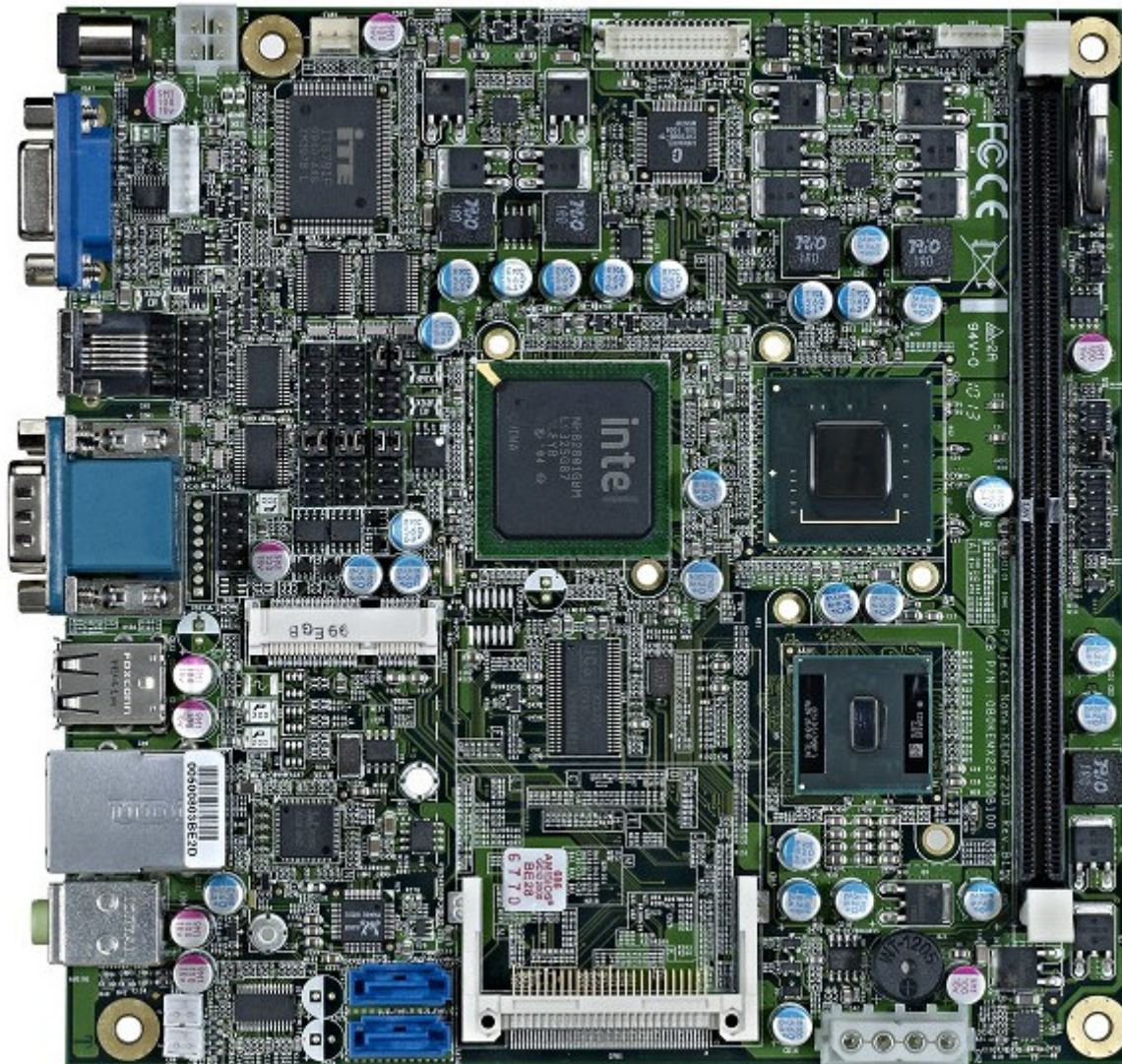


KEMX-2230

Industrial Motherboard in Mini-ITX form factor
with Intel® Atom N270

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	4/27/2010	Zack	Initial Release



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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

Safety Instructions

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 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 KEMX-2230 is a Mini-ITX form factor industrial motherboard combining the latest Intel 45nm Intel® Atom™ processor with the high integration of the Intel® 945GSE/ ICH7-M chipset. The new architecture of Atom™ N270 enables the lowest power consumption and smallest form factor for thin client and fundamental use. Featured are DDR2-400/533 SODIMM up to 2GB, 18/ 24-bit LVDS, Compact Flash socket, Fast Ethernet, SATA 3 Gb/s, mini PCI Express expansion slot, 6x USB 2.0, 4 COM ports with Power Selection, RJ11 for cash drawer, HD audio, and keyboard/mouse. The KEMX-2230 is a compact, high performance industrial motherboard that is ideal for POS, multimedia, gaming, and thin client applications.

Checklist

- Driver/ Manual CD
- Quick Installation Guide
- I/O Shield
- KEMX-2230 Mini-ITX mainboard
- SATA cable (7-pin connector with lock, L=46cm)
- Y-Cable

Features

- Intel® Atom™ Processor N270
- Intel® 945GSE / ICH7-M
- Supports Dual Display, VGA, 18/24-bit LVDS
- DDR2 SO-DIMM Socket, total up to 2 GB
- 1x Mini PCIe slot, 1x Compact Flash Socket
- 2x SATA, 6x USB 2.0, 1x GbE
- 4x COM ports, 4x DI/DO, 1x RJ-11 for Cash Drawer
- Watchdog Timer, Hardware Monitor

■ Product Specifications

	KEMX-2230`
CPU Support	Intel® Atom™ N270
Chipset	Intel® 945GSE + ICH7-M
Memory	1x DDR2 400/533 Long-DIMM Socket, up to 2GB
BIOS	AMI PnP 8Mb SPI ROM
Display	Integrated on Intel® 945GSE Chipset 18/24-bit dual-channel LVDS 1x VGA
LAN	1x RJ-45, Realtek RTL8111C Gigabit Ethernet
Audio	Realtek ALC662-VC HD Audio Codec, supports Line-out & Microphone (Speak-out with AMP. 2x 2W)
Peripheral Support	1x CF socket 2x SATA 3Gb/s 4x COMs with Power Selection 6x USB 2.0 1 x wafer counter for PS/2 & KB/MS 4x DI/DO
Power Connector	ATX-4P or DC Jack for 12V Power Input only
Expansion	1x Mini PCI Express
Watchdog Timer	1-255 step
Hardware Monitor	Operating voltage, CPU temperature and fan speed
Dimensions	Mini-ITX (170 x 170 mm)
Environmental Factors	Operation Temp: 0°C - 60°C Storage Temp.: -10°C - 85°C Humidity: 0% - 90%
Certifications	CE, FCC Class A

Table 1 KEMX-2230 Specification

Remark: Please refer to the related table for connection.

