华北工控®

EMB-4850

EPIC Embedded Board

USER' Manual V1.2

USER'Manual

Industrial & Communication Computer

EMB-4850

EPIC Embedded Board

USER' Manual V1.2

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Declaration of conformity

CE

Shenzhen NORCO Intelligent Technology Co.,Ltd.

declares that the product

EMB-4850 EPIC Embedded Board

(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-4850

Responsible Party：Shenzhen NORCO Intelligent Technology Co.,Ltd.

Equipment Classification：FCC Class B Subassembly

Type of Product：EPIC Embedded Board

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: 2008

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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.

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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.

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-4850 Mainboard	1pcs
■User's Manual	1 pcs
■driver CD	1 pcs
■jumper header	1bag
■ VGA cable	1 pcs
■ Parallel Port cable	1 pcs
■ Serial port cable	1 pcs
■ Double USB cable	1 pcs
■ SATA cable	2 pcs
■ IDE cable	1 pcs
■ Audio cable	1pcs

Chapter 1
General Information

Chapter1 General Information

1.1 Introduction

The EMB-4850 is an EPIC Embedded industry motherboard with a high performance based on Intel Core Duo processors. The EMB-4850, in conjunction with Intel 945GM+ICH7M chipset, support Intel core Duo processor, 533/667MHz Font Side Bus. Support for dual channel DDR2 667MHz memory technology, capacity up to 2GB;integrated Intel GMA 950 graphic controller, support VGA、LVDS、TV-OUT Display output mode, VGA+LVDS and TVOUT+LVDS dual independent display; supply 1 Mini-IDE interface,1 AUDIO interface,1 parallel interface,2 Serial ports(COM2 support RS232/422/485 mode);2 SATAⅡ ports;4 USB 2.0 Ports(supply ESD protect);2 1000/MB Ethernet interface. It also provides with other advanced functions, IrDA，WatchdogTimer,PC/104+ extend function and GPIO function （8Bit Input/Output）.EMB-4850 with EPIC spec can provide the most advanced design of volume and function. It can work without fans. Provide the perfect solution for your built-in application.

1.2 Ordering Information

Model Number	Description
EMB-4850	EPIC Embedded Industry Board with VGA/LVDS/TV-OUT/2LAN/2COM/LPT/AUIDO/GPIO

1.3 Environmental and Dimensions

Operating Environmental

Temperature:0～60℃

Humidity: 5%～95%

Dimensions

115mm×165mm (W×H)

1.4 Specifications

1) EPIC Embedded Industry Motherboard

2) Support FSB with 533/800MHz Intel® Core Duo Processors(Socket 479)

3) Chipset: Intel® 945GM+ICH7M

4) Memory: support dual channel 200-pin SO-DIMM slot, memory up to 2GB (DDRⅡ533/667)

5) BIOS：4M bit Flash BIOS, ACPI power management support

6) Watchdog Timer: 256 levels, 1 (s/m) programmable, timeout interrupt or system reset

7)Graphic Display: Intel945GM integrated Graphic controller, memory size optimized Shared Memory architecture, support up to 224MB frame buffer using system memory. Support VGA/LVDS/TV-OUT, VGA+LVDS and TVOUT+LVDS dual independent display

8) Expansion slot: 1x PC/104+ slot

9) IDE Controller: Standard mini IDE Interface

10) SATAⅡ Interface: 2 SATAⅡ Interface, data transmission speed up to 300MB/s

11) LAN: 2x1000Mbps Ethernet Interface, REALTEK 8111B Network chipset, 2×RJ-45

12) USB: Motherboard provide a standard dual-layer USB port and a set of 2×5 header USB ports, which both support USB 2.0 at a high speed of 480Mbps.

13) Audio: Realtek ALC888 Audio, Support 7.1 channels HD audio output

14) Support IrDA transfers

15) I/0 Interface: Winbond W83627HF I/0 chipset, on board provide 1 Parallel port、2 serial ports（COM1->RS232，COM2->RS232 /RS422/RS485，Supply ESD protect）、1 IrDA Port 、1PS/2 keyboard/mouse interface

16) Power supply: +12V single power supply

17) GPIO: 8Bit Input/Output

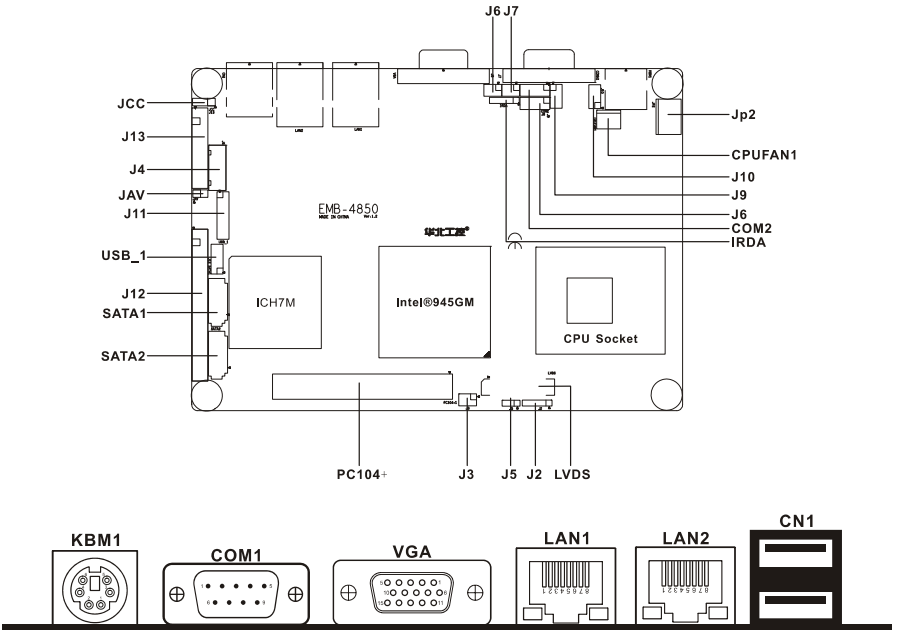
Chapter2
Product Installation

Chapter 2 H/W Installation

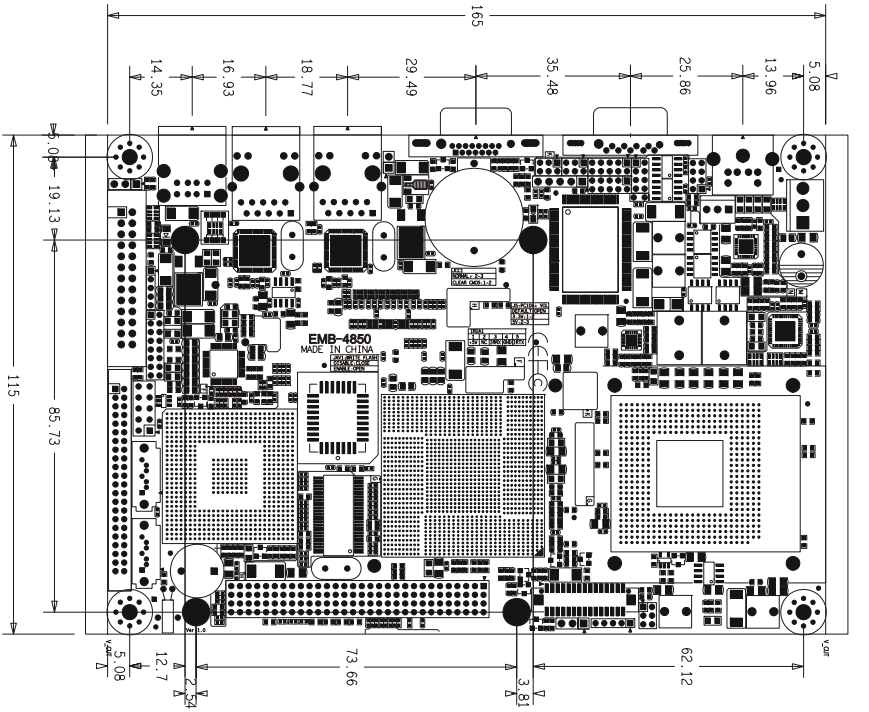
2.1 Connector Locations

The following picture is interface index for MITX-6852, when you install your devices, please consult it and read the following guide. During installation please care: for some devices, if incorrectly install, it will not work normally.

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



2.2 Dimensions



2.3 Installation step

Please consult the following step to install your computer:

1: Adjust all jumpers on the EMB-4850 per this manual

2: Install CPU

3: Install memory

4: Install Expand card (PC/104+ card)

5: Connect all of the signal line, cable, panel-control circuitry and power supply

6. Boot computer, Finish BIOS setup

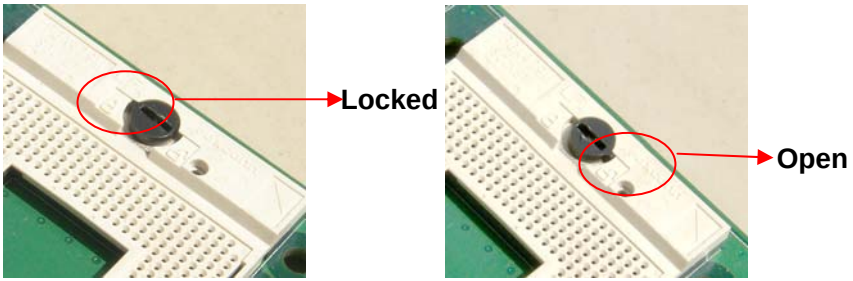
Remind！Key components of this motherboard are Integrated circuit, and these components will be easily damaged by electrostatic influence. So, before installing motherboard, you should always follow the following precautions:

1. Disconnect your Computer from the power supply before handling it.
2. Hold side by the edges, don't touch any components or pins on the board
3. Use a grounded wrist strap while getting in touch with integrated circuit component (such 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 CPU & Cooling Fan Installation

Installing CPU complied following steps：

1: Twist the screws above the CPU socket with a screwdriver, and turn this pointer on screw aimed at "Open" from the "Locked" position.



2: Hold the CPU by both sides, adjust the 1st pin (Marked as golden triangle) to be align with the "missing" pin, then put the CPU in place. Check and adjust the CPU until it lays on the

socket paralleled, then twist the pointer on screw aimed at "Locked" from the "Open" position.。

Notice：Ensure this motherboard support the CPU you choose, if the direction you inserted was wrong, CPU may be damaged. After system boot, BIOS will examine CPU type and frequency automatically, BIOS setting won't allow you change the CPU frequency, in order to make system work steadily, please set your CPU exterior frequency by its specification, and we don't suggest you over clock your CPU. At present most Intel ® CPU frequency multiplication have been set when them leave factory, can not be changed.

Install CPU cooling fan complied steps following：

1. Fix the heat sink go with fan on motherboard, keep heat sink & CPU wafer tangent.
2. Connect fan cable with on-board CPUFAN socket.

Notice：

Before fixing, daub coolant on the surface of the heat sink connect CPU first to swell the cooling function, check CPU work on or not regularity, to insure the CPU in good ventilate situation.

2.5 Jumper settings

* **Note**：

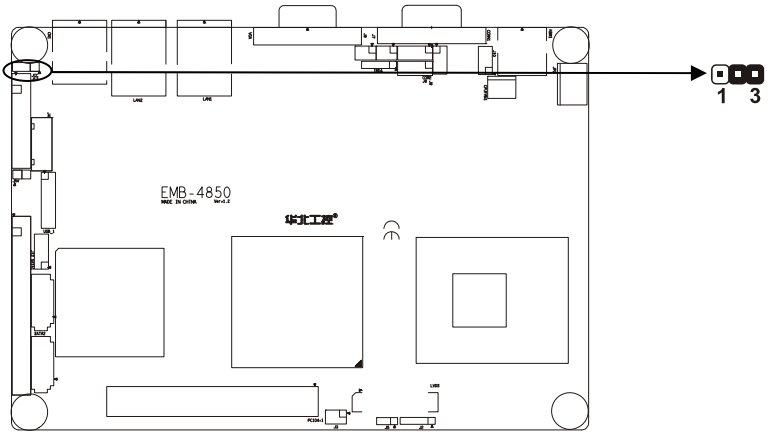
Jumpers are located on the motherboard, they represent clear CMOS jumper JCC etc. pin1 for all jumpers are located on the side with a thick white line refer to the motherboard's silkscreen , jumpers with three pins will be shown as 1-2 to represent pin1&pin2 connected and 2-3 to represent pin2&pin3 connected.

2.5.1 CMOS Clear (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. Push clear CMOS button and wait for 4 second.
3. Turn on the system. The BIOS is now reset to its default setting



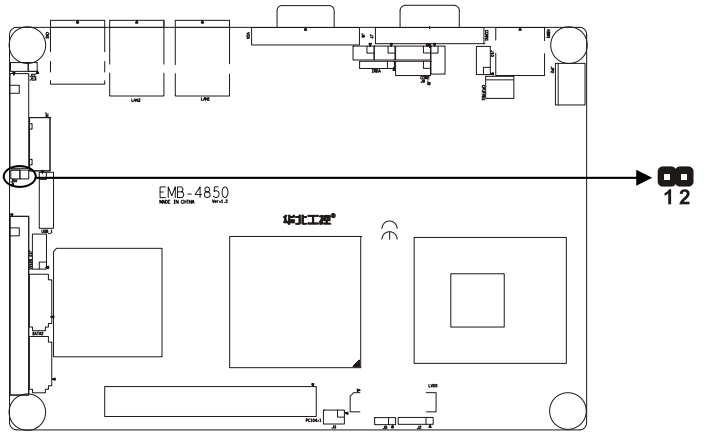
Setting JCC：

Setting	JCC1
2-3	Normal(default)
1-2	Clear

⚠Do not clear CMOS when power on, it harm to the motherboard.

