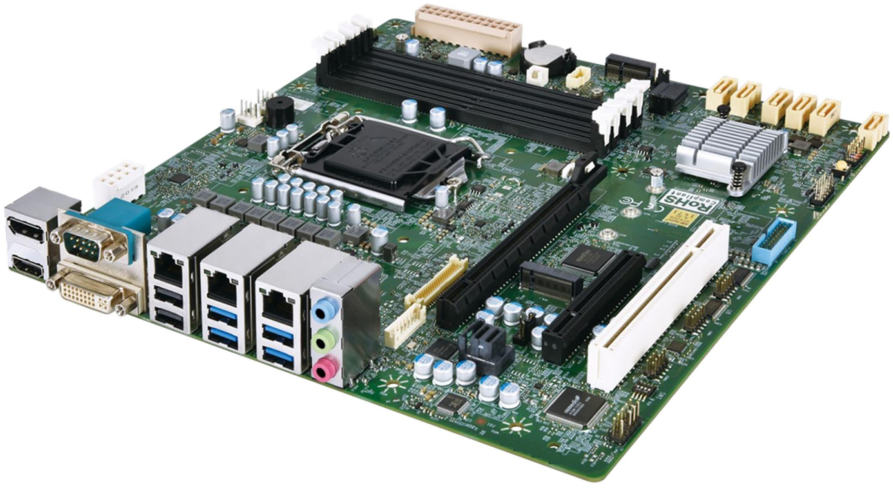
INS8266A

Intel® Comet Lake-S 10th Processor with H420E/Q470E/W480E Chipset Micro-ATX



Safety Information

Electrical safety

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

Operation safety

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

Statement

RoHS Compliance

Perfectron RoHS Environmental Policy and Status Update

Perfectron is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with

European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

In order to meet the RoHS compliant directives, Perfectron has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard Perfectron development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which Perfectron are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant

Revision History

Revision	Date (dd.mm.yyyy)	Changes
Version 1.0	10.06.2022	Initial Release

Packing list

Item	Description	Q'ty
1	INS8266A	1
2	CD(Drivier + User's manual)	1
3	SATA Cable	1

If any of the above items is damaged or missing, please contact your local distributor.

Table of Contents

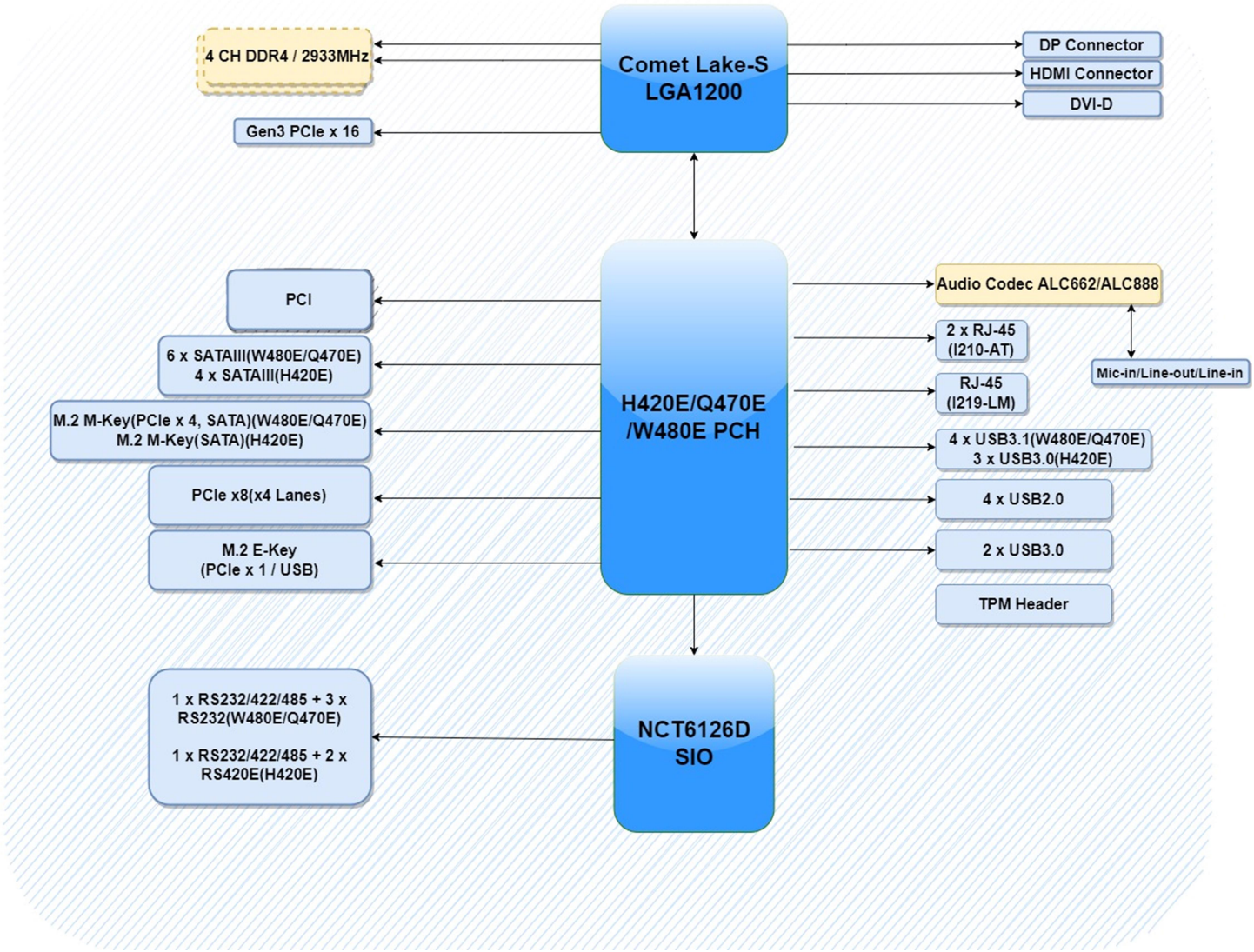
Chapter 1: Product Information

1.1 Specification

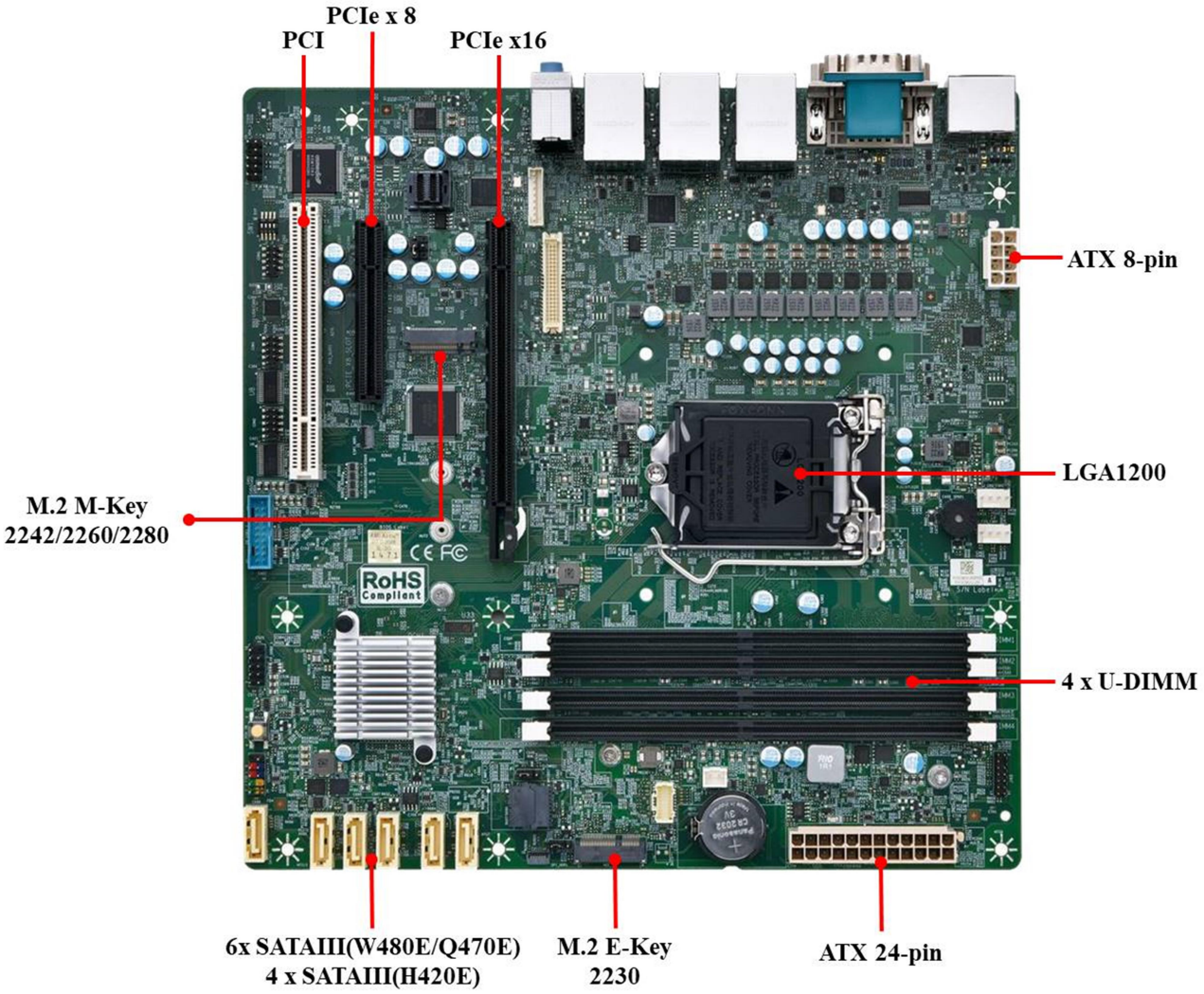
Processor & System	
CPU	10th Gen Intel® Comet Lake LGA1200 Socket Processor, Core i9/i7/i5/i3 up to 10-core TDP Max. 125W
Memory type	DDR4 U-DIMM 2933MHz / Max. 64 GB / 4 x 288-pin
Chipset	Intel® H420E / Q470E / W480E(Support RAID 0 / 1 / 5 / 10)
I/O Chipset	Nuvoton NCT6126D
TPM	TPM Header
H/W Monitor	Temperature Monitor / Voltage Monitor / Fan Monitor
Watchdog	1-255 sec. or 1-255 min. software programmable and can be generate system reset
Smart Fan Control	CPU Fan / System Fan
Expansion	
M.2	1 x M.2 2242 / 2260 / 2280 M key (PCIe x4 ,SATA)(H420E Only support SATA) 1 x M.2 2230 E key (PCIe x1, USB2.0, CNVi)
PCI Slot	1 x PCI
PCIe Slot	1 x PCIe 3.0x16 slot / PCIex16 support 3 options of PCIe switch: #1: 1 x PCIe x16, #2: 2 x PCIe x8, #3: 1 x PCIe X8 + 2 x PCIe x4 1 x PCIe 2.0 x8 slot (x4 Lanes) /PCIe x4 lanes is switched with M.2 M-Key Slot
Display	
Chipset	Intel® HD Graphics
DVI	Up to 1920 x 1200 @60 Hz
HDMI	Up to 4K (4096 x 2160) @30 Hz
Display Port	Up to 4K (4096 x 2304) @60 Hz
eDP (Option)	Up to 4K (4096 x 2304) @60 Hz
Ethernet	
Chipset	Intel® I219-LM Giga LAN + 2 x Intel® I210-AT Giga LAN
Audio	
Codec	Realtek® ALC662/ALC888
Rear I/O	
USB3.1	4(Q470E/W480E)
USB3.0	4(H420E)
Display port	1 x HDMI 1.4 ; 1 x DisplayPort 1.2 ; 1 x DVI-I(DVI-D Optional)
Lan	3(1 x Optional)
Audio	Mic-in, Line-in, and Line-out
Internal I/O	
SATAIII	6(Q470E/W480E) / 4(H420E)
USB2.0	2
USB3.0	2
Display I/O	1 x eDP 1 x Backlight connector
GPIO	1 x MiAPI Header

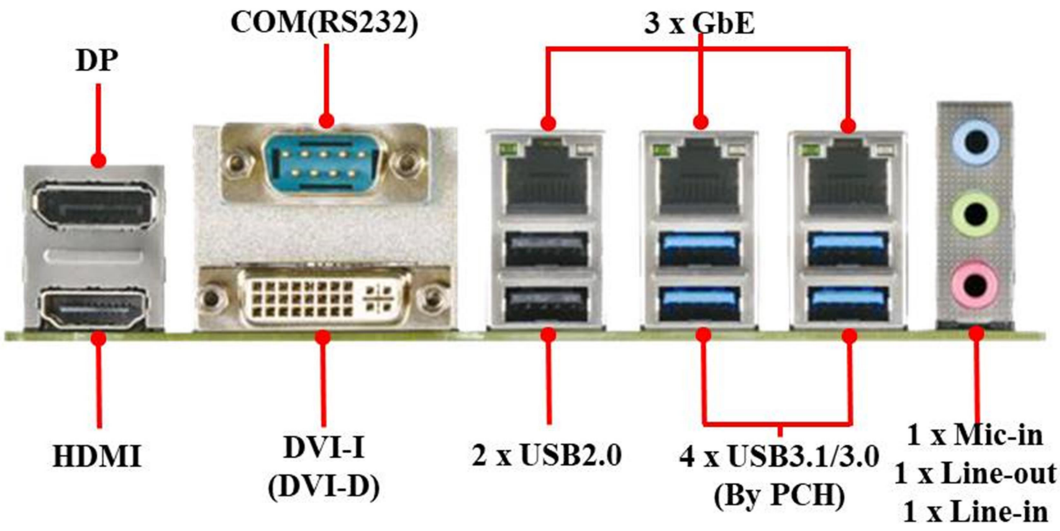
Serial	3 (1 x Support RS-232/422/485)
Fan	1 x 4-pin CPU Fan Connector / 1 x 4-pin System Fan Header
Power	1 x ATX 8pin / 1 x ATX 24pin (AT/ATX mode by jumper setting)
Mechanical and Environment	
Form Factor	Micro ATX
Power Type	ATX 8-pin + ATX 24-pin
Dimension	244mm x 244mm(9.6" x 9.6")
Operating Temperature	ET : -20°C ~ 70°C UT : -40°C ~ 85°C
Storage Temperature	-40°C ~ 85°C
Relative humidity	10% to 95%, non-condensing
Standard Compliance	
Standard Compliance	CE/FCC
OS	
OS Support	Windows® 10 64-bit Linux(Support by request)

