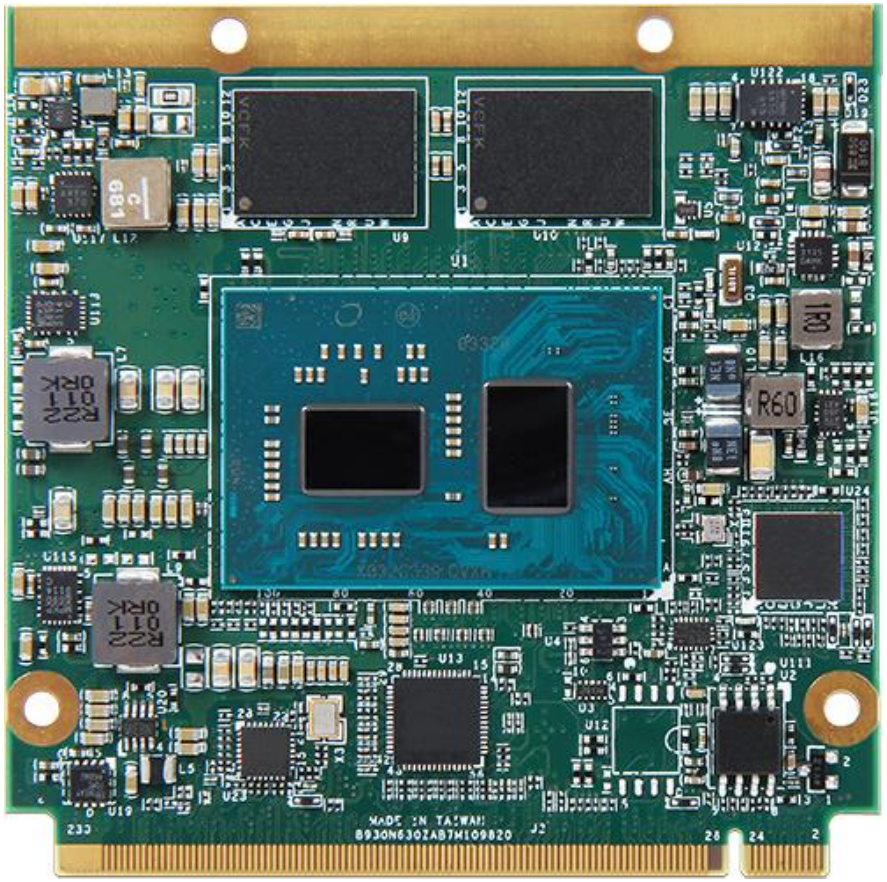

Qseven
PQ7-M109
User's Guide Revision 0.2
(Preliminary)

Revision History

R0.1	- Preliminary
R0.2	- Update spec table - Update processor list - Update Windows OS driver revision - Update ordering guide - Update BIOS setup

Table of Contents

List of Tables

List of Figures

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1 Introduction

PQ7-M109, Mitwell's new Qseven Module product, the successor of PQ7-M109. Qseven is an Industrial Computer-On-Module standard, there are two form factors, 70 x 70 mm and smaller form factor 70 x 40 mm which known as uQseven. The Qseven connector use total 230 edge fingers that mate with MXM connector. The PQ7-M109 is powered by Intel Elkhart Lake platform, a new generation of its predecessor, Apollo Lake. PQ7-M109 has many advantages such as better computing and graphics engine, 4K display (4096 x 2160 @ 60Hz) but no power consumption increase, TDP from 6W to 12W. PQ7-M109 has on-board 4G LPDDR4 to support data transfer speeds of up to 3200MHz, which is nearly 30% faster than previous generation. An on board eMMC device with few sizes is available for mass storage options.

2 Block Diagram

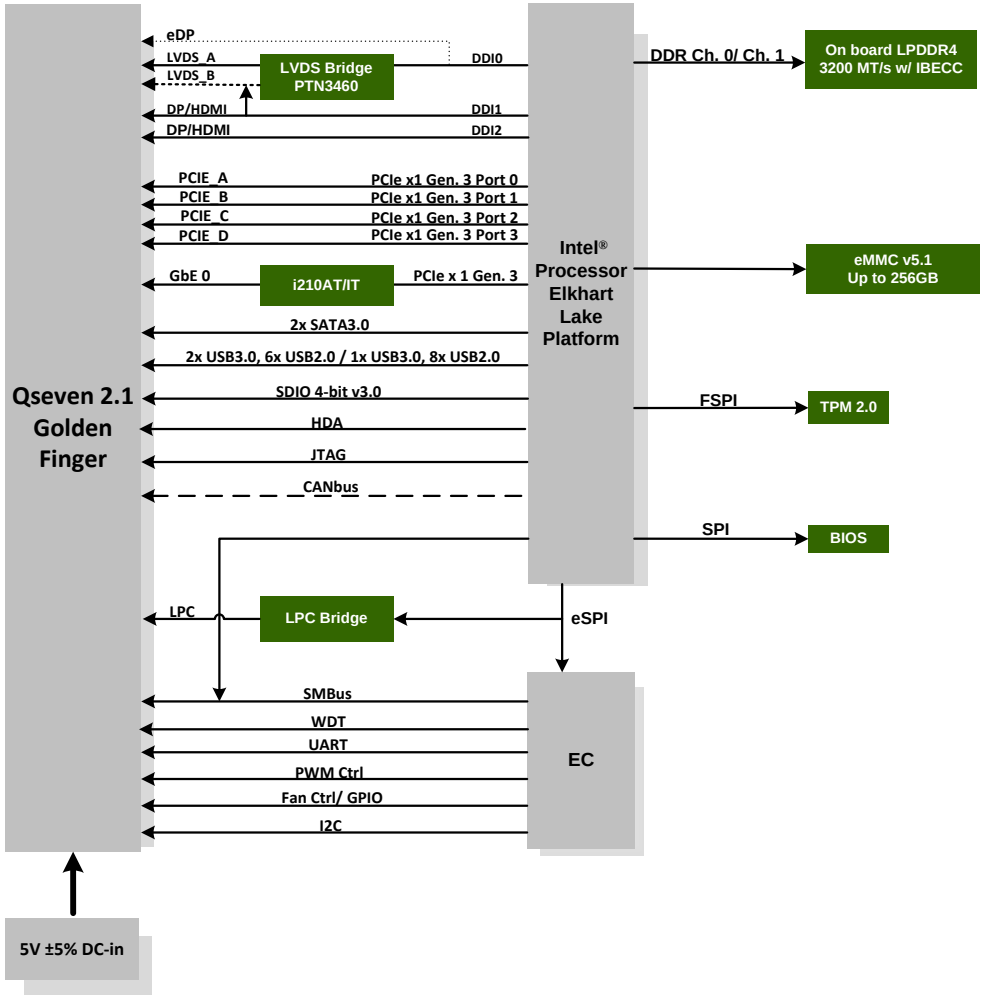


Figure 1 Block Diagram

3 Specifications

Product	➢ PQ7-M109
Form Factor	➢ Qseven v2.1 | 70 x 70mm / 2.76" x 2.76"
Processor	➢ Intel Celeron N6210 — 2x cores @ 1.2GHz/2.6 GHz, 1.5MB L2 cache, 6.5W TDP ➢ Intel Celeron J6412 — 4x cores @ 2.0GHz/2.6 GHz, 1.5MB L2 cache, 10W TDP ➢ Intel Atom x6425E — 4x cores @ 2.0GHz/3.0GHz, 1.5MB L2 cache, 12W TDP ➢ Intel Atom x6413E — 4x cores @ 1.5GHz/3.0GHz, 1.5MB L2 cache, 9W TDP ➢ Intel Atom x6211E — 2x cores @ 1.3GHz/3.0 GHz, 1.5MB L2 cache, 6W TDP (See below section for processor list)
BIOS	➢ AMI Aptio5 BIOS
Memory	➢ On Board LPDDR4, In Band-ECC ➢ 2GB | 4GB | 8GB
Storage	➢ On Board eMMC v5.1 ➢ 8GB | 16GB | 32GB | 64GB
Graphics Options	➢ Single/Dual channel LVDS 24 bit (1920x1200 @ 60Hz) * ➢ eDP 1.3 (4096 x 2160p @ 60Hz) (signal shared with LVDS by BOM select) ➢ DP 1.4 8K (7680×4320) @ 30Hz or 4K (4096x2160) @ 60Hz * ➢ HDMI 2.0b up to 4K(4096×2160) @60Hz (signal shared with DP by jumper or active

	connector on carrier) Note: * as default setting
Ethernet	➢ GbE ; Intel I210-AT/IT
Audio	➢ Intel® High Definition Audio
Serial IO	➢ LPC ➢ I2C ➢ Serial Ports (TX / RX) ➢ SMBus
PCI Express	➢ 4 PCI Express x1 Gen3 (8.0 GT/s)
USB	➢ 6 x USB2.0 (480 Mbps), 2 x USB3.0 (5 Gbps) * ➢ 8 x USB2.0 (480 Mbps), 1 x USD3.0 (5 Gbps) Note: * as default setting
SATA	➢ 2 x SATA3.0 (6 Gbps)
Power DC IN	➢ +5VDC ±5VD
Hardware Monitors	➢ ITE 5121 Embedded Controller, Voltage, Fan and Temperature
Power Management	➢ ACPI 5.0
Environment	➢ Operating Temperature 0 ° C ~ 70 ° C (processor dependent) ➢ Storage Temperature -40 ° C ~ +85 ° C ➢ Relative Humidity 0%~95%

Table 1 PQ7-M109 Specification

3.1 PQ7-M109 Processor & Chipset list

PQ7-M109 Processor List	Intel Atom® x6425E Processor	Intel Atom® x6413E Processor	Intel Atom® x6211E Processor	Intel® Celeron® Processor J6412	Intel® Celeron® Processor N6210
CPU Specifications					
# of Cores	4	4	2	4	2
# of Threads	4	4	2	4	2
Processor Base Frequency	2.00 GHz	1.50 GHz	1.30 GHz	2.0 GHz	1.20 GHz
Burst Frequency	3.00 GHz	3.00 GHz	3.00 GHz	2.6 GHz	2.6 GHz
Cache	1.5 MB L2 Cache	1.5 MB L2 Cache	1.5 MB L2 Cache	1.5 MB L2 Cache	1.5 MB L2 Cache
TDP	12 W	9 W	6 W	10 W	6.5 W
Memory Specifications					
Memory Types	LPDDR4/x 8GB/ 16GB, @3200MT/s	LPDDR4/x 8GB/ 16GB, @3200MT/s	LPDDR4/x 8GB/ 16GB, @3200MT/s	LPDDR4/x 8GB/ 16GB, @3200MT/s	LPDDR4/x 8GB/ 16GB, @3200MT/s
Max # of Memory Channels	4	4	4	4	4
ECC Memory Supported	No	No	No	No	No
Processor Graphics					
Processor Graphics	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors	Intel® UHD Graphics for 10th Gen Intel® Processors

Graphics Base Frequency	500 MHz	500 MHz	350 MHz	400 MHz	250 MHz
Graphics Burst Frequency	750 MHz	750 MHz	750 MHz	800 MHz	750 MHz
Graphics Output	eDP/DP/HDMI/MIPI-DSI	eDP/DP/HDMI/MIPI-DSI	eDP/DP/HDMI/MIPI-DSI	eDP/DP/HDMI/MIPI-DSI	eDP/DP/HDMI/MIPI-DSI
Execution Units	32	16	16	16	16
4K Support	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz	Yes, at 60Hz
Max Resolution (DP)/ (eDP - Integrated Flat Panel)‡	4096x2160@ 60Hz	4096x2160@ 60Hz	4096x2160@ 60Hz	4096x2160@ 60Hz	4096x2160@ 60Hz
# of Displays Supported	3	3	3	3	3
OpenCL* Support	Yes	Yes	Yes	Yes	Yes
Expansion Options					
PCI Express Revision	3	3	3	3	3
PCI Express Configurations	PCIe 0: 1 x4/2 x2/1 x2 + 2 x1/4 x1, PCIe 1-3: 1 x2/1 x1	PCIe 0: 1 x4/2 x2/1 x2 + 2 x1/4 x1, PCIe 1-3: 1 x2/1 x1	PCIe 0: 1 x4/2 x2/1 x2 + 2 x1/4 x1, PCIe 1-3: 1 x2/1 x1	PCIe 0: 1 x4/2 x2/1 x2 + 2 x1/4 x1, PCIe 1-3: 1 x2/1 x1	PCIe 0: 1 x4/2 x2/1 x2 + 2 x1/4 x1, PCIe 1-3: 1 x2/1 x1
Max # of PCI Express Lanes	8	8	8	8	8
I/O Specifications					
# of USB Ports	4	4	4	4	4
USB Revision	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
Total # of SATA Ports	2	2	2	2	2
Integrated LAN	3x 2.5GbE	3x 2.5GbE	3x 2.5GbE	3x 2.5GbE	3x 2.5GbE
General Purpose IO	Yes	Yes	Yes	Yes	Yes
UART	Yes	Yes	Yes	Yes	Yes
Package Specifications					

TJUNCTION	105°C	105°C	105°C	105°C	105°C
Operating Temperature Range	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	0°C to 70°C	0°C to 70°C
Package Size	35mm x 24mm	35mm x 24mm	35mm x 24mm	35mm x 24mm	35mm x 24mm

Table 2 PQ7-M109 Processor list

3.2 Supported Operating Systems

The PQ7-M109 supports the following operating systems.

Category	Operating System	Supported
Microsoft	Windows 10 IoT Enterprise (64bit)	Yes
Linux	Yocto Project BSP tool-based embedded Linux distribution (64-bit)	By Request

Table 3 Supported Operating Systems

3.3 Windows OS driver

Please download the drivers from MITWELL website
https://www.mitwell.com.tw:457/products/PQ7-M109.html

Item	Driver version	Description
Chipset	10.1.18536.8242	WIN10 x86,x64
Graphic	27.20.100.8816	WIN10,x64
Audio	11.1.0.17	WIN10,x64
TXE_Driver	2034.15.40.1261	WIN10,x64
LAN I210	25.5.0.7	WIN10,x64
Serial IO Driver*	5.123.1.1021	WIN10,x64

Table 4 Windows OS driver list

*Need manual update from Microsoft Management Console Interface

3.4 Electrical Characteristics

Input voltage	+5VDC ± 5%
RTC Battery Consumption	6uA
Power on mode	AT / ATX

Table 5 Electrical Characteristics

3.5 Power sequence

ATX Mode for 1st Power on

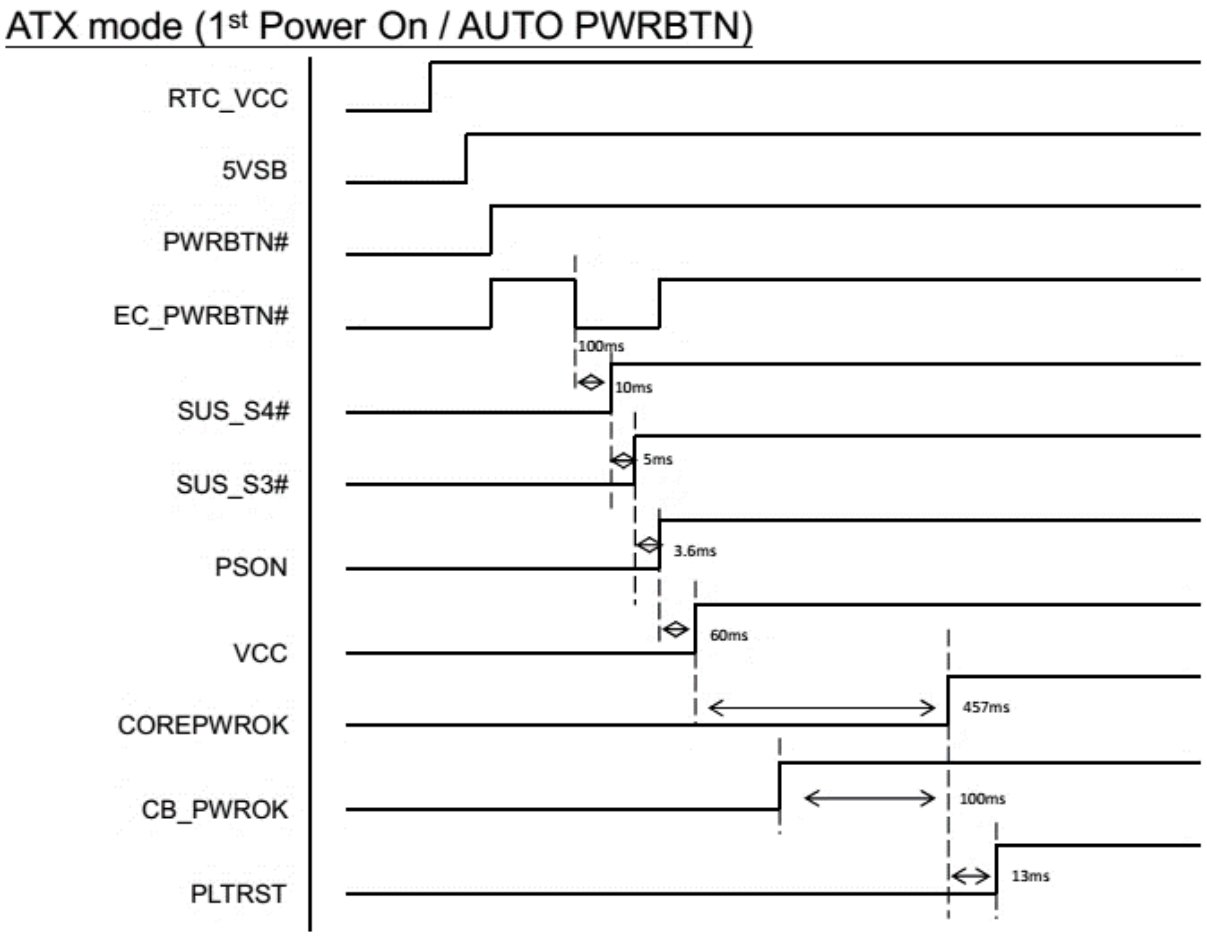


Figure 2 Power sequence ATX Mode (1st Power On)

