MITAC Desktop Board PH13CMI Product Guide

Desktop Board Features

This chapter briefly describes the features of Desktop Board PH13CMI. Table 1 summarizes the major features of the Desktop Board.

MECHANICAL	
FORM FACTOR	Mini-ITX: 6.7” x 6.7” (170 mm x 170 mm)
SYSTEM	
PROCESSOR	10th Gen Intel® Comet Lake LGA1200 Socket Processor, 10core TDP Max 35W, (ATX support 6core 95W; 8ccore TDP 65W; 125W TDP down to 95W)
CHIPSET	Intel® Q470 support RAID 0, 1, 5, 10 vPro colay H420E
MEMORY	DDR4 2933/2666/2400MHz, 2 x 260-pin SO-DIMM, Max. 64GB (Non-ECC)
GRAPHICS	Intel® HD Graphics
ETHERNET	Intel® I219-LM Giga LAN + Intel® I210-AT Giga LAN
AUDIO	Realtek® ALC662 / ACL888
I/O CHIPSET	Nuvoton NCT6126D(eSPI)
TPM	BOM option NPCT750
EXPANSION SLOT	PCIe x16 slot M.2 2242 / 2280 M key (PCIe X4, SATA) **H420E support SATA M.2 2230 E key (PCIe, USB 2.0) mPCIE(USB, PCIE, SATA)
BIOS	256 Mbit SPI, AMI BIOS
H/W MONITOR	Temperature Monitor, Voltage Monitor, Fan Monitor
WATCHDOG TIMER	1~255 Steps by Software Program
SMART FAN CONTROL	CPU Fan / System Fan
GRAPHICS	
VGA	—
DVI	—
HDMI	Up to 4K (4096 x 2160) @30 Hz

DISPLAYPORT	Up to 4K (4096 x 2304) @60 Hz
2rd DisplarPort	-
LVDS	Up to 1920 x 1200 @60 Hz
eDP(Option)	Up to 4K (4096 x 2304) @60 Hz
REAR I/O	
USB	4 x USB3.2 Gen2 (Q470) / 4 x USB 3.2 Gen1 (H420E) 4 x USB2.0
DISPLAY I/O	1 x HDMI , 1 x DisplayPort
AUDIO I/O	1 x Mic-in ,1 x Line-out, 1 x Line-in
LAN I/O	2 x RJ-45
SERIAL PORT	2x RS232 (one support RS422/485)
PS/2 PORT	—
OTHERS	
INTERNAL CONNECTORS	
STORAGE	2 x SATAIII
USB	2 x USB 2.0 (USB hub 1 to 3)) 1 x USB3.0 (H420E, Q470)
DISPLAY I/O	1 x LVDS (*Optional eDP SKU available), 1 x Backlight Connector
SERIAL PORT	—
PS/2 PORT	—
PARALLEL PORT	—
GPIO	1 x MiAPI Header (Programmable)
FAN	1 x 4-pin CPU Fan Connector, 1 x 4-pin System Fan Connector
POWER	DC: via cable ATX: 1 x ATX24pin + ATX 4pin Jumper: 1 x AT / ATX Mode Select
OTHERS	1 x Front Audio Header (Mic-in / Line-out), 1 x CMOS Jumper, 1 x panel power select header, 1x buzzer header, 1 x SPDIF
POWER REQUIREMENT	

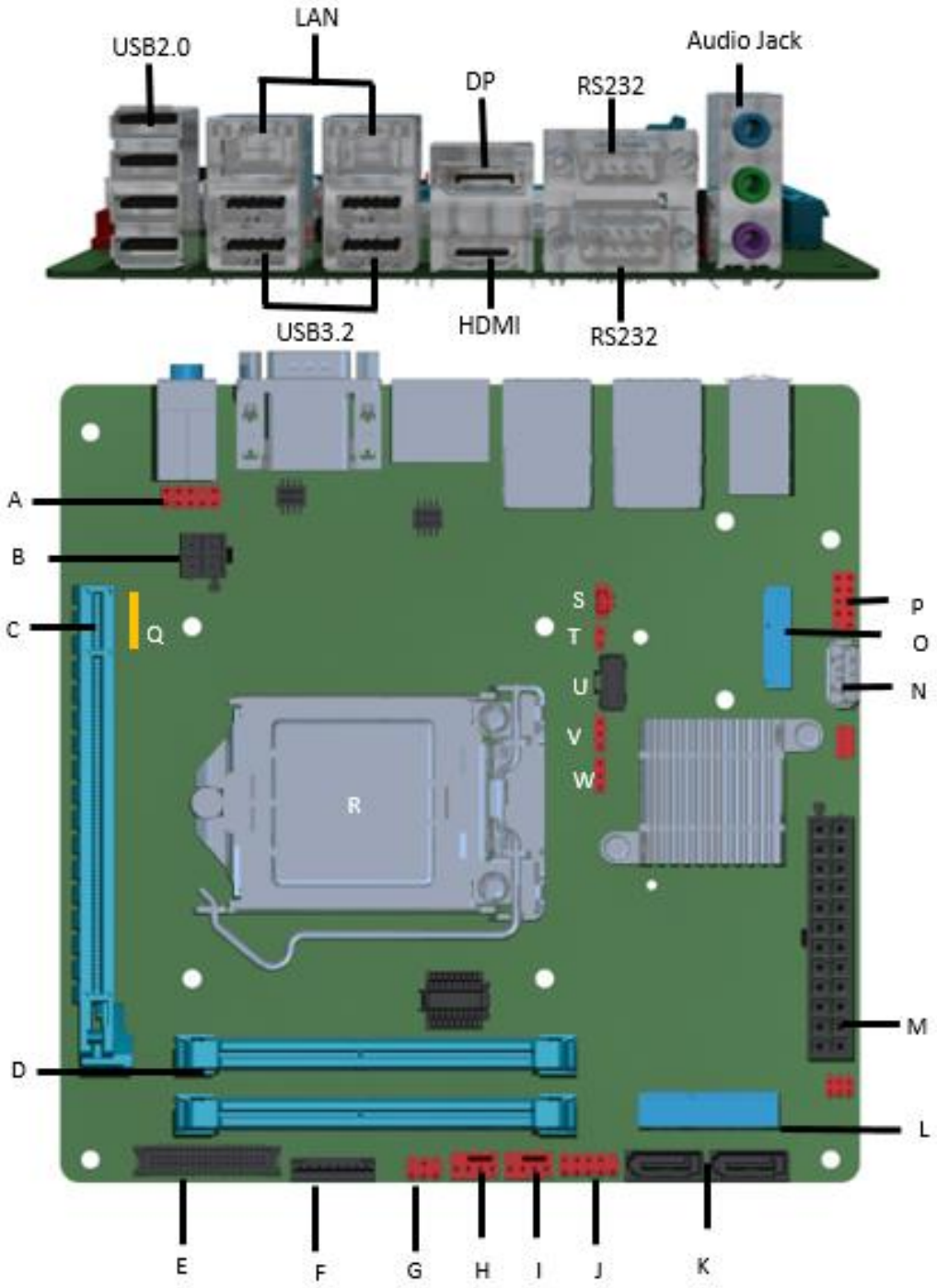
POWER INPUT	DC 12V or ATX Power
ENVIRONMENTAL	
OPERATING TEMPERATURE	0 ~ 60°C (32 ~140°F)
STORAGE TEMPERATURE	-40 ~ 85°C (-40 ~185°F)
OPERATING HUMIDITY	10% ~ 95% R / H, non-condensing
CERTIFICATION	CE & FCC Class B

TABLE 1. MITAC DESKTOP BOARD PH13CMI FEATURES

Note: please install I219 LAN driver into OS image on PXE server before using PXE installation function

Desktop Board Components

Figure 1 shows the approximate location of the major components on the top side of MITAC Desktop Board PH13CMI.



Item	Description
A	Front Audio Header
B	ATX 4pin
C	PCIEx16
D	DDR4 SODIMM socket
E	LVDS/eDP connector
F	LVDS Backlight header
G	Panel power option
H	CPU FAN Header
I	System FAN Header
J	Front Panel Header
K	SATA
L	Full Size Mini PCIe slot
M	ATX 24pin
N	USB3.0 connector
O	M.2 2230 E Key
P	USB2.0 Header (pitch 2.54mm)
Q	SPDIF Header
R	LGA 1200 CPU socket

S	RTC battery header
T	Buzzer header
U	MiAPI Header
V	Clear CMOS Header
W	AT/ATX mode selection

TABLE 2. MITAC DESKTOP BOARD PH13CMI COMPONENTS (SHOWN IN FIGURE 1)

Processor

The board supports 10th generation Intel Core processors. Other processors may be supported in the future. This board supports processors with a maximum wattage of 65 W Thermal Design Power (TDP).

NOTE

This board has specific requirements for providing power to the processor. Additional power required will depend on configurations chosen by the integrator.

System Memory

NOTE

To be fully compliant with all applicable DDR SDRAM memory specifications, the board should be populated with DIMMs that support the Serial Presence Detect (SPD) data structure. This allows the BIOS to read the SPD data and program the chipset to accurately configure memory settings for optimum performance. If non-SPD memory is installed, the BIOS will attempt to correctly configure the memory settings, but performance and reliability may be impacted or the DIMMs may not function under the determined frequency.

The Desktop Board has two 260-pin DDR4 SO-DIMM sockets with gold-plated contacts.

Connecting to the Internal Headers and Connectors

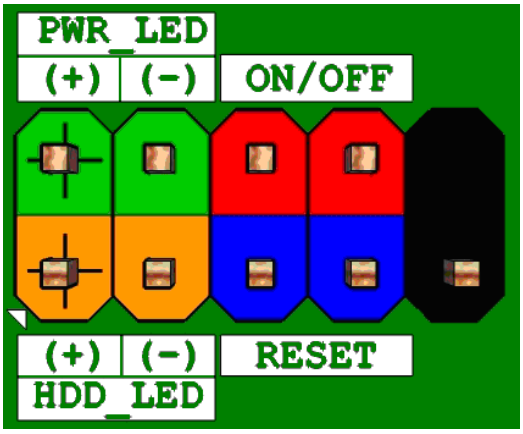


Figure 1 : Front Panel Connector

Pin	Signal Name	Description	Pin	Signal Name	Description
1	HDD_POWER_LED	Pull-up resistor (750) to +5V	2	POWER_LED_MAIN	[Out] Front panel LED (Green)
3	HDD_LED#	[Out] Hard disk activity LED	4	POWER_LED_ALT	[Out] Front panel LED (Yellow)
5	GROUND	Ground	6	POWER_SWITCH#	Power button
7	RESET_SWITCH#	Reset switch	8	GROUND	Ground
9	+5V_DC	Power	10	KEY	No pin

Table 1: Front Panel Connector

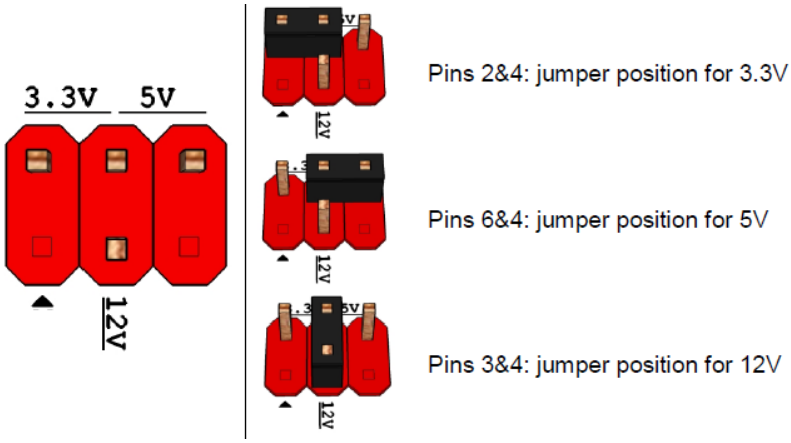


Figure 2: Panel power Header pin-out

Pin	Signal Name	Description
1	Key	No pin
2	3.3V	3.3V option (default)
3	12V	12V option
4	LCD_VCC	Send voltage to connector
5	Key	No pin
6	5V	5V option

Table 2: Panel power Header signal

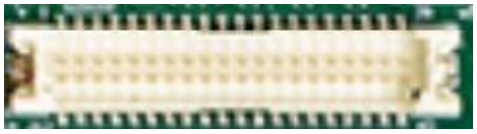


Figure 3: LVDS Connector

Joint Tech / maker P/N : A1252WV-SF-2X20PD01

(alternative Xianyi / maker P/N : W2631-40P-R3211)

LVDS(40pin)			
Pin	Net Name	Pin	Net Name
1	VCC3	21	LVDS1_LINK1_CON_DP
2	Panel Power	22	LVDS1_LINK0_CON_DP
3	VCC3	23	LVDS1_LINK1_CON_DN
4	Panel Power	24	LVDS1_LINK0_CON_DN
5	LVDS_DDC_SCL	25	GND
6	LVDS_DDC_SDA	26	GND
7	GND (CABLE_ID1)	27	LVDS1_LINK3_CON_DP
8	GND	28	LVDS1_LINK2_CON_DP
9	LVDS0_LINK1_CON_DP	29	LVDS1_LINK3_CON_DN
10	LVDS0_LINK0_CON_DP	30	LVDS1_LINK2_CON_DN
11	LVDS0_LINK1_CON_DN	31	GND
12	LVDS0_LINK0_CON_DN	32	GND
13	GND	33	LVDS1_CLK_CON_DP
14	GND	34	LVDS0_CLK_CON_DP
15	LVDS0_LINK3_CON_DP	35	LVDS1_CLK_CON_DN
16	LVDS0_LINK2_CON_DP	36	LVDS0_CLK_CON_DN
17	LVDS0_LINK3_CON_DN	37	GND
18	LVDS0_LINK2_CON_DN	38	GND
19	GND	39	+12V
20	GND	40	+12V

Table 3: 40-pin LVDS data header pin-out reference

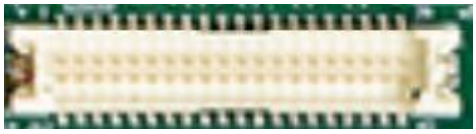


Figure 4: eDP Connector

Joint Tech / maker P/N : A1252WV-SF-2X20PD01

(Alternative Xianyi / maker P/N : W2631-40P-R3211)

eDP(40pin)			
Pin	Net Name	Pin	Net Name
1	VCC3	21	PCH_BL_EN
2	Panel Power	22	PCH_BACKLIGHT_PWM
3	VCC3	23	NC
4	Panel Power	24	NC
5	EDP_CPU_AUXN	25	GND
6	EDP_CPU_AUXP	26	GND
7	GND (CABLE_ID1)	27	NC
8	HPD	28	NC
9	eDP1_DP	29	NC
10	eDP0_DP	30	NC
11	eDP1_DN	31	GND
12	eDP0_DN	32	GND
13	GND	33	NC
14	GND	34	NC
15	eDP3_DP	35	NC
16	eDP2_DP	36	NC
17	eDP3_DN	37	GND
18	eDP2_DN	38	GND
19	GND	39	+12V
20	GND	40	+12V

Table 4: 40-pin eDP data header pin-out reference

Figure 5: LVDS inverter power header pin-out

Grand tech / maker P/N: RWA-411087-R00

(Alternative Aqua tech /maker P/N: L-WA108083R74)

Pin	Signal Name	Description
1	LVDS_BKTEN_R	Backlight enable
2	LVDS_PWM	Backlight PWM control
3	BKLT_PWR (12v)	Inverter power
4	BKLT_PWR (12v)	Inverter power
5	GND	Ground
6	GND	Ground
7	BRIGHT_UP-	BRIGHTNESS UP
8	BRIGHT_DOWN-	BRIGHTNESS DOWN