1.2 Block Diagram



1.3 Board Placement

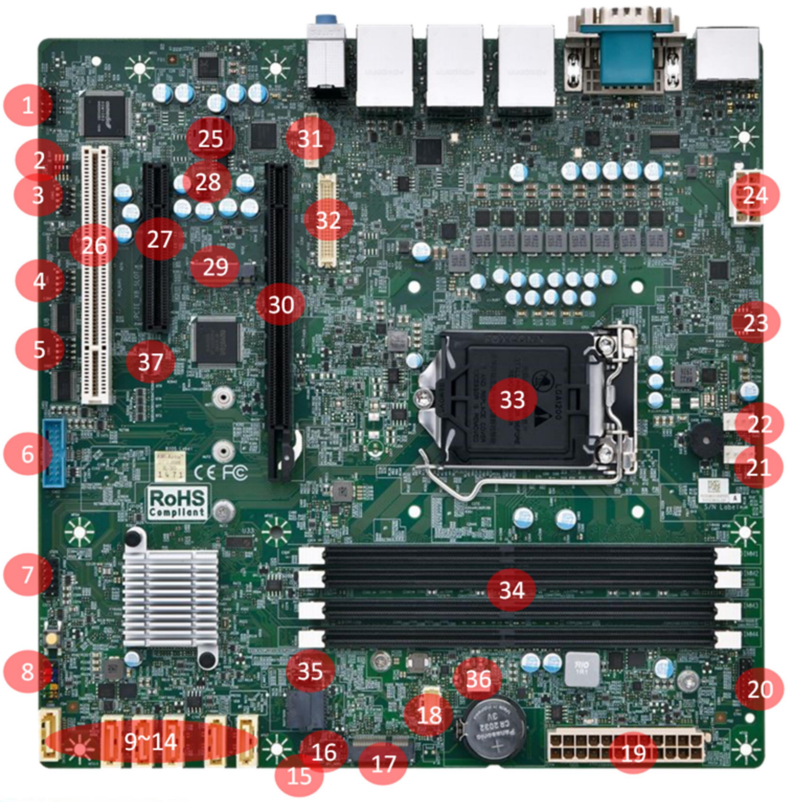




Chapter 2: Jumpers and Connectors

2.1 Jumpers And Connectors List

Label	Function
1	Front Audio Header
2	COM3 Termination Resistor Switch
3	RS232/422/485 Header
4	RS232
5	RS232
6	Dual USB3.0 Header
7	Dual USB2.0 Header
8	Front I/O Header
9	SATA Port
10	SATA Port
11	SATA Port
12	SATA Port
13	SATA Port
14	SATA Port(Optional with M.2 SATA
15	SPI Programing Header(Debug)
16	AT/ATX Mode Selection Jumper
17	M.2 2230 E-Key
18	MiAPI Header
19	ATX 24Pin
20	TPM Header
21	System Fan Header
22	CPU Fan Header
23	PCIe Bifurcation Switch
24	ATX 8Pin
25	NPIO Header(PCIex4)
26	PCI Slot
27	PCIe x8 Slot(PCIe x 4 Signal)
28	Panel Power Option

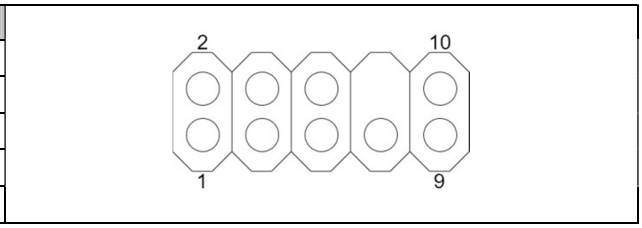


29	M.2 2242/2280 M-Key
30	PCIe x16 Slot
31	LVDS Backlight Header
32	LVDS/eDP Connecotr
33	CPU Socket
34	4 x DDR4 U-DIMM
35	CMOS Reset Header
36	Intrusion Header
37	Debug Header

2.2 Jumper Settings And Connector Pin Define

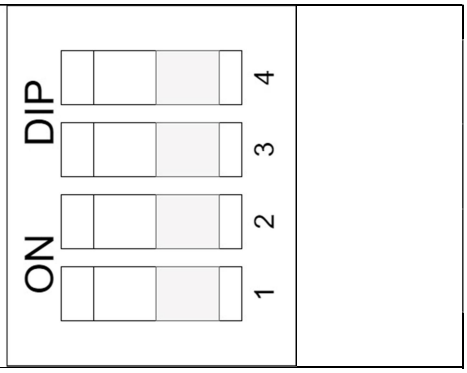
Front Audio Header

PIN	DEFINITION	PIN	DEFINITION
1	MIC	2	AUD_GND
3	MIC_BIAS	4	Presence
5	FP_OUT_R	6	AUD_GND
7	FIO_SENSE	8	Key
9	FP_OUT_L	10	AUD_GND



COM3 Termination Resistor Switch

PIN	Net Name
1	NRX3
2	NDCD3
3	NTX3
4	NDTR3

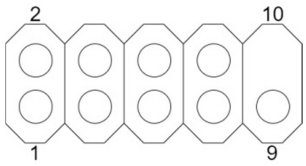


ON : Pull High, OFF : NC

Termination Mode,
1.RS422 Pull H/L in RX/DCD
2.RS485 Pull H/L in RX/DCD and TX/DTR

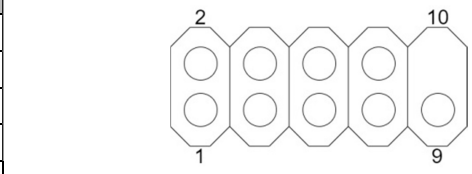
RS232/RS422/RS485 Header

PIN	DEFINITION	PIN	DEFINITION
1	DCD	2	RXD#
3	TXD#	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	Key(no pin)



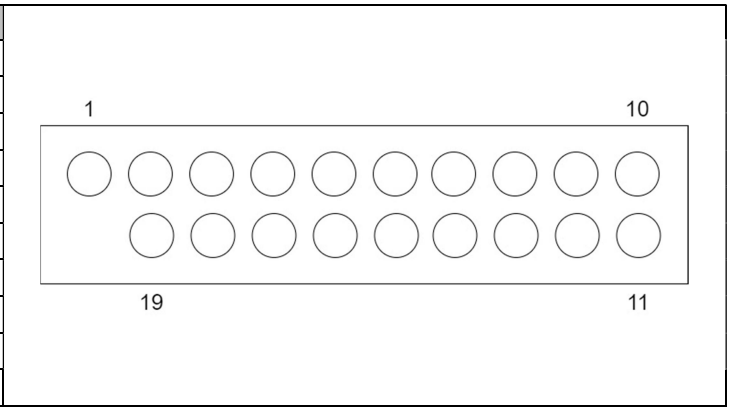
RS232 Header

PIN	DEFINITION	PIN	DEFINITION
1	DCD	2	RXD#
3	TXD#	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	Key(no pin)



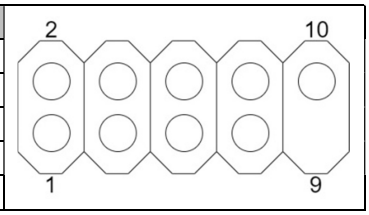
Dual USB3.0 Header

PIN	DEFINITION	PIN	DEFINITION
1	+5V DC		Key(no pin)
2	2.0 Data (negative)	19	+5V DC
3	2.0 Data (positive)	18	2.0 Data (negative)
4	GND	17	2.0 Data (positive)
5	3.0 Data (negative)	16	GND
6	3.0 Data (positive)	15	3.0 Data (negative)
7	GND	14	3.0 Data (positive)
8	3.0 Data (negative)	13	GND
9	3.0 Data (positive)	12	3.0 Data (negative)
10	No Connect	11	3.0 Data (positive)



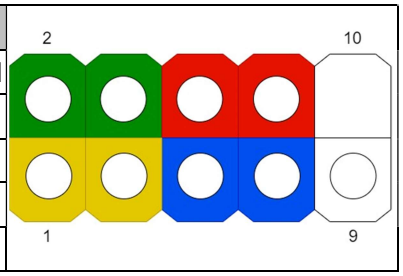
USB2.0 Header

PIN	DEFINITION	PIN	DEFINITION
1	5V_USB	2	5V_USB
3	Data (negative)	4	Data (negative)
5	Data (positive)	6	Data (positive)
7	GND	8	GND
9	Key (no pin)	10	No Connect



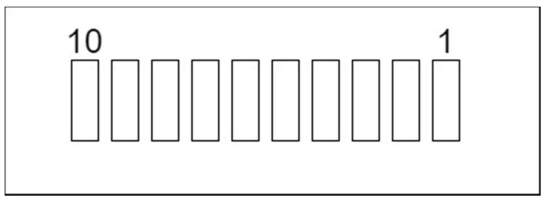
Front I/O Header

PIN	DEFINITION	PIN	DEFINITION
1	HDD_POWER_LED	2	POWER_LED_MAIN
3	HDD_LED#	4	POWER_LED_ALT
5	GND	6	POWER_SWITCH#
7	RESET_SWITCH#	8	GND
9	+5V_DC	10	KEY (no pin)

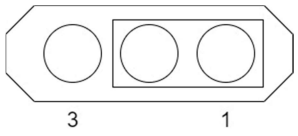
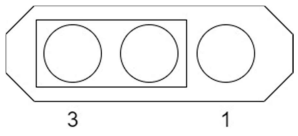


SPI Programing Header

PIN	DEFINITION
1	GND
2	P_Flash(3.3V)
3	NC
4	ROMWREN0_N
5	SPI_MOSI_FLASH
6	SPI_MISO_FLASH
7	SPI_CLK_FLSH
8	SPI_CS0_N_FLASH
9	NC
10	NC

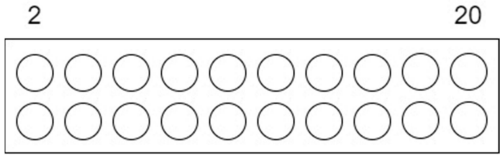


AT/ATX Mode Selection Header

PIN	DEFINITION	
1-2	AT Mode	
2-3	ATX Mode(Default)	

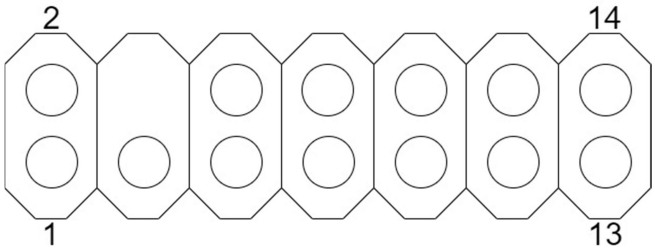
MiAPI Header

PIN	DEFINITION	PIN	DEFINITION
1	MAPI_GPIO1	2	VCC
3	MAPI_GPIO2	4	MAPI_GPIO6
5	MAPI_GPIO3	6	MAPI_GPIO7
7	MAPI_GPIO4	8	MAPI_GPIO8
9	MAPI_GPIO5	10	MAPI_GPIO9
11	WD_Time	12	MAPI_GPIO10
13	Power Button	14	SMBUS_DATA
15	UART_TX	16	SMBUS_CLK
17	UART_RX	18	5VSB
19	GND	20	N/A



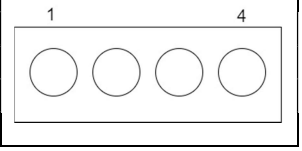
TPM Header

PIN	DEFINITION	PIN	DEFINITION
1	VCC3_TPM	2	TPM_CS2
3	TPM_MISO	4	Key(no pin)
5	TPM_MOSI	6	PLTRST_N
7	PRIQ_N	8	GND
9	NC	10	SPI_CLK
11	NC	12	TPM_DET
13	NC	14	VSB_3V3



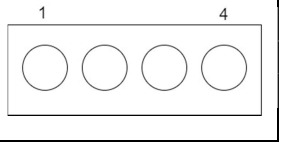
System FAN Header

PIN	DEFINITION
1	GND
2	+12V
3	System_FAN_TACH
4	System _FAN_CTRL



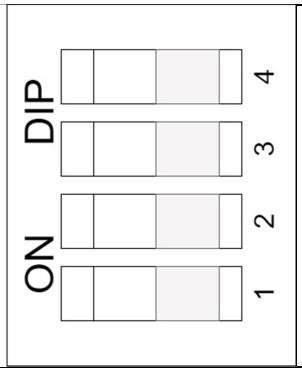
CPU FAN Header

PIN	DEFINITION
1	GND
2	+12V
3	CPU_FAN_TACH
4	CPU_FAN_CTRL



PCIe Bifurcation Switch

PIN	Net Name
1	CFG5
2	CFG6
3	NC
4	NC



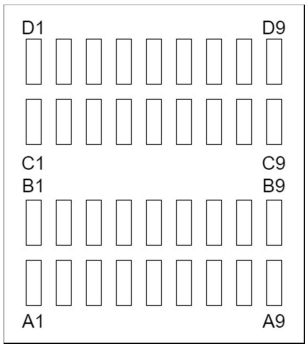
ON : Pull Low, OFF : NC

CFG[6 : 5] : PCIe Bifurcation

- 00 = 1 x 8 , 2 x 4 PCIe
- 01 = reserved
- 10 = 2 x 8 PCIe
- 11 = 1 x 16 PCIe(Default)

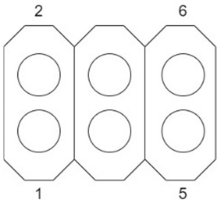
NPIO Header

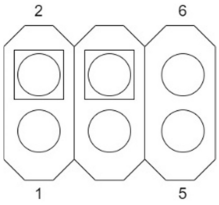
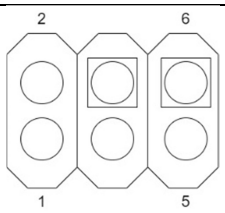
PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION
A1	REFCLK+	B1	PERST#	C1	VCC 3.3V	D1	SMDAT
A2	REFCLK+	B2	CLKREQ#	C2	N.C	D2	SMCLK
A3	GND	B3	GND	C3	GND	D3	GND
A4	PERp1	B4	PERp0	C4	PETp1	D4	PETp0
A5	PERn1	B5	PERn0	C5	PETn1	D5	PETn0
A6	GND	B6	GND	C6	GND	D6	GND
A7	PERp3	B7	PERp2	C7	PETp3	D7	PETp2
A8	PERn3	B8	PERn2	C8	PETn3	D8	PETn2
A9	GND	B9	GND	C9	GND	D9	GND

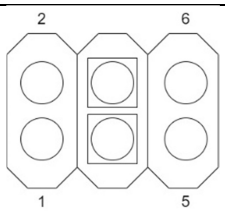


Panel Power Option

PIN	DEFINITION	PIN	DEFINITION
1	Key(no pin)	2	VCC3
3	+12V	4	LCD_VCC_SEL
5	Key(no pin)	6	VCC



3.3V	
5V(Default)	

