

IEI Technology Corp.

MODEL: IMBA-9454ISA

Intel® Core 2 Duo, Pentium® 4, Pentium® D or Celeron® D ATX Motherboard with 533 MHz,800 MHz or 1066 MHZ FSB and Supports Dual-channel DDR2, VGA, PCIe x16, ISA FDD, LPT, SATA II, USB 2.0 and PCIe GbE

User Manual



Rev. 1.00 MAY 2008





Date	Version	Changes
2008-05-30	1.00	Initial release



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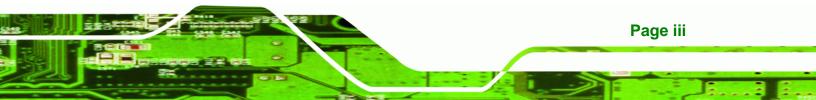
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Manual Conventions



Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word "warning" is written as "**WARNING**," both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:



This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IMBA-9454ISA or personal injury to the user. Please take warning messages seriously.



Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IMBA-9454ISA. Cautions are easy to recognize. The word "caution" is written as "**CAUTION**," both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

Page iv



This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IMBA-9454ISA. Please take caution messages seriously.

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These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word "note" is written as "**NOTE**," both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:



This is an example of a note message. Notes should always be read. Notes contain critical information about the IMBA-9454ISA. Please take note messages seriously.

Page v





If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9454ISA from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to <u>sales@iei.com.tw</u>.

The items listed below should all be included in the IMBA-9454ISA package.

- 1 x IMBA-9454ISA single board computer
- 2 x Dual RS-232 cable
- 1 x ATA 66/100 flat cable
- 1 x I/O Shielding
- 2 x SATA cables
- 1 x SATA power cables
- 1 x Mini jumper Pack
- 1 x Quick Installation Guide
- 1 x Utility CD

Page vi

Images of the above items are shown in Chapter 3.

Table of Contents

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1	INTRODUCTION	1
	1.1 Overview	2
	1.1.1 IMBA-9454ISA Features	2
	1.2 IMBA-9454ISA OVERVIEW	3
	1.2.1 IMBA-9454ISA Overview Photo	3
	1.2.2 IMBA-9454ISA Peripheral Connectors and Jumpers	4
	1.3 TECHNICAL SPECIFICATIONS	6
2	DETAILED SPECIFICATIONS	9
	2.1 DIMENSIONS	10
	2.1.1 Board Dimensions	10
	2.1.2 External Interface Panel Dimensions	10
	2.2 Data Flow	.11
	2.3 Compatible Processors	12
	2.3.1 Intel® Core TM 2 Duo Features	13
	2.3.2 Intel® Pentium® 4 Features	13
	2.3.3 Intel® Celeron® D Features	13
	2.4 INTEL [®] 945G Northbridge Chipset	13
	2.4.1 Intel [®] 945G Overview	13
	2.4.2 Intel [®] 945G Memory Support	14
	2.4.3 Intel [®] 945G Integrated Graphics Media Accelerator 950	15
	2.4.4 Intel [®] 945G PCIe x16	16
	2.4.4.1 PCIe x16 Bus Specifications	17
	2.4.5 Intel [®] 945G Integrated Graphics	18
	2.4.6 Intel [®] 945G Direct Media Interface (DMI)	
	2.5 INTEL [®] ICH7 Southbridge Chipset	
	2.5.1 Intel [®] ICH7 Overview	
	2.5.2 Intel [®] ICH7 Audio Codec '97 Controller	
	2.5.3 Intel [®] ICH7 IDE Interface	
	2.5.4 Intel [®] ICH7 Low Pin Count (LPC) Interface	
	2.5.5 Intel [®] ICH7 PCI Interface	24

Page vii

	2.5.5.1 PCI-to-ISA Bridge	. 25
	2.5.6 PCI Express Gigabit Ethernet	. 27
	2.5.7 Intel [®] ICH7 Real Time Clock	. 28
	2.5.8 Intel [®] ICH7 SATA Controller	. 28
	2.5.9 Intel [®] ICH7 USB Controller	. 29
	2.6 LPC BUS COMPONENTS	. 30
	2.6.1 LPC Bus Overview	. 30
	2.6.2 BIOS Chipset	. 31
	2.6.3 Super I/O chipset	. 32
	2.6.3.1 Super I/O LPC Interface	. 32
	2.6.3.2 Super I/O Digital Input/Output	. 32
	2.6.3.3 Super I/O 16C550 UARTs	. 32
	2.6.3.4 Super I/O Enhanced Hardware Monitor	. 33
	2.6.3.5 Super I/O Fan Speed Controller	. 33
	2.6.3.6 Super I/O Floppy Disk Controller	. 33
	2.6.3.7 Super I/O Keyboard/Mouse Controller	
	2.6.3.8 Super I/O Parallel Port	. 34
	2.6.4 Fintek F81216DG LPC Serial Port Chipset	. 34
	2.7 Environmental and Power Specifications	. 34
	2.7.1 System Monitoring	. 34
	2.7.2 Operating Temperature and Temperature Control	. 35
	2.7.3 Power Consumption	. 35
3	UNPACKING	. 37
	3.1 ANTI-STATIC PRECAUTIONS	. 38
	3.2 UNPACKING	. 38
	3.2.1 Unpacking Precautions	. 38
	3.3 UNPACKING CHECKLIST	. 39
	3.3.1 Package Contents	. 39
	3.4 Optional Items	. 41
4	CONNECTOR PINOUTS	. 43
	4.1 Peripheral Interface Connectors	. 44
	4.1.1 IMBA-9454ISA Layout	. 44
	4.1.2 Peripheral Interface Connectors	. 45

5

4.1.3 External Interface Panel Connectors	46
4.2 INTERNAL PERIPHERAL CONNECTORS	47
4.2.1 ATX +12V Power Connector	47
4.2.2 ATX Power Connector	48
4.2.3 Auxiliary Audio Connector (4-pin)	50
4.2.4 Audio CD In Connector (4-pin)	50
4.2.5 Audio Connector	51
4.2.6 CompactFlash® Socket	53
4.2.7 Digital Input/Output (DIO) Connector	55
4.2.8 Fan Connector (+12V) (CPU Cooling Fan)	56
4.2.9 Fan Connector (+12V) (System Cooling Fans)	57
4.2.10 Floppy Disk Connector (34-pin)	58
4.2.11 Front Panel Connector (14-pin)	60
4.2.12 IDE Connector (40-pin)	61
4.2.13 Infrared Interface Connector (5-pin)	63
4.2.14 PCI Slot	64
4.2.15 PCI Express x16 Slot	67
4.2.16 SATA Drive Connectors	71
4.2.17 Serial Port Connectors (RS-232)	72
4.2.18 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)	73
4.2.19 Serial Port Connector (COM 2)(RS-422 or RS-485 only)	74
4.2.20 SPDIF Connector	76
4.2.21 Trusted Platform Module (TPM) Connector	77
4.2.22 USB Connectors (Internal)	78
4.3 EXTERNAL PERIPHERAL INTERFACE CONNECTORS	79
4.3.1 Keyboard/Mouse Connector	80
4.3.2 Parallel Port Connector	81
4.3.3 Audio Connectors	82
4.3.4 LAN Connectors	82
4.3.5 USB Connectors	83
4.3.6 VGA Connector	84
4.3.7 Serial Communications Connector	85
INSTALLATION	87
5.1 ANTE STATIC DECAUTIONS	88

Page ix

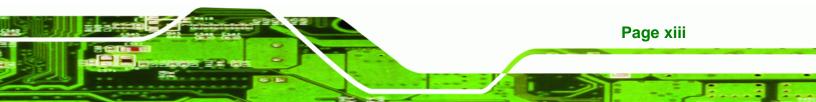
5.2 INSTALLATION CONSIDERATIONS	89
5.2.1 Installation Notices	89
5.2.2 Installation Checklist	90
5.3 UNPACKING	
5.3.1 Unpacking Precautions	
5.4 CPU, CPU COOLING KIT AND DIMM INSTALLATION	
5.4.1 LGA775 CPU Installation	
5.4.2 LGA775 Cooling Kit Installation	
5.4.3 DIMM Installation	
5.4.4 CF Card Installation	100
5.5 JUMPER SETTINGS	101
5.5.1 AT Power Select Jumper Settings	102
5.5.2 CF Card Setup	103
5.5.3 Clear CMOS Jumper	104
5.5.4 COM 2 Function Select Jumper	105
5.6 CHASSIS INSTALLATION	106
5.6.1 Airflow	106
5.7 INTERNAL PERIPHERAL DEVICE CONNECTIONS	107
5.7.1 Peripheral Device Cables	107
5.7.2 ATA Flat Cable Connection	108
5.7.3 FDD Cable Connection (Optional)	109
5.7.4 Dual RS-232 Cable with Slot Bracket	110
5.7.5 Dual RS-232/422/485 Cables (Optional Cable)	
5.7.6 SATA Drive Connection	112
5.7.7 USB Cable (Dual Port) (Optional)	113
5.7.8 USB Cable (Four Port) (Optional)	114
5.8 EXTERNAL PERIPHERAL INTERFACE CONNECTION	115
5.8.1 Audio Connection	116
5.8.2 LAN Connection	117
5.8.3 Parallel Device Connection	117
5.8.4 PS/2 Keyboard and Mouse Connection	118
5.8.5 Serial Device Connection	119
5.8.6 USB Connection (Dual Connector)	120
5.8.7 VGA Monitor Connection	

6	BIOS SCREENS	. 123
(6.1 INTRODUCTION	124
	6.1.1 Starting Setup	. 124
	6.1.2 Using Setup	. 124
	6.1.3 Getting Help	. 125
	6.1.4 Unable to Reboot After Configuration Changes	. 125
	6.1.5 BIOS Menu Bar	. 125
(6.2 Main	126
(6.3 Advanced	127
	6.3.1 CPU Configuration	. 128
	6.3.2 IDE Configuration	. 130
	6.3.2.1 IDE Master, IDE Slave	. 132
	6.3.3 Floppy Configuration	. 137
	6.3.4 Super IO Configuration	. 139
	6.3.5 Hardware Health Configuration	. 144
	6.3.6 Power Configuration	. 148
	6.3.6.1 ACPI Configuration	149
	6.3.6.2 APM Configuration	150
	6.3.7 Remote Access Configuration	. 153
	6.3.8 Trusted Computing	. 157
	6.3.9 USB Configuration	. 158
	6.3.9.1 USB Mass Storage Device Configuration	. 160
(6.4 PCI/PNP	162
(6.5 Воот	165
	6.5.1 Boot Settings Configuration	. 165
	6.5.2 Boot Device Priority	. 168
	6.5.3 Removable Drives	. 169
	6.5.4 USB Drives	. 170
(6.6 Security	171
(6.7 Chipset	173
	6.7.1 NorthBridge Configuration	
	6.7.2 SouthBridge Configuration	. 177
(6.8 Exit	180
7	DRIVER INSTALLATION	183

Page xi

,	7.1 Available Software Drivers	
,	7.2 Driver CD Auto-run	
,	7.3 CHIPSET DRIVER INSTALLATION	
,	7.4 INTEL GRAPHICS MEDIA ACCELERATOR DRIVER INSTALLATION	
,	7.5 BROADCOM LAN DRIVER (FOR GBE LAN) INSTALLATION	
,	7.6 REALTEK HD AUDIO DRIVER (ALC883) INSTALLATION	
	7.6.1 BIOS Setup	
	7.6.2 Driver Installation	197
,	7.7 SATA RAID DRIVER INSTALLATION	
A	BIOS OPTIONS	
B	TERMINOLOGY	
С	DIO INTERFACE	221
(C.1 DIO INTERFACE INTRODUCTION	
(C.2 DIO CONNECTOR PINOUTS	
(C.3 Assembly Language Samples	
	C.3.1 Enable the DIO Input Function	223
	C.3.2 Enable the DIO Output Function	223
D	WATCHDOG TIMER	
Е	ADDRESS MAPPING	
]	E.1 Address Map	
]	E.2 1st MB Memory Address Map	
]	E.3 IRQ MAPPING TABLE	
]	E.4 DMA CHANNEL ASSIGNMENTS	
F	COMPATIBILITY	
]	F.1 COMPATIBLE OPERATING SYSTEMS	
]	F.2 COMPATIBLE PROCESSORS	
]	F.3 Compatible Memory Modules	
G	INTEL® MATRIX STORAGE MANAGER	
	G.1 INTRODUCTION	
	G.1.1 Precautions	238
(G.2 FEATURES AND BENEFITS	

G.3 ACCESSING THE INTEL® MATRIX STORAGE MANAGER	. 239
G.4 RAID CONFIGURATION	. 240
G.4.1 Creating a RAID Volume	. 240
G.4.2 Deleting a RAID Volume	. 245
G.4.3 Resetting a Disk to Non-RAID	. 247
G.4.4 Exiting the Matrix Storage Manager	. 250
H HAZARDOUS MATERIALS DISCLOSURE	. 251
H.1 HAZARDOUS MATERIAL DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS	
RoHS Compliant Under 2002/95/EC Without Mercury	. 252
INDEX	. 255





List of Figures

Figure 1-1: IMBA-9454ISA Motherboard	2
Figure 1-2: IMBA-9454ISA Overview [Front View]	4
Figure 2-1: IMBA-9454ISA Dimensions (mm)	10
Figure 2-2: External Interface Panel Dimensions (mm)	10
Figure 2-3: Data Flow Block Diagram	11
Figure 2-4: LGA775 CPU Socket	12
Figure 2-5: 240-pin DIMM Sockets	15
Figure 2-6: PCIe x16 Socket	17
Figure 2-7: Audio Connectors	20
Figure 2-8: IDE Connector	23
Figure 2-9: PCI Slots	25
Figure 2-10: ISA Bus	26
Figure 2-11: PCIe GbE	27
Figure 2-12: SATA Connectors	29
Figure 2-13: USB Connectors	30
Figure 2-14: LPC Bus Components	31
Figure 4-1: Connector and Jumper Locations	44
Figure 4-2: ATX Power Connector Location	48
Figure 4-3: ATX Power Connector Pinout Locations	49
Figure 4-4: Auxiliary Audio Connector Location (4-pin)	50
Figure 4-5: Audio CD In Connector Pinouts (4-pin)	51
Figure 4-6: Audio Connector Location (10-pin)	52
Figure 4-7: CF Card Socket Location	54
Figure 4-8: DIO Connector Connector Locations	56
Figure 4-9: +12V Fan Connector Location	57
Figure 4-10: +12V Fan Connector Location	58
Figure 4-11: 34-pin FDD Connector Location	59
Figure 4-12: Front Panel Connector Pinout Locations (14-pin)	60

Page xiv

Figure 4-13: IDE Device Connector Locations
Figure 4-14: Infrared Connector Pinout Locations64
Figure 4-15: PCI Slot Location65
Figure 4-16: PCIe x16 Connector Location68
Figure 4-17: SATA Drive Connector Locations72
Figure 4-18: RS-232 COM Connector Pinout Locations73
Figure 4-19: RS-232/422/485 Serial Port Connector Location74
Figure 4-20: RS-422/485 Serial Port Connector Location75
Figure 4-21: SPDIF Connector Pinout Locations76
Figure 4-22: TPM Connector Pinout Locations77
Figure 4-23: USB Connector Pinout Locations78
Figure 4-24: IMBA-9454ISA External Interface Connectors79
Figure 4-25: PS/2 Pinouts80
Figure 4-26: Parallel Port Connector Pinout Locations81
Figure 4-27: Audio Connector82
Figure 4-28: RJ-45 Ethernet Connector83
Figure 4-29: USB Connector Pinout Locations84
Figure 4-29: USB Connector Pinout Locations
-
Figure 4-30: VGA Connector84
Figure 4-30: VGA Connector
Figure 4-30: VGA Connector 84 Figure 4-31: Serial Communications Connector Pinout Locations 85 Figure 5-1: Intel LGA775 Socket 93 Figure 5-2: Remove the CPU Socket Protective Shield 94 Figure 5-3: Open the CPU Socket Load Plate 94 Figure 5-4: Insert the Socket LGA775 CPU 95
Figure 4-30: VGA Connector 84 Figure 4-31: Serial Communications Connector Pinout Locations 85 Figure 5-1: Intel LGA775 Socket 93 Figure 5-2: Remove the CPU Socket Protective Shield 94 Figure 5-3: Open the CPU Socket Load Plate 94 Figure 5-4: Insert the Socket LGA775 CPU 95 Figure 5-5: IEI CF-520 Cooling Kit 96
Figure 4-30: VGA Connector 84 Figure 4-31: Serial Communications Connector Pinout Locations 85 Figure 5-1: Intel LGA775 Socket 93 Figure 5-2: Remove the CPU Socket Protective Shield 94 Figure 5-3: Open the CPU Socket Load Plate 94 Figure 5-4: Insert the Socket LGA775 CPU 95 Figure 5-5: IEI CF-520 Cooling Kit 96 Figure 5-6: IEI CF-775A-RS Cooling Kit 96
Figure 4-30: VGA Connector84Figure 4-31: Serial Communications Connector Pinout Locations85Figure 5-1: Intel LGA775 Socket93Figure 5-2: Remove the CPU Socket Protective Shield94Figure 5-3: Open the CPU Socket Load Plate94Figure 5-4: Insert the Socket LGA775 CPU95Figure 5-5: IEI CF-520 Cooling Kit96Figure 5-6: IEI CF-775A-RS Cooling Kit96Figure 5-7: Securing the Heat sink to the PCB Board98
Figure 4-30: VGA Connector84Figure 4-31: Serial Communications Connector Pinout Locations85Figure 5-1: Intel LGA775 Socket93Figure 5-2: Remove the CPU Socket Protective Shield94Figure 5-3: Open the CPU Socket Load Plate94Figure 5-4: Insert the Socket LGA775 CPU95Figure 5-5: IEI CF-520 Cooling Kit96Figure 5-6: IEI CF-775A-RS Cooling Kit96Figure 5-7: Securing the Heat sink to the PCB Board98Figure 5-8: Installing a DIMM99
Figure 4-30: VGA Connector84Figure 4-31: Serial Communications Connector Pinout Locations85Figure 5-1: Intel LGA775 Socket93Figure 5-2: Remove the CPU Socket Protective Shield94Figure 5-3: Open the CPU Socket Load Plate94Figure 5-4: Insert the Socket LGA775 CPU95Figure 5-5: IEI CF-520 Cooling Kit96Figure 5-6: IEI CF-775A-RS Cooling Kit96Figure 5-7: Securing the Heat sink to the PCB Board98Figure 5-8: Installing a DIMM99Figure 5-9: CF Card Installation101
Figure 4-30: VGA Connector84Figure 4-31: Serial Communications Connector Pinout Locations85Figure 5-1: Intel LGA775 Socket93Figure 5-2: Remove the CPU Socket Protective Shield94Figure 5-3: Open the CPU Socket Load Plate94Figure 5-4: Insert the Socket LGA775 CPU95Figure 5-5: IEI CF-520 Cooling Kit96Figure 5-6: IEI CF-775A-RS Cooling Kit96Figure 5-7: Securing the Heat sink to the PCB Board98Figure 5-8: Installing a DIMM99Figure 5-9: CF Card Installation101Figure 5-10: AT Power Select Jumper Location103

Page xv

Figure 5-14: IDE Cable Connection 108
Figure 5-15: FDD Cable Connection 109
Figure 5-16: Dual RS-232 Cable Installation110
Figure 5-17: Dual Serial Port Connector Cable Connection111
Figure 5-18: SATA Drive Cable Connection112
Figure 5-19: SATA Power Drive Connection113
Figure 5-20: Dual USB Cable Connection114
Figure 5-21: Four Port USB Cable Connection115
Figure 5-22: Audio Connectors116
Figure 5-23: LAN Connection117
Figure 5-24: Parallel Device Connector118
Figure 5-25: PS/2 Keyboard/Mouse Connector119
Figure 5-26: Serial Device Connector 120
Figure 5-27: USB Connector 121
Figure 5-28: VGA Connector 122
Figure 7-1: Introduction Screen 185
Figure 7-2: Available Drivers 185
Figure 7-3: Chipset Driver Installation Program186
Figure 7-4: Chipset Driver Installation Welcome Screen
Figure 7-5: Chipset Driver Installation License Agreement 187
Figure 7-6: Chipset Driver Readme File Information 187
Figure 7-7: Chipset Driver Installation Complete
Figure 7-8: Select the Operating System 189
Figure 7-9: VGA Driver 189
Figure 7-10: Intel ${ m I}$ Graphics Media Accelerator InstallShield Wizard
Figure 7-11: InstallShield Wizard Extracting Files 190
Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen
Figure 7-13: Intel® Graphics Media Accelerator Driver License Agreement 191
Figure 7-14: Intel® Graphics Media Accelerator Driver Installing Notice
Figure 7-15: Intel® Graphics Media Accelerator Installation Complete
Figure 7-16: Windows Control Panel 193
Figure 7-17: System Icon 194

Page xvi

Figure 7-18: Device Manager Tab 19	94
Figure 7-19: Device Manager List 19	95
Figure 7-20: Search for Suitable Driver19	96
Figure 7-21: Locate Driver Files19	96
Figure 7-22: Location Browsing Window19	97
Figure 7-23: Select the Audio CODEC19	98
Figure 7-24: Select the OS19	99
Figure 7-25: Select the OS Version19	99
Figure 7-26: Locate the Setup Program Icon 20	00
Figure 7-27: The InstallShield Wizard Starts 20	00
Figure 7-28: Preparing Setup Screen 20	01
Figure 7-29: InstallShield Wizard Welcome Screen	01
Figure 7-30: Audio Driver Software Configuration	02
Figure 7-31: Installation Wizard Updates the System	02
Figure 7-32: Restart the Computer 20	03
Figure 7-33: SATA RAID Driver Installation Program	04
Figure 7-34: SATA RAID Setup Program Icon 20	05
Figure 7-35: InstallShield Wizard Setup Screen	05
Figure 7-36: Matrix Storage Manager Setup Screen	06
Figure 7-37: Matrix Storage Manager Welcome Screen	06
Figure 7-38: Matrix Storage Manager Warning Screen	07
Figure 7-39: Matrix Storage Manager License Agreement	07
Figure 7-40: Matrix Storage Manager Readme File 20	08
Figure 7-41: Matrix Storage Manager Setup Complete	80

Page xvii

111

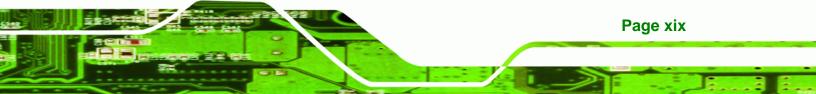


List of Tables

Table 1-1: Technical Specifications7
Table 2-1: Supported HDD Specifications 22
Table 2-2: Power Consumption
Table 3-1: Package List Contents 40
Table 3-2: Package List Contents 42
Table 4-1: Peripheral Interface Connectors 46
Table 4-2: Rear Panel Connectors 47
Table 4-3: ATX Power Connector Pinouts48
Table 4-4: ATX Power Connector Pinouts49
Table 4-5: Auxiliary Audio Connector Pinouts (4-pin) 50
Table 4-6: Audio CD In Connector Pinouts 51
Table 4-7: Audio Connector Pinouts
Table 4-8: CF Card Socket Pinouts
Table 4-9: DIO Connector Connector Pinouts 56
Table 4-10: +12V Fan Connector Pinouts
Table 4-11: +12V Fan Connector Pinouts
Table 4-12: 34-pin FDD Connector Pinouts 60
Table 4-13: Front Panel Connector Pinouts (14-pin)61
Table 4-14: IDE Connector Pinouts63
Table 4-15: Infrared Connector Pinouts64
Table 4-16: PCI Slot67
Table 4-17: PCIe x16 Side A Pinouts70
Table 4-18: PCIe x16 Side B Pinouts71
Table 4-19: SATA Drive Connector Pinouts
Table 4-20: RS-232 COM Connector Pinouts73
Table 4-21: RS-232/RS-485 Serial Port Connector Pinouts74
Table 4-22: RS-422/485 Serial Port Connector Pinouts 76
Table 4-23: SPDIF Connector Pinouts



Table 4-24: TPM Connector Pinouts	78
Table 4-25: USB Port Connector Pinouts	79
Table 4-26: PS/2 Connector Pinouts	80
Table 4-27: Parallel Pinouts	81
Table 4-28: LAN Pinouts	83
Table 4-29: RJ-45 Ethernet Connector LEDs	83
Table 4-30: USB Connector Pinouts	84
Table 4-31: VGA Connector Pinouts	85
Table 4-32: COM1 RS-232 Mode Connector Pinouts	86
Table 5-1: Jumpers	102
Table 5-2: AT Power Select Jumper Settings	102
Table 5-3: CF Card Setup Jumper Settings	103
Table 5-4: Clear CMOS Jumper Settings	105
Table 5-5: COM 2 Function Select Jumper Settings	106
Table 5-6: IEI Provided Cables	107
Table 6-1: BIOS Navigation Keys	125





BIOS Menus

Menu 1: Main 126
Menu 2: Advanced 128
Menu 3: CPU Configuration 129
Menu 4: IDE Configuration 130
Menu 5: IDE Master and IDE Slave Configuration 132
Menu 6: IDE Master and IDE Slave Configuration 138
Menu 7: Super IO Configuration 139
Menu 8: Hardware Health Configuration144
Menu 9: Power Configuration 148
Menu 10: ACPI Configuration 149
Menu 11:Advanced Power Management Configuration 150
Menu 12: Remote Access Configuration [Advanced] 153
Menu 13: Trusted Computing 157
Menu 14: USB Configuration 158
Menu 14: USB Configuration
Menu 15: USB Mass Storage Device Configuration 160
Menu 15: USB Mass Storage Device Configuration 160 Menu 16: PCI/PnP Configuration 163
Menu 15: USB Mass Storage Device Configuration
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166Menu 19: Boot Device Priority Settings168
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166Menu 19: Boot Device Priority Settings168Menu 20: Removable Drives170
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166Menu 19: Boot Device Priority Settings168Menu 20: Removable Drives170Menu 21: USB Drives171
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166Menu 19: Boot Device Priority Settings168Menu 20: Removable Drives170Menu 21: USB Drives171Menu 22: Security172
Menu 15: USB Mass Storage Device Configuration160Menu 16: PCI/PnP Configuration163Menu 17: Boot165Menu 18: Boot Settings Configuration166Menu 19: Boot Device Priority Settings168Menu 20: Removable Drives170Menu 21: USB Drives171Menu 22: Security172Menu 23: Chipset174

Page xx





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Introduction





1.1 Overview



Figure 1-1: IMBA-9454ISA Motherboard

The IMBA-9454ISA ATX form factor motherboard is a LGA775 Intel® Core[™]2 Duo, Pentium® 4 or Celeron® D platform with a 533 MHz, 800 MHz or 1066 MHz front side bus (FSB). Up to 4.0 GB of DDR2 SDRAM and up to four SATA II hard disk drives (HDD) are supported. High-performance PCI Express (PCIe) Gigabit Ethernet (GbE) connectivity is integrated into the system. Four or five PCI slots, two or one ISA slots and eight USB 2.0 connectors (four external and four internal) provide flexible expansion options. Added system security is provided with Trusted Platform Module (TPM v1.2) support. An external VGA connector and three audio-jacks facilitate multi-media applications.

1.1.1 IMBA-9454ISA Features

Some of the IMBA-9454ISA features are listed below.

- Supports LGA775 Intel® CPUs including:
 - O Intel® Core™2 Duo
 - O Intel® Pentium® 4
 - O Intel® Celeron® D

Page 2

- Maximum FSB of 1066 MHz
- Supports four 240-pin 533 MHz or 667 MHz 1.0 GB (max.) DDR2 memory modules

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Page 3

- Added security with support for TPM v1.2
- Expansion slots include:
 - O Five PCI slots
 - O Two ISA slots
- Four SATA II drives with transfer rates of 3.0 Gbps supported
- Eight USB 2.0 devices supported
- Dual PCIe GbE Ethernet connectors
- ATX form factor
- RoHS compliant
- Supports ATX power supplies

1.2 IMBA-9454ISA Overview

1.2.1 IMBA-9454ISA Overview Photo

The IMBA-9454ISA has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the IMBA-9454ISA.

