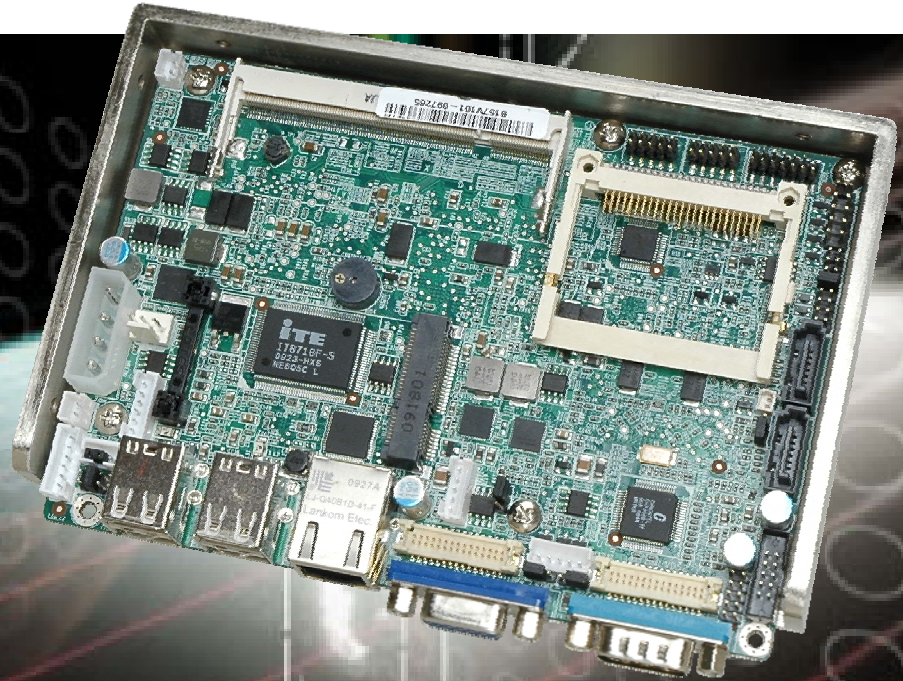




IEI Technology Corp.



MODEL:

WAFER-945GSELVDS2

**3.5" SBC with 1.6 GHz Intel® ATOM™ N270
VGA, Dual LVDS, Gigabit Ethernet, CompactFlash®
Audio and SATA, RoHS Compliant**

User Manual

Rev. 1.01 – 12 August, 2011



Revision

Date	Version	Changes
12 August, 2011	1.01	Modified SATA connector description
24 September, 2009	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

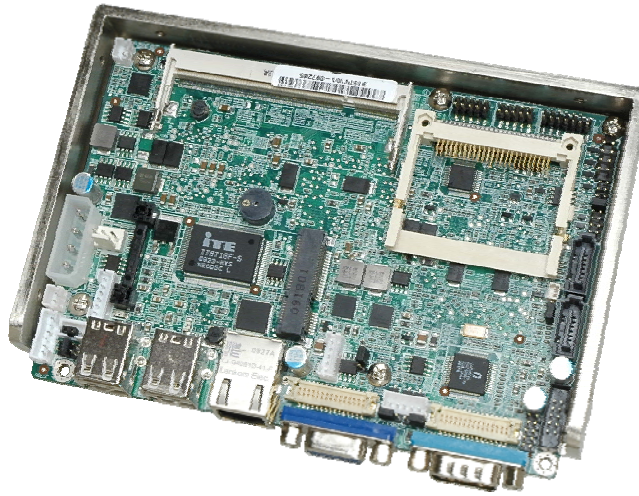


Figure 1-1: WAFER-945GSELVDS2

The WAFER-945GSELVDS2 is a 3.5" motherboard with a 1.6 GHz Intel® ATOM™ N270 processor with 512 KB L2 cache. Also supports one supports one 400 MHz or 533 MHz DDR2 SO-DIMM up to 2.0 GB.

The WAFER-945GSELVDS2 has 18-bit and 24-bit dual-channel LVDS connectors, and a single VGA video output.

External connectors include USB and Gigabit Ethernet connectors. Expansion options include SATA slots, a PCIe Mini card slot, serial port connectors, CompactFlash® card slot and audio connector.

1.2 Overview Photo

The WAFER-945GSELVDS2 has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the WAFER-945GSELVDS2.

