

FS-97C

Full-size PICMG CPU Card

User's Manual

Edition: 1.0

2006/12/25



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Packing List:

Please check the package material before you install the system.

Hardware:

FS-97C Single Board Computer x 1

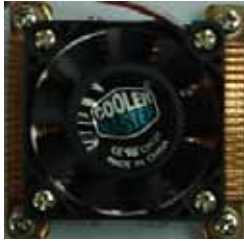
Cable Kit:



40-pin ATA100 IDE flat cable x 2



Floppy flat cable x 1



CPU Cooler x 1



4-pin to 3-pin ATX cable x 1



PS/2 Keyboard & Mouse Cable x 1



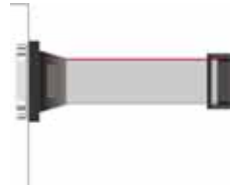
SATA Cable x 2



DB25 & DB9 cable x 1
(FS-97CDG only)



Dual DB9 cable x 1
(FS-97CDG2 only)



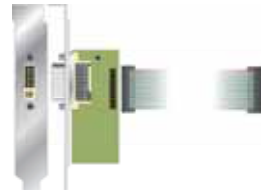
DB25 cable x 1
(FS-97CDG2 only)



USB cable x 2



Audio Port Cable x 1



DVI module with bracket x 1

Printed Matters:

User's Manual x 1

Driver CD x 1

Index

Chapter 1 <Introduction>	6
1.1 <Product Overview>	6
1.2 <Product Specification>	7
1.3 < Mechanical Drawing >	9
1.4 <Block Diagram>	10
Chapter 2 <Hardware Setup>	12
2.1 <Connector Location>	12
2.2 <Connector Reference>.....	13
2.2.1 <Internal Connector>	13
2.2.2 <External Connector>.....	13
2.3 <Jumper Reference>.....	14
2.4 < CPU and Memory Setup >	15
2.4.1 <CPU Setup>	15
2.4.2 <Memory Setup>	16
2.5 <CMOS Setup>	17
2.6 <Enhanced IDE Interface>.....	18
2.7 <Serial ATA interface>.....	19
2.8 <LAN Interface>.....	19
2.9.1 <Analog VGA Interface>	20
2.9.2 <Digital Display>	21
2.9.3 <DVI Interface >	24
2.9.4<TV-out Interface>	25
<Audio Interface>.....	25
2.10 <Onboard Audio Interface>.....	28
2.11 <USB2.0 Interface>	29
2.12 <Serial Port Jumper Setting >.....	31
2.13 <Power and Fan Installation>	32
2.13.1 <Power connectors>	32

2.13.2 <Fan Connectors>	33
2.14 <GPIO Interface>	34
2.15 <Switch and Indicator>	35
Chapter 3 <System Configuration>	37
3.1 <Video Memory Setup>	37
Chapter 4 <BIOS Setup>	39
(This Page is Left for Blank)	40
Appendix A <I/O Port Pin Assignment>	41
A.1 IDE Port	41
A.2 <Serial ATA Port>	41
A.3 < Floppy Port >	42
A.4 <IrDA Port>	42
A.5 < Parallel Port>	43
A.6 <Serial Port>	43
A.7 <VGA Port>	44
A.8 <LAN Port>	44
A.9 < USB Port >	44
A.10 <AT Keyboard Port>	45
A.11 <PS/2 Keyboard & Mouse Port>	45
Appendix B <Flash BIOS>	47
B.1 BIOS Auto Flash Tool	47
B.2 Flash Method	47
Appendix C <System Resources>	48
Appendix D <Watch Dog timer Setting >	52
Contact Information	54

Chapter 1 <Introduction>

1.1 <Product Overview>

FS-97C is the Full-size single board computer with last Intel desktop technology with PICMG form factor. with supporting Intel Core 2 Duo / Core Duo / Core solo / Celeron M processor for 533/667MHz front side bus, Intel 945GM and ICH7-M chipset, integrated GMA950 graphics, DDR2 SDRAM memory, Realtek AC97 Audio, Serial ATA and two Intel 82573L Gigabit LAN .

Intel Yonah/Merom Core Duo Processor

The board supports Intel Core 2 Duo / Core Duo / Core Solo / Celeron M processor with 533/667MHz front side bus, 2MB L2 cache, to provide more powerful performance than before.

New features for Intel 945GM chipset

The board integrates Intel 945GM and ICH7-M chipset, to provide new generation of the mobile solution, supports Intel GMA950 graphics, DDR2 533/667 memory, built-in high speed mass storage interface of serial ATA, AC97 Audio with 5.1 channels surrounding sound.

All in One multimedia solution

Based on Intel 945GM and ICH7-M chipset, the board provides high performance onboard graphics, 18-bit Dual channel LVDS interface, DVI and HDTV and 5.1 channels AC97 Audio, to meet the every requirement of the multimedia application.

Flexible Extension Interface

The board also provides Compact Flash Type II socket and two mini-PCI socket.

1.2 <Product Specification>

General Specification

Form Factor	Full-size PICMG Single Board Computer PICMG version 1.0 (Rev. 2.0), PCI version 2.0 compliant
CPU	Intel® Core 2 Duo/ Core Duo/ Core Solo/ Celeron M processor Package type: Micro-FCPGA478 Front side bus: 533/667MHz
Memory	2 x 240-pin DDR2 400/533/667MHz SDRAM Maximum DRAM address decode space is 3GB. Up to 10.67GB/s of bandwidth with dual-channel interleaved mode Dual-Channel technology supported Unbuffered, none-ECC memory supported only
Chipset	Intel® 945GM and ICH7-M
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® ICH7-M built-in RTC with lithium battery
Enhanced IDE	UltraATA100 IDE interface supports up to 2 ATAPI devices One 40-pin IDE port onboard One CompactFlash Type II socket on solder side
Serial ATA	Intel® ICH7-M integrates 2 Serial ATA interfaces (No RAID Function) Up to 150MB/s of transfer rate

Multi-I/O Port

Chipset	Intel® ICH7-M with Winbond® W83627THG controller
Serial Port	One RS232 and one jumper selectable RS232/422/485
USB Port	4 x Hi-Speed USB 2.0 ports with 480Mbps of transfer rate
Parallel Port	One internal bi-direction parallel port with SPP/ECP/EPP mode
Floppy Port	One internal Floppy port
IrDA Port	One IrDA compliant Infrared interface supports SIR
K/B & Mouse	PS/2 keyboard and mouse port
GPIO	One 12-pin Digital I/O connector with 8-bit programmable
Smart Fan	One CPU fan connectors for fan speed controllable

VGA Display Interface

Chipset	Intel® 945GM GMCH (Graphic Memory Controller Hub)
Memory	Up to 224MB shared with system memory
Display Type	CRT, LCD monitor with analog display, DVI,HDTV
Connector	External DB15 female connector on rear I/O panel Onboard 40-Pin LVDS connector

Onboard 26-Pin DVI connector
 Onboard 9-Pin TV-out connector

Ethernet Interface

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

Solid State Disk Interface

Flash Type	Compact Flash Typell for Compact Flash Card or Micro Drive
------------	--

ISA Interface

ISA Bridge	Winbond W83628G & W83629G
Function	I/O & IRQ supported only, no support DMA & bus mastering

Audio Interface

Chipset	REALTEK ALC655
Interface	5.1 channel surround audio with Line-in, Line-out and MIC-in
Connector	Onboard audio connector with pin header Onboard CD-IN connector

Expansive Interface

Mini PCI	2 x Mini PCI socket
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Power and Environment

