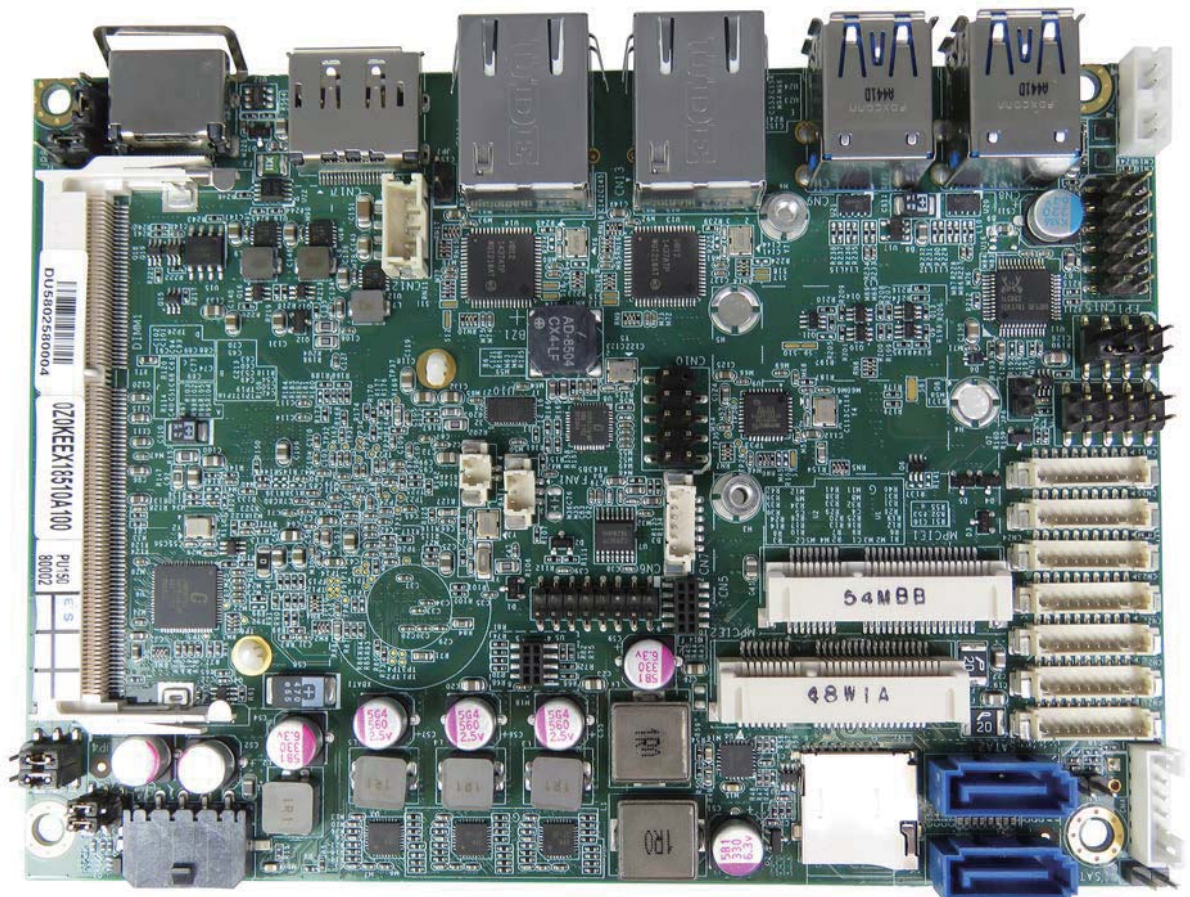


KEEX-1850 Series

Standard / Extended Temperature Single Board Computer
in Intel® Embedded Compact Extended Form Factor
with Intel® Braswell SoC Processor

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.

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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.

Safety Instructions

- 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 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 KEEX-1850 Series is an industrial embedded single board computer (SBC) based on Intel® Braswell SoC Processor with Intel® HD Graphics integrated. Featured are 1x DDR3L SO-DIMM socket, 1x DP, 1x HDMI, 1x LVDS / 1x VGA, 1x/2x SATA, 1x/0x mSATA, 1x uSD, 2x GbE, 4x USB3.0, 2x USB2.0, 6x COM, 1x DIO and 1x/2x mPCIe (SIM card support).

Checklist (* : Optional)

- Driver/ Manual CD
- Quick Installation Guide
- KEEX-1850 Series main board
- 1x SATA Cable*
- 1x SATA Power Cable*
- 1x DC Jack Cable*

Features

- Intel® Braswell SoC Processor
- 1x DDR3L SO-DIMM Socket
- 1x DP, 1x HDMI, 1x 24-bit 2-ch LVDS / 1x VGA
- 1x/2x SATA, 1x/0x mSATA, 1x uSD card cage
- 2x GbE, 4x USB3.0, 2x USB2.0, 6x COM, 1x 8-bit DIO
- 1x/2x mPCIe (SIM card support)
- Watchdog Timer, Hardware Monitor, TPM (optional)
- Extended Temperature model available: -20°C ~ 70°C

■ Product Specifications

Model Name	▪ KEEX-1850 Series
Form Factor	▪ ECX, 146x105mm / 5.75" x 4.13"
CPU Support	▪ KEEX-1854/1856/1854T: Intel® Celeron® Quad Core N3160 (2M Cache, 2.24 GHz) ▪ KEEX-1855/1855T: Intel® Celeron® Dual Core N3060 (2M Cache, 2.48 GHz)
Memory	▪ 1x DDR3L SO-DIMM up to 8GB
Graphics	▪ Intel® HD Graphics
Displays	▪ 1x DP (on rear) ▪ 1x HDMI (on rear) ▪ 1x 24-bit 2-ch LVDS / 1x VGA (onboard)
Ethernet	▪ 2x GbE LAN (Intel I210-AT)
Audio	▪ 1x header for Line-In, Line-Out & Mic-In ▪ 2x Wafers for Stereo Speaker output
Peripheral Support	<ul style="list-style-type: none"> ▪ Storage supported <ul style="list-style-type: none"> • 1x/2x SATA connector • 1x/0x mSATA (mixed with mPCIe) • 1x uSD card cage ▪ USB <ul style="list-style-type: none"> • 4x USB3.0 (on rear) • 2x USB2.0 ▪ FAN supported <ul style="list-style-type: none"> • +5VDC Smart FAN supported ▪ MISC <ul style="list-style-type: none"> • 1x header for Reset button, HDD LED and External Speaker support • 1x header for Power button, Power LED and SM bus • 1x header for mPCIe activity LED support ▪ Super I/O <ul style="list-style-type: none"> • 6x wafers for RS-232 COM (COM1 & COM2 support RS-232/422/485) • 1x 8-bit DIO ▪ TPM support <ul style="list-style-type: none"> • Optional Infineon SLB9635 for TPM support
Expansion Slot	▪ 1x/2x mPCIe Socket ▪ 1x SIM card wafer
BIOS	▪ AMI uEFI BIOS
Hardware Monitor	▪ Voltages monitoring ▪ Temperature monitoring.
Watchdog	▪ Programmable WDT to generate System reset event
Real Time Clock	▪ SoC integrated RTC
Power	▪ 1x lockable Wafer for +12VDC Power input ▪ ATX/AT Mode Support
Operation Temp.	<ul style="list-style-type: none"> ▪ Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (standard) -20°C ~ 70°C / -4°F ~ 158°F (extended) ▪ Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (standard) -40°C ~ 85°C / -40°F ~ 185°F (extended) ▪ Humidity: 0% ~ 95%
Certifications	▪ CE, FCC Class A

