



IEI Technology Corp.



MODEL:
WAFER-NM701-1007U

3.5" SBC with Intel® Mobile Celeron® 1007U CPU and Intel® NM70 Chipset, DDR3, VGA, LVDS, Dual PCIe GbE, USB 2.0, mSATA, SATA 3Gb/s, Audio and RoHS

User Manual

Rev. 1.01 – 14 May, 2013



Revision

Date	Version	Changes
14 May, 2013	1.01	Changed the model name from WAFER-NM701-847 to WAFER-NM701-1007U Updated the CPU spec
2 April, 2013	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Table of Contents

1 INTRODUCTION.....	1
1.1 INTRODUCTION.....	2
1.2 FEATURES.....	2
1.3 CONNECTORS	3
1.4 DIMENSIONS.....	4
1.5 DATA FLOW	5
1.6 TECHNICAL SPECIFICATIONS	6
2 PACKING LIST.....	8
2.1 ANTI-STATIC PRECAUTIONS	9
2.2 UNPACKING PRECAUTIONS.....	9
2.3 PACKING LIST.....	10
2.4 OPTIONAL ITEMS	11
3 CONNECTORS	12
3.1 PERIPHERAL INTERFACE CONNECTORS.....	13
3.1.1 WAFER-NM701-1007U Layout.....	13
3.1.2 Peripheral Interface Connectors	14
3.1.3 External Interface Panel Connectors.....	15
3.2 INTERNAL PERIPHERAL CONNECTORS	15
3.2.1 5 V SATA Power Connectors.....	15
3.2.2 12 V Power Connector.....	16
3.2.3 Audio Connector	16
3.2.4 Backlight Inverter Connector	17
3.2.5 Battery Connector.....	18
3.2.6 Digital Input/Output (DIO) Connector.....	19
3.2.7 Fan Connector (CPU).....	20
3.2.8 Fan Connector (System)	21
3.2.9 Keyboard/Mouse Connector	21
3.2.10 LVDS Connector	22
3.2.11 PCIe Mini Card Slot.....	24

WAFER-NM701-1007U 3.5" Motherboard

3.2.12 Power & HDD LED Connector.....	25
3.2.13 Power Button Connector.....	26
3.2.14 Reset Button Connector	27
3.2.15 RS-232 Serial Port Connectors.....	28
3.2.16 RS-422/485 Serial Port Connector	29
3.2.17 SATA 3Gb/s Drive Connectors.....	30
3.2.18 SMBus Connector	31
3.2.19 SO-DIMM Connector.....	32
3.2.20 SPI Flash Connector.....	33
3.2.21 USB Connectors.....	33
3.3 EXTERNAL PERIPHERAL INTERFACE CONNECTOR PANEL	34
3.3.1 Ethernet Connectors	35
3.3.2 RS-232 Serial Port Connector (COM1).....	36
3.3.3 USB Connectors.....	36
3.3.4 VGA Connector	37
4 INSTALLATION	38
4.1 ANTI-STATIC PRECAUTIONS	39
4.2 INSTALLATION CONSIDERATIONS.....	39
4.3 SO-DIMM INSTALLATION	41
4.4 JUMPER SETTINGS	42
4.4.1 AT/ATX Power Selection Jumper.....	43
4.4.2 Clear CMOS Jumper.....	43
4.4.3 Clear ME RTC Registers Jumper	44
4.4.4 Flash Descriptor Security Override Jumper.....	45
4.4.5 LVDS Panel Resolution Selection Jumper	45
4.4.6 LVDS Voltage Selection.....	47
4.4.7 mSATA Detecting Mode Selection Jumper.....	48
4.5 CHASSIS INSTALLATION.....	48
4.5.1 Airflow.....	48
4.5.2 Motherboard Installation.....	49
4.6 INTERNAL PERIPHERAL DEVICE CONNECTIONS.....	49
4.6.1 AT/ATX Power Connection	49
4.6.2 Audio Kit Installation.....	51
4.6.3 LVDS LCD Installation.....	52

4.6.4 Full-size PCIe Mini Card Installation	54
4.6.5 Half-size PCIe Mini Card Installation.....	56
4.6.6 SATA Drive Connection	57
4.6.7 Single RS-232 Cable	58
4.6.8 Keyboard/Mouse Y-cable Connector	59
4.7 EXTERNAL PERIPHERAL INTERFACE CONNECTION	61
4.7.1 LAN Connection.....	61
4.7.2 Serial Device Connection	62
4.7.3 USB Connection (Dual Connector).....	62
4.7.4 VGA Monitor Connection	63
4.8 HEAT SINK ENCLOSURE.....	64
5 BIOS.....	66
5.1 INTRODUCTION.....	67
5.1.1 Starting Setup.....	67
5.1.2 Using Setup	67
5.1.3 Getting Help.....	68
5.1.4 Unable to Reboot after Configuration Changes	68
5.1.5 BIOS Menu Bar.....	68
5.2 MAIN.....	69
5.3 ADVANCED	70
5.3.1 ACPI Settings	71
5.3.2 RTC Wake Settings	72
5.3.3 CPU Configuration.....	74
5.3.4 SATA Configuration	75
5.3.5 USB Configuration.....	76
5.3.6 F81867 Super IO Configuration.....	77
5.3.6.1 Serial Port n Configuration	78
5.3.7 F81867 H/W Monitor.....	83
5.3.7.1 Smart Fan Mode Configuration	84
5.3.8 Serial Port Console Redirection	85
5.3.9 iEi Feature	88
5.3.10 ICP Board	89
5.4 CHIPSET	90
5.4.1 PCH-IO Configuration	90

WAFER-NM701-1007U 3.5" Motherboard

5.4.2 <i>System Agent (SA) Configuration</i>	92
5.4.2.1 Graphics Configuration.....	92
5.4.2.2 Memory Configuration	95
5.5 BOOT.....	96
5.6 SECURITY.....	98
5.7 EXIT	98
6 SOFTWARE DRIVERS	100
6.1 AVAILABLE SOFTWARE DRIVERS	101
6.2 STARTING THE DRIVER PROGRAM	101
6.3 CHIPSET DRIVER INSTALLATION.....	103
6.4 GRAPHICS DRIVER INSTALLATION.....	106
6.5 LAN DRIVER INSTALLATION	110
6.6 AUDIO DRIVER INSTALLATION	112
A BIOS OPTIONS	115
B ONE KEY RECOVERY	118
B.1 ONE KEY RECOVERY INTRODUCTION	119
<i>B.1.1 System Requirement</i>	120
<i>B.1.2 Supported Operating System</i>	121
B.2 SETUP PROCEDURE FOR WINDOWS	122
<i>B.2.1 Hardware and BIOS Setup</i>	123
<i>B.2.2 Create Partitions</i>	123
<i>B.2.3 Install Operating System, Drivers and Applications</i>	127
<i>B.2.4 Build-up Recovery Partition</i>	128
<i>B.2.5 Create Factory Default Image</i>	130
B.3 AUTO RECOVERY SETUP PROCEDURE	135
B.4 SETUP PROCEDURE FOR LINUX	140
B.5 RECOVERY TOOL FUNCTIONS	143
<i>B.5.1 Factory Restore</i>	145
<i>B.5.2 Backup System</i>	146
<i>B.5.3 Restore Your Last Backup</i>	147
<i>B.5.4 Manual</i>	148
B.6 RESTORE SYSTEMS FROM A LINUX SERVER THROUGH LAN	149
<i>B.6.1 Configure DHCP Server Settings</i>	150

<i>B.6.2 Configure TFTP Settings</i>	151
<i>B.6.3 Configure One Key Recovery Server Settings</i>	152
<i>B.6.4 Start the DHCP, TFTP and HTTP</i>	153
<i>B.6.5 Create Shared Directory</i>	153
<i>B.6.6 Setup a Client System for Auto Recovery</i>	154
B.7 OTHER INFORMATION	157
<i>B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller</i>	157
<i>B.7.2 System Memory Requirement</i>	159
C TERMINOLOGY	160
D DIGITAL I/O INTERFACE	164
D.1 INTRODUCTION.....	165
D.2 DIO CONNECTOR PINOUTS	165
D.3 ASSEMBLY LANGUAGE SAMPLES.....	166
<i>D.3.1 Enable the DIO Input Function</i>	166
<i>D.3.2 Enable the DIO Output Function</i>	166
E WATCHDOG TIMER	167
F HAZARDOUS MATERIALS DISCLOSURE	170
F.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY	171

List of Figures

Figure 1-1: WAFER-NM701-1007U	2
Figure 1-2: Connectors	3
Figure 1-3: WAFER-NM701-1007U Dimensions (mm).....	4
Figure 1-4: Data Flow Diagram.....	5
Figure 3-1: Connectors and Jumpers.....	13
Figure 3-2: 5 V SATA Power Connector Locations	15
Figure 3-3: 12 V Power Connector Location.....	16
Figure 3-4: Audio Connector Location	17
Figure 3-5: Backlight Inverter Connector Location.....	18
Figure 3-6: Battery Connector Location.....	19
Figure 3-7: Digital I/O Connector Location	19
Figure 3-8: CPU Fan Connector Location	20
Figure 3-9: System Fan Connector Location.....	21
Figure 3-10: Keyboard/Mouse Connector Location	22
Figure 3-11: LVDS Connector Location.....	23
Figure 3-12: PCIe Mini Card Slot Location.....	24
Figure 3-13: Power & HDD LED Connector Location.....	26
Figure 3-14: Power Button Connector Location.....	27
Figure 3-15: Reset Button Connector Location.....	28
Figure 3-16: RS-232 Serial Port Connector Locations.....	29
Figure 3-17: RS-422/485 Connector Location.....	30
Figure 3-18: SATA Drive Connector Locations	31
Figure 3-19: SMBus Connector Location	32
Figure 3-20: SO-DIMM Connector Location	32
Figure 3-21: SPI Flash Connector Location.....	33
Figure 3-22: USB Connector Locations.....	34
Figure 3-23: External Peripheral Interface Connector	34
Figure 3-24: RJ-45 Ethernet Connector.....	35
Figure 3-25: COM1 Pinout Locations.....	36
Figure 3-26: VGA Connector	37

Figure 4-1: SO-DIMM Installation	41
Figure 4-2: AT/ATX Power Selection Jumper Location	43
Figure 4-3: Clear CMOS Jumper Location	44
Figure 4-4: Clear ME RTC Registers Jumper Location.....	44
Figure 4-5: Flash Descriptor Security Override Jumper Location	45
Figure 4-6: LVDS Panel Resolution Selection Jumper Location	46
Figure 4-7: LVDS Voltage Selection Jumper Location	47
Figure 4-8: mSATA Detecting Mode Selection Jumper Location	48
Figure 4-9: Power Cable to Motherboard Connection	50
Figure 4-10: Connect Power Cable to Power Supply.....	51
Figure 4-11: Audio Kit Cable Connection	52
Figure 4-12: LVDS Connector.....	53
Figure 4-13: Backlight Inverter Connection.....	54
Figure 4-14: Remove the Retention Screws for the Full-size PCIe Mini Card.....	55
Figure 4-15: Insert the Full-size PCIe Mini Card into the Socket at an Angle.....	55
Figure 4-16: Secure the Full-size PCIe Mini Card.....	56
Figure 4-17: Install the Supplied Plastic Shafts	56
Figure 4-18: Insert the Half-size PCIe Mini Card into the Socket at an Angle	57
Figure 4-19: Secure the Half-size PCIe Mini Card	57
Figure 4-20: SATA Drive Cable Connection.....	58
Figure 4-21: Single RS-232 Cable Installation	59
Figure 4-22: Keyboard/mouse Y-cable Connection	60
Figure 4-23: LAN Connection	61
Figure 4-24: Serial Device Connector.....	62
Figure 4-25: USB Connector.....	63
Figure 4-26: VGA Connector	64
Figure 4-27: Heat Sink Enclosure Retention Screws.....	65
Figure 6-1: Start Up Screen	102
Figure 6-2: Drivers	102
Figure 6-3: Chipset Driver Welcome Screen.....	103
Figure 6-4: Chipset Driver License Agreement	104
Figure 6-5: Chipset Driver Read Me File	104
Figure 6-6: Chipset Driver Setup Operations	105
Figure 6-7: Chipset Driver Installation Finish Screen.....	106
Figure 6-8: Graphics Driver Welcome Screen	107

WAFER-NM701-1007U 3.5" Motherboard

Figure 6-9: Graphics Driver License Agreement.....	107
Figure 6-10: Graphics Driver Read Me File	108
Figure 6-11: Graphics Driver Setup Operations	109
Figure 6-12: Graphics Driver Installation Finish Screen	110
Figure 6-13: LAN Driver Welcome Screen	111
Figure 6-14: LAN Driver Installation	111
Figure 6-15: LAN Driver Installation Complete.....	112
Figure 6-16: Audio Driver Welcome Screen.....	113
Figure 6-17: Audio Driver Installation.....	113
Figure 6-18: Audio Driver Installation Complete	114
Figure B-1: IEI One Key Recovery Tool Menu	119
Figure B-2: Launching the Recovery Tool	124
Figure B-3: Recovery Tool Setup Menu	124
Figure B-4: Command Prompt	125
Figure B-5: Partition Creation Commands.....	126
Figure B-6: Launching the Recovery Tool	128
Figure B-7: Manual Recovery Environment for Windows	128
Figure B-8: Building the Recovery Partition.....	129
Figure B-9: Press Any Key to Continue	129
Figure B-10: Press F3 to Boot into Recovery Mode.....	130
Figure B-11: Recovery Tool Menu	130
Figure B-12: About Symantec Ghost Window.....	131
Figure B-13: Symantec Ghost Path	131
Figure B-14: Select a Local Source Drive	132
Figure B-15: Select a Source Partition from Basic Drive	132
Figure B-16: File Name to Copy Image to	133
Figure B-17: Compress Image.....	133
Figure B-18: Image Creation Confirmation	134
Figure B-19: Image Creation Complete	134
Figure B-20: Image Creation Complete	134
Figure B-21: Press Any Key to Continue	135
Figure B-22: Auto Recovery Utility	136
Figure B-23: Disable Automatically Restart.....	136
Figure B-24: Launching the Recovery Tool	137
Figure B-25: Auto Recovery Environment for Windows	137



Figure B-26: Building the Auto Recovery Partition..... 138

Figure B-27: Factory Default Image Confirmation 138

Figure B-28: Image Creation Complete 139

Figure B-29: Press any key to continue 139

Figure B-30: IEI Feature 140

Figure B-31: Partitions for Linux..... 141

Figure B-32: System Configuration for Linux..... 142

Figure B-33: Access menu.lst in Linux (Text Mode)..... 142

Figure B-34: Recovery Tool Menu 143

Figure B-35: Recovery Tool Main Menu 144

Figure B-36: Restore Factory Default..... 145

Figure B-37: Recovery Complete Window 145

Figure B-38: Backup System..... 146

Figure B-39: System Backup Complete Window 146

Figure B-40: Restore Backup 147

Figure B-41: Restore System Backup Complete Window 147

Figure B-42: Symantec Ghost Window 148

Figure B-43: Disable Automatically Restart..... 155

List of Tables

Table 1-1: WAFER-NM701-1007U Specifications	7
Table 2-1: Packing List.....	11
Table 2-2: Optional Items.....	11
Table 3-1: Peripheral Interface Connectors	14
Table 3-2: Rear Panel Connectors	15
Table 3-3: 5 V SATA Power Connector Pinouts	16
Table 3-4: 12 V Power Connector Pinouts	16
Table 3-5: Audio Connector Pinouts	17
Table 3-6: Backlight Inverter Connector Pinouts	18
Table 3-7: Battery Connector Pinouts	19
Table 3-8: Digital I/O Connector Pinouts.....	20
Table 3-9: CPU Fan Connector Pinouts.....	20
Table 3-10: System Fan Connector Pinouts	21
Table 3-11: Keyboard/Mouse Connector Pinouts	22
Table 3-12: LVDS1 Connector Pinouts.....	23
Table 3-13: PCIe Mini Card Slot Pinouts	25
Table 3-14: Power & HDD LED Connector Pinouts	26
Table 3-15: Power Button Connector Pinouts	27
Table 3-16: Reset Button Connector Pinouts	28
Table 3-17: RS-232 Serial Port Connector Pinouts	29
Table 3-18: RS-422/485 Connector Pinouts	30
Table 3-19: DB-9 RS-422/485 Pinouts.....	30
Table 3-20: SATA Drive Connector Pinouts.....	31
Table 3-21: SMBus Connector Pinouts	32
Table 3-22: SPI Flash Connector Pinouts	33
Table 3-23: USB Connector Pinouts.....	34
Table 3-24: LAN Pinouts	35
Table 3-25: RJ-45 Ethernet Connector LEDs	35
Table 3-26: RS-232 Serial Port (COM 1) Pinouts	36
Table 3-27: USB Port Pinouts.....	37



Table 3-28: VGA Connector Pinouts.....	37
Table 4-1: Jumpers	42
Table 4-2: AT/ATX Power Selection Jumper Settings.....	43
Table 4-3: Clear CMOS Jumper Settings.....	44
Table 4-4: Clear ME RTC Registers Jumper Settings	44
Table 4-5: Flash Descriptor Security Override Jumper Settings.....	45
Table 4-6: LVDS Panel Resolution	46
Table 4-7: LVDS Voltage Selection Jumper Settings.....	47
Table 4-8: mSATA Detecting Mode Selection Jumper Settings	48
Table 5-1: BIOS Navigation Keys	68

BIOS Menus

BIOS Menu 1: Main	69
BIOS Menu 2: Advanced	71
BIOS Menu 3: ACPI Settings	71
BIOS Menu 4: RTC Wake Settings	72
BIOS Menu 5: CPU Configuration	74
BIOS Menu 6: SATA Configuration	75
BIOS Menu 7: USB Configuration	76
BIOS Menu 8: F81867 Super IO Configuration	77
BIOS Menu 9: Serial Port n Configuration Menu	78
BIOS Menu 10: F81867 H/W Monitor	83
BIOS Menu 11: Smart Fan Mode Configuration	85
BIOS Menu 12: Serial Port Console Redirection	86
BIOS Menu 13: iEi Feature	88
BIOS Menu 14: ICP Board	89
BIOS Menu 15: Chipset	90
BIOS Menu 16: PCH-IO Configuration	91
BIOS Menu 17: System Agent (SA) Configuration	92
BIOS Menu 18: Graphics Configuration	93
BIOS Menu 19: Memory Configuration	95
BIOS Menu 20: Boot	96
BIOS Menu 21: Security	98
BIOS Menu 22: Exit	99

Chapter

1

Introduction

1.1 Introduction

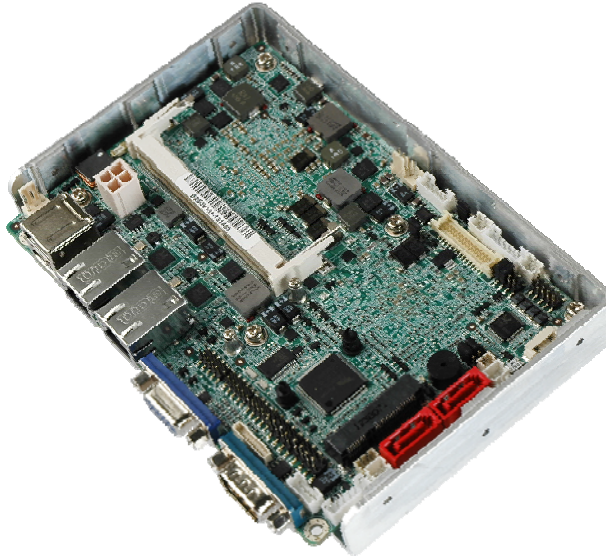


Figure 1-1: WAFER-NM701-1007U

The WAFER-NM701-1007U is a 3.5" SBC with an Intel® mobile Celeron® 1007U processor and Intel® NM70 Express Chipset. It supports one 1333 MHz or 1066 MHz DDR3 SO-DIMM memory and dual display output, including one VGA and one LVDS. With the heat sink enclosure design, the WAFER-NM701-1007U is ideal for easy fanless assembly solution.

The WAFER-NM701-1007U provides one PCIe Mini card slot which is compatible with mSATA SSD storage. Other expansion options include two SATA 3Gb/s connectors, four serial ports, six USB 2.0 ports and one audio connector.

1.2 Features

Some of the WAFER-NM701-1007U motherboard features are listed below:

- 3.5" form factor
- On-board Intel® mobile Celeron® 1007U processor (dual-core, 1.5 GHz)
- Intel® NM70 Express Chipset
- Supports one 1333/1066 MHz DDR3 SO-DIMM (up to 8 GB)
- VGA and LVDS interfaces for dual display
- PCIe Mini card slot with mSATA support

WAFER-NM701-1007U 3.5" Motherboard

- Dual GbE
- Complete I/O with two SATA 3Gb/s, four COM, six USB 2.0 and audio
- RoHS compliant

1.3 Connectors

The connectors on the WAFER-NM701-1007U are shown in the figure below.

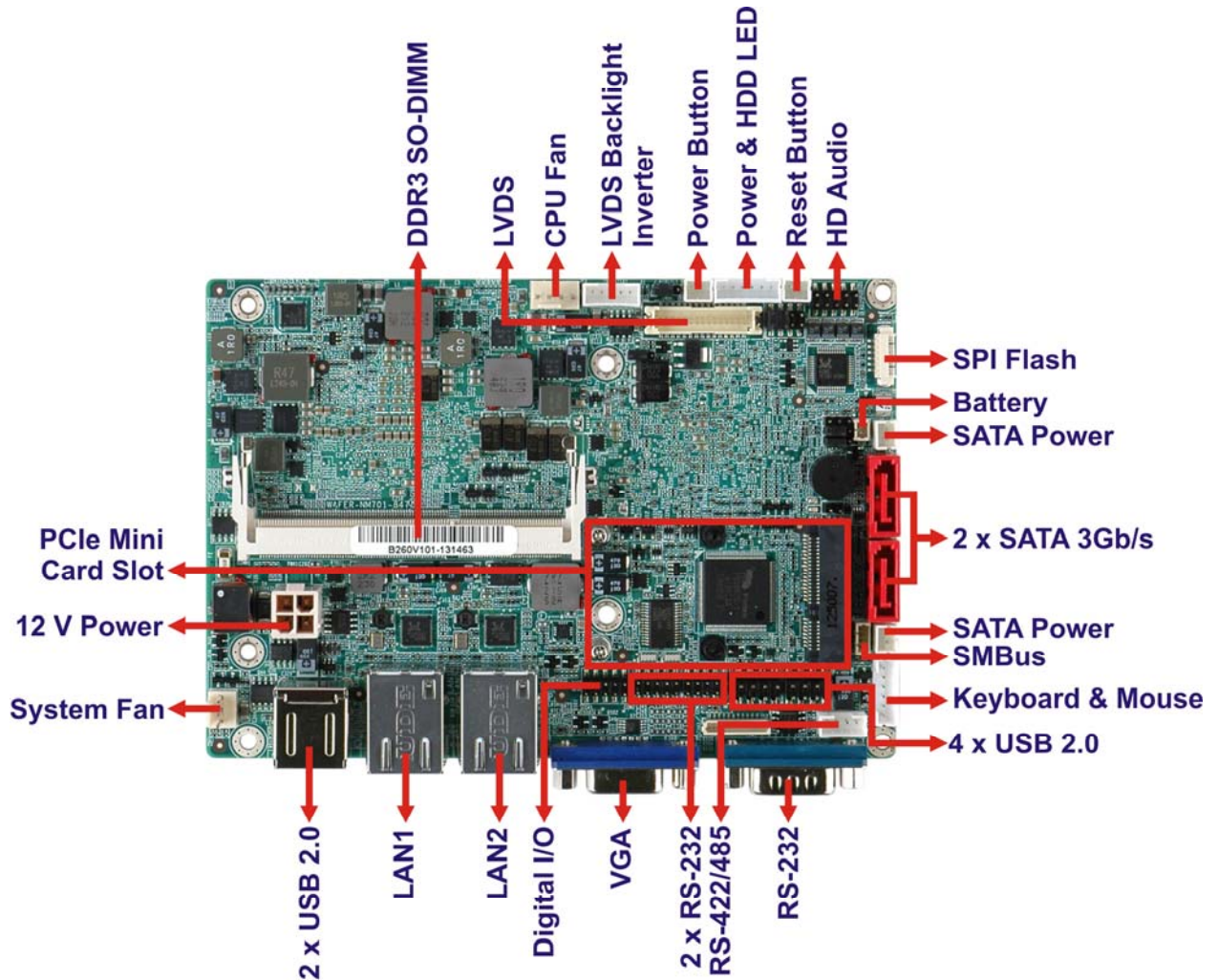


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the WAFER-NM701-1007U are shown in the diagram below.

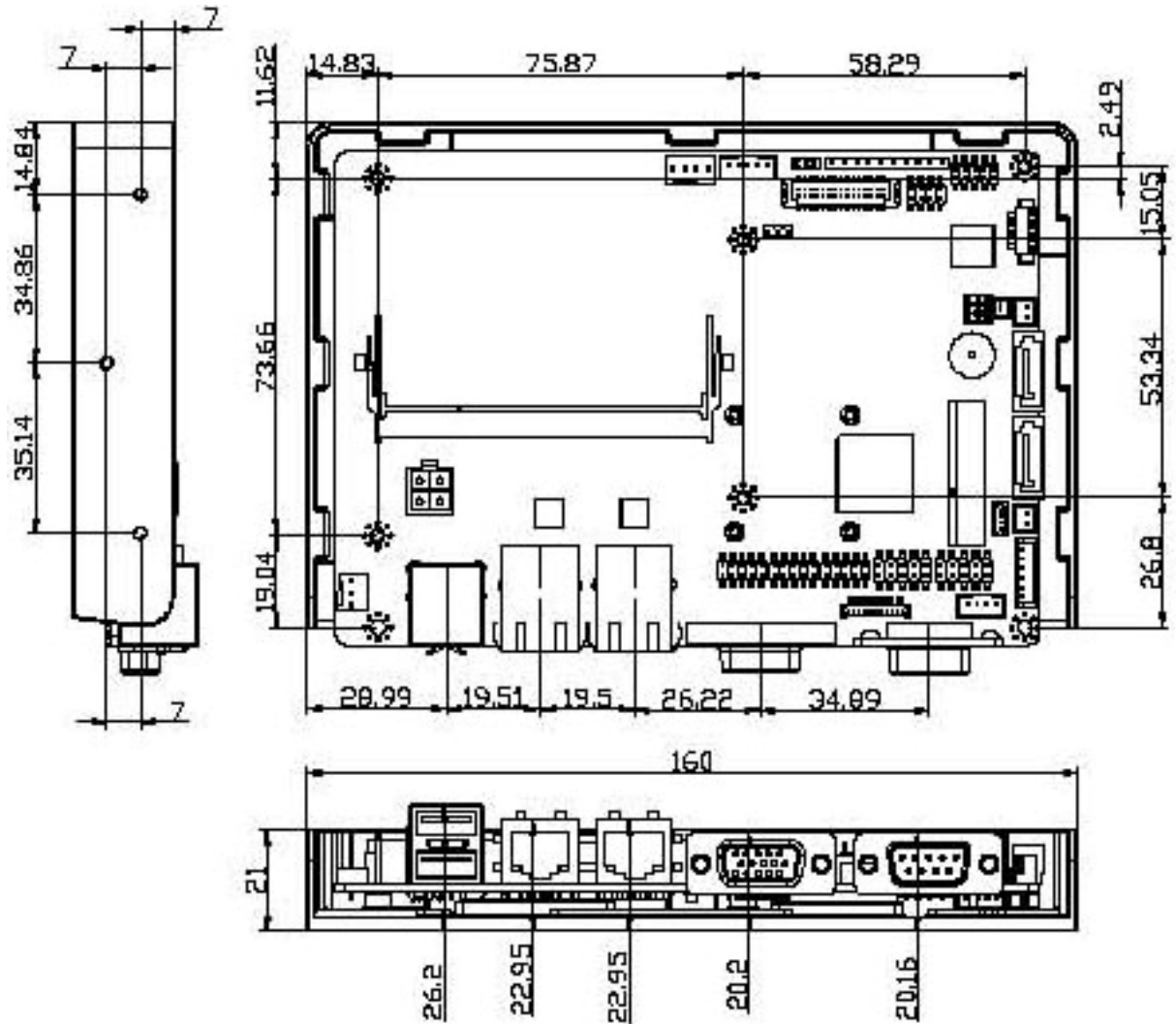


Figure 1-3: WAFER-NM701-1007U Dimensions (mm)

WAFER-NM701-1007U 3.5" Motherboard

1.5 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

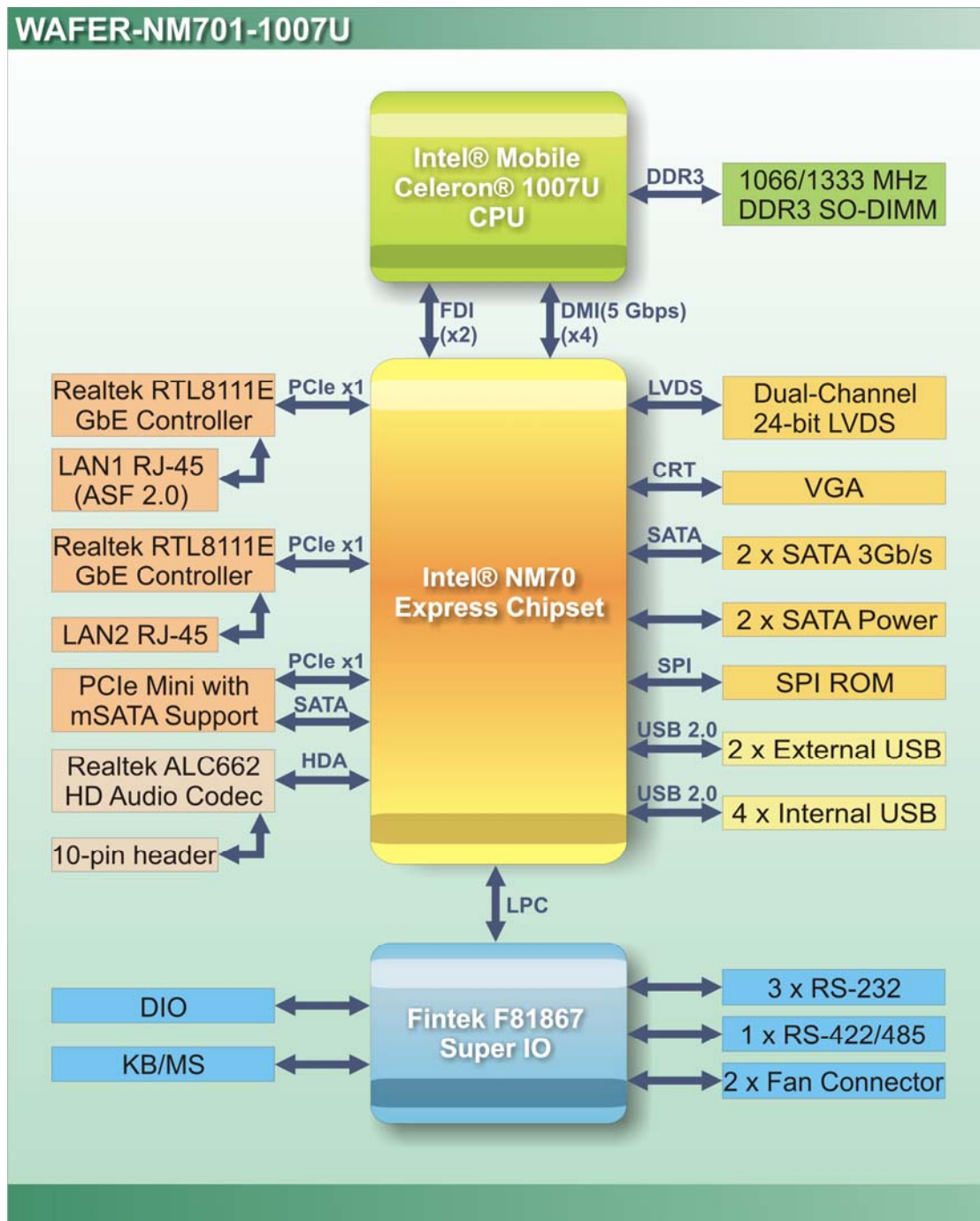


Figure 1-4: Data Flow Diagram

1.6 Technical Specifications

The WAFER-NM701-1007U technical specifications are listed below.