■ System Block Diagram

● Block Diagram

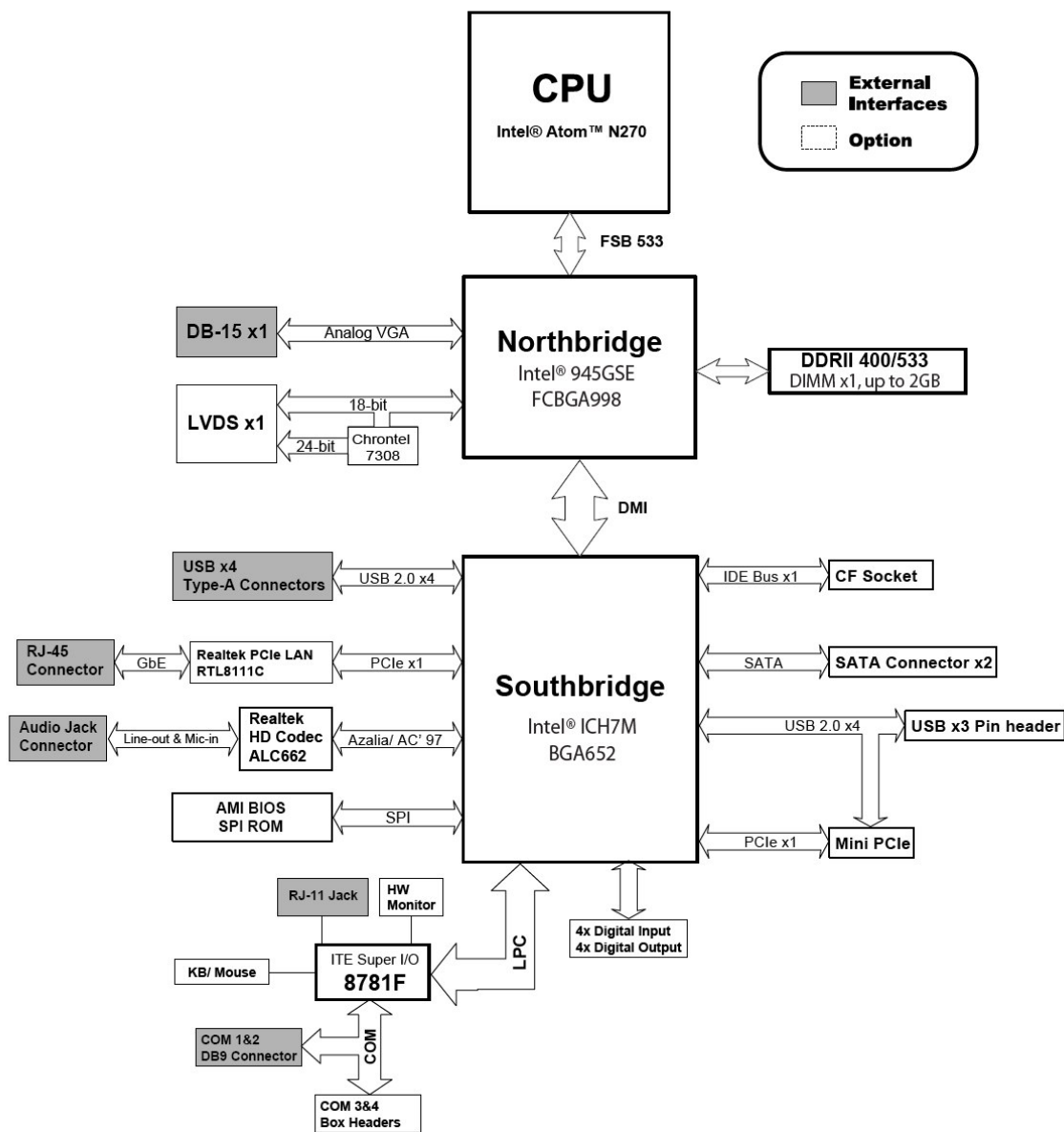


Figure 1 Block Diagram

■ Mechanical Dimensions

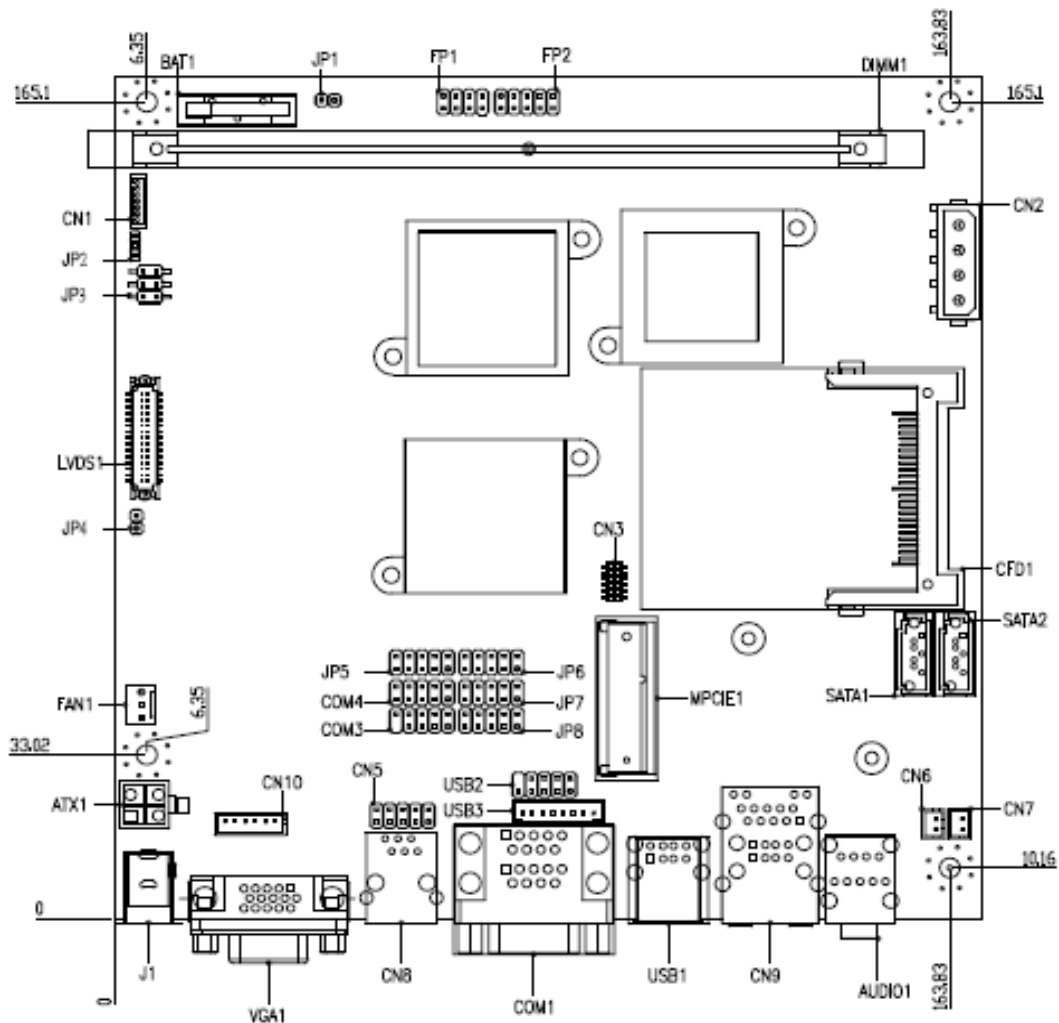
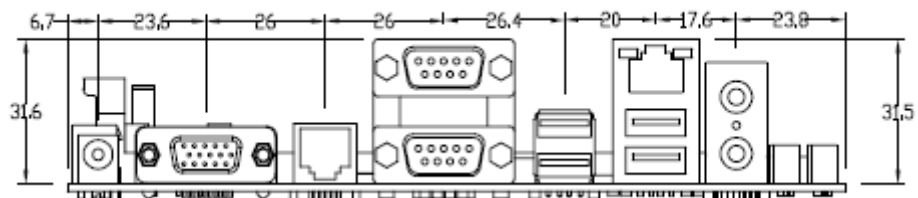


