CAPA500

6th/ 7th Generation Intel® Core™ Processor Family 3.5" 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.

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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Introduction
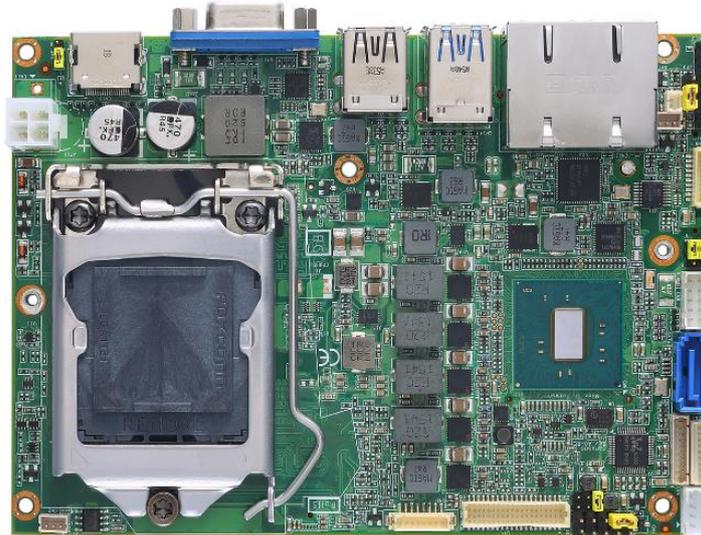
The CAPA500, a high performance 3.5" board, supports LGA1151 socket for 6th/ 7th Generation Intel® Core™ i7/ i5/ i3 processors with H110 (Q170 optional) chipsets. The board delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

There is one 260-pin unbuffered SO-DIMM socket for single channel DDR4 2133MHz memory supporting up to 16GB memory capacity. It also features two Gigabit/Fast Ethernet ports, one SATA port with transfer rate up to 6Gb/s, three USB 3.0 and three USB 2.0 high speed compliant, and built-in HD audio codec that can achieve the best stability and reliability for industrial applications. Additionally, it provides you with unique embedded features, such as one serial port (RS-232/422/485) and 3.5" form factor that applies an extensive array of PC peripherals.

1.1   Features

- LGA1151 for 6th/ 7th Generation Intel® Core™ i7/ i5/ i3/ Celeron® with TDP 35W processors
- H110 (Q170 optional) chipset
- 1 DDR4 SO-DIMM supports up to 16GB memory capacity
- 3 USB 3.0 and 3 USB 2.0 ports
- 1 COM port
- 1 PCI-Express Mini Card w/mSATA supported
- +12V only DC-in supported
- Wide temperature: -20°C~70°C supported (for 6th Gen CPU)

1.2   Specifications

- **CPU**
  - LGA1151 Socket

  Suggested CPU
  - Intel® Core™ i7-6700TE quad core 2.4GHz / i7-7700T quad 2.9GHz.
  - Intel® Core™ i5-6500TE quad core 2.3GHz / i5-7500T quad 2.7GHz
  - Intel® Core™ i3-6100TE dual core 2.7GHz / i3-7101TE dual 3.4GHz
  - Intel® Celeron® processor G4400TE dual code 2.4GHz.

  > ***SpeedStep might be functioned to minimize power draw and heat generation.***
  >
  > **Note**

- **Chipset**
  - Intel® H110 chipset.
  - Intel® Q170 chipset (Optional).

- **Thermal Solution**
  - Active.

- **Operating Temperature**
  - -20°C~70°C (for 6th Gen CPU)
  - -20°C~60°C (for 7th Gen CPU)

- **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 capacity.

- **Onboard Multi I/O**
  - Controller: Fintek F81803U.
  - Serial Port: One port for RS-232/422/485.

- **Serial ATA**
  - One SATA-600 connector.
  - mSATA supported.

- **USB Interface**
  - Four USB ports on the rear I/O: Three for USB 3.0 and one for USB 2.0.
  - Two USB 2.0 ports in 2x5-pin internal wafer connector.

- **Display**
  - One 15-pin D-Sub as VGA connector. Max. resolution is 1920x1200 @ 60Hz.
  - One 2x20-pin connector for 18/24-bit single/dual channel LVDS and one 8-pin inverter connector. LVDS resolution is up to 1920x1200 in 24-bit dual channels.
  - One HDMI. Max. resolution is 4096x2160 @ 30Hz.

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.

- **Ethernet**
  - LAN1: Intel® i211AT supports 1000/100/10Mbps Gigabit/Fast Ethernet with Wake-on-LAN and PXE Boot ROM.
  - LAN2: Intel® i219LM supports 1000/100/10Mbps Gigabit/Fast Ethernet with Wake-on-LAN and PXE Boot ROM.

- **Audio**
  - HD audio compliant with Realtek ALC662.
  - Line-out and line-in/MIC-in in 1x10-pin wafer connector.

- **Expansion Interface**
  - One full-size PCI-Express Mini Card socket complies with PCI-Express Mini Card Spec. V1.2.

- **ZIO Connector**
  - 60-pin high speed connector; containing one PCI Express x1, one USB 2.0, one USB 3.0, one LPC and one SMBus.

- **Power Input**
  - One 2x2-pin connector.
  - +12V only DC-in.
  - AT auto power on function supported.

- **Power Management**
  - ACPI (Advanced Configuration and Power Interface).

- **Form Factor**
  - 3.5" form factor.

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

1.3   Utilities Supported

- Chipset and graphics driver
- Ethernet driver (Intel® i211AT and i219LM)
- Audio driver
- XHCI driver
- iAMT utility and drivers

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Chapter 2
Board and Pin Assignments

2.1 Board Dimensions and Fixing Holes
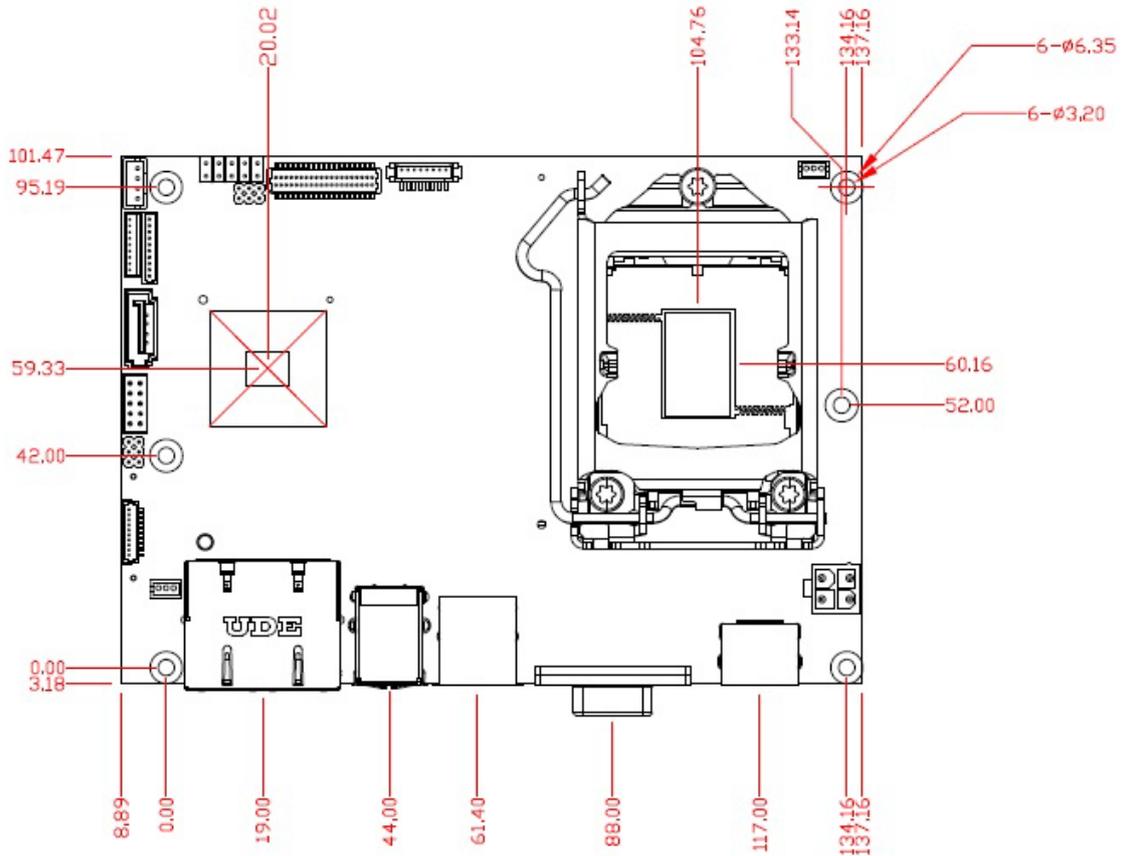
Top View
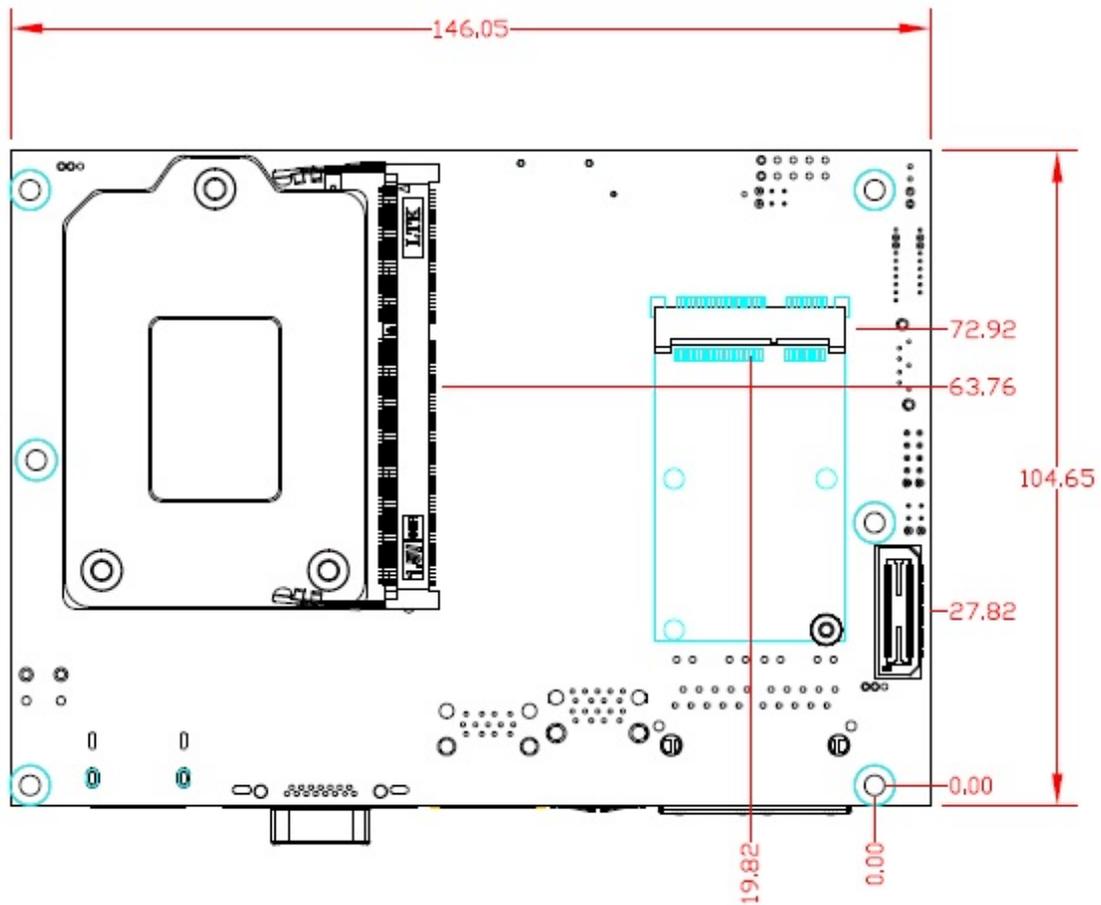
Bottom View
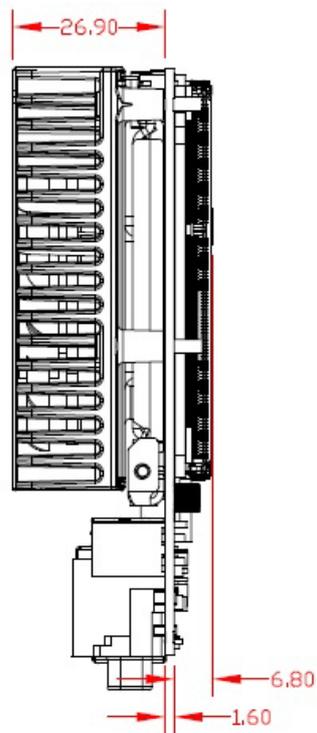
Side View

2.2 Board Layout
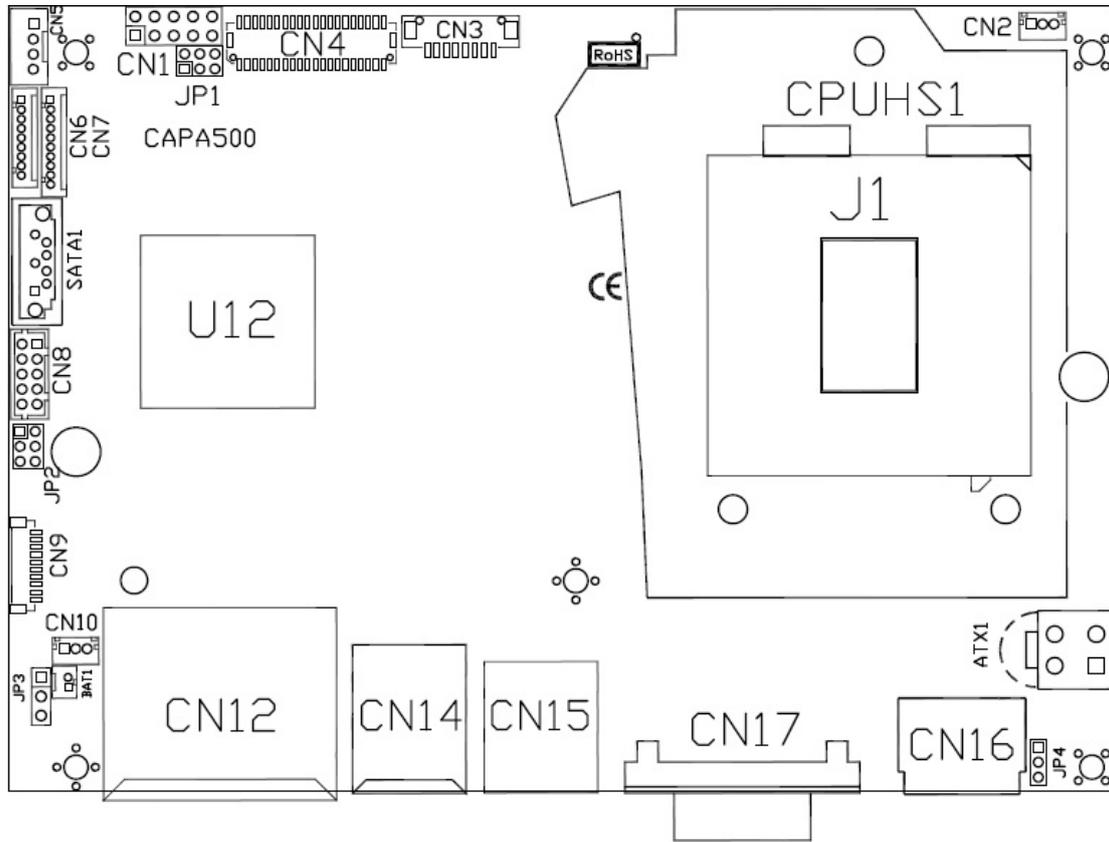
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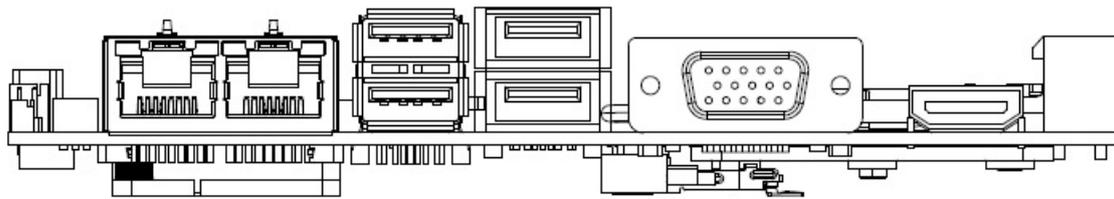
Side View
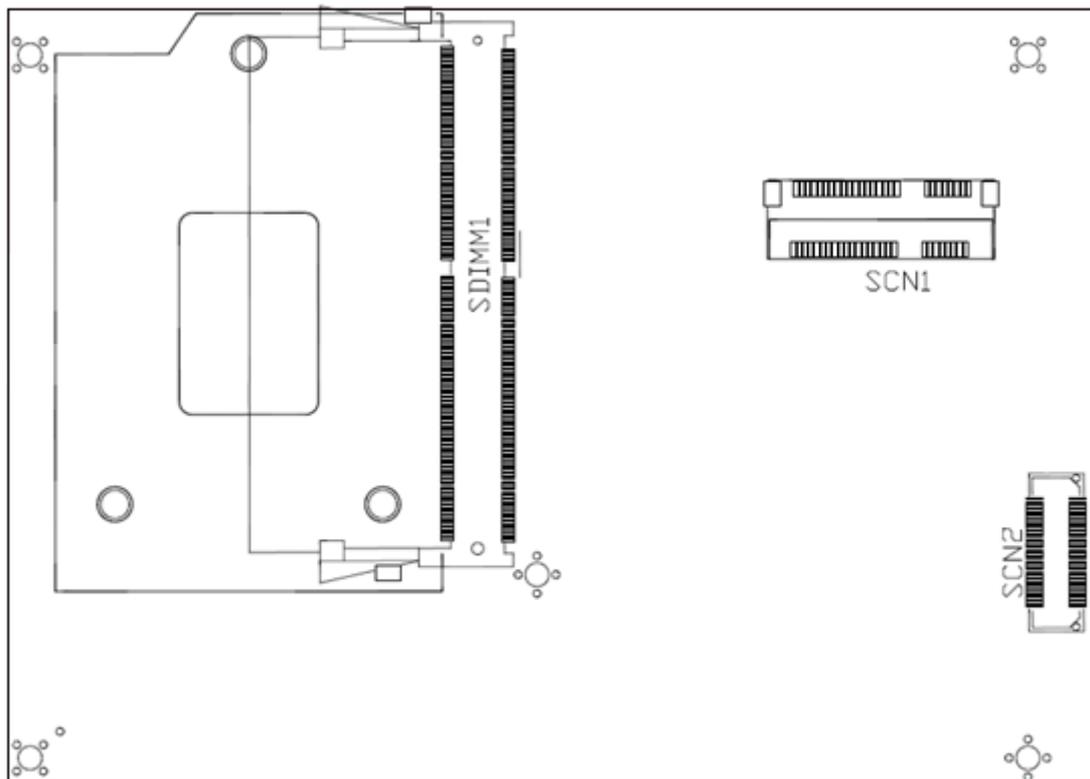
Bottom View

2.3 Installing Fan

The processor needs specially designed heatsink and fan assembly to cool down and ensure sufficient air flow inside your system.

