



integration with integrity

User's Manual

Single Board Computer 3301450

Version 1.0, March 2005

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Chapter 1

General Information

1.1 Features

The 3301450 is a member of GLOBAL American's P4-based SBC family. The features of this model are as follows:

- * Intel® Pentium® M/Celeron processor (478uFCPGA/479uFCBGA) with 400MHz FSB at maximum speed of up to 1.7GHz
- * 184-pin DIMM x 2 supports DDR200/266/333 SDRAM memory up to 2GB
- * Supports maximum 36-bit (18+18) dual pixel LVDS display
- * 10/100 Fast Ethernet LAN x 1~2
- * USB 2.0 port x 4

1.2 Specifications

System Architecture

- * Full-size SBC with PCI/ISA Golden Finger

CPU Support

- * Single 478uFCPGA
- * Supports Intel® Pentium® M: 1MB on die L2 cache with 400MHz FSB and speed up to 2.0GHz
- * Supports Intel® Dothan: 2MB on die L2 cache with 400MHz FSB and speed up to 2.0GHz
- * Supports Intel® Celeron® M: 512KB on die L2 cache with 400MHz FSB and speed up to 1.3GHz

Memory

- * 184-pin DDR DIMM x 2
- * Supports unbuffered non-ECC DDR 200/266 up to 1GB

BIOS

- * Award System BIOS
- * Advanced Power Management/Advanced Configuration & Power Interface support
- * 4M bits flash ROM
- * Plug & Play support

Chipsets

- * Intel® 852GM
- * Intel® 82801 DB x 1, I/O Controller Hub (ICH4)

LAN

- * Intel® 82551ER 10/100 Fast Ethernet x 1
- * Optional Intel® 82551ER 10/100 Fast Ethernet x 1 (for 3301450 only)
- * Compliant with PCI V2.1/2.2 IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3ab
- * RJ45 connector with LED x 1 (The other RJ45 is optional for LAN)
- * Support for drivers: Windows® XP/2000/2003, Linux
- * 2-pin header x 2 for extended LAN LED x 1(The other 2 x 2-pin header is optional for LAN)

Display

- * Intel® 852GM integrated dynamic video shared memory of 32MB (max) adjusted by OS.
- * Resolution: Up to 1600 x 1200 for CRT or Up to 1280 x 1024 for TFT
- * Internal LVDS: Support 18/24bit single pixels or 18-bit dual pixels LVDS panel (Resolution support up to 1280 x 1024)
- * Dual Display : Simultaneous Scan-CRT + LVDS LCD, Dual View-CRT+LVDS LCD
- * CCFL connector for LCD panel backlight: Provides +12V or +5V for backlight inverter
- * D-sub 15-pin VGA port x 1

I/O Interface

- * Serial port:10-pin box headerx2 (optional COM2 RS232/422/485 by switch for 3301450 only)
- * USB 2.0 port x 4 through 6-pin box header x 2
- * HDD: Ultra ATA 100/66/33 support, 40-pin connector x 2.
- * Optional CF socket x 1 (for 3301450 only)
- * Disk on Chip: DOC socket x 1
- * Disk on Module: 2-pin power connector for DOM
- * Parallel Port: 26-pin connector x 1
- * Floppy: 34-pin connector x 1
- * PS/2 keyboard/mouse: 6-pin MiniDIN connector x 1. 5-pin connector x 1 for external KB/Mouse
- * Optional AC97 audio interface: 4-pin header for Mic-in x 2 and Line-out x 2 for 3301450 only
- * Digital I/O port: 4 In and 4 Out with TTL level interface
- * Onboard buzzer x 1
- * IrDA Header x 1
- * Onboard 2-pin header for reset
- * 5 pins for key lock, 2 pins for power LED, 2 pins for HDD Power LED
- * 3-pin FAN JST connector x 1

I/O on Bracket

- * PS/2 Keyboard/Mouse Min DIN x 1
- * VGA 15-pin D-sub Connector x 1
- * 10/100 Fast Ethernet LAN with LED x1~2

System Monitor

- * System monitor controller is derived from IT8712
- * 6 voltage (for +3.3V, +5V, +12V, Vcore, +5V Standby, and +3.3V Standby)
- * 2 Fan speed (for CPU and system)
- * 2 temperature (one for CPU; the other for system)

Real Time Clock

- * On chip RTC with battery backup
- * External Li-on Battery x 1

Power Requirements

- * Supports AT and ATX power supply (Select by jumper)
- * +3.3V is converted from +5V and not directly from backplane or power supply
- * +5Vsb (standby power) is connected from backplane through both 3-pin and 4-pin connectors for wide-ranging backplane support
- * Power consumption: measure with Intel® Dothan® 1.7GHz
 - * a. +12V: 0.15A
 - * b. +5V: 5.25A
 - * c. 3.3V:0A
 - * d. 5Vsb: 0.05A

Watchdog Timer

- * 1~128 seconds time-out intervals

Dimensions

- * 338.58 (L) x 122mm(W) [13.3 (L) x 3.8 inches (W)]

Environments

- * Operating temperatures: 0 to 60 degrees C
- * Storage temperatures: -20 to 80 degrees C
- * Relative humidity: 10 to 90% (non-condensing)

Certification

- * CE
- * FCC

Ordering Information

3301450:

Full-sized socket 478 Pentium® M CPU card with LAN (Intel®82551ER) x 2, CF socket, audio, dual LVDS support, and RS422/485 support

1.3 Board Layout

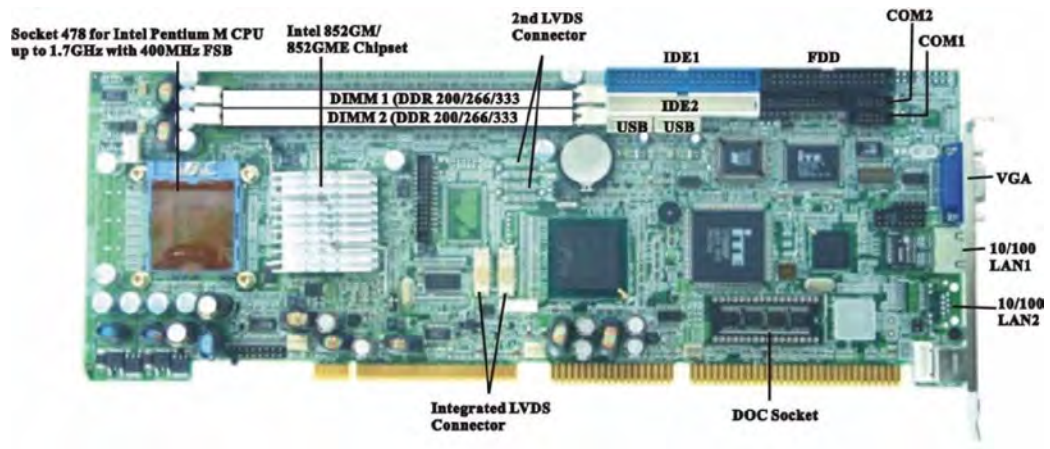


Figure 1-1: 3301450 Front Layout

1.4 Checklist

After opening the package of the 3301450, please check and make sure you have all of the following items:

- † One 3301450 SBC
(A mechanical drawing of this model is shown below.)
- † One 3301450 quick reference guide
- † One 50CM Cable JST 2.5mm 3 pin to 3 pin (5V standby ATX Power-on Cable)
- † One Y Cable for Keyboard and Mouse
- † One Cable Set (FDD x1, SIO+PIO x1, SIO x1/Keyboard x1/IDE66 x1)
- † One USB Cable with Bracket
- † One Driver/Manual CD
- † One CPU Cooler

1.5 Mechanical Drawing

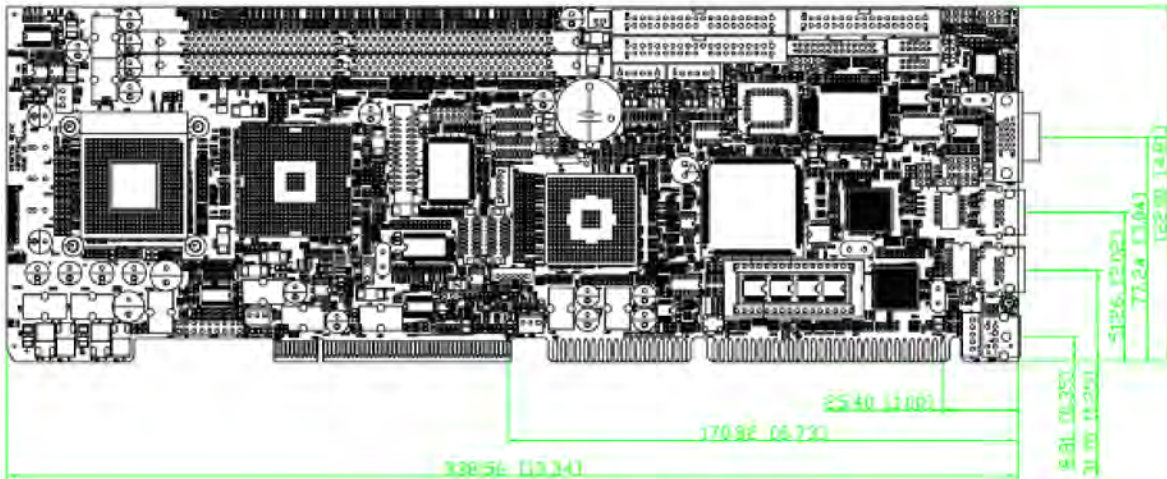


Figure 1-2: Mechanical Drawing of 3301450

1.6 CPU Cooler

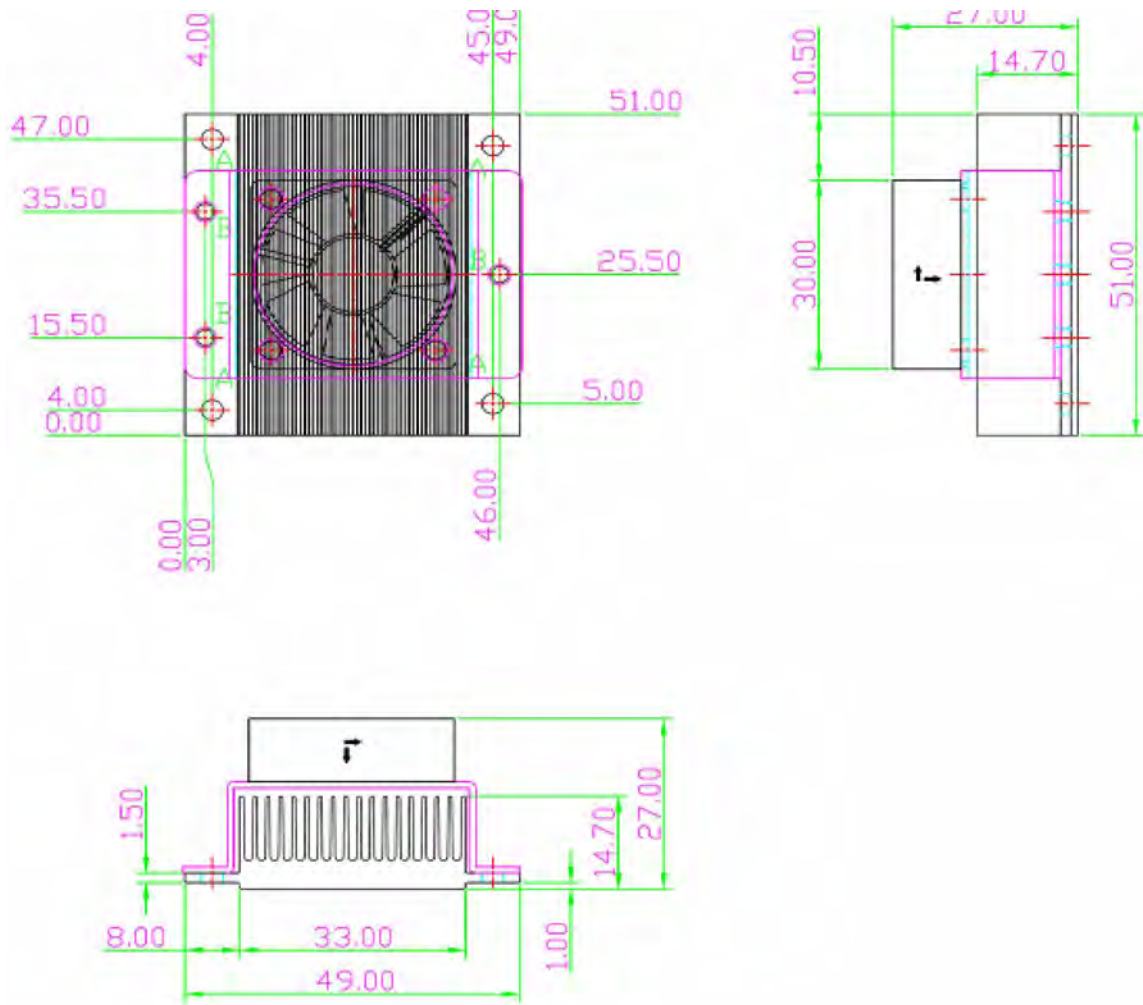


Figure 1-3: 3301450 CPU Cooler

1.7 Block Diagram

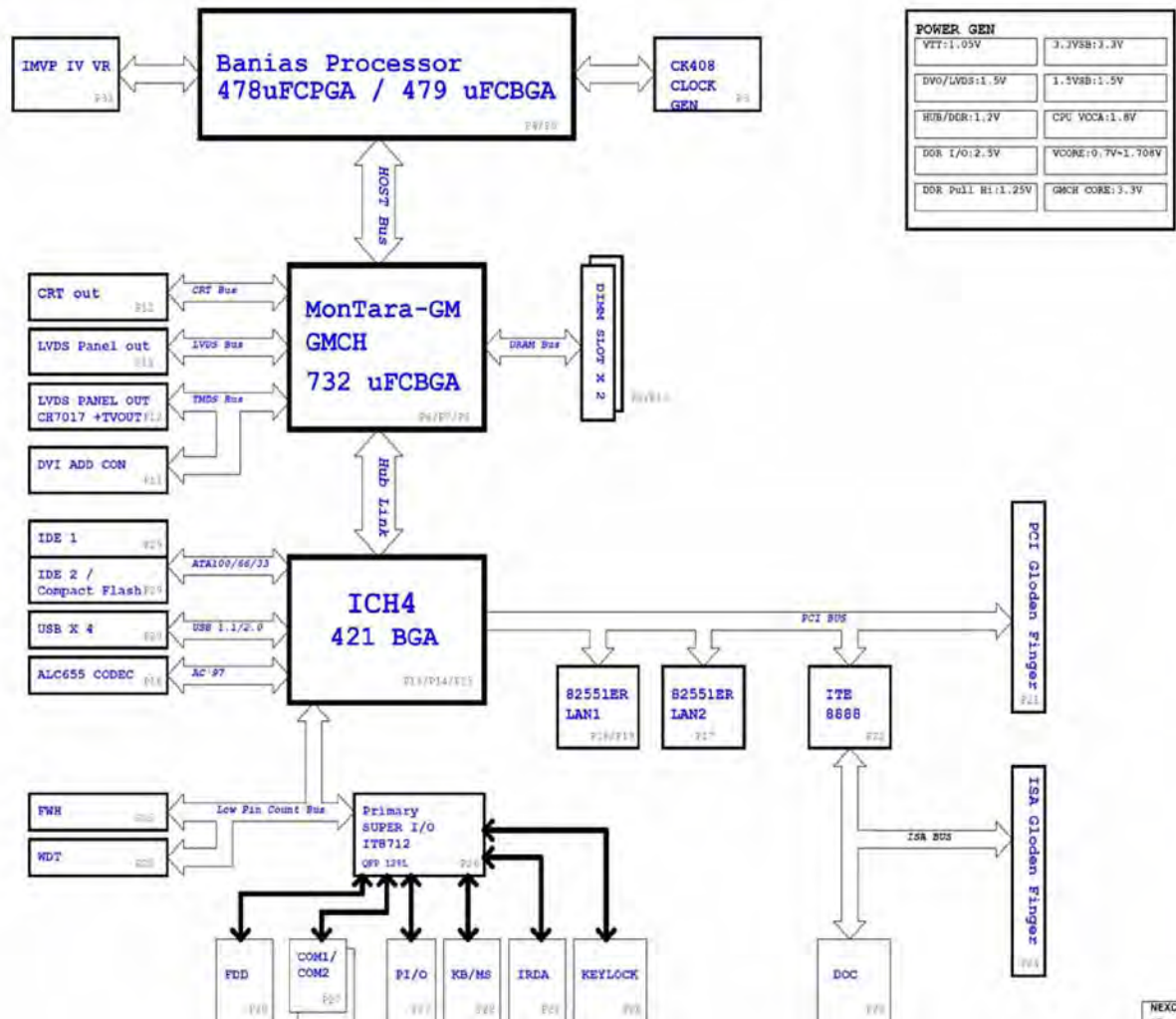


Figure 1-3: 3301450 Block Diagram

Chapter 2

Jumper & Switch Settings

This chapter of the User's Manual describes how to set jumpers.

Note: The procedures that follow are generic for all of the 3301450 models

Before You Begin

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components.

Most of the procedures that follow require only a few simple tools, including the following:

- ◁ A Phillips screwdriver
- ◁ A flat-tipped screwdriver
- ◁ A set of jewelers Screwdrivers
- ◁ A grounding strap
- ◁ An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself.

- ◁ Always disconnect the unit from the power outlet whenever you are working inside the case.
