Global
AMERICAN

3308570
Wide Range Temperature
3.5″ Miniboard

User's Manual
Version 1.0

RoHS VERIFIED

+85ºC
∧
∨
−40ºC

2010.03
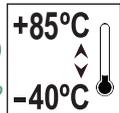
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Contents

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Chapter 1

Introduction

1.1 Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

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1.2 About this User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.

1.4 Replacing the Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash-can. It must be disposed of in accordance with local regulations concerning special waste.

1.5 Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

1.6 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantibility and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List

Packing List
Before you begin installing your single board, please make sure that the following materials have been shipped:

1 x 3308570 3.5" Miniboard with heat sink

1 x Driver CD
1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

1.8 Ordering Information

3308570	Intel Atom™ N270 1.6GHz Wide Range Temperature 3.5" Miniboard
	4 x COM ports & digital I/O daughter board
	Cable Kit 1 x Audio Cable 2 x COM Port Cables 1 x IDE Cable 1 x KB & MS Cable 2 x LAN Cables 1 x LPT to FDD Cable 1 x Parallel Port Cable 2 x SATA Cables 1 x TV-out Cable 3 x USB Cables 1 x VGA Cable

1.9 Specifications

Form Factor	3.5" Miniboard
CPU	Intel® Atom™ N270 CPU 1.6GHz with 533MHz FSB
Chipset	Intel® 945GSE + Intel® ICH7M
System Memory	1 x 200-pin SO-DIMM Socket Up to 2GB DDR2 400/533MHz SDRAM (Bottom side)
VGA/ LCD Controller	Integrated Intel Graphics Media Accelerator 950, Dual Channels 24-bit LVDS
Ethernet	2 x Realtek 8111C PCIe Gigabit Ethernet controllers
I/O Chips	Winbond W83627HG
BIOS	AMI PnP Flash BIOS
Audio	Realtek ALC655 AC97 Audio CODEC, MIC-in/ Line-In/ Line-Out
Storage	2 x Serial ATA 150MB/s HDD transfer rate 1 x IDE Ultra ATA 33, support 2 IDE devices 1 x Floppy connector share with LPT port Soldered onboard 2GB NANDrive
Serial Port	2 x COM ports (COM1: RS-232, COM2: RS-232/422/485 selectable)
Parallel Port	1 x LPT Port (SPP/EPP/ECP mode selectable)
KBMS	One 6-pin wafer connector (PS/2 interface Keyboard and Mouse via cable)
Universal Serial Bus	6 x USB 2.0 ports
Digital I/O	8-bit programmable Digital Input/Output
Expansion Interface	1 x Mini-Card Slot 1 x Mini PCI Socket (Bottom side)
Operation Temp.	-40°C ~ 85°C (-40°F ~ 185°F)
Watchdog Timer	1~255 levels Reset
Dimension (L x W)	146 x 102 mm (5.7 " x 4.0 ")

1.10 Board Dimensions

8.84

142.77

146

3.17

21.97

98.78

101.96

31.8±1
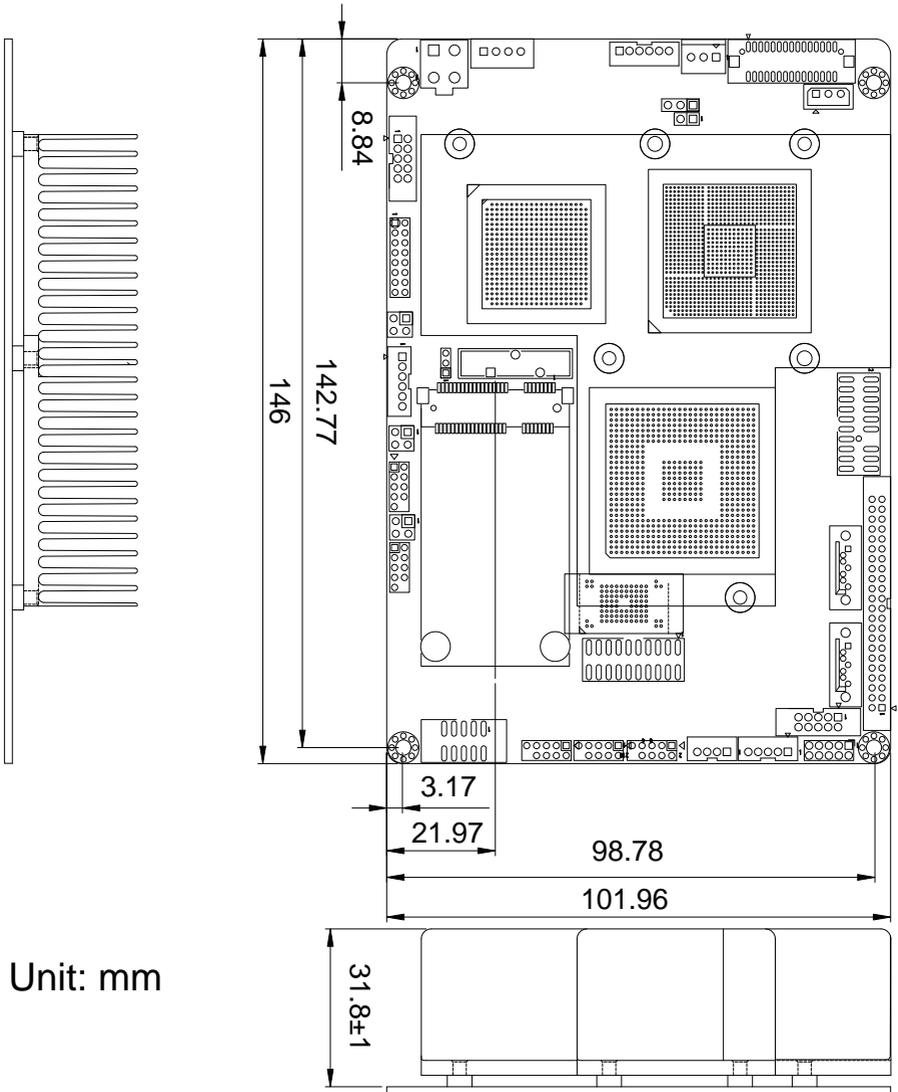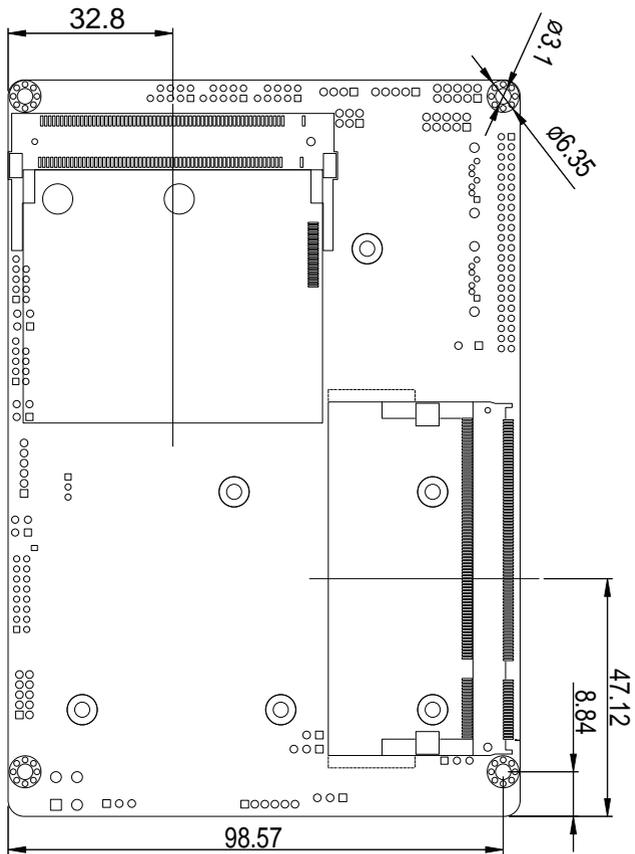
Unit: mm

Unit: mm

Bottom View

1.11 Installing the Memory
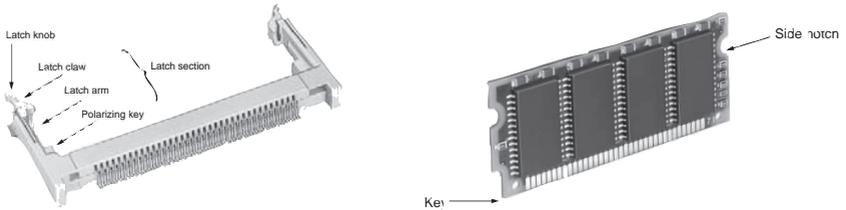
To install the Memory module, locate the Memory SO-DIMM slot on the board and perform as below:

1. Adjust the socket polarizing key and the board key to the same direction.
2. Insert the board obliquely. Moreover, lay the board in parallel to the opening at angle of 20° to 30°, and softly insert the board so as to hit the socket bottom. Stopping insertion halfway will result in improper insertion.
3. Applying the board side notch in parallel to the socket bottom so that the board position cannot be displaced, press the board side notch up, and fix it to the latch portion at both socket edges. Press the board side notch, and release the notch with a snap "click" tone, if the printed board exceeds the latch claw head.
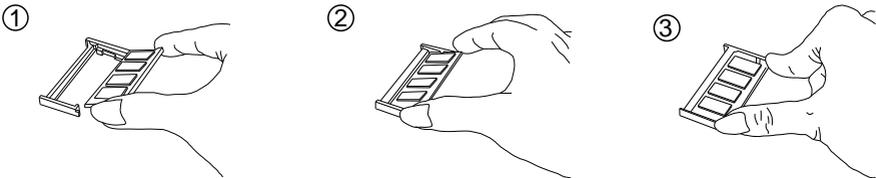
Procedures for board extraction

Apply the thumb nail to the latch knob at both socket edges. Forcibly widen the latch knobs to right and left ways, and release the latch. Then draw the board out along an angle where the board is raised.
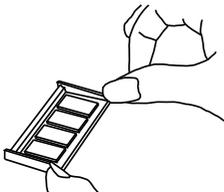
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Chapter 2

Installation

2.1 Block Diagram

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                          Intel®
                          Atom
                          N270

                            ↕  FSB
                               533MHz

                                              Analog
                                              R.G.B.              VGA

1 x 200-pin SO-DIMM    Single Channel DDR2    Mobile    SDVO    SDVO to LVDS    Dual-Channel
up to 2GB              400/533MHz             Intel®    I/F     transmitter     LVDS 24-bit    LVDS
                                              945GSE            CH7308

                                                                                TV-out

                              DMI

                                                          Serial ATA I/F        2 x SATA
AUDIO          ALC655      AC Link
               AC97                           Intel®
               CODEC                          ICH7-M     IDE ATA I/F            1 x IDE

USB x 6        6 x USB Ports                                                    Soldered onboard
                                                                               2GB NANDrive
Mini-PCI       PCI Bus
Socket                                        PCIe*1 I/F    2 x Realtek        2 x pin-header
                                                            8111C GbE
Mini-Card      PCIe x 1
Slot

                              LPC I/F                                           LPC Conn.