After applying thermal grease on the processor and installing it on the socket, please place heatsink and fan assembly on top of the processor. Match the four screws to the fixing holes on the board. Then screw tightly the heatsink and CPU fan assembly onto the board.
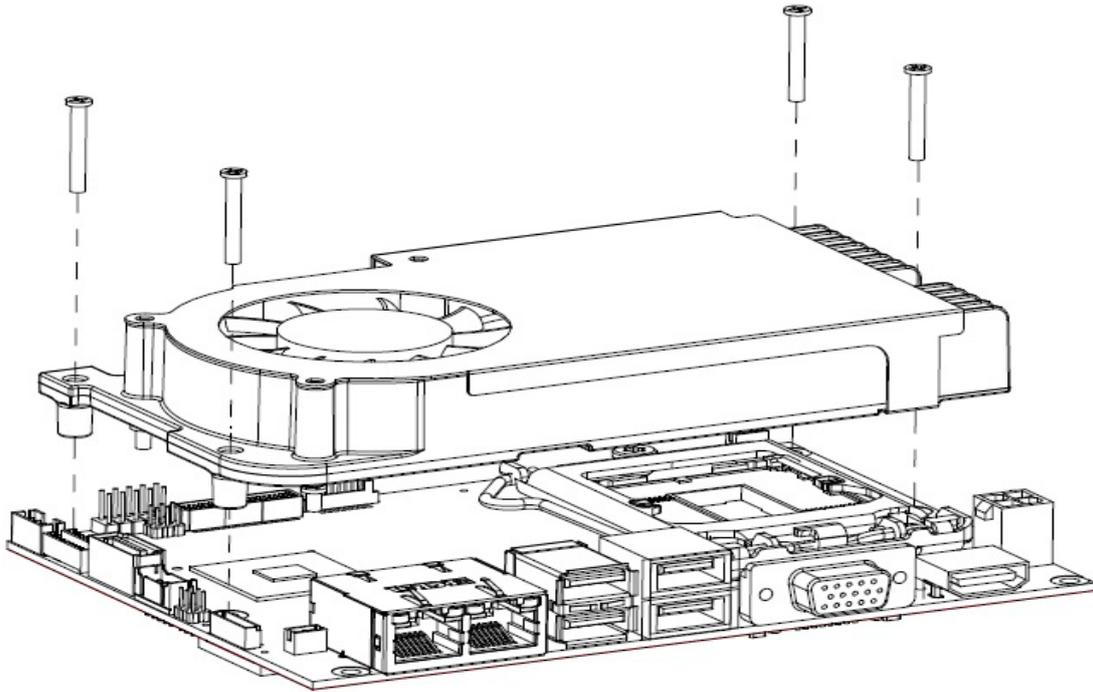
	Be careful not to over tighten the screws as it can damage the processor or the CPU board.
Note	

Also make sure the fan cable is plugged to fan connector (see section 2.5.2) as indicated in image below.

2.4   Jumper 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.
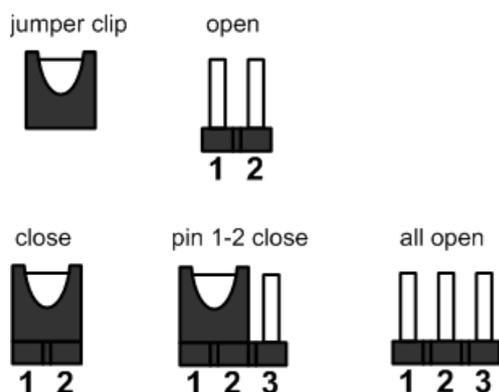
Properly configure jumper settings on the CAPA500 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.

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

Note

Jumper	Description		Setting
JP1	LVDS +3.3V/+5V/+12V Voltage Selection Default: +3.3V		1-2 Close
JP2	COM1 Data/Power Selection Default: RS-232 Data	CN6 Pin 1: DCD	3-5 Close
		CN6 Pin 8: RI	4-6 Close
JP3	Restore BIOS Optimal Defaults Default: Normal Operation		1-2 Close
JP4	Auto Power On Default: Disable		1-2 Close

2.4.1   LVDS +3.3V/+5V/+12V Voltage Selection (JP1)

The board supports voltage selection for flat panel displays. Use this jumper to set LVDS connector (CN4) 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
+12V level	5-6 close
+5V level	2-4 close
+3.3V level (Default)	1-2 close
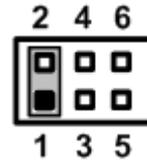
2.4.2   COM1 Data/Power Selection (JP2)

The COM1 port has +5V level power capability on DCD and +12V level on RI by setting jumper JP2. When this port is set to +5V or +12V level, please make sure its communication mode is RS-232. You can change the communication mode (RS-232/422/485) via BIOS setting, see section 4.4.

Function	Setting
Power: Set CN6 pin 1 to +5V level	1-3 close
Data: Set CN6 pin 1 to DCD (Default)	3-5 close
Power: Set CN6 pin 8 to +12V level	2-4 close
Data: Set CN6 pin 8 to RI (Default)	4-6 close
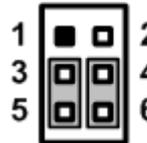
2.4.3   Restore BIOS Optimal Defaults (JP3)

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 operation (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close

2.4.4   Auto Power On (JP4)

If JP4 is enabled for power input, the system will be automatically power on without pressing soft power button. If JP4 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 (Default)	1-2 close
Enable auto power on	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 of connectors on the hardware.

Connector	Description
CN1	Front Panel Connector
CN2	Fan Connector
CN3	Inverter Connector
CN4	LVDS Connector
CN5	SATA Power Connector
CN6	COM1 Wafer Connector
CN7	Audio Connector
CN8	USB 2.0 Wafer Port 5 and 6
CN9	Digital I/O Connector
CN10	SMBus Connector
CN11 (Optional)	Power Connector
CN12	Ethernet Port 1 and 2
CN14	USB 3.0 Port 3 and 4
CN15	USB 3.0 Port 1 & USB 2.0 Port 3 and 4
CN16	HDMI Connector
CN17	VGA Connector
ATX1	ATX Power Connector
BAT1	CMOS Battery Connector
SATA1	SATA Port
SCN1	Full-size PCI-Express Mini Card Connector
SCN2	ZIO Expansion Connector
SDIMM1	DDR4 SO-DIMM Connector

2.5.1 Front Panel Connector (CN1)

Pin	Signal
1	GND
2	PWR_PSON#
3	PWRLED-
4	PWRLED+
5	PWRSW-
6	PWRSW+
7	HW RST-
8	HW RST+
9	HDDLED-
10	HDDLED+
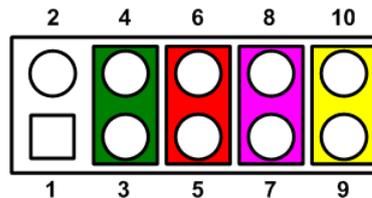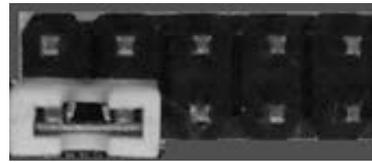
Power LED
Pin 4 connects anode (+) of LED and pin 3 connects cathode(-) of LED. The power LED lights up when the system is powered on.

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(+).

2.5.2 Fan Connector (CN2)

A fan interface is available through this 1x3-pin connector. You can find fan speed option within BIOS Setup Utility if fan is installed. For further information, see BIOS Setup Utility: Advanced\H/W Monitor\PC Health Status (see section 4.4).

Pin	Signal
1	GND
2	+12V level
3	Fan speed feedback
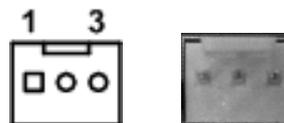
2.5.3   Inverter Connector (CN3)

This is an 8-pin connector which is compliant with Hirose DF13-8P-1.25C for inverter. We strongly recommend you to use the matching DF13-8P-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
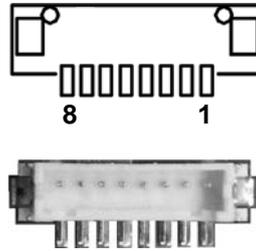
2.5.4   LVDS Connector (CN4)

This board has a 2x20-pin connector which is compliant with JST SHDR-40VS-B 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 JP1 (see section 2.4.1).

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

2.5.5   SATA Power Connector (CN5)

The CN5 is a 1x4-pin p=2.0mm wafer for SATA power interface and fully compliant with JST B4B-PH-K-S.

Pin	Signal
1	+12V level
2	GND
3	GND
4	+5V level
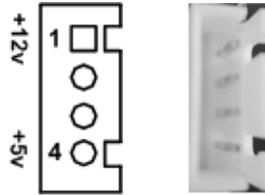
2.5.6   COM1 Wafer Connector (CN6)

This is a 1x9-pin p=1.25mm wafer for serial port interface and fully compliant with MOLEX 53047. It is also equipped with +5V level power capability on DCD and +12V level on RI by setting JP2 (see section 2.4.2). The pin assignments of RS-232/422/485 are listed in table below. If you need COM1 to support RS-422 or RS-485, please refer to BIOS setting in section 4.4.

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	DSR	No use	No use
3	RXD	TX+	Data+
4	RTS	No use	No use
5	TXD	RX+	No use
6	CTS	No use	No use
7	DTR	RX-	No use
8	RI	No use	No use
9	GND	No use	No use
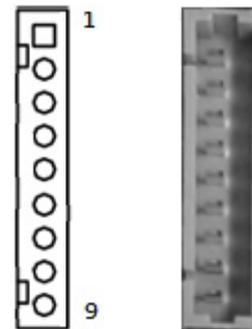
2.5.7   Audio Connector (CN7)

This is a 1x10-pin p=1.25mm wafer and fully compliant with Molex 53047 for audio interface.

Pin	Signal	Pin	Signal
1	MIC_IN	2	GND
3	LINE_IN_L	4	GND
5	LINE_IN_R	6	GND
7	AUDIO_OUT_L	8	GND
9	AUDIO_OUT_R	10	GND
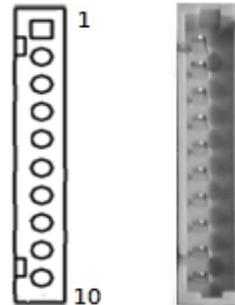
2.5.8   USB 2.0 Wafer Connector (CN8)

This 2x5-pin wafer is a Universal Serial Bus (USB) connector. We strongly recommend you to use the matching Hirose DF11-xdp-2dsa connector for installing versatile USB 2.0 (480Mbps) compliant interface peripherals.

Pin	Signal	Pin	Signal
1	USB VCC (+5V level)	2	USB VCC (+5V level)
3	USB #5_D-	4	USB #6_D-
5	USB #5_D+	6	USB #6_D+
7	GND	8	GND
9	GND	10	GND
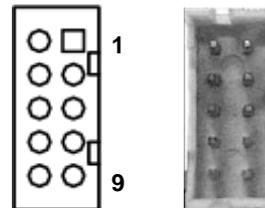
2.5.9   Digital I/O Connector (CN9)

The CN9 is a 1x10-pin p=1.0mm wafer for digital I/O interface and fully compliant with JST BM10B-SRSS-TB. This 8-channel digital I/O meets requirements for a system customary automation control and 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.

Pin	Signal	Pin	Signal
1	Digital Input 0	2	Digital Output 4
3	Digital Input 1	4	Digital Output 3
5	Digital Input 2	6	Digital Output 2
7	Digital Output 0	8	Digital Output 1
9	+5V	10	GND
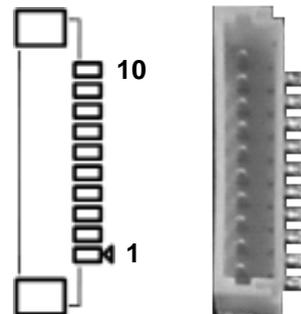
2.5.10 SMBus Connector (CN10)

This connector is a 1x3-pin p=2.0mm wafer and fully compliant with JST B3B-PH-K-S for SMBus interface. The SMBus (System Management Bus) is a simple bus for the purpose of lightweight communication.

Pin	Signal
1	CLK
2	DATA
3	GND
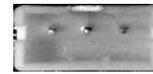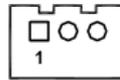
2.5.11 Power Connector (CN11) (Optional)

This is a 1x4-pin connector in right angle for +12V DC input. Note that CN10 is co-layout with ATX power connector (ATX1).

Pin	Signal
1	+12V
2	+12V
3	GND
4	GND
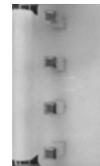
2.5.12 Ethernet Ports (CN12)

The board has two RJ-45 connectors for LAN1 and LAN2. Ethernet connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

Pin	1000 Base-T	100/10 Base-T	Description
L1	BI_DA+	TX+	Bidirectional or Transmit Data+
L2	BI_DA-	TX-	Bidirectional or Transmit Data-
L3	BI_DB+	RX+	Bidirectional or Receive Data+
L4	BI_DC+	N.C.	Bidirectional or Not Connected
L5	BI_DC-	N.C.	Bidirectional or Not Connected
L6	BI_DB-	RX-	Bidirectional or Receive Data-
L7	BI_DD+	N.C.	Bidirectional or Not Connected
L8	BI_DD-	N.C.	Bidirectional or Not Connected
A	Active Link LED (Yellow) Off: No link Blinking: Data activity detected		
B	Speed LED 1000: Orange 100/10: Green/OFF		

LAN1   LAN2
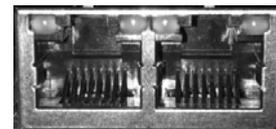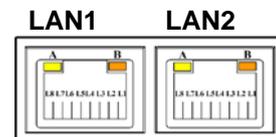
2.5.13 USB 3.0 Port (CN14)

This is a Universal Serial Bus (compliant with USB 3.0 (5Gb/s)) connector on the rear I/O for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pin	Signal	Pin	Signal
1	USB_VCC (+5V power)	10	USB_VCC (+5V power)
2	USB_Data1-	11	USB_Data2-
3	USB_Data1+	12	USB_Data2+
4	GND	13	GND
5	SSRX3-	14	SSRX4-
6	SSRX3+	15	SSRX4+
7	GND	16	GND
8	SSTX3-	17	SSTX4-
9	SSTX3+	18	SSTX4+
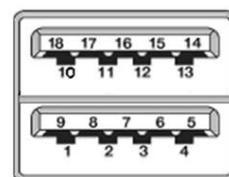
2.5.14 USB 3.0/2.0 Port (CN15)

Pin	Signal	Pin	Signal
1	USB VCC (+5V level)	8	SSTX1-
2	USB_Data3-	9	SSTX1+
3	USB_Data3+	10	USB VCC (+5V level)
4	GND	11	USB #4_D-
5	SSRX1-	12	USB #4_D+
6	SSRX1+	13	GND
7	GND		
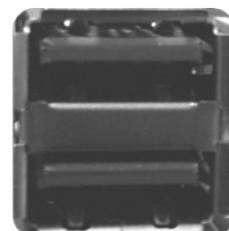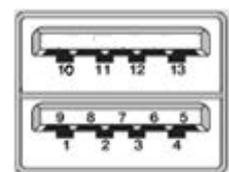
2.5.15 HDMI Connector (CN16)

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		
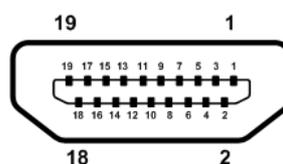
2.5.16 VGA Connector (CN17)

This is a 15-pin D-Sub connector which is commonly used for VGA display. This VGA interface configuration can be configured via software utility.

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	N.C.
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync
15	DDC CLK		
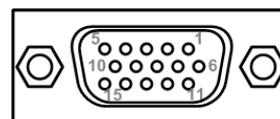
2.5.17 ATX Power Connector (ATX1)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector.

The ATX1 is a 4-pin power supply interface. External power supply plug fits into ATX1 in only one orientation. Properly press down power supply plug until it completely and firmly fits into this connector. Loose connection may cause system instability.

Note that ATX1 is co-layout with 1x4-pin right angle connector (CN11).

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V
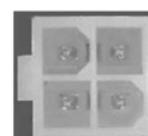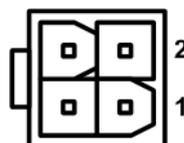
2.5.18 CMOS Battery Connector (BAT1)

This connector is for CMOS battery interface.

Pin	Signal
1	+3.3V
2	GND

2.5.19 SATA Port (SATA1)

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

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND
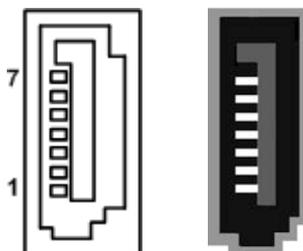
2.5.20 Full-size PCI-Express Mini Card Connector (SCN1)

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). You can select PCI-Express or mSATA feature via BIOS setting in section 4.4.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
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_PCH_CARD_RN7/ SATA1_mSATA_RXP	24	+3.3VSB
25	PE_PCH_CARD_RP7/ SATA1_mSATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_PCH_CARD_TN7/ SATA1_mSATA_TXN	32	SMB_DATA
33	PE_PCH_CARD_TP7/ SATA1_mSATA_TXP	34	GND
35	GND	36	USB_D7-
37	GND	38	USB_D7+
39	+3.3VSB	40	GND
41	+3.3VSB	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	+3.3VSB
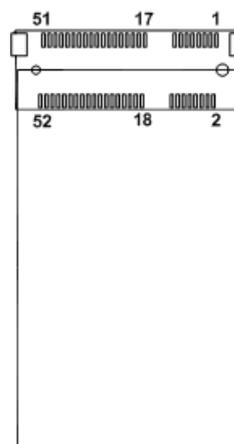
2.5.21 ZIO Expansion Connector (SCN2)

The board is equipped with SCN2 on the bottom side for connecting CPU board to a ZIO module.

Pin	Signal	Pin	Signal
A1	+12V	B1	GND
A2	+5VSB	B2	GND
A3	+5VSB	B3	GND
A4	+3.3VSB	B4	GND
A5	+3.3VSB	B5	RSVD
A6	RSVD	B6	RSVD
A7	PWROK	B7	RSVD
A8	SMB_CLK	B8	RSVD
A9	SMB_DATA	B9	GND
A10	GND	B10	PCI-E TXP6
A11	PCI-E RXP6	B11	PCI-E TXN6
A12	PCI-E RXN6	B12	WAKE_N
A13	USBOC_N	B13	PCI-E CLKP
A14	USB #9_D+	B14	PCI-E CLKN
A15	USB #9_D-	B15	GND
A16	USB #10_D+	B16	CLK_24M
A17	USB #10_D-	B17	SERIRQ
A18	GND	B18	LAD0
A19	SSTX2+	B19	LAD1
A20	SSTX2-	B20	LAD2
A21	PLTRST_N	B21	LAD3
A22	SSRX2+	B22	L_FRAME
A23	SSRX2-	B23	GND
A24	GND	B24	DDPC_0P
A25	DDPC_1P	B25	DDPC_0N
A26	DDPC_1N	B26	DDPC_2P
A27	DDPC_3P	B27	DDPC_2N
A28	DDPC_3N	B28	GND
A29	GND	B29	DDPC_AUXP
A30	DDPC_HPD	B30	DDPC_AUXN
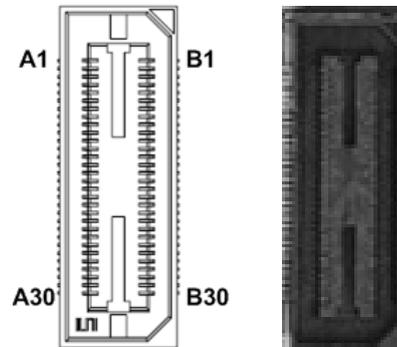
Chapter 3
Hardware Description

3.1   Microprocessors

The CAPA500 supports Intel$^®$ Core^{TM} i7/ i5/ i3/ Celeron$^®$ processors, which enable your system to operate under 64-bit Windows$^®$ 7, Windows$^®$ 8 and Windows$^®$ 10 environments (except that the 7th processors only support Windows$^®$ 10). 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 CAPA500 uses AMI Plug and Play BIOS with a single 128Mbit SPI Flash.

