MX56N

AMD G-Series APU with A55E Controller Hub (FCH) Mini ITX Motherboard

User's Manual

Ver. 1.0

BCM Advanced Research, An Industrial Leader Since 1990 in Industrial Motherboards & Systems
11 Chrysler, Irvine, CA 92618 USA | www.bcmcom.com | (PH)949.470.1888 | (FAX)949.470.0971
For Tech Support, please visit www.bcmcom.com/bcm_support_legacyProductSupport.htm or contact BCMTechSupport@bcmcom.com

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(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

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BCM Advanced Research
11 Chrysler
Irvine, CA, 92618 USA
Phone: +1-949-470-1888
Fax: +1-949-470-0971
Website: www.bcmcom.com
E-mail: BCMTechSupport@bcmcom.com

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This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by BCM, or which have been to misuse, abuse, accident or improper installation. BCM assumes no liability under the terms of this warranty as a consequence of such events.
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1. Collect all the information about the problem encountered. (For example, CPU type and speed, BCM products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.

3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.

4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Manual Objectives

This manual describes in detail the BCM MX510D Mini ITX motherboard.

We strongly recommend that you study this manual carefully before attempting to interface with RX45Q or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

Safety Precautions

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety

precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Document Amendment History

Revision	Revision History	Date
V 1.0	First release for PCB 1.1	2011/05/10

Specifications Summary

APU	G-Series
APU Type	AMD G-Series T56N 1.6GHz DC/T48N 1.4GHz DC/T40N 1.0GHz DC/ T40E 1.0GHz DC(Optional)/T44R 1.2GHz SC/T40R 1.0GHz SC(Optional)
Processor Family	AMD G-Series
Long Life Processor List	TDP 5~18W, T shutdown 125℃
Package	FT1 (BGA) 413 balls p=0.8mm, 19x19 mm
L2 Cache	L1: 32KB+32KB per core, L2: 512KB cache per core
UMI	4-Lane(x4) PCIe gen2
Power Management	C6 supported
PCIE	4-Lane(x4) PCIe gen2
CPU Process	40 nm

Memory

System Memory	
Memory Type	One DDR3 1066 SODIMM
DIMM #	1x SODIMM 204Pin/ Single Channel
Max. Capacity	4 GB

Chipset

FCH	
Fusion Controller Hub	AMD A55E Controller Hub (Hudson-E1)
PCIe	x4 Gen 2
USB	8 USB 2.0 (4 Rear, 4 Internal)
SMBus	Yes
LPC	Yes
SATA	5 SATA 3.0 (One support SATADOM)
HD Audio	support 4 channel, Power Saving, 4 codec
Clock Gen.	Integrated
Package	FCBGA 23x23mm, 605 balls
Environment	TDP 2.7~5.7W, T case 105℃
Display	
Integrated Graphic Controller	AMD Radeon HD 6320(T56N)/AMD Radeon HD 6310(T48N)/AMD Radeon HD 6290(T40N)/AMD Radeon HD 6250(T40E/T44R/T40R)
HW decoder/3D feature	DirectX 11, OpenGL4.0, dedicated HW(UVD3.0)for H.264, VC-1, MPEG-2, DivX decode

LVDS	1, 18bpp (Single link LVDS up to 1400 x 1050)
VGA	T56N/T48N (18W) supports up to 2560 x 1600 T40N/T44R (9W) supports up to 1920 x 1200
HDMI	1 support HDMI 1.3a & 1080p up to 1920 x 1080
Dual Display	VGA+LVDS, VGA+HDMI, HDMI+LVDS
Gigabit Ethernet	
Chipset	LAN1 RTL 8111DL Gigabit LAN LAN2 RTL 8111DL Gigabit LAN
LAN LED	Left: Link (Off)/ Active (Flash Yellow)
	Right: 1Gbps(Green) / 100Mbps (Orange) / 10Mbps (Off)
Disable LAN through BIOS	Yes
WOL	Yes
Boot from LAN	Yes
ASF	N/A
Audio	
Codec	7.1 Channel HD Audio
Chipset	Realtek ALC892
Audio output header	Yes, Front Audio Pin Header
Front IO Connector	Stack Phone Jack (Mic In, Line-out, Line-in)
SPDI/F	Yes
Amplifier	TI TPA3005
RS232 COM	
LPC to COM	2 COM for Rear I/O D-Sub 2 COM with headers
Super I/O	
Chipset	Winbond W83627DHG-P
Fan speed monitor & control	FAN Speed Control by Thermal Sensor
Temperature	Yes
Voltage	+3.3V, +5V, 5Vsb, +12V, -12V
Buzzer	
Onboard buzzer	Yes
WDT	
Watchdog Timer	Programmable 1~255 sec/min
TPM	
TPM	Onboard TPM1.1/1.2 By Infineon SLB9635 (Optional)

BIOS

BIOS Core	
BIOS Core	AMI EFI
BIOS Flash	
BIOS Flash	16Mb SPI
SW RAID	
SW RAID	None
Bootup Device	—
Serial ATA	Yes (CFast)
IDE device	N/A
USB device	Yes
Boot from LAN	Yes
Power Management	—
ACPI	ACPI 3.0
APM	NA
Sleep State	S3, S4, S5
Other Feature	
PC Health	YES
CMOS backup	BIOS CMOS automatic backup and restore setup data
SmartFAN	CPU, SYS FAN, Smart Fan III+
Graphics memory mode	Shared Memory up to 2GB
Power Play	380, 200MHz, configure Power to 2.7~5.7W
SATA	Support SATA III(6Gbps)

Internal Connector

Debug Port	
CPU	HDT header
SPI	1
Display	
LVDS	1
eDP	1, (optional)
Inverter	
LVDS INV	3.3 V
Audio	
Front Panel	1
Amplifier	1
SPDI/F	1
USB	
USB	4

Serial	
COM	2
IDE	
IDE	NA
SATA	
SATA	5 (SATA III 6 Gb/s)
SATA power	NA
Fan connector	
System fan connector	1 system fan(3pin for system with smart fan control)
CPU fan connector	1 CPU fan(3pin for system with smart fan control)
GPIO	
General	8bit

Front I/O

Display	
HDMI	1
VGA	1, co-layout with header
DVI	NA
Ethernet	
RJ-45	2, stack with USB
USB	
USB	4 (USB 2.0 port)
COM	
Serial port	2* RS-232
PS/2	
KB/MS	2, co-lay single DIN
Audio	—
Phone Jack	1 Line-in 1 Line-out 1 MIC co-lay 1 jack connector

Power

Power Connector	
Power Type	AT/ATX
Power Requirement	+3.3V, +5V, +12V, -12V, 5Vsb

LED Indicator

LED	
HDD Status	4; alive, green; dead, red 4; access, flash yellow

Power on rear IO	1; Blue

Expansion Slot

Expansion Slot	
Mini-PCI Express	1
PCIex 4	1

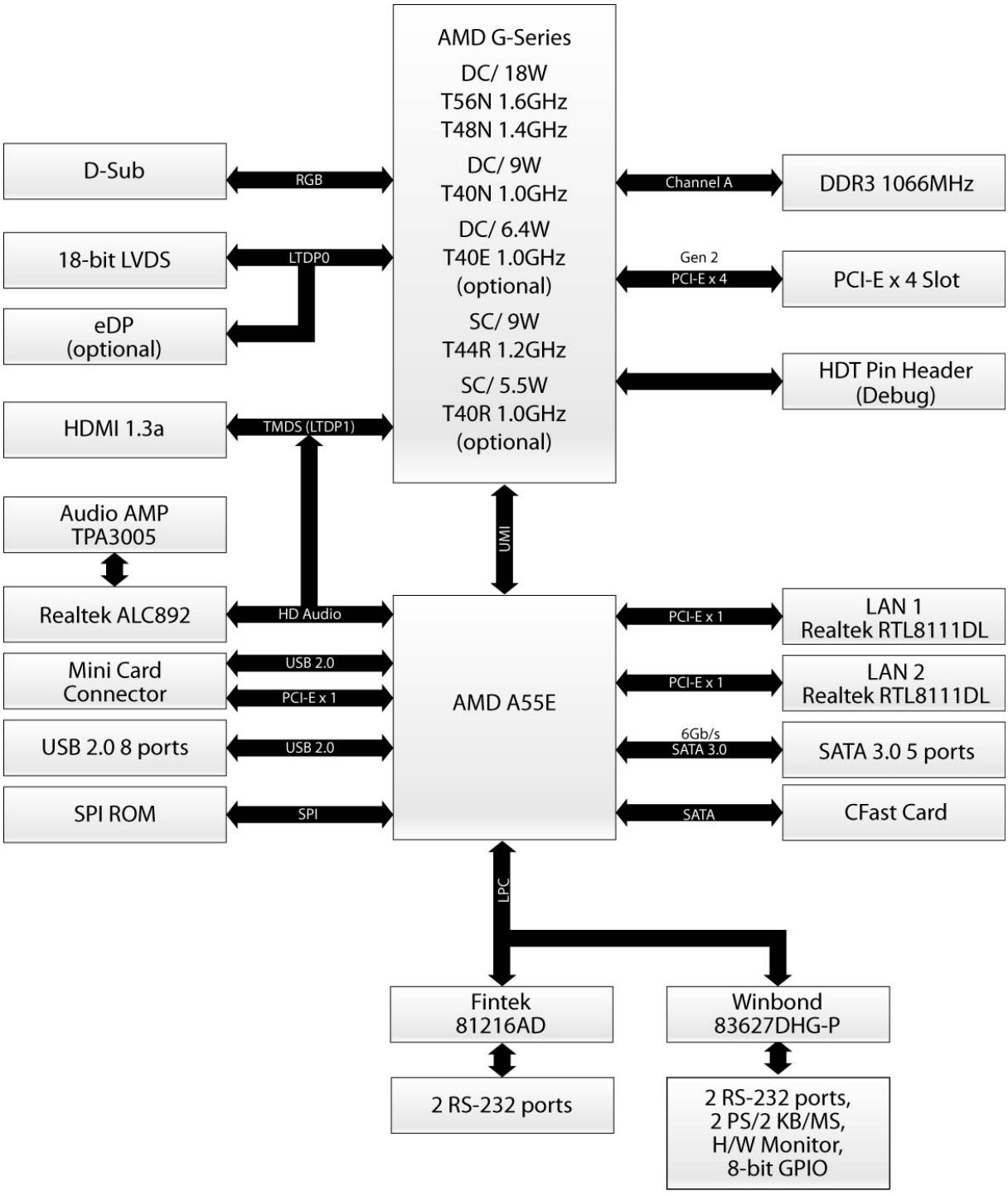
PCB Physical Feature	
Dimension	170x 170mm
Layer	6 Layer
Power Consumption	< 45W
Operating Temperature	0℃-60℃
Heat Sink	Cooler FAN
Storage Temperature	-20℃ ~ 80℃
Vibration (non OP)	3.0 Grms, heat sink backplane TBD
PCB Printing	
Model name in silkscreen	None
Revision in silkscreen	No
PCB Color	Blue
CE mark on PCB	Yes
WEEE	Yes
BCM PCB part number	Yes
Version	No
FCC mark on PCB	Yes
Cert. Compliance	
CE	Pre-scan for Class B, EN-55022/24
FCC	Pre-scan for FCC PART 15, Class B
IEC-60601	compliance

Accessory

Accessory List	
FP_USB cable	None
SATA cable Kit	1 data and 1 power
Serial Port	2
I/O Shield	1
Driver CD	1
Startup Manual	1
FP_Power button, power LED, HDD LED kit	None

AVL	
OS Support List	Windows XP SP3, Windows 7 Pro, Linux Fedora 14

Block Diagram



Chapter 1

This chapter describes the motherboard features and the new technologies it supports.

