User Manual

ASMB-785

LGA 1151 Intel® Xeon® E3-1200 v5/
6th Generation Core™ Series ATX
Server Board with DDR4, 4 PCIe, 3
PCI, 6 USB 3.0, 6 COM, 6 SATA3,
Quad/Dual LANs

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Enabling an Intelligent Planet

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FCC

This device complies with the requirements in part 15 of the FCC rules:

Operation is subject to the following two conditions:

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- This device must accept any interference received, including interference that may cause undesired operation.

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Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Peripheral Compatibility

Category	Advantech PN	Vendor	Part Description	Remarks
CPU	TBD	Intel	Xeon E3-1220 v5 / 3.0GHz / 4 Cores	80W (No processor graphics equipped)
	96MPXES-3.3-8M11T	Intel	Xeon E3-1225 v5 / 3.3GHz / 4 Cores	80W
	TBD	Intel	Xeon E3-1230 v5 / 3.3GHz / 4 Cores	80W (No processor graphics equipped)
	TBD	Intel	Xeon E3-1235L v5 / 2.0GHz / 4 Cores	25W
	TBD	Intel	Xeon E3-1240 v5 / 3.5GHz / 4 Cores	80W (No processor graphics equipped)
	TBD	Intel	Xeon E3-1240L v5 / 2.1GHz / 4 Cores	25W (No processor graphics equipped)
	TBD	Intel	Xeon E3-1245 v5 / 3.5GHz / 4 Cores	80W
	TBD	Intel	Xeon E3-1260L v5 / 2.9GHz / 4 Cores	45W (No processor graphics equipped)
	96MPXES-3.6-8M11T	Intel	Xeon E3-1270 v5 / 3.6GHz / 4 Cores	80W (No processor graphics equipped)
	TBD	Intel	Xeon E3-1275 v5 / 3.6GHz / 4 Cores	80W
	TBD	Intel	Core i3-6100TE / 2.7GHz / 2 Cores	35W
	TBD	Intel	Core i3-6100 / 3.7GHz / 2 Cores	47W
	96MPI5S-2.3-6M11T1	Intel	Core i5-6500TE / 2.3GHz / 4 Cores	35W
	96MPI5S-3.2-6M11T	Intel	Core i5-6500 / 3.2GHz / 4 Cores	65W
	96MPI7S-2.4-8M11T1	Intel	Core i7-6700TE / 2.4GHz / 4 Cores	35W
	96MPI7S-3.4-8M11T	Intel	Core i7-6700 / 3.4GHz / 4 Cores	65W
	TBD	Intel	Core i7-6700K / 4.2GHz / 4 Cores	91W
Memory	DDR4 288PIN 1600/1866/2133 ECC/Non-ECC unbuffered DIMM, capacity up to 16GB per DIMM			
Cooler / Heatsink	1960049408N001	CoolJag	LGA 1151 CPU heatsink for 1U chassis	
	1960052651N021	CoolJag	LGA 1151 CPU cooler for 2U/4U chassis	

	AIMB-RF10F-01A1E	Advantech	AIMB-RF10F (1U riser card)	1*PCIe x16 slot
Riser Card	ASMB-RF348-21A1E	Advantech	ASMB-RF348 (2U riser card)	1*PCIe x4 (bottom slot) + 1*PCIe x8 (top slot)
	ASMB-RF3X8-21A1E	Advantech	ASMB-RF3X8 (2U riser card)	1*PCIe x8 (bottom slot) + 2*PCI-X (top/ middle slot)

> **Note!** *We strongly recommend to purchase all peripheral parts from Advantech to avoid any compatibility issues.*

ASMB-785 Ordering Information

Part Number	Chipset	Memory	LAN	Display	IPMI
ASMB-785G4-00A1E	C236	DDR4 288pin ECC/Non-ECC unbuffered DIMM	4	2*DVI + 1*VGA	Optional Module (IPMI-1000)
ASMB-785G2-00A1E	C236	DDR4 288pin ECC/Non-ECC unbuffered DIMM	2	2*DVI + 1*VGA	Optional Module (IPMI-1000)

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- 1 ASMB-785 Startup Manual
- 1 Driver CD (user's manual is included)
- 2 Serial ATA HDD data cables (including 1 right angle cable)
- 2 Serial ATA HDD power cables
- 1 I/O port bracket
- 1 Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ASMB-785 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ASMB-785, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter   4   Chipset Software Installation Utility 79

Chapter   5   VGA Setup..83

Chapter   6   LAN Configuration...............................85

Chapter   7   Intel ME...87

Chapter   8   Intel USB 3.0..89

Chapter   9   SATA RAID Setup 91

Chapter 1

Hardware Configuration

1.1 Introduction

ASMB-785 motherboard is designed with the most advanced Intel® C236 PCH for industrial server grade applications that require high-performance computing. The motherboard supports Intel® Xeon® E3 v5 processors with DDR4 288pin 1600/1866/2133 MHz ECC/Non-ECC memory for up to 64 GB. ASMB-785 also provides cost-effective Intel HD graphics integrated on processor, and the graphics VRAM has 1 GB maximum of shared memory with 2 GB and above of system memory installed.

To fulfill various demands from the video surveillance and factory automation markets, ASMB-785 offers maximum up to four Gen3 PCIe slots, including one PCIe x16 slot with x16 link, or switchable to two PCIe x16 slots with x8 link from CPU, and two PCIe x4 slots from PCH. In addition, ASMB-785 also comes with three PCI slots via a discrete PCIe to PCI bridge chip to support legacy PCI expansion cards and has four or two Gigabit Ethernet LAN via dedicated PCIe bus, which offers bandwidth up to 300 MB/s.

By using the Intel® C236 chipset, ASMB-785 offers a variety of features such as seven onboard SATA III interfaces (bandwidth = 600 MB/s) with software RAID; 6 x USB 3.0 and 7 x USB 2.0 connectors. These powerful I/O capabilities ensure reliable data storage capabilities and high-speed I/O peripheral connectivity.

The ASMB-785 also adopts Advantech's unique, patented Sleep Mode Control Circuit for AT Power Mode. With all these excellent features and outstanding performance, ASMB-785 is the ideal platform for today's industrial applications.

1.2 Features

- **Triple Display:** ASMB-785 has one VGA and two DVI-D ports. Users are able to use all display outputs to implement triple display functions.
- **PCIe architecture:** There is one PCIe x16 slot (x16 link) or two PCIe x16 slots (x8 link) from the Intel CPU, and two x4 slots (x4 link) from the Intel C236 PCH.
- **High Performance I/O capability:** 4 or 2 x Gigabit LAN via PCIe bus, 3 x PCI 32-bit/33 or 66 MHz PCI slots, 6 x USB 3.0, 7 x USB 2.0 ports (1*Type A USB 2.0), 6 x SATA III connectors.
- **Standard ATX form factor with industrial features:** ASMB-785 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer functions, etc.
- **Automatic power on after power failure:** It is often necessary to have an unattended system come back into operation when power resumes after a power failure. Advantech's industrial motherboard allows users to set the system to power on automatically without anyone hitting power button. Please refer to the detailed "AT" mode settings in Table 1.10 of Section 1.8.1.6.
- **Active Management Technology 9.0:** The hardware and firmware base solution is powered by the system auxiliary power plane to remotely monitor networked systems. Intel AMT (iAMT) stores hardware and software information in non-volatile memory. Built-in management provides out-of-band management capabilities, allowing remote discovery and KVM to repair systems after OS failures or when a system has crashed. Alert and event logging features detect problems and quickly reduce downtime, pro-actively blocking incoming threats, containing infected clients before they impact the network, and proactively notifying the user when critical software agents are removed. To enable iAMT, please refer to Section 3.2.2.3 AMT Configuration.

1.3 Specifications

1.3.1 CPU

- Supports one E3-1200 v5 Series and 6th Gen. Core i3, i5 & i7 CPU in an LGA1151 socket.
- Max. TPD can support up to 80 W.

1.3.2 PCH

- **System Chipset:** Intel® C236
- **SATA hard disk drive interface:** Six on-board SATA III connectors support Advanced Host Controller Interface (AHCI) technology, Intel Rapid Storage Technology (IRST) for software RAID 1, 0, 10 and 5 support, and have data transmission rates up to 600 MB/s.

1.3.3 Memory

- **RAM:** Up to 64 GB in four 288-pin DIMM sockets. Supports dual-channel DDR4 ECC/Non-ECC 1600/1866/2133 unbuffered U-DIMM.

> *Note!* 1. Due to the inherent limitations of PC architecture, the system may not fully detect 64 GB RAM when 64 GB RAM is installed.
>
> 2. A 32-bit OS may not fully detect 4 GB of RAM when 4 GB is installed.

1.3.4 Input/Output

- **PCIe slot (Gen3):** 1 PCIe x16 expansion slot with x16 link or switchable to 2 PCIe x16 expansion slots with x8 link, or 2 PCIe x4 expansion slots with x4 links.
- **PCI slot:** 3 PCI slot, 32-bit, 33 or 66 MHz PCI 2.2 compliant, and clock could be selected by jumper(JPCICLK1).
- **Enhanced parallel port:** Configured to LPT1 or disabled. Standard DB-25 female connector cable is a optional accessory. LPT1 supports EPP/SPP/ECP.
- **Serial port:** Six serial ports (1 in rear and 5 onboard), only supports RS-232.
- **PS/2 Keyboard and mouse connector:** To save rear I/O space, ASMB-785 reserves a 6-pin header on board (KBMS1) and via a cable kit to build two 6-pin mini-DIN connectors for easy connection to PS/2 keyboard and mouse.
- **USB port:** Supports up to 6 USB 3.0 ports with transmission up to 5Gbps and 7 USB 2.0 ports with transmission rates up to 480 Mbps.
- **LPC:** One LPC connector supports Advantech TPM LPC modules and COM 232/485 modules. (Slot-2 & 3 can't be used when COM module is installed.)
- **GPIO:** ASMB-785 supports 8-bit GPIO from super I/O for general purpose control application.

1.3.5 Graphics

- **Graphics processor:** Integrated Intel HD Graphics.
- **Display memory:** 1 GB maximum shared memory with 2 GB and above system memory installed
- **DVI-D:** Two DVI-D ports up to resolution 1920 x 1200 @ 60 Hz refresh rate
- **D-Sub:** Up to 1920 x 1200 resolution @ 60 Hz refresh rate

1.3.6 Ethernet LAN

- **Interface:** Supports four 10/100/1000 Mbps Ethernet port (s) via PCIe bus which provides a 300 MB/s data transmission rate.
- **Controller:** LAN1: Intel I219-LM; LAN2 ~ 4: Intel I210-AT (LAN3/4 is for G4 SKU only).

1.3.7 Industrial Features

- **Watchdog timer:** It can generate system reset or NC. The watchdog timer is programmable, with each unit equal to one second (255 levels).
- **IPMI:** Supports IPMI 2.0 via optional IPMI-1000 module

1.3.8 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, ±12 V, 5 VSB
- **Power consumption:**
  Max. load: +3.3 V @ 0.96 A, +5 V @ 1.58 A, +12 V @ 0.32 A, +12 V (8P) @ 7.21 A, +5 Vsb @ 0.11 A, -12 V @ 0.06 A
- **Board size:** 304.8 x 244 mm (12" x 9.6")
- **Board weight:** 0.75 kg (1.68 lb)

1.4 Jumpers and Connectors

Connectors on the ASMB-785 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

The tables below list the function of each of the jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumper list	
Label	**Function**
JCMOS1	CMOS clear
JME1	Intel ME disable jumper for ME/BIOS update
JWDT1	Watch Dog Reset
CPUFAN_SEL1, SYSFAN_SEL1	FAN PWM(1-2)/DC mode selection(2-3)
PSON1	AT(1-2) / ATX(2-3)
JCASE1	Case open
JPEG1, JPEG2	PCIEX16_SLOT6 PCIe link switch between one x16 or two x8, or x8 plus two x4
JPEG3	Default (1-2)/reserve for debug (2-3)
JTHR_SEL1	To select on board or external thermometer
JGREEN1	Enable/Disable deep sleep mode
JUSB1	Rear window USB2.0/3.0 port power source switch between +5 VSB and +5 V
JUSB2	On board USB2.0/3.0 port power source switch between +5 VSB and +5 V
JPCICLK1	PCI slot clock selection between 33 and 66 MHz

Table 1.1: Jumper list	
JSKTOCC1	To force power when no CPU installed, normal (1-2)/ debug (2-3)

Table 1.2: Connector list	
Label	**Function**
ATXPWR1	ATX 24 Pin main power connector (for system)
ATX12V1	Processor power connector (for CPU)
SATA0~6	SATA III (6 Gb/s)
USB7_8, USB9_10, USB11_12	USB 2.0 Port (Header)
USB13	USB 2.0 Port (USB Type A)
USB3_4	USB 3.0 Port (Header)
PCI_SLOT1, PCI_SLOT3, PCI_SLOT5	PCI slot
PCIEX4_SLOT2,PCIEX4_SLOT7	PCIe x4 slot (Gen3 x4 link)
PCIEX16_SLOT4, PCIEX16_SLOT6	PCIE x16 slots (one Gen3 x16 link for slot 6 or two Gen3 x8 link)
DIMMA0,DIMMA1, DIMMB0,DIMMB1	DDR4 288-pin slot
CPUFAN0	CPU FAN connector
SYSFAN0,SYSFAN1, SYSFAN2,SYSFAN3	System FAN connector
LAN1_USB1_2, LAN2_USB5_6	LAN1 / USB 3.0 port 1, 2 stack connector
	LAN2 / USB 3.0 port 5, 6 stack connector
LAN3_4	LAN3 & LAN4 connector
VGA1_COM1	VGA+COM connector
DVI1_DVI2	DVI-D connector
KBMS1	External keyboard and mouse connector (6 pin)
SPI_CN1	SPI flash card pin header
LANLED1~2	LAN LED extension connector
SMBUS1	SM Bus From PCH
GPIO1	8-bit GPIO header
FPAUD1	Audio front panel header
COM2, COM3_4, COM5_6	Serial port: RS-232
LPC1	Low pin count connector for Advantech TPM LPC and RS232/422/485 modules.
VOLT1	Voltage display
AUDIO1	Audio connector
BH2	For optional battery kit
EX_THR1	For thermometer kit
SGPIO1, SGPIO2	Serial General Purpose I/O
JFP1	Power Switch / Reset connector
JFP2	External speaker/HDD LED connector/SMBus connector
JFP3	Keyboard Lock and Power LED
SPDIF_OUT1	SPDIF audio output pin header
BMC1	BMC connector to support IPMI-1000 module
PMBUS1	PMBUS connector to communicate with power supply

1.5 Board Layout: Jumper and Connector Locations
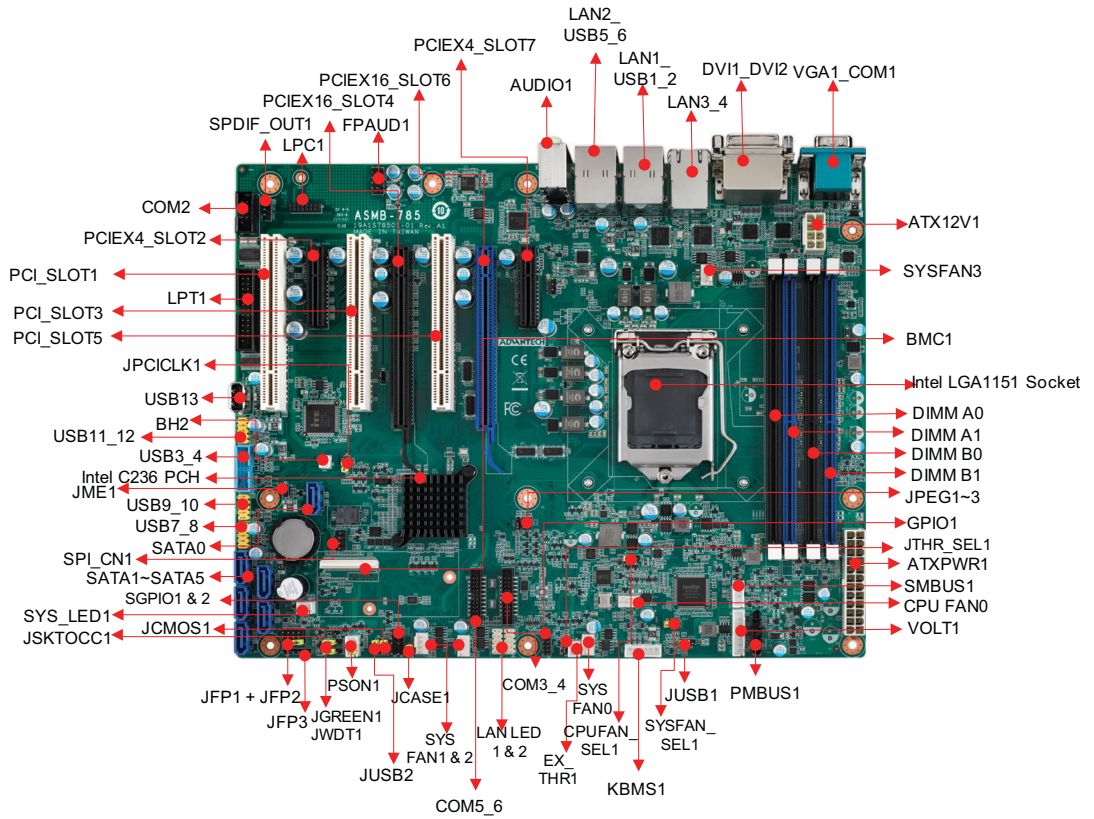
Figure 1.1 Jumper and Connector Locations

ASMB-785G2-00A1E

ASMB-785G4-00A1E
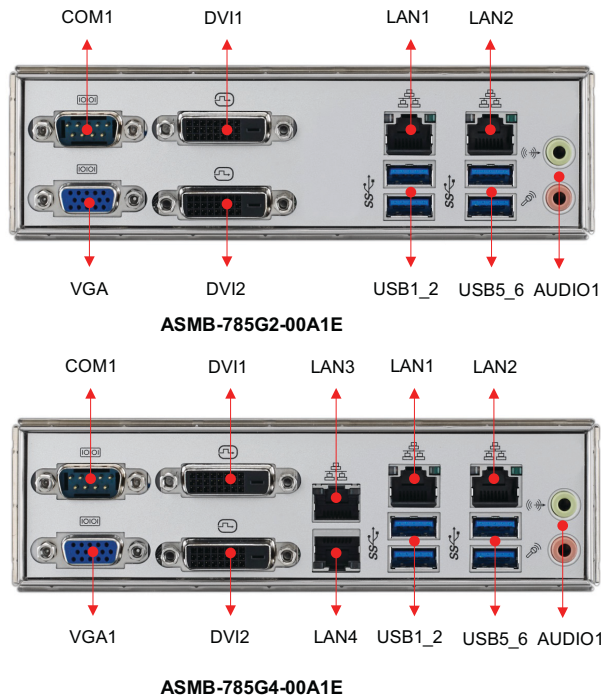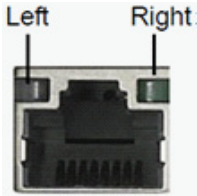
Figure 1.2 I/O connectors

1.5.1 Onboard LAN LED Definition

Table 1.3: Onboard LAN LED Definition			
10/100/1000 Mbps LAN Link/Activity LED Scheme			
		LAN1 ~ LAN4	
Left Right		Left LED	Right LED
10 Mbps	Link	Off	Green
	Active	Off	Blinking green
100 Mbps	Link	Amber	Green
	Active	Amber	Blinking green
1000 Mbps	Link	Green	Green
	Active	Green	Blinking green
No Link		Off	Off

1.5.2 Onboard LEDs (LED2, LED3, LED4)

The ASMB-785 has onboard power LED for 5V Power, 5V Standby and 3.3V AUX.

Table 1.4: Onboard LED (LED2, LED3, LED4)			
LED	Description	LED Definition	
5V_LED2	Power on LED	Off: Power off	On (Green): System is On
5VSB_LED3	Standby LED	Off: No input AC Power	On (Green): System is ON, in sleep mode, or in soft-off mode
3V3DSW_LED4	Deep sleep well LED	Off: No input AC Power, Deep sleep mode enable	On (Green): System is ON, in sleep mode, in soft-off mode, or deep sleep mode disable

1.6   ASMB-785 Block Diagram
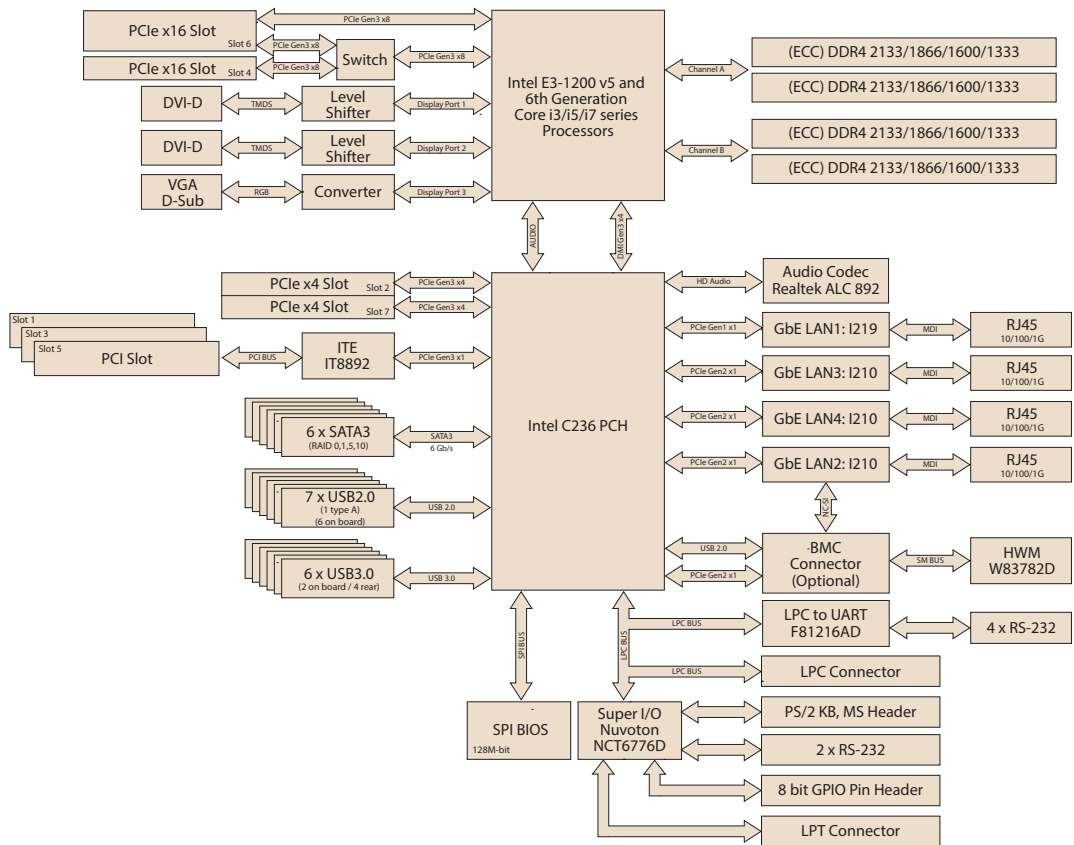
Figure 1.3 ASMB-785 Block Diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis when-ever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sud-den power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative sur-face or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the man-ufacturer. Discard used batteries according to the manufacturer's instructions.*

1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard default settings and your options for each jumper.
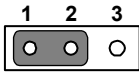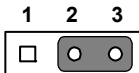
1.8.1 How to set jumpers

You can configure your motherboard to match the needs of your application by set-ting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn on) a jumper, you connect the pins with the clip. To "open" (or turn off) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when set-ting jumpers.

1.8.1.1 CMOS and ME clear (JCMOS1)

The ASMB-785 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set JCMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.
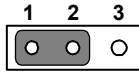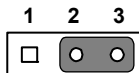
Table 1.5: JCMOS1

Function	Jumper Setting	
* Keep CMOS data	**1 2 3**	1-2 closed
Clear CMOS data	**1 2 3**	2-3 closed

* default setting

1.8.1.2 ME update (JME1)

The ASMB-785 contains a jumper that can update for ME firmware. Normally this jumper should be set with pin 1-2 closed. If you want to update ME firmware, set JME1 to 2-3 closed to disable ME for new ME firmware update.
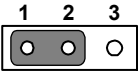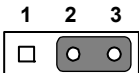
Table 1.6: JME1

Function	Jumper Setting	
*Lock ME update	**1 2 3**	1-2 closed
ME update	**1 2 3**	2-3 closed

* default setting

1.8.1.3 Watchdog timer output (JWDT1)

The ASMB-785 contains a watchdog timer that will reset the CPU. This feature means the ASMB-785 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.7: Watchdog timer output (JWDT1)

Function	Jumper Setting	
*Reset	**1 2 3**	1-2 closed
NC	**1 2 3**	2-3 closed

* default setting
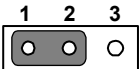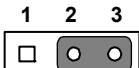
> **Note!** *The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.*

1.8.1.4 USB power switch (JUSB1/JUSB2)

The ASMB-785 contains a jumper that can support on board USB ports power source from +5Vsb or +5V. The JUSB1 jumper controls the USB2.0 and 3.0 ports of rear window. The JUSB2 jumper controls the USB2.0 and 3.0 ports of onboard header and connectors. The default setting is 1-2 closed which supports USB stand-by power under S5. When the jumper is 2-3 closed, the on board USB ports power source will be switched to +5V if you want to disable USB stand-by power under S5, and under 2-3 closed, which won't support S3 and S4 modes.
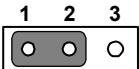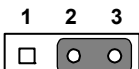
Table 1.8: USB power switch (JUSB1/JUSB2)	
Function	**Jumper Setting**
*+5Vsb	1-2 closed
+5V	2-3 closed
* default setting	

1.8.1.5 CPU,SYSTEM fan PWM/DC mode selection(CPUFAN_SEL1, SYSFAN_SEL1)

The ASMB-785 contains a jumper that can support PWM or DC mode. Normally this jumper should be set with pin 1-2 closed. If you want to change to DC mode, set CPUFAN_SEL1, SYSFAN_SEL1 to 2-3 closed for disable.
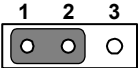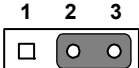
Table 1.9: Fan mode selection (CPUFAN_SEL1, SYSFAN_SEL1)	
Function	Jumper Setting
*PWM mode	1-2 closed
DC mode	2-3 closed
* default setting	

1.8.1.6 ATX/AT mode selector (PSON1)

The ASMB-785 contains a jumper that can support ATX or AT mode. Normally this jumper should be set with pin 2-3 closed. If you want to change to AT mode, set PSON to 1-2 closed.
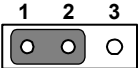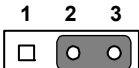
Table 1.10: ATX/AT mode selector (PSON1)

Function	Jumper Setting	
AT Mode	**1 2 3** ⊙ ⊙ ○	1-2 closed
* ATX Mode	**1 2 3** □ ⊙ ⊙	2-3 closed

* default setting

1.8.1.7 PCIe link switch (JPEG1, JPEG2)

The ASMB-785 contains a jumper that can switch one PCIe x16 link on PCIEX16_SLOT6 to two x8 link on PCIEX16_SLOT6 & SLOT4. Default setting with pin 1-2 closed is one x16 on PCIEX16_SLOT6 (PCIEX16_SLOT4 can't work). If you want to use PCIEX16_SLOT4 with x8 link, set JPEG1 to 2-3 closed and keep JPEG2 pin 1-2 closed for enable. Jumper setting for riser card support please refer to Section 2.15 PCIe x16 Expansion Slot.
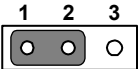
Table 1.11: PCIe link switch (JPEG1)

Function	Jumper Setting	
* One x16 link	**1 2 3** ⊙ ⊙ ○	1-2 closed
Two x8 link	**1 2 3** □ ⊙ ⊙	2-3 closed

* default setting

1.8.1.8 PEG training (JPEG3)

The ASMB-785 contains a jumper that can support PEG training with pin 1-2 closed as default setting.

