



***AXIOMTEK***

## **PICO512**

**7<sup>th</sup> Generation Intel<sup>®</sup> Core<sup>™</sup> i7/ i5/ i3  
and Celeron<sup>®</sup> Processors Pico-ITX  
Board**

**User's Manual**



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## **CAUTION**

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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## **ESD Precautions**

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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# Table of Contents

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Disclaimers.....	ii
ESD Precautions .....	iii
<b>Chapter 1 Introduction.....</b>	<b>1</b>
1.1 Features .....	2
1.2 Specifications .....	2
1.3 Utilities .....	3
<b>Chapter 2 Board and Pin Assignments.....</b>	<b>5</b>
2.1 Board Dimensions and Fixing Holes.....	5
2.2 Board Layout .....	7
2.3 Assembly Drawing .....	9
2.4 Jumper and Switch Settings .....	11
2.4.1 Restore BIOS Optimal Defaults (JP1).....	12
2.4.2 LVDS Voltage Selection (JP2).....	12
2.4.3 Auto Power On (SW1).....	12
2.5 Connectors .....	13
2.5.1 Board to Board Connectors (CN2 and CN3).....	14
2.5.2 SATA Connector (CN4) .....	16
2.5.3 CMOS Battery Connector (CN5).....	16
2.5.4 Fan Power Connector (CN6).....	16
2.5.5 Digital I/O Connector (CN7) .....	16
2.5.6 SATA Power Connector (CN8) .....	17
2.5.7 Front Panel Connector (CN9) .....	17
2.5.8 USB 2.0 Wafer Connector (CN10) .....	18
2.5.9 Inverter Connector (CN11) .....	18
2.5.10 Power Wafer Connector (CN12) (Optional) .....	18
2.5.11 Ethernet Port (CN13) .....	18
2.5.12 DC Jack Power Connector w/ Screw (CN14) .....	19
2.5.13 HDMI Connector (CN15).....	19
2.5.14 LVDS Connector (CN16).....	20
2.5.15 I2C Connector (CN17) .....	22
2.5.16 Full-size PCI-Express Mini Card and mSATA Connector (SCN1).....	22
<b>Chapter 3 Hardware Description .....</b>	<b>23</b>
3.1 Microprocessors .....	23
3.2 BIOS .....	23

3.3	System Memory.....	23
3.4	I/O Port Address Map.....	24
3.5	Interrupt Controller (IRQ) Map .....	25
3.6	Memory Map .....	31
<b>Chapter 4 AMI BIOS Setup Utility .....</b>		<b>33</b>
4.1	Starting.....	33
4.2	Navigation Keys .....	33
4.3	Main Menu.....	35
4.4	Advanced Menu.....	36
4.5	Chipset Menu.....	47
4.6	Security Menu.....	54
4.7	Boot Menu.....	55
4.8	Save & Exit Menu .....	56
<b>Appendix A Watchdog Timer.....</b>		<b>59</b>
A.1	About Watchdog Timer .....	59
A.2	How to Use Watchdog Timer .....	59
<b>Appendix B Digital I/O .....</b>		<b>61</b>
B.1	About Digital I/O .....	61
B.2	How to Use Digital I/O .....	61
<b>Appendix C iAMT Settings .....</b>		<b>63</b>
C.1	Entering MEBx.....	63
C.2	Set and Change Password .....	63
C.3	iAMT Settings .....	66
C.4	iAMT Web Console.....	71
<b>Appendix D BIOS Flash Utility .....</b>		<b>75</b>

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# Chapter 1

## Introduction



The PICO512 is a Pico-ITX board with 7<sup>th</sup> Generation Intel® Core™ i7/ i5/ i3 and Celeron® processor that delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

The board has one 260-pin unbuffered SO-DIMM socket for DDR4 2133MHz SO-DIMM memory with maximum memory capacity up to 16GB. It also features one Gigabit/Fast Ethernet, one SATA port with transfer rates up to 6Gb/s and one USB 2.0 high speed compliant, that can achieve the best stability and reliability for industrial applications. Additionally, it provides you with unique embedded feature such as Pico-ITX form factor that applies an extensive array of PC peripherals. The board can be enhanced by its built-in watchdog timer function, a special industrial feature not commonly seen on other motherboards.

## 1.1 Features

- 7<sup>th</sup> Generation Intel® Core™ i7/ i5/ i3 and Celeron® ULT processor
- 1 DDR4 SO-DIMM supports up to 16GB memory capacity
- 1 USB 2.0 port and 1 Gigabit Ethernet port
- 1 8-bit digital I/O interface
- 1 PCI-Express Mini Card
- Intel® AMT 11 supported

## 1.2 Specifications

- **CPU**
  - 7<sup>th</sup> Generation Intel® Core™ i7-7600U 2.8GHz dual core.
  - 7<sup>th</sup> Generation Intel® Core™ i5-7300U 2.6GHz dual core.
  - 7<sup>th</sup> Generation Intel® Core™ i3-7100U 2.4GHz dual core.
  - Intel® Celeron® 3965U 2.2GHz.
- **Thermal Solution**
  - Active.
- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
  - 128Mbit SPI Flash, DMI, Plug and Play.
  - PXE Ethernet Boot ROM.
- **System Memory**
  - One 260-pin unbuffered DDR4 SO-DIMM socket.
  - Maximum up to 16GB DDR4 2133MHz memory.
- **Onboard Multi I/O**
  - Controller: IT8528.
  - 8-bit digital I/O.
- **Serial ATA**
  - One SATA-600 connector.
  - mSATA support (optional).
- **USB Interface**
  - One USB port with fuse protection and complies with USB Spec. Rev. 2.0.
- **Display**
  - One HDMI with resolution up to 4096x2160 @24Hz
  - One 2x20-pin connector for 18/24-bit single and dual channel LVDS and one 8-pin wafer connector for inverter control. LVDS resolution is up to 1920x1200 in 24-bit dual channel.
- **Watchdog Timer**
  - 1~65535 seconds or minutes; up to 65535 levels.
- **Ethernet**
  - One 1000/100/10Mbps Gigabit/Fast Ethernet port in RJ-45 connector.
  - Support Wake-on-LAN, PXE Boot ROM with Intel® i219LM.



- **Expansion Interface**
  - One full-size PCI-Express Mini Card (with mSATA supported) complies with PCI-Express Mini Card Spec. V1.2.
  - Low/high speed board to board connectors.
- **Power Input**
  - DC jack power connector, co-layout with 1x2-pin right angle connector.
  - +12V DC-in only.
  - AT auto power on function supported.
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface).
- **Form Factor**
  - Pico-ITX form factor.



**Note**

*All specifications and images are subject to change without notice.*

## 1.3 Utilities

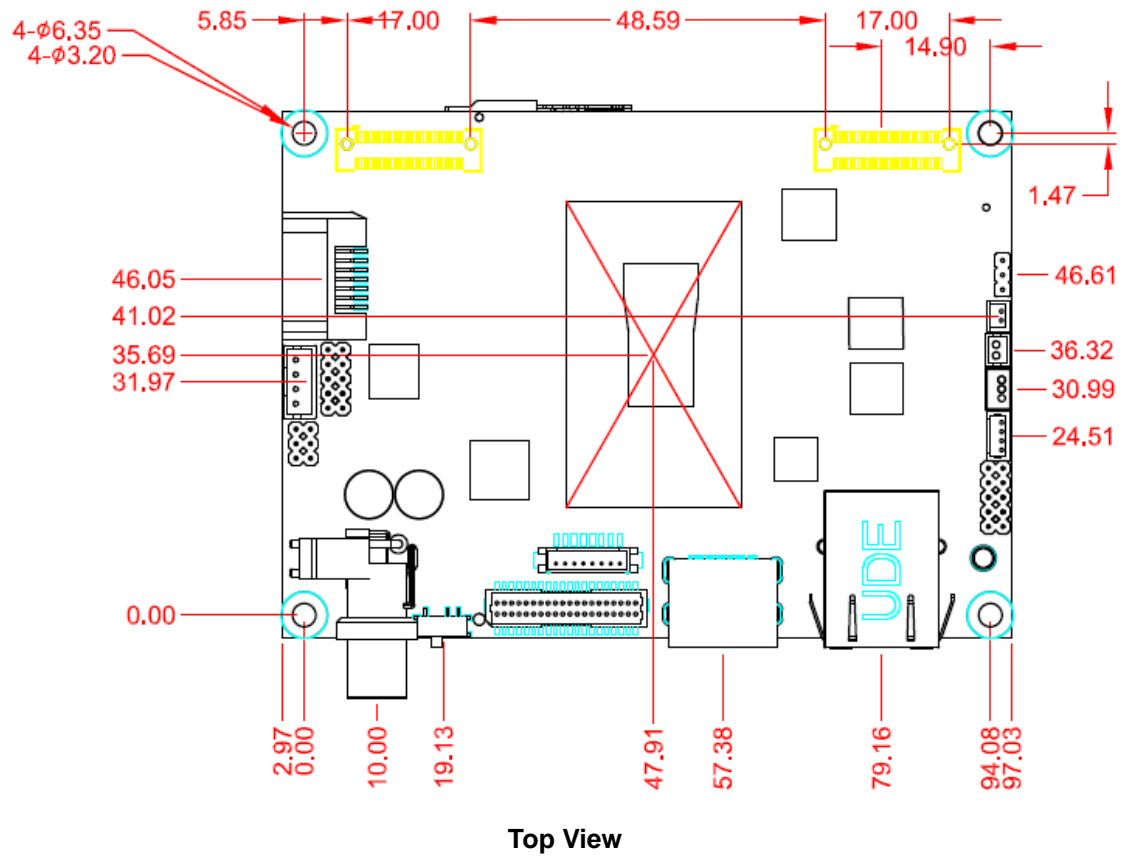
- Chipset and graphics driver
- Ethernet driver
- Audio driver
- Intel Management Engine Software for AMT support

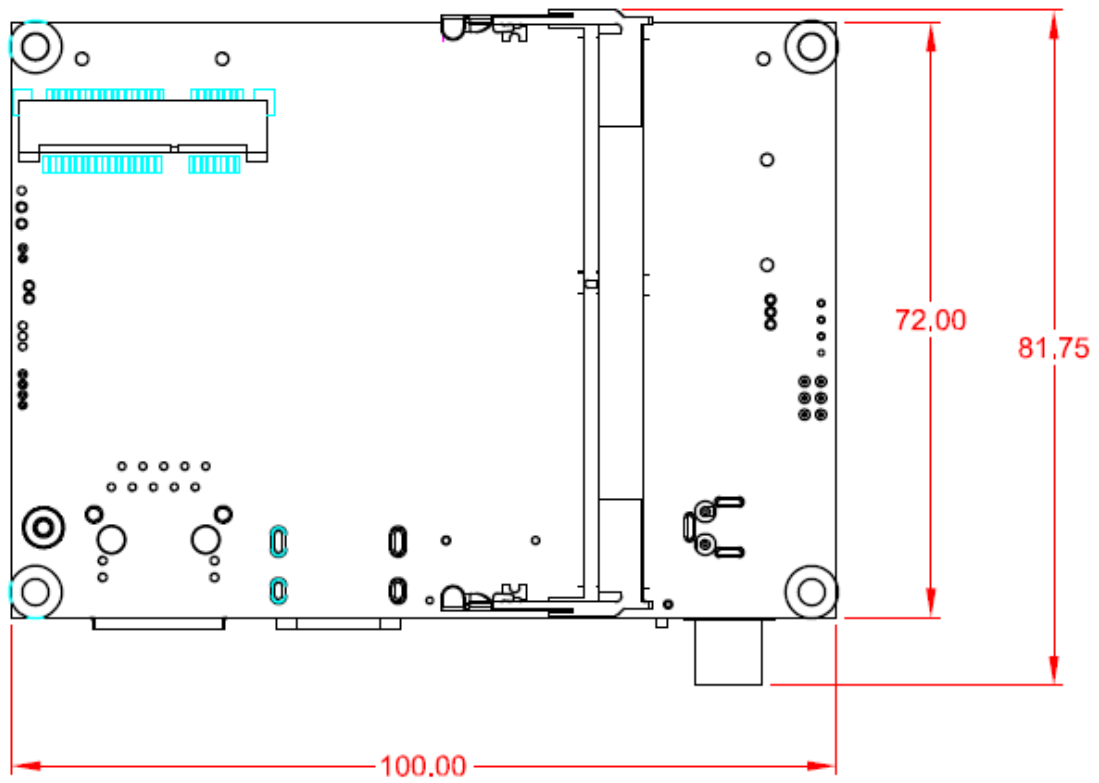
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# Chapter 2

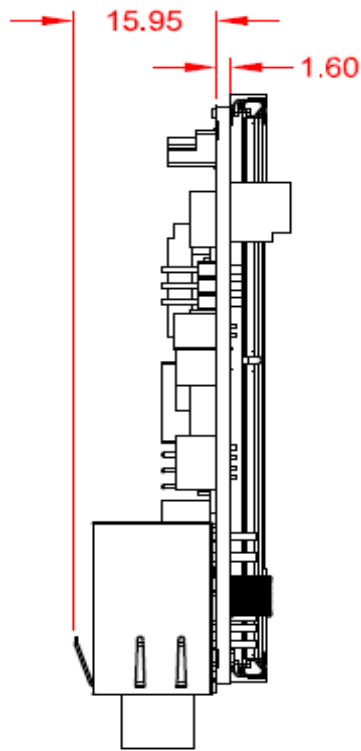
## Board and Pin Assignments

### 2.1 Board Dimensions and Fixing Holes



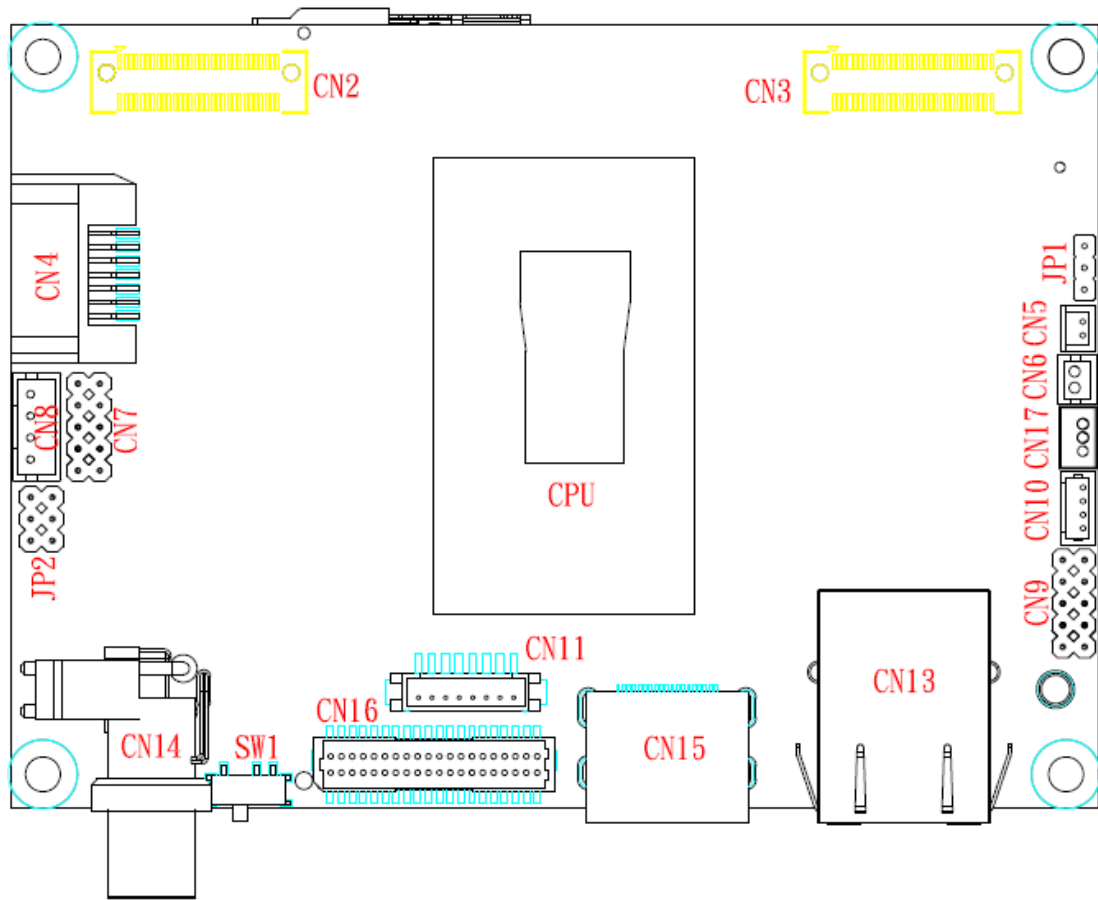


Bottom View

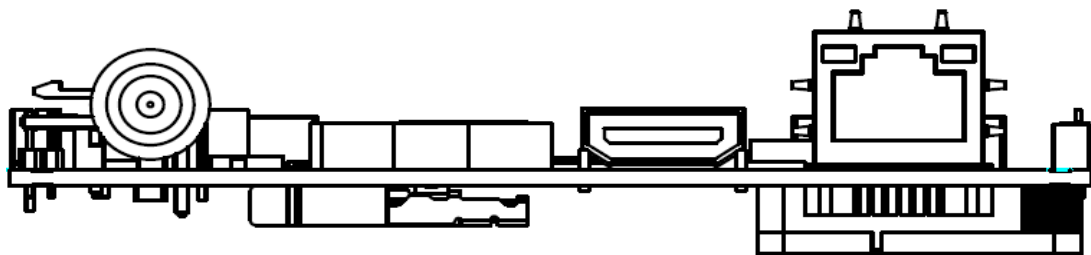


Side View

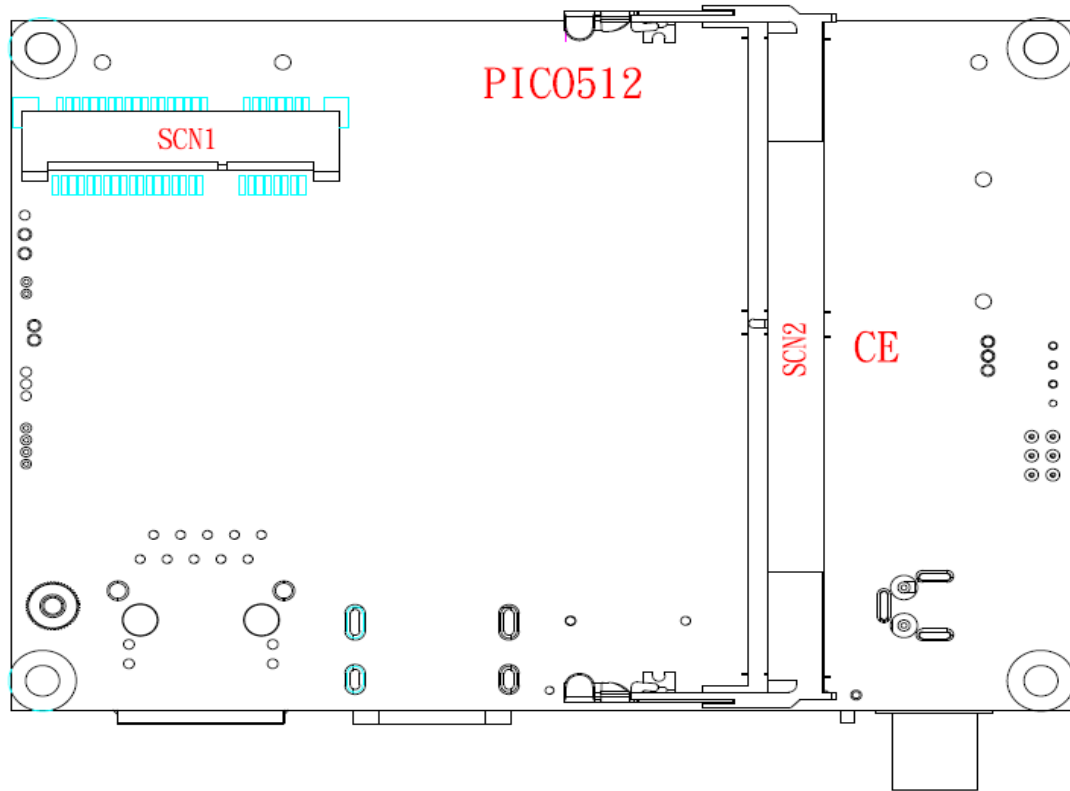
## 2.2 Board Layout



Top View



Side View

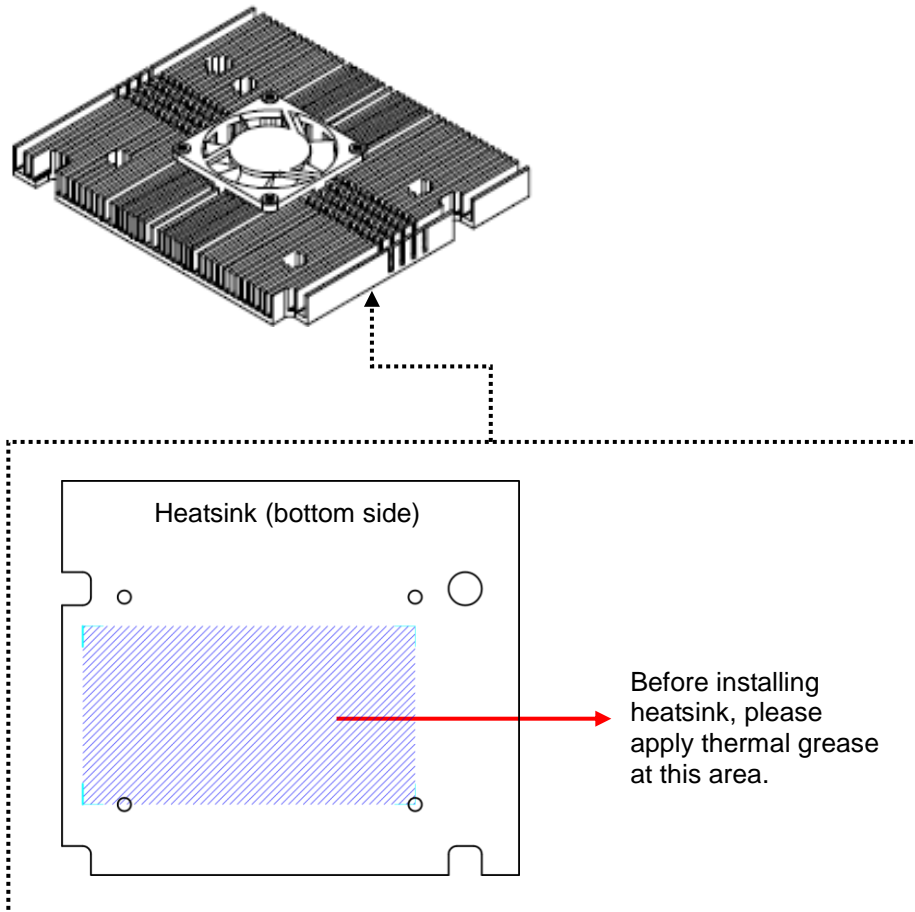


**Bottom View**

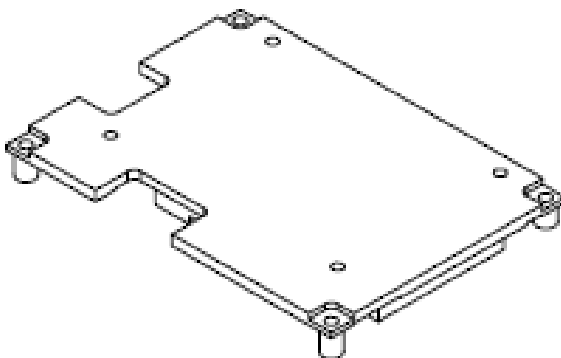
## 2.3 Assembly Drawing

For thermal dissipation, a thermal solution enables the PICO512's components to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink in order to avoid hot spots. Images below illustrate how to install the thermal solution on PICO512.

