



Single Board Computer  
**PEAK 872VL2**  
User's Manual

Aug-02-2010 Edit

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For any update, please visit our website: [www.nexcom.com](http://www.nexcom.com)*

## **Preface**

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Version 1.2

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### **Acknowledgements**

The PEAK 872VL2 series is a trademark of NEXCOM international CO., LTD. All other product names mentioned herein are registered trademarks of their respective owners.

### **Regulatory Compliance Statements**

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

### **Federal Communications Commission (FCC) For Class A Device**

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 instructions, 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.

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## **CE Certification**

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

### **WARNINGS**

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

### **CAUTION**

Electrostatic discharge (ESD) can damage NSA components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

## **Safety Information**

Before installing and using the PEAK 872VL2, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a hearing device.

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# **Chapter 1**

## **General Information**

## **1.1 Main Feature**

### **PICMG 1.3 Full size Single Board Computer**

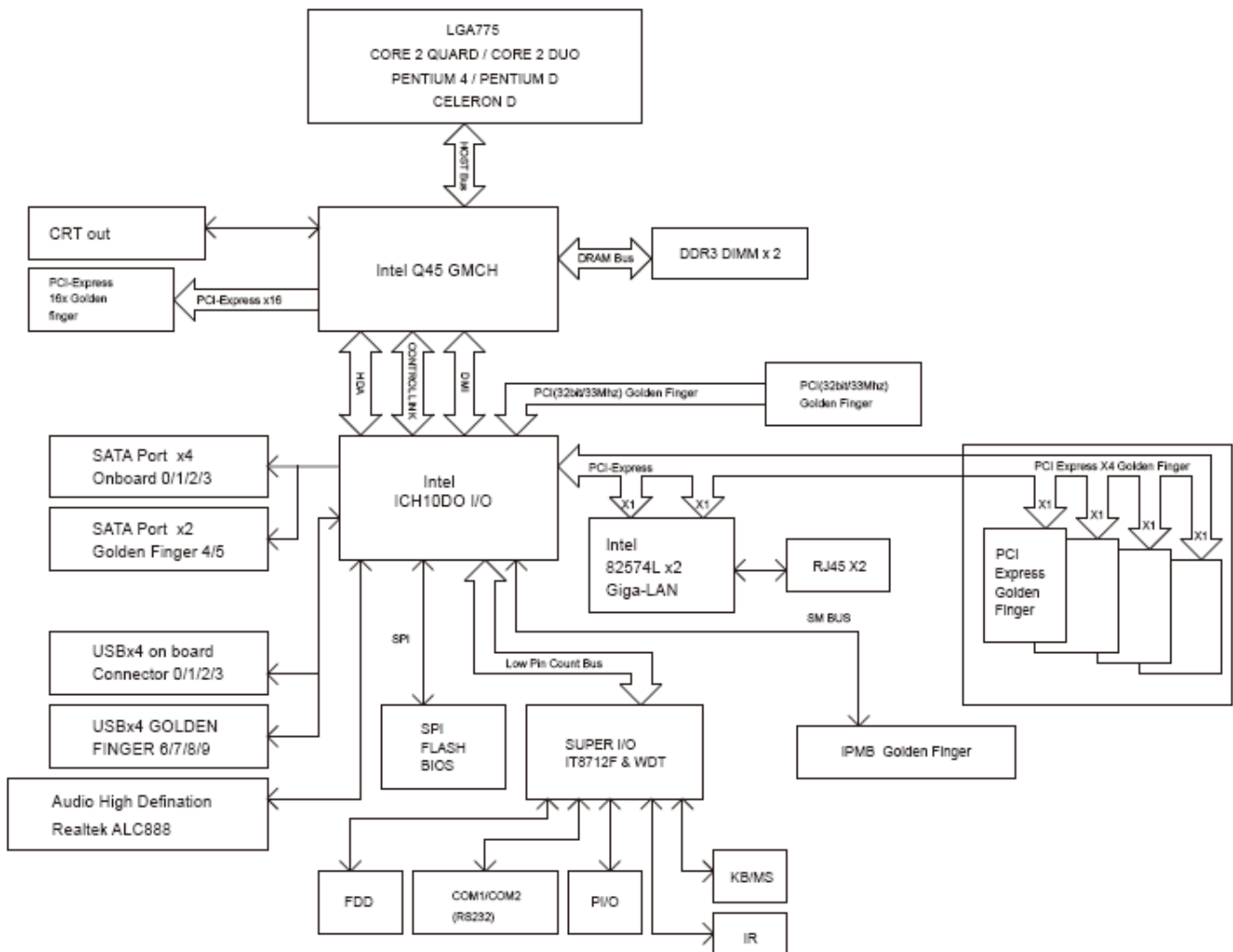
PEAK872VL2 is PICMG 1.3 full-size Single Board Computer (SBC), which supports Intel® Core 2 Quad/ Core 2 Duo processors. It features Intel® Q45 and ICH10 DO chipsets supporting speed up to 3.0 GHz and Hyper-Threading technology.