KB/ MS         KB, MS        Super IO         COM1,2         COM ports
                            W83627HG
8-bit          DIO                            LPT/FDD        LPT/FDD
Programmable
```

2.2 Jumpers and Connectors

Jumpers

JVLCD1: LCD Panel Voltage Selection (4)

The voltage of LCD panel could be selected by JVLCD1 in +5V or +3.3V.
Connector type: 2.54 mm pitch 1x3-pin headers

Pin	Voltage	
1-2	+5V	
2-3	+3.3V (Default)	
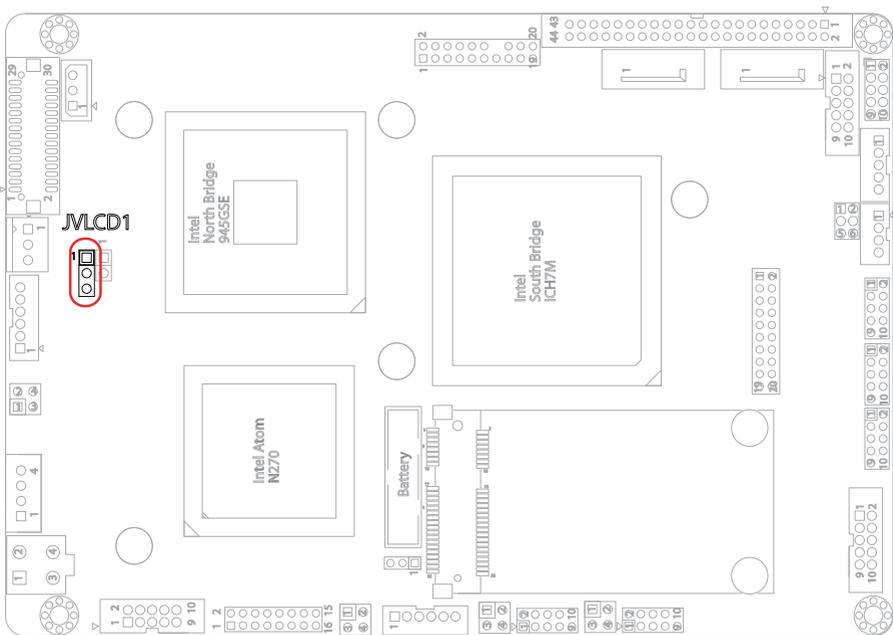
JAT1: AT/ATX Power Mode Selection (6)

The power mode jumper selects the power mode for the system.
Connector type: 2.54mm pitch 1x2 pin headers.

Pin	Mode	
Short	AT Mode	1 ▭ 2
Open	ATX Mode (Default)	1 □○ 2
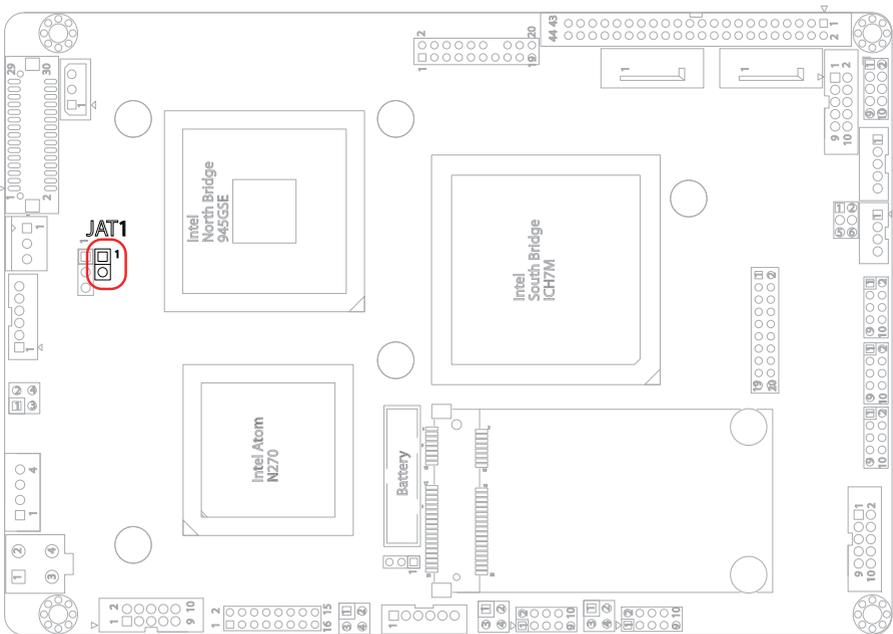
JBAT1: Clear CMOS Setting (12)

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.
Connector type: 2.00mm pitch 1x3-pin headers

Pin	Mode	
1-2	Keep CMOS (Default)	
2-3	Clear CMOS	

You may need to clear the CMOS if your system cannot boot up because you forgot your password, the CPU clock setup is incorrect, or the CMOS settings need to be reset to default values after the system BIOS has been updated.
Refer to the following solutions to reset your CMOS setting:

Solution A:
1. Power off the system and disconnect the power cable.
2. Place a shunt to short pin 1 and pin 2 of JBAT1 for five seconds.
3. Place the shunt back to pin 2 and pin 3 of JBAT1.
4. Power on the system.

Solution B:
If the CPU Clock setup is incorrect, you may not be able to boot up. In this case, follow these instructions:
1. Turn the system off, then on again. The CPU will automatically boot up using standard parameters.
2. As the system boots, enter BIOS and set up the CPU clock.

Note:
If you are unable to enter BIOS setup, turn the system on and off a few times.
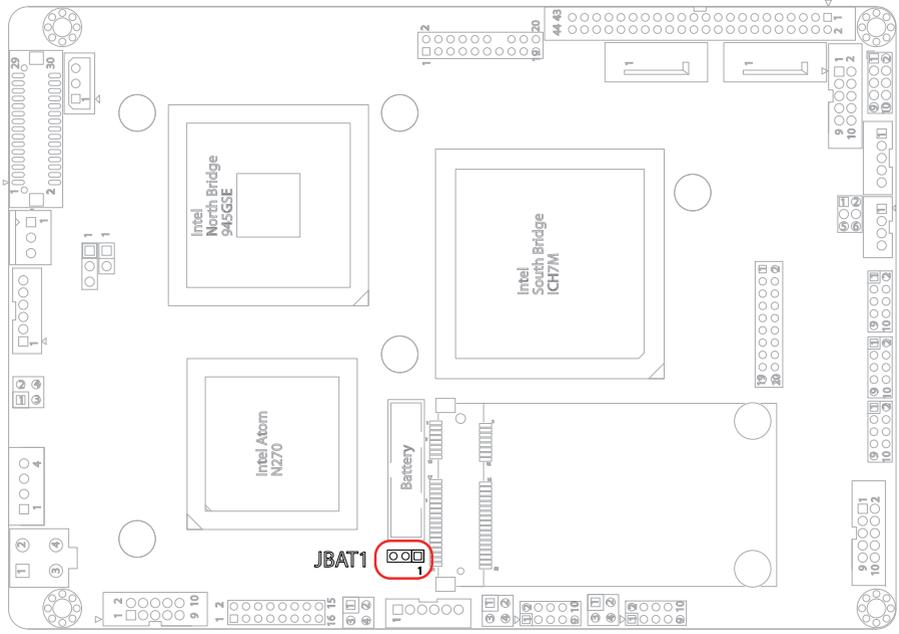
JRS1: COM2 RS-232/422/485 Mode Selection (24)

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper JRS1 switches between RS-232 or RS-422/485 mode. When JRS1 is set to RS-422 or RS-485 mode, there will be only +12V outlet while JRS1 is set. All RS-232/422/482 modes are available on COM2.

It can be configured COM2 to operate in RS-232, RS-422 or RS-485 mode Connector type: 2.00mm pitch 2x3-pin headers.

Mode	RS-232 (Default)	RS-422	RS-485
1-2	Short	Open	Open
3-4	Open	Short	Open
5-6	Open	Open	Short
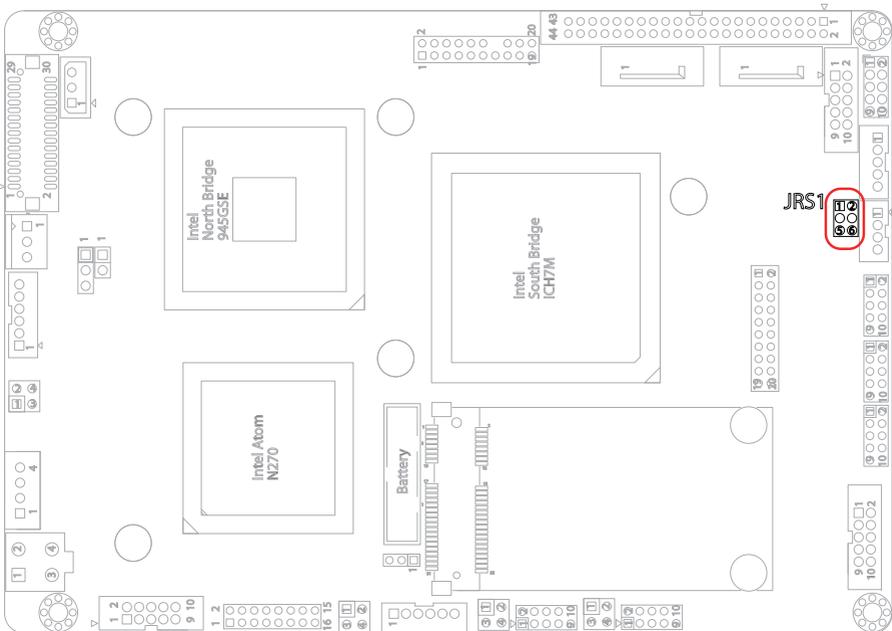
Connectors

LVDS1: LVDS LCD Connector (1)

The LVDS connector supports 24-bit dual channels LVDS.
VDD could be selected by JVLCD1 in +5V or +3.3V.
Connector type: DF-13-30DP-1.25V

Pin	Description	Pin	Description
2	VDD	1	VDD
4	TX2CLK+	3	TX1CLK+
6	TX2CLK-	5	TX1CLK-
8	GND	7	GND
10	TX2D0+	9	TX1D0+
12	TX2D0-	11	TX1D0-
14	GND	13	GND
16	TX2D1+	15	TX1D1+
18	TX2D1-	17	TX1D1-
20	GND	19	GND
22	TX2D2+	21	TX1D2+
24	TX2D2-	23	TX1D2-
26	GND	25	GND
28	TX2D3+	27	TX1D3+
30	TX2D3-	29	TX1D3-
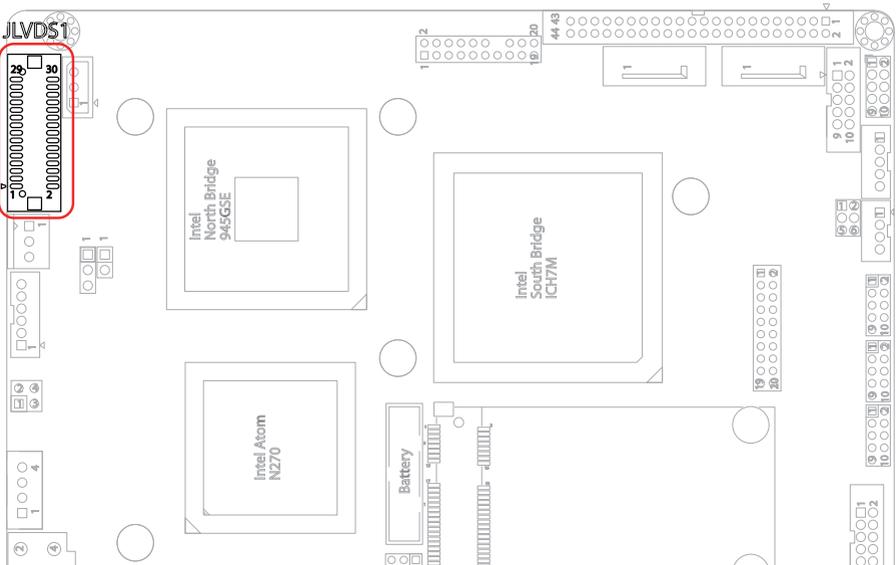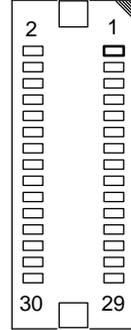
CPUFAN: CPU Fan Power Connector (2)

CPUFAN is 3-pin headers for the system fan. The fan must be a +12V fan.

