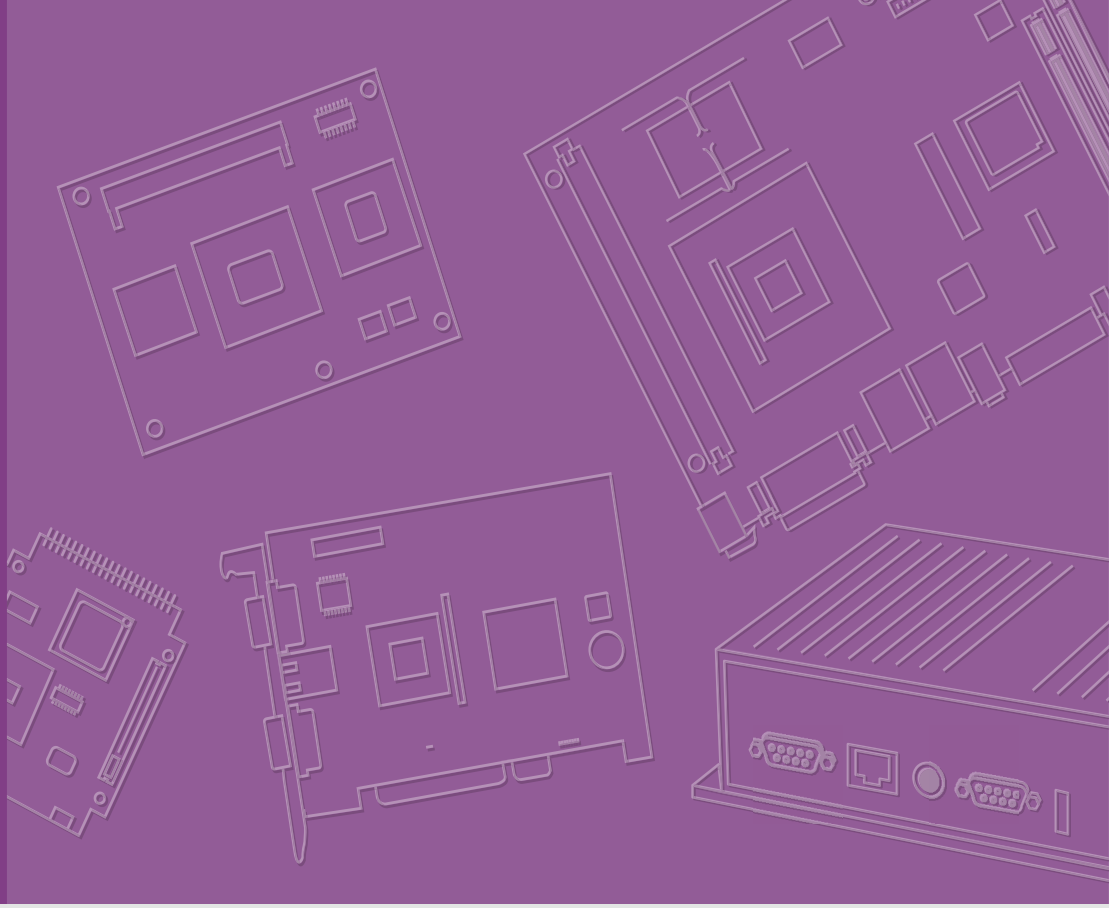

User Manual

SOM-7583

CPU Computer on Module

ADVANTECH

Enabling an Intelligent Planet

Copyright

Acknowledgments

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All other product names or trademarks are properties of their respective owners.

Product Warranty (2 years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

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 displayed 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 a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Part No. 2006758300 Edition 1

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

Test conditions for passing also include the equipment being operated within an industrial enclosure. In order to protect the product from damage caused by electrostatic discharge (ESD) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

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 instruction manual, 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 assistance.

FM

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

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
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 calling:
   - 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 that could cause personal injury if not observed!*

Caution! *Cautions are included to help prevent hardware damage and data loss. For example,*

"Batteries are at risk of exploding if incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions."

Note! *Notes provide additional and/or optional information.*

Document Feedback

To assist us with improving this manual, we welcome all comments and constructive criticism. Please send all feedback in writing to support@advantech.com.

Safety Precautions - 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 the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.
- Disconnect the power before making any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment 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. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. 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 from transient overvoltage.
12. Never pour 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 any of the following occurs, have the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated the equipment.
    - The equipment has been exposed to moisture.
    - The equipment is malfunctioning, or does not operate according to the user manual.
    - The equipment has been dropped and damaged.
    - The equipment shows obvious signs of breakage.
15. Do not leave the equipment in an environment with a storage temperature of below -20 °C (-4 °F) or above 60 °C (140 °F) as this may damage the components. The equipment should be kept in a controlled environment.
16. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 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.

Contents

Chapter 1

General Information

This chapter details background information on the SOM-7583 CPU Computer on Module.

Sections include:

- Introduction
- Functional Block Diagram
- Product Specification

1.1 Introduction

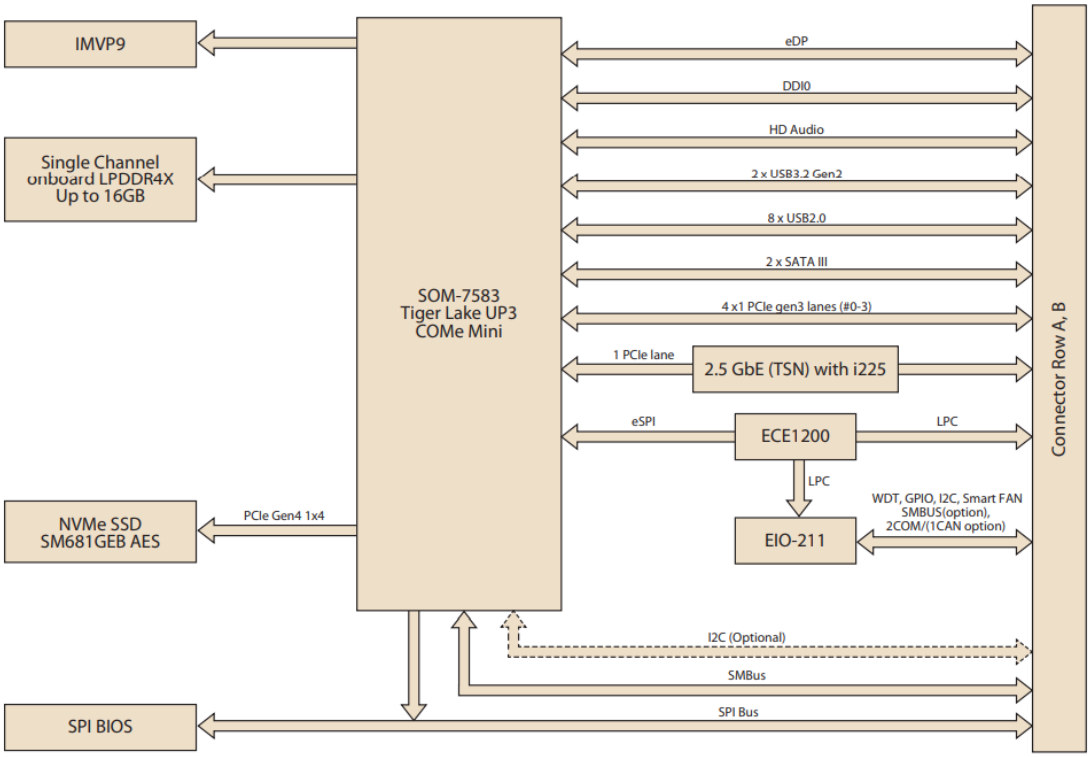
Advantech's SOM-7583 series features 11th Generation Intel® Core™/Celeron processors that leverage 14nm process technology. This solution supports LPDDR4x 4266MT/s with 1.1V power design, and up to 16GB memory down. In addition, SOM-7583 augments memory capacity configuration via an i7-1185G7E SKU upgrade to quad-core. SOM-7583 further provides super speed I/O technology such as 2.5Gbase-T TSN LAN, PCIe Gen 4, and USB 3.2 Gen 2.

This solution also integrates 11th Gen. Intel® Core™ processors Iris® Xe Graphics to empower up to 4 x independent 4K displays or 2 x 8K HDR ports.

This device features Advantech's iManager (SUSI4). This software meets embedded application requirements by providing a multi-level watchdog timer, voltage and temperature monitoring, thermal protection, and mitigation via processor throttling, LCD backlight on/off and brightness control, and embedded storage for customized information. When combined with Advantech WISE-DeviceOn, it can remotely monitor and control devices.

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 microcontrollers 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
GPIO	General purpose input output
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	Watchdog Timer

1.2 Functional Block Diagram



1.3 Product Specifications

1.3.1 Compliance

- PICMG COM.0 (COM Express) Revision 3.0
- Compact Size – 55 x 84 mm (2.1 x 3.3 in)
- Pin-out Type 10 compatible

1.3.2 Feature List

Feature Type	Connector Row	Feature	Type 10 Define		SOM-7583
			Max.	Min.	
Display	A-B	eDP (muxed on LVDS Channel A)	1	0	1
	A-B	Digital Display Interfaces 0	1	0	1
Expansion	A-B	PCI Express x1	4	1	4
	A-B	LPC	1	1	1
Serial	A-B	SMBus	1	1	1
	A-B	I2C Bus	1	1	1
	A-B	Serial Port	2	0	2
	A-B	CAN Bus (muxed on SER1)	1	0	1
I/O	A-B	LAN Port 0 (Gigabit Ethernet)	1	1	1
	A-B	SATA	2	1	2
	A-B	USB2.0	8	4	8
	A-B	USB Client	1	0	0
	A-B	HD Audio	1	0	1
	A-B	SPI Bus	2	1	1
	A-B	General Purpose I/O (GPIO)	8	8	8
	A-B	SDIO (muxed on GPIO)	1	0	0
	A-B	Watchdog Timer Output	1	0	1
	A-B	Speaker Out	1	1	1
	A-B	Carrier Board BIOS Flash Support	1	0	1
	A-B	Power Button Support	1	1	1
	A-B	Power Good	1	1	1
	A-B	VCC_5V_SBY Contacts	4	4	4
	A-B	Sleep	1	0	1
	A-B	Thermal Protection	1	0	1
	A-B	Lid Input	1	0	1
	A-B	Battery Low Alarm	1	0	1
	A-B	Suspend/Wake Signals	3	0	3
	A-B	Fan PWM/Tachometer	2	0	2
	A-B	Trusted Platform Modules	1	0	1
	A-B	USB 3.0 (Gen2, 10Gbps)	2	0	2

1.3.3 Processor System

CPU	Std. Freq.	Max. Turbo Freq.	Core	Cache (MB)	TDP(W)
i7-1185G7E	1.8GHz	4.4GHz	4	12	15*
i5-1145G7E	1.5GHz	4.1GHz	4	8	15*
i3-1115G4E	2.2GHz	3.9Ghz	2	6	15*
Celeron® 6305E	1.8GHz	N/A	2	4	15
i7-1185GRE	1.8GHz	4.4GHz	4	12	15*
i5-1145GRE	1.5GHz	4.1GHz	4	8	15*
i3-1115GRE	2.2GHz	3.9Ghz	2	6	15*

*TDP can be configured up to 28W or down to 12W.

1.3.4 Graphics/Audio

Iris® Xe Graphics uses high-performance, low-power HW acceleration for video decoding operations for multiple video codecs.

The HW encode is exposed by the graphics driver using the following APIs:

- Intel Media SDK
- MFT (Media Foundation Transform) filters

Iris® Xe Graphics supports full HW accelerated video encoding for AVC/MPEG2/ HEVC/VP8/JPEG.

CPU	Graphic Core	Base Freq.	Max Freq.
i7-1185G7E	Iris® Xe Graphics	1.8GHz	4.4GHz
i5-1145G7E	Iris® Xe Graphics	1.5GHz	4.1GHz
i3-1115G4E	Iris® Xe Graphics	2.2GHz	3.9GHz
Celeron® 6305E	Intel® UHD Graphics	1.8GHz	N/A
i7-1185GRE	Iris® Xe Graphics	1.8GHz	4.4GHz
i5-1145GRE	Iris® Xe Graphics	1.5GHz	4.1GHz
i3-1115GRE	Intel® UHD Graphics	2.2GHz	3.9GHz

- Dual Display: DDI/eDP

1.3.5 Expansion Interfaces

1.3.5.1 LPC

Supports Low Pin Count (LPC) 1.1 specifications without DMA or bus mastering. Enables connection to super I/O, embedded controllers, or TPM. LPC clock is 24MHz.

1.3.6 Serial Bus

1.3.6.1 SMBus

Supports SMBus 2.0 specifications with alert pin.

1.3.6.2 I2C Bus

Supports I2C bus 7-bit and 10-bit address modes at both 100KHz and 400KHz.

1.3.7 I/O

1.3.7.1 Gigabit Ethernet

Ethernet: Intel I225IT Gigabit LAN supports 10/100/1000/2.5G Mbps Speed.

1.3.7.2 SATA

Supports up to 2 x 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 and 1.3.1 mode.

1.3.7.3 USB 3.2 Gen2/USB 2.0

SOM-7583 supports 2 x ports USB 3.2 Gen2 (10 Gbps) and 8 x ports USB 2.0 (480 Mbps). These are backward compatible to USB1.x. For USB 3.1 this solution supports LPM (U0, U1, U2, and U3) manageability to conserve power.

Notice: To meet USB 3.2 Gen 2 performance, we strongly recommend to use of a certified cable.

1.3.7.4 USB 3.1

Type 10	P0	P1
SoC	P0	P1
Type 10	OC_01	
SoC USB_OC#	OC_0	

1.3.7.5 USB2.0

Type 10	P0	P1	P2	P3	P4	P5	P6	P7
SoC	P0	P1	P2	P3	P4	P5	P6	P7
Type 10	OC_01	OC_23	OC_45	OC_67				
SoC USB_OC#	OC_0	OC_1	OC_2	OC_3				

1.3.7.6 SPI Bus

Supports BIOS flash only. SPI clock can be 50MHz; with capacity up to 32MB.

1.3.7.7 GPIO

8 x programmable general purpose input or output (GPIO).

1.3.7.8 Watchdog

Supports multi-level watchdog time-out output. Provides 1-65535 level, from 100 milliseconds to 109.22 minutes interval.

1.3.7.9 Serial port

2 x wire serial port (Tx/Rx) and support 16550 UART compliance:

- Programmable FIFO or character mode
- 16-byte FIFO buffer on transmitter and receiver in FIFO mode
- Programmable serial-interface characteristics: 5, 6, 7, or 8-bit character
- Even, odd, or no parity bit selectable
- 1, 1.5, or 2 stop bit selectable
- Baud rate up to 115.2K

1.3.7.10 TPM

Support TPM 2.0 module by default.

1.3.7.11 Smart Fan

Support 2 x Fan PWM control signal and 2 x tachometer inputs for fan speed detection. Provides 1 x on module with connector and 1 x on carrier board followed by PICMG COM Express R3.0 specification.

1.3.7.12 BIOS

There is a BIOS chip on the module by default. Users can place BIOS chip on a carrier board with appropriate design and jumper setting on BIOS_DIS#[1:0].

BIOS_DIS0#	BIOS_DIS#1	Boot up destination/function
Open	Open	Boot from Module's SPI BIOS
Open	GND	SPI_CS0# to Carrier Board, SPI_CS1# to Module
GND	GND	SPI_CS0# to Module, SPI_CS1# to Carrier Board

Notice: We recommend going to the BIOS setup menu and loading the default settings during the first boot up if the system COMS are cleared.

1.3.8 Power Management

1.3.8.1 Power Supply

Supports both ATX and AT power modes. The VSB is for suspend power and is optional if not required by standby (suspend-to-RAM) support. The RTC Battery is optional if keeping time and date is not required.

- V_{CC}: 8.5V ~ 20V
- V_{SB}: 4.75V ~ 5.25V (Suspend power)
- RTC Battery Power: 2.0 ~ 3.3V

1.3.8.2 PWROK

Power OK (PWROK) is from the main power supply. A high value indicates sufficient power. This signal can be used to delay module startup in order to program the time of carrier based FPGAs or other configurable devices.

1.3.8.3 Power Sequence

According to PICMG COM Express R3.0 specifications.

1.3.8.4 Wake Event

Diverse wake-up event support allows users to apply the solution to different scenarios:

- Wake-on-LAN(WOL): Wake to S0 from S3/S4/S5
- USB Wake: Wake to S0 from S3/S4
- PCIe Device Wake: According to user inquiry and possible BIOS customization
- LPC Wake: According to user inquiry and possible BIOS customization

1.3.8.5 Advantech S5 ECO Mode (Deep Sleep Mode)

Advantech iManager features a mechanism that enables the system to enter a very low suspend power mode, or “S5 ECO mode”. In this mode, the module will cut power — including suspend and active power — and keep an on-module controller active. In this mode, the device will only consume 50mW to enable a longer battery pack lifespan. This mode is enabled using BIOS. In this mode, the system (or module) needs to use the power button to boot up.

1.3.9 Environment

1.3.9.1 Temperature

- Operating: 0 ~ 60 °C (32 ~ 140 °F), with an active heat sink under 0.7m/s air flow chamber
- Storage: -40 ~ 85 °C (-40 ~ 185 °F)

1.3.9.2 Humidity

- Operating: 40 °C (104 °F) @ 95% relative humidity, non-condensing
- Storage: 60 °C (140 °F) @ 95% relative humidity, non-condensing

1.3.9.3 Vibrations

IEC60068-2-64: Random vibration test during operation at 3.5 Grms

1.3.9.4 Drop Test (Shock)

Federal Standard 101 Method 5007 test procedure with standard packing

1.3.9.5 EMC

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

1.3.10 MTBF

Please refer Advantech SOM-7583 Series Reliability Prediction Report No: 21R200A0

1.3.11 OS Support

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 distributors) 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 the Internet and browse the website http://support.advantech.com.tw to download a setup file.

1.3.12 Advantech iManager

iManager supports APIs for GPIO, smart fan control, a multi-stage watchdog timer, outputs, temperature sensors, and hardware monitor. Follow by PICMG EAPI 1.0 specifications that provide backwards compatibility.

1.3.13 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-7583C7-S8A1	61.981W	36.67W	8.672W	2.012 W	0.552W	12.614uA

Hardware Configurations:

1. MB: SOM-7583C7-S8A1 (PCB: A101-2)
2. DRAM: Total 16GB (Micron 16GB LPDDR4x 4266MT/s)
3. Carrier board: SOM-DB5830 A201-2

Test Condition:

1. Test temperature: room temperature (about 25 °C; 77 °F)
2. Test voltage: rated voltage DC +12.0V
3. Test loading:
   - Maximum load mode: Running programs.
   - Idle mode: DUT power management off and no running any program.
4. OS: Windows 10 Enterprise

1.3.14 Performance

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

1.3.15 Selection Guide w/P/N

Part Number	CPU	Base Freq.	CPU TDP	LLC	GFX Gen.11	LPDDR 4X	SSD	Thermal Solution	i22 5	vPro	Operating Temp
SOM-7583C7-S8A1	i7-1185G7E	1.8 GHz	15W	12MB	96EUs	16GB	64GB	Active	IT	No	0 ~ 60 °C (32 ~140 °F)
SOM-7583C7A-S8A1 (For MZ10)	i7-1185G7E	1.8 GHz	15W	12MB	96EUs	16GB	64GB	Active	IT	No	0 ~ 60° C (32 ~140 °F)
SOM-7583C5-S5A1	i5-1145G7E	1.5 GHz	15W	8MB	80EUs	8GB	32GB	Active	IT	No	0 ~ 60° C(32 ~140 °F)
SOM-7583C3-U2A1	i3-1115G4E	2.2 GHz	15W	6MB	48EUs	8GB	32GB	Active	IT	No	0 ~ 60° C(32 ~140 °F)
SOM-7583CR-S8A1	6305E	1.8 GHz	15W	4MB	48EUs	8GB	32GB	Active	IT	No	0 ~ 60° C(32 ~140 °F)
SOM-7583R7X-S8A1	i7-1185G7E	1.8 GHz	15W	12MB	96EUs	16GB	64GB	Active	IT	Yes	-40 ~ 85 °C(-40 ~ 185 °F)
SOM-7583R5X-S5A1	i5-1145G7E	1.5 GHz	15W	8MB	80EUs	8GB	32GB	Active	IT	Yes	-40 ~ 85 °C (-40 ~ 185 °F)
SOM-7583R3X-U2A1	i3-1115G4E	2.2 GHz	15W	6MB	48EUs	8GB	32GB	Active	IT	No	-40 ~ 85 °C(-40 ~ 185 °F)

1.3.16 Packing list

Part No.	Description	Quantity
1970004887T001	SOM-7583 Heat spreader	1 x

1.3.17 Development Board

Part No.	Description
SOM-DB5830A-00A2	COMe Express R3.0 Type10 Development Board (LVDS version)

1.3.18 Optional Accessory

Part No.	Description
1970004886N001	SOM-7583 Semi-cooler

1.3.19 Pin Description

Advantech provides useful checklists for schematic design and layout routing. These detail pin electrical properties and connections for different scenarios. It also specifies layout constraints and recommendations for trace length, impedance, and other information during design.

Please contact your nearest Advantech branch office or call for getting the design documents and further advance supports.

Chapter 2

Mechanical Information

This chapter details mechanical information on the SOM-7583 CPU Computer on Module.

Sections include:

- Board Information
- Mechanical Diagrams
- Assembly Diagrams

2.1 Board Information

The figures below indicate the main chips on SOM-7583 Computer-on-Module.

Please be aware of their positions while designing your carrier board to avoid mechanical damage. Note the thermal solutions contact points for improved thermal dissipation performance.

