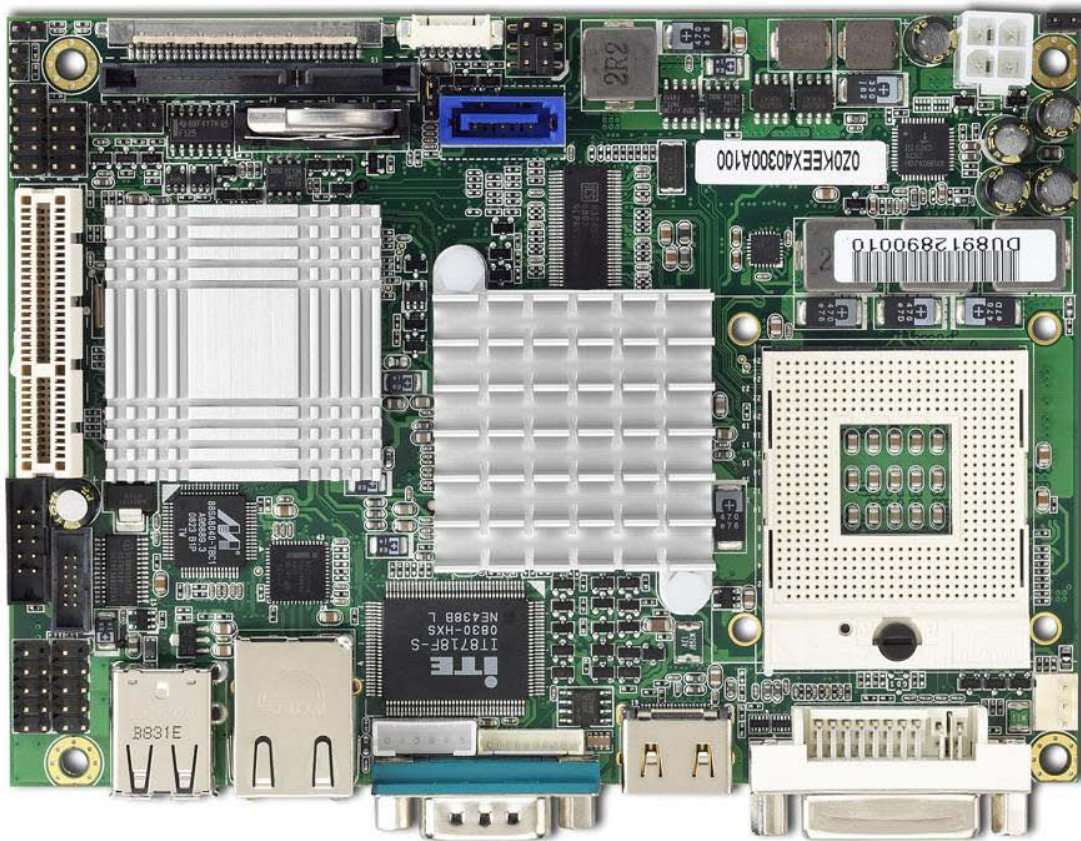


KEEX-4030

Intel® Embedded Compact Extended Form Factor
with Intel® GM45/ ICH9M

User's Guide



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Quanmax reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology.

Changes which affect the operation of the unit will be documented in the next revision of this user's guide.

Revision	Date	Edited by	Changes
1.0	03/26/2009	SLee	Initial Release
1.1	04/15/2009	SLee	JP1 Setting Correction
1.2	08/21/2009	SLee	Update LVDS table
1.3	10/05/2009	SLee	Minor Correction, Delete iAMT Function
1.4	12/16/2009	SLee	Correct RS232/422/485 pin assignment
1.5	07/30/2010	Zack	Add Quad-Core CPU
1.6	01/29/2011	Zack	Add Remark on Clear CMOS

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Safety Instructions

■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

WARNING



High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION



Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.

■ Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container

or packaging.

- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

Preface

■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

NOTE



Driver downloads and additional information are available under Downloads on our web site: www.quanmax.com.

■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to “Warranty Policy” for the return procedure.

■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

FCC Compliance Statement for Class A Devices

The product(s) described in this user's guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

NOTE



The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

■ Warranty Policy

Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at www.quanmax.com. Please consult your distributor for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Limited Warranty return, please contact Support at www.quanmax.com and

login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to support@quanmax.com to apply for one.

All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the date of purchase.

To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.

Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

Limitation of Liability

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

■ Maintaining Your Computer

Environmental Factors

■ Temperature

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised.

Consideration should be given to the maximum rated ambient temperature.

Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

■ **Humidity**

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

■ **Altitude**

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

■ **Surge Protector**

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

■ Line Conditioner

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep a system's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

■ Uninterruptible Power Supply

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive units allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

■ Overview

The KEEEX-4030 is an ECX Form Factor embedded single board computer (SBC) that combines the high performance Intel® Core™2 Duo/Quad-Core processor with Intel® GM45/ ICH9M chipset and supports DDR3 SODIMM up to 4GB. This SBC offers the latest performance, features and I/O interfaces at an extremely attractive price/performance ratio and measures 105mm x 146mm, a 75 percent space reduction over micro-ATX boards.

The KEEEX-4030 features HDMI, DVI and 18/24-bit dual channel LVDS panel support, SATA 3 Gb/s, RS-232/422/485 serial port, DI/DO, Gigabit Ethernet, USB 2.0, keyboard/mouse, and HD audio. PCIe x4 support provides expansion capability.

Checklist

- SATA cable
- Y cable for keyboard & mouse
- Driver CD
- Quick Installation Guide
- KEEEX-4030 embedded board

Features

- Intel® Core 2 Duo 45nm Penryn/Quad-Core Processor support
- Intel® GM45/ICH9-M chipset
- 1x SO-DIMM DDR3 800/1066 up to 4GB
- Intel® Graphics Media Accelerator 4500MHD supports
- LVDS/DVI/HDMI, 1x PCIe x4 slot
- 2x SATA 3 Gb/s, 1x CompactFlash Type II
- 1x GbE, 6x USB 2.0, HD Audio, 4x DI/DO, 2x COM
- Watchdog Timer, Hardware Monitor, TPM 1.2