Product Introduction

Production Introduction

1.1 Before you Proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1.2 Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

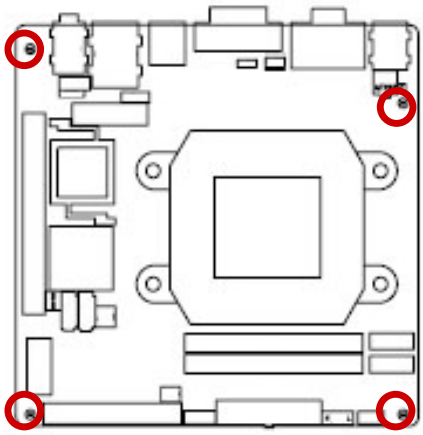
1.2.1 Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

1.2.2 Screw Holes

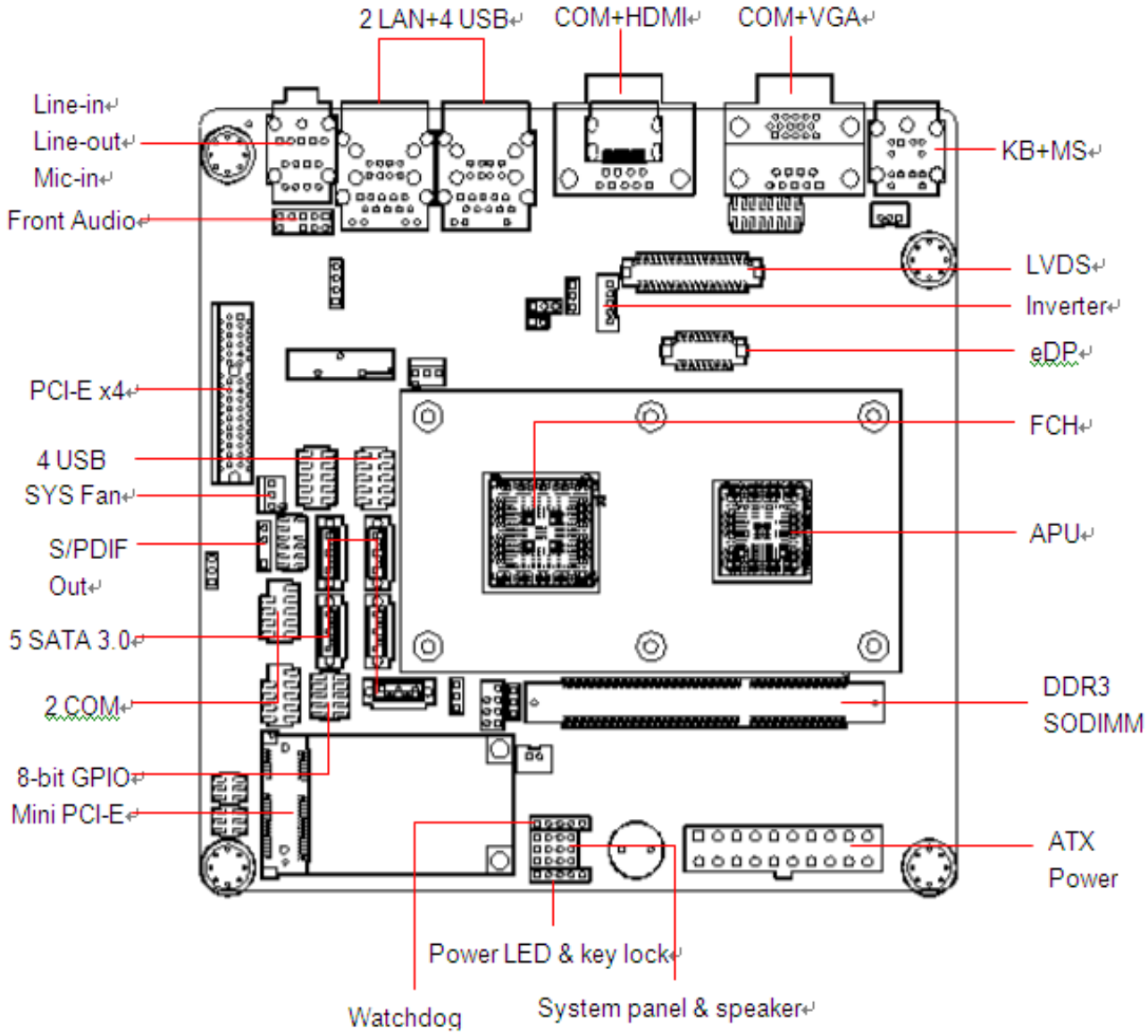
Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not over tighten the screws! Doing so can damage the motherboard.



Place this side towards the rear of the chassis

1.3 Motherboard Layout



Layout Content List

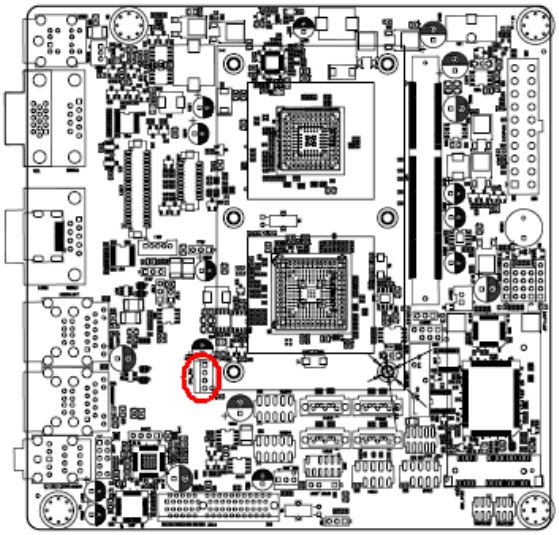
Slots			
Label	**Function**	**Note**	
CFast	Compact Flash socket	Rear side	
MINI_PCIE	Mini PCI-E slot	52PIN	
PCIE	PCI Eslot	64PIN	
SODIMM_A1	204-PIN SODIMM slot 1	204-PIN	

Jumpers			
Label	**Function**	**Note**	
CLRTC	Clear CMOS	3 x 1 header, pitch 2.54mm	
JCOMPWR1	COM1 RI/+5V/+12V Selection	3 x 2 header, pitch 2.0mm	
JCOMPWR2	COM2 RI/+5V/+12V Selection	3 x 2 header, pitch 2.0mm	

Rear IO			
Label	**Function**	**Note**	
KBMS	PS/2 keyboard and mouse	6-pin Mini-Din	
COM12	Serial Port Connector	D-sub 9-pin, male	
VGA_DVI	VGA Connector	D-sub 15-pin, female	
USB3,4,5,6	USB Connector x 4	2 x 5 Header, pitch 2.54mm	
LAN1,2	RJ-45 Ethernet Connector x 2		
AUDIO	Line-in Port, Line-out Port, Microphone Port,	7.1 Channel Audio I/O (3 jacks)	

1.4 Central Processing Unit (CPU)

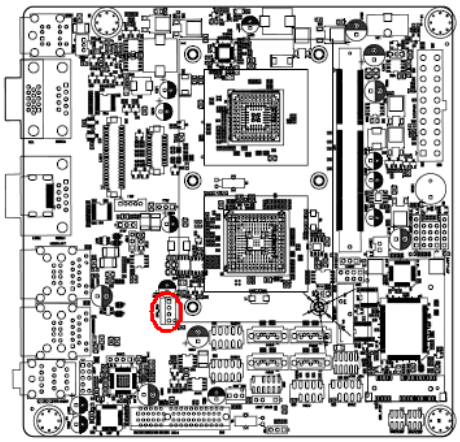
1.4.1 Connect the CPU Fan cable to the CPU_FAN connector on the motherboard.



Do not forget to connect the CPU Fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

After installation, make sure to plug-in the ATX power cable to the motherboard.

1.4.2 Connect the CPU fan cable to the CPU_FAN connector on the motherboard.



- Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector.
- These are not jumpers! DO NOT place jumper caps on the fan connectors.

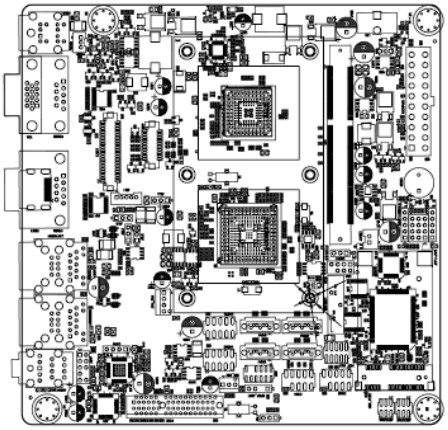
After installation, make sure to plug-in the ATX power cable to the motherboard.

1.5 System Memory

1.5.1 DIMM Sockets Location

The motherboard comes with one 204-pin Double Data Rate 3 (DDR3) SODIMM sockets.

A DDR3 module has the same physical dimensions as a DDR DIMM but has a 204-pin footprint. DDR3 DIMMs are notched differently to prevent installation on a DDR DIMM socket. The following figure illustrates the location of the sockets:



1.5.2 Memory Configurations

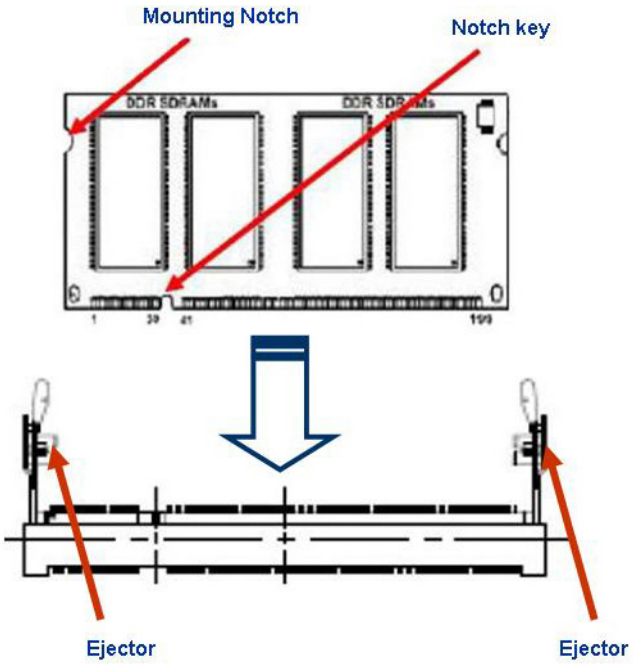
You can install 1GB, 2GB and 4GB DDR3 DIMMs into the SODIMM sockets using the memory configurations in this section.

- Installing DDR3 DIMM other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- This motherboard does not support memory modules made up of 128 Mb chips or double-sided x16 memory modules.
  Make sure that the memory frequency matches the CPU FSB (Front Side Bus). Refer to the Memory frequency/CPU FSB synchronization table.

1.5.3 Installing a DDR3 DIMM

Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

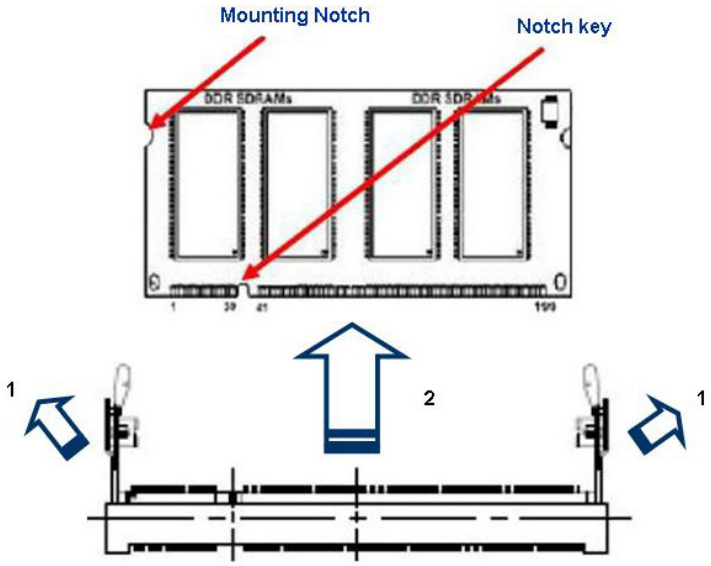
1. Locate the DIMM socket on the board.
2. Hold two edges of the DIMM module carefully, and keep away of touching its connectors.
3. Align the notch key on the module with the rib on the slot.
4. Firmly press the modules into the socket automatically snaps into the mounting notch. Do not force the DIMM module in with extra force as the DIMM module only fit in one direction.



- A DDR3 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.
- The DDR3 DIMM sockets do not support DDR DIMMs. DO NOT install DDR DIMMs to the DDR3 DIMM socket.

1.5.4 Removing a DDR3 DIMM

Press the two ejector tabs on the slot outward simultaneously, and then pull out the DIMM module.



Support the DIMM lightly with your fingers when pressing the ejector tabs. The DIMM might get damaged when it flips out with extra force.

1.6 Expansion Slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.6.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.6.2 Configuring an Expansion Card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings if any.
2. Assign an IRQ to the card if needed. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

1.6.3 Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	-	Redirect to IRQ#9
3	11	IRQ holder for PCI streering*
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI streering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT)*
8	3	System CMOS/Rear Time
9	4	IRQ holder for PCI streeing*
10	5	IRQ holder for PCI streeing*
11	6	IRQ holder for PCI streeing*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel
15	10	Secondary IDE Channel

* There IRQs are usually available for ISA or PCI device.