The Intel® Q45 supports dual channel non-ECC DDR3 800/1066 MHz DRAM in tow DIMM slots and an integrated graphics controller. The Intel® ICH10 DO manages UltraATA 100 & SATA HDD ports, parallel ports and floppy port. Furthermore, it supports other versatile I/O ports such as two serial ports, eight USB ports and two PCIe Gigabit LAN ports.

NEXCOM offers the following 2U and 4U Backplanes that support the PICMG 1.3 specification:

- 2U Backplane: NBP 2U220 / NBP 2U040
- 4U Backplane: NBP 14570 / NBP 14111 / NBP 14210

## 1.2 Specifications



**Figure 1.1: Block Diagram of PEAK 872VL2**

### CPU support

- Support Intel® LGA775 Core™ 2 Quad, Core™ 2 Duo, **Pentium® 4/ Pentium® D/ Celeron® D processors** with 533/800/1066/1333 MHz
- Intel® Embedded Processor List (Intel® Longevity CPU):
  - Intel® Core™ 2 Quad Processor (Q9400)
  - Intel® Core™ 2 Duo Processor (E8400 & E7400 & E6400 & E4300)
  - Intel® **Pentium® D Processor (E2160)**
  - Intel® Celeron® Processor 440

## **Main Memory**

- ◆ 2 x 240-pin DIMM, for up to 4 GB dual channel Non-ECC DDR3 800/1066/1333 SDRAM

## **Chipset**

- Intel® Q45 Graphic Controller Hub (GMCH)
- Intel® ICH10 DO

## **BIOS**

- Award system BIOS
- Plug & Play support
- Advanced Power Management and Advanced Configuration & Power Interface support

## **On-board LAN**

- 2x Intel 82574L PCI Express Gigabit Ethernet Controllers
- Support Boot From LAN (PXE)
- 2x RJ45 with LED

## **Display**

- Intel® Q45 GMCH Integrated Intel® GMA4500, Max 128 MB of DVMT for Graphics Memory Allocation
- ◆ Analog display support up to 2048x1536 @ 75Hz for CRT

## **Audio**

- ◆ HD Audio Codec, Realtek ALC888
- ◆ 3x (1x4-pin) headers for Line-in / Line-out / MIC-in

## **Watchdog Timer**

- ◆ 1-minute increments from 1 to 255 minutes
- ◆ 1-second increments from 1 to 255 seconds
- ◆ On-chip RTC with battery backup
- ◆ 1 x External Li-Ion battery

## **I/O Interface**

- ◆ USB 2.0: 8 ports (4 on board, 4 to backplane)
- ◆ Serial port: 2 port, with 2x5pin headers (COM 1 and COM 2)
- ◆ SATA HDD: 6 ports, Support RAID 0/1/5/10 and Intel Matrix Storage Technology (Intel® MST)
- ◆ Parallel port: 1 x 26-pin connector
- ◆ Floppy: 1 x 34-pin connector
- ◆ IrDA: 1 x 5-pin header
- ◆ GPIO: Supports 4 sets general purpose I/O each with TTL level (5 V) interface
- ◆ On-board buzzer x1



- ◆ Power LED / Power On / Reset / SMBUS : 2 x 8 pin header
- ◆ 5-pin for key lock/power LED / HDD Power LED
- ◆ 1 x 4-pin fan connector (for CPU); 2 x 3-pin fan connectors (for System)
- ◆ IPMB interface through PICMG 1.3 Golden-finger
- ◆ I/O On SBC Bracket
  - 1 x VGA DB-15 connector
  - 2 x RJ45 Gigabit Ethernet LAN port
  - 1 x PS/2 Keyboard/Mouse

### System Monitor

- 4 Voltages (+3.3V, +5V, +12V, Vcore)
- 2 Temperatures (For CPU and System)
- 3 FAN speed monitors (1 for CPU and 2 for System FAN)

### Dimensions

- ◆ PICMG 1.3 SHB
- ◆ Dimension: 338.58mm (L) x 126.39mm (W) (13.3" x 4.9")

### Power Input

- Power source from backplane through golden finger
- Support ATX/AT power supplies
- +12V/ +5V / +3.3V / +5Vsb

### Environment

- Board level operating temperatures: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: 10%~90%, (Non-condensing)

### Certifications

- CE approval
- FCC class A

## Ordering Information

**PEAK872VL2 (P/N: 10P0872VL00X0)** RoHS Compliant

PICMG 1.3 Full-Size SHB, Intel® Q45 Chipset, LGA775 Core 2 Quad / Core 2 Duo / Pentium 4 Pentium D / Celeron with 533/800/1066/1333 MHz FSB, 32bit/33MHz PCI, 2x DDR3 DIMM

VGA integrated, 2x Intel 82574L PCI Express GbE/6x SATA

## **1.3 Power Consumption Measurement**

Power Type	+12V	+3.3V	+5VSB	+5V
Consumed watts(Item: W )	130	31.193	2.058	52.696
Consumed currents (Item A )	10.833	9.452	0.411	10.54
Actually required currents (Item A/0.8 )	13.542	11.815	0.515	13.174

### NOTE:

1. Full Loading: Utilize CPU 100% with Burn-in test running
2. Light Loading: Utilize CPU loading below 5% without data or application running.