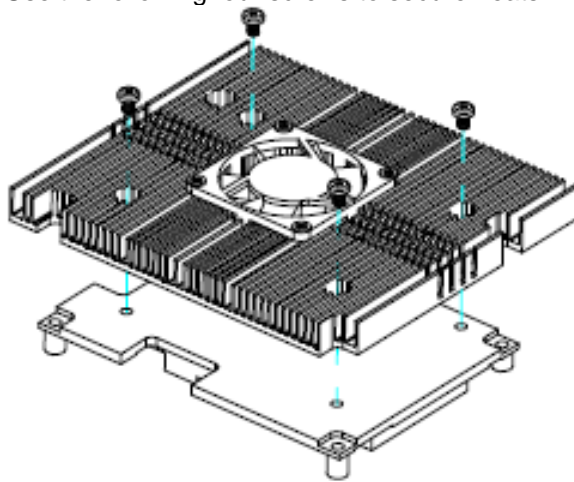
1. Heatsink for PICO512 (see image below):



2. Heat spreader for PICO512 (see image below):



3. Use the following four screws to secure heatsink on heatspreader.



x4

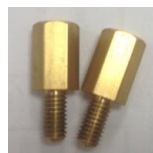
4. The PICO512 has four assembly holes for installing thermal solution. Align and firmly secure the plate to the PICO512. Be careful not to over-tighten the screws.



x4



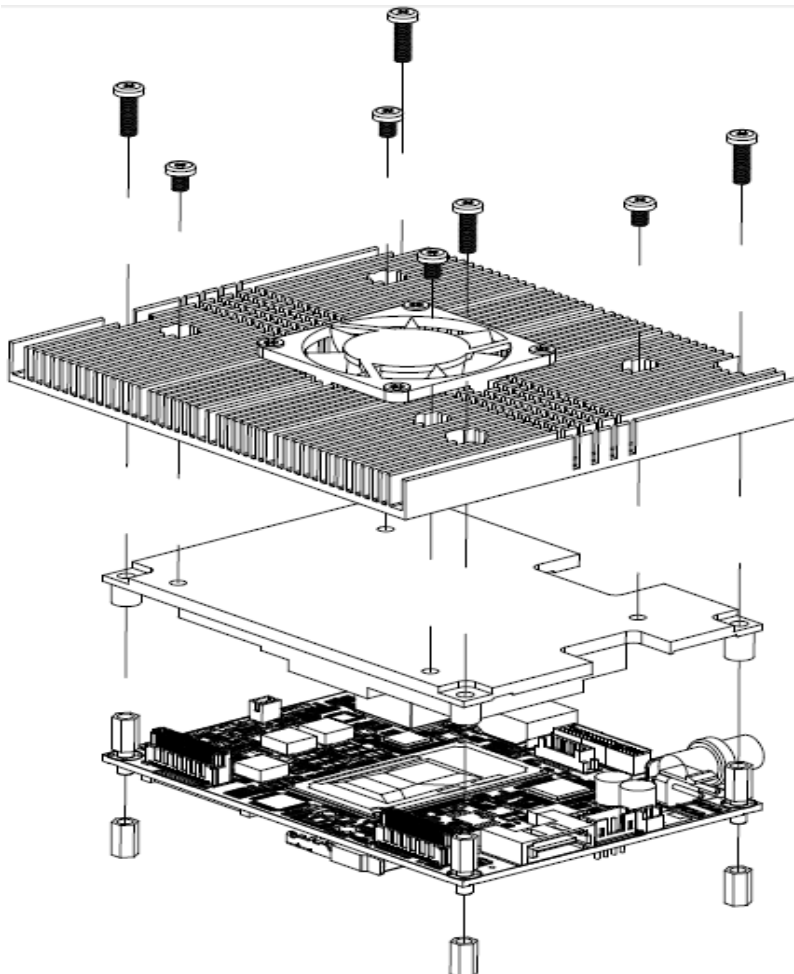
x2



x2



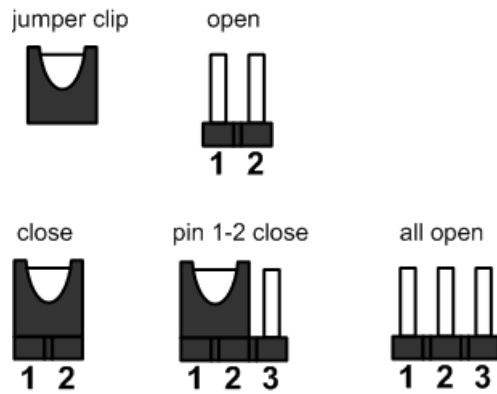
x4





## 2.4 Jumper and Switch Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.



Properly configure jumper and switch settings on the PICO512 to meet your application purpose. Below you can find a summary table of jumpers, switch and onboard default settings.



Note

**Once the default jumper or switch setting needs to be changed, please do it under power-off condition.**

Jumper and Switch	Description	Setting
JP1	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
JP2	LVDS Voltage Selection Default: +3.3V Level	1-2 Close
SW1	Auto Power On Default: Enable	2-3 Close

### 2.4.1 Restore BIOS Optimal Defaults (JP1)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

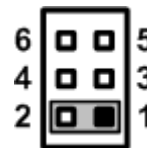
Function	Setting
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close



### 2.4.2 LVDS Voltage Selection (JP2)

The board supports voltage selection for flat panel displays. Use this jumper to set LVDS connector (CN16) pin 1~6 VCCM to +3.3V, +5V or +12V. To prevent hardware damage, before connecting please make sure that input voltage of flat panel is correct.

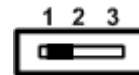
Function	Setting
+3.3V level (Default)	1-2 close
+5V level	2-4 close
+12V level	5-6 close



### 2.4.3 Auto Power On (SW1)

If SW1 is enabled for power input, the system will be automatically power on without pressing soft power button. If SW1 is disabled for power input, it is necessary to manually press soft power button to power on the system.

Function	Setting
Disable auto power on	1-2 close
Enable auto power on (Default)	2-3 close



## 2.5 Connectors

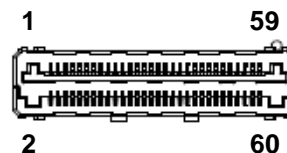
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN2	Board to Board Connector 1 (Low Speed)
CN3	Board to Board Connector 2 (High Speed)
CN4	SATA Connector
CN5	CMOS Battery Connector
CN6	Fan Power Connector
CN7	Digital I/O Connector
CN8	SATA Power Connector
CN9	Front Panel Connector
CN10	USB 2.0 Wafer Connector
CN11	Inverter Connector
CN12 (Optional)	Power Wafer Connector
CN13	Ethernet Port
CN14	DC Jack Power Connector w/ Screw
CN15	HDMI Connector
CN16	LVDS Connector
CN17	I2C Connector
SCN1	Full-size PCI-Express Mini Card and mSATA Connector
SCN2	DDR4 SO-DIMM Connector

### 2.5.1 Board to Board Connectors (CN2 and CN3)

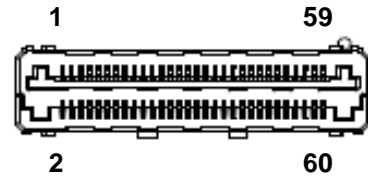
CN2 is a 2x30-pin board to board connector. It is compatible with Samtec SMD LSHM-130-04.0-F-DV-A-N-K-TR-2x30P. The pin assignments are given as follows.

Pin	Signal	Pin	Signal
1	HD_LINK_SYNC	2	HD_LINK_BCLK
3	HD_LINK_SDI	4	HD_LINK_RST
5	HD_LINK_SDO	6	3.3V AUDIO Power
7	DCD2/COM3_EN	8	DSR2/COM4_EN
9	RXD2/COM3_TERM	10	RTS2/COM4_TERM
11	TXD2/COM3_GPIO0	12	CTS2/COM4_GPIO0
13	DTR2/COM3_GPIO1	14	RI2/COM4_GPIO1
15	DCD1/COM1_EN	16	DSR1/COM2_EN
17	RXD1/COM1_TERM	18	RTS1/COM2_TERM
19	TXD1/COM1_GPIO0	20	CTS1/COM2_GPIO0
21	DTR1/COM1_GPIO1	22	RI1/COM2_GPIO1
23	N.C	24	N.C
25	LPC_CLK	26	L_AD3
27	L_FRAME	28	L_AD2
29	SERIRQ	30	L_AD1
31	N.C	32	L_AD0
33	USB_OC01	34	USB_OC23
35	GND	36	GND
37	DP0	38	DP2
39	DN0	40	DN2
41	GND	42	GND
43	DP1	44	DN3
45	DN1	46	DP3
47	GND	48	GND
49	FP_PSIN_N	50	+V5_SBY
51	SATA_LED	52	+V5_SBY
53	FP_RST_N	54	+V5_SBY
55	PLTRST_SIO	56	GND
57	+3.3V	58	+V5S
59	+3.3V	60	+V5S



CN3 is a 2x30-pin board to board connector. It is compatible with Samtec SMD LSHM-130-04.0-F-DV-A-N-K-TR-2x30P. The pin assignments are given as follows.

Pin	Signal	Pin	Signal
1	USB3_RXP1	2	PCIE_IO_RXP
3	USB3_RXN1	4	PCIE_IO_RXN
5	GND	6	GND
7	USB3_TXP1	8	PCIE_IO_TXP
9	USB3_TXN1	10	PCIE_IO_TXN
11	GND	12	GND
13	USB3_RXP2	14	B2B_PCIE_CLK
15	USB3_RXN2	16	B2B_PCIE_CLK#
17	GND	18	GND
19	USB3_TXP2	20	DDI2_TXP0
21	USB3_TXN2	22	DDI2_TXN0
23	GND	24	GND
25	USB3_RXP3	26	DDI2_TXP1
27	USB3_RXN3	28	DDI2_TXN1
29	GND	30	GND
31	USB3_TXP3	32	DDI2_TXP2
33	USB3_TXN3	34	DDI2_TXN2
35	GND	36	GND
37	USB3_RXP4	38	DDI2_TXP3
39	USB3_RXN4	40	DDI2_TXN3
41	GND	42	GND
43	USB3_TXP4	44	DDPC_CTRLDATA
45	USB3_TXN4	46	DDPC_CTRLCLK
47	GND	48	GND
49	DDPC_AUXP	50	DDPC_HPD
51	DDPC_AUXN	52	PCIE_WAKE#
53	GND	54	SMBDAT_MAIN
55	+12V	56	SMBCLK_MAIN
57	+V3.3_SBY	58	+V5S
59	+V3.3_SBY	60	+V5S



***It is suggested to insert I/O board (AX93A00, AX93A01, AX93A02 or AX93A09) into CN2 and CN3 on PICO512.***

**Note1**



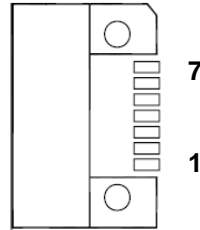
***If sets IO board (AX93A00.AX93A01) Display (VGA or HDMI) as Primary, then secondary (LVDS) will be disabled due to intel graphic limitation.***

**Note2**

### 2.5.2 SATA Connector (CN4)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface port. It is a computer bus interface for connecting to devices such as hard disk drive.

Pin	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



### 2.5.3 CMOS Battery Connector (CN5)

This connector is for CMOS battery interface.

Pin	Signal
1	+3.3V
2	GND



### 2.5.4 Fan Power Connector (CN6)

The CN6 is a 2-pin (pitch=1.5mm) wafer connector for fan power interface.

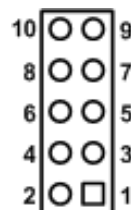
Pin	Signal
1	+5V
2	GND



### 2.5.5 Digital I/O Connector (CN7)

This is a 5x2-pin (pitch=2.0mm) pin header. The board is equipped with an 8-channel (3 inputs and 5 outputs) digital I/O that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals, see Appendix B.

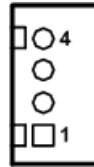
Pin	Signal	Pin	Signal
1	DIO0	2	DIO4
3	DIO1	4	DIO5
5	DIO2	6	DIO6
7	DIO3	8	DIO7
9	+5V	10	GND



### 2.5.6 SATA Power Connector (CN8)

The CN8 is a 4-pin (pitch=2.0mm) wafer connector, which is compliant with JST B4B-PH-K-S, for SATA power interface.

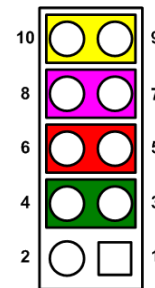
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V



### 2.5.7 Front Panel Connector (CN9)

This is a 5x2-pin (pitch=2.0mm) pin header for power and reset button interface.

Pin	Signal	Pin	Signal
1	GND	2	PS_ON
3	GND	4	+5V
5	GND	6	PWRBTN
7	GND	8	RESET
9	SATA_LED	10	+3.3V



#### Power Status

Pin 1 and pin 2 are for power status button; letting user know the power status of this board.

#### Power LED

Pin 4 connects anode (+) of LED and pin 3 connects cathode(-) of LED. The power LED lights up when the system is powered on.

#### Power On/Off Button

Pin 5 and 6 connect the power button on front panel to CPU board, which allows users to turn on or off power supply.

#### System Reset Switch

Pin 7 and 8 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

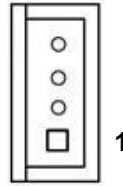
#### HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 9 and 10 connect the hard disk drive to the front panel HDD LED, pin 9 is assigned as cathode(-) and pin 10 is assigned as anode(+).

### 2.5.8 USB 2.0 Wafer Connector (CN10)

This is a 4-pin (pitch=1.25mm) wafer connector, which is compliant with Molex 530470410, for USB 2.0 interface.

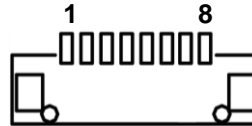
Pin	Signal
1	USB3_PWR67
2	D6+
3	D6-
4	GND



### 2.5.9 Inverter Connector (CN11)

This is DF13-8S-1.25C 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction.

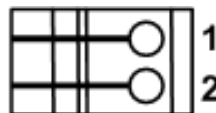
Pin	Signal
1	VBL1 (+12V level)
2	VBL1 (+12V level)
3	VBL2 (+5V level)
4	VBL_ENABLE
5	GND
6	GND
7	GND
8	VBL Brightness Control



### 2.5.10 Power Wafer Connector (CN12) (Optional)

The CN12 is a 2-pin (pitch=3.96mm) wafer connector in right angle for DC +12V input. This connector is co-layout with CN14.

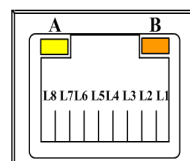
Pin	Signal
1	+12V
2	GND



### 2.5.11 Ethernet Port (CN13)

The board has one RJ-45 Ethernet connector. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 and the other end (phone jack) to a 1000/100/10 Base-T hub.

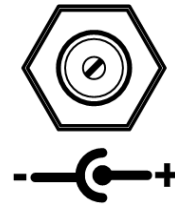
Pin	Signal	Pin	Signal
L1	MDI0P	L5	MDI2P
L2	MDI0N	L6	MDI2N
L3	MDI1P	L7	MDI3P
L4	MDI1N	L8	MDI3N
A	Active LED (Yellow)		
B	1000 LAN LED (Orange) / 100 LAN LED (Green)		





### 2.5.12 DC Jack Power Connector w/ Screw (CN14)

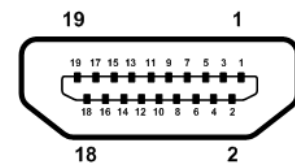
The CN14 is a DC jack with screw. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.



### 2.5.13 HDMI Connector (CN15)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pin	Signal	Pin	Signal
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT_Clock+
11	GND	12	HDMI OUT_Clock-
13	N.C.	14	N.C.
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		

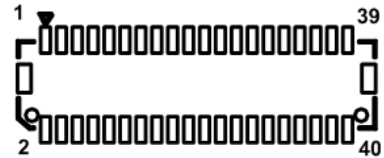


### 2.5.14 LVDS Connector (CN16)

This board has a 2x20-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B connector for LVDS interface. Pin 1~6 VCCM can be set to +3.3V, +5V or +12V by setting JP2 (see section 2.4.2).

#### 18-bit single channel

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	Channel A D0-	24	N.C.
25	Channel A D0+	26	N.C.
27	GND	28	GND
29	Channel A D1-	30	N.C.
31	Channel A D1+	32	N.C.
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND



**24-bit single channel**

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C	8	N.C
9	GND	10	GND
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	GND
17	N.C	18	N.C
19	N.C	20	N.C
21	GND	22	GND
23	Channel A D0-	24	N.C
25	Channel A D0+	26	N.C
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

**18-bit dual channel**

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C	8	N.C
9	GND	10	GND
11	N.C	12	Channel B D0-
13	N.C	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	N.C
31	Channel A D1+	32	N.C
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

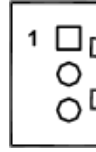
**24-bit dual channel**

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C	8	N.C
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND

### 2.5.15 I2C Connector (CN17)

This is a 3-pin (pitch=1.25mm) wafer connector. The I2C is a simple bus for the purpose of lightweight communication.

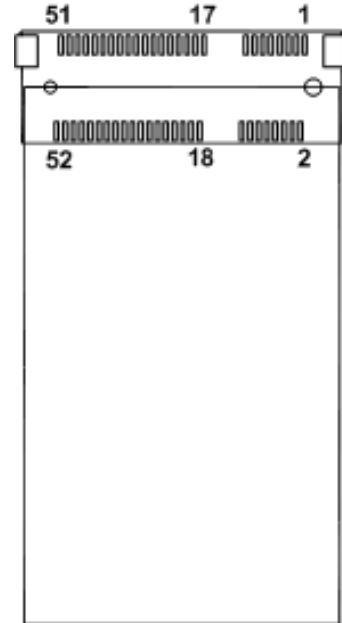
Pin	Signal
1	I2C_CLK_SBY
2	I2C_DAT_SBY
3	GND



### 2.5.16 Full-size PCI-Express Mini Card and mSATA Connector (SCN1)

This is a full-size PCI-Express Mini Card connector on the bottom side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express, USB 2.0 or SATA (mSATA). To enable or disable mSATA support, please refer to BIOS setting in section 4.4.

Pin	Signal	Pin	Signal
1	WAKE#	2	+V3.3_SBY
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN/SATA_RXP	24	+V3.3_SBY
25	PE_RXP/SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN/SATA_TXN	32	SMB_DATA
33	PE_TXP/SATA_TXP	34	GND
35	GND	36	USB_D4-
37	GND	38	USB_D4+
39	+V3.3_SBY	40	GND
41	+V3.3_SBY	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+V3.3_SBY



# Chapter 3

## Hardware Description

### 3.1 Microprocessors

The PICO512 supports 7<sup>th</sup> Generation Intel® Core™ i7/ i5/ i3 and Celeron® processors, which enables your system to operate under Windows® 10 environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.




















































### 3.2 BIOS

The PICO512 uses AMI Plug and Play BIOS with a single 128Mbit SPI Flash.

### 3.3 System Memory

The PICO512 supports one 260-pin DDR4 SO-DIMM socket for maximum memory capacity up to 16GB DDR4 SDRAMs. The memory module comes in sizes of 2GB, 4GB, 8GB and 16GB.