Specification/Model	WAFER-NM701-1007U
Form Factor	3.5"
System CPU	1.5 GHz Intel® mobile Celeron® 1007U dual-core CPU
Express Chipset	Intel® NM70
Memory	One 204-pin 1333/1066 MHz DDR3 SO-DIMM support (up to 8 GB)
Graphics Engine	Intel® HD Graphics Gen 6 with DirectX 10.1 and OpenGL 3.0 support Full MPEG-2, VC1, AVC decoding
Display	Dual display output support VGA is integrated in the Intel® NM70 Express Chipset (2048x1536@75MHz) 24-bit dual-channel LVDS is integrated in the Intel® NM70 Express Chipset (1920x1600@60MHz)
Ethernet	Dual Realtek RTL8111E PCIe GbE controller (LAN1 with ASF 2.0 support)
BIOS	UEFI BIOS
Super I/O Controller	Fintek F81867
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansions	One full-size/half-size PCIe Mini card slot with mSATA support
Audio	Realtek ALC662 HD Audio codec One 10-pin header
COM	Three RS-232 (one by external connector; two by on-board pin headers) One RS-422/485 by internal 4-pin wafer connector
Digital I/O	One 8-bit digital input/output connector (4-bit input/4-bit output)
Fan	One 4-pin CPU fan connector One 3-pin system fan connector
Keyboard/Mouse	One internal 6-pin wafer connector
SATA	Two SATA 3Gb/s ports with 5 V power

WAFER-NM701-1007U 3.5" Motherboard

Specification/Model	WAFER-NM701-1007U
SMBus	One 4-pin wafer connector
USB	Six USB 2.0/1.1 devices supported: Two by external connectors Four by on-board pin headers
Power Supply	12 V only AT and ATX support One internal 4-pin (2x2) power connector
Power Consumption	12V @ 2.72A (1.5 GHz Intel® mobile Celeron® 1007U CPU with 8 GB 1333 MHz DDR3 SO-DIMM memory)
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 85°C
Humidity (Operating)	5% ~ 95% (non-condensing)
Dimensions (LxW)	146 mm x 102 mm
Weight (GW/NW)	600 g/250 g

Table 1-1: WAFER-NM701-1007U Specifications



Chapter

2

Packing List

WAFER-NM701-1007U 3.5" Motherboard

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the WAFER-NM701-1007U is unpacked, please do the following:







- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List


NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the WAFER-NM701-1007U was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The WAFER-NM701-1007U is shipped with the following components:

Quantity	Item and Part Number	Image
1	WAFER-NM701-1007U motherboard with heat sink enclosure	
2	SATA and power cable (P/N: 32801-000201-100-RS)	
2	Plastic shaft for securing a half-size PCIe Mini card (P/N: 43124-0010C2-01-RS)	
1	Audio cable (P/N: 32000-072100-RS)	
1	RS-232 cable (P/N: 32200-000049-RS)	
1	PS/2 KB/MS Y-cable (P/N: 32000-023800-RS)	

WAFER-NM701-1007U 3.5" Motherboard






Quantity	Item and Part Number	Image
1	Power cable (P/N: 32100-087100-RS)	
1	Mini jumper pack	
1	One Key Recovery CD	
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:




Item and Part Number	Image
Dual-port USB cable (P/N: 32001-002700-200-RS)	
RS-232 cable (P/N: 32200-000049-RS)	
RS-422/485 cable (200 mm) (P/N: 32205-003800-100-RS)	

Table 2-2: Optional Items



Chapter

3

Connectors

WAFER-NM701-1007U 3.5" Motherboard

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 WAFER-NM701-1007U Layout

The figure below shows all the connectors and jumpers.

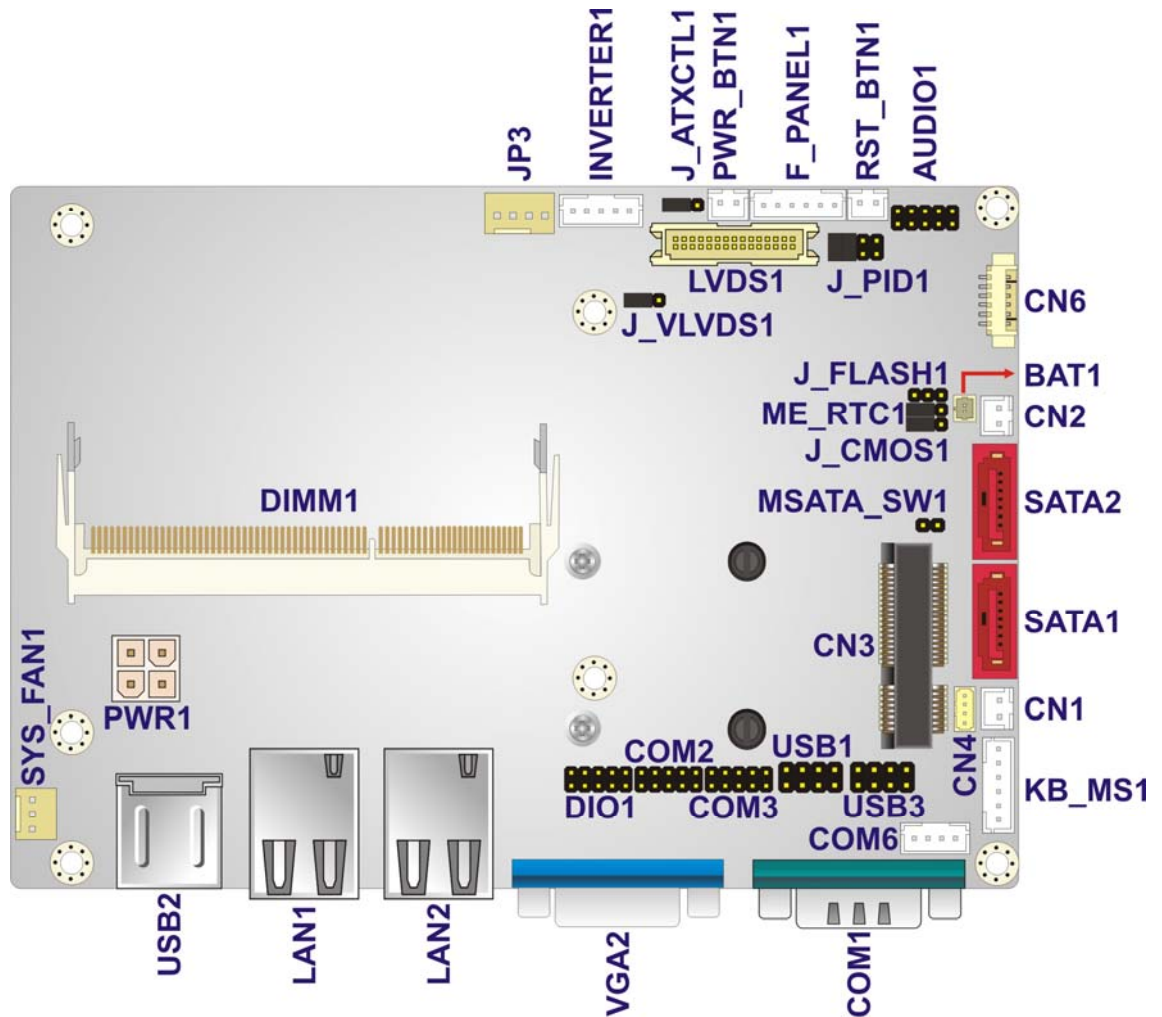


Figure 3-1: Connectors and Jumpers

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
5 V SATA power connectors	2-pin wafer	CN1, CN2
12 V power connector	4-pin Molex power connector	PWR1
Audio connector	10-pin header	AUDIO1
Backlight inverter connector	5-pin wafer	INVERTER1
Battery connector	2-pin wafer	BAT1
Digital Input/Output (DIO) connector	10-pin header	DIO1
Fan connector (CPU)	4-pin wafer	JP3
Fan connector (system)	3-pin wafer	SYS_FAN1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LVDS connector	30-pin crimp	LVDS1
PCIe Mini card slot	52-pin PCIe Mini	CN3
Power & HDD LED connector	6-pin wafer	F_PANEL1
Power button connector	2-pin wafer	PWR_BTN1
Reset button connector	2-pin wafer	RST_BTN1
RS-232 serial port connectors	10-pin header	COM2, COM3
RS-422/485 serial port connector	4-pin wafer	COM6
SATA 3Gb/s drive connectors	7-pin SATA	SATA1, SATA2
SMBus connector	4-pin wafer	CN4
SO-DIMM connector	204-pin SO-DIMM connector	DIMM1
SPI flash connector	6-pin wafer	CN6
USB 2.0 connectors	8-pin header	USB1, USB3

Table 3-1: Peripheral Interface Connectors

WAFER-NM701-1007U 3.5" Motherboard

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Dual USB port	Dual USB port	USB2
Ethernet connectors	RJ-45	LAN1, LAN2
RS-232 serial port connector	Male DB-9	COM1
VGA connector	15-pin female	VGA2

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the WAFER-NM701-1007U.

3.2.1 5 V SATA Power Connectors

CN Label: CN1, CN2

CN Type: 2-pin wafer

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

Use the 5 V SATA power connectors to connect to SATA device power connection.

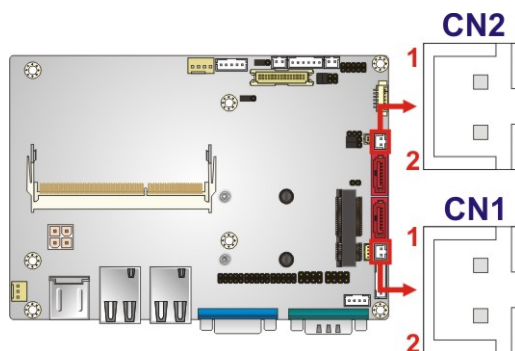


Figure 3-2: 5 V SATA Power Connector Locations

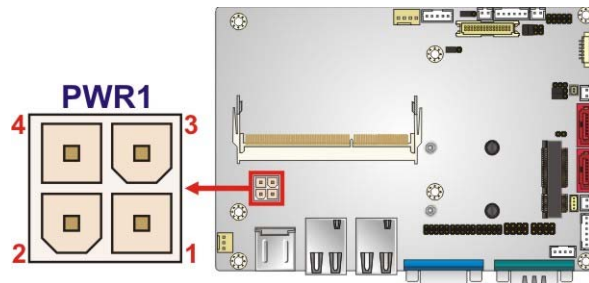
Pin No.	Description
1	+V5S
2	Ground

Table 3-3: 5 V SATA Power Connector Pinouts

3.2.2 12 V Power Connector

- CN Label:** PWR1
- CN Type:** 4-pin Molex power connector
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-4**

The power connector is connected to an external power supply and supports 12V power input. Power is provided to the system, from the power supply through this connector.


Figure 3-3: 12 V Power Connector Location

Pin	Description
1	GND
2	GND
3	+12V
4	+12V

Table 3-4: 12 V Power Connector Pinouts

3.2.3 Audio Connector

- CN Label:** AUDIO1
- CN Type:** 10-pin header

WAFER-NM701-1007U 3.5" Motherboard

CN Location: See Figure 3-4

CN Pinouts: See Table 3-5

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

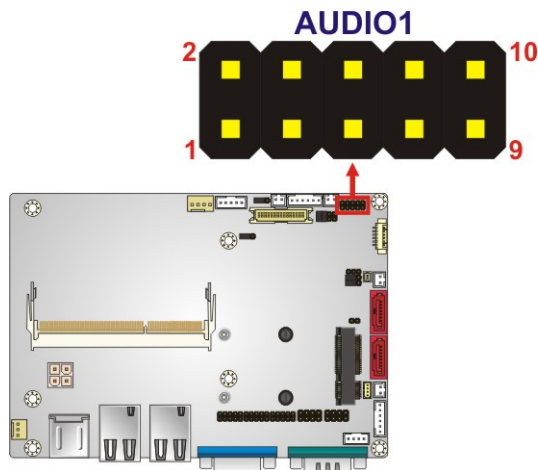


Figure 3-4: Audio Connector Location

Pin	Description	Pin	Description
1	LFRONT-R	2	LLINE-R
3	GND	4	GND
5	LFRONT-L	6	LLINE-L
7	GND	8	GND
9	LMIC1-CONN-R	10	LMIC1-CONN-L

Table 3-5: Audio Connector Pinouts

3.2.4 Backlight Inverter Connector

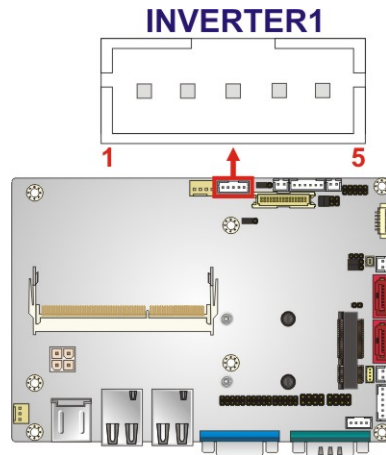
CN Label: INVERTER1

CN Type: 5-pin wafer

CN Location: See Figure 3-5

CN Pinouts: See Table 3-6

The backlight inverter connector provides the backlight on the LCD display connected to the WAFER-NM701-1007U with +12V of power.


Figure 3-5: Backlight Inverter Connector Location

Pin	Description
1	BRIGHTNESS
2	GND
3	+V12S_LCD_BKL
4	GND
5	ENABKL

Table 3-6: Backlight Inverter Connector Pinouts

3.2.5 Battery Connector


CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label:	BAT1
CN Type:	2-pin wafer
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-7

WAFER-NM701-1007U 3.5" Motherboard

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

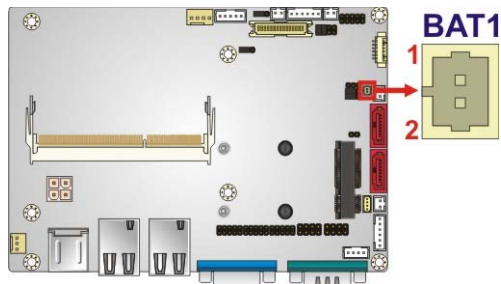


Figure 3-6: Battery Connector Location

Pin	Description
1	VBATT
2	GND

Table 3-7: Battery Connector Pinouts

3.2.6 Digital Input/Output (DIO) Connector

- CN Label:** DIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-8**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

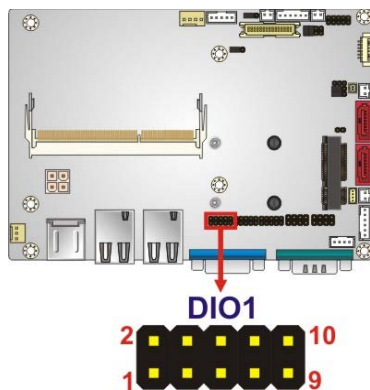


Figure 3-7: Digital I/O Connector Location

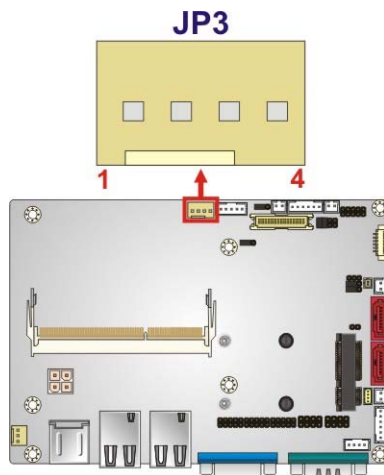
Pin	Description	Pin	Description
1	GND	2	+V5S
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

Table 3-8: Digital I/O Connector Pinouts

3.2.7 Fan Connector (CPU)

- CN Label:** JP3
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-9**

The fan connector attaches to a CPU cooling fan.


Figure 3-8: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+V12S
3	Rotation Signal
4	PWM Control Signal

Table 3-9: CPU Fan Connector Pinouts

WAFER-NM701-1007U 3.5" Motherboard

3.2.8 Fan Connector (System)

- CN Label:** SYS_FAN1
- CN Type:** 3-pin wafer
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-10**

The fan connector attaches to a system cooling fan.

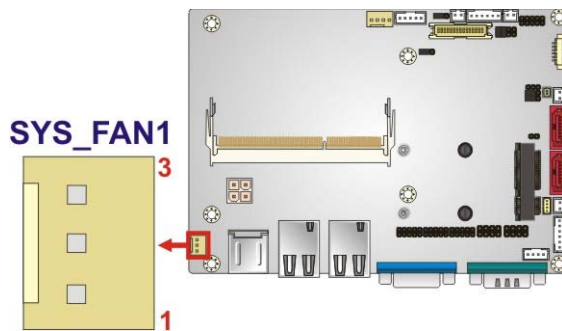


Figure 3-9: System Fan Connector Location

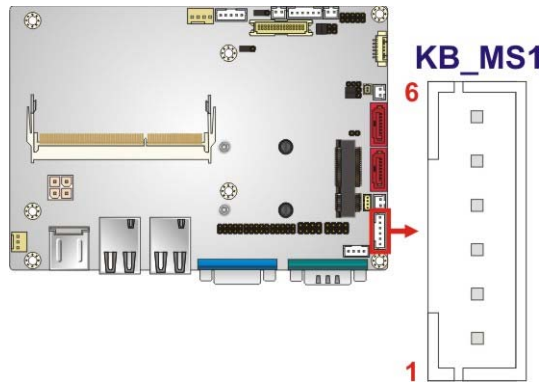
PIN NO.	DESCRIPTION
1	Rotation Signal
2	+12V
3	GND

Table 3-10: System Fan Connector Pinouts

3.2.9 Keyboard/Mouse Connector

- CN Label:** KB_MS1
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-11**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.


Figure 3-10: Keyboard/Mouse Connector Location

Pin	Description
1	VCC5_KBMS
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	KBGND

Table 3-11: Keyboard/Mouse Connector Pinouts

3.2.10 LVDS Connector

- CN Label:** LVDS1
CN Type: 30-pin crimp
CN Location: See **Figure 3-11**
CN Pinouts: See **Table 3-12**

The LVDS connector is for an LCD panel connected to the board.

WAFER-NM701-1007U 3.5" Motherboard

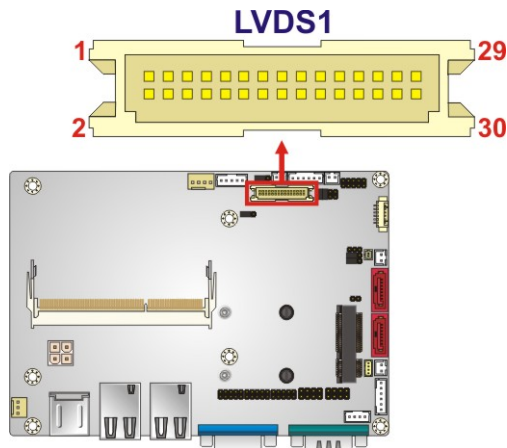


Figure 3-11: LVDS Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND	14	GND
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND	26	GND
27	VCC/VCC3	28	VCC/VCC3
29	VCC/VCC3	30	VCC/VCC3

Table 3-12: LVDS1 Connector Pinouts

3.2.11 PCIe Mini Card Slot

- CN Label:** CN3
- CN Type:** 52-pin PCIe Mini card slot
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-13**

The PCIe Mini card slot enables a full-size/half-size PCIe Mini expansion module to be connected to the board, such as a wireless LAN (WLAN) card or PCIe Mini disk on module (DOM) SSD card.

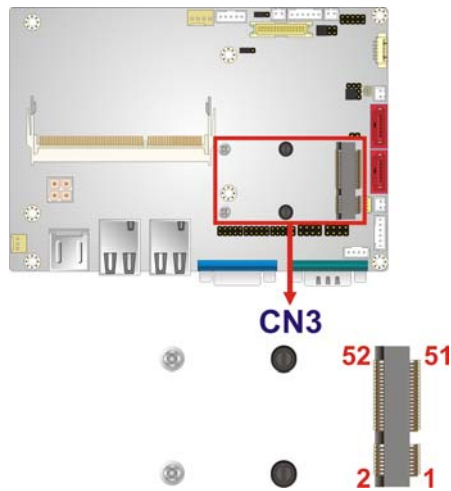


Figure 3-12: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND

WAFER-NM701-1007U 3.5" Motherboard

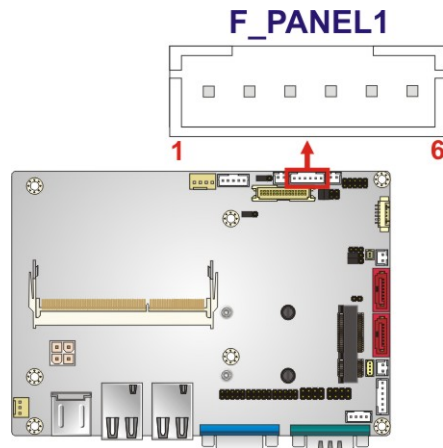
Pin	Description	Pin	Description
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB D-
37	N/C	38	USB D+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-13: PCIe Mini Card Slot Pinouts

3.2.12 Power & HDD LED Connector

- CN Label:** F_PANEL1
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-14**

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.


Figure 3-13: Power & HDD LED Connector Location

	Pin	Description
+5V	1	VCC
	2	GND
Power LED	3	POWER_LED+
	4	POWER_LED-
HDD LED	5	HDD_LED+
	6	HDD_LED-

Table 3-14: Power & HDD LED Connector Pinouts

3.2.13 Power Button Connector

CN Label: PWR_BTN1

CN Type: 2-pin wafer

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15**

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

WAFER-NM701-1007U 3.5" Motherboard

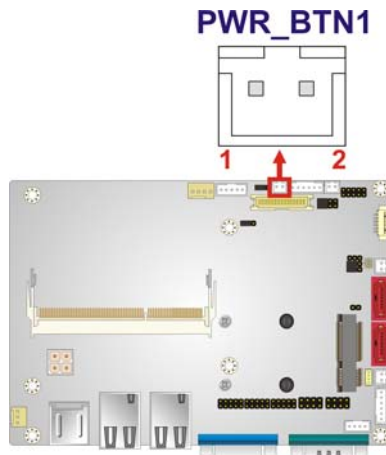


Figure 3-14: Power Button Connector Location

Pin	Description
1	PWR_BTN+
2	PWR_BTN-

Table 3-15: Power Button Connector Pinouts

3.2.14 Reset Button Connector

- CN Label:** RST_BTN1
- CN Type:** 2-pin wafer
- CN Location:** See **Figure 3-15**
- CN Pinouts:** See **Table 3-16**

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

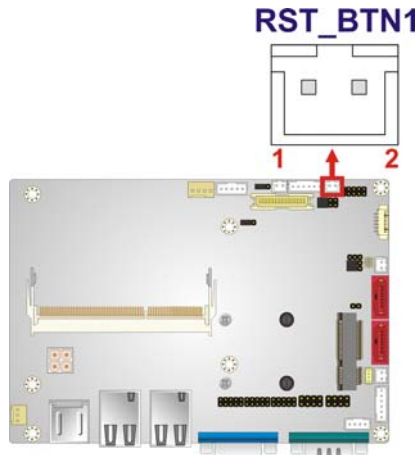


Figure 3-15: Reset Button Connector Location

Pin	Description
1	RESET+
2	RESET-

Table 3-16: Reset Button Connector Pinouts

3.2.15 RS-232 Serial Port Connectors

- CN Label:** COM2, COM3
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-17**

Each of these connectors provides one RS-232 serial communications channel. The COM serial port connector can be connected to an external RS-232 serial port device.

WAFER-NM701-1007U 3.5" Motherboard

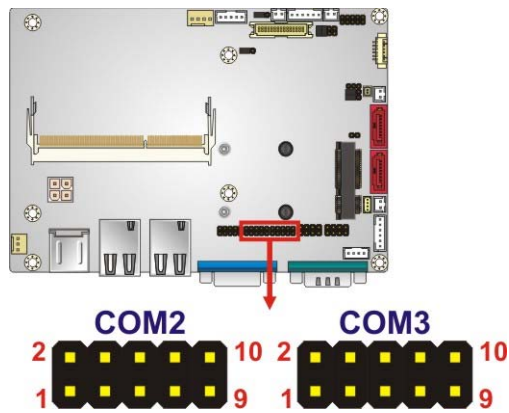


Figure 3-16: RS-232 Serial Port Connector Locations

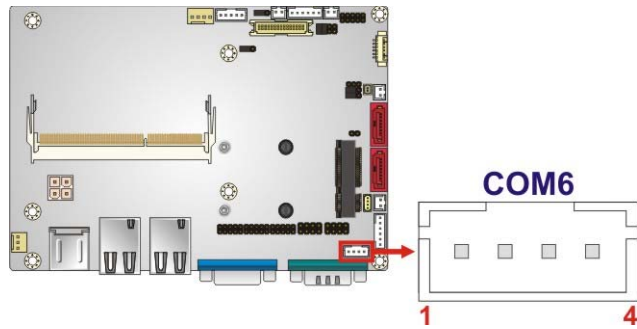
Pin	Description	Pin	Description
1	-NDCD2	2	-NDSR2
3	NSIN2	4	-NRTS2
5	NSOUT2	6	-NCTS2
7	-NDTR2	8	-XRI2
9	GND	10	GND

Table 3-17: RS-232 Serial Port Connector Pinouts

3.2.16 RS-422/485 Serial Port Connector

CN Label:	COM6
CN Type:	4-pin wafer
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-18

This connector provides RS-422 or RS-485 communications.


Figure 3-17: RS-422/485 Connector Location

Pin	Description	Pin	Description
1	RXD422-	3	TXD422+ /TXD485+
2	RXD422+	4	TXD422- /TXD485-

Table 3-18: RS-422/485 Connector Pinouts

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

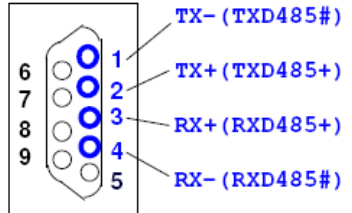
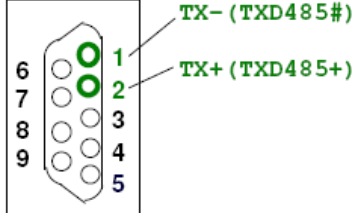
RS-422 Pinouts	RS-485 Pinouts
	

Table 3-19: DB-9 RS-422/485 Pinouts

3.2.17 SATA 3Gb/s Drive Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connector
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-20**

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.

WAFER-NM701-1007U 3.5" Motherboard

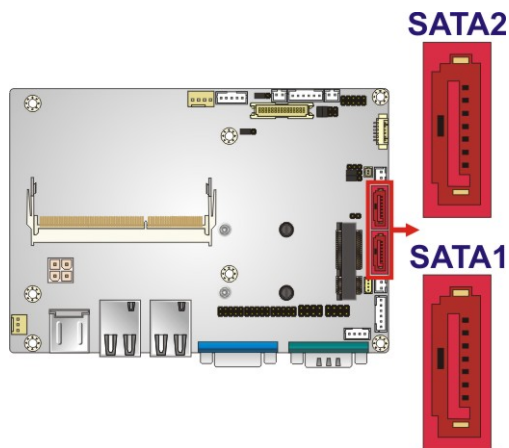


Figure 3-18: SATA Drive Connector Locations

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

Table 3-20: SATA Drive Connector Pinouts

3.2.18 SMBus Connector

- CN Label:** CN4
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-19**
- CN Pinouts:** See **Table 3-21**

The SMBus (System Management Bus) connector provides low-speed system management communications.

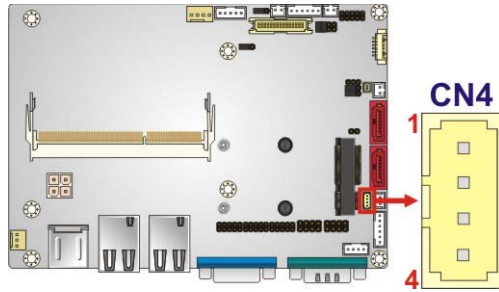


Figure 3-19: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

Table 3-21: SMBus Connector Pinouts

3.2.19 SO-DIMM Connector

- CN Label:** DIMM1
- CN Type:** 204-pin DDR3 SO-DIMM connector
- CN Location:** See **Figure 3-20**

The SO-DIMM connector is for installing memory on the system.

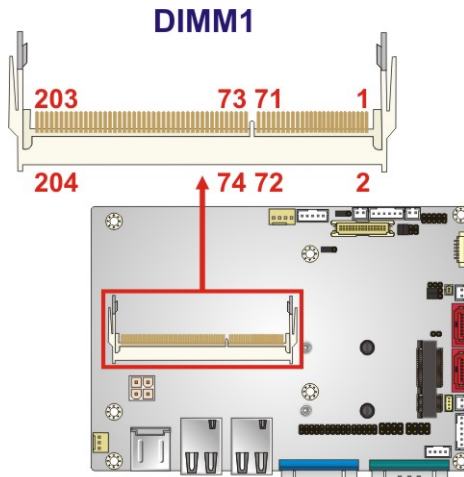


Figure 3-20: SO-DIMM Connector Location

WAFER-NM701-1007U 3.5" Motherboard

3.2.20 SPI Flash Connector

- CN Label:** CN6
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-22**

The SPI connector is used to flash the BIOS.

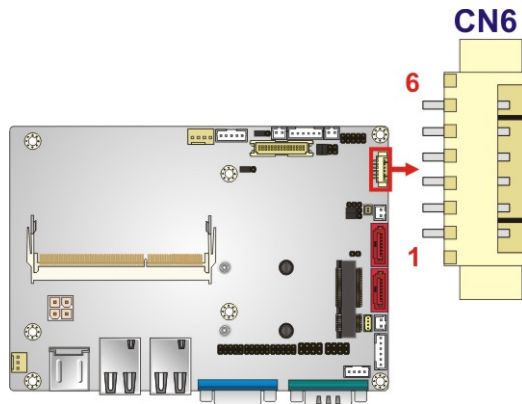


Figure 3-21: SPI Flash Connector Location

Pin	Description
1	+3.3V
2	SPI_CS
3	SPI_SO
4	SPI_CLK
5	SPI_SI
6	GND

Table 3-22: SPI Flash Connector Pinouts

3.2.21 USB Connectors

- CN Label:** USB1, USB3
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-22**
- CN Pinouts:** See **Table 3-23**

Each USB connector provides connectivity to two USB 2.0/1.1 ports.

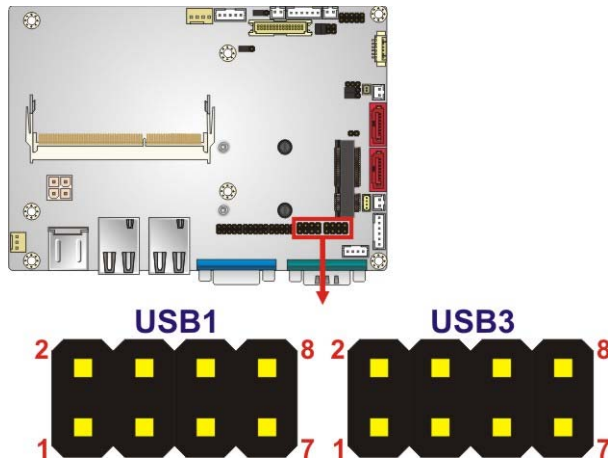


Figure 3-22: USB Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-23: USB Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

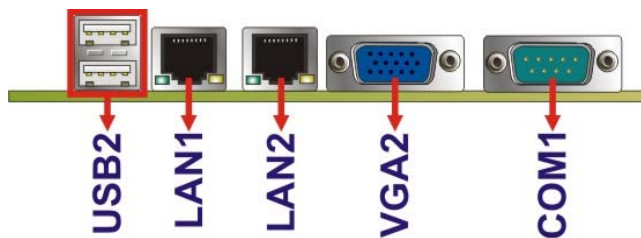


Figure 3-23: External Peripheral Interface Connector

WAFER-NM701-1007U 3.5" Motherboard

3.3.1 Ethernet Connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45 connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-24**

The WAFER-NM701-1007U is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

Pin	Description	Pin	Description
1	LAN1_MDIO+	5	LAN1_MDI2+
2	LAN1_MDIO-	6	LAN1_MDI2-
3	LAN1_MDI1+	7	LAN1_MDI3+
4	LAN1_MDI1-	8	LAN1_MDI3-

Table 3-24: LAN Pinouts

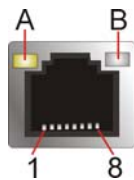


Figure 3-24: RJ-45 Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-25: RJ-45 Ethernet Connector LEDs

3.3.2 RS-232 Serial Port Connector (COM1)

- CN Label:** COM1
- CN Type:** Male DB-9 connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-26** and **Figure 3-25**

The serial port connects to a RS-232 serial communications device.

