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User's Manual

Single Board Computer 2807870

Version 1.0, February 2008

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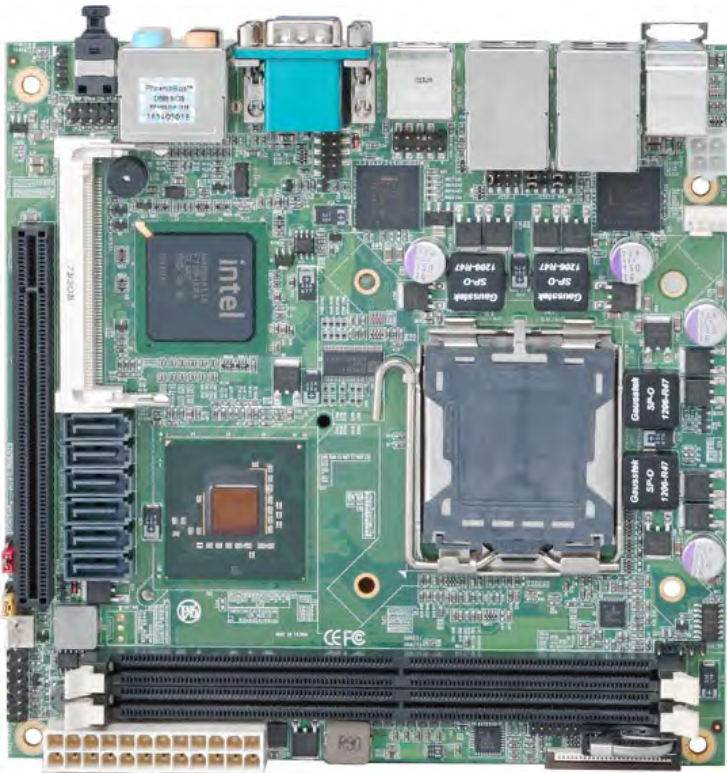
Packing List

Please check package component before you use our products.
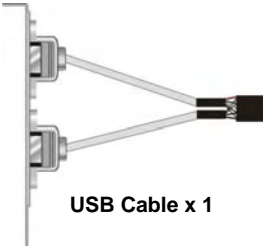
Hardware:

2807870 Mini-ITX motherboard x 1

Cable Kit:

SATA Cable x 2

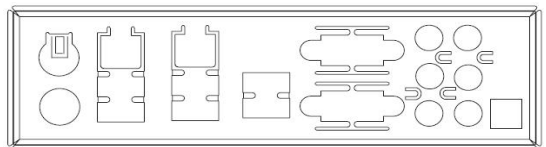**26-pin Slim Type Floppy Cable x 1**

SATA Power Y Cable x 1

USB Cable x 1

COM Port Cable x 1

RAID drivers Disc for Windows 2000,

Windows XP and Windows Server 2003

I/O Shield x 1

Other Accessories:

Drivers CD (including User's Manual) x 1

Index

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Chapter1 <Introduction>

1.1 <Product Overview>

2807870 is the motherboard with last Intel desktop technology with Mini-ITX form factor. Based on Intel® Q35 and ICH9DO, the board integrates a new Core2 Quad / Core 2 Duo processor 775-pin socket, DDR2 memory socket, Intel® Graphic Media Accelerator 3100 technology, Serial ATA II with RAID function for a powerful desktop system.

Intel® LGA775 processor

The Intel® Core2 Quad / Core 2 Duo processor now comes with a new form factor with 775-pin PLGA package, for 800/1066/1333MHz front-side-bus, 4MB L2 cache, for 65nm and 45nm manufacturing technology, the PLGA processor without pin header on solder side can make user installing the processor on the socket easier.

Intel® Q35 and ICH9DO chipset

The Intel Q35 integrates DDR2 667/800MHz for memory, and Graphic Media Accelerator (GMA) 3100 technology for new graphic engine. It can provide up to 384MB of frame buffer when you install over 1GB of system memory. The ICH9DO integrates with up to 6 USB2.0 interfaces and serial ATA II interface with RAID function.

Flexible Extension Interface

2807870 provides one PCIE slot for graphics card, it also can support
PCI Express by 1/ 16 LAN card or others device and one Mini-PCI socket.

1.2 <Product Specification>

General Specification	
Form Factor	Mini-ITX motherboard
CPU	Support Intel Core 2 Quad / Core 2 Duo / Celeron processor Package type: LGA775 Front side bus: 800 / 1066 / 1333MHz
Memory	Two DDRII 667 / 800 MHz DIMM up to 4GB
Chipset	Intel Q35 & ICH9DO
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Watchdog Timer	Generates a system reset with internal timer for 1min/s ~255min/s
Power Management	ACPI 1.0 compliant, supports power saving mode
Serial ATA Interface	Intel ICH9DO built-in 6 x Serial ATAII interface up to 300MB/s Support RAID 0,1,5,10 and Intel Matrix Storage Technology
VGA Interface	Intel integrated extreme GMA 3100 (Graphic Media Accelerator) Technology
Video Memory	Up to 384MB shared with system memory
Audio Interface	Intel integrated ICH9DO with Realtek ALC888 HD Audio
LAN Interface	2 x Intel 82573L Gigabit LAN
GPIO interface	Onboard programmable 8-bit Digital I/O interface
Extended Interface	One PCIE x 16 slot, one Mini PCI socket to support Mini-PCI Type III A
Internal I/O Port	1 x RS232/422/485, 1 x slim FDD port, 1 x GPIO port, 1 x CDIN connector, 1 x Audio connector, 1 x IrDA connector and 2 x USB ports
External I/O Port	2 x RJ45 LAN ports, 1 x DB15 VGA port, 1 x PS/2 Keyboard/Mouse Port, 6 x USB2.0 ports, 1 x SPDIF connector and 1 x Serial Port
External Audio	Line-in, MIC-in, Front, Rear, Center/Subwoofer and Side outputs
Power Requirement	Standard 24-pin ATX power supply and P4 4-pin 12V (20-pin is compatible)
Dimension	170mm x 170mm
Temperature	Operating within 0~60 centigrade Storage within -20~85 centigrade
Multi-I/O Port	
Chipset	Intel Q35, ICH9DO (82801IO) & 8M SPI
Serial Port	One external RS-232 and one internal RS232/422/485 serial ports
USB Port	Eight Hi-Speed USB 2.0 ports with 480Mbps of transfer rate
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 Q35, ICH9DO
Frame Buffer	Up to 384MB shared with system memory
Display Type	CRT or LCD monitor display

Ethernet Interface

Controller	Two Intel 82573L Gigabit Ethernet controller
Type	Triple speed 10/100/1000Base-T Auto-switching Fast Ethernet Full duplex, IEEE802.3U compliant
Connector	Two External RJ45 connectors with LED on rear I/O panel

Audio Interface

Chipset	Intel Q35, ICH9DO (82801IO) & 8M SPI Intel High Definition Audio compliance
Interface	7.1 channels sound output
Connector	External six phone jack for 7.1 channel audio on rear I/O panel External SPDIF connector on rear I/O panel Internal 10-pin header for line-in/-out, MIC-in, 4-pin header for CD-IN

Expansive Interface

Mini PCI	One Mini-PCI socket **TYPE III A** (32-bit, 33MHz) Power supply: +3.3V, +5V