Table 1.12: PEG training (JPEG3)
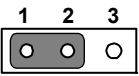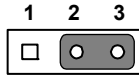
Function	Jumper Setting	
* PEG training	**1 2 3** ⊙ ⊙ ○	1-2 closed

* default setting

1.8.1.9 PCI Clock Selection (JPCICLK1)

JPCICLK1 is a jumper to select PCI slot clock between 66 or 33 MHz, and the default setting is 33 MHz (2-3 closed).

Table 1.13: PCI Clock Selection (JPCICLK1)	
Function	**Jumper Setting**
PCI Clock at 66 MHz	1-2 closed
*PCI Clock at 33 MHz	2-3 closed
* default setting	

1.9 System Memory

ASMB-785 has four 288-pin memory sockets for DDR4 unbuffered ECC/Non-ECC 1600/1866/2133 MHz memory modules with maximum capacity of 64 GB (Maximum 16 GB for each DIMM).

Note! ASMB-785 does NOT support registered DIMMs (RDIMMs).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket, and then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

	Quantity of memory module installed		
	1	2	4
Socket / Color			
DIMM A0 (Black)			V
DIMM A1 (Blue)	V	V	V
DIMM B0 (Black)			V
DIMM B1 (Blue)		V	V

1.11 PCI Bus Routing Table

AD PCI slot INT	PCI_SLOT1 AD16	PCI_SLOT3 AD17	PCI_SLOT5 AD18
A	A	B	C
B	B	C	D
C	C	D	A
D	D	A	B

Chapter 2

Connecting
Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

2.2 USB Ports (LAN1_USB1_2, LAN2_USB5_6, USB3_4, USB7~13)

ASMB-785 provides up to 13 USB ports. USB7~13 are USB 2.0 ports supporting transmission rates up to 480 Mbps, and USB1~6 are USB 3.0 ports supporting transmission rates up to 5Gbps.These ports support Plug & Play and hot swapping for up to 127 external devices, which are able to be disabled in the BIOS menu.

The ASMB-785 is equipped with two (G2 sku) or four (G4 sku) high-performance 1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient 1000 Mbps operation.

If all USB ports will be used, USB power is recommended to switch to +5V instead of +5VSB.
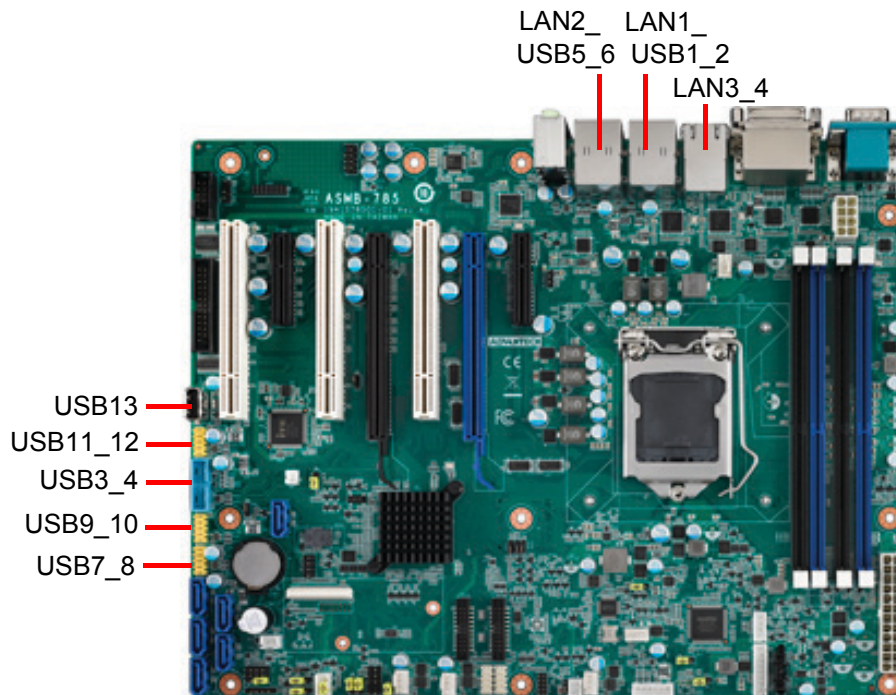
2.3 USB Power Switch (JUSB1/JUSB2)

JUSB2   JUSB1
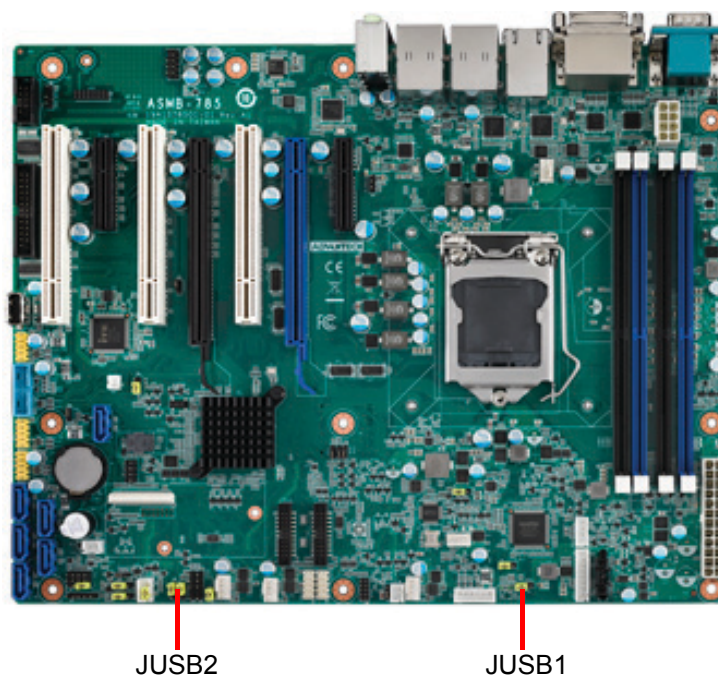
ASMB-785 allows user to set USB power between +5VSB and +5V.

When the jumper is set as +5V, the board doesn't support S3/S4.

Jumper	USB Ports
JUSB1	Rear Window: USB1_2, USB3_4, USB5_6
JUSB2	On board: USB7_8, USB9_10, USB11_12, USB13

> **Note!**
>
> *When USB power is switched to +5V, it can't be connected with pow-ered KVM.*

Table 2.1: USB power switch (JUSB1/JUSB2)

Function	Jumper Setting	
*+5Vsb	1 2 3	1-2 closed
+5V	1 2 3	2-3 closed

* default setting

2.4 VGA and DVI1, DVI2 Connector

DVI1_DVI2   VGA_COM1
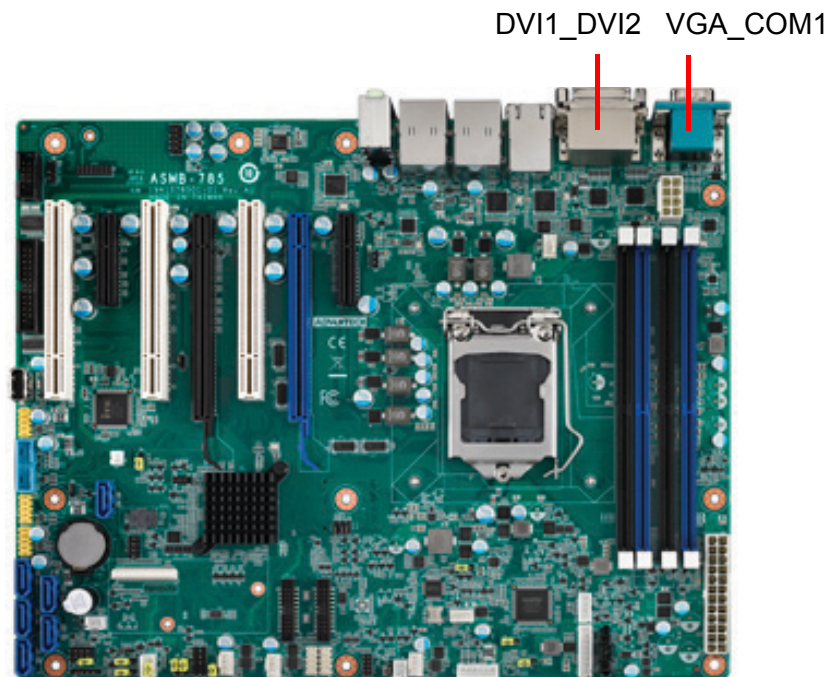
The ASMB-785 includes one VGA and two DVI-D connectors, users could display all ports at the same time (The result may different because of OS support limitations).

2.5   Serial Ports (COM1 ~ COM6)

VGA_COM1

COM2

COM5_6   COM3_4
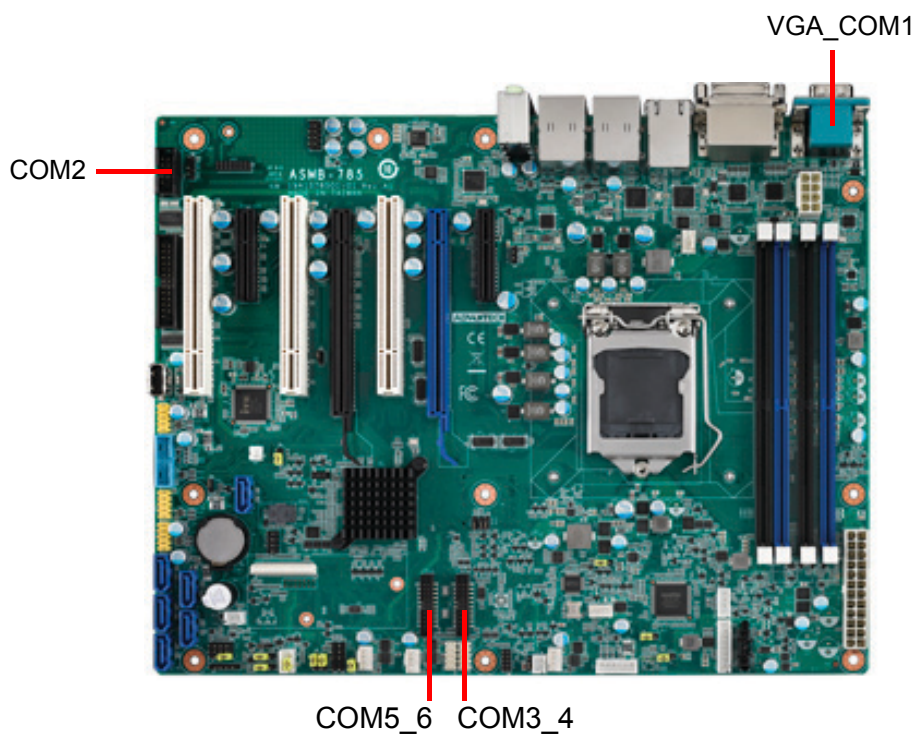
The ASMB-785 offers six serial ports (one on the rear panel and five onboard). All ports can connect to a serial mouse, printer or communications network.

The IRQ and address ranges for those ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways.

2.6 External Keyboard & Mouse (KBMS1)
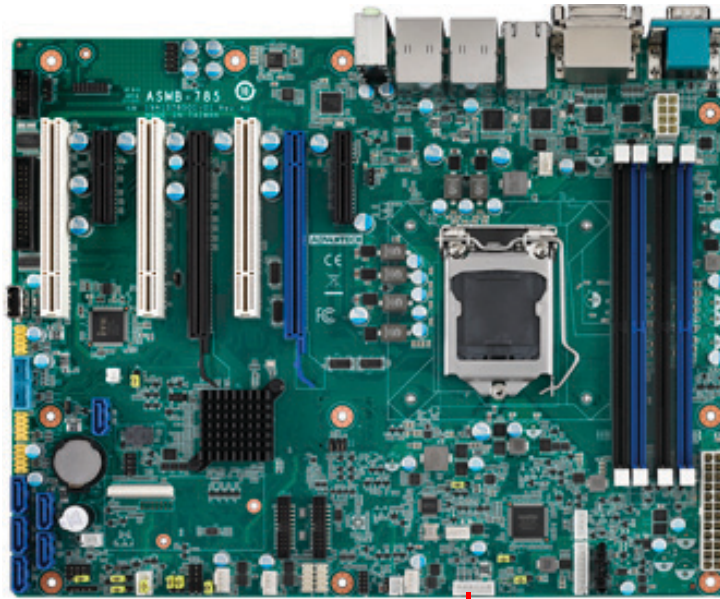
KBMS1

There is an onboard external keyboard and mouse connector on the motherboard. That gives system integrators greater flexibility in designing their systems.

2.7 CPU Fan Connector (CPUFAN0)
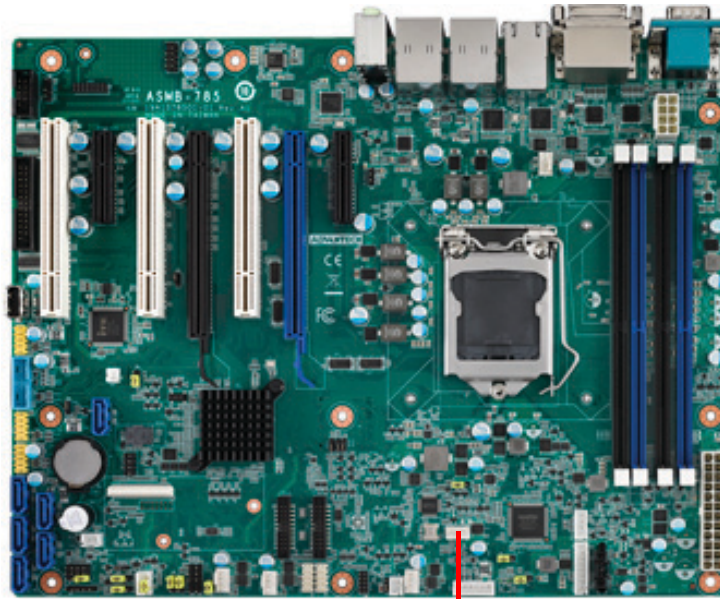
CPUFAN0

If a fan is used, this connector supports cooling fans that draw up to 2.5 A (30 W).

2.8 System FAN Connector (SYSFAN0 ~ SYSFAN3)

SYSFAN3

SYSFAN2   SYSFAN1   SYSFAN0
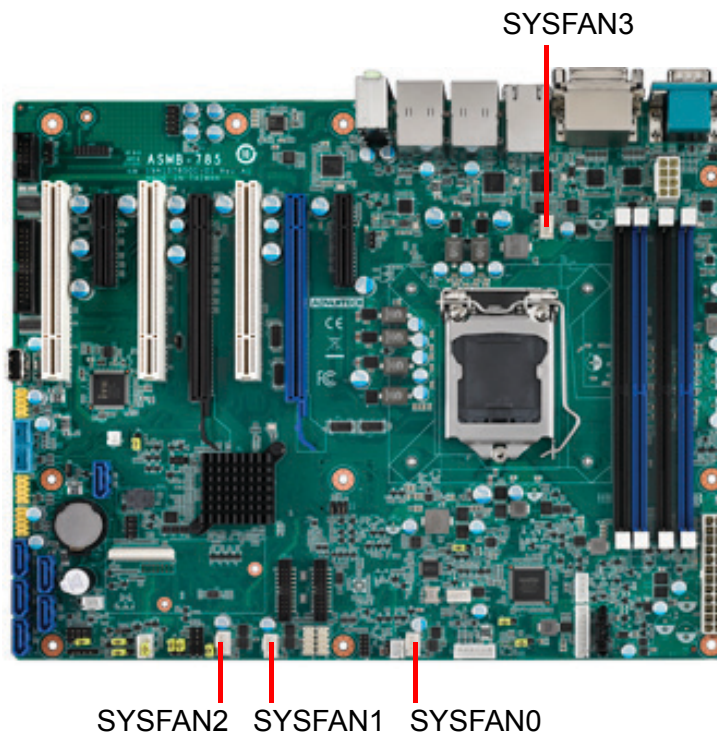
If a fan is used, this connector supports cooling fans that draw up to 2.5 A (30 W).

2.9 Front Panel Connectors (JFP1/2/3)

There are several external switches and LEDs to monitor and control the ASMB-785.

JFP1+JFP2
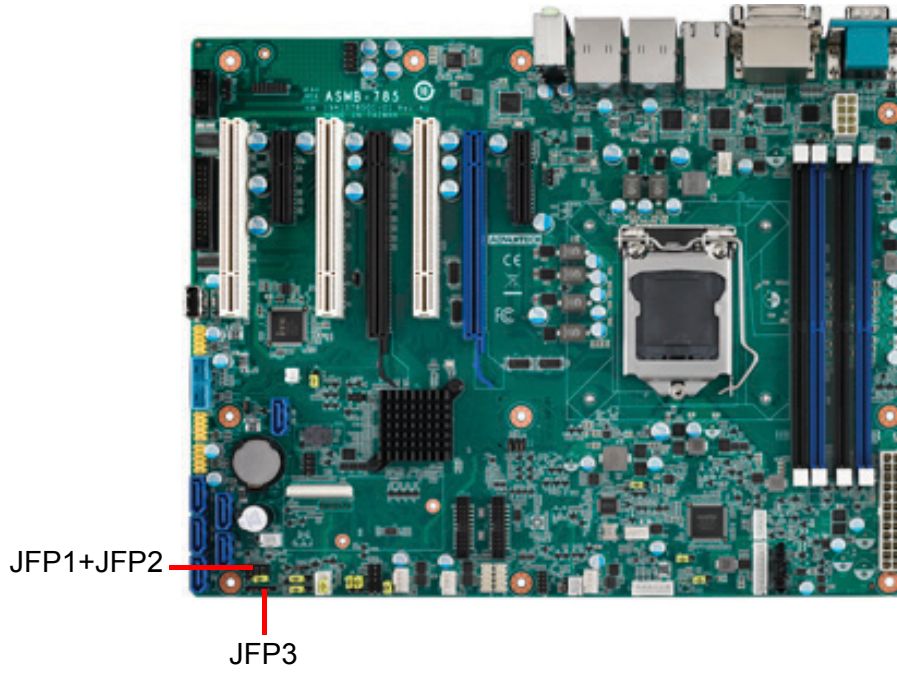
JFP3

JFP1	3	6	9	12
&	2	5	8	11
JPF2 ▷	1	4	7	10

| JFP3 ▷ | 1 | 2 | 3 | 4 | 5 |

PWRSW	RESET
HDDLED	SNMP SM_BUS
SPEAKER	

PWRLED & KEYLOCK

2.9.1 Power LED (JFP3 pins 1, 3)

JFP3 is a 5-pin connector for the power LED. Refer to Appendix B for detailed information on the pin assignments. If a ATX power supply is used, the system's power LED status will be as indicated as follows.

Table 2.2: PS/2 or ATX power supply LED status	
Power mode	LED
System On	On
System Suspend	Fast Flash
System Off	Off
System Off in deep sleep	Off

```
 1  2  3  4  5
┌─────────────┐
│ ▢  ○  ○  ○  ○ │
└─────────────┘
 +        -
```
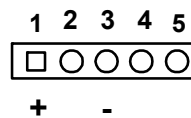
2.9.2 External Speaker (JFP2 pins 1, 4, 7, 10)

JFP2 pins 1, 4, 7, 10 connector for an external speaker. The ASMB-785 provides an onboard buzzer as an alternative. To enable the onboard buzzer, set pins 7-10 as closed.

```
 1    4    7   10
┌────────────────┐
│ ▢   ○    ○    ○ │
└────────────────┘
```
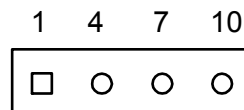
2.9.3 HDD LED Connector (JFP1 pins 2 & 5)

You can connect an LED to connector JFP1 to indicate when the HDD is active.

```
 2    5
┌───────┐
│ ▢   ○ │
└───────┘
```
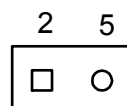
2.9.4 SNMP SMBus Connector (JFP2 pins 8 & 11)

ASMB-785 supports Advantech module for providing a platform independent system management. When you're installing module on ASMB-785, please connect it to pins 8 and 11 of JFP2. (Pin 8 is data pin, pin 11 is clock pin)

```
 8   11
┌───────┐
│ ▢   ○ │
└───────┘
```
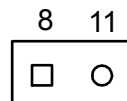
2.9.5 ATX Soft Power Switch (JFP1 pins 3 & 6)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to pins 3 and 6 of JFP1. This connection enables you to turn your computer on and off.

```
 3    6
┌───────┐
│ ▢   ○ │
└───────┘
```
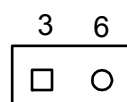
2.9.6 Reset Connector (JFP1 pins 9 & 12)

Many computer cases offer the convenience of a reset button.

9   12
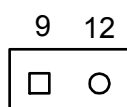
2.10 8-pin Alarm Board Connector (VOLT1)
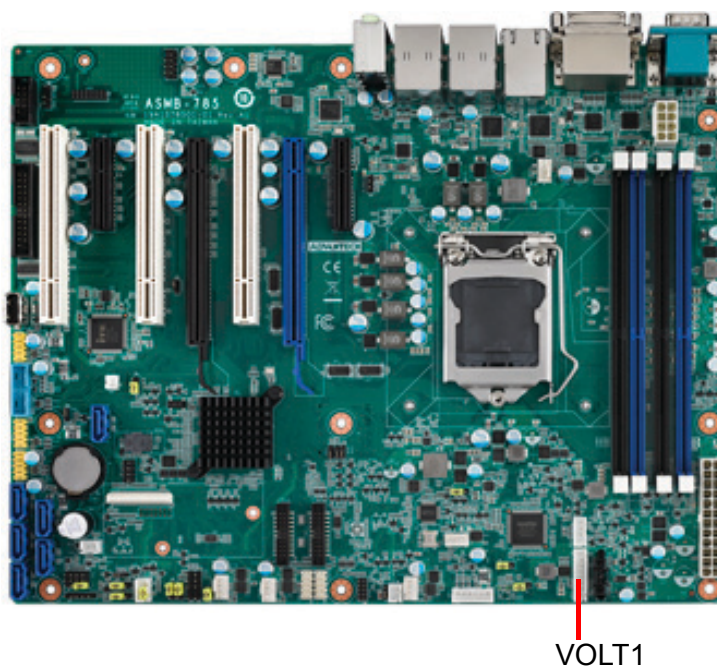
VOLT1

VOLT1 connects to the alarm board of Advantech chassis. These alarm boards monitors the input voltage of +12V, +5V, +5Vsb, -5V +3.3V and -12V, and give warnings if a power supply fails.

2.11 Case Open Connector (JCASE1)
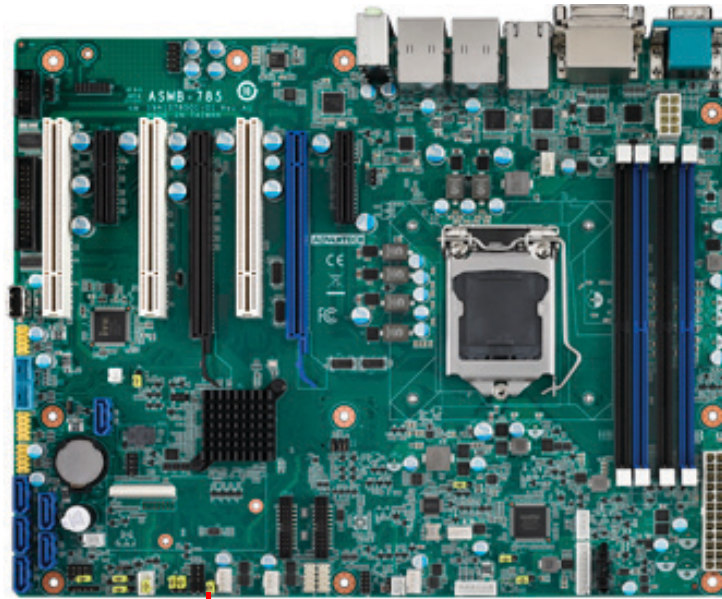
JCASE1

JCASE1 is for chassis with a case open sensor. The defaults setting of JCASE1 is shorted by jumper and disabled in the BIOS. Before using, please remove the jumper and attach the appropriate cable from the chassis. Then, change the BIOS setting to enable the case open function. Please refer to Chapter 3 BIOS Operation, section 3.2.2.6 HW Monitor. If the chassis is opened, the BIOS will inform you with a warning message of a chassis intrusion during system reboot and post screen.

2.12 Front Panel LAN Indicator Connector (LANLED1, LANLED2)

LANLED1 is extension connector of LAN1 & LAN2. LANLED2 is extension connector of LAN3 & LAN4 (G4 SKU only).