Table 5: 8-pin LVDS inverter power header signals

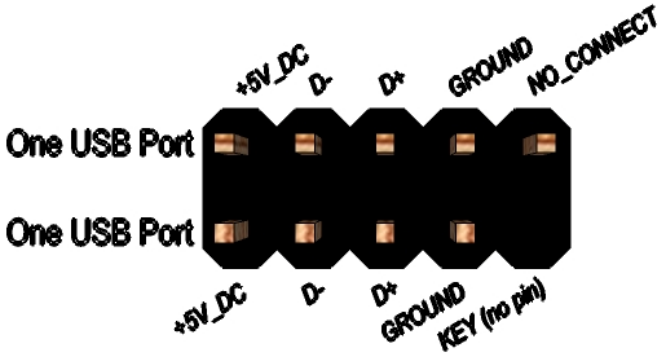


Figure 6: Dual USB2.0 pin-out (pitch 2.54mm)

Pin	Signal	Pin	Signal
1	5V_USB	2	5V_USB
3	Data (negative)	4	Data (negative)
5	Data (positive)	6	Data (positive)

Pin	Signal	Pin	Signal
7	Ground	8	Ground
9	Key (no pin)	10	No Connect

Table 6 Dual USB 2.0 Header

Figure 7: SPDIF Header

Pin	Net name
1	GND
2	SPDIF-OUT
4	Power(5V)

Table 7: SPDIF Header signal

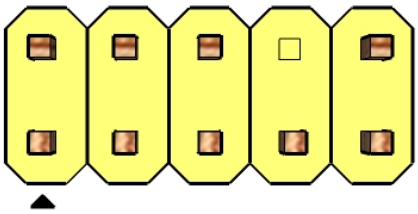


Figure 8: FP Audio pin-out

Pin	Signal Name	Description
1	MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	MIC_BIAS	Microphone power / additional MIC input for stereo microphone support

4	Presence	Active low signal that signals bios that an audio dongle is connected to the analog header
5	FP_OUT_R	Right channel audio signal to front panel
6	AUD_SENSE_MIC_FP	Front panel microphone jack detect (short to pin7 to enable)
7	FIO_SENSE	Front panel detect pin
8	Key	No pin
9	FP_OUT_L	Left channel audio signal to front panel
10	AUD_SENSE_HP	Front panel headphone jack detect (shore to pin7 to enable)

Table 8: FP Audio Header

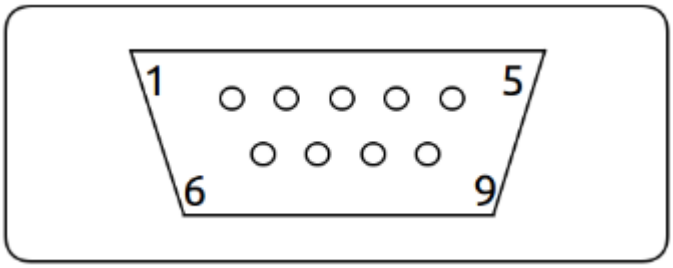


Figure 9: Serial port Male connector pin-out

	RS232	RS-422	RS-485
Pin	**Signal Name**	**Signal Name**	**Signal Name**
1	DCD	TX-	DATA-
2	RXD#	TX+	DATA+
3	TXD#	RX-	NC
4	DTR	RX+	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Table 9 Serial port Male connector pin-out

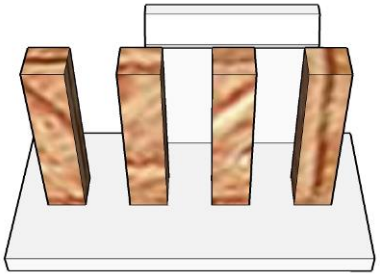


Figure 10 Processor fan header pin-out

Pin	Signal
1	Ground
2	+12V
3	CPU_FAN_TACH
4	CPU_FAN_CTRL

Table 10 fan header signals

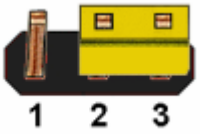


Figure 11: CMOS Clear Header

CMOS Clear

1-2	Clear CMOS
2-3	Normal

Table 11: CMOS Clear behavior

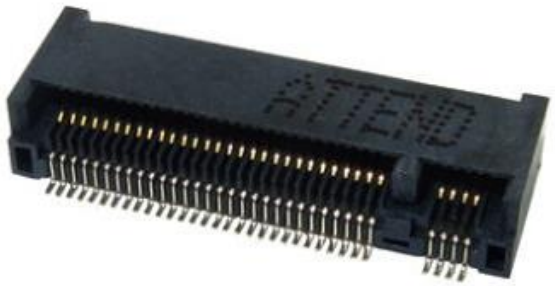


Figure 12: M.2 M key slot For Storage pin-out

74	3.3Vaux	GND	75
72	3.3Vaux	GND	73
70	3.3Vaux	GND	71
68	SUSCLK(32kHz)(O)(0/3.3V)	PEDET(OC-PCIe/GND-SATA)	69
	Connector Key	N/C	67
	Connector Key	Connector Key	
	Connector Key	Connector Key	
	Connector Key	Connector Key	
58	N/C	Connector Key	
56	N/C	GND	57
54	PEWake#(IO){0/3.3V}or N/C	REFCLKP	55
52	PERST#(O)(0/3.3V) or N/C	REFCLKN	53
50	PERST#(O)(0/3.3V) or N/C	GND	51
48	N/C	PETp0/SATA-A+	49
46	N/C	PETn0/SATA-A-	47
44	N/C	GND	45
42	N/C	PERp0/SATA-B-	43
40	N/C	PERn0/SATA-B+	41
38	DEVSLP(O){0/3.3V}	GND	39
36	N/C	PETp1	37
34	N/C	PETn1	35
32	N/C	GND	33
30	N/C	PERp1	31
28	N/C	PERn1	29
26	N/C	GND	27
24	N/C	N/C	25

22	N/C	N/C	23
20	N/C	GND	21
18	3.3Vaux	N/C	19
16	3.3Vaux	N/C	17
14	3.3Vaux	GND	15
12	3.3Vaux	N/C	13
10	DAS/DSS#(I){OD}	N/C	11
8	N/C	GND	9
6	N/C	N/C	7
4	3.3Vaux	N/C	5
2	3.3Vaux	GND	3
		GND	1

Table 12: M.2 M key slot For Storage signals

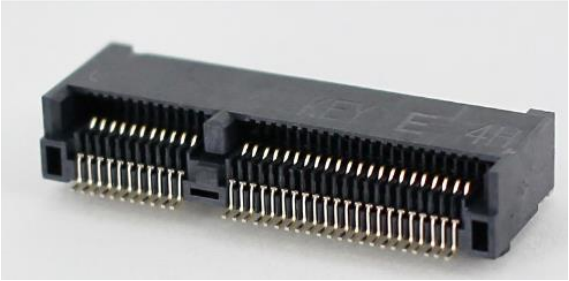


Figure 13: M.2 E key slot For wireless pin-out

	Standard M.2 Key E	LcP Signals	LcP Signals	Standard M.2 Key E	
			GND		75
74	+V3P3A		WT_CLKP	REFCLKN1	73
72	+V3P3A		WT_CLKN	REFCLKP1	71
70	PEWake 1# (IO)(0/3.3V)		GND		69
68	CLKREQ1# (IO)(0/3.3V)		WT_D0P	PERn1	67
66	PERST1# (O)(0/3.3V)		WT_D0N	PERp1	65
64	RESERVED	REFCLK0 (I)(1V@38.4MHz)	GND		63
62	ALERT# (I)(0/1.8)	A4WP_IRQ#	WT_D1P	PETn1	61
60	I2C_CLK (O)(0/1.8V)	A4WP_I2C_CLK	WT_D1N	PETp1	59
58	I2C_DATA (IO)(0/1.8)	A4WP_I2C_DATA	GND		57
56	W_DISABLE1# (O)(0/3.3V)		PEWake0# (IO)(0/3.3V)		55
54	W_DISABLE2# (O)(0/3.3V)		CLKREQ0# (IO)(0/3.3V)		53
52	PERST0# (O)(0/3.3V)		GND		51
50	SUSCLK(32kHz) (O)(0/3.3V)	C_P32K (3.3V Tolerant)	REFCLKN0		49
48	COEX_TXD (O)(0/1.8V)		REFCLKP0		47
46	COEX_RXD (O)(0/1.8V)		GND		45
44	COEX3 (IO)(0/1.8V)		PERn0		43
42	CLink CLK		PERp0		41
40	CLink DATA		GND		39
38	CLink RESET (O)(0/3.3V)		PETn0		37
36	LPSS UART RTS (O)(0/1.8V)	/ BRI_DT (MUX'd in PCH/SoC)	PETp0		35
34	LPSS UART CTS (I)(0/1.8V)	/ RGI_RSP (MUX'd in PCH/SoC)	GND		33
32	LPSS UART Tx (O)(0/1.8V)	/ RGI_DT (MUX'd in PCH/SoC)	Connector Key		
E	Connector Key		Connector Key		E
	Connector Key		Connector Key		
	Connector Key		Connector Key		
	Connector Key		WGR_CLKP	SDIO Reset#(O)(0/1.8V)	23
22	LPSS UART Rx (I)(0/1.8V)	/ BRI_RSP (MUX'd in PCH/SoC)	WGR_CLKN	SDIO Wake#(I)(0/1.8V)	21
20	UART Wake# (I)(0/3.3V)		GND	SDIO DAT3(IO)(0/1.8V)	19
18	GND	GND/LNA_EN (LcP Production)	WGR_D0P	SDIO DAT2(IO)(0/1.8V)	17
16	LED2# (I)(OD)		WGR_D0N	SDIO DAT1(IO)(0/1.8V)	15
14	PCM_OUT (O)(0/1.8V)	/ CLKREQ0 (MUX'd in PCH/SoC)	GND	SDIO DAT0(IO)(0/1.8V)	13
12	PCM_IN (I)(0/1.8V)		WGR_D1P	SDIO CMD(IO)(0/1.8V)	11
10	PCM_SYNC (OI)(0/1.8V)	/RF_RESET_B (MUX'd in PCH/SoC)	WGR_D1N	SDIO CLK(O)(0/1.8V)	9
8	PCM_CLK (OI)(0/1.8V)		GND		7
6	LED1# (I)(OD)		USB_D-		5
4	+V3P3A		USB_D+		3
2	+V3P3A		GND		1

Table 13: M.2 E key slot For wireless signals

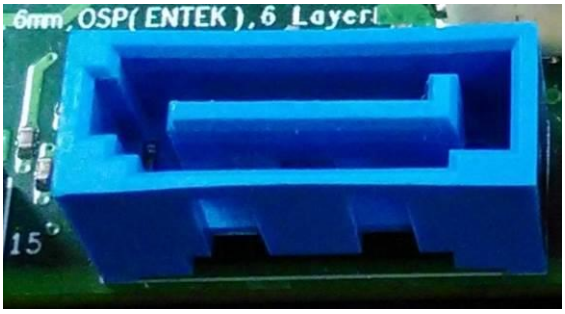


Figure 14: SATA Header pin-out

Pin	Signal Name	Description
1	GND	Ground
2	SATAHDR_TXP0_C	SATA DATA Transmit(positive)
3	SATAHDR_TXN0_C	SATA DATA Transmit(negative)
4	GND	Ground
5	SATAHDR_RXN0_C	SATA DATA Receive(negative)
6	SATAHDR_RXP0_C	SATA DATA Receive(positive)
7	GND	Ground
8	G1	NC
9	G2	NC

Table 14: SATA Header signals

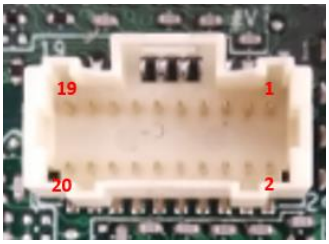


Figure 15: MiAPI Header

Pin	Net name	Pin	Net name
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	NA

Table 15: MiAPI pin out

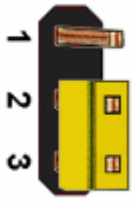


Figure 16: AT/ATX mode Header

1-2	AT Mode
2-3	ATX Mode

Table 16: AT/ATX mode Header

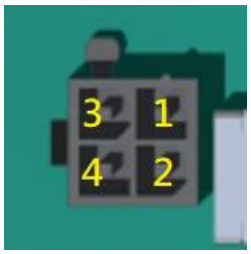


Figure 17: Power Supply Connector(12V for processor)

Pin	Signal Name
1	GND
2	GND
3	12v DC in
4	12v DC in

Table 17: Power Supply Connector (12V for processor) define

Figure 18: Power Supply Connector (“ATX” Multirail)

Pin	Net name	Pin	Net name
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	GND	3	GND
16	PS_ON (low asserted)	4	+5V
17	GND	5	GND
18	GND	6	+5V
19	GND	7	GND
20	-5V (not used)	8	PWR_OK(high asserted)
21	+5V	9	+5V Aux
22	+5V	10	+12V
23	+5V	11	+12V
24	GND	12	+3.3V

Table 18: Power Supply Connector (“ATX” Multirail) define

Power Supply Connectors & related Wiring Notes (ATX Multirail / Single 12V Operation) ATX Multirail Operation

(4 pin 12V connector for CPU power)

Pin	Signal Name
1	GND
2	GND
3	12v in
4	12v in

(24 pin ATX connector)

Pin	Net name	Pin	Net name
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	GND	3	GND
16	PS_ON	4	+5V
17	GND	5	GND
18	GND	6	+5V
19	GND	7	GND
20	-5V	8	PWR_OK
21	+5V	9	+5V Aux
22	+5V	10	+12V
23	+5V	11	+12V
24	GND	12	+3.3V

24 pin ATX connector:

1) Pin 14 (-12V) and pin 20 (-5V) are not required
2) Pin 9, Pin 10 & Pin11 are responsible for operational state

Important Note:

If the Power Supply is changed from Multirail to single 12V or vice versa, make sure to disconnect the mainboard from any power at least for 10 minutes!

Requirement for ATX Multirail operation:

Operational state from the main PSU is off.

The mainboard checks if

PIN10 and PIN11 = 0V

&

PIN 9 = 5V

only then the main PSU starts and the

mainboard is in ATX Multirail operating mode.

Single 12V Operation

(4 pin 12V connector for CPU power)

Pin	Signal Name
1	GND
2	GND
3	12v in
4	12v in

(24 pin ATX connector)

Pin	Net name	Pin	Net name
13	+3.3V out	1	+3.3V out
14	NC	2	+3.3V out
15	GND	3	GND
16	NC	4	+5V out
17	GND	5	GND
18	GND	6	+5V out
19	GND	7	GND
20	+12V out	8	NC
21	+5V	9	RSVD
22	+5V	10	+12V in
23	+5V	11	+12V in
24	GND	12	+3.3V

For single 12V operation both connectors 24 pin and 4 pin are required!

24 pin ATX connector:

1) Pin 8, 14, 16 (NC) must NOT be used in single 12V mode!
2) Pin 9, Pin 10 & Pin 11 are responsible for the operating mode
3) Pin 9: Leave open or connect to 12V. Don't connect to GND!

All four $+12V_{in}$ pins must be connected to the +12V supply source.
Both GND pins (4-pin conn.) & two GND pins (24-pin connector) must be connected to the supply source.

Important Note (Single 12V mode):

The "output" pins ($3.3V_{out}$, $5V_{out}$, $12V_{out}$) provide power for drives or extra devices.