Table 1 KEEX-1850 Series Specification

■ System Block Diagram

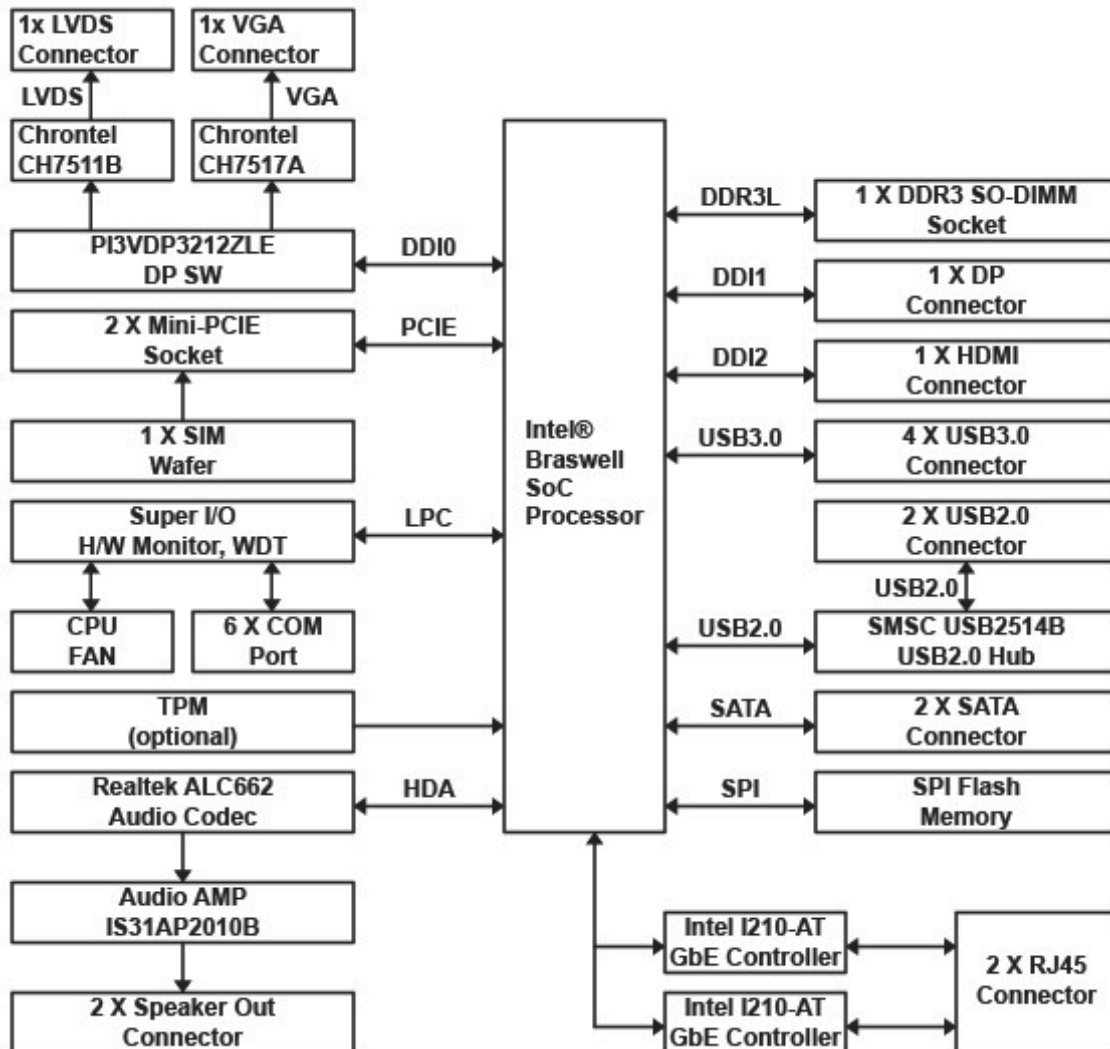


Figure 1 Block Diagram

■ Mechanical Dimensions

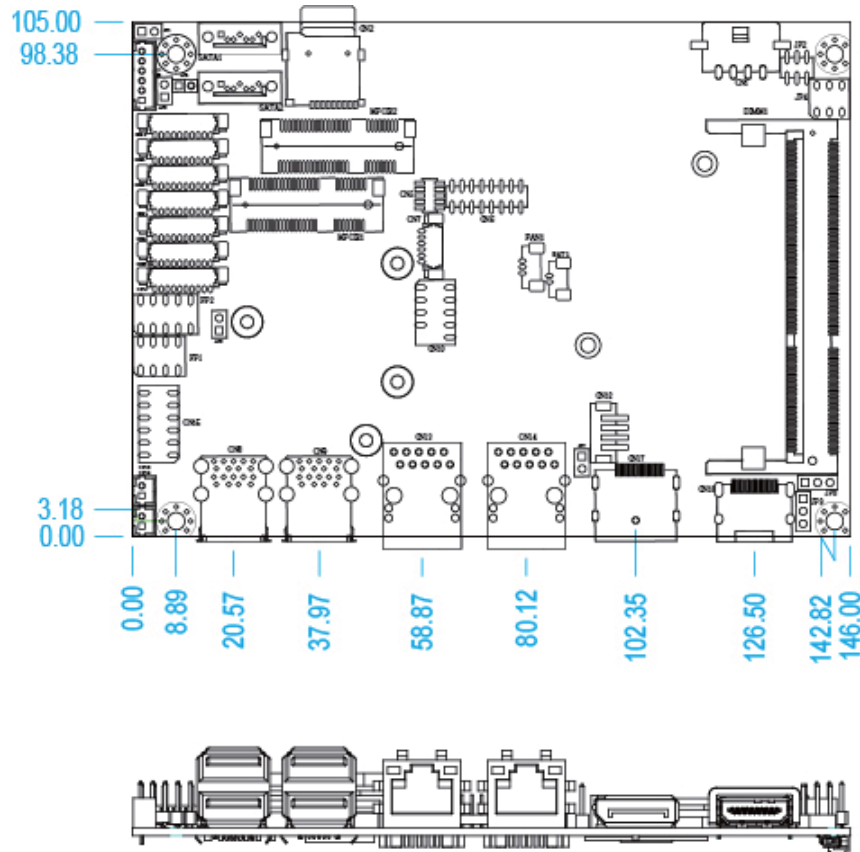


Figure 2 Mechanical Dimensions

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.