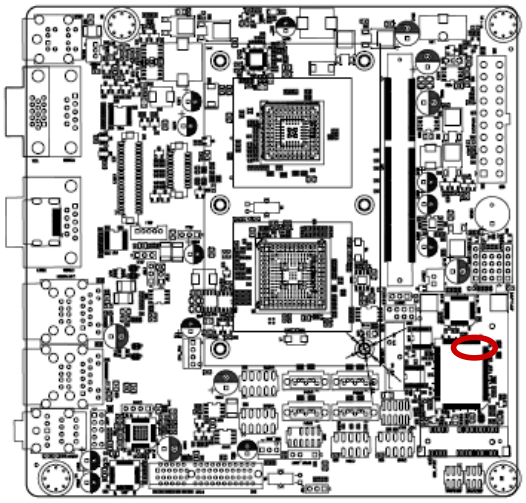
1.7 Jumpers

1.7.1 Clear CMOS (CMOS1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords. To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

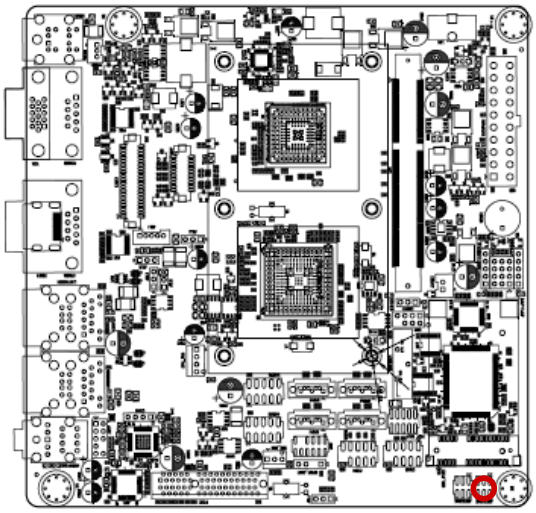
Except when clearing the CMOS, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



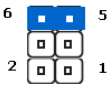
Normal (Default)

Clear CMOS

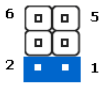
1.7.2 COM3 RI/+5V/+12V Selection (JSETCOM3)



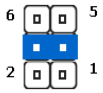
+12V



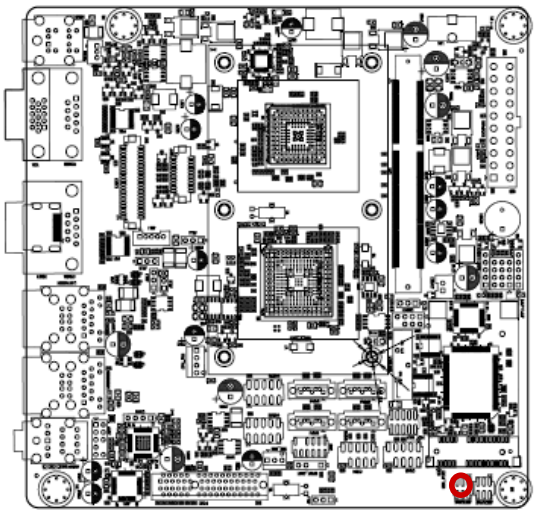
Ring



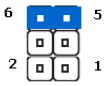
+5V (Default)



1.7.3 COM4 RI/+5V/+12V Selection (JSETCOM4)

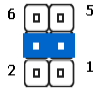


+12V



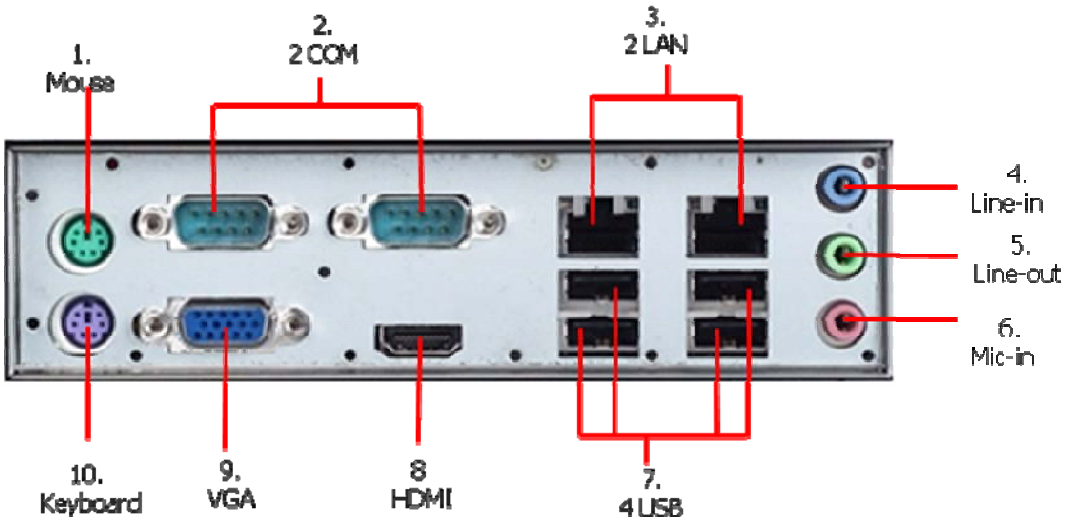
Ring

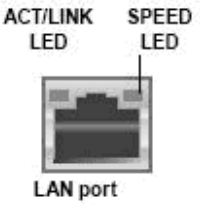
+5V (Default)



1.8 Connectors

1.8.1 Rear Panel Connectors



No	Label	Function	Description
1	KBMS	PS/2 mouse connector	The standard PS/2 mouse DIN connector is for a PS/2 mouse.
2	COM12	Serial port connector	D-Sub 9-pin, male
3	LAN_USB12	LAN (RJ-45) connector 	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. The optional 10/100 Mbps LAN controller allows 10/100 Mbps connection to a Local Area Network (LAN) through a network hub.

ACT / LINK LED		SPEED LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10Mbps connection
Orange	Linked	ORANGE	100Mbps connection
Blinking	Data activity	GREEN	1Gbps connection

4	AUDIO	Line-In port (Light Blue).	This port connects a tape, CD, DVD player, or other audio sources.
5	AUDIO	Line-Out port (Lime)	This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.
6	AUDIO	Microphone port (Pink)	This port connects a microphone.

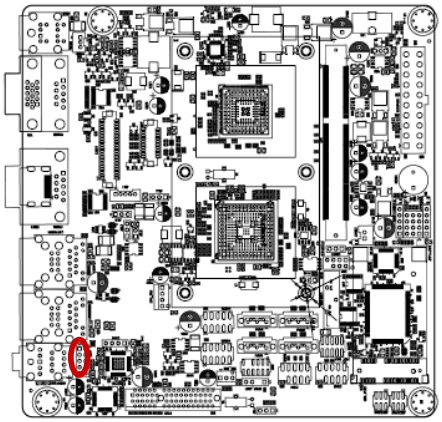
Refer to the audio configuration table below for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

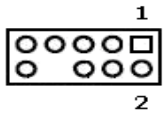
Port	Headset			
	2-channel	**4-channel**	**6-channel**	**8-channel**
Light Blue	Line in	Line in	Line in	Line in
Lime	Line out	Front speaker out	Front speaker out	Front speaker out
Pink	Mic In	Mic In	Mic In	Mic In

7	LAN_USB3,4,5,6	USB 2.0 connector	These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8	HDMI		
9	VGA_DVI	VGA port	This 15-pin port is for a VGA monitor or other VGA-compatible devices.
10	KBMS	PS/2 KB connector	This port is for a PS/2 keyboard

1.8.2 Front Panel Audio Connector (AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC ‘97 (optional) audio standard. Connect one end of the front panel audio I/O module cable to this connector.



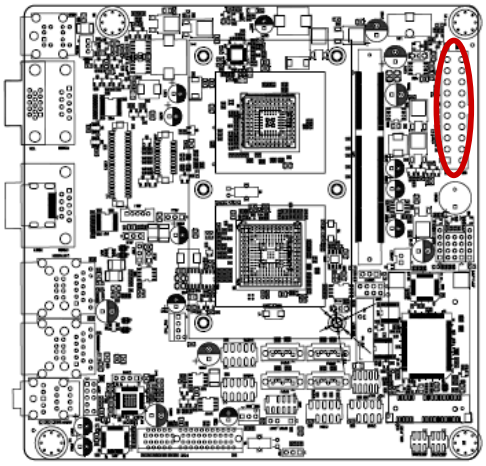


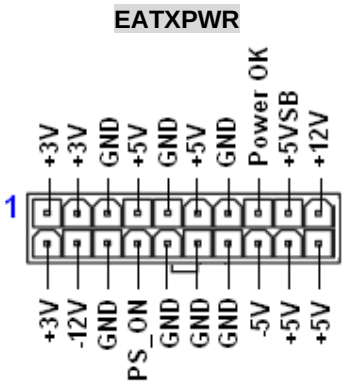
10. SENSE2_RTN	9. LIN2_L
8. NC	7. SENSE_B
6. SENSE1_RTN	5. LIN2_R
4. PRESENSE	3. MIC2_R
2. GND	1. MIC2_L

For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard’s high‑definition audio capability.

1.8.3 ATX Power Connector (ATXPWR)

These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

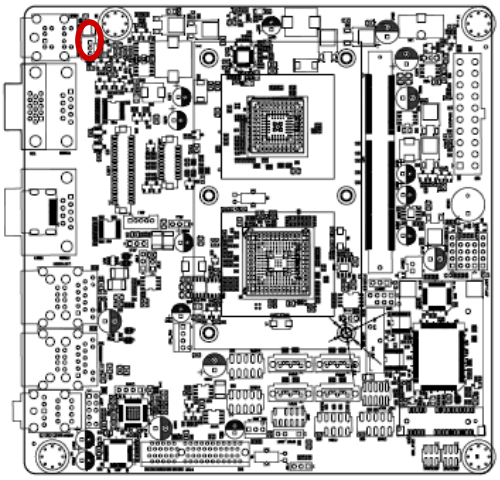


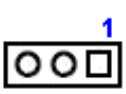


Important notes on the Motherboard Power Requirements

- Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system can become unstable and might experience difficulty powering up if the power supply is inadequate.
- You must install a PSU with a higher power rating if you intend to install additional devices.

1.8.4 AT/ATX Mode Select (PSON1)

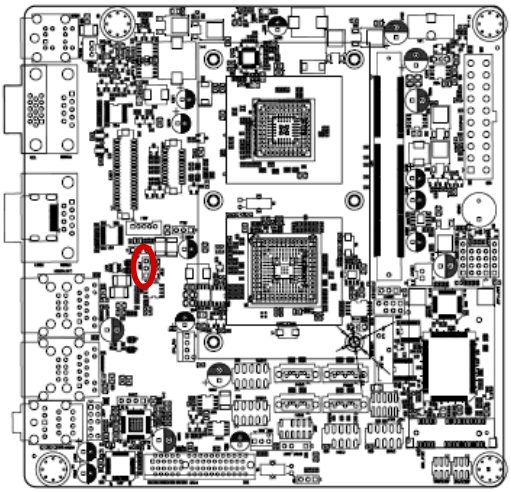




ATX MODE (Default)

AT MODE

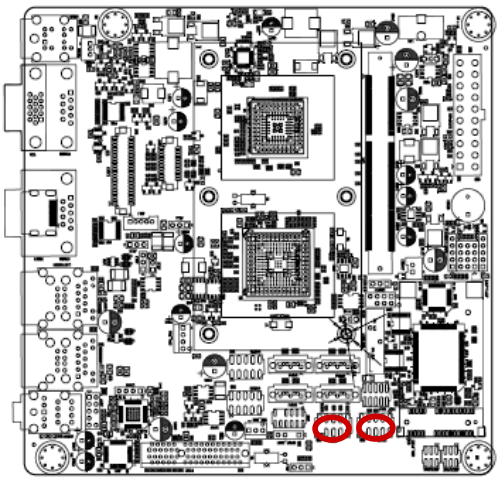
1.8.5 LCD POWER (VDDSAFE) (JBL3)



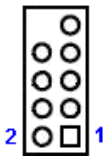
3.3V

5V

1.8.6 Serial Port Connector (COM3, COM4)

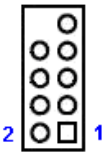


COM3



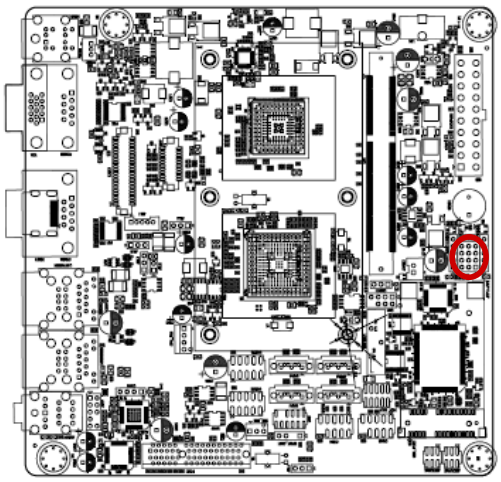
	9. GND
7. DTR3	8. COM3P9SEL
5. TX3	6. CTS3
3. RX3	4. RTC3
1. DCD3	2. DSR3