2.5.2 Virus-Avoided Jumper (JAV)

The BIOS is contained inside the Flash ROM. If the jumper JAV is set as dosed, you can not upgrade the BIOS. However in this status, the system BIOS can avoid being attacked by virus, such as CIH virus.

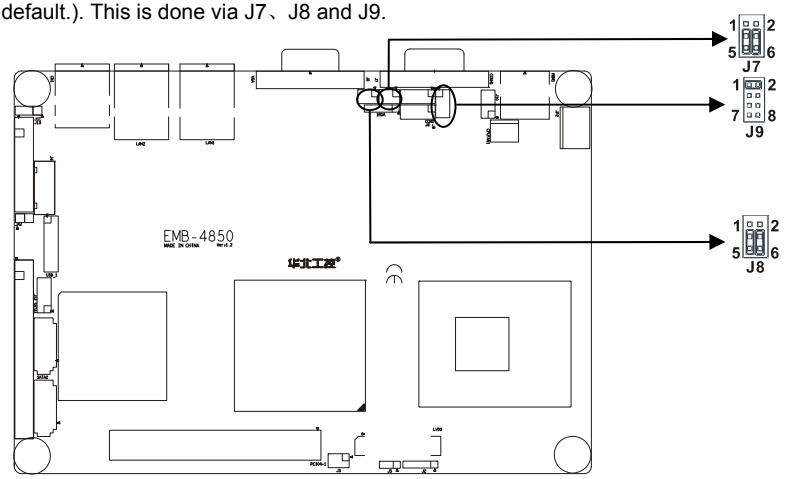


Setting JAV:

Setting	JAV1
Open	Update BIOS
Close	BIOS write-protect（default）

2.5.3 COM2 setting(J7、J8、J9)

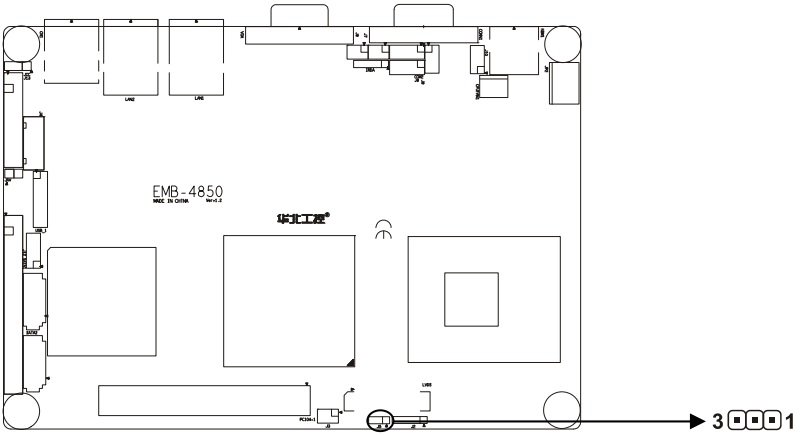
COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode (RS232 for default.). This is done via J7、J8 and J9.



Mode	J7	J8	J9
RS232	3-5,4-6	3-5,4-6	1-2
RS422	1-3,2-4	1-3,2-4	3-4
RS485	1-3,2-4	1-3,2-4	5-6,7-8

2.5.4 PC104+ select voltage setting (J5)

1 standard PC104+ expansion slot, the user may act according to own demand to choose the different PC/104+ expansion module, the different module input voltage is dissimilar, you may through jump the line to the PC/104+ module voltage to carry on the select



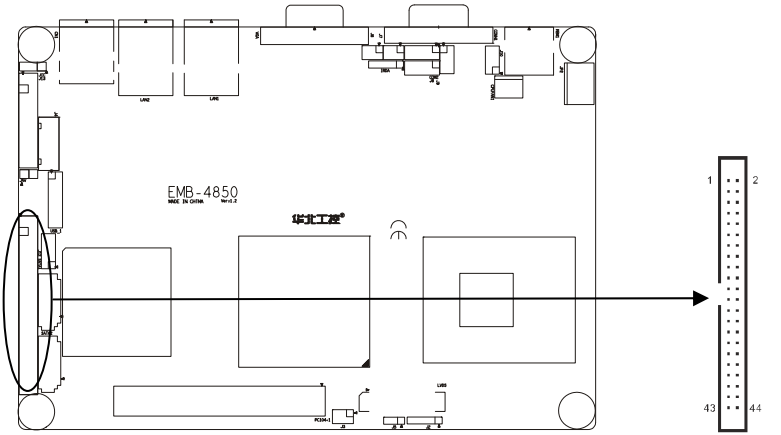
Setting	J5
Open	default
1-2	3.3V
2-3	5V

2.6 External Connector

⚠Please carefully read this manual when connecting external connector, so as to avoid damage to the motherboard!

2.6.1 mini IDE Connector（J12）

The board provides 1 mini IDE channel to which you can attach up to two Enhanced Integrated Device Electronics hard disk drives or CDROM to the board's internal controller.



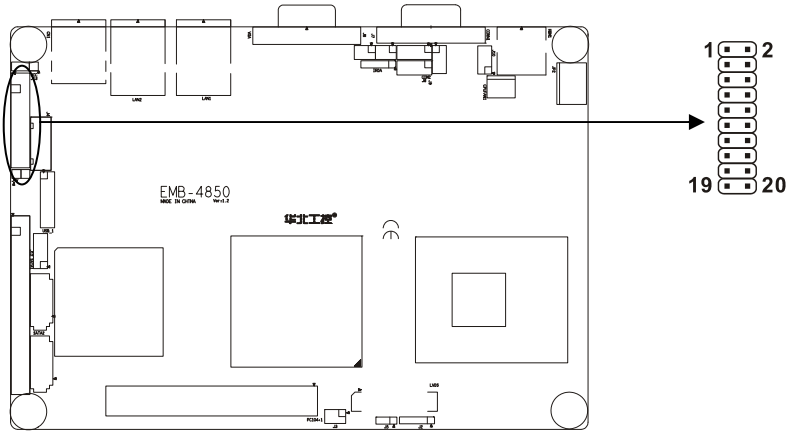
J12:

Signal name	Pin		Signal name
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

2.6.2 Parallel Port Connector（J13）

Normal 26 Pin Parallel Port，According to your needs to connect parallel port device。



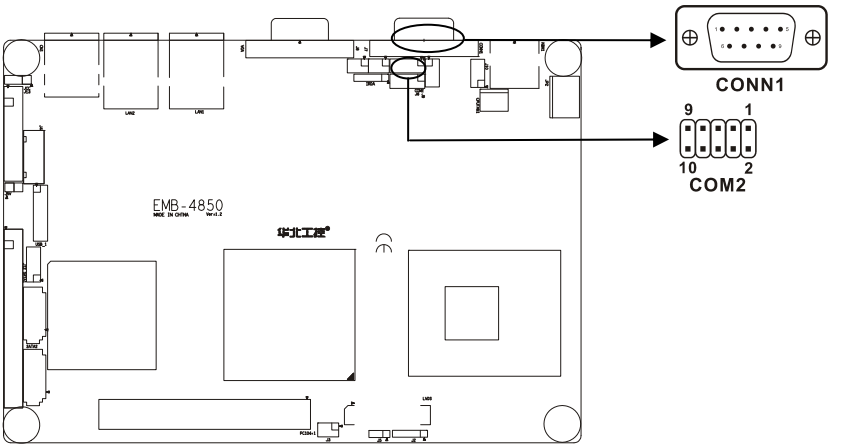
J13:

Signal name	Pin		Signal name
T_STB#	1	2	T_AFD#
PDQ0	3	4	T_ERR#
PDQ1	5	6	T_INIT#
PDQ2	7	8	T_SLIN#
PDQ3	9	10	GND
PDQ4	11	12	GND
PDQ5	13	14	GND
PDQ6	15	16	GND
PDQ7	17	18	GND
T_ACK#	19	20	GND
T_BUSY	21	22	GND

T_PE	23	24	GND
T_SLCT	25	26	GND

2.6.3 Serial port Connector（CONN1、COM2）

This board provides 2 serial ports (COM1:RS-232;COM2:RS-232/422/485)in 1 DB-9 connector(CONN1) and 1 2×5 header. You can enable/disable them and choose the IRQ or I/O address from BIOS SETUP.COM2 setting refer to" 2.3.3 COM2 setting(J7、J8、J9)".



CONN1：

Pin	Signal name	Signal name
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal
5	GND	System Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator

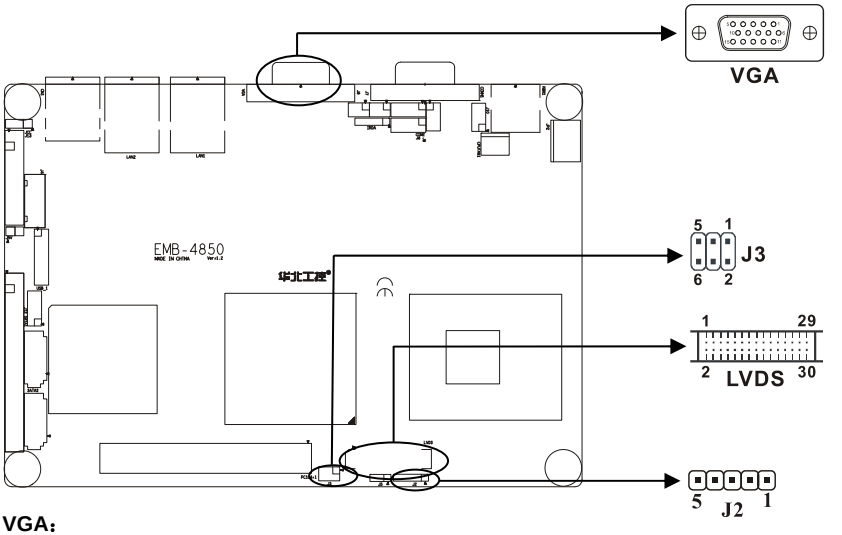
COM2：

Signal name	Pin		Signal name
DCD	1	2	DSR
RXD	3	4	RTS

TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	GND

2.6.4 Display Connector(VGA1、LVDS1、J3、J2)

The board has 3 connectors to support these displays: one for standard CRT VGA monitors (15DB), one for TV displays (HD TV and SD TV), and one for LVDS type LCD panels.VGA+LVDS and TVOUT+LVDS dual independent display



VGA：

Pin	Signal name	Pin	Signal name	Pin	Signal name
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 name	Pin		Signal name
VDDLVDS	1	2	VDDLVDS
GND	3	4	GND

LA_DATAN0	5	6	LB_DATAN0
LA_DATAP0	7	8	LB_DATAP0
GND	9	10	GND
LA_DATAN1	11	12	LB_DATAN1
LA_DATAP1	13	14	LB_DATAP1
GND	15	16	GND
LA_DATAN2	17	18	LB_DATAN2
LA_DATAP2	19	20	LB_DATAP2
GND	21	22	GND
LA_CLKN	23	24	LB_CLKN
LA_CLKP	25	26	LB_CLKP
GND	27	28	GND
L_DDC_DATA	29	30	L_DDC_CLK
NC	31	32	NC
GND	33	34	GND

LVDS PANEL BACKLIGHT（J2）：

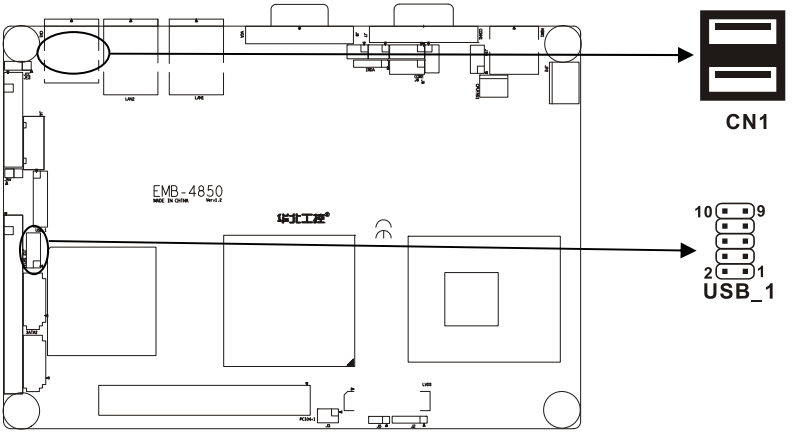
Pin	Signal name
1	+12V
2	L_BKLTEN
3	L_BKLTCTL
4	GND
5	VCC

TV-OUT（J3）：

Signal name	Pin		Signal name
DACA_OUT	1	2	GND
DACB_OUT	3	4	GND
DACC_OUT	5	6	GND

2.6.5 USB Connector (USB1、CN1)

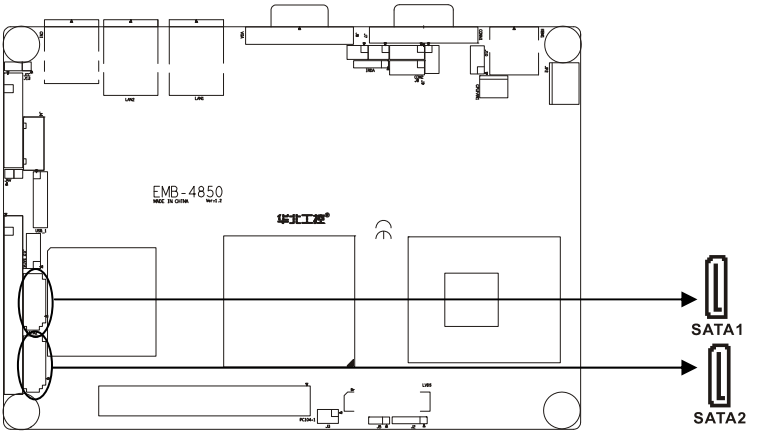
Onboard provide a standard dual-layer USB port and a set of 2×5 header USB ports, which both support USB 2.0 at a high speed of 480Mbps.