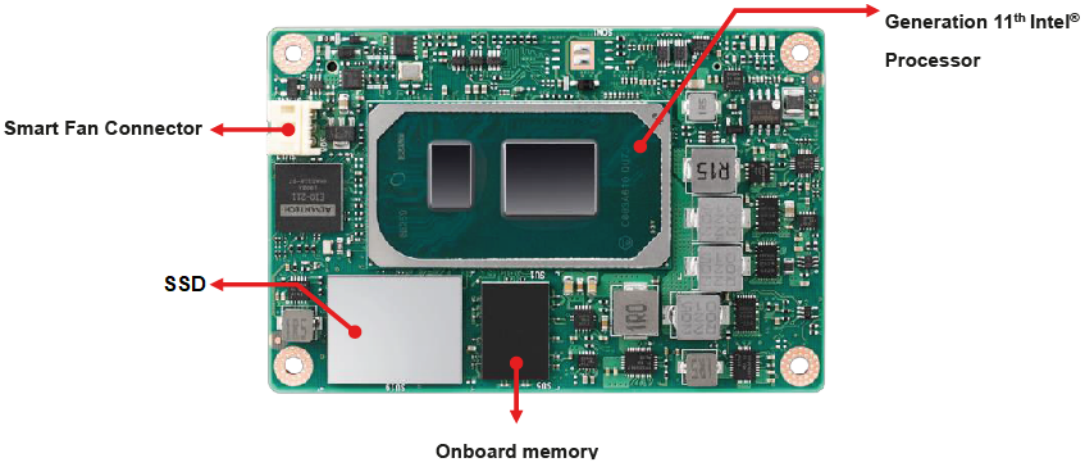


Figure 2.1 Board Chip Identification – Front

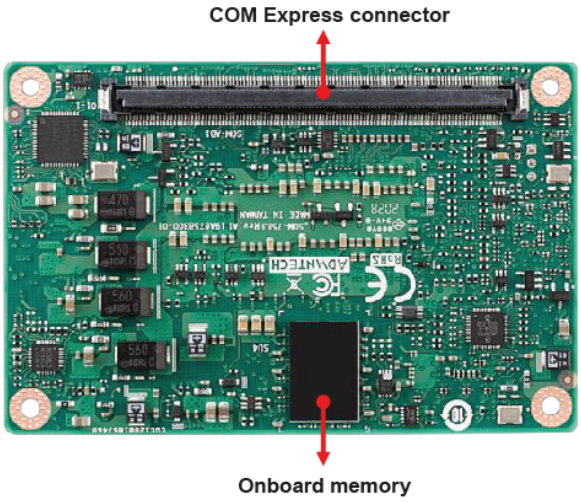
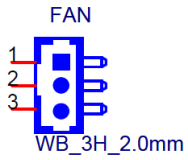


Figure 2.2 Board Chip Identification – Rear

2.1.1 Connector List

Table 2.1: FAN1 Fan	
FAN1	**Fan**
Description	Wafter 2.0 mm 3P 90D(M)DIP 2001-WR-03-LF W/Lock
Pin	Pin Name
1	Fan Tacho-input
2	Fan Out
3	GND



2.2 Mechanical Drawing

Furthers details concerning 2D/3D models can be found on the Advantech COM support service website: at http://com.advantech.com.

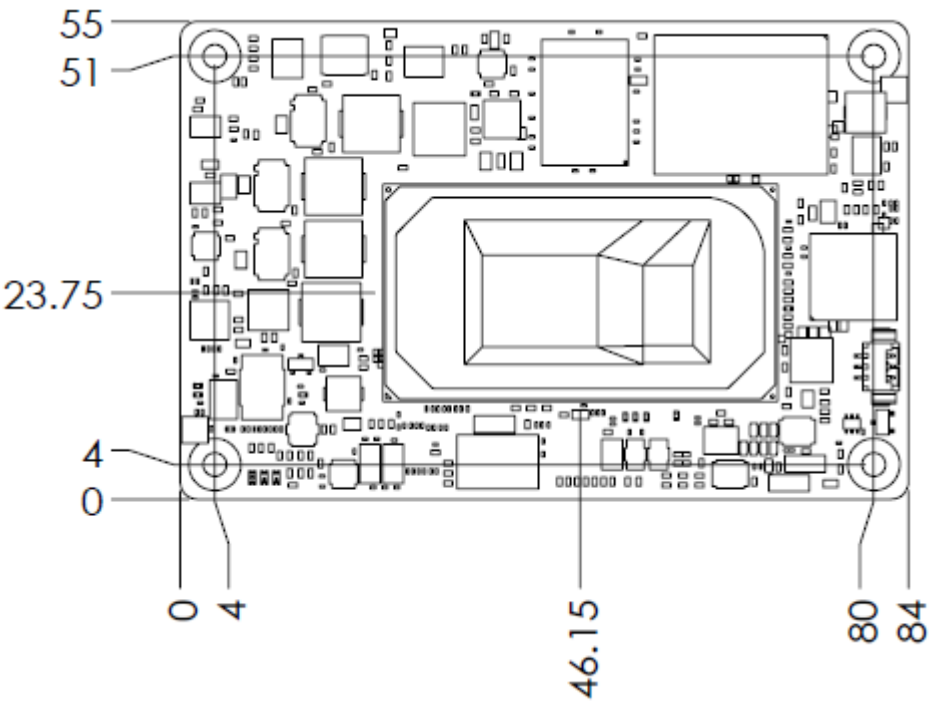


Figure 2.3 Board Mechanical Diagram - Front

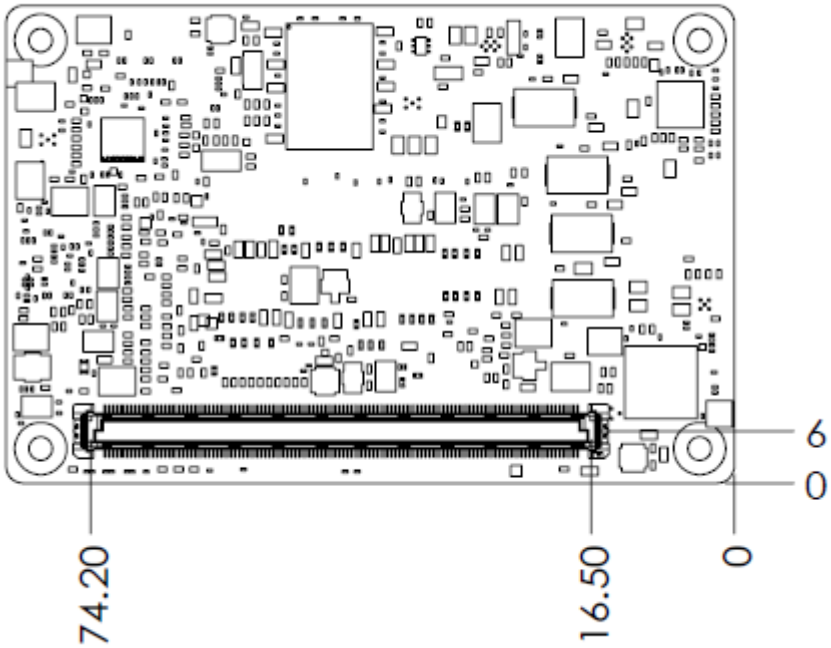


Figure 2.4 Board Mechanical Diagram - Rear

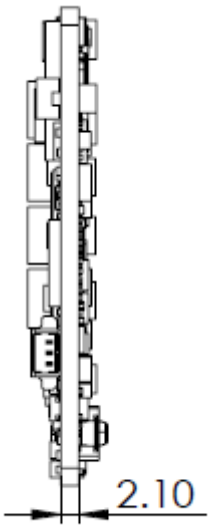


Figure 2.5 Board Mechanical Diagram - Side

2.3 Assembly Drawing

These figures demonstrate the thermal module, COM module, and carrier board's assembly order.

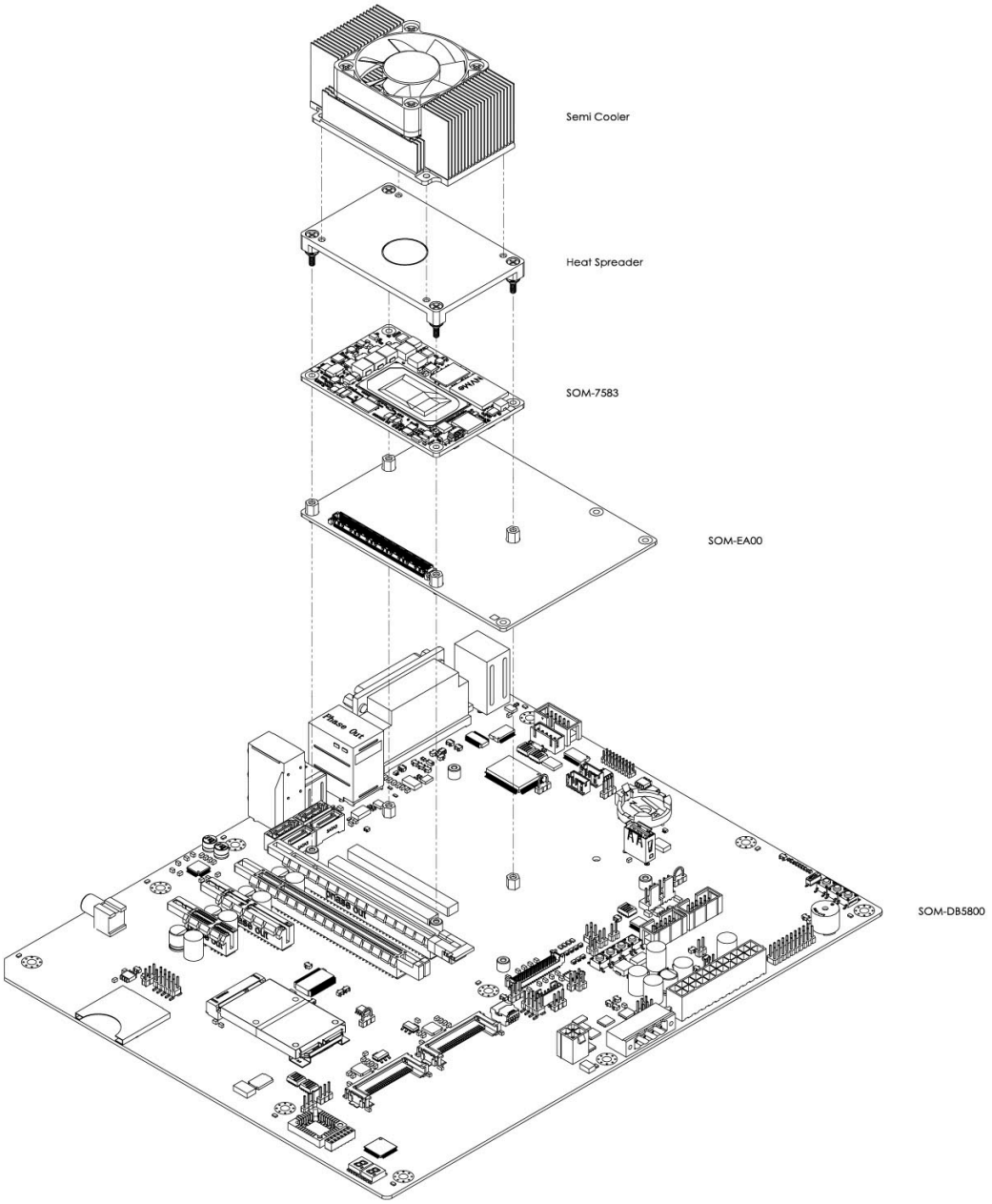


Figure 2.6 Assembly Diagram

There are 4 x reserved screw holes for SOM-7583 that enable pre-assembly with a heat spreader.

2.4 Assembly Diagram

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

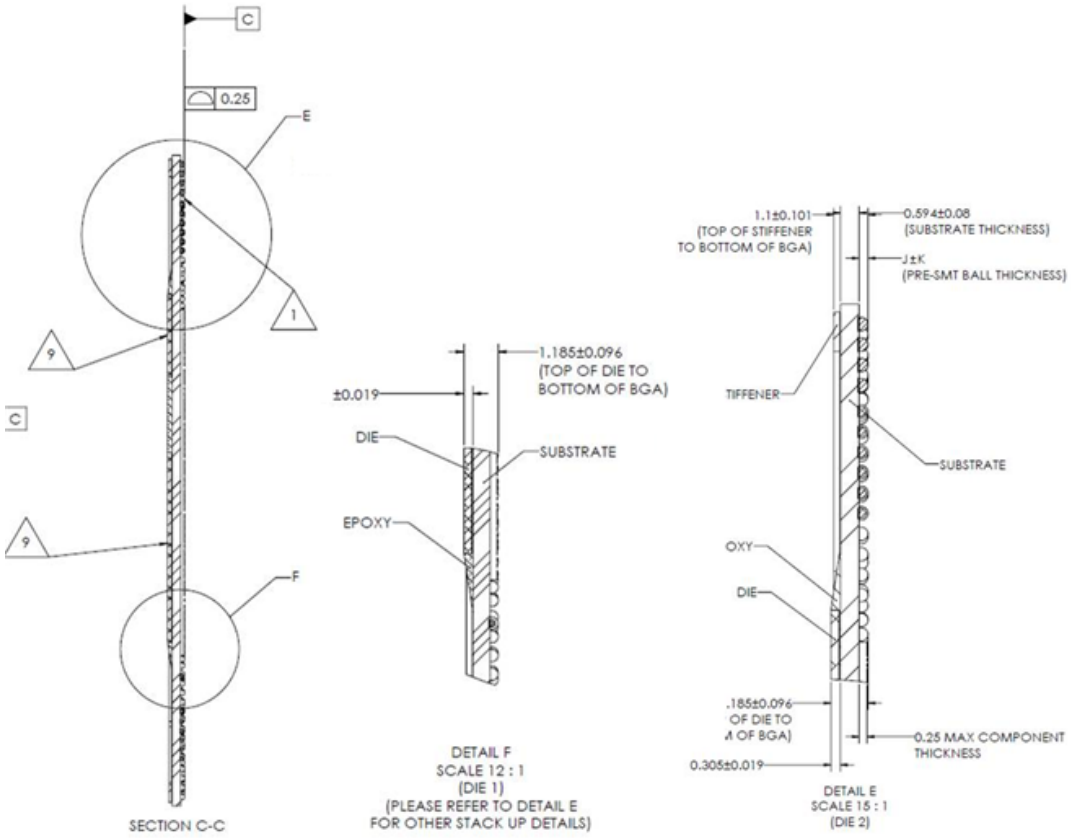


Figure 2.7 10 TGL-UP3 4C Height and Tolerance Diagram

(For all other SKUs please contact Advantech sales or FAE for more details)

Chapter 3

AMI BIOS

This chapter details BIOS setup information for the SOM-7583 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.

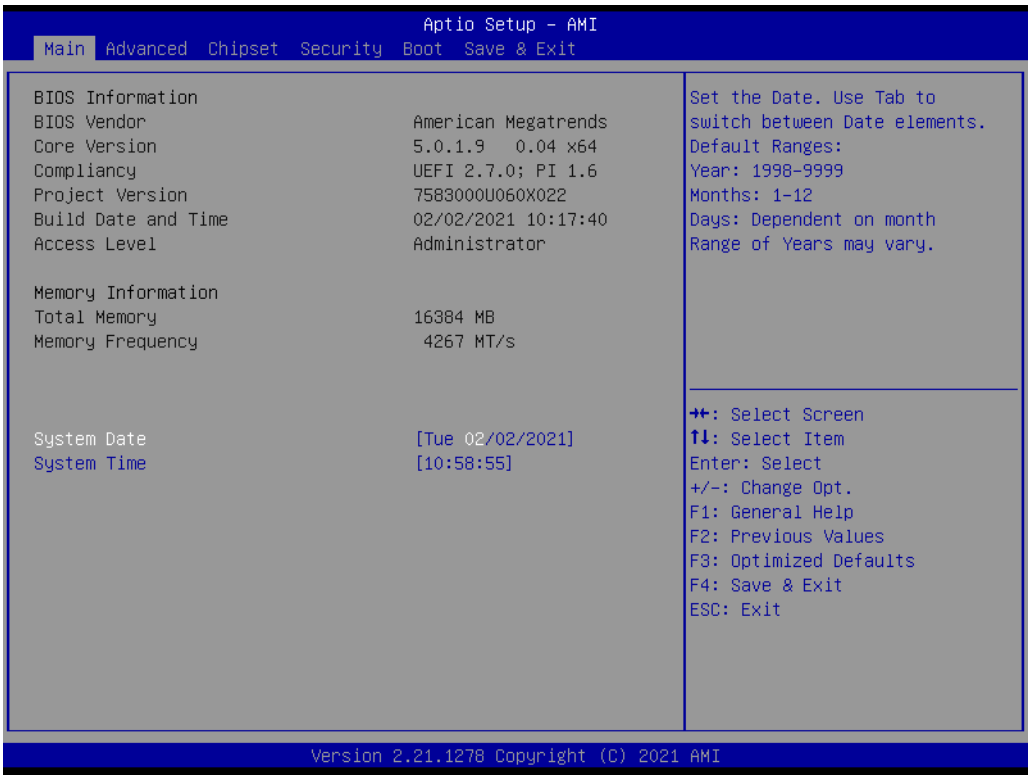


Figure 3.1 Setup Program Initial Screen

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.

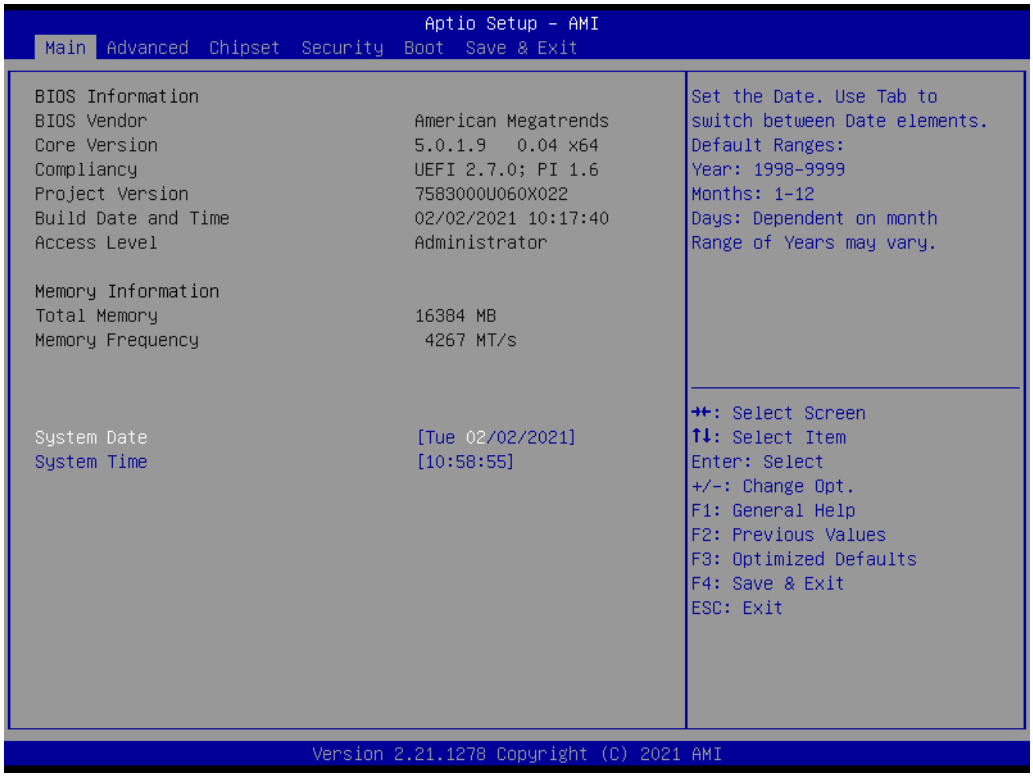


Figure 3.2 Main Setup Screen

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-7583 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.

