User's Manual for

EmbeddedLine EL1081

Intel® N2800/D2550
Slim & Fanless Embedded PC
With DVI/Audio/2LAN

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Perfect Industrial IT

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.

WARNING! Some internal parts of the system may have high electrical voltage. And therefore we strongly recommend that qualified engineers can open and disassemble the system.

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CHAPTER 3 SOFTWARE UTILITIES

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APPENDIX A SYSTEM ASSEMBLY

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INTRODUCTION

CHAPTER

1

Section includes:

- About This Manual
- System Specifications
- Safety Precautions

Experienced users can skip to chapter 2 on page 2-1 for Quick Start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our Intel® N2800/D2550 Embedded PC. The system 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. The user can apply this manual for configuration according to the following chapters:

Chapter 1 Introduction

This chapter introduces you to the background of this manual, and the specifications for this system. The final page of this chapter will indicate how to avoid damaging this board.

Chapter 2 Hardware Configuration

This chapter outlines the component locations and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

This chapter contains helpful information for proper installations of the VGA utility, LAN utility, and Sound utility.

Chapter 4 AMI BIOS Setup

This chapter indicates you how to set up the BIOS configurations.

Appendix A System Assembly

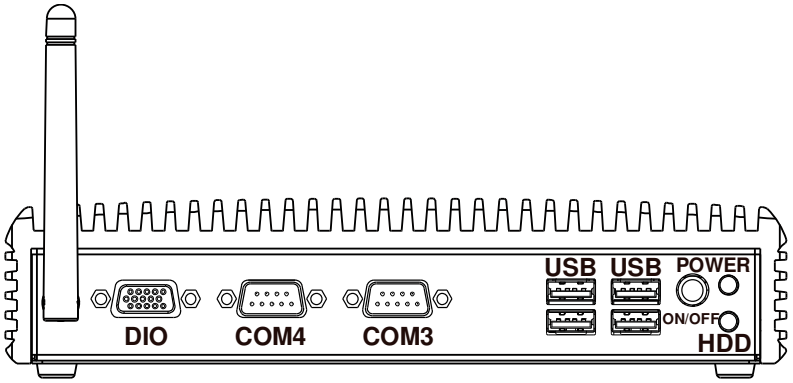
This appendix gives you the exploded diagrams and part numbers.

Appendix B Technical Summary

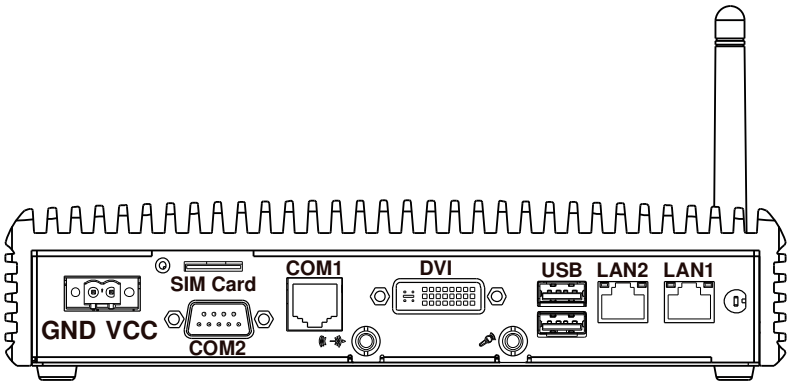
This appendix gives you the information about the Block diagram, Technical maps, Watchdog-timer configuration, and Flash BIOS Update.

1-2. SYSTEM ILLUSTRATION

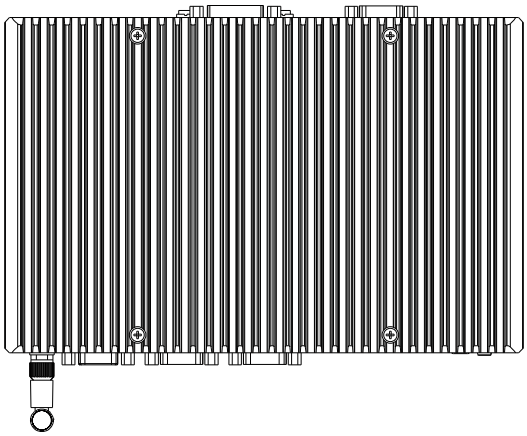
Front View



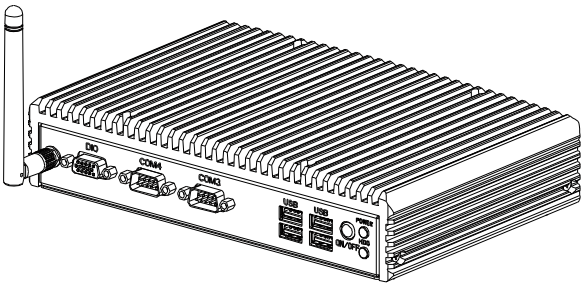
Rear View



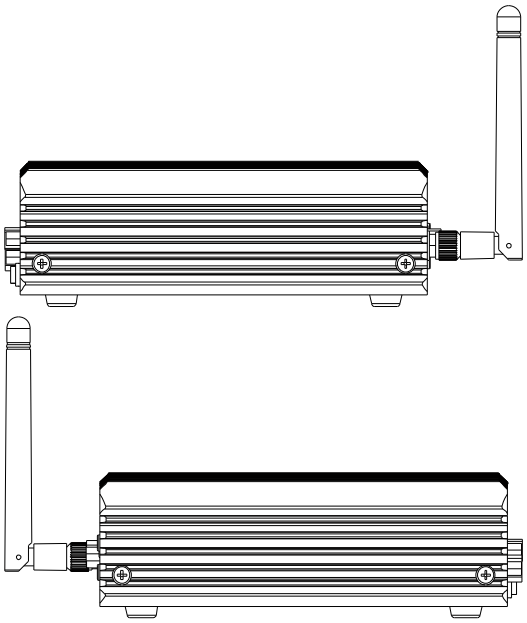
Top View



Quarter View



Side View



1-3. SYSTEM SPECIFICATION

System

CPU Support	Intel® N2800/D2550 on board
Chipset	Intel® NM10
OS Support	Windows 7
Memory Support	1 x DDR3 SO-DIMM Socket (up to 4GB)
Drive Bay	1 x 2.5 inch SATA HDD or SSD driver space
Power Requirement	9~36V DC-in
Power Adaptor	24V, 72W (Optional)
Watchdog	1~255s Watchdog timer selectable with Reset/NMI
Expansion Slot	1 x CFast slot, 1 x Mini-PCIe slot
System Weight	2 kg
Dimension (W x H x D)	217.5 x 45 x 148 mm (8.56" x 1.77" x 5.83")
Certificate	FCC/CE

I/O Ports (Front)

Serial Port	2 ports (COM3/4 for RS232)
Digital I/O	4-in/4-out
USB	4 x USB 2.0

I/O Ports (Rear)

Serial Port	2 ports (COM1 for RS232, COM2 for RS232/422/485) Both are RI/5V/12V selectable.
DVI	1 x DVI
LAN	2 x 10/100/1000 Mbps
Audio	High Definition 1 x Line-out, 1 x Mic-in
USB	2 x USB 2.0
SIM Card	1 x SIM card slot

Environment

Operation Temp.	HDD: 0 ~ 45°C (32 ~ 113°F) CFast card: 0 ~ 55°C (32 ~ 131°F)
Storage Temp.	-20 ~ 60°C (-4 ~ 158°F)
Humidity	20 ~ 90%

1-4. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Keep your system away from static electricity on all occasions.

2. Prevent electric shock. Don't touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change 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 whole system.

CHAPTER

2

HARDWARE CONFIGURATION

** QUICK START **

Helpful information describes the jumper & connector settings, and component locations.

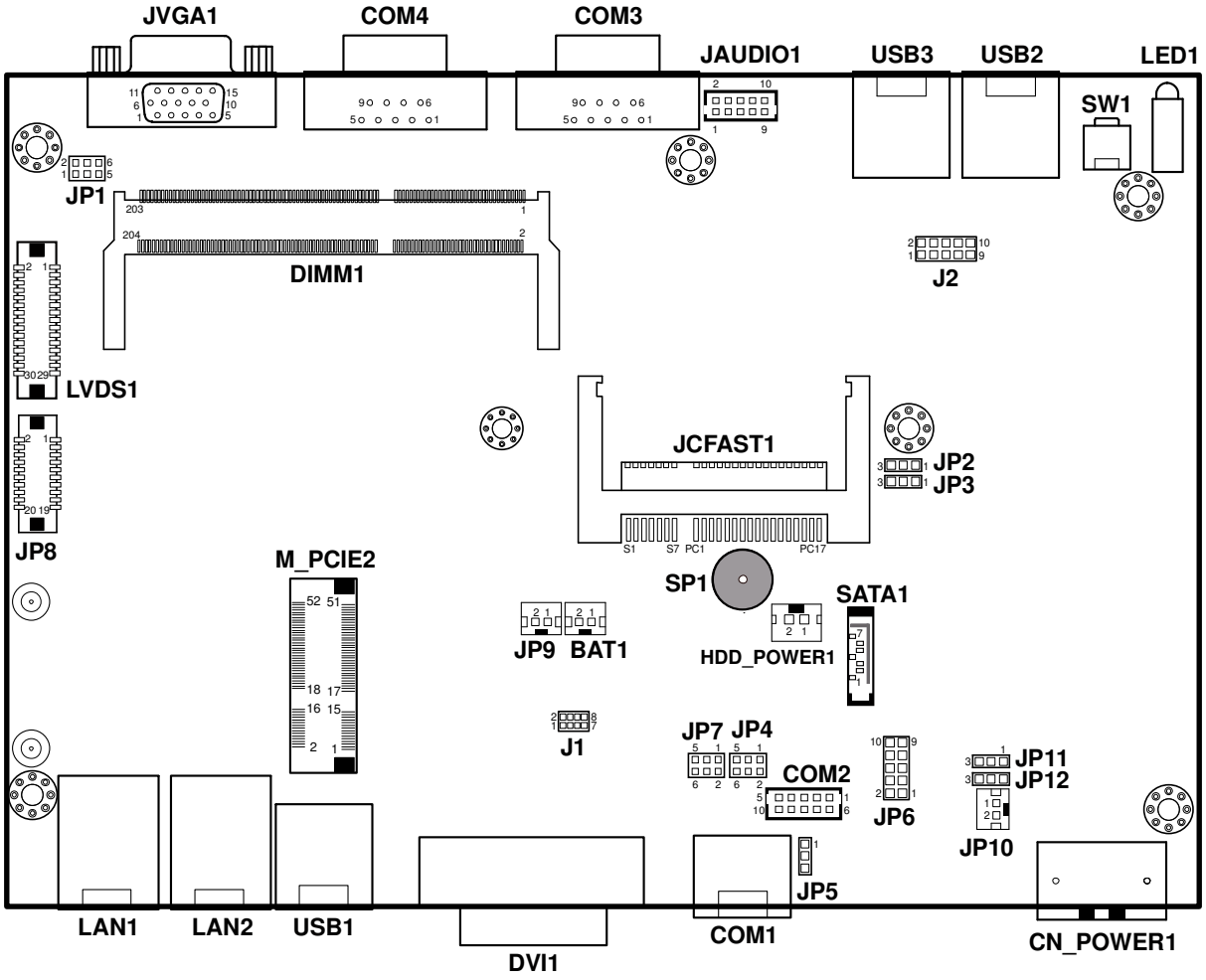
Section includes:

- Jumper & Connector Quick Reference Table
- Component Locations
- Configuration and Jumper settings
- Connector's Pin Assignments

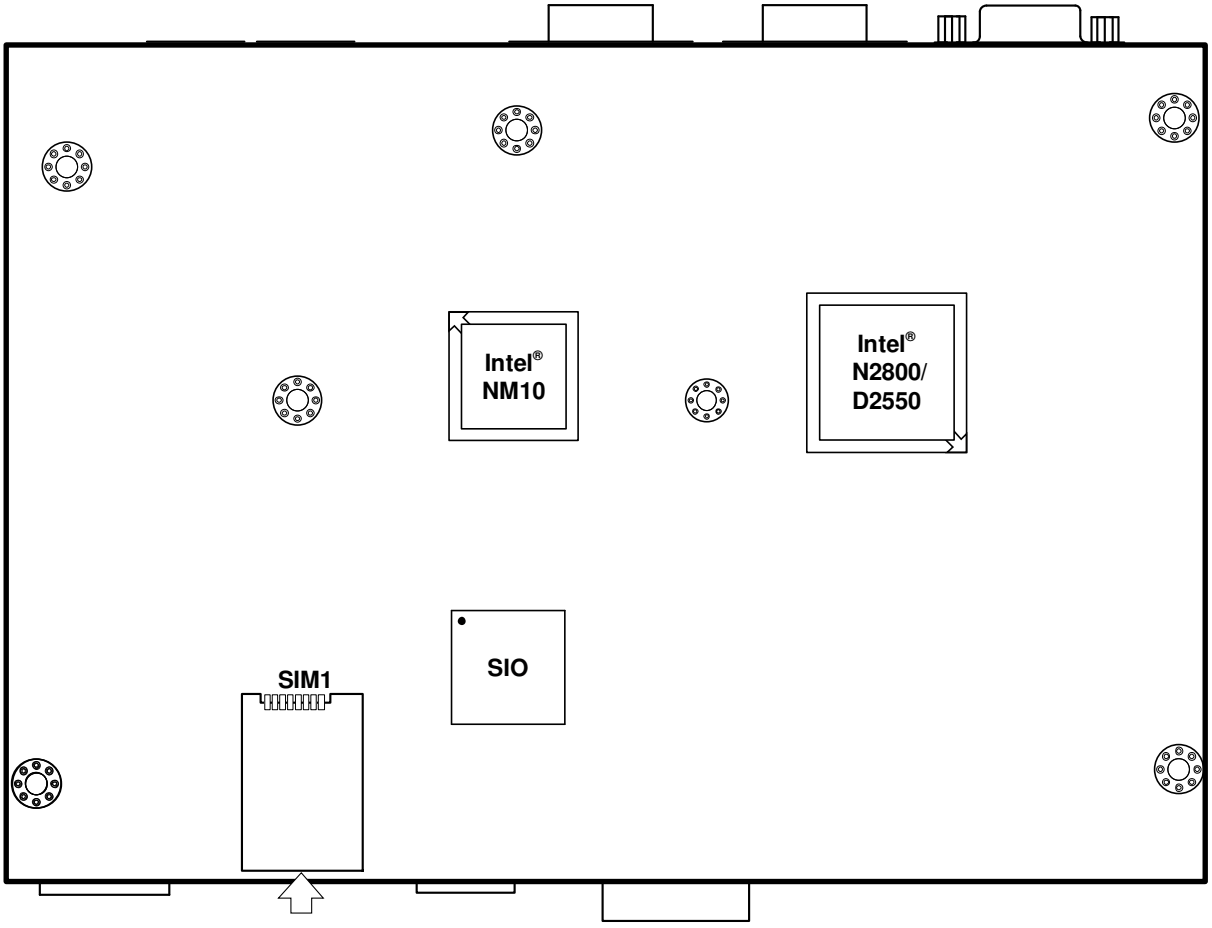
2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

JUMPER / CONNECTOR	NAME
COM Port Connector	COM1, COM2, COM3, COM4
COM Port Configuration Connector	JP4, JP7
COM2 RS-232/422/485 Selection	JP6
COM2 Auto Detect Selection	JP5
Digital I/O Connector	JVGA1
USB Port	USB1, USB2, USB3
LAN Port	LAN1, LAN2
DVI-I Port	DVI1
PWR IN Connector	CN_POWER1
SATA & SATA Power Connector	SATA1, HDD_POWER1
Audio Connector	JAUDIO1
Clear CMOS Data Selection	JP2
System Power Connector	JP11, JP12
CFast Card Slot	JCFAST1
CFast Card Power Connector	JP3

2-2. COMPONENT LOCATIONS



Connectors, Jumpers and Components Locations - Front



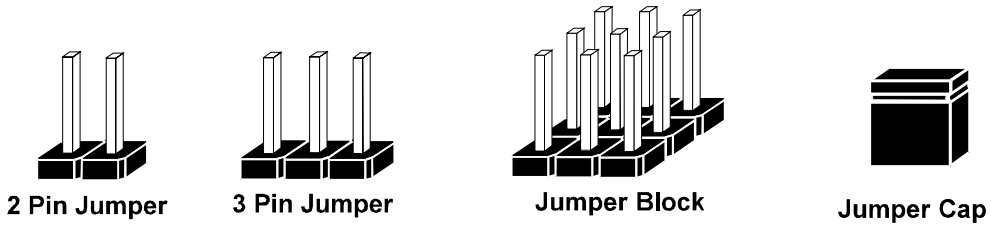
Connectors, Jumpers and Components Locations - Rear

2-3. HOW TO SET THE JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and 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 set-up your hardware configuration by "open" or "close" pins.