Maximum "output" power ratings:

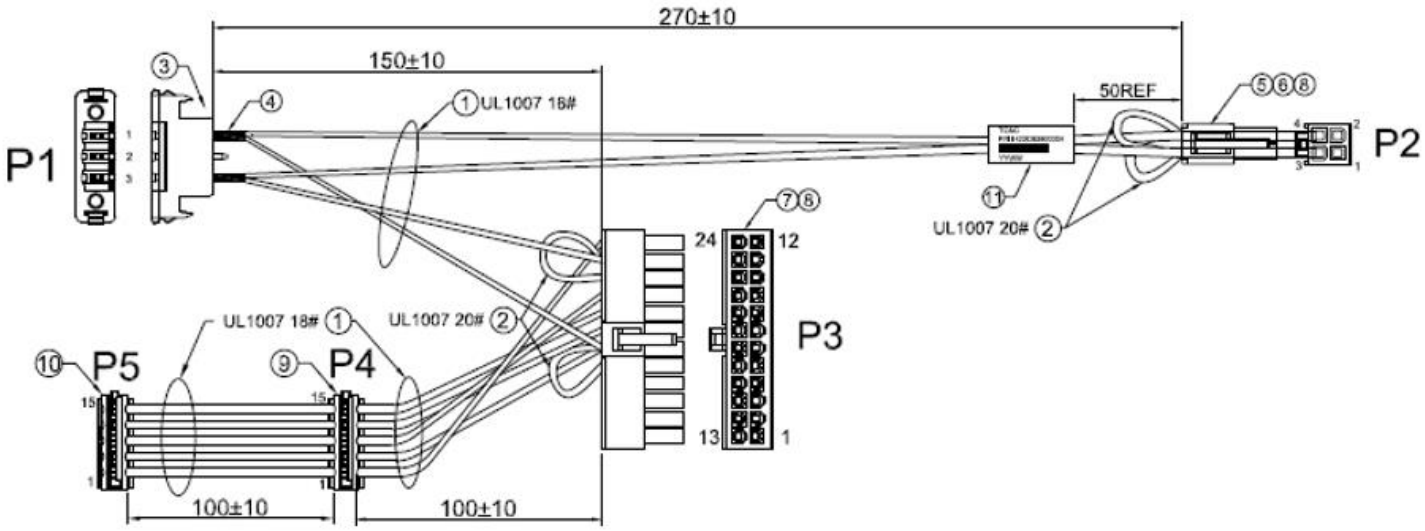
- $+3.3V_{out}$: max. 4A = combined output current of 3.3V PCIe x16 and $3.3V_{out}$ pins (1, 2, 12, 13)
- $+5V_{out}$: max. 9A = combined output current of all USB ports and $+5V_{out}$ pins (4, 6, 21, 22, 23)
- $+12V_{out}$: max. 6A depends on output power of single 12V PSU! ($12V_{out}$ = pin 20)
- If the mainboard is off no output voltages are available on the 24 pin ATX connector

Note: Each single pin of both connectors is capable of max. 8A!
All pins of the 4-pin connector must be used due to peak current in Turbo Mode.

Requirement for Single 12V operation:
IF PIN10 and PIN11 = 12V
&
PIN 9 = open or 12V
only then the mainboard is in Single 12V operating mode.

Single 12V Operation – Cabling Notes

Please use MiTAC suggest cable (3pin terminal connector to 24p ATX + 4pin ATX + SATA power convert cable (422D83800004)) for single 12V operation. Cable drawing as below:

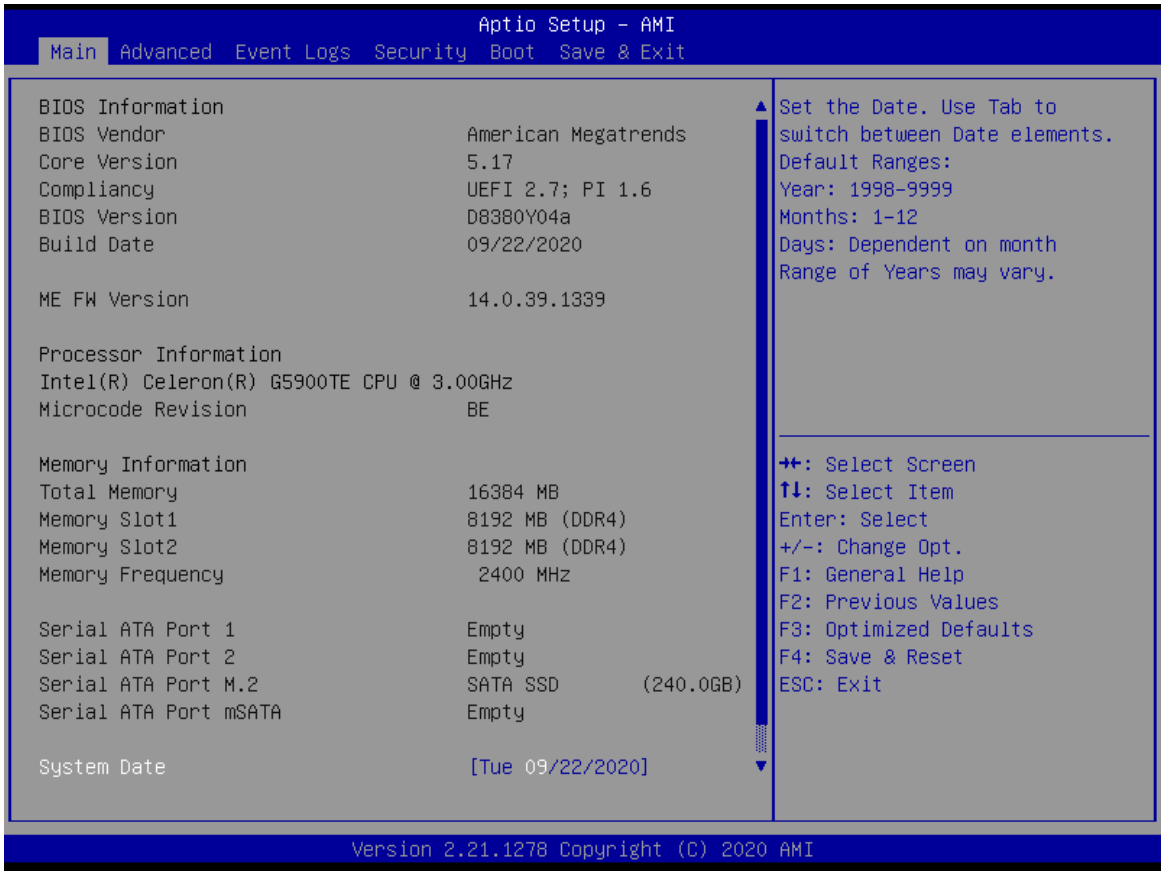


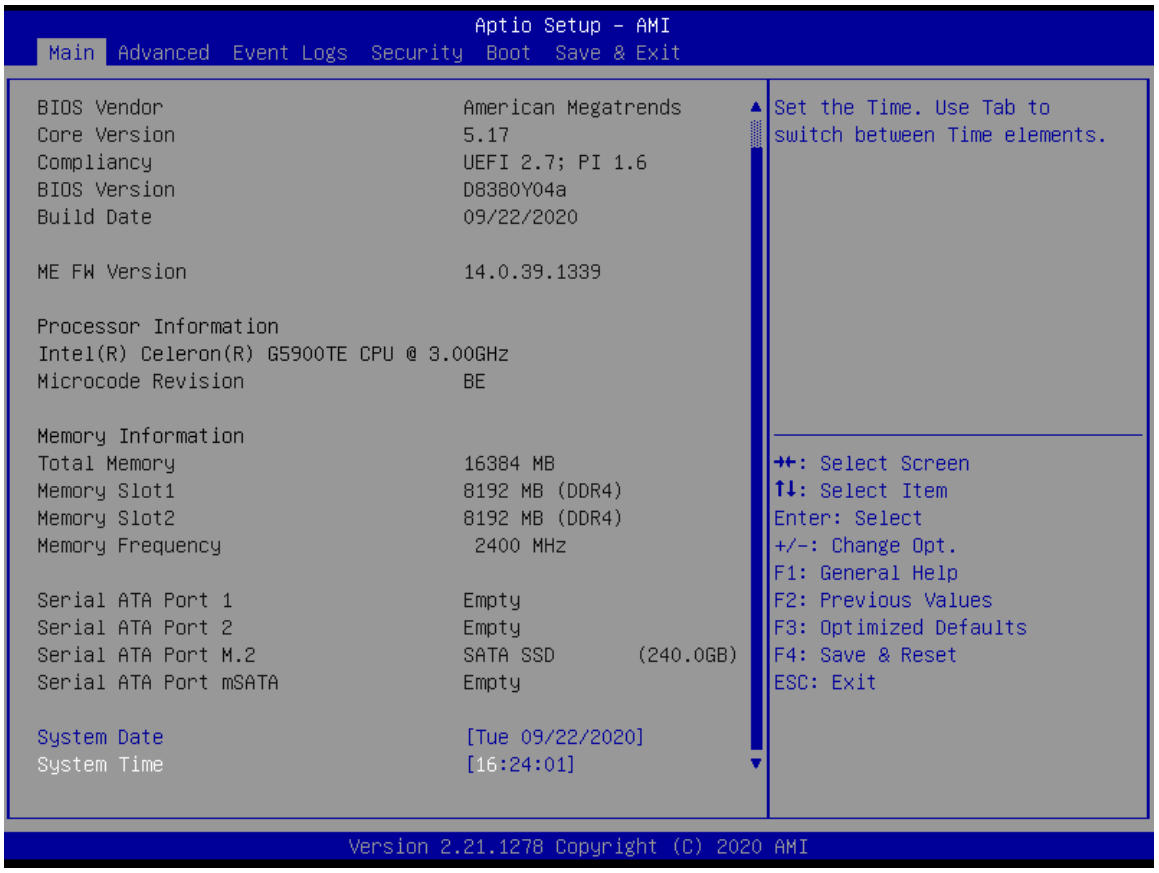
P1: 3pin terminal connector (Pin1:12v; Pin2:NC; Pin3:GND) for 12V input
P2: 4pin 12V connector for CPU power
P3: 24pin ATX connector
P4: SATA Power
P5: SATA Power

MITAC Desktop Board PH13CMI

BIOS Specification

1 MAIN PAGE


Aptio Setup – AMI
Main Advanced Event Logs Security Boot Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 5.17
Compliancy UEFI 2.7; PI 1.6
BIOS Version D8380Y04a
Build Date 09/22/2020
ME FW Version 14.0.39.1339
Processor Information
Intel(R) Celeron(R) G5900TE CPU @ 3.00GHz
Microcode Revision BE
Memory Information
Total Memory 16384 MB
Memory Slot1 8192 MB (DDR4)
Memory Slot2 8192 MB (DDR4)
Memory Frequency 2400 MHz
Serial ATA Port 1 Empty
Serial ATA Port 2 Empty
Serial ATA Port M.2 SATA SSD (240.0GB)
Serial ATA Port mSATA Empty
System Date [Tue 09/22/2020]
Set the Date. Use Tab to switch between Date elements.
Default Ranges:
Year: 1998-9999
Months: 1-12
Days: Dependent on month
Range of Years may vary.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Reset
ESC: Exit
Version 2.21.1278 Copyright (C) 2020 AMI



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

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

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

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

Field Name	**Memory Slot1**
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**
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 Frequency**
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**
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**
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.

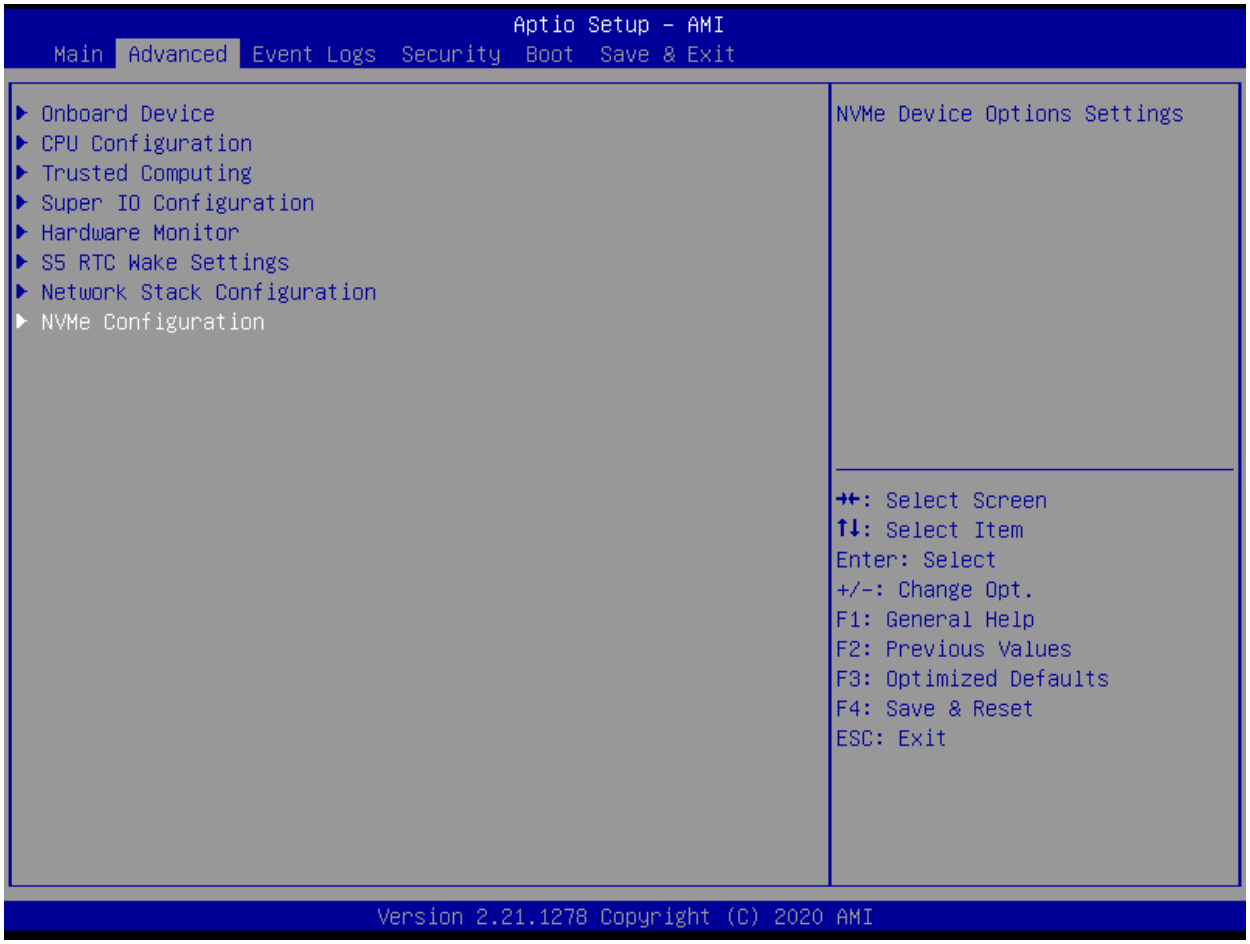
Field Name	**Serial ATA Port M.2**
Value	Display the installed SATA device model/size of port 3.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Serial ATA Port mSATA**
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	**System Date**
Default Value	[Www mm/dd/yyyy]
Possible Value	Www : Mon/Tue/Wed/Thu/Fri/Sat/Sun mm : 1-12 dd : 1-31
Help	Set the Date. Use Tab to switch between Date elements. Default Rangers: Year : 1998-9999 Months : 1-12

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

2 ADVANCED 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	**Hardware Monitor**
Help	Monitor hardware status
Comment	Press Enter when selected to go into the associated Sub-Menu.

