Arima

NK14X
USER MANUAL

Arima Computer Corp.
Building Your Competitive Advantage

TABLE OF CONTENTS:

Legal Disclaimer

The information provided in this document is subject to change without notice.
Arima Computer Corp. makes no warranty regarding this document.
Always read the safety instructions carefully.

Arima Computer Corp. cannot anticipate all of your working conditions; for safety, you should use caution, care and good judgment when following the procedures described in this material. Arima Computer Corp. shall not be liable for errors contained in this material nor any damage incurred in the use of this material.

Arima Computer Corp. assumes no responsibility for any damage to property, injury to persons, or losses incurred as a result of misuse of the information provided.
Arima Computer Corp. assumes no responsibility for the reliability of its software on equipments that are not manufactured by Arima Computer Corp.

Copyright Notice

Revision: 0.90
Release Date: Oct. 2007

Technical Support

If a problem arises with your system during installation or operation and is unable to be resolved from the user manual, consult the following list of resources for help:

- ✓ Contact the place of purchase for help. This is the recommended solution as they can provide the quickest assistance.
- ✓ Visit Arima Computer Corp. website for up to the minute FAQ, guides and updates. The website can be found at: http://www.arima.com.tw/server
- ✓ Or contact our support staff at: server@arima.com.tw

About this User Guide

This manual contains some special icons that accompany special sections that are meant to help you along in the installation process. The special sections contain useful and/or critical information that you should know. Watch for these icons as you read through the manual.

Type of icons:	Description:
NOTE	This icon indicates useful and timely information that will aid you in the setup.
WARNING	This icon indicates information on dangerous and/or costly behavior to avoid.

Safety Instruction

- ✓   Keep this manual for future reference.
- ✓   Keep the equipments in a safe, cool, dry place.
- ✓   Perform the installation on a dry, flat surface.
- ✓   Ground yourself by touching a plugged-in power supply, which displaces static electricity.
- ✓   Adjust the power source to the proper voltage before connecting the equipment to the power outlet.
- ✓   Place the power cord in such a manner as to ensure that no one can step on it or trip over it.
- ✓   Always unplug the power cord when performing installation.
- ✓   Do not have liquid nearby as electrical shock can occur if liquid spills onto the equipment.
- ✓   Operating temperature: 10ºC to 35ºC or 50ºF to 95ºF.
- ✓   Pay attention to the warnings in the installation instructions when appropriate.
- ✓   In the following cases, do not try to fix the problem yourself, contact a party in Technical Support
  - •   The power cord or plug is damaged.
  - •   Liquid has been spilled onto the equipment.
  - •   Obvious sign of damage can be detected on the equipment.

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Chapter 1. Getting Started

1.1 Congratulations

You have in possession one of the most powerful and versatile 1-way AMD Opteron processor solutions, the NK14X. Powered by cutting edge nVIDIA MCP55V Professional chipset, NK14x efficiently utilizes the combined strength of 2000MT/s Hyper Transport, PCI-E x16 slot, six Integrated Serial ATAII controllers, to name just a few. It provides versatility, performance, value and dependability for today's computing environment. In just a couple of pages, a detailed specification will provide you with a comprehensive view of the capabilities of NK14X. Thank you for purchasing Arima Computer Corp. family of products.

1.2 Unpacking

Arima Computer Corp. provides a number of accessories for your convenience. Below is a checklist of the things that are included in this purchase:

2 x SATA cables
1 x SATA power cord
1 x Spare jumper
1 x Driver CD
1 x Quick Installation Guide

1.2.1 Quick Installation Guide
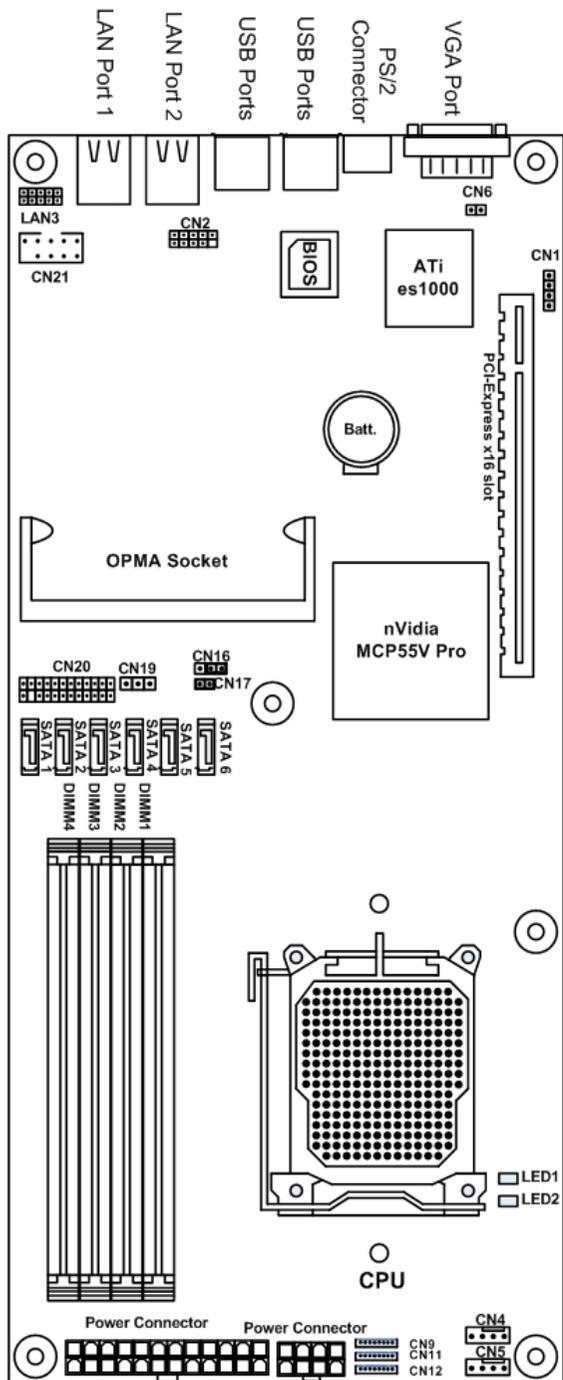
CN1   ID LED and Intruder

Pin	Description
1	ID LED+
2	ID LED-
3	Intruder
4	Intruder

CN6   On-Board VGA Select Jumper

Open	Closed
VGA Enabled (default)	VGA Disabled

CN16   Clear CMOS Select Jumper

1-2	2-3
Clear CMOS	Normal (Default)

CN19   IPMI Header

Pin	Description
1	LED Clear Switch
2	LED Clear Switch
3	Front Panel Alert

LAN 3   LAN3 Header

Pin	Description	Pin	Description
1	TX_P	2	3.3V_SB
3	TX_N	4	OPMA LAN Act
5	RX_P	6	3.3V_SB
7	RX_N	8	OPMA LAN Lin
9	3.3V	10	GND
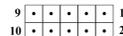
LAN Connector Indicator Light

State of Link	Speed LED (Green/Orange)	Link/Activity LED (Green)
No link	OFF	OFF
Link @ 10Mbps	OFF	On
Link @ 100Mbps	ON (Green)	On
Link @ 1000Mbps	ON (Orange)	On
Activity	ON	BLINK

Recommended Memory Configurations

1 DIMM	Slot 4
2 DIMMs	Slot 4, 3
4 DIMMs	Slot 4, 3, 2, 1

The Latest BIOS, Manual, Memory AVL, Drivers and Utility can be downloaded from
http://www.arima.com.tw/server

CN21   COM1 Headers

Pin	Description	Pin	Description
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	N/A

CN2   USB Header

Pin	Description	Pin	Description
1	VCC	2	VCC
3	USB_N0/2	4	USB_N1/3
5	USB_P0/2	6	USB_P1/3
7	GND	8	GND
9		10	N/A

CN20   Front Panel
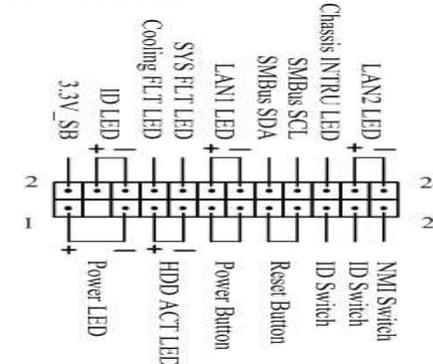
Recommended Memory Configurations for Quad-Core CPU

	DIMM1	DIMM2	DIMM3	DIMM4
DDR2-533	-	-	Any	Any
DDR2-533	SR or DR	SR or DR	SR or DR	SR or DR
DDR2-533	QR	QR	QR	QR
DDR2-667	-	-	SR or DRx8	SR or DRx8
DDR2-667	-	-	DRx4 or QR	DRx4 or QR
DDR2-667	SR or DRx8	SR or DRx8	SR or DRx8	SR or DRx8
DDR2-667	SR or DR	SR or DR	DRx4	DRx4
DDR2-667	DRx4	DRx4	SR or DR	SR or DR

※SR=Single Rank DIMM ; DR=Dual Rank DIMM ;
QR=Quad Rank DIMM ; any= SR,DR, or QR

Rev. 0.91

S2215552G00001

1.3 Features Highlight

CPU:
- ✓ Support AMD Dual-Core and Qua-Core Opteron 2000 series processor
- ✓ Supports up to 2000MT/s Hyper Transport

CHIPSET:
- ✓ nVIDIA nForce MCP55V Pro

SYSTEM MEMORY:
- ✓ Four 240-pin 1.8-Volt DDR2 DIMM sockets

EXPANSION SLOTS:
- ✓ One PCI-Express x16 slot

STORAGE:
- ✓ Total support of hard disk formats from SATA II, SATA, and to ATA.

INTEGRATED LAN CONTROLLER:
- ✓ Marvell Alaska 88E1116 Dual Port PHY with MCP55V Pro integrated MAC with TOE function – Dual port 10/100/1000BASE-T PHY

SYSTEM MANAGEMENT:
- ✓ IPMI 2.0 compliance (daughter card through 200 pin connector)
- ✓ General management features required:
    - CPU and Chassis environment temperature monitoring
    - Fan speed control and Fan status monitoring
    - Motherboard voltage monitoring

1.4 Motherboard Specification

Processors
- ✓ AMD Dual-Core and Qua-Core Opteron 2000 series processor
  - 512KB/1MB L2 cache per Core
  - Socket F LGA 1207-pin
  - Support 16 Rank, up to 4 Rank per DIMM
  - Selectable TDP 120W or 95W or 68W
- ✓ Supports up to 2000MT/s Hyper Transport
- ✓ Supports AMD technologies: AMD64 technology, PowerNow Technology with OPM, AMD Virtualization, Enhance Virus Protection & OPMA

Chipsets
- ✓ nVidia nForce MCP55V Pro chipset
- ✓ Winbond Super I/O W83627EHG chip
- ✓ Analog Devices ADM1026 Hardware Monitor chip

Memory
- ✓ 4 Registered ECC DDR2 DIMM slots and a maximum 16GB of memory
- ✓ Supports 512MB / 1GB / 2GB / 4GB @ 533 / 667 MHz modules
- ✓ Supports up to 4 Rank Registered ECC DDR2 DIMM

Expansion Slots
- ✓ One PCI-Express x16 slot (Supports Low-profile add-on card only)
- ✓ One IPMI 2.0 connector

Integrated Graphics
- ✓ ATI ES1000 with 32MB DDR2 memory

Gigabit Ethernet
- ✓ Two Marvell Alaska 88E1116 Single Port PHY with MCP55V Pro integrated MAC with TOE function – Dual port 10/100/1000BASE-T PHY
- ✓ Two single RJ-45 connector with LEDs

MCP55V Pro Integrated Serial ATA II Controller
- ✓ 6 ports connector, data transfers up to 3.0Gb/s (300MB/s)
- ✓ Integrated nVidia MediaShield™ RAID to support RAID 0,1,10, 5, JBOD (windows only)

MCP55V Pro Integrated USB 2.0
- ✓ 4 USB 2.0 ports (1 internal 9 pin headers, and 2 Type A connectors on Rear)

Super I/O
- ✓ Winbond Super I/O W83627EHG chip
- ✓ One PS/2 connector include mouse and keyboard function (cable needed)
- ✓ One 9-pin serial port (internal pin header)

Rear I/O
- ✓ One PS/2 connector include mouse and keyboard function (Cable needed)
- ✓ Two Type-A USB-2.0 connectors
- ✓ Two RJ-45 ports (one for GbE, one for GbE and IPMI shared)
- ✓ DB15 Video connector

BIOS
- ✓ 8Mb Phoenix BIOS
- ✓ Legacy USB support, all ports
- ✓ SMBIOS 2.3.3 and DMI 2.0 compliant
- ✓ Plug and Play (PnP)
- ✓ APM (Advanced Power Management) 1.2
- ✓ ACPI (Advanced Configuration and Power Interface) 2.0 Compliant
- ✓ Fan Speed Control (work in situation of w/o OPMA)
- ✓ PXE (Pre-Boot Execution)
- ✓ Soft Power-down
- ✓ Multiple boot support (with BIOS Boot Specification v3.1 (BBS) support) must be ready console re-direct
- ✓ After power failure (always on and last status, always off*)
- ✓ Update in DOS and x64 Windows.