Pin	Description
1	GND
2	+12V
3	FAN_Detect
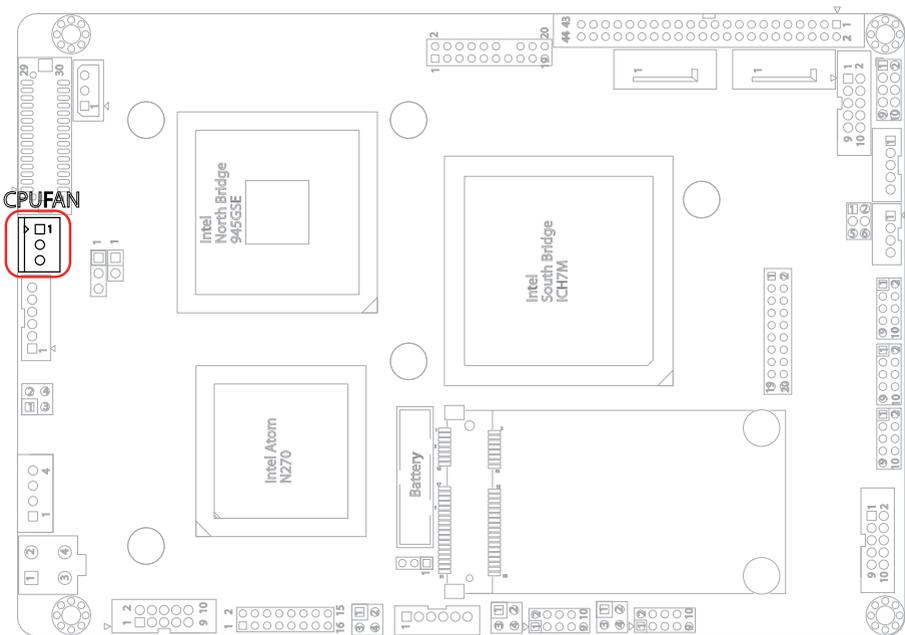
TV1: TV-out Connector (3)

The TV out connector is for output to a television.
Connector type: 2.00mm pitch 1x6-pin box wafer connector

Composite Video

1	CVBS	2	GND
3	Unused	4	GND
5	Unused	6	GND

S-Video

1	Unused	2	GND
3	Luminance	4	GND
5	Chrominance	6	GND
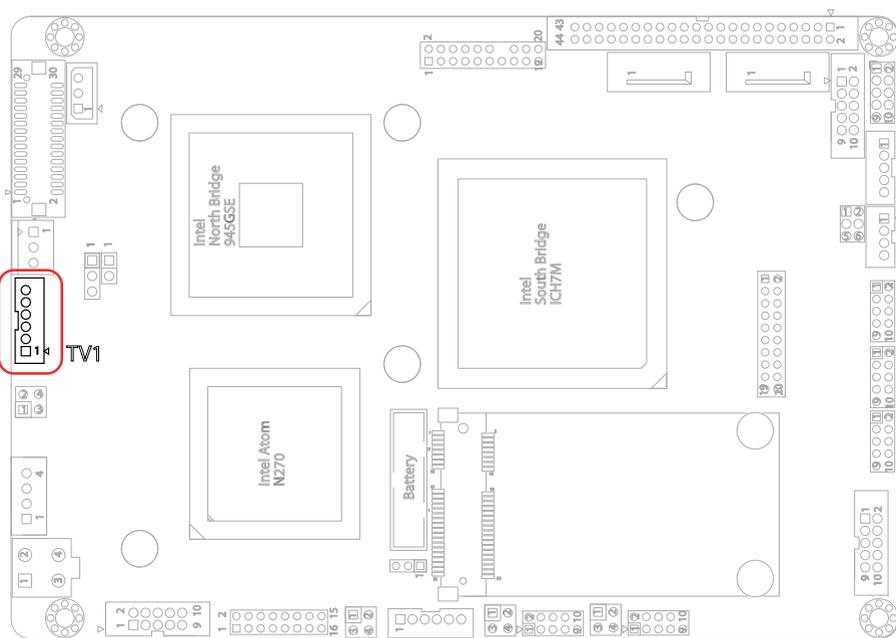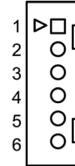
JFRT2: Signaling Headers for LED Indicators (5)

It provides signals for system LED indicators indicating the computer activities.

Connector type: 2.54 mm pitch 2x2-pin headers

Pin	Description	Pin	Description
1	PWRLED+	2	PWRLED-
3	HDDLED+	4	HDDLED-
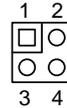
PWRLED: Power LED indicator, pin 1-2.

    This 2-pin connector connects to the case-mounted Power LED indicator.

HDDLED: HDD LED indicator, pin 3-4.

    This 2-pin connector connects to the case-mounted HDD LED indicator.
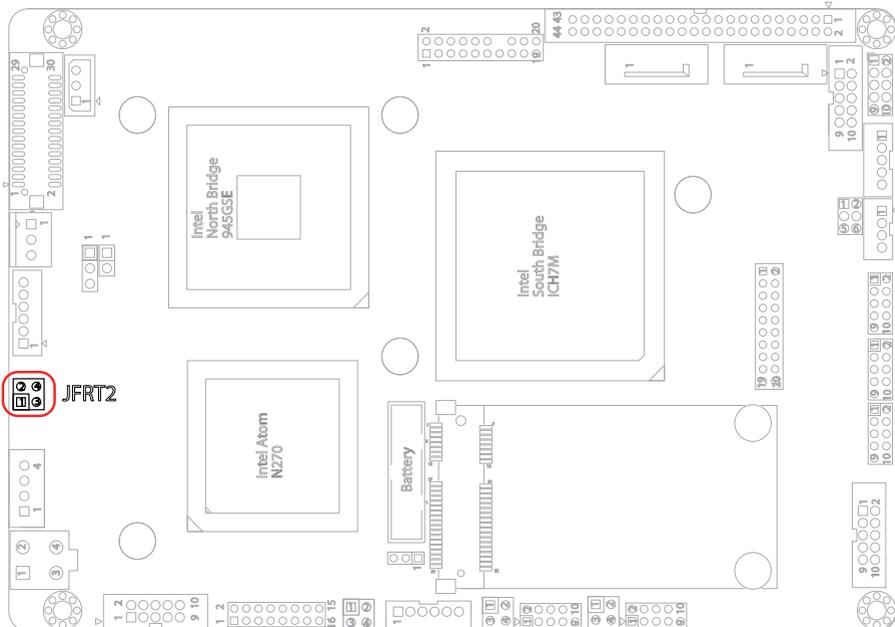
EATX1: ATX Feature Connector (7)

Connector type: 2.54mm pitch 1x4-pin box wafer connector (Optional)

Pin	Description
1	PS-ON
2	GND
3	5V_SB
4	ATX_PWRGD
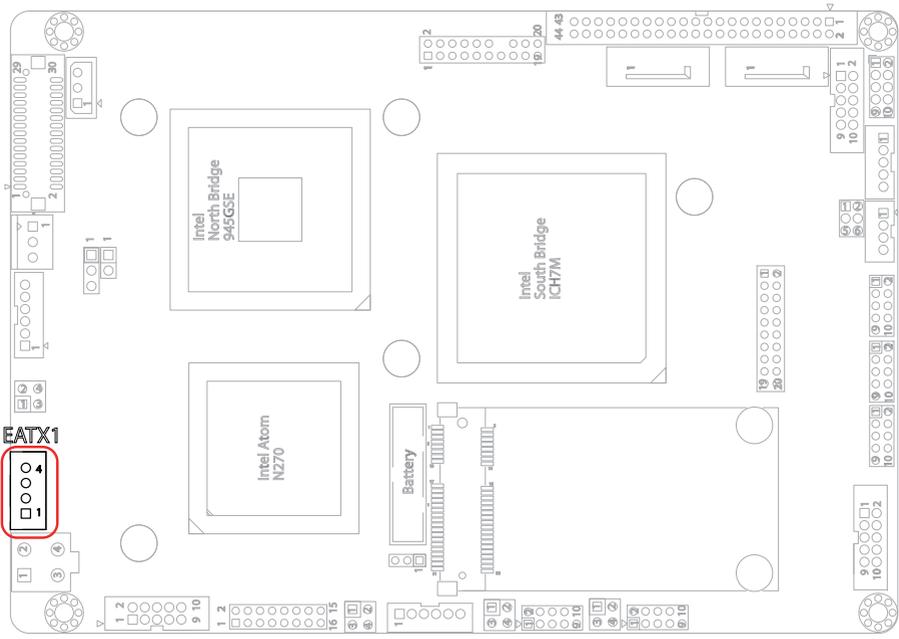
PWR1: Aux. ATX +12V Connector (8)

PWR1 supplies the CPU operation ATX +12V (Vcore).

Pin	Description	Pin	Description
2	GND	4	+12V
1	GND	3	+12V
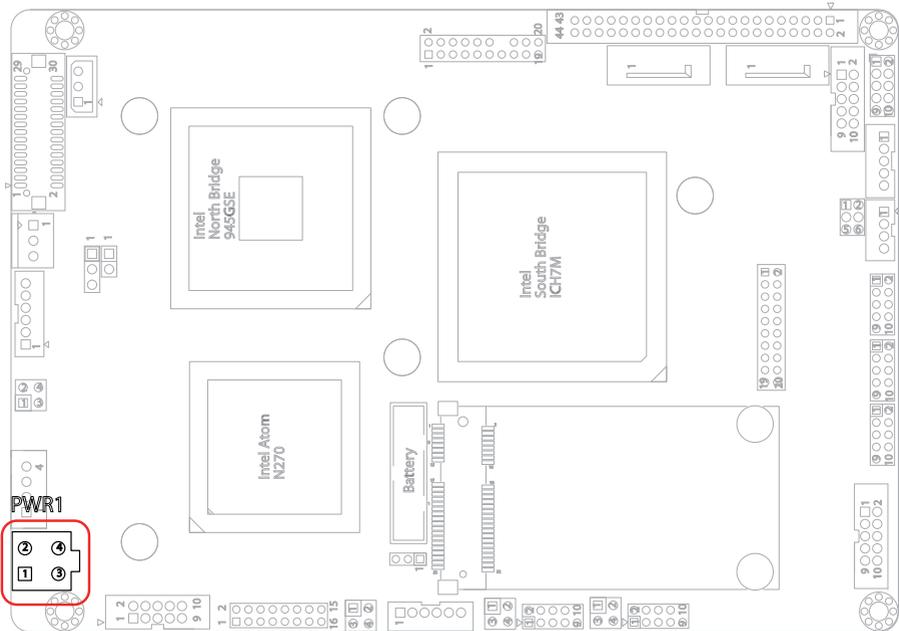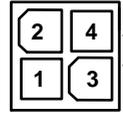
COM1~2: RS-232 Connectors (9, 28)

Connector type: 2.00mm pitch 2x5-pin box headers.

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
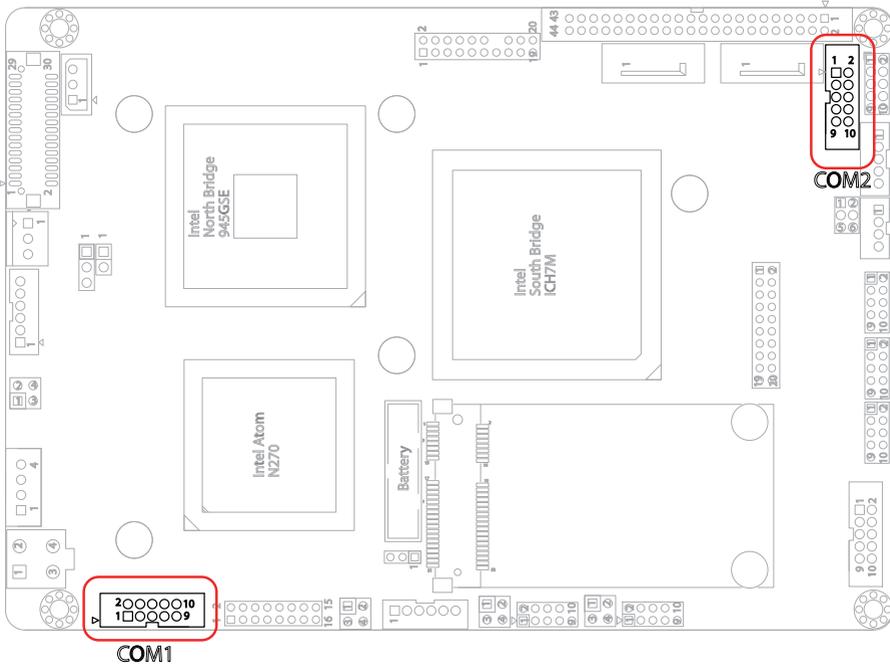
VGA1: Analog RGB Connector (10)

Connector type: 2.00mm pitch 2x8-pin headers.

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2 □ 0 0 0 0 0 0 □ 16
1 □ 0 0 0 0 0 0 0 15
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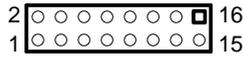
Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	Analog RGB_Detect
11	N/C (Key)	12	VDDAT
13	HSYNC	14	VSYNC
15	VDCLK	16	N/C

VGA1
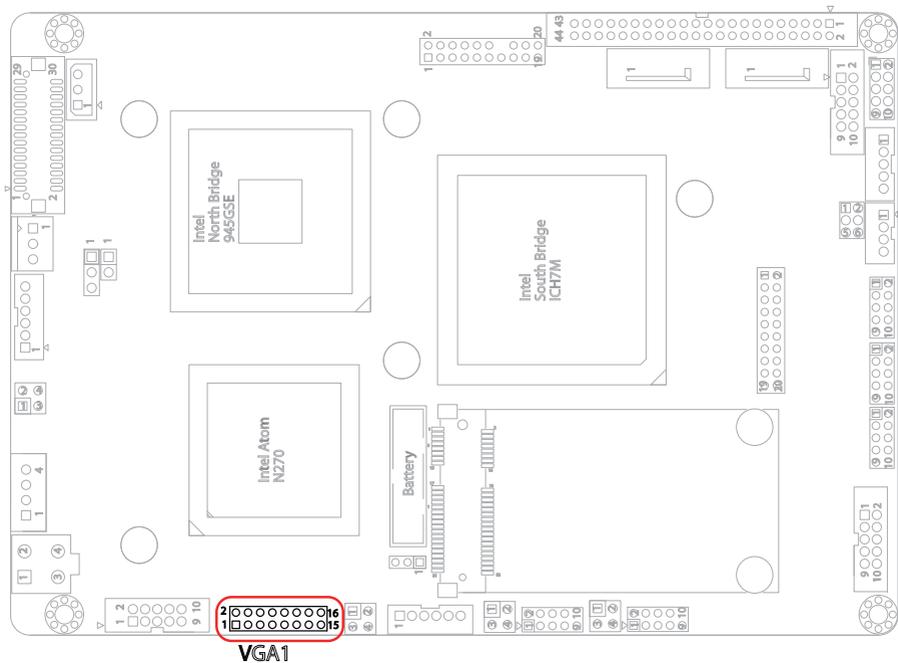
JFRT1: Signaling Headers for Switches (11)

The connector provides signals for switches to change the computer status.
Connector type: 2.54 mm pitch 2x2-pin headers

Pin	Description	Pin	Description
1	PWRBTN+	2	PWRBTN-
3	RESET+	4	RESET-
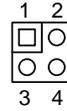
PWRBTN: ATX soft power switch, pin 1-2.

This 2-pin connector connects to the case-mounted Power button.

RES: Reset Button, pin 3-4.

This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.
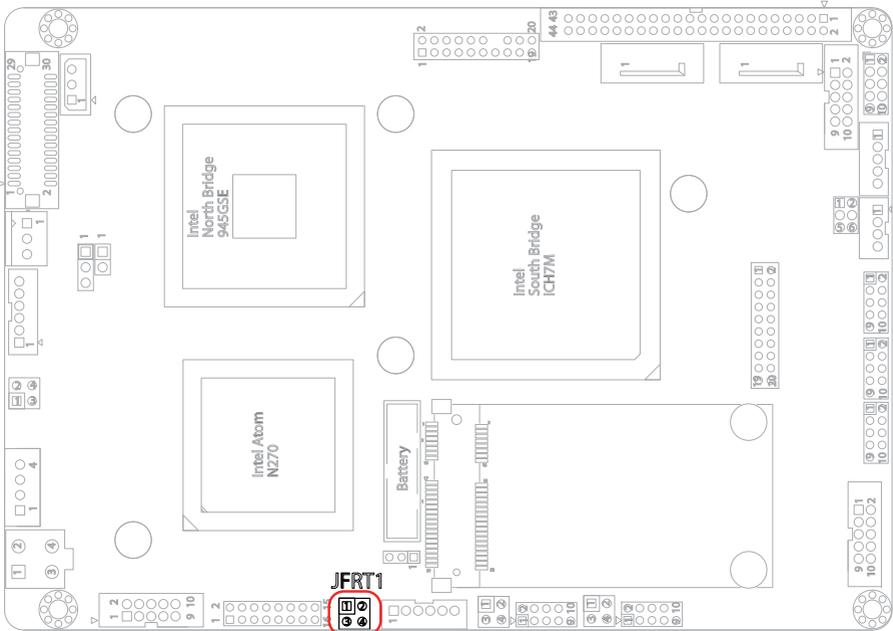
EKBMS1: Keyboard & Mouse (13)

Connector Type: 2.0mm pitch 1x6-pin box wafer connector

Pin	Description
1	KB_DATA
2	GND
3	MS_DATA
4	KB_CLK
5	KB_VCC
6	MS_CLK
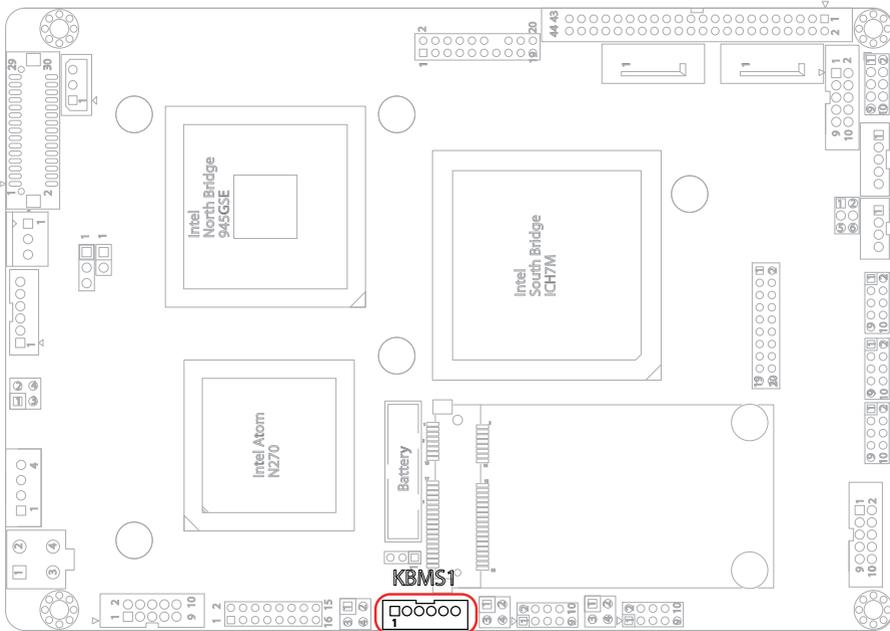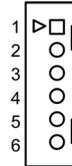
LLED1~2: LAN1/ LAN2 LED Indicator (16, 14)

Connector type: 2.54mm pitch 2x2-pin headers

Pin	Description	Pin	Description
1	Active	2	+3V
3	Link/100	4	Link/1000
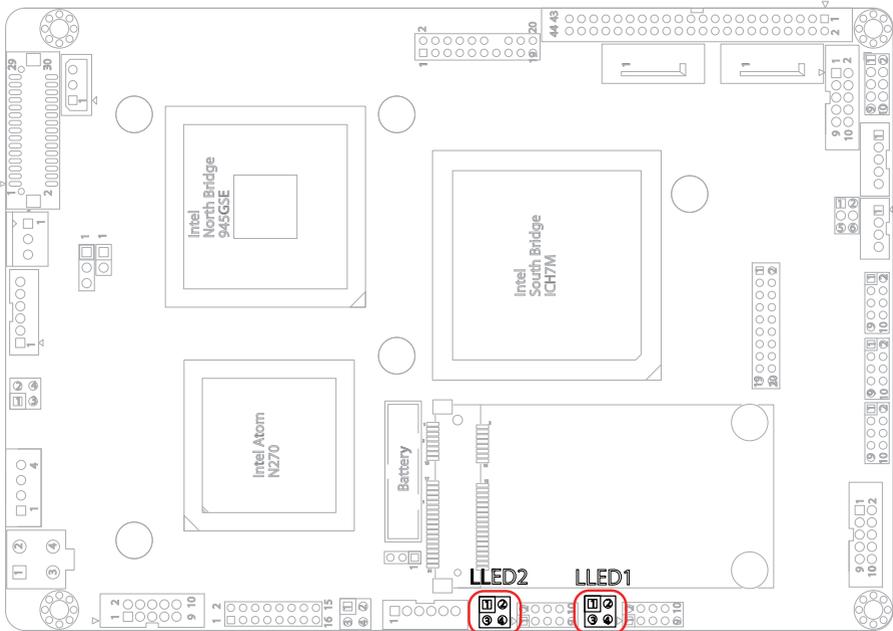
