COM Express™ PCOM-B702G User's Guide R0.1

Revision History

Rev.	Note	Date
R0.1	Preliminary	Jan.2017

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1 Introduction

PCOM-B702G is the latest COM Express Type 7, Basic form factor (95mm x 95mm) Computer On Module launched by Portwell, Inc. PCOM-B702G is designed with Intel® Atom-Processor series.

2 Block Diagram

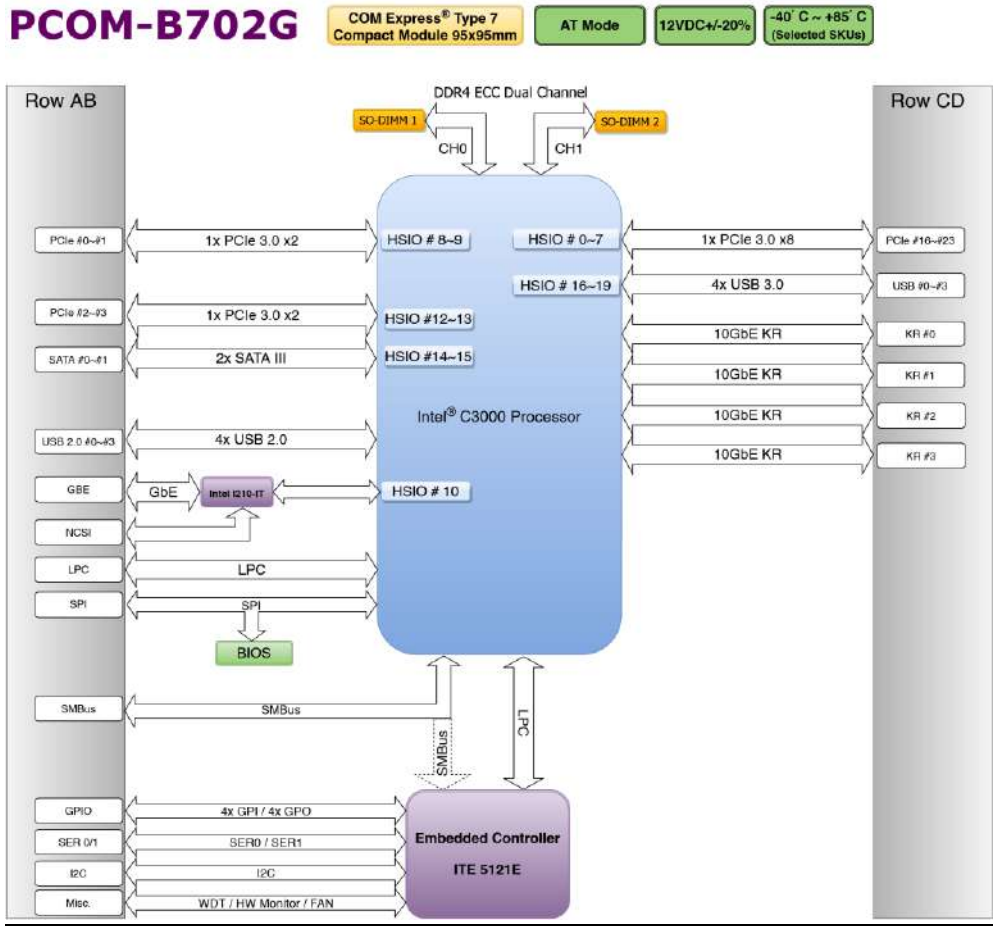


Figure 1 Block Diagram

3 Specifications

Table 1 PCOM-B702GVG SPEC

Product	➢ PCOM-B702G
Form Factor	➢ COM Express™ standard pin out Type 7 Rev. 2.1 (Basic 95 x 95mm).
Processor	➢ Intel®Atom-Processor-C3558 ➢ Intel®Atom-Processor-C3508 ➢ Intel®Atom-Processor-C3338 ➢ Intel®Atom-Processor-C3308
BIOS	➢ AMI Aptio5 BIOS
Memory	➢ SODIMM DDR4 ➢ Support ECC ➢ Up to 128GB 2400MHz
Ethernet	➢ Intel® I210IT ➢ 4 x KR(10GbE)
Audio	➢ Intel® High Definition Audio
Security	➢ TPM

Table 2 PCOM-B702G Specification 1-2

<continued>

I/O	➢ 4 PCI Express Gen3 (8.0 GT/s) configuration x1,x2 ➢ 1 PCI Express x8 (PEG) up to Gen3 (8.0 GT/s) configuration x4, x8, x16 ➢ 4 x USB2.0 (480 Mbps) ➢ 4 x USB3.0 (5 Gbps) ➢ 2 x SATA3.0 (6 Gbps)

	➢ GPIO / I2C / 2 Serial Ports / SMBus
Hardware Monitors	➢ ITE8380 Embedded Controller, Voltage, Fan and Temperature
Power Management	➢ ACPI 4.0
Environment	➢ Operating Temperature 0°C ~ 60°C (processor dependent) ➢ Storage Temperature 0°C ~ +60°C ➢ Relative Humidity 5%~95%

3.1 PCOM-B702G Processor list

3.1 PCOM-B702G Processor list

PCOM-B702G Series	PCOM-B702G	PCOM-B702G -	PCOM-B702G -	PCOM-B702G
Ordering P/N	AB1-3H49	AB1-3J40	AB1-3H46	AB1-3H45
Processor Number	C3558	C3508	C3338	C3308
Cache	8 MB	8 MB	4 MB	4 MB
Instruction Set	64-bit	64-bit	64-bit	64-bit
# of Cores	4	4	2	2
# of Threads	4	4	2	2
Processor Base Frequency	2.2 GHz	1.5 GHz	1.5 GHz	1.6 GHz
TDP	16 W	11.5 W	9 W	9 W

Table 3 PCOM-B702G Processor list

3.2 Supported Operating Systems

The PCOM-B702GVG supports the following operating systems.

Vendor	Operating System	Supported
Microsoft	Windows 7 (32/64bit)	
	Windows 8 (32/64bit)	
	Windows 8.1 (32/64bit)	
	Windows 10 (32/64bit)	
	Microsoft Windows 2008 R2 SP1	
	Microsoft Windows 2012	
	Microsoft Windows 2012 R2	
Linux	Fedora 22 (kernel 4.0.4-301)	
	Ubuntu 15.04 (kernel 3.11.6.4)	

Table 4 Supported OS list

3.3 Windows OS driver

Please download the drivers from Portwell download center website http://www.portwell.tw/support/download_center.php

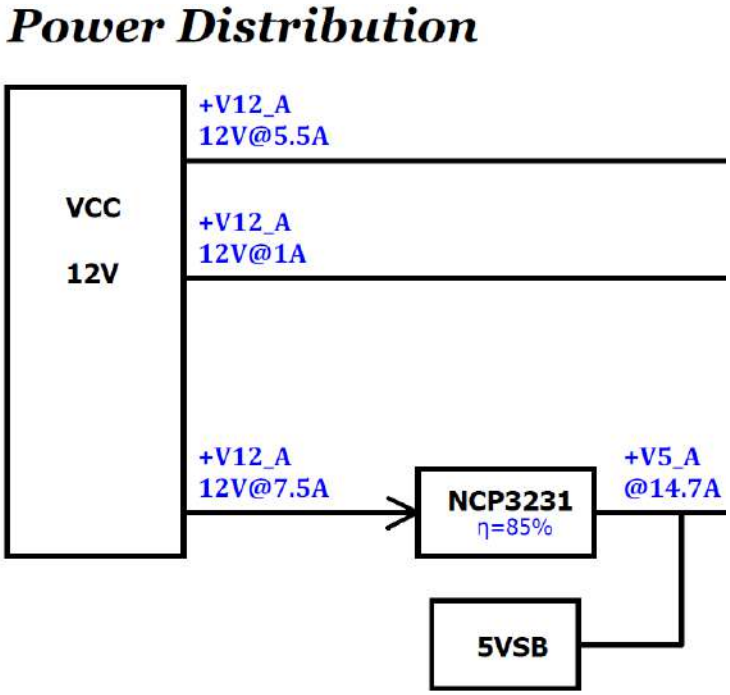
Drivers file name	Supported Operating Systems
10GLAN_Win7_64	Windows Server 2008 R2 (64bit) Microsoft Windows 7 (64bit)
Chipset_Win7_8_81_32_64	Microsoft Windows 7 (32/64bit) Microsoft Windows 8 (32/64bit) Microsoft Windows 8.1 (32/64bit)
Graphics_Win7_32_64	Microsoft Windows 7 (32/64bit)
Graphics_Win8_81_32_64	Microsoft Windows 8 / 8.1 (32/64bit)
Graphic_Windows10_Driver	Microsoft Windows 10 (32/64bit)
I210LAN_Win7_8_81_32_64	Microsoft Windows 7 (32/64bit) Microsoft Windows 8 / 8.1 (32/64bit) Windows Server 2008 R2 Microsoft Windows 2012 Microsoft Windows 2012 R2
XHCI_Win7_32_64	Microsoft Windows 7 (32/64bit) Windows Server 2008 (32/64bit)
10GLAN_Win8_81_64	Microsoft Windows 8 / 8.1 (64bit) Microsoft Windows 2012 (64bit) Microsoft Windows 2012 R2 (64bit)