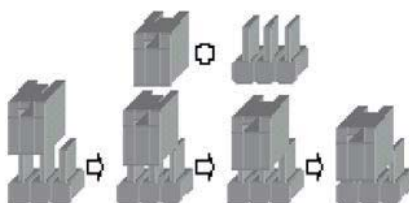


Figure 3 Jumper Connector

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.

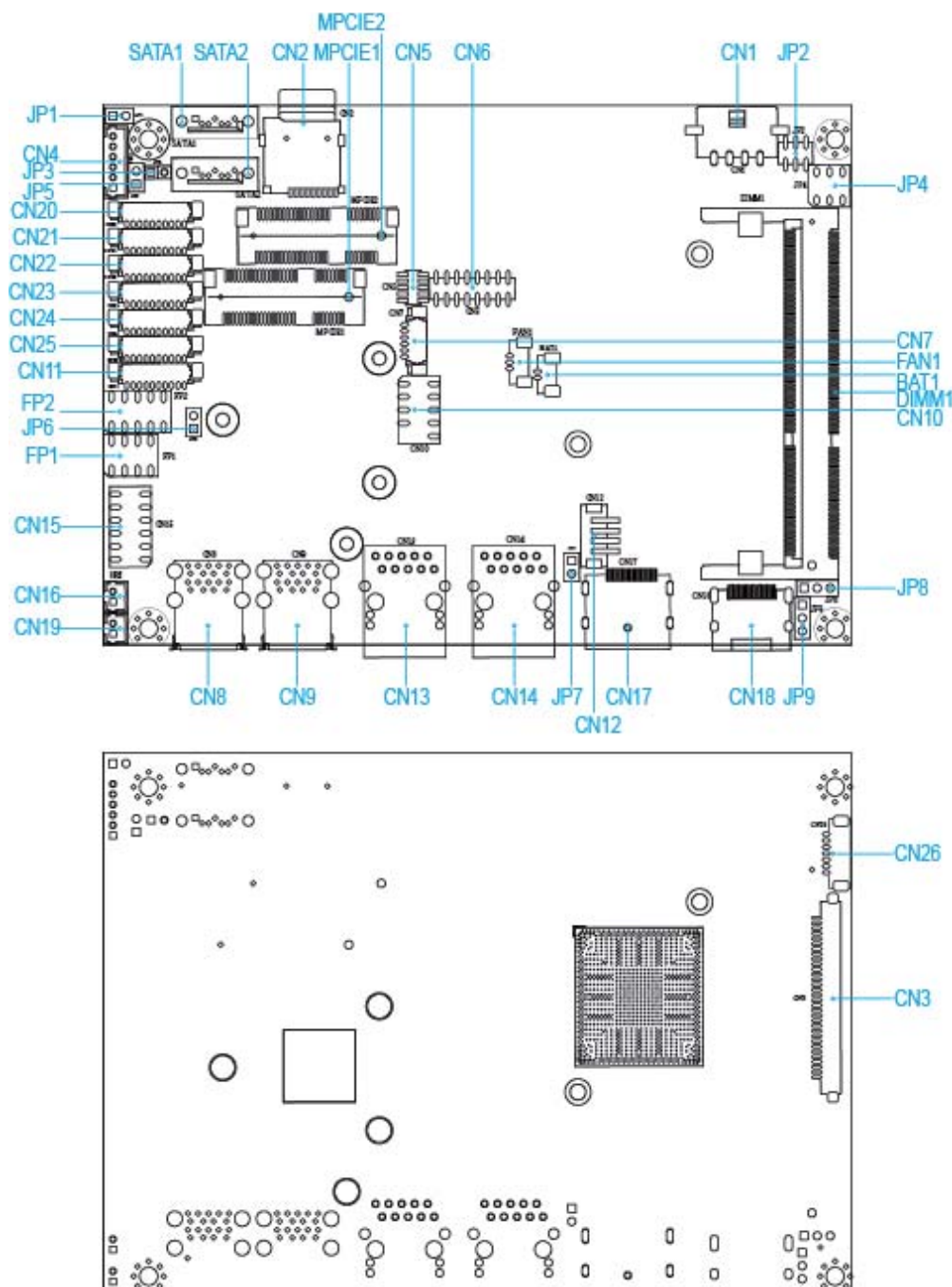


Figure 4 Jumper and Connector Locations

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	RTC Reset Selection
JP2	Backlight Enable Selection
JP3	MPCIE Activity LED Indication
JP4	Panel & Backlight Power Selection
JP6	USB Power Selection
JP7	ME F/W Selection
JP8	Keyboard Lock Selection
JP9	AT / ATX Power Mode Selection

Table 3 JP1 RTC Reset Selection


1		Jumper	Status
		1-2 Open	Normal Operation.
2		1-2 Short	Clear CMOS
DIP 2P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]			

Table 4 JP2 Backlight Enable Selection

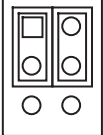
1		2	Jumper	Setting	Status
			1	1-3 3-5	Backlight Enable Level = +3.3V Backlight Enable Level = +5V
5			2	2-4 4-6	Backlight Enable High Active Backlight Enable Low Active
SMD 6P 2R MALE TYPE 180D P-2.0mm[PINREX 222-97-03GBB1]					

Table 5 JP3 MPCIE Activity LED Indication


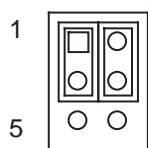
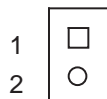
1		Jumper	Status
		1	LED+
2		2	LED-
DIP 2P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]			

Table 6 JP4 Panel & Backlight Power Selection



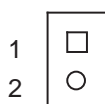
Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
SMD 2*3P 3362*03SAGR TYPE 180D P-2.54mm [YIMTEX 3362*03SAGR]		

Table 7 JP6 USB Power Selection



Jumper	Status
1-2 Open	USB power will be cut off in S4 & S5 state.
1-2 Short	USB power is always supply.
DIP 2P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 8 JP7 ME F/W Selection



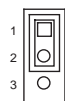
Jumper	Status
1-2 Open	Normal Operation
1-2 Short	ME F/W Disabled
DIP 2P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 9 JP8 Keyboard Lock Selection



Jumper	Status
1-2 Open	Normal Operation.
1-2 Short	Keyboard Lock.
DIP 3P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*03SAGR(6T)]	

Table 10 JP9 AT / ATX Power Mode Selection



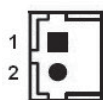
Jumper	Status
1-2 Short	ATX Mode
2-3 Short	AT Mode
DIP 3P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*03SAGR(6T)]	