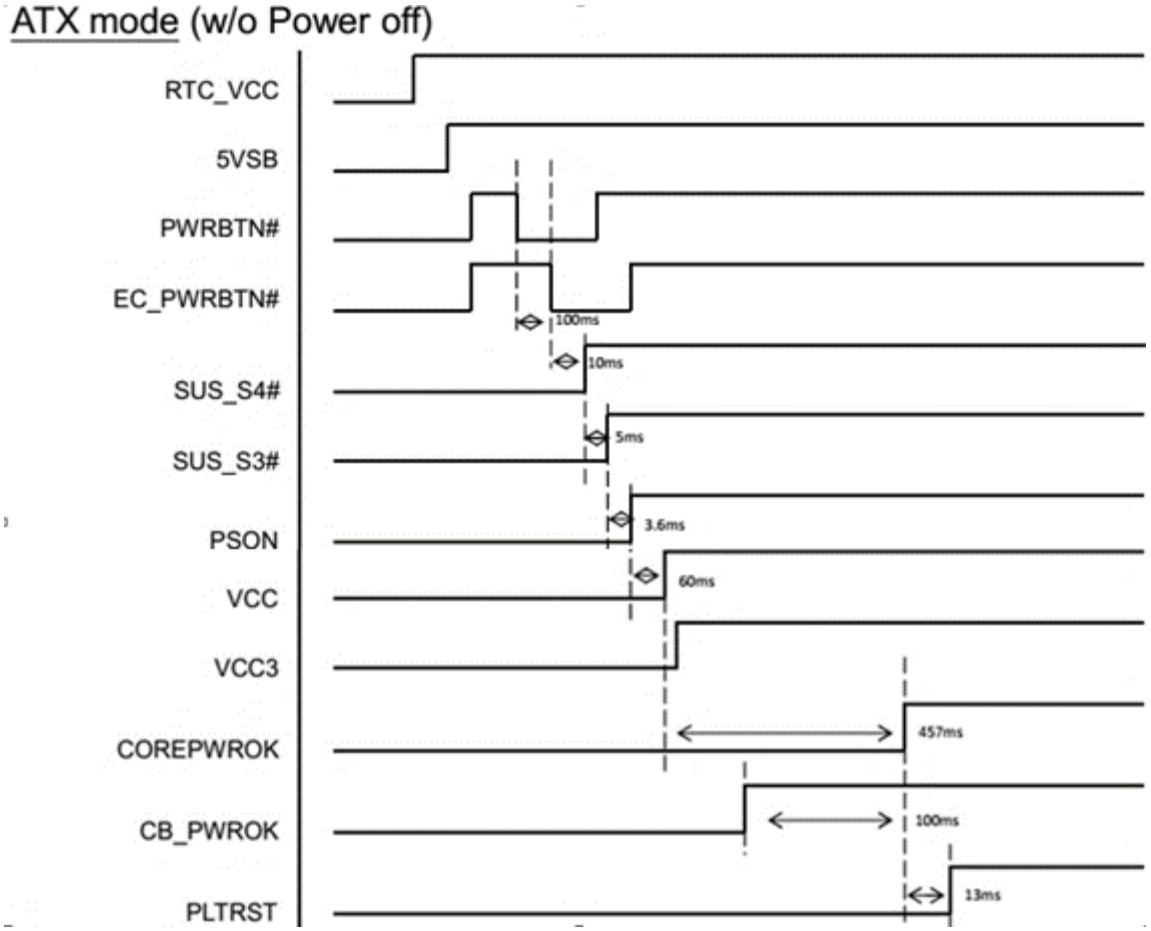


Figure 3 Power sequence ATX Mode (w/o power off)

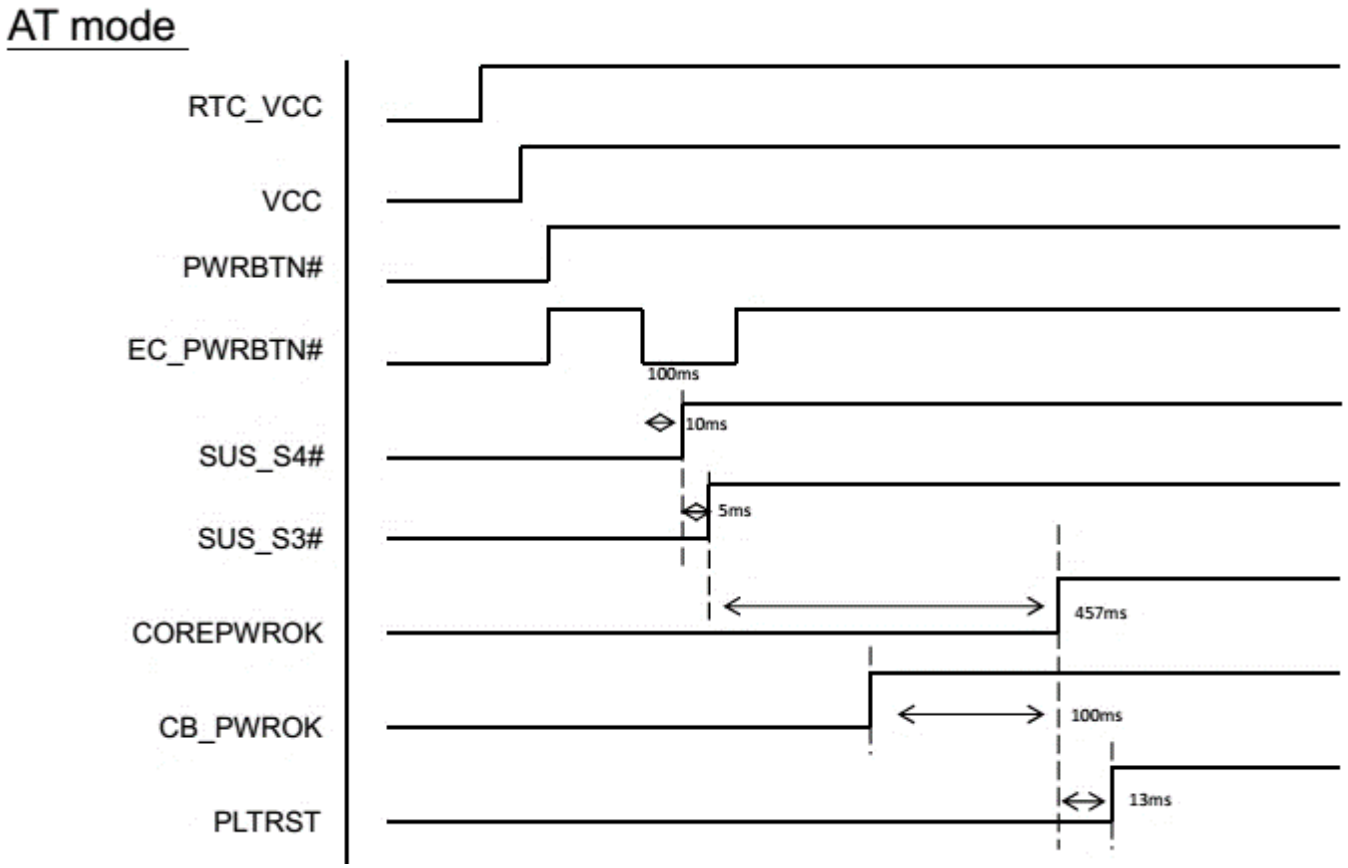


Figure 4 Power sequence AT Mode

3.6 Power Consumption

The power consumption values were measured with the following setup:

- PQ7-M109 ZR0 MB
- PQ7-C201 carrier board
- MITWELL cooling solution
- Microsoft Windows 10 (UEFI, 64-bit)

MAX Mode	S0	S0 Peak	Frequency (S0)
PQ7-M109-x6425E-8G-64G	2.76A, 13.8W(5V)	3.87A, 19.35W(5V)	2.7 GHz

Table 6 Power Consumption Max Mode

Max is defined as following table:

Items	Max
CPU	Turbo & Full cores by Burn in test
Graphic	Full loading By Burn-in Test
Memory	Full loading by Burn-in Test
HDMI	Monitor x 1
USB	K/M x2
SATA	Read/Write test by Burn-in

Table 7 Power Consumption Max define

3.7 Mechanical Dimensions

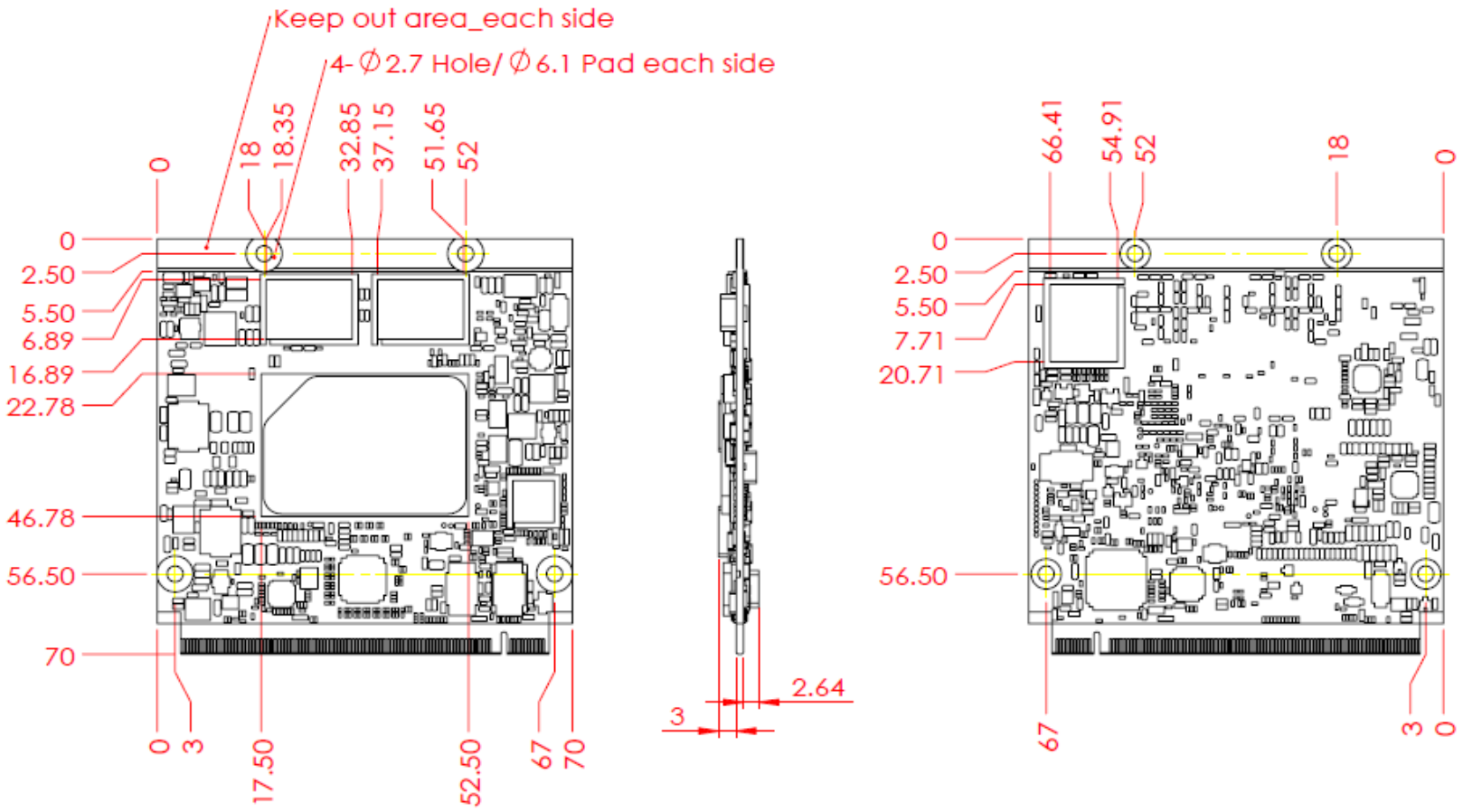


Figure 5 Mechanical Dimensions with EHL X Series - Top/Bottom

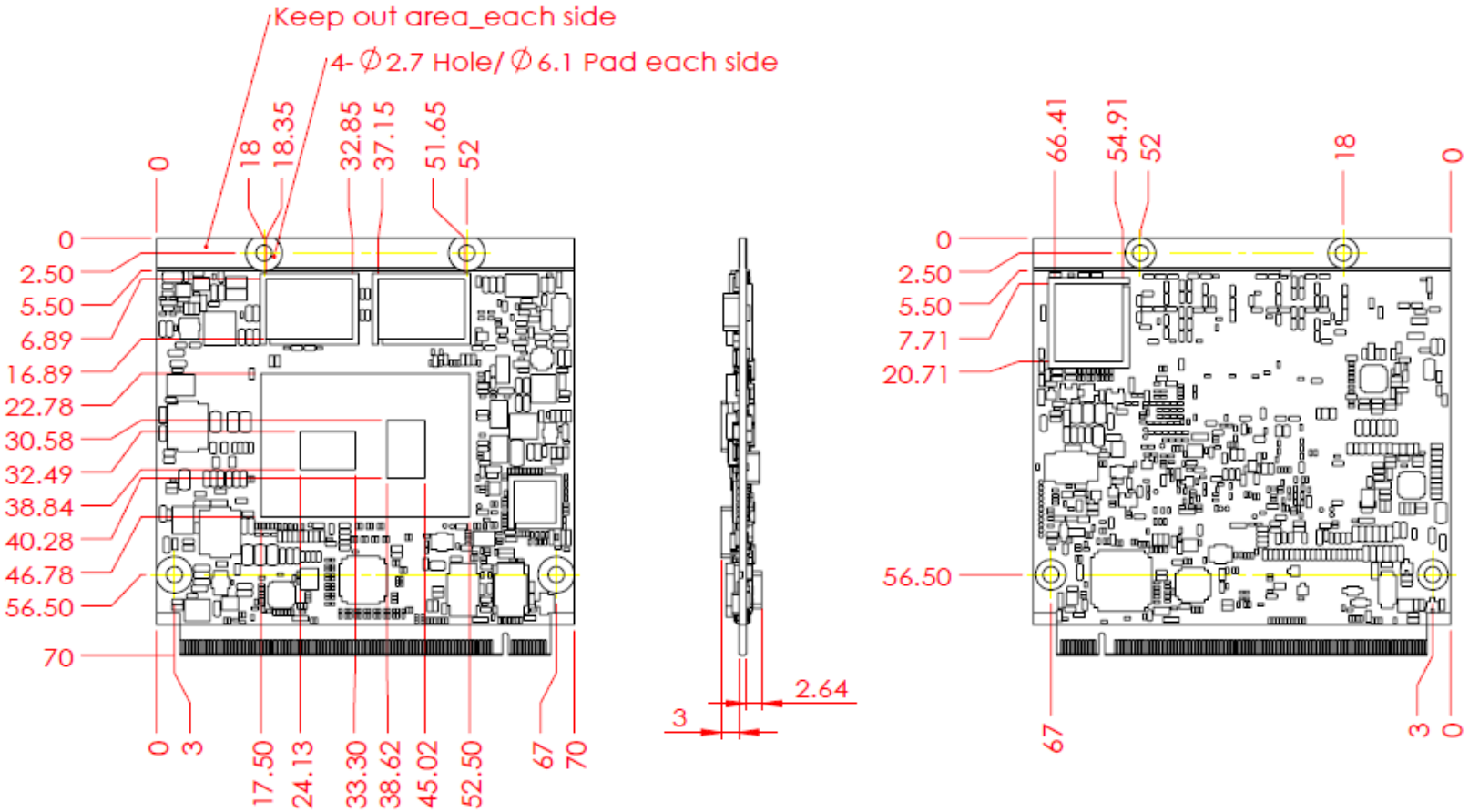


Figure 6 Mechanical Dimensions with EHL N/J Series - Top/Bottom

3.8 PQ7-M109 and Cooler weight

PQ7-M109	N/J Series	X series
Motherboard	32.5g	25.5g
Heat Sink (with screws)	91.0g	91.0g
Heat Spreader (with screws)	52.5g	53g
Heat Sink + Heat spreader (with screws)	143.5g	144g

Table 8 Net weight

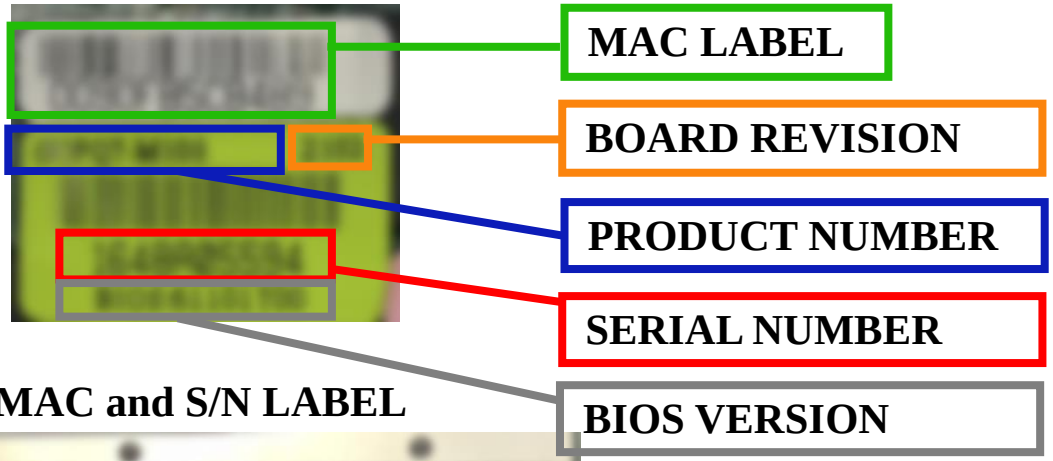
3.9 Environmental Specifications

Storage Temperature	0 ~ 70°C (EHL-N/J) | -40 ~ 85°C (EHL-X) (board level only)
Operation Temperature	0 ~ 70°C (EHL-N/J) | -40 ~ 85°C (EHL-X) (board level only)
Storage Humidity	0% ~ 95%
Operation Humidity	0% ~ 95%

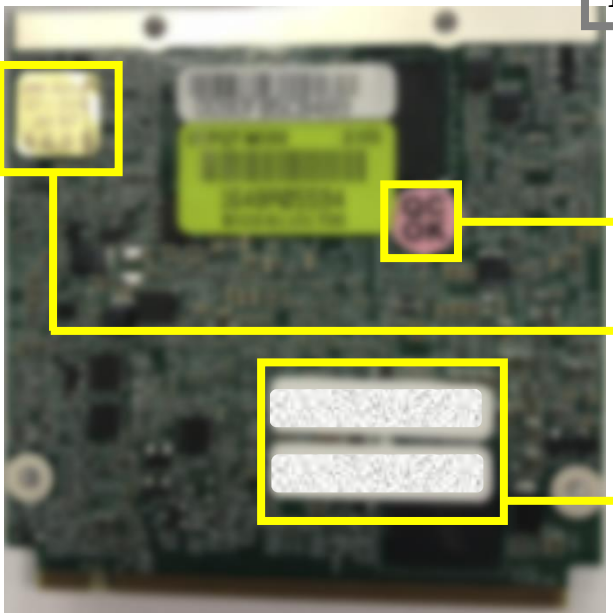
Table 9 Environmental Specifications

*Processor frequency performance may decrease when operation temperature over 70°C under different thermal solutions

