TECHNICAL MANUAL

Of

AMD Hudson E1/D1 Chipset

Based

for AMD Brazos APU Mini-ITX M/B

NO.G03-NC85-F

Revision：2.0

Release date: April, 2011

Trademark:

*** Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.**

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	April, 2011

Item Checklist

- ☑ Motherboard
- ☑ User's Manual
- ☑ DVD for motherboard utilities
- ☑ Cable(s)
- ☑ I/O Back panel shield

Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 60 centigrade is the suitable temperature. (The figure differs from the request of the main chipset)

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

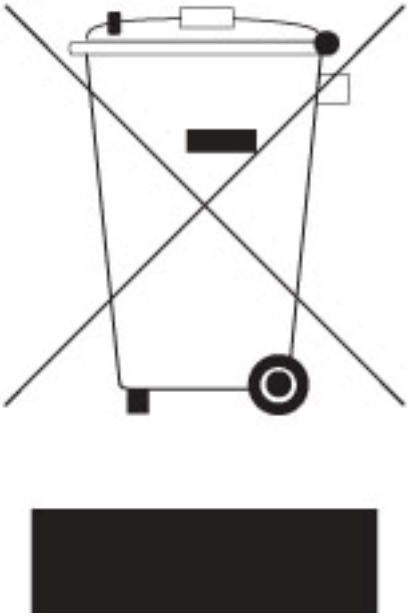


TABLE OF CONTENT

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- AMD Hudson E1 Chipset and AMD Brazos eOntario G-Series APU (NF81 series)
- AMD Hudson D1 Chipset and AMD Brazos Zacate E-Series APU (NC85 series)
- Low power consumption but high performance
- Support DirectX 11 3D Graphics Acceleration
- Support SO-DIMM DDRIII 1066 up to 8GB
- Integrated with VIA VT1705 6-CH HD Audio CODEC
- Integrated with Realtek RT8111E Gigabit LAN chip
- Support USB 2.0 data transport demands
- Support PCI slot, Mini-PCIE x1 slot
- Support Mini-SATA slot (NF81 series)
- Support CPU Smart FAN
- Compliance with ErP standard

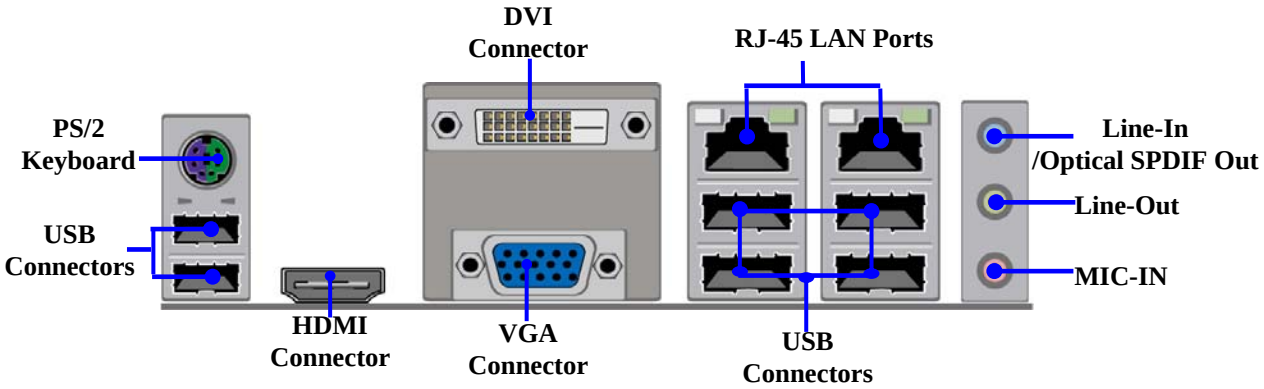
1-2 Specification

Spec	Description
Design	● 6 layers Mini-ITX form factor ; PCB size: 17.0x17.0cm
Chipset	● Hudson D1 Chipset (NC85 series) ● Hudson E1 Chipset (NF81 series)
APU	● AMD Brazos Zacate E-Series APU (NC85 series) ● AMD Brazos eOntario G-Series APU (NF81 series)
Memory Socket	● 204-pin DDRIII SODIMM socket x2 ● Support DDRIII 1066 MHz DDRIII SODIMM expandable to 8GB
Expansion Slot	● PCI slot x1 ● Mini-PCIE x1 slot x1 ● Mini SATAIII slot x1 (NF81 series)
Integrated LAN	● Integrated one Realtek RTL8111E PCI-E Gigabit LAN chip (NC85 series) ● Integrated dual Realtek RTL8111E PCI-E Gigabit LAN chip (NF81 series) ● Support Fast Ethernet LAN function of providing 10Mb/100Mb/1000Mb Ethernet data transfer rate
Audio	● VIA VT1705 6-Channel HD Audio CODEC ● Audio driver and utility included
BIOS	● AMI 16MB SPI Flash ROM
Multi I/O	● PS/2 keyboard connector x 1 ● HDMI connector x 1 ● DVI connector x1 (HDMI Connector and DVI Connector can not be used at the same time) ● VGA connector x1 ● USB port connector x 6 and USB header x2 ● RJ-45 LAN connector x1(NC85 series) ● RJ-45 LAN connector x2(NF81 series)

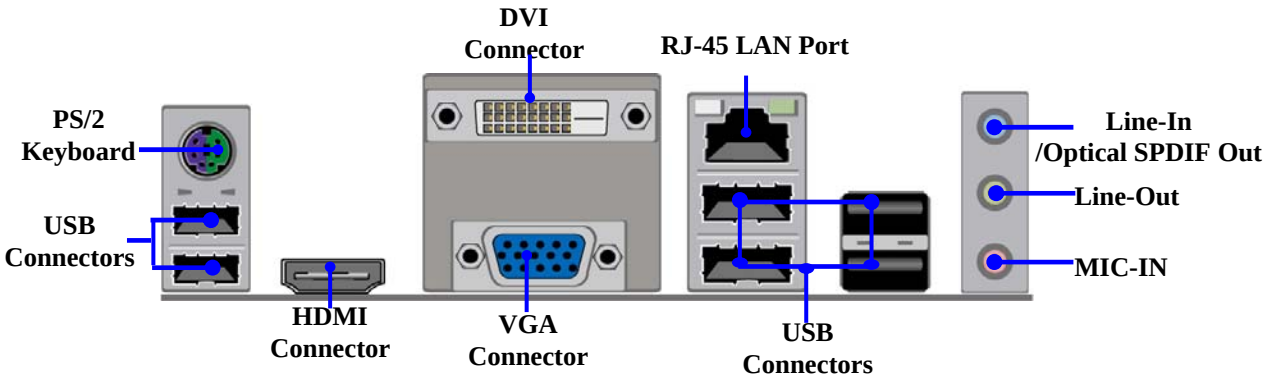
	● Audio connector x1 (Line-in, Line-out, MIC) ● SATAII connector x 4 (NC85 series) ● SATAIII connector x 5(NF81 series) ● Front panel audio header x1 ● Serial port header x1 ● GPIO header x1 ● Front panel header x1 ● CIR header x1 ● Speaker header x1 ● 24-bit Dual CH LVDS header x1 (NF81 series) ● 18-bit single channel LVDS header x1 (NC85 series)