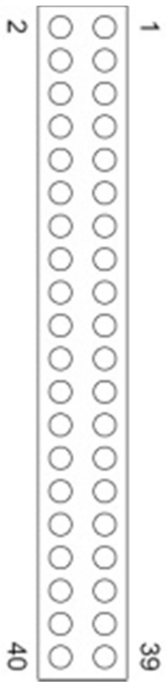
12V	

LVDS Backlight Header

PIN	DEFINITION
1	BKLT_EN
2	BKLT_CTRL
3	BKLT_PWR
4	BKLT_PWR
5	GND
6	GND
7	BRIGHT_UP-
8	BRIGHT_DOWN-

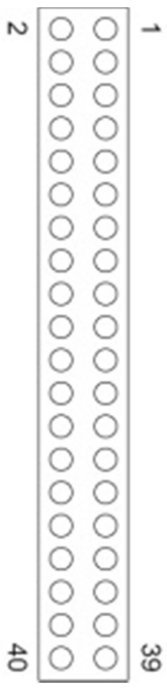
LVDS Connector

PIN	DEFINITION	PIN	DEFINITION
1	VCC3	2	Panel Power
3	VCC3	4	Panel Power
5	LVDS_DDC_SCL	6	LVDS_DDC_SDA
7	GND (CABLE_ID1)	8	GND
9	TB0P (LVDS ChA diff data output – positive)	10	TA0P (LVDS ChA diff data output – positive)
11	TB0N (LVDS ChA diff data output – negative)	12	TA0N (LVDS ChA diff data output –negative)
13	GND	14	GND
15	TD0P (LVDS ChA diff data output – positive)	16	TD0P (LVDS ChA diff data output – positive)
17	TD0N (LVDS ChA diff data output – negative)	18	TC0N (LVDS ChA diff data output –negative)
19	GND	20	GND
21	TB1P (LVDS ChB diff data output – positive)	22	TA1P (LVDS ChB diff data output – positive)
23	TB1N (LVDS ChB diff data output – negative)	24	TA1N (LVDS ChB diff data output –negative)
25	GND	26	GND
27	TD1P (LVDS ChB diff data output – positive)	28	TC1P (LVDS ChB diff data output – positive)
29	TD1N (LVDS ChB diff data output – negative)	30	TC1N (LVDS ChB diff data output –negative)
31	GND	32	GND
33	TCK1P (LVDS ChB diff data output – positive)	34	TCK0P (LVDS ChA diff data output – positive)
35	TCK1N (LVDS ChB diff data output – negative)	36	TCK0N (LVDS ChA diff data output –negative)
37	GND	38	GND
39	NC	40	NC

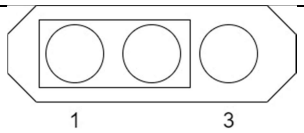
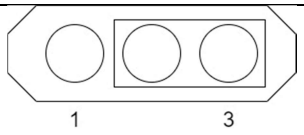


eDP Connector(Optional)

PIN	DEFINITION	PIN	DEFINITION
1	VCC3	2	Panel Power
3	VCC3	4	Panel Power
5	EDP_CPU_AUXN	6	EDP_CPU_AUXP
7	GND (CABLE_ID1)	8	HPD
9	EDP_CPU_1+	10	EDP_CPU_0+
11	EDP_CPU_1-	12	EDP_CPU_0-
13	GND	14	GND
15	NC	16	NC
17	NC	18	NC
19	GND	20	GND
21	BKLT_EN	22	PCH_BACKLIGHT_PWM
23	NC	24	NC
25	GND	26	GND
27	NC	28	NC
29	NC	30	NC
31	GND	32	GND
33	NC	34	NC
35	NC	36	NC
37	GND	38	GND
39	BKLT_PWR	40	BKLT_PWR

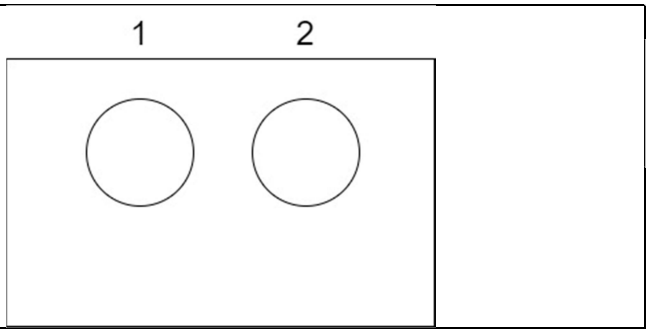


CMOS Reset Header

PIN	DEFINITION	
1-2	Clear CMOS	
2-3	Normal(Default)	

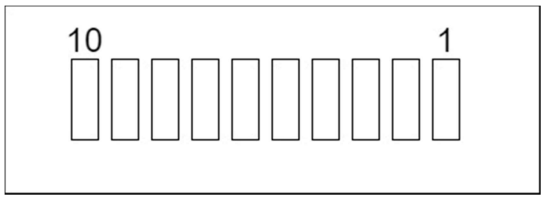
Intrusion Switch Header

PIN	DEFINITION
1	INTRUDER_N
2	GND



SPI Programing Header

PIN	DEFINITION
1	GND
2	ESPI_RST_N
3	ESPI_CLK
4	ESPI_CS0_N
5	LAD_ESPI_IO_3
6	LAD_ESPI_IO_2
7	LAD_ESPI_IO_1
8	LAD_ESPI_IO_0
9	VCC3
10	3VSB



Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

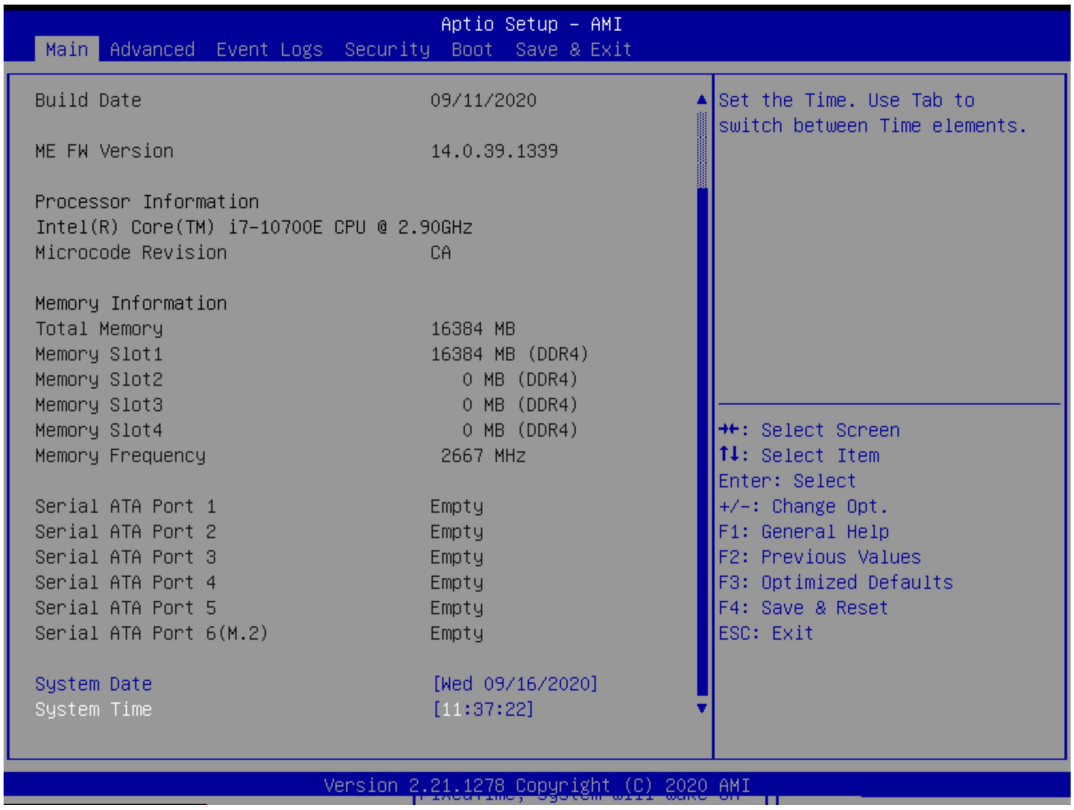
3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
F1	The <F1> key offer general help.
F2	The <F3> key load previous values.
F3	The <F3> key load optimized defaults.
F4	The <F4> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

3.3 Main Menu



Field Name	BIOS Vendr
Default Value	American Megatrends
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Core Version
Default Value	5.17
Comment	This field is not selectable. There is no help text associated with it

Field Name	Compliancy
Default Value	UEFI 2.7 ; PI 1.6
Comment	This field is not selectable. There is no help text associated with it

Field Name	BIOS Version
Default Value	Display the version of the BIOS
Comment	This field is not selectable. There is no help text associated with it

Field Name	Build Date and Time
Default Value	Display build date of the BIOS
Comment	This field is not selectable. There is no help text associated with it.

Field Name	ME FW Version
Default Value	ME Firmware Version.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Processor Information
Default Value	Display the installed CPU brand.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Microcode Version
Default Value	Display the CPU microcode revision.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Total Memory
Default Value	Display the installed memory size.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Memory Slot1
Default Value	Display the installed memory size of slot1.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Memory Slot2
Default Value	Display the installed memory size of slot2.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Memory Slot3
Default Value	Display the installed memory size of slot3.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Memory Slot4
Default Value	Display the installed memory size of slot4.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Memory Frequency
Default Value	Display the installed memory Frequency
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Serial ATA Port 1
Default Value	Display the installed SATA device model/size of port 1
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Serial ATA Port 2
Default Value	Display the installed SATA device model/size of port 2
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Serial ATA Port 3
Default Value	Display the installed SATA device model/size of port 3
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Serial ATA Port 4
Default Value	Display the installed SATA device model/size of port 4
Comment	This field is not selectable. There is no help text associated with it.

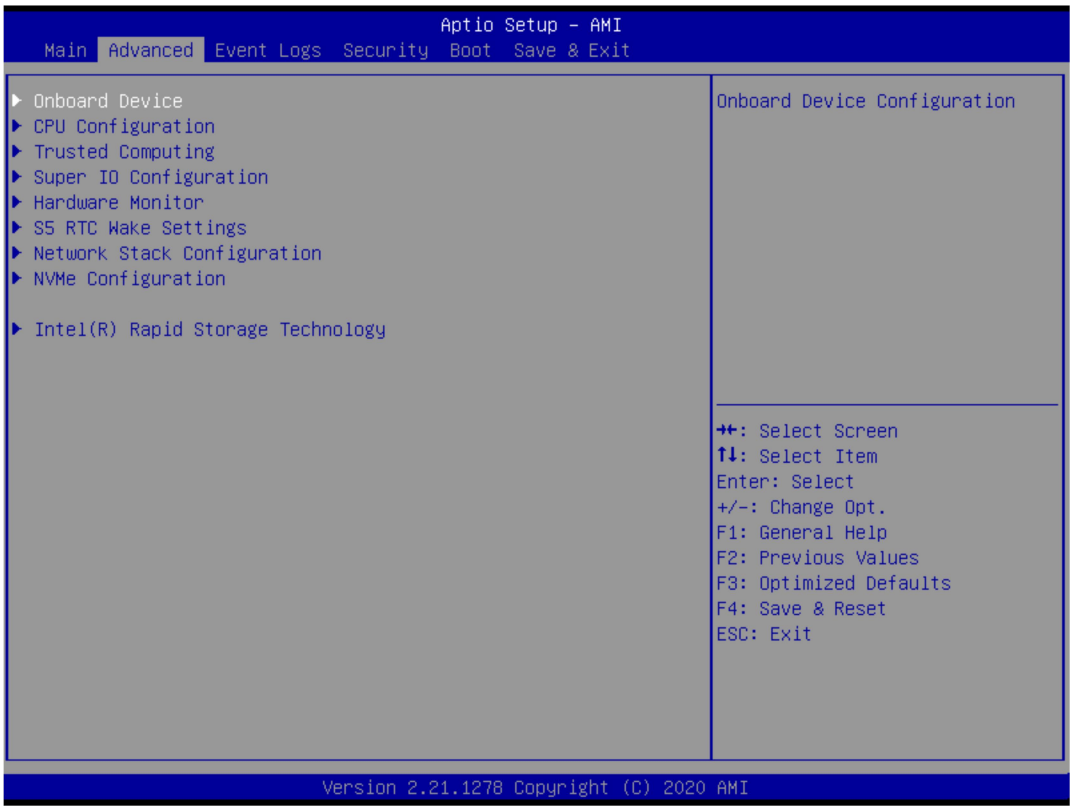
Field Name	Serial ATA Port 5
Default Value	Display the installed SATA device model/size of port 5
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Serial ATA Port 6 (M.2)
Default Value	Display the installed SATA device model/size of port ´
Comment	This field is not selectable. There is no help text associated with it.

Field Name	System Date
Default Value	[Www mm/dd/yyyy]
Possible Value	Www : Mon/Tue/Wed/Thu/Fri/Sat/Sun mm : 1-12 dd : 1-31 yyyy : 1998-2099
Help	Set the Date. Use Tab to switch between Date elements. Default Rangers Year : 1998-2099 Months : 1-12 Days : Dependent on month Range of Years may vary

Field Name	System Time
Default Value	[hh :mm :ss]
Possible Value	hh : 0-23 mm : 0-59 ss : 0-59
Help	Set the Time. Use Tab to switch between Time elements.

3.4 Advance Page



Field Name	Onboard Device
Help	Onboard Device Configuration
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	CPU Configuration
Help	CPU Configuration Parameters
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	Trusted Computing
Help	Trusted Computing Settings
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	Super IO Configuration
Help	System Super IO Chip Parameters.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	HW Monitor
Help	Monitor hardware status
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	S5 RTC Wake Settings
Help	Enable system to wake from S5 using RTC alarm

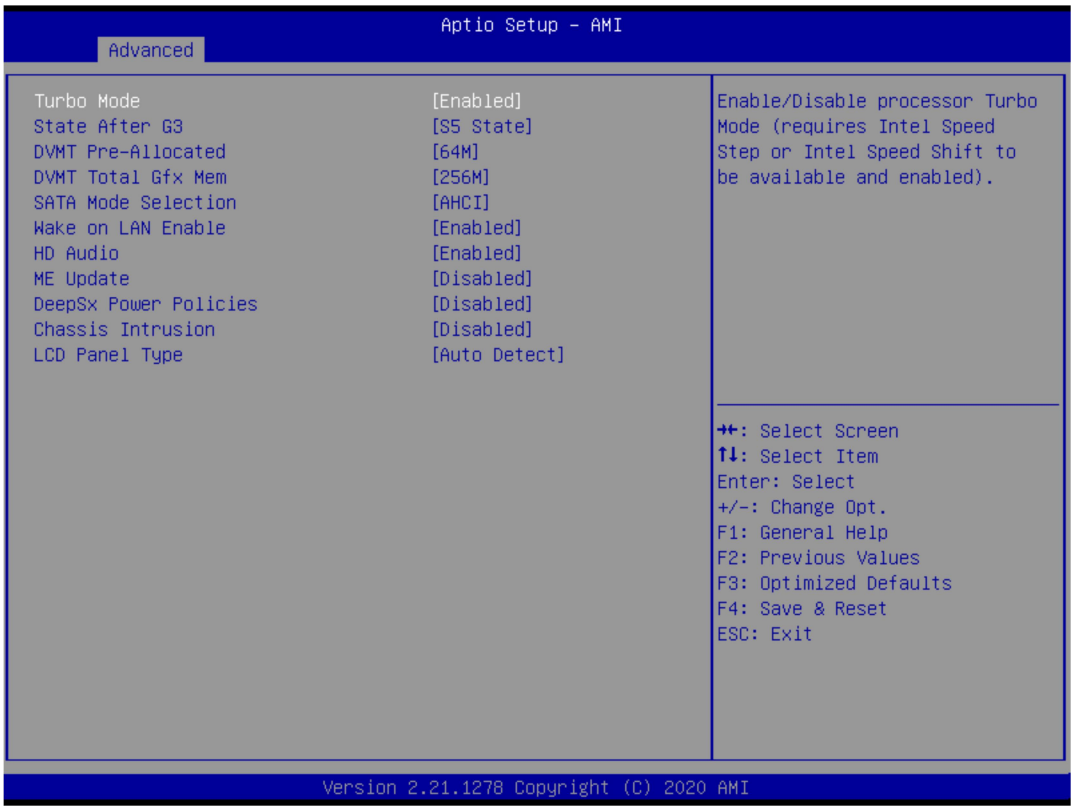
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Network Stack Configuration**
Help	Network Stack Settings.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**NVMe Configuration**
Help	NVMe Device Options Settings
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Intel (R) Rapid Storage Technology (Suppressed if SATA Mode)**
Help	This formset allow the user to manage RAID volumes on the Intel(R) RAID Controller.
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.4.1 Onboard Device



Field Name	**Turbo Mode**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).