3.3   System Memory

The CAPA500 supports one 260-pin DDR4 SO-DIMM socket for maximum memory capacity up to 16GB DDR4 SDRAMs. The memory module comes in sizes of 1GB, 2GB, 4GB , 8GB and 16GB.

3.4 I/O Port Address Map

∨ 📑 Input/output (IO)
    📁 [0000000000000000 - 0000000000000CF7] PCI Express Root Complex
    📁 [0000000000000020 - 0000000000000021] Programmable interrupt controller
    📁 [0000000000000024 - 0000000000000025] Programmable interrupt controller
    📁 [0000000000000028 - 0000000000000029] Programmable interrupt controller
    📁 [000000000000002C - 000000000000002D] Programmable interrupt controller
    📁 [000000000000002E - 000000000000002F] Motherboard resources
    📁 [0000000000000030 - 0000000000000031] Programmable interrupt controller
    📁 [0000000000000034 - 0000000000000035] Programmable interrupt controller
    📁 [0000000000000038 - 0000000000000039] Programmable interrupt controller
    📁 [000000000000003C - 000000000000003D] Programmable interrupt controller
    📁 [0000000000000040 - 0000000000000043] System timer
    📁 [000000000000004E - 000000000000004F] Motherboard resources
    📁 [0000000000000050 - 0000000000000053] System timer
    📁 [0000000000000061 - 0000000000000061] Motherboard resources
    📁 [0000000000000063 - 0000000000000063] Motherboard resources
    📁 [0000000000000065 - 0000000000000065] Motherboard resources
    📁 [0000000000000067 - 0000000000000067] Motherboard resources
    📁 [0000000000000070 - 0000000000000070] Motherboard resources
    📁 [0000000000000070 - 0000000000000077] System CMOS/real time clock
    📁 [0000000000000080 - 0000000000000080] Motherboard resources
    📁 [0000000000000092 - 0000000000000092] Motherboard resources
    📁 [00000000000000A0 - 00000000000000A1] Programmable interrupt controller
    📁 [00000000000000A4 - 00000000000000A5] Programmable interrupt controller
    📁 [00000000000000A8 - 00000000000000A9] Programmable interrupt controller
    📁 [00000000000000AC - 00000000000000AD] Programmable interrupt controller
    📁 [00000000000000B0 - 00000000000000B1] Programmable interrupt controller
    📁 [00000000000000B2 - 00000000000000B3] Motherboard resources
    📁 [00000000000000B4 - 00000000000000B5] Programmable interrupt controller
    📁 [00000000000000B8 - 00000000000000B9] Programmable interrupt controller
    📁 [00000000000000BC - 00000000000000BD] Programmable interrupt controller
    📁 [00000000000000F0 - 00000000000000F0] Numeric data processor
    🖥 [00000000000003B0 - 00000000000003BB] Intel(R) HD Graphics 630
    🖥 [00000000000003C0 - 00000000000003DF] Intel(R) HD Graphics 630
    🖧 [00000000000003F8 - 00000000000003FF] Communications Port (COM1)
    📁 [00000000000004D0 - 00000000000004D1] Programmable interrupt controller
    📁 [0000000000000680 - 000000000000069F] Motherboard resources
    📁 [0000000000000800 - 000000000000087F] Motherboard resources
    📁 [0000000000000A00 - 0000000000000A0F] Motherboard resources
    📁 [0000000000000A10 - 0000000000000A1F] Motherboard resources
    📁 [0000000000000A20 - 0000000000000A2F] Motherboard resources
    📁 [0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
    📁 [000000000000164E - 000000000000164F] Motherboard resources
    📁 [0000000000001800 - 00000000000018FE] Motherboard resources
    📁 [0000000000001854 - 0000000000001857] Motherboard resources
    📁 [000000000000E000 - 000000000000EFFF] Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #5 - A114
    🖥 [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics 530
    🖥 [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics 630
    📁 [000000000000F040 - 000000000000F05F] Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
    🖧 [000000000000F060 - 000000000000F07F] Standard SATA AHCI Controller
    🖧 [000000000000F080 - 000000000000F083] Standard SATA AHCI Controller
    🖧 [000000000000F090 - 000000000000F097] Standard SATA AHCI Controller
    📁 [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) 0x00000004 (04)　Communications Port (COM1)
　　📺 (ISA) 0x00000008 (08)　System CMOS/real time clock
　　🖼 (ISA) 0x0000000B (11)　Intel(R) HD Graphics 530
　　📺 (ISA) 0x0000000D (13)　Numeric data processor
　　📺 (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
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　　📺 (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
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　　📺 (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
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(ISA) 0x00000109 (265)   Microsoft ACPI-Compliant System
(ISA) 0x0000010A (266)   Microsoft ACPI-Compliant System
(ISA) 0x0000010B (267)   Microsoft ACPI-Compliant System
(ISA) 0x0000010C (268)   Microsoft ACPI-Compliant System
(ISA) 0x0000010D (269)   Microsoft ACPI-Compliant System
(ISA) 0x0000010E (270)   Microsoft ACPI-Compliant System
(ISA) 0x0000010F (271)   Microsoft ACPI-Compliant System
(ISA) 0x00000110 (272)   Microsoft ACPI-Compliant System
(ISA) 0x00000111 (273)   Microsoft ACPI-Compliant System
(ISA) 0x00000112 (274)   Microsoft ACPI-Compliant System
(ISA) 0x00000113 (275)   Microsoft ACPI-Compliant System
(ISA) 0x00000114 (276)   Microsoft ACPI-Compliant System
(ISA) 0x00000115 (277)   Microsoft ACPI-Compliant System
(ISA) 0x00000116 (278)   Microsoft ACPI-Compliant System
(ISA) 0x00000117 (279)   Microsoft ACPI-Compliant System
(ISA) 0x00000118 (280)   Microsoft ACPI-Compliant System
(ISA) 0x00000119 (281)   Microsoft ACPI-Compliant System
(ISA) 0x0000011A (282)   Microsoft ACPI-Compliant System
(ISA) 0x0000011B (283)   Microsoft ACPI-Compliant System
(ISA) 0x0000011C (284)   Microsoft ACPI-Compliant System
(ISA) 0x0000011D (285)   Microsoft ACPI-Compliant System
(ISA) 0x0000011E (286)   Microsoft ACPI-Compliant System
(ISA) 0x0000011F (287)   Microsoft ACPI-Compliant System
(ISA) 0x00000120 (288)   Microsoft ACPI-Compliant System
(ISA) 0x00000121 (289)   Microsoft ACPI-Compliant System
(ISA) 0x00000122 (290)   Microsoft ACPI-Compliant System
(ISA) 0x00000123 (291)   Microsoft ACPI-Compliant System
(ISA) 0x00000124 (292)   Microsoft ACPI-Compliant System
(ISA) 0x00000125 (293)   Microsoft ACPI-Compliant System
(ISA) 0x00000126 (294)   Microsoft ACPI-Compliant System
(ISA) 0x00000127 (295)   Microsoft ACPI-Compliant System

(ISA) 0x00000128 (296) Microsoft ACPI-Compliant System
(ISA) 0x00000129 (297) Microsoft ACPI-Compliant System
(ISA) 0x0000012A (298) Microsoft ACPI-Compliant System
(ISA) 0x0000012B (299) Microsoft ACPI-Compliant System
(ISA) 0x0000012C (300) Microsoft ACPI-Compliant System
(ISA) 0x0000012D (301) Microsoft ACPI-Compliant System
(ISA) 0x0000012E (302) Microsoft ACPI-Compliant System
(ISA) 0x0000012F (303) Microsoft ACPI-Compliant System
(ISA) 0x00000130 (304) Microsoft ACPI-Compliant System
(ISA) 0x00000131 (305) Microsoft ACPI-Compliant System
(ISA) 0x00000132 (306) Microsoft ACPI-Compliant System
(ISA) 0x00000133 (307) Microsoft ACPI-Compliant System
(ISA) 0x00000134 (308) Microsoft ACPI-Compliant System
(ISA) 0x00000135 (309) Microsoft ACPI-Compliant System
(ISA) 0x00000136 (310) Microsoft ACPI-Compliant System
(ISA) 0x00000137 (311) Microsoft ACPI-Compliant System
(ISA) 0x00000138 (312) Microsoft ACPI-Compliant System
(ISA) 0x00000139 (313) Microsoft ACPI-Compliant System
(ISA) 0x0000013A (314) Microsoft ACPI-Compliant System
(ISA) 0x0000013B (315) Microsoft ACPI-Compliant System
(ISA) 0x0000013C (316) Microsoft ACPI-Compliant System
(ISA) 0x0000013D (317) Microsoft ACPI-Compliant System
(ISA) 0x0000013E (318) Microsoft ACPI-Compliant System
(ISA) 0x0000013F (319) Microsoft ACPI-Compliant System
(ISA) 0x00000140 (320) Microsoft ACPI-Compliant System
(ISA) 0x00000141 (321) Microsoft ACPI-Compliant System
(ISA) 0x00000142 (322) Microsoft ACPI-Compliant System
(ISA) 0x00000143 (323) Microsoft ACPI-Compliant System
(ISA) 0x00000144 (324) Microsoft ACPI-Compliant System
(ISA) 0x00000145 (325) Microsoft ACPI-Compliant System
(ISA) 0x00000146 (326) Microsoft ACPI-Compliant System
(ISA) 0x00000147 (327) Microsoft ACPI-Compliant System
(ISA) 0x00000148 (328) Microsoft ACPI-Compliant System
(ISA) 0x00000149 (329) Microsoft ACPI-Compliant System
(ISA) 0x0000014A (330) Microsoft ACPI-Compliant System
(ISA) 0x0000014B (331) Microsoft ACPI-Compliant System
(ISA) 0x0000014C (332) Microsoft ACPI-Compliant System
(ISA) 0x0000014D (333) Microsoft ACPI-Compliant System
(ISA) 0x0000014E (334) Microsoft ACPI-Compliant System
(ISA) 0x0000014F (335) Microsoft ACPI-Compliant System
(ISA) 0x00000150 (336) Microsoft ACPI-Compliant System
(ISA) 0x00000151 (337) Microsoft ACPI-Compliant System
(ISA) 0x00000152 (338) Microsoft ACPI-Compliant System
(ISA) 0x00000153 (339) Microsoft ACPI-Compliant System
(ISA) 0x00000154 (340) Microsoft ACPI-Compliant System
(ISA) 0x00000155 (341) Microsoft ACPI-Compliant System
(ISA) 0x00000156 (342) Microsoft ACPI-Compliant System
(ISA) 0x00000157 (343) Microsoft ACPI-Compliant System
(ISA) 0x00000158 (344) Microsoft ACPI-Compliant System
(ISA) 0x00000159 (345) Microsoft ACPI-Compliant System
(ISA) 0x0000015A (346) Microsoft ACPI-Compliant System

(ISA) 0x0000015B (347)   Microsoft ACPI-Compliant System
(ISA) 0x0000015C (348)   Microsoft ACPI-Compliant System
(ISA) 0x0000015D (349)   Microsoft ACPI-Compliant System
(ISA) 0x0000015E (350)   Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351)   Microsoft ACPI-Compliant System
(ISA) 0x00000160 (352)   Microsoft ACPI-Compliant System
(ISA) 0x00000161 (353)   Microsoft ACPI-Compliant System
(ISA) 0x00000162 (354)   Microsoft ACPI-Compliant System
(ISA) 0x00000163 (355)   Microsoft ACPI-Compliant System
(ISA) 0x00000164 (356)   Microsoft ACPI-Compliant System
(ISA) 0x00000165 (357)   Microsoft ACPI-Compliant System
(ISA) 0x00000166 (358)   Microsoft ACPI-Compliant System
(ISA) 0x00000167 (359)   Microsoft ACPI-Compliant System
(ISA) 0x00000168 (360)   Microsoft ACPI-Compliant System
(ISA) 0x00000169 (361)   Microsoft ACPI-Compliant System
(ISA) 0x0000016A (362)   Microsoft ACPI-Compliant System
(ISA) 0x0000016B (363)   Microsoft ACPI-Compliant System
(ISA) 0x0000016C (364)   Microsoft ACPI-Compliant System
(ISA) 0x0000016D (365)   Microsoft ACPI-Compliant System
(ISA) 0x0000016E (366)   Microsoft ACPI-Compliant System
(ISA) 0x0000016F (367)   Microsoft ACPI-Compliant System
(ISA) 0x00000170 (368)   Microsoft ACPI-Compliant System
(ISA) 0x00000171 (369)   Microsoft ACPI-Compliant System
(ISA) 0x00000172 (370)   Microsoft ACPI-Compliant System
(ISA) 0x00000173 (371)   Microsoft ACPI-Compliant System
(ISA) 0x00000174 (372)   Microsoft ACPI-Compliant System
(ISA) 0x00000175 (373)   Microsoft ACPI-Compliant System
(ISA) 0x00000176 (374)   Microsoft ACPI-Compliant System
(ISA) 0x00000177 (375)   Microsoft ACPI-Compliant System
(ISA) 0x00000178 (376)   Microsoft ACPI-Compliant System
(ISA) 0x00000179 (377)   Microsoft ACPI-Compliant System
(ISA) 0x0000017A (378)   Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379)   Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380)   Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381)   Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382)   Microsoft ACPI-Compliant System
(ISA) 0x0000017F (383)   Microsoft ACPI-Compliant System
(ISA) 0x00000180 (384)   Microsoft ACPI-Compliant System
(ISA) 0x00000181 (385)   Microsoft ACPI-Compliant System
(ISA) 0x00000182 (386)   Microsoft ACPI-Compliant System
(ISA) 0x00000183 (387)   Microsoft ACPI-Compliant System
(ISA) 0x00000184 (388)   Microsoft ACPI-Compliant System
(ISA) 0x00000185 (389)   Microsoft ACPI-Compliant System
(ISA) 0x00000186 (390)   Microsoft ACPI-Compliant System
(ISA) 0x00000187 (391)   Microsoft ACPI-Compliant System
(ISA) 0x00000188 (392)   Microsoft ACPI-Compliant System
(ISA) 0x00000189 (393)   Microsoft ACPI-Compliant System
(ISA) 0x0000018A (394)   Microsoft ACPI-Compliant System
(ISA) 0x0000018B (395)   Microsoft ACPI-Compliant System
(ISA) 0x0000018C (396)   Microsoft ACPI-Compliant System
(ISA) 0x0000018D (397)   Microsoft ACPI-Compliant System

(ISA) 0x0000018E (398)   Microsoft ACPI-Compliant System
(ISA) 0x0000018F (399)   Microsoft ACPI-Compliant System
(ISA) 0x00000190 (400)   Microsoft ACPI-Compliant System
(ISA) 0x00000191 (401)   Microsoft ACPI-Compliant System
(ISA) 0x00000192 (402)   Microsoft ACPI-Compliant System
(ISA) 0x00000193 (403)   Microsoft ACPI-Compliant System
(ISA) 0x00000194 (404)   Microsoft ACPI-Compliant System
(ISA) 0x00000195 (405)   Microsoft ACPI-Compliant System
(ISA) 0x00000196 (406)   Microsoft ACPI-Compliant System
(ISA) 0x00000197 (407)   Microsoft ACPI-Compliant System
(ISA) 0x00000198 (408)   Microsoft ACPI-Compliant System
(ISA) 0x00000199 (409)   Microsoft ACPI-Compliant System
(ISA) 0x0000019A (410)   Microsoft ACPI-Compliant System
(ISA) 0x0000019B (411)   Microsoft ACPI-Compliant System
(ISA) 0x0000019C (412)   Microsoft ACPI-Compliant System
(ISA) 0x0000019D (413)   Microsoft ACPI-Compliant System
(ISA) 0x0000019E (414)   Microsoft ACPI-Compliant System
(ISA) 0x0000019F (415)   Microsoft ACPI-Compliant System
(ISA) 0x000001A0 (416)   Microsoft ACPI-Compliant System
(ISA) 0x000001A1 (417)   Microsoft ACPI-Compliant System
(ISA) 0x000001A2 (418)   Microsoft ACPI-Compliant System
(ISA) 0x000001A3 (419)   Microsoft ACPI-Compliant System
(ISA) 0x000001A4 (420)   Microsoft ACPI-Compliant System
(ISA) 0x000001A5 (421)   Microsoft ACPI-Compliant System
(ISA) 0x000001A6 (422)   Microsoft ACPI-Compliant System
(ISA) 0x000001A7 (423)   Microsoft ACPI-Compliant System
(ISA) 0x000001A8 (424)   Microsoft ACPI-Compliant System
(ISA) 0x000001A9 (425)   Microsoft ACPI-Compliant System
(ISA) 0x000001AA (426)   Microsoft ACPI-Compliant System
(ISA) 0x000001AB (427)   Microsoft ACPI-Compliant System
(ISA) 0x000001AC (428)   Microsoft ACPI-Compliant System
(ISA) 0x000001AD (429)   Microsoft ACPI-Compliant System
(ISA) 0x000001AE (430)   Microsoft ACPI-Compliant System
(ISA) 0x000001AF (431)   Microsoft ACPI-Compliant System
(ISA) 0x000001B0 (432)   Microsoft ACPI-Compliant System
(ISA) 0x000001B1 (433)   Microsoft ACPI-Compliant System
(ISA) 0x000001B2 (434)   Microsoft ACPI-Compliant System
(ISA) 0x000001B3 (435)   Microsoft ACPI-Compliant System
(ISA) 0x000001B4 (436)   Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437)   Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438)   Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439)   Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440)   Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441)   Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442)   Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443)   Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444)   Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445)   Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446)   Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447)   Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448)   Microsoft ACPI-Compliant System

(ISA) 0x000001C1 (449)   Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450)   Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451)   Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452)   Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453)   Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454)   Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455)   Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456)   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)   Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131
(PCI) 0x0000000B (11)   Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
(PCI) 0x00000010 (16)   High Definition Audio Controller
(PCI) 0xFFFFFFF3 (-13)   Intel(R) Management Engine Interface
(PCI) 0xFFFFFFF4 (-12)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF5 (-11)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF6 (-10)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF7 (-9)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF8 (-8)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFF9 (-7)   Intel(R) I211 Gigabit Network Connection
(PCI) 0xFFFFFFFA (-6)   Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
(PCI) 0xFFFFFFFB (-5)   Intel(R) HD Graphics 630
(PCI) 0xFFFFFFFC (-4)   Intel(R) Ethernet Connection (2) I219-V
(PCI) 0xFFFFFFFD (-3)   Standard SATA AHCI Controller
(PCI) 0xFFFFFFFE (-2)   Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #5 - A114

3.6 Memory Map

The memory mapping list is shown as follows:

∨ ▥ Memory
  [00000000000A0000 - 00000000000BFFFF] Intel(R) HD Graphics 630
  [00000000000A0000 - 00000000000BFFFF] PCI Express Root Complex
  [0000000090000000 - 00000000DFFFFFFF] PCI Express Root Complex
  [00000000C0000000 - 00000000CFFFFFFF] Intel(R) HD Graphics 530
  [00000000C0000000 - 00000000CFFFFFFF] Intel(R) HD Graphics 630
  [00000000DE000000 - 00000000DEFFFFFF] Intel(R) HD Graphics 530
  [00000000DE000000 - 00000000DEFFFFFF] Intel(R) HD Graphics 630
  [00000000DF000000 - 00000000DF01FFFF] Intel(R) I211 Gigabit Network Connection
  [00000000DF000000 - 00000000DF0FFFFF] Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #5 - A114
  [00000000DF020000 - 00000000DF023FFF] Intel(R) I211 Gigabit Network Connection
  [00000000DF100000 - 00000000DF11FFFF] Intel(R) Ethernet Connection (2) I219-V
  [00000000DF120000 - 00000000DF12FFFF] High Definition Audio Controller
  [00000000DF130000 - 00000000DF13FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
  [00000000DF140000 - 00000000DF143FFF] High Definition Audio Controller
  [00000000DF144000 - 00000000DF147FFF] Intel(R) 100 Series/C230 Series Chipset Family PMC - A121
  [00000000DF148000 - 00000000DF149FFF] Standard SATA AHCI Controller
  [00000000DF14A000 - 00000000DF14A0FF] Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
  [00000000DF14B000 - 00000000DF14B7FF] Standard SATA AHCI Controller
  [00000000DF14C000 - 00000000DF14C0FF] Standard SATA AHCI Controller
  [00000000DF14E000 - 00000000DF14EFFF] Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131
  [00000000DFFE0000 - 00000000DFFFFFFF] Motherboard resources
  [00000000E0000000 - 00000000EFFFFFFF] Motherboard resources
  [00000000FD000000 - 00000000FDABFFFF] Motherboard resources
  [00000000FD000000 - 00000000FE7FFFFF] PCI Express Root Complex
  [00000000FDAC0000 - 00000000FDACFFFF] Motherboard resources
  [00000000FDAD0000 - 00000000FDADFFFF] Motherboard resources
  [00000000FDAE0000 - 00000000FDAEFFFF] Motherboard resources
  [00000000FDAF0000 - 00000000FDAFFFFF] Motherboard resources
  [00000000FDB00000 - 00000000FDFFFFFF] Motherboard resources
  [00000000FE000000 - 00000000FE01FFFF] Motherboard resources
  [00000000FE036000 - 00000000FE03BFFF] Motherboard resources
  [00000000FE03D000 - 00000000FE3FFFFF] Motherboard resources
  [00000000FE40F000 - 00000000FE40FFFF] Intel(R) Management Engine Interface
  [00000000FE410000 - 00000000FE7FFFFF] 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 - 00000000FED4087F] Trusted Platform Module 2.0
  [00000000FED45000 - 00000000FED8FFFF] Motherboard resources
  [00000000FED90000 - 00000000FED93FFF] Motherboard resources
  [00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
  [00000000FF000000 - 00000000FFFFFFFF] Legacy device
  [00000000FF000000 - 00000000FFFFFFFF] Motherboard resources

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 JP3 (see section 2.4.3).***

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
→← **Left/Right**	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ **Up/Down**	The Up and Down <Arrow> keys allow you to select a setup screen or sub screen.
+− Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	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.
Enter	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.

