USER MANUAL

SP-6140/6145

Intel® E3845/E3826/J1900 10.4”/15” Fanless Panel PC With DVI/Audio/2LAN

SP-6140/6145 M2

SP-6140/6145

Intel® E3845/E3826/J1900

10.4”/15” Fanless Panel PC

With DVI/Audio/2LAN

DISCLAIMER

This user’s manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

	**CAUTION:** Danger of explosion may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

	**WARNING:** Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to open and disassemble the system. Please operate the LCD and Touchscreen with extra care as they can be broken easily.

Contents

1 Introduction

This chapter gives you the information for the SP-6140/6145. It also outlines the system specifications.

The following topics are included:

- About This Manual
- System Diagram
- System Specifications
- Safety Precautions

Experienced users can go to **Chapter 2 System Configuration** for a quick start.

1.1 About This Manual

Thank you for purchasing our SP-6140/6145 Intel® E3845/E3826/J1900 processor 10.4" Fanless and Low Power Panel PC with DVI/Audio/2LAN. SP-6140/6145 provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. Users can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces the framework of this user manual. It also provides the system views and specifications for SP-6140/6145. The final section of this chapter indicates some safety reminders on how to take care of your system properly.

Chapter 2 Hardware Configuration

This chapter outlines the component locations and their functions. You will learn how to set jumpers and how to configure this system to suite your application needs.

Chapter 3 Software Utilities

This chapter provides the instructions for installing the Intel® Utility, and VGA, LAN, Sound and Touch Screen drivers.

Chapter 4 AMI BIOS Setup

This chapter explains how to set up the BIOS configurations.

Appendix A System Diagrams

This appendix provides you the exploded diagrams and part numbers of the SP-6140/6145.

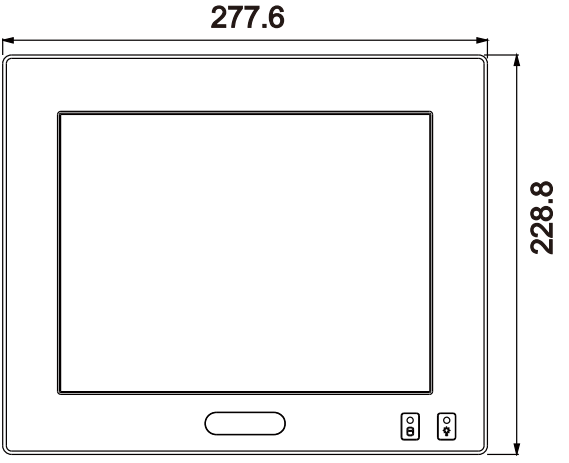
Appendix B Technical Summary

This appendix provides the information about the system block diagram, Technical maps, Watchdog timer configuration, and Flash BIOS Update.

1.2 SP-6140 System Diagrams

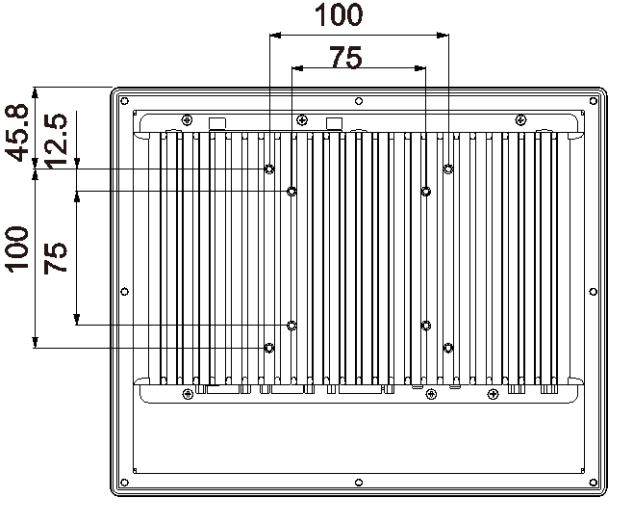
1.2.1 Front View

Unit: mm



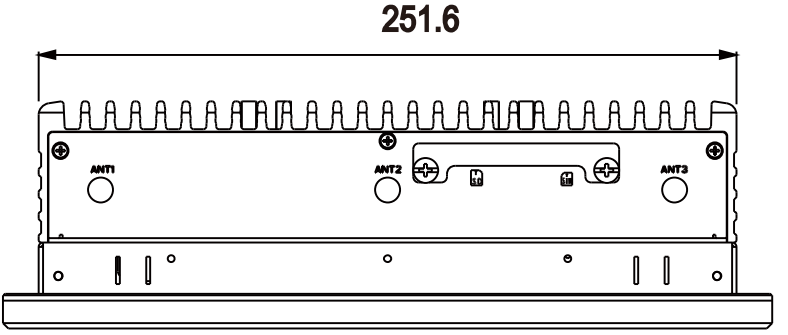
1.2.2 Rear View

Unit: mm



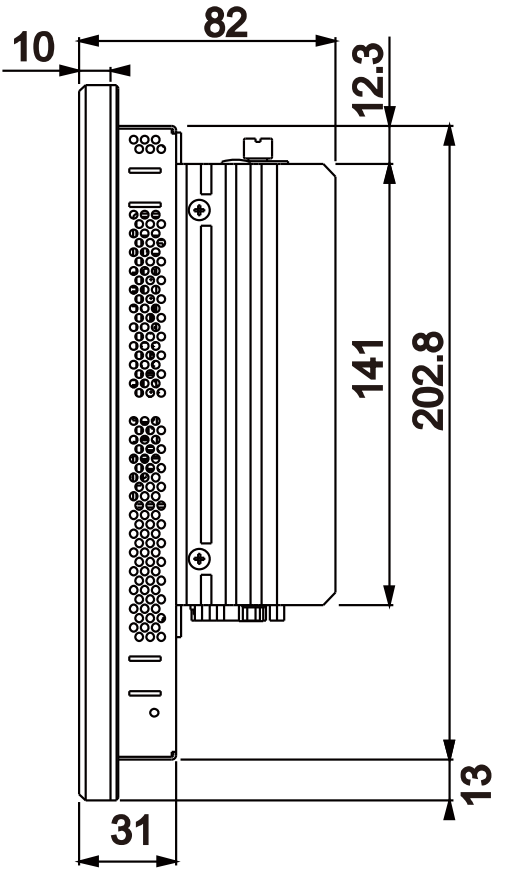
1.2.3 Top View

Unit: mm

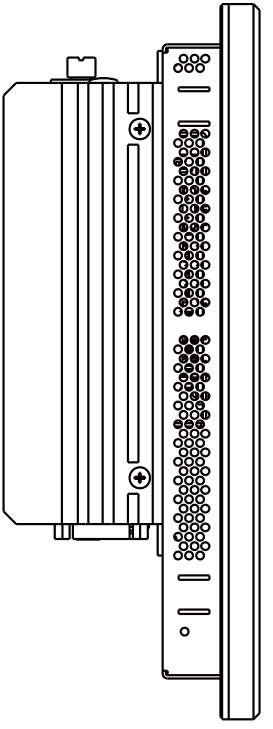


1.2.4 Right Side View

Unit: mm



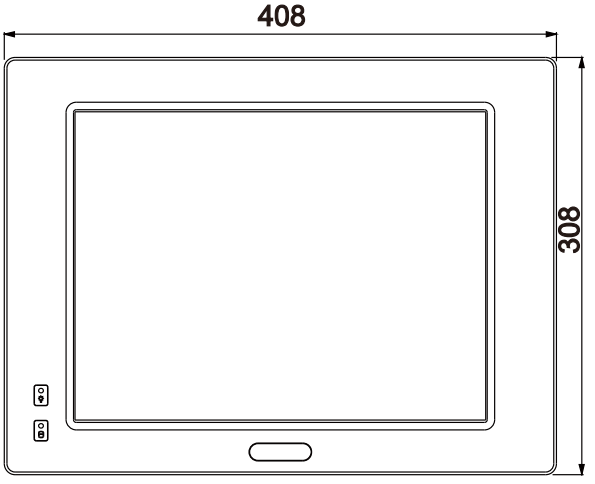
1.2.5 Left Side View



1.3 SP-6145 System Diagrams

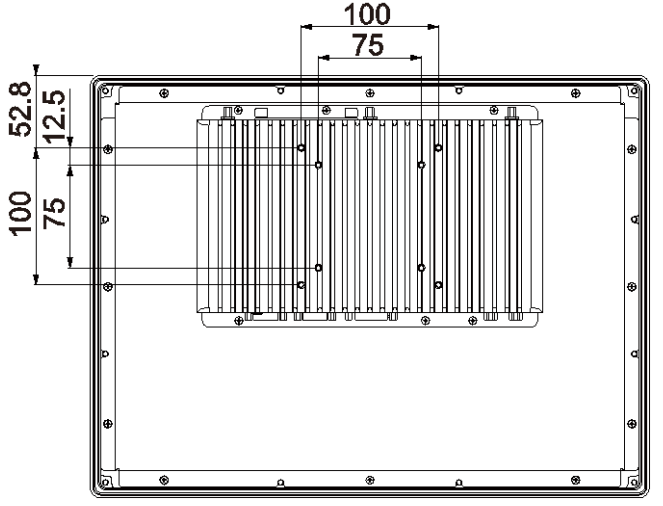
1.3.1 Front View

Unit: mm



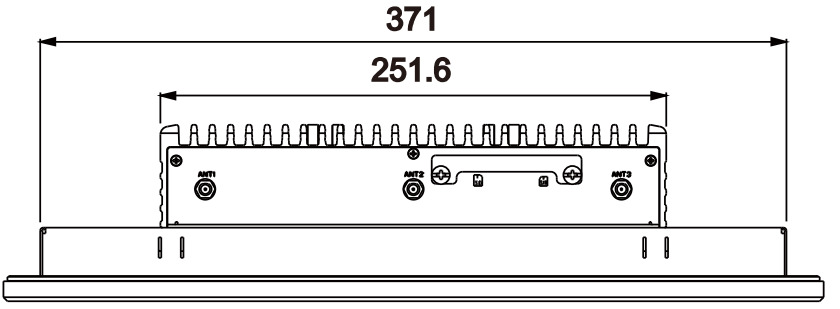
1.3.2 Rear View

Unit: mm



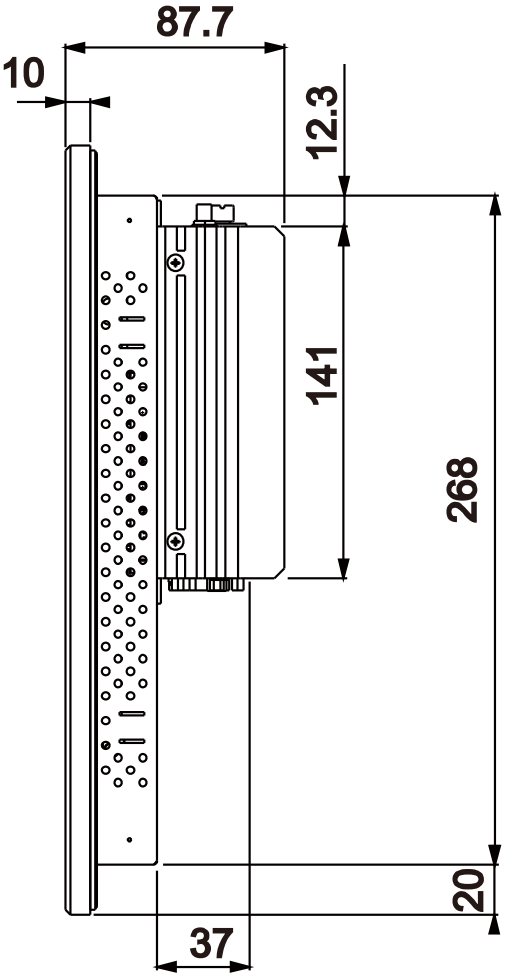
1.3.3 Top View

Unit: mm

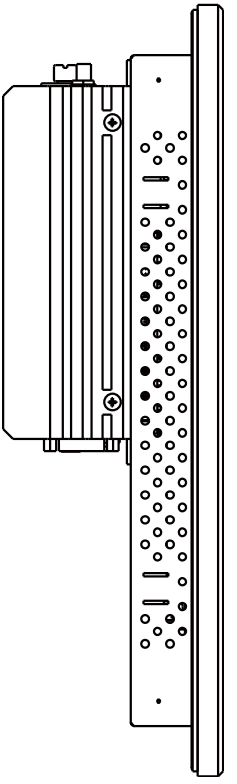


1.3.4 Right Side View

Unit: mm



1.3.5 Left Side View



1.4 System Specifications

System

CPU Support	Intel® E3845/E3826/J1900 processor on board
Chipset	Intel® SoC
OS Support	Win7/ Win8.1/ WES7/ WES 8.1 Industry Pro
Memory Support	1 x DDR3L SO-DIMM socket (up to 8GB)
Drive Bay	1 x 2.5" SATA HDD
Watchdog	Timeout interval selectable from 1-255 seconds
Power Requirement	DC-in 9V~36V
Front Bezel	Aluminum
IP65	Front panel only
Wall Mount Type	VESA 75 / VESA 100
Net Weight	• **SP-6140:** 3.5 kg • **SP-6145:** 5.4 kg
Dimension (W x H x D)	• **SP-6140:** 277.6 mm x 228.8 mm x 82 mm • **SP-6145:** 408 mm x 308 mm x 87.7 mm
Certificate	FCC/CE

I/O Ports

Serial Ports	• 4 x COM ports (For COM1 and COM2 ports, 5V/12V/RI is selectable via jumpers.) • COM1/2 port: RS-232/422/485 selectable by BIOS • RS-232 is supported for COM3/4
USB	2 x USB 2.0 + 1 x USB 3.0
Display	1 x DVI-I
LAN	• 2 x LAN (10/100/1000 Mbps) with the optional PoE • 2 PoE ports support IEEE 802.3af (max. 15.4W for each port (optional))
Audio	1 x Line-out 1 x MIC-in
Expansion Slots	• 1 x CFast card slot • 1 x full-sized mini PCIe slot (PCIe+USB+external SIM slot)

	• 1 x half-sized mini PCIe slot (PCIe+USB)
SD Card Slot	1 x external SD card slot (with cover)
SIM Card Slot	1 x external SIM card slot (with cover)
Power Input	1 x 2-pin DC-in terminal block, supporting 9V-36V DC
Power ON/OFF	1 x Power ON/OFF button

Display

LCD Panel Size	• **SP-6140:** 10.4” • **SP-6145:** 15”
Resolution (Brightness)	XGA (resolution: 1024x768)
Touch Panel Type	(Abon) 5-wire Analog resistive type (USB interface)

Environment

Operating Temperature (with Airflow)	• HDD: 0°C ~ 40°C (32°F ~ 104°F) • Wide temp. storage and peripherals: -20°C ~ 55°C (-4°F ~ 131°F) (without Audio and PoE, for E3845/E3826 processor) • Wide temp. storage and peripherals: -20°C ~ 50°C (-4°F ~ 122°F) (with PoE, without Audio, for E3845/E3826 processor)
Storage Temperature	-30°C~ 60°C (-22°F ~ 140°F)
Relative Humidity	20%~ 90% RH, Non-Condensing

1.5 Safety Precautions

Before using this system, read the following information carefully to protect your system from damages, and extend the life cycle of the system.

1. Check the Line Voltage
   - The operating voltage for the power supply should be within the range of 9V to 36V DC; otherwise the system may be damaged.
2. Environmental Conditions
   - Keep your system away from static electricity on all occasions.
   - Avoid electrical shock. Don’t touch any components of this system when the system is powered on. Always disconnect the power supply when the system is not in use.
   - Place your SP-6140/6145 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
   - Avoid installing your SP-6140/6145 system in extremely hot or cold places.
   - Avoid direct sunlight exposure for a long period of time (for example, in a

closed car in summer time. Also avoid the system from any heating device.). Or do not use SP-6140/6145 when it has been left outdoors in a cold winter day.

- Bear in mind that the operating ambient temperature is between 0°C and 40°C (32°F and 104°F) for HDD and 0°C and 45°C (32°F and 113°F) for SSD.
- Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
- Protect your SP-6140/6145 from strong vibrations which may cause hard disk failure.
- Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
- Always shut down the operation system before turning off the power.

3. Handling
   - Always disconnect the power cord when you are changing any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the entire system.
   - Avoid placing heavy objects on the top of the system.
   - Do not turn the system upside down. This may cause the hard drive to malfunction.
   - Do not allow any objects to fall into this device.
   - If water or other liquid spills into the device, unplug the power cord immediately.
4. Good Care
   - When the outside case gets stained, remove the stains using neutral washing agent with a dry cloth.
   - Never use strong agents such as benzene and thinner to clean the surface of the case.

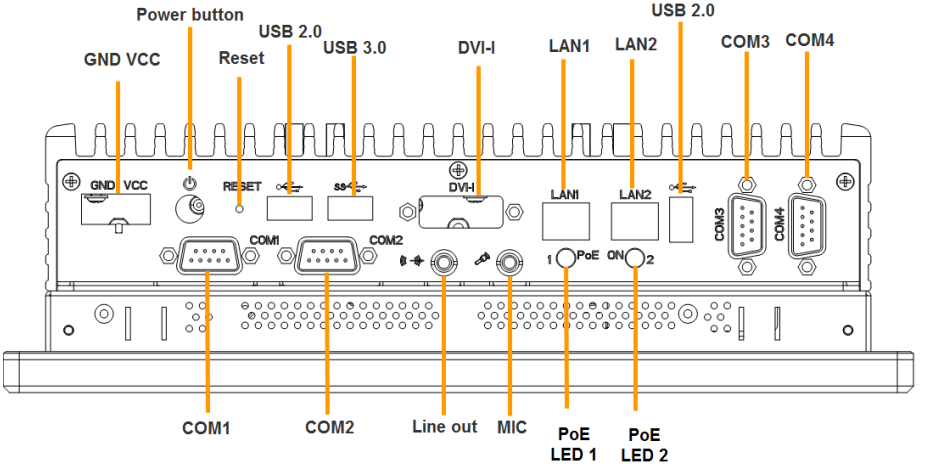
2 System Configuration

This chapter contains helpful information that describes the jumper and connector settings, component locations, and pin assignment.

The following topics are included:

- External I/O Ports Diagram
- Main Board Component Locations
- How to Set Jumpers
- Setting Main Board Connectors and Jumpers
- Daughter Board Component Locations
- Setting Daughter Board Jumpers and Connectors

2.1 SP-6140/6145 Rear I/O Ports Diagram



2.2 Jumper & Connector Quick Reference Table

Jumper / Connector	NAME
Pwr In Connector	CN_POWER1
COM Ports & Connectors	COM1, COM2, COM3, COM4, COM5, COM6
COM Port RI & Voltage Selection	JPCOM1, JPCOM2
USB Ports	USB2, USB4, USB5
LAN Ports	LAN1, LAN2
DVI-I Connector	DVI2
Digital I/O Connector	JDIO1
Audio Connector	JAUDIO1
SATA & SATA Power Connector	SATA1, SATA_PWR1
CFast Card Slot	CFAST1
CFast Card Power Connector	JP11
Clear CMOS Data Selection	JP1
LVDS Connector	LVDS1
LVDS Resolution Selection	JP4, JP5
LVDS Voltage Selection	JP6
Backlight Voltage Selection	JP_BLEN1
LVDS Enable Selection	JP34, JP35
LVDS HPD Enable Selection	JP38
Inverter Connector	INV1
Display Data Channel Selection	JP13

2.3 Main Board Component Location and Jumper Settings

M/B: SP-6140/6145

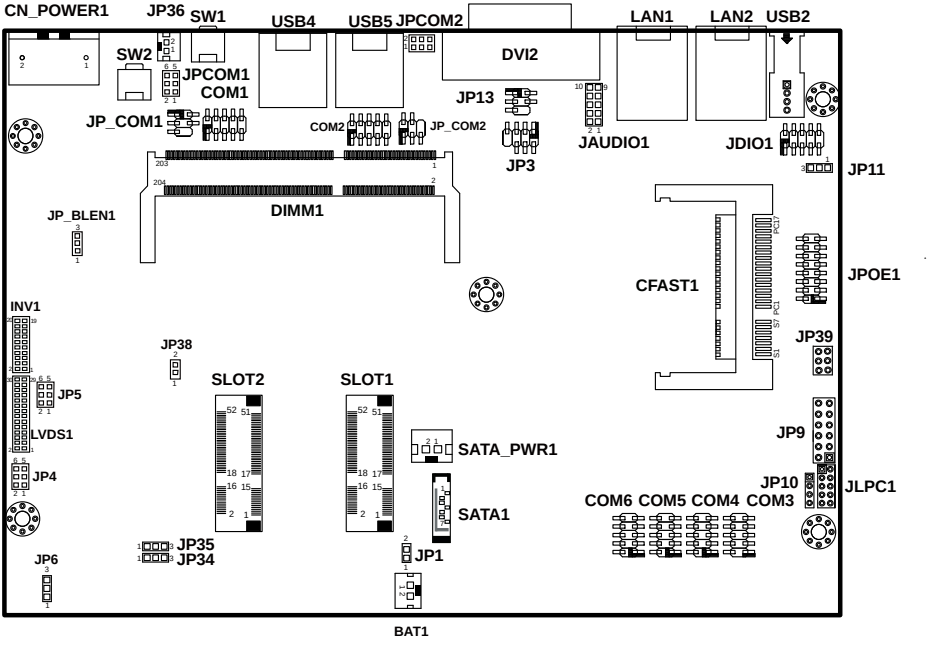


Figure 2-1. Connectors, Jumpers and Components Locations – Front Side

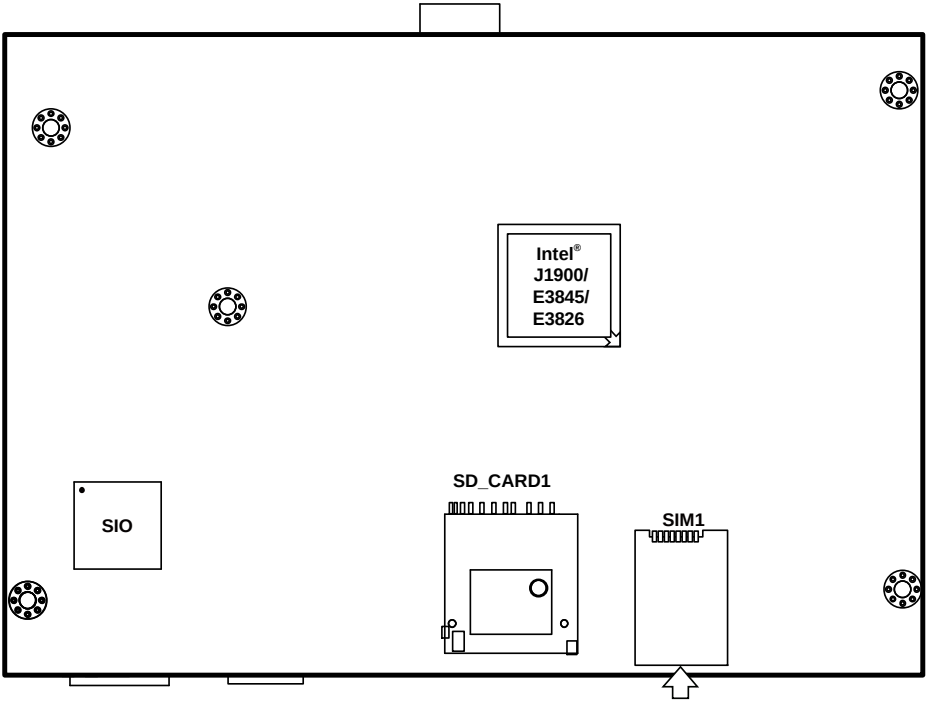


Figure 2-2. Super I/O, SD Card, SIM Card Location – Rear Side

	**WARNING:** Always disconnect the power cord when you are working with the connectors and jumpers on the main board. Make sure both the system and the external devices are turned OFF as sudden surge of power could ruin sensitive components. Make sure SP-6140/6145 is properly grounded.