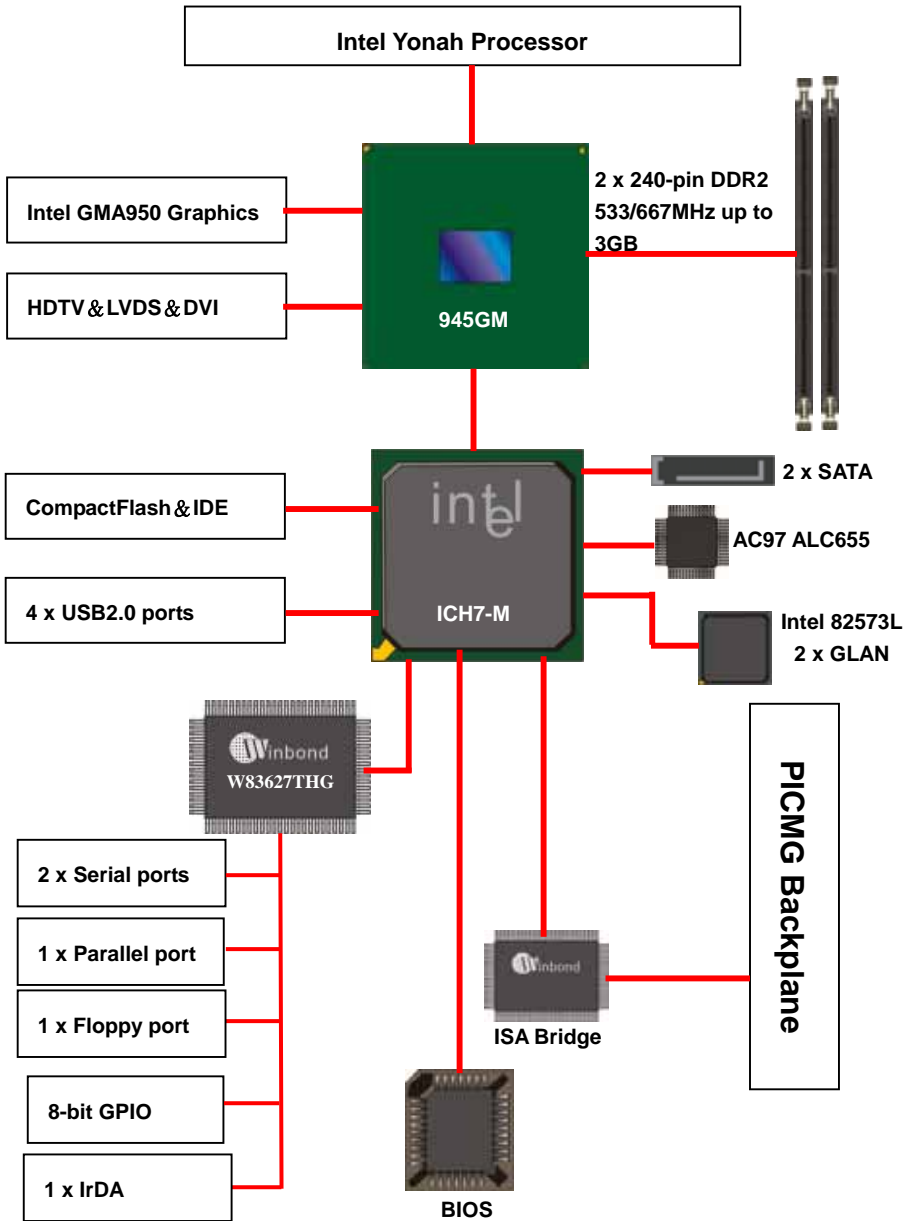
Power Requirement	+5V, +12 DC input & 5V _{SB} Requirement
Dimension	338 (L) x 122 (H) mm
Temperature	Operating within 0 ~ 60°C (32 ~ 140°F) Storage within -20 ~ 85°C (-4 ~ 185°F)

Ordering Code

FS-97CDG	Support Intel Core 2 Duo/Core Duo/Core solo/Celeron M Processor with onboard VGA, DVI, LVDS, Audio, SATA, Giga LAN, USB2.0, Serial port, LPT, CF, GPIO, Mini PCI, FDD, IrDA
FS-97CDG2	Same as above and with secondary Gigabit LAN

The specifications may be different as the actual board.

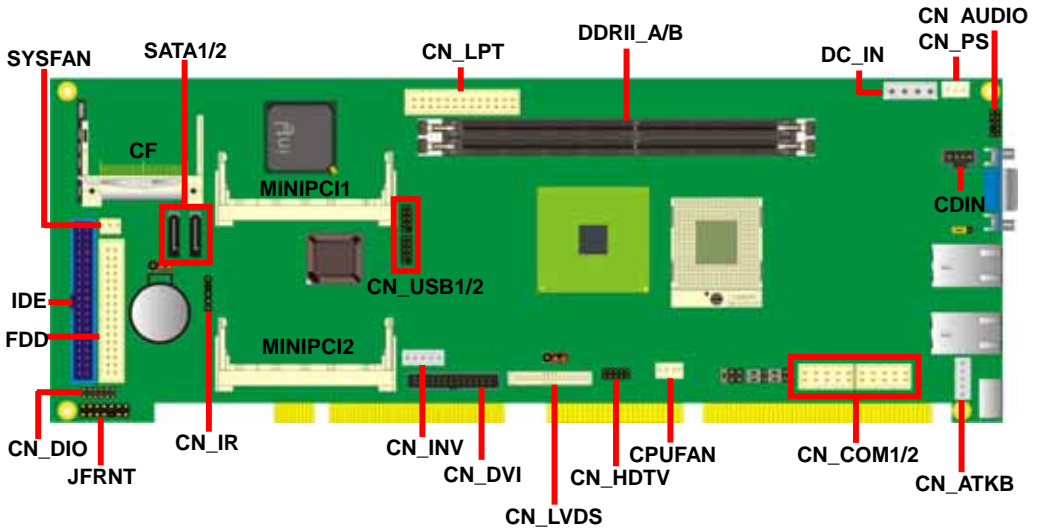
1.4 <Block Diagram>



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Chapter 2 <Hardware Setup>

2.1 <Connector Location>



2.2 <Connector Reference>

2.2.1 <Internal Connector>

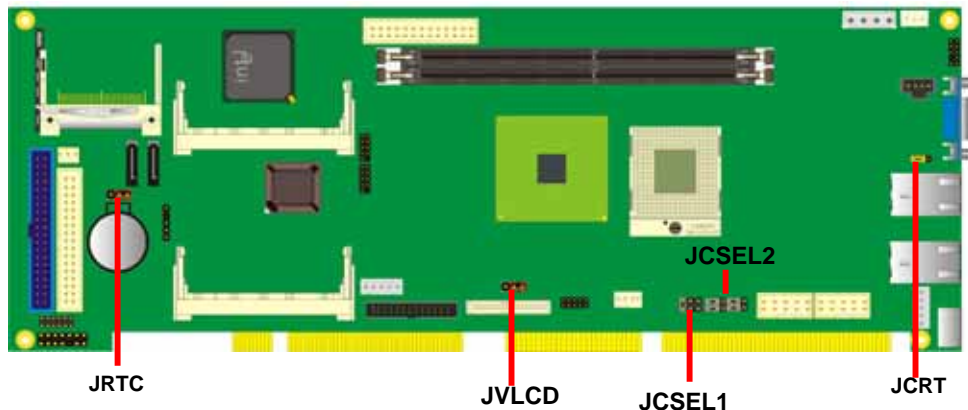
Connector	Function	Remark
DDRIL_A/B	240 –pin DDR2 SDRAM DIMM socket	Standard
IDE	40-pin primary IDE connector	Standard
FDD	34-pin floppy connector	Standard
S_ATA1/2	7-pin Serial ATA connector	Standard
DC_IN	4-pin AT power supply connector	Standard
CN_PS	3-pin ATX function connector	Standard
CN_AUDIO	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_LPT	13 x 2-pin LPT connector	Standard
CN_HDTV	5 x 2-pin HDTV interface	Standard
CN_LVDS	20 x 2-pin LVDS connector	Standard
CN_INV	5-pin LCD inverter 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_IR	5-pin IrDA connector	Standard
CN_ATKB	5-pin AT keyboard connector	Standard
CN_DVI	26-pin TMDS connector	Standard
JFRNT	14-pin front panel switch/indicator connector	Standard
CF	Compact Flash TYPE-II socket	Standard
MINIPCI1/2	Mini-PCI socket	Standard
CN_COM1/2	10-pin serial port connector	Standard

2.2.2 <External Connector>

Connector	Function	Remark
CRT	DB15 VGA connector	Standard
RJ45_1/2	One RJ45 LAN connector	Standard
PS2	PS/2 keyboard and mouse connector	Standard

