华北工控®

EMB-3650

3.5” Embedded SBC

USER' Manual V1.0

USER'Manual

Industrial & Communication Computer

EMB-3650

3.5” Embedded SBC

USER' Manual V1.0

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Declaration of conformity

CE

ShenZhen NORCO Intelligent Technology CO.,LTD.

declares that the product

EMB-3650 3.5” Embedded Single Board Computer

(reference to the specification under which conformity is declared in accordance with 89/336 EEC-EMC Directive)

☑	EN 55022	Limits and methods of measurements of radio disturbance Characteristics of information technology equipment
☑	EN 50081-1	Generic emission standard Part 1: Residential, commercial and light industry
☑	EN 50082-1	Generic immunity standard Part 1: Ressidential, commercial and light industry

European Representative:

Shenzhen NORCO Intelligent Technology CO.,LTD.

Signature: _____

Place/Data: HONG KONG/2008

Printed Name: Anders Cheung

Position/Title: President

Declaration of conformity

Trade Name：Shenzhen NORCO Intelligent Technology CO.,LTD.

Model Name：EMB-3650

Responsible Party：Shenzhen NORCO Intelligent Technology CO.,LTD.

Equipment Classification：FCC Class B Subassembly

Type of Product：3.5” Embedded Single Board Computer

Manufacturer：Shenzhen NORCO Intelligent Technology CO.,LTD.

Supplementary Information:

This device complies with Part 15 of the FCC Rules.Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Signature: _____

Data: 2009

Copyright

With the exception of showing the accessories of product configuration, this manual do not create any commitment of our company. We retained the rights to change it without prior notice. We will not be responsible for any installation, the result of improper use of direct, indirect, intentional or unintentional damage or hidden dangers.

Before buying products, please learn about product performance from the seller to see if it is in line with your needs. NORCO is a registered trademark of Shenzhen NORCO Intelligent Technology CO.,Ltd. Other trademarks involved in this manual, their ownership are owned by its respective owners.

Common Sense in Safety Application

1. Before using this product, be sure to read carefully this user's manual;
2. Any plate cards not ready to be installed shall be kept in the anti-static protective bags;
3. Before taking out the plate cards from the anti-static protective bags, first place hands on the grounding metal object for a while (e.g. 10 seconds) so as to release static electricity in body and hands;
4. While fetching plate cards, you should wear static protective gloves and have the habit of contacting brims of them;
5. In order to prevent bodily electric shock or damage to products, first turn off the AC power or unplug the power cord out of power sockets while inserting main boards or plate cards or configuring again;
6. Before it is necessary to move plate cards or the unit, be sure to unplug the AC power cords out of the power sockets;
7. Be sure to unplug AC power cords when there is an increase/decrease in plate cards for this product;
8. Before you connect or unplug any equipment, be sure to determine whether all power cords are unplugged in advance;
9. To prevent any unnecessary injuries to products due to frequent power on/off to the products, after the unit is shut down, you must wait at least 30 seconds before you restart up the unit.
10: If anything unexpected exists during Equipment used, please contact the professionals.

Contents

Packing List

Thank you very much for choosing our products. Please check your package completely as the following item checklist first, if you find any components lost or damaged, please contact your retailer.

■EMB-3650 motherboard	1pcs
■User's Manual	1pcs
■Drive Disk	1pcs
■Jumpers	4pcs
■PS/2 Y mode 1 to 2 keyboard&mouse Cable	1pcs
■LPT convert cable	1pcs
■Serial port convert cable	2pcs
■USB convert cable	1pcs
■SATA Data Cable	2pcs
■IDE Data Cable	1pcs
■Audio Cable	1pcs

Chapter 1
General Information

Chapter1 General Information

1.1 Introduction

EMB-3650 is one of 3.5" high application, lower power embedded motherboard. It use Intel® Silverthorn + Poulsbo chipset and onboard Intel Silverthorn（Intel Atom Z530）processor。FSB is 1.6GHz，L2 =512KB。Onboard 4x DDRⅡ533MHz memory chips，each is 128MB，totally 512MB；North Bridge SCH Poulsbo integrated display controller（Intel® GMA500），support VGA/DVI（VGA and DVI can not exist in the motherboard simutanouly），LVDS，TV-OUT，VGA/DVI（optional）and LVDS、LVDS and TV-OUT can support dual independent display simutaniously. For I/O, motherboard provides one 2×22 Header Mini-IDE slot，one 2×8 Header high- simulation audio output AUDIO port，two 2×5 Header serial ports（COM2 support RS232/422/485 mode），2x SATA ports，4xUSB 2.0 ports，1x100/1000Mbps Ethernet。

EMB-3650 be with its small size, low power and rich features of the expansion of interfaces applicable to a variety of embedded occasions. Users no need to add more expansion devices. It can be widely used in communication control, media display, advertising, LCD screen, industrial control, traffic control, information system, finance equipment, automatic ticketing system, automotive, digital control, interactive client, military and various terminal markets and other industries.

1.2 Product Feature

Structure

●3.5" Embedded Single Board Computer

Dimension

● 145mm X 102mm（LXW）

Processor

●Onboard Intel Silverthorn（Intel Atom Z530）processor

●FSB1.6GHz

● L2 Cache 512MB

Chipset

●CPU：Intel Silverthorn

●SCH：Poulsbo

System Memory

● Onboard 512MB memory

● Support DDRⅡ533MHz

Display

●Poulsbo Integrate display controller

●VGA（Optional）：from SDVO convert to standard VGA，（with DVI as optional）

●LCD：From SDVO convert to DVI interface（with VGA as optional）and integrated single channel 18bit and 24bit LVDS

●2×3Header TV interface

●CRT resolution max. up to 1024×768

● Dual display：VGA/DVI+LVDS，LVDS+TV-OUT achieve dual dependently display

●PWM dimming，backlight power control

Storage Function

● With one 2 x 22 Header IDE

●1x 50Pin CF card socket，support DMA mode

●1x SDIO/MMC interface，support SD Flash or SDIO WIFI extension

●Sil3132 PCIE extent，provide 2xSATAⅡ port，speed max. Up to 150MB/s

USB Function

● Provide 2 group 2×5 Header USB2.0 interface，speed max. Up to 480Mb/s

Audio

●HD Codec Audio

●Realtek ALC262

LAN

●Realtek RTL8111C chip

●10/100/1000Mb Ethernet

●rear panel RJ-45 Ethernet interface

I/0

●I/0：Winbond W83627DHG I/O

●COM：Onboard with 2xCOM，COM1，COM2 is 2x 5Pin port（support RS232/485/422 optional）

●KB&MS:PS/2 MINI-DIN interface

Power supply

●Single power input:（+12V）

BIOS

●8M-bit Flash BIOS (Option with SPI Rom)

Watchdog

● support hardware reset function

Working Temperature

●Temp.0-60℃

●Humidity:5%-95%

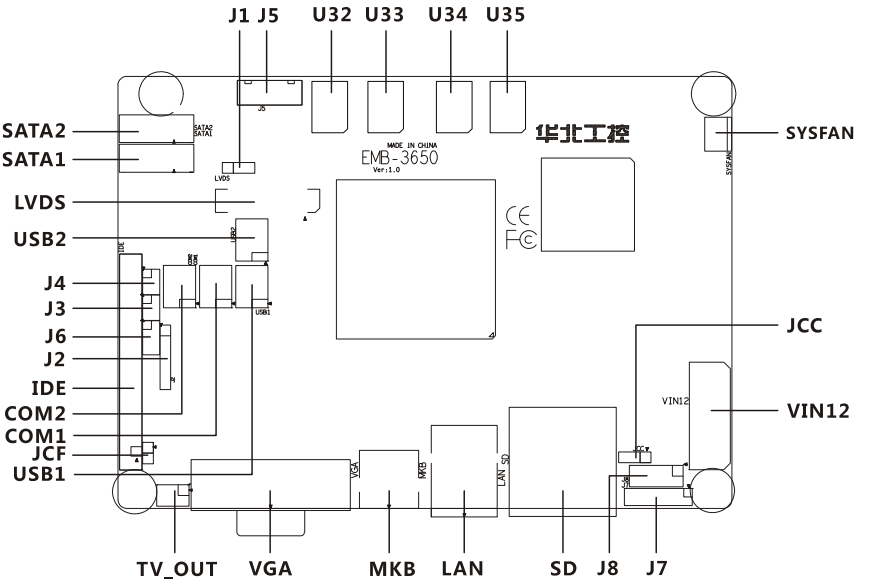
Chapter 2
Installation Instructions

Chapter 2 Installation Instructions

2.1 Interface Location

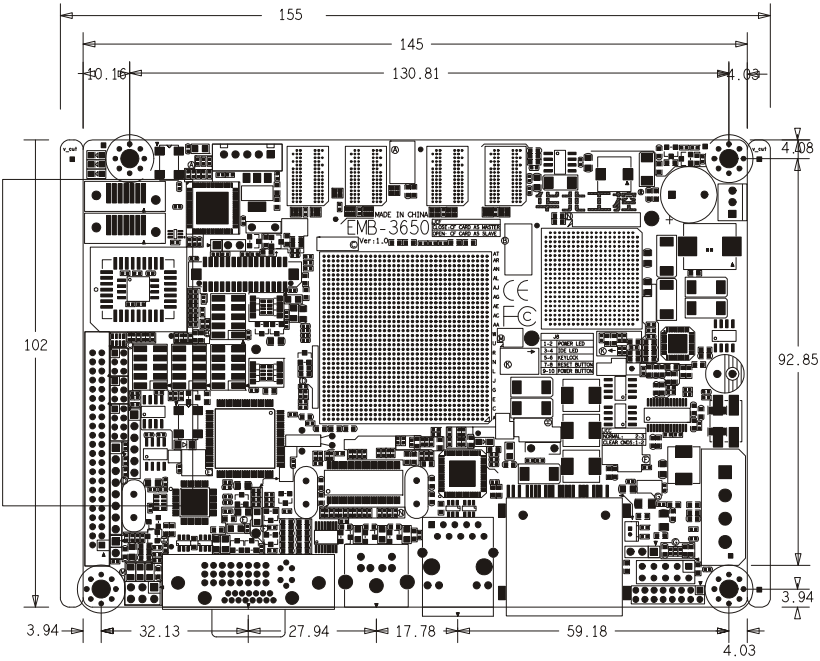
Following drawing is interface of EMB-3650. Please keep carefully when installation. If some parts install wrong, the machine will cannot work well。

Remark: During installation, in order to protect the part of board, please put on antistatic gloves。



2.2 Product Dimension

Following is the dimension drawing of EMB-3650，which marked the dimensions in details.



2.3 Installation Steps

Please follow the installation steps :

1. Read EMB-3650 manual and set all Jumpers in right position
2. Connect all signal cable, power cable, and panel controller cable and power supply
3. Boot up computer and finish BIOS program setting.

⚠Key components of this motherboard are Integrated circuit, and these components will be easily damaged by electrostatic influence. So, before installing motherboard, you should always follow the following precautions:

1. Disconnect your Computer from the power supply before handling it.

2. Hold side by the edges; don't touch any component or pins on the board

3. Use a grounded wrist strap while getting in touch with integrated circuit component (like as CPU, RAM).

4. Place components on a grounded antistatic bag that came with the Single Board Computer, when these components are separated from the system.

2.4 Jumper function setting

Note:

Jumpers are located on the motherboard, they represent clear CMOS jumper JCC etc. pin1 for all jumpers are located on the side with a thick white line refer to the motherboard’s silkscreen , jumpers with three pins will be shown as 1-2 to represent pin1&pin2 connected and 2-3 to represent pin2&pin3 connected.

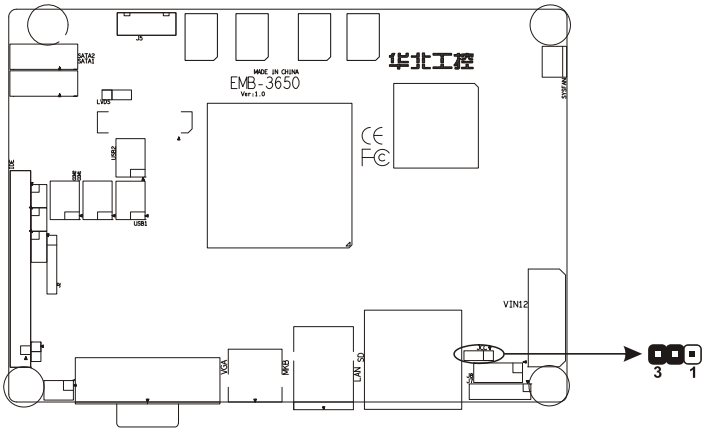
2.4.1 Clear CMOS (JCC)

This jumper is used to erase CMOS data and reset system BIOS information. The procedure for clearing CMOS is:

1. Turn off the system.

2: 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.

