Thunder n3600M /// S2932

Version 1.1

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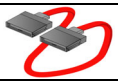
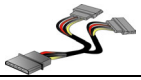
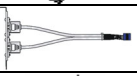
Check the box contents!

Item	S2932WG2NR	S2932G2NR
	1x Thunder n3600M S2932WG2NR motherboard	1x Thunder n3600M S2932G2NR motherboard
	1x 34-Pin floppy drive cable	1x 34-Pin floppy drive cable
	6 x SATA cable	6 x SATA cable
	3 x SATA Drive Power Adapter	3 x SATA Drive Power Adapter
	2 x SAS Cable	--
	1 x Ultra-DMA-100/66 IDE cable	1 x Ultra-DMA-100/66 IDE cable
	1 x USB2.0 cable	1 x USB2.0 cable
	1 x Thunder n3600M user's manual	1 x Thunder n3600M user's manual
	1 x Thunder n3600M Quick Reference guide	1 x Thunder n3600M Quick Reference guide
	1 x TYAN driver CD	1 x TYAN driver CD
	1 x I/O shield	1 x I/O shield
	1 x SLI bridge	1 x SLI bridge
	2 x CPU Retention Frame and Back Plate	2 x CPU Retention Frame and Back Plate
	1 x COM Port cable	1 x COM Port cable

NOTE

Chapter 1: Introduction

1.1 - Congratulations

You have purchased one of the most powerful server solutions. The Thunder n3600M (S2932) is a flexible AMD64 platform for multiple applications, based on NVIDIA nForce Pro3600 and SMSC DME5017 chipsets.

Designed to support AMD® uPGA 1207-pin ZIF L1 socket processors and 64GB DDRII-667 memory, the S2932 with integrated Dual Gigabit Ethernet LAN, built-in 32MB DDR video memory and six serial ATA ports, is ideal for CPU, memory, and video intensive applications such as CAD, Graphics Design, and High Bandwidth Video Editing, etc.

Remember to visit TYAN's Website at http://www.TYAN.com. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades.

1.2 - Hardware Specifications

Processor
- Two uPGA 1207-pin ZIF L1 sockets
- Supports up to two AMD® Opteron™ Rev. F 2000 Series Santa Rosa Dual core processors, and Barcelona Quad core processors
- Integrated 128-bit DDR memory controller

Expansion Slots
- Two (2) x16 PCI Express with x8 bandwidth
- Three (3) PCI-X slots
- One (1) 32-bit, 33MHz PCI v2.3 slots
- Total six (6) usable expansion slots

Chipset
- nVIDIA nForce Pro 3600
- NEC nPD720400
- SMSC DME5017
- LSI 1068E

Integrated I/O Interfaces
- One (1) floppy connector
- One (1) IDE connector
- Six (6) SATA ports
- Eight (8) SAS ports
- Four (4) USB2.0 ports (2 at rear, 2 via cable)
- Two (2) COM port (1 at rear, 1 via cable)
- Tyan 2x9 front-panel pin header
- Tyan 2x7 pin header (2.0mm) for FAN tachometer and PWM
- 2x25 IPMI pin header

Integrated 2D/3D PCI Graphics
- ATI ES1000 PCI graphics controller
- 32MB DDR Frame Buffer of video memory

Integrated IDE
- One (1) ATA IDE slot for two IDE devices
- Support for ATA-133/100/66/33 IDE drives and ATAPI compliant devices

System Management
- SMSC DME5017 w/ hardware monitoring
- Seven 4-pin fan header
- Temperature and voltage monitoring
- Watchdog timer
- Port 80 code display LED
- TYAN IPMI support

Memory
- Dual memory channels
- Supports up to 16 DDRII-667 DIMMs
- Up to 64GB of register ECC/non-ECC memory

Integrated Serial ATA II
- Serial ATA Host controllers embedded
- Supports six serial ports running at 3.0Gb/s
- NV RAID 0, 1, 0+1, 5 and JBOD support
- SATA activity LED connector

Serial Attached SCSI(SAS)
- LSI 1068E PCI-E SAS controller
- Supports 8 SAS ports running at 3.0Gb/s
- RAID 0, 1 and JBOD support

Back Panel I/O Ports
- Stacked PS/2 mouse & keyboard ports
- Two (2) USB 2.0 ports
- One (1) COM1 connector
- One (1) 15-pin VGA port
- Two RJ45 (Marvell 88E1121 PHy + nVIDIA MAC) 10/100/1000 Base-T port with link/activity LED

Integrated LAN Controllers
- Two 10/100/1000 Base-T LAN (nForce Pro3600 integrated MAC with Marvell 88E1121Gigabit Ethernet PHY)
- IEEE802.3 compliant, WOL/PXE support

BIOS
- AMI BIOS 8Mbit Flash
- Supports ACPI 2.0
- PnP, DMI2.0, WfM2.0 power management

Power
- ATX12V support, on-board 4-phase VRD
- Universal 24-pin + 8-pin power connectors
- 4-pin auxiliary power connector

Form Factor
- Extended ATX (13” x 12”)
- 8 layers PCB

Regulatory
- FCC Class B (Declaration of Conformity)
- CE (Declaration of Conformity)

PCI-E Assignment
- X16 PCI Express with x8 bandwidth
- X16 PCI Express with x8 bandwidth
- NEC nPD720400 with x4 bandwidth
- LSI 1068E with x8 bandwidth

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Thunder n3600M S2932 matches the EATX specification. Before continuing with installation, confirm that your chassis supports an ATX motherboard.

How to install our products right… the first time

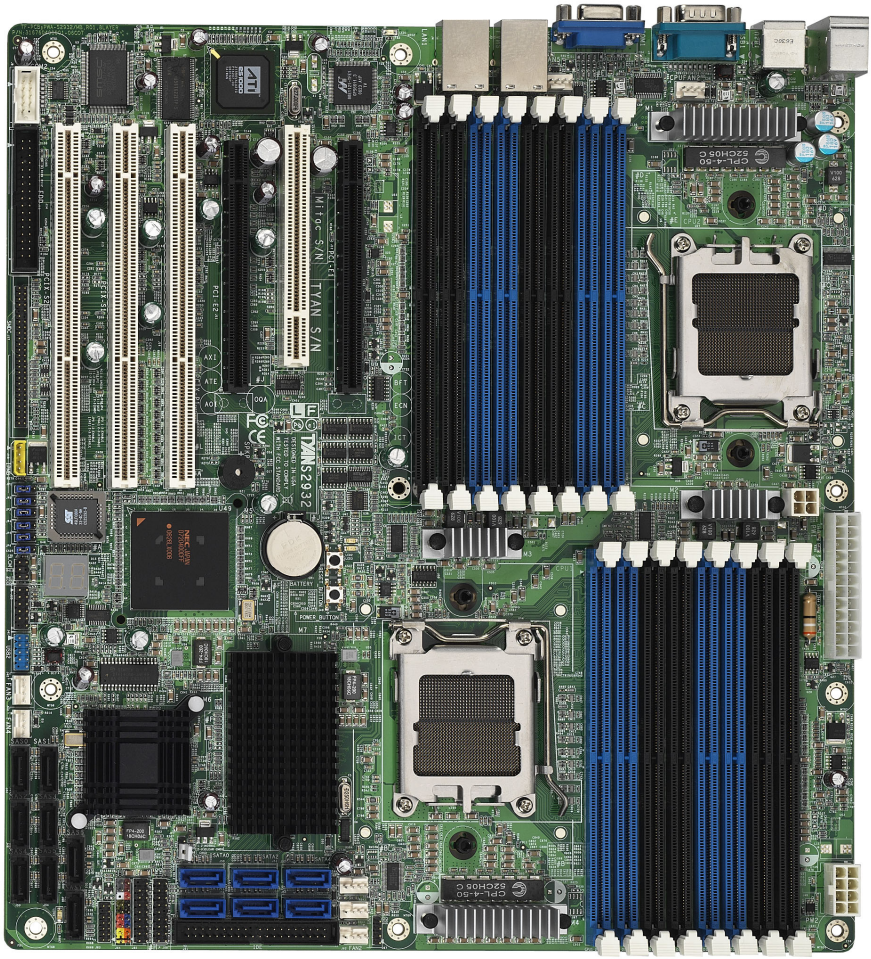
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

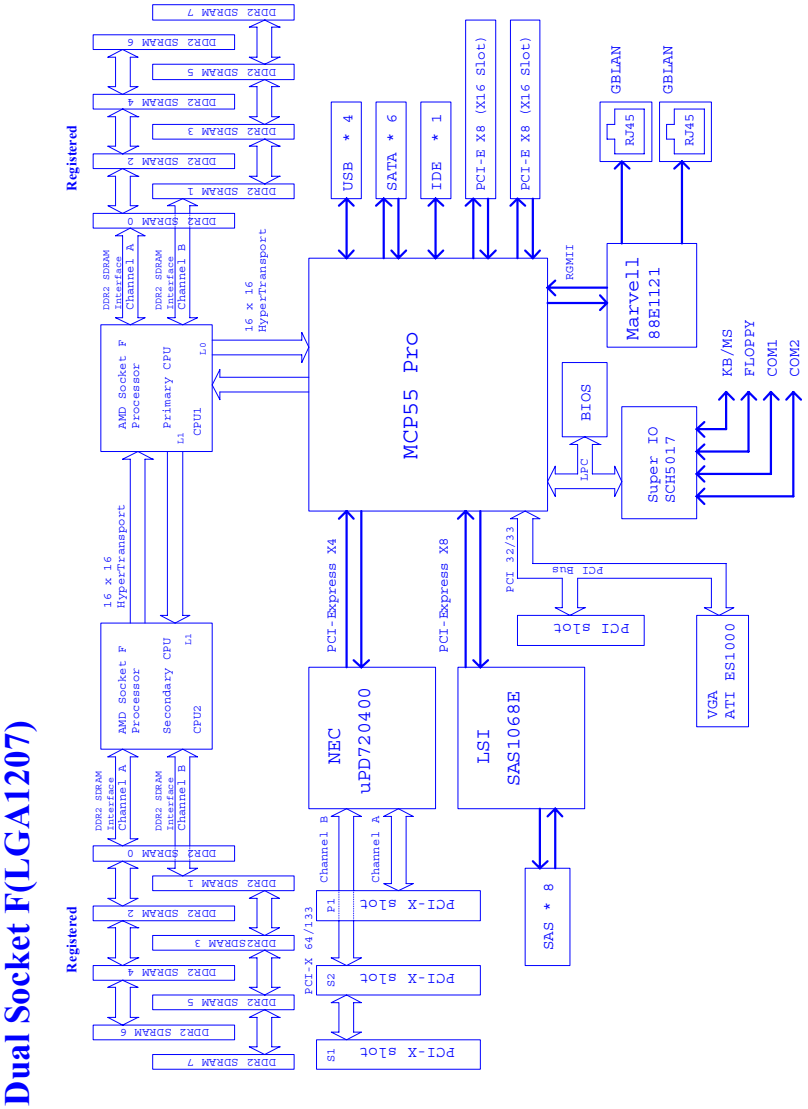
NOTE	**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

2.1- Board Image



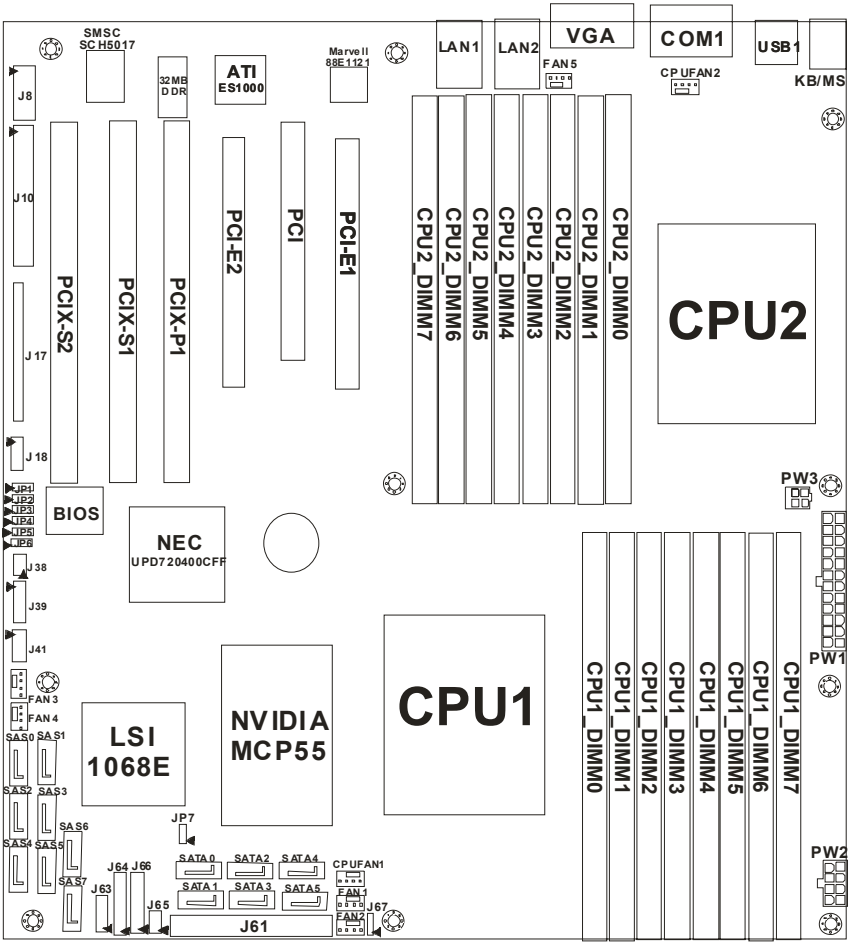
This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