- ◁ If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- ◁ Hold electronic circuit boards (such as the 3301450 board) by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- ◁ Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- ◁ Use correct screws and do not over tighten screws.

2.1 Functions of Jumpers

You can use jumpers to set configuration options. The table below defines function of each jumper:

Connector	Function	Connector	Function
J1	Primary IDE	J24	CF Card
J2	Floppy	J25	Disk on Module External Power
J3	COM2	JP1	Line-In
J4	PIO	JP2	Mic-In 1
J5	Secondary IDE	JP3	Line-Out
J6	COM1	JP4	Key Lock
J7	USB 2/3	JP8	IR
J8	USB 0/1	JP11	GPIO
J9	ATX Connector	JP12	82551ER LAN1 ACT/Link LED
J10	TV-Out	JP15	82551ER LAN1 Speed 100 LED
J11	CH7017 LVDS Channel A	JP17	82551ER LAN2 Speed 100 LED
J12	CH7017 LVDS Channel B	JP18	82551ER LAN2 ACT/Link LED
J13	DVO Add-on Card	JP19	IDE LED/Power LED/Power On/Reset/Buzzer
J15	CH7017 LVDS Panel Backlight	JP21	Mic-In 2
J16	82855GME LVDS Channel A	CON1	VGA Connector
J17	82855GME LVDS Channel B	CON4	Keyboard + Mouse Connector
J18	82855GME LVDS Panel Backlight	CON5	82551ER LAN2 Connector
J19	CPU Fan	CON6	82551ER LAN1 Connector
J20	System Fan	U31	M-system Disk on Chip
J21	External Keyboard	RT1	System Thermal