3. Turn on the system. The BIOS is now reset to its default setting

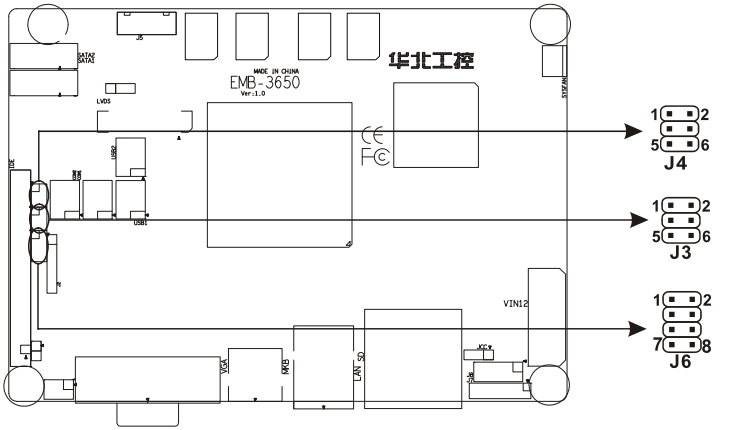


Setting	JCC
2-3	Normal working status，default setting
1-2	Clear CMOS，all BIOS be set to factory default mode

⚠ Please must turn off power supply before clear CMOS, to avoid damage the board.

2.4.2 COM2 jumper function setting（J4、J3、J6）

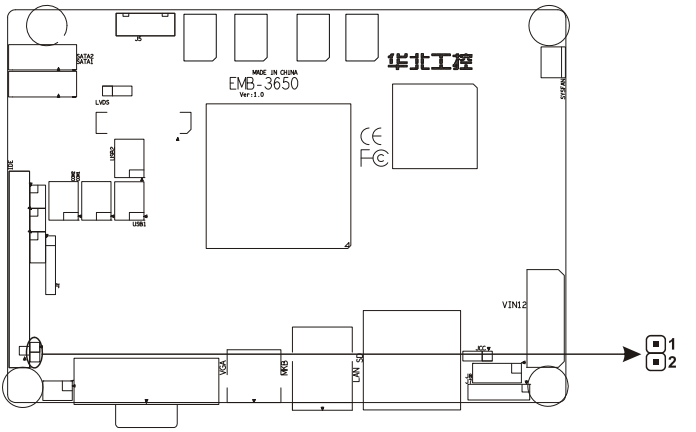
J4、J3、J6 jumper be used for COM2 mode setting，COM2 support RS 232/RS 422/RS 485 mode，You can select suitable one, and the default is RS232。



Setting	COM2 mode setting
J6：1-2 J3：3-5，4-6 J4：3-5，4-6	RS 232（Default setting）
J6：3-4 J3：1-3，2-4 J4：1-3，2-4	RS 422
J6：5-6，7-8 J3：1-3，2-4 J4：1-3，2-4	RS 485

2.4.3 CF card setting（JCF）

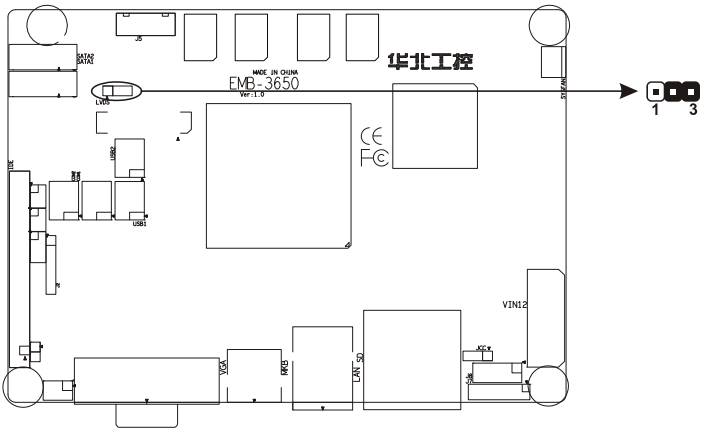
JCF jumper be used for CF card master or slave setting，JCF close，CF card is master device，When you not use the jumper, it will be slave device.



Setting	JCF
Use	CF card as Master device
Remove	CF card as slave device

2.4.4 LCD Equipment rated voltage selection jumper（J1）

Before select LCD devices, please check the equipment working rate voltage. This jumper be decided by LVDS screen supply voltage.



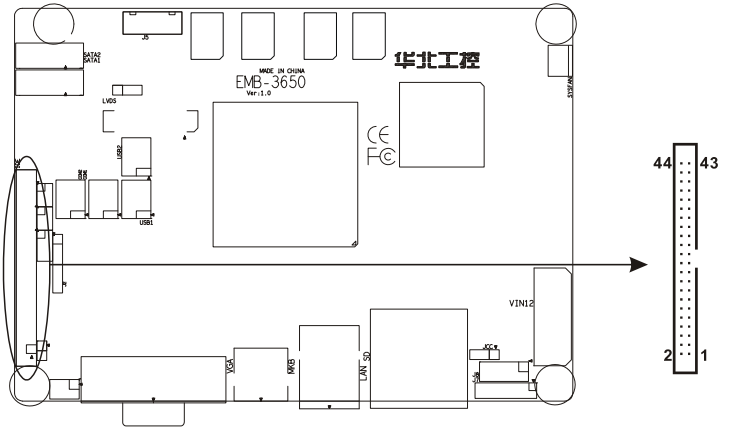
Panel VCC Selection		
J1	1-2	5V
	2-3	3.3V

2.5 Interface explain

⚠ Please read the manual carefully before you connect external devices to avoid the board damage.

2.5.1 mini IDE port（IDE）

Onboard with 1x44 Pin mini IDE port，can connected to 2x IDE devices at the same time，One device is master and another is slave. Please follow the below jumper setting guide to select master or slave device installation. Connecting method is: Master device connected to the end of power cable, slave device be connected to the middle of cable. If there is only one device, it should be master.



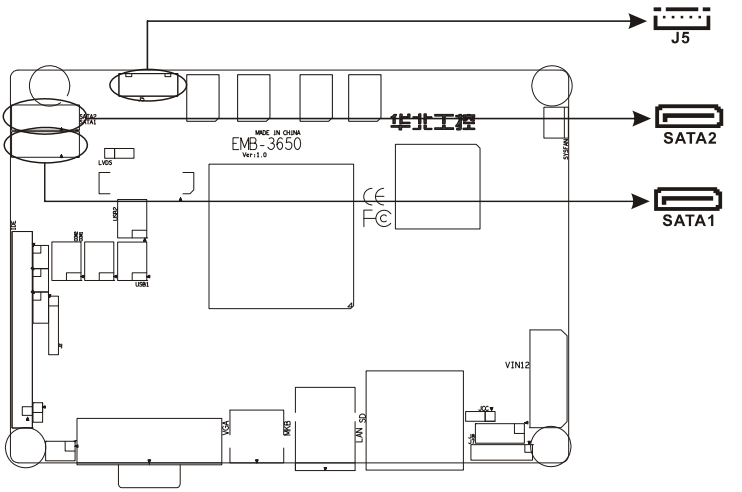
IDE（Mini IDE）：

Signal	PIN		Signal
RESET#	1	2	GND
DDP7	3	4	DDP8
DDP6	5	6	DDP9
DDP5	7	8	DDP10
DDP4	9	10	DDP11
DDP3	11	12	DDP12
DDP2	13	14	DDP13
DDP1	15	16	DDP14

DDP0	17	18	DDP15
GND	19	20	NC
PDREQ	21	22	GND
PDIOW#	23	24	GND
PDIOR#	25	26	GND
PIORDY	27	28	CSEL
PDMACK#	29	30	GND
IRQ14	31	32	NC
DAP1	33	34	PATADET#
DAP0	35	36	DAP2
CS1P#	37	38	CS3P#
ACTP#	39	40	GND
VCC	41	42	VCC
GND	43	44	NC

2.5.2 SATA port and SATA hardware power interface（SATA1-SATA2，J5）

EMB-3650 ‘s two SATA ports be from PCI-E transfer，speed max. up to 150MB/s，And can connect 2x SATA devices。When you select single power supply, you can use HDD power cable from accessories box.



SATA1-2:

PIN	Signal
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

J5（while using single power supply, J5 is the mini HDD interface）**:**

PIN	Signal
1	+12V
2	GND
3	VCC
4	GND
5	VCC3

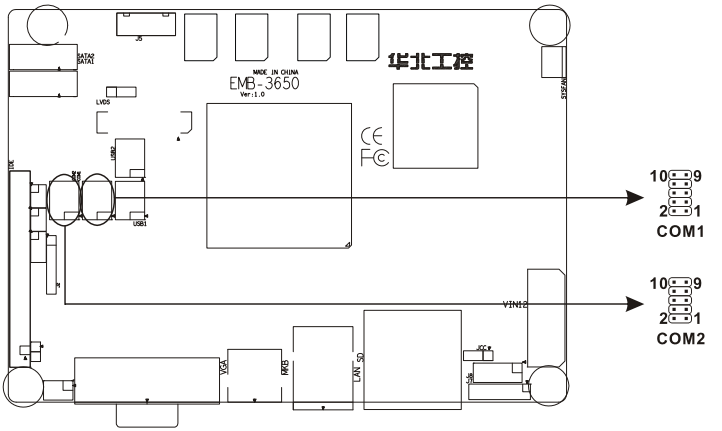
2.5.3 CF card interface（Compact Flash）

There is 1x 50Pin standard CF card socket in the rear board（drawing omit）, can support Type Ⅰ/Ⅱ CF card..

CF card socket and IDE port use the same channel. IDE port can connect 2xIDE device at the same time. When you use CF card, IDE port only can connected one device.

2.5.4 Serial port（COM1、COM2）

Onboard with 2 serial ports , it is 2×5Header，When you use it, please find a COM convert cable from accessories box(From Pin header to standard DB9 COM mode). You can close or enable COM in the BIOS of "INTEGRATED PERIPHERALS".COM1 support RS 232，COM2 support RS 232/RS 422/RS 485， Please refer to the "COM2 jumper setting".



COM1：

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

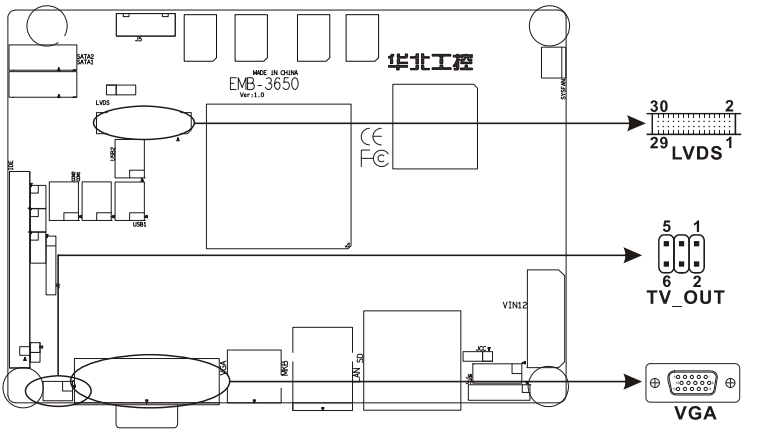
When COM2 is RS232/RS422/RS485，the PIN definition as following：

RS485	RS422	RS232	PIN	RS232	RS422	RS485

DATA-	TX-	DCD	1	2	DSR	NC	NC
DATA+	TX+	RXD	3	4	RTS	NC	NC
NC	RX+	TXD	5	6	CTS	NC	NC
NC	RX-	DTR	7	8	RI	NC	NC
GND	GND	GND	9	10	GND	GND	GND

2.5.5 Display interface（VGA/DVI、LVDS、TV-OUT）

Onboard with 1x DB15 VGA interface or standard DVI interface（Optional）、One single channel 18/24bit LVDS port、1x TV-OUT interface，VGA/DVI and LVDS，LVDS and TV-OUT can support dual dependently display.



VGA(Optional)：

PIN	Signal	PIN	Signal	PIN	Signal
1	Red	6	GND	11	NC
2	Green	7	GND	12	SDA
3	Blue	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYNC
5	GND	10	GND	15	5VDDCK

LVDS：

Signal	PIN		Signal
VDDLVDS	1	2	VDDLVDS

GND	3	4	GND
LA_DATAN0	5	6	NC
LA_DATAP0	7	8	NC
GND	9	10	GND
LA_DATAN1	11	12	NC
LA_DATAN1	13	14	NC
GND	15	16	GND
LA_DATAN2	17	18	LA_DATAN3
LA_DATAP2	19	20	LA_DATAP3
GND	21	22	GND
LA_CLKN	23	24	NC
LA_CLKP	25	26	NC
GND	27	28	GND
L_DDC_DATA	29	30	L_DDC_CLK

DVI(Optional)：

Signal	PIN		Signal
TDC2#	1	2	TDC2
GND	3	4	NC
NC	5	6	SC-DDC
SD-DDC	7	8	NC
TDC1#	9	10	TDC1
GND	11	12	NC
NC	13	14	VCC
GND	15	16	HP-DETECT
TDC0#	17	18	TDC0
GND	19	20	NC
NC	21	22	GND
TLC	23	24	TLC#
GND	25	26	GND

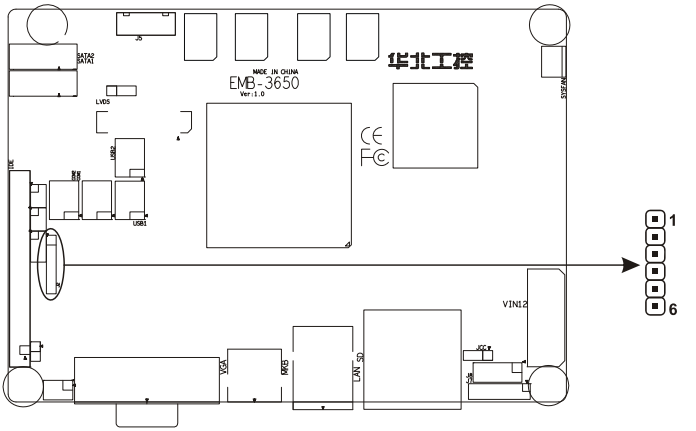
NC	27	28	NC

TV_OUT:

Signal	PIN		Signal
Pb_HDTV_OUT	1	2	GND
Y_Y_OUT	3	4	GND
C_Pr_OUT	5	6	GND

2.5.6 LVDS backlight control（J2）

J2 jumper be used for LVDS backlight panel control setting.