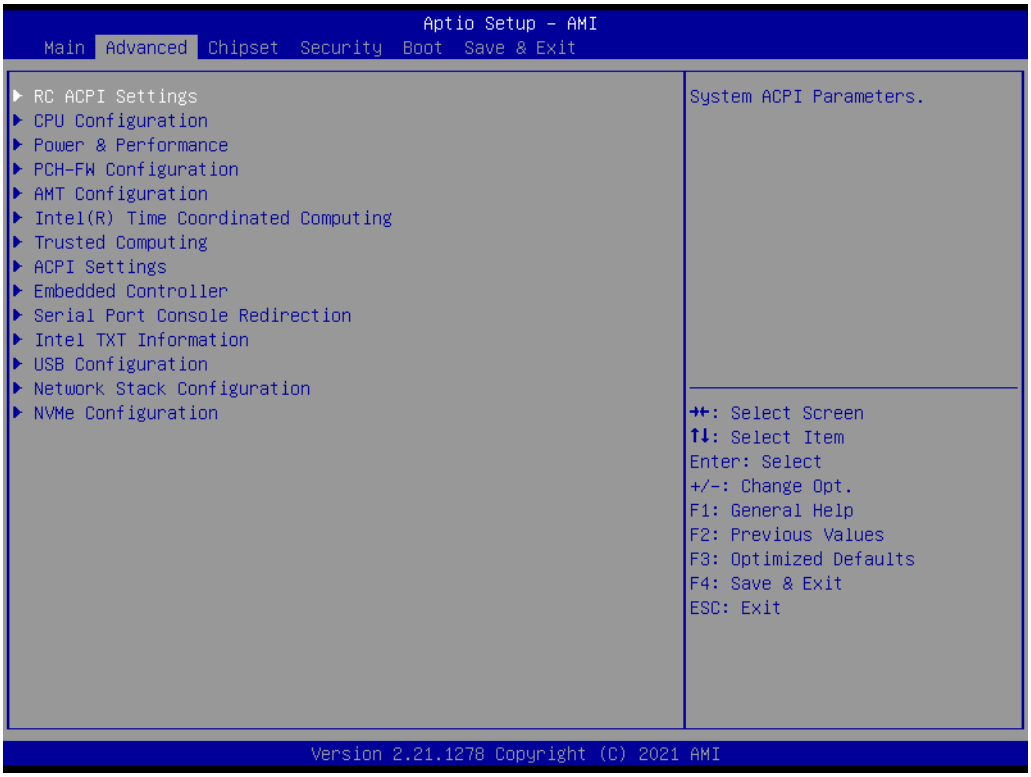


Figure 3.3 Advanced BIOS Features Setup Screen

3.4.1 RC ACPI Settings

Figure 3.4 RC ACPI Settings

3.4.2 CPU Configuration

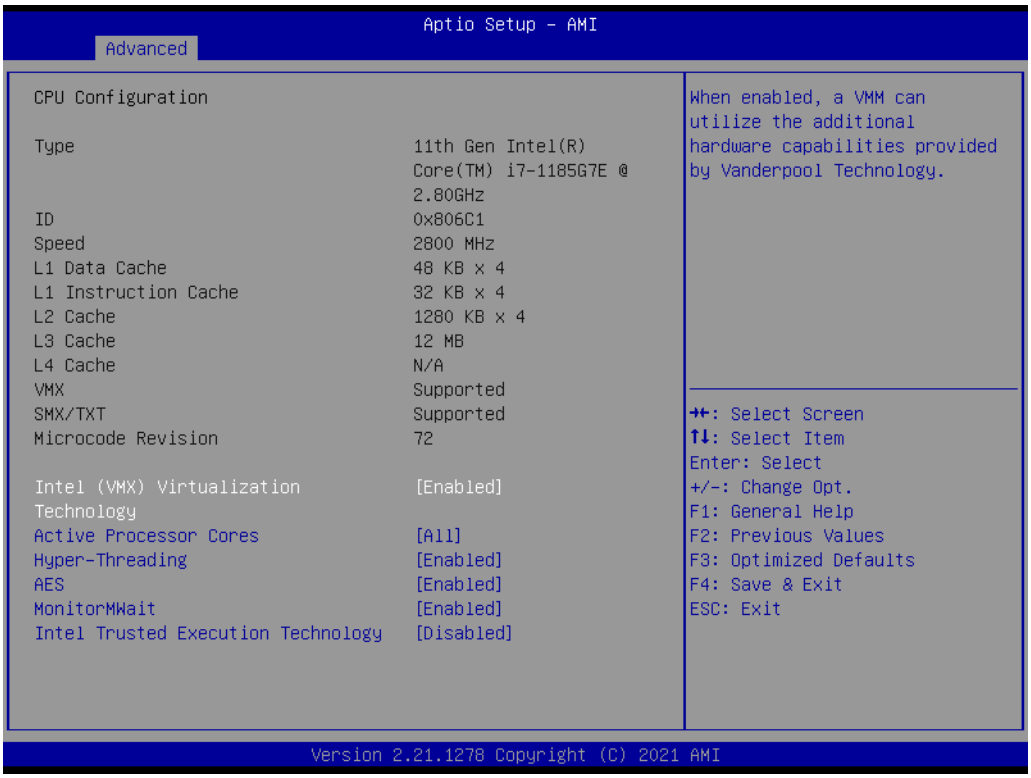


Figure 3.5 CPU Configuration_1

- **Intel (VMX) Virtualization Technology**
- **Active Processor Core**

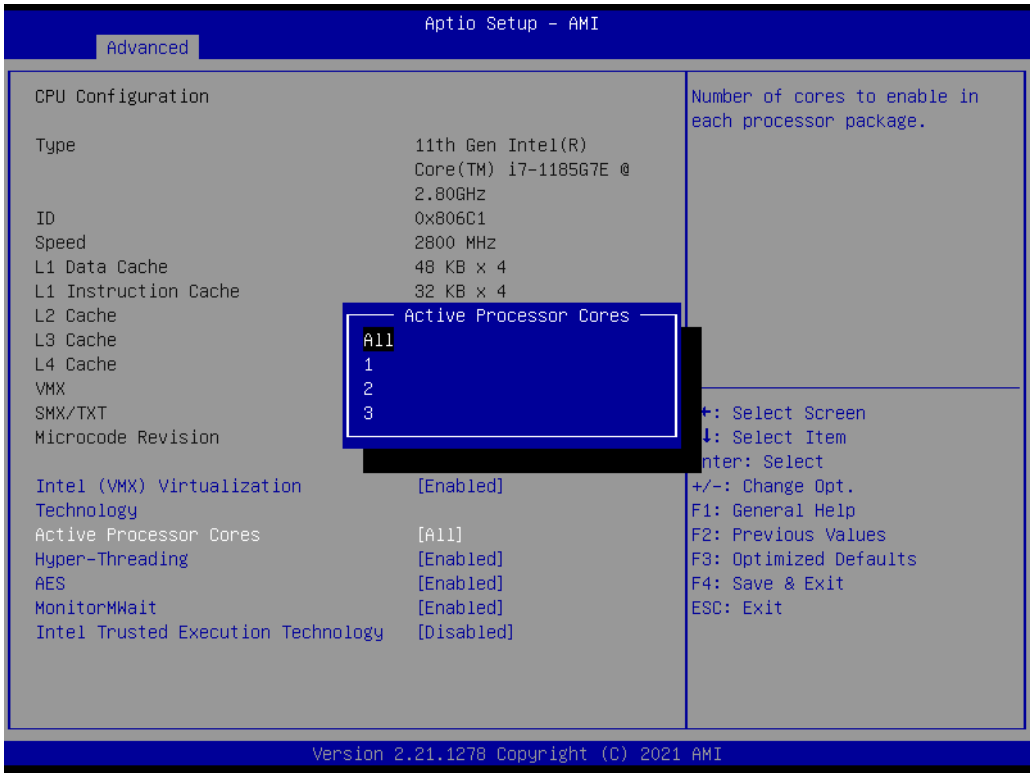


Figure 3.6 Active Processor Core Setting

- **Hyper-Threading**
- **AES**
- **MonitorMWait**
- **Intel Trusted Execution Technology**

3.4.3 Power & Performance

Figure 3.7 Power & Performance

- **CPU- Power Management Control**
- **GT- Power Management Control**

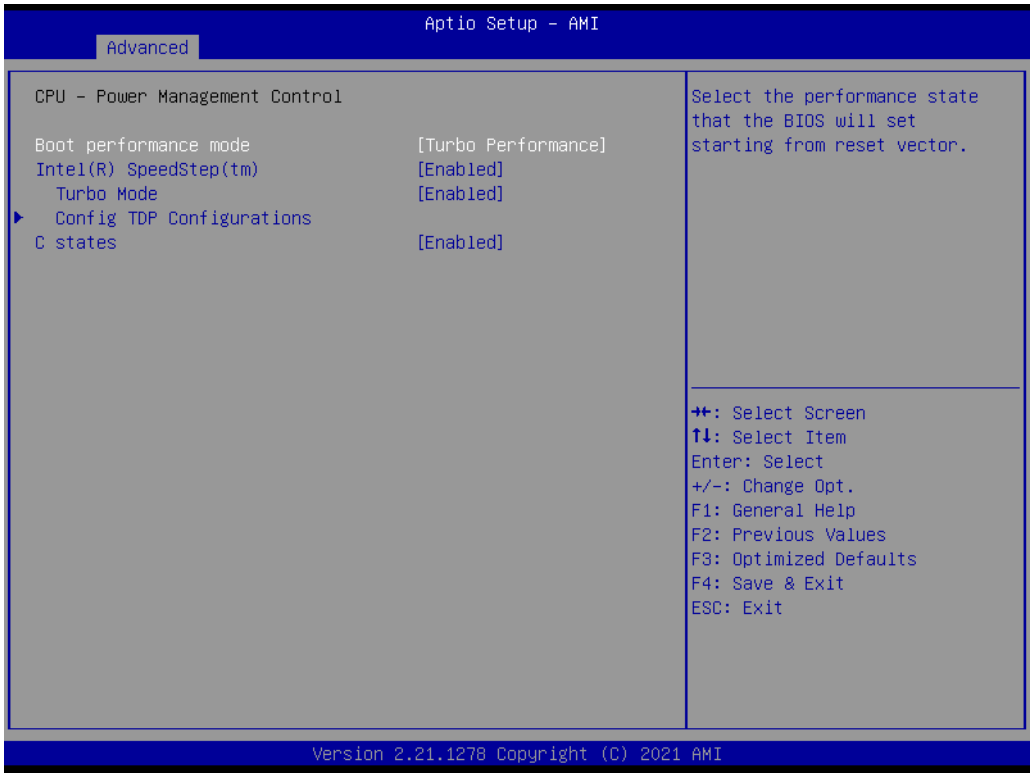


Figure 3.8 CPU- Power Management Control

- **Boot performance mode**
- **Intel® SpeedStep™**
- **Turbo Mode**
- **Configure TDP Configurations**

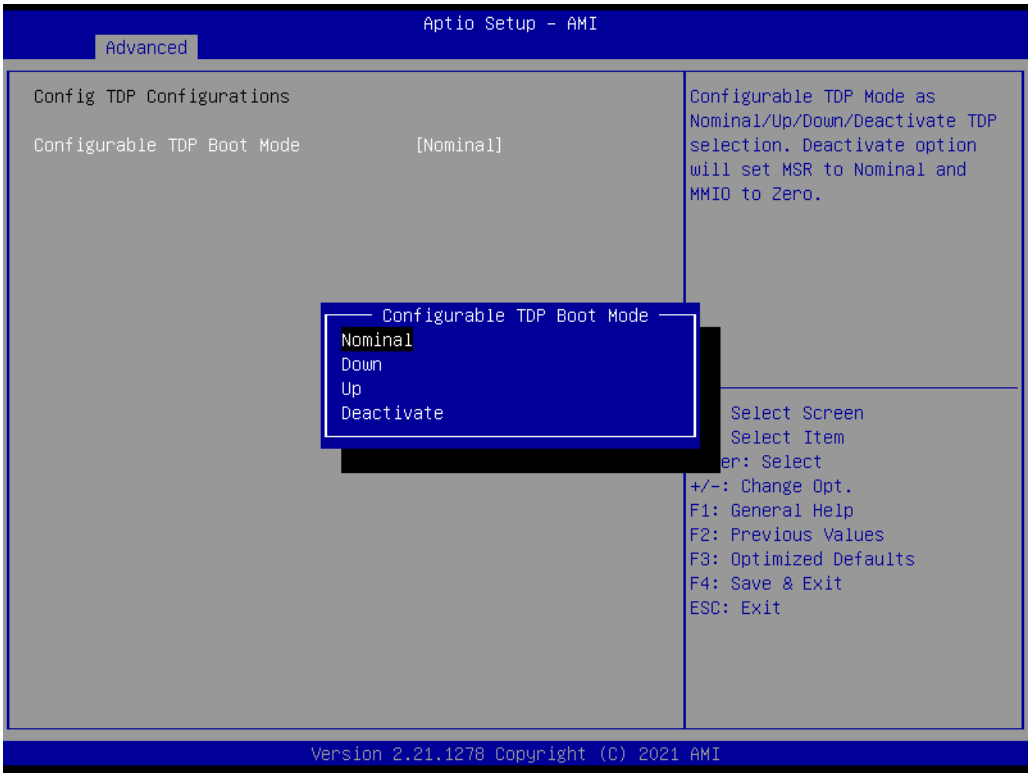


Figure 3.9 Configurable TDP Boot Mode

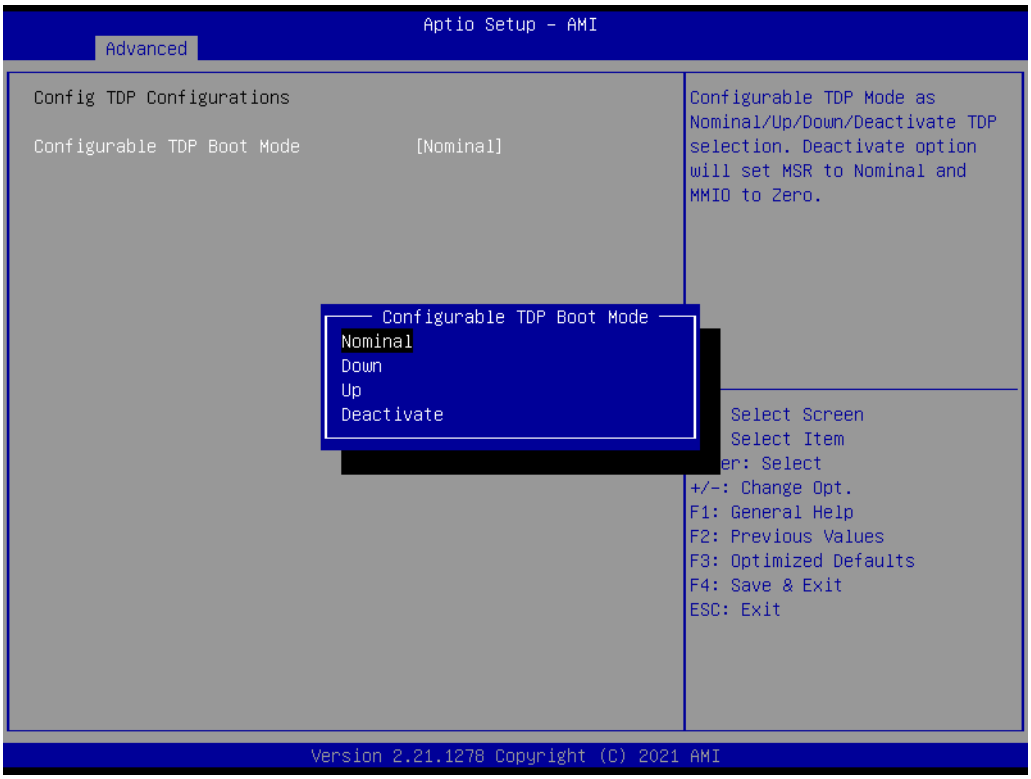


Figure 3.10 ConfigTDP Turbo Activation Ratio

GT- Power Management Control

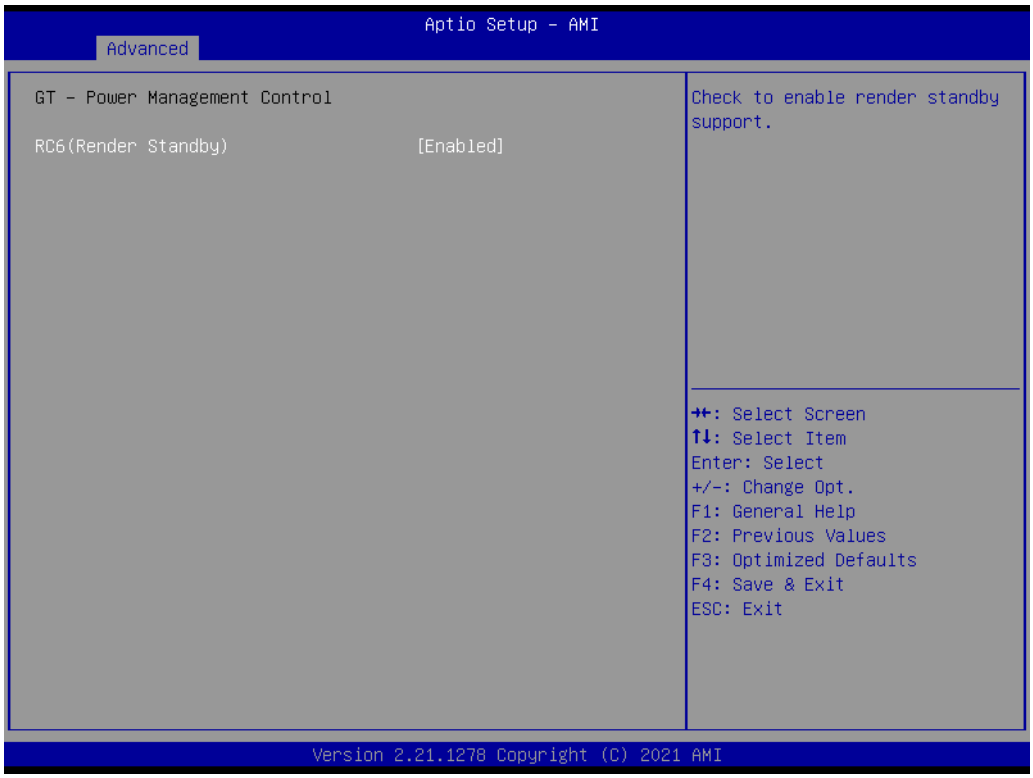


Figure 3.11 GT- Power Management Control

- **RC6 (Render Standby)**
  Check to enable render standby support.

3.4.4 PCH-FW Configuration

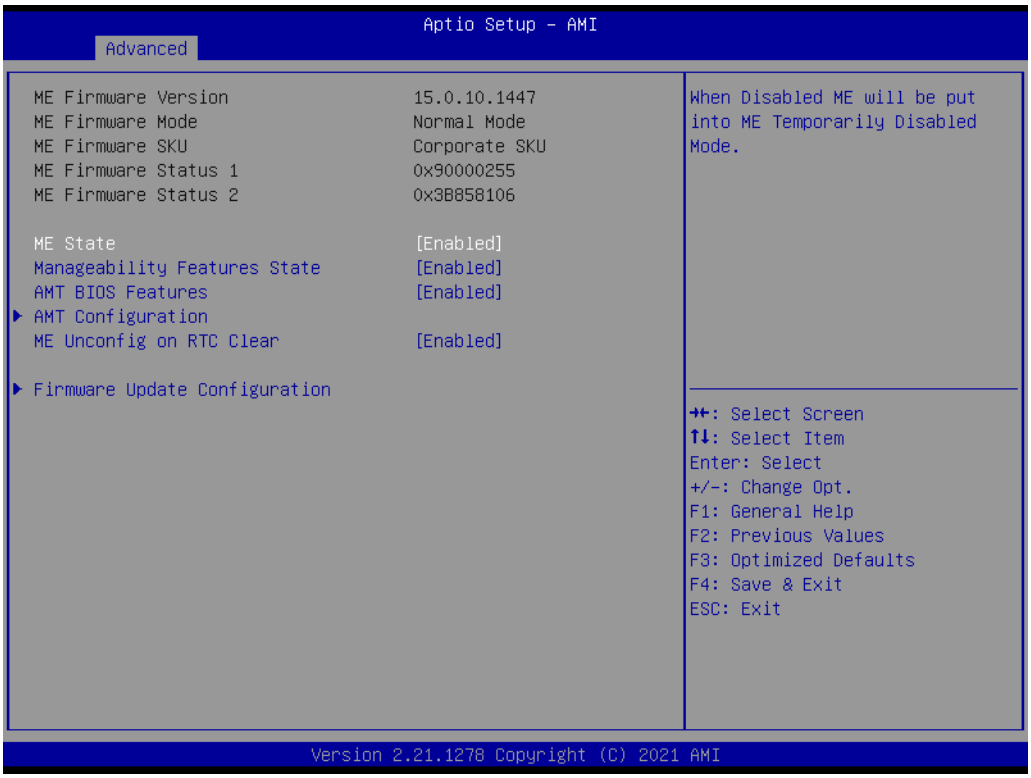


Figure 3.12 PCH-FW Configuration

- **ME Firmware**
  - Version
  - Mode
  - SKU
  - Status 1
  - Status 2
- **ME State**
- **ME Unconfig on RTC Clear**
- **Firmware Update Configuration**