Figure 2 Mechanical Dimensions



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.

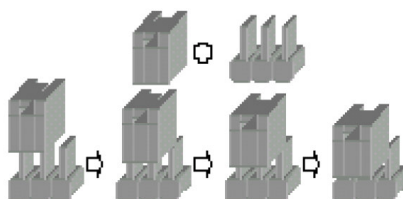


Figure 3 Jumper Connector

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.

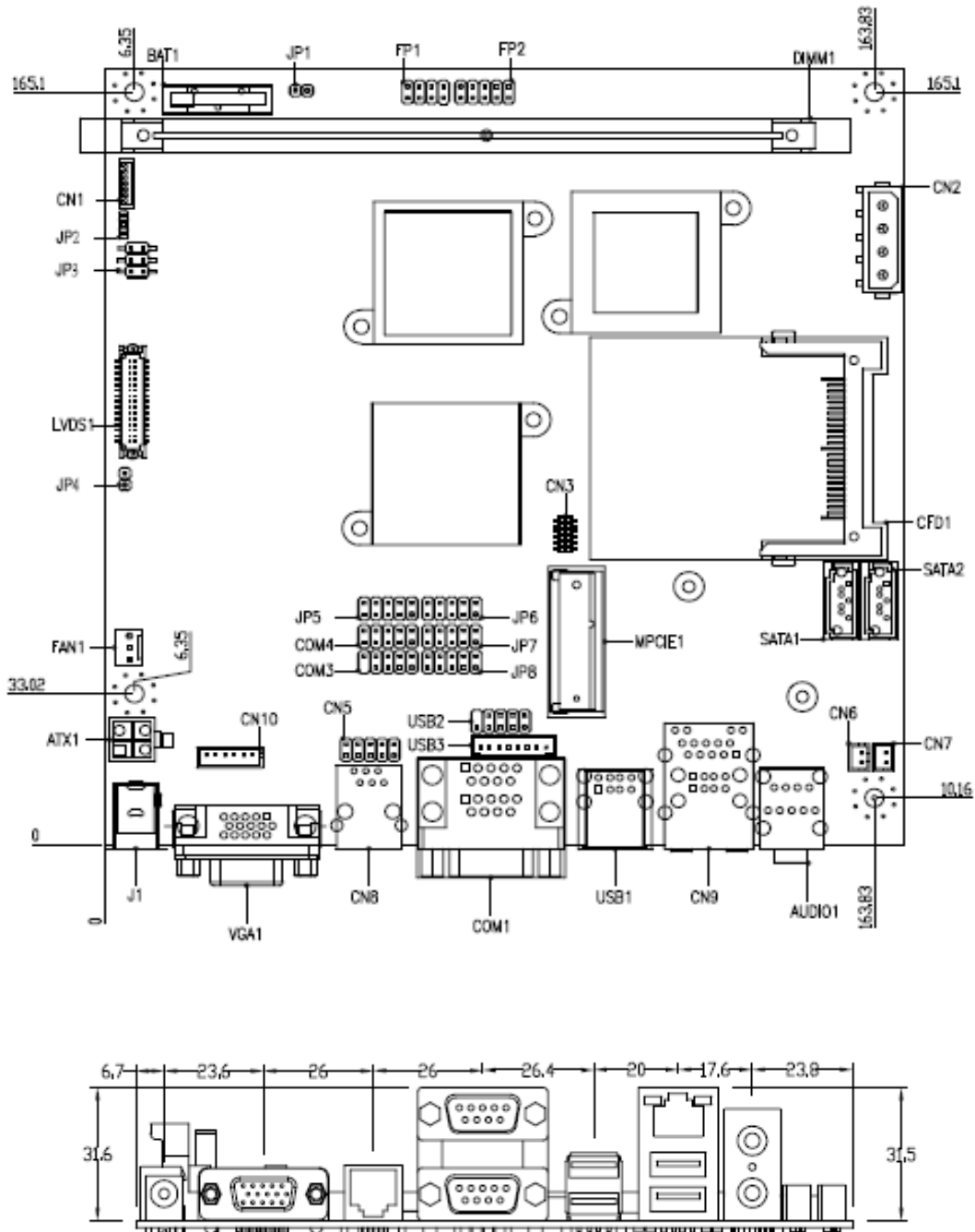


Figure 4 Jumper and Connector Locations

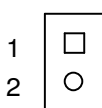
Jumper Settings

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	Clear CMOS Selection
JP2	Backlight Enable Power Selection
JP3	Backlight and Panel Power Selection
JP4	Power Mode Selection
JP5	COM4 Signal / Power Selection
JP6	COM3 Signal / Power Selection
JP7	COM1 Signal / Power Selection
JP8	COM2 Signal / Power Selection

Table 3 JP1 Clear CMOS Selection



Jumper	Status
Open	Normal Operation
Short	Clear CMOS

DIP 2P 1R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3321*02SAGR(6T)]

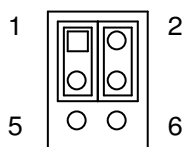
Table 4 JP2 Backlight Enable selection



Jumper	Status
1-2	Active High
2-3	Active Low

DIP 3P 1R MALE STRAIGHT TYPE Pitch: 2.0mm [YIMTEX 3291*03SAGR(6T)]