Pin	Description	Pin	Description
1	DATA CARRIER DETECT (DCD1)	6	DATA SET READY (DSR1)
2	RECEIVE DATA (RXD1)	7	REQUEST TO SEND (RTS1)
3	TRANSMIT DATA (TXD1)	8	CLEAR TO SEND (CTS1)
4	DATA TERMINAL READY (DTR1)	9	RING INDICATOR (RI1)
5	GND		

Table 3-26: RS-232 Serial Port (COM 1) Pinouts

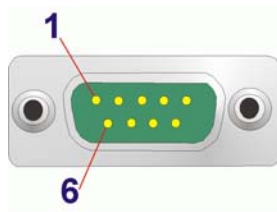


Figure 3-25: COM1 Pinout Locations

3.3.3 USB Connectors

- CN Label:** USB2
- CN Type:** Dual USB port
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-27**

The ports connect to both USB 2.0 and USB 1.1 devices.

WAFER-NM701-1007U 3.5" Motherboard

Pin	Description	Pin	Description
1	USB_VCC	5	USB_VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GND	8	GND

Table 3-27: USB Port Pinouts

3.3.4 VGA Connector

- CN Label:** VGA2
- CN Type:** 15-pin female
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Figure 3-26** and **Table 3-28**

The VGA connector connects to a monitor that accepts a standard VGA input.

Pin	Description	Pin	Description
1	BR	2	BG
3	BB	4	NC
5	GND	6	CRT_PLUG#
7	GND	8	GND
9	CRT_VCC	10	GND
11	NC	12	5VDDCDA
13	5HSYNC	14	5VSYNC
15	5DDCCLK		

Table 3-28: VGA Connector Pinouts

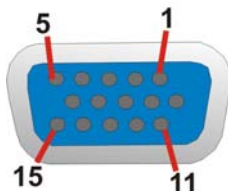


Figure 3-26: VGA Connector



Chapter

4

Installation

WAFER-NM701-1007U 3.5" Motherboard

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the WAFER-NM701-1007U may result in permanent damage to the WAFER-NM701-1007U and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-NM701-1007U. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WAFER-NM701-1007U or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:**- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the WAFER-NM701-1007U, place it on an anti-static pad. This reduces the possibility of ESD damaging the WAFER-NM701-1007U.
- **Only handle the edges of the PCB:-:** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the WAFER-NM701-1007U installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the WAFER-NM701-1007U on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the WAFER-NM701-1007U off:
 - When working with the WAFER-NM701-1007U, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the WAFER-NM701-1007U **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

WAFER-NM701-1007U 3.5" Motherboard

4.3 SO-DIMM Installation



WARNING:

Using incorrectly specified SO-DIMM may cause permanent damage to the WAFER-NM701-1007U. Please make sure the purchased SO-DIMM complies with the memory specifications of the WAFER-NM701-1007U. SO-DIMM specifications compliant with the WAFER-NM701-1007U are listed in Chapter 1.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 4-1**.

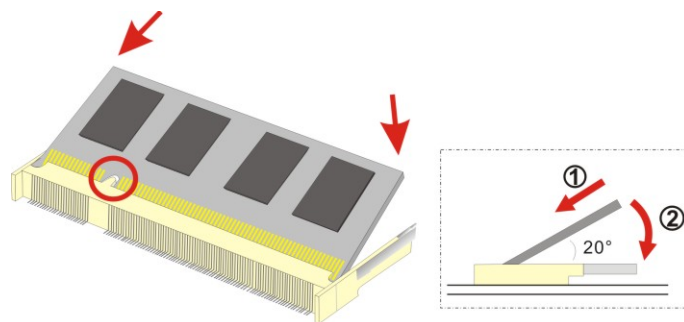


Figure 4-1: SO-DIMM Installation

- Step 1:** **Locate the SO-DIMM socket.** Place the WAFER-NM701-1007U on an anti-static pad with the solder side facing up.
- Step 2:** **Align the SO-DIMM with the socket.** The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.
- Step 3:** **Insert the SO-DIMM.** Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-1**)
- Step 4:** **Open the SO-DIMM socket arms.** Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 4-1**)

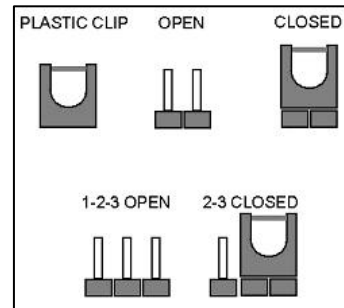
Step 5: Secure the SO-DIMM. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

4.4 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AT/ATX power selection	J_ATXCTL1	3-pin header
Clear CMOS	J_CMOS1	3-pin header
Clear ME RTC registers	ME_RTC1	3-pin header
Flash descriptor security override	J_FLASH1	3-pin header
LVDS panel resolution selection	J_PID1	8-pin header
LVDS voltage selection	J_VLVDS1	3-pin header
mSATA detecting mode selection	MSATA_SW1	2-pin header

Table 4-1: Jumpers

WAFER-NM701-1007U 3.5" Motherboard

4.4.1 AT/ATX Power Selection Jumper

Jumper Label:	J_ATXCTL1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-2

The AT/ATX power selection jumper specifies the system power mode as AT or ATX.

Setting	Description
Short 1-2	Use ATX power (Default)
Short 2-3	Use AT power

Table 4-2: AT/ATX Power Selection Jumper Settings

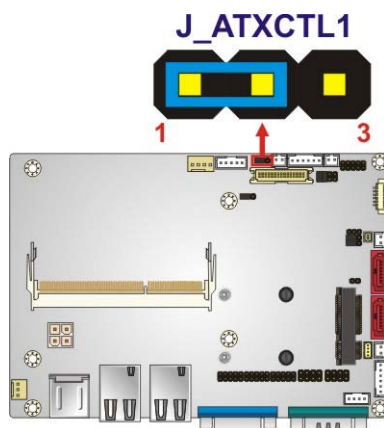


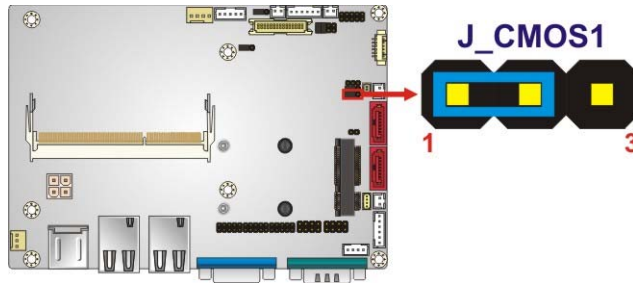
Figure 4-2: AT/ATX Power Selection Jumper Location

4.4.2 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-3
Jumper Location:	See Figure 4-3

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, and then move back to the default position.

Setting	Description
Short 1-2	Normal (Default)
Short 2-3	Clear BIOS

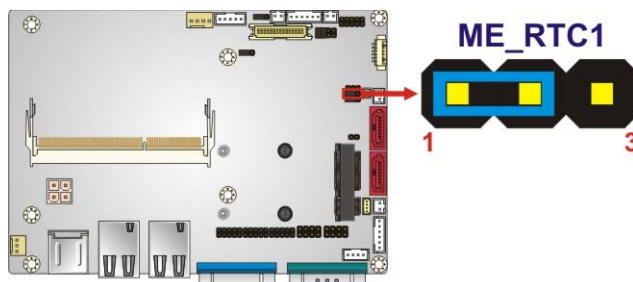
Table 4-3: Clear CMOS Jumper Settings

Figure 4-3: Clear CMOS Jumper Location

4.4.3 Clear ME RTC Registers Jumper

Jumper Label:	ME_RTC1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-4
Jumper Location:	See Figure 4-4

This jumper allows resetting the RTC registers used for the Intel® Management Engine when the on-board battery is changed.

Pin	Description
Short 1-2	Save ME RTC registers (Default)
Short 2-3	Clear ME RTC registers

Table 4-4: Clear ME RTC Registers Jumper Settings

Figure 4-4: Clear ME RTC Registers Jumper Location

WAFER-NM701-1007U 3.5" Motherboard

4.4.4 Flash Descriptor Security Override Jumper

Jumper Label:	J_FLASH1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-5
Jumper Location:	See Figure 4-5

The Flash Descriptor Security Override jumper specifies whether to override the flash descriptor.

Setting	Description
Short 1-2	Disabled (Default)
Short 2-3	Enabled

Table 4-5: Flash Descriptor Security Override Jumper Settings

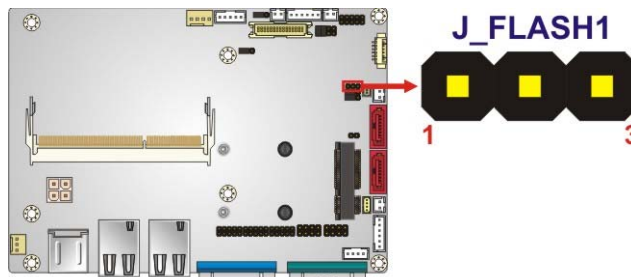


Figure 4-5: Flash Descriptor Security Override Jumper Location

4.4.5 LVDS Panel Resolution Selection Jumper

Jumper Label:	J_PID1
Jumper Type:	8-pin header
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-6

Selects the resolution of the LCD panel connected to the LVDS connector.

Pin	Description
OPEN	640 X 480 (18-bit)
1-2	800 X 480 (18-bit)

Pin	Description
3-4	800 X 600 (18-bit)
1-2 & 3-4	1024 X 768 (18-bit) Default
5-6	1024 X 768 (24-bit)
1-2 & 5-6	1280 X 1024 (48-bit)
3-4 & 5-6	1600 X 1200 (48-bit)
1-2 & 3-4 & 5-6	1280 X 768 (18-bit)
7-8	1280 X 800 (18-bit)
1-2 & 7-8	1366 X 768 (24-bit)
3-4 & 7-8	1440 X 900 (48-bit)
1-2 & 3-4 & 7-8	1600 X 900 (48-bit)
5-6 & 7-8	1680 X 1050 (48-bit)
1-2 & 5-6 & 7-8	1920 X 1080 (48-bit)
3-4 & 5-6 & 7-8	1920 X 1200 (48-bit)
1-2 & 3-4 & 5-6 & 7-8	LVDS disabled

Table 4-6: LVDS Panel Resolution

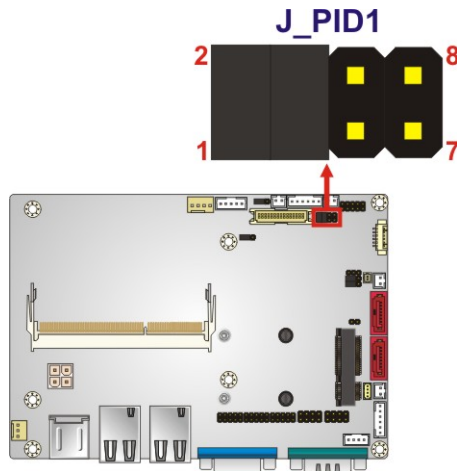


Figure 4-6: LVDS Panel Resolution Selection Jumper Location

WAFER-NM701-1007U 3.5" Motherboard

4.4.6 LVDS Voltage Selection



WARNING:

Permanent damage to the screen and WAFER-NM701-1007U may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label:	J_VLVDS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-7
Jumper Location:	See Figure 4-7

Sets the voltage provided to the monitor by LVDS.

Setting	Description
Short 1-2	3.3V (Default)
Short 2-3	5V

Table 4-7: LVDS Voltage Selection Jumper Settings

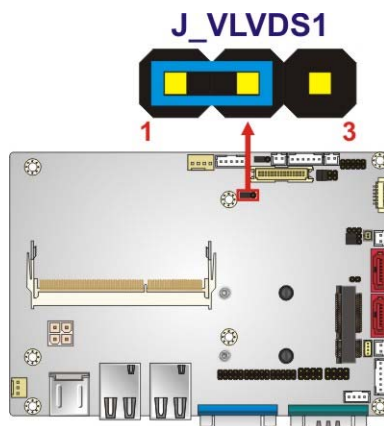


Figure 4-7: LVDS Voltage Selection Jumper Location

4.4.7 mSATA Detecting Mode Selection Jumper

Jumper Label:	MSATA_SW1
Jumper Type:	2-pin header
Jumper Settings:	See Table 4-8
Jumper Location:	See Figure 4-8

The jumper configures the PCIe Mini slot to automatically detect mSATA device or to force mSATA to be enabled.

Setting	Description
Open	Auto-detect mSATA device (Default)
Short 1-2	Enable mSATA

Table 4-8: mSATA Detecting Mode Selection Jumper Settings

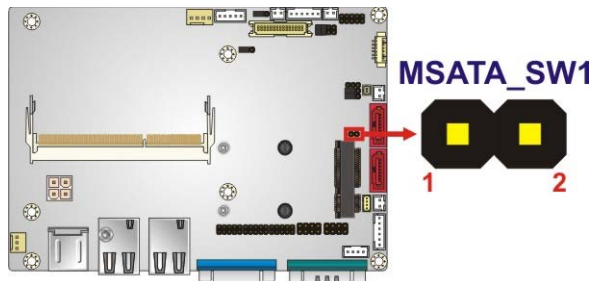


Figure 4-8: mSATA Detecting Mode Selection Jumper Location

4.5 Chassis Installation

4.5.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other on-board components. The chassis in which the WAFER-NM701-1007U must have air vents to allow cool air to move into the system and hot air to move out.

WAFER-NM701-1007U 3.5" Motherboard

The WAFER-NM701-1007U must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.



NOTE:

IEI has a wide range of chassis available. Please contact your WAFER-NM701-1007U vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieiworld.com.tw>) to find out more about the available chassis.

4.5.2 Motherboard Installation

To install the WAFER-NM701-1007U motherboard into the chassis please refer to the reference material that came with the chassis.

4.6 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the on-board connectors.

4.6.1 AT/ATX Power Connection

Follow the instructions below to connect the WAFER-NM701-1007U to an AT or ATX power supply.



WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the WAFER-NM701-1007U.

Step 1: **Locate the power cable.** The power cable is shown in the packing list in **Chapter 2.**

Step 2: Connect the Power Cable to the Motherboard. Connect the 4-pin (2x2) Molex type power cable connector to the power connector on the motherboard. See

Figure 4-9.

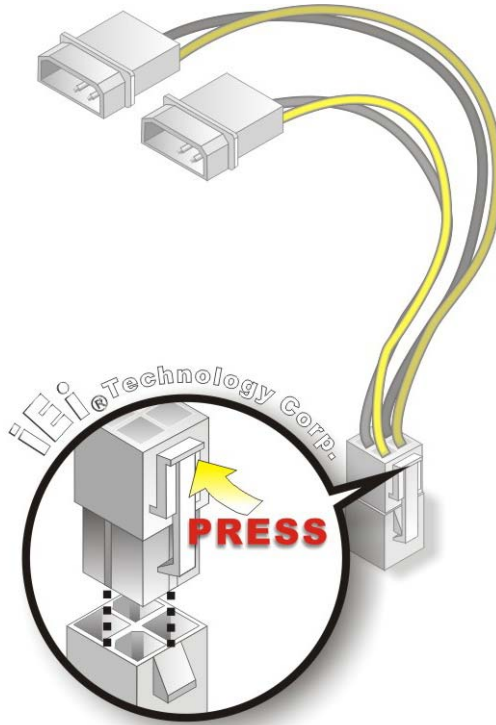


Figure 4-9: Power Cable to Motherboard Connection

Step 3: Connect Power Cable to Power Supply. Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT/ATX power supply. See **Figure 4-10.**

WAFER-NM701-1007U 3.5" Motherboard

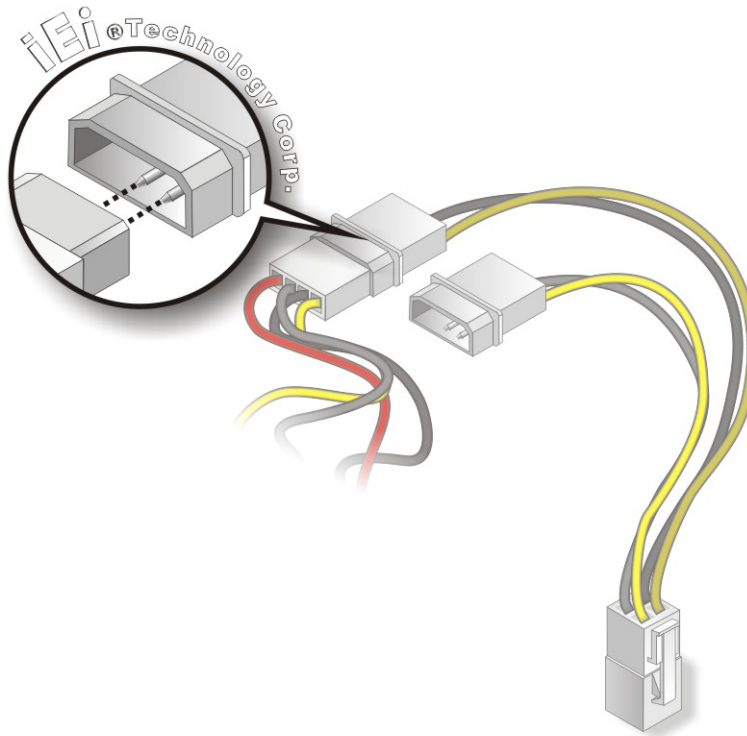


Figure 4-10: Connect Power Cable to Power Supply

4.6.2 Audio Kit Installation

The Audio Kit that came with the WAFER-NM701-1007U connects to the 10-pin audio connector on the WAFER-NM701-1007U. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

- Step 1:** **Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.
- Step 2:** **Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 4-11**.

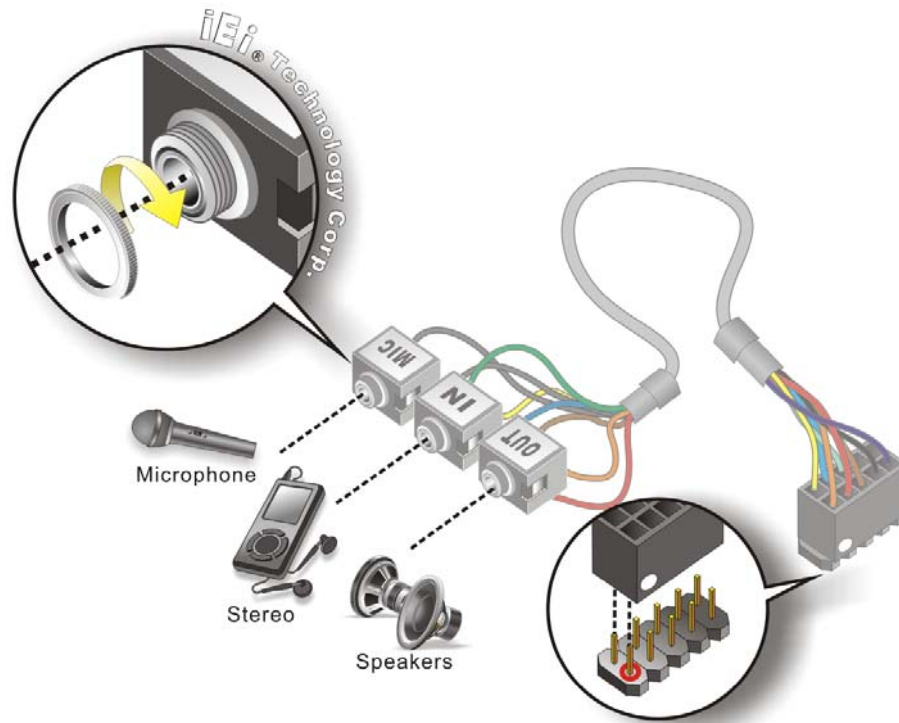


Figure 4-11: Audio Kit Cable Connection

Step 3: **Connect the audio devices.** Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

4.6.3 LVDS LCD Installation

The WAFER-NM701-1007U can be connected to a TFT LCD screen through the LVDS crimp connectors on the board. To connect a TFT LCD to the WAFER-NM701-1007U, please follow the steps below.

Step 1: **Locate the connector.** The location of the LVDS connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector.** Insert the connector from the LVDS PCB driving board to the LVDS connector as shown in **Figure 4-12**. When connecting the connectors, make sure the pins are properly aligned.

WAFER-NM701-1007U 3.5" Motherboard

**WARNING:**

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

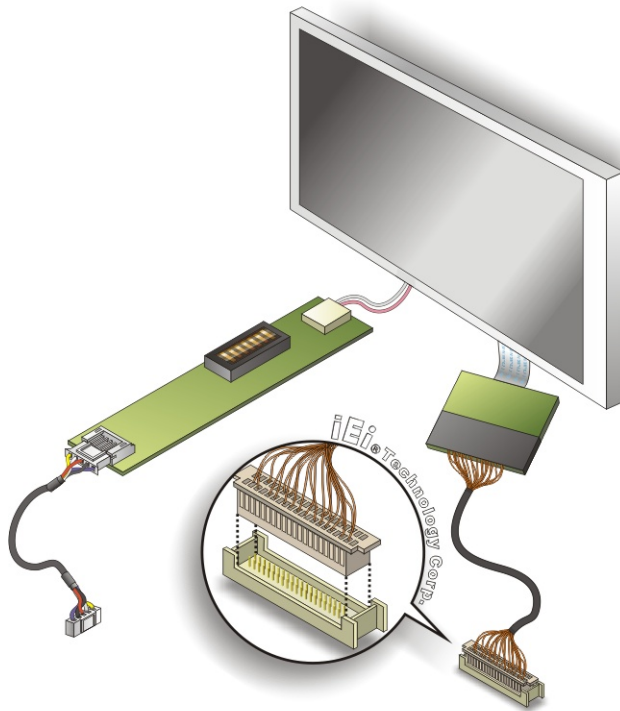


Figure 4-12: LVDS Connector

Step 3: **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Chapter 3**.

Step 4: **Connect backlight connector.** Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-13**. When inserting the cable connector, make sure the pins are properly aligned.

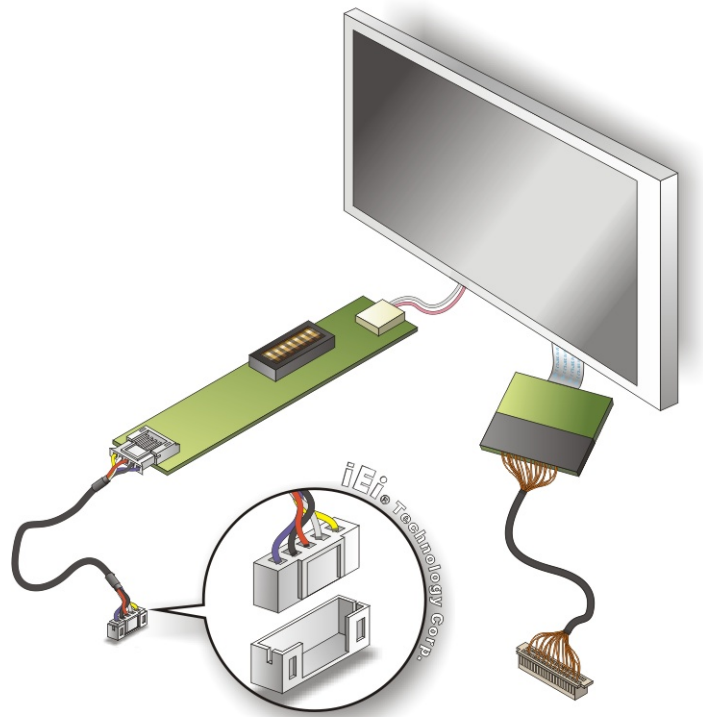


Figure 4-13: Backlight Inverter Connection

4.6.4 Full-size PCIe Mini Card Installation

The WAFER-NM701-1007U allows installation of either a full-size or half-size PCIe Mini card. To install a full-size PCIe Mini card, please follow the steps below.

- Step 1:** **Locate the full-size PCIe Mini card slot.** The location of the PCIe Mini card slot is shown in **Chapter 3**.
- Step 2:** **Remove the retention screws.** Remove the retention screws secured on the motherboard as shown in **Figure 4-14**.

WAFER-NM701-1007U 3.5" Motherboard

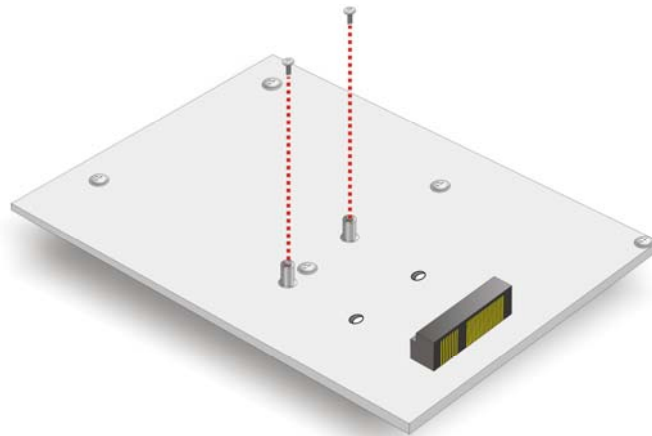


Figure 4-14: Remove the Retention Screws for the Full-size PCIe Mini Card

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20° (Figure 4-15).

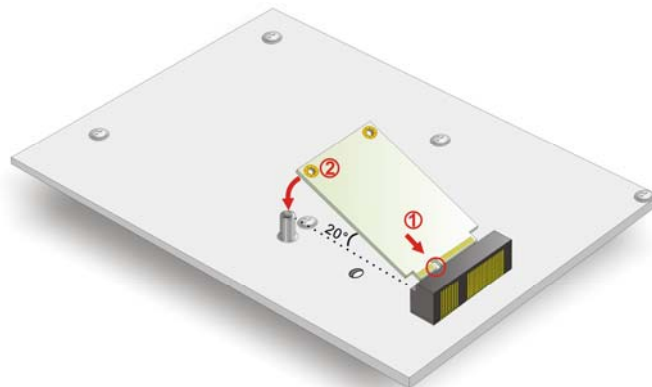


Figure 4-15: Insert the Full-size PCIe Mini Card into the Socket at an Angle

Step 4: Secure the full-size PCIe Mini card. Secure the full-size PCIe Mini card with the retention screws previously removed (Figure 4-16).

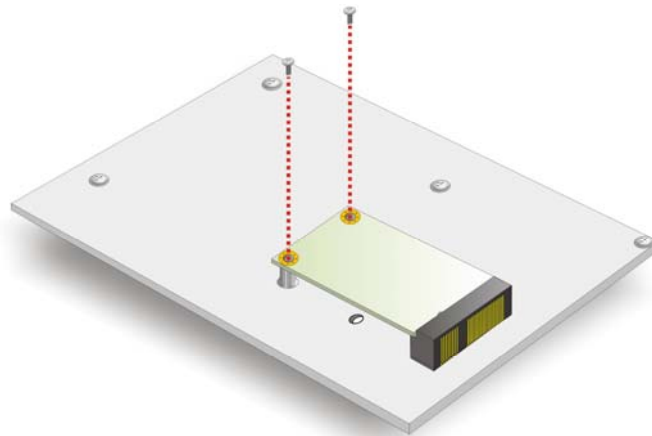


Figure 4-16: Secure the Full-size PCIe Mini Card

4.6.5 Half-size PCIe Mini Card Installation

The WAFER-NM701-1007U allows installation of either a full-size or half-size PCIe Mini card. To install a half-size PCIe Mini card, please follow the steps below.

Step 1: **Locate the PCIe Mini card slot.** The location of the PCIe Mini card slot is shown in **Chapter 3**.

Step 2: **Install the supplied plastic shafts.** Insert the supplied plastic shafts to the screw holes on the motherboard (**Figure 4-17**). Press the plastic shafts down until they clip into place on the motherboard.

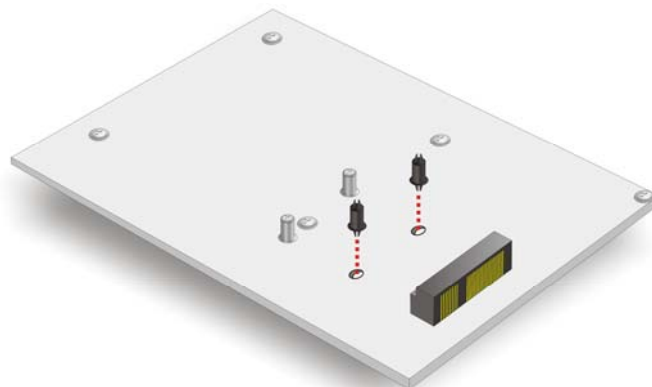


Figure 4-17: Install the Supplied Plastic Shafts

WAFER-NM701-1007U 3.5" Motherboard

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20° (Figure 4-18).

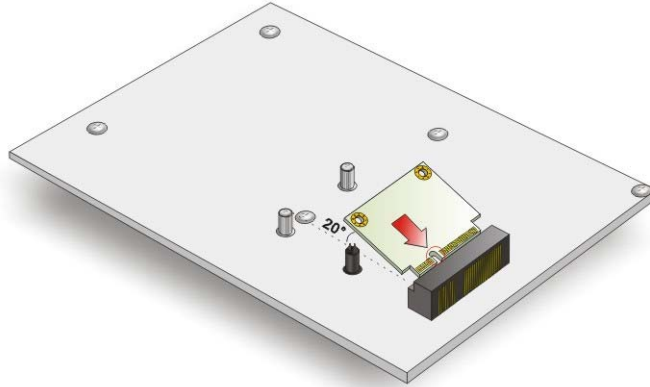


Figure 4-18: Insert the Half-size PCIe Mini Card into the Socket at an Angle

Step 4: Push down until the card clips into place. Push the other end of the card down until it clips into place on the plastic shafts (Figure 4-19).

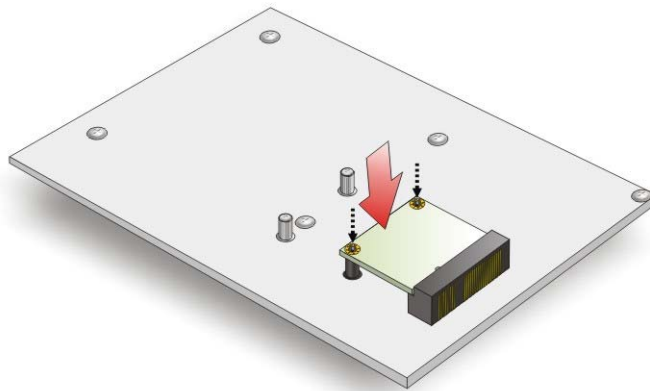


Figure 4-19: Secure the Half-size PCIe Mini Card

4.6.6 SATA Drive Connection

The WAFER-NM701-1007U is shipped with two SATA drive cables. To connect the SATA drive to the connector, please follow the steps below.

Step 1: Locate the SATA connector and the SATA power connector. The locations of the connectors are shown in Chapter 3.

Step 2: **Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-20**.