System Management
- ✓ IPMI 2.0 compliance (daughter card through 200 pin connector)
- ✓ DDR2 SO-DIMM connector used (Please refer the OPMA connector spec)
- ✓ General management features required: (by BIOS and OPMA)
   - CPU and Chassis environment temperature monitoring
   - Fan speed control and Fan status monitoring
   - Motherboard voltage monitoring

Fan header
- ✓ Two 4 pins FAN headers with PWM control (Pin define: GND, FAN, 12V, PWM)
- ✓ Three 8pins FAN connector with PWN control (Pin define: GND, FAN, 12V, PWM1, GND, FAN, 12V, PWM1)
- ✓ Supports fan speed control in 4-pin Fan only; 8-pin fans will be work in full speed if plugged

Form Factor
- ✓ Half of SSI MEB form factor with size: 5.9" X 13"

Power
- ✓ 8-pin (+12V) and 24-pin power connector (Vertical)

1.5 Motherboard Layout [Major Components]

The following diagram indicates all the major components of the motherboard.
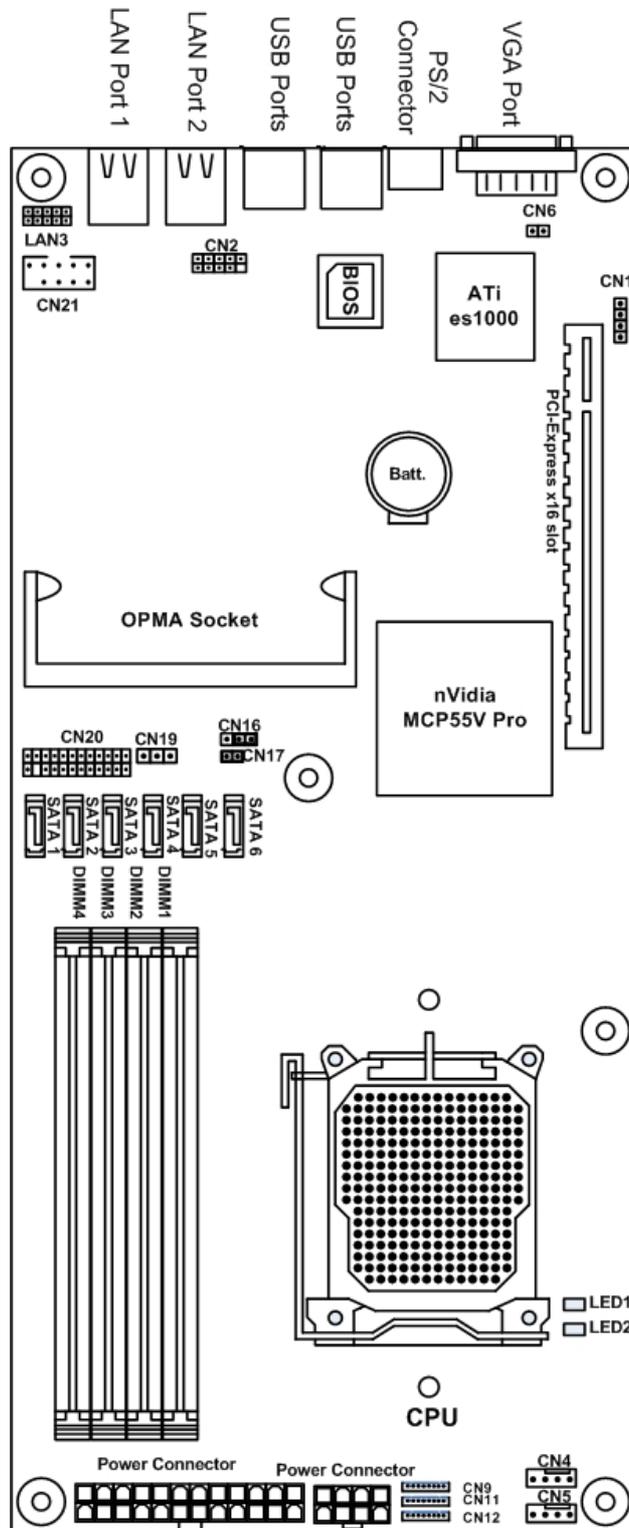
Chapter 2. Hardware Installation

2.1 Block Diagram

Kick-Off : Jun'07
ES: Jul'07
CS: Sep'07
MP: Oct'07

Form factor : Half SSI
(5.9" x 13") 10Layers

AMD Opteron 2000 (Socket F)
Split Power Supported
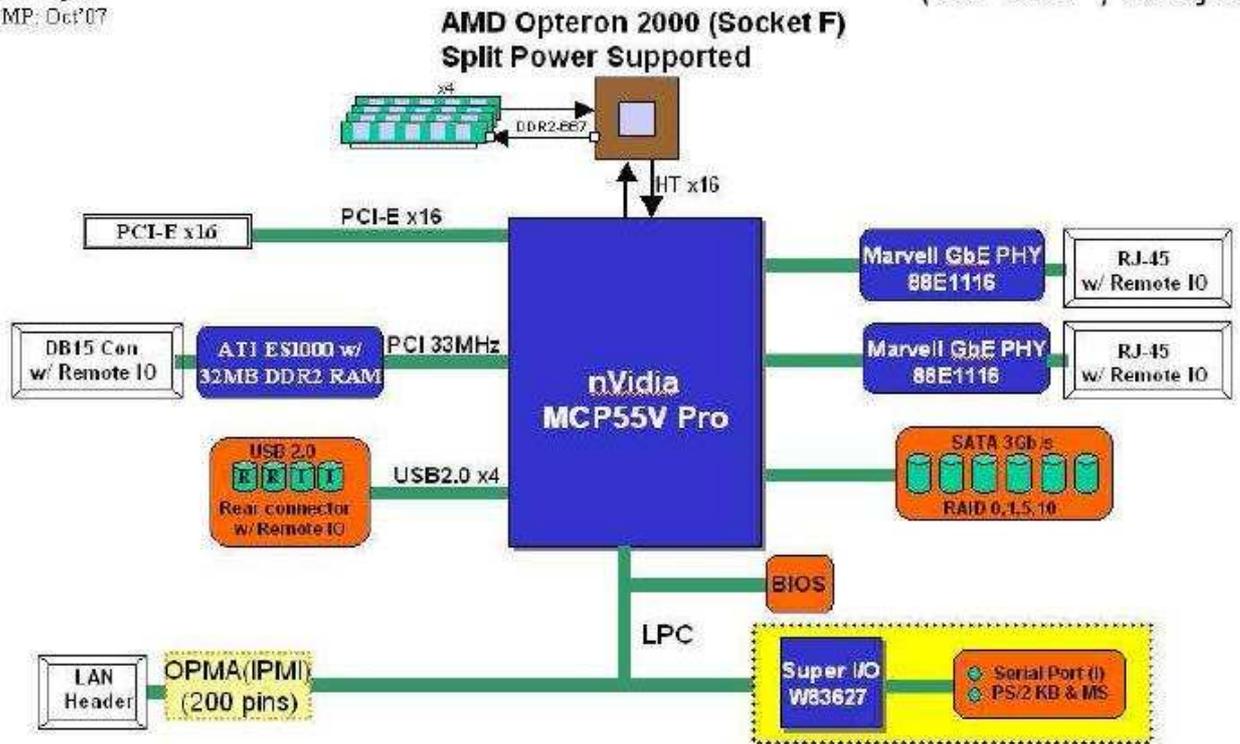
2.2 Installing the Processor

Procedure:
First read the instructions that came with the CPU. Follow the procedures below step by step.

1. Locate the processor socket on the motherboard and carefully remove the protective cover.

2. Pull the lever out of its locked position and let it spring into its open position.

3. Now that the lever is in its unlocked position, lift up the metal cover to reveal the CPU socket.

4. Place the CPU into the socket with the arrows pointing to the bottom right of the socket as shown (there are two gaps on both sides of the CPU, make sure they fit perfectly into the socket. If it is placed correctly, the CPU pins should be able to fit into the socket perfectly).

The CPU will not fit if the orientation is wrong. Do not try to force the CPU into the socket; it could result in irreparable damage to the CPU.

15

5. Close the metal cover and return the lever into its original locked position.
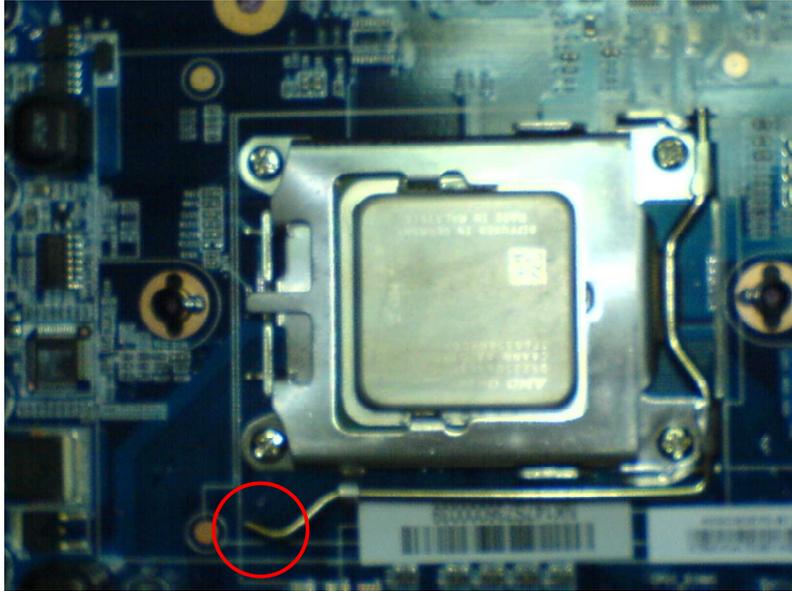
6. Now, rest the motherboard into the chassis, align the two holes of the backplate with the two bolts of the chassis.
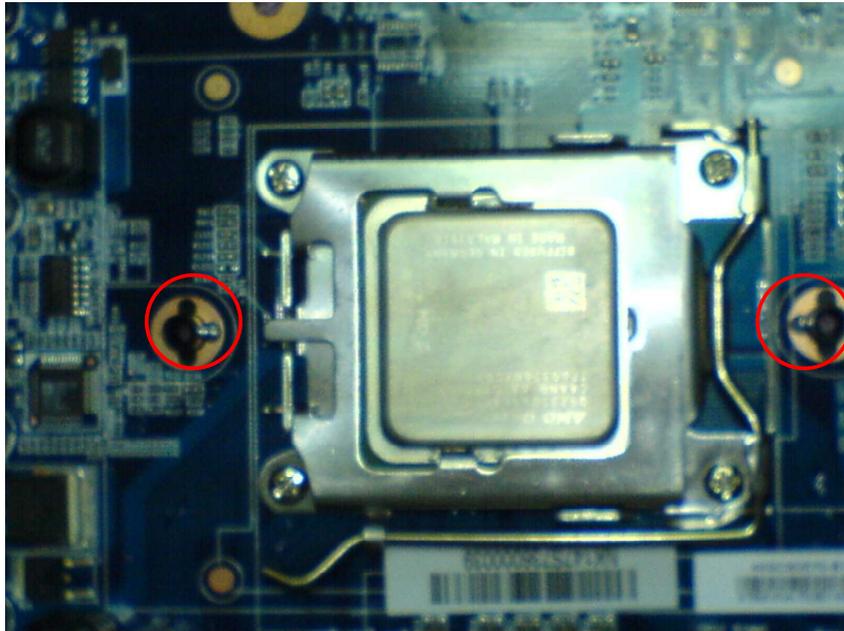
We do not recommend you to apply thermal compound at this point of the installation. The heatsink provided along with your CPU already has thermal grease on the bottom for your convenience. Do not apply more thermal grease if it is already present. Too much thermal grease will spill onto the CPU circuit and damage the CPU.