Table 2-1: Functions of Jumpers

2.2 Setting Jumpers

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **SHORT**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **OPEN**. Please see the following illustrations:

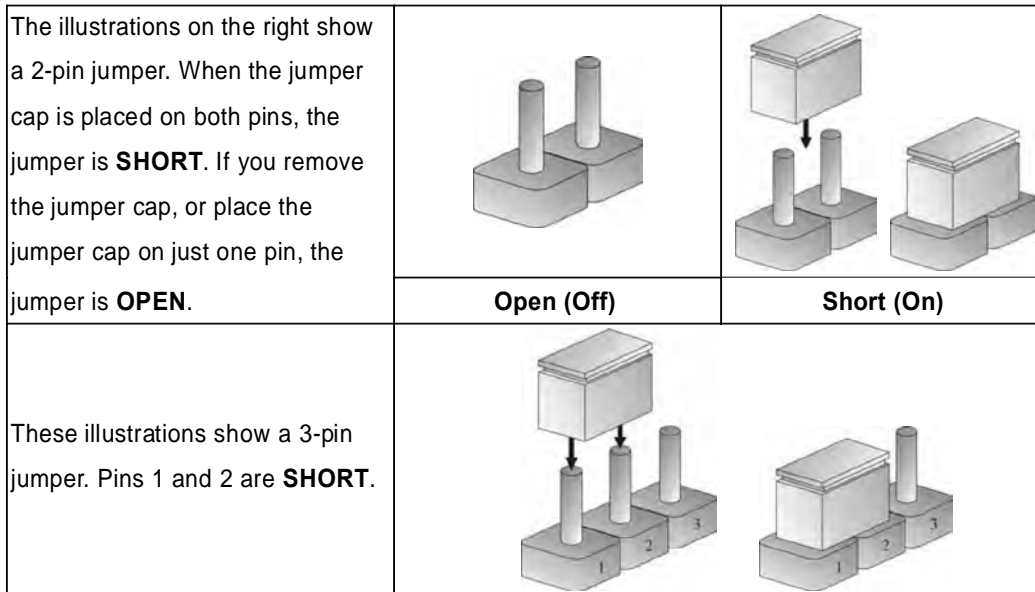


Figure 2-1 : How to Set Jumpers

2.3 Location of Jumpers

The illustration below shows the location of the mainboard jumpers:

□ = Pin 1
* = Pin 1

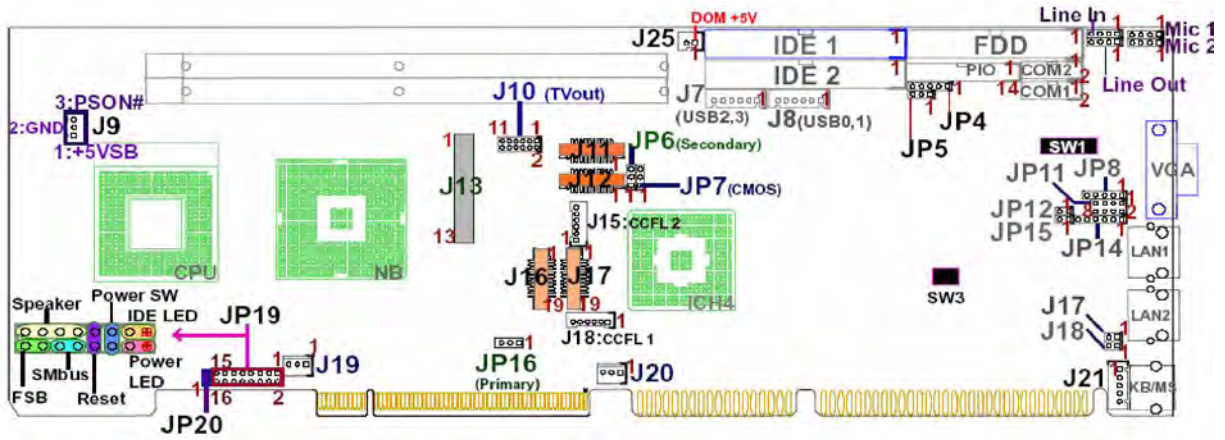


Figure 2-2 : Location of Jumpers

2.4 Jumper Setting

Switch Setting Table (* = default setup)

SW1: COM Port Type Select

SW1	1-20	2-19	3-18	4-17	5-16	6-15	7-14	8-13	9-12	10-11
*RS232	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
(Option)RS422	OFF	ON	ON	OFF	ON	OFF	ON	ON	ON	ON
(Option)RS485	ON	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	ON

SW3: M-System Disk on chip & LAN1/LAN2

SW3	1-8	2-7	3-6	4-5
D0000	ON	OFF	X	X
D8000	*OFF	*ON	X	X
LAN1 Enable	X	X	*ON	X
LAN2 Enable	X	X	X	*ON

Note: Disk on Chip

1. BIOS Default: OFF
2. SW3 Default: D8000-ON
3. Default has no BIOS memory for DOC.

If DOC is needed, please change jumper setting as above.

JP7: RTC Clear

	NORMAL	Clear CMOS
JP7	*1-2	2-3

JP6/JP16: Panel Power Select

	VCC5	VCC3
JP6 (CH7017)	1-2	*2-3
JP16 (855GME)	1-2	*2-3

JP19/JP20: CPU FSB Clock Select

	JP20(Pin:1,2)	JP19(Pin:14,16)
*400MHZ	ON	OFF
533MHZ	ON	ON

JP5: CF Card Master/Slave Select

	Slave	Master
JP5	*1-2	2-3

2.5 Connector Pin Definition

J1/J5 : Secondary IDE/ Primary IDE Connector

Pin	Definition	Pin	Definition
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	NC
21	DMA REQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IOCHRDYA	28	GND
29	DMA ACK#	30	GND
31	Interrupt	32	NC
33	DiskAddress1	34	DMA66 Detect
35	DiskAddress0	36	DiskAddress2
37	HDCCS1	38	HDCCS3
39	HDD Active LED	40	GND