■ Product Specifications

CPU Support	Intel® 45 nm Penryn-based Core 2 Duo (Socket-P) Intel® Quad-Core Processor
Chipset	Intel® GM45 +ICH9M
Memory	1x DDR3 800/1066 SO-DIMM, up to 4 GB
BIOS	AMI Plug & Play BIOS – SPI Flash ROM
Display	Intel® Graphics Media Accelerator 4500MHD 18/24-bit Dual channel LVDS 1x HDMI, 1x DVI-I
LAN	1x RJ-45, Gigabit Ethernet (Intel® 82567)
Audio	HD Audio via optional daughter board
Peripheral Support	2x SATA 3Gb/s (one with onboard power connector) 1x CompactFlash socket 6x USB 2.0 2x COMs (1x RS-232/422/485, 1x RS-232) 4x DI/DO 1x KB/ MS Box Header 1x LPC Box Header
TPM	TPM 1.2
Power Connector	ATX-4P +12VDC Input
Expansion	1x PCIe x4 slot (w/ 4x PCIe x1 speed)
Watchdog Timer	1-255 step
Hardware Monitor	Operating voltage, CPU temperature and fan speed
Dimensions	Intel® ECX Form Factor (105 x 146mm) Operation Temp: 0°C - 60°C
Environmental Factors	Storage Temp.: -10°C - 85°C Humidity: 0% - 90%
Certifications	CE, FCC Class A