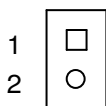
Table 5 JP3 Backlight & Panel Power Selection



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

SMD 2*3P 3362*03SAGR TYPE 180 Degree P-2.54mm [YIMTEX 3362*03SAGR]

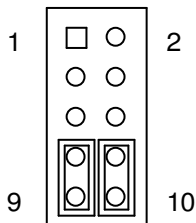
Table 6 JP4 Power Mode Selection



Jumper	Status
Short	AT Mode
Open	ATX Mode

DIP 2P 1R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3321*02SAGR(6T)]

Table 7 JP7 COM1 Port Signal / Power Selection

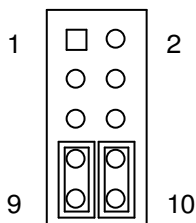


Jumper	Setting	Function
1	1-3 Short	Pin 1 = +12V
	3-5 Short	Pin 1 = +5V
	5-7 Short	Pin 1 = +5V
	7-9 Short (See Note)	Pin 1 = DCD@RS232, TX+@RS422, RTX+@RS485
2	2-4 Short	Pin 9 = +12V
	4-6 Short	Pin 9 = +5V
	6-8 Short	Pin 9 = +5V
	8-10 Short	Pin 9 = RI

Note: KEMX-2231 Jumper 7-9 Short, Pin 1 = DCD@RS232 only.

DIP 10P 2R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3322*05SAGR(6T)]

Table 8 JP5, JP6, JP8 COM Port Signal/Power Selection



Jumper	Setting	Function
1	1-3 Short	Pin 1 = +12V
	3-5 Short	Pin 1 = +5V
	5-7 Short	Pin 1 = +5V
	7-9 Short	Pin 1 = DCD@RS232
2	2-4 Short	Pin 9 = +12V
	4-6 Short	Pin 9 = +5V
	6-8 Short	Pin 9 = +5V
	8-10 Short	Pin 9 = RI

DIP 10P 2R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3322*05SAGR(6T)]

Rear Panel Pin Assignments

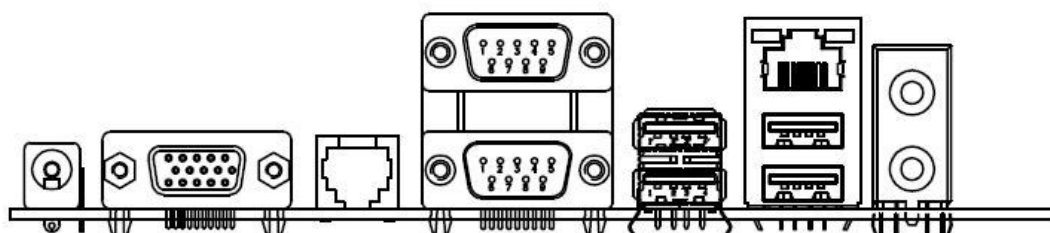
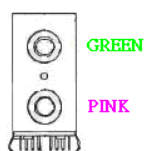


Figure 5 Rear Panel IO

Table 10 Rear Panel Connector List (from right to left, respectively)

Label	Function
AUDIO1	2-Port Audio phone jack
CN9	USB2.0 Port 2, 3 Type A Connector & 10/100/1000 Ethernet RJ-45 Connector
USB1	USB2.0 Port 0, 1 Type A Connector
COM1	COM1&COM2 DUAL DB-9 Connector
CN8	Cash Drawer RJ11 Connector
VGA1	VGA DB-15 Connector
J1	POWER JACK Connector

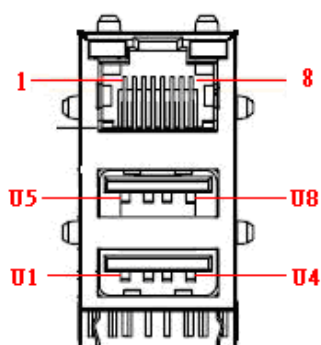
Table 11 AUDIO1, 2-Port Audio phone jack



Color	Signal Name
GREEN	LINE OUT
PINK	MIC IN

AUDIO JACK*2 DIP 9P 90D AZALIA.D3.5mm [KORTAK ZJ387S-9B-7H]

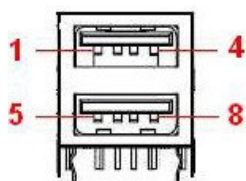
Table 12 CN9 RJ-45 + USB Port-2&3 Connector



Signal Name	Pin	Pin	Signal Name
MDI[0]+	1	U1	+5V
MDI[0]-	2	U2	USB2-
MDI[1]+	3	U3	USB2+
MDI[1]-	4	U4	GND
MDI[2]+	5	U5	+5V
MDI[2]-	6	U6	USB3-
MDI[3]+	7	U7	USB3+
MDI[3]-	8	U8	GND

USB*2/RJ45*1+TFM+LED(10/100/1000)22P DIP 90° [UDE RU1-161F9WGF(XB)]

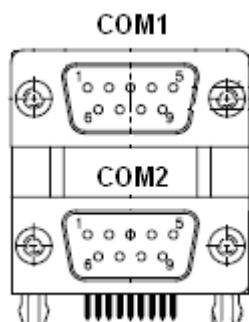
Table 4 USB1 2-Stack USB 2.0 Type A Connector



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

USB DIP 4*2P 90D 鍍金 1~3u [KUON YI KS-002-ANB-L]

Table 5 COM1 RS-22/422/485 & COM2 RS-232 Dual DB-9 Male Connector



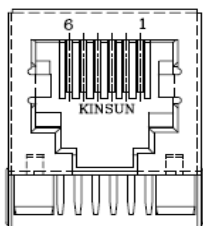
COM1				
Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
B1	DCD	TX-	DATA-	TX-
B2	RXD	RX+	NA	RX+
B3	TXD	TX+	DATA+	TX+
B4	DTR	RX-	NA	RX-
B5	GROUND	GROUND	GROUND	GROUND
B6	DSR	NA	NA	NA
B7	RTS	NA	NA	NA
B8	CTS	NA	NA	NA
B9	+5V/+12V/RI	+5V/+12V/NA	+5V/+12V/NA	+5V/+12V/NA
12	GROUND			
13	GROUND			
COM2				
A1	DCD			
A2	RXD			
A3	TXD			
A4	DTR			
A5	GROUND			
A6	DSR			
A7	RTS			
A8	CTS			
A9	+5V/+12V/RI			
10	GROUND			
11	GROUND			

Note 1 : RS-232 / 422 / 485 can be selected in BIOS setup.

Note 2 : The function of pin B9/A9 can be selected by JP7/JP8 (in BIOS setup.)