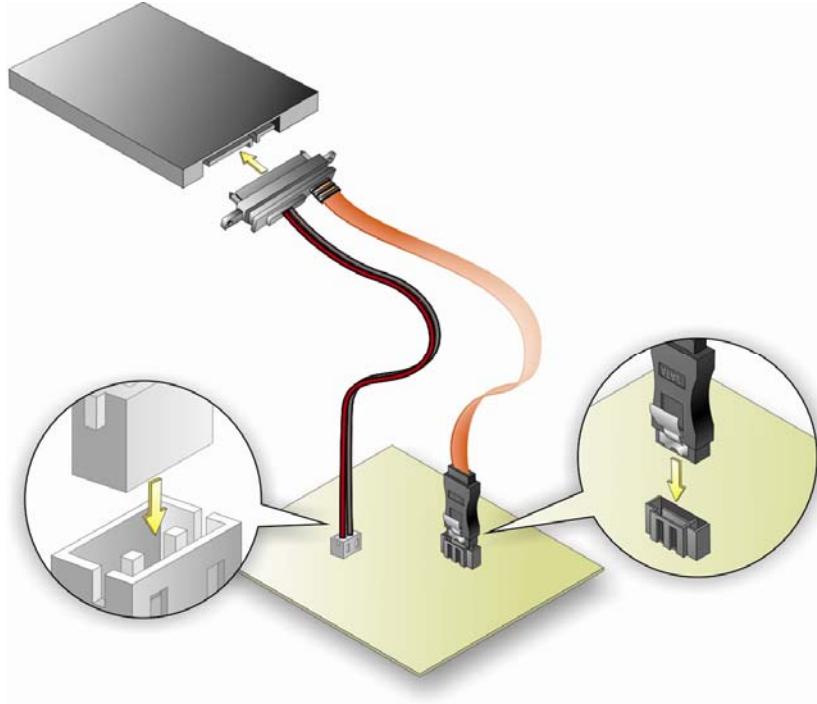


Figure 4-20: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk.** Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-20**.

Step 4: To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

4.6.7 Single RS-232 Cable

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector.** The locations of the RS-232 connectors are shown in **Chapter 3**.

WAFER-NM701-1007U 3.5" Motherboard

Step 2: **Insert the cable connector.** Insert the connector into the serial port header.

See **Figure 4-21**. A key on the front of the cable connector ensures the connector can only be installed in one direction.

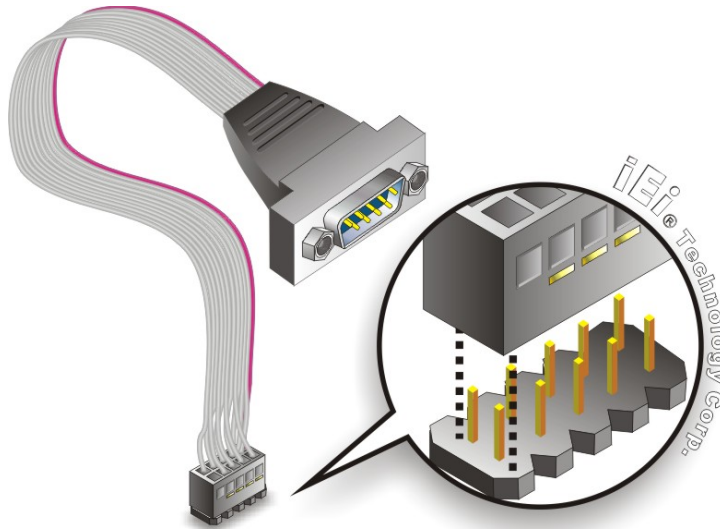


Figure 4-21: Single RS-232 Cable Installation

Step 3: **Secure the bracket.** The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 4: **Connect the serial device.** Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

4.6.8 Keyboard/Mouse Y-cable Connector

The WAFER-NM701-1007U is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the WAFER-NM701-1007U and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector.** The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the WAFER-NM701-1007U keyboard/mouse connector. See **Figure 4-22**.

Step 3: Insert the cable connectors Once the cable connector is properly aligned with the keyboard/mouse connector on the WAFER-NM701-1007U, connect the cable connector to the on-board connector. See **Figure 4-22**.

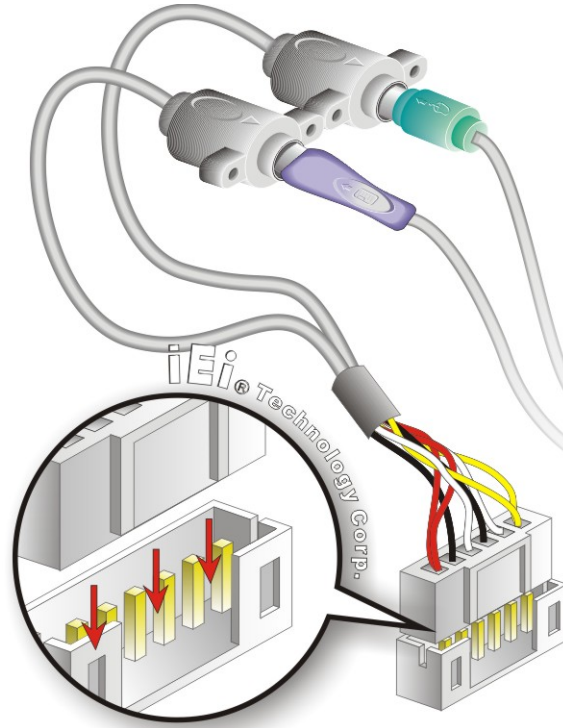


Figure 4-22: Keyboard/mouse Y-cable Connection

Step 4: Attach PS/2 connectors to the chassis. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: Connect the keyboard and mouse. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

WAFER-NM701-1007U 3.5" Motherboard

4.7 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the WAFER-NM701-1007U.

4.7.1 LAN Connection

The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connector.** The locations of the RJ-45 connectors are shown in **Chapter 3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with the RJ-45 connector on the WAFER-NM701-1007U. See **Figure 4-23**.

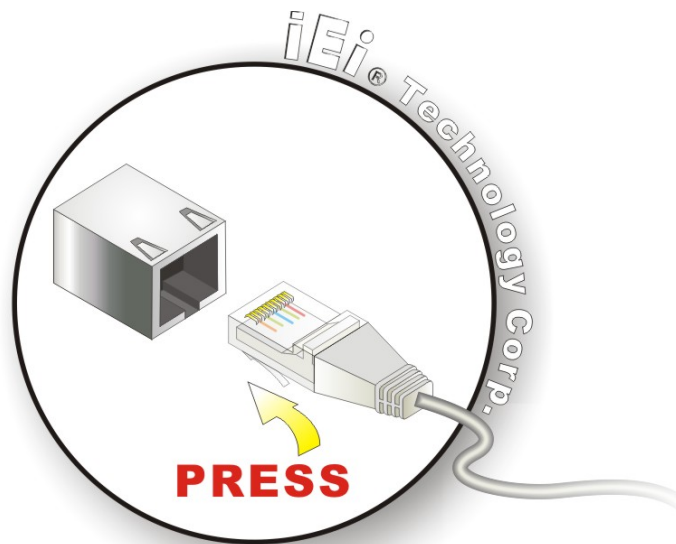


Figure 4-23: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.7.2 Serial Device Connection

The WAFER-NM701-1007U has a single male DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the WAFER-NM701-1007U.

Step 1: **Locate the DB-9 connector.** The location of the DB-9 connector is shown in Chapter 3.

Step 2: **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 4-24**.

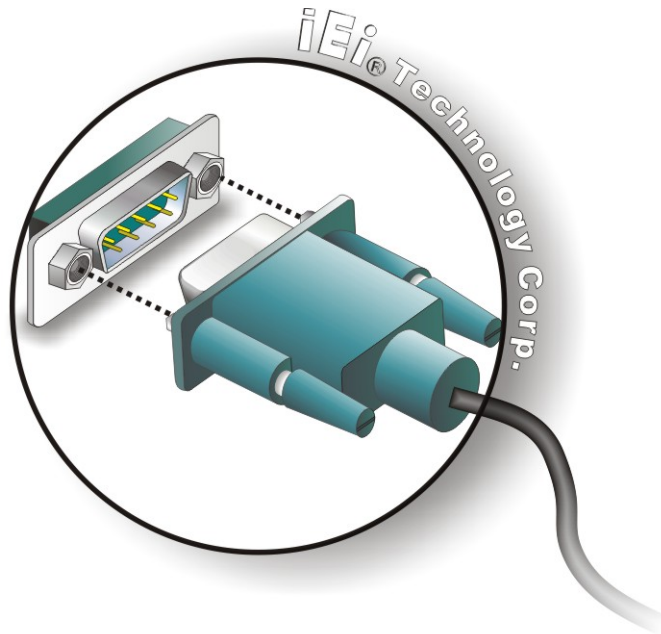


Figure 4-24: Serial Device Connector

Step 3: **Secure the connector.** Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.7.3 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the WAFER-NM701-1007U.

WAFER-NM701-1007U 3.5" Motherboard

- Step 1:** Locate the USB Series "A" receptacle connectors. The locations of the USB Series "A" receptacle connectors are shown in **Chapter 3**.
- Step 2:** Insert a USB Series "A" plug. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-25**.

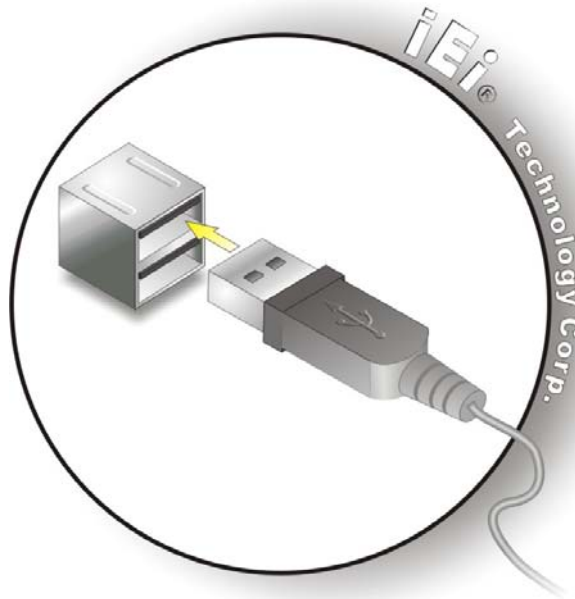


Figure 4-25: USB Connector

4.7.4 VGA Monitor Connection

The WAFER-NM701-1007U has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the WAFER-NM701-1007U, please follow the instructions below.

- Step 1:** Locate the female DB-15 connector. The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2:** Align the VGA connector. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: Insert the VGA connector Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the WAFER-NM701-1007U. See **Figure 4-26**.

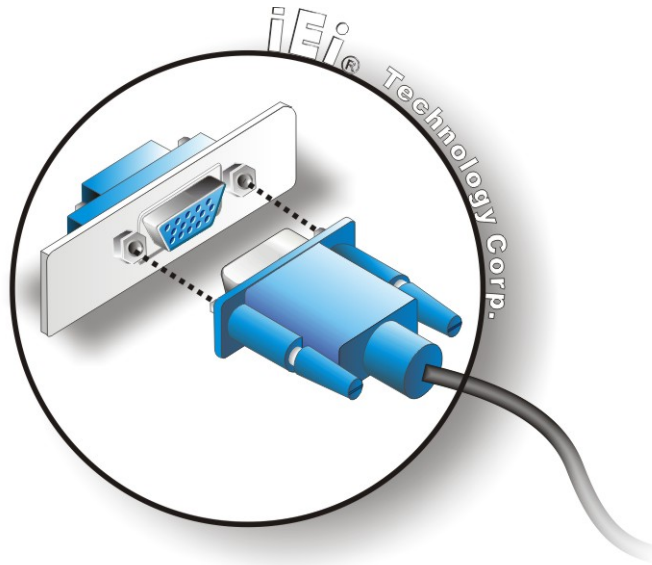


Figure 4-26: VGA Connector

Step 4: Secure the connector. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.8 Heat Sink Enclosure



WARNING:

Never run the WAFER-NM701-1007U without the heat sink enclosure secured to the board. The heat sink enclosure ensures the system remains cool and does not need addition heat sinks to cool the system.

WAFER-NM701-1007U 3.5" Motherboard



WARNING:

When running the WAFER-NM701-1007U, do not put the WAFER-NM701-1007U directly on a surface that can not dissipate system heat, especially the wooden or plastic desk. It is highly recommended to run the WAFER-NM701-1007U

→ on a heat dissipation surface or

→ using copper pillars to hold the board up from the desk below

When the WAFER-NM701-1007U is shipped, it is secured to a heat sink enclosure with five retention screws. If the WAFER-NM701-1007U must be removed from the heat sink enclosure, the five retention screws must be removed.

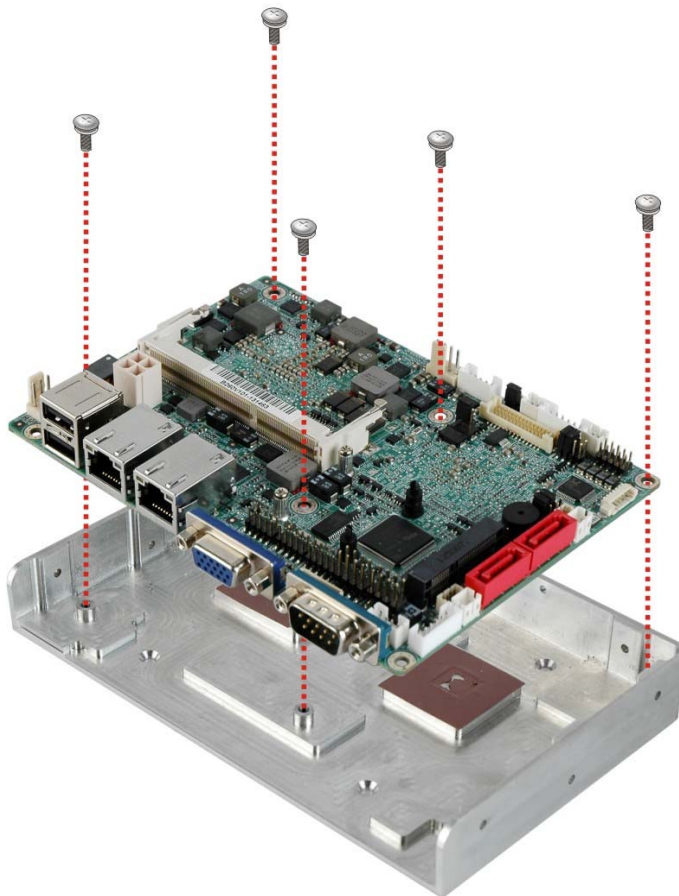


Figure 4-27: Heat Sink Enclosure Retention Screws

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the “**Press DEL or F2 to enter SETUP**” message appears on the screen.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up key	Move to the next page
Page Dn key	Move to the previous page

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the jumper described in **Chapter 4**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

WAFER-NM701-1007U 3.5" Motherboard

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information				Set the Date. Use Tab to switch between Data elements.	
BIOS Vendor	American Megatrends				
Core Version	4.6.5.3				
Compliance	UEFI 2.3; PI 1.2				
Project Version	B260AR03.ROM				
Build Date and Time	12/06/2012 11:53:40				
Processor Information					
Name	SandyBridge				
Brand String	Intel(R) Celeron(R) CPU				
Frequency	1500 MHz				
Processor ID	206a7				
Stepping	D2				
Number of Processors	2Core(s) / 2Thread(s)				
Microcode Revision	28				
GT Info	GT2 (800 MHz)				
IGFX VBIOS Version		2143		-----	
Memory RC Version	1.2.2.0				
Total Memory	4096 MB (DDR3)				
Memory Frequency	1600 MHz				
PCH Information					
Name	PantherPoint				
Stepping	04/C1				
TXT Capability of Platform/PCH	Supported				
LAN PHY Revision	N/A				
ME FW Version	8.1.2.1318				
ME Firmware SKU	1.5MB				
SPI Clock Frequency			→←: Select Screen		
DOFR Support	Unsupported		↑ ↓: Select Item		
Read Status Clock Frequency	33 MHz		Enter: Select		
Write Status Clock Frequency	33 MHz		+/-: Change Opt.		
Fast Read Status Clock Frequency	33 MHz		F1: General Help		
System Date	[Mon 03/04/2013]		F2: Previous Values		
System Time	[15:10:27]		F3: Optimized Defaults		
Access Level	Administrator		F4: Save & Exit		
			ESC: Exit		
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.					

BIOS Menu 1: Main

→ System Overview

The system overview lists a brief summary of the BIOS. The fields in system overview cannot be changed. The items shown in the system overview include:

- BIOS Information
- Processor Information
- Memory Information
- PCH Information
- SPI Clock Frequency

The **Main** menu has two user configurable fields:

→ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

→ System Time [xx:xx:xx]

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:



WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

WAFER-NM701-1007U 3.5" Motherboard

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit
-----
> ACPI Settings
> RTC Wake Settings
> CPU Configuration
> SATA Configuration
> USB Configuration
> F81867 Super IO Configuration
> F81867 H/W Monitor
> Serial Port Console Redirection
> iEi Feature
> ICP Board

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

Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Advanced
-----
ACPI Settings
ACPI Sleep State          [S1 only(CPU Stop Cl...)]

Select ACPI sleep state
the system will enter
when the SUSPEND button
is pressed.
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 3: ACPI Settings

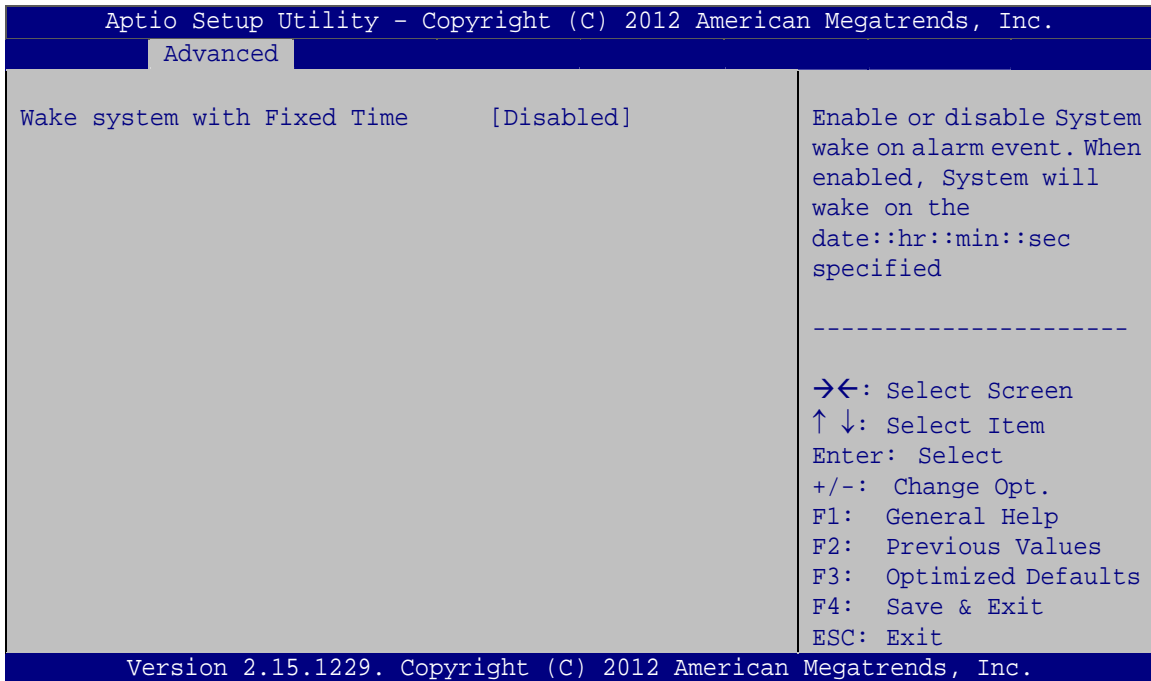
➔ **ACPI Sleep State [S1 only (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **S1 only (CPU Stop Clock)** **DEFAULT** The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3 only (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.



BIOS Menu 4: RTC Wake Settings

WAFER-NM701-1007U 3.5" Motherboard

→ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

→ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

→ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
CPU Configuration
Intel(R) Celeron(R) CPU 1007UE @ 1.50GHz
CPU Signature                206a7
Microcode Patch              28
Max CPU Speed                1500 MHz
Min CPU Speed                800 MHz
CPU Speed                    1500 MHz
Processor Cores              2
Intel HT Technology          Not Supported
Intel VT-x Technology        Supported
Intel SMX Technology         Not Supported
64-bit                      Supported

L1 Data Cache                32 KB x 2
L1 Code Cache                32 KB x 2
L2 Cache                     256 KB x 2
L3 Cache                     2048 KB

Intel Virtualization Technology [Disabled]

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

Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 5: CPU Configuration

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed
- Processor Core: Lists the number of the processor cores
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.

WAFER-NM701-1007U 3.5" Motherboard

- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- 64-bit: Indicates if 64-bit is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

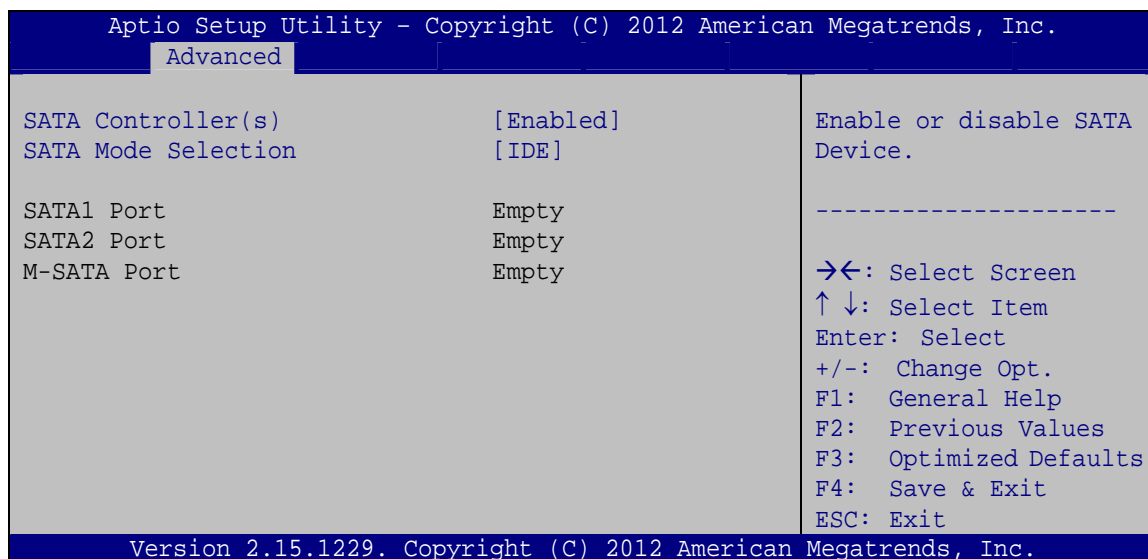
➔ Intel Virtualization Technology [Disabled]

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel Virtualization technology allows several OSs to run on the same system at the same time.

- ➔ **Disabled** **DEFAULT** Disables Intel Virtualization Technology.
- ➔ **Enabled** Enables Intel Virtualization Technology.

5.3.4 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 6: SATA Configuration

→ **SATA Controller(s) [Enabled]**

Use the **SATA Controller(s)** option to enable or disable SATA devices.

- **Enabled** **DEFAULT** Enables SATA devices.
- **Disabled** Disables SATA devices.

→ **SATA Mode Selection [IDE]**

Use the **SATA Mode Selection** option to configure SATA devices as normal IDE or AHCI devices.

- **IDE** **DEFAULT** Configures SATA devices as normal IDE device.
- **AHCI** Configures SATA devices as AHCI device.

5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
USB Configuration                                     Enables Legacy USB
USB Devices:                                         support. AUTO option
  None                                               disables legacy support
Legacy USB Support                                  if no USB devices are
  [Enabled]                                         connected. DISABLE
                                                    option will keep USB
                                                    devices available only
                                                    for EFI applications.
                                                    -----
                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
    
```

BIOS Menu 7: USB Configuration

WAFER-NM701-1007U 3.5" Motherboard

→ Legacy USB Support [Enabled]

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- **Enabled** **DEFAULT** Legacy USB support enabled
- **Disabled** Legacy USB support disabled
- **Auto** Legacy USB support disabled if no USB devices are connected

5.3.6 F81867 Super IO Configuration

Use the **F81867 Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the serial ports.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
F81867 Super IO Configuration
F81867 Super IO Chip                      F81867
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration
> Serial Port 5 Configuration
> Serial Port 6 Configuration

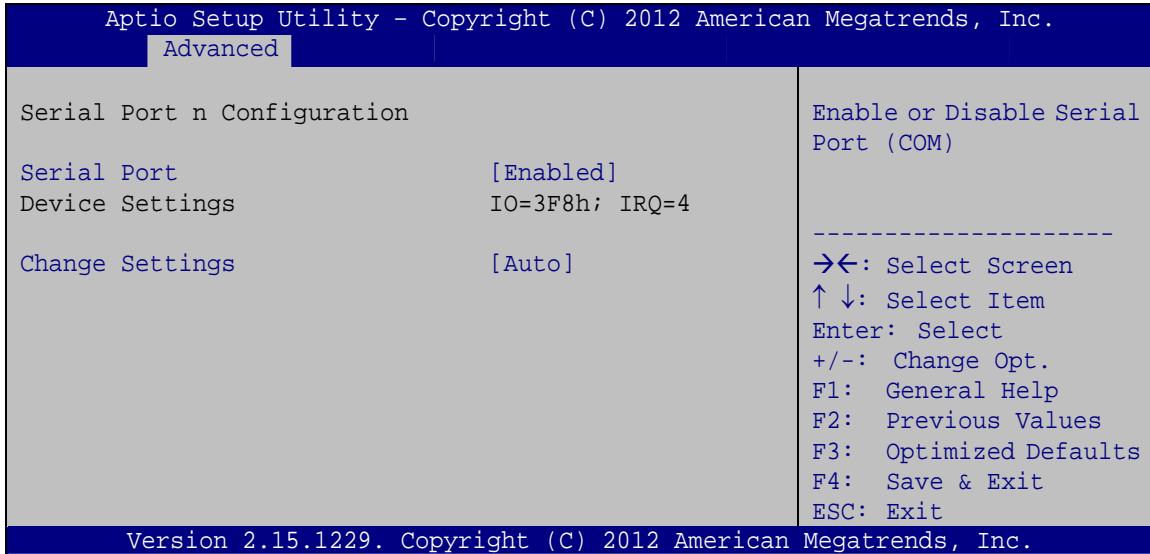
Set Parameters of Serial Port 1 (COMA)
-----
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 8: F81867 Super IO Configuration

5.3.6.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.



BIOS Menu 9: Serial Port n Configuration Menu

5.3.6.1.1 Serial Port 1 Configuration

→ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** Disable the serial port
- **Enabled** **DEFAULT** Enable the serial port

→ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- **IO=3F8h;**
IRQ=4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

WAFER-NM701-1007U 3.5" Motherboard

- ➔ **IO=3F8h;**
IRQ=3, 4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2F8h;**
IRQ=3, 4 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2C0h;**
IRQ=3, 4 Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
- ➔ **IO=2C8h;**
IRQ=3, 4 Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.6.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** Disable the serial port
- ➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2F8h;**
IRQ=3 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- ➔ **IO=3F8h;**
IRQ=3, 4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2F8h;**
IRQ=3, 4 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2C0h;**
IRQ=3, 4 Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

- **IO=2C8h;**
IRQ=3, 4 Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.6.1.3 Serial Port 3 Configuration

→ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** Disable the serial port
- **Enabled** **DEFAULT** Enable the serial port

→ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- **IO=3E8h;**
IRQ=10 Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- **IO=3E8h;**
IRQ=10, 11 Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- **IO=2E8h;**
IRQ=10, 11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- **IO=2D0h;**
IRQ=10, 11 Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- **IO=2D8h;**
IRQ=10, 11 Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

5.3.6.1.4 Serial Port 4 Configuration

→ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

WAFER-NM701-1007U 3.5" Motherboard

- ➔ Disabled Disable the serial port
- ➔ Enabled **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E8h;**
IRQ=10 Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
- ➔ **IO=3E8h;**
IRQ=10, 11 Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E8h;**
IRQ=10, 11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h;**
IRQ=10, 11 Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2D8h;**
IRQ=10, 11 Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

5.3.6.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ Disabled Disable the serial port
- ➔ Enabled **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

WAFER-NM701-1007U 3.5" Motherboard

- | | | | |
|---|--------------------------------|----------------|---|
| → | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| → | IO=2D0h;
IRQ=10 | | Serial Port I/O port address is 2D0h and the interrupt address is IRQ10 |
| → | IO=2C0h;
IRQ=10, 11 | | Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11 |
| → | IO=2C8h;
IRQ=10, 11 | | Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11 |
| → | IO=2D0h;
IRQ=10, 11 | | Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11 |
| → | IO=2D8h;
IRQ=10, 11 | | Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11 |
| → | IO=2E0h;
IRQ=10, 11 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11 |

5.3.6.1.6 Serial Port 6 Configuration

→ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- | | | | |
|---|-----------------|----------------|-------------------------|
| → | Disabled | | Disable the serial port |
| → | Enabled | DEFAULT | Enable the serial port |

→ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- | | | | |
|---|----------------------------|----------------|---|
| → | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| → | IO=2D8h;
IRQ=10 | | Serial Port I/O port address is 2D8h and the interrupt address is IRQ10 |

WAFER-NM701-1007U 3.5" Motherboard

- ➔ **IO=2C0h;** Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
IRQ=10, 11
- ➔ **IO=2C8h;** Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
IRQ=10, 11
- ➔ **IO=2D0h;** Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
IRQ=10, 11
- ➔ **IO=2D8h;** Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
IRQ=10, 11
- ➔ **IO=2E0h;** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
IRQ=10, 11

5.3.7 F81867 H/W Monitor

The **F81867 H/W Monitor** menu (**BIOS Menu 10**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
PC Health Status
> Smart Fan Mode Configuration
CPU temperature           : +52 C
System temperature       : +51 C
CPU_FAN1 Speed           : N/A
SYS_FAN1 Speed           : N/A
+VCC_CORE                 : +0.968 V
+VCC_GFX                  : +0.968 V
+V5S                      : +5.129 V
+V12S                     : +11.176 V
+V1.5                     : +1.568 V
VSB5V                     : +5.040 V
+V3.3S                    : +3.328 V
VSB3V                     : +3.344 V
VBAT                      : +3.280 V
Smart Fan Mode Select
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.

```

BIOS Menu 10: F81867 H/W Monitor

→ PC Health Status

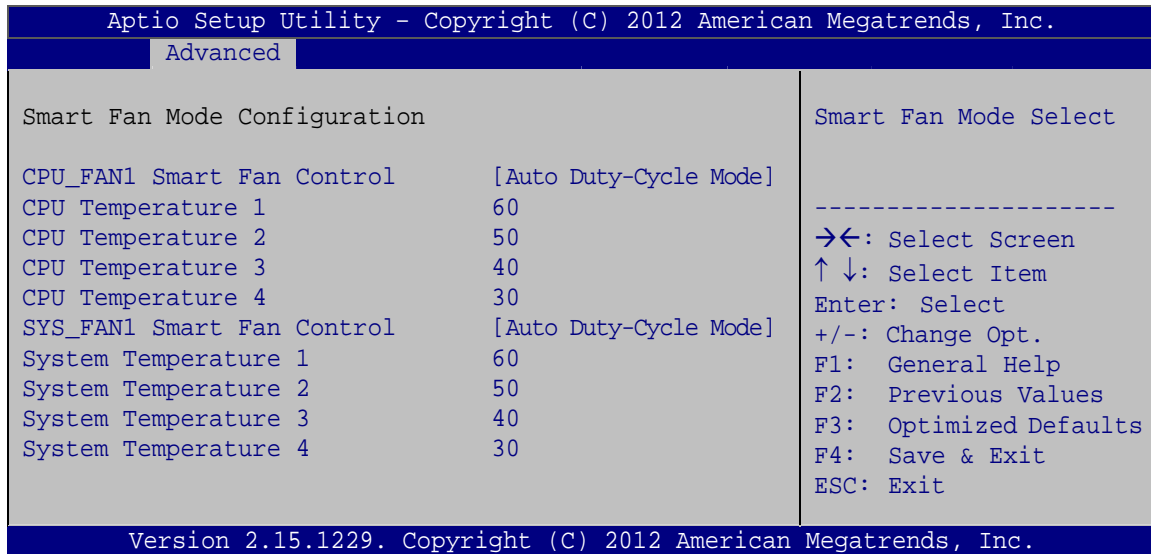
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
 - CPU Temperature
 - System Temperature
- Fan Speeds:
 - CPU Fan Speed
 - System Fan Speed
- Voltages:
 - +VCC_CORE
 - +V5S
 - +V12S
 - +V1.5
 - VSB5V
 - +V3.3S
 - VSB3V
 - VBAT

5.3.7.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 11**) to configure fan temperature and speed settings.