LAN1~2: Gigabit Ethernet Connectors (17, 15)

Connector type: 2.0mm pitch 2x5-pin headers

Pin	Description	Pin	Description
1	TX+/ MDI0+	2	TX-/ MDI0-
3	RX+/ MDI1+	4	N/C/ MDI2+
5	N/C/ MDI2-	6	RX-/ MDI1-
7	N/C/ MDI3+	8	N/C/ MDI3-
9	N/C	10	N/C (Key)
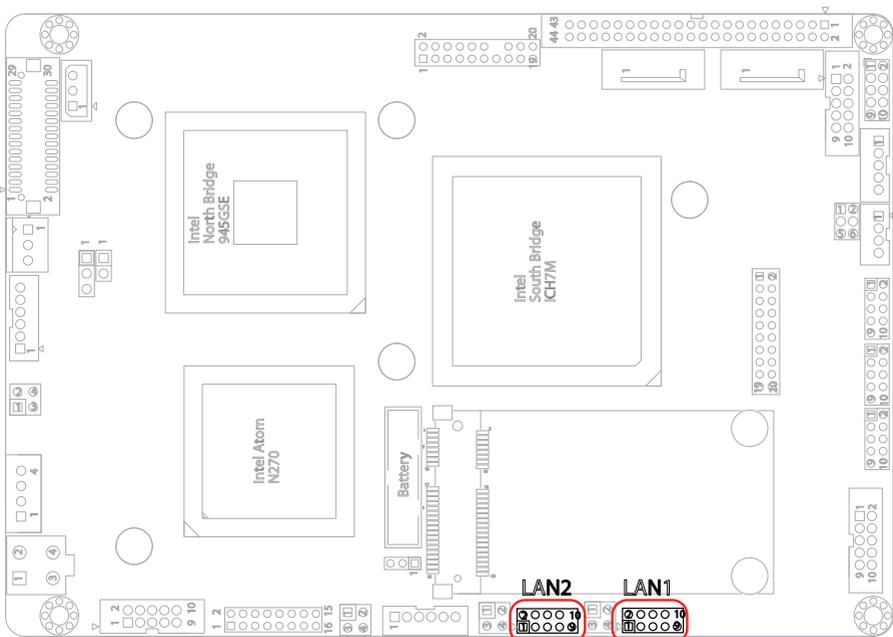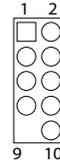
MC1: Mini-Card Slot (18)
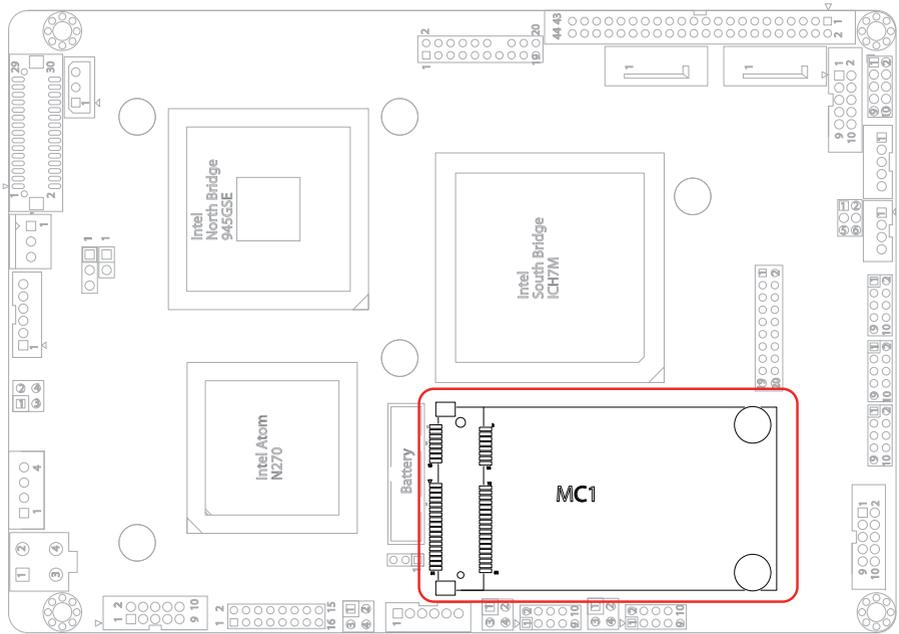
JLPC1: Low Pin Count Connector (19)

Connector type: 2.00mm pitch 2x10-pin headers

Pin	Description	Pin	Description
1	VCC5	2	VCC5
3	LDRQ	4	LFRAME
5	SERIRQ	6	GND
7	LAD2	8	LAD3
9	LAD0	10	LAD1
11	LRESET	12	GND
13	SMBDA	14	PCLK
15	GND	16	SMBCK
17	LPC48MHz	18	LPC_PME
19	VCC3	20	VCC3
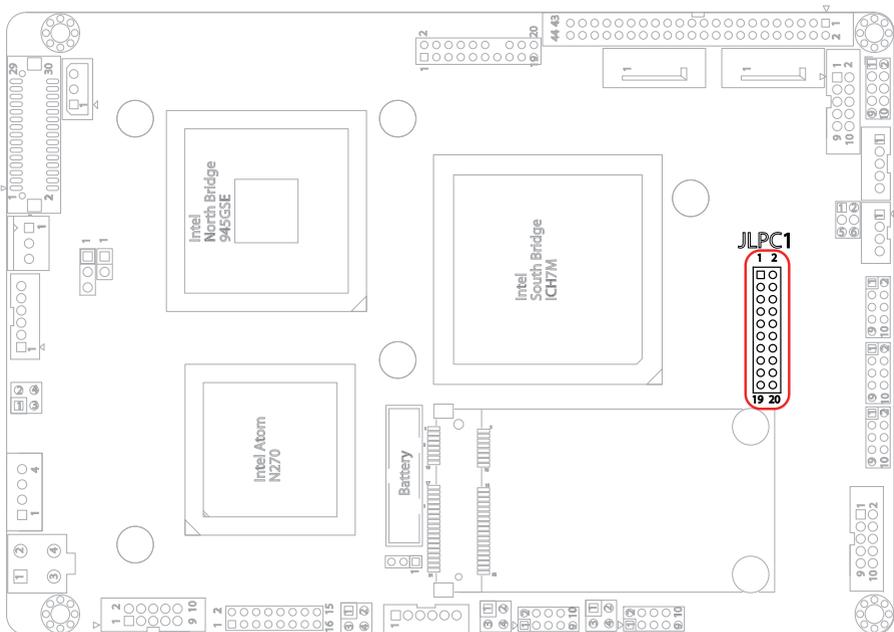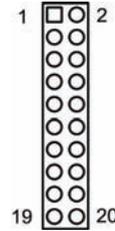
AUDIO1: AUDIO Connector (20)

Connect a tape player or another audio source to the light blue Line-in connector to record audio on your computer or to play audio through your computer's sound chip and speakers.

Connect a micro-phone to the pink microphone connector to record audio to your computer.

Connector type: 2.00mm pitch 2x5-pin box headers.

Pin	Description	Pin	Description
1	Line-in Left	2	Line-in Right
3	GND	4	GND
5	MIC1	6	MIC2
7	GND	8	GND
9	Line-out Left	10	Line-out Right
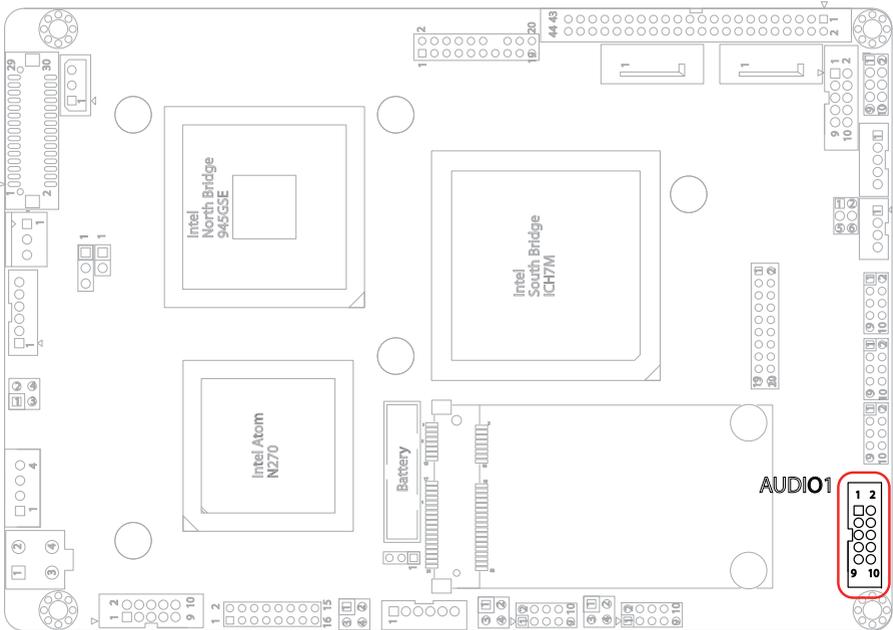
USB1~3: USB Connectors (21, 22, 23)

Connector type: 2.00mm pitch 2x5-pin headers.

USB1~3 support six USB 2.0 w/ 480Mb/s by pin headers

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD-	4	USBD-
5	USBD+	6	USBD+
7	GND	8	GND
9	GND	10	N/C (Key)
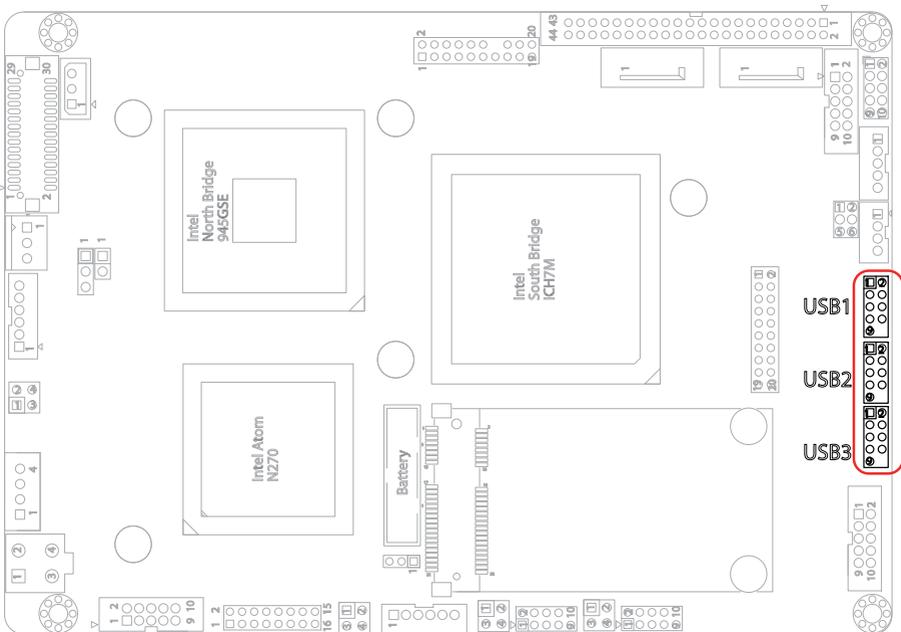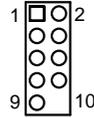
CON1: RS-422/ 485 Connector (25)

Connector type: 2.00mm pitch 1x4-pin box wafer connector

Pin	RS-422	RS-485
1	TX+	DATA+
2	TX-	DATA-
3	RX+	N/C
4	RX-	N/C
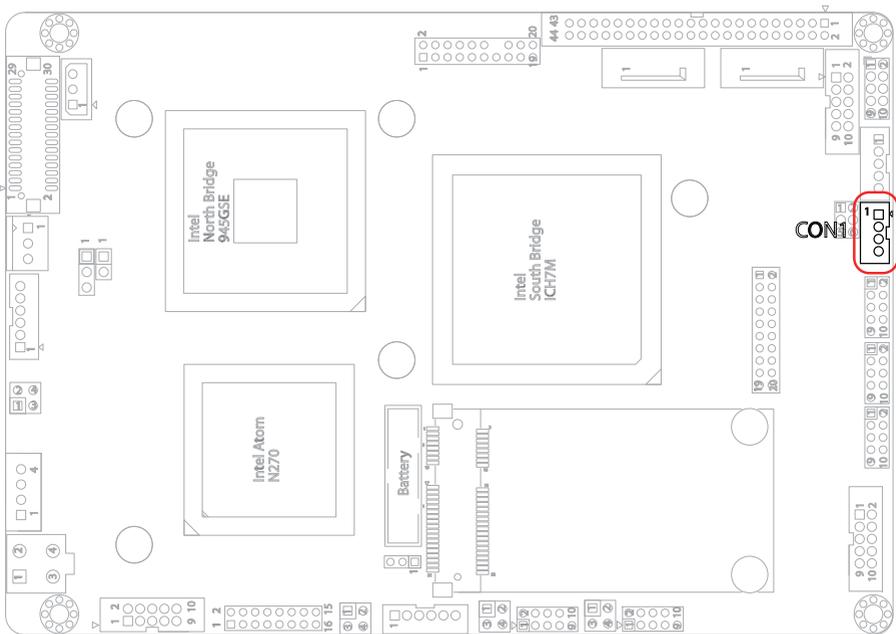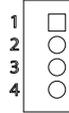
INV1: LCD Inverter Connector (26)

Connector type: 2.00mm pitch 1x5-pin box wafer connector.

Pin	Description
1	+12V
2	GND
3	Backlight on/off
4	Brightness control
5	GND
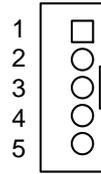
- Backlight:
     Setting to High: On
     Setting to Low: Off
     This signal is used to gate power into the backlight circuitry.

- Brightness control:
     This signal is used as the PWM Clock input signal.
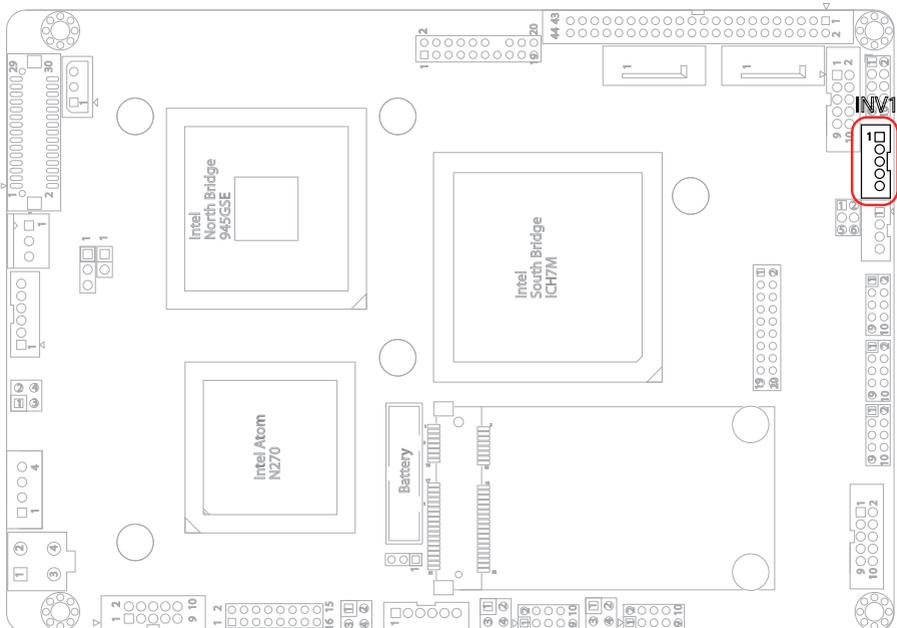
DIO1: Digital I/O Connector (27)

DIO1 supports 8-bit programmable Digital Input/ Output.
Connector type: 2.00mm pitch 2x5-pin headers

Pin	Description	Pin	Description
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	+5V	10	GND
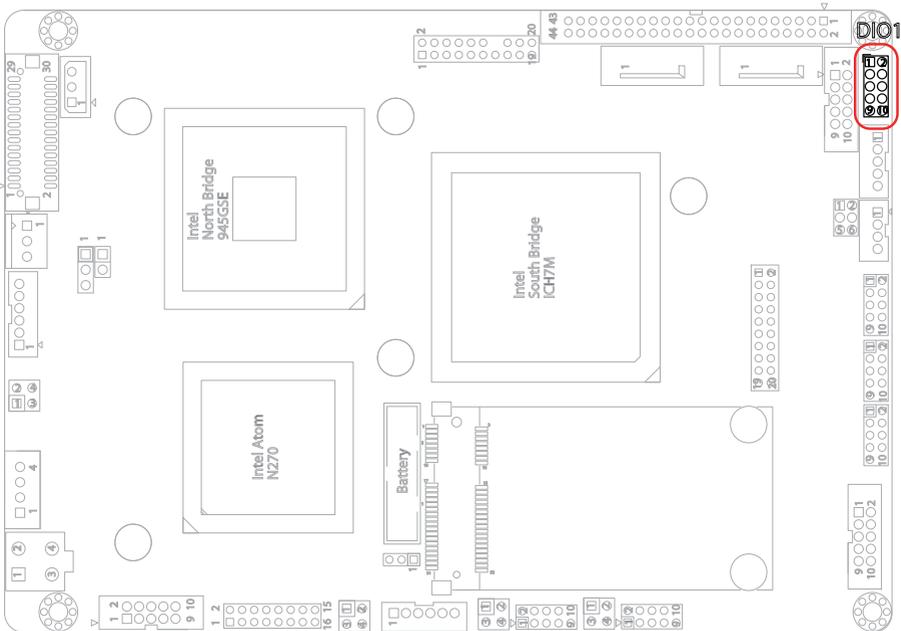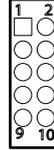
IDE1: IDE Connector (29)

An IDE drive ribbon cable has two connectors to support two IDE devices. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive.

Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1 (color) edge of the cable corresponds to pin 1 of the IDE connector.

Connector type: 2.00mm pitch 2x22-pin headers

Pin	Description	Pin	Description