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IMBA-9454ISA ATX Motherboard

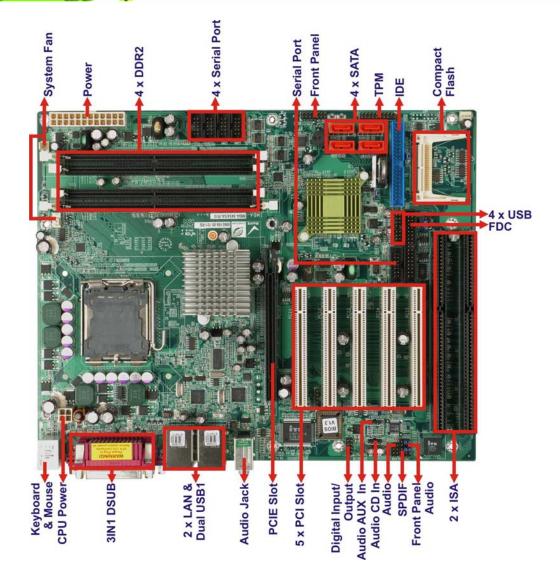


Figure 1-2: IMBA-9454ISA Overview [Front View]

1.2.2 IMBA-9454ISA Peripheral Connectors and Jumpers

The IMBA-9454ISA has the following connectors on-board:

- 1 x ATX +12V power connector
- 1 x ATX power connector
- 1 x Audio auxiliary in connector
- 1 x Audio CD In connector
- 1 x Audio connector (front panel)
- 1 x Audio connector

Page 4

- 1x CF card Type II socket
- 1 x CPU cooling fan connector
- 2 x System cooling fan connectors
- 1 x Digital input/output (DIO) connector
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x IDE connector
- 1 x Infrared connector
- 2 x ISA sockets
- 5 x PCI sockets
- 4 x RS-232 serial port connectors
- 1 x RS-232/422/485 serial port connector
- 4 x Serial ATA drive connectors
- 1 x Serial port (COM2) select RS-232/422/485
- 1 x SPDIF connector
- 1 x TPM connector
- 2 x USB connectors

The IMBA-9454ISA has the following external peripheral interface connectors on the board rear panel

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Page 5

- 3 x Audio jacks
- 2 x Ethernet connectors
- 1 x Parallel port connector
- 2 x PS/2 connectors
- 1 x Serial port connector
- 4 x USB 2.0 port connectors
- 1 x VGA connector

The IMBA-9454ISA has the following on-board jumpers:

- AT power select
- Clear CMOS
- CF card setting
- Select RS-232/422/485 for COM2



1.3 Technical Specifications

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IMBA-9454ISA technical specifications are listed in Table 1-1. See Chapter 2 for details.

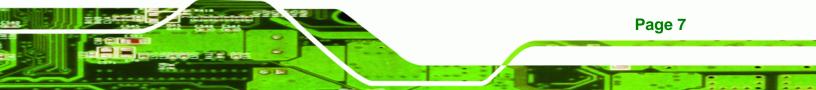
Specification	IMBA-9454ISA
Form Factor	ATX
System CPU	LGA775 Intel® Core™ 2 Duo
	LGA775 Intel® Pentium® 4
	LGA775 Intel® Celeron® D
Front Side Bus	533 MHz, 800 MHz or 1066 MHz
System Chinest	Northbridge: Intel® 945
System Chipset	Southbridge: Intel® ICH7
Memory	Four dual channel 240-pin DDR2 DIMM sockets support
	four 533 MHz or 667 MHz 1.0 GB (max.) DIMM. A maximum
	of 4.0 GB of DDR2 is supported.
Display	VGA integrated into the Intel® 945G
BIOS	AMI Flash BIOS
Audio	Realtek ALC655 AC'97 codec
ТРМ	One 20-pin connector TPM v1.2 module
Expansion Options	Five PCI slots
	Two ISA slots
Infrared (IrDA)	One infrared interface
LAN	Dual Broadcom BCM5787M PCIe GbE chipsets with ASF
	2.0 support
SuperIO	ITE IT8712F
SSD	СF Туре II

Page 6

Digital I/O	8-bit digital I/O, 4-bit input/4-bit output
СОМ	Five RS-232 serial ports (four internal, one external)
	One RS-232, RS-422 or RS-485 serial port (internal)
USB 2.0	Eight USB 2.0 devices supported
IDE	One 40-pin IDE connector connects to two Ultra
	ATA33/66/100 devices
SATA	Four 3.0 Gbps SATA II drives supported
Keyboard/mouse	Two PS/2 connectors for keyboard and mouse
Parallel Port	One external parallel port connects to parallel
	communications device (e.g. printer)
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	ATX power only
	5 V @ 4.25 A, 12 V @ 10.17 A and 3.3 V @ 6.07 A
Power Consumption	(Intel® Pentium® 4 3.73GHz, 1066MHz FSB CPU and 1GB
	667MHz DDR2)
Temperature	0°C – 60°C (32°F - 140°F)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	305 mm x 244 mm
Weight (GW/NW)	1200g/650g

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Table 1-1: Technical Specifications





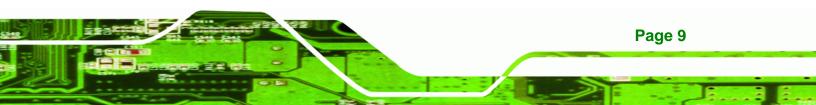
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Detailed Specifications



2.1 Dimensions

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2.1.1 Board Dimensions

The dimensions of the board are listed below:

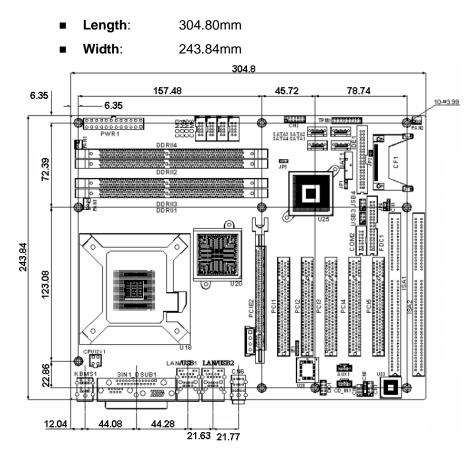


Figure 2-1: IMBA-9454ISA Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in Figure 2-2.

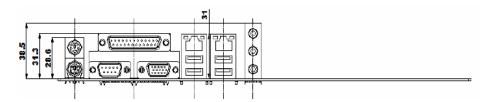


Figure 2-2: External Interface Panel Dimensions (mm)

Page 10

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

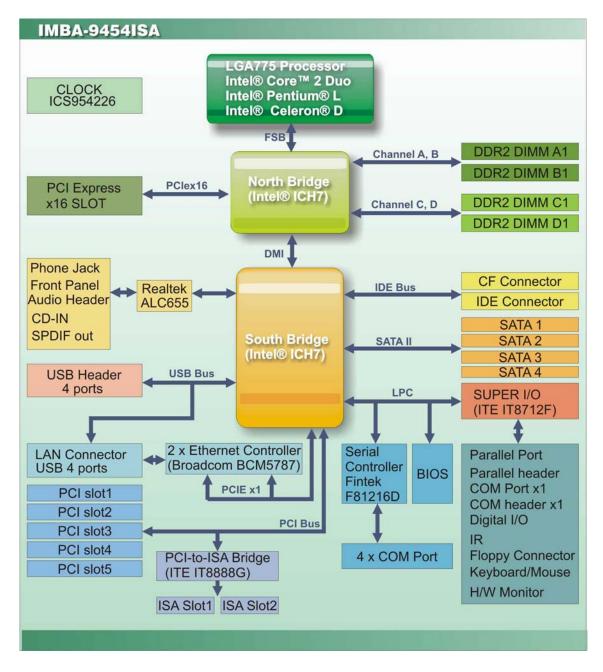


Figure 2-3: Data Flow Block Diagram





2.3 Compatible Processors

The IMBA-9454ISA supports the following LGA775 processors:

- Intel® Core™2 Duo
- Intel® Pentium® 4
- Intel® Celeron® D

All of the above processors are interfaced with an Intel® 945G northbridge chipset through the front side bus (FSB).

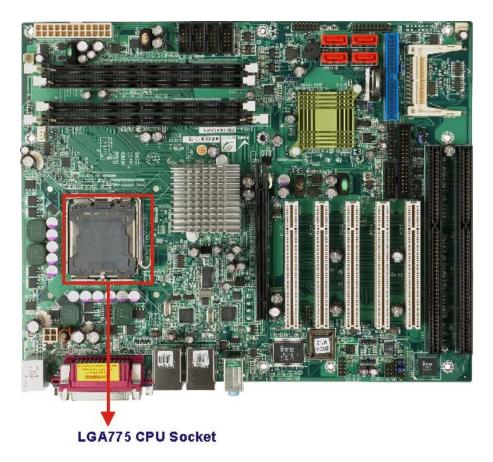


Figure 2-4: LGA775 CPU Socket

Features of the supported processors are listed in sections below.



2.3.1 Intel® Core™2 Duo Features

Intel® Core[™]2 Duo features include:

- Two processing cores
- Up to 8MB of shared L2 cache
- Up to 1066 MHz FSB
- Intel® Wide Dynamic Execution
- Intel® Intelligent Power Capability Intel® Smart Memory Access

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- Intel® Advanced Smart Cache
- Intel® Advanced Digital Media Boost

2.3.2 Intel® Pentium® 4 Features

Intel® Pentium® 4 features include:

- Hyper-Threading Technology
- Enhanced Intel SpeedStep® Technology
- Intel® Extended Memory 64 Technology
- Execute Disable Bit

2.3.3 Intel® Celeron® D Features

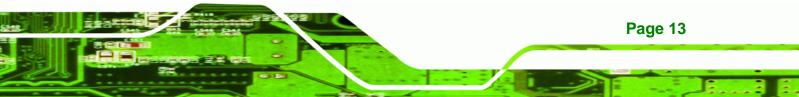
Intel® Celeron® D features include:

- Intel® Extended Memory 64 Technology
- 512KB Level 2 cache
- 533MHz FSB
- Execute Disable Bit
- Streaming SIMD solutions

2.4 Intel[®] 945G Northbridge Chipset

2.4.1 Intel[®] 945G Overview

The Intel[®] 945G graphics and memory controller hub (GMCH) is interfaced to the Intel[®] I/O Controller Hub 7 (ICH7) through a high speed Direct Media Interface (DMI) chip-to-chip connection. The high-speed DMI integrates priority based servicing that



allows for concurrent traffic and true isochronous transfer capabilities. Some of the features of the Intel® 945G are listed below.

Support 533/800/1066MHz FSB

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Page 14

- Supports four, 1GB, 400/533/667MHz dual channel DDR SDRAM DIMMs
- Integrated VGA and SDVO (Serial Digital Video Output) outputs
- Integrated Intel[®] Graphics Media Accelerator 950 (Intel[®] GMA 950)
- 2.0GB/s concurrent DMI bandwidth maximizes chipset communications
- PCI Express x16 Graphics Interface with a raw bit rate on data pins of 2Gb/s
- Integrated Intel® High Definition Audio
- Integrated Intel® Matrix Storage Technology
- Integrated Intel® Active Management Technology
- Integrated Intel® Flex Memory Technology

2.4.2 Intel[®] 945G Memory Support

The Intel® 945G supports four, 1.0 GB, 400/533/667MHz dual channel DDR2 SDRAM DIMMs. Four 240-pin memory sockets on the IMBA-9454ISA enable a maximum of 4GB of DDR2 memory to be installed on the system. The memory sockets are shown in **Figure 2-1**.

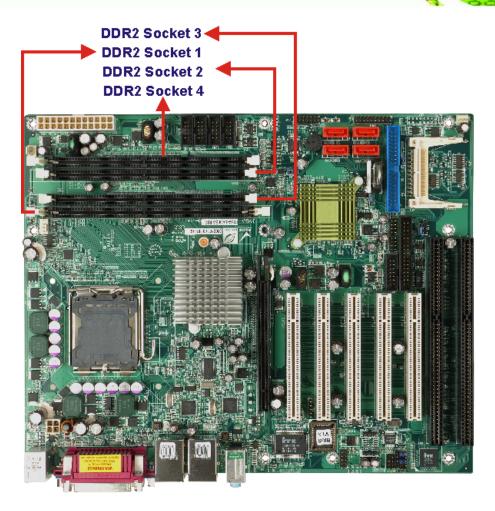
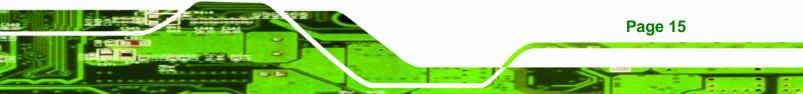


Figure 2-5: 240-pin DIMM Sockets

2.4.3 Intel[®] 945G Integrated Graphics Media Accelerator 950

The Intel® 945G has the Intel® GMA 950 integrated into the chipset. Some of the features of the GMA 950 are listed below.

- Intel GMA 950 Graphics Core
 - O 400MHz 256-bit graphics core
 - Up to 10.6 GB/sec memory bandwidth with DDR2 667 MHz system memory
 - O 1.6 GPixels/sec and 1.6 GTexels/sec fill rate
 - O 192 MB maximum video memory
 - O 2048x1536 at 75 Hz maximum resolution
 - O Dynamic Display Modes for flat-panel, wide-screen and Digital TV support



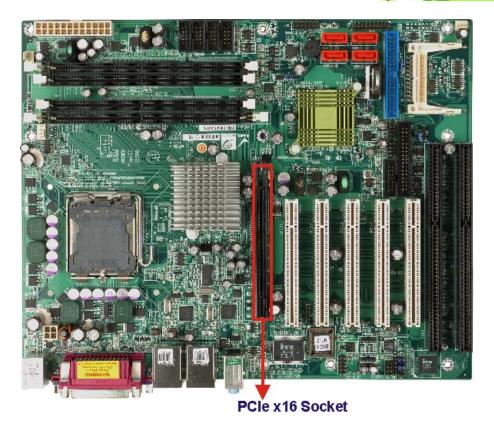


- O Operating systems supported: Microsoft Windows* XP, Windows* XP
 64-bit, Media Center Edition, Windows 2000; Linux-compatible (Xfree86 source available)
- High Performance 3D
 - O Up to 4 pixels per clock rendering
 - Microsoft* DirectX* 9 Hardware Acceleration Features: Pixel Shader 2, Volumetric Textures, Shadow Maps, Slope Scale Depth Bias, Two-Sided Stencil
 - Microsoft* DirectX* 9 Vertex Shader 3.0 and Transform and Lighting supported in SW through highly optimized Processor Specific Geometry Pipeline (PSGP)
 - O Texture Decompression for DirectX* and OpenGL*
 - O OpenGL* 1.4 support with ARB extensions
- Advanced Display Technology
 - O Consumer Electronic display (Digital TV) support
 - Two Serial Digital Video Out (SDVO) ports for flat-panel monitors via ADD2 cards
 - O Multiple display types (LVDS, DVI-I, DVI-D, CRT)
 - O Dual screen support via ADD2 digital video devices
 - O HDTV 720p and 1080i display resolution support
 - O Interlaced Display output support
- High Quality Media Support
 - High Definition Hardware Motion Compensation to support HD hi-bitrate MPEG2 media playback
 - O Up and Down Scaling of Video Content
 - O HD Content Decode up to two stream support
 - O 5x3 Overlay Filtering

2.4.4 Intel[®] 945G PCIe x16

Page 16

The Intel® 945G northbridge chipset has a dedicated 16-lane PCIe port for an external PCIe x16 graphics card. The PCIe x16 graphics card is installed in the on-board PCIe x16 slot shown in **Figure 2-6**.



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Figure 2-6: PCIe x16 Socket

2.4.4.1 PCIe x16 Bus Specifications

Some of the PCIe x16 bus specifications are listed below.

- Compliant with the current PCI Express Base Specification base PCIe frequency of 2.5GHz
- Raw bit rate on the pins is 250Gb/s
- Maximum theoretical bandwidth of 4GB/s in each direction resulting in an 8GB/s bandwidth when in PCIe x16 mode
- 100MHz differential reference clock
- PCIe power management support
- L0, L1, L2/L3 ready, L3
- Hierarchical PCI compliant configuration mechanism for downstream components
- PCIe extended configuration space
- PCIe enhanced addressing mechanism



- Supports traditional PCI traffic
- Supports traditional AGP traffic
- APIC and MSI messaging support

2.4.5 Intel[®] 945G Integrated Graphics

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The Intel® 945G northbridge chipset has an Intel® Gen. 3.5 integrated graphics engine that supports CRT display devices. A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® 945GM graphics engine. The Intel[®] 945GM internal graphics engine, with an integrated 400MHz RAMDAC and hot plug CRT support, supports analog CRT monitors up to QXGA.

2.4.6 Intel[®] 945G Direct Media Interface (DMI)

Intel® 945G northbridge GMCH is connected to the Intel[®] ICH7 Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel[®] 945GM DMI are listed below:

- 2GB/s (1GB/s in each direction) bus speed
- 32-bit downstream address

2.5 Intel[®] ICH7 Southbridge Chipset

2.5.1 Intel[®] ICH7 Overview

The ICH7 southbridge chipset on the IMBA-9454ISA has the features are listed below.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
 - O Enhanced DMA controller
 - O Interrupt controller
 - O Timer functions
- Integrated SATA host controller with DMA operations on four ports with data transfer rates up to 3.0 Gb/s

Page 18

- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports eight USB 2.0 devices with four UHCI controllers and one EHCI controller

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- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec '97 (AC'97) Revision 2.3
- Supports Intel[®] High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial Peripheral Interface (SPI) for Serial and Shared Flash
- 1.05 V Core Voltage
- Intel® High Definition Audio Interface
- Intel® Active Management Technology
- Intel® Quick Resume Technology Support

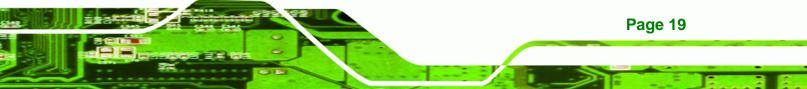
2.5.2 Intel[®] ICH7 Audio Codec '97 Controller



The onboard audio connector and the audio jacks cannot be used concurrently. If the audio jacks are being used, the jumper headers inserted on the onboard audio connector must remain in place. If the onboard audio connector is used, the jumper headers must be removed and the audio jack functions are disabled.

The Audio Codec '97 (AC'97) controller integrated into the ICH7 complies with AC'97 Component Specification, Version 2.3. The AC'97 controller is interfaced to a RealTek ALC655 AC'97 codec which is in turn connected to the following audio connectors:

- CD-In connector (pin header)
- Audio connector (pin header)
- Auxiliary audio connector (pin header)
- SPDIF connector (pin header)
- Surround sound speaker connector (pin header)



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IMBA-9454ISA ATX Motherboard

- Audio jacks (phone jacks)
 - O Mic-In
 - O Line-In
 - O Line-Out

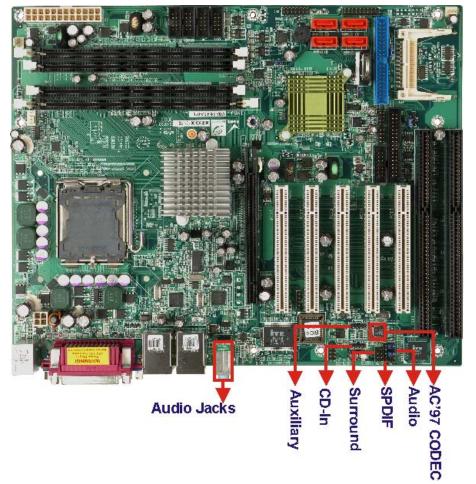


Figure 2-7: Audio Connectors

Some of the features of the RealTek ALC655 are listed below:

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
 - O Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
 - O 14.318MHz -> 24.576MHz PLL to eliminate crystal
 - O 12.288MHz BITCLK input



- O Integrated PCBEEP generator to save buzzer
- O Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX

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- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- EAXTM 1.0 & 2.0 compatible
- Direct Sound 3DTM compatible
- A3DTM compatible
- I3DL2 compatible
- HRTF 3D positional audio10-band software equalizer

2.5.3 Intel[®] ICH7 IDE Interface

The integrated IDE interface on the ICH7 southbridge supports two IDE hard disks and ATAPI devices, PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- Ultra ATA/100, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s
- Ultra ATA/33, with data transfer rates up to 33MB/s





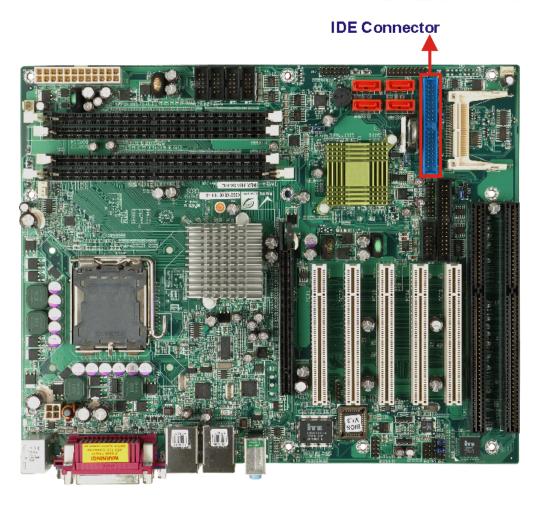
Table 2-1 shows the supported HDD specifications.

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-1: Supported HDD Specifications

The IDE connector is shown below





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Figure 2-8: IDE Connector

2.5.4 Intel[®] ICH7 Low Pin Count (LPC) Interface

The ICH7 LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH7 is connected to the following components:

- BIOS chipset
- Super I/O chipset
- Serial port controller





2.5.5 Intel[®] ICH7 PCI Interface



PCI and ISA slots can only be used in the following configuration:

- Five PCI slots and one ISA slot OR
- Four PCI slots and two ISA slots can be

The five PCI slots cannot be used with two ISA slots concurrently.

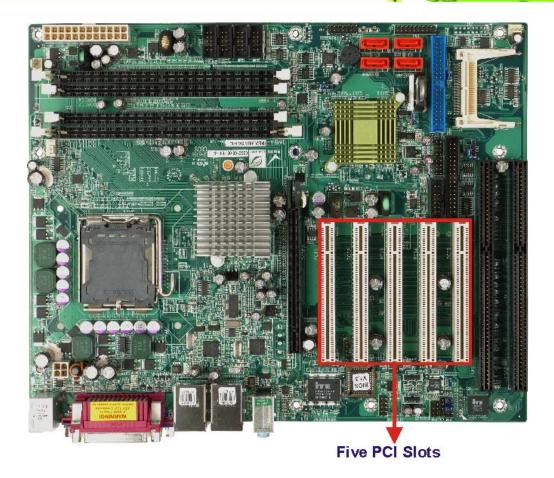
The PCI interface on the ICH7 is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz

Page 24

- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to six external PCI bus masters

Five of the six PCI bus masters are interfaced to five PCI slots. The remaining PCI bus master is interfaced to an ITE IT8888G PCI-to-ISA bridge, which is then connected to two ISA slots.



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Figure 2-9: PCI Slots

2.5.5.1 PCI-to-ISA Bridge

The IT8888G has a PCI specification v2.1 compliant 32-bit PCI bus interface and supports both PCI Bus master and slave. The PCI interface supports both programmable positive and full subtractive decoding schemes. The ISA bridge and sockets are shown below.

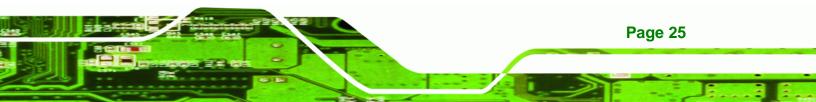






Figure 2-10: ISA Bus

Some of the features of the IT8888G PCI to ISA bridge are listed below.

- PCI Interface
- Programmable PCI Address Decoders
- PC/PCI DMA Controller
- Distributed DMA Controller
- ISA Interface
- SM Bus
- 1 analog line-level mono output: MONO_OUT
- Power-on Serial Bus Configuration
- Serial IRQ
- Versatile power-on strapping options
- Supports NOGO function
- Single 33 MHz Clock Input

Page 26

- +3.3V PCI I/F with +5V tolerant I/O buffers
- +5V ISA I/F and core Power Supply

2.5.6 PCI Express Gigabit Ethernet

Two of the PCIe x1 root ports on the Intel® ICH7 are interfaced to two Broadcom BCM5787M PCI Express (PCIe) GbE controllers. The Broadcom BCM5787M PCI Express (PCIe) GbE controller is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory.

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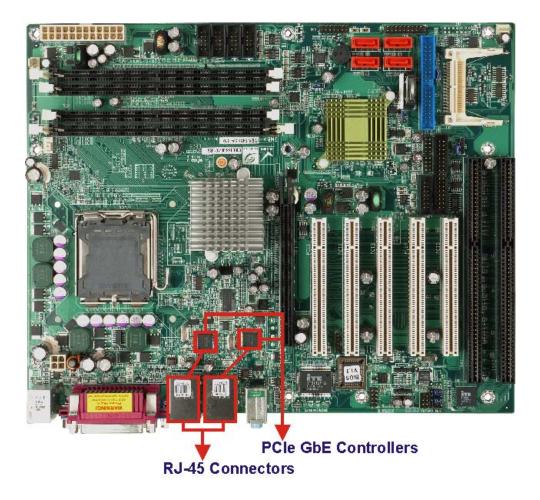


Figure 2-11: PCIe GbE

Some of the BCM5787 controller features are listed below:





- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a

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- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support
- JTAG support

2.5.7 Intel[®] ICH7 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH7. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.8 Intel[®] ICH7 SATA Controller

The integrated SATA controller on the ICH7 southbridge supports four SATA drives with independent DMA operations. SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 3.0Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a and supports several optional sections of the Serial ATA II: Extensions to Serial ATA 1.0 Specification, Revision 1.0 (AHCI support is required for some elements).



SATA Connectors

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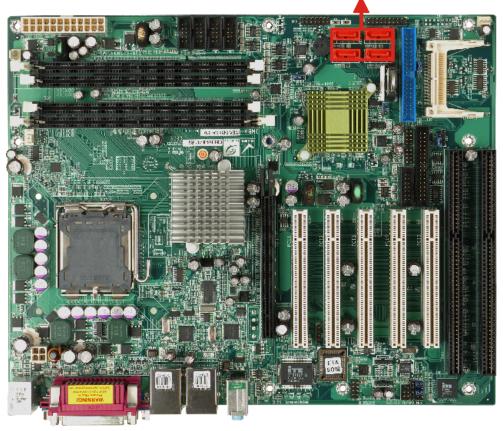


Figure 2-12: SATA Connectors

2.5.9 Intel[®] ICH7 USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH7 on the IMBA-9454ISA. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH7 integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH7 integrated Universal Host Controller Interface (UHCI) controllers.

Four of the USB ports are accessed through two 4-pin pin headers. The remaining four USB ports are external USB connectors.



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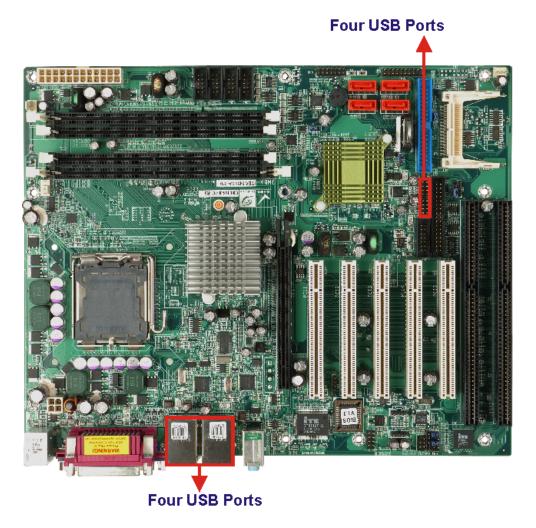


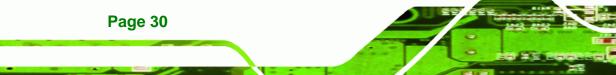
Figure 2-13: USB Connectors

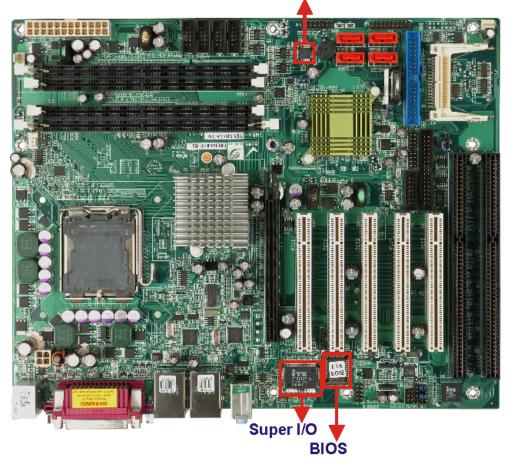
2.6 LPC Bus Components

2.6.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- Serial port chipset





Serial Port Controller

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Figure 2-14: LPC Bus Components

2.6.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support



2.6.3 Super I/O chipset

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The iTE IT8712F Super I/O chipset is connected to the ICH8DO southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8712F chipset are listed below:

- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

2.6.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel[®] Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.6.3.2 Super I/O Digital Input/Output

The input mode supports switch debouncing or programmable external IRQ routing. The output mode supports two sets of programmable LED blinking periods.

