IM-GM45-D

MS-9834 (v1.x) Industrial Computer Board

Copyright Notice

The material in this document is the intellectual property of **MICRO-STAR INTER-NATIONAL**. We take every care in the preparation of this document, but no guarantee is given as to the correctness of its contents. Our products are under continual improvement and we reserve the right to make changes without notice.

Trademarks

All trademarks are the properties of their respective owners.

- ■ MSI® is registered trademark of Micro-Star Int'l Co.,Ltd.
- ■ NVIDIA® is registered trademark of NVIDIA Corporation.
- ■ ATI® is registered trademark of ATI Technologies, Inc.
- ■ AMD® is registered trademarks of AMD Corporation.
- ■ Intel® is registered trademarks of Intel Corporation.
- ■ Windows® is registered trademarks of Microsoft Corporation.
- ■ AMI® is registered trademark of Advanced Micro Devices, Inc.
- ■ Award® is a registered trademark of Phoenix Technologies Ltd.
- ■ Sound Blaster® is registered trademark of Creative Technology Ltd.
- ■ Realtek® is registered trademark of Realtek Semiconductor Corporation.
- ■ JMicron® is registered trademark of JMicron Technology Corporation.
- ■ Netware® is a registered trademark of Novell, Inc.

Revision History

Revision	Revision History	Date
V1.0	First release	June 2009

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

◎　Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: *http://www.msi.com/index. php?func=service*

◎　Contact our technical staff at: *http://ocss.msi.com*

Safety Instructions

- Always read the safety instructions carefully.

- Keep this User's Manual for future reference.

- Keep this equipment away from humidity.

- Lay this equipment on a reliable flat surface before setting it up.

- The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.

- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.

- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.

- Always Unplug the Power Cord before inserting any add-on card or module.

- All cautions and warnings on the equipment should be noted.

- Never pour any liquid into the opening that could damage or cause electrical shock.

- If any of the following situations arises, get the equipment checked by service personnel:

  ○ The power cord or plug is damaged.

  ○ Liquid has penetrated into the equipment.

  ○ The equipment has been exposed to moisture.

  ○ The equipment does not work well or you can not get it work according to User's Manual.

  ○ The equipment has dropped and damaged.

  ○ The equipment has obvious sign of breakage.

  DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者:
這是甲類資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

廢電池請回收
For better environmental protection, waste batteries should be collected separately for recycleing special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against

CE $N1996$

harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

- ○ Reorient or relocate the receiving antenna.
- ○ Increase the separation between the equipment and receiver.
- ○ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ○ Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

FC Micro-Star International
MS-9834

OIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

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.

WEEE (Waste Electrical and Electronic Equipment) Statement

ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...
Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt
Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...
Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что....
В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:
Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat….
De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling. Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da…
Po Direktivi Evropske unije ("EU") o odbačenoj ekektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...
Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne " nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:
Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...
Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobce elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebírání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...
Az Európai Unió ("EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che….
In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adeguerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta

TABLE OF CONTENTS

Chapter 1
Overview

Thank you for choosing the IM-GM45-D (MS-9834 v1.X), an excellent industrial computer board from MSI.

Based on the innovative **Intel® GM45 & ICH9ME** chipsets for optimal system efficiency, the IM-GM45-D accommodates the latest 45nm **Intel® Penryn/Core 2 Extreme/Core 2 Quad/Core 2 Duo/Celeron M** processors in Socket P and supports up to 2 DDR2 667/800 SO-DIMM slots to provide the maximum of 4GB memory capacity.

In the advanced-level and mid-range market segment, the IM-GM45-D provides a high-performance solution for applications on digital signage, kiosk, gaming, and thin client.

MAINBOARD SPECIFICATIONS

Processor

- 45nm Intel Core 2 Duo Mobile / Celeron processors in Socket P

FSB

- 667/ 800/ 1066MHz

Chipset

- North Bridge: Intel GM45 chipset
- South Bridge: Intel ICH9ME chipset

Memory

- 2 DDR2 667/800 SO-DIMM slots (200 pins / 1.8V)
- Supports the maximum of 4GB

LAN

- Gigabit Fast Ethernet by Intel 82574L & 82567 GbE controller

SATA

- 4 SATAII ports by Intel ICH9ME
- Storage and data transfers at up to 3Gb/s

Audio

- HDA Codec by Realtek ALC888 7.1 channel
- Compliant with Azalia 1.0 specs
- 6 watt amplifier

Connectors

- Back Panel I/O
  - 1 serial port
  - 1 HDMI port
  - 1 DVI port
  - 2 Gigabit LAN jacks
  - 4 USB ports
  - 3 audio jacks
- Onboard Connectors/Pinheaders
  - 1 front panel audio pinheader
  - 1 USB 2.0 pinheader (2 ports)
  - 4 RS-232 serial port connectors

- 1 SPI Flash ROM pinheader (for debugging)
- 1 S/PDIF-out pinheader
- 1 LVDS connector
- 1 amplifier pinheader

Slot

- 1 Mini PCI-E slot
- 1 32-bit/33MHz PCI slot

Form Factor

- 170mm x 170mm

BLOCK DIAGRAM

Intel® Core™2 Duo &
Intel® Celeron® M (Penryn)

1066 FSB

2 x SO-DIMM

LVDS	SDVO
HDMI	SDVO
DVI	SDVO

Intel® GM45 Express GMCH

DDR2 667/800

8 USB 2.0 Ports
1 mini PCIe slot
4 SATA Ports
1 PCI

ICH9EM

Realtek ALC888
Intel 82574L Gigabit Network
Intel 82573L Gigabit Network
JMicron 368 PCI-E to IDE Controller

