LV-672

Mini-ITX motherboard

User's Manual

Edition: 1.04
2005/03/23

Intel® 915G
EXPRESS CHIPSET
• Intel® Graphics Media Accelerator 900

DDR2 533

SERIAL ATA

PCI EXPRESS™

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Packing List

Please check package component before you use our products.

Hardware:

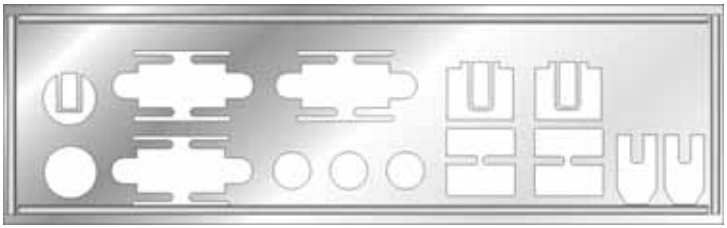
LV-672 Mini-ITX motherboard x 1

Cable Kit:

40-pin ATA100 IDE flat cable x 1

26-pin slim type floppy cable x 1

Serial ATA ribbon cable x 2



I/O Shield x 1

RAID drivers Disc for Windows 2000,

Windows XP and Windows Server 2003

Other Accessories:

Divers CD (including User's Manual) x 1

User's Manual x 1

Index

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Chapter1 <Introduction>

1.1 <Product Overview>

LV-672 is the motherboard with last Intel desktop technology with Mini-ITX form factor. Based on Intel® 915G and ICH6R, the board integrates a new Pentium 4 processor 775-pin socket, DDR2 memory socket, Intel® Graphic Media Accelerator 900 technology, PCI express interface and Serial ATA with RAID function for a powerful desktop system.

Intel® LGA775 processor

The Intel® Pentium 4 processor now comes with a new form factor with 775-pin PLGA package, for 800MHz front-side-bus, 1MB L2 cache, and for 90nm manufacturing technology, the PLGA processor without pin header on solder side can make user installing the processor on the socket easier.

Intel® 915G and ICH6R chipset

The Intel 915G integrates DDR2 400/533MHz for memory, and Graphic Media Accelerator (GMA) 900 technology for new graphic engine. It can provide up to 224MB of frame buffer when you install over 256MB of system memory. The ICH6R integrates with up to 8 USB2.0 interfaces (6 ports for **LV-672**), and serial ATA interface with RAID function.

Dual Intel® 82541GI Gigabit LAN

With dual Gigabit LAN with Intel® 82541GI, **LV-672** comes with a powerful network function for the system that requires large transfer data of NAS system or Server platform.

PCI-Express interface

LV-672 integrates a 16x PCI-Express interface, it can provide up to 8GB/s of bandwidth, which AGP 8x can only provide up to 2GB/s.

Multimedia interfaces

LV-672 also integrates 5.1channel AC97 audio, mini-PCI interface and IEEE1394 port, for these flexible function, system integrator can built more powerful systems for many applications.

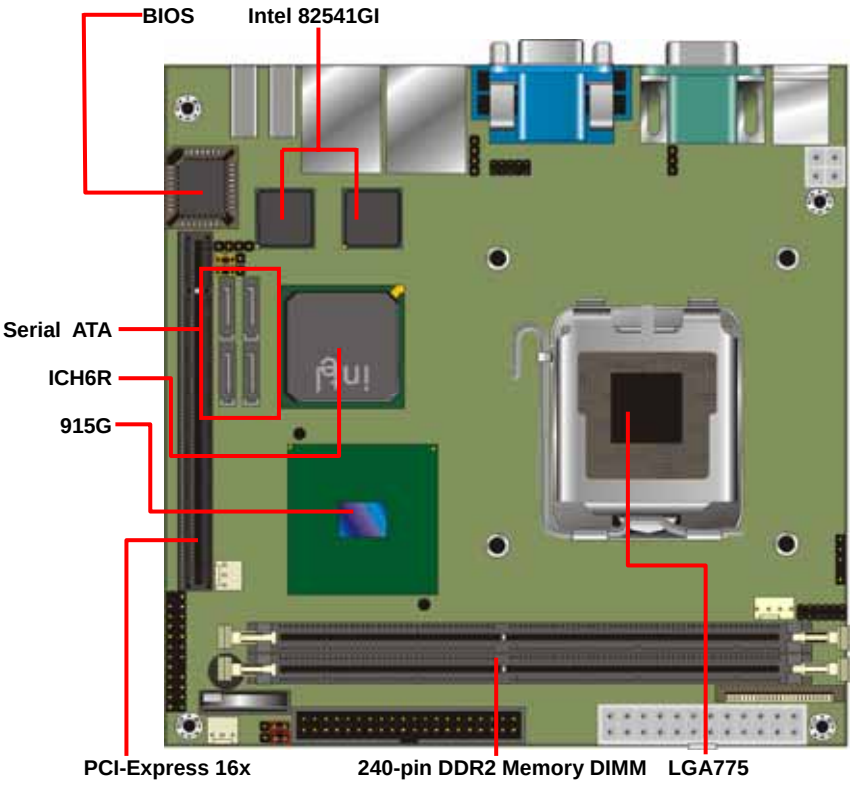
1.2 <Product Specification>

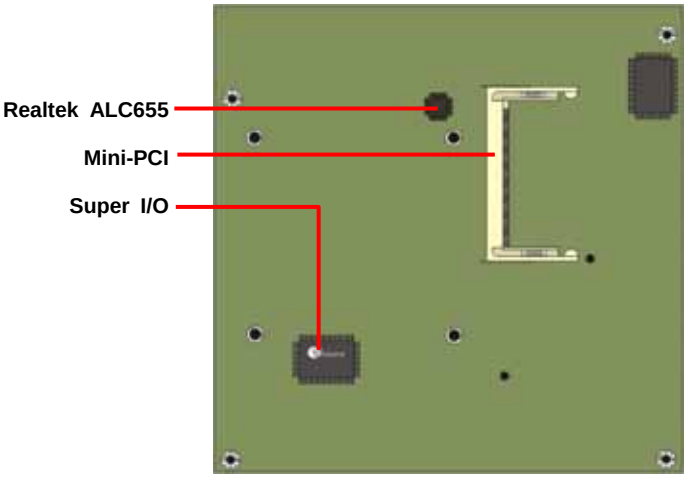
General Specification	
Form Factor	Mini-ITX motherboard
CPU	Intel® **Pentium 4** / **Celeron D** processor with **LGA775** socket Package type: 775 pin PLGA L2 Cache: 256KB/1MB Front side bus: 533/800MHz (133/200MHz x 4) **Intel® Hyper-Threading Technology** supported
Memory	2 x 240-pin DDR2 400/533MHz SDRAM up to 2GB Up to 8GB/s of bandwidth with dual-channel interleaved mode **Dual-Channel technology** supported Unbufferred, none-ECC memory supported only
Chipset	Intel® 915G (Northbridge) and ICH6R (Southbridge)
BIOS	Phoenix-Award v6.00PG 4Mb PnP flash BIOS
Green Function	Power saving mode includes doze, standby and suspend modes. ACPI version 1.0 and APM version 1.2 compliant
Watchdog Timer	System reset programmable watchdog timer with 1 ~ 255 sec./min. of timeout value
Real Time Clock	Intel® ICH6R built-in RTC with lithium battery
Enhanced IDE	Enhanced IDE interface supports dual channels and up to 2 ATAPI devices at Ultra DMA100 One 40-pin IDE port onboard
Serial ATA	Intel® ICH6R integrates 4 Serial ATA interface RAID 0, 1, Intel Matrix Storage Technology supported
Multi-I/O Port	
Chipset	Intel® 82801FR ICH6R with Winbond® W83627THF controller
Serial Port	Two external RS-232 serial ports
USB Port	Six Hi-Speed USB 2.0 ports with 480Mbps of transfer rate
Parallel Port	None
Floppy Port	One slim type Floppy port
IrDA Port	One IrDA compliant Infrared interface supports SIR
K/B & Mouse	External PS/2 keyboard and mouse ports on rear I/O panel
GPIO	One 12-pin Digital I/O connector with 8-bit programmable I/O interface
Smart Fan	One CPU fan connectors for fan speed controllable
VGA Display Interface	
Chipset	Intel® 915G GMCH (Graphic Memory Controller Hub)
Core Frequency	333MHz
Memory	Intel® DVMT 3.0 with up to 224MB shared with system memory
Display Type	CRT, LCD monitor with analog display
Connector	External DB15 female connector on rear I/O panel

Ethernet Interface	
Chipset	Intel® PRO/1000MT LAN interface with Intel 82541GI
Type	10Base-T / 100Base-TX/1000Base-T, auto-switching Fast Ethernet Full duplex, IEEE802.3U compliant
Connector	Dual External RJ45 connectors with LED on rear I/O panel
Audio Interface	
Chipset	Intel® ICH6R with Realtek® ALC655 AC97 3D audio codec
Interface	5.1 channel 3D audio with Line-in, Line-out and MIC-in
Connector	External Audio phone jack for Line-out/Front, Line-in/Rear and MIC(stereo)-in/Center Onboard audio connector with pin header Onboard CD-IN connector
Expansive Interface	
PCI-Express	One 16x PCI-Express slot (***compatible with 1x slot***) Up to 8GB/s of transfer bandwidth Power supply: +3.3V, +12V
PCI	One Mini-PCI socket **TYPE III** (32-bit, 33MHz) Power supply: +3.3V, +5V
IEEE1394	AGERE FW323-06 controller integrated IEEE1394A supported Up to 400Mb/s of transferring rate
Power and Environment	
Power Requirement	Standard ATX **24-pin (20-pin is compatible)** power supply Additional +12V 4-pin power connector
Dimension	170 (L) x 170 (H) mm
Temperature	Operating within 0 ~ 60°C (32 ~ 140°F) Storage within -20 ~ 85°C (-4 ~ 185°F)
Ordering Code	
LV-672	Intel® Pentium 4 platform with Mini-ITX form factor LGA775 socket, DDR2, onboard GMA900 VGA, 5.1 CH Audio, SATA, USB2.0, PCI-Express 16x slot, Mini-PCI, IEEE1394 Dual Gigabit LAN
PCIE-SDVOD	PCI-Express add-on card for single DVI interface
PCIE-SDVO2D	PCI-Express add-on card for dual DVI interface
OALUSBA-1	Dual USB Cable (30cm)
OALPJ-S	Audio phone jack cable

The specifications may be different as the actual production.
For further product information please visit the website at http://www.commell.com.tw

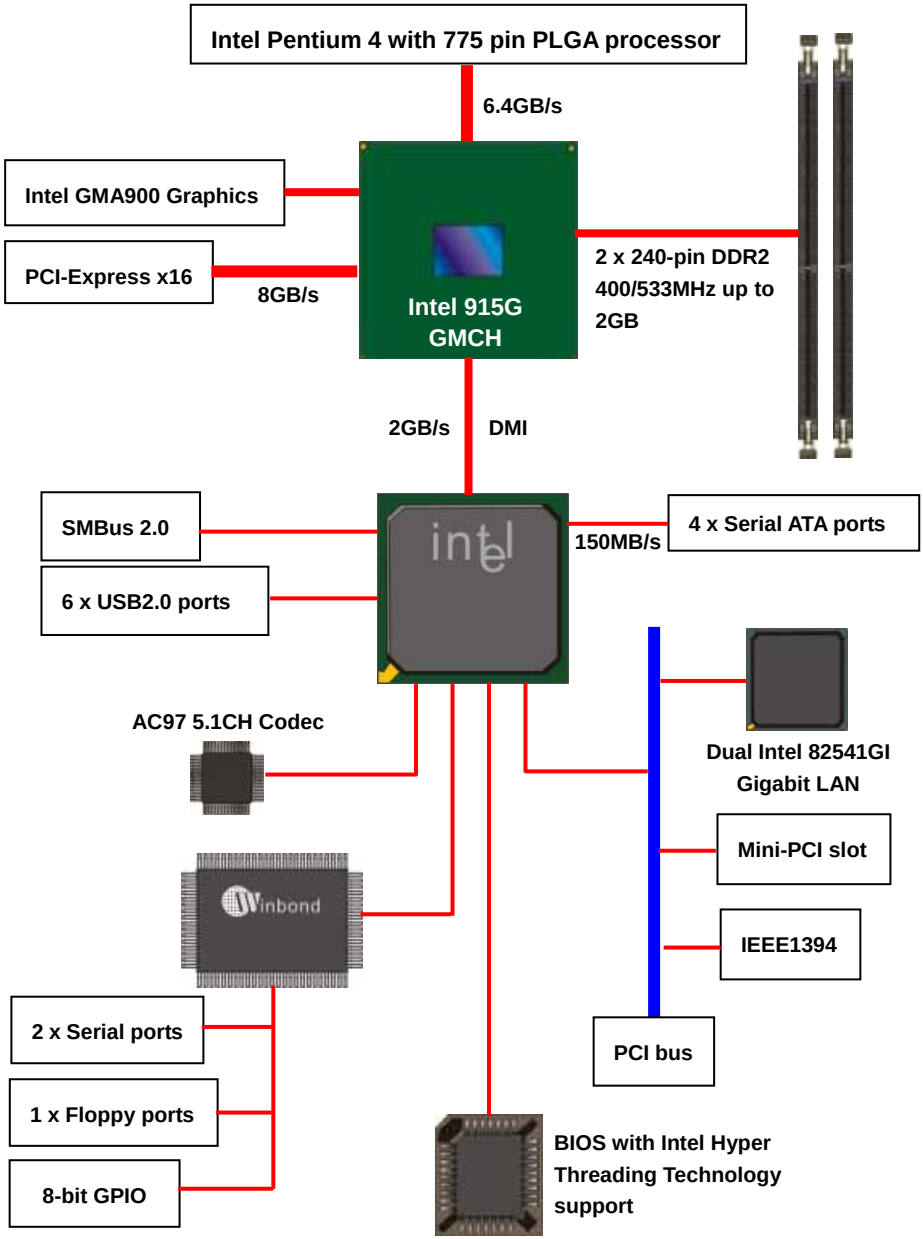
1.3 <Component Placement>





(Solder Side)