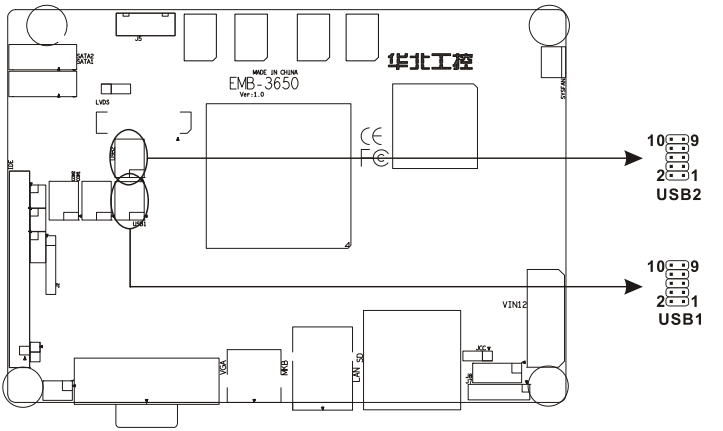


J2：

PIN	Signal
1	+12V_LVDS
2	L_BKLTEN
3	GND
4	CPUFAN_PWM
5	VCC_LVDS
6	L_BKLTCTL

2.5.7 USB port（USB1、USB2）

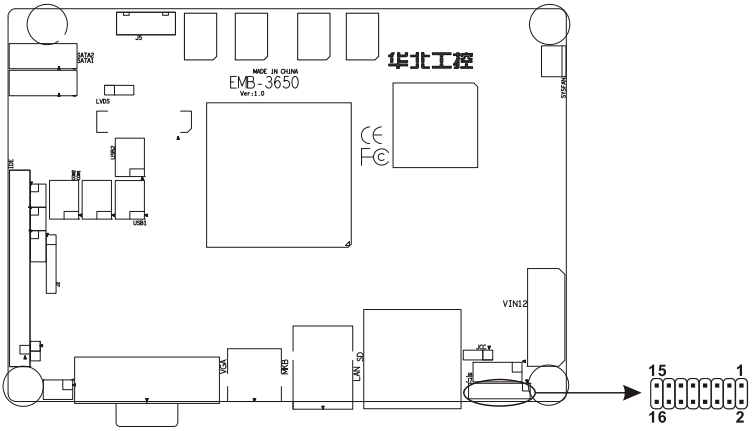
Onboard with two group 2×5 Header USB port。If you need to use it, you can find a USB convert cable from accessories box. The USB ports can support USB2.0，speed max. up to 480Mbps.



Signal	PIN		Signal
+5V	1	2	GND
USB DATA-	3	4	GND
USB DATA+	5	6	USB DATA+
GND	7	8	USB DATA-
GND	9	10	+5V

2.5.8 Audio interface（J7）

Onboard with a 2×8Header AUDIO interface，support speak out、LINE-IN、MIC-IN and CD-IN.



J7：

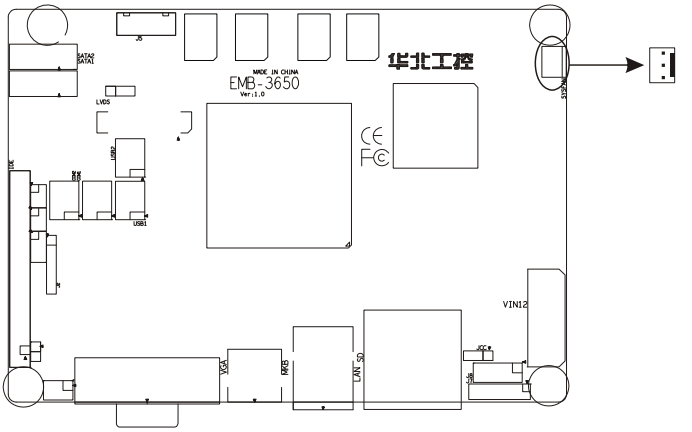
Signal	PIN		Signal
SPKOUT_R	1	2	GND
SPKOUT_L	3	4	GND
HP_OUTR	5	6	HP_OUTL
GND	7	8	GND
LINE_R	9	10	LINE_L
GND	11	12	GND
NC	13	14	MIC_INL
MIC_INR	15	16	GND

2.5.8 Cooling fan socket（SYS FAN）

Onboard with a cooling fan socket（SYS FAN），Users will place motherboard inside to the chassis, in order to strengthen the host cooling, it is recommended c you select the cooling fan socket. And when you use it, please pay attention to the following three points:：

(1) Electric current for fan≤350mA (4.2W, 12V).

(2) Please ensure that the fan wire is consistent with the wire for this socket. The power cord must be in the middle position. In addition, ensure the GND cord wire (usually black) and fan rotation output pulse signal wire (in other color). It is recommended that the fan with rotary speed detection be used.

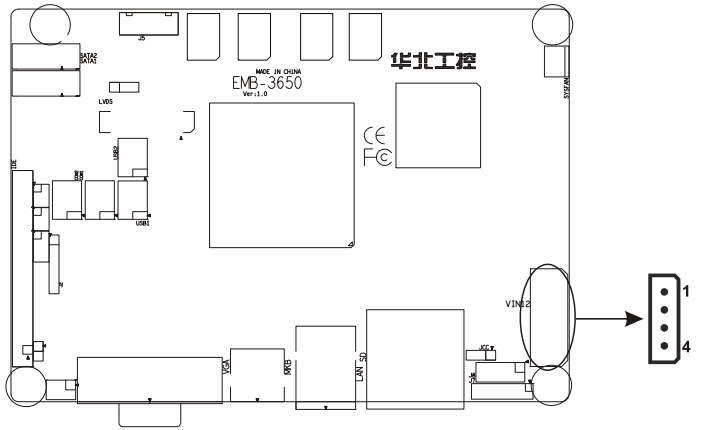


CPUFAN：

PIN	Signal
1	GND
2	+12V
3	+12V

2.5.9 Power interface（VIN12）

EMB-3650 support +12V single power supply input.



VIN12：

PIN	Signal
1	+12V

2	GND
3	GND
4	+5V

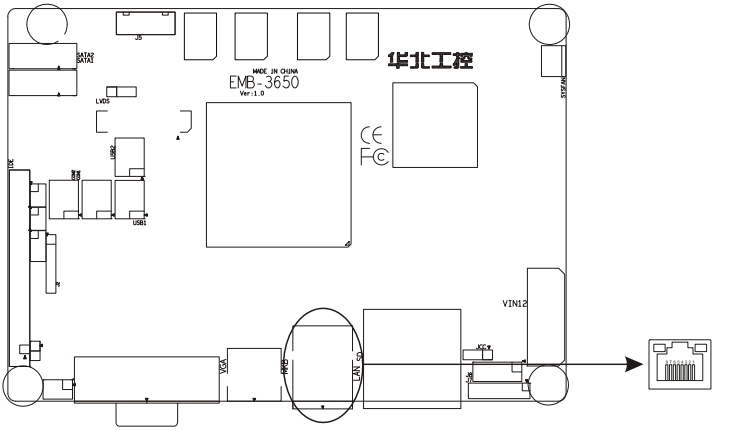
2.5.10 LAN port

EMB-3650 has 100Mbps/1000Mbps Ethernet interface，LILED and ACTLED is the LED of Ethernet jack, it shows LAN connection and active status. Please refer to following LED description：

TD+，TD-：Positive/negative data transfer sending

RD+，RD-：Positive/negative data signal receiving.

ACTLED：Network active LED　LILED：Network link status LED

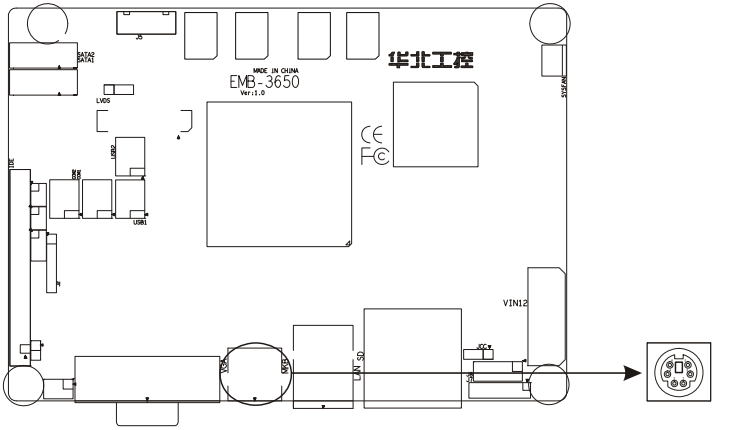


RJ45 PORT LED status:

LILED(Green)	Function	ACTLED(Yellow)	Function
Bright	Effective link	Bright	Data transfer sending
Dark	Invalid link or close	Dark	Stop data transfer

2.5.11 KB/MS socket (MKB)

MKB is 6pin socket, can connect to PS/2KB/MS，If connect KB/MS at the same time, you can find a 1 to 2 PS/2 cable from accessories box.

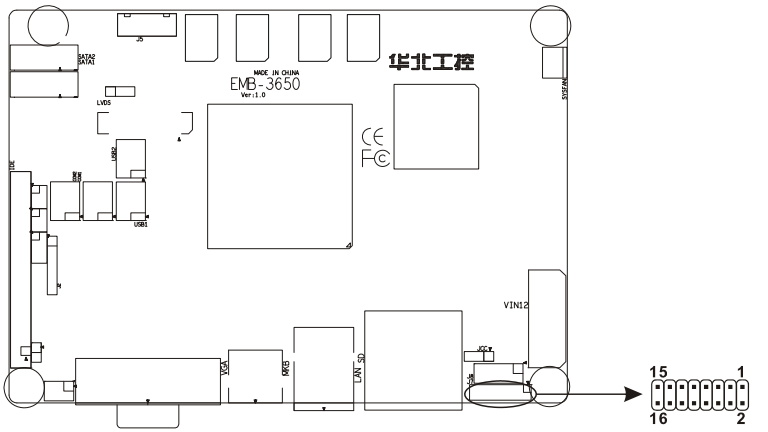


MKB：

Signal	PIN
KB_DATA	1
MS_DATA	2
GND	3
5VSB	4
KBCLK_R	5
MSCLK_R	6

2.5.12 Front Panel port（J7）

J7 be used for connecting function button and LED to front panel of chassis.



Signal	PIN		Signal
VCC	1	2	GND
HDD_LED-	3	4	HDD_LED+
KBLOCK#	5	6	GND
SYS_RST#	7	8	GND
PWRBTN#_IN	9	10	GND

Please refer to the following guide. And pay attention to positive and negative link. If you make wrong, it will can not work well.

POWER LED
IDE LED
KEYLOCK
RESET BUTTON
POWER BUTTON

1）System power LED PIN（PIN1（positive）、PIN2 PWLED）

Connect PIN1/2 to the cable of system power LED. When system be boot up, the LED bright, when system power off, the LED dark.

2）IDE device status LED PIN（PIN3（Positive）、PIN4 HDD LED）

Normally, there is 1xIDE device LED on the panel of chassis. When IDE device is running, The LED will be bright. Please connect IDE LED cable PIN3/4 to the chassis panel

3）Keyboard lock PIN（PIN5/6 KEYLOCK）

Connect PIN5/6 to the keyboard lock button. It can be used to control keyboard.

4）Reset button PIN（PIN7/8 RESET ）

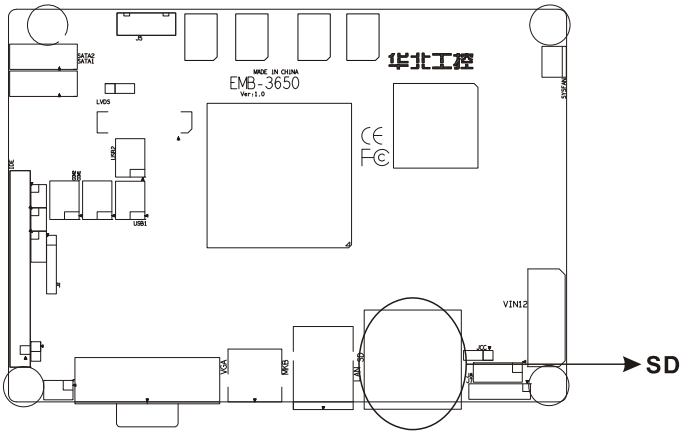
Connect PIN7/8 to chassis reset button. When system cannot work well, reset button can let the system rework without turn off power. That will extent system life.

5）Power switch controller PIN（PIN9（negative）、PIN10 PWRSW）

Connect PIN9/10 to the switch of chassis panel.