2.3 <Jumper Reference>

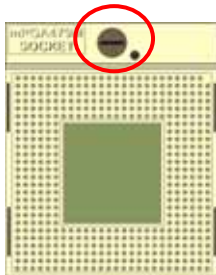
Jumper	Function
JRTC	CMOS Operating/Clear Setting
JVLCD	LCD Panel Voltage Setting
JCRT	CRT attach select setting
JCSEL1/2	COM2 RS232/422/485 mode setting



2.4 < CPU and Memory Setup >

2.4.1 <CPU Setup>

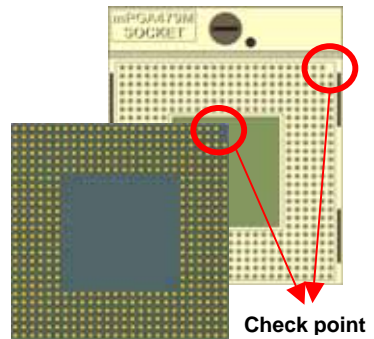
The board comes with the socket479 for Intel Core 2 Duo/Core Duo /Core solo processor , it supports new generation of Intel Core 2 Duo/Core Duo /Core solo processor with 533/667MHz of front side bus and 2MB L2 cache. Please follow the instruction to install the CPU properly.



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



Unlock way



Check point

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

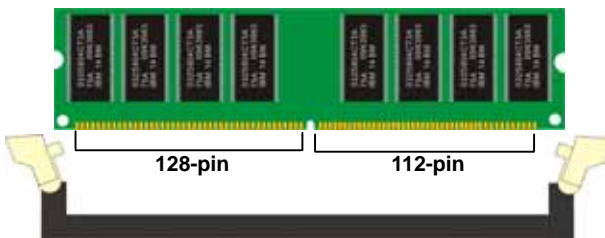
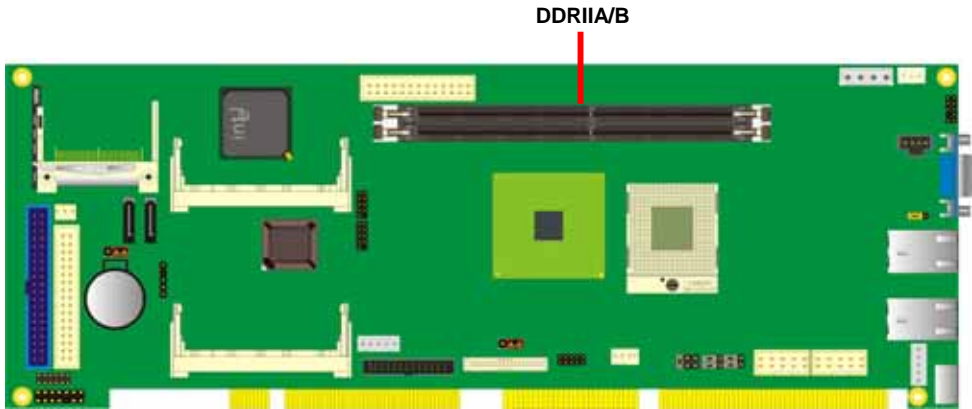


3. Lock the socket

2.4.2 <Memory Setup>

FS-97C has two 240-pin DDR2 DIMM support up to 3GB of memory capacity. The memory frequency supports 533/667MHz. Only Non-ECC memory is supported. **Dual-Channel technology** is supported while applying two same modules on one of each group.

Notice: When applying 3GB of memory, due to the memory resource issue, the available memory size would be less than 3GB.



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

2.5 <CMOS Setup>

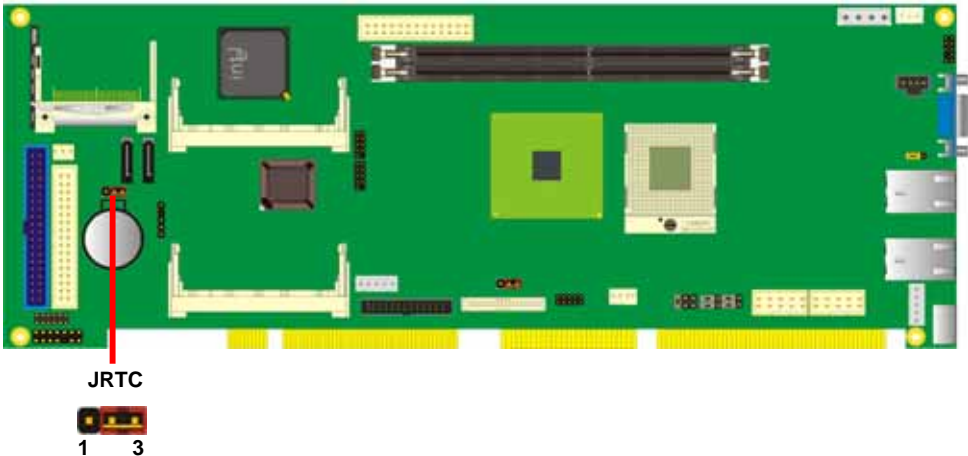
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

Jumper: JRTC

Type: Onboard 3-pin jumper

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

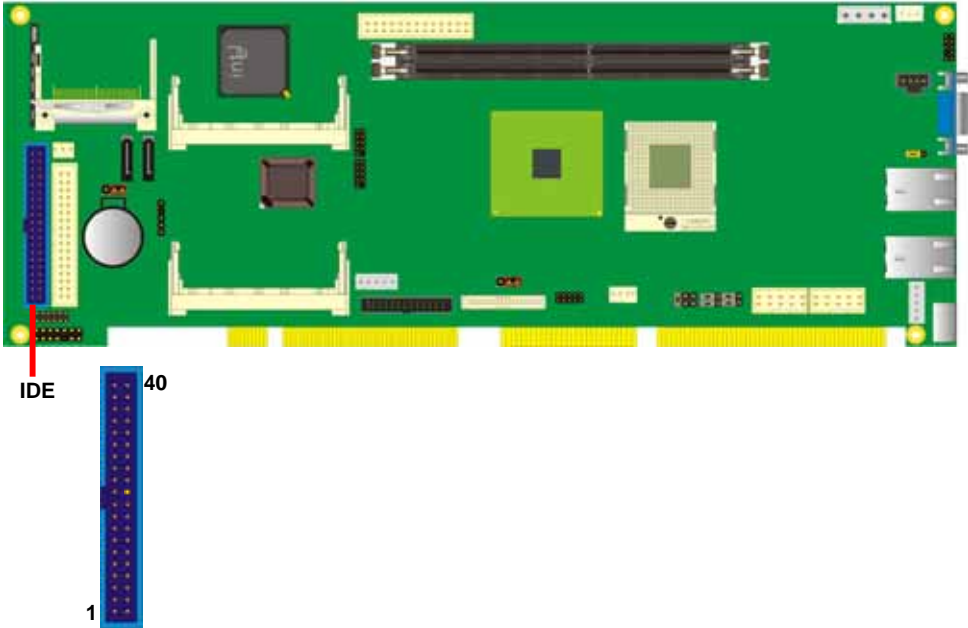
Default setting: 2-3



2.6 <Enhanced IDE Interface>

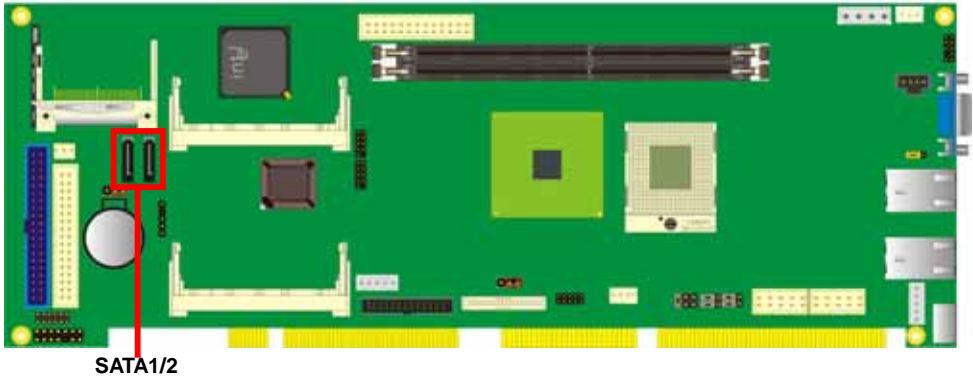
The board has one Ultra ATA100 IDE interface to support up to 2 ATAPI devices, and one Compact Flash Type II socket on the solder side.