1.4 <Block Diagram>



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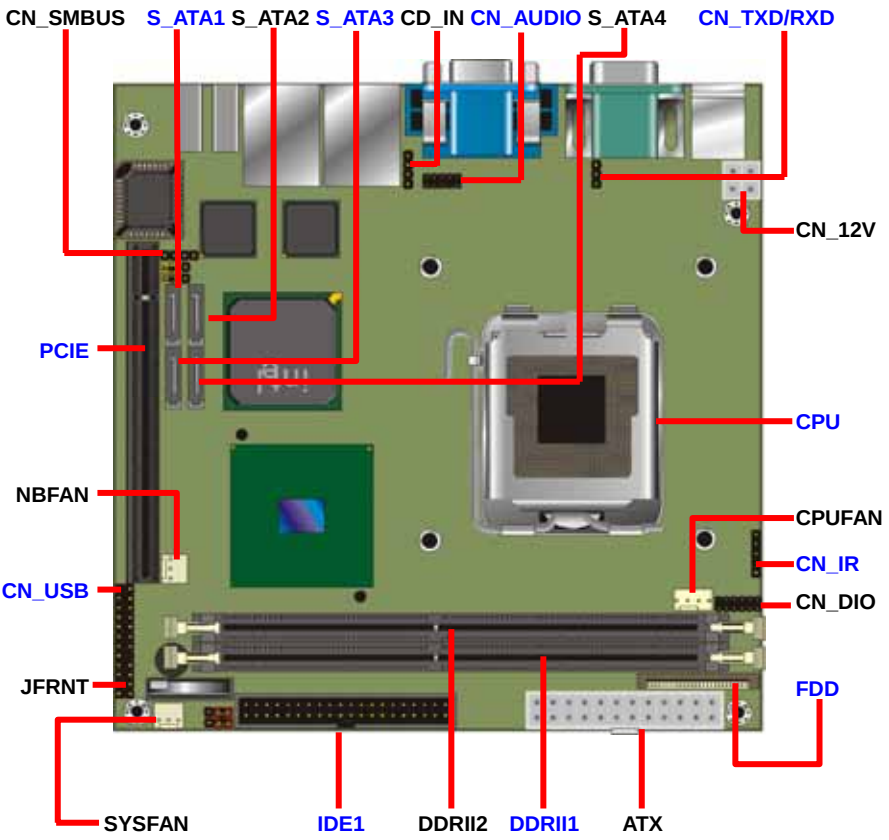
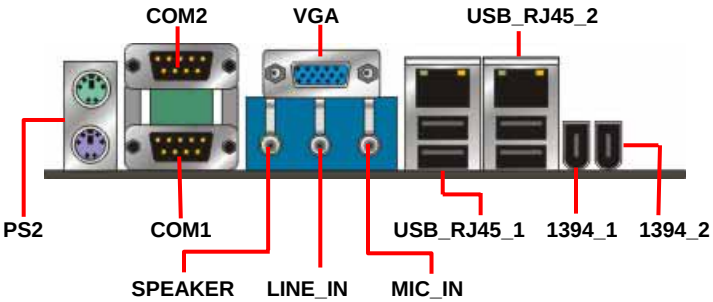
Chapter 2 <Hardware Setup>

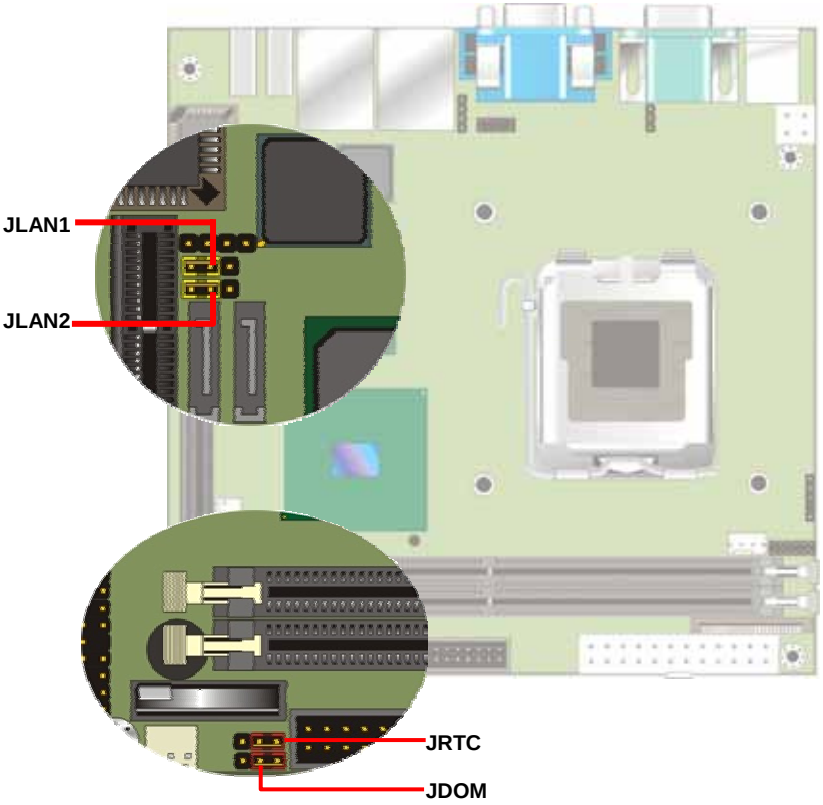
2.1 <Connector Location>





2.2 <Jumper Reference>

Jumper	Function
JRTC	CMOS Operating/Clear Setting
JDOM	IDE1 Pin-20 voltage setting
JLAN1	LAN1 Enable/Disable setting
JLAN2	LAN2 Enable/Disable setting



2.3 <Connector Reference>

2.3.1 <Internal Connectors>

Connector	Function	Remark
CPU	LGA775 CPU socket	Standard
DDRII1/2	240 -pin DDR2 SDRAM DIMM socket	Standard
IDE1	40-pin primary IDE connector	Standard
FDD	26-pin slim type floppy connector	Standard
S_ATA1/2/3/4	7-pin Serial ATA connector	Standard
ATX	24-pin power supply connector	Standard
CN_12V	4-pin +12V additional power supply connector	Standard
CN_AUDIO	5 x 2-pin audio connector	Standard
CDIN	4-pin CD-ROM audio input connector	Standard
CN_DIO	6 x 2-pin digital I/O connector	Standard
CN_USB	10-pin USB connector	Standard
CPUFAN	4-pin CPU cooler fan connector	Standard
SYSFAN	3-pin system cooler fan connector	Standard
NBFAN	3-pin Northbridge cooler fan connector	Standard
CN_IR	5-pin IrDA connector	Standard
CN_SMBUS	4-pin I^2C connector	Standard
CN_TXD/RXD	3-pin TXD/RXD COM port signal connector	Standard
JFRNT	14-pin front panel switch/indicator connector	Standard

2.3.2 <External Connectors>

Connector	Function	Remark
VGA	DB15 VGA connector	Standard
USB_RJ45_1/2	Dual USB and RJ45 LAN connector	Standard
COM1/2	Serial port connector	Standard
PS2	PS/2 Keyboard/Mouse connector	Standard
SPEAKER	Audio Line-out port	Standard
LINE_IN	Audio Line-in port	Standard
MIC_IN	Audio Microphone input port	Standard
1394_1/2	IEEE1394 port	Standard

2.4 <CPU and Memory Setup>

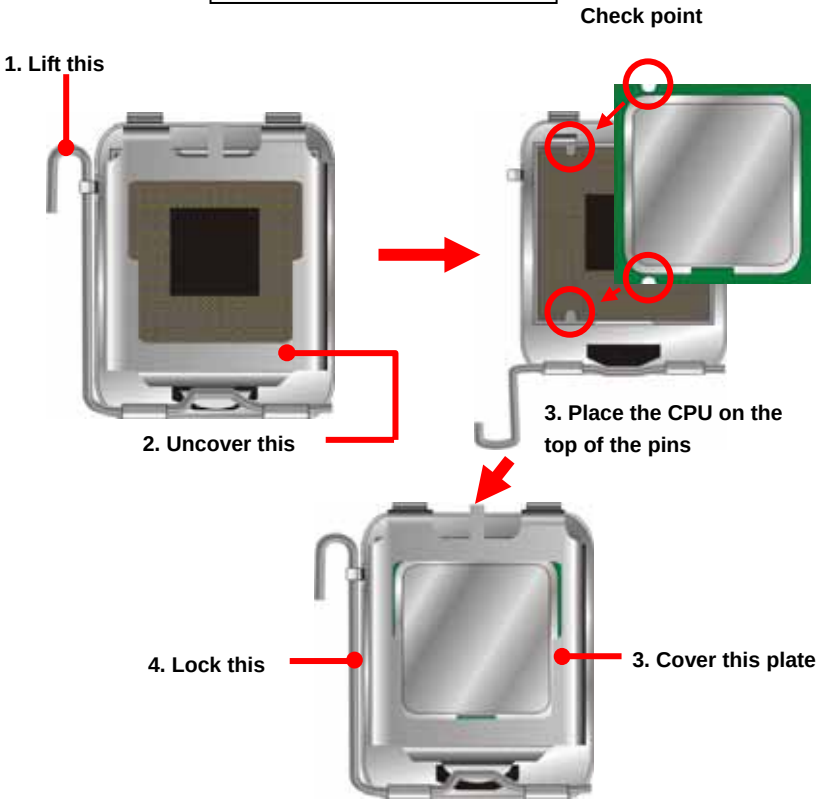
2.4.1 <CPU installation>

LV-672 has a LGA755 CPU socket onboard; please check following steps to install the processor properly.

Attention If LV-672 need RMA ,Please keep CPU socket cover on the CPU Socket.

Warning If CPU Socket internal Pin damage,We could not provide warranty.