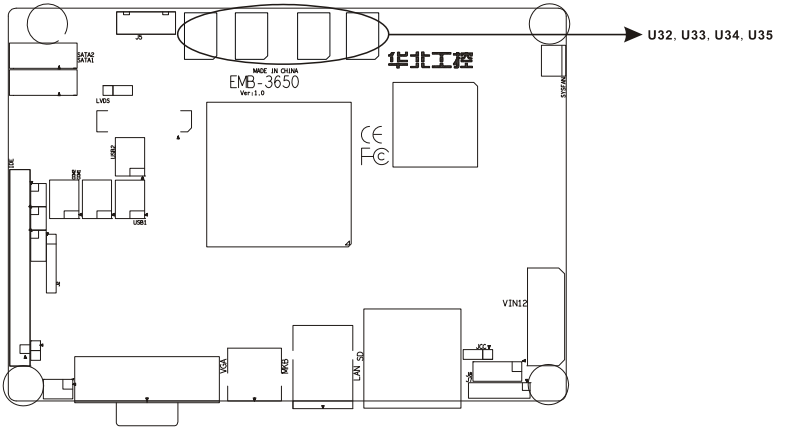
2.5.13 SD interface (SD)

Onboard with 1x SDIO/MMC interface, support SD Flash or SDIO WIFI extend.



2.5.14 Onboard Memory（U32，U33，U34，U35）

Onboard DDRⅡ533MHz/512MB memory，be from four chips，4×128MB。



Chapter 3
BIOS Setup

Chapter3 BIOS Setup

AMI BIOS upgrade:

It is true that hardware and software are upgrading all the time. When your IPC can not support the newest processor (for example), you should upgrade the BIOS to try to keep up with the latest technology. Upgrading (or flashing) the BIOS is not an easy attempt. To make sure upgrade succeed, please follow the instruction below:

Set jumper JAV as open

Afudos.exe is the program for BIOS to modify and upgrade，need to be run in DOS mode.

Step1: use boot disk load DOS, run Amiflash.exe and write the newest file: XXXX.ROM into the Flash IC.

Order format: A:\ Afudos XXXX.ROM

If you need to add other parameters, please add <space>/? after the order format.

Example：Afudos 3650I100.rom /P /B /C /N /X

Remarks:

1. Upgrading BISO may cause your system crash, so please operate carefully.
2. Please use the upgrading program in the CD-ROM provided by us
3. Please do not power off or reboot the system when upgrading, otherwise, the BIOS maybe be damaged.
4. Please backup your BIOS before upgrading

AMI BIOS information

Awards BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off

AMI BIOS Setup

Power on your computer, when this information display in your screen: Del->SETUP please press “DEL”, then it will enter BIOS setup interface.

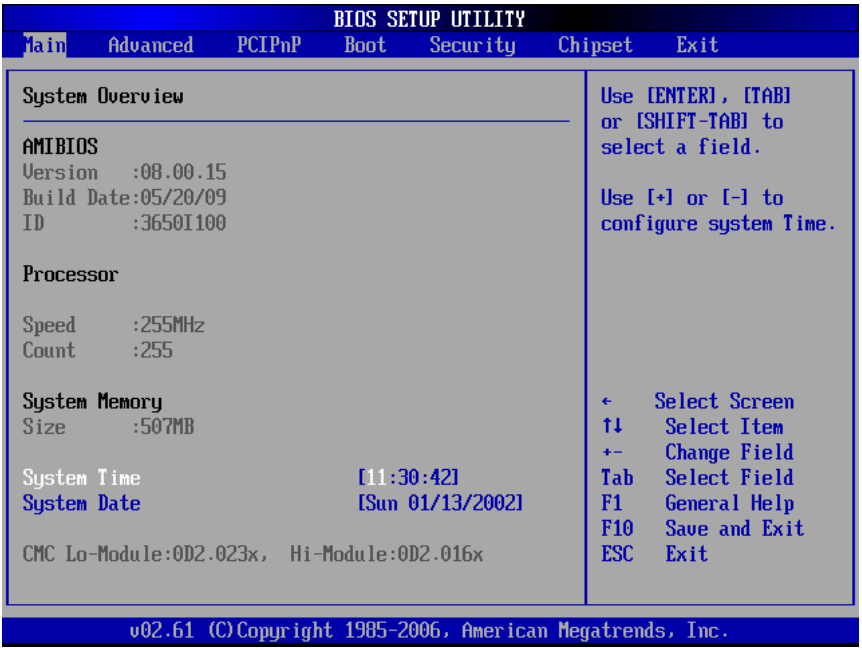
1. Power on or Reset computer；
2. When "Press <Del> to enter setup" in screen, please press <Del>
3. Use the “←↑→↓”to choose the option which your want to modify, press <Enter> and show

the sub-menu.

4. Use the "←↑→↓"and <Enter> to modify the value.

5. At any time, press<Esc> can back to the father-menu.

3.1 Main Menu



AMI BIOS (Read only)

BIOS information: such as Version, BIOS ID and Manufactory Day.

Processor (Read only)

CPU information: such as processor type and frequency.

System Memory (Read only)

Memory size

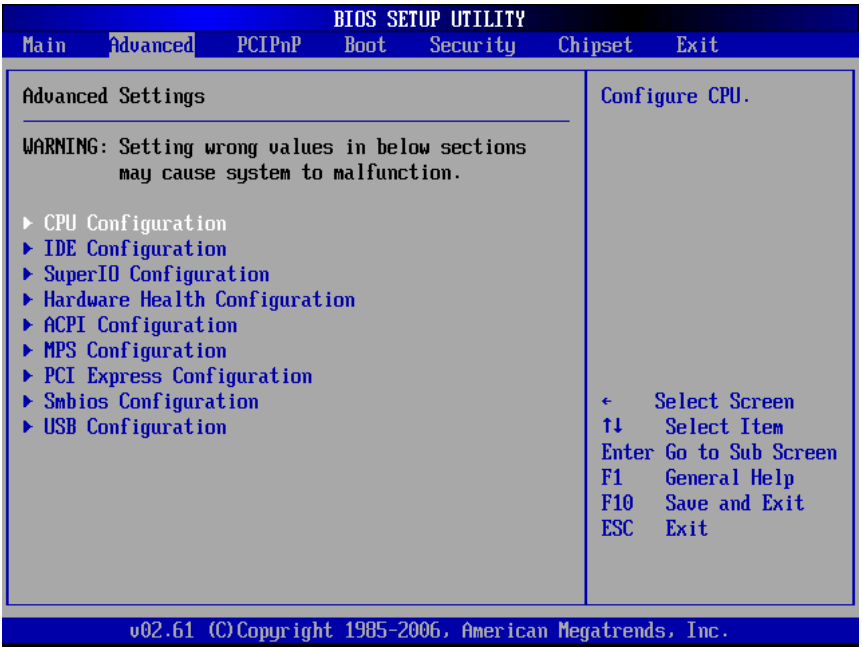
System Time

Format: Hour/Minute/Second

System Date

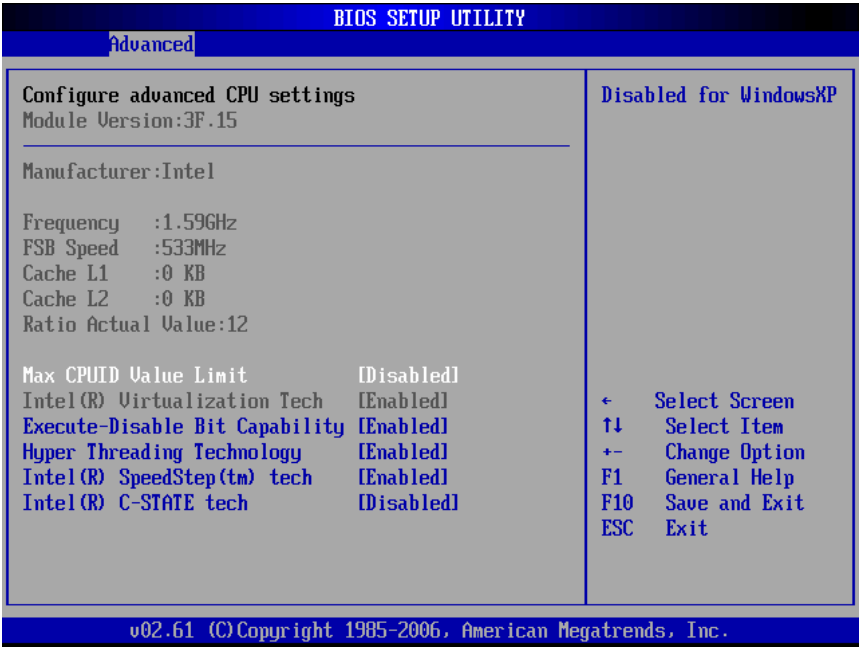
Format: Day/Month/Date/Year；<Day><Month><Date><Year> can be set by user.

3.2 Advanced Menu



WARNING: setting wrong values in below sections may cause system to malfunction.

3.2.1 CPU Configuration



Configure advanced settings

Include CPU detail description: Vendor, Type, Frequency, L1 cache, L2 cache…

Max CPUID Value Limit

When you are using the operating system which doesn't support extended CPU ID function, please set this project "Enabled]。The settings are [Disabled] [Enabled]。

Intel(R) Virtualization Tech

Set if use the additional hardware function provided by Vanderpool technology. Option：<Disabled>，<Enabled(Default)>.

Execute-Disable Bit Capability

Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system, Execute Disable Bit allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor

disables code execution, preventing damage and worm propagation.

Hyper-Threading Technology

While using CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper Threading Technology in OS which supports Hyper-Threading Technology or select "Disabled" for other OS which do not support HT technology.

Intel（R） SpeedStep （tm） tech.

When you use AC power or battery，dynamically switch voltage and frequency between AC and battery according to CPU burthen.<Enabled>for open，<Disabled> for close.

Automatic: CPU service frequency self-regulation according to amount of process

Maximum: CPU always run in highest speed

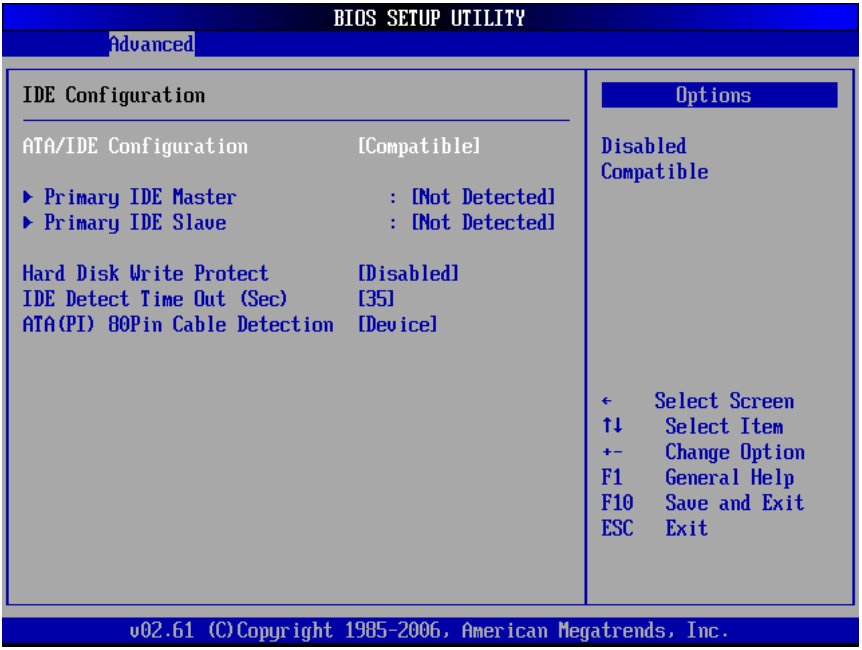
Minimum: CPU always run in lowest speed

Disable: close it

Intel（R） C-STATE tech

When Intel depth power-saving feature switch option overclocking, Bios shold be set to < disable>, If it be <enable>, the Bios will shows" C state package limit setting"

3.2.2 IDE Configuration



ATA/IDE Configuration

ATA/IDE mode is compatible for compatibility mode or turbo mode. In compatibility mode, only 4 HDDs are supported. The rest 2 HDD ports will not available even if they are connected. Turbo mode can support all the HDDs, but some of the old OS can't support above 4 HDDs.

Primary/Secondary/Third/ IDE Master/Slave

This six options use to choose IDE device's type etc. include Type, LBA/Large Mode, Block (Multi-Sector Transfer), PIO Mode, DMA Mode, S.M.A.R.T.（Self-Monitoring, Analysis and Reporting Technology）, 32Bit Data Transfer these seven option, we suggest you choose Auto, the system will auto-search devices, if you want Config by yourself, make sure all parameter of the HDD support this mode first.

Hard Disk Write Protect

Setup HDD Write Protect function :< Enabled> Write Protect, HDD read only: <Disabled> HDD can write or read.