Field Name	**State After G3**
Default Value	[S5 State]
Possible Value	S0 State
Help	Specify what state to go to when power is re-applied after a power failure

Field Name	**DVMT Pre-Allocated**
Default Value	[64M]
Possible Value	64M 32M/F7 36M 40M 44M 48M 52M

Help	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

Field Name	**DVMT Total Gfx Mem**
Default Value	[256M]
Possible Value	128M 256M MAX
Help	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Field Name	**SATA Mode Selection**
Default Value	[AHCI]
Possible Value	AHCI / Intel RST With Intel Optane System Acceleration
Help	Determines how SATA controller(s) operate.

Field Name	**PCIe Storage Dev On Port 9 (Available when SATA Mode Selection set to "Intel RST Premium With Intel Optane System Acceleration")**
Default Value	[Not RST Controlled]
Possible Value	Not RST Controlled / RST Controlled
Help	Enable/Disable RST Pcie Storage Remapping.

Field Name	**Wake on LAN Enable**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Enable/Disable integrated LAN to wake the system.

Field Name	**HD Audio**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled.

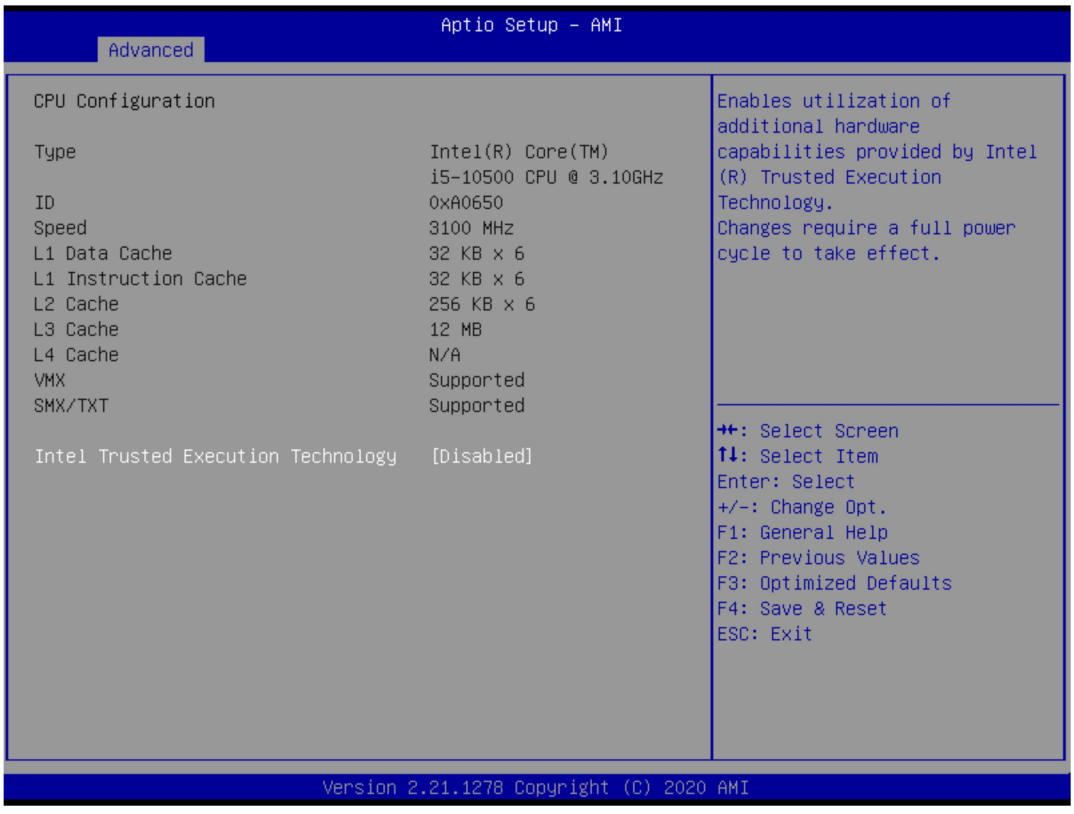
Field Name	**ME Update**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Temporary disable Intel CSME for ME FW Update. Enabled = Intel CSME disabled after first time reboot only

Field Name	**DeepSx Power Policies**
Default Value	[Disabled]
Possible Value	Enabled in S4-S5 Disabled
Help	Configure the DeepSx Mode configuration.

Field Name	Chassis Intrusion
Default Value	[Disabled]
Possible Value	Disabled Enabled Reset
Help	Configure Chassis Intrusion.

Field Name	LCD Panel Type
Default Value	[Auto Detect]
Possible Value	Auto Detect 800x480 eDP
Help	Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

3.4.2 CPU Configuration



Field Name	Type
Default Value	[Intel CPU Brand String]
Comment	This field is not selectable. There is no help text associated with it.

Field Name	ID
Default Value	Displays CPU Signature
Comment	This field is not selectable. There is no help text associated with it.

Field Name	Speed
Default Value	Displays the CPU Speed

Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L1 Data Cache**
Default Value	L1 Data Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L1 Instruction Cache**
Default Value	L1 Instruction Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L2 Cache**
Default Value	L2 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L3 Cache**
Default Value	L3 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

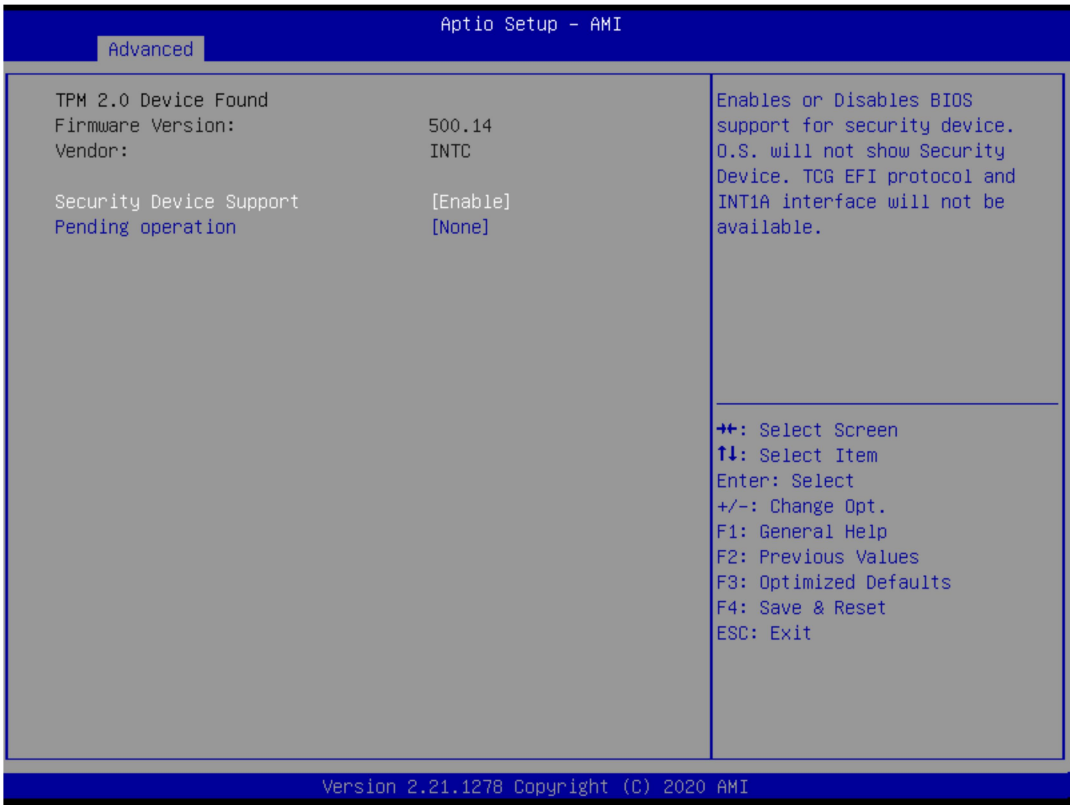
Field Name	**L4 Cache**
Default Value	L4 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**VXM**
Default Value	L3 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**SMX/TXT**
Default Value	SMX/TXT Supported or Not
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Intel Trusted Execution Technology**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology. Changes require a full power cycle to take effect.

3.4.3 Trusted Computing



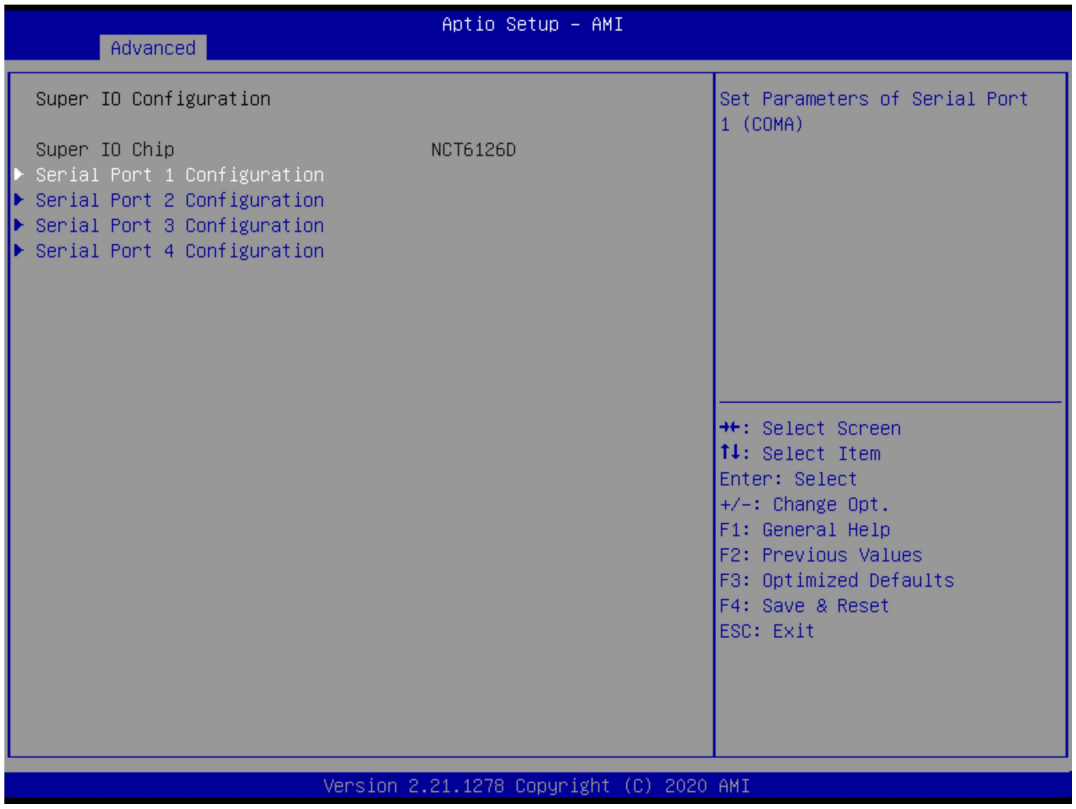
Field Name	**Firmware Version**
Default Value	TPM module version.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Vendor**
Default Value	TPM module vendor name.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Security Device Support**
Default Value	[Enable]
Possible Value	Enable Disable
Help	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Field Name	**Pending operation**
Default Value	[None]
Possible Value	None TPM Clear
Help	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

3.4.4 Super IO Configuration



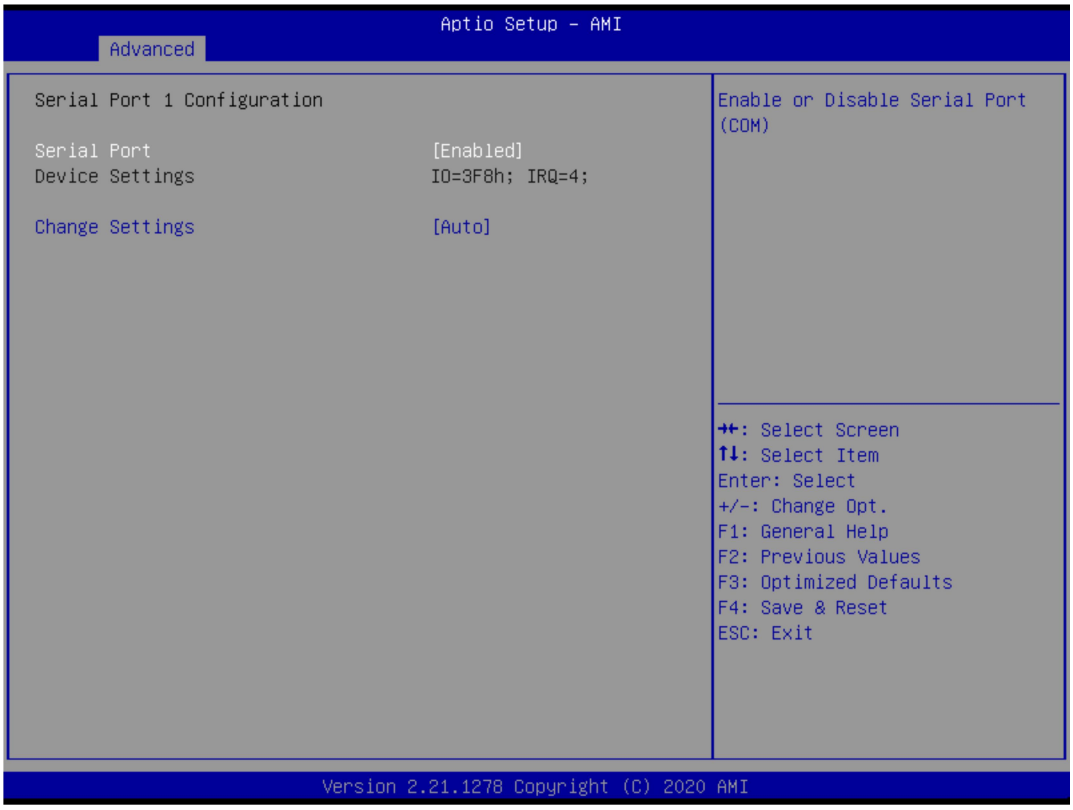
Field Name	**Serial Port 1 Configuration**
Help	Set Parameters of Serial Port 1 (COMA)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Serial Port 2 Configuration**
Help	Set Parameters of Serial Port 2 (COMB)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Serial Port 3 Configuration(Gray outin Q470-Entry / H420e skus)**
Help	Set Parameters of Serial Port 3 (COMA)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Serial Port 4 Configuration**
Help	Set Parameters of Serial Port 4 (COMB)
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.4.5 Serial Port 1 Configuration