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

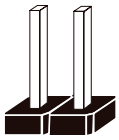
JUMPERS AND CAPS



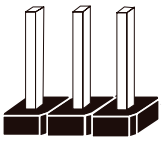
If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

JUMPER DIAGRAMS

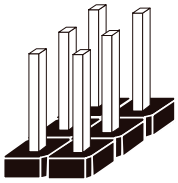
Jumper Cap looks like this



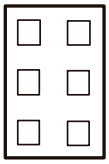
2 pin Jumper looks like this



3 pin Jumper looks like this

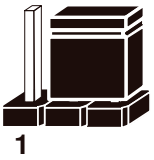


Jumper Block looks like this

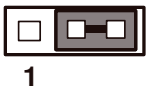


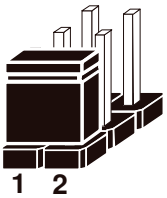
JUMPER SETTINGS

2 pin Jumper close(enabled) Looks like this

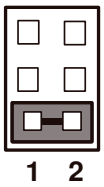


3 pin Jumper 2-3 pin close(enabled) Looks like this





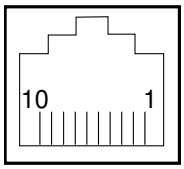
Jumper Block 1-2 pin close(enabled) Looks like this



2-4. COM PORT & CONNECTOR

COM1: COM1 Connectors
The pin assignments are as follows:

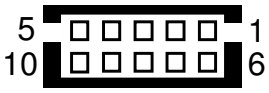
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD1	6	DSR1
2	RXD1	7	RTS1
3	TXD1	8	CTS1
4	DTR1	9	RI selectable
5	GND	10	NC



COM1

COM2: COM2 Connector
The pin assignments are as follows:

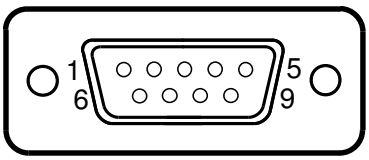
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD2	6	DSR2
2	RXD2	7	RTS2
3	TXD2	8	CTS2
	DTR2	9	RI selectable
5	GND	10	NC



COM2

COM3, COM4: COM Connectors
The pin assignments are as follows:

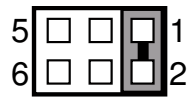
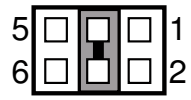
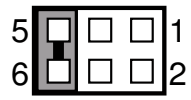
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD3	6	DSR3
2	RXD3	7	RTS3
3	TXD3	8	CTS3
4	DTR3	9	RI selectable
5	GND		



COM3/
COM4

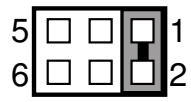
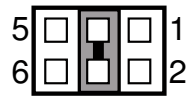
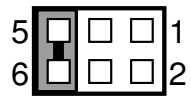
2-5. COM PORT CONFIGURATION CONNECTOR

JP7: COM1 Port Configuration Connector
The selections are as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RI	1-2	 **JP7**
12V	3-4	 **JP7**
5V	5-6	 **JP7**

Note: Manufacturing Default is RI.

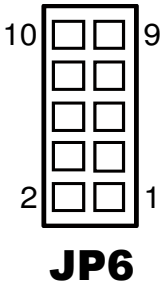
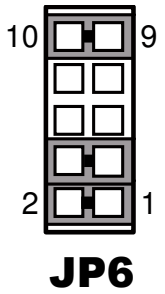
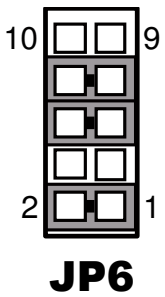
JP4: COM2 Port Configuration Connector
The selections are as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RI	1-2	 **JP4**
12V	3-4	 **JP4**
5V	5-6	 **JP4**

Note: Manufacturing Default is RI.

2-6. RS-232/422/485 (COM2) SELECTION

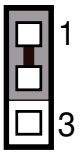
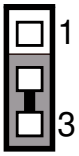
JP6: RS-232/422/485 (COM2) Selection
The selections are as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RS-232	All open	
RS-422	1-2, 3-4, 9-10	
RS-485	1-2, 5-6, 7-8	

Note: Manufacturing Default is RS-232.

2-7. COM2 AUTO DETECT SELECTION

JP5: COM2 Auto Detect Selection
The selections are as follows:

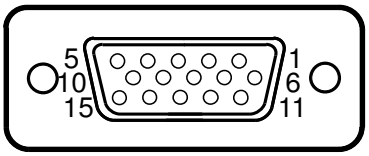
SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Normal	1-2	 JP5
Auto	2-3	 JP5

Note: Manufacturing Default is Auto.

2-8. DIGITAL I/O PORT

JVGA1: Digital I/O Port
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DIN0	9	DOUT0
2	GND	10	GND
3	DIN1	11	DOUT1
4	GND	12	GND
5	DIN2	13	DOUT2
6	VCC	14	GND
7	DIN3	15	DOUT3
8	GND		



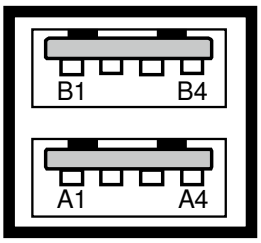
JVGA1

2-9. USB PORT

USB1, USB2, USB3: USB Ports
The pin assignments are as follows:

USB1:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCC5	B1	VCC5
A2	USB0-	B2	USB1-
A3	USB0+	B3	USB1+
A4	GND	B4	GND



USB1/
USB2/
USB3

USB2:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCC5	B1	VCC5
A2	USB2-	B2	USB3-
A3	USB2+	B3	USB3+
A4	GND	B4	GND

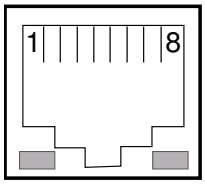
USB3:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
A1	VCC5	B1	VCC5
A2	USB4-	B2	USB5-
A3	USB4+	B3	USB5+
A4	GND	B4	GND

2-10. LAN PORT

LAN1, LAN2: LAN Connectors
The pin assignments are as follows:

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



Green Yellow

LAN1/ LAN2

LAN LED Indicator:

Left Side LED

Green Color Blinking	LAN Message Active
Off	No LAN Message Active

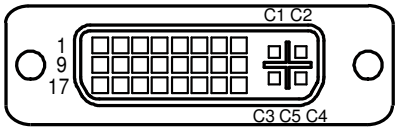
Right Side LED

Yellow Color On	10/100 LAN Speed Indicator
Orange Color on	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

2-11. DVI PORT

DVI1: DVI Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDMI_2-	16	HDMI_HPD
2	HDMI_2+	17	HDMI_0-
3	GND	18	HDMI_0+
4	NC	19	GND
5	NC	20	NC
6	HDMI_clock	21	NC
7	HDMI_data	22	GND
8	CRT_VSYNC	23	HDMI_Clock+
9	HDMI_1-	24	HDMI_Clock-
10	HDMI_1+	C1	CRT_RED
11	GND	C2	CRT_GREEN
12	NC	C3	CRT_BLUE
13	NC	C4	CRT_HSYNC
14	VCC	C5	GND
15	GND		

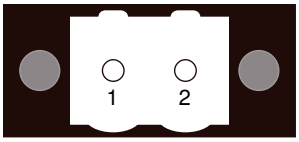


DVI1

2-12. PWR IN CONNECTOR

CN_POWER1: PWR IN Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	PWR-I
2	GND



CN_POWER1

2-13. SATA & SATA POWER CONNECTOR

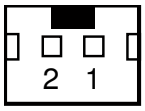
SATA1: SATA Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	G1	5	RX-
2	TX+	6	RX+
3	TX-	7	G3
4	G2		

SATA1

HDD_POWER1: SATA Power Connector
The pin assignments are as follows:

PIN	ASSIGNMENT
1	VCC
2	GND



HDD_POWER1

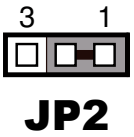
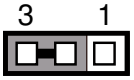
2-14. AUDIO CONNECTOR

JAUDIO1: Audio Connectors
The pin assignments are as follows:

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

2-15. CLEAR CMOS DATA SELECTION

JP2 : Clear CMOS Data Selection
The jumper setting is as follows:

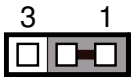
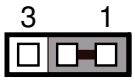
SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Normal	1-2	 JP2
Clear CMOS*	2-3	 JP2

Note: Manufacturing Default is Normal.

*To clear CMOS data, user must power-off the computer and set the jumper to “Clear CMOS” as illustrated above. After five to six seconds, set the jumper back to “Normal” and power-on the computer.

2-16. SYSTEM POWER SELECTION

JP11, JP12 : System Power Selection
The jumper setting is as follows:

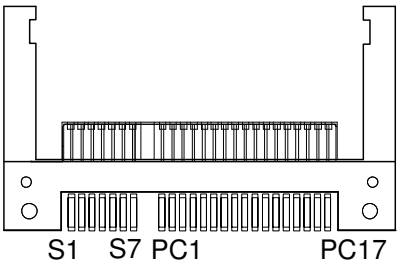
SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION	
Normal	1-2	 JP11	 JP12

Note: Manufacturing Default is Normal.

2-17. CFAST CARD SLOT

JCFAST1: CFAST Card Slot
The pin assignments are as follows:

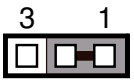
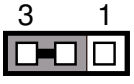
PIN	ASSIGNMENT	PIN	ASSIGNMENT
S1	GND	PC6	NC
S2	SATA_TXP0	PC7	GND
S3	SATA_TXN0	PC8	NC
S4	GND	PC9	NC
S5	SATA_RXN0	PC10	NC
S6	SATA_RXP0	PC11	NC
S7	GND	PC12	NC
PC1	NC	PC13	3.3V/5V
PC2	GND	PC14	3.3V/5V
PC3	NC	PC15	GND
PC4	NC	PC16	GND
PC5	NC	PC17	NC



JCFAST1

2-18. CFAST CARD POWER CONNECTOR

JP3 : CFAST Card Power Connector
The jumper setting is as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
3.3V	1-2	 JP3
5V	2-3	 JP3

Note: Manufacturing default is 3.3V.

SOFTWARE UTILITIES

CHAPTER

3

This chapter comprises the detailed information of VGA driver, LAN driver, and Sound driver.

Section includes:

- Introduction
- Intel® Chipset Software Installation Utility
- VGA Driver Utility
- LAN Driver Utility
- SOUND Driver Utility

3-1. INTRODUCTION

Enclosed with our package, you will find a CD ROM disk containing all types of drivers we have. As a user, you will only need some of files contained in the CD ROM disk, please take note of the following chart:

FILE NAME (Assume that CD ROM drive is D:)	**PURPOSE**
D:\é \UTILITY	Intel® Chipset Device Software installation utility
D:\é \VGA	Intel® Graphics Media Accelerator 3600 Series
D:\é \LAN	Realtek RTL8111F for LAN driver installation
D:\é \SOUND	Realtek ALC888S High Definition Audio for sound driver installation
D:\é \FLASH	For BIOS update

Note: Be sure to install the Utility right after the OS is fully installed.

3-2. INTEL® CHIPSET SOFTWARE INSTALLATION UTILITY

3-2-1. Introduction

The Intel® Chipset Device Software installs 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

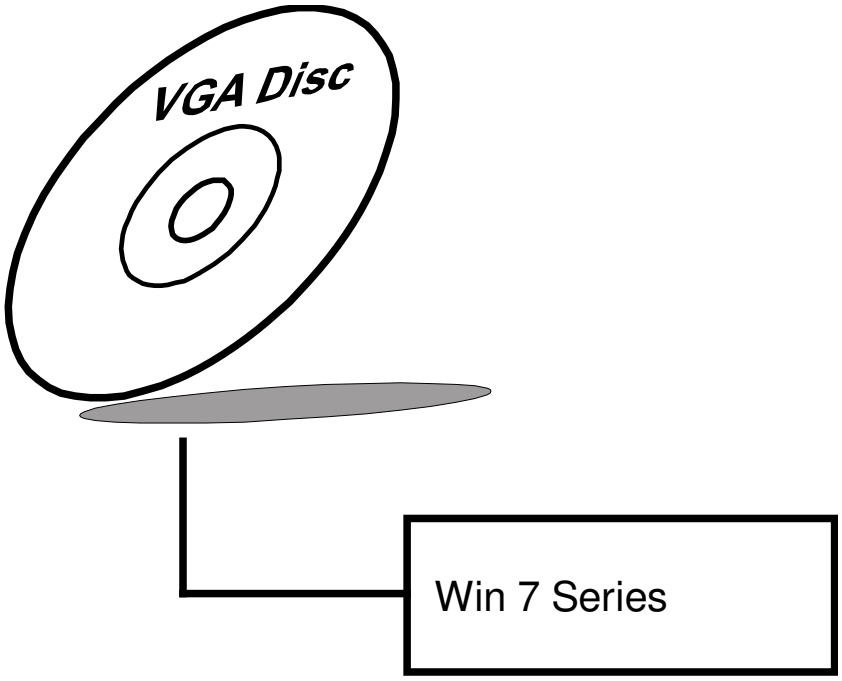
3-2-2. Installation of Utility for Windows 7

The Utility Pack is made only for Windows 7. It should be installed right after the OS installation; kindly follow the following steps:

1. Place insert the Utility Disk into Floppy Disk Drive A/B or CD ROM drive.
2. Under Windows system, go to the directory where Utility Disc is located. e.g.: \DRIVER\UTILITY\infinst_autol.exe
3. Click infinst_autol.exe file for utility installation.
4. Follow the instructions on the screen to complete the installation.
5. Once installation is completed, shut down the system and restart in order for the changes to take effect.

3-3. VGA DRIVER UTILITY

The VGA interface is embedded with our system to support CRT display.
The following illustration briefly shows you the content of VGA driver in D:\…\VGA.

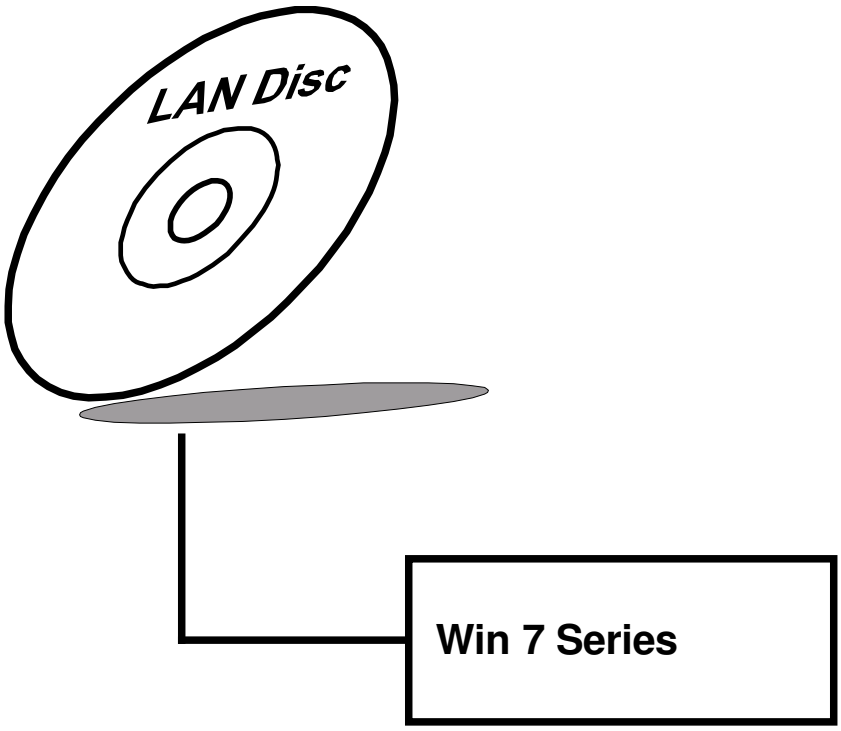


3-3-1. Installation of VGA Driver

1. Start the computer (Win 7).
2. Insert the Utility Disk into the CD ROM drive or drive A/B.
3. Open the VGA folder for your system to choose an appropriate folder, and double-click "exe" file to install. e.g. d:\…\VGA\Your system\ ***.exe
   (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
4. Follow the Wizard's on-screen instructions to complete the installation.

3-4. LAN DRIVER UTILITY

The system is enhanced with LAN function that can support various network adapters. The content of the LAN driver is found as follows:

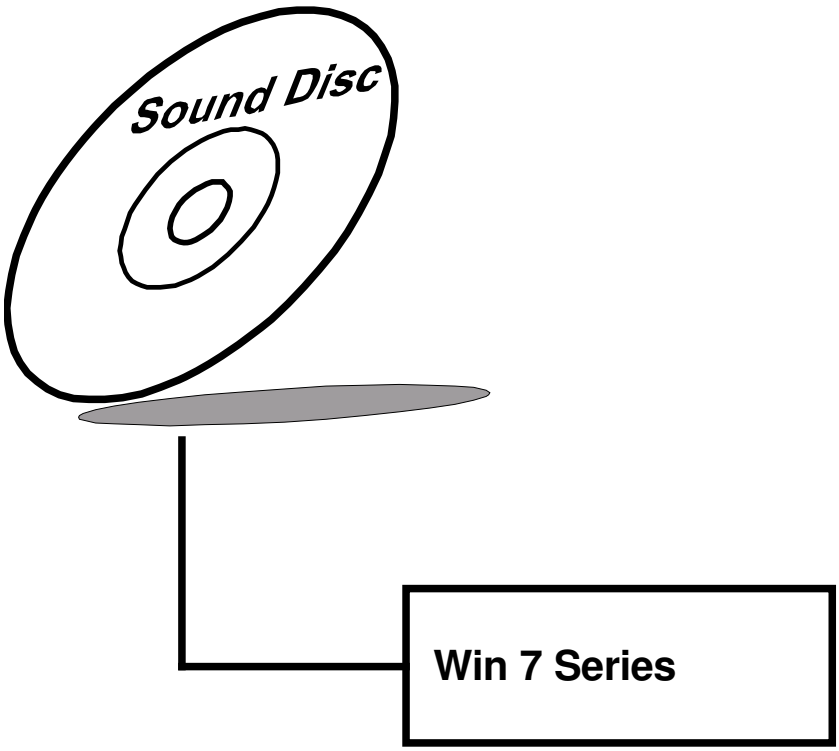


For more details on Installation procedure, please refer to Readme.txt file found on LAN DRIVER UTILITY.

3-5. SOUND DRIVER UTILITY

3-5-1. Introduction

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



3-5-2. Installation Procedure for Windows 7

1. Open the SOUND folder. For your system to choose an appropriate folder, and Run the setup.exe program to start the installation. e.g. :\…\SOUND\Your system\setup.exe
2. (If D is not your CD-ROM drive, substitute D with the correct drive letter.)
3. Click on [Next] to continue the procedure. If the Windows popup "Windows can't verify the publisher of this driver software" message, press "Install this driver software anyway" to continue the installation.
4. Finally, select to restart the system and press [Finish] to complete the installation.

CHAPTER

4

AMI BIOS SETUP

This chapter shows how to set up the AMI BIOS.

