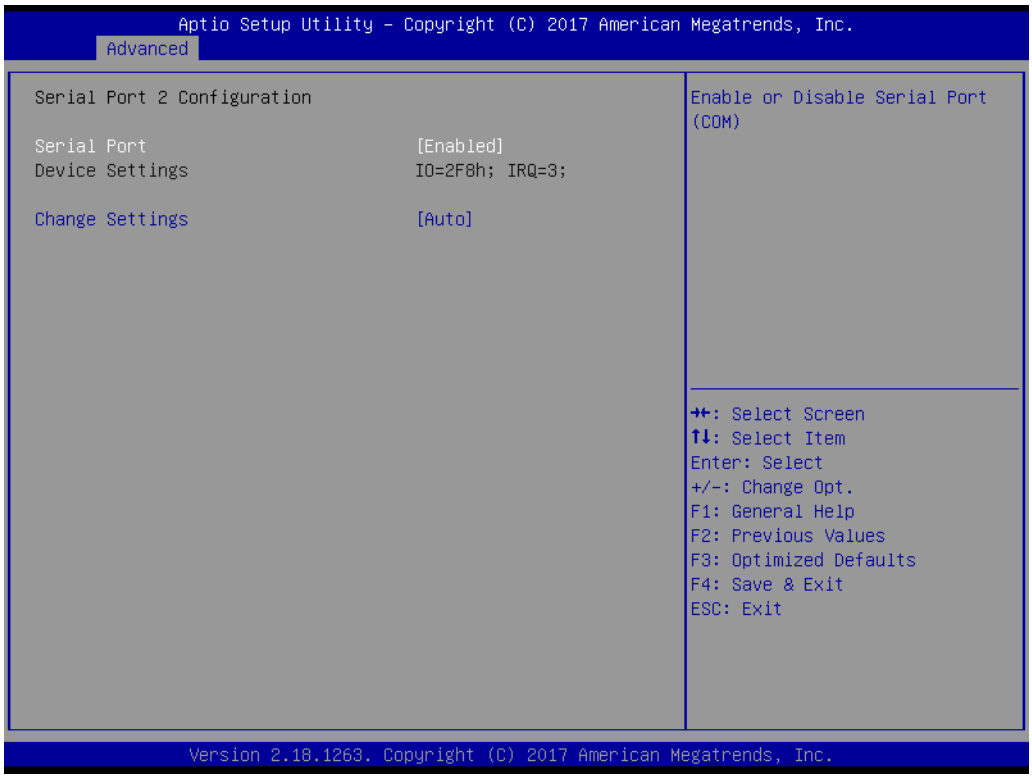


Figure 3.8 Serial Port 2 Configuration

Serial Port

Enable or Disable Serial Port (COM)

Device Settings

Set Parameters of Serial Port 2 (COMB)

Change Settings

Select an optimal settings for Super IO Device

3.4.3.3 Hardware Monitor

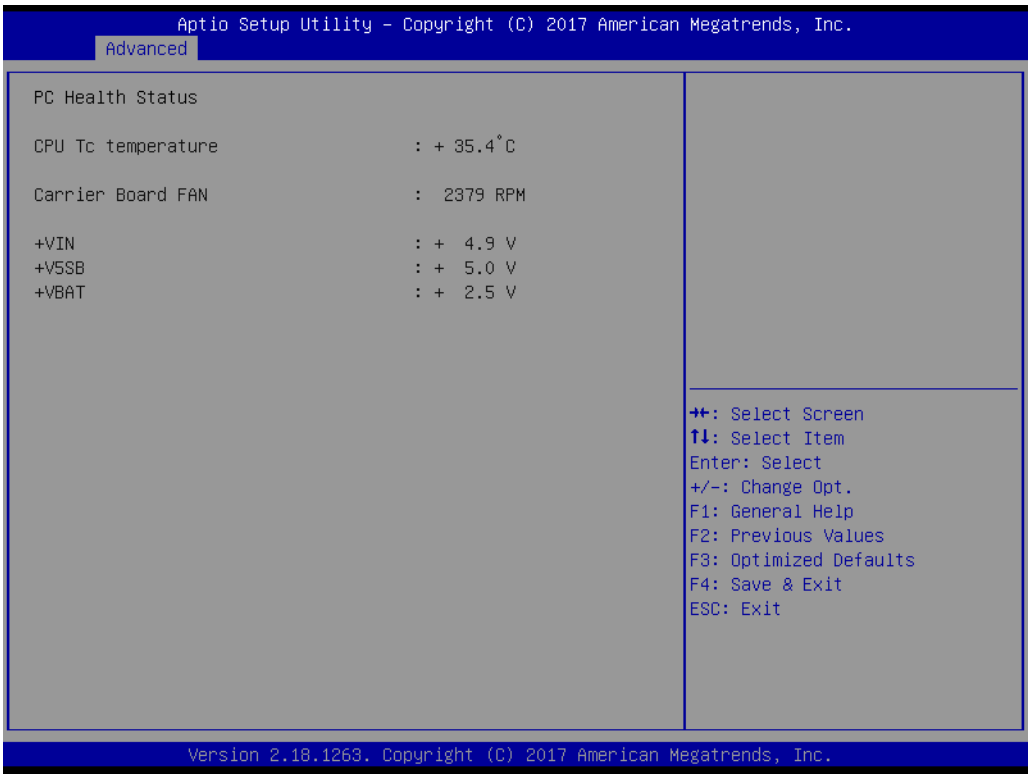


Figure 3.9 Hardware Monitor

3.4.4 Serial Port Console Redirection

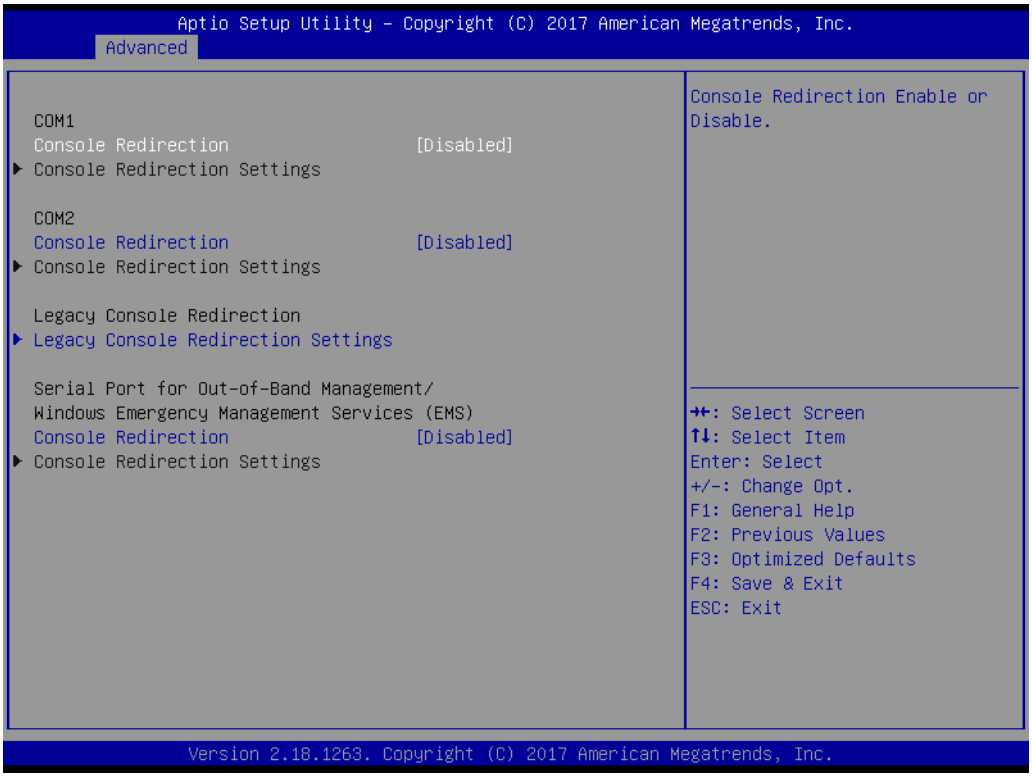


Figure 3.10 Serial Port console Redirection

COM1

Console Redirection

Console Redirection Enable or Disable.

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

COM2

Console Redirection

Console Redirection Enable or Disable.

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Legacy Console Redirection

Legacy Console Redirection Settings

Legacy Console Redirection Settings

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

Console Redirection

Console Redirection Enable or Disable.

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

3.4.5 CPU Configuration

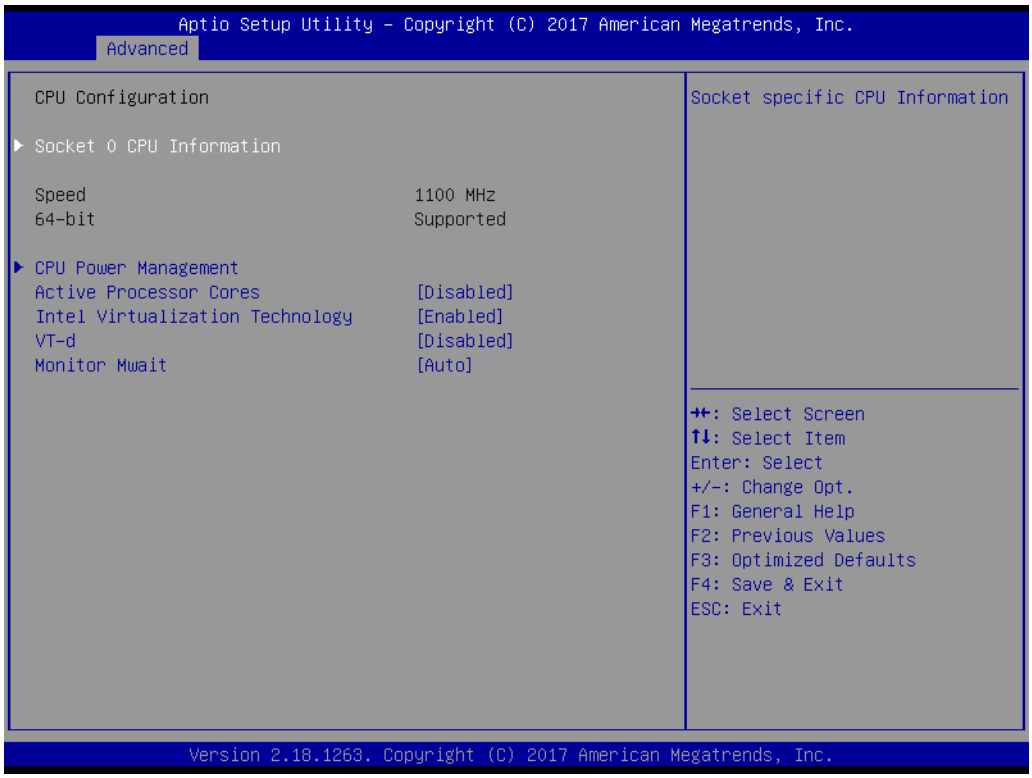


Figure 3.11 CPU Configuration

Socket 0 CPU Information

Socket specific CPU Information

Speed

Displays the Processor Speed.

64-bit

Displays if 64-bit is supported

CPU Power Management

CPU Power Management options

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

VT-d

Enable/Disable CPU VT-d

Monitor Mwait

Enable/Disable Monitor Mwait.

