integration with integrity

3301500 User's Manual

5.25" Embedded Controller with Socket 479

Version 1.0

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Safety Instructions

Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handling the 3301500 to protect yourself from the discharge of any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

NOTE: *DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENT WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.*

Chapter 1

General Description

The 3301500 is an Intel® 82855GME/ICH4 chipset-based board designed for PCI Bus PGA 479 Intel® Pentium® M 1.2~1.7GHz CPU compatibility. These features combine and make the 3301500 an ideal all-in-one industrial single board computer. Additional features include and enhanced I/O with CRT/LVDS Panel, Giga LAN, audio and USB2.0 ports interface.

Its onboard ATA/33/66/100 to IDE drive interface architecture allows the 3301500 to support data transfers of 33, 66 or 100MB/sec. to each IDE drive connection. Designed with the Intel® 82855GME/ICH4 core logic chipset, the board supports all PGA 479 Pentium® M CPU series operating 1.2~1.7GHz. The display controller is Intel® 82855GME supporting CRT display up to 1600 x 1200, and also provides 24-bit single channel LVDS panel interface.

System memory is also sufficient with one DDR socket that can support up to 1GB.

Additional onboard connectors include an advanced USB2.0 port providing faster data transmission, and one RJ-45 connector for 10/100 Base-TX Ethernet use.

1.1 Major Features

The 3301500 comes with the following features:

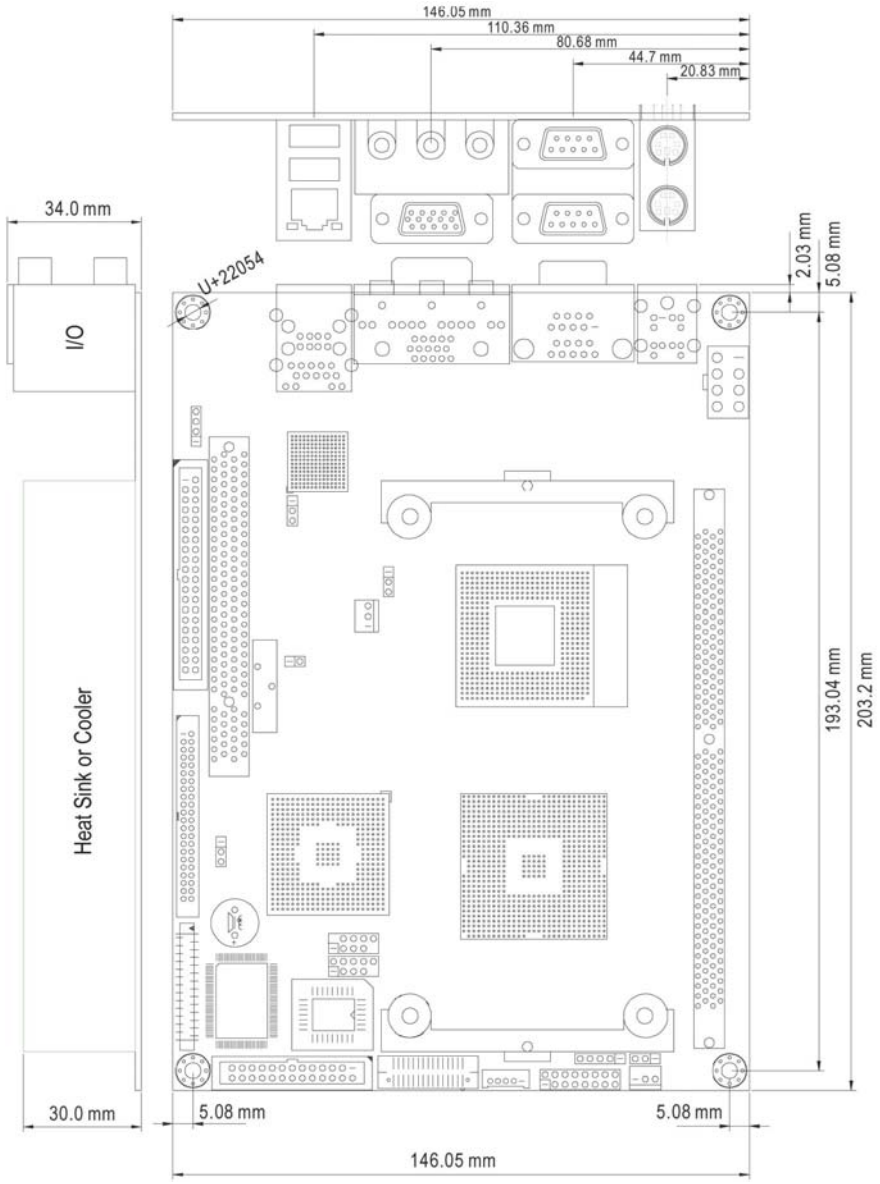
- PGA 479 for Intel® Pentium® M 1.2~1.7GHz
- Supports 400MHz FSB
- One DDR socket with a max. capacity of 1GB
- Intel® 82855GME/ICH4 system chipset
- Winbond W83627HF super I/O chipset
- Intel 82855GME CRT display controller
- Intel 82540 100/1000 Based LAN
- AC97 3D audio controller
- Fast PCI ATA/33/66/100 IDE controller
- Two COM, six USB2.0 connectors
- Supports LVDS Panel interface
- Supports Hardware Monitor function