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Main   Advanced   Chipset   Security   Boot   Save & Exit

 BIOS Information                                          Set the Date. Use Tab to
 Project Version             CAPA500 V3.00                 switch between Date elements.
 Build Date and Time         06/06/2017 11:49:04

 System Date                 [Wed 06/07/2017]
 System Time                 [15:50:46]

 Access Level                Administrator


                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```

BIOS Information
Display the 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:

- ► ACPI Settings
- ► CPU Configuration
- ► SATA Configuration
- ► PCH-FW Configuration
- ► AMT configuration (Only for Q170)
- ► USB Configuration
- ► Super IO Configuration
- ► Hardware Monitor
- ► Utility Configuration
- ► Device Configuration

For items marked with "►", please press <Enter> for more options.

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Main   Advanced   Chipset   Security   Boot   Save & Exit

 ▶ ACPI Settings                                          System ACPI Parameters.
 ▶ CPU Configuration
 ▶ SATA Configuration
 ▶ PCH-FW Configuration
 ▶ AMT Configuration
 ▶ USB Configuration
 ▶ Super IO Configuration
 ▶ Hardware Monitor
 ▶ Utility Configuration
 ▶ Device Configuration

                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

● **ACPI Settings**
You can use this screen to select options for ACPI configuration, and change the value of the selected option. A description of selected item appears on the right side of the screen.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 ACPI Settings                                          Select the highest ACPI sleep
                                                        state the system will enter
 ACPI Sleep State                  [S3 (Suspend to RAM)]   when the SUSPEND button is
                                                        pressed.




                            ┌──── ACPI Sleep State ────┐
                            │ Suspend Disabled          │
                            │ S3 (Suspend to RAM)       │
                            └───────────────────────────┘
                                                        ←→: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
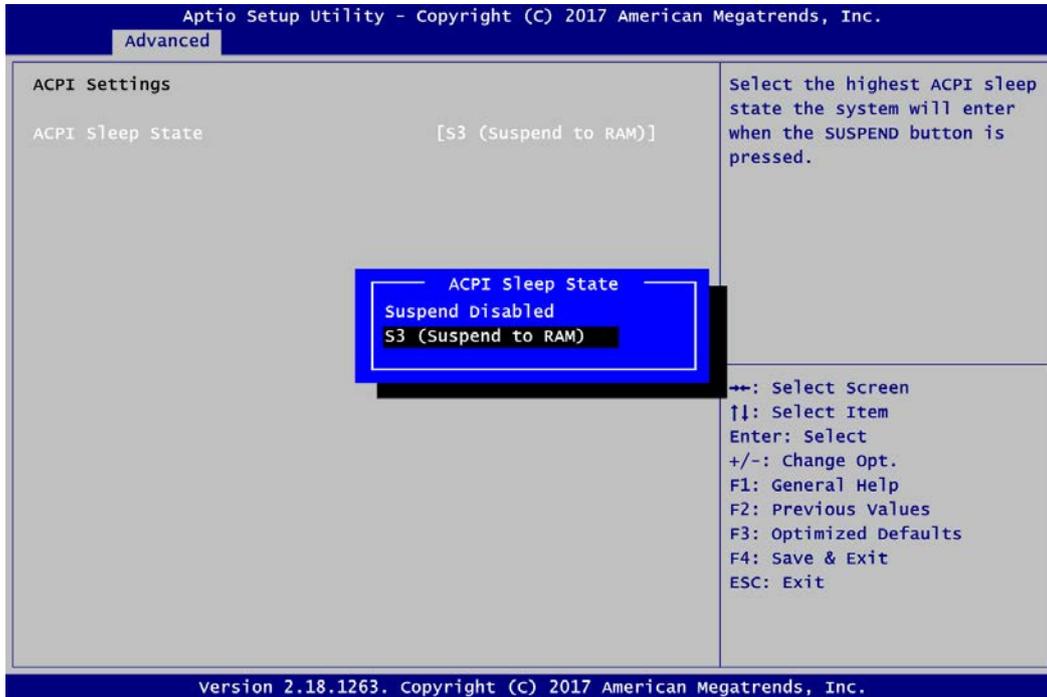
ACPI Sleep State
Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The default is S3 (Suspend to RAM); this option selects ACPI sleep state the system will enter when suspend button is pressed.

- **CPU Configuration**
  This screen shows the CPU Configuration.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
     Advanced

   CPU Configuration                                     Enabled for Windows XP and
                                                         Linux (OS optimized for
   Type                     Intel(R) Core(TM)            Hyper-Threading Technology)
                            i7-6700 CPU @ 3.40GHz        and Disabled for other OS (OS
   ID                       0x506E3                      not optimized for
   Speed                    3400 MHz                     Hyper-Threading Technology).
   L1 Data Cache            32 KB x 4
   L1 Instruction Cache     32 KB x 4
   L2 Cache                 256 KB x 4
   L3 Cache                 8 MB
   L4 Cache                 N/A
   VMX                      Supported
   SMX/TXT                  Supported

   Hyper-Threading          [Enabled]                    →←: Select Screen
   Intel (VMX) Virtualization [Enabled]                  ↑↓: Select Item
   Technology                                            Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```

Hyper-threading
Enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking function as two logical ones.

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 currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.

```
         Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 SATA Controller(s)                   [Enabled]              Choose PCIE Mini Card as PCIE
 PCIE Mini Card Function              [mSATA]                or mSATA.
 SATA Mode Selection                  [AHCI]

 Serial ATA Port 0                    Empty
 Serial ATA Port 1                    Empty

                      ┌─── PCIE Mini Card Function ───┐
                      │  PCIE                          │
                      │  mSATA                         │
                      └────────────────────────────────┘
                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit


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```

SATA Controller(s)
Enable or disable the SATA Controller feature. The default is Enabled.

PCIE Mini Card Function
Select PCI-Express Mini Card or mSATA support for SCN1 (see section 2.5.20).

SATA Mode Selection
The SATA mode is AHCI.

● **PCH-FW Configuration**
This screen displays ME Firmware information.

```
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    Advanced

 ME FW Version              11.6.10.1196
 ME Firmware Mode           Normal Mode
 ME Firmware SKU            Consumer SKU



                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



           Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
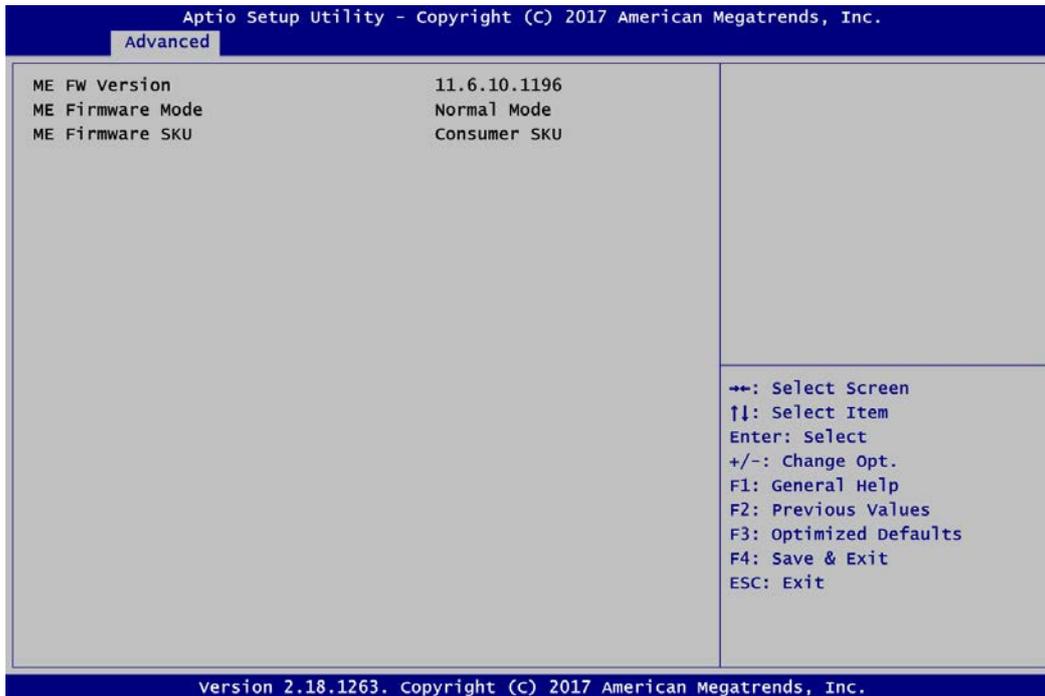
● **AMT Configuration**
Use this screen to configure AMT parameters.

Only for Q170:

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 AMT BIOS Features          [Enabled]




                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



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```
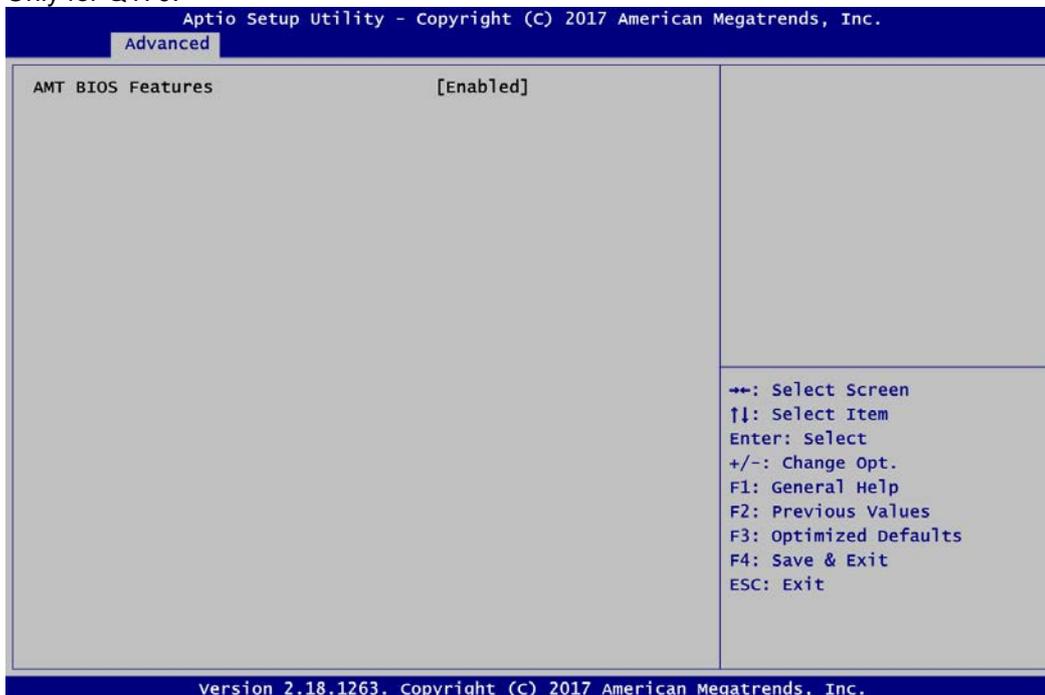
AMT BIOS Features
Enable Active Management Technology BIOS Extension, also refer to Appendix C for iAMT settings.

- **USB Configuration**
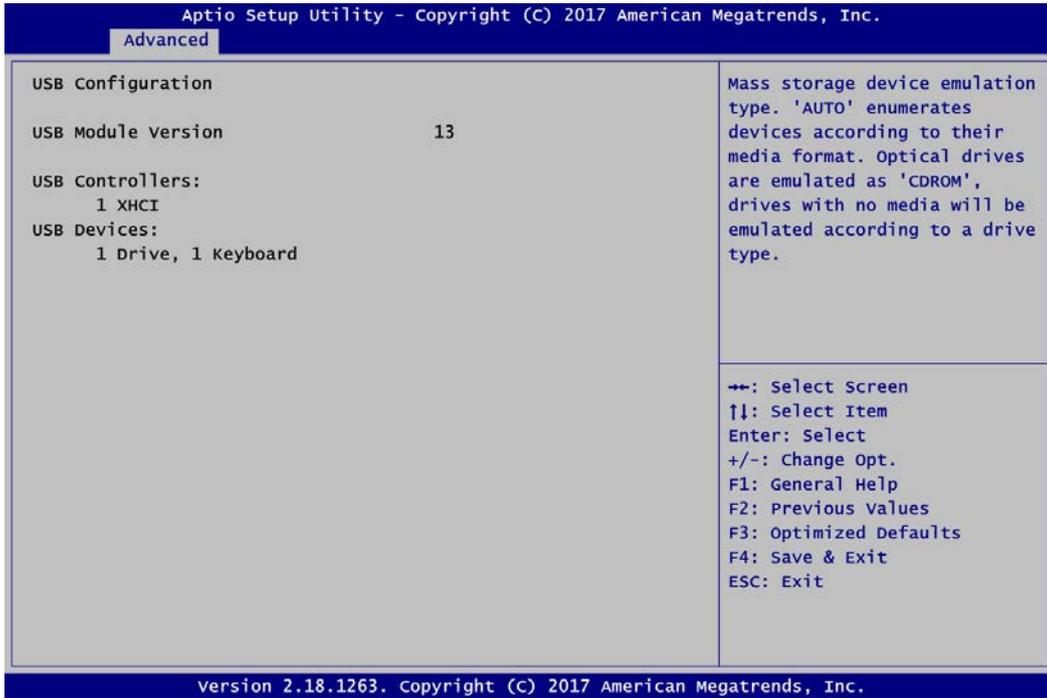
USB Devices
Display all detected USB devices.

● **Super IO Configuration**
You can use this screen to select options for F81803 Super IO Configuration, and change the value of the selected option. A description of selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Advanced

   Super IO Configuration                                   Set Parameters of Serial Port
                                                            1 (COMA).
   Super IO Chip                    F81803
  ▶ Serial Port 1 Configuration




                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit



          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
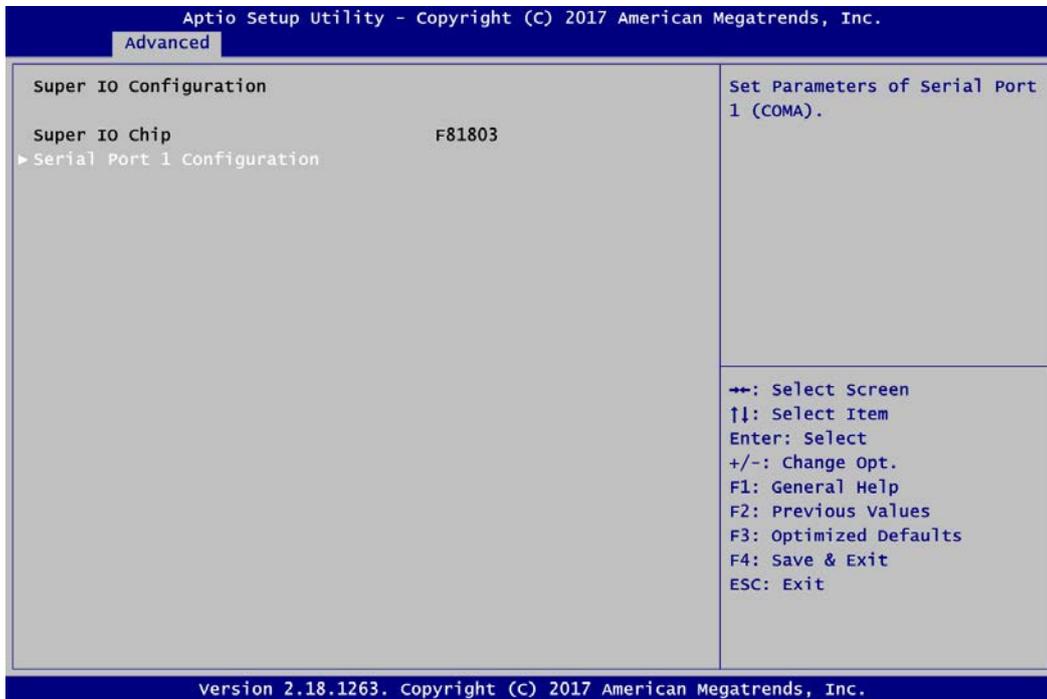
Serial Port 1 Configuration
Set parameters related to serial port 1 on CAPA500.

● **Serial Port 1 Configuration**

```
              Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
       Advanced

  Serial Port 1 Configuration                                   COM Mode: RS232,RS485,RS422

  Serial Port                           [Enabled]
  Device Settings                       IO=3F8h; IRQ=4;

  COM Mode                              [RS232]

                          ┌─────── COM Mode ───────┐
                          │ RS232                  │
                          │ RS485                  │
                          │ RS422                  │
                          └────────────────────────┘
                                                              ←→: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit

              Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

Serial Port
Enable or disable serial port 1 on CAPA500. The optimal setting for onboard F81803 SIO address is 3F8h and for interrupt request address is IRQ4.

COM Mode
Use this item to set RS-232/422/485 communication mode.

● **Hardware Monitor**
This screen monitors hardware health status.

```
               Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Advanced

 Pc Health Status                                               Enable or Disable Smart Fan

 Smart Fan Function                    [Enabled]
▶ Smart Fan Mode Configuration

 CPU temperature                       : +28 °C
 System temperature                    : +32 °C
 Fan1 Speed                            : 5747 RPM
 VBAT                                  : +3.024 V
 +5V                                   : +4.920 V
 +5VSB                                 : +3.312 V
 +3.3V                                 : +3.248 V
 +3.3VSB                               : +3.296 V
                                                               →←: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit



               Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

This screen displays the temperature of CPU and system, cooling fan speed in RPM, standby and system voltages (+3.3VSB/+5VSB and +3.3V/+5V).