Signal name	Pin		Signal name
VCC	1	2	GND
USB D-	3	4	GND
USB D+	5	6	USB D+
GND	7	8	USB D-
GND	9	10	+5V

2.6.6 SATA Connector (SATA1、SATA2)

EMB-4850 supports Serial ATA via two connectors (SATA1、SATA2). Data transfer rates up to 300 MB/s are possible, enabling very fast data and file transfer, and independent DMA operation on two ports.

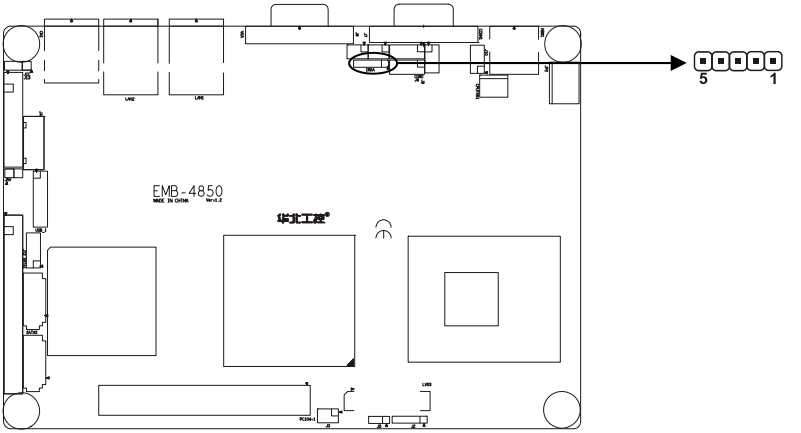


SATA1、SATA2：

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

2.6.7 IrDA(IRDA)

This board provides a group of IrDA pins, support IrDA version 1.0 SIR or SHARP ASK-IR protocol infrared ray transmission function

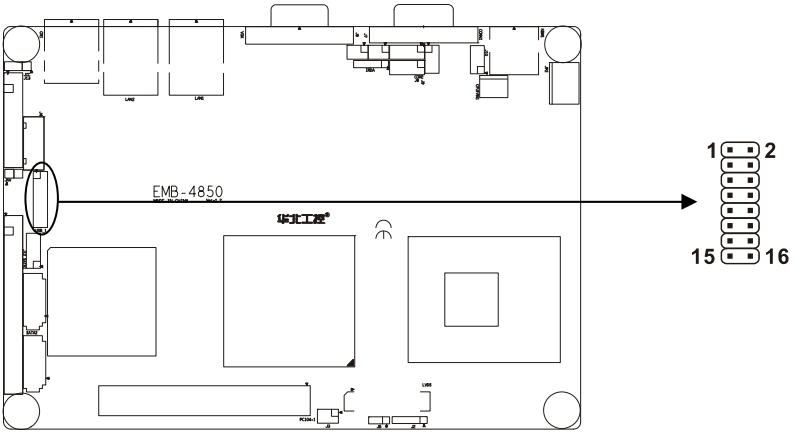


IRDA：

Pin	Signal name
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

2.6.8 Audio Connector(J11)

Realtek ALC888 Audio, Support 7.1 channels HD audio output.

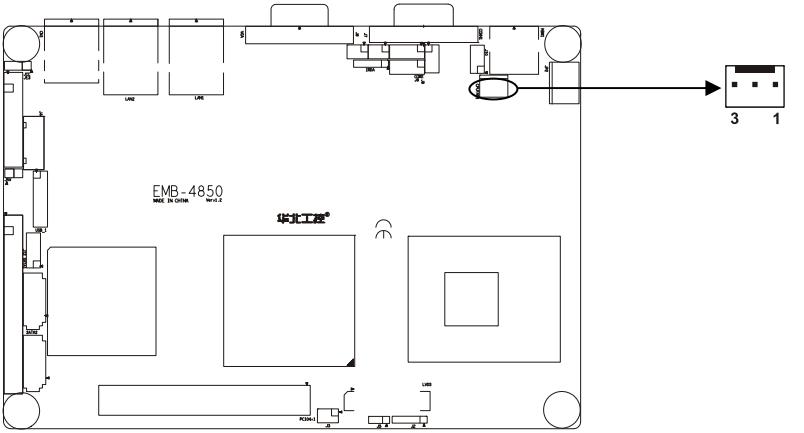


J11：

Signal name	Pin		Signal name
SPKOUT_R	1	2	AUDIO_GND
SPKOUT_L	3	4	AUDIO_GND
LINEOUTR	5	6	LINEOUT_L
AUDIO_GND	7	8	AUDIO_GND
LINE_R	9	10	LINE_L
AUDIO_GND	11	12	AUDIO_GND
NULL	13	14	MIC_IN_L
MIC_IN_R	15	16	AUDIO_GND

2.6.9 CPU FAN Connector (CPUFAN)

This board provide a 3Pin CPU fan socket, attention: electric current for fan≤350mA (4.2W, 12V), affirm fan cable matches fan socket.

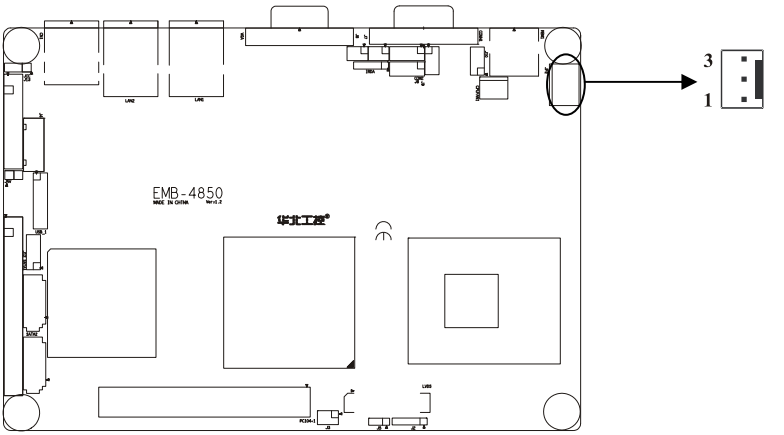


CPUFAN：

Pin	Signal name
1	GND
2	VCC12
3	Speed detect

2.6.10 Power Connector (JP2)

+12V Single power supply.



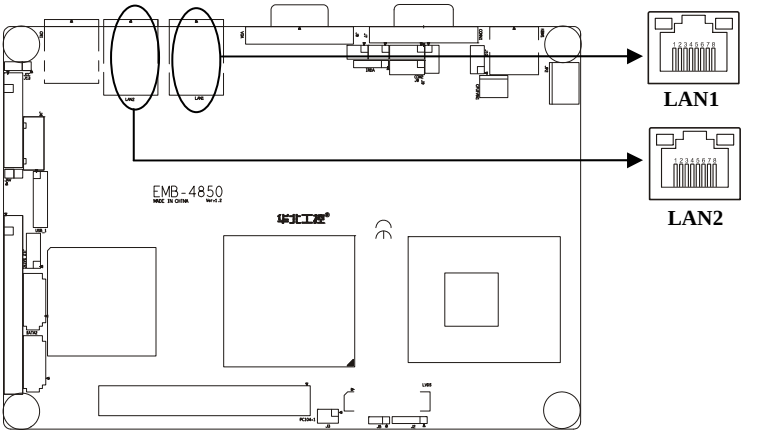
Pin	Signal name
1	+12V
2	GND
3	GND

2.6.11 Ethernet Connector (LAN1、LAN2)

Onboard provide 2 1000Mbps Ethernet interface, LILED and ACTLED separately is aside LAN yellow color led and green led. They indicate LAN's linking state and transmitting active state

TX+,TX-:positive/negative send data signal; RX+,RX-:positive/negative receive data signal

ACTLED：network active state LED; LILED：network linking state LED.



LED state description：

LILED(Yellow)	Network link status	ACTLED(green)	Message transfer status
On	effective	On	transfering
Off	invalidation	Off	NO message transfering

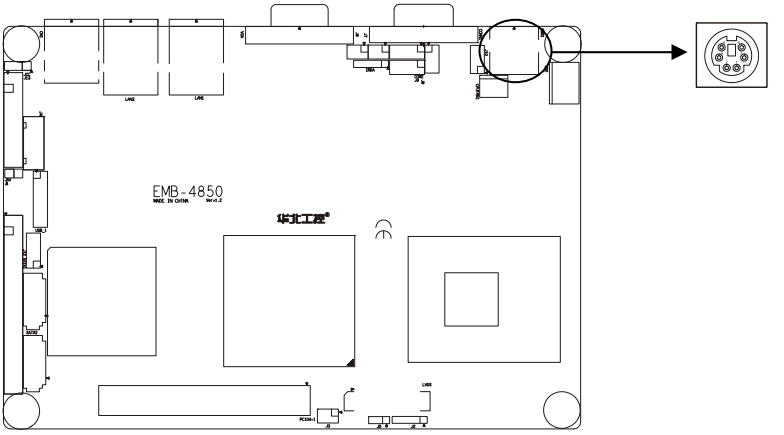
LAN：

Signal name	Pin		Signal name
TX+	1	2	TX-
RX+	3	4	NC
NC	5	6	RX-

NC	7	8	NC

2.6.12 PS/2 KB/MS connector(KBM1)

1 PS/2 kb/ms jack, need to be Connected with PS/2 KB/MS Y-shape convert cable.

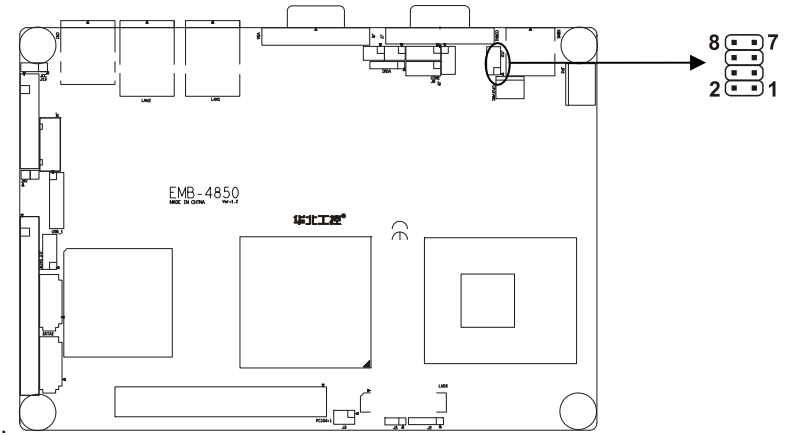


KBM1：

Signal name	Pin
KB_DATA	1
MS_DATA	2
GND	3
+5V	4
KB_CLK	5
MS_ CLK	6

2.6.13 Front Panel Connector (J10)

This connector mainly supply power indicator led , hard disk indicator led , power restart indicator led, power auto-manage indicator led, restart button and sleep button etc. connecting pin.



Signal description	Pin		Signal description
POWERSW-	1	2	5VSB
RSTBTN#	3	4	GND
GRELED+	5	6	GRELED-
HDD LED+	7	8	HDD LED-

1) Power On/Off Control Pins (J10 pin1&2 for PWRSW)

Connect these two pins with bounce switch on panel of chassis, can switch-on or switch-off power.

2) Reset Button Pins(J10 pin3&4 for RESET)

Connect this pins and RESET switch on panel of chassis with cable. When system can not work on, reset can make system restart, without turning on/off the power, thereby it can prolong system serviceable life.

3）Sleep LED Pins(J10 pin 5&6 for GREEN LED)

Connect these two pins with power LED(Pin5 is anode),when it is power-on, LED light on; power-off, LED light off; winking means sleeping

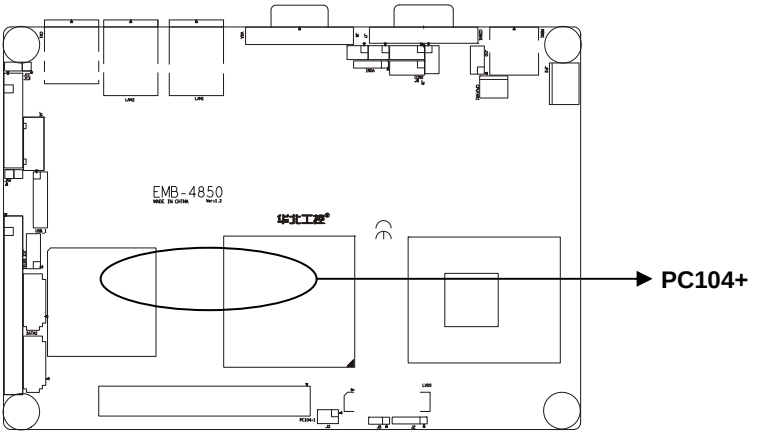
4) IDE LED Pins (J10 pin7&8 for HDD LED)

As a rule, there is a IDE LED on the panel of chassis, while IDE device(like hard Disk) is reading or writing(no matter which IDE device), LED will flash, shows that IDE Device is

running. Connect IDE LED on chassis panel and these pins (pin20 is LED anode).