2.6.3.3 Super I/O 16C550 UARTs

Page 32

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

Two standard serial ports (COM1 and COM2)

IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another four serial port connectors

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2.6.3.4 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.6.3.5 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.6.3.6 Super I/O Floppy Disk Controller

The Super I/O floppy disk controller has the following specifications:

- Supports floppy drives with the following capacity:
 - O 360K
 - O 720K
 - O 1.2M
 - 0 1.44M
 - O 2.88M

2.6.3.7 Super I/O Keyboard/Mouse Controller

The Super I/O keyboard/mouse controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events





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The multi-mode high-performance parallel port supports the bi-directional Standard Parallel Port (SPP), the Enhanced Parallel Port (EPP) and the Extended Capabilities Port (ECP) modes.

2.6.4 Fintek F81216DG LPC Serial Port Chipset

The Fintek F81216DG chipset enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the Southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
 - O 3 x Pure UART
 - O 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48MHz
- Powered by 3Vcc

2.7 Environmental and Power Specifications

2.7.1 System Monitoring

Three thermal inputs on the IMBA-9454ISA Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- CPU temperature
- System Temperature 1
- System Temperature 2

All three fan speeds are monitored and can be seen in the BIOS as:

- CPI Fan Speed
- System Fan 1 Speed
- System Fan 2 Speed

Page 34

Eight voltage inputs on the IMBA-9454ISA Super I/O Enhanced Hardware Monitor monitor the following volatages:

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- CPU Core
- DRAM Vcc
- +3.30V
- +5.00V
- +12.0V
- FSB VCC +1.2V
- +1.5V

The IMBA-9454ISA Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

VBAT

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.7.2 Operating Temperature and Temperature Control

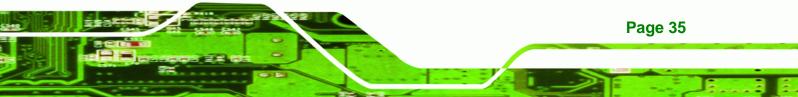
The maximum and minimum operating temperatures for the IMBA-9454ISA are listed below.

- Minimum Operating Temperature: 0°C (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.7.3 Power Consumption

Table 2-2 shows the power consumption parameters for the IMBA-9454ISA running with a 1066 MHz FSB 3.73 GHz Intel® Pentium® 4 processor with 1 GB of 667 MHz DDR2 memory.



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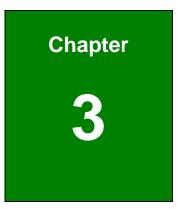
IMBA-9454ISA ATX Motherboard

Voltage	Current
+3.3 V	6.07 A
+5 V	4.25 A
+12 V	10.17 A

Table 2-2: Power Consumption







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Unpacking



3.1 Anti-static Precautions

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Failure to take ESD precautions during the installation of the IMBA-9454ISA may result in permanent damage to the IMBA-9454ISA and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9454ISA. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-9454ISA, 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 IMBA-9454ISA, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-9454ISA.
- Only handle the edges of the PCB:-: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IMBA-9454ISA is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 3.1.
- Make sure the packing box is facing upwards so the IMBA-9454ISA does not fall out of the box.
- Make sure all the components shown in Section 3.3 are present.

Page 38

3.3 Unpacking Checklist



If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9454ISA from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to <u>sales@iei.com.tw</u>.

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3.3.1 Package Contents

The IMBA-9454ISA is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-9454ISA	
2	Dual RS-232 cable (P/N : 32200-004101-RS)	
1	ATA 66/100 flat cable (P/N : 32200-000052-RS)	



1	I/O Shielding (P/N : 45002-450903-00-RS)	
2	SATA cables (P/N : 32000-062800-RS)	
1	SATA power cables (P/N : 32100-088600-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	EXECUTION CONTRACT
1	Utility CD	

Table 3-1: Package List Contents

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3.4 Optional Items

2-port USB cable (w bracket)	
(P/N :CB-USB02-RS)	*
4-port USB cable	
(P/N : CB-USB14-RS)	
CPU cooling kit	
(P/N : CF-520-RS)	
CPU cooling kit	
(P/N : CF-775A-RS)	
Dual RS-232/422/485 cable	\wedge
(P/N : 32200-000063-RS)	
FDD cable	
(P/N : 32200-000017-RS)	
PCIe x16 VGA output SDVO card with	
dual display support	· Partice
(P/N : SDVO-100VGA-R10)	

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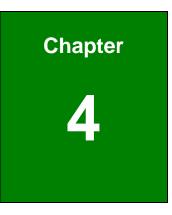
IMBA-9454ISA ATX Motherboard

PCIe x16 DVI output SDVO card with dual display support (P/N : SDVO-100DVI-R10)	
Infineon TPM module (P/N : TPM-IN01-R10)	
Winbond TPM module (P/N : TPM-WI01-R10)	

Table 3-2: Package List Contents

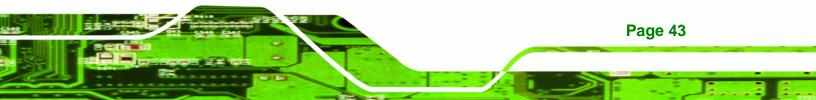






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Connector Pinouts





4.1 Peripheral Interface Connectors

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Section 4.1.2 shows peripheral interface connector locations. Section 4.1.2 lists all the peripheral interface connectors seen in Section 4.1.2.

4.1.1 IMBA-9454ISA Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

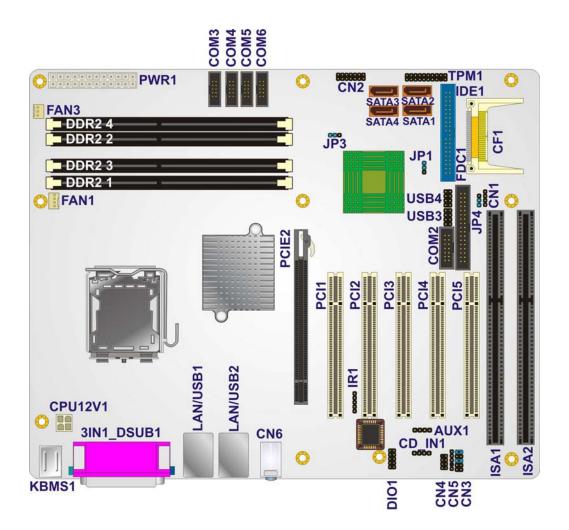


Figure 4-1: Connector and Jumper Locations



4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IMBA-9454ISA.Detailed descriptions of these connectors can be found below.

Connector	Туре	Label
ATX +12V power connector	4-pin ATX	CPU12V1
ATX power connector	24-pin ATX	PWR1
Audio auxiliary in	4-pin header	AUX1
Audio CD In	4-pin header	CD_IN1
Audio connector (front panel)	10-pin header	CN3
Audio connector	8-pin header	CN4
CF card Type II socket	50-pin socket	CF1
Cooling fan connector, CPU	4-pin wafer	FAN1
Cooling fan connector, system	3-pin wafer	FAN2
Cooling fan connector, system	3-pin wafer	FAN3
Digital input/output connector	10-pin header	DIO1
Floppy disk connector	17-pin box header	FDC1
Front panel connector	14-pin header	CN2
IDE connector	40-pin box header	IDE1
Infrared (IrDA) connector	5-pin header	IR1
ISA socket	98-pin ISA slot	ISA1
ISA socket	98-pin ISA slot	ISA2
PCI socket	124-pin PCI slot	PCI1
PCI socket	124-pin PCI slot	PCI2

Page 45

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PCI socket	124-pin PCI slot	PCI3
PCI socket	124-pin PCI slot	PCI4
PCI socket	124-pin PCI slot	PCI5
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial ATA drive connector	7-pin SATA	SATA5
Serial ATA drive connector	7-pin SATA	SATA6
Serial port (COM2) select RS-232/422/485	4-pin header	CN1
Serial port connector (COM2) (RS-232/422/485)	14-pin box header	COM2
Serial port connector (COM3) (RS-232)	10-pin box header	COM3
Serial port connector (COM4) (RS-232)	10-pin box header	COM4
Serial port connector (COM5) (RS-232)	10-pin box header	COM5
Serial port connector (COM6) (RS-232)	10-pin box header	COM6
SPDIF connector	5-pin header	CN5
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB3
USB connectors	8-pin header	USB4

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the IMBA-9454ISA. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 79**

Connector	Туре	Label
Audio connector	3 x audio jacks	CN6
Keyboard and mouse connector	Dual PS/2	KBMS1
Parallel port connector	D-Sub 25-pin female	3IN1 DSUB1
Serial port connector (RS-232)	D-Sub 9-pin male	3IN1 DSUB1
Dual USB and LAN Combo	Dual USB ports and RJ-45	LAN/USB1
Dual USB and LAN Combo	Dual USB ports and RJ-45	LAN/USB 2
VGA port connector	D-Sub 15-pin female	3IN1 DSUB1

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Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IMBA-9454ISA.

4.2.1 ATX +12V Power Connector

CN Label:	CPU12V1
CN Type:	4-pin ATX power connector (2x2)
CN Location:	See Figure 4-2
CN Pinouts:	See Table 4-3

The 4-pin ATX power connector is connected to an ATX power supply.

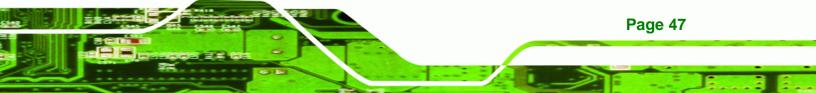






Figure 4-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 4-3: ATX Power Connector Pinouts

4.2.2 ATX Power Connector

CN Label:	PWR1
CN Type:	24-pin ATX (2x12)
CN Location:	See Figure 4-3
CN Pinouts:	See Table 4-4

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.



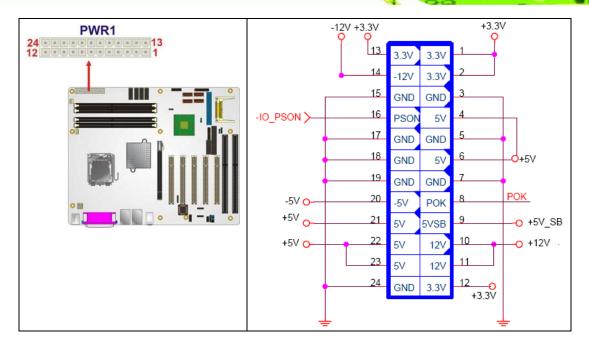


Figure 4-3: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GROUND	15	GROUND
4	+5V	16	PS-ON
5	GROUND	17	GROUND
6	+5V	18	GROUND
7	GROUND	19	GROUND
8	POWER GOOD	20	GND
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 4-4: ATX Power Connector Pinouts



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4.2.3 Auxiliary Audio Connector (4-pin)

CN Label:	AUX1	
CN Type:	4-pin header	
CN Location:	See Figure 4-4	
CN Pinouts:	See Table 4-5	

The 4-pin auxiliary audio connector provides a second audio input to the system.

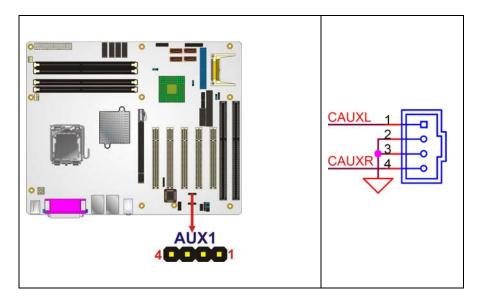


Figure 4-4: Auxiliary Audio Connector Location (4-pin)

PIN	DESCRIPTION
1	CAUXL
2	GND
3	GND
4	CAUXR

Table 4-5: Auxiliary Audio Connector Pinouts (4-pin)

4.2.4 Audio CD In Connector (4-pin)

CN Label: CD_IN1

Page 50

CN Type:	10-pin header	
CN Location:	See Figure 4-5	
CN Pinouts:	See Table 4-6	

The 4-pin audio CD in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

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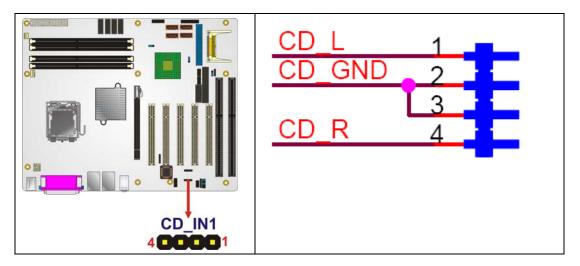


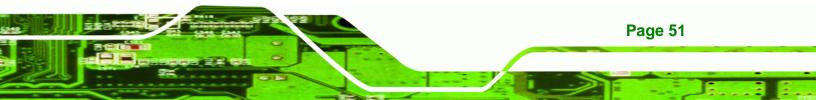
Figure 4-5: Audio CD In Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION	
1	CD Signal In (Left)	
2	Ground	
3	Ground	
4	CD Signal In (Right)	

Table 4-6: Audio CD In Connector Pinouts

4.2.5 Audio Connector

CN Label:	CN3	
CN Type:	10-pin header (2x5)	
CN Location:	See Figure 4-6	





CN Pinouts: See Table 4-7



This connector is an alternative audio connector to the audio jacks on the external peripheral interface connector panel. To use this connector the jumper caps must be removed. When this connector is used, the audio jacks are disabled and can no longer be used.

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.

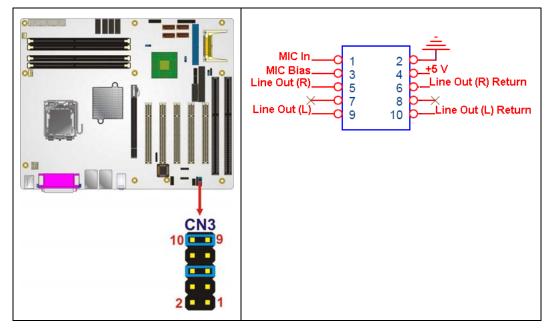


Figure 4-6: Audio Connector Location (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC In	2	GND
3	MIC Bias	4	+5V

Page 52

5	Line Out (Right)	6	Line Out (Right) Return
7	N/C	8	N/C
9	Line Out (Left)	10	Line Out (Left) Return

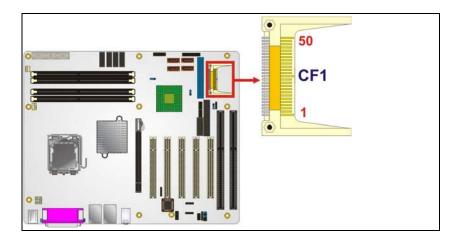
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Table 4-7:	Audio Conne	ector Pinouts
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4.2.6 CompactFlash® Socket

CN Label:	CF1
CN Type:	50-pin header (2x25)
CN Location:	See Figure 4-7
CN Pinouts:	See Table 4-8

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the IMBA-9454ISA.





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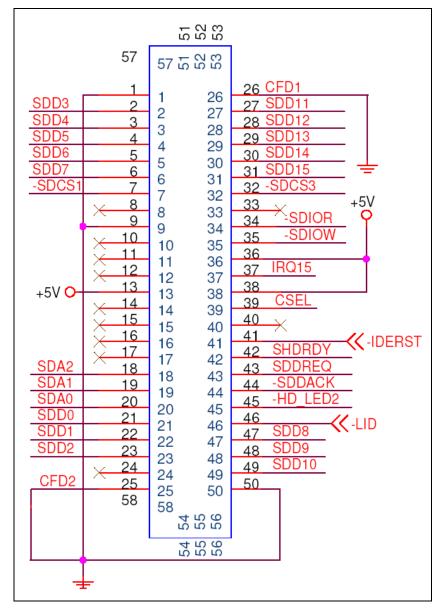


Figure 4-7: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	vcc_сом
12	N/C	37	IRQ15
13	vcc_сом	38	vcc_сом
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SAO	45	HDD_ACTIVE#
21	DATA O	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

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Table 4-8: CF Card Socket Pinouts

4.2.7 Digital Input/Output (DIO) Connector

CN Label:	DIO1
CN Type:	10-pin header (2x5)
CN Location:	See Figure 4-8
CN Pinouts:	See Table 4-9

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



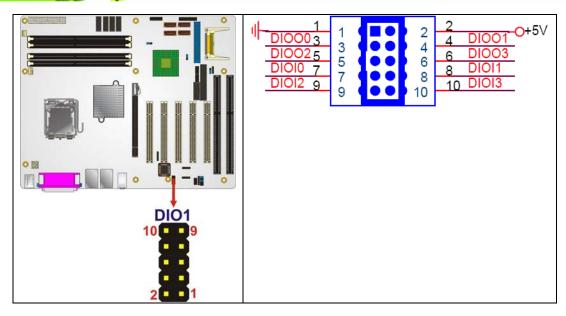


Figure 4-8: DIO Connector Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	vcc
3	Output 0	4	Output 1
5	Output 2	6	Output 3
7	Input 0	8	Input 1
9	Input 2	10	Input 3

Table 4-9: DIO Connector Connector Pinouts

4.2.8 Fan Connector (+12V) (CPU Cooling Fan)

CN Label:	FAN1
CN Type:	4-pin wafer
CN Location:	See Figure 4-9
CN Pinouts:	See Table 4-10

The CPU cooling fan connector provides a 12V, 500mA current to a CPU cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the



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system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

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Figure 4-9: +12V Fan Connector Location

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

Table 4-10: +12V Fan Connector Pinouts

4.2.9 Fan Connector (+12V) (System Cooling Fans)

CN Label:	FAN2, FAN3
CN Type:	3-pin header
CN Location:	See Figure 4-9
CN Pinouts:	See Table 4-10

Two system cooling fan connectors provide a 12V, 500mA current to two system cooling fans. The connectors have a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.







Figure 4-10: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	Fan Speed Detect

Table 4-11: +12V Fan Connector Pinouts

4.2.10 Floppy Disk Connector (34-pin)

CN Label:	FDC1
CN Type:	34-pin header (2x17)
CN Location:	See Figure 4-11
CN Pinouts:	See Table 4-12

The floppy disk connector is connected to a floppy disk drive.



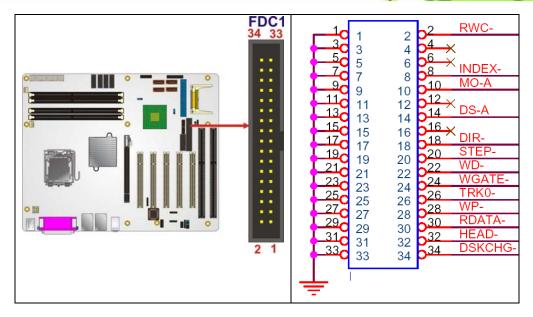


Figure 4-11: 34-pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Page 59

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PIN NO. DESCRIPTION	PIN NO.	DESCRIPTION
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Table 4-12: 34-pin FDD Connector Pinouts

4.2.11 Front Panel Connector (14-pin)

CN Label:	CN2		
CN Type:	14-pin header (2x7)		
CN Location:	See Figure 4-12		
CN Pinouts:	See Table 4-13		

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power LED
- Power button
- Beeper
- Reset
- HDD LED

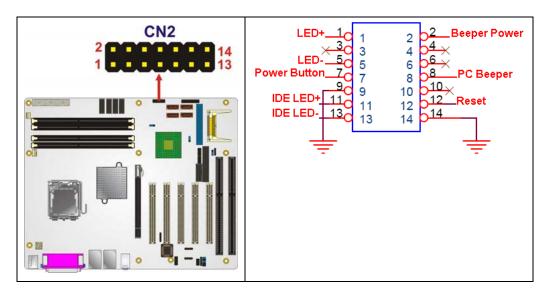


Figure 4-12: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED+	Buzzer	2	Beeper Power
	3	N/C		4	N/C
	5	LED-		6	N/C
Power	7	Power Button		8	PC Beeper
Button	9	GND	Reset	10	N/C
HDD LED	11	IDE LED+		12	Reset
	13	IDE LED-		14	GND

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Table 4-13: Front Panel Connector Pinouts (14-pin)

4.2.12 IDE Connector (40-pin)

CN Label:	IDE1	
CN Type:	40-pin header (2x20)	
CN Location:	See Figure 4-13	
CN Pinouts:	See Table 4-14	

One 40-pin IDE device connector on the IMBA-9454ISA supports connectivity to two hard disk drives.



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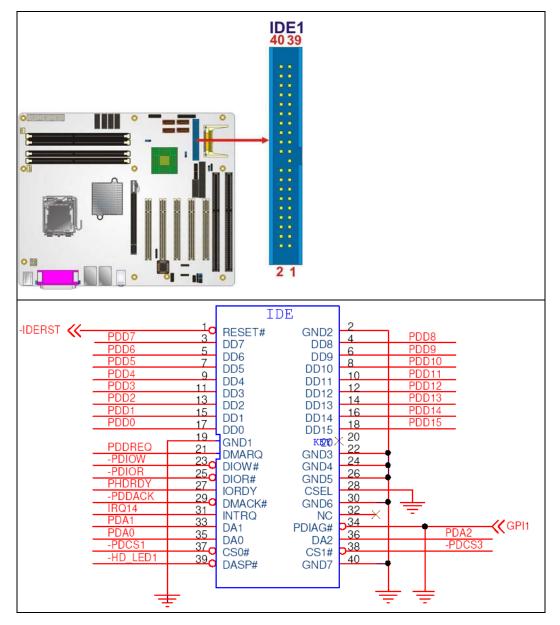


Figure 4-13: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA O	18	DATA 15
19	GROUND	20	N/C
21	I DE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	I DE CHRDY	28	GROUND
29	IDE DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SAO	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

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Table 4-14: IDE Connector Pinouts

4.2.13 Infrared Interface Connector (5-pin)

CN Label:	IR1	
CN Type:	5-pin header (1x5)	
CN Location:	See Figure 4-14	
CN Pinouts:	See Table 4-15	

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.



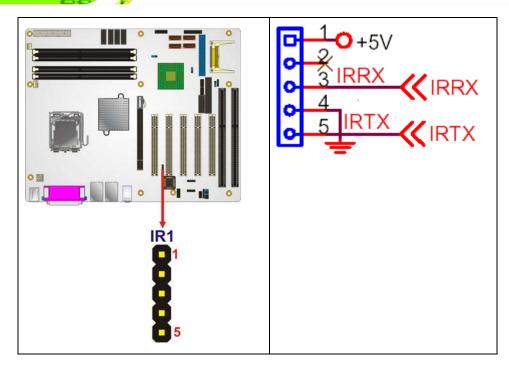


Figure 4-14: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION	
1	VCC	
2	NC	
3	IR-RX	
4	GND	
5	IR-TX	

Table 4-15: Infrared Connector Pinouts

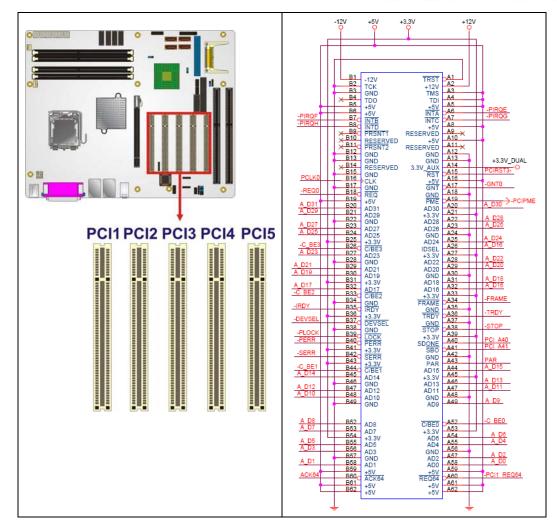
4.2.14 PCI Slot

Page 64

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CN Label:	PCI1, PCI2, PCI3, PCI4, PCI5
CN Type:	PCI Slot
CN Location:	See Figure 4-15
CN Pinouts:	See Table 4-16

The PCI slot enables a PCI expansion module to be connected to the board.





PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	тск
A3	TMS	В3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	ΙΝΤΑ	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
А9	RESERVED3	В9	PRSNT1

Page 65

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A10+5VB10RESERVED1A11RESERVED4B11PRSNT2A12GNDB12GNDA13GNDB13GNDA143.3V_AUXB14RESERVED2A15RSTB15GNDA16+5VB16CLKA17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA29AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA32AD16B32AD17A33+3.3VB33C/BE2A34FRAMEB34GNDA35GNDB35IRDY				
A12GNDB12GNDA13GNDB13GNDA143.3V_AUXB14RESERVED2A15RSTB15GNDA16+5VB16CLKA17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A27+3.3VB27AD23A28AD22B28GNDA29AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA34FRAMEB34GNDA35GNDB35IRDY	A10	+5V	B10	RESERVED1
A13GNDB13GNDA143.3V_AUXB14RESERVED2A15RSTB15GNDA16+5VB16CLKA17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA29AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA34FRAMEB34GNDA35GNDB35IRDY	A11	RESERVED4	B11	PRSNT2
A143.3V_AUXB14RESERVED2A15RSTB15GNDA16+5VB16CLKA17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA29AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA33+3.3VB33C/BE2A34FRAMEB34GNDA35GNDB35IRDY	A12	GND	B12	GND
A15 RST B15 GND A16 +5V B16 CLK A17 GNT B17 GND A18 GND B18 REQ A19 PME B19 +5V A20 AD30 B20 AD31 A21 +3.3V B21 AD29 A22 AD28 B22 GND A23 AD26 B23 AD27 A24 GND B24 AD25 A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A28 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME	A13	GND	B13	GND
A16+5VB16CLKA17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB26C/BE3A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA30GNDB30AD19A31AD18B31+3.3VA32AD16B34GNDA34FRAMEB34GNDA35GNDB35IRDY	A14	3.3V_AUX	B14	RESERVED2
A17GNTB17GNDA18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA30GNDB30AD19A31AD18B31+3.3VA32AD16B32AD17A34FRAMEB34GNDA35GNDB35IRDY	A15	RST	B15	GND
A18GNDB18REQA19PMEB19+5VA20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD22B28GNDA29AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA32AD16B32AD17A34FRAMEB34GNDA35GNDB35IRDY	A16	+5V	B16	CLK
A19 PME B19 +5V A20 AD30 B20 AD31 A21 +3.3V B21 AD29 A22 AD28 B22 GND A23 AD26 B23 AD27 A24 GND B24 AD25 A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND	A17	GNT	B17	GND
A20AD30B20AD31A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA32AD16B32AD17A34FRAMEB34GNDA35GNDB35IRDY	A18	GND	B18	REQ
A21+3.3VB21AD29A22AD28B22GNDA23AD26B23AD27A24GNDB24AD25A25AD24B25+3.3VA26IDSELB26C/BE3A27+3.3VB27AD23A28AD20B29AD21A30GNDB30AD19A31AD18B31+3.3VA32AD16B32AD17A33+3.3VB33C/BE2A34FRAMEB34GNDA35GNDB35IRDY	A19	PME	B19	+5V
A22 AD28 B22 GND A23 AD26 B23 AD27 A24 GND B24 AD25 A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND	A20	AD30	B20	AD31
A23 AD26 B23 AD27 A24 GND B24 AD25 A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A21	+3.3V	B21	AD29
A24 GND B24 AD25 A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A22	AD28	B22	GND
A25 AD24 B25 +3.3V A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A23	AD26	B23	AD27
A26 IDSEL B26 C/BE3 A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A24	GND	B24	AD25
A27 +3.3V B27 AD23 A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A25	AD24	B25	+3.3V
A28 AD22 B28 GND A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A26	IDSEL	B26	C/BE3
A29 AD20 B29 AD21 A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A27	+3.3V	B27	AD23
A30 GND B30 AD19 A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A28	AD22	B28	GND
A31 AD18 B31 +3.3V A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A29	AD20	B29	AD21
A32 AD16 B32 AD17 A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A30	GND	B30	AD19
A33 +3.3V B33 C/BE2 A34 FRAME B34 GND A35 GND B35 IRDY	A31	AD18	B31	+3.3V
A34FRAMEB34GNDA35GNDB35IRDY	A32	AD16	B32	AD17
A35 GND B35 IRDY	A33	+3.3V	B33	C/BE2
	A34	FRAME	B34	GND
	A35	GND	B35	IRDY
A30 IUI B30 +3.3V	A36	TRDY	B36	+3.3V
A37 GND B37 DEVSEL	A37	GND	B37	DEVSEL
A38 STOP B38 GND	A38	STOP	B38	GND
A39 +3.3V B39 LOCK	A39	+3.3V	B39	LOCK
A40 SDONE B40 PERR	A40	SDONE	B40	PERR
A41 SBO B41 +3.3V	A41	SBO	B41	+3.3V

A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BEO	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	ADO	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

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Table 4-16: PCI Slot

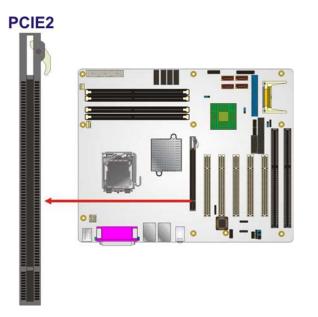
4.2.15 PCI Express x16 Slot

CN Label:	PCIE2
CN Type:	164-pin PCIe x16 slot
CN Location:	See Figure 4-26
CN Pinouts:	See Table 4-17 (Side A) Table 4-18 (Side B)

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.