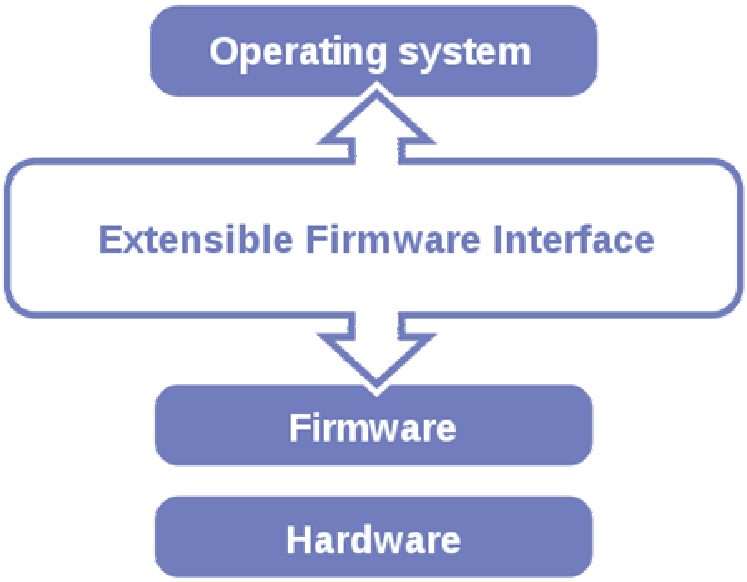
Section includes:

- Introduction
- Entering Setup
- Main
- Advanced
- Chipset
- Boot
- Security
- Save & Exit

4-1. INTRODUCTION

The system uses an AMI Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the BIOS Setup program, Power-on Self-Test (POST), the 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 an 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 provide standard environment for booting an operating system and running pre-boot applications. Following illustration shows Extensible Firmware Interface's position in the software stack.



EFI BIOS provides an user interface allow users the ability to modify hardware configuration, e.g. change system date and time, enable or disable a system component, decide bootable device priorities, setup personal password, etc., which is convenient for modifications and customization of the computer system and allows technicians another method for finding solutions if hardware has any problems.

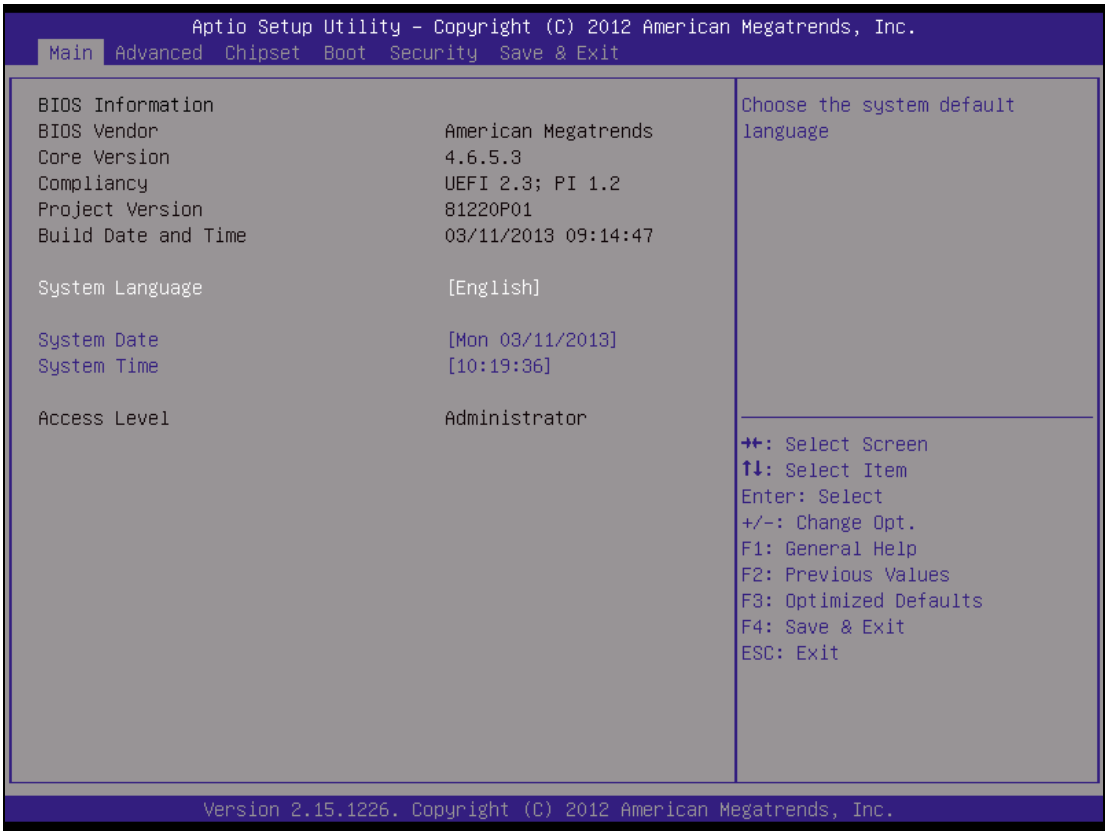
The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <Del> or <ESC> key after the POST memory test begins and before the operating system boot begins. The settings are shown below.

4-2. ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines and the following message will appear on the lower screen:

BIOS POST Screen

As long as this message is present on the screen you may press the <Del> key (the one that shares decimal point at the bottom of the number keypad) or <ESC> to access the Setup program. In a moment, the main menu of the Aptio Setup Utility will appear on the screen:



Setup program initial screen

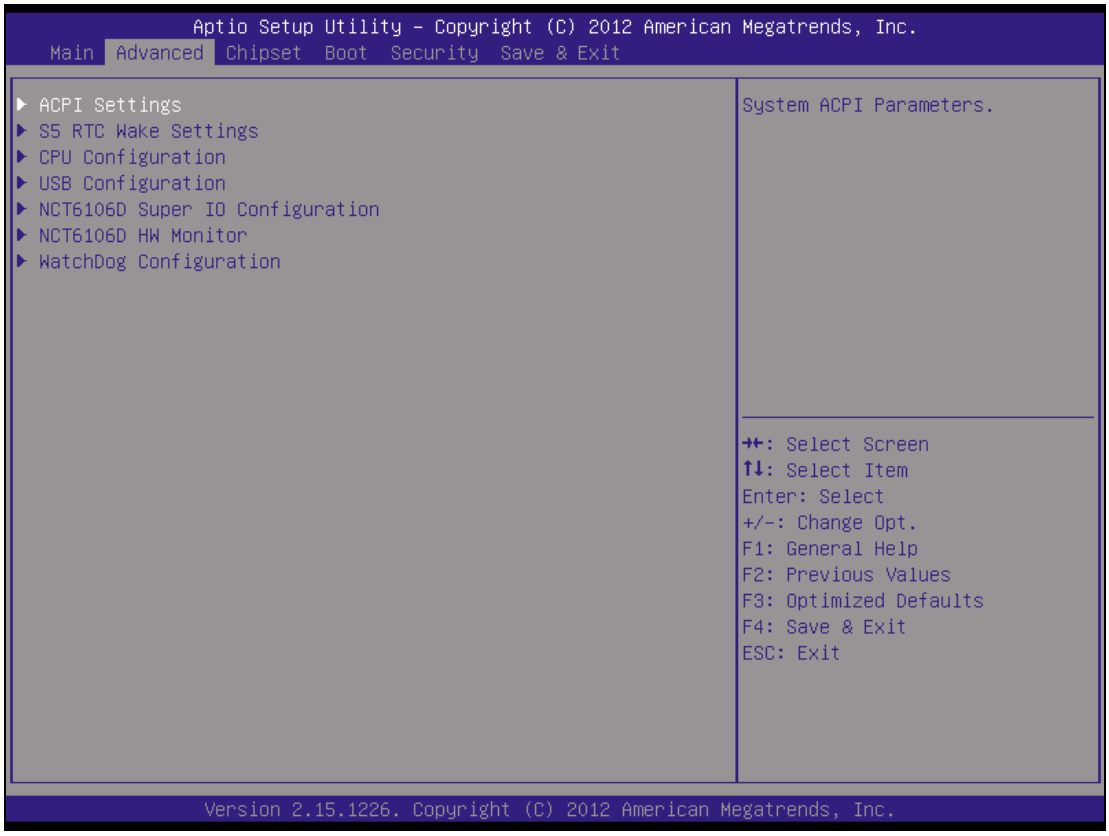
You may move the cursor by up/down keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear at the bottom of the screen.

4-3. MAIN

Main Screen

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of current BIOS version.
System Date	Month, day, year	Specifies the current date.
System Time	Hour, minute, second	Specifies the current time.

4-4. ADVANCED



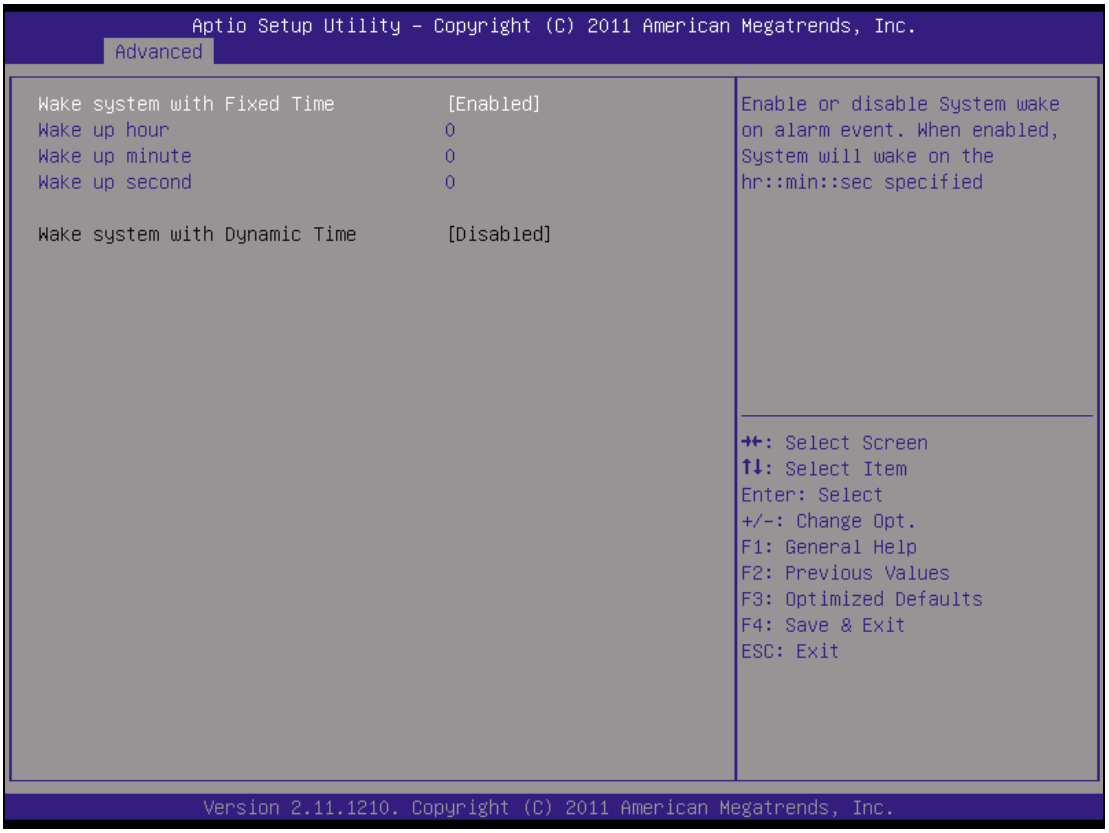
Advanced screen

4-4-1. ADVANCED - ACPI SETTINGS

ACPI Settings Screen

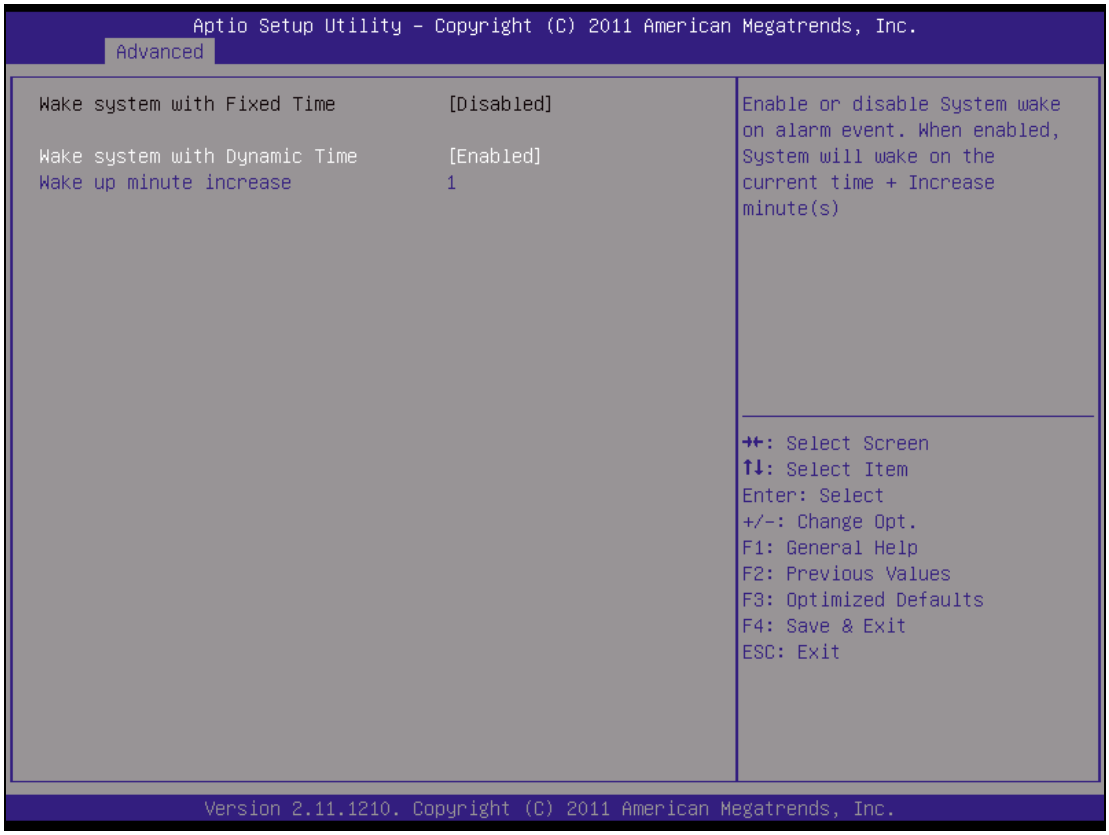
BIOS Setting	Options	Description/Purpose
Enable Hibernation	-Disabled -Enabled	Enables or disables system ability to hibernate (OS/S4 sleep state).
ACPI Sleep state	-Suspend Disabled -S1 (CPU Stop Clock) -S3 (Suspend to RAM)	Select the highest ACPI sleep state the system will enter when the suspend button is pressed.

4-4-2. ADVANCED –S5 RTC WAKE SETTINGS



S5 RTC Wake Settings screen

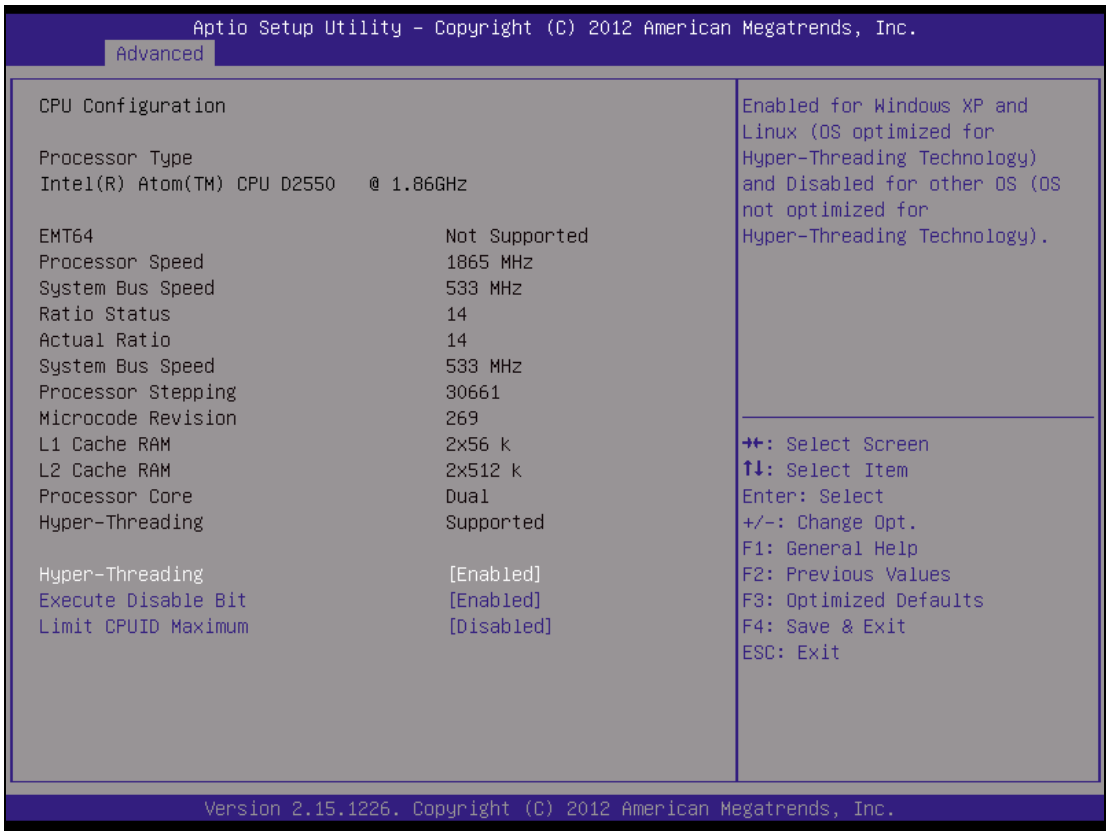
BIOS Setting	Options	Description/Purpose
Wake up with fixed time	-Disabled -Enabled	Enable wake up feature with fixed time.
Wake up hour	Multiple options ranging from 0 to 23	Sets the hour for wake up.
Wake up minute	Multiple options ranging from 0 to 59	Sets the minute for wake up.
Wake up second	Multiple options ranging from 0 to 59	Sets the second for wake up.



S5 RTC Wake Settings screen

BIOS Setting	Options	Description/Purpose
Wake system with dynamic time	-Disabled -Enabled	Enable wake up feature with dynamic time.
Wake up minute increase	Multiple options ranging from 1 to 5	Sets the minute for wake up.