IDE Detect Time Out （Sec）

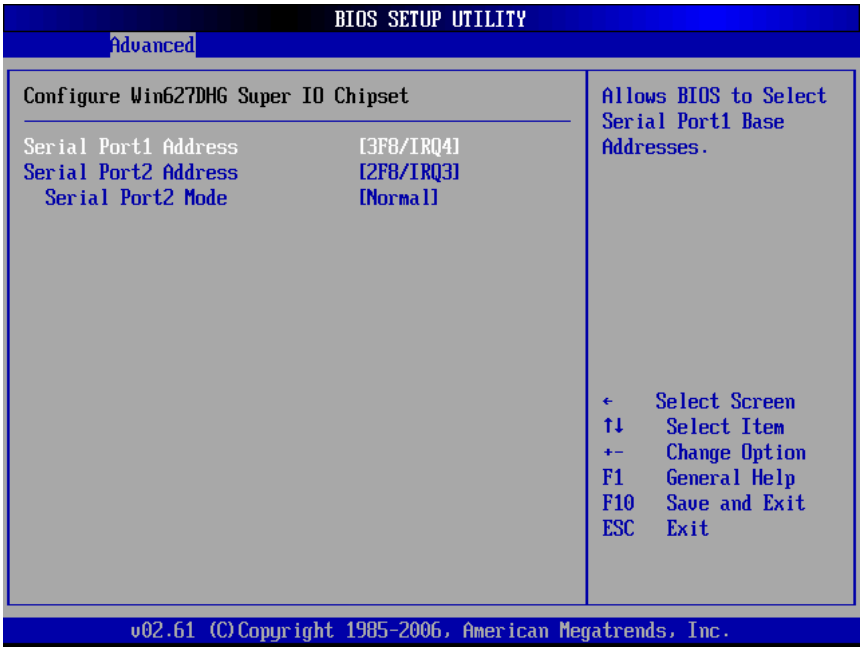
This option for BIOS searching IDE device in appointed time (by seconds).

ATA（PI） 80Pin Cable Detection

Setup detect ATA (PI) 80pin cable: 80pin ATA cable is for Ultra ATA/66, Ultra ATA/100 and Ultra ATA/133 .Standard cable is 40pin, can not support high transfer rate. These two cables is pin compatible.

<Host & Device> will reference the cable type both IDE controller and IDE device. Also it is default value. <Host> use the cable type used by IDE controller；<Device> use the cable type used by IDE device.

3.2.3 SupperIO Configuration



Serial Port1 Address

This option is used to config interrupt and address of serial port 1, There are options :3F8/IRQ4 (default)],[2F8/ IRQ3],[3E8/ IRQ4], [2E8/IRQ3], [Auto], [Disabled]，best to select Default address and interrupt. COM1 and COM2 can't share with the same address and interrupt no.

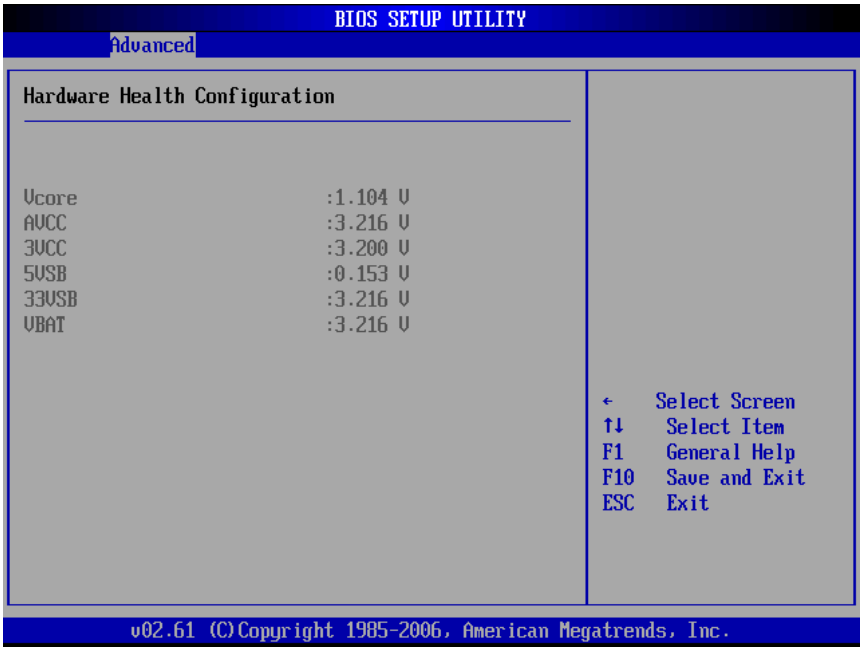
Serial Port2 Address

This option is used to config interrupt and address of serial port 1, There are options :3F8/IRQ4 (default)],[2F8/ IRQ3],[3E8/ IRQ4], [2E8/IRQ3], [Auto], [Disabled]，COM1 and COM2 can't share with the same address and interrupt no.

Serial Port2 Mode

This option configures serial port 2 mode. Default [Normal] as a standard RS-232 serial communications interface, the value of other settings for infrared communications interface standard.

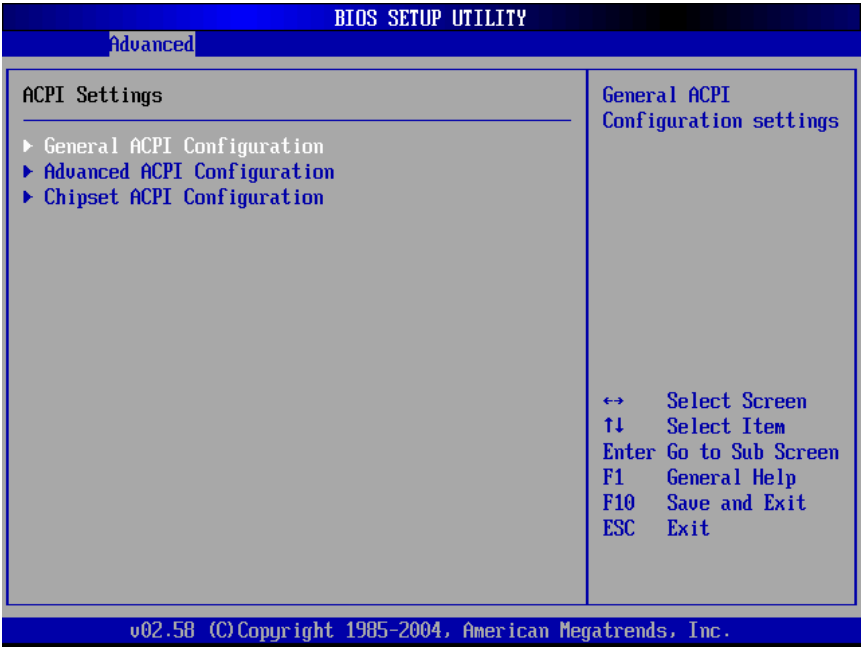
3.2.4 Hardware Health Configuration



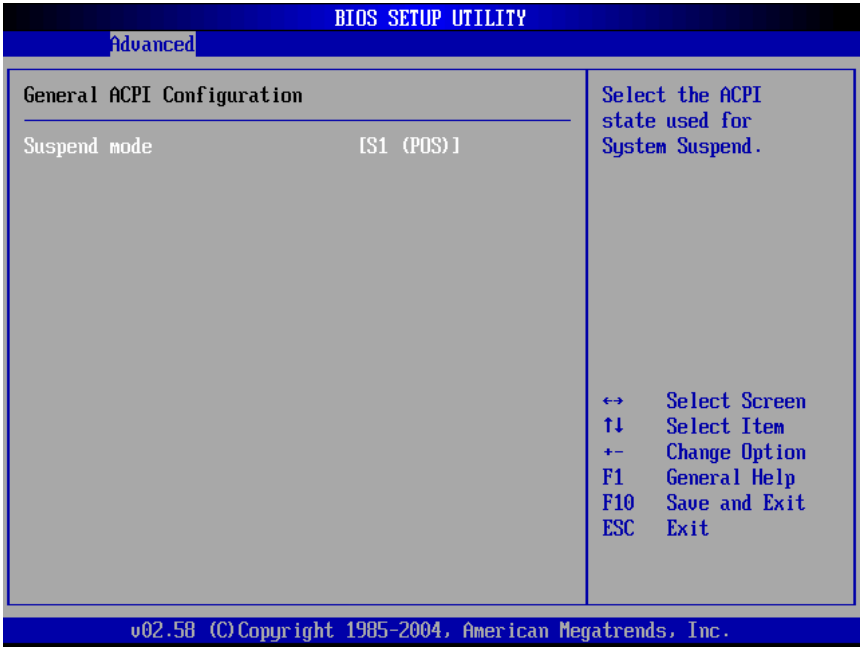
Hardware Health Configuration

Enable/Disable the onboard hardware monitor controller. If this option is enabled, the BIOS and OBS utility can get the system board’s health information from hardware monitor controller.

3.2.5 ACPI Configuration



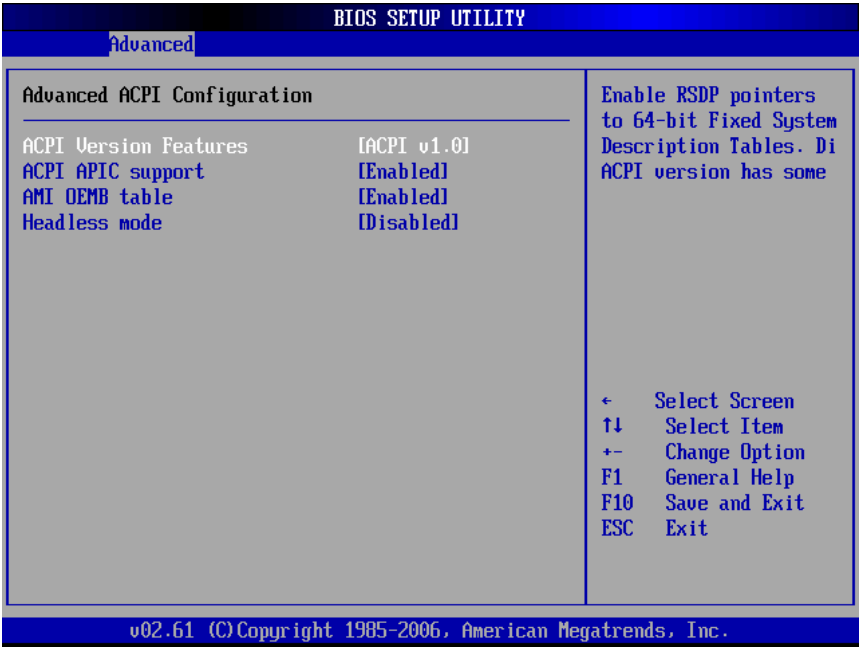
(1) General ACPI Configuration



Suspend

Enter into power-saving model after selecting system into sleep. The model is not the same, nor is the level of system function consumption. S1(pos)：CPU stops working, other devices remain normal power supply

(2) Advanced ACPI Configuration



ACPI Version Features

Select ACPI version number, different versions support different characteristics, more often downward compatible.

ACPI APIC support

Select whether to open ACPI (Advanced programmed Intermit controller） ,enlargeable system can make use of IRQ resource.

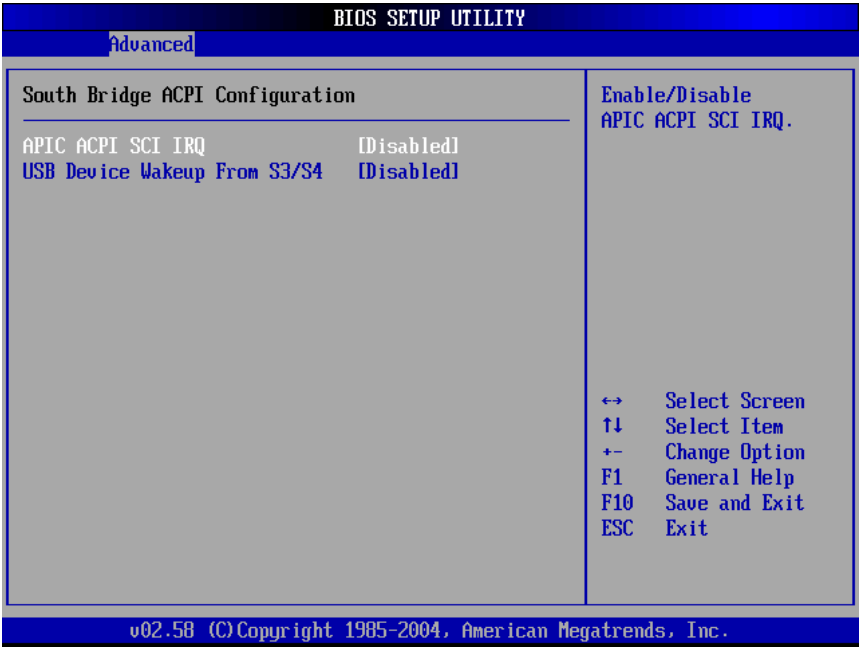
AMI OEMB table

Select whether to support OEMB table, option item: Disabled / Enabled.

Headless mode

Select whether to support Headless (not display facilities, not mouse, not keyboard) mode.

