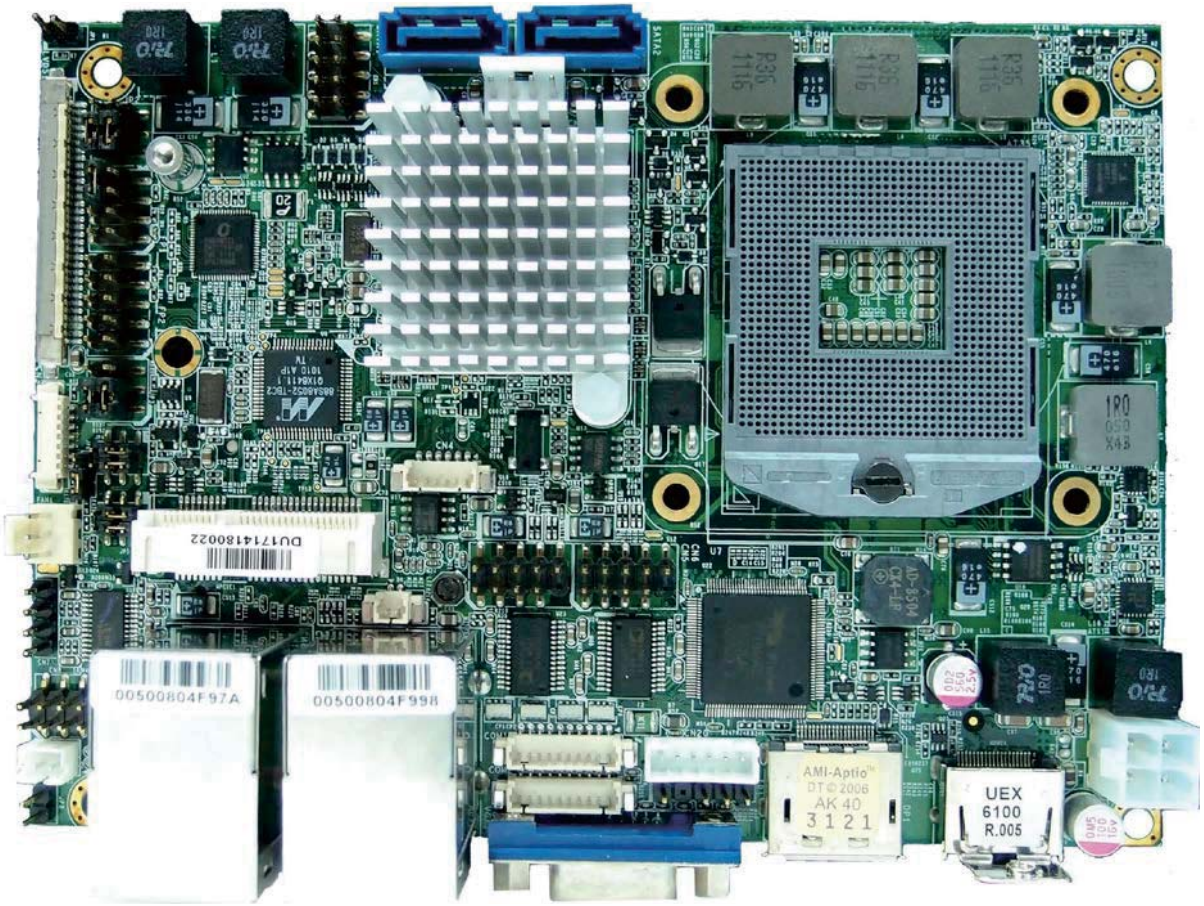
KEEX-6100 Series

Industrial ECX Embedded SBC with 2nd generation Intel® core i3/i5/i7 processor

User's Guide



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Content

Content 3
Figures 5
Tables 6
Safety Instructions 8
- Before You Begin 8
- When Working Inside a Computer 8
- Preventing Electrostatic Discharge 9

Preface 11
- How to Use This Guide 11
- Unpacking 11
- Regulatory Compliance Statements 11
- Warranty Policy 12
- Maintaining Your Computer 13

Chapter 1 Introduction 16
- Overview 16
- Product Specifications 17
- System Block Diagram 19
- Mechanical Dimensions 20

Chapter 2 Hardware Settings 22
- Overview 22
- Jumper Settings and Pin Definitions 23
  - Jumper Settings 24
  - Rear Panel Pin Assignments 26
  - Main Board Pin Assignments 28

Chapter 3 System Installation 37
- Expansion Interfaces 37
- Memory Module Installation 37

Chapter 4 AMI BIOS Setup 39
- Overview 39
- Main Menu 40
- Advanced Menu 41
- Boot Menu 52
- Security Menu 53
- Save & Exit Menu 53

Chapter 5 Driver Installation 55
Appendix A DIO (Digital I/O) Sample Code..... 56
Appendix B WatchDog Timer Sample Code..... 58

Figures

Figure 1 Block Diagram 19
Figure 2 Mechanical Dimensions 21
Figure 3 Jumper Connector 22
Figure 4 Jumper and Connector Locations 23
Figure 5 Rear Panel IO 26
Figure 6 Align the SO-DIMM Memory Module with the onboard socket 37
Figure 7 Press down on the SO-DIMM Memory Module to lock it in place 38

Tables

Table 1 KEEX-6100 Series Specification 18
Table 2 Jumper List 24
Table 3 JP1 ME F/W Selection 24
Table 4 JP2 Panel & Backlight Power Selection for LVDS2 24
Table 5 JP3 Panel Backlight Power Selection for LVDS1 25
Table 6 JP4 Backlight Power Enable Selection for LVDS1 25
Table 7 JP5 Backlight Power Enable Selection for LVDS2 25
Table 8 JP6 AT/ATX Mode Selection 25
Table 9 JP7 SRTC Reset Selection 25
Table 10 JP8 RTC Reset Selection 25
Table 11 Rear Panel Connector List 26
Table 12 CN9 LAN1 & USB 2.0 Port 0, 1 Connector 26
Table 13 CN10 LAN2 & USB 2.0 Port 8, 9 Connector 26
Table 14 DP1 Display Port Connector 27
Table 15 HDMI1 HDMI Connector 27
Table 16 VGA1 DB-15 VGA Connector 27
Table 17 Internal Connector List 28
Table 18 ATX2 +12V Power Input Connector 28
Table 19 CR2032 Battery Power Input Wafer 28
Table 20 CFD1 CF Type II Connector 29
Table 21 COM1 RS-232/422/485 Port 1 Wafer 30
Table 22 COM2 RS-232 Port 2 Wafer 30
Table 23 CN1 Digital Input / Output Pin Header 30
Table 24 CN2 SATA HDD Power Output Wafer 30
Table 25 CN3 Backlight Power Output Wafer for LVDS1 31
Table 26 CN4 SIM Interface Wafer for MPCIE1 31
Table 27 CN5 USB 2.0 Port 2, 3 Pin Header 31
Table 28 CN6 USB 2.0 Port 10, 11 Pin Header 31
Table 29 CN7 S/PDIF Pin Header 32
Table 30 CN8 Audio Pin Header 32
Table 31 CN12 Left Channel 2W Audio AMP Output Wafer 32
Table 32 CN13 Right Channel 2W Audio AMP Output Wafer 32
Table 33 CN14 Backlight Power Output Wafer for LVDS2 32
Table 34 CN20 Keyboard & Mouse Wafer 33

Table 35 DIMM1 DDR3 Memory SO-DIMM Socket 33
Table 36 FAN1 CPU FAN Wafer..... 33
Table 37 FP1 Front Panel 1 Pin Header 33
Table 38 FP2 Front Panel 2 Pin Header 33
Table 39 IR1 IrDA Pin Header..... 33
Table 40 LVDS1 Primary 24-bit, 2-channel LVDS Panel Connector..... 34
Table 41 LVDS2 Secondary 24-bit, 2-channel LVDS Panel Connector..... 34
Table 42 MPCIE1 Mini-PCIE Express v 1.2 Socket 35
Table 43 SATA1 Serial ATA Port 0 Connector 36
Table 44 SATA2 Serial ATA Port 1 Connector 36
Table 45 BIOS Main Menu 40
Table 46 Advanced Menu..... 41
Table 47 Advanced Menu – Display Configuration..... 42
Table 48 Advanced Menu – Super IO Configuration..... 43
Table 49 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration 44
Table 50 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration 44
Table 51 Advanced Menu –Power Management Configuration..... 45
Table 52 Advanced Menu –CPU Advanced Configuration 46
Table 53 Advanced Menu –Trusted Computing 47
Table 54 Advanced Menu –SATA Configuration..... 47
Table 55 Advanced Menu –Intel TXT(LT) Configuration..... 48
Table 56 Advanced Menu – AMT Configuration 48
Table 57 Advanced Menu –USB Configuration 50
Table 58 Advanced Menu –H/W Monitor..... 51
Table 59 Boot Menu 52
Table 60 Security Menu 53
Table 61 Save & Exit Menu..... 53

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 over voltage 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 unit s 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 KEEX-6100 Series is an ECX Form Factor embedded single board computer (SBC) that equips the latest 2nd generation Intel® Core™ i3/i5/i7 processors with the high integration of the Intel® QM67/ HM65 chipset. Featured are DDR3 1066/1333 SO-DIMM up to 8GB, 2x 24-bit LVDS, HDMI, DP, VGA, 2x Gigabit Ethernet, 2x SATA, mini PCIe slot, 8x USB 2.0, 2x COM ports with Power Selection, HD audio and CompactFlash.