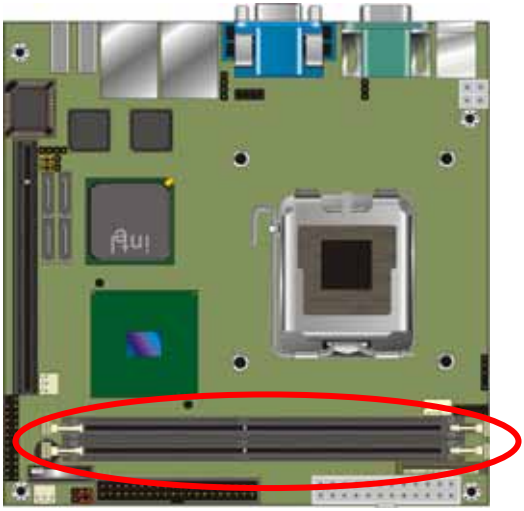
Intel® Pentium 4 processor
Package type: 775 pin PLGA
L2 Cache: 1MB
FSB: 800MHz (200MHz x 4)
Manufacturing: 90nm
Intel Hyper Threading Technology supported

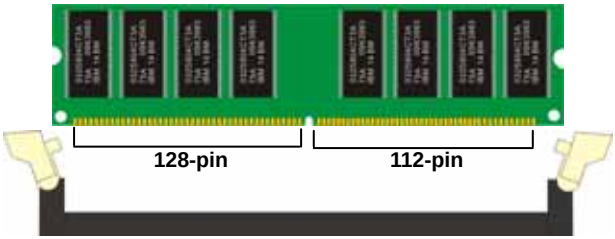


Notice: Please place the CPU on the pins tenderly to avoid bending the pins

2.4.2 <Memory installation>

LV-672 has two 240-pin DDR2 DIMM support up to 2GB of memory capacity. The memory frequency supports 400/533MHz (100MHz x 4 or 133MHz x 4). Only Non-ECC memory is supported. **Dual-Channel technology** is supported while applying two same modules.





Please check the pin number to match the socket side well before installing memory module.

2.5 <CMOS Setup>

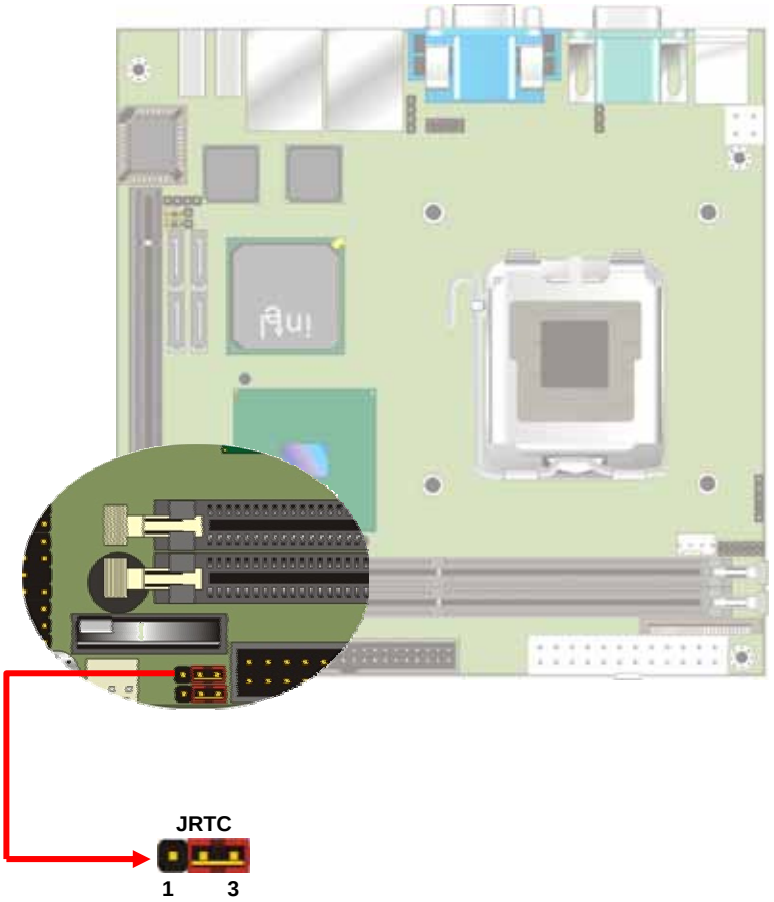
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

Jumper: JRTC

Type: Onboard 3-pin jumper

JRTC	Mode
1-2	Clear CMOS
2-3	Normal Operation

Default setting



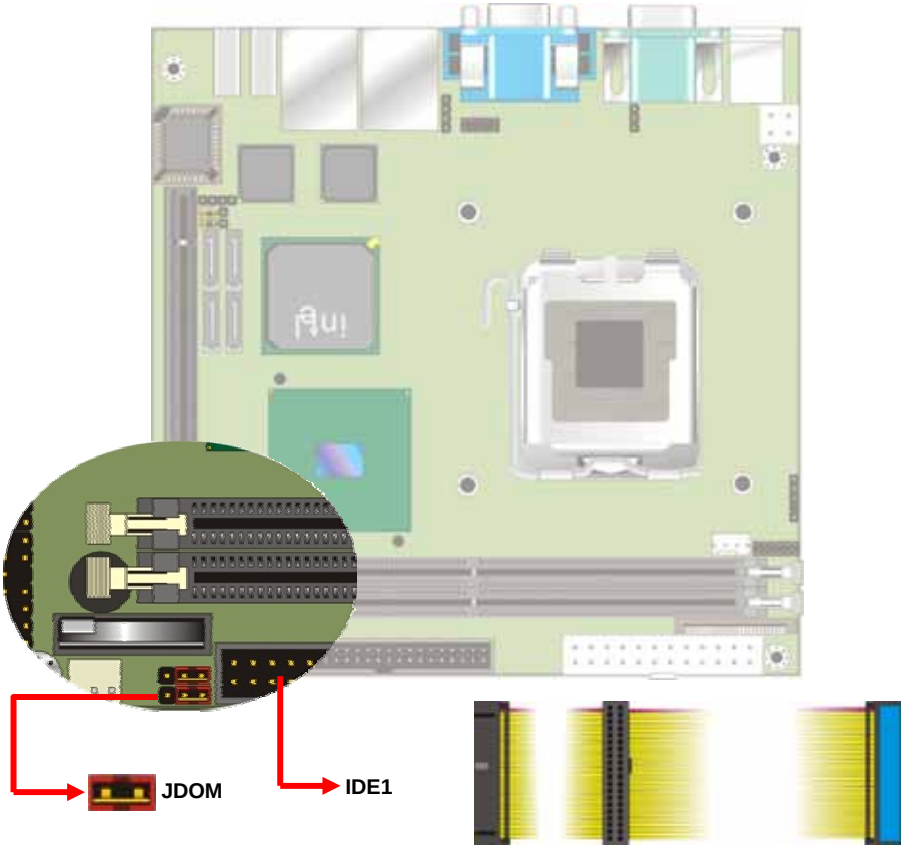
2.6 <Enhanced IDE interface>

The Intel® ICH6R (south bridge chip) supports one enhanced IDE interface, dual channel for two ATAPI devices with ATA100. Based on this function, **LV-672** has one 40-pin IDE connector with jumper selectable for pin-20 +5V supported. The jumper **JDOM** is two-pin type for pin-20 supplied with +5V to apply the DOM (Disk on Module).

Jumper: **JDOM**
Type: onboard 3-pin header

JDOM	Mode
ON	IDE1 pin-20 5V power supply enable
OFF	No 5V power supply on IDE1 pin-20

Default setting



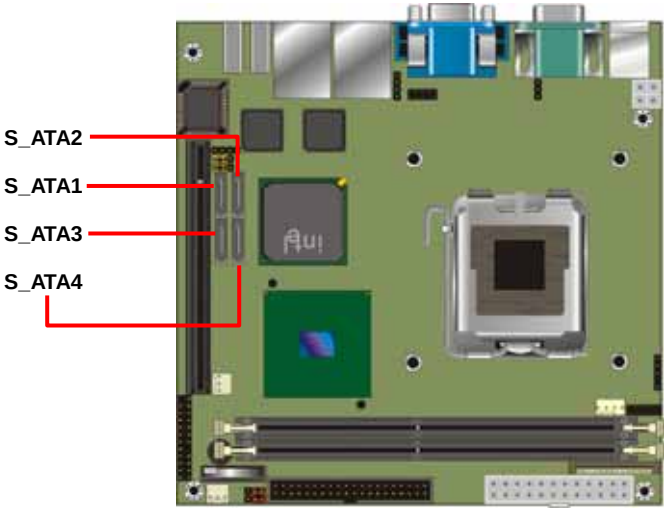
2.7 <Serial ATA installation>

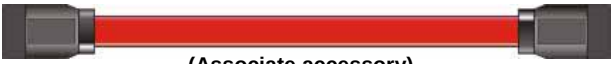
LV-672 has four Serial ATA interfaces with RAID function, the transfer rate of the Serial ATA can be up to 150MB/s. Please go to http://www.serialata.org/ for more about Serial ATA technology information. Based on Intel® ICH6R, it supports **Intel® Matrix Storage Technology** with combination of RAID 0 and RAID 1 modes. The main features of RAID on ICH6R are listed below:

1. Supports for up to RAID volumes on a single, two-hard drive RAID array.
2. Supports for two, two-hard drive RAID arrays on any of four Serial ATA ports.
3. Supports for Serial ATA ATAPI devices.
4. Supports for RAID spares and automatic rebuild.
5. Supports for AHCI on RAID arrays, including NCQ and native hot plug.

For more information please visit Intel's official website.

For more about the system setup for Serial ATA, please check the chapter of SATA configuration.

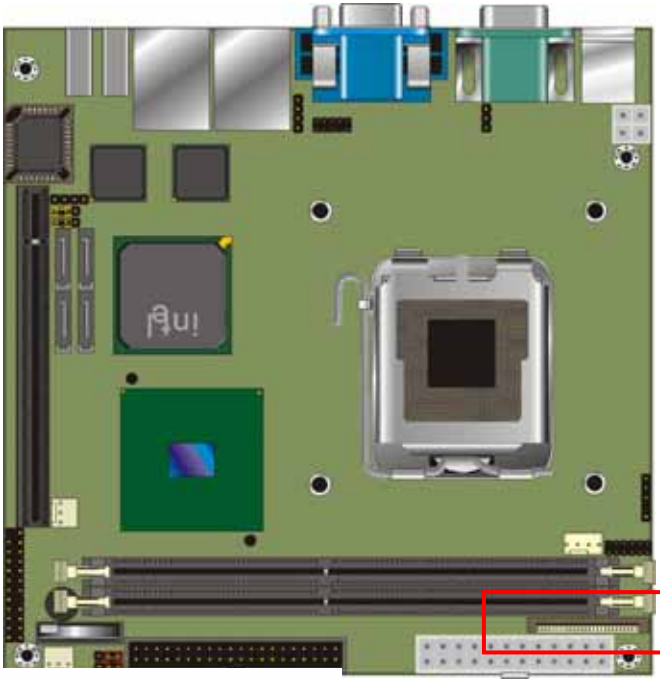


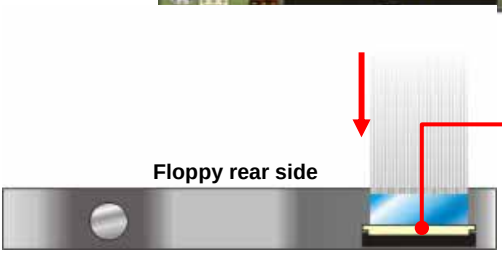


(Associate accessory)

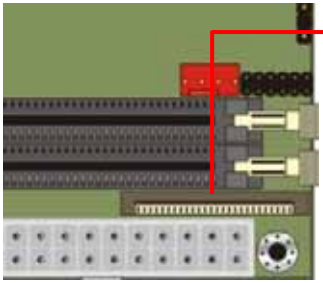
2.8 <Floppy Installation>

LV-672 has one slim type 26-pin floppy interface, it supports notebook use floppy and powering from onboard, please follow up the steps below to install the device.