## 1.4 Board Layout

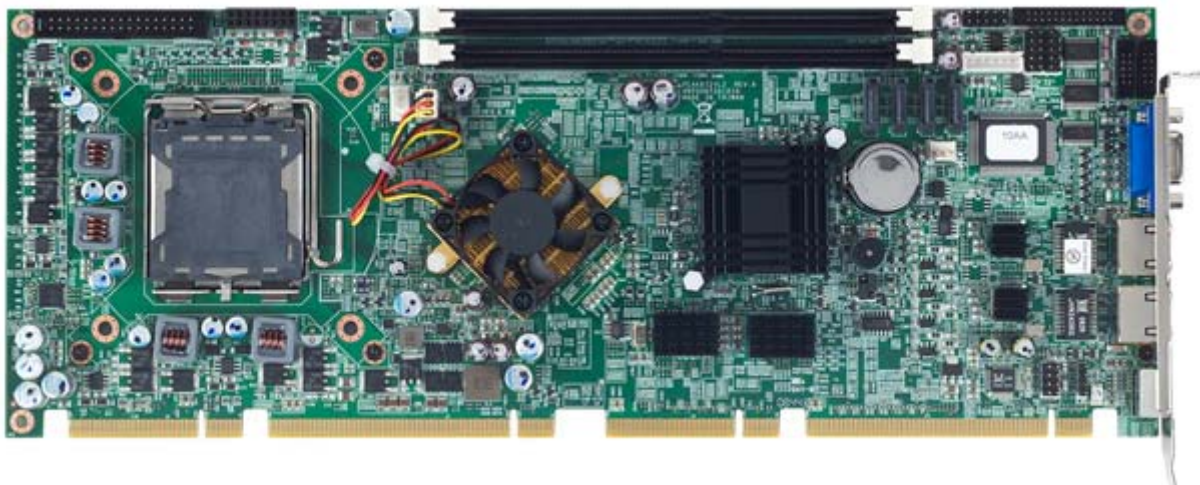


Figure 1.2: Overview of PEAK 872VL2

## 1.5 Board Dimensions

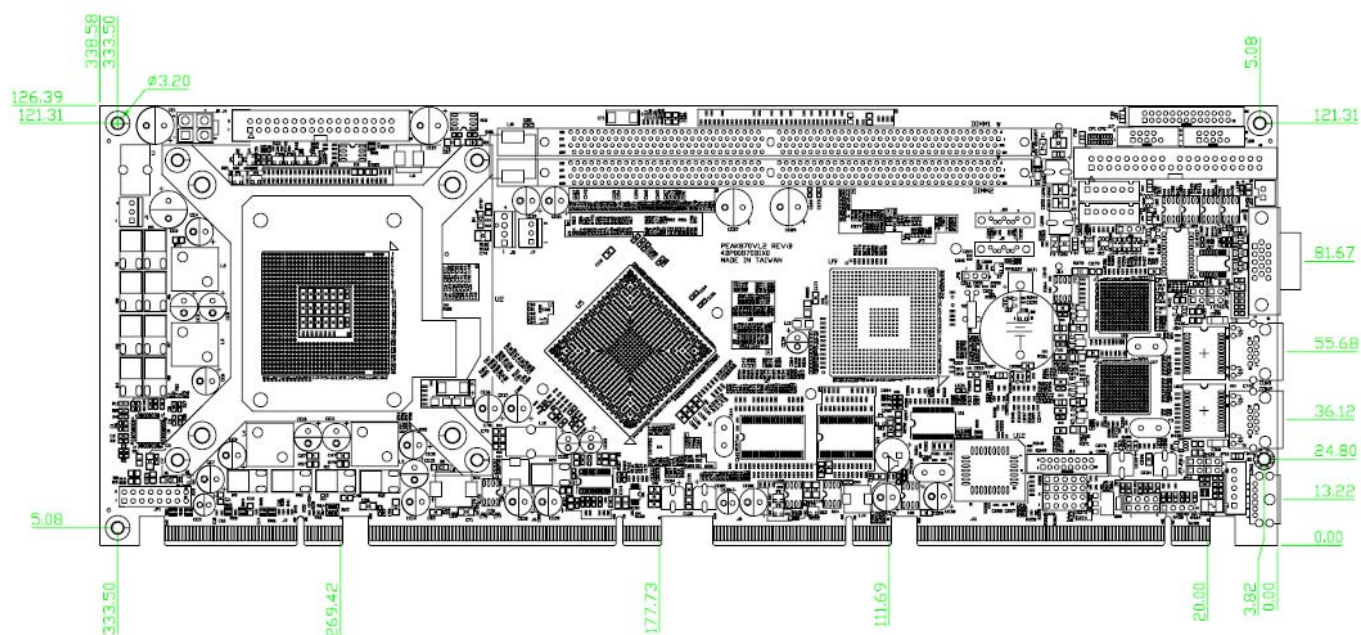


Figure 1.3: Mechanical Drawing of the PEAK-872

## **Chapter 2**

# **Jumper Setting**

This chapter of the User's Manual describes how to set jumpers.