Internal Connector Pin Assignment

Table 11 Internal Connector Pin List

Label	Function
BAT1	CR2032 Battery Power Input Wafer
BZ1	Onboard Buzzer
CN1	DC12V Power Input Wafer
CN2	Micro-SD Card Cage
CN3	18/24-bit, Single Channel LVDS Panel Connector
CN4	PS/2 Keyboard / Mouse Wafer
CN5	P80_Header
CN6	VGA Header
CN7	SIM Interface Wafer for MPCIE1
CN10	USB2.0 Port DN_1 , DN_2 Pin Header
CN11	Digital Input / Output Wafer
CN12	HDD Power Output Wafer
CN15	Audio Input / Output Pin Header
CN16	Left Channel 3W Audio AMP Output Wafer
CN19	Right Channel 3W Audio AMP Output Wafer
CN20	COM1 RS-232/422/485 Port Wafer
CN21	COM2 RS-232/422/485 Port Wafer
CN22	RS-232 Port 3 Wafer
CN23	RS-232 Port 4 Wafer
CN24	RS-232 Port 5 Wafer
CN25	RS-232 Port 6 Wafer
CN26	Backlight Power Output Wafer
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	DC5V FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
MPCIE1	Mini-PCI Express v1.2 Socket
MPCIE2	Mini-PCI Express v1.2 Socket
SATA1	Serial ATA Port 0 Connector
SATA2	Serial ATA Port 1 Connector

Table 12 BAT1 CR2032 Battery Power Input Wafer



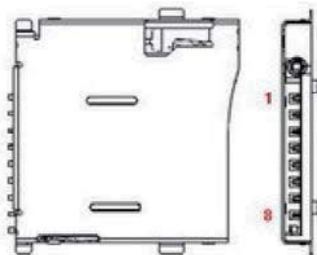
Pin	Signal Name
1	Battery+
2	Battery-
SMD 2P 180D P-1.25mm WAFER [Pinrex 712-73-02TWR0]	

Table 13 CN1 DC12V Power Input Wafer



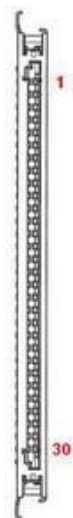
Pin	Signal
1	+12Vin
2	GND
3	GND
4	+12Vin
ATX POWER SMD 4P 1R MALE 90° Pitch:3.0mm Hollow PIN [PINREX 733-97-04TBR1]	

Table 14 CN1 DC12V Power Input Wafer



Pin	Signal Name
1	DAT2
2	CD/DAT3
3	CMD
4	VDD
5	CLK
6	GND
7	DAT0
8	DAT1
SMT 8P Micro-SD (T-Flash) Memory Card Connector, LCP, Black, Au 10u" Plated [HOMETOM SD08F36BDA005]	

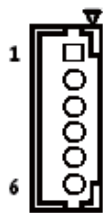
Table 15 CN3 Secondary 18/24-bit, 2-channel LVDS Panel Connector



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 *

SMD MALE 30P 90° 1R Pitch:1mm [JAE
JS-1267-30(G1)NH]
* : Panel Power can be selected by JP4.

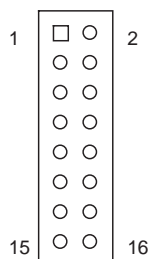
Table 16 CN4 PS/2 Keyboard / Mouse Wafer



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

DIP 6P 180° Pitch=2.0mm WAFER [YIMTEX
503PW1*06ST-1R]

Table 17 CN6 VGA Header



Pin	Signal	Pin	Signal
1	R	2	G
3	B	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	NC	12	DDC_DATA
13	HSYNC	14	VSYNC
15	DDC_CLK	16	NC

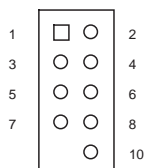
SMD 16P 2R MALE Straight Type Pitch:2.0mm,
Gold Flash, Black Insulator [Pinrex
222-97-08GBB1]

Table 18 CN7 SIM Interface Wafer for MPCIE1



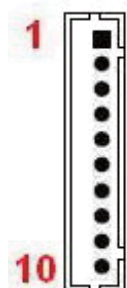
Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND
SMD 6P 180D P-1.25mm WAFER [Pinrex 712-73-06TWB0]	

Table 19 CN10 USB2.0 Port DN_1, DN_2 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
SMD 10P 2R MALE STRAIGHT TYPE Pitch:2.54mm Remove PIN 9 NY 6T[YIMTEX 3362*05SANGR-09]			

Table 20 CN11 Digital Input / Output Wafer



Pin	Signal Name
1	+5V
2	DI0
3	DO0
4	DI1
5	DO1
6	DI2
7	DO2
8	DI3
9	DO3
10	GND
SMD 10P 1R 180D MALE P=1.25mm, Tin Plated, NY46, White Insulator [Pinrex 712-73-10TWB0]	

Table 21 CN12 HDD Power Output Wafer

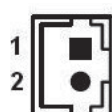


Pin	Signal
1	+12V
2	GND
3	GND
4	+5V
SMD MALE 4P 1R 180D P-2.0mm, Tin Plated, White Insulator [PINREX 721-93-04TWE9]	

Table 22 CN15 Audio Input / Output Pin Header

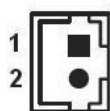
Pin	Signal Name	Pin	Signal Name
1	MIC-In_L	2	MIC-In_R
3	MIC-In_JD#	4	GND
5	Line-In_L	6	Line-In_R
7	Line-In_JD#	8	GND
9	Line-Out_L	10	Line-Out_R
11	Line-Out_JD#	12	GND
SMD 12P 2R 180D Pitch:2.54mm, Gold Flash, NY9T, Green Insulator [PINREX 212-92-06GBE1]			

Table 23 CN16 Left Channel 3W Audio AMP Output Wafer



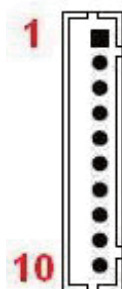
Pin	Signal Name
1	Speaker+
2	Speaker-
DIP 2P 180° Pitch=2.0mm WAFER [YIMTEX 503PW1*02STR & 503PW1*02ST-1R]	

Table 24 CN19 Right Channel 3W Audio AMP Output Wafer



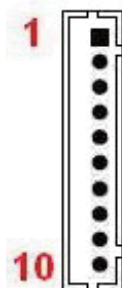
Pin	Signal Name
1	Speaker+
2	Speaker-
DIP 2P 180° Pitch=2.0mm WAFER [YIMTEX 503PW1*02STR & 503PW1*02ST-1R]	

Table 25 CN20 COM1 RS-232/422/485 Port 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	TX+	DATA+	TX+
4	RTS	N/A	N/A	N/A
5	TXD	RX+	N/A	RX+
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
SMD 10P 1R 180D MALE P=1.25mm, Tin Plated, NY46, White Insulator [Pinrex 712-73-10TWB0]				