WAFER-NM701-1007U 3.5" Motherboard



BIOS Menu 11: Smart Fan Mode Configuration

→ CPU_FAN1/SYS_FAN Smart Fan Control [Auto Duty-Cycle Mode]

Use the **CPU_FAN1** or **SYS_FAN1 Smart Fan Control** option to configure the CPU or System Smart Fan.

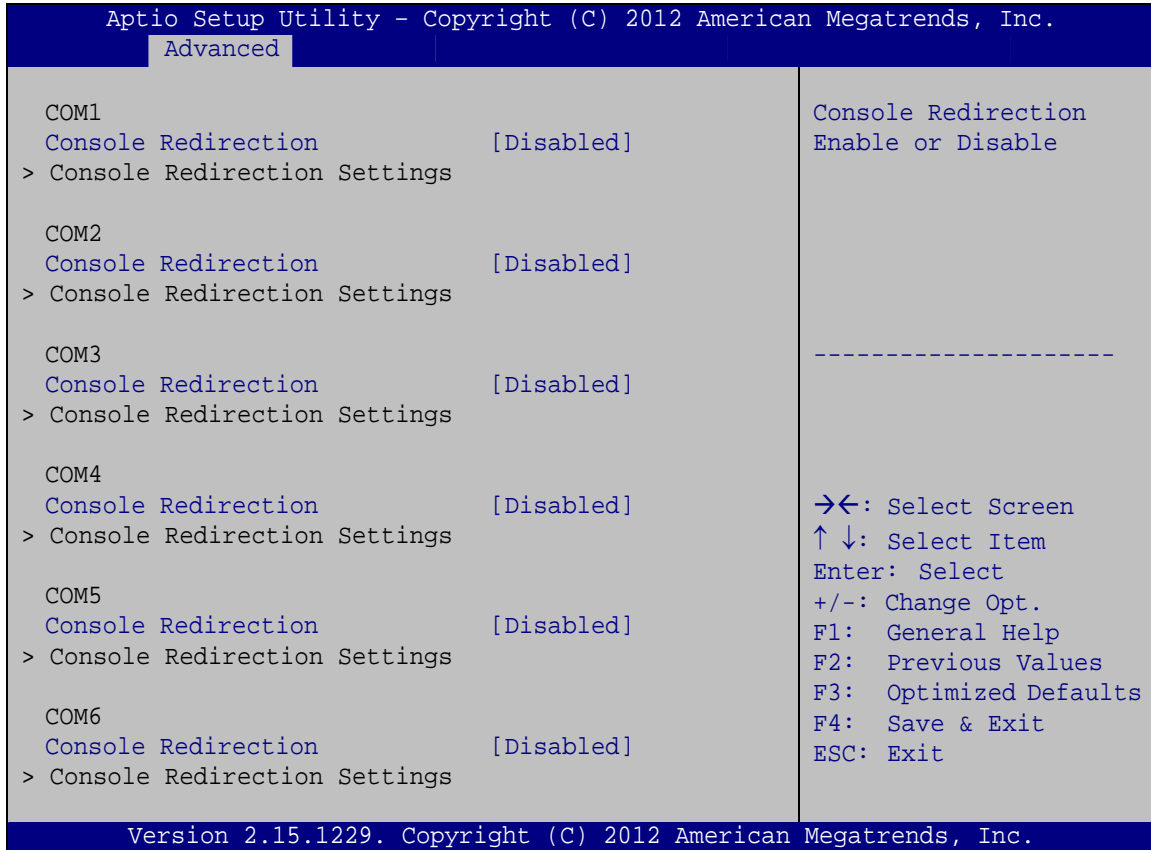
- **Auto Duty-Cycle Mode** **DEFAULT** The fan adjusts its speed using Auto Duty-Cycle settings
- **Manual Duty Mode** The fan spins at the speed set in Manual Duty Mode settings

→ CPU/System Temperature n

Use the +/- key or enter a decimal number to change the fan **CPU** or **System Temperature n** value.

5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 12**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 12: Serial Port Console Redirection

→ Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

- **Disabled** **DEFAULT** Disabled the console redirection function
- **Enabled** Enabled the console redirection function

→ Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type.

- **VT100** The target terminal type is VT100
- **VT100+** The target terminal type is VT100+
- **VT-UTF8** The target terminal type is VT-UTF8
- **ANSI** **DEFAULT** The target terminal type is ANSI

WAFER-NM701-1007U 3.5" Motherboard

→ Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- **9600** Sets the serial port transmission speed at 9600.
- **19200** Sets the serial port transmission speed at 19200.
- **38400** Sets the serial port transmission speed at 38400.
- **57600** Sets the serial port transmission speed at 57600.
- **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

→ Data Bits [8]

Use the **Data Bits** option to specify the number of data bits.

- **7** Sets the data bits at 7.
- **8** **DEFAULT** Sets the data bits at 8.

→ Parity [None]

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- **None** **DEFAULT** No parity bit is sent with the data bits.
- **Even** The parity bit is 0 if the number of ones in the data bits is even.
- **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- **Mark** The parity bit is always 1. This option does not provide error detection.
- **Space** The parity bit is always 0. This option does not provide error detection.

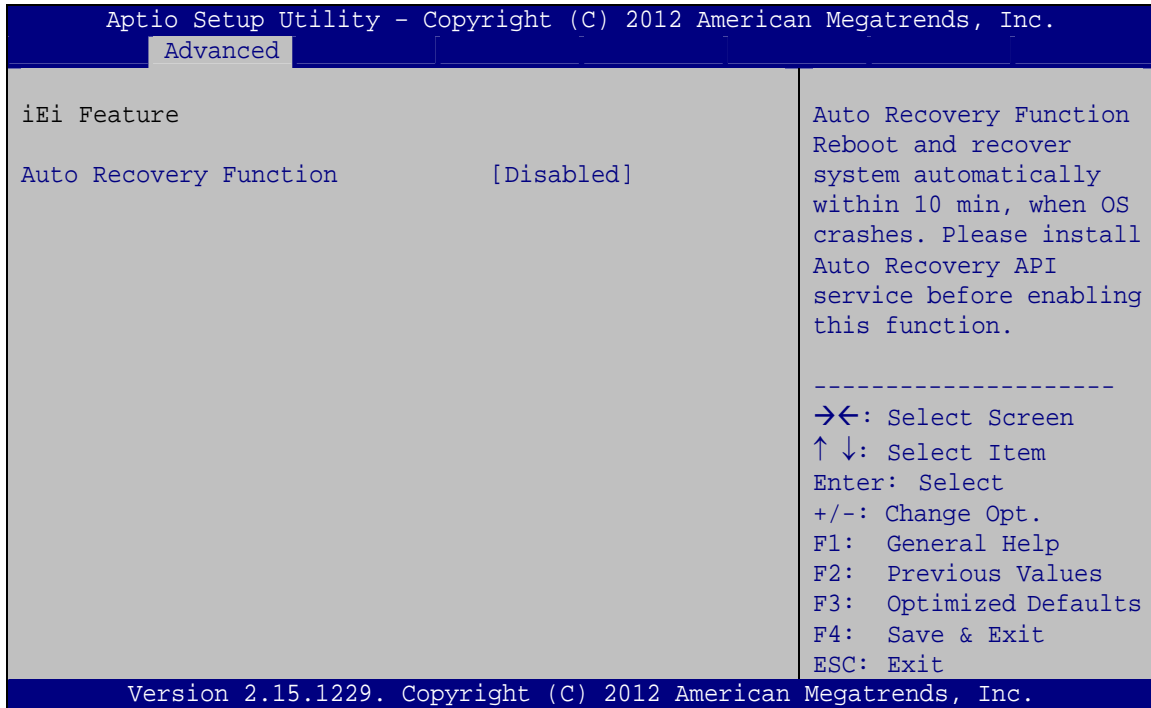
→ Stop Bits [1]

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- 1 DEFAULT** Sets the number of stop bits at 1.
- 2** Sets the number of stop bits at 2.

5.3.9 iEi Feature

Use the **iEi Feature** menu (BIOS Menu 13) to configure One Key Recovery function.


BIOS Menu 13: iEi Feature
→ Auto Recovery Function [Disabled]

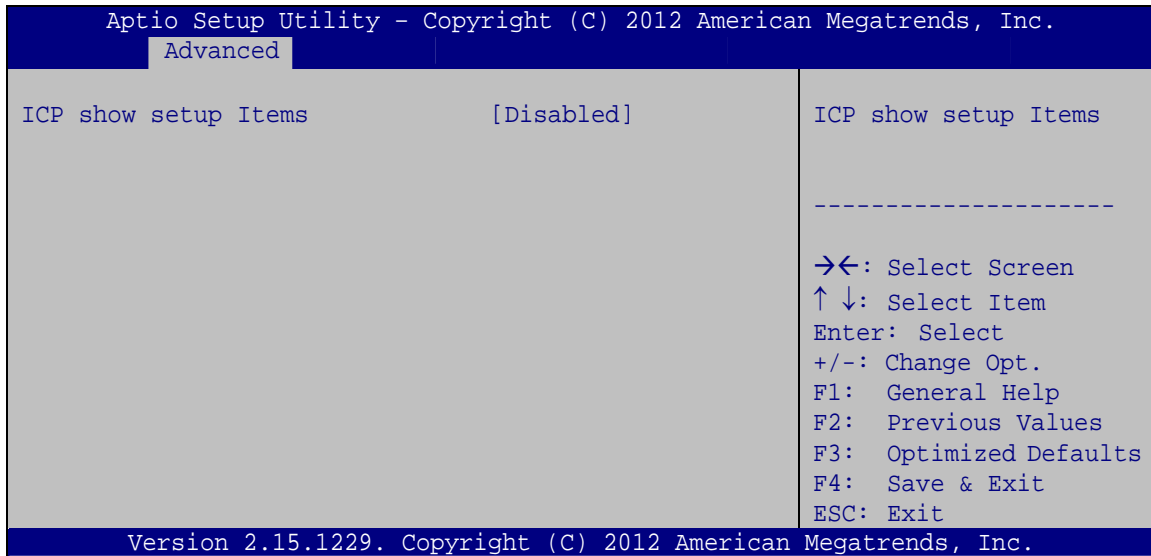
Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

- Disabled DEFAULT** Auto recovery function disabled
- Enabled** Auto recovery function enabled

WAFER-NM701-1007U 3.5" Motherboard

5.3.10 ICP Board

Use the **ICP Board** menu (**BIOS Menu 14**) to show detailed setup items.



BIOS Menu 14: ICP Board

→ ICP show setup Items [Disabled]

Use the **ICP show setup Items** BIOS option to enable or disable configuring the ICP board parameters.

- **Disabled** **DEFAULT** Disables to show detailed setup items.
- **Enabled** If selected, the following BIOS menus appear, allowing you to configure the CPU PPM and CPU DTS, and view the Intel RC driver version details and switchable graphics mode selection:
 - Intel RC Drivers Version Detail
 - CPU PPM Configuration
 - Switchable Graphics
 - Sandybridge DTS Configuration

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the PCH IO and System Agent (SA) configuration menus.



WARNING!

Setting the wrong values for the chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
> PCH-IO Configuration
> System Agent (SA) Configuration

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

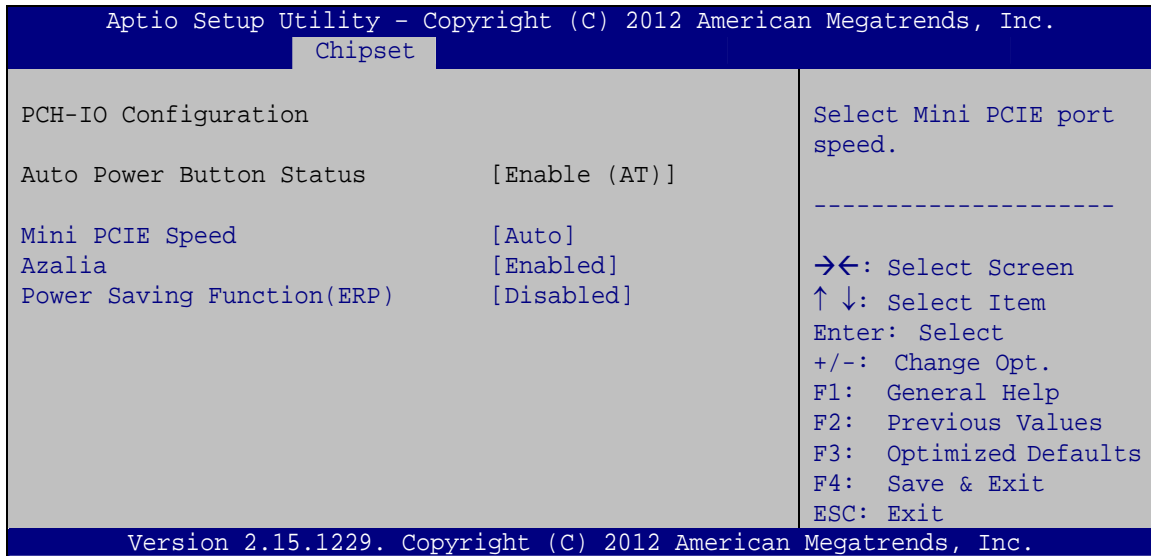
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 15: Chipset

5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 16**) to configure the PCH parameters.

WAFER-NM701-1007U 3.5" Motherboard



BIOS Menu 16: PCH-IO Configuration

→ Mini PCIE Speed [Auto]

Use this option to select the support type of the PCIe Mini slot. The following options are available:

- Auto **Default**
- Gen1
- Gen2

→ Azalia [Enabled]

Use the **Azalia** option to enable or disable the High Definition Audio controller.

- **Disabled** The onboard High Definition Audio controller is disabled.
- **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled

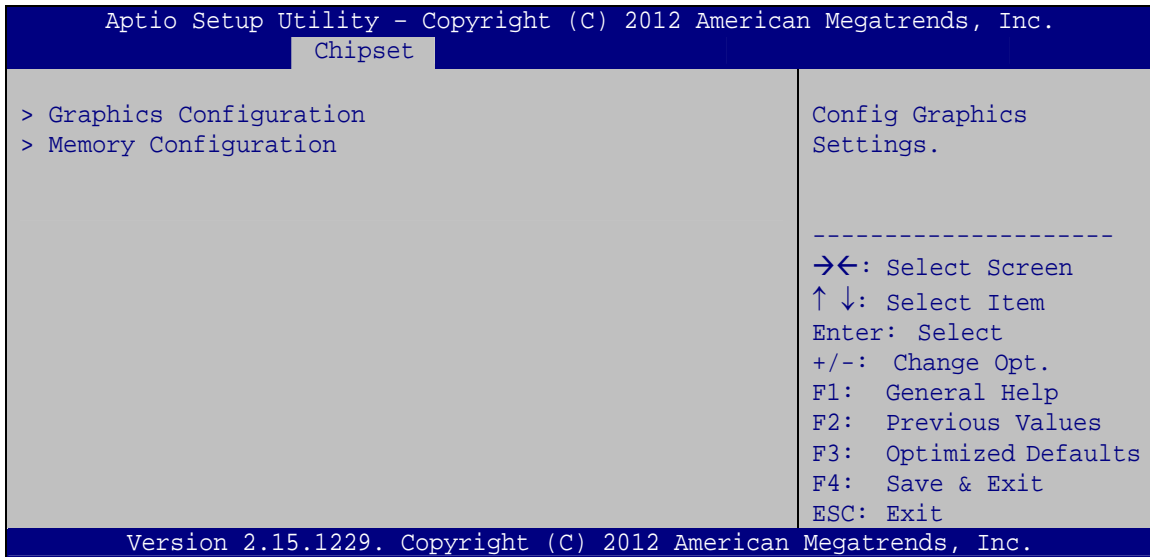
→ Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function(ERP)** option to enable or disable the power saving function.

- **Disabled** **DEFAULT** Disables the power saving function.
- **Enabled** Enables the power saving function.

5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 17**) to configure the System Agent (SA) parameters.

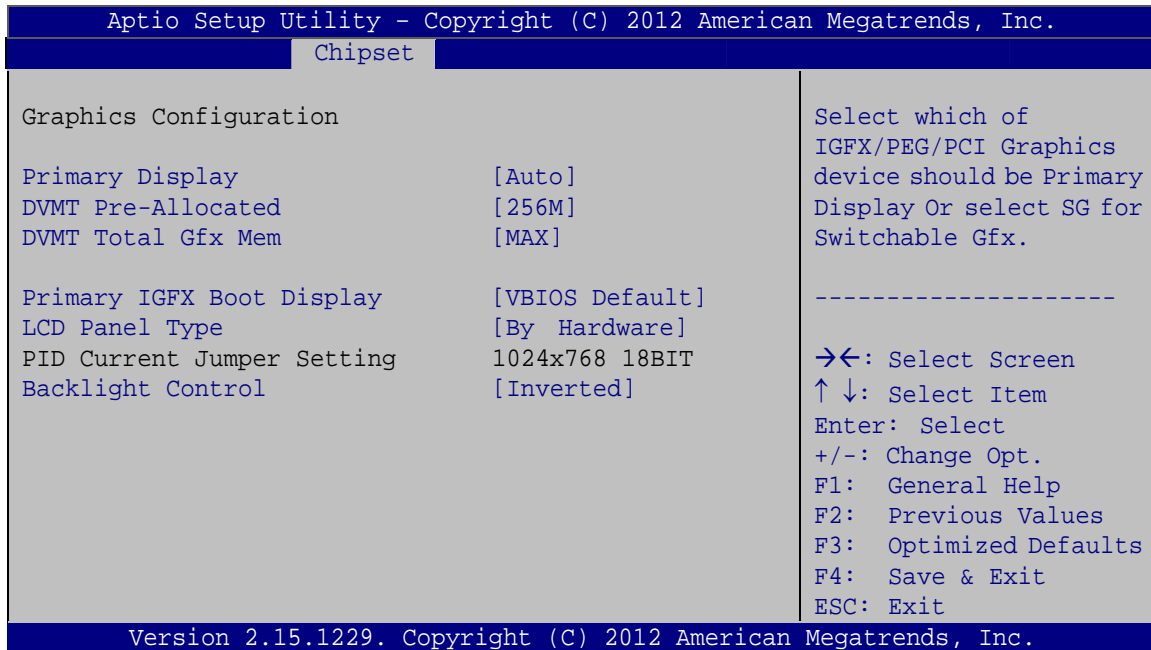


BIOS Menu 17: System Agent (SA) Configuration

5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** submenu (**BIOS Menu 18**) to configure the video device connected to the system.

WAFER-NM701-1007U 3.5" Motherboard



BIOS Menu 18: Graphics Configuration

→ Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses.

The following options are available:

- Auto **Default**
- IGFX
- PEG

→ DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 128M
- 256M **Default**
- 512M

→ DVMT Total Gfx Mem [MAX]

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

→ Primary IGFX Boot Display [VBIOS Default]

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**
- CRT
- LVDS

→ LCD Panel Type [By Hardware]

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- By Hardware **DEFAULT**
- 640x480 18BIT
- 800x480 18BIT
- 800x600 18BIT
- 1024x768 18BIT
- 1024x768 24BIT
- 1280x1024 48BIT
- 1600x1200 48BIT
- 1280x768 18BIT
- 1280x800 18BIT
- 1366x768 24BIT
- 1440x900 48BIT
- 1600x900 48BIT
- 1680x1050 48BIT
- 1920x1080 48BIT
- 1920x1200 48BIT

WAFER-NM701-1007U 3.5" Motherboard

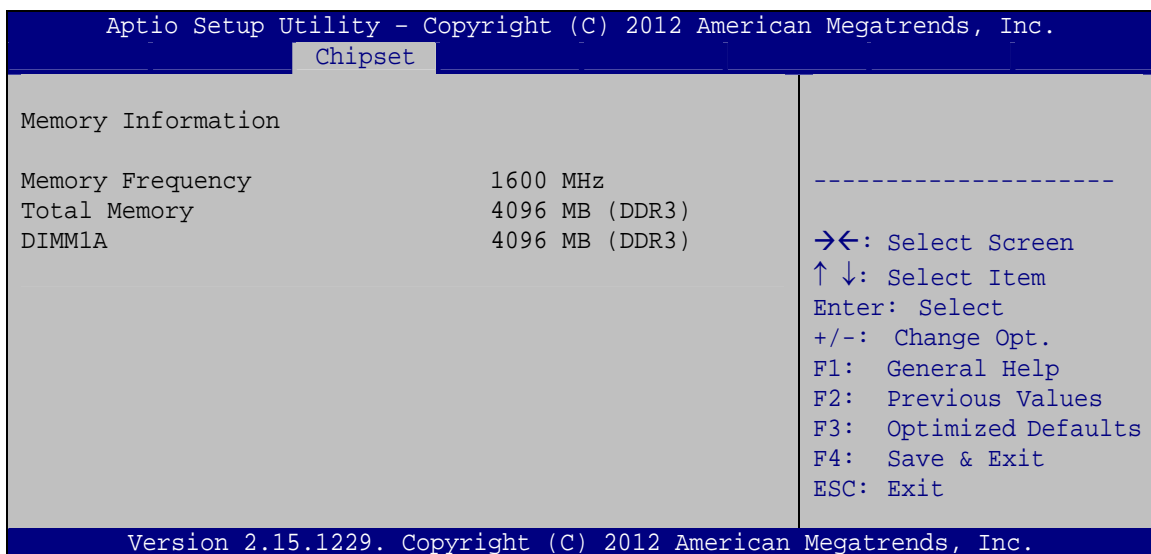
→ Backlight Control [Inverted]

Use the **Backlight Control** option to select the backlight control mode.

- **Normal** Brightest at high voltage level
- **Inverted** **DEFAULT** Brightest at low voltage level

5.4.2.2 Memory Configuration

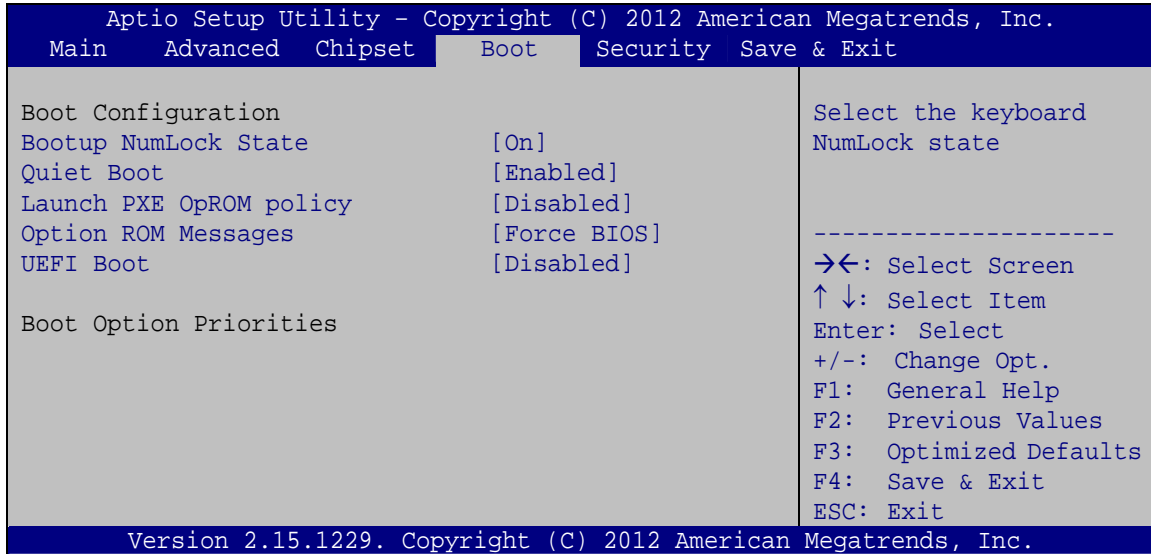
Use the **Memory Configuration** menu (**BIOS Menu 19**) to view memory information.



BIOS Menu 19: Memory Configuration

5.5 Boot

Use the **Boot menu (BIOS Menu 20)** to configure system boot options.



BIOS Menu 20: Boot

→ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

→ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

→ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

WAFER-NM701-1007U 3.5" Motherboard

→ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- **Disabled** Normal POST messages displayed
- **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

→ Launch PXE OpROM policy [Disabled]

Use the **Launch PXE OpROM policy** option to enable or disable boot option for legacy network devices.

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

→ Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

- **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- **Keep Current** Sets display mode to current.

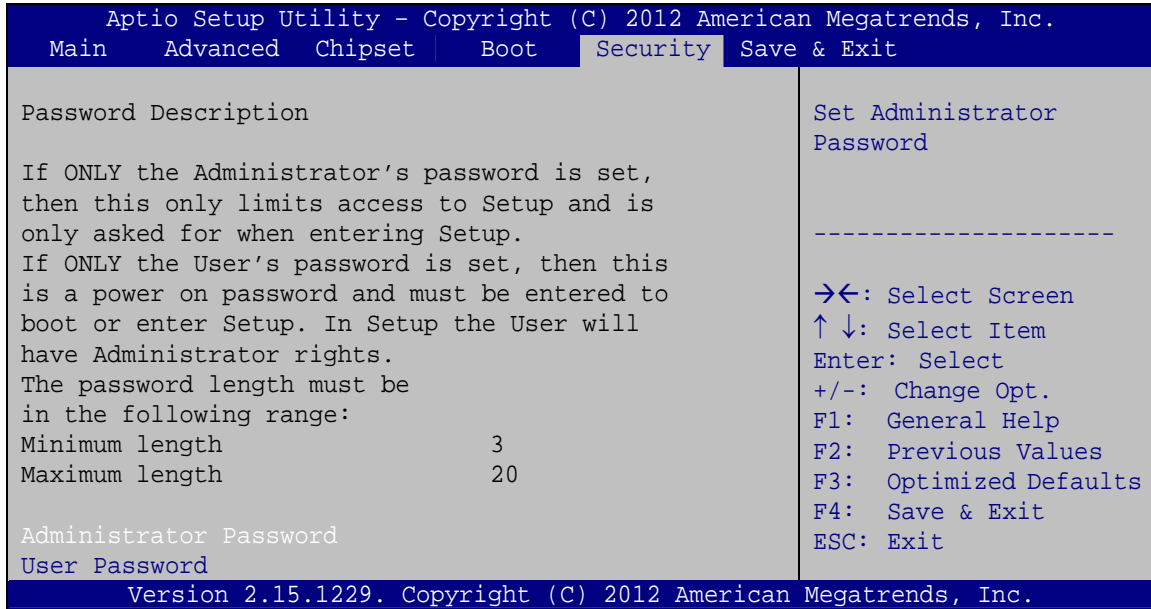
→ UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- **Disabled** **DEFAULT** Disables to boot from the UEFI devices.
- **Enabled** Enables to boot from the UEFI devices.

5.6 Security

Use the **Security** menu (**BIOS Menu 21**) to set system and user passwords.



BIOS Menu 21: Security

→ Administrator Password

Use the **Administrator Password** to set or change a administrator password.

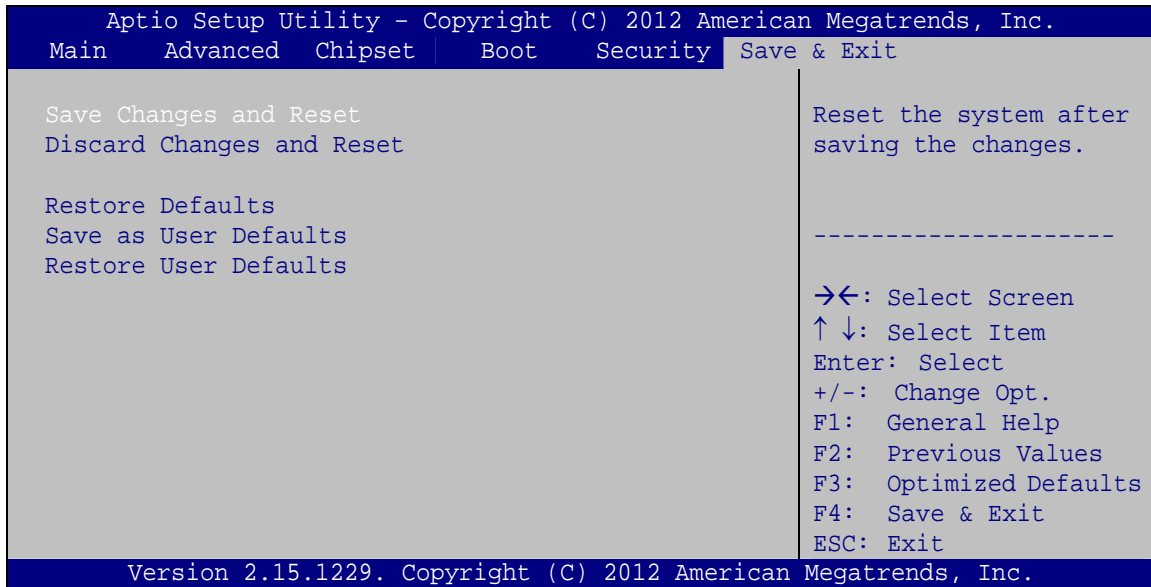
→ User Password

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.

WAFER-NM701-1007U 3.5" Motherboard



BIOS Menu 22:Exit

→ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

→ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

→ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

→ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

→ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.



Chapter

6

Software Drivers

6.1 Available Software Drivers



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN
- Audio

Installation instructions are given below.

6.2 Starting the Driver Program

To access the driver installation programs, please do the following.

Step 1: Insert the CD that came with the system into a CD drive connected to the system.



NOTE:

If the installation program doesn't start automatically:
Click "Start->Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 6-1**).

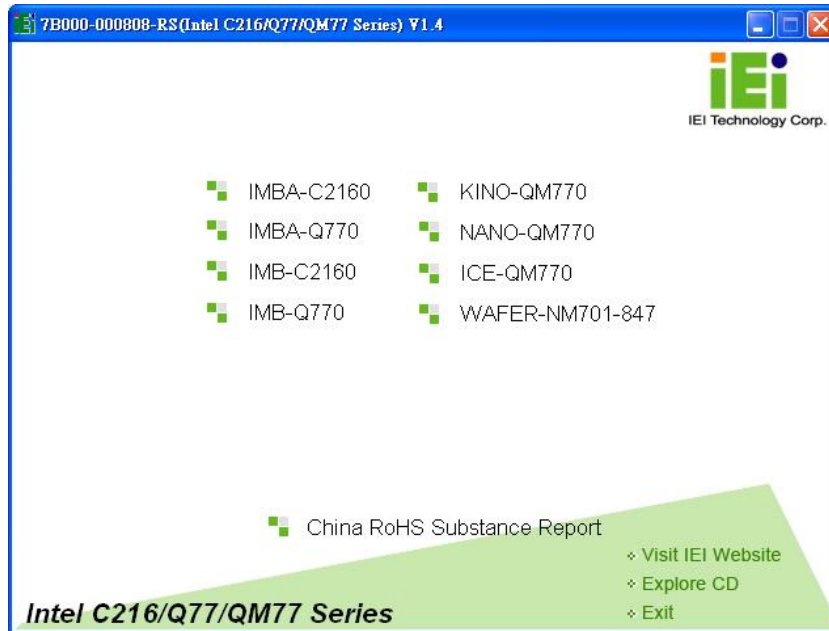


Figure 6-1: Start Up Screen

Step 3: Click WAFER-NM701-1007U.

Step 4: The list of drivers in **Figure 6-2** appears.



Figure 6-2: Drivers

WAFER-NM701-1007U 3.5" Motherboard

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “1-Chipset”.

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-3** appears. Click **Next** to continue.



Figure 6-3: Chipset Driver Welcome Screen

Step 5: The license agreement in **Figure 6-4** appears.

Step 6: Read the **License Agreement**.