WAFER-945GSELVDS2

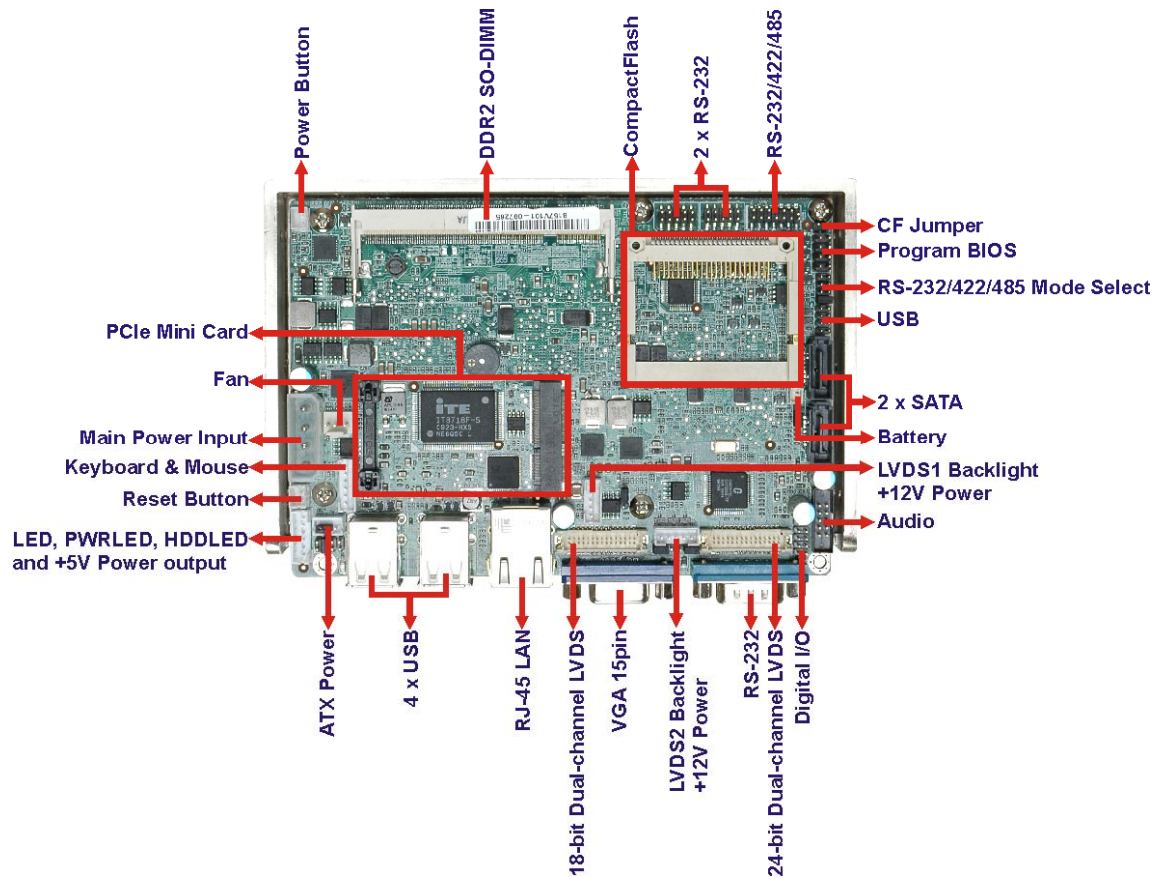


Figure 1-2: WAFER-945GSELVDS2 Overview [Front View]

1.3 Technical Specifications

WAFER-945GSELVDS2 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	WAFER-945GSELVDS2
Form Factor	3.5"
System CPU	1.6 GHz Intel® ATOM™ N270
Front Side Bus (FSB)	533 MHz
Northbridge	Intel® 945GSE
Southbridge	Intel® ICH7M

Specification	WAFER-945GSELVDS2
Memory	One 200-pin SO-DIMM socket supports one 400 MHz or 533 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM
CompactFlash®	One CompactFlash® Type II socket
Super I/O	ITE IT8718
Display	18-bit dual-channel LVDS 24-bit dual-channel LVDS VGA
BIOS	AMI
Audio	Realtek ALC655 AC'97 audio chip
LAN	1 x Realtek 8111CP PCIe GbE chips
COM	3 x RS-232 serial ports (one external, two internal) 1 x RS-232/422/485 serial port (internal)
USB2.0	6 x USB (four external, two internal)
SATA	Two 3.0 Gb/s SATA drives supported
Keyboard/mouse	One internal pin-header connector
Expansion	One PCIe mini card
Digital I/O	8-bit (4-bit input, 4-bit output)
Power Consumption	2.49 A @ 5 V (1.6 GHz Intel ATOM N270 with 2 GB DDR2)
Temperature	0°C – 60°C (32°F - 140°F)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	102 mm x 146 mm
Weight (GW/NW)	700 g / 350 g

Table 1-1: Technical Specifications

WAFER-945GSELVDS2

1.4 Dimensions

The dimensions of the board are shown below:

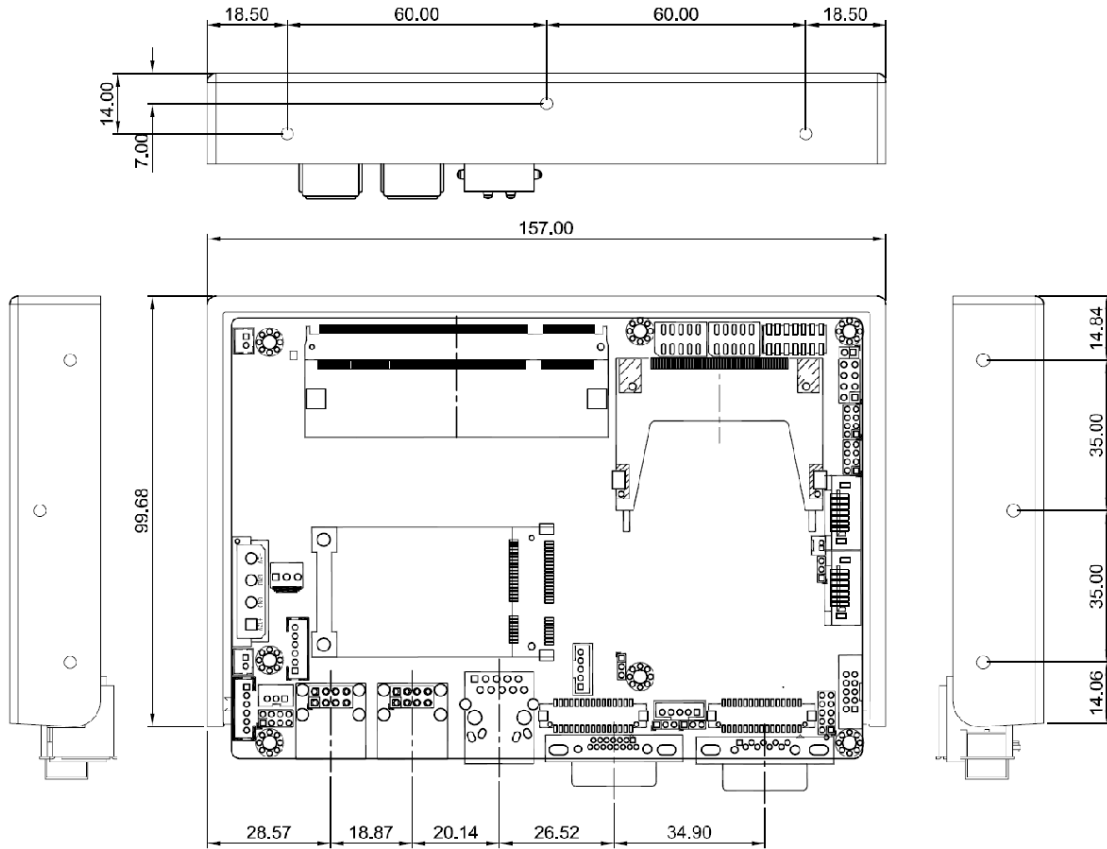


Figure 1-3: Main Dimensions (mm)

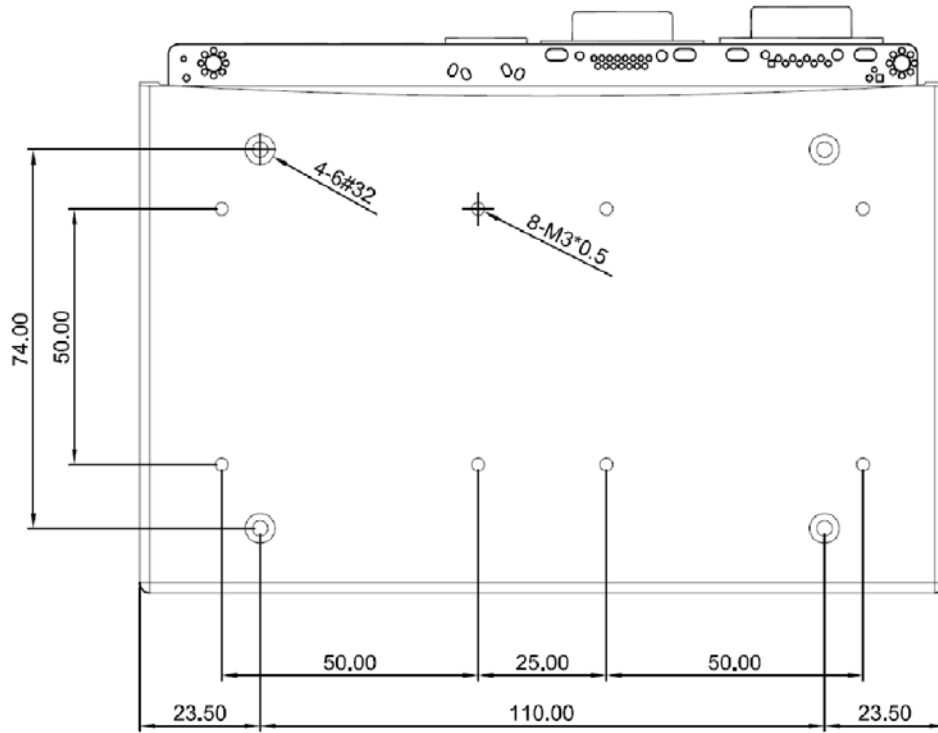


Figure 1-4: Bottom Dimensions (mm)