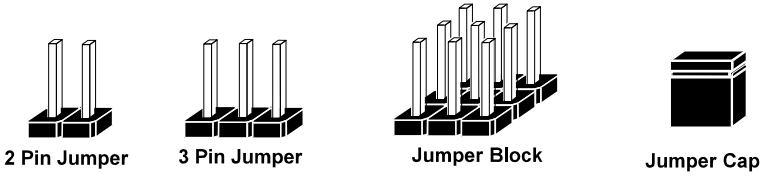
	**CAUTION:** Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while configuring the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.

2.4 Setting Jumpers

You can configure your board by setting the jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card. By using a small plastic "cap", also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can configure your hardware settings by "opening" or "closing" jumpers.

Jumpers can be combined into sets that are called jumper blocks. When jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows what this looks like.

Jumpers & Caps



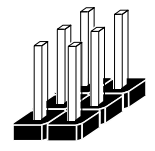
If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different types of jumpers and jumper settings.

Jumper diagrams

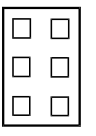
Jumper Cap looks like this

2 pin Jumper looks like this

3 pin Jumper looks like this

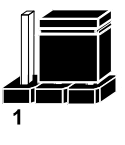


Jumper Block looks like this

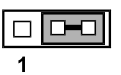


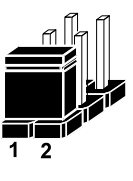
Jumper settings

2 pin Jumper closed(enabled)
looks like this

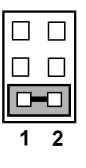


3 pin Jumper
2-3 pin closed(enabled)
looks like this





Jumper Block
1-2 pin closed(enabled)
looks like this

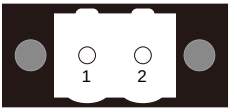


2.5 Setting Main Board Connectors and Jumpers

2.5.1 Power In Connector (CN_POWER1)

CN_POWER1: PWR IN Connector

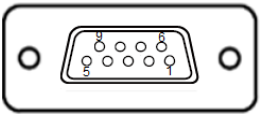
PIN	ASSIGNMENT
1	PWRI (9V~36V)
2	GND



2.5.2 COM Ports & Connectors (COM1-6)

COM1: COM Connector, fixed as RS-232/422/485.
The pin assignments are as follows:

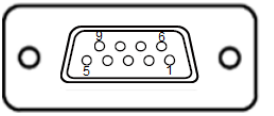
PIN	ASSIGNMENT		
	RS-232	RS-422	RS-485
1	COM1_DCD_C	TX-	485-
2	COM1_RX_C	TX+	485+
3	COM1_TX_C	RX+	NC
4	COM1_DTR_C	RX-	NC
5	GND	NC	GND
6	COM1_DSR_C	NC	NC
7	COM1_RTS_C	NC	NC
8	COM1_CTS_C	NC	NC
9	RI/+5V/+12V selectable	NC	NC



COM1

COM2: COM Connector, fixed as RS-232/422/485.
The pin assignments are as follows:

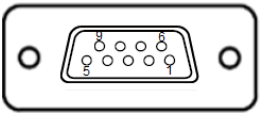
PIN	ASSIGNMENT		
	RS-232	**RS-422**	**RS-485**
1	COM2_DCD_C	TX-	485-
2	COM2_RX_C	TX+	485+
3	COM2_TX_C	RX+	NC
4	COM2_DTR_C	RX-	NC
5	GND	NC	GND
6	COM2_DSR_C	NC	NC
7	COM2_RTS_C	NC	NC
8	COM2_CTS_C	NC	NC
9	RI/+5V/+12V selectable	NC	NC



COM2

COM3: COM3 Connector, RS-232 interface
The pin assignments are as follows:

Pin	Assignment	Pin	Assignment
1	COM3_DCD_C	6	COM3_DSR_C
2	COM3_RX_C	7	COM3_RTS_C
3	COM3_TX_C	8	COM3_CTS_C
4	COM3_DTR_C	9	COM3_RI_C
5	GND	-	-



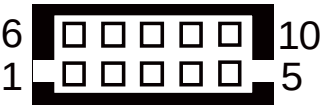
COM3/COM4

COM4: COM4 Connector, RS-232 interface
The pin assignments are as follows:

Pin	Assignment	Pin	Assignment
1	COM4_DCD_C	6	COM4_DSR_C
2	COM4_RX_C	7	COM4_RTS_C
3	COM4_TX_C	8	COM4_CTS_C
4	COM4_DTR_C	9	COM4_RI_C
5	GND	-	-

COM5: COM5 Connector, RS-232 interface
The pin assignments are as follows:

Pin	Assignment	Pin	Assignment
1	COM5_DCD_C	6	COM5_DSR_C
2	COM5_RX_C	7	COM5_RTS_C
3	COM5_TX_C	8	COM5_CTS_C
4	COM5_DTR_C	9	COM5_RI_C
5	GND	10	NC



COM5/COM6

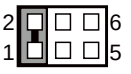
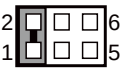
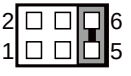
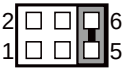
COM6: COM6 Connector, RS-232 interface
The pin assignments are as follows:

Pin	Assignment	Pin	Assignment
1	COM6_DCD_C	6	COM6_DSR_C
2	COM6_RX_C	7	COM6_RTS_C
3	COM6_TX_C	8	COM6_CTS_C
4	COM6_DTR_C	9	COM6_RI_C
5	GND	10	NC

Note: COM1/2 connectors are selectable for RI, +5V or +12V.For more information, please refer to the **COM Port RI & Voltage Selection** section.

2.5.3 COM Port RI & Voltage Selection (JPCOM1, JPCOM2)

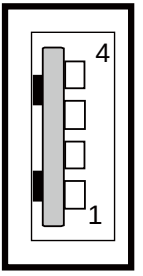
JPCOM1, JPCOM2: COM Port RI & Voltage Selection

Selection	Jumper Setting	Jumper Illustration	
RI (default)	1-2	 **JPCOM1**	 **JPCOM2**
VCC12	3-4	 **JPCOM1**	 **JPCOM2**
VCC5V	5-6	 **JPCOM1**	 **JPCOM2**

2.5.4 USB Connectors (USB2, USB4, USB5)

USB2: Internal USB Connector

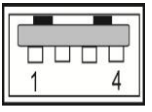
Pin	Assignment
1	VCC5V
2	USBC2N
3	USBC2P
4	GND
5	GND



USB2

USB4: Internal USB Connector

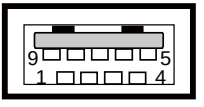
Pin	Assignment
1	VCC5V
2	USBC4N
3	USBC4P
4	GND
5	GND



USB4

USB5: Internal USB3.0 Connector

Pin	Assignment
1	VCC5V
2	USBB_DM
3	USBB_DP
4	GND
5	U3RXNDN1
6	U3RXNDP1
7	GND
8	U3TXDN1
9	U3TXDP1

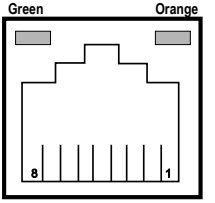


USB5

2.5.5 LAN Ports (LAN1, LAN2)

LAN1: LAN Connectors

Pin	Assignment
1	MDI_0P
2	MDI_0N
3	MDI_1P
4	MDI_1N
5	MDI_2P
6	MDI_2N
7	MDI_3P
8	MDI_3N



LAN1 LED Status

There are 2 LAN LED indicators for LAN1 on the rear panel of the system. By observing their status, you can know the status of the Ethernet connection.

LAN LED Indicator	Color	Status	Description
Left Side LED	Green	Blink	10/100 LAN connection is activated.
	-	Off	No LAN message active.
Right Side LED	Orange	On	10/100 LAN connection is activated.
	Red	On	Giga LAN connection is activated.
	-	Off	No LAN switch/ hub is activated.

LAN2: LAN Connectors

Pin	Assignment
1	MDI_0P
2	MDI_0N
3	MDI_1P
4	MDI_1N
5	MDI_2P
6	MDI_2N
7	MDI_3P
8	MDI_3N

LAN2 LED Status

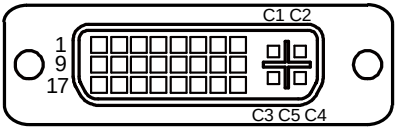
There are 2 LAN LED indicators for LAN1 on the rear panel of the system. By observing their status, you can know the status of the Ethernet connection.

LAN LED Indicator	Color	Status	Description
Left Side LED	Green	Blink	LAN Message Active
	-	Off	No LAN message active.
Right Side LED	Orange	On	10/100 LAN connection is activated.
	Red	On	Giga LAN connection is activated.
	-	Off	No LAN switch/ hub is activated.

2.5.6 DVI-I Connector (DVI2)

DVI2: DVI-I Connector

Pin	Assignment
1	DVI_2-
2	DVI_2+
3	GND
4	NC
5	NC
6	DVI_clock
7	DVI_data
8	CRT_VSYNC
9	DVI_1-
10	DVI_1+
11	GND
12	NC
13	NC
14	VCC
15	GND
16	DVI_HPD
17	DVI_0-
18	DVI_0+
19	GND
20	NC
21	NC
22	GND
23	DVI_Clock+
24	DVI_Clock-
C1	CRT_RED
C2	CRT_GREEN
C3	CRT_BLUE
C4	CRT_HSYNC
C5	GND

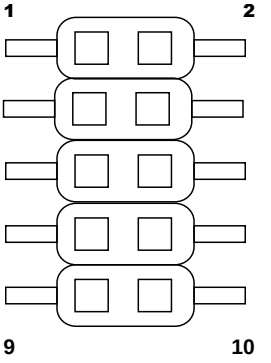


DVI2

2.5.7 Digital I/O Connector (JDIO1)

JDIO1: Digital I/O Connector

Pin	Assignment	Pin	Assignment
1	V5_SB	2	GND
3	DIN1	4	DOUT1
5	DIN2	6	DOUT2
7	DIN3	8	DOUT3
9	DIN4	10	DOUT4

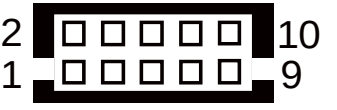


JDIO1

2.5.8 Audio Connector

JAUDIO1: Audio Connector

Pin	Assignment
1	MIC1L
2	MIC1R
3	GND
4	GND
5	LINEINL
6	LINEINR
7	GND
8	GND
9	LINEOUTL
10	LINEOUTR



JAUDIO1

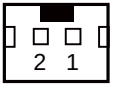
2.5.9 SATA & SATA Power Connector (SATA1, SATA_PWR1)

SATA1: Serial ATA Connector

Pin	Assignment
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA_PWRf1: Serial ATA Power Connector

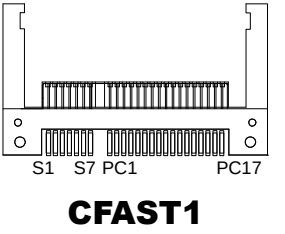
Pin	Assignment
1	VCC5V
2	GND



2.5.10 CFAST Card Slot (CFAST1)

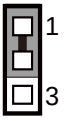
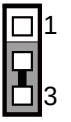
CFAST1: CFAST Card Slot

Pin	Assignment	Pin	Assignment
S1	GND	PC6	NC
S2	SATA_TXP0	PC7	GND
S3	SATA_TXN0	PC8	NC
S4	GND	PC9	NC
S5	SATA_RXN0	PC10	NC
S6	SATA_RXP0	PC11	NC
S7	GND	PC12	NC
PC1	NC	PC13	3.3V/5V
PC2	GND	PC14	3.3V/5V
PC3	NC	PC15	GND
PC4	NC	PC16	GND
PC5	NC	PC17	NC



2.5.11 CFAST Card Power Selection (JP11)

JP11: CFAST Card Power Connector

Selection	Jumper Setting	Jumper Illustration
3.3V (Default)	1-2	 **JP11**
5V	2-3	 **JP11**

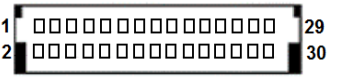
2.5.12 Clear CMOS Data Selection (JP1)

JP1: Clear CMOS Data Selection Connector

Selection	Jumper Setting	Jumper Illustration
Normal (default)	1-X	 **JP1**
Clear CMOS	1-2	 **JP1**

2.5.13 LVDS Connector (LVDS1)

LVDS1: LVDS Connector

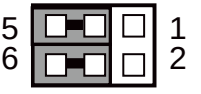
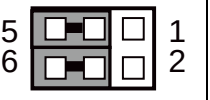
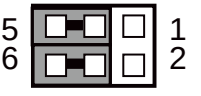
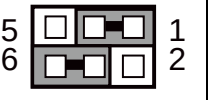


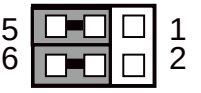
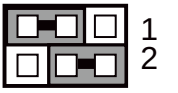
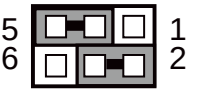
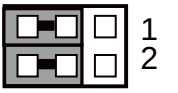
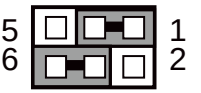
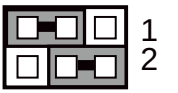
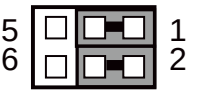
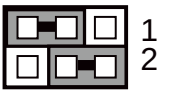
LVDS1

Pin	Assignment	Pin	Assignment
1	LVDS_VCC	2	GND
3	NC	4	NC
5	GND	6	NC
7	NC	8	GND
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	LVDS0_CLK+ (Odd)
17	LVDS0_CLK-(Odd)	18	GND
19	LVDS0_D2+(Odd)	20	LVDS0_D2- (Odd)
21	GND	22	LVDS0_D1+ (Odd)
23	LVDS0_D1-(Odd)	24	GND
25	LVDS0_D0+(Odd)	26	LVDS0_D0- (Odd)
27	LVDS0_D3+(Odd)	28	LVDS0_D3- (Odd)
29	LVDS_VCC	30	LVDS_VCC

2.5.14 LVDS Resolution Selection (JP4, JP5)

JP4 & JP5: LVDS (Low Voltage Differential Signaling) Resolution Selection

SELECTION	JUMPTER SETTING	JUMPER ILLUSTRATION	
800x600 1CH/18bit	JP4(4-6) JP4(3-5) JP5(4-6) JP5(3-5)	 **JP4**	 **JP5**
1024x768 1CH/18bit	JP4(4-6) JP4(3-5) JP5(4-6) JP5(1-3)	 **JP4**	 **JP5**

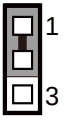
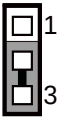
SELECTION	JUMPTER SETTING	JUMPER ILLUSTRATION	
1024x768 1CH/24bit	JP4(4-6) JP4(3-5) JP5(2-4) JP5(3-5)	 **JP4**	 **JP5**
1366x768 1CH/24bit	JP4(2-4) JP4(3-5) JP5(4-6) JP5(3-5)	 **JP4**	 **JP5**
1280x1024 2CH/24bit	JP4(4-6) JP4(1-3) JP5(2-4) JP5(3-5)	 **JP4**	 **JP5**
1920x1080 2CH/24bit	JP4(2-4) JP4(1-3) JP5(2-4) JP5(3-5)	 **JP4**	 **JP5**

Note: Manufacturing default is 1 CH/18 bit 1024x768 for SP-6140.

Manufacturing default is 1 CH/24 bit 1024x768 for SP-6145.

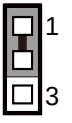
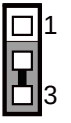
2.5.15 LVDS Voltage Selection (JP6)

JP6: LVDS Voltage Selection

Selection	Jumper Setting	Jumper Illustration
3.3V	1-2	 **JP6**
5V	2-3	 **JP6**

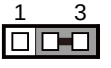
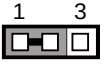
2.5.16 Backlight Voltage Selection (JP_BLEN1)

JP_BLEN1: Backlight Voltage Selection

Selection	Jumper Setting	Jumper Illustration
3.3V	1-2	 **JP_BLEN1**
5V	2-3	 **JP_BLEN1**

2.5.17 LVDS Enable Selection (JP34, JP35)

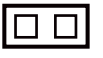
JP34/JP35: LVDS Enable Selection

Selection	Jumper Setting	Jumper Illustration
LVDS Enable (Default)	2-3	  **JP34/JP35**
LVDS Disable	1-2	  **JP34/JP35**

2.5.18 LVDS HPD Enable Selection (JP38)

JP38: LVDS HPD Enable Selection

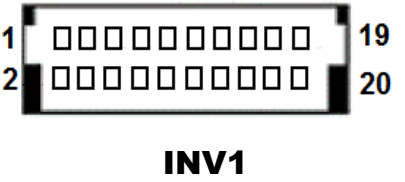
The selections are as follows:

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
LVDS HPD Enable (Default)	1-2	 **JP38**
LVDS HPD Disable	1-x	 **JP38**

2.5.19 Inverter Connector (INV1)

INV1: Inverter Connector

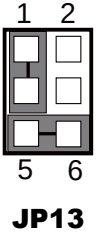
Pin	Assignment	Pin	Assignment
1	V5P0A	2	V5P0A
3	USB_N2_LVDS	4	VCC12
5	USB_P2_LVDS	6	VCC12
7	GND	8	VCC12
9	INV1_EN	10	VCC12
11	NC	12	VCC12
13	NC	14	NC
15	GND	16	P_LED
17	GND	18	PWM
19	VCC5	20	NC



2.5.20 Display Data Channel Selection (JP13)

JP13: DDC Selection

Configure JP13 to control the DDC selection.

Selection	Jumper Setting	Jumper Illustration
VGA DDC	1-2 4-6	
DVI-I DDC (Default)	1-3 5-6	

Note: Please set JP13 to **VGA DDC** when VGA & DVI-D connectors are connected for dual display.

2.6 Daughter Board Component Locations

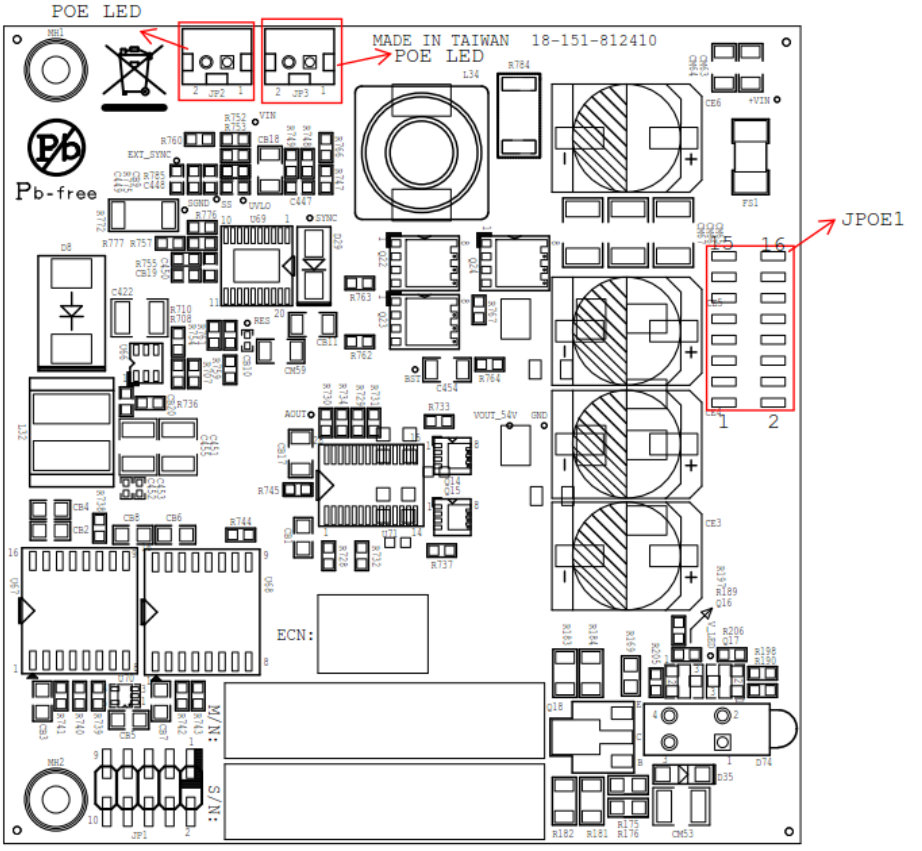


Figure 2-2. Daughter Board Connectors, Jumpers and Components Locations - Front

2.7 Daughter Board Connectors and Jumpers List

JUMPER / CONNECTOR	NAME
PoE Connector	JPOE1
PoE LED	JP2, JP3

2.8 Setting Daughter Board Jumpers and Connectors

2.8.1 PoE Connector (JPOE1)

JPOE1: PoE Connector

PIN	ASSIGNMENT
1	PSE_D3(OUT2)
2	GND
3	GND
4	GND
5	GND
6	PSE_SDAI
7	GND
8	PSE_D1(OUT1)
9	PSE_SCL
10	VOUT_54V
11	+VIN(+12V)
12	VOUT_54V
13	+VIN(+12V)
14	VOUT_54V
15	+VIN(+12V)
16	+VIN(+12V)

2.8.2 PoE Ports (JP2, JP3)

PoE LED Status

There are 2 PoE LED indicators on the rear panel of the system. By observing their status, you can know the status of the Ethernet connection.

PoE LED Indicator	Color	Status	Description
	Orange	Blink	PoE Active
	-	Off	No PoE Active

3 Software Utilities

This chapter provides the detailed information that guides users how to install VGA driver, LAN driver, and Sound driver for the system.

The following topics are included:

- Installing Intel® Chipset Software Installation Utility
- Installing Windows® 7 Utility
- Installing VGA Driver Utility
- Installing LAN Driver Utility
- Installing Sound Driver Utility
- Installing Touchscreen Driver Utility

3.1 Introduction

Enclosed with our SP-6140/6145 package, you will find a DVD-ROM disk containing all types of drivers provided. The SP-6140/6145 user will only need some of the files contained in the DVD-ROM disk. Please see the following table for details:

File Name (Assume DVD-ROM drive is D:)	Purpose
D:\Driver\Platform\Win7, Win8.1 (32-bit)\Main Chip or D:\Driver\Platform\Win7, Win8.1 (64-bit)\Main Chip	Intel® Chipset Software Installation Utility
D:\Driver\Platform\ Win7, Win8.1 (32-bit)\TXE or D:\Driver\Platform\ Win7, Win8.1 (64-bit)\TXE	Intel® Trusted Execution Engine Driver installation
D:\Driver\Platform\ Win7 (32/64-bit)\KMDF	Intel® Kernel-Mode Driver Framework Driver installation
D:\Driver\Platform\ Win7, Win8.1 (32-bit)\VGA or D:\Driver\Platform\ Win7, Win8.1 (64-bit)\VGA	Intel® Atom™ Processor E3800 Series Driver installation
D:\Driver\Platform\ Win7, Win8.1 (32-bit)\LAN or D:\Driver\Platform\ Win7, Win8.1 (64-bit)\LAN	WGI210IT Intel® Springville GbE Controller for LAN Driver installation

File Name (Assume DVD-ROM drive is D:)	Purpose
D:\Driver\Platform\ Win7, Win8.1 (32-bit)\Sound or D:\Driver\Platform\ Win7, Win8.1 (64-bit)\Sound	Realtek® ALC888S for Sound Driver installation
D:\Driver\Device\Platform\ Win7(32/64-bit) USB3.0	For USB3.0 Driver installation
D:\Driver\Device	Driver installation for Touch screen Card Reader , wireless, 3G, etc.
D:\Driver\FLASH	Driver installation for BIOS update utility (AMI)

Note: Install the driver utilities immediately after the OS installation is completed.