7. First align the two pegs with the two mounting holes on the motherboard. After you have made sure that the pegs are in their proper positions, lock the pegs into the mounting holes.

To remove the heatsink, gently turn the pegs until they loosen themselves from the mounting holes. Gently pull up the heatsink, to prevent any damage to the CPU.

Heatsink not included in the package.

2.3 Installing the Memory

2.3.1 DIMM Combination

The diagram below shows the 4 DIMM slots from 1 to 4 for the CPU.
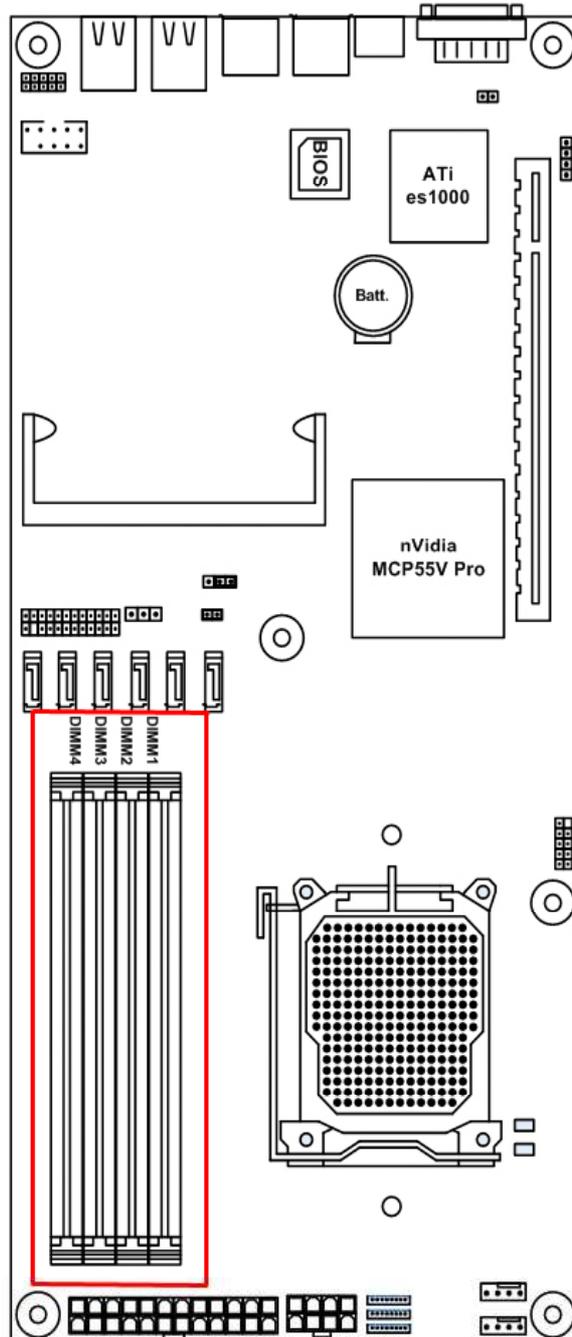
Types of memory supported:
There are 4 DIMM sockets for 240-pin 1.8-Volt DDR2 DIMMs (WILL ONLY SUPPORT Registered ECC type memory module). Please note the diagrams below to identify if your DIMM memories are ECC or non-ECC.

Before installing your memory sticks, please ensure that the memory sticks you have are compatible with the NK14X. The NK14X will only support DDR2-667/533 modules. Please study the table below for memory module specification of the NK14X.

Key Notes:
- ✓ DDR2 Memory Modules Supported: 512MB – 4GB (Registered ECC Only)
- ✓ Installed memory will all be automatically detected (No jumpers or settings are needed)
- ✓ NK14X supports up to 16GB in total
- ✓ Unbuffered memory is NOT supported

1 DIMM	Slot 3
2 DIMMs	Slot 3, 4
4 DIMMs	Slot 1, 2, 3, 4

Any configuration other than the recommended is not guaranteed to work. Please refrain from using those configurations, as we cannot provide technical support on them.

2.3.2 Installing DIMM modules

1. Open up the brackets on the sides by flicking them to the sides:

2. Line up the memory with socket. Make sure the gap fits into the socket.

3. Push the memory stick down until the brackets on the sides snap to secure the memory module in place. Make sure the brackets are locked into the memory module.

These pictures only show the procedures for the installation of one memory module. Please refer to section 2.3.1 to make sure the memory module combination is qualified for the motherboard.

2.4 Jumper Configuration

2.4.1 Clear CMOS header

Header CN16 controls CMOS setting. Position your motherboard as it appears in the following diagram.
To clear CMOS:
1. Turn off the system, and make sure the standby power on the power supply has been turned off too.
2. Short pin 1 and pin 2 using a jumper for a few seconds, and switch back to pin 2 and pin 3 (as default).
3. Turn on the system and reconfigure the BIOS.
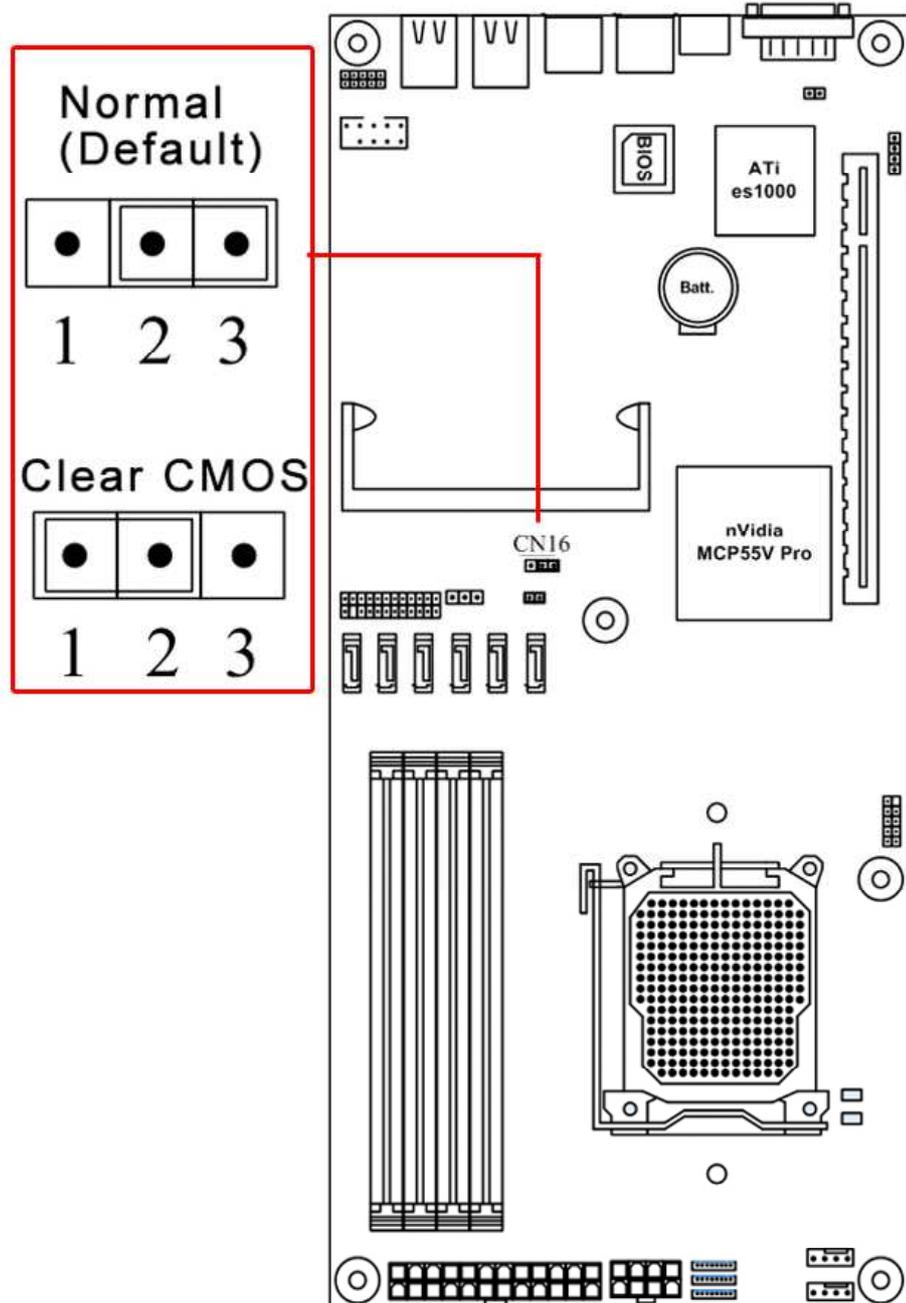
2.4.2 Enable onboard VGA header

Header CN6 controls the onboard VGA setting.
CN6 has the default set as enabled is open, and switch the jumper to short will disable onboard VGA.
Refer to the following diagram for CN6 location:

VGA Enable
(Default)

VGA Disable
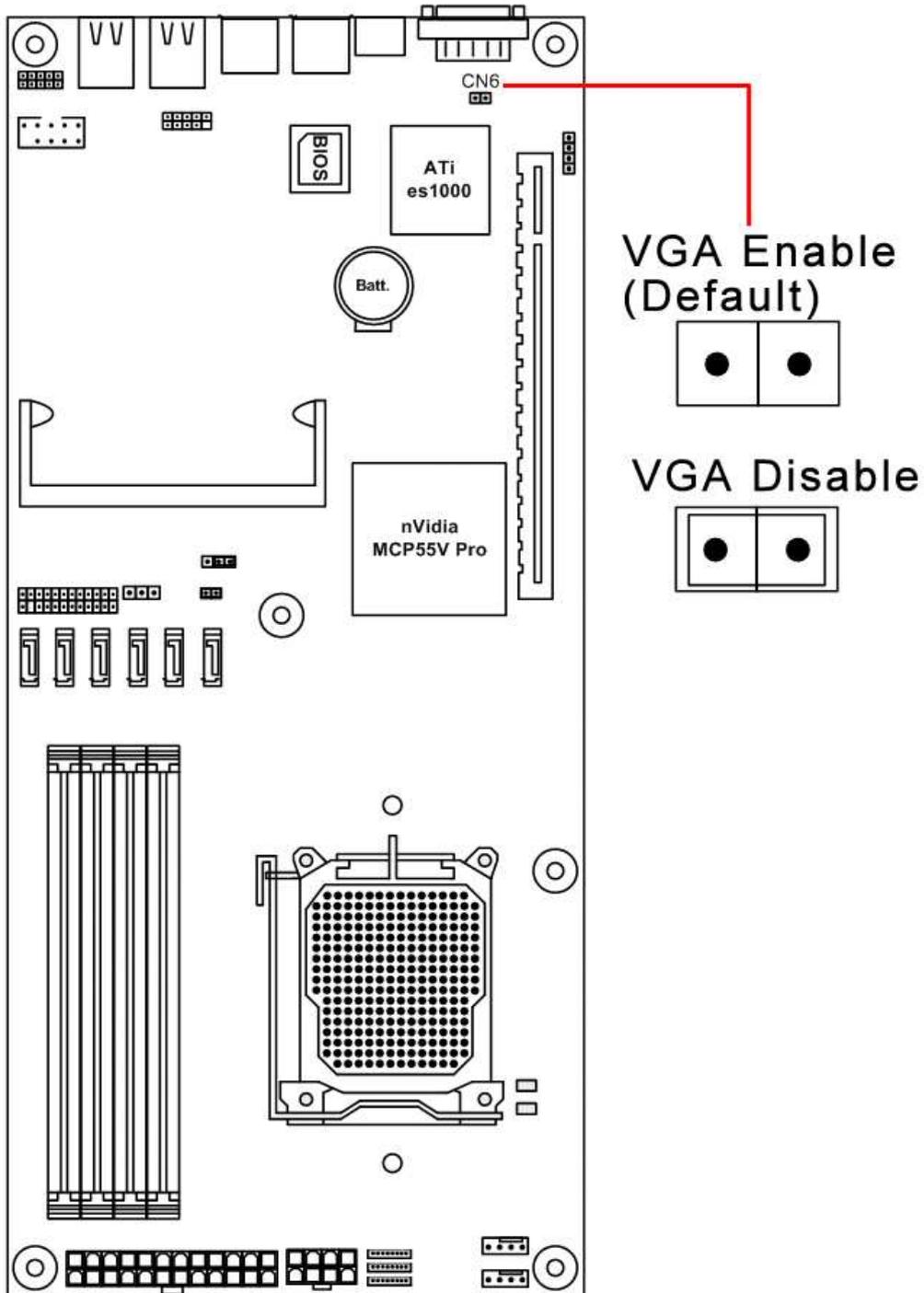
2.4.3 ID LED and Intrusion Function Pin Header