Power and Environment

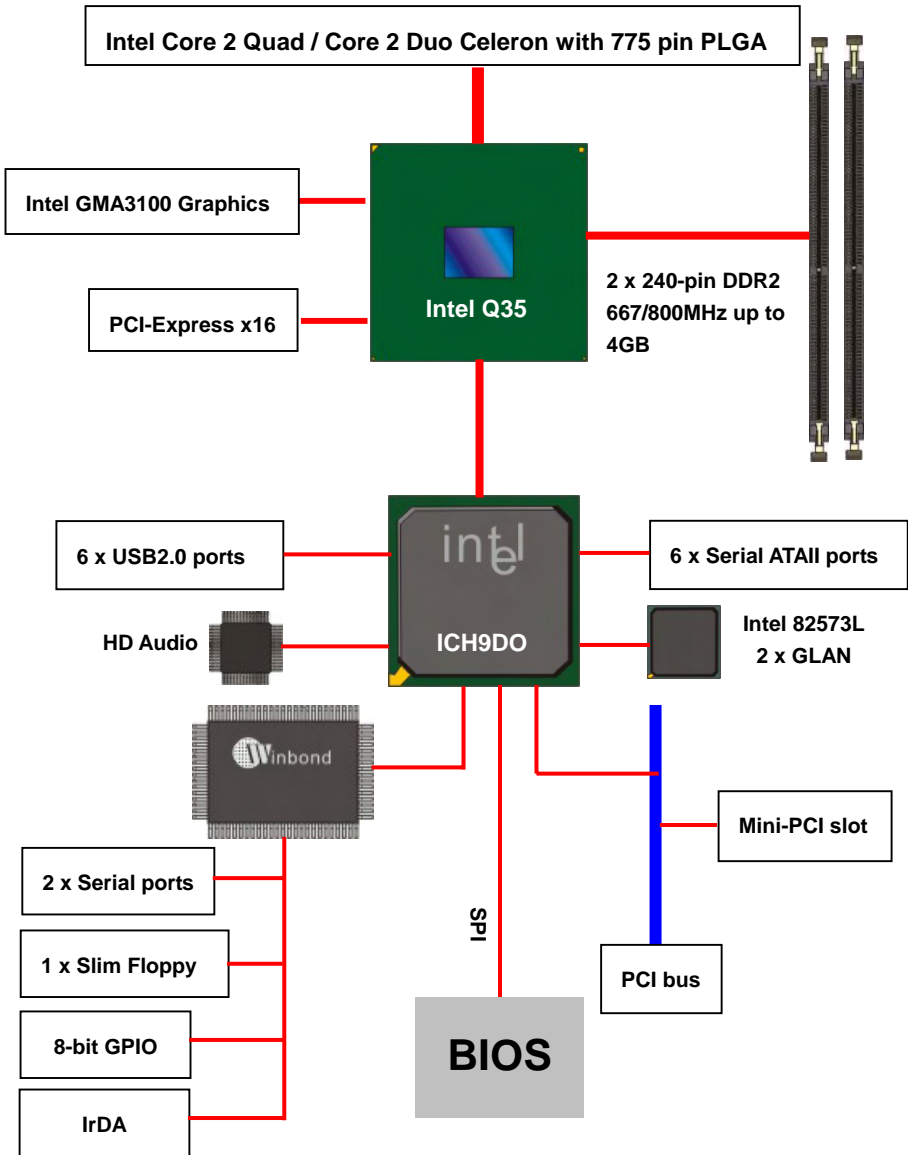|	
Power Requirement	Standard ATX **24-pin (20-pin is compatible)** power supply Additional +12V 4-pin power connector
Dimension	170 (L) mm x 170 (H) mm
Temperature	Operating within $0 \sim 60^oC$ ($32 \sim 140^oF$) Storage within $-20 \sim 85^oC$ ($-4 \sim 185^oF$)

Ordering Code

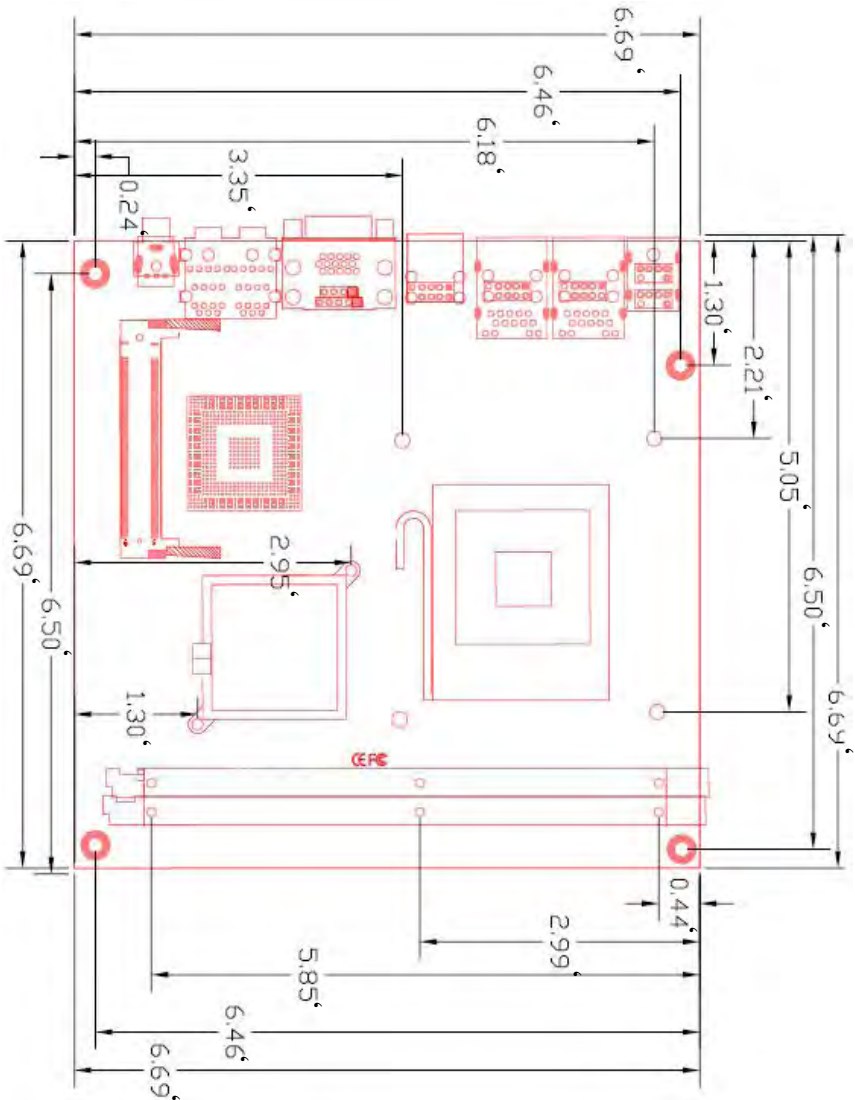|	
2807870	**o**nboard VGA, 2 x Intel Gigabit LAN, 6 x USB2.0, Mini-PCI, 2 x serial Port, 1 x slim FDD Realtek ALC888 HD 7.1 Channel Audio, 6 x SATA, 1 x IrDA
1801120-R	Mini PCI with one 44-pin Ultra DMA 33 IDE interface supports up to 2 ATAPI devices 1 x Compact Flash Type II and 2 x serial ATA interface

The specifications may be different as the actual production.

For further information please visit the website at http://globalamericaninc.com.
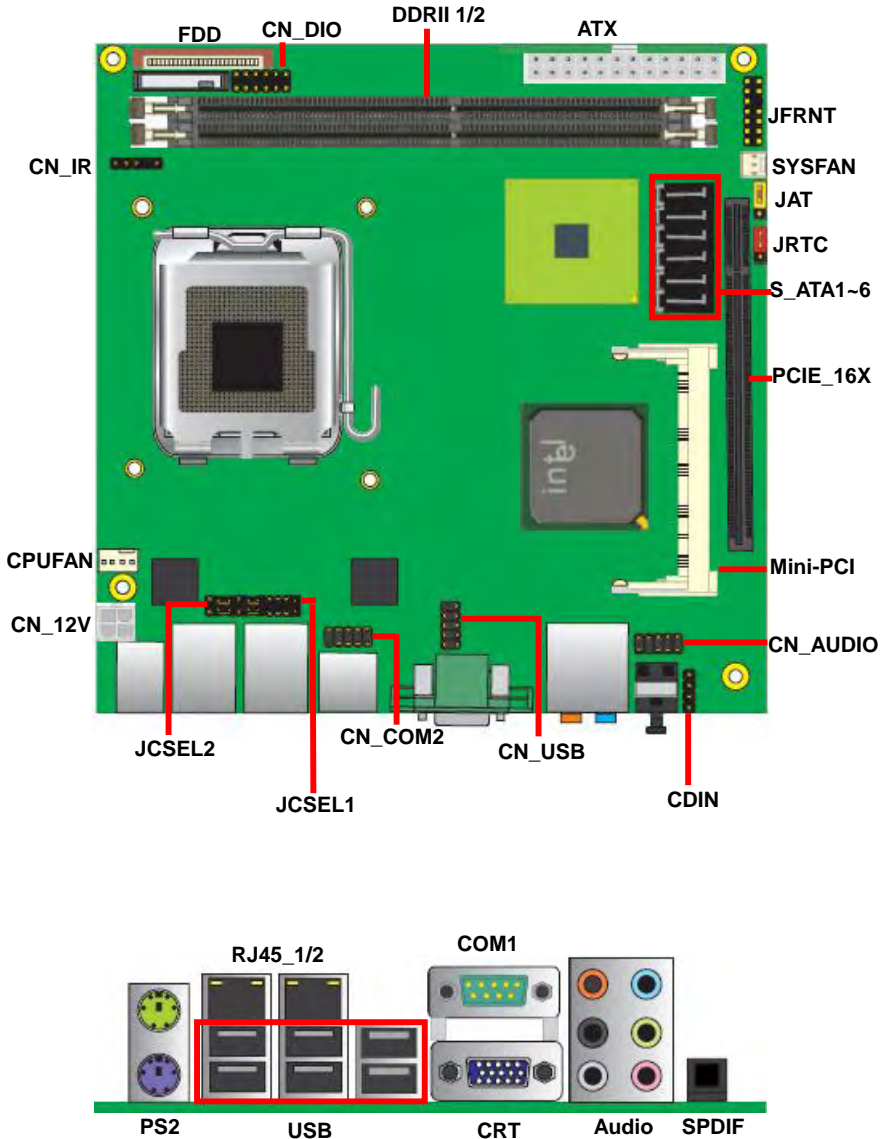
1.3 <Block Diagram>