3.2 Installing Intel® Chipset Software Installation Utility

The Intel® Chipset Software Installation Utility installs the Windows *.INF files to the target system. These files outline to the operating system how to configure the Intel chipset components in order to ensure that the following features function properly:

- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

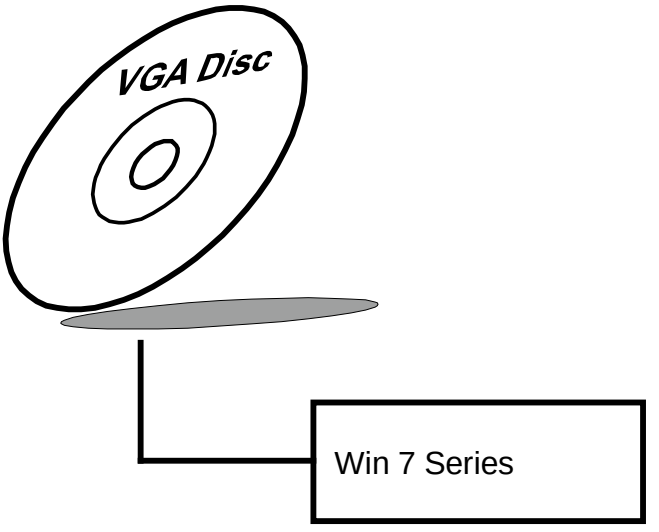
3.2.1 Installing Windows® 7 Utility

The Utility Pack is made only for Windows 7. It should be installed right after the OS installation is completed. Please follow the steps below:

1. Insert the Utility Disk into Floppy Disk Drive A/B or DVD-ROM drive.
2. In the Windows system, browse to the directory where Utility Disc is located.
   e.g.: D:\Driver\Platform\(OS)\Utility\infinst_autol.exe
3. Click **infinst_autol.exe** file for utility installation.
4. Follow the on-screen instructions to complete the installation.
5. Once the installation is completed, shut down the system and restart for the changes to take effects.

3.3 Installing VGA Driver Utility

The VGA interface is embedded in our SP-6140/6145 system to support CRT display. The following illustration shows the content of VGA driver.



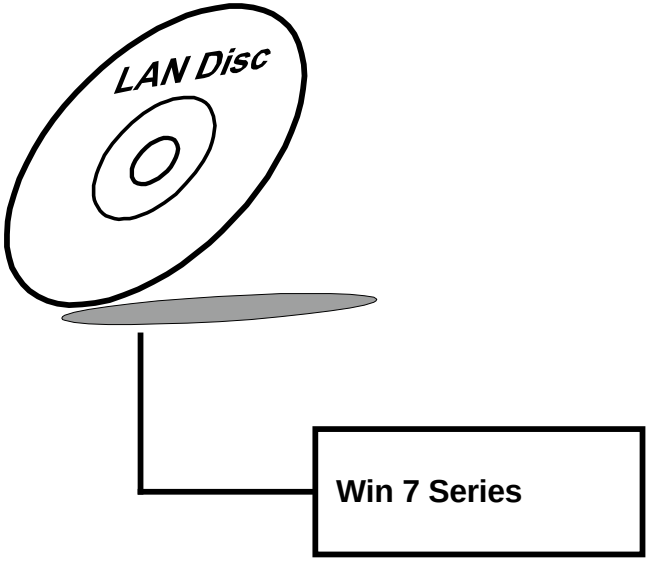
To install the VGA driver utility for Windows 7, follow the steps below:

1. Start the computer.
2. Insert the Utility Disk into the DVD-ROM drive or drive A/B.
3. Open the VGA folder in your system and choose an appropriate folder, and double-click ***.exe** file to install.
   e.g. D:\Driver\Platform\(OS)\Graphics\Your system\ ***.exe
   (If D drive is not your DVD-ROM drive, replace the "D" with the correct drive letter.)

4 Follow the on-screen instructions as guided by the Wizard to complete the installation.

3.4 Installing LAN Driver Utility

The SP-6140/6145 is enhanced with LAN function that can support various network adapters. The content of the LAN driver is found as follows:



To install the LAN Driver, follow the steps below:

1 Connect the USB DVD-ROM device to SP-6140/6145 and insert the driver disk.

2 Enter the "LAN" folder where the driver is located (depending on your OS platform).

3 Click **Setup.exe** file for driver installation.

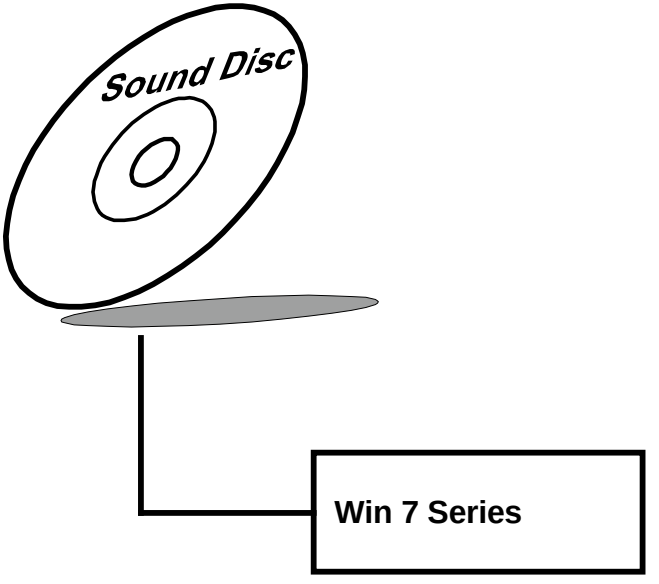
4 Follow the on-screen instructions to complete the installation.

5 Once the installation is done, shut down the system and restart SP-6140/6145 for the changes to take effects.

For more details on the installation procedure, refer to the Readme.txt file that you can find on LAN Driver Utility.

3.5 Installing Sound Driver Utility

The Audio chip enhanced in this system is fully compatible with Windows 7. Below, you will find the content of the Sound driver:



To install the Sound Driver for Windows 7, follow the steps below:

1 Open the **Sound** folder in your system and choose an appropriate folder, and run the **setup.exe** program to start the installation.
e.g.: D:\Driver\Platform\(OS)\ SOUND\Your system\setup.exe

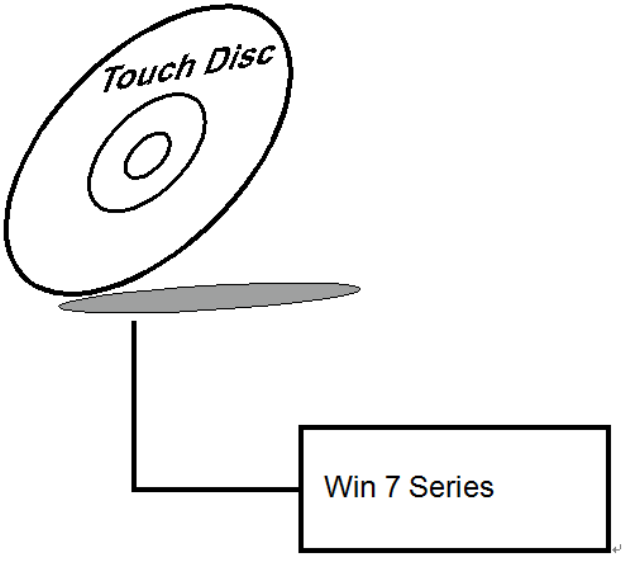
(If D drive is not your DVD-ROM drive, replace the "D" with the correct drive letter.)

2 Click **Next** to continue the procedure. If the "Windows can't verify the publisher of this driver software" message is alerted, click "Install this driver software anyway" to continue the installation.

3 Restart the system and click **Finish** to complete the installation.

3.6 Installing Touchscreen Driver Utility

The touch screen driver utility can only be installed on Windows 7, and it should be installed right after the OS installation.



To install the touchscreen driver, follow the steps below:

1. Open the **Device/Touchscreen** folder where the touchscreen driver is located.
2. Click **Setup.exe** file for driver installation.
3. Follow the on-screen instructions to complete the installation.
4. Once the installation is completed, shut down the system and restart for the changes to take effect.

4 BIOS SETUP

This chapter guides users how to configure the basic system configurations via the AMI BIOS Setup Utilities. The information of the system configuration is saved in battery-backed CMOS RAM and BIOS NVRAM so that the Setup information is retained when the system power is off. The BIOS Setup Utilities consist of the following menu items:

4.1 Introducing BIOS Setup

The SP-6140/6145 System uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the built-in BIOS setup program, Power-On Self-Test (POST), PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between the operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These elements have combined to provide a standard environment for booting the operating system and running pre-boot applications.

The diagram below shows the Extensible Firmware Interface's location in the software stack.

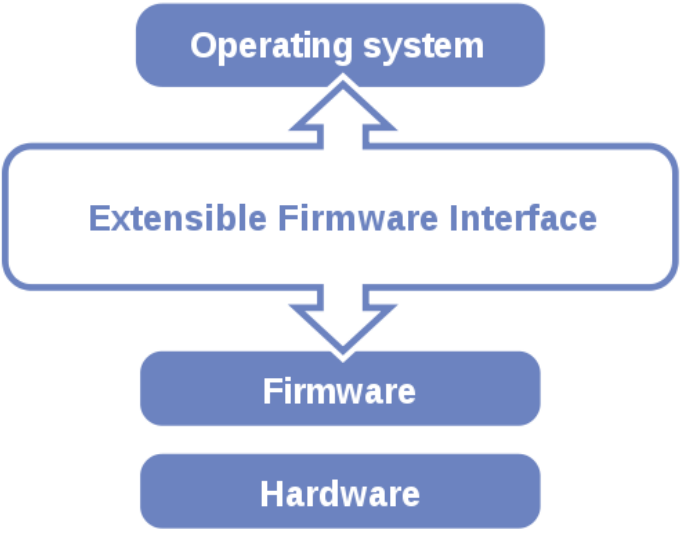


Figure 4-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface that allows you to modify hardware configuration, e.g. change the system date and time, enable/disable a system component, determine bootable device priority, set up personal password, etc., which is convenient for engineers to perform modifications and customize the computer system and allows technicians to troubleshoot the occurred errors when the hardware is faulty.

The BIOS setup menu allows users to view and modify the BIOS settings for the computer. After the system is powered on, users can access the BIOS setup menu by pressing <Del> or <Esc> immediately while the POST message is running before the operating system is loading.

Users will need to set up the system configuration from the BIOS Setup Utility when any of the following conditions occurs:

1. You are starting your system for the first time.
2. You have changed the hardware in your system or the hardware becomes faulty.
3. The system configuration is reset after the user configures to clear CMOS data via the JP1 jumper.
4. The power of the CMOS RAM became lost and the system configuration has been erased.

All the menu settings are described in details in this chapter.

4.2 Accessing Setup Utility

After the system is powered on, BIOS will enter the Power-On Self-Test (POST) routines and the POST message will be displayed:

Figure 4-2. POST Screen with AMI Logo

Press **<Del>** to access the Setup Utility program and the **Main** menu of the Aptio Setup Utility will appear on the screen as shown below:

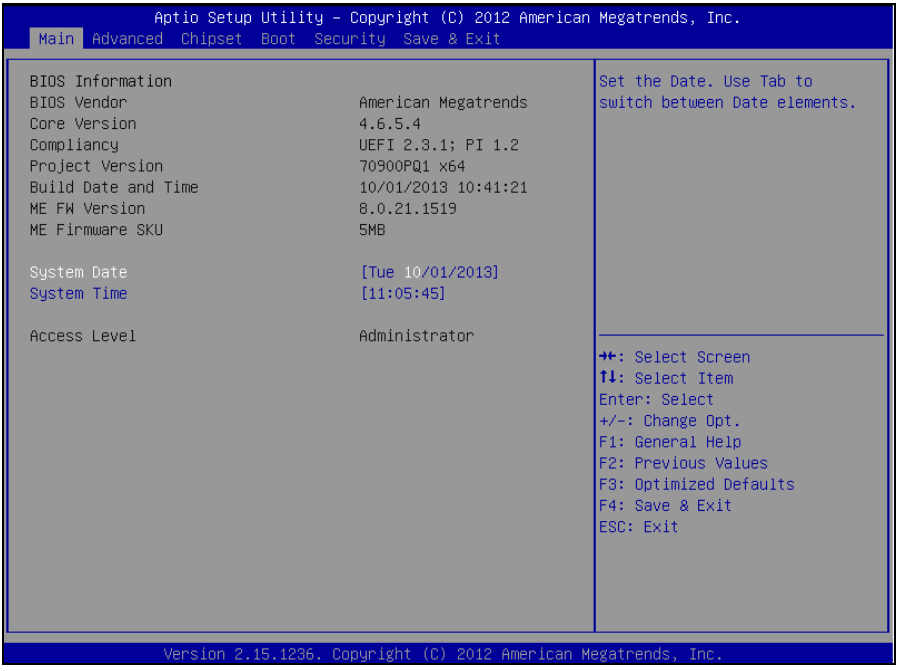


Figure 4-3. BIOS Setup Menu Initialization Screen

If you enter incorrect passwords for 3 consecutive times, the screen will be locked and you will not be able to enter any data unless the system is restarted.

The language of the BIOS setup menu interface and help messages are shown in US English. You may use the up <↑> /down <↓> arrow key to select among the items and press **Enter** to confirm and enter the sub-menu. A brief help message of the selected item will also appear at the bottom of the screen for your information. The following table provides the list of the keys that you can use while operating the BIOS setup menu.

BIOS Setup Menu Key	Description
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from the selected item upwards or downwards)
Enter	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

BIOS Messages

This section describes the alert messages generated by the board's BIOS. These messages would be shown on the monitor when certain recoverable errors/events occur during the POST stage. The table bellow gives an explanation of the BIOS alert messages:

BIOS Message	Explanation
A first boot or NVRAM reset condition has been detected.	BIOS has been updated or the battery was replaced.

BIOS Message	Explanation
The CMOS defaults were loaded.	Default values have been loaded after the BIOS was updated or the battery was replaced.
The CMOS battery is bad or has been recently replaced.	The battery may be losing power and users should replace the battery immediately. Also, this message is displayed once the new battery is replaced.

4.3 Main Menu

The **Main** menu allows you to view the BIOS Information, change the system date and time, and view the user access privilege level. Use tab to switch between date elements.

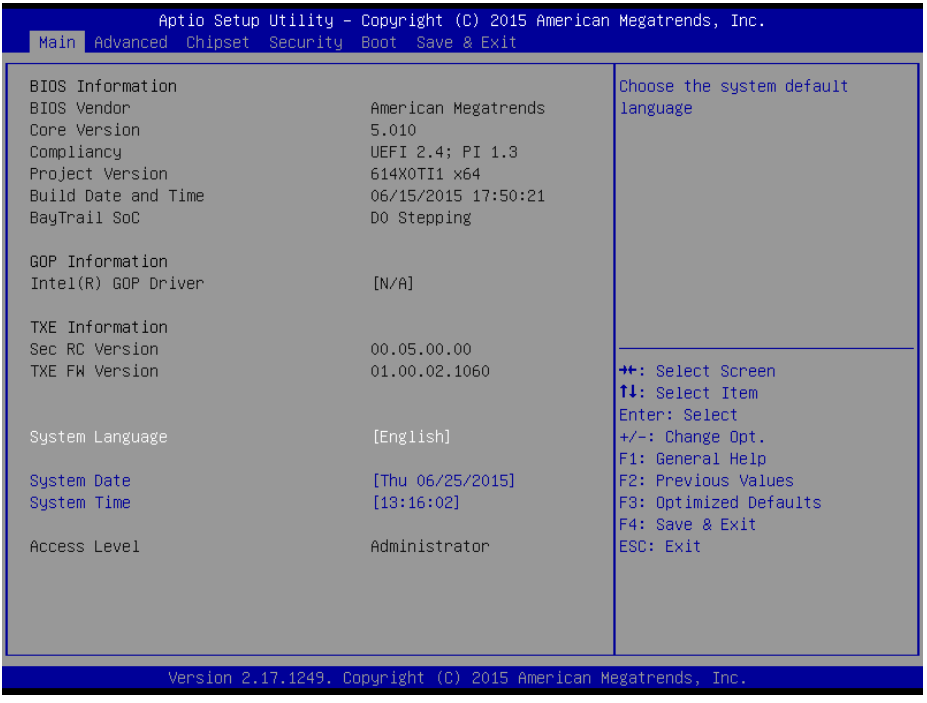


Figure 4-4. BIOS Main Menu

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Display the name of the BIOS vendor.
Core Version	No changeable options	Display the current BIOS core version number.

BIOS Setting	Options	Description/Purpose
Compliancy	No changeable options	Display the current UEFI version.
Project Version	No changeable options	Display the BIOS version currently installed on the platform.
Build Date and Time	No changeable options	Display the date of the current BIOS version.
Intel(R) GOP Driver	No changeable options	Display the GOP driver version.
Sec RC Version	No changeable options	Display the current Sec RC version.
TXE Firmware Version	No changeable options	Display the current TXE Version
System Language	English	BIOS Setup language.
System Date	month, day, year	Set the current date. The "Day" is automatically changed.
System Time	hour, minute, second	Set the clock of the system.
Access Level	No changeable options	The privilege level of the current user.

4.4 Advanced Menu

From the **Advanced** menu, you are allowed to configure the following functions:

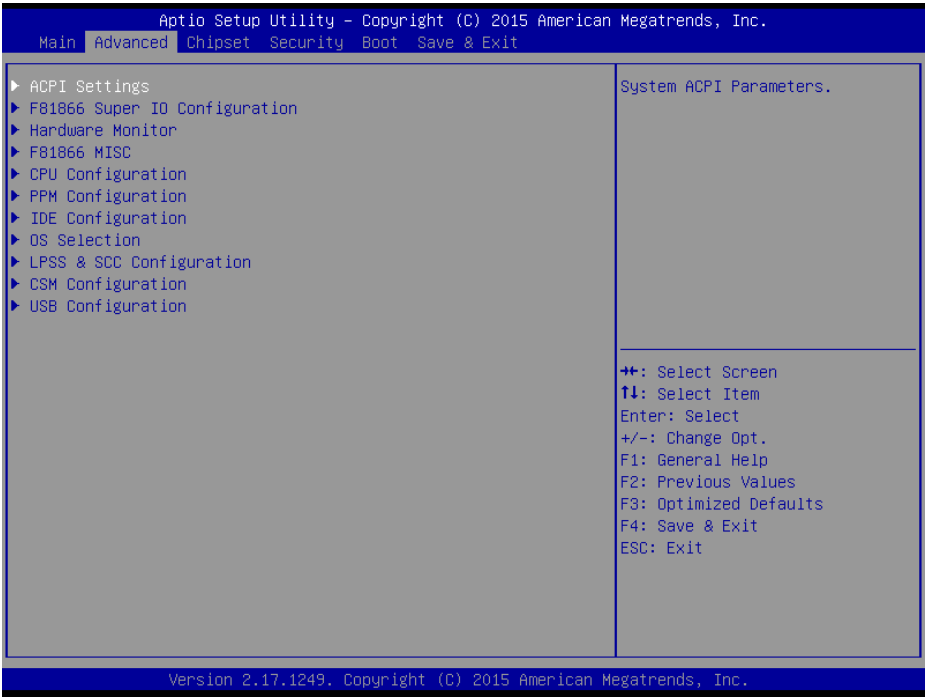


Figure 4-5. BIOS Advanced Menu

BIOS Setting	Options	Description/Purpose
ACPI Settings	Sub-menu	Set the system ACPI parameters.
F81866 Super IO Configuration	Sub-menu	Set the system Super IO Chip configuration.
Hardware Monitor	Sub-menu	Monitor the hardware status
F81866 MISC	Sub-menu	Configure the F81866 related function.
CPU Configuration	Sub-menu	Set the CPU configuration parameters.
PPM Configuration	Sub-menu	Set the PPM configuration parameters.
IDE Configuration	Sub-Menu	Set the SATA configuration parameters.
OS Selection	Sub-menu	Select the OS settings.
LPSS & SCC Configuration	Sub-menu	Configure the LPSS & SCC configuration setting.
CSM Configuration	Sub-menu	Configure the Option ROM execution, boot options filters, etc.
USB Configuration	Sub-menu	Set the USB configuration parameters.

4.4.1 ACPI Configuration

Select **ACPI Configuration** from the **Advanced** menu and press **Enter** to configure relevant ACPI configuration parameters.

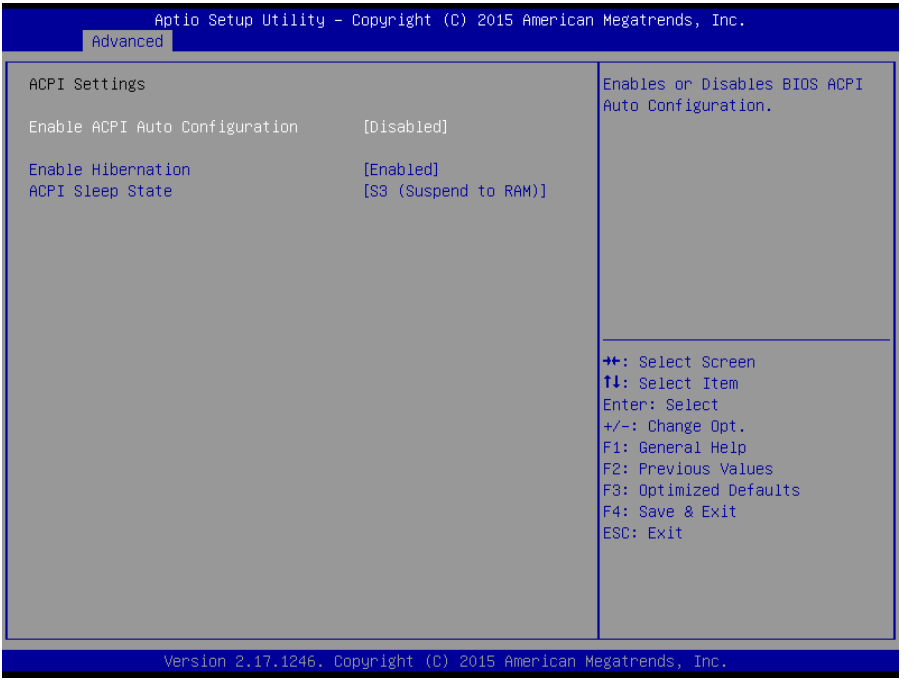


Figure 4-6. ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable ACPI Auto Configuration	- Disabled - Enabled	Enable or disable ACPI feature.
Enable Hibernation	- Disabled - Enabled	Enable or disable the system ability to hibernate (OS/S4 Sleep State). This option may be not effective for some OS.
ACPI Sleep State	- Suspend Disabled - S3 Only (Suspend to RAM)	Specify the ACPI sleep state. • **Suspend Disabled:** Disable ACPI sleep feature. • **S3 Only:** Allow the platform to enter the Suspend to RAM mode.