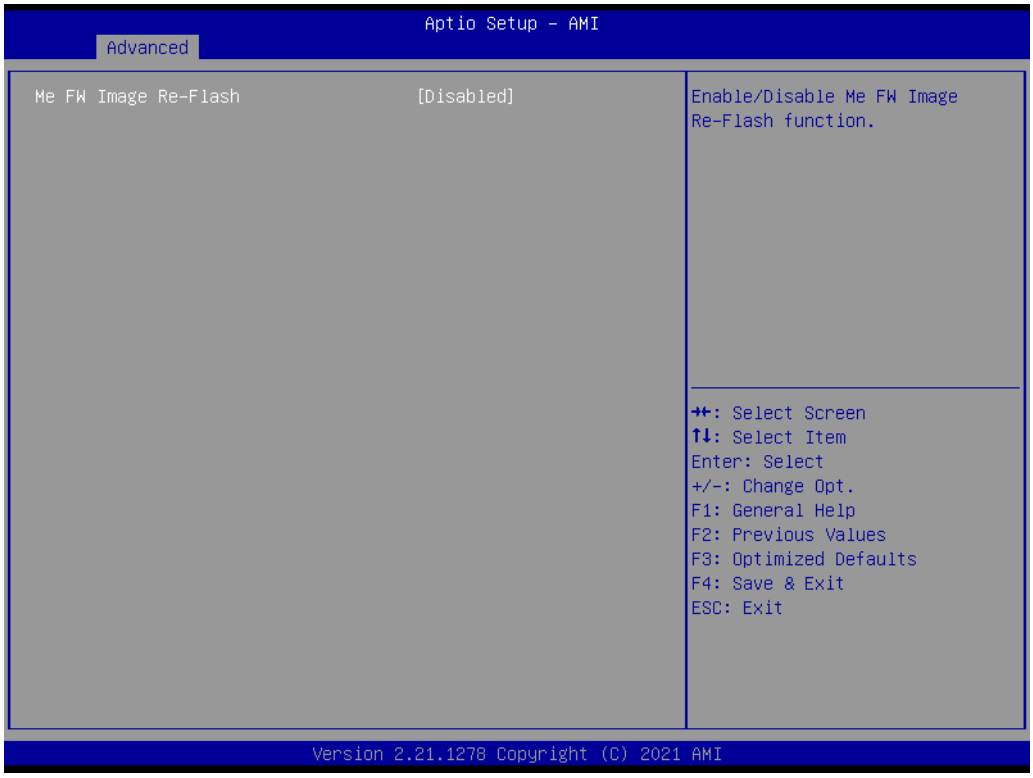


Figure 3.13 Firmware Update Configuration

3.4.5 Trusted Computing

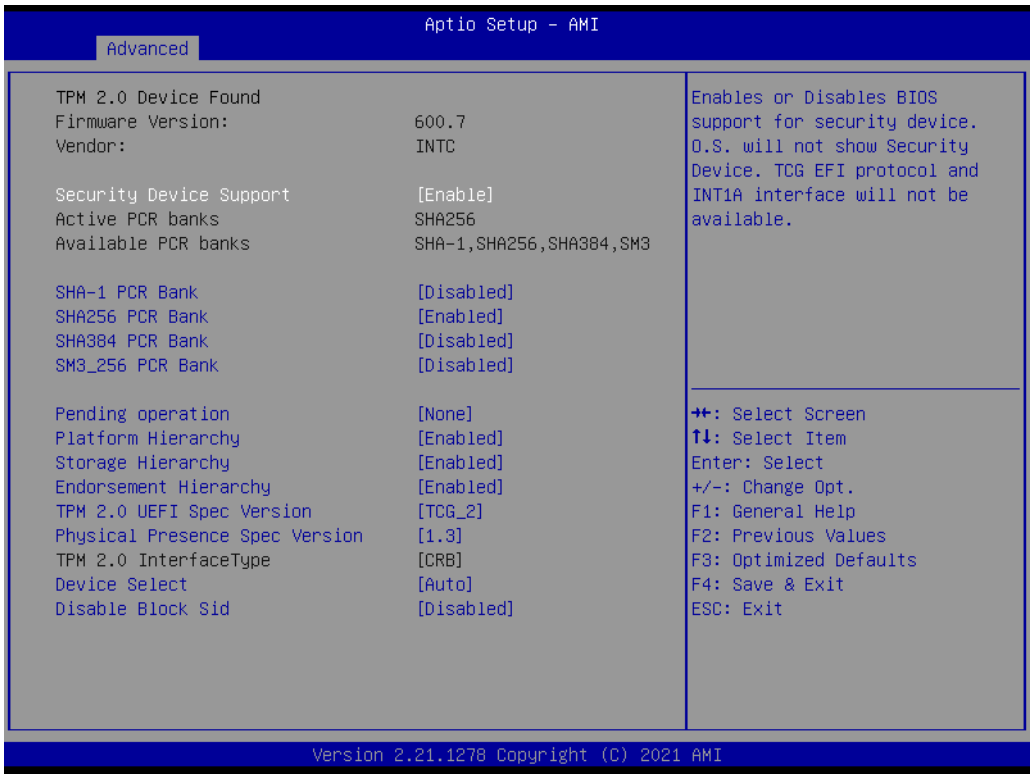


Figure 3.14 Trusted Computing

3.4.6 ACPI Settings

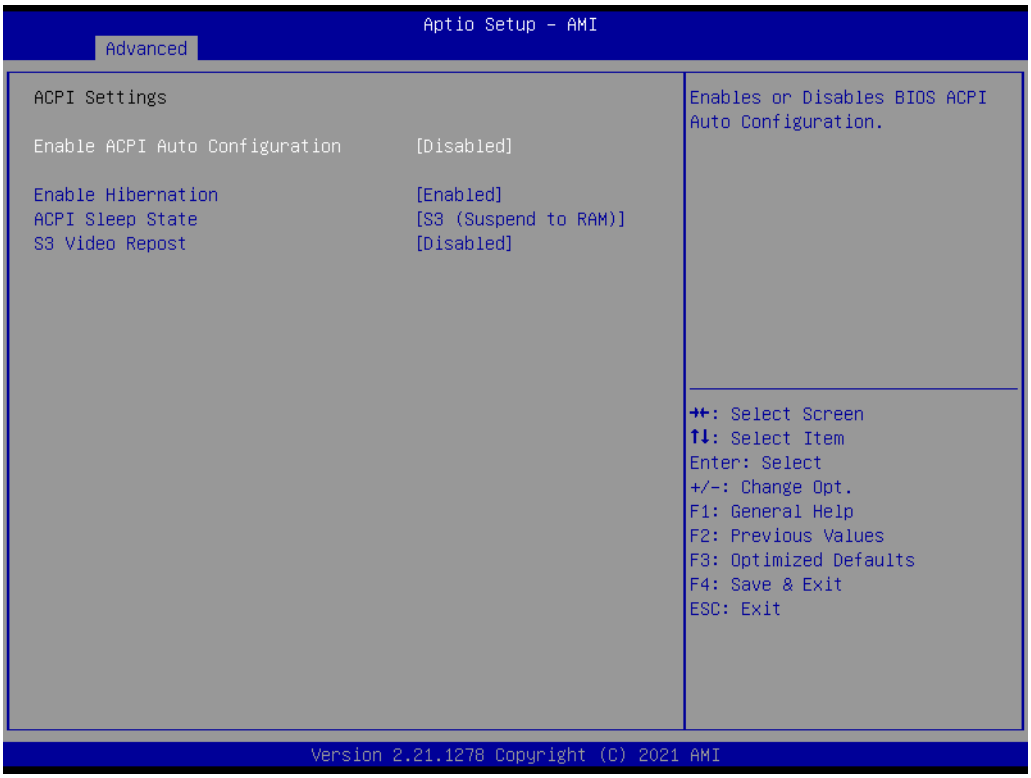


Figure 3.15 ACPI Settings

- **Enable ACPI Auto Configuration**
- **Enable Hibernation**
- **ACPI Sleep State**
- **S3 Video Repost**

3.4.7 Embedded Controller

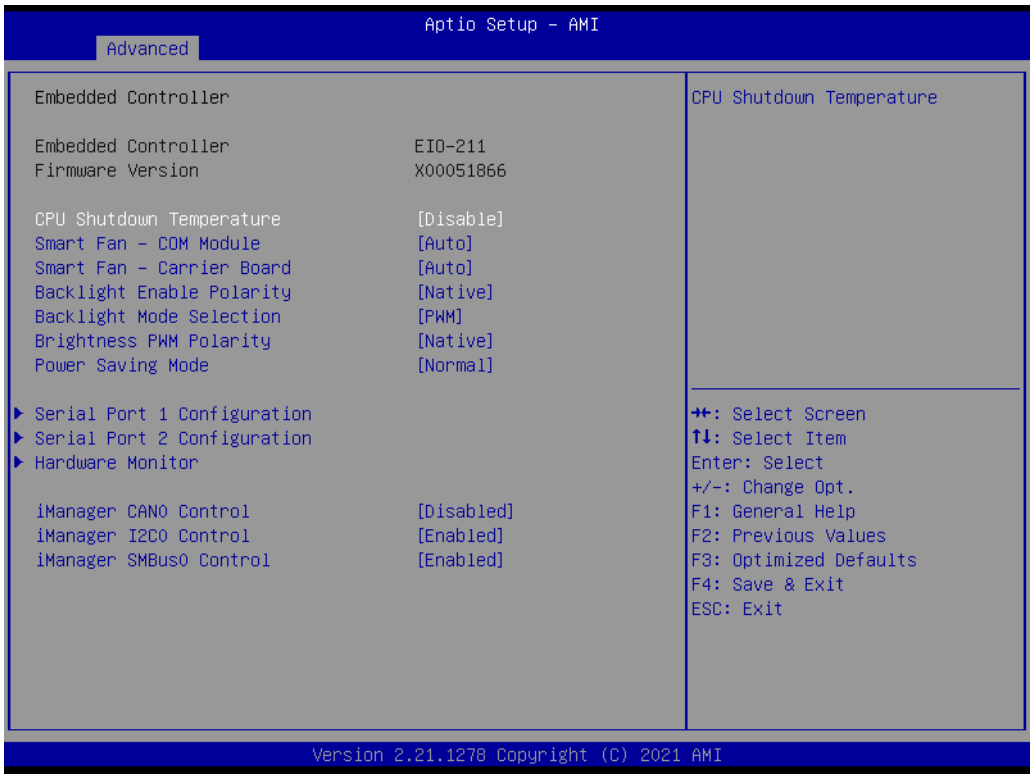


Figure 3.16 Embedded Controller

- **CPU Shutdown Temperature**
- **Smart Fan – COM Module**
- **Smart Fan – Carrier Board.**
- **Backlight Enable Polarity**
- **Brightness Mode Selection**
- **Brightness PWM Polarity**
- **Power Saving Mode**
- **Serial Port 1 Configuration**
- **Serial Port 2 Configuration**
- **Hardware Monitor**