1. **Lift up this plastic bar**
2. **Slot the cable in (Blue paste for outside)**
3. **Press back the plastic bar**



4. **Lift up the brown plastic bar**
5. **Slot the cable in (Blue paste for brown bar side)**
6. **Press back the plastic bar**

2.9 <LAN installation>

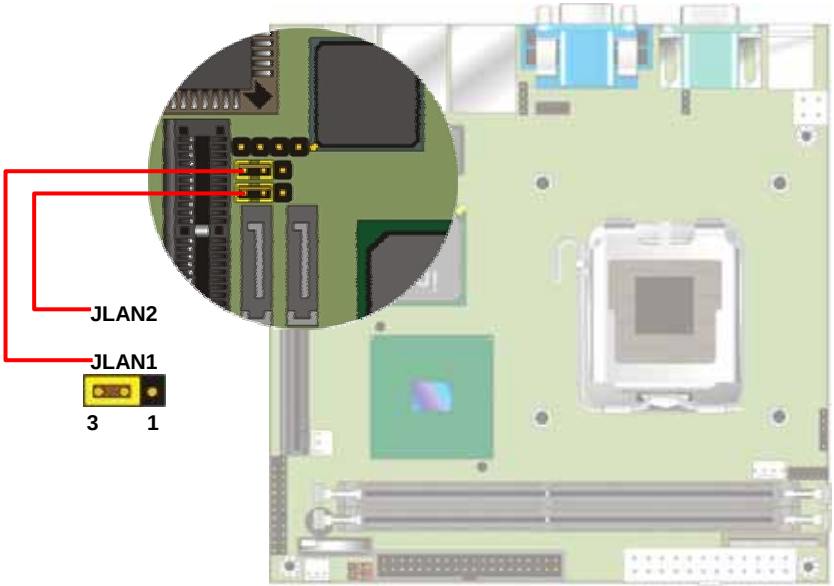
LV-672 integrates two Gigabit LAN interfaces with Intel 82541GI; they provide a standard IEEE 802.3 Ethernet interface for 1000BASE-T, 100BASE-TX and 10BASE-T applications. **LV-672** provides two RJ45 connectors on the rear I/O panel. The **JLAN1** and **JLAN2** can let you set to enable/disable the onboard LAN function.

Jumper: JLAN1/JLAN2

Type: Onboard 3-pin jumper

JLAN1/JLAN2	Mode
1-2	Disable
2-3	Enable

Default setting

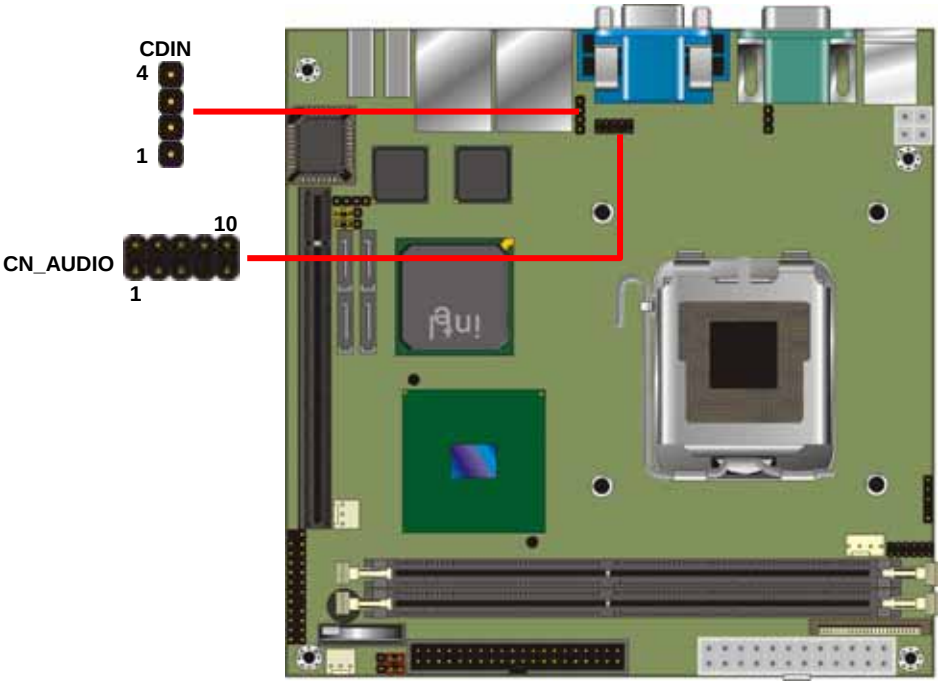


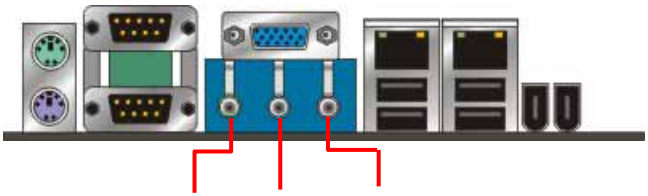
2.10 <Audio Installation>

LV-672 integrated with REALTEK® ALC655 Codec for 5.1 channel sound output. It supports 16-bit stereo full-duplex with 48 KHz sampling rate, compliant with AC97 Rev.2.3 specifications.

The board has one phone jack on rear I/O panel for Line-out, Line-in, MIC(stereo)-in as 2-channel sound system, and Front, Rear, Center as 5.1-channel sound system. It also has one 10-pin header for additional audio output, the cable with phone jack is optional available.

For advanced configuration with system, please check the chapter of audio configuration.





Line-out Front **Line-in Rear** **MIC-in (system setup with 2-channel) Center (system setup with 5.1-channel)**

Connector: CN_AUDIO

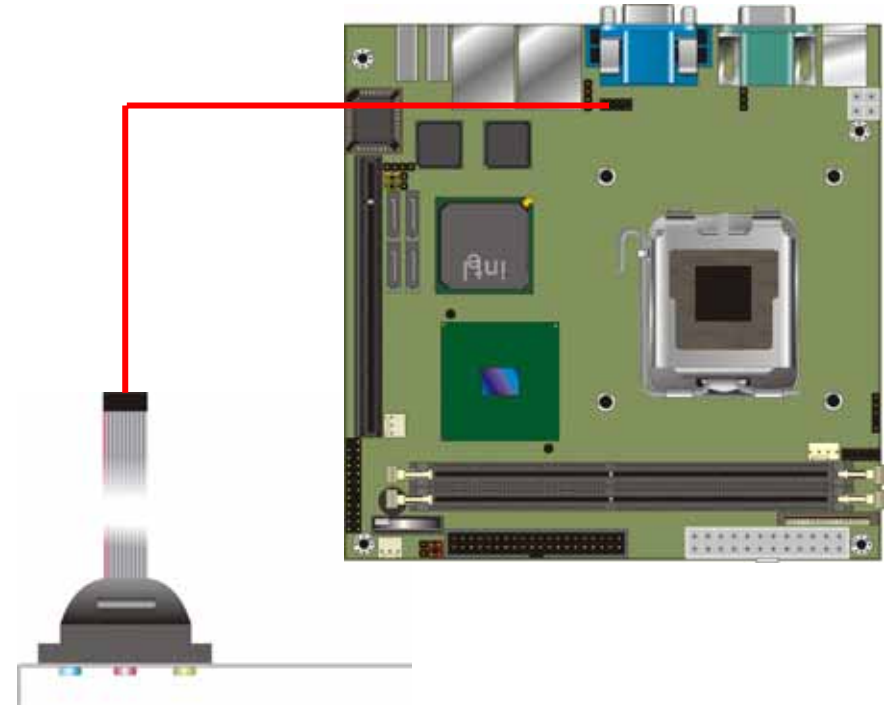
Type: 10-pin (2 x 5) header (pitch = 2.00mm)

Pin	Description	Pin	Description
1	Line – Left	2	Ground
3	Line – Right	4	MIC1
5	MIC2	6	Ground
7	N/C	8	Line Out – Left
9	Line Out – Right	10	Ground

Connector: CDIN

Type: 4-pin header (pitch = 2.54mm)

Pin	Description
1	CD – Left
2	Ground
3	Ground
4	CD – Right

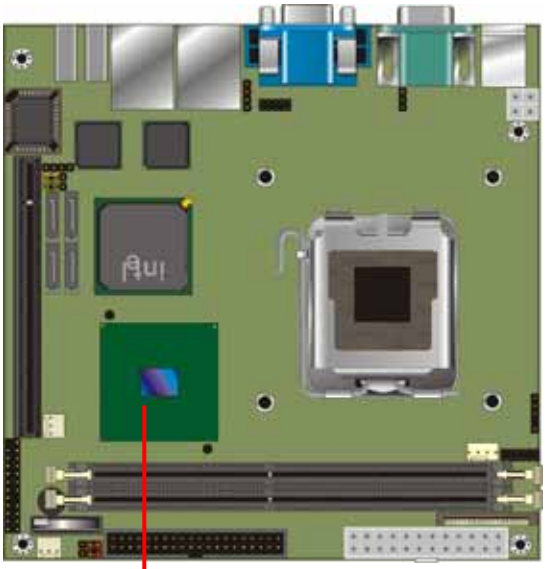


Line-in MIC-in Line-out
(Optional Audio Cable)

2.11 <Display Installation>

LV-672 integrates with Intel® 915G GMCH for Intel Graphic Media Accelerator (GMA) 900 technology. It supports Intel® DVMT (Dynamic Video Memory Technology) 3.0 for up to 224MB frame buffer size shared with system memory. With a 333MHz core and DirectX 9 and OpenGL acceleration, **LV-672** provides the powerful onboard graphics interface without additional graphic card. *(More information please visit Intel's website)*

For more information of configuring the frame buffer size, please check the chapter of video memory configuration.



Intel 915G GMCH

VGA (DB15)

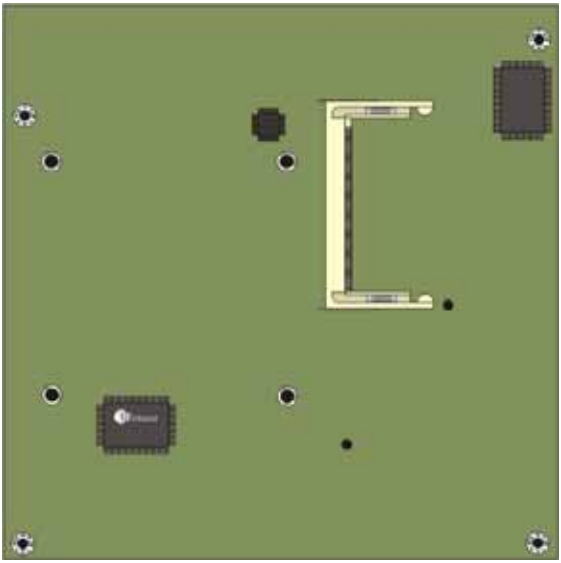
2.12 <IEEE1394 and USB Installation>

LV-672 integrates two IEEE1394 (FireWire) ports and six USB2.0 ports. The specifications of IEEE1394 and USB2.0 are listed below:

Interface	IEEE1394	USB2.0
Controller	AGERE FW323-06	Intel ICH6R
Transfer Rate	100/200/400Mb/s	Up to 480Mb/s
Output Voltage	12V	500mA

The Intel® ICH6R contains and Enhanced Host Controller Interface (EHCI) and four Universal Host Controller Interfaces (UHCI), it can determine whether your connected device is for USB1.1 or USB2.0, and change the transfer rate automatically.