Checklist

- Driver/ Manual CD
- Quick Installation Guide
- SATA Cable
- KEEX-6100 main board

Features

- 2nd Generation Intel® Core™ i3/i5/i7 Processors
- Intel® QM67 / HM65 Express Chipset
- 1x DDR3 SO-DIMM Socket
- 2x LVDS, HDMI, VGA, DP supported
- 1x mini PCIe
- 2x GbE
- 2x COM ports, 8x USB 2.0
- 2x 7-pin SATA connectors supported
- 1x CompactFlash socket onboard
- Watchdog Timer, Hardware Monitor

■ Product Specifications

<table>
<tr><td>Model Name</td><td>▪ KEEX-6100 Series</td></tr>
<tr><td>Form Factor</td><td>▪ ECX (146mm x 105mm)</td></tr>
<tr><td>Processor</td><td>▪ 2nd Generation Intel core i3/i5/i7 Processors with rPGA988B package</td></tr>
<tr><td>Memory</td><td>▪ 1x SO-DIMM, dual channel DDR3, non-ECC supported, up to 8GB</td></tr>
<tr><td>Chipset</td><td>▪ KEEX-6100---Intel® QM67 Express Chipset
▪ KEEX-6101---Intel® HM65 Express Chipset</td></tr>
<tr><td>Graphics</td><td>▪ Intel HD Graphics 3000 rocessor graphics
● 1x VGA with DB-15 female connector
● 1x HDMI connector
● 1x DP Connector
● 2x 1x 30-pin SPWG connectors for 2x dual channel 24-bit LVDS
● 2x 1x 7-pin pitch 1.25 mm wafer connector for LVDS1 and LVDS2 backlight control</td></tr>
<tr><td>Ethernet</td><td>▪ 2x Ethernet ports supported
● 1x Intel 82579LM Gb/s Ethernet PHY onboard as LAN1
● 1x Realtek RTL8111C Gb/s Ethernet controller onboard as LAN2
● 2x RJ-45 w/z Gb/s transformer connector on rear I/O
● LAN1 with iAMT supported
● Both LAN1 & LAN2 with WOL/PXE supported</td></tr>
<tr><td>Audio</td><td>▪ Realtek ALC662-VC HD codec onboard
● 1x 2W audio amplifier onboard
● 1x 2x 6-pins pitch 2.54mm header for Line-Out, Line-In and Mic-In; Pin definition is as shown below:
<table>
<tr><th>Pin Description</th><th>Pin #</th><th>Pin #</th><th>Pin Description</th></tr>
<tr><td>Mic-In_L</td><td>1</td><td>2</td><td>Mic-In_R</td></tr>
<tr><td>Mic-In Jack Detect</td><td>3</td><td>4</td><td>Audio_GND</td></tr>
<tr><td>Line-In 1_L</td><td>5</td><td>6</td><td>Line-In 1_R</td></tr>
<tr><td>Line-In Jack 1 Detect</td><td>7</td><td>8</td><td>Audio_GND</td></tr>
<tr><td>Line-Out_L</td><td>9</td><td>10</td><td>Line-Out_R</td></tr>
<tr><td>Line-Out Jack Detect</td><td>11</td><td>12</td><td>Audio_GND</td></tr>
</table>
● 2x 2-pins pitch 2.0 mm wafer connector for Right/Left speaker out
● 1x 1x 4-pin pitch 2.54 mm header for S/PDIF</td></tr>
<tr><td>Peripheral Support</td><td>▪ Storage supported
● 2x 7-pin SATA connectors supported on top side of the board
● 1x 4-pin connector onboard with +5V and +12V supported for SATA device.
● 1x CF socket
▪ 8x USB2.0 ports supported
● 4x USB 2.0 ports offer on front I/O, stack with RJ-45.
● 2x 2x5-in pitch 2.54 mm headers for 4x USB 2.0 ports onboard for internal use.
▪ 2x COM ports supported
● 2x 1x10-pin pitch 1.27 mm wafer connectors onboard for COM1 and COM2
● COM1 with RS-232/422/485 supported.
● COM2 with RS-232 only.</td></tr>
</table>

	▪ 1x 1x6-pin pitch 2.00 mm wafer connector for PS/2 keyboard and mouse. ▪ 1x 1x5-pin pitch 2.54mm header for IrDA supported. ▪ 1x 1x3-pin fan connector onboard with smart fan supported. ▪ 1x 2x 5-pin pitch 2.54 mm header onboard for 8-bit DIO. ● 4-bit input and 4-bit output. ● DIO default setting is “H”.
Expansion Slot	▪ 1x full size mini-PCIe X8 slot supported ▪ 1x connector onboard for SIM card signals supported
Super I/O chip	▪ Fintek F71869ED
Hardware Monitor	▪ Voltage monitoring ▪ CPU and system temperatures detection ▪ Fan detection
TPM	▪ TPM 1.2 supported
BIOS	▪ AMI uEFI Plug & Play SPI BIOS ▪ iAMT 7.0 supported ▪ Watchdog Timer supported, 1-255 step offered
RTC	▪ Chipset internal RTC
Battery	▪ 1x 2-pin wafer connector onboard for fly-wire CR2032 battery supported
Power	▪ 1x +12VDC Power Input ▪ 1x +12VDC & +5VDC HDD Power output ▪ ATX/ AT Mode Supported
OS Supported	▪ Windows XP/XPe/Windows 7
Operation Temp.	▪ 0ºC – 60ºC
Storage Temp.	▪ -20ºC – 80ºC
Humidity	▪ 0% – 95% RH
Certifications	▪ CE, FCC Class A