### 3.4 I/O Port Address Map

▼		Input/output (IO)
		[0000000000000000 - 000000000000CF7] PCI Express Root Complex
		[0000000000000020 - 000000000000021] Programmable interrupt controller
		[0000000000000024 - 000000000000025] Programmable interrupt controller
		[0000000000000028 - 000000000000029] Programmable interrupt controller
		[000000000000002C - 00000000000002D] Programmable interrupt controller
		[000000000000002E - 00000000000002F] Motherboard resources
		[0000000000000030 - 000000000000031] Programmable interrupt controller
		[0000000000000034 - 000000000000035] Programmable interrupt controller
		[0000000000000038 - 000000000000039] Programmable interrupt controller
		[000000000000003C - 00000000000003D] Programmable interrupt controller
		[0000000000000040 - 000000000000043] System timer
		[000000000000004E - 00000000000004F] Motherboard resources
		[0000000000000050 - 000000000000053] System timer
		[0000000000000061 - 000000000000061] Motherboard resources
		[0000000000000063 - 000000000000063] Motherboard resources
		[0000000000000065 - 000000000000065] Motherboard resources
		[0000000000000067 - 000000000000067] Motherboard resources
		[0000000000000070 - 000000000000070] Motherboard resources
		[0000000000000070 - 000000000000077] System CMOS/real time clock
		[0000000000000080 - 000000000000080] Motherboard resources
		[0000000000000092 - 000000000000092] Motherboard resources
		[00000000000000A0 - 0000000000000A1] Programmable interrupt controller
		[00000000000000A4 - 0000000000000A5] Programmable interrupt controller
		[00000000000000A8 - 0000000000000A9] Programmable interrupt controller
		[00000000000000AC - 0000000000000AD] Programmable interrupt controller
		[00000000000000B0 - 0000000000000B1] Programmable interrupt controller
		[00000000000000B2 - 0000000000000B3] Motherboard resources
		[00000000000000B4 - 0000000000000B5] Programmable interrupt controller
		[00000000000000B8 - 0000000000000B9] Programmable interrupt controller
		[00000000000000BC - 0000000000000BD] Programmable interrupt controller
		[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
		[00000000000003B0 - 00000000000003BB] Intel(R) HD Graphics 620
		[00000000000003C0 - 00000000000003DF] Intel(R) HD Graphics 620
		[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
		[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
		[0000000000000680 - 000000000000069F] Motherboard resources
		[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
		[000000000000164E - 000000000000164F] Motherboard resources
		[0000000000001800 - 00000000000018FE] Motherboard resources
		[0000000000001854 - 0000000000001857] Motherboard resources
		[000000000000F000 - 000000000000F03F] Intel(R) HD Graphics 620
		[000000000000F040 - 000000000000F05F] Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23
		[000000000000F060 - 000000000000F07F] Standard SATA AHCI Controller
		[000000000000F080 - 000000000000F083] Standard SATA AHCI Controller
		[000000000000F090 - 000000000000F097] Standard SATA AHCI Controller
		[000000000000F0A0 - 000000000000F0A7] Intel(R) Active Management Technology - SOL (COM3)
		[000000000000FF00 - 000000000000FFFE] Motherboard resources
		[000000000000FFFF - 000000000000FFFF] Motherboard resources
		[000000000000FFFF - 000000000000FFFF] Motherboard resources
		[000000000000FFFF - 000000000000FFFF] Motherboard resources

### 3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

▼	Interrupt request (IRQ)	
	(ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000003 (03)	Communications Port (COM2)
	(ISA) 0x00000004 (04)	Communications Port (COM1)
	(ISA) 0x00000008 (08)	System CMOS/real time clock
	(ISA) 0x0000000E (14)	Motherboard resources
	(ISA) 0x00000036 (54)	Microsoft ACPI-Compliant System
	(ISA) 0x00000037 (55)	Microsoft ACPI-Compliant System
	(ISA) 0x00000038 (56)	Microsoft ACPI-Compliant System
	(ISA) 0x00000039 (57)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003A (58)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003B (59)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003C (60)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003D (61)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003E (62)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003F (63)	Microsoft ACPI-Compliant System
	(ISA) 0x00000040 (64)	Microsoft ACPI-Compliant System
	(ISA) 0x00000041 (65)	Microsoft ACPI-Compliant System
	(ISA) 0x00000042 (66)	Microsoft ACPI-Compliant System
	(ISA) 0x00000043 (67)	Microsoft ACPI-Compliant System
	(ISA) 0x00000044 (68)	Microsoft ACPI-Compliant System
	(ISA) 0x00000045 (69)	Microsoft ACPI-Compliant System
	(ISA) 0x00000046 (70)	Microsoft ACPI-Compliant System
	(ISA) 0x00000047 (71)	Microsoft ACPI-Compliant System
	(ISA) 0x00000048 (72)	Microsoft ACPI-Compliant System
	(ISA) 0x00000049 (73)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004A (74)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004B (75)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004C (76)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004D (77)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004E (78)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004F (79)	Microsoft ACPI-Compliant System
	(ISA) 0x00000050 (80)	Microsoft ACPI-Compliant System
	(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
	(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
	(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
	(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
	(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
	(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
	(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
	(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
	(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
	(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
	(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
	(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
	(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
	(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
	(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
	(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
	(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
	(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
	(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
	(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
	(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
	(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
	(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System



























































































































	(ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
	(ISA) 0x000001CF (463)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D0 (464)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D1 (465)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D2 (466)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D3 (467)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D4 (468)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D5 (469)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D6 (470)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
	(ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x0000000B (11)	Mobile 6th/7th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31
	(PCI) 0x0000000B (11)	Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23
	(PCI) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0x00000013 (19)	Intel(R) Active Management Technology - SOL (COM3)
	(PCI) 0xFFFFFFFF (-6)	Intel(R) Management Engine Interface
	(PCI) 0xFFFFFFFFFB (-5)	Intel(R) Ethernet Connection I219-LM
	(PCI) 0xFFFFFFFFFC (-4)	Intel(R) HD Graphics 620
	(PCI) 0xFFFFFFFFFD (-3)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
	(PCI) 0xFFFFFFFFFE (-2)	Standard SATA AHCI Controller



### 3.6 Memory Map

The memory mapping list is shown as follows:

▼	 Memory	
	 [0000000000A0000 - 0000000000BFFFF] Intel(R) HD Graphics 620	
	 [0000000000A0000 - 0000000000BFFFF] PCI Express Root Complex	
	 [0000000090000000 - 00000000DFFFFFFF] PCI Express Root Complex	
	 [00000000C0000000 - 00000000CFFFFFFF] Intel(R) HD Graphics 620	
	 [00000000DE000000 - 00000000DEFFFFFF] Intel(R) HD Graphics 620	
	 [00000000DF000000 - 00000000DF01FFFF] Intel(R) Ethernet Connection I219-LM	
	 [00000000DF020000 - 00000000DF02FFFF] High Definition Audio Controller	
	 [00000000DF030000 - 00000000DF03FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)	
	 [00000000DF040000 - 00000000DF043FFF] High Definition Audio Controller	
	 [00000000DF044000 - 00000000DF047FFF] Mobile 6th/7th Generation Intel(R) Processor Family I/O PMC - 9D21	
	 [00000000DF048000 - 00000000DF049FFF] Standard SATA AHCI Controller	
	 [00000000DF04A000 - 00000000DF04A0FF] Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23	
	 [00000000DF04B000 - 00000000DF04B7FF] Standard SATA AHCI Controller	
	 [00000000DF04C000 - 00000000DF04C0FF] Standard SATA AHCI Controller	
	 [00000000DF04D000 - 00000000DF04DFFF] Intel(R) Active Management Technology - SOL (COM3)	
	 [00000000DF04F000 - 00000000DF04FFFF] Mobile 6th/7th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31	
	 [00000000DFFE0000 - 00000000DFFFFFFF] Motherboard resources	
	 [00000000E0000000 - 00000000EFFFFFFF] Motherboard resources	
	 [00000000FD000000 - 00000000FDABFFFF] Motherboard resources	
	 [00000000FD000000 - 00000000FE7FFFFFFF] PCI Express Root Complex	
	 [00000000FDAC0000 - 00000000FDACFFFF] Motherboard resources	
	 [00000000FDAD0000 - 00000000FDADFFFF] Motherboard resources	
	 [00000000FDAE0000 - 00000000FDAEFFFF] Motherboard resources	
	 [00000000FDAF0000 - 00000000FDAFFFFF] Motherboard resources	
	 [00000000FDB00000 - 00000000FDBFFFFF] Motherboard resources	
	 [00000000FE000000 - 00000000FE01FFFF] Motherboard resources	
	 [00000000FE028000 - 00000000FE028FFF] Motherboard resources	
	 [00000000FE029000 - 00000000FE029FFF] Motherboard resources	
	 [00000000FE036000 - 00000000FE03BFFF] Motherboard resources	
	 [00000000FE03D000 - 00000000FE3FFFFFFF] Motherboard resources	
	 [00000000FE40F000 - 00000000FE40FFFF] Intel(R) Management Engine Interface	
	 [00000000FE410000 - 00000000FE7FFFFFFF] Motherboard resources	
	 [00000000FED00000 - 00000000FED003FF] High precision event timer	
	 [00000000FED10000 - 00000000FED17FFF] Motherboard resources	
	 [00000000FED18000 - 00000000FED18FFF] Motherboard resources	
	 [00000000FED19000 - 00000000FED19FFF] Motherboard resources	
	 [00000000FED20000 - 00000000FED3FFFF] Motherboard resources	
	 [00000000FED40000 - 00000000FED40FFF] Trusted Platform Module 1.2	
	 [00000000FED45000 - 00000000FED8FFFF] Motherboard resources	
	 [00000000FED90000 - 00000000FED93FFF] Motherboard resources	
	 [00000000FEE00000 - 00000000FEEFFFFFFF] Motherboard resources	
	 [00000000FF000000 - 00000000FFFFFFFF] Legacy device	
	 [00000000FF000000 - 00000000FFFFFFFF] Motherboard resources	

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# Chapter 4

## AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

### 4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the <Del> key immediately.
2. After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.



**Note**

*If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting JP1 (see section 2.4.1).*

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

### 4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



**Note**

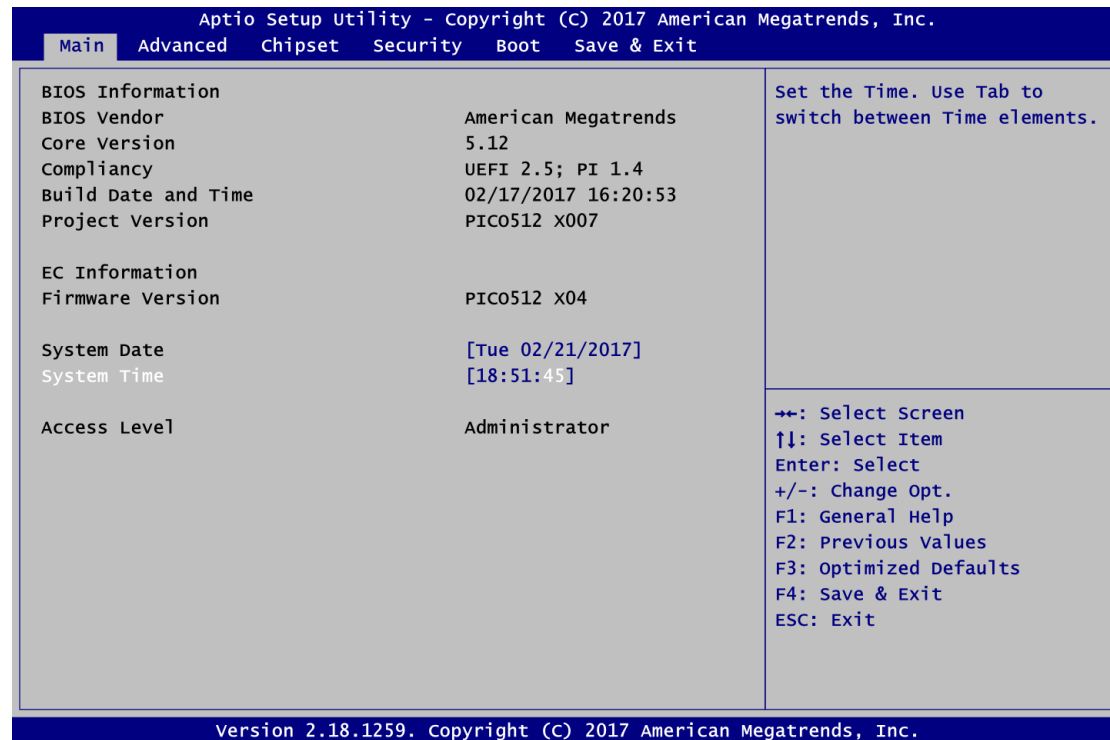
*Some of the navigation keys differ from one screen to another.*

Hot Keys	Description
<b>→← Left/Right</b>	The Left and Right <Arrow> keys allow you to select a setup screen.
<b>↑↓ Up/Down</b>	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
<b>+– Plus/Minus</b>	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
<b>Tab</b>	The <Tab> key allows you to select setup fields.
<b>F1</b>	The <F1> key allows you to display the General Help screen.
<b>F2</b>	The <F2> key allows you to Load Previous Values.
<b>F3</b>	The <F3> key allows you to Load Optimized Defaults.
<b>F4</b>	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
<b>Esc</b>	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
<b>Enter</b>	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.



## 4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.



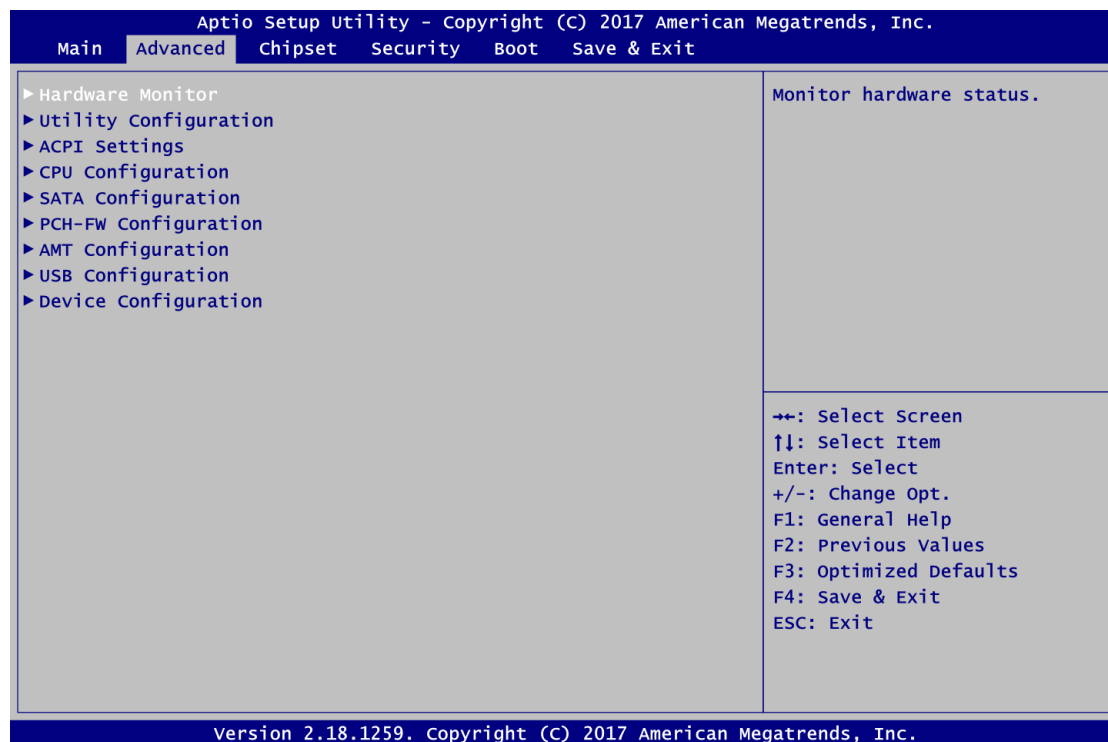
- **BIOS Information**  
Display the auto detected BIOS information.
- **System Date/Time**  
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.
- **Access Level**  
Display the access level of current user.

## 4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

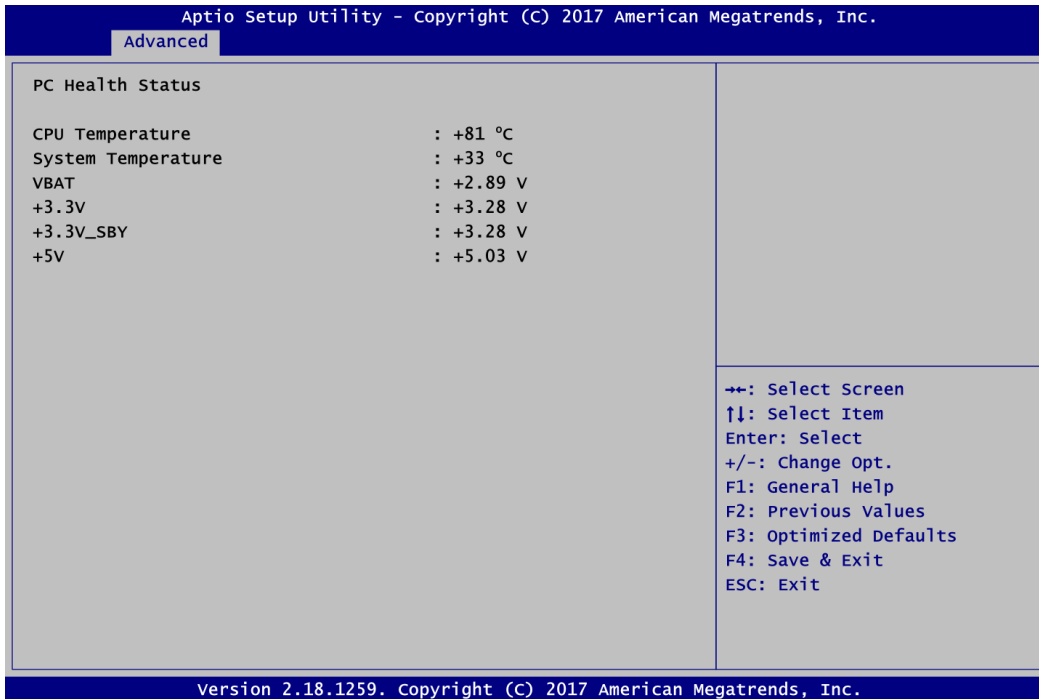
- ▶ Hardware Monitor
- ▶ Utility Configuration
- ▶ ACPI Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ PCH-FW Configuration
- ▶ AMT Configuration
- ▶ USB Configuration
- ▶ Device Configuration

For items marked with “▶”, please press <Enter> for more options.



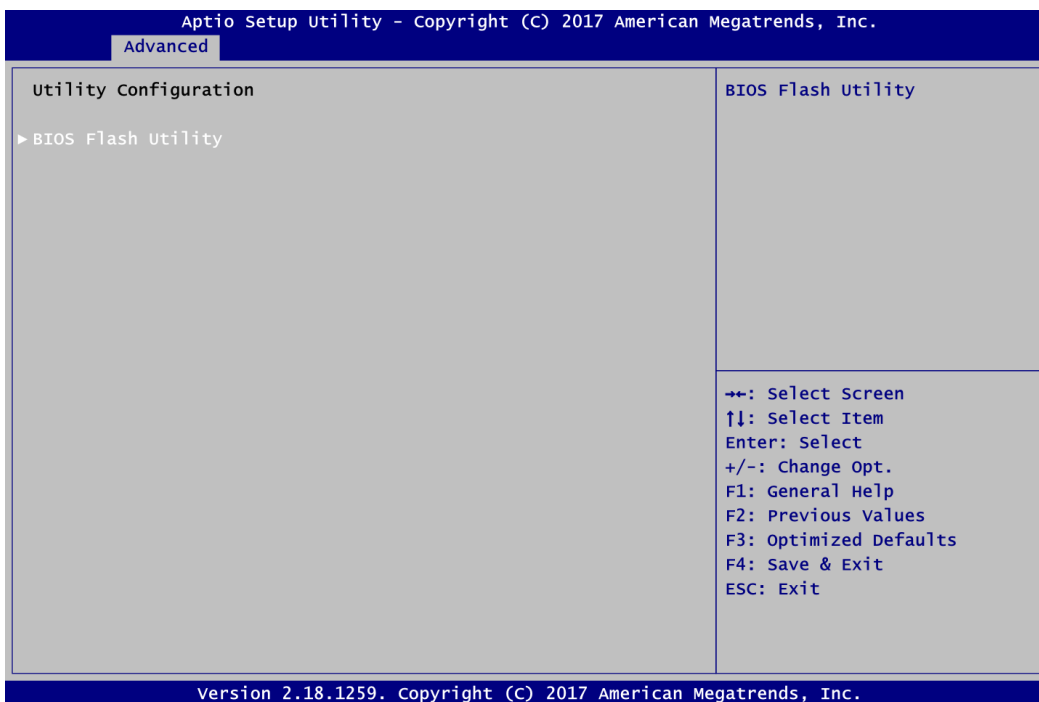
- **Hardware Monitor**

This screen monitors hardware health status.



This screen displays the temperature of system and CPU, and system voltages (VBAT and +3.3V/+3.3V\_SBY/+5V).