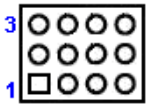
COM4



	9. GND
7. DTR4	8. COM4P9SEL
5. TX4	6. CTS4
3. RX4	4. RTC4
1. DCD4	2. DSR4

1.8.7 System Panel & Speaker (JFP1 + JFP2)

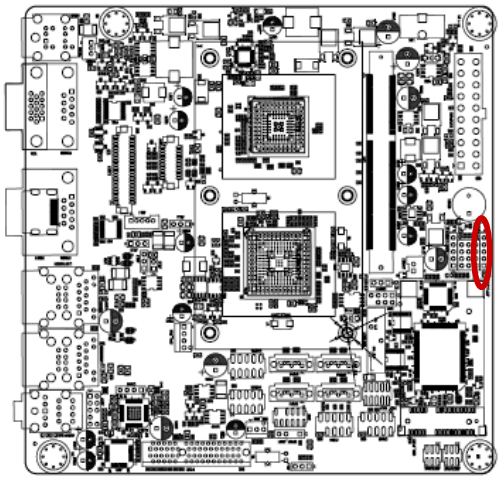


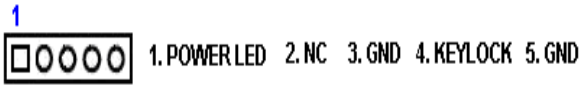


3. PWRBT+	6. PWRBT-	9. SYS_RST	12. GND
2. HDLED+	5. HDLED-	8. I2C DATA	11. I2CCLK
1. +5V	4. NC	7. SPK_P3	10. SPK_P4

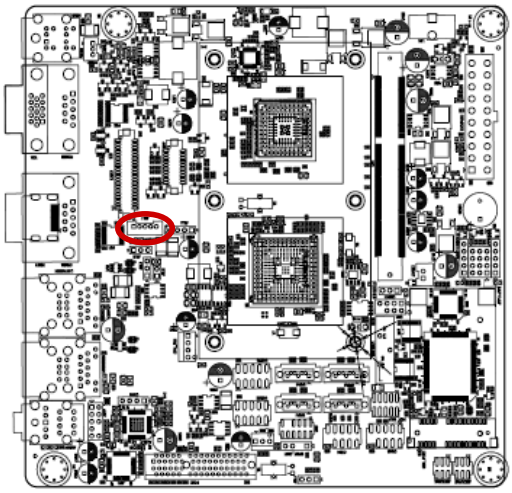
PIN7-10	Internal SPK	PIN3-6	POWER BT
PIN1-10	External SPK	PIN9-12	SYS_RESET

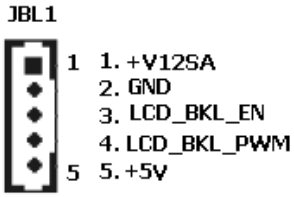
1.8.8 Power LED & Keylock (JFP3)



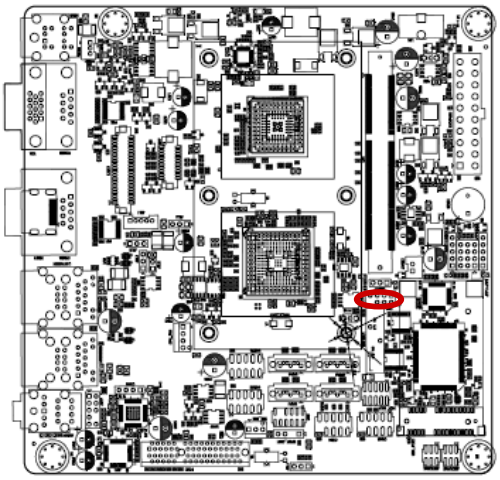


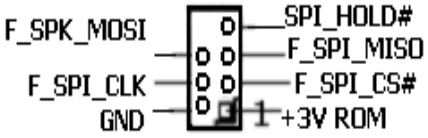
1.8.9 Inverter PWR (JBL1)



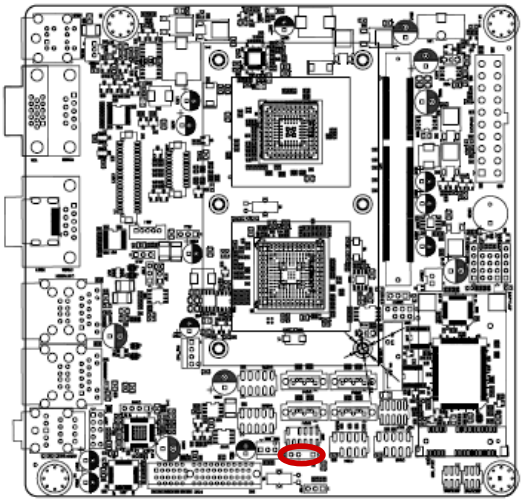


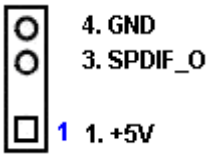
1.8.10 SPI connector (CN4)



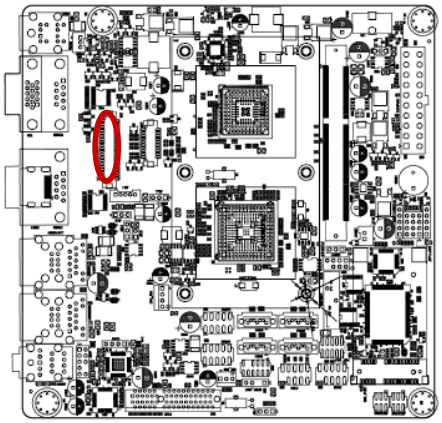


1.8.11 SPDIF OUT (SPDIF_OUT1)



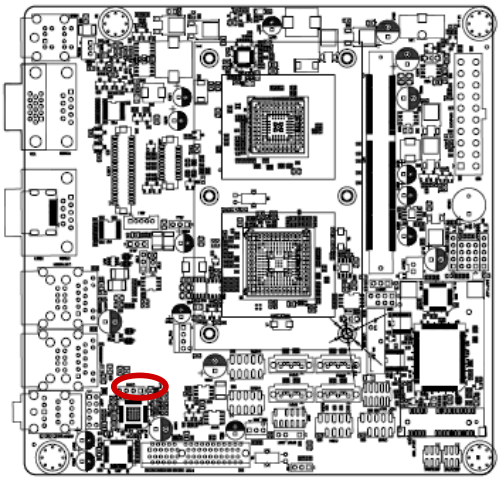


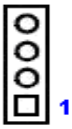
1.8.12 18-bit LVDS Connector (LVDS1)



1.VDDSAFE	11.GND	21.LVDS_L2_P	31.LVDS_DDC_CLK
2.VDDSAFE	12.GND	22.NC	32.LVDS_DDC_DATA
3.GND	13.LVDS_L1_N	23.GND	33.GND
4.GND	14.NC	24.GND	34.GND
5.VDDSAFE	15.LVDS_L1_P	25.LVDS_CLK_N	35.NC
6.VDDSAFE	16.NC	26.NC	36.NC
7.LVDS_L0_N	17.GND	27.LVDS_CLK_P	37.NC
8.NC	18.GND	28.NC	38.NC
9.LVDS_L0_P	19.LVDS_L2_N	29.GND	39.LCD_BLK_EN
10.NC	20.NC	30.GND	40.VCON

1.8.13 AMP_R+R-/AMP_L+L- (CN10)

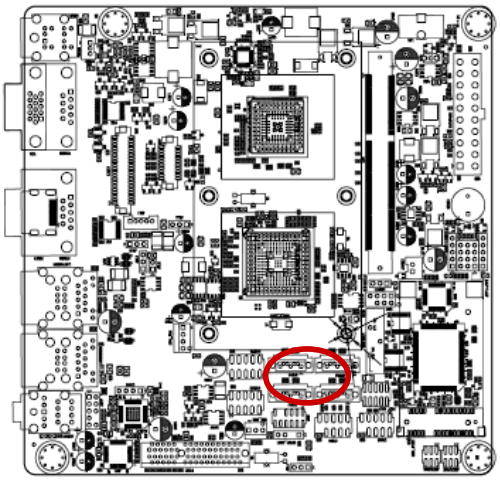


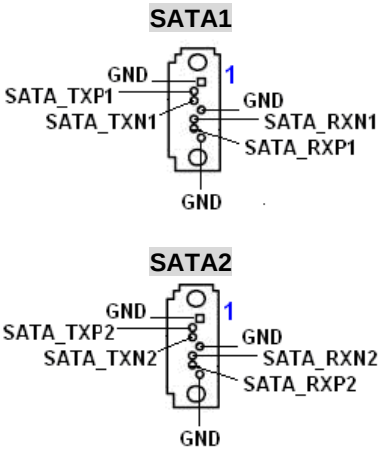


1. L-
2. L+
3. R-
4. R+

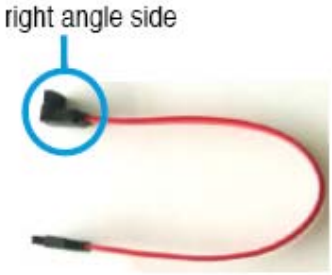
1.8.14 Serial ATA Connector (SATA1, SATA2)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.





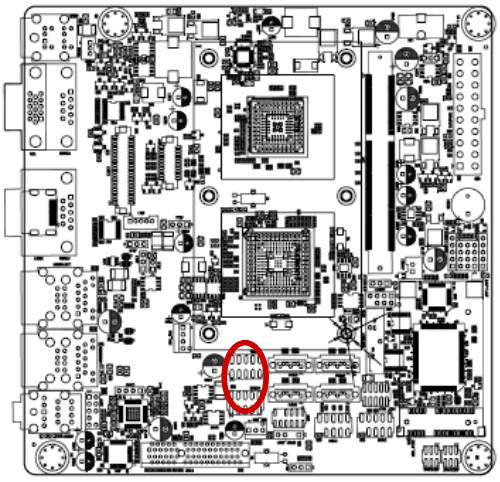
Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

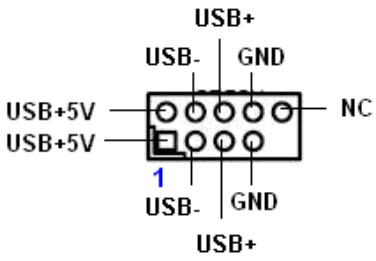


- Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 before using Serial ATA.
- When using the connectors in Standard IDE mode, connect the primary (boot) hard disk drive to the SATA1 connector.

1.8.15 USB 2.0 Connector (USB56)

These connectors are for USB 2.0 ports. Connect the USB/GAME module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.





Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

The USB module is purchased separately.

Chapter 2

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS Setup

BIOS Setup

2.1 BIOS Setup Program

This motherboard supports a programmable firmware chip that you can update using the provided utility. Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl + Alt + Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Optimized Defaults** from the BIOS menu screen.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the system builder’s website to download the latest BIOS file for this motherboard

2.1.1 Legend Box

The keys in the legend bar allow you to navigate through the various setup menus

Key(s)	Function Description
←	Select Screen
↑ ↓	Select Item
+ -	Change Option / Field
Enter	Go to Sub Screen
PGDN	Next Page
PGUP	Previous Page
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit
ESC	Exit

2.1.2 List Box

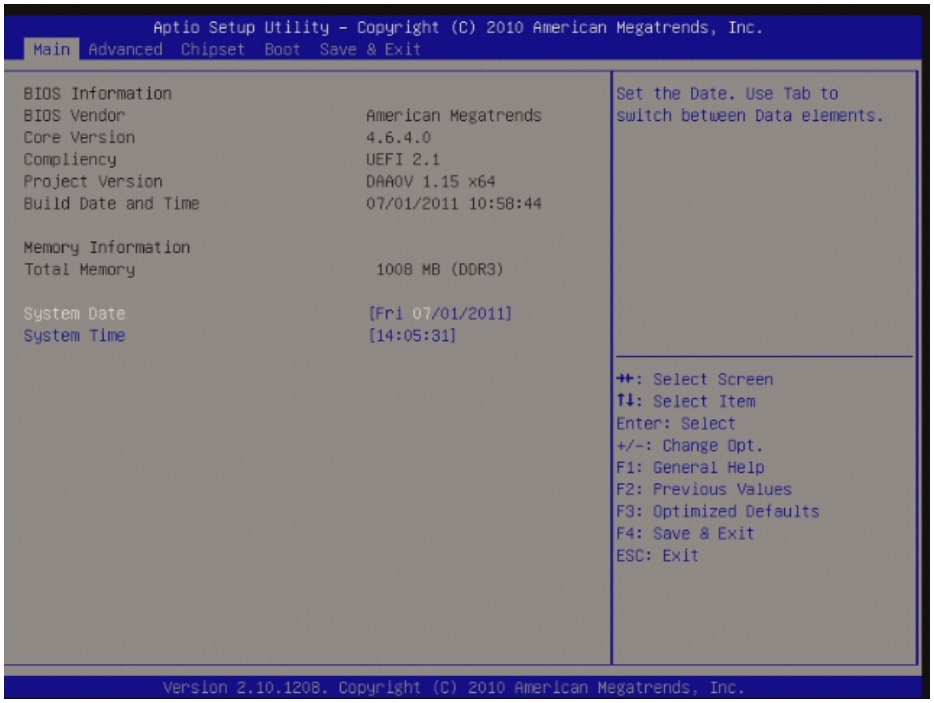
This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

2.1.3 Sub-menu

Note that a right pointer symbol  appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

2.2 BIOS Menu Screen

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.