Table 1 KEEX-6100 Series Specification

System Block Diagram

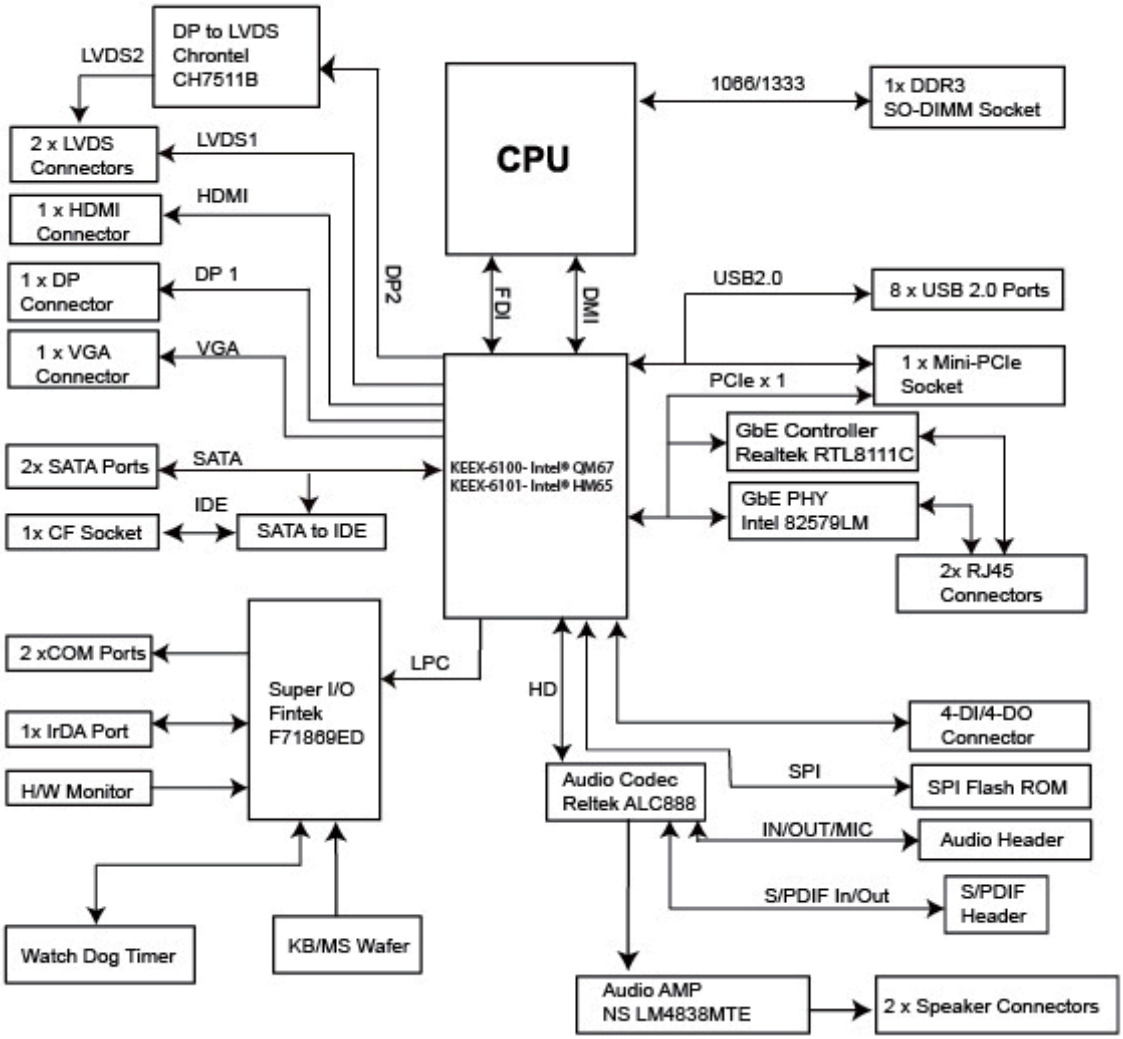
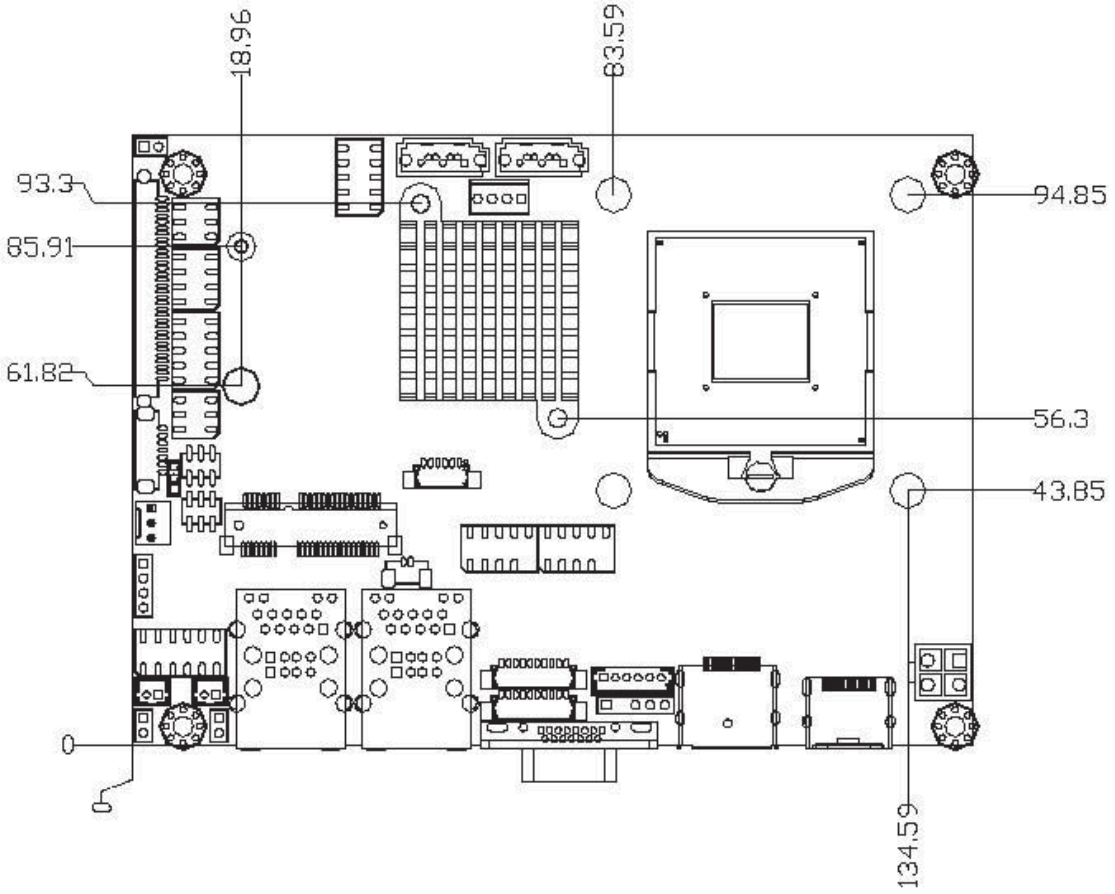


Figure 1 Block Diagram

■ Mechanical Dimensions



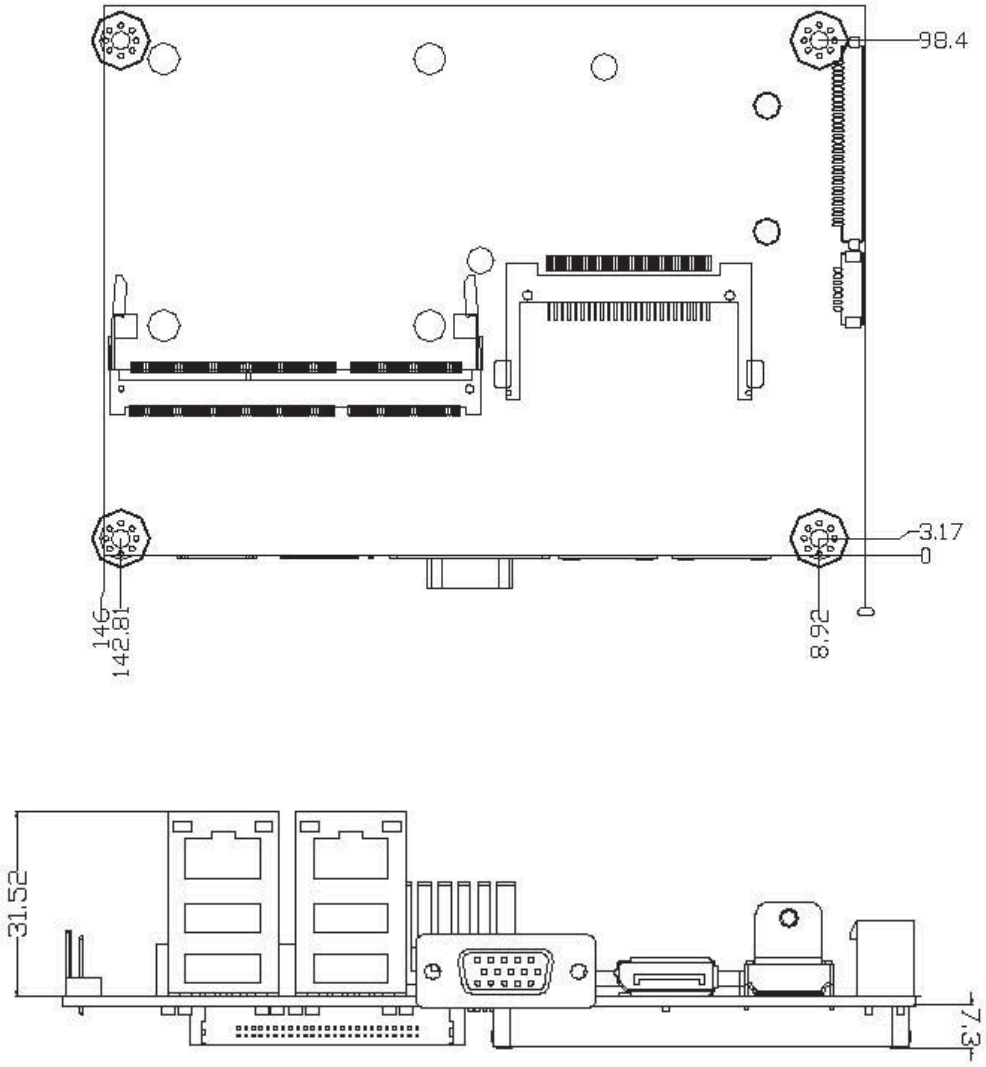


Figure 2 Mechanical Dimensions

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.