Header CN1 is the pin header for ID LED and intrusion function.
Refer to the following diagram for CN1 location:
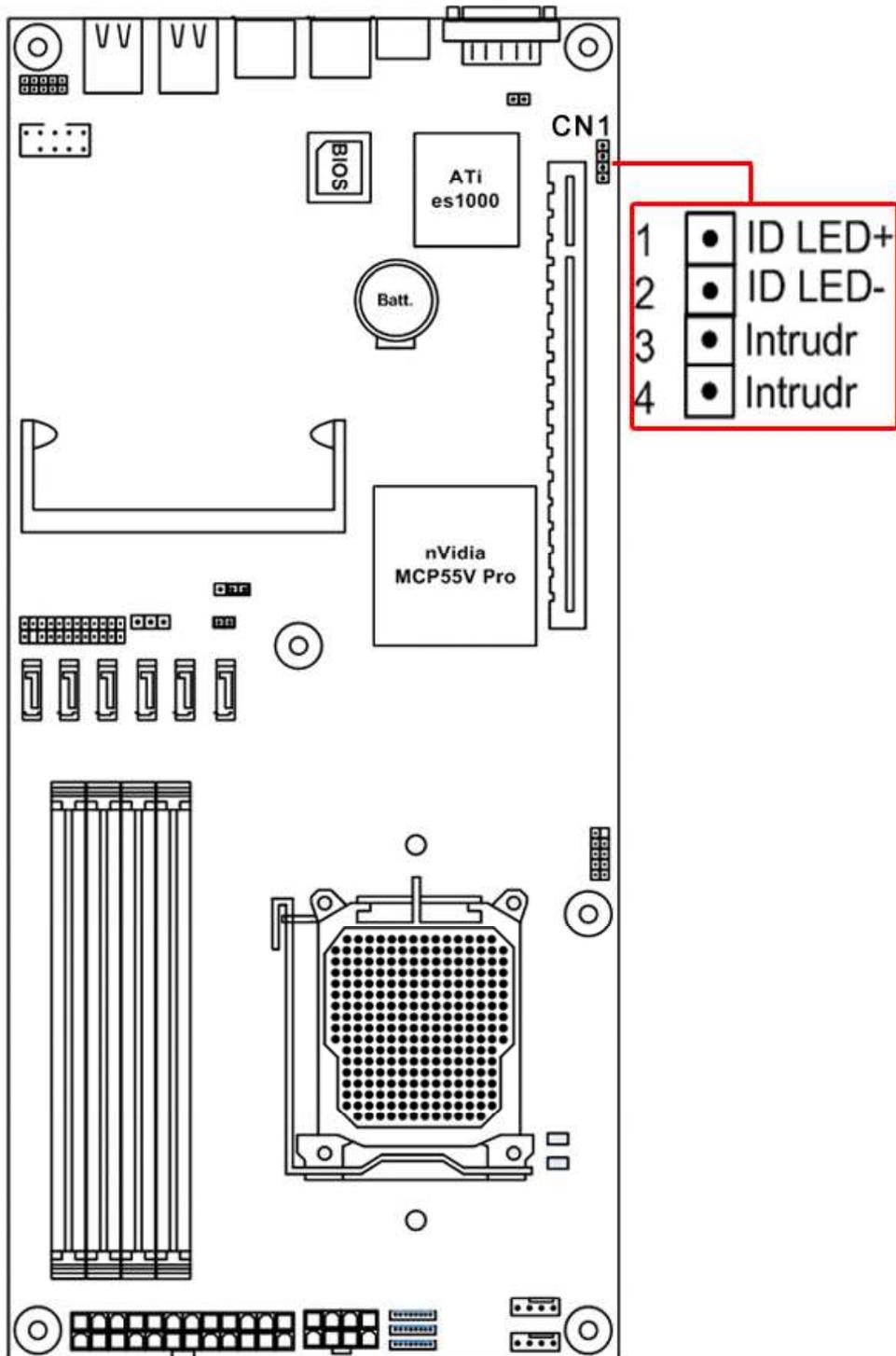
2.4.4 IPMI Header

Header CN19 is pin header for IPMI.
Refer to the following diagram for CN19 location:
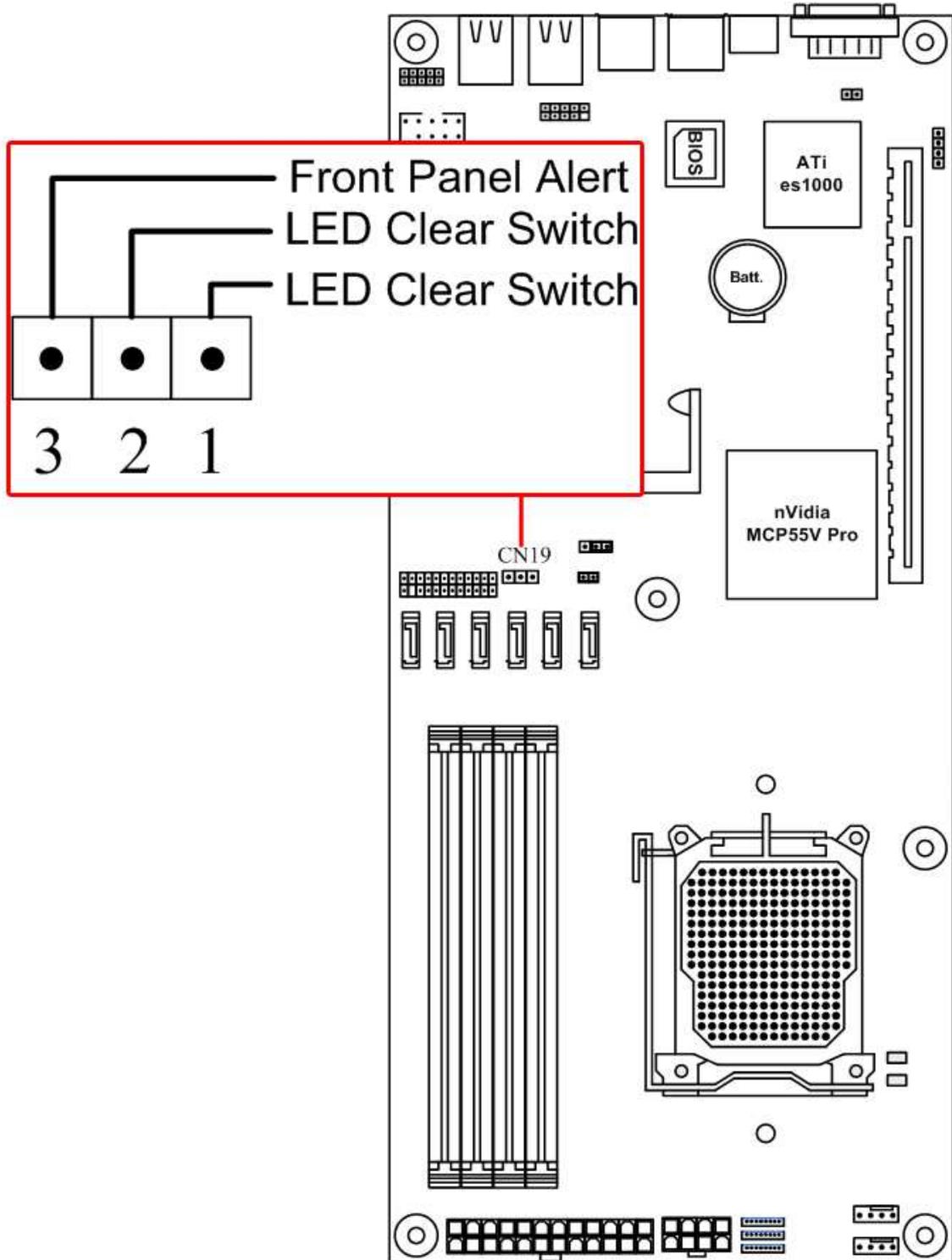
2.4.5 CPU FAN1, 2; Front FAN 1, 2; System FAN 1, 2

Header CN9, CN11 and CN12 are the ping header for CPU fan, front fan and system fan. Refer to the diagram below for the locations of the headers.
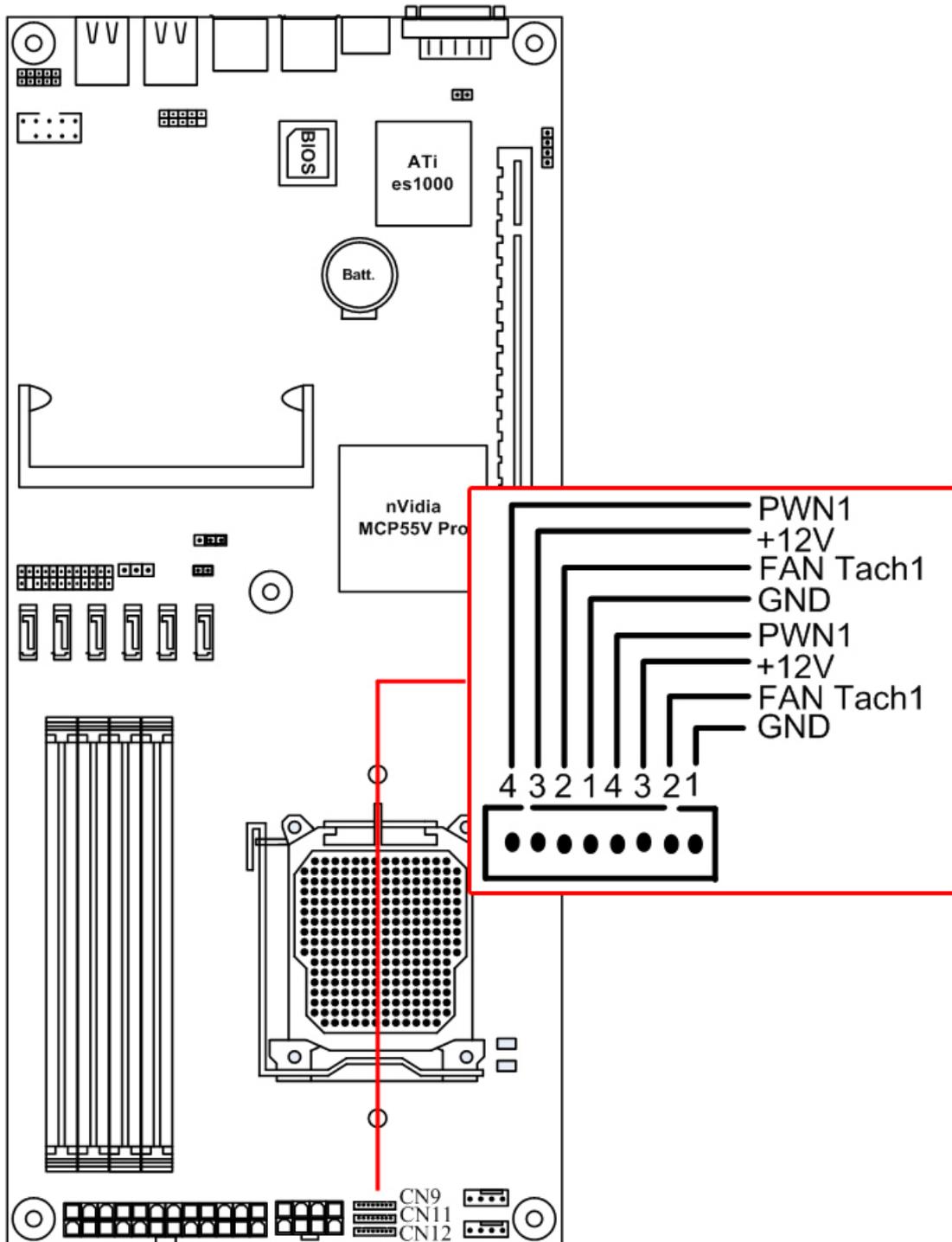
2.4.6 CPU FAN 4; 3