2.2 - Block Diagram



Thunder n3600M S2932 Block Diagram

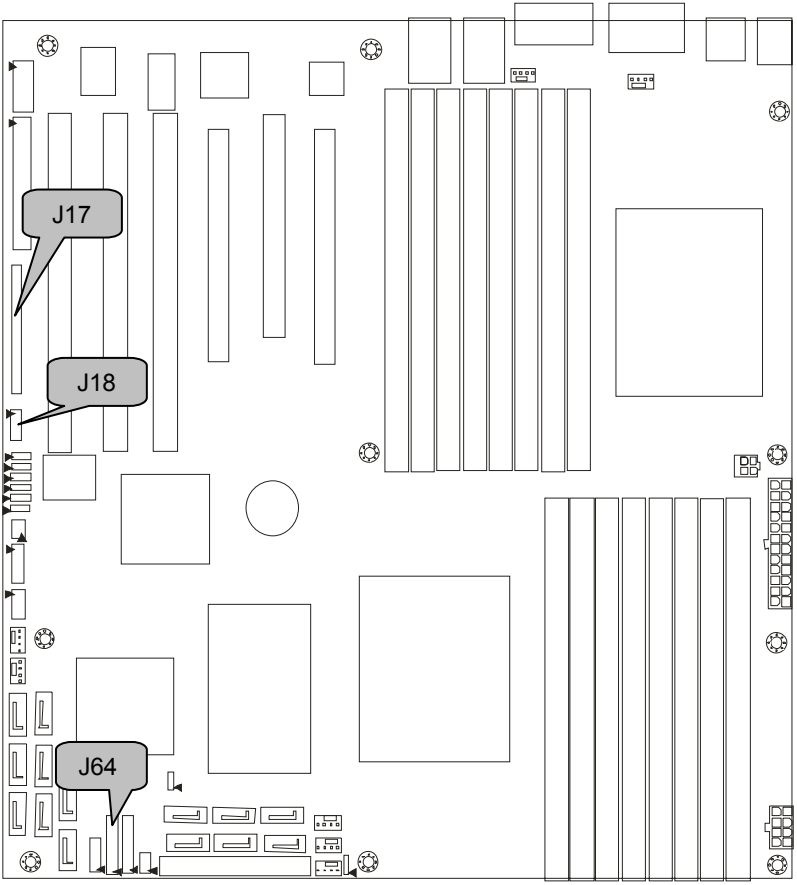
2.3 - Board Parts, Jumpers and Connectors



Jumper Legend

	OPEN - Jumper OFF, without jumper cover
	CLOSED – Jumper ON, with jumper cover

Jumper/Connector	Function
JP1/JP2	PCI-S1/ PCI-S2 Speed Setting Jumper
JP3/JP4	SMDC Select Jumper
JP5	VGA Enable/Disable Jumper
JP6	SAS Enable/Disable Jumper
JP7	Clear CMOS Jumper
J1	Keyboard/Mouse Connectors
J2	VGA Connector
J3	COM Port Connector
J4/J5	Gigabit LAN Port
J7/J42/J43/J59/J62	Chassis Fan Connectors J59: FAN1, J62: FAN2, J42: FAN3, J43: FAN4 J7: FAN5
J8	COM Port Pin Header
J9/J55	J55: CPUFAN1; J9: CPUFAN2 connectors
J10	Floppy Connector
J17	SMDC Connector
J18	IPMB Pin Header
PW1/PW2/PW3	Power Connectors (see p.34 for details)
J38	LCM Pin Header (for Barebone use only)
J39/J63	TYAN Front Panel 2 Connector (for Barebone use only)
J41	Front Panel USB2.0 Connectors
J61	Primary IDE Connector
J64	Front Panel Header
J65	SGPIO Header (for Barebone use only)
J66	SAS Fault LED Pin Header (for Barebone use only)


J17
J18
J64

J64: Front Panel Header

The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

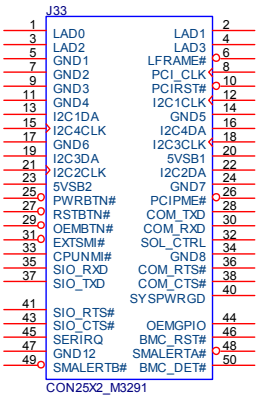
HDD LED+	1	2	PWR LED+
HDD LED-	3	4	PWR LED-
Reset Switch	5	6	PWR Switch
Reset Switch	7	8	Power Switch
NMI	9	10	Warning LED+
NMI	11	12	Warning LED-
5VSB	13	14	key
SMBus Data	15	16	GND
SMBus Clock	17	18	Chassis Intrusion

J18: IPMB Pin Header

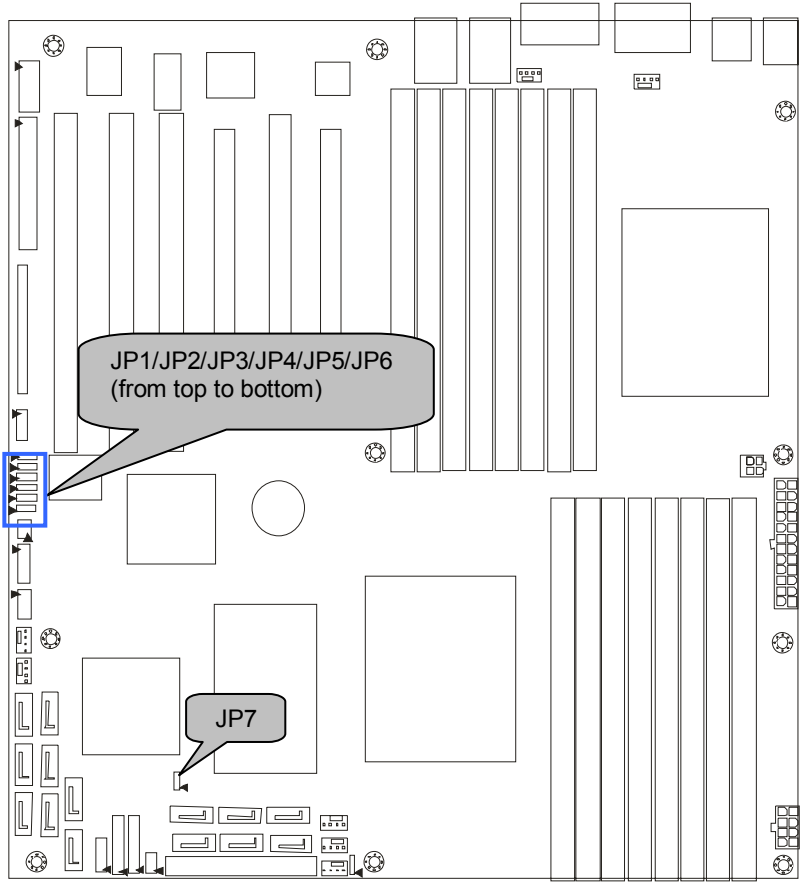
Use this header to connect to the IPMB device.

Pin 1	Pin 2	Pin 3	Pin 4
IPMB DATA	GND	IPMB CLK	NC

J17: SMDC Connector



The SMDC connector allows you to connect with Tyan Server Management Daughter Card (SMDC). The S2932 supports Tyan SMDC M3291. See Appendix for more information on SMDC.



JP1/JP2: PCI-S1/PCI-S2 Speed Setting Jumper

	Max frequency is 133MHz
	Max frequency is 100MHz

JP3/JP4: SMDC Select Jumper

	Support SMDC. Please note that both JP3 and JP4 must be Pin #2-3 closed to support SMDC.

JP5: VGA Enable/Disable Jumper

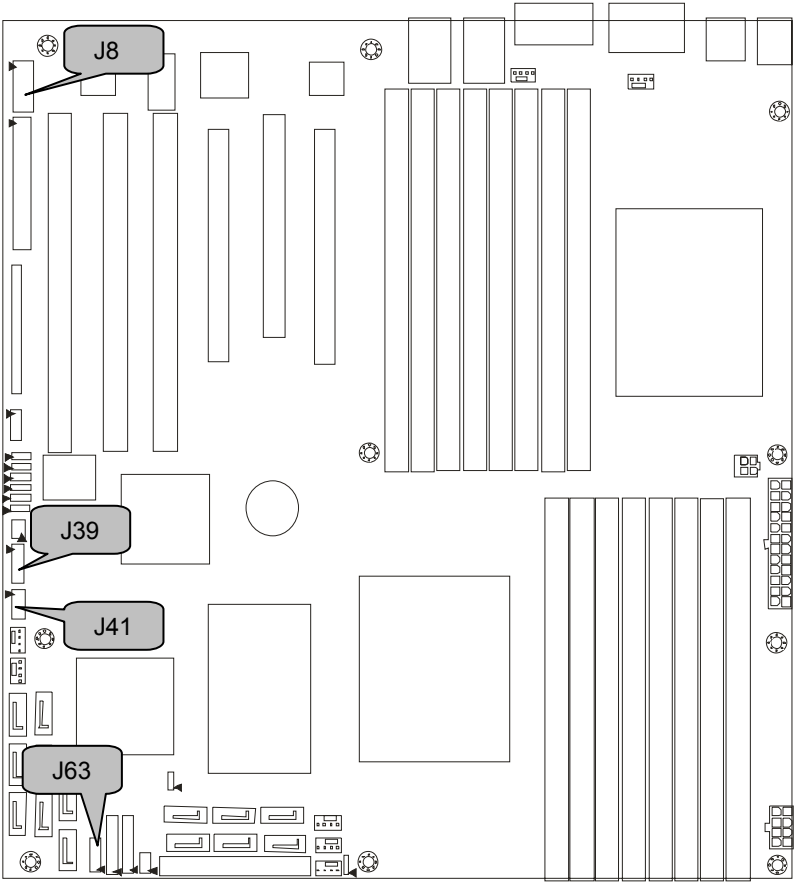
	Enable the onboard VGA function. **(Default)**
	Disable the onboard VGA function.

JP6: SAS Enable/Disable Jumper

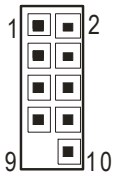
	Enable the onboard SAS function. **(Default)**
	Disable the onboard SAS function.

JP7: Clear CMOS Jumper

 **Normal (Default)**	Use this jumper when you forgot your system/setup password or need to clear system BIOS setting. How to clear the CMOS data - Power off system and **disconnect power supply from AC source** - Use jumper cap to close Pin_2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin_1 and 2 Reconnect power supply to AC source Power on system
 **Clear**	



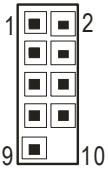
J41: Front Panel USB2.0 Connector



Signal	Pin	Pin	Signal
USB PWR	1	2	USB PWR
USB1-	3	4	USB2-
USB1+	5	6	USB2+
GND	7	8	GND
Key	9	10	GND

Use these headers to connect to the USB devices via the enclosed USB cable.

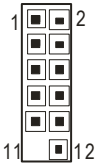
J8: COM Port Pin Header



Use these pin definitions to connect a port to COM2.
*TYAN does not provide cable for this header. It is designed for OEM use only.

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

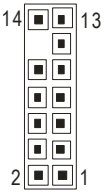
J39: TYAN Front Panel 2 Connector (for Barebone use only)



Signal	Pin	Pin	Signal
LAN1 LED+	1	2	LAN1 LED-
LAN2 LED+	3	4	LAN2 LED-
NC	5	6	NC
ID LED+	7	8	ID LED-
ID S/W+	9	10	ID S/W-
Key	11	12	NC

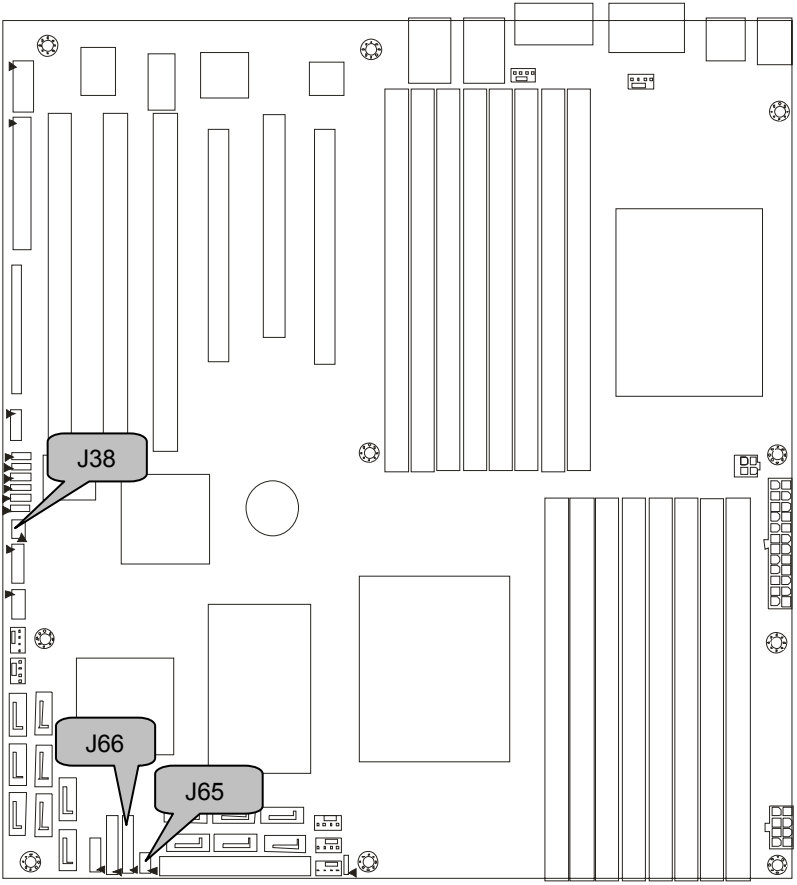
Use this header to connect to the front panel of barebone.

J63: TYAN Fron Panel 2 Connector (for Barebone use only)

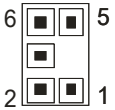


Signal	Pin	Pin	Signal
TACH1	1	2	TACH6
TACH2	3	4	TACH7
TACH3	5	6	TACH8
TACH4	7	8	TACH9
TACH5	9	10	TACH10
GND	11	12	Key
GND	13	14	PWM

Use this header to connect to the front panel of barebone.


J38
J66
J65

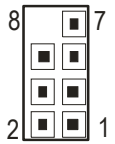
J38: LCM Pin Header (for Barebone use only)



Signal	Pin	Pin	Signal
VCC5V	1	2	RXD2
Key	3	4	GND
5VSB	5	6	TXD2

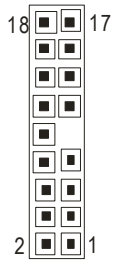
Use this header to connect the LCM module with system monitoring function. This header is reserved for barebone use.