(3) Chipset ACPI Configuration



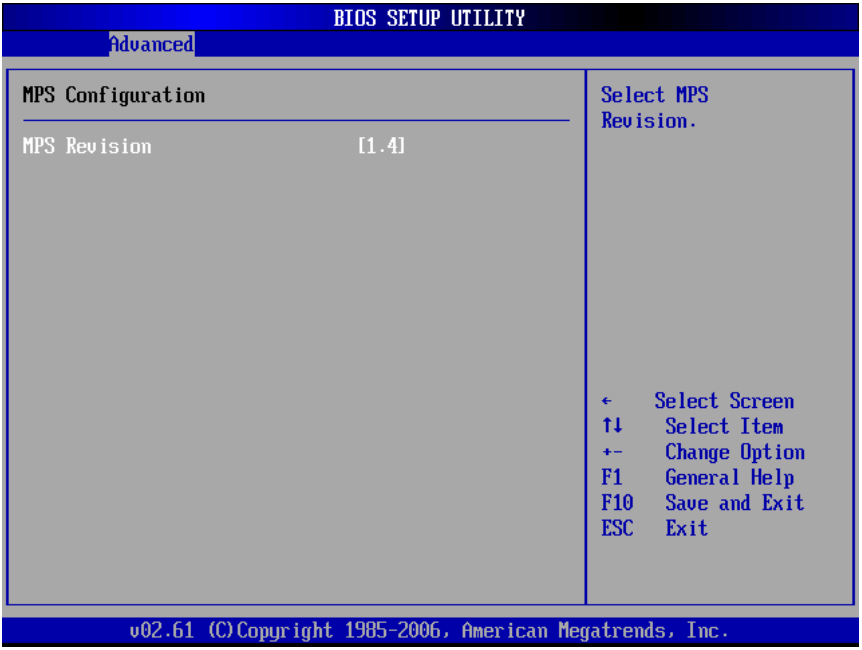
APIC ACPI SCI IRQ

Enabled/Disabled interior I/O APIC（Advanced programmed Intermit controller）and multiprocessor list.

USB Device Wakeup From S3/S4

In S3/S4, utilize USB device wakeup, [Enabled]: allow, [Disabled] forbid.

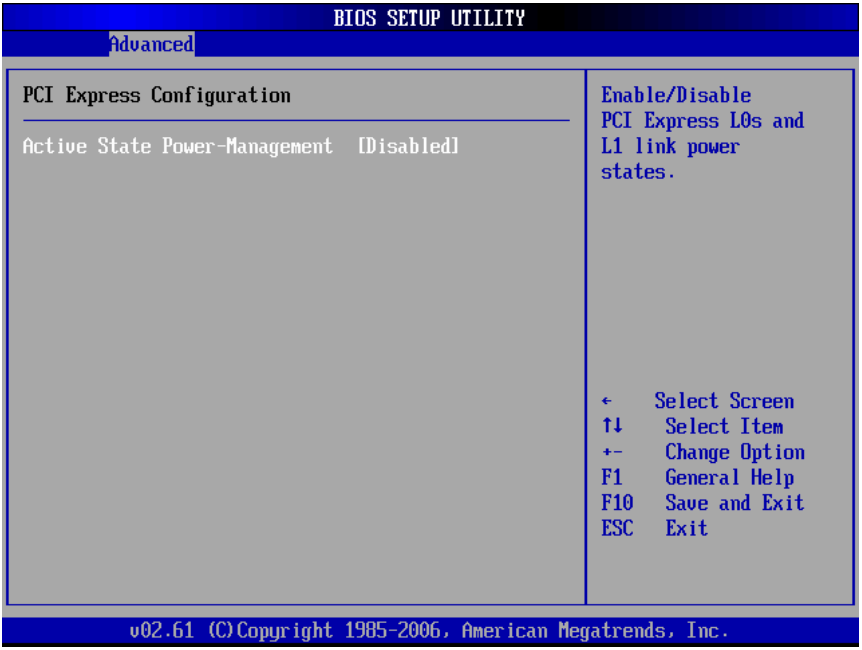
3.2.6 MPS Configuration



MPS Revision

This is a multi-processor standard version option. This option allows the user to select multi-processor standard version according to the operation system being used. And this option can function only when there are two or more than two physical or logical processors.

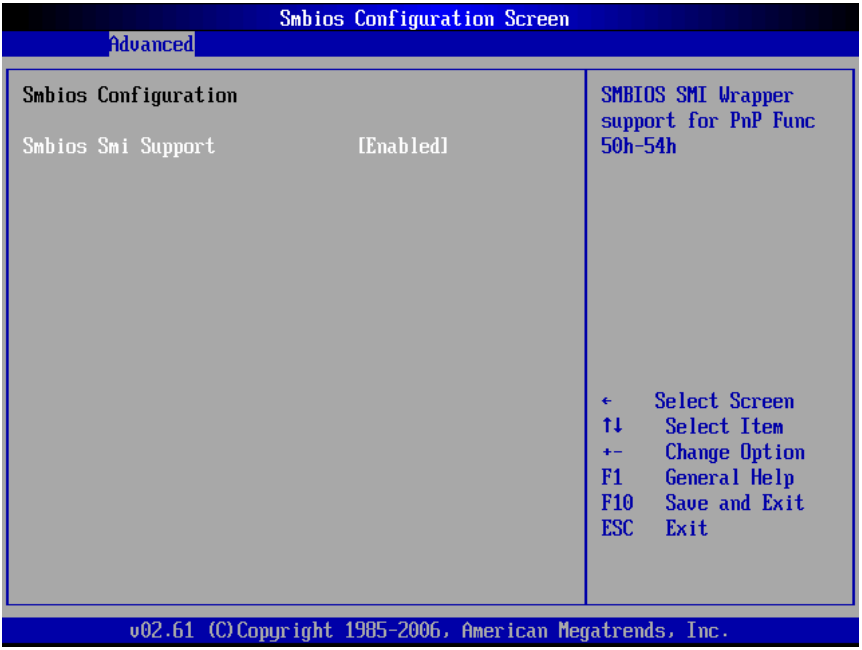
3.2.7 PCI Express Configuration



Active State Power-Management

When PCIE bus is not in active state, if start power-management or not.

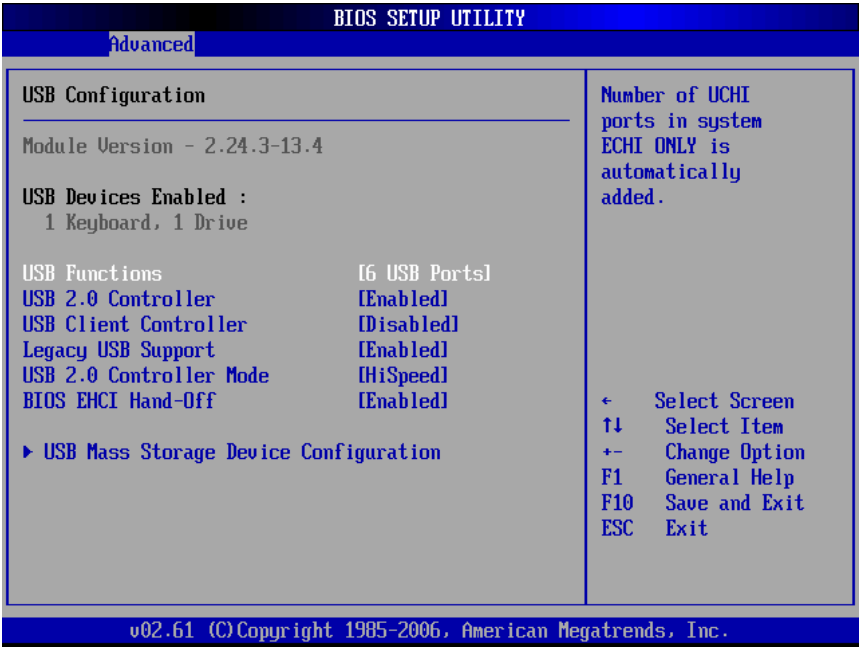
3.2.8 Smbios Configuration



Smbios Smi Support

If support SMBIOS PnP Function 50-54h by SMI. [Enabled：Support]，[Disabled：NO Support].

3.2.9 USB Configuration



Module Version （read-only）

This option displays the version message of currency serial bus module.

USB Devices Enabled（read-only）

This option displays USB devices which are in connection with motherboard.

USB Function

This options for opening the amount of USB port.

USB2.0 Controller

<Enabled>: allow use USB2.0 ports

<Disabled>: forbid use USB2.0ports

Legacy USB Support

If need support USB device in DOS mode: such as USB Flash Disk, USB keyboard, then select<Enabled> or<Auto>.If not :< Disabled>.

USB2.0 Controller Mode

This option for choose USB2.0 port mode, Available after "USB2.0 Controller" --<Enable>:.

<Full Speed>: USB port is 1.1 spec (12Mbps).

<HiSpeed>: USB port is 2.0 spec (480Mbps).

BIOS EHCI Hand-off

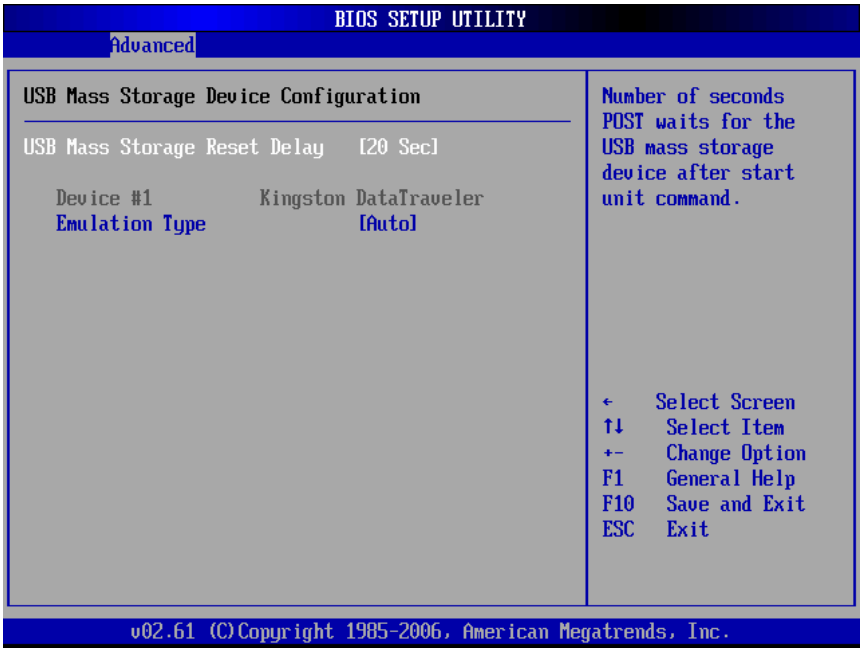
This item is to stop EHCI when OS hasn't EHCI Hand-off loading mechanism. If this item is set as [Disabled], the driver can change the attribute of EHCI.

Hotplug USB FDD Support

Hot swap USB device and floppy supported, default as [Auto]

Move the cursor to" USB Mass Storage Device Configuration", and press <Enter> key to appear the frame as below:

USB Mass Storage Device Configuration



USB Mass Storage Reset Delay

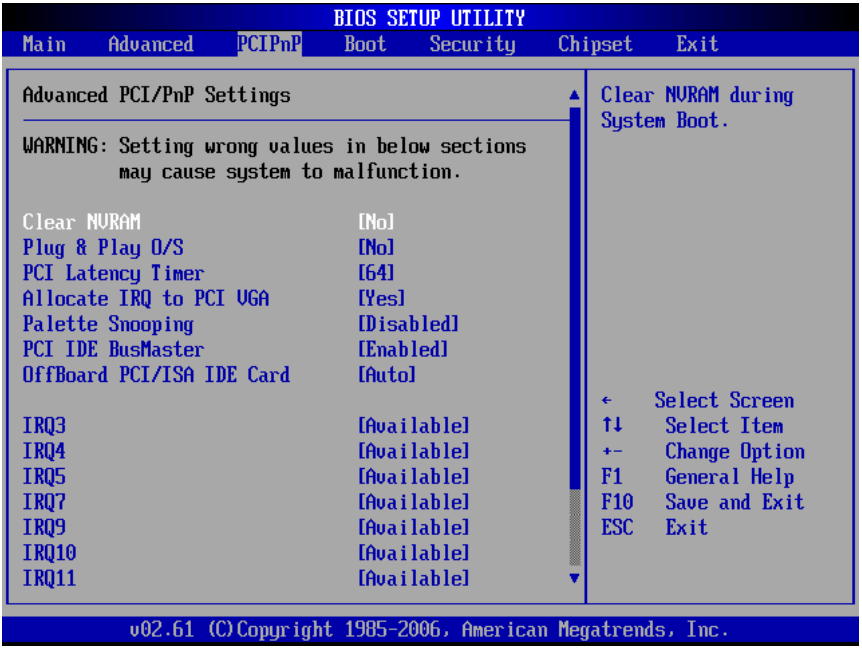
This option allows you to choose your system bios usb storage devices to detect the waiting time, Default set is :< 20Sec>.

Emulation Type

Setup removable Disk mode when use U Disk boot up system.

Mode: Auto/Floppy/Forced FDD/Hard Disk/CDROM. Default set is <AUTO>

3.3 PCIPNP



WARNING: setting wrong values in below sections may cause system to malfunction.

Clear NVRAM

Set this value to force the BIOS to clear the Non-Volatile Random Access Memory (NVRAM). The Optimal and Fail-Safe default setting is [No].

Plug & Play O/S

Set this value to allow the system to modify the settings for Plug and Play operating

system support. The Optimal and Fail-Safe default setting is [No].

PCI Latency Timer

Use this to adjust the PCI Latency Timer. This option sets the latency of all PCI devices on the PCI bus. The Optimal and Fail-Safe default setting is [64].

Allocate IRQ to PCI VGA

Set this value to allow or stop the system from giving the VGA adapter card an interrupt address. The Optimal and Fail-Safe default setting is [Yes].

Palette snooping

Set this value to allow the system to modify the Palette Snooping settings. The Optimal and Fail-Safe default setting is Disabled.

PCI IDE BusMaster

<Enabled>: Open BusMaster function: improve PCI IDE device transfer speed.

<Disabled>: Close BusMaster function.