- **Utility Configuration**

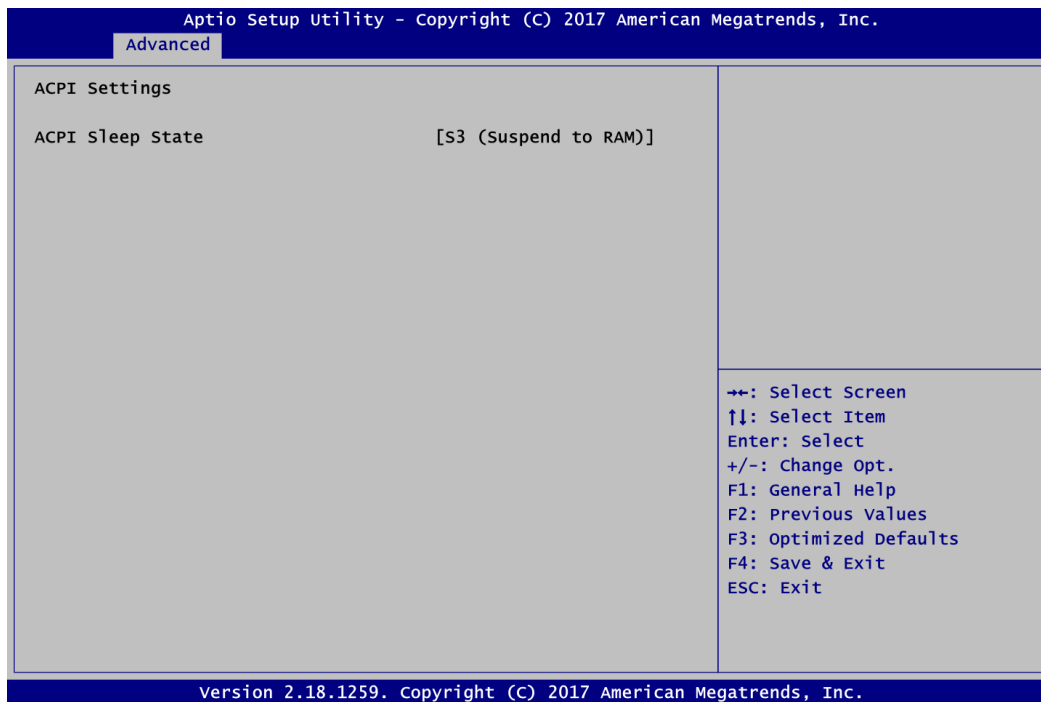


**BIOS Flash Utility**

BIOS flash utility configuration. For more detailed information, please refer to Appendix D.

- **ACPI Settings**

You can check this screen for the ACPI configuration.

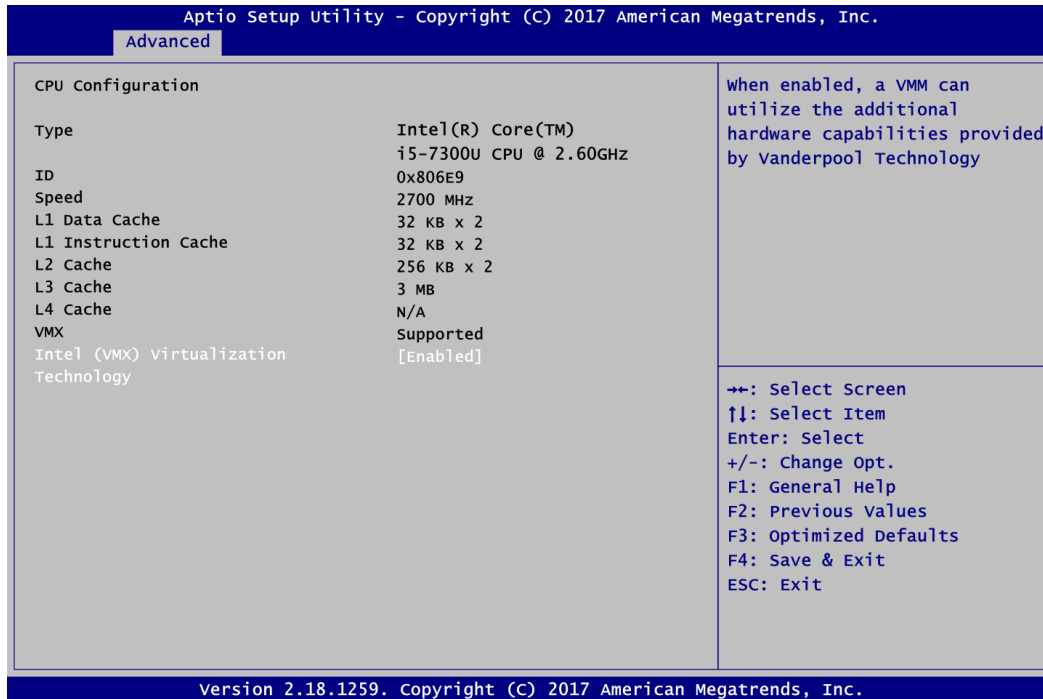


**ACPI Sleep State**

When the suspend button is pressed, the ACPI sleep state is S3 (Suspend to RAM).

- **CPU Configuration**

This screen shows the CPU Configuration.

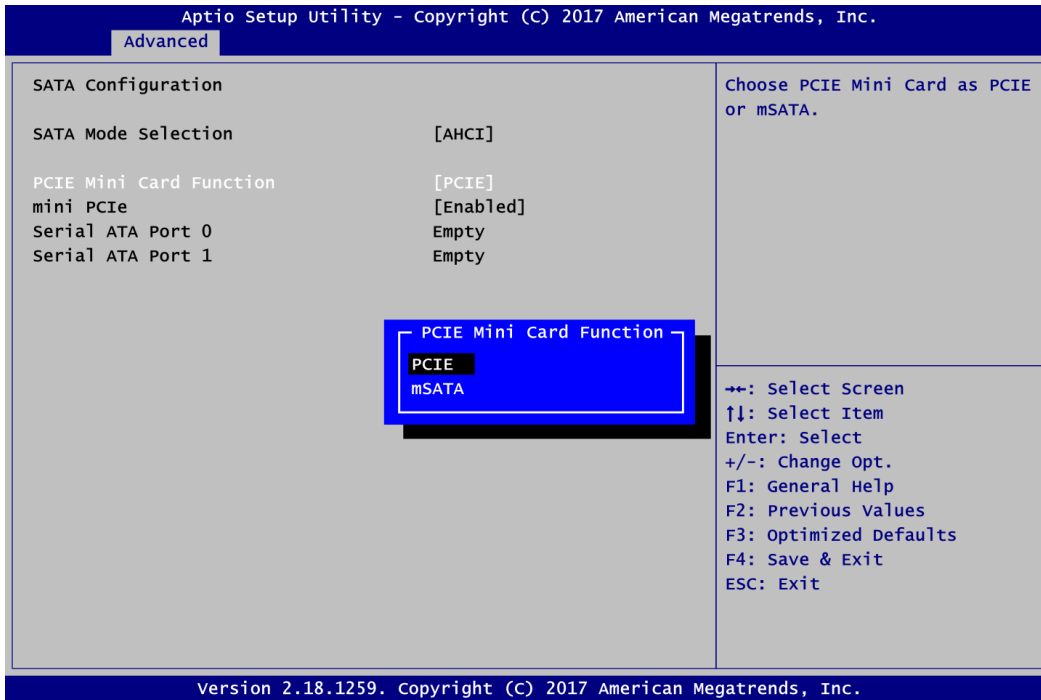


### Intel (VMX) Virtualization Technology

Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a single computer system to work as several virtual systems.

- **SATA Configuration**

In the SATA Configuration menu, you can see the current installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



**SATA Mode Selection**

AHCI (Advanced Host Controller Interface) mode is how SATA controller(s) operate.

**PCIE Mini Card Function**

Select Mini PCIe or mSATA device. The default is PCIE.

**mini PCIe**

When mSATA is enabled, mini PCIe is disabled automatically and vice versa.

**Serial ATA Port 0**

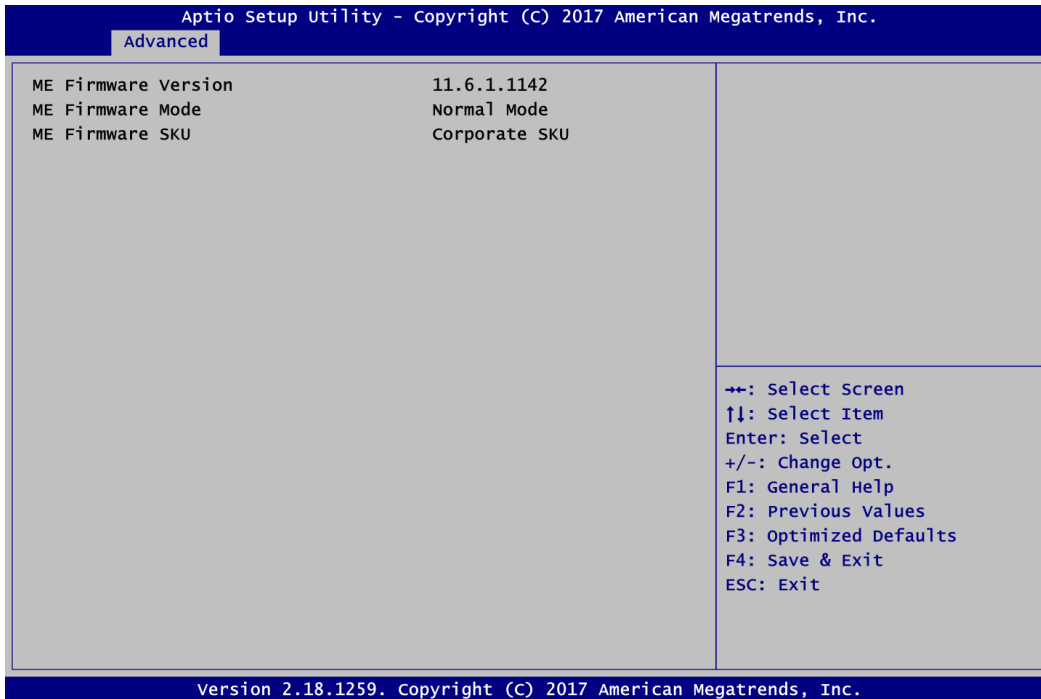
It shows the device installed in connector CN4 (see section 2.5.2).

**Serial ATA Port 1**

It shows the installed mSATA card when mSATA is enabled.

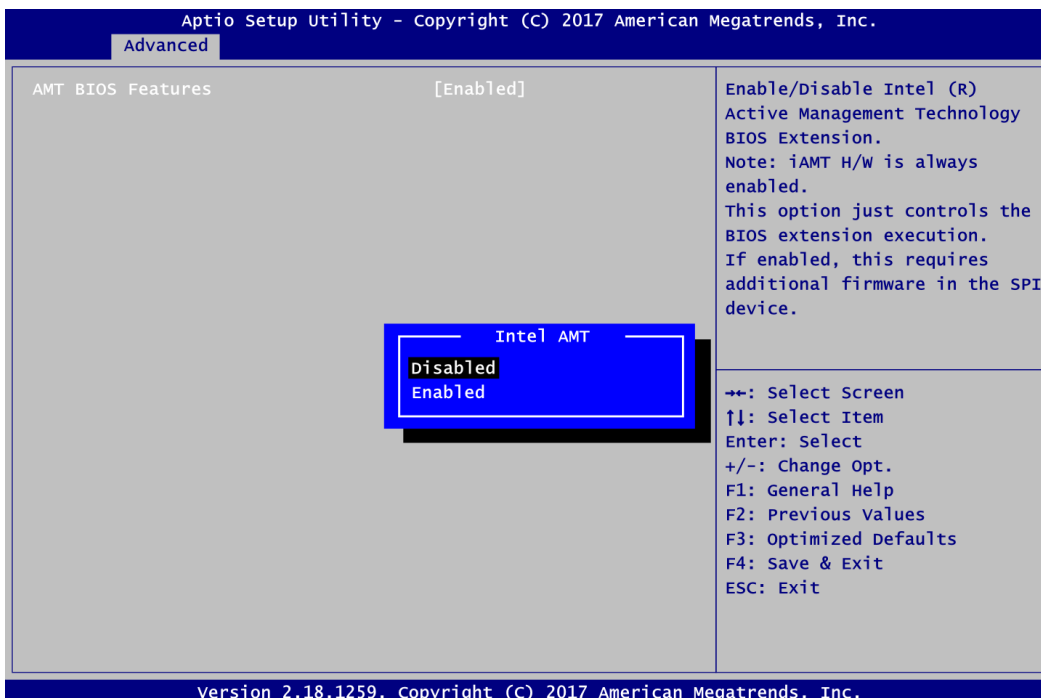
- **PCH-FW Configuration**

This screen displays ME Firmware information.



- **AMT Configuration**

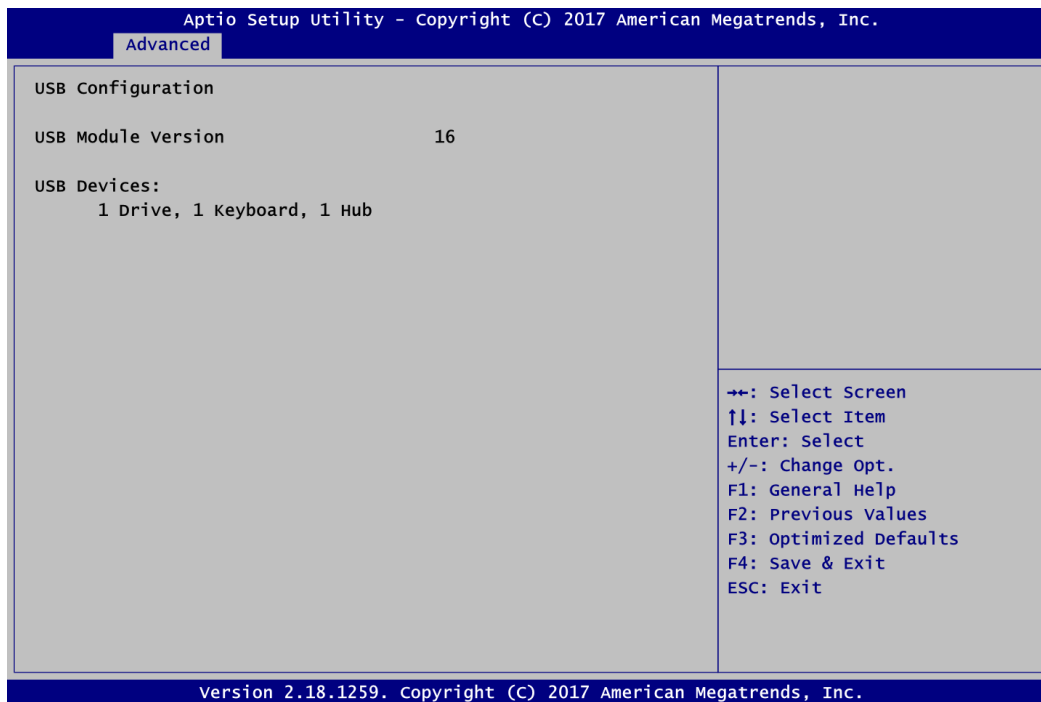
Use this screen to configure AMT parameters.



**Intel AMT**

Enable or disable Intel® Active Management Technology BIOS Extension. The default is Enabled. For more detailed information, please refer to Appendix C.

- **USB Configuration**



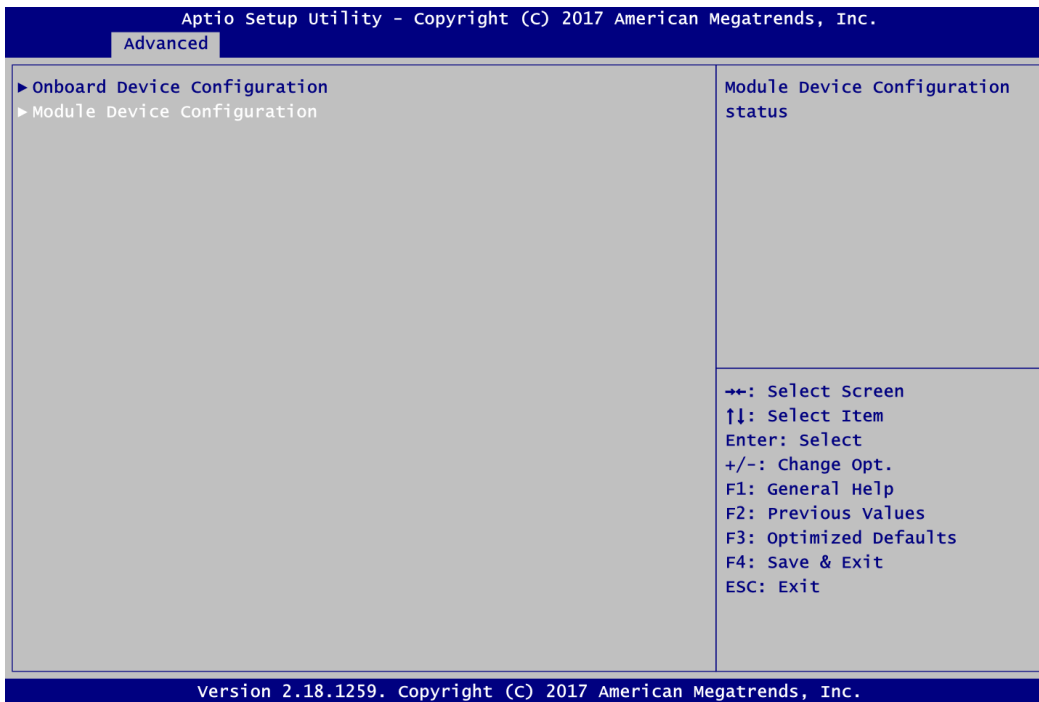
### USB Devices

Display all detected USB devices which are installed in connector CN10 on PICO512, CN6 and CN7 on AX93A00, CN4 and CN6 on AX93A01, USB1~USB4 on AX93A02 or CN3 on AX93A09.



- **Device Configuration**

A description of selected item appears on the right side of the screen. For items marked with “▶”, please press <Enter> for more options.

**Onboard Device Configuration**

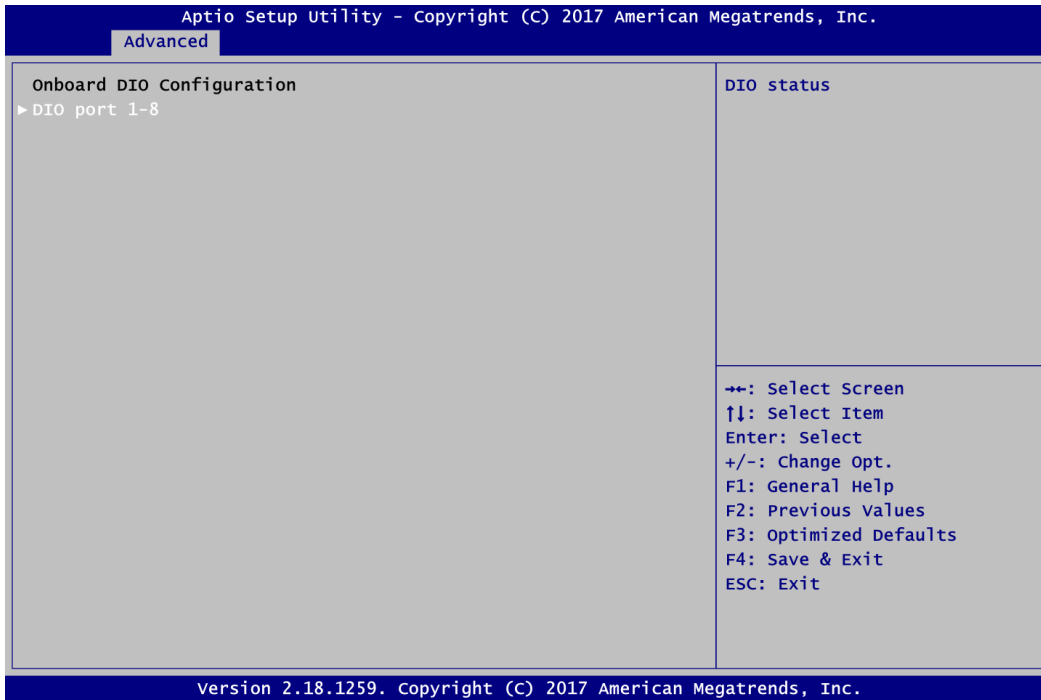
Use this option to configure onboard device (e.g., Digital I/O setting).

**Module Device Configuration**

This option appears only if an I/O board is installed. BIOS will auto-detect all supported functions and you can use it to change settings on the I/O board. The PICO512 supports the following I/O boards: AX93A00, AX93A01, AX93A02 and AX93A09.

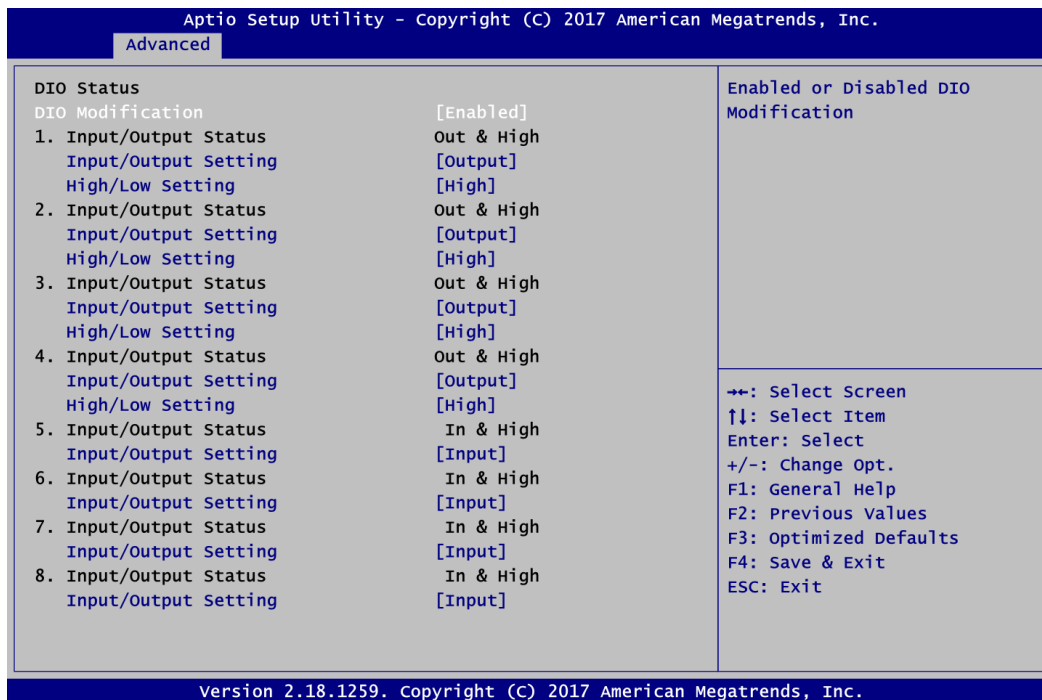
● **Onboard Device Configuration**

You can use this screen to select options for the 8-bit Digital I/O Configuration. A description of the selected item appears on the right side of the screen. For items marked with “▶”, please press <Enter> for more options.