Serial Port 1 Configuration

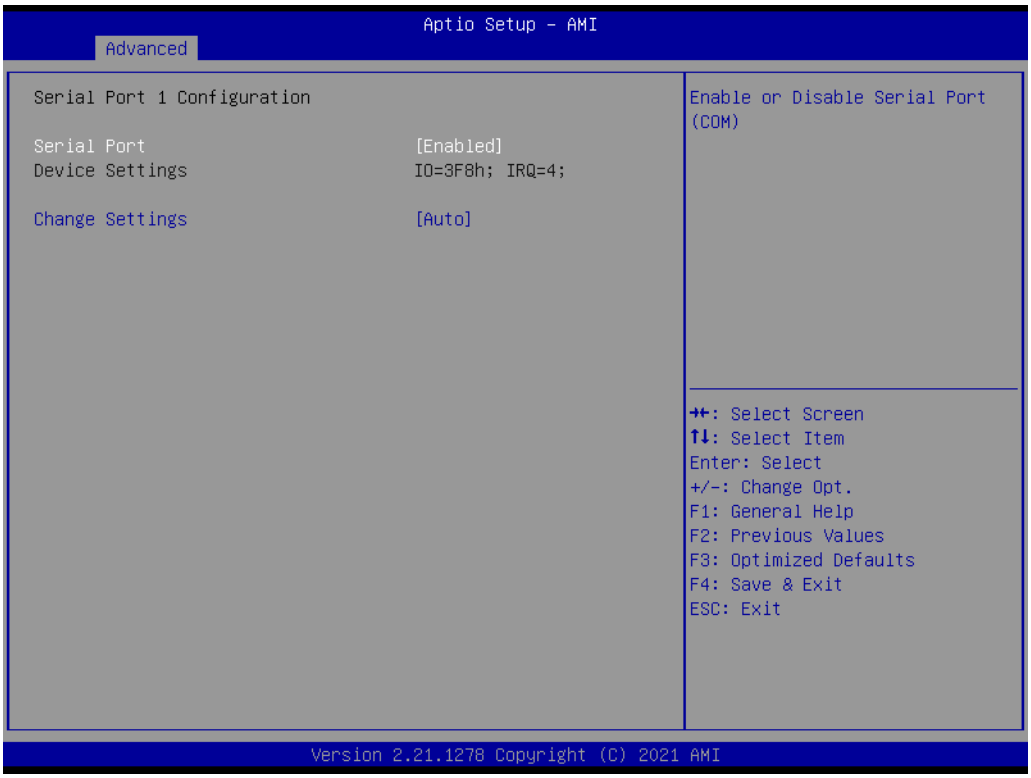


Figure 3.17 Serial Port 1 Configurations

- **Serial Port**
- **Change Settings**

Serial Port 2 Configuration

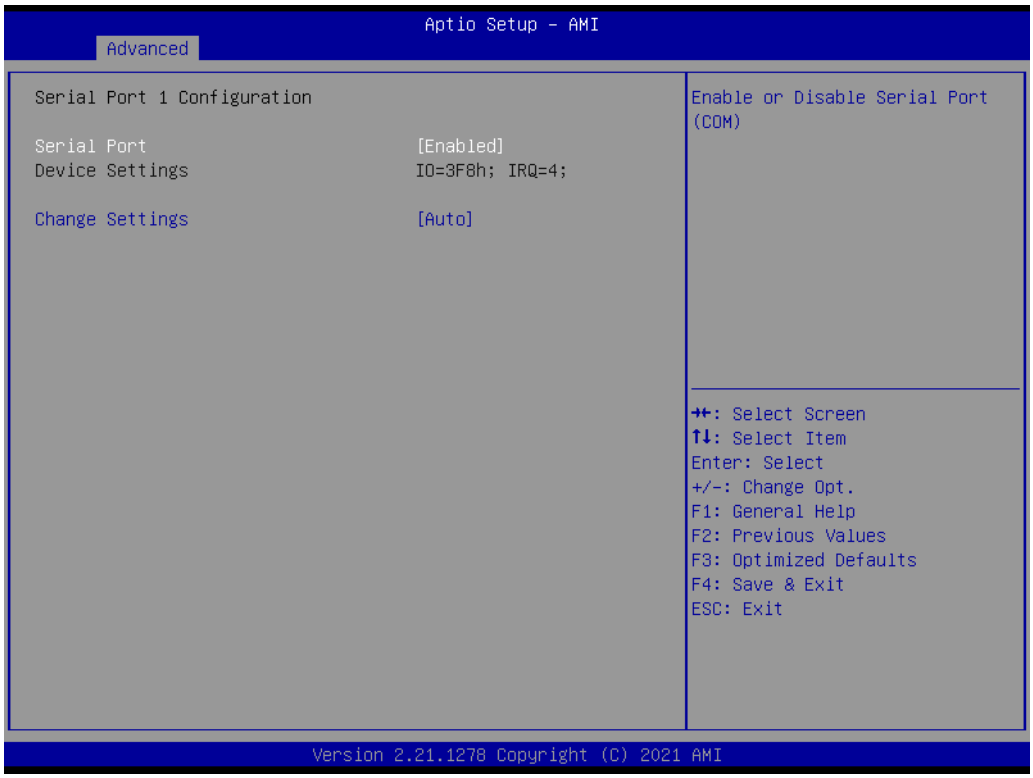


Figure 3.18 Serial Port 2 Configurations

- **Serial Port**
- **Change Settings**

Hardware Monitor

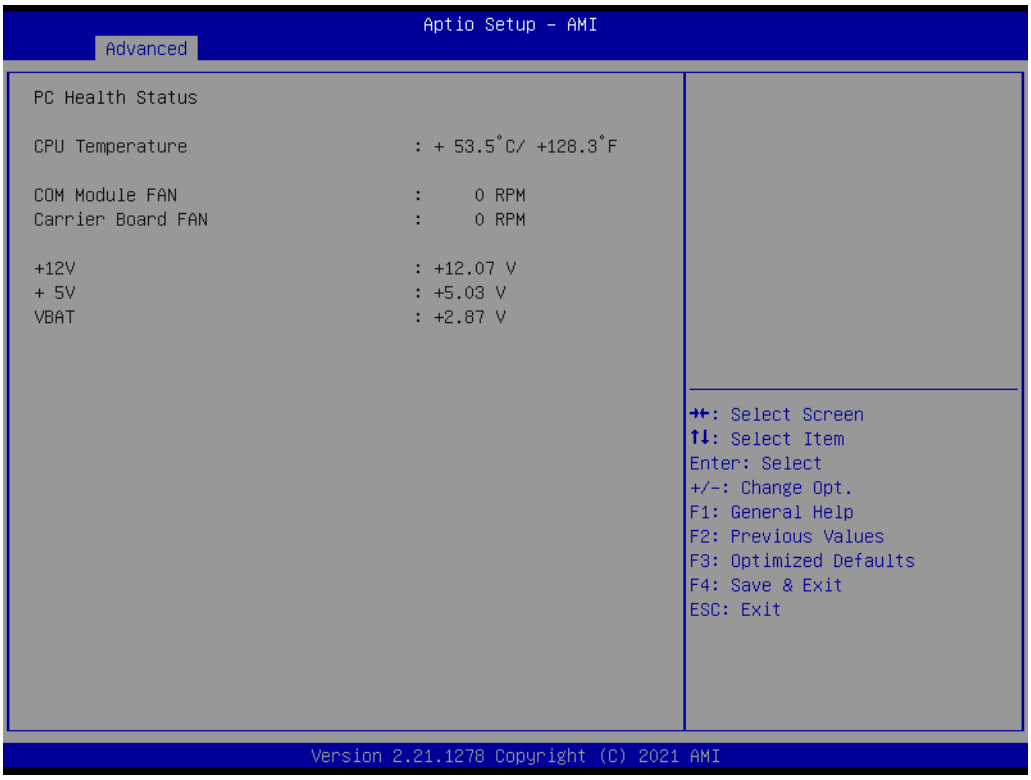


Figure 3.19 Hardware Monitor

3.4.8 Serial Port Console Redirection

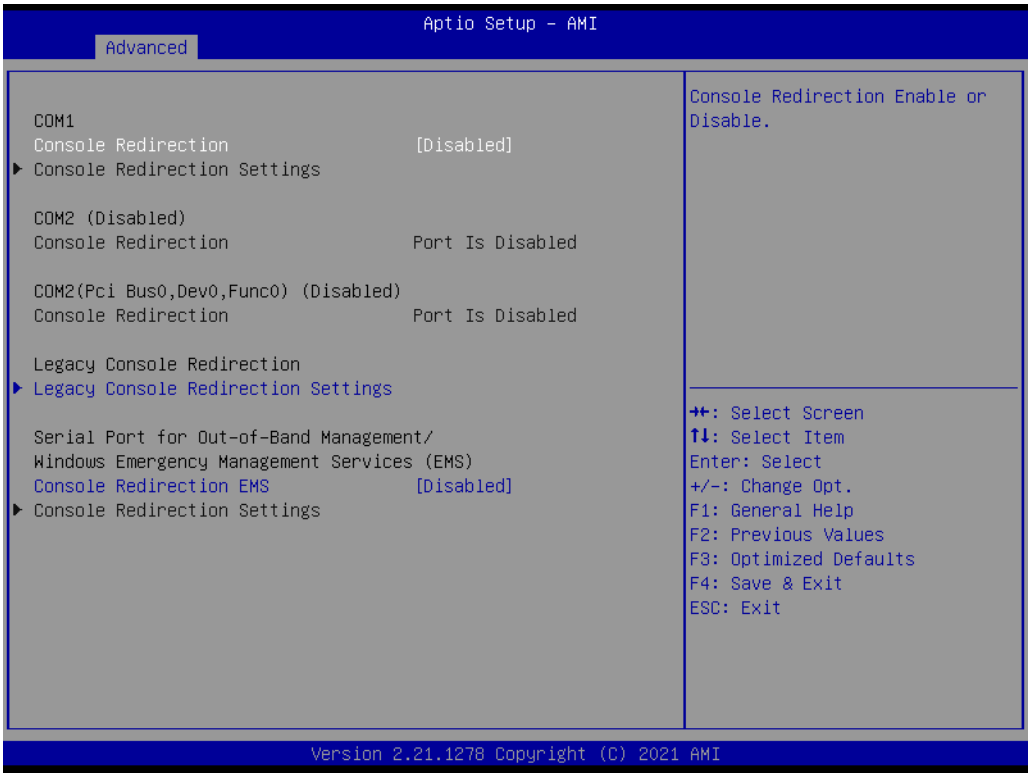


Figure 3.20 Serial Port Console Redirection

- **COM1 Console Redirection**

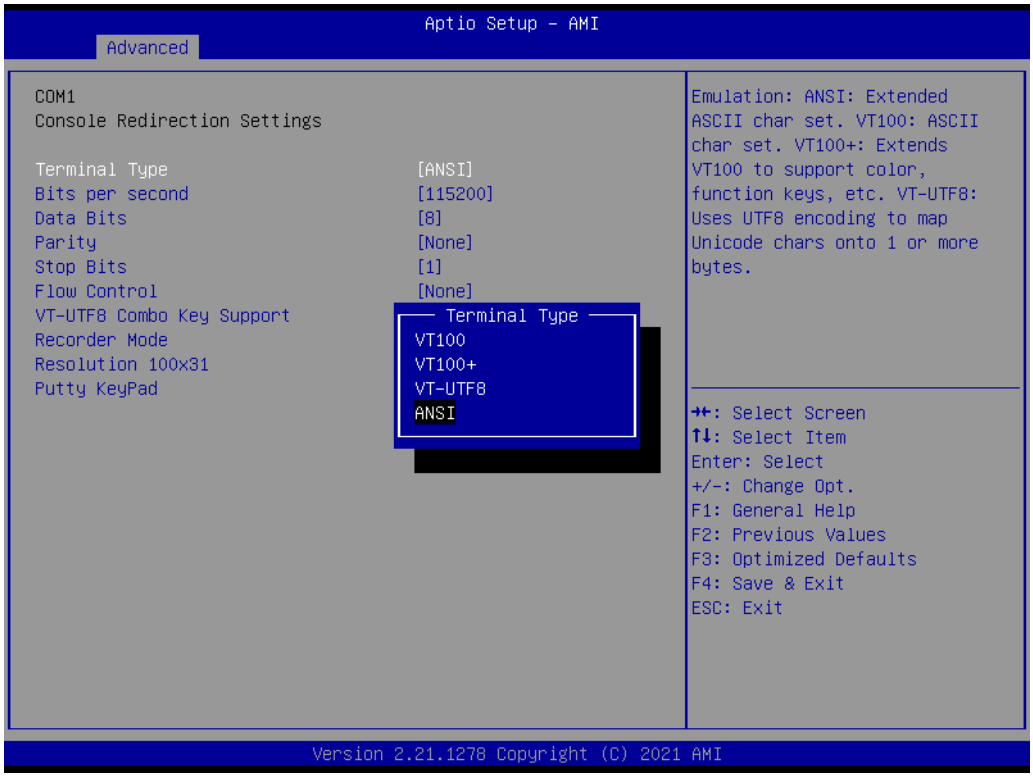


Figure 3.21 Terminal Type Settings

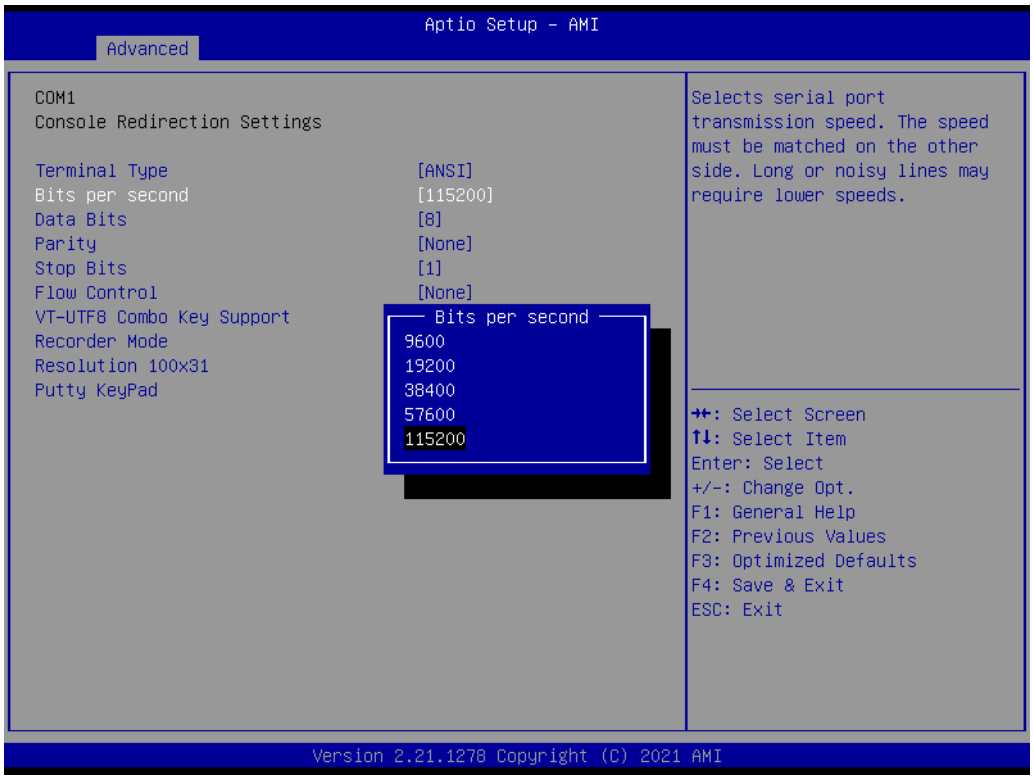


Figure 3.22 Terminal Type Settings

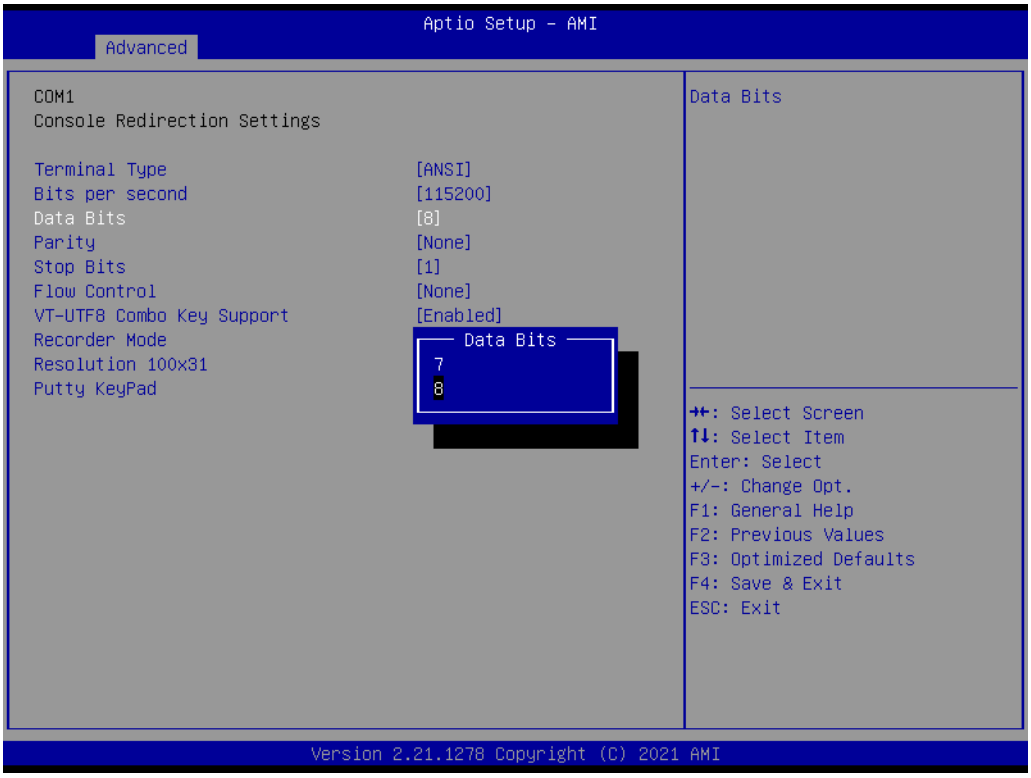


Figure 3.23 Data Bits Settings

Figure 3.24 Parity Settings

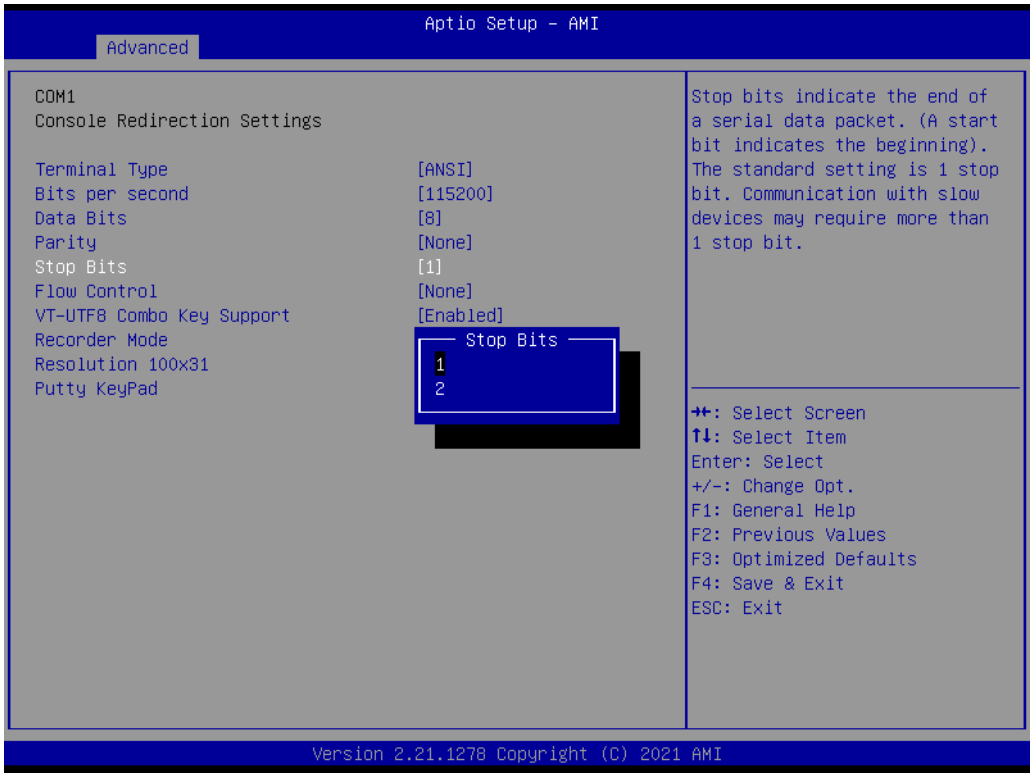


Figure 3.25 Stop Bits Settings

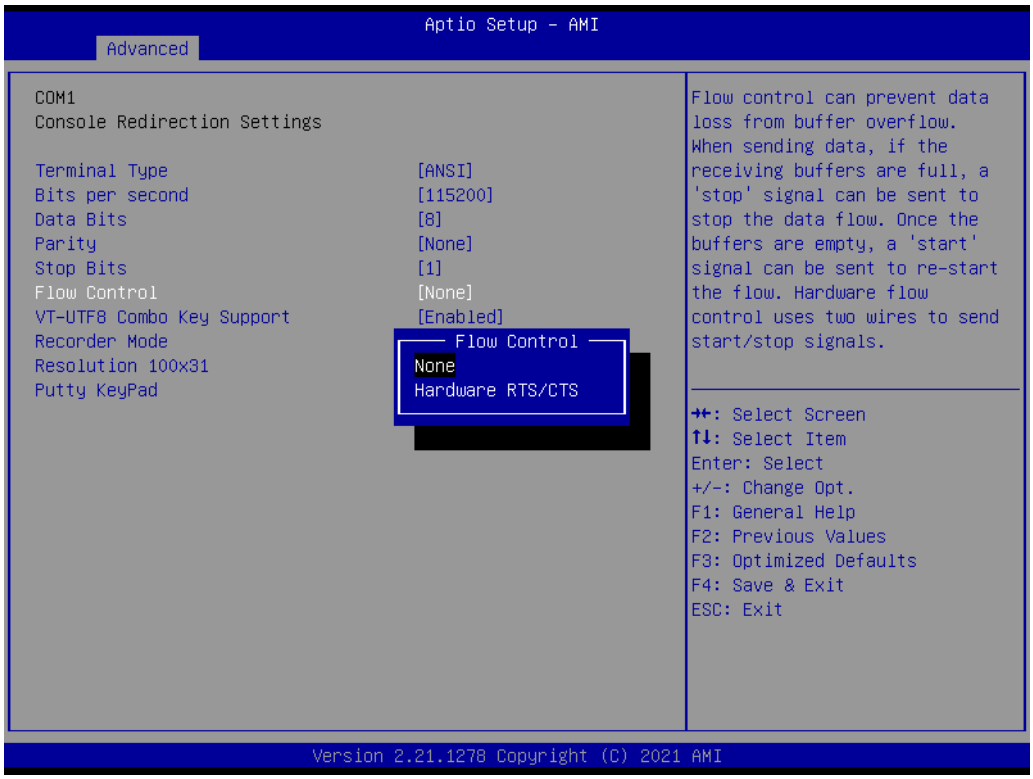


Figure 3.26 Flow Control Settings

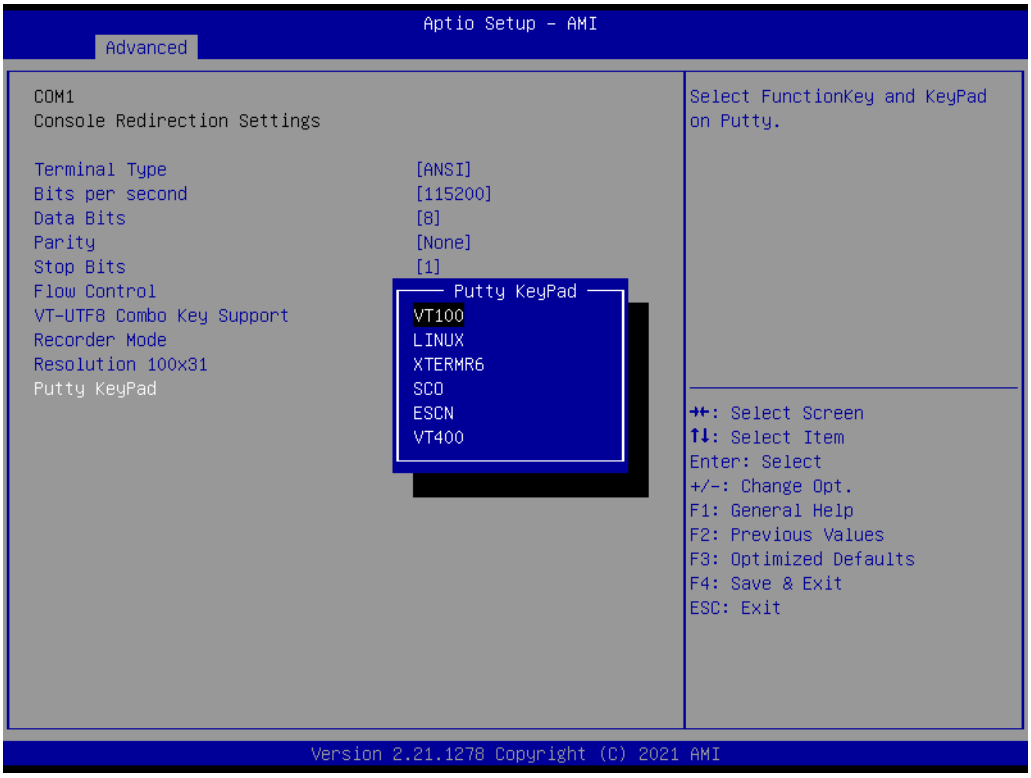


Figure 3.27 Putty KeyPad Settings

- **COM2 Console Redirection**
- **COM3 Console Redirection**
- **COM4 Console Redirection**
- **Legacy Console Redirection Settings**
- **Console Redirection**

3.4.9 USB Configuration

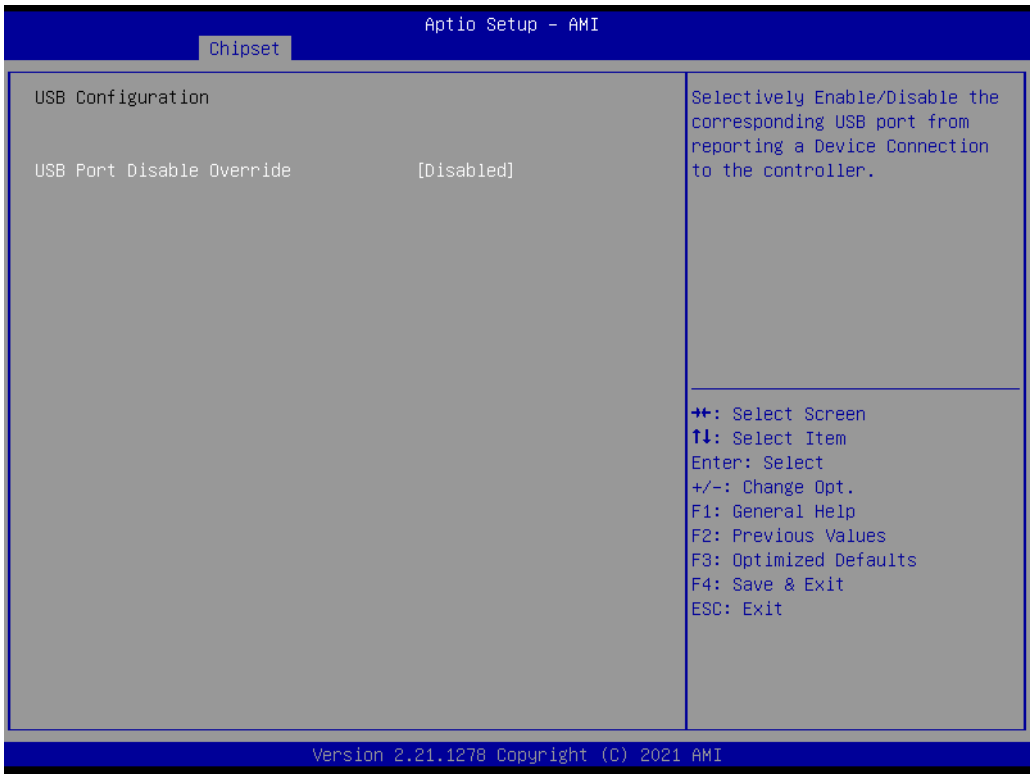


Figure 3.28 USB Configuration

- **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
  - USB Mass Storage Driver Support
  - USB transfer time-out