Header CN4 and CN5 are the pin header for CPU fan 4 and 3.
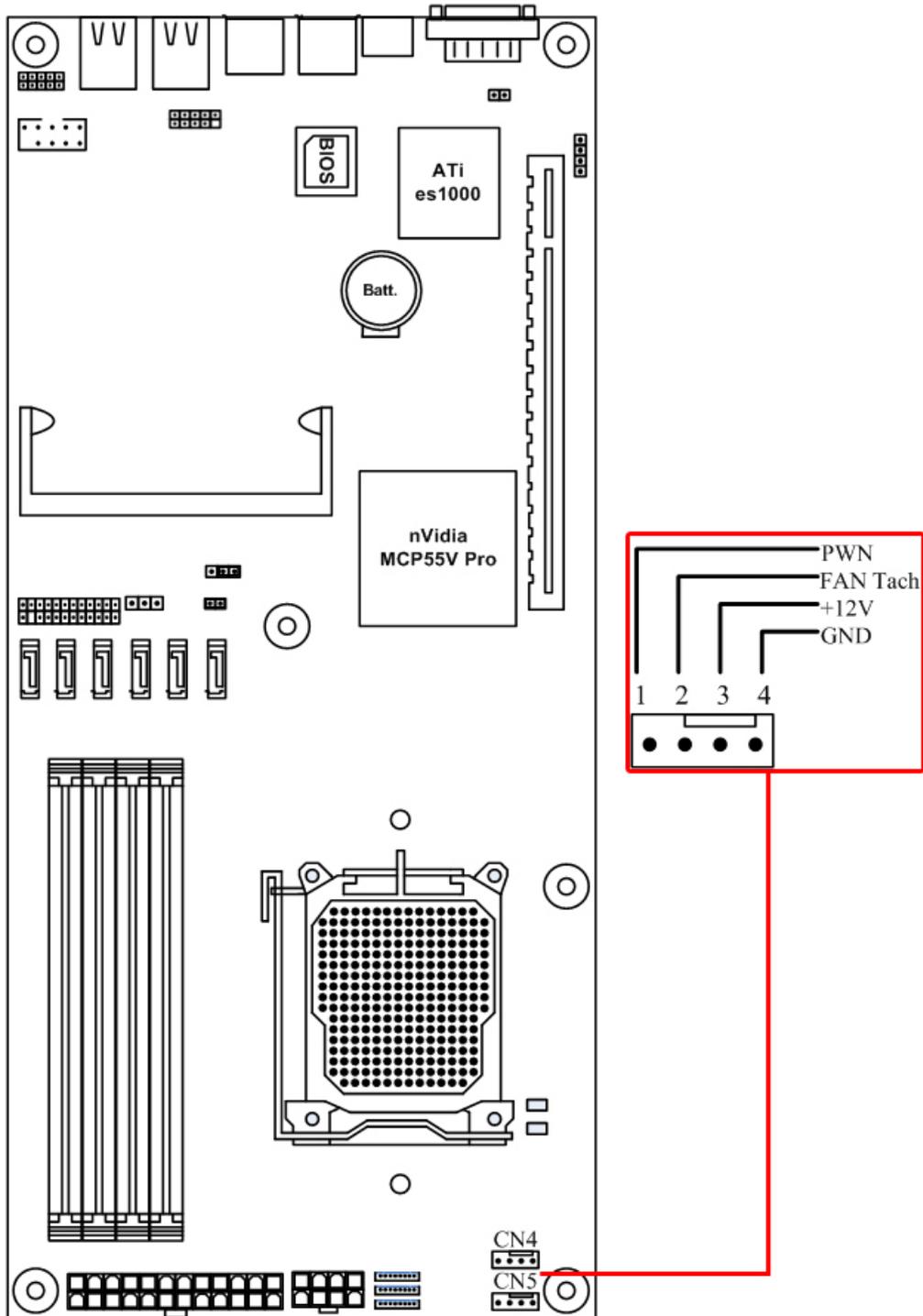
2.5 Power Supply

2.5.1 ATX 24-pin power connector and CPU 8/4-pin connector

There is one 24-pin power input connection and an 8/4-pin power input connection on the motherboard. The 24-pin power connection is used to connect to the power supply, while the 8/4-pin power connection is used to power up the CPU. BOTH must be connected in order for the system to boot up. Make sure the plugs are inserted into the connectors properly, to prevent any damage.

Please make sure your power supply can support at least 2 amps standby power for the Advanced Configuration and Power Interface (ACPI) functions.

Make sure the AC adapter is not plugged into the wall outlet during installation. The electric current could damage the motherboard.

Refer to the following diagram below for the connector locations.

Power Connector Power Connector

+3.3V
+3.3V
COM
+5V
COM
+5V
COM
PWR_OK
5VSB
+12V
+12V
+3.3V

GND
GND
GND
GND

+3.3V
-12V
COM
PS_ON
COM
COM
COM
Reserved
+5V
+5V
+5V
COM

+12V
+12V
+12V
+12V
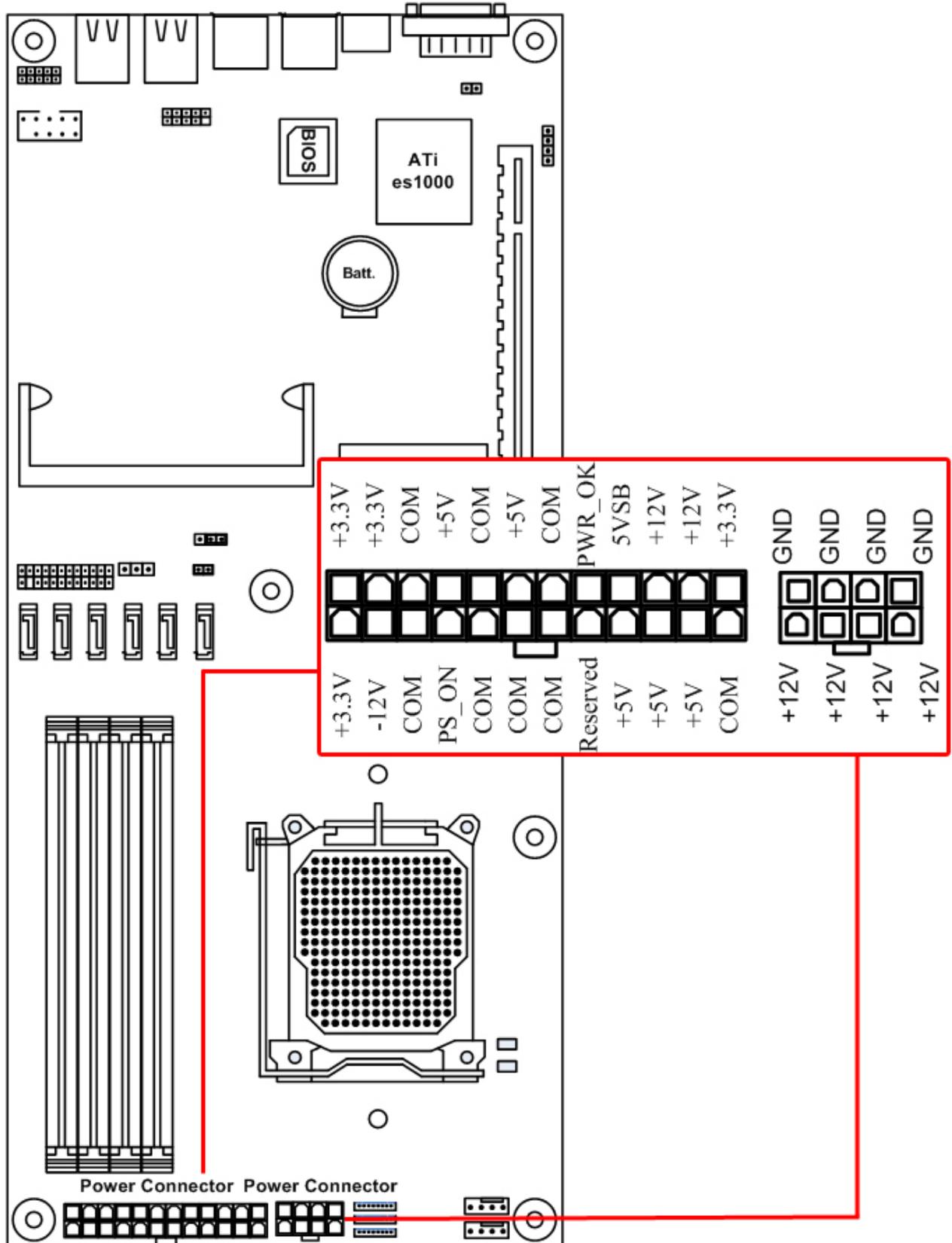
2.6 Cables & Connectors