Table 2.3: Front Panel LAN Indicator Connector (LANLED1)			
Pin	Signal	Pin	Signal
1	LAN1_LED0_ACT	2	LAN2_LED1_ACT
3	VCC3_LAN1LED	4	VCC3_LAN2LED
5	LAN1_LED1_1000M	6	LAN2_LED2_1000M
7	LAN1_LED2_100M	8	LAN2_LED0_100M
9	VCC3	10	NC

Table 2.4: Front Panel LAN Indicator Connector (LANLED2)			
Pin	Signal	Pin	Signal
1	LAN3_LED1_ACT	2	LAN4_LED1_ACT
3	VCC3_LAN3LED	4	VCC3_LAN4LED
5	LAN3_LED2_1000M	6	LAN4_LED2_1000M
7	LAN3_LED0_100M	8	LAN4_LED0_100M
9	VCC3	10	NC
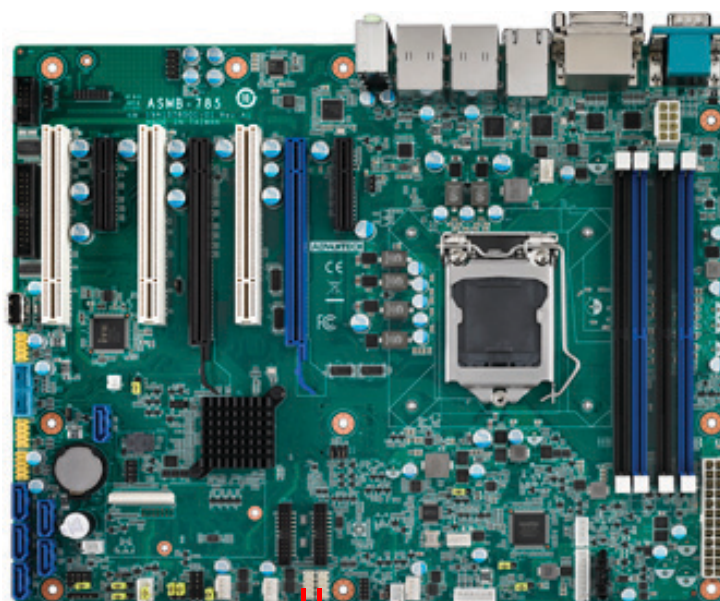
LANLED2 LANLED1
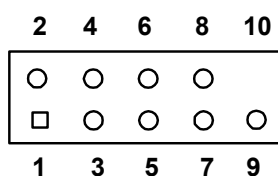
2.13 Serial ATA Interface (SATA0~5)
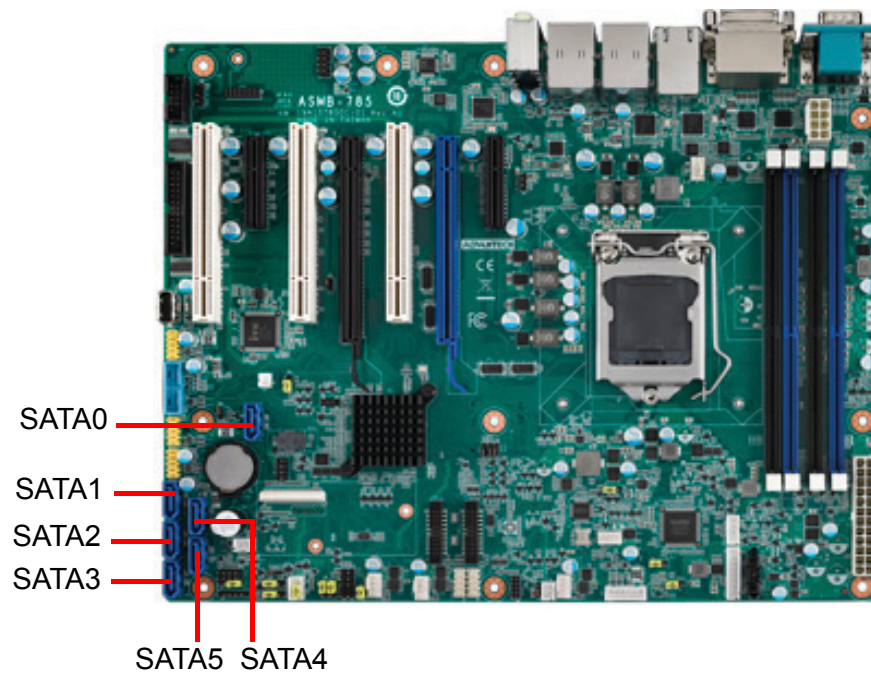
ASMB-785 features six high performance serial ATA III interfaces (up to 600 MB/s, blue connector).

2.14 PCI Slots (PCI_SLOT1, PCI_SLOT3, PCI_SLOT5)

PCI_SLOT1
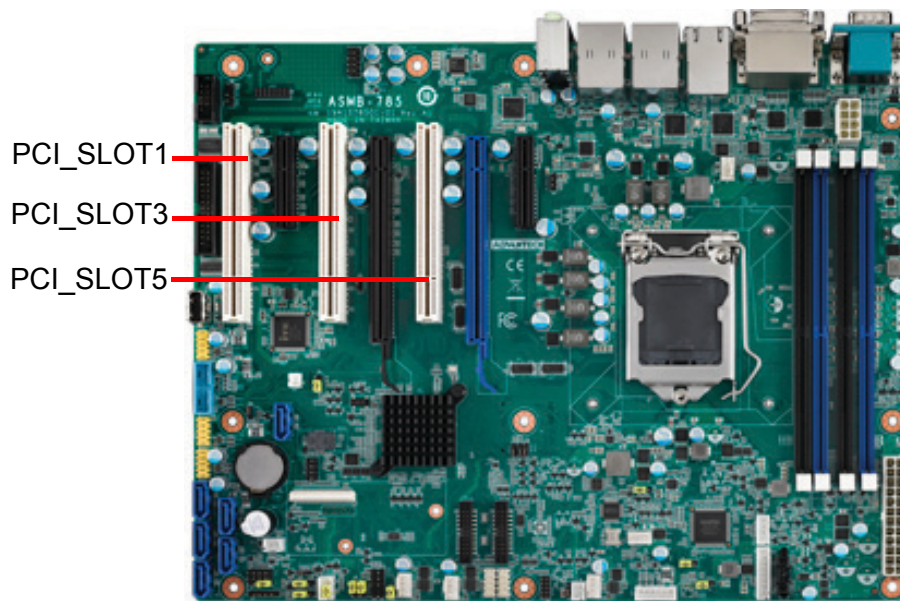
PCI_SLOT3

PCI_SLOT5

There are three 32bit PCI slots designed on ASMB-785, and default clock is 33 Mhz. PCI clock could be selected between 33 or 66 MHz by JPCICLK1 jumper.

2.15 PCIe x16 Expansion Slot (PCIEX16_SLOT4 and PCIEX16_SLOT6)
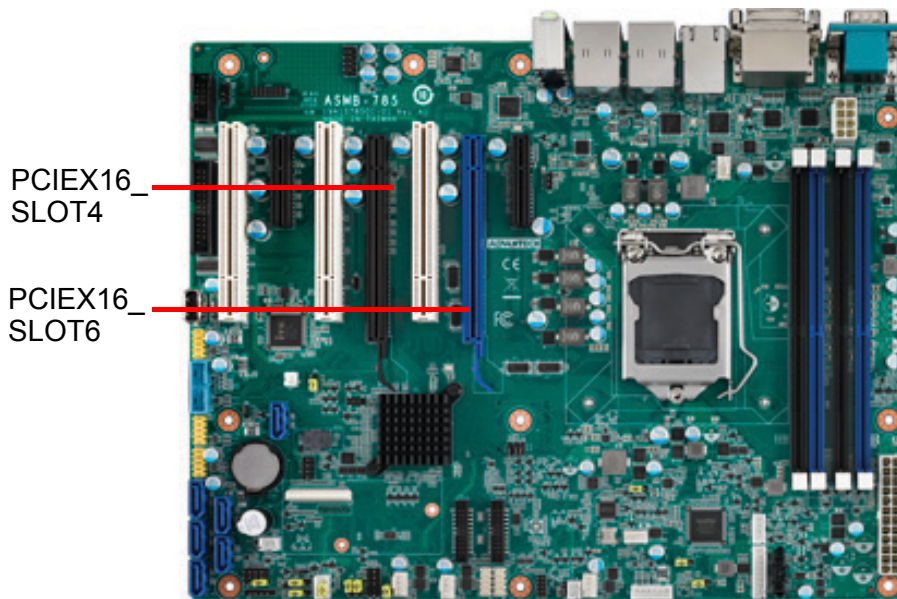
The ASMB-785 provides one PCIe x16 slots (x16 link) or two PCIe x16 slots (x8 link) for users to install add-on VGA cards when their applications require higher graphics performance than the CPU embedded graphics controller can provide, or high band-width demanded I/O cards, such as a frame grabber card, RAID card and a 10G LAN card. One x16 link on PCIEX16_SLOT6 or two x8 link on PCIEX16_SLOT6 & SLOT4 can be set via JPEG1 and JPEG2.

> **Note!** *If there is only one PCIe x16 card it should be installed on PCIEx16_SLOT6, and JPEG1 & JPEG2 is set as 1 PCIe x16 link (both JPEG1 and JPEG2 are 1-2 closed).*

Table 2.5: PCIX16_SLOT6 Configuration for Riser Card (JPEG1, JPEG2)			
Function	**JPEG1**	**JPEG2**	**Riser Card Support**
*PCIe x16	1-2 closed	1-2 closed	1U: AIMB-RF10F-01A1E 2U: AIMB-R431F-21A1E
PCIe x8/x8	1-2 closed	2-3 closed	2U: ASMB-RF3X8-21A1E
PCIe x8/x4/x4	2-3 closed	2-3 closed	2U: ASMB-RF348-21A1E
* default setting			

2.16 PCIe x4 Expansion Slot (PCIEX4_SLOT2, PCIEX4_SLOT7)

PCIEX4_SLOT2   PCIEX4_SLOT7
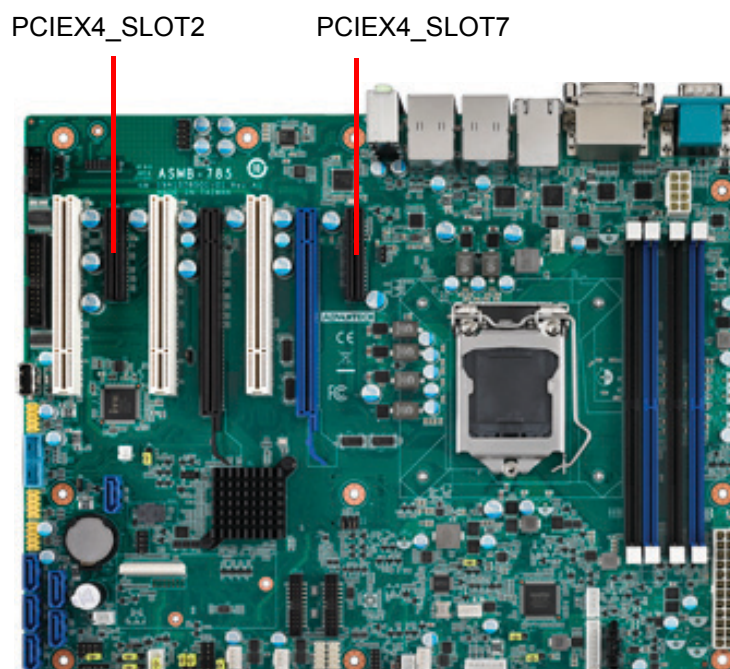
PCIEX4_SLOT2 is Gen3 x4 link.
PCIEX4_SLOT7 is Gen3 x4 link.

2.17 Auxiliary 8-pin power connector (ATX12V1)

For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version). Do not forget to connect the 8-pin EATX12V power plug, otherwise the system will not boot.

ATX12V1
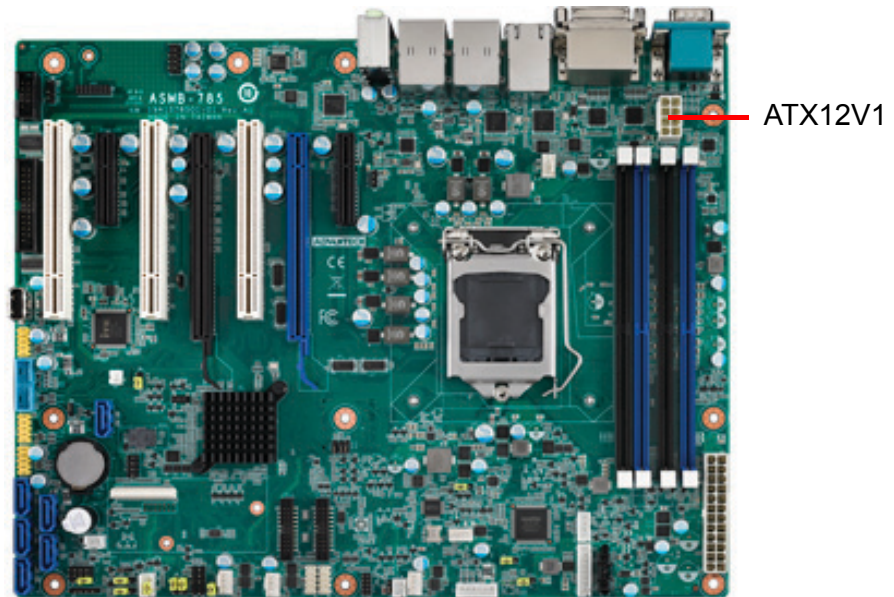
2.18 SPI Flash Connector(SPI_CN1)

SPI flash card pin header can be connected to BIOS-flashing tools to flash the BIOS, during which ASMB-785 cannot be powered on
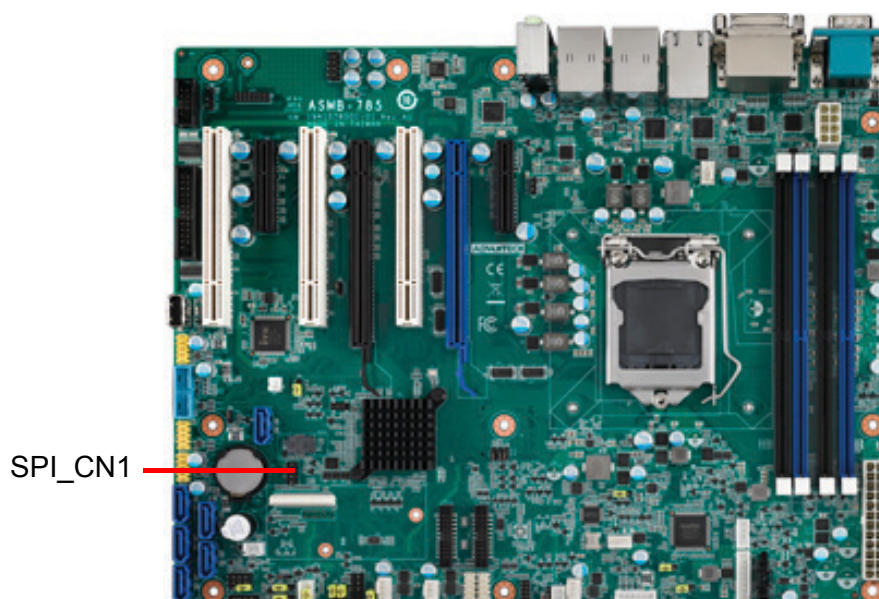
2.19 Low Pin Count Connector (LPC1)
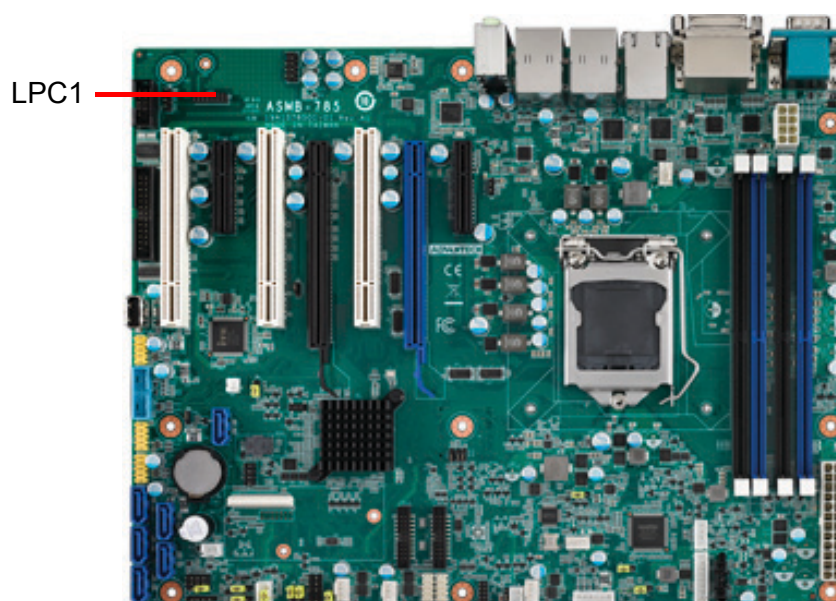
LPC connector on ASMB-785 is reserved for Advantech TPM and COM 232/485 modules. The slot-2 & 3 can't be used when Advantech's COM module is installed.

Table 2.6: Advantech LPC Module List	
Advantech P/N	**Description**
PCA-TPM-00A1E	TPM Module
PCA-COM232-00A1E	4 ports RS-232 module connect to LPC connector

2.20 Parallel Port (LPT1)
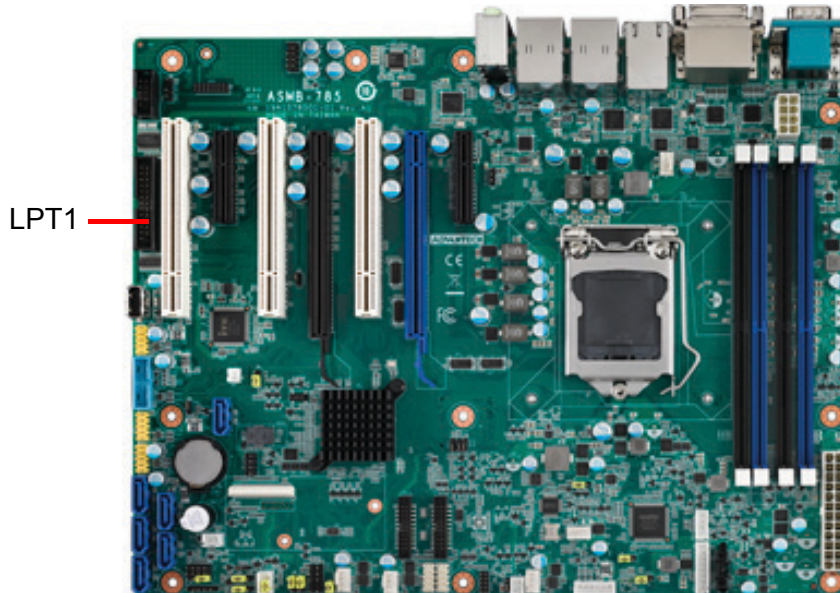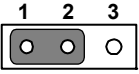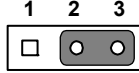
The parallel port is normally used to connect the motherboard to a printer. The ASMB-785 includes an onboard parallel port, accessed through a 25-pin flat-cable connector, LPT1.

2.21 PCI Clock Selection (JPCICLK1)
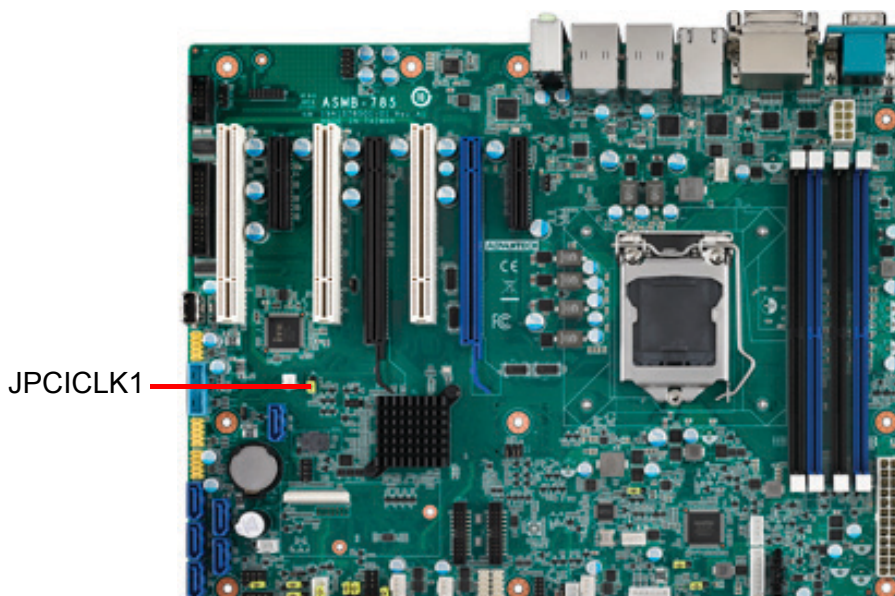
JPCICLK1 is a jumper to select a PCI slot clock speed between 66 or 33 MHz, the default setting is 33 MHz (2-3 closed).

Table 2.7: PCI Clock Selection (JPCICLK1)

Function	Jumper Setting	
PCI Clock at 66 MHz	**1 2 3**	1-2 closed
*PCI Clock at 33 MHz	**1 2 3**	2-3 closed

* default setting

Chapter 3

BIOS Operation

3.1 Introduction

With the AMIBIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the ASMB-785 setup screens.

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
 Main  Advanced  Chipset  Security  Boot  Save & Exit

 BIOS Information                                          Set the Date. Use Tab to
 BIOS Vendor                   American Megatrends         switch between Date elements.
 Core Version                  5.0.1.1   0.25 x64
 Compliancy                    UEFI 2.4; PI 1.3
 BIOS Version                  S785000CF60X009
 Build Date and Time           11/16/2015 14:55:16
 Access Level                  Administrator
 Product Name                  ASMB-785G4


 System Date                   [Tue 12/01/2015]
 System Time                   [10:31:08]
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit




          Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.1 Main setup screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in NVRAM area so it retains the Setup information when the power is turned off.

3.2 Entering BIOS Setup

Press <Del> or <Esc> at bootup to enter AMI BIOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

When users first enter the BIOS Setup Utility, they enter the Main setup screen. Users can always return to the Main setup screen by navigating to the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

3.2.1 Main Menu

Press <Del> or <Esc> at bootup to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
         Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

  BIOS Information                                          Set the Date. Use Tab to
  BIOS Vendor                     American Megatrends       switch between Date elements.
  Core Version                    5.0.1.1   0.25 x64
  Compliancy                      UEFI 2.4; PI 1.3
  BIOS Version                    S785000CF60X009
  Build Date and Time             11/16/2015 14:55:16
  Access Level                    Administrator
  Product Name                    ASMB-785G4


  System Date                     [Tue 12/01/2015]
  System Time                     [10:31:08]
                                                          →←: 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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```

Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ **System time / System date**

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 must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the ASMB-785 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

   BIOS Information                                         Set the Date. Use Tab to
   BIOS Vendor                 American Megatrends          switch between Date elements.
   Core Version                5.0.1.1   0.25 x64
   Compliancy                  UEFI 2.4; PI 1.3
   BIOS Version                S785000CF60X009
   Build Date and Time         11/16/2015 14:55:16
   Access Level                Administrator
   Product Name                ASMB-785G4



   System Date                 [Tue 12/01/2015]
   System Time                 [10:31:08]
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



              Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.3 Advanced BIOS features setup screen