1394_1 1394_2

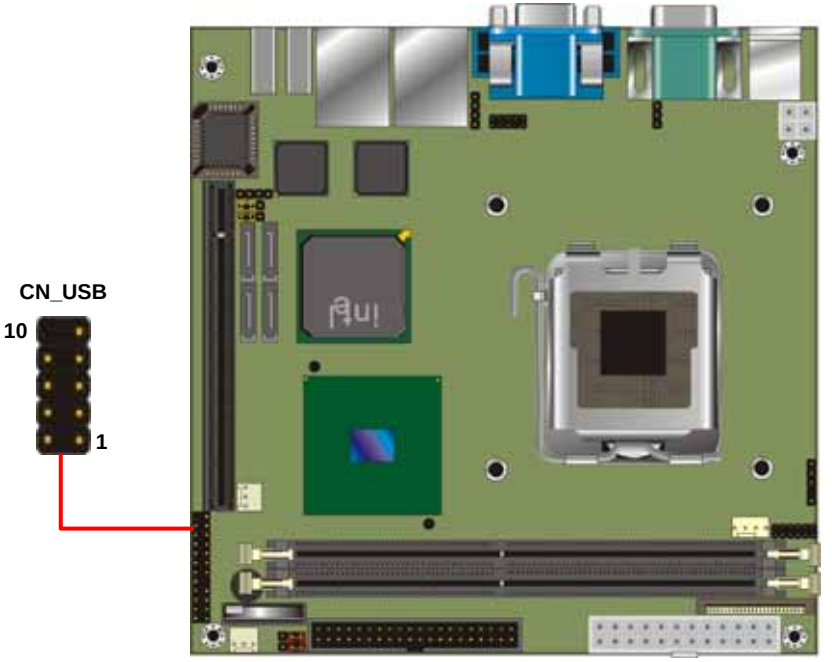


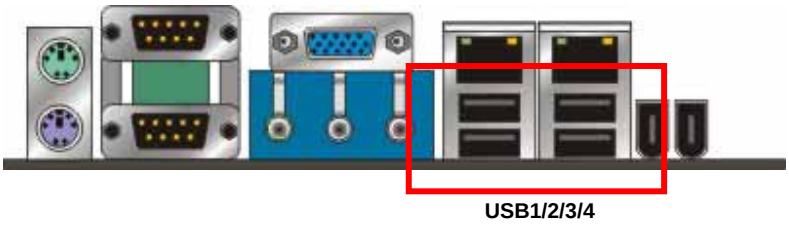
AGERE FW323-06
1394 LINK/PHY

Connector: **CN_USB**

Type: 10-pin (5 x 2) header for USB5/6 Ports

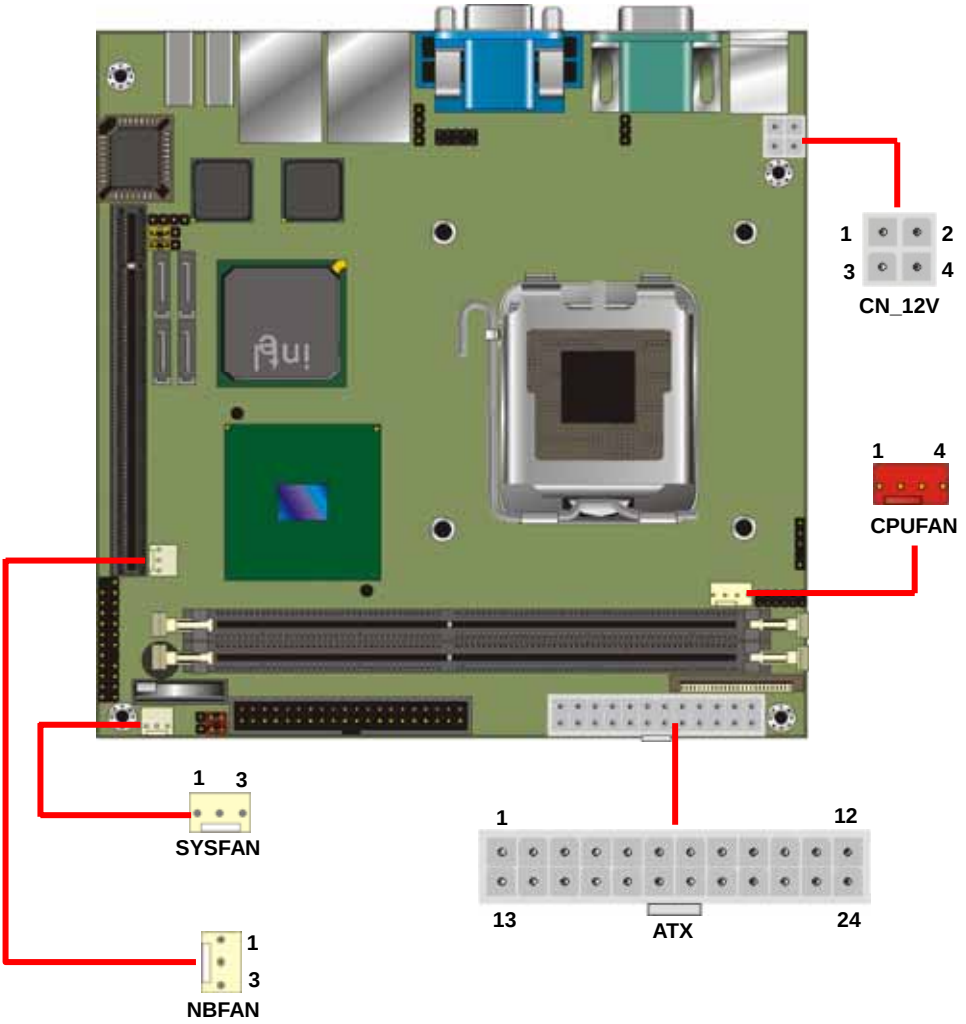
Pin	Description	Pin	Description
1	VCC	2	VCC
3	Data0-	4	Data1-
5	Data0+	6	Data1+
7	Ground	8	Ground
9	Ground	10	N/C





2.13 <Power and Fan Installation>

The **LV-672** provides a standard ATX power supply with **24-pin** ATX connector and additional 12V connector, and the board provides one **4-pin** fan connectors supporting smart fan for CPU cooler and two 3-pin cooler fan connectors for system and Northbridge chip. The 4-pin additional power connector is necessary for CPU powering; please connect this well before you finishing the system setup.



Connector: **ATX**

Type: 24-pin ATX power connector

PIN assignment			
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	5V	16	PS_ON
5	GND	17	GND
6	5V	18	GND
7	GND	19	GND
8	PW_OK	20	-5V
9	5V_SB	21	5V
10	12V	22	5V
11	12V	23	5V
12	3.3V	24	GND

Connector: **CN_12V**

Type: 4-pin standard Pentium 4 additional +12V power connector

Pin	Description	Pin	Description
1	Ground	2	Ground
3	+12V	4	+12V

Connector: **CPUFAN**

Type: 4-pin fan wafer connector

Pin	Description	Pin	Description
1	Ground	2	+12V
3	Fan Speed Detection	4	Fan Control

Connector: **NBFAN**, **SYSFAN**

Type: 3-pin fan wafer connector

Pin	Description	Pin	Description	Pin	Description
1	Ground	2	+12V	3	Fan Control

2.14 <GPIO interface>

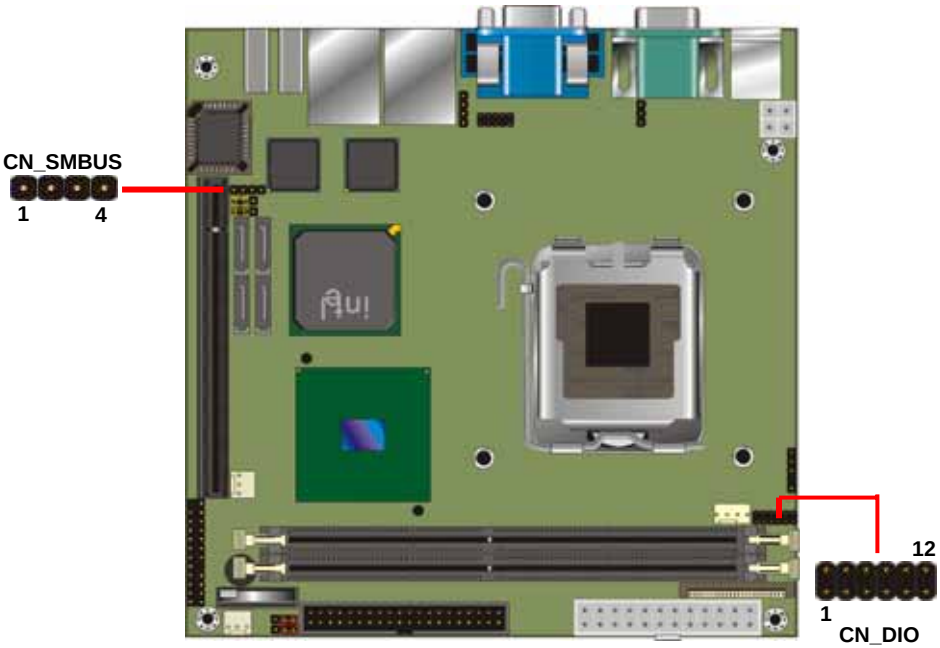
The board provides a programmable 8-bit digital I/O interface, and a SMBus (System management bus) interface for control panel application.

Connector: **CN_SMBUS**
Type: 4-pin SMBus connector (pitch = 2.54mm)

Pin	Description	Pin	Description
1	SMBDATA	2	SMBCLK
3	Ground	4	VCC3

Connector: **CN_DIO**
Type: onboard 2 x 6-pin header, pitch=2.0mm

Pin	Description	Pin	Description
1	Ground	2	Ground
3	GP10	4	GP14
5	GP11	6	GP15
7	GP12	8	GP16
9	GP13	10	GP17
11	VCC	12	+12V



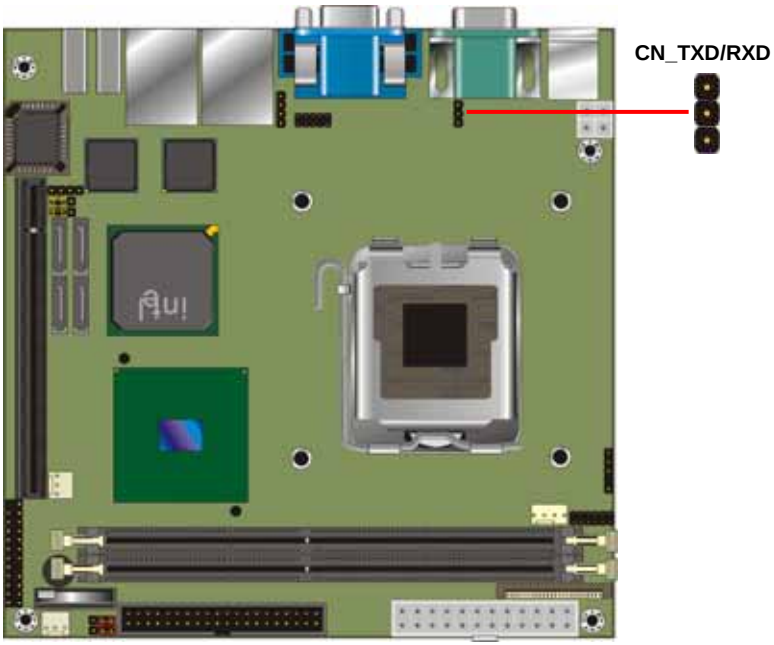
2.15 <Serial Port>

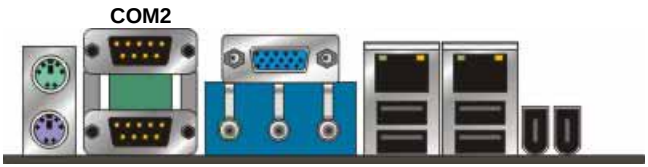
The board has two RS232 serial ports on real I/O panel, and onboard one 3-pin additional TXD/RXD connector for POS application.

Connector: **CN_TXD/RXD**

Connector type: onboard 3-pin header (pitch = 2.00mm)

Pin Number	Pin Assignment
1	TXD
2	RXD
3	Ground



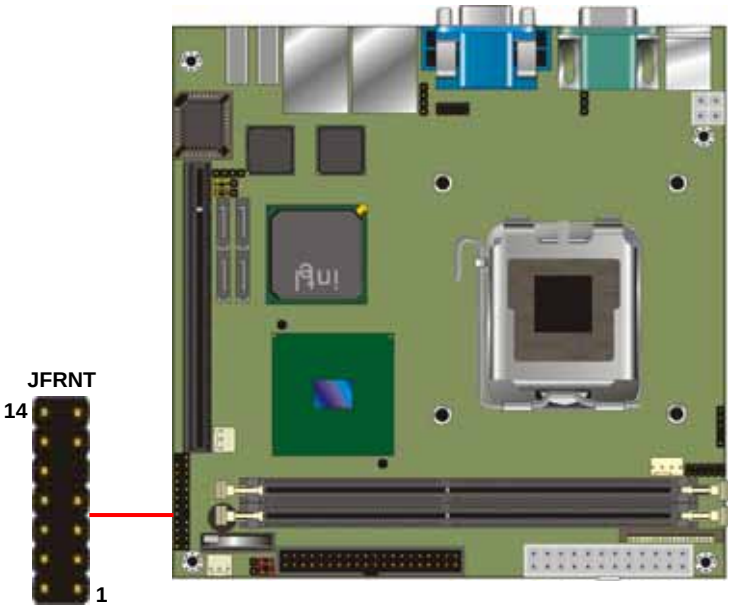


2.16 <Switch and Indicator>

The **JFRNT** provides front control panel of the board, such as power button, reset and beeper, etc. Please check well before you connecting the cables on the chassis.