J65: SGPIO Header (for Barebone use only)



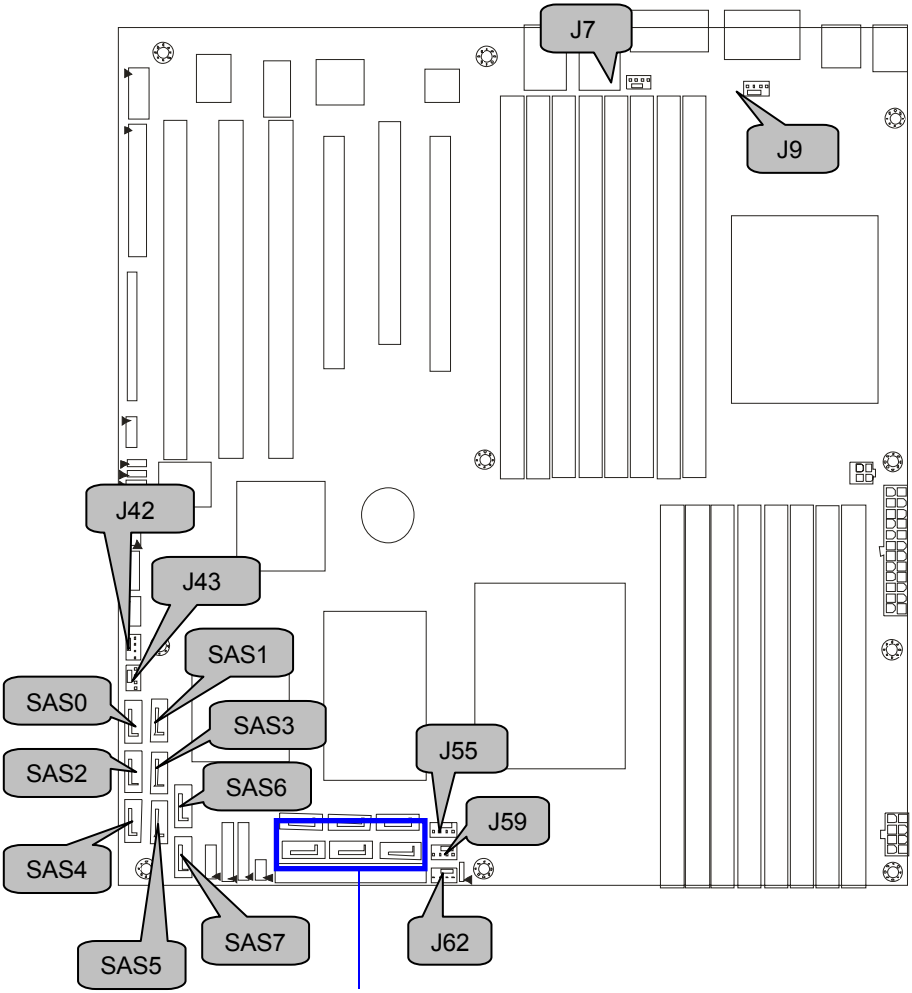
Signal	Pin	Pin	Signal
SDATA_OUT0	1	2	SDATA_IN0
SCLOCK	3	4	SLOAD
SDATA_OUT1	5	6	SDATA_IN1
GND	7	8	Key

J66: SAS Fault LED Pin Header (for Barebone use only)



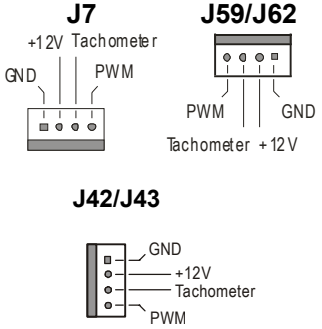
Signal	Pin	Pin	Signal
SAS0+	1	2	SAS0-
SAS1+	3	4	SAS1-
SAS2+	5	6	SAS2-
SAS3+	7	8	SAS3-
Key	9	10	NC
SAS4+	11	12	SAS4-
SAS5+	13	14	SAS5-
SAS6+	15	16	SAS6-
SAS7+	17	18	SAS7-

Use this header to connect to the SAS Fault LED on Barebone.



Top: from left to right
SATA0, SATA2, SATA4
Bottom: from left to right
SATA1, SATA3, SATA5

J7/J42/J43/J59/J62: Front Fan Connectors

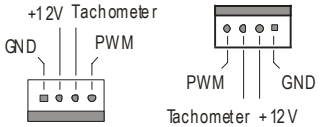


Use these headers to connect the chassis cooling fans to your motherboard to keep the system stable and reliable.

J59: FAN1, J62: FAN2, J42: FAN3, J43: FAN4
J7: FAN5

These connectors support the tachometer monitoring and auto fan speed control.

J9/J55: CPU FAN Connector



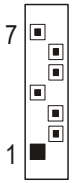
CPUFAN2 **CPUFAN1**

Use this header to connect the processor cooling fan to your motherboard to keep the system stable and reliable.

J55: CPUFAN1, J9: CPUFAN2

This connector supports the tachometer monitoring and auto fan speed control.

SATA 0/1/2/3/4/5: Serial ATA RAID Connectors
SAS 0/1/2/3/4/5/6/7 SAS Connectors

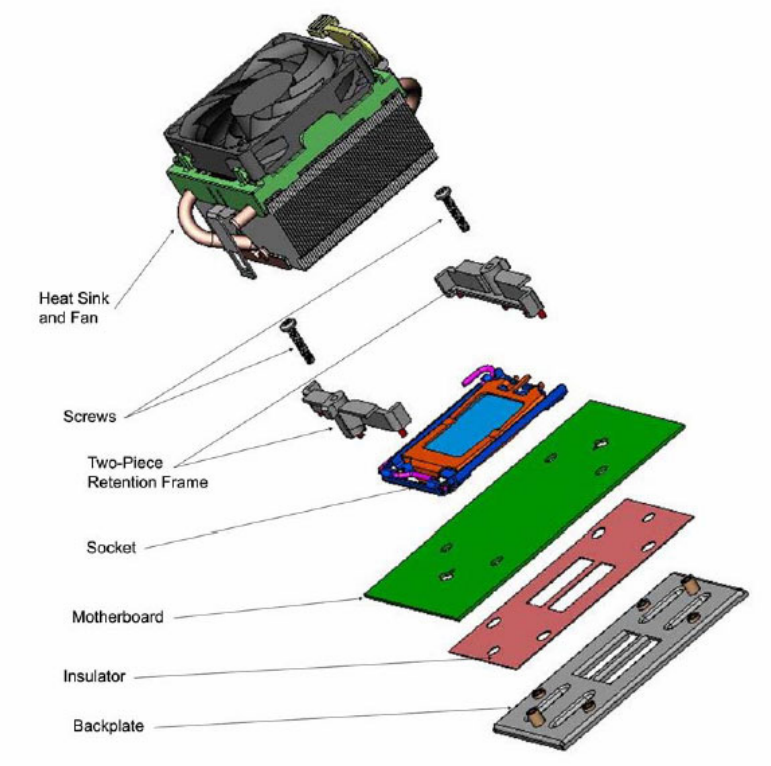


7	GND	**SATA 0/1/2/3/4/5 Connectors** - Connects to the Serial ATA drives via the Serial ATA cable - You may have the support of RAID 0, 1, 0+1, and 5 through the onboard MCP55 Pro chip. **SAS 0/1/2/3/4/5/6/7 SAS Connectors** - Connects to the Serial ATA or SAS HDD via the Serial ATA cable - You may have the support of NV RAID 0, 1 and JBOD through the onboard LSI SAS1068E chip.
6	RXP	
5	RXN	
4	GND	
3	TXN	
2	TXP	
1	GND	

2.4 - Installing the Processor

Your Thunder n3600M S2932 supports the latest processor technologies from AMD. Check the TYAN website for latest processor support:

http://www.tyan.com



Exploded View of AMD PIB Platforms Thermal Solution based on AMD Socket F Processor

Back plate Assembly

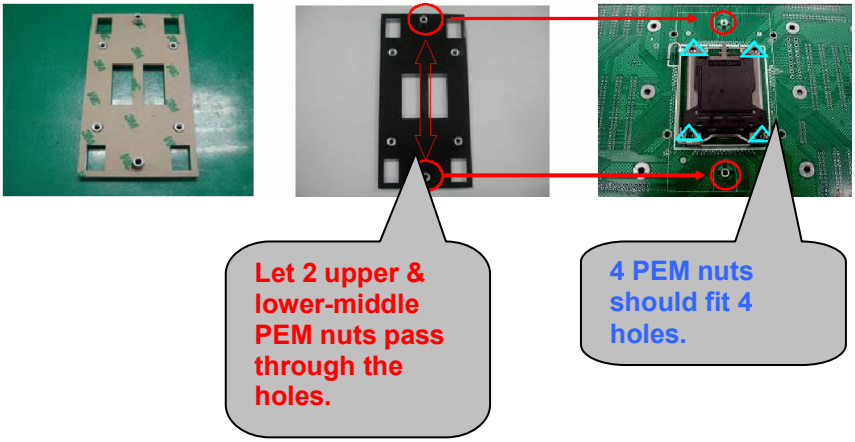
The back plate is mounted on the backside of the motherboard and enhances local stiffness to support shock and vibration loads acting on the heat sink. The back plate assembly prevents excessive motherboard warpage in the area near the processor. Without a back plate, excessive warpage could cause serious damage to electrical connections of the processor socket and integrated circuit packages surrounding the processor. The back plate also serves as a stiffener plate for the LGA socket.

While doing the installation, be careful in holding the components. Follow these instructions to install your back plate:

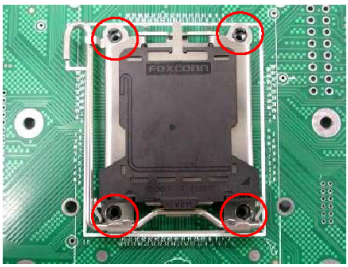
1. Remove the release liner from the back plate.

2. Align the PEM nuts on the back plate to the holes on the reverse side of the PCB.

3. First, insert the taller upper & lower middle PEM nuts through the holes of the PCB. The remaining four shorter PEM nuts should automatically fit the 4 holes on the PCB as shown in the following pictures.

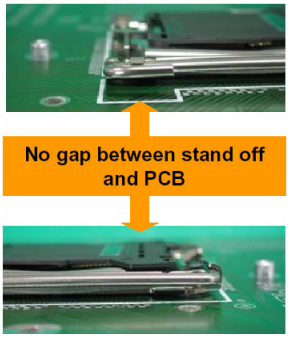


4. Locate four screw holes on socket and screw the socket to the PCB board.



NOTE: Do not assemble CPU before securing socket with screws.

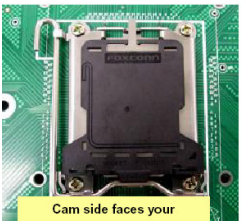
5. Inspect Socket F assembly to PCB. The Socket F must be tightly attached onto the PCB. There must NOT be any gap between stand off the PCB.

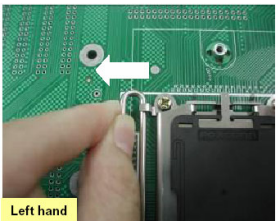


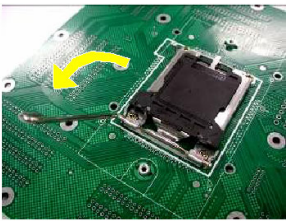
Processor Installation

The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.
Follow these instructions to install your processor:

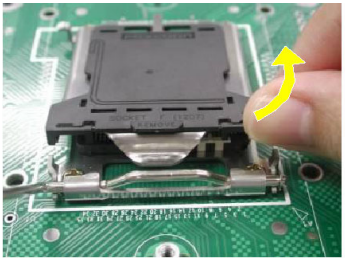
1. Place the PCB such that the socket cam side faces you. Make sure the lever hook is on your top-left side.
2. Use your left thumb and forefinger to hold the lever hook, then pull it to the left side to clear the retention tab.
3. Rotate the lever to a fully open position.

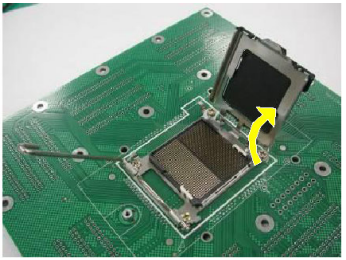




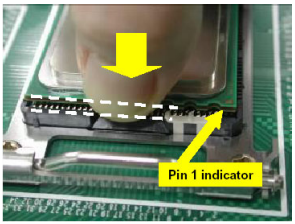


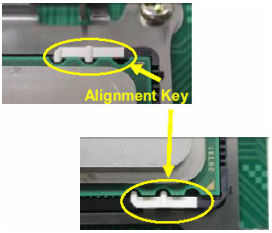
4. Lift the load plate to a fully open position.





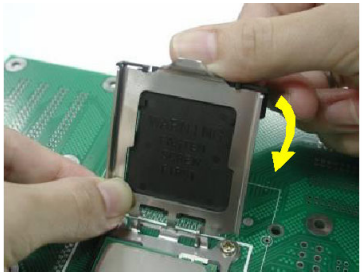
5. Locate the Pin 1 indicator of the package. Align the package with the socket and carefully insert the package into the socket with vertical motion only. Vertically check if the CPU is seated well in the socket housing. If not, take out the CPU, with vertical motion only, and repeat the above steps.

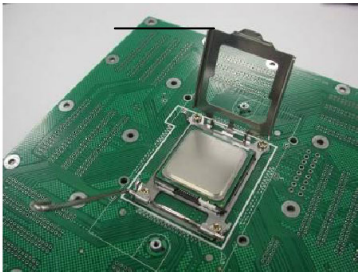




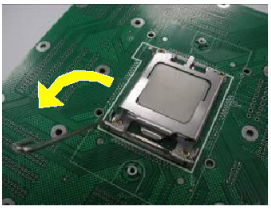
NOTE: The alignment keys must be located in the notches of the package.

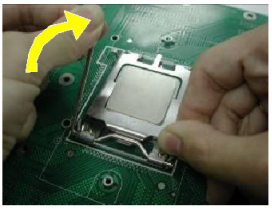
6. Remove the PnP cap. Use your left hand to hold the load plate. Then use your right thumb to remove the PnP cap from the load plate. With the package in the socket, the PnP cap removal process will not damage the contacts.





7. Close the socket. Rotate the load plate onto the package lid. Engage the load lever while pressing down lightly onto the load plate. Secure the lever near the hook end under the retention tab.



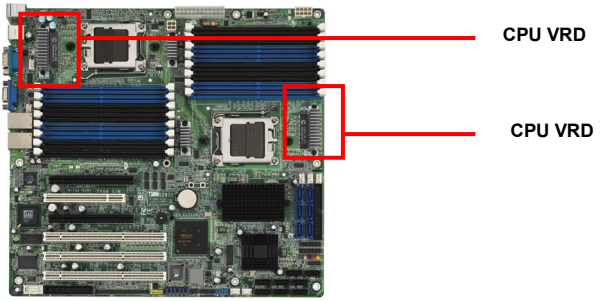


8. Repeat this procedure for the second processor if necessary.

CPU VRD Heat Dispersion Notice

INSTALL FAN INTO CHASSIS TO LET AIR FLOW IN!!!