3.4.5.1 Socket 0 CPU Information

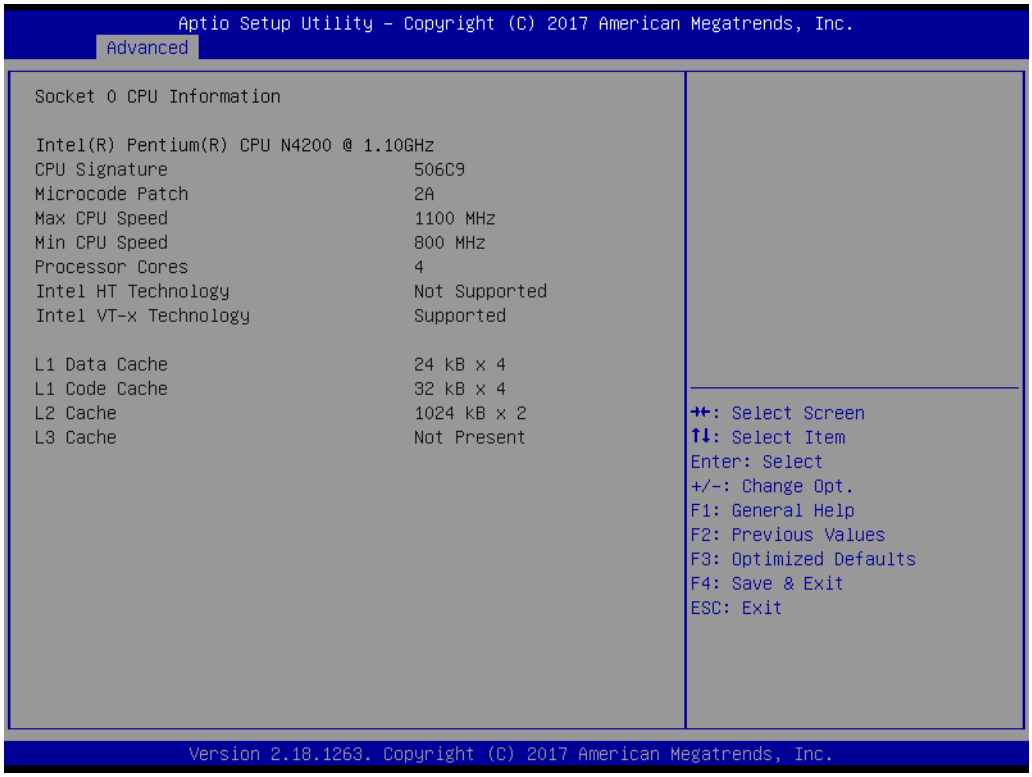


Figure 3.12 Socket 0 CPU Information

CPU Signature
Displays CPU Signature
Microcode Patch
CPU Microcode Patch Revision
Max CPU Speed
Displays the Max CPU Speed
Min CPU Speed
Displays the Max CPU Speed
Processor Cores
Displays number of cores.
Intel HT Technology
When Hyper-threading is enabled, 2 logical CPUS per core is present.
Intel VT-x Technology
CPU VMX hardware support for virtual machines.
L1 Data Cache
L1 Data Cache Size
L1 Code Cache
L1 Code Cache Size
L2 Cache
L2 Cache Size
L3 Cache
L3 Cache Size

3.4.5.2 CPU Power Management

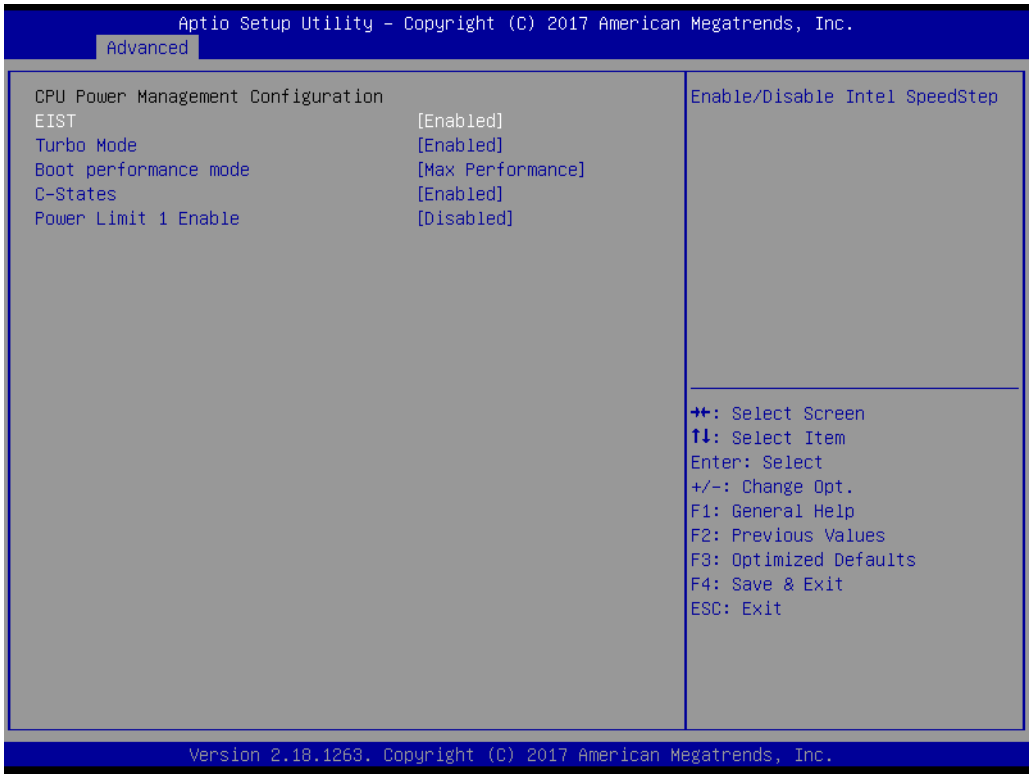


Figure 3.13 CPU Power Management

EIST

Enable/Disable Intel SpeedStep

Turbo Mode

Turbo Mode.

Boot performance mode

Select the performance state that the BIOS will set before OS handoff.

C-States

Enable/Disable C States

Power Limit 1 Enable

Enable/Disable Power Limit 1

3.4.6 Network Stack Configuration

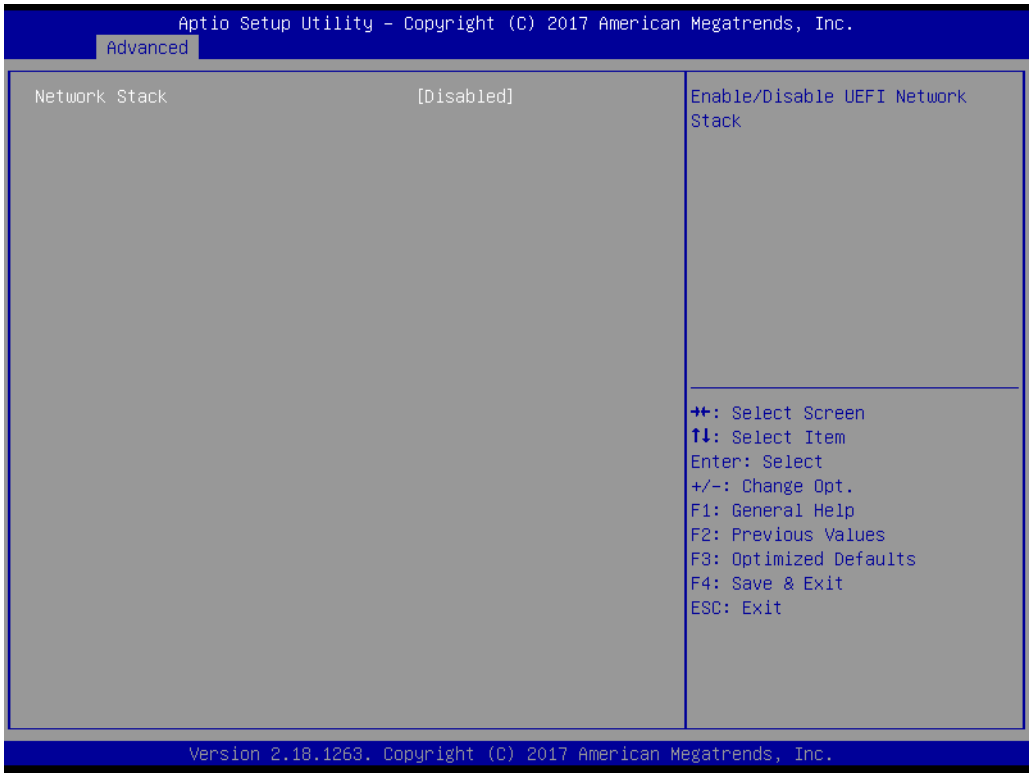


Figure 3.14 Network Stack Configuration

Network Stack

Enable/Disable UEFI Network Stack

3.4.7 CSM Configuration

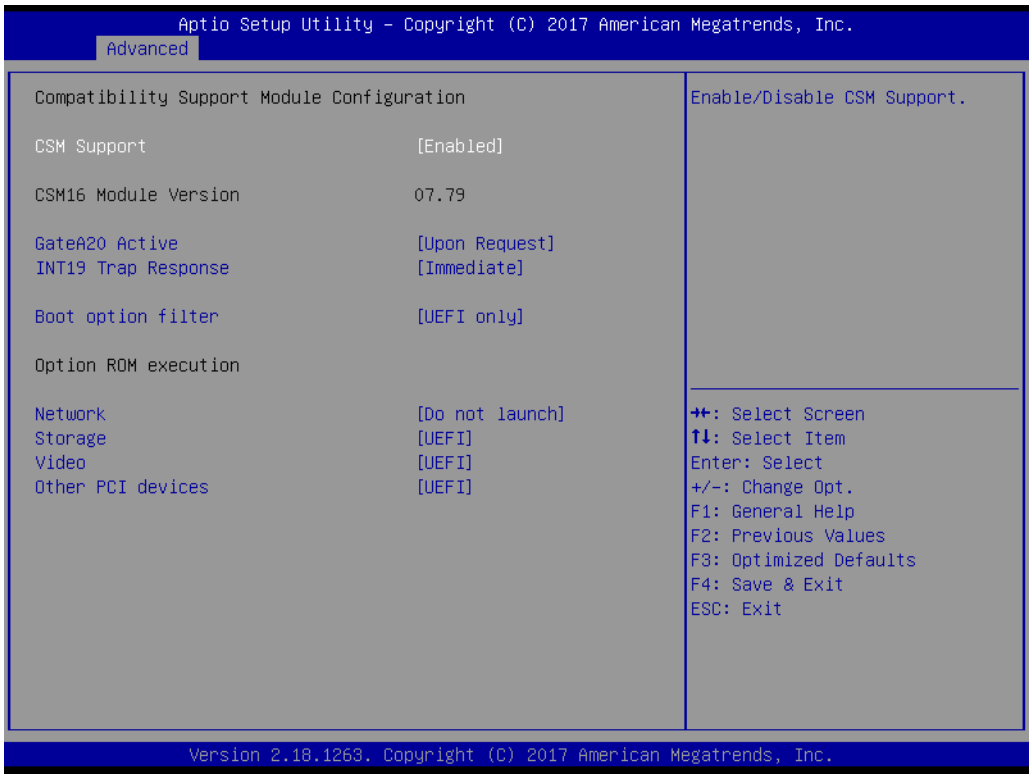


Figure 3.15 CSM Configuration

CSM Support

Enable/Disable CSM Support.

CSM16 Module Version

CSM16 Module Version

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services. Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

Boot option filter

This option controls Legacy/UEFI ROMs priority

Option ROM execution

Network

Controls the execution of UEFI and Legacy PXE OpROM

Storage

Controls the execution of UEFI and Legacy Storage OpROM

Video

Controls the execution of UEFI and Legacy Video OpROM

Other PCI devices

Determines OpROM execution policy for devices other than Network, Storage, or Video