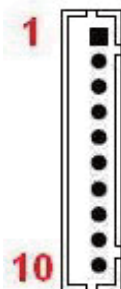
Table 26 CN21 COM2 RS-232/422/485 Port Wafer



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	TX+	DATA+	TX+
4	RTS	N/A	N/A	N/A
5	TXD	RX+	N/A	RX+
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

SMD 10P 1R 180D MALE P=1.25mm, Tin Plated, NY46, White Insulator
[Pinrex 712-73-10TWB0]

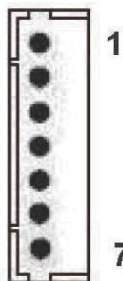
Table 27 CN22~CN25 COM3~6 RS-232 Port Wafer



Pin	Signal Name
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	+5V

SMD 10P 1R 180D MALE P=1.25mm, Tin Plated, NY46, White Insulator [Pinrex 712-73-10TWB0]

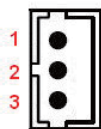
Table 28 CN14 Backlight Power Output Wafer



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

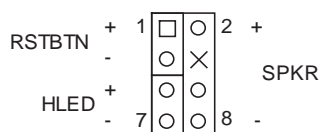
SMD 7P 90D P-1.25mm WAFER [YIMTEX 501MW1X07MTR-1R]
 * : BL_ADJ can be setting in BIOS setup.
 ** : Backlight Power can be selected by JP4.
 *** : BL_EN can be selected by JP2.

Table 29 FAN1 DC5V FAN Wafer



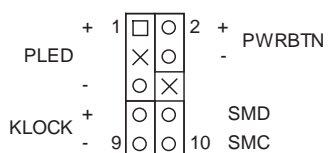
Pin	Signal
1	SENSE
2	+5V
3	GND
SMD 3P 180D P-1.25mm WAFER [Pinrex 712-73-03TWE0]	

Table 30 FP1 Front Panel 1 Pin Header



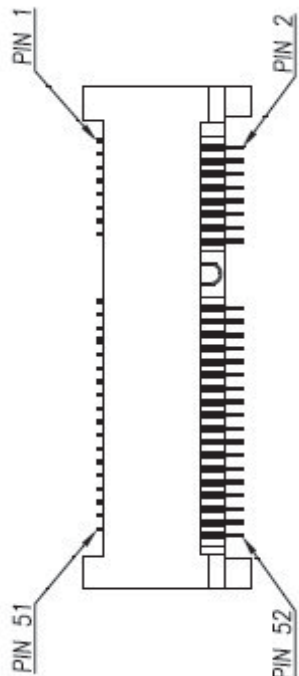
Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -
SMD 8P 2R MALE STRAIGHT TYPE Pitch:2.54mm NY 6T [YIMTEX 3362*04SANGR]			
Note : Internal Buzzer is enabled when Pin6-8 is shorted.			

Table 31 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	SMB_ALERT#
7	BATLOW#	8	SMBus Data
9	GND	10	SMBus Clock
SMD 10P 2R MALE STRAIGHT TYPE Pitch:2.54mm NY 6T[YIMTEX 3362*05SANGR]			

Table 32 MPCIE1 Mini-PCI Express v1.2 Socket

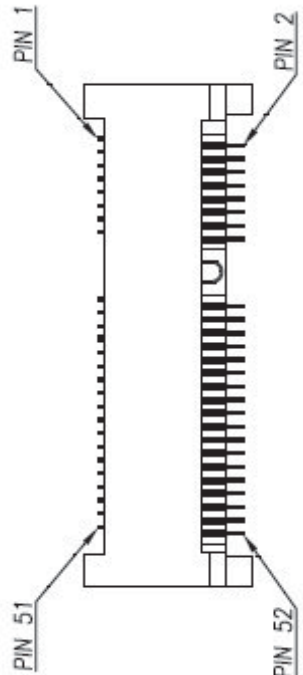


Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	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

MINI PCI-Express Connector, H:5.6mm, Gold Flash,
Tape Reel [FOXCONN AS0B221-S56Q-7H]

*: These pins are connected to CN7 SIM Interface directly

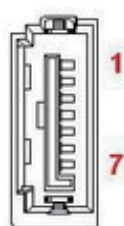
Table 33 MPCIE2 Mini-PCI Express v1.2 Socket



Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	Reserved
Ground	9	10	Reserved
REFCLK-	11	12	Reserved
REFCLK+	13	14	Reserved
Ground	15	16	Reserved
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

MINI PCI-Express Connector, H:9.9mm, 10u Gold Plating, Tape Reel [FOXCONN AS0B226-S99Q-7H]

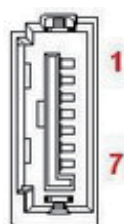
Table 34 SATA1 Serial ATA Port 0 Connector



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

[FOXCONN LD1807V-S52U]

Table 35 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]

Rear Panel Pin Assignments

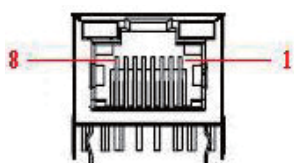


Figure 5 Rear Panel IO

Table 36 Rear Panel Connector List

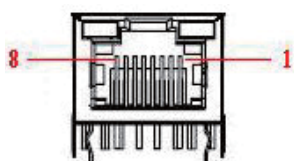
Label	Function
CN13	GbE LAN1 RJ-45 Connector
CN14	GbE LAN2 RJ-45 Connector
CN8	USB3.0 Port 1,2 Type-A Connector
CN9	USB3.0 Port 3,4 Type-A Connector
CN17	DP Connector
CN18	HDMI Connector

Table 37 CN13 GbE LAN1 RJ-45 Connector



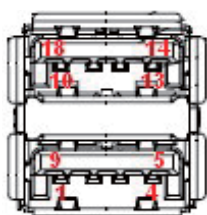
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-
RJ45+TFM+LED 10/100/1000 14P DIP 90° [UDE RT7-174AAM1A(XA)]			

Table 38 CN14 GbE LAN2 RJ-45 Connector



Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-
RJ45+TFM+LED 10/100/1000 14P DIP 90° [UDE RT7-174AAM1A(XA)]			

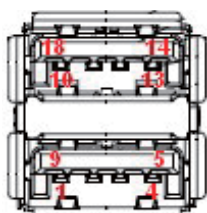
Table 39 CN8 USB3.0 Port-0,1 Type-A Connector



Pin	Signal Name	Pin	Signal Name
1	+USBA_VCC	10	+USBB_VCC
2	USBA_D-	11	USBB_D-
3	USBA_D-	12	USBB_D-
4	GND	13	GND
5	USBA_RX-	14	USBB_RX-
6	USBA_RX+	15	USBB_RX+
7	GND	16	GND
8	USBA_TX-	17	USBB_TX-
9	USBA_TX+	18	USBB_TX+

USB3.0x2, Double USB3.0 Type A Receptacle, 30u" Pd/Ni Plated + Gold flash, Blue, Tray [FOXCONN UEA1112C-8HS6-4F]
 * : The power source of +USBVCC can be selected by JP6.