4.4.2 F81866 Super IO Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and press **Enter** to configure the serial ports 1-6.

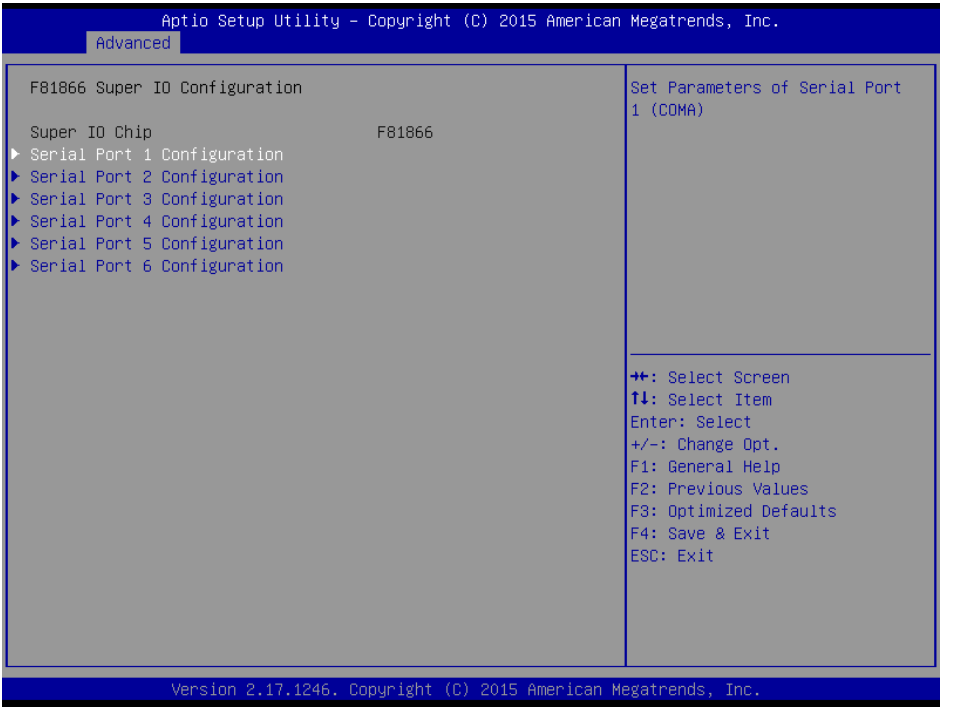


Figure 4-7. Super IO Setting Screen

BIOS Setting	Option	Description/Purpose
Super IO Chip	No changeable options	Display the super IO chip model name and its manufacturer.
Serial Port 1 Configuration	Sub-menu	Configure the parameters for COMA.
Serial Port 2 Configuration	Sub-menu	Configure the parameters for COMB.
Serial Port 3 Configuration	Sub-menu	Configure the parameters for COMC.
Serial Port 4 Configuration	Sub-menu	Configure the parameters for COMD.
Serial Port 5 Configuration	Sub-menu	Configure the parameters for COME.
Serial Port 6 Configuration	Sub-menu	Configure the parameters for COMF.

4.4.2.1 Serial Port 1 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 1 Configuration**, and press **Enter** to configure relevant settings.

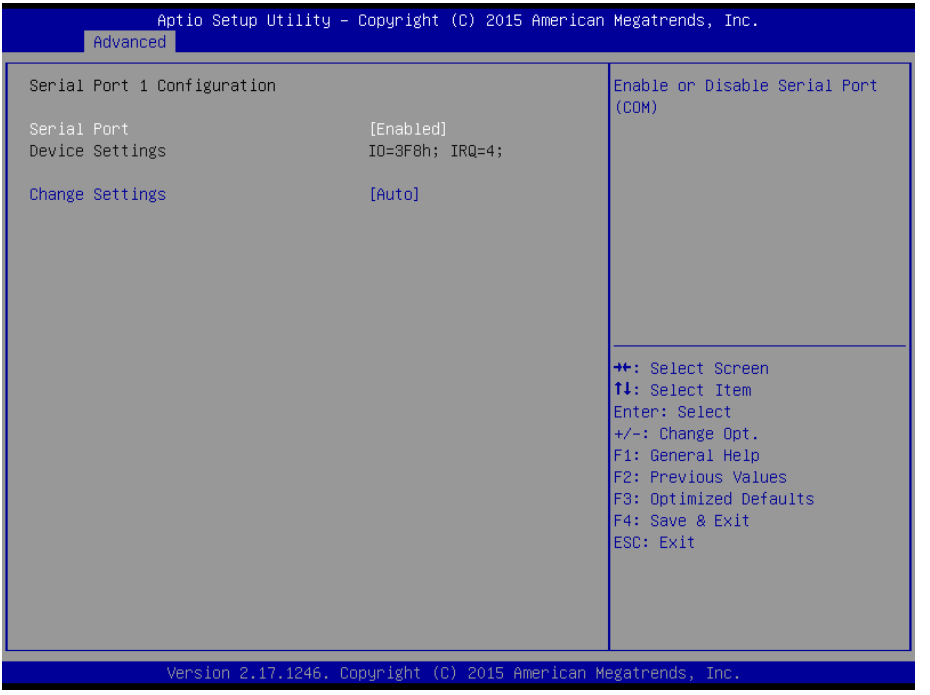


Figure 4-8. Serial Port 1 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 1.
Device Settings	No changeable options	Display the current settings of Serial Port 1.
Change Settings	-Auto -IO=3F8h; IRQ=4 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource settings for Serial Port 1.

4.4.2.2 Serial Port 2 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 2 Configuration**, and press **Enter** to configure relevant settings.

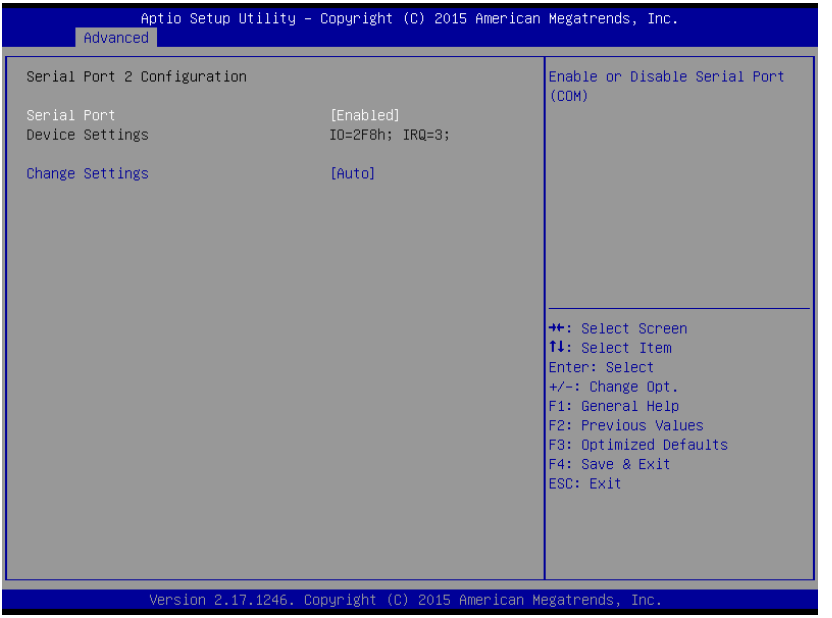


Figure 4-9. Serial Port 2 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 2.
Device Settings	No changeable options	Display the current settings of Serial Port 2.
Change Settings	-Auto -IO=2F8h; IRQ=3 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource settings for Serial Port 2.

4.4.2.3 Serial Port 3 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 3 Configuration**, and press **Enter** to configure relevant settings.

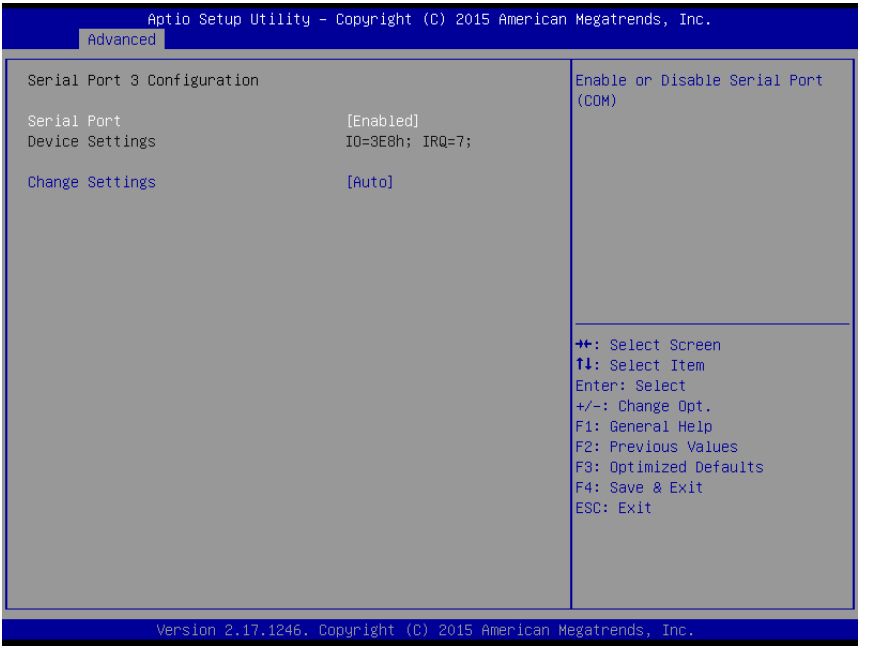


Figure 4-10. Serial Port 3 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 3.
Device Settings	No changeable options	Display the current settings of Serial Port 3.
Change Settings	-Auto -IO=3E8h; IRQ=7 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource settings for Serial Port 3.

4.4.2.4 Serial Port 4 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 4 Configuration**, and press **Enter** to configure relevant settings.

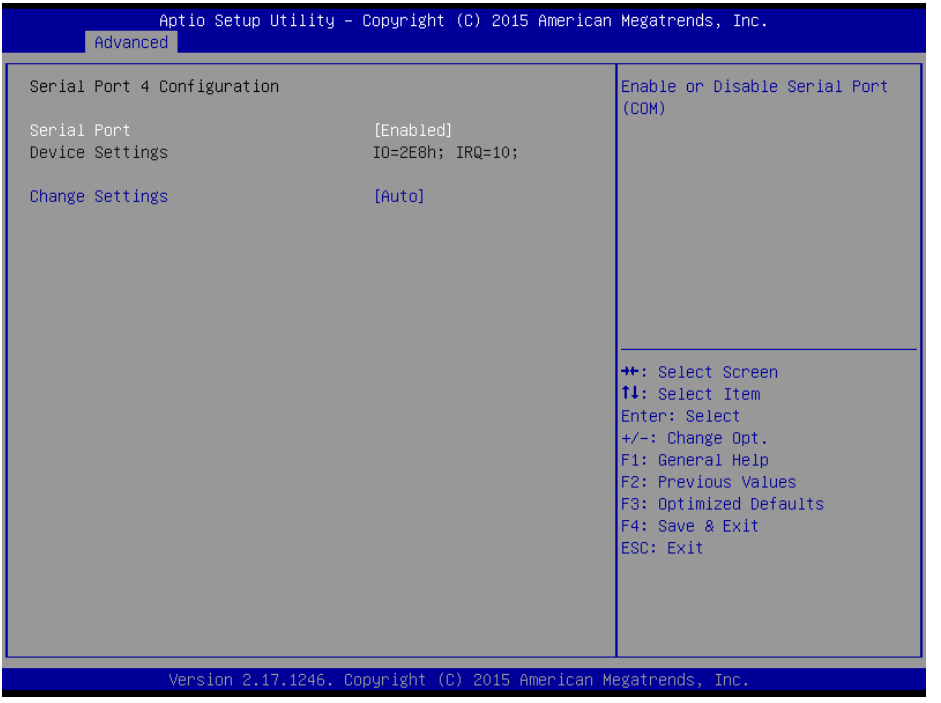


Figure 4-11. Serial Port 4 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable Serial Port 4.
Device Settings	No changeable options	Display the current settings of Serial Port 4.
Change Settings	-Auto -IO=2E8h; IRQ=10 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource settings for Serial Port 4.

4.4.2.5 Serial Port 5 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 5 Configuration**, and press **Enter** to configure relevant settings.

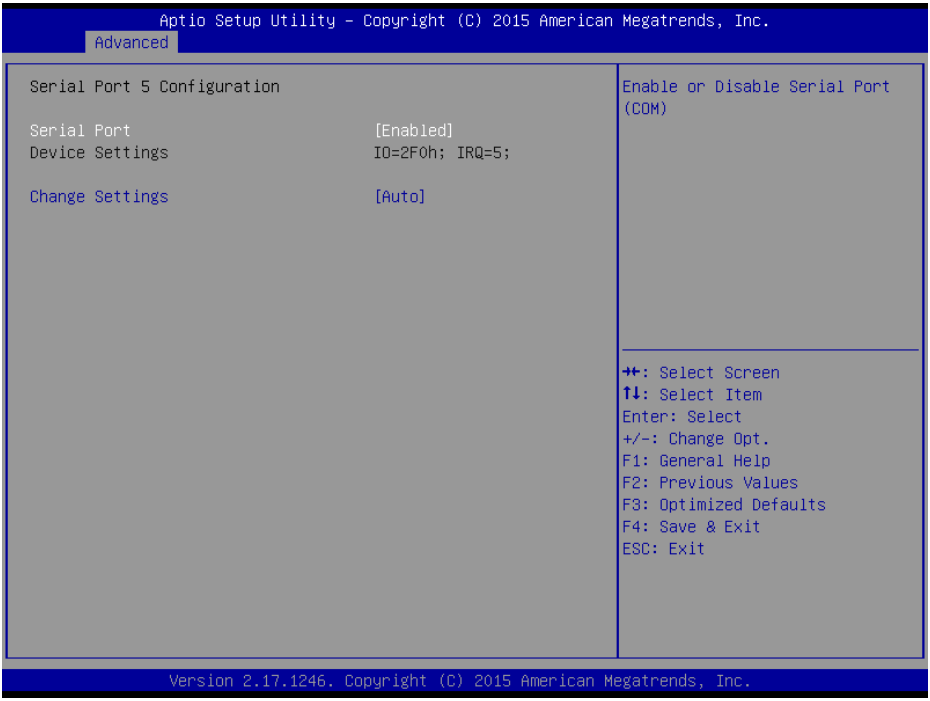


Figure 4-12. Serial Port 5 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable serial port 5.
Device Settings	No changeable options	Displays current settings of serial port 5.
Change Settings	-Auto -IO=2E8h; IRQ=5 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource for the serial port 5.

4.4.2.6 Serial Port 6 Configuration

Select **F81866 Super IO Configuration** from the **Advanced** menu and select **Serial Port 6 Configuration**, and press **Enter** to configure relevant settings.

Figure 4-13. Serial Port 6 Configuration Screen

BIOS Setting	Option	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or disable serial port 6.
Device Settings	No changeable options	Displays current settings of serial port 6
Change Settings	-Auto -IO=2E8h; IRQ=11 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select IRQ and I/O resource for the serial port 6.

4.4.3 Hardware Monitor

Select **Hardware Monitor** from the **Advanced** menu and press **Enter** to monitor the status of the system hardware, including system temperature, CPU temperature and the voltage levels of VCORE, 5VSB, VCC5, VCC12, VCC3V, VSB3V and VBAT in supply.

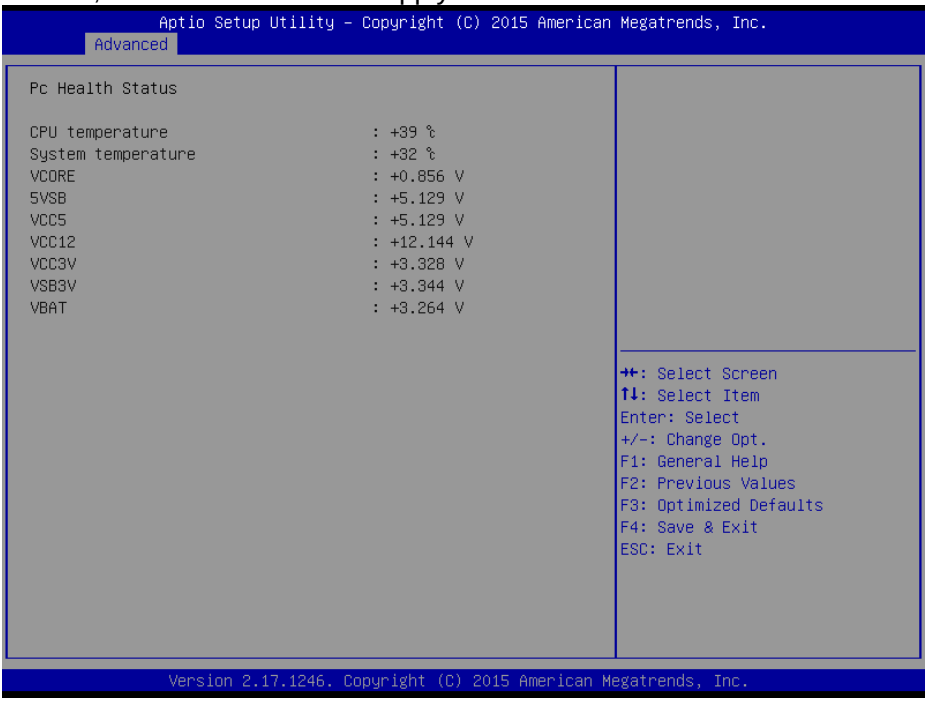


Figure 4-14. Hardware Monitor Screen

BIOS Setting	Option	Description/Purpose
CPU temperature	No changeable options	Display the processor temperature.
System temperature	No changeable options	Display the system temperature.
VCORE	No changeable options	Display the voltage level of the +VCORE in supply.
5VSB	No changeable options	Display the voltage level of the +VSB5 in supply.
VCC5	No changeable options	Display the voltage level of the + VCC5 in supply.
VCC12	No changeable options	Display the voltage level of the + VCC12 in supply.
VCC3V	No changeable options	Display the voltage level of the + VCC3 in supply.
VSB3V	No changeable options	Display the voltage level of the standby VCC3 in supply.
VBAT	No changeable options	Display the voltage level of the battery in supply.

4.4.4 F81866 MISC

Select **F81866 MISC** from the **Advanced** menu and press **Enter** to enable/disable Watchdog timer and configure the COM1 and COM2 modes.

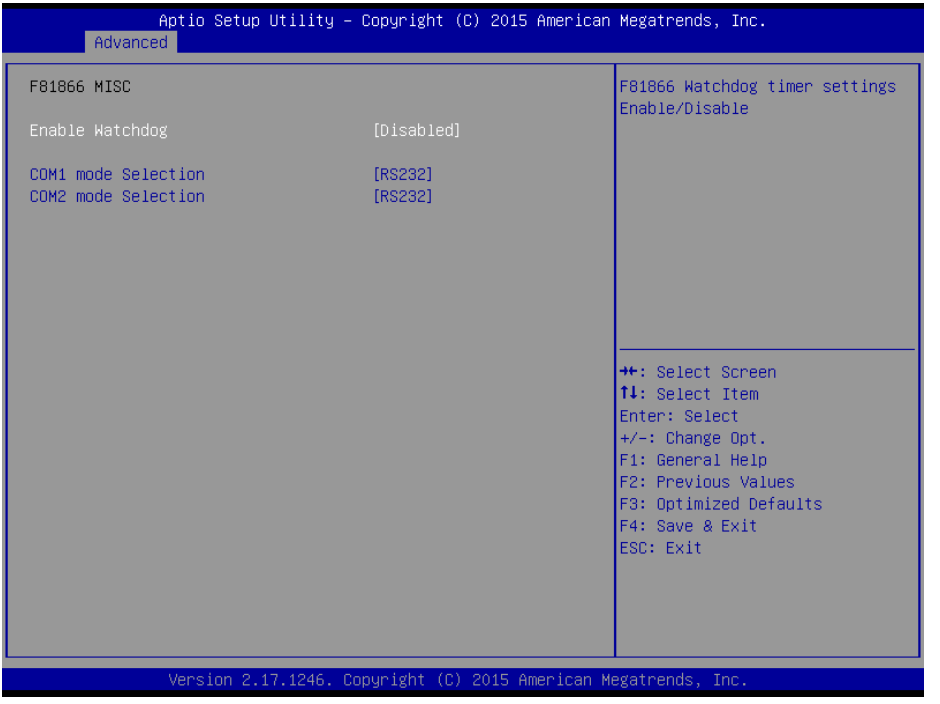


Figure 4-15. F81866 MISC Setting Screen

BIOS Setting	Option	Description/Purpose
Enable Watchdog	-Disabled -Enabled	Enable/ Disable Watchdog timer.
Watchdog timer unit	-1s - 60s	Set the desired value in seconds or minutes for the watchdog timer.
Count for Timer (seconds)	1 to 255 seconds	Set the desired value in seconds for the watchdog timer.
COM1 mode Selection	-RS-232 -RS-422 -RS-485	Select RS-232 or RS-422 or RS-485 for the COM1 port.
COM2 mode Selection	-RS-232 -RS-422 -RS-485	Select RS-232 or RS-422 or RS485 for the COM2 port.

4.4.5 CPU Configuration

Select **CPU Configuration** from the **Advanced** menu and press **Enter** to view CPU signature, configure Socket 0 CPU information, view CPU speed, Intel x86-64 (amd64) 64-bit OS support, and enable/disable the legacy operating systems to boot processors with extended CPUID functions.

Figure 4-16. Advanced Menu > CPU Configuration Screen

BIOS Setting	Option	Description/Purpose
CPU Signature	No changeable options	Report the CPU signature.
Socket 0 CPU Information	Sub-Menu	Report the CPU information.
CPU Speed	No changeable options	Report the current CPU speed.
64-bit	No changeable options	Report if the processor supports Intel x86-64 (amd64) implementation.
Limit CPUID Maximum	- Disabled - Enabled	Enable the legacy operating systems to boot processors with extended CPUID functions. Select **Disabled** for Win XP.

4.4.5.1 Socket 0 CPU Information

Select **CPU Configuration > Socket 0 CPU Information** from the **Advanced** menu and press **Enter** to view the relevant settings.

Figure 4-17. Socket 0 CPU Information Screen

BIOS Setting	Option	Description/Purpose
CPU Signature	No changeable options	Report the CPU signature.
Microcode Patch	No changeable options	Report the CPU Microcode Patch Version.
Max CPU Speed	No changeable options	Report the maximum CPU speed.
Min CPU Speed	No changeable options	Report the minimum CPU speed.
Processor Cores	No changeable options	Display the number of physical cores in processor.
Intel HT Technology	No changeable options	Report if the Intel Hyper-Threading Technology is supported by the processor
Intel VT-x Technology	No changeable options	Report if the Intel VT-x Technology is supported by processor.
L1 Data Cache	No changeable options	Display the L1 data cache size.
L1 Code Cache	No changeable options	Display the L1 Code cache size.
L2 Cache	No changeable options	Display the L2 cache size.
L3 Cache	No changeable options	Display the L3 cache size.

4.4.6 PPM Configuration

Select **CPU Configuration > PPM Configuration** from the **Advanced** menu and press **Enter** to enable/disable Intel SpeedStep.

