

# HS-770

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Half-Size PCI CPU Card

## User's Manual

Edition 1.1

2007/6/13

A Version



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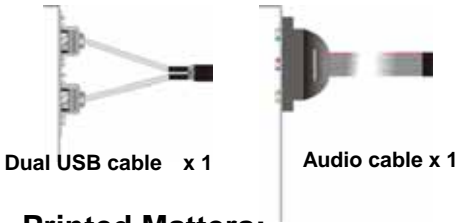
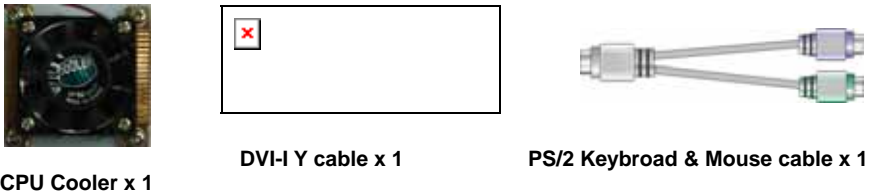
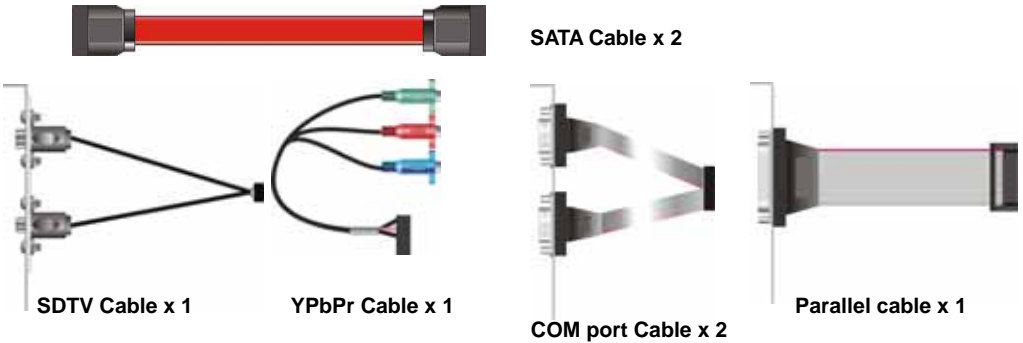
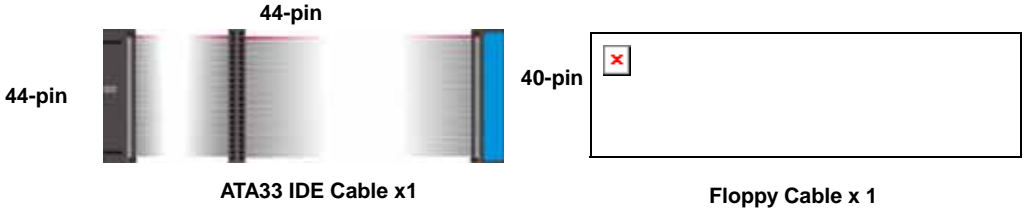
# Packing List:

Please check the package content before you starting using the board.

## Hardware:

HS-770 motherboard x 1

## Cable Kit:



## Printed Matters:

User's Manual x 1

Driver CD x 1

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# Chapter 1 <Introduction>

## 1.1 <Product Overview>

**HS-770** is the new generation of the Half-size PCI CPU card, with supporting last Intel Pentium M processors for 533MHz front side bus, Intel 915GM(E) and ICH6-M chipset, integrated GMA900 graphics, DDR2 memory, REALTEK AC97 Audio, Serial ATA, mini PCI and dual Gigabit LAN.

### **New Intel Pentium M Processor**

The board supports last Intel Pentium M processors with 533MHz front side bus, 2MB L2 cache, to provide more powerful performance than before.

### **New features for Intel 915GM(E) chipset**

The board integrates Intel 915GM(E) and ICH6-M chipset, to provide new generation of the mobile solution, supports Intel GMA900 graphics, DDR2 400/533 memory, built-in high speed mass storage interface of serial ATA,

### **Multimedia solution**

Based on Intel 915GM(E) and ICH6-M chipset, the board provides two high performance onboard graphics, 24-bit dual channel LVDS interface, HDTV to meet the very requirement of the multimedia application.

### **Flexible Extension Interface**

The board provides one Compact Flash Type II slot and one mini-PCI slot.

## 1.2 <Product Specification>

### General Specification

Form Factor	Half-size PCI CPU card
CPU	Intel® <b>Pentium M</b> / <b>Celeron M</b> processors Package type: FC-PGA478 L2 Cache: 512KB/1MB/2MB Front side bus: 400/533MHz ( The Intel® Celeron® M Processor 4xx series have been designed to work with the Mobile Intel® 945 Express Chipset Family only .)
Memory	2 x 240-pin DDR2 400/533MHz SDRAM up to 2GB Up to 8GB/s of bandwidth with dual-channel interleaved mode <b>Dual-Channel technology</b> supported Unbuffered, none-ECC memory supported only
Chipset	Intel® 915GM(E) (Northbridge) and ICH6-M (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® ICH6-M built-in RTC with lithium battery
Enhanced IDE	UltraDMA33/66/100 IDE interface supports up to 2 ATAPI devices One 44-pin IDE port onboard One Compact Flash Type II socket on solder side
Serial ATA	Intel® ICH6-M integrates 2 Serial ATA interfaces Up to 150MB/s of transfer rate

### Multi-I/O Port

Chipset	Intel® ICH6-M with Winbond® W83627THF controller
Serial Port	3 internal RS-232 serial ports one internal RS-232/422/485 serial ports
USB Port	Four Hi-Speed USB 2.0 ports with 480Mbps of transfer rate
Parallel Port	One internal
Floppy Port	One standard type Floppy port
IrDA Port	One IrDA compliant Infrared interface supports SIR
K/B & Mouse	External PS/2 keyboard and mouse ports on near LAN port
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® 915GM(E) GMCH (Graphic Memory Controller Hub)
Frame Buffer	Up to 128MB shared with system memory
Display Type	CRT, LCD monitor with digital display Onboard 24-bit dual channel LVDS interface Onboard HDTV interface



Connector	External DVI female connector on near LAN port Onboard 40-pin LVDS connector Onboard 8-pin TV-out connector
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**Ethernet Interface**

Controller	Marvell 88E8053 PCI Express Gigabit Ethernet controller
Type	Triple speed 10/100/1000Base-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® ICH6M with Realtek® ALC201A codec
Interface	2 channels
Connector	Onboard Audio connector for Line-out, Line-in, MIC-in

**Expansive Interface**

CF	One Compact Flash Type II socket on solder Side
PCI	One Mini-PCI socket for <b>TYPE III</b> (32-bit, 33MHz) Power supply: +3.3V, +5V

**Power and Environment**

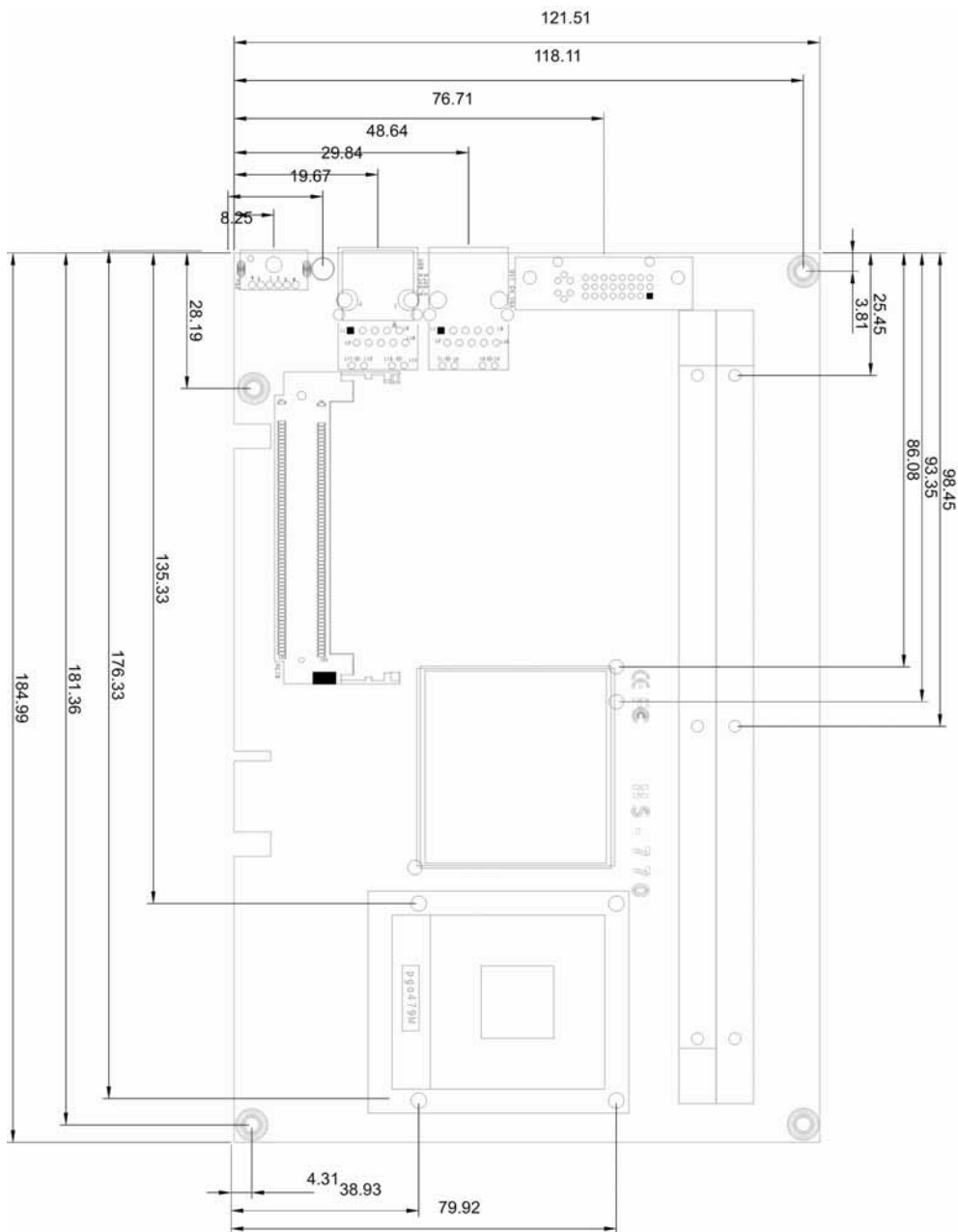
Power Requirement	Onboard 4-pin connector DC 5V/12V
Dimension	185mm (L) x 121 (H) mm
Temperature	Operating within 0 ~ 60°C (32 ~ 140°F) Storage within -20 ~ 85°C (-4 ~ 185°F)