The board also provides a Compact Flash Type II socket with jumper (**JCFSEL**) selectable slave/Master mode on secondary IDE channel.



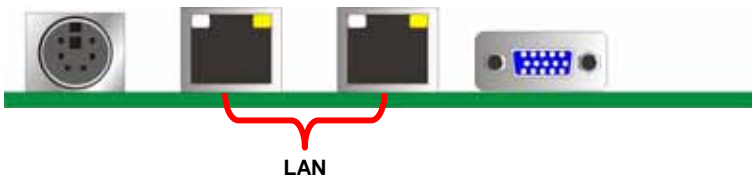
2.7 <Serial ATA interface>

Based on Intel ICH7-M, the board provides two Serial ATA interfaces with up to 150MB/s of transfer rate.



2.8 <LAN Interface>

The Intel 82573L supports triple speed of 10/100/1000Base-T, with IEEE802.3 compliance and Wake-On-LAN supported.



2.9 <Onboard Display Interface>

Based on Intel 945GM chipset with built-in GMA (Graphic Media Accelerator) 950 graphics, the board provides one DB15 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 and LCD and DVI and TV-out.

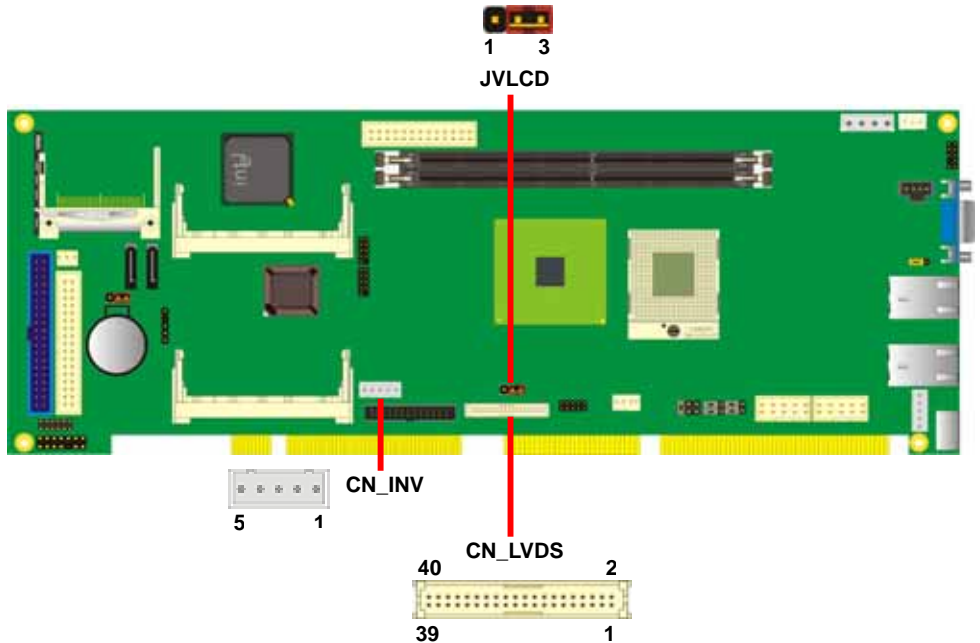
2.9.1 <Analog VGA Interface>

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



2.9.2 <Digital Display>

The board provides one 40-pin LVDS connector for 18-bit dual channel panels, supports up to 1600 x 1200 (UXGA) of resolution, with one LCD backlight inverter connector and one jumper for panel voltage setting



Connector: **CN_INV**

Type: 5-pin LVDS Power Header

Connector model: **JST B5B-XH-A**

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

Connector: **JVLCD**

Type: 3-pin Power select Header

Pin	Description
1	VCC(5V)
2	LCDVCC
3	VCC3(3.3)

Connector: **CN_LVDS**

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	BTX3-
26	ACLK+	25	BTX3+
28	GND	27	GND
30	ATX3-	29	BCLK-
32	ATX3+	31	BCLK+
34	GND	33	GND
36	N/C	35	N/C
38	N/C	37	N/C
40	N/C	39	N/C

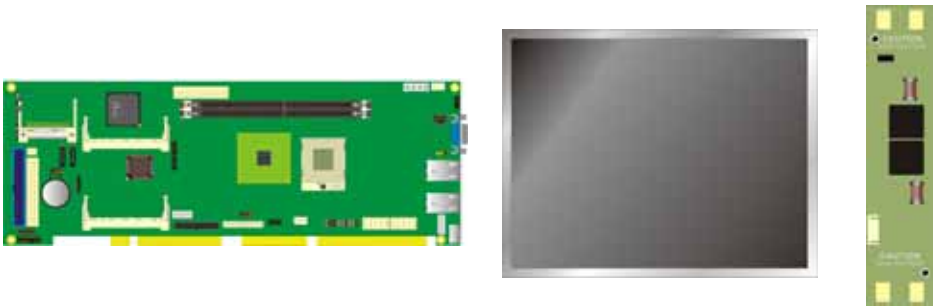
To setup the LCD, you need the component below:

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:

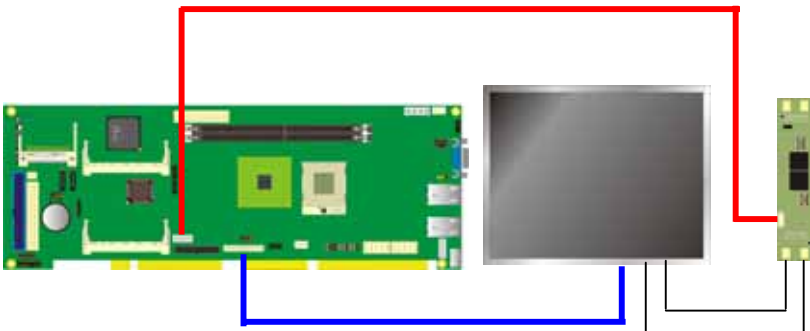
1. Preparing the **FS-97C**, LCD panel and the **backlight inverter**.



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



4. To connect all of the devices well.



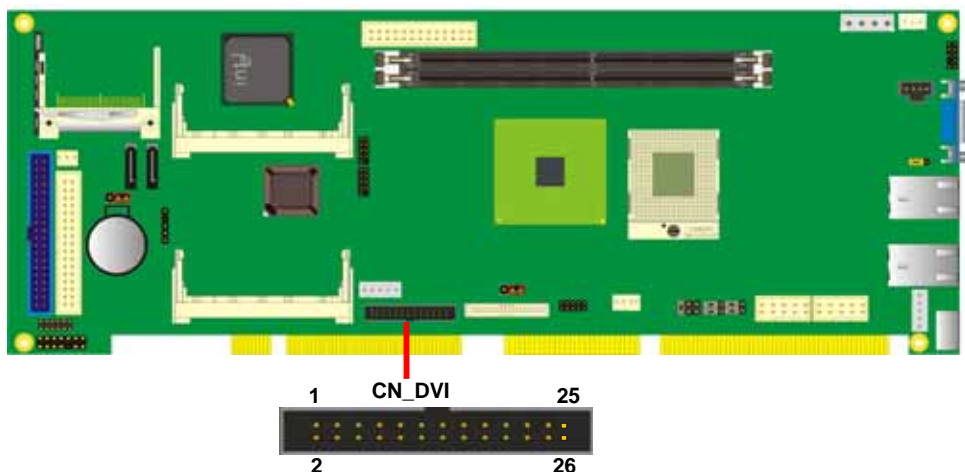
2.9.3 <DVI Interface >

The board also comes with a DVI interface with Chronitel CH7307C for digital video interface.