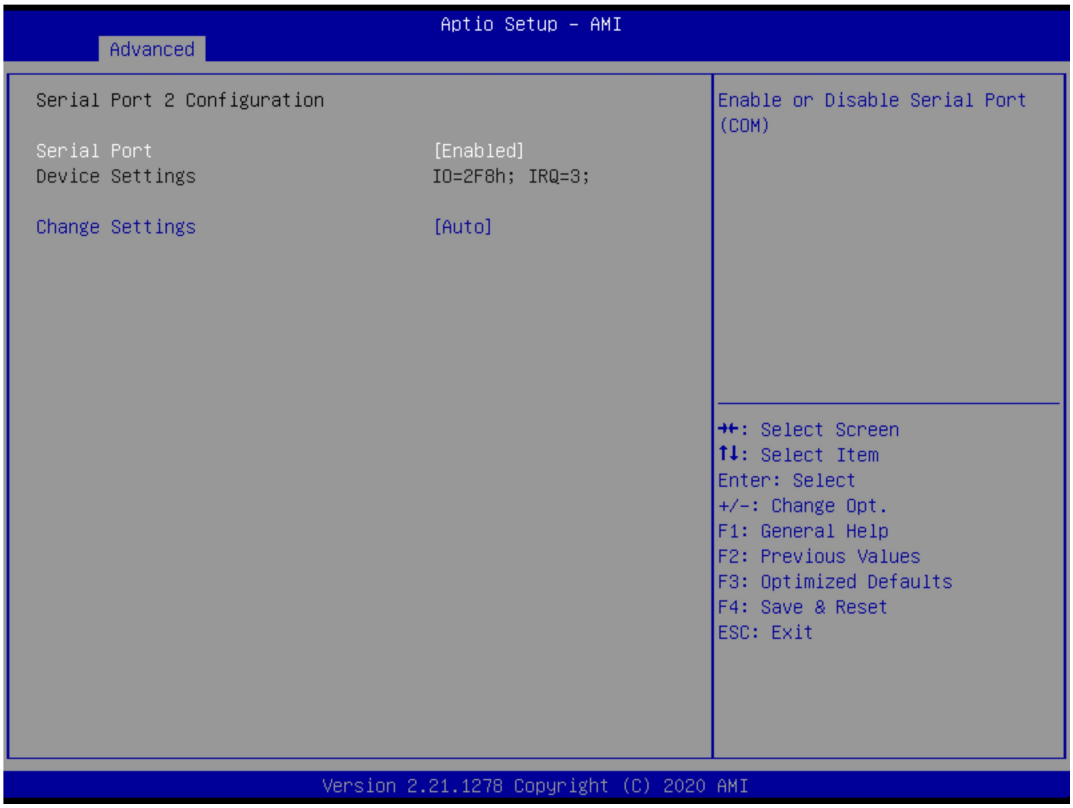


Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM1 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Change Settings**
Default Value	[AUTO]
Possible Value	Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;
Help	Select an optimal settings for Super IO Device

3.4.6 Serial Port 2 Configuration

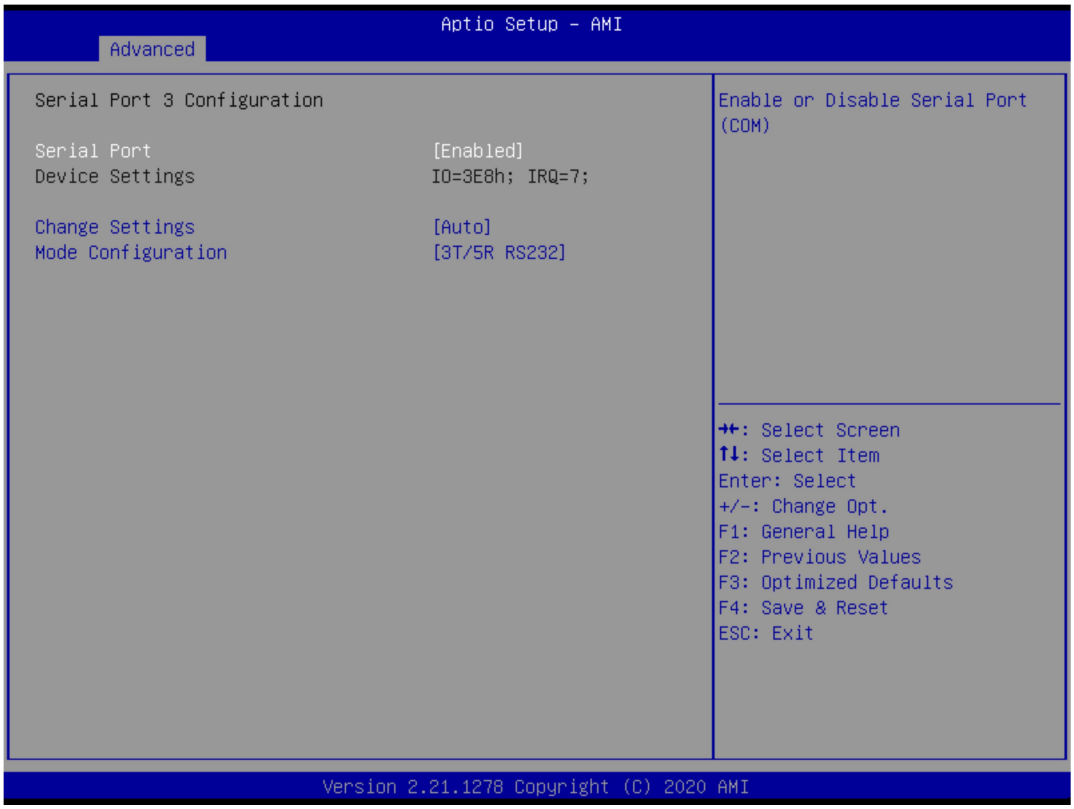


Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM2 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Change Settings**
Default Value	[AUTO]
Possible Value	Auto IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;
Help	Select an optimal settings for Super IO Device

3.4.7 Serial Port 3 Configuration



Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

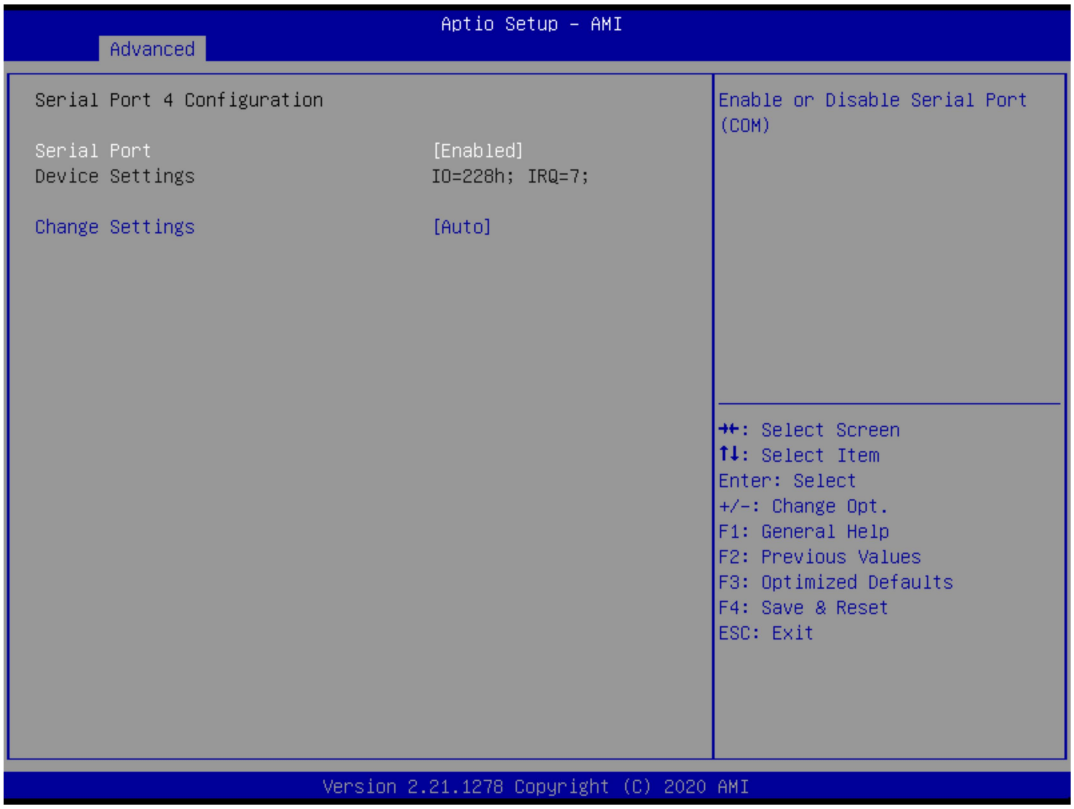
Field Name	**Device Settings**
Default Value	Device Super IO COM3 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Change Settings**
Default Value	[AUTO]
Possible Value	Auto IO=3F8h; IRQ=7; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;
Help	Select an optimal settings for Super IO Device

Field Name	**Mode Configuration**
Default Value	[3T/5R RS232]
Possible Value	1T/1R RS422 3T/5R RS232;

	1T/1R RS485 TX ENABLE Low Active; 1T/1R RS422 with termination resistor; 1T/1R RS485 with termination resistor TX ENABLE Low Active; Disabled
Help	Configure serial port as RS232/RS422/RS485.

3.4.8 Serial Port 4 Configuration

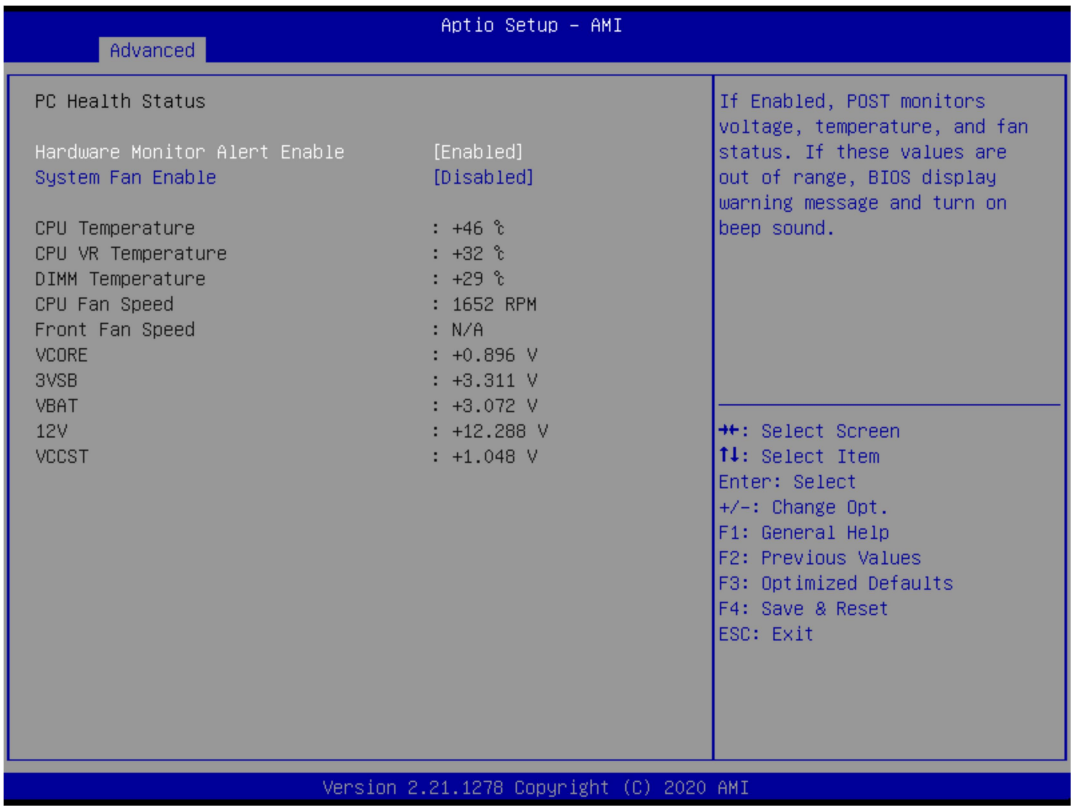


Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM3 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Change Settings**
Default Value	[AUTO]
Possible Value	Auto IO=220h; IRQ=7; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=228h; IRQ=3,4,5,6,7,9,10,11,12;
Help	Select an optimal settings for Super IO Device

3.4.9 Hardware Monitor



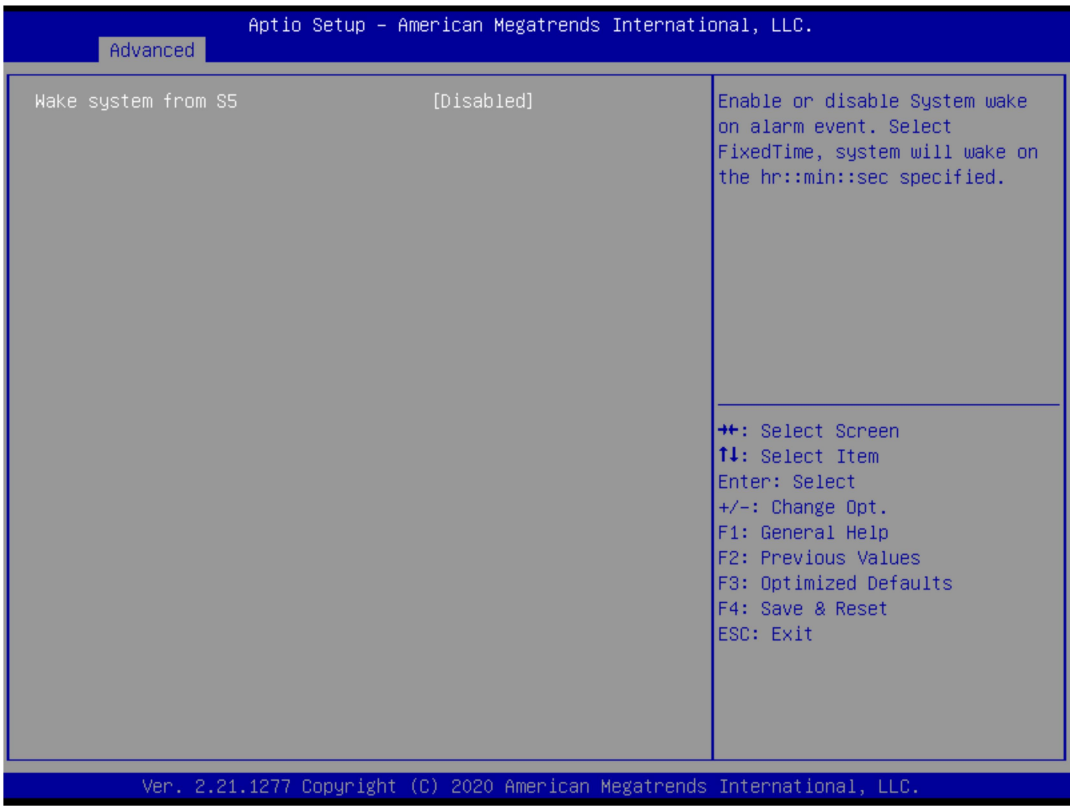
Type	Range
CPU Temperature	-20 ~ (By Processor Tjmax) °C
CPU VR Temperature	-20 ~ 120 °C
DIMM Temperature	-20 ~ 120 °C
CPU Fan Speed Front Fan Speed	There are many kinds of the fan could be installed into the syste so we could only set 0 RPM for the failed fan speed, and there is also no high RPM limitation.
CPU Vcore	0 ~1.52V
3VSB	3.135~3.465V
VBAT	2.6~3.3V
12V	11.4 ~ 12.6V
VCCST	1.029~1.071V

Field Name	Hardware Monitor Alert Enable
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	If Enabled, POST monitors voltage, temperature, and fan status. If these values are out of range, BIOS display warning message and tur on beep sound.