3.2.2.1 Trusted Computing

```
           Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
    Advanced

Configuration                                      Enables or Disables BIOS
  Security Device Support        [Enable]          support for security device.
  Device Select                  [Auto]            O.S. will not show Security
                                                   Device. TCG EFI protocol and
                                                   INT1A interface will not be
Current Status Information                         available.
  NO Security Device Found




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


           Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.4 TPM Settings

■ **Security Device Support**
"Enable" or "disable" TPM Support. You can purchase Advantech LPC TPM module to enable TPM function. P/N: PCA-TPM-00A1E

3.2.2.2 ACPI Settings
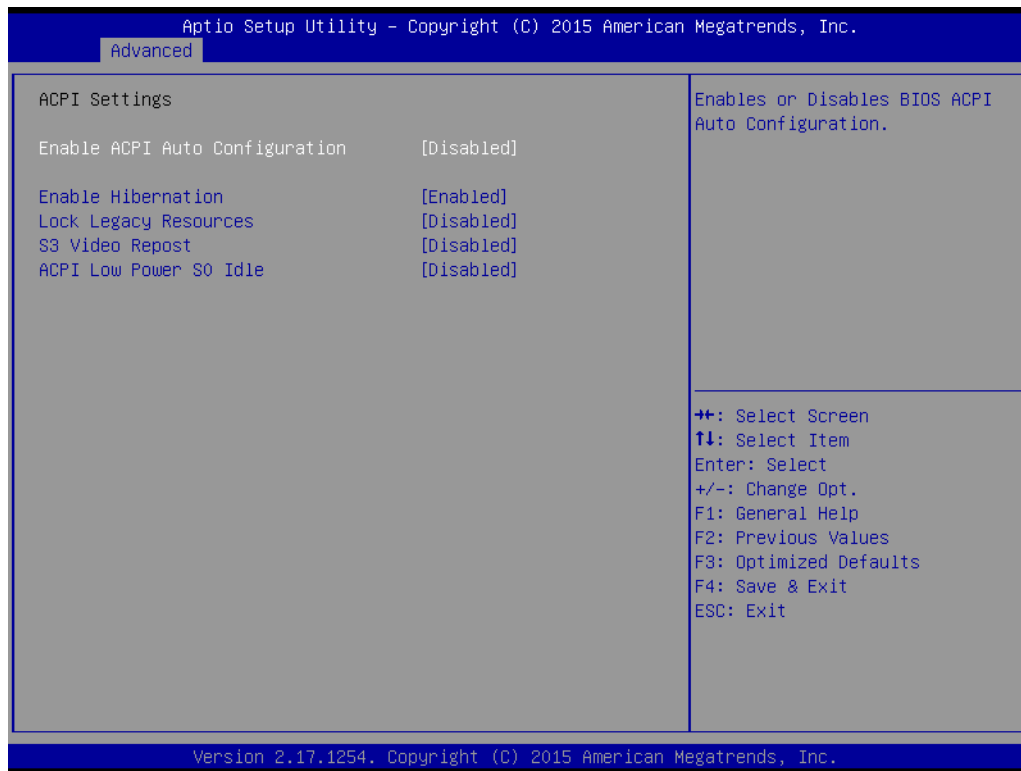
Figure 3.5 ACPI Settings

- ■ **Enable ACPI Auto Configuration**
  "Enable" or "Disable" BIOS ACPI Auto Configuration.
- ■ **Enable Hibernation**
  "Enable" or "disable" Hibernation.
- ■ **ACPI Sleep State**
  Specifies the ACPI sleep state when the system enters suspend.
- ■ **Lock Legacy Resources**
  "Enable" or "Disable" Lock Legacy Resources.
- ■ **S3 Video Repost**
  This item is to enabled or disabled S3 video repost.
- ■ **ACPI Low Power S0 Idle**
  "Enable" or "Disable" ACPI Low Power S0 Idle support.

3.2.2.3 AMT Configuration
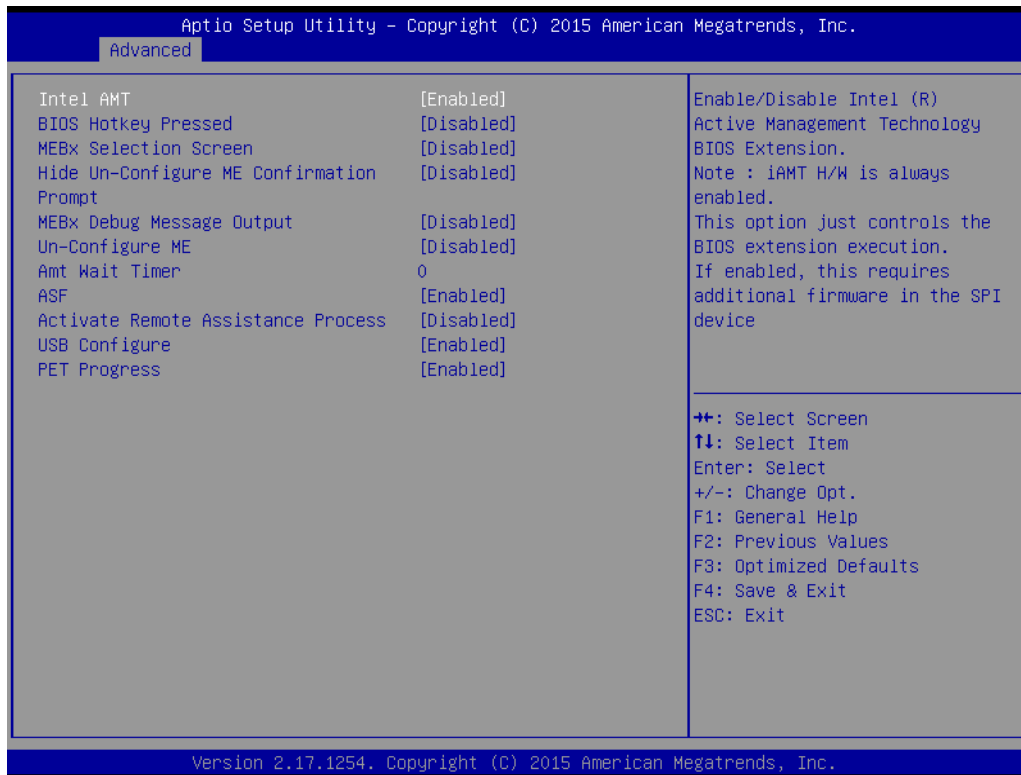
Figure 3.6 AMT Configuration

■ **Intel AMT**

   Enable or Disable Intel Active Management Technology BIOS Extension.

■ **BIOS Hotkey Pressed**

   To enable or disable BIOS hotkey press.

■ **MEBx Selection Screen**

   "Enable or Disable" MEBx selection screen.

■ **Hide Un-Configure ME Confirmation Prompt**

   Hide un-configuration ME without password confirmation prompt.

■ **MEBx Debug Message Output**

   Enable MEBx debug message output.

■ **Un-Configure ME**

   To un-configure ME without password.

■ **AMT Wait Timer**

   To set a waiting time before sending ASF_BOOT_OPTIONS.

■ **Disable ME**

   Set ME to Soft temporary disable.

■ **ASF**

   Enable or disable Alert Specification format.

■ **Activate Remote Assistance Process**

   To trigger CIRA boot.

■ **USB Configure**

   To enable or disable USB configure function.

■ **PET Progress**

   Enable or disable PET event progress to receive PET events.

3.2.2.4 PCH-FW Configuration
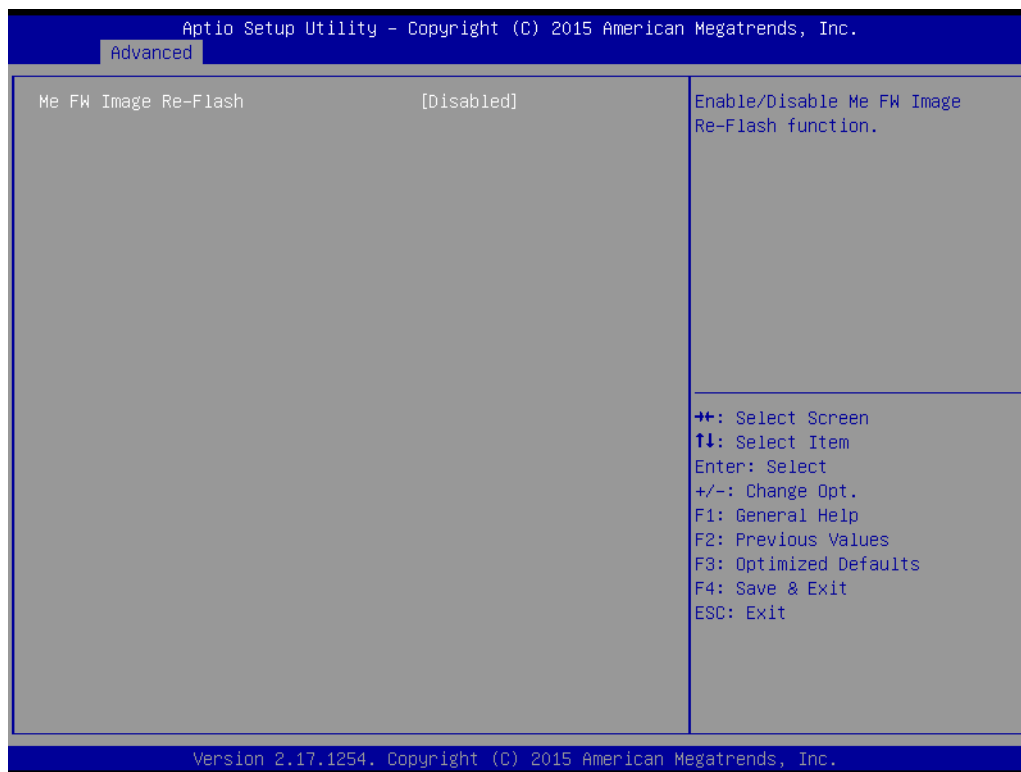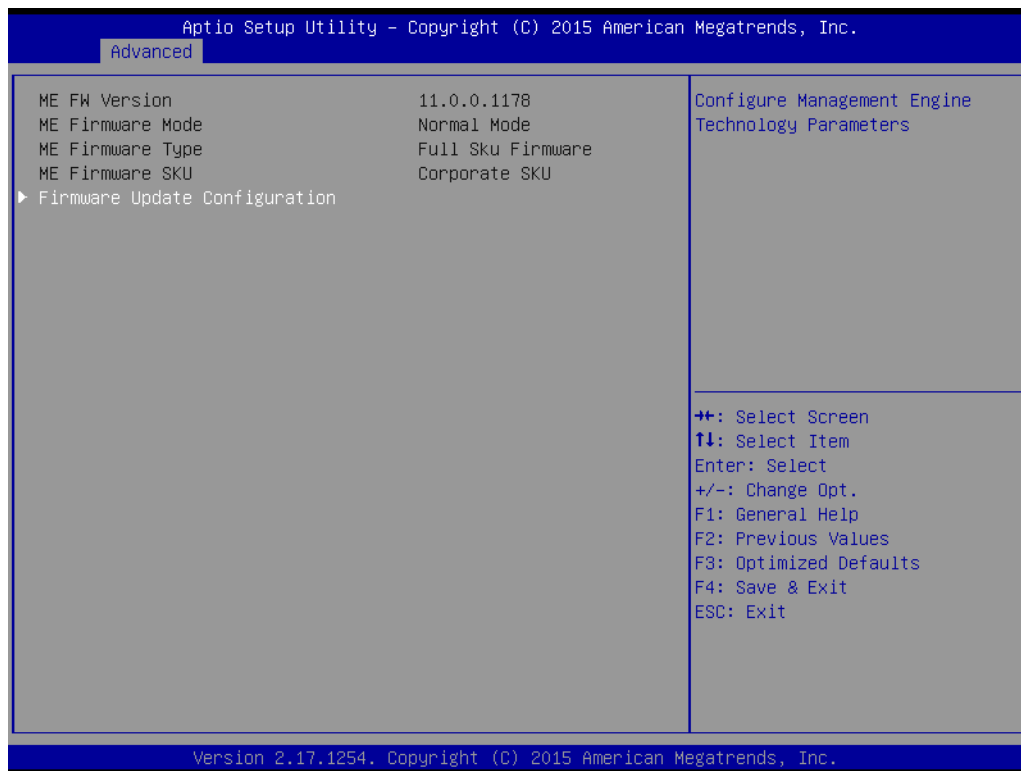
Figure 3.7 Intel ME FW Configuration Information

This page shows the Intel ME configuration.

■ **ME FW Image Re-flash**

"Enable" or "Disable" ME FW Image Re-Flash function.

3.2.2.5 SMART Settings

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

  SMART Settings                                              Run SMART Self Test on all
                                                              HDDs during POST.
  SMART Self Test                  [Disabled]









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



                    Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```
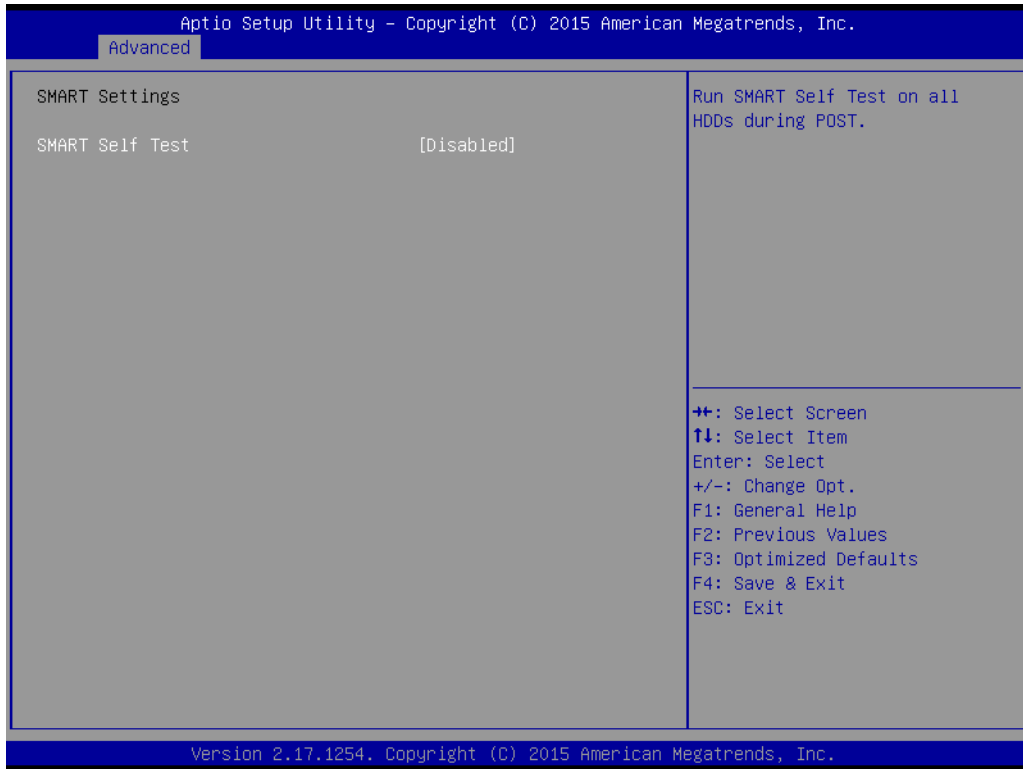
Figure 3.8 SMART Setting

■ **SMART Self Test**

This item is to enable or disable SMART self test on all HDDs during post.

■ **NCT6776 HW Monitor**

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

  Case Open Warning                [Disabled]                 Enable or Disable Case Open
  Wake On Ring                     [Disabled]                 Warning
  Watch Dog Timer                  [Disabled]
  CPU Warning Temperature          [Disabled]
  ACPI Shutdown Temperature        [Disabled]
  Smart Fan Function               [Normal Mode]

  PC Health Status
  System Inlet Temperature         : +34°C
  System Outlet Temperature        : +30°C
  CPU Temperature(PECI)            : +25°C

  CPU Fan Speed                    : 5000 RPM
  System Fan0 Speed                : N/A                      ↔: Select Screen
  System Fan1 Speed                : N/A                      ↑↓: Select Item
  System Fan2 Speed                : N/A                      Enter: Select
  System Fan3 Speed                : N/A                      +/-: Change Opt.
                                                              F1: General Help
  CPU Voltage                      : +2.224 V                 F2: Previous Values
  +12V                             : +12.233 V                F3: Optimized Defaults
  +5V                              : +5.054 V                 F4: Save & Exit
  +5VSB                            : +5.022 V                 ESC: Exit
  +3.3V                            : +3.376 V
  +3.3VSB                          : +3.312 V
  +VBAT                            : +2.928 V


                    Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.9 PC Health Status

- ◼ **Case Open Warning**

  Enable/Disable the chassis Intrusion monitoring function. When enabled and the case is opened, a warning message will show in post screen.

- ◼ **Wake On Ring**

  Enable/Disable Wake On Ring Function.

- ◼ **Watch Dog Timer**

  Enable/Disable Watch Dog Timer Function.

- ◼ **CPU Warning Temperature**

  Use this to set the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.

- ◼ **ACPI Shutdown Temperature**

  Use this to set the ACPI shutdown temperature threshold. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheat damage.

- ◼ **Smart Fan Function**

  ASMB-785 offers three different fan curves:

  1.Normal Mode - Enable smart fan for normal system configuration.

  2.Quiet Mode - Enable smart fan for quiet system with no expansion cards.

  3.Disable - All fans run as full speed.

3.2.2.6 COM1/COM2/LPT Configuration

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
       Advanced

    COM1/COM2/LPT Configuration                              Set Parameters of Serial Port
                                                             1 (COM1)
    Super IO Chip                        NCT6776
 ▶ COM1 Configuration
 ▶ COM2 Configuration
 ▶ Parallel Port Configuration




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



                Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.10 COM1/COM2/LPT Configuration
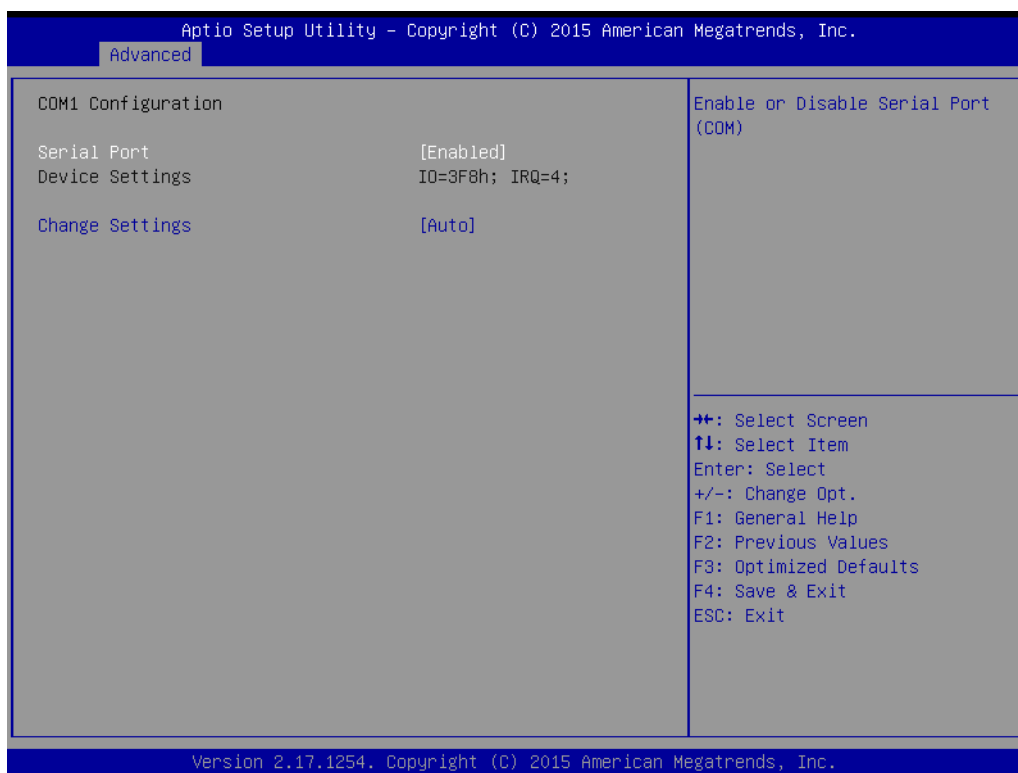
Figure 3.11 COM1 Configuration

Figure 3.12 COM2 Configuration

COM1 Configuration

■ **Serial Port**
"Enable" or "disable" COM1.

■ **Change Settings**
Select optimal settings for COM1.

COM2 Configuration

■ **Serial Port**

"Enable" or "disable" COM2.

■ **Change Settings**

Select optimal settings for COM2.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

    Parallel Port Configuration                                    Enable or Disable Parallel
                                                                   Port (LPT/LPTE)
    Parallel Port                      [Enabled]
    Device Settings                    IO=378h; IRQ=7; DMA=3;

    Change Settings                    [Auto]
    Device Mode                        [ECP and EPP 1.9 Mode]



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



                Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.13 Parallel Port Configuration

■ **Parallel Port Configuration**

Enable or disable Parallel Port.

3.2.2.7 COM3/4/5/6 Configuration
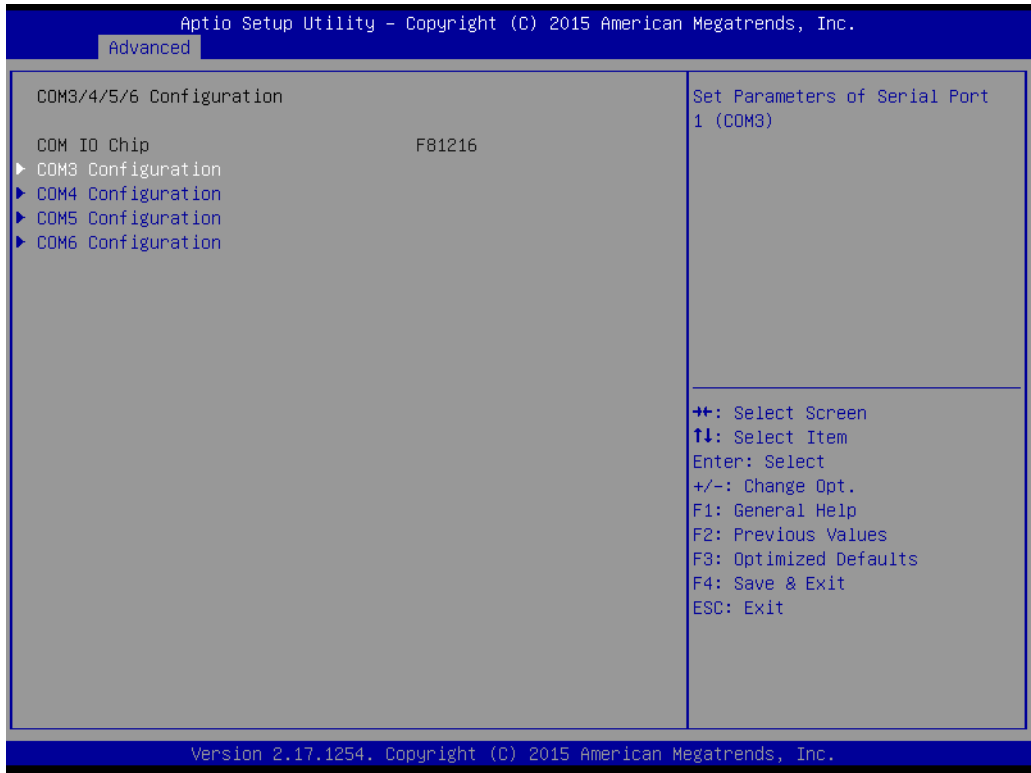
Figure 3.14 COM3/4/5/6 Configuration
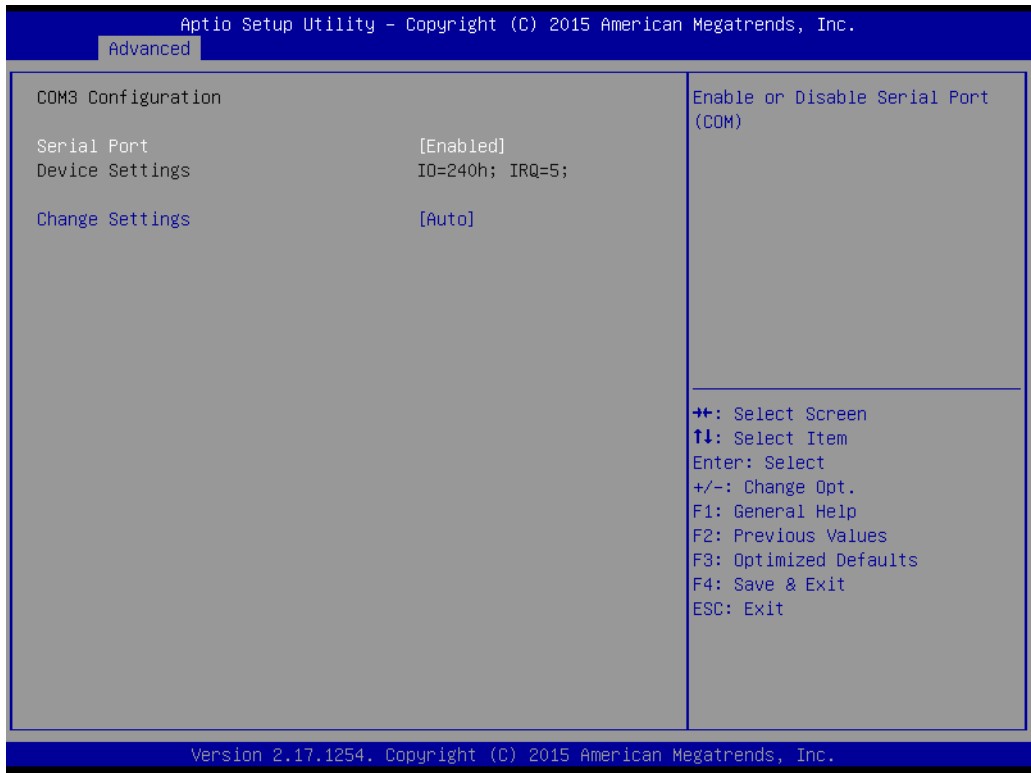
Figure 3.15 COM3 Configuration
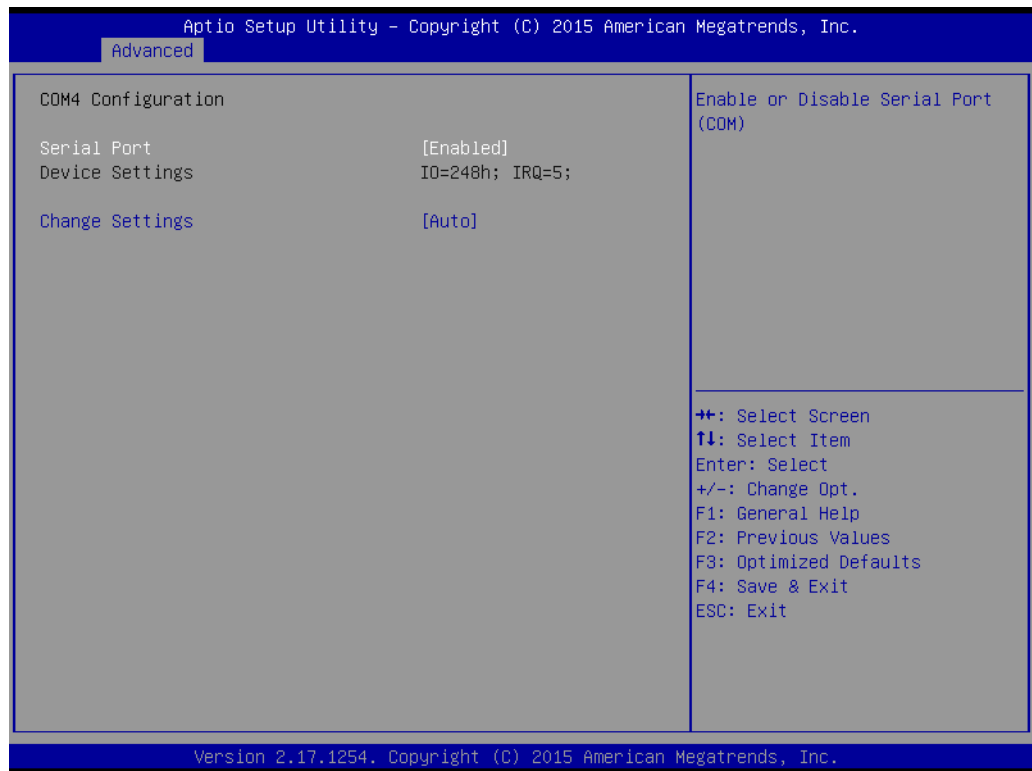
Figure 3.16 COM4 Configuration
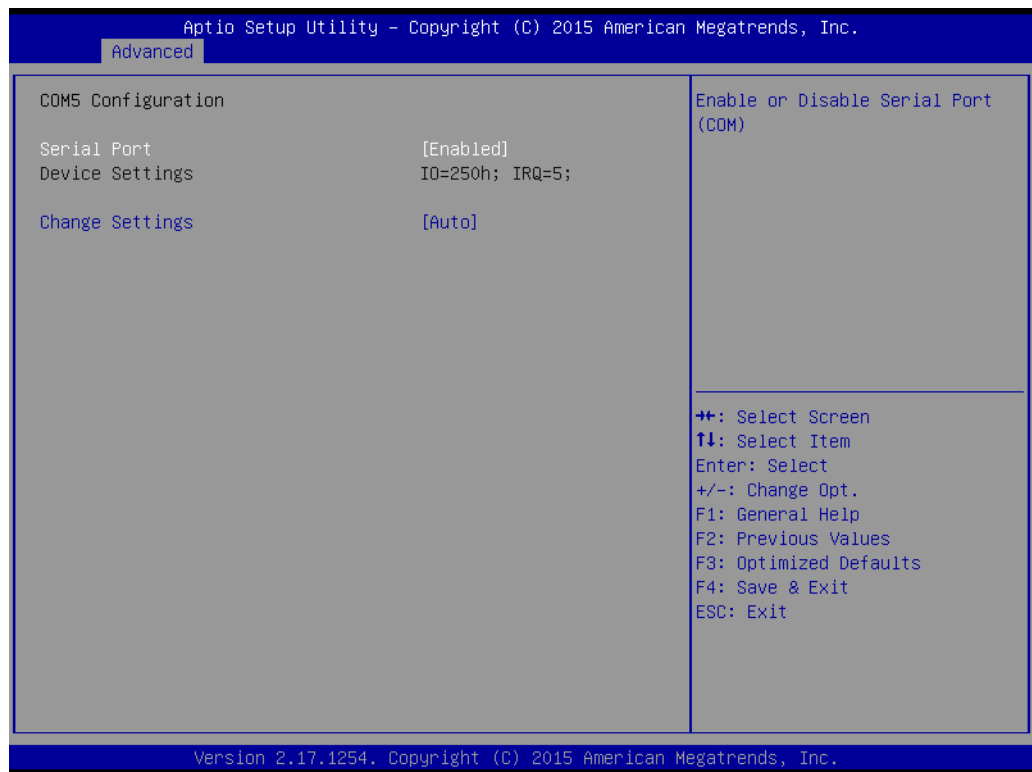
Figure 3.17 COM5 Configuration

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Advanced

     COM6 Configuration                                       Enable or Disable Serial Port
                                                              (COM)
     Serial Port                      [Enabled]
     Device Settings                  IO=258h; IRQ=5;

     Change Settings                  [Auto]



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



            Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.18 COM6 Configuration

COM3 Configuration

■ **Serial Port**
"Enable" or "Disable" COM3.

■ **Change Settings**
Select optimal settings for COM3.

COM4 Configuration

■ **Serial Port**
"Enable" or "Disable" COM4.

■ **Change Settings**
Select optimal settings for COM4.

COM5 Configuration

■ **Serial Port**
"Enable" or "Disable" COM5.

■ **Change Settings**
Select optimal settings for COM5.

COM6 Configuration

■ **Serial Port**
"Enable" or "Disable" COM6.

■ **Change Settings**
Select optimal settings for COM6.

3.2.2.8 PCA-COM232/COM485 Configuration

> *Note!*   *(This item only shows when a PCA COM module is installed)*
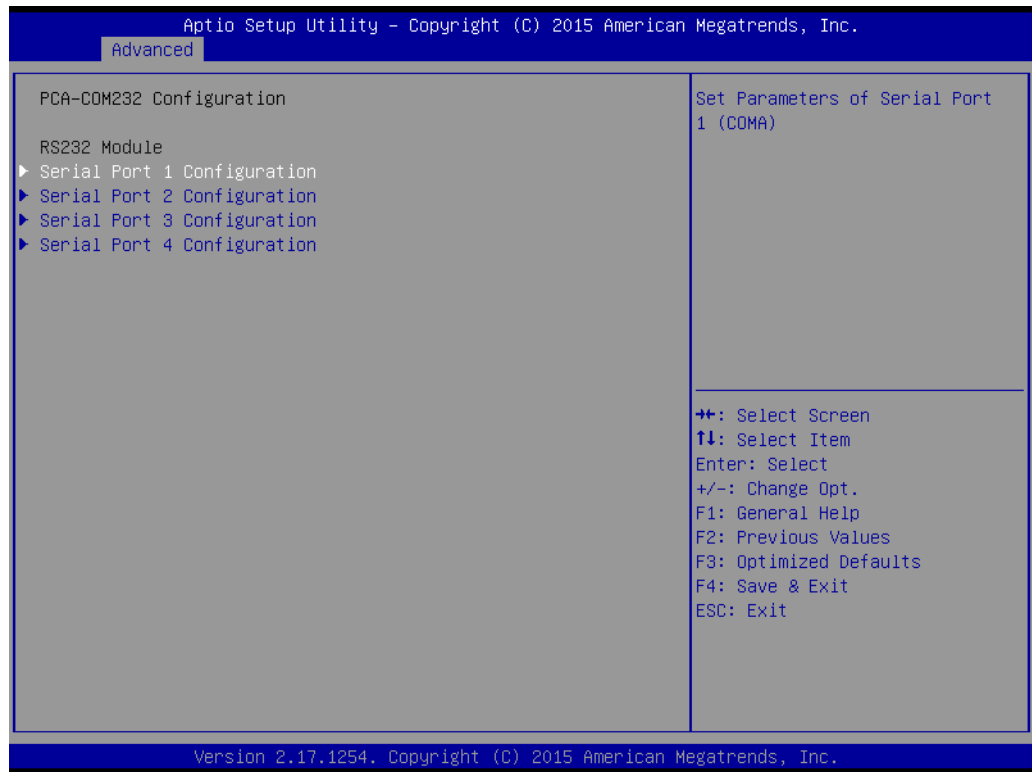
Figure 3.19 PCA-COM232 Configuration

ASMB-785 offers extra four COM ports through LPC connector.

You need to purchase "PCA-COM232-00A1E" or "PCA-COM485-00A1E" then install it in the LPC connector.
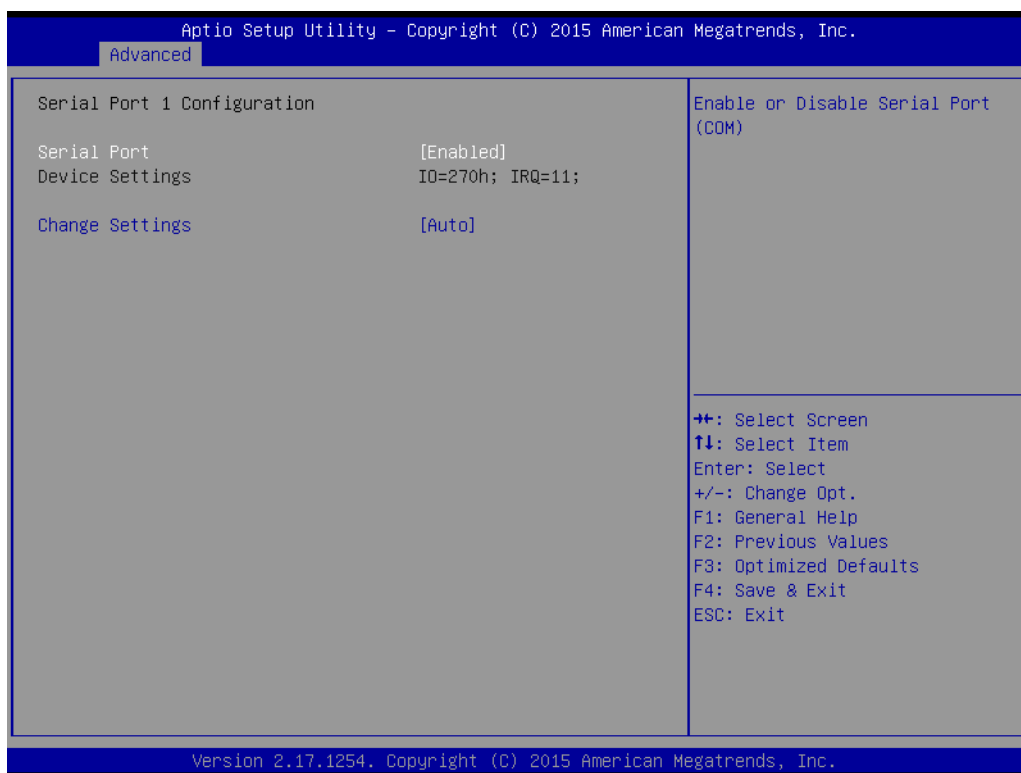
Figure 3.20 Serial Port 1 Configuration

Serial Port 1 Configuration

■ **Serial Port**
"Enable" or "Disable" Serial Port 1.

■ **Change Settings**
Select optimal settings for Serial Port 1.

Serial Port 2 Configuration

■ **Serial Port**
"Enable" or "Disable" Serial Port 2.

■ **Change Settings**
Select optimal settings for Serial Port 2.

Serial Port 3 Configuration

■ **Serial Port**
"Enable" or "Disable" Serial Port 3.

■ **Change Settings**
Select optimal settings for Serial Port 3.

Serial Port 4 Configuration

■ **Serial Port**
"Enable" or "Disable" Serial Port 4.

■ **Change Settings**
Select optimal settings for Serial Port 4.

3.2.2.9 Serial Port Console Redirection