2.6.14 PC/104+

A standard PC104 + expansion slot, users can choose a different PC/104 + extension according to their own needs . different modules of the input voltage is not the same, you can through the PC/104 + module voltage jumper to set.

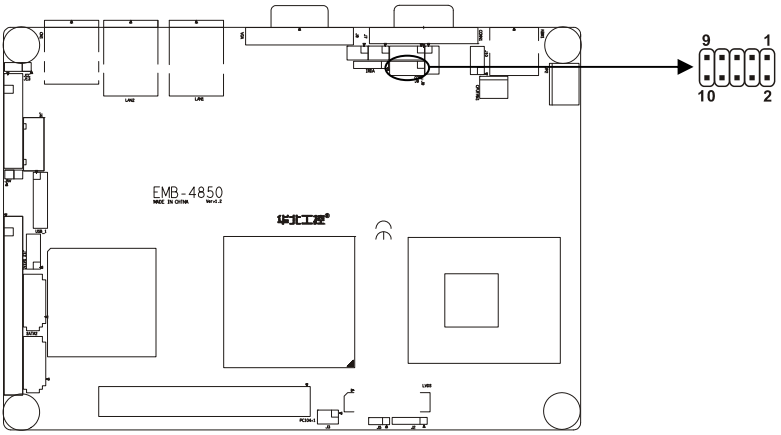


Pin	Signal name	Pin	Signal name	Pin	Signal name	Pin	Signal
A1	GND/5V	B1	NC	C1	+5V_4	D1	AD00
A2	VI/O_0	B2	AD02	C2	AD01	D2	+5V_7
A3	AD05	B3	GND_6	C3	AD04	D3	AD03
A4	C/BE#0	B4	AD07	C4	GND_11	D4	AD06
A5	GND_0	B5	AD09	C5	AD08	D5	GND_17
A6	AD11	B6	VI/O_1	C6	AD10	D6	M66EN
A7	AD14	B7	AD13	C7	GND_12	D7	AD12
A8	+3.3V_0	B8	C/BE#1	C8	AD15	D8	+3.3V_7
A9	SERR#	B9	GND_7	C9	SB#0	D9	PAR
A10	GND_1	B10	PERR#	C10	+3.3V_5	D10	SDONE
A11	STOP#	B11	+3.3V_3	C11	LOCK#	D11	GND_18
A12	+3.3V_1	B12	TRDY#	C12	GND_13	D12	DEVSEL
A13	FRAME#	B13	GND_8	C13	IRDY#	D13	+3.3V_8

A14	GND_2	B14	AD16	C14	+3.3V_6	D14	C/BE#2
A15	AD18	B15	+3.3V_4	C15	AD17	D15	GND_19
A16	AD21	B16	AD20	C16	GND_14	D16	AD19
A17	+3.3V_2	B17	AD23	C17	AD22	D17	+3.3V_9
A18	IDSEL0	B18	GND_9	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	C/BE#3	C19	VI/O_3	D19	IDSEL3
A20	GND_3	B20	AD26	C20	AD25	D20	GND_20
A21	AD29	B21	+5V_2	C21	AD28	D21	AD27
A22	+5V_0	B22	AD30	C22	GND_15	D22	AD31
A23	REQ#0	B23	GND_10	C23	REQ#1	D23	VI/O_4
A24	GND_4	B24	REQ#2	C24	+5V_5	D24	GNT#0
A25	GNT#1	B25	VI/O_2	C25	GNT#2	D25	GND_21
A26	+5V_1	B26	CLK0	C26	GND_16	D26	CLK1
A27	CLK2	B27	+5V_3	C27	CLK3	D27	GND_22
A28	GND_5	B28	INTD#	C28	+5V_6	D28	RST#
A29	+12V	B29	INTA#	C29	INTB#	D29	INTC#
A30	-12V	B30	NC	C30	NC	D30	GND

2.6.15 GPIO (J6)

The board supports 8-bit GPIO through GPIO connector. The 8 digital in and out-puts can be programmed to read or control devices, with input or out- put defined. The default setting is 4 bits input and 4 bits output.



J6：

Signal name	Pin		Signal name
GPIN 1	1	2	GND
GPIN 2	3	4	GPOUT 1
GPIN 3	5	6	GPOUT 2
GPIN 4	7	8	GPOUT 3
GND	9	10	GPOUT 4

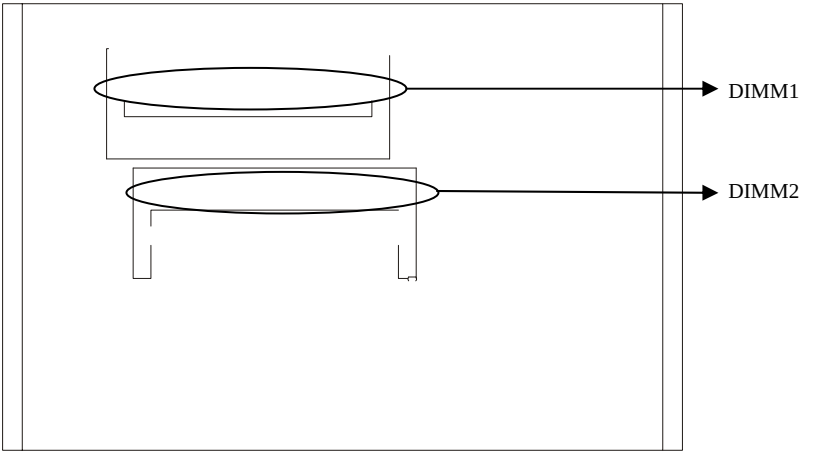
2.6.16 System Memory

Two SO_DDR2 dual-channel DDR Ⅱ socket(show as SO_DDR1&SO_DDR2)on board, when fixing memory bank, pay attention to following advice：

1. During fixing, make its nick aim at the nick of SO-DIMM socket , and work the memory bank in its socket sideling, then press it adown to the right position, make the handle beside SO-DIMM socket lock the memory tightly.

2. Support DDR Ⅱ 533/667MHz memory, max. up to 2GB.

3. Recommend using memory with SPD (the memory with auto-detect function), insure memory work stability.


DIMM1
DIMM2

Chapter 3
BIOS Setup

Chapter 3 BIOS Setep

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 4850I101.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

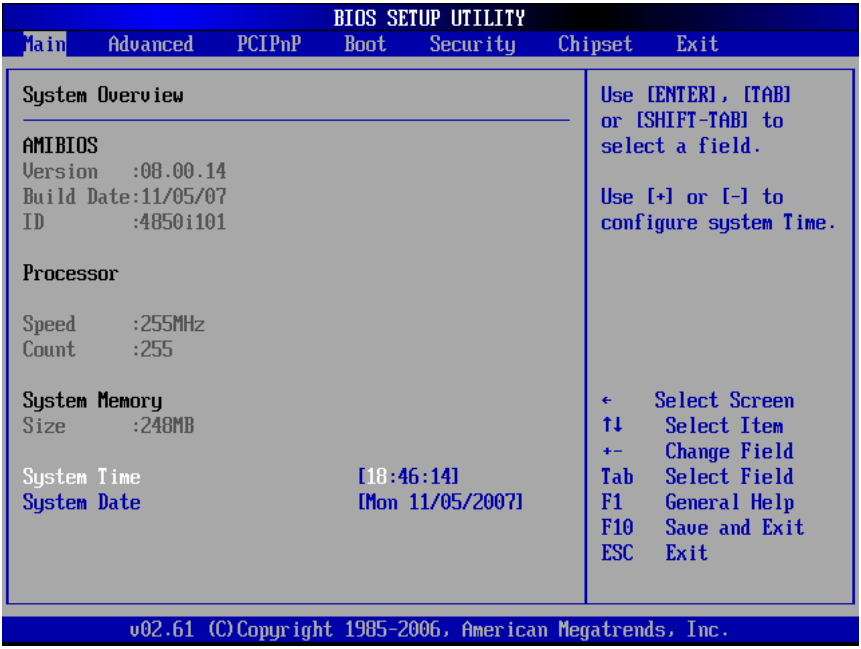
Power on your computer, when this information display in your screen: Del->SETUP please press “DEL”, then it will enter BIOS setup interface.

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, or use Mouse do this operation..
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

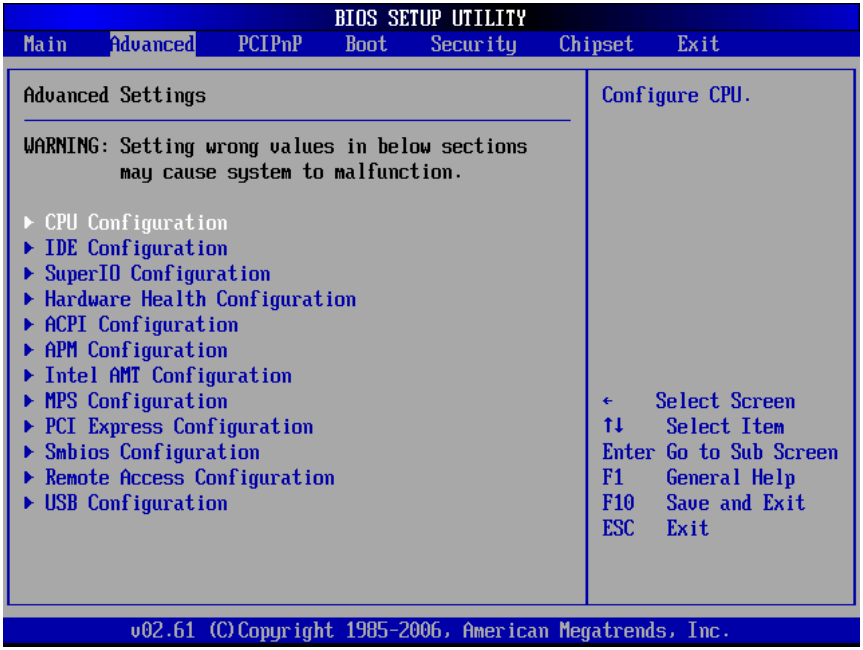
System Time

Format: Hour/Minute/Second

System Date

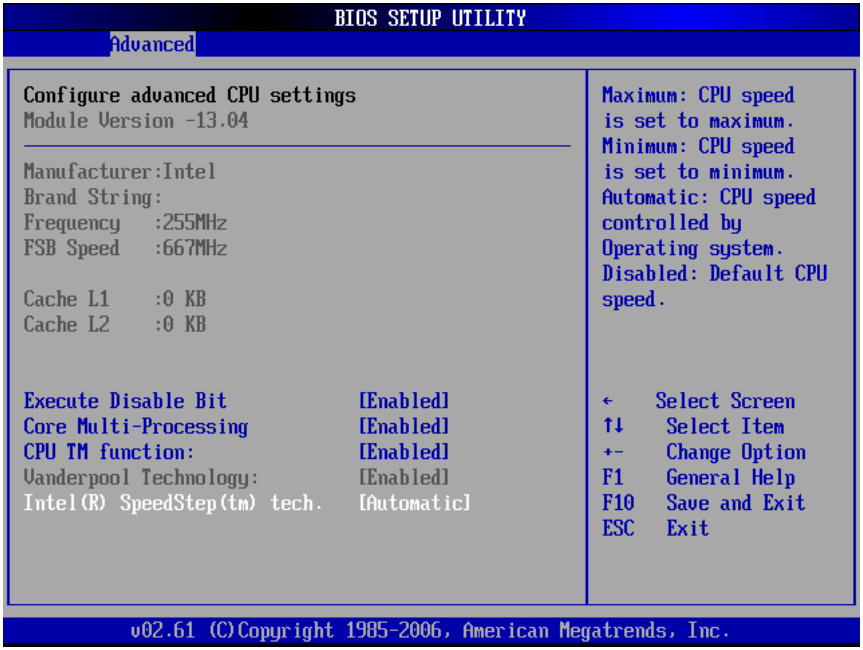
Format: Day/Month/Date/Year； <Day> is Read only. <Month><Date><Year> can be set by user

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…

Execute Disable Bit

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.

Core Multi-Processing

This option can ensure kernel load dual-processor in best way

Enabled: use multi-kernel CPU。

Disabled: use one of CPU.

CPU TM function

For enable/disable CPU in-house temperature controlling functions。

Venderpool Technology

Operating System imaginary technology of Intel。It makes one computer run even number OS, VT Tech makes processor with and/or virtual tech. By Vanderpool Technology, we can run two OS on one computer at one time, one processor run one OS, the other processor run another OS.

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.