Intel Core 2 Quad / Core 2 Duo Celeron with 775 pin PLGA

Intel GMA3100 Graphics

PCI-Express x16

Intel Q35

2 x 240-pin DDR2 667/800MHz up to 4GB

6 x USB2.0 ports

HD Audio

ICH9DO

6 x Serial ATAII ports

Intel 82573L 2 x GLAN

Winbond

2 x Serial ports

1 x Slim Floppy

8-bit GPIO

IrDA

SPI

Mini-PCI slot

PCI bus

BIOS

1.4 <Mechanical Drawing >

Chapter 2 <Hardware Setup>

2.1 <Connector Location>

2807870 User's Manual

2.2 <Jumper Reference>

Jumper	Function
JRTC	CMOS Operating/Clear Setting
JAT	Power mode select
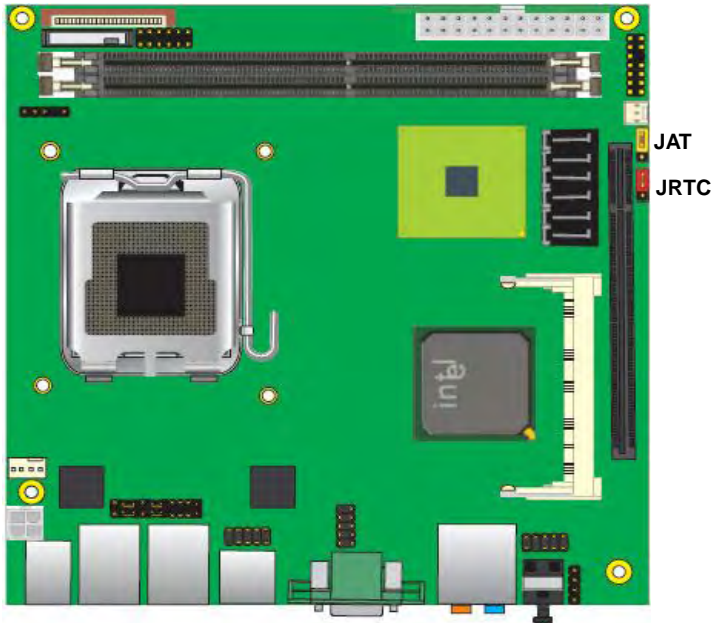
2.3 <Connector Reference>

2.3.1 <Internal Connectors>

Connector	Function	Remark
CPU	LGA775 CPU socket	
DDRII1/2	240 -pin DDR2 SDRAM DIMM socket	
Slim FDD	26-pin slim type floppy connector	
S_ATAII1/2/3/4/5/6	7-pin Serial ATA II connector	
ATX	24-pin power supply connector	
CN_12V	4-pin +12V additional power supply connector	
CN_AUDIO	5 x 2-pin audio connector	
CDIN	4-pin CD-ROM audio input connector	
CN_DIO	6 x 2-pin digital I/O connector	
CN_USB	10-pin USB connector	
CPUFAN	4-pin CPU cooler fan connector	
SYSFAN	3-pin system cooler fan connector	
CN_IR	5-pin IrDA connector	
JFRNT	14-pin front panel switch/indicator connector	
PCIE_16X	1 PCI Express 16x slot	
Mini-PCI	1 x Mini-PCI socket	
CN_COM2	5 x 2-pin com connector	

2.3.2 <External Connectors>

Connector	Function	Remark
PS2	PS/2 Keyboard/Mouse connector	
CRT+COM1	DB15 VGA + Serial port connector	
USB_RJ45_1/2	Dual USB and one RJ45 LAN Port	
AUDIO	Audio connectors	
SPDIF	SPDIF digital audio output connector	

2.4 <CPU and Memory Setup>

2.4.1 <CPU installation>

2807870 has a LGA775 CPU socket onboard; please check following steps to install the processor properly.

Attention: If 2807870 need RMA please Keep CPU socket cover on the CPU Socket.

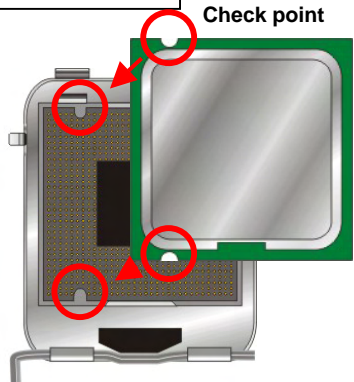*Warning: If CPU Socket internal Pin damage We could not provide warranty.*

Intel Ⓡ Core2 Quad/Core 2 Duo/Celeron processor
Package type: 775 pin LGA
L2 Cache: 4 MB
FSB: 800/1066/1333MHz (266MHz x 4)
Manufacturing: 65nm
Intel Hyper Threading Technology and Core 2 Quad
/Duo supported

1. Lift this bar
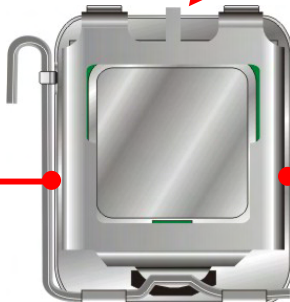
Check point
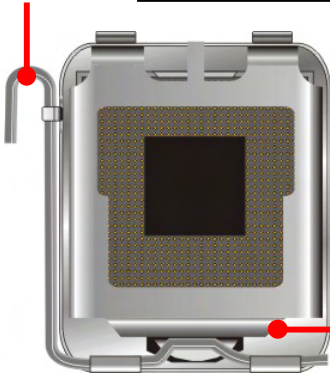
2. Uncover this plate

3. Place the CPU on the top of the pins

4. Lock this bar

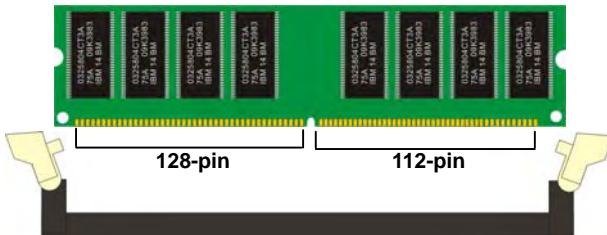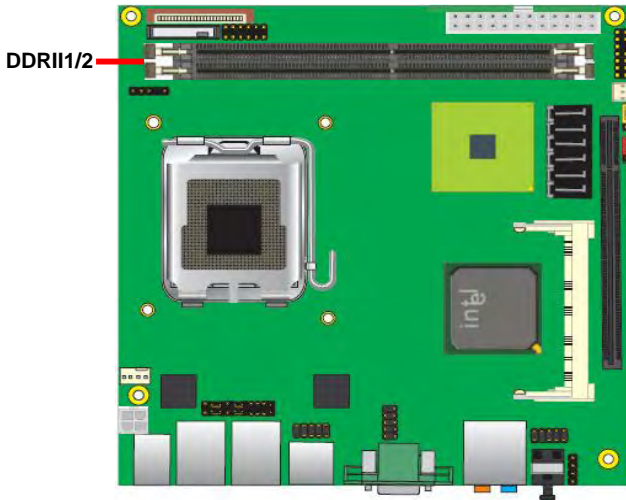**3. Cover this plate**

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

2.4.2 <Memory installation>

2807870 has two 240-pin DDR2 DIMM support up to 4GB of memory capacity. The memory

frequency supports 667/800MHz. Only Non-ECC memory is supported.