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C (Key)
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	GND
29	DACK	30	GND
31	IRQ14	32	N/C
33	PDA1	34	ATA66 DETECT
35	PDA0	36	PDA2
37	CS#1	38	CS#3
39	IDEACTP	40	GND
41	+5V	42	+5V
43	GND	44	N/C
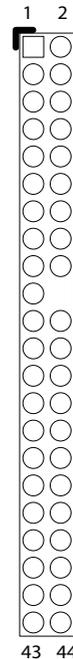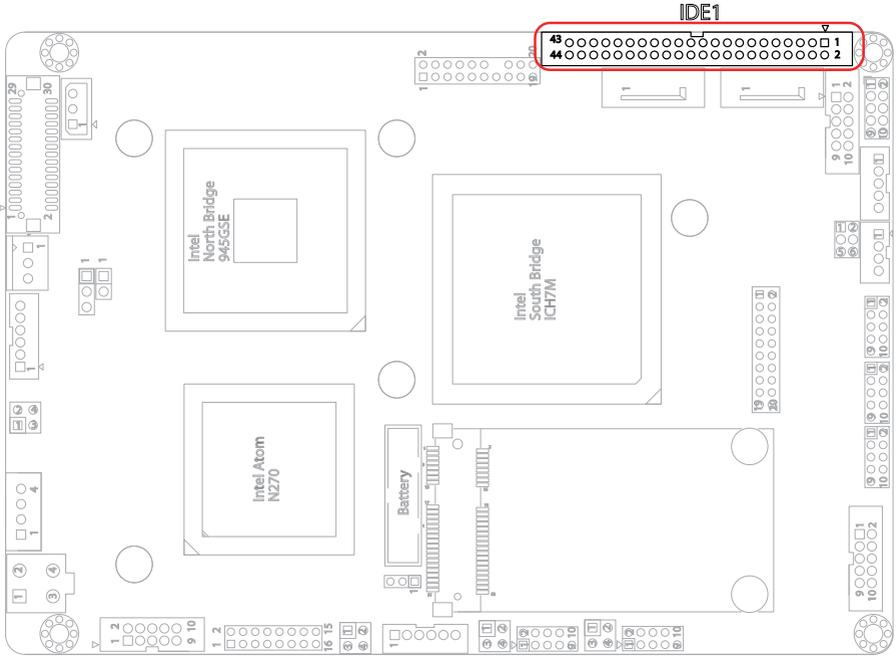
LPT1: Parallel Port Connector (30)

Connector type: 2.00mm pitch 2x10-pin headers.

Pin	Description	Pin	Description
1	STROBE#	2	AFD#
3	PTD0	4	Error#
5	PTD1	6	INIT#
7	PTD2	8	SLIN#
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	N/C (Key)
15	PTD6	16	Busy
17	PTD7	18	PE
19	ACK#	20	Select

LPT1 can be configured as a connector floppy disk drive (FDD) interface through BIOS setup.

Pin	Description	Pin	Description
1	N/C	2	RWC#
3	RINDEX#	4	HEAD#
5	TRACK0#	6	DIR#
7	WP#	8	STEP#
9	RDATA#	10	GND
11	DSKCHG#	12	GND
13	N/C	14	N/C (Key)
15	N/C	16	MOB#
17	N/C	18	WD#
19	DSB#	20	WE#

BIOS Setup

The default is to set LPT1 as printer connector. To change the value, get into BIOS setup --> Integrated Peripheral --> Super IO Device.

BIOS Option	Setting	Description
External FDD Controller	Enabled	Set as FDD connector
Onboard Parallel Port	Disabled	
External FDD Controller	Disabled	
Onboard Parallel Port	378/IRQ7	Set as Parallel Port

LPT1
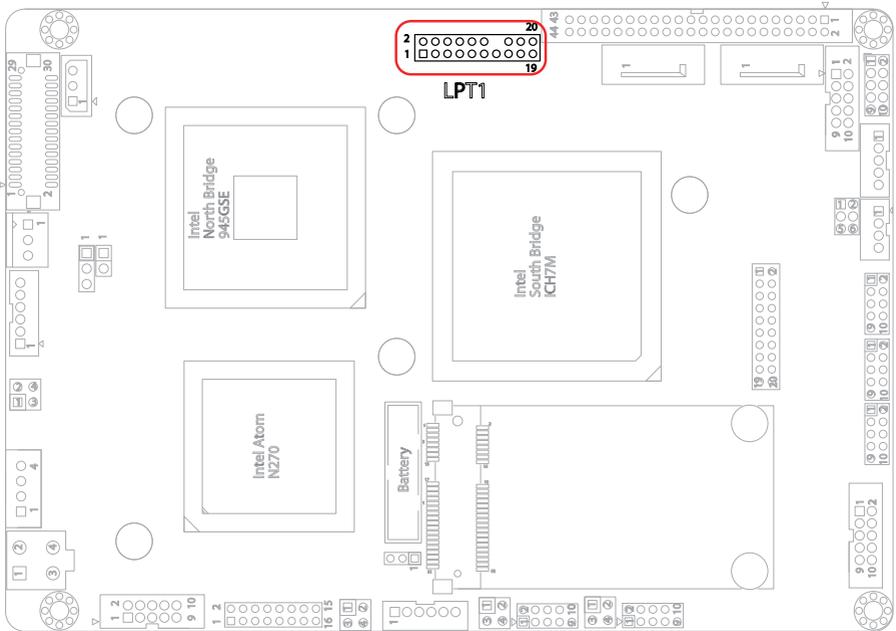
SATA1~ 2: Serial ATA Connectors (32, 31)

The CPU board on board supports two SATA connectors, second generation SATA drives transfer data at speeds as high as 150MB/s, twice the transfer speed of first generation SATA drives.

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
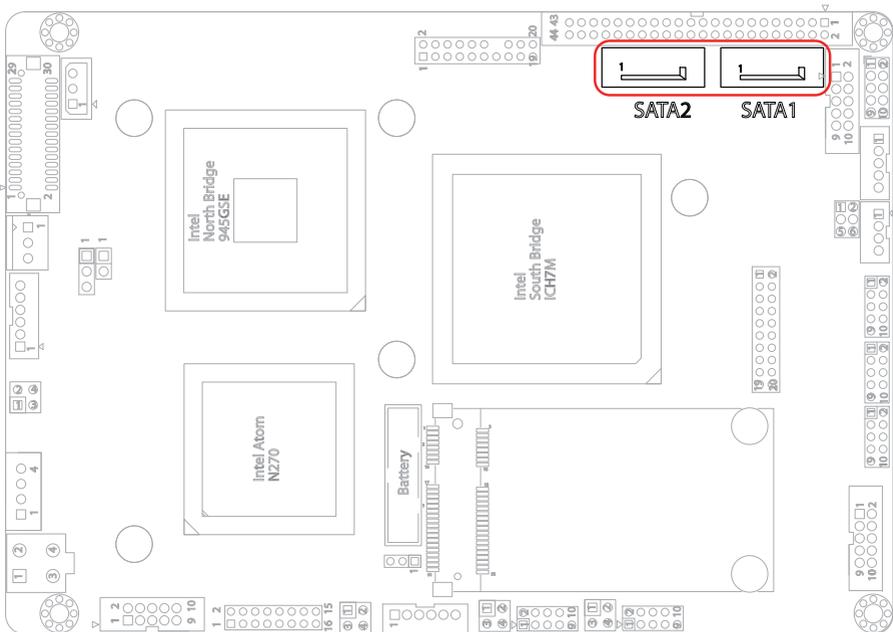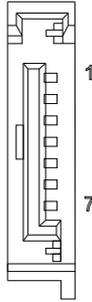
JSMB1: External SMBUS Connector (33)

Connector type: 2.54mm pitch 1x3-pin box wafer connector.

Pin	Description
1	SMB_DATA
2	SMB_CLK
3	SMB_ALERT#
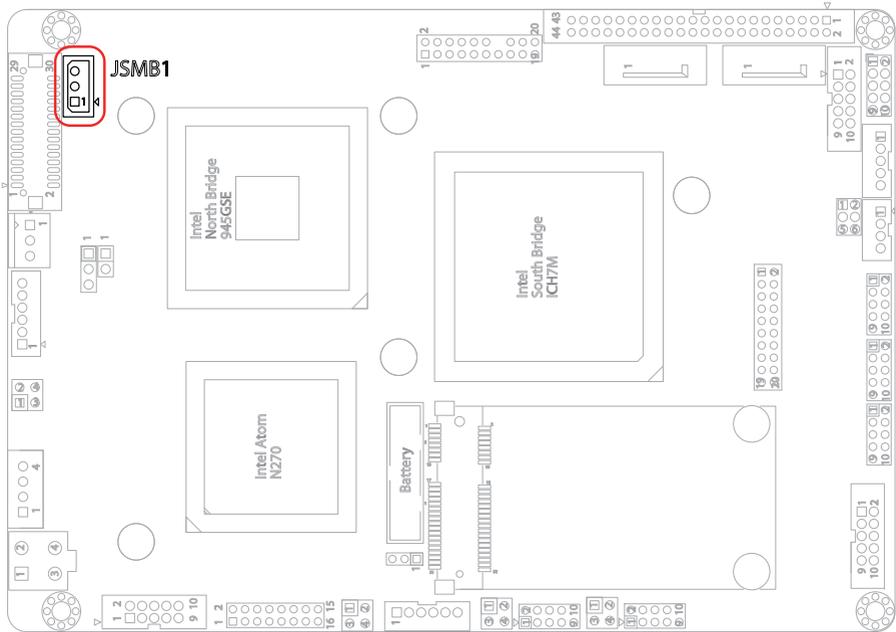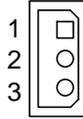
MINIPCI1: Mini PCI slot (bottom side)

SODIMM1: SO-DIMM Socket (bottom side)
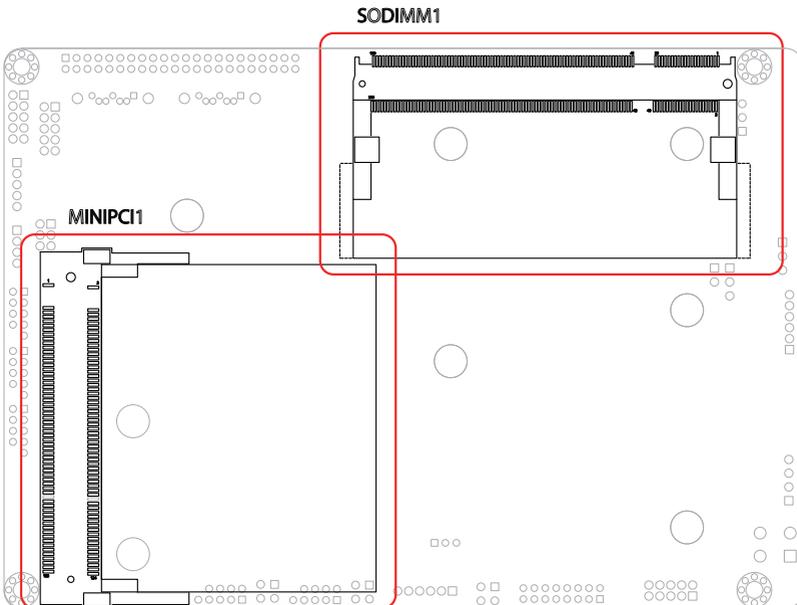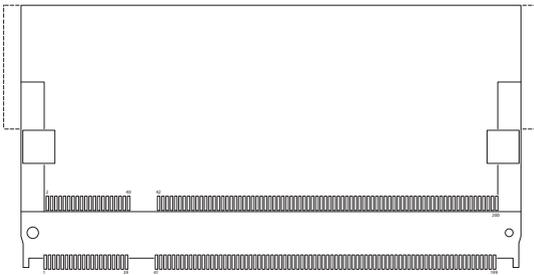
2.3 The Installation Paths of CD Driver

Windows 2000 & XP

Driver	Path
CHIPSET	\CHIPSET\INTEL\INF 8.3
VGA	\Graphics\Intel_2K_XP_32\1432
LAN	\ETHERNET\REALTEK\8111B_WIN5698
AUDIO	\AUDIO\REALTEK_AC97\WINDOWS_A401\98_2K_XP

Chapter 3

BIOS

3.1 BIOS Main Setup

The AMI BIOS provides a setup utility program for specifying the system configurations and settings which are stored in the BIOS ROM of the system. When you turn on the computer, the AMI BIOS is immediately activated. After you have entered the setup utility, use the left/right arrow keys to highlight a particular configuration screen from the top menu bar or use the down arrow key to access and configure the information below.

NOTE: In order to increase system stability and performance, our engineering staff are constantly improving the BIOS menu. The BIOS setup screens and descriptions illustrated in this manual are for your reference only, and may not completely match what you see on your screen.