Connector: **CN_DVI**

Connector type: 26-pin header connector (pitch = 2.54mm)

Pin Number	Assignment	Pin Number	Assignment
1	TX1+	2	TX1-
3	Ground	4	Ground
5	TXC+	6	TXC-
7	Ground	8	PVDD
9	N/C	10	N/C
11	TX2+	12	TX2-
13	Ground	14	Ground
15	TX0+	16	TX0-
17	N/C	18	HPDET
19	DDCDATA	20	DDCCLK
21	GND	22	N/C
23	N/C	24	N/C
25	N/C	26	N/C



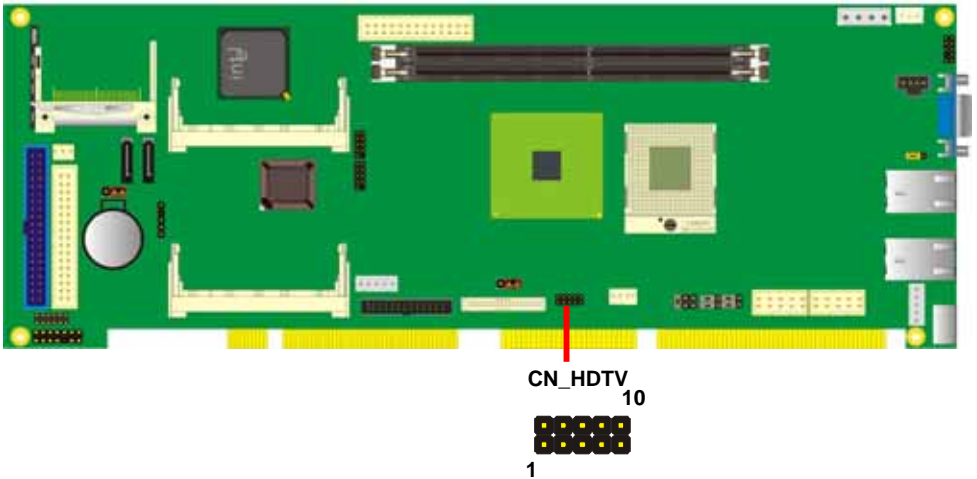
2.9.4<TV-out Interface>

The board provides an HDTV interface with Intel 945GM, supports PAL and NTSC of TV system, and display (clone or extended desktop) function with CRT,LVDS,DVI.

Connector: **CN_HDTV**

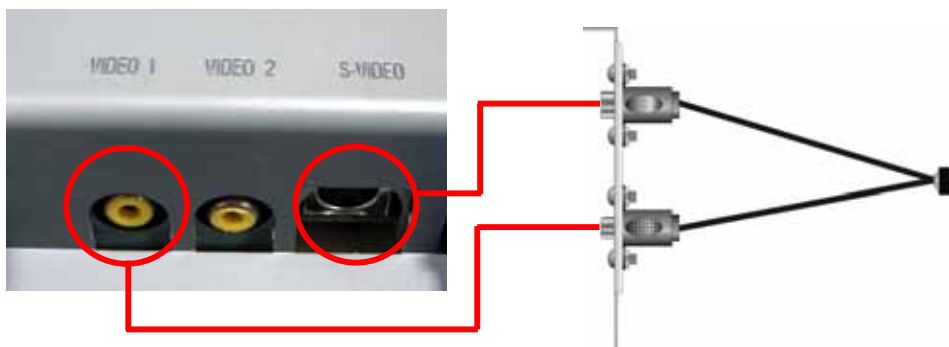
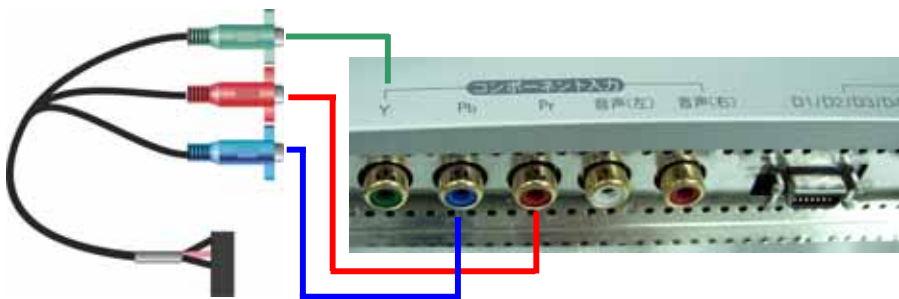
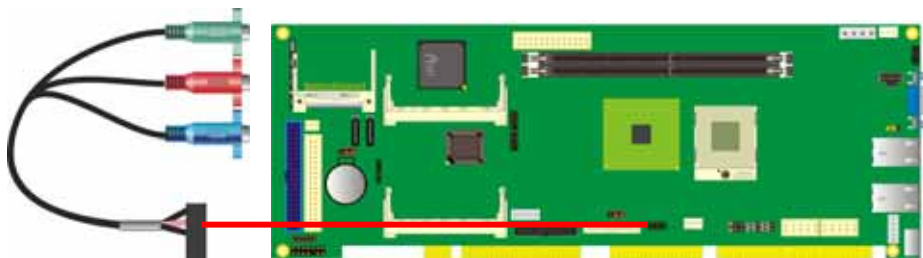
Connector type: 9-pin header HDTV connector (pitch = 2.54mm)

Pin Number	Assignment	Pin Number	Assignment
1	GND	2	DACB1
3	DACB2	4	GND
5	GND	6	N/C
7	DACB3	8	GND
9	N/C	10	N/C



To connect the TV set, please follow the diagram below to setup your system:

e YPrPb Component Cable
(For HDTV)



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



The panel type mapping is list below:

BIOS panel type selection form			
18 bits Single channel		24 bits Dual channel	
NO.	Output format	NO.	Output format
1	640 x 480	9	1024 x 768
2	800 x 600	10	1280 x 768
3	1024 x 768	11	1280 x 1024
24 bits Single channel		12	1366 x 768
4	1280 x 768	13	1400 x 1050 @ 108Mhz
5	1280 x 1024	15	1600 x 1200
6	1366 x 768		
7	1280 x 800		
8	1600 x 1200		
14	1024 x 768		

2.10 <Onboard Audio Interface>

The board provides the onboard AC97 5.1-channel audio interface with Realtek ALC655

Connector: CN_AUDIO

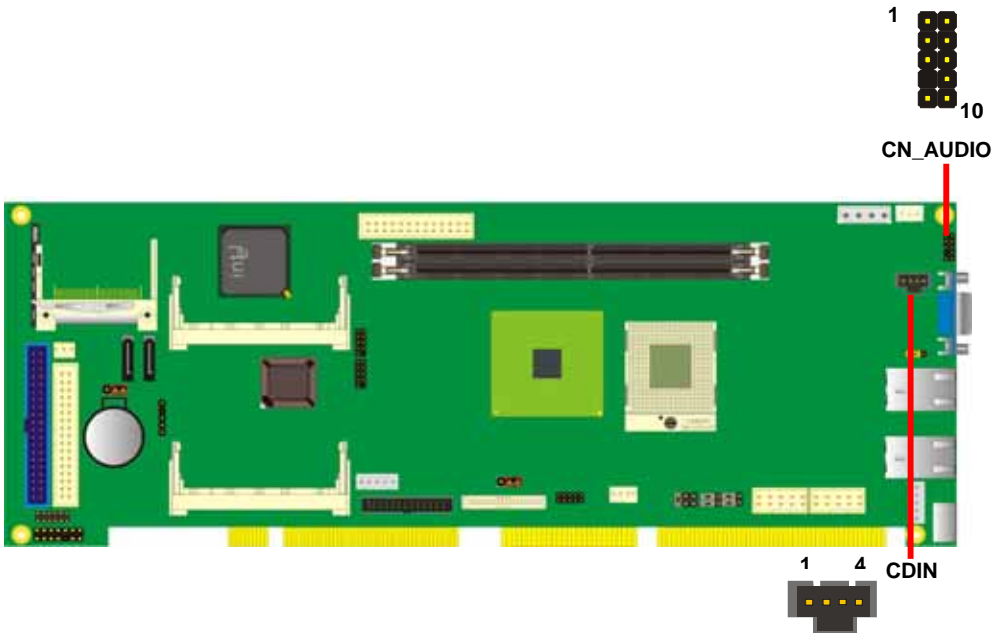
Type: 10-pin (2 x 5) 1.27mm x 2.54mm-pitch header