Table 5 Windows OS driver list

3.4 Electrical Characteristics

Input voltage	+12VDC (Nominal)
RTC Battery	
Power on mode	AT Mode & ATX Mode

Table 6 Electrical characteristics



PCOM-B702G Power sequence

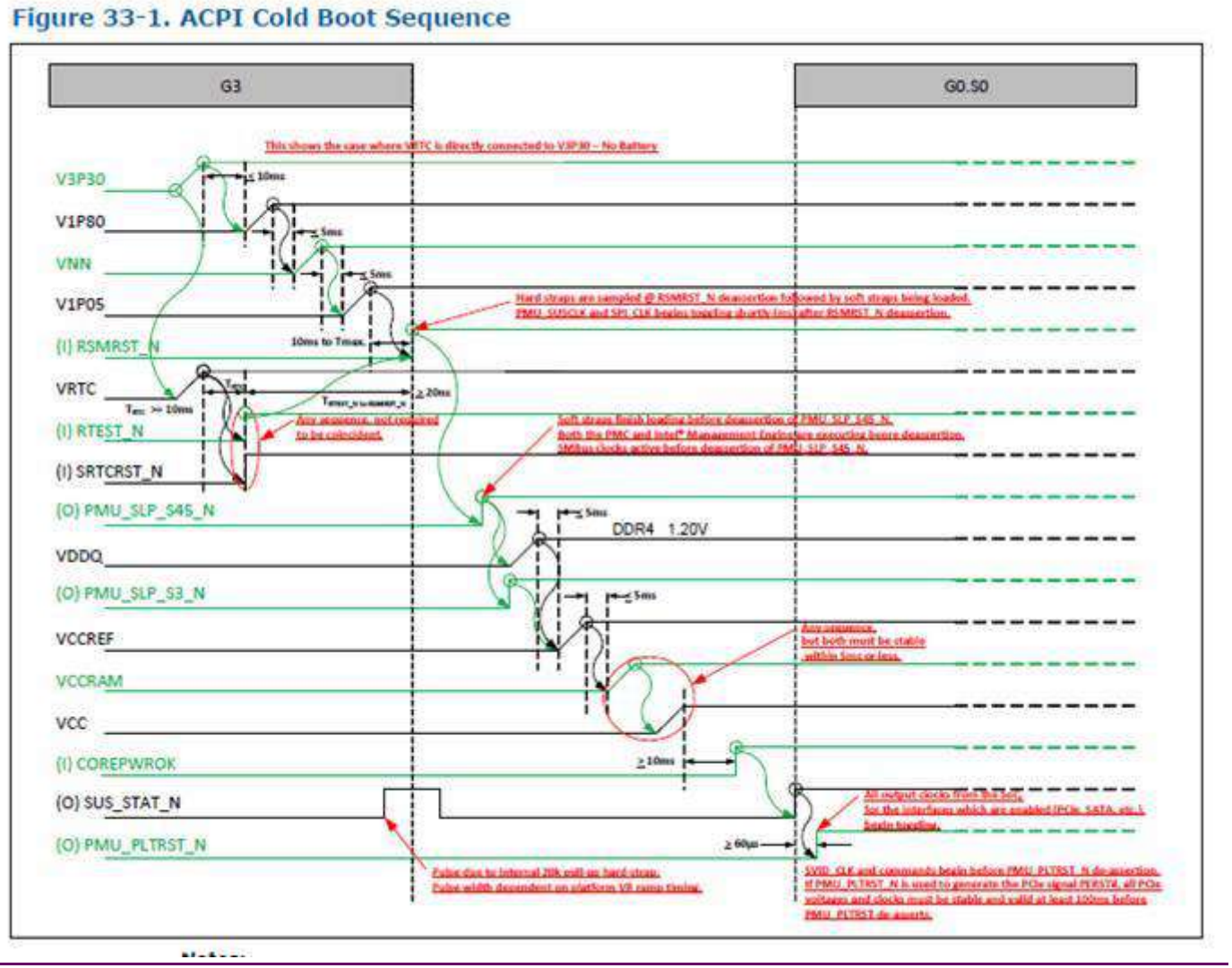


Figure 1 Power on sequence

Figure 33-3. ACPI Shutdown Sequence

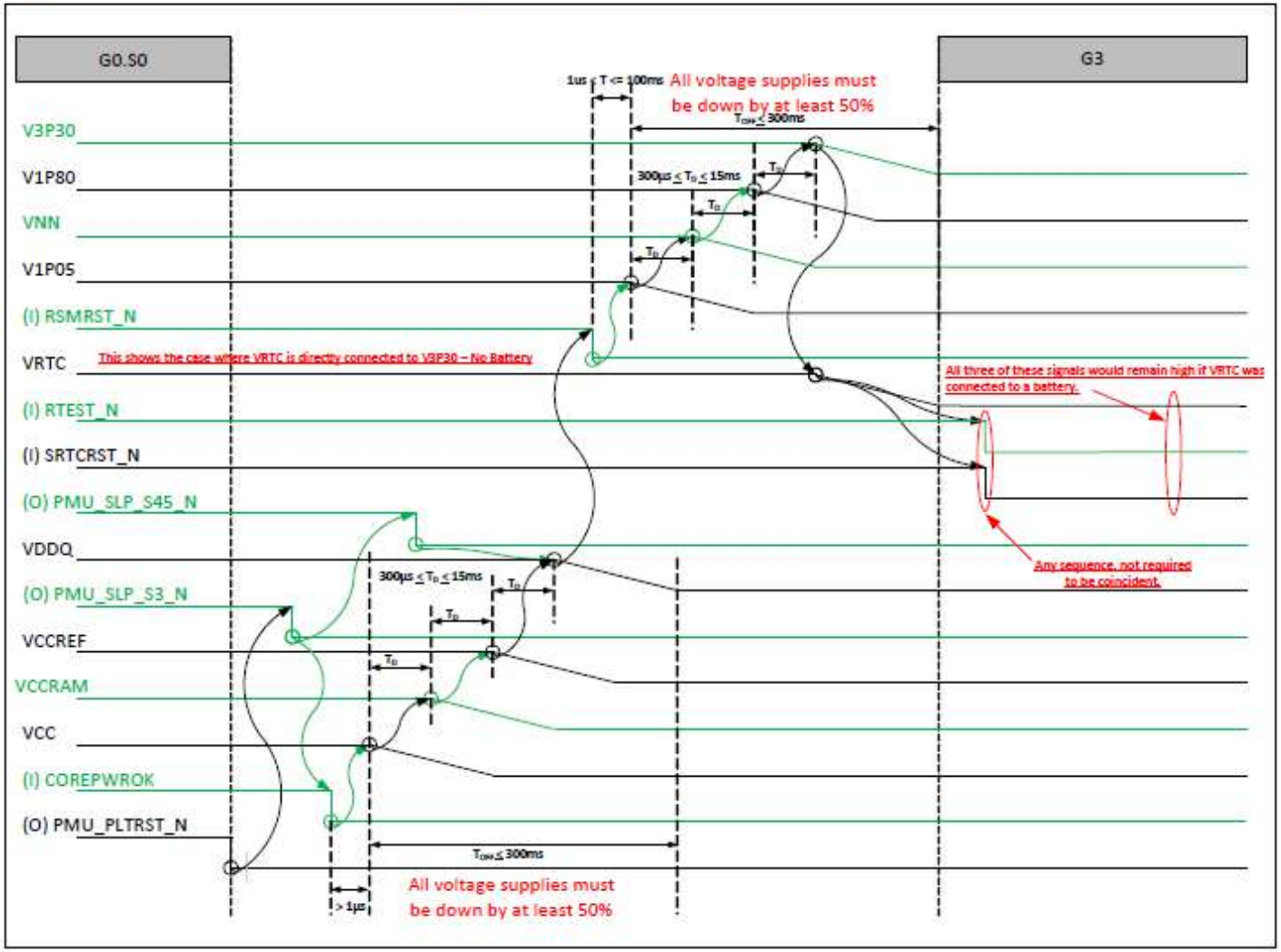


Figure 2 Shutdown sequence

3.5 Mechanical Dimensions

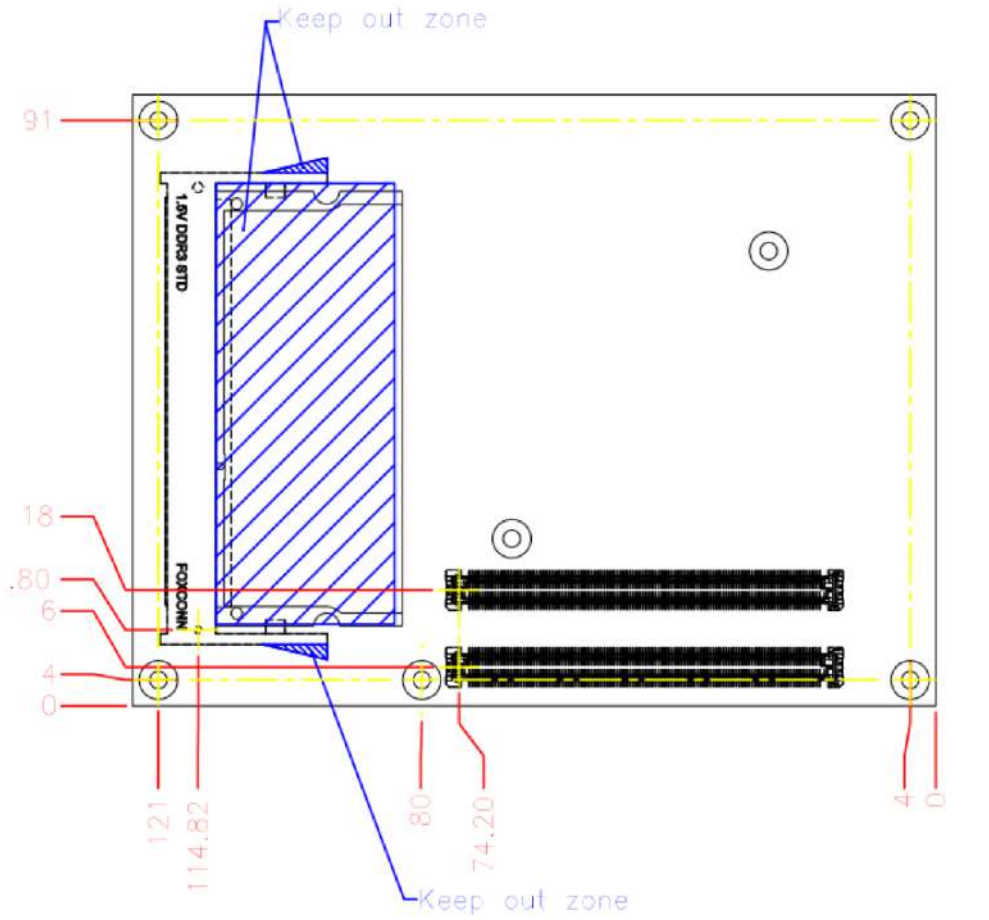


Figure 3 Mechanical Dimensions - Top

Net weight

Module	.0g +/- 2%
Cooler (H/S+FAN)	.0g +/- 2%

Table 7 Weight

3.6 2x SODIMM socket design

PCOM-B702G has designed additional Memory SODIMM socket, which supports up to DDR4 128GB capacity. There are 2 SODIMM socket of channel 0 & channel 1 .

3.7 Environmental Specifications

Storage Temperature	-40°C ~85°C
Operation Temperature	0°C ~60°C Extended : -40°C ~+85°C (Processor dependent)
Storage Humidity	0%~95%
Operation Humidity	0%~95%

Table 8 Environmental Specifications

3.8 Ordering Guide

PCOM-B702GVG

Product	Ordering P/N	Status
PCOM-B702G-C3558	AB1-3H49	Available
PCOM-B702G-C3508	AB1-3J40	Available
PCOM-B702G-C3338	AB1-3H46	Available
PCOM-B702G-C3308	AB1-3H45	Available

Table 9 Ordering Guide - PCOM-B702G

Accessory

Accessory	Ordering P/N	Status
PCOM-B702G Heatsink	N/A	
Evaluation Carrier PCOM-C701	AB1-3J61Z	Available

Table 10 Ordering Guide - Accessory

3.9 Packaging

Package	Appearance	Size
Anti-Static bubble bag		180x135mm
White Paper Box		210x151x40mm

Shipping Box (10 pcs White paper box)		595x300x195mm

4 BIOS Setup Items

PCOM-B702VG is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PCOM-B702VG communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

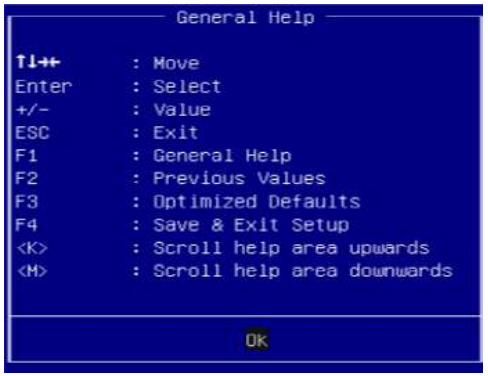
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

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 Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu 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.