-To ensure that the board runs efficiently and does not overheat, make sure there is air flow around the CPU VRD (as shown) to help disperse the heat generated around the CPU.



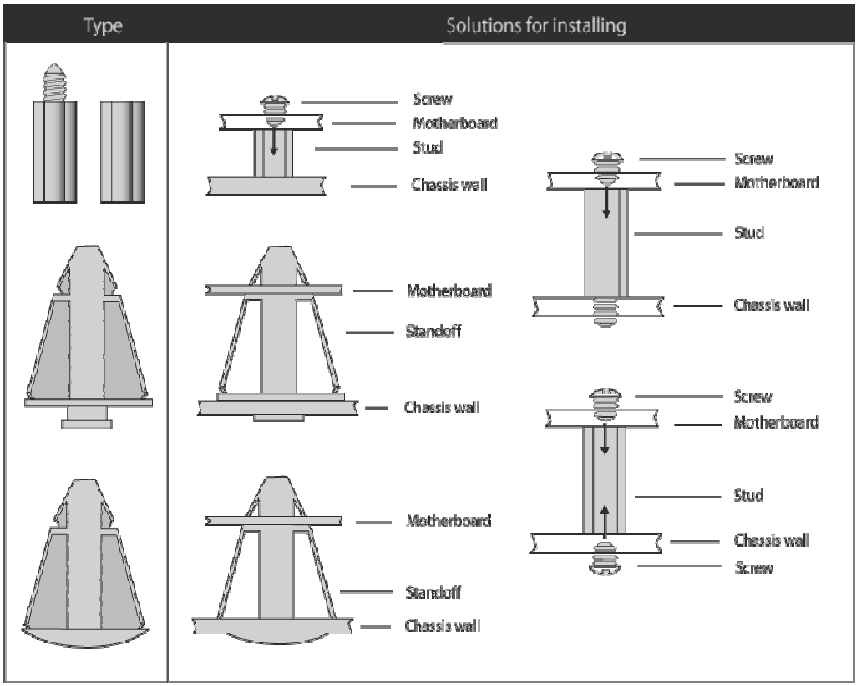
2.5 - Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

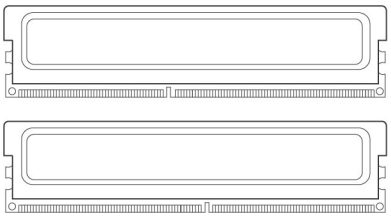
Mounting the Motherboard



2.6 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDR2 register ECC/non-ECC memory modules are required. Check the TYAN Web site at www.tyan.com for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR2 memory modules.



- All installed memory will automatically be detected and no jumpers or settings need changing.
- The Thunder n3600M S2932 supports up to 64GB of memory.

Memory Population Rule
(Note: X indicates a populated DIMM Slot)

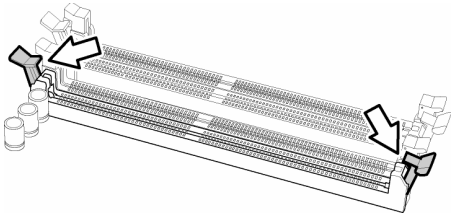
	Single CPU Installed (CPU1 only)				Dual CPU installed (CPU1 and CPU2)			
Population Option	1	2	3	4	5	6	7	8
CPU1_DIMM0				x				x
CPU1_DIMM1				x				x
CPU1_DIMM2			x	x			x	x
CPU1_DIMM3			x	x			x	x
CPU1_DIMM4		x	x	x		x	x	x
CPU1_DIMM5		x	x	x		x	x	x
CPU1_DIMM6	x	x	x	x	x	x	x	x
CPU1_DIMM7	x	x	x	x	x	x	x	x
CPU2_DIMM0								x
CPU2_DIMM1								x
CPU2_DIMM2							x	x
CPU2_DIMM3							x	x
CPU2_DIMM4						x	x	x
CPU2_DIMM5						x	x	x
CPU2_DIMM6					x	x	x	x
CPU2_DIMM7					x	x	x	x

NOTE:
Symmetrical DIMMS must be identical
- Same DRAM technology, eg 128-bit, 256-bit, etc
- Same DRAM bus width, eg x8 or x16
- Matched Sided DIMMs (single-sided or double-sided)

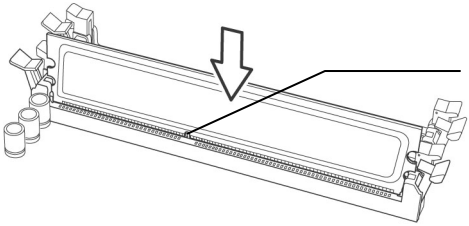
Memory Installation Procedure

Follow these instructions to install memory modules into the Thunder n3600M.

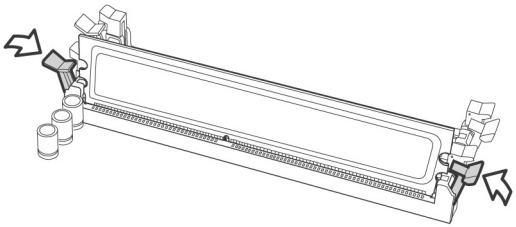
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



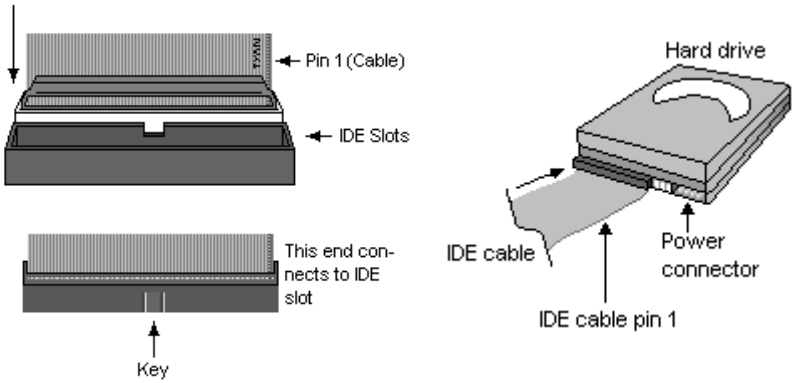
3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.7 - Attaching Drive Cables

Attaching IDE Drive Cable
Attaching the IDE drive cable is simple. These cables are "keyed" to only allow them to be connected in the correct manner. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

Attaching IDE cables to the IDE connectors is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

NOTE: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

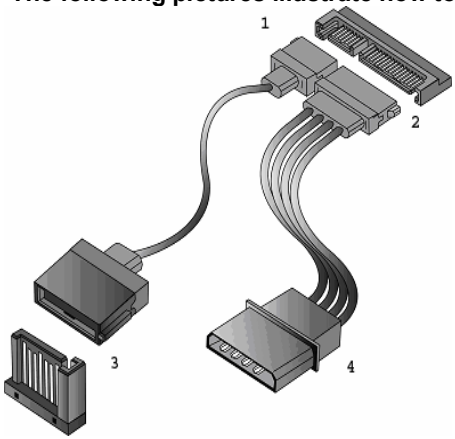
TIP: Pin 1 on the IDE cable (usually designated by a colored wire) faces the drive's power connector.

Attaching Serial ATA Cables
The Thunder n3600M S2932 is equipped with **6** Serial ATA (SATA) channels. Connections for these drives are very simple.

There is no need to set Master/Slave jumpers on SATA drives.

Tyan has supplied two SATA cables and one SATA power adapter. If you are in need of other cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



1.SATA drive cable connection

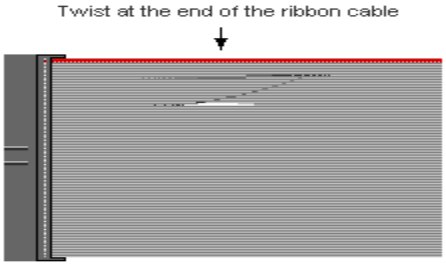
2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

Attaching Floppy Drive Cables

Attaching floppy diskette drives are done in a similar manner to hard drives. See the picture below for an example of a floppy cable. Most of the current floppy drives on the market require that the cable be installed with the colored stripe positioned next to the power connector. In most cases, there will be a key pin on the cable which will force a proper connection of the cable.



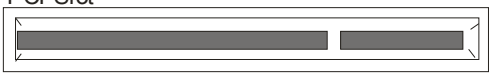
Attach first floppy drive (drive **A:**) to the end of the cable with the twist in it. Drive **B:** is usually connected to the next possible connector on the cable (the second or third connector after you install Drive **A:**).

2.8 - Installing Add-in Cards

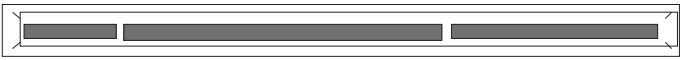
Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the most common slots that may appear on your motherboard. Not all of the slots shown will necessarily appear on your motherboard.

PCI Express (x16)

PCI Slot



PCI-X (64/133)



Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

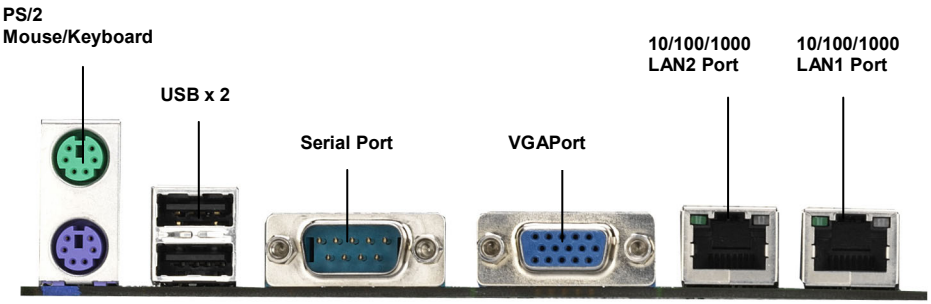
PCI IDESELs and IRQ Assignments

Slot or Device	IDSEL#	Bus#	PIRQ	PIRQ	PIRQ	PIRQ
PCI Slot	AD22	PCI	INT_W	INT_X	INT_Y	INT_Z
Onboard VGA	AD23	PCI	INT_Y			
PCI-X1 Slot #1 (32bit)	AD16	PCI-X1	INT_A	INT_B	INT_C	INT_D
PCI-X2 Slot #1 (32bit)	AD16	PCI-X2	INT_A	INT_B	INT_C	INT_D
PCI-X2 Slot #2 (32bit)	AD18	PCI-X2	INT_C	INT_D	INT_A	INT_B

NOTE	**YOU MUST ALWAYS** unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

2.9 - Connecting External Devices

Your motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

Onboard LAN LED Color Definition

The three onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
LEFT RIGHT		Left LED	Right LED
10 Mbps	Link	Green	1 Blinking Yellow
	Active	Blinking Green	1 Blinking Yellow
100 Mbps	Link	Green	2 Blinking Yellow
	Active	Blinking Green	2 Blinking Yellow
1000 Mbps	Link	Green	3 Blinking Yellow
	Active	Blinking Green	3 Blinking Yellow
No Link		Off	Off

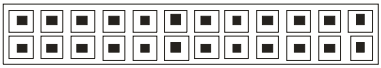
NOTE: In 10 Mbps, the Right LED blinks yellow once in repeat and continuous action. In 100 Mbps, the Right LED blinks yellow twice in repeat and continuous action. So does the condition in 1000 Mbps.

2.10 - Installing the Power Supply

There are three power connectors on your Thunder n3600M S2932. The Thunder n3600M S2932 requires that you have an EPS12V power supply that has a 24-pin, an 8-pin and a 4-pin power connectors.

NOTE: Please be aware that ATX 2.x, ATX12V and ATXGES power supplies may **not** be compatible with the board and can damage the motherboard and/or CPU(s).

24-Pin EPS/12V Power Connector



8-Pin 12V Power Connector

4-Pin 12V Power Connector

J28: PW1

12	+3.3V	24	GND
11	+12V2	23	+5V
10	+12V2	22	+5V
9	+5VSB	21	+5V
8	PWR OK	20	RESVD
7	GND	19	GND
6	+5V	18	GND
5	GND	17	GND
4	+5V	16	PSON#
3	GND	15	GND
2	+3.3V	14	-12V
1	+3.3V	13	+3.3V

J49: PW2

4	GND	8	+12V3
3	GND	7	+12V3
2	GND	6	+12V3
1	GND	5	+12V3

J27: PW3

4	+12V
3	+12V
2	GND
1	GND

Applying power to the board

1. Connect the 12V 8-pin power connector.
2. Connect the EPS/12V 24-pin power connector.
3. Connect the 4-pin power connector.
4. Connect power cable to power supply and power outlet

NOTE

YOU MUST unplug the power supply before plugging the power cables to motherboard connectors.

2.11 – Finishing up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.
In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

NOTE

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:
1. Turn on or reboot your system.
2. Press <Del> during POST (<F4> on remote console) to start the BIOS setup utility.

3.2 – BIOS Menu Bar

The menu bar at the top of the windows lists these selections:

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
PCI/PnP	To configure legacy Plug & Play or PCI settings
Boot	To configure system boot order
Security	To configure user and supervisor passwords
Chipset	To configure chipset management features
Exit	To exit setup utility

3.3 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<F1>	General help window
<ESC>	Exit current menu
← → arrow keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> or <Shift-Tab>	Cycle cursor up/down
<Home> or <End>	Move cursor to top/bottom of the window
<PgUp> or <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F9>	Load the Optimal default configuration values of the menu
<F10>	Save and exit
<Enter>	Execute command or select submenu

3.4 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**].