Step 7: Click **Yes** to continue.

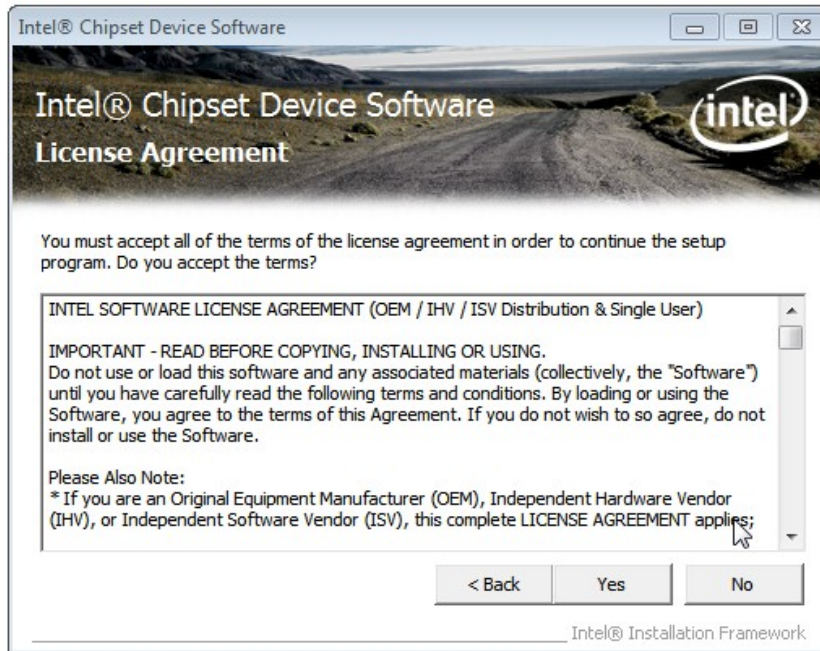


Figure 6-4: Chipset Driver License Agreement

Step 8: The Read Me file in Figure 6-5 appears.

Step 9: Click **Next** to continue.

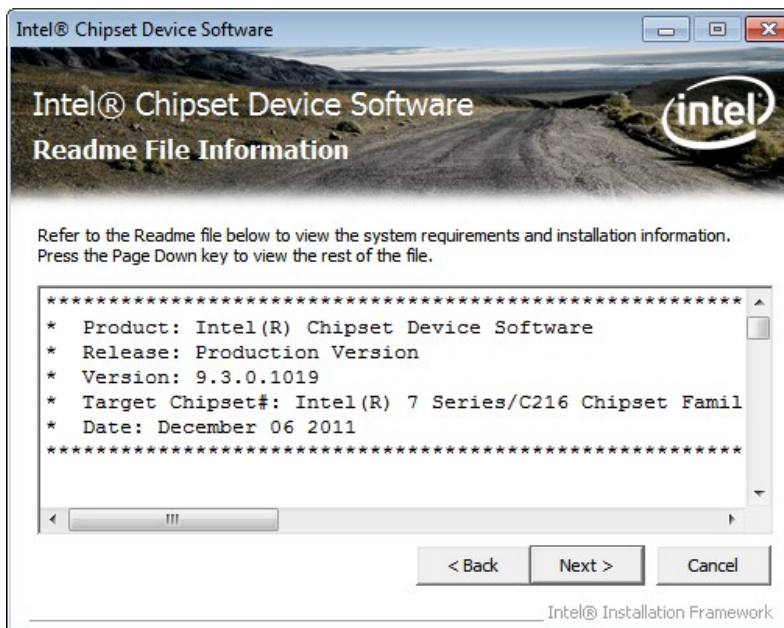


Figure 6-5: Chipset Driver Read Me File

WAFER-NM701-1007U 3.5" Motherboard

Step 10: Setup Operations are performed as shown in Figure 6-6.

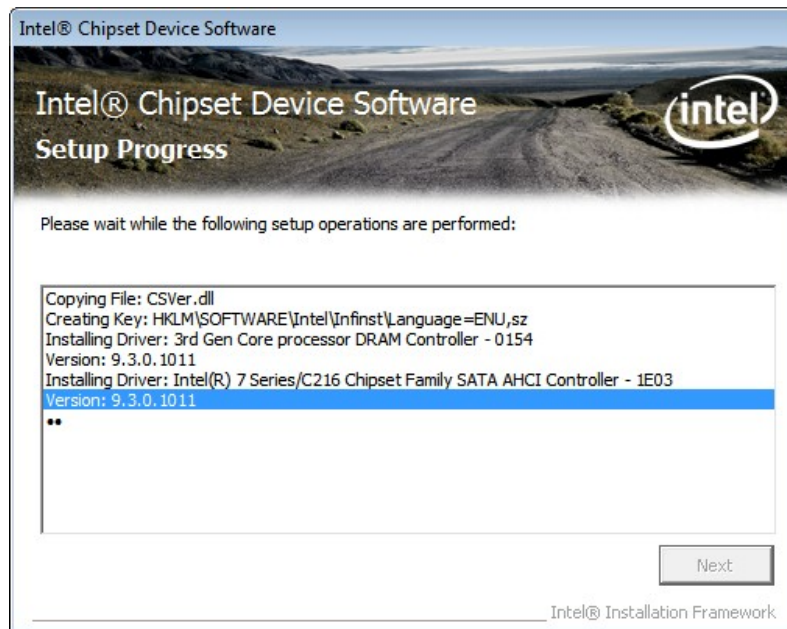


Figure 6-6: Chipset Driver Setup Operations

Step 11: Once the Setup Operations are complete, click **Next** to continue.

Step 12: The **Finish** screen appears.

Step 13: Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See Figure 6-7.



Figure 6-7: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the graphics driver, please do the following.

- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click **"2-Graphics"** and select the folder which corresponds to the operating system.
- Step 3:** Double click the setup file.
- Step 4:** The **Welcome Screen** in **Figure 6-8** appears. Click **Next** to continue.

WAFER-NM701-1007U 3.5" Motherboard

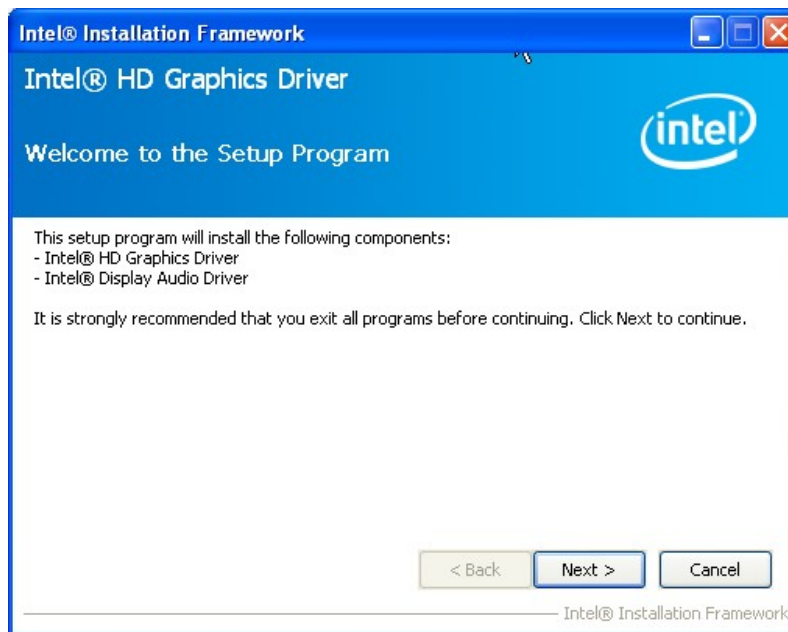


Figure 6-8: Graphics Driver Welcome Screen

Step 5: The license agreement in **Figure 6-9** appears. Read the **License Agreement**.

Step 6: Click **Yes** to continue.



Figure 6-9: Graphics Driver License Agreement

Step 7: The Read Me file in **Figure 6-10** appears.

Step 8: Click **Next** to continue.

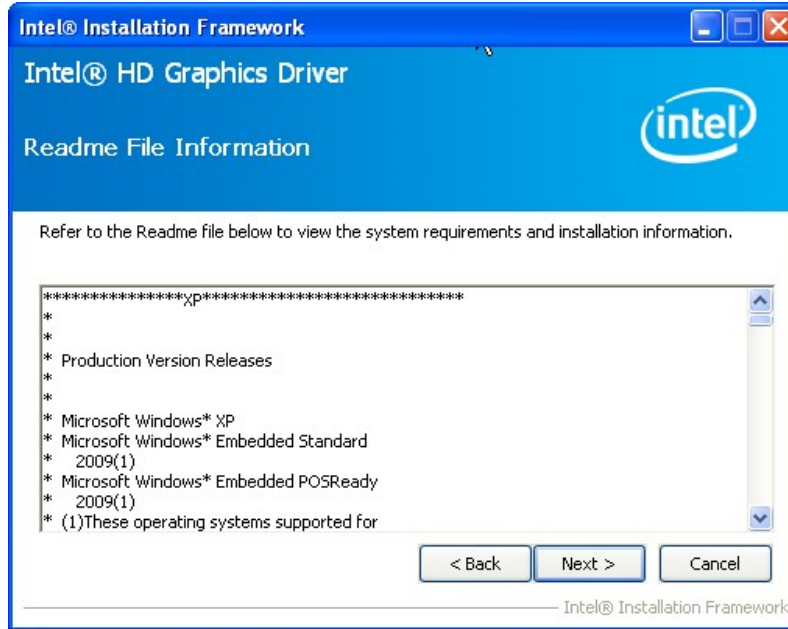


Figure 6-10: Graphics Driver Read Me File

Step 9: **Setup Operations** are performed as shown in **Figure 6-11**.

WAFER-NM701-1007U 3.5" Motherboard

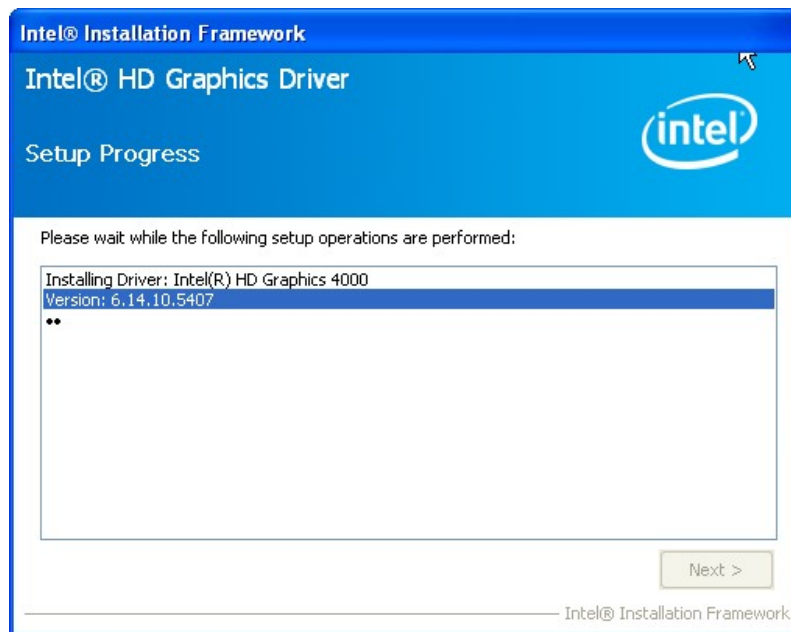


Figure 6-11: Graphics Driver Setup Operations

Step 10: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 11: The **Finish** screen appears.

Step 12: Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See **Figure 6-12**.

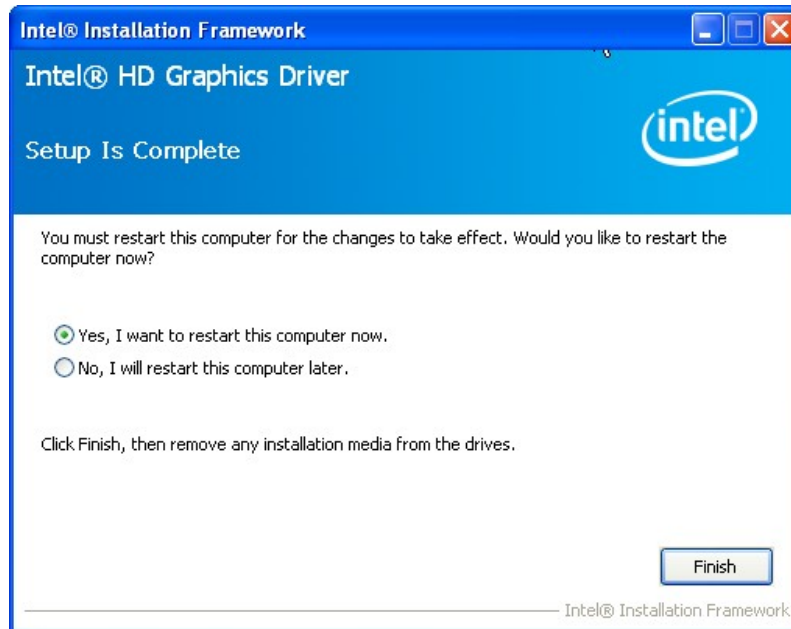


Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

- Step 1:** Access the driver list shown in Figure 6-2. (See **Section 6.2**)
- Step 2:** Click “**3-LAN**” and select the folder which corresponds to the operating system.
- Step 3:** Double click the setup file.
- Step 4:** The **Welcome** screen in **Figure 6-13** appears.

WAFER-NM701-1007U 3.5" Motherboard

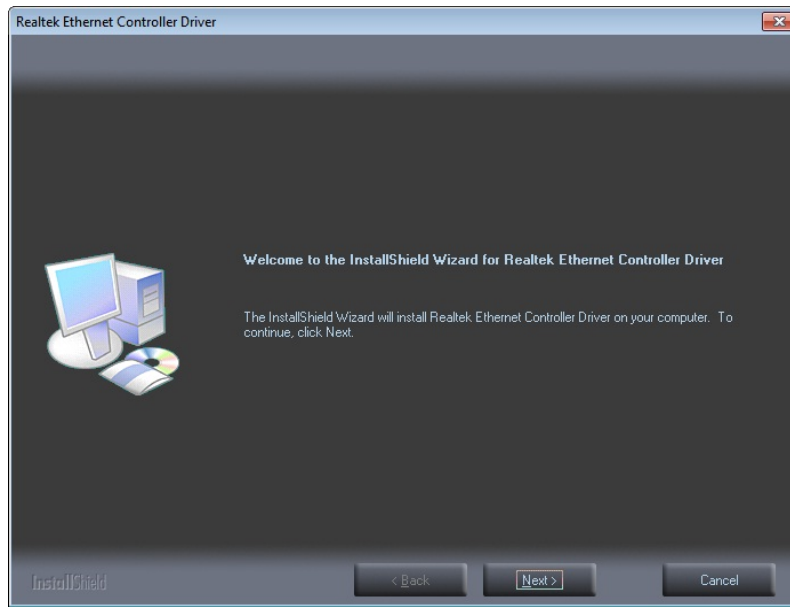


Figure 6-13: LAN Driver Welcome Screen

Step 5: Click **Next** to continue.

Step 6: The **Ready to Install** screen in **Figure 6-14** appears.

Step 7: Click **Install** to proceed with the installation.

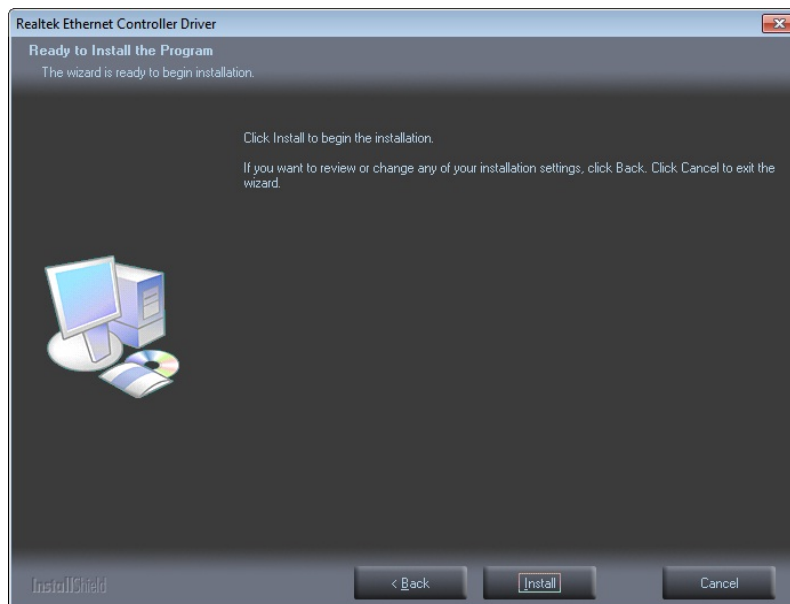


Figure 6-14: LAN Driver Installation

Step 8: The program begins to install.

Step 9: When the driver installation is complete, the screen in **Figure 6-15** appears.

Step 10: Click **Finish** to exit.

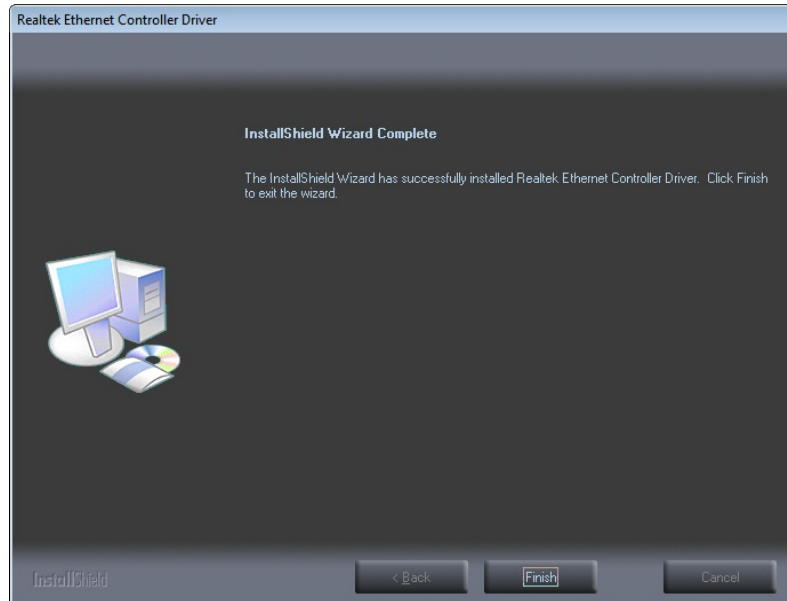


Figure 6-15: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the Audio driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click **"4-Audio"** and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **InstallShield Wizard** is prepared to guide the user through the rest of the process.

Step 5: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 6-16**).

WAFER-NM701-1007U 3.5" Motherboard

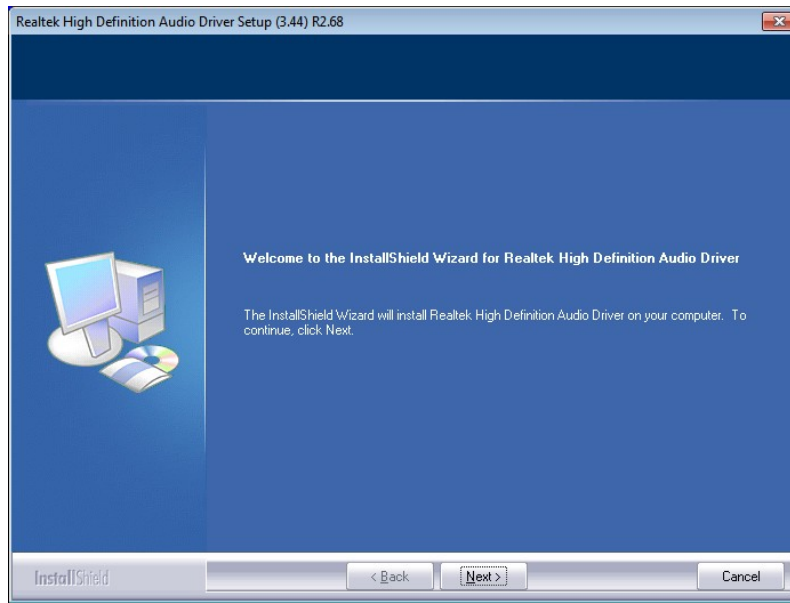


Figure 6-16: Audio Driver Welcome Screen

Step 6: Click **Next** to continue.

Step 7: The program begins to install. The installation progress can be monitored in the progress bar shown in **Figure 6-17**.

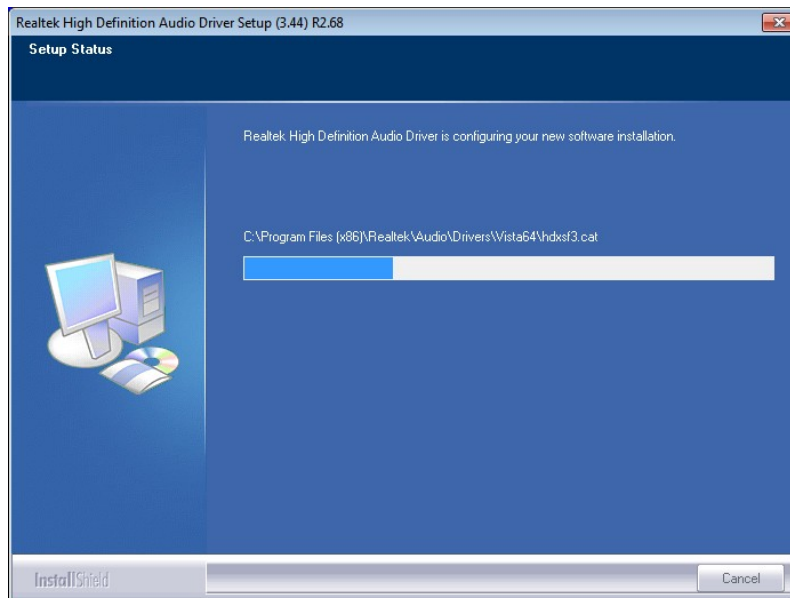


Figure 6-17: Audio Driver Installation

Step 8: When the driver installation is complete, the screen in **Figure 6-18** appears.

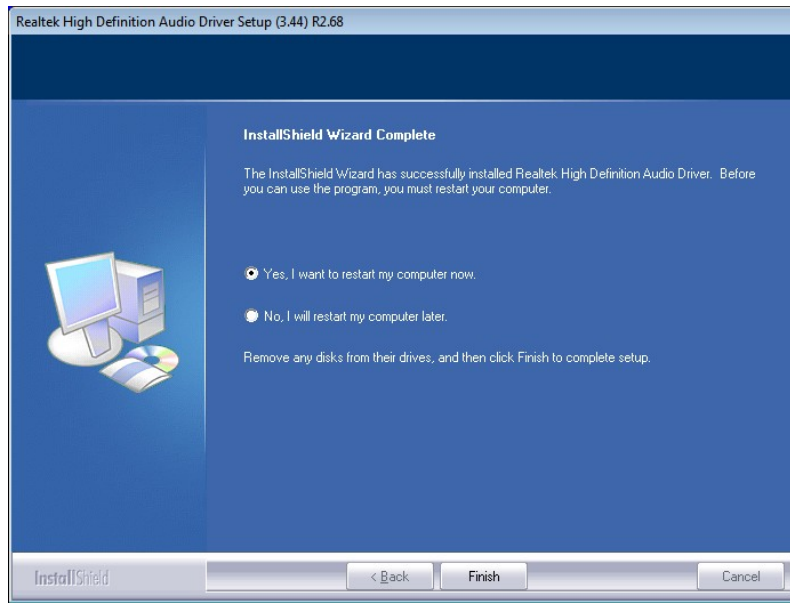


Figure 6-18: Audio Driver Installation Complete

Step 9: Select “**Yes, I want to restart my computer now**” and click **Finish**.

Step 10: The system reboots.

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

System Overview	70
System Date [xx/xx/xx]	70
System Time [xx:xx:xx]	70
ACPI Sleep State [S1 only (CPU Stop Clock)]	72
Wake system with Fixed Time [Disabled]	73
Intel Virtualization Technology [Disabled]	75
SATA Controller(s) [Enabled]	76
SATA Mode Selection [IDE]	76
Legacy USB Support [Enabled]	77
Serial Port [Enabled]	78
Change Settings [Auto]	78
Serial Port [Enabled]	79
Change Settings [Auto]	79
Serial Port [Enabled]	80
Change Settings [Auto]	80
Serial Port [Enabled]	80
Change Settings [Auto]	81
Serial Port [Enabled]	81
Change Settings [Auto]	81
Serial Port [Enabled]	82
Change Settings [Auto]	82
PC Health Status	84
CPU_FAN1/SYS_FAN Smart Fan Control [Auto Duty-Cycle Mode]	85
CPU/System Temperature n	85
Console Redirection [Disabled]	86
Terminal Type [ANSI]	86
Bits per second [115200]	87
Data Bits [8]	87
Parity [None]	87
Stop Bits [1]	88
Auto Recovery Function [Disabled]	88
ICP show setup Items [Disabled]	89
Mini PCIE Speed [Auto]	91

WAFER-NM701-1007U 3.5" Motherboard

Azalia [Enabled]	91
Power Saving Function(ERP) [Disabled].....	91
Primary Display [Auto]	93
DVMT Pre-Allocated [256M]	93
DVMT Total Gfx Mem [MAX].....	94
Primary IGFX Boot Display [VBIOS Default]	94
LCD Panel Type [By Hardware]	94
Backlight Control [Inverted].....	95
Bootup NumLock State [On].....	96
Quiet Boot [Enabled]	97
Launch PXE OpROM policy [Disabled].....	97
Option ROM Messages [Force BIOS].....	97
UEFI Boot [Disabled]	97
Administrator Password	98
User Password	98
Save Changes and Reset	99
Discard Changes and Reset	99
Restore Defaults	99
Save as User Defaults	99
Restore User Defaults	99



Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.



NOTE:

The latest One Key Recovery software provides an auto recovery function that allows a system running Microsoft Windows OS to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. Please refer to Section B.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

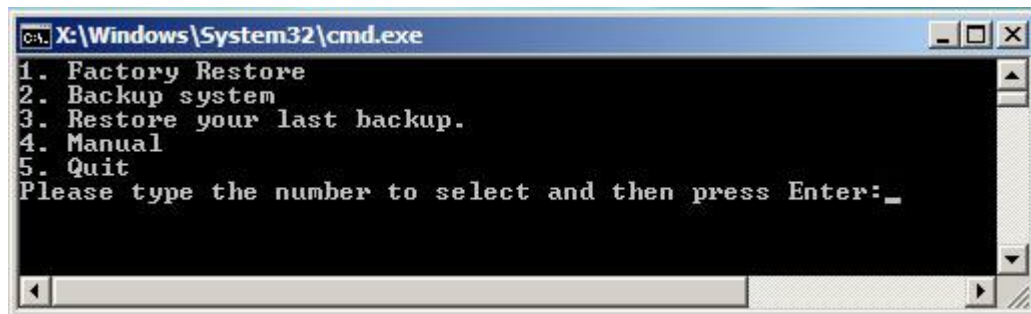


Figure B-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure B-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see Section **B.2.1**)
2. Create partitions (see **Section B.2.2**)
3. Install operating system, drivers and system applications (see **Section B.2.3**)
4. Build-up recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <F3> while booting up the system. The detailed information of each function is described in **Section B.5**.

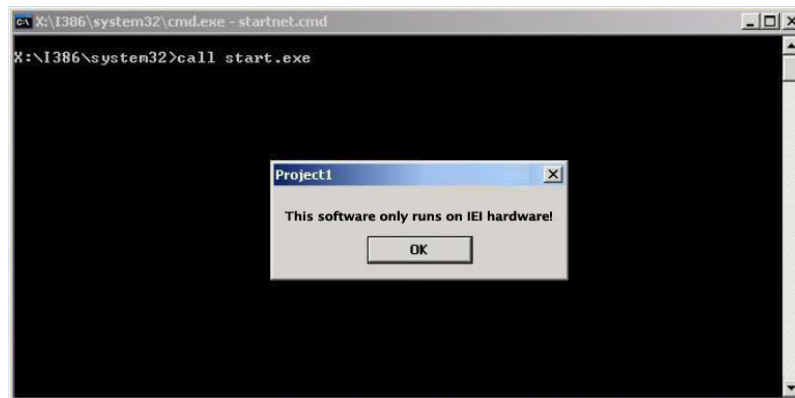
**NOTE:**

The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement

**NOTE:**

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.



To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the

WAFER-NM701-1007U 3.5" Motherboard

partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%



NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating system (OS). The supported OS versions are listed below.

- Microsoft Windows
 - Windows 2000
 - Windows XP (Service Pack 2 or 3 required)
 - Windows Vista
 - Windows 7
 - Windows CE 5.0
 - Windows CE 6.0
 - Windows XP Embedded
 - Windows Embedded Standard 7



NOTE:

The auto recovery function (described in **Section B.3**) and the restore through LAN function (described in **Section B.6**) are not supported in the Windows CE 5.0/6.0 operating system environment.

- Linux
 - Fedora Core 12 (Constantine)
 - Fedora Core 11 (Leonidas)
 - Fedora Core 10 (Cambridge)
 - Fedora Core 8 (Werewolf)
 - Fedora Core 7 (Moonshine)
 - RedHat RHEL-5.4
 - RedHat 9 (Ghirke)
 - Ubuntu 8.10 (Intrepid)
 - Ubuntu 7.10 (Gutsy)
 - Ubuntu 6.10 (Edgy)
 - Debian 5.0 (Lenny)
 - Debian 4.0 (Etch)
 - SuSe 11.2
 - SuSe 10.3

**NOTE:**

Installing unsupported OS versions may cause the recovery tool to fail.

B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section B.2.1**)

Step 2: Create partitions (see **Section B.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section B.2.3**)

Step 4: Build the recovery partition (see **Section B.2.4**) or build the auto recovery partition (see **Section B.3**)

Step 5: Create factory default image (see **Section B.2.5**)

WAFER-NM701-1007U 3.5" Motherboard

The detailed descriptions are described in the following sections.



NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux, most of the setup procedures are the same except for several steps described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

- Step 1:** Make sure the system is powered off and unplugged.
- Step 2:** Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.
- Step 3:** Connect an optical disk drive to the system and insert the recovery CD.
- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1st boot device. (**Boot** → **Boot Device Priority** → **1st Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

- Step 1:** Put the recovery CD in the optical drive of the system.

Step 2: Boot the system from recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

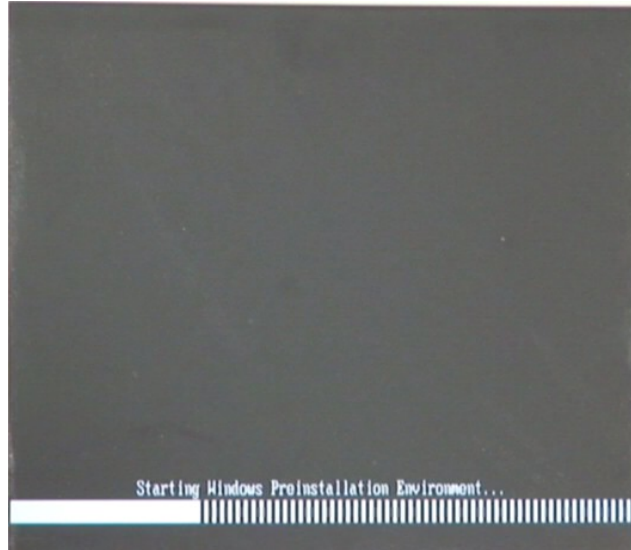


Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

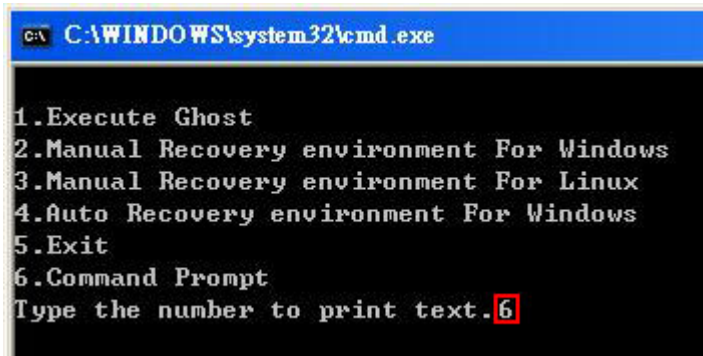
```
C:\WINDOWS\system32\cmd.exe

1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.
```

Figure B-3: Recovery Tool Setup Menu

Step 4: Press <6> then <Enter>.