4.2 Main

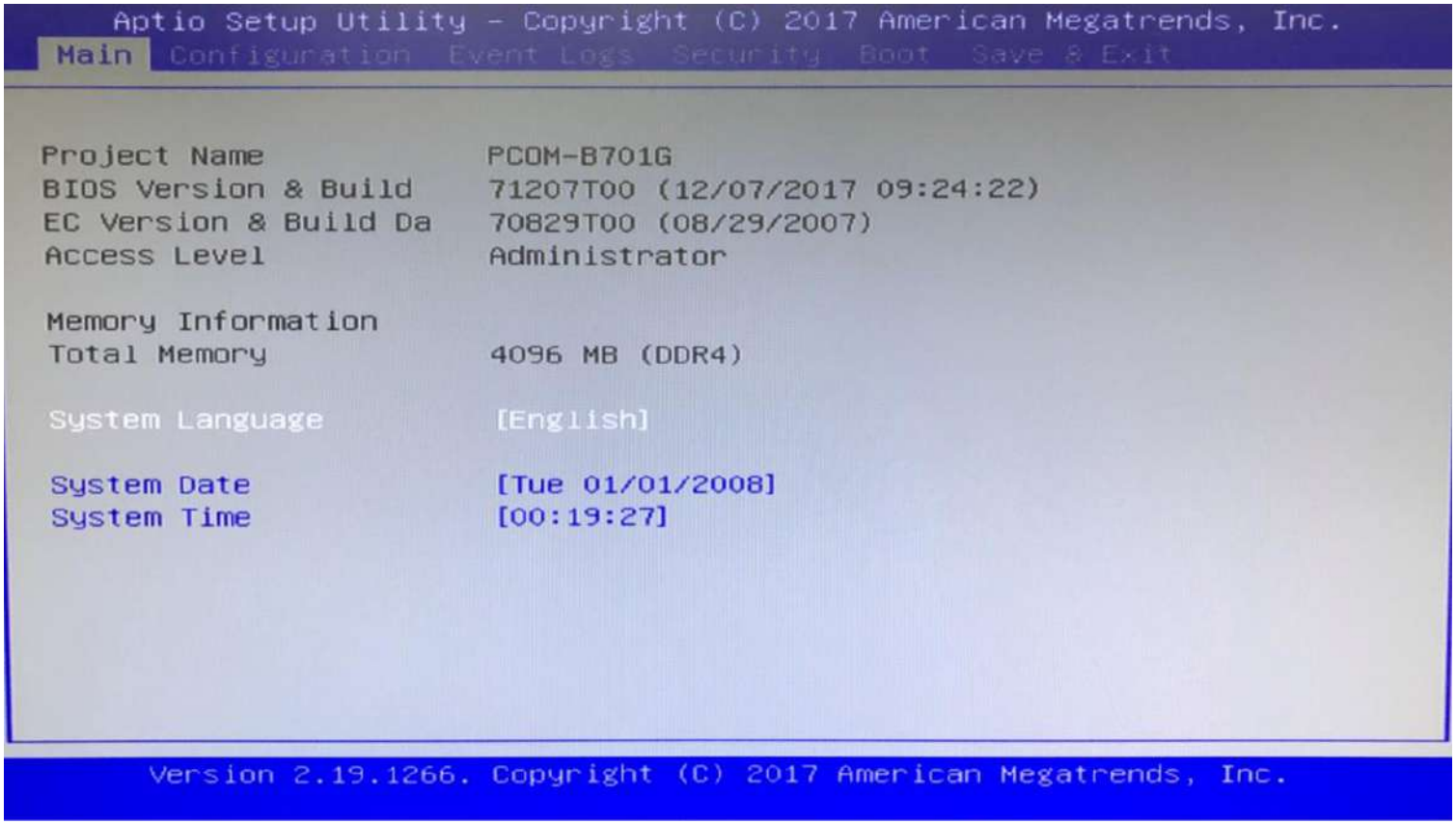


Figure 4 BIOS MAIN

4.3 Configuration

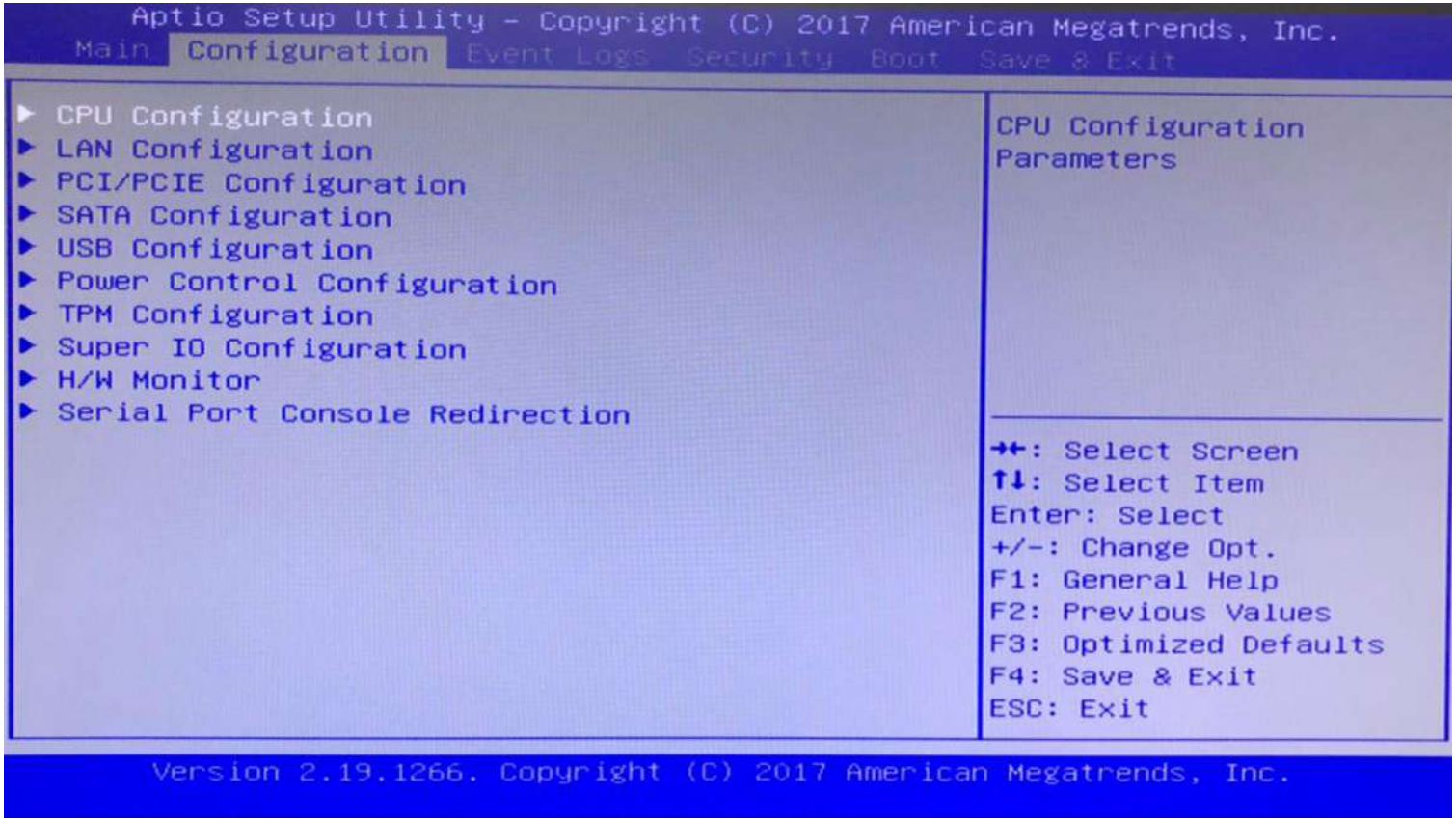


Figure 5 BIOS CONFIGURATION

CPU

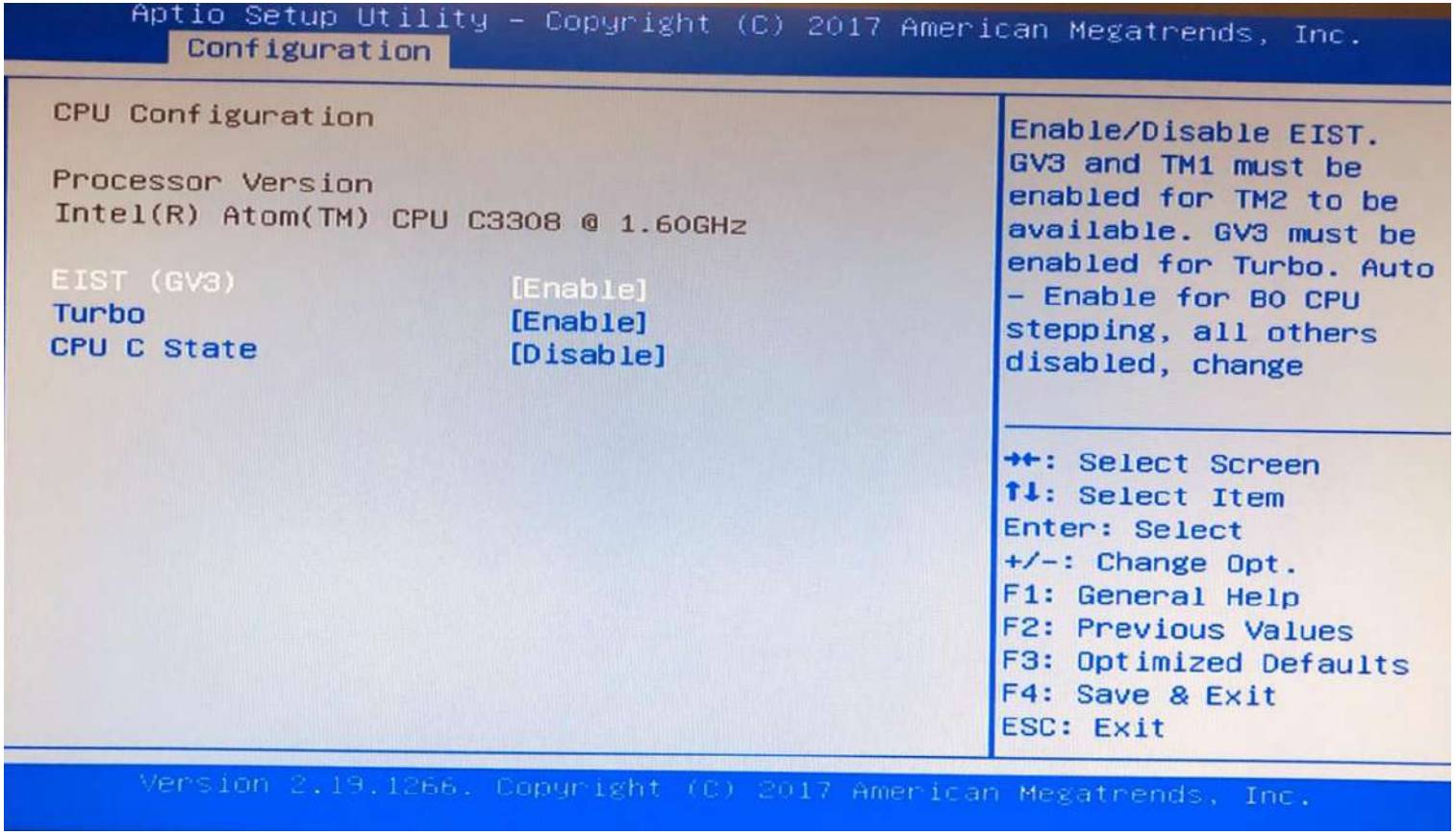


Figure 12 BIOS CPU

LAN

Figure 13 LAN

PCIE

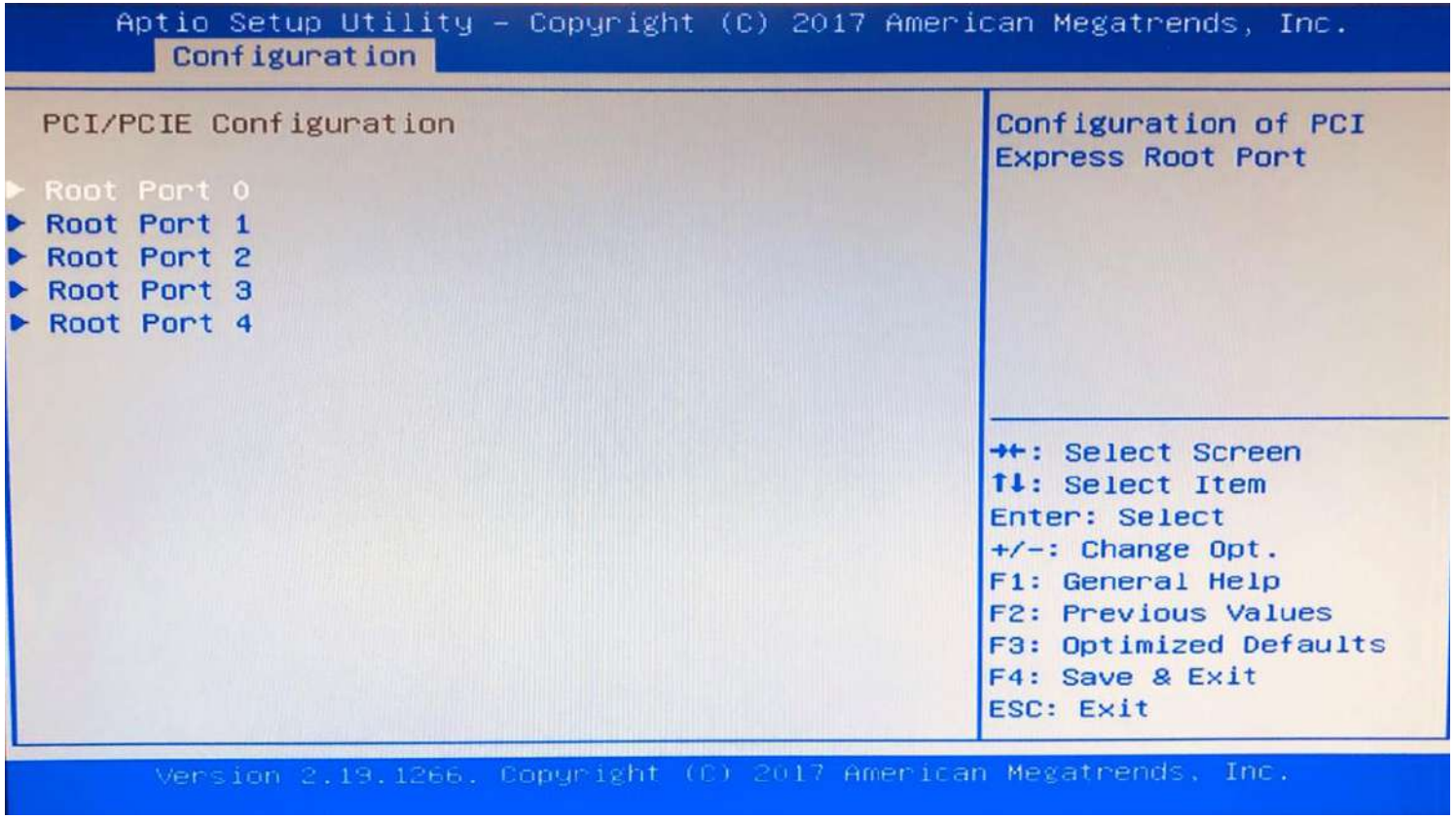


Figure 14 PCIE

SATA

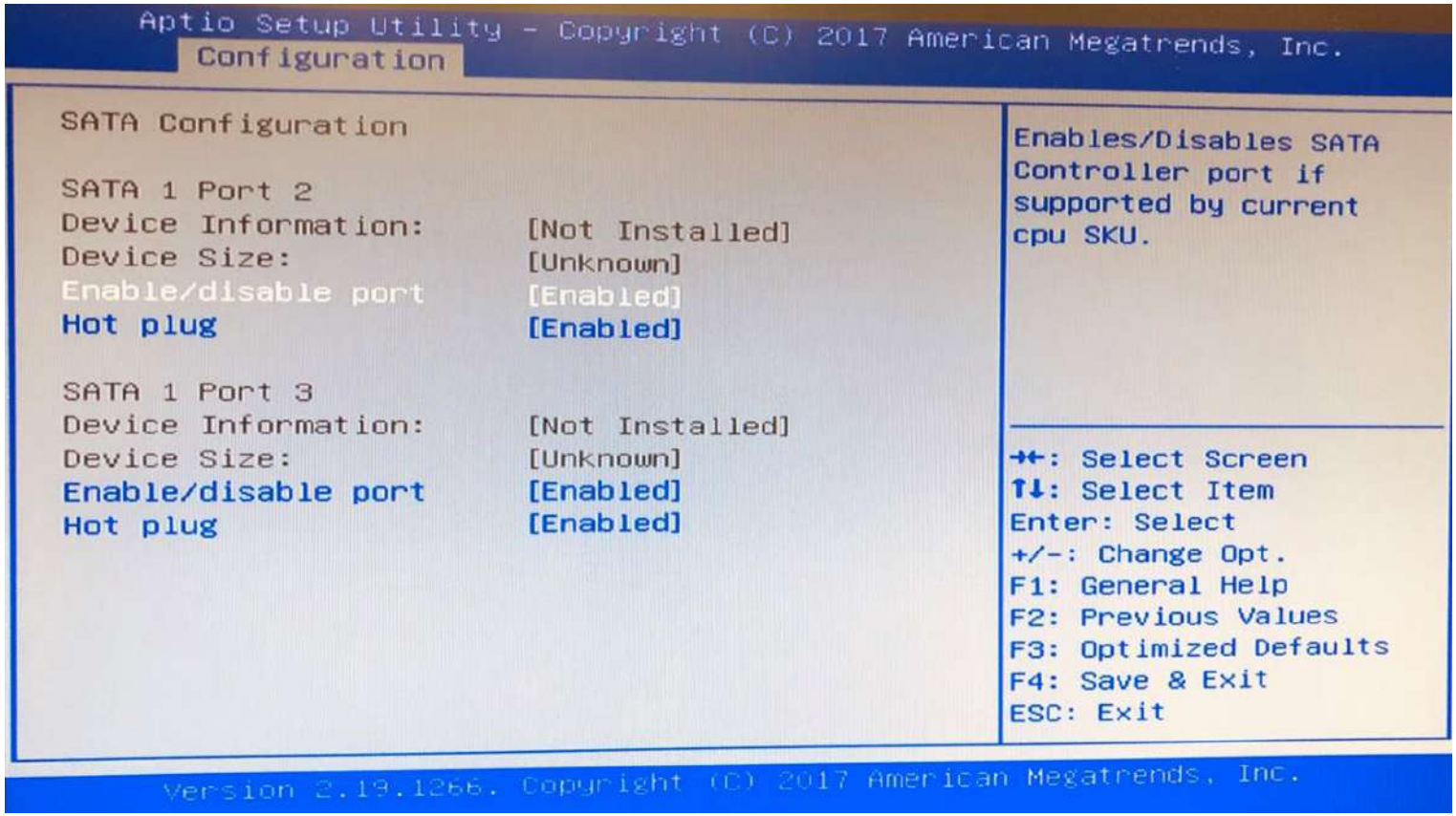


Figure 15 BIOS SATA

USB

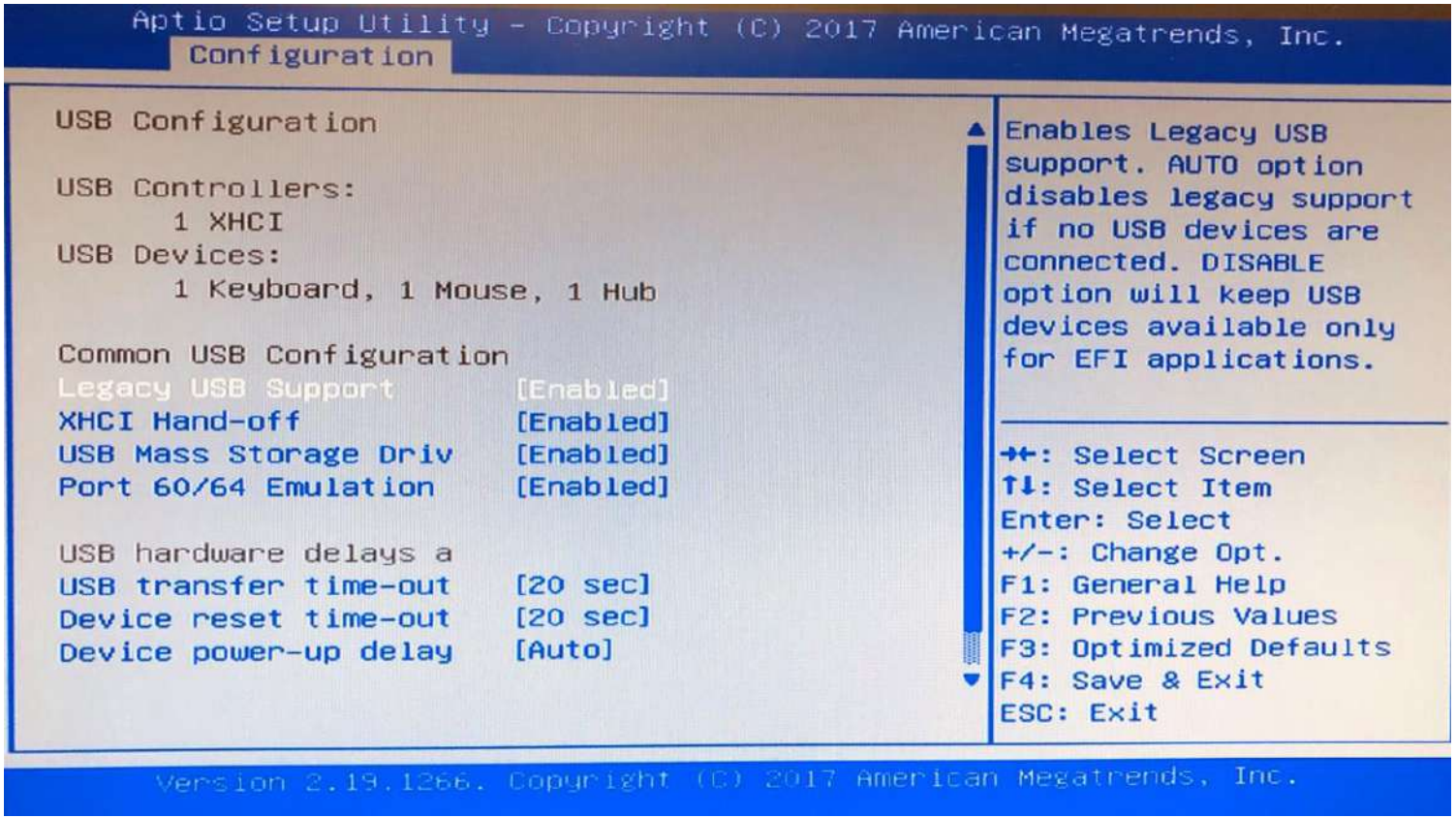