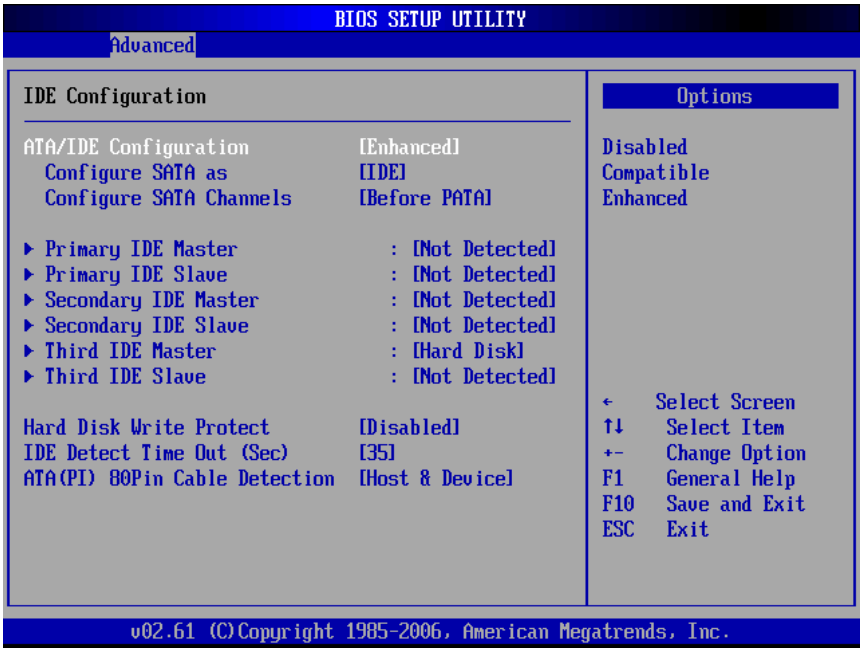
Automatic: CPU service frequency self-regulation according to amount of process

Maximum: CPU always run in highest speed

Minimum: CPU always run in lowest speed

Disable: close it

3.2.2 IDE Configuration



ATA/IDE Configuration

This file is for selecting ATA/IDE Configuration mode.

Configure SATA as

SATA configuration mode selection, you can set it as [RAID], [AHCI] or [IDE]

Configure SATA channels

SATA Channels selection，option have Before Pata，After Pata

Primary/Secondary/ Third IDE Master/Slave

IDE device works mode setup: including Type, LBA/Large Mode, Block mode (Multi-Sector Transfer), PIO Mode, DMA Mode, S.M.A.R.T, 32Bit Data Transfer.

Norco strongly recommends default setting: Let system auto setup your device; if want self-config, please confirm your Hard Disk information and whether it supports these work modes or not.

Hard Disk Write Protect

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

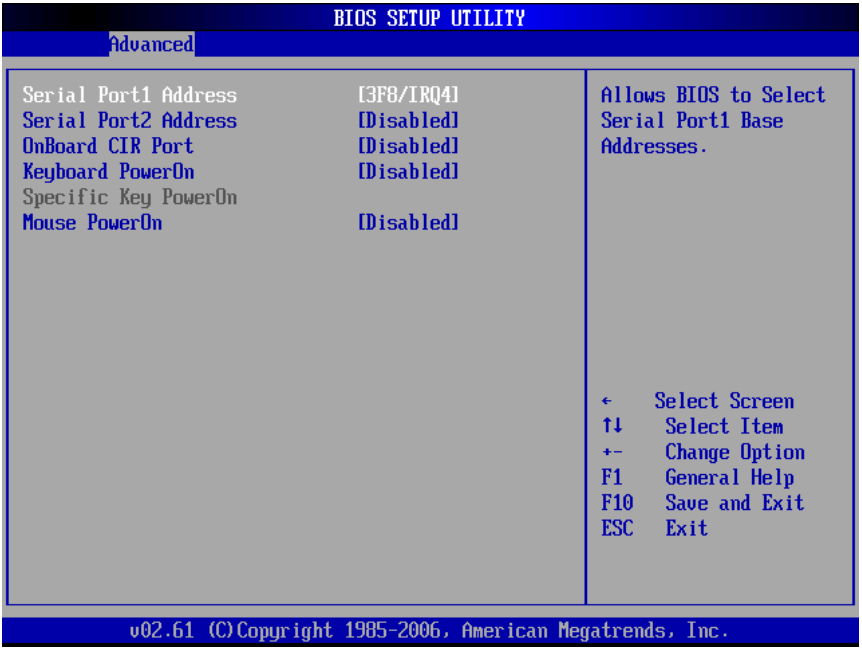
IDE Detect Time Out (Sec)

Set BIOS searching IDE device in appoint time (by seconds)

ATA(PI) 80Pin Cable Detection

Set detecting 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 are pin compatible.

3.2.3 SupperIO Configuration



Serial Port1 Address

Setup Serial Port1 interrupts and addresses.

Recommend Default set.

Serial Port2 Address

Setup Serial Port2 interrupts and addresses.

Recommend Default set.

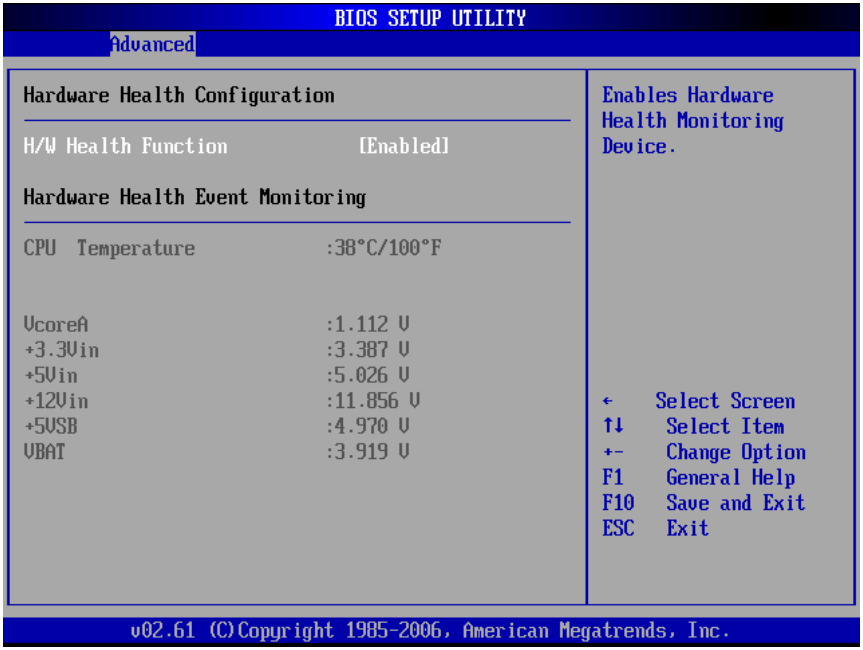
On Board CIR Port

This option for configure on board CIR port ,<Enabled>: Open ,<Disabled>: Close

Keyboard/ Mouse PowerOn

Support Keyboard/ Mouse Power On, <Enabled>: Open ,<Disabled>: Close

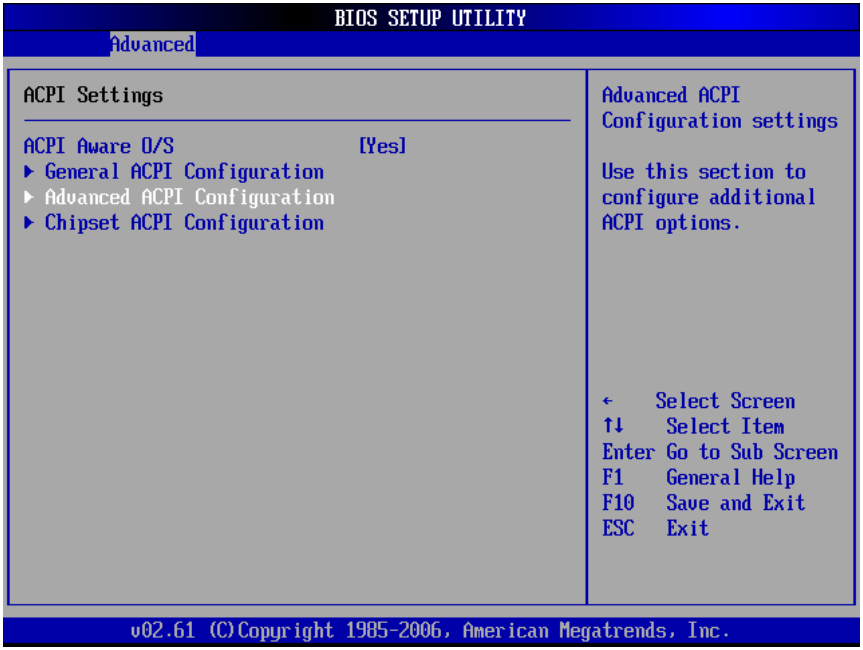
3.2.4 Hardware Health Configuration



Hardware Health Configuration

Enter this option to examine hardware health，such as CPU temperature，system temperature etc

3.2.5 ACPI Configuration



ACPI Aware O/S

If you choose <Yes> and system support ACPI, BIOS will according to ACPI criterion to distribute resource and system will use the resource to manage system power.

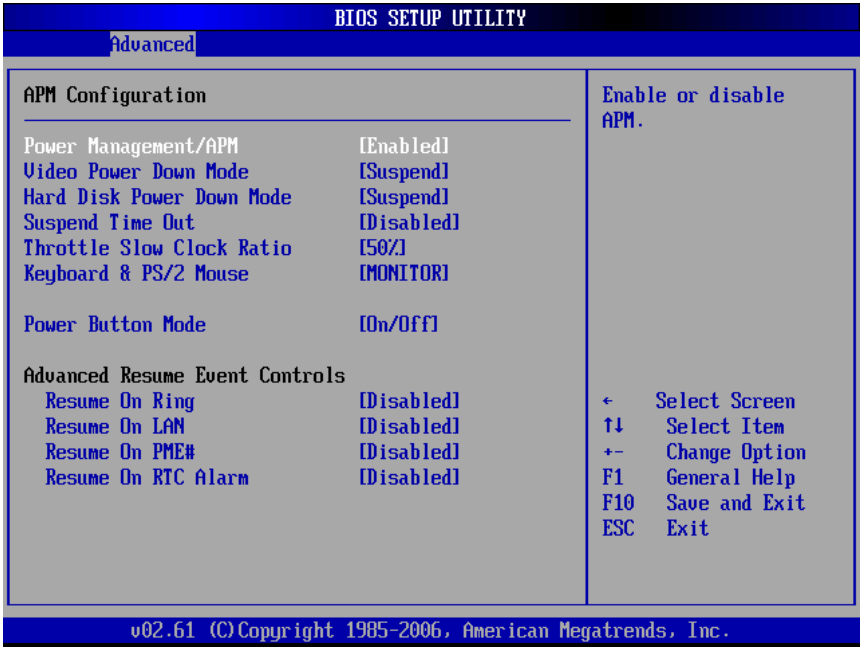
(1) General ACPI Configuration

(2) Advanced ACPI Configuration

(3) Chipset ACPI Configuration

ACPI options above are recommended to be kept as optimization setting by system

3.2.6 APM configuration



Power Management/APM

<Enable>: open power saving mode.

<Disable>: close power saving mode

Video Power Down Mode

Video power down mode setting，options <Suspend><Stand by><Disable> for select.

Hard Disk Power Down Mode

Hard disk power down mode setting，options <Suspend><Stand by><Disable> for select.

Suspend Time Out

Set the time limit when system detecting no operation to enter “suspend” mode. The time limit can be set from 1~60 minutes.

Throttle Slow Clock Ratio

If started up CPU power-save mode，when CPU temperature reaches a fixed value，this

option will show the CPU slow clock ratio.

Keyboard & PS/2 Mouse

If you want set keyboard and PS/2 mouse activities as power-management event, if so, set Power Management/APM as Enabled, not for Disabled.

Power Button Mode

<Instant Off>: Press “Power” key, system will power on/off.

<Suspend>: Press “Self off after 4sec override” key and system will reboot 4Sec later.

Resume On Ring, LAN, PME#

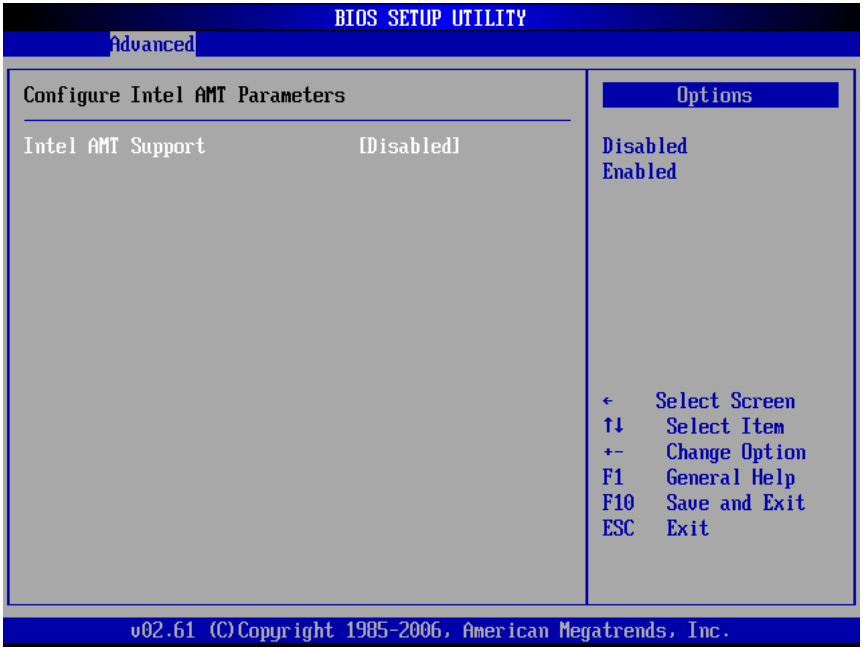
Set if Ring, LAN, PME can resume your PC, < Enabled> for yes, <Disabled> for no.