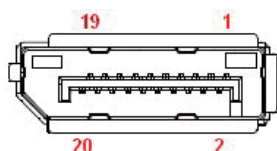
Table 40 CN9 USB3.0 Port-2,3 Type-A Connector



Pin	Signal Name	Pin	Signal Name
1	+USBA_VCC	10	+USBB_VCC
2	USBA_D-	11	USBB_D-
3	USBA_D-	12	USBB_D-
4	GND	13	GND
5	USBA_RX-	14	USBB_RX-
6	USBA_RX+	15	USBB_RX+
7	GND	16	GND
8	USBA_TX-	17	USBB_TX-
9	USBA_TX+	18	USBB_TX+

USB3.0x2, Double USB3.0 Type A Receptacle, 30u" Pd/Ni Plated + Gold flash, Blue, Tray [FOXCONN UEA1112C-8HS6-4F]
 * : The power source of +USBVCC can be selected by JP6.

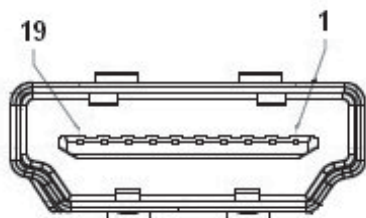
Table 41 CN17 DisplayPort Connector



Pin	Signal Name	Pin	Signal Name
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

DisplayPort Receptacle (Female) SMT type, 20-pin, Gold 30", 90°, Tray [WIN WIN WDPE-20F3L1BU3]

Table 42 CN18 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
HDMI Receptacle with Flange, selective gold / matte tin 15u", Black, HDMI Certification [ZI HUI 282-1921Q30243]	

Chapter 3

System Installation

■ 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.

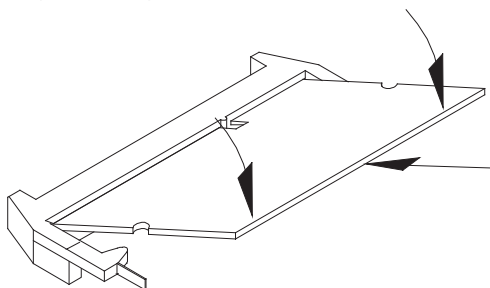


Figure 6 Align the SO-DIMM Memory Module with the onboard socket

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

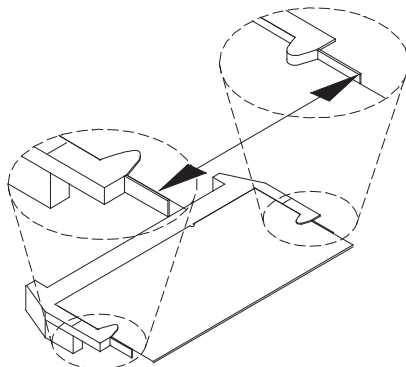


Figure 7 Press down on the SO-DIMM Memory Module to lock it in place

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 43 BIOS Main Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Product Information					
Product Name	KEEX-1854				
BIOS Version	R0.07 (x64)				
BIOS Build Date	09/17/2015				
TXE FW Version	02.00.00.2073				
CPU Information				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Intel® Celeron® CPU N3160 @ 1.60GHz					
Microcode Revision	34f				
Processor Cores	4				
Memory Information					
Total Size	4096 MB (DDR3L)				
Frequency	1600 MHz				
System date	[Wed 11/18/2015]				
System time	[10:34:48]				
Access Level	Administrator				
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

■ Advanced Menu

Table 44 Advanced Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Onboard LAN1 Controller		[Enabled]		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Onboard LAN1 Boot		[Disabled]			
Onboard LAN2 Controller		[Enabled]			
Onboard LAN2 Boot		[Disabled]			
Audio Controller		[Enabled]			
> Display Configuration					
> Super IO Configuration					
> CPU Chipset Configuration					
> SATA Configuration					
> USB Configuration					
> DIO Configuration					
> H/W Monitor					
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Onboard LAN 1 Controller

Options: Disabled, Enabled

Onboard LAN 1 Boot

Options: Disabled, Enabled

Onboard LAN 2 Controller

Options: Disabled, Enabled

Onboard LAN 2 Boot

Options: Disabled, Enabled

Audio Controller

Options: Disabled, Enabled

Table 45 Advanced Menu – Display Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Display Configuration				→←: Select Screen	
				↑↓: Select Item	
Primary Display		[IGD]		Enter: Select	
UWA Frame Buffer Size		[256MB]		+/-: Change Opt.	
DVMT Pre-Allocated		[64M]		F1: General Help	
DVMT Total Gfx Mem		[256MB]		F2: Previous Values	
Primary IGFX Boot Display		[VBIOS Default]		F3: Optimized Defaults	
VGA/LVDS Switch		[VGA]		F4: Save & Reset	
				ESC: Exit	
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Primary Display

Options: IGD, PCIe, Auto

UMA Frame Buffer Size

Options: 128MB, 256MB, 512MB

DVMT Pre-Allocated

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

DVMT Total Gfx Mem

Options: 128M, 256M, Max

Primary IGFX Boot Display

Options: VBIOS Default, DP, HDMI, VGA/LVDS

Secondary IGFX Boot Display

Options: Disabled, DP, HDMI, VGA/LVDS

VGA/LVDS Switch

Options: VGA, LVDS

LVDS Panel Type

Options: 640x480 18Bit 1CH, 800x480 18Bit 1CH, 800x600 18Bit 1CH, 1024x768 18Bit 1CH, 1440x900 18Bit 2CH, 1600x900 18Bit 2CH, 1024x600 18Bit 1CH, 1366x768 18Bit 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

LVDS Backlight Control - Voltage

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

Table 46 Advanced Menu – Super IO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Super IO Chip Parameters >Serial Port 1 Configuration >Serial Port 2 Configuration >Serial Port 3 Configuration >Serial Port 4 Configuration >Serial Port 5 Configuration >Serial Port 6 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
				Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.	