SPI

AMI BIOS

LPC

1 PATA

Winbond W83627DHG

1 RS-232

Fintek 81216G

4 RS-232
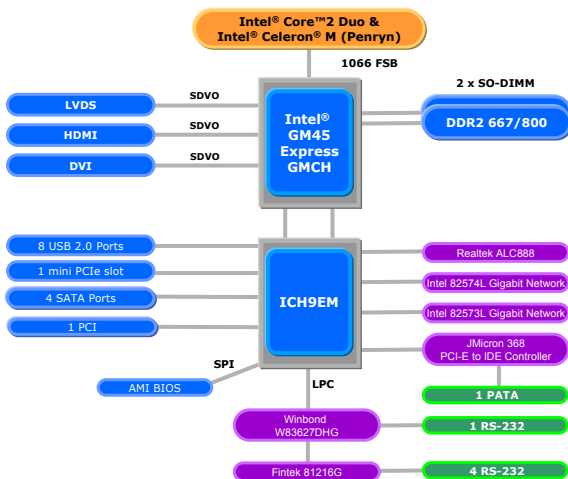
MAINBOARD LAYOUT
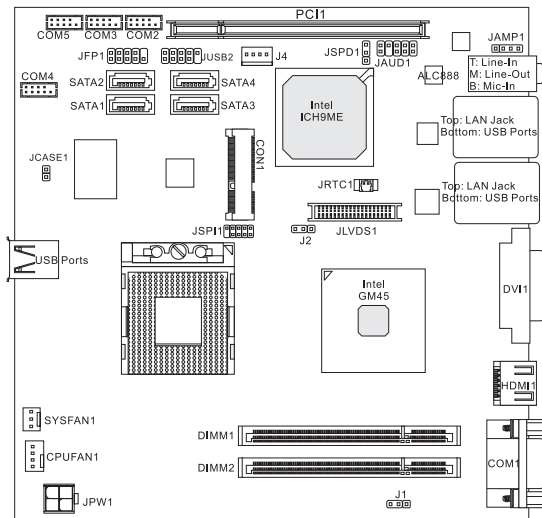
IM-GM45-D (MS-9834 v1.X) Mainboard

BOARD DIMENSION

Back Panel & I/O Shield Drawing
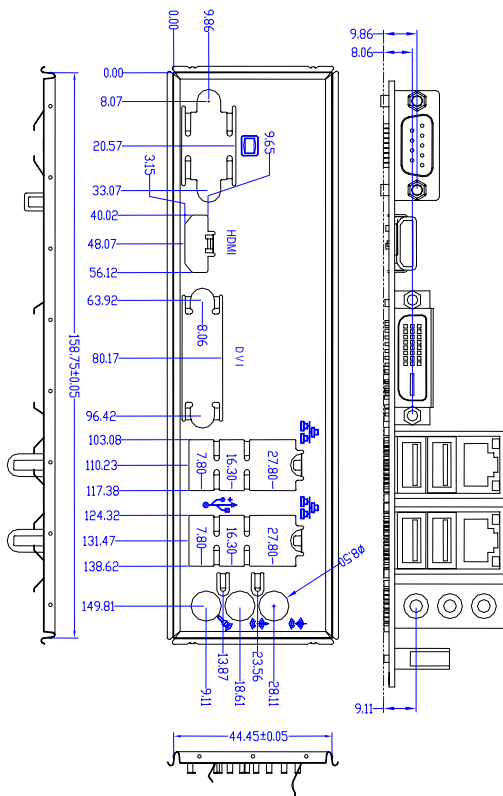
Power Consumption

Component	Description
Mainboard	MS-9834 Ver. 1.1
CPU	Intel Mobile Core 2 Duo 2.53G
Memory	Unigen 1GB DDR2 667
HDD	HITACHI 2.5" 320GB SATA II HDD
Operating System	Windows XP Professional SP2

	19V	Power (W)
Full Run	2.04 A	38.76 W
Idle Mode	0.90 A	17.2 W
S1	0.73 A	13.87 W
S3	0.058 A	1.102W
S4	0.036 A	0.684 W
S5	0.037 A	0.703 W

Safety Compliance & MTBF

Certification	Standard number		Title of standard
CE	RFI	EN 55022: 1998+A1: 2000+A2:2003 Class B	Product family standard
		EN 6100-3-2:2000 Class D	Limits for harmonic current emission
		EN 6100-3-3: 1995+A1:2001	Limitation of voltage fluctuation and flicker in low voltage supply system
	Immunity	EN 55024:1998+A1:20 01+A2:2003	Product family standard
BSMI	CNS 13438 乙類 (1997年版)		
C-Tick	AS/NZS CISPR 22:2004		
FCC	FCC CFR Title 47 Part 15 Subpart B: 2005 Class B		
	CISPR 22: 2005		
VCCI	VCCI V-3:2004, Class B		
	VCCI V-4:2004, Class B		

MTBF - Reliability Prediction

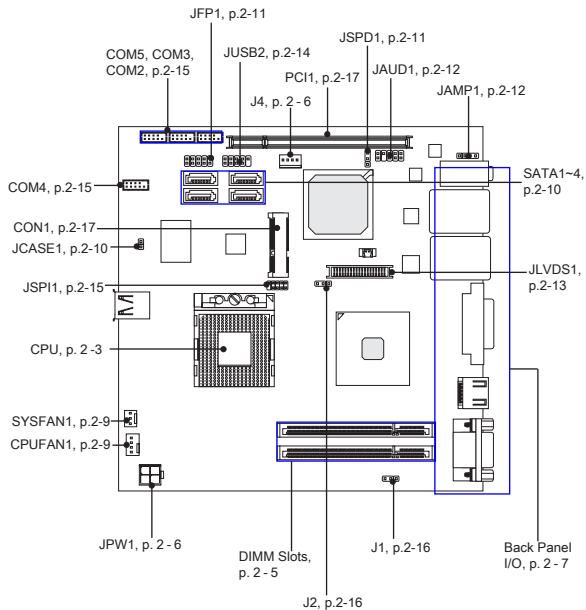| Calculation Model	Operation Temperature (°C)	Operation Environment	Duty Cycle	MTBF(hr.)
Telcordia Issue 1	40	GB, GC - Ground Benign, Controlled	17,917.991778	55,810

Chapter 2
Hardware Setup

This chapter provides you with the information on mainboard hardware configurations. Incorrect setting of jumpers and connectors may damage your mainboard. Please pay special attention not to connect these headers in wrong direction. DO NOT adjust any jumper while the mainboard is powered on.

QUICK COMPONENTS GUIDE

JFP1, p.2-11

COM5, COM3, COM2, p.2-15

JUSB2, p.2-14

JSPD1, p.2-11

PCI1, p.2-17

J4, p. 2 - 6

JAUD1, p.2-12

JAMP1, p.2-12

COM4, p.2-15

SATA1~4, p.2-10

CON1, p.2-17

JCASE1, p.2-10

JSPI1, p.2-15

JLVDS1, p.2-13

CPU, p. 2 -3

SYSFAN1, p.2-9

CPUFAN1, p.2-9

JPW1, p. 2 - 6

DIMM Slots, p. 2 - 5

J1, p.2-16

Back Panel I/O, p. 2 - 7

J2, p.2-16

CPU (Central Processing Unit)

When you are installing the CPU, make sure that you install the cooler to prevent overheating. If you do not have the CPU cooler, consult your dealer before turning on the computer.