```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
         Advanced

                                                                          Console Redirection Enable or
         COM1                                                             Disable.
         Console Redirection                      [Disabled]
     ▶ Console Redirection Settings

         Intel ME SOL (Disabled)
         Console Redirection                      Port Is Disabled

         Legacy Console Redirection
     ▶ Legacy Console Redirection Settings

         Serial Port for Out-of-Band Management/
         Windows Emergency Management Services (EMS)            ─────────────────────────
         Console Redirection                      [Disabled]
     ▶ Console Redirection Settings                            ↔: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit




                Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
         Advanced

         Legacy Serial Redirection Port        [COM1]           Select a COM port to display
                                                                redirection of Legacy OS and
                                                                Legacy OPROM Messages







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



                Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.21 Serial Port Console Redirection

■ **Console Redirection**
Enable or disable the console redirection feature.

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Advanced

    COM1                                               Emulation: ANSI: Extended
    Console Redirection Settings                       ASCII char set. VT100: ASCII
                                                       char set. VT100+: Extends
    Terminal Type                  [ANSI]              VT100 to support color,
    Bits per second                [115200]           function keys, etc. VT-UTF8:
    Data Bits                      [8]                 Uses UTF8 encoding to map
    Parity                         [None]              Unicode chars onto 1 or more
    Stop Bits                      [1]                 bytes.
    Flow Control                   [None]
    VT-UTF8 Combo Key Support      [Enabled]
    Recorder Mode                  [Disabled]
    Resolution 100x31              [Enabled]
    Legacy OS Redirection Resolution [80x24]
    Putty KeyPad                   [VT100]          ++: Select Screen
    Redirection After BIOS POST    [Always Enable]  ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

            Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.22 Console Redirection Settings

■ **Terminal Type**

Select a terminal type to be used for console redirection.

Options available: VT100/VT100+/ANSI /VT-UTF8.

■ **Bits per second**

Select the baud rate for console redirection.

Options available: 9600/19200/57600/115200.

■ **Data Bits**

This item is to set data bits between [8] or [7].

■ **Parity**

A parity bit can be sent with the data bits to detect some transmission errors.

Even: parity bit is 0 if the num of 1's in the data bits is even.

Odd: parity bit is0if num of 1's the data bits is odd.

Mark: parity bit is always 1. Space: Parity bit is always 0.

Mark and Space Parity do not allow for error detection.

Options available: None/Even/Odd/Mark/Space.

■ **Stop Bits**

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Options available: 1/2.

■ **Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Options available: None/Hardware RTS/CTS.

- **VT-UTF8 Combo Key Support**

  To enable VT-UTF8 combination key for supporting ANSI/VT100 terminals.
- **Recorder Mode**

  When this mode enabled, only text will be send. This is to capture Terminal data.

  Options available: Enabled/Disabled.
- **Resolution 100x31**

  Enables or disables extended terminal resolution.

  Options available: Enabled/Disabled.
- **Legacy OS Redirection Resolution**

  On Legacy OS, the number of Rows and Columns supported redirection.

  Options available: 80x24/80X25.
- **Putty Keypad**

  To support selection function key and keypad on Putty.
- **Redirection After BIOS POST**

  The settings specify if Bootloader is selected then legacy console redirection is disabled before booting to legacy OS.

  Default value is always enable which means legacy console redirection is enabled for legacy OS.
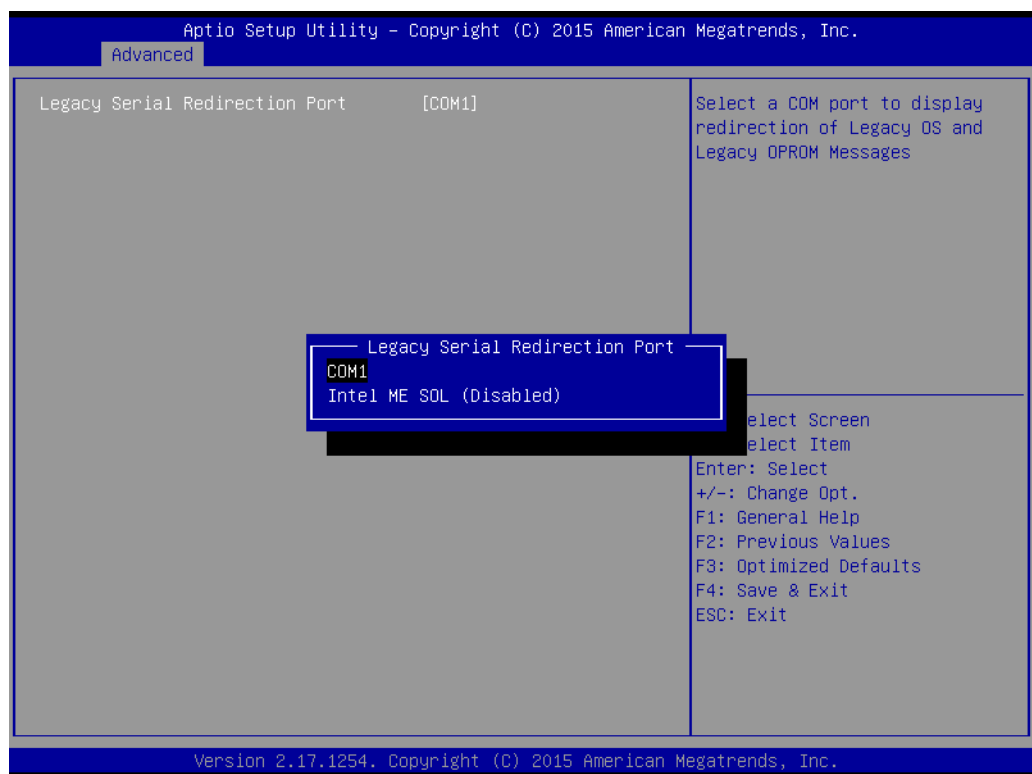
Figure 3.23 Legacy Console Redirection Settings

- **Legacy Console Redirection Settings**

  Select a COM port to display redirection of legacy OS and legacy OpROM messages.

```
         Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
 Advanced

 Out-of-Band Mgmt Port          [COM1]              Microsoft Windows Emergency
 Terminal Type                  [VT-UTF8]           Management Services (EMS)
 Bits per second                [115200]            allows for remote management
 Flow Control                   [None]              of a Windows Server OS through
 Data Bits                      8                   a serial port.
 Parity                         None
 Stop Bits                      1




                                                    →←: 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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```

Figure 3.24 Console Redirection Settings for EMS

■ **Out-of-Band Mgmt Port**
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

■ **Terminal Type**
Select a terminal type to be used for console redirection.
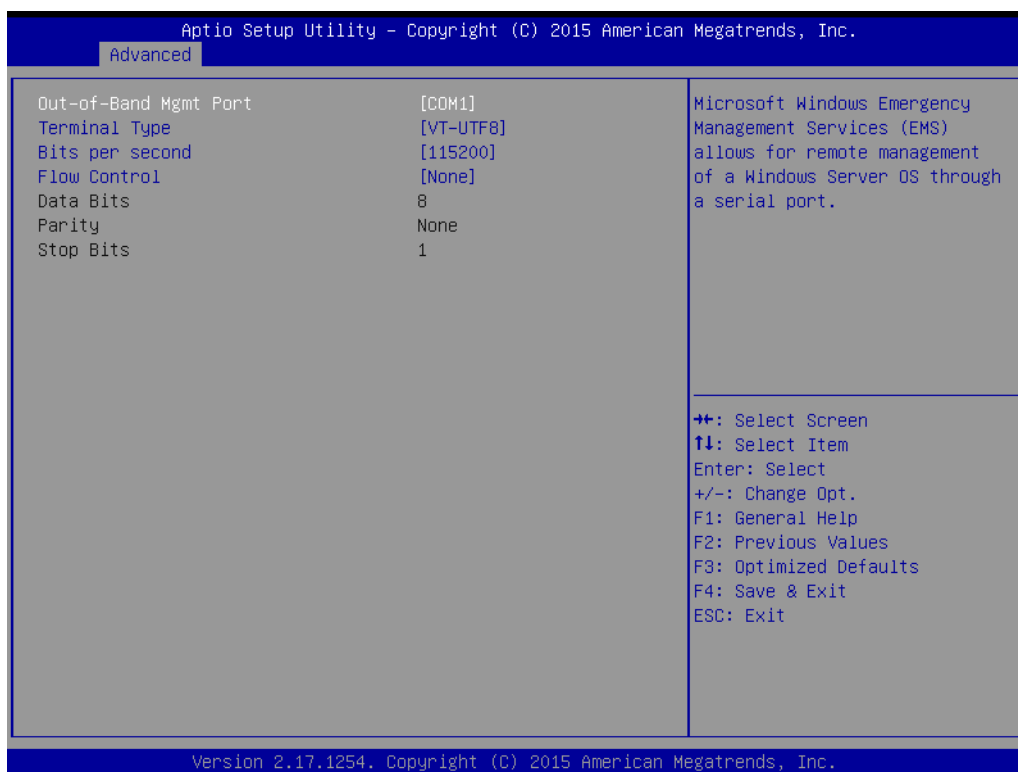Options available: VT100/VT100+/ANSI /VT-UTF8.

■ **Bits per second**
Select the baud rate for console redirection.
Options available: 9600/19200/57600/115200.

■ **Flow Control**
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
Options available: None/Hardware RTS/CTS.

3.2.2.10 CPU Configuration
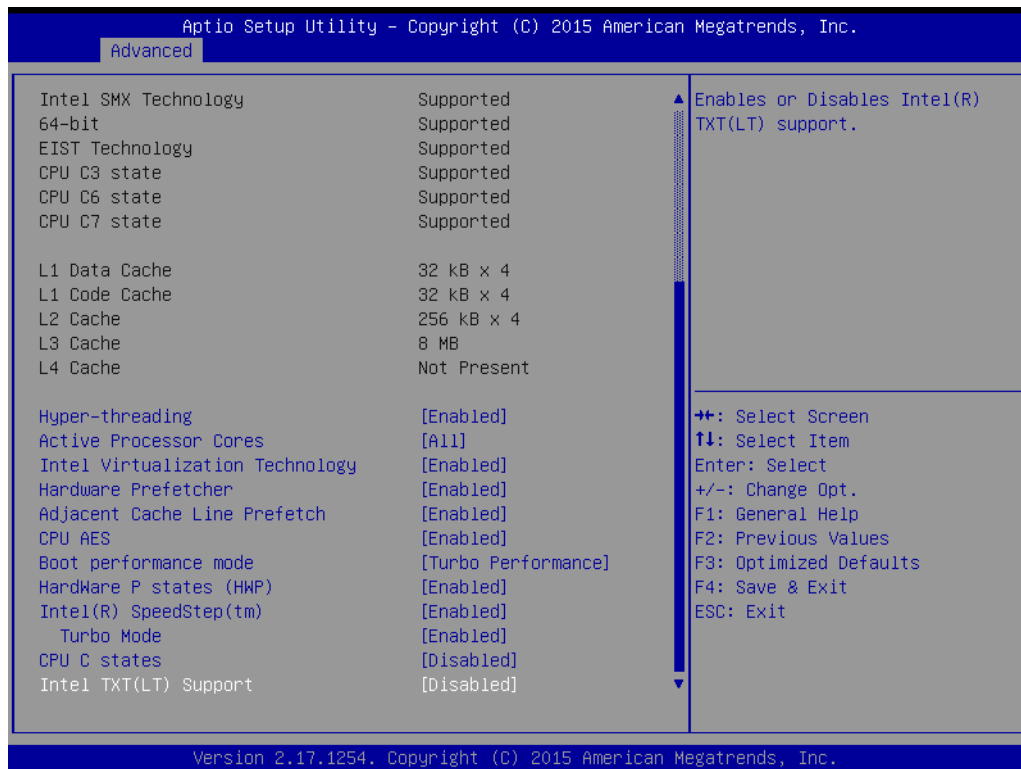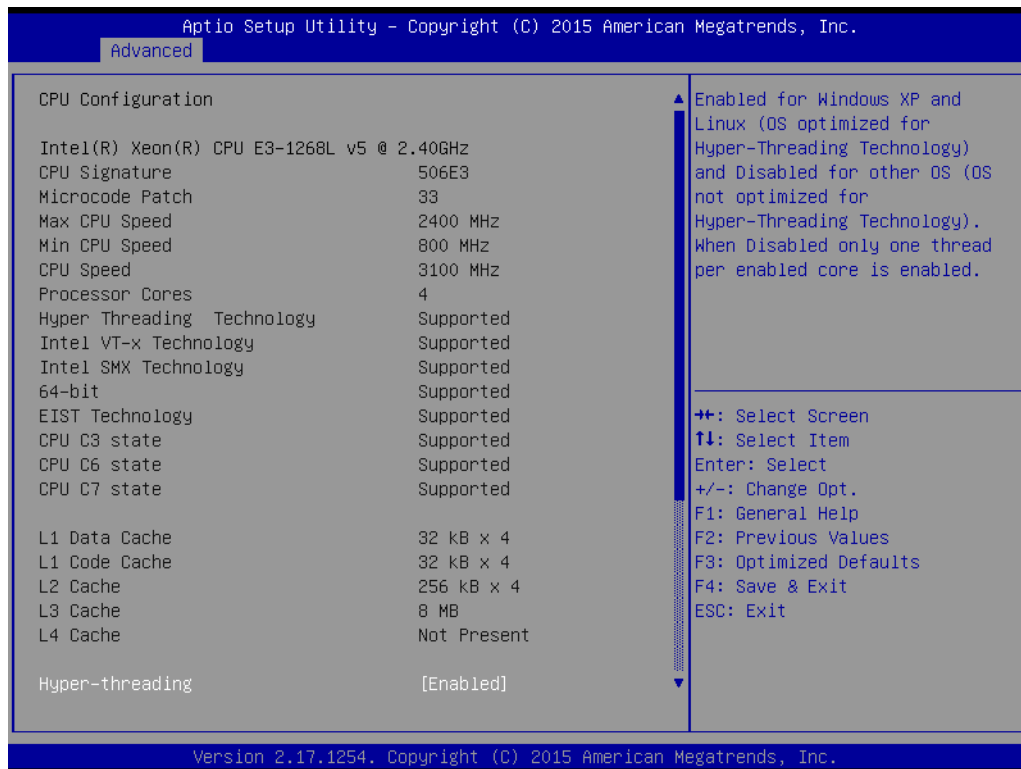
Figure 3.25 CPU Configuration

■ **Hyper-threading**

This item allows you to enable or disable Intel Hyper Threading technology.

■ **Active Processor Core**

Use this to select how many processor cores you want to activate when you are using a dual or quad core processor.

■ **Intel Virtualization Technology**

This feature is used to enable or disable the Intel Virtualization Technology (IVT) extension. It allows multiple operating systems to run simultaneously on the same system. It does this by creating virtual machines, each running its own x86 operating system.

■ **Hardware Prefetcher**

Hardware Prefetcher is a technique that fetches instructions and/or data from memory into the CPU cache memory well before the CPU needs it, so that it can improve the load-to-use latency. You may choose to enable or disable it.

■ **Adjacent Cache Line Prefetch**

The Adjacent Cache-Line Prefetch mechanism, like automatic hardware prefetch, operates without programmer intervention. When enabled through the BIOS, two 64-byte cache lines are fetched into a 128-byte sector, regardless of whether the additional cache line has been requested or not. You may choose to enable or disable it.

■ **CPU AES**

This item is to enable or disable CPU advanced encryption standard instructions.

■ **Boot performance mode**

Select the performance state that the BIOS will set before OS handoff.

■ **Hardware P states (HWP)**

Enable/Disable HWP function.

■ **Intel SpeedStep (tm)**

Allows more than two frequency ranges to be supported.

■ **Turbo Mode**

This item is to enable or disable turbo mode.

■ **CPU C States**

This item is to enable or disable CPU C states.

3.2.2.11 SATA Configuration
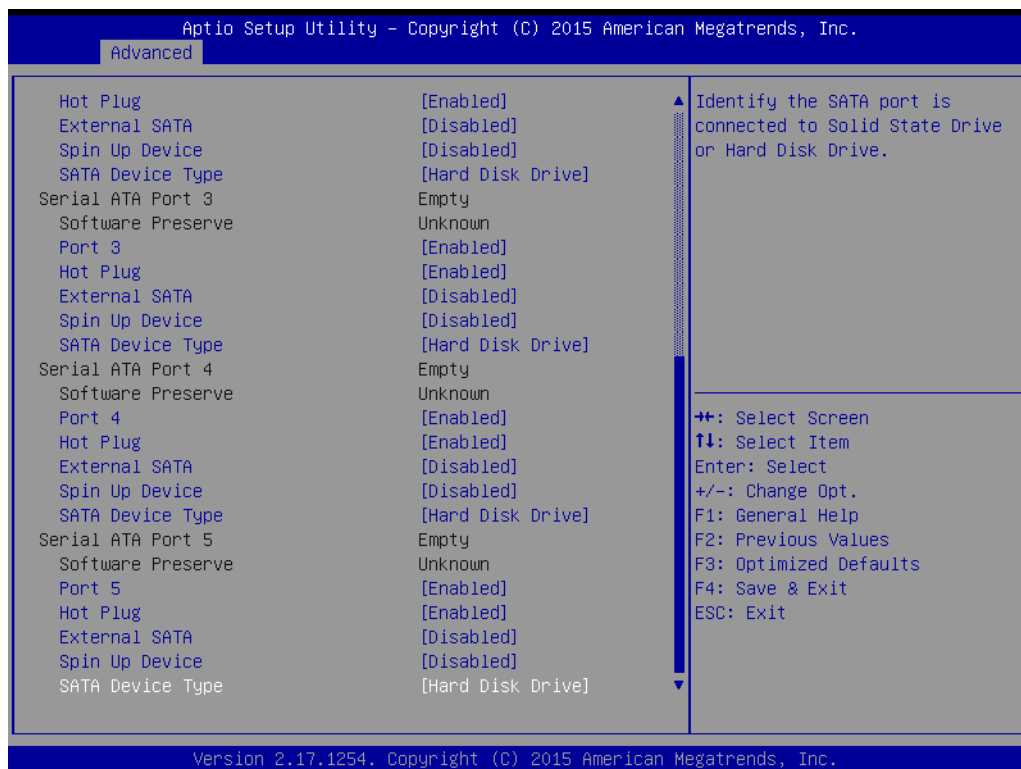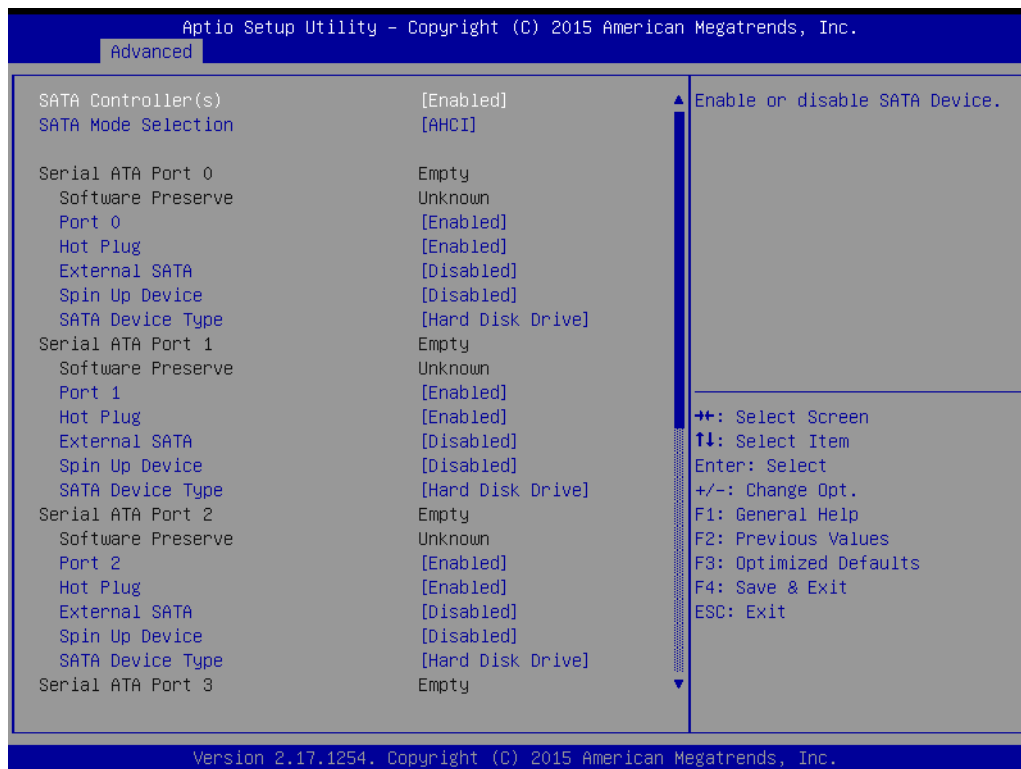
Figure 3.26 SATA Configuration

■ **SATA Controller(s)**
This item is to enable or disable SATA devices.

■ **SATA Mode Selection**
Set as IDE, AHCI, or RAID when SATA Controllers are enable.

■ **Port 0~5**
To enable or disable SATA port 0~5.

■ **Hot Plug**
Designates this port as Hot Pluggable.

■ **External SATA**
External SATA support.

■ **Port 0~5 Device Type**
To identify the SATA is connected to Solid State Drive or Hard Disk Drive.

■ **Port 0~5 Spin Up Device**
On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

3.2.2.12 PCI Subsystem Settings

```
             Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

 PCI Bus Driver Version          A5.01.08              Enables or Disables VGA
                                                       Palette Registers Snooping.
 PCI Devices Common Settings:
 VGA Palette Snoop              [Disabled]
 Above 4G Decoding              [Disabled]




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


             Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.27 PCI subsystem settings screen

■ **VGA Palette Snoop**
This item is designed to solve problems caused by some non-standard VGA cards.