3.10 Label Definition



MAC and S/N LABEL



QC LABEL

BIOS AUTHORITY LABEL

CUSTOMER LABEL BY REQUEST

4 Heat sink / Cooler dimensions

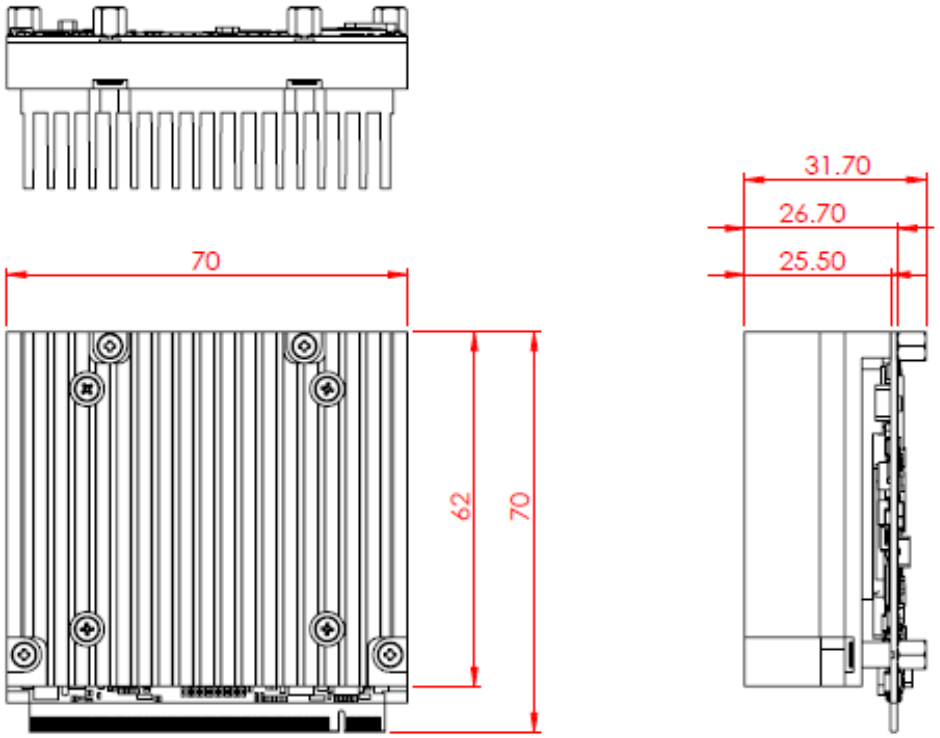


Figure 7 Heat sink / cooler for EHL X & N/J Series mechanical dimensions

4.1 H/S Assembly Guide

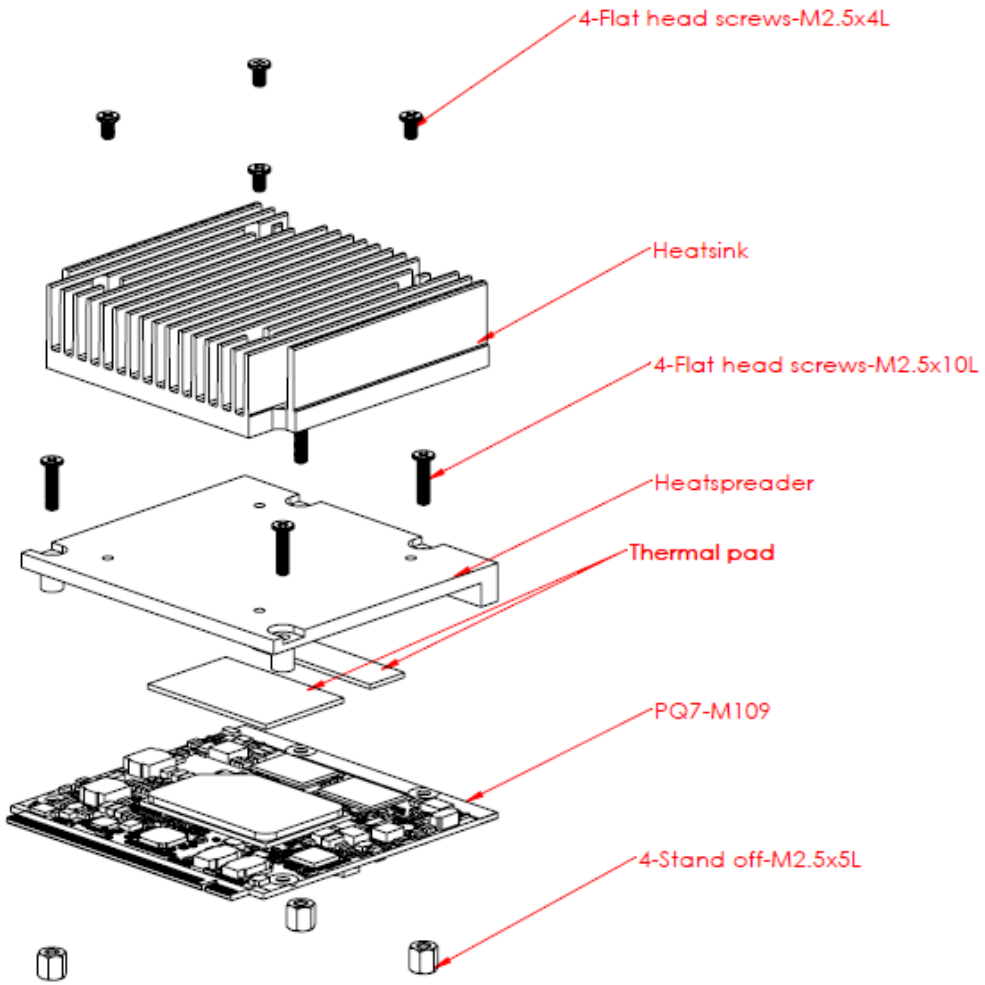


Figure 8 EHL X Series H/S Assembly guide

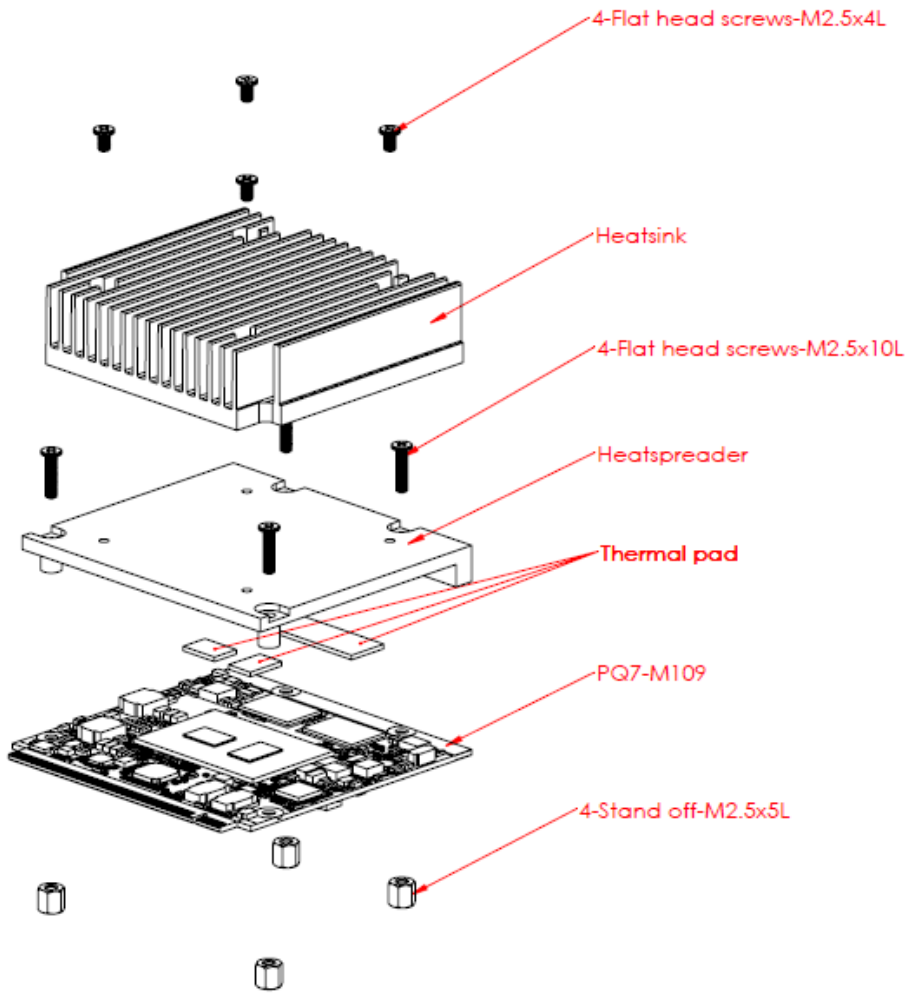


Figure 9 EHL N/J Series H/S Assembly guide

4.2 Packaging

Package	Appearance	Size
Anti-Static bubble bag		180x135mm
White Paper Box		210x151x40mm
Shipping Box (10 pcs White paper box)		595x300x195mm

Table 10 Packaging

4.3 Ordering Guide

PQ7-M109

Product	Ordering P/N	Status
PQ7-M109-N6210-4G-NA	AB7-3279Z	Launched
PQ7-M109-J6412-4G-NA	AB7-3280Z	Launched
PQ7-M109-x6211E-4G-NA	AB7-3281Z	Launched
PQ7-M109-x6413E-4G-NA	AB7-3282Z	Launched
PQ7-M109-x6425E-8G-64G	AB7-3268Z	Launched

Table 11 Ordering Guide - PQ7-M109

Accessory

Product	Ordering P/N	Status
PQ7-M109 Heat Spreader	B830A880 (EHL-X), B830A890 (EHL-N/J)	Available
PQ7-M109 Heat Sink Set	B830A860 (EHL-X), B830A870 (EHL-N/J)	Available
PQ7-C201	AB1-3B45	Available

Table 12 Ordering Guide - Accessory

5 Pin out Tables

PIN	SIGNAL	GROUP	PIN	SIGNAL	GROUP
1	GND		2	GND	
3	L1_MDI3_N	LAN	4	L1_MDI2_N	LAN
5	L1_MDI3_P		6	L1_MDI2_P	
7	L1_100#		8	L1_1000#	
9	L1_MDI1_N		10	L1_MDI0_N	
11	L1_MDI1_P		12	L1_MDI0_P	
13	L1_LINK#		14	L1_LINK#/ACT#	
15	NC		16	KBC_SLP_S5#	
17	WAKE1#_R		18	KBC_SLP_S3#	
19	ICH_SUS_STAT_N		20	PWRBTN#_D	
21	SLP_BTN		22	LID#_R	
23	GND		24	GND	
KEY					
25	GND		26	ATX_PWROK	
27	BATLOW_N_3P3		28	SYS_RESET_N	
29	SATA_TXP0	SATA	30	SATA_TXP1	SATA
31	SATA_TXN0		32	SATA_TXN1	
33	SATA_LED_N		34	GND	
35	SATA_RXP0		36	SATA_RXP1	
37	SATA_RXN0		38	SATA_RXN1	
39	GND		40	GND	

Table 13 PQ7-M109 Pin-out 1-5

41	BIOS_DISABLE		42	SD3_CLK	SD
43	SDMMC3_CD#	SD	44	NC	
45	SD3_CMD		46	SD3_WP	
47	SD_CARD_PWR_EN_N		48	SD3_D1	
49	SD3_D0		50	SD3_D3	SD
51	SD3_D2		52	NC	
53	NC		54	NC	
55	NC		56	NC	
57	GND		58	GND	
59	HDA_SYNC_3P3	Audio	60	SMB_CLK_3P3A	SMBUS
61	HDA_RST_N_3P3		62	SMB_DATA_3P3A	
63	HDA_BIT_CLK_3P3		64	ALERT_MXM	
65	HDA_SDIN0_3P3		66	SCL_MXM	Audio
67	HDA_SDOUT_3P3		68	DATA_MXM	
69	THRM#		70	WDTRIG#	
71	PM_THRM#		72	WDTO	
73	GND		74	GND	
75	USB3_TXN0	USB3.0	76	USB3_RXN0	USB3.0
77	USB3_TXP0		78	USB3_RXP0	
79	USB_OC3#		80	USB_OC2#	
81	USB2_DN5	USB2.0	82	USB2_DN4	USB2.0
83	USB2_DP5		84	USB2_DP4	
85	USB2_OC1#		86	USB_OC0#	
87	USB2_DN3		88	USB2_DN2	

Table 14 PQ7-M109 Pin-out 2-5

89	USB2_DP3		90	USB2_DP2	
91	NC		92	NC	
93	USB2_DN1	USB2.0	94	USB2_DN0	USB2.0
95	USB2_DP1		96	USB2_DP0	
97	GND		98	GND	
99	LVDS_A0+	LVDS /EDP	100	LVDS_B0+	LVDS
101	LVDS_A0-	LVDS /EDP	102	LVDS_B0-	LVDS
103	LVDS_A1+		104	LVDS_B1+	
105	LVDS_A1-		106	LVDS_B1-	
107	LVDS_A2+		108	LVDS_B2+	
109	LVDS_A2-		110	LVDS_B2-	
111	VDDEN		112	LVDS0_LIGHT_EN	LVDS /EDP
113	LVDS_A3+		114	LVDS_B3+	LVDS
115	LVDS_A3-		116	LVDS_B3-	
117	GND		118	GND	
119	LVDS_CLKA+	LVDS /EDP	120	LVDS_CLKB+	LVDS
121	LVDS_CLKA-		122	LVDS_CLKB-	
123	DDI1_BKLT_CTRL_3P3		124	NC	
125	LVDS0_DDC_DATA		126	DDI0_HPD#_CN	DP
127	LVDS0_DDC_CLK		128	DDI1_HPD#	
129	CAN0_TX	CAN	130	CAN0_RX	CAN
131	DDI2_TXP3_C	DP /TMDS	132	USB3_TXN1	USB 3.0
133	DDI2_TXN3_C		134	USB3_TXP1	
135	GND		136	GND	

Table 15 PQ7-M109 Pin-out 3-5

137	DDI2_TXP1_C	DP /TMDS	138	DDI2_AUX_DP	DP
139	DDI2_TXN1_C		140	DDI2_AUX_DN	
141	GND		142	GND	
143	DDI2_TXP2_C	DP /TMDS	144	USB3_RXN1	USB 3.0
145	DDI2_TXN2_C		146	USB3_RXP1	USB 3.0
147	GND		148	GND	
149	DDI2_TXP0_C	DP /TMDS	150	DDI2_DDC_SDA	TMDS
151	DDI2_TXN0_C	DP /TMDS	152	DDI2_DDC_SCL	TMDS
153	DDI2_HPD#_CN		154	DDI2_HPD#_CN	DP /TMDS
155	PCIECLK_DIFF_P0	PCIE	156	ICH_WAKE_N_R	
157	PCIECLK_DIFF_N0		158	CB_PLTRST	
159	GND		160	GND	
161	PCIE_TXP3	PCIE	162	PCIE_RXP3	PCIE
163	PCIE_TXN3		164	PCIE_RXN3	
165	GND		166	GND	
167	PCIE_TXP2	PCIE	168	PCIE_RXP2	PCIE
169	PCIE_TXN2		170	PCIE_RXN2	
171	TXDA#_EC	UART	172	RTSA_3P3_EC	UART
173	PCIE_TXP1	PCIE	174	PCIE_RXP1	PCIE
175	PCIE_TXN1		176	PCIE_RXN1	
177	RXDA#_EC	UART	178	CTSA_3P3_EC	UART
179	PCIE_TXP0	PCIE	180	PCIE_RXP0	PCIE
181	PCIE_TXN0		182	PCIE_RXN0	
183	GND		184	GND	

Table 16 PQ7-M109 Pin-out 4-5

185	LAD0	LPC	186	LAD1	LPC
187	LAD2		188	LAD3	
189	PCICLK		190	LFRAME#	
191	SERIRQ		192	NC	
193	MXM_RTC	VCC_RTC	194	SPKR	
195	FAN_TACHIN	FAN	196	FAN_PWMOUT	FAN
197	GND		198	GND	
199	ICH_SPI_MOSI_3P3	SPI	200	ICH_SPI_CS0_N_3P3	SPI
201	ICH_SPI_MISO_3P3		202	ICH_SPI_CS1_N_3P3	
203	ICH_SPI_CLK_3P3		204	NC	
205	5VSB	VCC_5V_SB	206	5VSB	VCC_5V_SB
207	NC		208	PSE_UART2_RXD	
209	PSE_UART2_TXD		210	NC	
211	NC		212	NC	
213	NC		214	NC	
215	NC		216	NC	
217	NC		218	NC	
219	VCC	VCC5	220	VCC	VCC5
221	VCC		222	VCC	
223	VCC		224	VCC	
225	VCC		226	VCC	
227	VCC		228	VCC	
229	VCC	VCC5	230	VCC	VCC5

Table 17 PQ7-M109 Pin-out 5-5

6 BIOS Setup Items

PQ7-M109 enters the boot process by AMI Aptio5 BIOS which is stored in an EEPROM through SPI interface on Module. Boot from Carrier board is also supported; please consult with your Sales Representatives for PQ7-M109 Carrier Design Guide.