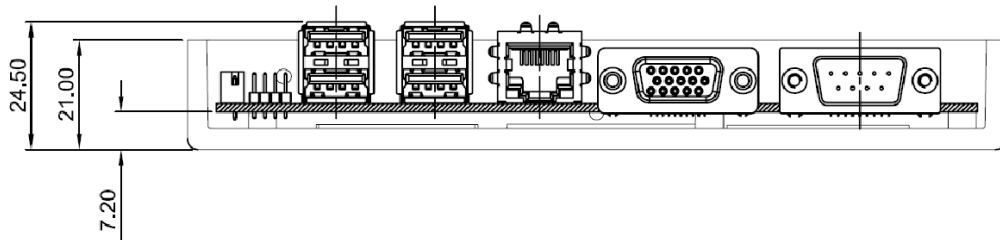


Figure 1-5: External Interface Panel Dimensions (mm)

WAFER-945GSELVDS2

1.5 Data Flow

Figure 1-6 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

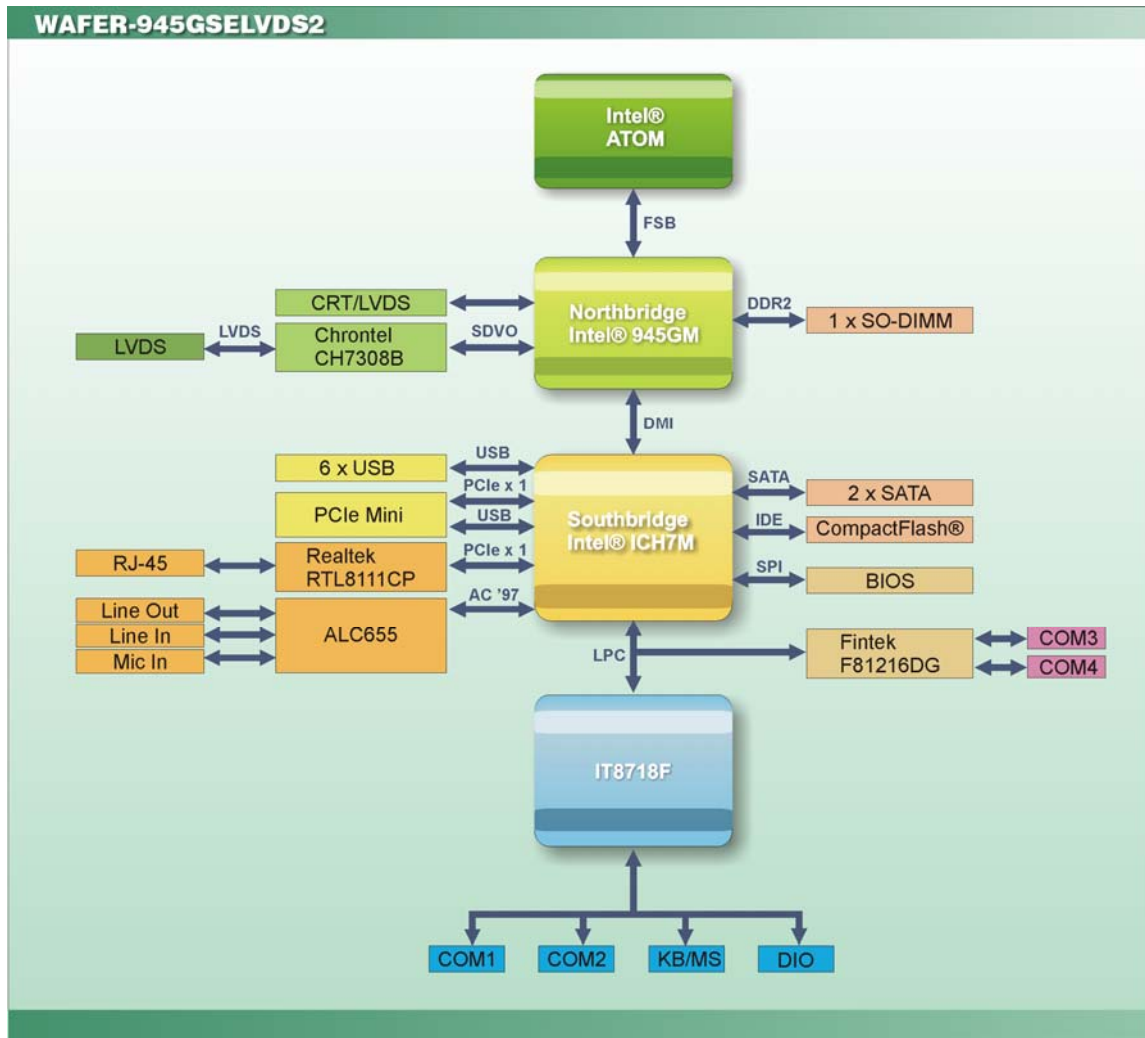


Figure 1-6: Data Flow Block Diagram

Chapter

2

Unpacking

WAFER-945GSELVDS2

2.1 Anti-static Precautions



WARNING!

Failure to take ESD precautions during the installation of the WAFER-945GSELVDS2 may result in permanent damage to the WAFER-945GSELVDS2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-945GSELVDS2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WAFER-945GSELVDS2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the WAFER-945GSELVDS2, place it on an anti-static pad. This reduces the possibility of ESD damaging the WAFER-945GSELVDS2.
- **Only handle the edges of the PCB:** - When handling the PCB, hold the PCB by the edges.