DDRII1/2

128-pin   **112-pin**

Please check the pin number to match the socket side well

before installing memory module.
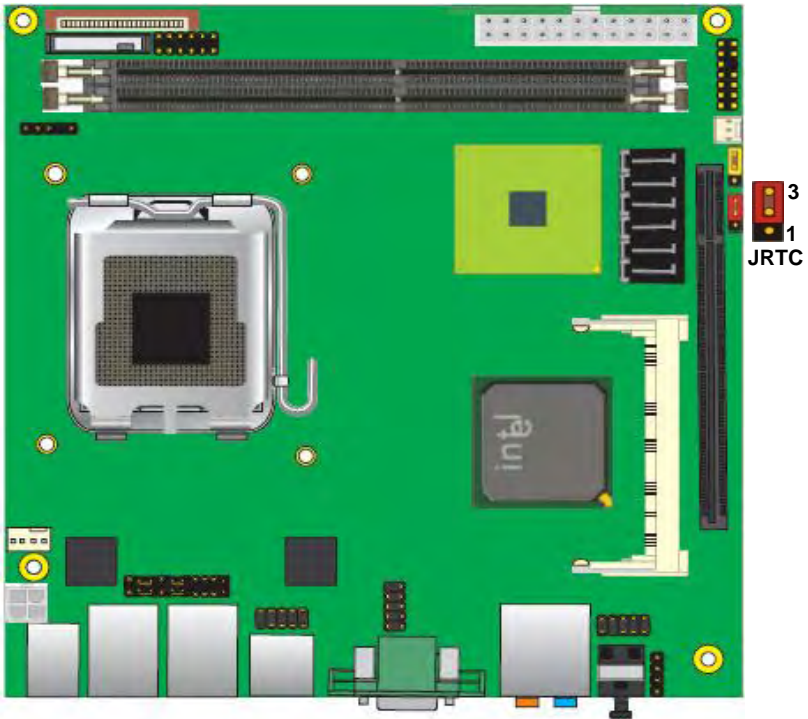
2.5 <CMOS Setup>

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 <Serial ATA installation>

2807870 has six Serial ATA II interfaces with RAID function, the transfer rate of the Serial ATA II can be up to 300MB/s. Please go to http://www.serialata.org/ for more about Serial ATA technology information. Based on Intel® ICH9DO, it supports **Intel® Matrix Storage Technology** with combination of RAID 0,1,5 and 10. The main features of RAID on ICH8DO 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 six Serial ATA ports.
3. Supports for Serial ATA ATAPI devices.
4. Supports for RAID spares and automatic rebuild.
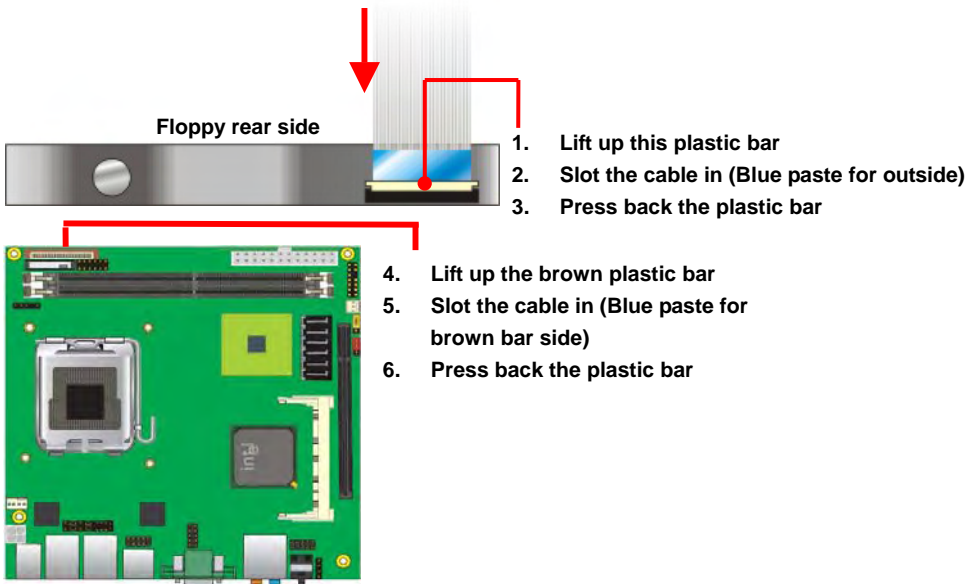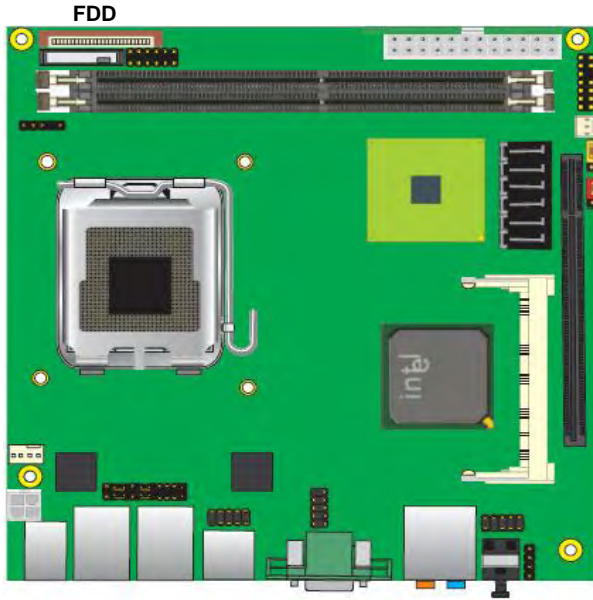5. Supports on RAID arrays, including NCQ and native hot plug.

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.
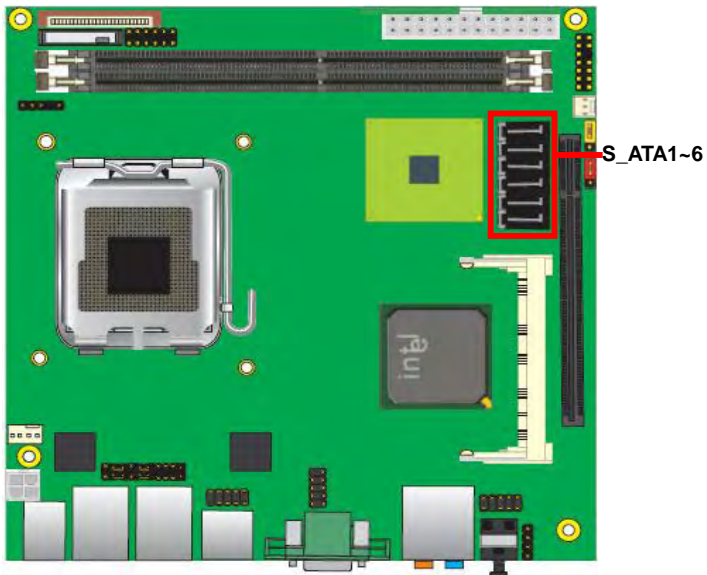
2.7 <Floppy Installation>

2807870 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.

FDD

Floppy rear side

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**

2.8 <LAN installation>

The board integrates with two Intel 82573L Gigabit Ethernet controllers, as the PCI bus with

133MB/s of transfer rate. The Intel 82573L supports triple speed of 10/100/1000Base-T,

with IEEE802.3 compliance and Wake-On-LAN supported.

RJ45 LAN Connector
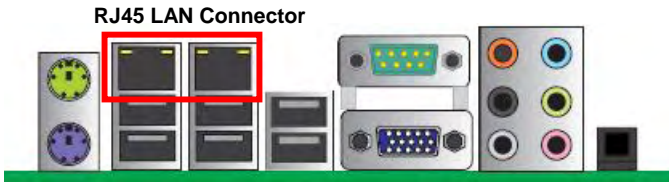
2.9 <Onboard Display Interface>

Based on Intel Q35 chipset with built-in graphics, the board provides one DB15 connector on real external I/O port, *Notice: When you install any PCI Express Graphic card, the onboard graphics would be disabled automatically.*

2.9.1 <Analog Display>

Please connect your CRT or LCD monitor with DB15 male connector to the onboard DB15 female connector on rear I/O port.
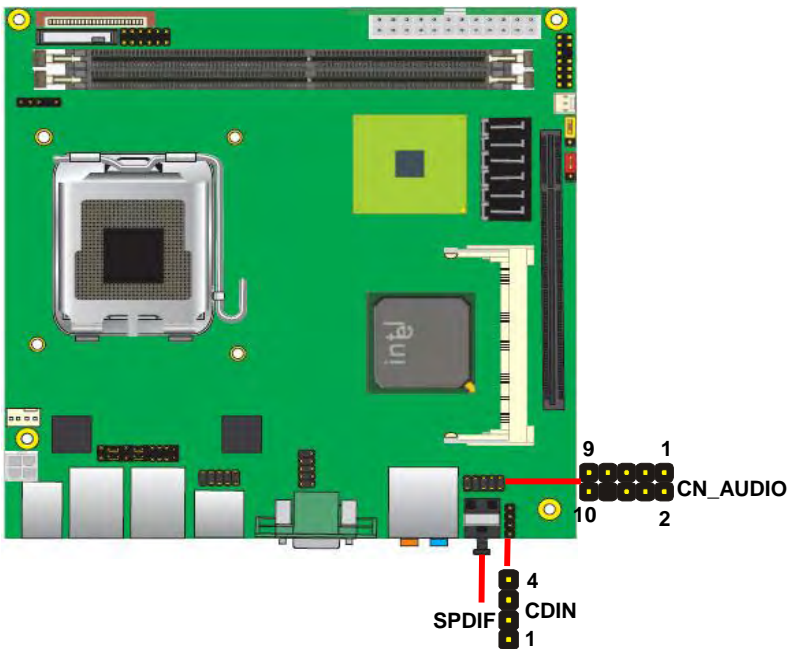

VGA

2.10 <Audio Installation>

The board integrates onboard audio interface with REALTEK ALC888 codec, with Intel next

generation of audio standard as High Definition Audio, it offers more vivid sound and other

advantages than former HD audio compliance.