**DIO port 1-8**

Select this option to open DIO status sub screen to set output or input for each port.

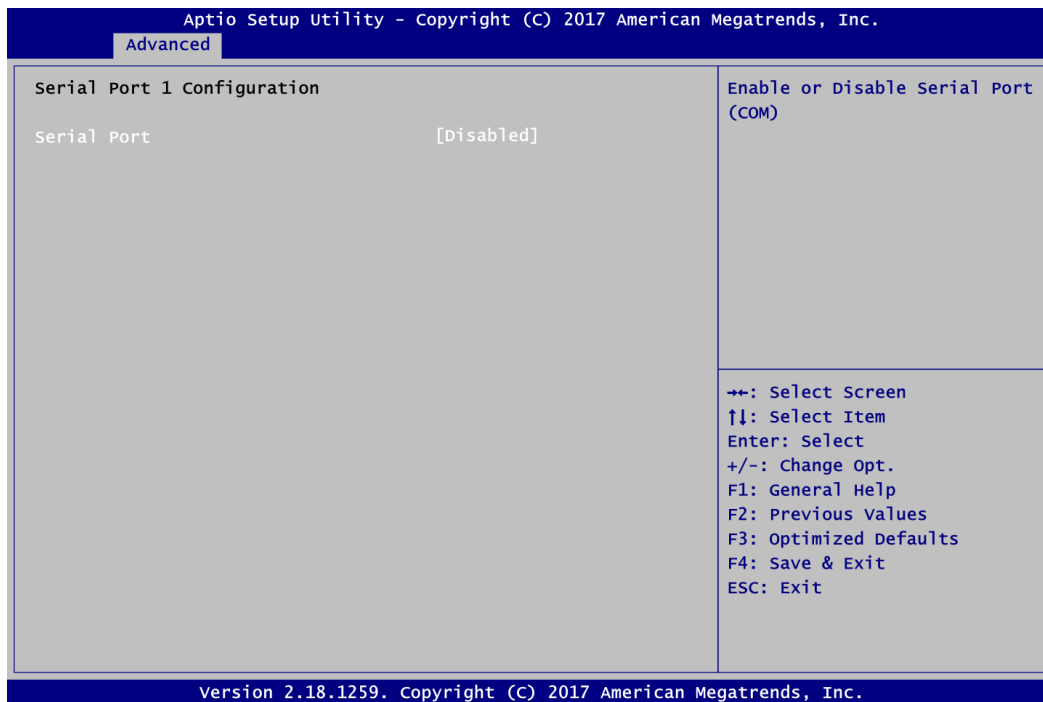


**DIO Modification**

Enable or disable digital I/O modification. The default is Disabled. Once it is enabled, you can change the digital I/O type of the selected option.

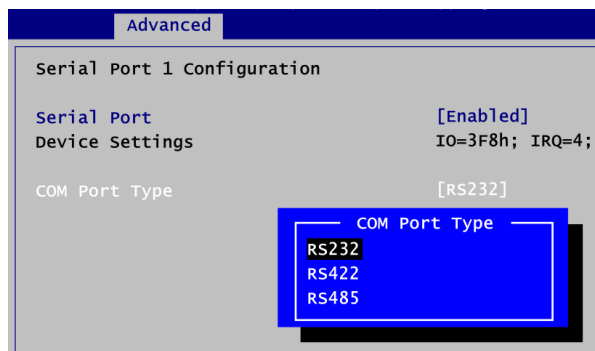
● **Module Configuration**

This screen is available only if an I/O board with serial ports is connected.



**Serial Port**

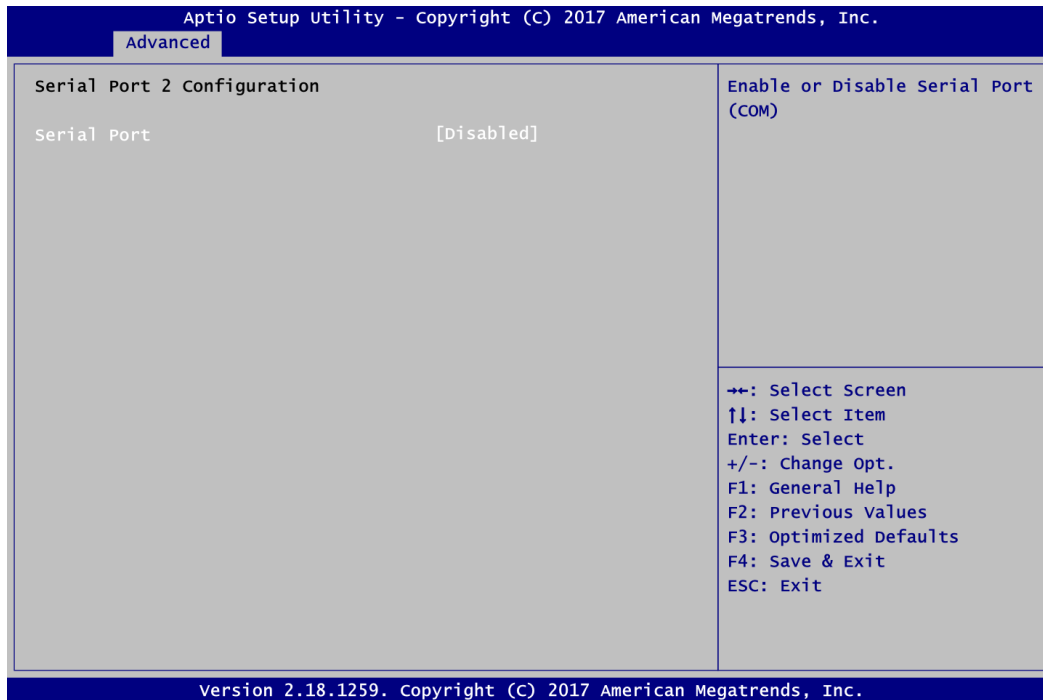
- Disabled: If I/O board is not installed.
- Enabled: If I/O board is installed, this option will be enabled automatically. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4, see image below.



**COM Port Type**

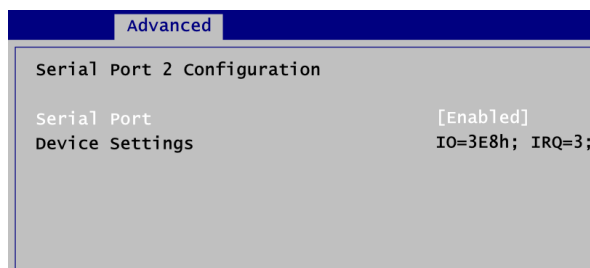
Use this option to set RS-232/422/485 mode for COM1 port on I/O board.

- **Serial Port 2 Configuration**



**Serial Port**

- Disabled: If I/O board is not installed.
- Enabled: If I/O board is installed, this option will be enabled automatically. The optimal setting for base I/O address is 3E8h and for interrupt request address is IRQ3, see image below.

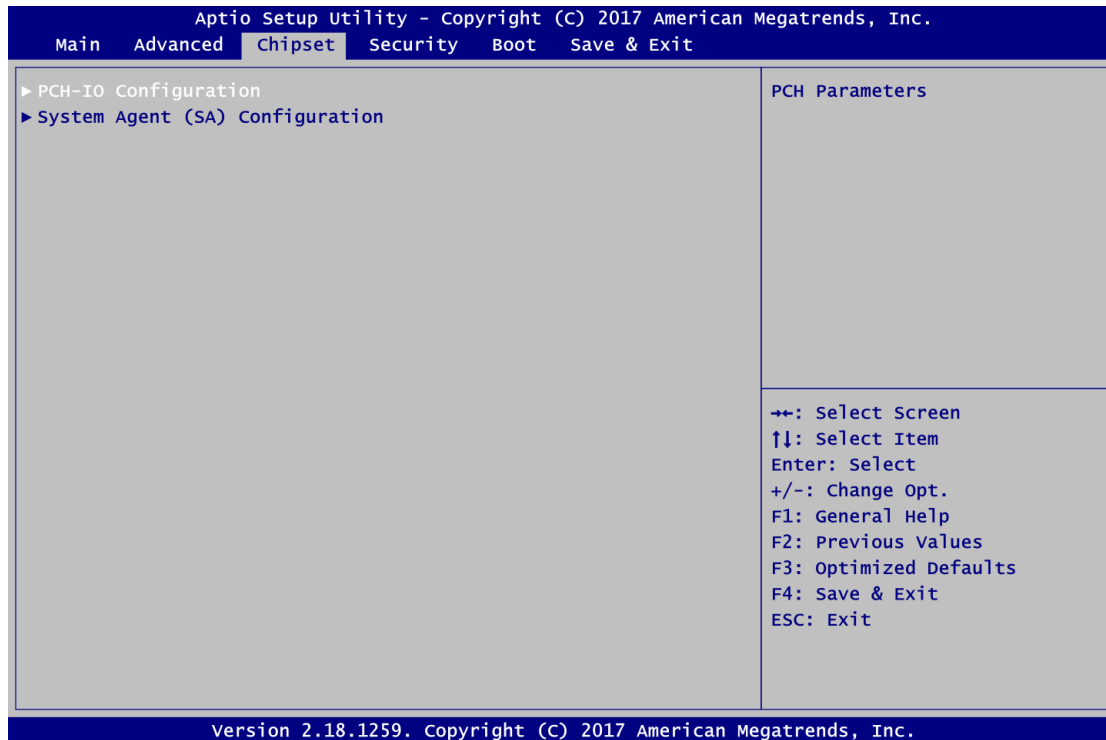


## 4.5 Chipset Menu

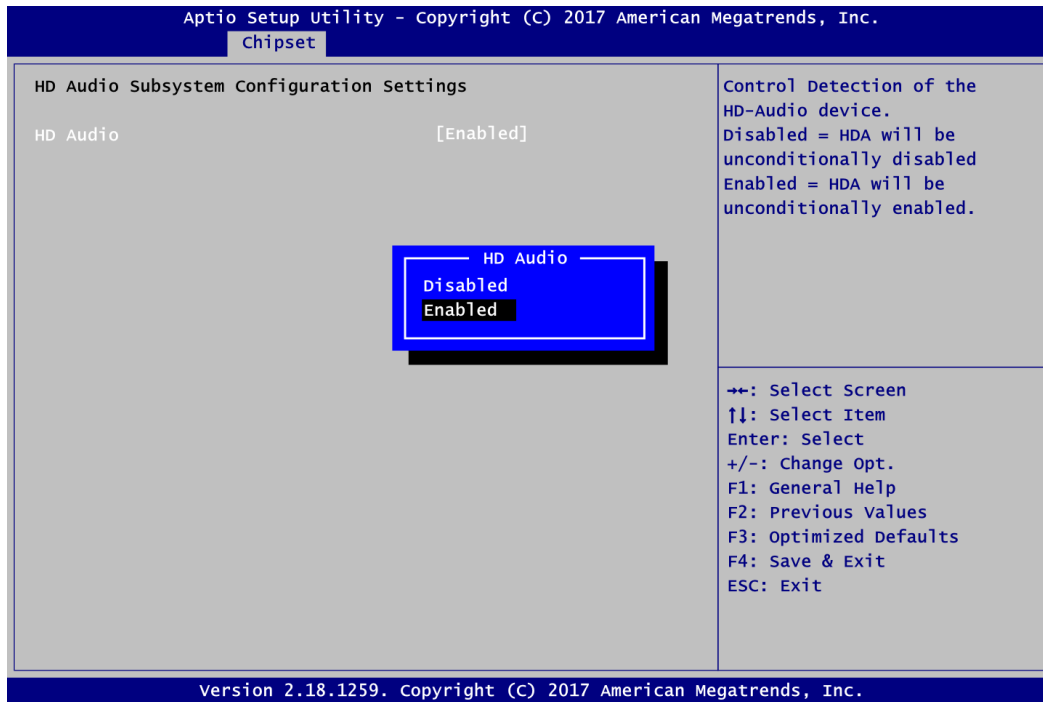
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

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

For items marked with “▶”, please press <Enter> for more options.



- **PCH-IO Configuration**

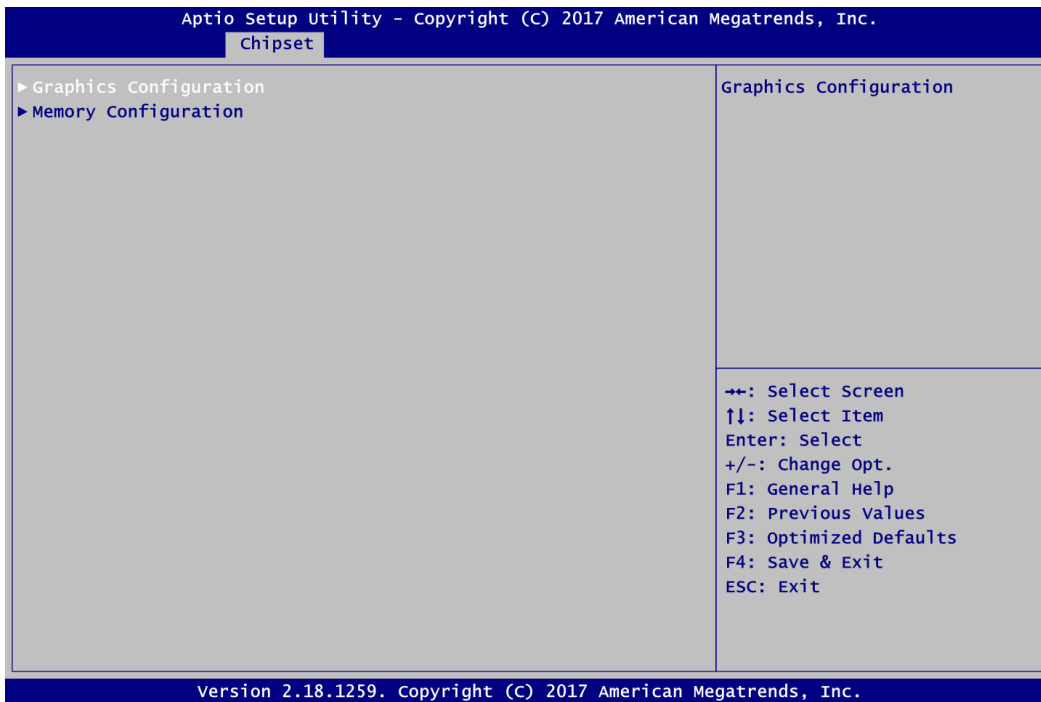


**HD Audio**

Control detection of the HD Audio device. Configuration options are Disabled and Enabled.

- **System Agent (SA) Configuration**

This screen shows System Agent version information and provides function for specifying related parameters.



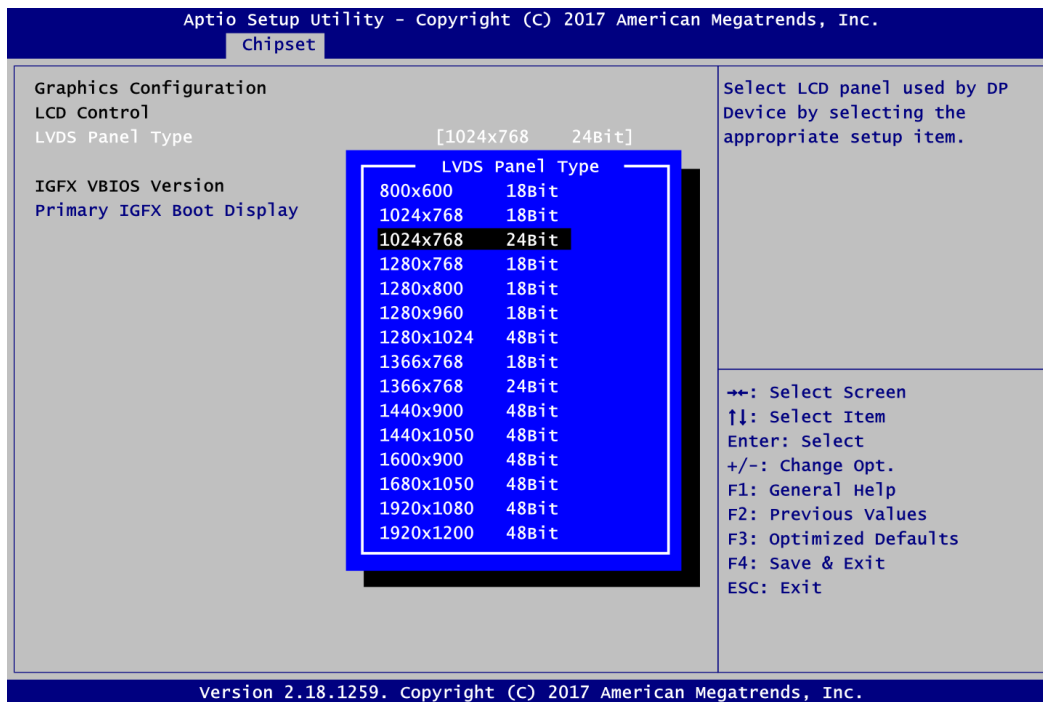
**Graphics Configuration**

Use this item to configure internal graphics controller.

**Memory Configuration**

Use this item to refer to the information related to system memory.

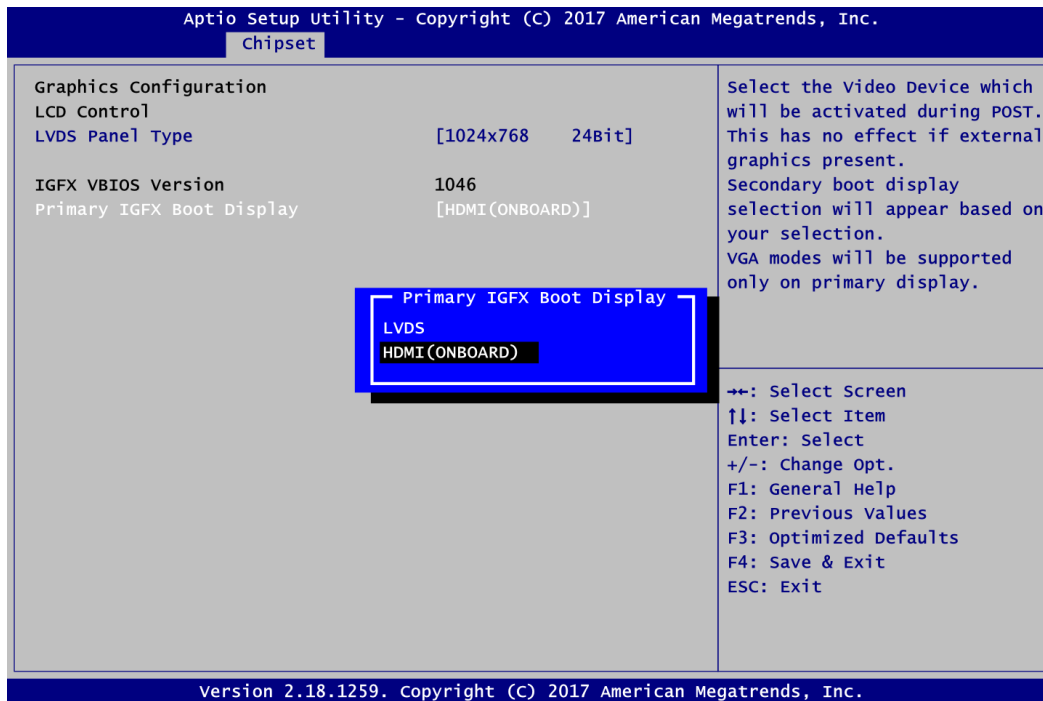
- **Graphics Configuration**



**LVDS Panel Type**

Select LVDS panel resolution; see the selection options in image above.





### Primary IGFX Boot Display

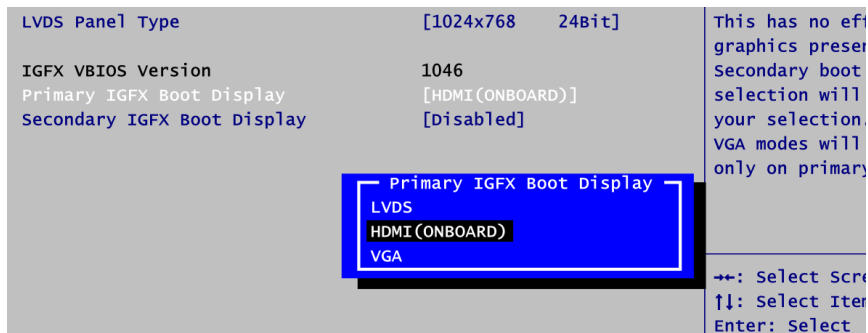
Select the video device which will be activated during POST (Power-On Self Test). The default is HDMI(ONBOARD). The image above shows option list in Primary IGFX Boot Display when no I/O board is installed.