J2 : Floppy Connector

Pin	Definition	Pin	Definition
1	GND	2	DENSEL#
3	GND	4	NC
5	GND	6	NC
7	GND	8	INDEX#
9	GND	10	MOTEA#
11	GND	12	DRVB#
13	GND	14	DRVA#
15	GND	16	MOTEB#
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TK00#
27	GND	28	WPT#
29	GND	30	RDATA#
31	GND	32	SIDE1#
33	GND	34	DSKCHG#

J6/J3 : COM1/ COM2(RS232 Mode) Connector

Pin	Definition	Pin	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	NC

J3 : COM2(RS422 Mode) Connector

Pin	Definition	Pin	Definition
1	TXD-	6	RTS-
2	TXD+	7	RTS+
3	RXD+	8	CTS+
4	RXD-	9	CTS-
5	GND	10	NC

J3 : COM2(RS485 Mode) Connector

Pin	Definition	Pin	Definition
1	TXD-/RXD-	6	NA
2	TXD+/RXD+	7	NA
3	NA	8	NA
4	NA	9	NA
5	GND	10	NC

J4 : PIO Connector

Pin	Definition	Pin	Definition
1	Line Print Strobe	14	Auto feed
2	Parallel Data0	15	Error
3	Parallel Data 1	16	Initialize
4	Parallel Data 2	17	Select input
5	Parallel Data 3	18	GND
6	Parallel Data 4	19	GND
7	Parallel Data 5	20	GND
8	Parallel Data 6	21	GND
9	Parallel Data 7	22	GND
10	Acknowledge	23	GND
11	BUSY	24	GND
12	Paper empty	25	GND
13	Select	26	GND

J7 : USB 2/3 Connector

Pin	Definition	Pin	Definition
1	+5VSB	2	DATA2-
3	DATA2+	4	DATA3-
5	DATA3+	6	GND

J8 : USB 0/1 Connector

Pin	Definition	Pin	Definition
1	+5VSB	2	DATA0-
3	DATA0+	4	DATA1-
5	DATA1+	6	GND

J9 : ATX POWER-ON Connector

Pin	Definition	Pin	Definition
1	+5VSB	2	GND
3	PSON#		

J10 : TV-OUT Connector

Pin	Definition	Pin	Definition
1	TV Video	2	TV GND
3	S Video C	4	TV GND
5	S Video V	6	TV GND
7	Component Y	8	TV GND
9	Component Pr	10	TV GND
11	Component Pb		

J11 : CH7017 LVDS Channel A Connector

Pin	Definition	Pin	Definition
1	DDCPCLK	2	DDCPDATA
3	VDD	4	RX0+
5	RX3+	6	RX0-
7	RX3-	8	VDD
9	GND	10	RX1+
11	RXCLK+	12	RX1-
13	RXCLK-	14	GND
15	GND	16	BACKLIGHT
17	RX2+	18	BACKLIGHT
19	RX2-	20	GND

J12 : CH7017 LVDS Channel B Connector

Pin	Definition	Pin	Definition
1	DDCPCLK	2	DDCPDATA
3	VDD	4	RX4+
5	RX7+	6	RX4-
7	RX7-	8	VDD
9	GND	10	RX5+
11	RXCLK+	12	RX5-
13	RXCLK-	14	GND
15	GND	16	BACKLIGHT
17	RX6+	18	BACKLIGHT
19	RX6-	20	GND

J13 : DVO ADD Card Connector

Pin	Definition	Pin	Definition
1	DVOCD 0	14	DVOCCLK#
2	DVOCD 1	15	DVOCCLK
3	DVOCD 2	16	DVOCBLANK#
4	DVOCD 3	17	DVOCVSYNC
5	DVOCD 4	18	DVOCHSYNC
6	DVOCD 5	19	DVOCFLDSTL
7	DVOCD 6	20	I2C CLOCK
8	DVOCD 7	21	I2C DATA
9	DVOCD 8	22	RESET
10	DVOCD 9	23	DVOBCINTRB
11	DVOCD 10	24	DVOBCCLKINT
12	DVOCD 11	25	+5V
13	GND	26	GND

J15 : CH7017 LVDS Panel Back Light Connector

Pin	Definition	Pin	Definition
1	Panel_B BackLight	2	Panel _B VDD
3	GND	4	GND
5	Panel_B BackLight Light adjust	6	LVDS_BKLTCTL

J16 : 82855GME LVDS Channel A Connector

Pin	Definition	Pin	Definition
1	DDCPCLK	2	DDCPDATA
3	VDD	4	RX0+
5	RX3+	6	RX0-
7	RX3-	8	VDD
9	GND	10	RX1+
11	RXCLK+	12	RX1-
13	RXCLK-	14	GND
15	GND	16	BACKLIGHT
17	RX2+	18	BACKLIGHT
19	RX2-	20	GND

J17 : 82855GME LVDS Channel B Connector

Pin	Definition	Pin	Definition
1	DDCPCLK	2	DDCPDATA
3	VDD	4	RX4+
5	RX7+	6	RX4-
7	RX7-	8	VDD
9	GND	10	RX5+
11	RXCLK+	12	RX5-
13	RXCLK-	14	GND
15	GND	16	BACKLIGHT
17	RX6+	18	BACKLIGHT
19	RX6-	20	GND

J18 : 82855GME LVDS Panel Back Light Connector

Pin	Definition	Pin	Definition
1	Panel_A BackLight	2	Panel _A VDD
3	GND	4	GND
5	Panel_A BackLight Light adjust	6	LVDS_BKLTCTL

J19/J20 : CPU FAN & SYSTEM FAN Connector

Pin	Definition	Pin	Definition
1	GND	2	+12V
3	SENSE		

J21 : External Keyboard Connector

Pin	Definition	Pin	Definition
1	KBCLK	2	KBDATA
3	NC	4	GND
5	+5V		

J24 : CF Card Connector

Pin	Definition	Pin	Definition
1	GND	2	DATA3
3	DATA4	4	DATA5
5	DATA6	6	DATA7
7	HDC CD100	8	GND
9	GND	10	GND
11	GND	12	GND
13	+5V	14	GND
15	GND	16	GND
17	GND	18	Disk Address 2
19	Disk Address 1	20	Disk Address 0
21	DATA0	22	DATA1
23	DATA2	24	NC
25	GND	26	GND
27	DATA11	28	DATA12
29	DATA13	30	DATA14
31	DATA15	32	HDC CS300
33	N/C	34	IOR
35	IOW	36	+5V
37	Interrupt 15	38	+5V
39	CF_CSEL#	40	NC
41	RESET#	42	IOCHRDY
43	DMA REQ	44	DMA ACK#
45	HDD Active Led	46	DMA66 DEC
47	DATA8	48	DATA9
49	DATA10	50	GND