Resume On RTC

If timing boot, <Disabled> for no, <Enabled>: Pop-up a window shown two options as below:

1. <RTC Alarm Date(days)>：for setting the date to boot, selection bound from the 1st to 31st, also can be set as Every Day, it means timing resume everyday at this time.
2. <System Time>：for setting the time to boot, format is: Hour/Min/Sec

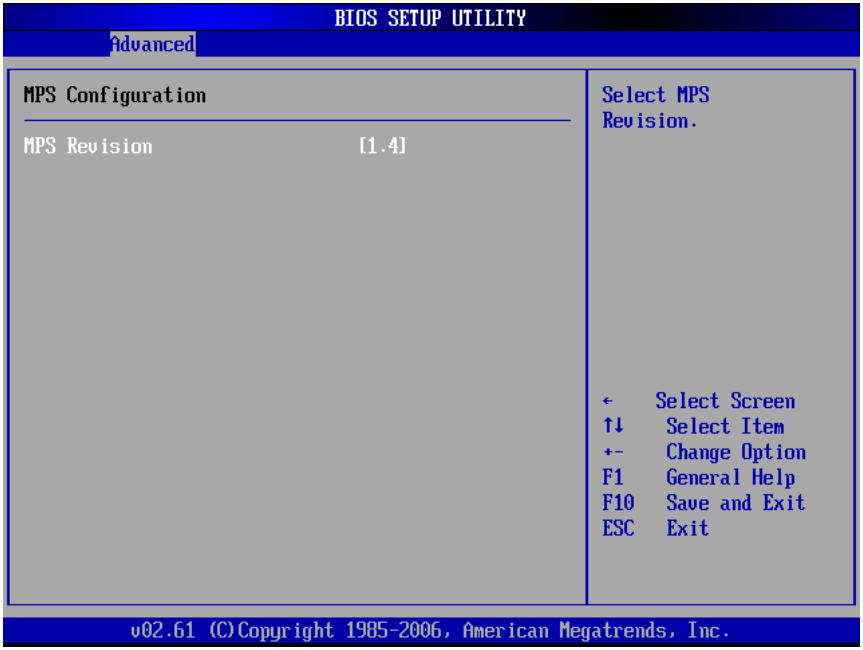
3.2.7 Intel AMT Configuration



Intel AMT Support

Intel AMT, EMB-4850 not support this function pro tempore

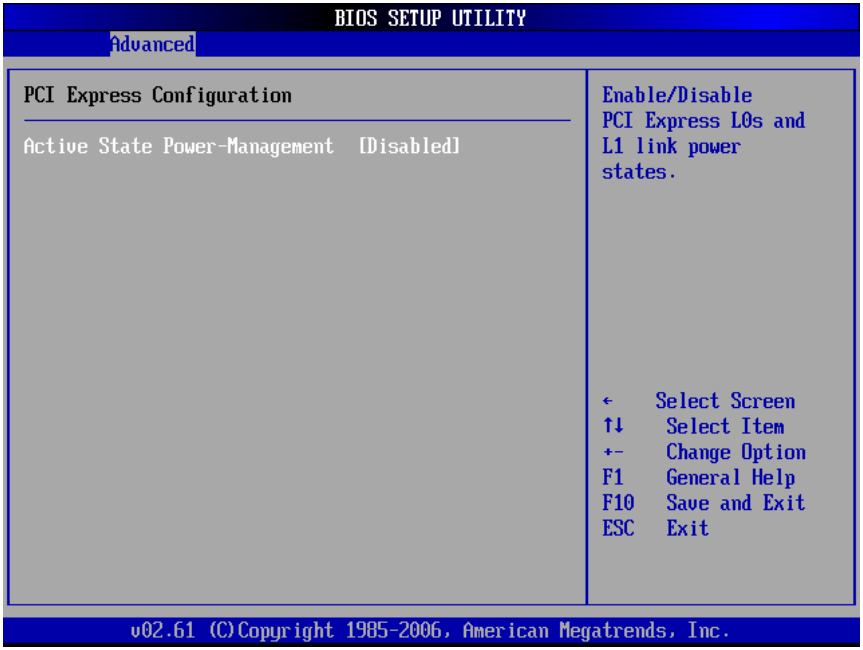
3.2.8 MPS Configuration



MPS Revision

It contains MPS Revision options. MPS is Multi Processor Specification for short, this option make sense just when the system with Multi Processor or Virtual Processor. MPS have two versions of 1.1 and 1.4. For the OS those advanced than Win2000 are completely compatible to MPS 1.4, and for the OS version former than WinNT, must select version 1.1. Wrong set will cause the second processor to be closed.

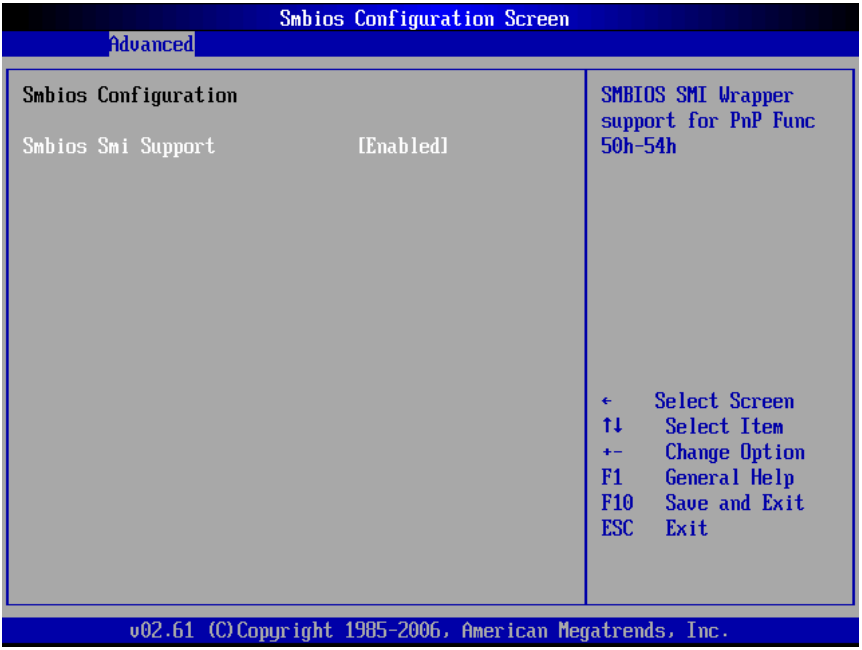
3.2.9 PCI Express Configuration



Active State Power-Management

Active State Power-Management technology，[Enabled]:open，[Disabled]:Close

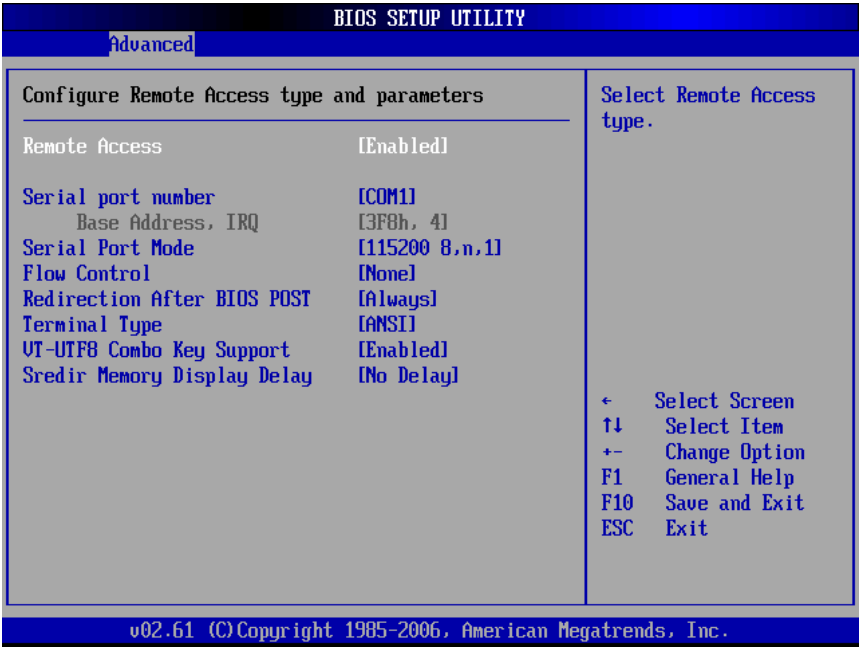
3.2.10 Smbios Configuration



Smbios Smi Support

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

3.2.11 Remote Access Configuration



Remote Access

If support remote access, yes as [Enabled], no as [Disabled]

Serial Port number

This option for user choose Serial Port number

Serial Port Mode

This item for user choose Serial Port Mode

Flow Control

Flow control.

Redirection After BIOS POST

After BIOS POST do redirection, [Enabled], [Disabled] for select.

Terminal Type

Terminal type selection

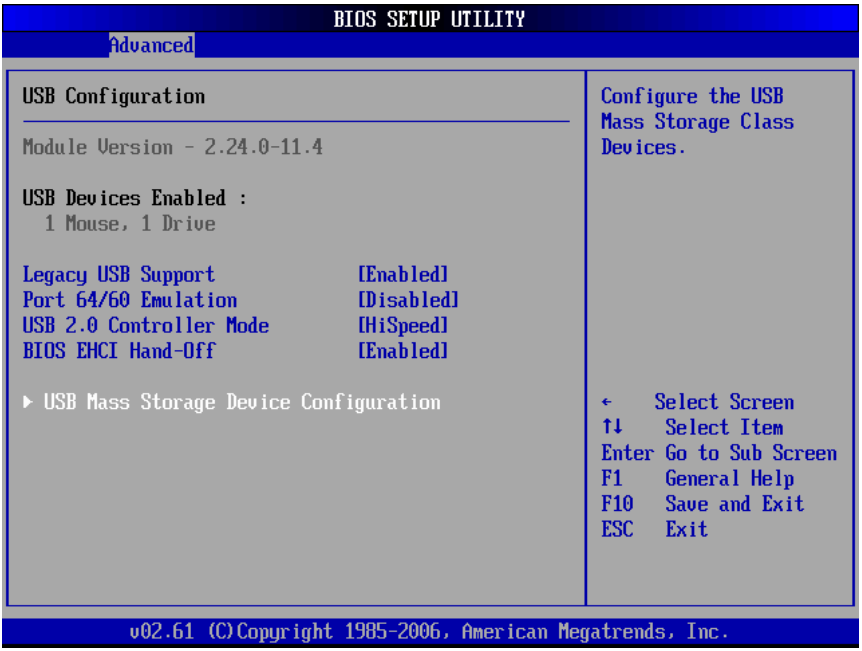
VT-UTF8 Combo Key Support

Both support VT and UTF8 ? yes as [Disabled], no as [Enabled]

Sredir Memory Display Delay

Serial port terminal display delay.

3.2.12 USB Configuration



USB Devices Enabled（read only）

This item display system annectent USB device

Legacy USB Support

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

Port 64/60 Emulation

This option is for control USB port 64/60 emluator function. When it startup this function,

USB keyboard can gather some special key combination.Close：<Disabled>,Open：< Enabled>

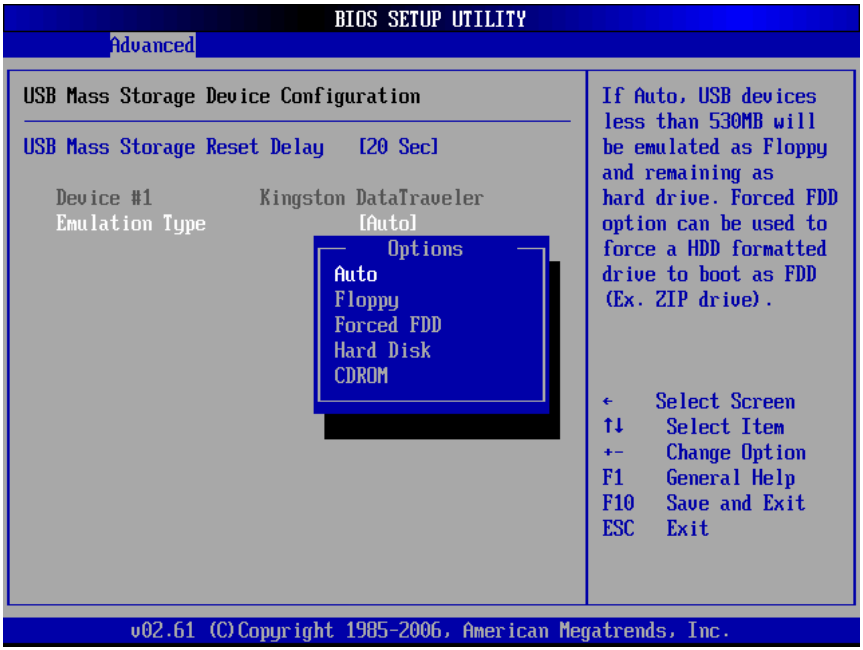
USB 2.0 Controller Mode

This option for choose USB2.0 port mode, <FullSpeed>: USB port 2.0 (480Mbps). <HiSpeed>: USB port 1.1 (12Mbps).