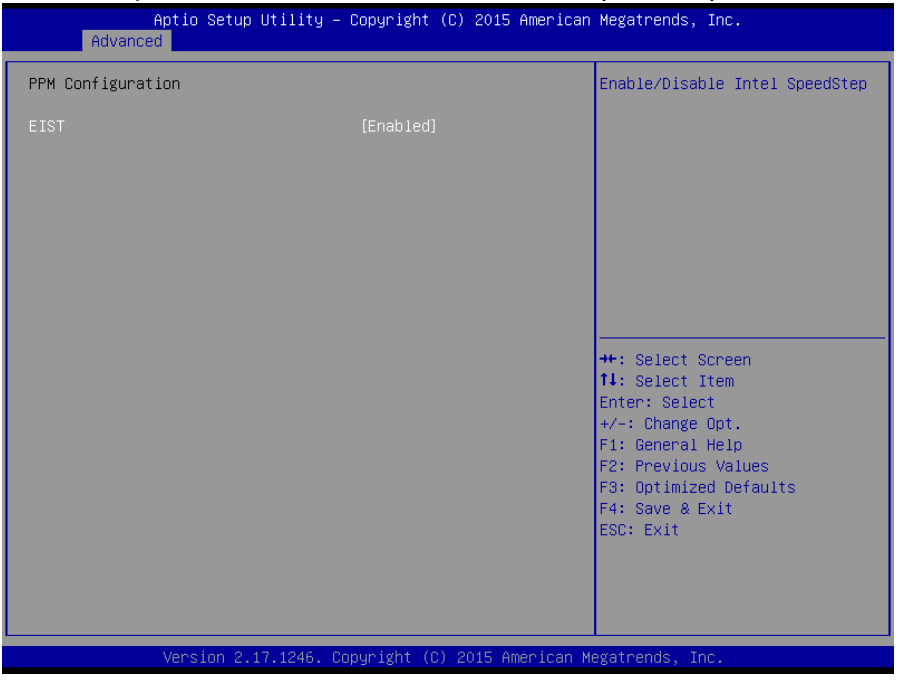


Figure 4-18. PPM Configuration Screen

BIOS Setting	Option	Description/Purpose
EIST	-Disabled -Enabled	Enable/Disable Intel SpeedStep.

4.4.7 IDE Configuration

Select **CPU Configuration > IDE Configuration** from the **Advanced** menu and press **Enter** to configure relevant SATA settings.

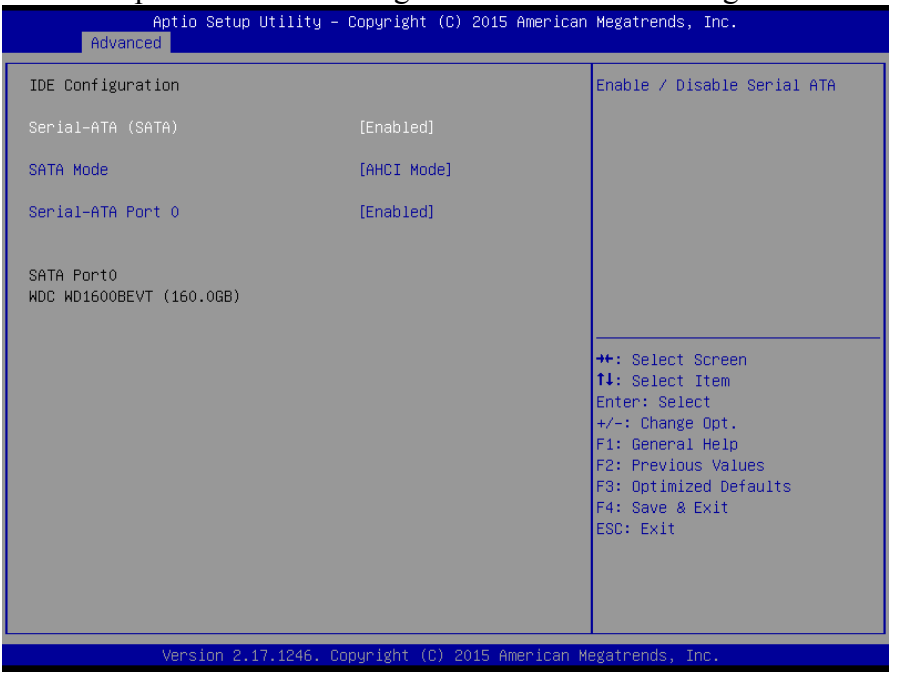


Figure 4-19. IDE Configuration Screen

BIOS Setting	Option	Description/Purpose
SATA Controller(s)	- Disabled - Enabled	Enable or disable SATA Device.
SATA Mode	- IDE mode - AHCI mode	Configure SATA as follows: • **IDE:** Set SATA operation mode to IDE mode. • **AHCI:** SATA works as AHCI (Advanced Host Controller Interface) mode for achieving better performance.
Serial-ATA Port 0	- Disabled - Enabled	Enable or disable SATA port 0 device.
SATA Port 0	[drive]	Display the drive installed on this SATA port 0. Shows [Empty] if no drive is installed.

4.4.8 OS Selection

Select **CPU Configuration** > **OS Selection** from the **Advanced** menu and press **Enter** to select the Windows operating system.

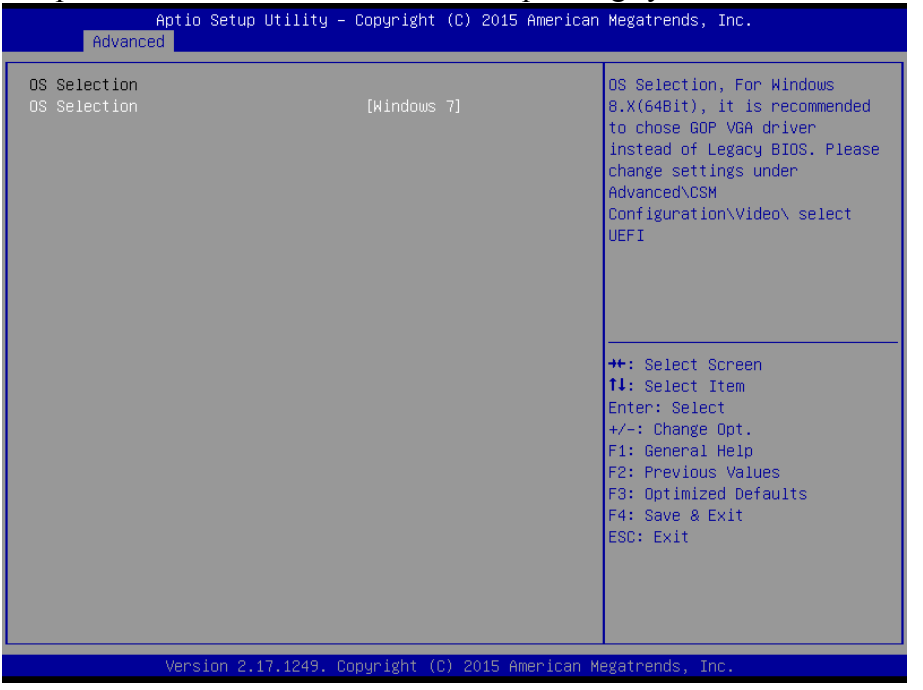


Figure 4-20. OS Selection Configuration Screen

BIOS Setting	Option	Description/Purpose
OS Selection	- Windows 8.X - Windows 7	Select Windows 8.X or Windows 7 operating system.

For Windows 8.X (64bit) operating system, it is recommended to choose GOP VGA driver. Instead of Legacy BIOS, please go to the **Advanced** Menu > **CSM Configuration** and change the **Video** setting to **UEFI**.

4.4.9 LPSS & SCC Configuration

Select **CPU Configuration > LPSS & SCC Configuration** from the **Advanced** menu and press **Enter** to set the LPSS & SCC device mode.

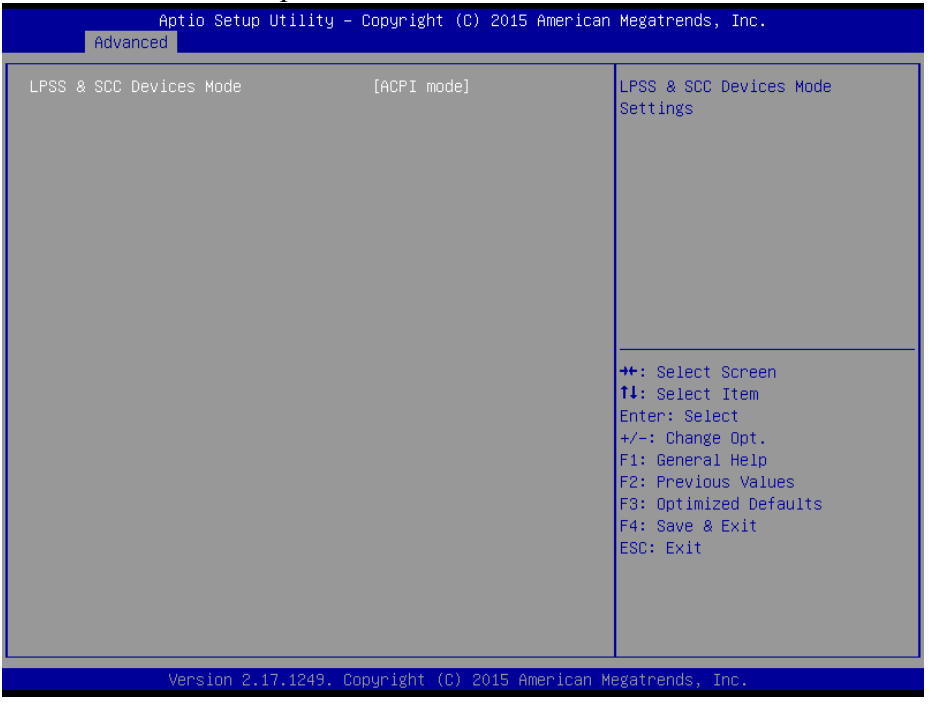


Figure 4-21. LPSS & SCC Configuration Screen

BIOS Setting	Option	Description/Purpose
LPSS & SCC Device Mode	- ACPI mode - PCI mode	Set the LPSS & SCC Device mode

4.4.10 CSM Configuration

Select **CPU Configuration > CSM Configuration** from the **Advanced** menu and press **Enter** to configure the relevant CSM settings.

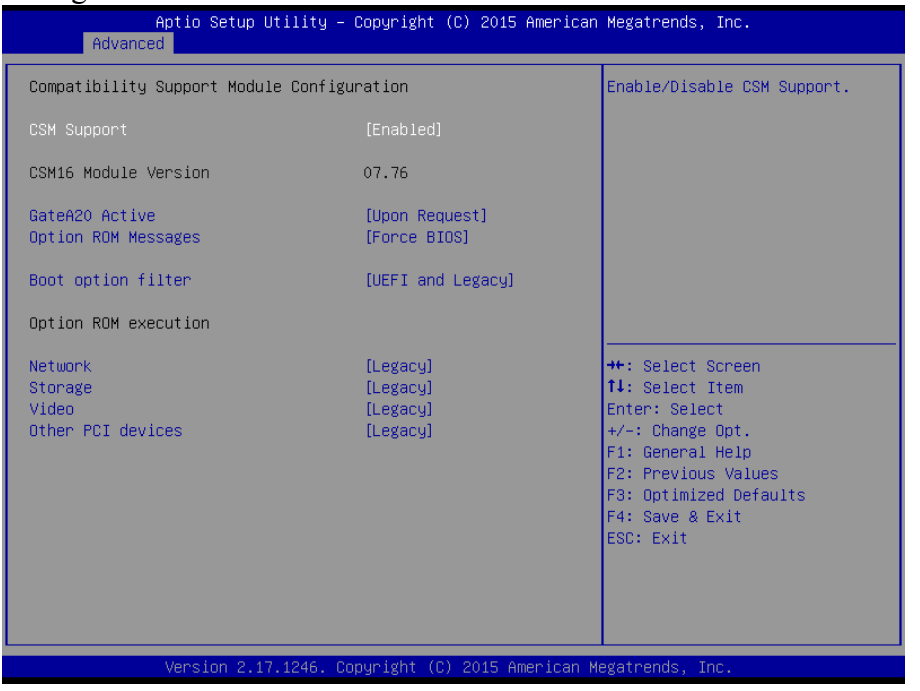


Figure 4-22. CSM Configuration Screen

BIOS Setting	Option	Description/Purpose
CSM Support	- Disabled - Enabled	Disable or Enable CSM support
CSM16 Module Version	No changeable options	Display the current CSM (Compatibility Support Module) version.
GateA20 Active	- Upon Request - Always	Select the Gate A20 operation mode. • **Upon Request:** GA20 can be disabled using BIOS services. • **Always:** Disabling GA20 is not allowed. This setting is useful when any RT code is executed above 1MB.
Option ROM Messages	- Force BIOS - Keep Current	Set the display mode for Option ROM messages.
Boot option filter	- UEFI and Legacy	This option controls the type of devices

BIOS Setting	Option	Description/Purpose
	- Legacy only - UEFI only	that the system can boot.
Network	- Do not launch - UEFI - Legacy	Control the execution of UEFI or Legacy PXE
Storage	- Do not launch - UEFI - Legacy	Control the execution of UEFI or Legacy Storage
Video	- Do not launch - UEFI - Legacy	Control the execution of UEFI and Legacy Video.
Other PCI devices	- Do not launch - UEFI - Legacy	Determine the Option ROM execution policy for devices other than Network, Storage, or Video.

4.4.11 USB Configuration

Select **CPU Configuration > USB Configuration** from the **Advanced** menu and press **Enter** to configure the relevant USB settings.

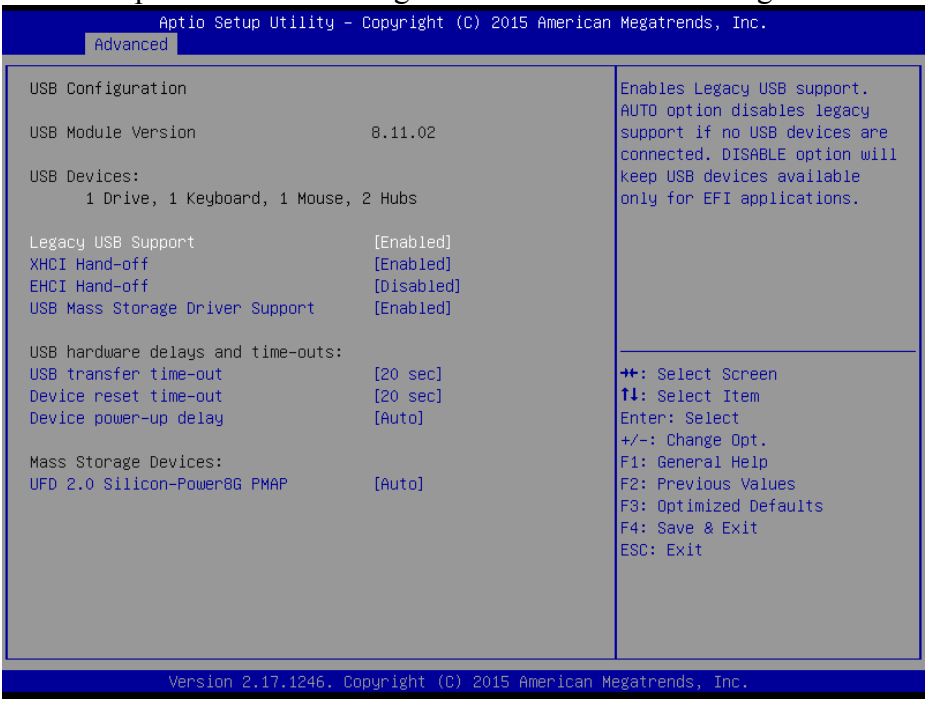


Figure 4-23. USB Configuration Screen

BIOS Setting	Option	Description/Purpose
USB Devices	No changeable options	Display the number of the available USB devices.
Legacy USB Support	- Enabled - Disabled - Auto	Enable support for legacy USB.
XHCI Hand-off	- Enabled - Disabled	This is a workaround for OSes without XHCI hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without EHCI hand-off support.
USB Mass Storage Driver Support.	- Disabled - Enabled	Enable/Disable USB mass storage driver support.
USB transfer time-out	1 / 5 / 10 /20 seconds	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset	10 / 20 / 30 / 40 seconds	USB mass storage device Start Unit

BIOS Setting	Option	Description/Purpose
time-out		command time-out.
Device power-up delay	- Auto - Manual	The maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses the default value: for a Root port, it is 100 ms; for a Hub port, the delay is taken from Hub descriptor.
Device power-up delay in seconds	1 to 40 seconds	The delay range is from 1 to 40 seconds in one-second increment.
Mass Storage Devices:	- Auto - Floppy - Force FDD - Hard Disk - CD-ROM	Display the device name and choose the device emulation type.

4.5 Chipset Menu

Select the **Chipset** menu and press **Enter** to configure the North Bridge and South Bridge.

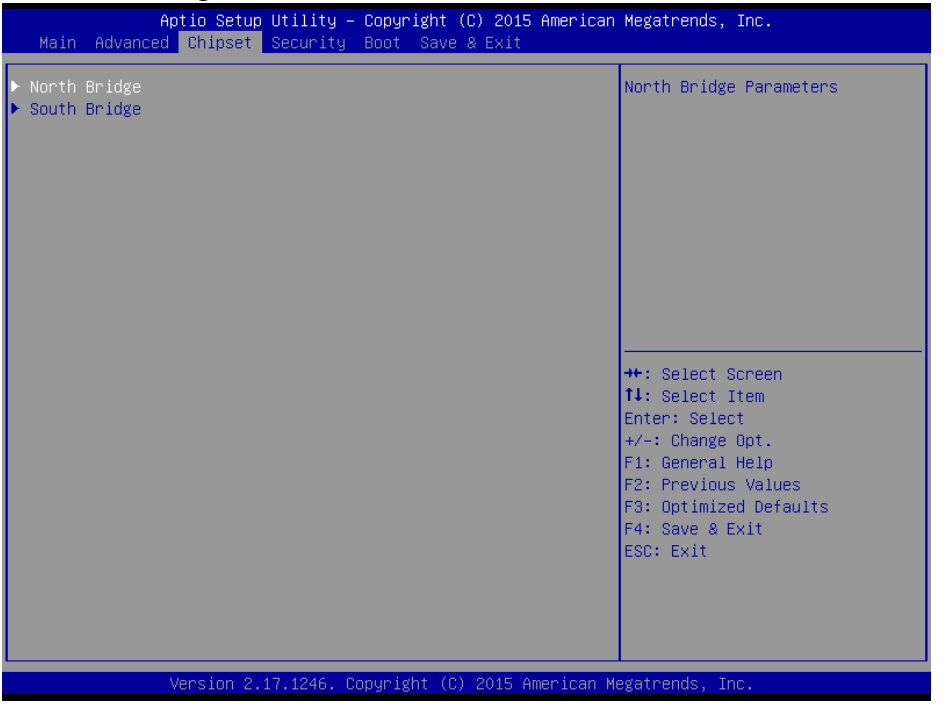


Figure 4-24. Chipset Menu Screen

BIOS Setting	Option	Description/Purpose
North Bridge	Sub-menu	Set the parameters for Panther Point (North Bridge).
South Bridge	Sub-menu	Set the parameters for Ivy Bridge (South Bridge).

4.5.1 Configuring North Bridge

Select the **North Bridge** option from the **Chipset** menu, and press **Enter** to configure relevant parameters.

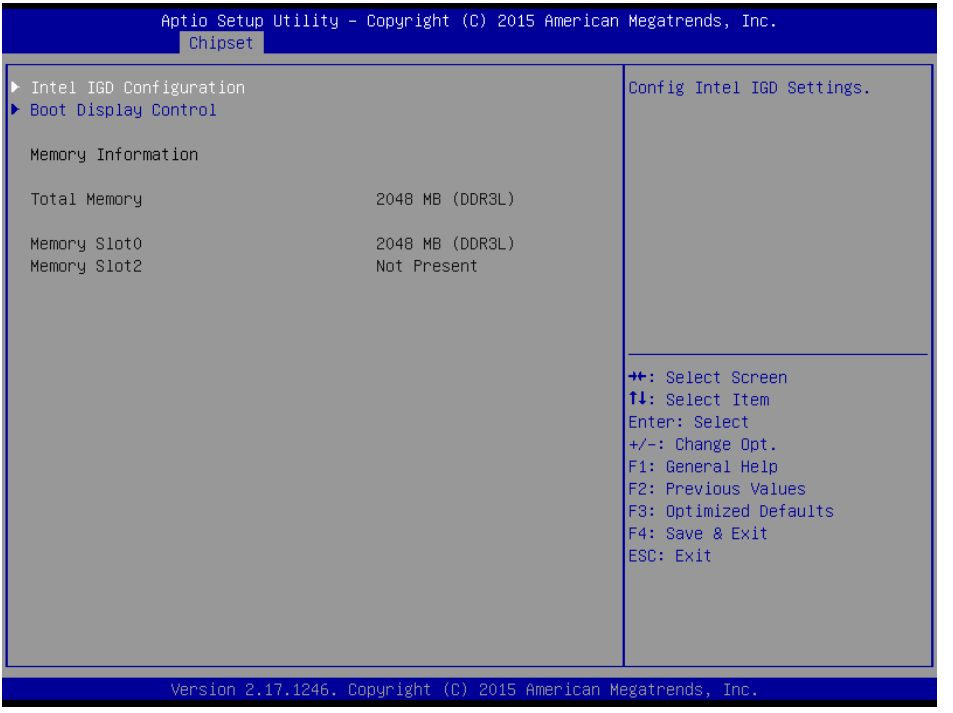


Figure 4-25. North Bridge Configuration Screen

BIOS Setting	Option	Description/Purpose
Intel IGD Configuration	Sub-menu	Configure Intel IGD Settings.
Boot Display Control	Sub-menu	Boot Display Control.
Memory Information	No changeable options	Display the DRAM information on platform.
Total Memory	No changeable options	Display the DRAM size

4.5.1.1 GOP Configuration

Select **GOP Configuration** from **Chipset** menu > **North Bridge** > **Intel IGD Configuration** and press **Enter** to configure relevant parameters.