4-4-3. ADVANCED -CPU CONFIGURATION

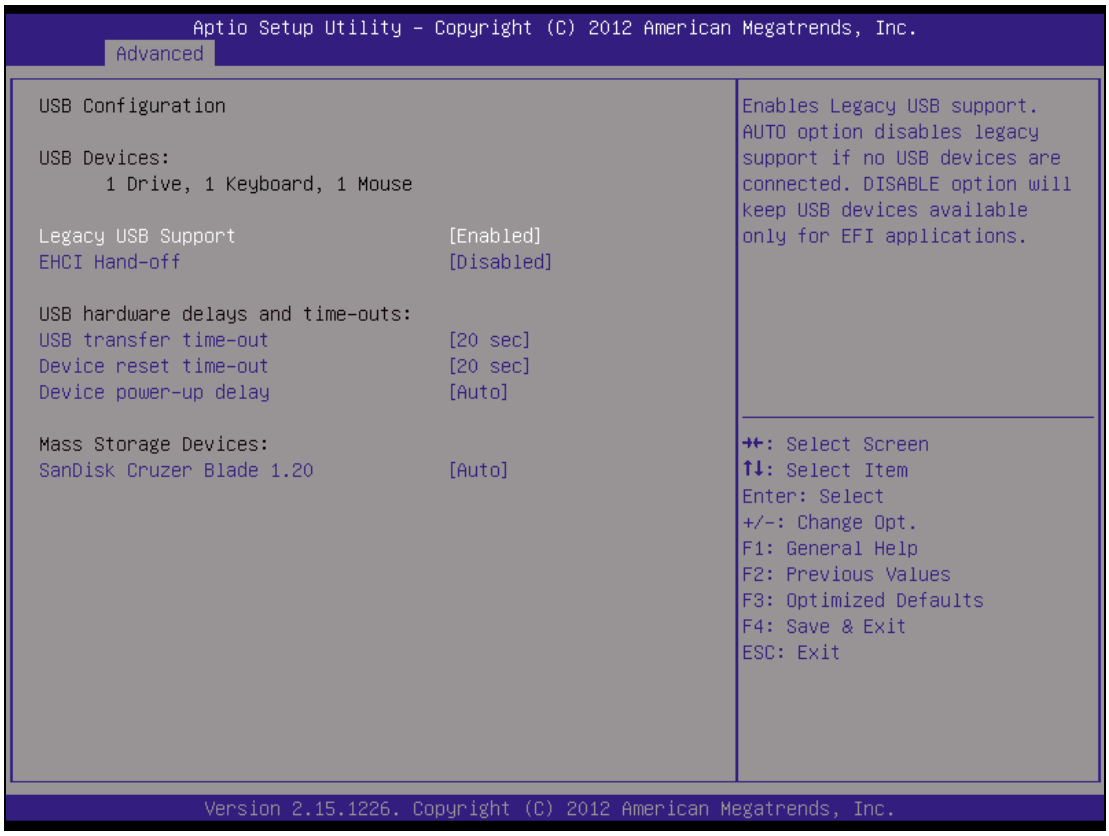


CPU Configuration screen

BIOS Setting	Options	Description/Purpose
Processor Type	No changeable options	Displays the processor brand string obtained from the CPUID instruction.
Processor Speed	No changeable options	Displays the maximum processor speed at current settings.
System Bus Speed	No changeable options	Displays the System bus frequency.
Actual Ratio	No changeable options	This is a read-only item, which displays the ratio actual value of this motherboard.
Processor Stepping	No changeable options	Displays the processor family, mode and stepping.
Macrocode Revision	No changeable options	Displays processor's microcode update revision.

BIOS Setting	Options	Description/Purpose
L1 cache RAM	No changeable options	Displays amount of Level 1 cache.
L2 cache RAM	No changeable options	Displays amount of Level 2 cache.
Processor Cores	No changeable options	Displays information about number of physical cores in processor.
Hyper-Threading	No changeable options	Reports if Intel Hyper-Threading Technology is supported by processor.
Hyper-threading	-Disabled -Enabled	It is enabled for Windows and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology).
Execute Disable Bit	-Disabled -Enabled	Enable to implement Execute Disable Technology.
Limit CPUID Maximum	-Disabled -Enabled	This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and Disabled (for the Windows OS.).

4-4-4. ADVANCED -USB CONFIGURATION

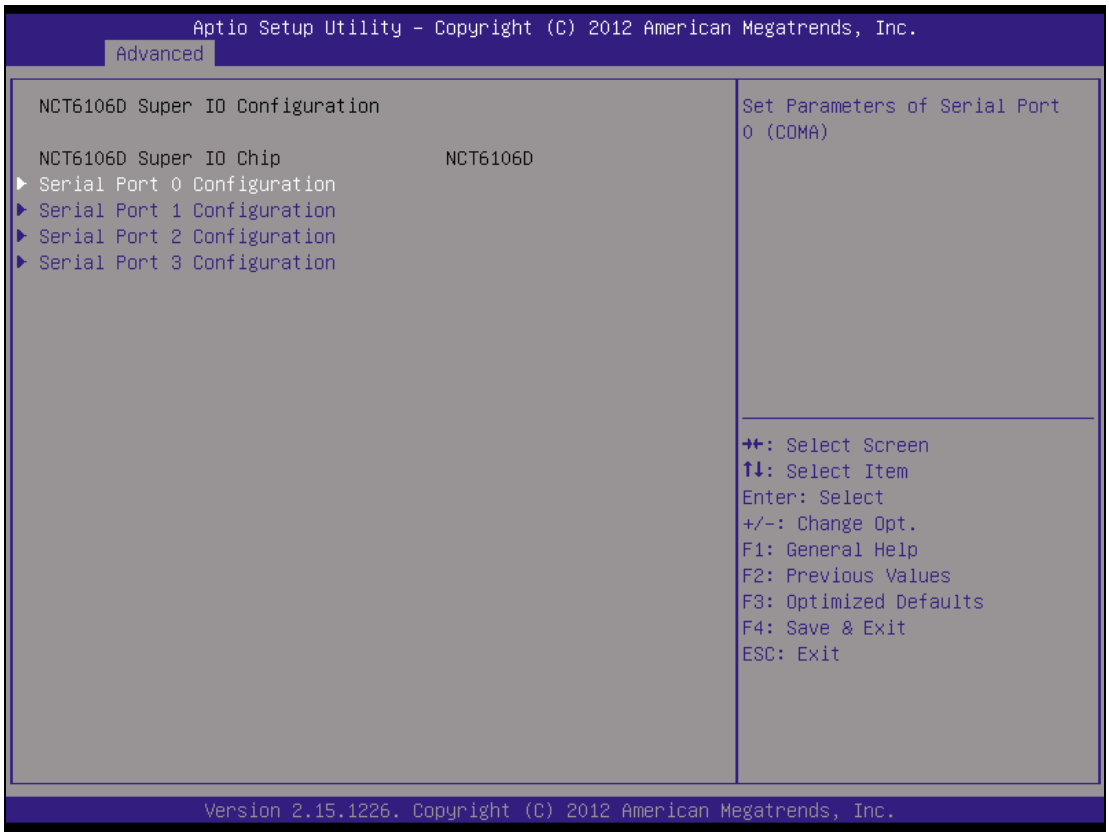


USB Configuration screen

BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays number of available USB devices.
Legacy USB Support	-Disabled -Enabled -Auto	Enables support for legacy USB.
EHCI Hand-off	-Disabled -Enabled	When enabled it allows BIOS support control of the EHCI controller and the OS handoff synchronization capability.
USB transfer time-out	-1 sec -5 sec -10 sec -20 sec	The time-out value for Control, Bulk, and Interrupt transfers.

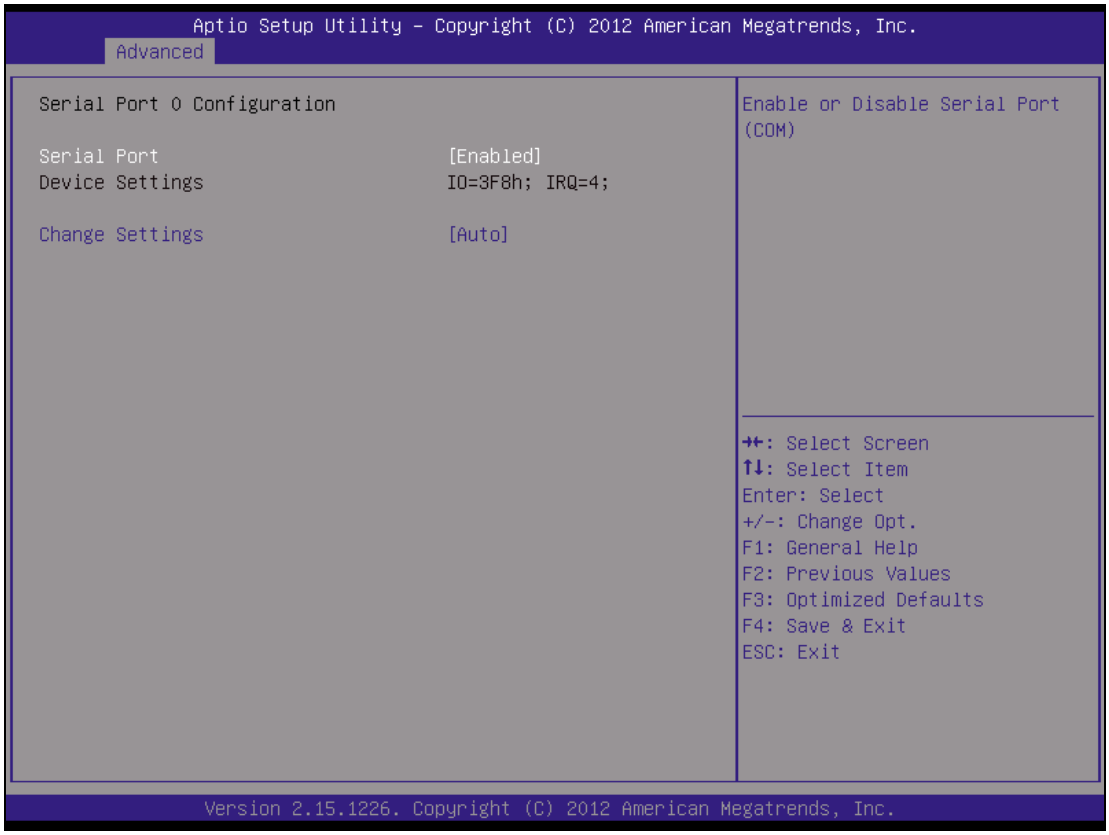
BIOS Setting	Options	Description/Purpose
Device reset time-out	-10 sec -20 sec -30 sec -40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	-Auto -Manual	Device power-up delay Maximum time the device will take before it properly reports itself to the Host Controller.

4-4-5. ADVANCED –NCT6106D SUPER IO CONFIGURATION



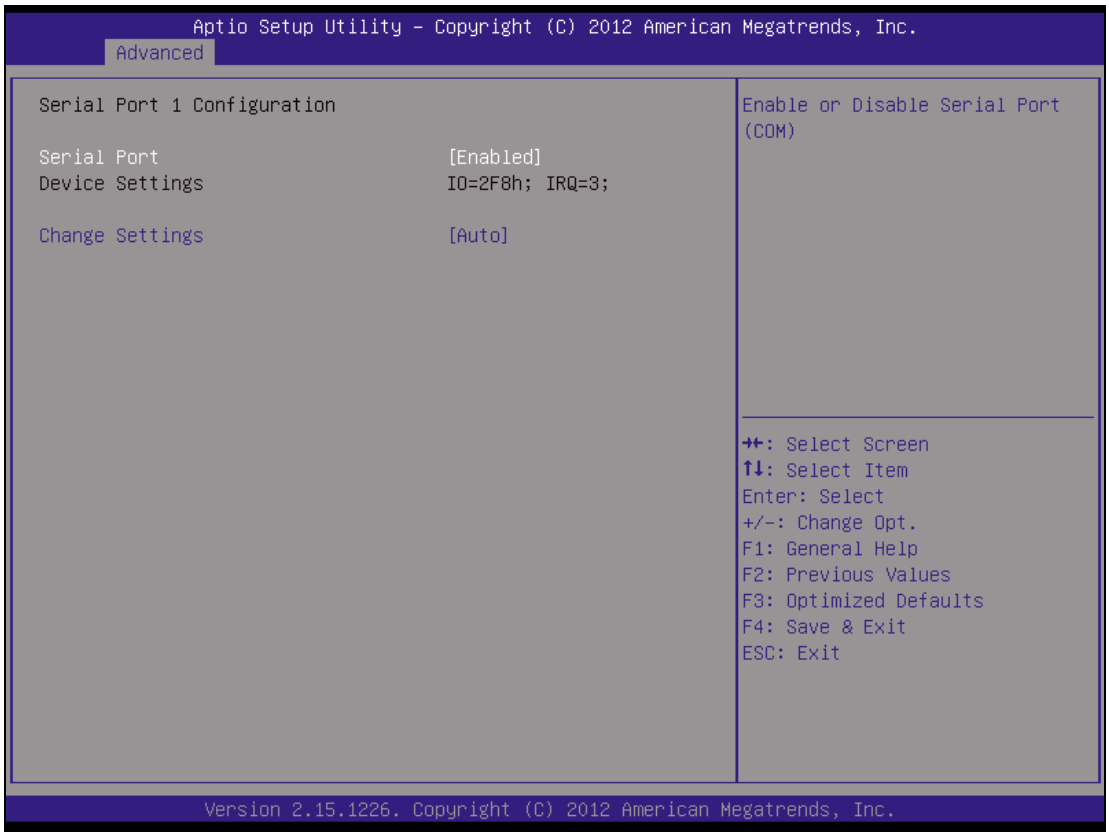
NCT6106D Super IO Configuration screen

BIOS Setting	Options	Description/Purpose
Super IO Chip	No changeable options	Displays the super IO chip model and its manufacturer.



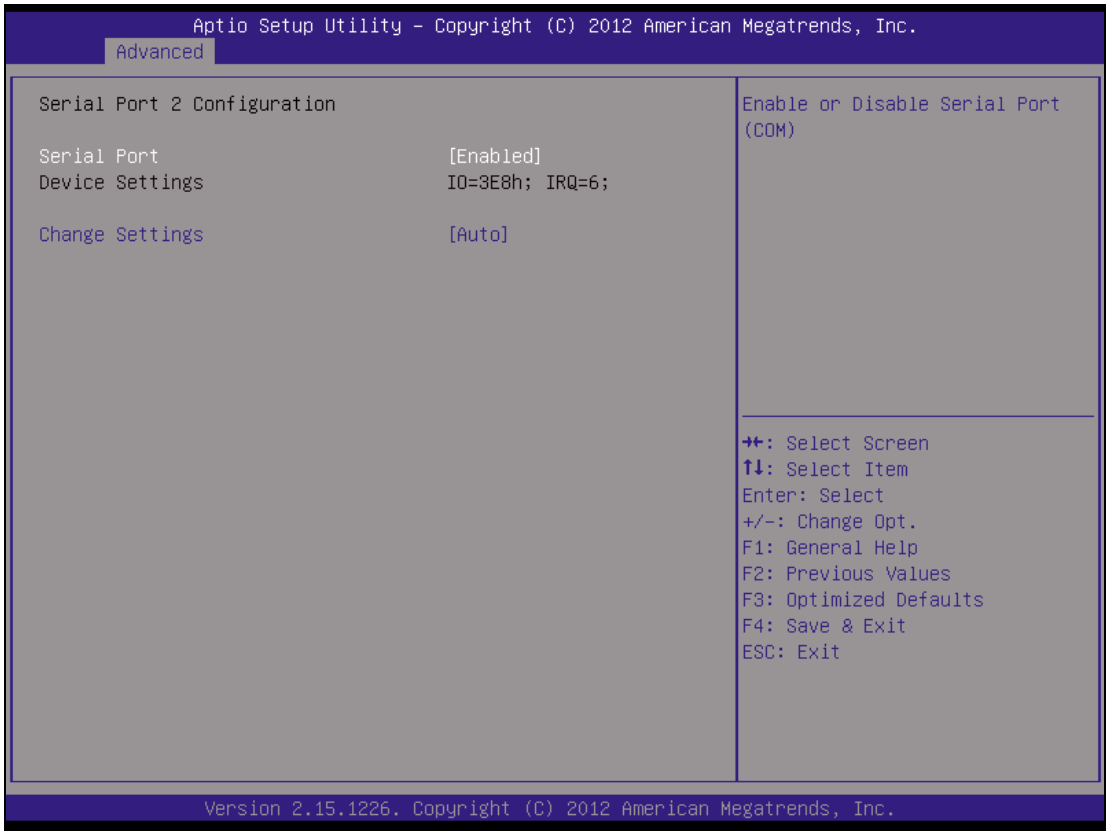
Serial Port 0 Configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Configures the serial port 0.
Device Settings	No changeable options	Reports the current serial port 0 setting.
Change Settings	-Auto -IO=3F8h; IRQ=4 -IO=3F8h; IRQ=3,4,5,6,7,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,10,11,12	Specifies the base I/O address and interrupt request for the serial port 0 if enabled.