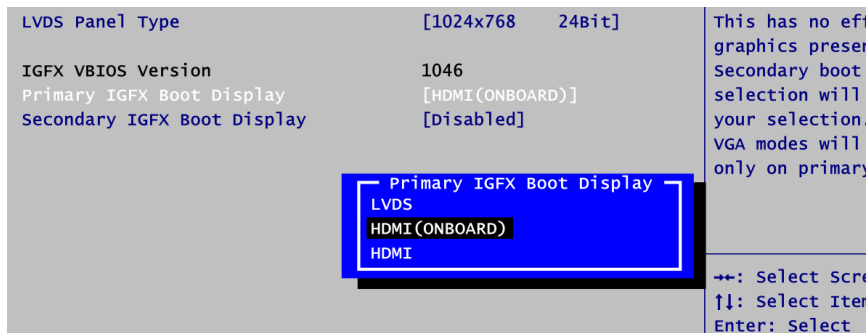
**Note**

*When powering on PICO512 for the first time, video device must be plugged into HDMI port (CN15). Then, after first power on, you can set VGA on AX93A00 or HDMI on AX93A01 as primary IGFX boot display.*

When AX93A00 is installed, the Secondary IGFX Boot Display option appears and the Primary IGFX Boot Display option list will be LVDS, HDMI(ONBOARD) and VGA, see image below.

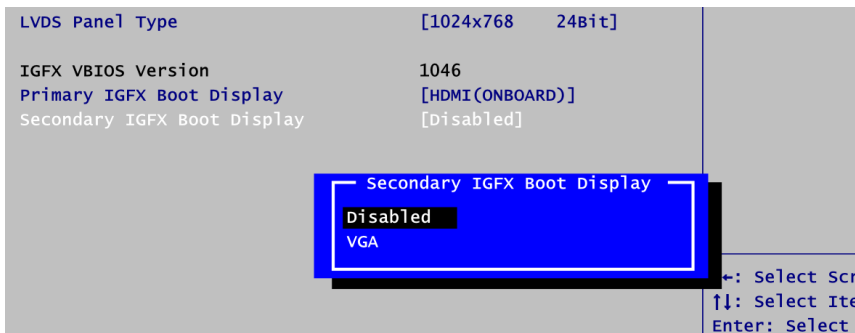


Otherwise when AX93A01 is installed, the Secondary IGFX Boot Display option appears and the Primary IGFX Boot Display option list will be LVDS, HDMI(ONBOARD) and HDMI, see image below.

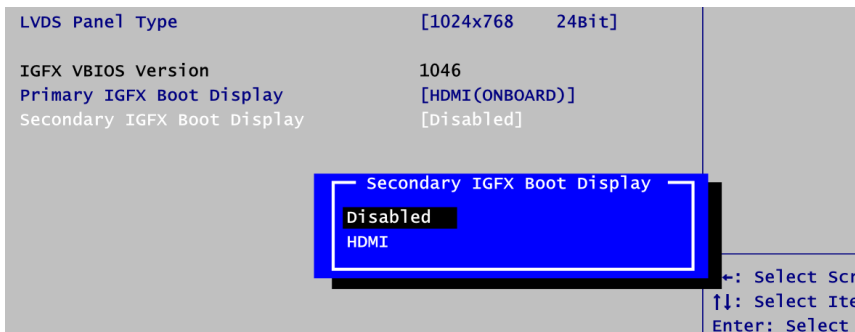


### Secondary IGFX Boot Display

Select secondary display device. The default is Disabled. When AX93A00 is installed, the option list in Secondary IGFX Boot Display will be Disabled and VGA, see image below.

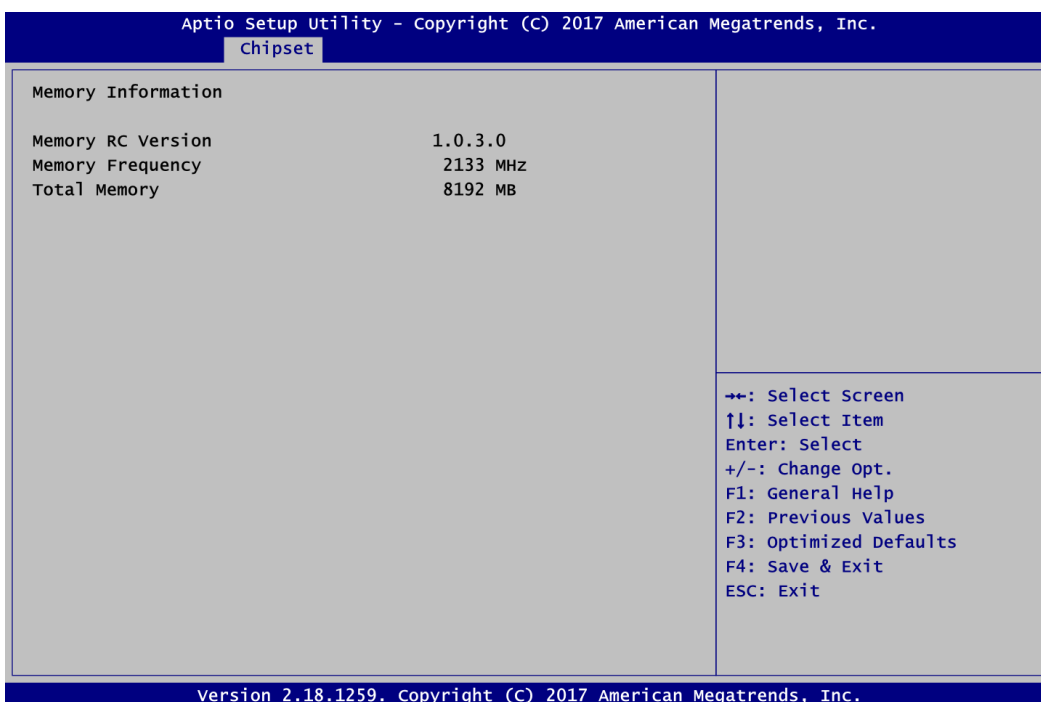


Otherwise when AX93A01 is installed, the option list in Secondary IGFX Boot Display will be Disabled and HDMI.



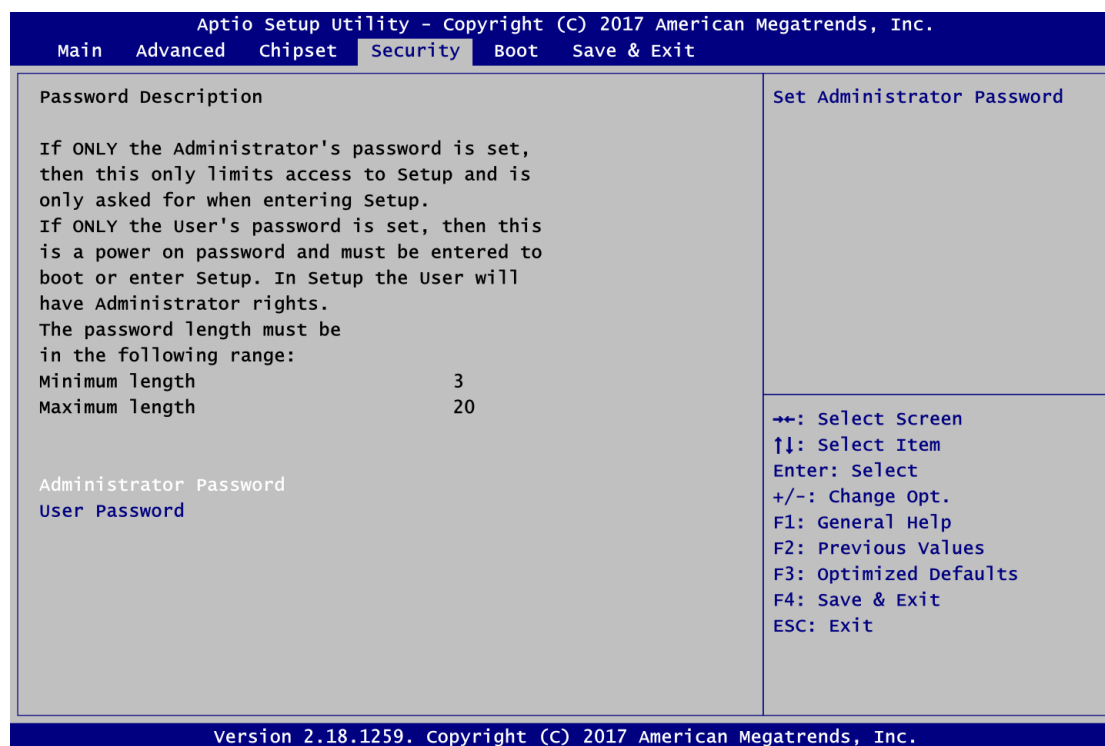
- **Memory Information**

This screen shows the system memory information.



## 4.6 Security Menu

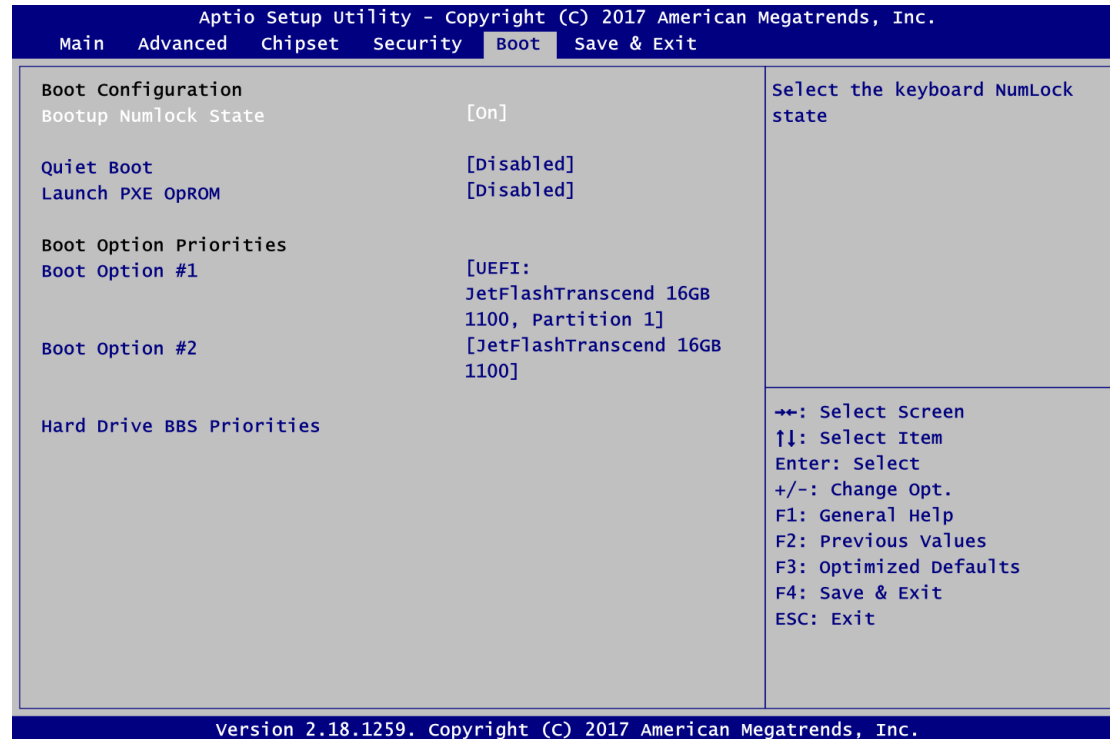
The Security menu allows users to change the security settings for the system.



- Administrator Password**  
 This item indicates whether an administrator password has been set (installed or uninstalled).
- User Password**  
 This item indicates whether a user password has been set (installed or uninstalled).

## 4.7 Boot Menu

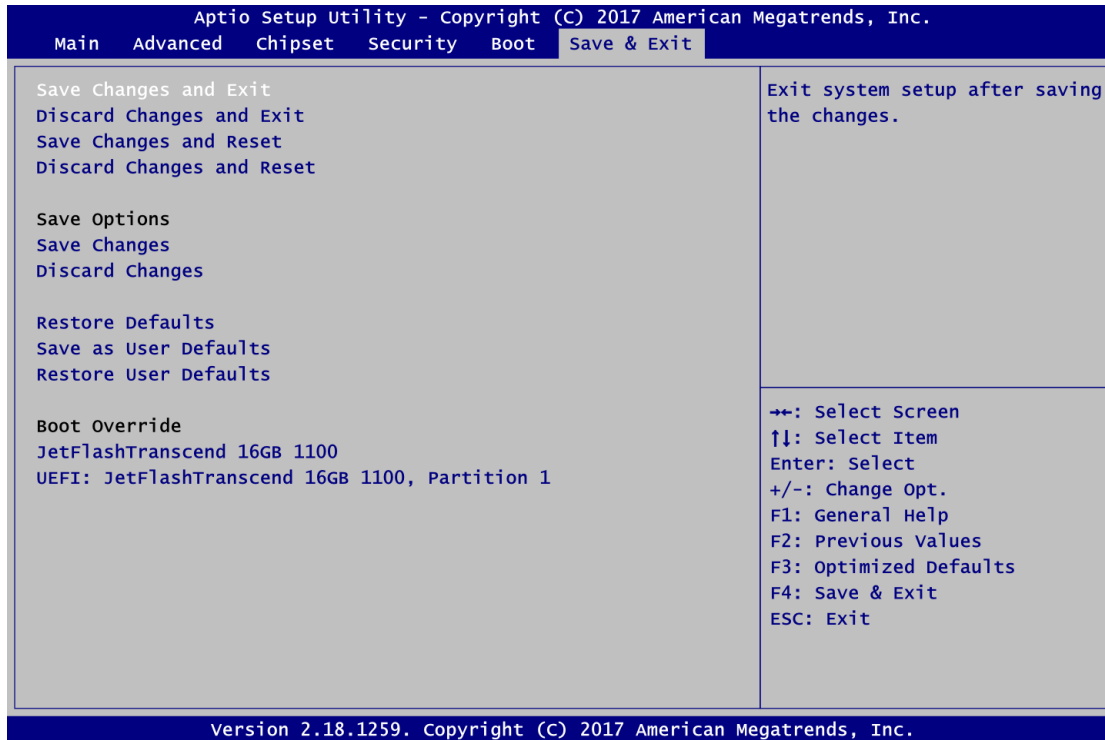
The Boot menu allows users to change boot options of the system.



- **Bootup NumLock State**  
Use this item to select the power-on state for the keyboard NumLock.
- **Quiet Boot**  
Select to display either POST output messages or a splash screen during boot-up.
- **Legacy PXE OpROM**  
Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.
- **Boot Option Priorities [Boot Option #1, #2...]**  
These are settings for boot priority. Specify the boot device priority sequence from the available devices.
- **Hard Drive BBS Priorities**  
These are settings for configuring the order for a specific device group. These options are only visible if at least one device for this group is present.

## 4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.



- Save Changes and Exit**  
When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
- Discard Changes and Exit**  
Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
- Save Changes and Reset**  
When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
- Discard Changes and Reset**  
Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.
- Save Changes**  
When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**  
Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
- **Restore Defaults**  
It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.
- **Save as User Defaults**  
Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
- **Restore User Defaults**  
It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
- **Boot Override**  
Select a drive to immediately boot that device regardless of the current boot order.

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# Appendix A

## Watchdog Timer

### A.1 About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

### A.2 How to Use Watchdog Timer

Assembly sample code :

```
mov    dx,fa10          ; 5 seconds (Maximum is 65535 seconds; fill in
                        ; 0xFA10 and 0xFA11 register, ex: 0xFA11=0x01,
                        ; 0xFA10=0x68 means 360 seconds)
mov    al,05
out    dx,al

mov    dx,fa12          ; Enable WDT
mov    al,01
out    dx,al
```

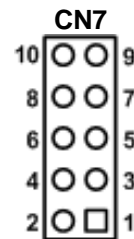
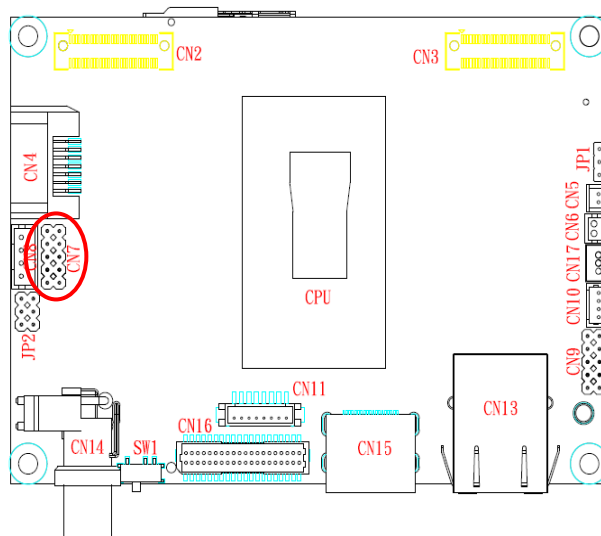
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# Appendix B

## Digital I/O

### B.1 About Digital I/O

The onboard GPIO or digital I/O has 8 bits (DIO0~7). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power). The BIOS default settings are 3 inputs and 5 outputs where all of these pins are set to 1.



Pin	Signal	Pin	Signal
1	DIO0(Bit 0)	2	DIO4(Bit 4)
3	DIO1(Bit 1)	4	DIO5(Bit 5)
5	DIO2(Bit 2)	6	DIO6(Bit 6)
7	DIO3(Bit 3)	8	DIO7(Bit 7)
9	+5V	10	GND

### B.2 How to Use Digital I/O

Assembly sample code :

```

mov    dx,fa18          ; Set DIO 0-7 to Output
mov    al,00
out    dx,al

mov    dx,fa19          ; Set DIO 4-7 to High
mov    al,f0
out    dx,al

mov    dx,fa18          ; Set DIO 0-7 to Input
mov    al,ff
out    dx,al

mov    dx,fa19          ; Get DIO 0-7 status
in     al,dx

mov    dx,fa18          ; Set DIO 0-4 to Input, 5-7 to Output
mov    al,1f            ; al = 1F => 00011111
out    dx,al

mov    dx,fa19          ; Set DIO 6 to High
mov    al,40            ; al = 40 => 01000000
out    dx,al

in     al,dx            ; Get DIO 0-7 status
    
```

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# Appendix C

## iAMT Settings

The Intel® Active Management Technology (Intel® iAMT) has decreased a major barrier to IT efficiency that uses built-in platform capabilities and popular third-party management and security applications to allow IT a better discovering, healing, and protection their networked computing assets.

In order to utilize Intel® iAMT you must enter the ME BIOS (<Ctrl + P> during system startup), change the ME BIOS password, and then select “Intel® iAMT” as the manageability feature.

### C.1 Entering MEBx

1. Go to BIOS to enable iAMT function (see section 4.4).
2. Exit from BIOS after starting iAMT, and press <Ctrl + P> to enter MEBx Setting.

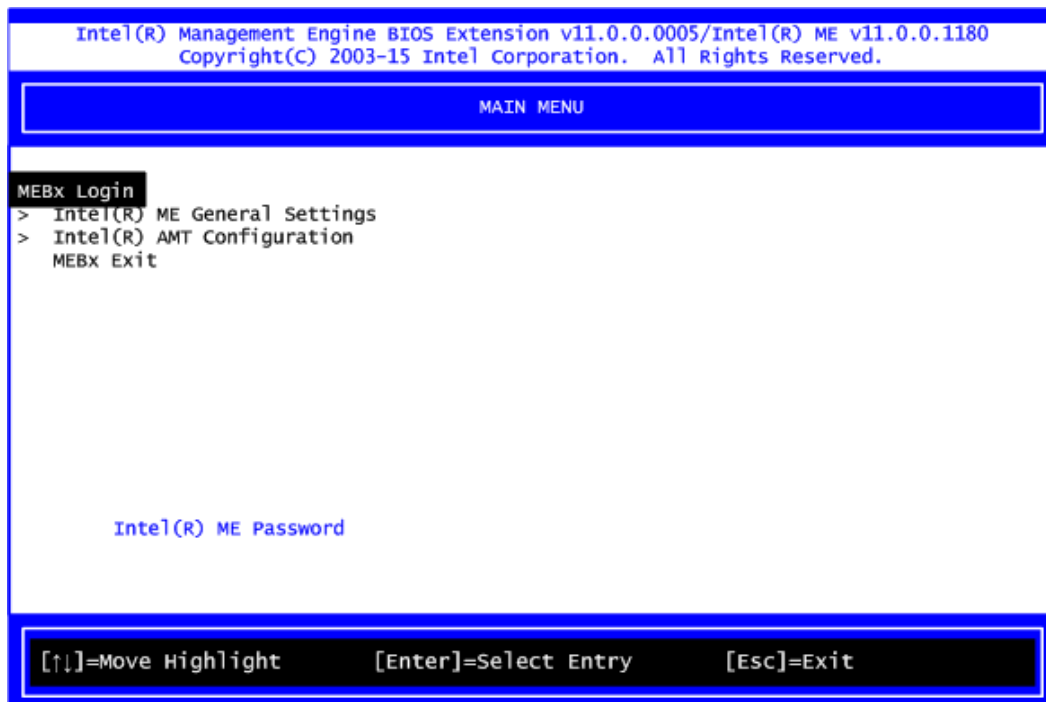


Note

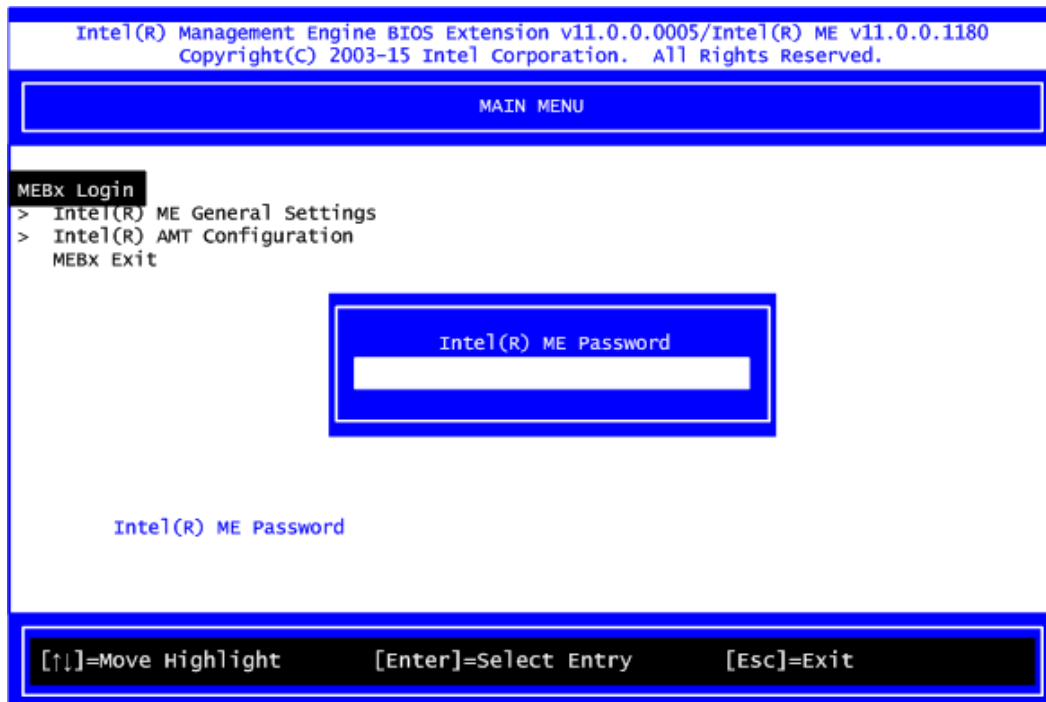
*It is better to press <Ctrl + P> before the screen popping out.*