Figure 16 BIOS USB

Power control

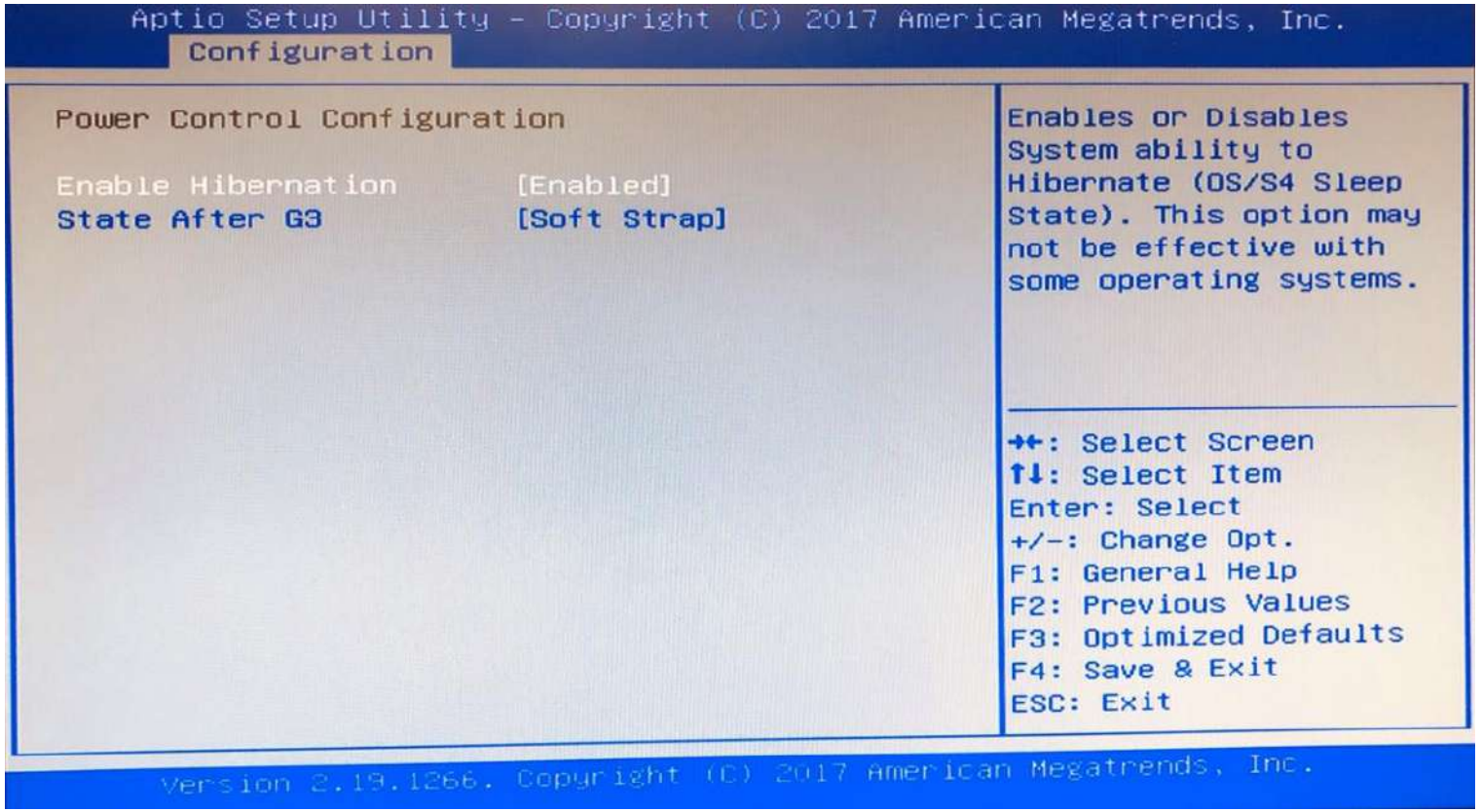


Figure 17 BIOS POWER CONTROL

TPM

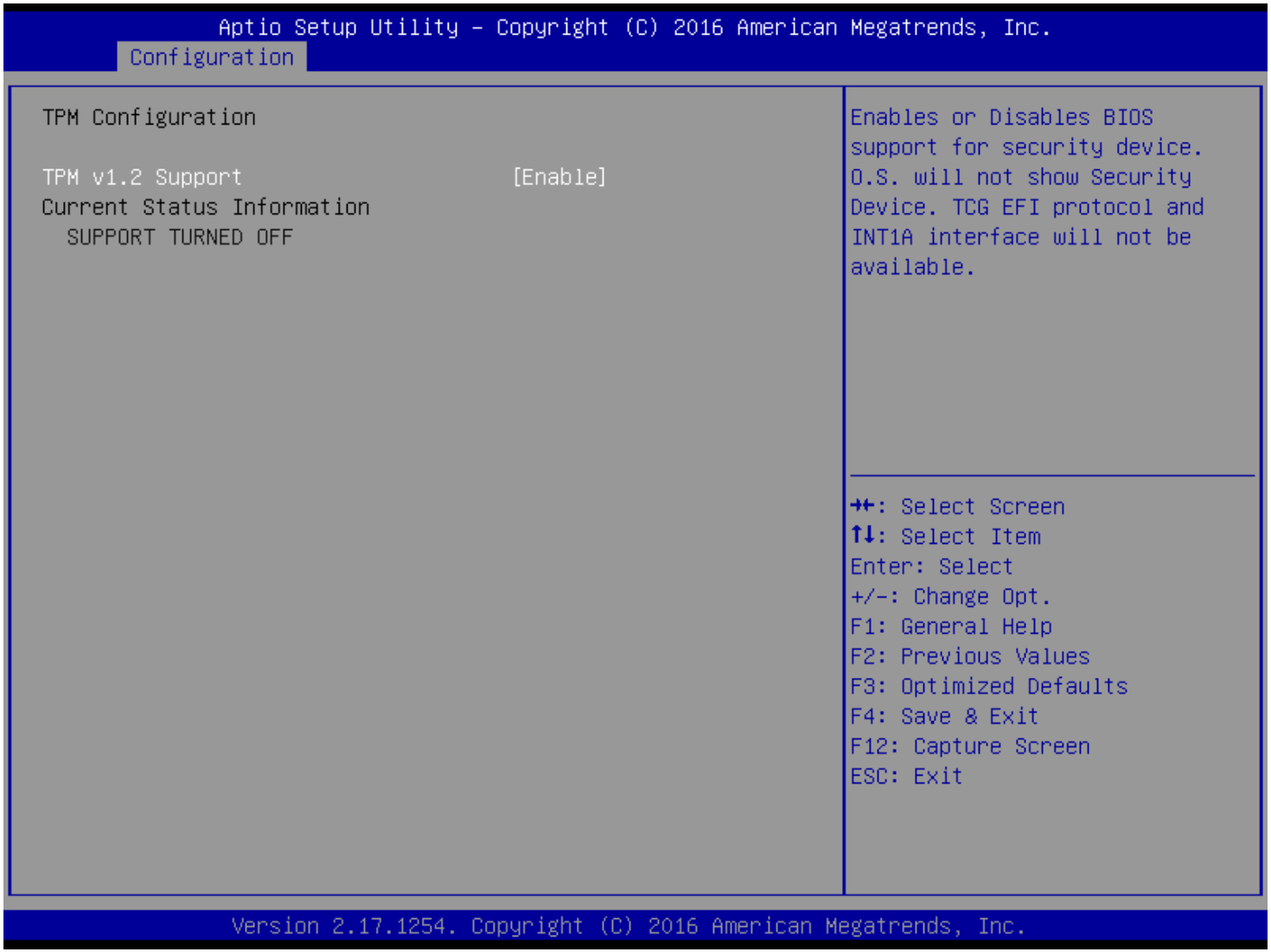


Figure 18 BIOS TPM

Super IO

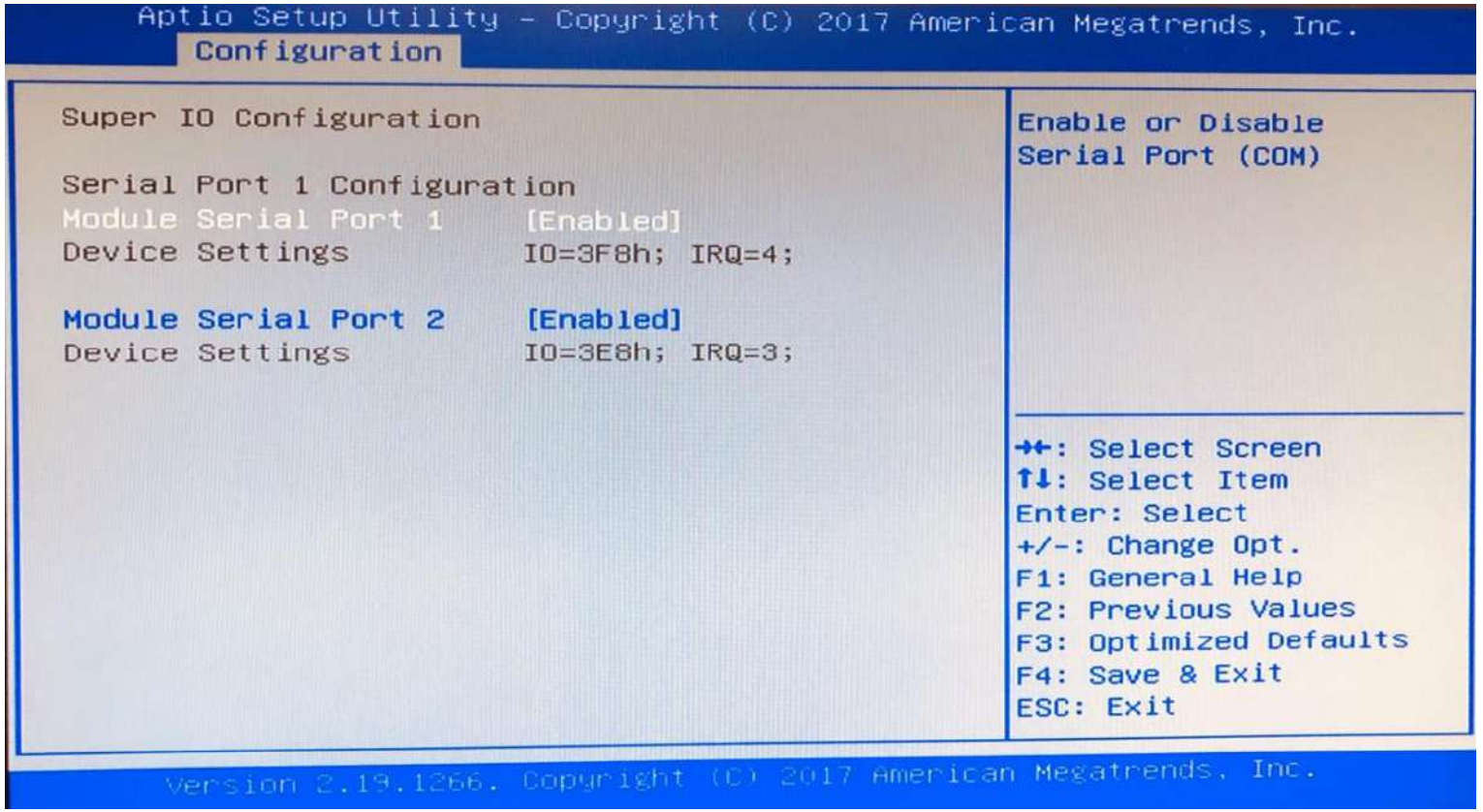


Figure 19 BIOS SUPER IO

HW Monitor

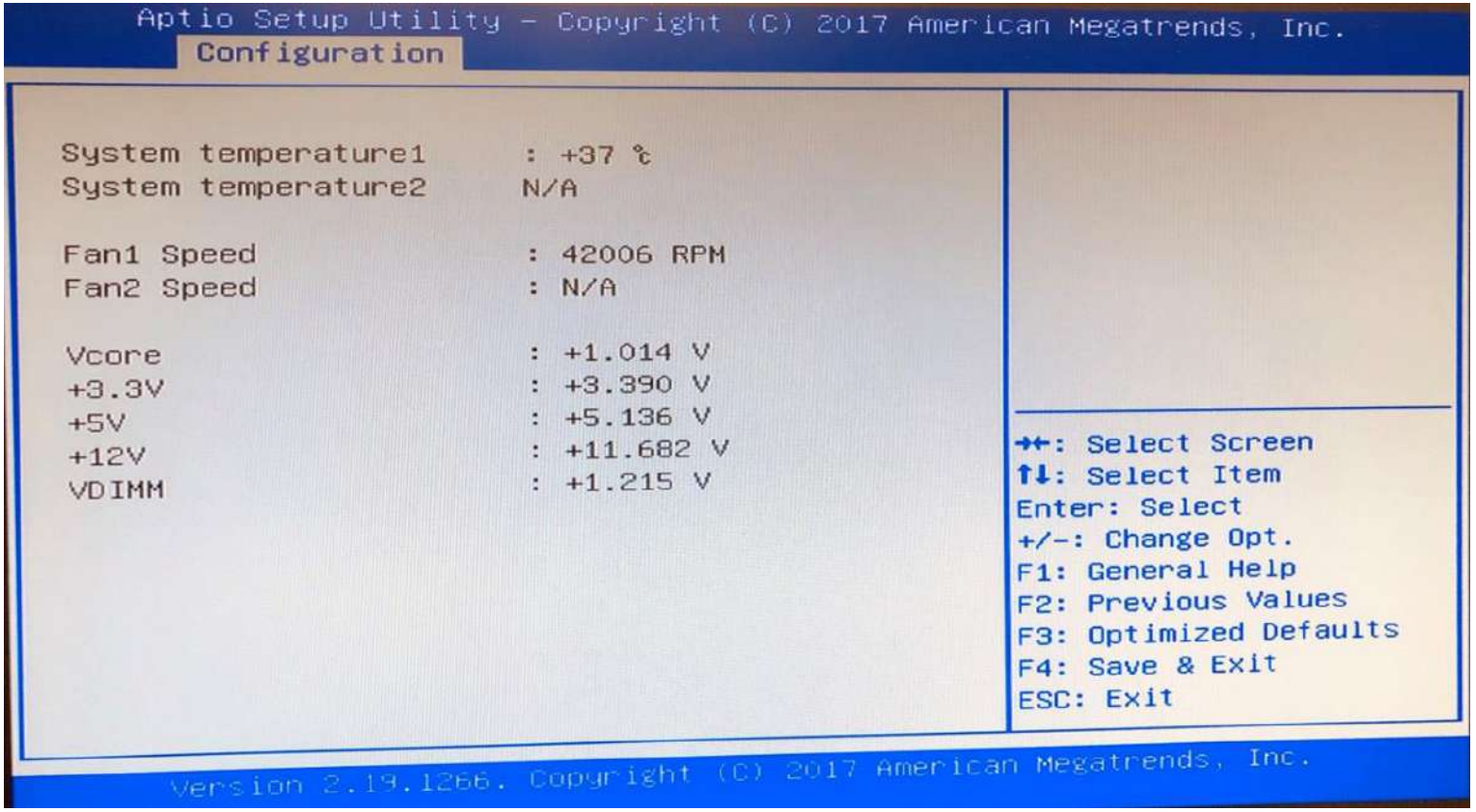


Figure 20 BIOS HW MONITOR

Serial Port

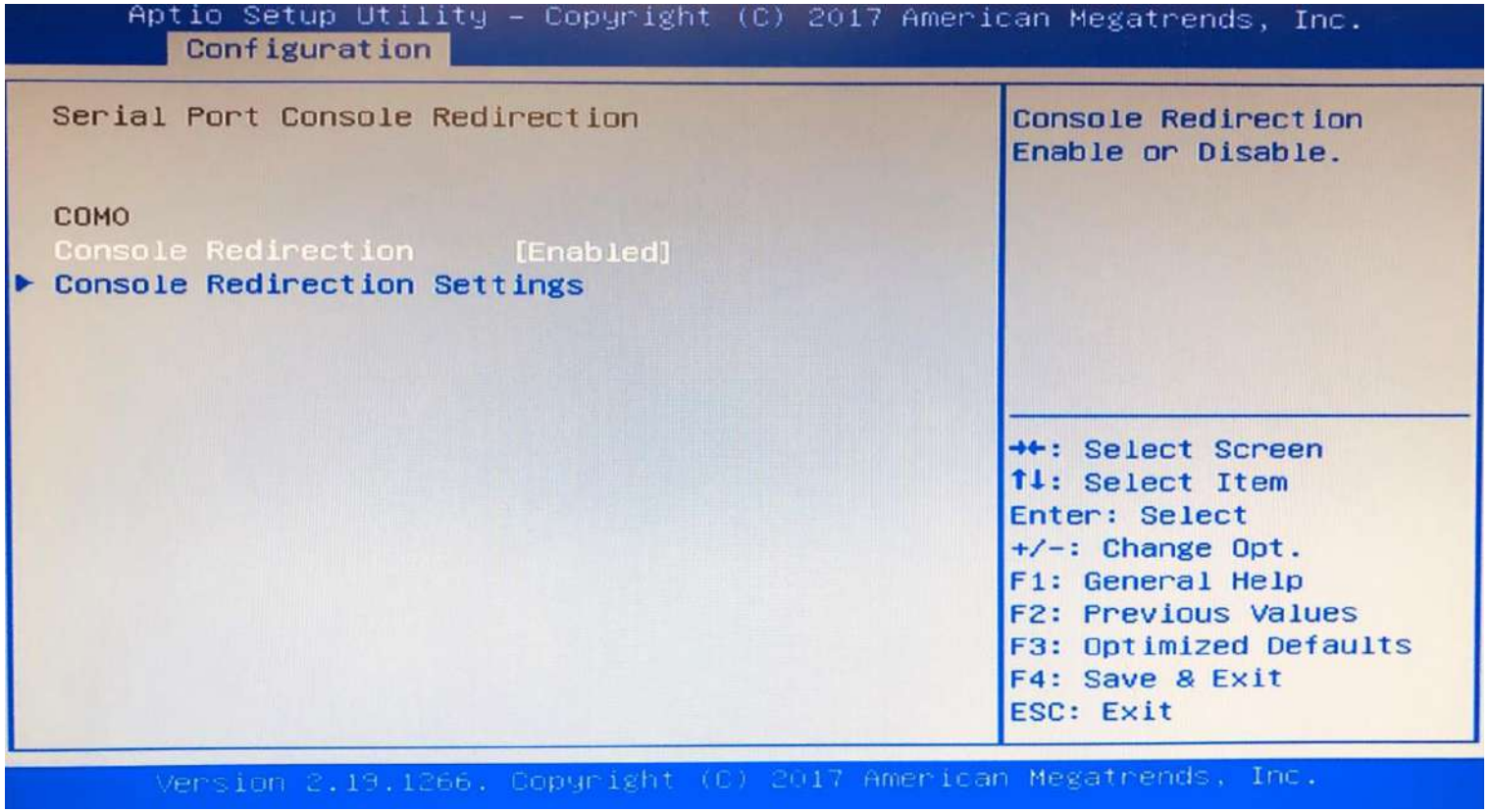


Figure 21 BIOS SERIAL PORT