WAFER-NM701-1007U 3.5" Motherboard



```
C:\WINDOWS\system32\cmd.exe

1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.6
```

Figure B-4: Command Prompt

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition. (Press <Enter> after entering each line below)

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>create part pri size= ____
DISKPART>assign letter=F
DISKPART>exit
system32>format N: /fs:ntfs /q /y
system32>format F: /fs:ntfs /q /v:Recovery /y
system32>exit
```

```

X:\I386\SYSTEM32\CMD.EXE
X:\I386\SYSTEM32>diskpart → Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC

DISKPART> list vol → Show partition information

Volume ### Ltr Label Fs Type Size Status Info
-----
Volume 0 X CD_ROM CDFS DUD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy

DISKPART> sel disk 0 → Select a disk
Disk 0 is now the selected disk.

DISKPART> create part pri size=2000 → Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=N → Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.

DISKPART> create part pri size=1800 → Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=F → Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.

DISKPART> exit → Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y → Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.

X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y → Formate partition 2 (F) as NTFS formate and
name it as "Recovery".
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.

X:\I386\SYSTEM32>exit → Exit Windows PE
  
```

Figure B-5: Partition Creation Commands



NOTE:

Use the following commands to check if the partitions were created successfully.

```

X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
   Partition ###  Type              Size              Offset
-----
   Partition 1    Primary           2000 MB           32 KB
   Partition 2    Primary           1804 MB          2000 MB
DISKPART> exit
  
```

Step 6: Press any key to exit the recovery tool and automatically reboot the system.
Please continue to the following procedure: Build the Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.



NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Build-up Recovery Partition

- Step 1:** Put the recover CD in the optical drive.
- Step 2:** Start the system.
- Step 3:** **Boot the system from the recovery CD.** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

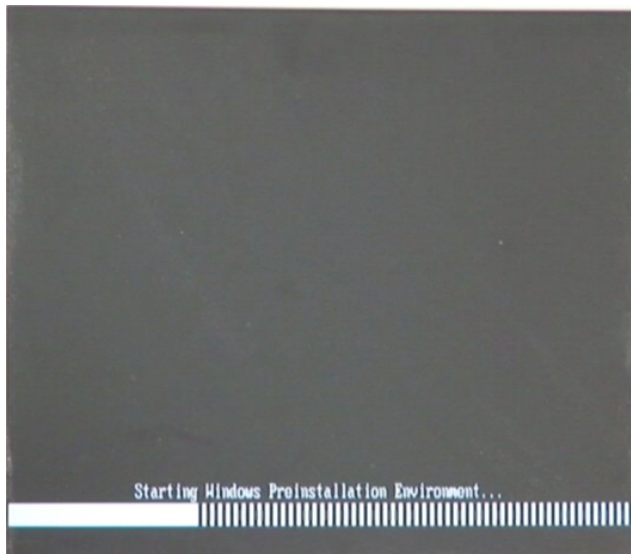


Figure B-6: Launching the Recovery Tool

- Step 4:** When the recovery tool setup menu appears, press <2> then <Enter>.

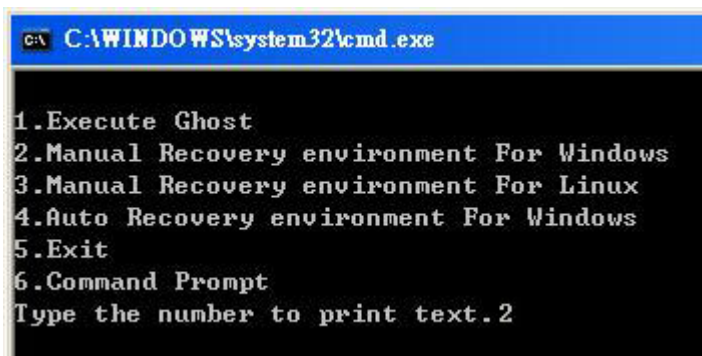


Figure B-7: Manual Recovery Environment for Windows

WAFER-NM701-1007U 3.5" Motherboard

Step 5: The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.

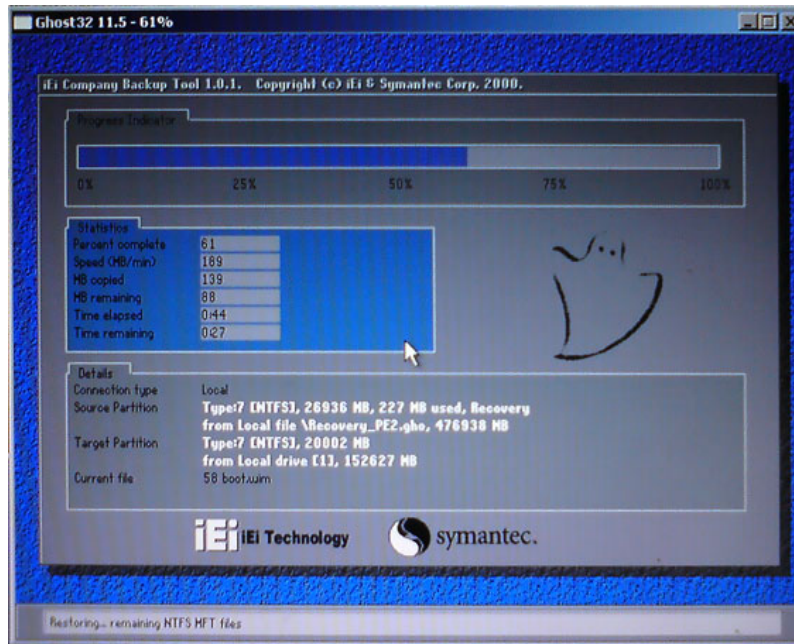


Figure B-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

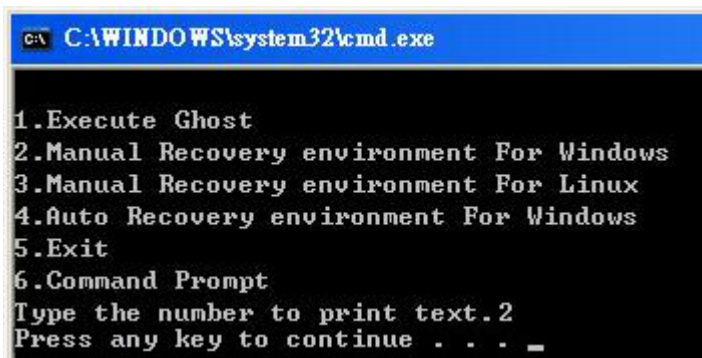


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image



NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-10**), press the <F3> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

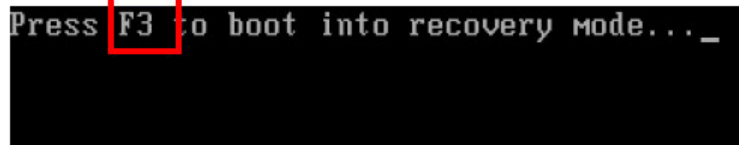


Figure B-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <4> and press <Enter>. (**Figure B-11**)

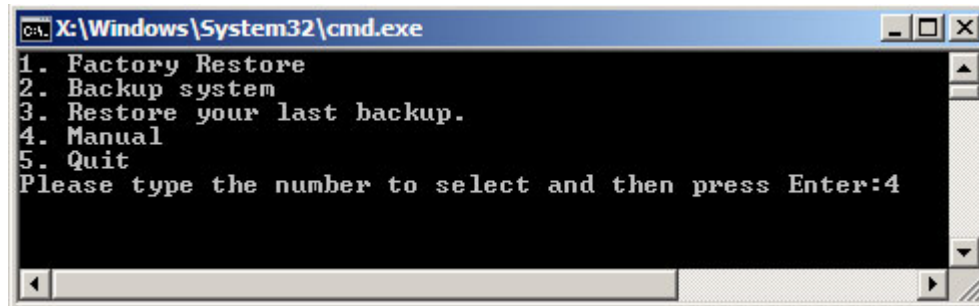


Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

WAFER-NM701-1007U 3.5" Motherboard

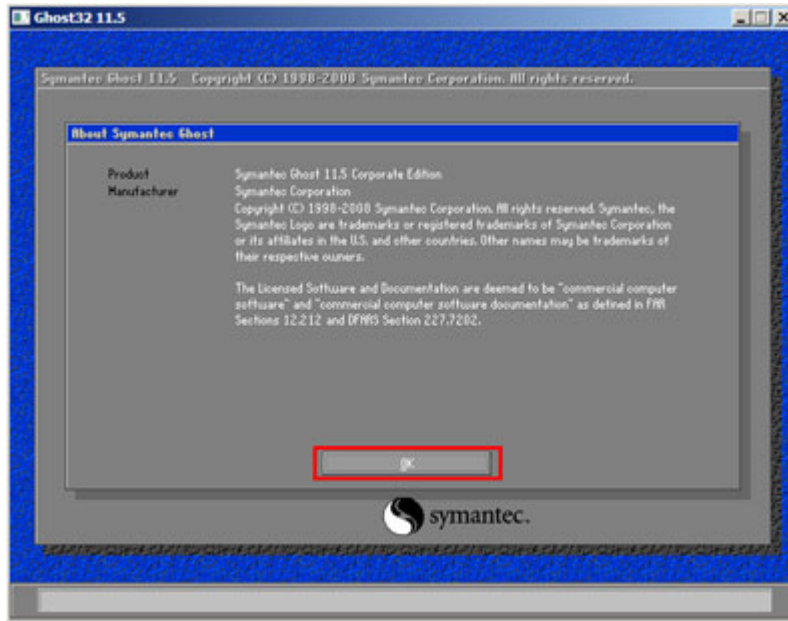


Figure B-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure B-13**).

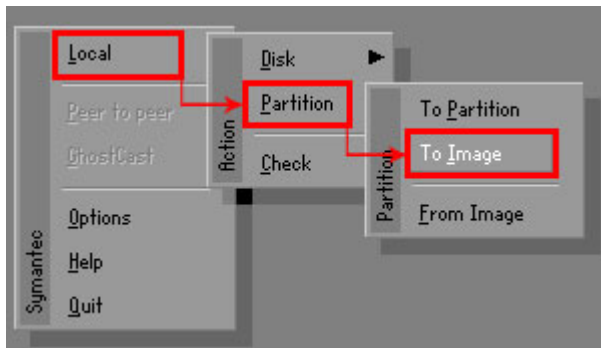


Figure B-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure B-14**. Then click OK.

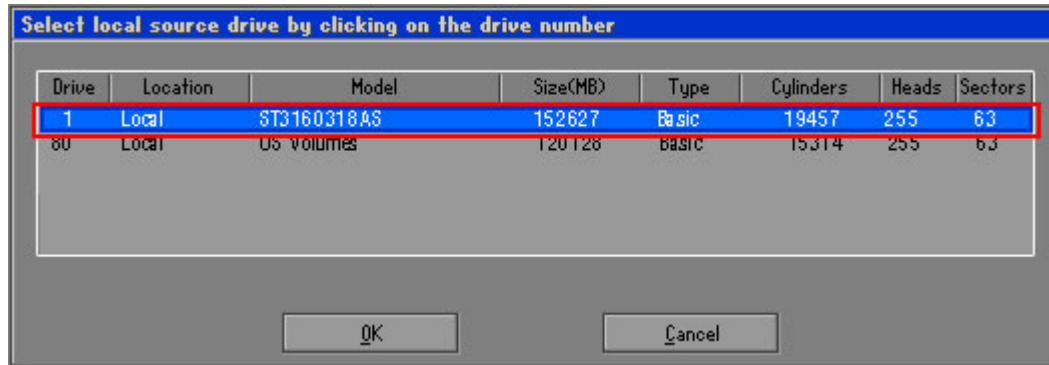


Figure B-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure B-15**. Then click OK.

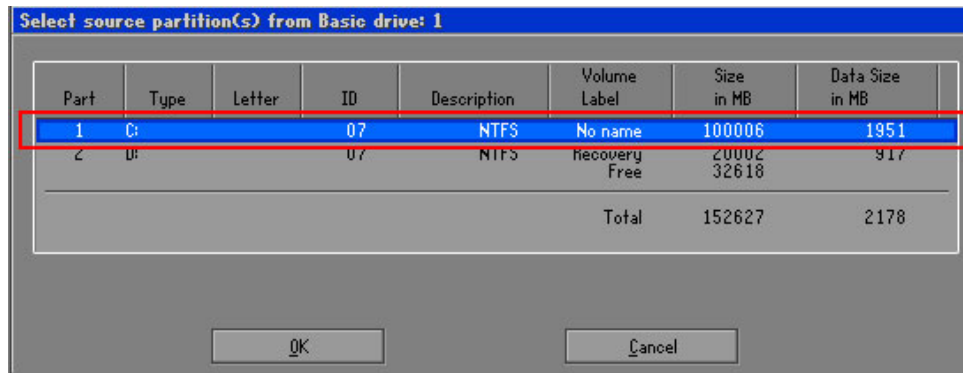


Figure B-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure B-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named **IEI.GHO**.



WARNING:

The file name of the factory default image must be **iei.GHO**.

WAFER-NM701-1007U 3.5" Motherboard

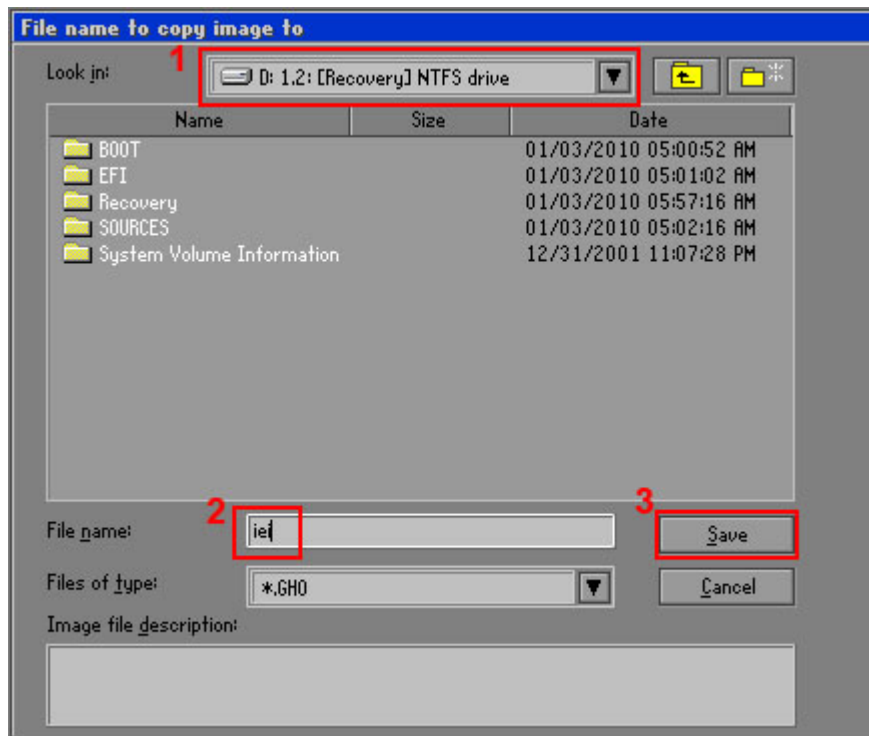


Figure B-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure B-17** prompts, click **High** to make the image file smaller.

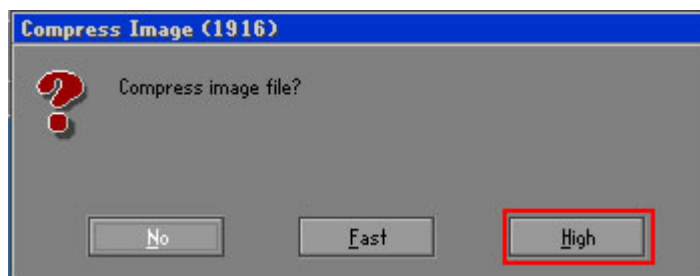


Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

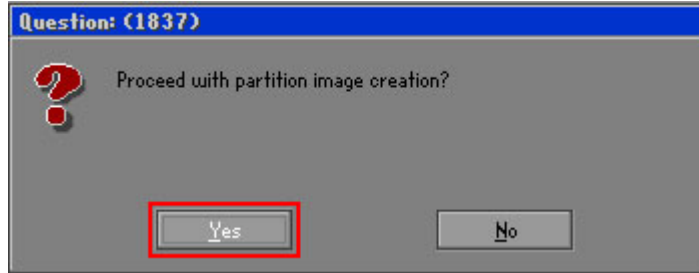


Figure B-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-19**).

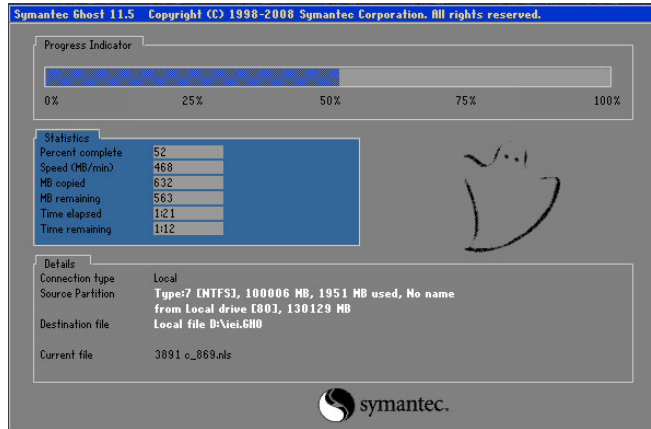


Figure B-19: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**. Click **Continue** and close the Ghost window to exit the program.

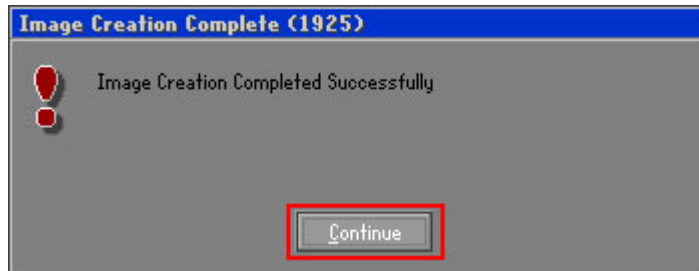
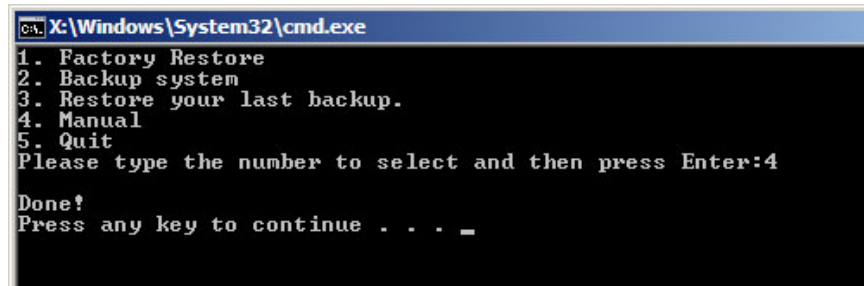


Figure B-20: Image Creation Complete

WAFER-NM701-1007U 3.5" Motherboard

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.



```
C:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:4
Done!
Press any key to continue . . . _
```

Figure B-21: Press Any Key to Continue

B.3 Auto Recovery Setup Procedure

The auto recovery function allows a system to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To use the auto recovery function, follow the steps described in the following sections.



CAUTION:

The auto recovery function can only run on a Microsoft Windows system with the following OS versions:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7



CAUTION:

The setup procedure may include a step to create a factory default image. It is suggested to configure the system to a factory default environment before the configuration, including driver and application installations.

Step 1: Follow the steps described in **Section B.2.1 ~ Section B.2.3** to setup BIOS, create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility **MUST** be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



Figure B-22: Auto Recovery Utility

Step 3: **Disable the automatically restart function before creating the factory default image.** Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure B-23**)

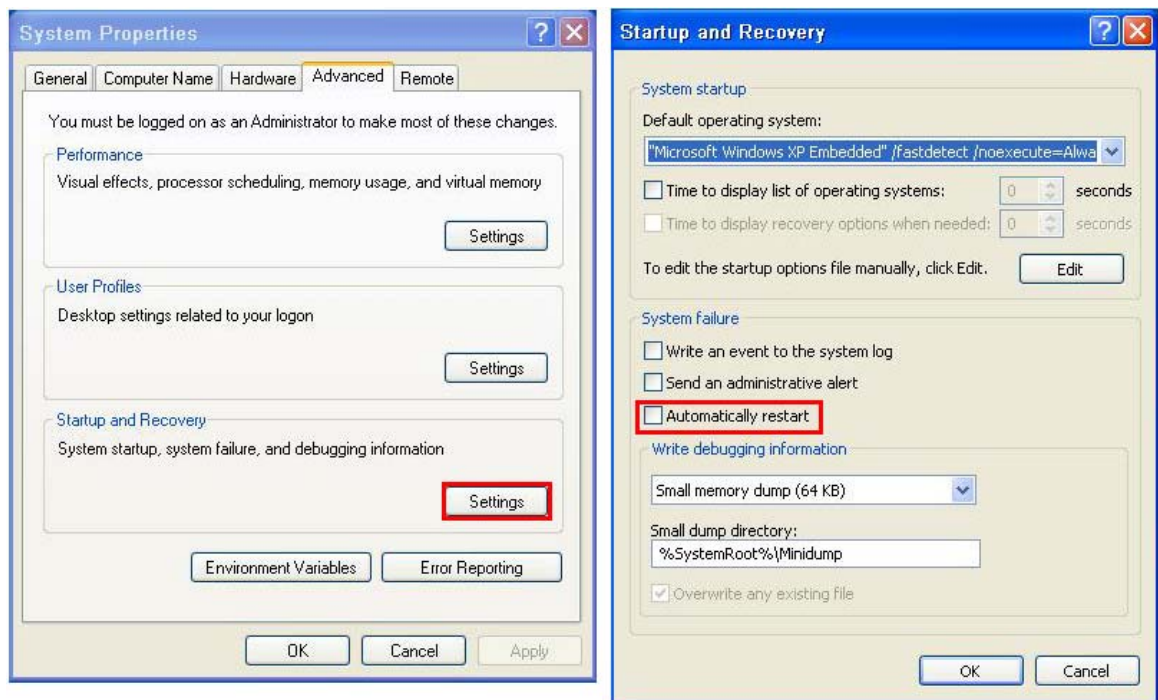


Figure B-23: Disable Automatically Restart

WAFER-NM701-1007U 3.5" Motherboard

Step 4: Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

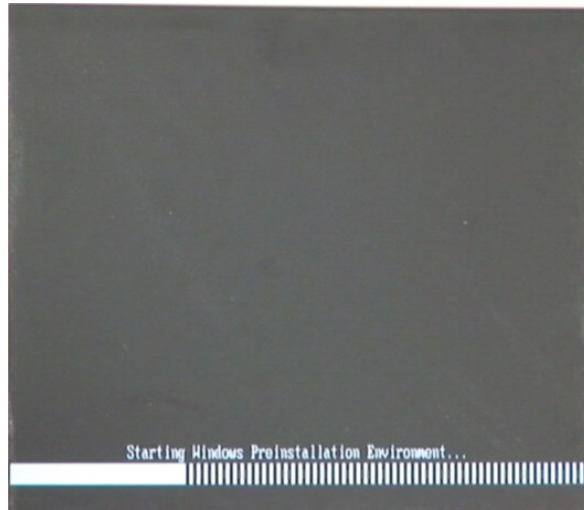


Figure B-24: Launching the Recovery Tool

Step 5: When the recovery tool setup menu appears, press <4> then <Enter>.

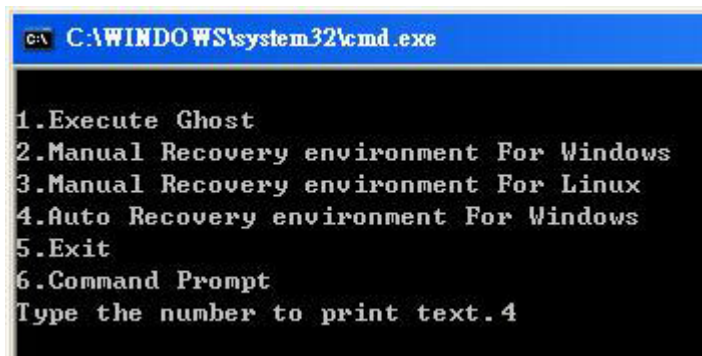


Figure B-25: Auto Recovery Environment for Windows

Step 6: The Symantec Ghost window appears and starts configuring the system to build an auto recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the auto recovery tool is saved in this partition.

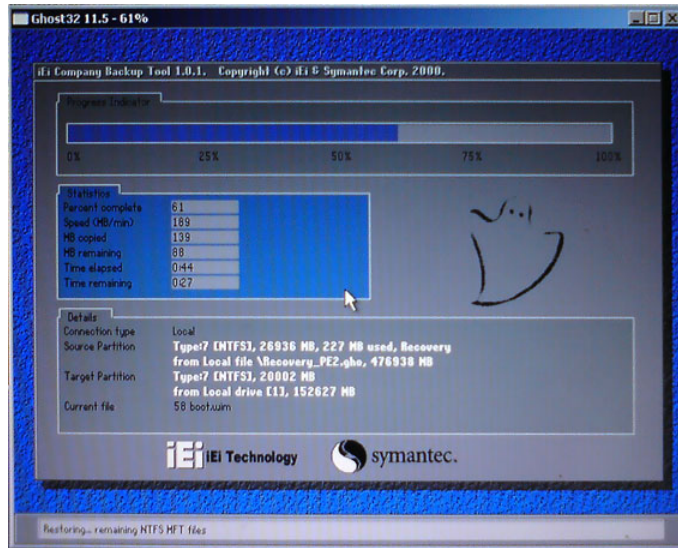


Figure B-26: Building the Auto Recovery Partition

Step 7: After completing the system configuration, the following message prompts to confirm whether to create a factory default image. Type **Y** to have the system create a factory default image automatically. Type **N** within 6 seconds to skip this process (The default option is YES). It is suggested to choose YES for this option.



Figure B-27: Factory Default Image Confirmation

WAFER-NM701-1007U 3.5" Motherboard

Step 8: The Symantec Ghost starts to create the factory default image (**Figure B-28**).

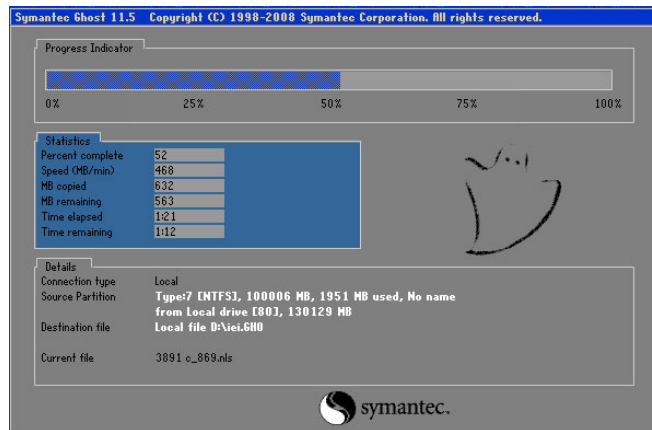


Figure B-28: Image Creation Complete

Step 9: After completing the system configuration, press any key in the following window to restart the system.

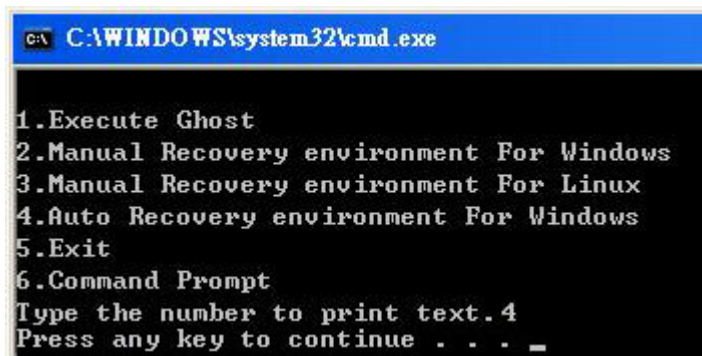


Figure B-29: Press any key to continue

Step 10: Eject the One Key Recovery CD and restart the system.

Step 11: Press the <DELETE> key as soon as the system is turned on to enter the BIOS.

Step 12: Enable the Auto Recovery Function option (**Advanced** → **iEi Feature** → **Auto Recovery Function**).

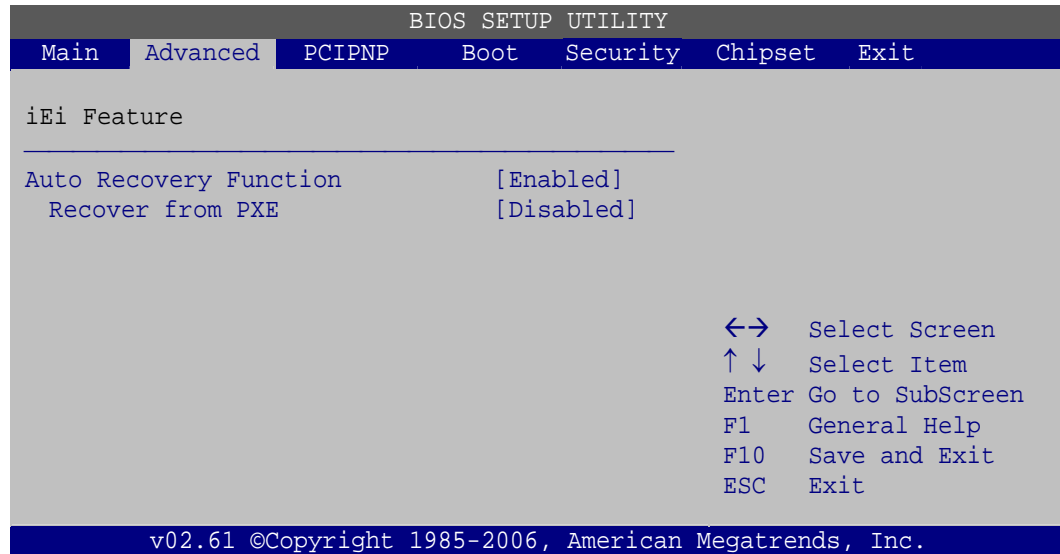


Figure B-30: IEI Feature

Step 13: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

B.4 Setup Procedure for Linux

The initial setup procedures for a Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup the recovery tool for Linux OS.

Step 1: Hardware and BIOS setup. Refer to **Section B.2.1**.

Step 2: Install Linux operating system. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.



NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

WAFER-NM701-1007U 3.5" Motherboard

- Partition 1: /
- Partition 2: **SWAP**



NOTE:

Please reserve enough space for partition 3 for saving recovery images.

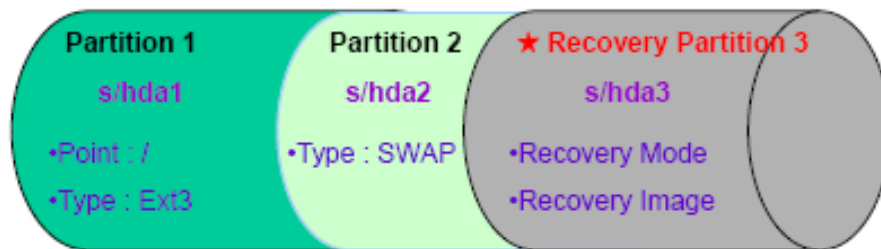


Figure B-31: Partitions for Linux

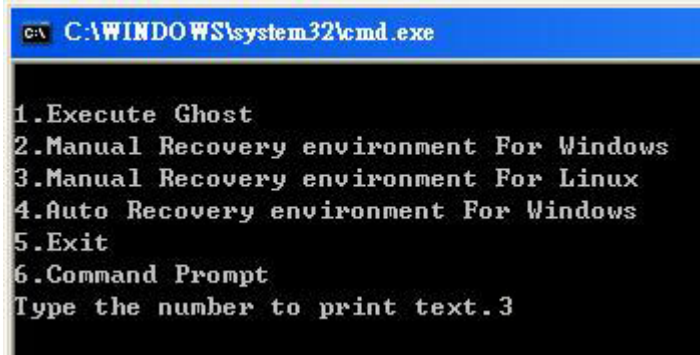
Step 3: Create a recovery partition. Insert the recovery CD into the optical disk drive.

Follow **Step 1 ~ Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>exit
system32>format N: /fs:ntfs /q /v:Recovery /y
system32>exit
```

Step 4: Build-up recovery partition. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <3> and press <Enter> (**Figure B-32**). The Symantec Ghost window appears and starts configuring the system to build-up a

recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.



```

C:\WINDOWS\system32\cmd.exe

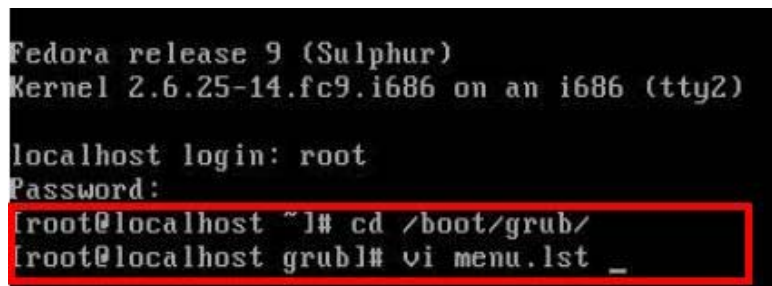
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
    
```

Figure B-32: System Configuration for Linux

Step 5: Access the recovery tool main menu by modifying the “menu.lst”. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst



```

Fedora release 9 (Sulphur)
Kernel 2.6.25-14.fc9.i686 on an i686 (tty2)

localhost login: root
Password:
[root@localhost ~]# cd /boot/grub/
[root@localhost grub]# vi menu.lst _
    
```

Figure B-33: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.