### C.2 Set and Change Password

1. You will be asked to set a password when first log in. The default password is “admin”.



2. You will be asked to change the password before setting ME.

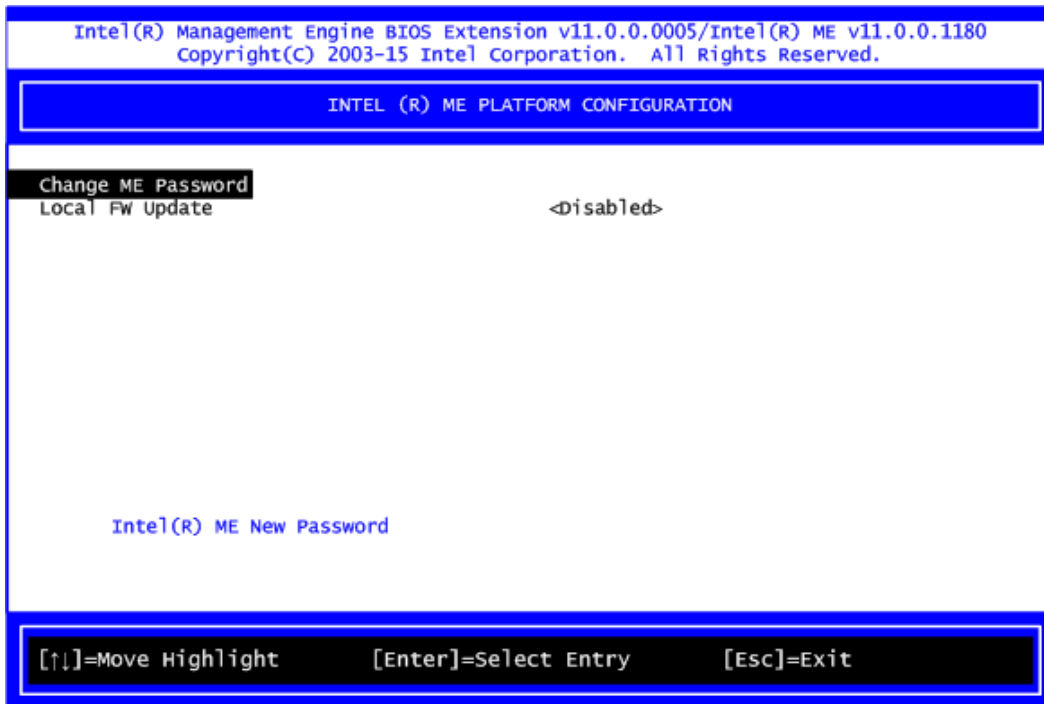


3. You must confirm your new password while revising. The new password must contain:  
(example: **!!11qqQQ**) (default value).

- Eight characters
- One upper case
- One lower case
- One number
- One special symbol, such as ! , \$ or ; , ( , " , , excepted)

Underline ( \_ ) and space are valid characters for password, but they won't make higher complexity.

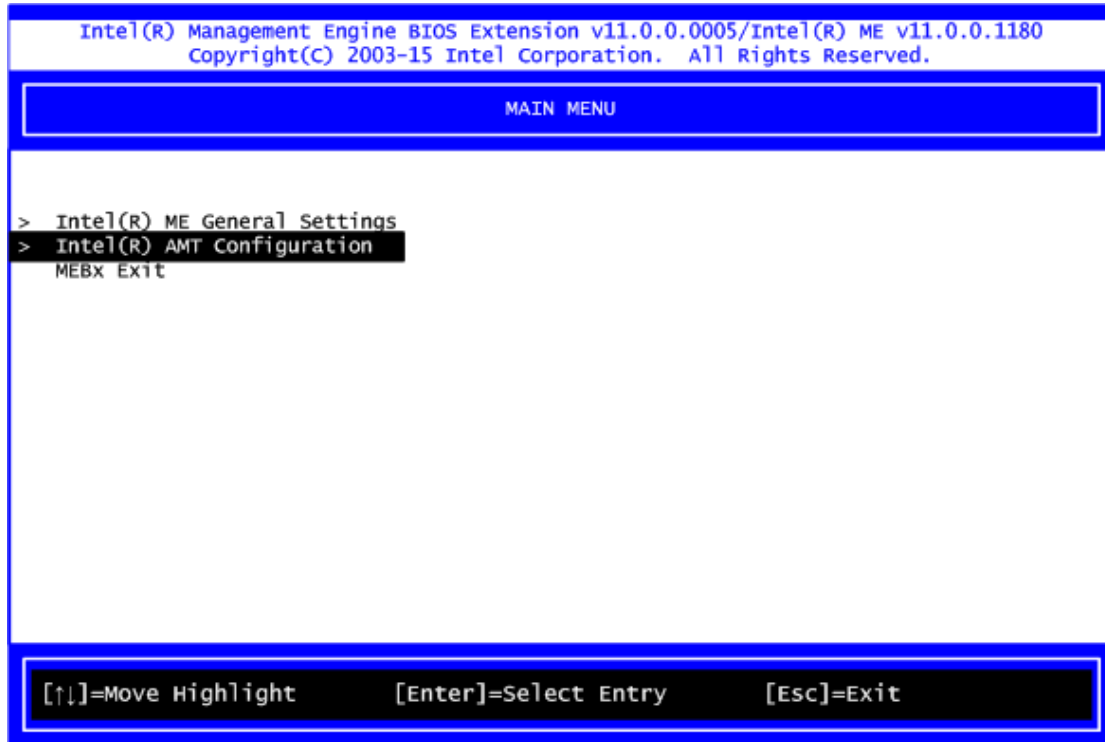
- From Main Menu, select ME General Settings to get into ME Platform Configuration screen. In this screen you can modify Local FW Update setting.



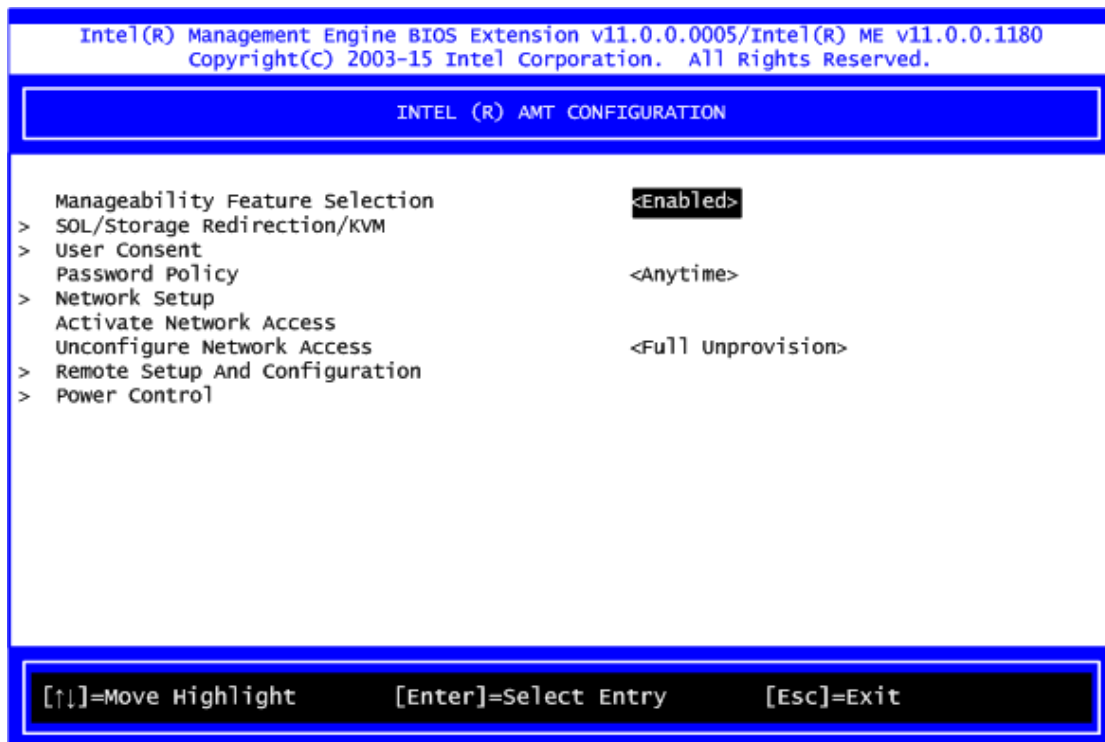
- Return to Main Menu.

### C.3 iAMT Settings

Select Intel® AMT configuration and press <Enter>.



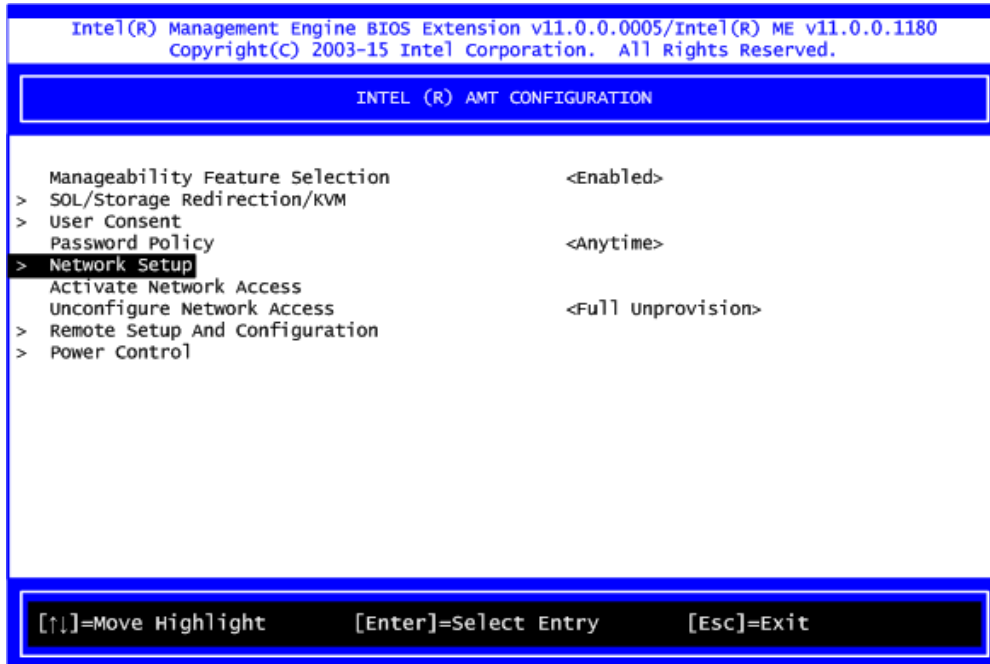
From AMT Configuration menu, select Manageability Feature Selection and set it to Enabled. This item allows you to enable or disable Intel® AMT feature.



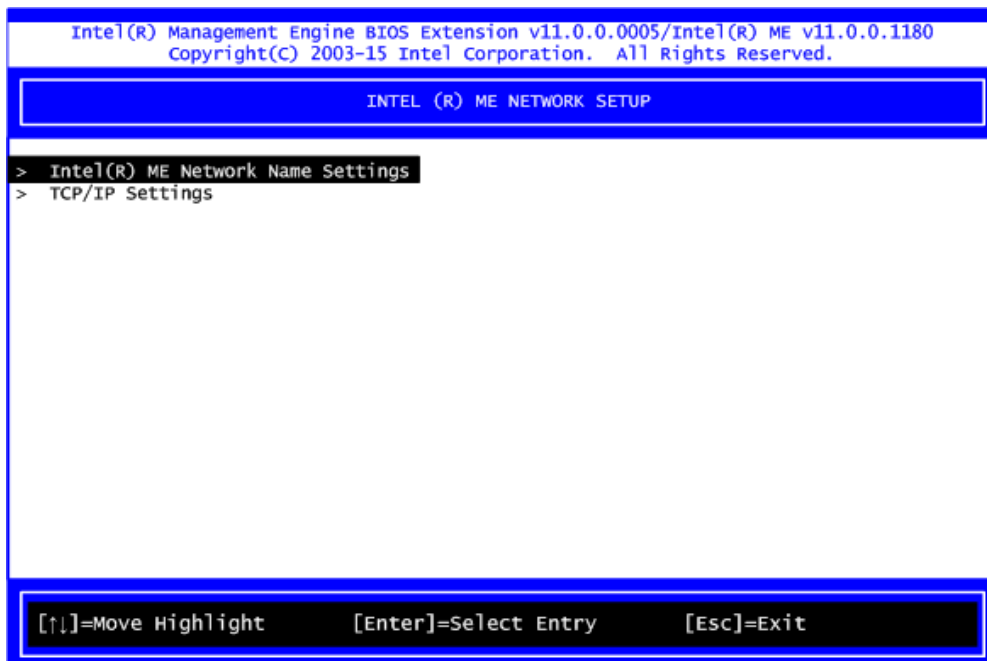


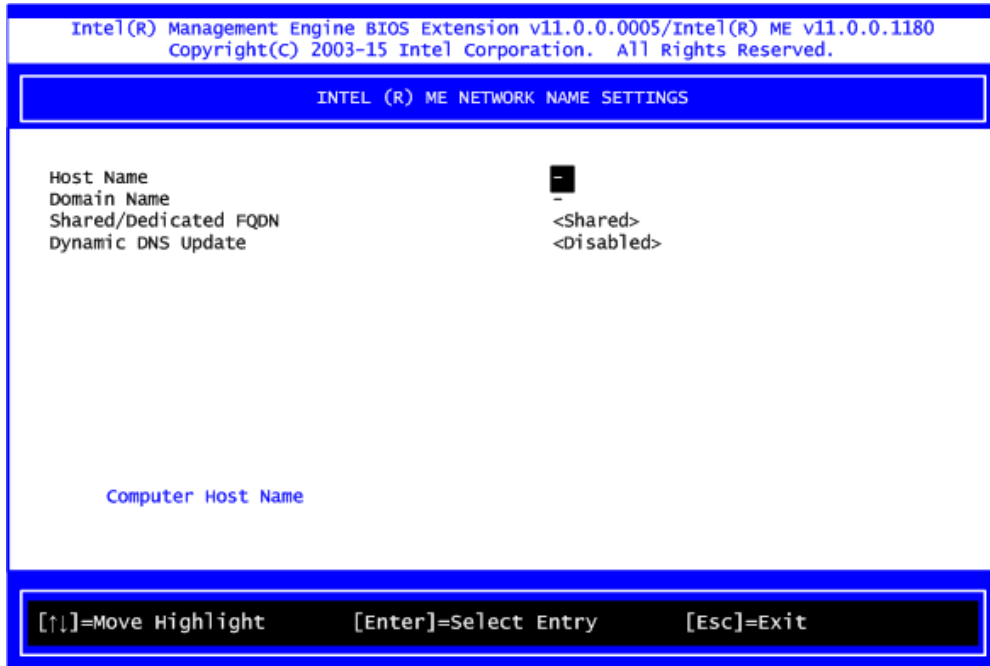
- **Network Setup**

1. Select Network Setup to configure iAMT.

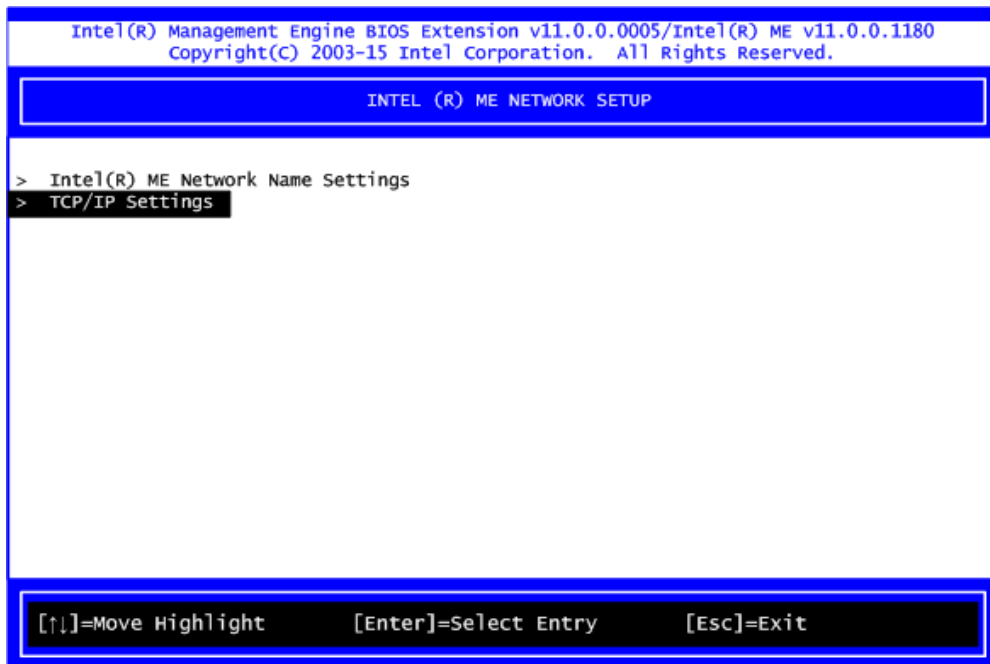


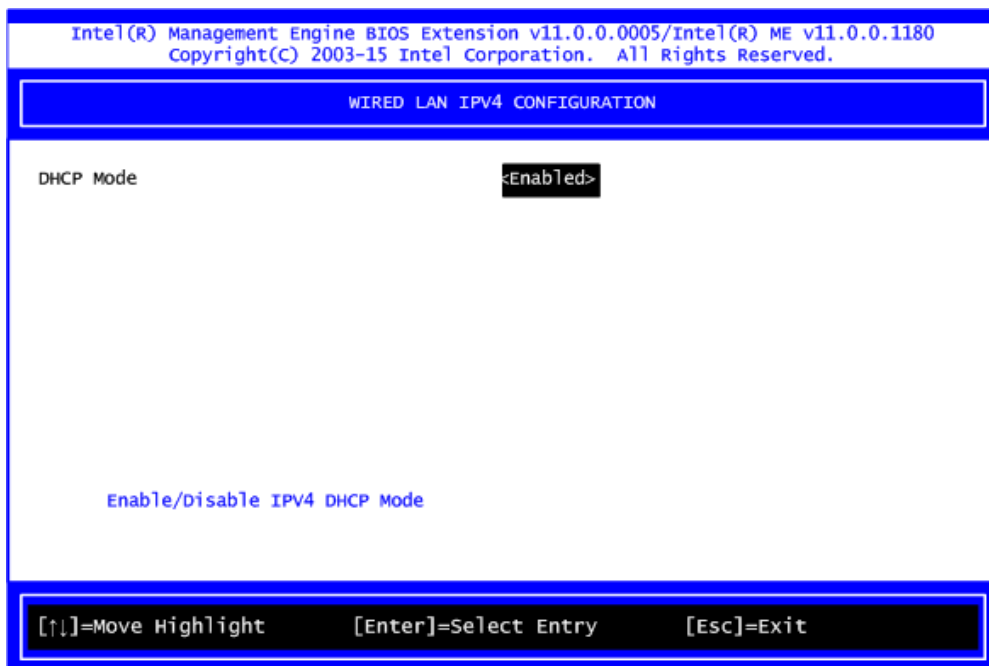
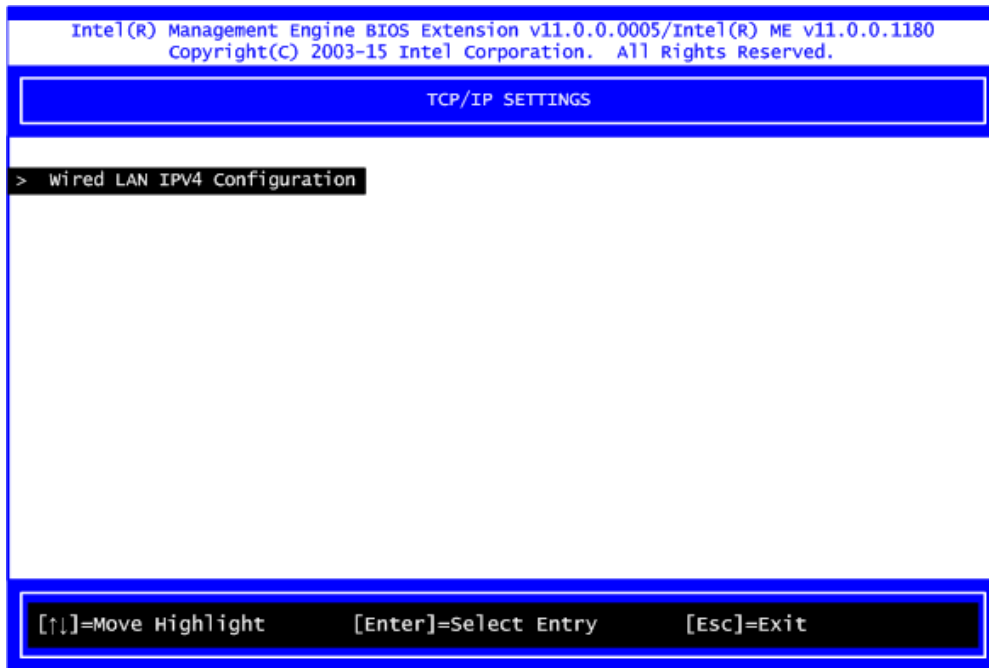
2. Select ME Network Name Settings to set computer host and domain name.