Pin	Description	Pin	Description
1	LIN_L	2	Ground
3	LIN_R	4	MIC 1
5	MIC 2	6	Ground
7	N/C	8	FRONTL
9	FRONTR	10	Ground

Connector: CDIN

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

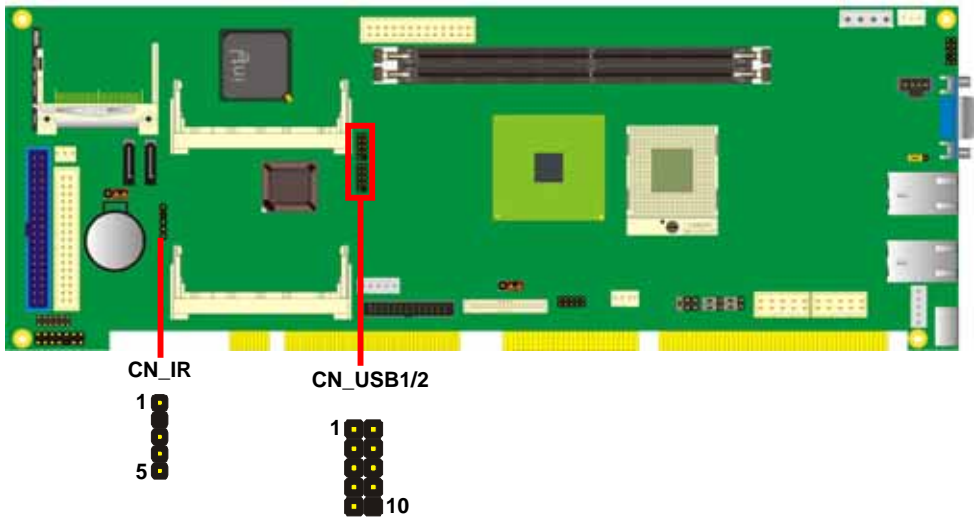
Pin	Description
1	CD – Left
2	Ground
3	Ground
4	CD – Right



2.11 <USB2.0 Interface>

Based on Intel ICH7-M , the board provides 4 USB2.0 ports. The USB2.0 interface provides up to 480Mbps of transferring rate.

Interface	USB2.0
Controller	ICH7-M
Transfer Rate	Up to 480Mb/s
Output Intensity	500mA



Connector: **CN_IR**

Type: 5-pin header for SIR Port

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

Connector: **CN_USB1/2**

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

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

PS: The USB2.0 will be only active when you connecting with the USB2.0 devices, if you insert an USB1.1 device, the port will be changed to USB1.1 protocol automatically. The transferring rate of USB2.0 as 480Mbps is depending on device capacity, exact transferring rate may not be up to 480Mbps.

2.12 <Serial Port Jumper Setting >

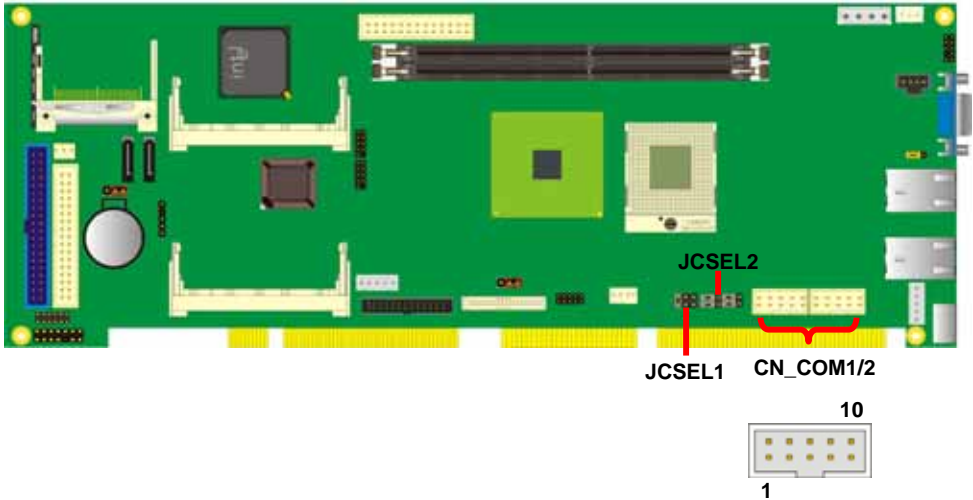
The board supports one RS232 serial port and one jumper selectable RS232/422/485 serial ports. The jumper JCSEL1 & JCSEL2 can let you configure the communicating modes for COM2.

Connector: **CN_COM1/2**

Type: 10-pin (5 x 2) 2.54mm x 2.54mm-pitch header for COM2

Pin	Description	Pin	Description
1	DCD/422RX-/485-	2	RXD/422RX+/485+
3	TXD/422TX+	4	DTR/422TX-
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N/C

	JCSEL1	JCSEL2
RS-232		
RS-485		
RS-422		



2.13 <Power and Fan Installation>

The board comes with a 4-pin AT power connector for powering the board, three fan connectors for Northbridge, CPU and system. The board also provides a 3-pin ATX function connector. You can just connect the two power connectors without any backplane to work.

2.13.1 <Power connectors>

Connector: **DC_IN**

Type: 4-pin P-type connector for +5V/+12V input

Pin	Description	Pin	Description	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

2.13.2 <Fan Connectors>

Connector: **CPUFAN**

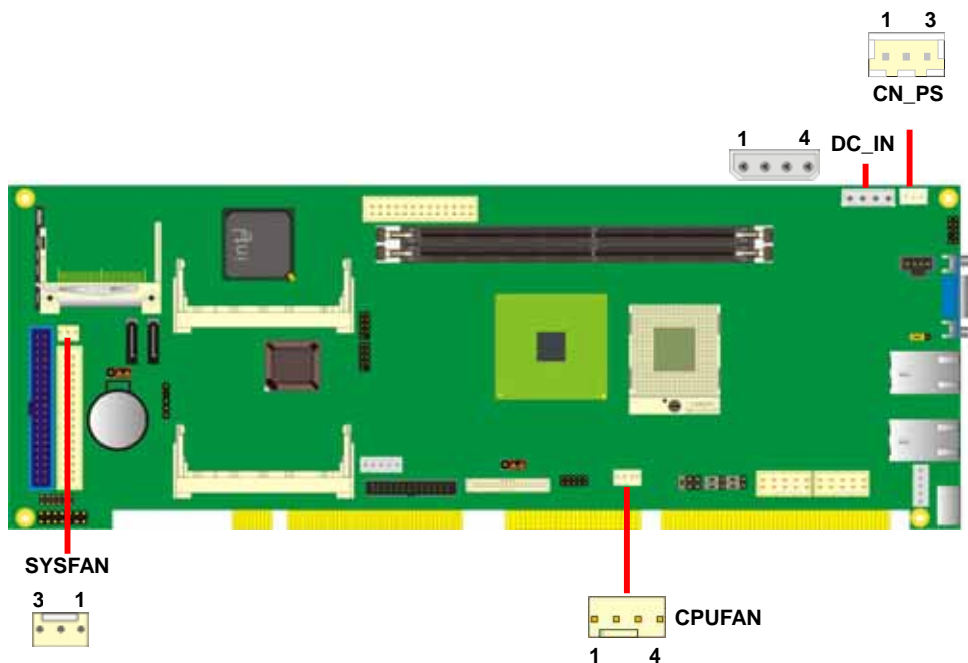
Type: 4-pin fan wafer connector

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	Fan Speed Detection



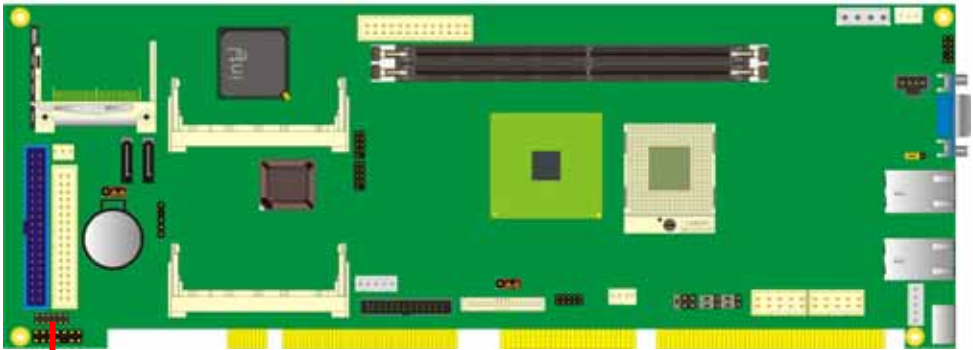
2.14 <GPIO Interface>

The board provides a 12-pin General Purpose I/O interface, with programmable 8-bit I/O (4-bit input & 4-bit output).