3.5 In Case of Problems

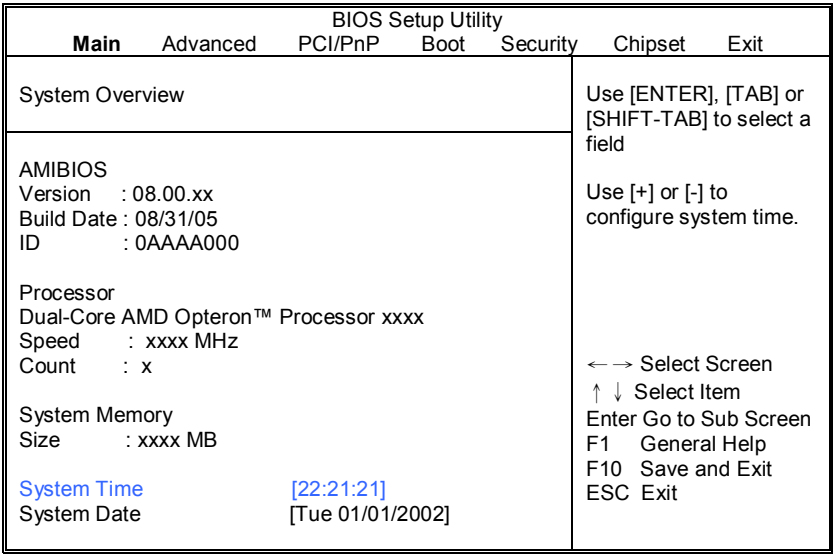
If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by TYAN or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated when this manual is written. Please visit Tyan's website at http://www.tyan.com for the information of BIOS updating.

3.6 BIOS Main Menu

The Main BIOS Menu is the first screen that you can navigate. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured, options in blue can be changed.

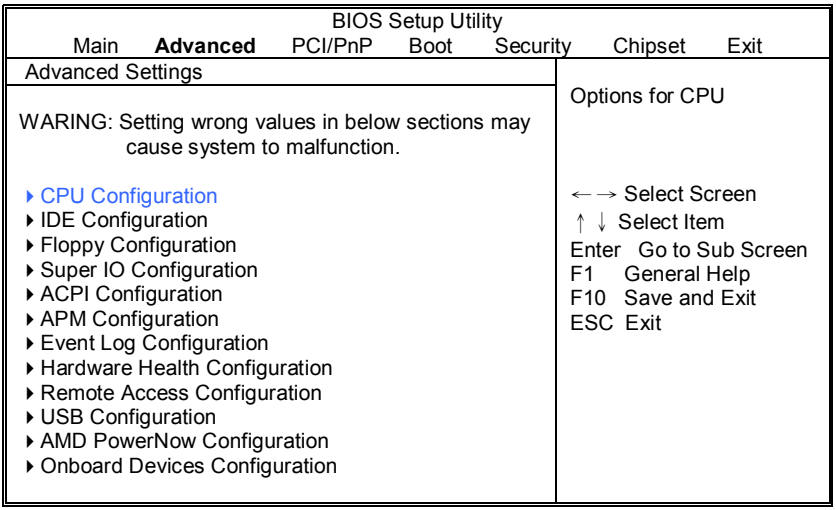
The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.



Feature	Option	Description
Main		
System Time	HH : MM : SS	Set the system time
System Date	MM : DD : YYYY	Set the system date

3.7 Advanced Menu

You can select any of the items in the left frame of the screen, such as Super I/O Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



Feature	Option	Description
Advanced Settings		
CPU Configuration	**Menu Item**	Options for CPU
IDE Configuration	**Menu Item**	Configure the IDE device(s)
Floppy Configuration	**Menu Item**	Configure the Floppy drive(s)
Super IO Configuration	**Menu Item**	Configures Super IO Chipset SCH5017
ACPI Configuration	**Menu Item**	Section for Advanced ACPI Configuration
APM Configuration	**Menu Item**	Section for APM configuration
Event Log Configuration	**Menu Item**	Mark as read, Clear or View Event Log statistics
Hardware Health Configuration	**Menu Item**	Configure/monitor the Hardware Health
Remote Access Configuration	**Menu Item**	Configure Remote Access

Feature	Option	Description
Advanced Settings		
USB Configuration	**Menu Item**	Configure the USB support
AMD PowerNow Configuration	**Menu Item**	Configure AMD PowerNow support
Onboard Devices Configuration	**Menu Item**	Configure onboard devices

3.7.1 CPU Configuration

You can use this screen to view CPU Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

CPU Configuration
Module Version : XX.XX
AGESA Version : XXXXXX
Physical Count : X
Logical Count : X

Quad Core AMD Opteron (tm) Processor xxxxxxxx
Revision : xx
Cache L1: xxxx
Cache L2: xxxx
Cache L3: xxxx
Speed: xxxx
Current FSB Multiplier : xxxx
Maximum FSB Multiplier: xxxx
Able to change Freq.: xxx
uCode Patch Level: xxxx

GART Error Reporting [Disabled]
Microcode Update [Enabled]
Secure Virtual Machine Mode [Enabled]
NMI Function [Enabled]

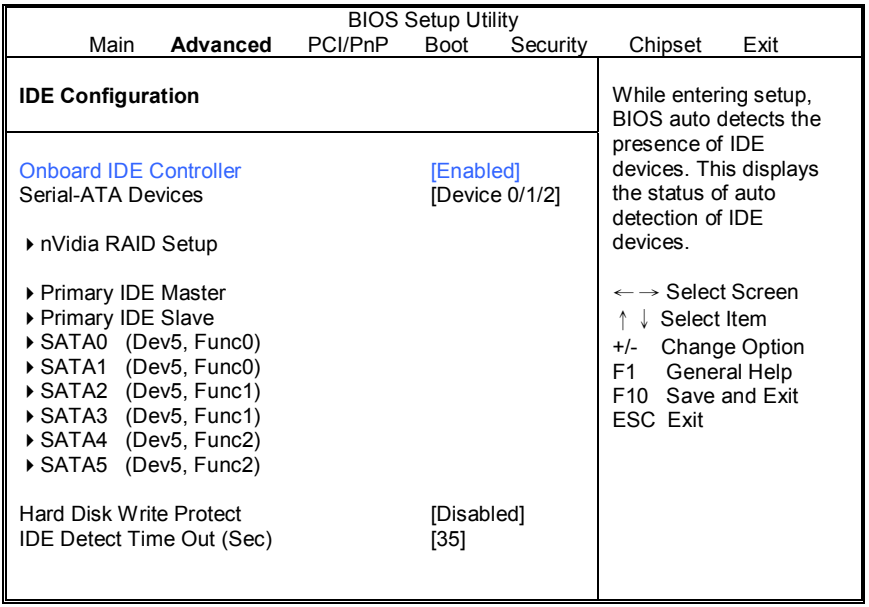
This option should remain disabled for normal operation. The driver developer may disable it for testing purpose.

←→ Select Screen
↑ ↓ Select Item
+/- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Feature	Option	Description
CPU Configuration		
Module Version	Read only	Displays information about CPU
AGESA Version		
Physical Count		
Logical Count		
Revision	Read only	Displays information about CPU
Cache L1		
Cache L2		
Cache L3		
Speed		
Current FSB Multiplier		
Maximum FSB Multiplier		
Able to change Freq.		
uCode Patch Level		
GART Error Reporting	**Disabled**	This option should remain disabled for normal operation. The driver developer may enable it for the purpose of testing.
	Enabled	
Microcode Update	**Enabled**	Enable CPU Microcode update
	Disabled	
Secure Virtual Machine Mode	**Enabled**	Enable/disable Secure Virtual Machine Mode (SVM)
	Disabled	
NMI Function	**Enabled**	Allow NMI button or SMDC to generate NMI
	Disabled	

3.7.2 IDE Configuration Sub-Menu

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



Feature	Option	Description
IDE Configuration		
Onboard IDE Controller	**Enabled** Disabled	Enable/Disable onboard IDE controller.
Serial-ATA Devices	**Device 0/1/2** Disabled Device 0 Device 0/1	Configure serial ATA devices.
Hard Disk Write Protect	**Disabled** Enabled	Enable/Disable device write protection. This will be effective only if device is accessed through BIOS.
IDE Detect Time Out (Sec)	**0~35** (at 5 interval)	Select the time out value for detecting ATA/ATAPI device(s).

3.7.2.1 nVidia RAID Setup

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
RAID Setup	While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices. ←→ Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
nVidia RAID Function [Disabled]	

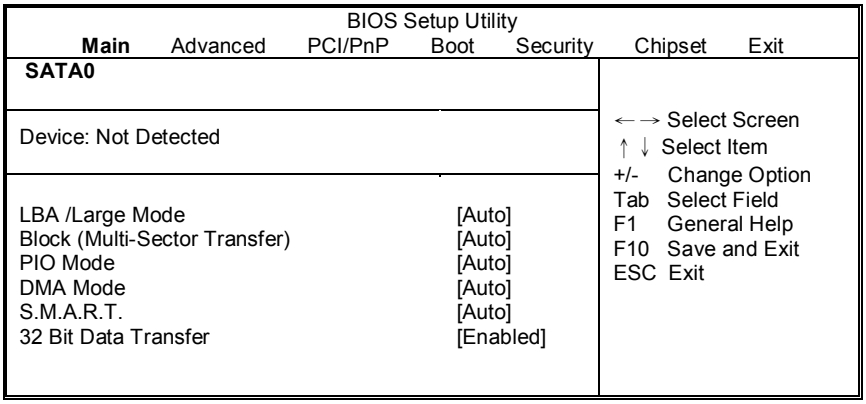
Feature	Option	Description
nVidia RAID Setup		
nVidia Function	**Disabled** Enabled	While entering setup, you can choose enabled/disabled RAID mode for each ATA channel.

3.7.2.2 Primary IDE Master/Slave Sub-Menu

BIOS Setup Utility **Main** Advanced PCI/PnP Boot Security Chipset Exit	
Primary IDE Master	Selects the type of device connected to the system. ←→ Select Screen ↑ ↓ Select Item +/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Device: Not Detected	
Type [Auto] LBA /Large Mode [Auto] Block (Multi-Sector Transfer) [Auto] PIO Mode [Auto] DMA Mode [Auto] S.M.A.R.T. [Auto] 32 Bit Data Transfer [Enabled]	

Feature	Option	Description
Primary IDE Master		
Type	**Auto** Not Installed CD/DVD ARMD	Selects the type of device connected to the system.
LBA/Large Mode	**Auto** Disabled	Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled. Disabled: Disabled LBA Mode.
Block (Multi-Sector Transfer)	**Auto** Disabled	Disabled: The Data transfer from and to the device occurs one sector at a time. Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
PIO Mode	**Auto** 0~4 (at 1 interval)	Selects the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
DMA Mode	**Auto**	Selects DMA Mode. Auto: Auto detected.
S.M.A.R.T.	**Auto** Disabled Enabled	S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
32Bit Data Transfer	**Enabled** Disabled	Enables 32-bit to maximize the IDE hard disk data transfer rate.

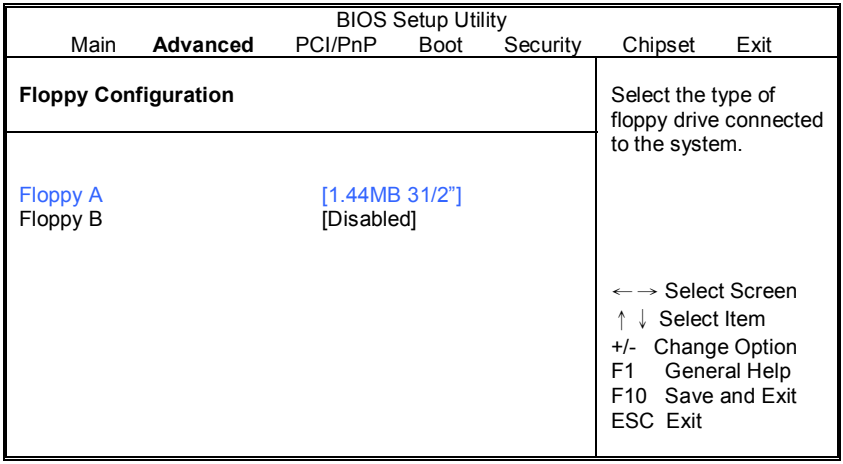
3.7.2.3 SATA0/1/2/3/4/5 Sub-Menu



Feature	Option	Description
SATA 0		
LBA/Large Mode	**Auto**	Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled. Disabled: Disabled LBA Mode.
	Disabled	
Block (Multi-Sector Transfer)	**Auto**	Disabled: The Data transfer from and to the device occurs one sector at a time. Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
	Disabled	
PIO Mode	**Auto**	Selects the PIO Mode. Select Auto to enhance hard disk performance by optimizing the hard disk timing.
	0~4 (at 1 interval)	
DMA Mode	**Auto**	Selects DMA Mode. Auto: Auto detected.
S.M.A.R.T.	**Auto**	S.M.A.R.T (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.
	Disabled	
	Enabled	
32Bit Data Transfer	**Enabled**	Enables 32-bit to maximize the IDE hard disk data transfer rate.
	Disabled	

3.7.3 Floppy Configuration Sub-Menu

You can use this screen to specify options for the Floppy Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Floppy Configuration		
Floppy A	Disabled	Selects the type of floppy drive connected to the system.
	360 KB 51/4"	
	1.2 MB 51/4"	
	720 KB 31/2"	
	1.44 MB 31/2"	
	2.88 MB 31/2"	
Floppy B	**Disabled**	Selects the type of floppy drive connected to the system.
	360 KB 51/4"	
	1.2 MB 51/4"	
	720 KB 31/2"	
	1.44 MB 31/2"	
	2.88 MB 31/2"	

3.7.4 Super IO Configuration Sub-Menu

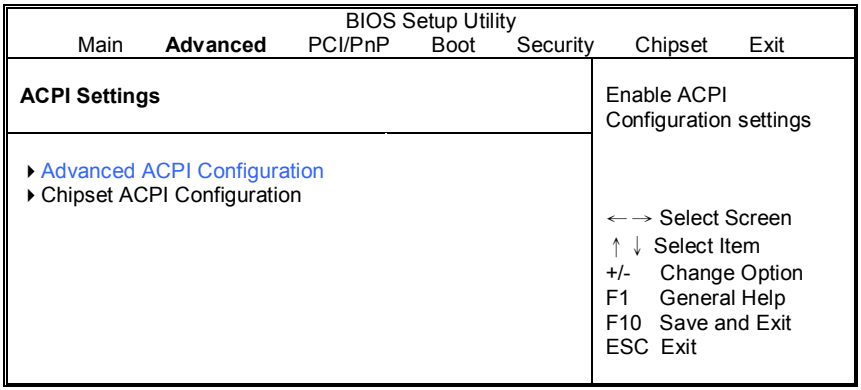
You can use this screen to select options for the Super I/O settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
Configure SCH5017 Super IO Chipset	Allows BIOS to enable or disable Floppy Controller.
Onboard Floppy Controller [Enabled] Serial Port1 Address [3F8/IRQ4] Serial Port2 Address [2F8/IRQ3] Chassis Intrusion Detect [Disabled] Watchdog Mode [Disabled] Watchdog Timer [2]	←→ Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