Smart Fan Function
Enable or disable Smart Fan function. The default is disabled. If Smart Fan function is enabled, the CPU fan spins at different speed depending on system temperature; the higher the temperature, the faster the system fan spins. In Manual Mode, user can manually change system fan speed to 0%, 45~60%, 60%~80 or 80%~100% If Smart Fan function is disabled, the CPU fan always runs at full speed.

- **Smart Fan Mode Configuration**
  You can use this screen to set the boundary of fan temperature and fan expect speed.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Advanced

  Smart Fan Mode Configuration                            When Boundary # temperature is
                                                          exceed this boundary, CPUFAN
  CpuFan Boundary 1 temperature      45                   expected value will load from
  CpuFan Boundary 2 temperature      0                    Expect Speed #. The relative
  CpuFan Boundary 3 temperature      0                    expect fan speed 80%~100% of
  CpuFan Boundary 4 temperature      0                    the full speed in this
  CpuFan Expect Speed 1              100                   temperature section.
  CpuFan Expect Speed 2              50
  CpuFan Expect Speed 3              45
  CpuFan Expect Speed 4              39
  CpuFan Limit hysteresis            2

                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

- **Utility Configuration**

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Advanced

  Utility Configuration                                   BIOS Flash Utility

  ▶ BIOS Flash Utility




                    ┌──────────────────────────────────────────┐
                    │        Select File from a File system    │
                    │ Acpi(a0341d0, 0)\PCI(14|0)\USB(13,0)\HD(Part1, Sig ?)\ │
                    └──────────────────────────────────────────┘
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

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

● **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.

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

  ▶ Onboard Device Configuration            Module Device Configuration
  ▶ Module Device Configuration             status








                                            ←→: Select Screen
                                            ↑↓: Select Item
                                            Enter: Select
                                            +/-: Change Opt.
                                            F1: General Help
                                            F2: Previous Values
                                            F3: Optimized Defaults
                                            F4: Save & Exit
                                            ESC: Exit



           Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
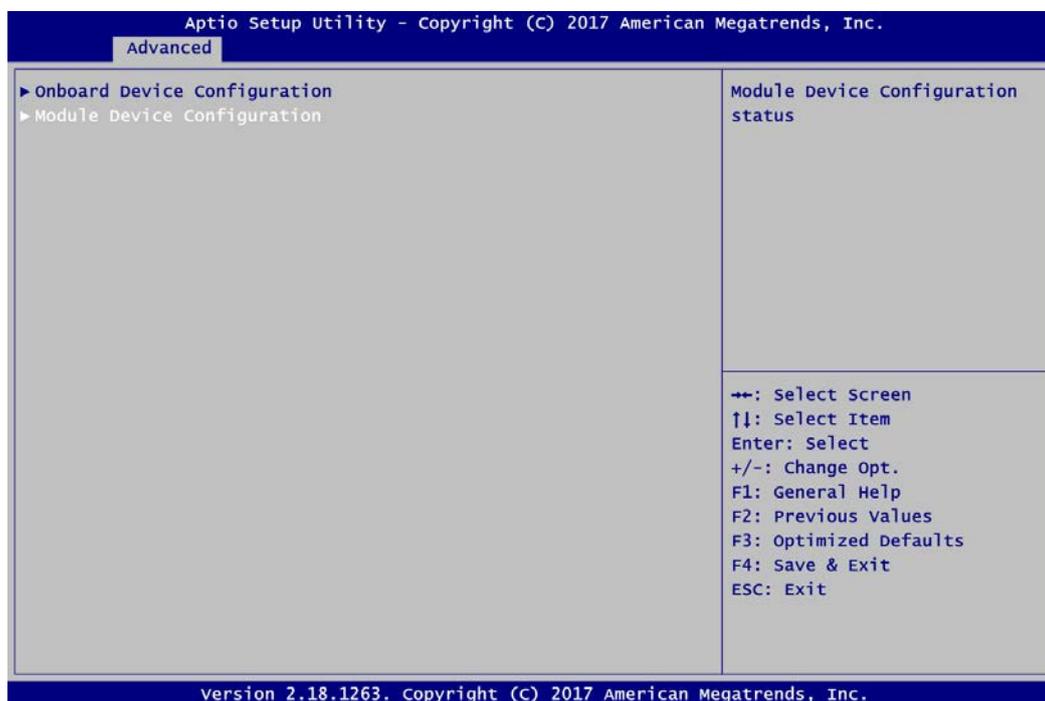
Onboard Device Configuration
Use this option to configure onboard device (e.g., DIO setting).

Module Device Configuration
This option appears only if a ZIO module is installed. BIOS will auto-detect all supported functions and you can use it to change settings on the ZIO module. The CAPA500 supports the following ZIO expansion modules: AX93262, AX93285, AX93291 and AX93295.

● **Onboard Device Configuration\Onboard DIO Configuration**

```
           Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 Onboard DIO Configuration                              Enabled or Disabled DIO
 DIO Modification                 [Enabled]             Modification
 ▶ Load Manufacture Default
 ▶ DIO port 1-8




                                                        ←→: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

DIO Modification
Enable or disable digital I/O modification. The default is Disabled. Once it is enabled, you can load manufacture default and access to the DIO status sub screen to set output or input.

Load Manufacture Default
Use this option to load default settings.

DIO port 1-8
Select this option to open DIO status sub screen to set output or input for each port.

● **DIO port 1-8**
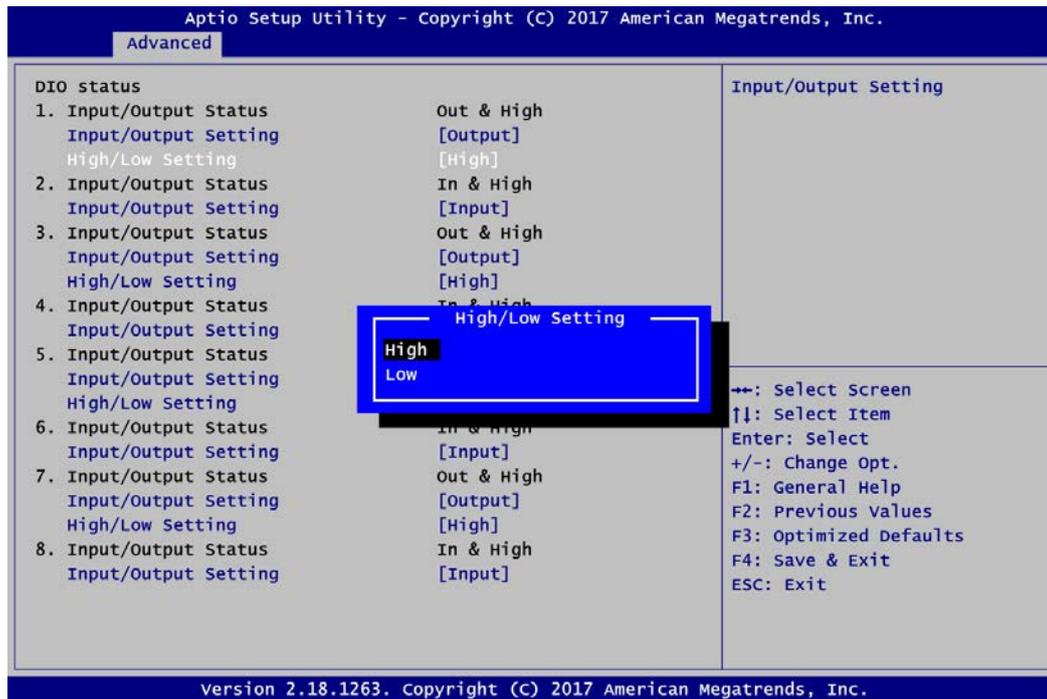
● **Module Device Configuration\Module Super IO Configuration**
   This screen is available only if a ZIO module with serial ports is connected. For items marked with "►", please press <Enter> for more options.

```
         Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 ► Module Super IO Configuration                    System Super IO Chip
                                                    Parameters.










                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



         Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
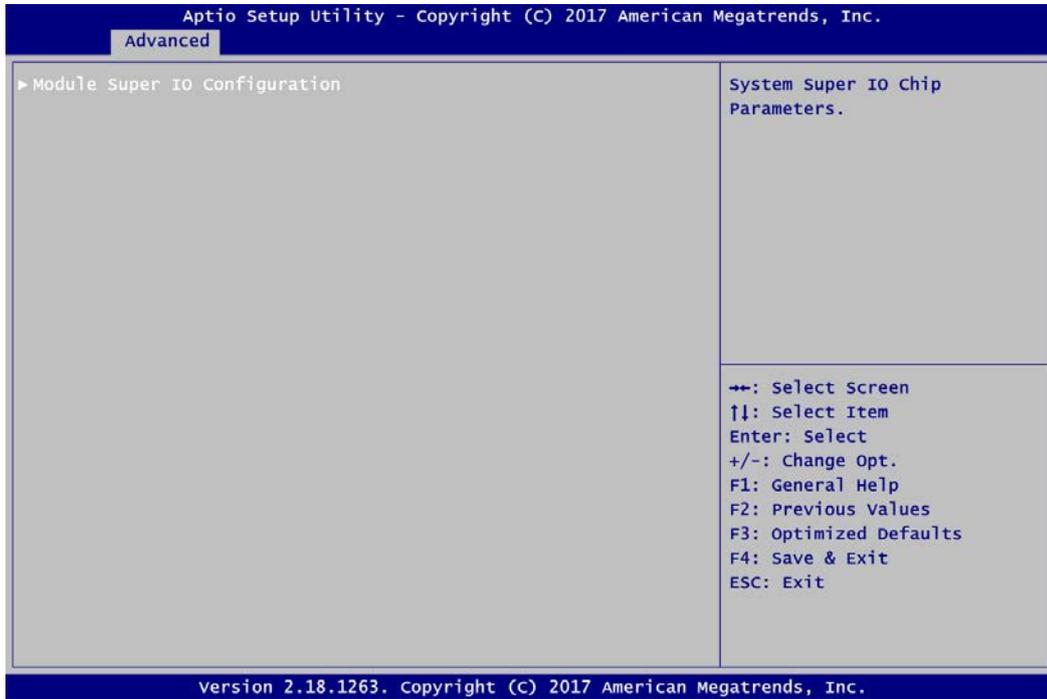
● **Module Super IO Configuration**
   You can use this screen to select options for NCT6627 Super IO Configuration, and change the value of the selected option. A description of selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Advanced

 Module Super IO Configuration                                Set Parameters of Serial Port
                                                              1 (COMA).
 Super IO Chip                          NCT6627
►Serial Port 1 Configuration
►Serial Port 2 Configuration
►Serial Port 3 Configuration
►Serial Port 4 Configuration




                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit



          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
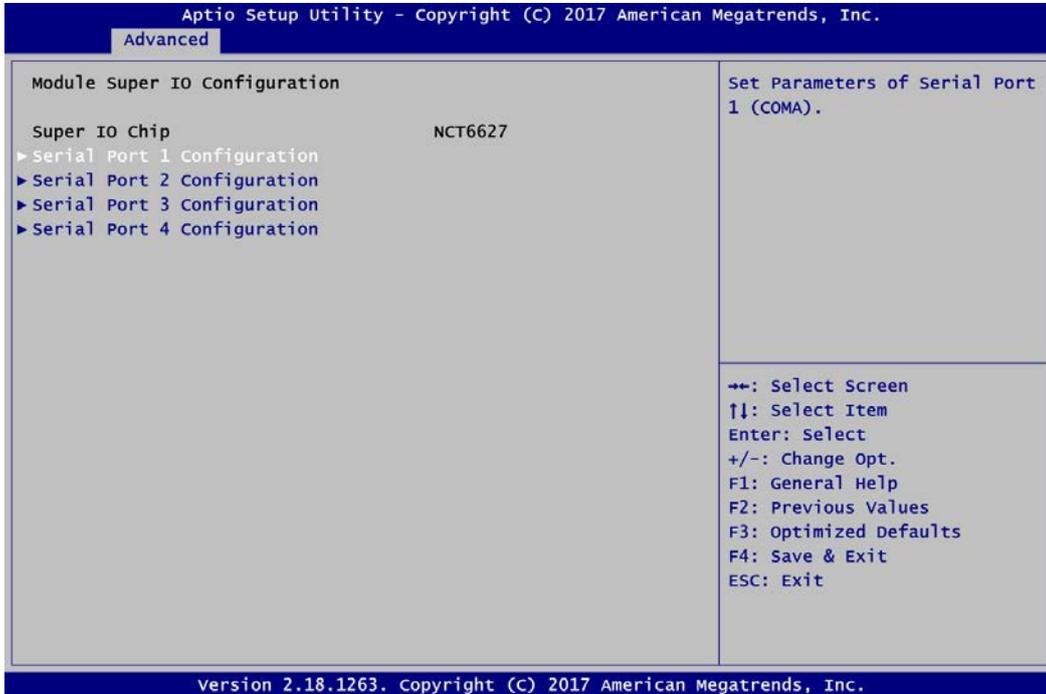
Serial Port 1~4 Configuration
Set parameters related to serial port 1~4 on ZIO module.

Note	***The numbers of serial ports depends on which ZIO module is connected. Once the Module Device Configuration is selected, this screen will show the numbers of serial ports on that selected ZIO module.***

● **Serial Port 1 Configuration**

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
       Advanced

   Serial Port 1 Configuration                                   Enable or Disable Serial Port
                                                                 (COM)
   Serial Port                        [Enabled]
   Device Settings                    IO=240h; IRQ=10;

   COM Port Type                      [RS232]




                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



             Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
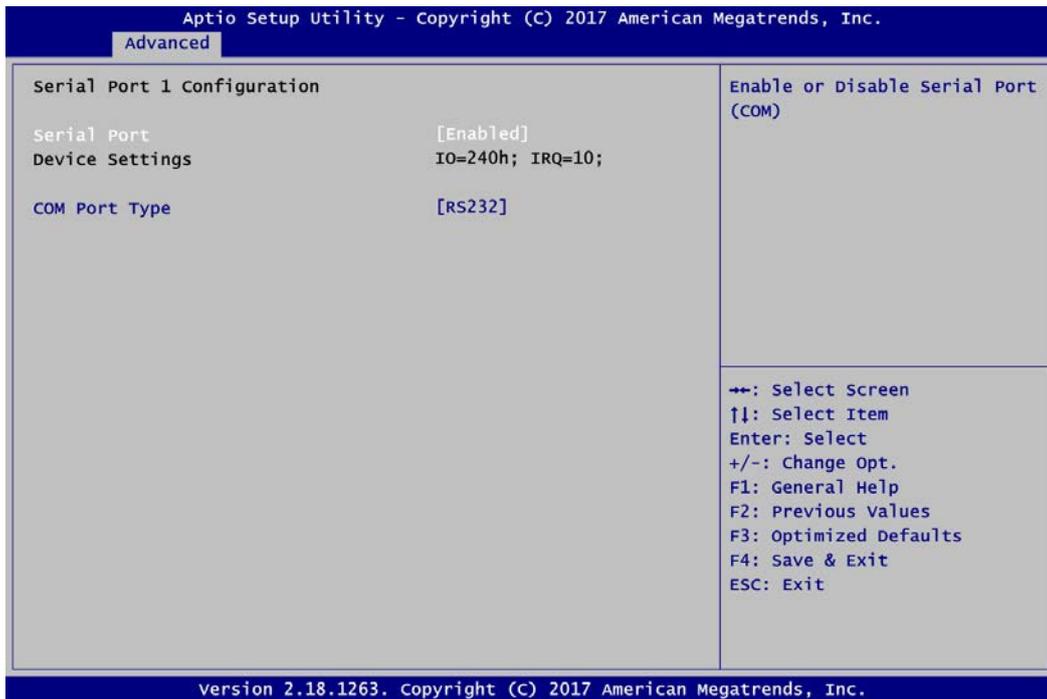
**Serial Port**
Enable or disable serial port 1 on ZIO module. The optimal setting for base I/O address is 240h and for interrupt request address is IRQ10.

COM Port Type
Use this item to set RS-232/422/485 communication mode.

● **Serial Port 2 Configuration**

```
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   Advanced

Serial Port 2 Configuration                            Enable or Disable Serial Port
                                                       (COM)
Serial Port                    [Enabled]
Device Settings                IO=248h; IRQ=3;

COM Port Type                  [RS232]


                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


         Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
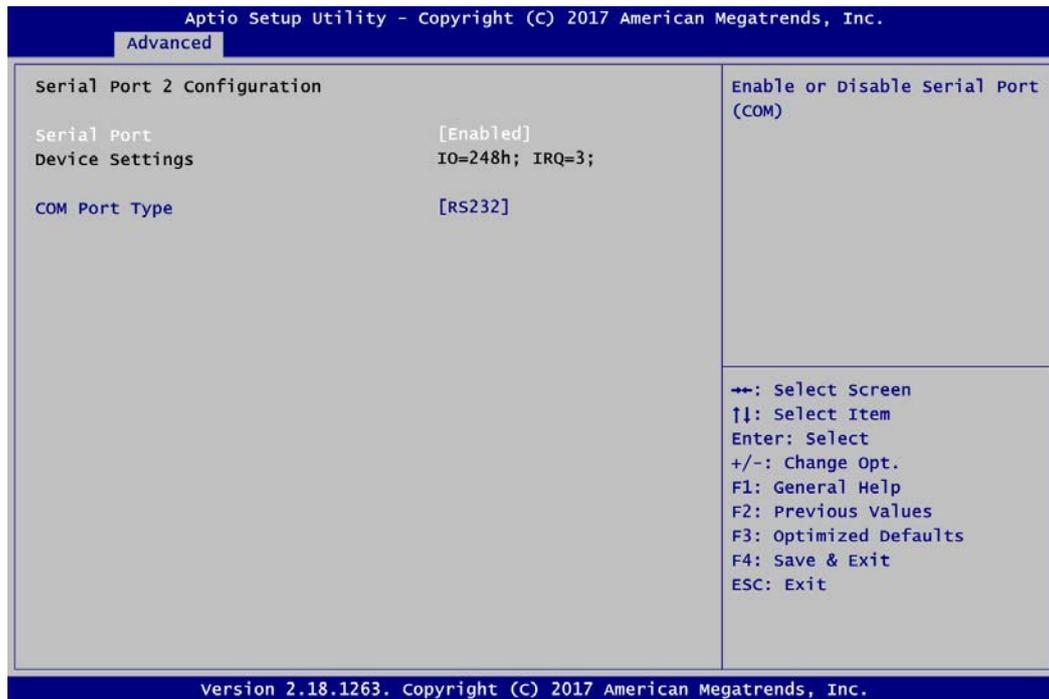
Serial Port
Enable or disable serial port 2 on ZIO module. The optimal setting for base I/O address is 248h and for interrupt request address is IRQ3.

COM Port Type
Use this item to set RS-232/422/485 communication mode.

● **Serial Port 3 Configuration**

```
          Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 Serial Port 3 Configuration                                    COM Port Type: RS232, RS422,
                                                                RS485
 Serial Port                             [Enabled]
 Device Settings                         IO=250h; IRQ=5;

 COM Port Type                           [RS232]




                                                                →←: Select Screen
                                                                ↑↓: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F3: Optimized Defaults
                                                                F4: Save & Exit
                                                                ESC: Exit



          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
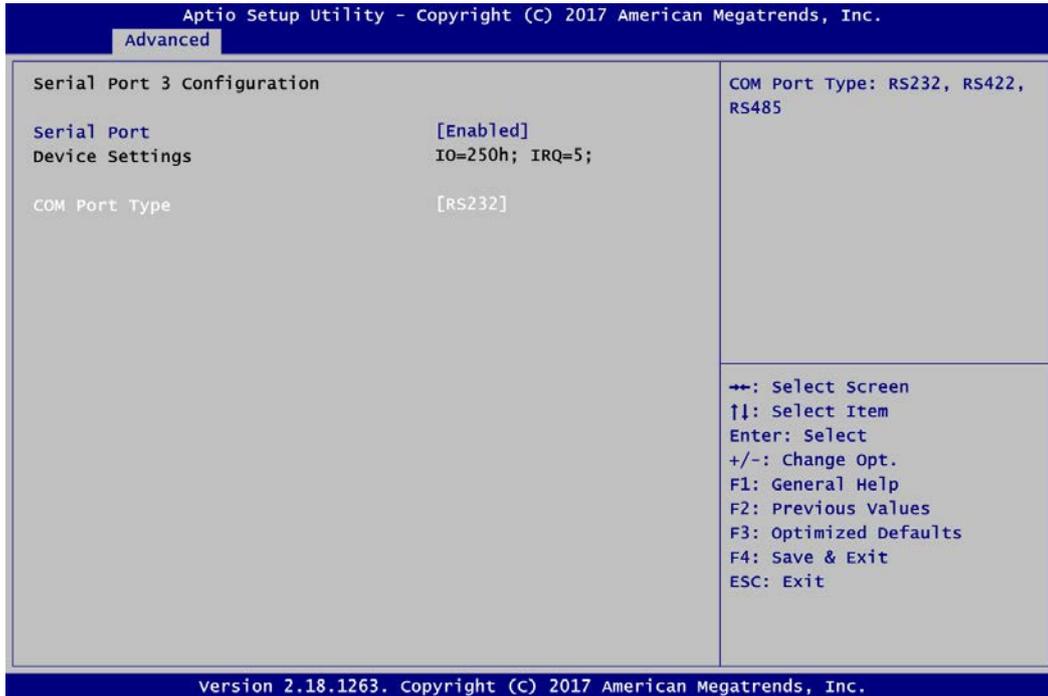
Serial Port
Enable or disable serial port 3 on ZIO module. The optimal setting for base I/O address is 250h and for interrupt request address is IRQ5.