Dual D-SUB 9 90D(M) [FAN YING D20HB1102112PN]

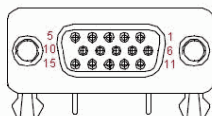
Table 15 CN8 Cash Drawer RJ-11 Connector



Pin	Signal
1	GND
2	NC
3	IO_VCC12
4	DIO_IN0
5	DIO_OUT0_N
6	GND

Note: Pin 5 signal open drain output (Max : 12V/1A)
 JACK PHONE RJ11 DIP 6P 90D (F)[KINSUN 3019483913]

Table 16 VGA1 CRT DB-15 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		

D-SUB 15P DIP (F) 90D H/D CONNECTOR Blue 附六角螺絲 [凱迅 3125-000-15SB]

Table 17 J1 Power Jack Connector



Pin	Signal
1	+12V
2	GND
3	NC

JACK DC POWER DIP 3PIN 內徑 φ 2.5mm 90° [KUON YI KD-014SA-L]



NOTE

Do not use J1 & ATX1 connectors at the same time.

Main Board Pin Assignments

Table 18 CN1 Panel Backlight Wafer



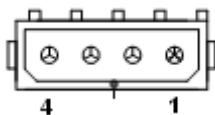
Pin	Signal Name
1	BL_EN / BL_EN# *
2	GND
3	+5V / +12V **
4	+5V / +12V **
5	GND
6	BL_ADJ
7	NC

DIP 7P 180D P-1.25mm WAFER [YIMTEX 501MW1*07STR]

*: Selected by JP2

** : Selected by JP3

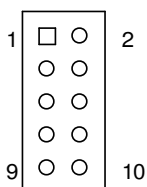
Table 19 CN2 AT Power Wafer



Pin	Signal Name
4	+5V
3	GND
2	GND
1	+12V

P-5.08mm W/O LOCK [VENSİK 2470-F-04PST-PB]

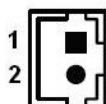
Table 20 CN5 Digital Input / Output Pin Header



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

DIP 10P 2R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3322*05SAGR(6T)]

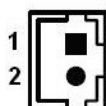
Table 21 CN6 Left Speaker Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-

DIP 2P 180° Pitch=2.0mm WAFER [YIMTEX 503PW1*02STR]

Table 22 CN7 Right Speaker Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-

DIP 2P 180° Pitch=2.0mm WAFER [YIMTEX 503PW1*02STR]

Table 23 CN10 PS/2 KB/MS Output Wafer



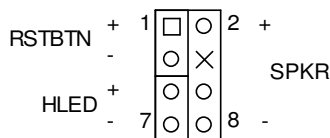
Pin	Signal Name
1	MSCLK
2	VCC
3	MSDAT
4	KBDAT
5	GND
6	KBCLK

Pitch=2.0mm 6P MALE 1R 180D [STM M24266]

Table 24 DIMM1 DDR2 Memory Socket

DIP DIMM 240P 4R DDR2 1.8V P-1.00mm VERTICAL BLACK [WIN WIN WDR2S-240A1N11B3UW]

Table 25 FP1 Front Panel 1 Pin Header



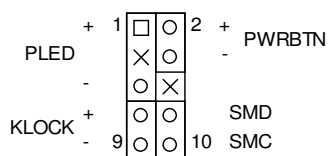
Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	NC
7	HDD LED -	8	Speaker -

DIP 8P 2R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3322*04SAGR (6T)]

2-8 : External Speaker wire

6-8 Short: Internal Speaker Enable

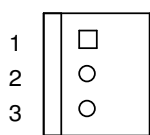
Table 26 FP2 Front Panel 2 Pin Header



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

DIP 10P 2R MALE STRAIGHT TYPE Pitch: 2.54mm [YIMTEX 3322*05SAGR(6T)]

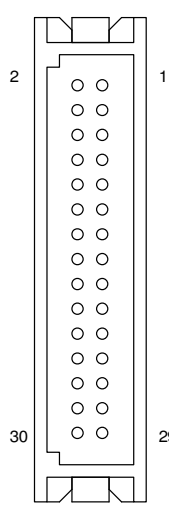
Table 27 FAN1 System FAN Wafer



Pin	Signal
1	GND
2	+12V
3	FAN_RPM

Pitch: 2.54mm WAFER [YIMTEX 521AW1*03STR]

Table 28 LVDS1 LVDS Panel Connector

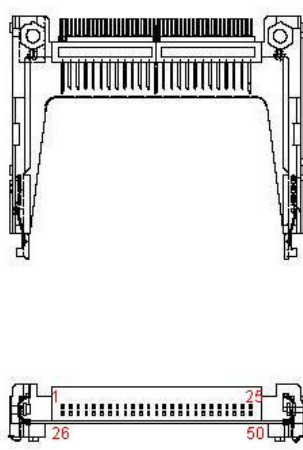


Signal Name	Pin	Pin	Signal Name
LVDS_BLCTL	2	1	ENABKL
+3.3V / +5V*	4	3	+3.3V / +5V*
LVDS_BCK-	6	5	LVDS_ACK-
LVDS_BCK+	8	7	LVDS_ACK +
GND	10	9	GND
LVDS_B0-	12	11	LVDS_A0-
LVDS_B0+	14	13	LVDS_A0+
LVDS_B1-	16	15	LVDS_A1-
LVDS_B1+	18	17	LVDS_A1+
LVDS_B2-	20	19	LVDS_A2-
LVDS_B2+	22	21	LVDS_A2+
LVDS_B3-	24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

SMD MALE 30P 180° 2ROWS Pitch: 1.25mm Tin Plated [HIROSE DF13-30DP-1.25(24)]

*: Panel Power Selected by JP3.