6.1 Entering Setup -- Launch System Setup

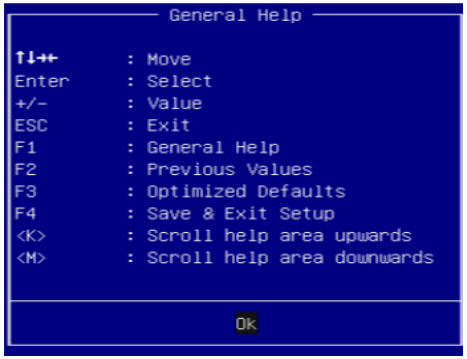
Power on PQ7-M109 Module and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

Press <Del> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to see General Help

The BIOS setup program provides a General Help screen. The menu can be easily called up by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



6.2 Main

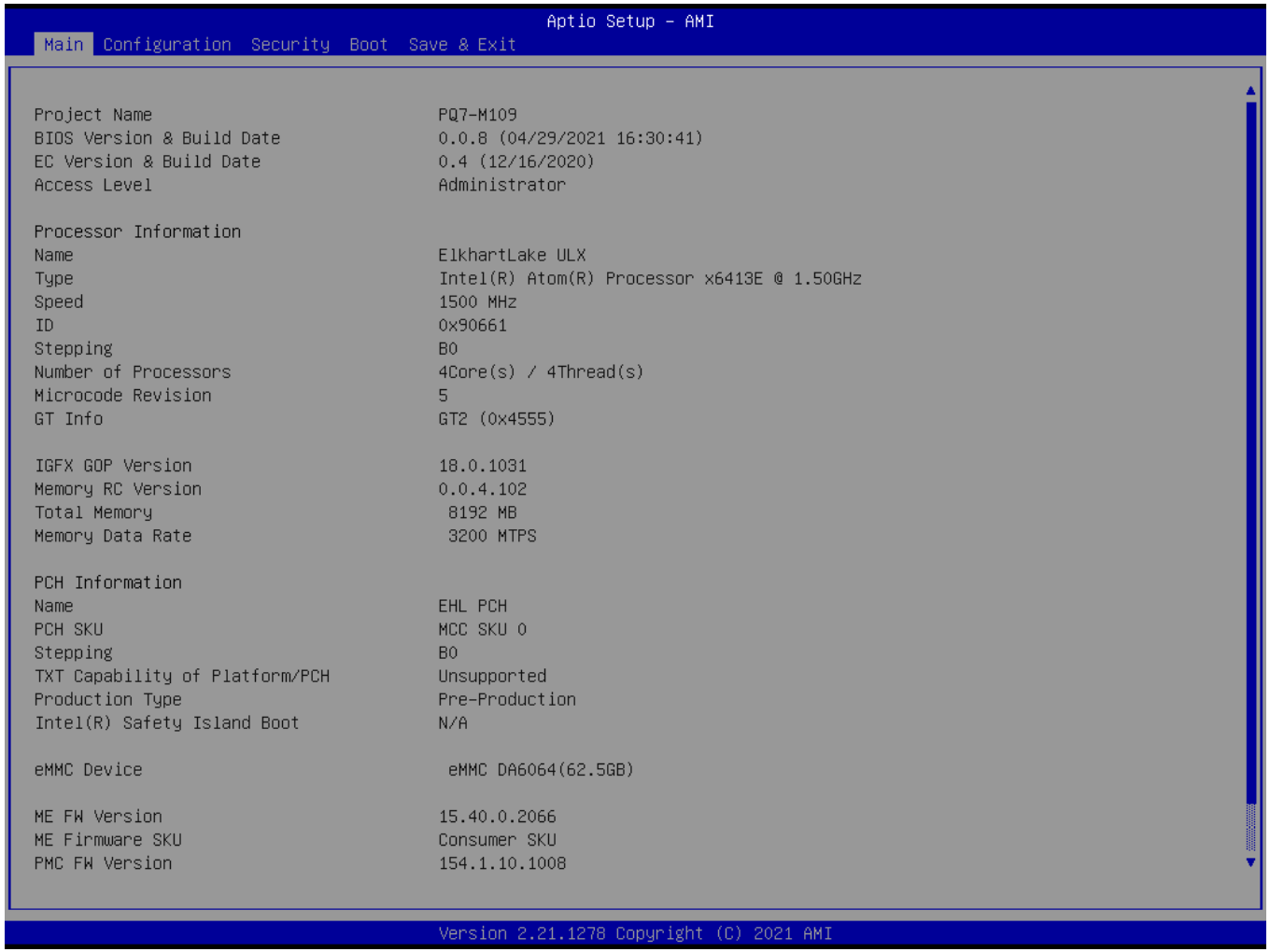


Figure 10 BIOS - Main 1-2

6.3 Configuration

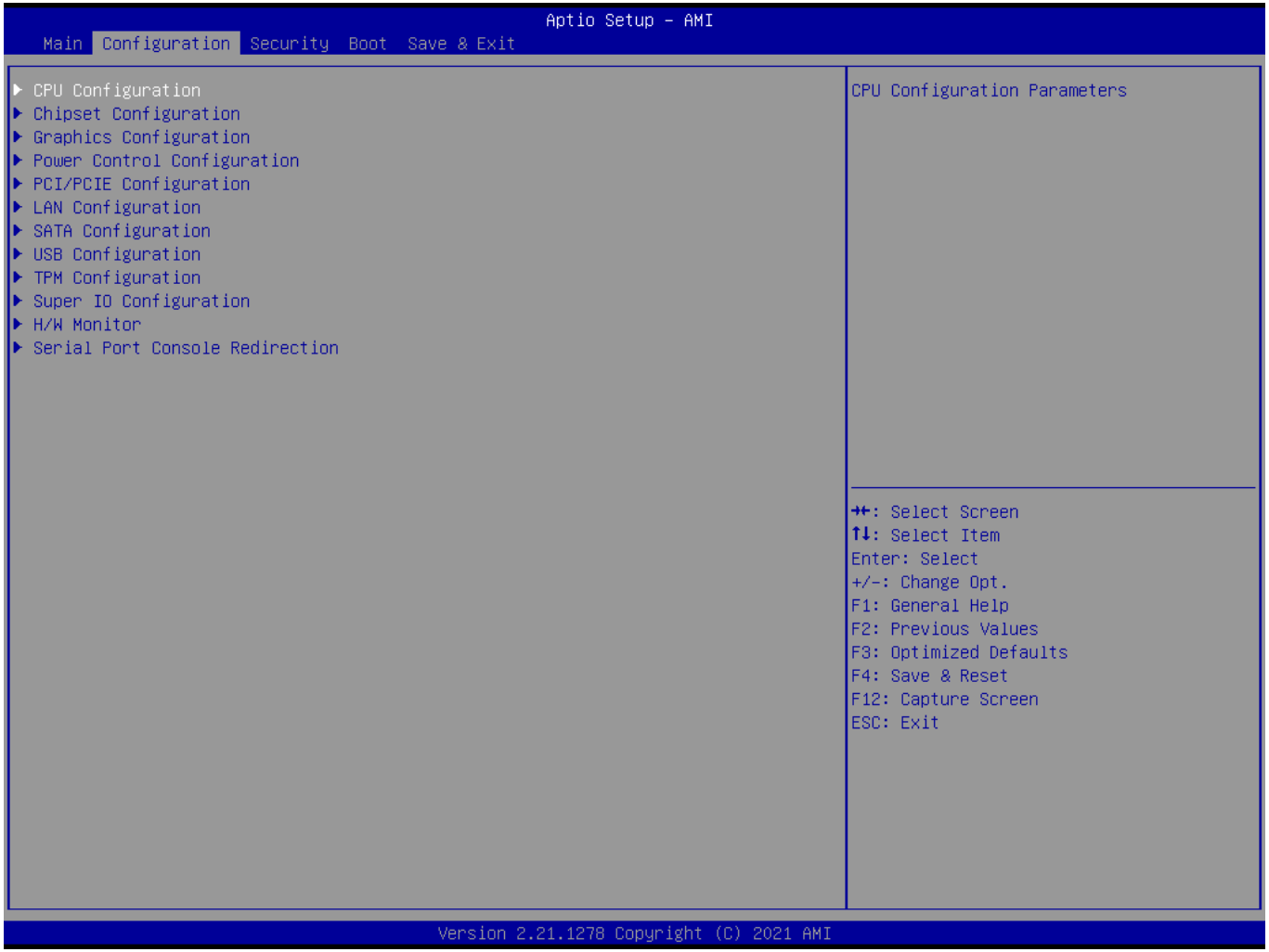


Figure 11 BIOS - Configuration

6.4 CPU

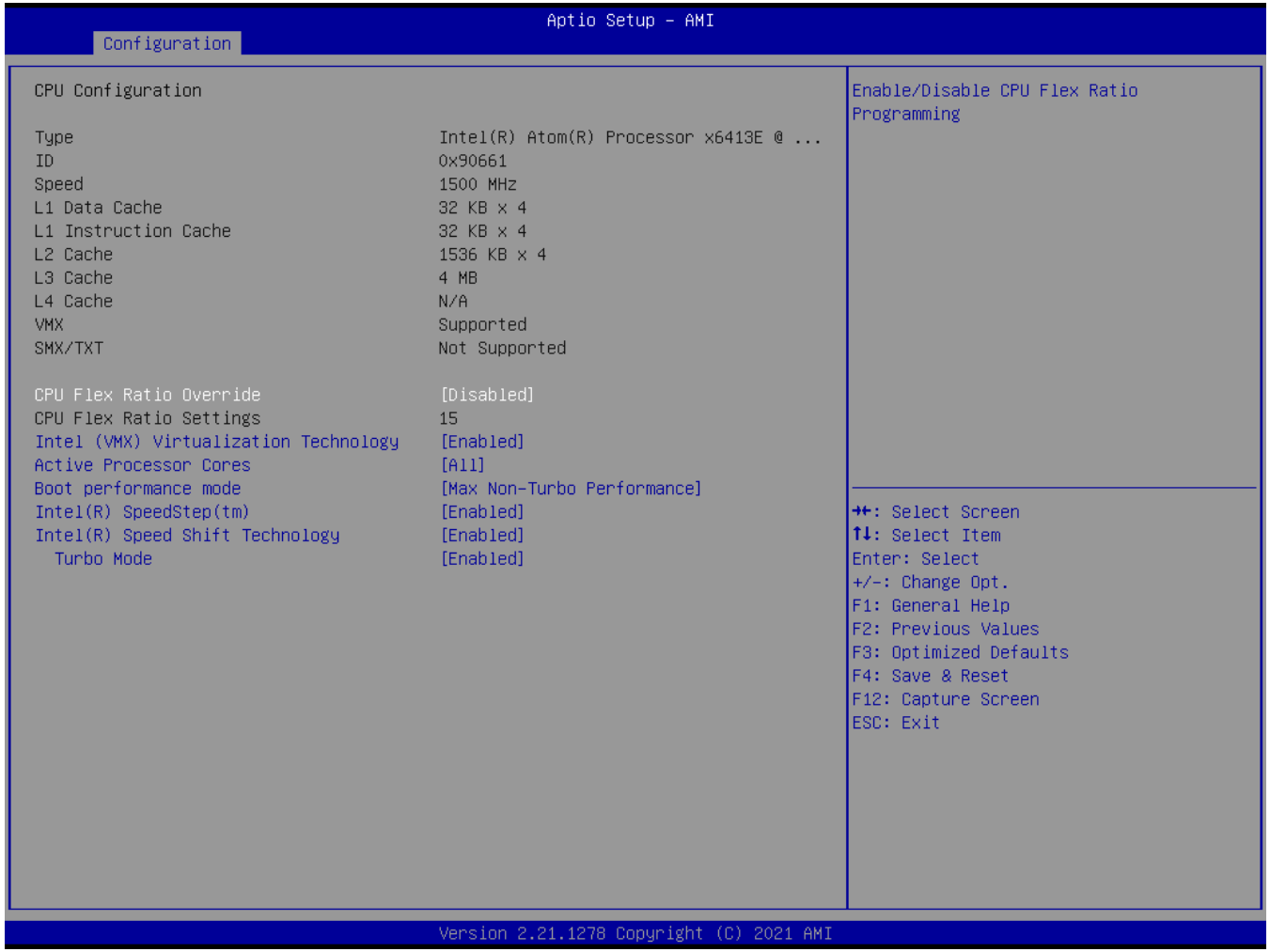


Figure 12 BIOS - Configuration - CPU 1-2

6.5 Chipset

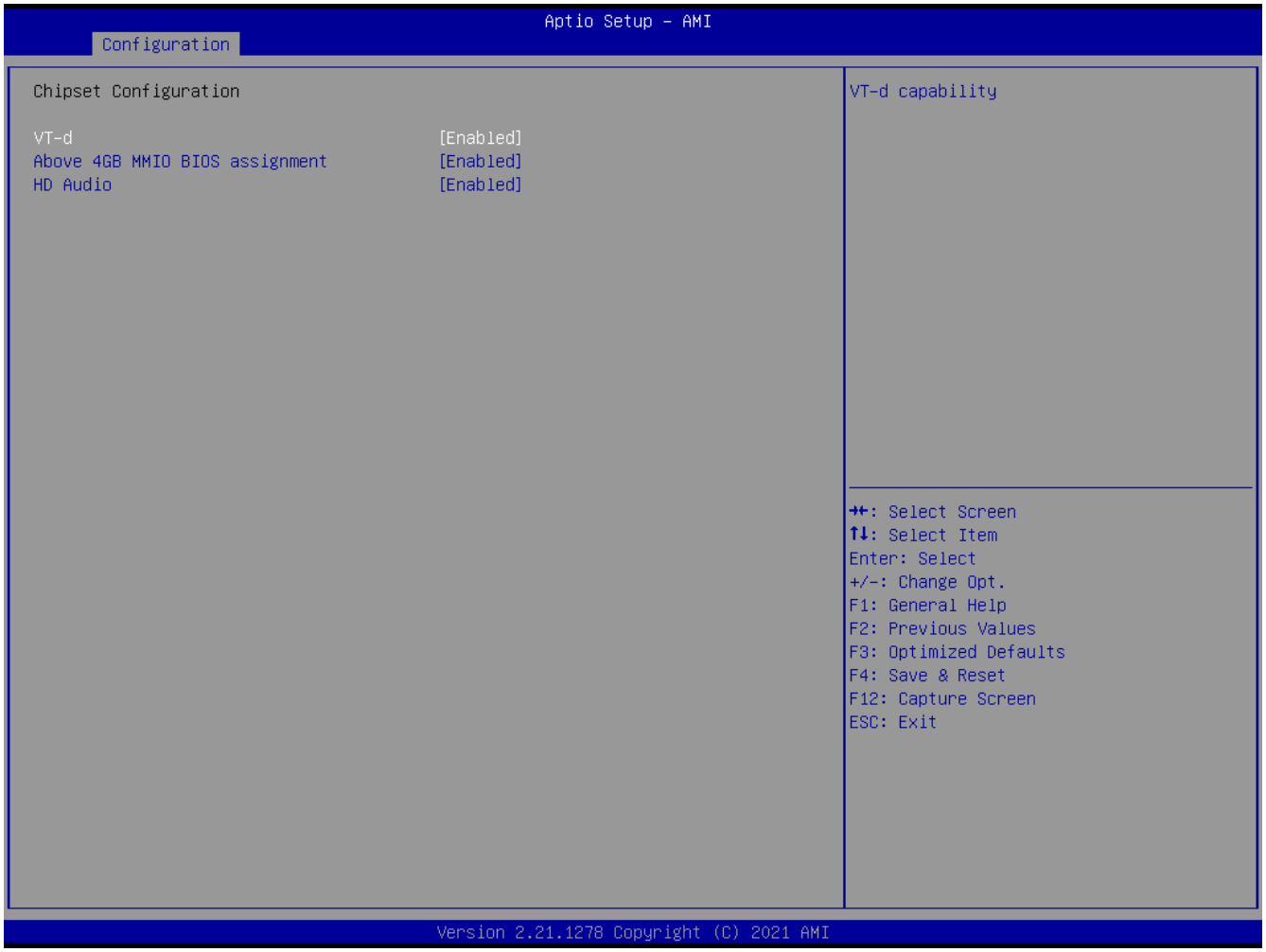


Figure 13 BIOS - Configuration - Chipset

6.6 LAN

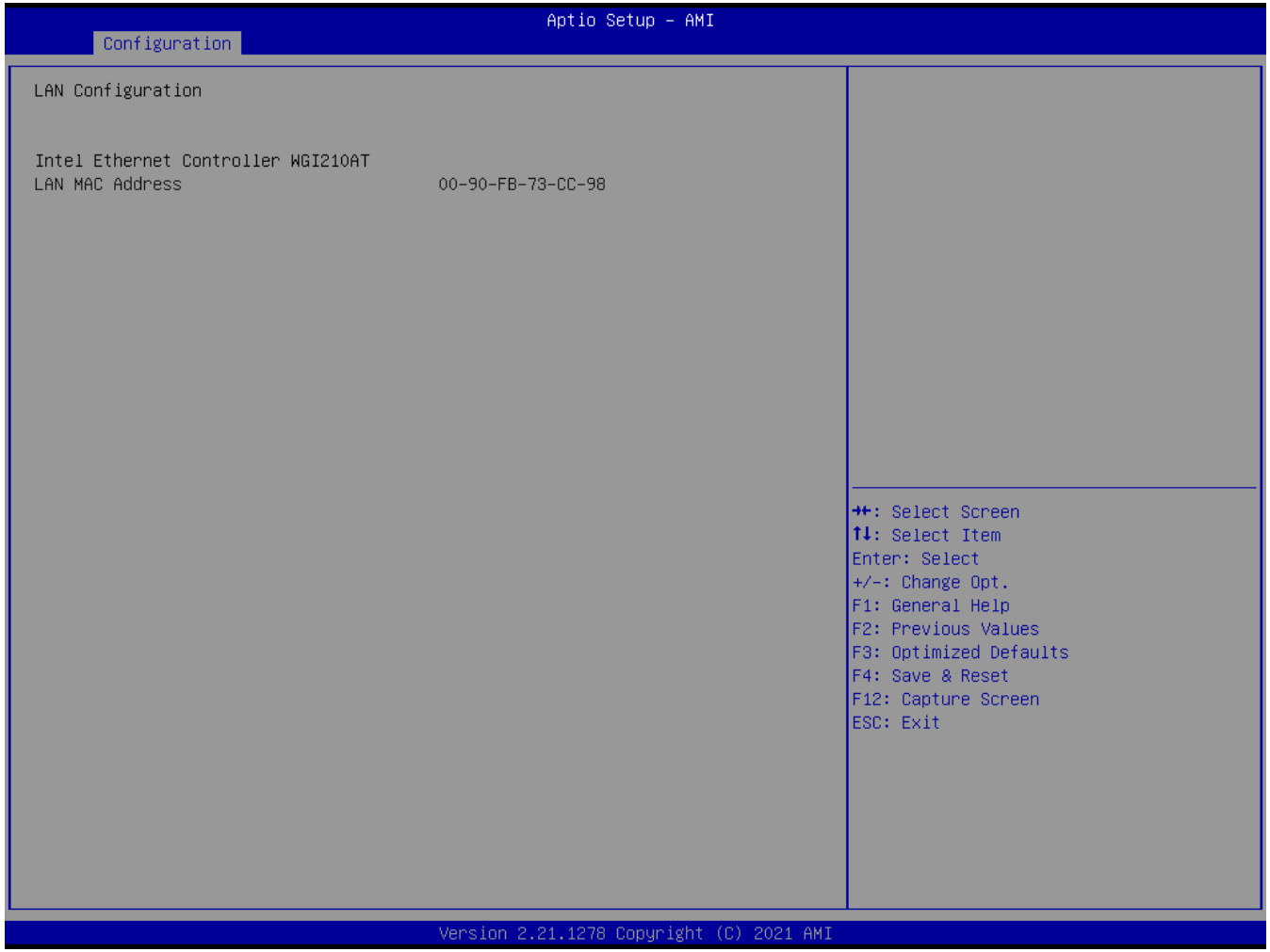


Figure 14 BIOS - Configuration - LAN

6.7 Graphics

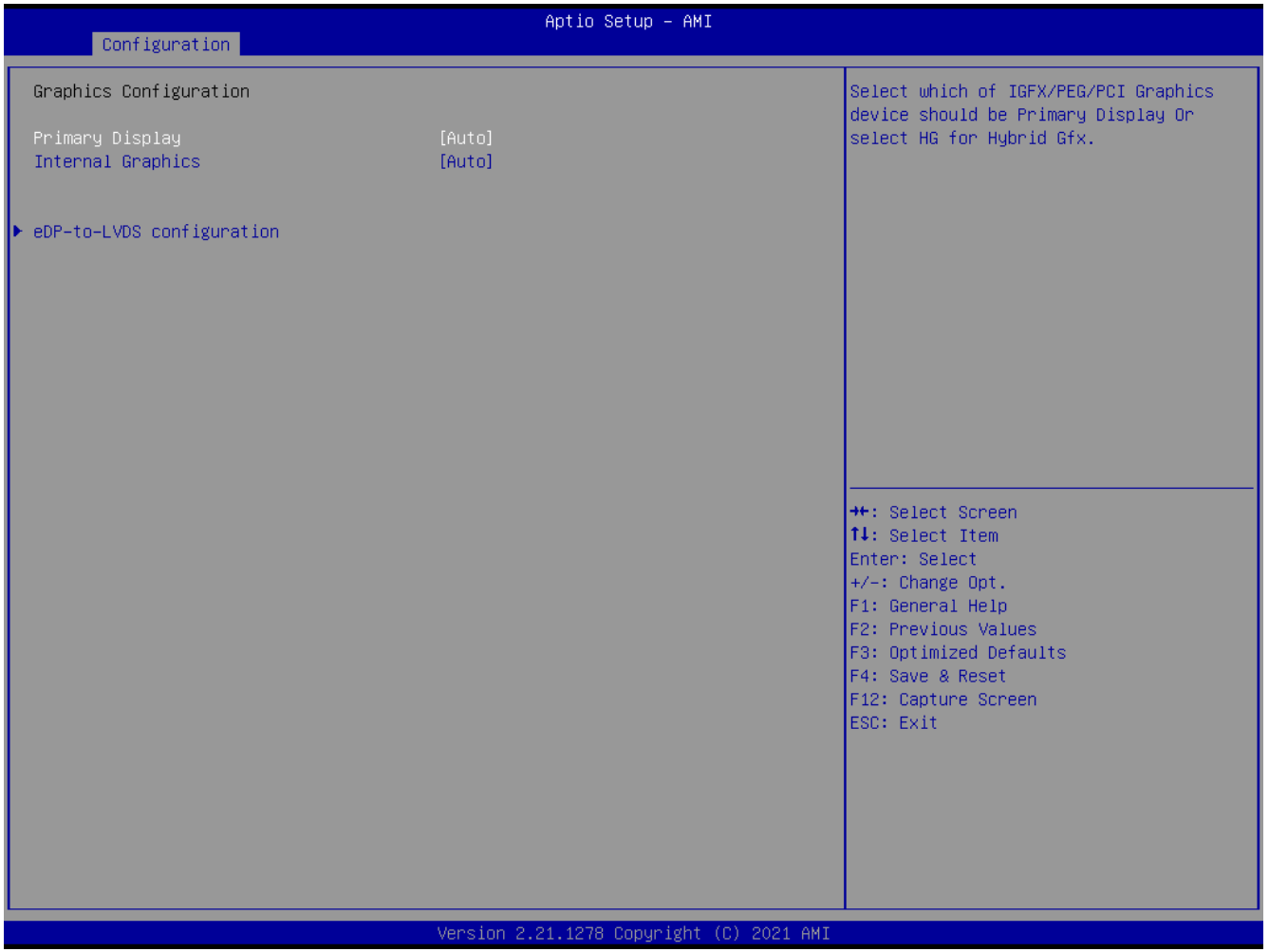