COM Port Type
Use this item to set RS-232/422/485 communication mode.

● **Serial Port 4 Configuration**

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

  Serial Port 4 Configuration                                    Enable or Disable Serial Port
                                                                 (COM)
  Serial Port                         [Enabled]
  Device Settings                     IO=258h; IRQ=6;

  COM Port Type                       [RS232]




                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



            Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
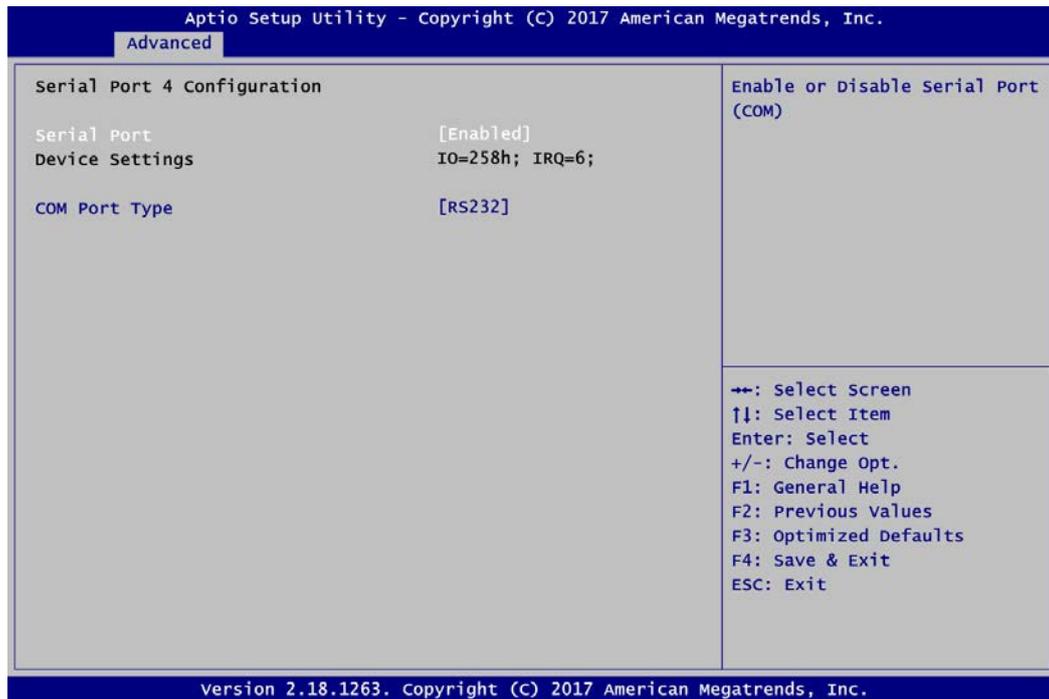
Serial Port
Enable or disable serial port 4 on ZIO module. The optimal setting for base I/O address is 258h and for interrupt request address is IRQ6.

COM Port Type
Use this item to set RS-232/422/485 communication mode.

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:

> ► System Agent (SA) Configuration
> ► PCH-IO Configuration

For items marked with "►", please press <Enter> for more options.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Main    Advanced    Chipset    Security    Boot    Save & Exit

 ► System Agent (SA) Configuration                        System Agent (SA) Parameters
 ► PCH-IO Configuration




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```
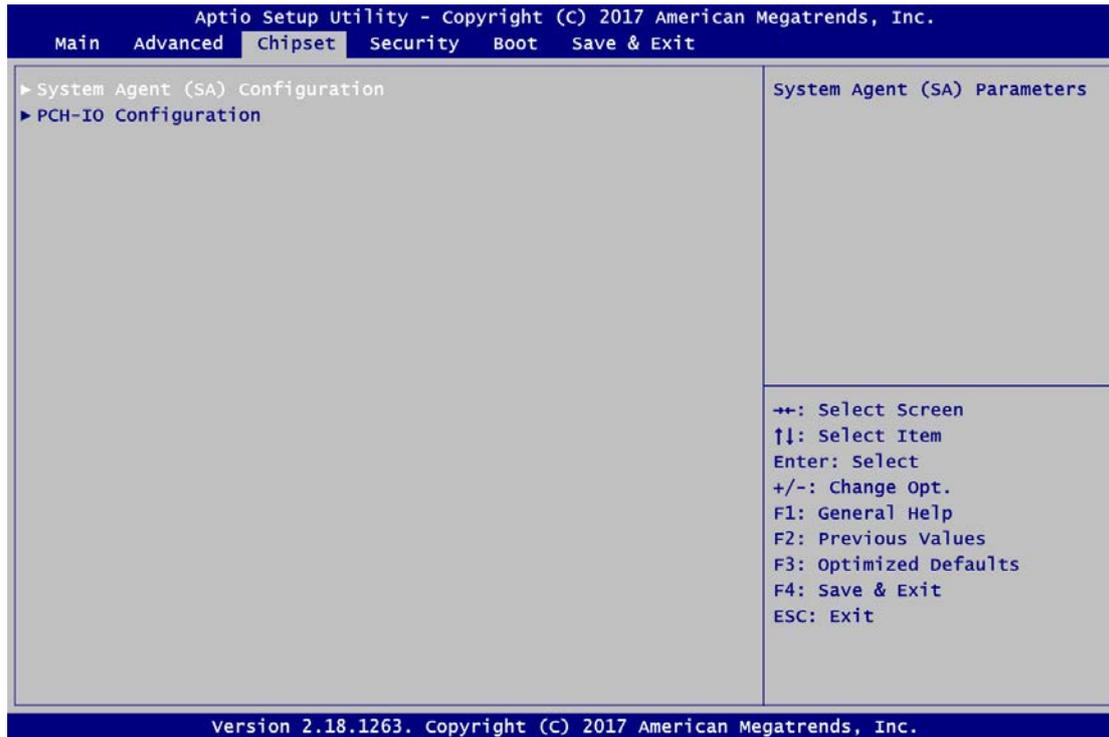
- **System Agent (SA) Configuration**
  This screen shows System Agent version information and provides function for specifying related parameters.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Chipset

  SA PCIe Code Version              1.8.0.0              Graphics Configuration.
  VT-d                              Supported

  ▶ Graphics Configuration
  ▶ Memory Configuration




                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Graphics Configuration
Use this item to open graphics configuration sub screen.

Memory Configuration
Use this item to refer to information related to system memory.

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                     Chipset

 IGFX VBIOS Version                    1036                    Select the Video Device which
                                                              will be activated during POST.
 Primary IGFX Boot Display             [Auto]                 This has no effect if external
 Secondary IGFX Boot Display           [Disabled]             graphics present.
 LVDS Panel Type                       [1680x1050    48Bit]   Secondary boot display
                                                              selection will appear based on
                                                              your selection.
                                                              VGA modes will be supported
                          ┌─── Primary IGFX Boot Display ───┐ only on primary display.
                          │ Auto                            │
                          │ HDMI                            │
                          │ VGA                             │
                          │ LVDS                            │ ➔←: Select Screen
                          │                                 │ ↑↓: Select Item
                          └─────────────────────────────────┘ Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit


           Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

Primary IGFX Boot Display
Select the video device which will be activated during POST (Power-On Self Test). The default is Auto.

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                     Chipset

 IGFX VBIOS Version                    1036                    Select Secondary Display Device

 Primary IGFX Boot Display             [VGA]
 Secondary IGFX Boot Display           [HDMI]
 LVDS Panel Type                       [1024x768     24Bit]




                          ┌─── Secondary IGFX Boot Display ──┐
                          │ Disabled                         │
                          │ HDMI                             │
                          │                                  │
                          └──────────────────────────────────┘ ➔←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit


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```

Secondary IGFX Boot Display
Select the secondary display device. The default is Disabled.

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
            Chipset

 IGFX VBIOS Version               1036                      Select LCD panel used by DP
                                                            Device by selecting the
 Primary IGFX Boot Display        [VGA]                     appropriate setup item.
 Secondary IGFX Boot Display  ┌──── LVDS Panel Type ────┐
 LVDS Panel Type              │  800x600      18Bit     │
                              │  1024x768     18Bit     │
                              │  1024x768     24Bit     │
                              │  1280x768     18Bit     │
                              │  1280x800     18Bit     │
                              │  1280x960     18Bit     │
                              │  1280x1024    48Bit     │
                              │  1366x768     18Bit     │  →←: Select Screen
                              │  1366x768     24Bit     │  ↑↓: Select Item
                              │  1440x900     48Bit     │  Enter: Select
                              │  1440x1050    48Bit     │  +/-: Change Opt.
                              │  1600x900     48Bit     │  F1: General Help
                              │  1680x1050    48Bit     │  F2: Previous Values
                              │  1600x1200    48Bit     │  F3: Optimized Defaults
                              │  1920x1080    48Bit     │  F4: Save & Exit
                              │  1920x1200    48Bit     │  ESC: Exit
                              └─────────────────────────┘

            Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

LVDS Panel Type
Select LVDS panel resolution.

● **Memory Information**
   This screen shows the system memory information.

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
            Chipset

Memory RC Version              2.0.0.6
Total Memory                   8192 MB




                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit



          Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

⚫ **PCH-IO Configuration**
This screen shows PCH-IO information.

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
     Chipset

Name                              SKL PCH-H
PCH SKU                           Q170
Hsio Revision                     52




                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit




           Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

CAPA500 Intel® Core™ Processor Family 3.5" Board

4.6   Security Menu

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

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Main    Advanced    Chipset   Security   Boot    Save & Exit

  Password Description                                    Set Administrator Password

  If ONLY the Administrator's password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length              3
  Maximum length              20                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
  Administrator Password                                  +/-: Change Opt.
  User Password                                           F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



             Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

- **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).

AMI BIOS Setup Utility   63

4.7   Boot Menu

The Boot menu allows users to change boot options of the system.
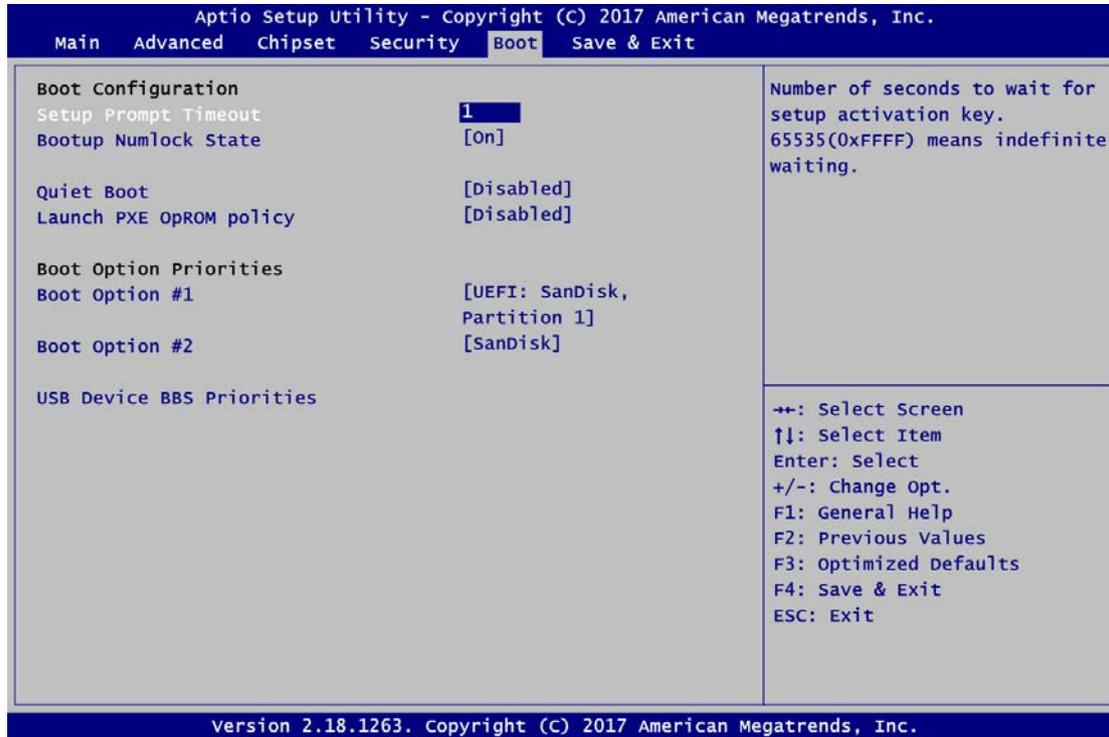
- ● **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- ● **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.

- ● **Launch PXE OpROM policy**
  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.

- ● **USB Device BBS Priorities**
  These are settings for configuring the boot 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.
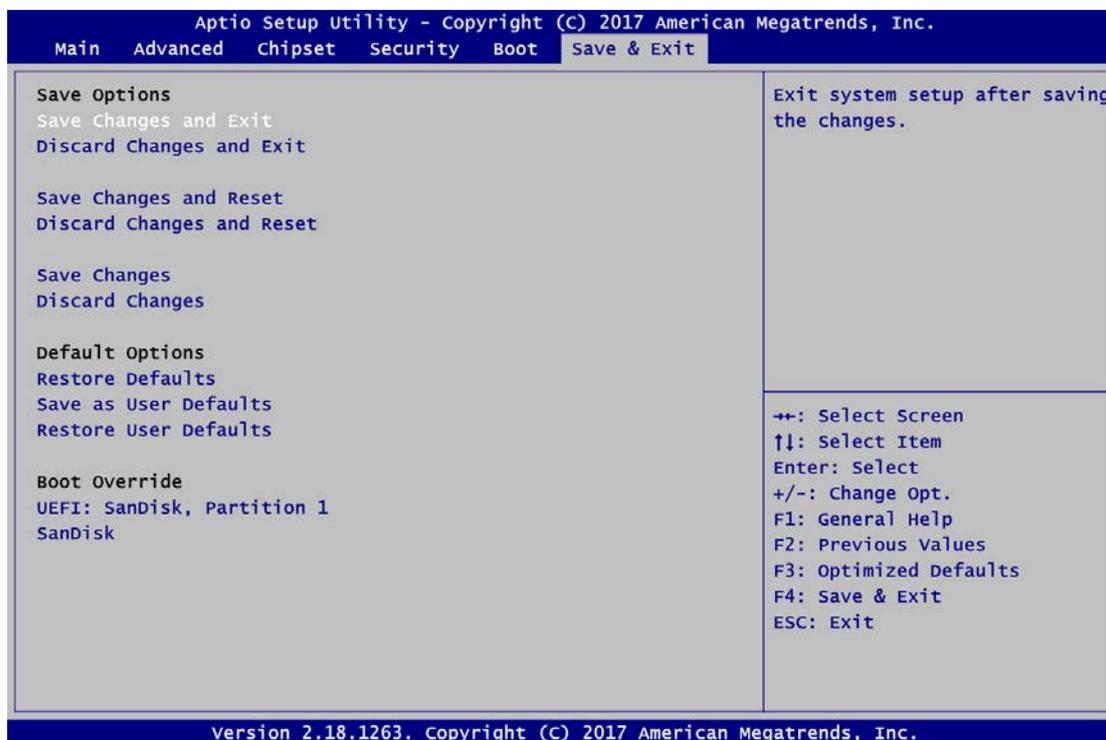
- **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

- **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.

Appendix A
Watchdog Timer

A.1   About Watchdog Timer

Software stability is major issue in most application. Some embedded systems are not watched by operator for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

A.2   How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.
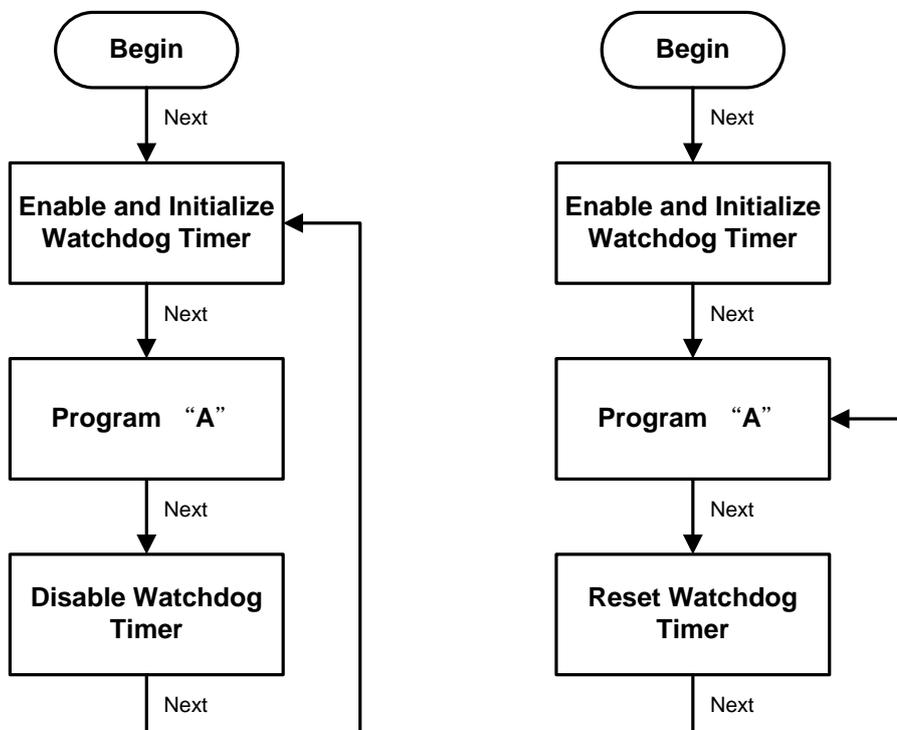
A.3 Sample Program

Assembly sample code :

```
;Enable WDT:
mov     dx,2Eh
mov     al,87                   ;Un-lock super I/O
out     dx,al
out     dx,al

;Select Logic device:
mov     dx,2Eh
mov     al,07h
out     dx,al
mov     dx,2Fh
mov     al,07h
out     dx,al

;Enable WDT base address:
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,01h
out     dx,al

;Activate WDT:
mov     dx,2Eh
mov     al,0F0h
out     dx,al
mov     dx,2Fh
mov     al,80h
out     dx,al

;Set base timer :
mov     dx,2Eh
mov     al,0F6h
out     dx,al
mov     dx,2Fh
mov     al,Mh                   ;M=00h,01h,...FFh (hex),Value=0 to 255
out     dx,al                   ;(see  Note below)

;Set Second or Minute :
mov     dx,2Eh
mov     al,0F5h
out     dx,al
mov     dx,2Fh
mov     al,Nh                   ;N=71h or 79h(see  Note below)
out     dx,al
```

Note:

*If **N**=71h, the time base is set to second.*
M = *time value*
  00: Time-out disable
  01: Time-out occurs after 1 second
  02: Time-out occurs after 2 seconds
  03: Time-out occurs after 3 seconds
   .
   .
  FFh: Time-out occurs after 255 seconds

*If **N**=79h, the time base is set to minute.*
M *= time value*
    00: Time-out disable
    01: Time-out occurs after 1 minute
    02: Time-out occurs after 2 minutes
    03: Time-out occurs after 3 minutes
     .
     .
    FFh: Time-out occurs after 255 minutes

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Appendix B
Digital I/O

B.1 About Digital I/O

The digital I/O on CPU board has 8 bits. 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.