2.2 Unpacking

2.2.1 Unpacking Precautions

When the WAFER-945GSELVDS2 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the WAFER-945GSELVDS2 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

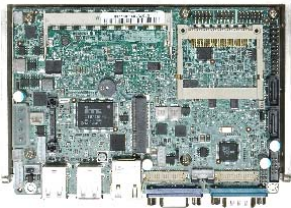







NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the WAFER-945GSELVDS2 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

2.3.1 Package Contents

The WAFER-945GSELVDS2 is shipped with the following components:

Quantity	Item and Part Number	Image
1	WAFER-945GSELVDS2	
2	SATA cable (P/N: 32000-062800-RS)	
1	KB/MS Cable (P/N: 32000-023800-RS)	
1	Audio cable (P/N: 32000-072100-RS)	
1	Serial port cable (P/N: 32200-000049-RS)	
1	Mini jumper pack (2.0mm) (P/N:33100-000033-RS)	

WAFER-945GSELVDS2



Quantity	Item and Part Number	Image
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

2.3.2 Optional Items

The WAFER-945GSELVDS2 is shipped with the following components:





Item and Part Number	Image
Dual USB cable (wo bracket) (P/N: 32000-070301-RS)	
RS-232/422/485 cable (P/N:32200-026500-RS)	
ATX cable (P/N: 32100-052100)	
SATA power cable (P/N: 32100-088600-RS)	

Table 2-2: Optional Items



Chapter

3

Connectors

WAFER-945GSELVDS2

3.1 Peripheral Interface Connectors

The connectors on the WAFER-945GSELVDS2 are shown in the diagram below.

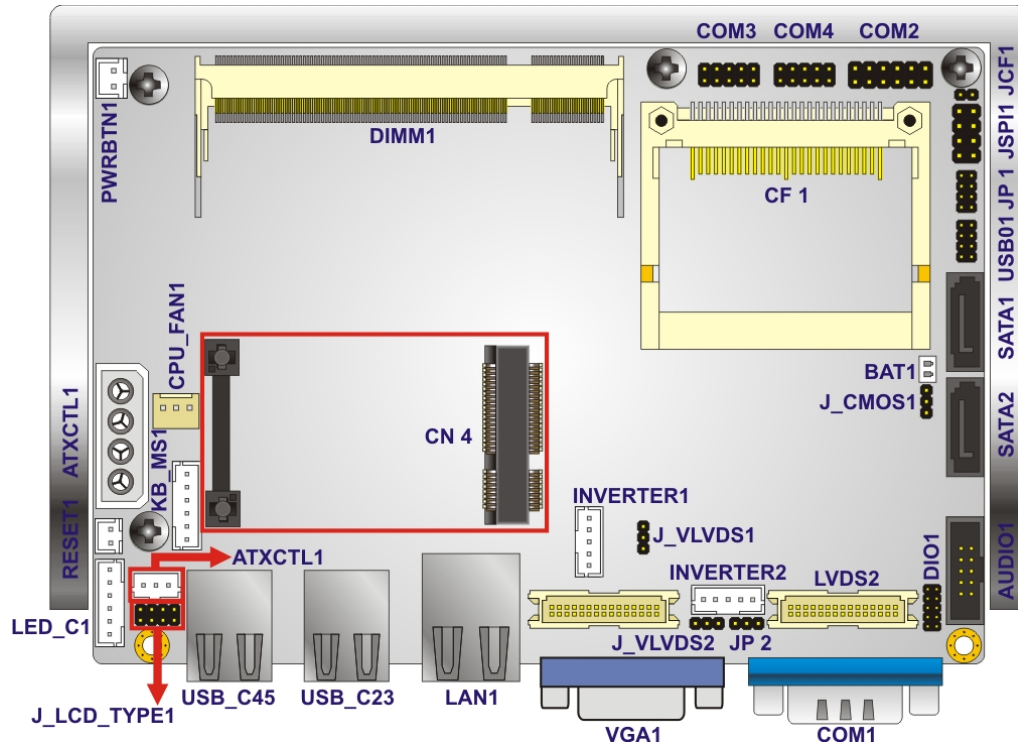


Figure 3-1: Connector and Jumper Locations [Front Side]

3.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the WAFER-945GSELVDS2. Detailed descriptions of these connectors can be found below.

3.2.1 Internal Peripheral Connectors

Connector	Type	Label
ATX enable connector	3-pin wafer	ATXCTL1
ATX power connector	4-pin molex	ATXPWR1
Audio connector	10-pin header	AUDIO1
Battery connector	2-pin box header	BT1
CompactFlash® slot	CF slot	CF1

Connector	Type	Label
Digital I/O connector	10-pin header	DIO1
Fan connector	3-pin wafer	CPU_FAN1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LED connector	6-pin header	LED_C1
LVDS1 connector	30-pin crimp	LVDS1
LVDS1 inverter connector	5-pin wafer	INVERTER1
LVDS2 connector	30-pin crimp	LVDS2
LVDS2 inverter connector	5-pin wafer	INVERTER2
PCIe Mini Card slot	PCIe Mini Slot	CN4
Power Button	2-pin wafer	PWRBTN1
Reset button connector	2-pin header	RESET1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1, SATA2
Serial port	10-pin header	COM3, COM4
Serial port (RS-232/422/485)	14-pin header	COM2
USB 2.0 connector	8-pin header	USB01

Table 3-1: Peripheral Interface Connectors

3.2.2 External Interface Panel Connectors

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
RS-232 serial port connector	Male DB-9	COM1
Dual USB port	USB port	USB_C23 USB_C45
VGA port connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

WAFER-945GSELVDS2

3.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the WAFER-945GSELVDS2.