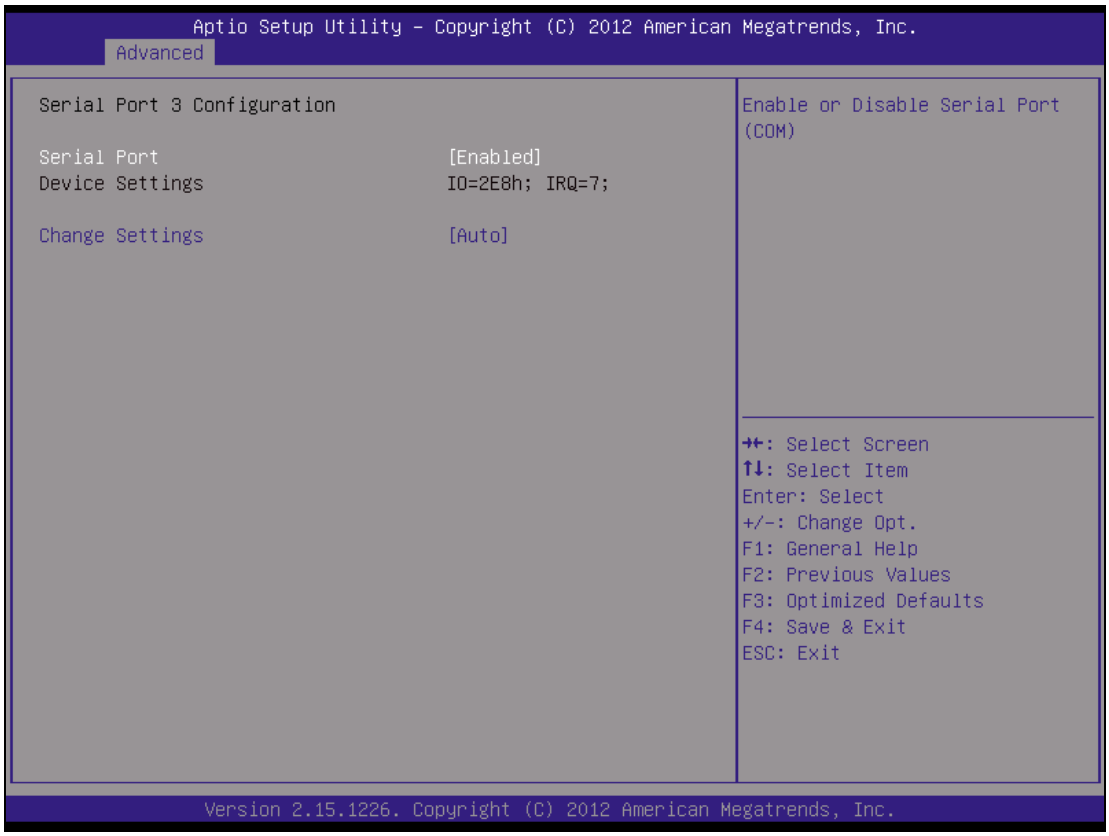
Serial Port 1 Configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Configures the serial port 1.
Device Settings	No changeable options	Reports the current serial port 1 setting.
Change Settings	-Auto -IO=2F8h; IRQ=3 -IO=3F8h; IRQ=3,4,5,6,7,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,10,11,12	Specifies the base I/O address and interrupt request for the serial port 1 if enabled.



Serial Port 2 Configuration screen

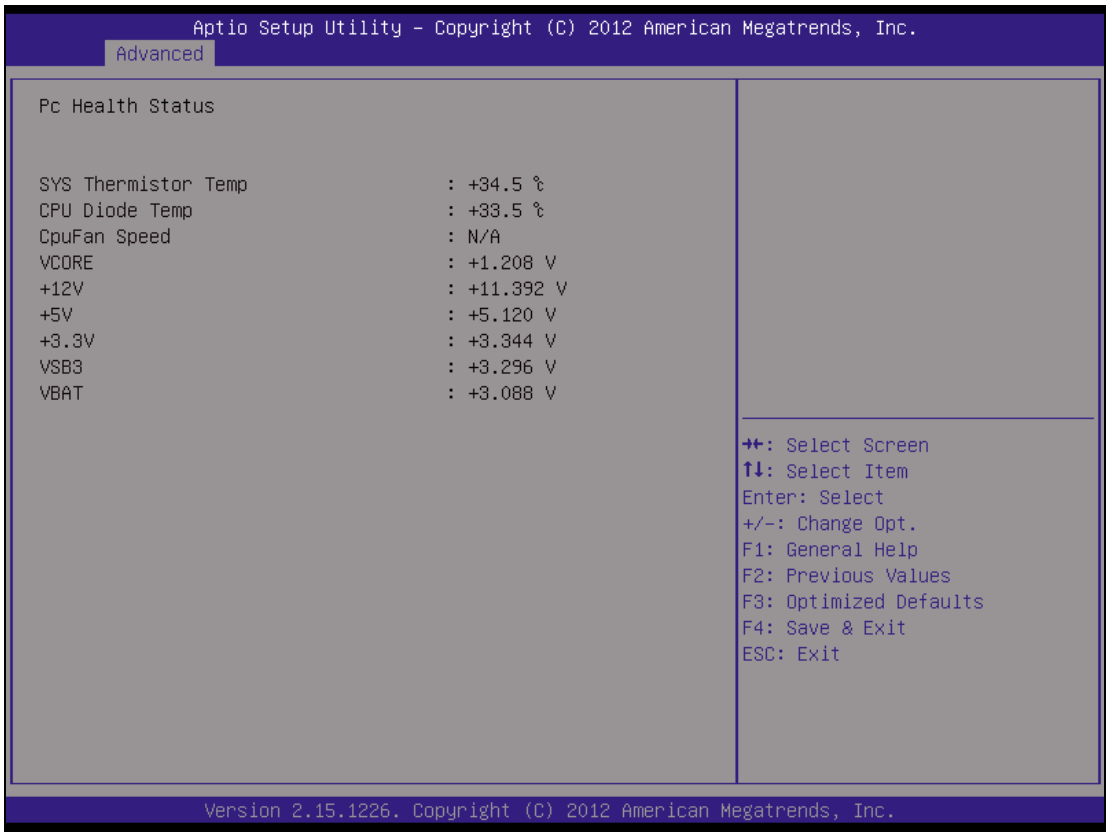
BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Configures the serial port 2.
Device Settings	No changeable options	Reports the current serial port 2 setting.
Change Settings	-Auto -IO=3E8h; IRQ=6 -IO=3E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E0h; IRQ=3,4,5,6,7,10,11,12 -IO=2F0h; IRQ=3,4,5,6,7,10,11,12	Specifies the base I/O address and interrupt request for the serial port 2 if enabled.



Serial Port 3 Configuration screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Configures the serial port 3.
Device Settings	No changeable options	Reports the current serial port 3 setting.
Change Settings	-Auto -IO=2E8h; IRQ=7 -IO=3E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,10,11,12 -IO=2E0h; IRQ=3,4,5,6,7,10,11,12 -IO=2F0h; IRQ=3,4,5,6,7,10,11,12	Specifies the base I/O address and interrupt request for the serial port 3 if enabled.

4-4-6. ADVANCED – NCT6106D HW MONITOR



NCT6106D HW Monitor screen

BIOS Setting	Options	Description/Purpose
SYS Thermistor Temp	No changeable options	Displays system's temperature.
CPU Diode Temp	No changeable options	Displays processor's temperature.
CPUFan Speed	No changeable options	Displays fan speed of the CPU fan.
VCORE	No changeable options	Displays voltage level of the +VCORE in supply.
+12V	No changeable options	Displays voltage level of the +12V in supply.
+5V	No changeable options	Displays voltage level of the +5V in supply.
+3.3V	No changeable options	Displays voltage level of the +3.3V in supply.

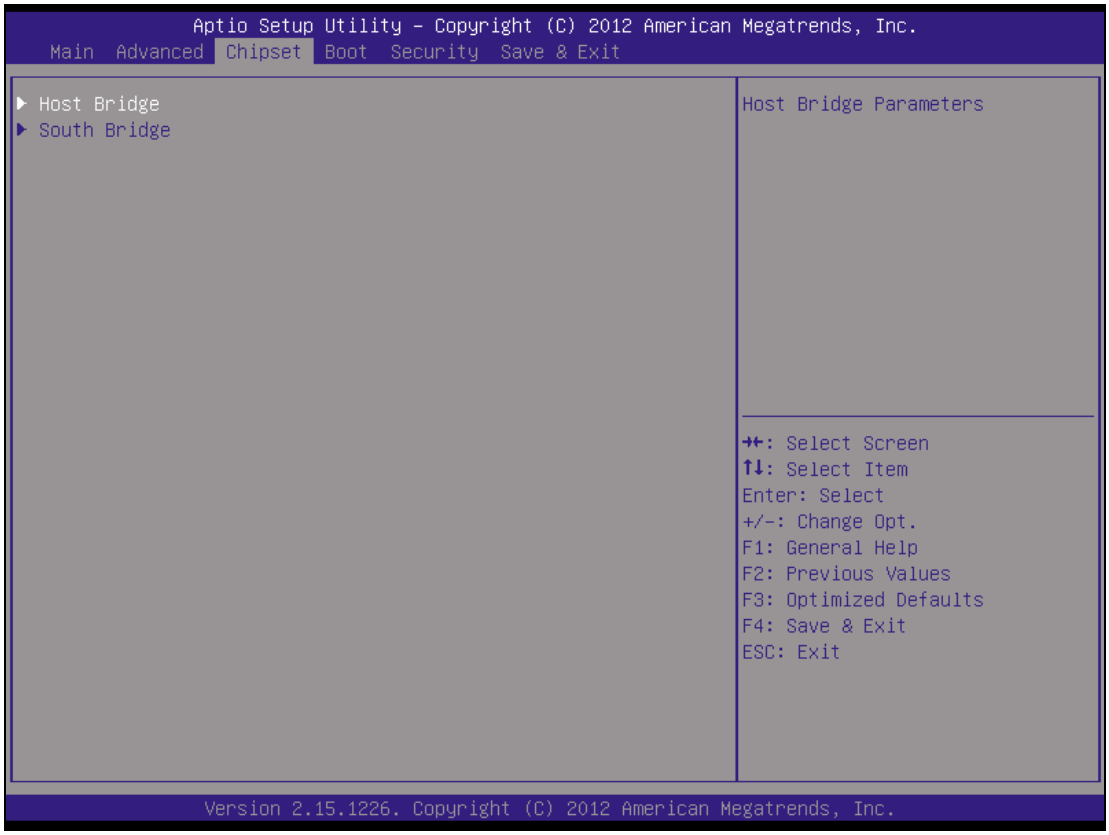
BIOS Setting	Options	Description/Purpose
VSB3	No changeable options	Displays voltage level of the +3.3VSB in supply.
VBAT	No changeable options	Displays voltage level of the backup CMOS battery.

4-4-7. ADVANCED –WATCHDOG CONFIGURATION

Watchdog Configuration screen

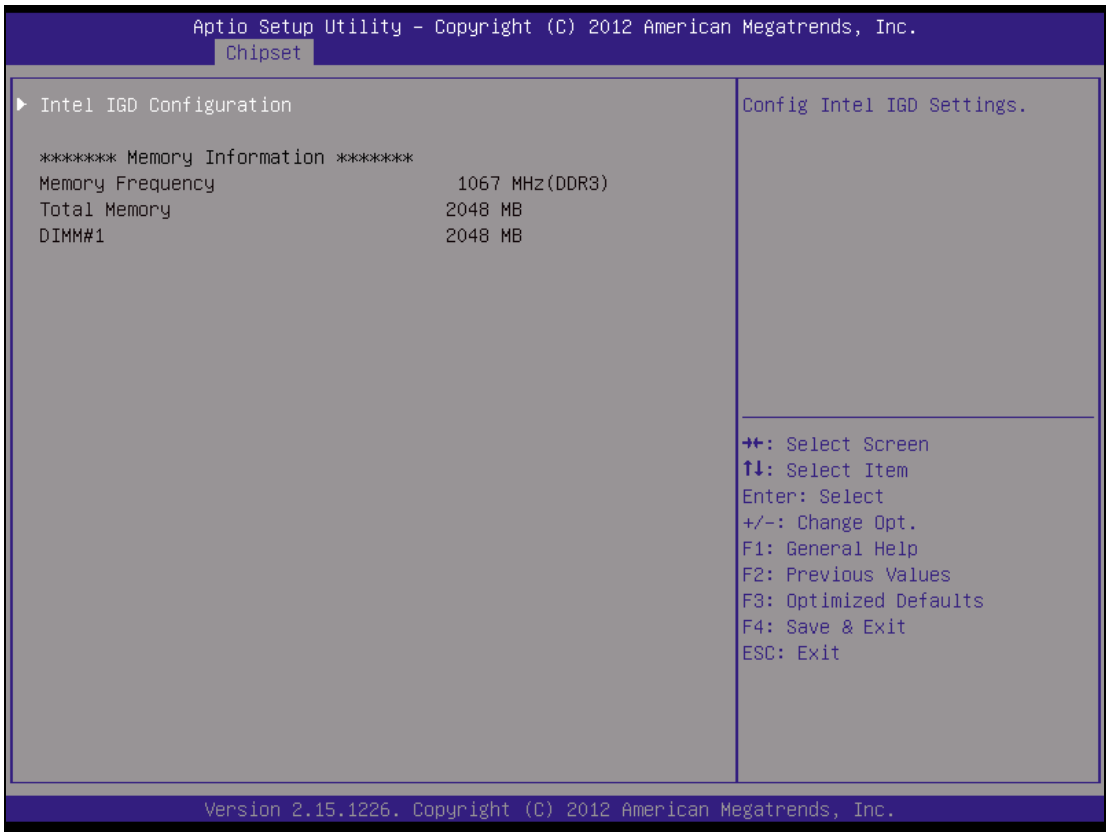
BIOS Setting	Options	Description/Purpose
Watchdog count mode	-Second -Minute	Selects unit for watchdog timer.
Watchdog timeout value	Multiple options ranging from 0 to 255	Sets the desired value for watchdog timer. 0 means disabled.

4-5. CHIPSET



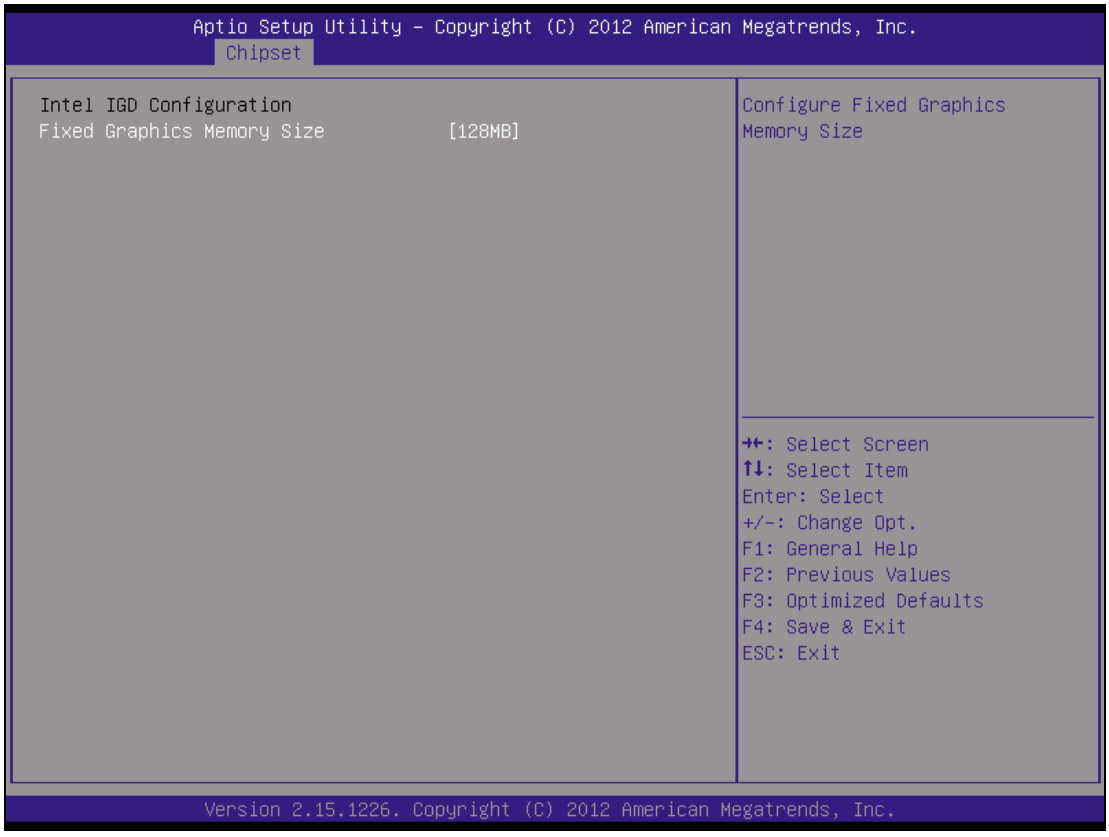
Chipset Screen

4-5-1. CHIPSET – HOST BRIDGE



Host Bridge screen

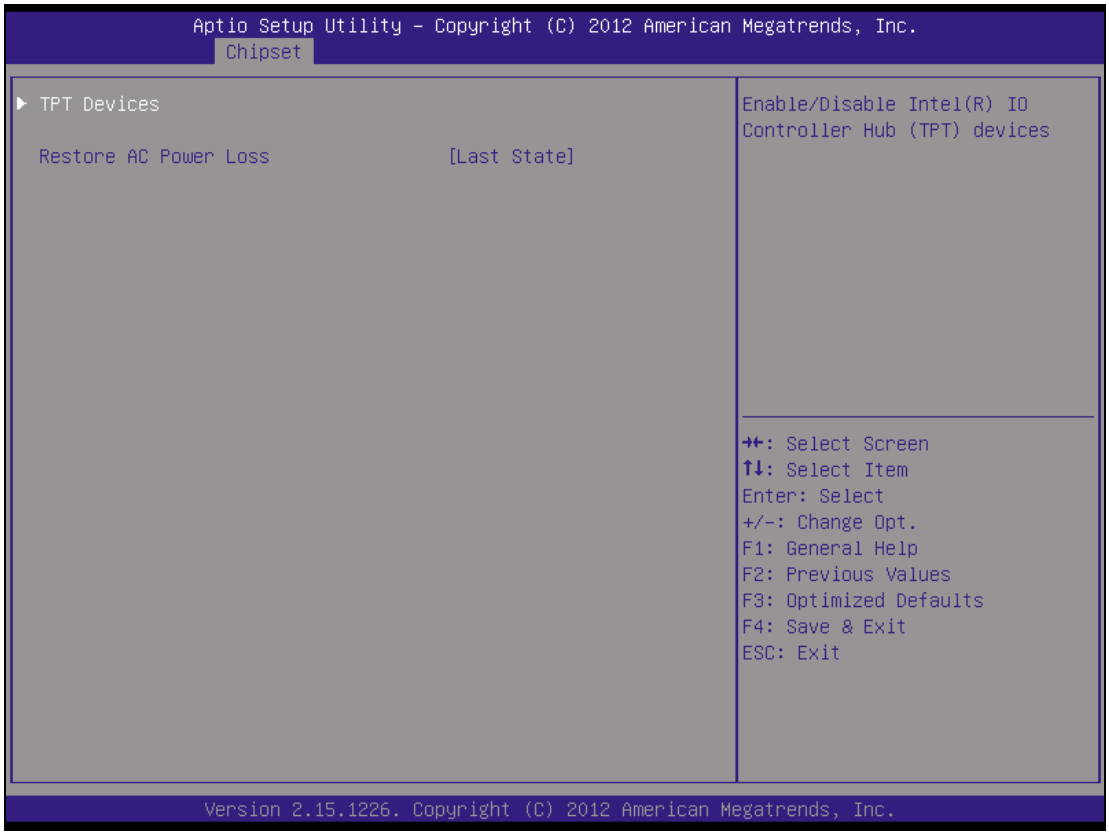
BIOS Setting	Options	Description/Purpose
Memory Frequency	No changeable options	Display the speed of your memory.
Total Memory	No changeable options	Displays the total amount of RAM.
DIMM#1	No changeable options	Display the amount of RAM installed in first memory slot.