```
                        BIOS SETUP UTILITY
 Main   Advanced   Chipset   Boot   Security   Exit

 System Overview                              Use [ENTER], [TAB]
                                              or [SHIFT-TAB] to
 BIOS Version :00000.000                      select a field.
 Build Date:02/08/10
                                              Use [+] or [-] to
 Processor                                    configure system Time.

 Speed      :

 System Memory
 Size      :504MB

 System Time                [16:08:29]        ←    Select Screen
 System Date                [Mon 02/08/2010]  ↑↓   Select Item
                                              +-   Change Field
                                              Tab  Select Field
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit


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```

System Time

Set the system time.
The time format is: **Hour :** 00 to 23
                        Minute : 00 to 59
                        Second : 00 to 59

System Date

Set the system date. Note that the 'Day' automatically changes when you set the date.
The date format is: **Day :** Sun to Sat
                        Month : 1 to 12
                        Date : 1 to 31
                        Year : 1999 to 2099

3.2 Advanced Settings

```
                        BIOS SETUP UTILITY
  Main    Advanced    Chipset    Boot    Security    Exit

  Advanced Settings                              Configure CPU.

  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ Floppy Configuration
  ▶ SuperIO Configuration
  ▶ Hardware Health Configuration
  ▶ USB Configuration
                                          ←     Select Screen
                                          ↑↓    Select Item
                                          Enter Go to Sub Screen
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit

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```

3.2.1 CPU Configuration

The CPU Configuration setup screen varies depending on the installed processor.

```
                        BIOS SETUP UTILITY
   Advanced

Configure advanced CPU settings                Enabled for Winodws XP
                                               and Linux4(OS optimiz-
Manufacturer:Intel                             ed for Hyper Threading
                                               Technology) and disla-
Frequency    :255MHz                           bled for other OS
FSB Speed    :532MHz                            (OS not optimized for
Cache L1     :16128 KB                          Hyper-Threading Techn-
Cache L2     :15616 KB                          ology)
Ratio Actual Value:12

Hyper Threading Technology     [Enabled]
Intel(R) SpeedStep(tm) tech    [Enabled]

                                               ←    Select Screen
                                               ↑↓   Select Item
                                               +-   Change Option
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit


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```

Hyper Threading Technology

Hyper Threading Technology enables a single physical processor to execute two separate code streams (called threads) concurrently, increasing processor utilization and providing greater throughput and improved performance.

Intel® SpeedStep™ Tech

Maximum: CPU speed is set to maximum.
Minimum: CPU speed is set to minimum.
Automatic: CPU speed controlled by Operating system.
Disabled: Default CPU speed.

3.2.2 IDE Configuration

```
                        BIOS SETUP UTILITY
   Advanced

 IDE Configuration                                       Options

 ATA/IDE Configuration        [Compatible]        Disabled
   Legacy IDE Channels        [SATA Pri, PATA Sec] Compatible
                                                  Enhanced
 ▶ Primary IDE Master         : [Not Detected]
 ▶ Primary IDE Slave          : [Not Detected]
 ▶ Secondary IDE Master       : [Hard Disk]
 ▶ Secondary IDE Slave        : [Hard Disk]


                                                  ←    Select Screen
                                                  ↑↓   Select Item
                                                  +-   Change Option
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit


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```

Primary IDE Master/Slave

Select one of the hard disk drives to configure it. Press <Enter> to access its submenu.

Secondary IDE Master/Slave

Select one of the hard disk drives to configure it. Press <Enter> to access its submenu.

3.2.3 Floppy Configuration

```
                        BIOS SETUP UTILITY
 Advanced

 Floppy Configuration                          Select the type of
                                               floppy drive
 Floppy A                  [1.44 MB 3½"]       connected to the
                                               system.




                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit


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```
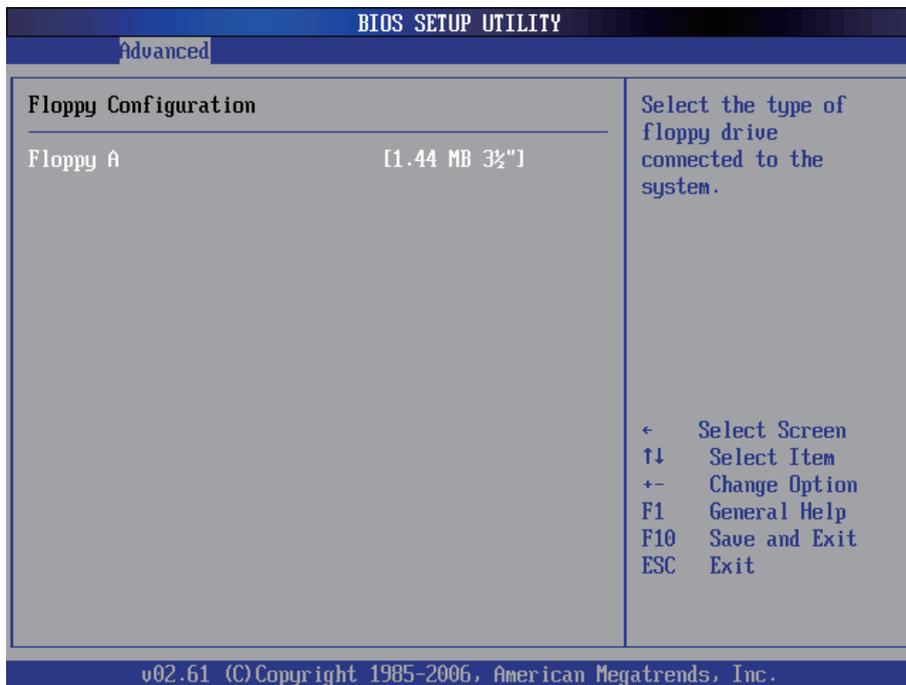
Press Enter to select the type of floppy drive connected to the system.