Important

Overheating

Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.

Replacing the CPU

While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

CPU Installation

1.   Locate the CPU socket on the mainboard. On the upper end of the CPU socket is a socket actuator in the form of a slotted screw head. Make sure that you open or close the socket with a flathead screwdriver before and after installing the CPU.

2.   Turn the socket actuator counterclockwise to open the socket. Locate the golden arrow on the CPU and align it to the upper right corner of the socket. Put the CPU gently down. If the socket is completely opened, the CPU pins will securely fit into the socket.
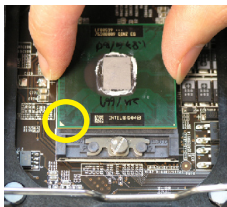
3.   Turn the socket actuator clockwise to close the socket.
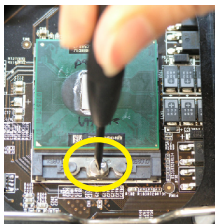
Important

Mainboard photos shown in this section are for demonstration only and may differ from the actual look of your mainboard.

Memory

These DIMM slots are intended for memory modules.

DDR2 SO-DIMM Slot
200-pin, 1.8V

Installing Memory Modules

1. Locate the DIMM1 SO-DIMM slot. Align the notch on the DIMM with the key on the slot and insert the DIMM into the slot at 45-degree angle.

2. Push the DIMM gently forwards until the slot levers click and lock the DIMM in place. Follow the same procedures to install the second DIMM if necessary.

3. To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly.

Important

- *You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.*

- *To enable successful system boot-up, always insert the DIMM into the **DIMM1 first**.*

POWER SUPPLY

System Power Connector: JPW1

This connector provides power to the system and CPU.

JPW1

JPW1 Pin Definition

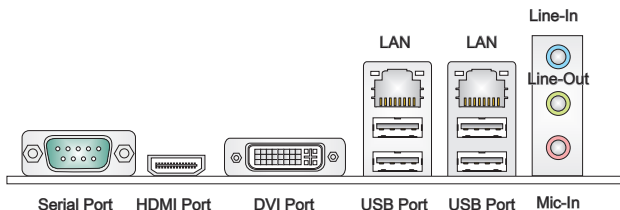| PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

SATA HDD Power Connector: J4

This connector provides power to the SATA hard disk drive.

+12V
GND
GND
VCC5

J4

Important

Power supply of 200watts (and above) is highly recommended for system stability.

BACK PANEL I/O

Serial Port   HDMI Port   DVI Port   USB Port   USB Port   Mic-In   LAN   LAN   Line-In   Line-Out

▶ **Serial Port**

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

▶ **HDMI Port**

The High-Definition Multimedia Interface (HDMI) is an all-digital audio/video interface capable of transmitting uncompressed streams. HDMI supports all TV format, including standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable.

▶ **DVI Port**

The DVI-D (Digital Visual Interface-Digital) connector allows you to connect an LCD monitor. It provides a high-speed digital interconnection between the computer and its display device. To connect an LCD monitor, simply plug your monitor cable into the DVI connector, and make sure that the other end of the cable is properly connected to your monitor (refer to your monitor manual for more information.)

▶ **USB Port**

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

► LAN

The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

Activity Indicator ———— ———— Speed Indicator

|		Left LED	Right LED
		Active LED	100M/1000M Speed LED
LED Color		Yellow	Green/Orange
10M Cable Plug-in	No Transmission	OFF	OFF
	Transition	Yellow (Blinking)	OFF
100M Cable Plug-in	No Transmission	OFF	Green (Lighting)
	Transition	Yellow (Blinking)	Green (Lighting)
1000M Cable Plug-in	No Transmission	OFF	Orange (Lighting)
	Transition	Yellow (Blinking)	Green (Lighting)
In S3/S4/S5 Standby State		Green (Lighting)	OFF

► Audio Ports

- Line-In (Blue) - Line In, is used for external CD player, tapeplayer or other audio devices.
- Line-Out (Green) - Line Out, is a connector for speakers or head-phones.
- Mic (Pink) - Mic, is a connector for microphones.

CONNECTORS

Fan Power Connector: CPUFAN1, SYSFAN1

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

```
CONTROL
SENSOR
+12V
GND
      CPUFAN1
```

```
SENSOR
+12V
GND
      SYSFAN1
```
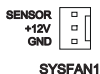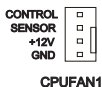
Important

* *Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.*

* *Fan cooler set with 3- or 4-pin power connector are both available for CPU-FAN1.*

Chassis Intrusion Connector: JCASE1

This connector is provided to connect the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

JCASE1

GND
CINTRU
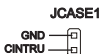
Serial ATA II Connector: SATA1 ~ SATA4

This connector is a high-speed Serial ATA II interface port. Each connector can connect to one Serial ATA II device.

SATA2   SATA4

SATA1   SATA3
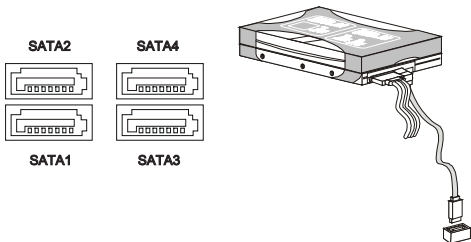
Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

S/PDIF-Out Connector: JSPD1 (Optional)

This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.

JSPD1

GND
S/PDIF-Out
5V

S/PDIF Bracket (Optional)
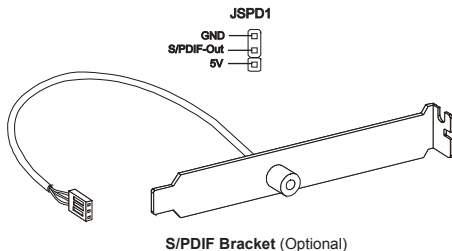
Front Panel Connector: JFP1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

Power LED **Power Switch**

JFP1

2 ... 10
1 ... 9

HDD LED **Reset Switch**
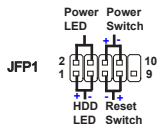
PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW +	Power Switch high reference pull-up
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW -	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.
10	KEY	Key

Audio Amplifier Connector: JAMP1

The JAMP1 is used to connect audio amplifiers to enhance audio performance.