The main specifications of ALC888 are:

● **High-performance DACs with 100dB S/N ratio**

● **8 DAC channels support 16/20/24-bit PCM format for 7.1 audio solution**

● **16/20/24-bit S/PDIF-OUT supports 44.1K/48K/96kHz sample rate**

● **Compatible with HD**

● **Meets Microsoft WHQL/WLP 2.0 audio requirements**

The board provides 7.1 channels audio phone jacks on rear I/O port, and amplified speaker

out and Line-in/MIC-in ports for front I/O panel through optional cable.

Connector: CN_AUDIO

Type: 10-pin (2 x 5) header (pitch = 2.54mm)

Pin	Description	Pin	Description
1	MIC_L	2	Ground
3	MIC_R	4	ACZ_DET
5	Speaker_R	6	MIC Detect
7	SENSE	8	N/C
9	Speaker_L	10	Speaker Detect

Connector: CDIN

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

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

Center		**LINE-IN**
Rear Speaker		**LINE-OUT**
Side Speaker		**MIC-IN**

Rear I/O phone jacks

2.11 <GPIO interface>

The board provides a programmable 8-bit digital I/O interface, and SMBus (System

management bus) interface for control panel application.

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

12   11

CN_DIO

2   1
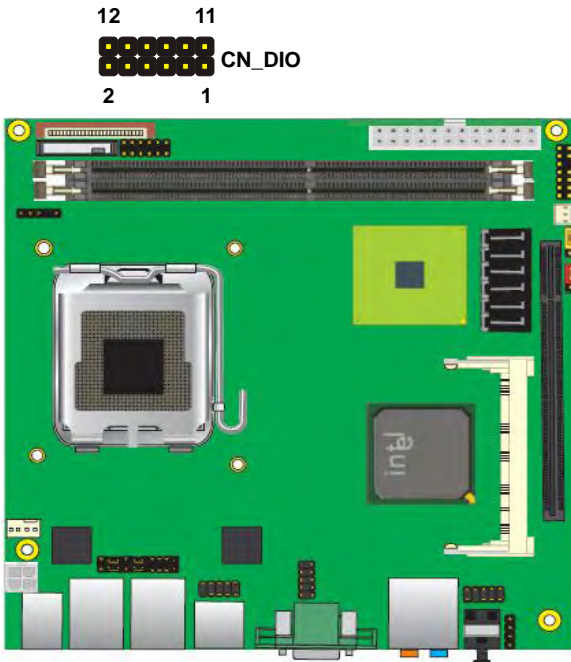
2.12 < USB Installation>

2807870 integrates four USB2.0 ports. The specifications USB2.0 are listed below:

Interface	USB2.0
Controller	Intel ICH9DO
Transfer Rate	Up to 480Mb/s
Voltage	5V

The Intel® ICH9DO contains two Enhanced Host Controller Interface (EHCI) and six 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.
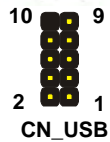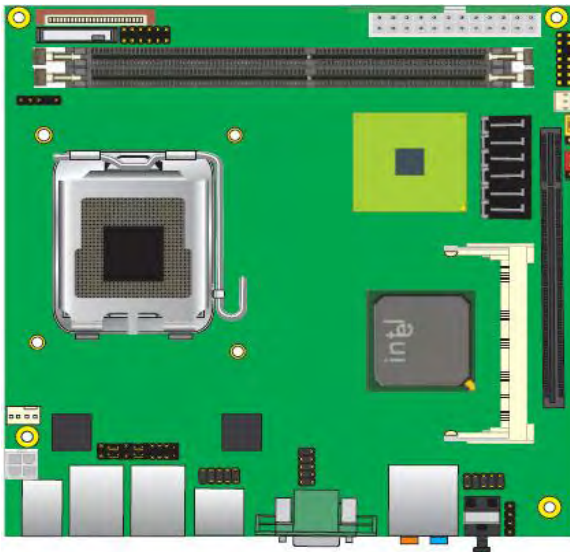

USB

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

CN_USB

2.13 <Power and Fan Installation>

The **2807870** 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 one 3-pin cooler fan connectors for system fan. The 4-pin CN_12V additional power connector is necessary for CPU powering; please connect this well before you finishing the system setup.
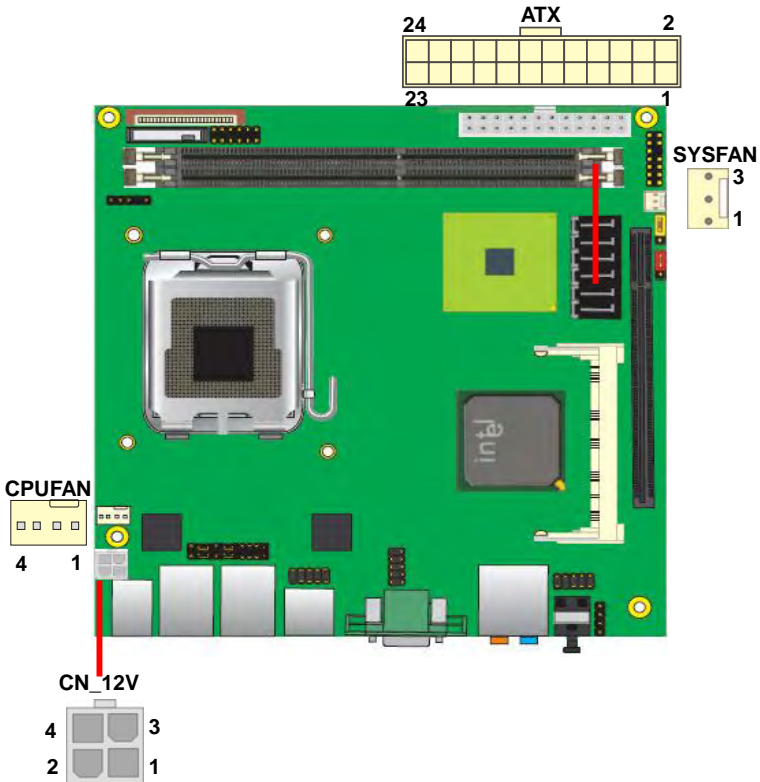
2807870 User's Manual

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: **SYSFAN**

Type: 3-pin fan wafer connector

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

2.14 <Serial Port>

The board supports one RS232 serial port and one jumper selectable RS232/422/485 serial

ports. The jumper JCSEL1 & JCSEL2 can let you configure the communicating modes for

COM2.

Connector: **CN_COM2**
Type: 10-pin (5 x 2) 2.54mm x 2.54mm-pitch header for COM2
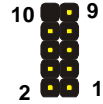
Pin	Description	Pin	Description
1	DCD/422TX-/485-	2	RXD/422TX+/485+
3	TXD/422RX+	4	DTR/422RX-
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N/C

	JCSEL1	JCSEL2
SIR		
RS-422		
RS-485		
RS-232		

2.15 <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	HDLED+	1	2	PWDLED+	**Power**
	HDLED-	3	4	N/C	**LED**
Reset	Reset+	5	6	PWDLED-	
	Reset-	7	8	SPKIN+	**Speaker**
	N/C	9	10	N/C	
Power	PWRBT+	11	12	N/C	
Button	PWRBT-	13	14	SPKIN-	
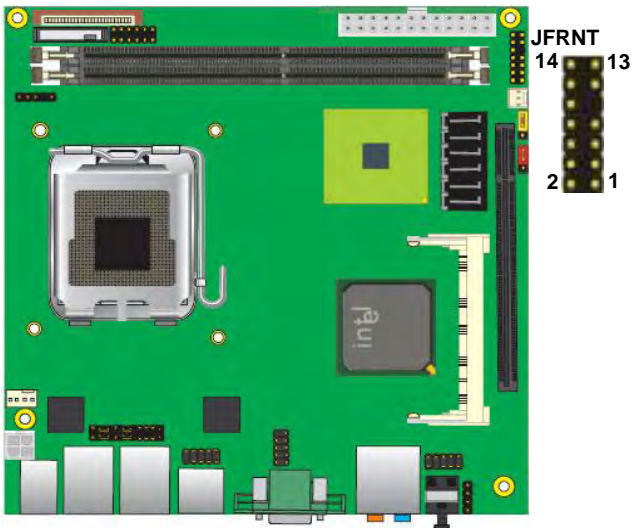
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Chapter 3 <System Configuration>

3.1 <SATA configuration>

SATA Mode:
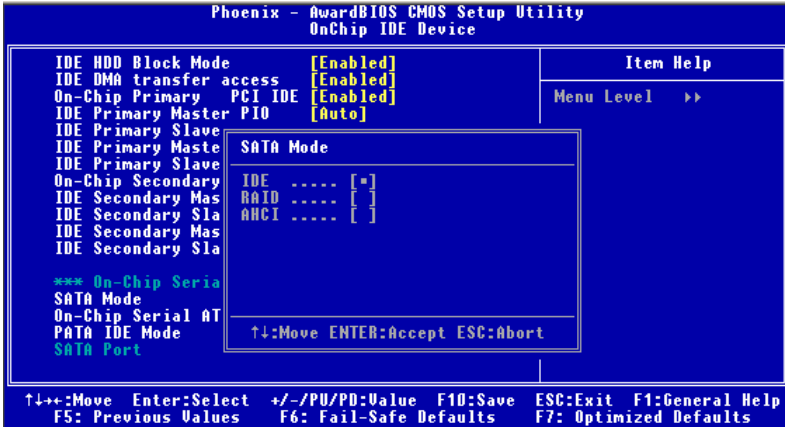
This option can let you select whether the Serial ATA hard drives would work under normal

IDE mode or RAID mode. The RAID mode need more than one HDD is applied.