3.3.1 ATX Power Connector

- CN Label:** ATXPWR1
- CN Type:** 4-pin AT power connector (1x4)
- CN Location:** See Figure 3-2
- CN Pinouts:** See Table 3-3

The 4-pin ATX power connector is connected to an ATX power supply.

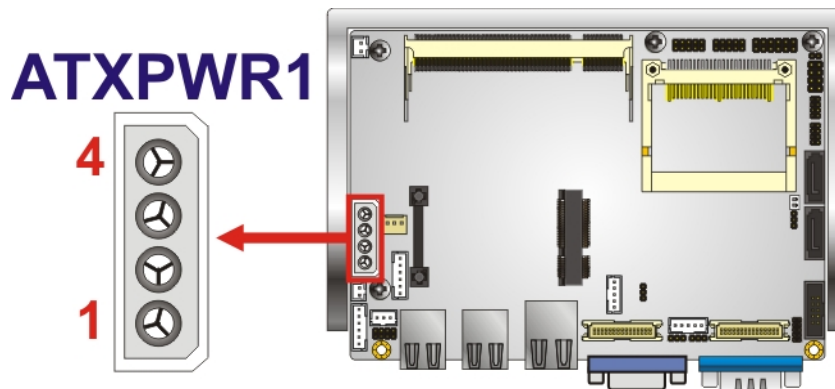


Figure 3-2: ATX Power Connector Location

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

Table 3-3: ATX Power Connector Pinouts

3.3.2 ATX Power Control Connector

- CN Label:** ATXCTL1

CN Type: 3-pin wafer (1x3)

CN Location: See Figure 3-3

CN Pinouts: See Table 3-4

Short pins 2-3 for AT power use, or connect to power control cable for ATX power control use.