JAMP1

1 ▫▫▫▫

PIN	SIGNAL
1	AMP_L-
2	AMP_L+
3	AMP_R-
4	AMP_R+

Front Panel Audio Connector: JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JAUD1

9 ▫▫▫▫▫ 1
10 ▫▫▫▫▫ 2

PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	PRESENCE#	Active low signal-signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected
5	LINE out_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No connection
9	LINE out_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

LVDS Flat Panel Connector: JLVDS1

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interfaced flat panel to the JLVDS1, be sure to check the panel datasheet and set the J2 jumper (p. 3-15) for proper power voltage.

JLVDS1

```
40 ┌─────────────────────┐ 2
39 └─────────────────────┘ 1
```

Display Matrix

	CRT	LVDS	DVI	HDMI
CRT		V	V	V
LVDS	V		V	V
DVI	V	V		V
HDMI	V	V	V	

| SIGNAL	PIN		SIGNAL
+12V	2	1	+12V
+12V	4	3	+12V
GND	6	5	+12V
GND	8	7	VCC3/VCC5
LCD_VDD	10	9	LCD_VDD
LDDC_DATA	12	11	LDDC_CLK
LVDS_VDDEM	14	13	L_BKLTCTL
GND	16	15	L_BKLTEM
LA_DATA0	18	17	LA_DATA0#
LA_DATA1	20	19	LA_DATA1#
LA_DATA2	22	21	LA_DATA2#
LA_CLK	24	23	LA_CLK#
LA_DATA3	26	25	LA_DATA3#
GND	28	27	GND
LB_DATA0	30	29	LB_DATA0#
LB_DATA1	32	31	LB_DATA1#
LB_DATA2	34	33	LB_DATA2#
LB_CLK	36	35	LB_CLK#
LB_DATA3	38	37	LB_DATA3#
GND	40	39	GND

Front USB Connector: JUSB2

This connector, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like.

JUSB2

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	KEY	10	NC

USB 2.0 Bracket
(Optional)
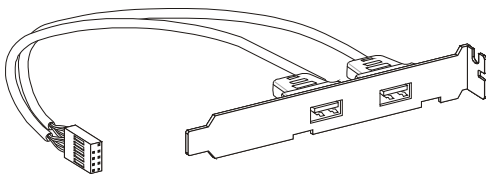
Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

RS-232 Serial Port Connector: COM2 ~ COM5

This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it through the optional serial port bracket.

COM2/3/4/5

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM3	Power Source
10	KEY	Key

SPI Flash ROM Connector: JSPI1

This connector is used to flash SPI flash ROM.

JSPI1

PIN	SIGNAL	PIN	SIGNAL
1	VCC3_SB	2	VCC3_SB
3	SPI_MISO_F	4	SPI_MOSI_F
5	SPI_CS0_F#	6	SPI_CLK_F
7	GND	8	GND
9	SPI_HOLD#	10	NC

Jumpers

Serial Port Power Jumper: J1

This jumper specifies the operation voltage of the onboard serial ports.

```
 ▣▣▣ 1
  J1
```
```
 □▣▣ 1
  +12V
```
```
 ▣▣□ 1
  +5V
```

LVDS Power Jumper: J2

Use this jumper to specify the LVDS power.

```
 ▣▣▣ 1
  J2
```
```
 □▣▣ 1
  +3V
```
```
 ▣▣□ 1
  +5V
```

SLOT

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slot supports the PCI Express interface expansion card.

The CON1 is Mini PCI-E connector for wireless LAN, TV tuner, and Robson NAND Flash.

Mini PCI-E Slot

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.

32-bit PCI Slot

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

ENTERING SETUP

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- *The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*

- *Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:*

    A9834IMS V1.0 041509 where:

    1st digit refers to BIOS maker as A = AMI, W = AWARD, and

    P = PHOENIX.

    2nd - 5th digit refers to the model number.

    6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and

    V = VIA.

    7th - 8th digit refers to the customer as MS = all standard customers.

    V1.0 refers to the BIOS version.

    041509 refers to the date this BIOS was released.

Control Keys

< ↑ >	Move to the previous item
< ↓ >	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a sub-menu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F9>	Load Optimized Defaults
<F8>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.
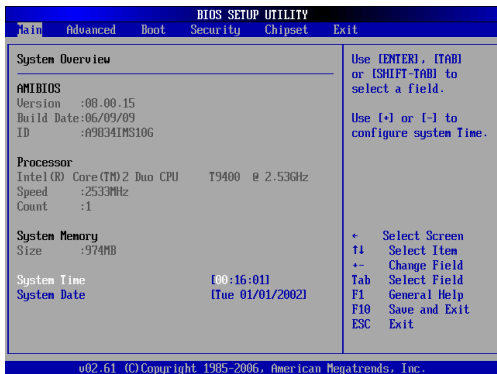
Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

▶ Primary IDE Master
▶ Secondary IDE Master

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

THE MENU BAR

```
                        BIOS SETUP UTILITY
 Main    Advanced    Boot    Security    Chipset    Exit

 System Overview                              Use [ENTER], [TAB]
                                              or [SHIFT-TAB] to
 AMIBIOS                                      select a field.
 Version    :08.00.15
 Build Date:06/09/09                          Use [+] or [-] to
 ID         :A9034IMS10G                      configure system Time.

 Processor
 Intel(R) Core(TM)2 Duo CPU    T9400 @ 2.53GHz
 Speed     :2533MHz
 Count     :1

 System Memory                                ←    Select Screen
 Size      :974MB                             ↑↓   Select Item
                                              +-   Change Field
 System Time              [00:16:01]          Tab  Select Field
 System Date              [Tue 01/01/2002]    F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit

          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

‣ **Main**

Use this menu for basic system configurations, such as time, date etc.

‣ **Advanced**

Use this menu to setup the items of special enhanced features.

‣ **Boot**

Use this menu to specify the priority of boot devices.

‣ **Security**
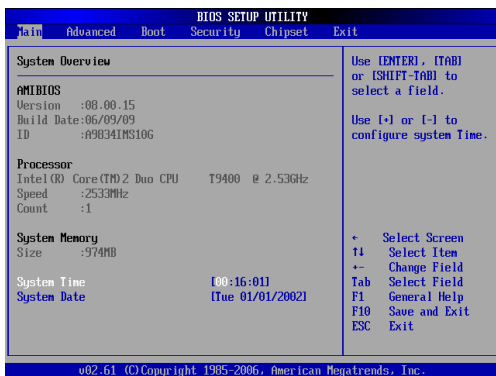
Use this menu to set supervisor and user passwords.

‣ **Chipset**

This menu controls the advanced features of the onboard Northbridge and Southbridge.

‣ **Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

MAIN

```
                         BIOS SETUP UTILITY
 Main   Advanced   Boot   Security   Chipset   Exit

 System Overview                            Use [ENTER], [TAB]
                                            or [SHIFT-TAB] to
 AMIBIOS                                     select a field.
 Version   :08.00.15
 Build Date:06/09/09                         Use [+] or [-] to
 ID        :A9834IMS10G                      configure system Time.