1.2 Specifications

- **CPU:** PGA 479 for Intel® Pentium® M 1.2~1.7GHz
- **Bus Interface:** PCI Bus
- **Front Side Bus:** Supports 400MHz FSB
- **Memory:** One DDR socket supporting up to 1GB (DDR-200/DDR-266)
- **Chipset:** Intel® 82855GME/ICH4
- **I/O Chipset:** Winbond W83627HF
- **PCI Slot:** One standard PCI slot
- **VGA:** Intel 82855GME supporting CRT display up to 1600 x 1200
- **Panel Display:** Supports 24-bit single channel LVDS Panel interface
- **LAN:** Intel® 82540 100/1000 Based LAN
- **Audio:** AC97 3D audio controller
- **IDE:** Four IDE disk drives supporting ATA/33/66/100 and with transfer rates of up to 33/66/100MB/sec.
- **FDD:** Supports one slim floppy disk drive

- **Parallel:** One enhanced bi-directional parallel port supporting SPP/ECP/EPP
- **Serial Port:** 16C550 UART-compatible RS-232 x 2 serial ports with 16-byte FIFO
- **IrDA:** One TX/RX IrDA header
- **USB:** Supports six USB2.0 connectors
- **Keyboard/Mouse:** PS/2 6-pin Mini DIN
- **BIOS:** Award PnP Flash BIOS
- **Watchdog Timer:** Software program time-out intervals from 1~256 sec.
- **CMOS:** Battery backup
- **Power Connector:** One 8-pin +5V/+12V ATX power connector
- **Temperature:** 0~60°C (operating); -20~+80°C (storage)
- **Humidity:** 10~90%; non-condensing (operating)
- **Hardware Monitor:** Winbond W83627HF
- **Board Size:** 20.3 x 14.6 cm

1.3 Board Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The 3301500 is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the board, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, and keyboard controller chip to ensure that they are firmly seated. The 3301500 delivery package contains the following items:

- **Board x 1**
- **Utility CD Disk x 1**
- **ATA/66/100 IDE flat cable**
- **Parallel flat cable x 1**
- **USB2.0 cable**
- **ATX power cable**
- **Low Profile Heatsink with Fan**
- **User's Manual**

It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the returned shipment of the product. In case you discover anything missing and/or damaged items from the list of items, please contact your dealer immediately.