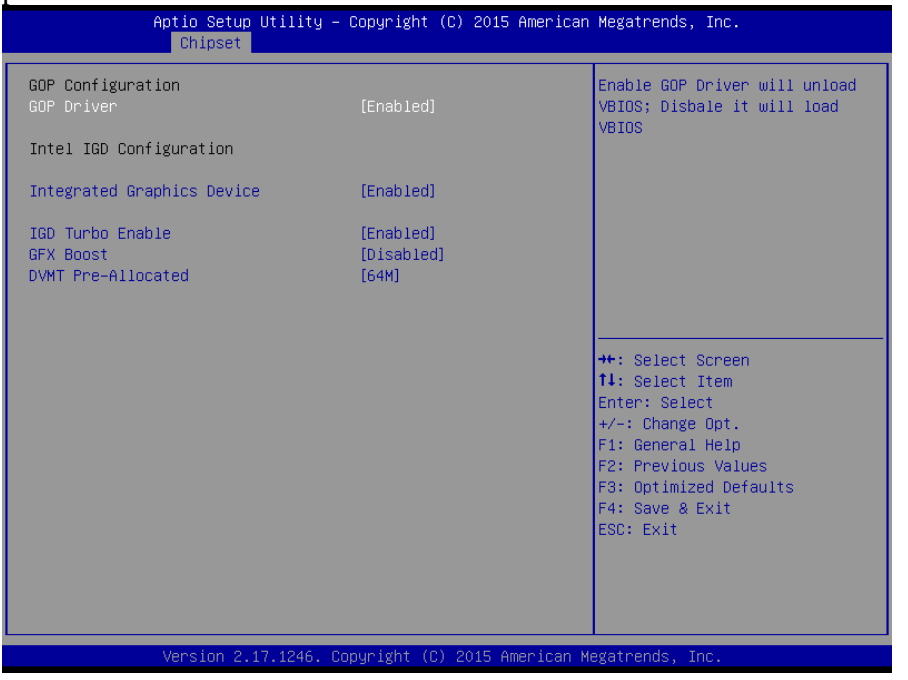


Figure 4-26. GOP Configuration Screen

BIOS Setting	Option	Description/Purpose
GOP Driver	- Enabled - Disabled	Enable or disable the GOP Driver for UEFI OS
Intel IGD Configuration	No changeable options	Display the IGD information on the platform.
Integrated Graphics Device	- Enabled - Disabled	• **Enabled:** Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. • **Disabled:** Always disable IGD
IGD Turbo Enable	- Enabled - Disabled	Enable or disable IGD Turbo.
GFX Boost	- Enabled - Disabled	Enable or disable GFX Boost accelerated graphics processing
DVMT Pre-Allocated	- 64M - 96M - 128M - 256M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

BIOS Setting	Option	Description/Purpose
	- 512M	

4.5.1.2 Boot Display Control Configuration

Select the **North Bridge** option from the **Chipset** menu, and select **Boot Display Control** and press **Enter** to configure relevant parameters.

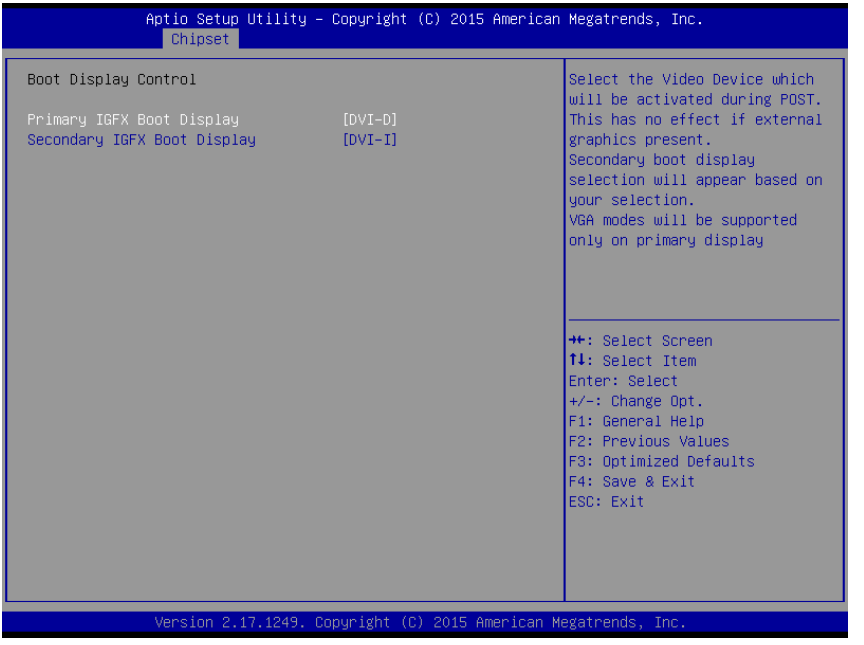


Figure 4-27. Boot Display Control Screen

BIOS Setting	Option	Description/Purpose
Primary IGFX Boot Display	- CRT - LVDS - DVI-I	Select the primary video device that will be activated during POST.
Secondary IGFX Boot Display	- CRT - LVDS - DVI-I	Select the secondary video device.

4.5.2 Configuring South Bridge

Select **South Bridge** from the **Chipset** menu, and press **Enter** to configure relevant parameters.

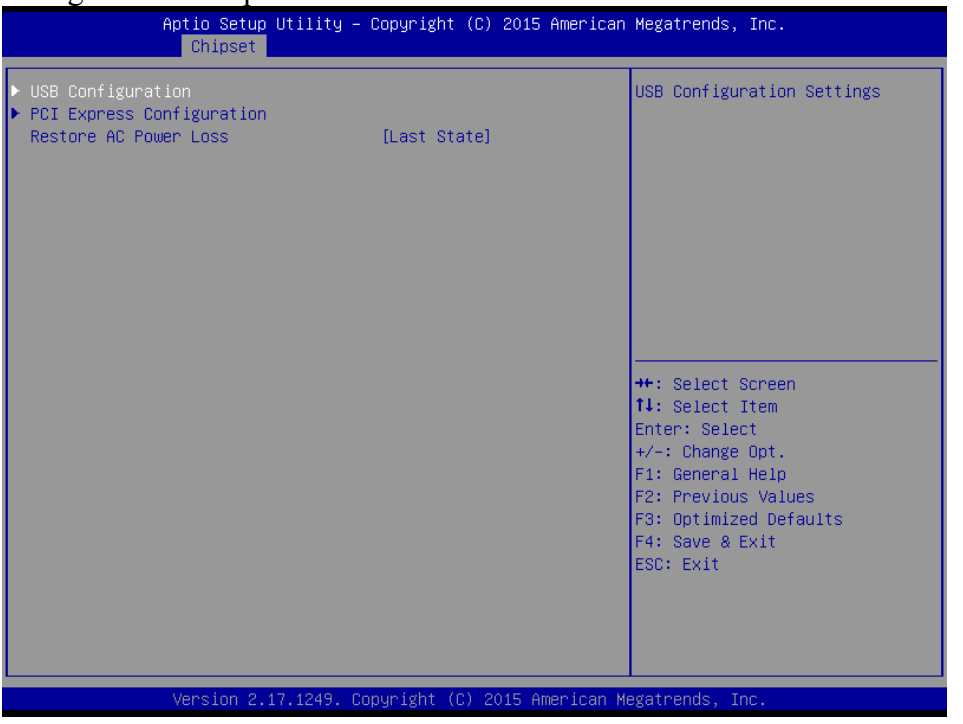


Figure 4-28. South Bridge Screen

BIOS Setting	Option	Description/Purpose
USB Configuration	Sub-menu	USB configuration settings.
PCI Express Configuration	Sub-menu	PCI Express configuration settings.
Restore AC Power Loss	- Power Off - Power On - Last State	Select the AC power state when the power supply is restored following a power failure. • **Power Off** keeps the power off unless the power button is pressed. • **Power On** keeps the system power on after the AC power is restored to the board. • **Last State** brings the system back to the last power state before the AC power is lost.

4.5.3 USB Configuration

Select the **South Bridge** option from the **Chipset** menu, and select **USB Configuration** and press **Enter** to configure relevant parameters.

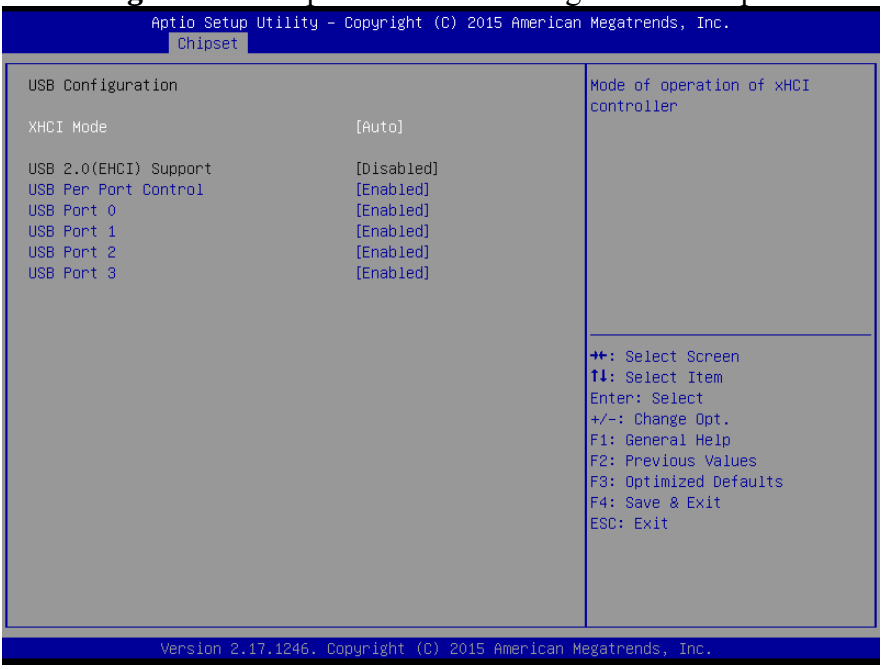


Figure 4-29. Chipset Menu > USB Configuration Screen

BIOS Setting	Option	Description/Purpose
XHCI Mode	- Disabled - Enabled - Auto - Smart Auto	Select the operation mode of XHCI controller.
USB 2.0(EHCI) Support	- Disabled - Enabled	(XHCI Mode need set disabled.) Enable Enhanced Host Controller Interface 1 for high-speed USB functions (USB 2.0).
USB Per Port Control	- Disabled - Enabled	Enable or disable each USB port.
USB Port 0	- Disabled - Enabled	Enable or disable USB port 0.
USB Port 1	- Disabled - Enabled	Enable or disable USB port 1.
USB Port 2	- Disabled - Enabled	Enable or disable USB port 2.
USB Port 3	- Disabled - Enabled	Enable or disable USB port 3.

4.5.4 PCI Express Configuration

Select the **South Bridge** option from the **Chipset** menu, and select **PCI Express Configuration** and press **Enter** to enable/disable the Mini PCI-E ports 1 and 2, and their speeds.

Figure 4-30. PCI Express Configuration Screen

BIOS Setting	Option	Description/Purpose
PCI Express Port 0	- Disabled - Enabled	Enable or disable PCI Express port 0.
Speed	- Auto - Gen1 - Gen2	Select the speed of the PCI Express port 0.
PCI Express Port 1	- Disabled - Enabled	Enable or disable PCI Express port 1.
Speed	- Auto - Gen1 - Gen2	Select the speed for PCI Express port 1.

4.6 Security Menu

From the **Security** menu, you are allowed to configure or change the administrator password. You will be asked to enter the configured administrator password before you are allowed to access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. Heed that a user password does not provide access to many of the features in the Setup utility.

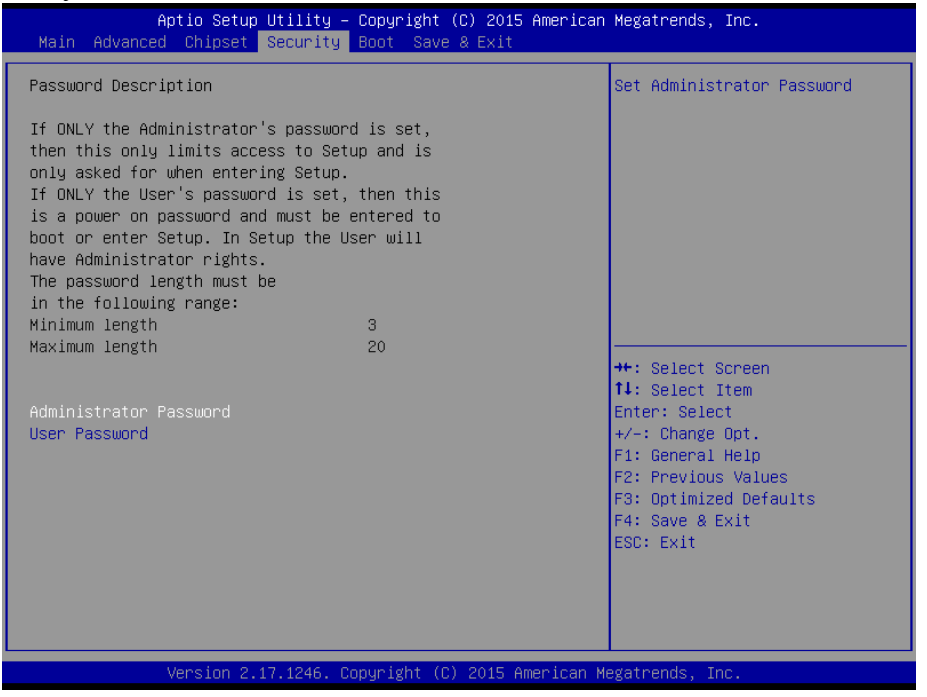


Figure 4-31. BIOS Password Configuration Screen

Configure the Administrator Password according to the password policy specified below:

BIOS Setting	Option	Description/Purpose
Administrator Password	3-20 alphanumeric characters	Configure the administrator password.
User Password	3-20 alphanumeric characters	Configure the user password.

Follow the instructions below to configure the administrator password:

1. Select the **Administrator Password** item and press **Enter**.
2. Type in the new administrator password and press **Enter** when you are finished.
3. Another dialog box prompts you to retype the password for confirmation. Retype the password correctly and press **Enter**.
4. Navigate back to the main menu and select **SAVE & EXIT** menu. Your system will then reboot and you'll be prompted for the password.

To remove the password protection, highlight the **Administrator Password** item and type in the current password. Press **Enter** to disable the password protection from the dialog box that opens.

4.7 Boot Menu

Select the **Boot** menu to configure the boot sequence and priority of the boot devices.

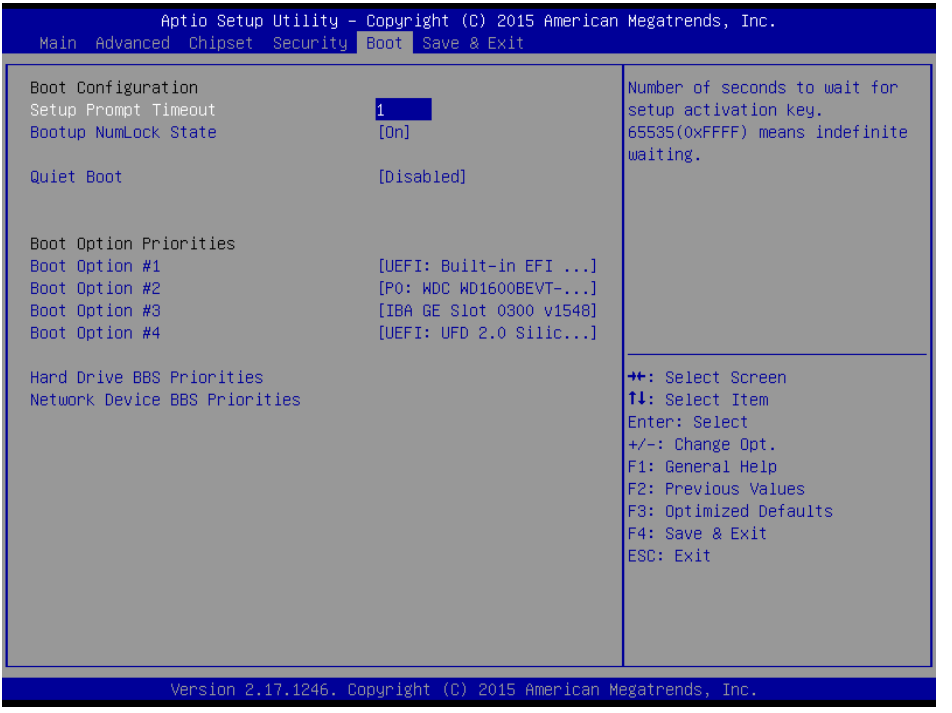


Figure 4-32. Boot Menu Screen

BIOS Setting	Option	Description/Purpose
Setup Prompt Timeout	Numeric	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Select the NumLock sate after the system is powered on. • **On:** Enable the NumLock function automatically after the system is powered on. • **Off:** Disable the NumLock function after the system is powered on.
Quiet Boot	- Disabled - Enabled	Enable/Disable the Quiet Boot Option.
Boot Option #1~#n	- [Drive(s)] - Disabled	Allow users to set the boot options listed in BBS Priorities.
Hard Drive BBS Priorities	Sub-Menu	Allow users to select the boot order of the available drive(s).

BIOS Setting	Option	Description/Purpose
Network Device BBS Priorities	Sub-Menu	Set the order of the legacy devices in the group.

4.7.1 Configuring Hard Drive BBS Priorities

Select **Hard Drive BBS Priorities** from the **Boot** menu to configure the boot sequence and priority of the available drives.

Figure 4-33. Hard Drive BBS Priorities Screen

BIOS Setting	Option	Description/Purpose
Boot Option #1 - #n	- [Drive(s)] - Disabled	Change the boot order of the available drive(s).

4.7.2 Configuring Network Device BBS Priorities

Select **Network Device BBS Priorities** from the **Boot** menu to set the order of the legacy devices in the group.

Figure 4-34. Network Device BBS Priorities Screen

BIOS Setting	Option	Description/Purpose
Boot Option #1 - #n	- [Drive(s)] - Disabled	Set the system boot order.

4.8 Save & Exit Menu

To save and validate the changed BIOS settings, select the **Save & Exit** menu and the following page will display:

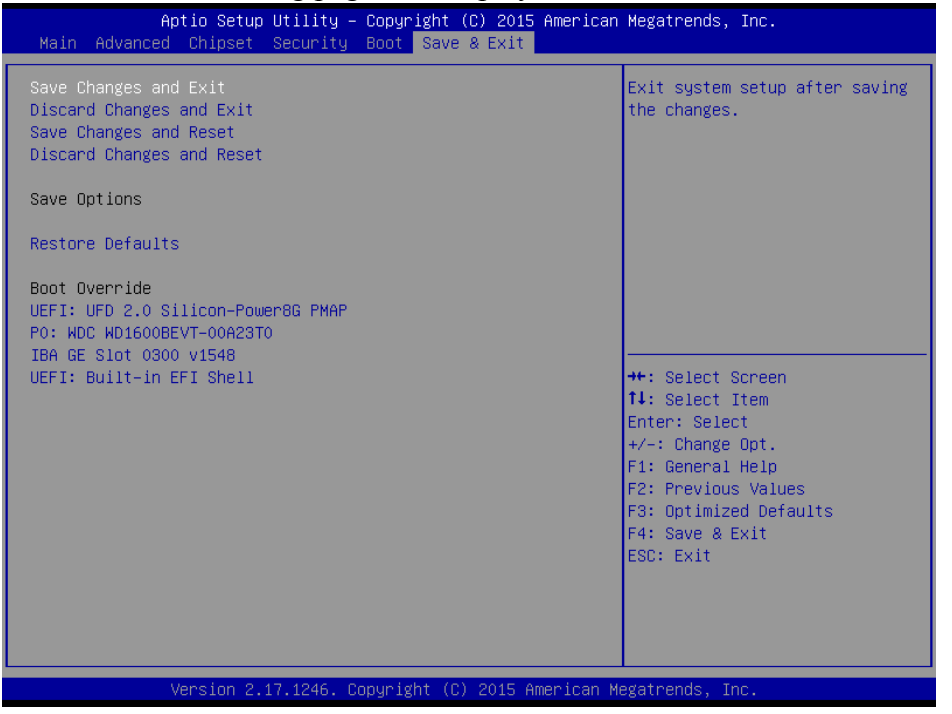


Figure 4-35. Save & Exit Screen

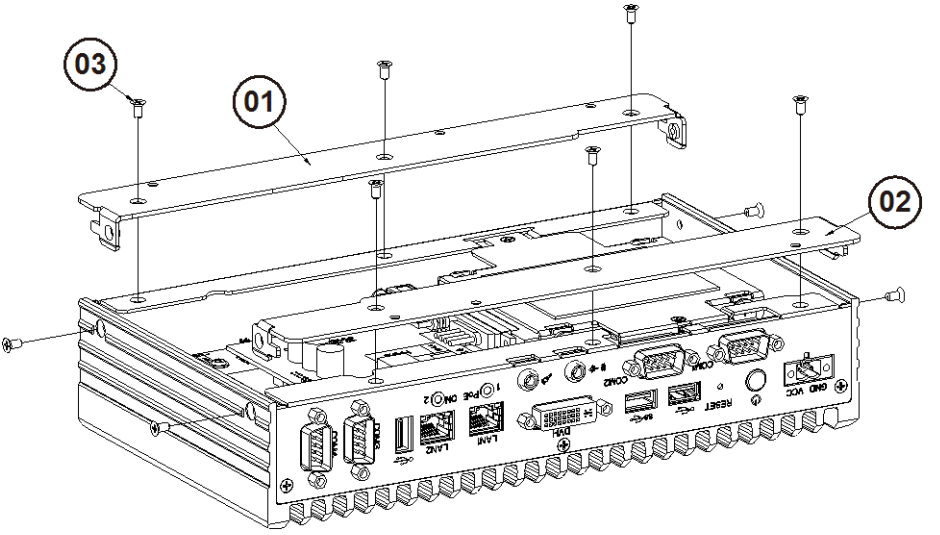
BIOS Setting	Option	Description/Purpose
Save Changes and Exit	No changeable options	Exit the system and save the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exit the system without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Save the changes in NVRAM and resets.
Discard Changes and Reset	No changeable options	Reset the system without saving any changes made in BIOS settings.
Restore Defaults	No changeable options	Load the optimized defaults for BIOS settings. You can also press **F3** to perform the operation.
Boot Override	- [Drive(s)]	Force to boot the system from the selected [drive(s)].

Appendix A System Diagrams

This appendix contains exploded diagrams and part numbers of the SP-6140/6145 system.