2.2.1.1 System Date [week, xx/ xx/ xxxx]

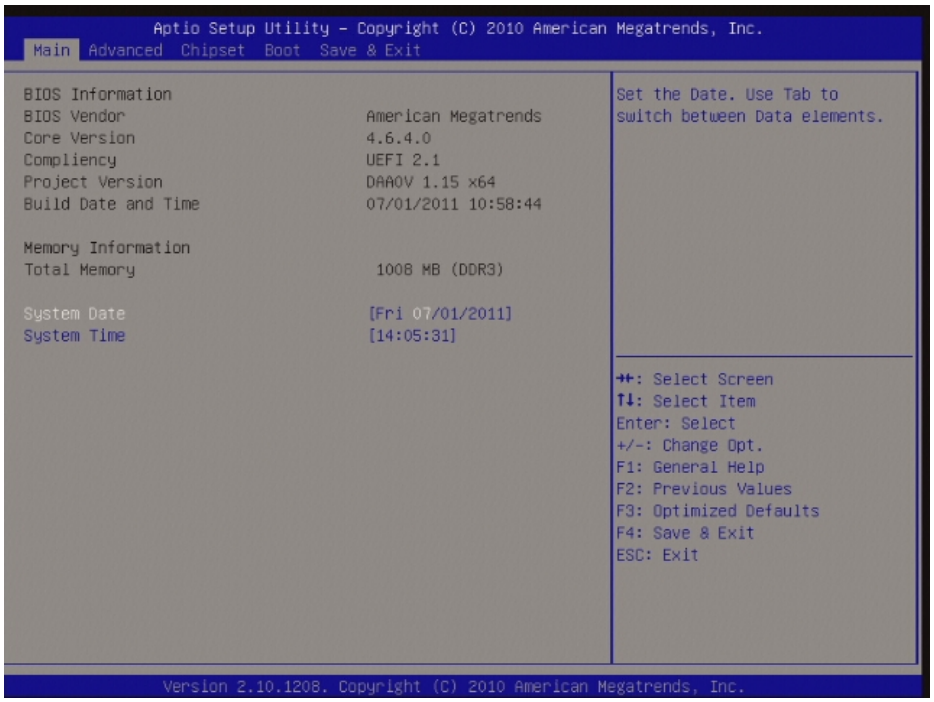
Set the Date. Use Tab to switch between Data elements.

The date format is <week>, <month>, <day>, <year>.

2.2.1.2 System Time [xx : xx : xx]

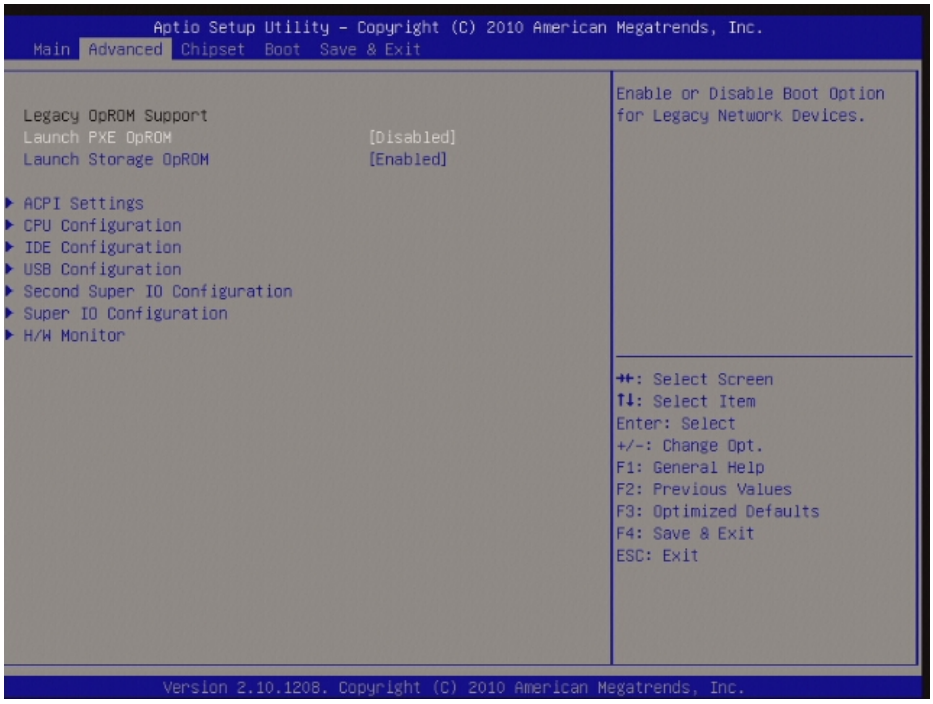
Set the Time. Use Tab to switch between Time elements.

The time format is <hour><minute><second>, based on the 24-hour clock.



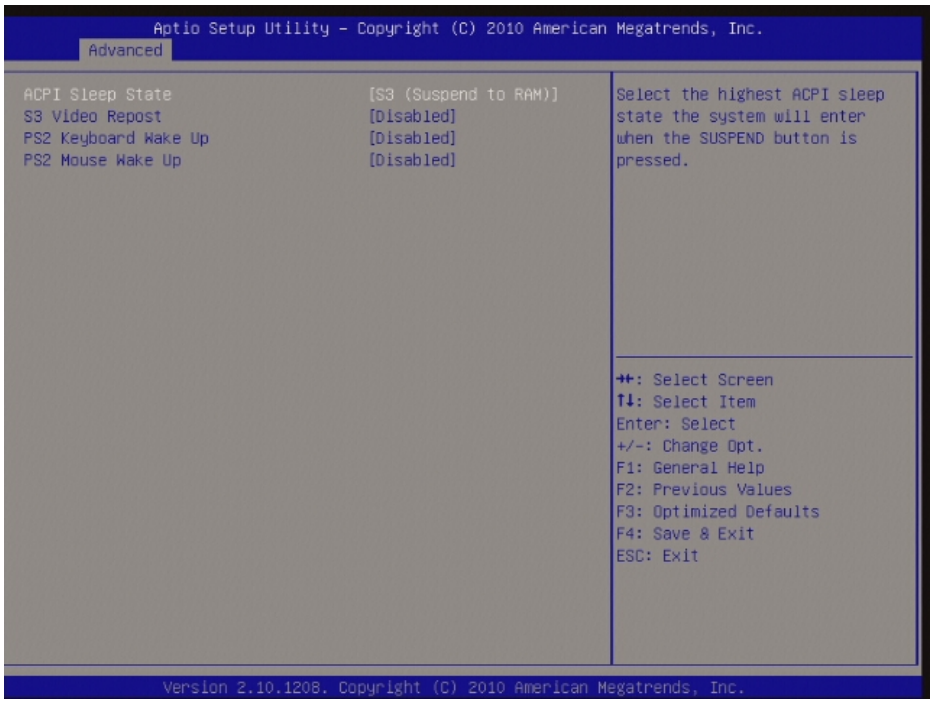
2.2.2 Advanced

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Chipset 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.



2.2.2.1 ACPI Setting

System ACPI Parameters



- **ACPI Sleep State**
  Select the highest ACPI Sleep state the system will enter when the SUSPEND button is pressed. Only support S3

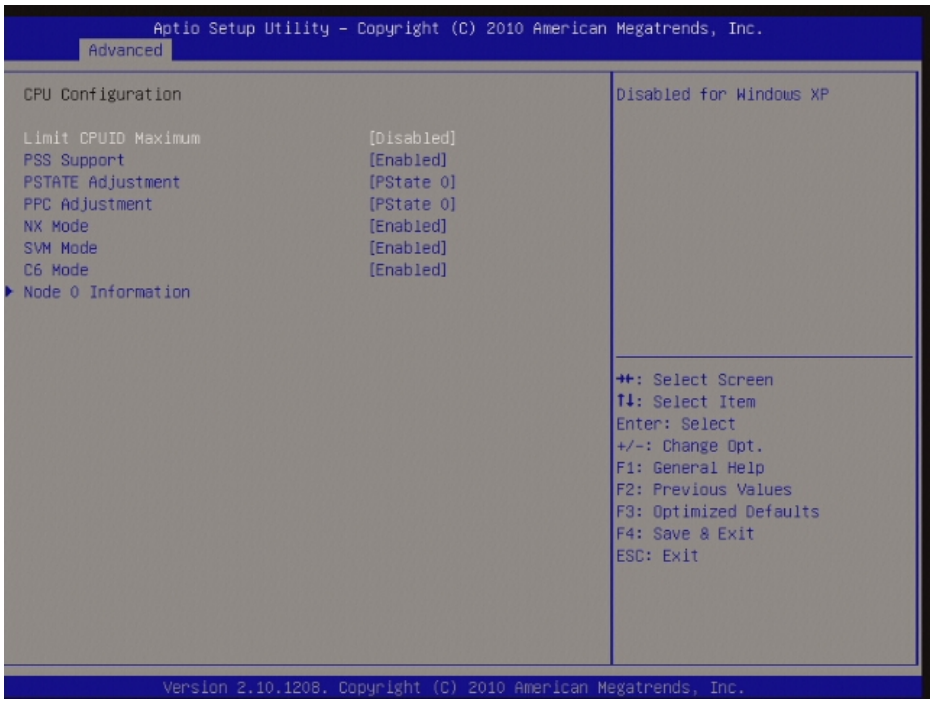
- **S3 Video Repost**
  Enable or Disable S3 Video,

- **PS2 Keyboard Wake Up**
  Enable or Disable PS2 Keyboard Wake up

- **PS2 Mouse Wake Up**
  Enable or Disable PS2 Mouse Wake Up

2.2.2.2 CPU Configuration

The screen displays the auto-detected CPU specifications in more details.



- **Limit CPUID Maximum**
  Disable for Windows XP

- **PSS Support**
  Enable/disable the generation of ACPI_PPC, _PSS, and _PCT objects

- **PSTATE Adjustment**
  Provide to adjust startup P-state level

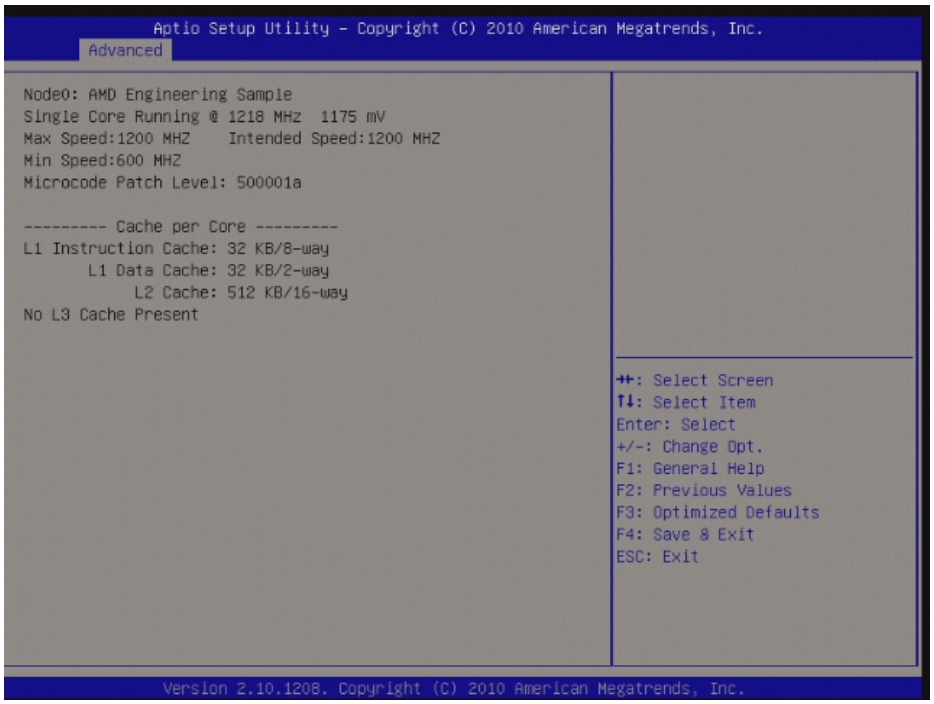
- **PPC Adjustment**
  Provide to adjust _PPC object.