Chapter 3

Hardware Installation

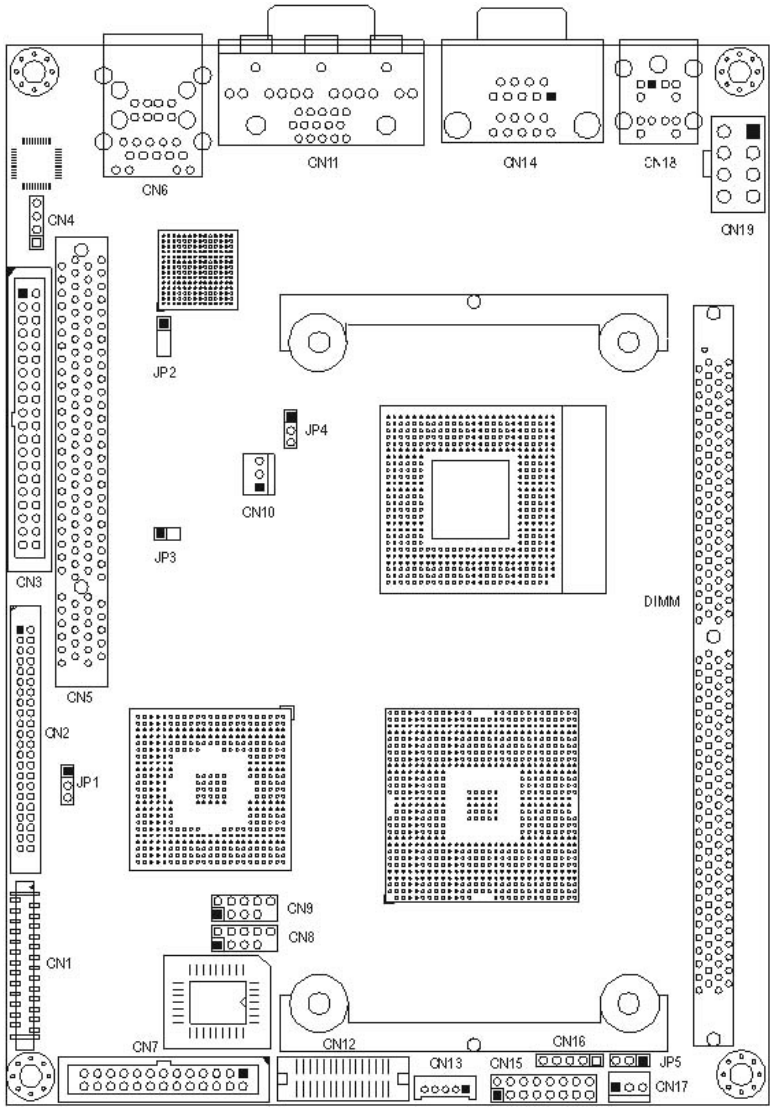
This chapter provides the information on how to install the hardware using the 3301500. This chapter also contains information related to jumper settings of switch, watchdog timer selection, etc.

3.1 Before Installation

After confirming your package contents, you are now ready to install your hardware. The following are important reminders and steps to take before you begin with your installation process.

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper.
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections in this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.

3.2 Board Layout



3.3 Jumper List

Jumper	Default Setting	Setting	Page
JP1	Clear CMOS Select: *Normal Operation*	Short 1-2	17
JP2	Watchdog Timer Select: *Reset*	Short 2-3	19
JP3	Bus Clock Rate Select: *400MHz FSB*	Short 1-2	10
JP4	Fan1 Voltage Select: *+12V*	Short 1-2	17
JP5	Fan1 Voltage Select: *+12V*	Short 1-2	17

3.4 Connector List

Connector	Definition	Page
CN1	Slim FDD Connector	14
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CN3	Primary IDE Connector	11
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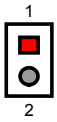
CN19	8-pin ATX Power Connector	17
DIMM1	184-pin DDR Socket	10

3.5 Configuring the CPU

The 3301500 offers the convenience in CPU installation with its auto-detect feature. After installing a new microprocessor onboard, the 3301500 automatically identifies the frequency and clock speed of the installed microprocessor chip, thereby eliminating the need for user to do additional CPU configuration or hardware settings related to it.

- **JP3: Bus Clock Rate Select**

Options	Settings
400MHz FSB (default)	Short 1-2
533MHz FSB	Open 1-2



3.6 System Memory

The 3301500 provides one DDR socket at location *DIMM1.* The maximum capacity of the onboard memory is 1GB.

3.7 VGA Controller

NOTE 1: *3301500 does not support DSTN/STN Panel.*

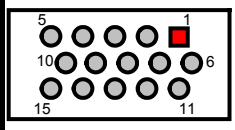
NOTE 2: *3301500 does not support 640 x 480 TFT Panel.*

NOTE 3: *There are specific panel cable and inverter for each different LCD. If customers need other LCDs (different from TOSHIBA LTM10C348F), please contact your sale representatives.*

The onboard Intel 82845GME supports CRT display up to 1600 x 1200. The 3301500 provides two connection methods of CRT and LVDS Panel device. *CN11* offers a CRT connector, and *CN12* offers 24-bit single channel LVDS Panel connectors.