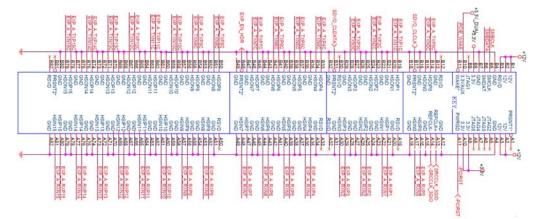


Figure 4-16: PCIe x16 Connector Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1		A2	HSIn(1	A43		A64	HSIp(11
AI	Name	2)	A43	HSIp(6)	A04)
A2		A2		A44		A65	HSIn(11
AZ	PRSNT#1	3	GND	A44	HSIn(6)	AOS)
A3		A2		A45		A66	
AS	+12v	4	GND	A45	GND	ADD	GND

A4		A2	HSIp(2	A46		A67	
	+12v	5)		GND		GND
A5		A2	HSIn(2	A47		A68	HSIp(12
AD	GND	6)	A47	HSIp(7)	A00)
		A2					HSIn(12
A6	JTAG2	7	GND	A48	HSIn(7)	A69)
		A2					
A7	JTAG3	8	GND	A49	GND	A70	GND
		A2	HSIp(3				
A 8	JTAG4	9)	A50	RSVD	A71	GND
		A3	Ý HSIn(3				HSIp(13
A9	JTAG5	0)	A51	GND	A72)
A1	51705	A3	,				, HSIn(13
0	+3.3v	1	GND	A52		A73	
	+3.3V		GND		HSIp(8))
A1	0.0	A3	DOVD	A53		A74	
1	+3.3v	2	RSVD		HSIn(8)		GND
A1		A3		A54		A75	
2	PWRGD	3	RSVD		GND		GND
A1		A3		A55		A76	HSIp(14
3	GND	4	GND		GND)
A1		A3	HSIp(4	A56		A77	HSIn(14
4	REFCLK+	5)		HSIp(9))
A1		A3	HSIn(4	A57		A78	
5	REFCLK-	6)	107	HSIn(9)	A70	GND
A1		A3		A58		A79	
6	GND	7	GND	A30	GND	A79	GND
A1		A3		450		400	HSIp(15
7	HSIp(0)	8	GND	A59	GND	A80)
A1		A3	HSIp(5		HSIp(10		HSIn(15
8	HSIn(0)	9)	A60)	A81)
A1		A4	HSIn(5		HSIn(10		
9	GND	о)	A61)	A82	GND
A2		A4	<u> </u>				
0	RSVD	1	GND	A62	GND		
-							

Page 69

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A2		A4		A 4 2		
1	GND	2	GND	A63	GND	

Table 4-17: PCIe x16 Side A Pinouts

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PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1		B2		B4		B64	
ы	+12v	2	GND	3	GND	Б04	GND
B2		B2		B4		B65	
Βz	+12v	3	HSOp(2)	4	GND	805	GND
В3		B2		B4	HSOp(7	B66	HSOp(1
53	RSVD	4	HSOn(2)	5)	воо	2)
В4		B2		B4	HSOn(7	B67	HSOn(1
D4	GND	5	GND	6)	607	2)
B5		B2		B4		B68	
БЭ	SMCLK	6	GND	7	GND	DOO	GND
В6		B2		B4	PRSNT#	B69	
во	SMDAT	7	HSOp(3)	8	2	809	GND
В7		B2		B4		B70	HSOp(1
В7	GND	8	HSOn(3)	9	GND	870	3)
B8		B2		B5	HSOp(8	B71	HSOn(1
Бо	+3.3v	9	GND	0)	671	3)
В9		B3		B5	HSOn(8	B72	
D7	JTAG1	0	RSVD	1)	Б72	GND
B1		B3		B5		B73	
0	3.3Vaux	1	PRNT#2	2	GND	D73	GND
B1		B3		B5		B74	HSOp(1
1	WAKE#	2	GND	3	GND	B74	4)
B1		B3		B5	HSOp(9	B75	HSOn(1
2	RSVD	3	HSOp(4)	4)	675	4)
B1		B3		B5	HSOn(9	B76	
3	GND	4	HSOn(4)	5)	670	GND
B1		B3		B5		D 77	
4	HSOp(0)	5	GND	6	GND	B77	GND

B1		B3		B5		B78	HSOp(1
5	HSOn(0)	6	GND	7	GND	D/8	5)
B1		B3		B5	HSOp(1	B79	HSOn(1
6	GND	7	HSOp(5)	8	0)	B79	5)
B1		B3		B5	HSOn(1	B80	
7	PRSNT#2	8	HSOn(5)	9	0)	680	GND
B1		B3		B6		B81	PRSNT#
8	GND	9	GND	0	GND	DOI	2
B1		B4		B6		B82	
9	HSOp(1)	о	GND	1	GND	D02	RSVD#2
B2		B4		B6	HSOp(1		
0	HSOn(1)	1	HSOp(6)	2	1)		
B2		B4		B6	HSOn(1		
1	GND	2	HSOn(6)	3	1)		

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Table 4-18: PCIe x16 Side B Pinouts

4.2.16 SATA Drive Connectors

CN Label:	SATA1, SATA2, SATA3, SATA4
CN Type:	7-pin SATA drive connectors
CN Location:	See Figure 4-17
CN Pinouts:	See Table 4-19

The six SATA drive connectors are each connected to a second generation SATA drive. Second generation SATA drives transfer data at speeds as high as 300Mb/s. The SATA drives can be configured in a RAID configuration.



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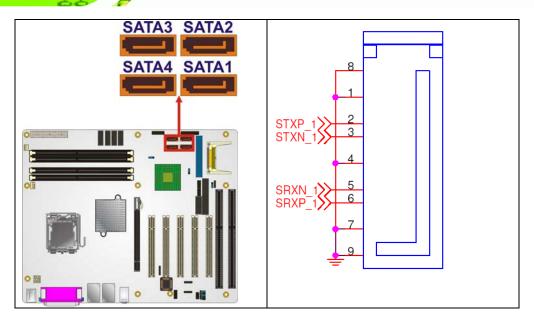


Figure 4-17: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	тх-
4	GND
5	RX-
6	RX+
7	GND

Table 4-19: SATA Drive Connector Pinouts

4.2.17 Serial Port Connectors (RS-232)

CN Label:	COM3, COM4, COM5 and COM6
CN Type:	10-pin header (2x5)
CN Location:	See Figure 4-18
CN Pinouts:	See Table 4-20



The four 10-pin serial port connectors provide four additional RS-232 serial communications channels. The four internal RS-232 serial port connectors can be connected to external RS-232 serial port devices.

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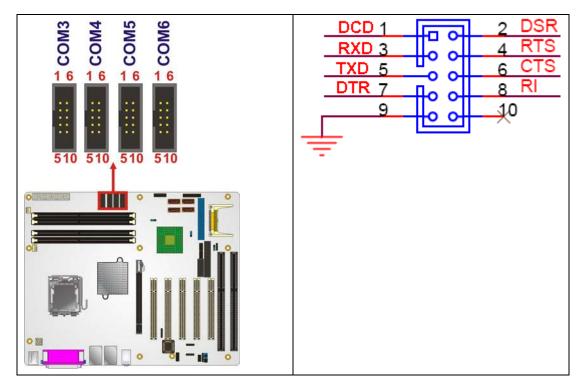


Figure 4-18: RS-232 COM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N/C

Table 4-20: RS-232 COM Connector Pinouts

4.2.18 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: COM2

CN Type: 14-pin header (2x7)





CN Location:	See Figure 4-19
CN Pinouts:	See Table 4-21

The 14-pin serial port connector connects to the COM 2 serial communications channels. COM 2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the COM 2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

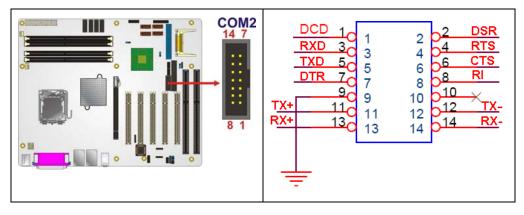


Figure 4-19: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND
11	TX+	12	TX-
13	RX+	14	RX-

Table 4-21: RS-232/RS-485 Serial Port Connector Pinouts

4.2.19 Serial Port Connector (COM 2)(RS-422 or RS-485 only)

CN Label: CN1

CN Type: 4-pin header (1 x 4)

CN Location:	See Figure 4-20
CN Pinouts:	See Table 4-22



This connector and the RS-422/485 pins on the COM2 connector cannot be used at the same time. For RS-422/485 serial communications, either this connector can be used or the pins on the COM2 connector can be used.

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Page 75

The 4-pin serial port connector connects to the COM 2 RS-422 and RS-485 serial communications channels. The RS-422/485 only COM2 connector can be used instead of the 14-pin COM2 connector when RS-422/485 communication protocols are implemented. To use this connector the COM 2 function select jumper must be configured in the RS-422/RS-485 serial communications mode.

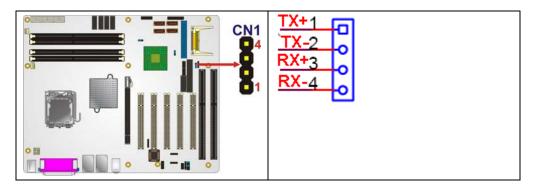


Figure 4-20: RS-422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION
1	TXD+
2	TXD-
3	RXD+
4	RXD-



Table 4-22: RS-422/485 Serial Port Connector Pinouts

4.2.20 SPDIF Connector

CN Label:	CN5	
CN Type:	5-pin header	
CN Location:	See Figure 4-21	
CN Pinouts:	See Table 4-23	

Use the SPDIF connector to connect digital audio devices to the system.

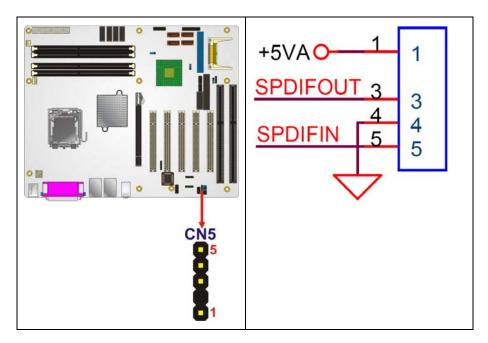


Figure 4-21: SPDIF Connector Pinout Locations

PIN	DESCRIPTION	
1	VCC AUDIO	
2	NC	
3	SPDIF OUT	
4	GND AUDIO	
5	SPDIF IN	

Table 4-23: SPDIF Connector Pinouts

4.2.21 Trusted Platform Module (TPM) Connector

CN Label:	TPM1	
CN Type:	20-pin header (2x10)	
CN Location:	See Figure 4-22	
CN Pinouts:	See Table 4-24	

The Trusted Platform Module (TPM) connector secures the system on bootup.

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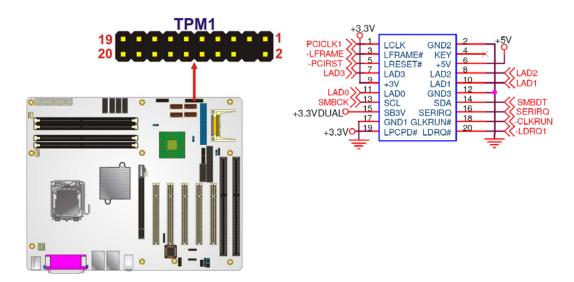
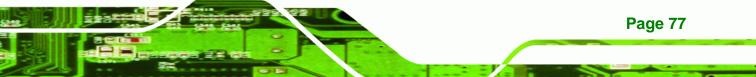


Figure 4-22: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5V
7	LAD3	8	LAD2
9	+3.4V	10	LAD1
11	LADO	12	GND3
13	SCL	14	SDA



15	SB3.3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-24: TPM Connector Pinouts

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4.2.22 USB Connectors (Internal)

CN Label:	USB3, USB4	
CN Type:	8-pin header (2x4)	
CN Location:	See Figure 4-23	
CN Pinouts:	See Table 4-25	

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

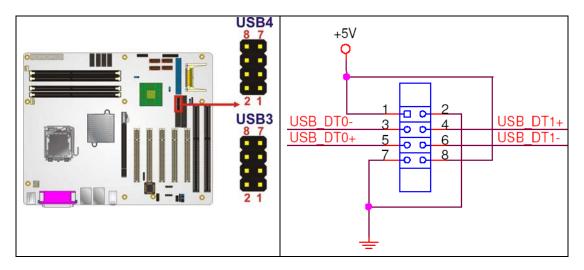


Figure 4-23: USB Connector Pinout Locations



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATAM+
5	DATAN+	6	DATAN-
7	GND	8	VCC

 Table 4-25: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

The external peripheral interface connectors on the back panel are connected to devices externally when the IMBA-9454ISA is installed in a chassis. The peripheral connectors on the rear panel are:

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Page 79

- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 2 x RJ-45 Ethernet connector
- 3 x Audio jacks
- 4 x USB 2.0 connectors
- 1 x VGA connector
- 1 x Serial port connector

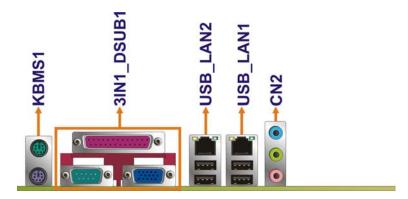


Figure 4-24: IMBA-9454ISA External Interface Connectors



4.3.1 Keyboard/Mouse Connector

CN Label:	KBMS1
CN Type:	PS/2 connector
CN Location:	See Figure 4-24
CN Pinouts:	See Figure 4-25 and Table 4-26

The IMBA-9454ISA keyboard and mouse connectors are standard PS/2 connectors.

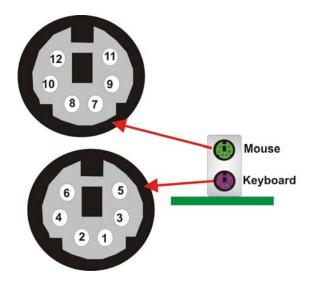


Figure 4-25: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-26: PS/2 Connector Pinouts

4.3.2 Parallel Port Connector

CN Label:	LPT1
CN Type:	DB-25
CN Location:	See Figure 4-24
CN Pinouts:	See Figure 4-26 and Table 4-27

These ports are usually connected to a printer. IMBA-9454ISA includes one on-board parallel ports accessed through one 25-pin D-type female connector.

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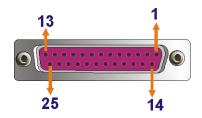


Figure 4-26: Parallel Port Connector Pinout Locations

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 4-27: Parallel Pinouts



4.3.3 Audio Connectors

CN Label:	CN2
CN Type:	Audio jack
CN Location:	See Figure 4-24
CN Pinouts:	See Figure 4-27
■ Line In	port (Light Blue): Connects a CD-ROM, DVD player, or other audio

- devices.
 Speaker Out port (Lime): Connects to a headphone or a speaker. With
 - multi-channel configurations, this port can also connect to front speakers.
- Microphone (Pink): Connects a microphone.



Figure 4-27: Audio Connector

4.3.4 LAN Connectors

CN Label:	LAN/USB1, LAN/USB2
CN Type:	RJ-45
CN Location:	Figure 4-24
CN Pinouts:	Table 4-28

The IMBA-9454ISA is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	тхс-
2	TXA-	6	ТХВ-
3	ТХВ+	7	TXD+
4	TXC+	8	TXD-

Table 4-28: LAN Pinouts

Activity Linked

Figure 4-28: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-29**.

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STATUS	DESCRIPTION	STATUS	DESCRIPTION
YELLOW	Activity	GREEN	Linked

 Table 4-29: RJ-45 Ethernet Connector LEDs

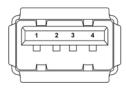
4.3.5 USB Connectors

- CN Label: USB/LAN1, USB/LAN2
- CN Type: Dual USB port
- CN Location: See Figure 4-24
- CN Pinouts: See Figure 4-29 and Table 4-30

USB devices connect directly to the USB connectors on the external peripheral connector panel.









PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-30: USB Connector Pinouts

4.3.6 VGA Connector

CN Label:	VGA
CN Type:	HD-D-sub 15 Female connector
CN Location:	See Figure 4-24 (labeled 6)
CN Pinouts:	See Figure 4-30 and Table 4-31

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

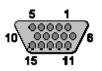


Figure 4-30: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND

PIN	Description	PIN	Description
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		



4.3.7 Serial Communications Connector

CN Label:	COM1
CN Type:	D-sub 9 Male connector
CN Location:	See Figure 4-24 (labeled 7)
CN Pinouts:	See Figure 4-31 and Table 4-32

The serial connector on the external interface panel provides serial connection in the RS-232 mode.

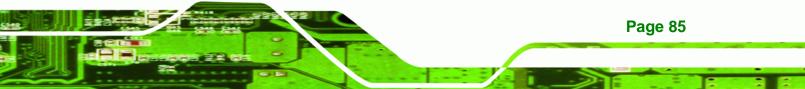
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Figure 4-31: Serial Communications Connector Pinout Locations

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)



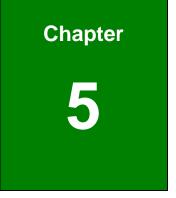


PIN	DESCRIPTION
9	RING INDICATOR (RI)

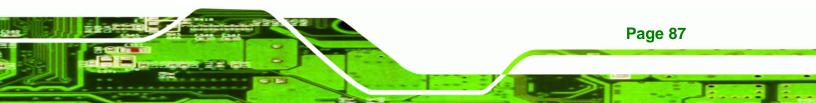
Table 4-32: COM1 RS-232 Mode Connector Pinouts







Installation





5.1 Anti-static Precautions

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Failure to take ESD precautions during the installation of the IMBA-9454ISA may result in permanent damage to the IMBA-9454ISA and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9454ISA. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-9454ISA, 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 IMBA-9454ISA, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-9454ISA.
- Only handle the edges of the PCB:-: When handling the PCB, hold the PCB by the edges.



5.2 Installation Considerations



The following installation notices and installation considerations should be read and understood before the IMBA-9454ISA is installed. All installation notices pertaining to the installation of the IMBA-9454ISA should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-9454ISA and injury to the person installing the motherboard.

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5.2.1 Installation Notices



The installation instructions described in this manual should be carefully followed in order to prevent damage to the IMBA-9454ISA, IMBA-9454ISA 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 IMBA-9454ISA 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 IMBA-9454ISA 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 IMBA-9454ISA off:





• When working with the IMBA-9454ISA, 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 IMBA-9454ISA 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.

5.2.2 Installation Checklist

The following checklist is provided to ensure the IMBA-9454ISA is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The IMBA-9454ISA is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
 - O Primary and secondary IDE device
 - O SATA drives
 - O Power supply
 - O USB cables
 - O Serial port cables
 - O I/O Shielding
- The following external peripheral devices are properly connected to the chassis:
 - O VGA screen
 - O Keyboard
 - O Mouse

Page 90

- O RS-232 serial communications device
- O Parallel port device (printer)
- O LAN connection

5.3 Unpacking

5.3.1 Unpacking Precautions

When the IMBA-9454ISA is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 5.1.
- Make sure the packing box is facing upwards so the IMBA-9454ISA does not fall out of the box.

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 Make sure all the components in the checklist shown in Chapter 3 are present.



If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-9454ISA from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to <u>sales@iei.com.tw</u>.

Page 91



5.4 CPU, CPU Cooling Kit and DIMM Installation



A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, IMBA-9454ISA and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IMBA-9454ISA. If one of these components is not installed the IMBA-9454ISA cannot run.

5.4.1 LGA775 CPU Installation



Page 92

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- CPU: An Intel® Pentium 4 Processor with HT Technology must be installed
- Chipset: An Intel[®] Chipset that supports HT Technology (that has been met by the IMBA-9454ISA)
- OS: An operating system that has optimizations for HT Technology



CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

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The LGA775 socket is shown in Figure 5-1.

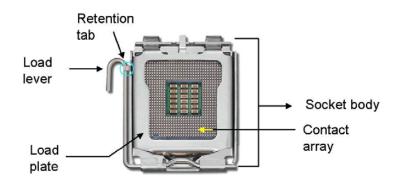


Figure 5-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the IMBA-9454ISA, follow the steps below:



When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: Remove the protective cover. Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "REMOVE" sign and use your fingernail to pry the protective cover off. See Figure 5-2.





Figure 5-2: Remove the CPU Socket Protective Shield

Step 2: Open the socket. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. See Figure 5-3.

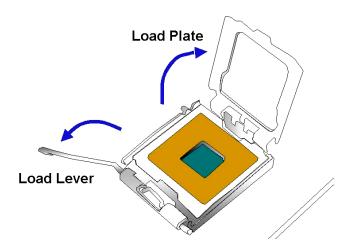


Figure 5-3: Open the CPU Socket Load Plate

- Step 3: Inspect the CPU socket Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 4: Orientate the CPU properly. Make sure the IHS (Integrated Heat Sink) side is facing upward.
- Step 5: Correctly position the CPU. Match the Pin 1 mark with the cut edge on the



CPU socket.

Step 6: Align the CPU pins. Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

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Step 7: Insert the CPU. Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See Figure 5-4.

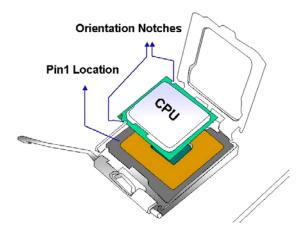
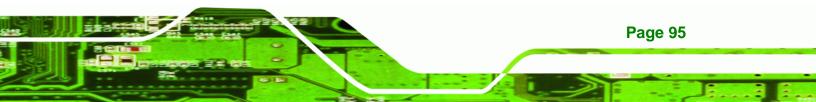


Figure 5-4: Insert the Socket LGA775 CPU

- Step 8: Close the CPU socket. Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.
- Step 9: Connect the CPU 12V cable. After the cooling kit is installed connect the CPU cable to the CPU 12V power connector





5.4.2 LGA775 Cooling Kit Installation



It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the IMBA-9454ISA.

IEI's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.



Figure 5-5: IEI CF-520 Cooling Kit



Figure 5-6: IEI CF-775A-RS Cooling Kit

Two optional, separately purchased LGA775 IEI CPU cooling kits are available. The IEI CF-520 is shown in **Figure 5-5** and the CF-775A-RS is shown **Figure 5-6** can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.





Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

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To install the cooling kit follow the instructions below.

- Step 1: Place the cooling kit onto the socket LGA775 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- **Step 2: Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.
- Step 3: Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.
- Step 4: Secure the cooling kit. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See Figure 5-7)





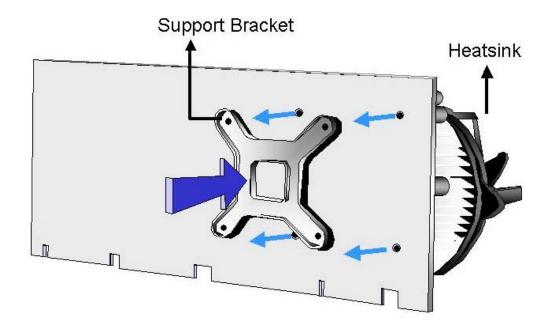


Figure 5-7: Securing the Heat sink to the PCB Board

- **Step 5: Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.
- Step 6: Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the IMBA-9454ISA. Carefully route the cable and avoid heat generating chips and fan blades.

5.4.3 DIMM Installation



Using incorrectly specified DIMM may cause permanently damage the IMBA-9454ISA. Please make sure the purchased DIMM complies with the memory specifications of the IMBA-9454ISA. DIMM specifications compliant with the IMBA-9454ISA are listed in **Chapter 2**.

Page 98

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-8**.

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Page 99

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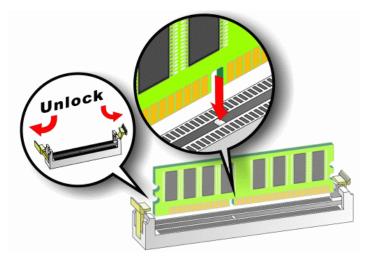


Figure 5-8: Installing a DIMM

- Step 1: Open the DIMM socket handles. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See Figure 5-8.
- Step 2: Align the DIMM with the socket. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See Figure 5-8.
- Step 3: Insert the DIMM. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See Figure 5-8.
- **Step 4: Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.



5.4.4 CF Card Installation



The IMBA-9454ISA can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type 1 or Type 2) onto the IMBA-9454ISA, please follow the steps below:

- **Step 1:** Locate the CF card socket. Place the IMBA-9454ISA on an anti-static pad with the solder side facing up. Locate the CF card.
- Step 2: Align the CF card. Make sure the CF card is properly aligned with the CF socket.
- Step 3: Insert the CF card. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See Figure 5-9.



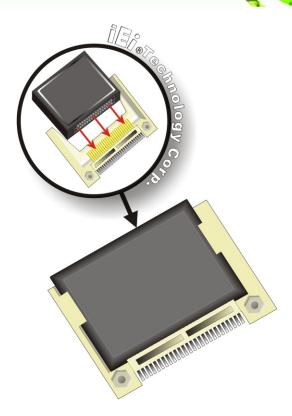
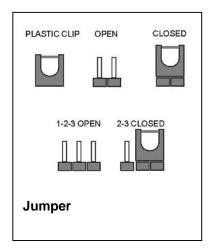


Figure 5-9: CF Card Installation

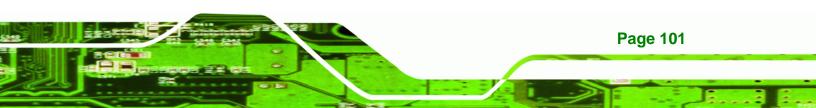
5.5 Jumper Settings



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



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Before the IMBA-9454ISA is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-9454ISA are listed in **Table 5-1**.

Description	Label	Туре
AT/ATX power select	JP3	3-pin header
CF card setup	JP2	3-pin header
Clear CMOS	JP1	3-pin header
COM 2 function select	JP4	3-pin header

Table 5-1: Jumpers

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5.5.1 AT Power Select Jumper Settings

Jumper Label:	JP3
Jumper Type:	2-pin header
Jumper Settings:	See Table 5-2
Jumper Location:	See Figure 5-10

The AT Power Select jumper specifies the systems power mode as AT or ATX. AT Power Select jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 1 - 2	Use ATX power	Default
Open 2 - 3	Use AT power	

Table 5-2: AT Power Select Jumper Settings

The location of the AT Power Select jumper is shown in Figure 5-10 below.



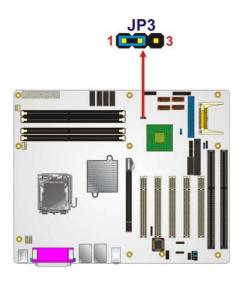


Figure 5-10: AT Power Select Jumper Location

5.5.2 CF Card Setup

Jumper Label:	JP2
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-11

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 5-3**.