**Ordering Code**

<b>HS-770DXG2</b>	Intel Pentium M Mini-ITX motherboard with onboard VGA, Dual Gigabit LAN, SATA, 4 x USB 2.0 Ports, Audio, 4 x RS232 serial port, LVDS, HDTV, Mini-PCI
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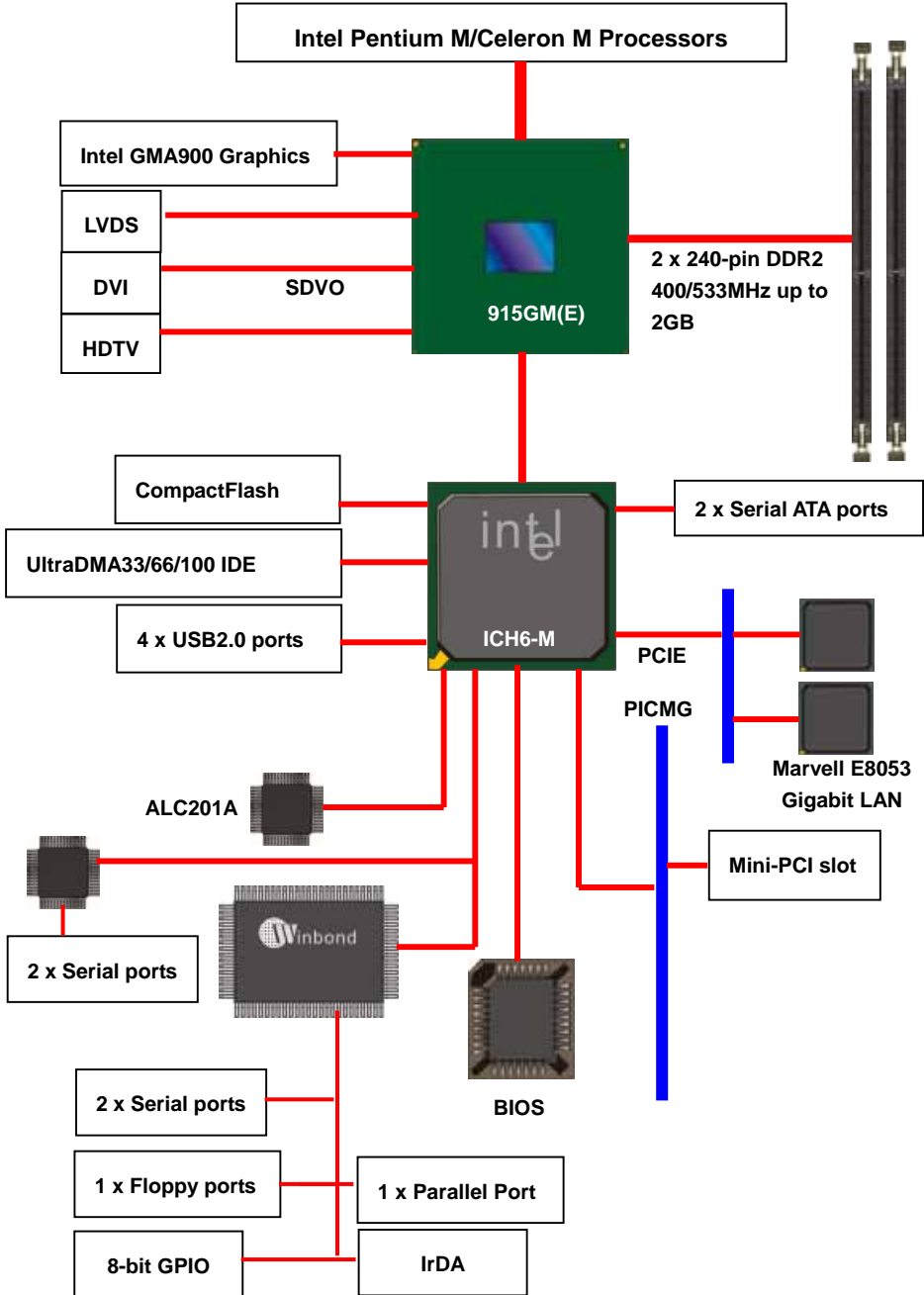
The specifications may be different as the actual production.  
For further product information please visit the website at <http://www.comnell.com.tw>