3.4.8 NVMe Configuration

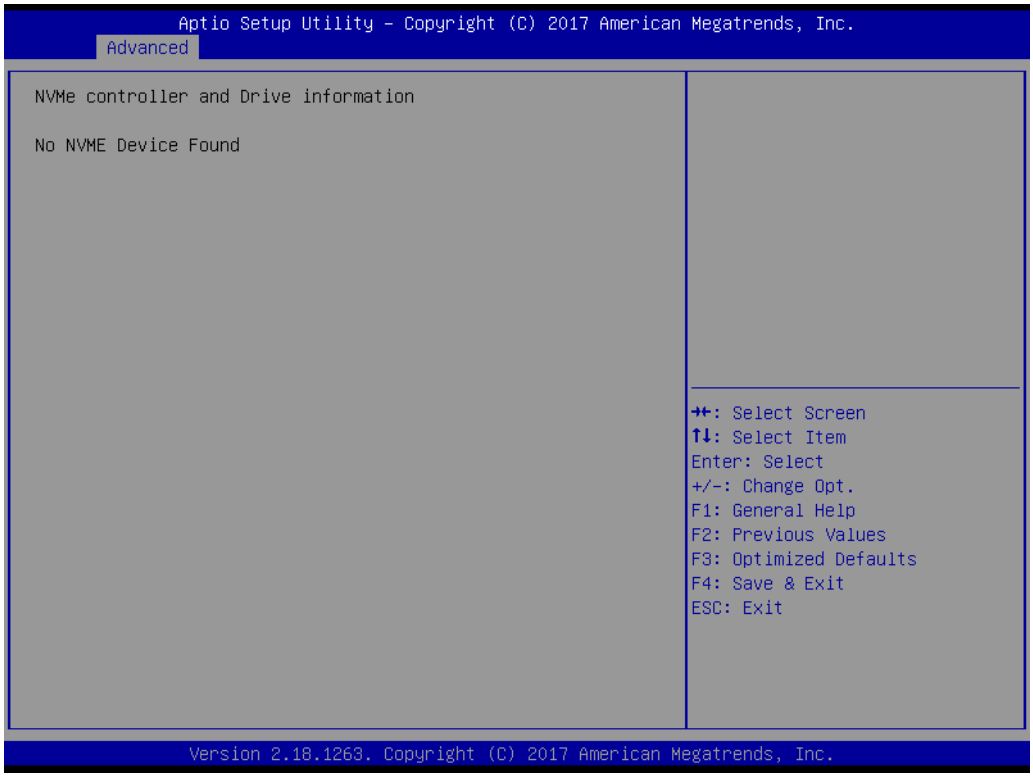


Figure 3.16 NVMe Configuration

3.4.9 SDIO Configuration

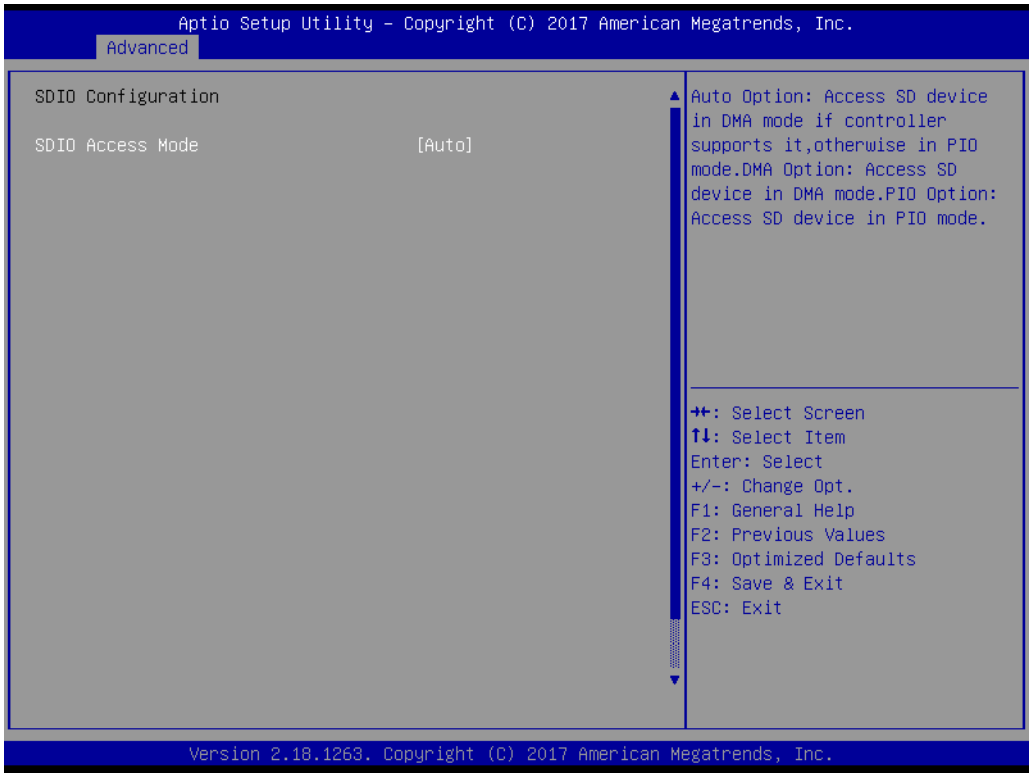


Figure 3.17 SDIO Configuration

SDIO Access Mode

Auto Option: Access SD device in DMA mode if the controller supports it, otherwise in PIO mode.DMA Option: Access SD device in DMA mode.PIO Option: Access SD device in PIO mode.

3.4.10 USB Configuration

Figure 3.18 USB Configuration

Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

XHCI Hand-off

This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out

USB mass storage device Start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Device power-up delay in seconds

Delay range is 1...40 seconds, in one second increments.

3.4.11 Platform Trust Technology

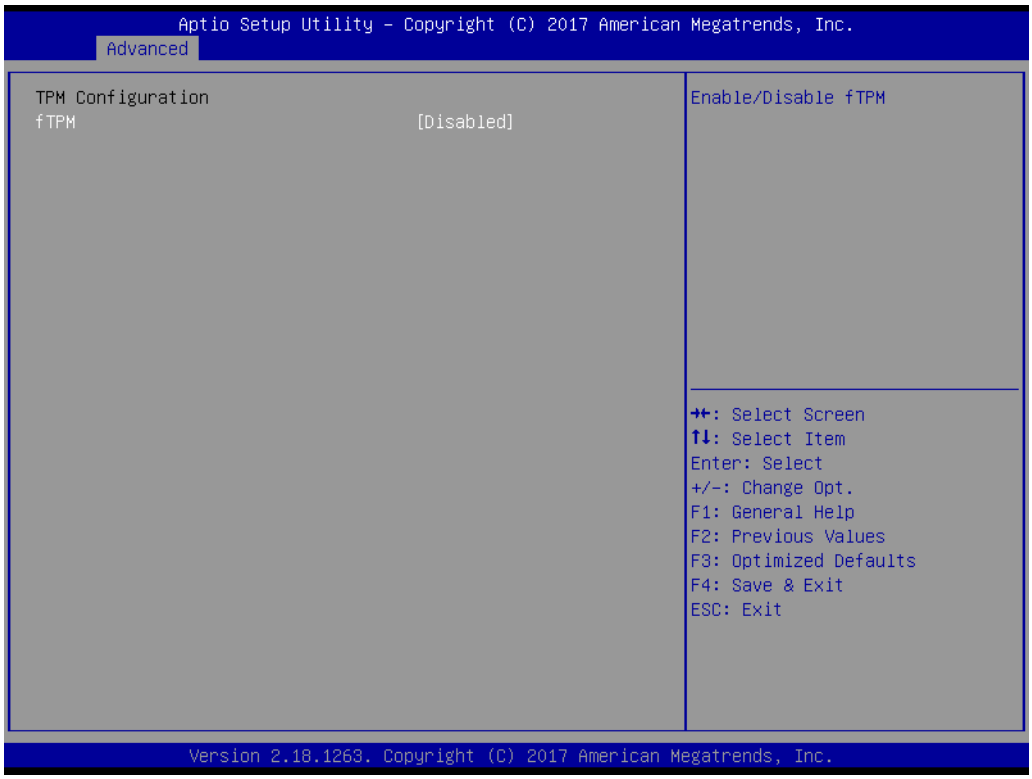


Figure 3.19 Platform Trust Technology

fTPM

Enable/Disable fTPM

3.4.12 Security Configuration

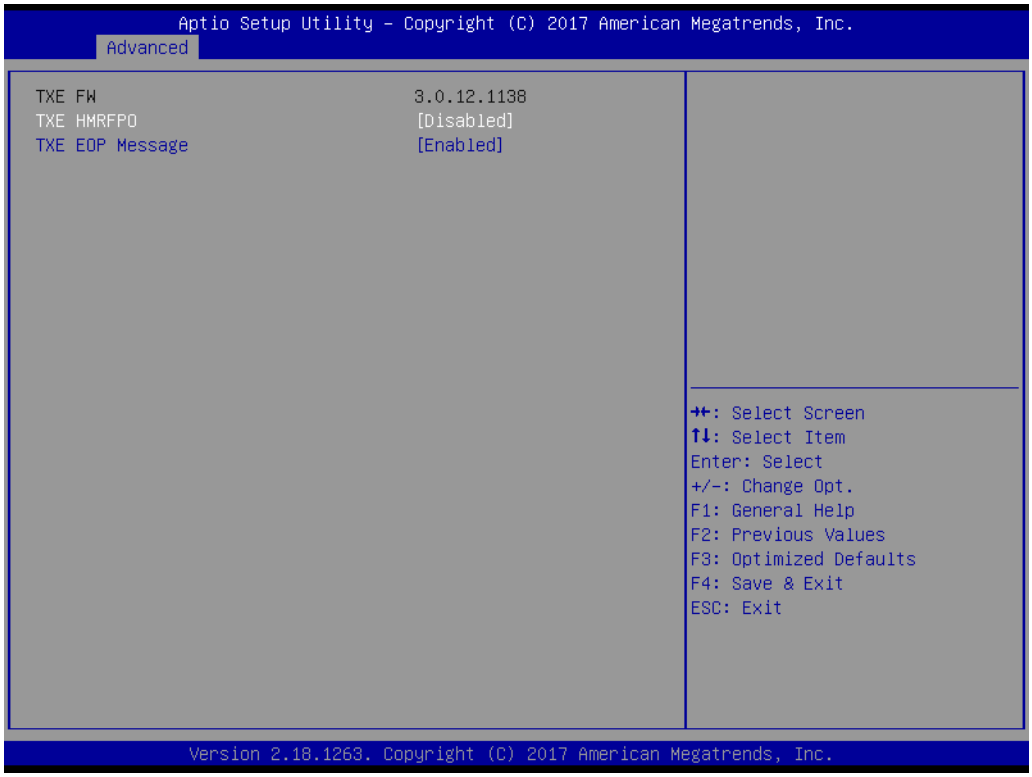


Figure 3.20 Security Configuration

TXE HMRFPO

TXE EOP Message

Send EOP Message Before Enter OS

3.5 Chipset Setup

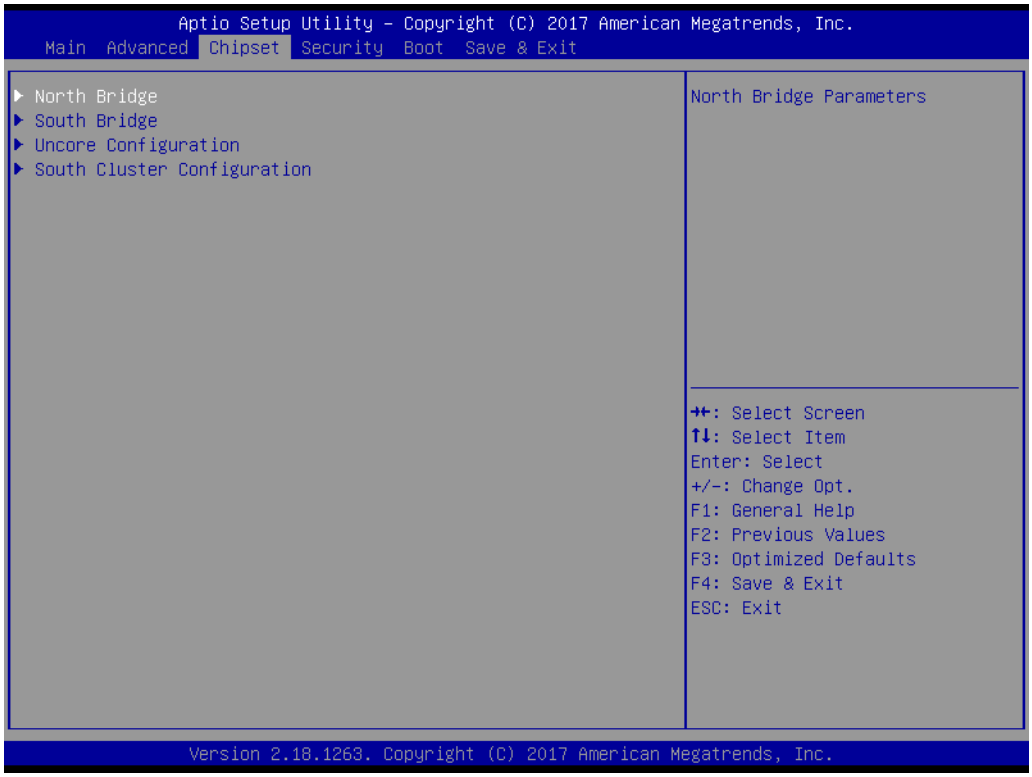


Figure 3.21 Chipset Setup

North Bridge
North Bridge Parameters
South Bridge
South Bridge Parameters
Uncore Configuration
Uncore Configuration
South Cluster Configuration
South Cluster Configuration