1-3 Layout Diagram

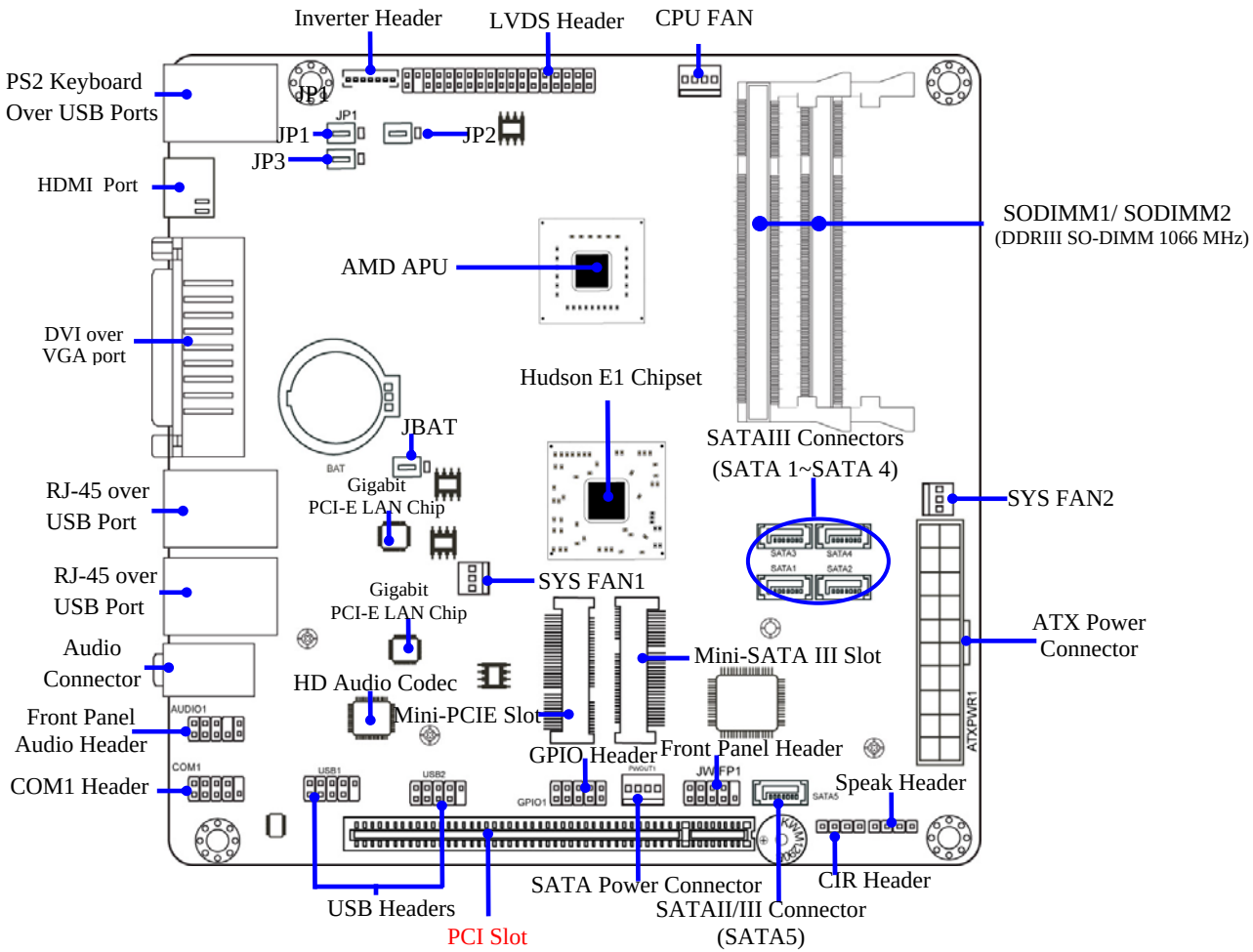
Rear IO Back Panel for NF81 series:



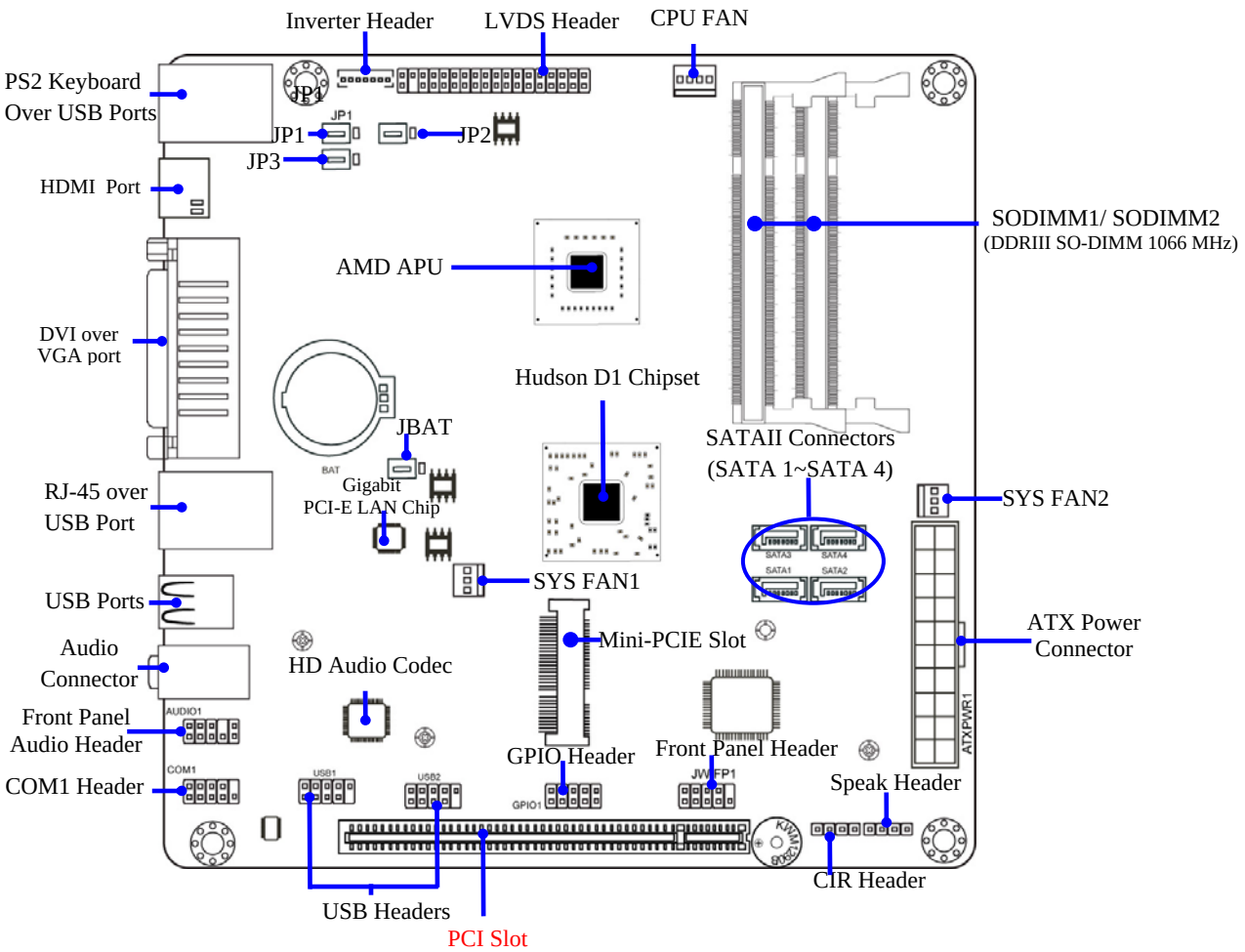
Rear IO Back Panel for NC85 series:



Internal Motherboard Diagram for NF81 series:



Internal Motherboard Diagram for NC85 series:



Jumper

Jumper	Name	Description
JBAT	CMOS RAM Clear Function Setting	3-pin Block
JP1	Inverter12V/5V Select	3-pin Block
JP2	LVDS PVCC 5V/3.3V Select	3-pin Block
JP4	KB/MS/USB Power on Function Setting	3-pin Block

Connectors

Connector	Name	Description
ATXPWR	ATX Power Connector	24-pin Connector
KB from UK1	PS2 Keyboard Connector	6-pin Female
HDMI1	High-Definition Multimedia Interface	19-pin Connector
DVI1	Digital Visual Interface	24-pin Connector
VGA1	Video Graphic Attach Connector	15-pin Female
SATA1/SATA2/ SATA3/SATA4(SATA5)	Serial ATAII Connector (NC85 series) /SATAIII Connector (NF81series)	7-pin Connector
USB from UK1/UL1/UL2	USB Port Connector	4-pin Connector
LAN from UL1(/UL2)	RJ-45 LAN Connector	8-pin Connector
CN2	AUDIO Connector	3 Phone Jack

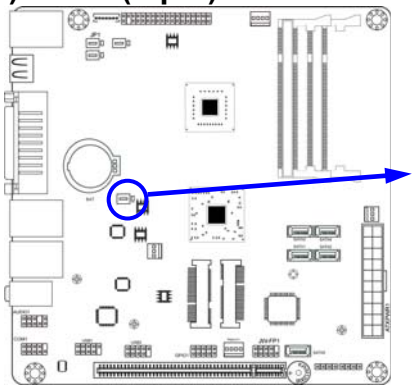
Headers

Header	Name	Description
AUDIO1	Front panel audio Headers	9-pin block
USB1, USB2	USB Headers	9-pin Block
COM1	Serial Port Header	9-pin Block
JW_FP1	Front Panel Header (PWR LED/ HD LED/ /Power Button /Reset)	9-pin Block
CIR	CIR Header	4-pin Block
SPEAK1	Speaker Header	4-pin Block
LVDS1	LVDS Header	36-pin Block
INVERTER1	LVDS Inverter Connector	7-pin Block
GPIO1	GPIO header	10-pin Block

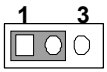
Chapter 2
Hardware Installation

2-1 Jumper Setting

(1) JBAT(3-pin): Clear CMOS

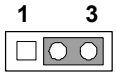


JBAT



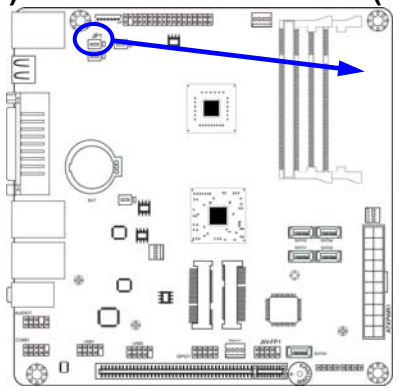
1-2 Short： Normal

JBAT



2-3 Short： CMOS Clear

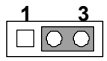
(2) Inverter 5V/12V Select (3-pin):JP1



JP1

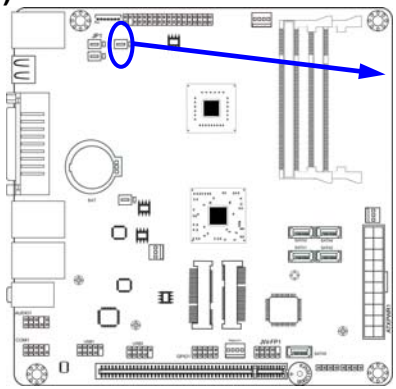
1-2 Closed：
INVERTEL POWER 12V Selected

JP1



2-3 Closed：
INVERTEL POWER 5V Selected

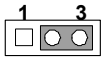
(3) LVDS PVCC 5V / 3.3V Function setting (3-pin): JP2



JP2

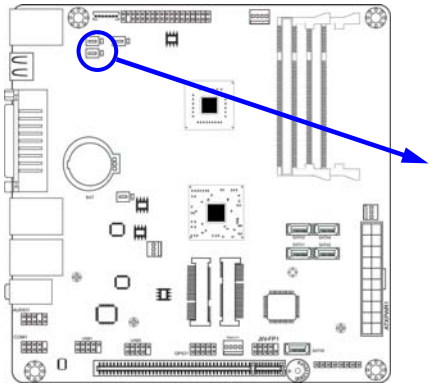
1-2 Closed:
LVDS PVCC 5V Selected

JP2



2-3 Closed:
LVDS PVCC 3.3V Selected

(4) KB/MS/USB Power on Function Enabled/Disabled (3-pin): JP3



JP3

1-2 Closed: KB/MS/USB POWER-ON Disacled(default)