3.2.4 Super IO Configuration

```
                        BIOS SETUP UTILITY
   Advanced

 Configure Win627 Super IO Chipset                 Allows BIOS to Select
                                                   Serial Port1 Base
 Serial Port1 Address        [3F8/IRQ4]            Addresses.
 Serial Port2 Address        [2F8/IRQ3]
   Serial Port2 Mode         [Normal]
 Parallel Port Address       [378]
   Parallel Port Mode        [Normal]
   Parallel Port IRQ         [IRQ7]



                                                   ←     Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit



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```

Serial Port1 / Port2 Address
Select an address and corresponding interrupt for the first and second serial ports.
The options:
>   3F8/IRQ4
>   2E8/IRQ3
>   3E8/IRQ4
>   2F8/IRQ3
>   Disabled
>   Auto

Parallel Port Address

Select an address for the parallel port.
The options:
    3BC
    378
    278
    Disabled

Parallel Port Mode
Select an operating mode for the onboard parallel port.
The options:
    SPP, EPP, ECP, ECP + EPP, Normal

Parallel Port IRQ
Select an interrupt for the parallel port.
The options:
    IRQ5
    IRQ7

3.2.5 Hardware Health Configuration

```
                        BIOS SETUP UTILITY
   Advanced

Hardware Health Configuration                     Enables Hardware
                                                  Health Monitoring
H/W Health Function          [Enabled]            Device.

Hardware Health Event Monitoring

System Temperature           :32°C/89°F
CPU Temperature              :55°C/131°F

Fan1 Speed                   :5113 RPM

VcoreA                       :1.145 V
1.5V                         :1.516 V
+3.3Vin                      :3.370 V                ←    Select Screen
+12Vin                       :11.065 V               ↑↓   Select Item
VBAT                         :3.080 V                +-   Change Option
                                                     F1   General Help
                                                     F10  Save and Exit
                                                     ESC  Exit


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```

H/W Health Configuration

This item allows you to enable/disable the hardware health monitoring device.

3.2.6　USB Configuration

```
                        BIOS SETUP UTILITY
   Advanced

  USB Configuration                             Enables support for
                                                legacy USB. AUTO
  Legacy USB Support           [Enabled]        option disables
  USB 2.0 Controller Mode      [FullSpeed]      legacy support if
  BIOS EHCI Hand-Off           [Enabled]        no USB devices are
                                                connected.
  ▶ USB Mass Storage Device Configuration



                                                ←    Select Screen
                                                ↑↓   Select Item
                                                +-   Change Option
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit


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```

Legacy USB Support
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

USB 2.0 Controller Mode
Configures the USB 2.0 controller in High Speed (480Mbps) or Full Speed (12MBPS).

BIOS EHCI Hand-Off
Allows you to enable support for operating systems without an EHCI hand-off feature. Configuration options: [Disabled] [Enabled]
Do not disable the BIOS EHCI Hand-Off option if you are running a Windows® operating system with USB device.

USB Mass Storage Device Configuration

This item displays information when USB devices detected.

3.3 Chipset Settings

This submenu allows you to configure the specific features of the chipset installed on your system. The chipset manage bus speeds and access to system memory resources, such as DRAM. It also coordinates communications with the PCI bus.

Notice
Beware of that setting inappropriate values in items of this menu may cause system to malfunction.

```
                          BIOS SETUP UTILITY
  Main     Advanced    Chipset    Boot     Security    Exit

  Advanced Chipset Settings                        Configure North Bridge
 ─────────────────────────────────────────        features.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  ▶ North Bridge Configuration
  ▶ South Bridge Configuration


                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```

3.3.1 North Bridge Configuration

```
                    BIOS SETUP UTILITY
         Chipset

North Bridge Chipset Configuration            Select which graphics
                                              controller to use as
Boots Graphic Adapter Priority [PEG/PCI]      the primary boot
Internal Graphics Mode Select  [Enabled, 8MB] device.
DVMT Mode Select               [DVMT Mode]
  DVMT/FIXED Memory            [128MB]

Boot Display Device            [CRT + SDVO LVDS]
Flat Panel Type                [1024x768 18bit 1ch]



                                              ←     Select Screen
                                              ↑↓    Select Item
                                              +-    Change Option
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit



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```

Boots Graphic Adapter Priority

Select which graphics controller to use as the primary boot device.

Internal Graphics Mode Select

This setting allows you to select the amount of system memory that is allocated to the integrated graphics processor when the system boots up. The options: Enabled, 8MB (Default) / Enabled,1MB / Disabled

DVMT Mode Select

When Dynamic Video Memory Technology (DVMT) mode is selected, the system can dynamically allocate memory resources in accordance with the demands of the system and release back to the system once the requesting application has been terminated.
When Fixed mode is selected, the graphics driver will reserve a fixed portion of the system memory as graphics memory. The downside is once allocated, this memory cannot be used by the operating system even when it is not in use.
The options: DVMT Mode (Default), Fixed Mode, Combo Mode

DVMT/FIXED Memory

This setting allows you to set the maximum amount of system memory that can be allocated as graphics memory.
The options: 128MB (Default), 64MB, Maximum DVMT

Boot Display Device

This item allows you to select the display device.
The options: CRT (Default), TV

Flat Panel Type

This item allows you to select the type of LCD panel connected to the motherboard's built-in graphics chip.

3.3.2 South Bridge Configuration

```
                    BIOS SETUP UTILITY
        Chipset

 South Bridge Chipset Configuration                  │      Options

 USB Functions              [Enabled]                   Disabled
 USB 2.0 Controller         [Enabled]                   Enabled
 Audio Controller           [AC'97 Audio]
 Restore on AC Power Loss   [Power Off]

 PCIE Ports Configuration
 Onboard LAN1               [Enabled]
 Onboard LAN2               [Enabled]
 PCIE Mini Card             [Enabled]

                                                     ←    Select Screen
                                                     ↑↓   Select Item
                                                     +-   Change Option
                                                     F1   General Help
                                                     F10  Save and Exit
                                                     ESC  Exit


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```

USB Funtions

The item determines the activation of USB port.

USB 2.0 Controller

If your system contains a Universal Serial Bus 2.0 (USB 2.0) controller and you have USB peripherals, please enable this function.
The options: Enabled (Default), Disabled

Audio Controller

This item allows you to enable/disable the audio controller.
The options: AC'97 Audio (Default), Disabled

Restore on AC Power Loss

The options: Power Off, Power On, Last State.
With Power On selected, the system will be turned on after every AC power loss. If the Last State option is selected, after every AC power loss, whatever the system status, it will be the same when the AC power returns.

PCIE Ports Configuration

These items allow you to enable/disable the PCI-E devices installed on the system board.
The options: Enabled (Default), Disabled

3.4 Boot Settings

```
                         BIOS SETUP UTILITY
  Main    Advanced    Chipset    PCIPnP    Boot    Security    Exit

  Boot Settings                                   Configure Settings
 ─────────────────────────────────────           during System Boot.
  ▶ Boot Settings Configuration
  ▶ Boot Device Priority
  ▶ Hard Disk Drives




                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```
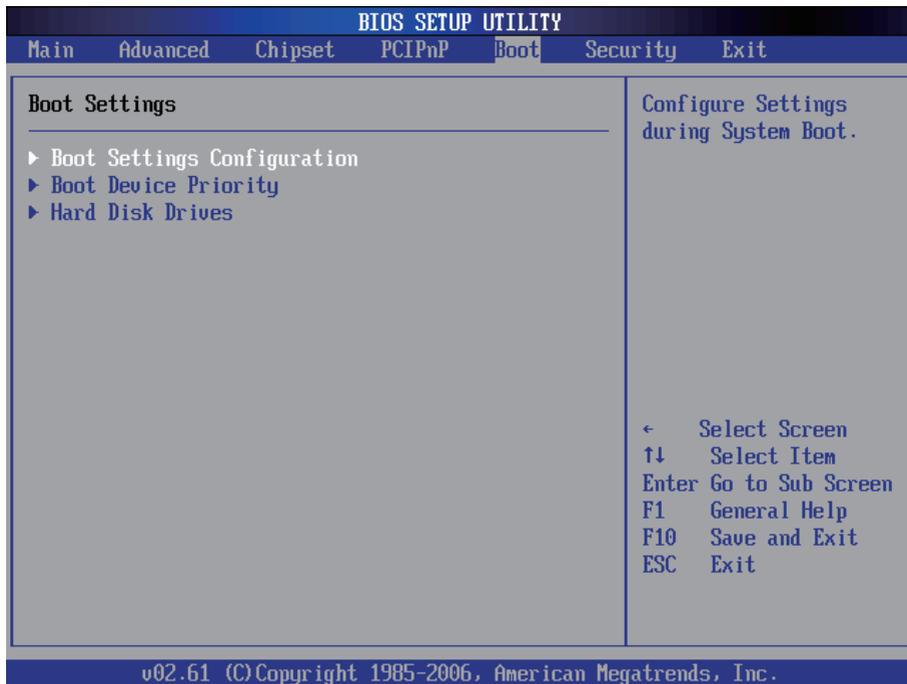
The Boot menu items allow you to change the system boot options. Select an item then press the Enter key to access the sub-menu.

3.4.1 Boot Settings Configuration

```
                        BIOS SETUP UTILITY
                              Boot

  Boot Settings Configuration                    Disabled: Displays
                                                 normal POST messages.
  Quiet Boot              [Disabled]             Enabled: Displays OEM
  Bootup Num-Lock         [On]                   Logo instead of POST
                                                 messages.




                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 +-    Change Option
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit



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```
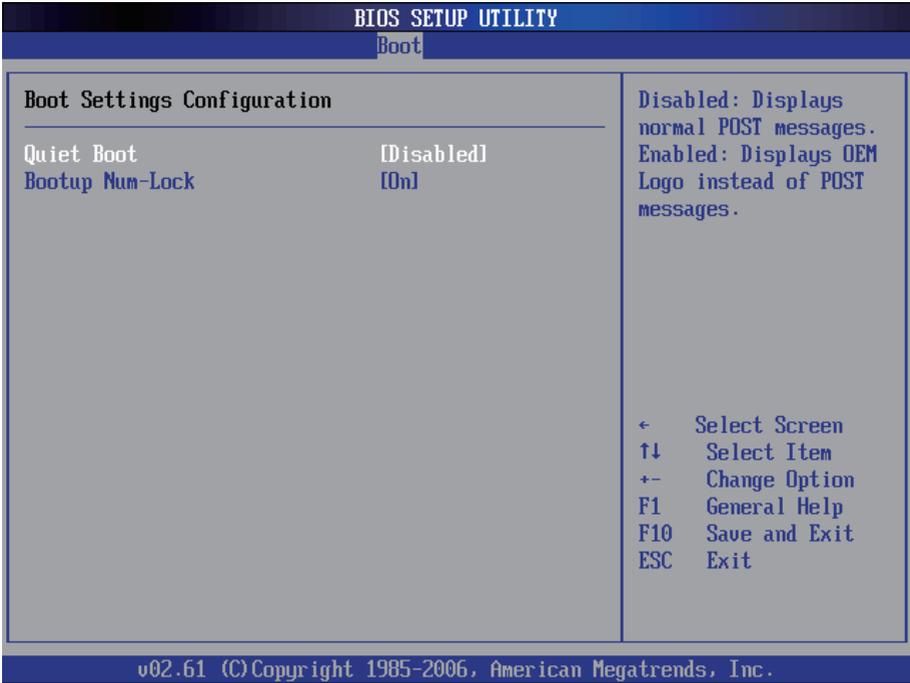
Quiet Boot
The item determines if the BIOS should hide the the normal POST messages with the manufacturer's full-screen logo.

When enabled, the BIOS will display the full-screen logo or mark during the boot-up sequence, hideing normal POST messages. When disabled, the BIOS will display the normal POST messages, instead of the full-screen logo or mark.

Bootup Num-Lock
This setting determines whether the Num Lock key should be activated at boot up.

3.4.2 Boot Device Priority

```
                        BIOS SETUP UTILITY
                            Boot

 Boot Device Priority                         Specifies the boot
                                              sequence from the
 1st Boot Device         [USB:Multi Flash Re] available devices.
 2nd Boot Device         [HDD:SM-FUJITSU MHT]
                                              A device enclosed in
                                              parenthesis has been
                                              disabled in the
                                              corresponding type
                                              menu.


                                              ←     Select Screen
                                              ↑↓    Select Item
                                              +-    Change Option
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit


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```

Items in this sub-menu specify the boot device priority from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

3.4.3 Hard Disk Drives

```
                        BIOS SETUP UTILITY
                            Boot

 Hard Disk Drives                               Specifies the boot
                                                sequence from the
 1st Drive                  [HDD:SM-FUJITSU MHT] available devices.
 2nd Drive                  [SATA:SS-2GB ATA F1]




                                                ←    Select Screen
                                                ↑↓   Select Item
                                                +-   Change Option
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit


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```
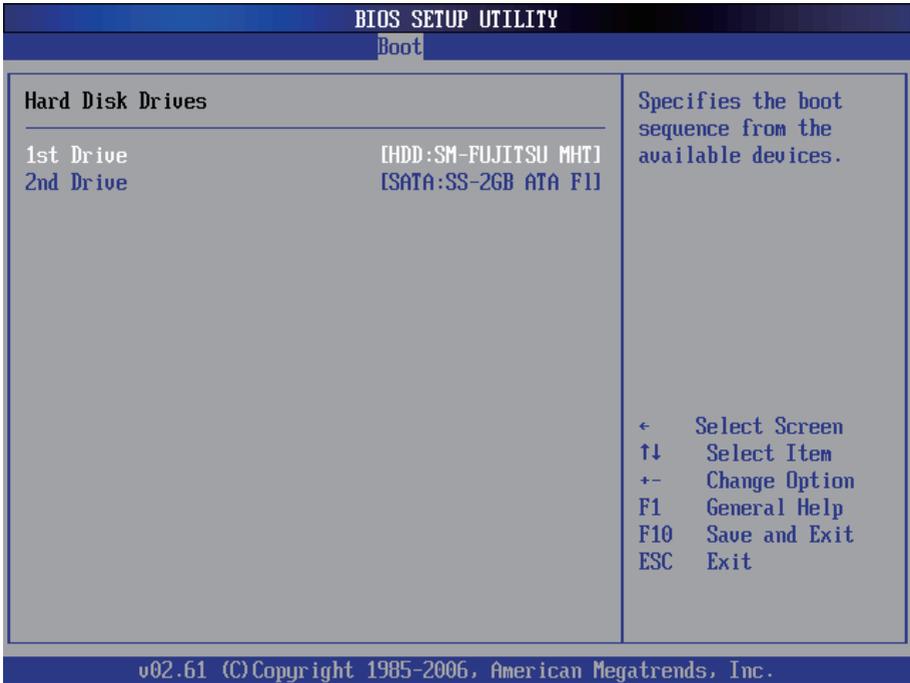
The BIOS will attempt to arrange the hard disk boot sequence automatically. You can also change the booting sequence. The number of device items that appears on the screen depends on the number of devices installed in the system.