*Note: The procedures that follow are generic for PEAK 872VL2.*

## **2.1 Before You Begin**

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- ◆ A Philips screwdriver
- ◆ A flat-tipped screwdriver
- ◆ A set of jewelers Screwdrivers
- ◆ A grounding strap
- ◆ An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

## **2.2 Precautions**

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself:

- ◆ Always disconnect the unit from the power outlet whenever you are working inside the case.
- ◆ If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- ◆ Hold electronic circuit boards (such as the PEAK 872VL2 board) by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- ◆ Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- ◆ Use correct screws and do not over tighten screws.

## 2.3 Setting Jumpers

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **SHORT**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **OPEN**. Please see the following illustrations

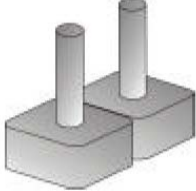
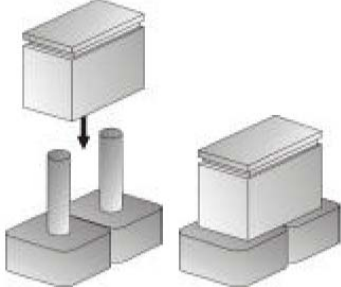
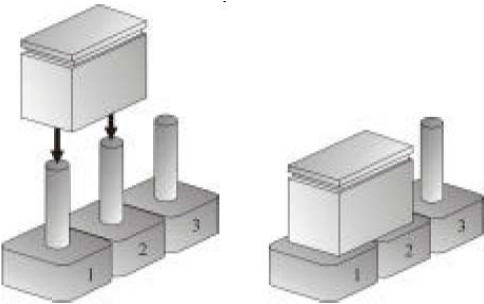
<p>The illustrations on the right show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is <b>SHORT</b>. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is <b>OPEN</b>.</p>		
	Open (Off)	Short (On)
<p>These illustrations show a 3-pin jumper. Pins 1 and 2 are <b>SHORT</b>.</p>		

Table 2-1: Setting Jumpers

## 2.4 Location of Jumpers

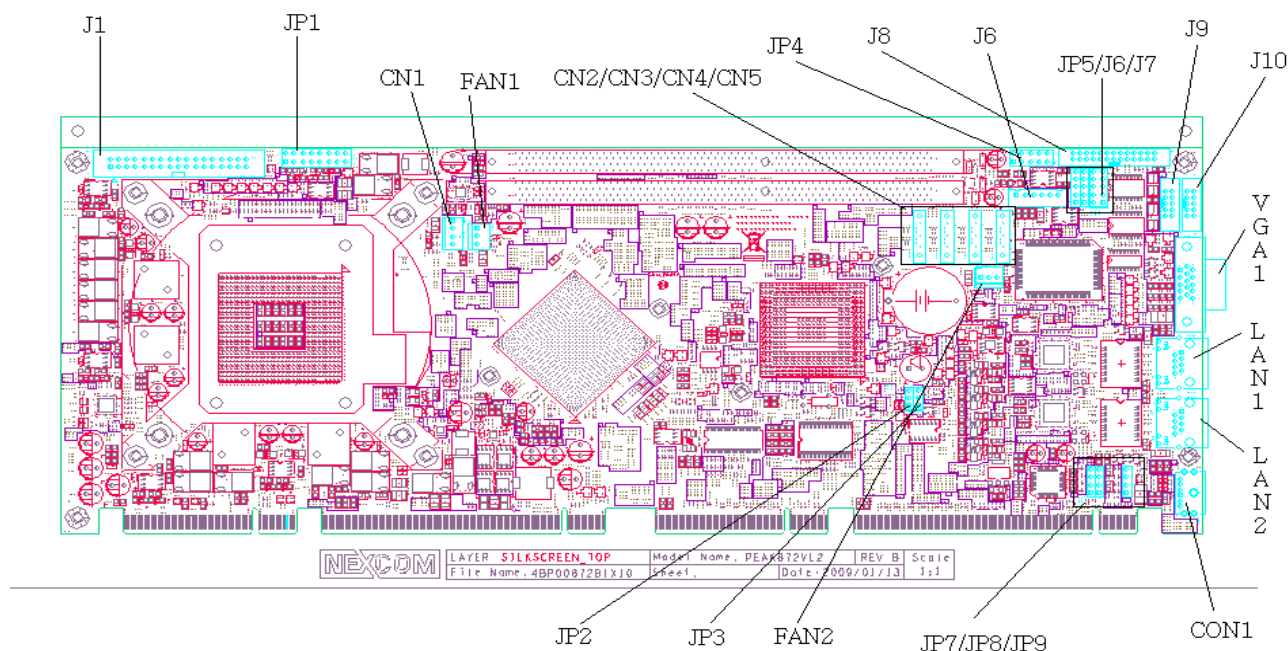
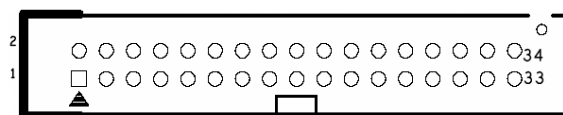