CN9
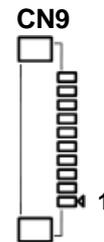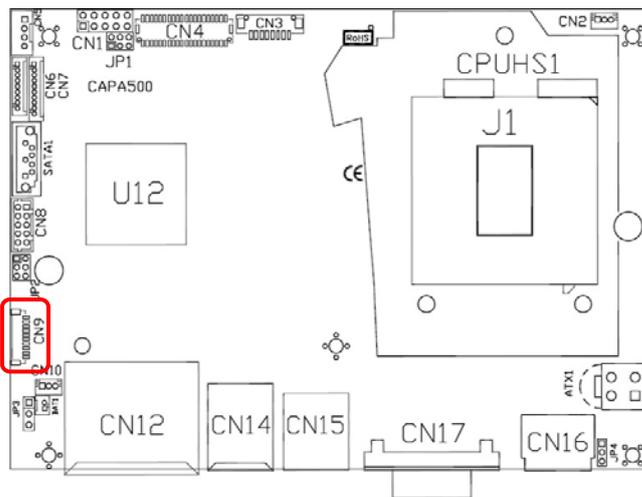
Pin	Signal	Pin	Signal
1	DI0	2	DO4
3	DI1	4	DO3
5	DI2	6	DO2
7	DO0	8	DO1
9	+5V	10	GND

B.2 Digital I/O Programming

- I^2C to GPIO PCA9554PW GPIO.
- I^2C address: 01000100.

Command byte

Command	Protocol	Function
0	Read byte	Input port register
1	Read/write byte	Output port register
2	Read/write byte	Polarity inversion register
3	Read/write byte	Configuration register

The command byte is the first byte to follow the address byte during a write transmission. It is used as a pointer to determine which of the following registers will be written or read.

Register 0: Input port register.
This register is a read-only port. It reflects the incoming logic levels of the pins, regardless of whether the pin is defined as an input or an output by Register 3. Writes to this register have no effect.

The default "X" is determined by the externally applied logic level, normally "1" when no external signal externally applied because of the internal pull-up resistors.

Register 0 – Input port register bit description

Bit	Symbol	Access	Value	Description
7	I7	Read only	X	
6	I6	Read only	X	
5	I5	Read only	X	
4	I4	Read only	X	Determined by externally applied logic level.
3	I3	Read only	X	
2	I2	Read only	X	
1	I1	Read only	X	
0	I0	Read only	X	

Register 1: Output port register.
This register reflects the outgoing logic levels of the pins defined as outputs by Register 3. Bit values in this register have no effect on pins defined as inputs. Reads from this register return the value that is in the flip-flop controlling the output selection, not the actual pin value.

Register 1 – Output port register bit description

Bit	Symbol	Access	Default Value	Description
7	O7	R	1	
6	O6	R	1	
5	O5	R	1	
4	O4	R	1	Reflects outgoing logic levels of pins defined as outputs by Register 3.
3	O3	R	1	
2	O2	R	1	
1	O1	R	1	
0	O0	R	1	

Register 2: Polarity Inversion register.
This register allows the user to invert the polarity of the Input port register data. If a bit in this register is set (written with "1"), the corresponding Input port data is inverted. If a bit in this register is cleared (written with "0"), the Input port data polarity is retained.

Register 2 – Polarity inversion register bit description

Bit	Symbol	Access	Default Value	Description
7	N7	R/W	0	
6	N6	R/W	0	
5	N5	R/W	0	Inverts polarity of Input port register data.
4	N4	R/W	0	0 = Input port register data retained (default value).
3	N3	R/W	0	1 = Input port register data inverted.
2	N2	R/W	0	
1	N1	R/W	0	
0	N0	R/W	0	

Register 3: Configuration register.
This register configures the directions of the I/O pins. If a bit in this register is set, the corresponding port pin is enabled as an input with high-impedance output driver. If a bit in this register is cleared, the corresponding port pin is enabled as an output. At reset, the I/Os are configured as inputs with a weak pull-up to V_{DD}.

Register 3 – Configuration register bit description

Bit	Symbol	Access	Default Value	Description
7	C7	R/W	1	Configures the directions of the I/O pins. 0 = Corresponding port pin enabled as an output. 1 = Corresponding port pin configured as input (default value).
6	C6	R/W	1	
5	C5	R/W	1	
4	C4	R/W	1	
3	C3	R/W	1	
2	C2	R/W	1	
1	C1	R/W	1	
0	C0	R/W	1	

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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.

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

C.2   Set and Change Password

1. You will be asked to set a password when first log in. The default password is "admin".
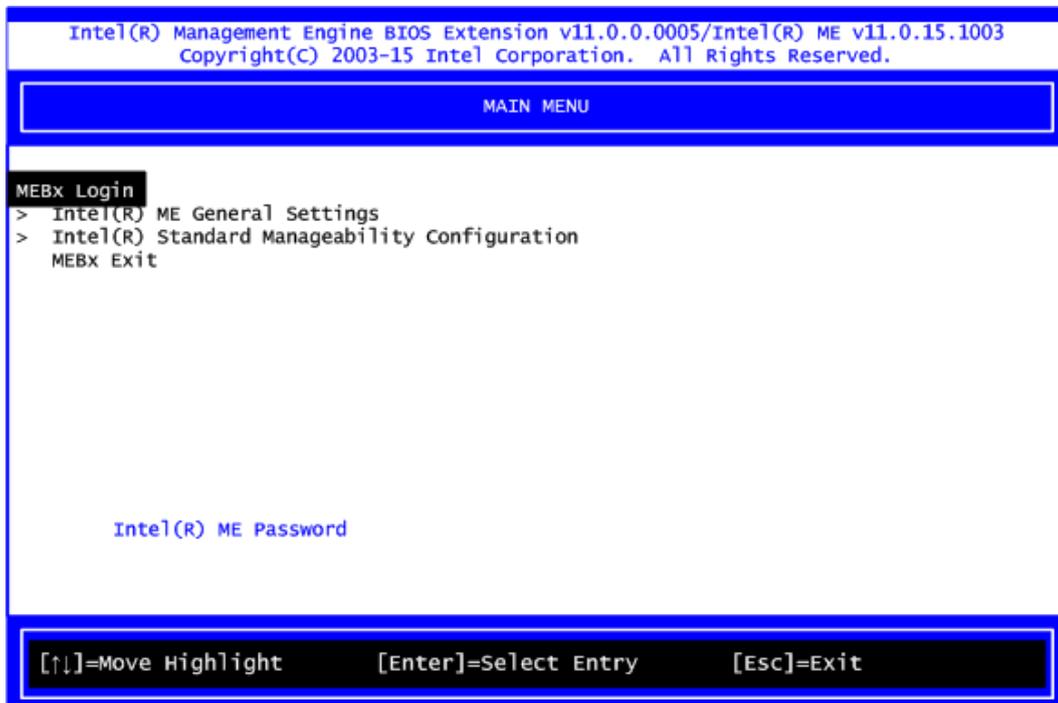
2. You will be asked to change the password before setting ME.

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.15.1003
              Copyright(C) 2003-15 Intel Corporation.  All Rights Reserved.

                        INTEL (R) ME PLATFORM CONFIGURATION

Change ME Password
Local FW Update                          <Enabled>




         Intel(R) ME New Password



[↑↓]=Move Highlight        [Enter]=Select Entry        [Esc]=Exit
```
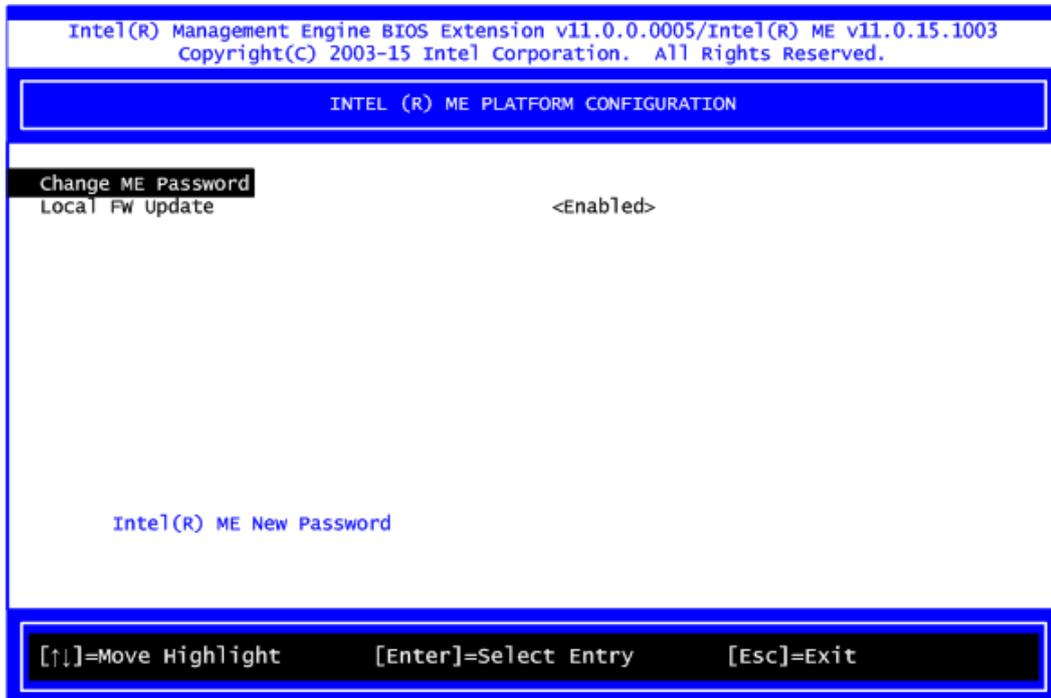
3. You must confirm your new password while revising. The new password must contain: (example: **!!11qqQQ**) (default value).

   - 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.

C.3   iAMT Settings

Select Intel® Standard ManageabilityConfiguration and press <Enter>.
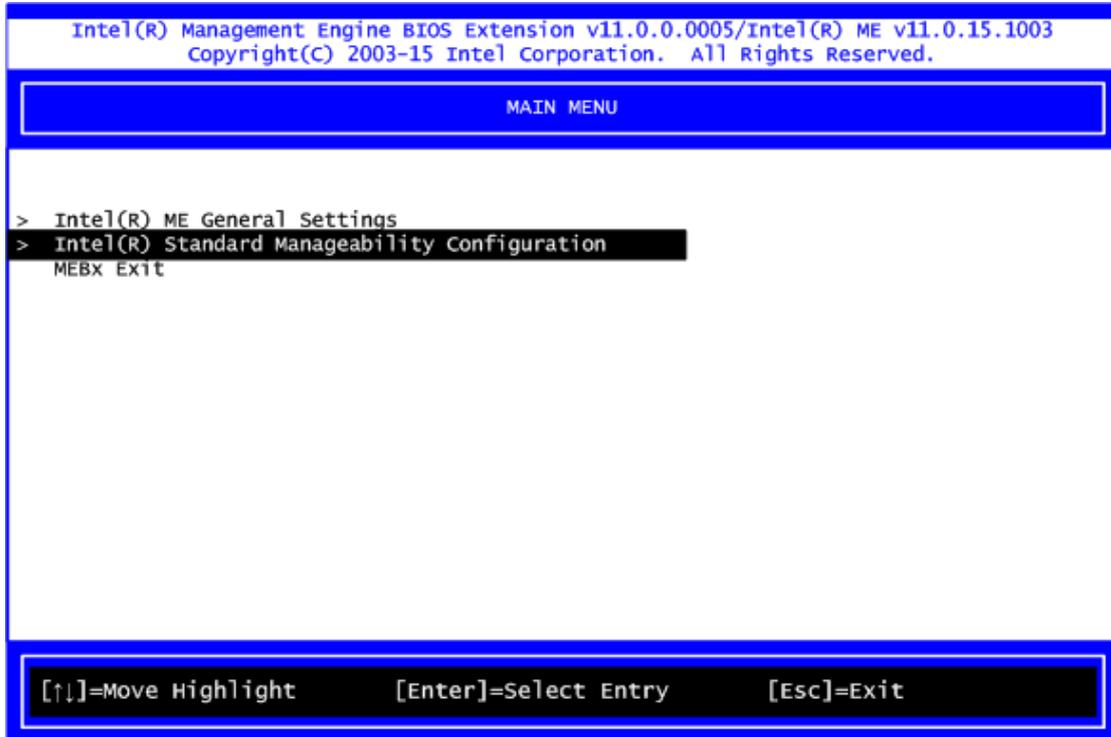
1. Select Network Setup to configure iAMT.
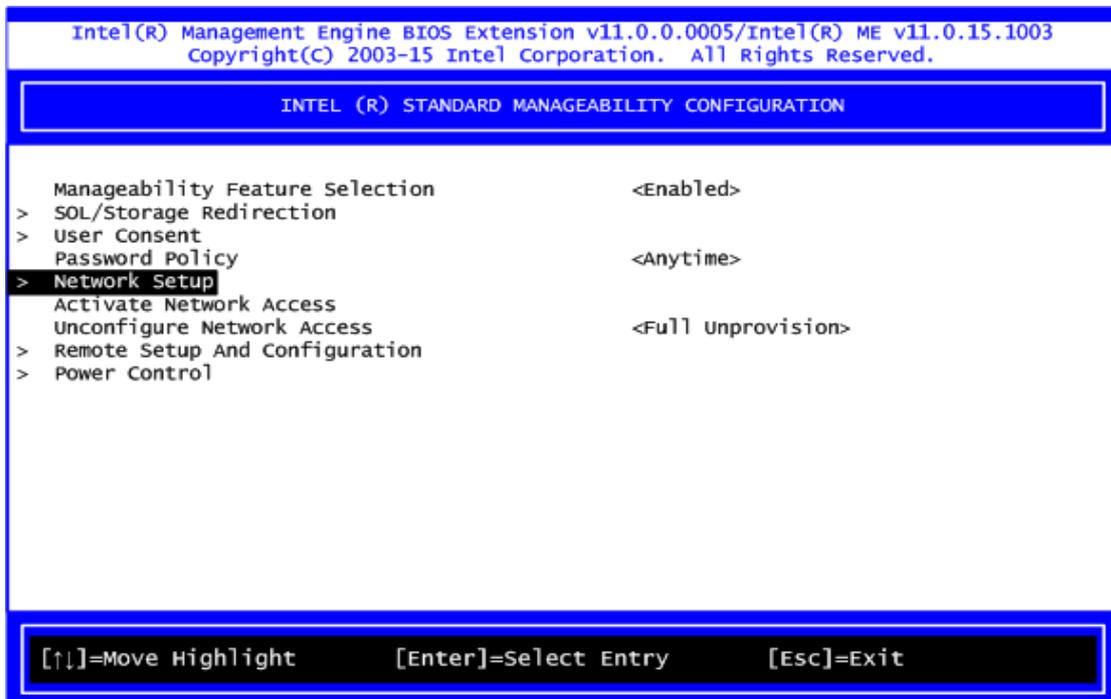
2. Select TCP/IP to get into Network interface and set it to Enabled. Get into DHCP Mode and set it to Disabled.
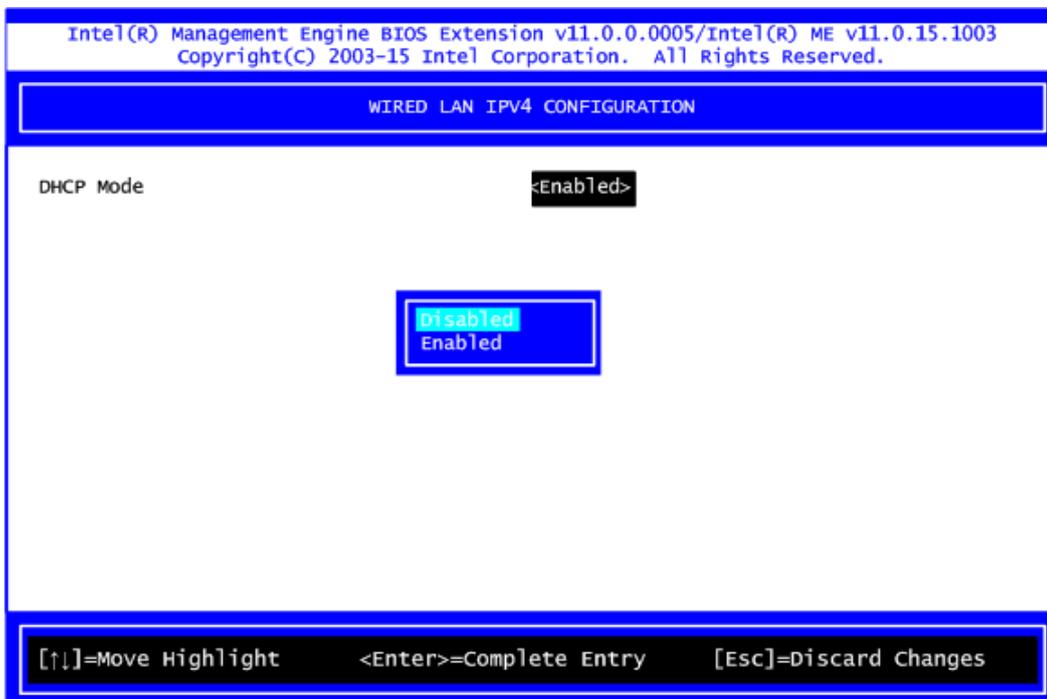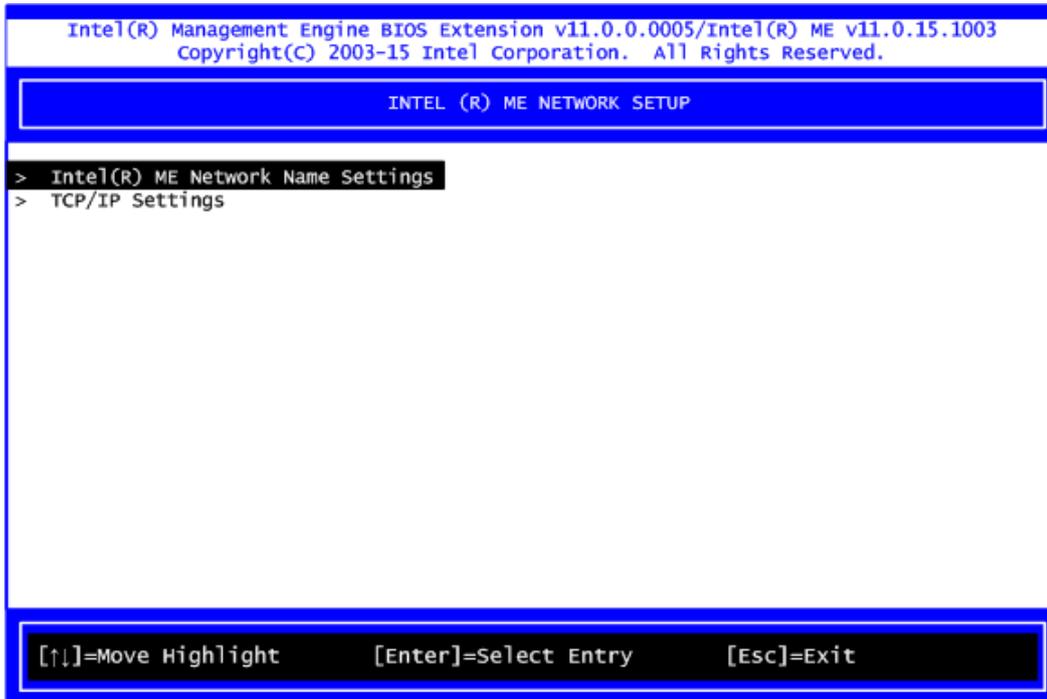
3. If DHCP Mode is disabled, set the following settings:

- IP address
- Subnet mask

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.15.1003
          Copyright(C) 2003-15 Intel Corporation.  All Rights Reserved.

                        WIRED LAN IPV4 CONFIGURATION


     DHCP Mode                             <Disabled>
     IPV4 Address                          192.168.0.255
     Subnet Mask Address                   255.255.255.0
     Default Gateway Address               0.0.0.0
     Preferred DNS Address                 0.0.0.0
     Alternate DNS Address                 0.0.0.0








          Subnet mask (e.g. 255.255.255.0)




     [↑↓]=Move Highlight       [Enter]=Select Entry       [Esc]=Exit
```