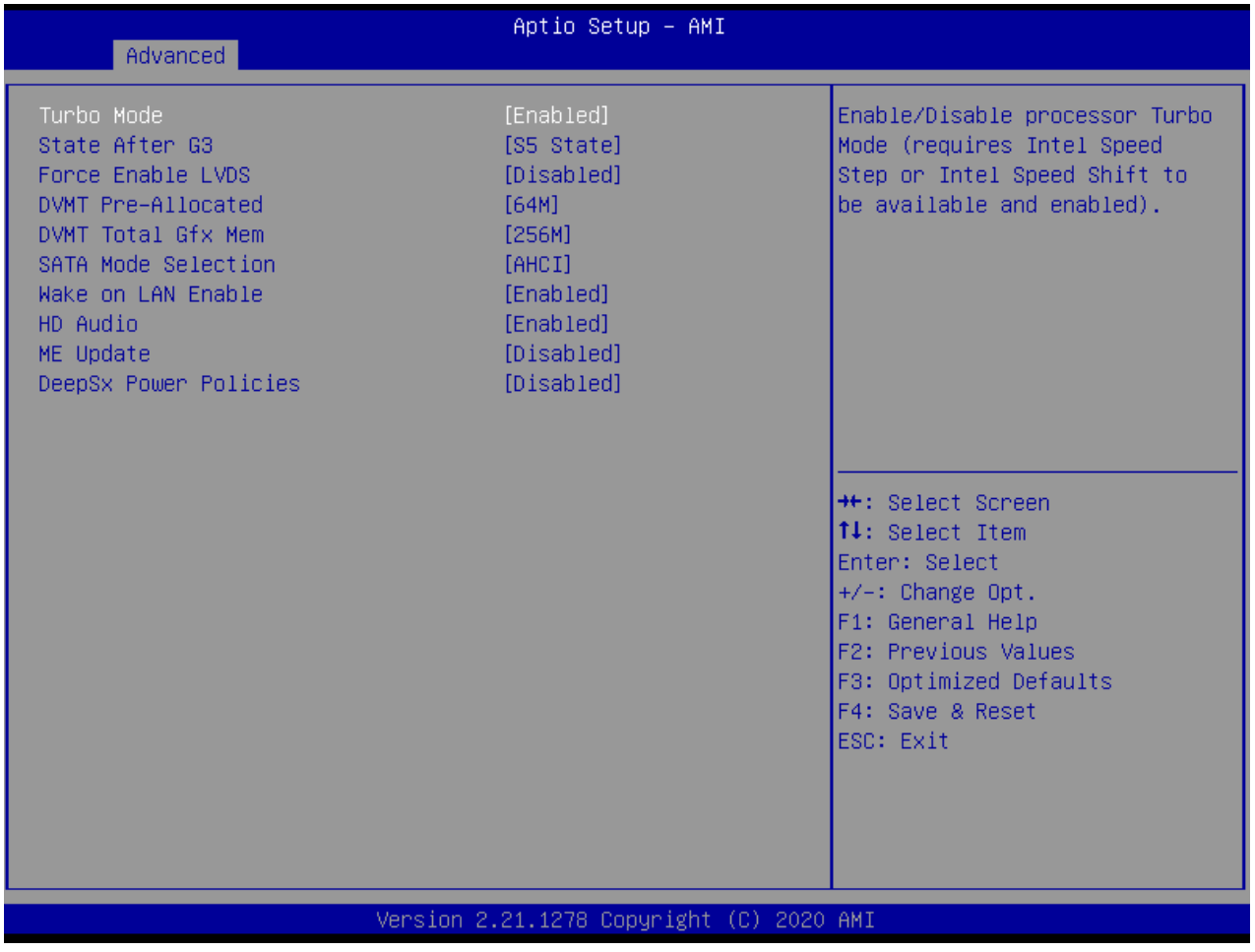
Field Name	**S5 RTC Wake Settings**
Help	Enable system to wake from S5 using RTC alarm
Comment	Press Enter when selected to go into the associated Sub-Menu.

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

2.1 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	**Force Enable LVDS**
Default Value	[Disabled]
Possible Value	Enabled
Help	Force Enable LVDS. Enabled:Enable LVDS whether plug correct panel

Field Name	**DVT Pre-Allocated**
Default Value	[64M]
Possible Value	64M 32M/F7
	40M 44M 48M 52M
Help	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by

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

Field Name	**SATA Mode Selection**

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**
Value	[Not RST Controlled]
Possible Value	Not RST Controlled / RST Controlled
Help	Enable/Disable RST Pcie Storage Remapping.

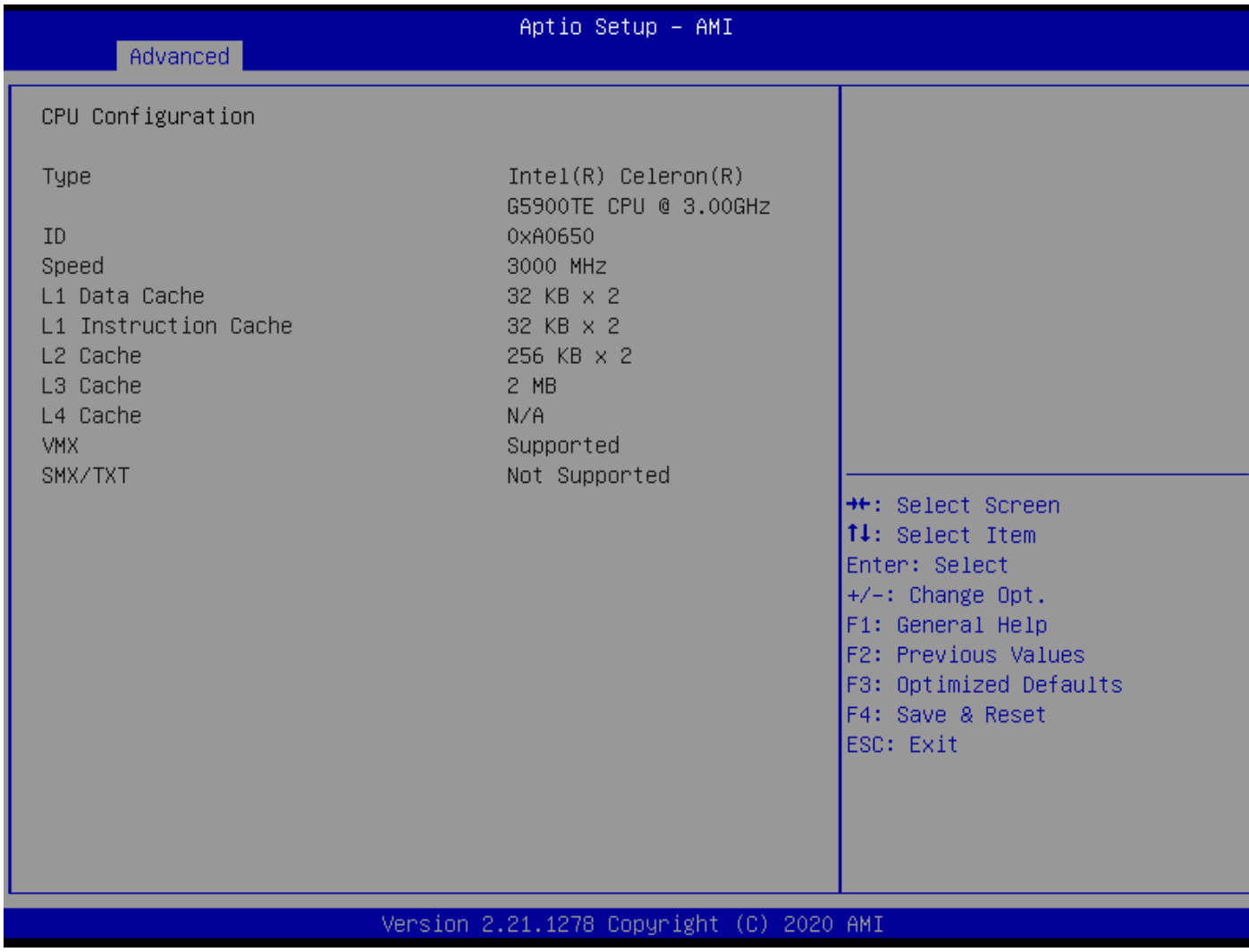
Field Name	**Wake on LAN Enable**
Default Value	[Enabled]
Possible Value	Enabled
Help	Enable/Disable integrated LAN to wake the system.

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

Field Name	**ME Update**
Default Value	[Disabled]
Possible Value	Enabled
Help	Temporary disable Intel CSME for ME FW Update. Enabled = Intel

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

2.2 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.

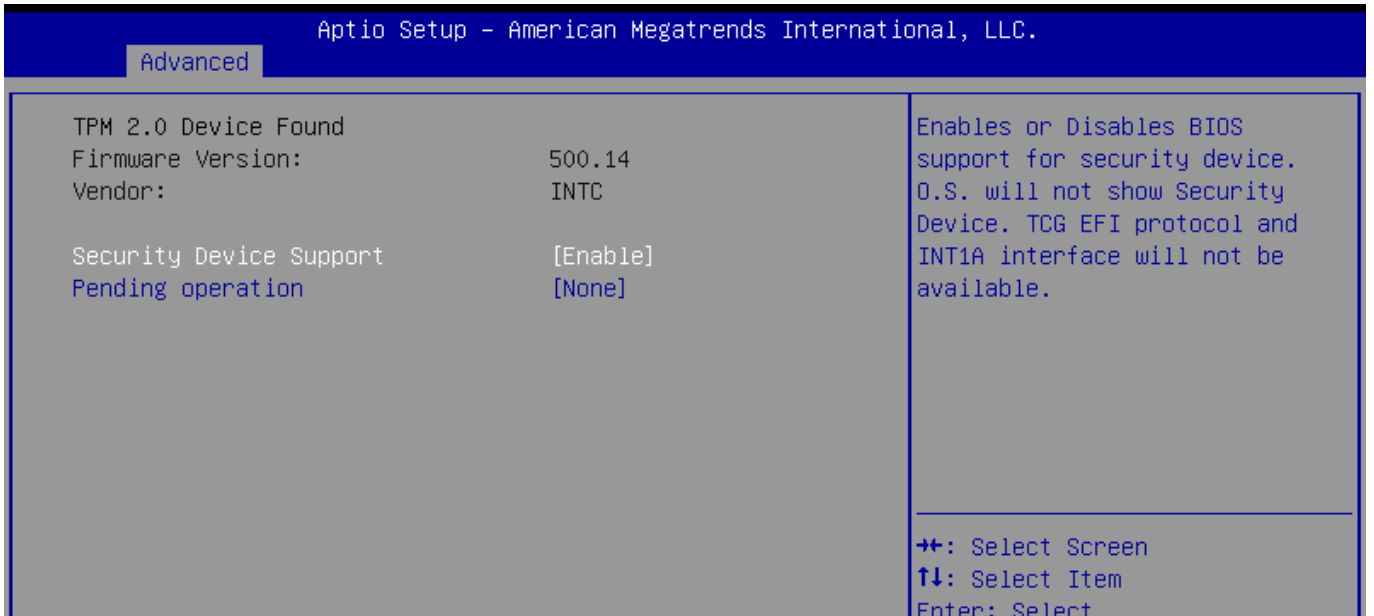
Field Name	**L3 Cache**
Default Value	L3 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

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	**VMX**
Default Value	VMX Supported or Not
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.

2.3 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	**Vender**
Default Value	TPM module vender 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

Help	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not

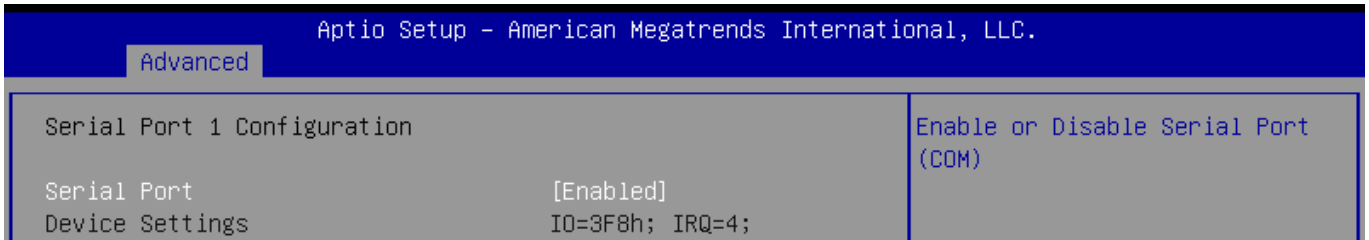
Field Name	**Pending operation**
Default Value	[None]
Possible Value	None
Help	Schedule an Operation for the Security Device. NOTE: Your Computer

2.4 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.

2.4.1 Serial Port 1 Configuration



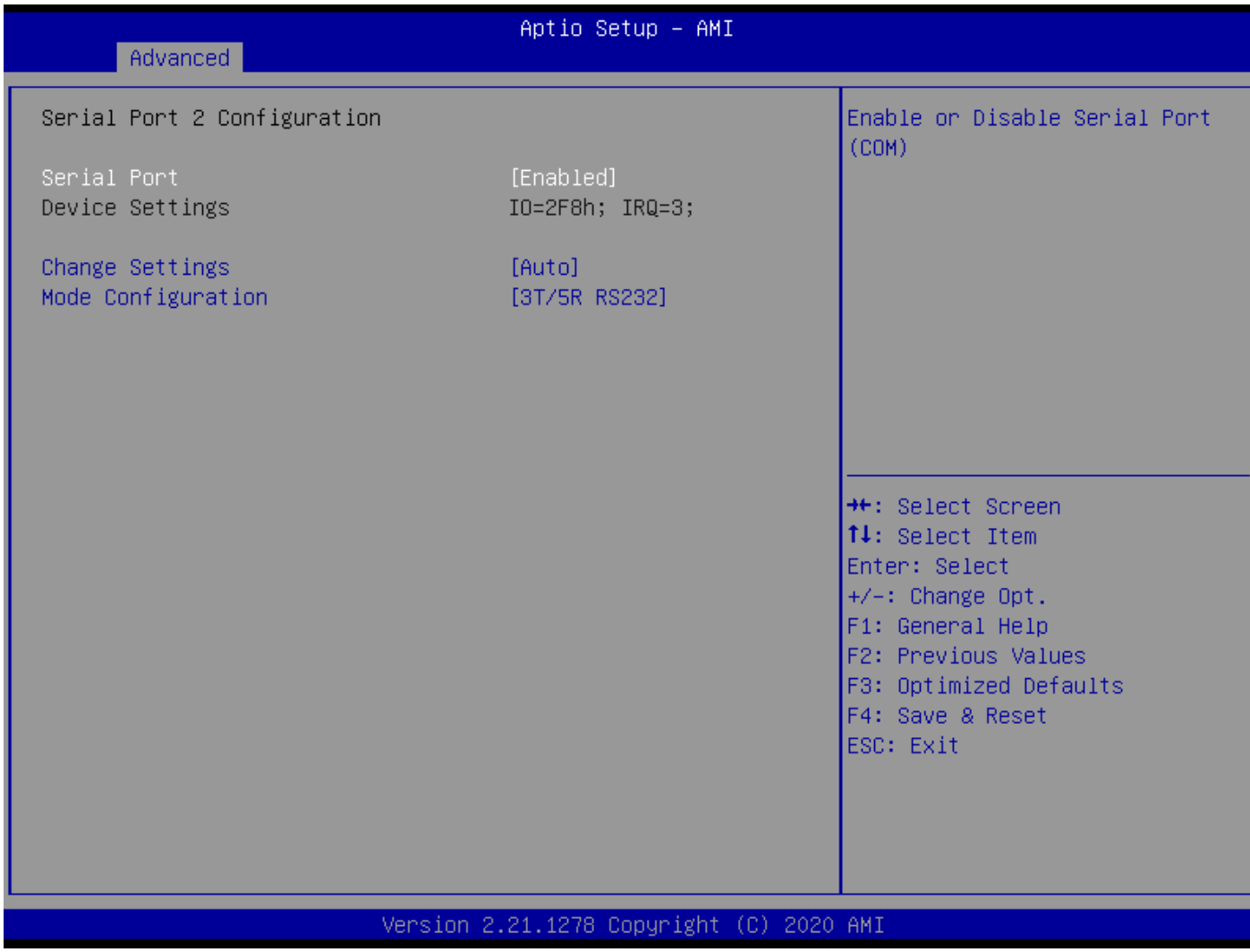
Field Name	**Serial Port**

Default Value	[Enabled]
Possible Value	Disabled
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;
Help	Select an optimal settings for Super IO Device