Table 1 KEEEX-4030 Specification

■ System Block Diagram

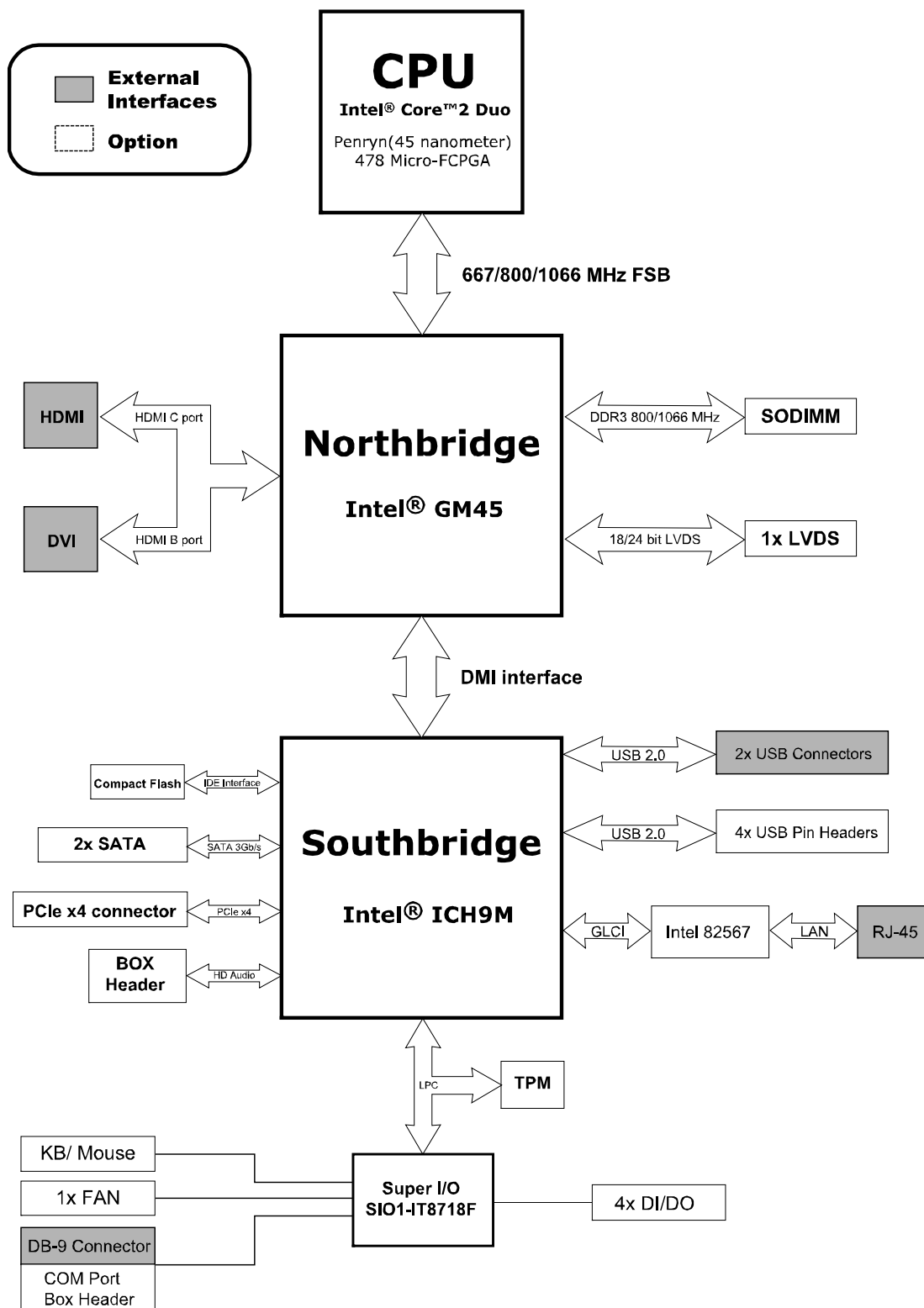


Figure 1 Block Diagram

■ Mechanical Dimensions

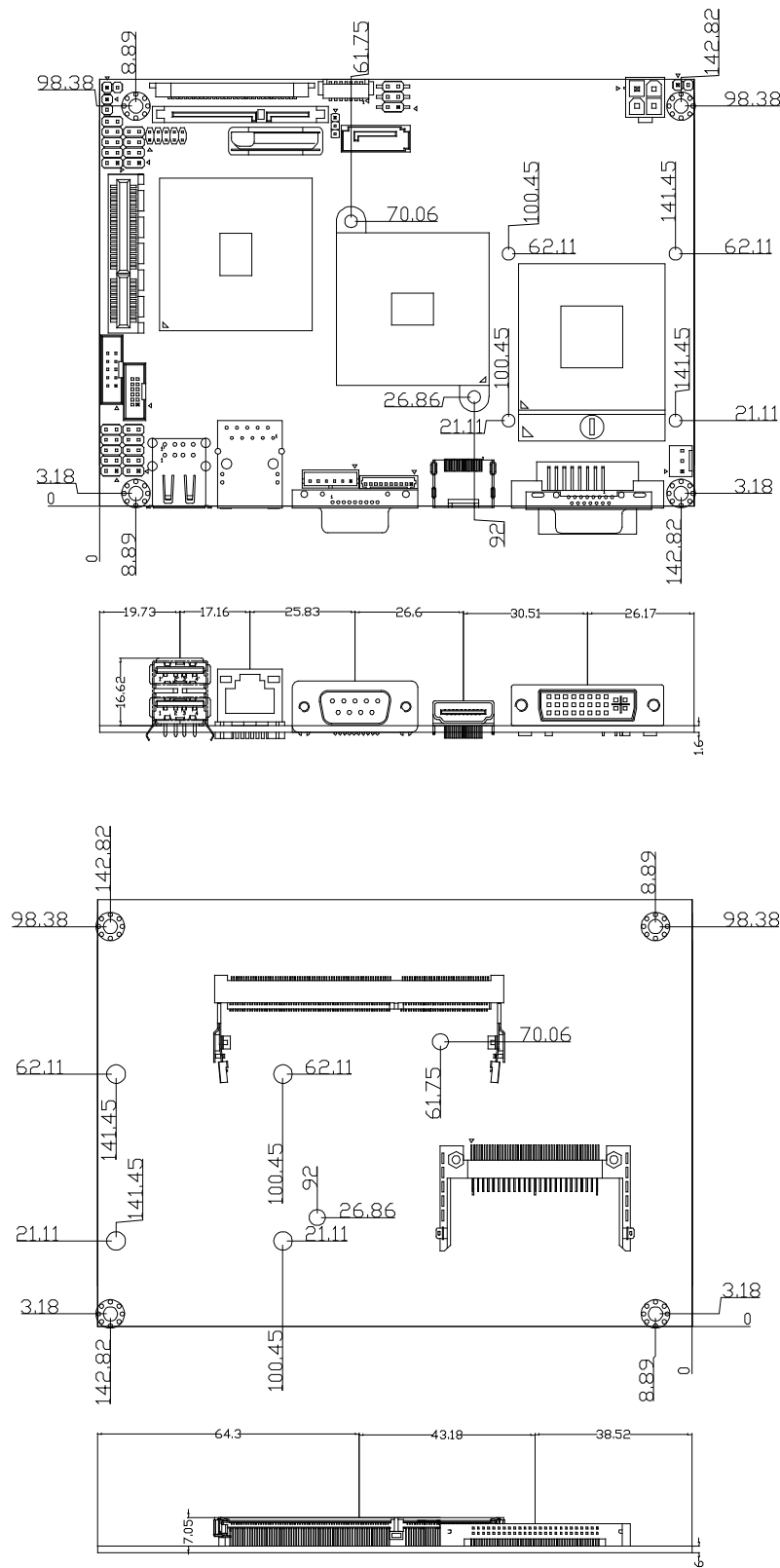


Figure 2 Mechanical Dimensions

Chapter 2

Hardware Settings

■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

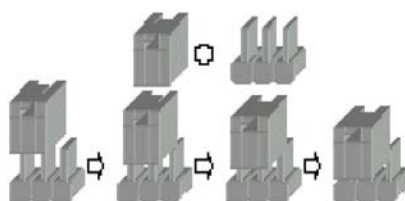


Figure 3 Jumper Connector

For a three-pin jumper (see *figure above*), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

■ Jumper Settings and Pin Definitions

For jumper and connector locations, please refer to the diagrams below.

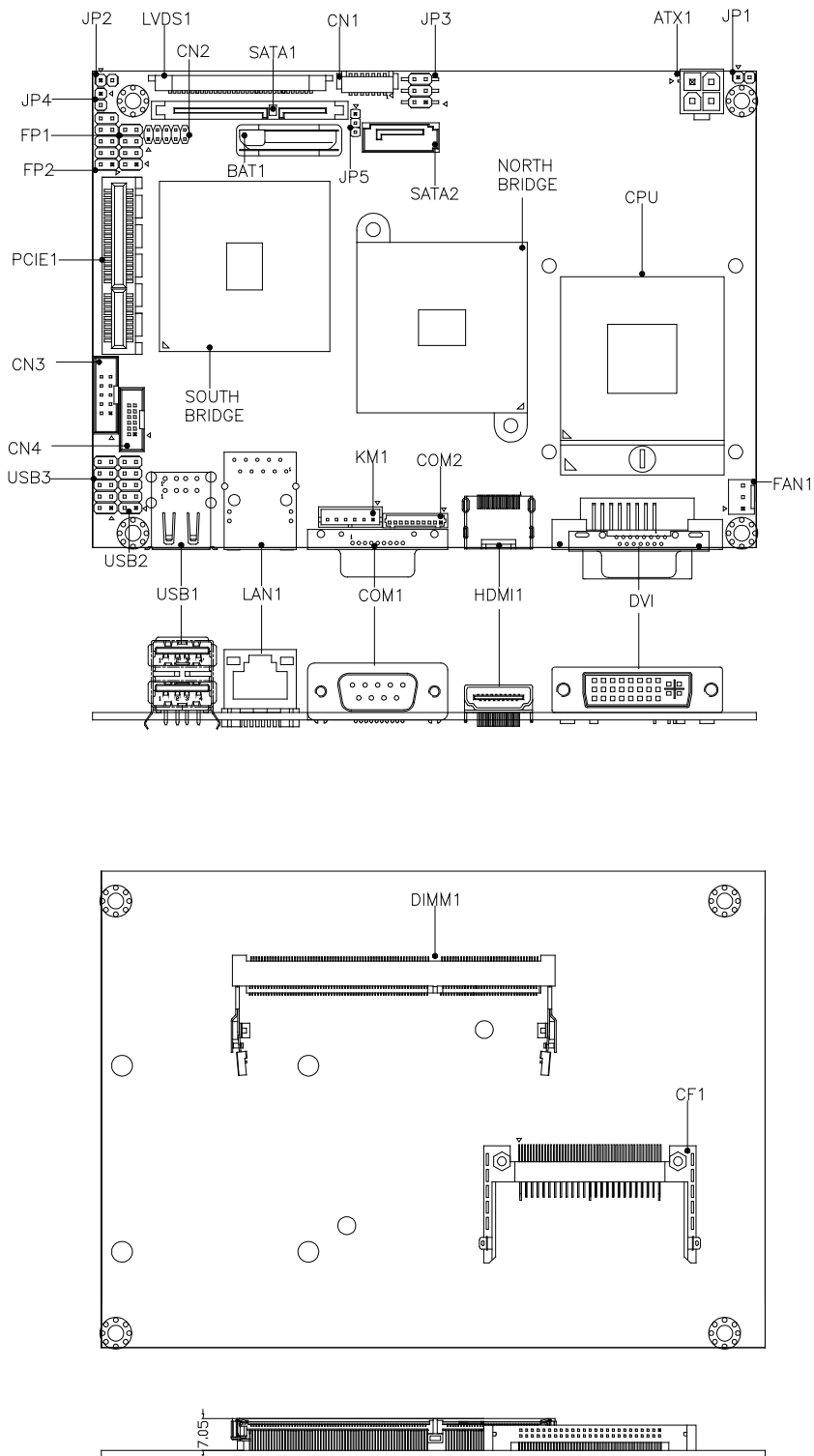


Figure 4 Jumper and Connector Locations

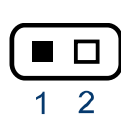
Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 2 Jumper List

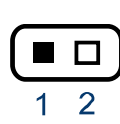
Label	Function
JP1	Power Mode Selection
JP2	Clear CMOS Selection
JP3	Backlight & Panel Power Selection
JP4	Clear ME RTC Registers
JP5	Backlight Enable Selection

Table 3 JP1 Power Mode Selection



Jumper	Status
Open	ATX Mode (Default)
Short	AT Mode

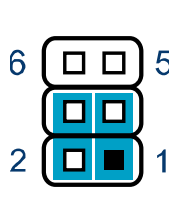
Table 4 JP2 Clear CMOS Selection



Jumper	Status
Open	Normal Operation (Default)
Short	Clear CMOS


Remark: You must go to **BIOS EXIT menu to do** “Load Optimal Defaults” after clear CMOS. Please refer to table 44.