- **NX Mode**
  Enable/disable No-execute page protection Function

- **SVM Mode**
  Enable/disable CPU Virtualization

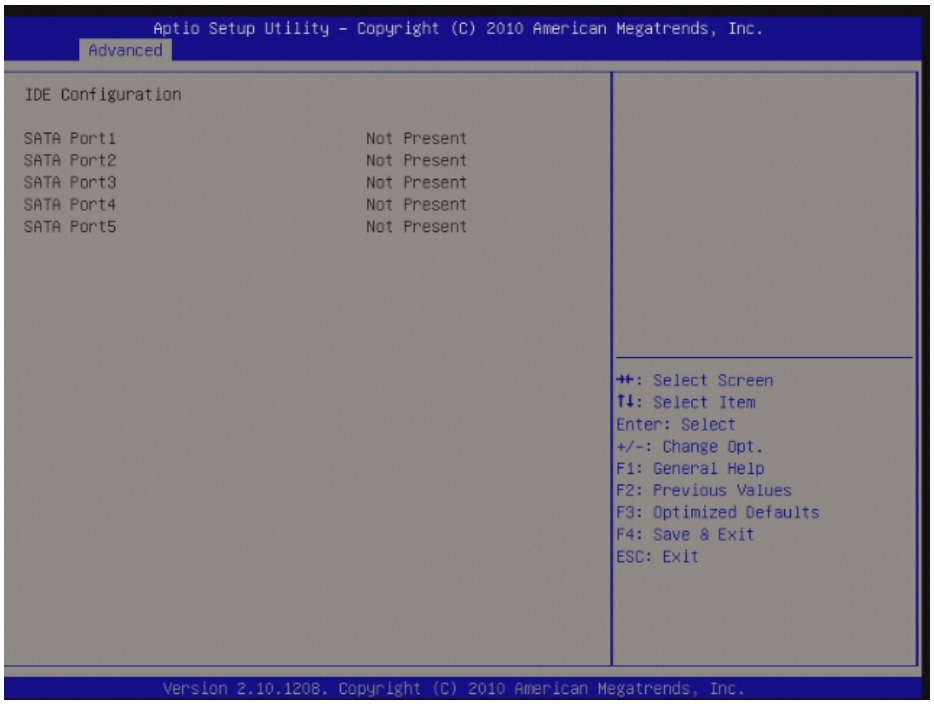
- **C6 Mode**
  Enable/disable C6

- **CPU Information**



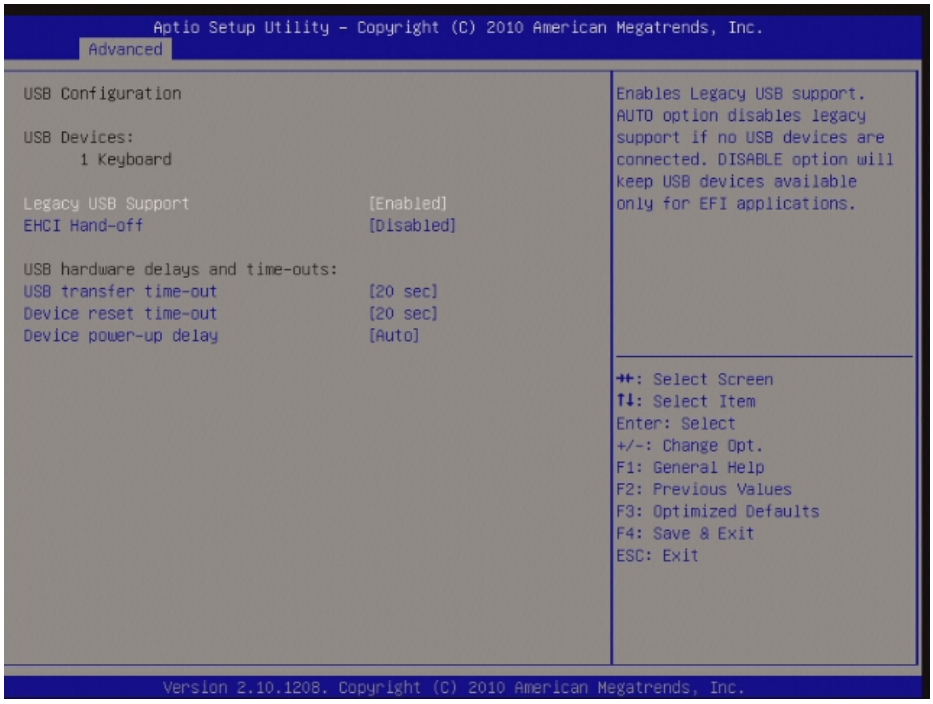
2.2.2.3 IDE Configuration

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. A description of the selected item appears on the right side of the screen. The settings are described on the following pages.



2.2.2.4 USB Configuration

The items in this menu allow you to change USB features. Select an item then press <Enter> to display the configuration options.



- **USB Devices Enabled**

The Module Version and USB Devices Enabled items show the auto-detected values. If no USB device is detected, the item shows none.

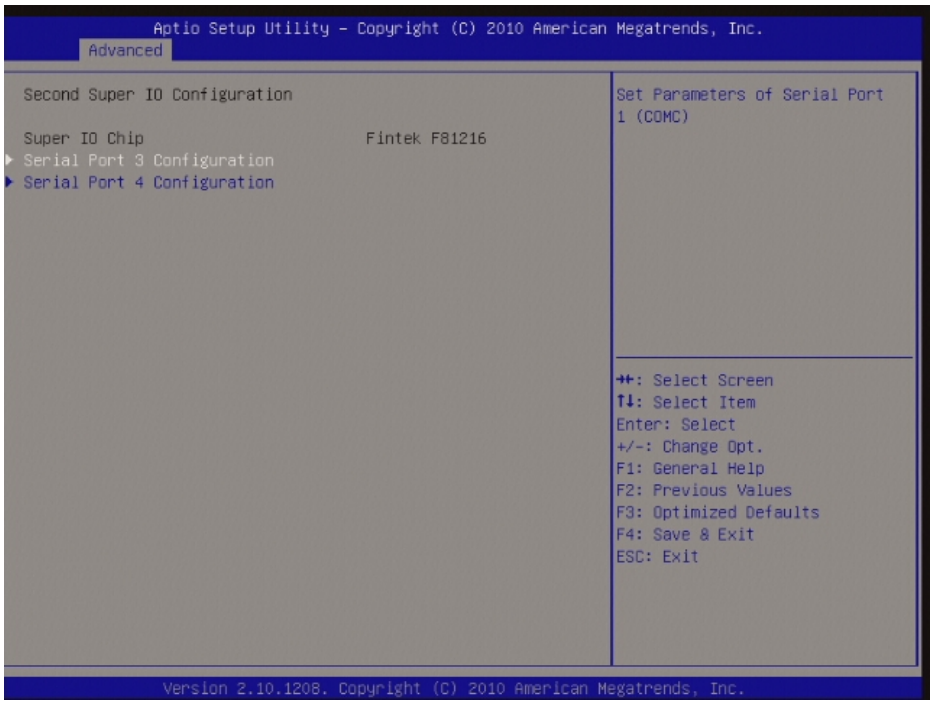
- **Legacy USB Support [Enabled]**

Allows you to enable or disable support for USB devices on legacy operating systems (OS). Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]

- **BIOS EHCI Hand-Off [Enabled]**

Allows you to enable support for operating systems without an EHCI hands off feature. Configuration options: [Disabled] [Enabled].

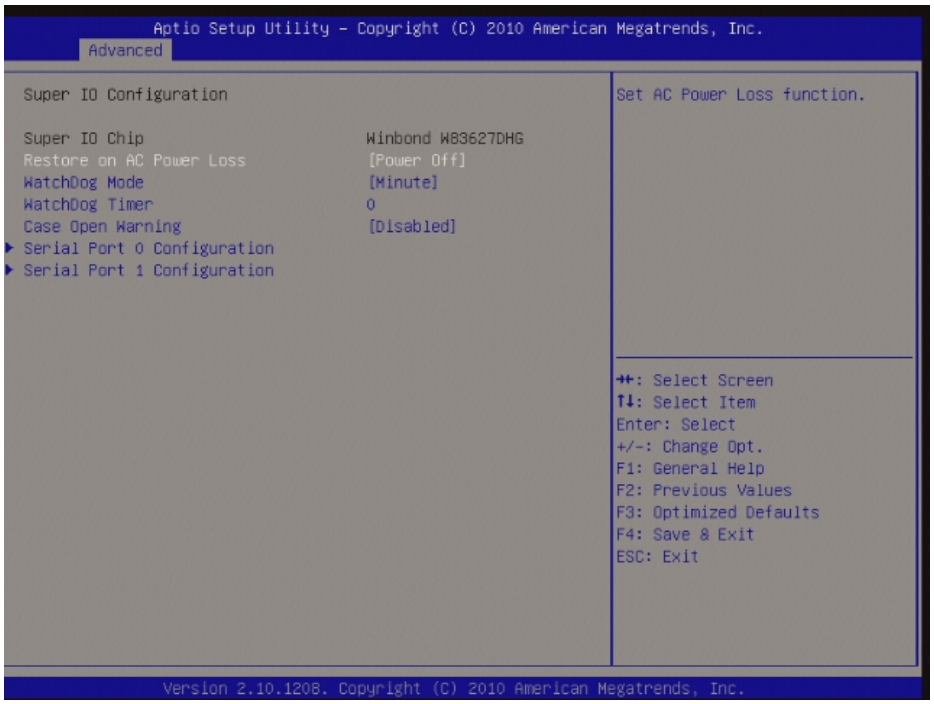
2.2.2.5 Second Super IO Configuration



- **Serial Port 3 Configuration**
  Set Parameters of Serial Port 3 (COMC)

- **Serial Port 4 Configuration**
  Set Parameters of Serial Port 4 (COMD)

2.2.2.6 Super IO Configuration



- **Restore on AC Power Loss**
  Set AC Power Loss function

- **WatchDog Mode**
  Set WatchDog Timer

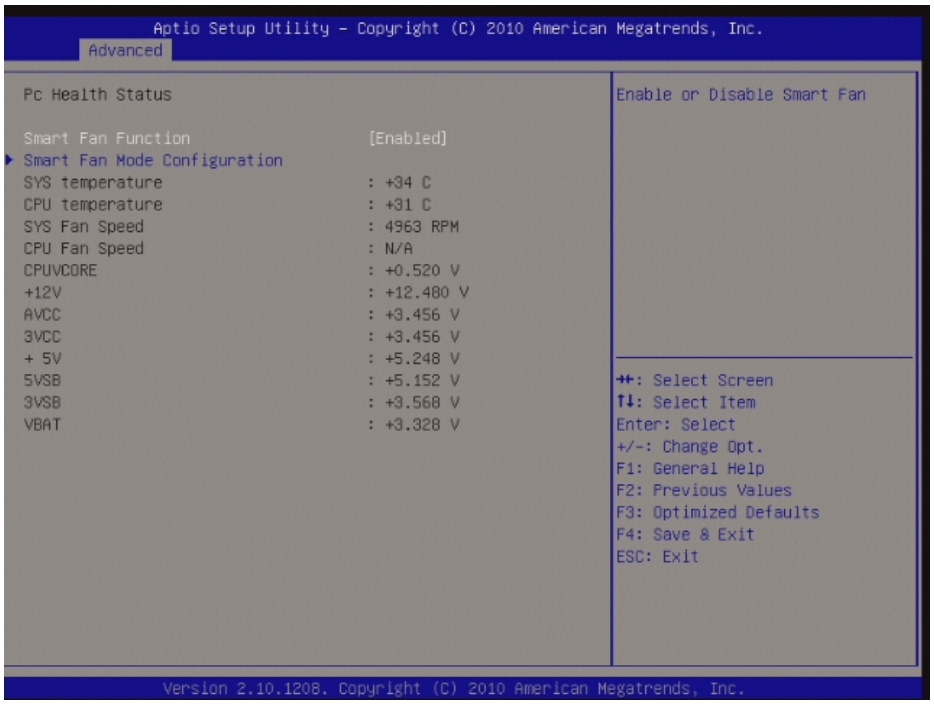
- **WtachDog Timer**
  Input expect Value (Range: 0-255)