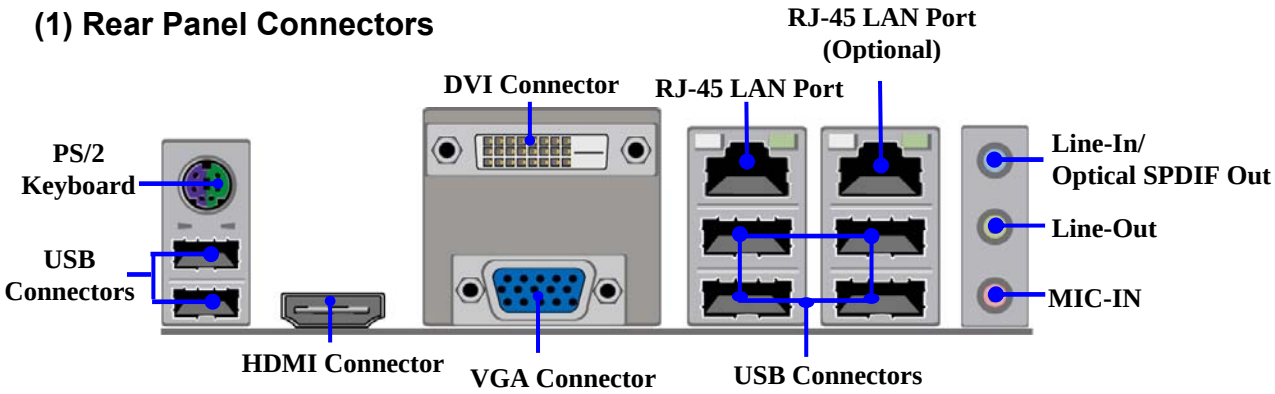
JP3

2-3 closed: KB/MS/ USB POWER-ON Enabled

2-2 Connectors and Headers

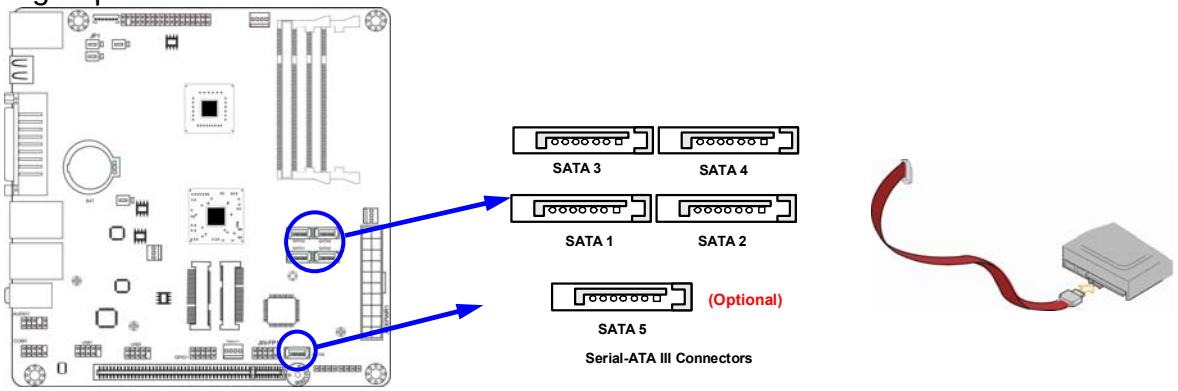
2-2-1 Connectors

(1) Rear Panel Connectors



(2) Serial-ATAII/III Port connector: SA TA1/SATA2/SATA3/SATA4/SATA5 (NF81 Series)

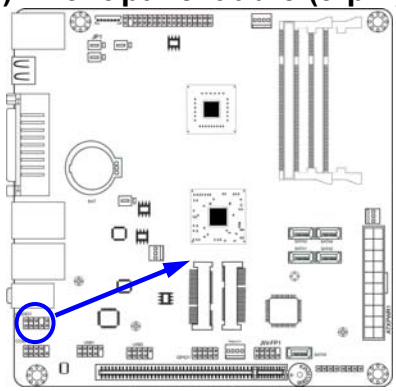
These connectors support the provided SATA hard disk cable to connect the motherboard and SATA hard disk drives. SATA connectors from NC85 series are high-speed SATA 3Gb/s connectors. SATA connectors from NF81 series are high-speed SATA 6Gb/s connectors.

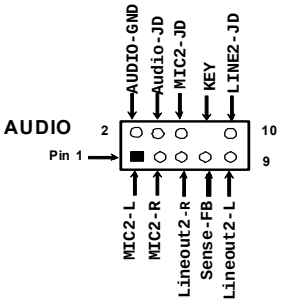


Notice!	SATA5, SATA power connector and Mini-SATA slot depend on the model you select. Please refer to the product you purchase for actual specification.

2-2-2 Headers

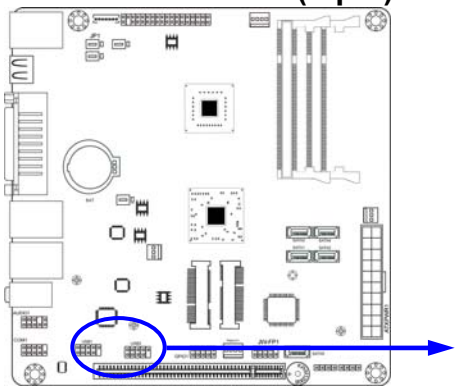
(1) Front panel audio (9-pin): AUDIO1

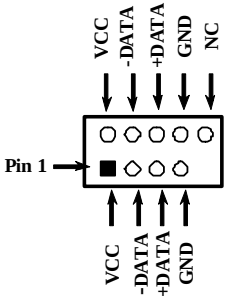




Line-Out, MIC Headers

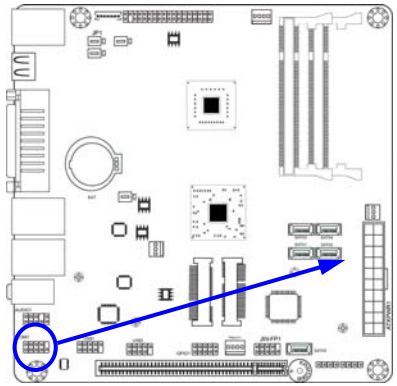
(2) USB Port Headers (9-pin): USB1/USB2

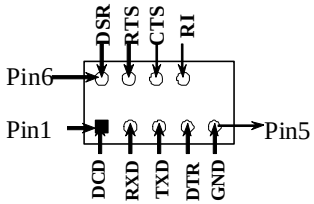




USB Port Header

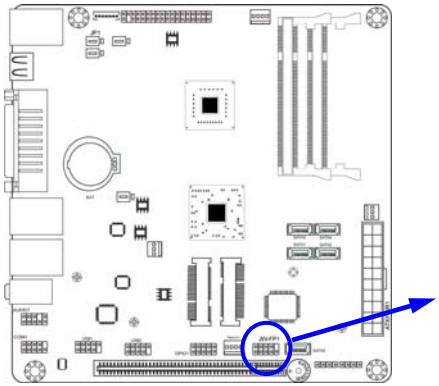
(3) Serial Port Header: COM1

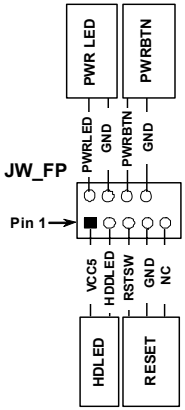




Serial COM Port 9-pin Block

(4) Front Panel Header: JW-FP1

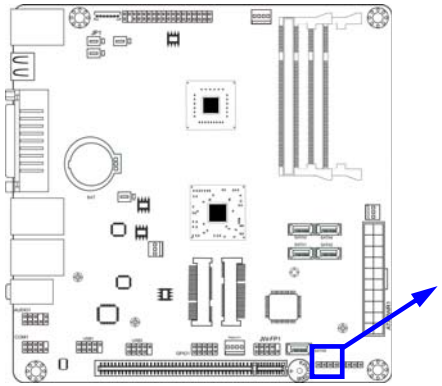


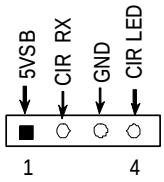


System Case Connections

(11) CIR Header: CIR

This 4-pin CIR header is to receive remote control signal.