Table 5 JP3 Backlight & Panel Power Selection



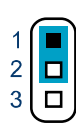
Jumper	Setting	Status
1	1-3	Backlight Power = +12V (Default)
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V (Default)
	4-6	Panel Power = +5V

Table 6 JP4 Clear ME RTC Registers



Jumper	Status
Open	Normal Operation (Default)
Short	Clear ME RTC Registers

Table 7 JP5 Backlight Enable Selection



Jumper	Status
1-2	Active High (Default)
2-3	Active Low

Rear Panel Pin Assignments

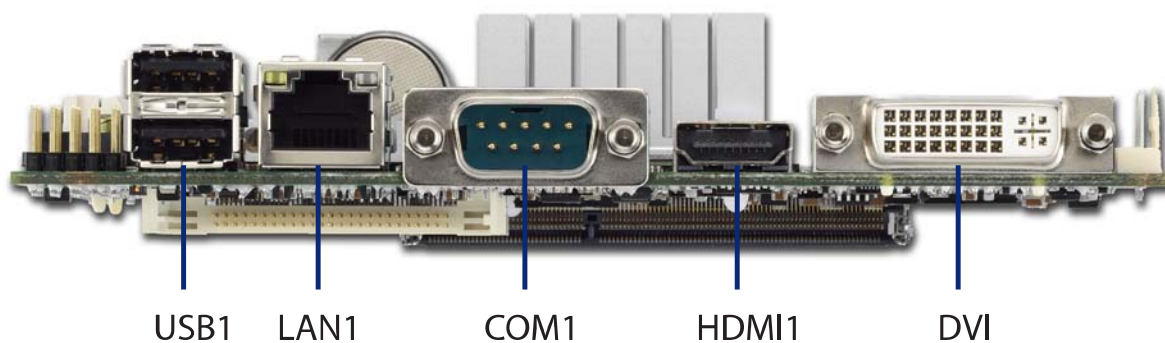
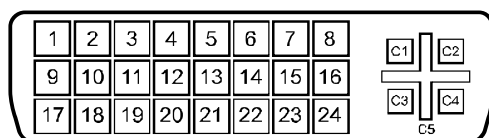


Table 8 Rear Panel Connector Descriptions

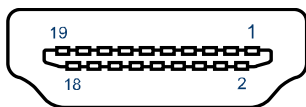
Label	Function
DVI	DVI-I Connector
HDMI1	HDMI connector
COM1	RS-232 Port A DB-9 Connector
LAN1	10/100/1000 Ethernet RJ-45 Connector
USB1	USB2.0 Port 0, 1 Type A Connector

Table 9 DVI (DVI-I Connector)



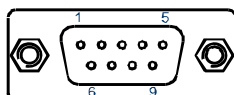
Pin	Signal Name	Pin	Signal Name
1	TX2N	2	TX2P
3	GND	4	TX5N
5	TX5P	6	SD_CLK
7	SD_DATA	8	VSYNC
9	TX1N	10	TX1P
11	GND	12	TX4N
13	TX4P	14	VGA_PWR
15	VGA_EN	16	HPD
17	TX0N	18	TX0P
19	GND	20	TX6N
21	TX6P	22	GND
23	TCLP	24	TXLN
PIN	Signal Name		
C1	Analog red		
C2	Analog green		
C3	Analog blue		
C4	Analog horizontal sync		
C5	Analog ground		

Table 10 HDMI1 (HDMI1 connector)



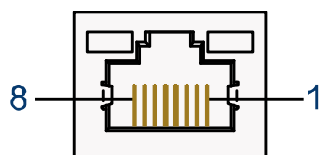
Signal Name	Pin	Pin	Signal Name
TMD_DATA2+	1	2	GND
TMD_DATA2-	3	4	TMD_DATA1+
GND	5	6	TMD_DATA1-
TMD_DATA0+	7	8	GND
TMD_DATA0-	9	10	HDMI_TCLP
GND	11	12	HDMI_TCLN
NC	13	14	NC
DDC_CLK	15	16	DDC_DATA
GND	17	18	+5V
HPDET	19		

Table 11 COM1 (RS-232/422/485 Port A DB-9 Connector)



Pin	RS232	RS422	RS485 Half Duplex
1	DCD, Data carrier detect	TX-	DATA-
2	RXD, Receive data	RX+	N/A
3	TXD, Transmit data	TX+	DATA+
4	DTR, Data terminal ready	RX-	N/A
5	GND, ground		
6	DSR, Data set ready		
7	RTS, Request to send		
8	CTS, Clear to send		
9	RI, Ring indicator		

Table 12 LAN1 (10/100/1000 Ethernet RJ-45 Connector)



Pin	Signal
1	Tx+
2	Tx-
3	Rx+
4	NC
5	NC
6	Rx-
7	NC
8	NC

Table 13 USB1 (USB2.0 Port 0, 1 Type A Connector)



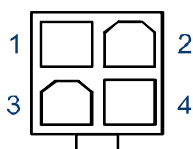
Pin	Signal Name	Pin	Signal Name
1	+5V	5	+5V
2	USB1-	6	USB0-
3	USB1+	7	USB0+
4	GND	8	GND

Main Board Pin Assignments

Table 14 Connector List

Label	Function
ATX1	+12V Power Input Connector
CF1	CF Type II Connector
CN1	Panel Backlight Wafer
CN2	Digital Input / Output Pin Header
CN3	HD Audio Box Header
CN4	LPC Box Header
COM2	RS-232 Port B Wafer
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	CPU FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
LVDS1	LVDS Panel Connector
PCIE1	PCIE x 4 Slot
SATA1	Serial ATA & HDD Power Connector
SATA2	Serial ATA Connector
USB2	USB2.0 Port 2, 3 Pin Header
USB3	USB2.0 Port 4, 5 Pin Header
KM1	Keyboard and mouse connector
ATX1	+12V Power Input Connector