BIOS EHCI Hand-Off

<Enabled>：When enter OS, BIOS auto close. <Disabled>：When enter OS, BIOS closed by OS.

USB Mass Storage Device Configuration



USB Mass Storage Reset Delay

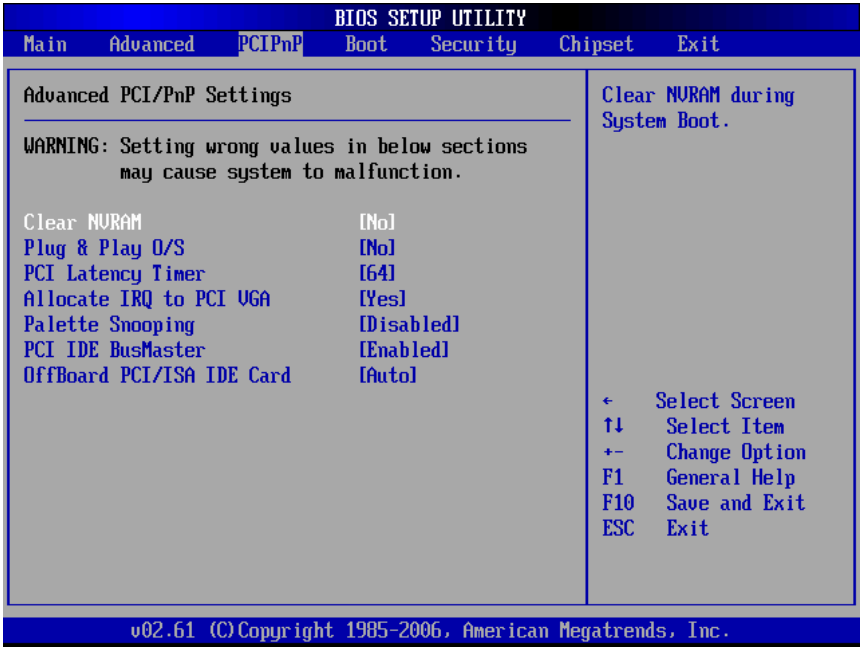
This option allows you to choose your system bios usb storage devices to detect the waiting time

Emulation Type

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

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

3.3 PCIPNP



WARMING：Setting wrong values in below sections may cause system to malfunction.

Clear NVRAM

YES**:** after system reboot reset ESCD NVRAM and reset it as NO.

Plug & Play O/S

If OS support hot swap devices, select yes, in this case, system will amend interrupt, I/O and DMA. If not select No, so BIOS will distribute resources to all devices.

PCI Latency Timer

All PCI latency timer setting. Unit is PCI clock period.

Allocate IRQ to PCI VGA

<Yes>: Allocate IRQ to PCI VGA card

<No>: can not use PCI VGA card

Palette Snooping

Yes: it will inform PCI devices it installed an device based on ISA at this moment, if you want change the default setting, please consult adapter's manual first, or set it as No.

PCI IDE BusMaster

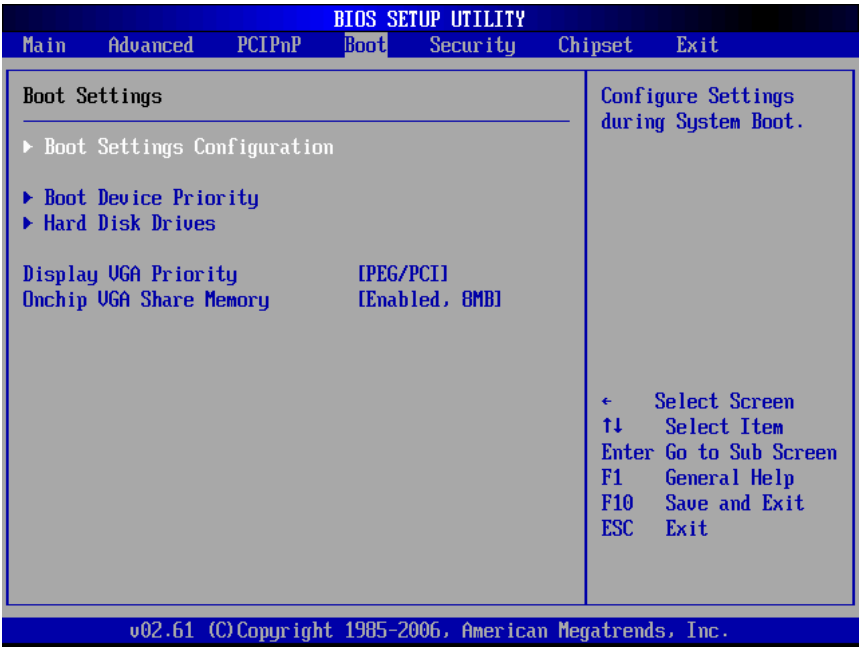
<Enabled>: Open BusMaster function: improve PCI IDE device transfer speed.

<Disabled>: close BusMaster function.

OffBoard PCI/ISA IDE Card

<Auto>: System detect device automatically.

3.4 Boot Menu



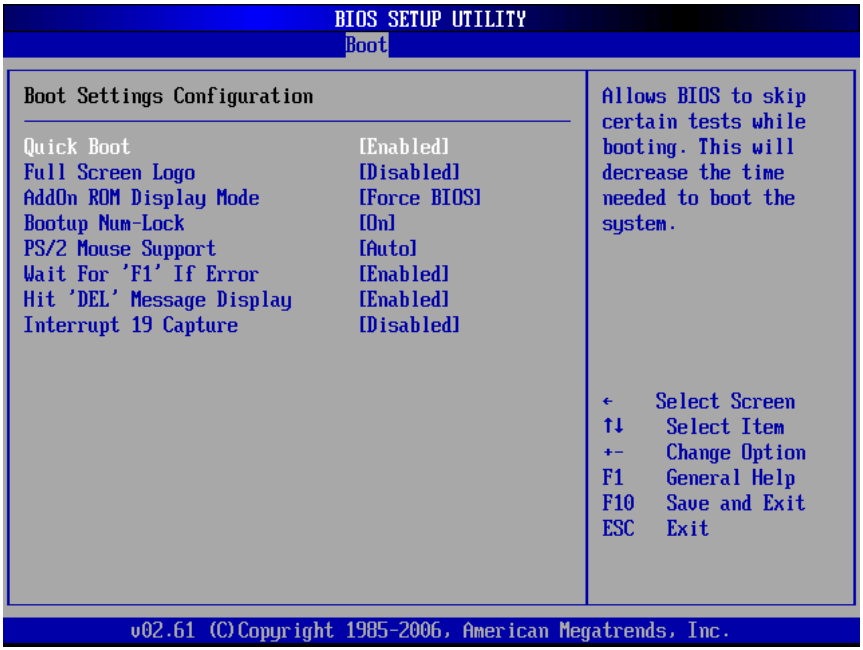
Display VGA Priority

Display VGA priority set.

Onchip VGA Share Memory

Shared graphic memory size setting, this option only take effect before VGA driver loading, after driver loading, it will redistribute graphic memory according to system memory, size up to 224M.

3.4.1 Boot Settings Configuration



Quick Boot

<Enabled>: Load OS without BIOS self-detecting,

<Disabled>: Load OS after BIOS detected.

Full Screen Logo

<Enabled>:Show user-defined welcome interface before you loading OS,

<Disabled>:Show default welcome interface before you loading OS

AddOn ROM Display Mode

For choosing Option ROM display mode,Setting value：[Force BIOS][Keep Current].

Bootup Num-lock

Num-lock state while boot (on/off)

PS/2 Mouse Support

PS/2 mouse support setting

<Enabled>: support

<Disabled>: not support

<Auto>: automatically

Wait For "F1" If Error

<Enabled>: waiting user press "F1" if OS detect incorrectly.

<Disabled>: neglect errors, directly loading OS

Hit 'DEL'Message Display

<Enabled>: When display BIOS logo, also has 'DEL' notice

<Disabled>: No 'DEL' notice.

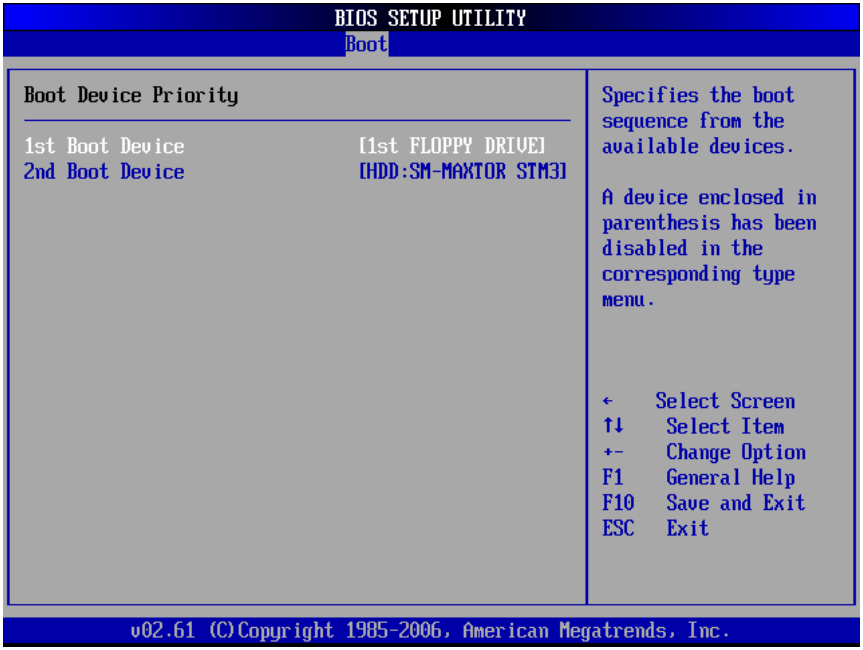
Interrupt 19 Capture

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

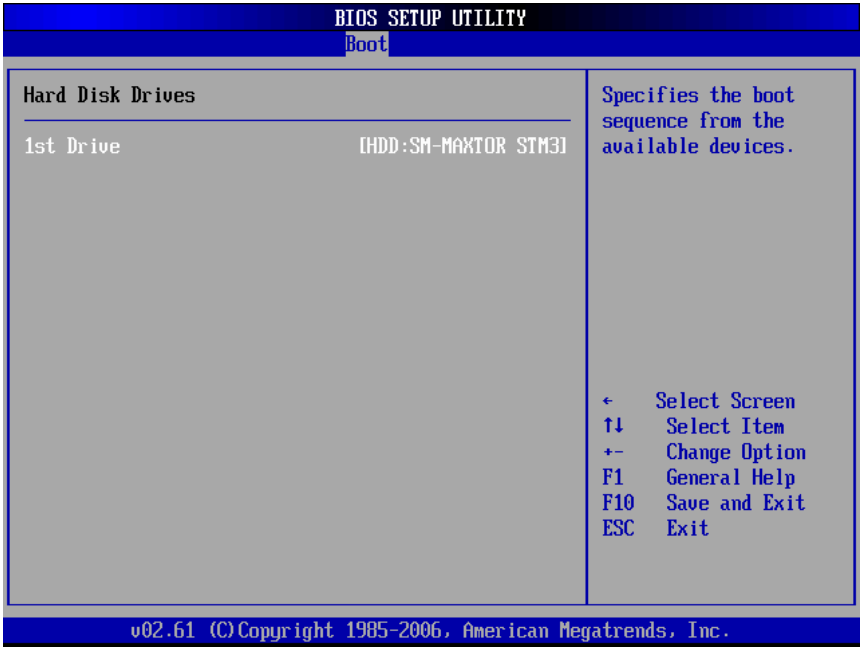
Press “Enter” will has sub-menu:

1st Boot Device

2nd Boot Device

System will detect device after this priority until find an available boot device,Boot device support Removable Drive or Hard Disk Drive

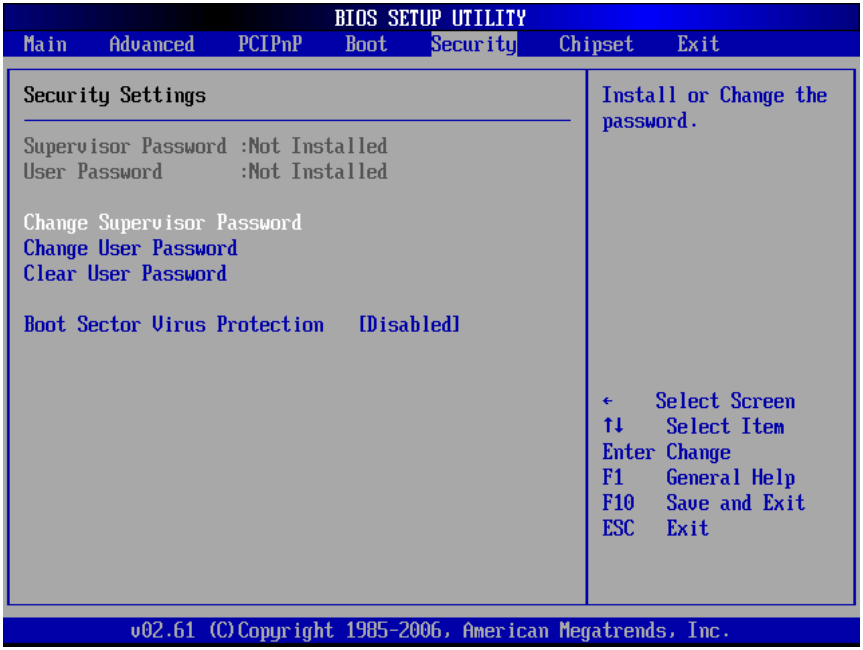
3.4.3 Hard Disk Driver



Hard Disk Drives

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!!!