 Processor
 Intel(R) Core(TM)2 Duo CPU   T9400  @ 2.53GHz
 Speed   :2533MHz
 Count   :1

 System Memory                           ←    Select Screen
 Size    :974MB                          ↑↓   Select Item
                                         +-   Change Field
 System Time             [00:16:01]      Tab  Select Field
 System Date             [Tue 01/01/2002] F1   General Help
                                         F10  Save and Exit
                                         ESC  Exit

            v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

‣ **AMI BIOS, Processor, System Memory**

These items show the firmware and hardware specifications of your system. Read only.

‣ **System Time**

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

‣ **System Date**

This setting allows you to set the system date. The date format is <Day>, <Month> <Date> <Year>.

ADVANCED
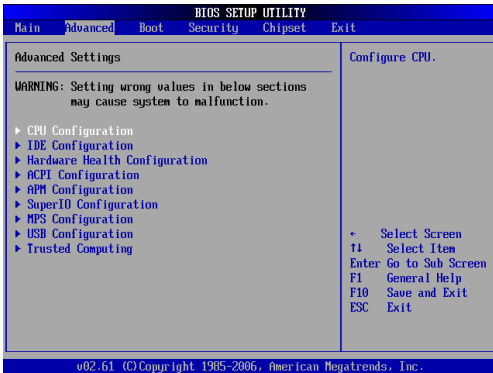
```
                          BIOS SETUP UTILITY
  Main    Advanced   Boot    Security   Chipset    Exit

  Advanced Settings                              Configure CPU.

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

  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ Hardware Health Configuration
  ▶ ACPI Configuration
  ▶ APM Configuration
  ▶ SuperIO Configuration
  ▶ MPS Configuration                            ←    Select Screen
  ▶ USB Configuration                            ↑↓   Select Item
  ▶ Trusted Computing                            Enter Go to Sub Screen
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

▶ CPU Configuration

```
                 Advanced

  Configure advanced CPU settings
  Module Version:3F.17

  Manufacturer:Intel
  Intel(R) Core(TM)2 Duo CPU    T9400 @ 2.53GHz
  Frequency   :2.53GHz
  FSB Speed   :1066MHz
  Cache L1    :64 KB
  Cache L2    :6144 KB
  Ratio Actual Value:9.5

  Hardware Prefetcher              [Enabled]
  Adjacent Cache Line Prefetch     [Enabled]
  Max CPUID Value Limit            [Disabled]
  Intel(R) Virtualization Tech     [Enabled]
  TM2 Function                     [Disabled]
  Execute-Disable Bit Capability   [Enabled]
  Core Multi-Processing            [Enabled]
  Intel(R) SpeedStep(tm) tech      [Enabled]
```

‣ Hardware Prefetcher

The processor has a hardware prefetcher that automatically analyzes its requirements and prefetches data and instructions from the memory into the Level 2 cache that are likely to be required in the near future. This reduces the latency associated with memory reads. When enabled, the processor's hardware prefetcher will be enabled and allowed to automatically prefetch data and code for the processor. When disabled, the processor's hardware prefetcher will be disabled.

‣ Adjacent Cache Line Prefetch

The processor has a hardware adjacent cache line prefetch mechanism that automatically fetches an extra 64-byte cache line whenever the processor requests for a 64-byte cache line. This reduces cache latency by making the next cache line immediately available if the processor requires it as well. When enabled, the processor will retrieve the currently requested cache line, as well as the subsequent cache line. When disabled, the processor will only retrieve the currently requested cache line.

‣ Max CPUID Value Limit

The Max CPUID Value Limit BIOS feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

‣ Intel(R) Virtualization Tech

Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple □irtual?systems.

‣ TM2 Function

This setting enables/disables the TM2 (Thermal Monitor 2) function.

‣ Execute Disable Bit Capability

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality 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 or worm propagation.

▸ **Core Multi-Processing**

CMP (Core Multi Processing) is the ability to have many independent processing cores on a single die, each with their own L1 Code & Data caches, Local APICs & thermal controls, while having a shared L2 cache, power management & bus interface. Intel multi-core architecture has a single Intel processor package that contains two or more processor "execution cores," or computational engines to enable enhanced performance and more-efficient simultaneous processing of multiple cores.

▸ **Intel(R) SpeedStep(tm) Tech**

EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

▸ **IDE Configuration**

```
            Advanced

 IDE Configuration

 SATA#1 Configuration          [Compatible]
   Configure SATA#1 as         [IDE]

 ▶ Primary IDE Master          : [Not Detected]
 ▶ Secondary IDE Master        : [Not Detected]
 ▶ Third IDE Master            : [Not Detected]
 ▶ Fourth IDE Master           : [TS64GSSD25S-S]
```
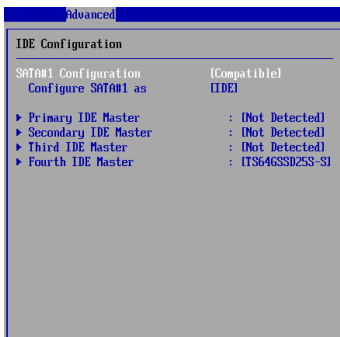
▸ **SATA#1 Configuration**

This setting specifies the operation mode of SATA ports.

▸ **Configure SATA#1 as**

This setting specifies the function of the on-chip SATA controller.

▶ **Primary/Secondary/Third/Fourth IDE Master**

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors
[Block(Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller

▶ Hardware Health Configuration

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.