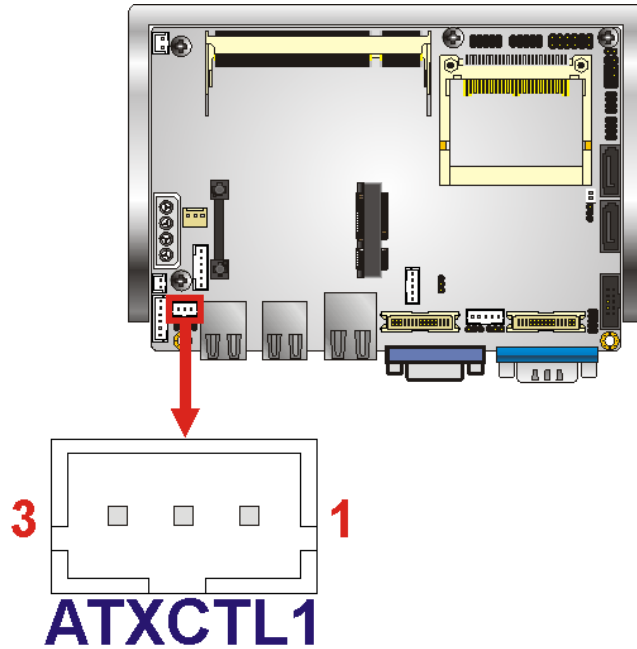


Figure 3-3: ATX Power Control Connector Location

Pin	Description
1	+5V Standby
2	GND
3	PS_ON#

Table 3-4: ATX Power Supply Enable Connector Pinouts

3.3.3 Audio Connector

CN Label: AUDIO1

CN Type: 10-pin header

CN Location: See Figure 3-4

WAFER-945GSELVDS2

CN Pinouts: See Table 3-5

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

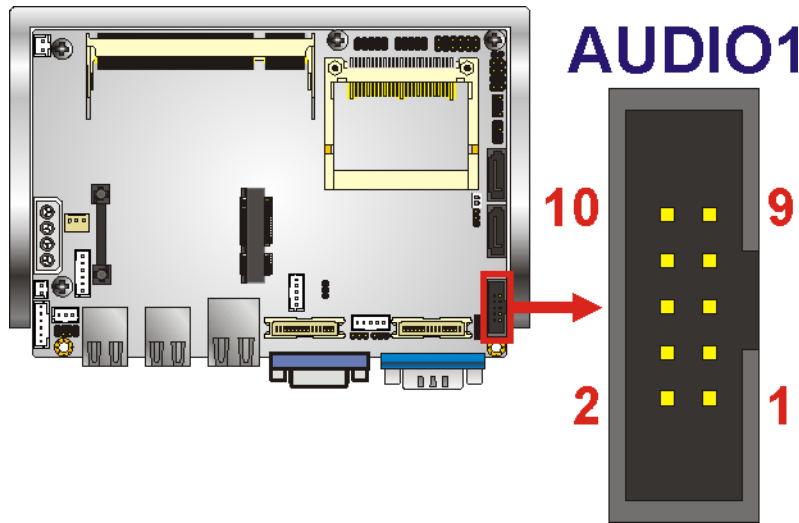


Figure 3-4: Audio Connector Pinouts

Pin	Description	Pin	Description
1	Line out R	2	Line in R
3	GND	4	GND
5	Line out L	6	Line in L
7	GND	8	GND
9	MIC in	10	Mic in

Table 3-5: Audio Connector Pinouts

3.3.4 Battery Connector



NOTE:

Attach the battery to the board or enclosure before use. Only the battery cable is connected before shipping, but battery must also be attached to a surface.

- CN Label:** BAT1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-6**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

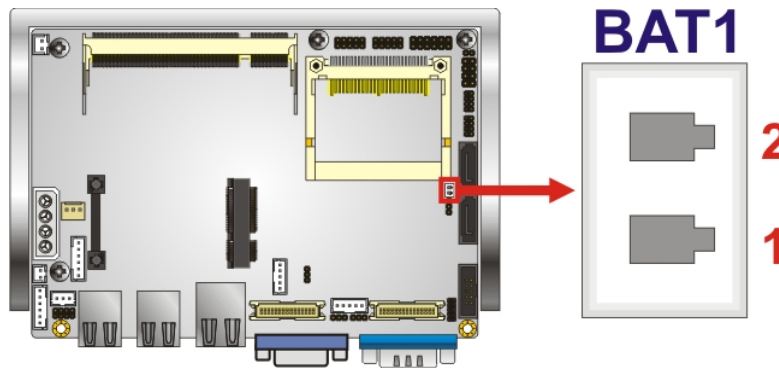


Figure 3-5: Battery Connector Location

Pin	Description
1	Battery+
2	Ground

Table 3-6: Battery Connector Pinouts

3.3.5 CompactFlash® Slot

- CN Label:** CF1
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 3-6
- CN Pinouts:** See Table 3-7

Used for installing a CompactFlash® card.

WAFER-945GSELVDS2

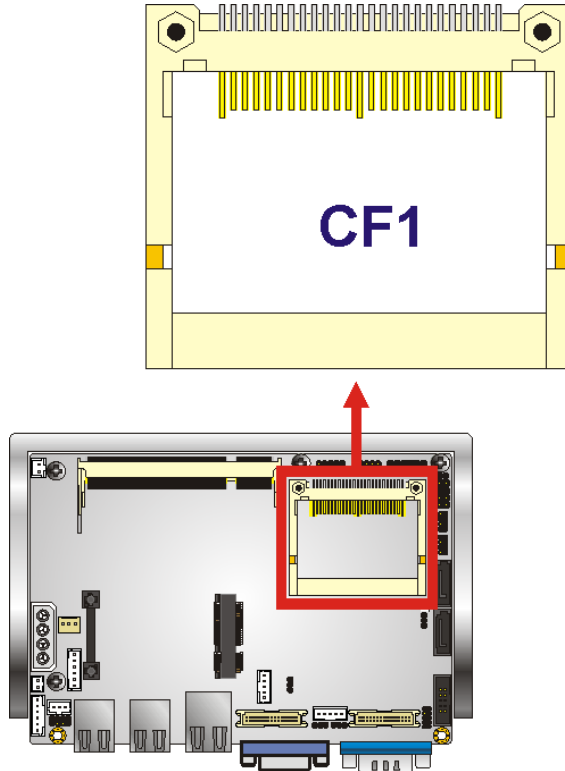


Figure 3-6: CF Card Slot Location

Pin	Description	Pin	Description
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#

Pin	Description	Pin	Description
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16#	49	D10
25	CD2#	50	GND2

Table 3-7: CF Card Slot Pinouts

3.3.6 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin header (2x5)
- CN Location:** See Figure 3-7
- CN Pinouts:** See Table 3-8

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

WAFER-945GSELVDS2

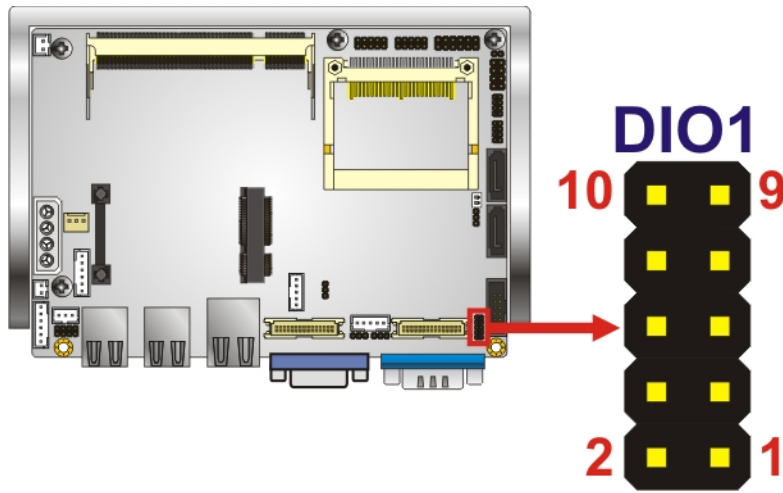


Figure 3-7: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-8: Digital I/O Connector Location

3.3.7 CPU Fan Connector

- CN Label:** CPU_FAN1
- CN Type:** 3-pin header
- CN Location:** See Figure 3-8
- CN Pinouts:** See Table 3-9

Connects to a CPU fan.