2.6.1 Front Panel Connectors

Power LED:	This 3-pin connector attaches to the power LED.
HDD Activity LED:	This 2-pin connector attaches to the LED of the hard disk. The LED lights up when HDD is active.
Power Button:	This 2-pin connector attaches to the power button of the system.
Reset Button:	This 2-pin connector attaches to the case-mounted reset switch for rebooting your computer without turning on/off your power switch.
ID Switch:	This connector connects to the switch that is to turn on and turn off the ID LED.
ID Switch:	This connector connects to the switch that is to turn on and turn off the ID LED.
NMI Switch:	This 1-pin connector connects to the switch that sends Non-Maskable Interrupt to the CPU. User can customize the button to perform a particular function.
3.3 VSB:	This connector provides the user with power to any extra devices that uses 3.3-volt power.
ID LED:	This connector connects to the LED that lights up when a problem arises with the system and let you easily find the problematic system.
Cooling FLT LED:	This connector connects to the LED that lights up when a problem arises with cooling system.
System FLT LED:	This connector connects to the LED that lights up when a problem arises with the system.
LAN#1 LED:	This connector connects to the LED that lights up when there is activity on Gbe 1.
SMBus SDA:	A private bus to BMC chip for serial data, for use with BMC only.
SMBus SCL:	A private bus to BMC chip for serial clock, for use with BMC only.
Chassis INTRU LED:	This connects to the mechanical switch that indicates whether the chassis had been opened. User can activate it if desired.
LAN#2 LED:	This connector connects to the LED that lights up when there is activity on Gbe 2.
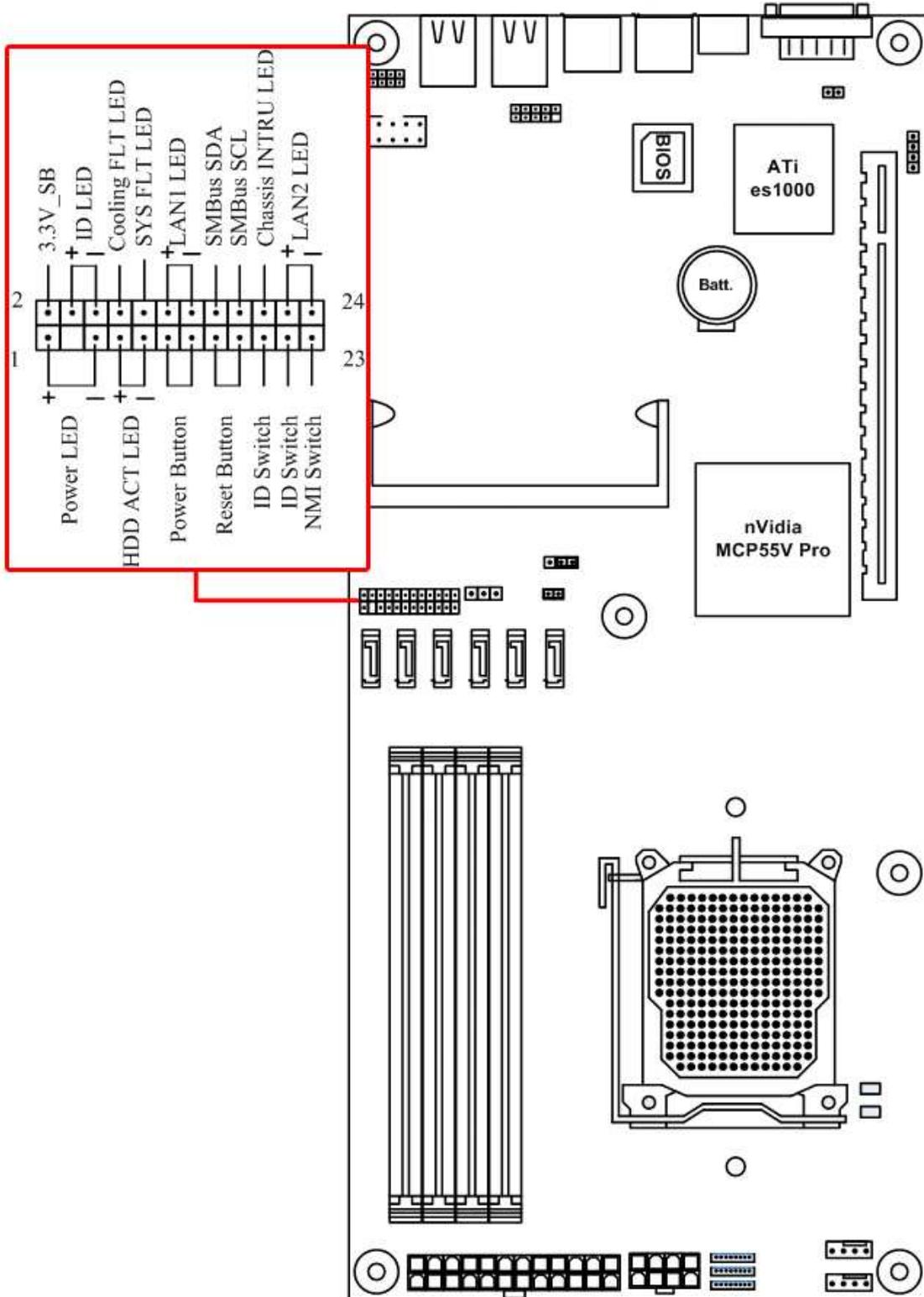
Remember to set BIOS to match the configuration that you implement here. Go to Advanced Menu section of BIOS for detail.

2.6.2 Rear Panel I/O ports

The following illustration displays the motherboard I/O port array.

Type of Port	Function
VGA connector (15-pin female)	The VGA port connects display devices such as a monitor. See the BIOS setup.
PS/2 connector	This connector includes keyboard and mouse function. (Cable need) K/B: This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards. Mouse: The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, IRQ12 can be used for expansion slot.
USB Ports	Two external USB 2.0 ports that allow simultaneous connections of 2 USB devices.
Gigabit Ethernet Port 1 & 2	These ports are RJ-45. The motherboard uses the Marvell Alaska 88E1116 Dual Port PHY with MCP55V Pro MAC with TOE function.

2.6.3 Back Panel LAN LED

Back Panel LAN LED:
The table below will allow the user to monitor LAN activities from the back of the system.

RJ-45 connectors LEDs

	State of Link	Speed LED (Green/Orange)	Link/Activity LED (Green)
	No link	OFF	OFF
	Link @ 10Mbps	OFF	On
	Link @ 100Mbps	ON (Green)	On
	Link @ 1000Mbps	ON (Orange)	On
	Activity	ON	BLINK

Speed LEDs ——— [RJ-45 connector] ——— Link/Activity LEDs

2.6.4 Back panel LAN3 Connector

Header LAN3 is the pin header for LAN3 connection. It is only for OPMA.
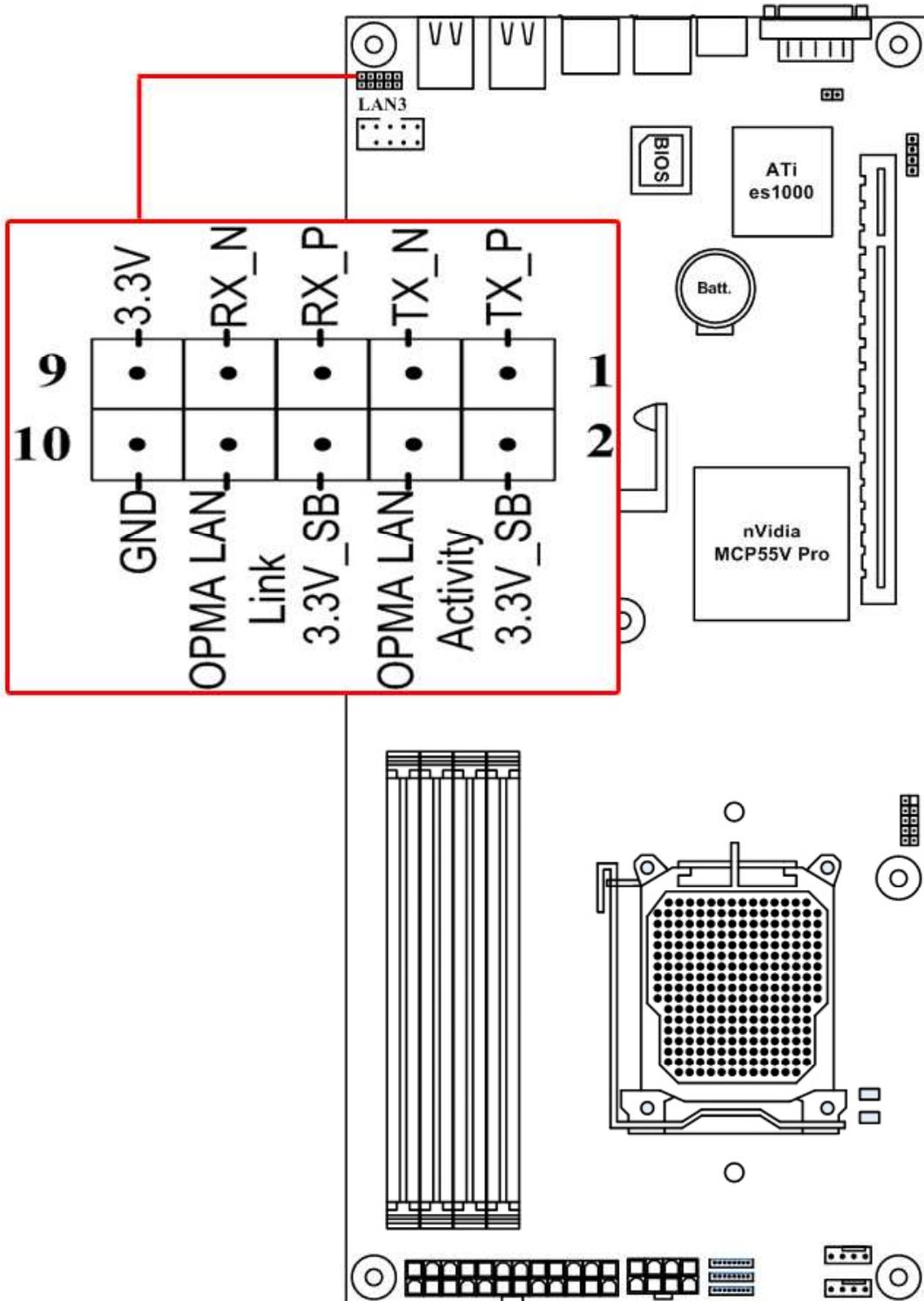
2.6.5 Front USB Connector

Header CN2 controls one front USB connection. To activate the front USB connects the USB wires to CN2. Refer to the following diagram for the location of CN2.
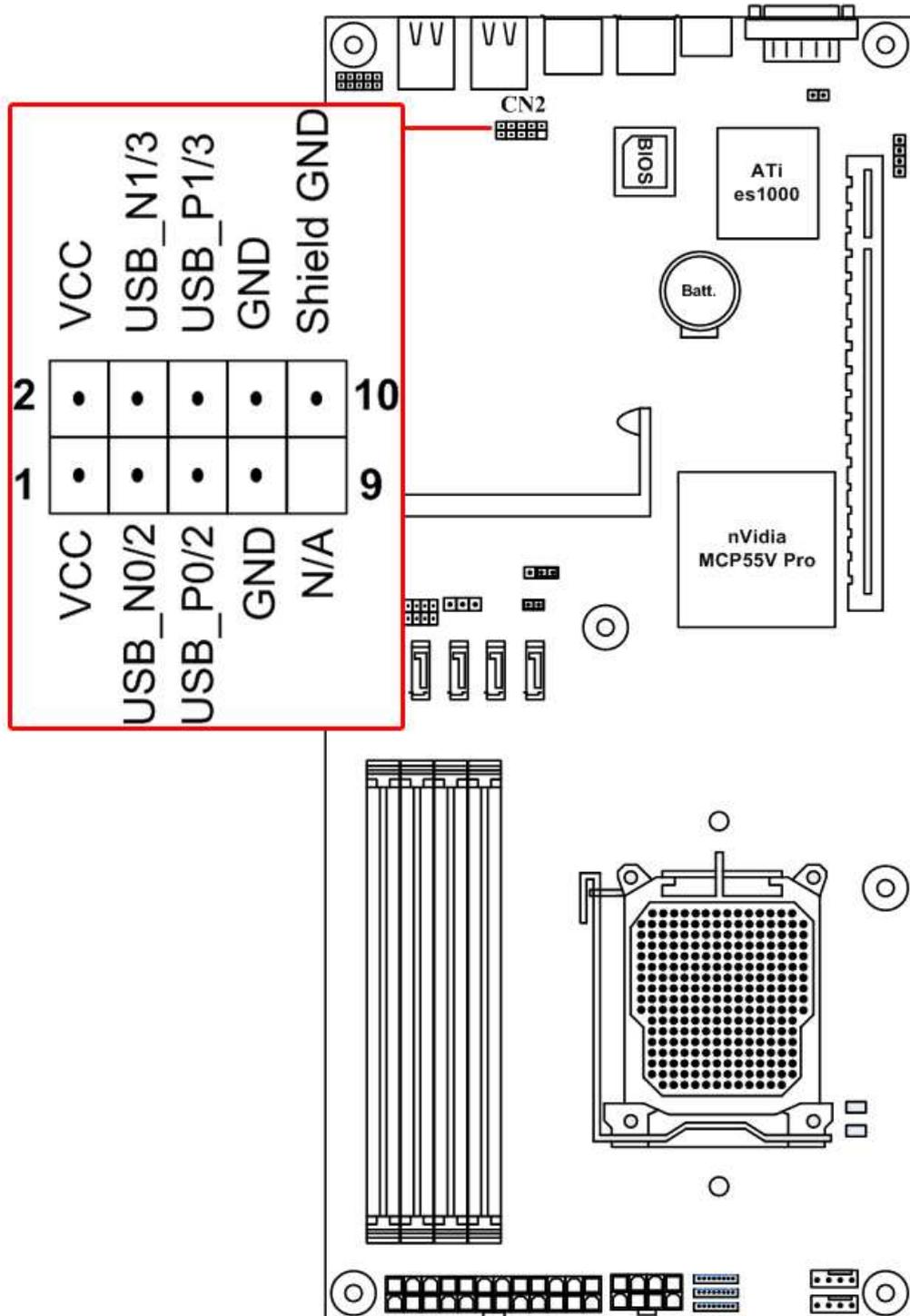
2.6.6 Front Panel Serial Port Connector