```
                    Advanced
    H/W Health Function          [Enabled]          ▲
    Chassis Intrusion            [Disabled]

    Hardware Health Event Monitoring

    CPU Temperature              :37°C/98°F
    System Temperature           :25°C/77°F

    CPUFAN0 Speed                :7670 RPM

    Vcore                        :1.048 V
    AVCC                         :3.248 V
    3VCC                         :3.248 V
    +12V                         :13.231 V
    V5B                          :3.248 V
    VBAT                         :3.200 V
    CPUFAN0 Mode Setting         [Manual Mode     ]
      CPUFAN0 PWM Control        [250]
    AUXFAN Mode Setting          [Manual Mode     ]
      AUXFAN PWM Control         [250]              ▼
```

▶ H/W Health Function

This setting enables/disables the hardware monitor function.

▶ Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to the default value later.

▶ CPUFAN0 Mode Setting, AUXFAN Mode Setting

This item enables or disables the Smart Fan feature. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU temperature to prevent your system from overheating.

▶ CPUFAN0 PWM Control, AUXFAN PWM Control

This setting allows users to control the fan speed by changing the duty cycle of the fan PWM (Pulse-Width Modulation) output.

‣ ACPI Configuration

```
            Advanced
General ACPI Configuration

Suspend mode                  [Auto]
USB Device Wakeup From S3      [Disabled]
```
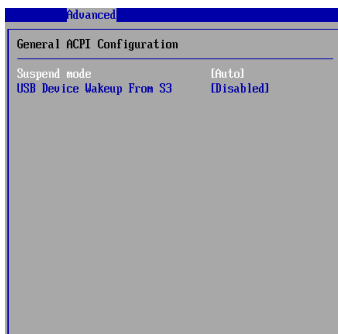
‣ Suspend Mode

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

‣ USB Device Wakeup From S3

This setting allows the activity of the USB device to wake up the system from the S3 sleep state.

‣ APM Configuration

```
              Advanced

 APM Configuration

 Restore on AC Power Loss        [Power Off]

 Advanced Resume Event Controls
  Resume On Ring                 [Disabled]
  Resume On LAN                  [Disabled]
  Resume On RTC Alarm            [Disabled]
```

‣ **Restore on AC Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Power Off]	Leaves the computer in the power off state.
[Power On]	Leaves the computer in the power on state.
[Last State]	Restores the system to the previous status before power failure or interrupt occurred.

‣ **Resume On Ring**

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

‣ **Resume On LAN**

This field specifies whether the system will be awakened from power saving modes when activity or input signal of onboard LAN is detected.

‣ **Resume On RTC Alarm**

When [Enabled], your can set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode.

▸ Super IO Configuration

```
                Advanced

  Configure Win627DHG Super IO Chipset

  Serial Port1 Address        [3F8/IRQ4]
     Serial Port1 Mode        [RS232]
  Serial Port2 Address        [2F8]
     Serial Port2 IRQ         [11]
  Serial Port3 Address        [2E8]
     Serial Port3 IRQ         [10]
  Serial Port4 Address        [2F0]
     Serial Port4 IRQ         [11]
  Serial Port5 Address        [2E0]
     Serial Port5 IRQ         [10]

  Watch Dog                   [Disabled]
```

▸ Serial Port 1/2/3/4/5 Address, Serial Port 1/2/3/4/5 IRQ

Select an address and a corresponding interrupt for the specified serial ports.

▸ Watch Dog

You can enable the system watch-dog timer, a hardware timer that generates either an NMI or a reset when the software that it monitors does not respond as expected each time the watch dog polls it.

▶ MPS Configuration

```
            Advanced

MPS Configuration

MPS Revision              [1.4]
```
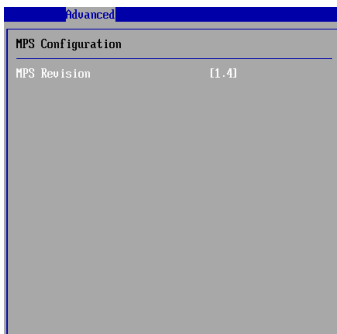
▶ MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

▶ USB Configuration

```
            Advanced

USB Configuration

Module Version - 2.24.3-13.4

USB Devices Enabled :
  1 Keyboard, 1 Mouse, 2 Hubs, 1 Drive

Legacy USB Support           [Enabled]
USB 2.0 Controller Mode      [HiSpeed]
BIOS EHCI Hand-Off           [Enabled]

▶ USB Mass Storage Device Configuration
```

‣ **Legacy USB Support**

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

‣ **USB 2.0 Controller Mode**

This setting specifies the operation mode of the onboard USB 2.0 controller.

‣ **BIOS EHCI Hand-Off**

This setting allows you to enable or disable a workaround for operating systems without EHCI (Enhanced Host Controller Interface) hand-off support. The Enhanced Host Controller Interface (EHCI) specification describes the register-level interface for a Host Controller for the Universal Serial Bus (USB) Revision 2.0.

‣ **USB Mass Storage Device Configuration**

```
USB Mass Storage Device Configuration

USB Mass Storage Reset Delay    [20 Sec]

   Device #1            SanDisk U3 Cruzer Micro 2.18
   Emulation Type            [Auto]
```

‣ **USB Mass Storage Reset Delay**

This setting controls the number of seconds the POST waits for the USB mass storage device after the start unit command is sent.

‣ **Emulation Type**

This setting enables you to set the type of device you want the USB mass storage device to emulate.

▶ Trusted Computing

```
              Advanced

Trusted Computing

TCG/TPM SUPPORT              [Yes]

Execute TPM Command          [Don't change]
 TPM Enable/Disable Status   [No State]
 TPM Owner Status            [No State]
```
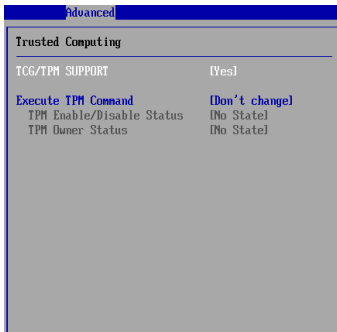
▶ **TCG/TPM Support**

This setting controls the Trusted Platform Module (TPM) designed by the Trusted Computing Group (TCG). TPMs are special-purpose integrated circuits (ICs) built into a variety of platforms to enable strong user authentication and machine attestation -- ssential to prevent inappropriate access to confidential and sensitive information and to protect against compromised networks.

▶ **Execute TPM Command**

TPM commands are managed through a child node of the TPM Management console named Command Management. To block or allow a TPM command is a task that local administrators can perform during the setup or re-configuration of a TPM-equipped computer.

▶ **TPM Enable/Disable Status**

This setting displays the TPM enable/disable status. Read only.

▶ **TPM Owner Status**

This setting shows the TPM ownership. Read only.

Boot

```
                         BIOS SETUP UTILITY
  Main    Advanced    Boot    Security    Chipset    Exit