### 1.3 <Mechanical Drawing>





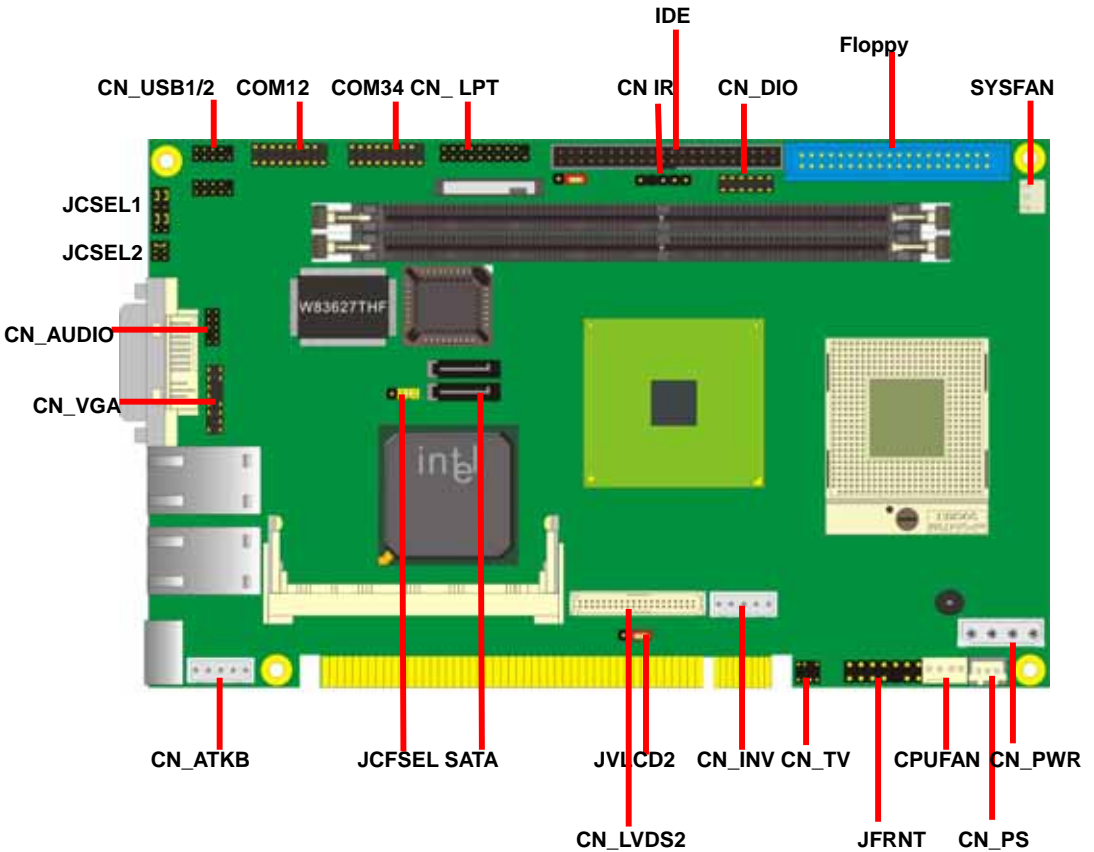
### 1.4 <Block Diagram>

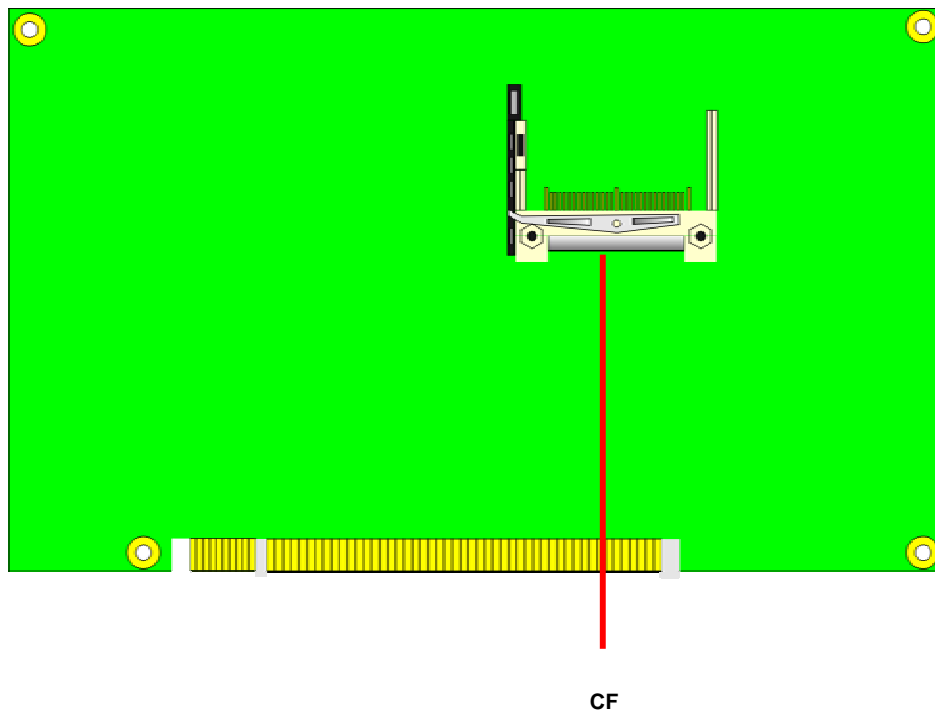


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## Chapter 2 <Hardware Setup>

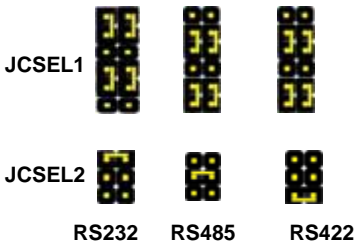
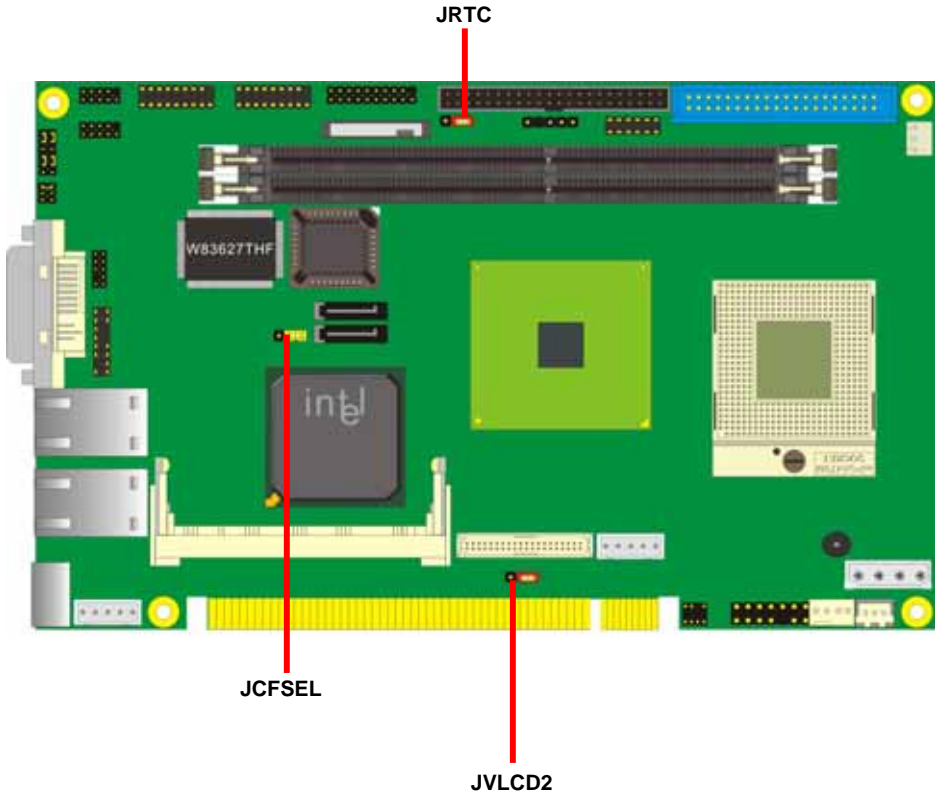
### 2.1 <Connector Location>





## 2.2 <Jumper Location & Reference>

Jumper	Function
JRTC	CMOS Operating/Clear Setting
JCFSEL	CF with IDE mode selection
JVLCD2	Panel Voltage Setting
JCSEL1	Choose RS232/485/422
JCSEL2	Choose RS232/485/422





## 2.3 <Connector Reference>

### 2.3.1 <Internal Connectors>

Connector	Function	Remark
CPU	Socket479 for CPU	Standard
DDRIIA/B	240 -pin DDR2 SDRAM DIMM socket	Standard
IDE	44-pin IDE connector	Silm
FDD	34-pin slim type floppy connector	Standard
SATA1/2	7-pin Serial ATA connector	Standard
CN_AUDIO	5 x 2-pin audio connector	Standard
CN_DIO	6 x 2-pin digital I/O connector	Standard
CN_USB1/2	5 x 2-pin USB connector	Standard
CPUFAN	4-pin CPU cooler fan connector	Standard
SYSFAN	3-pin system cooler fan connector	Standard
CN_LVDS2	20 x 2-pin LVDS connector	Standard
CN_INV	5-pin LCD inverter connector	Standard
CN_IR	5-pin IrDA connector	Standard
CN_COM12/34	10 x 2-pin COM1/2/3/4 connector	Standard
JFRNT	14-pin front panel switch/indicator connector	Standard
CN_TV	4 x 2-pin TV-out connector	Standard
MINIPCI	Mini-PCI socket	Standard
CF	CompactFlash Type II socket	Standard

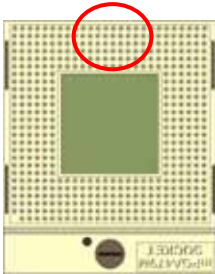
### 2.3.2 <External Connectors>

Connector	Function	Remark
DVI	DVI Digital VGA connector	Standard
RJ45_A/B	RJ45 Lan port connector	Standard
KB/MS	PS/2 keyboard/Mouse connector	Standard

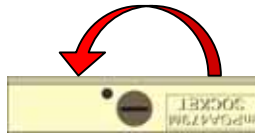
## 2.4 <CPU and Memory Setup>

### 2.4.1 <CPU Setup>

The board comes with the socket479 for Intel Pentium M/Celeron M processors, it supports new generation of Intel Pentium M processors with 533MHz of front side bus and 2MB L2 cache. Please follow the instruction to install the CPU properly.