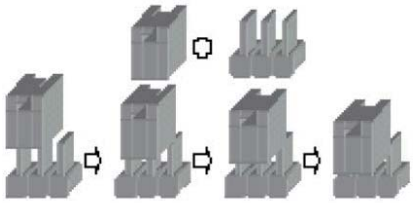


Figure 3 Jumper Connector

For a three-pin jumper (see *Figure 3*), 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.

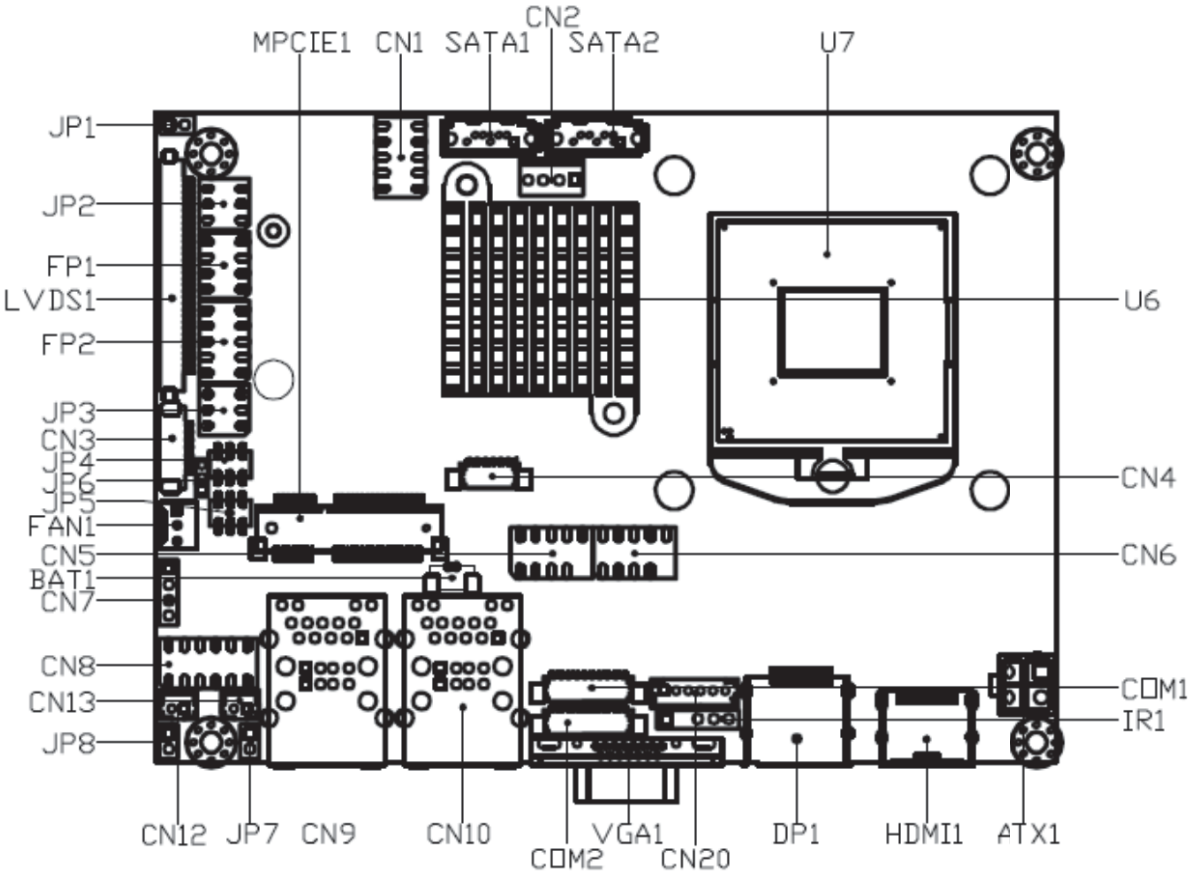


Figure 4 Jumper and Connector Locations

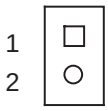
Jumper Settings

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

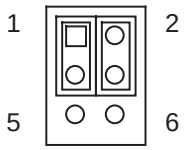
Label	Function
JP1	ME F/W Selection
JP2	Panel & Backlight Power Selection for LVDS2
JP3	Panel & Backlight Power Selection for LVDS1
JP4	Backlight Power Enable Selection for LVDS1
JP5	Backlight Power Enable Selection for LVDS2
JP6	AT / ATX Mode Selection
JP7	SRTC Reset Selection
JP8	RTC Reset Selection

Table 3 JP1 ME F/W Selection



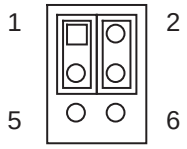
Jumper	Status
1-2 Open	Normal Operation.
1-2 Short	ME F/W Disabled.
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 4 JP2 Panel & Backlight Power Selection for LVDS2



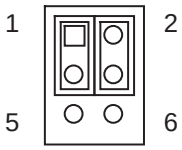
Jumper	Setting	Function
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 5 JP3 Panel Backlight Power Selection for LVDS1



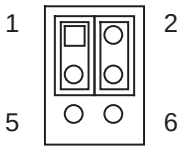
Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 6 JP4 Backlight Power Enable Selection for LVDS1



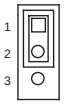
Jumper	Setting	Status
1	1-3	Backlight *Enable* Voltage = +3.3V
	3-5	Backlight *Enable* Voltage = +5V
2	2-4	Active High
	4-6	Active Low
Pitch:2.0mm[PINREX 222-97-03GBB1]		

Table 7 JP5 Backlight Power Enable Selection for LVDS2



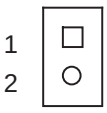
Jumper	Setting	Status
1	1-3	Backlight Enable Voltage = +3.3V
	3-5	Backlight Enable Voltage = +5V
2	2-4	Active High
	4-6	Active Low
Pitch:2.0mm[PINREX 222-97-03GBB1]		

Table 8 JP6 AT/ATX Mode Selection



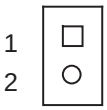
Jumper	Status
1-2 Short	ATX Mode
2-3 Short	AT Mode
Pitch: Pitch:2.0mm [YIMTEX 3291*03SAGR(6T)]	

Table 9 JP7 SRTC Reset Selection



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear ME Registers
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 10 JP8 RTC Reset Selection



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear RTC CMOS
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Rear Panel Pin Assignments

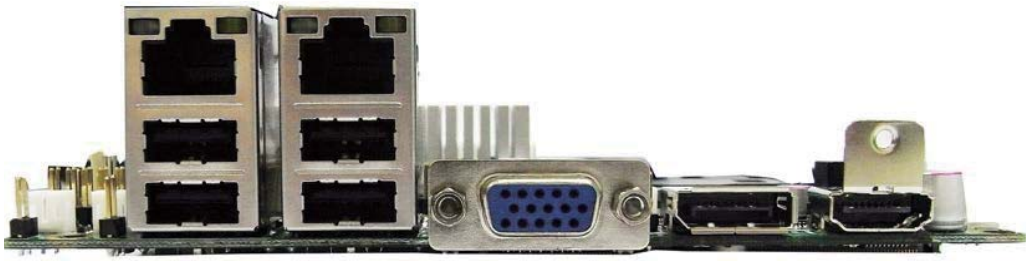
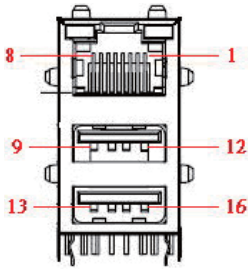


Figure 5 Rear Panel IO

Table 11 Rear Panel Connector List

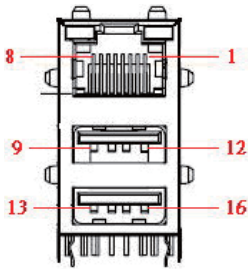
Label	Function
CN9	LAN1 & USB2.0 Port 0,1 Connector
CN10	LAN2 & USB2.0 Port 8,9 Connector
DP1	Display Port Connector
HDMI1	HDMI Connector
VGA1	DB-15 VGA Connector