2.4.2 Serial Port 2 Configuration



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

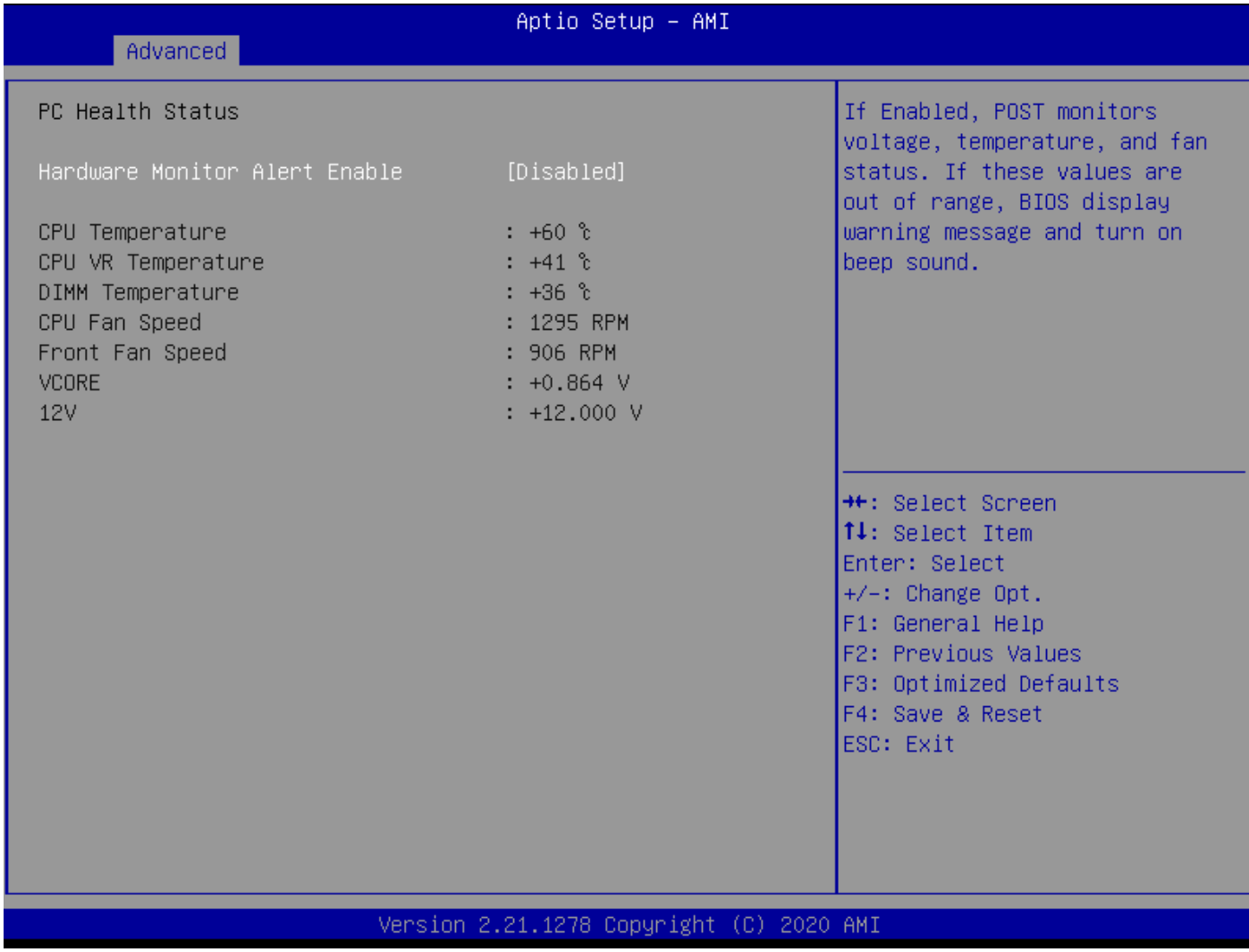
Field Name	**Device Settings**
Default Value	Device Super IO COM2 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

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;
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;
Help	Select an optimal settings for Super IO Device

2.5 HARDWARE MONITOR



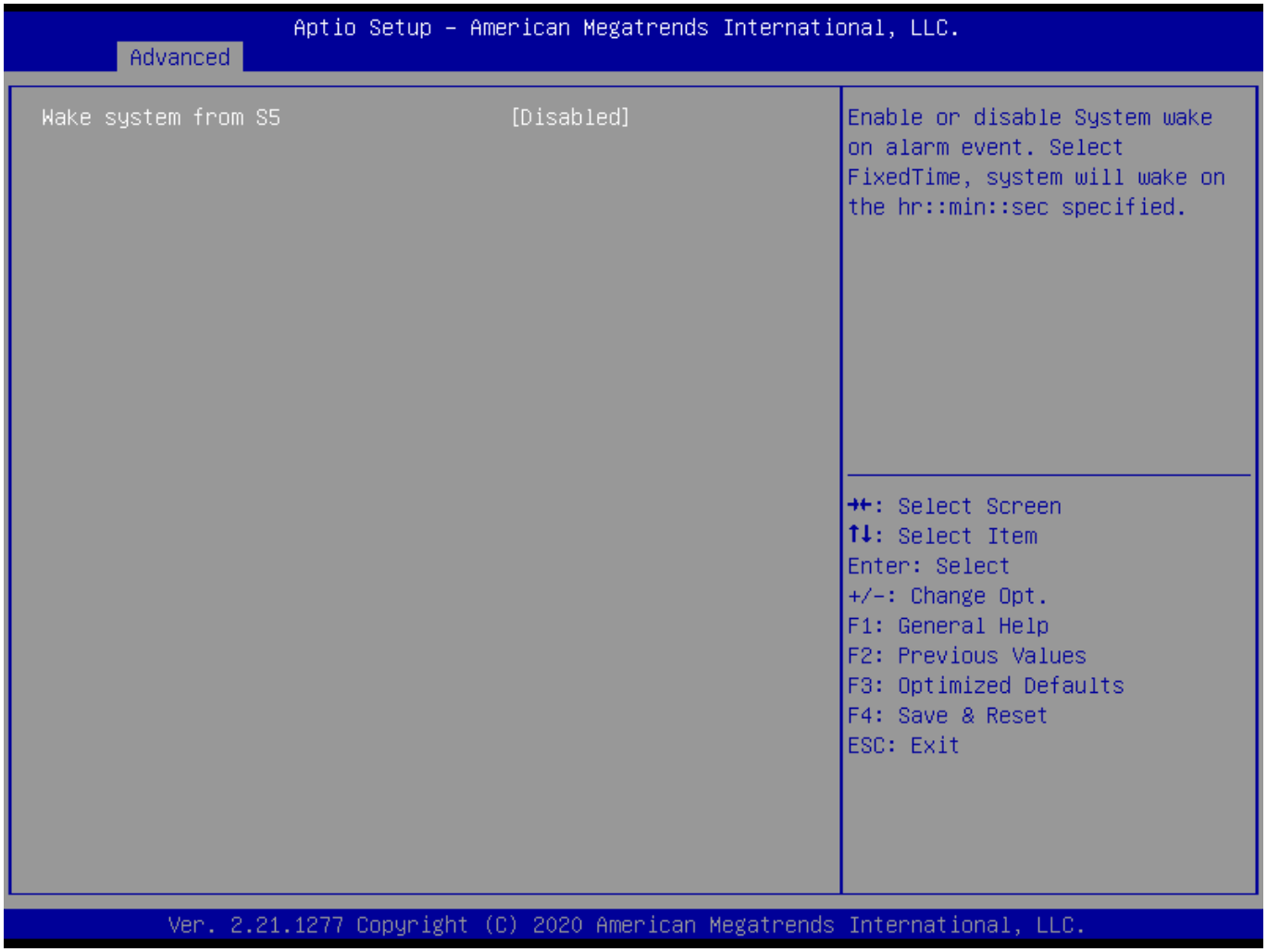
Type	Range
CPU Temperature	-20 ~ (By Processor Tjmax) °C
CPU VR Temperature	-20 ~ 120 °C
DIMM Temperature	-20 ~ 120 °C
CPU Fan Speed	There are many kinds of the fan could be installed into the syste so we could only set 0 RPM for the failed fan speed, and there is also
Front Fan Speed	
CPU Vcore	0~1.52V
12V	11.4~12.6V

Field Name	Hardware Monitor Alert Enable
Default Value	[Disabled]
Possible Value	Enabled

Help	If Enabled, POST monitors voltage, temperature, and fan status. If these values are out of range, BIOS display warning message and tur

Field Name	System Fan Enable **(Suppressed if Hardware Monitor Alert is**
Default Value	[Disabled]
Possible Value	Enabled
Help	If Enabled, POST monitors system fan status. If this values is out of

2.6 S5 RTC WAKE SETTINGS



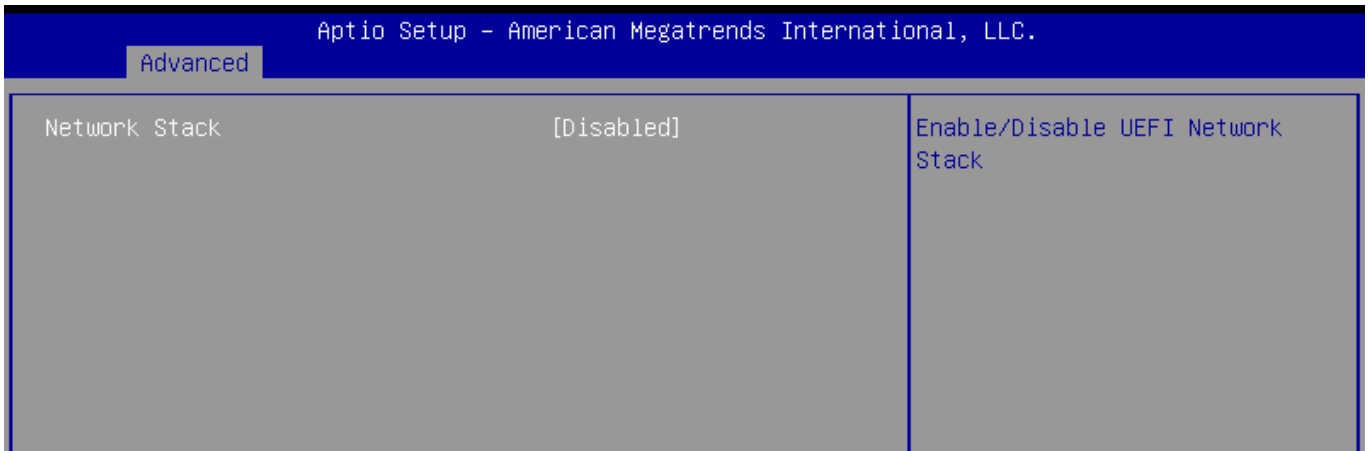
Field Name	Wake system from S5
Default Value	[Disabled]
Possible Value	Disabled
Help	Enable or disable System wake on alarm event, Select FixedTime,

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 minute(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 second(Show when Wake system from S5 set to Fixed
Default Value	0
Possible Value	0 - 59
Help	Select 0 – 59 for Second

2.7 NETWORK STACK CONFIGURATION

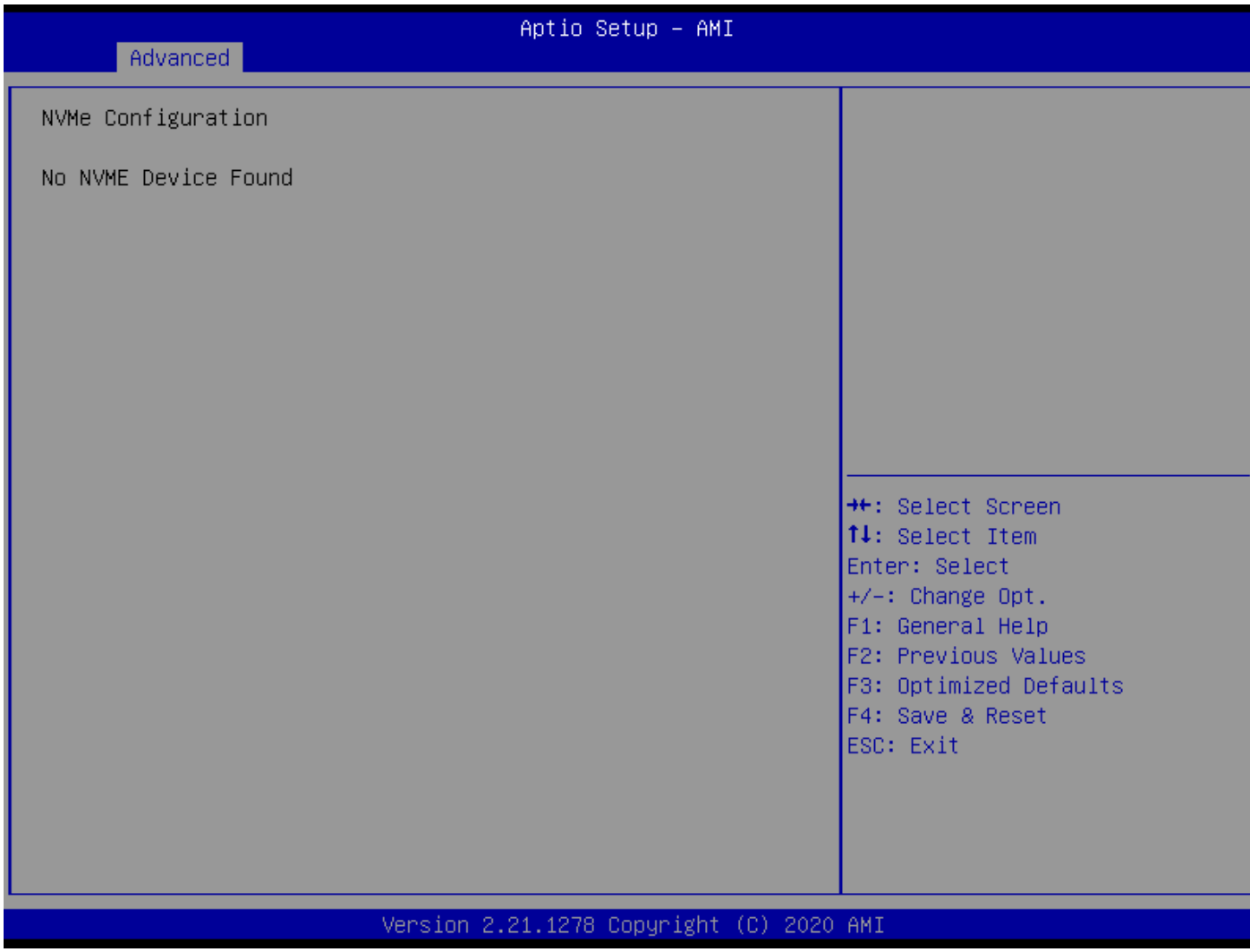


Field Name	**Network stack**
Default Value	[Disabled]
Possible Value	Disabled
Help	Enable/Disable UEFI Network stack.