1. Use the flat-type screw drive to unlock the CPU socket

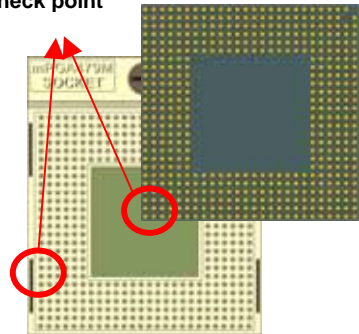


Unlock way



3. Lock the socket

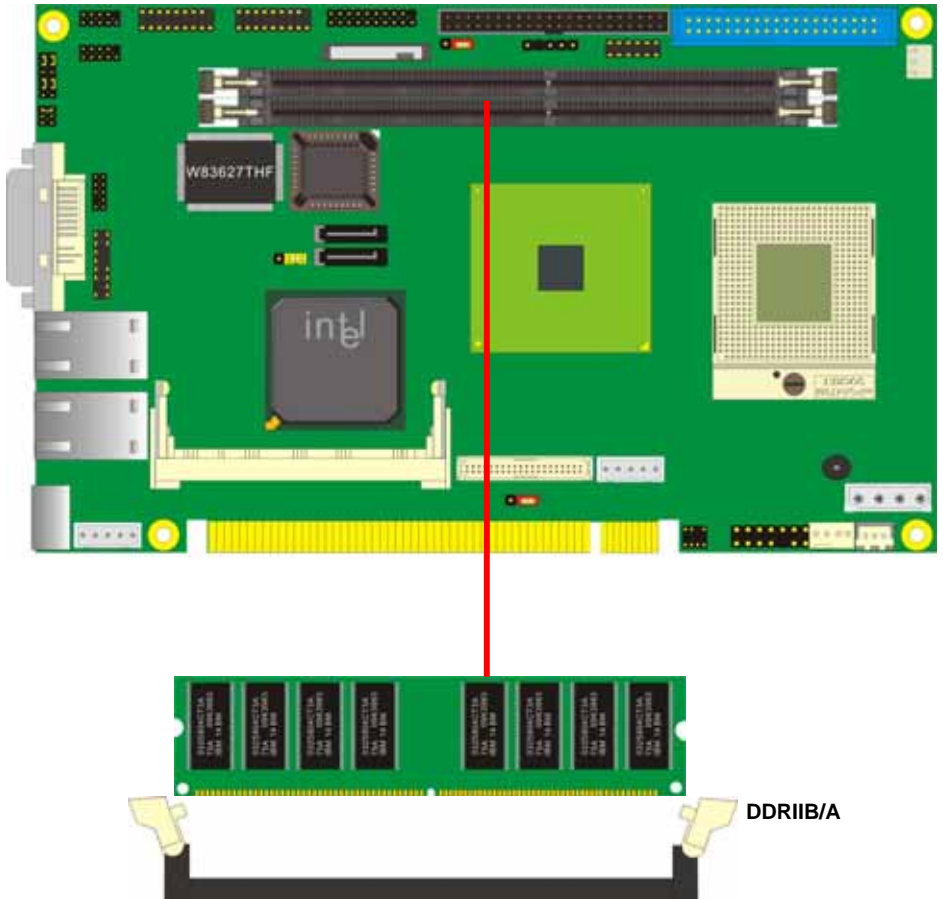
Check point



2. Follow the pin direction to install the processor on the socket

### 2.4.2 <Memory Setup>

The board provides two 240-pin DDR2 DIMMs to support DDR2 400/533 memory modules up to 2GB of capacity. Non-ECC, unbuffered memory is supported only. While applying two same modules, dual channel technology is enabled automatically for higher performance.



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

## 2.5 <CMOS Setup>

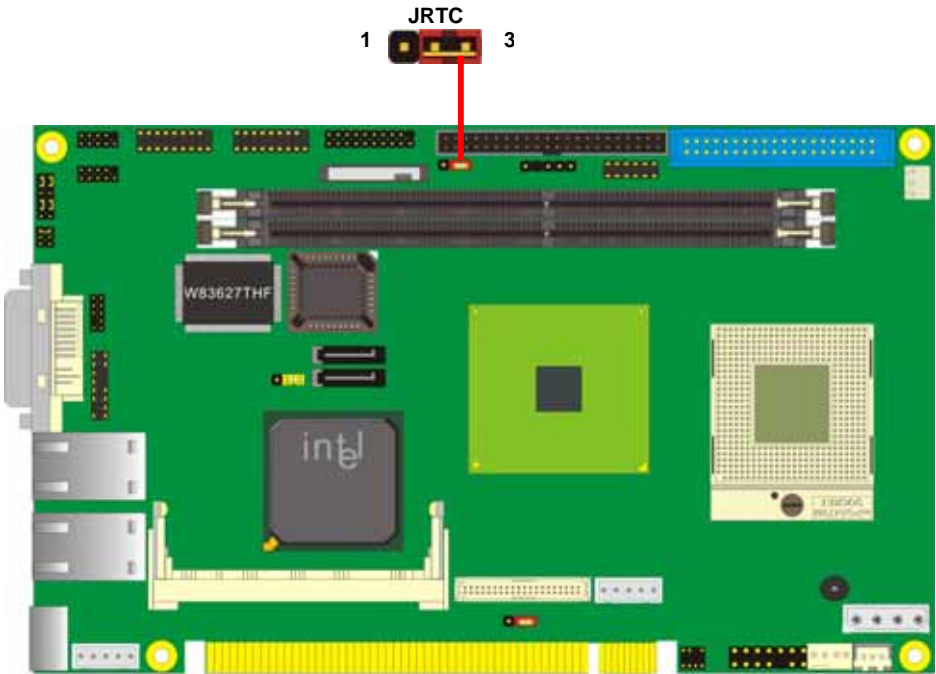
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

**Jumper: JRTC**

**Type: Onboard 3-pin jumper**

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

Default setting



## 2.6 <Enhanced IDE Interface>

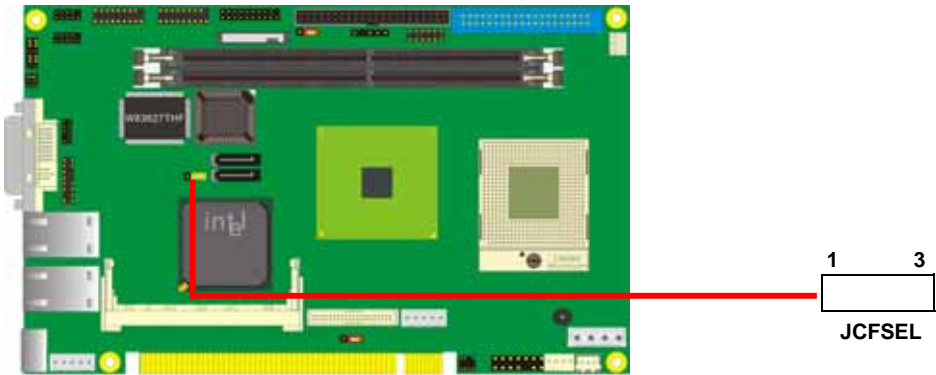
The board has one UltraDMA33 IDE interface to support up to 2 ATAPI devices, and one CompactFlash Type II socket on the solder side, with jumper **JCFSEL** for IDE master/slave mode selection.

Jumper: **JCFSEL**

Type: onboard 3-pin header

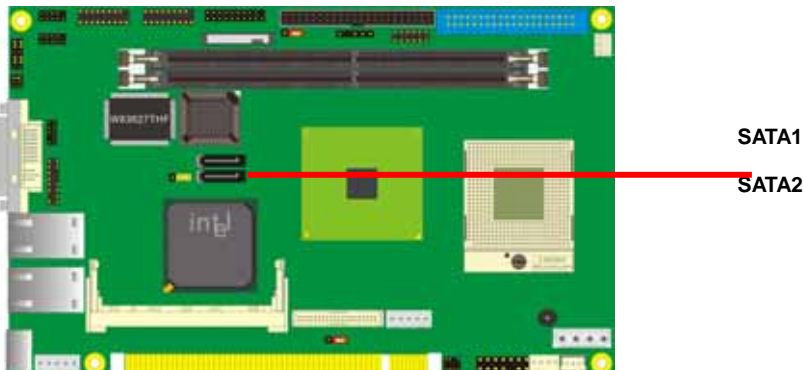
JCFSEL	Mode
1-2	Master
2-3	Slave

Default setting



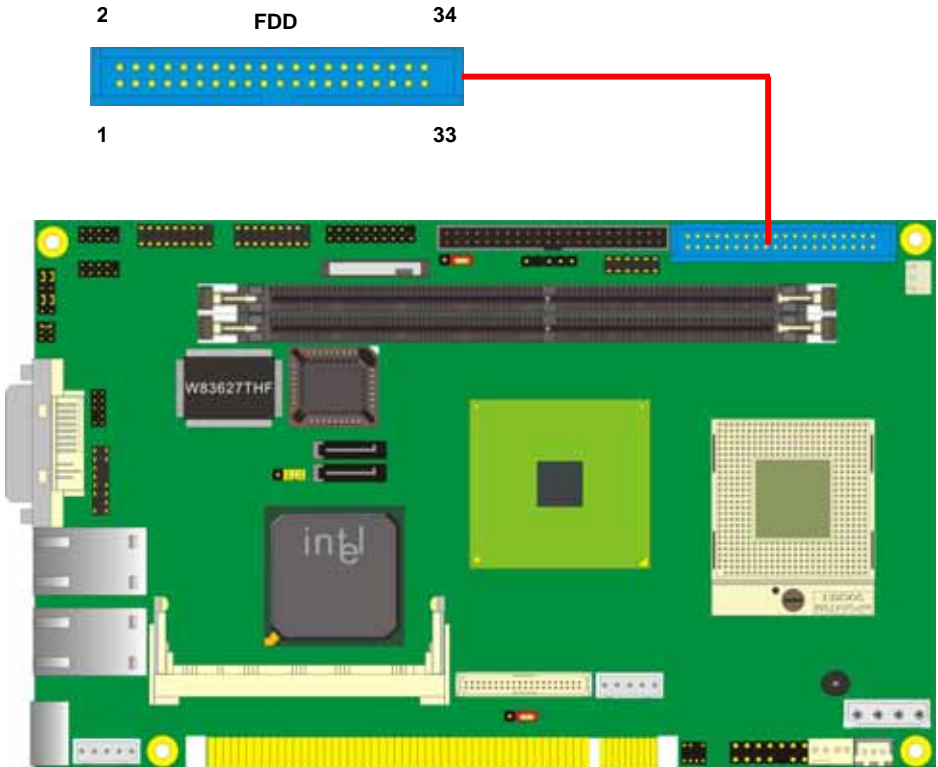
## 2.7 <Serial ATA Interface>

Based on Intel ICH6-M, the board provides two Serial ATA interfaces with up to 150MB/s of transfer rate.