3.5.1 North Bridge

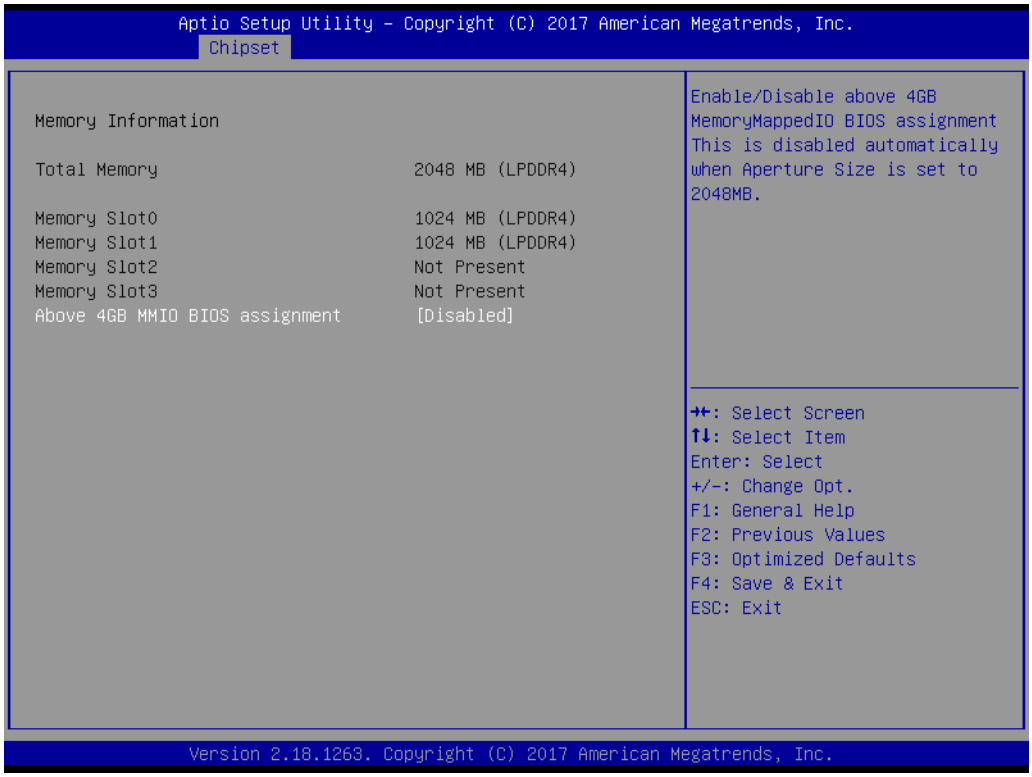


Figure 3.22 North Bridge

Total Memory

Total Memory in the System.

Memory Slot0

Memory in the slot.

Memory Slot1

Memory in the slot.

Memory Slot2

Memory in the slot.

Memory Slot3

Memory in the slot.

Above 4GB MMIO BIOS assignment

Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

3.5.2 South Bridge

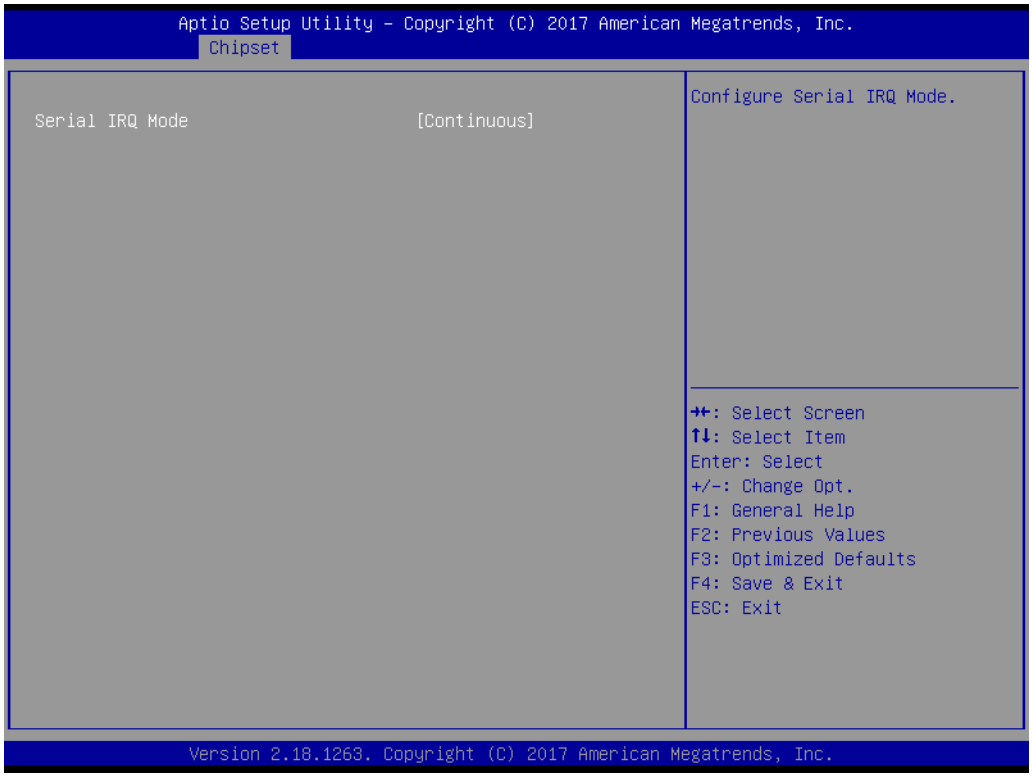


Figure 3.23 South Bridge

Serial IRQ Mode
Configure Serial IRQ Mode.

3.5.3 Uncore Configuration

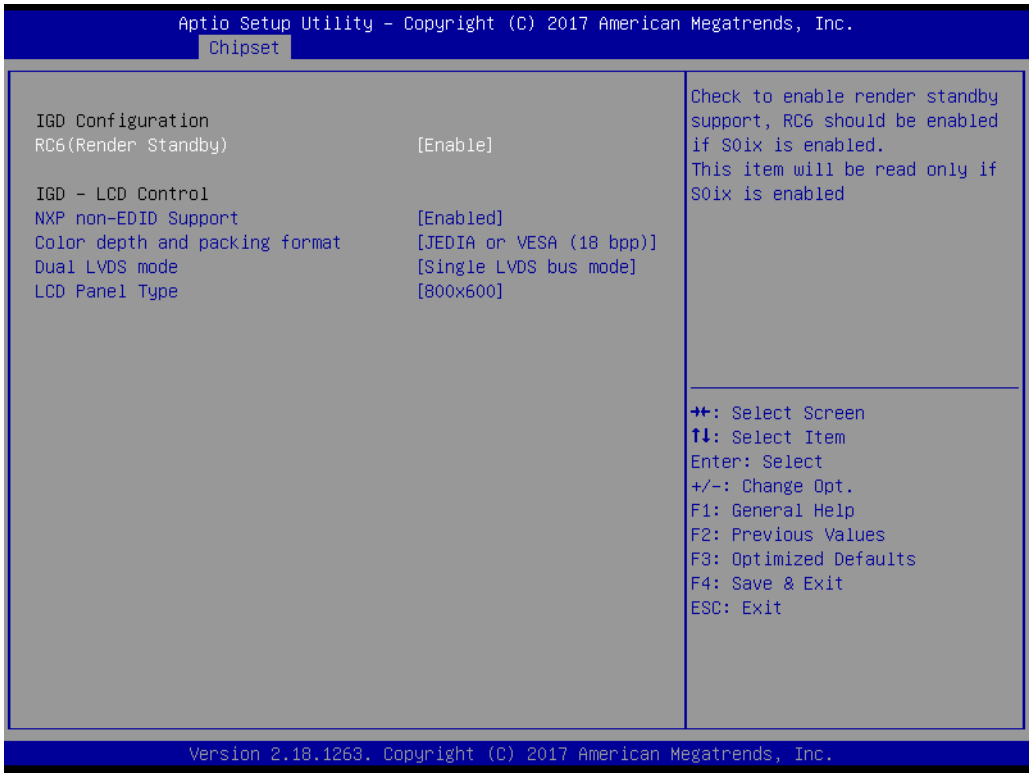


Figure 3.24 Uncore Configuration

IGD Configuration

RC6(Render Standby)

Check to enable render standby support, RC6 should be enabled if S0ix is enabled. This item will be read only if S0ix is enabled.

IGD - LCD Control

NXP non-EDID Support

NXP PTN3460 Support: Enable: Used internal EDID setting; Disable: Get EDID from DDC bus.

Color depth and packing format

Color depth and packing format

Dual LVDS mode

Dual LVDS mode

LCD Panel Type

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

3.5.4 South Cluster Configuration

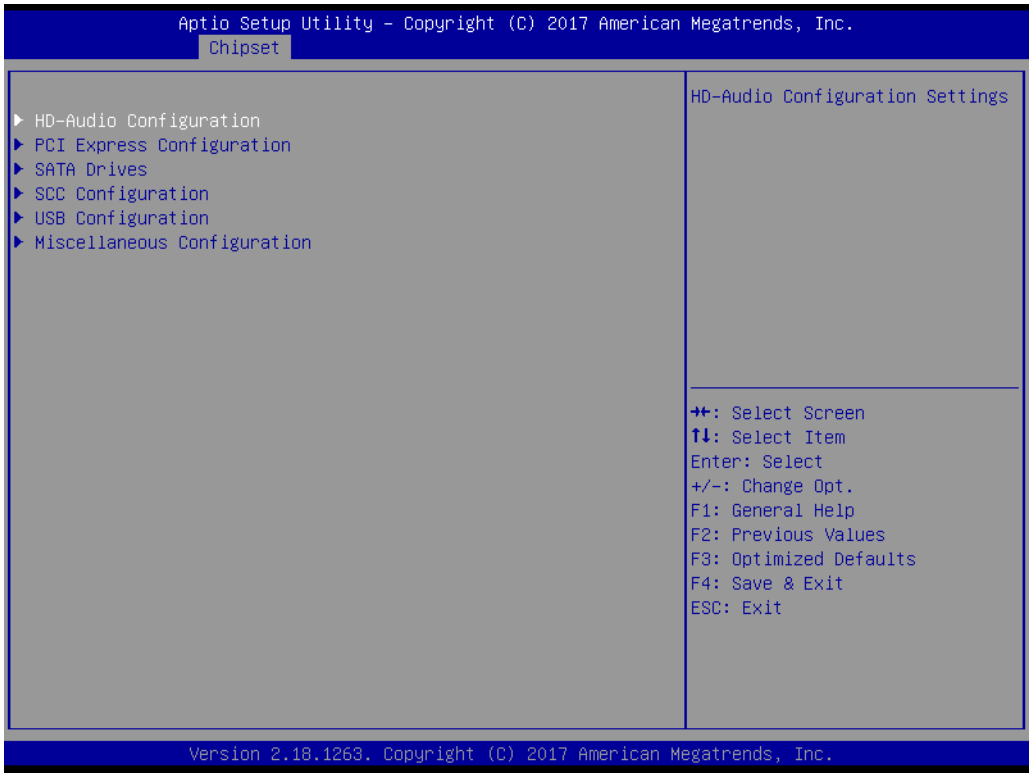


Figure 3.25 South Cluster Configuration

HD-Audio Configuration

HD-Audio Configuration Settings

PCI Express Configuration

PCI Express Configuration Settings

SATA Drives

Press <Enter> to select the SATA Device Configuration Setup options.