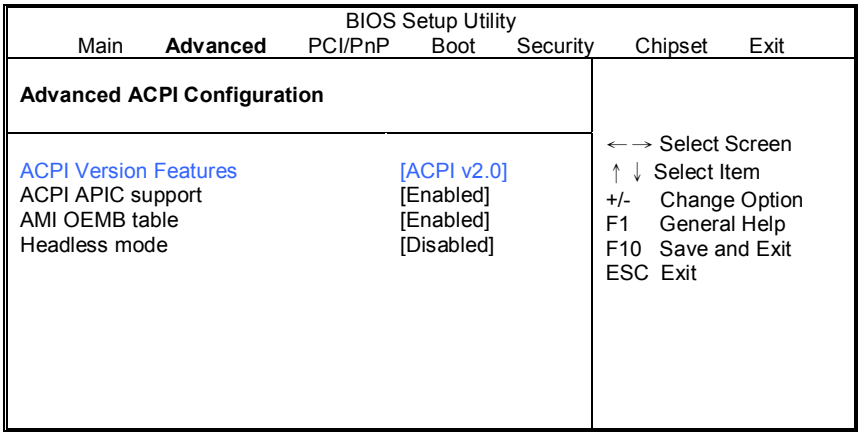
Feature	Option	Description
Configure SCH5017 Super IO Chipset		
Onboard Floppy Controller	Disabled	Allow BIOS to enable or disable the floppy controller.
	Enabled	
Serial Port1 Address	**3F8 IRQ4**	Allow BIOS to select Serial Port1 Base Addresses.
	3E8 IRQ4	
	2E8 IRQ3	
	Disabled	
Serial Port2 Address	**2F8 IRQ3**	Allow BIOS to select Serial Part2 Base Addresses.
	3F8 IRQ4	
	2E8 IRQ3	
	Disabled	
Chassis Intrusion Detect	**Disabled**	Enable/Disable the function of chassis intrusion detection. When chassis open event is detected, BIOS will record the event.
	Enabled	
Watchdog Mode	**Disabled**	POST: BIOS POST Watchdog timer counting. Start at PowerON. Stop at OS boot. OS: OS boot Watchdog. Start at OS boot. PowerON: Start at PowerON.
	POST	
	OS	
	Power ON	
Watchdog Timer	2	Watchdog timer sets 2/4/6/8/10/12 minutes. When WD time-out occurs, system will auto reboot.
	4	
	6	
	8	
	10	
	12	

3.7.5 ACPI Configuration Sub-Menu

Use this screen to select options for ACPI. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.

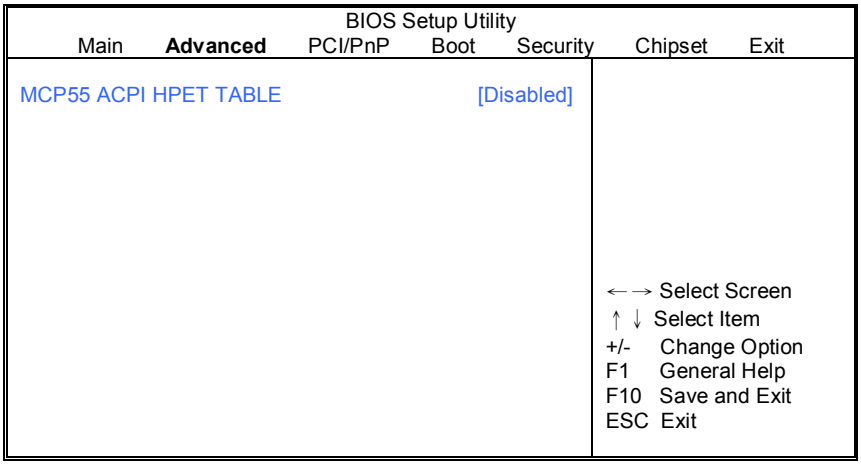


3.7.5.1 Advanced ACPI Configuration Sub-Menu



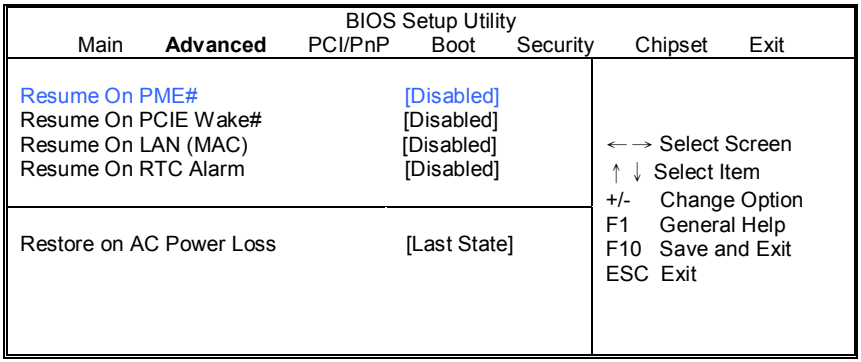
Feature	Option	Description
Advanced ACPI Configuration		
ACPI Version Features	ACPI v3.0 **ACPI v2.0** ACPI v1.0	Set this value to allow or prevent the system to be complaint with the ACPI 2.0 specification.
ACPI APIC Support	**Enabled** Disabled	This option allows you to define whether or not to enable APIC features.
AMI OEMB table	**Enabled** Disabled	Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table. Note: OEMB table is used to pass POST data to the AMI code during ACPI O/S operations.
Headless mode	Enabled **Disabled**	Enable or disable Headless operation mode through ACPI.

3.7.5.2 Chipset ACPI Configuration Sub-Menu



Feature	Option	Description
Chipset ACPI Configuration		
MCP55 ACPI HPET TABLE	**Disabled** Enabled	ACPI High Precision Event Timer description table.

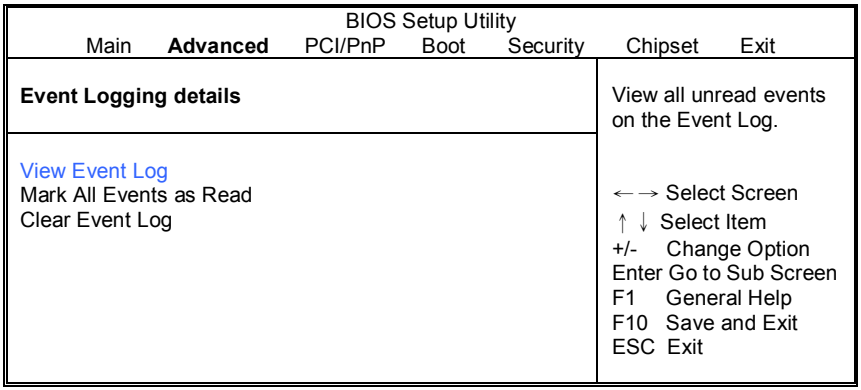
3.7.6 APM Configuration



Feature	Option	Description
APM Configuration		
Resume On PME#	**Disabled**	Disable/Enable PME to generate a wake event.
	Enabled	
Resume On PCIE Wake#	**Disabled**	Disable/Enable PME to generate a wake event.
	Enabled	
Resume On LAN (MAC)	**Disabled**	Enable/Disable LAN (MAC) to generate a wake event.
	Enabled	
Resume On RTC Alarm	**Disabled**	Enable/Disable RTC event to wake after a power failure.
	Enabled	
Restore on AC Power Loss	**Last State**	Configures how the system board responds to a power failure.
	Power on	
	Power off	

3.7.7 Event Log Configuration Sub-Menu

You can use this screen to view the Event Log Control Menu. This logs system events (such as CMOS clear) and writes the log into NVRAM. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Event Logging details		
View Event Log	—	Views all unread events on the Event Log.
Mark All Events as Read	OK Cancel	Marks all unread events as read.
Clear Event Log	OK Cancel	Erases all of events.

3.7.8 Hardware Health Configuration Sub-Menu

You can use this screen to view the Hardware Health Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Hardware Health Configuration		Enables Hardware Health Monitoring Device.
H/W Health Function	[Enabled]	
CPUFAN1, 2 FAN1, 2 PWM Control	[Disabled]	
FAN3, FAN4, FAN5 PWM Control	[Disabled]	
FAN Fail LED Indicator	[Disabled]	
Hardware Health Event Monitoring		←→ Select Screen ↑ ↓ Select Item +/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Exit
▸ Mainboard Voltages Report		
CPU1 Temperature	:xx C/ xxx F	
CPU2 Temperature	:xx C/ xxx F	
Ambient Temp (Near NEC)	:xx C/ xxx F	
Ambient Temp (Near MCP55)	:xx C/ xxx F	
CPU1 FAN1 Speed (TACH1)	:xxxx RPM	
CPU1 FAN2 Speed (TACH2)	:xxxx RPM	
FAN 1 Speed (TACH3)	:xxxx RPM	
FAN 2 Speed (TACH4)	:xxxx RPM	
FAN 3 Speed (TACH5)	:xxxx RPM	
FAN 4 Speed (TACH6)	:xxxx RPM	
FAN 5 Speed (TACH7)	:xxxx RPM	

Feature	Option	Description
Hardware Health Configuration		
H/W Health Function	**Enabled**	Enables Hardware Health Monitoring Device.
	Disabled	
CPUFAN1, 2 FAN1, 2 PWM Control	**Disabled**	Fan Control Mode Disabled: Fan full speed Enabled: Fan speed automatically adjusts according to specific temperature.
	Enabled	
FAN3, FAN4, FAN5 PWM Control	**Disabled**	Fan Control Mode Disabled: Fan full speed Enabled: Fan speed automatically adjusts according to specific temperature.
	Enabled	
FAN Fail LED Indicator	Enabled	Enabled: Any FAN speed less than 800 RPM, the FAN Fail LED will be lighted.
	Disabled	

3.7.8.1 Mainboard Voltages Report Sub-Menu

You can use this screen to monitor mainboard's voltages. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Board Voltages Event Monitoring

CPU1 Vdimm	: x.xxx V
CPU2 Vidimm	: x.xxx V
CPU1 Vcore	: x.xxx V
CPU2 Vcore	: x.xxx V
+V3.3 (SB)	: x.xxx V
3VDU	: x.xxx V
+V5 (SB)	: x.xxx V
VCC	: x.xxx V
+12V (for cpu1 vcore)	: x.xxx V
+12V (for cpu2 vcore)	: x.xxx V

← → Select Screen
↑ ↓ Select Item
+/- Change Option
Tab Select Field
F1 General Help
F10 Save and Exit
ESC Exit

3.7.9 Remote Access Configuration Sub-Menu

You can use this screen to view the Remote Access Configuration Menu. This feature allows access to the Server remotely via serial port. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

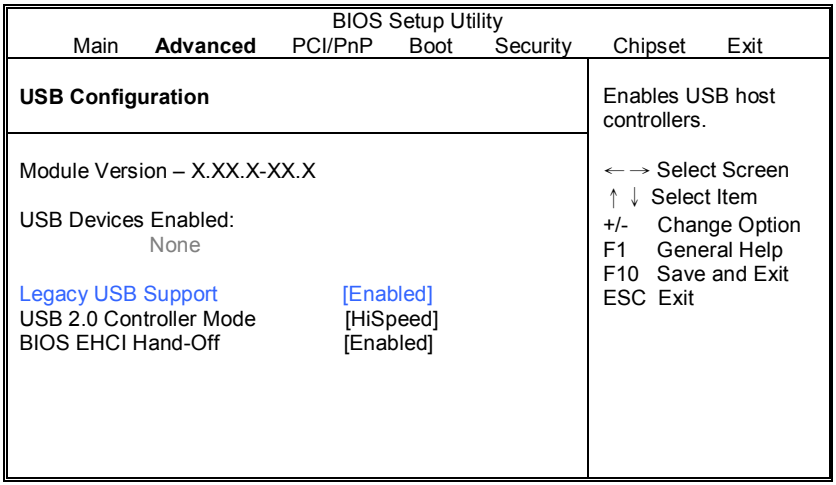
BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
Configure Remote Access type and parameters	Select remote access type.
Remote Access [Enabled]	
Serial Port Number [COM1] Base Address, IRQ [3F8h, 4] Serial Port Mode [115200 8, n, 1] Flow Control [None] Redirection After BIOS POST [Always] Terminal Type [ANSI] VT-UTF8 Combo Key Support [Enabled] Sredir Memory Display Delay [No Delay]	←→ Select Screen ↑ ↓ Select Item +/- Change Field F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
Configure Remote Access type and parameters		
Remote Access	**Enabled**	Enables remote access to system through serial port.
	Disabled	
Serial Port Number	**COM1**	Select Serial Port for console redirection. Make sure the selected port is enabled.
	COM2	
Base Address, IRQ	Read only	Displays Com Port Base Address and IRQ number.
Serial Port Mode	**115200 8,n,1**	Select Serial Port settings.
	57600 8,n,1	
	19200 8,n,1	
	9600 8,n,1	
Flow Control	**None**	Select Flow Control for console redirection.
	Hardware	
	Software	

Feature	Option	Description
Configure Remote Access type and parameters		
Redirection After BIOS POST	Disabled	Disable: Turns off the redirection after POST Boot Loader: Redirection is active during POST and during Boot Loader. Always: Redirection is always active. <Some OSs may not work if set to Always>
	Boot Loader	
	Always	
Terminal Type	**ANSI**	Select the target terminal type.
	VT100	
	VT-UTF8	
VT-UTF8 Combo Key Support	**Enabled**	Enable VT-UTF8 Combination key Support for ANSI/VT100 terminals.
	Disabled	
Sredir Memory Display Delay	**No Delay**	Gives the delay in seconds to display memory information
	Delay 1 Sec	
	Delay 2 Sec	
	Delay 4 Sec	

3.7.10 USB Configuration Sub-Menu

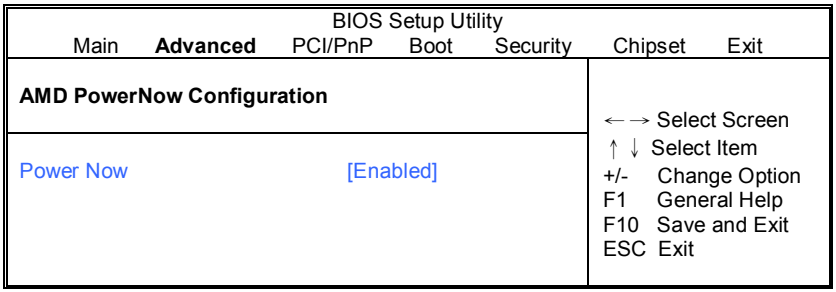
You can use this screen to view the USB Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
USB Configuration		
Legacy USB Support	Disabled	Enables support for legacy USB.
	Enabled	
USB 2.0 Controller Mode	**Hi Speed**	Configure the USB 2.0 controller in Hi Speed (480Mbps) or Full Speed (12Mbps).
	Full Speed	
BIOS EHCI Hand-Off	**Enabled**	This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
	Disabled	