  Boot Settings                                    Configure Settings
 ──────────────────────────────────────           during System Boot.
 ▶ Boot Settings Configuration

 ▶ Boot Device Priority
 ▶ Removable Drives




                                                  ←    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.
```

▶ **Boot Settings Configuration**
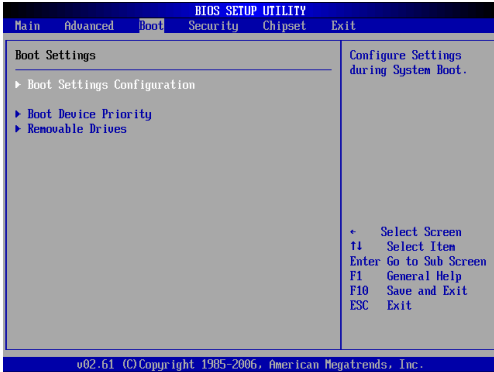
```
                          Boot

  Boot Settings Configuration

  Quick Boot                      [Enabled]
  Quiet Boot                      [Disabled]
  Bootup Num-Lock                 [On]
  Wait For 'F1' If Error          [Enabled]
  Hit 'DEL' Message Display       [Enabled]
  Flash Write Protection          [Enabled]
```

▶ **Quick Boot**

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during bootup for faster system boot.

▸ **Quiet Boot**

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.

When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

▸ **Bootup Num-Lock**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▸ **Wait For "F1" If Error**

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

▸ **Hit "DEL" Message Display**

Set this option to [Disabled] to prevent the message as follows:

<div align="center">

Hit Del if you want to run setup

</div>

It will prevent the message from appearing on the first BIOS screen when the computer boots. Set it to [Enabled] when you want to run the BIOS Setup Utility.

▸ **Flash Write Protection**

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

▶ **Boot Device Priority**

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

```
                          Boot
 Boot Device Priority

 1st Boot Device            [USB:SanDisk U3 Cru]
 2nd Boot Device            [SATA:4M-TS64GSSD25]
 3rd Boot Device            [Network:IBA GE Slo]
```
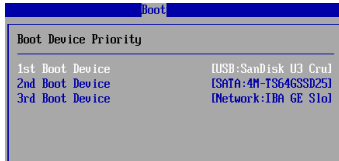
▶ **Removable Drives**

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

```
                          Boot
 Removable Drives

 1st Drive                  [USB:SanDisk U3 Cru]
```
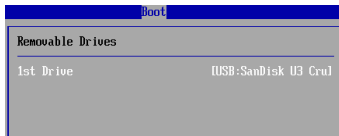
SECURITY
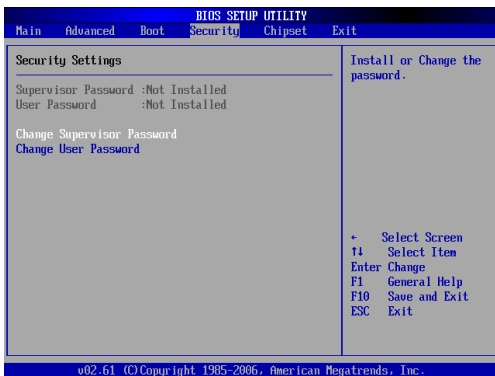
▶ **Supervisor Password / Change Supervisor Password**

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

▶ **User Password / Change User Password**

User Password controls access to the system at boot. These settings allow you to set or change the user password.

CHIPSET

‣ **North Bridge Configuration**

‣ **DVMT Mode Select**

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dy-

namically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

▸ **DVMT/FIXED Memory**

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

▸ **Boot Display Device**

Use the field to select the type of device you want to use as the display(s) of the system.

▸ **Flat Panel Type**

This setting allows you to set your preferences for the boot display device.

▸ **South Bridge Configuration**

```
                                          Chipset

South Bridge Chipset Configuration

USB Functions              [12 USB Ports]
USB Port Configure         [6X6 USB Ports]
USB 2.0 Controller         [Enabled]
GbE Controller             [Enabled]
  GbE LAN Boot             [Disabled]
  GbE Wake Up From S5      [Disabled]
HDA Controller             [Enabled]
SMBUS Controller           [Enabled]
LAN(82574) Option ROM      [Disabled]
```

▸ **USB Functions, USB Port Configure**

These settings specify the function of the onboard USB controller.

▸ **USB 2.0 Controller**

Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix.

▸ **GbE Controller**

This setting disables/enables the onboard Gigabit Ethernet controller.

▸ **GbE LAN Boot**

When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

▸ **GbE Wake Up From S5**

This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

▸ **HDA Controller**

This setting controls the High Definition Audio interface integrated in the Southbridge.

▸ **SMBUS Controller**

This setting controls the system management bus controller integrated in the Southbridge.

▸ **LAN (82574) Option ROM**

The item enables/disables the initialization of the onboard LAN Boot ROM during bootup. Selecting [Disabled] will speed up the boot process.

Exit

```
                        BIOS SETUP UTILITY
 Main    Advanced    Boot    Security    Chipset    Exit

 Exit Options                                    Exit system setup
                                                 after saving the
 Save Changes and Exit                           changes.
 Discard Changes and Exit
 Discard Changes                                 F10 key can be used
                                                 for this operation.
 Load Optimal Defaults
 Load Failsafe Defaults




                                                 ←     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.
```

‣ **Save Changes and Exit**

Save changes to CMOS and exit the Setup Utility.

‣ **Discard Changes and Exit**

Abandon all changes and exit the Setup Utility.

‣ **Discard Changes**

Abandon all changes and continue with the Setup Utility.

‣ **Load Optimal Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

‣ **Load Failsafe Defaults**

Use this menu to load the default values set by the BIOS vendor for stable system performance.

Chapter 4
System Resources

This chapter provides information on the following system resources:

1. Watch Dog Timer Setting (p.4-2);

2. AMI POST Code (p.4-3);

3. Resource List (p.4-7).

Watch Dog Timer Setting

```
Software code
SIO_IDX equ 4EH
SIO_DTA equ 4FH

Timer equ 10; reset after 10 seconds
```

```
1. Enter configuration mode
mov dx,SIO_IDX
mov al,87h
out dx,al
out dx,al
```

```
2. Set to LDN 08
mov dx,SIO_IDX
mov al,07h
out dx,al
mov dx,SIO_DTA
mov al,08h
out dx,al
```