Figure 2-1: Jumper Location

### (1) J1 : Floppy Connector

A. Connector size : 2 x 17 = 34 pins, 2.54 mm, 180°, BOX Header

B. Connector location



C. Connector pin definition

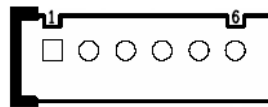
Pin	Definition	Pin	Definition
1	GND	18	DIR#
2	DENSEL#	19	GND
3	GND	20	STEP#
4	NC	21	GND
5	GND	22	Write Data#
6	NC	23	GND
7	GND	24	WGATE#
8	INDEX#	25	GND
9	GND	26	TK00#
10	MOTEA#	27	GND
11	GND	28	WPT#

12	DRVB#	29	GND
13	GND	30	Read Data#
14	DRVA#	31	GND
15	GND	32	SIDE1#
16	MOTEB#	33	GND
17	GND	34	DSKCHG#

## (2) J6 : USB 0/1 Connector

A . Connector size : 1 X 6 = 6 Pin , 2.50mm ,180°, JST Connector

B . Connector location



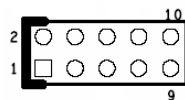
C .Connector pin definition

Pin	Definition	Pin	Definition
1	+5VSB	4	Data 1-
2	Data 0-	5	Data 1+
3	Data 0+	6	GND

## JP4 : USB 2/3 Connector

A . Connector size: 2 X 5 = 10 Pin, 2.54mm, 180°, PIN header

B . Connector location



C. Connector pin definition

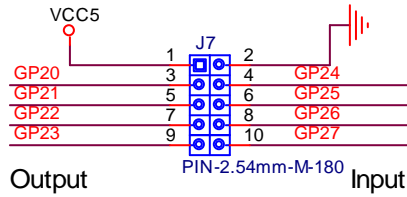
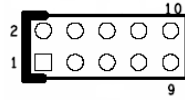
Pin	Definition	Pin	Definition
1	+5VSB	6	Data 3+
2	+5VSB	7	GND
3	Data 2-	8	GND
4	Data 3-	9	NC
5	Data 2+	10	(USB_OC23# )Default NC

## (3) J7 : GPIO Pinhead

A . Connector size : 2X5 = 10 PIN , 2.54mm , 180° , PIN Header

B . Connector location





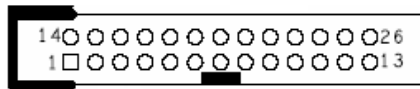
#### C . Connector pin definition

Pin	Definition	Pin	Definition
1	+5V	6	GP22_IN_1(PIN25)
2	GND	7	GP25_OUT_2(PIN 22)
3	GP27_OUT_0(PIN 20)	8	GP21_IN_2(PIN26)
4	GP23_IN_0(PIN24)	9	GP24_OOU_3(PIN23)
5	GP26_OUT_1(PIN 21)	10	GP20_IN_3(PIN27)

#### (4) JP8 : PIO connector

A . Connector size : 2 X 13 = 26 Pin ,2.0 mm, 180° ,BOX Header

B . Connector location



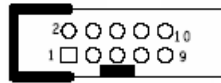
#### C . Connector pin definition

Pin	Definition	Pin	Definition
1	Line Print Strobe	14	Auto Feed#
2	Parallel Data 0	15	Error#
3	Parallel Data 1	16	Initialize#
4	Parallel Data 2	17	Select Input#
5	Parallel Data 3	18	GND
6	Parallel Data 4	19	GND
7	Parallel Data 5	20	GND
8	Parallel Data 6	21	GND
9	Parallel Data 7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper empty	25	GND
13	Select	26	NC