Security

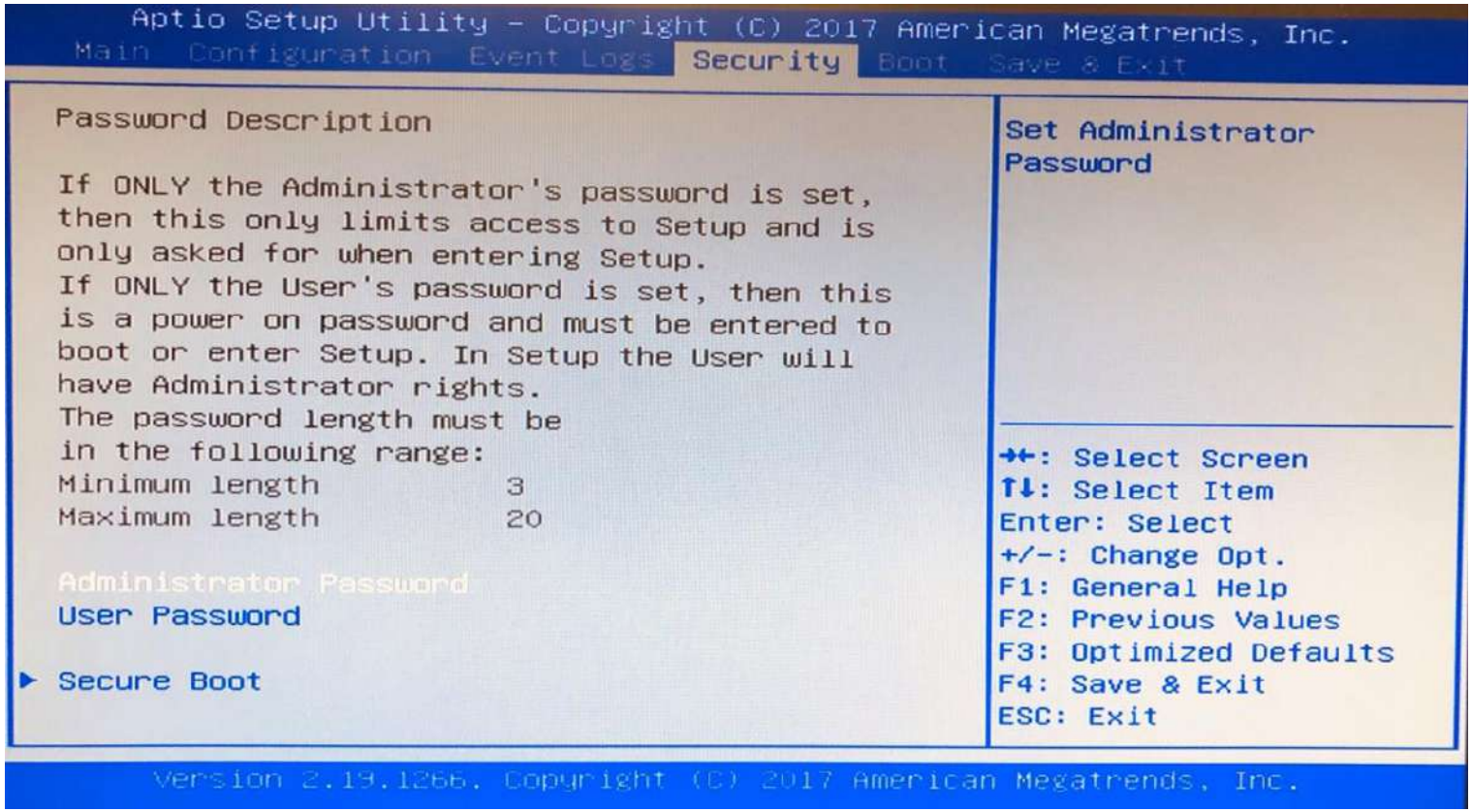


Figure 22 BIOS Security

4.4 Boot

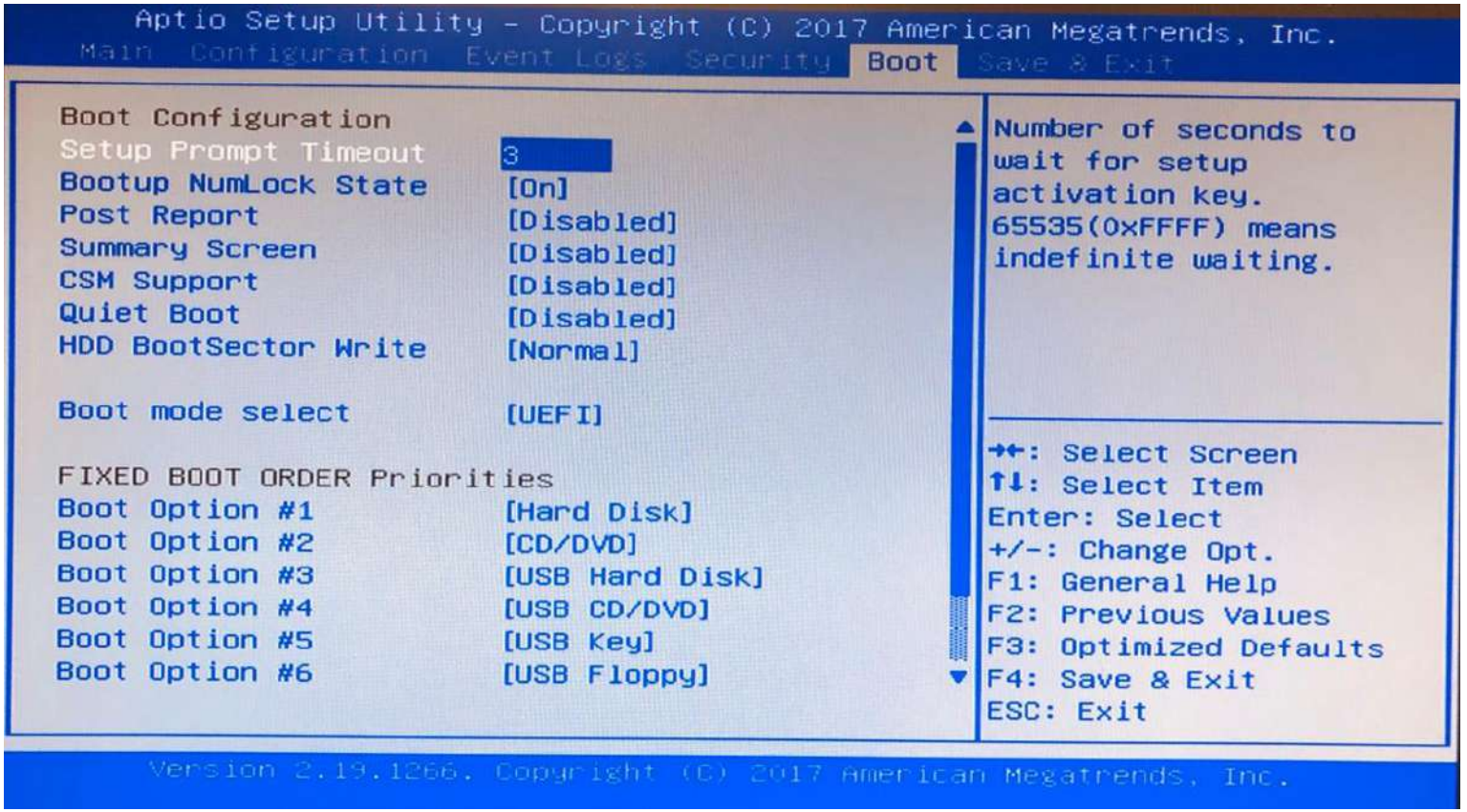


Figure 23 BIOS BOOT

4.5 Event Logs

Figure 24 BIOS Event Logs

4.6 Save & Exit

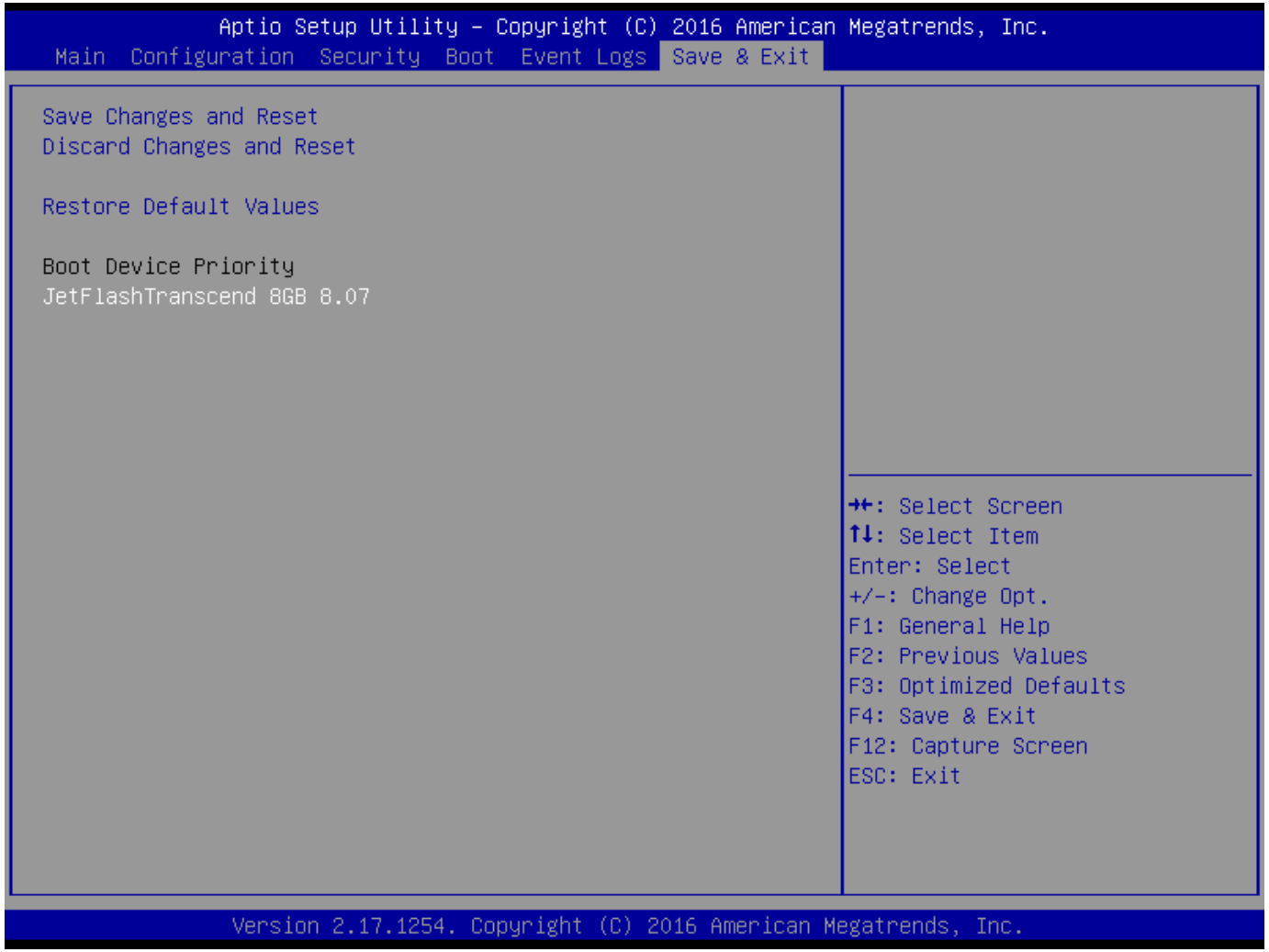


Figure 25 BIOS SAVE & EXIT

5 System Resources

LPC

Device	I/O Address	Note
Embedded Controller (ITE8528)	0x6E / 0x6F	EC Address
	0x62 / 0x66	EC ACPI CMD Port