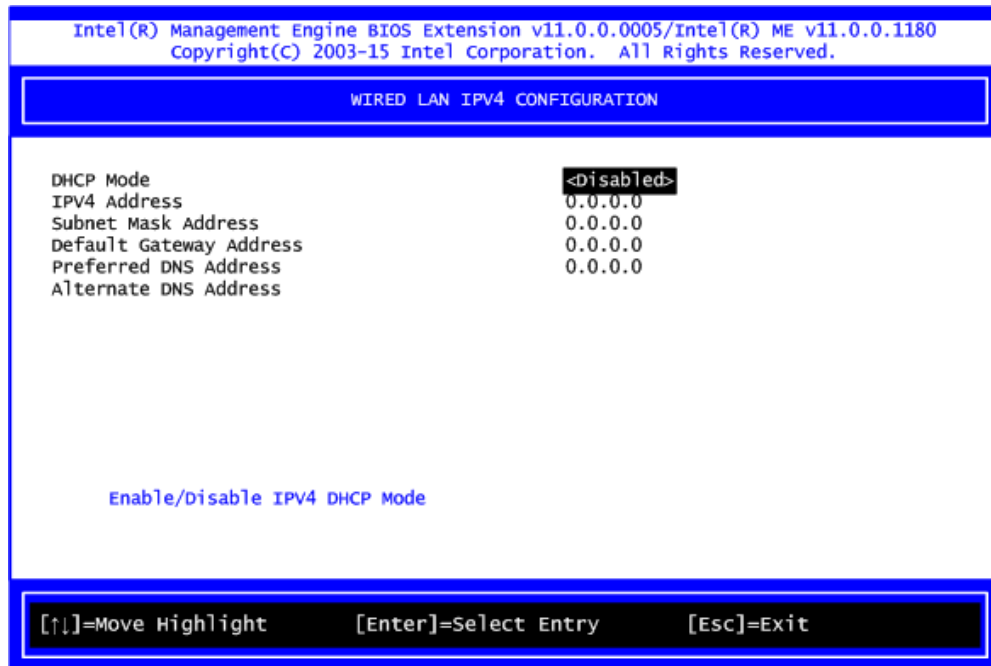
3. Select TCP/IP to get into Network interface and set it to Enabled. Get into DHCP Mode and set it to Disabled.



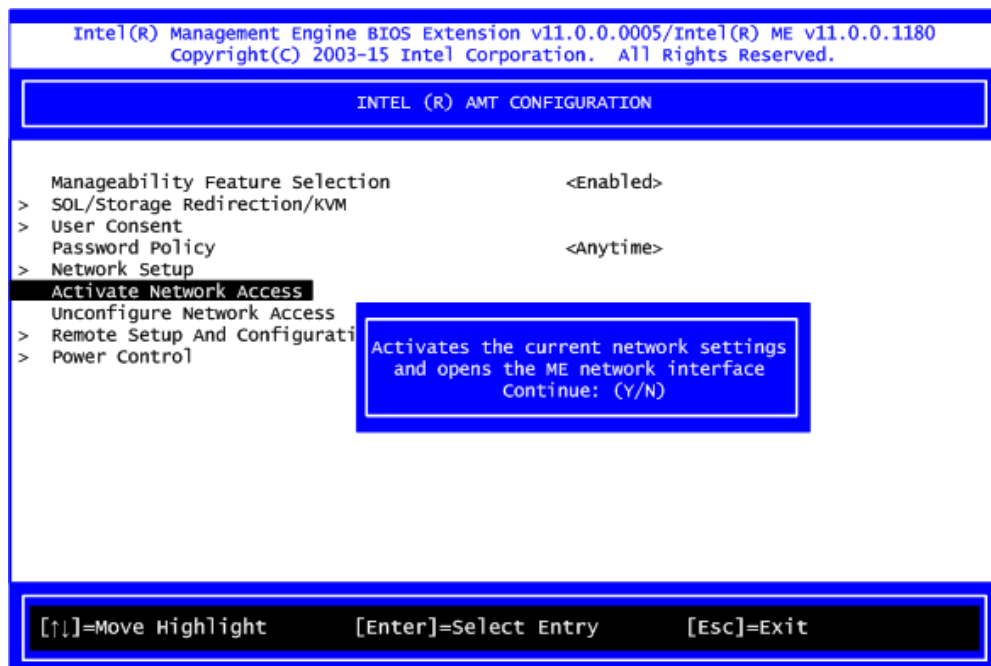


4. If DHCP Mode is disabled, set the following settings:

- IP address
- Subnet mask



5. Go back to Intel® iAMT Configuration, then select Activate Network Access and press <Enter>.

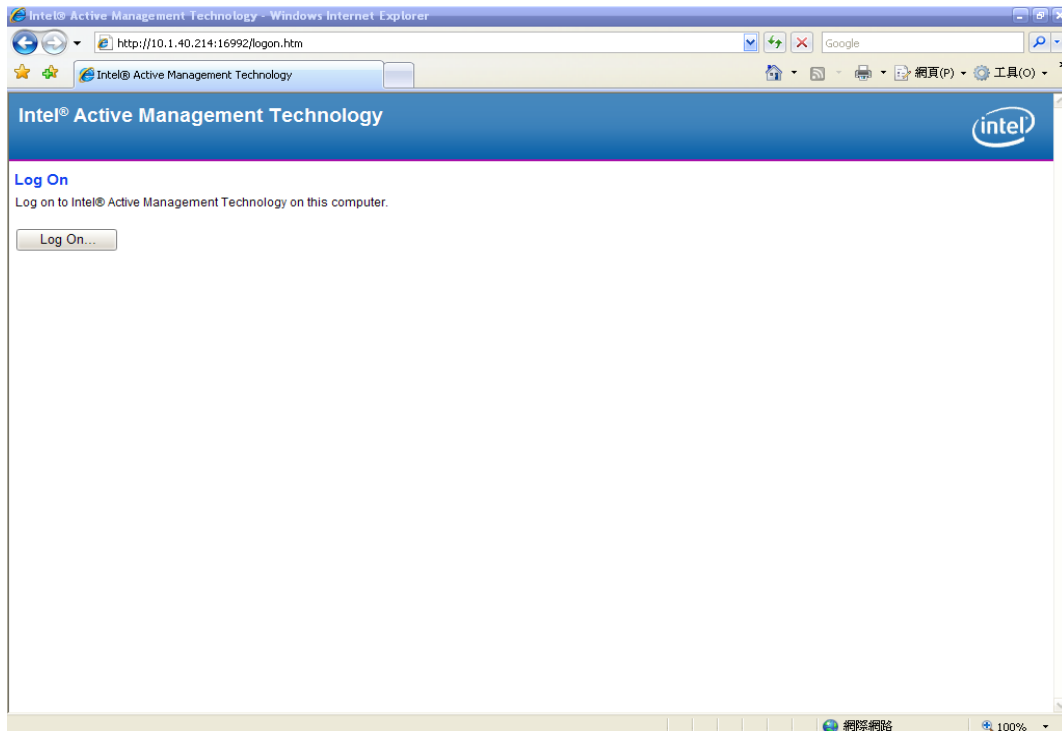


6. Exit from MEBx after completing the iAMT settings.

## C.4 iAMT Web Console

1. From a web browser, please type `http://(IP ADDRESS):16992`, which connects to iAMT Web.

Example: <http://10.1.40.214:16992>

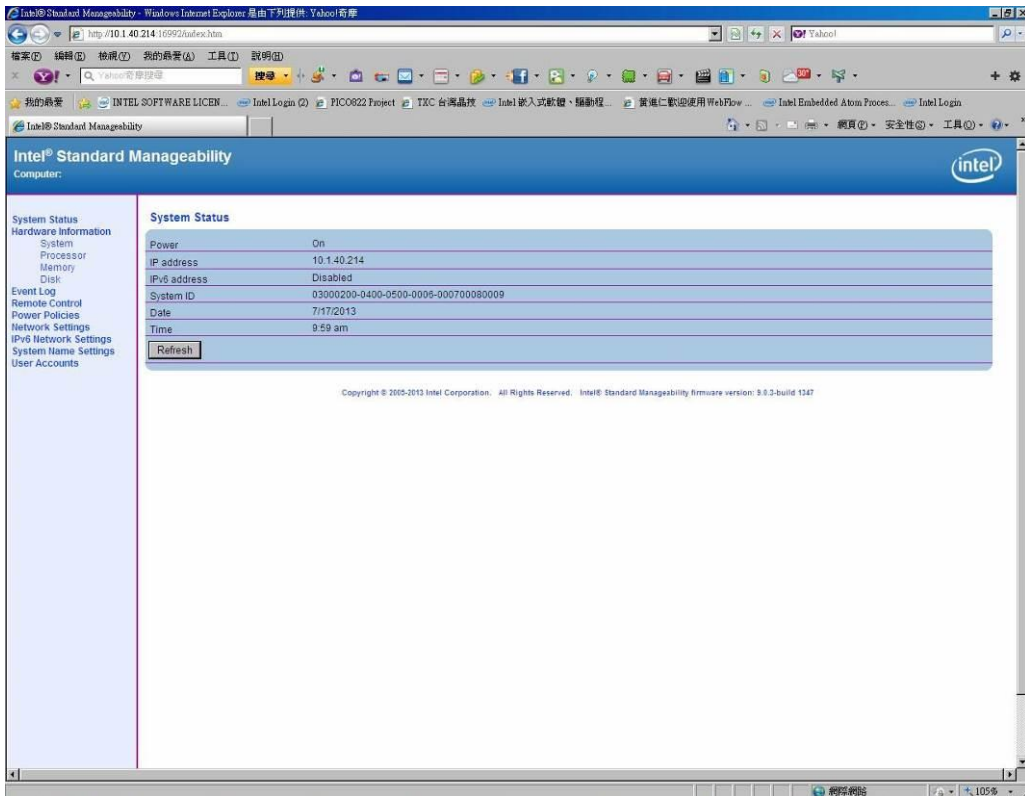


2. To log on, you will be required to type in username and password for access to the Web.

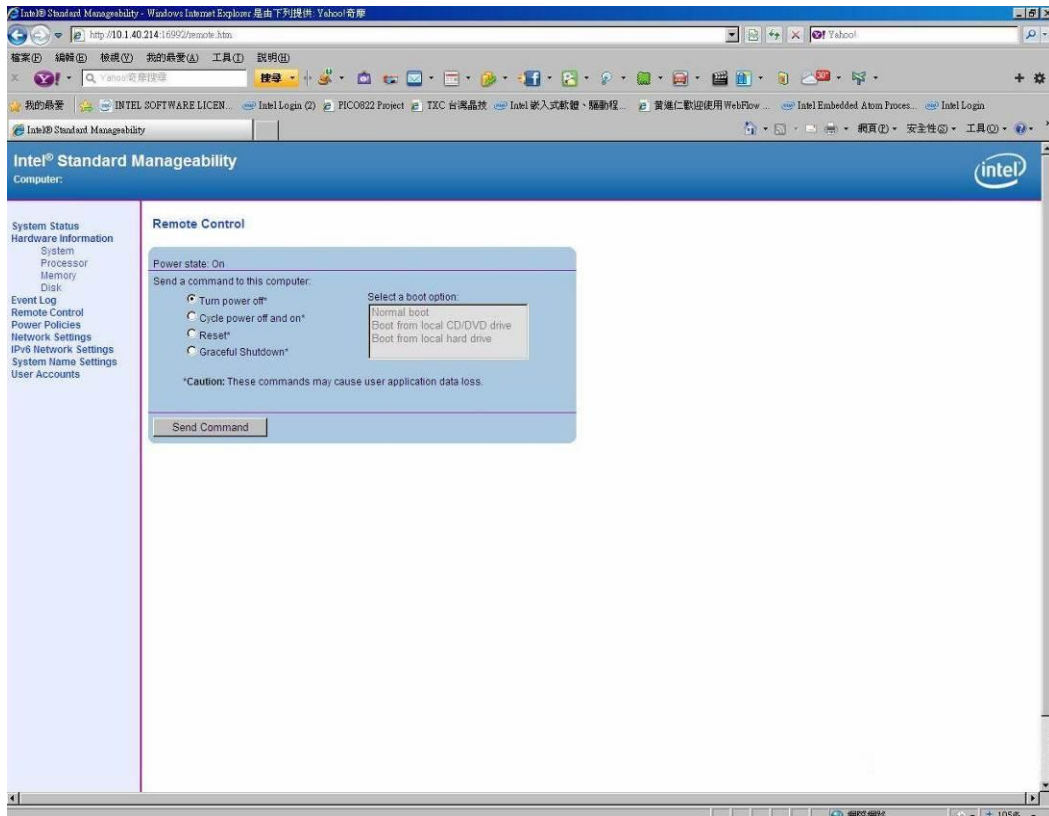
USER: admin (default value)

PASS: (MEBx password)

3. Enter the iAMT Web.



- Click Remote Control, and select commands on the right side.



- When you have finished using the iAMT Web console, close the Web browser.

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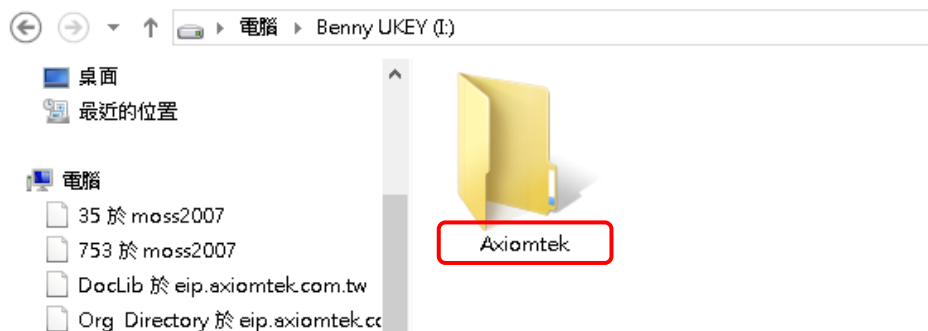


# Appendix D

## BIOS Flash Utility

The BIOS Flash utility is a new helpful function in BIOS setup program. With this function you can easily update system BIOS without having to enter operating system. In this appendix you may learn how to do it in just a few steps. Please read and follow the instructions below carefully.

1. In your USB flash drive, create a new folder and name it “Axiomtek”, see figure below.



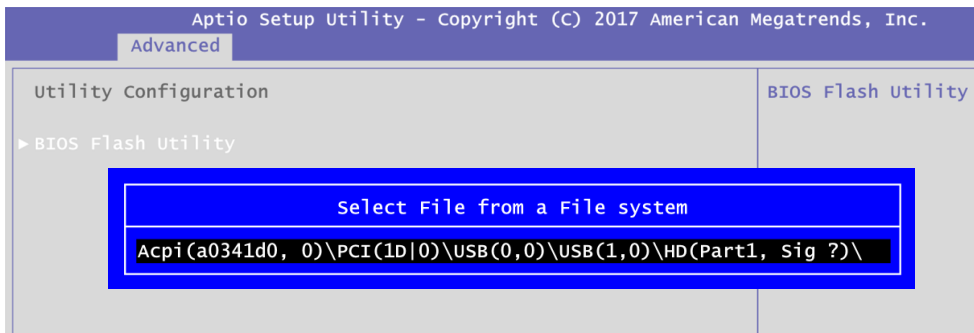
2. Copy BIOS ROM file (e.g. PICO512.005) to “Axiomtek” folder.



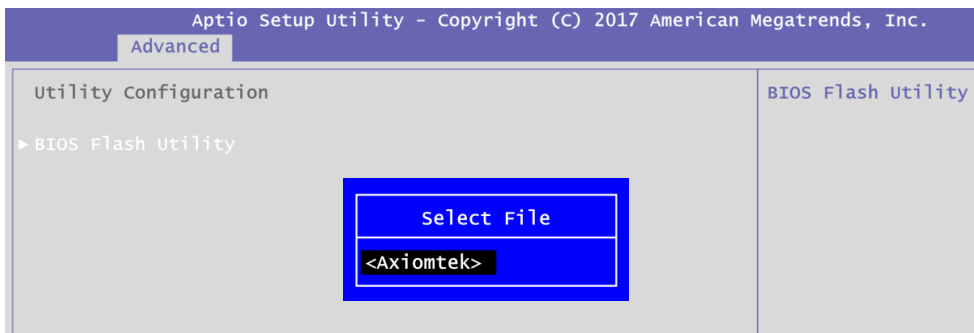
3. Insert the USB flash drive to your system.
4. Enter BIOS setup menu and go to Advanced\Utility Configuration. Select BIOS Flash Utility and press <Enter>.



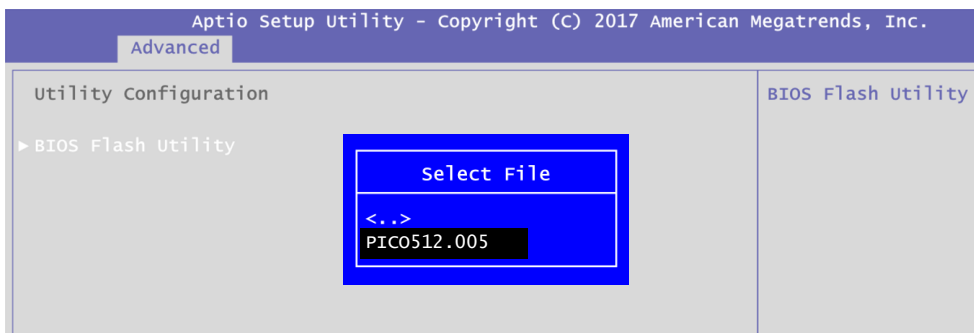
5. BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.



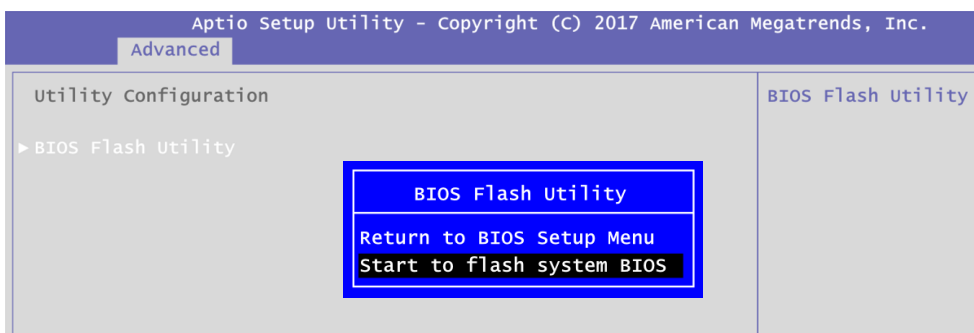
6. Select the USB drive containing BIOS ROM file you want to update using the <↑> or <↓> key. Then press <Enter> to get into "Axiomtek" folder.



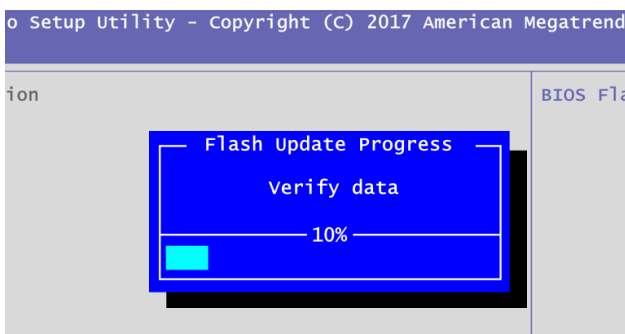
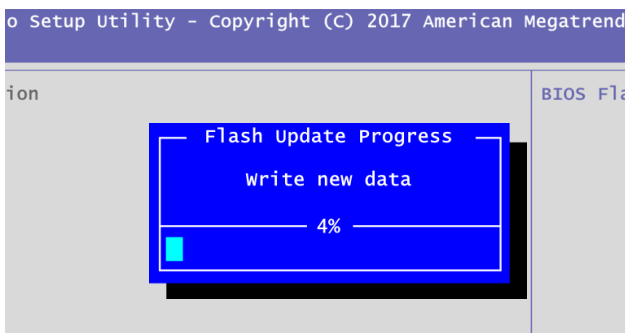
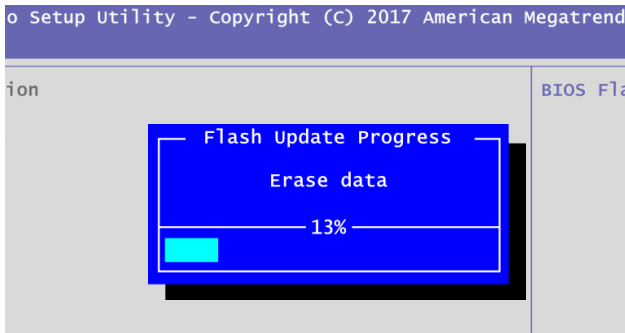
7. Now you can see the BIOS ROM file on the screen, press <Enter> to select.



8. Select Start to flash system BIOS option to begin updating procedure.



- Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.



- When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.