Table 47 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration

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

Options: RS232, RS422, RS485

RS485 Duplex Mode

Options: Half Duplex, Full Duplex

RS485 Auto Flow Control

Options: Disabled, Enabled

Table 48 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Serial Port 2 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Serial Port		[Enabled]			
Device Settings		IO=2F8h; IRQ=3;			
Change Settings		[Auto]			
Serial Port 1 Type		[RS232]			
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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;

Serial Port 2 Type

Options: RS232, RS422, RS485

RS485 Duplex Mode

Options: Half Duplex, Full Duplex

RS485 Auto Flow Control

Options: Disabled, Enabled

Table 49 Advanced Menu – Super IO Configuration – Serial Port 3 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Serial Port 3 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Serial Port		[Enabled]			
Device Settings		IO=3E8h; IRQ=7;			
Change Settings		[Auto]			
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=3E8h; IRQ=7;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

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

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 50 Advanced Menu – Super IO Configuration – Serial Port 4 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Serial Port 4 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Serial Port	[Enabled]				
Device Settings	IO=2E8h; IRQ=7;				
Change Settings	[Auto]				
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=2E8h; IRQ=7;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

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

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 51 Advanced Menu – Super IO Configuration – Serial Port 5 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Serial Port 5 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Serial Port	[Enabled]				
Device Settings	IO=2F0h; IRQ=7;				
Change Settings	[Auto]				
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=2F0h; IRQ=7;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

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

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 52 Advanced Menu – Super IO Configuration – Serial Port 6 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Serial Port 6 Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Serial Port	[Enabled]				
Device Settings	IO=2E0h; IRQ=7;				
Change Settings	[Auto]				
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=2E0h; IRQ=7;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

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

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 53 Advanced Menu – CPU Chipset Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
CPU Chipset Configuration				→←: Select Screen	
EIST		[Enabled]		↑↓: Select Item	
CPU C state Report		[Enabled]		Enter: Select	
Max CPU C-state		[C7]		+/-: Change Opt.	
SOix		[Disabled]		F1: General Help	
Limit CPUID Maximum		[Disabled]		F2: Previous Values	
Intel Virtualization Technology		[Disabled]		F3: Optimized Defaults	
				F4: Save & Reset	
				ESC: Exit	
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EIST

Options: Disabled, Enabled

CPU C state Report

Options: Disabled, Enabled

Max CPU C-state

Options: C7, C6, C1

SOix

Options: Disabled, Enabled

Limit CPUID Maximum

Options: Disabled, Enabled

Intel Virtualization Technology

Options: Disabled, Enabled

Table 54 Advanced Menu – SATA Configuration

BIOS SETUP UTILITY				
Main	Advanced	Power	Security	Boot Save & Exit
SATA Configuration				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit
SATA Controller				[Enabled]
SATA Interface Speed				[Gen3]
Serial ATA Port 1				SanDisk SD8SBA (256.0GB)
Port 1				[Enabled]
Serial ATA Port 2				Empty
Port 2				[Enabled]
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.				

SATA Controller

Options: Enabled, Disabled

SATA Interface Speed

Options: Gen1, Gen2, Gen3

Port 1

Options: Enabled, Disabled

Port 2

Options: Enabled, Disabled

Table 55 Advanced Menu – USB Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
USB Configuration				→←: Select Screen	
USB Devices:				↑↓: Select Item	
1 Keyboard, 1 Mouse, 1 Hub				Enter: Select	
Legacy USB Support		[Enabled]		+/-: Change Opt.	
XHCI Legacy Support		[Enabled]		F1: General Help	
XHCI Hand-off		[Enabled]		F2: Previous Values	
USB Mass Storage Driver Support		[Enabled]		F3: Optimized Defaults	
				F4: Save & Reset	
				ESC: Exit	
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Legacy USB Support

Options: Enabled, Disabled, Auto

XHCI Legacy Support

Options: Enabled, Disabled

XHCI Hand-off

Options: Enabled, Disabled

USB Mass Storage Driver Support

Options: Disabled, Enabled

Table 56 Advanced Menu – DIO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
DIO Configuration				<div>→←: Select Screen</div> <div>↑↓: Select Item</div> <div>Enter: Select</div> <div>+/-: Change Opt.</div> <div>F1: General Help</div> <div>F2: Previous Values</div> <div>F3: Optimized Defaults</div> <div>F4: Save & Reset</div> <div>ESC: Exit</div>	
User Configuration		[Disabled]			
DI_1		1			
DI_2		1			
DI_3		1			
DI_4		1			
DO_1		0			
DO_2		0			
DO_3		0			
DO_4		0			
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User Configuration

Options: Enabled, Disabled

DO_1

Options: Output Low, Output High

DO_2

Options: Output Low, Output High

DO_3

Options: Output Low, Output High

DO_4

Options: Output Low, Output High

Table 57 Advanced Menu – H/W Monitor

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Pc Health Status				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
CPU Warning Temperature		[Disabled]			
>Smart FAN Configuration					
CPU Temperature		: +48 C			
System Temperature		: +47 C			
CPU Fan Speed		: N/A			
+VCORE		: +1.013 V			
+VIN		: +12.268 V			
+5V		: +5.066 V			
+VMEM		: +1.389 V			
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CPU Warning Temperature

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

Smart FAN Configuration

■ CPU FAN Setting

Options: Manual, Smart

Table 58 Power Manu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Power Configuration				<div>→←: Select Screen</div> <div>↑↓: Select Item</div> <div>Enter: Select</div> <div>+/-: Change Opt.</div> <div>F1: General Help</div> <div>F2: Previous Values</div> <div>F3: Optimized Defaults</div> <div>F4: Save & Reset</div> <div>ESC: Exit</div>	
ACPI Sleep State		[S3 (Suspend to RAM)]			
Restore AC Power Loss		[Power Off]			
Power Saving Mode		[Disabled]			
Resume Event control					
Resume from S3 By PS/2 Keyboard		[Disabled]			
Resume from S3 By PS/2 Mouse		[Disabled]			
Resume By LAN Device		[Disabled]			
Resume By PCI-E Device		[Disabled]			
Resume By Ring Device		[Disabled]			
Resume By RTC Alarm		[Disabled]			
>WatchDog Timer Configuration					
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

ACPI Sleep State

Options: Suspend Disabled, S3 (Suspend to RAM)

Restore AC Power Loss

Options: Power Off, Power On, Last State

Power Saving Mode

Options: Disabled, EUP Enabled

Resume from S3 By PS/2 Keyboard

Options: Disabled, Enabled

Resume from S3 By PS/2 Mouse

Options: Disabled, Enabled

Resume By LAN Device

Options: Disabled, Enabled

Resume By PCI-E Device

Options: Disabled, Enabled

Resume By Ring Device

Options: Disabled, Enabled

Resume By RTC Alarm

Options: Disabled, Enabled

WatchDog Timer Configuration■ **WDT Function** [Disabled]

Options: Disabled, Enabled

■ Security Menu

Table 59 Security Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup</p> <p>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</p> <p>The password length must be in the following range:</p> <p>Minimum Length 3</p> <p>Maximum length 20</p> <p>Administrator Password</p> <p>User Password</p> <p>HDD Security Configuration:</p> <p>P0: SanDisk SD8S</p>				<p>→←: Select Screen</p> <p>↑↓: Select Item</p> <p>Enter: Select</p> <p>+/-: Change Opt.</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Defaults</p> <p>F4: Save & Reset</p> <p>ESC: Exit</p>	
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