Table 15 ATX1, +12V Power Input Connector

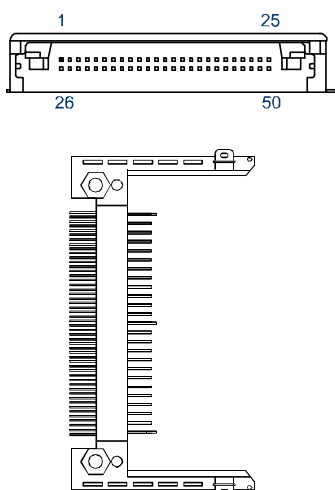


Pin	Signal Name
1	GND
2	GND
3	+12V
4	+12V

[YIMTEX 576MWA2*02STR]

Table 16 CF1, CF Type II Connector

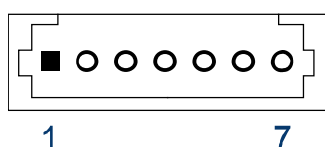
Pin	Signal Name	Pin	Signal Name
1	GND	26	GND
2	IDE Data 3	27	IDE Data 11
3	IDE Data 4	28	IDE Data 12
4	IDE Data 5	29	IDE Data 13
5	IDE Data 6	30	IDE Data 14
6	IDE Data 7	31	IDE Data 15
7	IDE Chip select 1#	32	IDE Chip select 3#
8	GND	33	GND



9	GND	34	IDEIOR#
10	GND	35	IDEIOW#
11	GND	36	+5V
12	GND	37	IDEIRQ
13	+5V	38	+5V
14	GND	39	PCSEL
15	GND	40	NC
16	GND	41	Reset IDE
17	GND	42	IDEIORDY
18	SDA2	43	DREQ
19	IDE Address 1	44	DACK#
20	IDE Address 0	45	IDE activity
21	IDE Data 0	46	PDIAG#
22	IDE Data 1	47	IDE Data 8
23	IDE Data 2	48	IDE Data 9
24	IOIS16#	49	IDE Data 10
25	GND	50	GND

[JINN SHYANG CF1A-71041-00E01]

Table 17 CN1, Panel Backlight Wafer



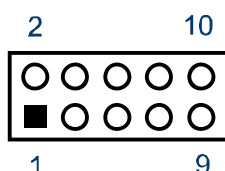
Pin	Signal Name
1	NC
2	BL_ADJ
3	GND
4	+5V / +12V *
5	+5V / +12V *
6	GND
7	BL_EN / BL_EN# **

Pitch:1.25mm [YIMTEX 501MW1*07MTRR]

* The function can be selected by JP3.

** The function can be selected by JP5.

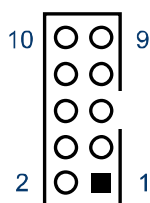
Table 18 CN2, Digital Input / Output Pin Header



Pin	Signal	Pin	Signal
1	Digital Output 0	2	Digital Input 0
3	Digital Output 1	4	Digital Input 1
5	Digital Output 2	6	Digital Input 2
7	Digital Output 3	8	Digital Input 3
9	+5V	10	GND

Pitch:2.0mm [YIMTEX 3292*05SAGR(6T)]

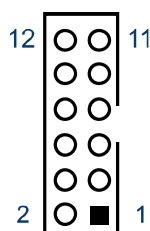
Table 19 CN3, HD Audio Box Header



Pin	Signal Name	Pin	Signal Name
1	RST#	2	SYNC
3	GND	4	SDOUT
5	SDIN	6	GND
7	GND	8	BCLK
9	+5V	10	+3.3V

Pitch:2.0mm [YIMTEX 32610SAG]

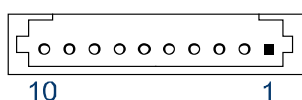
Table 20 CN4, LPC Box Header



Pin	Signal Name	Pin	Signal Name
1	+3.3V	2	GND
3	GND	4	LPC_AD3
5	LPC_RST#	6	LPC_AD2
7	LPC_CLK33	8	LPC_AD1
9	LPC_FRAME#	10	LPC_AD0
11	LPC_SERIRQ#	12	LPC_DRQ1#

Pitch:1.27mm [YIMTEX 327A121SAG(6T)]

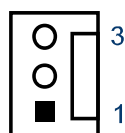
Table 21 COM2, RS-232 Port B Wafer



Pin	Signal
1	DCD, Data carrier detect
2	DSR, Data set ready
3	RXD, Receive data
4	RTS, Request to send
5	TXD, Transmit data
6	CTS, Clear to send
7	DTR, Data terminal ready
8	RI, Ring indicator
9	GND, ground
10	+5V

Pitch:1.25mm [YIMTEX 501MW1*10STR]

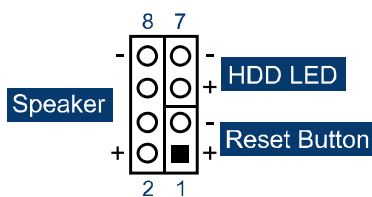
Table 22 FAN1, CPU FAN Wafer



Pin	Signal
1	GND
2	+12V
3	FAN_RPM

Pitch:2.54mm YIMTEX 521AW1*03STR

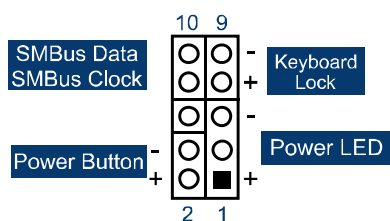
Table 23 FP1, Front Panel 1 Pin Header



Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	NC
7	HDD LED -	8	Speaker -

Pitch:2.54mm [YIMTEX 3322*04SAGR]

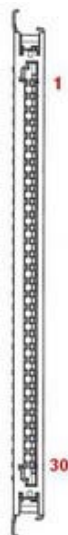
Table 24 FP2, Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	NC
7	Keyboard Lock	8	SMBus Data
9	GND	10	SMBus Clock

Pitch:2.54mm [YIMTEX 3322*05SAGR]

Table 25 LVDS1, LVDS Panel Connector

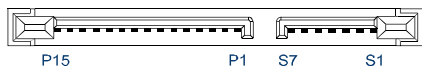


Pin	Signal Name	Pin	Signal Name
1	LVDS_A0-	16	LVDS_B1+
2	LVDS_A0+	17	GND
3	LVDS_A1-	18	LVDS_B2-
4	LVDS_A1+	19	LVDS_B2+
5	LVDS_A2-	20	LVDSBCLK-
6	LVDS_A2+	21	LVDS_BCLK+
7	GND	22	LVDS_B3-
8	LVDS_ACLK-	23	LVDS_B3+
9	LVDS_ACLK+	24	GND
10	LVDS_A3-	25	DCC_DAT
11	LVDS_A3+	26	VDDEN
12	LVDS_B0-	27	DCC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

Pitch:1.00mm JAE FI-X30SSL-HF

* The function can be selected by JP3.