Figure 15 BIOS - Configuration – Graphics

6.7.1 eDP-to-LVDS configuration

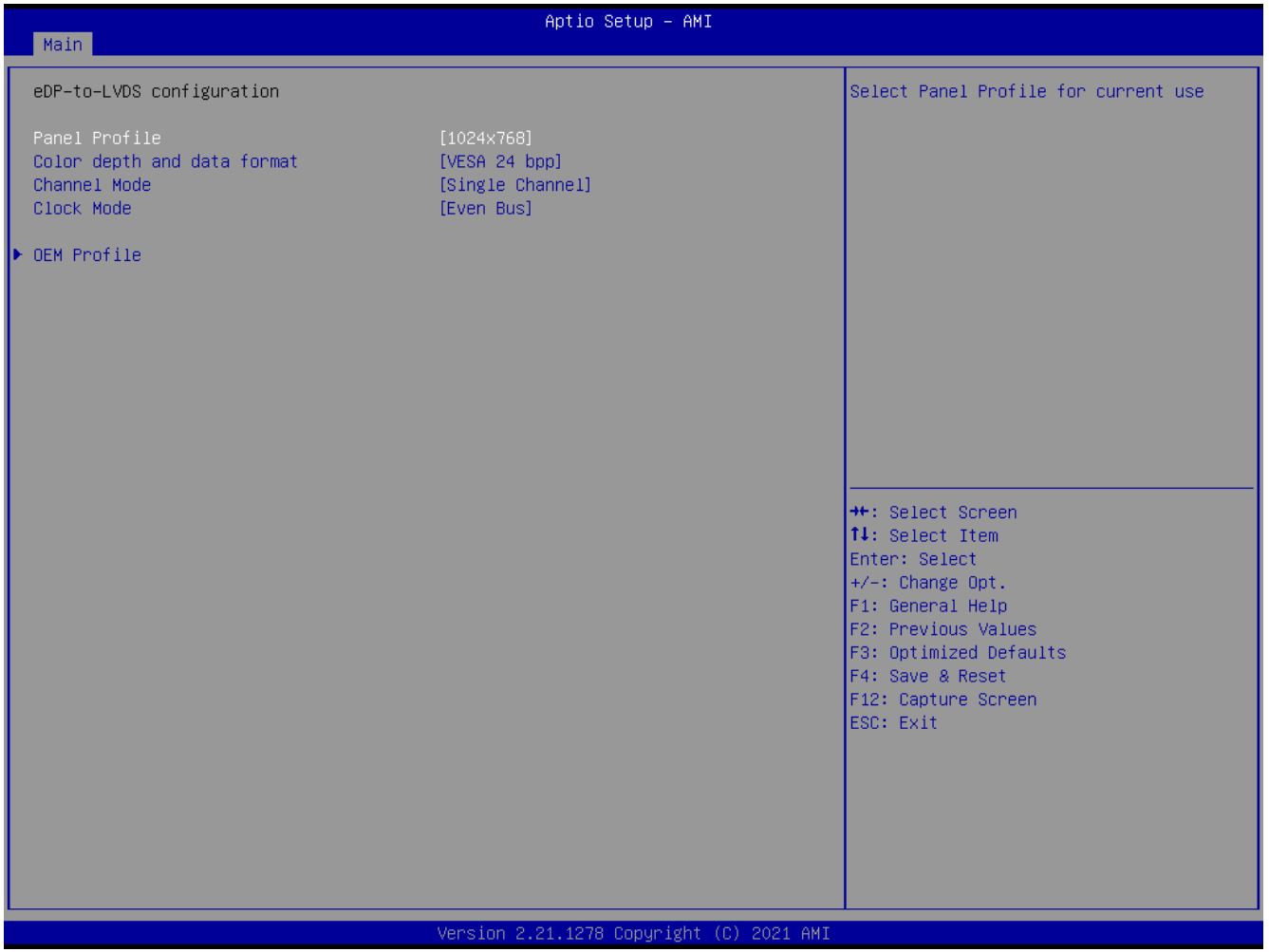


Figure 16 BIOS - Graphics - eDP-to-LVDS configuration

6.7.2 OEM Profile

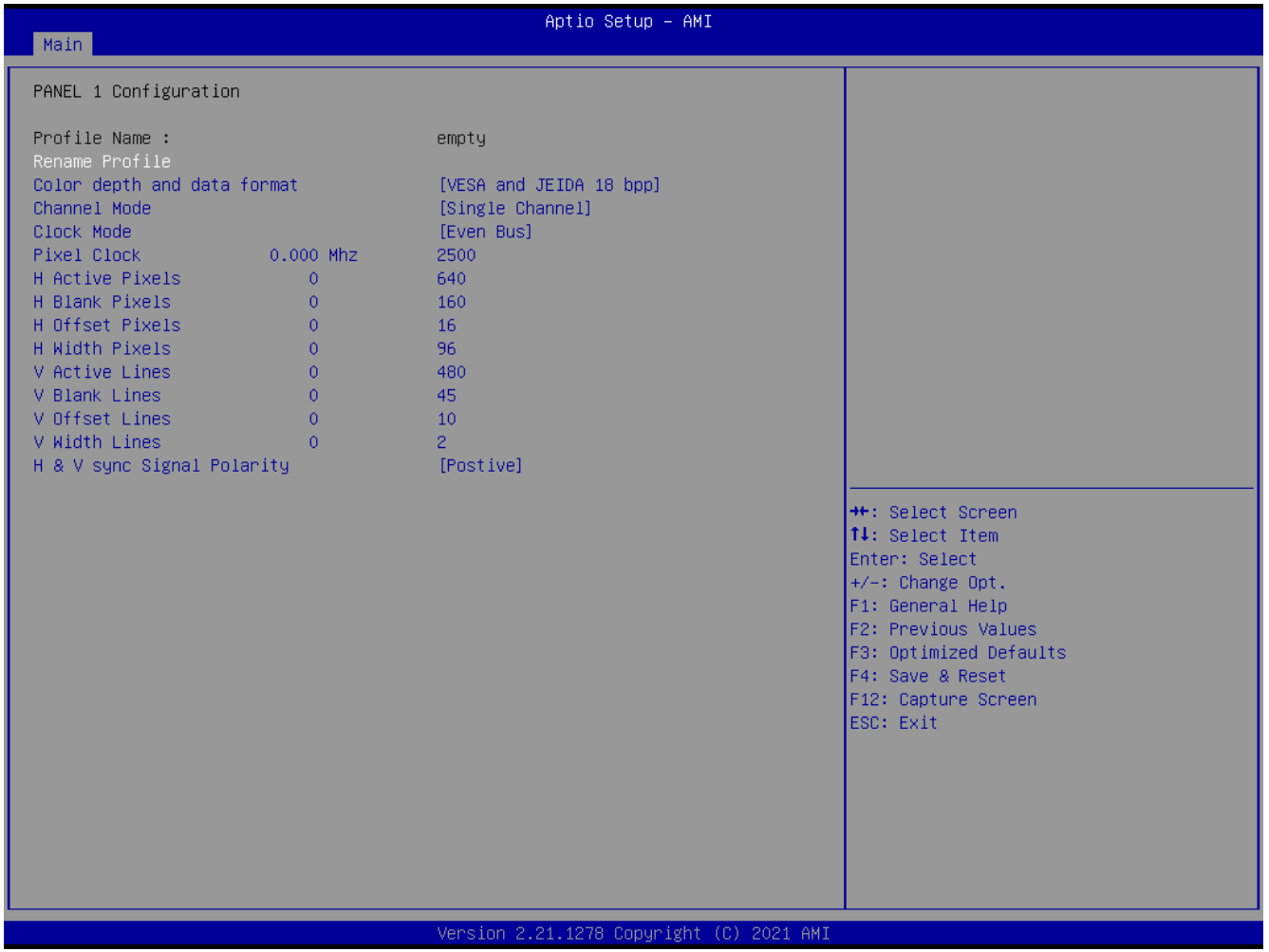


Figure 17 BIOS - PTN3460 - OEM

6.8 PCIE

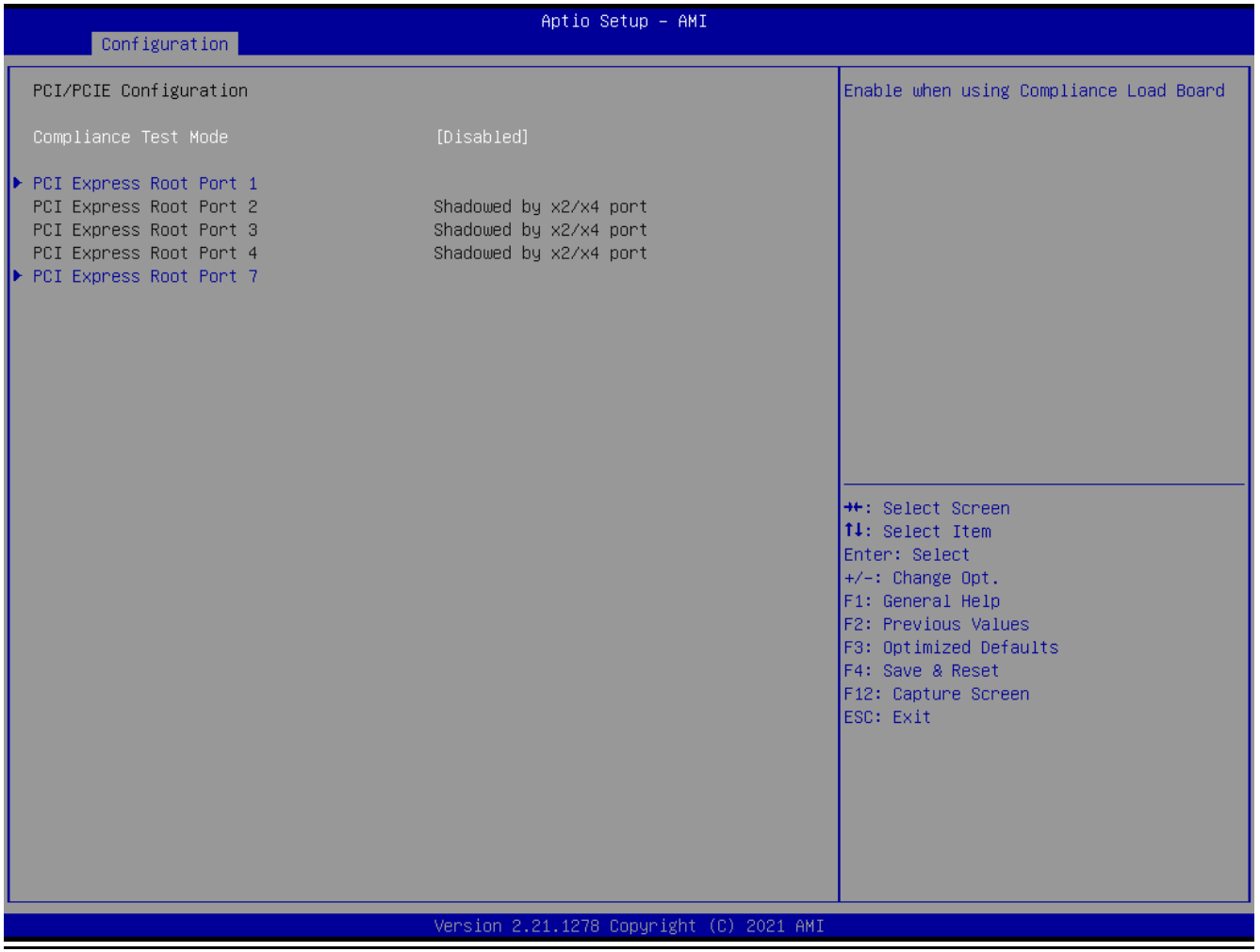


Figure 18 BIOS - Configuration - PCIE 1-3

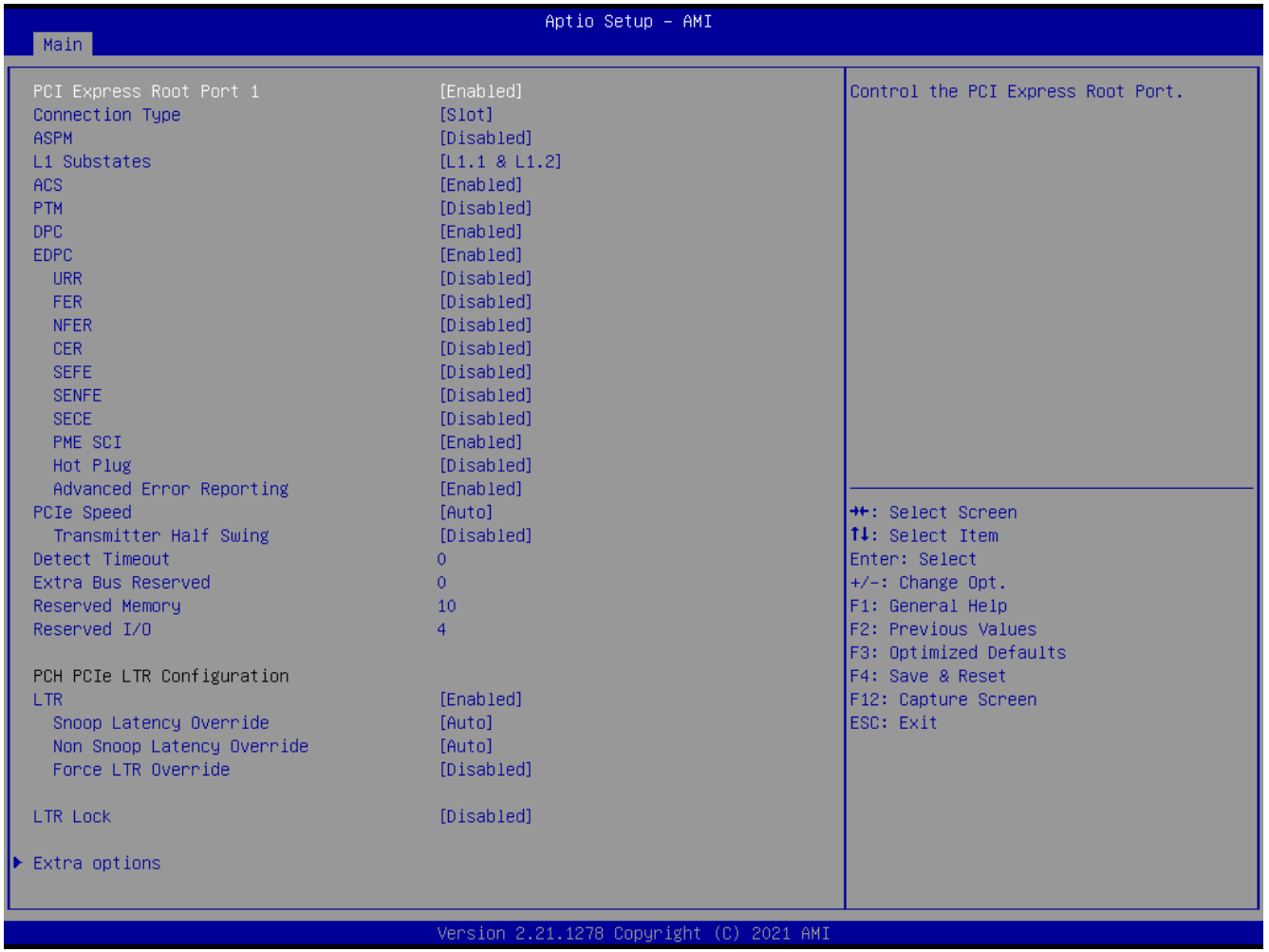


Figure 19 BIOS - Configuration - PCIE 2-3

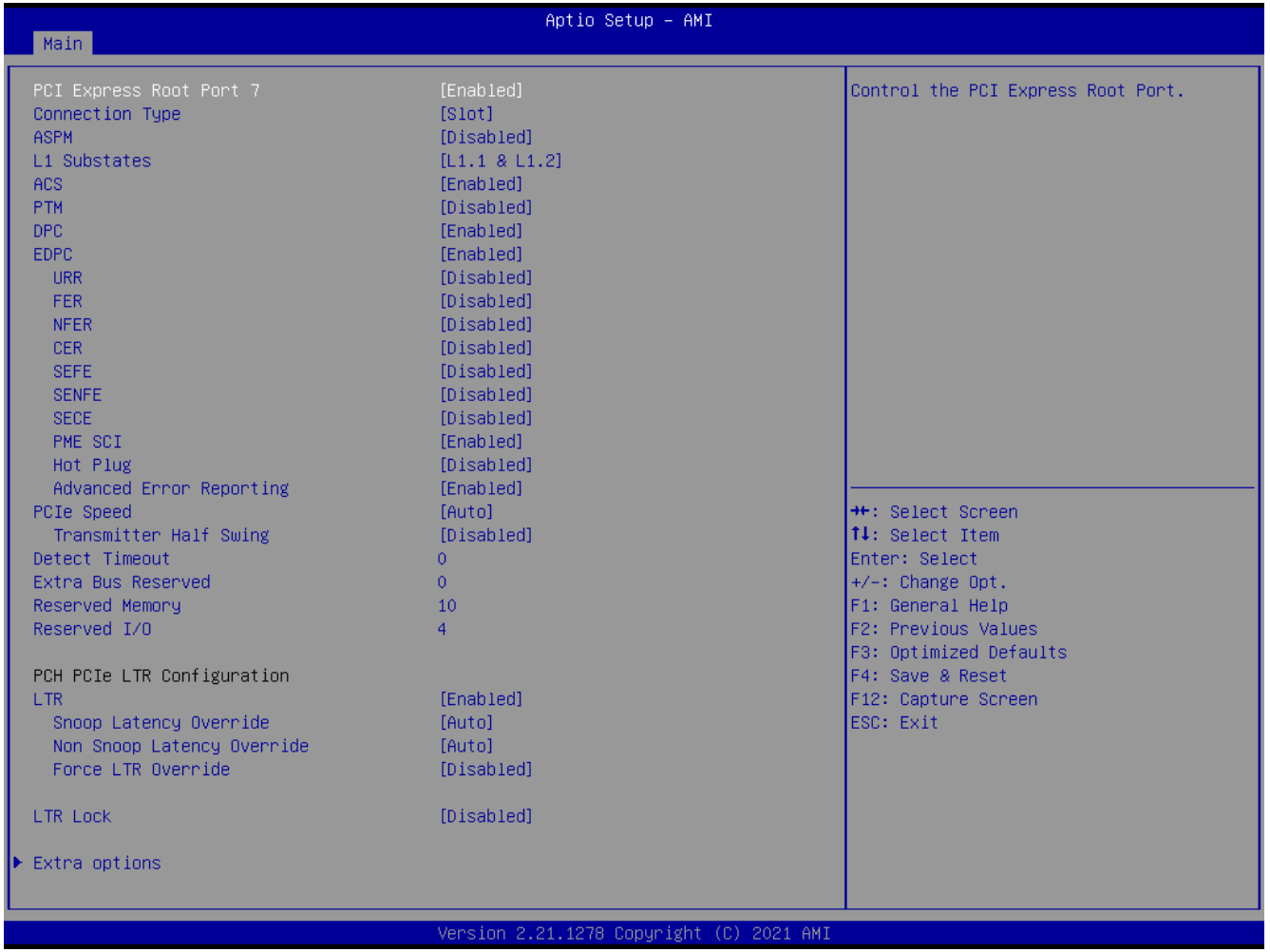


Figure 20 BIOS - Configuration - PCIE 3-3

6.9 SATA

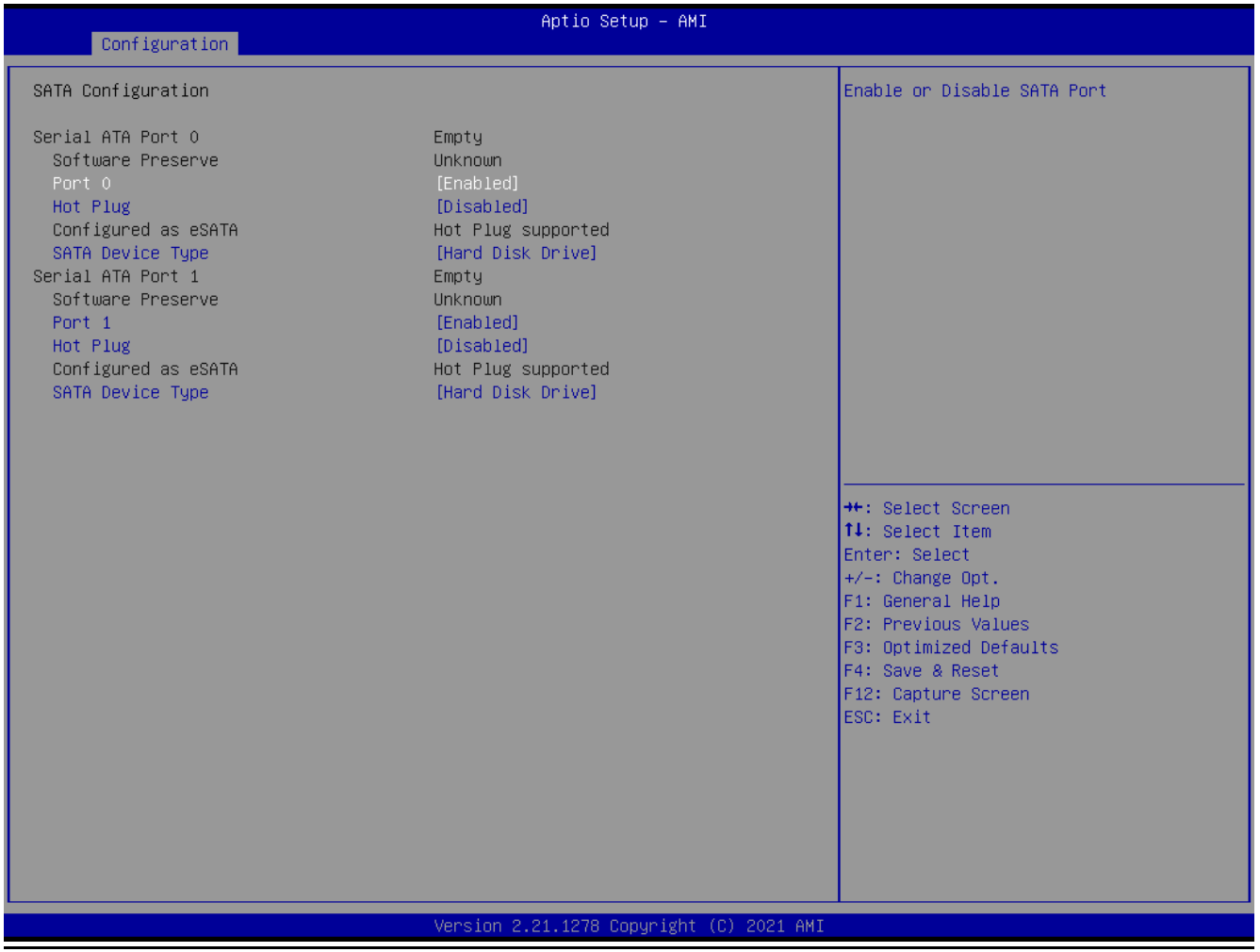


Figure 21 BIOS - Configuration - SATA

6.10 USB

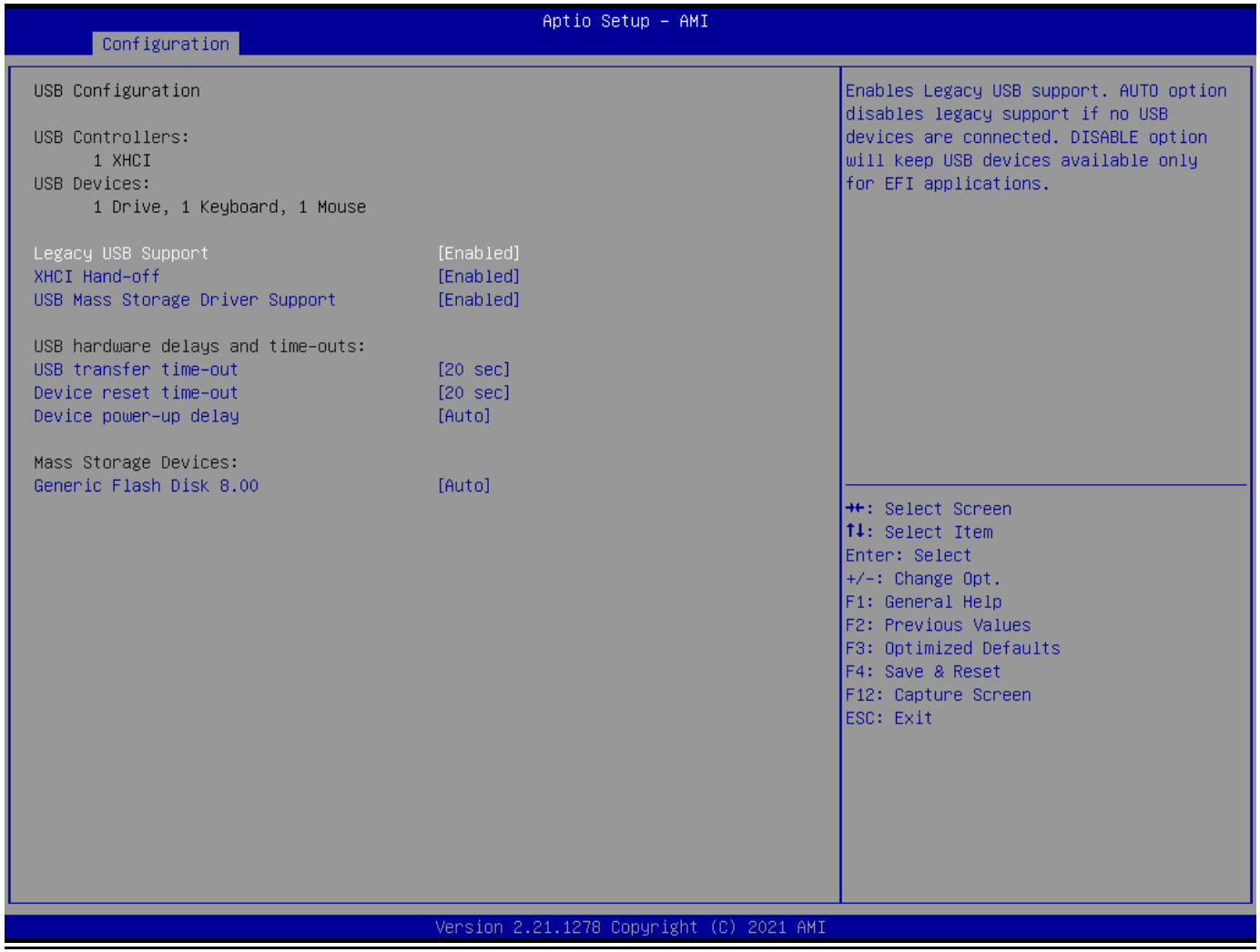


Figure 22 BIOS - Configuration - USB 1-2

6.11 Power Control

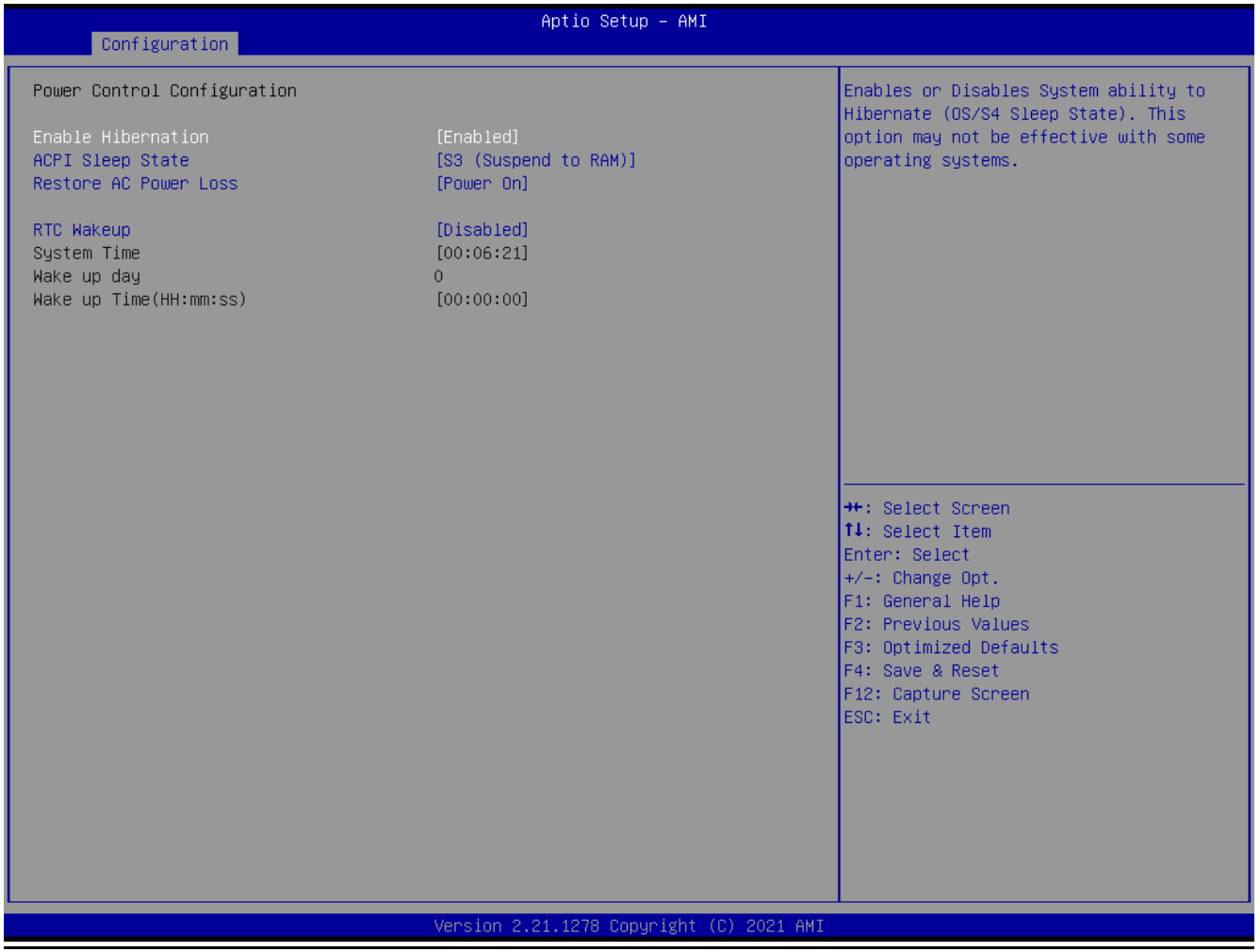


Figure 23 BIOS - Configuration - Power

6.12 TPM

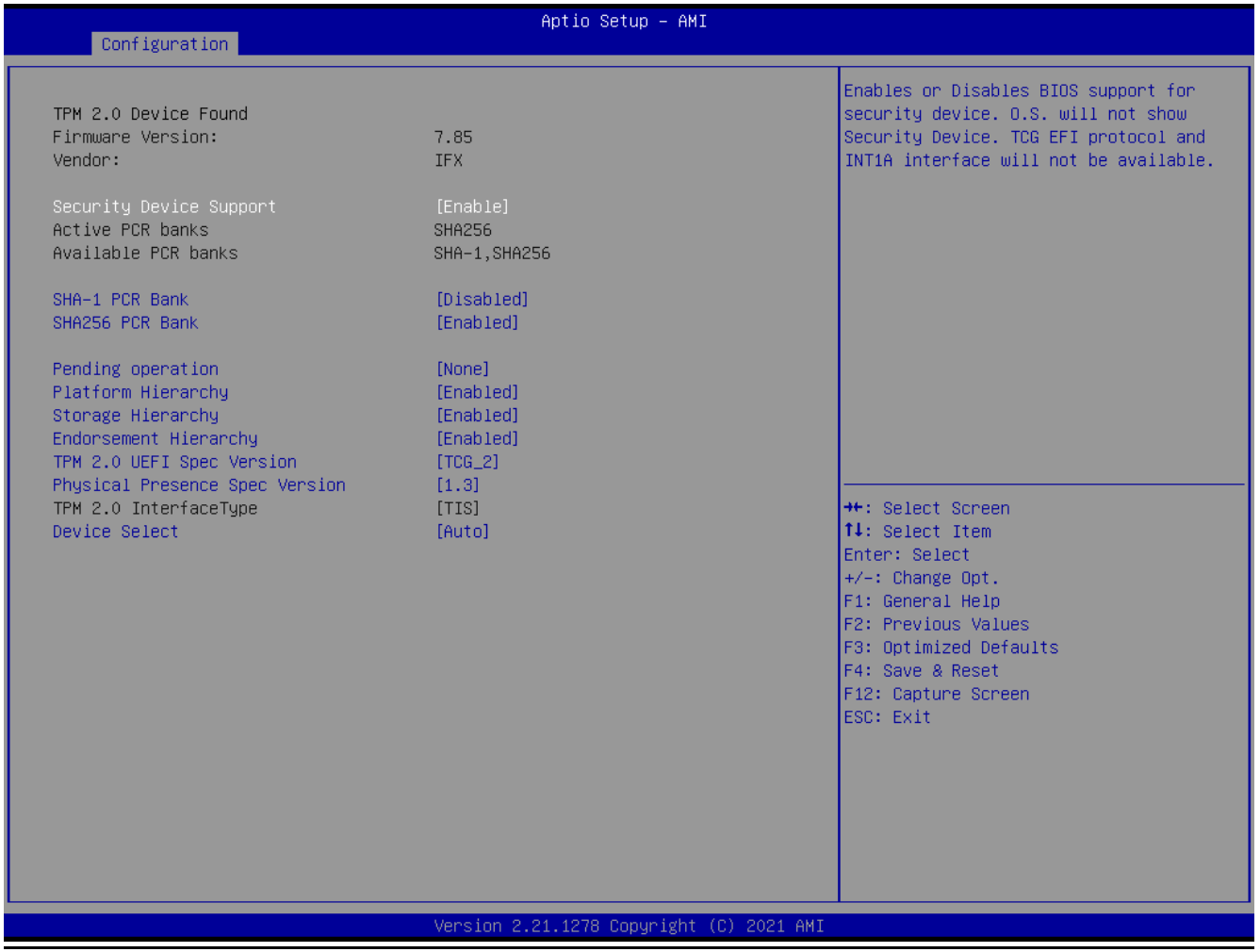


Figure 24 BIOS - Configuration - TPM