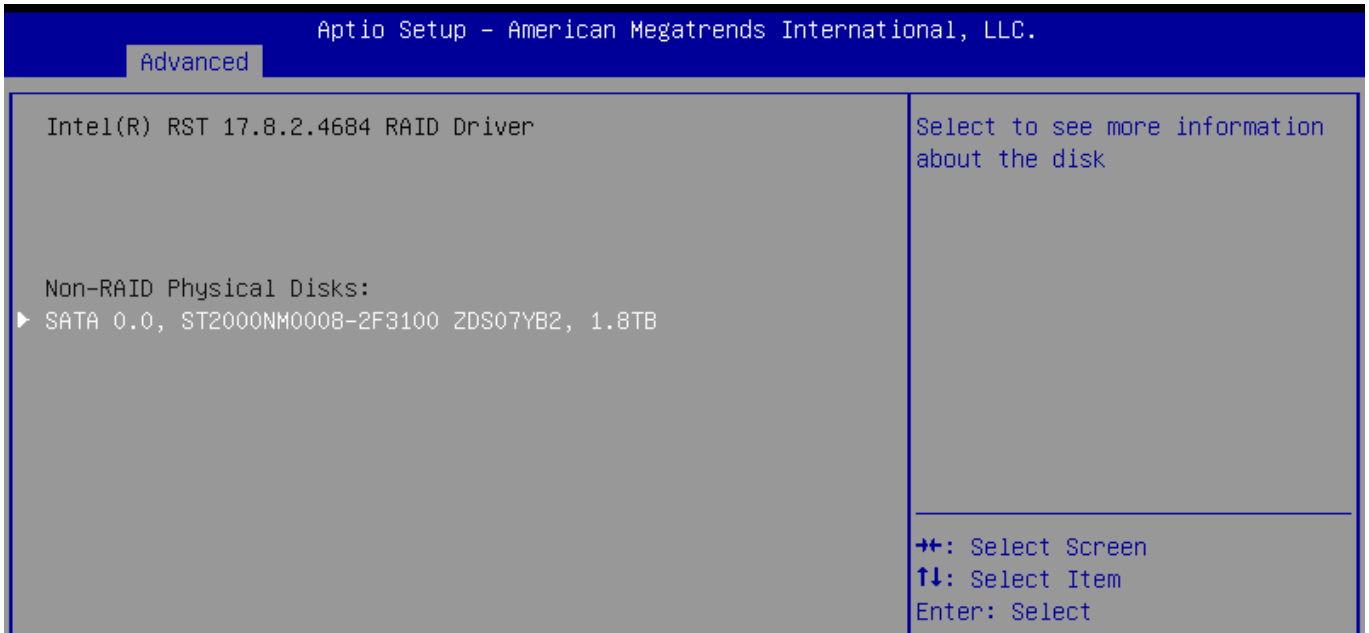
Field Name	**Ipv4 PXE Support (Available when Network stack Enabled)**
Default Value	[Disabled]
Possible Value	Disabled
Help	Enable/Disable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot

Field Name	**Ipv6 PXE Support (Available when Network stack Enabled)**
Default Value	[Disabled]
Possible Value	Disabled
Help	Enable/Disable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot

2.8 NVME CONFIGURATION



2.9 INTEL (R) RAPID STORAGE TECHNOLOGY

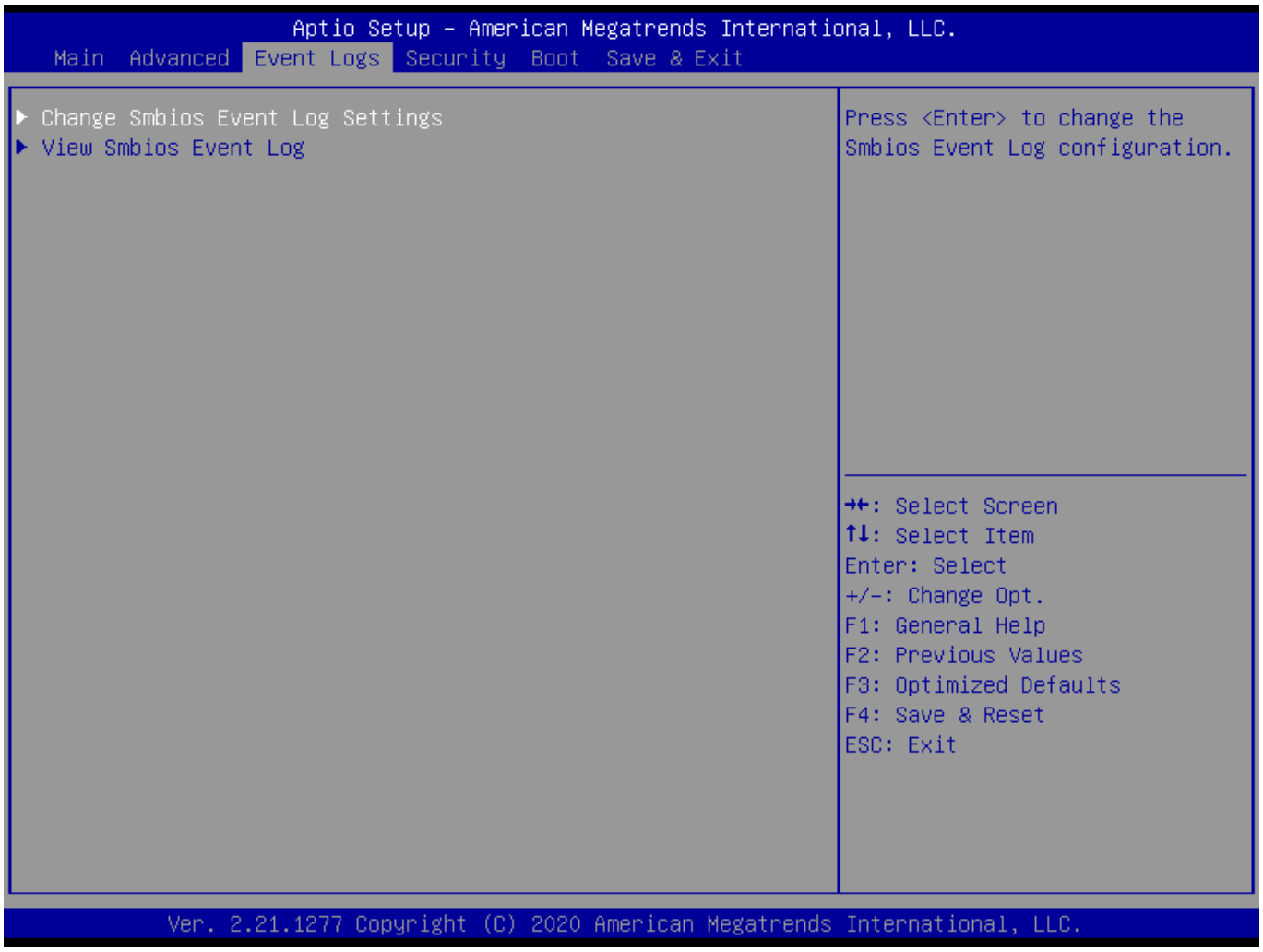


Field Name	**Create RAID Volume**
Help	This page allows you to create a RAID volume.

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.

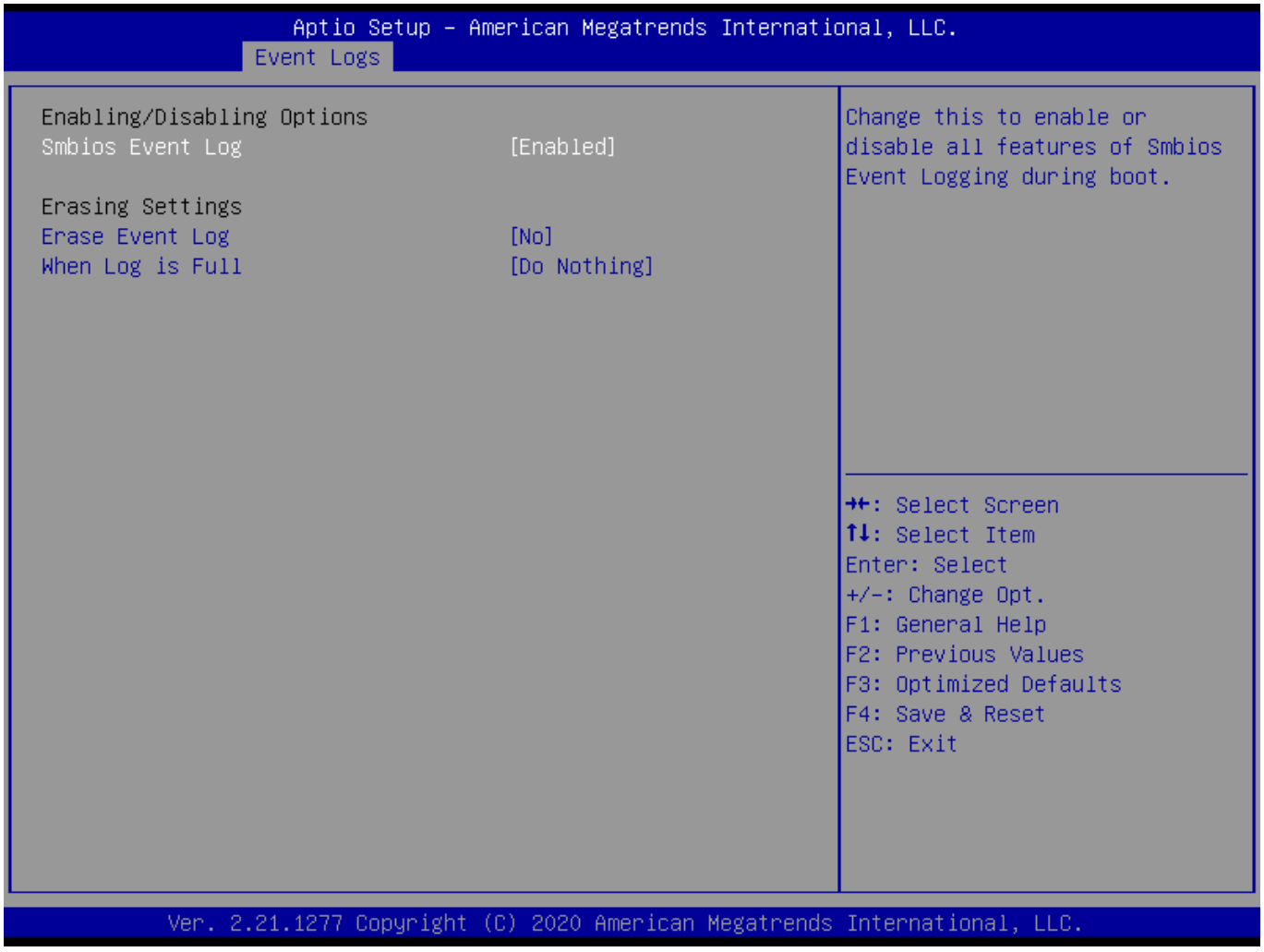
3 EVENT LOGS


Aptio Setup – American Megatrends International, LLC.
Main Advanced Event Logs Security Boot Save & Exit
Change Smbios Event Log Settings
View Smbios Event Log
Press <Enter> to change the Smbios Event Log configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Reset
ESC: Exit
Ver. 2.21.1277 Copyright (C) 2020 American Megatrends International, LLC.

Field Name	**Change Smbios Event Log Settings**
Help	Press <Enter> 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 <Enter> to view the Smbios Event Log records.
Comment	Press Enter when selected to go into the associated Sub-Menu.

3.1 CHANGE SMBIOS EVENT LOG SETTINGS

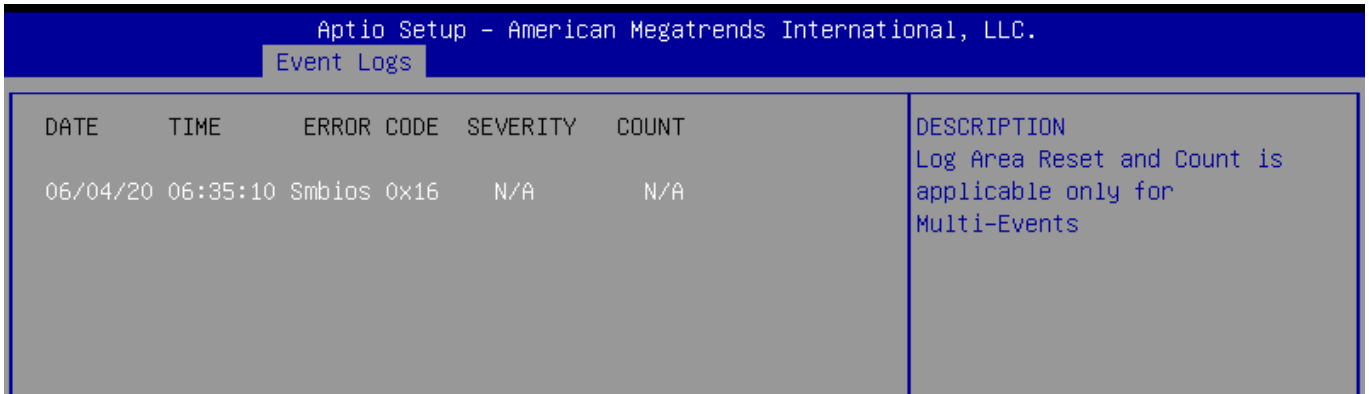


Field Name	**Smbios Event Log**
Default Value	[Enabled]
Possible Value	Enabled
Help	Change this to enable or disable all feature of Smbios Event Logging