### (5) J9/J10 : COM 1/ COM 2 connector

A . Connector size : 2X5 = 10 Pin , 2.0mm ,180°,BOX header

B . Connector location



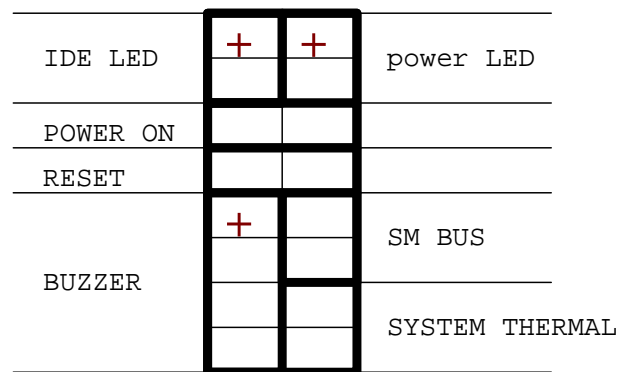
C . Connector pin definition

Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	NC

### (6) JP1 : IDE LED/ POWER LED / POWER ON / RESET / SM BUS / System Thermal Pin head

A . Connector size : 2X8 = 16 Pin , 2.54mm ,180°,PIN header

B . Connector location



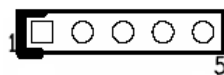
C . Connector pin definition

Pin	Definition	Pin	Definition
1	+5V	9	+5V
2	+5V	10	SMB_ Data
3	IDE_LED	11	GND
4	GND	12	SMB_ Clock
5	Power ON	13	GND
6	GND	14	Thermal Pin
7	Reset	15	Speaker
8	GND	16	Thermal GND

### (7) Keyboard Lock (JP5)

A . Connector size : 1X5 = 5 PIN , 2.54mm , 180°, PIN Header

B . Connector location



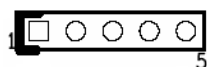
### C .Connector pin definition

Pin	Definition	Pin	Definition
1	+5V	4	Keyboard Lock
2	NC	5	GND
3	GND		

## (8) IR (JP6)

A . Connector size : 1X5 = 5 PIN , 2.54mm , 180°, PIN Header

B . Connector location



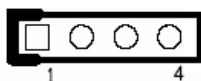
### C .Connector pin definition

Pin	Definition	Pin	Definition
1	+5V	4	GND
2	CIRRX	5	IRTX
3	IRRX		

## (9) Line in (JP7)

A . Connector size : 1X4 = 4 PIN , 2.54mm , 180°, PIN Header

B . Connector location



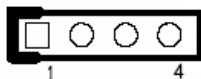
### C .Connector pin definition

Pin	Definition	Pin	Definition
1	LINEIN_L	3	LINEIN JD
2	GND	4	LINEIN_R

## (10) Line out (JP8)

A . Connector size : 1X4 = 4 PIN , 2.54mm , 180°, PIN Header

B . Connector location



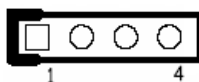
### C .Connector pin definition

Pin	Definition	Pin	Definition
1	LINEOUT_L	3	LINEOUT_JD
2	GND	4	LINEOUT_R

### (11) MIC in (JP9)

A . Connector size : 1X4 = 4 PIN , 2.54mm , 180°, PIN Header

B . Connector location



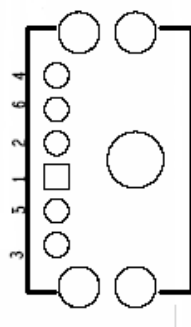
C .Connector pin definition

Pin	Definition	Pin	Definition
1	MICIN_L	3	MICIN_JD
2	GND	4	MICIN_R

### (12) Key board + mouse Connector (CON1)

A . Connector size : MINI DIN 6 Pin Connector

B . Connector location



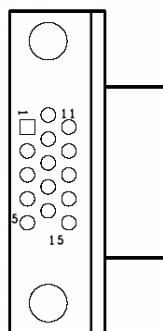
C .Connector pin definition

Pin	Definition	Pin	Definition
1	Mouse Data	4	Keyboard Clock
2	Keyboard Data	5	+5VSB
3	Mouse Clock	6	GND

### (13) VGA Connector(VGA1)

A . Connector size : VGA DSUB 15 Pin Connector

B . Connector location



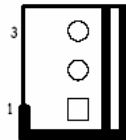
### C .Connector pin definition

Pin	Definition	Pin	Definition
1	Red	9	+5V
2	Green	10	GND
3	Blue	11	NC
4	NC	12	DDC Data
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC Clock
8	GND		

### (14) SYSTEM FAN1/FAN2 Connector (FAN1)/(FAN2)

A . Connector size : 1 X 3 = 3 Pin , 2.54mm ,180°, FAN Connector

B . Connector location



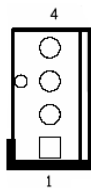
### C . Connector pin definition

Pin	Definition	Pin	Definition
1	ICH_PWM	3	Sense
2	+12V		

### (15) CPU FAN Connector (CN1)

A . Connector size : 1 X 4 = 4 Pin , 2.54mm ,180°, FAN Connector

B . Connector location



### C . Connector pin definition

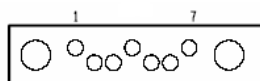
J5 : CPU FAN

Pin	Definition	Pin	Definition
1	GND	3	NC
2	+12V	4	ICH_PWM

### (16) SATA0/SATA1/ SATA2/SATA3 connector (CN2)(CN3) (CN4)(CN5)

A . Connector size : 7 Pin , 1.27mm ,180°, SATA Connector

B . Connector location



### C. Connector pin definition

J9/J10/ : SATA0/SATA 1

Pin	Definition	Pin	Definition
1	GND	5	SATA_RXN
2	SATA_TXP	6	SATA_RXP
3	SATA_TXN	7	GND
4	GND		