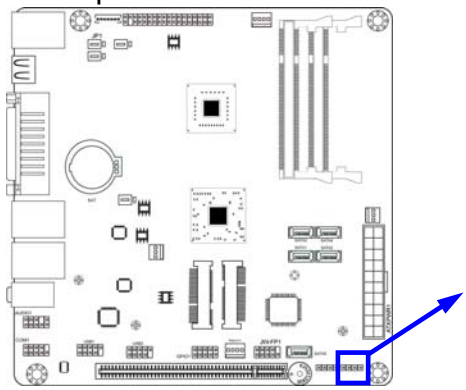


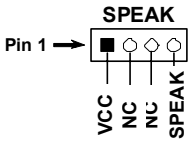


CIR Header

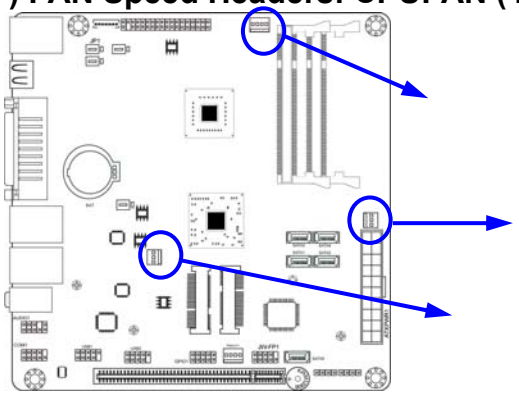
(5) Speaker connector: SPEAK1

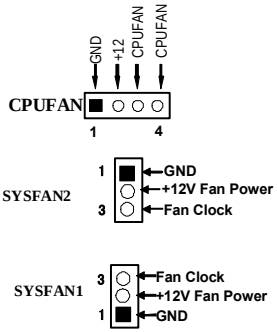
This 4-pin connector connects to the case-mounted speaker. See the figure below.





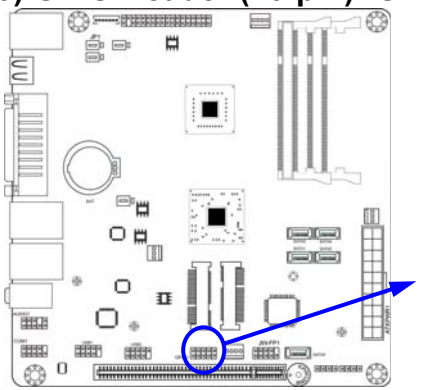
(7) FAN Speed Headers: CPUFAN (4-pin), SYSFAN1/SYSFAN2 (3-pin)

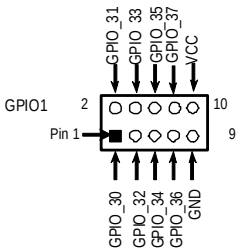




FAN Headers

(10) GPIO Header (10-pin): GPIO1

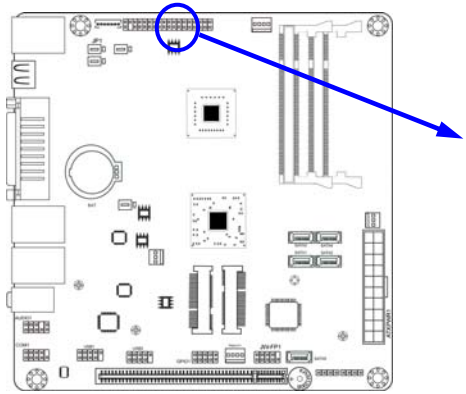


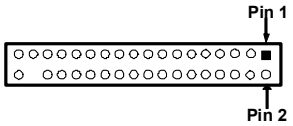


GPIO Connector

(12) LVDS Headers（36 Pin）: LVDS1

Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	LVDSB_DATAN3	Pin 2	LVDSB_DATAP3
Pin 3	LVDSB_CLKBN	Pin 4	LVDSB_DATABP
Pin 5	LVDSB_DATAN2	Pin 6	LVDSB_DATAP2
Pin 7	LVDSB_DATAN1	Pin 8	LVDSB_DATAP1
Pin 9	LVDSB_DATAN0	Pin 10	LVDSB_DATAP0
Pin 11	LVDS_DDC_DATA	Pin 12	LVDS_DDC_CLK
Pin 13	GND	Pin 14	GND
Pin 15	GND	Pin 16	GND
Pin 17	LVDSA_DATAP3	Pin 18	LVDSA_DATAN3
Pin 19	LVDS_CLKAP	Pin 20	LVDS_CLKAN
Pin 21	LVDSA_DATAP2	Pin 22	LVDSA_DATAN2
Pin 23	LVDSA_DATAP1	Pin 24	LVDSA_DATAN1
Pin 25	LVDSA_DATAP0	Pin 26	LVDSA_DATAN0
Pin 27	PVDD	Pin 28	PVDD
Pin 29	PVDD	Pin 30	PVDD
Pin 31	GND	Pin 32	GND
Pin 33	+5V	Pin 34	N/A
Pin 35	+12V (Reserved)	Pin 36	+3V