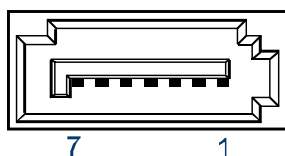
Table 26 SATA1, Serial ATA & HDD Power Connector



Pin	Signal Name	Pin	Signal Name
S1	GND	P5	GND
S2	TX+	P6	GND
S3	TX-	P7	+5V
S4	GND	P8	+5V
S5	RX-	P9	+5V
S6	RX+	P10	GND
S7	GND	P11	GND
P1	+3.3V	P12	GND
P2	+3.3V	P13	+12V
P3	+3.3V	P14	+12V
P4	GND	P15	+12V

7P+15P MALE 180D SATA CONNECTOR BLACK [WIN WIN WATH-22DLBGU4]

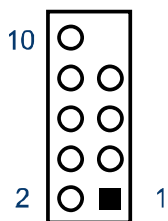
Table 27 SATA2, Serial ATA Connector



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

7P 180D SATA CONNECTOR BLUE [FOXCONN LD1807V-S52U]

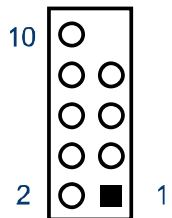
Table 28 USB2, USB2.0 Port 2, 3 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB2-	4	USB3-
5	USB2+	6	USB3+
7	GND	8	GND
9	KEY	10	GND

Pitch:2.54mm [YIMTEX 3322*05SAGR(6T) -09]

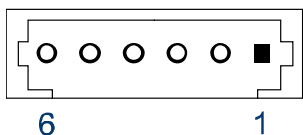
Table 29 USB3, USB2.0 Port 4, 5 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
9	KEY	10	GND

Pitch:2.54mm [YIMTEX 3322*05SAGR(6T) -09]

Table 30 KM1, Keyboard and mouse connector



Pin	Signal
1	MS_CLK
2	+5V
3	MS_DATA
4	KB_DAT
5	GND
6	KB_CLK

CONN WAFER DIP 6P MALE 1R 180D P=2.0mm [STM M24266]

Chapter 3

System Installation

■ Processor Installation

Processor Handling

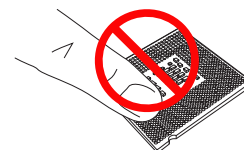
Carefully follow the steps below in order to prepare the CPU for installation:

1. Remove processor from packaging.
2. Handle the CPU by grasping the substrate edges only with thumb and forefinger.



CAUTION

DO NOT TOUCH PROCESSOR CONTACTS TO PREVENT DAMAGING THE CPU.



Installing the CPU

Carefully follow the steps below in order to install the CPU:

1. Check and confirm that you are installing the correct CPU type.
2. Using a screwdriver, disengage (open) the socket actuator, as shown in figure below.

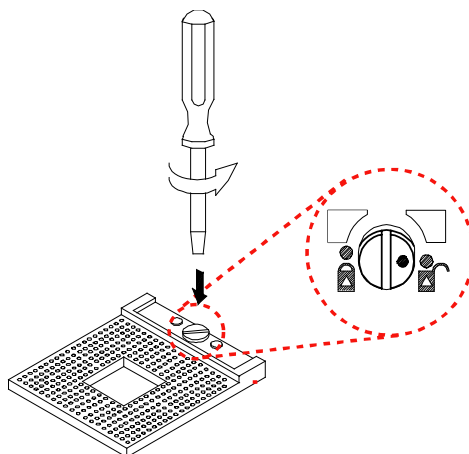


Figure 5 Disengage the socket actuator

- Align the gold triangle on the CPU with the similar marking on the socket (see Figure below). If the processor does not drop completely into the socket, turn the socket actuator to the open position until the processor drops completely in.



Note: You should not have to press down on the processor. If the processor does not drop completely into the socket, turn the actuator until the processor drops completely in.

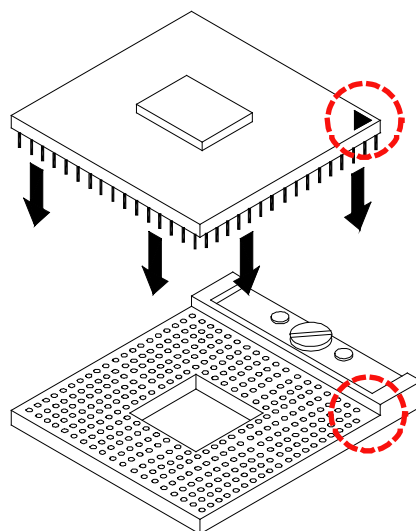


Figure 6 CPU alignment in Micro-FCPGA Socket (Socket P)

- While gently holding the processor down with your finger, secure the processor in the socket with a screwdriver by turning the socket actuator to the closed position:

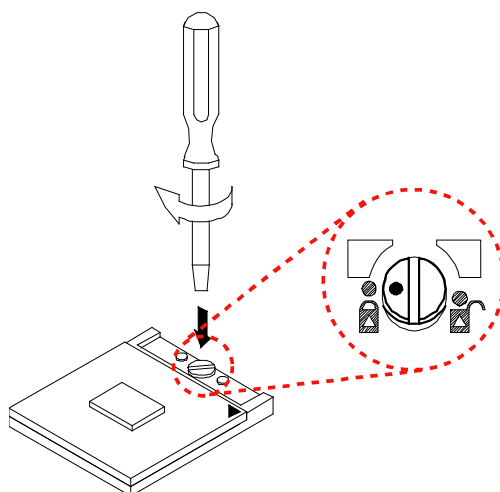


Figure 7 Secure the processor in the socket

Removing the CPU:

To remove the CPU, reverse the installation steps.

- Before removing the CPU, turn off the system power and wait for about 20 minutes until the heat radiation plate of the cooling fan and the CPU cools

down.

2. To remove the CPU, follow Step 2 of Installing the CPU above.
3. Remove the CPU by grasping the substrate edges only with thumb and forefinger and lifting it out with a purely vertical motion.



WARNING

The CPU and the heatsink may be hot and could cause burns.

■ Cooler Installation

The system must not be operated without a cooler (heat sink and fan) to provide the necessarily cooling. Install the cooling unit supplied as follows:



CAUTION

Make sure that good thermal contact is made between the processor and heat sink. Insufficient contact or incorrect use of heat sink, fan, or thermal compound can cause the processor to overheat, which may crash the system or cause permanent damage to the CPU.