3.2 <SATA RAID Configuration>

The board integrates Intel® ICH9DO with RAID function for Serial ATA II 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.

RAID 5 (striping with parity)

A RAID 5 array contains three or more hard drives where the data is divided into manageable blocks called strips. Parity is a mathematical method for recreating data that was lost from a single drive, which increases fault-tolerance. The data and parity are striped across all the hard drives in the array. The parity is striped in a rotating sequence to reduce bottlenecks associated with the parity calculations.

RAID 10 (RAID 0+1)

A RAID 10 array uses four hard drives to create a combination of RAID levels 0 and 1. The data is striped across a two-drive array forming the RAID 0 component. Each of the drives in the RAID 0 array is then mirrored by a RAID 1 component.

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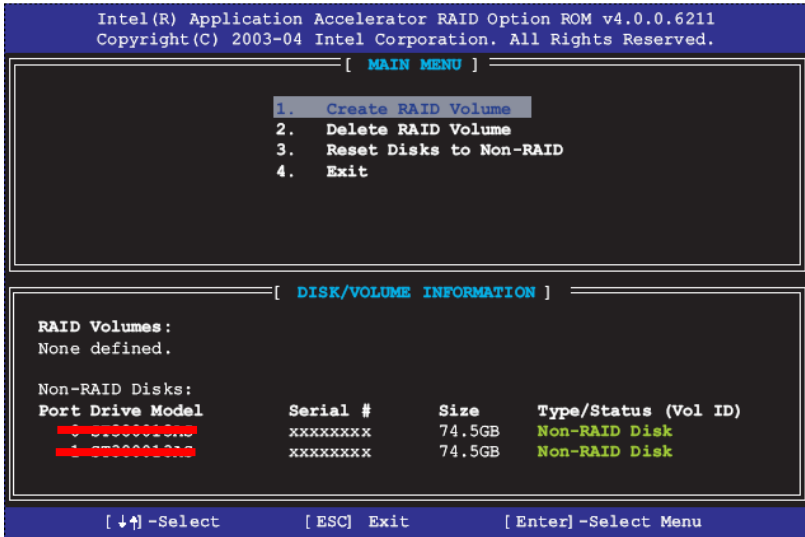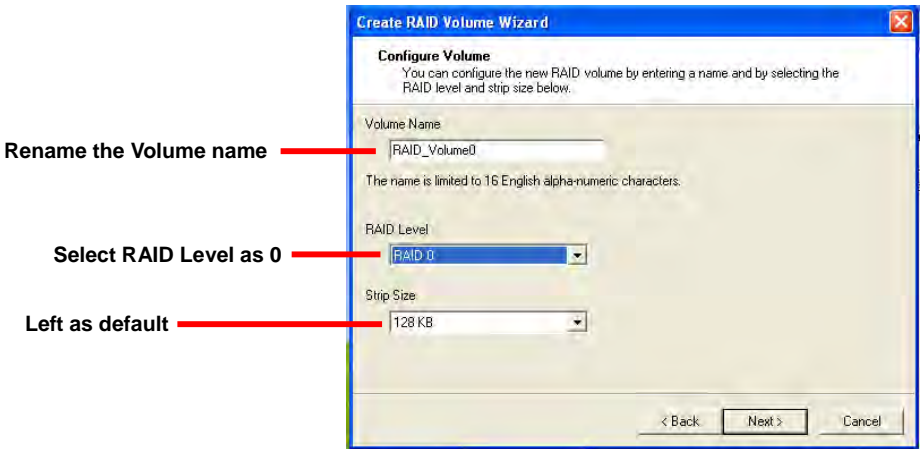
Please press **<CTRL+I>** to enter the RAID configuration menu.

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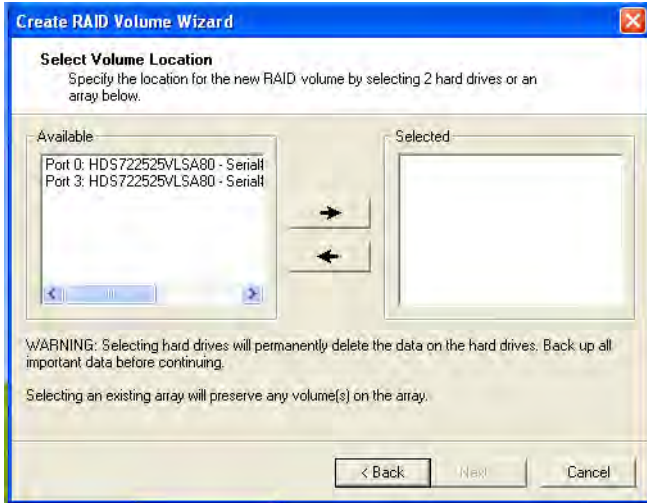
1. After installing Intel Application Accelerator, please execute Intel® Storage Utility.

Demo configuration for 2 SATA Drives and set as Intel Matrix Storage Technology set
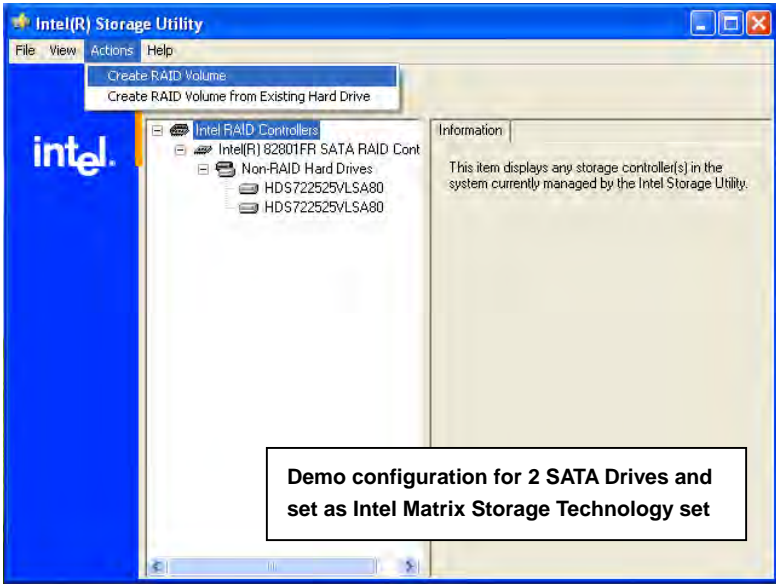
2. Select Actions to Create RAID Volume

Rename the Volume name

Select RAID Level as 0

Left as default

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)**
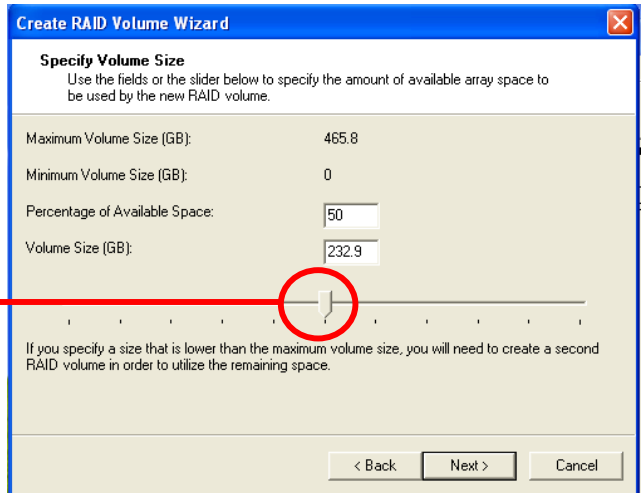
5. Repeat the step 1 to create second volume as RAID Level 1.
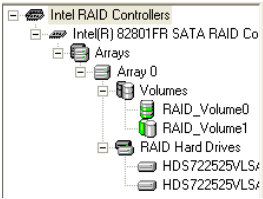
For other configuration set please click Help on tool bar.