6.13 Super IO

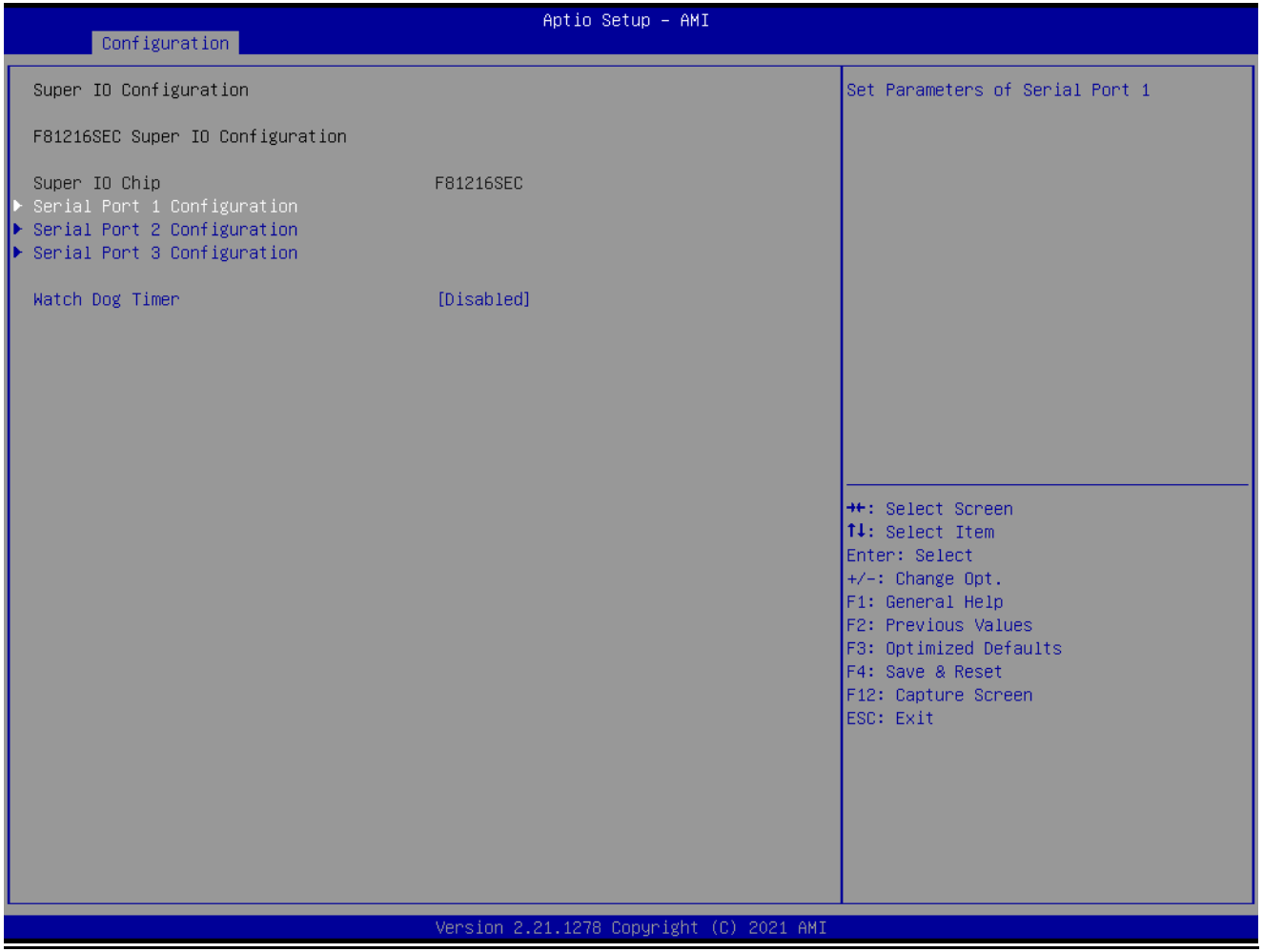


Figure 25 BIOS - Configuration - SuperIO

6.14 H/W Monitor

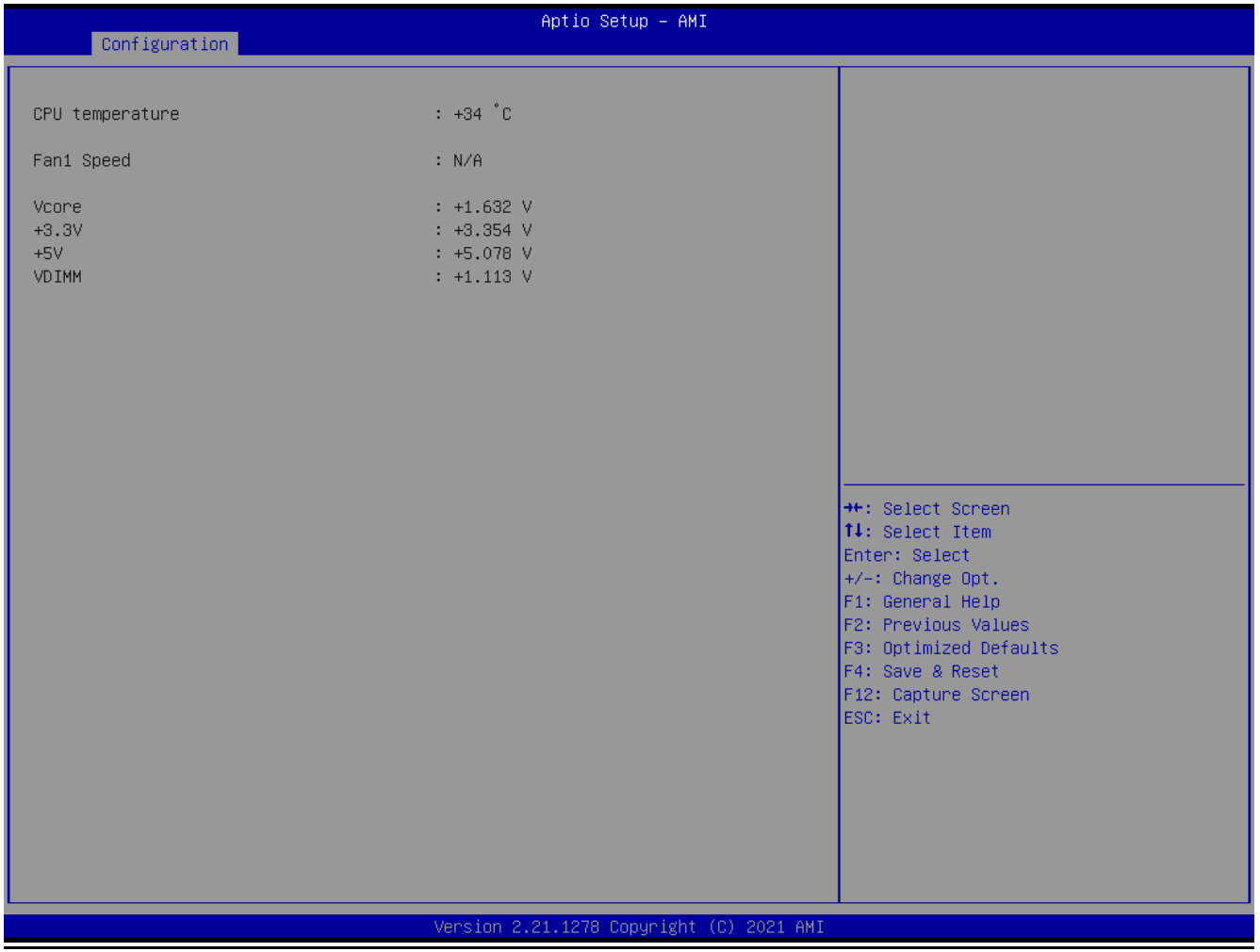


Figure 26 BIOS - Configuration - H/W Monitor

6.15 Serial Port Console

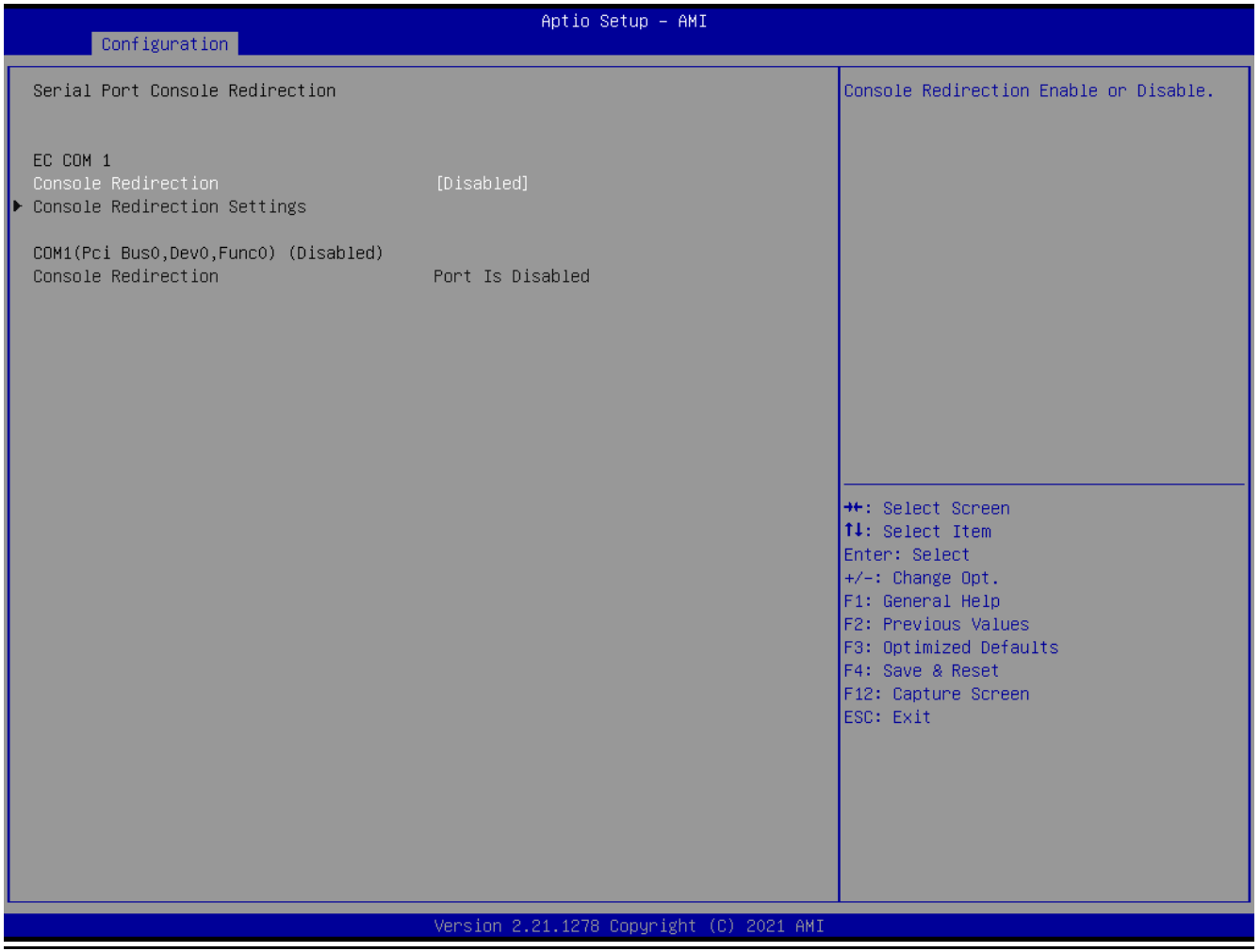


Figure 27 BIOS - Configuration - Serial Port Console

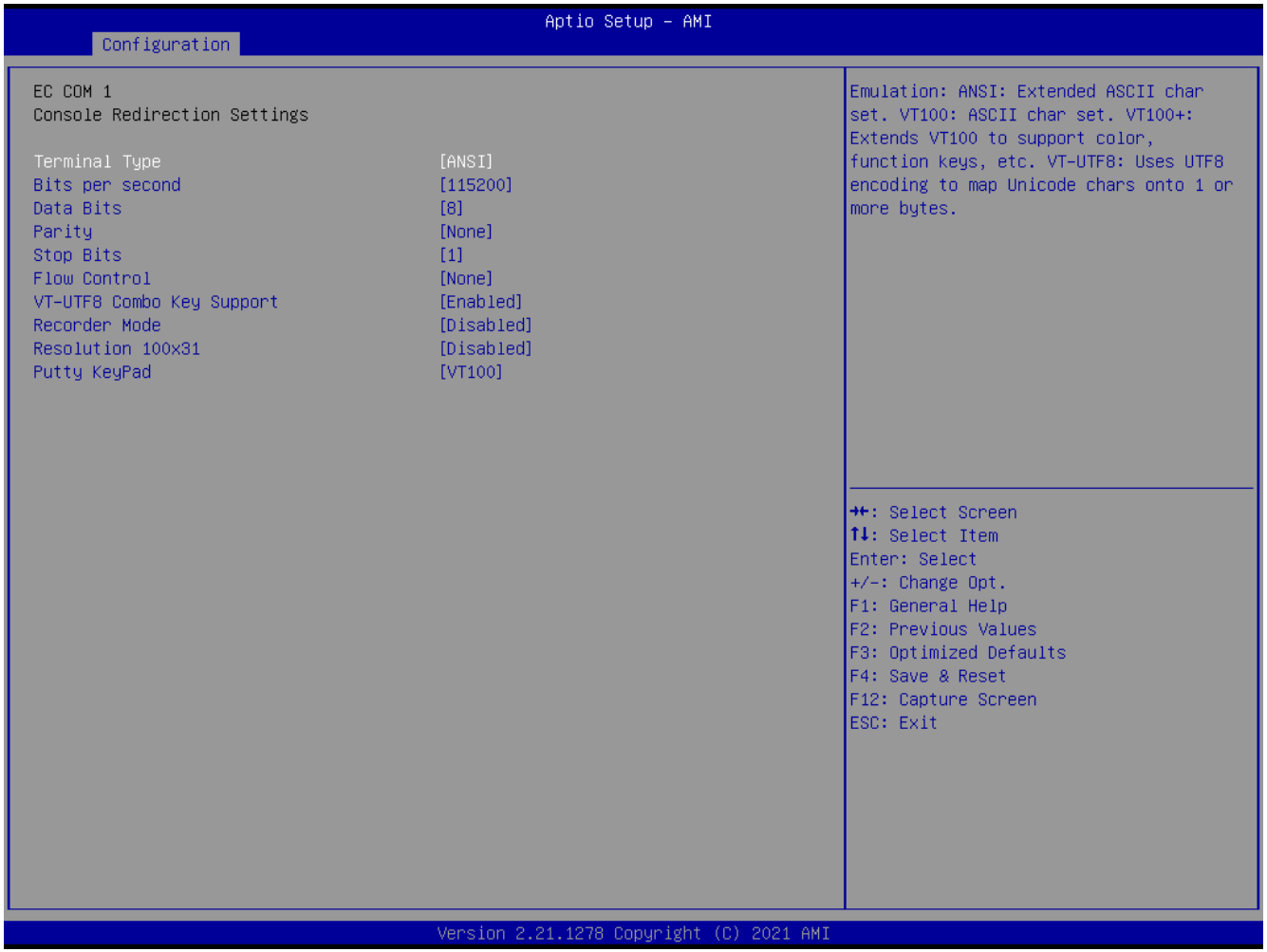


Figure 28 EC COM1 Console Redirection Settings

6.16 Security

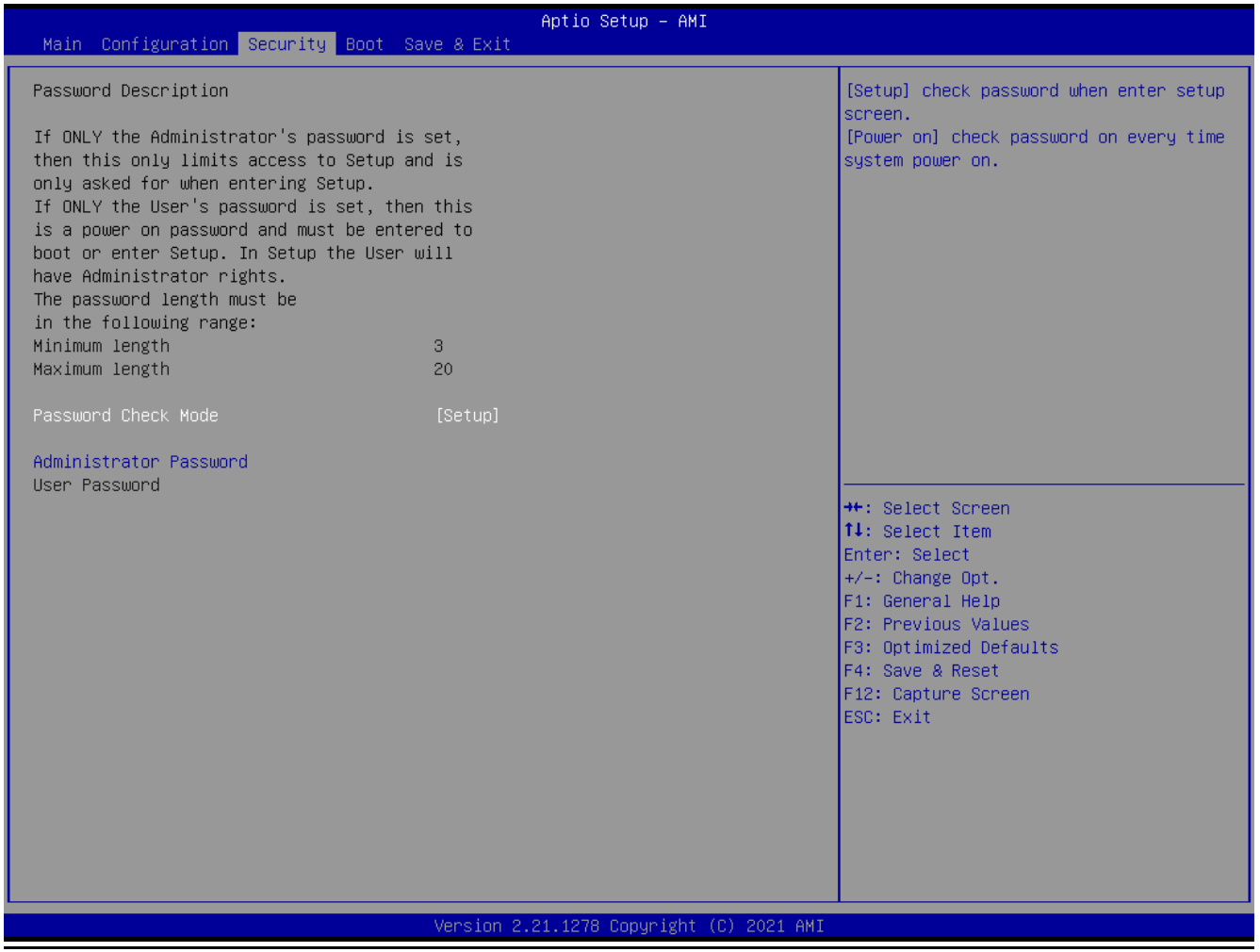


Figure 29 BIOS - Security

6.17 Boot

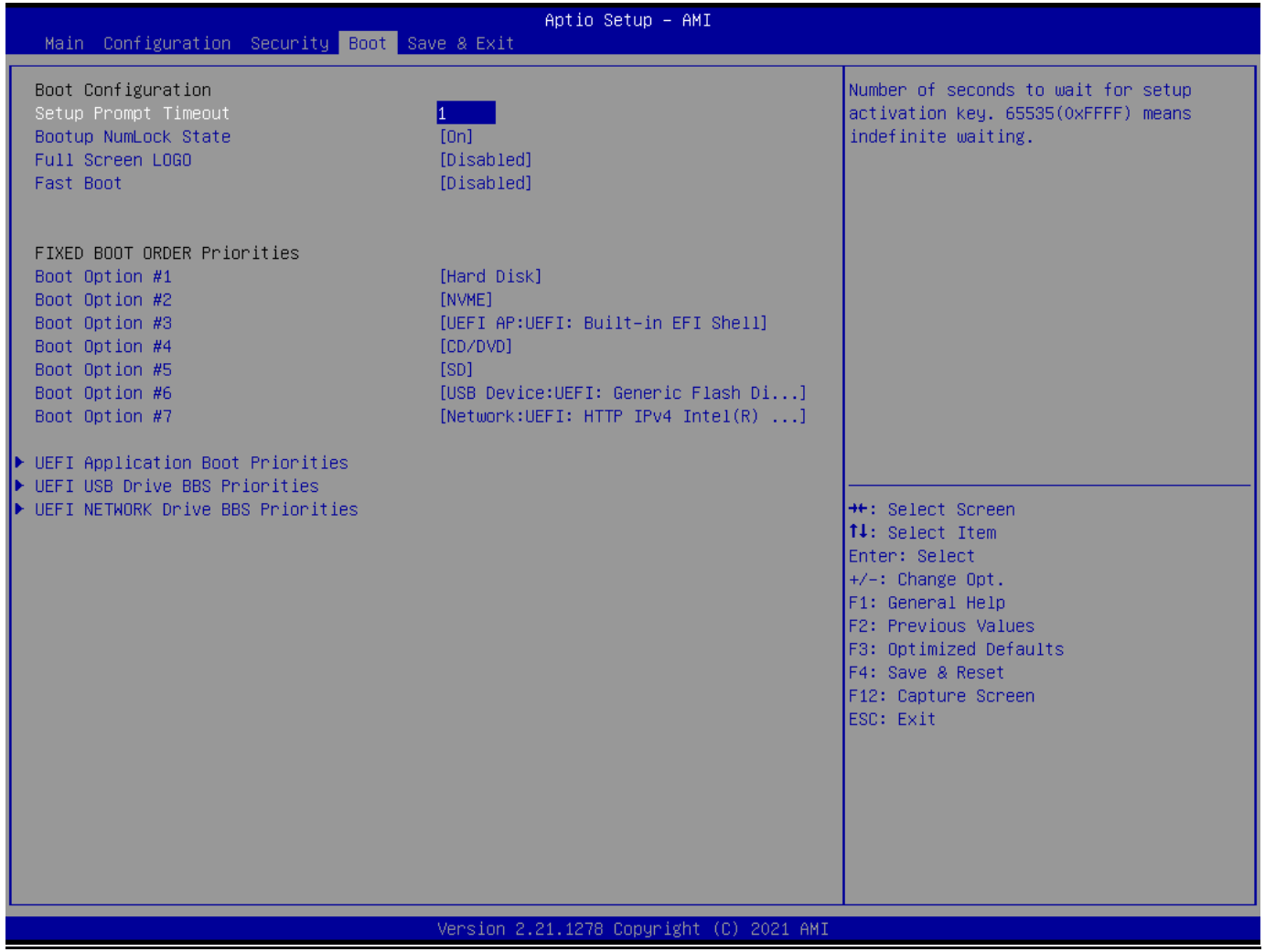


Figure 30 BIOS - Boot

6.18 Save & Exit

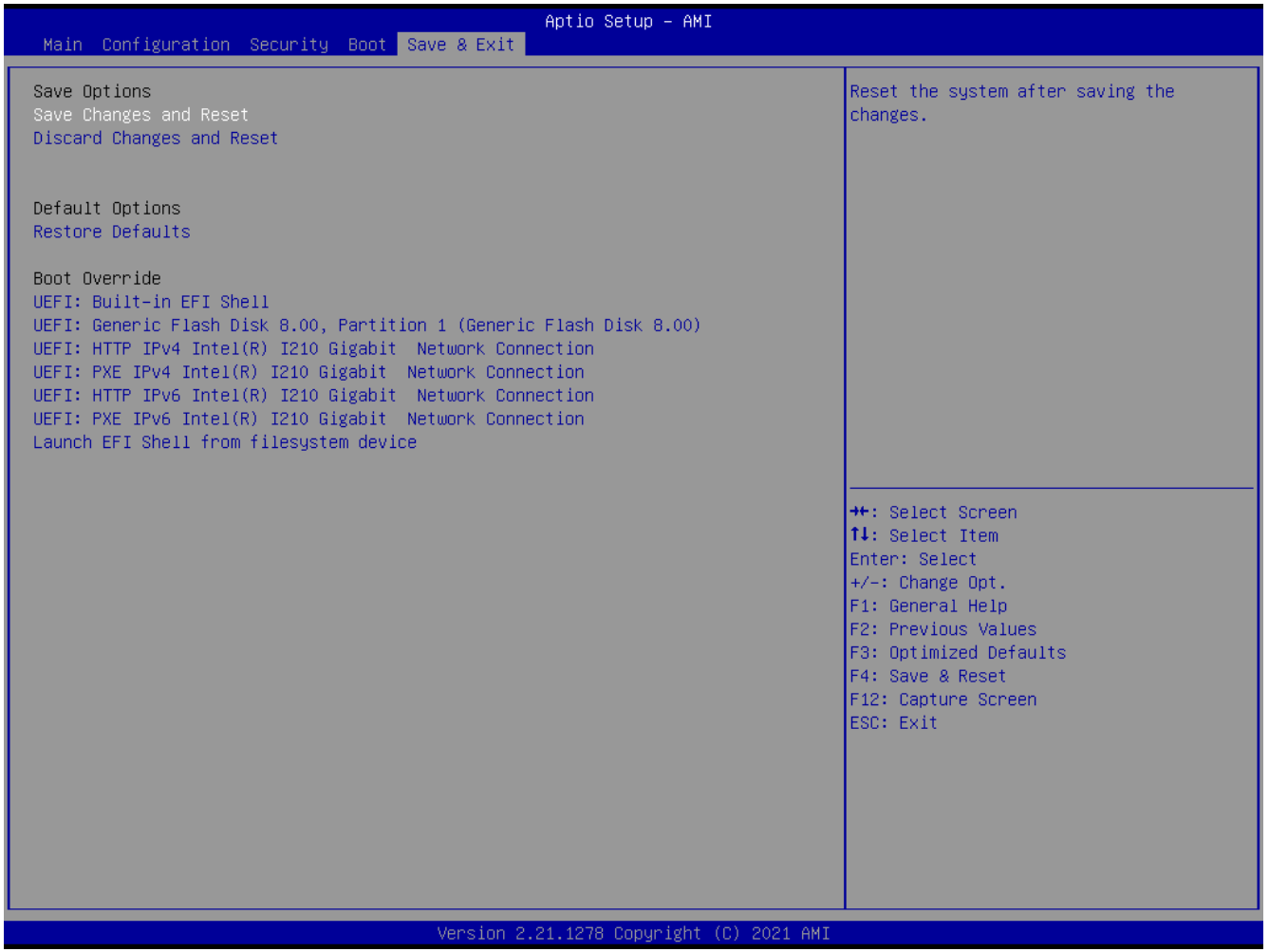


Figure 31 BIOS - Save & Exit

7 System Resources

Device	I/O Address	Note
Embedded Controller (ITEIT5121)	6E/6F	EC Address
	62/66	EC ACPI CMD Port
	0x3F8~0x8FF	EC UART0

Table 18 System Resource - EC IO Address

Interrupt Request Lines IRQ		
IRQ#	*Current Use*	*Default Use*