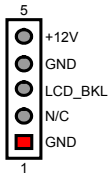
- **CN11: CRT Connector**

PIN	Description	PIN	Description
1	Red	2	Green
3	Blue	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDDATA
13	HSYNC	14	VSYNC
15	DDCLK		



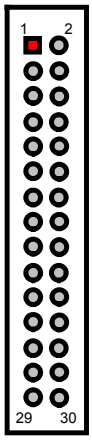
- **CN13: LVDS Power Connector**

PIN.	Description
1	GND
2	N/C
3	LCD_BKL
4	GND
5	+12V



- **CN12: 24-bit LVDS Connector**

PIN	Description	PIN	Description
1	LVDS_YAM0	2	LVDS_YAM1
3	LVDS_YAP0	4	LVDS_YAP1
5	GND	6	GND
7	GND	8	GND
9	LVDS_YAM2	10	LVDS_CLKAM
11	LVDS_YAP2	12	LVDS_CLKAP
13	GND	14	GND
15	GND	16	GND
17	LVDS_YAM3	18	GND
19	LVDS_YAP3	20	GND
21	GND	22	GND
23	GND	24	GND
25	VCC	26	VCC
27	VCC	28	VCC
29	VCC	30	VCC

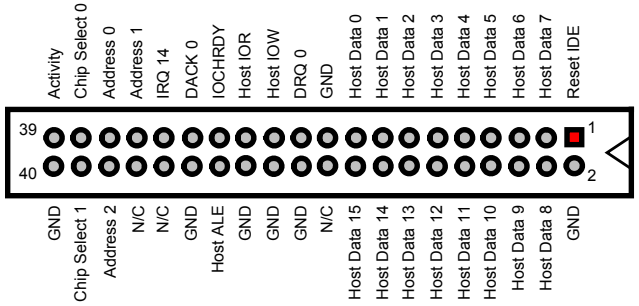


3.8 PCI E-IDE Drive Connector

CN3 and *CN2* are standard 40-pin and 44-pin daisy-chain driver connectors that serve the PCI E-IDE drive provisions onboard the 3301500. A maximum of four ATA/33/66/100 IDE drives can be connected to the 3301500 via *CN3* and *CN2*.

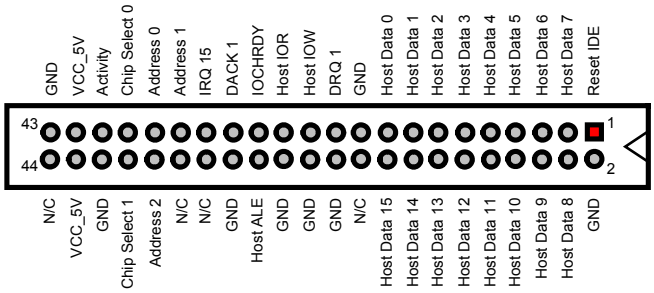
- **CN3: Primary IDE Connector**

PIN	Description	PIN	Description
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	N/C
21	DRQ 0	22	GND
23	Host IOW	24	GND
25	Host IOR	26	GND
27	IOCHRDY	28	Host ALE
29	DACK 0	30	GND
31	IRQ14	32	N/C
33	Address 1	34	N/C
35	Address 0	36	Address 2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	GND



CN2: Secondary IDE Connector

PIN	Description	PIN	Description
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	N/C
21	DRQ 1	22	GND
23	Host IOW	24	GND
25	Host IOR	26	GND
27	IOCHRDY	28	Host ALE
29	DACK 1	30	GND
31	IRQ15	32	N/C
33	Address 1	34	N/C
35	Address 0	36	Address 2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	GND
41	VCC_5V	42	VCC_5V
43	GND	44	N/C



3.9 Floppy Disk Drive Connector

The 3301500 uses a slim 26-pin header connector, *CN1*, for floppy disk drive connection. A total of one FDD drive may be connected to *CN1* at any given time.