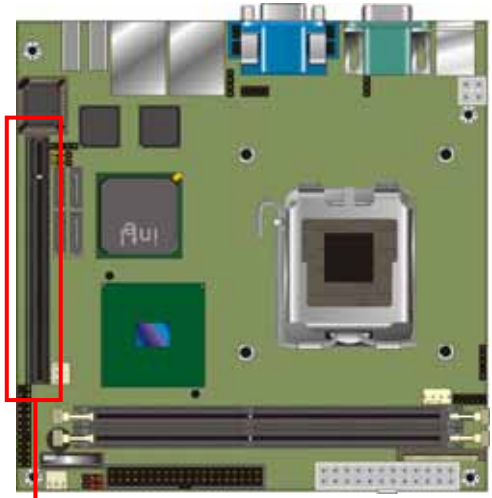
Connector: **JFRNT**
Type: onboard 14-pin (2 x 7) 2.54-pitch header

Function	Signal	PIN		Signal	Function
IDE LED	VCC	1	2	VCC	Power LED
	Active	3	4	N/C	
Reset	Reset	5	6	GND	
	GND	7	8	VCC	Speaker
	N/C	9	10	N/C	
Power Button	PWRBT	11	12	N/C	
	5VSB	13	14	SPKIN	

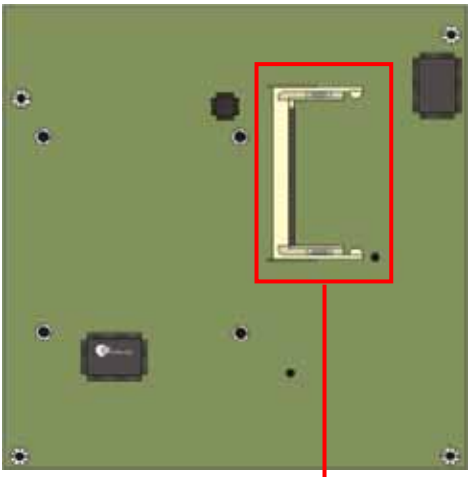


2.17 <Expansion Interface>

LV-672 has one PCI-Express 16x slot and one Mini-PCI socket onboard. PCI-Express is the last expansion interface technology, for its serial data transfer scheme, each lane will be up to 500MB/s (duplex), and the 16x (16 lanes) can be up to 8GB/s more than 2GB/s as AGP 8x bus transfer rate. The 16x slot can be also for 1x compatible use.



PCIE (PCI-Express 16x slot)



MINIPCI

Mini-PCI Card installation:

1. Slot in the card at 45 degree

2. Press the card onto the socket to hear a click sound

3. to remove the card, please pull out the locker on the socket.

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Chapter 3 <System Configuration>

3.1 <SATA configuration>

Based on Intel® ICH6R Southbridge chip, the board supports 4 Serial ATA ports; please follow the touring guide to setup your Serial ATA devices.

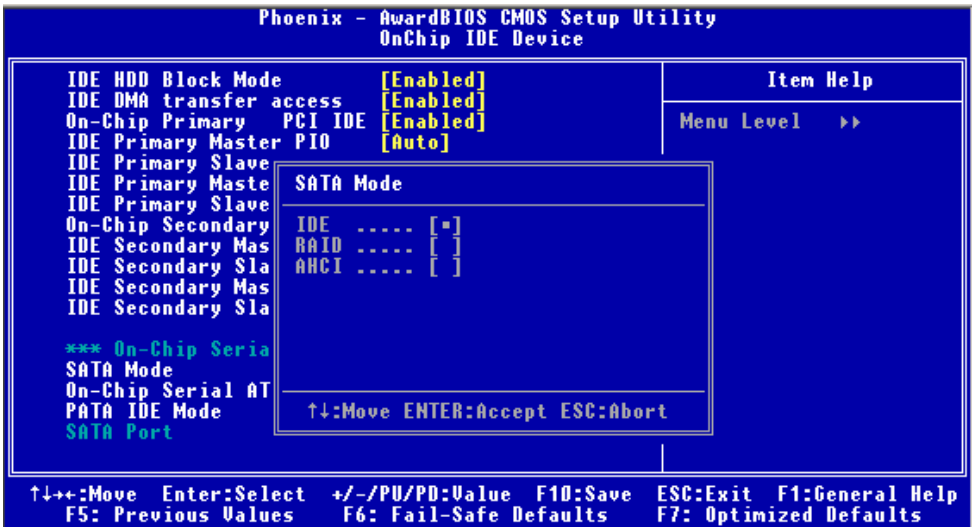
For Windows 98/SE/ME, Windows NT4.0 and DOS system, they only support up to 4 IDE devices including SATA devices, and Windows 2000/XP/Server2003 have no such limitation.

Operating System (Support Mode)	Parallel ATA	Serial ATA			
	Primary (2 Devices)	SATA1	SATA2	SATA3	SATA4
Windows 2000/XP (Enhance Mode)	O	O	O	O	O
Windows 98/ME/NT4.0					
Type 1 (**Combine Mode**)	O (Primary)	**X**	O (Secondary)	**X**	O (Secondary)
Type 2 (**Combine Mode**)	O (Secondary)	O (Primary)	**X**	O (Primary)	**X**
Type 3 (**SATA only**)	**X**	O (Primary) (Master)	O (Secondary) (Master)	O (Primary) (Slave)	O (Secondary) (Slave)

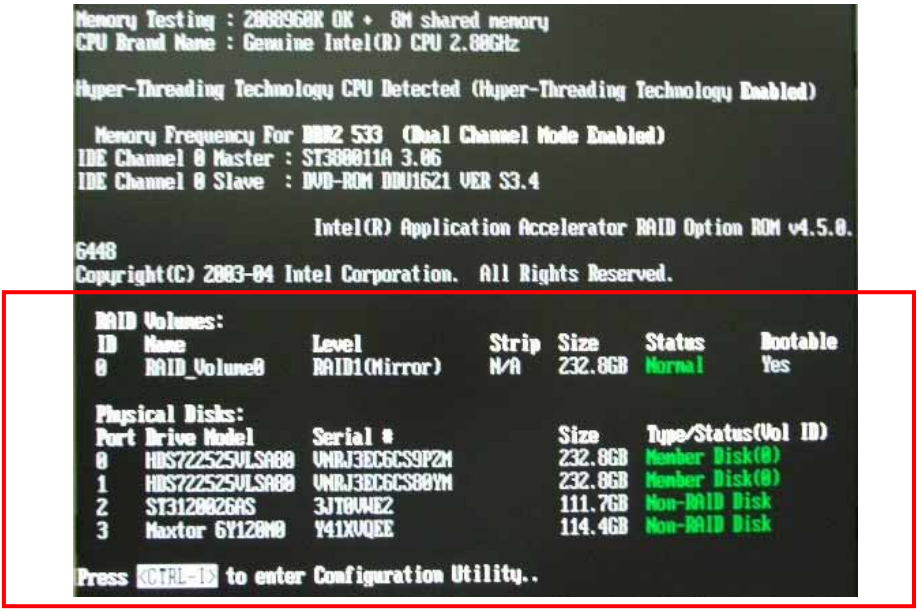
(Table 3.1.1)

The following BIOS setup screen shows how to setup your ATAPI devices with each mode.

SATA Mode:

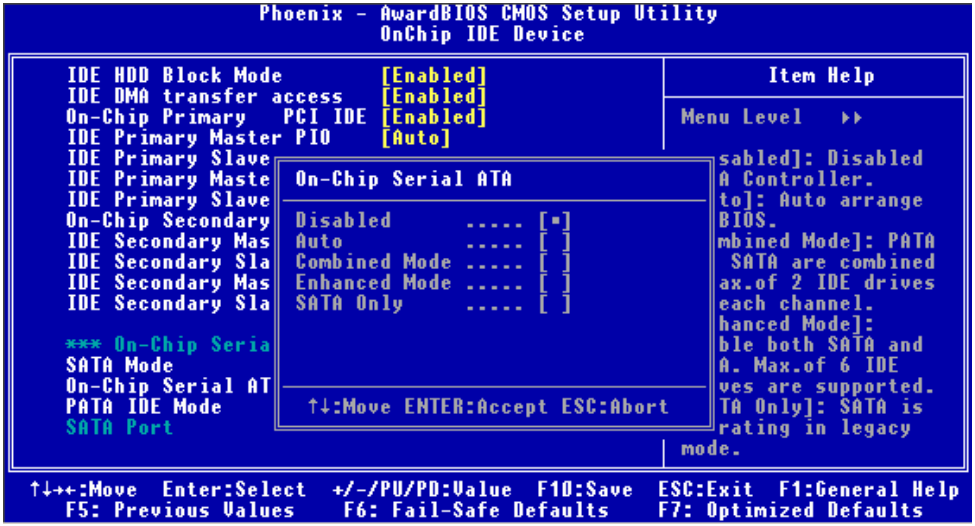


This option can let you select whether the Serial ATA hard drives would work under normal IDE mode or RAID mode. The RAID mode need more than one HDD is applied.



Once you enable the RAID mode, the boot-up screen would pop up the RAID configuration option for setup.

On-Chip Serial ATA mode:



This option can let you select operation modes of Serial ATA drives.

Disabled: To disable the onboard Serial ATA controller.

Auto: To allow the system select the optimized mode automatically.

Combined mode: PATA and SATA work as two channels for supporting two drives on each channel.

Enhanced mode: Max supported of the PATA and SATA for up to 6 drives.

SATA Only: To disable the PATA and only apply the SATA drives.

Notice: The Combined mode and Enhanced mode are supported depends on your operating system, please check **page35** for relative information.

3.2 <SATA RAID Configuration>

The board integrates Intel® ICH6R with RAID function for Serial ATA drives, and supports the configurations below:

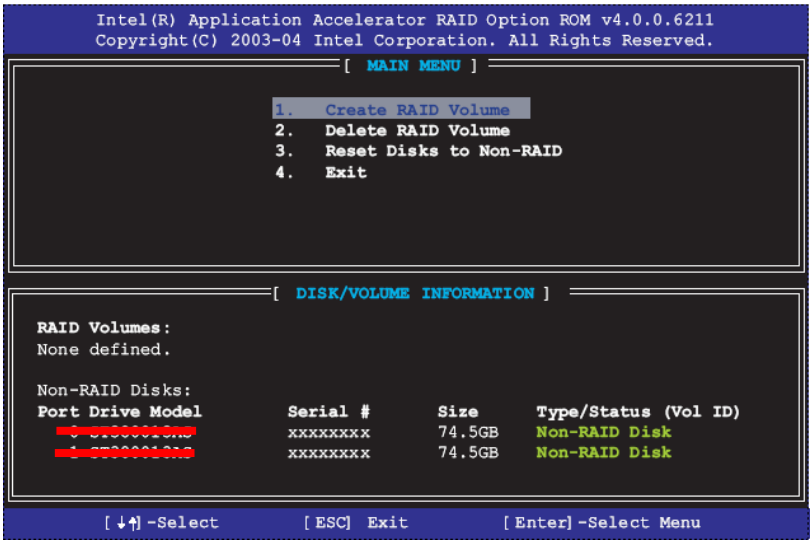
RAID 0 (Stripping): Two hard drives operating as one drive for optimized data R/W performance. It needs two unused drives to build this operation.

RAID 1 (Mirroring): Copies the data from first drive to second drive for data security, and if one drive fails, the system would access the applications to the workable drive. It needs two unused drives or one used and one unused drive to build this operation. The second drive must be the same or lager size than first one.

Intel Matrix Storage Technology: This technology would allow you to use **RAID 0+1** mode on only two drives (4 drives needed on traditional RAID 0+1). It will create two partitions on each hard drive to simulate **RAID 0** and **RAID 1**. It also can let you modify the partition size without re-formatted.

For more information of Intel Matrix Storage Technology, please visit Intel's website.

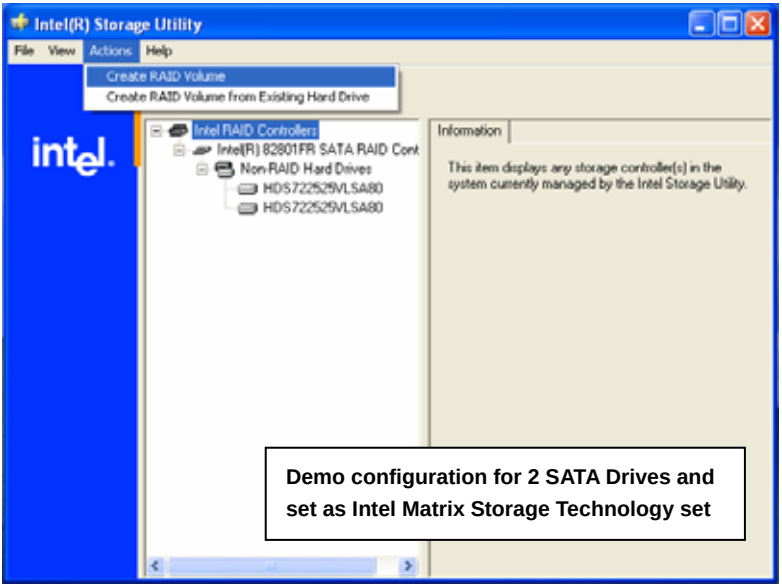
If you need to install an operation system on the RAID set, please use the driver disk attached in the package when it informs you to obtain the RAID drivers.