LVDS Header

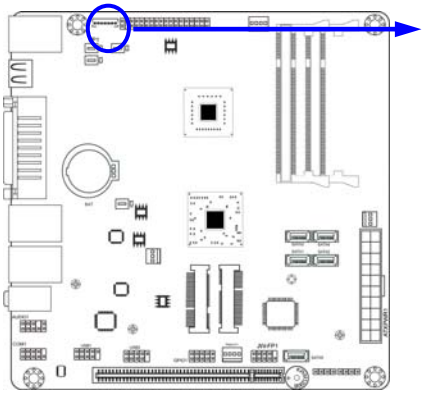
(13) LVDS Inverter headers: INVERTER1

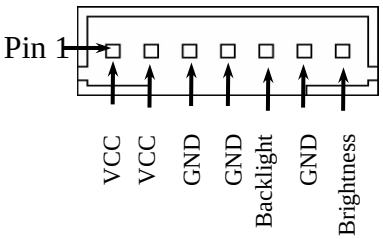
Pin 1 and pin2: VCC of inverter

Pin3, pin4 and pin6: GND

Pin5: Backlight

Pin7: Brightness





Chapter 3
Introducing BIOS

Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

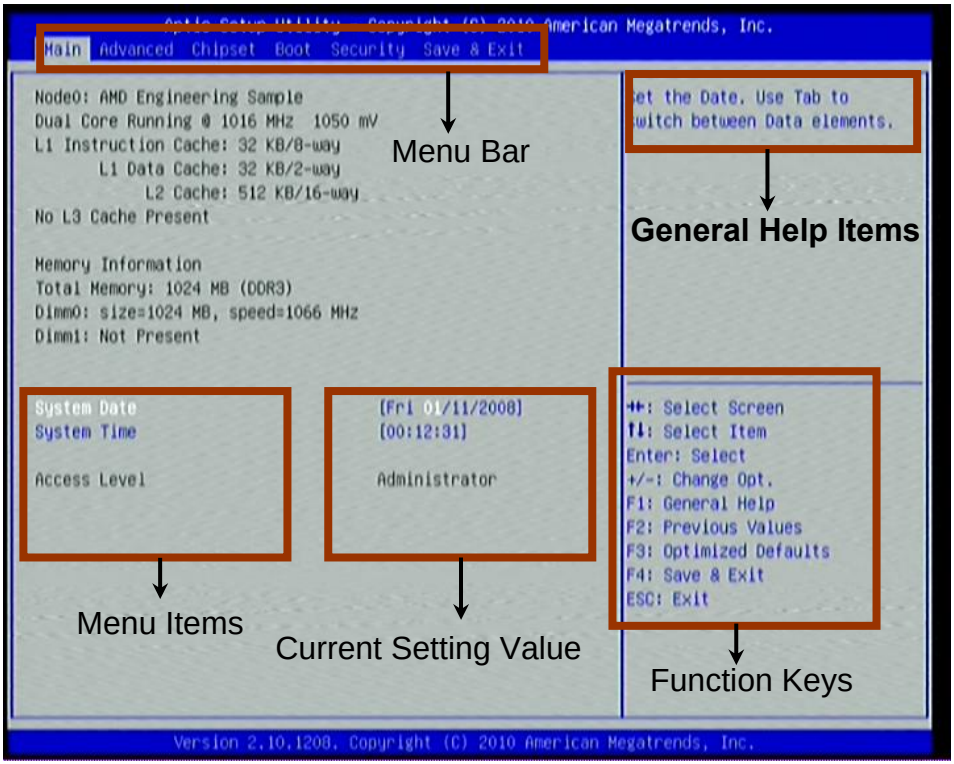
3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

Press <Del> to enter Setup

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



BIOS Menu Screen

3-3 Function Key

In the above BIOS Setup main menu, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose the item you want to confirm or to modify in the main menu.
- Press <Enter> to select.
- Press <+>/<–> key when you want to modify the BIOS parameters for the active option.
- [F1]: Press to general help information.
- [F2]: Press to load previous value.
- [F3]: Press to load optimized defaults.
- [F4]: Save and Exit.
- Press <Esc> to quit the BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press [F1] to pop up 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 Menu Bar

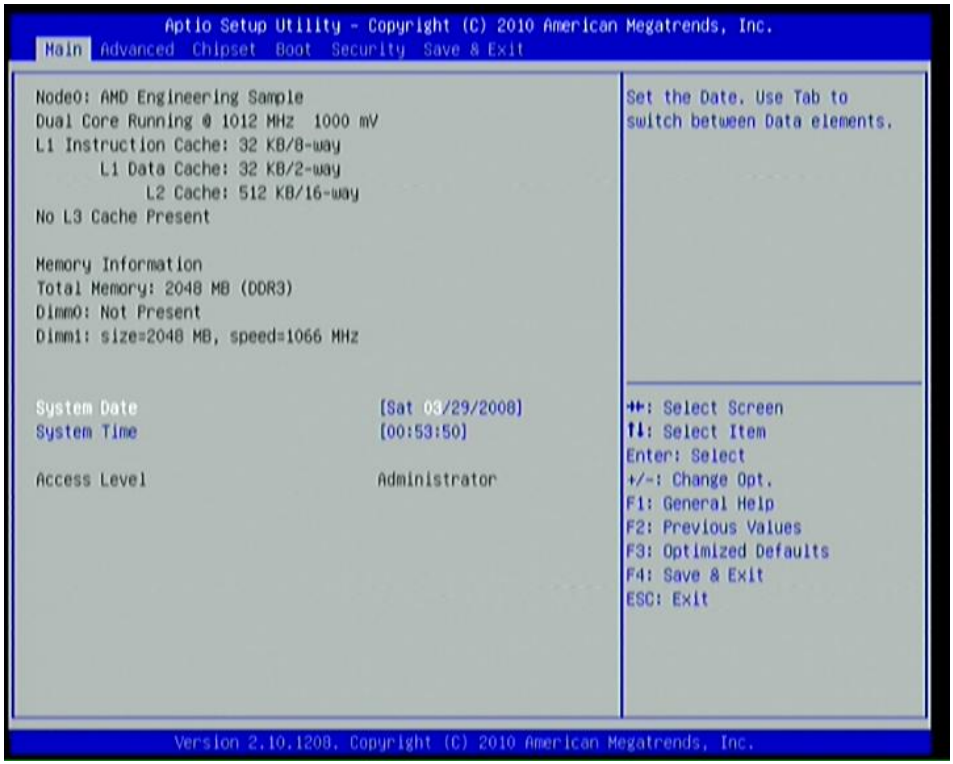
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Boot	To change boot settings
Security	Password settings
Save & Exit	Save setting, loading and exit options.

User can press the ←/→ (left, right) arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> / <-> key or numerical keyboard keys to select the value you want in each item.



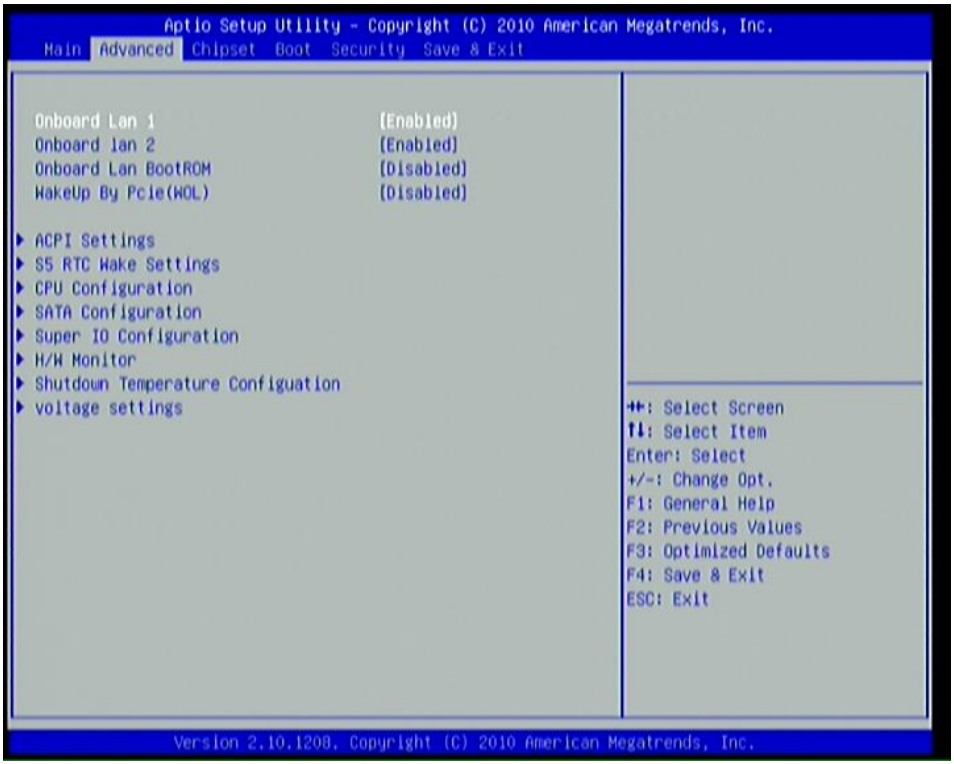
System Date

Set the date. Please use TAB to switch between data elements.