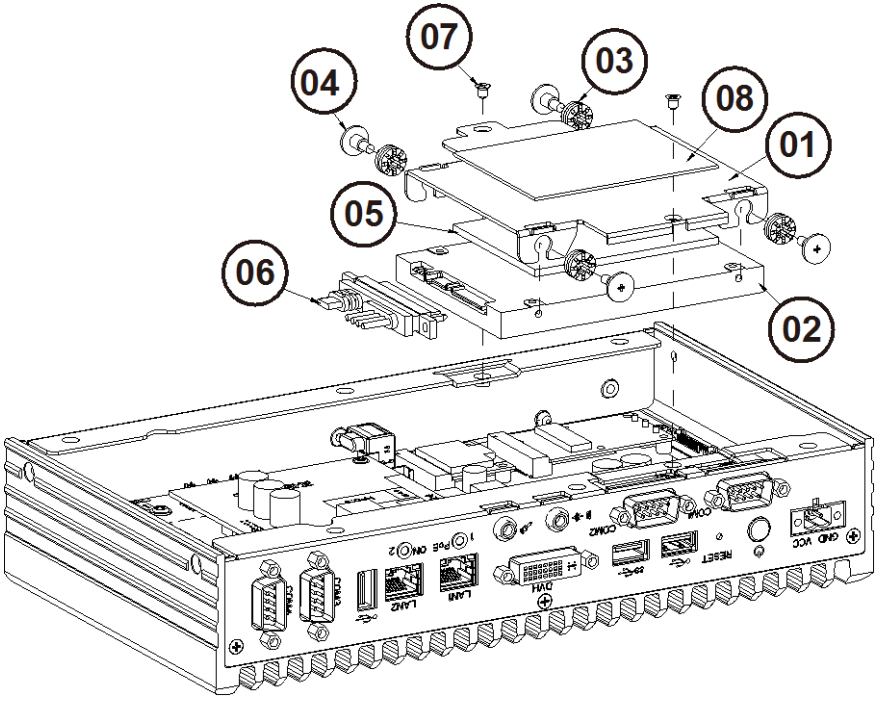
The following topics are included:

Bottom Bracket Assembly Exploded Diagram



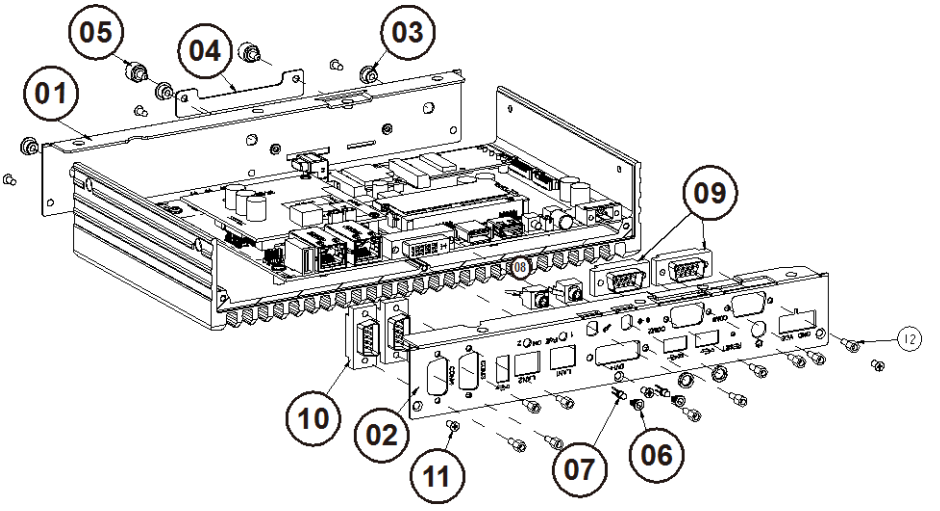
No.	Name	P/N No.	Q'ty
1	BOT BRACKET T	20-006-03002351	1
2	BOT BRACKET B	20-006-03001351	1
3	SCREW 3x6mm	22-215-30060011	10

SATA HDD Exploded Diagram



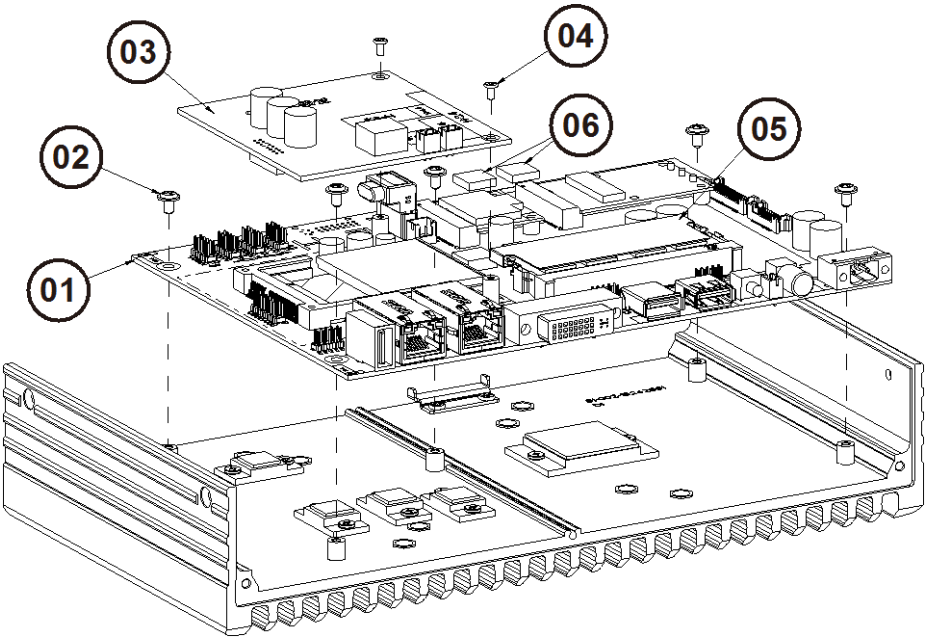
No.	Name	P/N No.	Q'ty
1	HDD-SUPPORT-BOARD	20-002-01001345	1
2	SATA HDD	By order	1
3	RUBBER WASHER	23-680-39580963	4
4	SCREW M3x4.8mm	82-272-30005013	4
5	THERMAL PAD	81-006-87055001	1
6	SATA HDD & POWER CABLE	--	1
7	SCREW M3x4mm	22-215-30004011	2
8	THERMAL PAD	21-006-88560001	1

Front Case and Rear Case Exploded Diagram



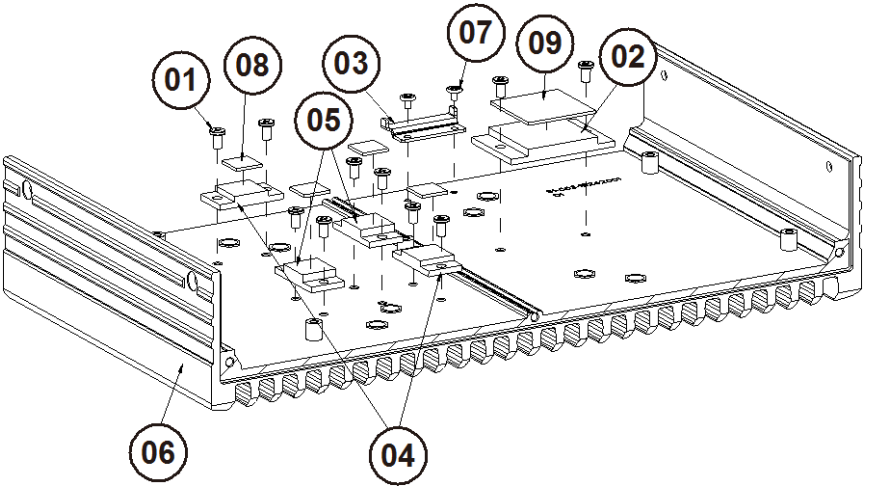
No.	Name	P/N No.	Q'ty
1	FRONT-BRACKET	20-006-01001351	1
2	REAR BRACKET	20-006-01002351	1
3	HOLE PLUG	90-067-01100000	3
4	SD-SIM-COVER	20-004-03061345	1
5	THREAD SCREW	22-302-06060011	2
6	LED HOUSING	30-014-04100165	2
7	LED CABLE	--	2
8	PHONE JACK CABLE	--	1
9	COM PORT CABLE	--	1
10	COM PORT CABLE	--	2
11	SCREW M3x6mm	22-215-30060011	6
12	HEX CU BOSS	22-692-40048051	10

Heat Sink Exploded Diagram



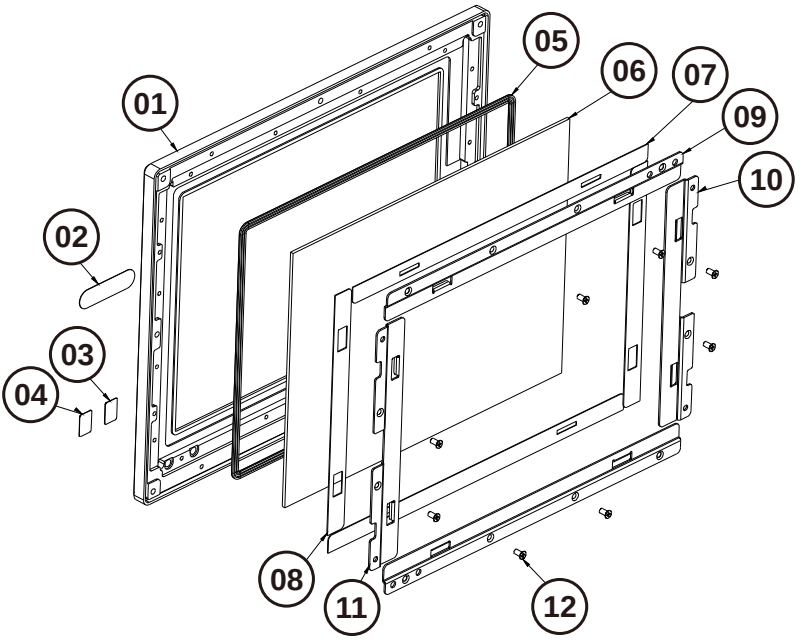
No.	Name	P/N No.	Q'ty
1	SB-8124RA-PPC	--	1
2	SCREW M3x5mm	22-242-30005311	5
3	SR-8124	--	1
4	SCREW M2x4mm	22-232-20004311	2
5	SO-DIMM HEATSINK	21-002-16925001	1
6	SIC HEATSINK	21-002-91010001	1

Heat Sink Block Exploded Diagram



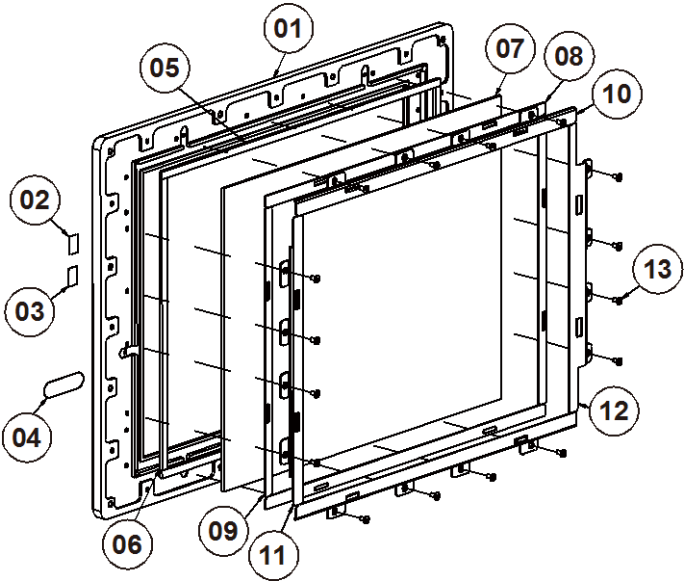
No.	Name	P/N No.	Q'ty
1	SCREW M3x5mm	22-272-30049015	10
2	CPU-HEAT-BLOCK	21-002-24027001	1
3	SD-COVER-HOLDER	20-029-03001345	1
4	SUPER-IO-BLOCK	21-002-12513002	2
5	PWM BLOCK	21-002-12513001	2
6	SP-614X-HEATSINK	81-002-15242001	1
7	SCREW M2x3mm	22-272-20003811	2
8	THERMAL PAD	81-006-81515002	4
9	THERMAL PAD	81-006-82626002	1

SP-6140 Touch Panel Exploded Diagram



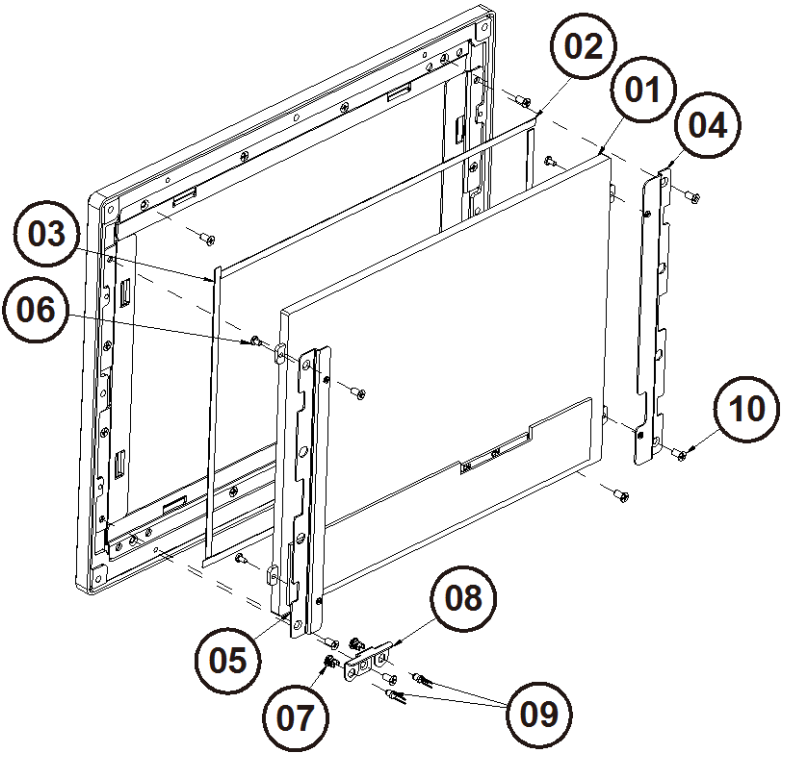
No.	Name	P/N No.	Q'ty
1	SP-6110 FRONT PANEL	20-003-01091239	1
2	FLAT LABEL FOR PORX	34-017-02104009	1
3	LED LABEL FOR HDD	34-017-02101009	1
4	LED LABEL FOR POWER	34-017-02103009	1
5	RUBBER FOR ELO TOUCH	30-013-01100045	1
6	Touch Panel	52-380-01151014	1
7	SP-6140-TL-PORON	30-013-24200347	2
8	SP-6140-RL-PORON	30-013-24100347	2
9	TOUCH-SUPPORT-TB	80-002-03003347	2
10	TOUCH-SUPPORT-L	80-002-03001347	1
11	TOUCH-SUPPORT-R	80-002-03002347	1
12	M3x6mm SCREW	22-215-30006311	6

SP-6145 Touch Panel Exploded Diagram



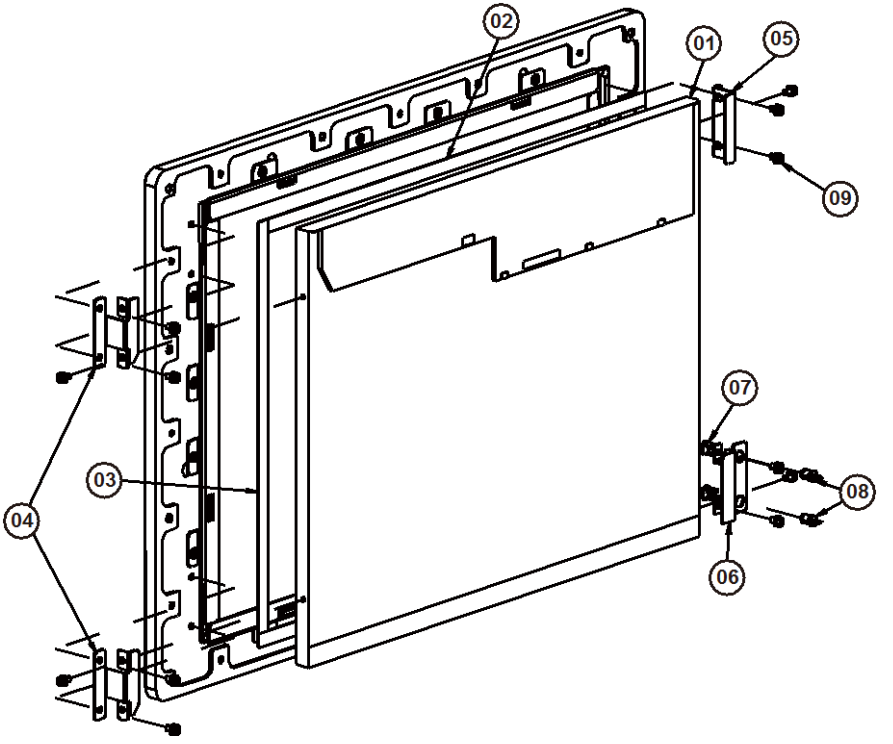
No.	Name	P/N No.	Q'ty
1	FRONT PANEL DIE CASTING	20-003-01061351	1
2	LED LABEL FOR POWER	34-017-02103009	1
3	LED LABEL FOR HDD	34-017-02101009	1
4	FLAT LABEL FOR PORX	34-017-02104009	1
5	TOUCH PANEL EVA 2.5V	30-013-15200271	2
6	TOUCH PANEL EVA 2.5L	30-013-15100271	2
7	15" Touch Panel	52-380-00151514	1
8	TOUCH-PANEL-PRON-1_0L	30-013-24100351	2
9	TOUCH-PANEL-PRON-1_0V	30-013-24200351	2
10	TOUCH-SUPPORT-TL	80-002-03006351	2
11	TOUCH-SUPPORT-R	80-002-03005351	1
12	TOUCH-SUPPORT-L	80-002-03004351	1
13	M3x6mm SCREW	22-215-30060011	16

SP-6140 LCD Display Exploded Diagram



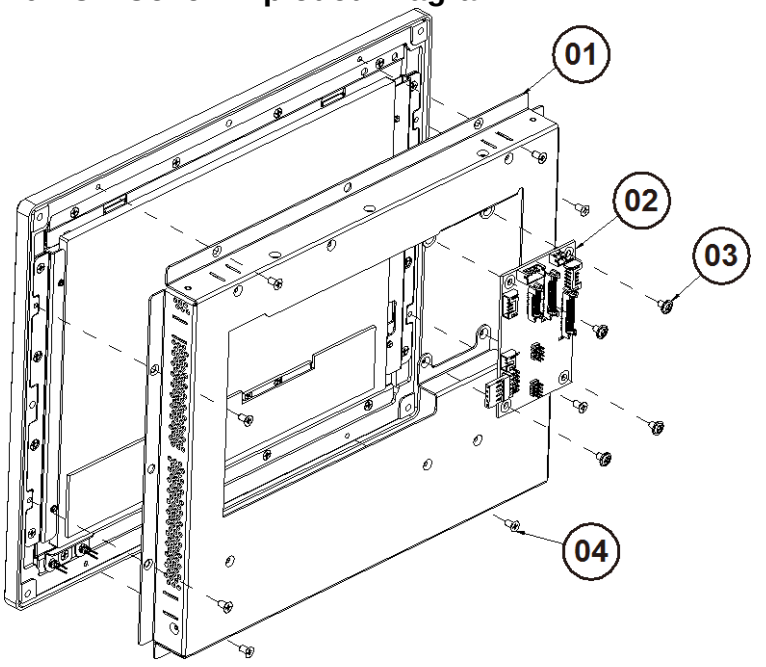
No.	Name	P/N No.	Q'ty
1	10.4" LCD Panel	52-351-01010419	1
2	LCD PORON	30-013-24600000	2
3	LCD PORON	30-013-24700000	2
4	LCD-HOLDER-L	80-029-03001347	1
5	LCD-HOLDER-R	80-029-03002347	1
6	M2x4mm SCREW	22-272-20004011	4
7	LED HOUSING	30-014-04100165	2
8	LED-HOLDER	80-029-03003347	1
9	POWER+HDD LED CABLE	27-018-34704111	1
10	M3x6mm SCREW	22-215-30006311	8

SP-6145 LCD Display Exploded Diagram



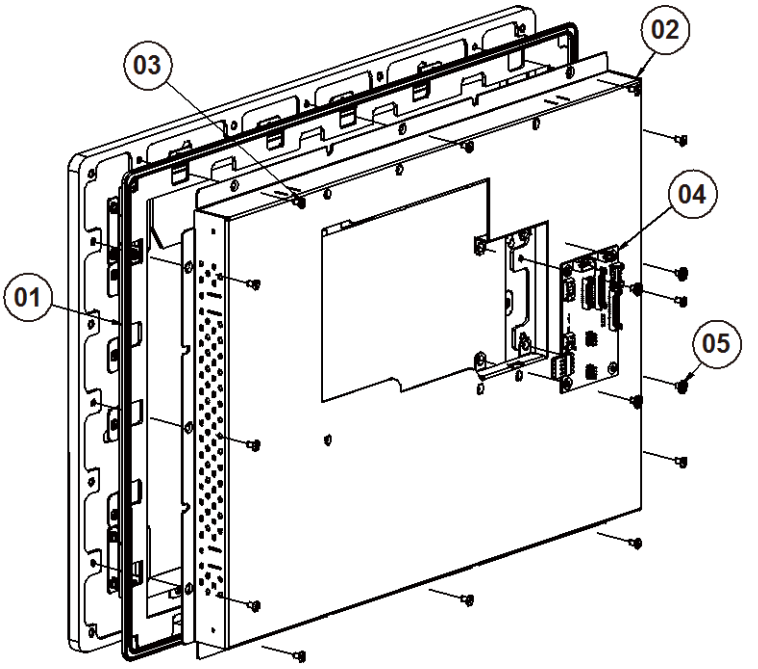
No.	Name	P/N No.	Q'ty
1	15" LCD Panel	52-351-03015032	1
2	LCD PORON TB	90-013-24200351	2
3	LCD PORON RL	90-013-24100351	2
4	LCD SUPPORT L	80-002-03001351	2
5	LCD SUPPORT R	80-002-03002351	1
6	LED SUPPORT	80-002-03003351	1
7	LED HOUSING	30-014-04100009	2
8	POWER+HDD LED CABLE		1
9	M3x6mm SCREW	22-232-30060211	12

SP-6140 LCD Cover Exploded Diagram



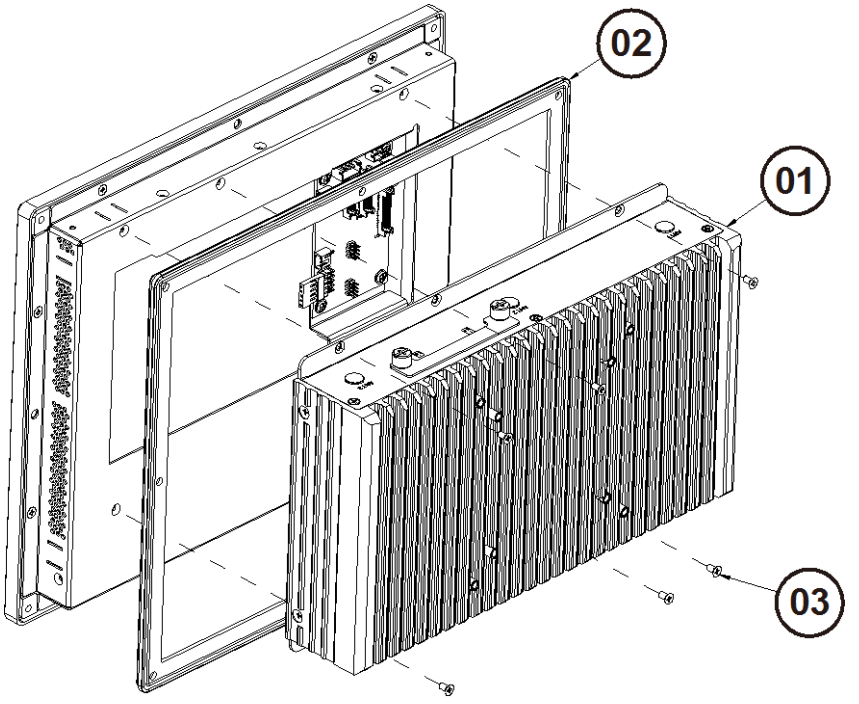
No.	Name	P/N No.	Q'ty
1	LCD-COVER	20-004-03061347	1
2	SR-6100RD-D6N	--	1
3	M3x5mm SCREW	22-242-30005311	4
4	M3x6mm SCREW	22-215-30060011	8

SP-6145 LCD Cover Exploded Diagram



No.	Name	P/N No.	Q'ty
1	WATERPROOF RUBBER	90-013-01100351	1
2	SP-6140-LCD-COVER	20-004-03061347	1
3	M3x6mm SCREW	22-215-30060011	12
4	SR-6100RD-D6N	--	1
5	M3x5mm SCREW	22-242-30005311	4

SP-6140/6145 System Exploded Diagram



No.	Name	P/N No.	Q'ty
1	SP-614X	--	1
2	OUTSIDE RUBBER	30-013-01100239	1
3	M3x6mm SCREW	22-215-30060011	6