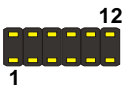
Connector: **CN_DIO**

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



CN_DIO



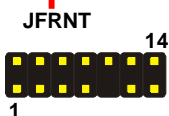
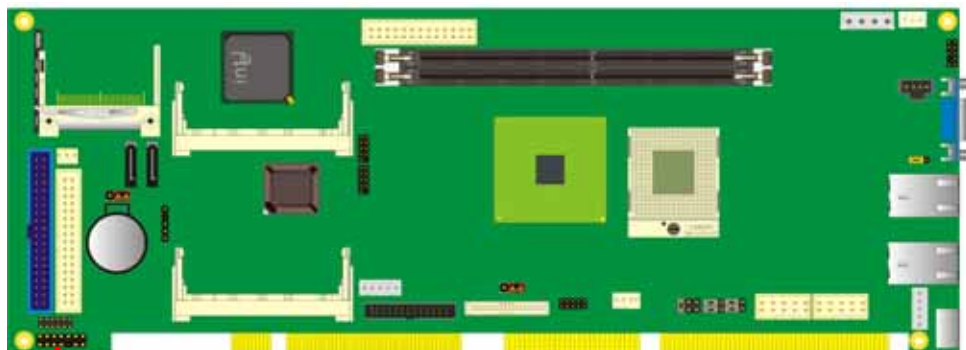
2.15 <Switch and Indicator>

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	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	
	GND	13	14	SPKIN	



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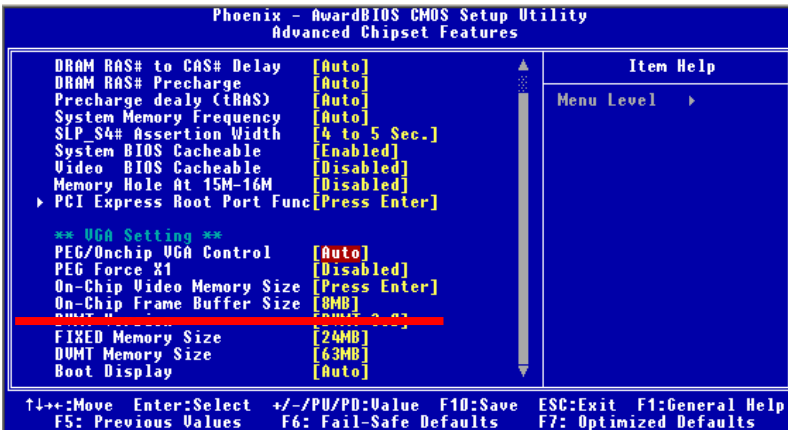
Chapter 3 <System Configuration>

3.1 <Video Memory Setup>

Based on Intel® 945GM chipset with GMA (Graphic Media Accelerator) 950, the board supports Intel® DVMT (Dynamic Video Memory Technology) 3.0, which would allow the video memory to be allocated up to 224MB.

To support DVMT, you need to install the Intel GMA 950 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>

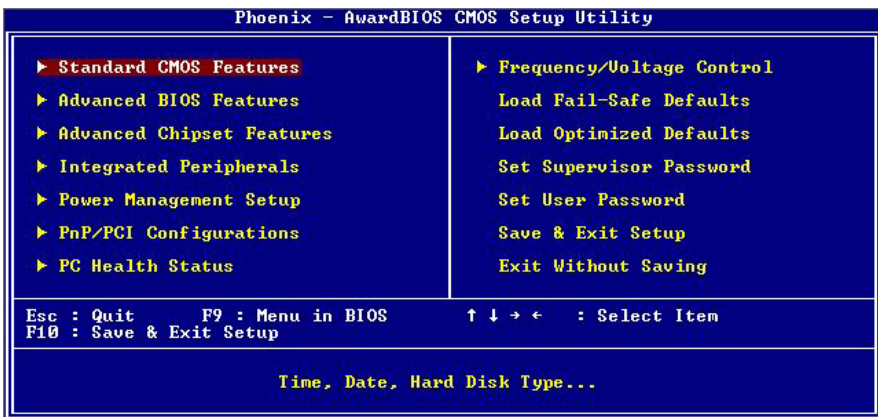
The motherboard uses the Award BIOS for the system configuration. The Award BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides 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 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: IDEType: 40-pin (20 x 2) box header

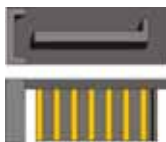


Pin	Description	Pin	Description
1	Reset	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	N/C
21	REQ	22	Ground
23	IOW-/STOP	24	Ground
25	IOR-/HDMARDY	26	Ground
27	IORDY/DDMARDY	28	GND
29	DACK-	30	Ground
31	IRQ	32	N/C
33	A1	34	CBLID
35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

A.2 <Serial ATA Port>

Connector: SATA1/2

Type: 7-pin wafer connector

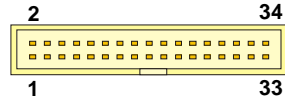


1	2	3	4	5	7	6	7
GND	RSATA_TXP1	RSATA_TXN1	GND	RSATA_RXN1	RSATA_RXP1	GND	

A.3 < Floppy Port >

Connector: **FDD**

Type: 34-pin (2 x 17) header



Pin	Description	Pin	Description
1	Ground	2	DRIVE DENSITY SELECT 0
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	INDEX-
9	Ground	10	MOTOR ENABLE A-
11	Ground	12	N/C
13	Ground	14	DRIVER SELECT A-
15	Ground	16	N/C
17	Ground	18	DIRECTION-
19	Ground	20	STEP-
21	Ground	22	WRITE DATA-
23	Ground	24	WRITE GATE-
25	Ground	26	TRACK 0-
27	Ground	28	WRITE PROTECT-
29	Ground	30	READ DATA-
31	Ground	32	HEAD SELECT-
33	Ground	34	DISK CHANGE-

A.4 <IrDA Port>

Connector: **CN_IR**

Type: 5-pin header for SIR Ports

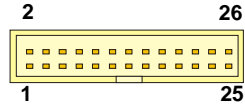


Pin	Description
1	VCC
2	N/C
3	IRRX
4	Ground
5	IRTX

A.5 < Parallel Port >

Connector: CN_LPT

Type: 26-pin (2 x 13) 2.54-pitch box header



Pin	Description	Pin	Description
1	STROBE-	14	AUTO FEED-
2	D0	15	ERROR-
3	D1	16	INITIALIZE-
4	D2	17	SELECT INPUT-
5	D3	18	Ground
6	D4	19	Ground
7	D5	20	Ground
8	D6	21	Ground
9	D7	22	Ground
10	ACKNOWLEDGE-	23	Ground
11	BUSY	24	Ground
12	PAPER EMPTY	25	Ground
13	SELECT+	26	N/C

A.6 < Serial Port >

Connector: CN_COM1/2

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

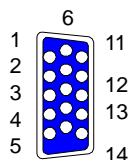


Pin	Description	Pin	Description
1	DCD	2	SIN
3	SO	4	DTR
5	Ground	6	DSR
7	RTS	8	CTS
9	RI	10	N/C