1. Install the correct CPU as described above.
2. Align the screw holes of the heatsink rear retention bracket with the mounting holes on the underside of the motherboard, located at the four corners of the CPU location. Insert into the holes and turn the motherboard over.
Note: Be careful not to touch the thermal pad on the underside of the heatsink. This pad is made of thermal compound and is deformable. It is designed to make optimal thermal contact with the CPU. No additional thermal compound is required.
3. Tighten each screw halfway to secure the cooler assembly to the motherboard. Then gradually tighten all four screws. Do not fully tighten the first screw before partially tightening the other screws as this may apply uneven pressure to the CPU, causing damage.
Note: Fan less Operation: In order to operate the KEEX-4030 without a fan, the cooling solution must be integrally designed with the chassis. Contact Quanmax for more information on fan less operation.

■ Memory Module Installation

Carefully follow the steps below in order to install the DIMMs:

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.
3. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.

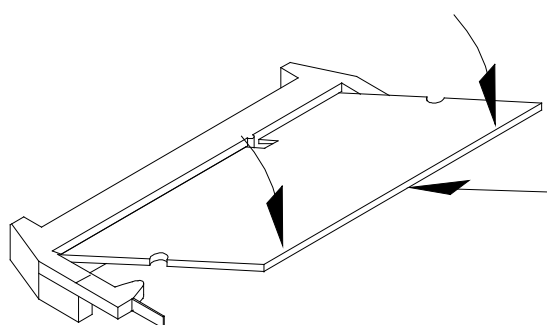


Figure 8 Align the SO-DIMM Memory Module with the onboard socket

4. Fully insert the module into the socket until a “click” is heard.
5. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module

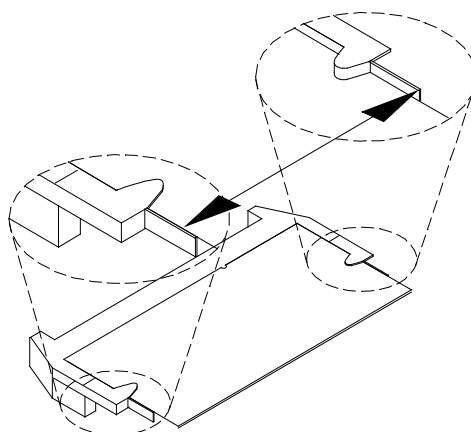


Figure 9 Press down on the SO-DIMM Memory Module to lock it in place

Removing a DIMM:

To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket.

Note: Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

Chapter 4

AMI BIOS Setup

■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.



NOTE: The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax.

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the “<” and “>” cursor keys to navigate between menu screens.

Table 31 BIOS Main Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
System Date			[Mon 01/21/2008]			
System Time			[10:18:15]			
> Primary IDE Master			: [Not Detected]			
> Primary IDE Slave			: [Not Detected]			
> Secondary IDE Master			: [Not Detected]			
> Fourth IDE Master			: [Not Detected]			
> System Information						
						While entering setup, BIOS auto detects the presence of IDE device. This displays the status of auto detection of IDE device. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

Below table is described for Primary IDE Master, Primary IDE Slave, Secondary IDE Master, Fourth IDE Master setting.

Table 32 IDE Device Setting Menu

BIOS SETUP UTILITY						
Main						
Primary IDE Master						
Device			: Not Detected			
LBA/ Large Mode			[Auto]			
DMA Mode			[Auto]			
S.M.A.R.T			[Auto]			
						Select the type of device connected to the system. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

LBA/ Large Mode [Auto]

Enables or disables the LBA (Logical Block Addressing)/ Large mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

Options: Disabled, Auto

DMA Mode [Auto]

Setup DMA Mode.

S.M.A.R.T [Auto]

SMART stands for Smart Monitoring, Analysis, and Reporting Technology. It allows AMIBIOS to use the SMART protocol to report server system information over a network.

Options: Auto, Disabled, Enabled

Table 33 System Information

BIOS SETUP UTILITY	
Main	
AMIBIOS Version : 0.08 Build Date: :01/07/09 Processor Intel(R) CORE(TM)2 Duo CPU T9400 @2.53GHz Speed :2533MHz System Memory Size :989	<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

■ Advanced Menu

Table 34 Advanced Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Advanced Settings <hr/> Warning: Setting wrong values in below sections may cause system to malfunction. > SuperIO Configuration > OnBoard Peripherals Configuration > iTPM function > Hardware Health Configuration		<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit				
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

Press <Enter> to select a sub-menu for detailed options.

Table 35 Super I/O Configuration

BIOS SETUP UTILITY		
Advanced		
Onboard I/O Configuration		Allow BIOS to Select Serial Port1 Base Addresses. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Serial Port1 Address	[3F8/IRQ4]	
COM1 Function Type	[RS232]	
COM1 Pin9 Voltage	[Normal]	
Serial Port2 Address	[2F8/IRQ3]	
COM2 Pin9 Voltage	[Normal]	
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.		

Serial Port1 Address [3F8/IRQ4]

Options: Disabled, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3

COM1 Function Type [RS232]

Options: RS232, RS422, RS485

COM1 Pin9 Voltage [Normal]

Options: Normal, 5V, 12V

Serial Port2 Address [2F8/IRQ3]

Options: Disabled, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3

COM2 Pin9 Voltage [Normal]

Options: Normal, 5V, 12V

Table 36 OnBoard Peripherals Configuration Settings

BIOS SETUP UTILITY		
Advanced		
OnBoard Peripherals Configuration Settings		Options
USB Functions	[Enabled]	Disabled Enabled <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Legacy USB Support	[Enabled]	
GbE Controller	[Enabled]	
GbE LAN Boot	[Disabled]	
HDA Controller	[Enabled]	
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USB Functions [Enabled]

Options: Disabled, Enabled

Legacy USB Support [Enabled]

Options: Disabled, Enabled, Auto

GbE LAN Boot [Disabled]

Options: Disabled, Enabled

HDA Controller

Options: Disabled, Enabled

Table 37 iTPM Function

BIOS SETUP UTILITY	
Advanced	
ITPM Function <hr/> TCG/TPM SUPPORT [NO]	Enable/ Disable TPM TCG (TPM 1.1/1.2) supp in BIOS <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

TCG/TPM SUPPORT [No]

Options: No, Yes

If the value is Enabled.