IRQ 0	System ROM	System Timer
IRQ 1	【Unassigned】	Usable IRQ
IRQ 2	【Unassigned】	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	System ROM	COM3
IRQ 6	【Unassigned】	Usable IRQ
IRQ 7	【Unassigned】	Usable IRQ
IRQ 8	【Unassigned】	Usable IRQ
IRQ 9	【Unassigned】	Usable IRQ
IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	【Unassigned】	Usable IRQ
IRQ 12	【Unassigned】	Usable IRQ
IRQ 13	【Unassigned】	Usable IRQ
IRQ 14	【Unassigned】	Usable IRQ
IRQ 15	【Unassigned】	Usable IRQ

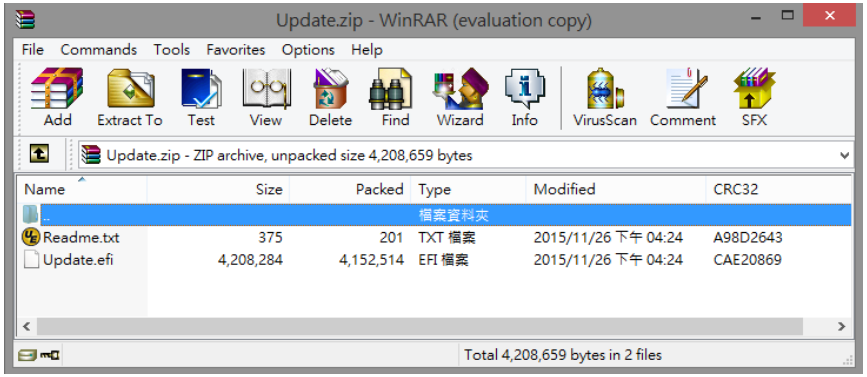
Table 19 System Resource IRQ

8 BIOS Update

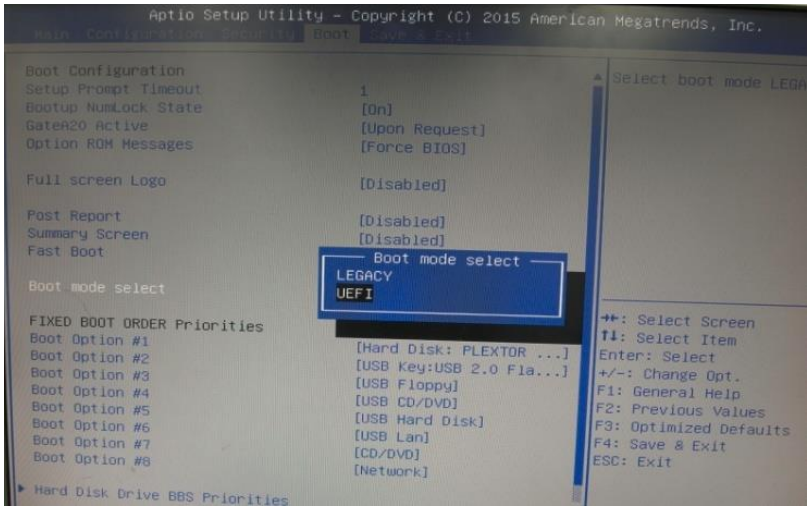
BIOS/EC UEFI Update SOP process

Step 1. Prepare a USB DOK (Caution : Must be FAT or FAT32 format).

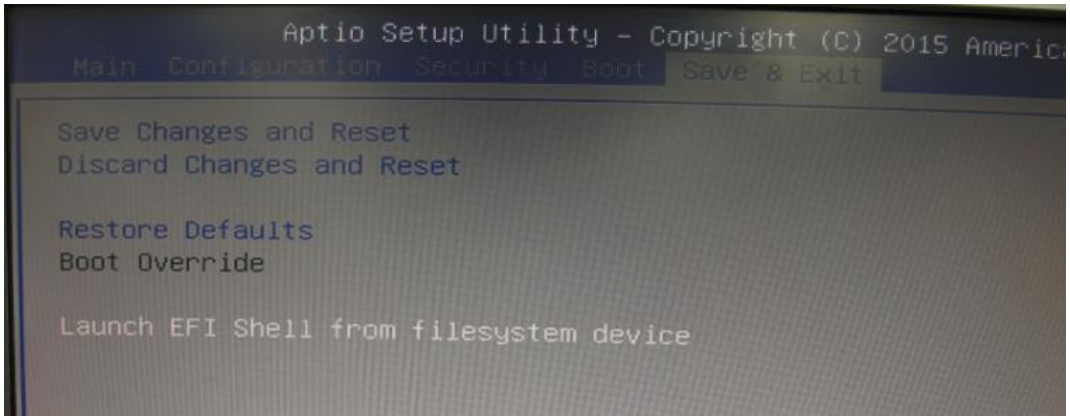
Step 2. Unzip update file to the USB DOK.



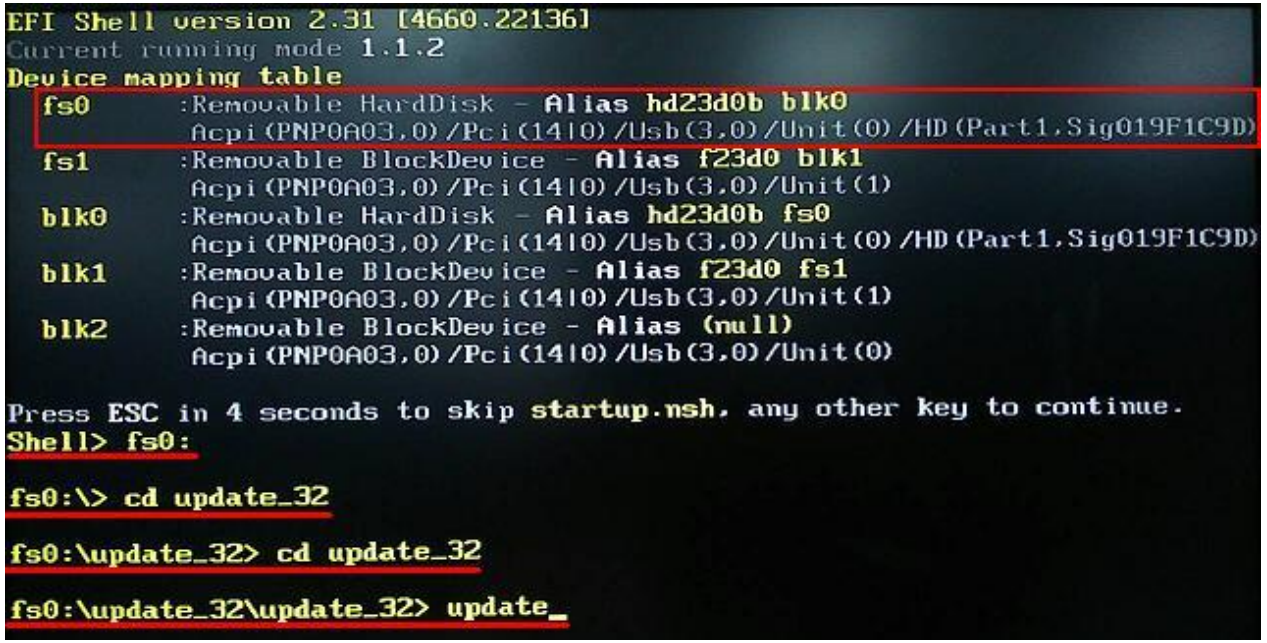
Step 3. Select UEFI boot mode in the BIOS boot menu and save, then restart the system.