Intel IGD Configuration screen

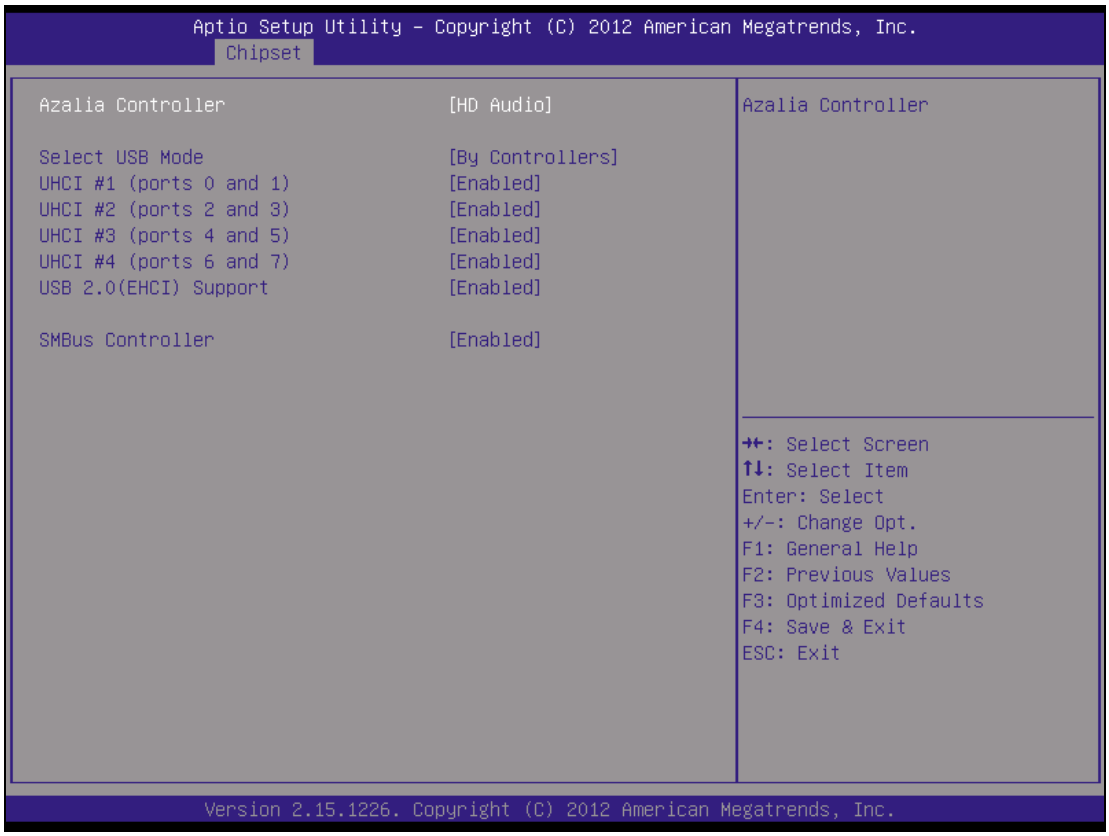
BIOS Setting	Options	Description/Purpose
Fixed graphic Memory Size	-128MB -256MB	Configure fixed graphics memory size.

4-5-2. CHIPSET – SOUTH BRIDGE



South Bridge screen

BIOS Setting	Options	Description/Purpose
Restore AC Power Loss	-Power Off -Power On -Last State	Determines the mode of operation in case of power loss. ▪ **Power Off** keeps the power off till the power button is pressed. ▪ **Power On** restores power to the computer. ▪ **Last State** restores the previous power state before power loss happened.

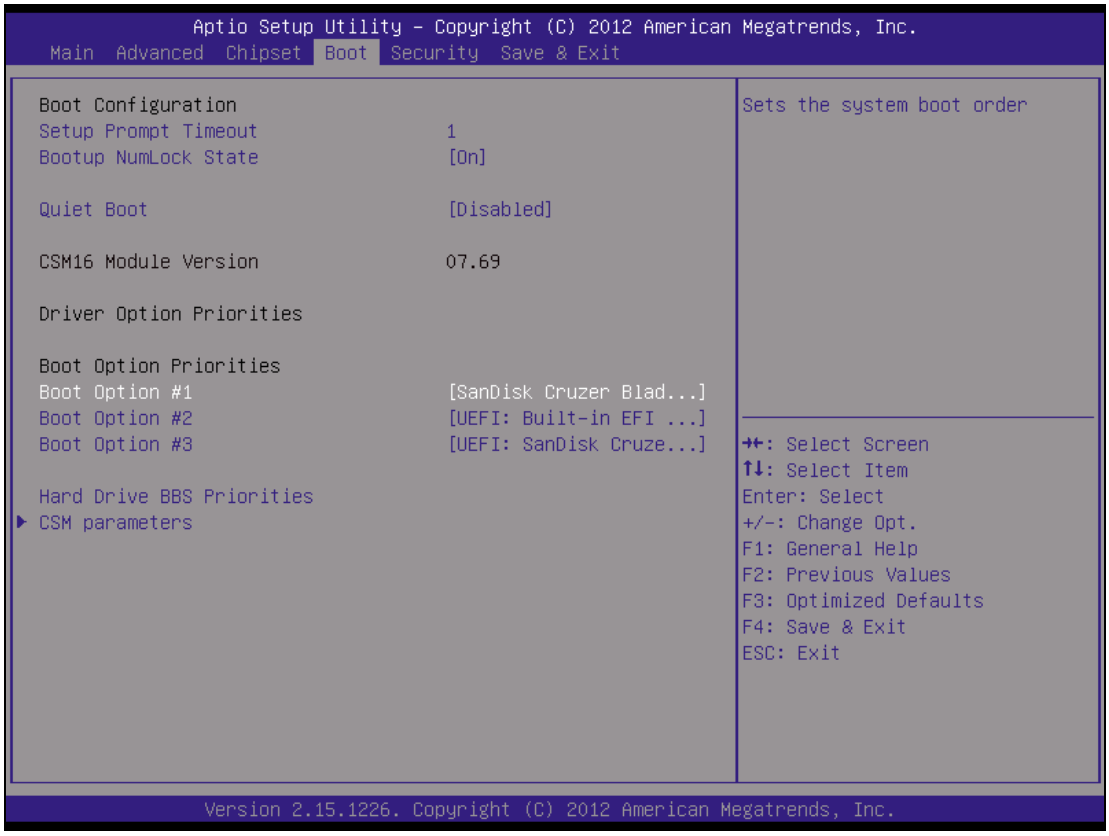


TPT Devices screen

BIOS Setting	Options	Description/Purpose
Azalia Controller	-Disabled -HD Audio	Azalia Controller
Select USB Mode	-By Ports -By Controllers	Select USB mode to control USB ports.
UHCI #1 (ports 0 and 1)	-Disabled -Enabled	Control the USB UHCI (USB 1.1) functions. Disable from highest to lowest Controller.
UHCI #2 (ports 2 and 3)	-Disabled -Enabled	Control the USB UHCI (USB 1.1) functions. Disable from highest to lowest Controller.

BIOS Setting	Options	Description/Purpose
UHCI #3 (ports 4 and 5)	-Disabled -Enabled	Control the USB UHCI (USB 1.1) functions. Disable from highest to lowest Controller.
UHCI #4 (ports 6 and 7)	-Disabled -Enabled	Control the USB UHCI (USB 1.1) functions. Disable from highest to lowest Controller.
USB 2.0 (EHCI) Support	-Disabled -Enabled	Enable or Disable USB 2.0 (EHCI) Support
SMBus controller	-Disabled -Enabled	Enable or Disable OnChip SMBus Controller.

4-6. BOOT

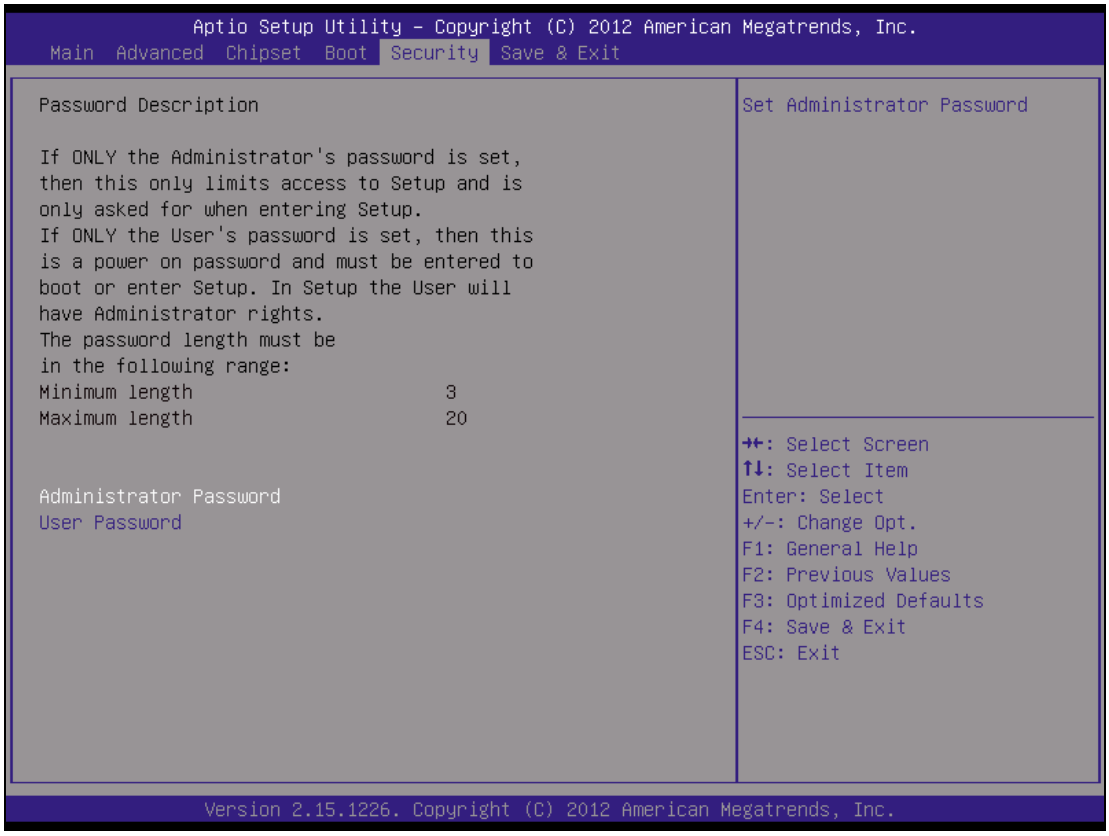


Boot Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Multiple options ranging from 1 to 65535	Specifies number of seconds to wait for setup activation key (value 65535 results in indefinite waiting).
Bootup NumLock Status	-On -Off	Specifies the power-on state of the numlock feature on the numeric keypad of keyboard.
Quiet Boot	-Disabled -Enabled	When quiet boot is enabled, it displays OEM logo instead of POST messages during boot.
CSM16 Module Version	No changeable options	Displays the current Compatibility Support Module version.
Option ROM	-Force BIOS	Allows the POST screen to display

BIOS Setting	Options	Description/Purpose
Messages	-Keep Current	Option ROM messages.
UEFI Boot	-Enabled -Disabled	▪ **Enabled**:enables all UEFI boot options. ▪ **Disabled**:disables all UEFI boot options.
Boot Option #1	-[drive(s)] -Disabled	Allows to the set boot option listed in Hard Drive BBS Priorities.

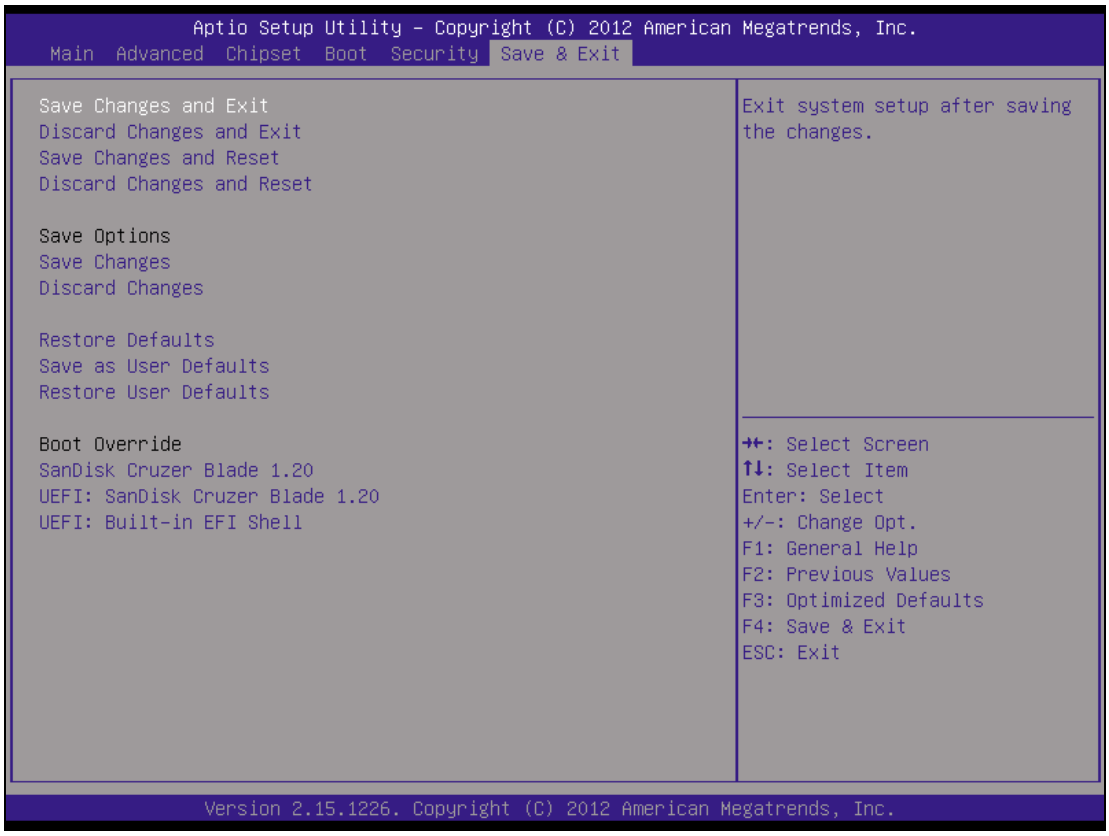
4-7. SECURITY



Security Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be up to 20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be up to 20 alphanumeric characters.	Specifies the user password.

4-8. Save & Exit



Save & Exit screen

BIOS Setting	Options	Description/Purpose
Save Changes and Exit	No changeable options	Exits and saves the changes in CMOS SRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in CMOS SRAM and resets.
Discard Changes and Reset	No changeable options	Resets without saving any changes made in BIOS settings.
Save Changes	No changeable options	Saves the changes done in BIOS settings so far.
Discard Changes	No changeable options	Discards the changes done in BIOS settings so far.

BIOS Setting	Options	Description/Purpose
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Saves the current values as user defaults.
Restore User Defaults	No changeable options	Loads the user defaults for BIOS settings.
Boot Override	-[drive(s)]	Forces to boot from selected [drive(s)].

APPENDIX

A

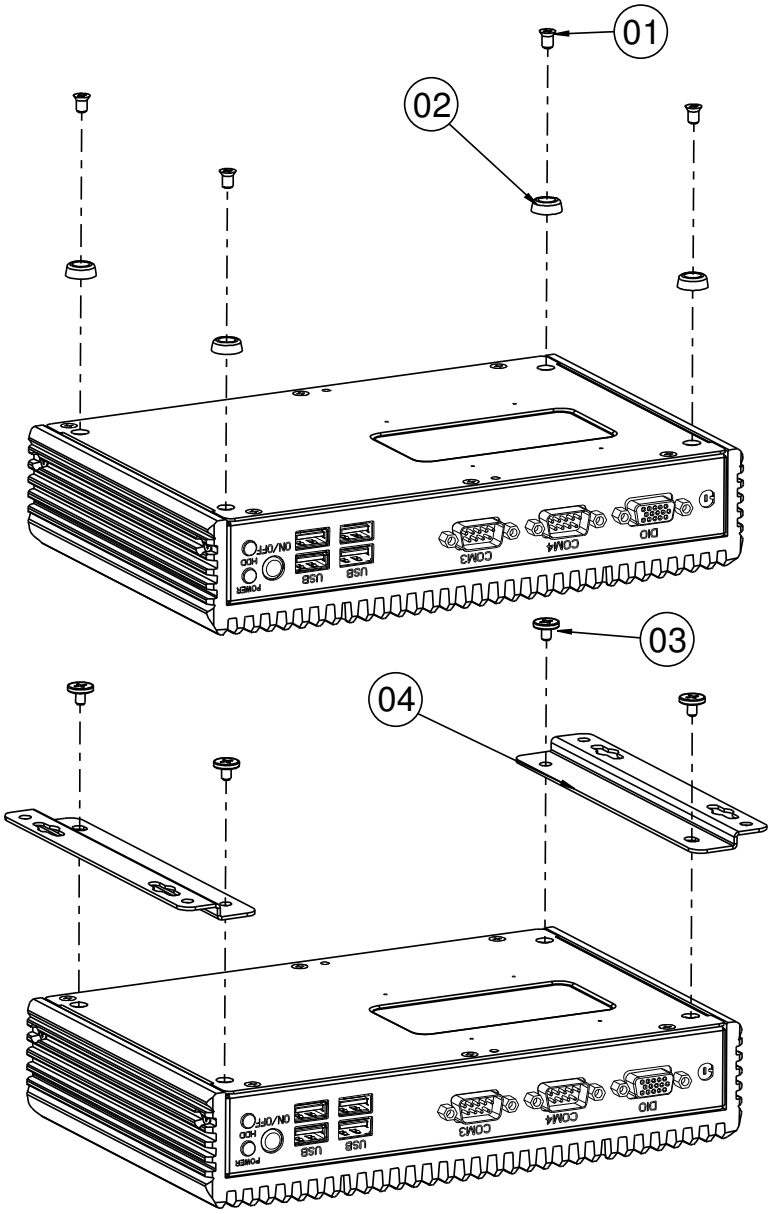
SYSTEM ASSEMBLY

This appendix contains the exploded diagrams & part numbers of the system.