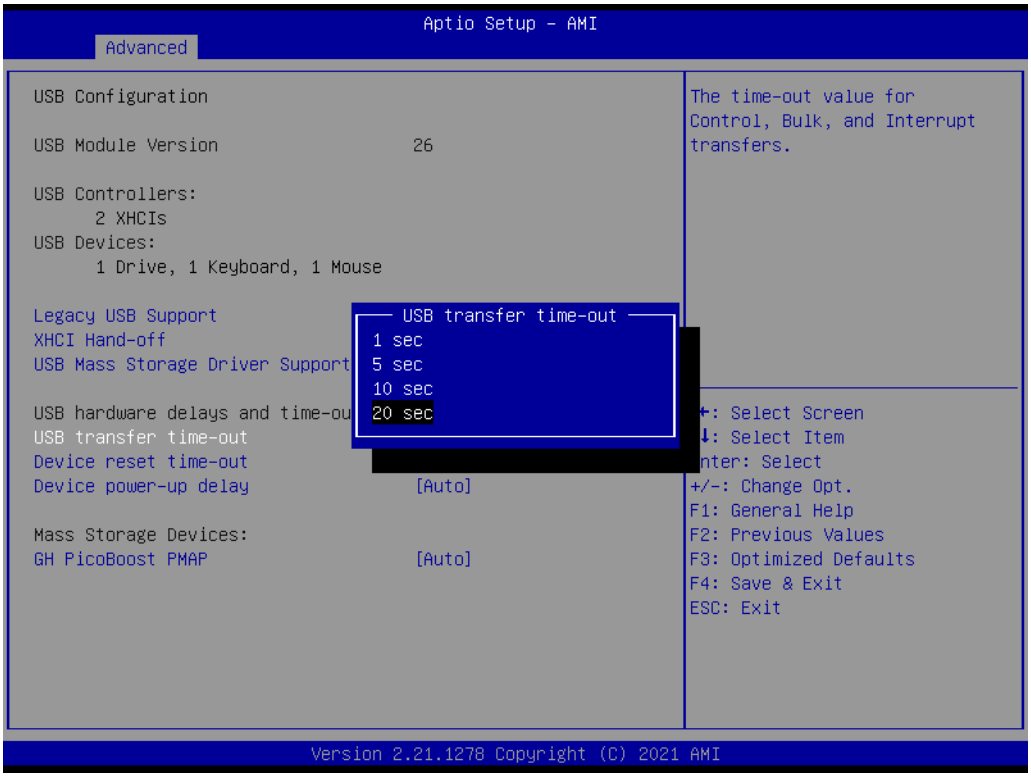


Figure 3.29 USB Transfer Time-out Settings

- **Device reset time-out**
- **Device power-up delay**

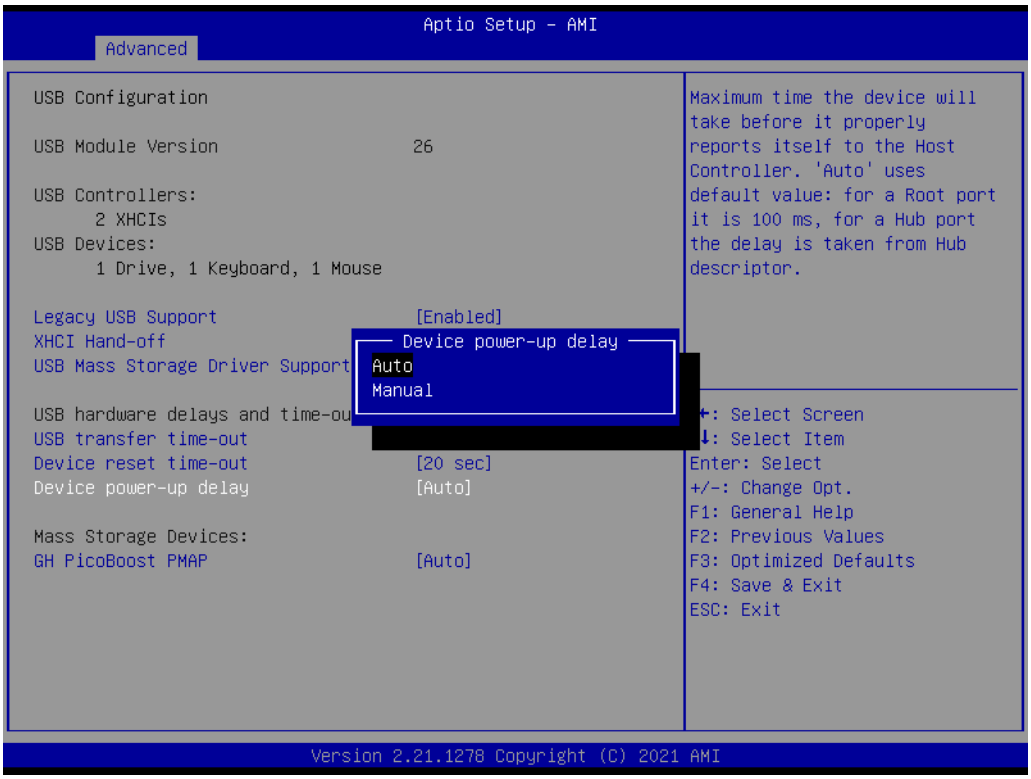


Figure 3.30 Device Power-up Delay Settings

3.4.10 Network Stack Configuration

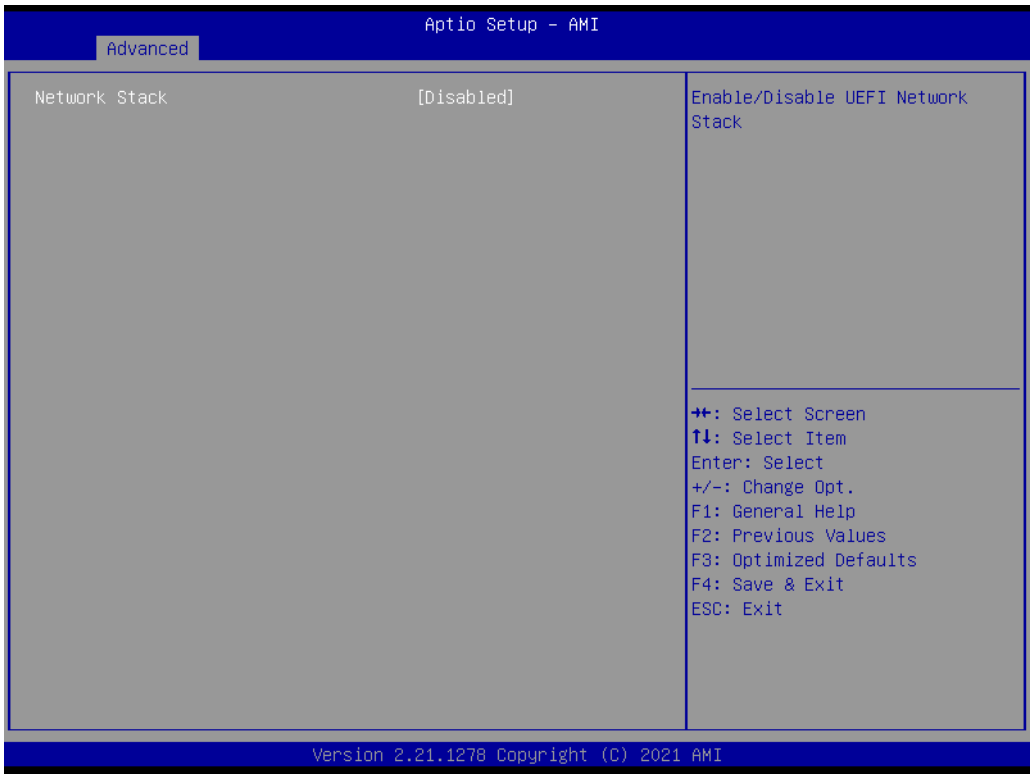


Figure 3.31 Network Stack Configuration

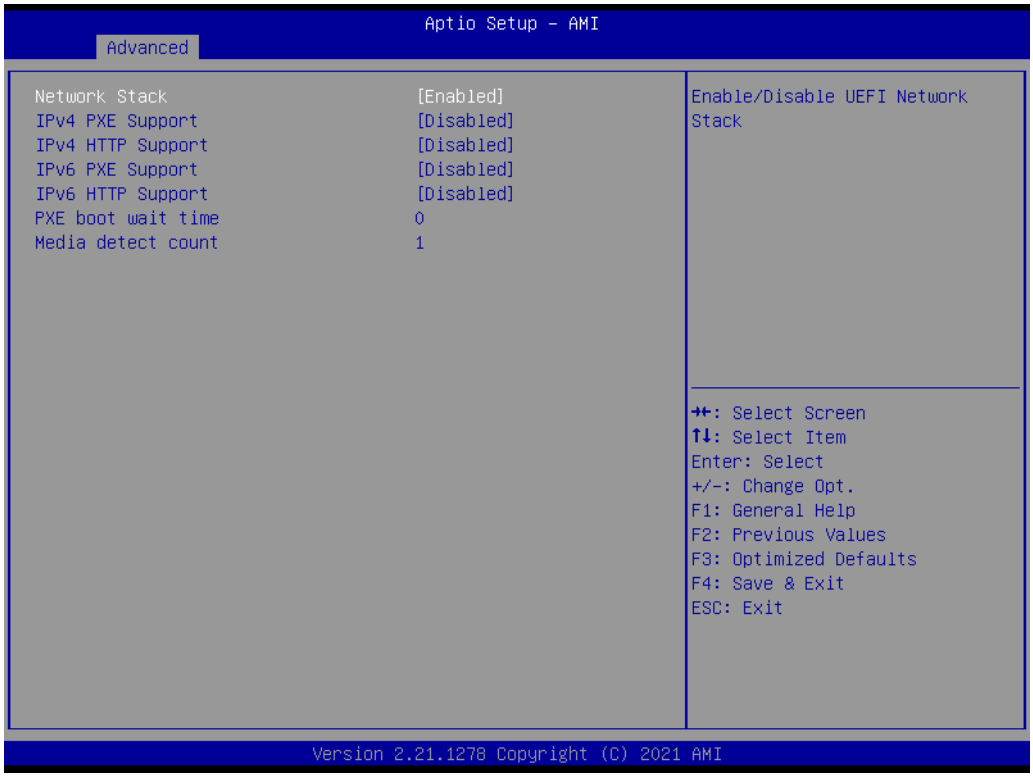


Figure 3.32 Network Stack Configuration Settings

3.5 Chipset Setting

Select the chipset tab from the SOM-7583 setup screen to enter the chipset BIOS Setup screen. You can display a chipset BIOS setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