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

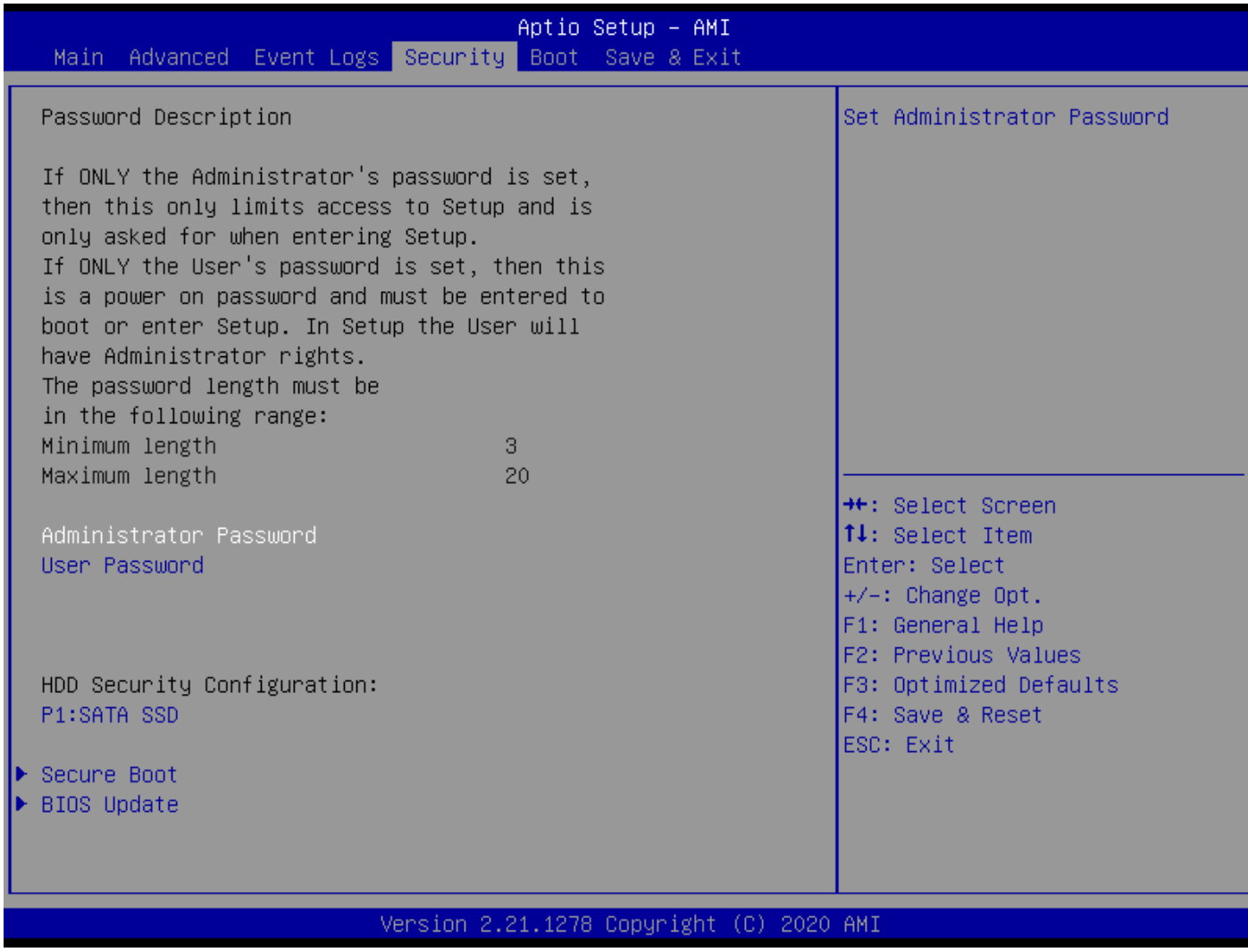
Field Name	**Whea Log is Full**
Default Value	[Do Nothing]
Possible Value	Do Nothing
Help	Choose options for reactions to a full Smbios Event Log.

3.2 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.

1 SECURITY PAGE



Field Name	**Administrator Password**
Help	Set Administrator Password

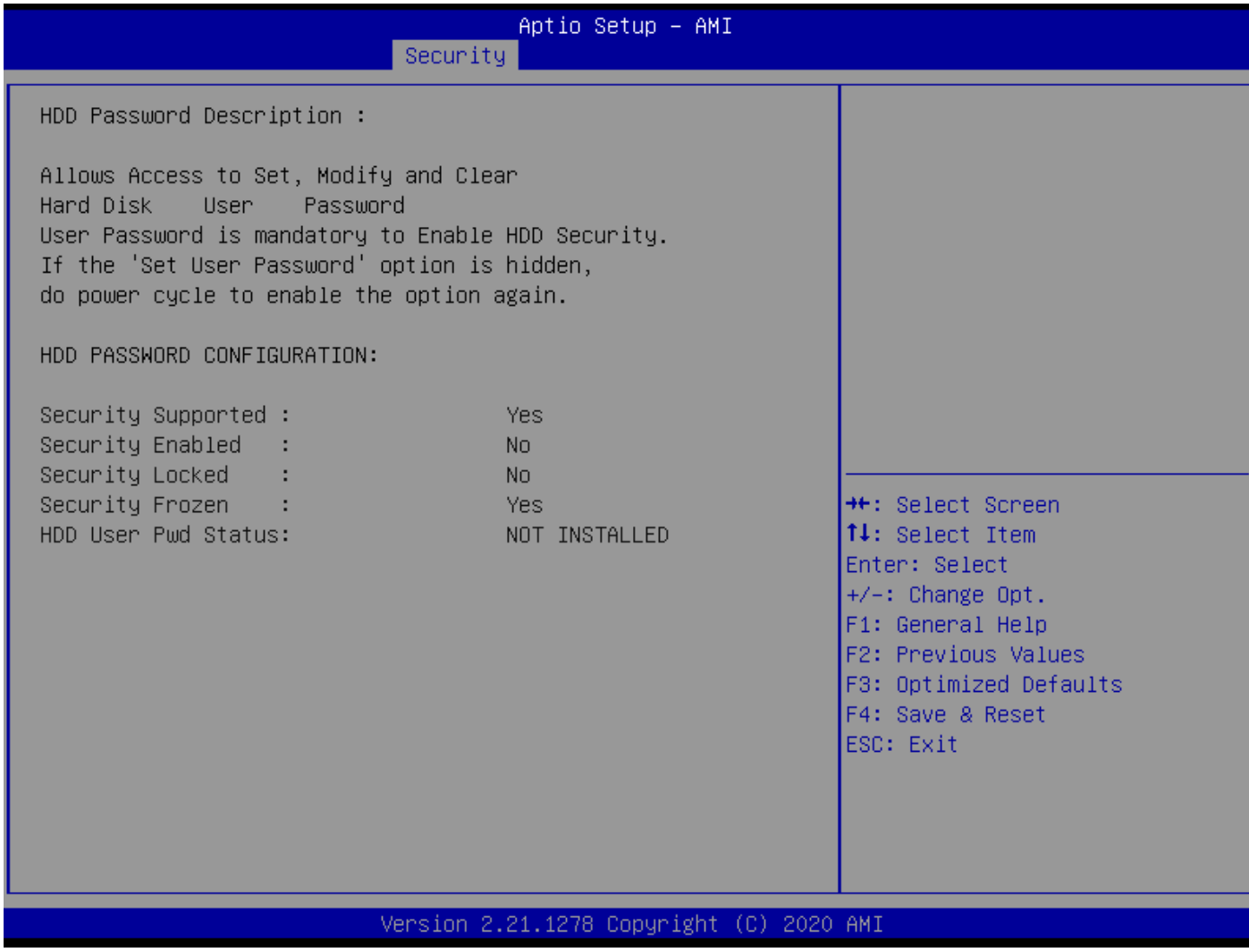
Field Name	**User Password**
Help	Set User Password.

Field Name	**Secure Boot**
Help	Secure Boot Configuration
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.

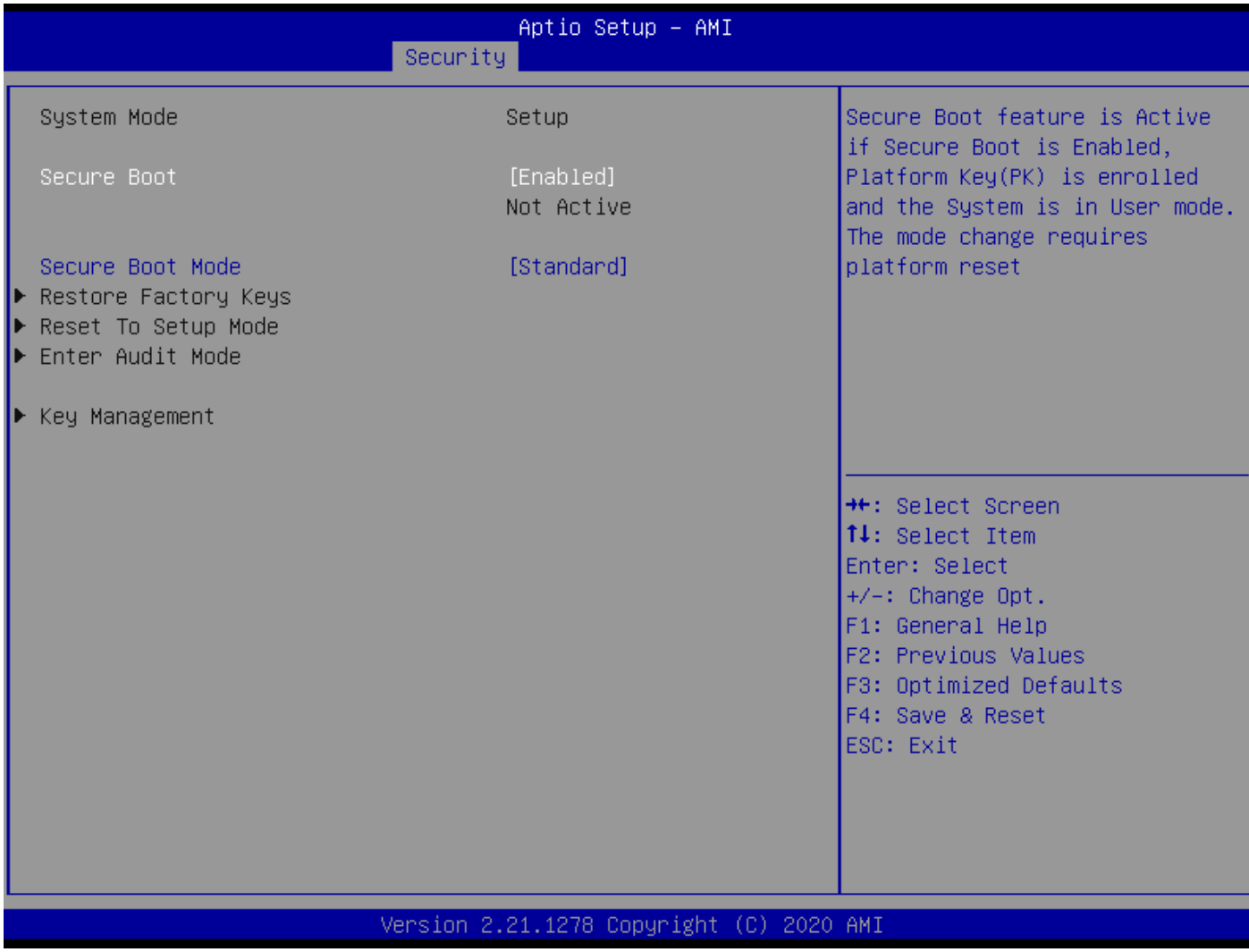
1.1 HDD SECURITY



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 impac on HDD when password is set or removed. If the 'Set HDD User Password' option is

1.2 SECURE BOOT



Field Name	**Secure Boot**
Default Value	[Enabled]
Possible Value	Enabled
Help	Secure Boot feature is Active if Secure Boot is Enabled,Platform Key(PK) is enrolled

Field Name	**Secure Boot Mode**
Default Value	[Standard]

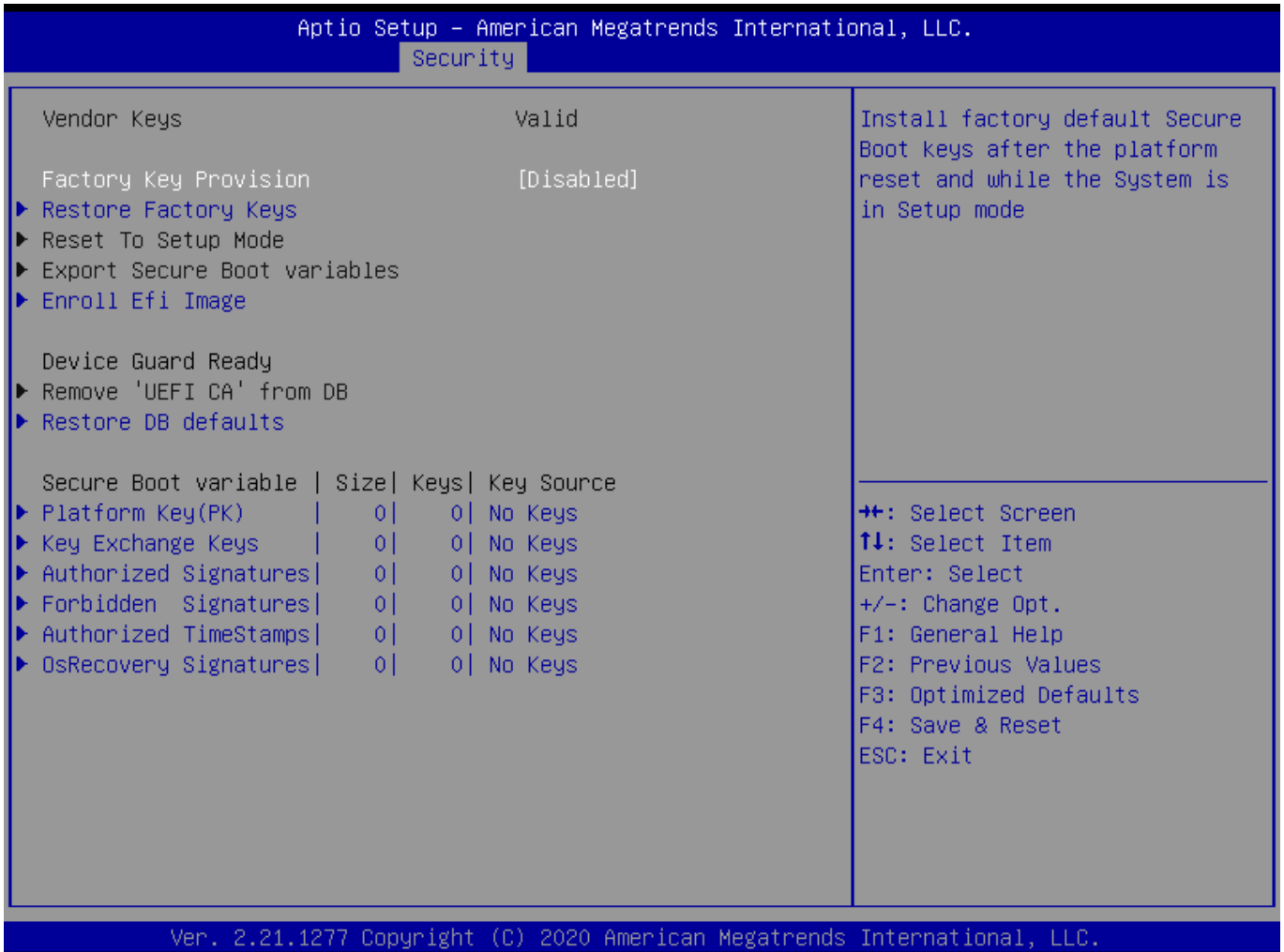
Possible Value	Standard
Help	Secure Boot mode options:Standard or Custom.In Custom mode, Secure Boot Policy

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
Comment	Enables expert users to modify Secure Boot Policy variables without full

1.2.1 Key Management



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

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

Field Name	**Enroll Efi Image**
Help	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE

Field Name	**Remove 'UEFI CA' from DB**
Help	Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in