Execute TPM Command [Don't change]

Options: Don't change, Disabled, Enabled

Table 38 Hardware Health Configuration

BIOS SETUP UTILITY		
Advanced		
Hardware Health Configuration		Options
CPU Warning Temperature	[Disabled]	Disabled
CPU Shutdown Temperature	[Disabled]	80°C/176°F
SYS Temperature	:57°C/ 134°F	85°C/185°F
CPU Temperature	:43°C/ 109°F	90°C/194°F
Fan1 Speed	:6490RPM	95°C/203°F
CPU Core	:1.136 V	<> Select Screen
Vcc	:1.040V	↑↓ Select Item
+3.30V	:3.166 V	+ - Change Field
+5.00V	:4.958 V	Tab Select Field
+12.0V	:11.182 V	F1 General Help
5VSB	: 4.945 V	F10 Save and Exit
VBAT	:3.344 V	ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.		

CPU Warning Temperature [Disabled]

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

CPU Shutdown Temperature [Disabled]

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

■ Boot Menu

Table 39 Boot Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Boot Settings > Boot Device Priority > Hard Disk Drives Quick Boot [Enabled] Full Screen LOGO Display [Disabled] Bootup Num-Lock [On] Wait For 'F1' If Error [Enabled] Hit 'DEL' Message Display [Enabled]					Specifies the Boot Device Priority sequence. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

Boot Device Priority

The items allow you to specify the Boot Device Priority sequence.

Hard Disk Drives

The items allow you to specify the Boot Device Priority sequence from available Removable Drives.

Quick Boot [Enabled]

Enabling this item allows BIOS to skip some Power On Self Tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Options: Disabled, Enabled

Full Screen LOGO Display [Disabled]

This item allows you to display normal or OEM logo POST message.

Bootup Num-Lock [On]

Allow you to select the power-on state for the NumLock.

Options: Off, On

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs.

Options: Disabled, Enabled

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.

Options: Disabled, Enabled

■ Chipset Menu

Table 40 Chipset Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Chipset Settings				Select which graphics controller to use as the primary boot device.		
Boot Graphics Adapter Priority				[PEG/PCI]		
Internal Graphics Mode Select				[Enabled, 32MB]		
Gfx Low Power Mode				[Disabled]		
> Video Function Configuration				<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

Boots Graphic Adapter Priority [PEG/PCI]

Select which graphics controller to use as the primary boot device.

Options: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI

Internal Graphics Mode Select [Enabled, 32MB]

Select the amount of system memory used by the Internal graphics device.

Options: Enabled 32MB, Enabled 64MB, Enabled 128MB

Gfx Low Power Mode [Disabled]

This option is applicable for SFF only.

Options: Disabled, Enabled

Press <Enter> to select a sub-menu for Video Function Configuration.

Table 41 Video Function Configuration

BIOS SETUP UTILITY		
Chipset		
Video Function Configuration		Options
DVMT Mode Select	[DVMT Mode]	DVMT Mode
DVMT/FIXED memory	[256 MB]	
PAVP Mode	[Disabled]	
Boot Display Device	[DVI]	<> Select Screen
Flat Panel Type	[1024x768 18Bit 1C]	↑↓ Select Item
HDCP Support	[Disabled]	+ - Change Field
Panel Backlight Voltage	[2.5]	Tab Select Field
		F1 General Help
		F10 Save and Exit
		ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.		

DVMT Mode Select [DVMT Mode]

Options: DVMT Mode

DVMT/FIXED Memory [256MB]

Options: 128MB, 256MB, Maximum DVMT

PAVP Mode [Disabled]

PAVP (Protected Audio Video Path) is a feature to ensure a robust and secure content protection path for high-definition video playback.

Options: Disabled, Lite, High

Boot Display Device [DVI]

Options: DVI, LVDS, VGA+LVDS

Flat Panel Type [1024x768 18 Bit 1CH]

Options:

640x480 18 Bit 1CH 1024x768 18 Bit 1CH

800x600 18 Bit 1CH 1280x800 18 Bit 1CH

HDCP Support [Disabled]

Options: Disabled, Enabled

Panel BackLight Voltage [2.5]

Options: Min 0.0V, Max: 5.0V

■ Power Menu

Table 42 Power Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Power Management Setting					Enable/ Disable ACPI support for Operating System.	
ACPI Function			[Enabled]		ENABLE: If OS supports ACPI, DISABLE: IF OS Does not support ACPI.	
Suspend mode			[S3 (STR)]			
Repost Video on S3 Resume			[No]			
Suspend Time Out			[Disabled]			
Power Button Mode			[On/Off]			
Restore on AC Power Loss			[Power On]			
USB Device Wakeup From S3/S4			[Disabled]		<> Select Screen	
GbE Wake Up From S5			[Disabled]		↑↓ Select Item	
Resume On RTC Alarm			[Disabled]		+- Change Field	
					Tab Select Field	
					F1 General Help	
					F10 Save and Exit	
					ESC Exit	
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ACPI Function [Enabled]

Enable/ Disable ACPI support for Operating System.

ENABLE: If OS supports ACPI, DISABLE: IF OS Does not support ACPI.

Suspend mode [S3 (STR)]

Options: S1 (POS), S3 (STR)

Repost Video on S3 Resume [No]

Options: No, Yes

Suspend Time Out [Disabled]

Options: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min

Power Button Mode [On/Off]

Go into On/Off, or Suspend when Power button is pressed.

Options: On/Off, Suspend

Restore on AC Power Loss [Power Off]

Options: Power OFF, Power ON, Last State

USB Device Wakeup From S3/S4 [Disabled]

Enable/ Disable USB Device Wakeup From S3/S4

Options: Disabled, Enabled

GbE Wake Up Form S5 [Disabled]

Options: Disabled, Enabled

Resume On RTC Alarm [Disabled]

Options: Disabled, Enabled

If the value is Enabled.

RTC Alarm Date (Days) [Every Day]

KeyIn "+" "-" to select

RTC Alarm Time [00:00:00] Use [ENTER], [TAB] or [SHIFT+TAB] to select a field
Use [+] or [-] to configure system time

■ Security Menu

Table 43 Security Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Security Setting Supervisor Password :Not Installed User Password :Not Installed Change Supervisor Password Change User Password					Install or Change the password. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
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Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

■ Exit Menu

Table 44 Exit Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Exit Setting Save Changes and Exit Discard Changes and Exit Discard Changes Load Optimal Defaults Load Failsafe Defaults					Exit System Setup after saving the changes. F10 key can be used for this operation. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
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Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Load Failsafe Defaults

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

Chapter 5

Driver Installation

If your KEEEX-4030 does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system. You can download the drivers for the KEEEX-4030 from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

NOTE



You have to install Windows XP/2K HD Audio Service Pack before you start graphic driver installation.

Please visit <http://support.microsoft.com/kb/888111> for more information.

NOTE



When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing <Ctrl>+<Alt>+<F1> simultaneously to show the image on screen.