Figure 3.33 Chipset Setup

- **System Agent (SA) Configuration**
- **PCH-IO Configuration**

3.5.1 System Agent (SA) Configuration

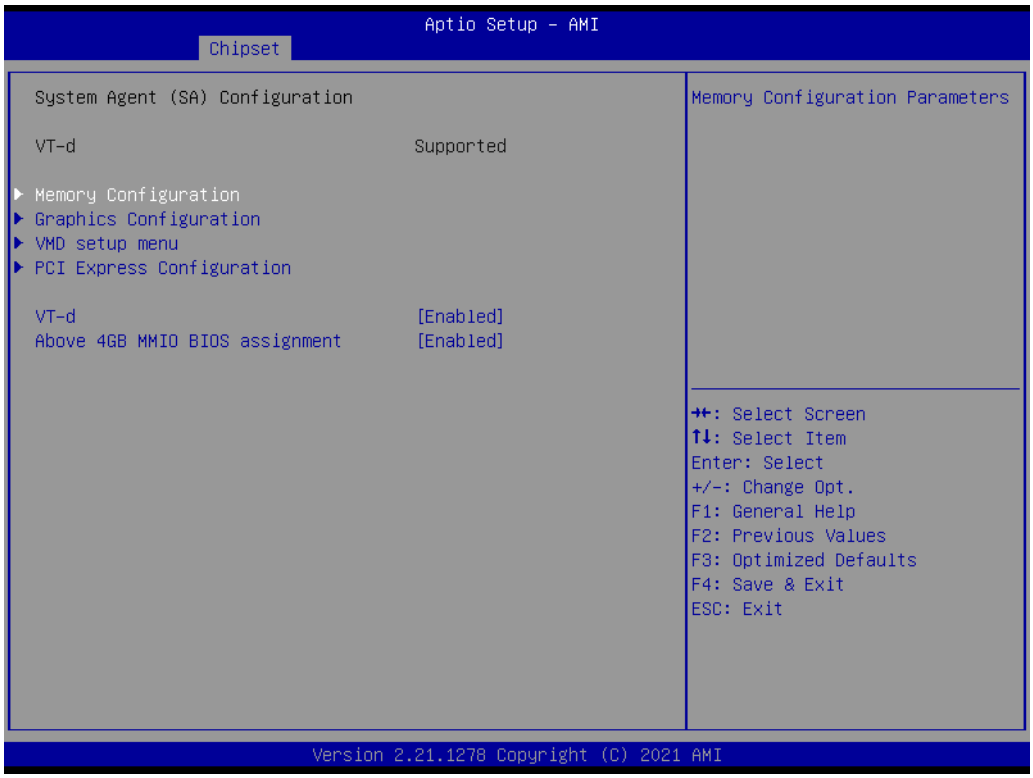


Figure 3.34 System Agent (SA) Configuration

- **Memory Configuration**
- **Graphics Configuration**
- **VT-d**

Memory Configuration

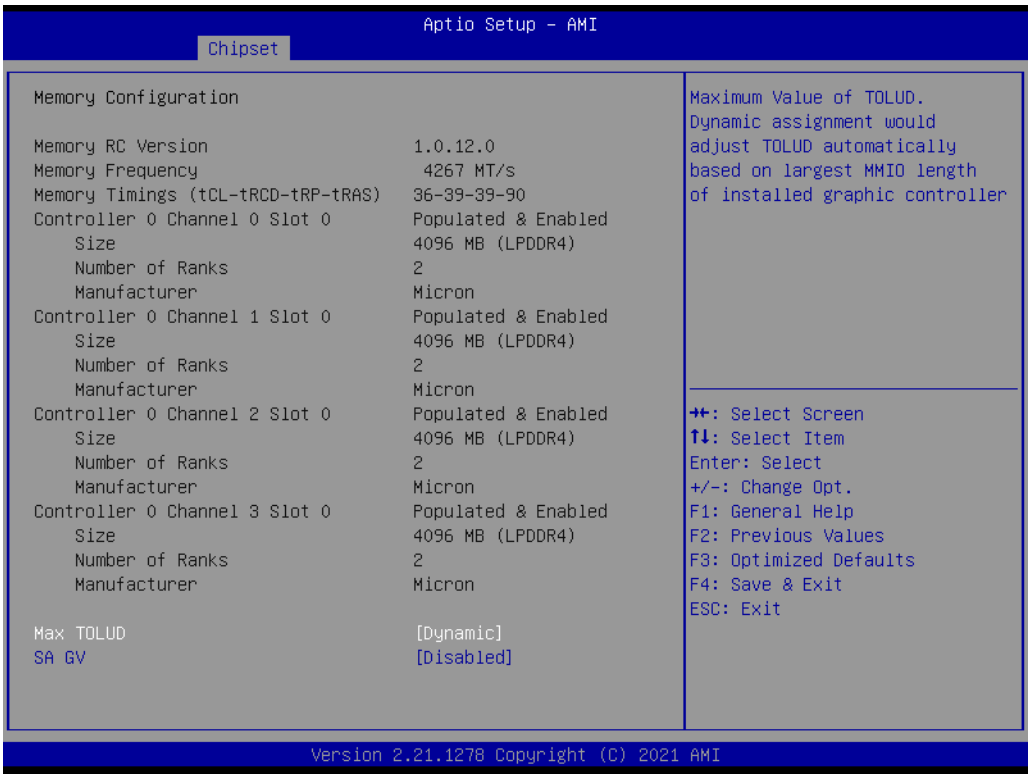


Figure 3.35 Memory Configuration

Graphics Configuration

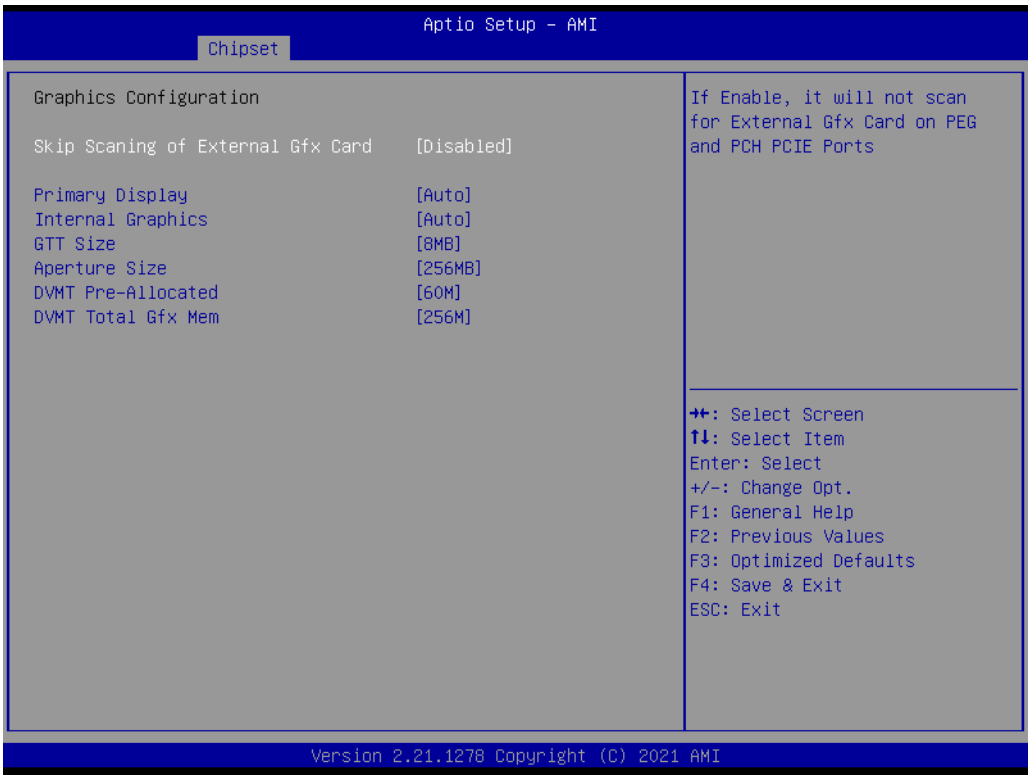


Figure 3.36 Graphics Configuration

Primary Display

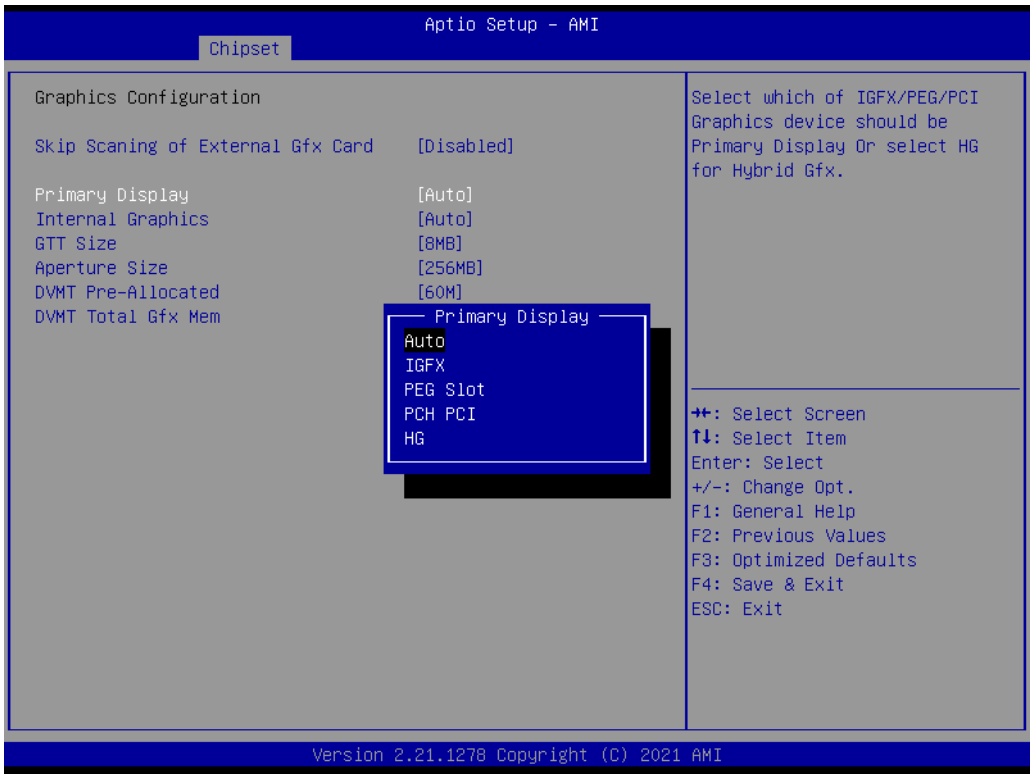


Figure 3.37 Primary Display

Internal Graphics

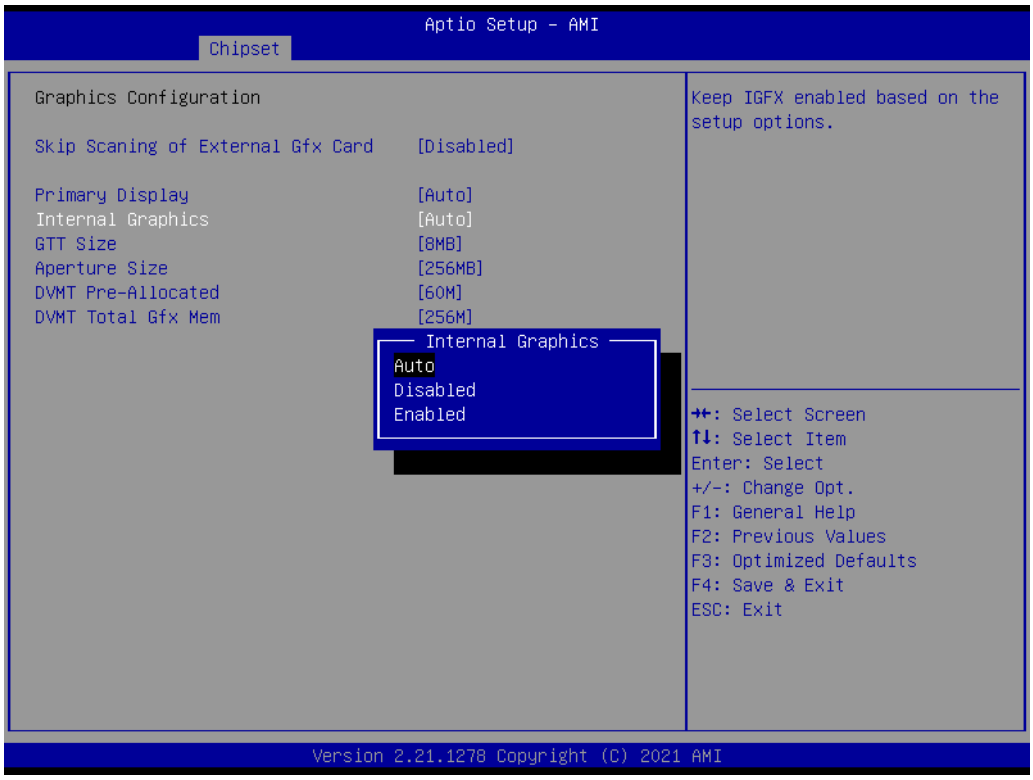


Figure 3.38 Internal Graphics Settings

GTT Size

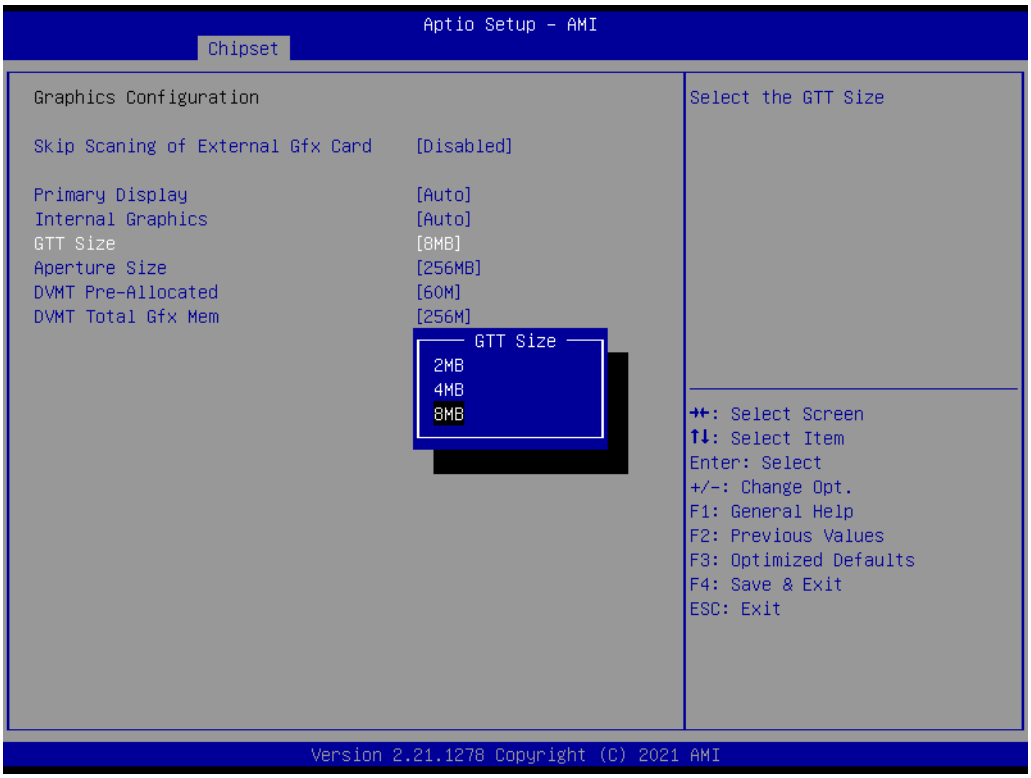


Figure 3.39 GTT Size Settings

Aperture Size

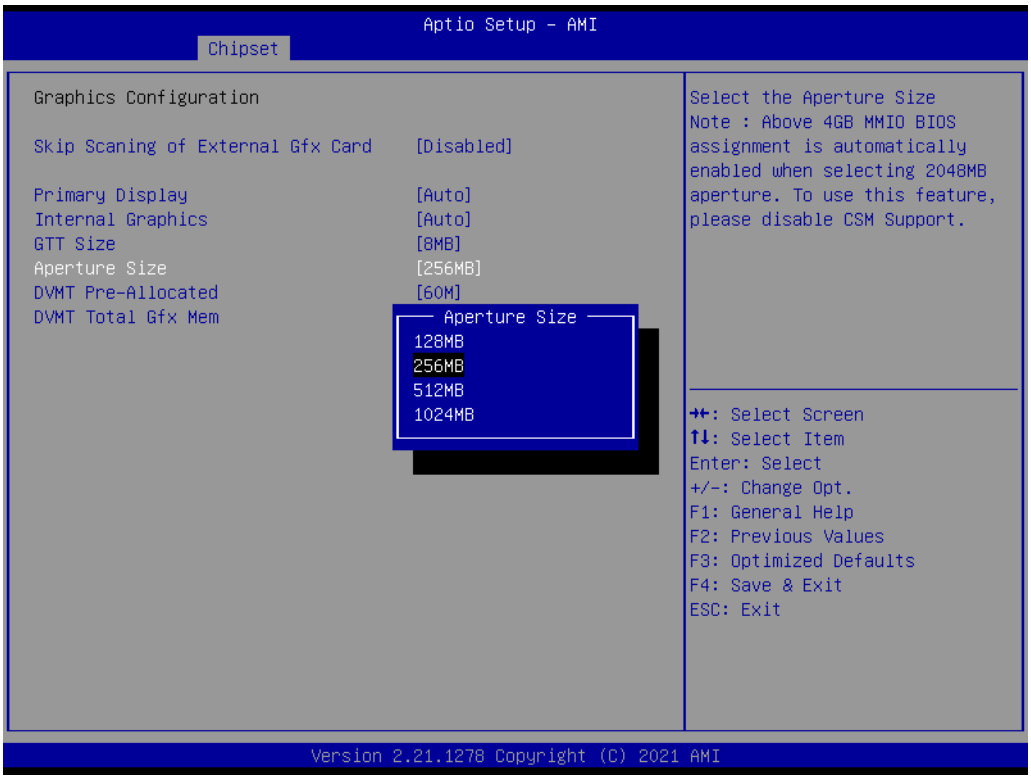


Figure 3.40 Aperture Size Settings

DVMT Pre-Allocated

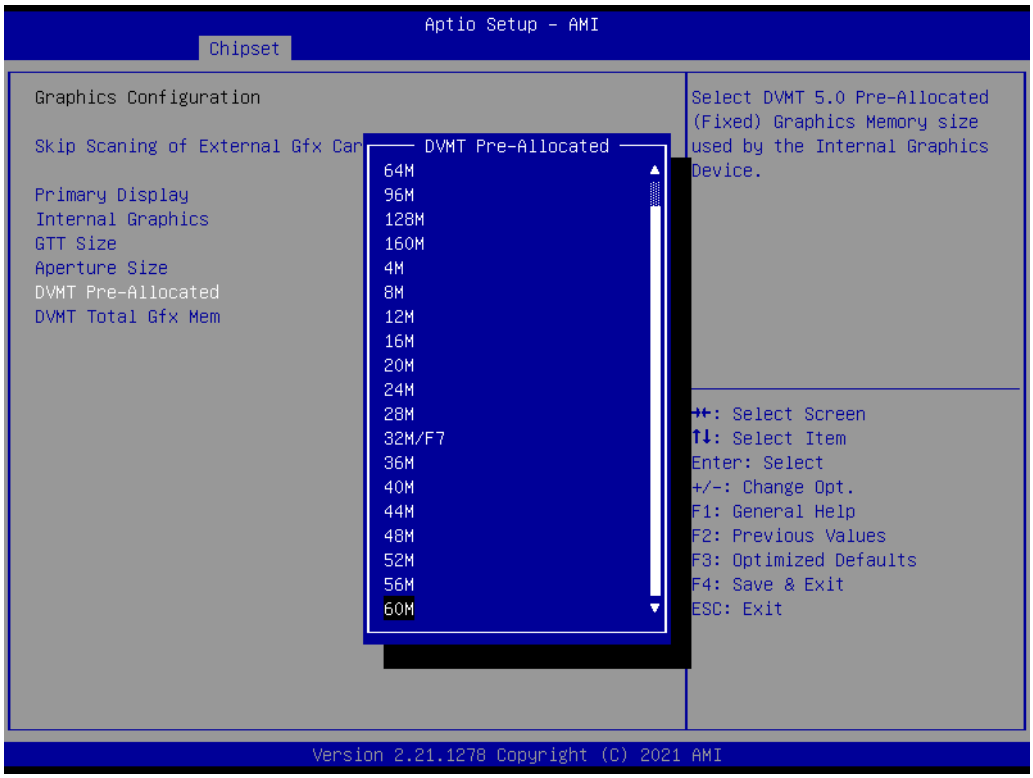


Figure 3.41 DVMT Pre-Allocated Settings

DVMT Toal Gfx Mem

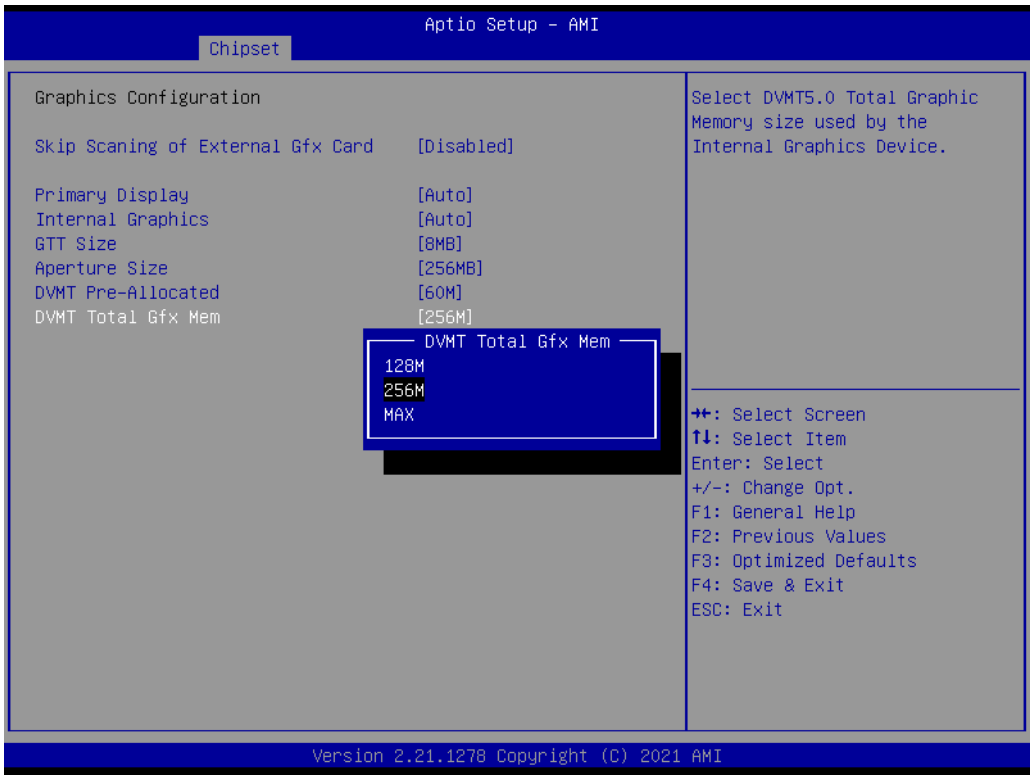


Figure 3.42 DVMT Toal Gfx Mem Settings

3.5.2 PCH-IO Configuration

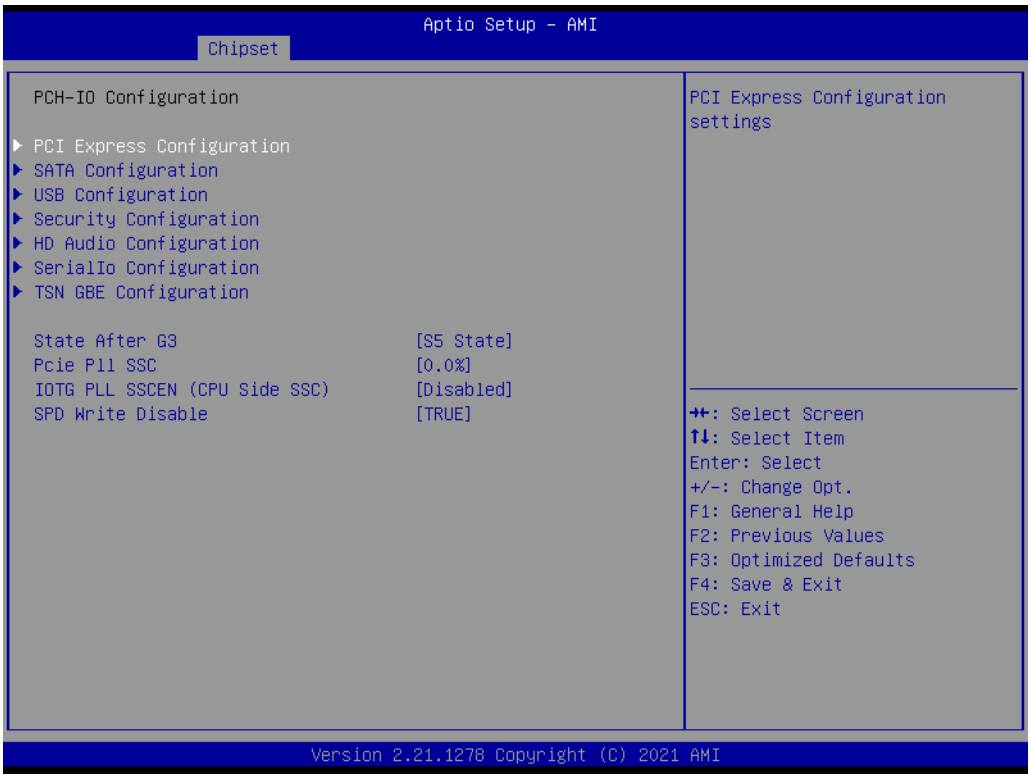


Figure 3.43 PCH-IO Configuration

- **PCI Express Configuration**
- **SATA And RST Configuration**
- **USB Configuration**
- **Security Configuration**
- **HD Audio Configuration**
- **Seriallo Configuration**
- **SCS Configuration**
  - PCH LAN Controller
  - Wake on LAN Enable
  - Serial IRQ Mode
  - State After G3
  - PCIe Pll SSC

PCI Express Configuration

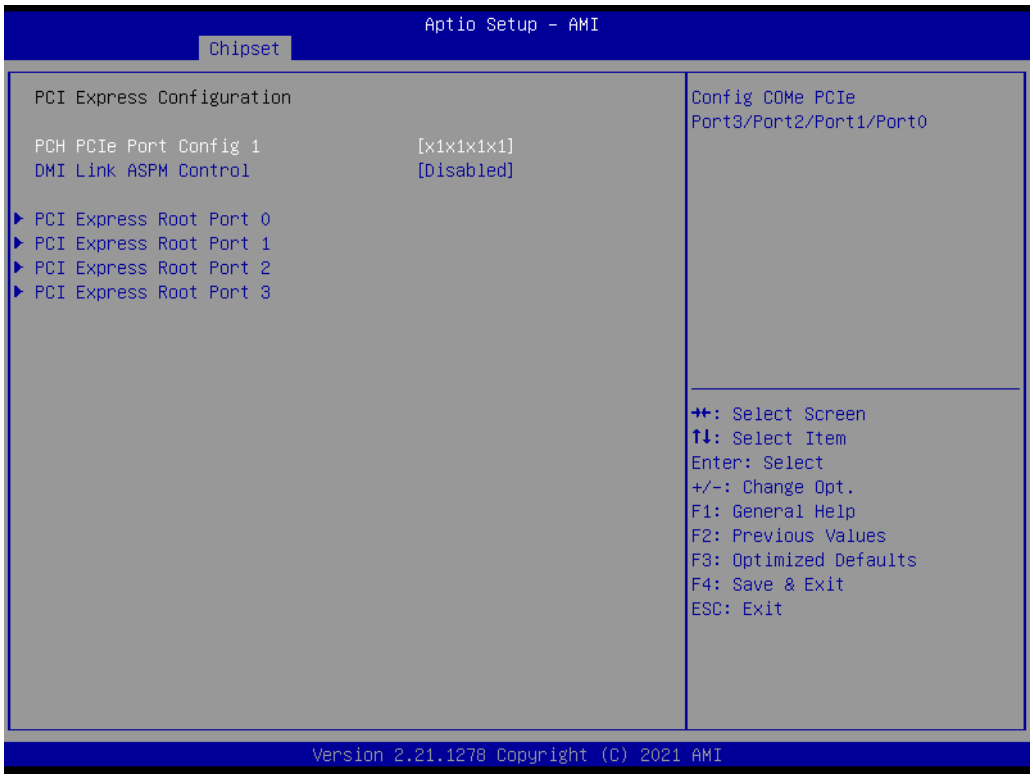


Figure 3.44 PCI Express Configuration

- **PCI Express Root Port 0**
  PCI Express Root Port 0 settings.
- **PCI Express Root Port 1**
  PCI Express Root Port 1 settings.
- **PCI Express Root Port 2**
  PCI Express Root Port 2 settings.
- **PCI Express Root Port 3**
  PCI Express Root Port 3 settings.
- **PCI Express Root Port 4**
  PCI Express Root Port 4 settings.
- **PCI Express Root Port 5**
  PCI Express Root Port 2 settings.

PCI Express Root Port 0 Configuration

Figure 3.45 PCI Express Root Port 0 Configuration

- **PCI Express Root Port 0**
- **ASPM**
  - Hot Plug
- **PCIe Speed**

SATA And RST Configuration

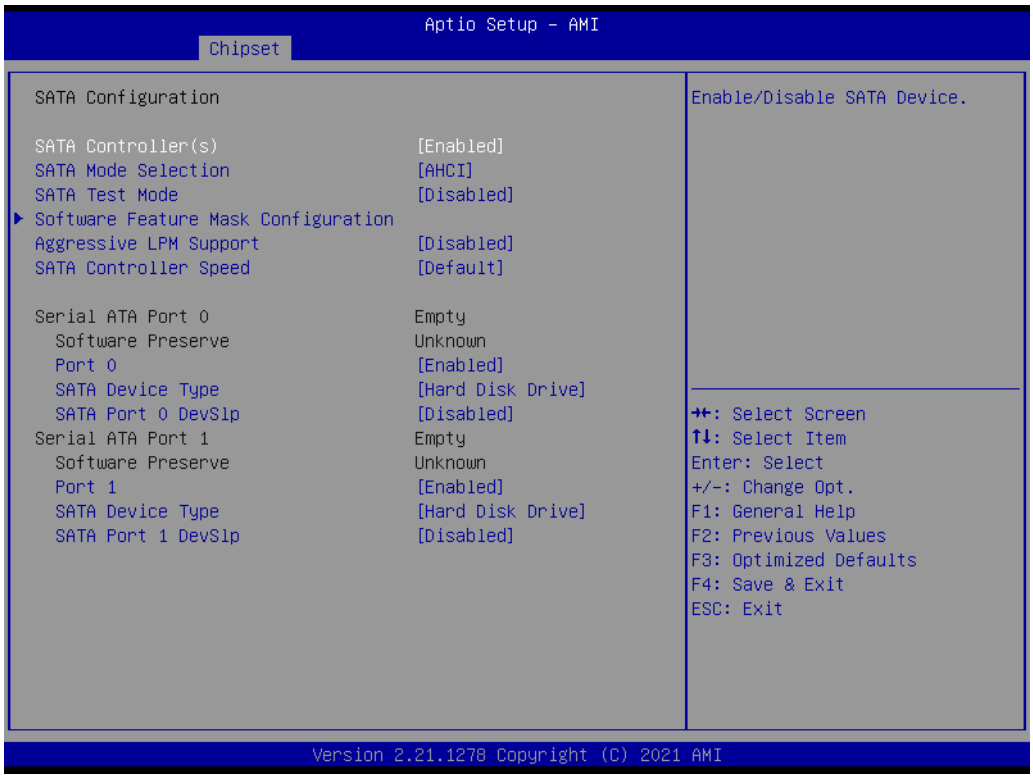


Figure 3.46 SATA And RST Configuration

- **SATA Controller(s)**
  Enable/Disable SATA Device.
- **SATA Mode Selection**
  Determines how SATA controller(s) operate.
- **Software Feature Mask Configuration**
  Enable/Disable SATA Device.
- **Aggressive LPM Support**
- **SATA Controller Speed**
  Indicates the maximum speed the SATA controller can support.
- **Port 0**
  Enable or Disable SATA port.
  - SATA Device Type
  - SATA Port 0 DevSlp
- **Port 1**
  Enable or Disable SATA port.
  - SATA Device Type
  - SATA Port 0 DevSlp

Security Configuration

Figure 3.47 Security Configuration Settings

HD Audio Configuration

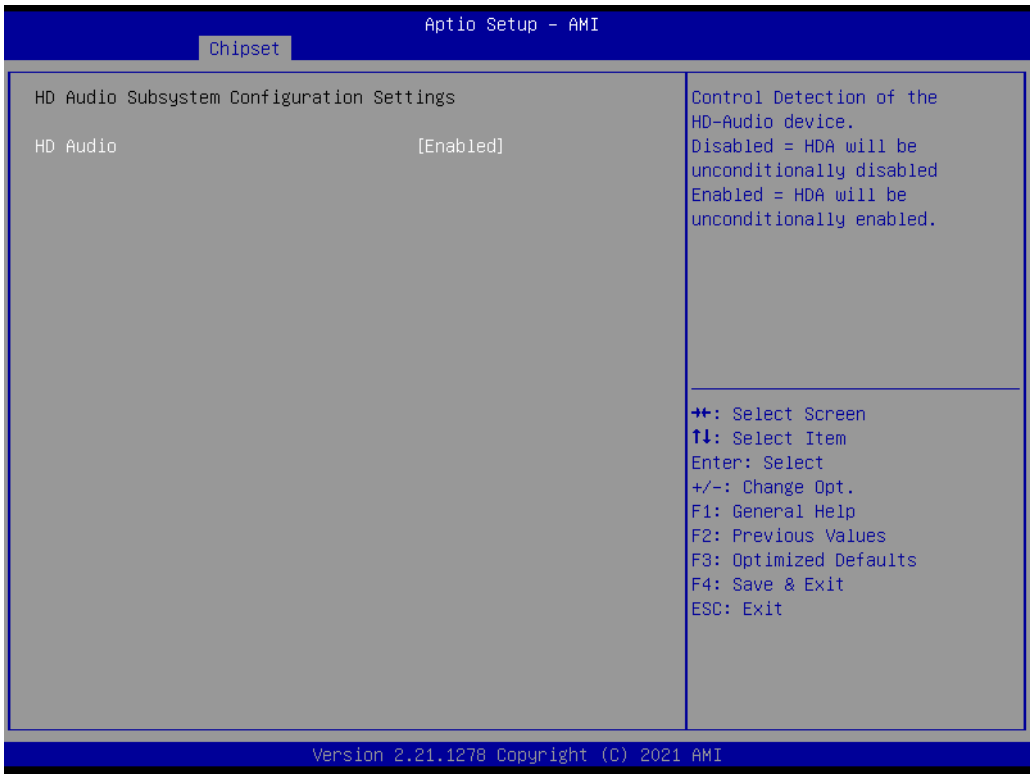


Figure 3.48 HD Audio Configuration

- **HD Audio**
  - Control Detection of the HD-Audio device.
  - Disabled= HDA will be unconditionally disabled
  - Enabled= HDA will be unconditionally enabled
  - Auto= HDA will be enabled if present, disabled otherwise

Security Configuration

Figure 3.49 Security Configuration Settings

- **RTC Memory Lock**
- **BIOS Lock**

Seriallo Configuration

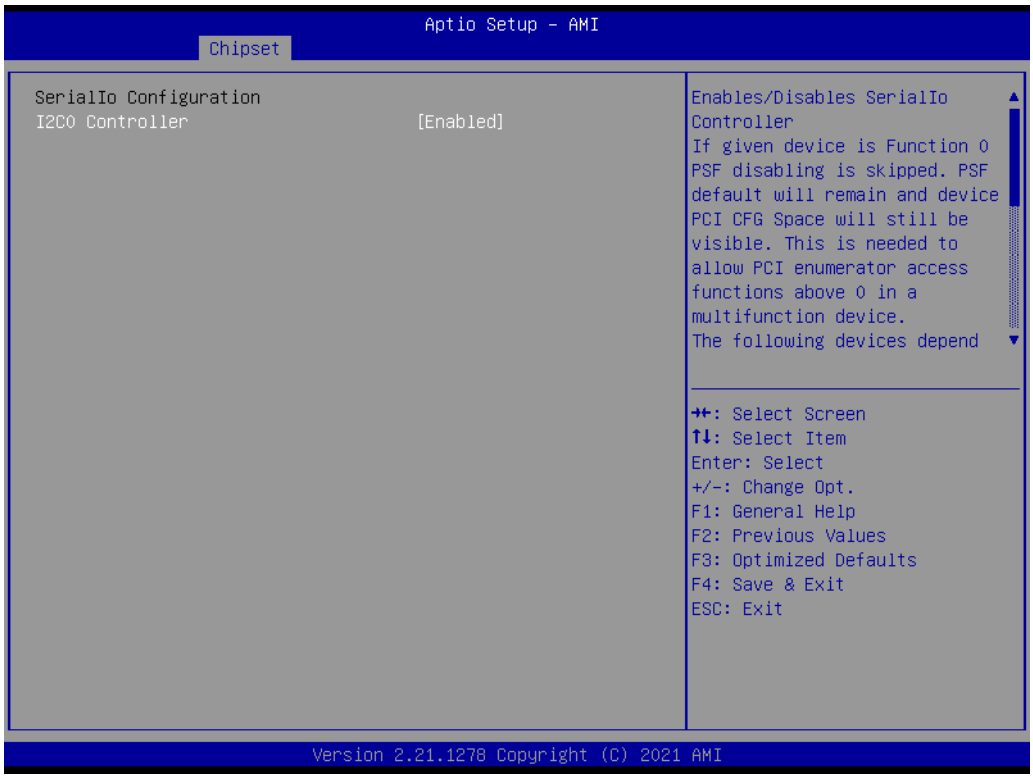


Figure 3.50 Serial IO Configuration Settings

3.5.3 Security Settings

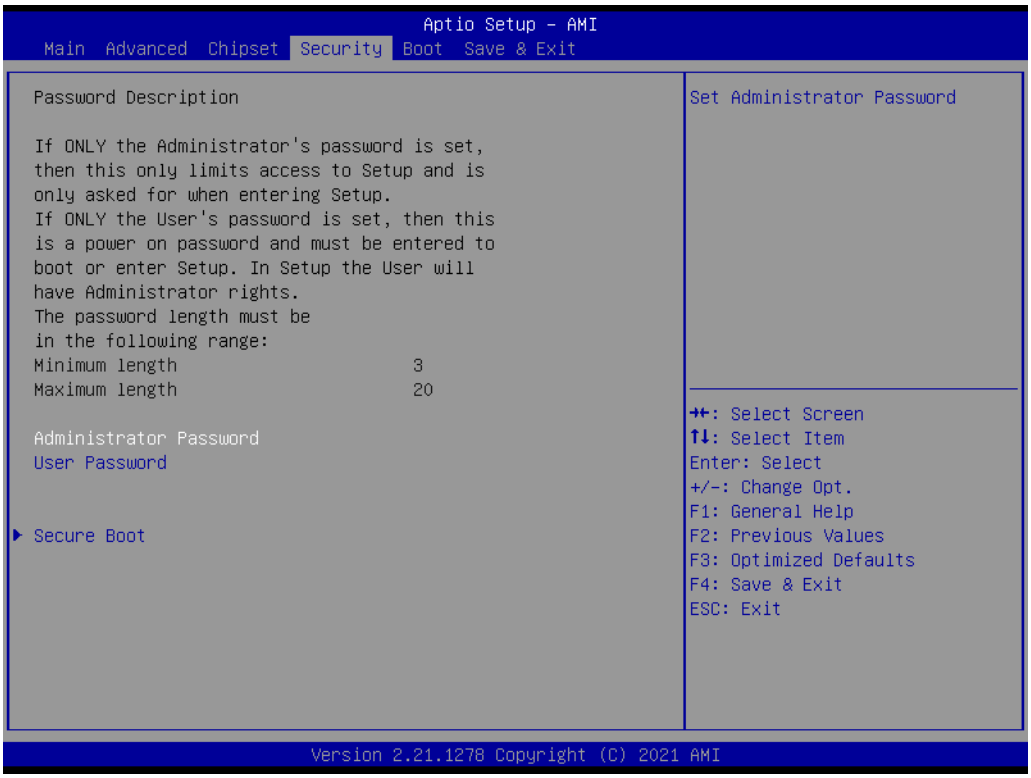


Figure 3.51 Security Setup

Select Security Setup from the SOM-7583 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>:

Change Administrator/User Password: Select this option and press <ENTER> to access the sub menu, and then type in the password.