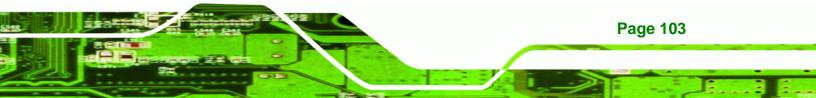
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CF Card Setup	Description	
Short	Master	Default
Open	Slave	

Table 5-3: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 5-11.





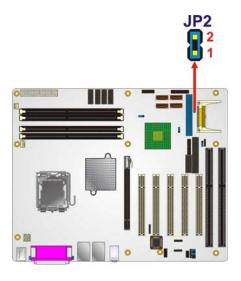


Figure 5-11: CF Card Setup Jumper Location

5.5.3 Clear CMOS Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-4
Jumper Location:	See Figure 5-12

If the IMBA-9454ISA fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.





AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

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Table 5-4: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in Figure 5-12 below.

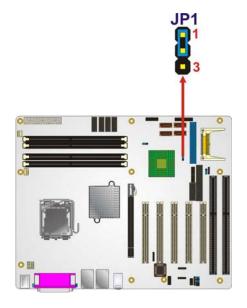
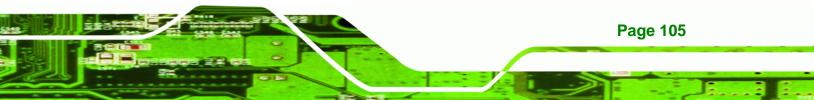


Figure 5-12: Clear CMOS Jumper

5.5.4 COM 2 Function Select Jumper

Jumper Label:	JP4
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-5
Jumper Location:	See Figure 5-13

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 5-5**.





COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 2-3	RS-422/RS-485	



The COM 2 Function Select jumper location is shown in Figure 5-13.



Figure 5-13: COM 2 Function Select Jumper Location

5.6 Chassis Installation

5.6.1 Airflow



Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IMBA-9454ISA must have air vents to allow cool air to move into the system and hot air to move out.

The IMBA-9454ISA 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.

Page 106



IEI has a wide range of backplanes available. Please contact your IMBA-9454ISA vendor, reseller or an IEI sales representative at <u>sales@iei.com.tw</u> or visit the IEI website (<u>http://www.ieiworld.com.tw</u>) to find out more about the available chassis.

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5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in Table 5-6 are shipped with the IMBA-9454ISA.

Quantity	Туре
1	ATA flat cable
1	Dual RS-232 cable
2	SATA drive cables
1	SATA drive power cables
1	I/O shielding

Table 5-6: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- FDD cable
- 2-port USB cable
- 4-port USB cable
- RS-232/422/485 cable
- PCIe x16 VGA output SDVO card
- PCIe x16 DVI output SDVO card
- TPM module



For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

5.7.2 ATA Flat Cable Connection

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The ATA 66/100 flat cable connects to the IMBA-9454ISA to one or two IDE devices. To connect an IDE HDD to the IMBA-9454ISA please follow the instructions below.

- Step 1: Locate the IDE connector. The location/s of the IDE device connector/s is/are shown in Chapter 3.
- Step 2: Insert the connector. Connect the IDE cable connector to the on-board connector. See Figure 5-14. A key on the front of the cable connector ensures it can only be inserted in one direction.

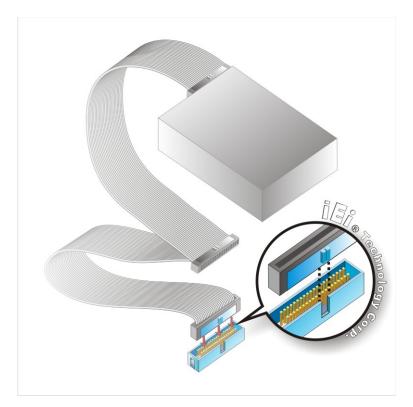


Figure 5-14: IDE Cable Connection

Step 3: Connect the cable to an IDE device. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable



corresponds to pin 1 on the connector.

5.7.3 FDD Cable Connection (Optional)

The FDD flat cable connects to the IMBA-9454ISA to one FDD device. To connect an FDD to the IMBA-9454ISA please follow the instructions below.

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- Step 1: Locate the FDD connector. The location of the FDD device connector is shown in Chapter 3.
- Step 2: Insert the connector. Connect the FDD cable connector to the on-board connector. See Figure 5-15. A key on the front of the cable connector ensures it can only be inserted in one direction.



Figure 5-15: FDD Cable Connection

Step 3: Connect the cable to an FDD device. Connect the connector at the other end of the cable to an FDD device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.





5.7.4 Dual RS-232 Cable with Slot Bracket

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The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

- Step 1: Locate the connectors. The locations of the RS-232 connectors are shown in Chapter 3.
- Step 2: Insert the cable connectors. Insert one connector into each serial port box headers. See Figure 5-16. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

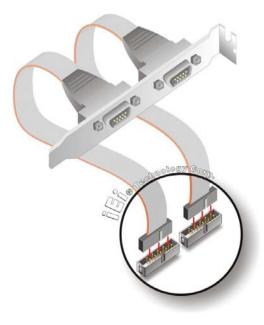


Figure 5-16: Dual RS-232 Cable Installation

Step 3: Secure the bracket. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis



5.7.5 Dual RS-232/422/485 Cables (Optional Cable)

The IMBA-9454ISA is shipped with one RS-232/422/485 dual serial port connector cable. The dual serial port connector cable connects the serial port connectors on the cable to the RS-232/422/485 serial port connectors on the IMBA-9454ISA. Follow the steps below to connect the dual serial port connector cable.

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- Step 1: Locate the serial port connector. The location of the RS-232/422/485 serial port connector is shown in Chapter 3.
- Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the IMBA-9454ISA COM2 serial port connector.
- Step 3: Insert the cable connectors. Once the cable connector is properly aligned with the COM2 serial port connector on the IMBA-9454ISA, connect the cable connector to the onboard connectors. See Figure 5-17.

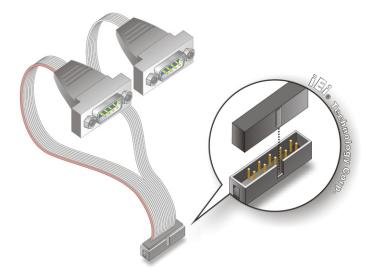


Figure 5-17: Dual Serial Port Connector Cable Connection

Step 4: Attach DB-9 serial port connectors to the chassis. The dual DB-9 serial port connectors can be inserted into dual preformed holes in the chassis. Once, inserted the DB-9 connectors should be secured to the chassis with retention screws.





5.7.6 SATA Drive Connection

The IMBA-9454ISA is shipped with six SATA drive cables and three SATA drive power cables. To connect the SATA drives to the connectors, please follow the steps below.

- Step 1: Locate the connectors. The locations of the SATA drive connectors are shown in Chapter 3.
- Step 2: Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See Figure 5-18.

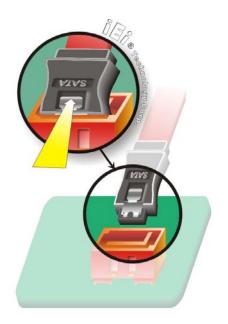


Figure 5-18: SATA Drive Cable Connection

- 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 5-19.
- Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See Figure 5-19.





Figure 5-19: SATA Power Drive Connection

5.7.7 USB Cable (Dual Port) (Optional)

The IMBA-9454ISA is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 3.



If the USB pins are not properly aligned, the USB device can burn out.

- Step 2: Align the connectors. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-9454ISA USB connector.
- Step 3: Insert the cable connectors. Once the cable connectors are properly aligned with the USB connectors on the IMBA-9454ISA, connect the cable connectors to the onboard connectors. See Figure 5-20.





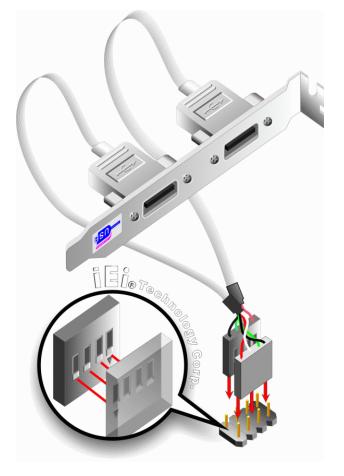


Figure 5-20: Dual USB Cable Connection

Step 4: Attach the bracket to the chassis. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.7.8 USB Cable (Four Port) (Optional)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the IMBA-9454ISA, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 4.





If the USB pins are not properly aligned, the USB device can burn out.

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- **Step 2:** Align the connectors. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-9454ISA USB connectors.
- Step 3: Insert the cable connectors.. Once the cable connectors are properly aligned with the USB connectors on the IMBA-9454ISA, connect the cable connectors to the onboard connectors. See Figure 5-20.

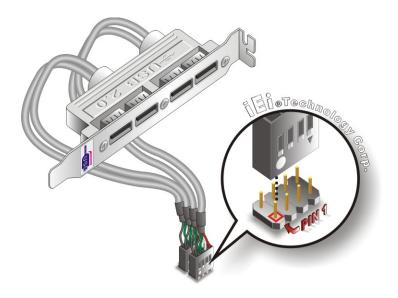


Figure 5-21: Four Port USB Cable Connection

Step 4: Attach the bracket to the chassis. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.



Audio devices

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- RJ-45 Ethernet cable connectors
- Parallel port devices
- PS/2 devices
- Serial port devices
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IMBA-9454ISA external peripheral interface connector making sure the pins are properly aligned.

5.8.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the IMBA-9454ISA.

- Step 1: Locate the audio phone jacks. The location of the audio phone jacks are shown in Chapter 3.
- **Step 2: Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-22.

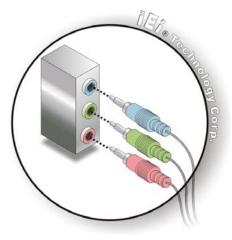


Figure 5-22: Audio Connectors

Page 116

5.8.2 LAN Connection

There are two external RJ-45 LAN connectors for PCIe GbE connection. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

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- Step 1: Locate the RJ-45 connectors. The locations of the USB connectors are shown in Chapter 4.
- Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-9454ISA. See Figure 5-23.

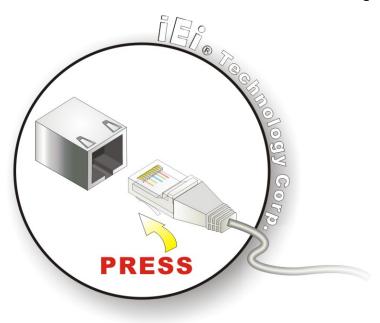
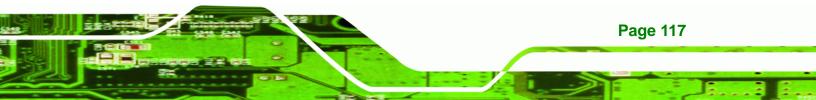


Figure 5-23: LAN Connection

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

5.8.3 Parallel Device Connection

A single female DB-25 connector on the external peripheral interface panel connects to parallel communications devices. Follow the steps below to connect a parallel device.





- Step 1: Locate the DB-25 connector. The location of the DB-25 connector is shown in Chapter 3.
- **Step 2: Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 5-24.

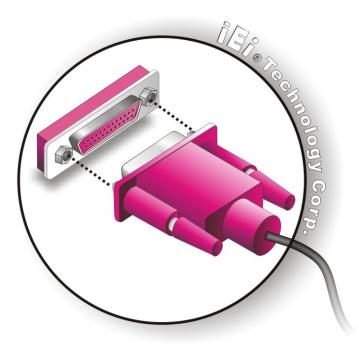


Figure 5-24: Parallel Device Connector

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Step 3: Secure the connector. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.4 PS/2 Keyboard and Mouse Connection

The IMBA-9454ISA has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-9454ISA.

- Step 1: Locate the dual PS/2 connector. The location of the dual PS/2 connector is shown in Chapter 3.
- Step 2: Insert the keyboard/mouse connector. Insert a PS/2 keyboard or mouse



connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 5-25.

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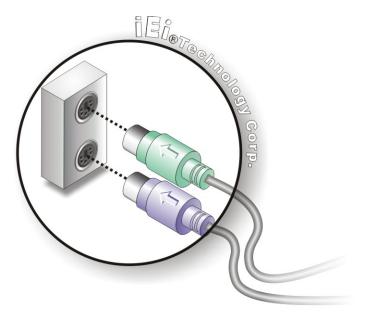


Figure 5-25: PS/2 Keyboard/Mouse Connector

5.8.5 Serial Device Connection

The IMBA-9454ISA has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-9454ISA.

- 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 5-26.





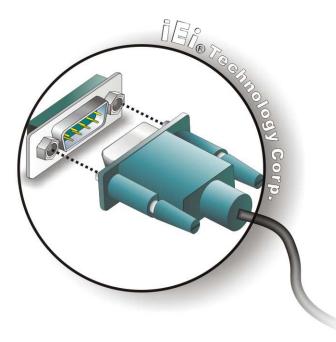


Figure 5-26: Serial Device Connector

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.

5.8.6 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 IMBA-9454ISA.

- Step 1: Locate the USB Series "A" receptacle connectors. The location 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 5-27.





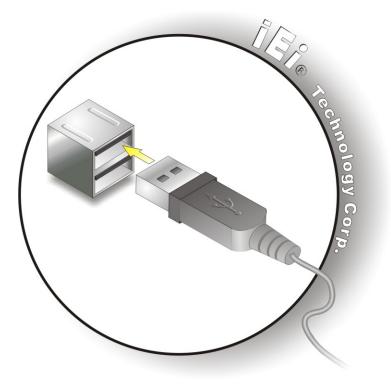


Figure 5-27: USB Connector

5.8.7 VGA Monitor Connection

The IMBA-9454ISA 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 IMBA-9454ISA, 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 IMBA-9454ISA. See Figure 5-28.





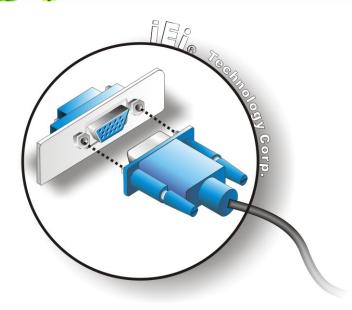
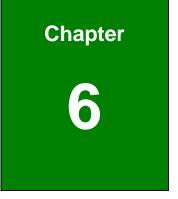


Figure 5-28: VGA Connector

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.







BIOS Screens



6.1 Introduction

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A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

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

- 1. Press the DELETE key as soon as the system is turned on or
- 2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen. 0.

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

6.1.2 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.

Кеу	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
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
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Page 124

F1 key	General help, only for Status Page Setup Menu and Option		
	Page Setup Menu		
F2 /F3 key	Change color from total 16 colors. F2 to select color		
	forward.		
F10 key	Save all the CMOS changes, only for Main Menu		

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Table 6-1: BIOS Navigation Keys

6.1.3 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.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **Chapter 5**.

6.1.5 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.
- PCIPnP Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- Security Sets User and Supervisor Passwords.
- Chipset Changes the chipset settings.
- **Power** Changes power management settings.
- 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.





6.2 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.

Main	Advanced	PCIPnP	BIOS SE Boot	TUP UTILITY Security	Chi	pset	Exit
System	Overview						[ENTER], [TAB]
Build 1	S n :08.00.14 Date:05/06/08 :E168MR13					sele Use	SHIFT-TAB] to ct a field. [+] or [-] to igure system Time.
Proces	sor						
100 m 100	:255MHz :255						
12000	Memory :1016MB					← †↓ +-	Select Screen Select Item Change Field
System <mark>System</mark>			1000	6 : 14] 02/19/2002]		Tab F1 F10 ESC	Select Field General Help
	v02.61 (C) Copyr igł	it 1985-2	006, America	n Meg	atren	ds, Inc.

BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
 - O Version: Current BIOS version
 - O Build Date: Date the current BIOS version was made
 - O ID: Installed BIOS ID

Processor: Displays auto-detected CPU specifications

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- O Type: Names the currently installed processor
- O Speed: Lists the processor speed
- **Count**: The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
 - O Size: Lists memory size

The System Overview field also has two user configurable fields:

➔ System Time [xx:xx:xx]

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

➔ System Date [xx/xx/xx]

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

6.3 Advanced

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



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.

- **CPU Configuration** (see Section 6.3.1)
- IDE Configuration (see Section 愬)
- Floppy Configuration (See Section)
- **SuperIO Configuration** (see Section 6.3.3)
- Hardware Health Configuration (see Section 6.3.5)



Power Configuration (see Section)

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- Remote Access Configuration (see Section 6.3.7)
- **Trusted Computing** (see Section 6.3.8)
- **USB Configuration** (see Section 6.3.7)

	Luncin Land			TUP UTILITY		
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanc	ed Settings				Con	figure CPU.
 CPU IDE Flop Supe Hard Powe Remo Trus 	G: Setting w may cause Configuratio Configuratio py Configura rIO Configura ware Health r Configurat te Access Co ted Computin Configuratio	system to n tion ation Configurat ion nfiguratio g	ion		t t Ent F1 F10 ESC	Save and Exit
	v02.61 (C) Copyr igh	it 1985-2	006, America	n Megatre	nds, Inc.

BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Page 128

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.

Configure advanced CPU settings Module Version:3F.08 Manufacturer:Intel Frequency :255MHz FSB Speed :42MHz Cache L1 :0 KB Cache L2 :0 KB	
Frequency :255MHz FSB Speed :42MHz Cache L1 :0 KB	
Lache LZ :U NB	
Intel(R) SpeedStep(tm) tech. [Disabled]	← Select Screen 14 Select Item F1 General Help F10 Save and Exit ESC Exit

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BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Frequency: Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size
- Ratio Actual Value:

→ Intel (R) SpeedStep (tm) tech. [Enabled]

Use the **Intel (R) SpeedStep (tm) tech.** option to enable or disable GV3. GV3 technology is a power-saving scheme where the OS optimizes overall power consumption by dynamically changing CPU frequency based on demand.



- → Disabled Disables SpeedStep i.e. GV3
- → Enabled DEFAULT Enables SpeedStep i.e. GV3

6.3.2 IDE Configuration

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Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.

	BIOS SETUP UTILITY	
Advanced		
IDE Configuration		Options
ATA/IDE Configuration Configure SATA as Configure SATA Channels Primary IDE Master Primary IDE Slave Secondary IDE Master Secondary IDE Slave Third IDE Master Third IDE Slave	IEnhanced] [I]DE] [Before PATA] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected] : [Not Detected]	Disabled Compatible Enhanced * Select Screen 14 Select Item *- Change Option F1 General Help F10 Save and Exit ESC Exit
v02.61 (C) Copyrigh	t 1985-2006, American Me	gatrends, Inc.

BIOS Menu 4: IDE Configuration

→ ATA/IDE Configurations [Compatible]

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

Disabled
 Disables the on-board ATA/IDE controller.

→ Compatible Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

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→ Enhanced DEFAULT Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

→ Configure SATA as [IDE]

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

- → IDE DEFAULT Configures SATA devices as normal IDE device.
- → AHCI Configures SATA devices as an AHCI device.

→ Configure SATA Channels [Behind PATA]

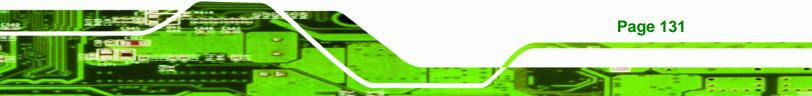
Use the **Configure SATA Channels** option to determine how SATA channels and PATA channels are ordered.

- → Before PATA DEFAULT Puts SATA channels before PATA channels.
- → Behind PATA Puts SATA channels behind PATA channels.

➔ IDE Master and IDE Slave

When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave



- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master

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Third IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

Advanced	IOS SETUP UTILITY	
Primary IDE Master		Select the type of device connected
Device :Not Detected Type LBA/Large Mode Block (Multi-Sector Transfer) PIO Mode DMA Mode S.M.A.R.T. 32Bit Data Transfer	IAutol [Auto] [Auto] [Auto] [Auto] [Auto] [Auto] [Enabled]	to the system.
		 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 5: IDE Master and IDE Slave Configuration

→ Auto-Detected Drive Parameters

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

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Page 133

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- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

→ Type [Auto]

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

Not Installed BIOS is prevented from searching for an IDE disk drive on the specified channel.

Auto DEFAULT The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the

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IMBA-9454ISA ATX Motherboard

specified channel.

CD/DVD The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
 ARMD This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

→ ZIP
 → LS-120

→ LBA/Large Mode [Auto]

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

Disabled BIOS is prevented from using the LBA mode control on the specified channel.
 Auto DEFAULT BIOS auto detects the LBA mode control on the specified channel.

→ Block (Multi Sector Transfer) [Auto]

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

DisabledBIOS is prevented from using Multi-Sector Transfer on thespecified channel. The data to and from the device occurs

Page 134

→

one sector at a time.

Auto DEFAULT BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

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→ PIO Mode [Auto]

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

→	Auto	DEFAULT	BIOS auto detects the PIO mode. Use this value if the IDE disk
			drive support cannot be determined.
→	0		PIO mode 0 selected with a maximum transfer rate of 3.3MBps
→	1		PIO mode 1 selected with a maximum transfer rate of 5.2MBps
→	2		PIO mode 2 selected with a maximum transfer rate of 8.3MBps
→	3		PIO mode 3 selected with a maximum transfer rate of 11.1MBps
→	4		PIO mode 4 selected with a maximum transfer rate of 16.6MBps
			(This setting generally works with all hard disk drives
			manufactured after 1999. For other disk drives, such as IDE
			CD-ROM drives, check the specifications of the drive.)

→ DMA Mode [Auto]

Use the DMA Mode BIOS selection to adjust the DMA mode options.

Auto DEFAULT BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.



•		
→	SWDMA0	Single Word DMA mode 0 selected with a maximum data
		transfer rate of 2.1MBps
→	SWDMA1	Single Word DMA mode 1 selected with a maximum data
		transfer rate of 4.2MBps
→	SWDMA2	Single Word DMA mode 2 selected with a maximum data
		transfer rate of 8.3MBps
→	MWDMA0	Multi Word DMA mode 0 selected with a maximum data
	WWDWAU	transfer rate of 4.2MBps
_		
→	MWDMA1	Multi Word DMA mode 1 selected with a maximum data
		transfer rate of 13.3MBps
→	MWDMA2	Multi Word DMA mode 2 selected with a maximum data
		transfer rate of 16.6MBps
→	UDMA1	Ultra DMA mode 0 selected with a maximum data transfer
		rate of 16.6MBps
→	UDMA1	Ultra DMA mode 1 selected with a maximum data transfer
	•	rate of 25MBps
→		
-	UDMA2	Ultra DMA mode 2 selected with a maximum data transfer
		rate of 33.3MBps
→	UDMA3	Ultra DMA mode 3 selected with a maximum data transfer
		rate of 44MBps (To use this mode, it is required that an
		80-conductor ATA cable is used.)
→	UDMA4	Ultra DMA mode 4 selected with a maximum data transfer
		rate of 66.6MBps (To use this mode, it is required that an
		80-conductor ATA cable is used.)
→	UDMA5	Ultra DMA mode 5 selected with a maximum data transfer



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rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

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→ S.M.A.R.T [Auto]

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

→	Auto	DEFAULT	BIOS auto detects HDD SMART support.
→	Disabled		Prevents BIOS from using the HDD SMART feature.
→	Enabled		Allows BIOS to use the HDD SMART feature

→ 32Bit Data Transfer [Enabled]

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

→	Disabled		Prevents the BIOS from using 32-bit data transfers.
→	Enabled	DEFAULT	Allows BIOS to use 32-bit data transfers on supported
			hard disk drives.

6.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.





and a state	BIOS SETUP UTILITY	
Advanced		
Floppy Configuration		Select the type of - floppy drive
Floppy A	[1.44 MB 3½"]	connected to the system.
		 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 6: IDE Master and IDE Slave Configuration

→ Floppy A

Page 138

Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4"
- 1.2 MB 51/4"
- 720 KB 31/2"
- 1.44 MB 31/2'
- 2.88 MB 31/2"

6.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

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Advanced	BIOS SETUP UTILITY	
Configure ITE8712 Super IO Serial Port1 Address Serial Port2 Address Serial Port2 Mode Parallel Port Address Parallel Port Mode Parallel Port IRQ Serial Port3 Address Serial Port4 Address Serial Port5 Address Serial Port6 Address	Chipset [3F8/IRQ4] [Norma I] [2F8/IRQ3] [Norma I] [378] [Norma I] [IRQ7] [3E8] [2E8] [2F0] [2E0]	Allows BIOS to Select Serial Port1 Base Addresses. ★ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 7: Super IO Configuration

→ Serial Port1 Address [3F8/IRQ4]

Use the Serial Port1 Address option to select the Serial Port 1 base address.

Disabled No base address is assigned to Serial Port 1
 3F8/IRQ4 DEFAULT Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4



3E8/IRQ4 Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
 2E8/IRQ3 Serial Port 1 I/O port address is 2E8 and the interrupt

→ Serial Port1 Mode [Normal]

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Use the **Serial Port1 Mode** option to select the Serial Port1 operational mode.

address is IRQ3

→	Normal	DEFAULT	Serial Port 1 mode is normal
→	IrDA		Serial Port 1 mode is IrDA
→	ASK IR		Serial Port 1 mode is ASK IR

→ Serial Port2 Address [2F8/IRQ3]

Use the Serial Port2 Address option to select the Serial Port 2 base address.

→	Disabled		No base address is assigned to Serial Port 2
→	2F8/IRQ3	DEFAULT	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
→	3E8/IRQ4		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
→	2E8/IRQ3		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

→ Serial Port2 Mode [Normal]

Page 140

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

Normal DEFAULT Serial Port 2 mode is normal

→	IrDA	Serial Port 2 mode is IrDA

→ ASK IR Serial Port 2 mode is ASK IR

→ Parallel Address [378]

The **Parallel Port Address** BIOS option assigns the I/O port address of the parallel port. The following address options are available:

→	Disabled		No I/O port address is assigned to the parallel port
→	378	(Default)	Parallel Port I/O port address is 378
→	278		Parallel Port I/O port address is 278
→	3BC		Parallel Port I/O port address is 3BC

→ Parallel Port Mode [Normal]

The Parallel Port Mode selection selects the mode the parallel port operates in.

→	Normal	(DEFAULT)	The normal parallel port mode is the standard mode
			for parallel port operation.
	EPP		The parallel port operates in the enhanced parallel
			port mode (EPP). The EPP mode supports
			bi-directional communication between the system
			and the parallel port device and the transmission
			rates between the two are much faster than the
			Normal mode.
ک			

 ECP
 The parallel port operates in the extended

 capabilities port (ECP) mode. The ECP mode
 supports bi-directional communication between the

 system and the parallel port device and the
 transmission rates between the two are much faster

Page 141

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EPP + ECP

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→

than the SPP mode.

The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port becomes compatible with EPP devices described above

→ Parallel Port IRQ [IRQ7]

The **Parallel Port Address** BIOS option assigns the parallel port interrupt address. The following address options are available.

→	IRQ5		Parallel port interrupt address is IRQ5
→	IRQ7	(Default)	Parallel port interrupt address is IRQ7

→ Serial Port3 Address [3E8]

Use the Serial Port3 Address option to select the base addresses for serial port 3

→	Disabled		No base address is assigned to serial port 3
→	3E8	DEFAULT	Serial port 3 I/O port address is 3E8
→	2E8		Serial port 3 I/O port address is 2E8
→	2F0		Serial port 3 I/O port address is 2F0
→	2E0		Serial port 3 I/O port address is 2E0

→ Serial Port4 Address [2E8]

Use the Serial Port4 IRQ option to select the interrupt address for serial port 4.

→	Disabled		No base address is assigned to serial port 3
→	3E8		Serial port 4 I/O port address is 3E8
→	2E8	DEFAULT	Serial port 4 I/O port address is 2E8
→	2F0		Serial port 4 I/O port address is 2F0
→	2E0		Serial port 4 I/O port address is 2E0

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→ Serial Port5 Address [2E0]

Use the Serial Port5 IRQ option to select the interrupt address for serial port 5.