■ Boot Menu

Table 60 Boot Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Boot Configuration				→←: Select Screen	
Full Screen LOGO Display		[Disabled]		↑↓: Select Item	
Setup Prompt Timeout		1		Enter: Select	
Bootup NumLock State		[On]		+/-: Change Opt.	
Keyboard Detect Warning		[Enabled]		F1: General Help	
CSM Support		[Enabled]		F2: Previous Values	
Boot Option Filter		[Legacy Only]		F3: Optimized Defaults	
Boot Option Priorities				F4: Save & Reset	
Boot Option #1		[P0: SanDisk SD8SBAT256G1122]		ESC: Exit	
Hard Drive BBS Priorities					
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Full Screen LOGO Display

Options: Disabled, Enabled

Bootup Numlock State

Options: On, Off

CSM Support

Options: Enabled, Disabled

Boot Option Filter

Options: UEFI and Legacy, Legacy only, UEFI only

Boot Option #1

Options: P0: SanDisk SD8SBAT256G1122, Disabled

■ Save & Exit Menu

Table 61 Save & Exit Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Security	Boot	Save & Exit
Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults				→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Reset ESC: Exit	
Version 2.17.1249. Copyright (C) 2015, American Megatrends, Inc.					

Save Changes and Exit

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

Discard Changes and Exit

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

Discard Changes

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

Load Optimal Defaults

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

Load Failsafe Defaults

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

Chapter 5

Driver Installation

If your KEEEX-1850 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 KEEEX-1850 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-1850 DOS DIO sample program
//Please compile with Microsoft(R) Visual C++ Version 1.5 & MASM611
//to utilized the program
//
//Access Method
// 32 bits memory address access
//
//0:Low 1:High
//DI_1: memory address 0xFED8C400 bit0
//DI_2: memory address 0xFED8C418 bit0
//DI_3: memory address 0xFED8C438 bit0
//DI_4: memory address 0xFED8C408 bit0
//
//DO_1: memory address 0xFED8C428 bit1
//DO_2: memory address 0xFED8C420 bit1
//DO_3: memory address 0xFED8C440 bit1
//DO_4: memory address 0xFED8C410 bit1
//
//*****
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

typedef unsigned long    DWORD;

DWORD MEM_BASE_ADDRESS = 0xFED88000;
DWORD addr_offset[8] = {0x4400, //DI_1
                        0x4418, //DI_2
                        0x4438, //DI_3
```

```

        0x4408, //DI_4
        0x4428, //DO_1
        0x4420, //DO_2
        0x4440, //DO_3
        0x4410}; //DO_4

DWORD addr=0;

int main()
{
    DWORD RetVal = 0;
    DWORD gGpioLvValue = 0;
    int i=0;

    //Read the DI pin 1~4 value
    into_PT_mode();//into the protect mode
    printf("Read DI_1~4 value\n");
    for (i=0; i<4; i++)
    {
        RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
        gGpioLvValue = RetVal & 0x1;
        printf("DI_%d = %d\n",i+1 ,gGpioLvValue > 0);
    }
    into_RL_mode();
    system("pause");

    //Read the DO pin 1~4 value
    into_PT_mode();
    printf("Read DO_1~4 value\n");
    for (i=4; i<8; i++)
    {
        RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
        gGpioLvValue = RetVal & 0x2;
        printf("DO_%d = %d\n",i-3 ,gGpioLvValue > 0);
    }
    into_RL_mode();
    system("pause");

    //Write the DO pin 1~4 to High

```

```

into_PT_mode();
printf("Write DO_1~4 value to High\n");
for (i=4; i<8; i++)
{
    RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
    gGpioLvValue = RetVal | 0x2;
    write_mem_dword(MEM_BASE_ADDRESS + addr_offset[i], gGpioLvValue);
}
printf("Read DO_1~4 value\n");
for (i=4; i<8; i++)
{
    RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
    gGpioLvValue = RetVal & 0x2;
    printf("DO_%d = %d\n",i-3 ,gGpioLvValue > 0);
}
into_RL_mode();
system("pause");

//Write the DO pin 1~4 to Low
into_PT_mode();
printf("Write DO_1~4 value to Low\n");
for (i=4; i<8; i++)
{
    RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
    gGpioLvValue = RetVal & 0xFFFFFFF0;
    write_mem_dword(MEM_BASE_ADDRESS + addr_offset[i], gGpioLvValue);
}
printf("Read DO_1~4 value\n");
for (i=4; i<8; i++)
{
    RetVal = read_mem_dword(MEM_BASE_ADDRESS + addr_offset[i]);
    gGpioLvValue = RetVal & 0x2;
    printf("DO_%d = %d\n",i-3 ,gGpioLvValue > 0);
}
into_RL_mode();

return 0;
}

```

Appendix B

WatchDog Timer Sample Code

```
//*****
//*****
//**
**
//**          (C) Copyright 2013-2015, Quanmax, Inc.          **
//**
**
//**          All Rights Reserved.          **
//**
**
//**          5F, No.455, Ti-Ding Blvd., Sec. 2,          **
//**          Neihs District, Taipei, Taiwan 114          **
//**          **
//**          Phone: +886-2-2799-2789
**
//**
**
//*****
//*****
//=====
=====//
//KEEX-1850 DOS Watchdog sample program          //
//Please compile with Turbo C 3.0 to utilized the program          //
//=====
=====//

#include<stdio.h>

#define SIO_CONFIG_INDEX 0x2e
#define SIO_CONFIG_DATA  SIO_CONFIG_INDEX+1

void UnlockSIO()
{
    outp(SIO_CONFIG_INDEX,0x87);
    outp(SIO_CONFIG_INDEX,0x87);
}

void LockSIO()
```

```

{
    outp(SIO_CONFIG_INDEX,0xAA);
}

void SetLDN(int LDN)
{
    outp(SIO_CONFIG_INDEX, 0x07);
    outp(SIO_CONFIG_DATA, LDN);
}

void main()
{
    int value = 0;

    UnlockSIO();
    SetLDN(0x08);

    //Enable WDT
    outp(SIO_CONFIG_INDEX,0x30);
    outp(SIO_CONFIG_DATA,0x01);

    //Set Timer unit(0xF0 bit3(0: 1sec, 1: 60 sec) of watchdog timer by setting
    this bit)
    outp(SIO_CONFIG_INDEX,0xF0);
    value=inp(SIO_CONFIG_DATA);
    outp(SIO_CONFIG_DATA,(value & 0xF7)); //set unit sec.

    //Set Timer Value(0xF1 Time of watchdog timer)
    outp(SIO_CONFIG_INDEX,0xF1);
    outp(SIO_CONFIG_DATA,0x14); //set to 20 sec (0x14)

    LockSIO();
}

```