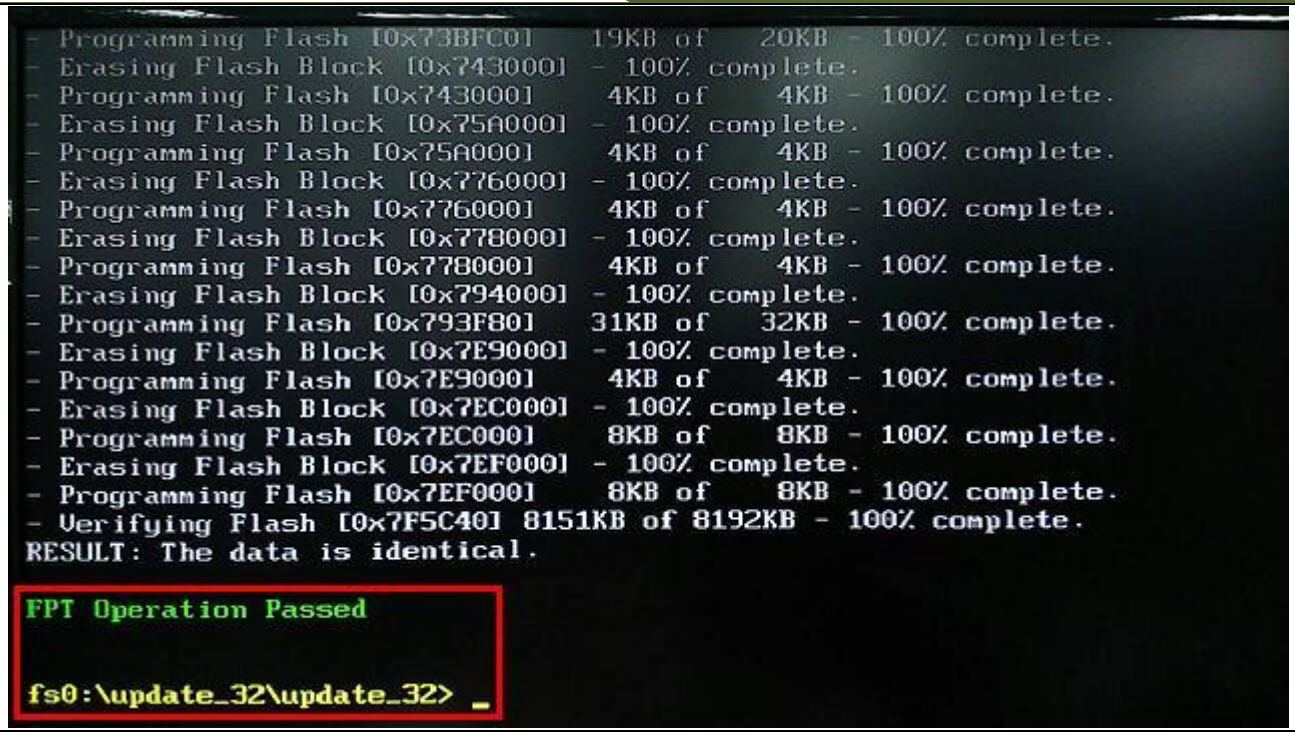
Step 4. Plug the USB DOK to the target system and boot from UEFI Shell.



Step 5. Under the UEFI shell, direct to your USB DOK, below example fs0 and type command: "update" and press enter.



Step 6. The update process will start and you can see the update progress. Once finished, please power off and restart the system.



<End of BIOS/EC UEFI update process>

9 Industry Specifications

The list below provides links to industry specifications that apply to MITWELL Qseven Modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC) http://www.intel.com/design/chipsets/industry/lpc.htm
Universal Serial Bus (USB) Specification, Revision 2.0 http://www.usb.org/home
PCI Specification, Revision 2.3 https://www.pcisig.com/specifications
Serial ATA Specification, Revision 3.0 http://www.serialata.org/
Qseven specification http://www.qseven-standard.org/