3.7.11 AMD PowerNow Configuration Sub-Menu

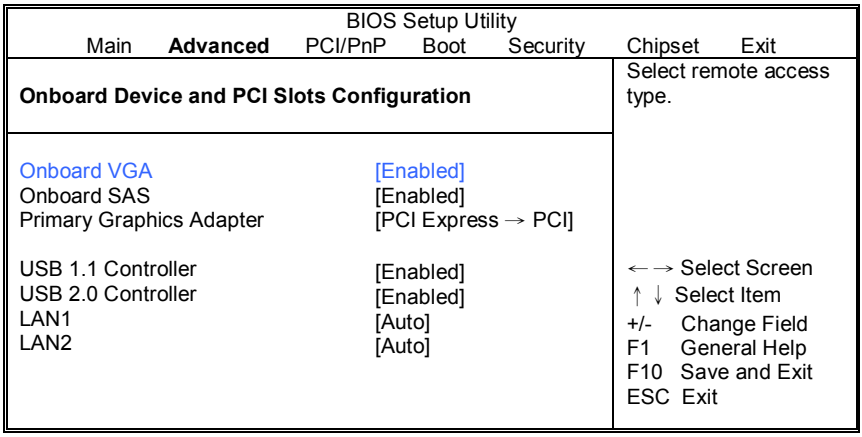
You can use this screen to view the AMD PowerNow Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
AMD PowerNow Configuration		
Power Now	**Enabled** Disabled	Enable/Disable PowerNow

3.7.12 Onboard Devices Configuration Sub-Menu

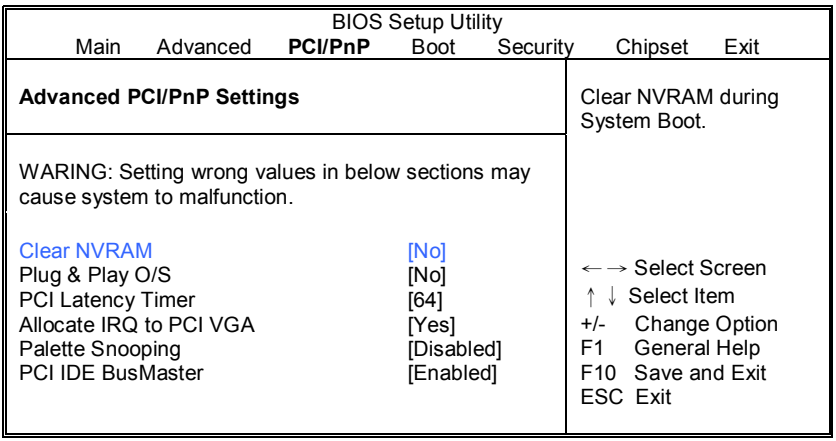
You can use this screen to view the Onboard Devices Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
MPS Configuration		
Onboard VGA/SAS	Disabled **Enabled**	Enabled/Disabled VGA/SAS controller
Primary Graphics Adapter	**PCI Express → PCI** PCI → PCI Express	Configure primary graphics adapter.
USB 1.1/2.0 Controller	Disabled **Enabled**	Enabled/Disabled LAN controller
LAN1/LAN2	**Auto** Disabled	Configure LAN1/LAN2

3.8 PCI PnP Menu

You can use this screen to view PnP (Plug & Play) BIOS Configuration Menu. This menu allows the user to configure how the BIOS assigns resources & resolves conflicts. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Advanced PCI/PnP Settings		
Clear NVRAM	**No**	Clears NVRAM during system Boot.
	Yes	
Plug & Play OS	Yes	No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
	No	
PCI Latency Timer	32	This setting controls how many PCI clocks each PCI device can hold the bus before another PCI device takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. Values in units of PCI clocks for PCI device latency timer register.
	64	
	96	
	128	
	160	
	192	
	224	
	248	
Allocate IRQ to PCI VGA	**Yes**	Yes: assigns IRQ to PCI VGA card if card requests IRQ.
	No	
Palette Snooping	**Disabled**	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled. Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
	Enabled	
PCI IDE BusMaster	Disabled	Enabled: BIOS uses PCI bus mastering for reading / writing to IDE drives.
	Enabled	

3.9 Boot Menu

You can display Boot Setup option by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility Main Advanced PCI/PnP **Boot** Security Chipset Exit	
Boot Settings	Configures settings during System Boot.
▸ Boot Settings Configuration ▸ Boot Device Priority ▸ Removable Drives ▸ Network Drives	←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

3.9.1 Boot Settings Configuration Sub-Menu

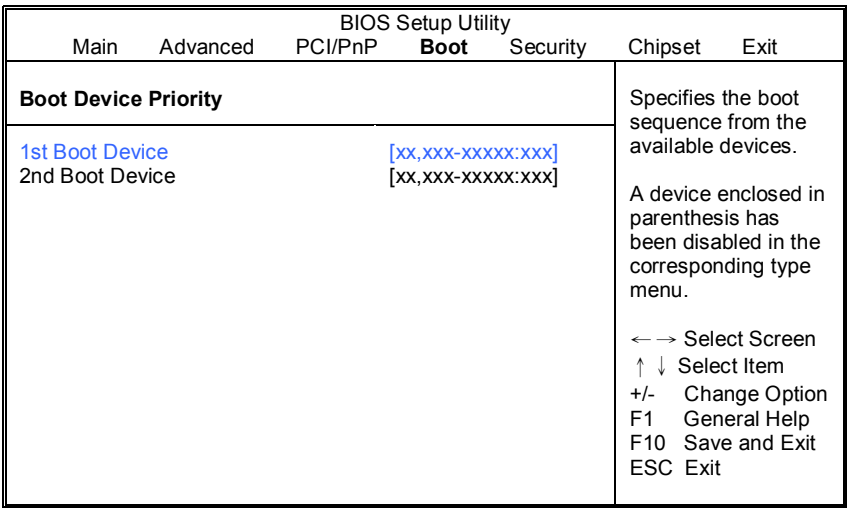
Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility Main Advanced PCI/PnP **Boot** Security Chipset Exit		
Boot Settings Configuration		Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system. ←→ Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
Quick Boot	[Disabled]	
Quiet Boot	[Disabled]	
AddOn ROM Display Mode	[Force BIOS]	
Bootup Num-Lock	[On]	
PS/2 Mouse Support	[Auto]	
Wait for 'F1' if Error	[Enabled]	
Hit 'DEL' Message Display	[Enabled]	
Interrupt 19 Capture	[Enabled]	
Endless Boot	[Disabled]	

Feature	Option	Description
Boot Settings Configuration		
Quick Boot	Enabled	This option allows user bypass BIOS self test during POST.
	Disabled	
Quiet Boot	**Disabled**	Disabled: displays normal POST messages. Enabled: displays OEM log instead of POST messages.
	Enabled	
Add On ROM Display Mode	**Force BIOS**	Allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.
	Keep Current	
Boot up Num-Lock	**On**	Selects Power-on state for Numlock.
	Off	
PS/2 Mouse Support	Enabled	Selects support for PS/2 Mouse.
	Disabled	
	Auto	
Wait for 'F1' If Error	**Enabled**	Waits for F1 key to be present if error occurs.
	Disabled	
Hit 'DEL' Message Display	**Enabled**	Displays "Press DEL to run Setup" in POST.
	Disabled	
Interrupt 19 Capture	Disabled	Enabled: allows option ROMs to trap interrupt 19.
	Enabled	
Endless Boot	Enabled	Enable/Disable endless loop boot from BBS table.
	Disabled	

3.9.2 Boot Device Priority

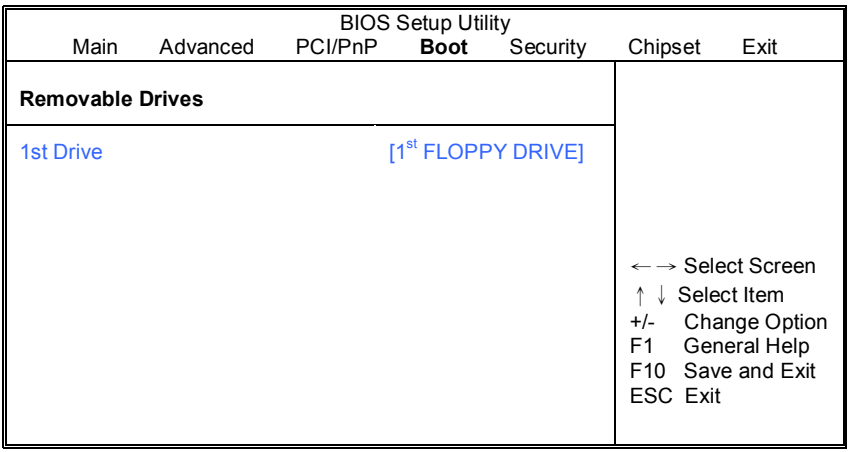
Use this screen to select options for the Boot Device Priority. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Boot Device Priority		
1st Boot Device 2nd Boot Device	**xx,xxx-xxxxx:xxx** xx,xxx-xxxxx:xxx Disabled	Settings for boot priority. These can be customized depending on your preference.

3.9.3 Removable Drives

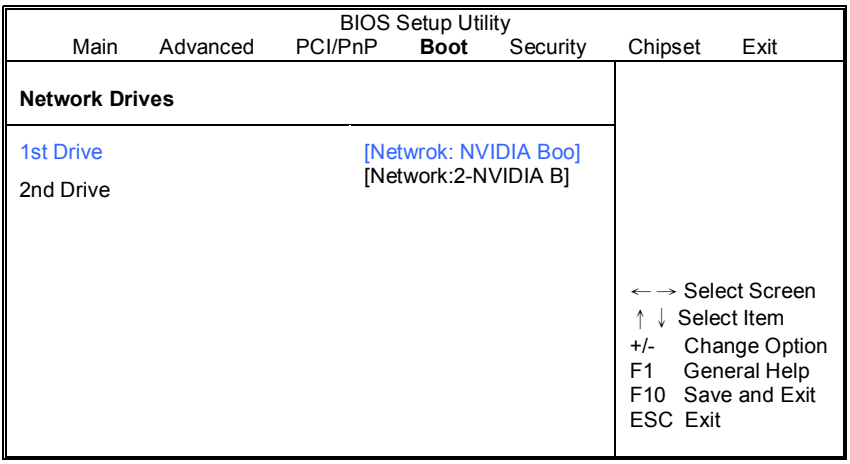
Use this screen to select options for the Removable Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Removable Drives		
1st Drive	**xx,xxx-xxxxx:xxx** Disabled	Specifies the boot sequence from the available devices.

3.9.4 Network Drives

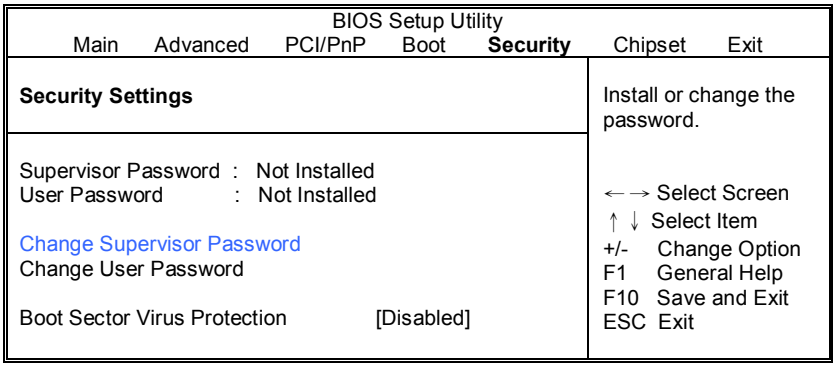
Use this screen to select options for the Network Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Network Drives		
1st /2nd Drive	**xx,xxx-xxxxx:xxx** Disabled	Specifies the boot sequence from the available devices.

3.10 Security Menu

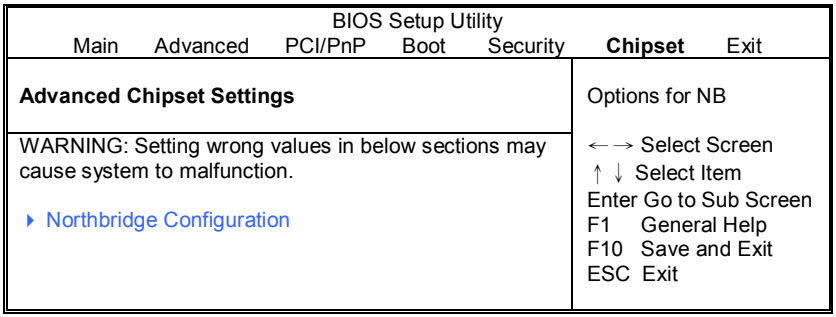
The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure.



Feature	Option	Description
Security Settings		
Supervisor Password:	**Not Installed** Installed	If the password has been set, Installed displays. If no password is set, Not Installed displays.
User Password:	**Not Installed** Installed	If the password has been set, Installed displays. If no password is set, Not Installed displays.
Change Supervisor Password	—	Selects this option to change or install Supervisor Password.
Change User Password	—	Selects this option to change or install User Password.
Boot Sector Virus Protection	**Disabled** Enabled	When it is set to [Enabled], BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted.