SCC Configuration

SCC Configuration Settings

USB Configuration

USB Configuration Settings

Miscellaneous Configuration

Enable/Disable Misc. Features

3.5.4.1 HD-Audio Configuration

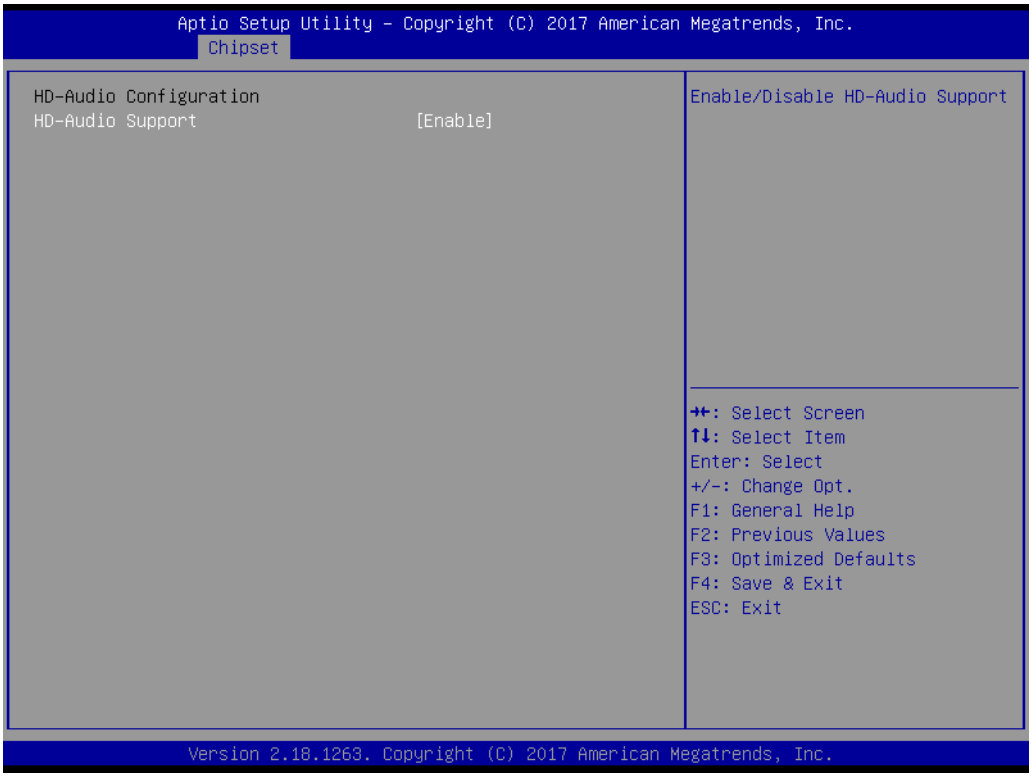


Figure 3.26 HD-Audio Configuration

HD-Audio Support

Enable/Disable HD-Audio Support

3.5.4.2 PCI Express Configuration

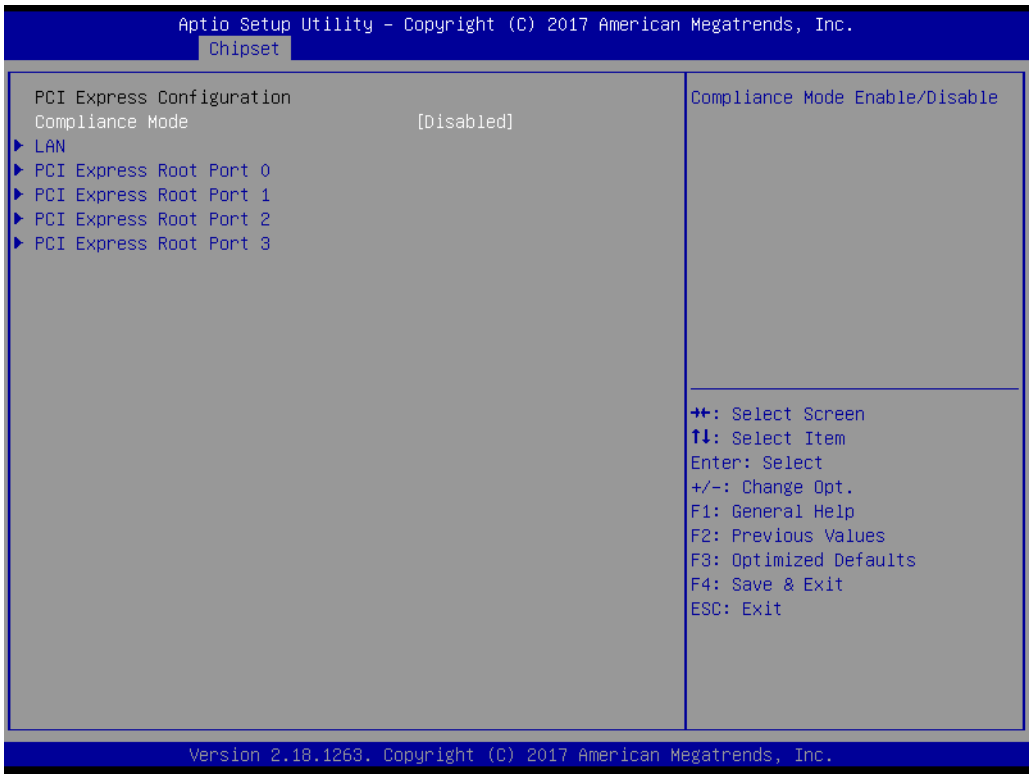


Figure 3.27 PCI Express Configuration

Compliance Mode

Compliance Mode Enable/Disable

LAN

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

PCI Express Root Port 0

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

PCI Express Root Port 1

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

PCI Express Root Port 2

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

PCI Express Root Port 3

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

LAN

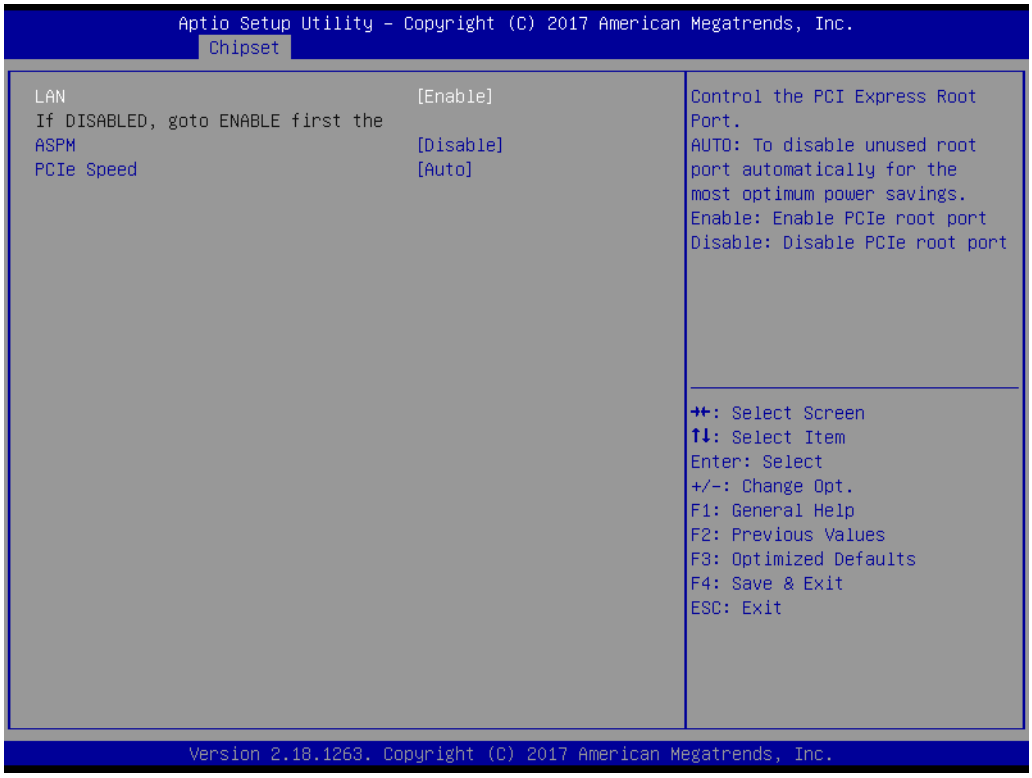


Figure 3.28 LAN

LAN

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

ASPM

PCI Express Active State Power Management settings

PCIe Speed

Configure PCIe Speed

PCI Express Root Port 0

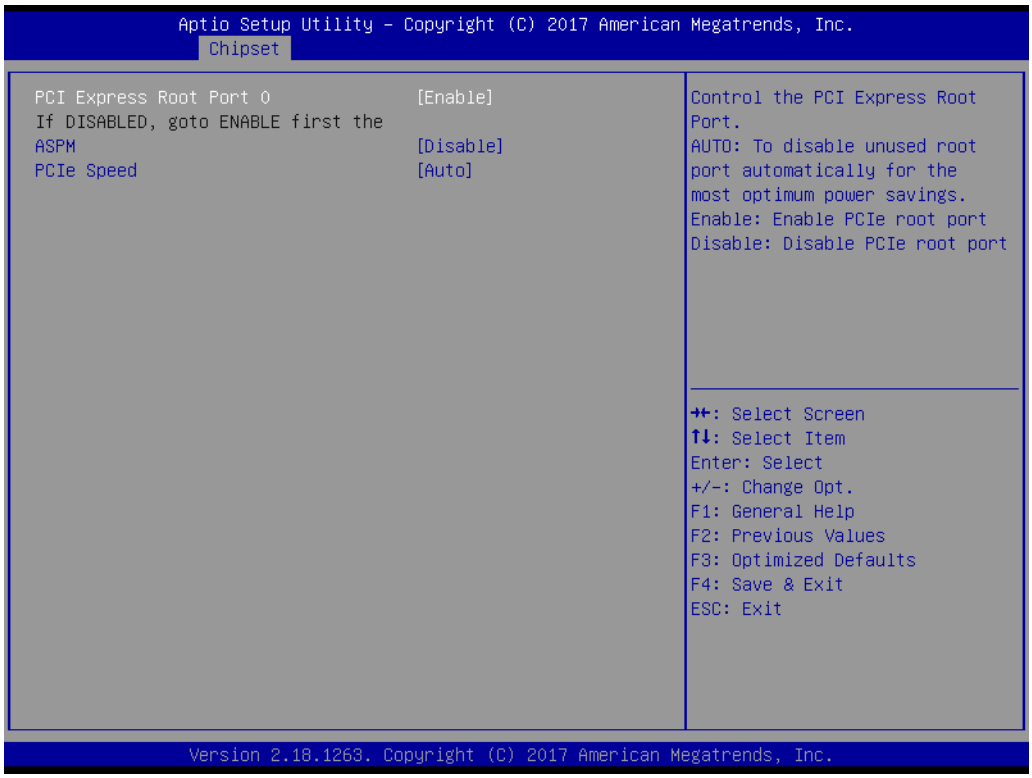


Figure 3.29 PCI Express Root Port 0

PCI Express Root Port 0

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

ASPM

PCI Express Active State Power Management settings

PCIe Speed

Configure PCIe Speed

PCI Express Root Port 1

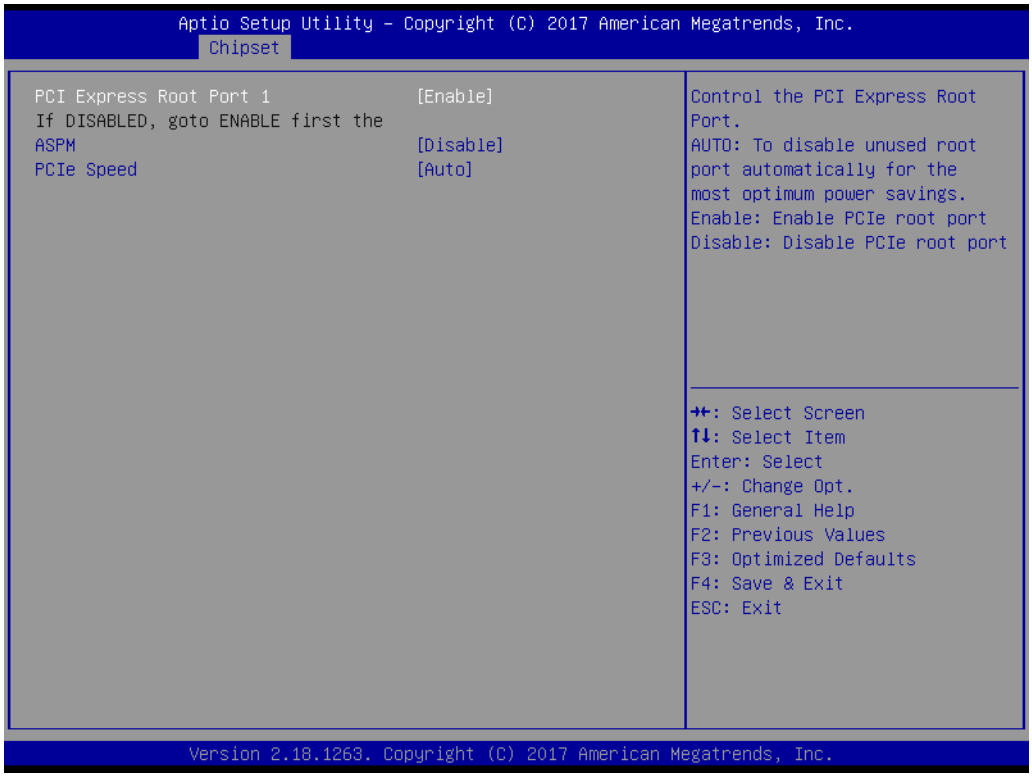


Figure 3.30 PCI Express Root Port 1

PCI Express Root Port 1

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