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

```
Intel(R) Management Engine BIOS Extension v11.0.0.0005/Intel(R) ME v11.0.15.1003
          Copyright(C) 2003-15 Intel Corporation.  All Rights Reserved.

                 INTEL (R) STANDARD MANAGEABILITY CONFIGURATION


     Manageability Feature Selection          <Enabled>
  >  SOL/Storage Redirection
  >  User Consent
     Password Policy                          <Anytime>
  >  Network Setup
     Activate Network Access
     Unconfigure Network Access
  >  Remote Setup And Configurati      Activates the current network settings
  >  Power Control                      and opens the ME network interface
                                              Continue: (Y/N)




     [↑↓]=Move Highlight       [Enter]=Select Entry       [Esc]=Exit
```

5. 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
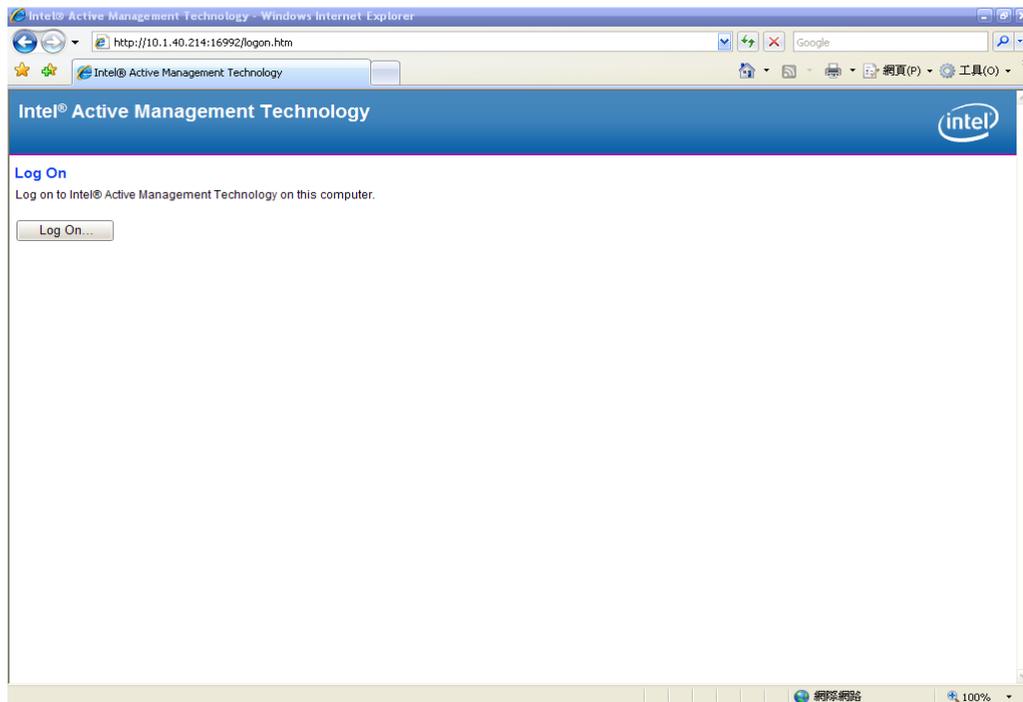
2. To log on, you will be required to type in username and password for access to the Web.

    USER: admin (default value)
    PASS: (MEBx password)

3. Enter the iAMT Web.
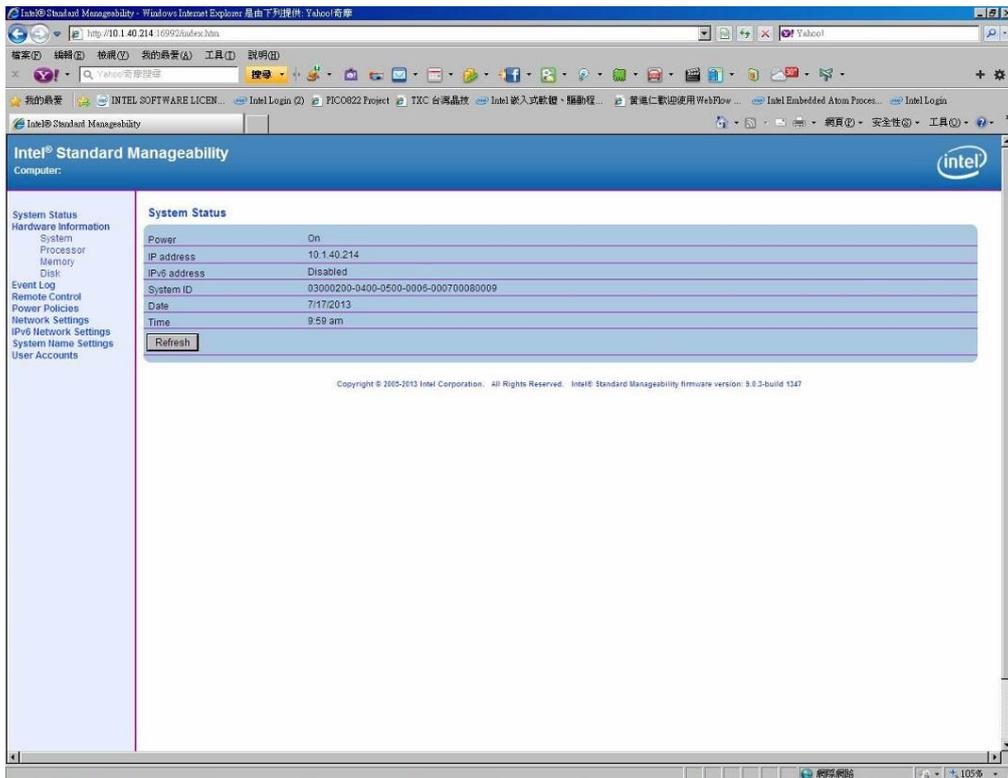
4. Click Remote Control, and select commands on the right side.
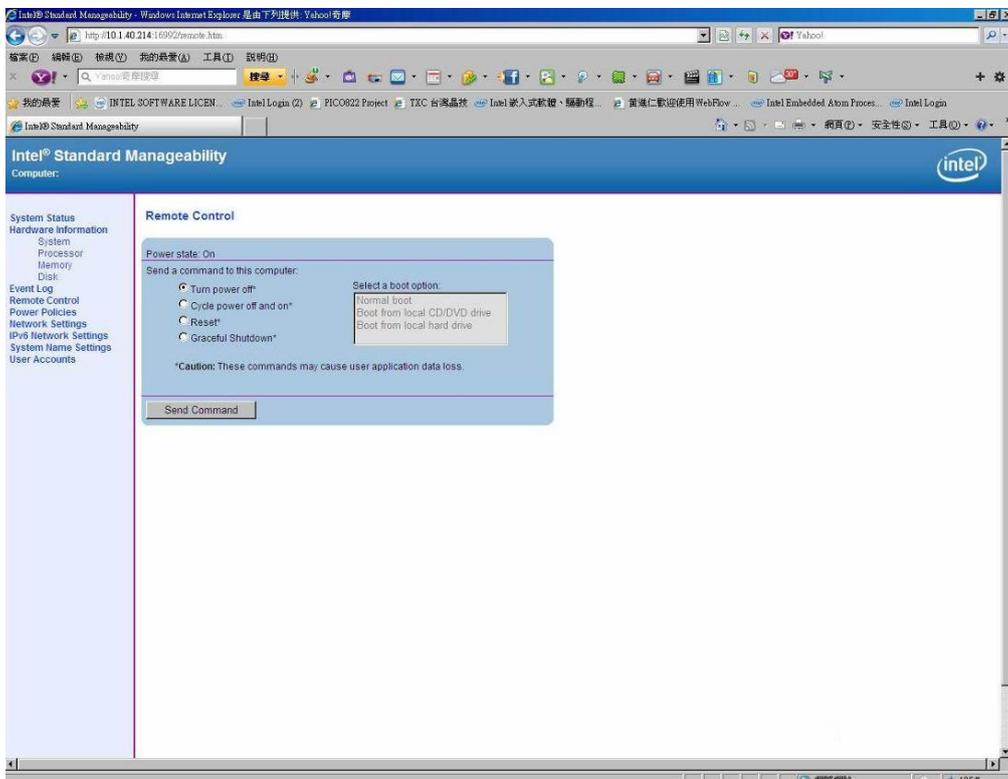
5. When you have finished using the iAMT Web console, close the Web browser.

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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.
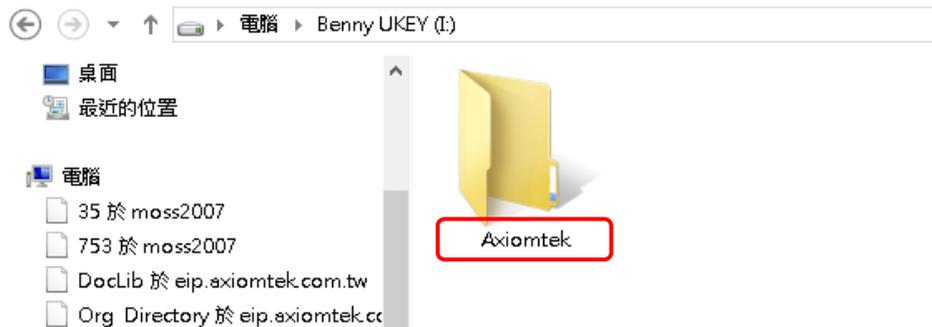
2. Copy BIOS ROM file (e.g. CAPA500X.005) to "Axiomtek" folder.

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>.
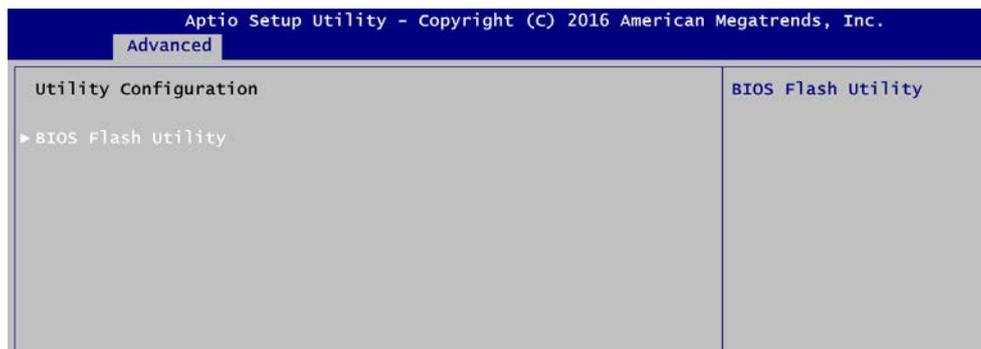
5. BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.
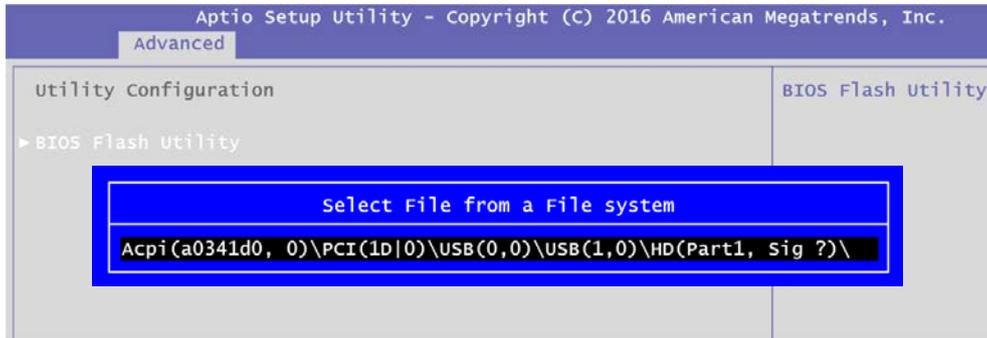
6. Select the USB drive containing BIOS ROM file you want to update using the <↑> or <↓> key. Then press <Enter> to get into "Axiomtek" folder.
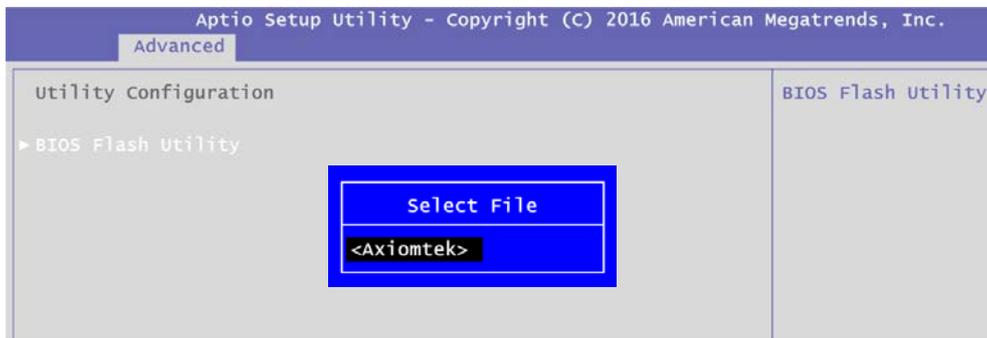
7. Now you can see the BIOS ROM file on the screen, press <Enter> to select.
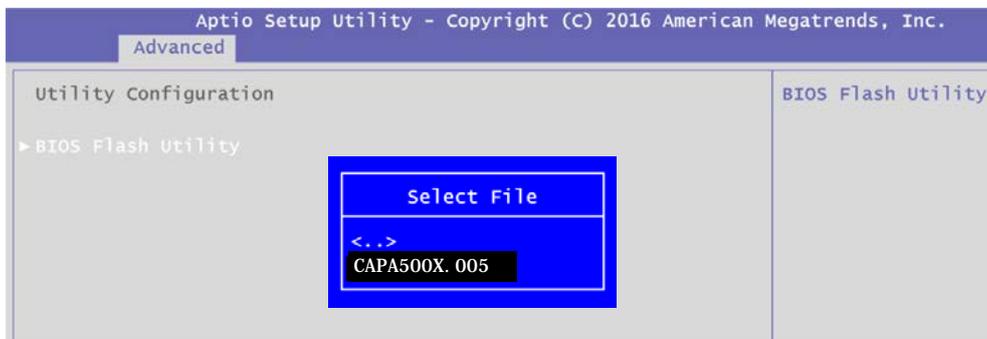
8. Select Start to flash system BIOS option to begin updating procedure.
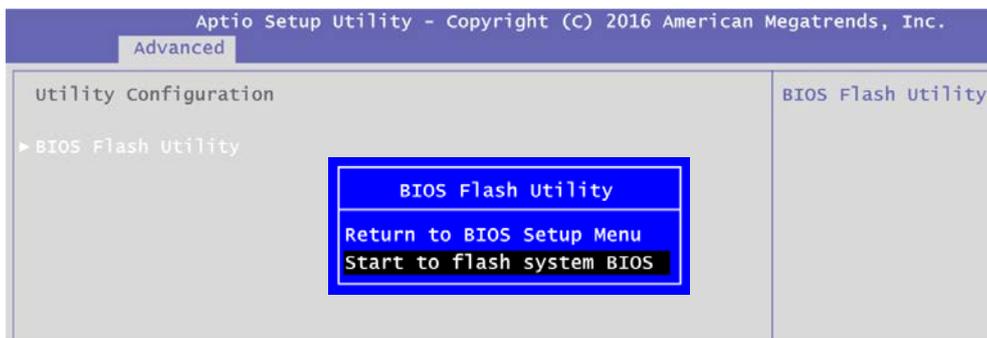
9. Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.
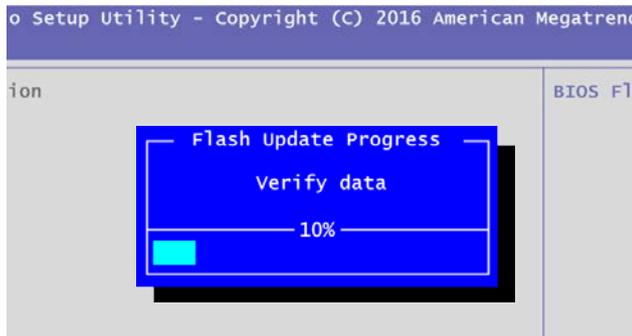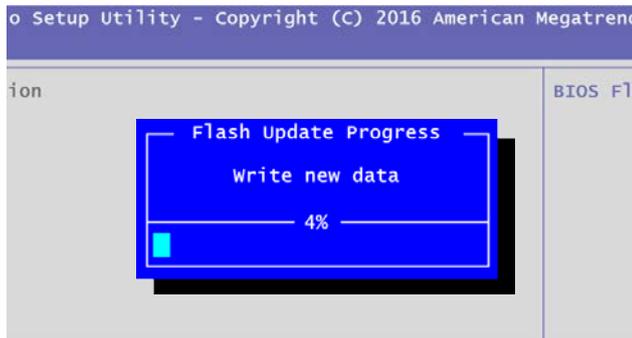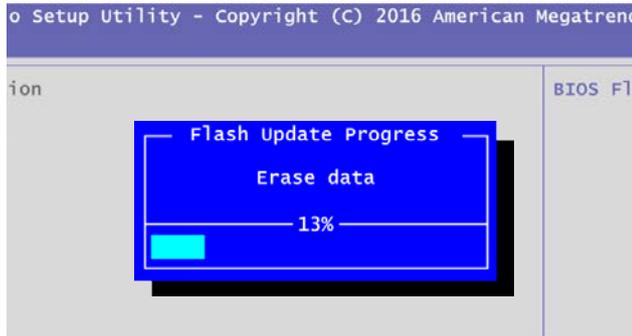
10. When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.