	0x200 / 0x201	EC BRAM Port for I2C function
	0x1300~0x13FF	EC LPC IO Space
	0x3F8~0x3FF	EC UART1
	0x3E8~0x3EF	EC UART2
Carrier SIO	0x2E / 0x2F	W83627UGH Address
	0x3F0~0x3F8	SIO UART1
	0x2F0~0x2F8	SIO UART3

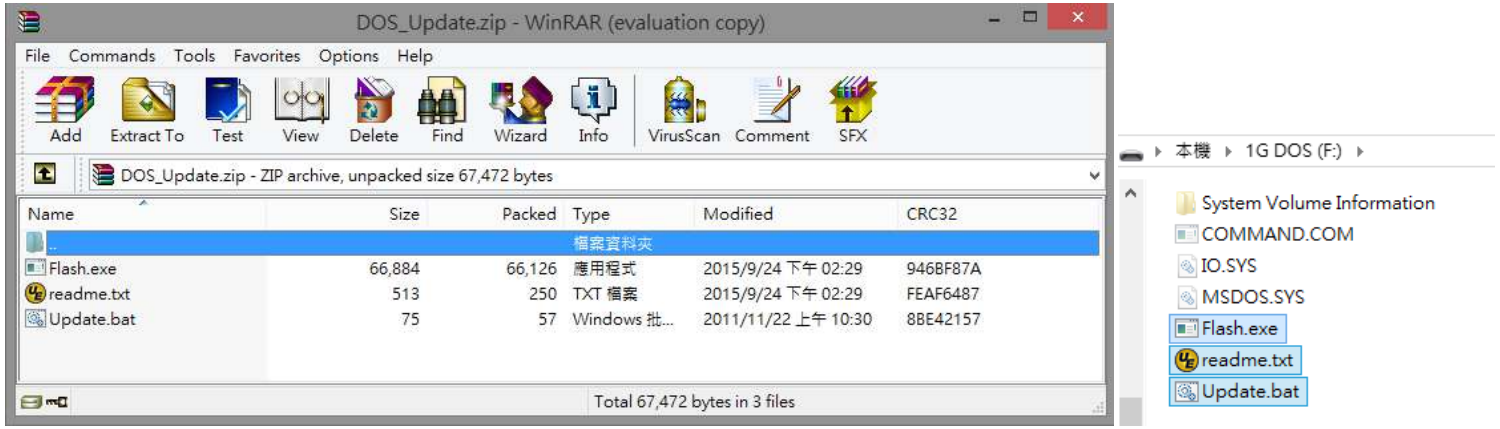
Table 11 System Resources

6 BIOS Update

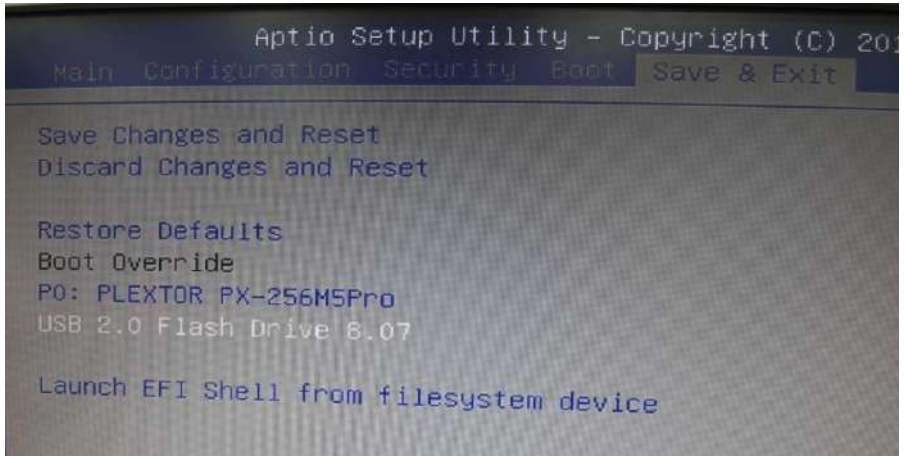
BIOS/EC DOS Update SOP process

Step 1. Create a DOS USB DOK. (Must be FAT or FAT32 format).