OffBoard PCI/ISA IDE Card

This item is to set PCI and ISA IDE card which is not onboard. If this item is set as [AUTO], the system will automatically detect the status of this item. You can also assign the slot which the cards are resided.

IRQ3-15

[Available]: Specified IRQ is available to be used by PCI/PnP devices.

[Reserved]: Specified IRQ is reserved for use by Legacy ISA devices.

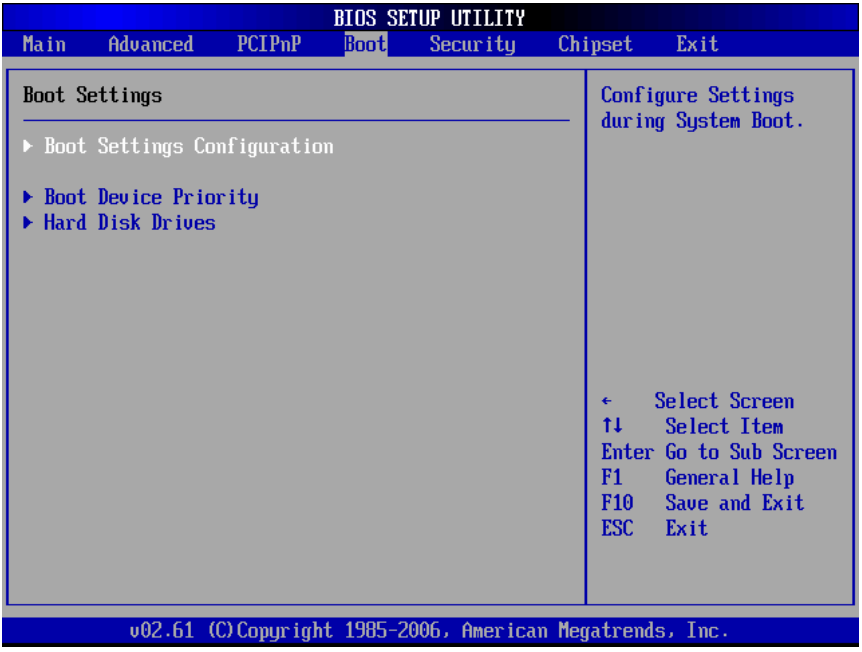
DMA Channel 0-7

[Available]: Specified DMA is available to be used by PCI/PnP devices.

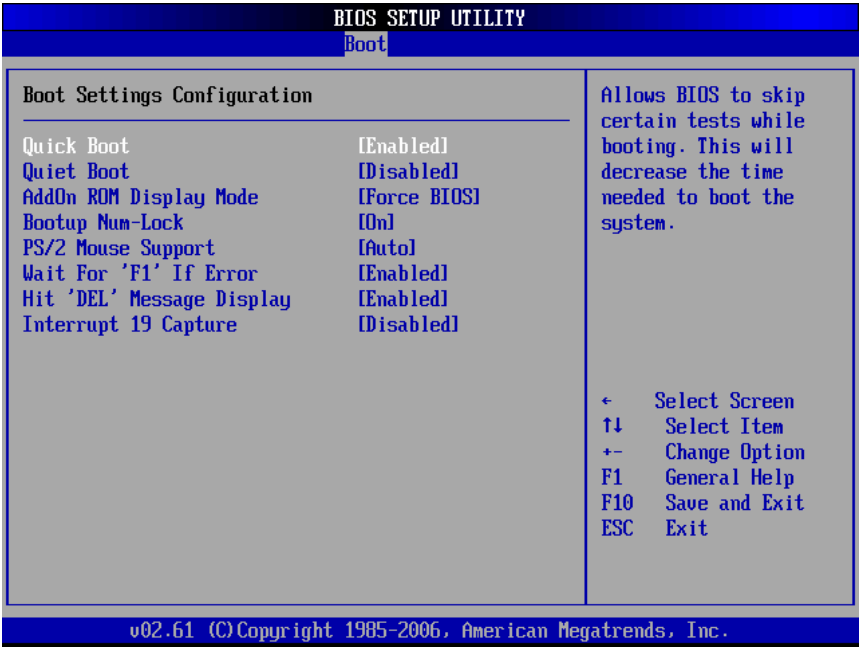
[Reserved]: Specified DMA is reserved for use by legacy ISA devices.

[Reserved Memory Size]: Size of memory block to reserve for legacy ISA devices.

3.4 Boot Menu


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Boot Settings
Boot Settings Configuration
Boot Device Priority
Hard Disk Drives
Configure Settings during System Boot.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

3.4.1 Boot Settings Configuration



Quick Boot

This function will skip over the 2nd and 3rd tests, accelerating the time of POST, whereas every PSOT is a complete test.

Quiet Boot

If this option is set to [Disabled], the BIOS display normal POST messages. If set to [Enabled], an OEM Logo is shown instead of POST messages.

AddOn ROM Display Mode

For choosing Option ROM display mode, Default:[Force BIOS]。

Boot Up Num-Lock

This item is to allow you select the Number Lock status when the system is power on. By default, [ON] is set to allow the number lock open when system start; if [OFF], the number pad is set as cursor controller.

PS/2 Mouse Support

This option is used to enable or disable the operation of PS/2 mouse port.

Wait For “F1” If Error

In the case of any errors found in the system self-detection, it is waiting for the user to press F1 key. While the system is activating self-detection, if the issue found is not fatal (unlikely to cause lockup or gross consequences), then the system will go on operation, but the prompt information such as “Press ‘F1’ to resume” or “Press ‘F1’ to Set up” will be displayed. Now, press F1 key to resume operation.

Hit “DEL” Message Display

If set as [Enabled], the boot-up screen will show hint as "Hit Del if you want to run setup". If set as [Disabled], the hint will be shown on the screen when system is booted. In most occasions, this item is set as [Enabled].

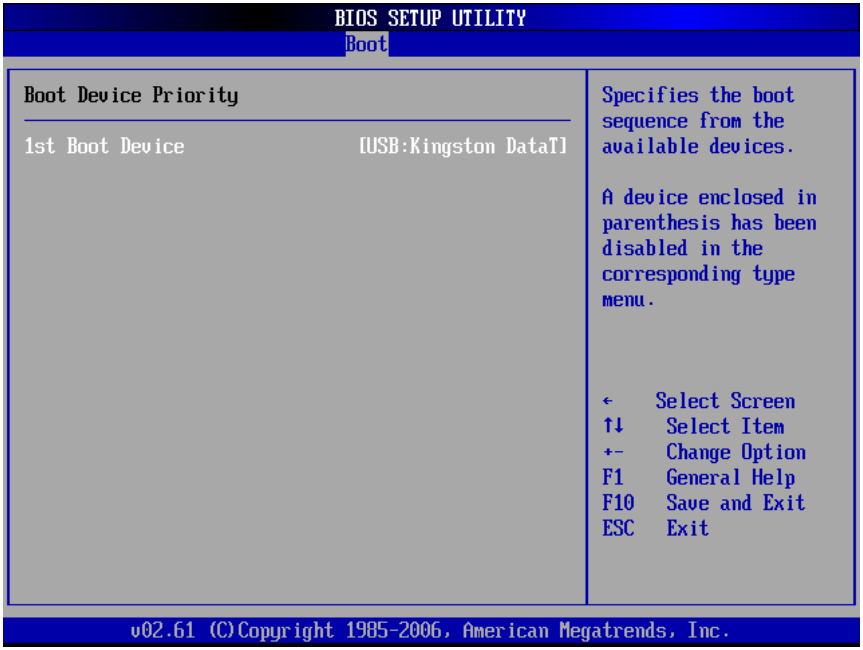
Interrupt 19 Capture

If BIOS start-up can be captured by special outside insert card.

<Enabled>: Yes, here BIOS will start-up by inserted card setting in its ROM,

<Disabled>: No, here BIOS start-up by the influence of inserted card..

3.4.2 Boot Device Priority



Boot Device Priority

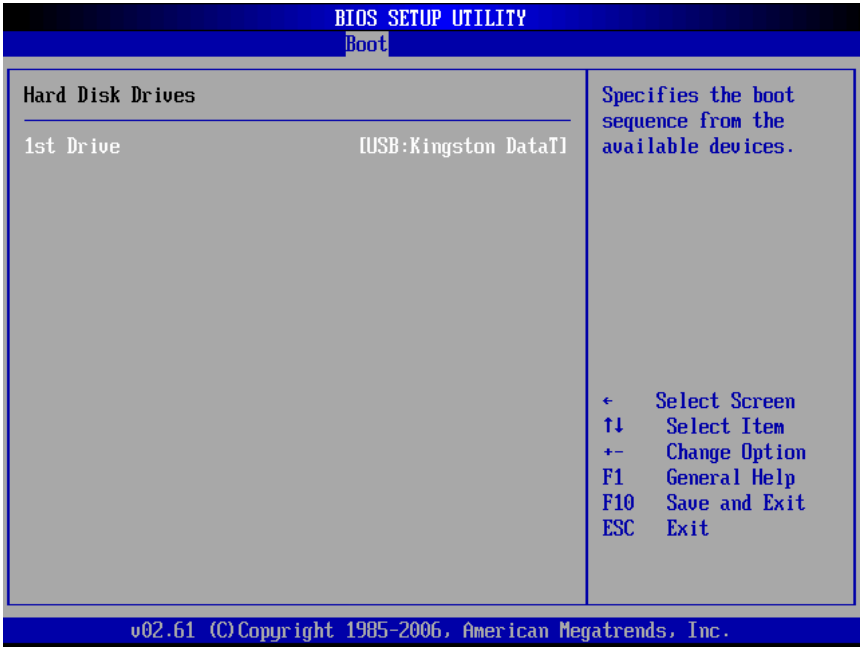
Press “Enter” will show sub-menu:

1st Boot Device

2nd Boot Device

System will detect device after this priority until find an available boot device then boot from it (Boot device support Removable Drive or Hard Disk Drive).

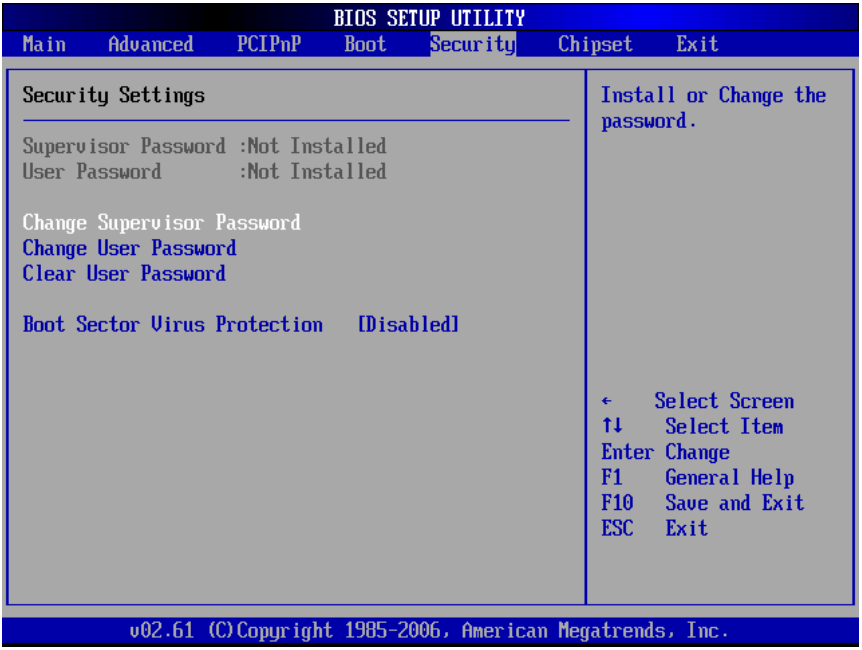
3.4.3 Hard Disk Drives



Hard Disk Drives

Boot device set for HDD, If has multi- HDD, must set up priority. The Highest Priority HDD will display in “Boot Device Priority”

3.5 Security Menu



Supervisor Password (read-only)

If set up supervisor password, will display [Installed], if not, will display [Not Installed].

User Password (read-only)

If set up user password, will display [Installed],If not , will display [Not Installed].

Change Supervisor Password

Select the Supervisor or User icon from the Security section of the BIOS Setup main menu. Enter the password and press ‘Enter’. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press ‘Enter’.

Change User Password

Press ‘Enter’, and enter sub-menu then you can change supervisor password.。

Clear User Password

Press ‘Enter‘, and select “yes” then you can clear user password.

Boot Sector Virus Protection

[Enabled]:Boot sector virus protection will be enabled. When execute Disk format or Write the Bootable section instruction, BIOS will send a warning.

Example as below:

Boot Sector Write!

Possible VIRUS: Continue (Y/N)? _

(Must press much 'N' and skip up)

Format!!!