### Switch setting table( \*:default setup)

#### AT/ATX Power type select

	AT	ATX
JP3	1-2	*2-3

#### RTC clear

	NORMAL	Clear CMOS
JP2	*1-2	2-3

### IDE LED/ POWER LED / POWER ON / RESET / SM BUS / System thermal pinhead

IDE LED	+	+	power LED
POWER ON			
RESET			
BUZZER	+		SM BUS
			SYSTEM THERMAL

## Chapter 3

### Expansion

## **3.1 System Memory**

PEAK 872 incorporates Intel Q45 chipset supports dual channel non-ECC un-buffered DDR2 667/800/1066 MHz memory. Two 240-pins DIMM sockets support up to a 4GB DIMM module. Followings are the recommended memory modules.

WE APPROVAL DDR3 MEMORY LIST:

TRANSCEND / 2G / DDR3 / 1066/NON ECC / NON BUFFER / TS256MLK64V1U

TRANSCEND / 1G / DDR3 / 1066/NON ECC / NON BUFFER / TS128MLK64V1U

TRANSCEND / 1G / DDR3 / 1333/NON ECC / NON BUFFER / TS256MLK64V3U

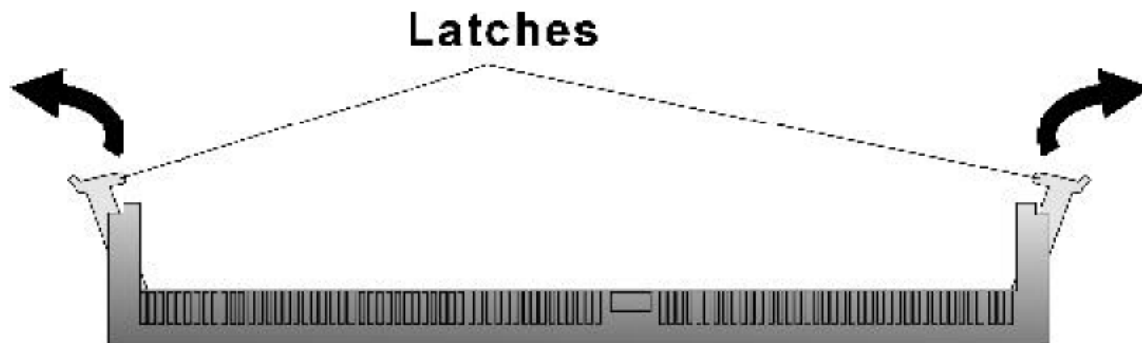
UNIGEN / / 1G / DDR3 / 1333/NON ECC / NON BUFFER / UG12U6400M8DU-ACANCMHA

**Table 3.1: Recommended Memory Modules**

## **3.2 Installing DIMM**

**To install DIMM**

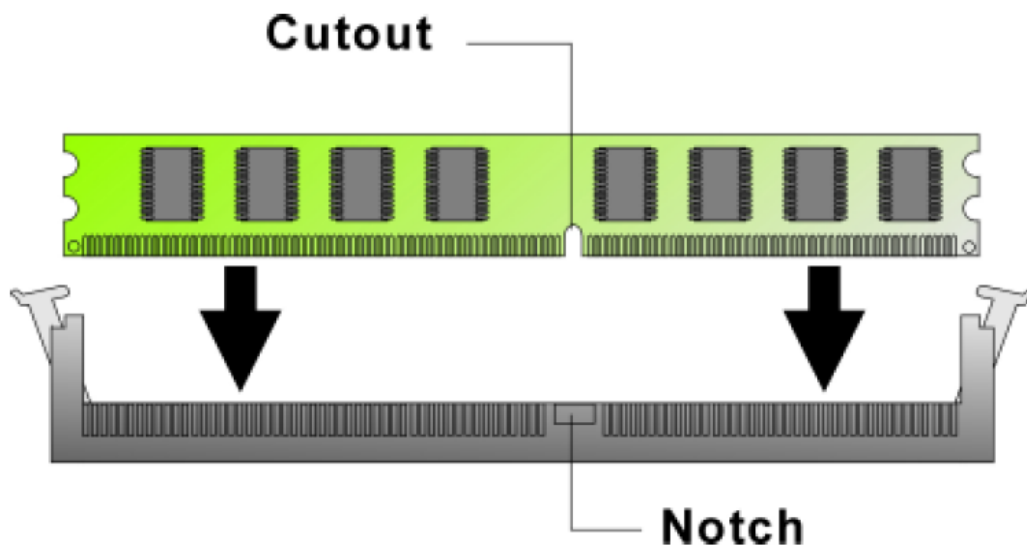
1. Make sure the two handles of the DIMM sockets are in the “open” position, i.e. the handles stay outward.