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

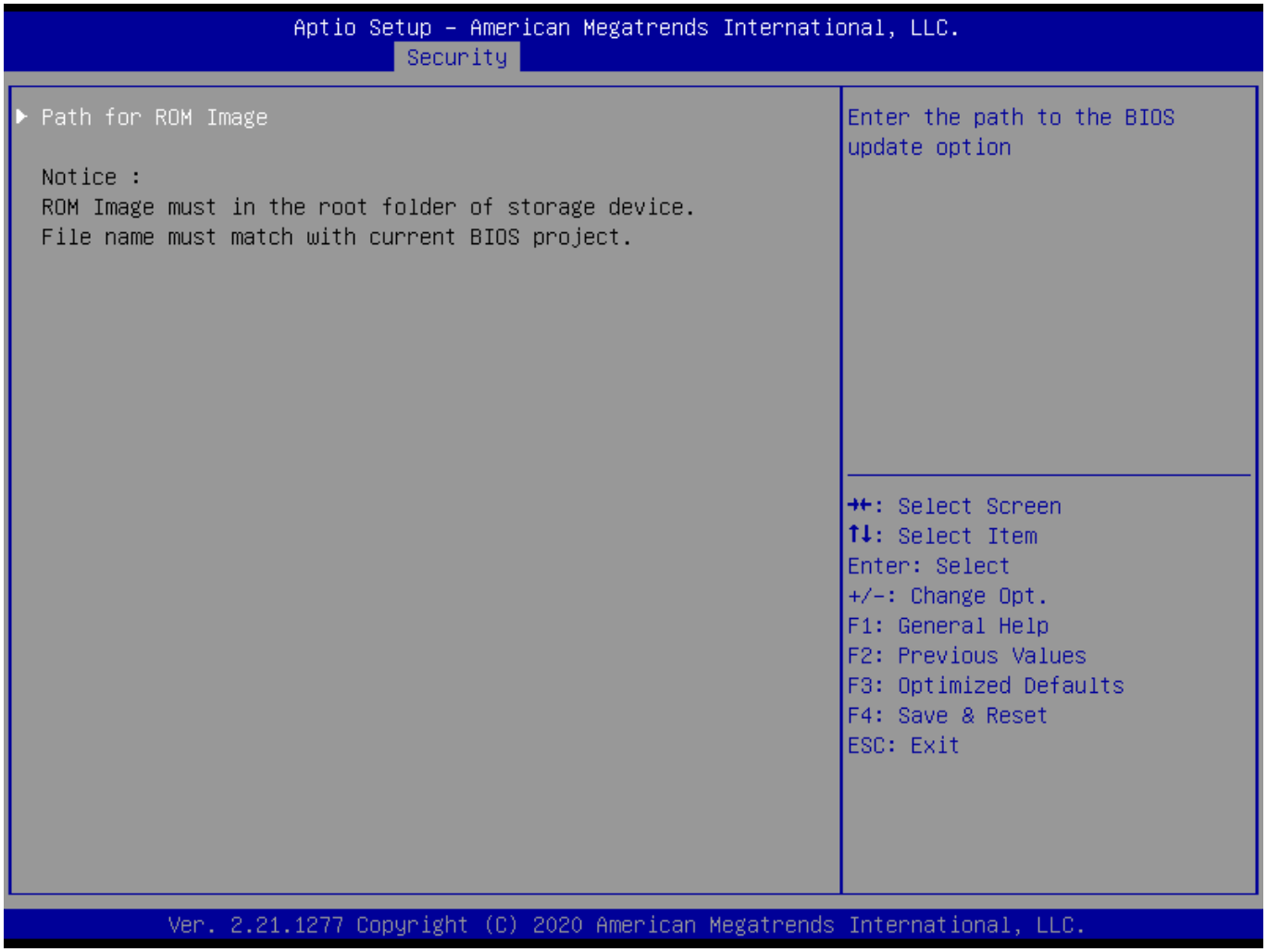
Field Name	**Forbidden Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable
comment	Press 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
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

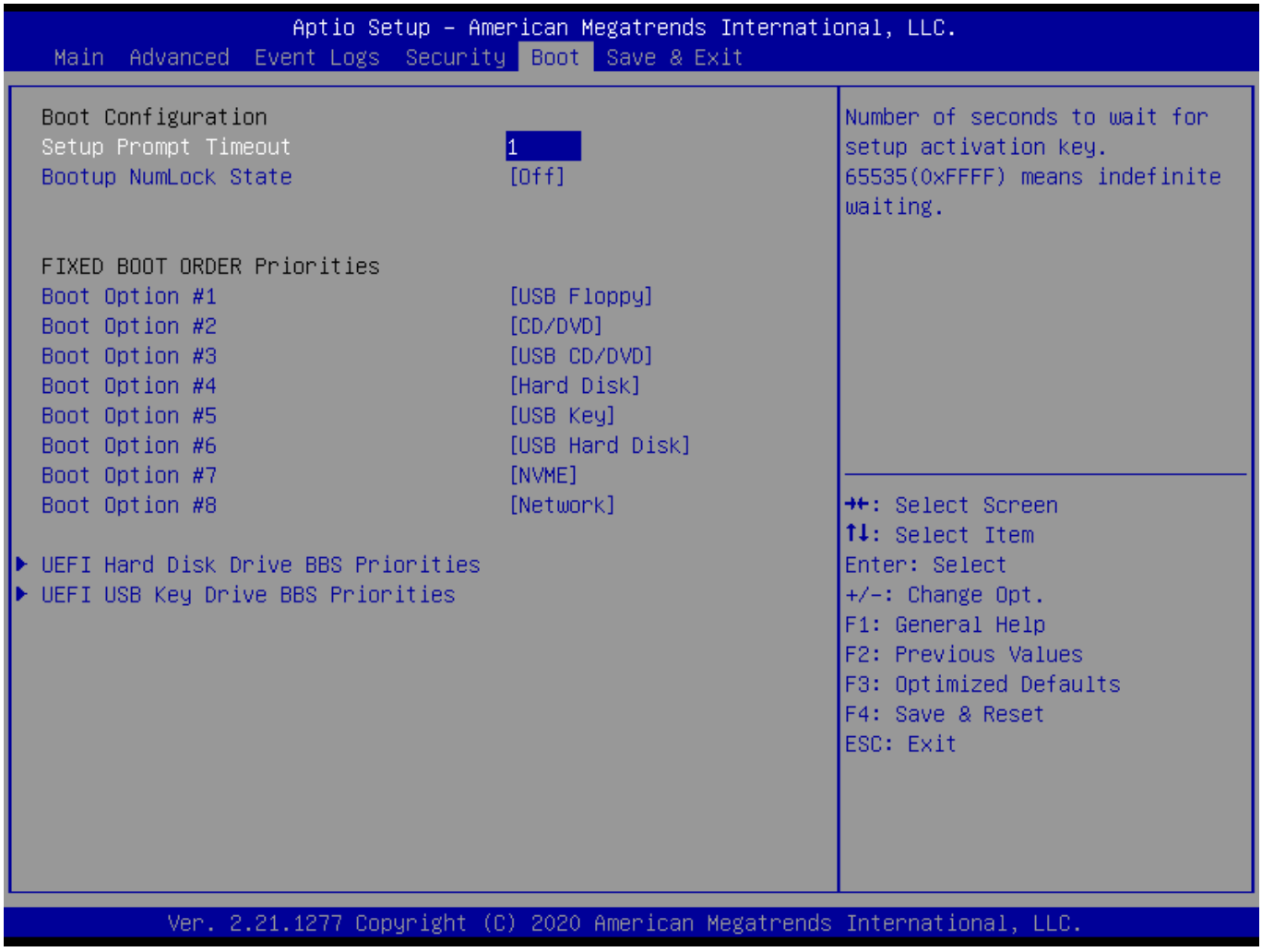
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX
comment	Press Enter when selected to go into the associated Sub-Menu.

1.3 BIOS UPDATE



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

2 BOOT PAGE



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

Field Name	**Bootup NumLock State**
Default Value	[Off]
Possible Value	On
Help	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
Help	Sets the system boot order

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

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

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

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

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

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

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

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

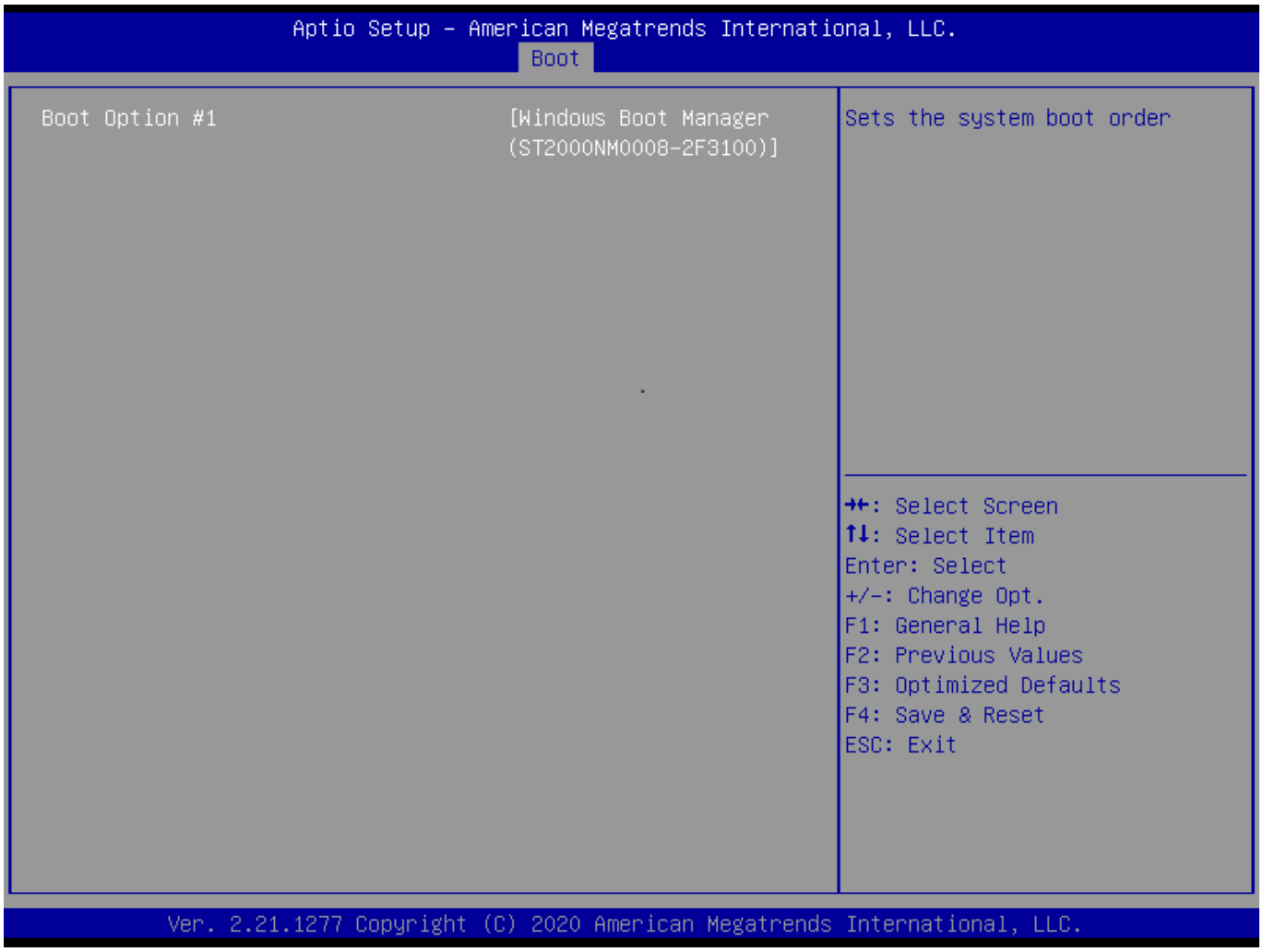
Field Name	**(UEFI) USB KEY Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available USB Key
Comment	Press Enter when selected to go into the associated Sub-Menu.

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

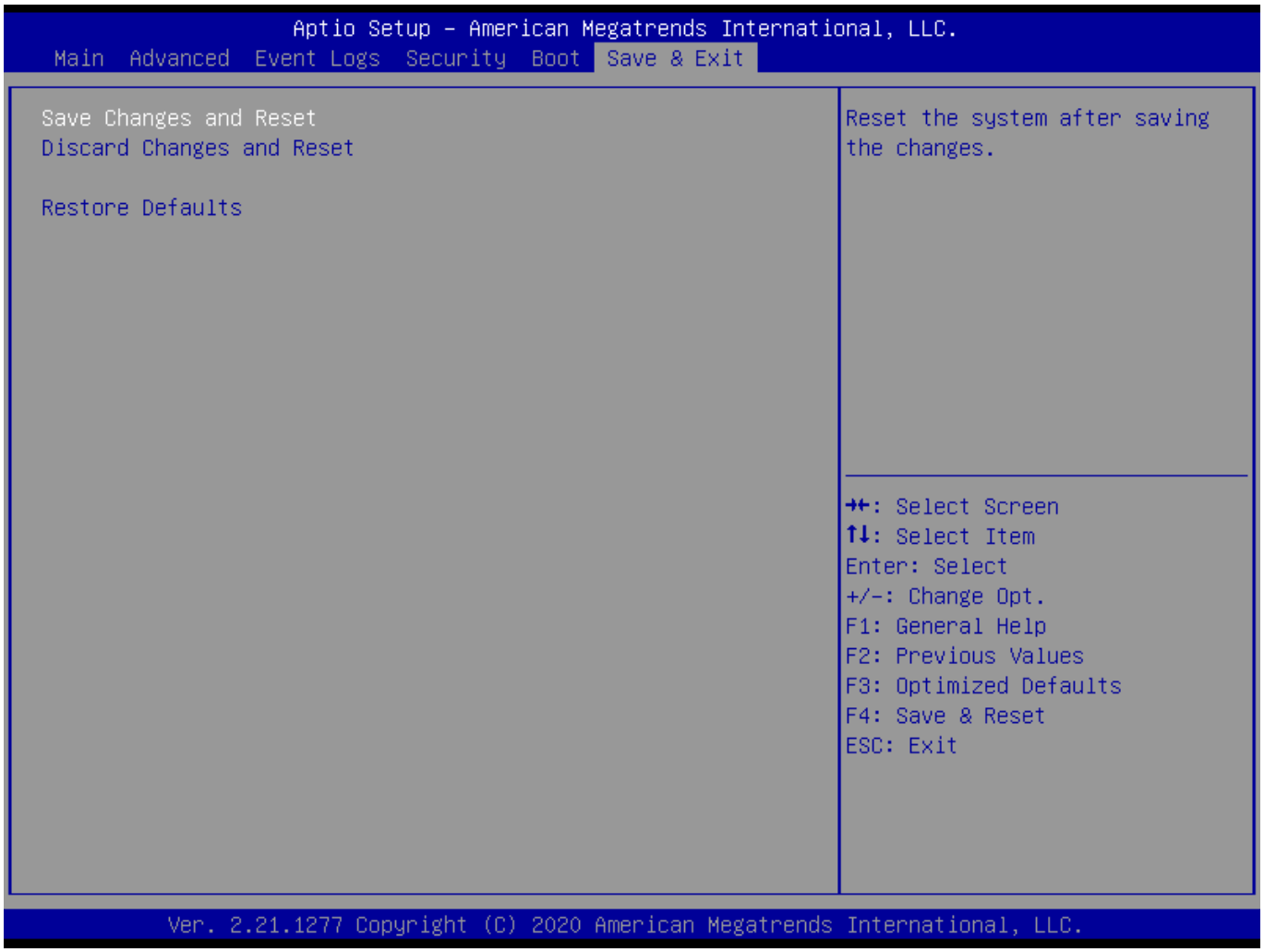
Field Name	**(UEFI) NETWORK Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available NETWOR
Comment	Press Enter when selected to go into the associated Sub-Menu.

2.1 (LIST BOOT DEVICE TYPE) DRIVE BBS PRIORITIES


Aptio Setup – American Megatrends International, LLC.
Boot
Boot Option #1
[Windows Boot Manager (ST2000NM0008-2F3100)]
Sets the system boot order
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Reset
ESC: Exit
Ver. 2.21.1277 Copyright (C) 2020 American Megatrends International, LLC.

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

3 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.