System Time

Set the time. Please use TAB to switch between time elements.

3-7 Advanced Menu



Onboard Lan 1/Onboard Lan 2 (Optional for NF81 series)

Use the above items to enable or disable onboard LAN 1/2.

Onboard PCIE Lan (Optional for NC85 series)

Use the above items to enable or disable onboard PCIE LAN.

Onboard Lan BootROM

Use this item to enable or disable boot option for legacy network devices.

Wake Up By Pcie(WOL)

Use this item to enable or disable system to wake up by PCIE LAN (WOL) function.

ACPI Settings

Enable ACPI Auto Configuration

Use this item to enable or disable BIOS ACPI auto configuration.

Enable Hibernation

Use this item to enable or disable system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

S5 RTC Wake Settings

This item will enable system to wake up from S5 using RTC alarm.

Press [Enter] to go into sub-item:

Wake System with Fixed Time.

The optional settings are: [Enabled]; [Disabled]. When set as Enabled, system will wake on the hour/minute/second specified. Please follow onscreen instructions.

CPU Configuration

PSTATE Adjustment

This item is provided to adjust startup P-state level.

PPC Adjustment

This item is provided to adjust _PPC object.

Virtualization Mode

Use this item to enable or disable CPU SVM virtualization. The optional settings are: [Disabled]; [Enabled].

C6 Mode

The optional settings are: [Disabled]; [Enabled].

SATA Configuration

Press [Enter] to make specified settings for available SATA device.

Super I/O Configuration

Serial Port 0 Configuration

Press [Enter] and set parameter of the following sub-items for serial port:

Serial Port

Use this item to enable or disable serial port (COM).

Change Settings

Use this item to select an optimal setting for super IO device.

Wake-up by PS/2 keyboard

Use this item to enable or disable PS/2 keyboard wake-up from S3/S4/S5.

Wake-up by PS/2 mouse

Use this item to enable or disable PS/2 mouse wake-up from S3/S4/S5.

EUP Support

Use this item to enable or disable EUP support.

PWRON after PWR-Fail

The optional settings are: [Former-Sts]; [Power On]; [Power Off].

WatchDog Function

Use this item to enable or disable Watchdog Timer Control. When set as Enabled, the following sub-items shall appear:

WatchDog Timer Unit

The optional settings are: [Sec];[Min].

WatchDog Timer Value

User can set a value in the range of 0 to 255.

H/W Monitor

Press [Enter] to view hardware health status. User can also make settings to the smart fan mode.

CPUFAN1/SYSFAN1/SYSFAN2 Smart Mode

When set as [Enabled], the following sub-items shall appear:

CPUFAN1 (SYSFAN1 /SYSFAN2) Highe st Speed Temp/ Idle Temp/ Secon d Speed Setting/Idle Setting

Make settings to the above sub-items by typing in number in the specified range to control working temperature of the board.

Shutdown Temperature Configuration

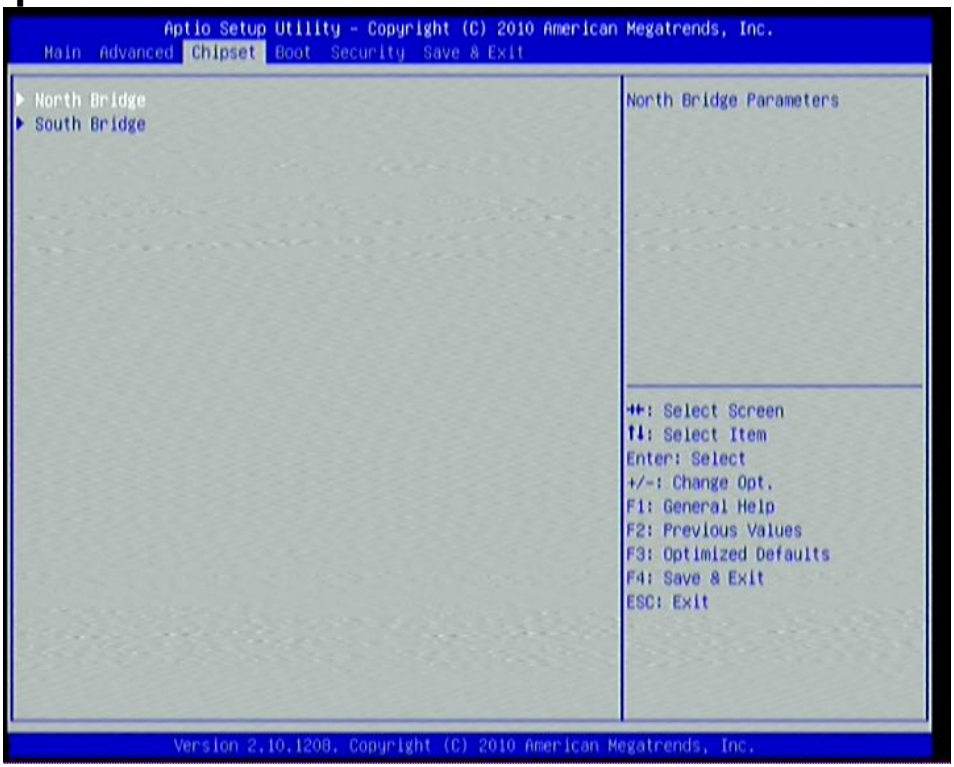
Use this item to select system shutdown temperature.

The optional settings are: Disabled; 60C/140F; 65C/149F; 70C/158F; 75C/167F.

Voltage Settings

Use this item select settings for DRAM voltage.

3-8 Chipset Menu



North Bridge

LVDS Mode

Use this item to enable or disable LVDS mode.

LVDS Panel Select

Use this item to select configuration for NON-EDID LVDS panel.

HDMI Audio

Use this item to enable or disable HDMI audio function.

IOMMU Mode

IOMMU is supported on Linux based systems to convert 32 bit I/O to 64 bit MMIO.

Memory Clock

This option allows user to select different memory clock.

Integrated Graphics

Use this item to enable integrated graphics controller. The optional settings are: Auto; Disabled; Force.

South Bridge

OnChip SATA Channel

The optional settings are: [Enabled]; [Disabled].

OnChip SATA Type

Use this item to select onchip SATA type.

SATA IDE Combined Mode (Optional for NF81 series)

The optional settings are: [Enabled]; [Disabled].