3.5 Security

```
                          BIOS SETUP UTILITY
   Main     Advanced    Chipset     Boot    Security    Exit

   Security Settings                              Install or Change the
                                                  password.
   Supervisor Password :Not Installed

   Change Supervisor Password

   Boot Sector Virus Protection    [Disabled]



                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  Enter Change
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```
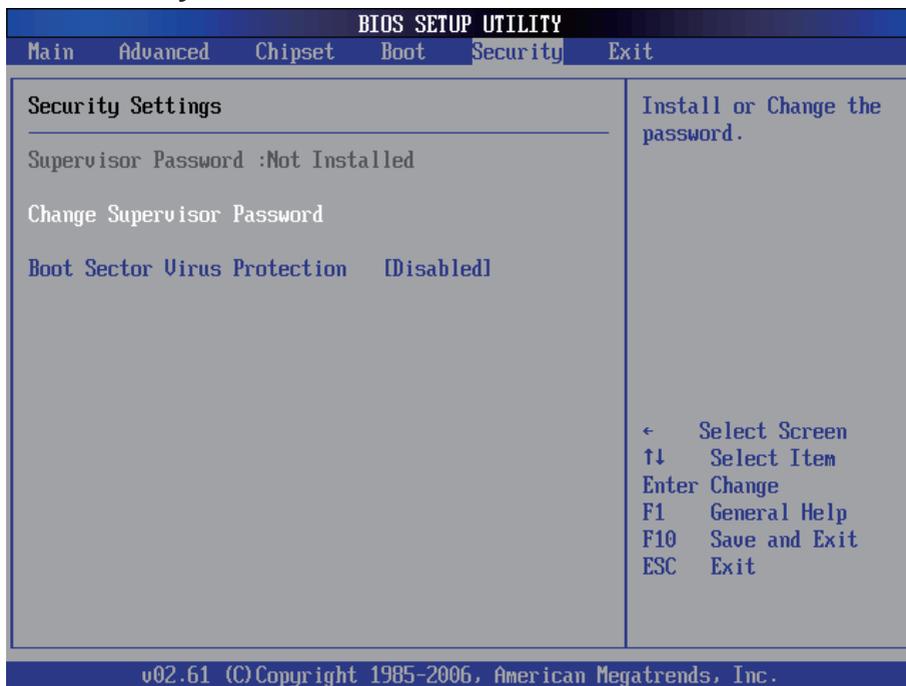
Supervisor Password

Set **Change Supervisor Password** to enter and change the options of the setup menus. When you enter this function, the following message will appear at the center of the screen to assist you in creating a password.

Enter New Password:

Type the password, up to six characters in length, and press <Enter>. The password typed now will substitute for any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <ESC> to abort the selection and not enter a password.

With a password enabled, a Password Check item appears. Set this item to **Setup**, you will be prompted to enter the password every time you try to enter the BIOS Setup utility. This prevents an unauthorized person from changing any part of your system configuration.

You can also require the BIOS to request a password every time your system is rebooted by setting it to **Always**. This would prevent unauthorized use of your computer.

To clear a password, just leave the field blank and press <Enter> when you are prompted to enter a new password. Once the password is cleared, the following message will appear at the center of the screen.

<div align="center">Password Uninstalled.</div>

Boot Sector Virus Protection

When enabled, the BIOS gives a warning to the screen allowing to disable the access or to continue whenever your boot sector is accessed for writing.

3.6 Exit Options

```
                        BIOS SETUP UTILITY
 Main    Advanced    Chipset    Boot    Security    Exit

 Exit Options                                  Exit system setup
 _____              after saving the
                                               changes.
 Save Changes and Exit
 Discard Changes and Exit                      F10 key can be used
 Load Optimal Defaults                         for this operation.




                                               ←     Select Screen
                                               ↑↓     Select Item
                                               Enter Go to Sub Screen
                                               F1     General Help
                                               F10    Save and Exit
                                               ESC    Exit



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```

Save Changes and Exit

Pressing <Enter> on this item and it asks for confirmation:

Save configuration changes and exit setup?

Pressing <OK> stores the selection made in the menus in CMOS - a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Discard Changes and Exit

Exit system setup without saving any changes.
<ESC> key can be used for this operation.

Load Optimal Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message:

Load Optimal Defaults?
[OK]   [Cancel]

Pressing [OK] loads the BIOS Optimal Default values for all the setup questions.

<F9> key can be used for this operation.

Chapter 4

Appendix

4.1 I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.
The following table lists the I/O port addresses used.

Address	Device Description
00000000 - 0000000F	DMA Controller
00000080 - 0000009F	DMA Controller
000000C0 - 000000DF	DMA Controller
00000020 - 00000021	Programmable Interrupt Controller
000000A0 - 000000A1	Programmable Interrupt Controller
00000040 - 00000043	System Timer
00000044 - 00000047	System Timer
00000060 - 00000064	Keyboard Controller
00000070 - 00000073	System CMOS/Real Time Clock
000000F0 - 000000FF	Math Co-processor
000001F0 - 000001F7	Primary IDE
00000274 - 00000277	ISAPNP Read Data Port
00000279, 00000A79	ISAPNP Configuration
000002F8 - 000002FF	Communications Port (COM2, If use)
00000378 - 0000037A	Parallel Port (If use)
000003B0 - 000003BF	MDA/MGA
000003C0 - 000003CF	EGA/VGA
000003D4 - 000003D9	CGA Analog RGB register
000003F0 - 000003F7	Floppy Diskette
000003F6 - 000003F6	Primary IDE
000003F8 - 000003FF	Communications Port (COM1, If use)
00000400 - 0000041F	South Bridge SMB
000004D0 - 000004D1	IRQ Edge/Level Control Ports
00000500 - 0000053F	South Btidge GPIO
00000800 - 0000087F	ACPI
00000A00 - 00000A07	PME

00000A10 - 00000A17	Hardware Monitor
00000CF8	PCI Configuration Address
00000CFC	PCI Configuration Data

4.2 Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System Timer
IRQ 1	Keyboard Controller
IRQ 2	VGA and Link to Secondary PIC
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	PCI Device
IRQ 6	Standard Floppy Disk Controller
IRQ 7	Parallel Port
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	PCI Device
IRQ 11	PCI Device
IRQ 12	PS/2 Compatible Mouse
IRQ 13	FPU Exception
IRQ 14	IDE Controller
IRQ 15	PCI Device

4.3 BIOS memory mapping

Address	Device Description
00000h - 9FFFFh	DOS Kernel Area
A0000h, BFFFFh	EGA and VGA Video Buffer (128KB)
C00000h - CFFFFh	EGA/VGA ROM
D0000h - DFFFFh	Adaptor ROM
E00000h - FFFFFh	System BIOS

4.4 Watchdog Timer (WDT) Setting

WDT is widely used for industry application to monitoring the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, the functional normal system will reload the WDT. The WDT never time out for a normal system. Then, WDT will time out and reset the system automatically to avoid abnormal operation.

This board supports 255 levels watchdog timer by software programming. Below are the source codes written in assembly & C, please take them for WDT application examples.

Assembly Code

```
;-- Initial W83627hf --
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 87h
        out     DX, AX          ;
        out     DX, AX          ; initial W83627HF start
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 2Bh
        out     DX, AL          ; Select CR2B
        mov     AL, 00h
        inc     DX
        out     DX, AL          ; Set CR2B bit 4=0, PIN89=WDTO
;--
        mov     AX, 2Eh
```

```
        mov     DX, AX
        mov     AL, 07h
        out     DX, AL          ; Point to Logical Device Selector
        mov     AL, 08h
        inc     DX
        out     DX, AL          ; Select Logical Device 8
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 30h
        out     DX, AL          ; select CR30
        mov     AL, 01h
        inc     DX
        out     DX, AL          ; update CR30 to 01h
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F0h
        out     DX, AL          ; select CRF0
        mov     AL, 00h
        inc     DX
        out     DX, AL          ; set CRF0=00h, output
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F5h
        out     DX, AL          ; select CRF5, WDT Timer unit
        mov     AL, 00h         ; bit2 =0 ->second ; bit2 =1 -> minute
        inc     DX
        out     DX, AL          ; update CRF5 bit2 to 00h
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F6h
        out     DX, AL          ; select CRF6, WDT Timer
        mov     AL, 05h
        inc     DX
        out     DX, AL          ; update CRF6 to 5 unit
;---
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, AAh
        out     DX, AX
;-- end
```

C Language Code

```
/*-----      Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*-----      routing, sub-routing -----*/

void main()

{
        outportb(0x2e, 0x87);       /* initial IO port twice */
        outportb(0x2e, 0x87);

        outportb(0x2e, 0x2B);       /* select CR2B */
        outportb(0x2e+1, 0x00);     /* update CR2B bit4 to 00h */
                                    /* Set PIN89 as WDTO */

        outportb(0x2e, 0x07);       /* point to logical device selector */
        outportb(0x2e+1, 0x08);     /* select logical device 8 */
        outportb(0x2e, 0x30);       /* select CR30 */
        outportb(0x2e+1, 0x01);     /* update CR30 to 01h */
        outportb(0x2e, 0xf0);       /* select CRF0 */
        outportb(0x2e+1, 0x00);     /* update CRF0 to 00h */
        outportb(0x2e, 0xf5);       /* select CRF5 to set timer unit */
        outportb(0x2e+1, 0x00);     /* update CRF5 bit2, 0:sec; 1:Min. */
        outportb(0x2e, 0xF6);       /* select CRF6 */
        outportb(0x2e+1, 0x05);     /* update CRF6 to 05h (5 sec) */

        outportb(0x2e, 0xAA);       /* stop program W83627HF, Exit */
}
```

4.5 Digital I/O Setting

Below are the source codes written in assembly & C, please take them for Digital I/O application examples.

Assembly Code

```
;-- Initial W83627hf --
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 87h
        out     DX, AX          ;
        out     DX, AX          ; initial W83627HF start
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 2Ah
        out     DX, AL          ; Select CR2A
        mov     AL, 0FCh
        INC     DX
        out     DX, AL          ; Set CR2A bit 7=1 as GPIO port 1
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 07h
        out     DX, AL          ; Point to Logical Device Selector
        mov     AL, 07h
        inc     DX
        out     DX, AL          ; Select Logical Device 7
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 30h
        out     DX, AL          ; select CR30
        mov     AL, 01h
        inc     DX
        out     DX, AL          ; set bit0=1, GPIO port 1 active
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F0h
        out     DX, AL          ; select CRF0, GP I/O select
        mov     AL, 00h
```

```
        inc     DX
        OUT     DX, AL          ; bit7~bit0 0:output  1:input
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F1h
        out     DX, AL          ; select CRF1, Data Register
        mov     AL, 0FFh
        inc     DX
        out     DX, AL          ; set all GPIO pin output 1
;--
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, 0F1h
        out     DX, AL          ; select CRF1, Data Register
        mov     AL, 000h
        inc     DX
        out     DX, AL          ; set all GPIO pin output 0
;---
        mov     AX, 2Eh
        mov     DX, AX
        mov     AL, AAh
        out     DX, AX
;-- end
```

C Language Code

```
/*-----    Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"


/*-----    routing, sub-routing -----*/

void main()

{
        outportb(0x2e, 0x87);        /* initial IO port twice */
        outportb(0x2e, 0x87);

        outportb(0x2e, 0x2a);        /* Select CR2A */
        outportb(0x2e+1, 0xfc);      /* set CR2A bit7=1 as GPIO port 1*/

        outportb(0x2e, 0x07);        /* point to logical device */
        outportb(0x2e+1, 0x07);      /* select logical device 7 */

        outportb(0x2e, 0x30);        /* select CR30 */
        outportb(0x2e+1, 0x01);      /* set bit0=1, GPIO port 1 active */

        outportb(0x2e, 0xf0);        /* select CRF0, GP I/O select */
        outportb(0x2e+1, 0x00);      /* bit7~bit0 0:output  1:input */

        outportb(0x2e, 0xf1);        /* select CRF1, Data Register */
        outportb(0x2e+1, 0xff);      /* set all GPIO pin output 1 */

        outportb(0x2e, 0xf1);        /* select CRF1, Data Register */
        outportb(0x2e+1, 0x00);      /* set all GPIO pin output 0 */

        outportb(0x2e, 0xAA);        /* stop program W83627HF, Exit */

}
```

Any advice or comments about our products and service, or anything we can help you with 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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