Field Name	System Fan Enable (Suppressed if Hardware Monitor Alert is Disabled)
Default Value	[Disabled]

Possible Value	Enabled Disabled
Help	If Enabled, POST monitors voltage, temperature, and fan status. If these values are out of range, BIOS display warning message and tur on beep sound.

3.4.10 S5 RTC Wake Settings



Field Name	**Wake system from S5**
Default Value	[Disabled]
Possible Value	Disabled Fixed Time
Help	Enable or disable System wake on alarm event, Select FixedTime, system will wake on the hr::min::sec specified.

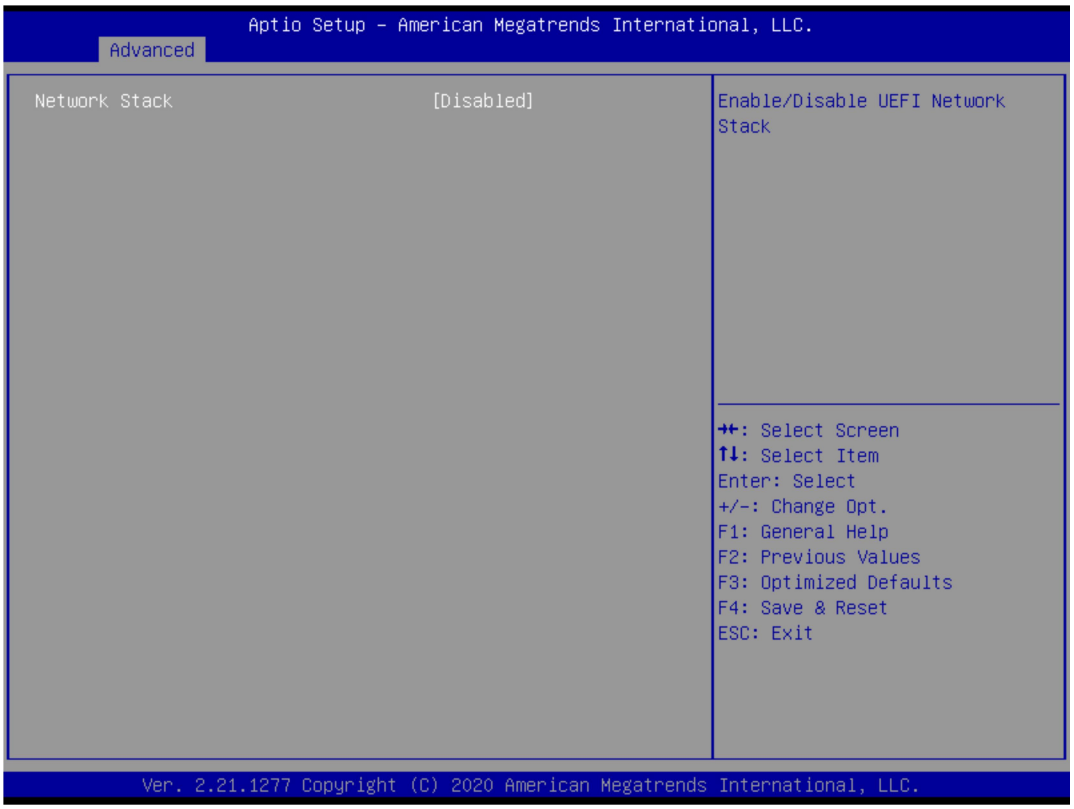
Field Name	**Wake up hour(Show when Wake system from S5 set to Fixed Time)**
Default Value	0
Possible Value	0-23
Help	Select 0-23 For example enter 3 for 3am and 15 for 3pm

Field Name	**Wake up hour(Show when Wake system from S5 set to Fixed Time)**
Default Value	0
Possible Value	0-59
Help	Select 0-59 For Minute

Field Name	**Wake up hour(Show when Wake system from S5 set to Fixed Time)**
Default Value	0

Possible Value	0-59
Help	Select 0-59 For Second

3.4.11 Network Stack Configuration

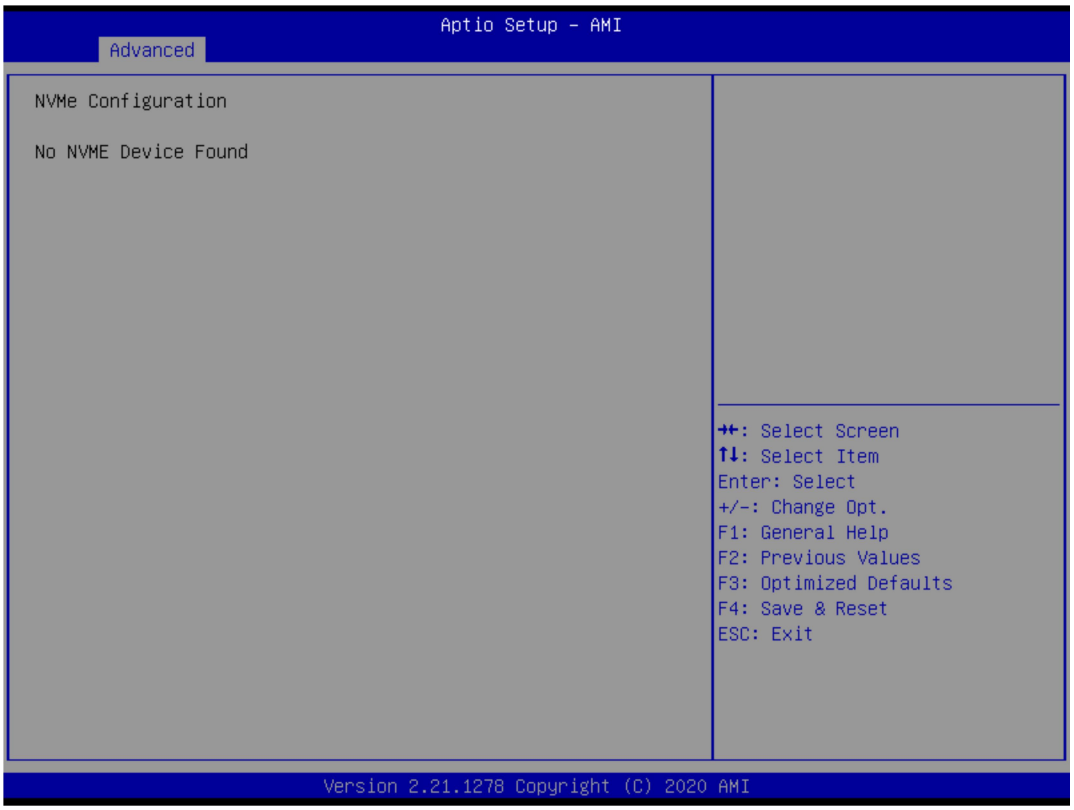


Field Name	**Network stack**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable UEFI Network stack.

Field Name	**Ipv4 PXE Support (Available when Network stack Enabled)**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable/Disable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot support will not be available.

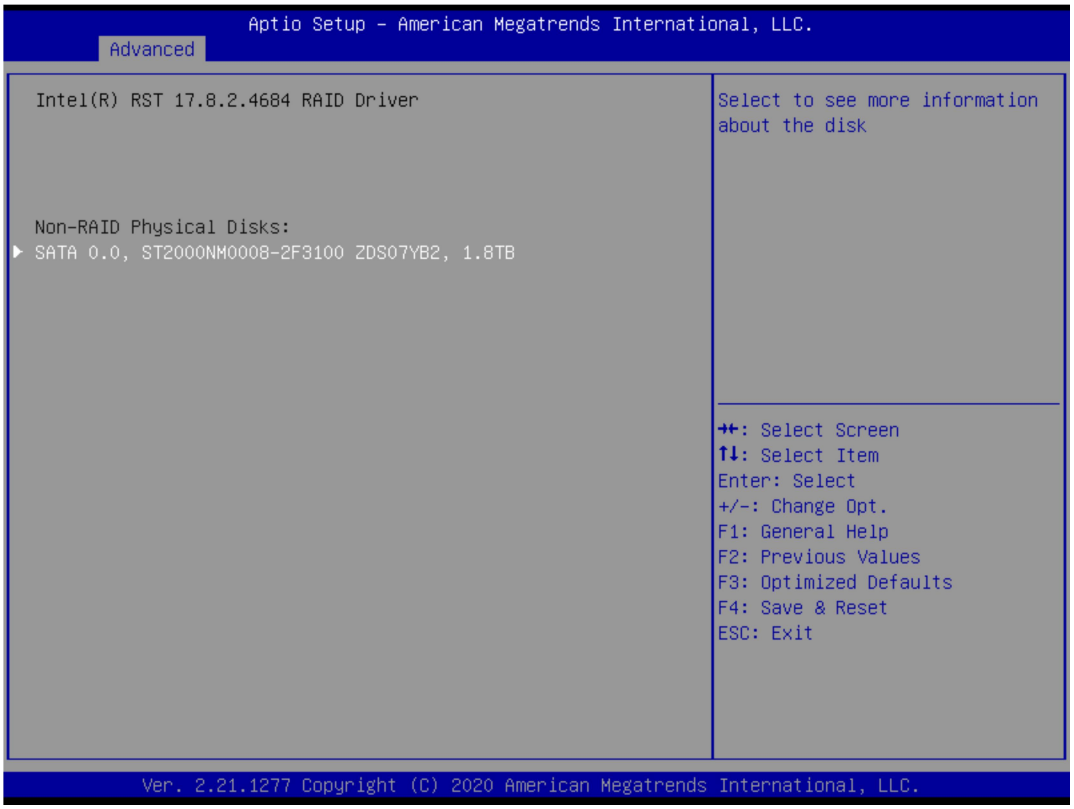
Field Name	**Ipv6 PXE Support (Available when Network stack Enabled)**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable/Disable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot support will not be available.

3.4.12 NVMe Configuration



Field Name	**Ipv4 PXE Support (Available when Network stack Enabled)**
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.4.13 Intel® Rapid Storage Technology

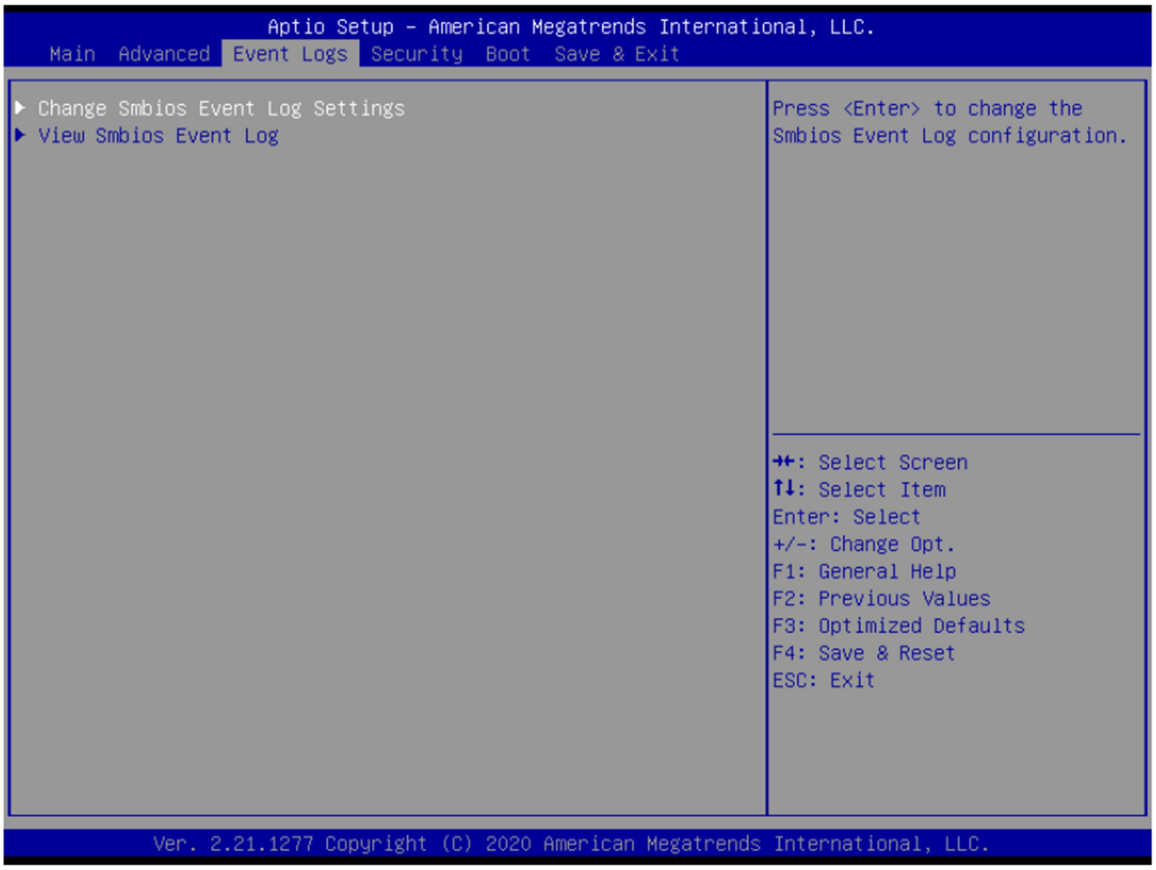


Field Name	Create RAID Volume
Help	This page allows you to create a RAID volume

Field Name	Raid Volume
Help	Select to see more information about the RAID Volume.