Table 12 CN9 LAN1 & USB 2.0 Port 0, 1 Connector



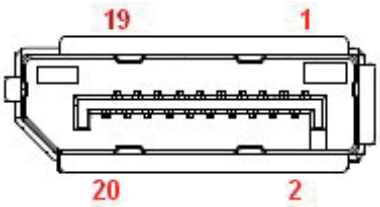
Pin	Signal	Pin	Signal
1	MDI[0]+	9	+USBVCC
2	MDI[0]-	10	USB_A-
3	MDI[1]+	11	USB_A+
4	MDI[1]-	12	GND
5	MDI[2]+	13	+USBVCC
6	MDI[2]-	14	USB_B-
7	MDI[3]+	15	USB_B+
8	MDI[3]-	16	GND
[UDE RU1-161F9WGF(XB)]			

Table 13 CN10 LAN2 & USB 2.0 Port 8, 9 Connector



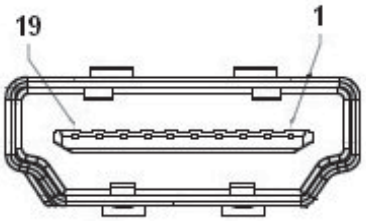
Pin	Signal	Pin	Signal
1	MDI[0]+	9	+USBVCC
2	MDI[0]-	10	USB_A-
3	MDI[1]+	11	USB_A+
4	MDI[1]-	12	GND
5	MDI[2]+	13	+USBVCC
6	MDI[2]-	14	USB_B-
7	MDI[3]+	15	USB_B+
8	MDI[3]-	16	GND
[UDE RU1-161F9WGF(XB)]			

Table 14 DP1 Display Port Connector



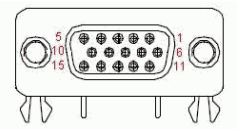
Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR
[WIN WIN WDPE-20F3L1BU3]			

Table 15 HDMI1 HDMI Connector



Pin	Signal
1	TMDS Data2+
2	Ground
3	TMDS Data2–
4	TMDS Data1+
5	Ground
6	TMDS Data1–
7	TMDS Data0+
8	Ground
9	TMDS Data0–
10	TMDS Clock+
11	Ground
12	TMDS Clock–
13	Reserved
14	Reserved
15	DDC_CLK
16	DDC_DATA
17	Ground
18	+5 V Power
19	Hot Plug Detect
[Foxconn QJ51193-HEB4-4F]	

Table 16 VGA1 DB-15 VGA Connector



Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	NC
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
NC	11	12	DDC data
HSYNC	13	14	VSYNC
DDC clock	15		
[FEN YING SM1003S01012PN**]**			

Main Board Pin Assignments

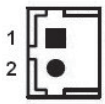
Table 17 Internal Connector List

Label	Function
ATX1	+12V Power Input Connector
BAT1	CR2032 Battery Power Input Wafer
BZ1	Onboard Buzzer
CFD1	CF Type II Connector
COM1	RS-232/422/485 Port 1 Wafer
COM2	RS-232 Port 2 Wafer
CN1	Digital Input / Output Pin Header
CN2	SATA HDD Power Output Wafer
CN3	Backlight Power Output Wafer for LVDS1
CN4	SIM Interface Wafer for MPCIE1
CN5	USB2.0 Port 2, 3 Pin Header
CN6	USB2.0 Port 10, 11 Pin Header
CN7	S/PDIF Pin Header
CN8	Audio Pin Header
CN12	Left Channel 2W Audio AMP Output Wafer
CN13	Right Channel 2W Audio AMP Output Wafer
CN14	Backlight Power Output Wafer for LVDS2
CN20	Keyboard & Mouse Wafer
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	CPU FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
IR1	IrDA Pin Header
LVDS1	Primary 24-bit, 2-channel LVDS Panel Connector
LVDS2	Secondary 24-bit, 2-channel LVDS Panel Connector
MPCIE1	Mini-PCIE Express v1.2 Socket
SATA1	Serial ATA Port 0 Connector
SATA2	Serial ATA Port 1 Connector

Table 18 ATX2 +12V Power Input Connector

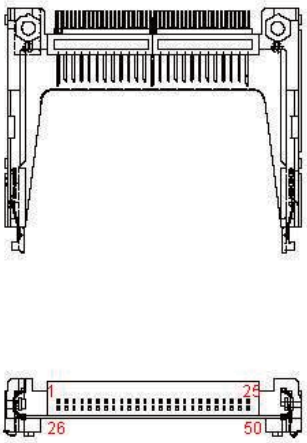
Pin	Signal Name
1	GND
2	GND
3	+12V
4	+12V
Pitch:4.2mm [YIMTEX 576MWA2*02STR]	

Table 19 CR2032 Battery Power Input Wafer



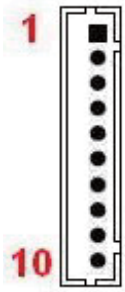
Pin	Signal Name
1	+VBAT
2	GND
Pitch:1.25mm [Pinrex 712-73-02TWR0]	

Table 20 CFD1 CF Type II Connector



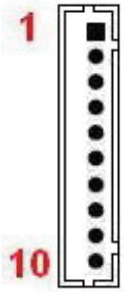
Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
IDE Data 3	2	27	IDE Data 11
IDE Data 4	3	28	IDE Data 12
IDE Data 5	4	29	IDE Data 13
IDE Data 6	5	30	IDE Data 14
IDE Data 7	6	31	IDE Data 15
IDE Chip select 1#	7	32	IDE Chip select 3#
GND	8	33	GND
GND	9	34	IDEIOR#
GND	10	35	IDEIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ
+5V	13	38	+5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	Reset IDE
GND	17	42	IDEIORDY
SDA2	18	43	DREQ
IDE Address 1	19	44	DACK#
IDE Address 0	20	45	IDE activity
IDE Data 0	21	46	PDIAG#
IDE Data 1	22	47	IDE Data 8
IDE Data 2	23	48	IDE Data 9
IOIS16#	24	49	IDE Data 10
GND	25	50	GND
[KINGFON CFCMD-45T15W100]			

Table 21 COM1 RS-232/422/485 Port 1 Wafer



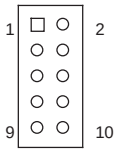
Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	DCD	TX-	DATA-	TX-
2	DSR	N/A	N/A	N/A
3	RXD	RX+	N/A	RX+
4	RTS	N/A	N/A	N/A
5	TXD	TX+	DATA+	TX+
6	CTS	N/A	N/A	N/A
7	DTR	RX-	N/A	RX-
8	RI	N/A	N/A	N/A
9	GND	GND	GND	GND
10	+5V	+5V	+5V	+5V
Pitch:1.25mm [Pinrex 712-73-10TWB0]				

Table 22 COM2 RS-232 Port 2 Wafer



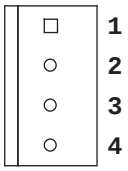
Pin	Signal Name
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	+5V
Pitch:1.25mm [Pinrex 712-73-10TWB0]	

Table 23 CN1 Digital Input / Output Pin Header



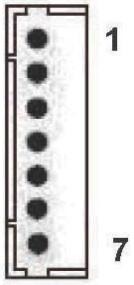
Pin	Signal	Pin	Signal
1	Digital Output 0	2	Digital Input 0
3	Digital Output 1	4	Digital Input 1
5	Digital Output 2	6	Digital Input 2
7	Digital Output 3	8	Digital Input 3
9	+5V	10	GND
Pitch:2.54mm [YIMTEX 3362*05SANGR]			

Table 24 CN2 SATA HDD Power Output Wafer



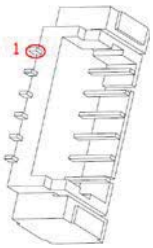
Pin	Signal Name
1	+12V
2	GND
3	GND
4	+5V
Pitch:2.5mm [YIMTEX 512CW4ST-2R]	

Table 25 CN3 Backlight Power Output Wafer for LVDS1



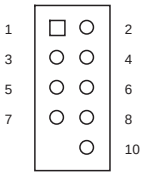
Pin	Signal Name
1	BL_ADJ_PWM *
2	BL_ADJ_VOL *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***
Pitch:1.25mm [YIMTEX 501MW1X07MTR-1R] *：BL_ADJ can be setting in BIOS setup. **：Backlight Power can be selected by JP3. ***：BL_EN can be selected by JP4.	