A.7 <VGA Port>

Connector: **VGA (VDL only)**

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	5VCCA
3	BLUE	8	Ground	13	HSYNC
4	N/C	9	LVGA5V	14	VSYNC
5	Ground	10	Ground	15	5VCLK

A.8 <LAN Port>

Connector: **RJ45_1/2**

Type: RJ45 connector with LED on rear panel

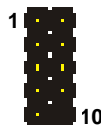


Pin	1	2	3	4	5	6	7	8
Description	TX+	TX-	RX+	N/C	N/C	RX-	N/C	N/C

A.9 <USB Port >

Connector: **CN_USB**

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

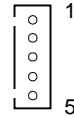


Pin	Description	Pin	Description
1	VCC	2	VCC
3	Data0-	4	Data1-
5	Data0+	6	Data1+
7	Ground	8	Ground
9	Ground	10	N/C

A.10 <AT Keyboard Port>

Connector: CN_ATKB

Type: 5-pin box header

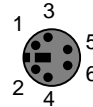


Pin	1	2	3	4	5
Description	VCC	Ground	N/C	DATA	CLK

A.11 <PS/2 Keyboard & Mouse Port>

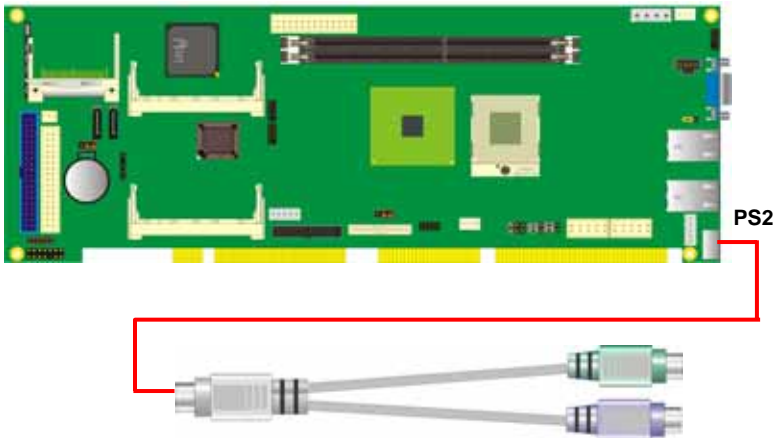
Connector: PS2

Type: 6-pin Mini-DIN connector on bracket



Pin	1	2	3	4	5	6
Description	KBD	MSD	Ground	VCC	KBC	MSC

Note: The PS/2 connector supports standard PS/2 keyboard directly or both PS/2 keyboard and mouse through the PS/2 Y-type cable.



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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>

File name of the tool is "awdf flash.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.

Appendix C <System Resources>

C1.<I/O Port Address Map>

[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
[000001F0 - 000001F7]	Primary IDE Channel
[00000200 - 00000200]	Standard Game Port
[00000201 - 00000207]	Standard Game Port
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[000002F8 - 000002FF]	Communications Port (COM2)
[00000378 - 0000037F]	Printer Port (LPT1)
[00000380 - 0000038B]	Mobile Intel(R) 945GM Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 945GM Express Chipset Family
[000003F0 - 000003F5]	Standard floppy disk controller
[000003F6 - 000003F6]	Primary IDE Channel
[000003F7 - 000003F7]	Standard floppy disk controller
[000003F8 - 000003FF]	Communications Port (COM1)
[00000400 - 000004BF]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[00000500 - 0000051F]	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000778 - 0000077B]	Printer Port (LPT1)

[00000800 - 0000087F]	Motherboard resources
[00000880 - 000008FF]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000B000 - 0000BFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[0000BF00 - 0000BF1F]	Intel(R) PRO/1000 PL Network Connection #2
[0000C000 - 0000CFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[0000CF00 - 0000CF1F]	Intel(R) PRO/1000 PL Network Connection
[0000E000 - 0000EFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000F200 - 0000F2FF]	Realtek AC'97 Audio
[0000F800 - 0000F80F]	Intel(R) 82801G (ICH7 Family) Ultra ATA Storage Controllers - 27DF
[0000FA00 - 0000FA3F]	Realtek AC'97 Audio
[0000FB00 - 0000FB1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000FC00 - 0000FC1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000FD00 - 0000FD1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000FE00 - 0000FE1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
[0000FF00 - 0000FF07]	Mobile Intel(R) 945GM Express Chipset Family

C2.<Memory Address Map>

[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 945GM Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	System board
[000F0000 - 000F7FFF]	System board
[000F8000 - 000FBFFF]	System board
[000FC000 - 000FFFFF]	System board
[00100000 - 3F6DFFFF]	System board
[00636500 - 00D1CFFF]	System board
[3F6E0000 - 3F6FFFFF]	System board
[3F700000 - FEBFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 945GM Express Chipset Family
[E0000000 - EFFFFFFF]	Motherboard resources
[FD600000 - FD6FFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[FD6E0000 - FD6FFFFF]	Intel(R) PRO/1000 PL Network Connection
[FD700000 - FD7FFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDA00000 - FDAFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDB00000 - FDBFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[FDC00000 - FDCFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
[FDCE0000 - FDCFFFFF]	Intel(R) PRO/1000 PL Network Connection #2
[FDD00000 - FDDFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
[FDE80000 - FDEFFFFF]	Mobile Intel(R) 945GM Express Chipset Family
[FDF00000 - FDF7FFFF]	Mobile Intel(R) 945GM Express Chipset Family
[FDF80000 - FDFBFFFF]	Mobile Intel(R) 945GM Express Chipset Family
[FDFFD000 - FDFFD0FF]	Realtek AC'97 Audio
[FDFFE000 - FDFFE1FF]	Realtek AC'97 Audio
[FDFFF000 - FDFFF3FF]	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
[FEC00000 - FEC00FFF]	System board
[FED13000 - FED1DFFF]	System board
[FED20000 - FED8FFFF]	System board
[FEE00000 - FEE00FFF]	System board
[FFB00000 - FFB7FFFF]	System board
[FFB80000 - FFBFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFF00000 - FFFFFFFF]	System board

C3.<System IRQ Resources>

- (ISA) 0 System 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 System CMOS/real time clock
- (ISA) 9 Microsoft ACPI-Compliant System
- (ISA) 13 Numeric data processor
- (ISA) 14 Primary IDE Channel
- (PCI) 5 Realtek AC'97 Audio
- (PCI) 10 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
- (PCI) 10 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
- (PCI) 10 Mobile Intel(R) 945GM Express Chipset Family
- (PCI) 11 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
- (PCI) 11 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
- (PCI) 11 Intel(R) PRO/1000 PL Network Connection
- (PCI) 15 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
- (PCI) 15 Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
- (PCI) 15 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
- (PCI) 15 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
- (PCI) 15 Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
- (PCI) 15 Intel(R) PRO/1000 PL Network Connection #2

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

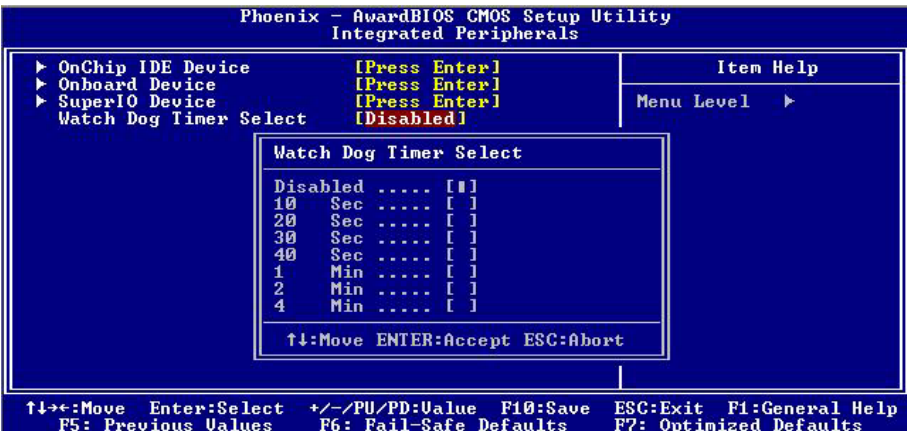
Watchdog timer setup as system reset with 5 second of timeout

```

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.



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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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