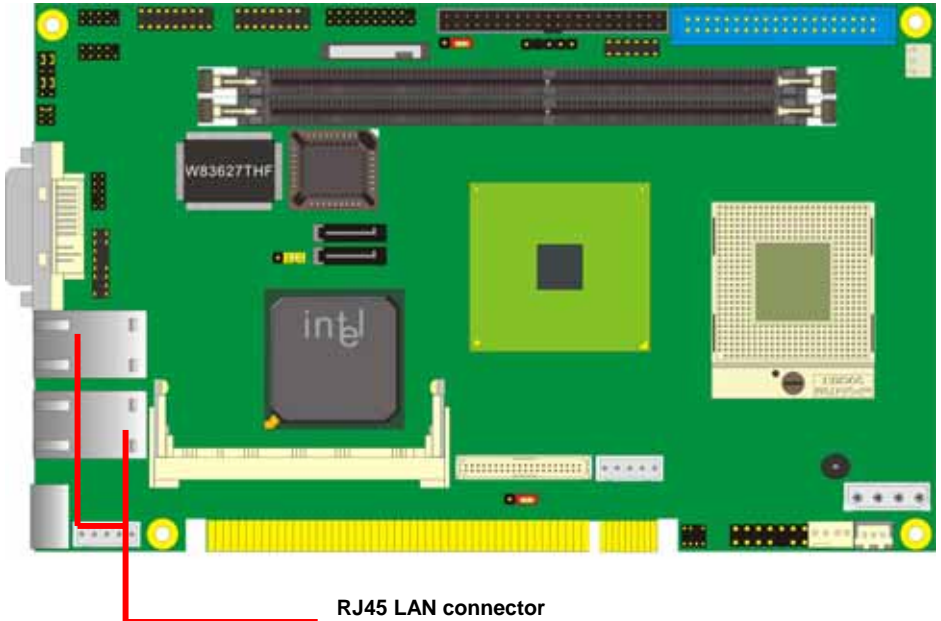
## 2.8 <Floppy Port>

The board provides one standard type floppy port.



## 2.9 <Ethernet Interface>

The board integrates with two Marvell 88E8053 PCI Express Gigabit Ethernet controllers, as the PCI Express 1x can speed up to 250MB/s of transfer rate instead of late PCI bus with 133MB/s of transfer rate. The Marvell 88E8053 supports triple speed of 10/100/100Base-T, with IEEE802.3 compliance and Wake-On-LAN supported.

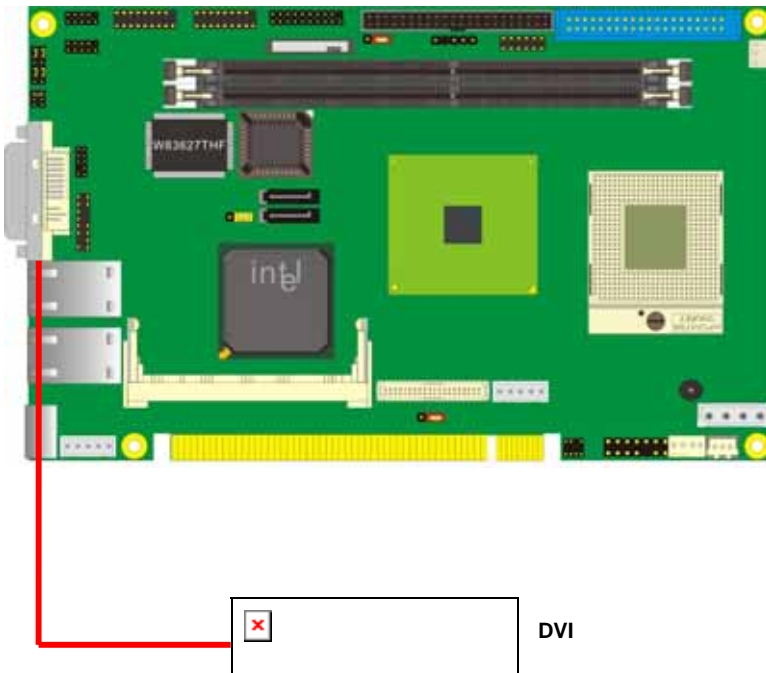


## 2.10 <Onboard Display Interface>

Based on Intel 915GM(E) chipset with built-in GMA (Graphic Media Accelerator) 900 graphics, the board provides one DVI connector on rear external I/O port, and one 40-pin LVDS interface with 5-pin LCD backlight inverter connector. The board provides dual display function with clone mode and extended desktop mode for CRT,DVI,LCD and TV

### 2.10.1 <Digital Visual Interface Display>

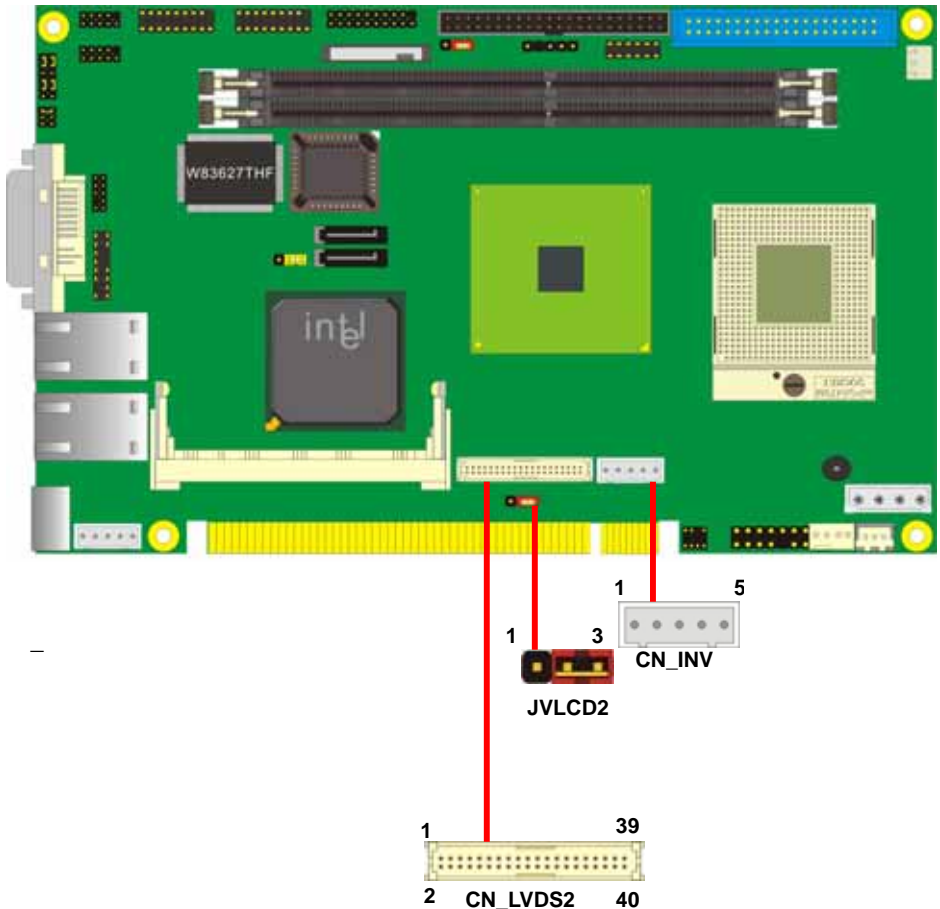
Please connect your CRT or LCD monitor with DVI male connector to the onboard female connector on rear I/O port.





### 2.10.2 <Digital Display>

The board provides one 40-pin LVDS connector for 24-bit single/dual channel panels, supports up to 1600 x 1200 (UXGA) and 1920 x 1200 (WUXGA) of resolution, with one LCD backlight inverter connector and one jumper for panel voltage setting.