- **Case Open Warning**
  Enable or Disable Case Open Warning

- **Serial Port 1 Configuration**
  Set Parameters of Serial Port 1 (COMA)

- **Serial Port 2 Configuration**
  Set Parameters of Serial Port 2 (COMB)

2.2.2.7 H/W Monitor

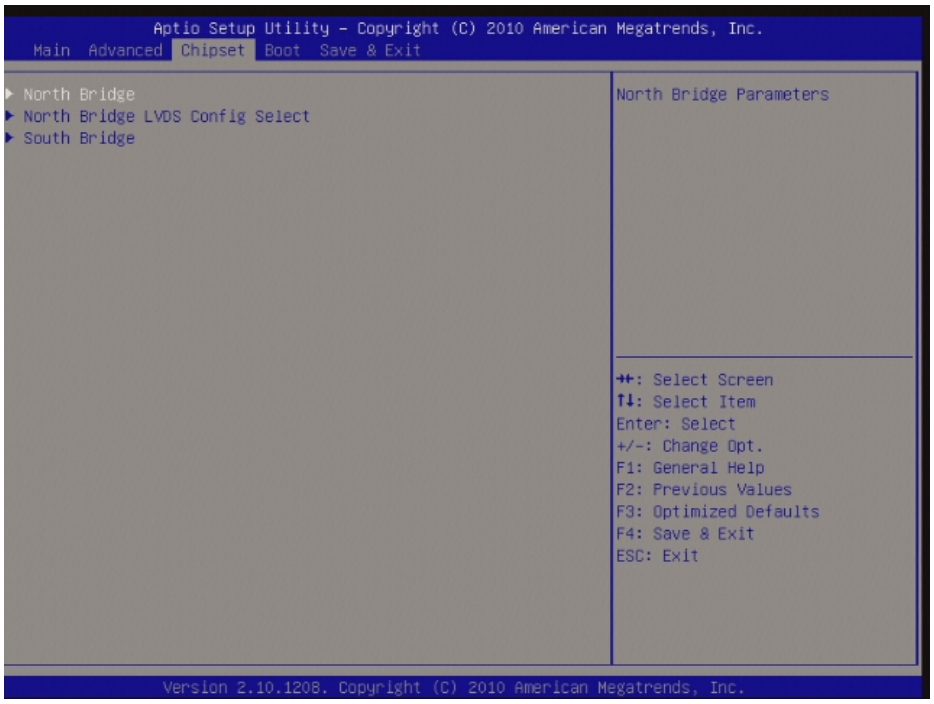


- **Smart Fan Function**
  Enable or Disable Smart Fan

- **Smart Fan Mode Configuration**
  Smart Fan Mode Select

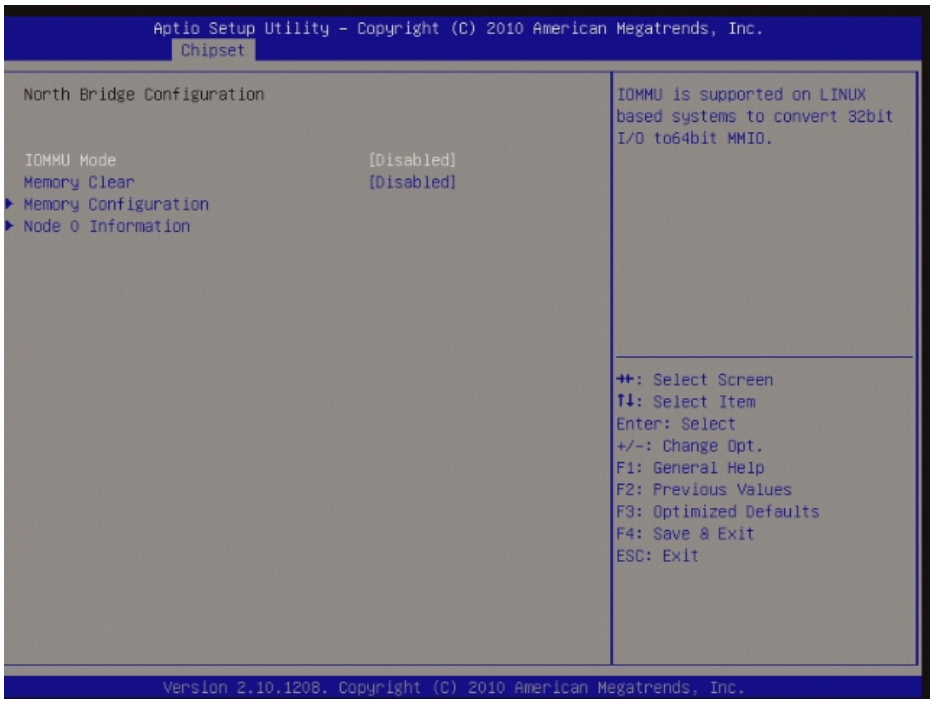
2.2.3 Chipset

The items in this menu allow you to change the Chipset-related features. Select North Bridge Configuration and press <Enter> for further configuration options.



2.2.3.1 North Bridge

The screen displays the auto-detected DDR3 SO-DIMM specifications in more detail

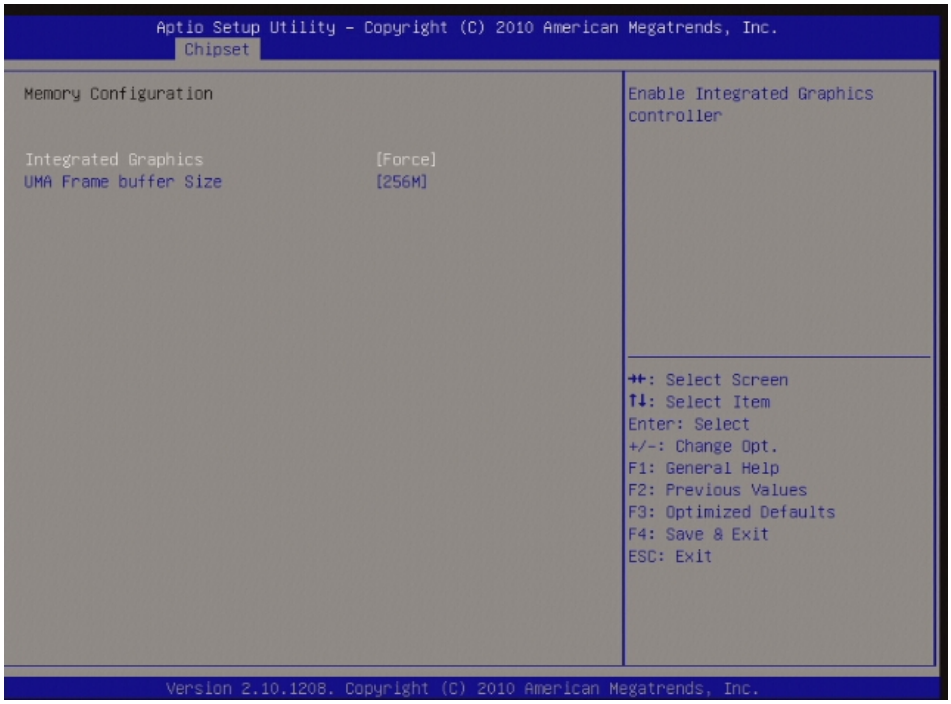


- **IOMU Mode**
  IOMMU is supported on LINUX based systems to convert 32bit I/O to64bit MMIO.

- **Memory Clear**
  Memory Clear functionality control

2.2.3.1.1 Memory Configuration

This screen allows you to configure the graphics options.

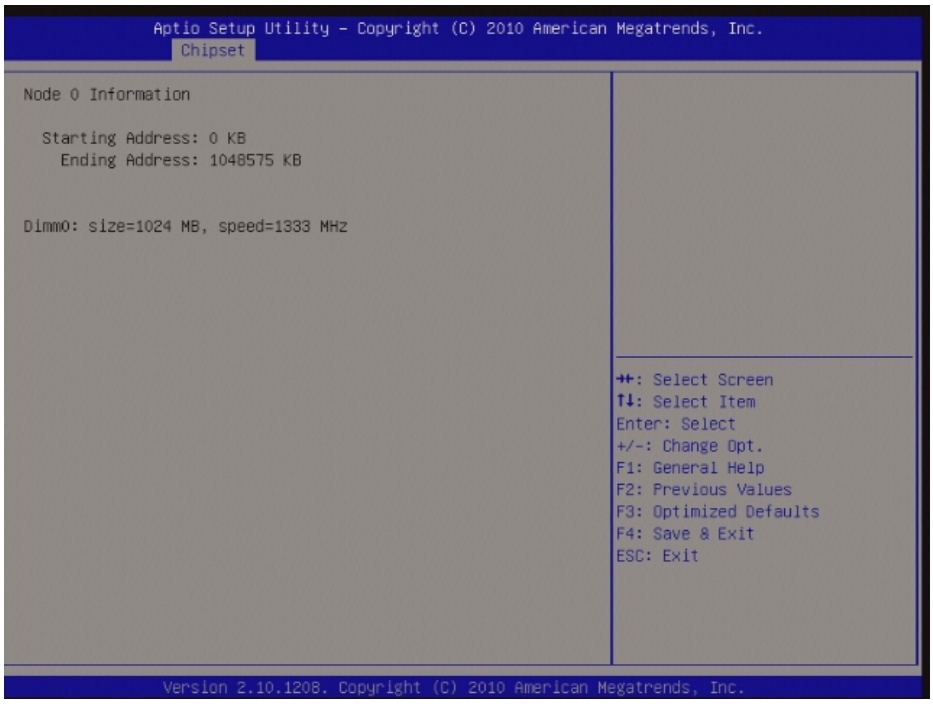


- **Integrated Graphics**
  Enable Integrated Graphics controller

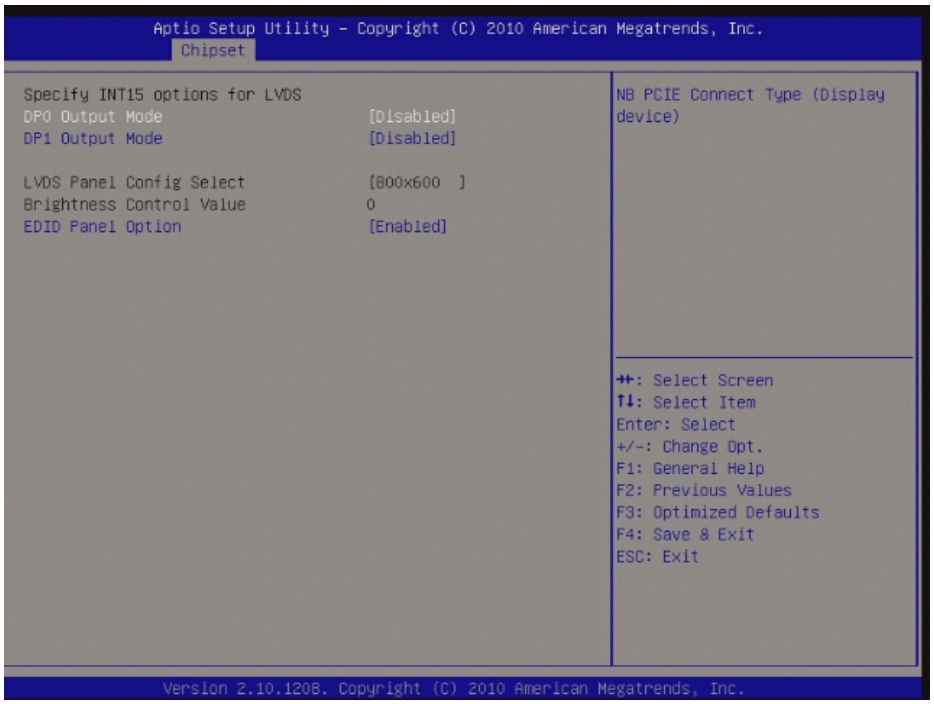
- **UMA Frame buffer Size**
  Set UMA FB size

2.2.3.1.2 Node 0 Information

View memory Information related to Node 0



2.2.3.2 North Bridge LVDS Config Select



- **DP0 Output Mode**
  NB PCIE Connect Type (Display device)