3.5.4 Boot Settings

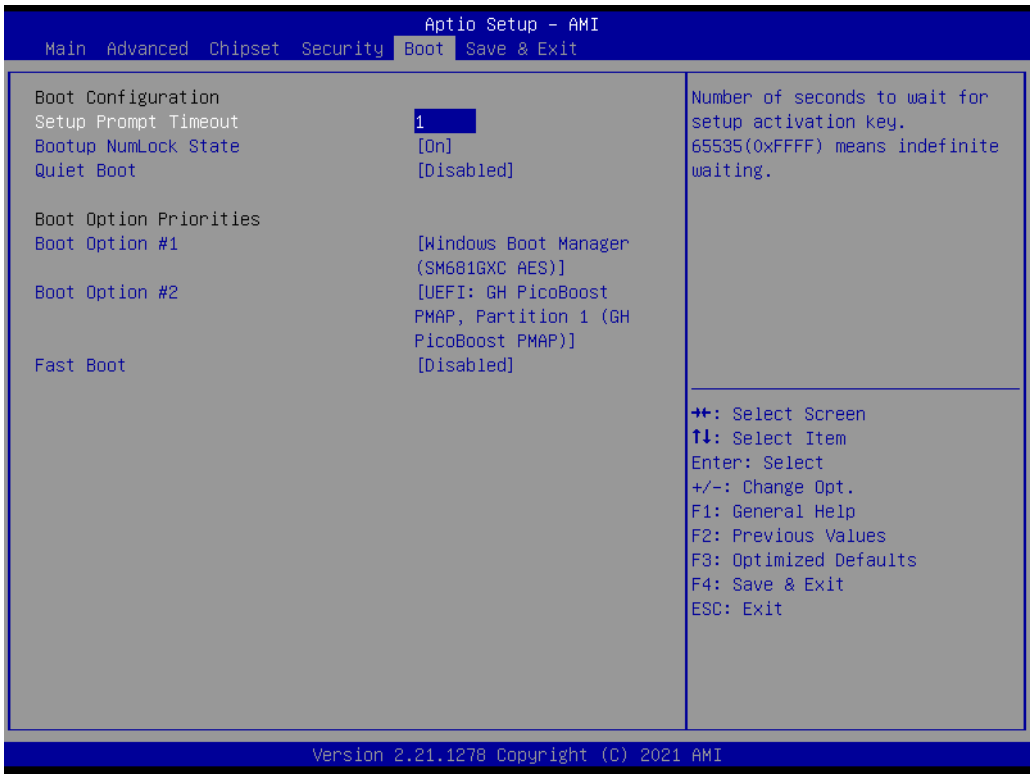


Figure 3.52 Security Setup

- **Setup Prompt Timeout**
- **Bootup NumLock State**
- **Quiet Boot**
  - Boot option#1
- **Fast Boot**

3.5.5 Save & Exit

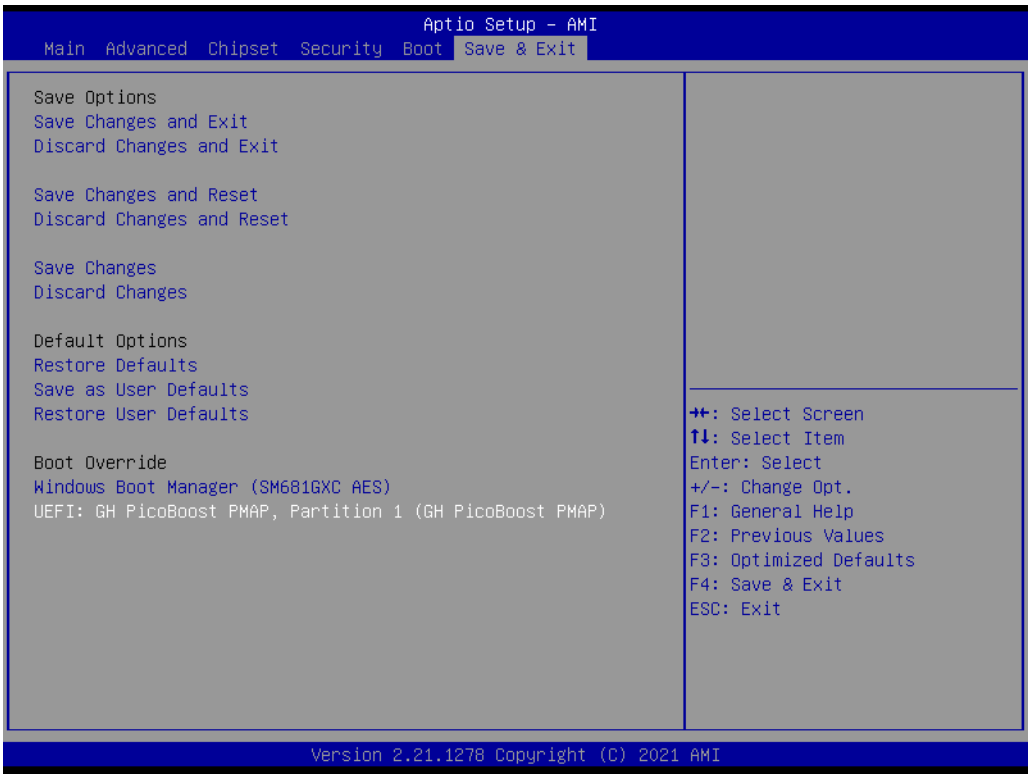


Figure 3.53 Security Setup

- **Save Changes and Exit**
- **Discard Changes and Exit**
- **Save Changes and Reset**
- **Discard Changes and Reset**
- **Save Changes**
- **Discard Changes**
- **Restore Defaults**
- **Save User Defaults**
- **Restore User Defaults**

Chapter 4

S/W Introduction and 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 distributors) 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

SOM-7583 supports Windows* 10 Enterprise. 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-7583 supports Linux:

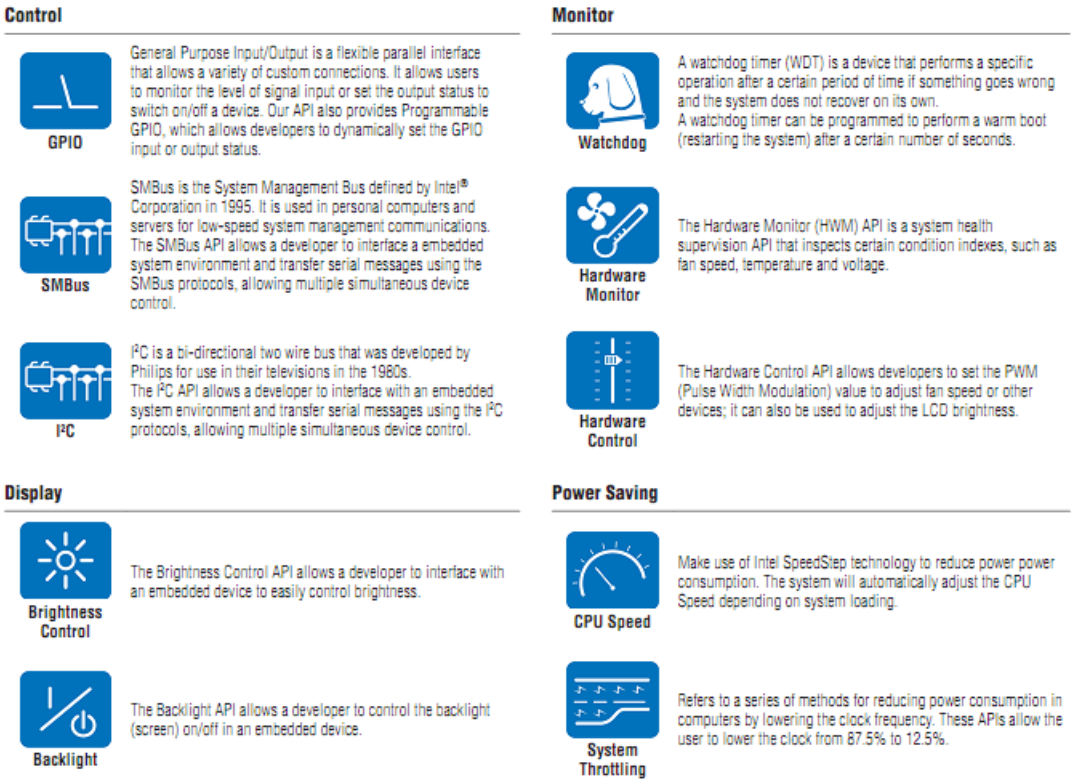
Ubuntu (by Request)

Wind River VxWorks* 7.0 (by Request)

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 and encrypted EEPROM for storing important security keys or other customer defined 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) specifications and unify in the same structures. It makes these embedded features easier to integrate, speeds up development schedules, and provides the customers with software continuity while upgrading hardware. For more details regarding how to use the APIs and utilities, please refer to Advantech iManager 2.0 Software API User Manual.



Appendix A

Pin Assignment

This appendix details information about the hardware pin assignment of the SOM-7583 CPU System on Module.

Sections include:

- SOM-7583 Type 10 Pin Assignment

A.1 SOM-7583 Type 10 Pin Assignment

This section gives SOM-7583 pin assignment on COM Express connector which compliant with COMR.0 R3.0 Type 10 pin-out definitions. More details about how to use these pins and get design reference. Please contact to Advantech for design guide, checklist, reference schematics, and other hardware/software support.

SOM-7583 Row A,B			
A1	GND (FIXED)	B1	GND (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	N/A
A9	GBE0_MDI1-	B9	N/A
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND (FIXED)	B11	GND (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	N/A	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND (FIXED)	B21	GND (FIXED)
A22	USB_SSRX0-	B22	USB_SSTX0-
A23	USB_SSRX0+	B23	USB_SSTX0+
A24	SUS_S5#	B24	PWR_OK
A25	USB_SSRX1-	B25	USB_SSTX1-
A26	USB_SSRX1+	B26	USB_SSTX1+
A27	BATLOW#	B27	WDT
A28	(S)ATA_ACT#	B28	HDA_SDIN2
A29	HDA_SYNC	B29	HDA_SDIN1
A30	HDA_RST#	B30	HDA_SDIN0
A31	GND (FIXED)	B31	GND (FIXED)
A32	HDA_BITCLK	B32	SPKR
A33	HDA_SDOUT	B33	I2C_CK
A34	BIOS_DIS0#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+

A41	GND (FIXED)	B41	GND (FIXED)
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	N/A
A48	RSVD	B48	USB_HOST_PRSNT
A49	N/A	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND (FIXED)	B51	GND (FIXED)
A52	RSVD	B52	RSVD
A53	RSVD	B53	RSVD
A54	GPI0	B54	GPO1
A55	RSVD	B55	RSVD
A56	RSVD	B56	RSVD
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND (FIXED)	B60	GND (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND (FIXED)	B70	GND (FIXED)
A71	LVDS_A0+	B71	LVDS_B0+
A72	LVDS_A0-	B72	LVDS_B0-
A73	LVDS_A1+	B73	LVDS_B1+
A74	LVDS_A1-	B74	LVDS_B1-
A75	LVDS_A2+	B75	LVDS_B2+
A76	LVDS_A2-	B76	LVDS_B2-
A77	LVDS_VDD_EN	B77	LVDS_B3+
A78	LVDS_A3+	B78	LVDS_B3-
A79	LVDS_A3-	B79	LVDS_BKLT_EN
A80	GND (FIXED)	B80	GND (FIXED)
A81	LVDS_A_CK+	B81	LVDS_B_CK+
A82	LVDS_A_CK-	B82	LVDS_B_CK-
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY
A85	GPI3	B85	VCC_5V_SBY
A86	N/A (*Note)	B86	VCC_5V_SBY
A87	eDP_HPD	B87	VCC_5V_SBY
A88	PCIE_CLK_REF+	B88	BIOS_DIS1#

A89	PCIE_CLK_REF-	B89	VGA_RED
A90	GND (FIXED)	B90	GND (FIXED)
A91	SPI_POWER	B91	VGA_GRN
A92	SPI_MISO	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	SPI_CLK	B94	VGA_VSYNC
A95	SPI_MOSI	B95	VGA_I2C_CK
A96	TPM_PP	B96	VGA_I2C_DAT
A97	N/A	B97	SPI_CS#
A98	SER0_TX	B98	N/A
A99	SER0_RX	B99	N/A
A100	GND (FIXED)	B100	GND (FIXED)
A101	SER1_TX	B101	FAN_PWMOUT
A102	SER1_RX	B102	FAN_TACHIN
A103	LID#	B103	SLEEP#
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND (FIXED)	B110	GND (FIXED)

Note! *A86 could be an optional pin reserved for SD_PWR_EN. Please contact FAE for details.*

Appendix B

Watchdog Timer

This appendix details information about the watchdog timer programming on the SOM-7583 CPU System on Module.

Sections include:

- Watchdog Timer Programming

B.1 Programming the Watchdog Timer

Trigger Event	Note
IRQ	(BIOS settings default disable)**
NMI	N/A
SCI	Support
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

Programming GPIO

This appendix details the General Purpose Input and Output pin setting.

Sections include:

- **System I/O ports**

C.1 GPIO Register

GPIO Byte Mapping	H/W Pin Name
BIT0	GPI 0
BIT1	GPI 1
BIT2	GPI 2
BIT3	GPI 3
BIT4	GPO 0
BIT5	GPO 1
BIT6	GPO 2
BIT7	GPO 3

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

Appendix D

System Assignments

This appendix details the system resource allocation on the SOM-7583 CPU System on Module.

Sections include:

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

D.1 System I/O Ports

Table D.1: System I/O ports

Addr.Range(Hex)	Device
0299-029A	Motherboard resources
02C0-02DF	Motherboard resources
02A0-02BF 0202BF0x000002BF	Motherboard resources
0290-02AD	Motherboard resources
0060-006F	Motherboard resources
0200-027F	Motherboard resources
0300-037F	Motherboard resources
0280-028F	Motherboard resources
02F0-02F7	Motherboard resources
002E-002F	Motherboard resources
004E-004F	Motherboard resources
0061-0061	Motherboard resources
0063-0063	Motherboard resources
0065-0065	Motherboard resources
0067-0067	Motherboard resources
0070-0070	Motherboard resources
0080-0080	Motherboard resources
0092-0092	Motherboard resources
00B2-00B3	Motherboard resources
0680-069F	Motherboard resources
164E-164F	Motherboard resources
0062-0062	Microsoft ACPI-Compliant Embedded Controller
0066-0066	Microsoft ACPI-Compliant Embedded Controller
0020-0021	Programmable interrupt controller
0024-0025	Programmable interrupt controller
0028-0029	Programmable interrupt controller
002C-002D	Programmable interrupt controller
0030-0031	Programmable interrupt controller
0034-0035	Programmable interrupt controller
0038-0039	Programmable interrupt controller
003C-003D	Programmable interrupt controller
00A0-00A1	Programmable interrupt controller
00A4-00A5	Programmable interrupt controller
00A8-00A9	Programmable interrupt controller
00AC-00AD	Programmable interrupt controller
00B0-00B1	Programmable interrupt controller
00B4-00B5	Programmable interrupt controller
00B8-00B9	Programmable interrupt controller
00BC-00BD	Programmable interrupt controller
04D0-04D1	Programmable interrupt controller
1854-1857	Motherboard resources
3090-3097	Standard SATA AHCI Controller
3080-3083	Standard SATA AHCI Controller

Table D.1: System I/O ports	
3060-307F	Standard SATA AHCI Controller
03F8-03FF	Communications Port (COM1)
02F8-02FF	Communications Port (COM2)
1800-18FE	Motherboard resources
0000-0CF7	PCI Express Root Complex
0D00-FFFF	PCI Express Root Complex
FFF8-FFFF	Intel® Active Management Technology - SOL (COM3)
0040-0043	System timer
0050-0053	System timer
2000-20FE	Motherboard resources
3000-303F	Intel® Iris(R) Xe Graphics
EFA0-EFBF	Intel® SMBus - A0A3

D.2 Interrupt Assignments

Table D.2: Interrupt Assignments	
Interrupt#	**Interrupt Source**
IRQ 0	System Timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 6	Motherboard resources
IRQ 14	Intel® GPIO Controller - 34C5
IRQ 16	High Definition Audio Controller
IRQ 19	Intel® Active Management Technology - SOL (COM3)
IRQ 28	Trusted Platform Module 2.0
IRQ54-511	Microsoft ACPI-Compliant System
IRQ 4294967292	Standard SATA AHCI Controller
IRQ 4294967275(-9)	Intel® Ethernet Controller (3) I225-LM
IRQ 4294967293	Intel® PCI Express Root Port #9 - A0B0
IRQ 4294967283(-91)	Standard NVM Express Controller
IRQ 4294967273	Intel® Management Engine Interface
IRQ 4294967280	Intel® Iris(R) Xe Graphics
IRQ 4294967294	PCI Express Root Port
IRQ 4294967274	Intel® GNA Scoring Accelerator module

D.3 1st MB Memory Map

Table D.3: 1st MB Memory Map	
Addr. Range (Hex)	**Device**
0xFEDC0000-0xFEDC7FFF	Motherboard resources
0xFEDA0000-0xFEDA0FFF	Motherboard resources
0xFEDA1000-0xFEDA1FFF	Motherboard resources
0xC0000000-0xCFFFFFFF	Motherboard resources
0xFED20000-0xFED7FFFF	Motherboard resources

Table D.3: 1st MB Memory Map	
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0x50700000-0x50701FFF	Standard SATA AHCI Controller
0x50703000-0x507030FF	Standard SATA AHCI Controller
0x50702000-0x507027FF	Standard SATA AHCI Controller
0xFED00000-0xFED003FF	High precision event timer
0x50500000-0x505FFFFF	Intel® Ethernet Controller (3) I225-LM
0x504FC000-0x504FFFFF	Intel® Ethernet Controller (3) I225-LM
0xFE000000-0xFE01FFFF	Motherboard resources
0xFE04C000-0xFE04FFFF	Motherboard resources
0xFE050000-0xFE0AFFFF	Motherboard resources
0xFE0D0000-0xFE0FFFFF	Motherboard resources
0xFE200000-0xFE7FFFFF	Motherboard resources
0xFF000000-0xFFFFFFFF	Motherboard resources
0xFD000000-0xFD68FFFF	Motherboard resources
0xFD6B0000-0xFD6CFFFF	Motherboard resources
0xFD6F0000-0xFDFFFFFF	Motherboard resources
0x50400000-0x505FFFFF	Intel® PCI Express Root Port #9 - A0B0
0x50600000-0x50603FFF	Standard NVM Express Controller
0xA0000-0xBFFFF	PCI Express Root Complex
0xE0000-0xE3FFF	PCI Express Root Complex
0xE4000-0xE7FFF	PCI Express Root Complex
0xE8000-0xEBFFF	PCI Express Root Complex
0xEC000-0xEFFFF	PCI Express Root Complex
0xF0000-0xFFFFF	PCI Express Root Complex
0xFE010000-0xFE010FFF	Intel® SPI (flash) Controller - A0A4
0xBFFFF000-0xBFFFFFFF	Intel® Active Management Technology - SOL (COM3)
0xFD6E0000-0xFD6EFFFF	Intel® GPIO Controller - 34C5
0xFD6D0000-0xFD6DFFFF	Intel® GPIO Controller - 34C5
0xFD6A0000-0xFD6AFFFF	Intel® GPIO Controller - 34C5
0xFD690000-0xFD69FFFF	Intel® GPIO Controller - 34C5
0xFED40000-0xFED44FFF	Trusted Platform Module 2.0
0xFFEFA000-0xFFEFAFFF	Intel® Management Engine Interface
0x0000-0xFFFFFF	Intel® Iris(R) Xe Graphics
0x0000-0xFFFFFFF	Intel® Iris(R) Xe Graphics
0xFFEFB000-0xFFEFBFFF	Intel® GNA Scoring Accelerator module
0xFFEFC000-0xFFEFFFFF	High Definition Audio Controller
0xFFF00000-0xFFFFFFFF	High Definition Audio Controller
0x1128000-0x11280FF	Intel® SMBus - A0A3

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Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.