Field Name	Non-RAID Physical Disks:
Help	Select to see more information about the disk.

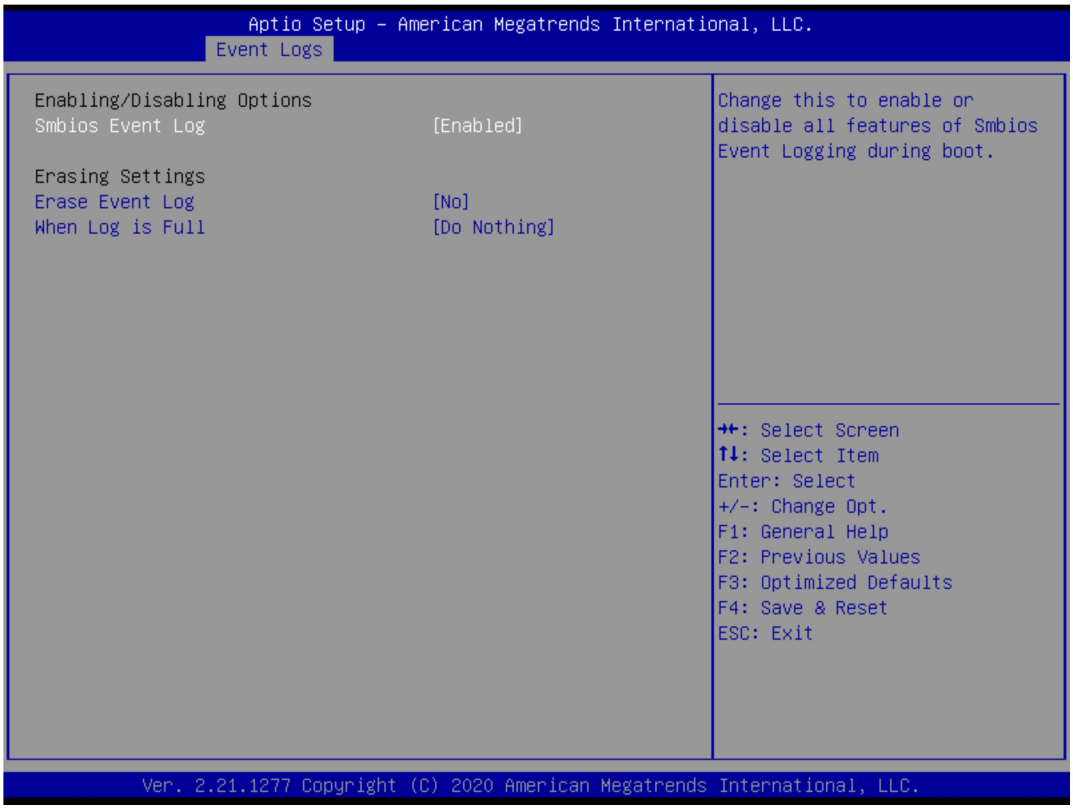
3.5 Event Logs



Field Name	Change Smbios Event Log Settings
Help	Press to change the Smbios Event Log configuration.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	View Smbios Event Log
Help	Press to view the Smbios Event Log records.
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.5.1 Change Smbios Event Log Settings

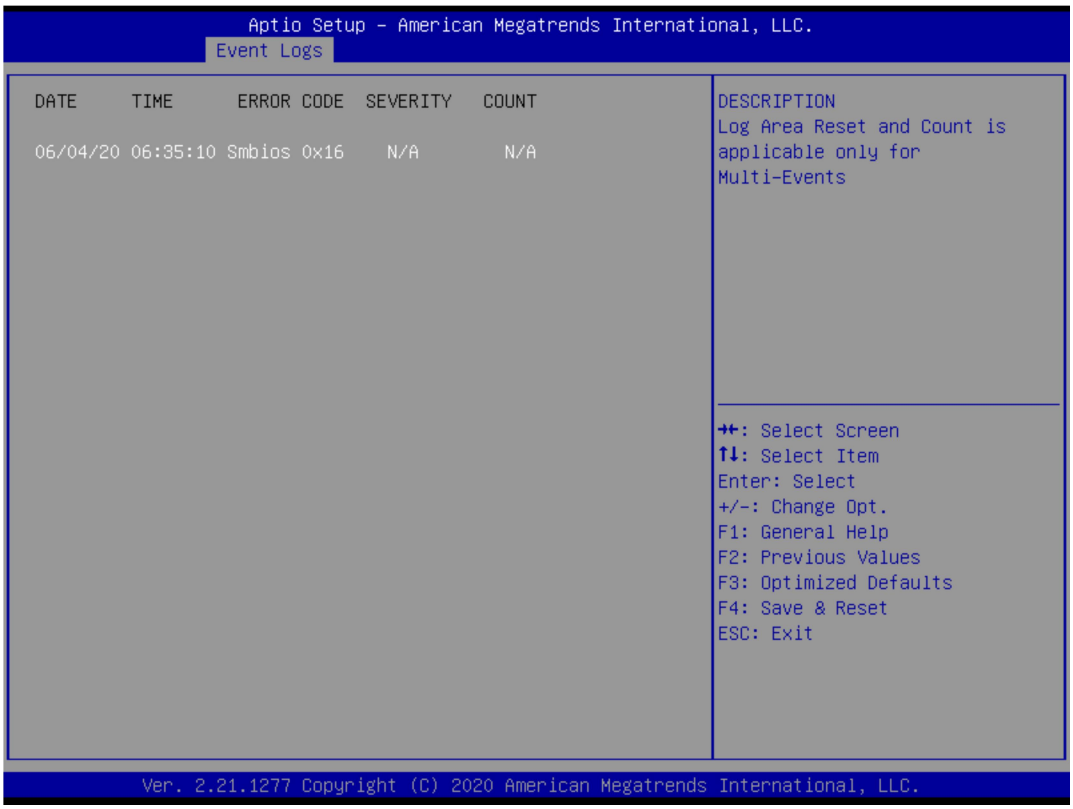


Field Name	**Smbios Event Log**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Change this to enable or disable all features of Smbios Event Logging during boot.

Field Name	**Erase Event Log**
Default Value	[No]
Possible Value	No Yes, Next reset Yes, Every reset
Help	Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.

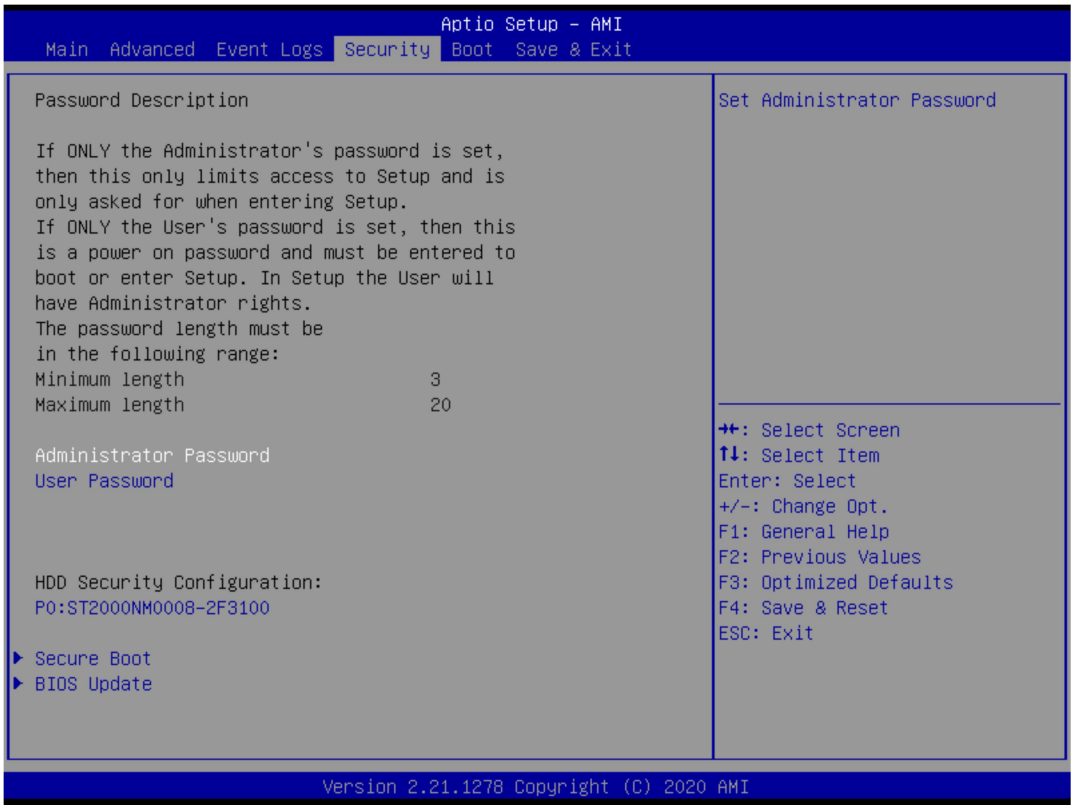
Field Name	**When Log is Full**
Default Value	[Do Nothing]
Possible Value	Do Nothing Erase Immediately
Help	Choose options for reactions to a full Smbios Event Log

3.5.2 View Smbios Event Log



Field Name	**DATE / TIME / ERROR CODE / SEVERITY / COUNT**
Default Value	MM/DD/YY HH:MM:SS Smbios 0x16 N/A N/A
Possible Value	By Events.
Help	By Events.

3.6 Security Page



Field Name	Administrator Password
Help	Set Administrator Password

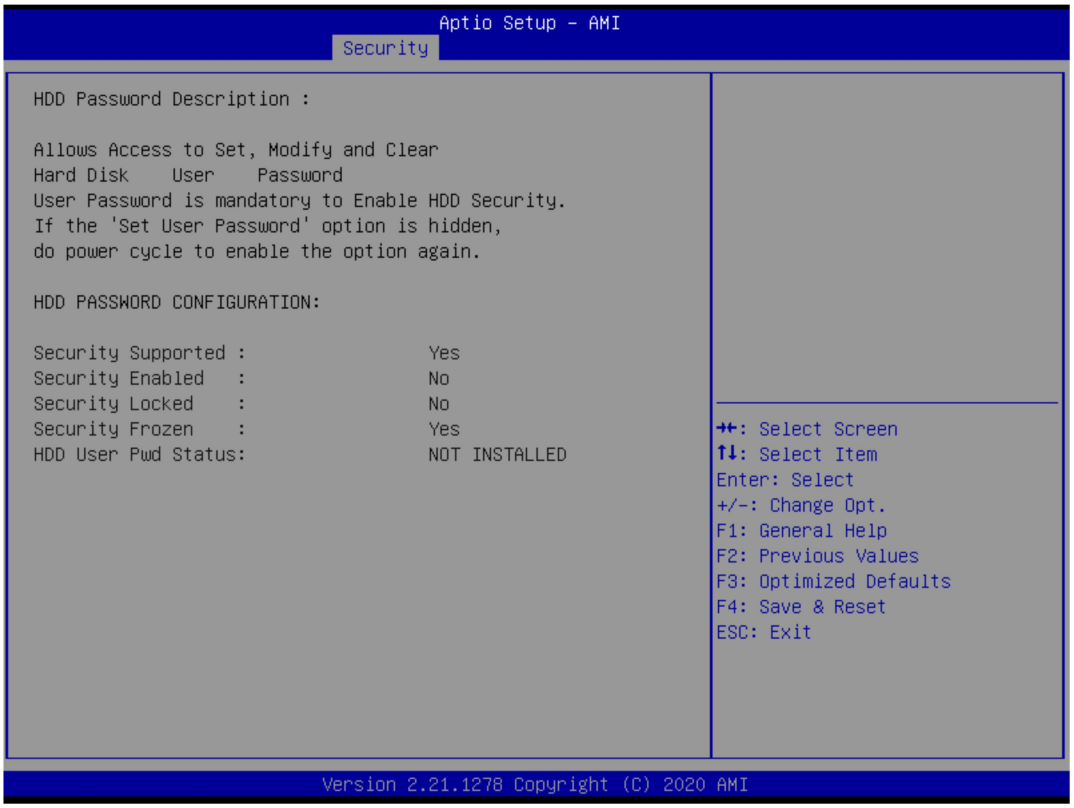
Field Name	User Password
Help	Set User Password.

Field Name	Secure Boot
Help	Set User Password.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	BIOS Update
Help	BIOS Update support
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	HDD Security drive
Help	HDD Security Configuration for selected drive
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.6.1 HDD Security



Field Name	Set User Password
Help	Set HDD User Password. *** Advisable to Power Cycle System after Setting Hard Disk Passwords ***.Discard or Save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is hidden, do power cycle to enable the option again

3.6.2 Secure Boot

Field Name	**Secure Boot**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Secure Boot feature is Active if Secure Boot is Enabled,Platform Key(PK) is enrolled and the System is in User mode.The mode change requires platform reset

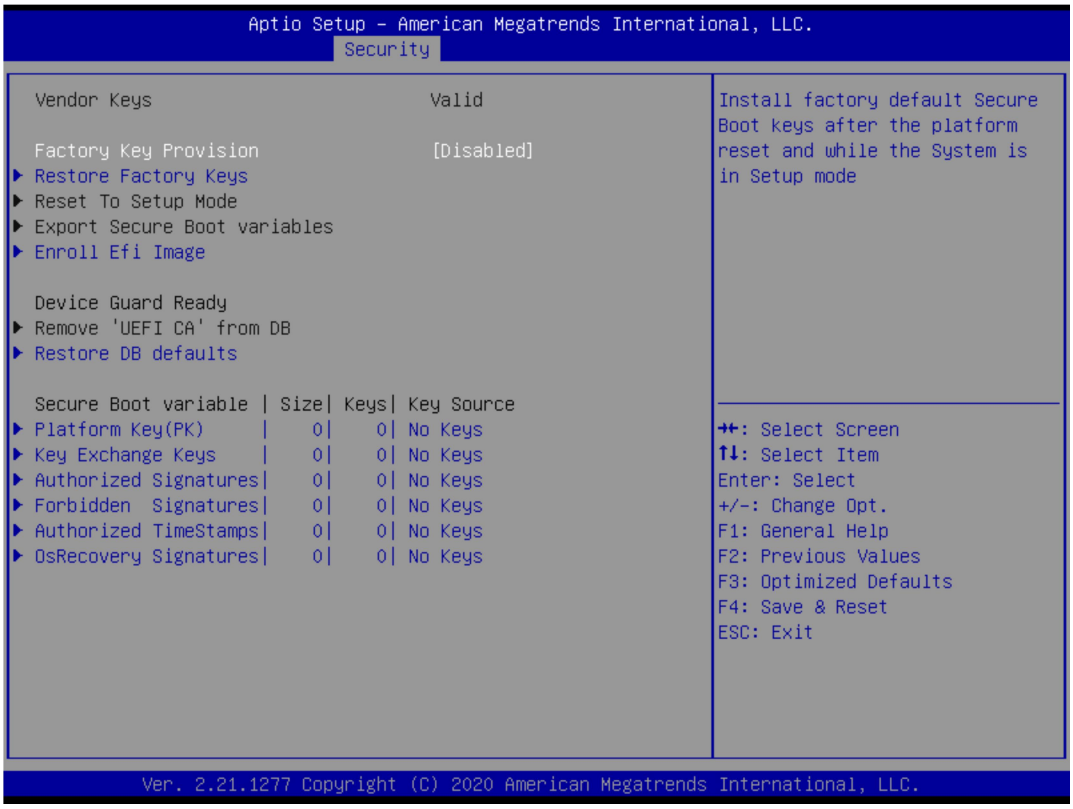
Field Name	**Secure Boot Mode**
Default Value	[Standard]
Possible Value	Standard Custom
Help	Secure Boot mode options:Standard or Custom.In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

Field Name	**Restore Factory Keys**
Help	Force System to User Mode. Install factory default Secure Boot key databases

Field Name	**Reset to Setup Mode**
Help	Delete all Secure Boot key databases from NVRAM

Field Name	Key Management
Help	Enables expert users to modify Secure Boot Policy variables without full authentication
Comment	Enables expert users to modify Secure Boot Policy variables without full authentication

3.6.3 Key Management(Secure Boot Mode set to Custom)



Field Name	Factory Key Provision
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode

Field Name	Restore Factory Keys
Help	Force System to User Mode. Install factory default Secure Boot key databases

Field Name	Reset to Setup Mode
Help	Delete all Secure Boot key databases from NVRAM

Field Name	Export Secure Boot variables
Help	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device

Field Name	Enroll Efi Image

Help	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

Field Name	**Remove 'UEFI CA' from DB**
Help	Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db)

Field Name	**Restore DB defaults**
Help	Restore DB variable to factory defaults

Field Name	**Platform Key (PK)**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu "Key Management".