```
3. Set WatchDog Timer
mov dx,SIO_IDX
mov al,0f6h
out dx,al
mov dx,SIO_DTA
mov al,Timer
out dx,al
```

```
4. Exit configuration mode
mov dx,SIO_IDX
mov al,0AAh
out dx,al
```

AMI POST Code

Bootblock Initialization Code Checkpoints

The Bootblock initialization code sets up the chipset, memory and other components before system memory is available. The following table describes the type of checkpoints that may occur during the bootblock initialization portion of the BIOS:

Checkpoint	Description
Before D1	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4GB limit and GA20 enabled. Verify the bootblock checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See Bootblock Recovery Code Checkpoints section of document for more information.
D7	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See POST Code Checkpoints section of document for more information.

POST Code Checkpoints

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

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.

Checkpoint	Description
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.

Checkpoint	Description
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

Resource List

ICH9 GPIO

GPIO	Type	Function	Power	Description
GPIO6	I	PCB version identify	3.3V	<table><tr><td>PCB VER</td><td>GPIO7</td><td>GPIO6</td></tr><tr><td>0A</td><td>0</td><td>0</td></tr><tr><td>10</td><td>0</td><td>1</td></tr></table>
GPIO7	I	PCB version identify	3.3V	<table><tr><td>PCB VER</td><td>GPIO7</td><td>GPIO6</td></tr><tr><td>0A</td><td>0</td><td>0</td></tr><tr><td>10</td><td>0</td><td>1</td></tr></table>
GPIO8	O	USB port power enable pin 1: enable USB port power 0: disable USB port power	3VSB	Set to 1 at S0,S3 Set to 0 at S4,S5
GPIO13	I	LPC_PME#	3VSB	For SIO PME#
GPIO27	O	Audio Amp volume control Gain0	3.3V	<table><tr><td>GAIN1</td><td>GAIN0</td><td>AV(dB)</td></tr><tr><td>0</td><td>0</td><td>15.3</td></tr><tr><td>0</td><td>1</td><td>21.2</td></tr><tr><td>1</td><td>0</td><td>27.2</td></tr><tr><td>1</td><td>1</td><td>31.8</td></tr></table>
GPIO28	O	Audio Amp volume control Gain1	3.3V	<table><tr><td>GAIN1</td><td>GAIN0</td><td>AV(dB)</td></tr><tr><td>0</td><td>0</td><td>15.3</td></tr><tr><td>0</td><td>1</td><td>21.2</td></tr><tr><td>1</td><td>0</td><td>27.2</td></tr><tr><td>1</td><td>1</td><td>31.8</td></tr></table>

SIO GPIO

Pin	GPIO	Type	Function	Power	Description
A8	GP34	O	#EN485 Default high for RS232 function	3VSB	**COM Type Select** <table><tr><td></td><td>RS232</td><td>RS422</td><td>RS485</td></tr><tr><td>232</td><td>1</td><td>0</td><td>0</td></tr><tr><td>#422</td><td>1</td><td>0</td><td>1</td></tr><tr><td>#485</td><td>1</td><td>1</td><td>0</td></tr></table>
B8	GP35	O	#EN422 Default high for RS232 function	3VSB	**COM Type Select** <table><tr><td></td><td>RS232</td><td>RS422</td><td>RS485</td></tr><tr><td>232</td><td>1</td><td>0</td><td>0</td></tr><tr><td>#422</td><td>1</td><td>0</td><td>1</td></tr><tr><td>#485</td><td>1</td><td>1</td><td>0</td></tr></table>
C7	GP36	O	EN232 Default high for RS232 function	3VSB	**COM Type Select** <table><tr><td></td><td>RS232</td><td>RS422</td><td>RS485</td></tr><tr><td>232</td><td>1</td><td>0</td><td>0</td></tr><tr><td>#422</td><td>1</td><td>0</td><td>1</td></tr><tr><td>#485</td><td>1</td><td>1</td><td>0</td></tr></table>

I/O Map

I/O Port	Description
0000-000F	DMA Controller 1
0020-0021	Interrupt Controller 1
002E-002F	SIO Port 1
0040-0043	System Timer
004E-004F	SIO Port 2
0060,0064	Keyboard Controller
0070-0073	RTC and CMOS
0080-0090	DMA Controller Page Registers
00A0-00A1	Interrupt Controller 2
00B2-00B3	APM Register
00C0-00DF	DMA Controller 2
00F0-00FF	Numeric Data Processor
01F0-01F7	Primary IDE Controller
02E0-03E8	COM2, COM3, COM4, COM5
03F8-03FF	COM1
0400-045F	ACPI I/O Space
0500-050F	SMBus I/O Space
0CF8-0CFF	PCI Configuration Port

SYSTEM RESOURCES

PCI Devices

Device	Ven.ID	Dev.ID	BUS#	Dev#	Func#
Intel Bridge	8086	2A40	00	00	00
Intel VGA	8086	2A42	00	02	00
Intel USB Controller	8086	2938	00	1A	02
Intel PCI Bridge	8086	2940	00	1C	00
Intel USB Controller	8086	2934	00	1D	00
Intel USB Controller	8086	2935	00	1D	01
Intel USB Controller	8086	2936	00	1D	02
Intel USB Controller	8086	293A	00	1D	07
Intel PCI Bridge	8086	2448	00	1E	00
Intel Bridge	8086	2919	00	1F	00
Intel IDE	8086	2928	00	1F	02
Intel	8086	2930	00	1F	03
Intel IDE	8086	292D	00	1F	05

Inrettupt Allocation

IRQ	Description
IRQ0	System Timer
IRQ1	Keyboard Controller
IRQ2	Cascade Interrupt
IRQ3	COM3, COM5
IRQ4	COM1, COM2, COM4
IRQ5	PCI Device
IRQ6	PCI Device
IRQ7	LPT1
IRQ8	RTC
IRQ9	ACPI Controller Interrupt
IRQ10	COM3, COM5
IRQ11	COM2, COM4
IRQ12	PS/2 Mouse
IRQ13	Num Data Processor
IRQ14	Primary IDE Controller
IRQ15	Secondary IDE Controller

DMA Channel Allocation

DMA Channel	Description
Channel 0	Unassigned 8-bit channel
Channel 1	Unassigned 8-bit channel
Channel 2	Unassigned 8-bit channel
Channel 3	Unassigned 8-bit channel
Channel 4	Cascade channel
Channel 5	Unassigned 16-bit channel
Channel 6	Unassigned 16-bit channel
Channel 7	Unassigned 16-bit channel