3.2.2.13 CSM Configuration
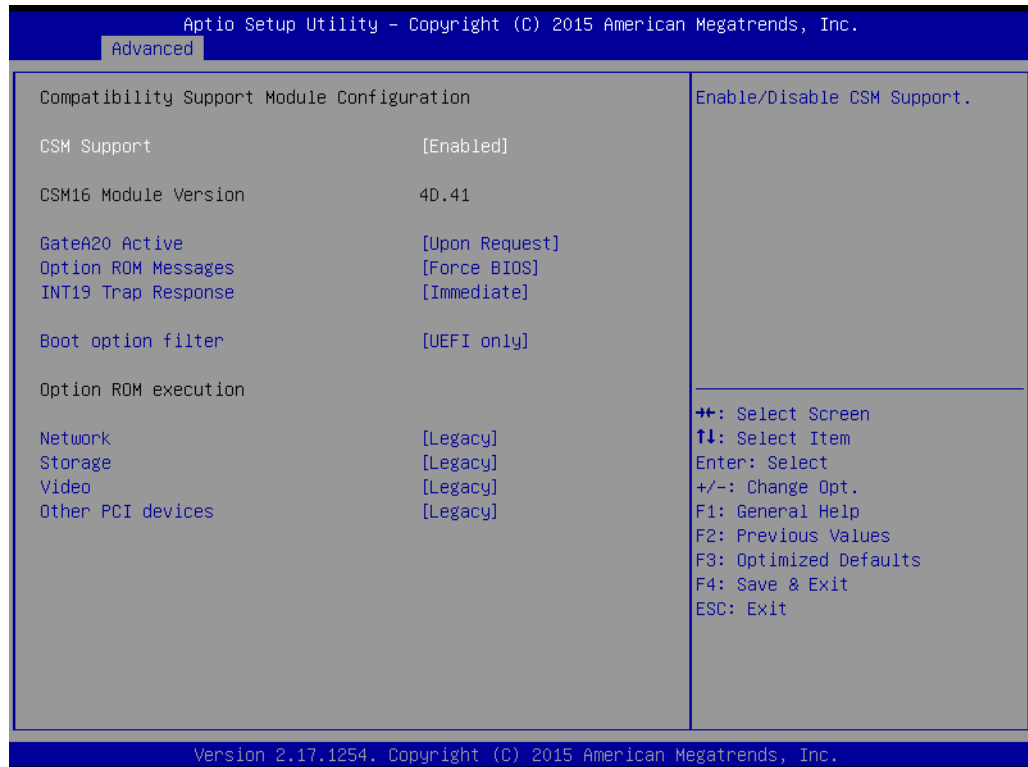
Figure 3.28 CSM16 Parameters

■ **GateA20 Active**

This item is useful when RT code is executed above 1MB. When this is set to "UPON RQUEST", GA20 can be disabled using BIOS services. When it's set to "Always", it does not allow disabling of GA20.

■ **Option ROM Messages**

"Force BIOS or Keep Current" to set the display mode for Option ROM

■ **INT19 Trap Response**

This item executes the Interrupt trap response for the OpROM immediately. When set to "Immediate", the trap will be executed right away. When it's set as "Postponed", the trap will be executed during legacy boot.

■ **Boot option filter**

This option controls Legacy/UEFI ROMs priority.

■ **Option ROM execution**

■ **Network**

Controls the execution of UEFI and legacy PXE OpROM

■ **Storage**

Controls the execution of UEFI and Legacy Storage OpROM

■ **Video**

Controls the execution of UEFI and Legacy Video OpROM

■ **Other PCI devices**

Determines execution of OpROM policy for devices other than Network, Storage or Video.

3.2.2.14 USB Configuration

```
                  Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
       Advanced

 USB Configuration                                        Enables Legacy USB support.
                                                          AUTO option disables legacy
 USB Module Version              12                       support if no USB devices are
                                                          connected. DISABLE option will
 USB Controllers:                                         keep USB devices available
      1 XHCI                                              only for EFI applications.
 USB Devices:
      1 Drive, 1 Keyboard

 Legacy USB Support             [Enabled]
 XHCI Hand-off                  [Disabled]
 USB Mass Storage Driver Support [Enabled]
 Port 60/64 Emulation           [Enabled]
                                                          ++: Select Screen
 USB hardware delays and time-outs:                       ↑↓: Select Item
 USB transfer time-out          [20 sec]                  Enter: Select
 Device reset time-out          [20 sec]                  +/-: Change Opt.
 Device power-up delay          [Auto]                    F1: General Help
                                                          F2: Previous Values
 Mass Storage Devices:                                    F3: Optimized Defaults
  1100                          [Auto]                    F4: Save & Exit
                                                          ESC: Exit



                  Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.29 USB Configuration

■ **Legacy USB Support**
This is for supporting USB devices under legacy OS such as DOS. When choosing "AUTO", the system will automatically detect if any USB device is plugged into the computer and enable USB legacy mode and disable USB legacy mode when no USB device is plugged in.

■ **XHCI Hand-off**
Enables or disables support for OS without XHCI hand-off features.

■ **USB Mass Storage Driver Support**
To enable or disable USB mass storage driver support.

■ **Port 60/64 Emulation**
Enables IO port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OS.

■ **USB transfer time-out**
Allows you to select the USB transfer time-out value. [1,5,10,20sec]

■ **Device reset time-out**
Allows you to select the USB device reset time-out value. [10,20,30,40 sec]

■ **Device power-up delay**
This item appears only when you set the Device power-up delay item to [manual].

3.2.3 Chipset

Figure 3.30 Chipset
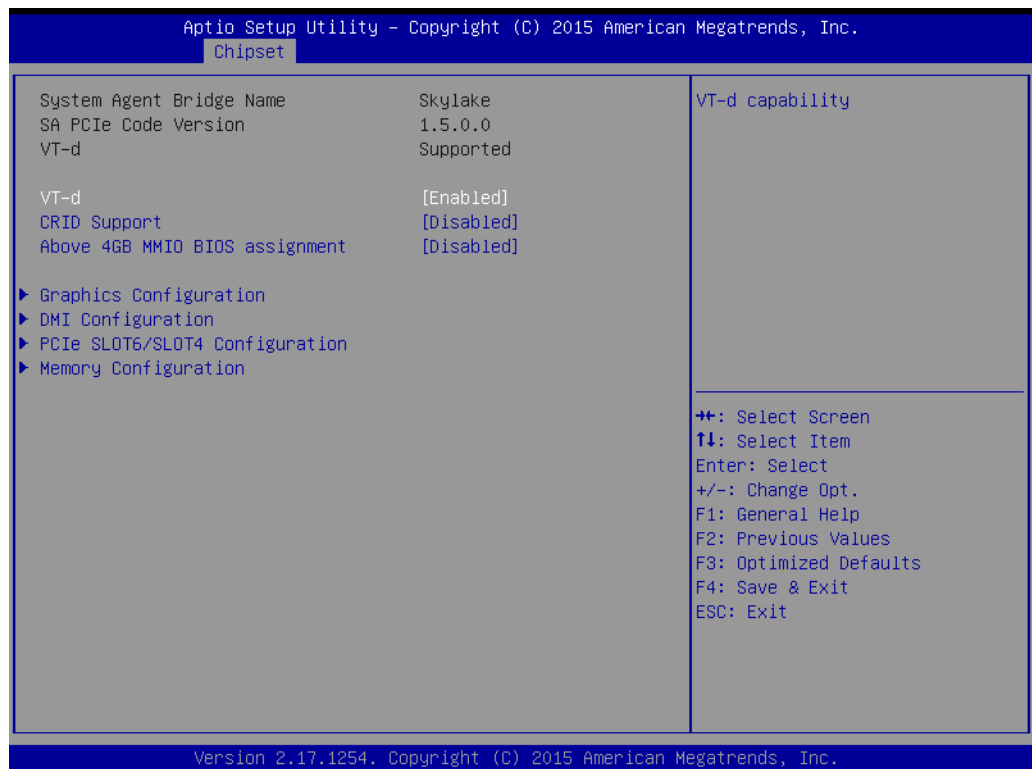
3.2.3.1 System Agent (SA) Configuration

Figure 3.31 System Agent (SA) Configuration

- **VT-d**
  To enable or disable VT-d function on MCH.
- **CRID Support**
  Enable/Disable CRID control for Intel SIPP.
- **Above 4G MMIO BIOS assignment**
  Enable/Disable above 4GB Memory Mapped IO BIOS assignment.
  This is disabled automatically when Aperture Size is set to 2048MB

3.2.3.2 Graphics Configuration


```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Chipset

 Graphics Configuration                                      If Enable, it will not scan
                                                             for External Gfx Card on PEG
                                                             and PCH PCIE Ports
 Skip Scanning of External Gfx Card       [Disabled]
 Internal Graphics                        [Auto]
 DVMT Total Gfx Mem                       [256M]

 Primary IGFX Boot Display                [VBIOS Default]


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


                Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.32 Graphics Configuration

- **Skip Scanning of External Gfx Card**
  If enabled, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.
- **Internal Graphics**
  To enable/disable/Auto internal graphics.
- **DVMT Total Gfx Mem**
  This item is to select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.
- **Primary IGFX Boot Display**
  Select the Video Device which will be activated during POST.
  This has no effect if external graphics present.
  Secondary boot display selection will appear based on your selection.
  VGA modes will be supported only on primary display.
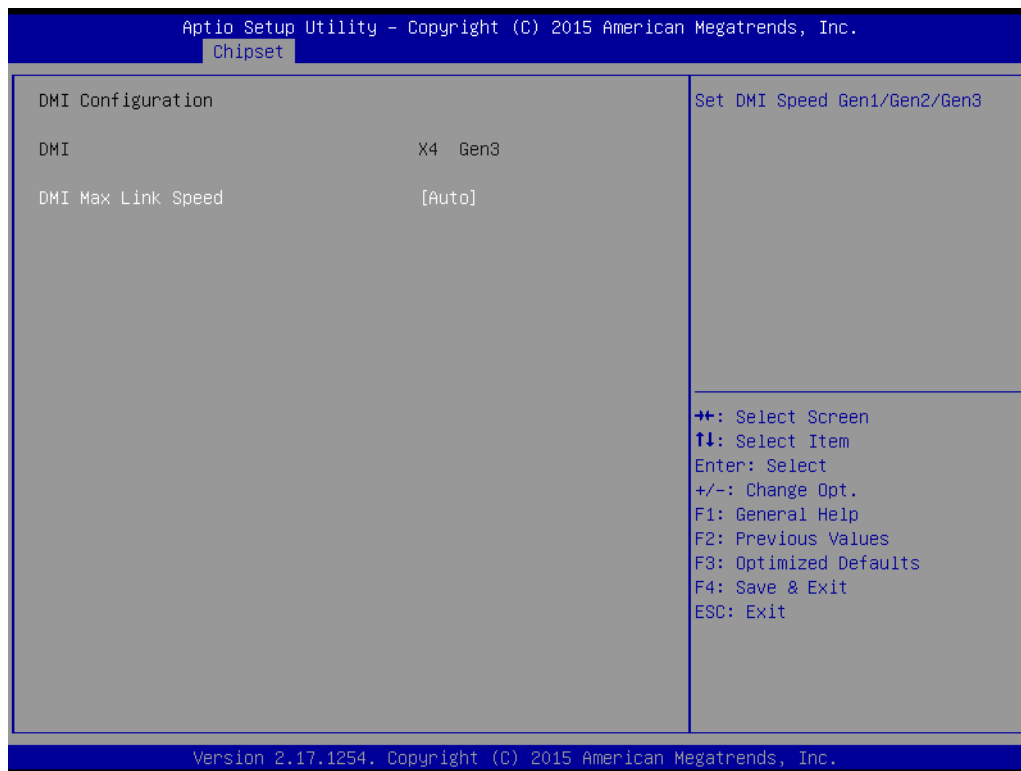
3.2.3.3 DMI Configuration

Figure 3.33 DMI Configuration

■ **DMI Max Link Speed**

Set DMI speed Gen1/Gen2/Gen3.

3.2.3.4 SLOT6/SLOT4 Configuration
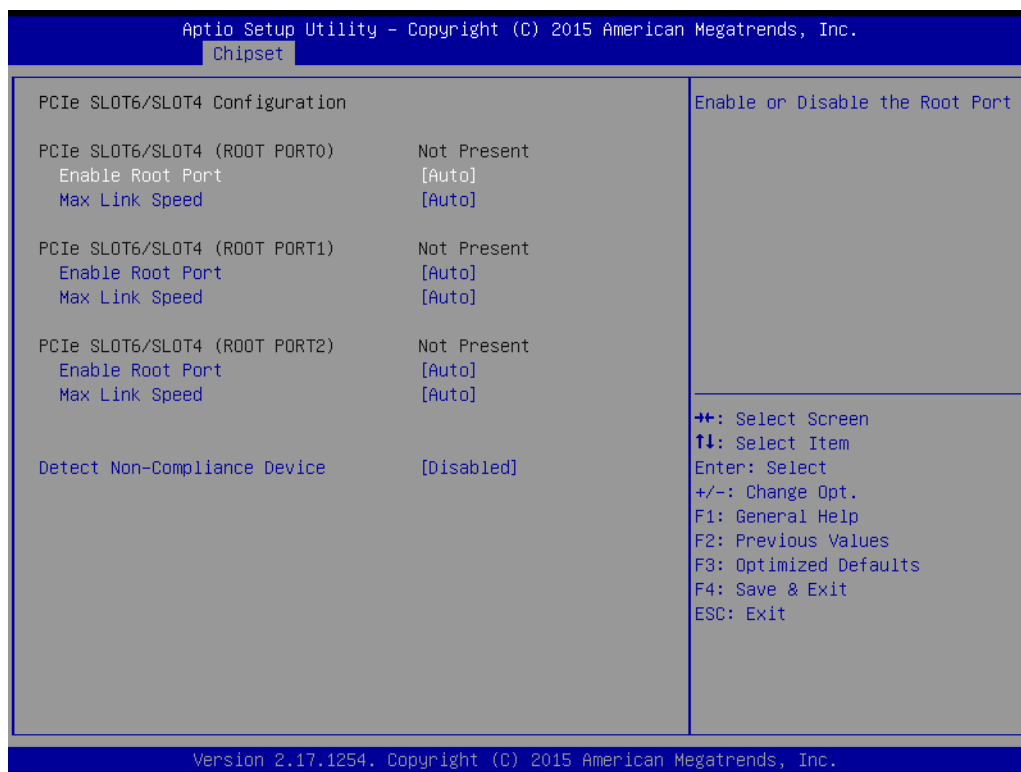
Figure 3.34 NB PCIe Configuration

■ **PCIe SLOT6/SLOT4 (ROOT PORT0)**
Enable Root Port.
Enable or Disable the Root Port.

■ **Max Link Speed**
Configure PEG 0:1:0 Max Speed.

■ **PCIe SLOT6/SLOT4 (ROOT PORT1)**
Enable Root Port.
Enable or Disable the Root Port.

■ **Max Link Speed**
Configure PEG 0:1:1 Max Speed.

■ **PCIe SLOT6/SLOT4 (ROOT PORT2)**
Enable Root Port.
Enable or Disable the Root Port.

■ **Max Link Speed**
Configure PEG 0:1:2 Max Speed.

■ **Detect Non-Compliance Device**
Detect Non-Compliance PCI Express Device in PEG.

3.2.3.5 Memory Configuration
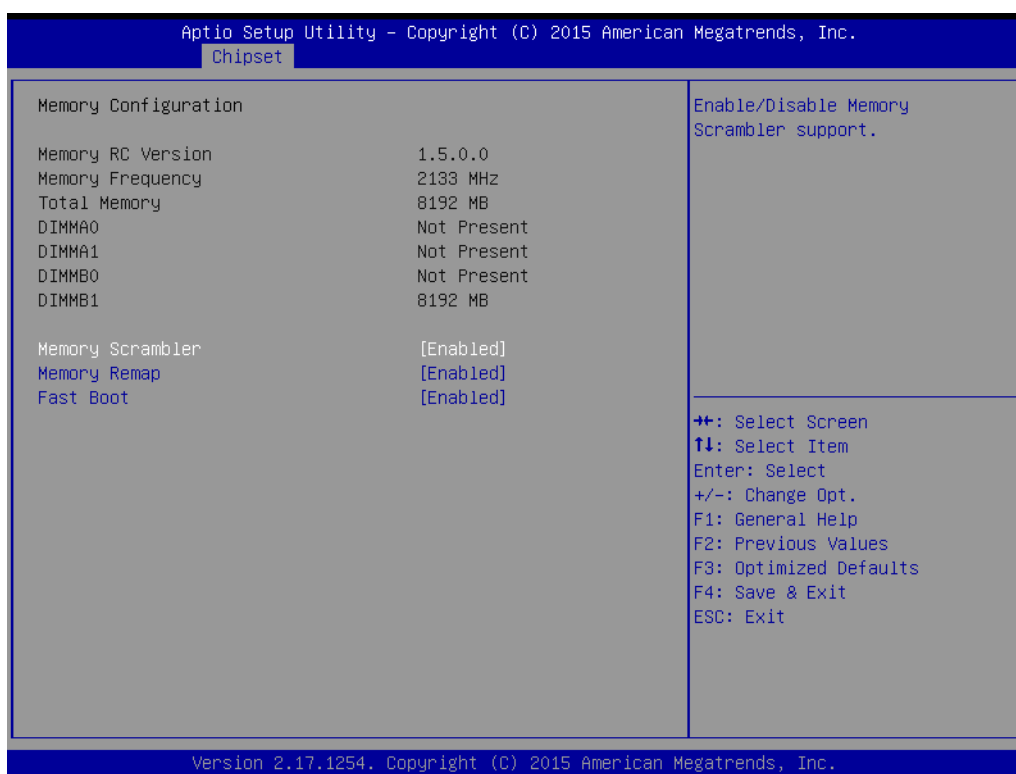
Figure 3.35 Memory Configuration

■ **Memory Scrambler**
Enable/Disable Memory Scrambler support.

■ **Memory Remap**
Enable/Disable Memory Remap above 4G.

■ **Fast Boot**
Enable/Disable fast path through the MRC.

3.2.3.6 PCH-IO Configuration

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
                Chipset

    Intel PCH RC Version              1.5.0.0              PCI Express Configuration
    Intel PCH SKU Name                Server SKU Intel C236  settings
                                      Chipset
    Intel PCH Rev ID                  31/D1

  ▶ PCI Express Configuration
  ▶ USB Configuration
  ▶ HD Audio Configuration
      Wake on LAN1                    [Enabled]
      LAN1 PXE OpROM                  [Disabled]
    LAN2 Controller                   [Enabled]
      LAN2 PXE OpROM                  [Disabled]
    LAN3 Controller                   [Enabled]
      LAN3 PXE OpROM                  [Disabled]          →←: Select Screen
    LAN4 Controller                   [Enabled]           ↑↓: Select Item
      LAN4 PXE OpROM                  [Disabled]          Enter: Select
    PCIE Wake                         [Disabled]          +/-: Change Opt.
    DeepSx Power Policies             [Disabled]          F1: General Help
    Serial IRQ Mode                   [Continuous]        F2: Previous Values
    High Precision Event Timer        [Enabled]           F3: Optimized Defaults
    After AC loss                     [Power Off]         F4: Save & Exit
                                                          ESC: Exit



              Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```
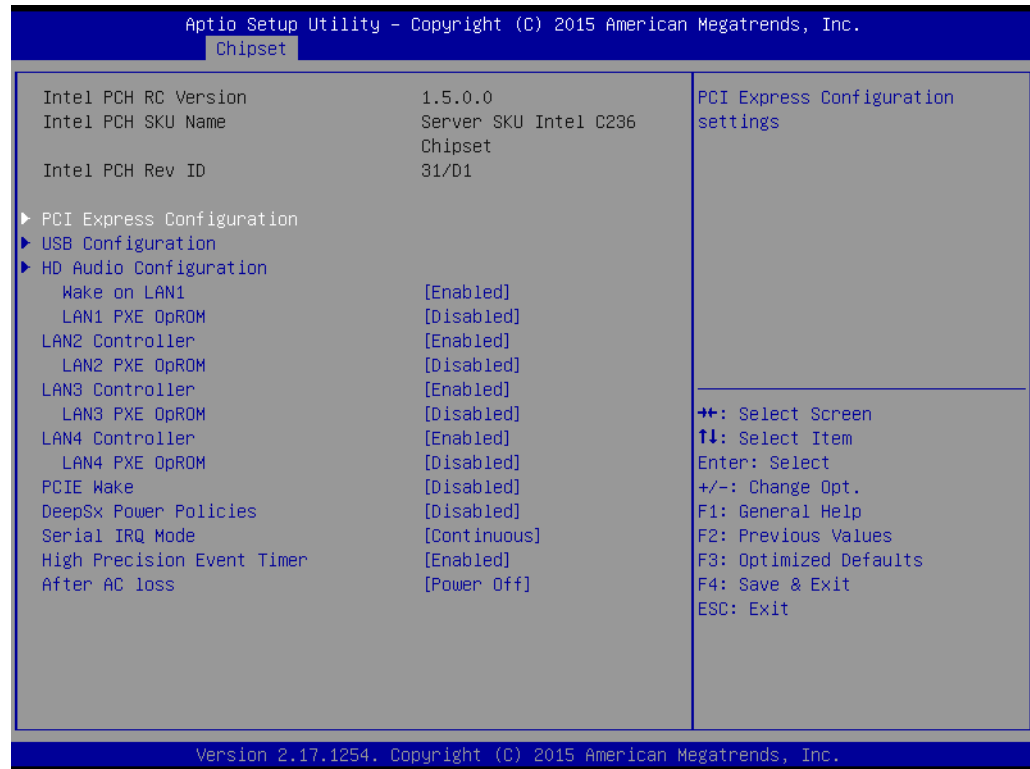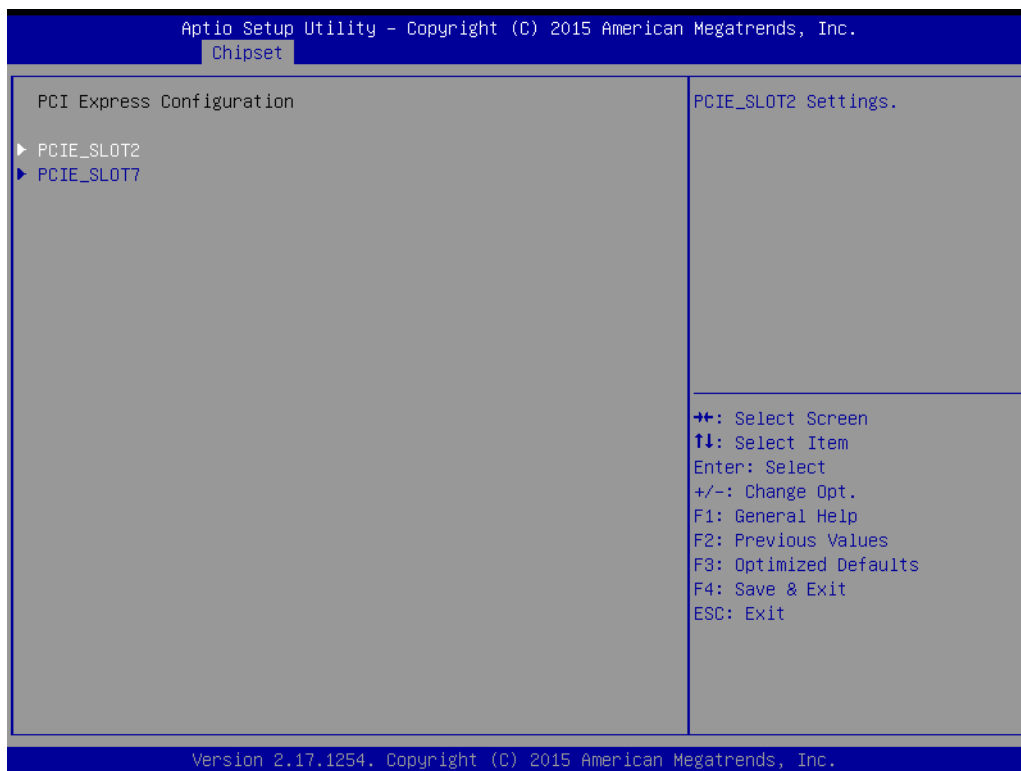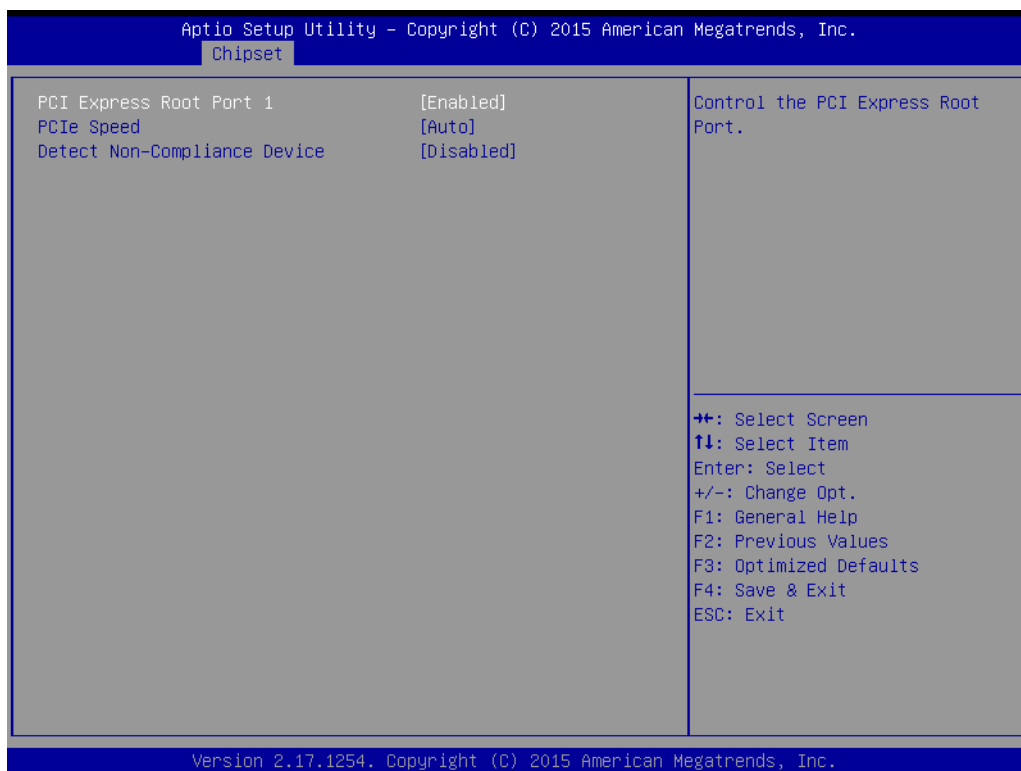
Figure 3.36 PCH-IO Configuration

- **PCIE Wake**

  To enable or disable PCIE to wake the system from S5.