3.3 <Audio Configuration>

The board integrates Intel® ICH9DO with REALTEK® ALC888 codec. It can support

2-channel or 7.1 channel sound under system configuration. Please follow the steps below

to setup your sound system.

1. Install REALTEK HD 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® Q35 chipset with GMA (Graphic Media Accelerator) 3100, the board supports Intel® DVMT (Dynamic Video Memory Technology) 3.0, which would allow the video memory be triggered up to 384MB.

To support DVMT, you need to install the Intel GMA 3100 Driver with supported OS.

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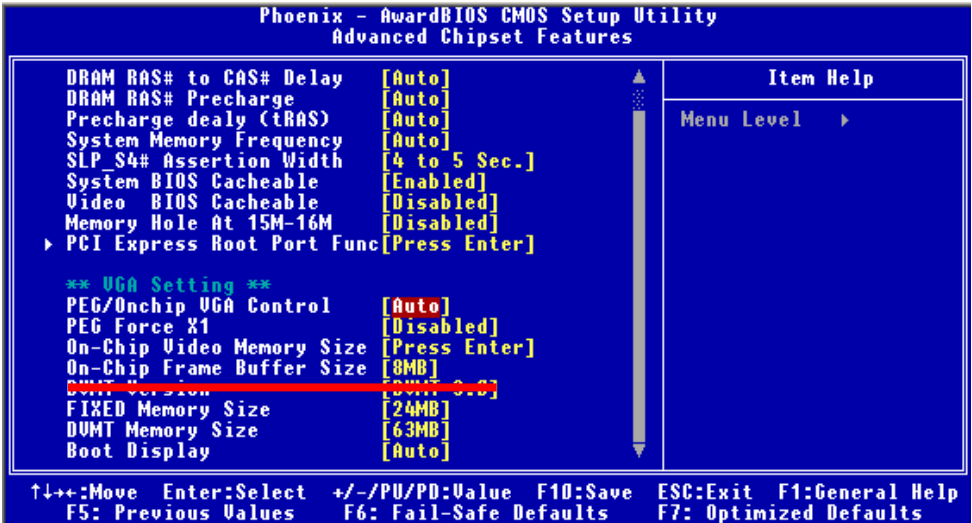
On-Chip Video Memory Size: This option combines three items below for setup.

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**.

2807870 User's Manual

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
256MB ~ 511MB	1MB	128MB	0MB	128MB
	1MB	0MB	128MB	128MB
	8MB	128MB	0MB	128MB
	8MB	0	128MB	128MB
512MB~1023MB	1MB	128MB	0	128MB
	1MB	256MB	0	256MB
	1MB	0	128MB	128MB
	1MB	0	256MB	256MB
	8MB	128MB	0	128MB
	8MB	256MB	0	256MB
	8MB	0	128MB	128MB
	8MB	0	256MB	256MB
1024MB upper	1MB	128MB	0	128MB
	1MB	256MB	0	256MB
	1MB	0	128MB	128MB
	1MB	0	256MB	256MB
	1MB	0	MAX	384MB
	8MB	128MB	0	128MB
	8MB	256MB	0	256MB
	8MB	0	128MB	128MB
	8MB	0	256MB	256MB
	8MB	0	MAX	384MB

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 Q35 GMCH with GMA3100 (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**
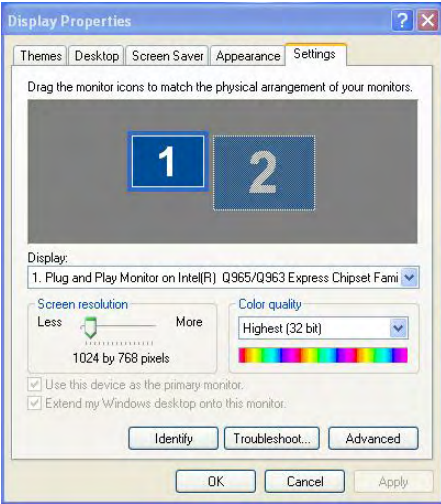
2. Click **Advanced** button for more specificity setup.
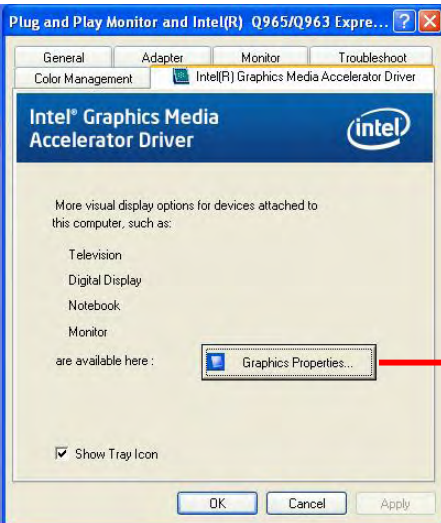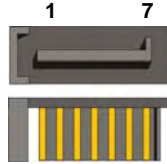

Click Graphics Properties... for advanced setup

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Appendix A <I/O Port Pin Assignment>

A.1 <Serial ATA Port>

Connector: **S_ATA1/2/3/4/5/6**

Type: 7-pin wafer connector

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

A.2<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.3 <IrDA Port>

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

1

5

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

A.4 <Serial Port>

1 6
2 7
3 8
4 9
5

Connector: **COM1**
Type: 9-pin D-sub male connector on bracket
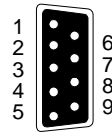
Pin	Description	Pin	Description
1	DCD	6	DSR
2	SIN	7	RTS
3	SO	8	CTS
4	DTR	9	RI
5	Ground		

A.5 <VGA Port>

6
1 11
2 12
3 13
4 14
5 15
10

Connector: **CRT**
Type: 15-pin D-sub female connector on bracket
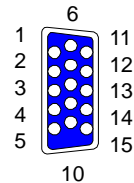
Pin	Description	Pin	Description	Pin	Description
1	RED	6	Ground	11	N/C
2	GREEN	7	Ground	12	DDC_DA
3	BLUE	8	Ground	13	HSYNC
4	N/C	9	+5V	14	VSYNC
5	Ground	10	Ground	15	DDC_CLK

A.6 <LAN Port>

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

Pin	1	2	3	4	5
Description	TRD0+	TRD0-	TRD1+	TRD2+	TRD2-

Pin	6	7	8	9	10
Description	TRD1-	TRD3+	TRD3-	NC	NC

Appedix B <System Resources>

B1. <I/O Port Address Map>

Input/output (IO)
- [00000000 - 0000000F] Direct memory access controller
- [00000000 - 00000CF7] PCI bus
- [00000010 - 0000001F] Motherboard resources
- [00000020 - 00000021] Programmable interrupt controller
- [00000022 - 0000003F] Motherboard resources
- [00000040 - 00000043] System timer
- [00000044 - 0000005F] Motherboard resources
- [00000060 - 00000060] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
- [00000061 - 00000061] System speaker
- [00000062 - 00000063] Motherboard resources
- [00000064 - 00000064] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
- [00000065 - 0000006F] Motherboard resources
- [00000070 - 00000073] System CMOS/real time clock
- [00000074 - 0000007F] Motherboard resources
- [00000080 - 00000090] Direct memory access controller
- [00000091 - 00000093] Motherboard resources
- [00000094 - 0000009F] Direct memory access controller
- [000000A0 - 000000A1] Programmable interrupt controller
- [000000A2 - 000000BF] Motherboard resources
- [000000C0 - 000000DF] Direct memory access controller
- [000000E0 - 000000EF] Motherboard resources
- [000000F0 - 000000FF] Numeric data processor
- [00000274 - 00000277] ISAPNP Read Data Port
- [00000279 - 00000279] ISAPNP Read Data Port
- [000002F8 - 000002FF] Communications Port (COM2)
- [00000378 - 0000037F] Printer Port (LPT1)
- [000003B0 - 000003BB] Intel(R) Q35 Express Chipset Family
- [000003C0 - 000003DF] Intel(R) Q35 Express Chipset Family
- [000003F0 - 000003F5] Standard floppy disk controller
- [000003F7 - 000003F7] Standard floppy disk controller
- [000003F8 - 000003FF] Communications Port (COM1)
- [00000400 - 000004BF] Motherboard resources
- [000004D0 - 000004D1] Motherboard resources
- [00000500 - 0000051F] Intel(R) ICH9 Family SMBus Controller - 2930
- [00000778 - 0000077B] Printer Port (LPT1)
- [00000800 - 0000087F] Motherboard resources
- [00000880 - 0000088F] Motherboard resources
- [00000A79 - 00000A79] ISAPNP Read Data Port