ASPM

PCI Express Active State Power Management settings

PCIe Speed

Configure PCIe Speed

PCI Express Root Port 2

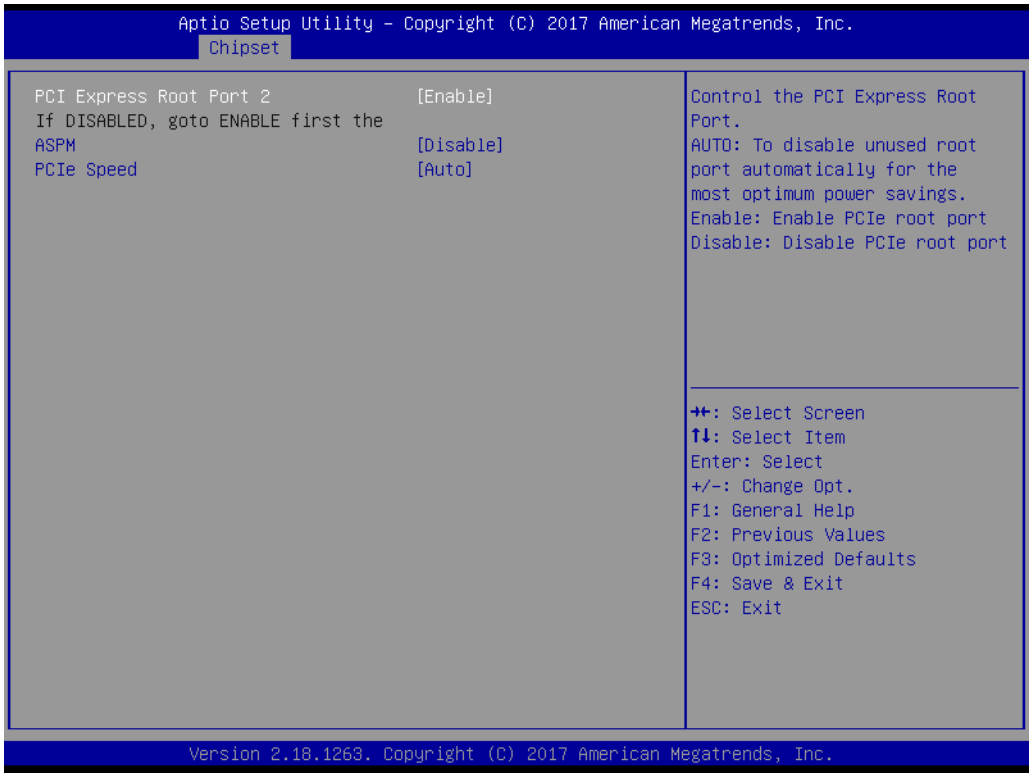


Figure 3.31 PCI Express Root Port 2

PCI Express Root Port 2

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

ASPM

PCI Express Active State Power Management settings

PCIe Speed

Configure PCIe Speed

PCI Express Root Port 3

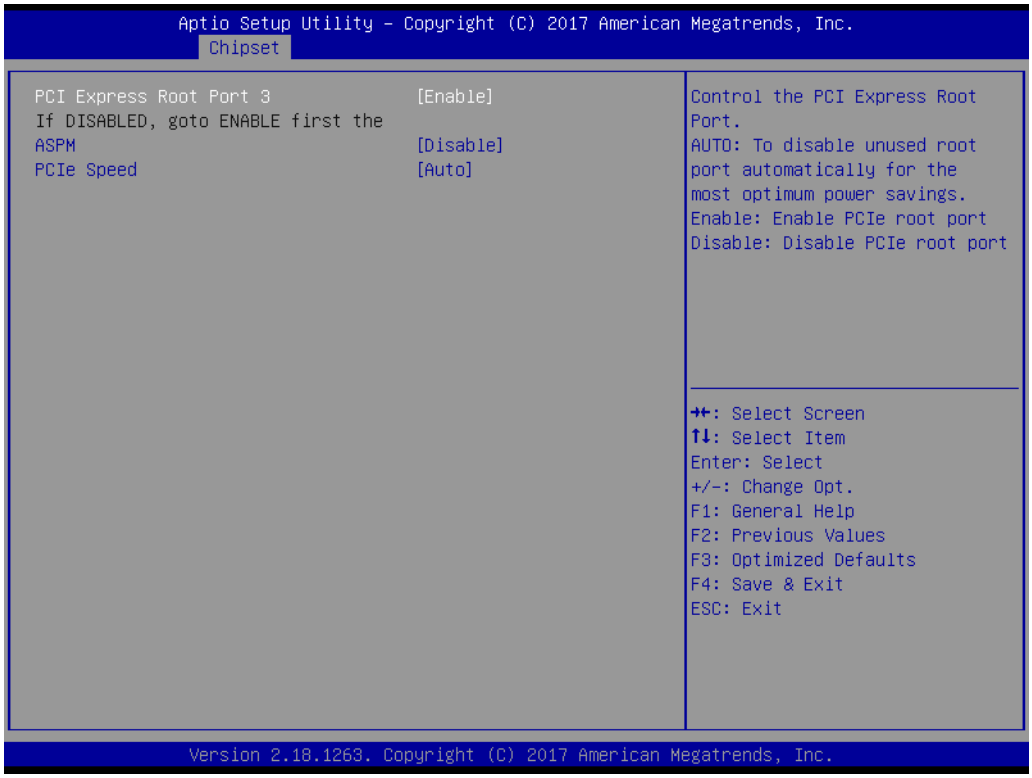


Figure 3.32 PCI Express Root Port 3

PCI Express Root Port 3

Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port Disable: Disable PCIe root port

ASPM

PCI Express Active State Power Management settings

PCIe Speed

Configure PCIe Speed

3.5.4.3 SATA Drive

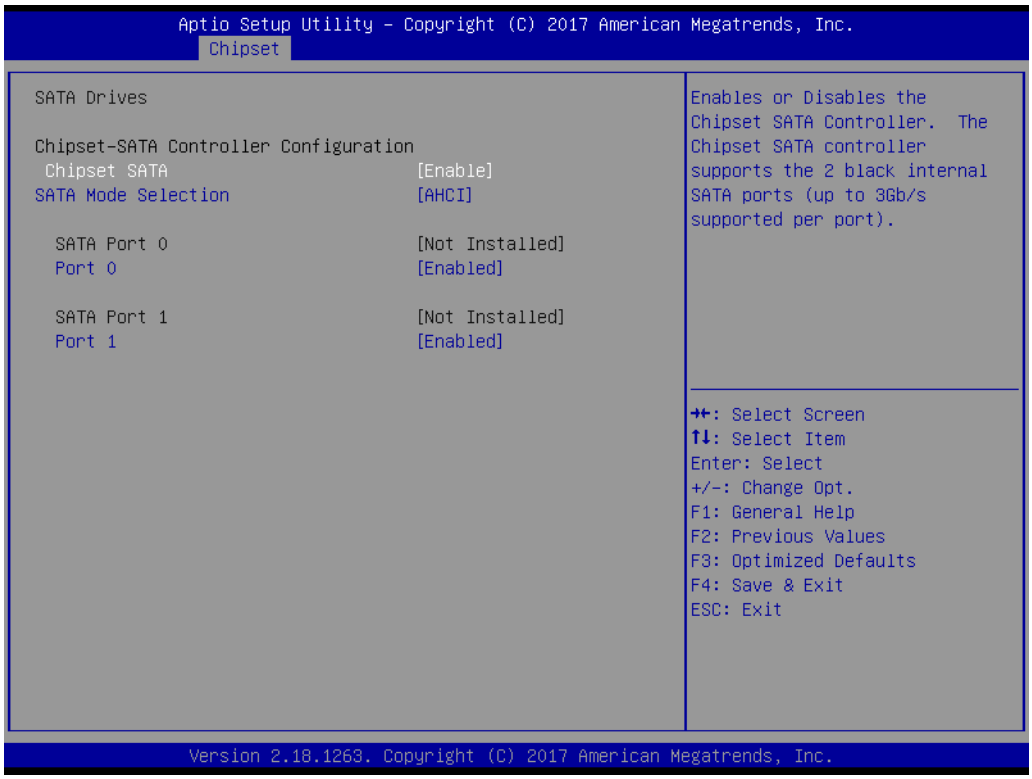


Figure 3.33 SATA Drives

Chipset-SATA Controller Configuration

Chipset SATA

Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Port 0

Port 0

Enable or Disable SATA Port

SATA Port 1

Port 1

Enable or Disable SATA Port

3.5.4.4 SCC Configuration

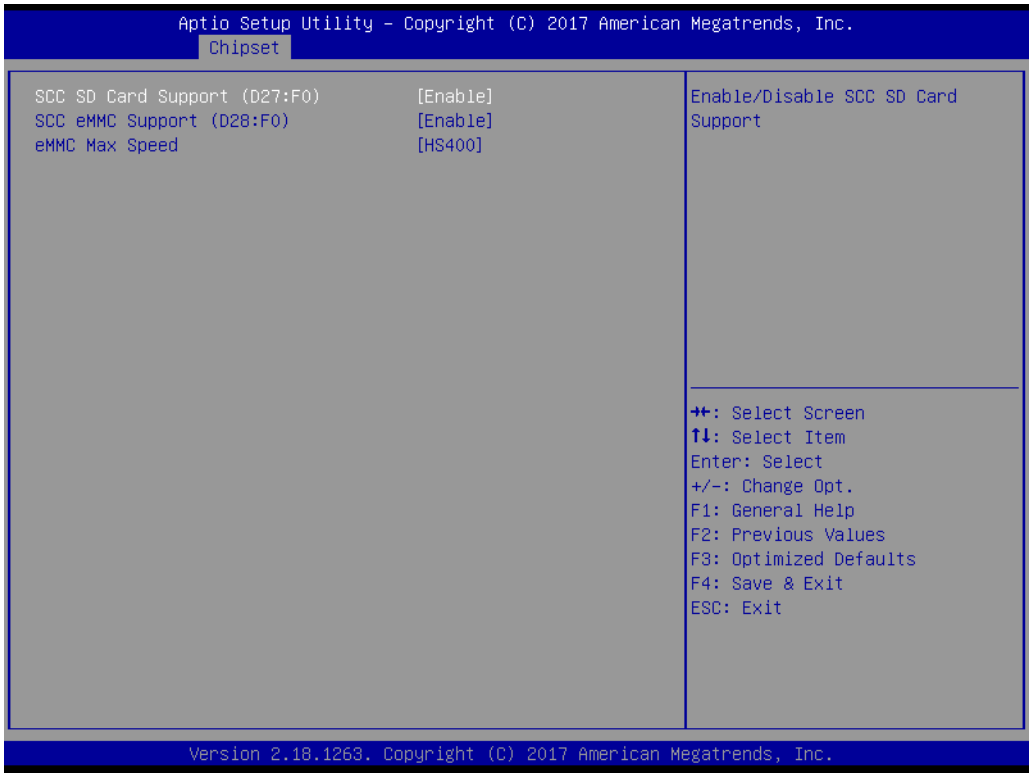


Figure 3.34 SCC Configuration

SCC SD Card Support (D27:F0)
Enable/Disable SCC SD Card Support
SCC eMMC Support (D28:F0)
Enable/Disable SCC eMMC Support
eMMC Max Speed
Select the eMMC max Speed allowed.

3.5.4.5 USB Configuration

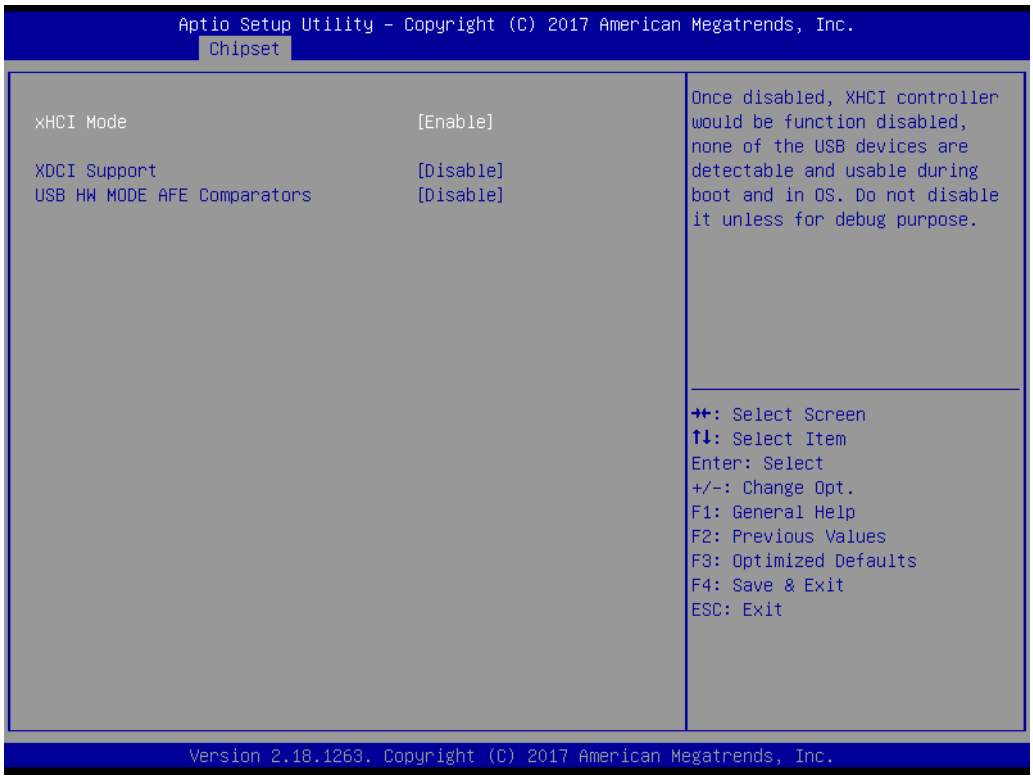


Figure 3.35 USB Configuration

xHCI Mode

Once disabled, XHCI controller would be function disabled, none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debug purpose.