Field Name	**Key Exchange Keys**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Authorized Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256)

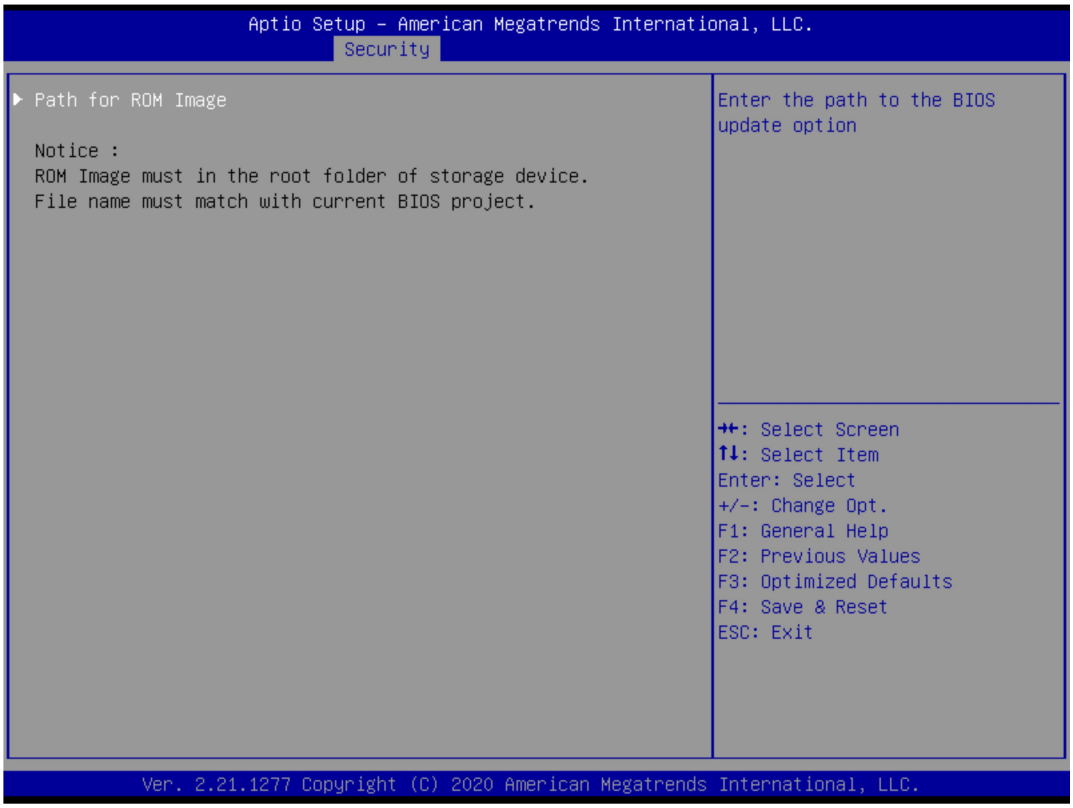
	Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Forbidden Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Authorized TimeStamps**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu.

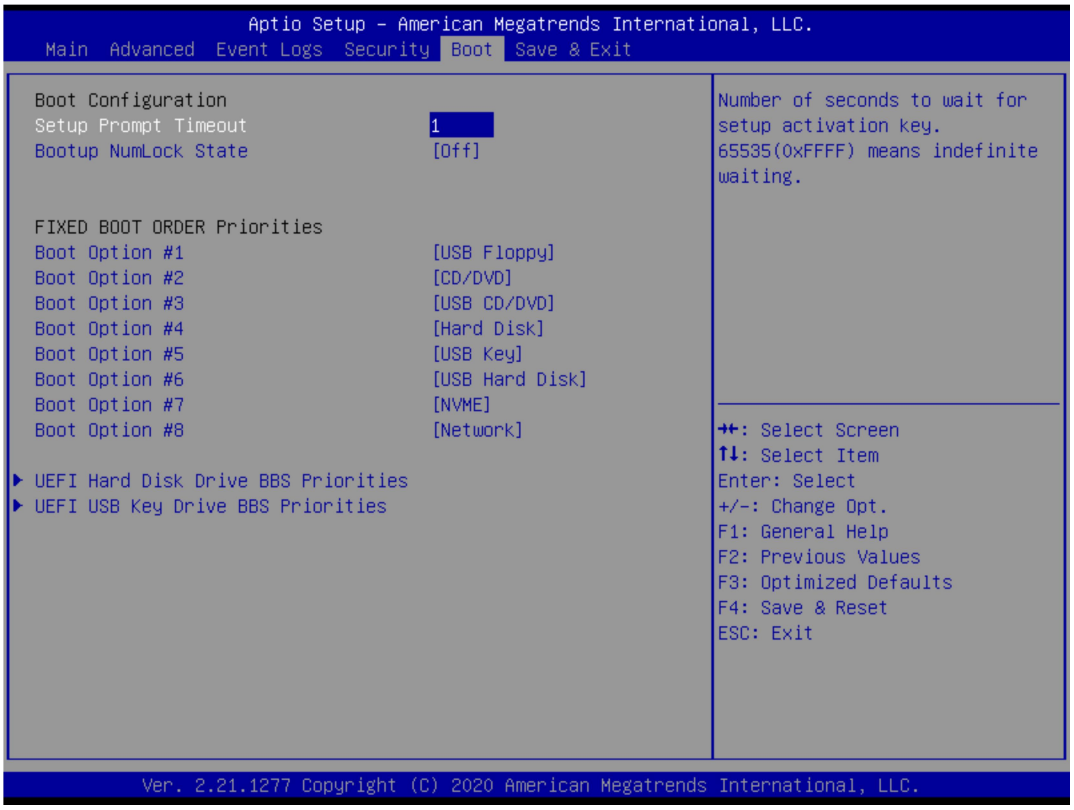
Field Name	**OsRecovery Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.6.4 BIOS Update



Field Name	**Path for ROM Image**
Help	Enter the path to the Secure flash option

3.7 Boot Page



Field Name	Setup Prompt Timeout
Default Value	1
Possible Value	1~65535
Comment	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Field Name	Bootup NumLock State
Default Value	[Off]
Possible Value	On Off
Comment	Select the keyboard NumLock state

Field Name	Boot Option #1
Default Value	[USB Floppy]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #2
Default Value	[USB CD/DVD]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #3
Default Value	[Hard Disk]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #4
Default Value	[USB Key]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #5
Default Value	[USB Hard Disk]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #6
Default Value	[NVME]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #7
Default Value	[Network]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	Boot Option #8
Default Value	[Network]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Comment	Sets the system boot order

Field Name	(UEFI) USB Floppy Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available USB Floppy Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	(UEFI) USB CDROM/DVD ROM Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available USB CDROM/DVD Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	(UEFI) Hard Disk Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

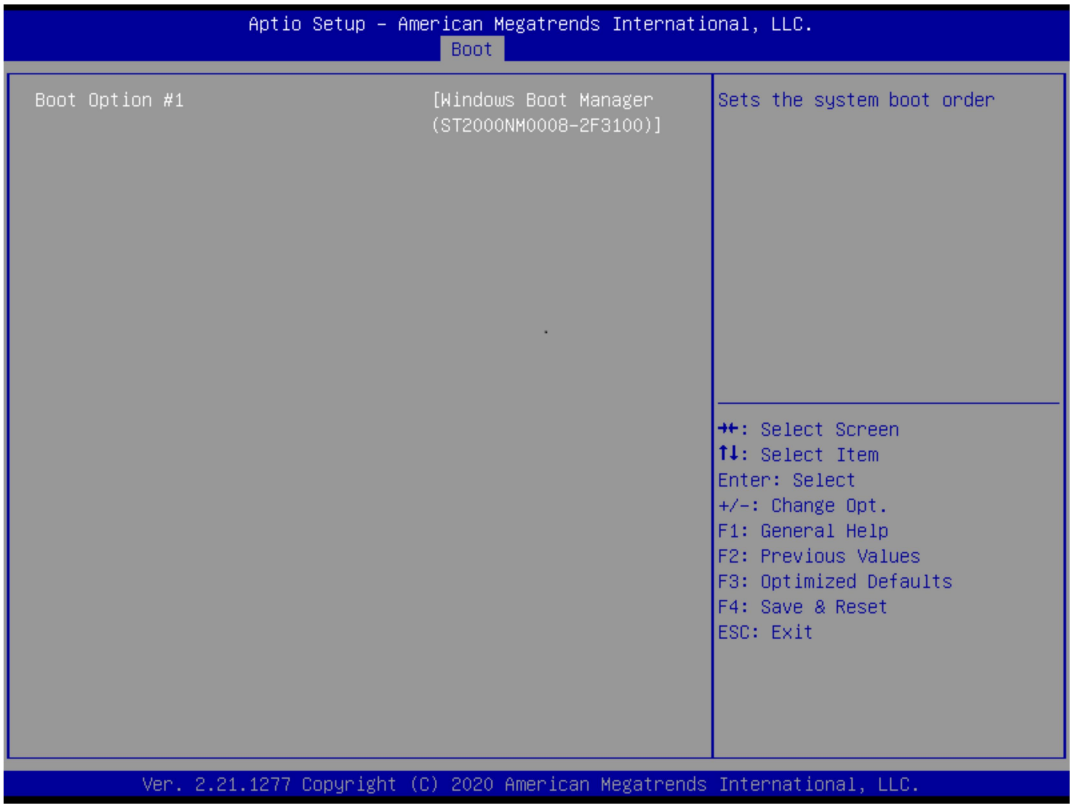
Field Name	(UEFI) USB KEY Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	(UEFI) USB Hard Disk Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	(UEFI) NVME Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

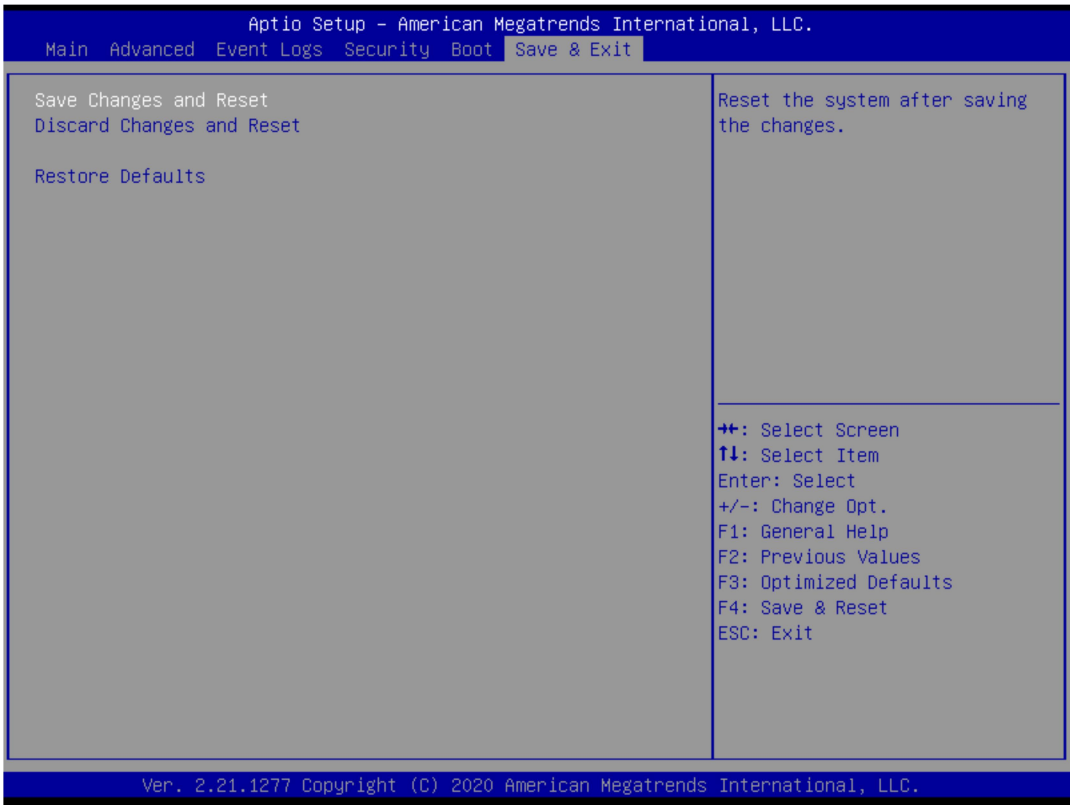
Field Name	(UEFI) NETWORK Drive BBS Priorities
Help	Specifies the Boot Device Priority sequence from available Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.7.1 (List Boot Device Type) Drive BBS Priorities



Field Name	**Boot Option #1**
Default Value	
Possible Value	Boot Device Name 1 of this type, Disable
Help	Sets the system boot order

3.8 Save & Exit Page



Field Name	Save Changes and Reset
Help	Reset the system after saving the changes.

Field Name	Discard Changes and Rest
Help	Reset system setup without saving any changes.

Field Name	Restore Defaults
Help	Restore/Load Default values for all the setup options.