Connector: **CN\_INV**

Type: 5-pin LVDS Power Header

Pin	Description
1	+12V
2	GND
3	GND
4	GND
5	ENABKL

Connector: **JVLCD2**

Type: 3-pin Power select Header

Pin	Description
1	VCC
2	LCDVCC
3	VCC3

Connector: **CN\_LVDS2**

Type: onboard 40-pin connector for LVDS connector

Connector model: **HIROSE DF13-40DP-1.25V**

Pin	Signal	Pin	Signal
2	LCDVCC	1	LCDVCC
4	GND	3	GND
6	ATX0-	5	BTX0-
8	ATX0+	7	BTX0+
10	GND	9	GND
12	ATX1-	11	BTX1-
14	ATX1+	13	BTX1+
16	GND	15	GND
18	ATX2-	17	BTX2-
20	ATX2+	19	BTX2+
22	GND	21	GND
24	ACLK-	23	N/C
26	ACLK+	25	N/C
28	GND	27	GND
30	N/C	29	BCLK-
32	N/C	31	BCLK+
34	GND	33	GND
36	LVDDCLK	35	N/C
38	LVDDDAT	37	N/C
40	N/C	39	N/C

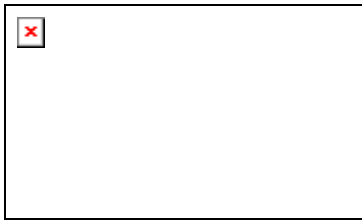
To setup the LCD, you need the component below:

1. A panel with LVDS interfaces.
2. An inverter for panel's backlight power.
3. A LCD cable and an inverter cable.

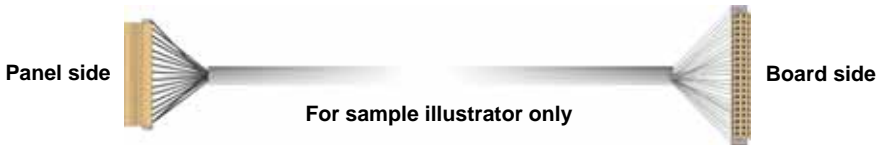
**For the cables, please follow the pin assignment of the connector to make a cable, because every panel has its own pin assignment, so we do not provide a standard cable; please find a local cable manufacture to make cables.**

**LCD Installation Guide:**

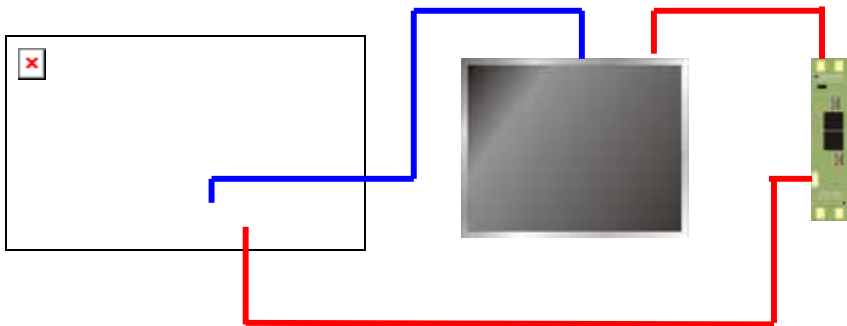
1. Preparing the **HS-770, LCD panel** and the **backlight inverter**.



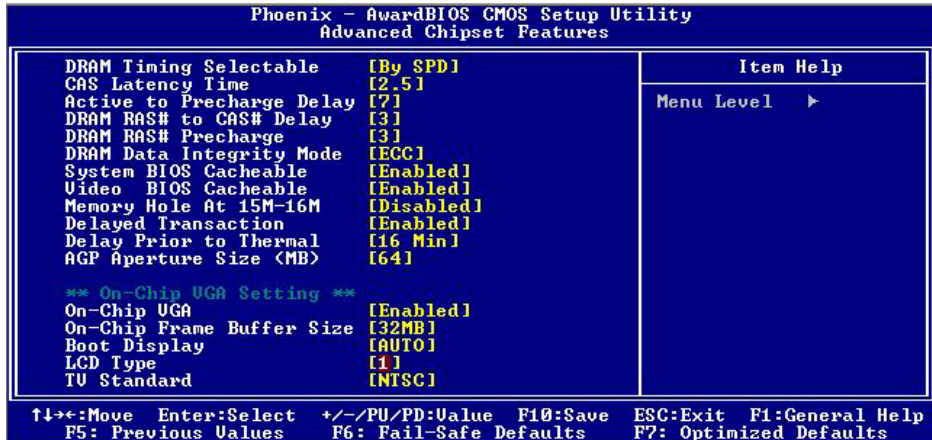
2. Please check the datasheet of the panel to see the voltage of the panel, and set the jumper **JVLCD2** to +5V or +3.3V.
3. You would need a LVDS type cable.



4. To connect all of the devices well.



After setup the devices well, you need to select the LCD panel type in the BIOS.



The panel type mapping is list below:

HS-770 BIOS LCD Type selection form			
Single channel 18bit (VER:1.0S18A)		Dual channel 18bit (VER:1.0D18A)	
NO.	Output format	NO.	Output format
1	640 x 480	1	
2	800 x 600	2	
3	1024 x 768	3	
4	1280 x 768	4	
Single channel 24bit (VER:1.0S24A)		Dual channel 24bit (VER:1.0D24A)	
NO.	Output format	NO.	Output format
1	1024 x 768	1	1024 x 768
2	1280 x 768	2	1280 x 1024
3	1280 x 1024	3	1400 x 1050
4	1366 x 768	4	1600 x 1200

### 2.10.3 <HDTV Interface>

The board provides output types with Composite, S-Video and Component (YPbPr)

Composite and S-Video up to 1024 x 768 for NTSC/PAL Component support

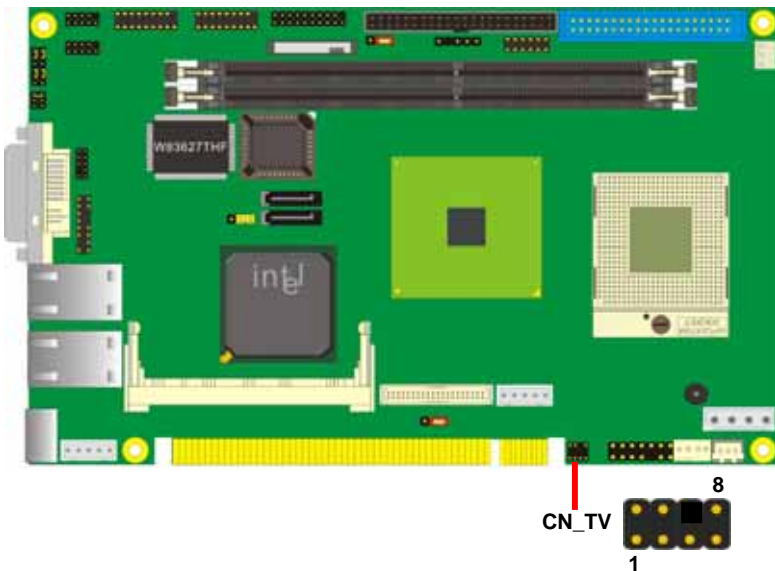
480p/720p/1080i/1080p mode

Connector: **CN\_TV** Connector

type: 8-pin header TV-out connector (pitch = 2.54mm)

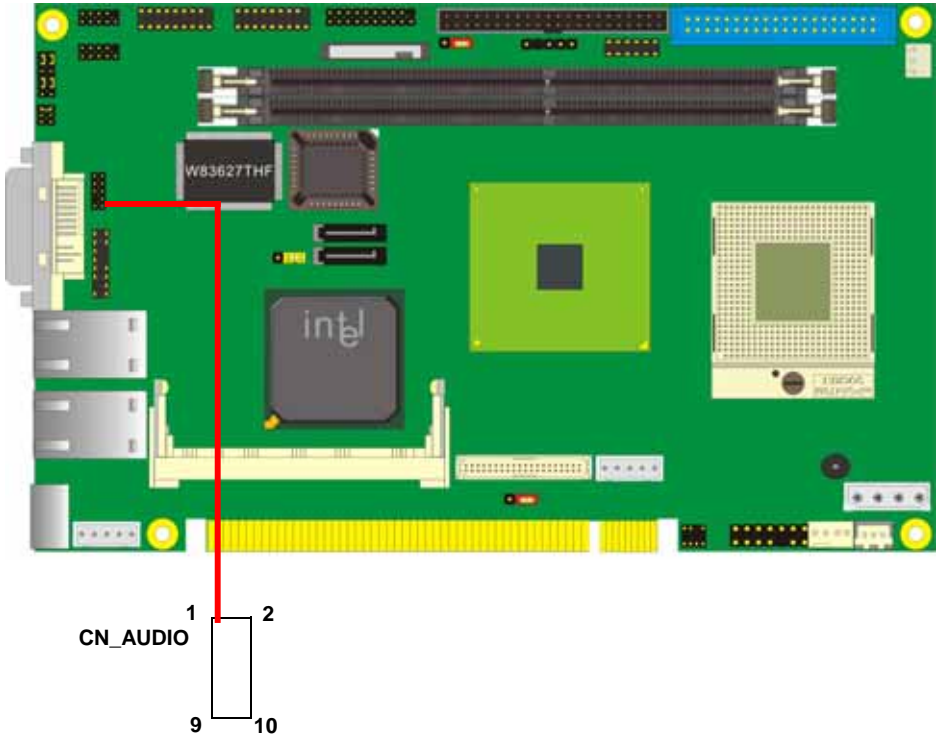
Pin Number	Assignment	Pin Number	Assignment
1	GND	2	S-Video/Y
3	S-video/Pr	4	GND
5	GND	6	GND
7	Composite/Pb	8	GND

*Notice1: This connector is for both S-Video/Composite and YPbPr outputs; please use attached two cables in the package for SDTV or HDTV devices. Notice2: S-Video and Composite can not be used at the same time.*



## 2.11 <Integrated Audio Interface>

HS-770 provides a stereo audio interface with Realtek ALC201A AC97 Codec. The **CN\_AUDIO** provides the interface to use attached audio cable.