→	Disabled		No base address is assigned to serial port 5
→	3E8		Serial port 6 I/O port address is 3E8
→	2E8		Serial port 6 I/O port address is 2E8
→	2F0	DEFAULT	Serial port 6l/O port address is 2F0
→	2E0		Serial port 6 I/O port address is 2E8

→ Serial Port6 Address [2D8]

Use the Serial Port6 IRQ option to select the interrupt address for serial port 6.

→	Disabled		No base address is assigned to serial port 6
→	3E8		Serial port 6 I/O port address is 3E8
→	2E8		Serial port 6 I/O port address is 2E8
→	2F0		Serial port 6I/O port address is 2F0
→	2E0	DEFAULT	Serial port 6 I/O port address is 2E8





6.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.

Advanced	BIOS SETUP UTILITY	
Hardware Health Configurat	ion	CPU confiruration
CPU FAN Mode Setting System FAN1 Mode Setting System FAN2 Mode Setting	[Full On mode]	— mode setting If Enable Automatic OPU For with
CPU Temperature	:43°C/109°F	— mode. CPU Fan will refer to
System Temperature #1		CPU Temperature.
System Temperature #2		
CPU Fan Speed	:4530 RPM	
System Fan1 Speed	:N/A	
System Fan2 Speed	:N/A	← Select Screen
		↑↓ Select Item
CPU Core	:1.232 V	+- Change Option
DRAM Vcc	:1.824 V	F1 General Help
+3.30V	:3.152 V	F10 Save and Exit
+5.000	:4.892 V	ESC Exit
+12.0V	:11.712 V	and a second
FSB Vcc +1.20V	:1.168 V	ESC Exit
+1.50V	:1.488 V	
VBAT	:3.280 V	•

BIOS Menu 8: Hardware Health Configuration

→ FAN Mode Setting [Full On Mode]

Use the **FAN Mode Setting** option to configure the fan mode options for the following fans:

- CPU Fan
- System Fan 1
- System Fan 2

The fan mode setting options are listed below.

→ Full On Mode DEFAULT Fan is on all the time
 → Automatic mode Fan is off when the temperature is low enough. Parameters must be set by the user.

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When the **FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Fan Start PWM
- Slope PWM 1

→ CPU Temp. Limit of OFF [000]



Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C



→ CPU Temp. Limit of Start [020]



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Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The CPU Temp. Limit of Start option can only be set if the CPU FAN Mode Setting option is set to Automatic Mode. Use the CPU Temp. Limit of Start option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the Fan 3 Start PWM option below. To select a value, select the CPU Temp. Limit of Start option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Fan Start PWM [070]

The Fan 3 Start PWM option can only be set if the CPU FAN Mode Setting option is set to Automatic Mode. Use the Fan 3 Start PWM option to select the PWM mode the fan starts to rotate with after the temperature specified in the Temperature 3 Limit of Start is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the Fan 3 Start PWM option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

→ Slope PWM 1 [1 PWM]

Page 146

The Slope PWM 1 option can only be set if the CPU FAN Mode Setting option is set to Automatic Mode. Use the Slope PWM 1 option to select the linear rate at which the PWM

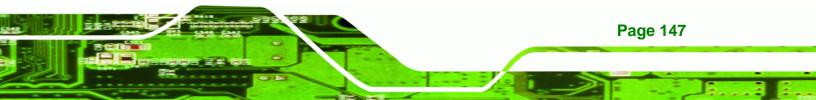
mode increases with respect to an increase in temperature. A list of available options is shown below:

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- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

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

- System Temperatures: The following system temperatures are monitored
 - O CPU Temperature
 - O System Temperature 1
 - O System Temperature 2
- **Fan Speeds**: The CPU cooling fan speed is monitored.
 - O CPU Fan Speed
 - O System Fan 1 Speed
 - O System Fan 2 Speed
- Voltages: The following system voltages are monitored
 - O CPU Core
 - O DRAM Vcc
 - O +3.30V
 - O +5.00V
 - O +12.0V
 - O FSB Vcc +1.2V
 - O +1.5V
 - O VBAT





6.3.6 Power Configuration

Use the Power Configuration menu (BIOS Menu 9) to configure the AHCI and APM options.

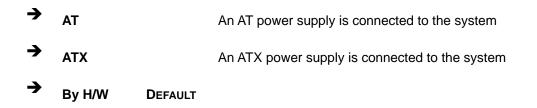
Power Supply Type:	Cby H/W]	Select the type of Pow
 ACPI Configuration APM Configuration 		
		← Select Screen ↑↓ Select Item
		+- Change Option F1 General Help
		F10 Save and Exit



→ Power Supply Type [H/W]

Page 148

Use the **Power Supply Type** BIOS option to select the power supply that is connected to the system.



The remaining two options in the Power Configuration menu (BIOS Menu 9) are submenus. These options include:

- ACPI Configuration
- APM Configuration

6.3.6.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 10**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.

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	BIOS SETUP UTILITY	
Advanced		
ACPI Settings		Select the ACPI
Suspend mode	ES1 (POS) J	 state used for System Suspend. * Select Screen * Select Item * Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 10: ACPI Configuration

→

→ Suspend Mode [S1(POS)]

The **Suspend Mode** BIOS option specifies the sleep state your system will enter when it is not being used.

S1 (POS) (Default) System appears off. The CPU is stopped; RAM is refreshed;





the system is running in a low power mode.

➔ S3 (STR) System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

6.3.6.2 APM Configuration

The APM Configuration menu (BIOS Menu 11) allows the advanced power management options to be configured.

APM Configuration		Go into On/Off,	
Power Button Mode Restore on AC Power Loss	[On/Off] [Last State]	— or Suspend when Power button is pressed.	
Advanced Resume Event Control Resume On KeyBoard/Mouse Resume On Ring Resume On PME# Resume On PCI-Express WAKE# Resume On RTC Alarm	[Disabled] [Disabled] [Disabled]		
		 ← Select Screen ↑↓ Select Item ← Change Option F1 General Help F10 Save and Exit ESC Exit 	

BIOS Menu 11: Advanced Power Management Configuration

→ Power Button Mode [On/Off]

Use the **Power Button Mode** BIOS to specify how the power button functions.



→	On/Off	(Default)	When the power button is pressed the system is either
			turned on or off
→	Suspend		When the power button is pressed the system goes into
			suspend mode

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➔ Restore on AC Power Loss [Power Off]

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

→	Power Off	(Default)	The system remains turned off
→	Power On		The system turns on
→	Last State		The system returns to its previous state. If it was on, it
			turns itself on. If it was off, it remains off.

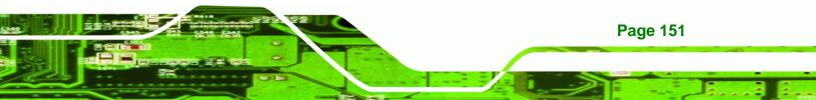
→ Resume on Keyboard/Mouse [Disabled]

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

→	Disabled	(Default)	Wake event not generated by activity on the
			keyboard or mouse
→	Enabled		Wake event generated by activity on the keyboard or
			mouse

→ Resume on Ring [Disabled]

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.



- Disabled (Default) Wake event not generated by an incoming call
 - Enabled Wake event generated by an incoming call

→ Resume on PME# [Disabled]

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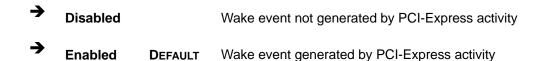
Use the **Resume on PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

Disabled (Default) Wake event not generated by PCI PME controller activity

Enabled
Wake event generated by PCI PME controller activity

→ Resume on PCI-Express WAKE# [Enabled]

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.



→ Resume On RTC Alarm [Disabled]

➔

Page 152

Enabled

Use the **Resume On RTC Alarm** to specify when the computer is roused from a suspended state.

Disabled (Default) The real time clock (RTC) cannot generate a wake event

If selected, the following will appear with values that can be selected:

→ RTC Alarm Date (Days)

➔ System Time

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

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Page 153

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6.3.7 Remote Access Configuration

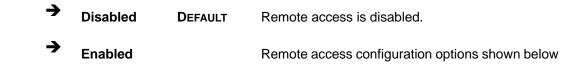
Use the **Remote Access Configuration** menu (**BIOS Menu 12**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

Advanced	BIOS SETUP UTILITY	
Configure Remote	Access type and parameters	Select Remote Access
Remote Access	[Disabled]	 ← Select Screen ↑↓ Select Item ← Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 12: Remote Access Configuration [Advanced]

➔ Remote Access [Disabled]

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.





appear:

- → Serial Port Number
 → Serial Port Mode
 → Flow Control
 → Redirection after BIOS POST
 → Terminal Type
 → VT-UTF8 Combo Key Support
 - ➔ Sredir Memory Display Delay

These configuration options are discussed below.

→ Serial Port Number [COM1]

Use the Serial Port Number option to select the serial port used for remote access.

→	COM1	DEFAULT	System is remotely accessed through COM1
→	COM2		System is remotely accessed through COM2
→	COM3		System is remotely accessed through COM3
→	COM4		System is remotely accessed through COM4
→	COM5		System is remotely accessed through COM5
→	COM6		System is remotely accessed through COM6

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

→ Base Address, IRQ [3F8h,4]

The **Base Address**, **IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.



→ Serial Port Mode [115200 8,n,1]

Use the Serial Port Mode option to select baud rate through which the console redirection

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is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1



Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

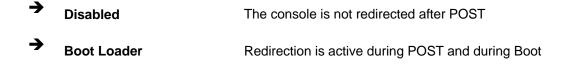
➔ Flow Control [None]

Use the **Flow Control** option to report the flow control method for the console redirection application.

→	None	DEFAULT	No control flow,
→	Hardware		Hardware is set as the console redirection
→	Software		Software is set as the console redirection

➔ Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.





Loader

DEFAULT

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Redirection is always active (Some OSes may not work if set to Always)

→ Terminal Type [ANSI]

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

→	ANSI	DEFAULT	The target terminal type is ANSI
→	VT100		The target terminal type is VT100
→	VT-UTF8		The target terminal type is VT-UTF8

→ VT-UTF8 Combo Key Support [Disabled]

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

Disabled Disables the VT-UTF8 terminal keys
 Enabled DEFAULT Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

→ Sredir Memory Display Delay [Disabled]

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay
 DEFAULT
- Delay 1 sec

- Delay 2 sec
- Delay 4 sec

6.3.8 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 13**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

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Advanced	BIOS SETUP UTILITY	
Trusted Computing		Enable/Disable TPM
TCG/TPM SUPPORT	[No]	- TCG (TPM 1.1/1.2) supp in BIOS
Clearing the TPM	[Press Enter]	
		← Select Screen
		↑↓ Select Item +- Change Option
		F1 General Help F10 Save and Exit
		ESC Exit
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BIOS Menu 13: Trusted Computing

→ TCG/TPM Support [Yes]

Use the TCG/TPM Support option to configure support for the TPM.



Yes TPM support is enabled.





→ Clearing the TPM [Press Enter]

Use the **Clearing the TPM** option to clear the information stored in the TPM.

6.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 14**) to read USB configuration information and configure the USB settings.

BIOS SETUP UTILITY Advanced	
USB Configuration	Options
Module Version - 2.24.3-13.4 USB Devices Enabled : 2 Drives	Disabled Enabled
USB Functions [Enabled] USB 2.0 Controller [Enabled] Legacy USB Support [Enabled] USB 2.0 Controller Mode [HiSpeed]	
▶ USB Mass Storage Device Configuration	 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
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BIOS Menu 14: USB Configuration

→ USB Functions [Enabled]

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ Disabled

USB function support disabled

Enabled DEFAULT USB function support enabled

→ USB 2.0 Controller [Enabled]

Use the USB 2.0 Controller BIOS option to enable or disable the USB 2.0 controller

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→	Disabled		USB 2.0 controller disabled
→	Enabled	DEFAULT	USB 2.0 controller enabled

→ 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.

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

→ USB2.0 Controller Mode [HiSpeed]

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

→	FullSpeed		The controller is capable of operating at 12Mb/s
→	HiSpeed	DEFAULT	The controller is capable of operating at 480Mb/s





6.3.9.1 USB Mass Storage Device Configuration



This option is only available if a USB drive is inserted into the USB port.

Use the USB Mass Storage Device Configuration menu (BIOS Menu 15) to configure USB mass storage class devices.

BIOS SETUP UTILITY Advanced		
USB Mass Storage Device Configuration	Number of seconds POST waits for the USB mass storage	
USB Mass Storage Reset Delay [20 Sec]		
Device #1 JetFlash TS1GJF110 Emulation Type [Auto]	device after start unit command.	
	← Select Screen ↑↓ Select Item	
	+- Change Option F1 General Help	
	F10 Save and Exit ESC Exit	
	Loo Linto	
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BIOS Menu 15: USB Mass Storage Device Configuration

→ USB Mass Storage Reset Delay [20 Sec]

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

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→	10 Sec		POST waits 10 seconds for the USB mass storage
-			device after the start unit command.
7	20 Sec	DEFAULT	POST waits 20 seconds for the USB mass storage
			device after the start unit command.
→	30 Sec		POST waits 30 seconds for the USB mass storage
			device after the start unit command.
→	40 Sec		POST waits 40 seconds for the USB mass storage
			device after the start unit command.

→ Device

The Device## field lists the USB devices that are connected to the system.

➔ Emulation Type [Auto]

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.



Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.



→	Auto	DEFAULT	BIOS auto-detects the current USB.
→	Floppy		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return $DL = 0$ or $DL = 1$ respectively.
→	Forced FDD		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
→	Hard Disk		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
→	CDROM		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

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Use the PCI/PnP menu (BIOS Menu 16) to configure advanced PCI and PnP settings.



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

Page 162

		BIOS SE	TUP UTILITY			
Main Advanced	PCIPnP	Boot	Security	Chi	ipset	Exit
Advanced PCI/PnP S	Settings			1	The second second second	able: Specified is available to be
WARNING: Setting way cause	wrong value: e system to				used devic Reser	by PCI/PnP
IRQ3 IRQ4 IRQ5 IRQ7 IRQ9 IRQ10 IRQ11 IRQ14 IRQ15 DMA Channel 0 DMA Channel 1 DMA Channel 3 DMA Channel 3 DMA Channel 5 DMA Channel 6 DMA Channel 7 Reserved Memory S	izo	IRese IAvai IAvai IAvai IAvai IAvai IAvai IAvai IAvai IAvai IAvai	rved rved lable lable lable lable lable lable lable lable lable lable lable lable lable lable lable lable bled		use t devic + t + F1 +- F1 +- F1 F10 ESC	y Legacy ISA ces. Select Screen Select Item Change Option General Heln Select Screen Select Item Change Option General Help Save and Exit Exit
		1985-2	006, America	n Mer	ratrend	s. Inc.
002:01	tor oopgragn	0 1300 L	ives, ther let	n neț	ja er enu	

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BIOS Menu 16: PCI/PnP Configuration

→ IRQ# [Available]

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

→	Available	DEFAULT	The specified IRQ is available to be used by
			PCI/PnP devices
→	Reserved		The specified IRQ is reserved for use by Legacy ISA
			devices

Available IRQ addresses are:

IRQ3





- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

→ DMA Channel# [Available]

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

→	Available	DEFAULT	The specified DMA is available to be used by
			PCI/PnP devices
→	Reserved		The specified DMA is reserved for use by Legacy
			ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

→ Reserved Memory Size [Disabled]

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

Disabled DEFAULT No memory block reserved for legacy ISA devices



→	16K	16KB reserved for legacy ISA devices
→	32K	32KB reserved for legacy ISA devices
→	64K	54KB reserved for legacy ISA devices

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6.5 Boot

Use the Boot menu (BIOS Menu 17) to configure system boot options.

Main	Advanced	PCIPnP	BIOS SE Boot	TUP UTILITY Security	Chi	pset Exit
Boot S	ettings					Configure Settings
► Boot ► Remo	Settings Co Device Prio wable Drives Drives	rity	n			 ← Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
	v02.61 (C) Copyr igh	t 1985-2	006, America	n Meg	atrends, Inc.

BIOS Menu 17: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 17) to configure advanced system boot options.



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Boot Settings Configuration	1	Allows BIOS to skip — certain tests while
Quick Boot Quiet Boot AddOn ROM Display Mode Bootup Num-Lock Boot From LAN Support	[Enabled] [Disabled] [Force BIOS] [On] [Disabled]	booting. This will decrease the time needed to boot the system.
		 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit

BIOS Menu 18: Boot Settings Configuration

→ Quick Boot [Enabled]

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

→	Disabled		No POST procedures are skipped
→	Enabled	DEFAULT	Some POST procedures are skipped to decrease
			the system boot time

➔ Quiet Boot [Disabled]

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

Disabled DEFAULT Normal POST messages displayed

Page 166

Enabled
 OEM Logo displayed instead of POST messages

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→ AddOn ROM Display Mode [Force BIOS]

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

Force BIOS DEFAULT The system forces third party BIOS to display during system boot.
 Keep Current The system displays normal information during

system boot.

→ Bootup Num-Lock [On]

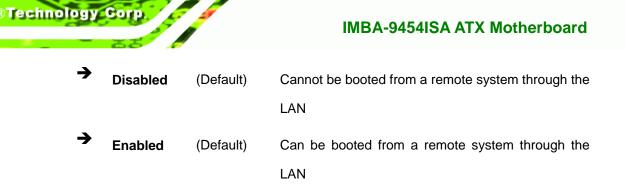
Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

- → 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.
- 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.

→ Boot From LAN Support [Disabled]

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.





6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 19**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD

Boot Device Priority		Specifies the boot
1st Boot Device 2nd Boot Device	LUSB: USB FLASH DRIJ L1st FLOPPY DRIVEJ	sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.
		 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit

BIOS Menu 19: Boot Device Priority Settings

Page 168

6.5.3 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

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- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]



Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



Removable Drives		Specifies the boot
1st Drive	[1st FLOPPY DRIVE]	sequence from the available devices.
		 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit

BIOS Menu 20: Removable Drives

6.5.4 USB Drives

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Use the USB Drives menu (**BIOS Menu 21**) to specify the boot sequence of the available USB devices. When the menu is opened, the USB devices connected to the system are listed as shown below:

- 1st Drive [1st USB DRIVE]
- 2nd Drive [2nd USB DRIVE]



Only the drives connected to the system are shown. For example, if

Page 170

only one USB drive is connected only "1st Drive" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available USB drives is shown. Select the first USB drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

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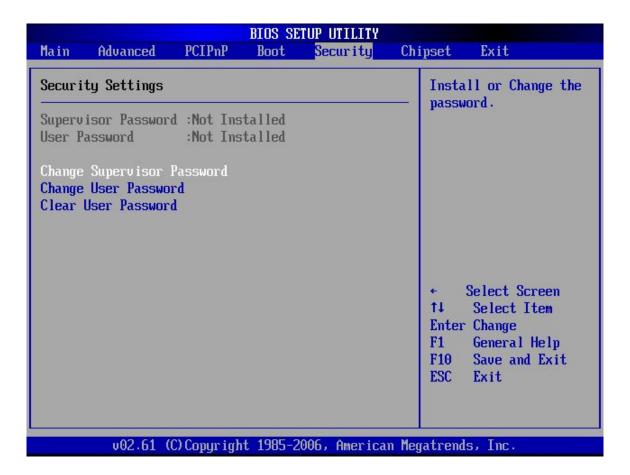
USB Drives		Specifies the boot sequence from the	
1st Drive 2nd Drive	IUSB: USB FLASH DRII IUSB:MITSUMI USB FDI	available devices.	
		 Select Screen Select Item Change Option General Help Save and Exit ESC Exit 	

BIOS Menu 21: USB Drives

6.6 Security

Use the Security menu (BIOS Menu 22) to set system and user passwords.





BIOS Menu 22: Security

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➔ Change Supervisor Password

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ Change User Password

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

Page 172

➔ Clear User Password

Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

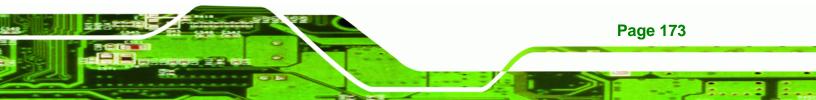
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6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 23**) to access the NorthBridge and SouthBridge configuration menus



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





			BIOS SE	TUP UTILITY			
Main	Advanced	PCIPnP	Boot	Security	Chi	pset	Exit
Advanc	ed Chipset S	ettings			_	Confi featu	gure North Bridge res.
WARNIN	G: Setting w may cause	rong value system to					
	h Bridge Con h Bridge Con						
	-	-					
						†↓ Enter F1 F10	Save and Exit
	v02.6 <u>1</u> (C) Copyr igh	t 1985-2	006, America	n Meg	ESC atrend	Exit s, Inc.

BIOS Menu 23: Chipset

6.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (BIOS Menu 23) to configure the northbridge chipset.



North Bridge Chipset Configuration		
	on	Options
	Disabled] PEG/PCI] Enabled, 8MB]	Disabled 15MB-16MB
	DVMT Mode] 128MB]	 ← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit

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BIOS Menu 24:NorthBridge Chipset Configuration

→ Memory Hole [Disabled]

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- Disabled DEFAULT Memory is not reserved for ISA expansion cards
- → 15MB 16MB Between 15MB and 16MB of memory is reserved for ISA expansion cards





→ Initiate Graphic Adapter

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Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD
- PEG/PCI DEFAULT
- PCI/PEG
- PCI/IGD

→ Internal Graphics Mode Select [Enable, 32MB]

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

→ Disable
 → Enable, 1MB
 → Enable, 8MB
 DEFAULT
 8MB of memory used by internal graphics device

→ DVMT Mode Select

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

→	Fixed Mode	DEFAULT	A fixed portion of graphics memory is reserved as
			graphics memory.
→	DVMT Mode		Graphics memory is dynamically allocated according to the system and graphics needs.
→	Combo Mode		A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed,



graphics memory is dynamically allocated according to the system and graphics needs.

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→ DVMT/FIXED Memory

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Select** option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB Default

6.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (BIOS Menu 25) the southbridge chipset to be configured.



South Bridge Chipset Configuration Options ASF Support Enabled] Spread Spectrum Mode Enabled] Audio Controller IAC'97 Audio] Onboard LAN1 : IEnabled] Onboard LAN2 : IEnabled] * Select Screen * Select Item * Chipset		BIOS SETU	P UTILITY	
ASF Support LEnabledI Spread Spectrum Mode [Enabled] Audio Controller [AC'97 Audio] Onboard LAN1 : Onboard LAN2 : IEnabled] + Select Screen 14 Select Item +- Change Option F1 General Help F10 Save and Exit			Chips	et
Spread Spectrum Mode [Enabled] Audio Controller [AC'97 Audio] Onboard LAN1 : Dnboard LAN2 : Unboard LAN2 : Enabled] * Select Screen * Select Item *- Change Option F1 General Help F10 Save and Exit	South Bridge Chipset Co	nfiguration		Options
Audio Controller IAC'97 Audiol Onboard LAN1 : IEnabledl Onboard LAN2 : IEnabledl + Select Screen 14 Select Item +- Change Option F1 General Help F10 Save and Exit	ASF Support	[Enable	d] E	nabled
ESC Exit	Audio Controller Onboard LAN1	LAC'97 : LEnable	Audio] d] d] f f F F	↓ Select Item - Change Option 1 General Help 10 Save and Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.				

BIOS Menu 25:SouthBridge Chipset Configuration

→ ASF Support [Enabled]

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Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

→	Disabled		The	system	will	not	commur	nicate	with	а	remote
			man	agement	serve	er.					
→	Enabled	DEFAULT	The	Alert Sta	ndarc	l Forr	mat (ASF) conti	roller	is a	ctivated
			and	can cor	nmur	nicate	with a	remo	te m	ana	agement
			serve	er.							



→ Spread Spectrum Mode [Enabled]

Use the **Spread Spectrum Mode** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

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- → Disabled EMI not reduced
- → Enabled DEFAULT EMI reduced

➔ Audio Controller [AC'97 Audio]

The Audio Controller option enables or disables the audio controller.

→	AC'97 Audio	DEFAULT	The on-board AC'97 audio controller is enabled.
→	All Disabled		The on-board audio controller is disabled.

➔ OnBoard LAN1 [Enabled]

The **OnBoard LAN1** option enables or disables the onboard LAN1.

Disabled Onboard LAN1 device manually disabled
 Enabled DEFAULT The onboard LAN1 device automatically detected and enabled

➔ OnBoard LAN2 [Enabled]

The **OnBoard LAN2** option enables or disables the onboard LAN1.

Disabled Onboard LAN2 device manually disabled
 Enabled DEFAULT The onboard LAN2 device automatically detected and enabled





6.8 Exit

Use the **Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.

			BIOS SE	TUP UTILITY				
Main	Advanced	PCIPnP	Boot	Security	Ch	ipset	Power	Exit
Exit O	ptions						system se saving t	
Discar	hanges and E d Changes an d Changes					change		
Load O	ptimal Defau ailsafe Defa						his opera	
Loau		urts						
						↔	Select S	
						†↓ Enter F1		b Screen Help
						F10 ESC		Exit
	v02.56 (C) Copyr igh	t 1985-2	00 <mark>4, Americ</mark> a	n Meç	gatrend	s, Inc.	

BIOS Menu 26:Exit

Page 180

→ Save Changes and Exit

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Exit

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

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➔ Discard Changes

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

→ Load Optimal Defaults

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

→ Load Failsafe Defaults

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.





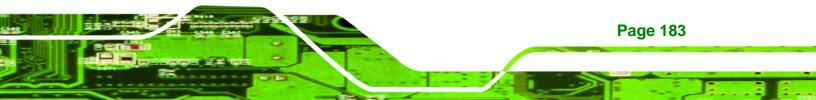
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Driver Installation





7.1 Available Software Drivers



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:

- Intel® Chipset driver
- VGA driver (Intel[®] Graphics Media Accelerator Driver)
- Audio driver (Realtek HD Audio Driver (ALC883))
- SATA driver (Intel® Matrix Storage Manager)
- IDE controller (IT8211)
- LAN Driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the IMBA-9454ISA are on the CD that came with the system. To install the drivers, please follow the steps below.

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



If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Page 184

Step 2: The driver main menu appears (Figure 7-1).

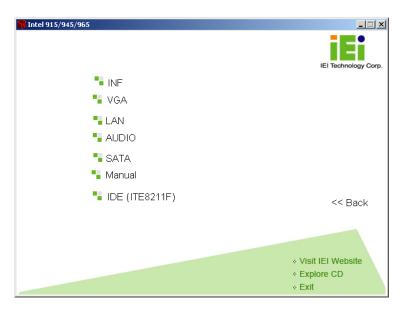
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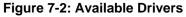
 WSB-9150 WSB-9154 PCIE-9450 WSB-9454 PCIC-9452 AC-KIT08R WSB-9454 PCIC-9650 IMB-9154 KINO-9452 KINO-9454 IMB-9454 KINO-9452 IMBA-9654 	🎁 Intel 915/945/965		×
WSB-9154 PCIE-9152 AC-KIT08R PCIE-9450 WSB-9452 AC-KIT883HD WSB-9454 PICOe-9452 AC-KIT883HD PCIE-9650 NANO-9452 AC-KIT883HD IMB-9154 NANO-9452 AC-KIT883HD IMB-9454 IMB-9454 IMB-9452 IMBA-9454 IMB-9454 IMB-9452			IEI Technology Corp.
 PCIE-9450 WSB-9454 PCIE-9650 IMB-9154 IMB-9454 KINO-9452 KINO-9454 IMB-9454 IMB-9454 	SB-9150	NSB-9152	
 PCIE-9450 WSB-9452 WSB-9454 PICOe-9452 AC-KIT883HD PCIE-9650 IMB-9154 NANO-9452 IMB-9454 KINO-9452 KINO-9454 IMB-9454 IMB-9454 		PCIE-9152	AC-KIT08R
 PCIE-9650 IMB-9154 IMB-9454 KINO-9452 KINO-9454 IMB-9454 IMB-9454 	PCIE-9450	- WSB-9452	
 IMB-9154 IMB-9454 KINO-9452 KINO-9454 IMB-9454 IMBA-9454 	W SB-9454	PICOe-9452	AC-KIT883HD
 IMB-9454 KINO-9452 KINO-9454 IMB-9452 IMBA-9454 	PCIE-9650		
 KINO-9454 IMBA-9454 IMBA-9454 			
 KINO-9454 IMB-9452 IMBA-9454 		KINO-9452	
	NINO-9454		
IMBA-9654			
♦ Explore CD ♦ Exit			

Figure 7-1: Introduction Screen

Step 3: Click IMBA-9454ISA.