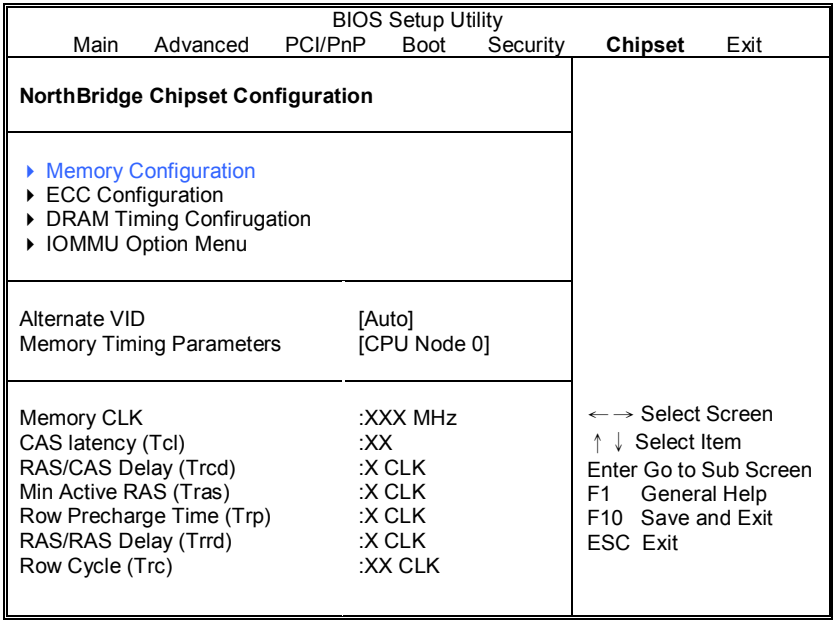
3.11 Chipset Menu

This menu allows the user to customize functions of the AMD Chipsets. North Bridge configuration contains options for Memory & CPU settings. South Bridge configuration contains options for SM Bus & USB. Additional configuration for the AMD8131 PCI-X Tunnel is available in the PCI-X Configuration Menu. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



3.11.1 Northbridge Configuration Sub-Menu

This menu gives options for customizing memory & Hypertransport settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

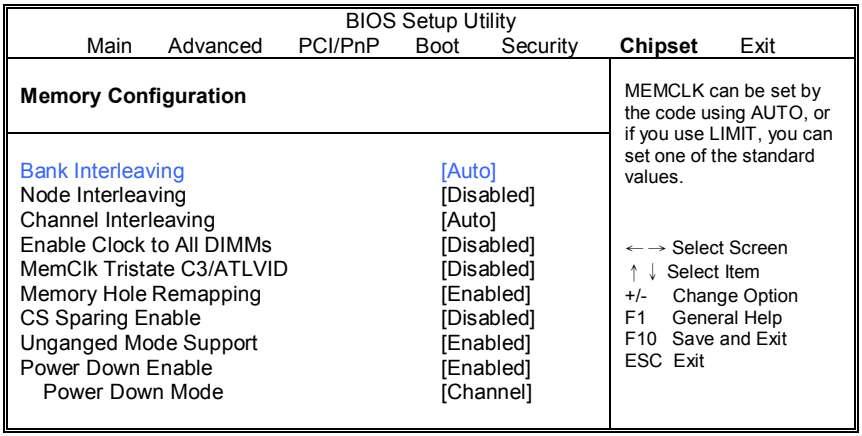


Feature	Option	Description
NorthBridge Chipset Configuration		
Alternate VID	**Auto** 0.850V 1.050V 1.025V 1.000V 0.975V 0.950V 0.925V 0.900V 0.875V 0.825V 0.800V	Specify the alternate VID while in low power status.
Memory Timing Parameters	CPU Node 0 CPU Node 1	Select which node's timing parameters to display

Feature	Option	Description
NorthBridge Chipset Configuration		
Memory CLK	Read only	It shows the clock frequency of the installed SDRAM.
CAS Latency (Tcl)	Read only	This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.
RAS/CAS Delay (Trcd)	Read only	When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.
Min Active RAS (Tras)	Read only	This setting allows you to select the number of clock cycles allotted for the RAS pulse width, according to DRAM specifications. The less the clock cycles, the faster the DRAM performance.
Row Precharge Time (Trp)	Read only	This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its chage before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.
RAS/RAS Delay (Trrd)	Read only	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is Auto.
Row Cycle (Trc)	Read only	Bits 7-4. RAS#-active to RAS#-active or auto refresh of the same bank.

3.11.1.1 Memory Configuration Sub-Menu

This menu has options for memory speed & latency. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

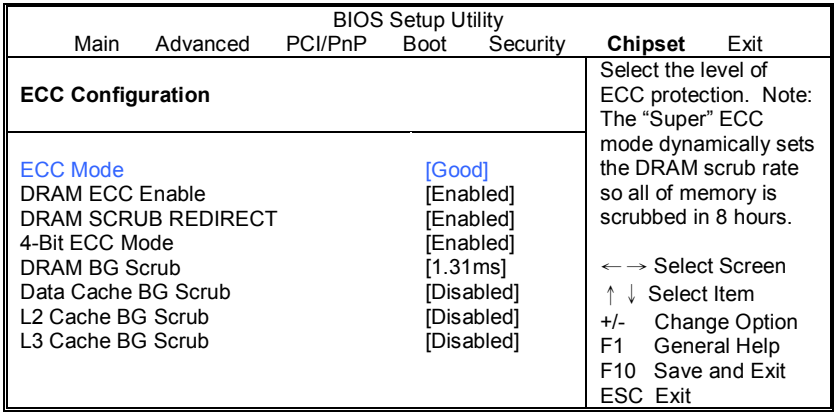


Feature	Option	Description
Memory Configuration		
Bank / Channel Interleaving	Disabled **Auto**	Enable Bank / Channel Memory Interleaving
Node Interleaving	**Disabled** Auto	Enable Node Interleaving
Enable Clock to All DIMMs	**Disabled** Enabled	Enable unused clocks to DIMMs Even Memory slots are not populated.
MemClk Tristate C3/ATLVID	**Disabled** Enabled	Enable/Disable MemClk Tri-Stating during C3 and Alt VID
Memory Hole Remapping	**Enabled** Disabled	Enable Memory Remapping around Memory Hole
CS Sparing Enable	**Disabled** Enabled	Reserve a spare memory rank in each node.
Unganged Mode Support	**Enabled** Disabled	Enabled: Configured to two single-channel DRAM Controllers Disabled : Configured to a single dual-channel DRAM Controller

Power Down Enable	**Enabled**	Enable or disable DDR power down mode
	Disabled	
Power Down Mode	**Channel**	Set DDR power down mode
	Chip Select	

3.11.1.2 ECC Configuration Sub-Menu

This menu allows the user to configure ECC setup for system & DRAM. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



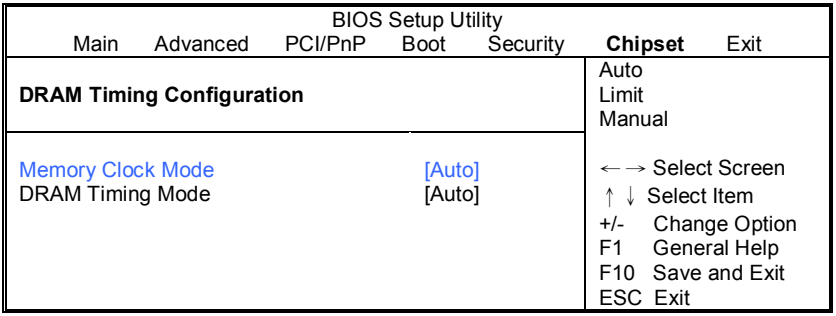
Feature	Option	Description
ECC Configuration		
ECC Mode	Disabled Basic **Good** Super Max User	Select the level of ECC protection. Note: The "Super" ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
DRAM ECC Enable	**Enabled** Disabled	DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
DRAM SCRUB REDIRECT	**Disabled** Enabled	DRAM SCRUB REDIRECT allows the system to correct DRAM ECC errors immediately when they occur, even if background scrubbing is on.
4-Bit ECC Mode	**Disabled** Enabled	Enable 4-Bit ECC Mode. Note: Also known as CHIPKILL ECC Mode

DRAM BG Scrub	Disabled 40ns 80ns 160ns 320ns 640ns 1.28us 2.56us 5.12us 10.2us 20.5us 41.0us 81.9us 163.8us 327.7us 655.4us **1.31ms** 2.62ms 5.24ms 10.49ms 20.97ms 42.00ms 84.00ms	DRAM scrubbing corrects memory errors so later reads are correct. Doing this while memory is not being used improves performance. Note: When AMD's node interleave feature is enabled, BIOS will force DRAM scrub off.
Data Cache BG Scrub	**Disabled** 40ns 80ns 160ns 320ns 640ns 1.28us 2.56us 5.12us 10.2us 20.5us 41.0us 81.9us 163.8us 327.7us 655.4us	Allows the L1 Data Cache RAM to be corrected while idle.

L2 /L3 Cache BG Scrub	**Disabled**	Allows the L2/L3 Data Cache RAM to be corrected while idle.
	40ns	
	80ns	
	160ns	
	320ns	
	640ns	
	1.28us	
	2.56us	
	5.12us	
	10.2us	
	20.5us	
	41.0us	
	81.9us	
	163.8us	
	327.7us	
	655.4us	

3.11.1.3 DRAM Timing Configuration Sub-Menu

This menu allows the user to configure DRAM Timing. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
DRAM Timing Configuration		
Memory Clock Mode	**Auto**	Select the DRAM Frequency programming method. If Auto, the DRAM speed will be based on SPDs. If Limit, the DRAM speed will not exceed the specified value. If Manual, the DRAM speed specified will be programmed by users.
	Limit	
	Manual	
DRAM Timing Mode	**Auto**	Allow users to configure the DRAM Timing manually.
	DCT 0	
	DCT 1	
	Both	

3.11.1.4 IOMMU Option Sub-Menu

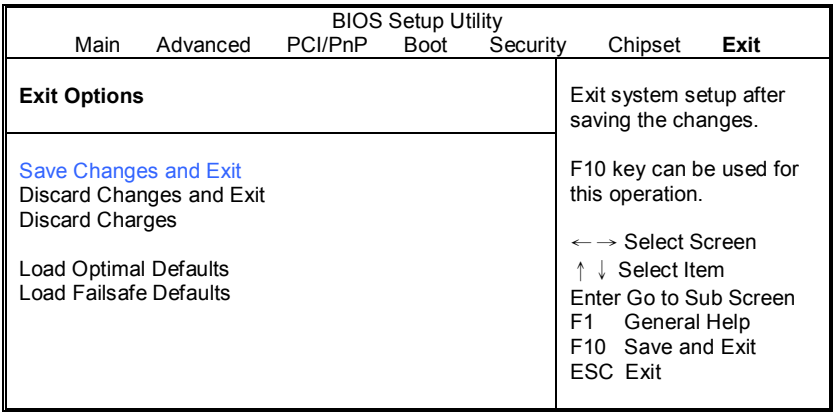
This menu has options for IOMMU. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility Main Advanced PCI/PnP Boot Security **Chipset** Exit	
IOMMU Mode [128MB]	Set GART size in systems without AGP, or disable altogether. Some OSes require valid GART for proper operation, If AGP is present, select appropriate option to ensure proper AGP operation. ←→ Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
IOMMU Option		
IOMMU Mode	AGP Present Disabled 32 MB 64 MB **128 MB** 256 MB 512 MB 1 GB	Set GART size in systems without AGP, or disable altogether. Some OSes require valid GART for proper operation. If AGP is present, select appropriate option to ensure proper AGP operation.

3.12 Exit Menu

You can display an Exit BIOS Setup option by highlighting it Arrow (↑/↓) keys and pressing Enter.



Save Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are stored into CMOS.
System will use the new settings to boot up.

Discard Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are not stored into CMOS.
System will use the old settings to boot up.

Discard Changes
Use this option to restore all new setup values that you have made but not saved into CMOS.

Load Optimal Defaults
Use this option to load default performance setup values.
Use this option when system CMOS values have been corrupted or modified incorrectly.

Load Failsafe Defaults
Use this option to load all default failsafe setup values.
Use this option when troubleshooting.

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at: http://www.tyan.com.

4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.
•Eight short beeps: It indicates that a video error has occurred.
•A single long beep repeatedly: It indicates that a DRAM error has occurred.
The most common type of error is a memory error.

Before contacting your vendor or TYAN Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site: http://www.tyan.com/

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.3 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

Checkpoint	Description
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

NOTE

Appendix: SMDC Information

Overview

Tyan Server Management Daughter Card (SMDC) is a powerful yet cost-efficient solution for high-end server management hardware packages. Tyan's goal is to provide remote system monitoring and control even when the operating system is absence or simply fails. This empowers Tyan's server board with advanced industrial-standard features.

Tyan SMDC is a snap-in card that provides essential server management solution. It enables any IT Manager by providing multi-interfaces to access the hardware remotely and perform **monitor**, **control** and **diagnose** activities effectively.

Tyan SMDC is not a peripheral card. Unlike regular peripheral card such as AGP card, Network card or SCSI card, SMDC does not require any hardware specific driver. As long as a standby power comes into the system, SMDC will begin looking after the system.

Tyan SMDC provides diversified methods to communicate with the hardware. IT manager has the flexibility to choose among *Keyboard Controller Style* (KCS), *Block Transfer* (BT) style, Intelligent Chassis Management Bus (ICMB), Intelligent Platform Management Bus (IPMB), Emergency Management Port (EMP) and standard IPMI-Over-LAN communication as defined in latest IPMI 1.5 specification.

Tyan SMDC is compatible with all IPMI-compliance software as well as Tyan System Operator™ (TSO) software package.

By adding SMDC, Tyan's server board becomes a highly manageable and IPMI compatible system with all the advanced features suggesting in IPMI Spec.

More detailed information on Tyan's SMDC card can be found on our website: http://www.tyan.com

Features of Tyan Server Management

Monitor various system components remotely
-such as fans, processor temperature, and more

Remote power on and power off

Console redirect
-the ability to view system remotely

Alert and error actions
-such as audible beep, e-mail, power down and reboot

SMDC runs on stand-by power
-the SMDC will continue to function, even if the system is not powered on

How SMDC and TSO Work

The brief descriptions below will help explain how these items function.

	Agent – a system with SMDC installed The SMDC is installed in the Agent system that uses a compatible/supported Tyan motherboard.
	Manager – manages the Agent The Manger is set up to manage the Agent that has the SMDC. The Manager and Agent should be located in the same place.
	Console – communicates with Manager The Console is used to monitor and control the Agent through the Manager.

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.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

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.

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. TYAN's BIOS updates can be found at http://www.tyan.com

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.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

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.

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.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

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.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

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.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

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.

SDRAM (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.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

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.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should turn to your dealer for help first. Your system has most likely been configured by them, and they should have the best idea of what hardware and software your system contains. Furthermore, if you purchased your system from a dealer near you, you can bring your system to them to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and
This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

Notice for Europe (CE Mark)
This product is in conformity with the Council Directive 89/336/EEC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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