**Connector: CN\_AUDIO**

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

Pin	Description	Pin	Description
1	Line – Right	2	Ground
3	Line – Left	4	MIC
5	MIC	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

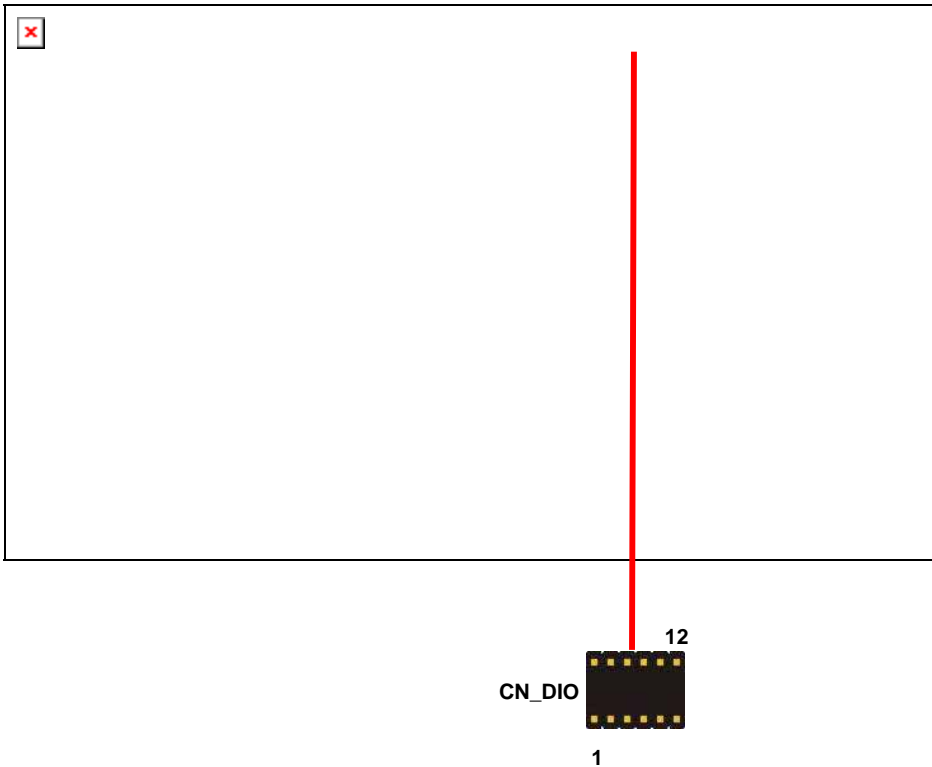
## 2.12 <GPIO Interface>

The board provides a programmable 8-bit digital I/O interface; you can use this general purpose I/O port for system control like POS or KIOSK.

Connector: **CN\_DIO**

Type: 12-pin (6 x 2) 2.0mm x 2.0mm-pitch header

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





## 2.13 <Power Supply>

### 2.13.1 <Power Input>

The board requires DC 12V/5V input with onboard 4-pin connector, for the input current, please take a reference of the power consumption report on appendix.

Connector: **CN\_PWR**

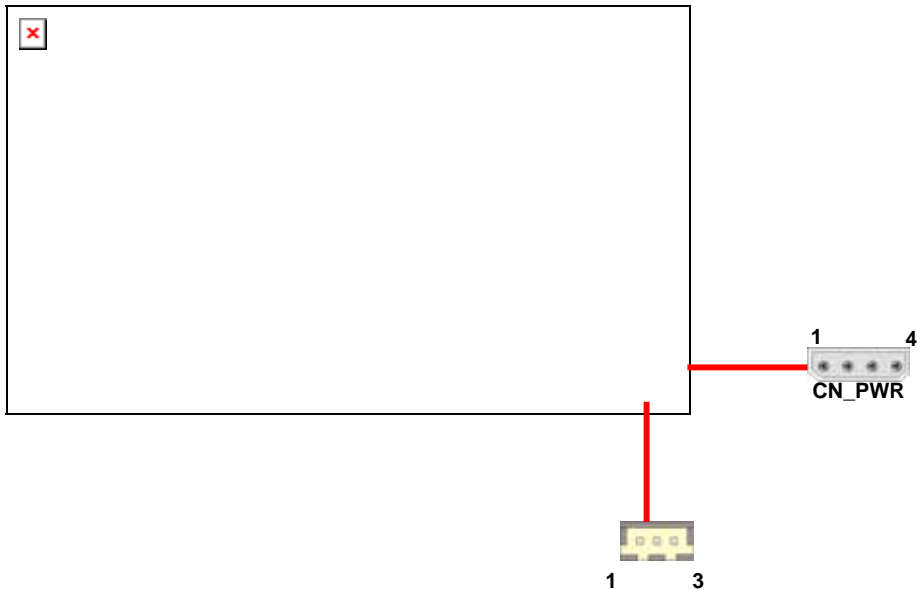
Type: 4-pin standard power connector

Pin	Description	Pin	Description
1	+12V	2	Ground
3	Ground	4	+5V

Connector: **CN\_PS**

Type: 3-pin ATX function connector

Pin	Description	Pin	Description	Pin	Description
1	5V Standby	2	Ground	3	Power On



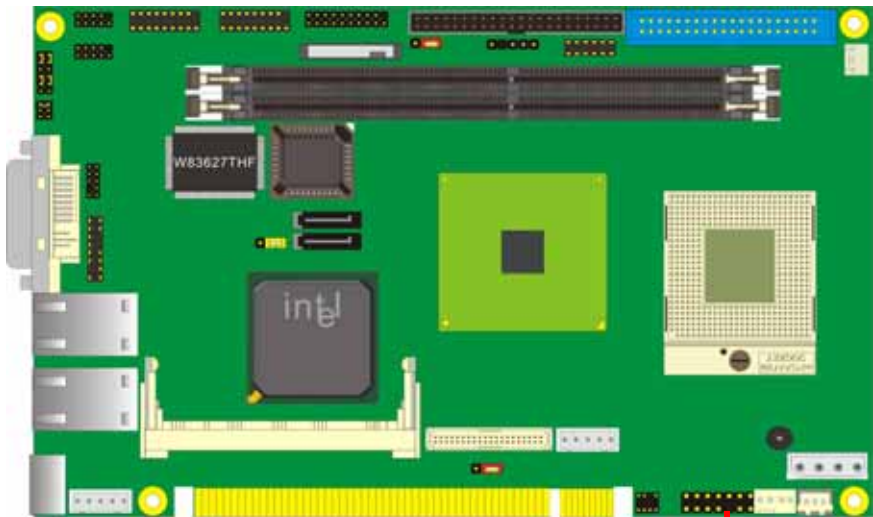
## 2.14 <Switch and Indicator>

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	Speaker
	GND	7	8	VCC	
N/C		9	10	N/C	
Power Button	PWRBT	11	12	N/C	
	5VSB	13	14	SPKIN	



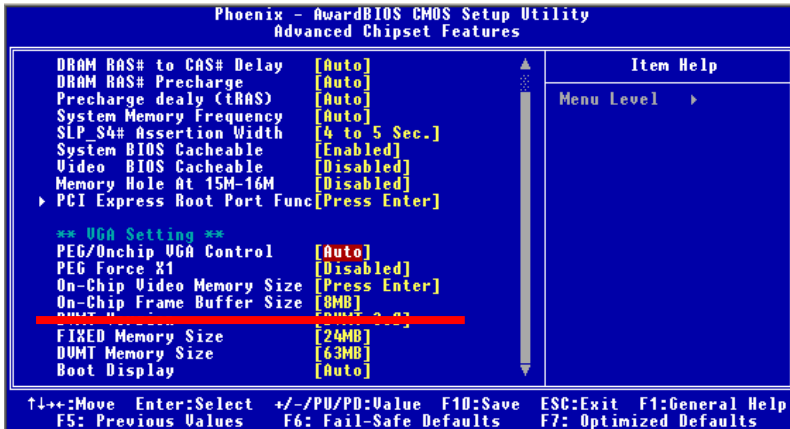
## Chapter 3 <System Setup>

### 3.1 <Video Memory Setup>

Based on Intel® 915GM(E) chipset with GMA (Graphic Media Accelerator) 900, the board supports Intel® DVMT (Dynamic Video Memory Technology) 3.0, which would allow the video memory to be allocated up to 128MB.

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
	8MB	64MB	0	64MB
	8MB	0	64MB	64MB
	8MB	128MB	0	128MB
	8MB	0	128MB	128MB
8MB	64MB	64MB	128MB	

Notice:

1. The On-Chip Frame Buffer Size would be included in the Fixed Memory.

Please select the memory size according to this table.