Section includes:

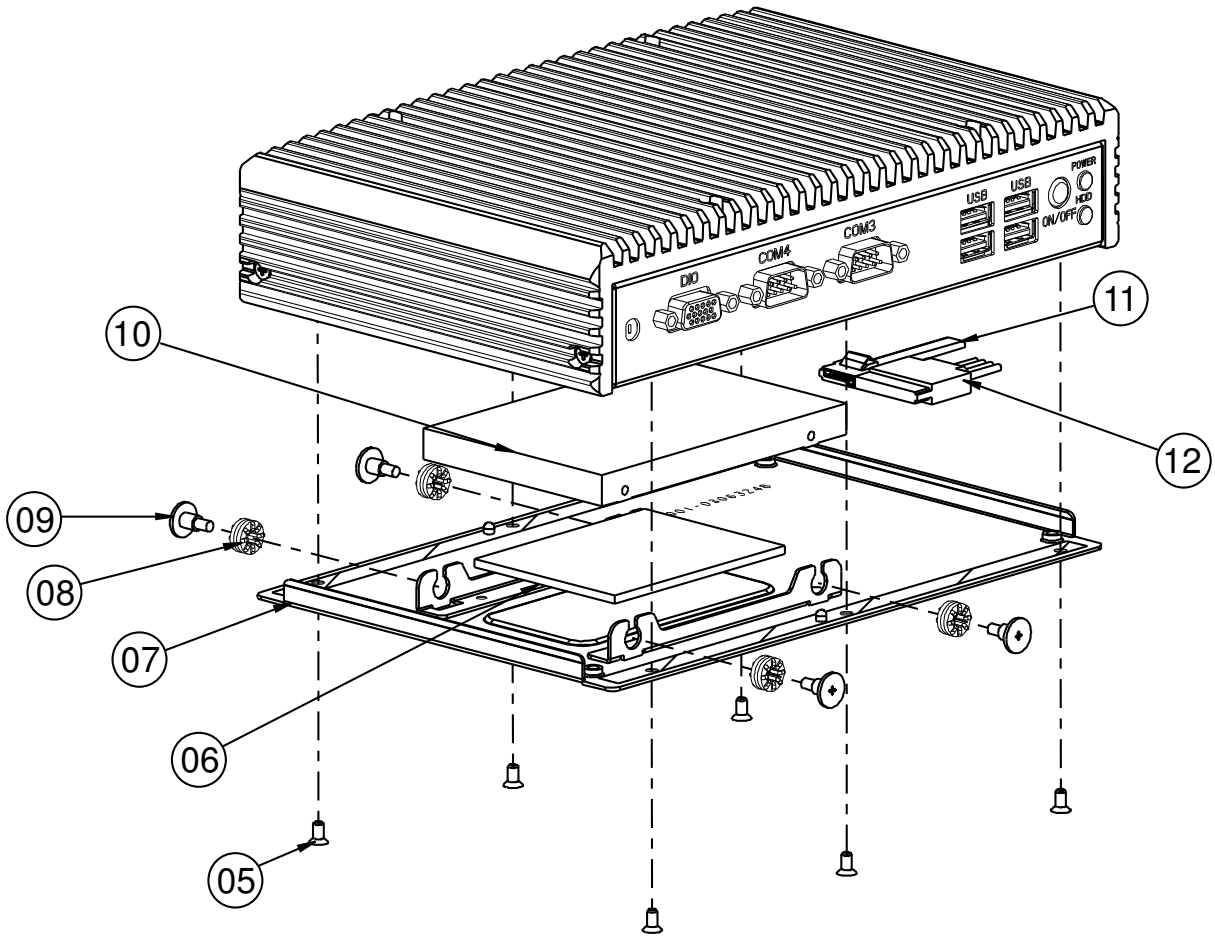
- Exploded Diagram for Stand (Optional)
- Exploded Diagram for Bottom Case
- Exploded Diagram for Front & Rear Case
- Exploded Diagram for Motherboard
- Exploded Diagram for Heatsink

EXPLODED DIAGRAM FOR STAND (OPTIONAL)



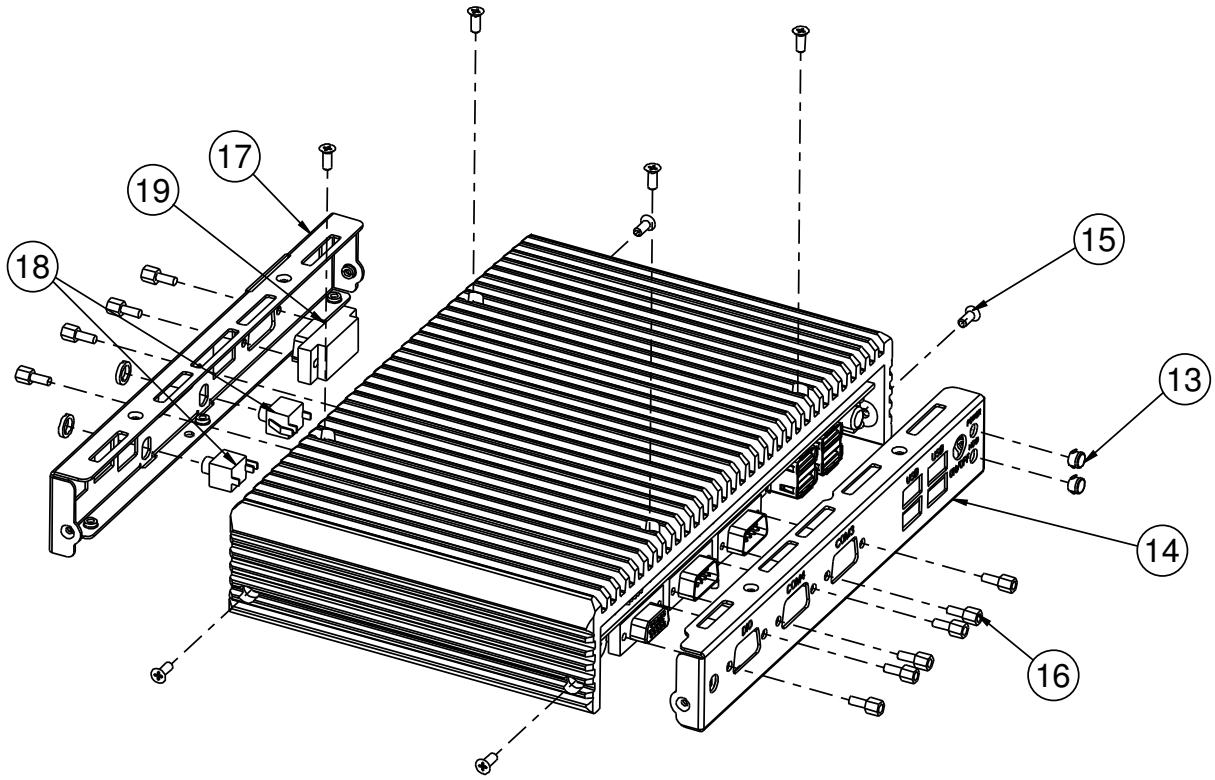
No.	Name	P/N No.	Qt'y
1	M4_L6_F_B	22-215-40006011	4
2	RUBBER	90-004-01400000	4
3	M4_L5_1_B (Optional)	22-275-40050911	4
4	stand (Optional)	80-017-03061248	2

EXPLODED DIAGRAM FOR BOTTOM CASE



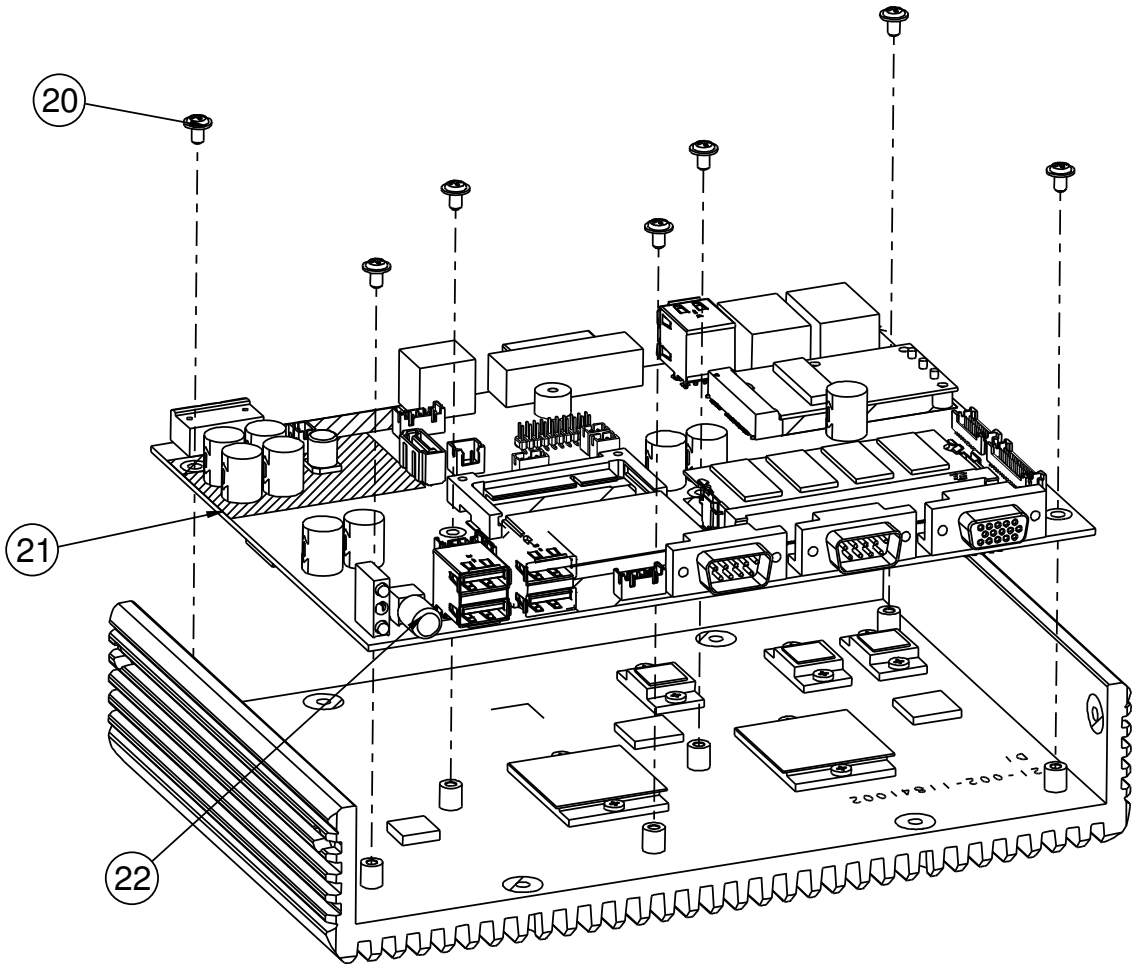
No.	Name	P/N No.	Qt'y
05	M3_L6_F_B	22-215-30060011	6
06	Thermal Pad	21-006-07055001	1
07	CASE	20-001-03063248	1
08	Rubber(GSA-010TGY)	23-680-39580963	4
09	HDD SCREW	82-272-30005013	4
10	2.5" HDD	See Order	1
11	Sata HDD Cable	27-008-20902031	1
12	Sata POWER Cable	27-008-24902971	1

EXPLODED DIAGRAM FOR FRONT & REAR CASE



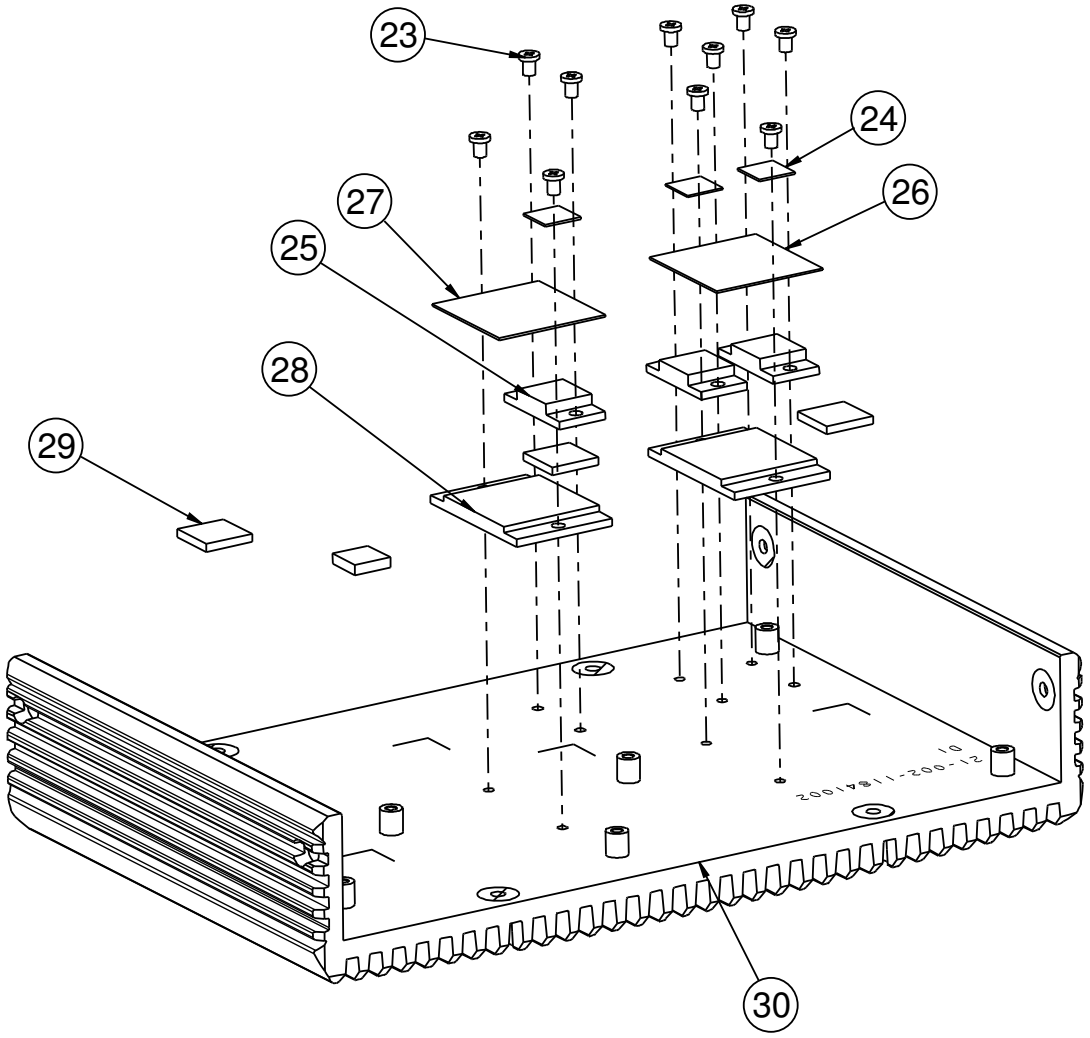
No.	Name	P/N No.	Qt'y
13	LED Lens	30-012-02100000	2
14	FRONT_CASE	20-001-03061249	1
15	M3_L6_F_B	22-215-30060011	8
16	No.4 BOSS	22-692-40048051	10
17	BACK_CASE	20-001-03062249	1
18	Sound Cable	27-028-24906111	1
19	com cable	27-024-24902031	1

EXPLODED DIAGRAM FOR MOTHERBOARD



No.	Name	P/N No.	Qt'y
20	M3_L5_Washer_Ni	22-242-30005311	7
21	SB-8122	SB-8122	1
22	Button	30-001-28100099	1

EXPLODED DIAGRAM FOR HEATSINK



No.	Name	P/N No.	Qt'y
23	M3_L5_1	22-272-30049015	12
24	Thermal Pad 10x10x1	81-006-81010003	3
25	PWM BLOCK	21-002-12513001	3
26	Thermal Pad 30x30x1	81-006-83030003	1
27	Thermal Pad 30x30x2	81-006-83030004	1
28	CPU_SOUTH BLOCK	21-002-13927001	2
29	Thermal pad	81-006-81313002	3
30	HEATSINK	21-002-11841002	1