- **Deep Sx Power Policies**

  Enable or disable Deep Sx feature. When Deep Sx is enabled, most power including 5VSB will be off during Deep Sx for energy saving.

- **Serial IRQ Mode**

  Configure Serial IRQ Mode.

- **High Precision Event Timer**

  Enable/Disable the High Precision Event Timer.

- **After AC Power Loss**

  To select AC power state when power is re-applied after a power failure.

Note! *When a system enters G3 status with deep S5 enabled, some power supply's 5VSB won't drop until after more than 30 seconds. If "Restore AC Power Loss" is set to "power on", the system won't boot up for 30 seconds after power failure. We recommend the user waits for more than 30 seconds to power on after a power failure. On the other hand, the system will auto power on if power is restored within 30 seconds, before 5VSB actually drops, even if "Restore AC Power Loss" is set to "power off".*
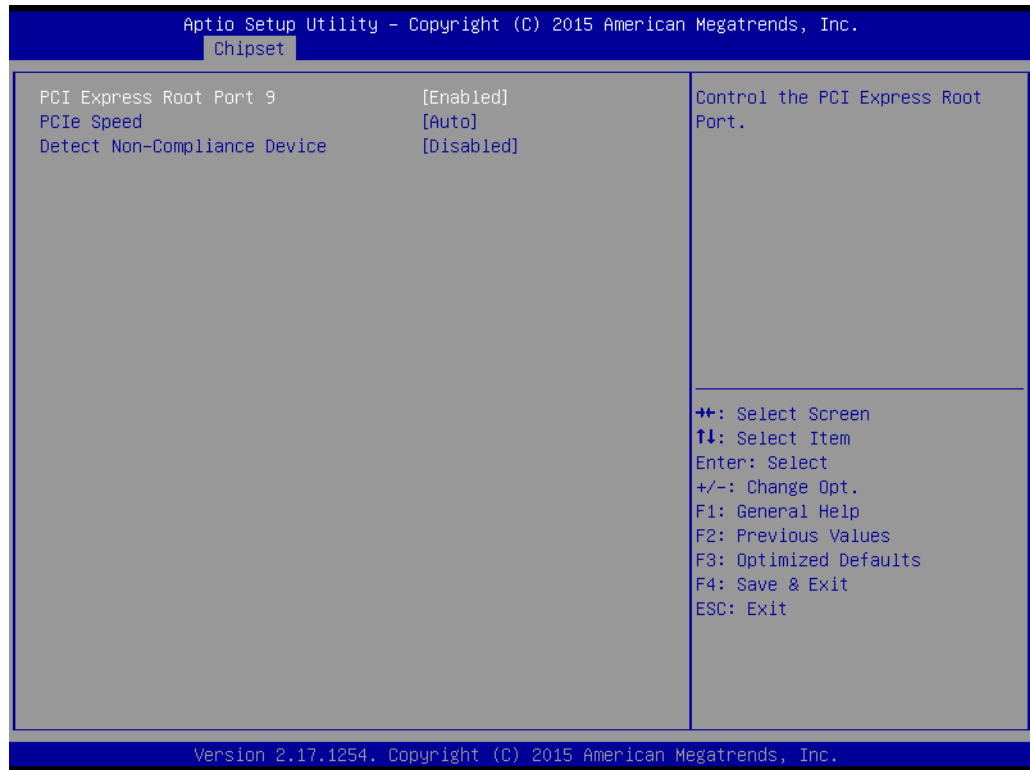
Figure 3.37 PCI Express Configuration

Figure 3.38 PCI Express Slot 2 Configuration

■ **PCI Express Root Port 1 (PCIE SLOT2)**
Control the PCI Express Root Port.

■ **PCIe Speed**
To set PCIe speed for PCI Express Slot 2.

■ **Detect Non-Compliance Device**
Detect Non-compliance PCIE device. When this item is enabled, it will take more time during POST.

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
              Chipset

PCI Express Root Port 9          [Enabled]              Control the PCI Express Root
PCIe Speed                       [Auto]                 Port.
Detect Non-Compliance Device     [Disabled]




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




              Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.39 PCI Express Slot 7 Configuration

■ **PCI Express Root Port 9 (PCIE SLOT7)**
Control the PCI Express Root Port.

■ **PCIe Speed**
To set PCIe speed for PCI Express Slot 7.

■ **Detect Non-Compliance Device**
Detects non-compliant PCIE device. When this item is set to enable, it will take more time during post.
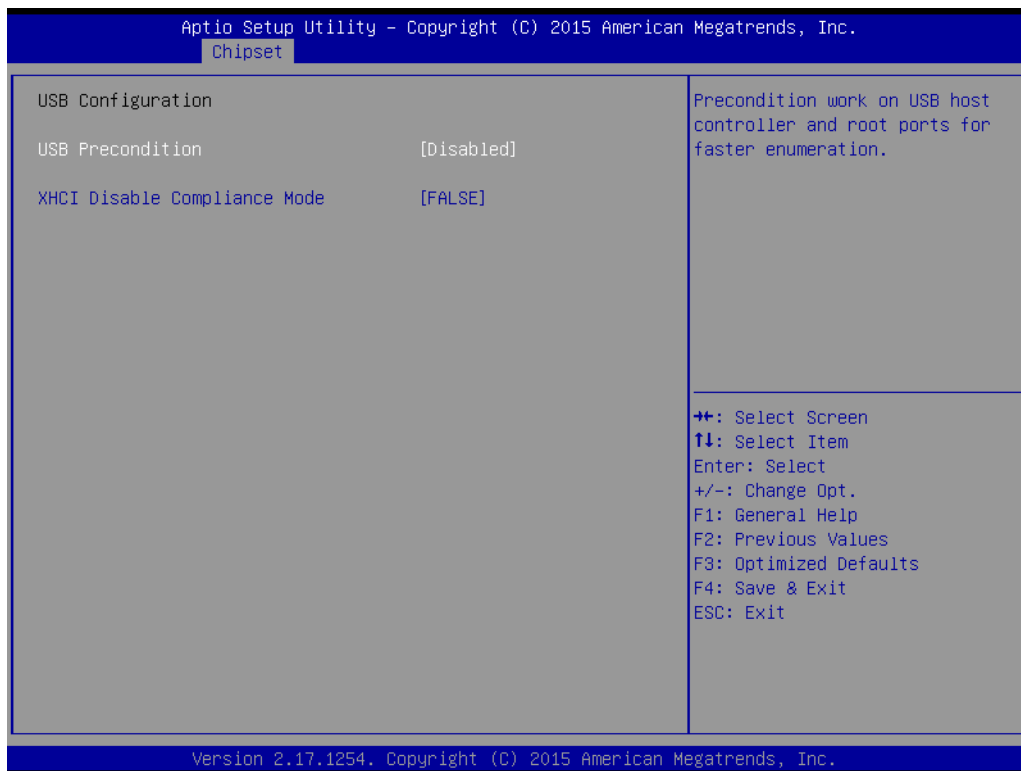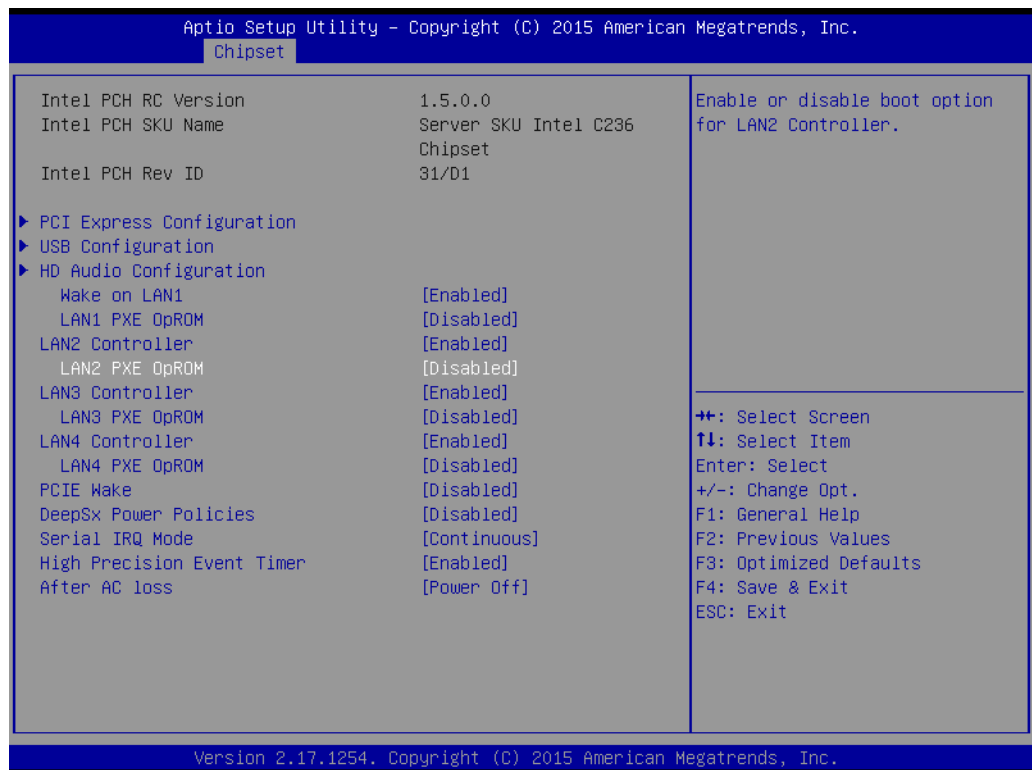
Figure 3.40 USB Configuration

◼ **USB Precondition**
Pre-condition work on USB host controller and root ports for faster enumeration.
◼ **XHCI Disable Compliance Mode**
Options to disable Compliance Mode Default is FALSE to not disable Compliance Mode.
Set TRUE to disable Compliance Mode.
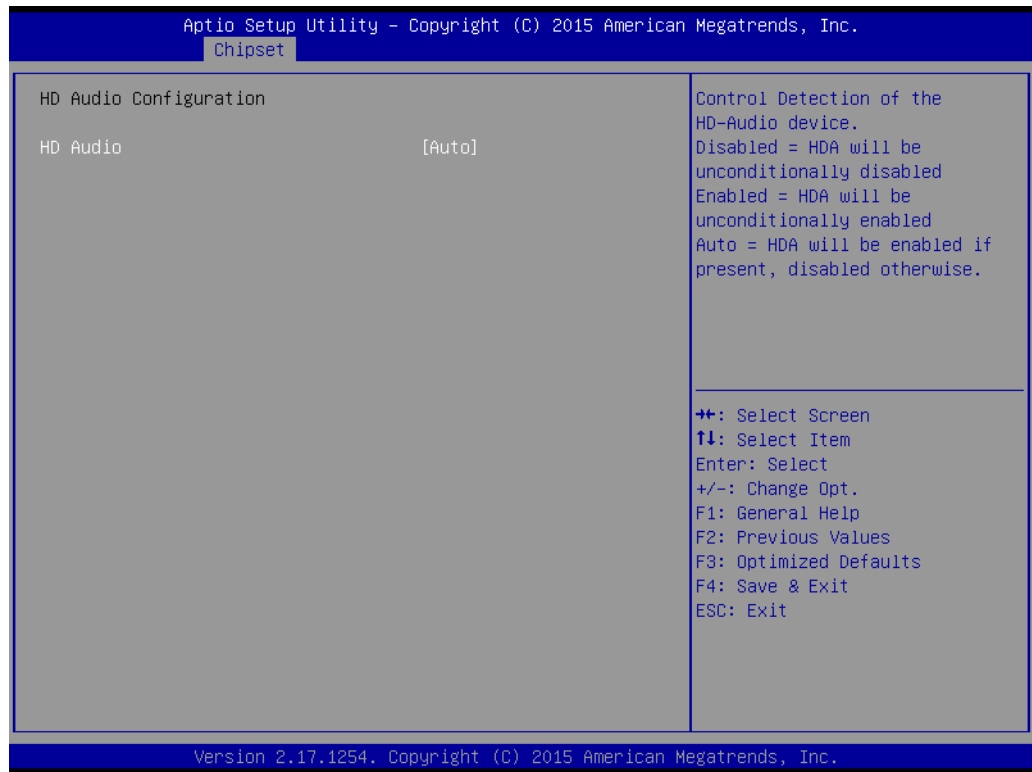
Figure 3.41 PCH Azalia

■ **Azalia**

Control detection of Azalia device.

Figure 3.42 LAN Configuration

■ **LAN1 PXE OpROM**

Enable or disable boot options for legacy network devices.

■ **Wake on LAN1**

Enable or disable integrated LAN to wake the system.

■ **LAN2 Controller**

Enable or disable onboard LAN2.

■ **LAN2 PXE OpROM**

Enable or disable boot options for legacy network devices.

■ **LAN3 Controller**

Enable or disable onboard LAN3.

■ **LAN3 PXE OpROM**

Enable or disable boot options for legacy network devices.

■ **LAN4 Controller**

Enable or disable onboard LAN4.

■ **LAN4 OpROM**

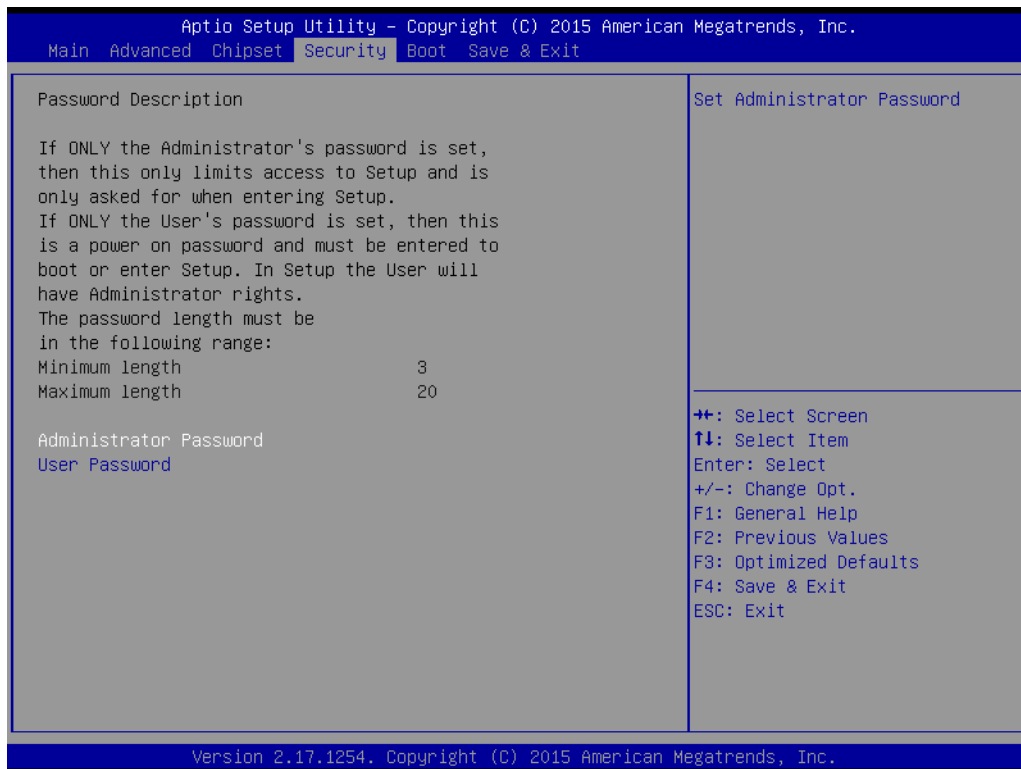Enable or disable boot options for legacy network devices.

3.2.4 Boot

Figure 3.43 Boot

- ■ **Setup Prompt Timeout**

  Use the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.

- ■ **Bootup NumLock State**

  "On" or "Off" power-on state for the NumLock.

- ■ **Quiet Boot**

  If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.

- ■ **Boot Option Priorities**

  Choose boot priority from boot device.

- ■ **New Boot Option Policy**

  Controls the placement of newly detected UEFI boot options.

3.2.5 Security

```
                    Aptio Setup Utility – Copyright (C) 2015 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
   Administrator Password                                 Enter: Select
   User Password                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

                    Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.44 Security

Select Security Setup from the ASMB-785 Setup main BIOS setup menu. All Security Setup options, such as password protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>.
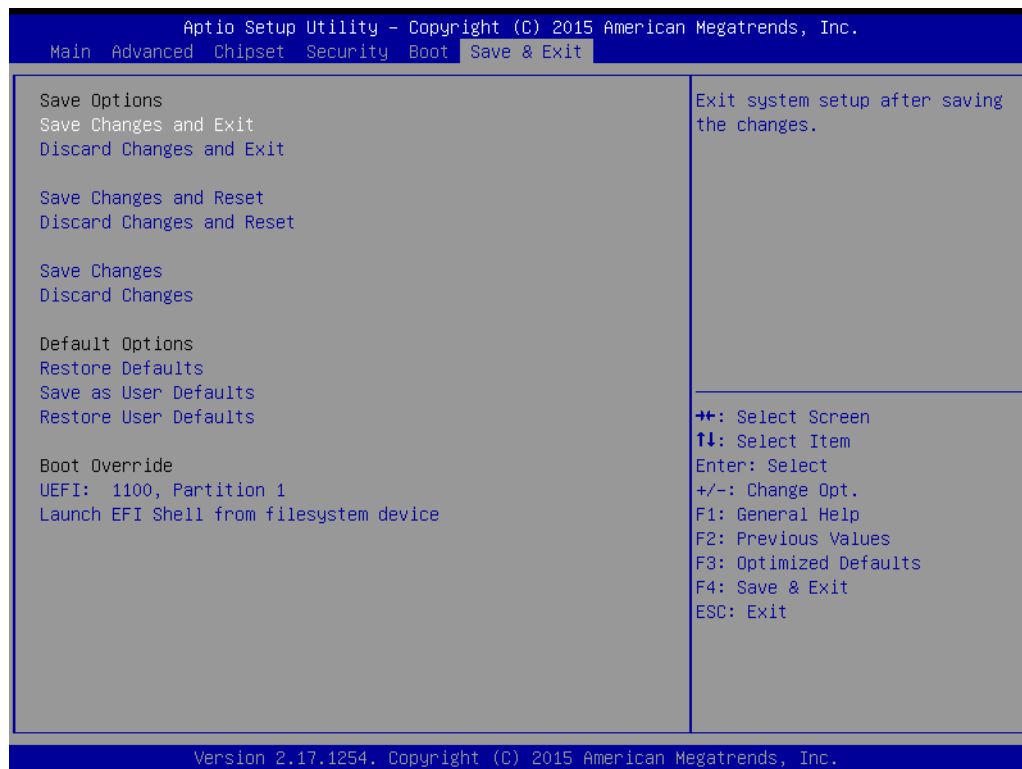
3.2.6 Save & Exit

```
           Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    Save Options                                          Exit system setup after saving
    Save Changes and Exit                                 the changes.
    Discard Changes and Exit

    Save Changes and Reset
    Discard Changes and Reset

    Save Changes
    Discard Changes

    Default Options
    Restore Defaults
    Save as User Defaults                                 →←: Select Screen
    Restore User Defaults                                 ↑↓: Select Item
                                                          Enter: Select
    Boot Override                                         +/-: Change Opt.
    UEFI:  1100, Partition 1                              F1: General Help
    Launch EFI Shell from filesystem device              F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