## Chapter 4 <BIOS Setup>

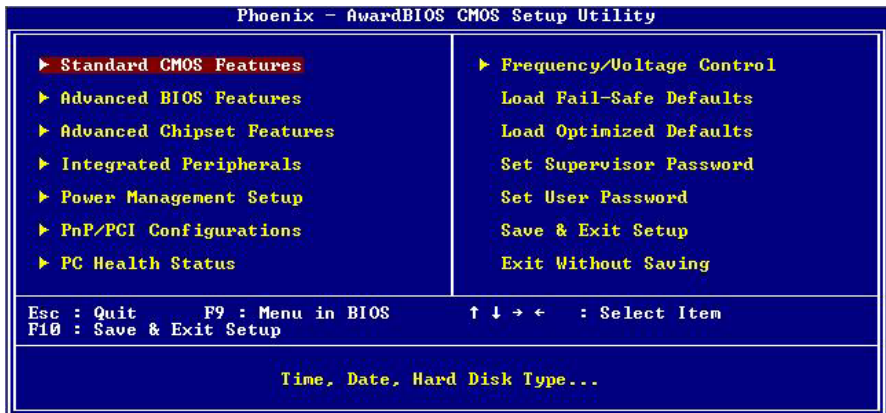
The motherboard uses the Award BIOS for the system configuration. The Award BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides 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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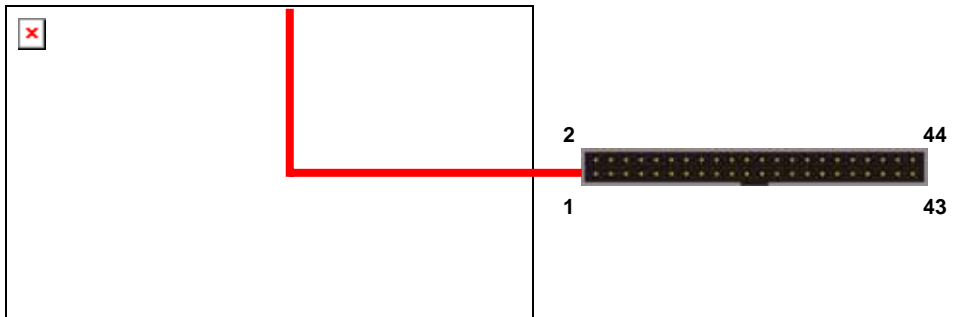
# Appendix A <I/O Port Pin Assignment>

## A.1 <IDE Port>

Connector: IDE

Type: 44-pin (22 x 2) box header

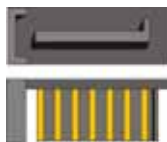
Pin	Description	Pin	Description
1	Reset	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	N/C
21	REQ	22	Ground
23	-IOW	24	Ground
25	-IOR	26	Ground
27	IRDY	28	Ground
29	DACK	30	Ground
31	IDEIRQ	32	IDE32
33	A1	34	P66DET
35	A0	36	A2
37	-CS1	38	-CS3
39	-HD LED1	40	Ground
41	+5V	42	+5V
43	Ground	44	Ground



## A.2 <Serial ATA Port>

Connector: **SATA1/2**

Type: 7-pin wafer connector

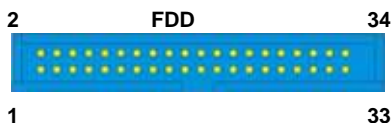


1	2	3	4	5	6	7
GND	RSATA_TXP1	RSATA_TXN1	GND	RSATA_RXN1	RSATA_RXP1	GND

## A.3 <Floppy Port>

Connector: **FDD**

Type: 34-pin connector



Pin	Description	Pin	Description
1	GND	2	FD DRV DEN
3	GND	4	N/C
5	GND	6	N/C
7	GND	8	FD INDEX
9	GND	10	FD MOA-
11	GND	12	N/C
13	GND	14	FD DSA-
15	GND	16	N/C
17	GND	18	FD DIR-
19	GND	20	FD STEP-
21	GND	22	FD WD-
23	GND	24	FD WE-
25	GND	26	FD TRAK-
27	GND	28	FD WP-
29	GND	30	FD RDATA-
31	GND	32	FD HEAD-
33	GND	34	FD DSKCHG-

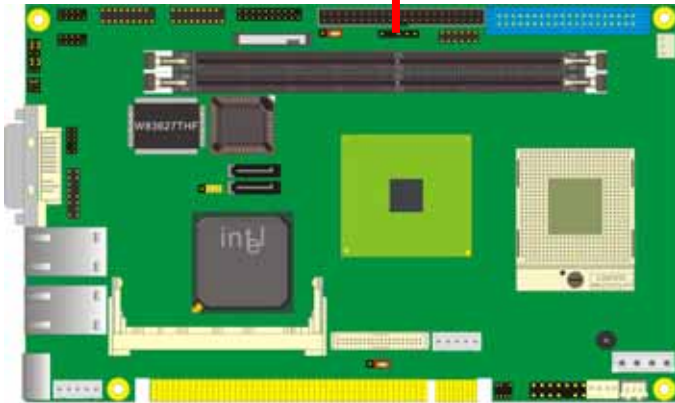


### A.4 <IrDA Port>

Connector: **CN\_IR**

Type: 5-pin header for SIR Ports

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

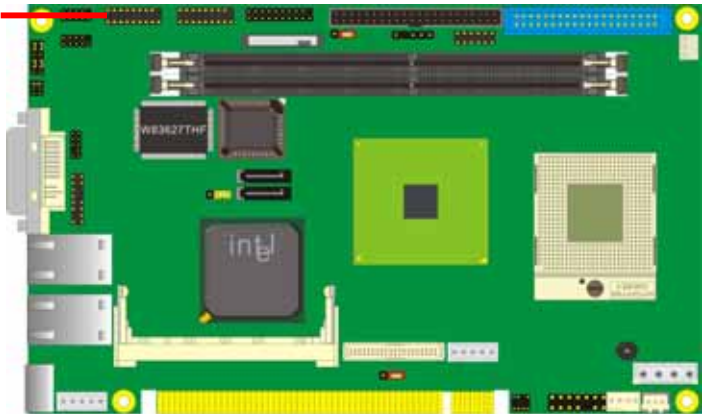
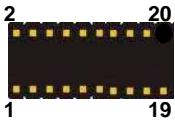


## A.5 <Serial Port>

Connector: **CN\_COM12/CN\_COM34**

Type: 20-pin (10 x 2) 1.27mm x 2.54mm-pitch header

Pin	Description	Pin	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N/C
11	DCD	12	RXD
13	TXD	14	DTR
15	GND	16	DSR
17	RTS	18	CTS
19	RI	20	N/C



### A.6 <VGA Port>

Connector: **DVI**

Type: DVI-I female connector on bracket



Pin	Description	Pin	Description	Pin	Description
1	TDC2-	11	VGAGND	21	N/C
2	TDC2+	12	N/C	22	VGAGND
3	VGAGND	13	N/C	23	TLC+
4	N/C	14	VCC	24	TLC-
5	N/C	15	VGAGND	C1	VGA R
6	VGACLK	16	THPDET	C2	VGA G
7	VGADAT	17	TDC0-	C3	VGA B
8	VGA VS	18	TDC0+	C4	VGA HS
9	TDC1-	19	VGAGND	C5	VGAGND
10	TDC1+	20	N/C	C6	VGAGND

### A.7 <LAN Port>

Connector: **RJ45/B**

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-

### A.3 < USB Interface >

Connector: **CN\_USB1/2**

Type: 10-pin (5 x 2) header for dual USB Ports



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

## Appendix B <Flash BIOS>

### B.1 <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.phoenix.com/en/home/>

[http://www.commell.com.tw/Support/Support\\_SBC.htm](http://www.commell.com.tw/Support/Support_SBC.htm)

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

### B.2 <Flash BIOS Procedure>

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. Restart 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>

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 4E 87                ;enter configuration
-o 4E 87
-o 4E 29
-o 4E 40                ;enale GPIO function
-o 4E 07
-o 4E 07                ;enable GPIO configuration
-o 4E F0
-o 4F xx                ;set GPIO as input/output; set '1' for input,'0' for output
-o 4E F1
-o 4F xx                ;if set GPIO's as output,in this register its value can be set
```

Optional :

```
-o 4E F2
-o 4F xx                ; Data inversion register ; '1' inverts the current valus of the
                        bits ,'0' leaves them as they are
-o 4E 30
-o 4F 01                ; active GPIO's
```

For further information ,please refer to Winbond W83627THF datasheet.

Notice : All GPIO pin pull-high external resistance requirement

## 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 a Business.

### Taiwan Commate Computer Inc.

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Address	8F, No. 94, Sec. 1, Shin Tai Wu Rd., Shi Chih Taipei Hsien, Taiwan
TEL	+886-2-26963909
FAX	+886-2-26963911
Website	<a href="http://www.commell.com.tw">http://www.commell.com.tw</a>
E-Mail	<a href="mailto:info@commell.com.tw">info@commell.com.tw</a> (General Information) <a href="mailto:tech@commell.com.tw">tech@commell.com.tw</a> (Technical Support)

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