J25 : Disk On Module External Power

Pin	Definition	Pin	Definition
1	+5V	2	GND

JP1 : LINE-IN Connector

Pin	Definition	Pin	Definition
1	LINEIN_L	2	Analog GND
3	JD2	4	LINEIN_R

JP2/JP21 : MIC-IN1/MIC-IN2 Connector

Pin	Definition	Pin	Definition
1	MICIN1	2	Analog GND
3	JD0	4	MICIN2

JP3 : LINE-OUT Connector

Pin	Definition	Pin	Definition
1	LINEOUT_L	2	Analog GND
3	JD1	4	LINEOUT_R

JP4 : Keylock

Pin	Definition	Pin	Definition
1	+5V	2	NC
3	GND	4	KEYLOCK
5	GND		

JP8 : IR

Pin	Definition	Pin	Definition
1	+5V	2	CIRRX
3	IRRX	4	GND
5	IRTX		

JP11 : GPIO

Pin	Definition	Pin	Definition
1	GP27_D_IN1 (PIN20)	2	GP23_D_OUT 1 (PIN24)
3	GP26_D_IN2 (PIN21)	4	GP22_D_OUT 2 (PIN25)
5	GP25_D_IN3 (PIN22)	6	GP21_D_OUT 3 (PIN26)
7	GP24_D_IN4 (PIN23)	8	GP20_D_OUT 4 (PIN27)

JP12 : 82551ER LAN1 ACT/LINK LED

Pin	Definition	Pin	Definition
1	LINK	2	ACTIVITY

JP15 : 82551ER LAN1 SPEED 100 LED

Pin	Definition	Pin	Definition
1	+5VSB	2	SPEED100

JP17 : 82551ER LAN2 SPEED100 LED

Pin	Definition	Pin	Definition
1	+5VSB	2	SPEED100

JP18 : 82551ER LAN2 ACT/LINK LED

Pin	Definition	Pin	Definition
1	ACTIVITY	2	LINK

JP19 : IDE LED/POWER LED/POWER ON/RESET/BUZZER Connector

Pin	Definition	Pin	Definition
1	+5V	2	+5V
3	IDE_LED	4	GND
5	POWER ON	6	GND
7	RESET	8	GND
9	SPEAKER	10	SMB_DATA
11	GND	12	SMB_CLK
13	GND		
15	+5V		

FUNCTION	PIN Definition
IDE LED	JP19(1,3)
POWER LED	JP19(2,4)
POWER BUTTON	JP19(5,6)
RESET	JP19(7,8)
SM BUS	JP19(10,12)
SPEAKER	JP19(9,15)

CON1 : VGA Connector

Pin	Definition	Pin	Definition
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	+5V	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

CON4: Keyboard + Mouse Connector

Pin	Definition	Pin	Definition
1	Keyboard DATA	2	Mouse DATA
3	GND	4	+5V
5	Keyboard CLK	6	Mouse CLK

CON5/CON6:82551ER LAN1/LAN2 RJ45 Connector

Pin	Definition	Pin	Definition
1	TXP	2	TXN
3	RXP	4	TERMPLANE
5	TERMPLANE	6	RXN
7	TERMPLANE	8	TERMPLANE
9	SPEED100	10	+5VSB
11	LINK	12	ACTIVITY

Switch Pin Definition

SW1: COM Port Type Select

Pin	Definition	Pin	Definition
1	RXD2	20	485RXD1
2	RTS2#	19	485CONTROL-B
3	422CTS-ON#	18	GND
4	422RTS-OFF#	17	GND
5	COM1_EN	16	GND
6	RS485-OFF#	15	GND
7	RS422ON1-1	14	RS422ON2-1
8	RS422ON2-1	13	RS422ON2-1
9	RS422ON3-1	12	RS422ON2-1
10	RS422ON4-1	11	RS422ON2-1

SW3: M-System Disk on chip & LAN1/LAN2

Pin	Definition	Pin	Definition
1	D0000_EN	8	MSYS_SEL#
2	D8000_EN	7	MSYS_SEL#
3	GND	6	PCIRESET#
4	GND	5	PCIRESET#

JP7: RTC Clear

Pin	Definition	Pin	Definition
1	+3.3V	3	GND
2	RTCRST#		

JP6/JP16: Panel Power Select

Pin	Definition	Pin	Definition
1	+5V	3	+3.3V
2	PANEL_BACKLIGHT		

JP19/JP20: CPU FSB Clock Select**JP19**

Pin	Definition	Pin	Definition
14	CLKSEL0	16	CLKSEL0_L

JP20

Pin	Definition	Pin	Definition
1	CLKSEL1	2	CLKSEL1_L

JP5: CF Card Master/Slave Select

Pin	Definition	Pin	Definition
1	+3.3V	3	GND
2	TYPESEL		

Chapter 3

Expanded Capabilities

3.1 System Memory

Your system memory is provided by DIMM's (Dual In-line Memory Modules) on the CPU board. The CPU board contains two memory banks: Bank 0 and 1, corresponds to connector DIMM1, DIMM2.

The table below shows possible DIMM configurations for the memory banks. Please be noted that the 3301450 supports Double Data (DDR333) SDRAM. Configurations using different brands of memory modules are not recommended.