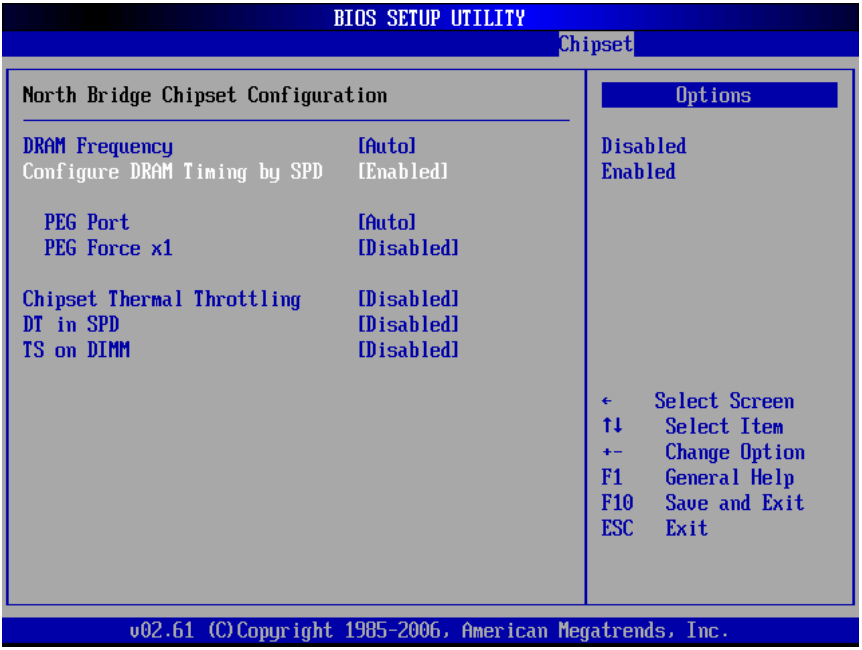
Possible VIRUS: Continue (Y/N)? _

(Must press much 'N' and skip up)

<Disabled>: close this function.

3.6 Chipset Menu

3.6.1 North Bridge Configuration



DRAM Frequency

Please config memory frequency according to its parameter, advice setting [Auto]。

Configure DRAM Timing by SPD

<Enabled> system auto-setting memory parameter by SPD .

<Disabled>: Manual setting memory parameter by entering submenu.

PEG Port

PCI Express Graphics port ,open or close, default set is <Auto>

PEG Force×1

PCI Express Graphics port transmission speed setting

<Enabled>:×1 mode,

<Disabled>:default

Chipset Thermal Throttling

Function of CPU thermal throttling, enter in it, you can set its temperature and enable it or not

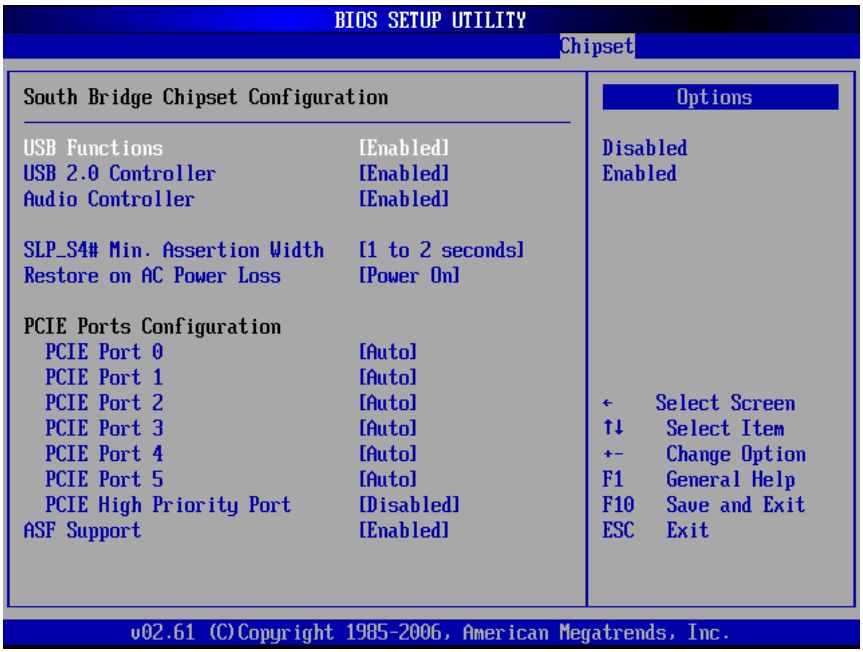
DT in SPD

Delta temperature (DT) in SPD.

TS on DIMM

TS on DIMM Tech, utilize a physic heat sensor integrated in DIMM to monitor DIMM temperature.

3.6.2 South Bridge Configuration



USB Functions

Option setting Whether to open USB functions,[Enable: open],[Disable: close]

USB 2.0 Controller

Set USB2.0 port open/close

Audio Controller

Set on-board audio open/close

SLP_S4# Min. Assertion Width

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

Restore on AC Power Loss

<Power Off>: boot system after press power button while power supply connected

<Power On>: boot system straightway while power supply connected

<Last State>: according to the setting by last time.

PCIE Ports Configuration

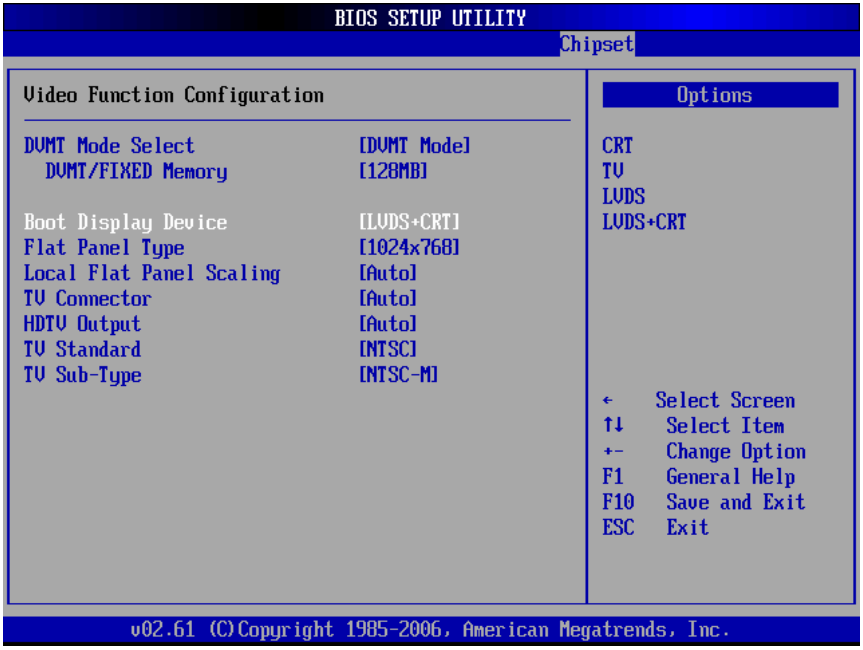
PCIE Port0-5

South Bridge integrate 6 PCIE-X priority

PCIE High Priority Port

Set PCIE port priority

3.6.3 Video Function Configuration



DVMT Mode Select

Setup the first used internal display device, can be set as：[Fixed Mode] [DVMT Mode].

[DVMT]: dynamic shared graphic memory size, driver will dynamic distribute system memory size to it

[FIXED]: fixed shared memory, driver will distribute system memory size according to BIOS setting

DVMT/FIXED Memory

Show DVMT/Fixed memory size.

Boot Display Device

Display devices setting, such as LVDS+CRT, CRT, LVDS, TV etc.

Flat Panel Type

This option is for set LCD type and resolution

Local Flat Panel Scaling

LVDS full screen display or all content display setting

TV Connector

TV-OUT port selection

HDTV Output

High-Definition TV output format set.

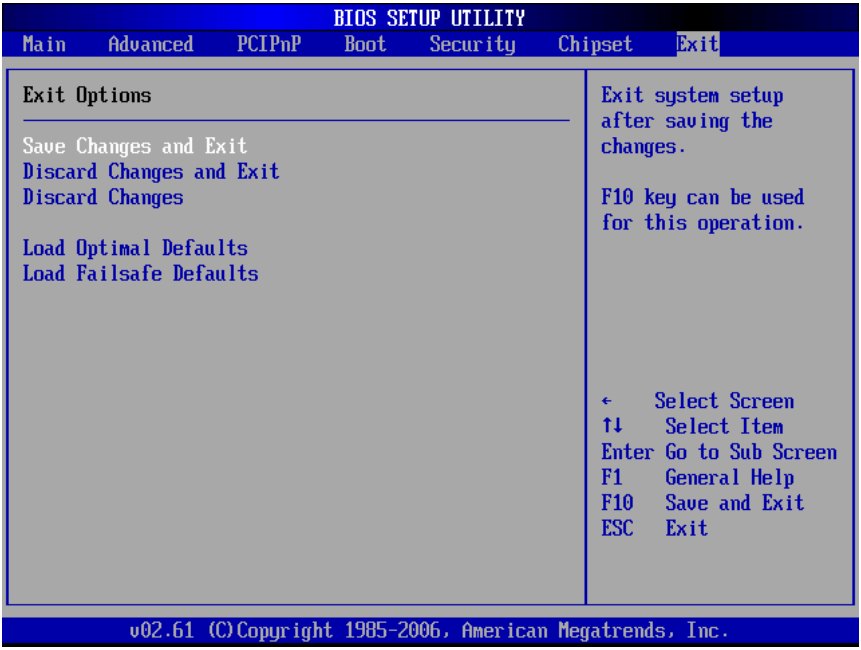
TV Standard

TV output type selection

TV Sub-Type

TV output sub-type selection

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 user first to 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 following steps：

1: click right on "My Computer" icon on the desktop, and then select "Properties" in the pop-up menu, and enter "System Properties" menu.

2: Select the "hardware" tab, then enter the "Device Manager", double-click on the yellow question mark or an exclamation point with the hardware "in upgrading Driver" and enter "hardware Update Wizard."

3: Choose "from the list or specified location to install (Senior)" to enter the next step, select "search in these locations on the best driver," then "Search removable media……" and "in the search included in this position " " √ " bear.

4: Click on "Browse", please place the location of browse to the disc corresponding folder, find the correct driver installation file and then click OK to enter the next step.

5: Complete the installation of hardware according to prompts, then restart your computer to drive the entry into force.

6: Repeat steps 1-5 to complete all procedures for the installation of hardware drivers.

Appendix 2：Watchdog programmer guide

watchdog Timer Setting（ASM）:

Set Watchdog Timer as 48 sec.（max. support 0xFF=255, set as 00 to stop watchdog）, run debug in DOS mode：2EH: address port, 2FH: data port

```
C:\>debug
-o 2e 87
-o 2e 87            ;decode
-o 2e 2b
-o 2f e0            ;bit4=0 ,set pin as watchdog func
-o 2e 07
-o 2f 08            ; select logic device
-o 2e 30
-o 2f 01            ;logic device activation
-o 2e f5
-o 2f 00            ;set count unit as second/（minute as o 2f 08）
-o 2e f6
-o 2f 30h           ;set Timer unit as 30h=48 sec.
-o 2fe aa           ;lock register
-q
C:\>
```

System will reboot after 48sec. time counting till user input last line of codes

==========

Watchdog Timer Setting (c++ language)：

```
outputb (0x2e, 0x87)
outputb (0x2e, 0x87)      // open SUPER IO register
outputb (0x2e, 0x2B)
outputb (0x2f, 0xE0)      //bit4=0 ,set pin as watchdog func
outputb (0x2E, 0x07)
outputb (0x2F, 0x08)      //select logical device
```

```
outputb (0x2e, 0x30)
outputb (0x2f, 0x01)       //active the device
outputb (0x2e, 0xF5)
outputb (0x2f, 0x00)       //set timer unit as second /（minute: outputb (0x2f, 0x08)）
outputb (0x2e, 0xF6)
outputb (0x2f, 0x30)       //set Timer Count as 30h=48second
outputb (0x2E, 0xAA)       //lock SUPER IO register
//------- code end ---------------------------------
```

Appendix 3: Glossary

ACPI:

Advanced Configuration and Power Management Interface for short,ACPI specification allows 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 Baby AT. 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, it's a semiconductor device. It will shine 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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