XDCI Support

Enable/Disable XDCI

USB HW MODE AFE Comparators

Enable/Disable USB HW MODE AFE Comparators

3.5.4.6 Miscellaneous Configuration

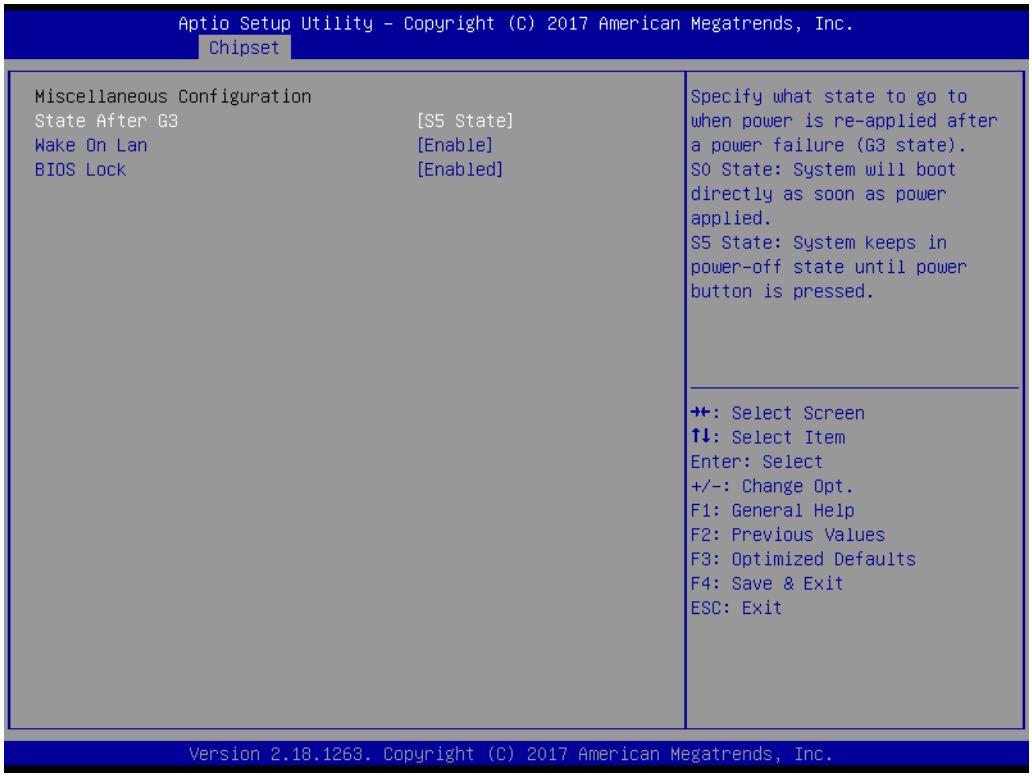


Figure 3.36 Miscellaneous Configuration

State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state). S0 State: System will boot directly as soon as power applied. S5 State: System keeps in power-off state until power button is pressed.

Wake On Lan

Enable or Disable the Wake on Lan.

BIOS Lock

Enable/Disable the SC BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

3.6 Security Chipset

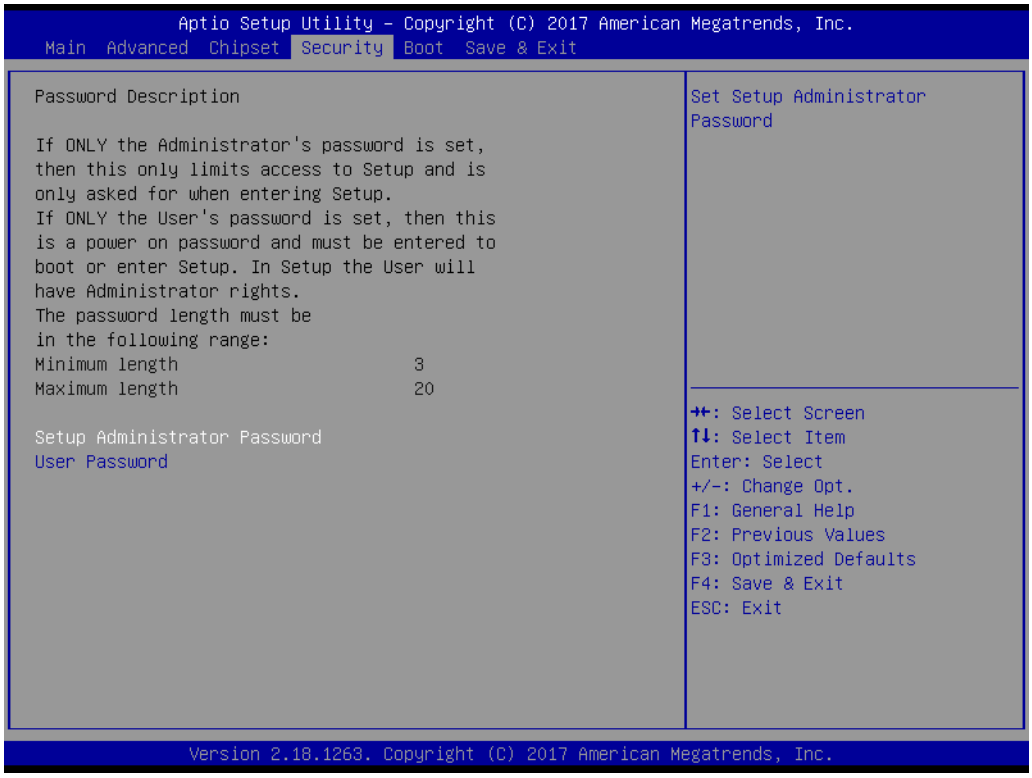


Figure 3.37 Security Chipset

Setup Administrator Password

Set Setup Administrator Password

User Password

Set User Password

3.7 Boot Setup

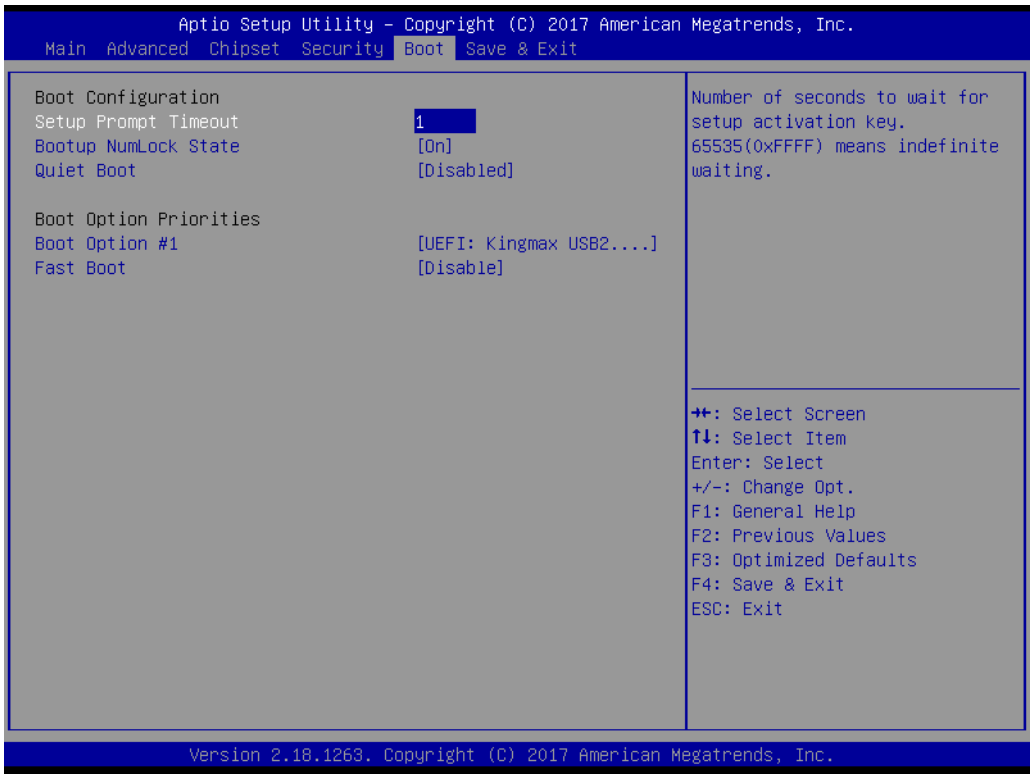


Figure 3.38 Boot Setup

Boot Configuration

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state

Quiet Boot

Enables or disables Quiet Boot option

Boot Option Priorities

Boot Option #1

Sets the system boot order

Fast Boot

Enable or Disable FastBoot features. Most probes are skipped to reduce time cost during boot.

3.8 Save & Exit

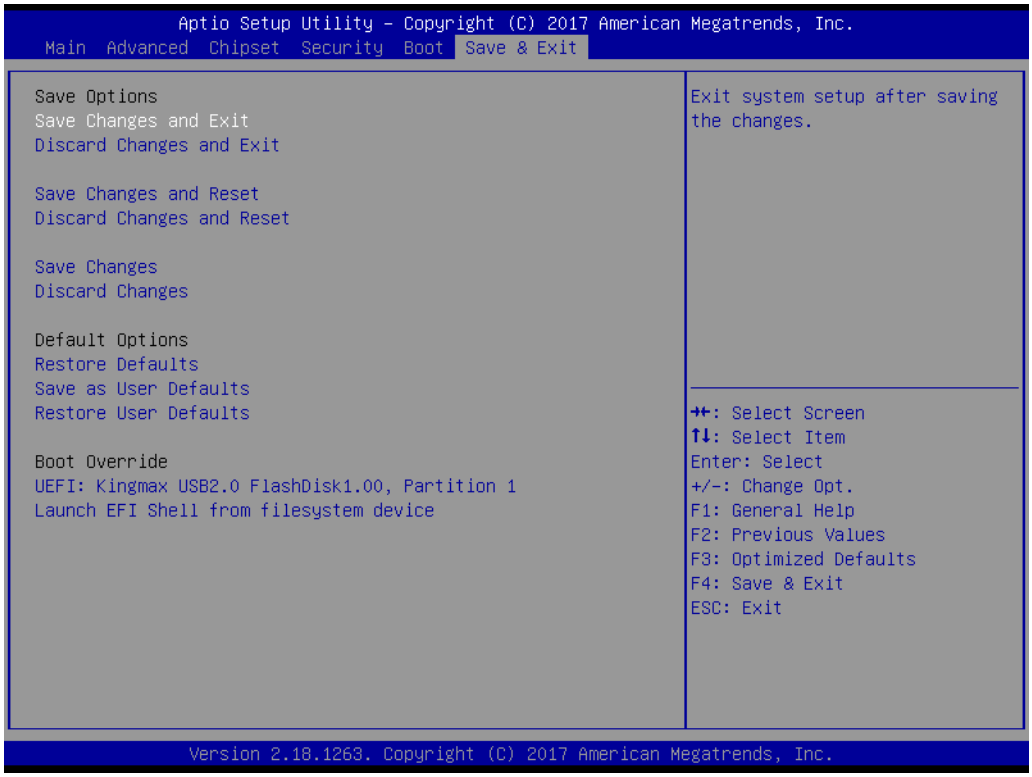


Figure 3.39 Save & Exit

Save Options

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Default Options

Restore Defaults

Restore/Load Default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

Boot Override

Launch EFI Shell from file system device

Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices

Chapter 4

S/W Introduction & Installation

- S/W Introduction
- Driver Installation
- Advantech iManager

4.1 S/W Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft Windows embedded technology." We enable Windows Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Driver Installation

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured.