Header CN21 (COM1) controls the activation of front panel serial port. Refer to the following diagram for location and orientation of CN21.
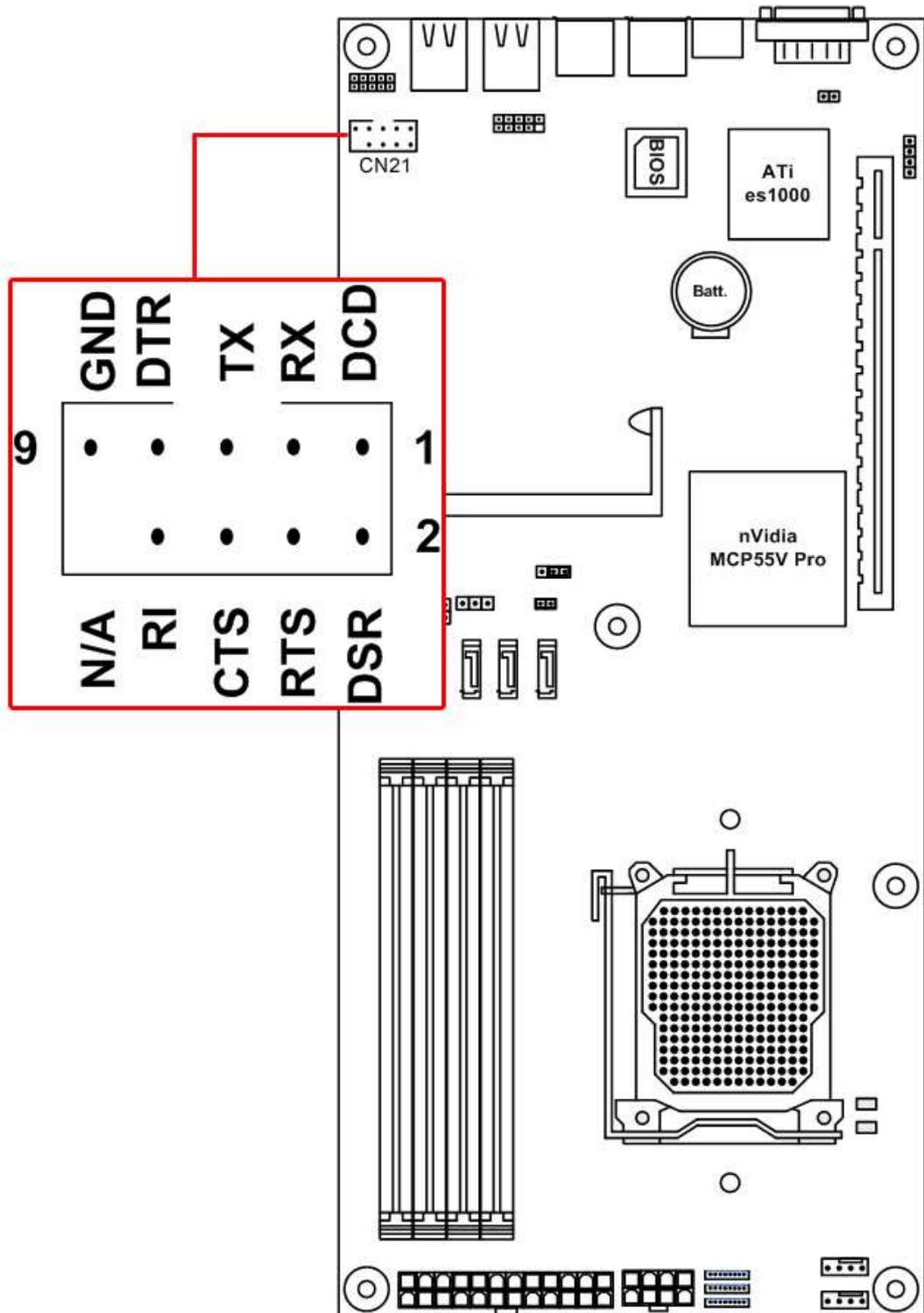
Chapter 3. BIOS Setup

This chapter discusses the PhoenixBIOS setup program built into the ROM BIOS.
BIOS is the basic input/output system, the firmware on the motherboard that enables the hardware to interact with the software. The setup program allows the users to modify the basic system configurations according to their needs. The configuration is then stored in a battery-backed NVRAM so that it retains the configuration even when the power is turned off. The PhoenixBIOS installed in the motherboard's ROM is a custom version of an industry standard BIOS.
The rest of the chapter will list all the menus and sub-menus in the BIOS. Along with them, you can also find the list of varieties for any configurable item in the BIOS.

3.1 Entering BIOS Setup

The PhoenixBIOS is activated when the system powers on. The BIOS reads the system information contained in the CMOS and begins the process of checking the system and configuring it. After finishing configuring the whole system, BIOS will seek an OS on disk and turn over control of the system to the OS found.
While BIOS is in control, the Setup menu can be accessed by pressing the <F2> key when the following message appears briefly at the bottom of the screen during Power On Self Test: "Press <F2> to enter SETUP."

3.2 Using Setup

The following table provides details about how to navigate the Setup program using keyboard.

KEY	FUNCTION
Up Arrow ↑	Move to the previous item.
Down Arrow ↓	Move to the next item.
Left Arrow ←	Move to the previous menu.
Right Arrow →	Move to the next menu.
Esc	In the sub-menu: Exit the sub-menu. In the main menu: Exit without saving.
Enter	Select the item. A pop-up window will appear to allow setting of the item's value. If the item has a ▶ in front of it, it means that the item leads to a sub-menu. Pressing <Enter> will take you to the sub-menu.
+	Increase the numeric value or goes to the previous setting value.
-	Decrease the numeric value or goes to the next setting value.
F1	General help on setup navigation keys. Press <F1> key to pop up a small help window that describe the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <ESC> key or <F1> key again.
F9	Setup Defaults.
F10	Save and Exit.

3.3 Troubleshooting

In case the system cannot be booted after some changes in BIOS, use the clear CMOS jumper setting to reset the BIOS to default (See Page 22). To avoid such problem, configure only the items that you thoroughly understand and refrain from modifying the advanced settings.

3.4 Main Menu:

```
                    Phoenix TrustedCore(tm) Setup Utility
   Main        Advanced      Security      Power    Boot      Server          Exit

                                                     Item Specific Help

   System Time:        [12:02:38]
   System Date:        [10/24/2007]               <Tab>, <Shift Tab>, or
                                                  <Enter> selects field.
   BIOS Version:       NK14X V0.10


   System Memory:       633 KB
   Extended Memory:     4095 MB




   F1  Help        ↑↓ Select Item      -/+  Change Values      F9   Setup Defaults
   Esc Exit           Select Menu      Enter  Select ► Sub-Menu  F10  Save and Exit
```

The following table shows the items that you can customize on the Main menu page:

Item	Options	Description
System Time	No options.	Shows the time of the day in the format of Hour/Min/Sec.
System Date	No options.	Shows the date in the format of MM/DD/YYYY.
BIOS Version	No options.	Version of the BIOS.
System Memory	No options.	This item is not configurable to user.
Extended Memory	No options.	This item is not configurable to user.

3.5 Advanced Menu:

```
                    Phoenix TrustedCore(tm) Setup Utility
      Main        Advanced      Security     Power      Boot      Server        Exit

                                                      │    Item Specific Help
                                                      │
      Reset Configuration Data:    [No]               │
      QuickBoot Mode:              [Enabled]          │   Select 'Yes' if you
      Boot-time Diagnostic Screen: [Disable]          │   want to clear the
      Summary screen:              [Enabled]          │   Extended system
      Display without KB Err Msg:  [No]               │   Configuration
                                                      │   Date (ESCD) area.
      ► Chipset Feature                               │
      ► Integrated Devices                            │
                                                      │
      ► Console Redirection                           │
                                                      │
                                                      │
                                                      │
                                                      │
                                                      │

      F1  Help       ↑↓ Select Item      -/+   Change Values       F9   Setup Defaults
      Esc  Exit          Select Menu     Enter  Select   ► Sub-Menu  F10  Save and Exit
```

The following table shows the items that you can customize on the Advanced menu page:

Item	Options	Description
Reset Configuration Data	No Yes	Select 'Yes' if you want to clear the Extended System Configuration Data (ESCD) area.
QuickBoot Mode	Disabled Enabled	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Boot-time Diagnostic Screen	Disabled Enabled	Display the diagnostic screen during boot
Summary screen	Disabled Enabled	Display system configuration on boot.
Display without KB Err Msg	No Yes	Control the Post Error Message display or not when without KB.

3.5.1 Chipset Feature Sub-Menu

The Chipset Feature sub-menu is shown in following figure:

```
                    Phoenix TrustedCore(tm) Setup Utility
            Advanced

    Chipset Feature                            Item Specific Help

 ► ECC Options                                 The setup options
   DRAM Bank Interleave    [Auto]              In this section
   HT-LDT Frequency:       [1000Mhz]           Control DRAM ECC
   Spread Spectrum:        [Disabled]          Functions. Therefore,
   Enable Multimedia Timer [Yes]               They only apply
   PowerNow                [Enabled]           To M2 and L1 systems.




   F1   Help      ↑↓ Select Item    -/+   Change Values      F9   Setup Defaults
   Esc  Exit         Select Menu    Enter  Select   ► Sub-Menu  F10  Save and Exit
```

The following table shows the items that you can customize on the Chipset Feature sub-menu page:

Item	Options	Description
DRAM Bank Interleave	Auto Disabled	Interleave memory blocks across the DRAM chip selects. Auto will set this enabled when possible.
HT-LDT Frequency	200Mhz 400 Mhz 600Mhz 800 Mhz 1000Mhz	Set frequency of HT links for coherent and non-coherent.
Spread Spectrum	Disabled Enabled	Disabled (default) or Enable Spread Spectrum.
Enable Multimedia Timer	No Yes	Enable/Disable Multimedia Timer support.
PowerNow	Disabled Enabled	Enable/Disable PowerNow Function

Following figure shows the ECC Options sub-menu:

Phoenix TrustedCore(tm) Setup Utility	
Advanced	
ECC Options	Item Specific Help

ECC Mode   [Disabled]
  ECC Error Checking   [Disabled]
  ECC Error Log   [Disabled]
  Chipkill   [Disabled]
  ECC Scrub Redirection [Disabled]
  DRAM ECC Scrub Control [Disabled]
  DCache ECC Scrub Control [Disabled]
  L2 ECC Scrub Control [Disabled]
	Set the level of ECC Protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

The following table shows the items that you can customize on the ECC Options sub-menu page:

Item	Options	Description
ECC Mode	Disabled Basic Good Super Max User	Set the level of ECC Protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.
ECC Error Checking	Disabled Enabled	Enable the Dram controller to read/write ECC check-bits on the DIMMs and it allows the north bridge to check and correct ECC errors on the dram bus during normal CPU or bus master read requests.
ECC Error Log	Disabled Enabled	Enable the MCA to log or report ECC errors on the dram bus. Note, the MCA (MC4_EN in particular) must still be programmed according to the desired MCE outcome. 0:24N:3x44[0]
Chipkill	Disabled Enabled	Enable 4-bit ECC mode (Chipkill) on dram controllers with all x4 ECC capable DIMMs. Setting to Auto will enable 4-bit ECC mode only when memory is configured for

44

		128-bit operation. 0:24N:3x44[23]
ECC Scrub Redirection	Disabled Enabled	Enable the northbridge to force a write to dram with corrected data when a correctable error on the dram bus is detected during a normal CPU or bus master read request. 0:24N:3x5C[0]
DRAM ECC Scrub Control	Disabled 160ns 320ns 630ns 1.28us 2.56us 5.12us 10.2us 20.5us 41us 81.9us 163.8us 327.7us 655.4us 1.31ms	Set the rate of background scrubbing for DRAM. 0:24N:3x58
DCache ECC Scrub Control	Disabled 160ns 320ns 630ns 1.28us 2.56us 5.12us 10.2us 20.5us 41us 81.9us 163.8us 327.7us 655.4us 1.31ms	Set the rate of background scrubbing for the DCache. 0:24N:3x58
L2 ECC Scrub Control	Disabled 160ns 320ns 630ns 1.28us 2.56us 5.12us 10.2us 20.5us 41us 81.9us 163.8us 327.7us 655.4us 1.31ms	Set the rate of background scrubbing for L2 Cache. 0:24N:3x58

Below figure is when change the value of ECC mode to other value except Disabled, there will appear an 'ECC Multibit Error Detection':

Phoenix TrustedCore(tm) Setup Utility	
Advanced	
ECC Options	Item Specific Help

ECC Mode   [User]
   ECC Error Checking   [Enabled]
   ECC Error Log   [Enabled]
   Chipkill   [Enabled]
   ECC Scrub Redirection   [Enabled]
   DRAM ECC Scrub Control   [1.31ms]
   DCache ECC Scrub Control   [Disabled]
   L2 ECC Scrub Control   [Disabled]
 	
   ECC Multibit Error Detection: [Enable]
	Set the level of ECC Protection. If User is selected, individual ECC options may be changed. Other options besides Disabled serve as presets. For super mode, all of memory is scrubbed every 8 hours.