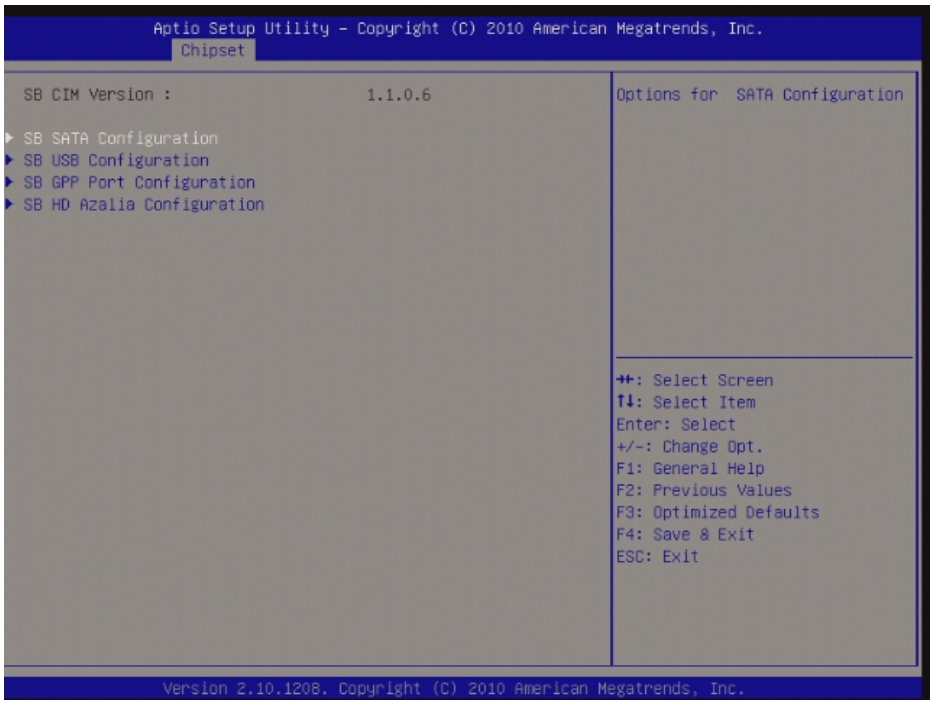
- **DP1 Output Mode**
  NB PCIE Connect Type (Display device)

- **LVDS Panel Config Select**
  800x600
  1024x768
  1280x720
  1280x800
  1280x1024
  1366x768
  1440x900
  1600x900
  1920x1024

- **Brightness Control Value**
  Input Brightness Value (Range :0 – 255)

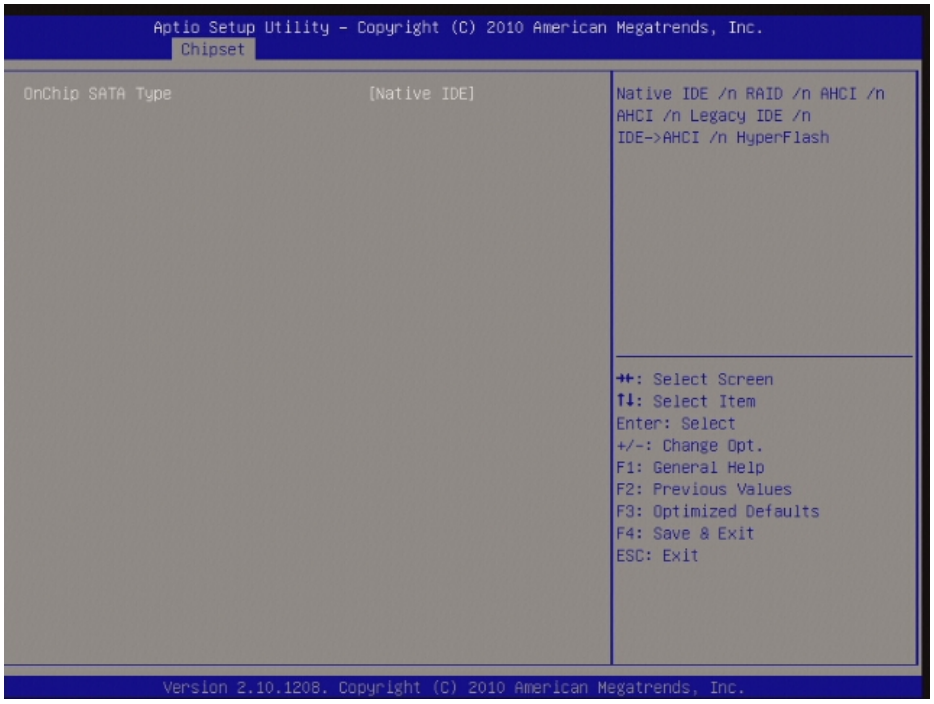
- **EDID Panel Option**
  EDID Panel Option

2.2.3.3 South Bridge



2.2.3.3.1 SB SATA Configuration

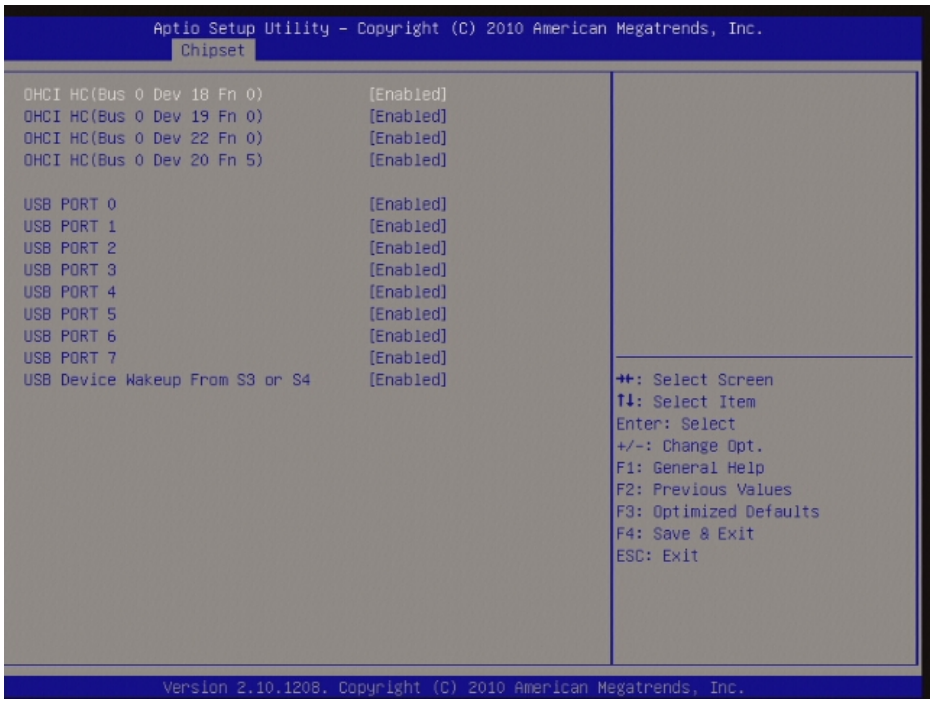
Options for SATA Configuration



- **OnChip SATA Type**
  Native IDE/ n RAID /n AHCI /n AHCI /n Legacy IDE /n IDE->AHCI /n HyperFlash

2.2.3.3.2 SB USB Configuration

Options for SB USB Configuration



2.2.3.3.3 SB GPP Port Configuration

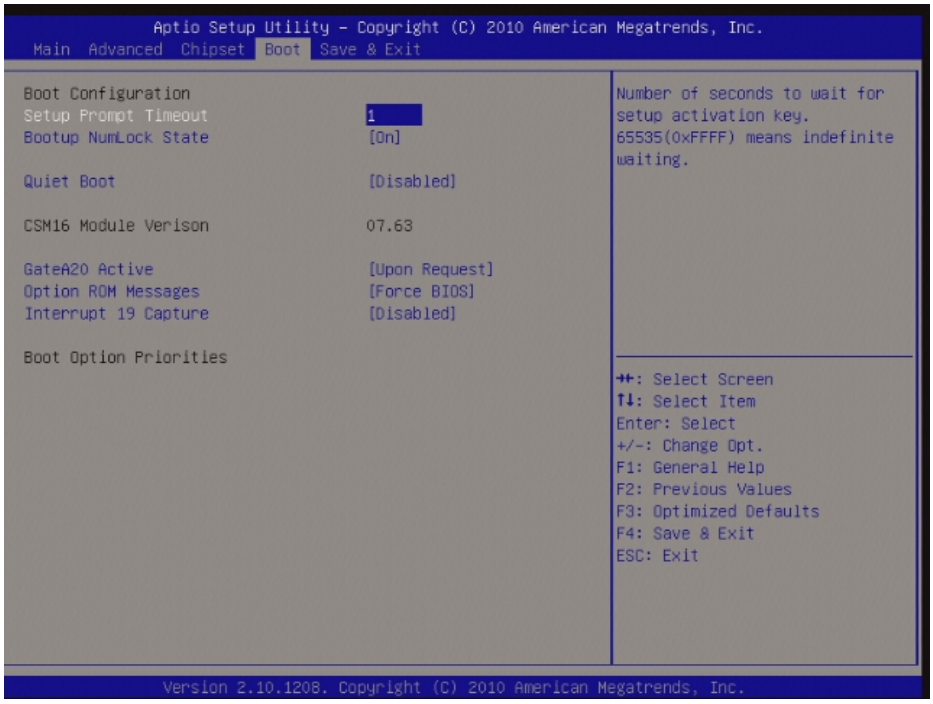
Options for SB gpp Port Config

2.2.3.3.4 HD Azalia Configuration

Options for SB HD Azalia

2.2.4 Boot

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



- **Setup Prompt Timeout [1]**

Number of seconds to wait for setup activation key.
65535 (0xFFFF) means indefinite waiting.

- **Bootup NumLock State [On]**

Select the keyboard NumLock state
Configuration options: [On] [Off]

- **Quick Boot [Disable]**

Configuration options: [Disable] [Enable]

- **CSM16 Module Version [07.64]**

Display CSM16 Module Version.

- **GataA20 Active [Upon Request]**

Upon Request – GA20 can be disable using BIOS services.
Always – do not allow disabling GA20; this option is useful when any RT code is ececuted above 1MB.
Configuration options: [Upon Request] [Always]

- **Option ROM Messages [Force BIOS]**

Set display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

- **Interrupt 19 Capture [Disable]**

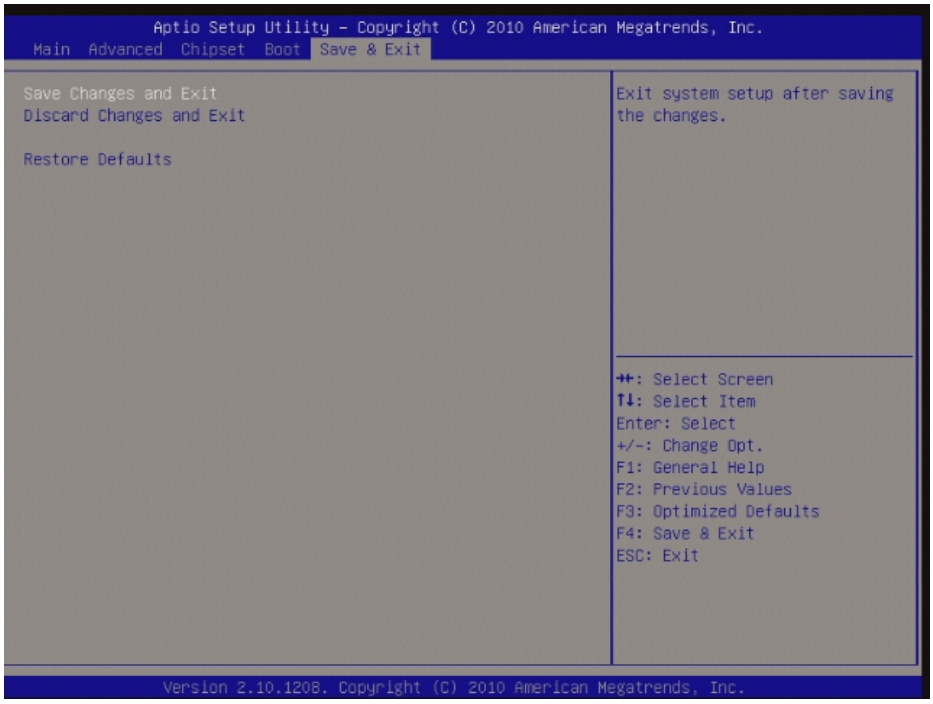
Enabled : Allow option ROMs to trap Int19.
Configuration options: [Disabled][Enabled]

- **Boot option priorities [Built-in EFI Shell]**

Select the system boot order.
Configuration options: [Built-in EFI Shell][Disabled]

2.2.5 Save & Exit

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Save Changes and Exit

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [OK] to save change and exit.

Discard Changes and Exit

Select this option only if you do not want to save the changes that you made to the setup program. If you made changes to fields other than System Date, System time, and Password, the BIOS asks for a confirmation before exiting.

Restore Defaults

Restore the user defaults to all the setup options