Table 29 CFD1 CF Type II Connector

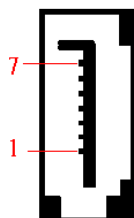


Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
IDE Data 3	2	27	IDE Data 11
IDE Data 4	3	28	IDE Data 12
IDE Data 5	4	29	IDE Data 13
IDE Data 6	5	30	IDE Data 14
IDE Data 7	6	31	IDE Data 15
IDE Chip select 1#	7	32	IDE Chip select 3#
GND	8	33	GND
GND	9	34	IDEIOR#
GND	10	35	IDEIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ
+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

CF SMD MALE 50P90D 2R stand-off 2mm, Standard type[晉祥 CF1A-71041-00E01]

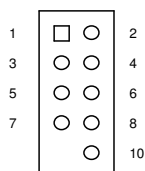
Table 30 SATA1, 2: SATA Connector



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

DIP 7P 180D CONNECTOR SATA BLACK [HI-TOP H16AB02300BAR]

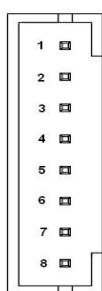
Table 31 USB2 USB2.0 Port 4, 5 Pin Header



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

DIP 10P 2R MALE STRAIGHT TYPE Pitch:2.54mm 第 9 pin 抽掉 [PINREX 210-72-05GY22]

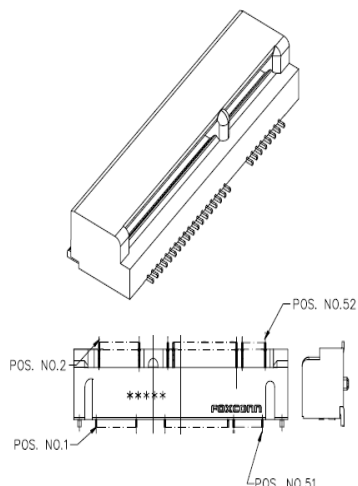
Table 32 USB3 USB2.0 Port 7 Wafer



Pin	Signal Name
1	USBVCC7
2	USB_7N
3	USB_7P
4	GND
5	+5V
6	PWR_BT-
7	HDD_LED+
8	HDD_LED-

DIP 8P 180D P-2.0mm WAFER [YIMTEX 503PW1*08STR]

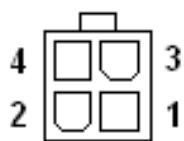
Table 33 MPCIE1 Mini PCIE slots V1.1



Signal Name	Pin	Pin	Signal Name
PCIE_WAKE#	1	2	+3.3V
NC	3	4	GND
NC	5	6	+1.5V
NC	7	8	NC
GND	9	10	NC
CLK100_PCIE-	11	12	NC
CLK100_PCIE+	13	14	NC
GND	15	16	NC
NC	17	18	GND
NC	19	20	WLAN_EN
GND	21	22	RST_PCIE#
PCIE_RX1-	23	24	+3.3VSB
PCIE_RX1+	25	26	GND
GND	27	28	+1.5V
GND	29	30	SB_SMB_CLK
PCIE_TX1-	31	32	SB_SMB_DAT
PCIE_TX1+	33	34	GND
GND	35	36	USB6N
NC	37	38	USB6P
NC	39	40	GND
NC	41	42	NC
NC	43	44	NC
NC	45	46	NC
NC	47	48	+1.5V
NC	49	50	GND
NC	51	52	+3.3V

SMD PCIE 52P 90D(F) MINI PCI-Express Connector [FOXCONN AS0B226-S56N-7F]
 SMD COLUMN M2.5 THREADS C.L=4.5mm STANDOFF=3mm [湘錘 BOB398.0BM]

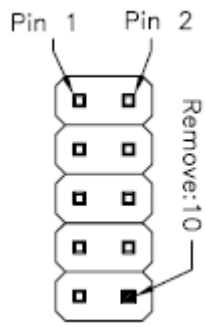
Table 34 ATX1 +12V Power Input Connector(KEMX-2230 Only)



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

Pitch:4.2mm 空心 PIN [YIMTEX 576MWA2*02STR]

Table 35 COM3&4 RS-232 Port-X Pin Header (x = 6,5)



Pin	Signal
1	+5V / +12V / DCD, Data carrier detect Note : Selected by JPx
2	RXD, Receive data
4	DTR, Data terminal ready
5	GND, ground
3	TXD, Transmit data
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	+5V / +12V / RI, Ring indicator Note : Selected by JPx
10	NC

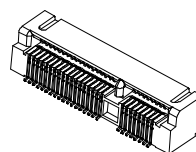
DIP 10P 2R MALE 180° Pitch: 2.54mm; remove 10th PIN [PINREX 210-72-05GB02]

Chapter 3

System Installation

■ Expansive Interfaces

mini PCIe x1 slot



CF

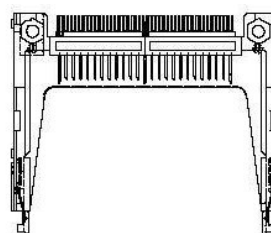


Figure 6 Expansive Interfaces

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 DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the DIMM.
2. Do not touch the connectors of the DIMM. Dirt or other residue may cause a malfunction.
3. To make sure the correct DDR2 DIMM notches should match with the DDR2 DIMM.
4. Hold the DIMM with its notch aligned with the memory socket of the board and insert it into the socket.
5. Fully insert the module into the socket.

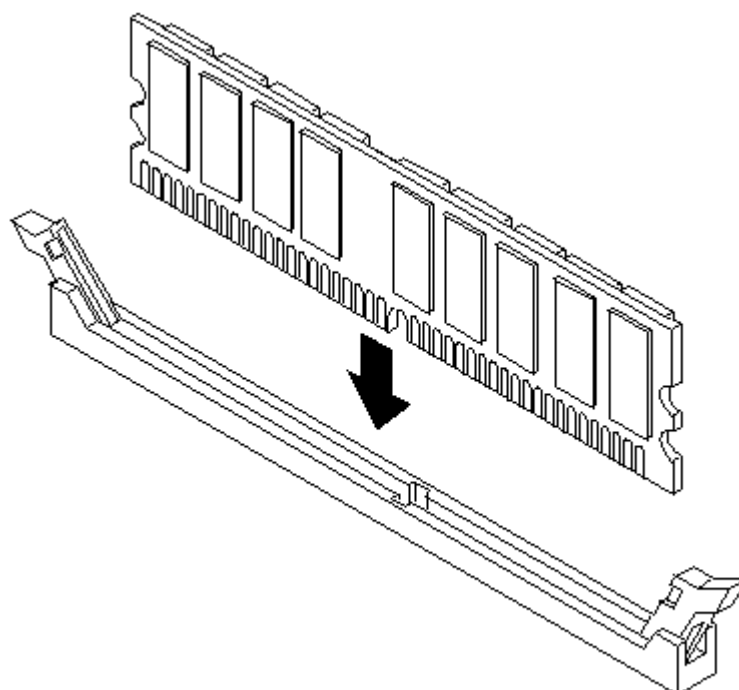


Figure 7 Press down on the DIMM Memory Module to lock it in place

Removing a DIMM:

To remove the DIMM, press down both sides of the holders carefully and lift it out of the socket.

Make sure you store the 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 36 BIOS Main Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
System Date			[Wed 04/21/2010]		Use [ENTER], [TAB]	
System Time			[14:10:20]		or [SHIFT-TAB] to	
					select a field.	
> SATA 1			: [Not Detected]		Use [+] or [-] to	
> SATA 2			: [Not Detected]		configure system Time.	
> CF			: [Not Detected]			
> System Information						
					← 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, and Secondary IDE Slave setting.