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ► Sub-Menu F10 Save and Exit	

The following table shows the items that you can customize on the ECC Options sub-menu page

Item	Options	Description
ECC Multibit Error Detection	Disabled Enabled	Enable multibit ECC error diction.

46

3.5.2 Integrated Devices Sub-Menu

The Integrated Devices sub-menu should look like following:

Phoenix TrustedCore(tm) Setup Utility	
Advanced	
Integrated Devices	Item Specific Help

USB Control   [USB1.1+USB2]
USB BIOS Legacy Support: [Enabled]
MAC LAN: [Enabled]
MAC LAN Bridge: [Enabled]
MAC 2 LAN: [Enabled]
MAC 2 LAN Bridge: [Enabled]
 	
Serial port A: [Enabled]
  Base I/O address: [3F8]
  Interrupt: [IRQ4]
 	
SATA1 Controller: [Enabled]
SATA2 Controller: [Enabled]
SATA3 Controller: [Enabled]
 	
► NV RAID Configuration
	Enable/Disable USB
	Controllers. Under DOS
	Only support USB1.1

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ► Sub-Menu F10 Save and Exit	

The following table shows the items that you can customize on the Integrated Devices sub-menu page:

Item	Options	Description
USB Control	Disabled USB1.1 USB1.1+USB2	Enable/Disable USB Controllers. Under DOS Only support USB1.1
USB BIOS Legacy Support	Disabled Enabled	Enables or Disables support for USB Keyboards and Mice. (Enable for use with a non-USB aware Operating System such as DOS or UNIX)
MAC1 LAN	Enabled Disabled	Enabled/Disable MAC 1 LAN Device
MAC 1LAN Bridge	Disabled Enabled	Enable MAC Lan Bridge
MAC 2 LAN	Enabled Disabled	Enabled/Disable MAC 2 LAN Device
MAC 2 LAN Bridge	Disabled Enabled	Enable MAC 2 Lan Bridge

Serial port A	Disabled
	Enabled
	Auto
		Configure serial port A using options:
		
		[Disabled]
		   No configuration
		
		[Enabled]
		   User configuration
		
		[Auto]
		   BIOS or OS chooses
		   Configuration
		
		(OS Controlled)
		   Displayed when
		   controlled by OS

Base I/O address	3F8 2F8 3E8 2E8	Set the base I/O address for serial port A.
Interrupt	IRQ3 IRQ4	Set the interrupt for serial port A.
SATA1 Controller	Enabled Disabled	Enable/Disable First Serial ATA Device If disabled first SATA the 2nd and 3rd will be disabled.
SATA2 Controller	Enabled Disabled	Enable/Disable Second Serial ATA Device
SATA3 Controller	Enabled Disabled	Enable/Disable Third Serial ATA Device

Following figure shows the NV RAID Configuration sub-menu:

Phoenix TrustedCore(tm) Setup Utility	
Advanced	
NV RAID Configuration	Item Specific Help
NV RAID Configuration: [Disabled] Disabled Enabled	Enabled/Disable Nvidia RAID control. SATA controller must be enabled for RAID feature to function. Enabling Master SATA0 Secondary requires enabling Secondary SATA Channel. Both options are listed in Integrated Devices.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ► Sub-Menu F10 Save and Exit	

3.5.3 Console Redirection Sub-Menu

The Console Redirection sub-menu looks like the following:

```
                Phoenix TrustedCore(tm) Setup Utility
        Advanced

        Console Redirection                    Item Specific Help

    Com Port Address        [Disabled]         If enabled, it will
                                               use a port on the
    Baud Rate            [19.2K]               motherboard.
    Console Type          [PC ANSI]
    Flow Control          [CTS/RTS]
    Console connection:      [Direct]
    Continue C.R. after POST:  [Off]



    F1   Help     ↑↓ Select Item      -/+   Change Values        F9   Setup Defaults
    Esc  Exit        Select Menu       Enter  Select    ► Sub-Menu   F10  Save and Exit
```

The following table shows the items that you can customize on the Console Redirection sub-menu page:

Item	Options	Description
Com Port Address	Disabled On-board COM A	If enabled, it will use a port on the motherboard.
Baud Rate	300 1200 2400 9600 19.2K 38.4K 57.6K 115.2K	Enables the specified baud rate.
Console Type	VT100 VT100, 8BIT PC ANSI, 7BIT PC ANSI VT100+ VT UTF8 ASCII	Enables the specified console type.
Flow Control	None XON/XOFF CTS/RTS	Enables Flow Control
Console connection	Direct Via modem	Indicate whether the console is connected directly to the system or a modem is used to connect.
Continue C.R. after POST	Off On	Enables Console Redirection after OS has loaded.

3.6 Security Menu:

The Security Menu is shown as the following figure:

```
                   Phoenix TrustedCore(tm) Setup Utility
         Main     Advanced    Security     Power      Boot   Server      Exit
┌─────────────────────────────────────────────────┬──────────────────────────┐
│                                                  │    Item Specific Help    │
│  Supervisor Password Is:     Clear               │                          │
│  User Password Is:           Clear               │  Supervisor Password     │
│                                                  │  controls access to the  │
│  Set Supervisor Password    [Enter]              │  setup utility.          │
│  Set User Password          [Enter]              │                          │
│                                                  │                          │
│                                                  │                          │
│                                                  │                          │
│                                                  │                          │
│                                                  │                          │
├──────────────────────────────────────────────────┴─────────────────────────┤
│  F1   Help      ↑↓ Select Item      -/+   Change Values      F9   Setup Defaults │
│  Esc  Exit         Select Menu      Enter  Select   ► Sub-Menu   F10  Save and Exit │
└─────────────────────────────────────────────────────────────────────────────┘
```

The following table shows the items that you can customize on the Security Menu page:

Item	Options	Description
Set Supervisor Password	No options.	Supervisor Password controls access to the setup utility.
Set User Password	No options.	User Password controls access to the system at boot.

51

3.7 Power Menu:

The Power Menu is shown as following figure:

```
                    Phoenix TrustedCore(tm) Setup Utility
        Main    Advanced     Security     Power      Boot   Server      Exit

                                                     Item Specific Help
    WakeUp On LAN/PME:      [Enabled]
    Resume On Time:         [Off]               Enables WakeUp on
    Resume Time:           [00:00:00]           LAN/PME support.
    After Power Failure:    [Power On]




    F1   Help      ↑↓ Select Item      -/+   Change Values      F9   Setup Defaults
    Esc  Exit         Select Menu      Enter  Select   ► Sub-Menu   F10  Save and Exit
```

The following table shows the items that you can customize on the Power Menu:

Item	Options	Description
WakeUp On LAN/PME	Disabled Enabled	Enables WakeUp on LAN/PME support.
Resume On Time	Off On	Enabled wakes the system up at a specific time.
Resume Time	No options.	Specify the time when the system is to wake up. <Tab>, <Shift-Tab>, or <Enter> selects field.
After Power Failure	Power On Last State Stay Off	Power On = when power is applied, the system will boot to the G0 state. Last State = when power is a applied, the system will keep last state Stay Off = when power is a applied, the system will boot to the G2:S5 state.

3.8 Boot Menu:

All the possible devices that you can boot from are automatically detected and listed on the page. The first device listed is the first boot device. In the example shown below, HITACHI Deskstar HDT722516DLA380 hard drive is the first boot device.

Phoenix TrustedCore(tm) Setup Utility						
Main	Advanced	Security	Power	**Boot**	Server	Exit

	Item Specific Help

Boot priority order:
 1: PCI SCSI: DSK00 HDT722516DLA380
 2:
 3:
 4:
 5:
 6:
 7:
 8:
Excluded from boot order:
  : PCI BEV: NVIDIA Boot Agent 249.0542
  : PCI BEV: 2-NVIDIA Boot Agent 249.05
  : Legacy Network Card
  : Bootable Add-in Cards
	Keys used to view or configure devices:
	Up and Down arrows select a device.
	<+> and <-> moves the device up or down.
	<f> and <r> specifies the device fixed or removable.
	<x> exclude or include the device to boot.
	<Shift + 1> enables or disables a device.
	<1 - 4> Loads default boot sequence.

F1	Help	↑↓ Select Item	-/+	Change Values	F9	Setup Defaults
Esc	Exit	Select Menu	Enter	Select ► Sub-Menu	F10	Save and Exit

3.9 Server Menu:

```
                    Phoenix TrustedCore(tm) Setup Utility
        Main    Advanced     Security      Power        Boot   Server        Exit

                                                   Item Specific Help
  ► Hardware Monitor
                                               Show hardware monitor
                                               Current state.




  F1   Help      ↑↓ Select Item    -/+  Change Values      F9   Setup Defaults
  Esc Exit       Select Menu       Enter Select   ► Sub-Menu   F10  Save and Exit
```

Item	Options	Description
Hardware Monitor	No options.	Show hardware monitor current state.

3.10 Exit Menu:

```
                    Phoenix TrustedCore(tm) Setup Utility
      Main    Advanced      Security       Power   Boot        Server        Exit

                                                   Item Specific Help
      Exit Saving Changes       [Enter]
      Exit Discarding Changes   [Enter]          Exit System Setup and
      Load Setup Defaults       [Enter]          save your changes to
      Discard Changes           [Enter]          CMOS.
      Save Changes              [Enter]



      F1   Help      ↑↓ Select Item      -/+   Change Values        F9   Setup Defaults
      Esc  Exit          Select Menu     Enter  Select    ► Sub-Menu  F10  Save and Exit
```

Item	Options	Description
Exit Saving Changes	Enter	Exit System Setup and save your changes to CMOS.
Exit Discarding Changes	Enter	Exit utility without saving Setup data to CMOS.
Load Setup Defaults	Enter	Load default values for all SETUP items.
Discard Changes	Enter	Load previous values from CMOS for all SETUP items.
Save Changes	Enter	Save Setup Data to CMOS.

APPENDIX I: Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DMI: A specification that establishes a standard framework for managing networked computers. DMI covers hardware and software, desktop systems and servers, and defines a model for filtering events and describing interfaces.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip.

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

OPROM: Firmware on adapter cards that control bootable peripherals. The system BIOS interrogates the option ROMs to determine which devices can be booted.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SMBIOS: The system management specification addresses how motherboard and system vendors present management information about their products in a standard format by extending the BIOS interface on Intel architecture systems.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

ZCR (Zero Channel RAID): ZCR card provides RAID-5 solution by working with the onboard SCSI/SATA/SATA-II chip through special PCI-X slot with Intel RAIDIOS logic, thus lowering cost of RAID-5 solution