- **CN1: Slim FDD Connector**

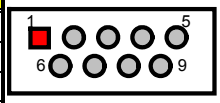
PIN	Description	PIN	Description
1	+5V	14	Step
2	Index	15	GND
3	+5V	16	Write_Data
4	Drive_Select	17	GND
5	+5V	18	Write_Gate
6	Disk_Change	19	GND
7	N/C	20	Track
8	Ready	21	GND
9	HD_Out	22	Write_Protect
10	Motor_On	23	GND
11	Reserve	24	Read_Date
12	Direction	25	GND
13	N/C	26	Side_One

3.10 Serial Port Connectors

The 3301500 offers one NS16C550 compatible UART with Read/Receive 16-byte FIFO serial ports and two DB9 connectors.

- **CN14: COM1/COM2 Connectors (DB9)**

PIN	Description	PIN	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

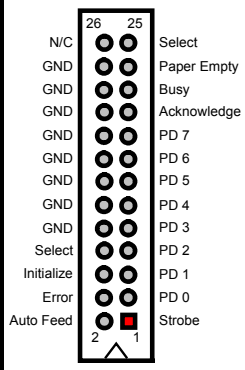


3.11 Parallel Connector

CN7 is a standard 26-pin flat cable connector designed to accommodate parallel port connection onboard the 3301500.

- **CN7: Parallel Connector**

PIN	Description	PIN	Description
1	Line Printer Strobe	2	Auto Feed
3	PD 0	4	Error
5	PD 1	6	Initialize
7	PD 2	8	Select
9	PD 3	10	GND
11	PD 4	12	GND
13	PD 5	14	GND
15	PD 6	16	GND
17	PD 7	18	GND
19	Acknowledge	20	GND
21	Busy	22	GND
23	Paper Empty	24	GND
25	Select	26	N/C

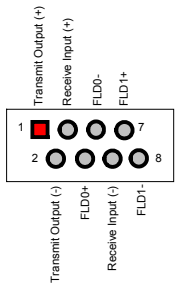


3.12 Ethernet Connector

The 3301500 has Intel® 82540 100/1000 Based LAN controller and provides one RJ-45 connector. Please refer to the following for its pin information.

- **CN6: Gigabit Ethernet RJ-45 Connector**

PIN	Description	PIN	Description
1	Transmit Output (+)	5	FLD0-
2	Transmit Output (-)	6	Receive Input (-)
3	Receive Input (+)	7	FLD1+
4	FLD0+	8	FLD1-

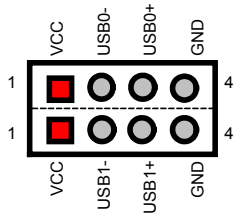


3.13 USB Connector

The 3301500 provides six USB ports at locations *CN6, CN9* and *CN8* for six USB connections to the 3301500.

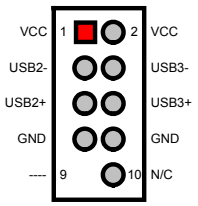
- **CN6: USB 0/1 Connector**

PIN	Description	PIN	Description
1a	VCC	1b	VCC
2a	USB0-	2b	USB1-
3a	USB0+	3b	USB2+
4a	Signal GND	4b	Signal GND



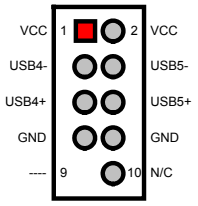
- **CN9: USB 2/3 Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	USB2-	4	USB3-
5	USB2+	6	USB3+
7	GND	8	GND
9	----	10	N/C



- **CN8: USB 4/5 Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
9	----	10	N/C



3.14 CMOS Data Clear

The 3301500 has a Clear CMOS jumper on *JP1.*

- **JP1: Clear CMOS**

Options	Settings
Normal Operation (default)	Short 1-2
Clear CMOS	Short 2-3

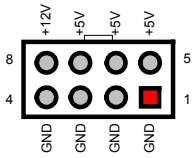
IMPORTANT: *Before you turn on the power of your system, please set JP1 to short 1-2 for normal operation.*

3.15 Power and Fan Connectors

3301500 provides one 8-pin ATX power connector at *CN19.*

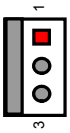
- **CN19: 8-pin ATX Power Connector**

PIN	Description	PIN	Description
1	GND	5	+5V
2	GND	6	+5V
3	GND	7	+5V
4	GND	8	+12V



- **CN10/CN17: Fan Power Connector**

PIN	Description
1	GND
2	VCC
3	Fan Status Signal



- **JP4/JP5: Fan Voltage Select**

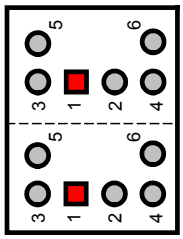
Options	Settings
+12V (default)	Short 1-2
+5V	Short 2-3

3.16 Keyboard/Mouse Connectors

The 3301500 offers one possibility for keyboard/mouse connection via *CN18*.