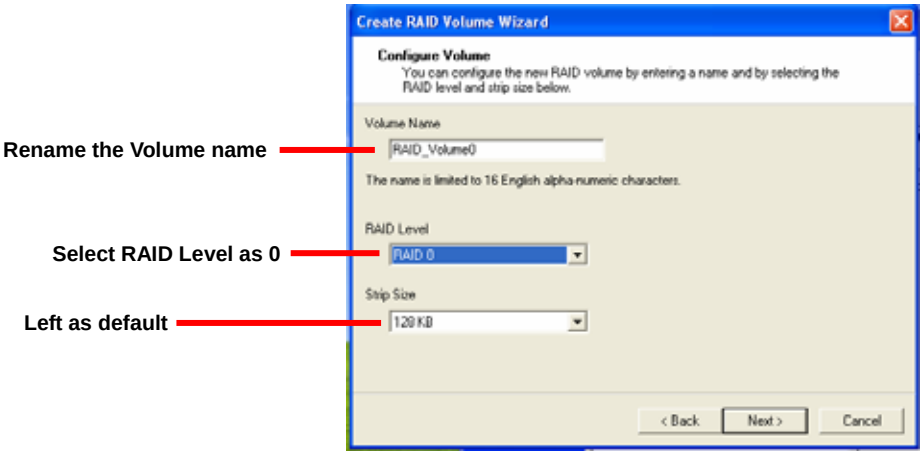
Please press **<CTRL+I>** to enter the RAID configuration menu.

You can setup the RAID under operation system for Microsoft® Windows XP SP1 or Windows 2000 SP4 version, please install the Intel® Application Accelerator Ver.4.5 later to support RAID configuration with Intel® Matrix Storage Technology.

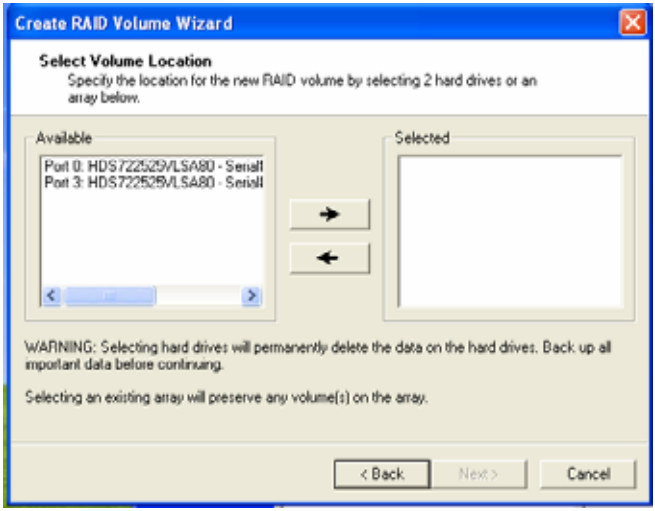
1. After installing Intel Application Accelerator, please execute Intel® Storage Utility.



2. Select Actions to Create RAID Volume

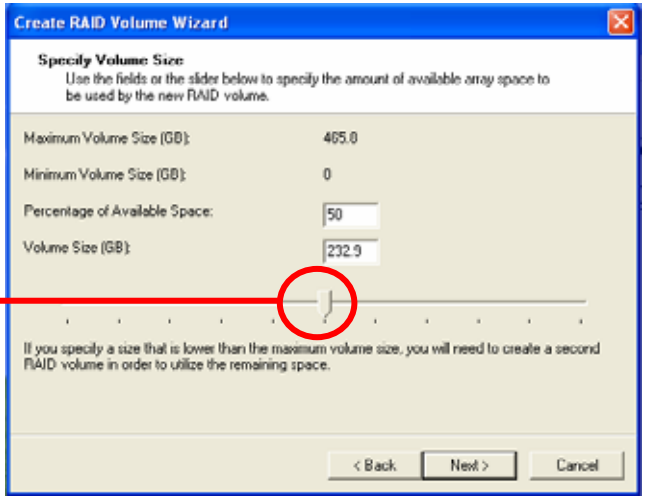


3. Please select two hard drives to prepare to set the RAID volume

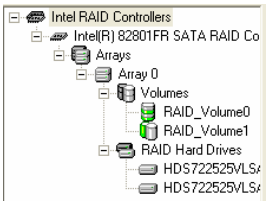


4. Specify the Volume size

Tune this bar to specify the volume size, if you specify the volume size lower than maximum, you can create a second volume for another RAID set.
(Make RAID 0+1 on only two hard drives)



5. Repeat the step 1 to create second volume as RAID Level 1.



For other configuration set please click Help on tool bar.

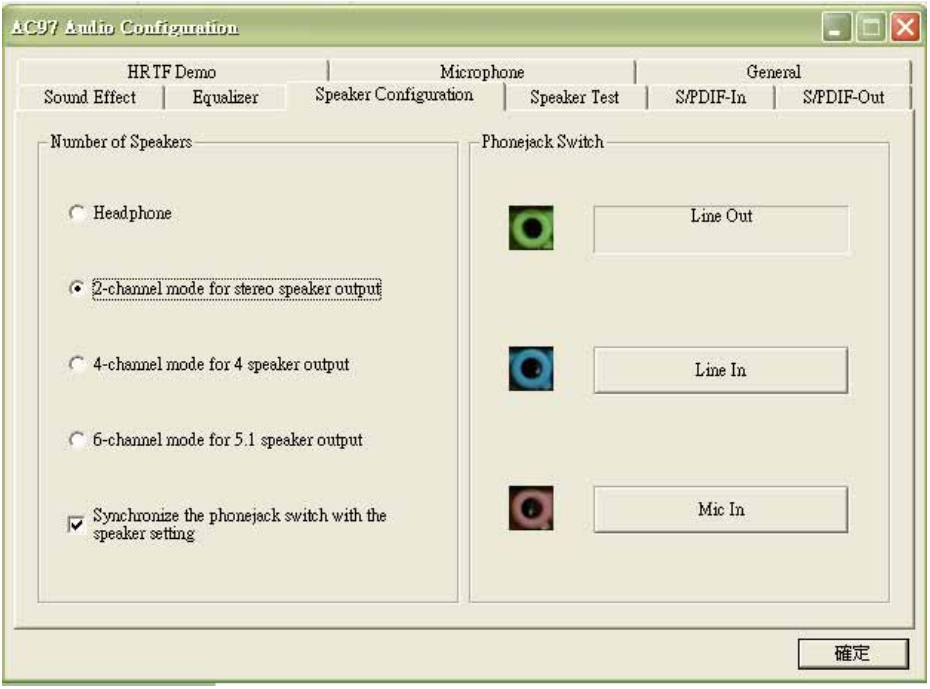
3.3 <Audio Configuration>

The board integrates Intel® ICH6R with REALTEK® ALC655 codec. It can support 2-channel or 5.1 channel sound under system configuration. Please follow the steps below to setup your sound system.

1. Install REALTEK AC97 Audio driver.

2. Lunch the control panel and Sound Effect Manager.

3. Select Speaker Configuration



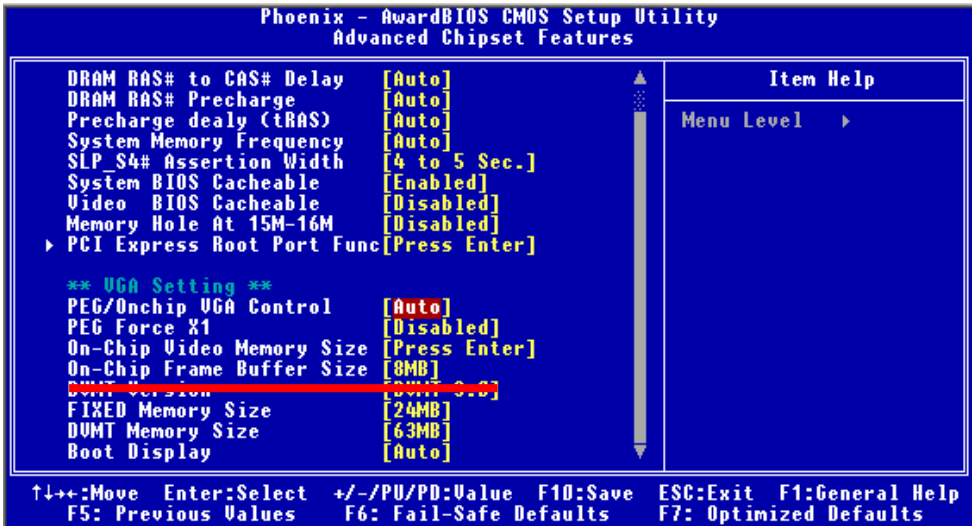
4. Select the sound mode to meet your speaker system.

3.4 <Video Memory Setup>

Based on Intel® 915G chipset with GMA (Graphic Media Accelerator) 900, the board supports Intel® DVMT (Dynamic Video Memory Technology) 3.0, which would allow the video memory be triggered up to 224MB.

To support DVMT, you need to install the Intel GMA 900 Driver with supported OS.

BIOS Setup:



On-Chip Video Memory Size: This option combines three items below for setup.

On-Chip Frame Buffer Size:

This item can let you select video memory which been allocated for legacy VGA and SVGA graphics support and compatibility. The available option is **1MB** and **8MB**.

Fixed Memory Size:

This item can let you select a static amount of page-locked graphics memory which will be allocated during driver initialization. Once you select the memory amount, it will be no longer available for system memory.

DVMT Memory Size:

This item can let you select a maximum size of dynamic amount usage of video memory, the system would configure the video memory depends on your application, this item is strongly recommend to be selected as **MAX DVMT**.

Fixed + DVMT Memory Size:

You can select the fixed amount and the DVMT amount at the same time for a guaranteed video memory and additional dynamic video memory, please check the table below for available setting.

System Memory	On-Chip Frame Buffer Size	Fixed Memory Size	DVMT Memory Size	Total Graphic Memory
128MB~255MB	1MB	32MB	0MB	32MB
	1MB	0MB	32MB	32MB
	8MB	32MB	0MB	32MB
	8MB	0	32MB	32MB
256MB~511MB	1MB	64MB	0MB	64MB
	1MB	0	64MB	64MB
	1MB	128MB	0MB	128MB
	1MB	0	128MB	128MB
	1MB	64MB	64MB	128MB
	8MB	64MB	0MB	64MB
	8MB	0	64MB	64MB
	8MB	128MB	0MB	128MB
	8MB	0	128MB	128MB
	8MB	64MB	64MB	128MB
512MB upper	1MB	64MB	0	64MB
	1MB	0	64MB	64MB
	1MB	128MB	0	128MB
	1MB	0	128MB	128MB
	1MB	64MB	64MB	128MB
	1MB	0	224MB	224MB
	8MB	64MB	0	64MB
	8MB	0	64MB	64MB
	8MB	128MB	0	128MB
	8MB	0	128MB	128MB
	8MB	64MB	64MB	128MB
	8MB	0	224MB	224MB

Notice:

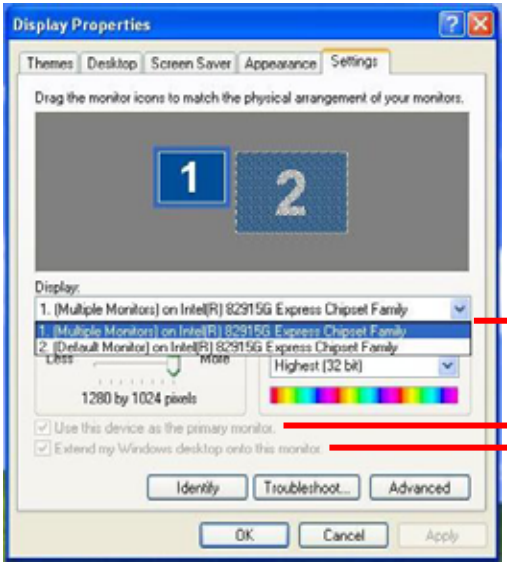
1. The On-Chip Frame Buffer Size would be included in the Fixed Memory.
2. Please select the memory size according to this table.