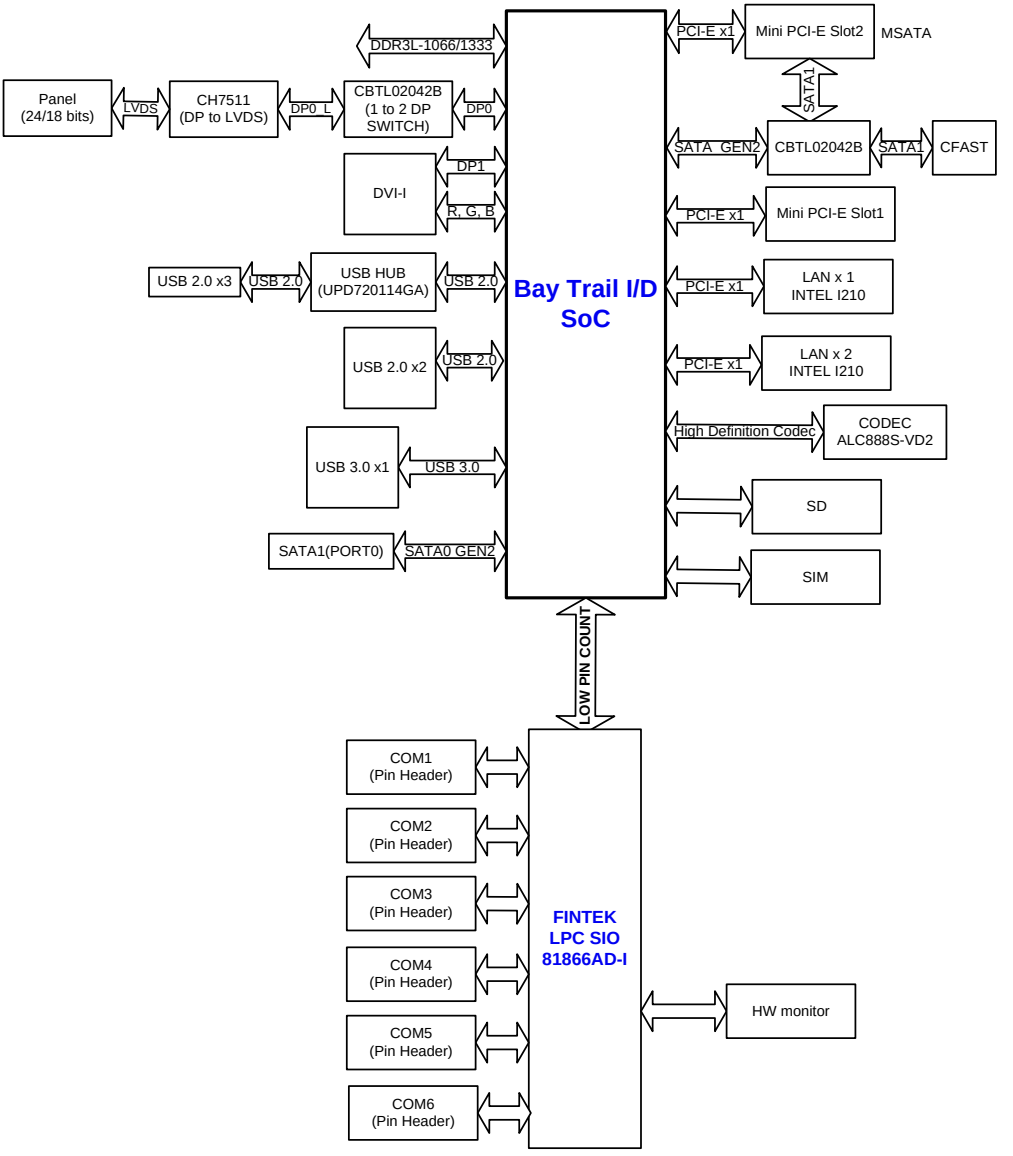
Appendix B Technical Summary

This appendix gives a brief introduction of the allocation maps for the system resources.

The following topics are included:

- System Block Diagram
- Interrupt Map
- I/O Map
- Memory Map
- Configuring Watchdog Timer
- Flash BIOS Update

System Block Diagram



Interrupt Map

(ISA) IRQ	Assignment
0	System timer
3	Communications Port (COM2)
4	Communications Port (COM1)
5	Communications Port (COM5)
7	Communications Port (COM3)
8	High Precision Event Timer
10	Communications Port (COM4)
11	Communications Port (COM6)
81	Microsoft ACPI-Compliant System
82	Microsoft ACPI-Compliant System
83	Microsoft ACPI-Compliant System
84	Microsoft ACPI-Compliant System
85	Microsoft ACPI-Compliant System
86	Microsoft ACPI-Compliant System
87	Microsoft ACPI-Compliant System
88	Microsoft ACPI-Compliant System
89	Microsoft ACPI-Compliant System
90	Microsoft ACPI-Compliant System
91	Microsoft ACPI-Compliant System
92	Microsoft ACPI-Compliant System
93	Microsoft ACPI-Compliant System
94	Microsoft ACPI-Compliant System
95	Microsoft ACPI-Compliant System
96	Microsoft ACPI-Compliant System
97	Microsoft ACPI-Compliant System

(ISA) IRQ	Assignment
98	Microsoft ACPI-Compliant System
99	Microsoft ACPI-Compliant System
100	Microsoft ACPI-Compliant System
101	Microsoft ACPI-Compliant System
102	Microsoft ACPI-Compliant System
103	Microsoft ACPI-Compliant System
104	Microsoft ACPI-Compliant System
105	Microsoft ACPI-Compliant System
106	Microsoft ACPI-Compliant System
107	Microsoft ACPI-Compliant System
108	Microsoft ACPI-Compliant System
109	Microsoft ACPI-Compliant System
110	Microsoft ACPI-Compliant System
111	Microsoft ACPI-Compliant System
112	Microsoft ACPI-Compliant System
113	Microsoft ACPI-Compliant System
114	Microsoft ACPI-Compliant System
115	Microsoft ACPI-Compliant System
116	Microsoft ACPI-Compliant System
117	Microsoft ACPI-Compliant System
118	Microsoft ACPI-Compliant System
119	Microsoft ACPI-Compliant System
120	Microsoft ACPI-Compliant System
121	Microsoft ACPI-Compliant System
122	Microsoft ACPI-Compliant System
123	Microsoft ACPI-Compliant System
124	Microsoft ACPI-Compliant System

(ISA) IRQ	Assignment
125	Microsoft ACPI-Compliant System
126	Microsoft ACPI-Compliant System
127	Microsoft ACPI-Compliant System
128	Microsoft ACPI-Compliant System
129	Microsoft ACPI-Compliant System
130	Microsoft ACPI-Compliant System
131	Microsoft ACPI-Compliant System
132	Microsoft ACPI-Compliant System
133	Microsoft ACPI-Compliant System
134	Microsoft ACPI-Compliant System
135	Microsoft ACPI-Compliant System
136	Microsoft ACPI-Compliant System
137	Microsoft ACPI-Compliant System
138	Microsoft ACPI-Compliant System
139	Microsoft ACPI-Compliant System
140	Microsoft ACPI-Compliant System
141	Microsoft ACPI-Compliant System
142	Microsoft ACPI-Compliant System
143	Microsoft ACPI-Compliant System
144	Microsoft ACPI-Compliant System
145	Microsoft ACPI-Compliant System
146	Microsoft ACPI-Compliant System
147	Microsoft ACPI-Compliant System
148	Microsoft ACPI-Compliant System
149	Microsoft ACPI-Compliant System
150	Microsoft ACPI-Compliant System
151	Microsoft ACPI-Compliant System

(ISA) IRQ	Assignment
152	Microsoft ACPI-Compliant System
153	Microsoft ACPI-Compliant System
154	Microsoft ACPI-Compliant System
155	Microsoft ACPI-Compliant System
156	Microsoft ACPI-Compliant System
157	Microsoft ACPI-Compliant System
158	Microsoft ACPI-Compliant System
159	Microsoft ACPI-Compliant System
160	Microsoft ACPI-Compliant System
161	Microsoft ACPI-Compliant System
162	Microsoft ACPI-Compliant System
163	Microsoft ACPI-Compliant System
164	Microsoft ACPI-Compliant System
165	Microsoft ACPI-Compliant System
166	Microsoft ACPI-Compliant System
167	Microsoft ACPI-Compliant System
168	Microsoft ACPI-Compliant System
169	Microsoft ACPI-Compliant System
170	Microsoft ACPI-Compliant System
171	Microsoft ACPI-Compliant System
172	Microsoft ACPI-Compliant System
173	Microsoft ACPI-Compliant System
174	Microsoft ACPI-Compliant System
175	Microsoft ACPI-Compliant System
176	Microsoft ACPI-Compliant System
177	Microsoft ACPI-Compliant System
178	Microsoft ACPI-Compliant System

(ISA) IRQ	Assignment
179	Microsoft ACPI-Compliant System
180	Microsoft ACPI-Compliant System
181	Microsoft ACPI-Compliant System
182	Microsoft ACPI-Compliant System
183	Microsoft ACPI-Compliant System
184	Microsoft ACPI-Compliant System
185	Microsoft ACPI-Compliant System
186	Microsoft ACPI-Compliant System
187	Microsoft ACPI-Compliant System
188	Microsoft ACPI-Compliant System
189	Microsoft ACPI-Compliant System
190	Microsoft ACPI-Compliant System

(PCI) IRQ	Assignment
5	Ethernet Controller
5	SM Bus Controller
10	Universal Serial Bus (USB) Controller
11	Ethernet Controller
11	Video Controller (VGA Compatible)
16	PCI standard PCI-to-PCI bridge
17	PCI standard PCI-to-PCI bridge
18	PCI standard PCI-to-PCI bridge
18	SDA Standard Compliant SD Host Controller
19	PCI standard PCI-to-PCI bridge
19	Standard AHCI 1.0 Serial ATA Controller
22	High Definition Audio Controller
23	Standard Enhanced PCI to USB Host Controller

Note: The resource information is gathered by Windows 7 (the IRQs could be assigned differently depending on your OS).

I/O MAP

I/O Map	Assignment
0x00000000-0x0000006F	PCI bus
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000077	System CMOS/real time clock
0x00000078-0x00000CF7	PCI bus
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources

I/O Map	Assignment
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E0-0x000002E7	Communications Port (COM6)
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F0-0x000002F7	Communications Port (COM5)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003B0-0x000003BB	VgaSave
0x000003C0-0x000003DF	VgaSave
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x0000D000-0x0000D01F	Ethernet Controller

I/O Map	Assignment
0x0000D000-0x0000DFFF	PCI standard PCI-to-PCI bridge
0x0000E000-0x0000E01F	Ethernet Controller
0x0000E000-0x0000EFFF	PCI standard PCI-to-PCI bridge
0x0000F000-0x0000F01F	SM Bus Controller
0x0000F020-0x0000F03F	Standard AHCI 1.0 Serial ATA Controller
0x0000F040-0x0000F043	Standard AHCI 1.0 Serial ATA Controller
0x0000F050-0x0000F057	Standard AHCI 1.0 Serial ATA Controller
0x0000F060-0x0000F063	Standard AHCI 1.0 Serial ATA Controller
0x0000F070-0x0000F077	Standard AHCI 1.0 Serial ATA Controller
0x0000F080-0x0000F087	Video Controller (VGA Compatible)

Memory Map

Memory Map	Assignment
0x000A0000-0x000BFFFF	PCI Bus
0x000A0000-0x000BFFFF	Vga Save
0x000C0000-0x000DFFFF	PCI Bus
0x000E0000-0x000FFFFF	PCI Bus
0x80000000-0xD0A1AFFF	PCI Bus
0xC0000000-0xCFFFFFFF	Video Controller (VGA Compatible)
0xD0000000-0xD03FFFFF	Video Controller (VGA Compatible)
0xD0400000-0xD04FFFFF	Intel Device
0xD0500000-0xD05FFFFF	Intel Device
0xD0600000-0xD06FFFFF	Ethernet Controller
0xD0600000-0xD07FFFFF	PCI standard PCI-to-PCI bridge
0xD0700000-0xD0703FFF	Ethernet Controller
0xD0800000-0xD08FFFFF	Ethernet Controller
0xD0800000-0xD09FFFFF	PCI standard PCI-to-PCI bridge
0xD0900000-0xD0903FFF	Ethernet Controller
0xD0A00000-0xD0A0FFFF	Universal Serial Bus (USB) Controller
0xD0A10000-0xD0A013FFF	High Definition Audio Controller
0xD0A14000-0xD0A01401F	SM Bus Controller
0xD0A15000-0xD0A153FF	Standard Enhanced PCI to USB Host Controller
0xD0A16000-0xD0A167FF	Standard AHCI 1.0 Serial ATA Controller
0xD0A17000-0xD0A17FFF	SDA Standard Compliant SD Host Controller
0xD0A18000-0xD0A18FFF	SDA Standard Compliant SD Host Controller

Memory Map	Assignment
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED00000-0xFED003FF	High Precision Event Timer
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xE0000-0xFFFFF	PCI Express Root Complex

Configuring Watchdog Timer

Configuring 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. Users must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Configuration Sequence

To program F81866 configuration registers, the following configuration sequence must be followed:

(1) Enter the extended function mode
(2) Configure the configuration registers
(3) Exit the extended function mode

(1) Enter the extended function mode

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

(2) Configure the configuration registers

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of

the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

(3) Exit the extended function mode

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Code example for Watchdog timer

Enable and start the Watchdog timer and set 30 seconds as the timeout interval.

```
------ Enter to extended function mode -------------------------------------
Mov             dx,             2eh
Mov             al,             87h
Out             dx,             al
Out             dx,             al
------ Select Logical Device 8 of watchdog timer -------------------------
Mov             al,             07h
Out             dx,             al
Inc             dx
Mov             al,             08h
Out             dx,             al
------ Set second as counting unit ----------------------------------------
Dec             dx
Mov             al,             0f5h
Out             dx,             al
Inc             dx
In              al,             dx
And             al,             not 08h
```

```
Out             dx,             al
------ Set the timeout interval as 30seconds and start counting----------
Dec             dx
Mov             al,             0f6h
Out             dx,             al
Inc             dx
Mov             al,             30
Out             dx,             al
------ Exit the extended function mode---------------------------------------
Dec             dx
Mov             al,             0aah
Out             dx,             al
```

FLASH BIOS UPDATE

I. Prerequisites

1 Prepare a bootable media (ex. USB storage device) which can boot system to DOS prompt.

2 Download and save the BIOS file (ex. 614X0TI3.bin) to the bootable device.

3 Copy AMI flash utility – AFUDOS.exe (v5.06.01) into bootable device.

4 Make sure the target system can first boot to the bootable device.

(1) Connect the bootable USB device.

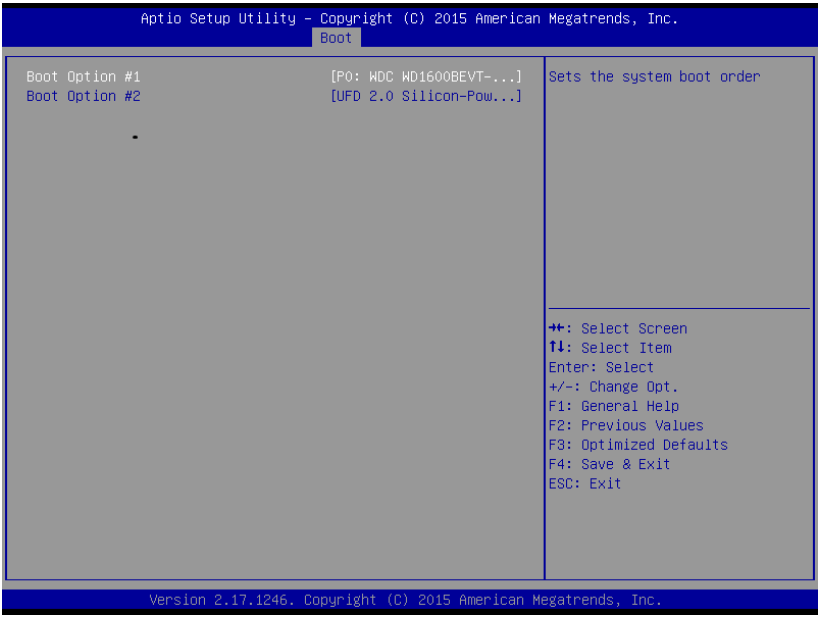
(2) Turn on the computer and press **<Esc>** or **<Del>** during boot to enter BIOS Setup.

(3) The system will then access the BIOS setup menu.

(4) Select the **[Boot]** menu.

(5) Select the **[Hard Drive BBS Priorities]** option and set the 1st boot device as the USB bootable device.

(6) Press **<F4>** to save the configuration and exit the BIOS setup menu.


Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
Boot
Boot Option #1
[P0: WDC WD1600BEVT-...]
Boot Option #2
[UFD 2.0 Silicon-Pow...]
Sets the system boot order
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.

II. AFUDOS Command for System BIOS Update

AFUDOS.exe is the AMI firmware update utility; the command line is shown as below:

AFUDOS <ROM File Name> [option1] [option2]….

Users can type "AFUDOS/ ?" to read the definition of each control option. The recommended options for BIOS ROM update include the following parameters:

/P: Program main BIOS image.
/B: Program Boot Block.
/N: Program NVRAM.
/X: Don't check ROM ID.

III. BIOS Update Procedure

1. Use the bootable USB storage to boot up the system into the DOS command prompt.
2. Type "**AFUDOS 614xxxxx.bin /p /b /n /x"** and press **Enter** to start the flash procedure.
   (Note that xxxx means the BIOS revision part, e.g. 0TI3…)
3. During the BIOS update procedure, you will see the BIOS update process status and the percentage of the completed update process. Beware! Do not turn off the system power or reset your computer when the procedure are still in progress; otherwise, the BIOS ROM may be crashed and the system will be unable to boot up next time.
4. After the BIOS update procedure is completed, the following messages will be shown:

```
C:\AMI\A5\afudos 614X0TI3.bin /p /b /n /x
+-------------------------------------------------------------------------------+
|                    AMI Firmware Update Utility v5.06.01                       |
|        Copyright (C )2014 American Megatrends Inc. All Rights Reserved.       |
+-------------------------------------------------------------------------------+
Reading flash ..................... done
- ME Data Size checking . ok
- FFS checksums ..... ok
Erasing Boot Block ..... ... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NVRAM Block ..... done
Updating NVRAM Block ..... done
Verifying NVRAM Block ..... done
```

Follow the instructions below to reboot the system:

5 Restart the system and boot up with the new BIOS configurations.

6 The BIO Update is completed after the system is restarted.

7 Reboot the system and verify if the BIOS version shown on the initialization screen has been updated correctly.

Flash BIOS Update

I. Prerequisites

1 Prepare a bootable media (e.g. USB storage device) which can be used to boot up the system for users to enter the DOS command prompt.

2 Download and save the BIOS file (e.g. 614X0TI3.bin) into the same folder as AFUDOS utility.

3 Copy AMI flash utility – AFUDOS.exe (v3.04) into the bootable device.

4 Make sure the target system can first boot to the bootable device.

(1) Connect the bootable USB device.

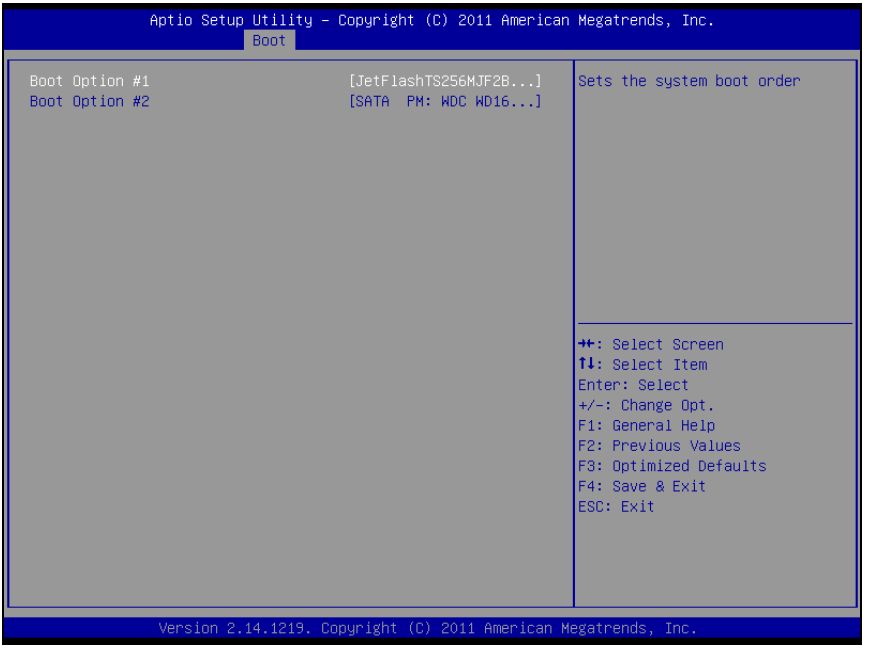
(2) Turn on the computer and press **<ESC>** or **<Del>** during the boot-up.

(3) The system will then access the BIOS setup menu.

(4) Select the **Boot** menu.

(5) Select the **Hard Drive BBS Priorities** option and set the 1st boot device as the USB bootable device.

(6) Press **F4** to save the configuration and exit the BIOS setup menu.



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/P: Program main BIOS image
/B: Program Boot Block
/N: Program NVRAM
/X: Do not check ROM ID

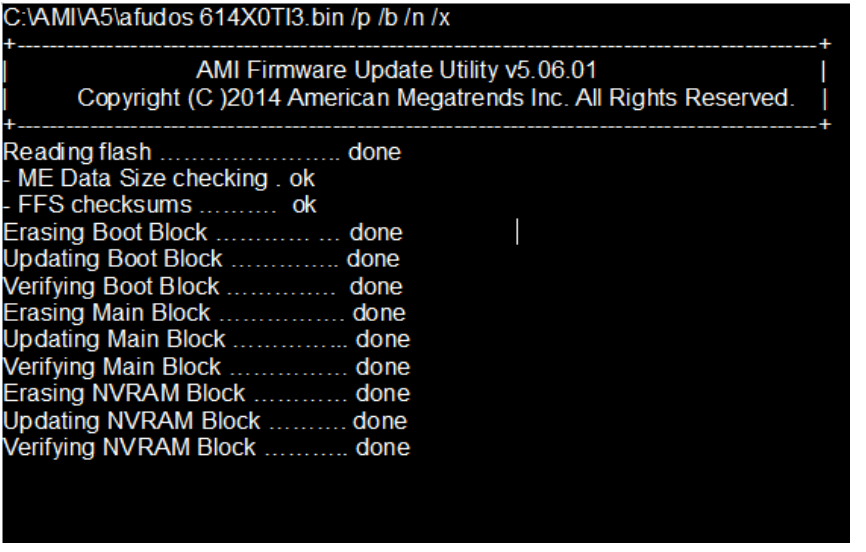
III. BIOS Update Procedure

1 Use the bootable USB storage to boot up the system into the DOS command prompt.

2 Type "**AFUDOS 614xxxxx.bin /p /b /n /x"** and press **Enter** to start the flash procedure.
(Note that xxxx means the BIOS revision part, e.g. 0TI3…)

3 During the BIOS update procedure, you will see the BIOS update process status and the percentage of the completed update process. Beware! Do not turn off the system power or reset your computer when the procedure are still in progress; otherwise, the BIOS ROM may be crashed and the system will be unable to boot up next time.

4 After the BIOS update procedure is completed, the following messages will be shown:



5 Restart the system and boot up with the new BIOS configurations.

6 The BIO Update is completed after the system is restarted.

7 Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.