Table 37 IDE Device Setting Menu

BIOS SETUP UTILITY						
Main						
Primary Master					Disable: Disables LBA Mode.	
Device			: Not Detected		Auto: Enables LBA Mode if the	
					device supports it and the	
					device is not already formatted	
					with LBA Mode disabled.	
LBA/ Large Mode			[Auto]			
DMA Mode			[Auto]		<> Select Screen	
S.M.A.R.T			[Auto]		↑↓ Select Item	
					+ - Change Field	
					Tab Select Field	
					F1 General Help	
					F10 Save and Exit	
					ESC Exit	
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LBA/ Large Mode

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

Options: Auto

S.M.A.R.T

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 38 System Information

BIOS SETUP UTILITY	
Main	
AMIBIOS Version : 1.0 Build Date: :04/21/10 Processor Intel® Atom™ CPU N270 @ 1.60GHz Speed :1600MHz Count :1 System Memory Size :1016MB	← Select Screen ↑↓ Select Item F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

■ Advanced Menu

Table 6 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. > I/O Configuration > OnBoard Peripherals Configuration > Hardware Health Configuration		← Select Screen ↑↓ Select Item Enter Go to Sub Screen 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 40 Onboard I/O Configuration

BIOS SETUP UTILITY	
Advanced	
Onboard I/O Configuration	Allow BIOS to Select Serial Port1 Base Address.
COM1 Address [3F8]	
COM1 IRQ [4]	
COM1 Function Type [RS232]	
COM2 Address [2F8]	
COM2 IRQ [3]	
COM3 Address [3E8]	← Select Screen
COM3 IRQ [10]	↑↓ Select Item
COM4 Address [2E8]	+ - Change Field
COM4 IRQ [11]	F1 General Help
	F10 Save and Exit
	ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

COM1 Address

Options: Disabled, 3F8, 3E8, 2E8

COM1 IRQ

Options: 3, 4, 10, 11

COM1 Function Type

Options: RS232, RS422, RS485

COM1 RS485

RS485 Duplex Mode

Options: Half Duplex, Full Duplex

COM2 Address

Options: Disabled, 2F8, 3E8, 2E8

COM2 IRQ

Options: 3, 4, 10, 11

COM3 Address

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM3 IRQ

Options: 3, 4, 10, 11

COM3 Mode

Options: Normal, IrDA, ASK IR, Smart Card Reader

COM4 Address

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM4 IRQ

Options: 3, 4, 10, 11

Table 7 OnBoard Peripherals Configuration Settings

BIOS SETUP UTILITY		
Advanced		
OnBoard Peripherals Configuration Settings		Options
USB Controller	[Enabled]	Disabled Enabled
USB Device Legacy Support	[Enabled]	
USB 2.0 Controller	[Enabled]	
Audio Controller	[Enabled]	
Onboard LAN Controller	[Enabled]	← Select Screen
Onboard LAN OPTROM	[Disabled]	↑↓ Select Item
		+ - Change Field
		F1 General Help
		F10 Save and Exit
		ESC Exit
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USB Controller

Options: Enabled, Disabled

USB Device Legacy Support

Options: Enabled, Disabled, Auto

USB 2.0 Controller

Options: Enabled, Disabled

Audio Controller

Options: Enabled, Disabled

Onboard LAN Controller

Options: Enabled, Disabled

Onboard LAN OPTROM

Options: Enabled, Disabled

Table 42 Hardware Health Configuration

BIOS SETUP UTILITY	
Advanced	
Hardware Health Configuration	
CPU Warning Temperature	[Disabled]
CPU Shutdown Temperature	[Disabled]
CPU Temperature	:44°C/ 111°F
SYS Temperature	:38°C/ 100°F
+V CORE	:1.104 V
+1.05V	:1.040 V
+3.3V	:3.312 V
+5V	:5.053 V
+12V	:11.968 V
+1.8v	:1.84 V
+VCC RTC	:3.002 V
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← Select Screen
 ↑↓ Select Item
 +- Change Field
 F1 General Help
 F10 Save and Exit
 ESC Exit

CPU Warning Temperature

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

CPU Shutdown Temperature

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

■ Boot Menu

Table 43 Boot Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Boot Settings <hr/> Quick Boot [Enabled] Bootup Num-Lock [ON] Wait For 'F1' If Error [Enabled] Hit 'DEL' Message Display [Enabled]					Allow BIOS to Skip certain tests while booting. This will decrease the time needed to boot the system. ← Select Screen ↑↓ Select Item +- Change Field F1 General Help F10 Save and Exit ESC Exit	
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

Quick Boot

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

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 44 Chipset Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Chipset Settings				Options		
DRAM Frequency		[Auto]		Auto		
Boots Graphic Adapter Priority		[PEG/PCI]		400 MHz		
Internal Graphics Mode Select		[Enabled, 8MB]		533 MHz		
Hyper Threading Technology		[Enabled]		← Select Screen		
> Video Function Configuration				↑↓ Select Item		
				+- Change Field		
				F1 General Help		
				F10 Save and Exit		
				ESC Exit		
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.						

DRAM Frequency

Options: Auto, 400 MHz, 533MHz

Boots Graphic Adapter Priority

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

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

Options: Disabled, Enabled 1MB, Enabled 8M

Hyper Threading Technology

Options: Disabled, Enabled

■ Video Function Configuration

Table 45 Video Function Configuration

BIOS SETUP UTILITY		
Chipset		
Video Function Configuration		Options
DVMT Mode Select	[DVMT Mode]	Fixed Mode
DVMT/FIXED Memory	[128M]	DVMT Mode
Boot Display Device	[VGA]	Combo Mode
Flat Panel Type	[1024X768 24Bit 1C]	
Local Flat Panel Scaling	[Auto]	
Panel BackLight Voltage	[2.5]	
		← Select Screen
		↑↓ Select Item
		+ - Change Field
		Tab Select Field
		F1 General Help
		F10 Save and Exit
		ESC Exit
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DVMT Mode Select

Options: Fixed Mode, DVMT Mode, Combo Mode

DVMT/FIXED Memory

Options: 64MB, 128MB, Maximum DVMT

Boot Display Device

Options: VGA, LVDS, VGA+LVDS

Flat Panel Type

Options:

1024x768	24Bit 1CH
1080x1024	24Bit 2CH
1366x768	24Bit 2CH
1920x1080	24Bit 2CH

Local Flat Panel Scaling

Options: Auto, Forced Scaling, Disabled

Panel BackLight Voltage

Options: Min 0.0V, Max: 5.0V

■ Power Menu

Table 46 Power Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Power Management Setting					Select the ACPI state used for System Suspend	
ACPI Function				[Enabled]		
Suspend mode				[S3 (STR)]		
Repost Video on S3 Resume				[No]	← Select Screen	
Suspend Time Out				[Disabled]	↑↓ Select Item	
Restore on AC Power Loss				Power Off]	+- Change Field	
Resume By USB Device				[Disabled]	F1 General Help	
Resume By PCI-E Device				[Disabled]	F10 Save and Exit	
Resume On RTC Alarm				[Disabled]	ESC Exit	
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ACPI Function

Enable/ Disable ACPI support for Operating System.