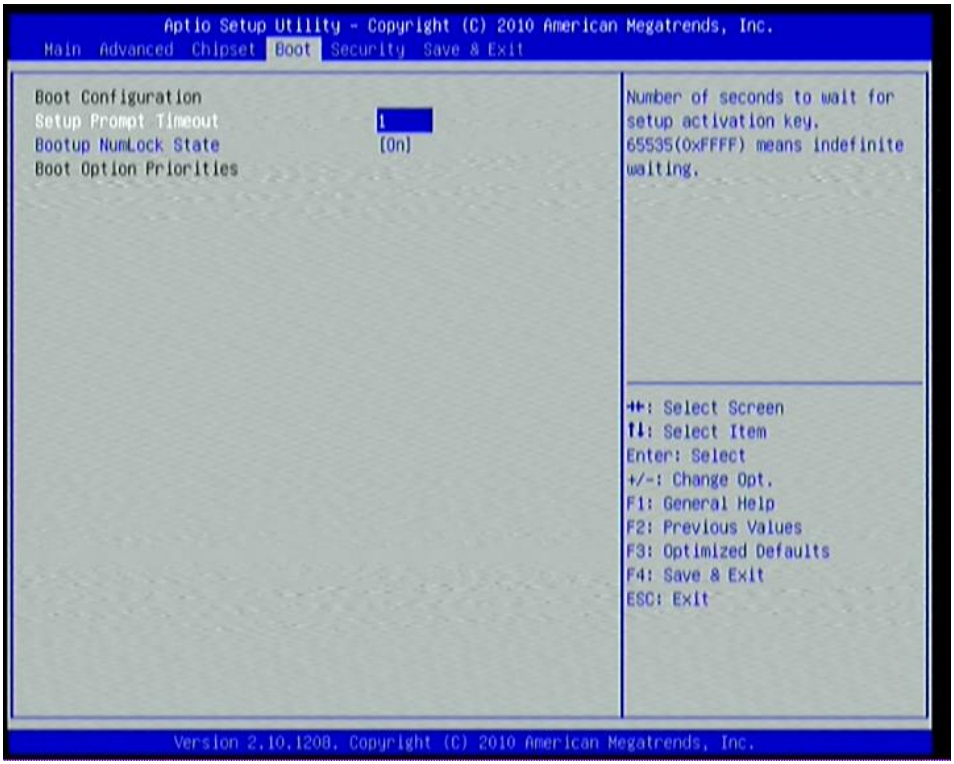
Onboard Audio Device

The optional settings are: [Enabled]; [Disabled].

SB USB Configuration

Press [Enter] to further setting USB port configuration.

3-9 Boot Menu



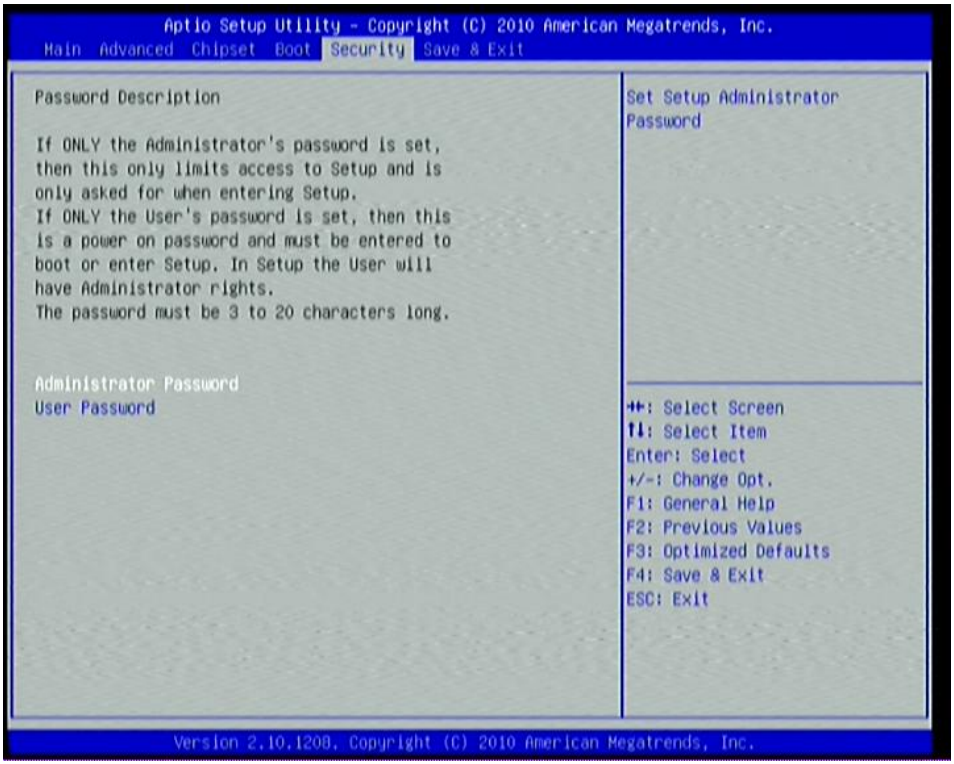
Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State

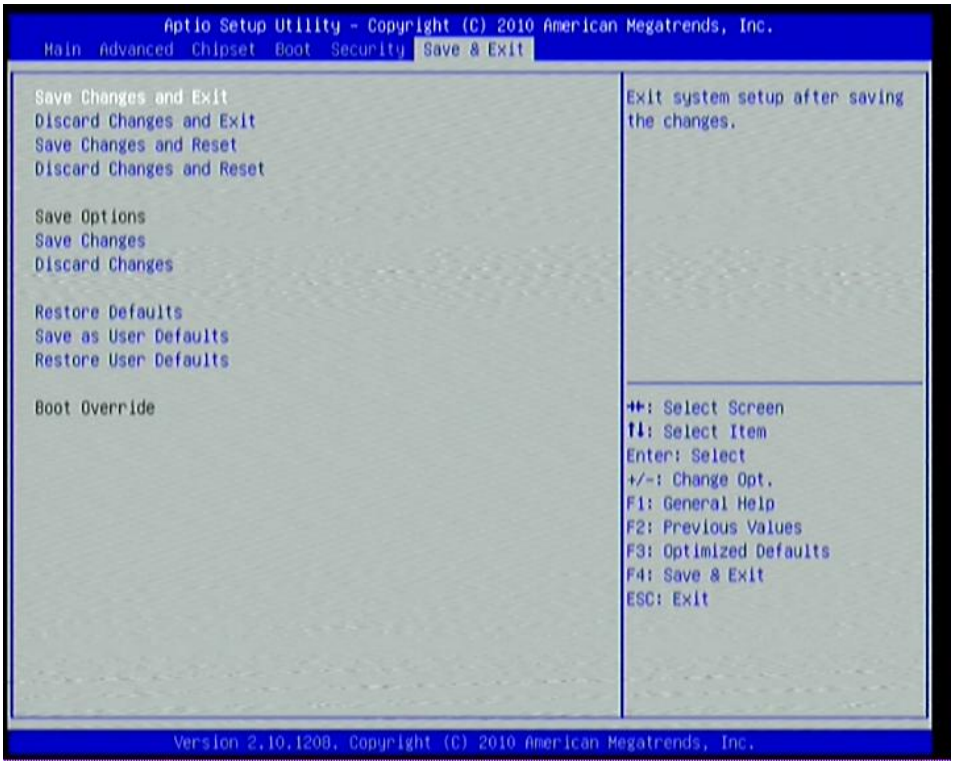
Use this item to select keyboard NumLock state. The optional settings are: [On]; [Off].

3-10 Security Menu



Security menu allow users to change administrator password and user password settings.

3-11 Save & Exit Menu



Save & Exit menu allows user to load optimal defaults, save or discard your changes to BIOS items.