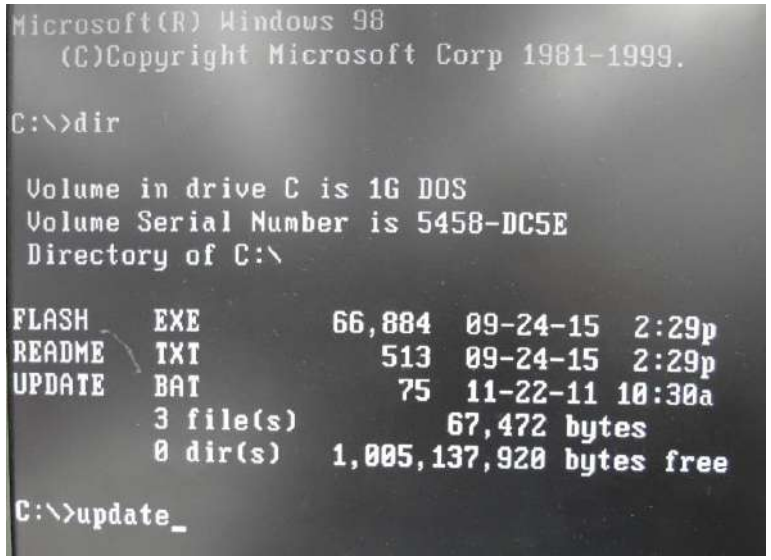
Step 2. Unzip update file to the DOS USB DOK.



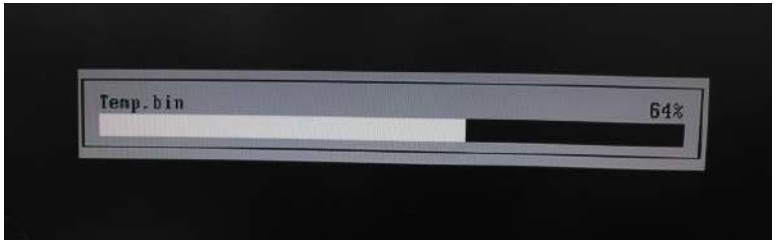
Step 3. Plug the DOS USB DOK into the target system and boot from the DOS USB DOK.



Step 4. Under the update file folder, type command : "update" and press enter.



Step 5. The update process will start and you can see the updating progress. Once finished, please power off and restart the system.