TECHNICAL SUMMARY

APPENDIX

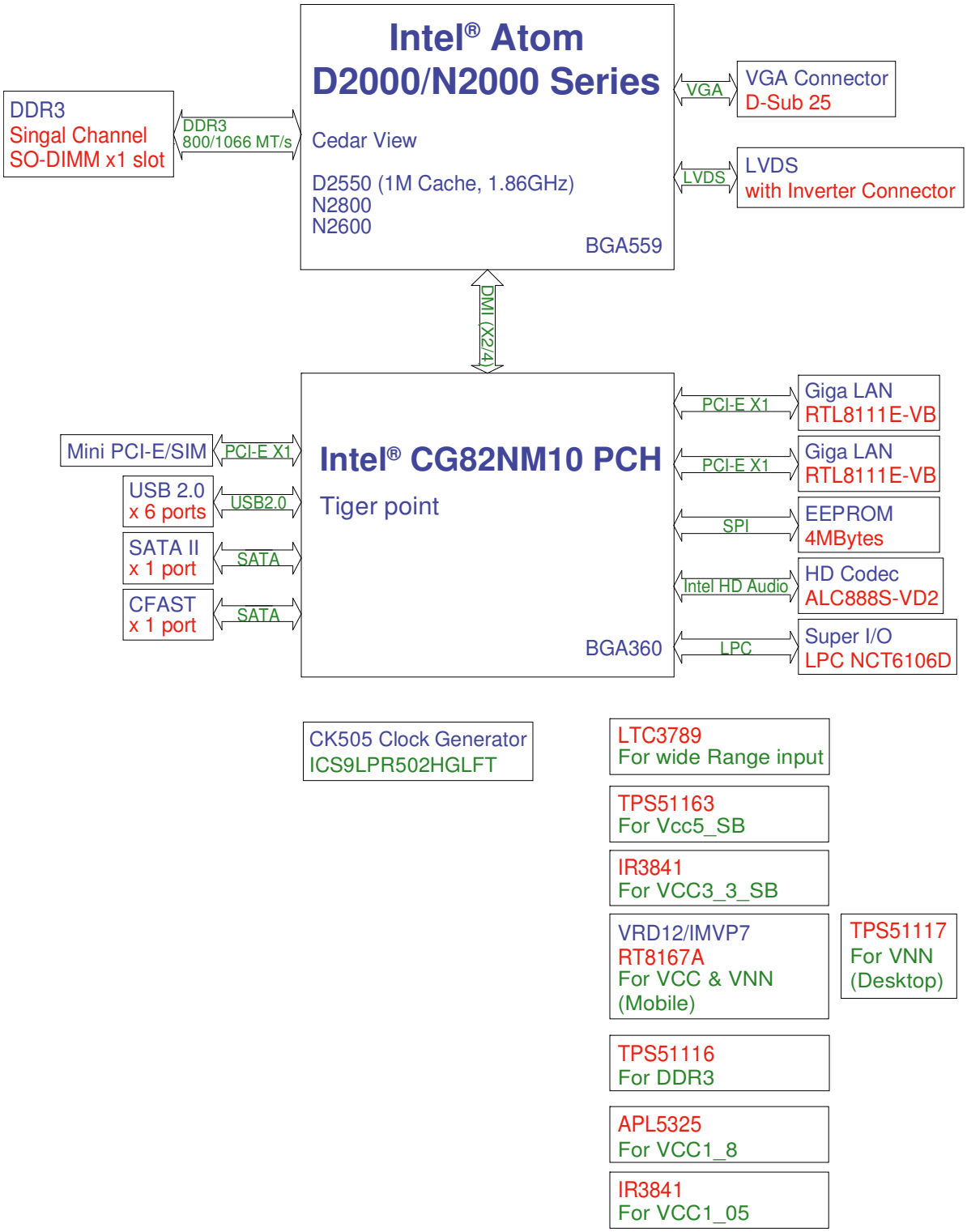
B

This section introduces you the maps concisely.

Section includes:

- Block Diagram
- Interrupt Map
- DMA Channels Map
- I/O Map
- Memory Map
- Watchdog Timer Configuration
- Flash BIOS Update

BLOCK DIAGRAM



INTERRUPT MAP

IRQ	ASSIGNMENT
0	System timer
3	Communications Port (COM2)
4	Communications Port (COM1)
6	Communications Port (COM3)
7	Communications Port (COM4)
8	System CMOS/real time clock
10	Intel® N10/ICH7 Family SMBus Controller - 27DA
13	Numeric data processor
16	Intel® N10/ICH7 Family USB Universal Host Controller - 27CB
16	Intel® N10/ICH7 Family PCI Express Root Port - 27D0
17	Intel® N10/ICH7 Family PCI Express Root Port - 27D2
18	Intel® N10/ICH7 Family USB Universal Host Controller - 27CA
19	Intel® N10/ICH7 Family USB Universal Host Controller - 27C9
19	Standard AHCI 1.0 Serial ATA Controller
22	High Definition Audio Controller
23	Intel® N10/ICH7 Family USB Universal Host Controller - 27C8
23	Intel® N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
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

IRQ	ASSIGNMENT
94	Microsoft ACPI-Compliant System
95	Microsoft ACPI-Compliant System
96	Microsoft ACPI-Compliant System
97	Microsoft ACPI-Compliant System
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
125	Microsoft ACPI-Compliant System

IRQ	ASSIGNMENT
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
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

IRQ	ASSIGNMENT
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
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

IRQ	ASSIGNMENT
190	Microsoft ACPI-Compliant System
4294967292	Realtek PCIe GBE Family Controller #2
4294967293	Realtek PCIe GBE Family Controller
4294967294	Intel® Graphics Media Accelerator 3600 Series

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

DMA CHANNELS MAP

TIMER CHANNEL	ASSIGNMENT
Channel 4	Direct memory access controller

I/O MAP

I/O MAP	ASSIGNMENT
0x00000000-0x0000001F	Direct memory access controller
0x00000000-0x0000001F	PCI bus
0x00000010-0x0000001F	Motherboard resources
0x00000020-0x00000021	Programmable interrupt controller
0x00000022-0x0000003F	Motherboard resources
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
0x00000044-0x0000005F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000061-0x00000061	Motherboard resources
0x00000062-0x00000063	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x0000006F	Motherboard resources
0x00000065-0x0000006F	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000077	System CMOS/real time clock
0x00000070-0x00000077	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000081-0x00000091	Direct memory access controller
0x00000084-0x00000086	Motherboard resources

I/O MAP	ASSIGNMENT
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x00000093-0x0000009F	Direct memory access controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A2-0x000000BF	Motherboard resources
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
0x000000C0-0x000000DF	Direct memory access controller
0x000000E0-0x000000EF	Motherboard resources
0x000000F0-0x000000F0	Numeric data processor
0x00000290-0x0000029F	Motherboard resources
0x000002A0-0x000002AF	Motherboard resources
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003B0-0x000003BB	Intel® Graphics Media Accelerator 3600 Series
0x000003C0-0x000003DF	Intel® Graphics Media Accelerator 3600 Series
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x000004D0-0x000004D1	Motherboard resources
0x00000500-0x0000057F	Motherboard resources
0x00000500-0x0000057F	Motherboard resources

I/O MAP	ASSIGNMENT
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x000006A0-0x000006AF	Motherboard resources
0x000006B0-0x000006EF	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x00001000-0x0000100F	Motherboard resources
0x0000D000-0x0000D0FF	Realtek PCIe GBE Family Controller #2
0x0000D000-0x0000D0FF	Intel® N10/ICH7 Family PCI Express Root Port - 27D2
0x0000E000-0x0000E0FF	Realtek PCIe GBE Family Controller
0x0000E000-0x0000E0FF	Intel® N10/ICH7 Family PCI Express Root Port - 27D0
0x0000F000-0x0000F01F	Intel® N10/ICH7 Family SMBus Controller - 27DA
0x0000F020-0x0000F02F	Standard AHCI 1.0 Serial ATA Controller
0x0000F040-0x0000F05F	Intel® N10/ICH7 Family USB Universal Host Controller - 27CB
0x0000F060-0x0000F07F	Intel® N10/ICH7 Family USB Universal Host Controller - 27CA
0x0000F080-0x0000F09F	Intel® N10/ICH7 Family USB Universal Host Controller - 27C9
0x0000F0A0-0x0000F0BF	Intel® N10/ICH7 Family USB Universal Host Controller - 27C8
0x0000F0C0-0x0000F0C3	Standard AHCI 1.0 Serial ATA Controller
0x0000F0D0-0x0000F0D7	Standard AHCI 1.0 Serial ATA Controller
0x0000F0E0-0x0000F0E3	Standard AHCI 1.0 Serial ATA Controller
0x0000F0F0-0x0000F0F7	Standard AHCI 1.0 Serial ATA Controller
0x0000F100-0x0000F107	Intel® Graphics Media Accelerator 3600 Series
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources

MEMORY MAP

MEMORY	ASSIGNMENT
0xFF000000-0xFFFFFFFF	Intel® 82802 Firmware Hub Device
0xFF000000-0xFFFFFFFF	Intel® 82802 Firmware Hub Device
0xDFE04000-0xDFE04FFF	Realtek PCIe GBE Family Controller
0xDFE00000-0xDFE03FFF	Realtek PCIe GBE Family Controller
0xDFE00000-0xDFE03FFF	Intel® N10/ICH7 Family PCI Express Root Port - 27D0
0xFED00000-0xFED003FF	High precision event timer
0xDFD04000-0xDFD04FFF	Realtek PCIe GBE Family Controller #2
0xDFD00000-0xDFD03FFF	Realtek PCIe GBE Family Controller #2
0xDFD00000-0xDFD03FFF	Intel® N10/ICH7 Family PCI Express Root Port - 27D2
0xDFC00000-0xDFCFFFFF	Intel® Graphics Media Accelerator 3600 Series
0x80000000-0xFEBFFFFF	PCI bus
0xDFF05000-0xDFF053FF	Intel® N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
0xFED14000-0xFED19FFF	System board
0xE0000000-0xEFFFFFFF	System board
0xFED1C000-0xFED1FFFF	Motherboard resources
0xFED1C000-0xFED1FFFF	Motherboard resources
0x0000-0x3FFF	Motherboard resources
0x0000-0x3FFF	Motherboard resources
0x0000-0x3FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEC00000-0xFEC00FFF	Motherboard resources
0xFEE00000-0xFEE00FFF	Motherboard resources
0xFED20000-0xFED8FFFF	Motherboard resources
0xFFC00000-0xFFFFFFFF	Motherboard resources
0xDFF04000-0xDFF043FF	Standard AHCI 1.0 Serial ATA Controller
0xDFF00000-0xDFF03FFF	High Definition Audio Controller
0xA0000-0xBFFFF	Intel® Graphics Media Accelerator 3600 Series

MEMORY	ASSIGNMENT
0xA0000-0xBFFFF	PCI bus
0xC0000-0xDFFFF	PCI bus
0xE0000-0xEFFFF	PCI bus
0xF0000-0xFFFFF	PCI bus
0x7F800000-0x7FFFFFFF	PCI bus

WATCHDOG TIMER CONFIGURATION

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. User 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 NCT6106D 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 watchdog timer and set timeout interval to 30 seconds.

```
;------ 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 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. Before system BIOS update

1. Prepare a bootable media (ex. USB storage device) which can boot system to DOS prompt.
2. Download and save the BIOS file (ex. 81220P01.rom) to the bootable device.
3. Copy AMI flash utility – AFUDOS.exe (v3.04) into bootable device.

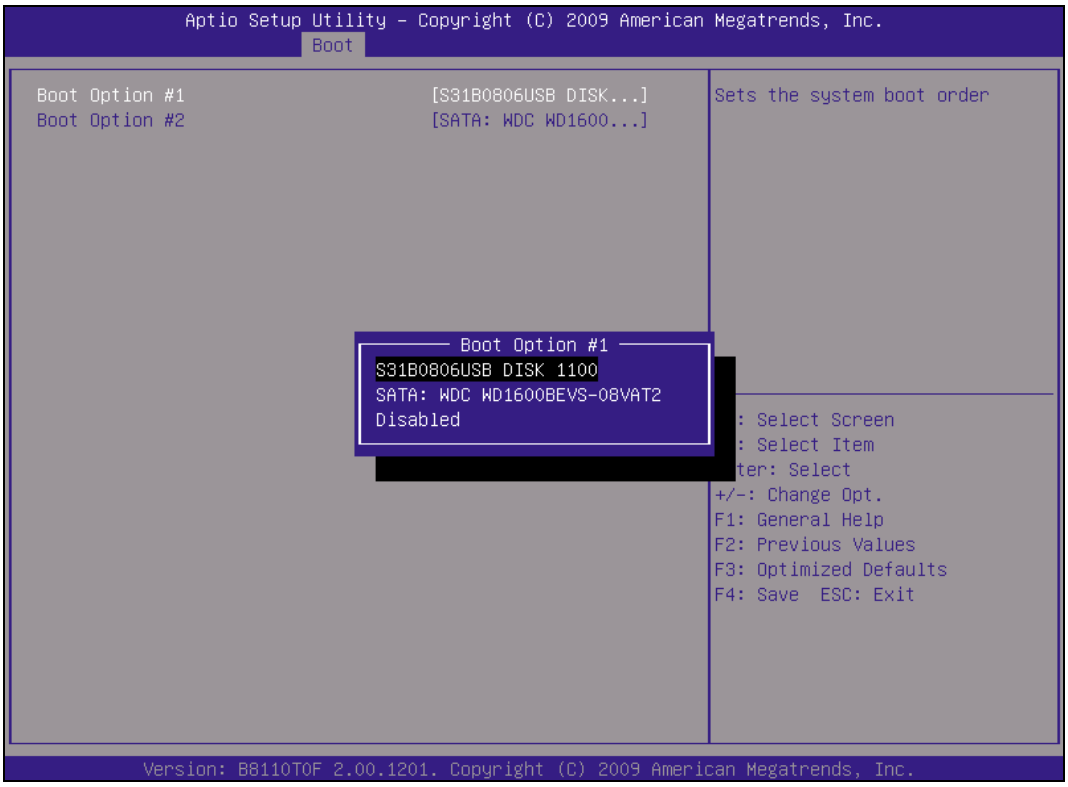
```
C:\AFUDOS>dir

 Volume in drive C has no label
 Volume serial Number is 0846-7844
 Directory of C:\AFUDOS

.              <DIR>        03-01-13  2:56p
..             <DIR>        03-01-13  2:56p
AFUDOS   EXE       167,152  11-12-12  3:12p
AFUDOS   TXT        11,357  11-16-12  1:49p
README   TXT         4,338  10-09-12  2:17p
AMI_AP~1 PDF       244,262  11-15-12  1:49p
81220P01 TXT     4,194,304  03-11-13  9:20a
         5 file(s)      4,621,413 bytes
         2 dir(s)   4,000,256,000 bytes free

C:\AFUDOS>
```

4. Make sure the target system can first boot to the bootable device.
   a. Connect the bootable USB device.
   b. Turn on the computer and press <ESC> or <Del> key during boot to enter BIOS Setup.
   c. System will go into the BIOS setup menu.
   d. Select [Boot] menu.
   e. Select [Hard Drive BBS Priorities], set the USB bootable device to be the 1st boot device.
   f. Press <F4> key to save configuration and exit the BIOS setup menu.


Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
Boot
Boot Option #1 [S31B0806USB DISK...]
Boot Option #2 [SATA: WDC WD1600...]
Sets the system boot order
Boot Option #1
S31B0806USB DISK 1100
SATA: WDC WD1600BEVS-08VAT2
Disabled
: Select Screen
: Select Item
ter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
Version: B8110T0F 2.00.1201. Copyright (C) 2009 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]….

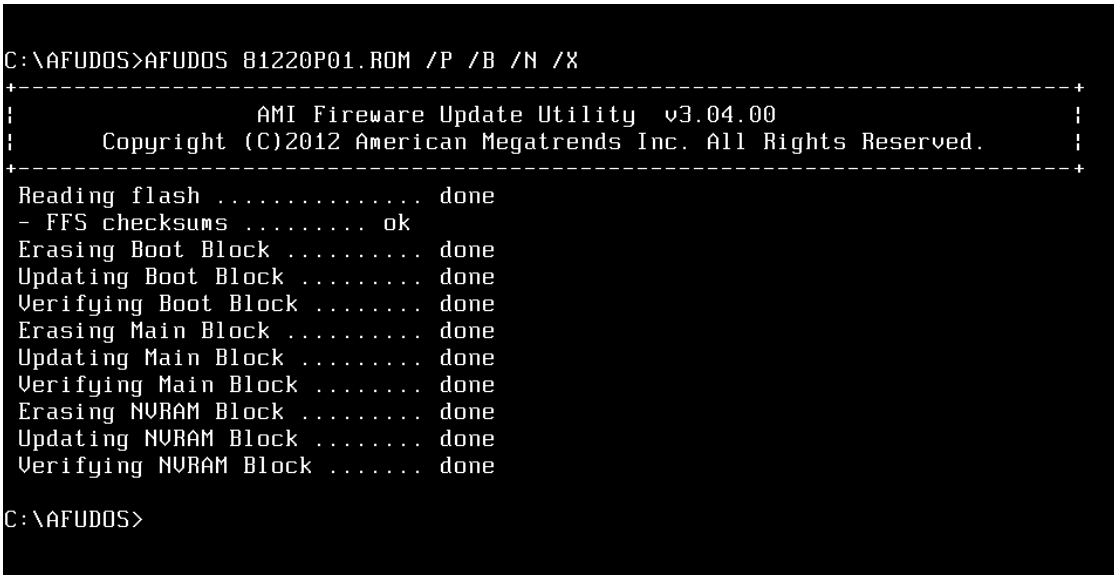
You can type "AFUDOS/ ?" to see all the definition of each control options. The recommended options for BIOS ROM update include following parameters:

/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 system into the DOS command prompt.
2. Type "**AFUDOS 8122xxxx.rom /p /b /n /x"** and press enter to start the flash procedure.

   (Note that xxxx means the BIOS revision part, ex. 0P01…)
3. During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and make system unable to boot up next time.
4. After BIOS update procedures is complete, the messages should be like the figure shown below.



5. User can restart the system and boot up with new BIOS now.
6. Update is complete after restart.
7. Verify during following boot that the BIOS version displayed at initialization screen has changed.
   a. Turn on the computer and press <Esc> or <Del> key during boot to enter BIOS Setup.
   b. System will go into the BIOS setup menu.
   c. Select [Main] menu.
   d. Check the project version.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.3
Compliancy UEFI 2.3; PI 1.2
Project Version 81220P01
Build Date and Time 03/11/2013 09:14:47
System Language [English]
System Date [Mon 03/11/2013]
System Time [10:19:36]
Access Level Administrator
Choose the system default language
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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