DIMM 1	DIMM2	Total Memory
128MB	Empty	128MB
Empty	128MB	128MB
128MB	128MB	256MB
256MB	Empty	256MB
Empty	256MB	256MB
256MB	256MB	512MB
512MB	Empty	512MB
Empty	512MB	512MB
512MB	512MB	1024MB
1024MB	Empty	1024MB
Empty	1024MB	1024MB
1024MB	1024MB	2048MB

Table 3-1 : 3301450DIMM Configurations

3.2 Installing DIMM

To install DIMM:

1. Make sure the two handles of the DIMM sockets are in the “open” position, i.e. the handles stay outward.

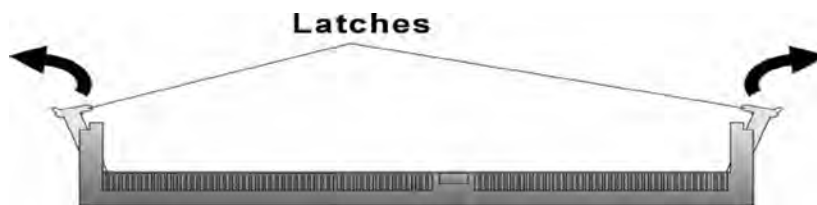


Figure 3-1 : How to Install DIMM (1)

2. Slowly slide the DIMM modules along the plastic guides in the both ends of the socket.

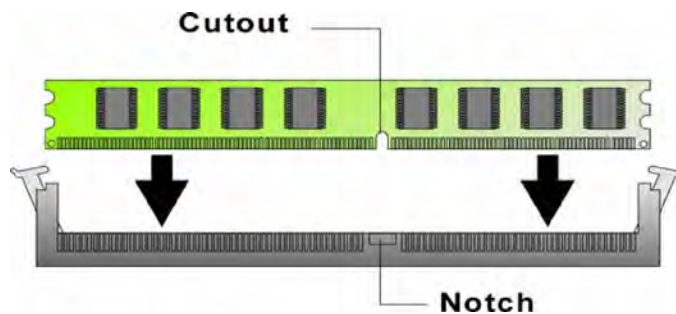


Figure 3-2 : How to Install DIMM (2)

3. Then press the DIMM module down right into the socket, until a click is heard. That means the two handles automatically locked the memory modules into the right position of the DIMM socket.

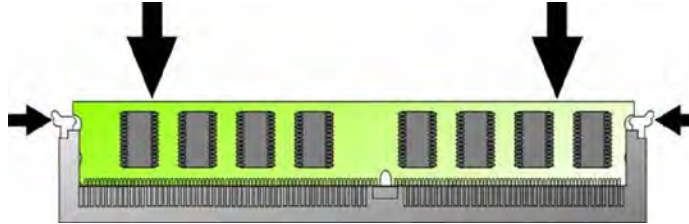


Figure 3-3 : How to Install DIMM (3)

4. To take away the memory module, just push the both handles outward, the memory module will be ejected by the mechanism in the socket.

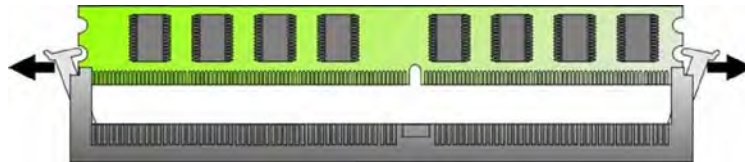


Figure 3-4 : How to Install DIMM (4)

3.3 Changing CPU

To change the CPU:

1. Remove the screw on the socket as shown in the picture.
2. Place the new CPU on the middle of the socket, orienting its beveled corner to line up with the socket's beveled corner. Make sure the pins of the CPU fit evenly to the socket openings. Screw it back to fasten the CPU to the socket.

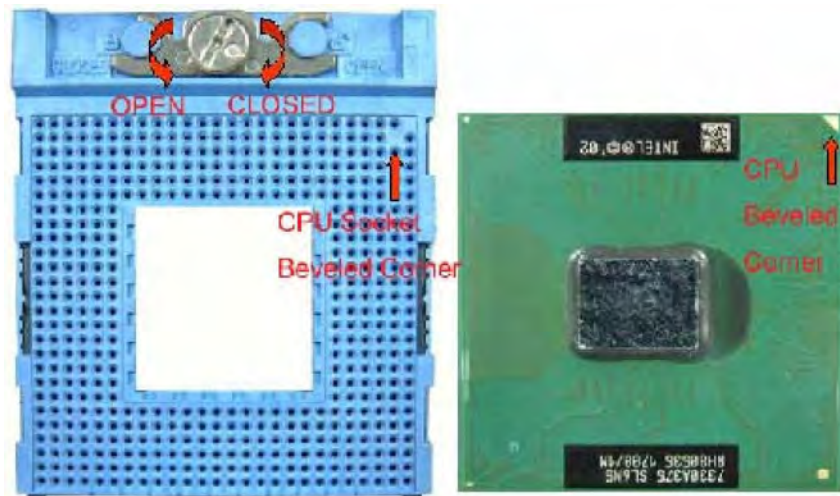
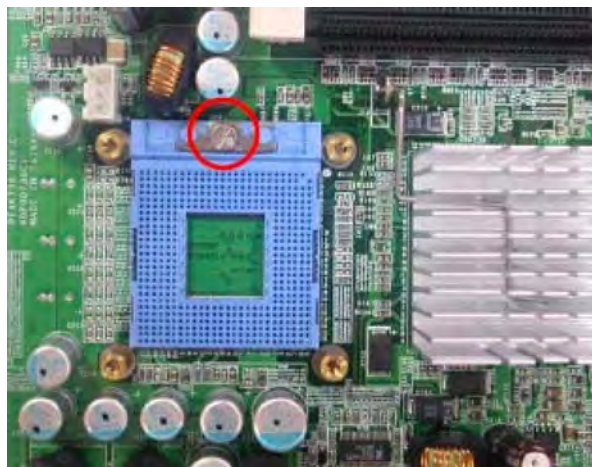


Figure 3-5 : How to Change CPU

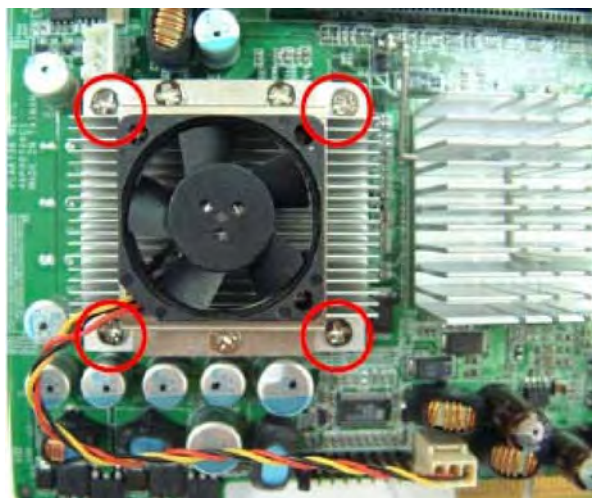
3.4 Installing Fan Heatsink (CPU)



Step 1: Make sure the two screws of the heatsink are placed at the top.