WAFER-NM701-1007U 3.5" Motherboard

```
#boot=/dev/sda
default=0
timeout=10 ← Modify timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.25-14.fc9.i686)
    root (hd0,0)
    kernel /vmlinuz-2.6.25-14.fc9.i686 ro root=UUID=10f1acd
    ac38b5c78910 rhgb quiet
    initrd /initrd-2.6.25-14.fc9.i686.img

title Recovery Partition
    root (hd0,2)
    makeactive ← Type command
    chainloader +1
```

- Type command:
title Recovery Partition
root (hd0,2)
makeactive
chainloader +1

Step 7: The recovery tool menu appears. (Figure B-34)

```
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:
```

Figure B-34: Recovery Tool Menu

Step 8: Create a factory default image. Follow **Step 2 ~ Step 12** described in **Section B.2.5** to create a factory default image.

B.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <F3> while booting up the system. However, if the setup procedure in Section B.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.

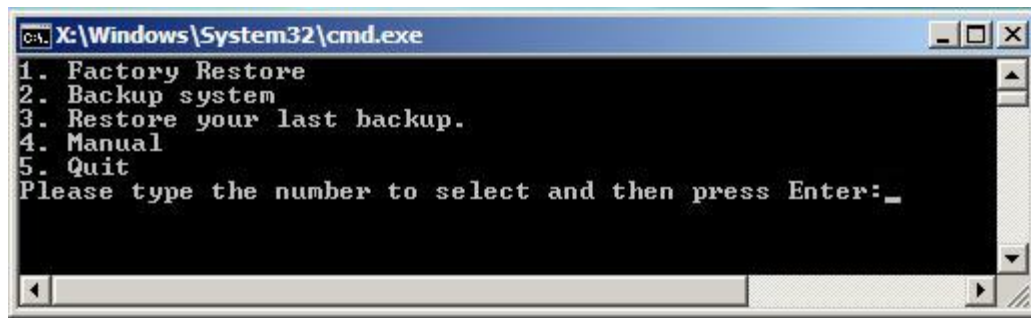


Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore:** Restore the factory default image (iei.GHO) created in **Section B.2.5**.
2. **Backup system:** Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup:** Restore the last system backup image
4. **Manual:** Enter the Symantec Ghost window to configure manually.
5. **Quit:** Exit the recovery tool and restart the system.



WARNING:

Please do not turn off the system power during the process of system recovery or backup.



WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

WAFER-NM701-1007U 3.5" Motherboard

B.5.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <1> and press <Enter> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

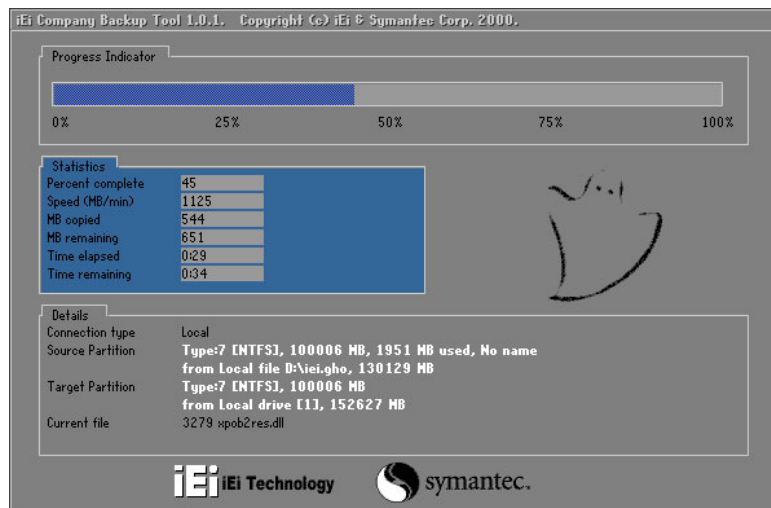


Figure B-36: Restore Factory Default

Step 3: The screen is shown in **Figure B-37** appears when completed. Press any key to reboot the system.

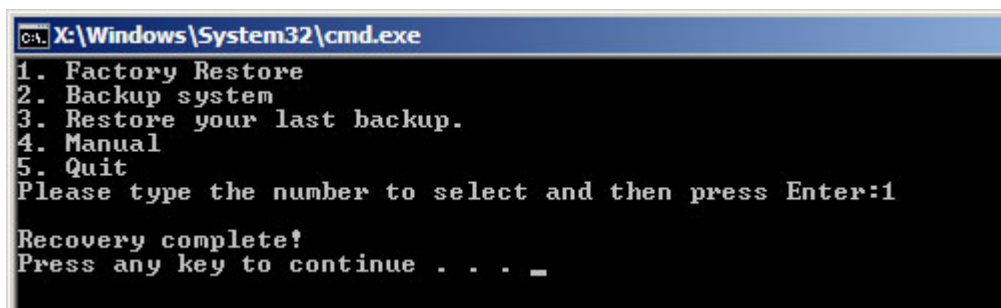


Figure B-37: Recovery Complete Window

B.5.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <2> and press <Enter> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called `iei_user.GHO` is created in the hidden Recovery partition.

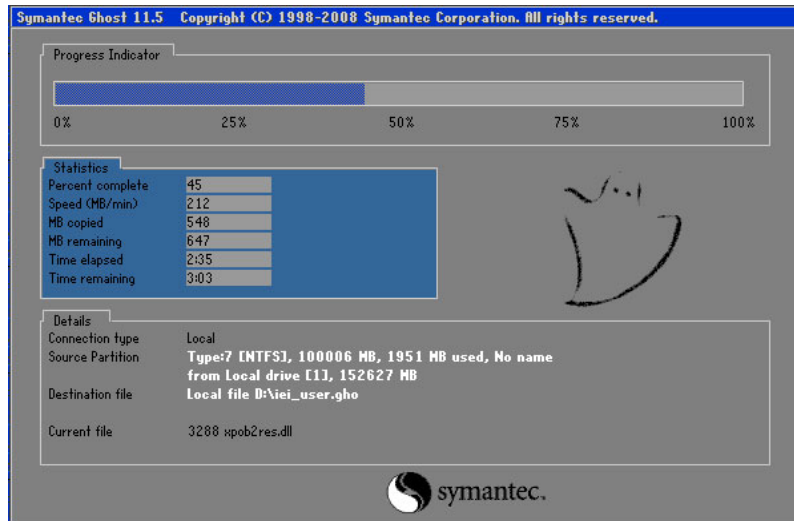


Figure B-38: Backup System

Step 3: The screen is shown in **Figure B-39** appears when system backup is complete. Press any key to reboot the system.

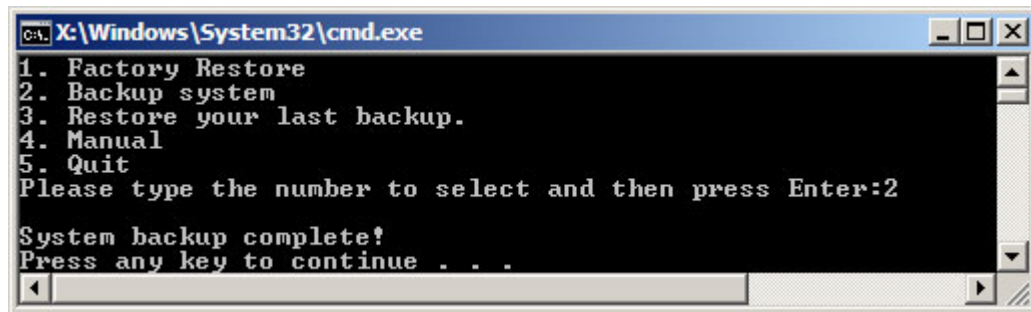


Figure B-39: System Backup Complete Window

WAFER-NM701-1007U 3.5" Motherboard

B.5.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <3> and press <Enter> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

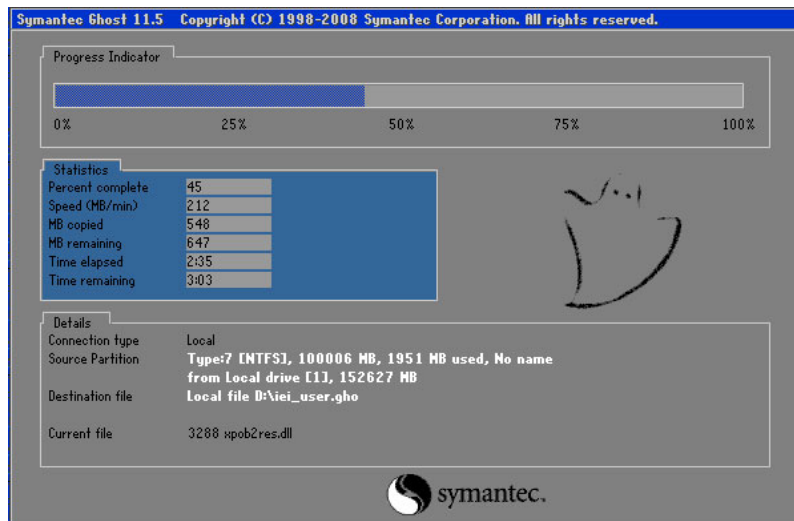


Figure B-40: Restore Backup

Step 3: The screen shown in **Figure B-41** appears when backup recovery is complete. Press any key to reboot the system.

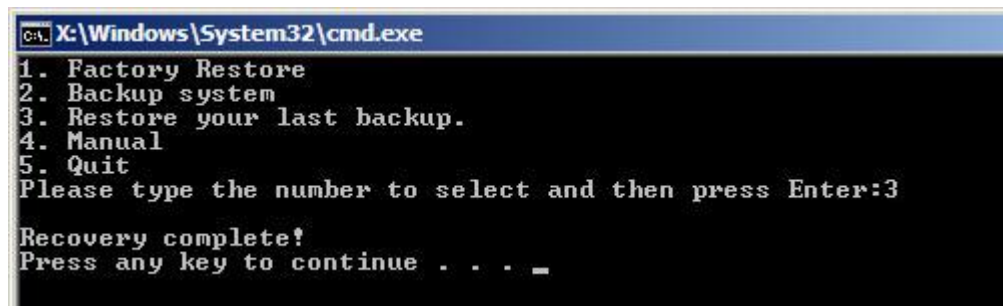


Figure B-41: Restore System Backup Complete Window

B.5.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <4> and press <Enter> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

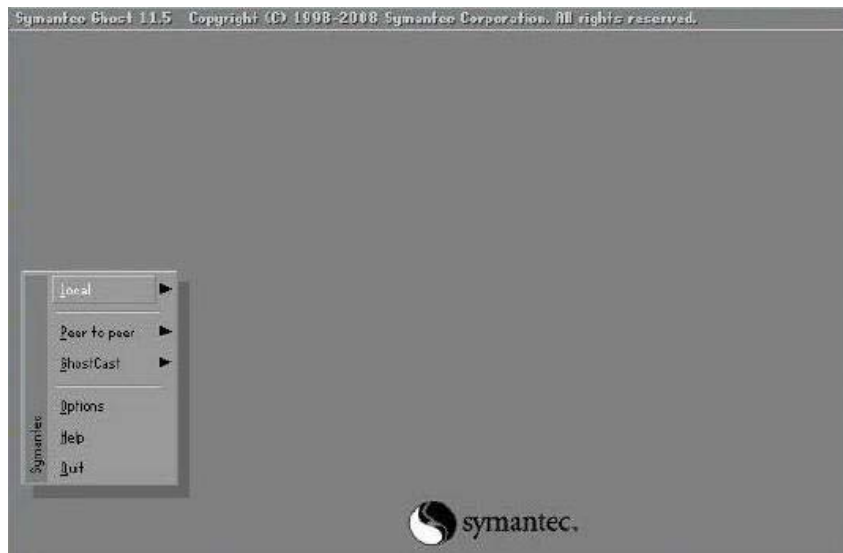
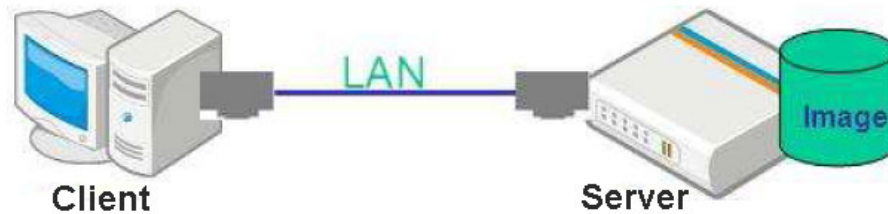


Figure B-42: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

B.6 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.



CAUTION:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

Prior to restoring client systems from a Linux server, a few setup procedures are required.

Step 1: Configure DHCP server settings

Step 2: Configure TFTP settings

Step 3: Configure One Key Recovery server settings

Step 4: Start DHCP, TFTP and HTTP

Step 5: Create a shared directory

Step 6: Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

B.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

`#yum install dhcp` (CentOS, commands marked in red)

`#apt-get install dhcp3-server` (Debian, commands marked in blue)

Step 2: Confirm the operating system default settings: dhcpd.conf.

CentOS

Use the following command to show the DHCP server sample location:

`#vi /etc/dhcpd.conf`

The DHCP server sample location is shown as below:

```
# DHCP Server Configuration file.
# see /usr/share/doc/dhcp*/dhcpd.conf.sample
#
```

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

`#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf`

`#vi /etc/dhcpd.conf`

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask            255.255.255.0;

    option nis-domain             "domain.org";
    option domain-name            "domain.org";
    option domain-name-servers   192.168.0.1;
    next-server 192.168.0.6;
    filename "pxelinux.0";
    option time-offset            -18000; # Eastern Standard Time
    option ntp-servers            192.168.1.1;
    option netbios-name-servers  192.168.1.1;
}
```

Debian

`#vi /etc/dhcpd.conf`

Edit “/etc/dhcpd.conf” for your environment. For example, add

`next-server PXE server IP address;`

WAFER-NM701-1007U 3.5" Motherboard

```
filename "pxelinux.0";
```

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask            255.255.255.0;

    option nis-domain             "domain.org";
    option domain-name            "domain.org";
    option domain-name-servers    192.168.0.1;
    next-server 192.168.0.6;
    filename "pxelinux.0";
    option time-offset            -18000; # Eastern Standard Time
    option ntp-servers            192.168.1.1;
}
```

B.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

```
#yum install tftp-server httpd syslinux (CentOS)
```

```
#apt-get install tftpd-hpa xinetd syslinux (Debian)
```

Step 2: Enable the TFTP server by editing the "/etc/xinetd.d/tftp" file and make it use the remap file. The "-vvv" is optional but it could definitely help on getting more information while running the remap file. For example:

CentOS

```
#vi /etc/xinetd.d/tftp
```

Modify:

```
disable = no
```

```
server_args = -s /tftpboot -m /tftpboot/tftpd.remap -vvv_
```

```
socket_type      = dgram
protocol        = udp
wait            = yes
user            = root
server          = /usr/sbin/in.tftpd
server_args     = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
disable         = no
per_source      = 11
cps             = 100 2
flags           = IPv4
```

Debian

Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

`#vi /etc/inetd.conf`

Modify: `#tftp dgram udp wait root /usr/sbin.....` (as shown below)

```
#:BOOT: TFTP service is provided primarily for booting. Most sites
# run this only on machines acting as "boot servers."
#tftp dgram udp wait root /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
/var/lib/tftpboot
```

`#vi /etc/xinetd.d/tftp`

```
socket_type      = dgram
protocol        = udp
wait            = yes
user            = root
server          = /usr/sbin/in.tftpd
server_args     = -s /tftpboot -n /tftpboot/tftpd.remap -vvv
disable         = no
per_source      = 11
cps             = 100 2
flags           = IPv4
```

B.6.3 Configure One Key Recovery Server Settings

Step 1: Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).



Step 2: Extract the recovery package to /.

```
#cp RecoveryR10.tar.bz2 /
#cd /
#tar -xvzf RecoveryR10.tar.bz2
```

Step 3: Copy “pxelinux.0” from “syslinux” and install to “tftpboot”.

```
#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/
```


WAFER-NM701-1007U 3.5" Motherboard

B.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

```
#service xinetd restart
```

```
#service httpd restart
```

```
#service dhcpd restart
```

Debian

```
#/etc/init.d/xinetd reload
```

```
#/etc/init.d/xinetd restart
```

```
#/etc/init.d/dhcp3-server restart
```

B.6.5 Create Shared Directory

Step 1: Install the samba.

```
#yum install samba
```

Step 2: Create a shared directory for the factory default image.

```
#mkdir /share
```

```
#cd /share
```

```
#mkdir /image
```

```
#cp iei.gho /image
```



WARNING:

The file name of the factory default image must be **iei.gho**.

Step 3: Confirm the operating system default settings: smb.conf.

```
#vi /etc/samba/smb.conf
```


Modify:

[image]

```
comment = One Key Recovery
```

```
path = /share/image
```

```
browseable = yes
```

```
writable = yes
```

```
public = yes
```

```
create mask = 0644
```

```
directory mask = 0755
```

Step 4: Edit “/etc/samba/smb.conf” for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
security = share
```

```
[image]
comment = One Key Recovery
path = /share/image
browseable = yes
writable = yes
public = yes
create mask = 0644
directory mask = 0755
```

Step 5: Modify the hostname

```
#vi /etc/hostname
```

Modify: RecoveryServer

```
RecoveryServer
```

B.6.6 Setup a Client System for Auto Recovery

Step 1: Disable the automatically restart function before creating the factory default image. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure B-43**)

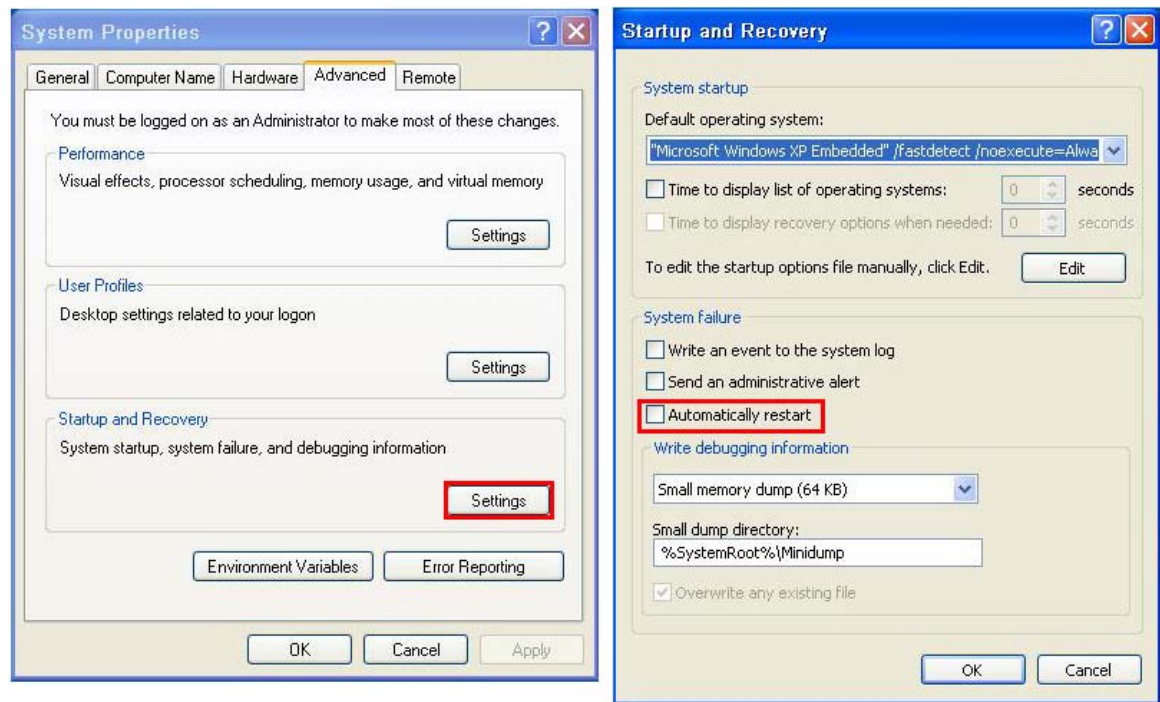


Figure B-43: Disable Automatically Restart

- Step 2:** Configure the following BIOS options of the client system.
 - Advanced → iEi Feature → Auto Recovery Function → **Enabled**
 - Advanced → iEi Feature → Recover from PXE → **Enabled**
 - Boot → Launch PXE OpROM → **Enabled**

- Step 3:** Continue to configure the **Boot Option Priorities** BIOS option of the client system:
 - Boot Option #1 → remain the default setting to boot from the original OS.
 - Boot Option #2 → select the boot from LAN option.

- Step 4:** Save changes and exit BIOS menu.
 - Exit → **Save Changes and Exit**

- Step 5:** Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility

MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



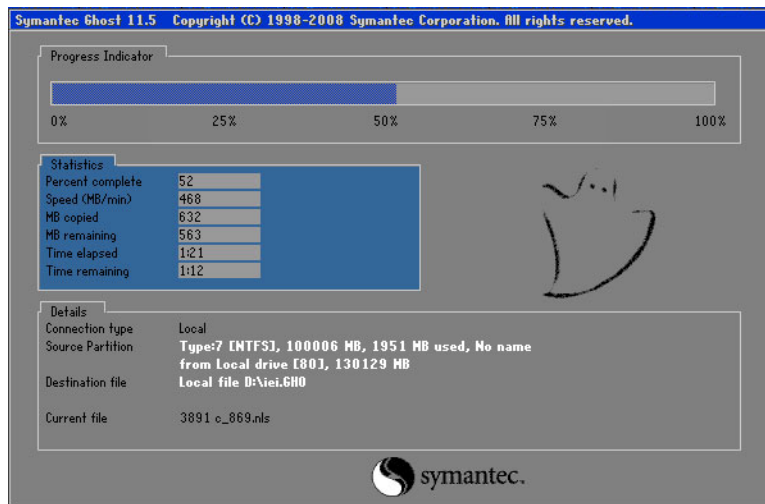
Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

```
Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89  GUID: 00020003-0004-0005-0006-0007000000
DHCP.. /
```

```
My IP address seems to be C0A80009 192.168.0.9
ip=192.168.0.9:192.168.0.8:192.168.0.2:255.255.255.0
TFTP prefix:
Trying to load: pxelinux.cfg/00020003-0004-0005-0006-000700000009
Trying to load: pxelinux.cfg/01-00-18-7d-13-e6-89
Trying to load: pxelinux.cfg/C0A80009
Trying to load: pxelinux.cfg/C0A8000
Trying to load: pxelinux.cfg/C0A800
Trying to load: pxelinux.cfg/C0A80
Trying to load: pxelinux.cfg/C0A8
Trying to load: pxelinux.cfg/C0A
Trying to load: pxelinux.cfg/C0
Trying to load: pxelinux.cfg/C
Trying to load: pxelinux.cfg/default
boot:
```

```
Windows is loading files...
IP: 192.168.0.8, File: \Boot\WinPE.wim
```


WAFER-NM701-1007U 3.5" Motherboard



NOTE:

A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

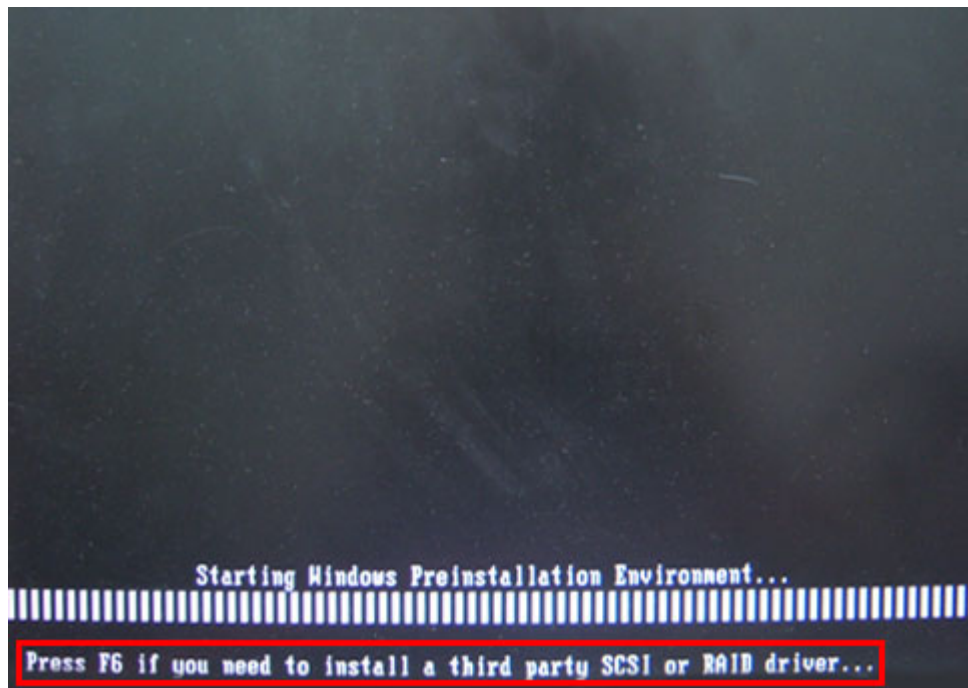
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

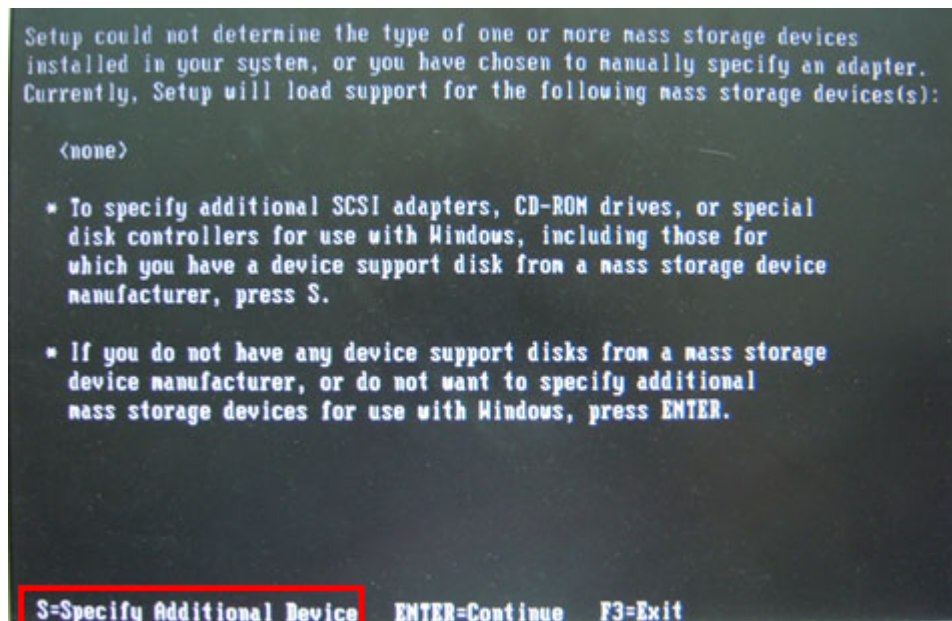
Step 2: Connect the USB floppy disk drive to the system.

Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

Step 4: When launching the recovery tool, press <F6>.

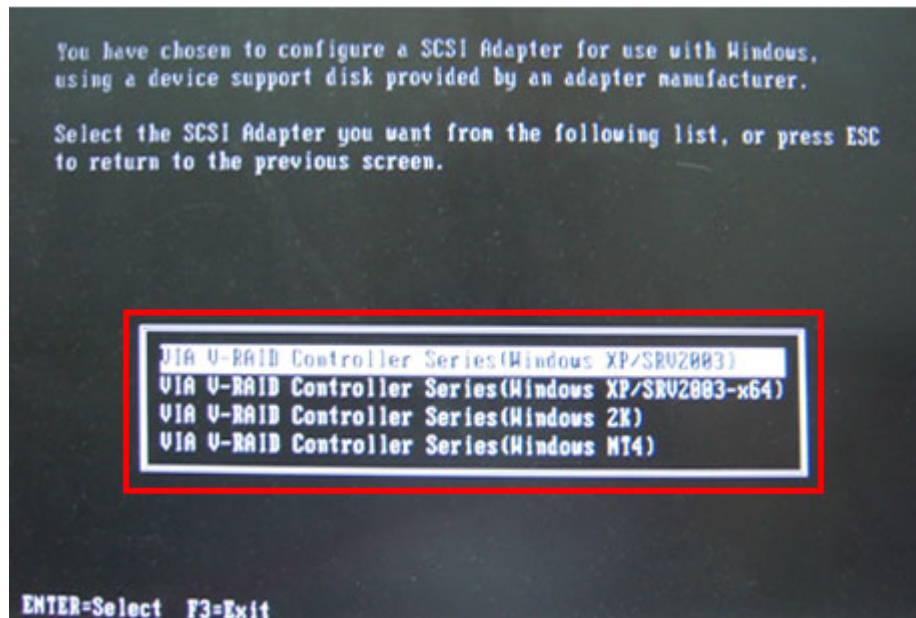


Step 5: When the following window appears, press <S> to select "Specify Additional Device".



WAFER-NM701-1007U 3.5" Motherboard

Step 6: In the following window, select a SATA controller mode used in the system. Then press <Enter>. The user can now start using the SATA HDD.



Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

B.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <F3> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS:** 128 MB system memory
- **Using AMI BIOS:** 512 MB system memory.



Appendix

C

Terminology

WAFER-NM701-1007U 3.5" Motherboard

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

WAFER-NM701-1007U 3.5" Motherboard

LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.



Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the WAFER-NM701-1007U is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

D.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table D-1: Digital I/O Connector Pinouts

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call

Appendix

E

Watchdog Timer



NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer’s period.
BL:	Time-out value (Its unit-second is dependent on the item “Watchdog Timer unit select” in CMOS setup).

Table E-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.



NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

;

```

MOV      AX, 6F02H      ;setting the time-out value
MOV      BL, 30         ;time-out value is 48 seconds
INT      15H

```

;

; ADD THE APPLICATION PROGRAM HERE

;

```

CMP      EXIT_AP, 1     ;is the application over?
JNE      W_LOOP        ;No, restart the application

MOV      AX, 6F02H      ;disable Watchdog Timer
MOV      BL, 0         ;
INT      15H

```

;

; EXIT ;



Appendix

F

Hazardous Materials Disclosure

F.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

WAFER-NM701-1007U 3.5" Motherboard

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。