**Figure3-1: How to Install DIMM (1)**

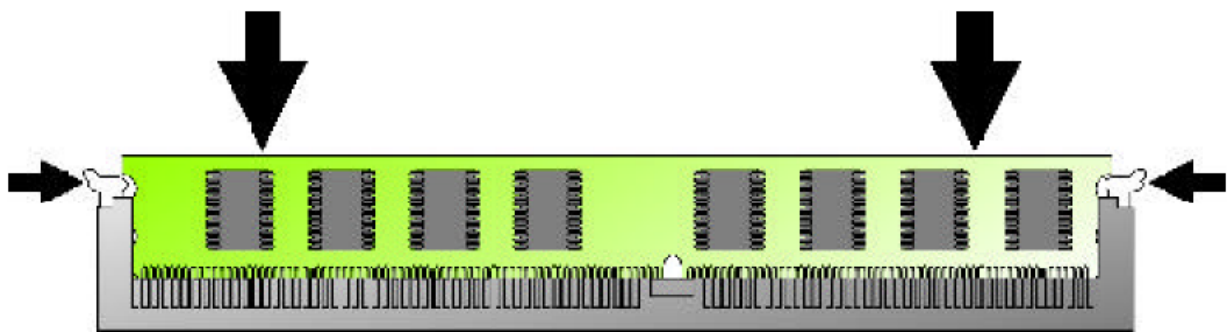
2. Slowly slide the DIMM modules along the plastic guides in the both ends of the socket.





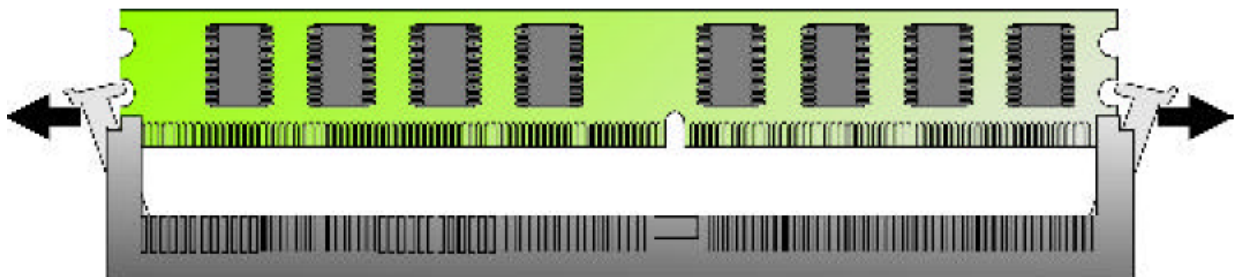
**Figure 3-2: How to Install DIMM (2)**

3. Then press the DIMM module down right into the socket, until a click is heard. That means the two handles automatically locked the memory modules into the right position of the DIMM socket.



**Figure 3-3: How to Install DIMM (3)**

4. To take away the memory module, just push the both handles outward, the memory module will be ejected by the mechanism in the socket.



**Figure 3-4: How to Install DIMM (4)**

### **3.3 Installing LGA775 Intel Core 2 Duo CPU, Heat Sink, and Fan**

Since the socket 775 is comprised of sensitive arrays of pins, improper or careless installation may cause permanent harm to the CPU. In some cases users may accidentally damage the socket simply by adjusting the position of the CPU.

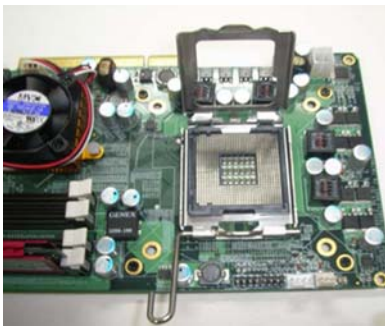
Please follow the installation instructions as shown below:

#### **Step 1:**

##### **1. Opening the Socket:**

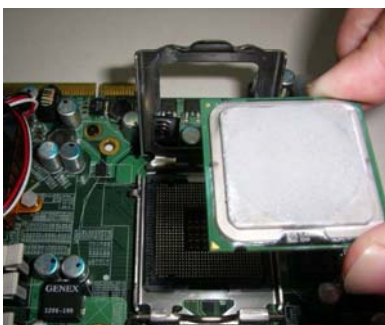
- a. Disengage the Load Lever by pressing down and out on the hook allowing the lever to clear the Retention Tab and rotate to the fully open position.
- b. Rotate Load Plate to fully open position.
- c. Remove the Protective Cover as shown below

**Caution:** Touch the Socket Contacts may damage to the contacts.



#### **Step 2:**

- a. Remove processor from shipping media by grasping substrate edges only.
- b. Grasp the processor with your thumb and forefinger on the edges with the orientation notches.
- c. Carefully place the CPU into the socket.



**Step 3:**

- a. Verify that the CPU is properly mated to the orientation keys.
- b. Close the upper plate, place the load lever back to the original position.

**Step 4:**

- a. Place the Heat Sink with Fan Set onto the four holes around the CPU socket making sure that the four screws are aligned with the holes on the PEAK 872.
- b. Pressing down the metal pads on the four Stand-Offs.
- c. Fasten the four screws.
- d. Connect the 4-pins CPU fan cable to the power connector as shown below.