- **CN18: PS/2 6-pin Mini DIN Keyboard/Mouse Connector**

PIN	Description
1	KB_Data
2	N/C
3	GND
4	+5V
5	KB_CLK
6	N/C
7	MS_Data
8	N/C
9	GND
10	+5V
11	MS_CLK
12	N/C

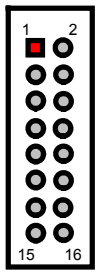


3.17 System Front Panel Connectors

The 3301500 has one LED at location *CN15(9-11)* that indicates the HDD status. *CN15(13-15)* is the Reset Button connector onboard. *CN15(1-3-5-7)* is speaker, *CN15(2-4-6)* is power LED, *CN15(8-10-12)* is keylock, and *CN15(14-16)* is power switch.

- **CN15: System Front Panel Connector**

PIN	Description	PIN	Description
1	+5V	2	PWLED+
3	N/C	4	N/C
5	BZ	6	PWLED-
7	SPKR	8	KBLOCK
9	HDLED+	10	GND
11	HDLED-	12	N/C
13	RESET+	14	PWRBT+
15	RESET-	16	PWRBT-

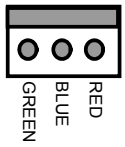


3.18 Audio Connectors

The 3301500 has an onboard AC97 3D audio interface. The following table list the pin assignments of the CD In and Audio connector.

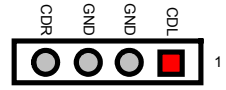
- **CN11: Audio Connector**

PIN	Description
Red	MIC In
Blue	Line In
Green	Line Out



- **CN4: CD In Connector**

PIN	Description	PIN	Description
1	CDL	2	GND
3	GND	4	CDR

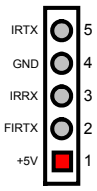


3.19 IrDA Connector

CN16 is a 5-pin internal FIR communication connector for connection to an IrDA device.

- **CN16: IrDA Connector**

PIN	Description
1	+5V
2	FIRTX
3	IRRX
4	GND
5	IRTX

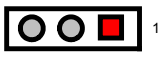


3.20 Watchdog Timer

Once the Enabled cycle is active, a Refresh cycle is requested before the time-out period. This restarts counting of the WDT period. When the time counting goes over the period preset of WDT, it will be assumed that the program operation is abnormal.

- **JP2: Clear CMOS**

Options	Settings
NMI	Short 1-2
Reset (default)	Short 2-3



The following sample programs show how to Enable, Disable and Refresh the Watchdog Timer:

```
;--------------------------------------------------------------------------------
; Enter the WDT function mode, interruptible double-write
;--------------------------------------------------------------------------------
      MOV     DX, 2EH
      MOV     AL, 87H
      OUT     DX, AL
      OUT     DX, AL
      MOV     DX, 2EH
      MOV     AL, 07H
      OUT     DX, AL
      MOV     DX, 2FH
      MOV     AL, 08H
      OUT     DX, AL
      MOV     DX, 2EH
      MOV     AL, F5H
      OUT     DX, AL              ; select CRF0
      MOV     DX, 2FH
      MOV     AL, 80H
      OUT     DX, AL
      MOV     DX, 2EH
      MOV     AL, F7H
      OUT     DX, AL
      MOV     DX, 2FH

      MOV     AL, 00H
      OUT     DX, AL
      MOV     DX, 2EH
      MOV     AL, F6H
      OUT     DX, AL
      MOV     DX, 2FH
      MOV     AL, 00H             ; * 00H=Disabled
      OUT     DX, AL
;--------------------------------------------------------------------------------
; Exit extended function mode
;------------- ------------------------------------------------------------------
      MOV     DX, 2EH
      MOV     AL, AAH
      OUT     DX, AL
```

* User can also use AL, 00H's defined time for reset purposes, e.g.00H for Disable, 01H = 1sec, 02H = 2sec…..FFH = 255sec.

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