Step 4: A new screen with a list of available drivers appears (Figure 7-2).





Step 5: Select the driver to install from the list in Figure 7-2. Detailed driver installation instructions follow below.

Page 185



7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

Step 1: Select INF from the list in Figure 7-2.

Step 2: A new window opens (Figure 7-3).





Step 3: Double-click the **infinst_Autol.exe** icon.

Step 4: The welcome screen in Figure 7-4 appears.

Intel(R) Chipset Softwa	Intel(R) Chipset Software Installation Utility 8.1.1.1010				
(intel)	Welcome to the Intel(R) Chipset Software Installation Utility.				
	This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.				
	Kext> Cancel Intel(R) Installation Frameworks				

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** to continue the installation process.



Step 6:	The license	agreement in	Figure	7-5 appears.
---------	-------------	--------------	--------	--------------

Intel(R) Chipset Softwa	re Installation Utility 8.1.1.1010
	License Agreement
(intel)	Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
	INTEL SOFTWARE LICENSE AGREEMENT (DEM / IHV / ISV Distribution & Single User)
	IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
	Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
	You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
	< <u>B</u> ack <u>Y</u> es <u>N</u> o
	Intel(R) Installation Frameworks



Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, click YES.

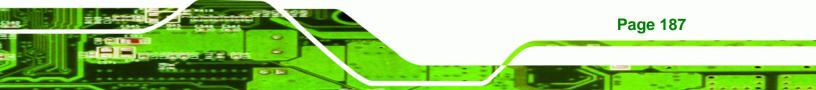
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Step 8: The Readme file in Figure 7-6 appears.

Intel(R) Chipset Softwa	re Installation Utility 8.1.1.1010
	Readme File Information
(intel)	Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
	* Product: Intel(R) Chipset Software Installation Utility * Release: Production * Version: 8.1.1.1010 * Target Chipset(s)#: Q963/Q965/P965/G965 and 3000/3010/3100 and 5000 Series * Date: November 08 2006 ***********************************
	< <u>Back</u> <u>Cancel</u> <u>Cancel</u> <u>Intel(R)</u> Installation Frameworks

Figure 7-6: Chipset Driver Readme File Information

Step 9: Read the Readme file information and then click **NEXT** to start the driver





installation.

Step 10: After the driver installation process is complete, a confirmation screen

appears (Figure 7-7).

Intel(R) Chipset Software Installation Utility 8.1.1.1010				
(intel)	The Intel(R) Chipset Software Installation Utility is complete.			
	The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.			
	< <u>B</u> ack			

Figure 7-7: Chipset Driver Installation Complete

Step 1: Click **FINISH** to complete the driver installation.

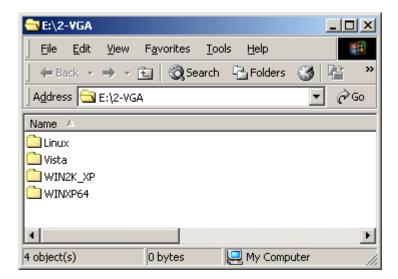
7.4 Intel Graphics Media Accelerator Driver Installation

To install the chipset driver, please follow the steps below.

Step 2: Select the VGA driver from the list in Figure 7-2.

Step 3: A new window opens (Figure 7-8).





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Figure 7-8: Select the Operating System

Step 4: Double-click the appropriate operating system folder.

Step 5: A new window appears (Figure 7-9).

E:\2-VGA\WIN2K_XP	
Eile Edit View Favorites Tools Help	
📙 🖙 Back 🔹 🤿 👻 🔂 🔞 Search 🖓 Folders 🔇	1 ¹² *
Address 🔁 E:\2-VGA\WIN2K_XP	∙ ∂Go
Name 🔺	
🖹 readme_2k_xp.txt	
Erelnotes_2k_xp_gfx.htm	
au win2k_xp1424.exe	
•	Þ
Type: Application Size: 7 7.99 MB	

Figure 7-9: VGA Driver

Step 6: Double-click the installation program icon to continue the installation process.

Step 7: The Readme information file shown in Figure 7-10 appears.





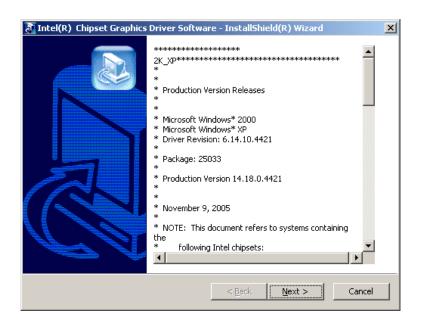


Figure 7-10: Intel® Graphics Media Accelerator InstallShield Wizard

Step 8: Read the Readme file information and click **NEXT** to begin extracting files

(Figure 7-11).

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Intel(R) Chipset Graphics Driver Software -	InstallShield(R) Wizard	×
Extracting Files The contents of this package are being extrac	cted.	
Please wait while the InstallShield(R) Wizard e Intel(R) Chipset Graphics Driver Software on moments.		
Reading contents of package		
InstallShield	< <u>B</u> ack <u>N</u> ext > Ca	ncel

Figure 7-11: InstallShield Wizard Extracting Files

Step 9: The Graphics Media Accelerator Driver Welcome screen appears

(Figure 7-12).



Intel(R) Graphics Medi	a Accelerator Driver
int _e l.	Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
	This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
	<u>≺ B</u> ack. <u>N</u> ext> <u>C</u> ancel
	Intel(R) Installation Frameworks

Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen

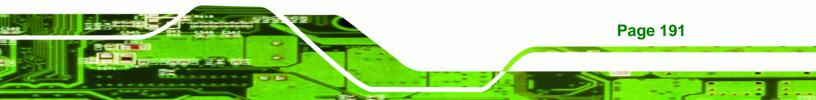
Technology Corp.

Step 10: Click NEXT and a license agreement appears (Figure 7-13).

Intel(R) Graphics Media Accelerator Driver				
	License Agreement			
int _e l.	Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.			
	INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)			
	IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") unit you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.			
	Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;			
	You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?			
	< <u>B</u> ack <u>Y</u> es <u>N</u> o			
	Intel(R) Installation Frameworks			



Step 11: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click YES and the installation notice appears (Figure 7-14) as the driver is installed.





Installing version 6.14.10.4421....



Step 12: After the driver installation process is complete, a confirmation screen appears

(Figure 7-15).

Intel(R) Graphics Media Accelerator Driver		
	The setup for the Intel(R) Graphics Media Accelerator Driver is complete.	
	You must restart your computer for changes to take effect. Would you like to restart your computer now?	
	 Yes, I want to restart my computer now. No, I will restart my computer later. 	
	Remove any disks from their drives, and then click Finish.	
	< <u>B</u> ack	



Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open Windows Control Panel (Figure 7-16).





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Figure 7-16: Windows Control Panel

Step 2: Double-click the System icon (Figure 7-17).



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🗟 Control Pa	nel					
File Edit	View Favor	ites Tools	Help			1
🔶 Back 👻	→ - E §	🗟 Search 🖻	Folders 🏼 🌀	R R X	vo	
Address 🐼	Control Panel					▼ 🖗 Go
<u>E</u>	*	*	'n	Z		I
Accessibility Options	Add/Remove Hardware	Add/Remove Programs	Administrative Tools	Adobe Gamma	Autodesk Plot Style Manager	Autodesk Plotter
🌯	H		<u> </u>	Aa	e.	
Automatic Updates	Date/Time	Display	Folder Options	Fonts	Gaming Options	Intel(R) Extreme
9		١	Õ	<u>_</u>		ų
Internet Options	Keyboard	Mail	Mouse	Network and Dial-up Co	Phone and Modem	Power Options
S	Ô	3		٦	((•))	
Printers	Program Updates	Regional Options	Scanners and Cameras	Scheduled Tasks	Sound Effect Manager	Sounds and Multimedia
	S p					
System	Users and Passwords					
0 object(s)						

Figure 7-17: System Icon

Step 3: Click the Device Manager tab (Figure 7-18).

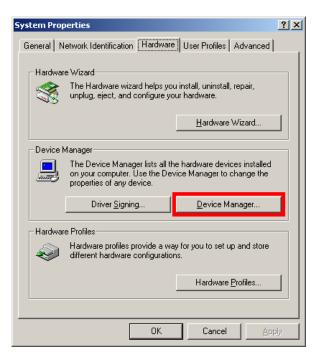


Figure 7-18: Device Manager Tab

Page 194

Step 4: A list of system hardware devices appears (Figure 7-19).

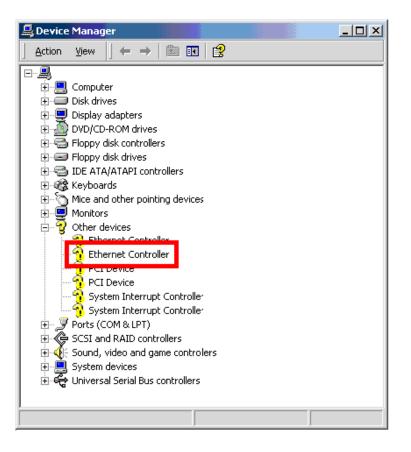


Figure 7-19: Device Manager List

Step 5: Double-click the listed device that has question marks next to it (this means

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Windows does not recognize the device).

Step 6: The Device Driver Wizard appears (Figure 7-20).



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Upgrade Device Driver Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
 Search for a suitable driver for my device (recommended) Display a list of the known drivers for this device so that I can choose a specific
driver
< <u>B</u> ack <u>N</u> ext > Cancel

Figure 7-20: Search for Suitable Driver

- Step 7: Select "Search for a suitable driver for my device (recommended)," and click **NEXT** to continue.
- Step 8: Select "Specify a Location" in the Locate Driver Files window (Figure 7-21).

Jpgrade Device Driver Wizard
Locate Driver Files Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
□ <u>C</u> D-ROM drives □ Specify a location
Microsoft Windows Update
< <u>B</u> ack <u>N</u> ext > Cancel

Figure 7-21: Locate Driver Files

Step 9: Click NEXT to continue.

Step 10: The Locate File window appears (Figure 7-22).



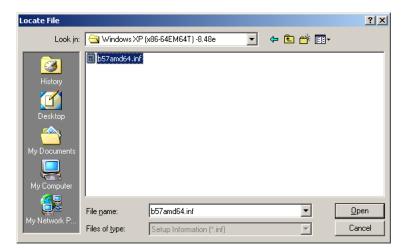


Figure 7-22: Location Browsing Window

Step 11: Select the proper OS folder under the "X:\3-LAN\BROADCOM BCM57xx Drivers" directory in the Locate File window, where "X:\" is the system CD drive.

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Step 12: Click OPEN and the driver is installed.

7.6 Realtek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

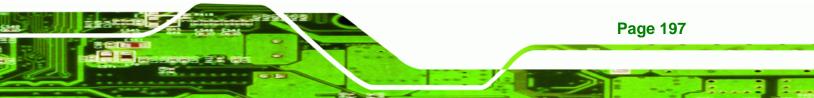
7.6.1 BIOS Setup

- Step 1: Enter the BIOS setup. To do this, reboot the system and press DEL during POST.
- **Step 2:** Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia].
- Step 3: Press F10 to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

- Step 1: Select AUDIO from the list in Figure 7-2.
- Step 2: A new window opens (Figure 7-23).



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🔁 E:\4-AUDI	0				_	
<u> </u>	⊻iew	F <u>a</u> vorites	<u>T</u> ools	<u>H</u> elp		
📔 🖛 Back 👻	⇒ - [🔁 🛛 🥘 Se	arch 🏼	Folders	3 🖻	»
Address 🔂	E:\4-AU	DIO			•	⇒G0
Name 🛆						
ALC655						
						►
2 object(s)		0 bytes		💐 My Comp	outer	//

Figure 7-23: Select the Audio CODEC

- Step 3: Double-click the ALC883 folder.
- Step 4: Double-click the appropriate operating system folder (Figure 7-24).



🔁 E:\4-AUDIO\ALC	883		- O ×
<u> </u>	F <u>a</u> vorites <u>T</u> oo	ls <u>H</u> elp	11
] 🖙 Back 👻 🔿 👻	🖭 📔 🔍 Search	급 Folders	🎯 📔 🔷 »
Address 🗋 E:\4-AU	IDIO\ALC883		▼ ∂°∽
Name 🔺			
inux 2.2.14			
✓ 2 object(s)	0 bytes	Jan My Comp	•

Figure 7-24: Select the OS

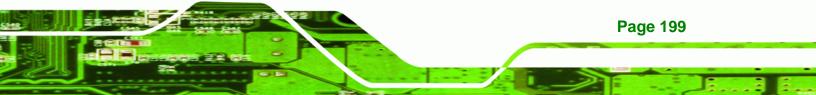
Step 5: Double-click the appropriate operating system version folder (**Figure 7-25**).

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E:\4-AUDIO\ALC883\WIN
<u>File E</u> dit <u>Vi</u> ew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp
] ← Back • → • 🔁 ② Search 🖓 Folders 🍏 🕍 🧼
Address 🔁 E:\4-AUDIO\ALC883\WIN
Name 🛆
Vista_5265 WDM_R149
3 object(s) 35.7 KB 🖳 My Computer //

Figure 7-25: Select the OS Version

Step 6: Double-click the Setup.exe program icon in Figure 7-26.





E:\4-AUDIO\ALC883\WIN\WDM_R149	
<u> </u>	11
📙 💠 Back 🔹 🔿 👻 🔂 🛛 🖓 Search 🛛 🖓 Folders 🔇	3 🗳 👋
Address C E:\4-AUDIO\ALC883\WIN\WDM_R149	▼ 🖓 Go
Name 🛆	
🔊 layout.bin	
README.TXT	
🔊 RtlExUpd.dll	
🐻 Rtlupd.ini	
SetCDfmt.exe	
🚰 Setup.exe	
🔊 setup.ibt	
🐻 setup.ini	
🔊 setup.inx	
🔊 setup.isn	
al ceturi ice	
Type: Application Size: 11 118 KB 📃 🖳 My Comput	er //.

Figure 7-26: Locate the Setup Program Icon

Step 7: The InstallShield Wizard starts (Figure 7-27).

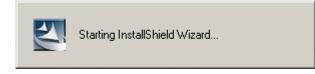
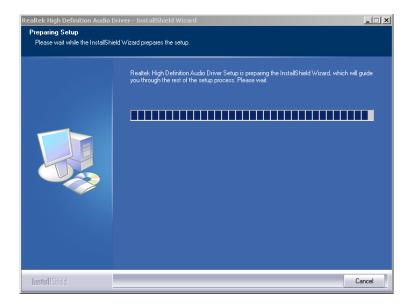


Figure 7-27: The InstallShield Wizard Starts

Step 8: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-28**).





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Figure 7-28: Preparing Setup Screen

Step 9: Once initialized, the InstallShield Wizard welcome screen appears (Figure 7-29).

Realtek High Definition Audio I	Driver Setup (2.19)	×
	Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.	
InstallShield	< Back Next > Cancel	

Figure 7-29: InstallShield Wizard Welcome Screen

Step 10: Click **NEXT** to continue the installation.

Step 11: InstallShield starts to install the new software as shown in Figure 7-30.





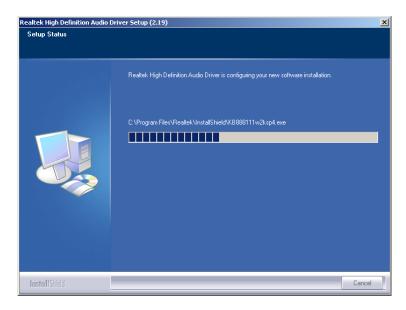


Figure 7-30: Audio Driver Software Configuration

Step 12: The Installation Wizard updates the system as shown in Figure 7-31.

Software Update	Installation Wizard
Updating You	Jr System
1	Please wait while setup inspects your current configuration and updates your files.
	Finishing installation
_ Detai	ls
Rur	nning processes after install
	< <u>B</u> ack Finish Cancel

Figure 7-31: Installation Wizard Updates the System

Step 13: After the driver installation process is complete, a confirmation screen appears (**Figure 7-32**).



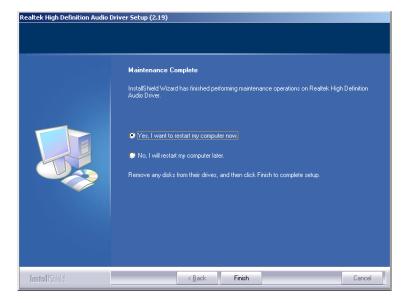


Figure 7-32: Restart the Computer

Step 14: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

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7.7 SATA RAID Driver Installation

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

- Step 1: Select SATA from the list in Figure 7-2.
- **Step 2:** A new window opens (Figure 7-33).



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🔁 E:\5-SATA			
<u> </u>	orites <u>T</u> ools	<u>H</u> elp	<u>19</u>
← Back → → + 🔁	🔇 Search प्	🗄 Folders 🛛 🛞	Pere »
Address 🗀 E:\5-SATA			▼ ∂Go
Name 🔺			
INTEL JMB363 Sil3132			
3 object(s)	0 bytes	🖳 My Compu	uter //

Figure 7-33: SATA RAID Driver Installation Program

- Step 3: Double-click the INTEL folder.
- Step 4: Double-click the iata62_cd.exe program icon in Figure 7-34.



🔁 E:\5-SATA\INTEL	
<u> </u>	
← Back → → → 🔂 📿 Search 🖓 Folders	3 PB PS »
Address 🔁 E:\5-SATA\INTEL	▼ ∂‰
Name 🛆	
Floppy Configuration Utility iata62_cd.exe readme.txt releasenotes.html	
Type: Application Size: 19.3 MB	Computer //

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Figure 7-34: SATA RAID Setup Program Icon

Step 5: Figure 7-35 shows the InstallShield Wizard preparing to guide the user

through the rest of the process.

Intel(R) Matrix Storage Manager - InstallShield Wizard
Preparing Setup Please wait while the InstallShield Wizard prepares the setup.
Intel(R) Matrix Storage Manager Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel



Step 6: Figure 7-36 shows the Matrix Storage Manager software configuring the

installation process.





Intel(R) Matrix Storage Manager Setup	×
Setup Status	
Intel(R) Matrix Storage Manager is configuring your new software installation.	
Installing	
InstallShield	Cancel

Figure 7-36: Matrix Storage Manager Setup Screen

Step 7: Figure 7-37 shows the Matrix Storage Manager welcome screen.



Figure 7-37: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-38**). Read the warning carefully and decide whether or not to continue the installation process.



Intel(R) Matrix Storage	Manager 6.2.0.2002
intel	Warning! Please read the following information: The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data. For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled: Intel(R) Matrix Storage Console Help Documentation Start Menu Shortcuts System Tray Icon Service Event Monitor Service Click Next to continue the setup. Click Cancel to exit the setup.
	< <u>Back</u> <u>Cancel</u> <u>Cancel</u> <u>Intel(R)</u> <u>Installation</u> <u>Frameworks</u>

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Figure 7-38: Matrix Storage Manager Warning Screen

Step 9: Click NEXT and a license agreement appears (Figure 7-39).

Intel(R) Matrix Storage Manager 6.2.0.2002		
	License Agreement	
(intel)	Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.	
	INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Asingle User)	
	IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.	
	Please Also Note: * If you are an Original Equipment Manufacturer (DEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;	
	You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?	
	< <u>B</u> ack <u>Y</u> es <u>N</u> o	
	Intel(R) Installation Frameworks	

Figure 7-39: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click YES and the Readme information file shown in Figure 7-40 appears.





Intel(R) Matrix Storage Manager 6.2.0.2002			
	Readme File Information		
(intel)	Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.		

Figure 7-40: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click NEXT.

Step 12: After the driver installation process is complete, a confirmation screen appears

Intel(R) Matrix Storage Manager 6.2.0.2002		
(intel)	The setup for the Intel(R) Matrix Storage Manager is complete.	
	You must restart this computer for the changes to take effect. Would you like to restart the computer now?	
	 Yes, I want to restart my computer now. No, I will restart my computer later. 	
	Click Finish, then remove any installation media from the drives.	
	< <u>B</u> ack	

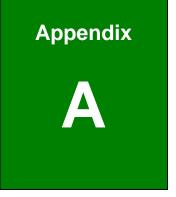
(Figure 7-41).



Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.







BIOS Options



The following is a list of the BIOS options that are available on this board.

→ System Overview 126
→ System Time [xx:xx:xx]
→ System Date [xx/xx/xx]
➔ Intel (R) SpeedStep (tm) tech. [Enabled]
➔ ATA/IDE Configurations [Compatible]130
→ Configure SATA as [IDE]
➔ Configure SATA Channels [Behind PATA]131
→ IDE Master and IDE Slave131
➔ Auto-Detected Drive Parameters
→ Type [Auto] 133
→ ZIP
→ LS-120
→ LBA/Large Mode [Auto]134
→ Block (Multi Sector Transfer) [Auto]
→ PIO Mode [Auto]135
→ DMA Mode [Auto]135
→ S.M.A.R.T [Auto]
→ 32Bit Data Transfer [Enabled]
→ Floppy A
→ Serial Port1 Address [3F8/IRQ4]139
→ Serial Port1 Mode [Normal]140
→ Serial Port2 Address [2F8/IRQ3]140
→ Serial Port2 Mode [Normal]140
➔ Parallel Address [378] 141
➔ Parallel Port Mode [Normal]141
→ Parallel Port IRQ [IRQ7]142
→ Serial Port3 Address [3E8]142
→ Serial Port4 Address [2E8]142
→ Serial Port5 Address [2E0]
→ Serial Port6 Address [2D8]

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➔ FAN Mode Setting [Full On Mode]
→ CPU Temp. Limit of OFF [000]145
→ CPU Temp. Limit of Start [020]146
→ CPU Fan Start PWM [070]146
→ Slope PWM 1 [1 PWM] 146
➔ Power Supply Type [H/W]148
→ Suspend Mode [S1(POS)]149
→ Power Button Mode [On/Off]150
→ Restore on AC Power Loss [Power Off]151
➔ Resume on Keyboard/Mouse [Disabled]151
➔ Resume on Ring [Disabled]151
→ Resume on PME# [Disabled]152
→ Resume on PCI-Express WAKE# [Enabled]152
→ Resume On RTC Alarm [Disabled]152
→ RTC Alarm Date (Days)152
→ System Time
→ Remote Access [Disabled]153
 → Remote Access [Disabled]
→ Serial Port Number
 → Serial Port Number
 → Serial Port Number → Serial Port Mode → Serial Port Mode → Flow Control → Flow Control → Redirection after BIOS POST → Redirection after BIOS POST → Terminal Type → Terminal Type → Serial Port Number [COM1] ↓ Serial Port Number [COM1]
 → Serial Port Number → Serial Port Mode → Serial Port Mode → Flow Control → Flow Control → Redirection after BIOS POST → Redirection after BIOS POST → Terminal Type → Terminal Type → Serial Type → Serial Port Number [COM1] → Base Address, IRQ [3F8h,4]
 → Serial Port Number → Serial Port Mode. → Serial Port Mode. → Flow Control → Flow Control → Redirection after BIOS POST. → Redirection after BIOS POST. → Terminal Type → 154 → VT-UTF8 Combo Key Support → Serial Port Number [COM1]. → Serial Port Number [COM1]. → Serial Port Mode [115200 8,n,1]. → Serial Port Mode [115200 8,n,1].
 → Serial Port Number → Serial Port Mode. → Flow Control → Flow Control → Redirection after BIOS POST. → Terminal Type → Terminal Type → VT-UTF8 Combo Key Support → Sredir Memory Display Delay → Serial Port Number [COM1]. → Serial Port Number [COM1]. → Serial Port Mode [115200 8,n,1]. → Flow Control [None]. → Flow Control [None].
 → Serial Port Number → Serial Port Mode → Flow Control → Redirection after BIOS POST → Terminal Type → Terminal Type → VT-UTF8 Combo Key Support → Sredir Memory Display Delay → Serial Port Number [COM1] → Serial Port Number [COM1] → Serial Port Mode [115200 8,n,1] → Serial Port Mode [115200 8,n,1] → Flow Control [None] → Redirection After BIOS POST [Always] → Serial Post [Always]



-

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→ TCG/TPM Support [Yes]			
→ Clearing the TPM [Press Enter]158			
→ USB Functions [Enabled]158			
→ USB 2.0 Controller [Enabled] 159			
→ Legacy USB Support [Enabled]159			
→ USB2.0 Controller Mode [HiSpeed]159			
→ USB Mass Storage Reset Delay [20 Sec]161			
→ Device ##			
→ Emulation Type [Auto]161			
→ IRQ# [Available]163			
→ DMA Channel# [Available]			
➔ Reserved Memory Size [Disabled]			
→ Quick Boot [Enabled]			
➔ Quiet Boot [Disabled]			
➔ AddOn ROM Display Mode [Force BIOS] 167			
→ Bootup Num-Lock [On]			
→ Boot From LAN Support [Disabled]167			
➔ Change Supervisor Password			
→ Change User Password			
→ Clear User Password			
→ Memory Hole [Disabled]			
➔ Initiate Graphic Adapter 176			
➔ Internal Graphics Mode Select [Enable, 32MB]			
→ DVMT Mode Select 176			
→ DVMT/FIXED Memory 177			
→ ASF Support [Enabled]			
→ Spread Spectrum Mode [Enabled] 179			
→ Audio Controller [AC'97 Audio]179			
→ OnBoard LAN1 [Enabled]179			
→ OnBoard LAN2 [Enabled]			
→ Save Changes and Exit			
→ Discard Changes and Exit			

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IMBA-9454ISA ATX Motherboard

➔ Discard Changes	181
➔ Load Optimal Defaults	181
➔ Load Failsafe Defaults	181

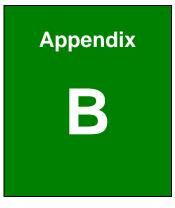




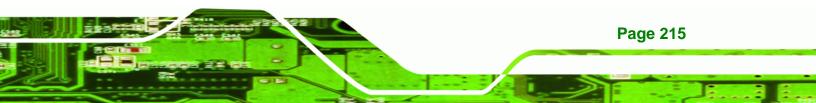
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Terminology



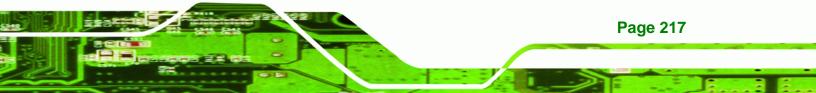
AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by
	Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed
	configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller
	register-level interface.
APM	The Advanced Power Management (APM) application program
	interface (API) enables the inclusion of power management in the
	BIOS.
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.
СОМ	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.



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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/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.

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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.		
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.		
MAC	The Media Access Control (MAC) protocol enables several terminals or		
	network nodes to communicate in a LAN, or other multipoint networks.		
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines		
	for full-duplex (two-way) serial (point-to-point) communications		
	between the SBC components and/or expansion cards and the SBC		
	chipsets. Each line has a 2.5 Gbps data transmission rate and a 250		
	MBps sustained data transfer rate.		
POST	The Power-on Self Test (POST) is the pre-boot actions the system		
	performs when the system is turned-on.		
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a		
	resolution of 320 x 240 pixels.		
RAID	Redundant Array of Inexpensive Disks (RAID) refers to redundantly		
	backing up data on multiple disks to ensure that if one disk fails, the		
	data is not lost and can be restored from the remaining disks in the		
	array.		
RAM	Random Access Memory (RAM) is volatile memory that loses data		

Page 218

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when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.

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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, while USB 2.0 supports 480Mbps data transfer rates.
- VGA The Video Graphics Array (VGA) is a graphics display system developed by IBM.

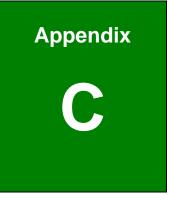




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DIO Interface





C.1 DIO Interface Introduction

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The DIO connector on the IMBA-9454ISA is interfaced to GIO ports on the iTE 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.



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

C.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 0	GP27	General purpose I/O port 2 bit 7.
4	Output 1	GP26	General purpose I/O port 2 bit 6.
5	Output 2	GP25	General purpose I/O port 2 bit 5.
6	Output 3	GP24	General purpose I/O port 2 bit 4.
7	Input 0	GP23	General purpose I/O port 2 bit 3.
8	Input 1	GP22	General purpose I/O port 2 bit 2
9	Input 2	GP21	General purpose I/O port 2 bit 1
10	Input 3	GP20	General purpose I/O port 2 bit 0

Page 222

C.3 Assembly Language Samples

C.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.