Table 26 CN4 SIM Interface Wafer for MPCIE1



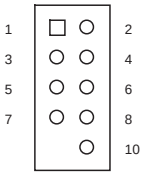
Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND
Pitch:1.25mm [Pinrex 712-73-06TWB0]	

Table 27 CN5 USB 2.0 Port 2, 3 Pin Header



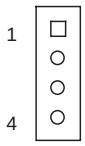
Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND
Pitch:2.54mm [YIMTEX 3362*05SANGR-09]			

Table 28 CN6 USB 2.0 Port 10, 11 Pin Header



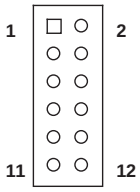
Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND
Pitch:2.54mm [YIMTEX 3362*05SANGR-09]			

Table 29 CN7 S/PDIF Pin Header



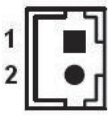
Pin	Signal Name
1	S/PDIF Input
2	GND
3	S/PDIF Output
4	GND
Pitch:2.54mm [YIMTEX 3321*04SAGR(6T)]	

Table 30 CN8 Audio Pin Header



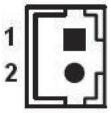
Pin	Signal Name	Pin	Signal Name
1	MIC_IN_L	2	MIC_IN_R
3	MIC_IN_JD	4	GND
5	LINE_IN_L	6	LINE_IN_R
7	LINE_IN_JD	8	GND
9	LINE_OUT_L	10	LINE_OUT_R
11	LINE_OUT_JD	12	GND
Pitch:2.54mm [PINREX 212-92-06GB01]			

Table 31 CN12 Left Channel 2W Audio AMP Output Wafer



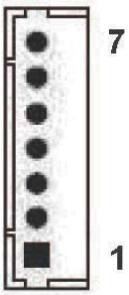
Pin	Signal Name
1	Speaker+
2	Speaker-
Pitch:2.0mm [YIMTEX 503PW1*02STR]	

Table 32 CN13 Right Channel 2W Audio AMP Output Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-
Pitch:2.0mm [YIMTEX 503PW1*02STR]	

Table 33 CN14 Backlight Power Output Wafer for LVDS2



Pin	Signal Name
1	BL_EN***
2	GND
3	+5V / +12V **
4	+5V / +12V **
5	GND
6	BL_ADJ_VOL *
7	BL_ADJ_PWM *

Pitch:1.25mm [YIMTEX 501MW1X07MTR-1R]

*：BL_ADJ can be setting in BIOS setup.

**：Backlight Power can be selected by JP2.

***：BL_EN can be selected by JP5

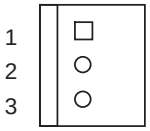
Table 34 CN20 Keyboard & Mouse Wafer

Pin	Signal Name
1	MSCLK
2	VCC
3	MSDAT*
4	KBDAT
5	GND
6	KBCLK
Pitch:2.0mm [YIMTEX 503PW1*06STR]	

Table 35 DIMM1 DDR3 Memory SO-DIMM Socket

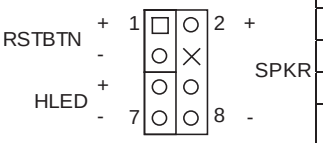
Height: 7.0mm [LINKTEK DDRRK-20401-TP7B]

Table 36 FAN1 CPU FAN Wafer



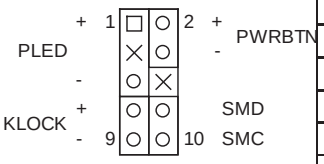
Pin	Signal
1	GND
2	+12V*
3	FAN_RPM
* : PWM Fan control supported.	

Table 37 FP1 Front Panel 1 Pin Header



Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -
Pitch:2.54mm [YIMTEX 3362*04SANGR] Note： Internal Buzzer is enabled when Pin6-8 is shorted.			

Table 38 FP2 Front Panel 2 Pin Header

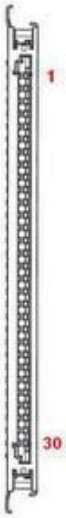


Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	NC
7	Keyboard Lock	8	SMBus Data
9	GND	10	SMBus Clock
Pitch:2.54mm [YIMTEX 3362*05SANGR]			

Table 39 IR1 IrDA Pin Header

Pin	Signal Name
1	+5V
2	Key
3	IR_Rx
4	GND
5	IR_Tx
Pitch:2.54mm [YIMTEX 3321*05SAGR(6T)-02]	

Table 40 LVDS1 Primary 24-bit, 2-channel 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-/NC
8	LVDS_ACLK-	23	LVDS_B3+/NC
9	LVDS_ACLK+	24	GND
10	LVDS_A3-/NC	25	DDC_DATA
11	LVDS_A3+/NC	26	VDDEN
12	LVDS_B0-	27	DDC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

Pitch:1.0mm [JAE FI-X30SSL-HF]

* : Panel Power can be selected by JP3.

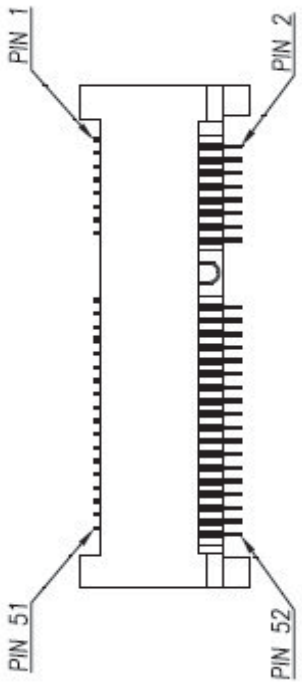
Table 41 LVDS2 Secondary 24-bit, 2-channel LVDS Panel Connector

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-/NC
8	LVDS_ACLK-	23	LVDS_B3+/NC
9	LVDS_ACLK+	24	GND
10	LVDS_A3-/NC	25	DDC_DATA
11	LVDS_A3+/NC	26	VDDEN
12	LVDS_B0-	27	DDC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

Pitch:1.0mm [JAE FI-X30SSL-HF]

* : Panel Power can be selected by JP2.

Table 42 MPCIE1 Mini-PCIE Express v 1.2 Socket



Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

Height:9.9mm [FOXCONN AS0B226-S99Q-7H]

* : These pins are connected to CN4 directly.

Table 43 SATA1 Serial ATA Port 0 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

Table 44 SATA2 Serial ATA Port 1 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

Chapter 3

System Installation

■ Expansion Interfaces

- 1x full size mini-PCIe slot supported
- 1x connector onboard for SIM card signals supported

NOTE

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

■ 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.

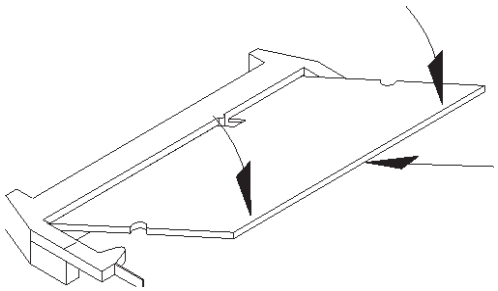


Figure 6 Align the SO-DIMM Memory Module with the onboard socket

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

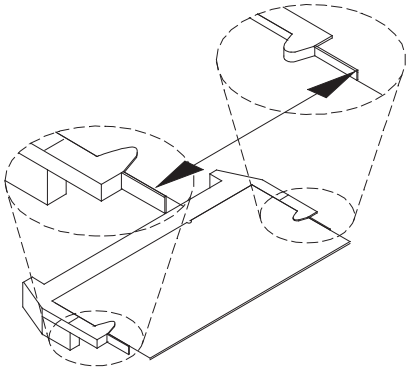


Figure 7 Press down on the SO-DIMM Memory Module to lock it in place

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. 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 45 BIOS Main Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit

BIOS Information		Set the Date. Use Tab to switch between Data elements.
Version	0.04	
Build Date	06/14/2011	
CPU Information		
Intel® Core ™ i5-2540M CPU @ 2.60GHz		
Microcode Revision	14	
Processor Cores	2	→ ← Select Screen
		↑↓ Select Item
Memory Information		Enter: Select
Total Size	2048 MB (DDR3)	+- Change Opt.
Frequency	1067 MHz	F1: General Help
		F2: Previous Values
System date	[Wed 07/06/2011]	F3: Optimized Defaults
System time	[17:21:40]	F4 Save & Exit
		ESC Exit