4.2.1 Windows Driver Setup

To install the drivers on a windows-based operation system, please connect to internet and browse the website http://support.advantech.com.tw and download the drivers that you want to install and follow Driver Setup instructions to complete the installation.

4.2.2 Other OS

SOM-3569 supports Linux.

4.3 Advantech iManager

Advantech's platforms come equipped with iManager, a micro controller that provides embedded features for system integrators. Embedded features have been moved from the OS/BIOS level to the board level, to increase reliability and simplify integration.

iManager runs whether the operating system is running or not; it can count the boot times and running hours of the device, monitor device health, and provide an advanced watchdog to handle errors just as they happen. iManager also comes with a secure & encrypted EEPROM for storing important security key or other customer define information. All the embedded functions are configured through API and provide corresponding utilities to demonstrate. These APIs comply with PICMG EAPI (Embedded Application Programmable Interface) specification and unify in the same structures. It makes these embedded features easier to integrate, speed up developing schedule, and provide the customer's software continuity while upgrade hardware. More detail of how to use the APIs and utilities, please refer to Advantech iManager 2.0 Software API User Manual.

Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

I²C

I²C is a bi-directional two wire bus that was developed by Philips for use in their televisions in the 1980s. The I²C API allows a developer to interface with an embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

Display

Brightness Control

The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

Hardware Control

The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust fan speed or other devices; it can also be used to adjust the LCD brightness.

Power Saving

CPU Speed

Make use of Intel SpeedStep technology to reduce power power consumption. The system will automatically adjust the CPU Speed depending on system loading.

System Throttling

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow the user to lower the clock from 87.5% to 12.5%.

Appendix A

Pin Assignment

This appendix gives you the information about the hardware pin assignment of the SOM-3569 CPU System on Module

Sections include:

- SOM-3569 Qseven R2.1 Pin Assignment

A.1 SOM-3569 Qseven R2.1 Pin Assignment

This section gives SOM-3569 pin assignment on Qseven golden finger which compliant with Qseven R2.1 pin-out definitions. More details about how to use these pins and get design reference. Please contact to Advantech for design guide, checklist, reference schematic, and other hardware/software supports.

Odd number	R2.1 SOM-3569 A101-2	Even number	R2.1 SOM-3569 A101-2
1	GND	2	GND
3	GBE_MDI3-	4	GBE_MDI2-
5	GBE_MDI3+	6	GBE_MDI2+
7	GBE_LINK100#	8	GBE_LINK1000#
9	GBE_MDI1-	10	GBE_MDI0-
11	GBE_MDI1+	12	GBE_MDI0+
13	GBE_LINK#	14	GBE_ACT#
15	NC	16	SUS_S4#
17	WAKE#	18	SUS_S3#
19	GPO0	20	PWRBTN#
21	SLP_BTN#	22	LID_BTN#
23	GND	24	GND
	KEY		KEY
25	GND	26	PWGIN
27	BATLOW#	28	RSTBTN#
29	SATA0_TX+	30	SATA1_TX+
31	SATA0_TX-	32	SATA1_TX-
33	SATA_ACT#	34	GND
35	SATA0_RX+	36	SATA1_RX+
37	SATA0_RX-	38	SATA1_RX-
39	GND	40	GND
41	BIOS_DISABLE#	42	SDIO_CLK#
43	SDIO_CD#	44	NC
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	NC
53	NC	54	NC
55	NC	56	USB_OTG_PEN
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DAT
63	HDA_BITCLK	64	SMB_ALERT#
65	HDA_SDI	66	I2C_CLK
67	HDA_SDO	68	I2C_DAT
69	THRM#	70	WDTRIG#

71	THRMTRIP#	72	WDOUT
73	GND	74	GND
75	USB_SSTX0-	76	USB_SSRX0-
77	USB_SSTX0+	78	USB_SSRX0+
79	USB_6_7_OC#	80	USB_4_5_OC#
81	USB_P5-	82	USB_P4-
83	USB_P5+	84	USB_P4+
85	USB_2_3_OC#	86	USB_0_1_OC#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+
91	USB_VBUS	92	USB_ID
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	eDP0_TX0+ / LVDS_A0+	100	LVDS_B0+
101	eDP0_TX0- / LVDS_A0-	102	LVDS_B0-
103	eDP0_TX1+ / LVDS_A1+	104	LVDS_B1+
105	eDP0_TX1- / LVDS_A1-	106	LVDS_B1-
107	eDP0_TX2+ / LVDS_A2+	108	LVDS_B2+
109	eDP0_TX2- / LVDS_A2-	110	LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	eDP0_TX3+ / LVDS_A3+	114	LVDS_B3+
115	eDP0_TX3- / LVDS_A3-	116	LVDS_B3-
117	GND	118	GND
119	eDP0_AUX+ / LVDS_A_CLK+	120	LVDS_B_CLK+
121	eDP0_AUX- / LVDS_A_CLK-	122	LVDS_B_CLK-
123	LVDS_BLT_CTRL	124	NC
125	LVDS_DID_DAT	126	eDP0_HPD#
127	LVDS_DID_CLK	128	NC
129	CAN0_TX	130	CAN0_RX
131	DP_LANE3+	132	USB_SSTX1-
133	DP_LANE3-	134	USB_SSTX1+
135	GND	136	GND
137	DP_LANE1+	138	DP_AUX+
139	DP_LANE1-	140	DP_AUX-
141	GND	142	GND
143	DP_LANE2+	144	USB_SSRX1-
145	DP_LANE2-	146	USB_SSRX1+
147	GND	148	GND
149	DP_LANE0+	150	HDMI_CTRL_DAT
151	DP_LANE0-	152	HDMI_CTRL_CLK
153	HDMI_HPD#	154	DP_HPD#
155	PCIE_CLK_REF+	156	PCIE_WAKE#
157	PCIE_CLK_REF-	158	PCIE_RST#
159	GND	160	GND
161	PCIE3_TX+	162	PCIE3_RX+
163	PCIE3_TX-	164	PCIE3_RX-
165	GND	166	GND

167	PCIE2_TX+	168	PCIE2_RX+
169	PCIE2_TX-	170	PCIE2_RX-
171	UART0_TX	172	UART0_RTS#
173	PCIE1_TX+	174	PCIE1_RX+
175	PCIE1_TX-	176	PCIE1_RX-
177	UART0_RX	178	UART0_CTS#
179	PCIE0_TX+	180	PCIE0_RX+
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	LPC_CLK	190	LPC_FRAME#
191	SERIRQ	192	NC
193	VCC_RTC	194	SPKR
195	FAN_TACHOIN	196	FAN_PWMOUT
197	GND	198	GND
199	SPI_MOSI	200	SPI_CS0#
201	SPI_MISO	202	SPI_CS1#
203	SPI_SCK	204	PULL LOW
205	VCC_5V_SB	206	VCC_5V_SB
207	RDC_COM2_CTS#	208	RDC_COM2_SIN
209	RDC_COM2_SOUT	210	RDC_COM2_RTS#
211	NC	212	NC
213	NC	214	NC
215	NC	216	NC
217	NC	218	NC
219	VCC	220	VCC
221	VCC	222	VCC
223	VCC	224	VCC
225	VCC	226	VCC
227	VCC	228	VCC
229	VCC	230	VCC

Appendix B

Watchdog Timer

This appendix gives you the information about the watchdog timer programming on the SOM-3569 CPU System on Module

Sections include:

- Watchdog Timer Programming

B.1 Programming the Watchdog Timer

Trigger Event	Note
IRQ	(BIOS setting default disable)**
NMI	N/A
SCI	Power button event
Power Off	Support
H/W Restart	Support
WDT Pin Activate	Support

** WDT new driver support automatically select available IRQ number from BIOS, and then set to EC. Only Win10 support it.

In other OS, it will still use IRQ number from BIOS setting as usual.

For details, please refer to iManager & Software API User Manual.

Appendix C

System Assignments

This appendix gives you the information about the system resource allocation on the SOM-3569 CPU System on Module

Sections include:

- System I/O ports
- DMA Channel Assignments
- Interrupt Assignments
- 1st MB Memory Map

C.1 System I/O Ports

Table C.1: System I/O ports	
Resource	**Device**
0x00000299-0x0000029A	Motherboard resources
0x000002C0-0x000002DF	Motherboard resources
0x000002A0-0x000002BF	Motherboard resources
0x00000290-0x0000029F	Motherboard resources
0x0000029E-0x000002AD	Motherboard resources
0x00000060-0x0000006F	Motherboard resources
0x00000280-0x0000028F	Motherboard resources
0x000002F0-0x000002F7	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000400-0x0000047F	Motherboard resources
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000062-0x00000062	Microsoft ACPI-Compliant Embedded Controller
0x00000066-0x00000066	Microsoft ACPI-Compliant Embedded Controller
0x0000F040-0x0000F05F	Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000200-0x0000027F	FuncDrv_CANController_IO for ACPI PNP1070
0x00000000-0x0000006F	PCI Express Root Complex
0x00000078-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller

0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x0000F000-0x0000F03F	Intel(R) HD Graphics
0x0000E000-0x0000EFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD7
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F060-0x0000F07F	Standard SATA AHCI Controller
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer

C.2 Interrupt Assignments

Table C.2: Interrupt Assignments

Resource	Device
IRQ 0	System timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 6	FuncDrv_CANController_IO for ACPI PNP1070
IRQ 8	System CMOS/real time clock
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT3452
IRQ 14	ApolloLake SD Card - 5ACA
IRQ 25	High Definition Audio Controller
IRQ 31	Intel(R) Serial IO I2C Host Controller - 5AB4
IRQ 39	ApolloLake eMMC - 5ACC
IRQ 1024	ApolloLake SD Card - 5ACA
IRQ 4294967279	Intel(R) Imaging Signal Processor 2600
IRQ 4294967280	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967281~ IRQ 4294967286	Intel(R) I211 Gigabit Network Connection
IRQ 4294967287	Intel(R) Trusted Execution Engine Interface
IRQ 4294967288	Intel(R) HD Graphics
IRQ 4294967289	Standard SATA AHCI Controller
IRQ 4294967290	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD7
IRQ 4294967291	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB
IRQ 4294967292	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADA
IRQ 4294967293	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
IRQ 4294967294	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8

C.3 1st MB Memory Map

Table C.3: 1st MB Memory Map	
Resource	Device
0xE0000000-0xEFFFFFFF	Motherboard resources
0xE0000000-0xEFFFFFFF	PCI Express Root Complex
0xFEA00000-0xFEAFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED06000-0xFED06FFF	Motherboard resources
0xFED08000-0xFED09FFF	Motherboard resources
0xFED80000-0xFEDBFFFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0x82210000-0x82213FFF	High Definition Audio Controller
0x82000000-0x820FFFFF	High Definition Audio Controller
0x82216000-0x822160FF	Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
0x82218000-0x82218FFF	ApolloLake eMMC - 5ACC
0x82217000-0x82217FFF	ApolloLake eMMC - 5ACC
0x8221C000-0x8221CFFF	Intel(R) Serial IO I2C Host Controller - 5AB4
0x8221B000-0x8221BFFF	Intel(R) Serial IO I2C Host Controller - 5AB4
0xFED00000-0xFED003FF	High precision event timer
0x82200000-0x8220FFFF	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
0xA0000-0xBFFFF	PCI Express Root Complex
0xC0000-0xDFFFF	PCI Express Root Complex
0xE0000-0xFFFFF	PCI Express Root Complex
0x7C000001-0x7FFFFFFF	PCI Express Root Complex
0x7B800001-0x7BFFFFFF	PCI Express Root Complex
0x80000000-0xCFFFFFFF	PCI Express Root Complex
0x82221000-0x82221FFF	Intel(R) Trusted Execution Engine Interface
0x81000000-0x81FFFFFF	Intel(R) HD Graphics
0x90000000-0x9FFFFFFF	Intel(R) HD Graphics
0xD0C00000-0xD0C00653	Intel(R) Serial IO GPIO Host Controller - INT3452
0x82100000-0x821FFFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD7
0x82100000-0x821FFFFF	Intel(R) I211 Gigabit Network Connection
0x8221A000-0x8221AFFF	ApolloLake SD Card - 5ACA
0x82219000-0x82219FFF	ApolloLake SD Card - 5ACA
0x82214000-0x82215FFF	Standard SATA AHCI Controller
0x8221E000-0x8221E0FF	Standard SATA AHCI Controller
0x8221D000-0x8221D7FF	Standard SATA AHCI Controller
0x82120000-0x82123FFF	Intel(R) I211 Gigabit Network Connection
0xCF000000-0xCFFFFFFF	Intel(R) Imaging Signal Processor 2600

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