3.5 <Display Properties Setting>

Based on Intel 915G GMCH with GMA 900 (Graphic Media Accelerator), the board supports two DACs for display device as different resolution and color bit.

Please install the Intel Graphic Driver before you starting setup display devices.

1. Click right button on the desktop to lunch **display properties**

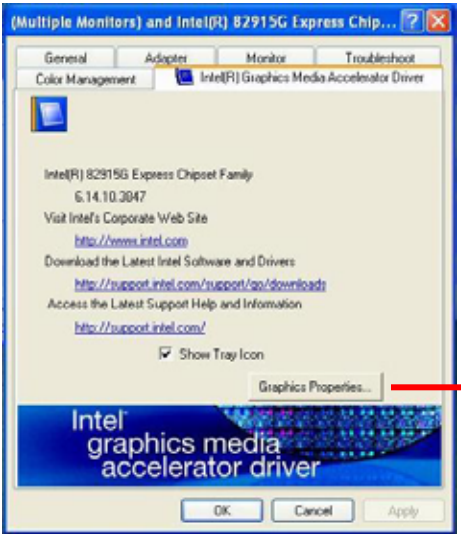


You can find two DACs on this setup screen, to select each for resolution and color bit setup.

You can choose on of the device for primary monitor.

You can setup the two devices for extended desktop

2. Click **Advanced** button for more specificity setup.



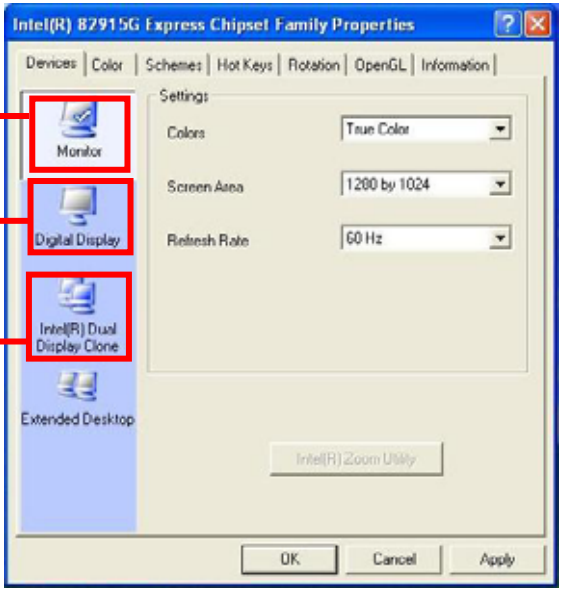
Click Graphics Properties... for advanced setup

3. This setup options can let you define each device settings.

Click Monitor to setup the CRT monitor for Colors, Resolution and Refresh Rate

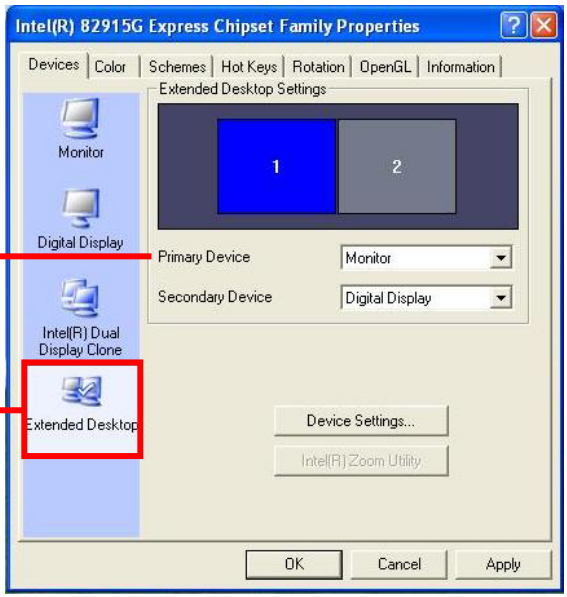
Click Digital Display to setup the DVI monitor for Colors, and Resolution

Click Intel® Dual Display Clone to setup the dual display mode as same screen



Set the main display device here

Click Extended Desktop to setup the dual display mode as different screen display

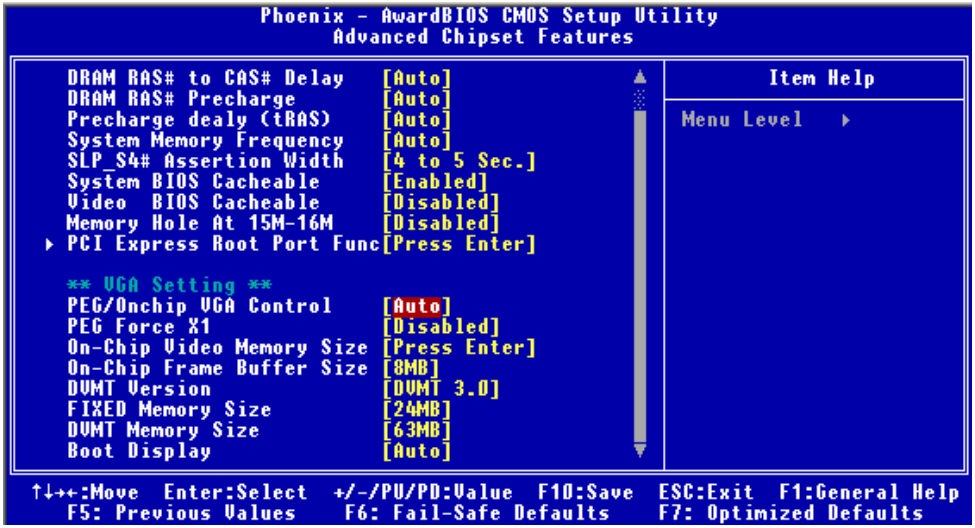


Notice: The dual display needs PCIE-SDVO module to support more than one display devices.

3.6 <PCI-Express interface setting>

The board provides one 16 lanes PCI-Express slot, it can be used for 16x graphic cards, or 1x LAN cards. (4x SCSI cards can be also compatible with 1x transfer way). Please check BIOS setting before you using PCI-Express card.

PEG Force X1:



If you use a 16x graphic card, please disable this function; if you use other 1x or 4x devices, please enable this function to force the interface working under 1x transfer mode.

Chapter 4 <BIOS Setup>

The motherboard uses the Award BIOS for the system configuration. The Award BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides critical low-level support for the system central processing, memory and I/O sub-systems.

The BIOS setup program of the single board computer let the customers modify the basic configuration setting. The settings are stored in a dedicated battery-backed memory, NVRAM, retains the information when the power is turned off. If the battery runs out of the power, then the settings of BIOS will come back to the default setting.

The BIOS section of the manual is subject to change without notice and is provided here for reference purpose only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.

To activate CMOS Setup program, press ＜DEL＞ key immediately after you turn on the system. The following message "Press DEL to enter SETUP" should appear in the lower left hand corner of your screen. When you enter the CMOS Setup Utility, the Main Menu will be displayed as **Figure 4-1**. You can use arrow keys to select your function, press ＜Enter＞ key to accept the selection and enter the sub-menu.

Figure 4-1 CMOS Setup Utility Main Screen

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Appendix A <I/O Port Pin Assignment>

A.1 IDE Port

Connector: **IDE1**

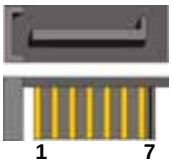
Type: 40-pin (20 x 2) box header

Pin	Description	Pin	Description
1	Reset	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	VCC
21	REQ	22	Ground
23	IOW-/STOP	24	Ground
25	IOR-/HDMARDY	26	Ground
27	IORDY/DDMARDY	28	IDESEL
29	DACK-	30	Ground
31	IRQ	32	N/C
33	A1	34	CBLID
35	A0	36	A2
37	CS0 (MASTER CS)	38	CS1 (SLAVE CS)
39	LED ACT-	40	Ground

A.2 <Serial ATA Port>

Connector: **S_ATA1/2/3/4**

Type: 7-pin wafer connector



1	2	3	4	5	6	7
GND	RSATA_TXP1	RSATA_TXN1	GND	RSATA_RXN1	RSATA_RXP1	GND

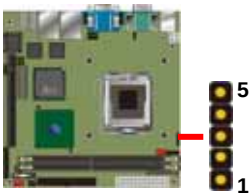
A.3 <Floppy Port>

Connector: **FDD**
Type: 26-pin connector

Pin	Description	Pin	Description
1	VCC	2	INDEX
3	VCC	4	DRV0
5	VCC	6	DSKCHG
7	DRV1	8	N/C
9	MTR1	10	MTR0
11	RPM	12	DIR
13	N/C	14	STEP
15	Ground	16	WRITE DATA
17	Ground	18	WRITE GATE
19	N/C	20	TRACK 0
21	N/C	22	WRPTR
23	Ground	24	RDATA-
25	Ground	26	SEL

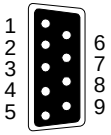
A.4 <IrDA Port>

Connector: **CN_IR**
Type: 5-pin header for SIR Ports



Pin	Description
1	VCC
2	N/C
3	IRRX
4	Ground
5	IRTX

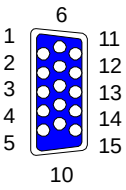
A.5 <Serial Port>



Connector: **COM1/COM2**
Type: 9-pin D-sub male connector on bracket

Pin	Description	Pin	Description
1	DCD	6	DSR
2	SIN	7	RTS
3	SO	8	CTS
4	DTR	9	RI
5	Ground		

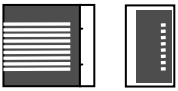
A.6 <VGA Port>



Connector: **VGA**
Type: 15-pin D-sub female connector on bracket

Pin	Description	Pin	Description	Pin	Description
1	RED	6	Ground	11	N/C
2	GREEN	7	Ground	12	5VCDA
3	BLUE	8	Ground	13	HSYNC
4	N/C	9	LVGA5V	14	VSYNC
5	Ground	10	Ground	15	5VCLK

A.7 <LAN Port>



Connector: **RJ451/2**
Type: RJ45 connector with LED on bracket

Pin	1	2	3	4	5
Description	TRD0+	TRD0-	TRD1+	TRD1-	NC

Pin	6	7	8	9	10
Description	NC	TRD2+	TRD2-	TRD3+	TRD3-

Appendix B <Flash BIOS>

B.1 BIOS Auto Flash Tool

The board is based on Award BIOS and can be updated easily by the BIOS auto flash tool. You can download the tool online at the address below:

http://www.award.com
http://www.commell.com.tw/support/support.htm

File name of the tool is "awdflash.exe", it's the utility that can write the data into the BIOS flash ship and update the BIOS.

B.2 Flash Method

1. Please make a bootable floppy disk.
2. Get the last .bin files you want to update and copy it into the disk.
3. Copy awardflash.exe to the disk.
4. Power on the system and flash the BIOS. (Example: C:/ awardflash XXX.bin)
5. Re-star the system.

Any question about the BIOS re-flash please contact your distributors or visit the web-site at below:

http://www.commell.com.tw/support/support.htm

Appendix C <Hardware Test>

C.1 <Power Consumption Test>

Hardware		
CPU	Intel® Pentium® 4 2.8GHz	
Memory	Samsung DDRII533 256MB x 2	
HDD	Seagate ST340014A	(not counted)
CDROM	SONY DDU1621 DVD-ROM	(not counted)
Power Supply	SEVENTEAM ST-402HLP	
Software		
OS	Windows XP SP1 English Version	
Application	3DMARK 2003	
Test Result		
3.3V	0.5A	1.65W
5V	2A	10W
12V	7.5A	90W

Hardware		
CPU	Intel® Pentium® 4 3.6GHz	
Memory	Apacer DDRII533 1GB x 2	
HDD	Seagate ST340014A	(not counted)
CDROM	SONY DDU1621 DVD-ROM	(not counted)
Power Supply	SEVENTEAM ST-402HLP	
Software		
OS	Windows XP SP1 English Version	
Application	3DMARK 2003	
Test Result		
3.3V	0.5A	1.65W
5V	2.3A	11.5W
12V	12A	144W

Contact Information

Any advice or comment about our products and service, or anything we can help you please don't hesitate to contact with us. We will do our best to support you for your products, projects and business.

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