Step 2: Make sure the position of the board is right (the upper socket with the screw is placed at the top).



Step 3: After installing the CPU, place the heatsink on top of it and tighten the four screws as circled.

Appendix

Appendix A : Watchdog Timer Setting

A.1 Watchdog Timer Working Procedure

Watchdog Timer (WDT) is a special hardware device that monitors the computer system during normal operation. WDT has a clock circuit that times down from a set number to zero. If a monitored item occurs before the timer reaches zero, WDT resets and counts down again. If for some reason the monitored item doesn't occur before the timer reaches zero, WDT performs an action, such as a diagnostic operation (rebooting the computer).

You must enter timer values into WDT Configuration Register (Write the control value to the Configuration Port), and clear WDT counter (read the Configuration Port).

WDT Configuration port	F2	Default at F2
Watch Dog Timer	Disabled	1. Default at disabled
	Enabled	2. Enabled for user's programming
WDT Active Time	1 sec 2 sec 4 sec 8 sec 16 sec 32 sec 64 sec 128 sec	Default at 128 sec

Table A-1 : Watchdog Timer Character and Function

A.2 Watchdog Timer Control Register

The Watchdog Timer Control Register controls the WDT working mode. Write the value to the WDT Configuration Port. The following table describes the Control Register bit definition:

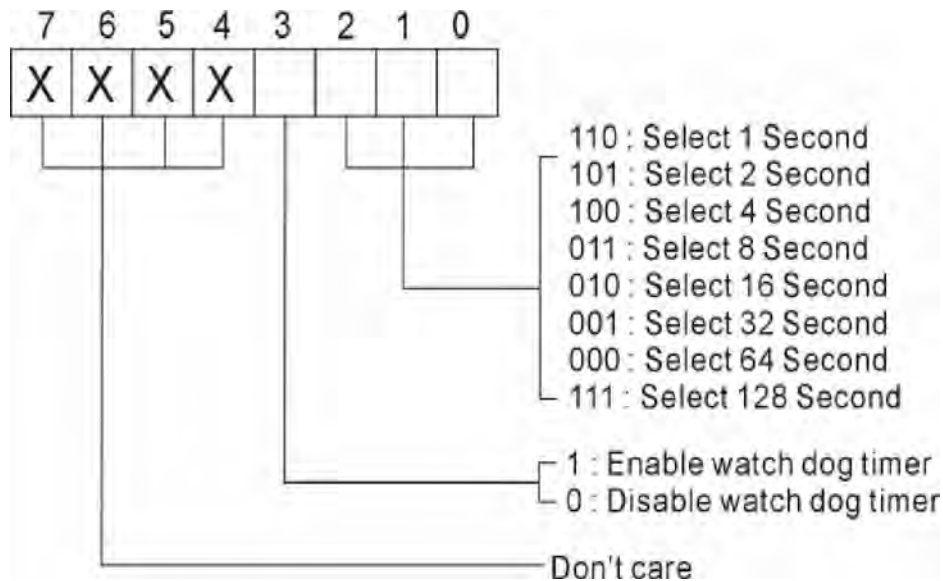


Table A-2 : WDT Control Register Bit Definition

A.3 Watchdog Timer Programming Procedure

A.3.1 Power On or Reset the System

The initial value of WDT Control Register (D3~D0) is zero (0), when power is on or the system has been reset. The following table indicates the initial value of WDT (00000000b) :

Bit	Value	Mean
3	0	Disable Watchdog Timer
2, 1, 0	0 0 0	Select 128 second

Table A-3 : WDT Control Register Initial Value

A.3.2 Clear the WDT

WDT counter interval cannot be longer than the preset time, otherwise, WDT sends a reset signal to the system.

The following is an example of clearing the WDT program in Intel 8086 assembly language.

```
; ( Clear the WDT)
Mov  dx, F2h ;Setting the WDT configuration port
In   al, dx
```

Note: Before running WDT, you must clear WDT to ensure that the initial value is zero.

A.3.3 WDT Control Register

Note: This register writes to WDT configuration port.

Set WDT Control Register to control the WDT working mode. The initial value of WDT Control Register is shown as follows:

```
; (Setting the WDT Control Register as AL)
Mov  al, 0h ; Setting initial value = 0 for the WDT Control Register
```

Follow these instructions to set the register:

1. Select the time-out intervals of WDT (decide the values of D2, D1, D0 in F2)

Example: If D2~D0 = 0, the time-out interval is 64 seconds.

```
AND  al, 11111000b ; Setting the time-out interval as 64 sec.
```

2. Enable or Disable WDT (decide D3 value in F2)

i.e. D3=0, Disables WDT

```
AND  al, 11110111b ; Disable the WDT
```

i.e. D3=1, Enables WDT

```
OR    al, 00001000b ; Enable the WDT
```

After finishing the above settings, you must output the Control Register's value to WDT Configuration Port. Then WDT will start according to the above settings.

```
MOV    dx, F2h    ; Setting WDT Configuration Port  
OUT    dx, al     ; Output the Control Register Value
```


Appendix B Programming the GPIO

GPIO (General Purpose Input/Output) pins are provided for custom system design. This appendix provides definitions and its default setting for the ten GPIO pins in the 3301450. The pin definition is shown in the following table:

Pin No.	GPIO mode	Power @ Default	Address	Pin No.	GPIO mode	Power @ Default	Address	
1	PG		bad		HB		01H 8	2
		PO 0		10		01H 0		
3	PG		bad		HB		01H 8	4
		PO 0		10		01H 1		
5	PG		bad		HB		01H 8	6
		PO 0		10		01H 2		
7	PG		bad		HB		01H 8	8
		PO 0		10		01H 3		

Table A-4 – GPIO Connector

1) Read the GPI Pin (1/3/5/7) status from I/O port 801H bit (4/5/6/7).

The bit is Set/Clear indicated High/Low

For example: set GPI Pin (1/3/5/7) output = high, then bit4~bit7 of al will be at GPIO`GPIO3

```
mov dx,801H
in al,dx
and al,not 00001111b
```

2) Control the GPO pin (2/4/6/8) level from I/O port 801H bit (0/1/2/3).

The bit is Set/Clear indicated output High/Low

For example: set GPI Pin (2/4/6/8) output = high

```
mov dx,801H
in al,00001111b
out dx,al
```

Note: All of these GPIO pins are 8mA digital open-drain buffer and internal pull-up.

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