Possible VIRUS: Continue (Y/N)? _

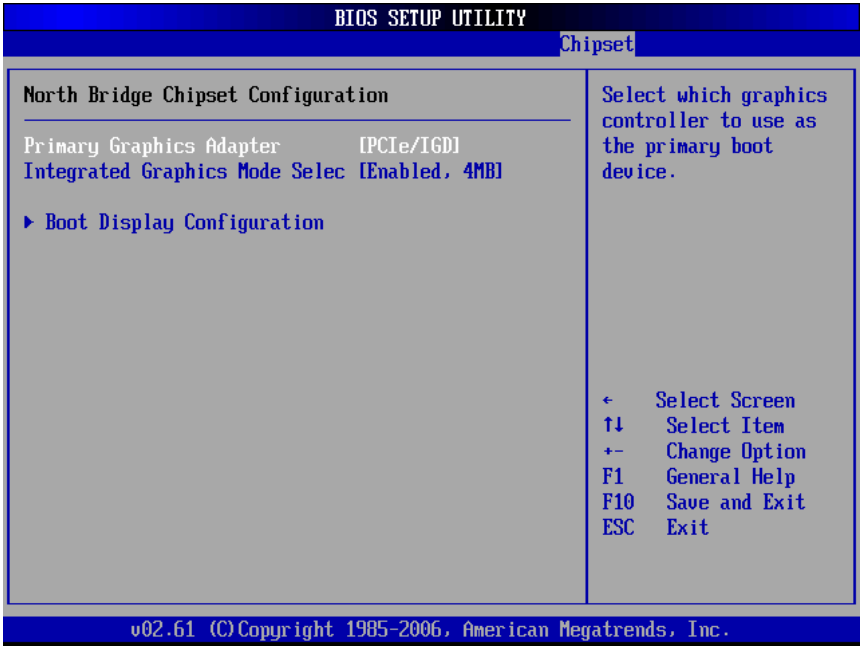
(Must press much 'N' and skip up)

[Disabled]: close this function.

3.6 Chipset Menu

3.6.1 North Bridge Configuration

Move the cursor to "NorthBridge Configuration", and press <Enter> key to appear the frame as below:



Primary Graphics Adapter

Setup display device PRI, options as below:

1: PEG PCI Express Graphics, PCIE,

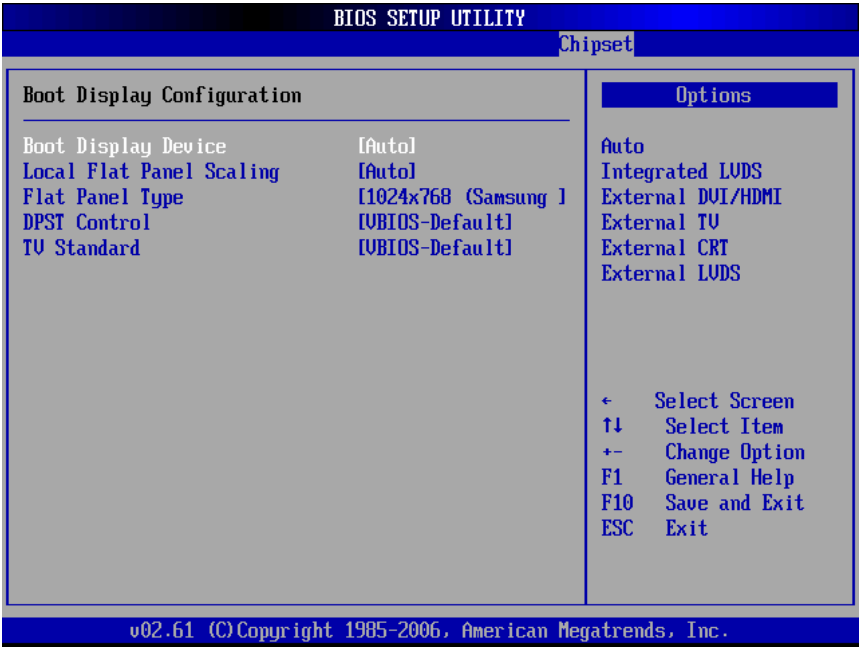
2: IGD Integrated Graphics Device,

3: PCI.

Integrated Graphics Mode Selec

Internal graphic mode and its memory size selection.

Boot Display Configuration



Boot Display Device

This option for configure display device when system booting.

Local Flat Panel Scaling

LVDS full screen display or all content display setting

Flat Panel Type

These fields allow you to select the LCD Panel type. The setting values for these ports are: <640x 480>, <800 x 600 >, <1024x 168>

DPST Control

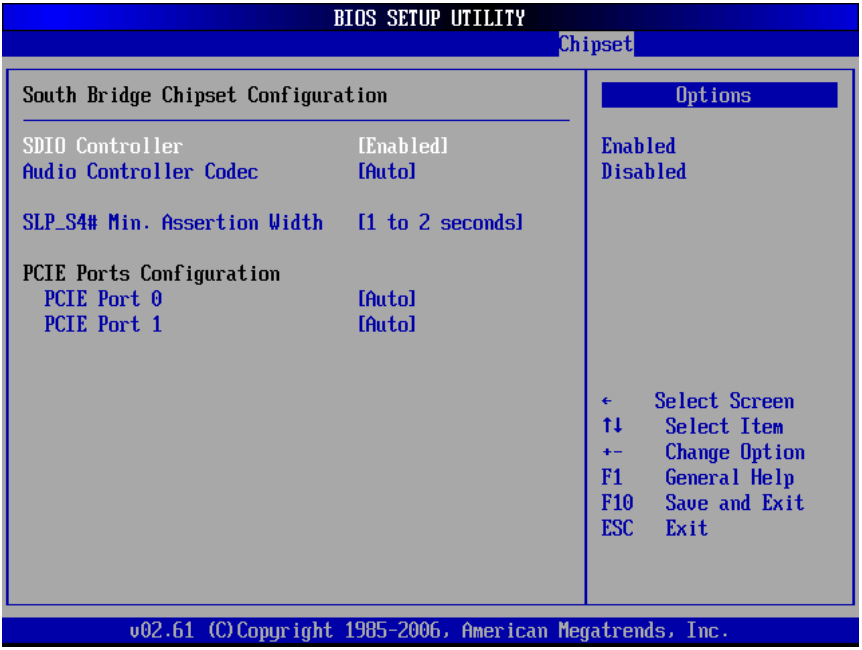
DPST Saving Electricity Setup，Recommend the use of default settings

TV Standard

TV output format options settings.

3.6.2 South Bridge Configuration

Move the cursor to "South Bridge Configuration", and press <Enter>key to appear the frame as below:



SDIO Controller

Setting open or closed SDIO controller，option: [Enabled (default)]，[Disabled].

Audio Controller Codec

Set opening or closing motherboard integrated sound adapter, recommend [Auto], [Disabled]: close, [Enabled]: open.

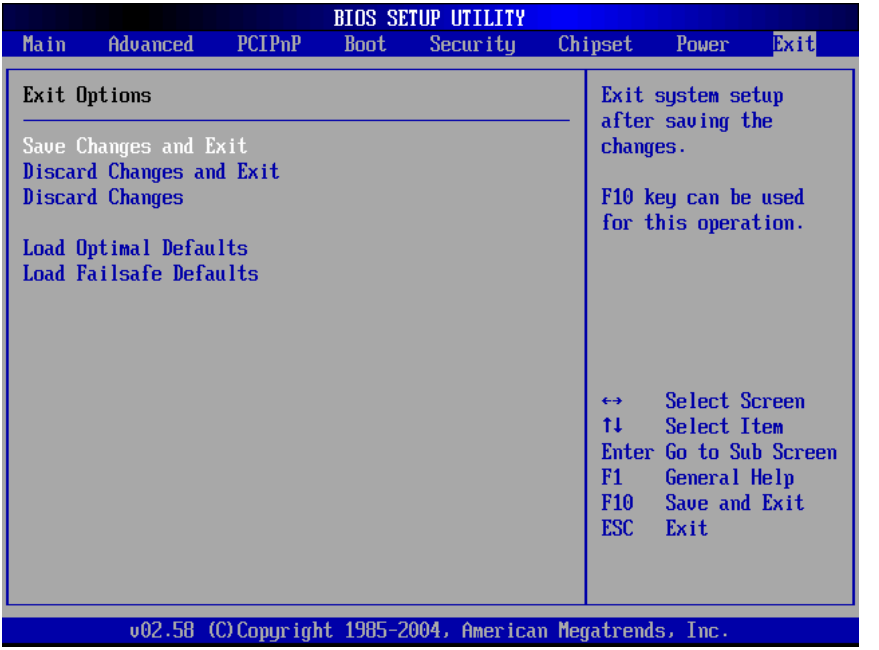
SLP_S4# Min. Assertion Width

SLP_S4# of memory Min. assertion width setting, Default as: 1 to 2 seconds

PCIE Ports ConfigurationPCIE Port1-2

Set whether use PCI-E 1-2 port. The choices:<Auto(default)>，<Disabled>，<Enabled>.

3.7 Exit Menu



Save Changes and Exit

Press <Enter> and <Enter>, to save BIOS change and reboot system.。

Discard Changes and Exit

Press <Enter> and <Enter>, will does not save BIOS change and reboot system.

Discard Changes

Press <Enter> and <Enter>, and continue set BIOS.

Load Optimal Defaults

Recommend you first use this option before config BIOS.

Load Failsafe Defaults

If System fails, recommend to load this option.

Appendix

Appendix

Appendix 1: Driver Installation

Please install drivers according to the following method:：

1：Put the driver CD-ROM of accessories box into computer driver，waiting for a little time，At this time the interface of drives installation selection automatically ejects(If no ejected interface appears, users can manually enter into drive, finding the driver operating procedures).

2：Make a choice according to the specification of motherboard model you purchased. Double-click on the specification of motherboard，choose motherboard model after entering。

3：Double click on the driver to be installed. Start installing according to the screen tips。

4：After completeing the installation of some drives, you will be reminded to restart the system. Repeat 1-3 steps to proceed with the installation of other drivers after restarting the system, untill all the procedures are installed.

5: after the completion of all the drivers, users have access to see device effect in device manager

Appendix 2：Watchdog programmer guide

watchdog reference code（ASM）:

Set the port to realize watchdog function through DEBUG order, so that it can carry out Watchdog Timer’s various functions.

port instruction：

2EH ： Address register

2FH ： Data register

Example：Set Watchdog Timer for 30 Seconds, DEBUG in DOS：

```
C:\>debug
-o 2e 87
-o 2e 87            ; Decode
-o 2e 2d
-o 2f e0            ; bit4=0, Select watchdog pin
-o 2e 07
-o 2f 08            ; Choose register
-o 2e 30
-o 2f 01            ; Activation logic devices
-o 2e f5
-o 2f 00            ; Set timer units as second /(set as min: o 2f 08)
-o 2e f6
-o 2f 30          ; Set Timer Count to 30 sec.(Max support FF = 255 , when it set as 00
                        Watchdog function stop)
-o 2fe aa           ; Lock register
-q
C :\>
```

As soon as you input last row of codes and pressed “enter”, system will reboot in 30 Sec.

Appendix 3: Glossary

ACPI

Advanced Configuration and Power Management Interface for short. ACPI specifications allow OS to control most power of computer and its extended devices. Windows 98/98SE, Windows 2000 and Windows ME are all support ACPI, it provide users a flexible system power management.

ATX:

AT extended, a motherboard layout according with modern standard replaced BabyAT. It changes disposal of many components, and do some new high efficiency design, so it is widely used now.

BIOS

Basic in/out system. It's a kind of software including all in/out control code interface in PC. It will do hardware testing while system booting, then system runs, it provides an interface between OS and hardware. BIOS is stored in a ROM chip.

BUS

In a computer system, it's the channels among different parts for exchanging data; it's also a group of hardware line. BUS here means part lines inside CPU and main components of memory.

Chipset

Integrated chips for executing one or more function. Here "Chipset" means system level chipset structured by Southbridge & Northbridge; it decides motherboard's structure and main functions.

CMOS

Complementary Metal-Oxide Semiconductor, a widely used semiconductor with the characteristic of high speed but low power. CMOS we mention here means part of obligate space in on-board CMOS RAM, for saving date, time, system information and system parameter etc.

COM

Computer-Output Microfilmer. A universal serial communication interface, usually adopts normative OB 9 connector.

DIMM: Dual Inline Memory Module. It’s a small circuit board with memory chipset, providing 64bit bus width.

DRAM

Dynamic Random Access Memorizer. It’s a normal type of memory often with a transistor and a capacitance to store 1 bit. With the development of the technology, more and more types and specification of ORAM exist in computer application. Now: SDRAM, DDR SDRAM and RDRAM are generally used.

IDE:

Driver specification for integrated device electronics, for connecting HDD/CD-ROM device.

IRDA:

Infrared Data Association for short, here means infrared transmit interface, to connect infrared transmit devices. This sort of device transmits data by infrared light-wave without connecting any cables .It have been developed a standard now.

LAN

Network interface. Network grouped by correlative computers in a small area, generally in a company or a building. Local area network is buildup by sever, workstation, some communications links, as a rule. Terminals can access data and devices anywhere through cables, so, many users can share costly device and resource.

LED

Light-Emitting Diode. a semiconductor device that shines when power supply is connected, often use to denote info lightly, for example, to denote power on or HDD work normally.

LPT:

Line print terminal. The denomination reserved by DOS, is used to denote universal parallel interface, and connect printer in a general way.

POST

Self-test when power on. While booting, BIOS will do once uninterrupted testing operation to the system, including RAM, keyboard, hard disk driver etc. Check them in normal situation and work well.

PS/2

A keyboard & mouse connective interface specification developed by IBM.PS/2 is a DIN interface with only 6PIN; it also can connect other devices, like modem.

USB

It’s Universal Serial Bus for short. A hardware interface adapts to low speed external devices, and is always used to connect keyboard, mouse etc. One PC can connect 127 USB devices Max, providing 12Mbit/s transmit bandwidth；USB supports hot swap and multi- data stream, namely, you can plug USB devices while system is running, system can auto-detect and makes it work on.

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