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■ Advanced Menu

Table 46 Advanced Menu

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Onboard LAN1 Controller	[Enabled]	Enable or Disable Onboard LAN1.
Onboard LAN1 Boot	[Disabled]	
Onboard LAN2 Controller	[Enabled]	
Onboard LAN2 Boot	[Disabled]	
Audio Controller	[Enabled]	
>Display Configuration		
>Super IO Configuration		
>Power Management Configuration		→ ← Select Screen
>CPU Advanced Configuration		↑↓ Select Item
>Trusted Computing		Enter: Select
>SATA Configuration		+- Change Opt.
>Intel TXT(LT) Configuration		F1: General Help
>AMT Configuration		F2: Previous Values
>USB Configuration		F3: Optimized Defaults
>H/W Monitor		F4 Save & Exit
		ESC Exit
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Onboard LAN Controller

Options: Disabled, Enabled

Onboard LAN Boot

Options: Disabled, Enabled

Audio Controller

Options: Disabled, Enabled, Auto

Table 47 Advanced Menu – Display Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Display Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display or Select SG for Switchable Gfx.
Primary Display	[Auto]	
Internal Graphics	[Auto]	
Aperture Size	[256 MB]	
DVMT Pre-Allocated	[64M]	
DVMT Total Gfx Mem	[256 M]	
IGFX – Boot Type	[VBIOS Default]	→ ← Select Screen
IGFX – 2nd Boot Type	[Disabled]	↑↓ Select Item
Active LVDS1	[Disabled]	Enter: Select
LVDS1 Panel Type	[VBIOS Default]	+- Change Opt.
LVDS1 Panel Color Depth	[18 bit]	F1: General Help
LVDS2 Panel Type	[1024 x 768 18 Bit 1CH]	F2: Previous Values
LVDS1 Backlight Control – Voltage	[2.5V]	F3: Optimized Defaults
LVDS2 Backlight Control – Voltage	[2.5V]	F4 Save & Exit
		ESC Exit
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Primary Display

Options: Auto, IGFX, PEG, PCI

Internal Graphics

Options: Auto, Disabled, Enabled

Aperture Size

Options: 128MB, 256MB, 512MB

DVMT Pre-Allocated

Options: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M

DVMT Total Gfx Mem

Options: 128M, 256M, MAX

IGFX – Boot Type

Options: VBIOS Default, CRT, LVDS1, HDMI, DP, LVDS2

IGFX – 2nd Boot Type

Options: Disabled, CRT, LVDS1, HDMI, DP, LVDS2

Active LVDS1

Options: Disabled, Enabled

LVDS1 Panel Type

Options: VBIOS Default, 1024x768 LVDS, 1280x1024 LVDS, 1366x768 LVDS, 1920x1080 LVDS

LVDS1 Panel Color Depth

Options: 18 Bit, 24 Bit

LVDS2 Panel Type

Options: 640x480 18Bit 1CH, 800x480 18Bit 1CH, 800x600 18Bit 1CH, 1024x768 18Bit 1CH, 1440x900 18Bit 2CH, 1600x900 18Bit 2CH, 800x480 24Bit 1CH, 800x600 24Bit 1CH, 1024x768 24Bit 1CH, 1280x1024 24Bit 2CH, 1366x768 24Bit 1CH, 1366x768 24Bit 2CH, 1440x900 24Bit 2CH, 1600x1200 24Bit 2CH, 1920x1080 24Bit 2CH, 1920x1200 24Bit 2CH

LVDS1 Backlight Control – Voltage

Options: 0.0V, 0.5V, 1.0V, 1.5V, 2.0V, 2.5V, 3.0V, 3.5V, 4.0V, 4.5V, 5.0V

LVDS2 Backlight Control – Voltage

Options: 0.0V, 0.5V, 1.0V, 1.5V, 2.0V, 2.5V, 3.0V, 3.5V, 4.0V, 4.5V, 5.0V

Table 48 Advanced Menu – Super IO Configuration

BIOS SETUP UTILITY				
Main	**Advanced**	Boot	Security	Save & Exit
Super IO Configuration >Serial Port 1 Configuration >Serial Port 2 Configuration				Set Parameters of Serial Port 1 (COM1) → ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Table 49 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
Change Settings	[Auto]	→ ← Select Screen
Serial Port 1 Type	[RS232]	↑↓ Select Item
		Enter: Select
		+- Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4 Save & Exit
		ESC Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Serial Port Type

Options: RS232, RS422, RS485

Table 50 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	
Change Settings	[Auto]	→ ← Select Screen
Device Mode	[Standard Serial Po…]	↑↓ Select Item
		Enter: Select
		+- Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4 Save & Exit
		ESC Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2F8h; IRQ=3; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Device Mode

Options: Standard Serial Port Mode, IrDA function, active pulse is 1.6us, IrDA function, active pulse is 3/16 bit time.

Table 51 Advanced Menu –Power Management Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Power Management Configuration		Select the highest ACPI sleep state the system will enter, when the SUSPEND button is pressed.
ACPI Sleep State	[S3 (Suspend to…)	
Restore AC Power Loss	[Power Off]	
Resume from S3 By PS/2 keyboard	[Disabled]	
Resume from S3 By PS/2 mouse	[Disabled]	
Resume By PCIE Device	[Disabled]	
Resume By RTC Alarm	[Enabled]	→ ← Select Screen
EUP Power Saving Mode		↑↓ Select Item
>Watchdog Timer Configuration		Enter: Select
		+- Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4 Save & Exit
		ESC Exit
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ACPI Sleep State

Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM)

Restore AC Power Loss

Options: Power Off, Power On, Last State

Resume From S By PS/2 keyboard

Options: Disabled, Enabled

Resume From S By PS/2 mouse

Options: Disabled, Enabled

Resume By PCIE Device

Options: Disabled, Enabled

Resume By RTC Alarm

Options: Disabled, Enabled

EUP Power Saving Mode

Options: Disabled, Enabled

Watchdog Timer Configuration

Options: Disabled, Enabled

Table 52 Advanced Menu –CPU Advanced Configuration

BIOS SETUP UTILITY				
Main	**Advanced**	Boot	Security	Save & Exit

CPU Advanced Configuration		Enable/Disable Intel ® Speed Step ™ Tech.
EIST	[Enabled]	
Turbo Mode	[Enabled]	
Intel ® Virtualization Tech	[Disabled]	
VT-d	[Enabled]	
Intel ® Hyper Treading Tech	[Enabled]	
Active Processor Cores	[All]	
Limit CPUID Maximum	[Disabled]	→ ← Select Screen
Execute Disable Bit	[Enabled]	↑↓ Select Item
		Enter: Select
		+- Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4 Save & Exit
		ESC Exit

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EIST

Options: Disabled, Enabled

Turbo Mode

Options: Disabled, Enabled

Intel ® Virtualization Tech

Options: Disabled, Enabled

VT-d

Options: Disabled, Enabled

Intel ® Hyper Threading Tech

Options: Disabled, Enabled

Active Processor Cores

Options: All, 1

Limit CPUID Maximum

Options: Disabled, Enabled

Execute Disable Bit

Options: Disabled, Enabled

Table 53 Advanced Menu –Trusted Computing

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
TPM Configuration TPM SUPPORT	[Disable]	Enable/Disable TPM support. O.S. will not show TPM. Reset of platform is required.
Current TPM Status Information TPM SUPPORT OFF		
		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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TPM

Options: Disabled, Enabled

Table 54 Advanced Menu –SATA Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
SATA Controller(s)	[Enabled]	Enable or Disable SATA Device.
SATA Mode Selection	[IDE]	
Serial ATA Port 1 Software Preserve	WDC WD6402AAEX (640.1 SUPPORTED	
Serial ATA Port 2 Software Preserve	Empty Unknown	
		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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SATA Controller(s)

Options: Disabled, Enabled

SATA Mode Selection

Options: IDE, AHCI, RAID

Table 55 Advanced Menu –Intel TXT(LT) Configuration

BIOS SETUP UTILITY				
Main	**Advanced**	Boot	Security	Save & Exit

Intel Trusted Execution technology Configuration Intel TXT support only can be enabled / disabled if SMX enabled. And must enables the VT support prior to TXT. Secure Mode Extensions (SMX) [Enabled] Intel TXT(LT) Support [Disabled]		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit

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Table 56 Advanced Menu – AMT Configuration

BIOS SETUP UTILITY				
Main	**Advanced**	Boot	Security	Save & Exit

Intel AMT [Enabled] Intel AMT Setup Prompt [Enabled] BIOS Hotkey Pressed [Disabled] MEBx Selection Screen [Disabled] Verbose MEBx Output [Enabled] Hide Un-Configure ME Confirmation [Disabled] MEBx Debug Message Output [Disabled] Un-Configure ME [Disabled] Intel AMT Password Write Enabled [Enabled] AMT Wait Timer 0 ASF [Enabled] Activate Remote Assistance Process [Disabled] USB Configure [Enabled] PET Progress [Enabled] Intel AMT SPI Protected [Disabled] AMT CIRA Timeout 0 Watchdog [Disabled] OS Timer 0 BIOS Timer 0		Enable/Disable Intel ® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device → ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit

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Intel AMT

Options: Disabled, Enabled

Intel AMT Setup Prompt

Options: Disabled, Enabled

BIOS Hotkey Pressed

Options: Disabled, Enabled

MEBx Selection Screen

Options: Disabled, Enabled

Verbose MEBx Output

Options: Disabled, Enabled

Hide Un-Configure ME Confirmation

Options: Disabled, Enabled

MEBx Debug Message Output

Un-Configure ME

Options: Disabled, Enabled

Intel AMT Password Write Enabled

Options: Disabled, Enabled

AMT Wait Timer

Options: 0 only

ASF

Options: Disabled, Enabled

Activate Remote Assistance Process

Options: Disabled, Enabled

USB Configure

Options: Disabled, Enabled

PET Progress

Options: Disabled, Enabled

Intel AMT SPI Protected

Options: Disabled, Enabled

Watchdog

Options: Disabled, Enabled

Table 57 Advanced Menu –USB Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
USB Configuration		Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
USB Devices: 2 Hubs		
Legacy USB Support	[Enabled]	
EHCI Hand-off	[Disabled]	
USB hardware delays and time-out:		
USB transfer time-out	[20 sec]	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Device reset time-out	[20 sec]	
Device power-up delay	[Auto]	
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Legacy USB Support

Options: Disabled, Enabled, Auto

EHCI hand-off

Options: Disabled, Enabled

USB Transfer Time-Out

Options: 1, 5, 10, 20 sec.

Device Transfer Time-Out

Options: 10, 20, 30, 40 sec.

Device Power-Up Delay

Options: Auto, Manual

Table 58 Advanced Menu –H/W Monitor

BIOS SETUP UTILITY				
Main	**Advanced**	Boot	Security	Save & Exit

PC Health Status		
CPU Warning Temperature	[Disabled]	
CPU Shutdown Temperature	[Disabled]	
CPU Smart FAN	[Disabled]	
SYS Manual PWM	255	
CPU Temperature	: +99 C	
Top Side System Temperature	: +48 C	
Bottom Side System Temperature	: +48 C	
CPU Fan Speed	: 5050 RPM	
+3.3V	: +3.296 V	→ ← Select Screen
+VCORE	: +1.080 V	↑↓ Select Item
+VGFX	: +0.440 V	Enter: Select
+1.05V	: +1.048 V	+- Change Opt.
+1.5V	: +1.493 V	F1: General Help
+5VDUAL	: +5.120 V	F2: Previous Values
+12V	: +11.792 V	F3: Optimized Defaults
+3.3VSB	: +3.328 V	F4 Save & Exit
		ESC Exit

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CPU Warning Temperature

Options: Disabled, 80 C, 85 C, 90 C, 95 C

CPU Shutdown Temperature

Options: Disabled, 80 C, 85 C, 90 C, 95 C

CPU Smart Fan

Options: Disabled, Enabled

■ Boot Menu

Table 59 Boot Menu

BIOS SETUP UTILITY		
Main Advanced **Boot** Security Save & Exit		
Boot Configuration		Enables or Disables Quiet Boot option
Full Screen LOGO Display	[Disabled]	
Setup Prompt Timeout	1	
Bootup NumLock State	[On]	
Boot Option Priorities		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Boot Option #1	[SATA: WDC WD6402AA…]	
Hard Drive BBS Priorities		
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Full Screen LOGO Display

Options: Disabled, Enabled

Bootup Numlock State

Options: On, Off

Boot Option #1

Options: SATA: WDC WD6402AAEX-00Z3A0, Disabled

Hard Drive BBS Priorities

Boot Option #1: SATA: Maxtor 6L120M0, Disabled

■ Security Menu

Table 60 Security Menu

BIOS SETUP UTILITY	
Main Advanced Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights Administrator Password User Password HDD Security Configuration: HDD 0: WDC WD6402AA	Set Setup Administrator Password → ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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■ Save & Exit Menu

Table 61 Save & Exit Menu

BIOS SETUP UTILITY	
Main Advanced Boot Security **Save & Exit**	
Save Changes and Exit Discard Changes and Reset Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults Save as User Defaults Restore User Defaults Boot Override SATA: WDC WD6402AAEX-00Z3A0	Exit system setup after saving the changes. → ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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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 KEMX-6000 Series 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 KEEX-6100 Series from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

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.

Appendix A

DIO (Digital I/O) Sample Code

```
//*************************************************************
//KEEX-6100 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//0:Low 1:High
//DI_1: IOport 0x50C bit2   DO_1: IOport 0x539 bit4
//DI_2: IOport 0x50C bit3   DO_2: IOport 0x539 bit5
//DI_3: IOport 0x50C bit4   DO_3: IOport 0x539 bit6
//DI_4: IOport 0x50C bit5   DO_4: IOport 0x53B bit0
//*************************************************************

int main()
{
	int RetVal;

	//Clear DO_1~4
	RetVal=inp(0x539);//IO Port: 0x539
	RetVal=(RetVal&0x8F);//DO_1 is bit 4
				//DO_2 is bit 5
				//DO_3 is bit 6
	outp(0x539,RetVal);

	RetVal=inp(0x53B);//IO Port: 0x53B
	RetVal=(RetVal&0xFE);//DO_4 is bit 0
	outp(0x53B,RetVal);

	system("pause");

	//Setting DO_1~4
	RetVal=inp(0x539);//IO Port: 0x539
	RetVal=(RetVal|0x70);//DO_1 is bit 4
```

```
                    //DO_2 is bit 5
                    //DO_3 is bit 6
    outp(0x539,RetVal);

    RetVal=inp(0x53B);//IO Port: 0x53B
    RetVal=(RetVal|0x01);//DO_4 is bit 0
    outp(0x53B,RetVal);

    system("pause");

    //Reading DI_1~4
    RetVal=inp(0x50C);//IO Port: 0x50C
    RetVal=(RetVal&0x3C);//DI_1 is bit 2
                    //DI_2 is bit 3
                    //DI_3 is bit 4
                    //DI_4 is bit 5
    printf("DI_= %d\n",RetVal);
    system("pause");

    return 0;
}
```

Appendix B

WatchDog Timer Sample Code

```
//=============================================
//KEEX-6100 DOS Watchdog sample program
//Please compile with Turbo C 3.0 to utilized the program
//=============================================

#include<stdio.h>
int main()
{
  int value;
//Initialized the WDT program
  outp(0x2E,0x87);
  outp(0x2E,0x87);

//Setting Logical Device Number to 0x07
  outp(0x2E,0x07);
  outp(0x2F,0x07);

//0xF5 bit6
//If watchdog timeout event occurs, this bit will be set to 1.
//Write a 1 to this bit will clear it to 0.
  outp(0x2F,0xF5);
  value=inp(0x2F);
  outp(0x2F,(value | 0x40));

//Set Timer unit
//(0xF5 bit3(0: 1sec, 1: 60 sec) of watchdog timer by setting this bit)
  outp(0x2E,0xF5);
  value=inp(0x2F);
  outp(0x2F,(value & 0xF7));//set unit sec.

//Set Timer Value(0xF6 Time of watchdog timer)
  outp(0x2E,0xF6);
  outp(0x2F,0x14);//set to 20 sec (0x14)

//Enable WDT
  outp(0x2E,0xF5);
  value=inp(0x2F);
  outp(0x2F,(value | 0x30));//
```

```
  outp(0x2E,0xF0);
  outp(0x2F,0x81);//bit7 WDTRST# output is enabled

  return 0;
}
```