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

C.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





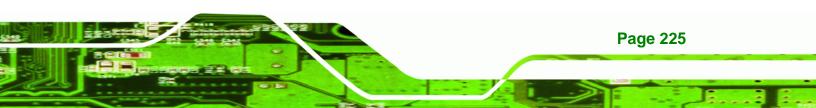
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Watchdog Timer





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The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

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 EMI 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:

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).

INT 15H:

Table D-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. While 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.





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

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Example program:

; INITIAL TIMER PERIOD COUNTER

W_LOOP:

;

;

;

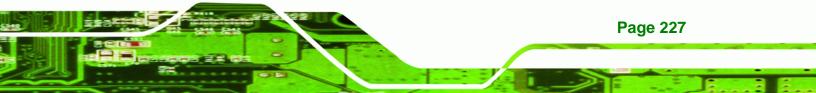
MOV	AX, 6F02H	;setting the time-out value
MOV	BL, 30	; time-out value is 48 seconds
INT	15H	

; ADD THE APPLICATION PROGRAM HERE

<i>T_AP, 1</i> ; is the application over?	EXIT_AP, 1	CMP
LOOP ;No, restart the application	W_LOOP	JNE
F02H ; disable Watchdog Timer	AX, 6F02H	MOV
;	BL, O	MOV
	15H	INT

; **EXIT** ;

;





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Address Mapping



E.1 Address Map

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I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
OFO-OFF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel Graphics Controller
3C0-3DF	Intel Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table E-1: IO Address Map

E.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
100000-	Extend BIOS

Table E-2: 1st MB Memory Address Map



E.3 IRQ Mapping Table

I RQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

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Table E-3: IRQ Mapping Table

E.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table E-4: IRQ Mapping Table





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Compatibility





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The compatible items described here have been tested by the IEI R&D team and found to be compatible with the IMBA-9454ISA

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the IMBA-9454ISA.

- Windows 2000
- Windows Server 2003 (32-bit)
- Windows Server 2003 (64-bit)
- Windows XP (32-bit)
- Windows XP (64-bit)
- Windows XP Embedded
- Windows Vista (32-bit)
- Windows Vista (64-bit)
- Mardriva 2008
- Fedora Core 8

F.2 Compatible Processors

The following Socket 775 (LGA775) processors have been successfully tested on the IMBA-9454ISA

Processor	Model	Clock Speed	L2 Cache	Bus Speed
Intel® Core™2 Duo	E6700	2.66 GHz	4.0 MB	1066 MHz
Intel® Core™2 Duo	E6600	2.4 GHz	4.0 MB	1066 MHz
Intel® Core™2 Duo	E6420	2.13 GHz	4.0 MB	1066 MHz
Intel® Core™2 Duo	E6400	2.13 GHz	2.0 MB	1066 MHz
Intel® Core™2 Duo	E6300	1.86 GHz	2.0 MB	1066 MHz

Processor	Model	Clock Speed	L2 Cache	Bus Speed
Intel® Core™2 Duo	E4400	2.0 GHz	2.0 MB	800 MHz
Intel® Core™2 Duo	E4300	1.80 GHz	2.0 MB	800 MHz
Intel® Core™2 Duo	E2160	1.80 GHz	2.0 MB	800 MHz
Intel® Pentium® 4	Extreme Edition	3.73GHz	2.0 MB	1066 MHz
Intel® Pentium® D	960 (65nm)	3.6GHz	4.0 MB	800 MHz
Intel® Pentium® D	840 (90nm)	3.2GHz	2.0 MB	800 MHz
Intel® Pentium® 4	651 (65nm)	3.4GHz	2.0 MB	800 MHz
Intel® Pentium® 4	670 (90nm)	3.8GHz	2.0 MB	800 MHz
Intel® Pentium® 4	661 (65nm)	3.6GHz	2.0 MB	800 MHz
Intel® Pentium® 4	560 (90nm)	3.6GHz	1.0 MB	800 MHz
Intel® Pentium® 4	530 (90nm)	3.0GHz	1.0 MB	800 MHz
Intel® Pentium® 4	520 (90nm)	2.8GHz	1.0 MB	800 MHz
Intel® Pentium® 4	506 (90nm)	2.66GHz	1.0 MB	533 MHz
Intel® Celeron ® D	352 (65nm)	3.2GHz	512 KB	533 MHz
Intel® Celeron ® D	351 (90nm)	3.2GHz	256 KB	533 MHz
Intel® Celeron ® D	346 (90nm)	3.06GHz	256 KB	533 MHz

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F.3 Compatible Memory Modules



The memory modules listed below have been tested on the IMBA-9454ISA other memory modules that comply with the specifications may also work on the IMBA-9454ISA but have not been tested.

The following memory modules have been successfully tested on the IMBA-9454ISA.



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IMBA-9454ISA ATX Motherboard

Manufacturer	Memory Type	Model No.	Capacity	Speed
A-DATA	DDR2	M20AD6H3J4171Q1E52	2.0 GB	800 MHz
Apacer	PC2-5300	ELPIDA E5108AG-6E-E	1.0 GB	667 MHz
Apacer	PC2-6400	Apacer AM4B5708CHJS8E	512 MB	800 MHz
CORSAIR	PC2-6400	CM2X1024-6400C4G	1.0 GB	800 MHz
CORSAIR	DDR2	CORSAIR 64M8CFEG EL1000617	512 MB	667 MHz
CORSAIR	DDR2	CORSAIR 64M8CFEG PS0900702	1.0 GB	667 MHz
CORSAIR	DDR2	MICRON 7KE11 D9HNL	2.0 GB	667 MHz
KINGMAX	DDR2	ELPIDA E5108AE-6E-E	1.0 GB	667 MHz
Kingston	DDR2	KHX5400D2K2/1G	512 MB	667 MHz
Kingston	DDR2	KHX5400D2K2/2G	1.0 GB	667 MHz
Kingston	DDR2	KVR667D2N5/2G	2.0 GB	667 MHz
Kingston	DDR2	KVR800D2N5	1.0 GB	800 MHz
Transcend	DDR2	Hynix HY5PS12821A	512 MB	667 MHz
Transcend	DDR2	Hynix Hy5PS1281E FP-S5	512 MB	800 MHz
Transcend	DDR2	MICRON 7SE17 D9HNP	2.0 GB	800 MHz
Twinmos	PC2-4300	ELPIDA E5116AB-5E-E	256 MB	533 MHz
UMAX	DDR2	UMAX 071214S U2S24D30TP-8E	2.0 GB	800 MHz
KINGMAX	DDR2	KINGMAX KKEA88B4LAUG-37DX	512 MB	533 MHz
KINGSTEK	DDR2	KINGSTEK KST3216533-612MP 256 MB		533 MHz
KINGSTEK	DDR2	Elixir N2TU51280BE-3C-646022ROCF 512 MB		533 MHz
KINGSTEK	DDR2	KINGSTEK KST648533-612LA	1.0 GB	533 MHz





Intel® Matrix Storage Manager





G.1 Introduction

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The Intel® ICH8DO chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.



A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

G.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.



Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.



Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

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G.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

G.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: Connect SATA drives to the system. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.



Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: Enable SATA drives in BIOS. Start the computer and access the BIOS setup program. Enable SATA support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.



- Step 3: Save and Exit BIOS. After the SATA support option is enabled, save and exit the BIOS.
- Step 4: Reboot the system. Reboot the system after saving and exiting the BIOS.
- Step 5: Press Ctrl+I. During the system boot process, press Ctrl+I when prompted to enter the RAID configuration software.
- Step 6: Configure the RAID settings. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.
- **Step 7: Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.**Step 0**:

G.4 RAID Configuration

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G.4.1 Creating a RAID Volume



All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: Select "Create RAID Volume." Use the arrow keys to highlight Create RAID

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Volume and press ENTER. See Figure G-1.

	Storage Manager option 2003-05 Intel Corporati	on. All Ri			
	L HAIN HENU 1. Create RAID 2. Delete RAID 3. Reset Disks 4. Exit	Volume Volume			
RAID Volumes: None defined. Phusical Disks:					
Port Drive Model 2 Maxtor 6916000 3 WDC WD1600JD-75H			Type/Status(Vol ID) Non-RAID Disk Non-RAID Disk		
[_{↑↓}]-Select	[ESC]-Exit	[ENTER]-Select Menu		

Figure G-1: Matrix Storage Manager Main Menu

Step 2: Name the RAID volume. Enter a name for the RAID volume, or press ENTER to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See Figure G-2.

Intel(R) Matrix Storage Manager option ROM 05.0.0.1032 ICH7R wRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
Name: Volume NewO J Name: Volume0 RAID Level: RAID0(Stripe) Disks: Select Disks Strip Size: 128KB Capacity: 298.0 GB Create Volume
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.
[]]]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure G-2: Create RAID Volume Name





Step 3: Choose the RAID level. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure G-3.



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RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.				
Name: Volume0 RAID Level: RAIDO(Stripe) Disks: Select Disks Strip Size: 128KB Capacity: 298.0 GB Create Volume				
[HELP]				
Choose the RAID level best suited to your usage model. RAIDO – Data striped across multiple physical drives for performance. RAID1 – Data mirrored across multiple physical drives for redundancy. RAID10 – Striped volume whose segments are RAID 1 volumes. Requires four hard drives. Functionally equivalent to RAID0+1. RAID5 – Data and parity striped across three or more physical drives for performance and redundancy.				
[]]]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select				

Figure G-3: Choose the Raid Level





Step 4: Select the Stripe Size. Select a stripe size from the list. See Figure G-4.

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.					
Name: Volume0 RAID Level: RAID0(Stripe) Disks: Select Disks Strip Size: 12383 Capacity: 238.0 GB Create Volume					
The following are typical values:					
RAIDO - 128KB RAID10 - 64KB					
RAIDS – 64KB					
[]]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select					

Figure G-4: Select the Stripe Size

Step 5: Enter the Volume Capacity. Enter the volume capacity, or press ENTER to

accept the default capacity. See Figure G-5.

Copyright(C) 2003-05 In	nnager option ROM v5.0.0.1032 ICH7R wRAID5 ntel Corporation. All Rights Reserved. REATE VOLUME MENU]
RAID Level:	
maximum volume capaci	[HELP] city. The default value indicates the by using the selected disks. If less city is chosen, creation of a second
volume is needed to u	ILESCI-Previous Menu [ENTER]-Select

Figure G-5: Enter the Volume Capacity





Step 6: Create the RAID Volume. Press ENTER to create the RAID volume as specified.

See Figure G-6.

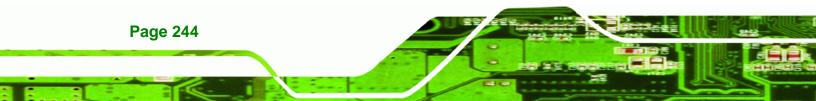
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.					
[CREATE VOLUME MENU] Name: Volume0 RAID Level: RAID0(Stripe) Disks: Select Disks Strip Size: 128KB Capacity: 298.0 GB Create Volume					
Press "Enter" to create the specified volume.					
[]]]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select					

Figure G-6: Create the RAID Volume

Step 7: Create RAID Volume Verification. After reading the warning, press Y to create the RAID volume as specified, or N to return to the Create RAID Volume menu.
 See Figure G-7. Step 0:

Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.	
[CREATE VOLUME MENU] Name: Volume0 RAID Level: RAIDO(Stripe) Disks: Select Disks Strip Size: 128KB Capacity: 298.0 GB	
WARNING: ALL DATA ON BELECTED DIBKS WILL BE LOST. Are you sure you want to create this volume? (Y/N):	
Press "Enter" to create the specified volume.	
[†]1Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select	

Figure G-7: Create RAID Volume Verification



G.4.2 Deleting a RAID Volume



All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

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Step 1: Select "Delete RAID Volume." Use the arrow keys to highlight Delete RAID

Volume and press ENTER. See Figure G-8.

	Intel(R) Matrix Storage Manager option ROM 05.0.0.1032 ICH7R uRAID5 Copyright(C) 2003-05 Intel Corporation. All Rights Reserved. I MAIN HERU J 1. Create RAID Volume 2. Delete RAID Volume 3. Reset Disks to Non-RAID 4. Exit						
		DISK/VOLUME		TION 1-			
RAID ID	Volumes: Name	Level	Stain	Size	Status	Bootable	
0	Volume0	RAID0(Stripe)		298.0GB		Yes	
Physical Disks: Size Type/Status(Vol ID) Port Drive Model Serial # Size Type/Status(Vol ID) 2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0) 3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)							
[]]-Select [ESC]-Exit [ENTER]-Select Menu							

Figure G-8: Delete RAID Volume Menu





Step 2: Select RAID Volume to be Deleted. Use the arrow keys to highlight the RAID

volume to be deleted and press ENTER. See Figure G-9.

	l(R) Matrix Stora opyright(C) 2003-				
Name Volume0	Level RAIDO(Str	=[DRLETE VOLU Drives ipe) 2	HE HENU 1 Capacity 298.0GB	Status Normal	Bootable Yes
		E HELP]		
Cal	ing a volume will ise any member di EXISTING DATA WI	sks to become	available as	non-RAID dis	ks.
	[↑]]Select [<e< td=""><td>SC>]-Previous </td><td>1enu []-</td><td>-Delete Volu</td><td>me</td></e<>	SC>]-Previous	1enu []-	-Delete Volu	me

Figure G-9: Select RAID Volume to be Deleted

Step 3: Delete Volume Verification. After reading the warning, press Y to delete the specified RAID volume, or N to return to the Delete Volume menu.
 See Figure G-10.

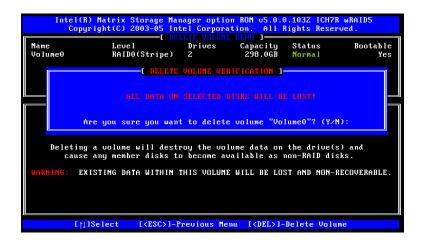


Figure G-10: Delete Volume Verification



Step 4: Non-RAID Disks. After deleting the RAID volume, the disks belonging to the

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volume will be shown as non-RAID disks. See Figure G-11. Step 0:

	Storage Manager opti 2003-05 Intel Corpor	ation. All Rig	
	I MAIN ME 1. Create RA 2. Delete RA 3. Reset Dis 4. Exit	ID Volume	
RAID Volumes: None defined.	──C DISK∕VOLUME IN	FORMATION]	
Physical Disks: Port Drive Model 2 Maxtor 6¥160M0 3 WDC WD1600JD-75H			Type/Status(Vol ID) Non-RAID Disk Non-RAID Disk
[႞]-Select	[ESC]-Exit	[EN TER]	-Select Menu

Figure G-11: Non-RAID Disks

G.4.3 Resetting a Disk to Non-RAID



All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.





Step 1: Select "Reset Disk to Non-RAID." Use the arrow keys to highlight Reset Disk

to Non-RAID and press ENTER. See Figure G-12.

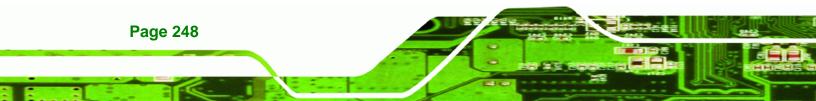
		1. Create 2. Delete	<mark>poration</mark> MENU]= RAID Vo RAID Vo	. All Ri lume	ghts Reser	
RAID ID 0	Volumes: Name Volume0	[DISR/VOLUME Level RAIDO(Stripe)	Strip	Size		Bootable Yes
	Maxtor 6Y160M0	Serial # Y45TDYSE WD-WCAL92193433		Size 152.7GB 149.0GB	Member Di	
	[ț]]-Select	[ESC]-Exit		LENTER	I-Select M	enu

Figure G-12: Reset Disk to Non-RAID Menu

Step 2: Select Disks to Reset. Use the arrow keys to scroll through the disk drives and press SPACE to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press ENTER. See Figure G-13.

			ROM v5.0.0.1032 ICH7R wRAID5 ion. All Rights Reserved.	
		1. Create RAID		
		E RESET RAID D		
	Resetting RAID da		ternal RAID structures	
			emoving these structures,	
L	the drive will re	vert back to a no	n-RAID disk.	
RA	WAXMING: Kesetting			
10	Port Drive Model	Serial #	Size Status	e
Ŭ		Y45TDYSE	152.7GB Member Disk	
	3 WDC WD1600JD-75	H WD-WCAL9219	3433 149.0GB Member Disk	
Ph				
Po				
2				
3	Select	the disks that s	hould be reset.	
	ENT Providence (Newf	ISPACEL Selecte	[ENTER] Solootion Complete	
	t ji-freolous/next	tarner 1-ae lects	[ENTER]-Selection Complete	
	[<u></u>]]-Select	[ESC]-Exit	[ENTER]-Select Menu	

Figure G-13: Select Disk to Reset



Step 3: Reset Disk Verification. After reading the warning, press Y to reset the selected disks as non-RAID, or N to return to the Reset RAID Data menu.
 See Figure G-14.

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		ID disks. By removi	l RAID structures ng these structures,
RA ID			on the disk to be lost.
Ph Po	Port Drive Model 2 Maxtor 6¥160M0 3 WDC WD1600JD-75H	Y45TDYSE	512e Status 152.7GB Member Disk 149.0GB Member Disk
2 3	Are you sure you want to	reset RAID data on	selected disks? (Y/N): _
		SPACE1-Selects [ENT	ER]-Selection Complete

Figure G-14: Reset Disk Verification

Step 4: Disk Drive and RAID Volume Status. After the disk drives have been reset, the Matrix Storage Manager Main menu is shown indicating the status of the RAID volumes and disk drives. See Figure G-15.

		1. Create	<mark>poration</mark> MENU]= RAID Vo RAID Vo	. All Ri lume lume	ghts Reserv	
RAID	Volumes:	DISK/VOLUME		TION 1-		
ID O	Name Volume0			Size 298.0GB	Status	Bootable Yes
ľ	ical Disks:	RAIDO(Stripe)	TCOND	290.000	Turreu	163
Port	Drive Model			Size		us(Vol ID)
2	Maxtor 6Y160M0	Y45TDYSE WD-Wcal92193433		152.7GB 149.0GB		
5	<u>MDC MD1000</u> 1D-12H	WD-WCHE52193433		145.068	nember D1	SR(0)
	[<u>]</u>]-Select	[ESC]-Exit		LENTER	l-Select Me	enu

Figure G-15: Disk Drive and RAID Volume Status





G.4.4 Exiting the Matrix Storage Manager

Step 1: Select "Exit." Use the arrow keys to highlight Exit and press ENTER.

See Figure G-16.

		1. Create 2. Delete	poration MENU]= RAID Vo RAID Vo	. All Ri	<mark>ghts Reser</mark>	
		DISK/VOLUME		TION J-		
RAID ID 0	Volumes: Name Volume0	Level RAIDO(Stripe)	Strip 128KB	Size 298.0GB		Bootable Yes
	Maxtor 6Y160M0	Serial # Y45TDYSE WD-WCAL92193433		Size 152.7GB 149.0GB	Non-RAID	
	[]]-Select	[ESC]-Exit	;	LENTER	1-Select M	enu

Figure G-16: Exit Menu

Step 2: Exit Verification. Press Y to exit the Matrix Storage Manager, or N to return to the Main menu. See Figure G-17.

	203-05 Intel Corporat I MAIN MENU 1. Create RAID 2. Delete RAID	Volume	
RAID Volumes: ID Nam 0 Vol Physical Port Dri	E DISK-VOLUME INFO C CONFIRM EXI e you sure you want t	1	Bootable Yes Vol ID)
2 Maxtor 6¥160M0	¥45TD¥SE JD-WCAL92193433	152.7GB Non-RAlD Di 149.0GB Member Dis}	sk
[↑]]-Select	[ESC]-Exit	[ENTER]-Select Men	u

Figure G-17: Exit Verification







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Hazardous Materials Disclosure





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.

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Part Name	Toxic	or Hazardou	s Substances	and Elements		
	Lead	Mercury	Cadmium	Hexavalent	Polybrominated	Polybrominated
	(Pb)	(Hg)	(Cd)	Chromium	Biphenyls	Diphenyl Ethers
				(CR(VI))	(PBB)	(PBDE)
Housing	х	0	Ο	0	0	X
Display	х	0	0	0	0	Х
Printed Circuit	Х	0	0	0	0	х
Board						
Metal	х	0	0	0	0	0
Fasteners						
Cable	Х	0	0	0	0	х
Assembly						
Fan Assembly	х	0	0	0	0	Х
Power Supply	х	0	0	0	0	х
Assemblies						
Battery	0	0	0	0	0	0
O: This toxi	c or haza	ardous substa	ance is contair	ned in all of the	homogeneous mater	ials for the part is
below the	limit req	uirement in S	SJ/T11363-200)6		
X: This toxic or h	azardou	s substance i	is contained in	at least one of	the homogeneous m	aterials for this part
is above	is above the limit requirement in SJ/T11363-2006					

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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	汞	镉	六价铬	多溴联苯	多溴二苯醚
	(Pb)	(Hg)	(Cd)	(CR(VI))	(PBB)	(PBDE)
壳体	X	0	0	0	0	Х
显示	х	0	0	0	0	х
印刷电路板	х	0	0	0	0	х
金属螺帽	х	0	0	0	0	0
电缆组装	х	0	0	0	0	х
风扇组装	х	0	0	0	0	х
电力供应组装	х	0	0	0	0	х
电池	0	0	0	0	0	0
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/T11363-20	006 标准规定的	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。						

Page 254

®Technology Corp



Index





BTechnology Corp

ACPI	149
Advanced Power Management	178
airflow	106
anti-static precautions	
anti-static pad	38, 88
anti-static wristband	38, 88
handling	38, 88
self-grounding	38, 88
ASKIR interface	63
AT power connector	47
location and pinouts	
AT power select jumper	
location	102
settings	102
ATA flat cable	108
ATX	48
ATX +12V power connector	4
ATX power connector	4
ATX power connector	
audio auxiliary in connector	4
audio CD in connector	4
Audio Codec '97	19
audio connector	4, 50, 52
location and pinouts	50, 52
audio connector CD in	51
location and pinouts	51
Audio device connector	116

В

BIOS 31, 124, 125, 126, 127, 128, 129, 130, 131, 132, 138, 139, 144, 148, 149, 150, 153, 155,

157, 158, 160, 162, 163, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 177, 178, 180

С

cables	107
ATA flat cable	108
dual port USB	113
dual RS-232 cable	110
four port USB	114
four serial port	111
SATA drive	40, 112
SATA drive power	40, 112
CF card	53, 100
installation	100
location and pinouts	53
setup jumper	103
socket	53
CF card setup jumper	103
location	103
settings	103
CF card Type II socket	5
chassis	106
installation	106
chipset	
southbridge	
chipset driver	
clear CMOS jumper	104
location	105
settings	105
CMOS	104
clear CMOS jumper	104
codec	



Page 257

IMBA-9454ISA ATX Motherboard

AC'9719
COM 274, 75
COM 2 function select 105
connector location and pinouts . 74, 75
RS-232, RS-422 or RS-48574
COM 2 function select jumper74, 75, 105
location106
settings 105
CompactFlash53
socket location and pinouts 53
connectors, pinouts and location
ATX power
audio 50
audio CD in 50
COM 2 serial port 72, 73, 74, 76
CompactFlash 53
digital input/output55
fan 56, 57
floppy disk 58
front panel 60
IDE 61
infrared interface
PCI Express x16 slot67
PCI slot 64
serial port (COM 2). 72, 73, 74, 76, 77
trusted platform module (TPM) 77
USB (internal)78
cooling106
airflow106
cooling fan56, 57, 96, 147
cooling kit installation96
CPU
cooling fan96
heat sink 96
installation92

CPU cooling fan connector.....5

D

®Technology Corp.

DB-1584
DB-15 connector121
DB-2581
DB-25 connector117
DB-985
DB-9 connector
digital input/output connector5, 55
location and pinouts 55
dimensions10
board 10
external peripheral interface connector
panel
DIMM
installation
specifcations
DIO connector
Drivers
Broadcom GbE LAN 192
dual port USB cable

Ε

electrostatic discharge
Enhanced Hardware Monitor
Ethernet
RJ-45 connector 5
Ethernet controllers82
external indicators60
external peripheral interface115
connection115
connectors115
External Peripheral Interface Connectors

BTechnology Corp.

Audio Jacks	82
Keyboard/Mouse	80
Parallel Port	81
Serial Communications (COM).	85
USB	83
VGA	84
external switches	60

F

fan connector	56, 57
location and pinouts	56, 57
fan speed controller	33
FDD	139
FDD device	109
connector	109
I FDD flat cable	109
FDD device	109
FDD flat cable	109
floppy disk connector	5, 58
location and pinouts	58
floppy disk drive	58
four port USB cable	114
four serial port cable	111
front panel audio connector	4
front panel connector	5, 60
location and pinouts	60
FSB	129
floppy disk drive four port USB cable four serial port cable front panel audio connector front panel connector location and pinouts	

G

graphics and memory controller hub13	3
Graphics Media Accelerator	5

IMBA-9454ISA ATX Motherboard

н

I

IDE connector	5
IDE connector, 40-pin	61
location and pinouts	61
IDE device	108
ATA flat cable	108
connector	108
IDE interface	21
infrared connector	5
infrared interface	63
Amplitude Shift Key Infrared	63
ASKIR	63
Serial Infrared	(2)
Seriar minarea minarea	63
SIR	
	63
SIR	63 63
SIR	63 63 63
SIR infrared interface connector location and pinouts	
SIR infrared interface connector location and pinouts installation checklist	

J

umper10	1, 102
AT power select	. 102
CF card setup	. 103

®Technology Corp.

IMBA-9454ISA ATX Motherboard

clear CMOS	104
COM 2 function select	105
jumper configuration	102
jumper settings	101

Κ

LAN connection	117
LPC bus	30
LPC interface	23, 32

L

Μ

Matrix Storage Manager	237
memory module installation	98
memory support	14

Ρ

Parallel Device Connection117
parallel port141, 142
parallel port connector5
PCI Express GbE controller27
PCI Express x16 Slot67
location and pinouts 67
PCI interface
PCI slot64
location and pinouts 64
PCI socket5
peripheral connectors47
peripheral device cables107
power button60
Power Button Mode150

power supply47
AT power select jumper 102
AT power supply 47
PS/280
PS/2 keyboard and mouse
connection118

R

RAID71
real time clock
RJ-45 connection117
single connector117
RJ-45 Ethernet connector5, 83
RJ-45 LAN connectors82
RS-232
cable connection110
COM 2 location and pinouts 73, 74
COM 3 location and pinouts 74
COM 4 location and pinouts 74
connector location and pinouts . 73, 74
dual cable110
serial port devices73
RS-232 serial port connector5
RS-232 serial port devices73
RS-232/422/485 serial port connector5
RS-42274, 75
COM 2 location and pinouts 74, 75
RS-48574, 75
COM 2 location and pinouts 74, 75

S

Safety Precautions	234
SATA	
controller	28

®Technology Corp.

SATA drive	112
cables	112
connection	112
power cable	112
SATA drive connector	71
location and pinouts	71
SATA drives	71
Serial ATA drive connector	5
Serial Device	
connection	119
Serial port (COM2) select RS-232/	422/4855
serial port connector	5, 73, 74, 75
location and pinouts	73, 74, 75
serial ports	32
SIR interface	63
socket LGA775 CPU	
cooling kit	
cooling kit installation	
installation	
southbridge chipset	18
SPDIF connector	5
Super I/O chipset	31, 32
system cooling fan connector	5
system voltages	144, 147

Т

technical specifications
temperature144
TPM connector5
trusted platform module77
trusted platform module (TPM) connector77
location and pinouts77

IMBA-9454ISA ATX Motherboard

U

unpacking
unpacking checklist
unpacking precautions
USB
cable
dual port113
four port114
cable113, 114
cable connection113
connectors113
controller 29
devices
external USB device connection 120
port78
USB 1.1
USB 2.0
USB 1.1
USB 2.0
USB 2.0 connector5
USB cable
dual port113
four port114
USB connector
USB connector, internal78
location and pinouts78
USB device connection120
dual connector 120

V

VGA	121
VGA connector	5
VGA monitor	121



W

warranty validation90

connection 121