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

Suspend mode

Options: S1 (POS), S3 (STR)

Repost Video on S3 Resume

Options: No, Yes

Suspend Time Out

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

Restore on AC Power Loss

Options: Power OFF, Power ON, Last State

Resume By USB Device

Enable/ Disable USB Device Wakeup From S3/S4

Options: Disabled, Enabled

Resume By PCI-E Device

Options: Disabled, Enabled

Resume On RTC Alarm

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 47 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 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 8 Exit Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	Exit
Exit Options					Exit System Setup after saving the changes.	
Save Changes and Exit					F10 key can be used for this operation.	
Discard Changes and Exit					← Select Screen	
Discard Changes					↑↓ Select Item	
Load Optimal Defaults					+- Change Field	
Load Failsafe Defaults					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 KEMX-2230 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 KEMX-2230 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

System Resources

Interrupt Request (IRQ) Lines

IRQ #	Used For	Comment
0	Timer0	
1	keyboard controller	
2	Cascade	
3	COM2	Note (1)
4	COM1	Note (1)
5	Free	
6	Floppy disk controller	Note (1)
7	Free	
8	Real Time Clock	
9	ACPI-Compliant System	
10	Free	
11	COM3&4	Note (1)
12	PS/2 Mouse	Note (1)
13	Floating point unit (FPU / NPU / Math coprocessor)	
14	Primary IDE channel	Note (1)
15	Secondary IDE channel	Note (1)

Note: If the “Used For” device is disabled in setup, the corresponding interrupt is available for other devices.

DMA Channels

DMA #	Used For	Comment
0	Memory Refresh	
1	Sound	Note (1)
2	Floppy disk controller	Note (1)
3	free	Unavailable if LPT used in ECP mode.
4	Cascade	
5	Sound	Note (1)
6	free	
7	free	

Note: If the "Used For" device is disabled in setup, the corresponding interrupt is available for other devices.

Memory Mapping

Upper Memory	Used For	Comment
C0000h - CBFFFh	VGA BIOS	No
CC000h - CFFFFh CD000h - CDFFFh	LAN Option ROM	Yes
E0000h - FFFFFh	System BIOS	No

PCI Devices

PCI Device	PCI Interrupt	Comment
LAN	INTA	AD20

PCI Express Devices

PCIe Device	PCIe Interrupt	Comment
PCIe x1 Slot 1	INTC	

Inter-IC Bus (I2C)

I2C Address	Used For	Comment
A0h	DDR2-RAM DIMM Socket 0 Address	

ISA I/O Port

I2C Address	Used For	Comment
2Eh	Super I/O	
2Eh	WatchDog Timer	Reference register in Super I/O

I/O Address Map

I/O Address	Used For	Comment
00h – 0Fh C0h – DFh	8237DMA Controller	
20h, 21h	8259A PIC	
2Eh, 2Fh	SuperIO Access Port	
A0h, A1h	8259A PIC	
40h – 43h (XT/AT)	8254PIT	

44h – 47h (PS/2)		
60h – 64h	KeyBoard Controller	
90h – 96h	PS/2 P OS	
F0h – FFh	Math Co-Processor, X87 Unit	
170h – 177h	Secondary IDE	
1F0h – 1F7h	Primary IDE	
200h – 22Fh	GAME I/O	
220h – 22Fh	Sound Blaster / AD Lib	
279h, A79h	Plug and Play Configuration Register	
A15h, A16h	HW Monitor Access Port	
2E8h – 2EFh	COM4	
2F8h – 2FFh	COM2	
378h – 37Ah	Parallel Printer Port	
3B0h – 3BFh	MDA / MGA	
3C0h – 3CFh	EGA / VGA	
3D4h – 3D9h	CGA/CRT Register, Controller and Palette Register	
3F0h – 3F7h	Floppy Diskette	
3F6h, 3F7h	Enhanced IDE	
3E8h – 3EFh	COM3	
3F8h – 3FFh	COM1	
0CF8h	PCI Configuration Register/address	
0CFCh	PCI Configuration Register/data	

Hardware Monitor Parameters

IT8781F Pin Name	Voltage/Temperature	Function/Comments
VIN0	+VCORE	Processor core voltage
VIN1	+1.05V	+/- 5%
VIN2	+3.3V	+/- 5%
VIN3	+5V	+/- 5%
VIN4	+12V	+/- 5%
VIN5	Chip core 1.5V	+/- 5%
VIN6	DDR 1.8V	+/- 5%
5VSB	5VSB	+/- 5%
SYS_TEMP	System Temperature	
CPU_TEMP	CPU Temperature	
PRDCHOT#		CPU over temperature shutdown output
BEEP		Beep function for hardware monitor

Appendix B

DIO (Digital I/O) Sample Code

```
//=====
//KEMX-2230 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//=====
int main(){
int RetVal;

//reset the output pins to zero

RetVal=inp(0x48f,RetVal);
RetVal=RetVal&0xE2;
outp(0x48f,RetVal);//DO0 is bit 0
//DO1 is bit 2
//DO2 is bit 3
//DO3 is bit 4

//Output RetVal to Digital Output
//Set all output to 1
RetVal=inp(0x48f,RetVal);
RetVal=RetVal|0x1d;
outp(0x48f,RetVal);

//Reading Digital input
RetVal=inp(0x48d);//DI0 is bit 2
//DI1 is bit 5
//DI2 is bit 6
//DI3 is bit 7

}
```

Appendix C

WatchDog Timer Sample Code

```
//=====
//KEMX-2230 DOS Watchdog sample program
//Please compile with Turbo C 3.0 to utilized the program
//=====
int main()
{
//Initialized the WDT program
outp(0x2e,0x87);
outp(0x2e,0x01);
outp(0x2e,0x55);
outp(0x2e,0x55);

//Setting Logical Device Number to 0x07
outp(0x2e,0x07);
outp(0x2f,0x07);

//Set Timer Value(0x73 is LSB while 0x74 is MSB)
outp(0x2e,0x73);
outp(0x2f,0x14);//set to 20 sec (0x14)

//Set Timer Unit to Second/Minute(Bit 7 equal to 1 is second/0 is minute)
//Enable WDT (Bit 4 equal to 1 is enable/0 is disable)
outp(0x2e,0x72);
outp(0x2f,0x90);//The unit is set as second
return 0;
}
```