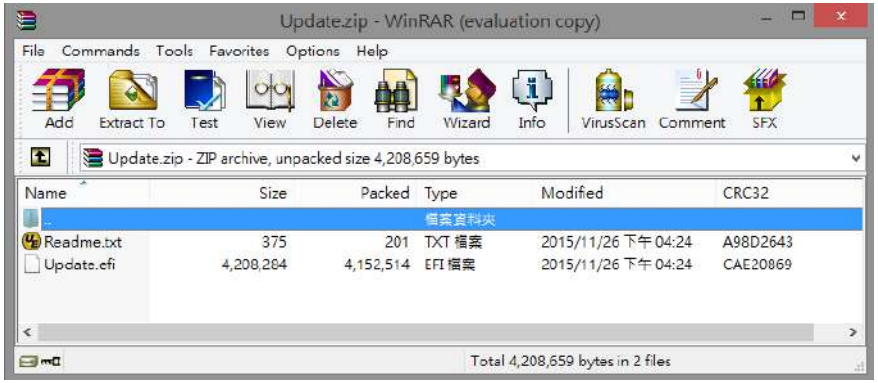


<End of BIOS/EC DOS update process>

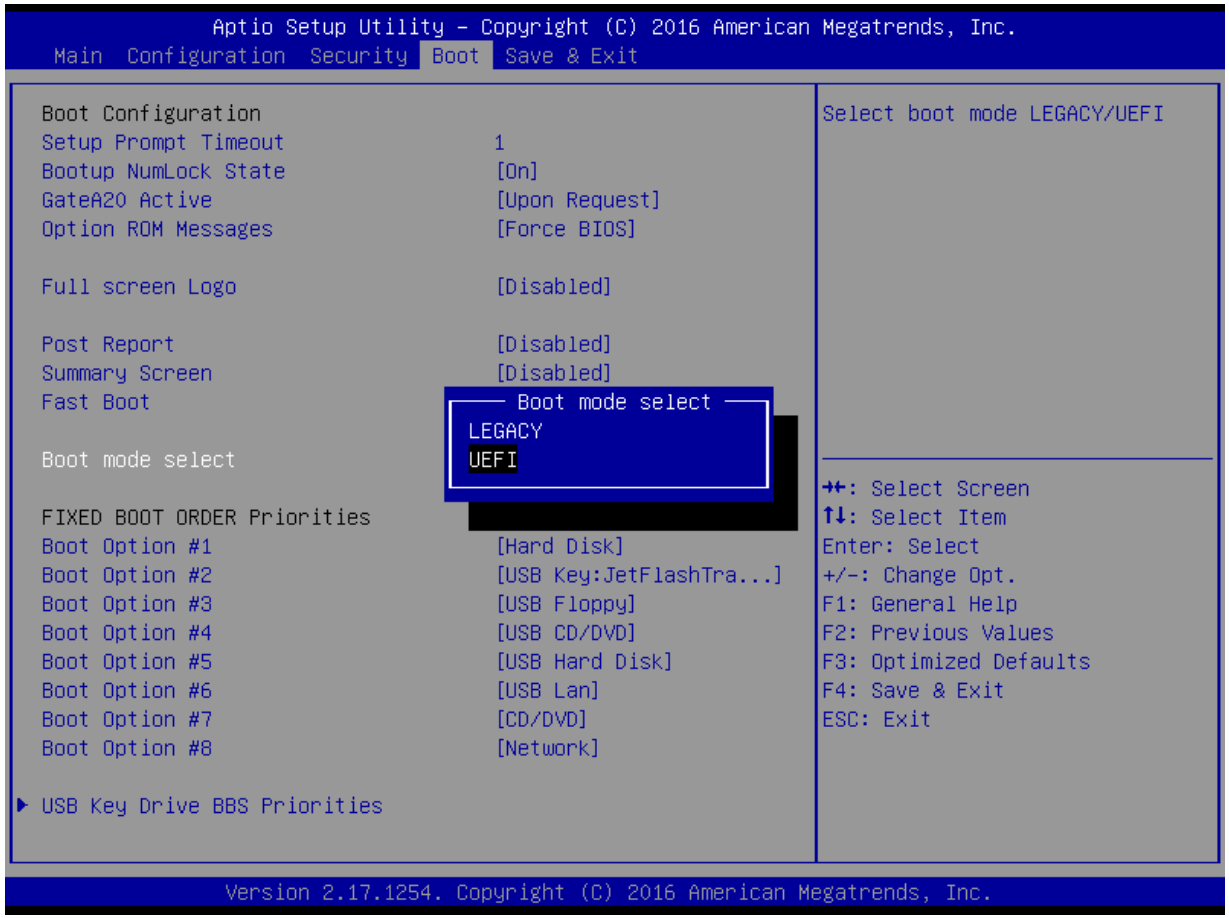
BIOS/EC UEFI Update SOP process

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

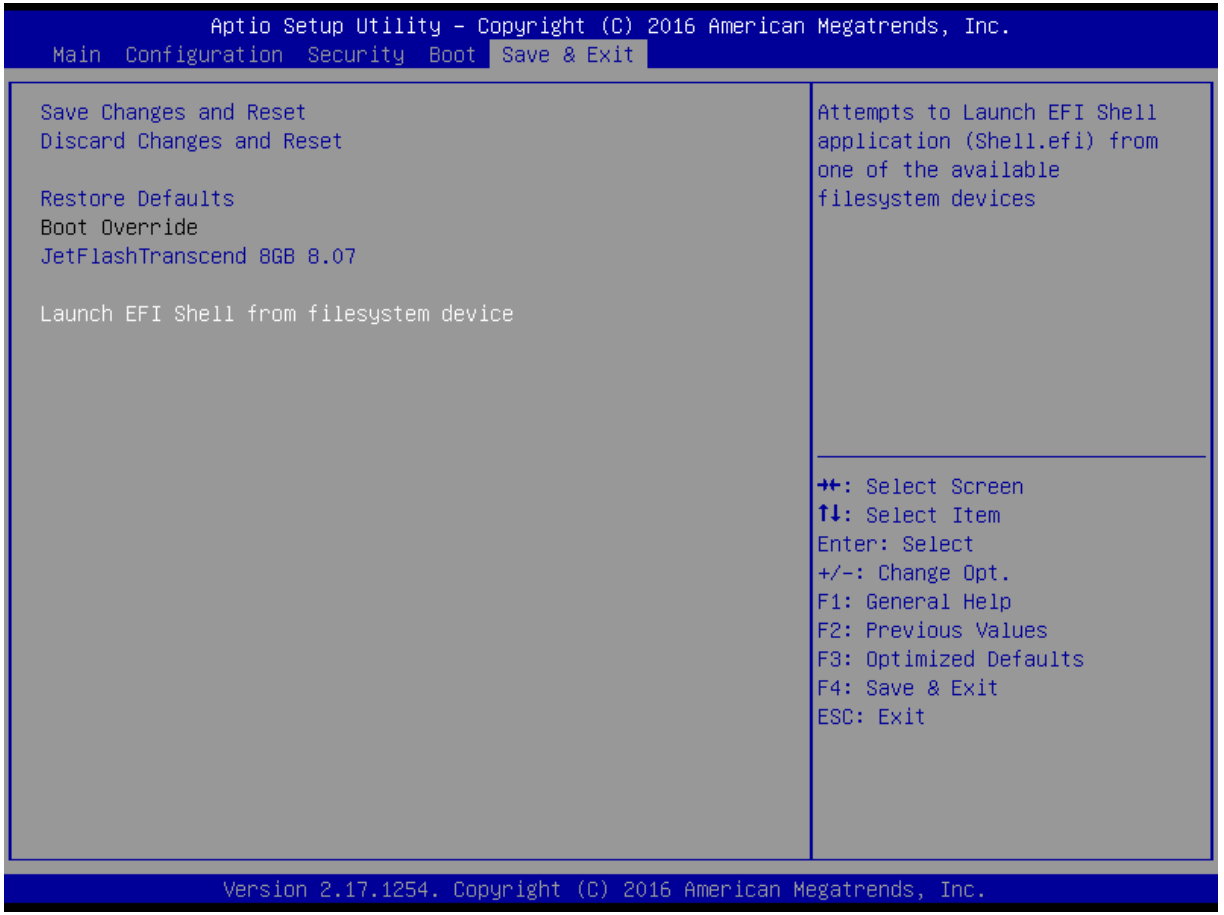
Step 2. Unzip update file to the USB DOK.



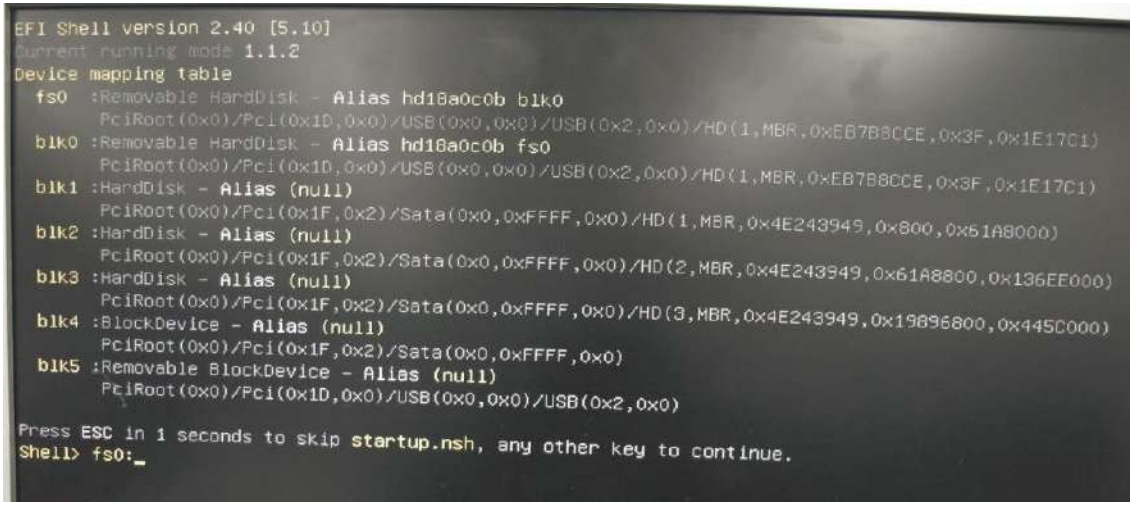
Step 3. Select UEFI boot mode in the BIOS boot menu and save, then restart the system.

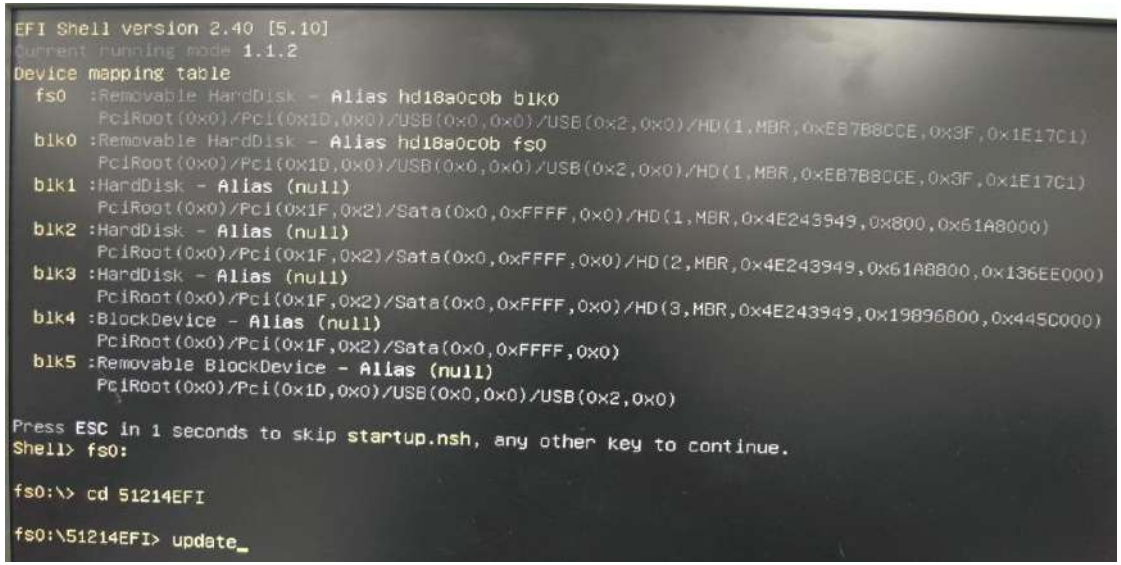


Step 4. Plug the USB DOK into the target system and boot from UEFI Shell.

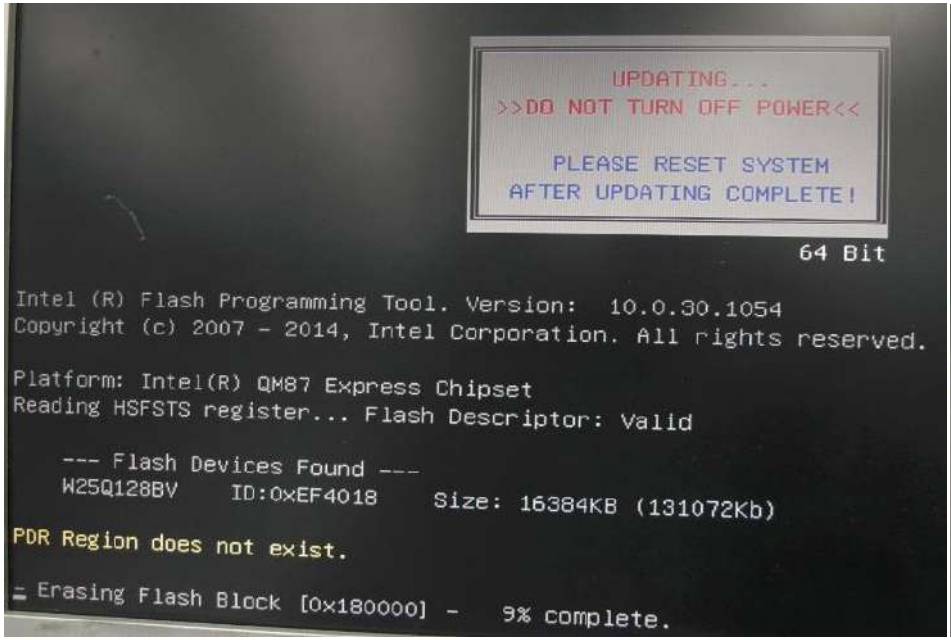


Step 5. Under the UEFI shell, direct to your USB DOK, below is an example uses fs0. Then direct to the folder with updated file and type command : "update" and press enter.





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



<End of BIOS/EC UEFI update process>

7 PORTWELL Software Tool

PORTWELL Evaluation Tool (PET)

The PORTWELL Evaluation Tool (PET) is an API which PORTWELL's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For more information please contact PORTWELL.

PORTWELL BIOS web Tool (PBT)

The PORTWELL BIOS web Tool (PBT) is a brand new on-line utility innovated by PORTWELL. PBT now is available for PORTWELL's premiere customers who are able to add customized BIOS logo and change BIOS default settings on American Megatrends (AMI) BIOS. Please contact PORTWELL for more information.

PORTWELL EC Auto Test Tool (PECAT)

The PORTWELL EC Auto Test Tool (PECAT) is a brand new utility innovated by PORTWELL. PECAT now is available for PORTWELL's premiere customers, who are able to Test Embedded Controller Function in UEFI Mode. Please contact PORTWELL for more information.

8 Industry Specifications

The list below provides links to industry specifications that apply to PORTWELL 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/
PICMG® COM Express Module™ Base Specification http://www.picmg.org/
PCI Express Base Specification, Revision 2.0 https://www.pcisig.com/specifications