[00000378 - 0000037F] Printer Port (LPT1)
[000003B0 - 000003BB] Intel(R) Q35 Express Chipset Family
[000003C0 - 000003DF] Intel(R) Q35 Express Chipset Family
[000003F0 - 000003F5] Standard floppy disk controller
[000003F7 - 000003F7] Standard floppy disk controller
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 000004BF] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[00000500 - 0000051F] Intel(R) ICH9 Family SMBus Controller - 2930
[00000778 - 0000077B] Printer Port (LPT1)
[00000800 - 0000087F] Motherboard resources
[00000880 - 0000088F] Motherboard resources
[00000A79 - 00000A79] ISAPNP Read Data Port
[00000D00 - 0000FFFF] PCI bus
[0000B000 - 0000BFFF] Intel(R) ICH9 Family PCI Express Root Port 2 - 2942
[0000BF00 - 0000BF1F] Intel(R) PRO/1000 PL Network Connection #2
[0000D000 - 0000DFFF] Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
[0000DF00 - 0000DF1F] Intel(R) PRO/1000 PL Network Connection
[0000EC00 - 0000EC0F] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000ED00 - 0000ED0F] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000EE00 - 0000EE03] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000EF00 - 0000EF07] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000F000 - 0000F003] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000F100 - 0000F107] Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
[0000F300 - 0000F30F] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F400 - 0000F40F] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F500 - 0000F503] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F600 - 0000F607] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F700 - 0000F703] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F800 - 0000F807] Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
[0000F900 - 0000F91F] Intel(R) ICH9 Family USB Universal Host Controller - 2936
[0000FA00 - 0000FA1F] Intel(R) ICH9 Family USB Universal Host Controller - 2935

B2. <Memory Address Map>

```
Memory
    [00000000 - 0009FFFF]  System board
    [0000046E - 0000056D]  System board
    [000A0000 - 000BFFFF]  Intel(R) Q35 Express Chipset Family
    [000A0000 - 000BFFFF]  PCI bus
    [000C0000 - 000DFFFF]  PCI bus
    [000E0000 - 000EFFFF]  System board
    [000F0000 - 000FFFFF]  System board
    [00100000 - BF5DFFFF]  System board
    [BF5E0000 - BF5FFFFF]  System board
    [BF600000 - BF6FFFFF]  System board
    [BF650000 - FEBFFFFF]  PCI bus
    [D0000000 - DFFFFFFF]  Intel(R) Q35 Express Chipset Family
    [E0000000 - EFFFFFFF]  Motherboard resources
    [FD800000 - FD8FFFFF]  Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
    [FD900000 - FD9FFFFF]  Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
    [FD9E0000 - FD9FFFFF]  Intel(R) PRO/1000 PL Network Connection
    [FDC00000 - FDCFFFFF]  Intel(R) Q35 Express Chipset Family
    [FDD00000 - FDDFFFFF]  Intel(R) ICH9 Family PCI Express Root Port 2 - 2942
    [FDE00000 - FDEFFFFF]  Intel(R) ICH9 Family PCI Express Root Port 2 - 2942
    [FDEE0000 - FDEFFFFF]  Intel(R) PRO/1000 PL Network Connection #2
    [FDF00000 - FDF7FFFF]  Intel(R) Q35 Express Chipset Family
    [FDFF8000 - FDFFBFFF]  Microsoft UAA Bus Driver for High Definition Audio
    [FDFFD000 - FDFFD0FF]  Intel(R) ICH9 Family SMBus Controller - 2930
    [FDFFE000 - FDFFE3FF]  Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293A
    [FDFFF000 - FDFFF3FF]  Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293C
    [FEC00000 - FEC00FFF]  System board
    [FED00000 - FED000FF]  System board
    [FED00000 - FED003FF]  High precision event timer
    [FED13000 - FED1FFFF]  System board
    [FED20000 - FED9FFFF]  System board
    [FEE00000 - FEE00FFF]  System board
    [FED00000 - FED000FF]  System board
    [FED00000 - FED003FF]  High precision event timer
    [FED13000 - FED1FFFF]  System board
    [FED20000 - FED9FFFF]  System board
    [FEE00000 - FEE00FFF]  System board
    [FFB00000 - FFB7FFFF]  System board
    [FFB80000 - FFBFFFFF]  Intel(R) 82802 Firmware Hub Device
    [FFF00000 - FFFFFFFF]  System board
```

B3.

```
Interrupt request (IRQ)
    (ISA)  0   High precision event timer
    (ISA)  1   Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
    (ISA)  3   Communications Port (COM2)
    (ISA)  4   Communications Port (COM1)
    (ISA)  6   Standard floppy disk controller
    (ISA)  8   High precision event timer
    (ISA)  9   Microsoft ACPI-Compliant System
    (ISA) 13   Numeric data processor
    (PCI) 11   Intel(R) ICH9 Family SMBus Controller - 2930
    (PCI) 16   Intel(R) ICH9 Family PCI Express Root Port 1 - 2940
    (PCI) 16   Intel(R) ICH9 Family USB Universal Host Controller - 2937
    (PCI) 16   Intel(R) PRO/1000 PL Network Connection
    (PCI) 16   Intel(R) Q35 Express Chipset Family
    (PCI) 17   Intel(R) ICH9 Family PCI Express Root Port 2 - 2942
    (PCI) 17   Intel(R) PRO/1000 PL Network Connection #2
    (PCI) 18   Intel(R) ICH9 Family USB Universal Host Controller - 2939
    (PCI) 18   Intel(R) ICH9 Family USB Universal Host Controller - 2936
    (PCI) 18   Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293C
    (PCI) 19   Intel(R) ICH9 2 port Serial ATA Storage Controller 2 - 2926
    (PCI) 19   Intel(R) ICH9 4 port Serial ATA Storage Controller 1 - 2920
    (PCI) 19   Intel(R) ICH9 Family USB Universal Host Controller - 2935
    (PCI) 21   Intel(R) ICH9 Family USB Universal Host Controller - 2938
    (PCI) 22   Microsoft UAA Bus Driver for High Definition Audio
    (PCI) 23   Intel(R) ICH9 Family USB Universal Host Controller - 2934
    (PCI) 23   Intel(R) ICH9 Family USB2 Enhanced Host Controller - 293A
```

Appendix C <Programming GPIO's>

The GPIO'can be programmed with the MSDOS debug program using simple IN/OUT commands.The following lines show an example how to do this.

GPIO0…..GPIO7   bit0……bit7

```
-o 2E 87                    ;enter configuration
-o 2E 87
-o 2E 07
-o 2F 09                    ;enale GPIO function
-o 2E 30
-o 2F 02                    ;enable GPIO configuration
-o 2E F0
-o 2F xx                    ;set GPIO as input/output; set '1' for input,'0'for
output
-o 2E F1
-o 2F xx                    ;if set GPIO's as output,in this register its value can
                             be set
```

Optional :

```
-o 2E F2
-o 2F xx                   ; Data inversion register ; '1' inverts the current valus
                             of the bits ,'0' leaves them as they are
-o 2E 30
-o 2F 01                   ; active GPIO's
```

For further information ,please refer to Winbond W83627DHG datasheet.

Appendix D <Watch Dog timer Setting >

The watchdog timer makes the system auto-reset while it stops to work for a period. The

integrated watchdog timer can be setup as system reset mode by program.

Timeout Value Range
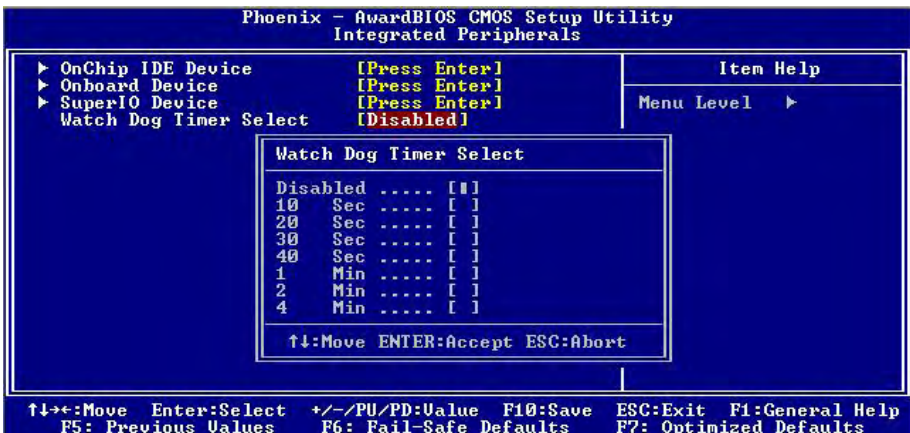- 1 to 255
- Second or Minute

Program Sample
Watchdog timer setup as system reset with 5 second of timeout

2E, 87	
2E, 87	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F5	Set as Second*
2F, 00	
2E, F6	Set as 5
2F, 05	

* Minute: bit 3 = 0; Second: bit 3 = 1

You can select Timer setting in the BIOS, after setting the time options, the system will
reset according to the period of your selection.

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

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