            Version 2.17.1254. Copyright (C) 2015 American Megatrends, Inc.
```

Figure 3.45 Save & Exit

■ **Save changes and exit***

When you have completed system configuration, select this option to save your changes, exit BIOS setup and boot into the OS so the new system configuration parameters can take effect.

■ **Discard changes and exit**

Select this option to quit setup without making any permanent changes to the system configuration.

■ **Save changes and Reset**

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot into the computer so the new system configuration parameters can take effect.

■ **Discard changes and Reset**

Select this option to quit Setup and reset computer without making any permanent changes to the system configuration.

■ **Save Changes**

Select this option to save your changes.

■ **Discard Changes**

Select this option to discard your changes.

■ **Restore Defaults**

Select this option to restore BIOS configuration as origin.

■ **Save as User Defaults**

Select this option to save user's configuration.

■ **Restore User Defaults**

Select this option to restore BIOS to user's configuration.

■ **Launch EFI Shell from file system device**

This option allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available file system devices.

*When you make some critical changes, the system will still reboot even you choose "Save changes and exit".

Chapter 4

Chipset Software
Installation Utility

4.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the ASMB-785 are located on the software installation DVD.

> **Note!** *The files on the software installation DVD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

4.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Serial ATA interface support
- USB 1.1/2.0/3.0 support
- Identification of Intel chipset components in the Device Manager

> **Note!** *The chipset driver is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*
> - *Windows® server 2008 R2 SP1 Enterprise (64-bit)*
> - *Windows® server 2012 R2 (64-bit)*
> - *Windows® 7 Ultimate SP1 (32-bit)*
> - *Windows® 7 Ultimate SP1 (64-bit)*
> - *Windows® 8 Pro (32-bit)*
> - *Windows® 8 Pro (64-bit)*

4.3 Windows OS Driver Setup

Insert the driver DVD into your system's DVD-ROM drive. You can see the driver folders items. Move the mouse cursor over the folder "01-Chipset". In CSI folder, you can click find an executable file to complete implementation of the driver.
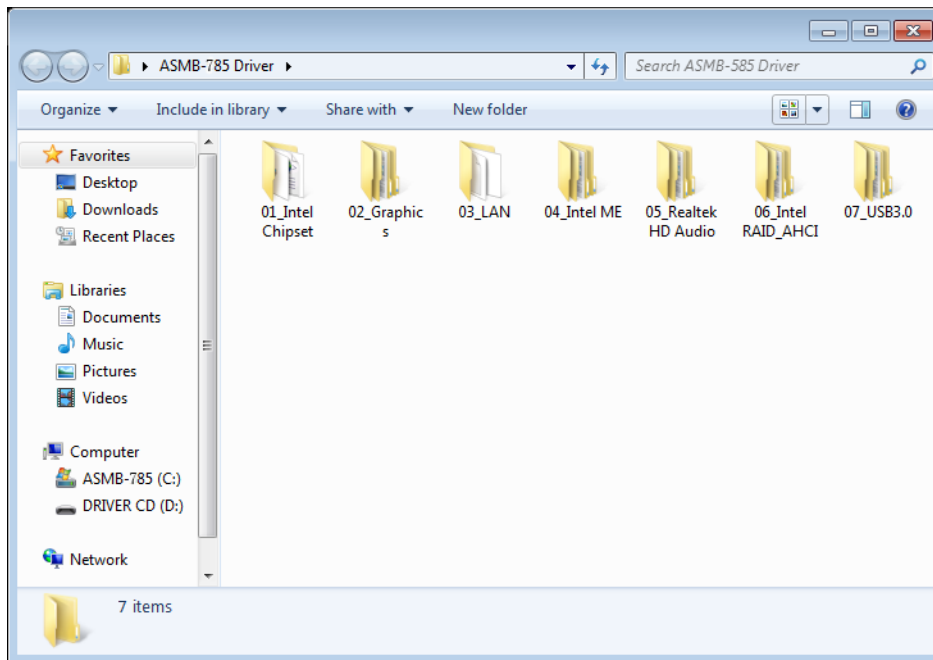
Chapter 5

VGA Setup

5.1 Introduction

The Intel® Xeon® E3-1200 v5 and 6th Gen. Core™ i3/i5/i7 series processors are embedded with an integrated graphics controller. You need to install the VGA driver to enable this function, which includes the following features:

■ Optimized integrated graphic solution: With Intel® Graphics Flexible Display Interface, it supports versatile display options and 32-bit 3D graphics engine. Dual independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone dual display modes. Optimized 3D support delivers an intensive and realistic visual experience.

5.2 Windows OS Driver Setup

Note! *Before installing this driver, make sure the INF driver has been installed in your system. See Chapter 4 for information on installing the INF driver.*

Insert the driver DVD into your system's DVD-ROM drive. You can see the driver folders items. Navigate to the "02 Graphics" folder and click the executable file to complete the installation of the drivers for Windows® OS.
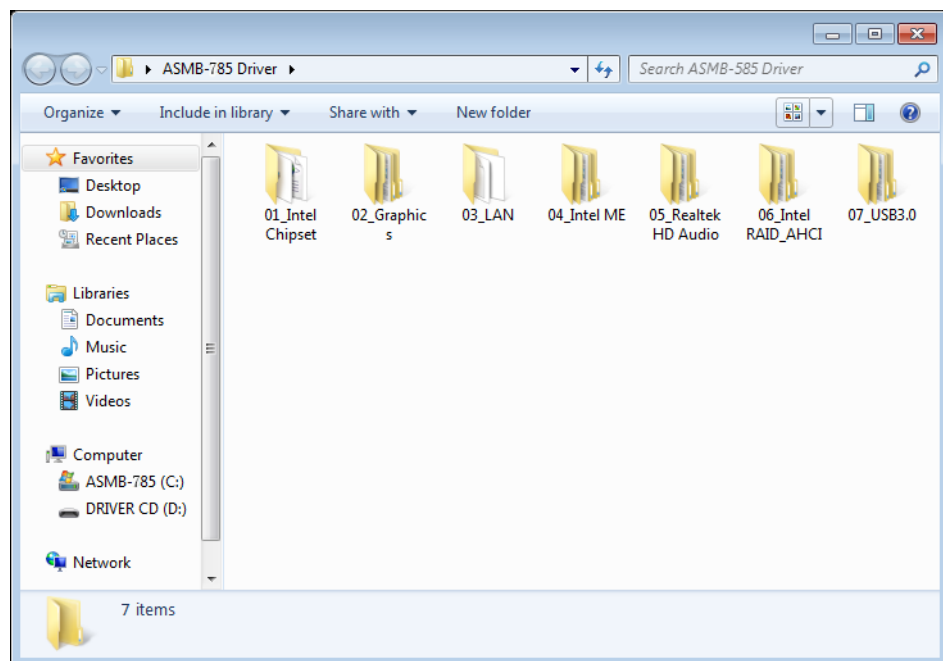
Chapter 6

LAN Configuration

6.1 Introduction

The ASMB-785 is equipped up to two or four Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (GbE LAN1: Intel® I219LM; GbE LAN2~4: Intel® I210-AT that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

6.2 Features

- 10/100/1000 Mbps Ethernet controller
- 10/100/1000 Mbps triple-speed MAC
- Full duplex at 10, 100, or 1000 Mbps and half duplex at 10 or 100 Mbps
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

6.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 4 for information on installing the CSI utility.*

The integrated Intel® gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

6.4 Windows OS Driver Setup (LAN)

Insert the driver DVD into your system's DVD-ROM drive. Select folder "03-LAN" then click the proper LAN driver for the OS.
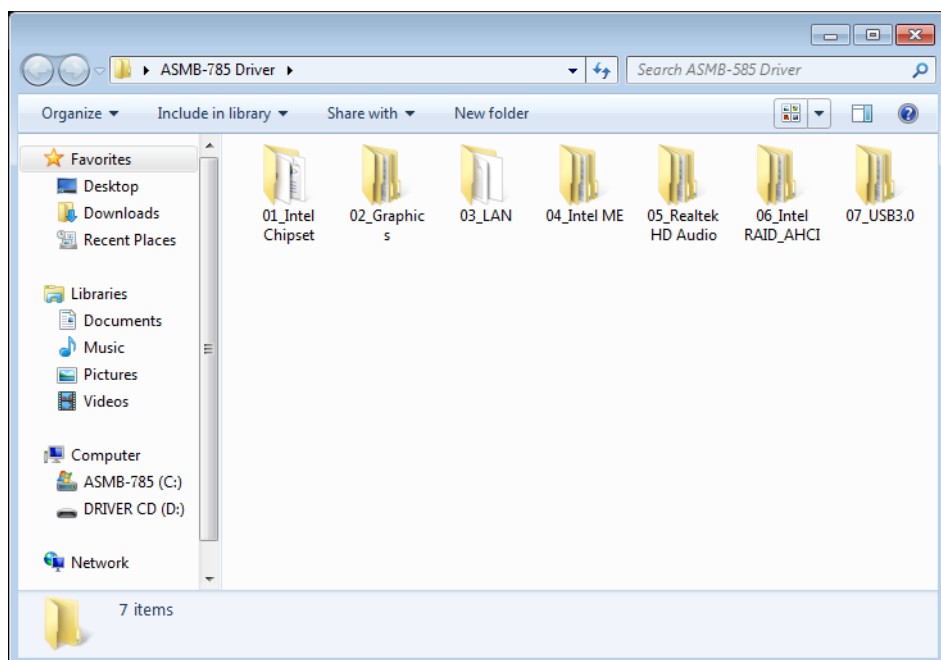
Chapter 7

Intel ME

7.1 Introduction

The Intel ME software components that need to be installed depend on the system's specific hardware and firmware features. The installer detects the system's capabilities and installs the relevant drivers and applications.
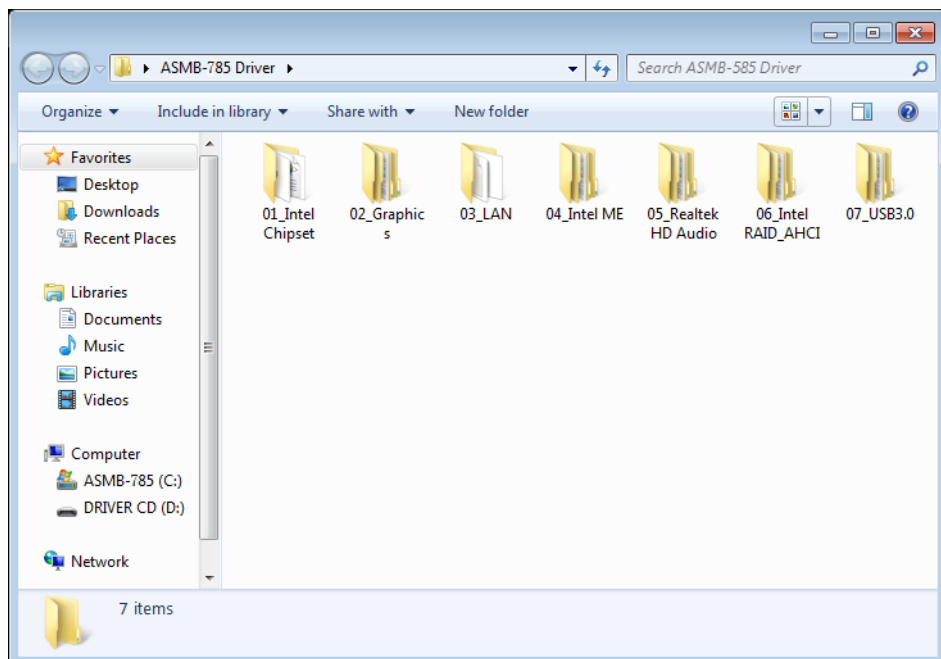
7.2 Installation

Insert the driver DVD into your system's DVD-ROM drive. Navigate to the "04_Intel ME" folder to install the driver.

> **Note!**
>
> *If the Intel® Management Engine (Xeon® ME) driver has not been successfully installed, you may see an error on a "PCI Simple Communications Controller" in Device Manager.*
>
> *If you use Win7 OS and there is a problem with ME installing, please find the folder "ME update kit for Win7" to fix it.*

The integrated Intel® gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.
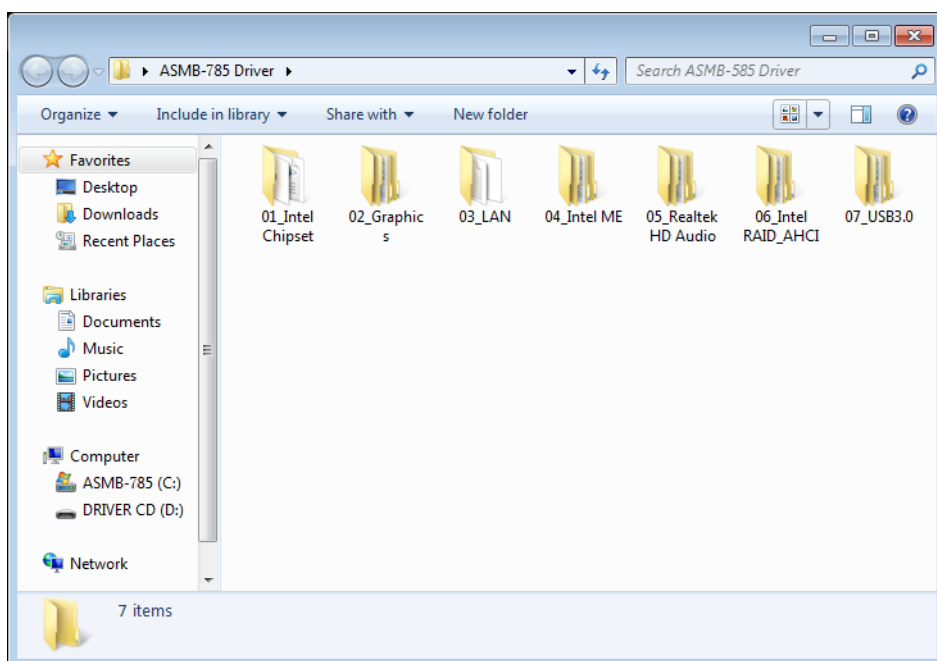
Chapter 8

Intel USB 3.0

8.1 Introduction

ASMB-785 provides Intel® USB 3.0 and the data transfer rate of USB3.0 (5Gbps) is 10 times to USB2.0 (480Mbps).

8.2 Installation

Insert the driver DVD into your system's DVD-ROM drive. Navigate to the "07_USB3.0" folder to install the driver.

> **Note!** The Intel® USB 3.0 eXtensible Host Controller Driver is not supported on Windows* XP and Windows* Vista. For these operating systems, ensure your BIOS settings have the xHCI Mode set to "Auto" or "Smart Auto". This will reconfigure the USB 3.0 ports to function as USB 2.0 ports using the native Windows* EHCI driver.

Chapter   9

SATA RAID Setup

9.1 Introduction

To support demanding disk I/O, Intel® C236 chipset integrates seven Serial ATA controllers with software RAID 0, 1, 5, 10 capabilities.

RAID 0 striping increases the storage performance and is designed to speed up data transfer rates for disk-intensive applications.

RAID 1 mirroring protects valuable data that might be lost in the event of a hard drive failure.

RAID 5 array contains three or more hard drives where the data is divided into manageable blocks called strips. Parity is a mathematical method for recreating data that was lost from a single drive, which increases fault-tolerance. The data and parity are striped across all the hard drives in the array. The parity is striped in a rotating sequence to reduce bottlenecks associated with the parity calculations.

RAID 10 array uses four hard drives to create a combination of RAID levels 0 and 1. The data is striped across a two-drive array forming the RAID 0 component. Each of the drives in the RAID 0 array is then mirrored by a RAID 1 component.
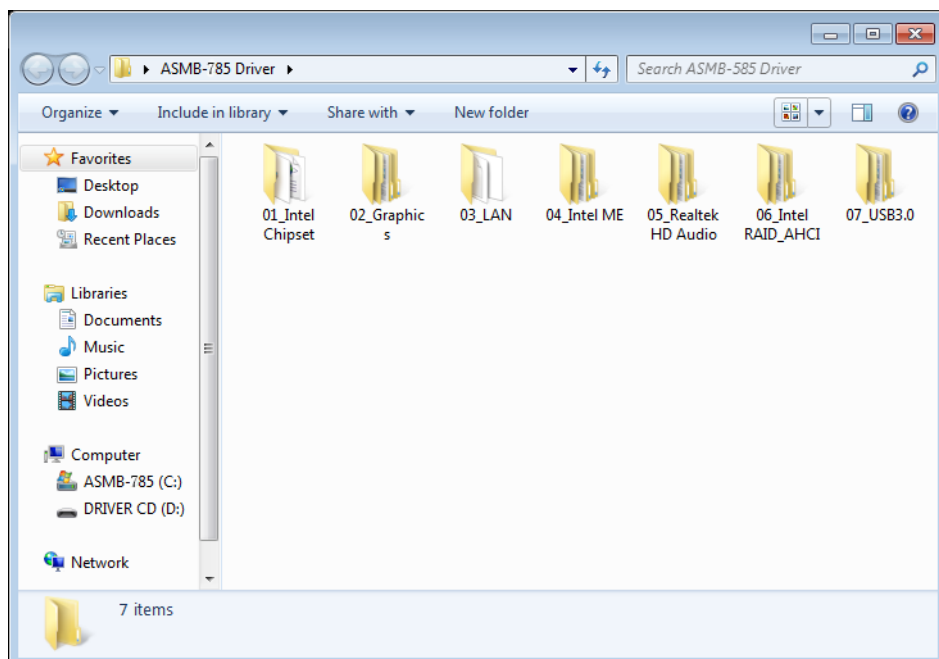
9.2 SATA RAID Driver and Utility Setup

The driver is in the DVD "06_Intel RAID_AHCI" folder. You may go to the directory of the DVD and follow Intel's installation guide to install the driver and utility.

> **Note!** *For the detailed installation instructions for the SATA RAID driver and utility, please check the User Guide in the driver CD. Path: folder "Intel Rapid Storage Technology" in "06_Intel RAID_AHCI".*

> **Note!** *Before you install the Intel® Rapid Storage Technology, please read the "readme.txt" which is in the folder "Intel Rapid Storage Technology" in "06_Intel RAID_AHCI".*
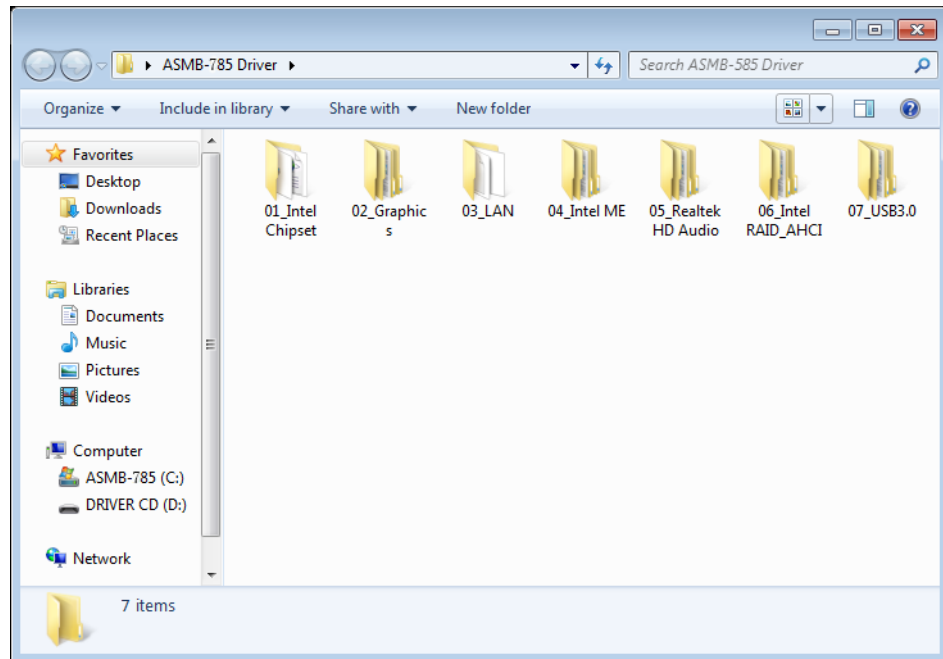
Chapter 10

HD Audio

10.1 Introduction

ASMB-785 equipped with Realtek ALC892 Audio chip. It provides "Line-out" & "Microphone" two ports for any related applications.

10.2 Installation

The driver is in the DVD's "05_Realtek HD Audio" folder. You may go to the directory of the DVD and follow the installation guide to install the driver and utility.

Appendix A

Programming the
Watchdog Timer

The ASMB-785's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.
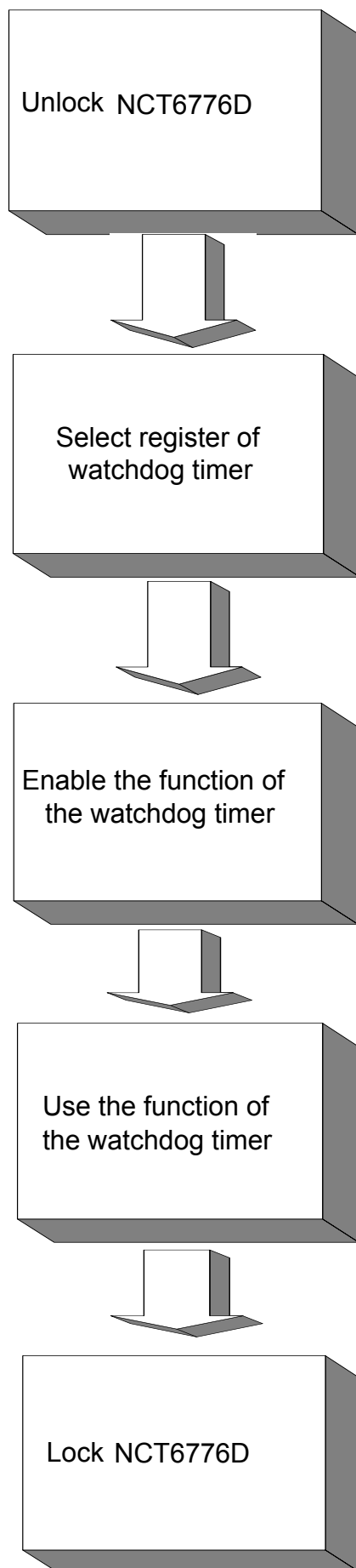
A.1 Watchdog timer overview

The watchdog timer is built in to the super I/O controller NCT6776D. It provides the following functions for user programming:

- Can be enabled and disabled by the user's program
- Timer can be set from 1 to 255 seconds
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.2 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

Unlock NCT6776D

Select register of
watchdog timer

Enable the function of
the watchdog timer

Use the function of
the watchdog timer

Lock NCT6776D

Table A.1: Watchdog timer registers		
Address of register (2E)	Read/ Write	Value (2F) & description
87 (hex)	-	Write this address to I/O address port 2E (hex) twice to unlock the NCT6776D
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set seconds as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit. Write 1 to bit 4: Watchdog timer count mode is 1000 times faster. If bit 3 is 0, the count mode is 1/1000 seconds mode. If bit 3 is 1, the count mode is 1/1000 minutes mode.
F6 (hex)	write	0: stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/ write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-	Write this address to I/O port 2E (hex) to lock NCT6776D.

A.2.1 Example Programs

Enable watchdog timer and set 10 seconds as the timeout interval

```
;------------------------------------------------------------
Mov dx,2eh ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
in al,dx
Or al,08h
Out dx,al
;------------------------------------------------------------
Dec dx; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
```

```
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;-------------------------------------------------------------
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10; 10 minutes
Out dx,al
;-------------------------------------------------------------
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```

Enable watchdog timer and set 5 minutes as the timeout interval

```
;-------------------------------------------------------------
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;-------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-------------------------------------------------------------
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx, al
Inc dx
In al,dx
Or al, 08h
```

```
Out dx,al
;------------------------------------------------------------
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5; 5 minutes
Out dx,al
;------------------------------------------------------------
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```
Enable watchdog timer to be reset by mouse
```
;------------------------------------------------------------
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
In al,dx
Or al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;------------------------------------------------------------
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```
Enable watchdog timer to be reset by keyboard

```
;--------------------------------------------------------------
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------------
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
;--------------------------------------------------------------
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```

Generate a time-out signal without timer counting

```
;--------------------------------------------------------------
Mov dx,2eh ; unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
```

```
Out dx,al
Inc dx
In al,dx
Or al,01h
Out dx,al
;-----------------------------------------------------------
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;-----------------------------------------------------------
Dec dx ; lock NCT6776D
Mov al,0aah
Out dx,al
```

Appendix B

I/O Pin Assignments

B.1 USB2.0 Header (USB7~12)
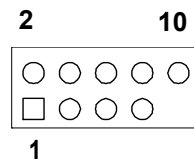
Table B.1: USB Header (USB6~11)

Pin	Signal	Pin	Signal
1	USB_VCC5	2	USB_VCC5
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND
9	Key	10	N/C

B.2 USB3.0 Header (USB3_4)
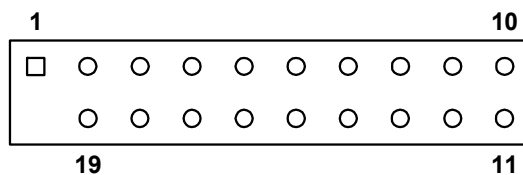
Table B.2: USB 3.0 Header (USB3_4)

Pin	Signal	Pin	Signal
1	+5V_USB2_3	20	NC
2	USB3_RX_DN5	19	+5V_USB2_3
3	USB3_RX_DP5	18	USB3_RX_DN6
4	GND	17	USB3_RX_DP6
5	USB3_TX_DN5	16	GND
6	USB3_TX_DP5	15	USB3_TX_DN6
7	GND	14	USB3_TX_DP6
8	USB2_N2	13	GND
9	USB2_P2	12	USB2_N3
10	USB_OC	11	USB2_P3

B.3 VGA Connector (VGA)
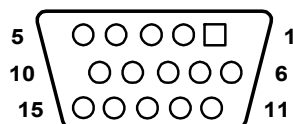
Table B.3: VGA Connector (VGA)			
Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.4 RS-232 Interface (COM2)
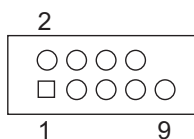
Table B.4: RS-232 Interface (COM2)	
COM1/COM2	
Pin	Signal
1	DCD
2	DSR
3	SIN
4	RTS
5	SOUT
6	CTS
7	DTR
8	RI
9	GND

B.5 External Keyboard and Mouse Connector (KBMS1)
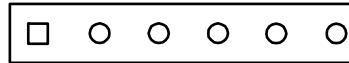
Table B.5: External Keyboard and Mouse Connector (KBMS1)	
Pin	**Signal**
1	KB CLK
2	KB DATA
3	MS DATA
4	GND
5	VCC
6	MS CLK

B.6 System Fan Power Connector (SYSFAN0~3)
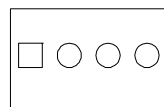
Table B.6: Fan Power Connector	
Pin	**Signal**
1	GND
2	+12 V
3	DETECT
4	PWM

B.7 Power LED and Keyboard Lock (JFP3)
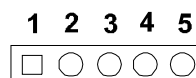
Table B.7: Power LED and Keyboard Lock (JFP3)	
Pin	**Function**
1	LED power + (3.3 V)
2	NC
3	LED power -
4	#keylock
5	Ground

B.8 External Speaker Connector (JFP2)

1	4	7	10
□	○	○	○
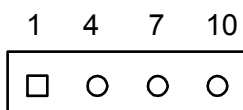
Table B.8: External Speaker Connector (JFP2)	
Pin	**Function**
1	SPK_VCC
4	SPK_OBS
7	SPK_BUZ
10	SPK_OUT

B.9 HDD LED Connector (JFP2)

2	5
□	○
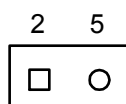
Table B.9: HDD LED Connector (JFP2)	
Pin	**Signal**
2	HDD_LED+
5	HDD_LED-

B.10 SNMP SMBus Connector (JFP2)

8	11
□	○
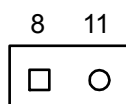
Table B.10: SNMP SMBus Connector (JFP2)	
Pin	**Signal**
8	HWM_SDA
11	HWM_SCL

B.11 ATX Soft Power Switch (JFP1)

```
3   6
□   ○
```
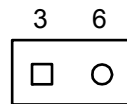
Table B.11: ATX Soft Power Switch (JFP1)	
Pin	Signal
3	PWR-BTN
6	GND

B.12 Reset Connector (JFP1)

```
9   12
□   ○
```
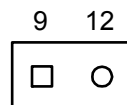
Table B.12: Reset Connector (JFP1)	
Pin	Signal
9	RESET
12	GND

B.13 USB/LAN ports (LAN1_USB1_2 and LAN2_USB5_6)
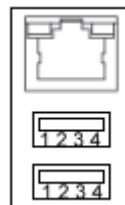
Table B.13: USB Port			
Pin	Signal	Pin	Signal
1	VCC_DUAL	3	Data0+
2	Data0-	4	GND

Table B.14: Giga LAN 10/100/1000 Mbps RJ-45 port			
Pin	Signal	Pin	Signal
1	MID0+	5	MID2+
2	MID0-	6	MID2+
3	MID1+	7	MID3+
4	MID1-	8	MID3+

B.14 Front Panel Audio Connector (FPAUD1)
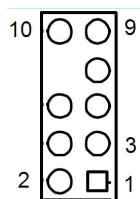
Table B.15: Front Panel Audio Connector (FPAUD1)	
Pin	Signal
1	MIC2_L
2	AGND
3	MIC2_R
4	PRESENSE
5	LIN2_R
6	MIC_DEC
7	FIO_JD
8	N/A
9	LIN2_L
10	LINEOUT2_DEC

B.15 8-pin Alarm Board Connector (VOLT1)
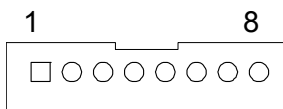
Table B.16: 8-pin Alarm Board Connector (VOLT1)			
Pin	Signal	Pin	Signal
1	5VSB	5	VCC
2	GND	6	VCC3
3	GND	7	-12V
4	-5V	8	+12V

B.16 Case Open Connector (JCASE1)

```
   1   2
  ┌───────┐
  │ □   ○ │
  └───────┘
```
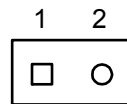
Pin	Signal
Table B.17: Case Open Connector (JCASE1)	
1	CASEOP
2	GND

B.17 Front Panel LAN LED Connector (LAN_LED1,LAN_LED2)

```
  2           8
 ┌──────────────┐
 │ ○  ○  ○  ○   │
 │ □  ○  ○  ○  ○│
 └──────────────┘
  1           9
```

Pin	Signal	Pin	Signal
Table B.18: LAN LED Connector (LANLED1)			
1	LAN1_LED0_ACT	2	LAN2_LED1_ACT
3	VCC3_LAN1LED	4	VCC3_LAN2LED
5	LAN1_LED1_1000M	6	LAN2_LED2_1000
7	LAN1_LED2_100M	8	LAN2_LED0_100
9	VCC3	10	N/C

Pin	Signal	Pin	Signal
Table B.19: LAN LED Connector (LANLED2)			
1	LAN3_LED1_ACT	2	LAN4_LED1_ACT
3	VCC3_LAN3LED	4	VCC3_LAN4LED
5	LAN3_LED2_1000M	6	LAN4_LED2_1000M
7	LAN3_LED0_100M	8	LAN4_LED0_100M
9	VCC3	10	NC

B.18 SPI_CN1: SPI Flash Card Pin Connector

Pin	Signal	Pin	Signal
Table B.20: SPI_CN1:SPI Flash Card Pin Connector			
1	+3VSB	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	N/A	8	NC

B.19 GPIO Connector (GPIO1)

Pin	Definition	Pin	Definition
1	SIO_GPIO0	2	SIO_GPIO4
3	SIO_GPIO1	4	SIO_GPIO5
5	SIO_GPIO2	6	SIO_GPIO6
7	SIO_GPIO3	8	SIO_GPIO7
9	VCC_GPIO0	10	GND

Table B.21: GPIO Connector (GPIO1)

B.20 SMBUS1: Connector of SMBUS from PCH

Pin	Signal
1	+5V
2	Clock
3	Data
4	GND
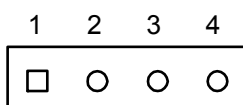
Table B.22: SMBUS Connector

B.21 System I/O Ports

Table B.23: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, programmable interrupt controller
022-03F	Motherboard resources
040-043	System timer
060-060	Standard PS/2 Keyboard
064-064	Standard PS/2 Keyboard
070-077	Real-time clock, non-maskable interrupt (NMI) mask
081-091	DMA controller
0A0-0A1	Interrupt controller 2, programmable interrupt controller
0C0-0DF	DMA controller
0F0-0F0	Numeric data processor
A35-A36	On-board hardware monitor
2F8-2FF	Serial port 2
778-77F	Printer port (LPT1)
3B0-3BB	Intel HD Graphics
3C0-3DF	Intel HD Graphics
3F8-3FF	Serial port 1

B.22 Interrupt Assignments

Priority	Interrupt#	Interrupt source
Table B.24: Interrupt assignments		
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	PS/2 Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Intel 8 series/C226 Chipset Family SMBus Controller
7	IRQ11	Available
8	IRQ12	PS/2 mouse
9	IRQ13	Numeric data processor
10	IRQ14	Available
11	IRQ15	Available
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	Available
15	IRQ6	Available
16	IRQ7	Parallel port 1 (print port)

B.23 1st MB Memory Map

Addr. range (Hex)	Device
Table B.25: 1st MB memory map	
E0000h - FFFFFh	BIOS
D0000h - DFFFFh	Unused
C0000h - CFFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.24 Parallel Port (LPT1)
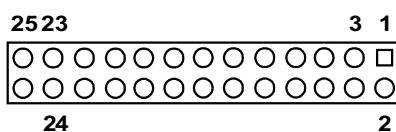
Table B.26: Parallel Port (LPT1)			
Pin	Signal	Pin	Signal
1	STROBE*	14	GND*
2	AFD*	15	D6
3	D0	16	IGND
4	ERR*	17	D7
5	D1	18	GND
6	INIT*	19	ACK*
7	D2	20	GND
8	SLIN*	21	BUSY
9	D3	22	GND
10	GND	23	PE
11	D4	24	GND
12	GND	25	SLCT
13	D5	26	N/C

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