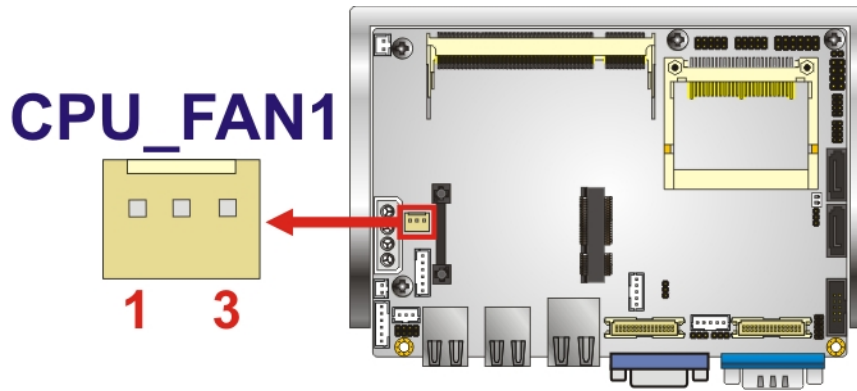


Figure 3-8: CPU Fan Connector Location

Pin	Description
1	GND
2	+12V
3	Fan Speed Detect

Table 3-9: CPU Fan Connector Pinouts

3.3.8 Keyboard/Mouse Connector

- CN Label:** KB_MS1
- CN Type:** 6-pin header (1x6)
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-10

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.

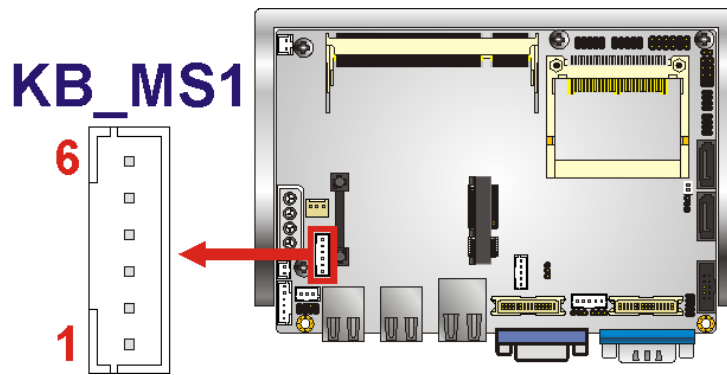


Figure 3-9: Keyboard/Mouse Connector Location

Pin	Description
1	VCC (+5 V)
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 3-10: Keyboard/Mouse Connector Pinouts

3.3.9 LED Connector

- CN Label:** LED_C1
- CN Type:** 6-pin wafer (1x6)
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-11

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.

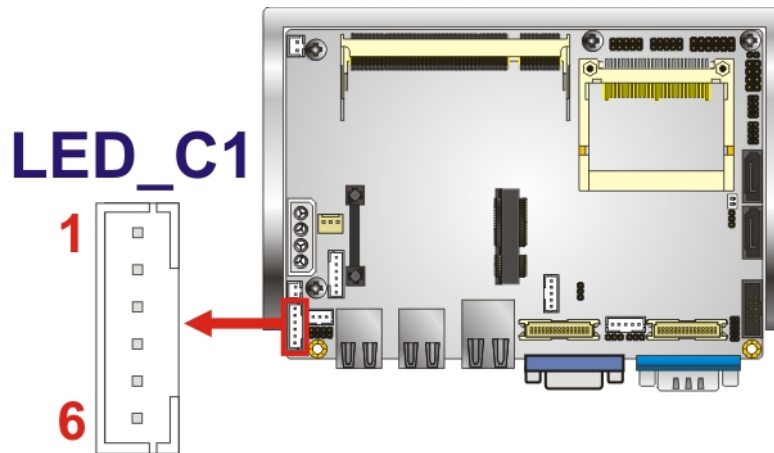


Figure 3-10: LED Connector Locations

Pin	Description
1	+5V
2	GND
3	Power LED+
4	Power LED-
5	HDD LED+
6	HDD LED-

Table 3-11: LED Connector Pinouts

3.3.10 LVDS1 LCD Connector

- CN Label:** LVDS1
- CN Type:** 30-pin crimp (2x15)
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-12**

The 18-bit, dual-channel LVDS connector can be attached to any compatible LVDS monitor.

WAFER-945GSELVDS2

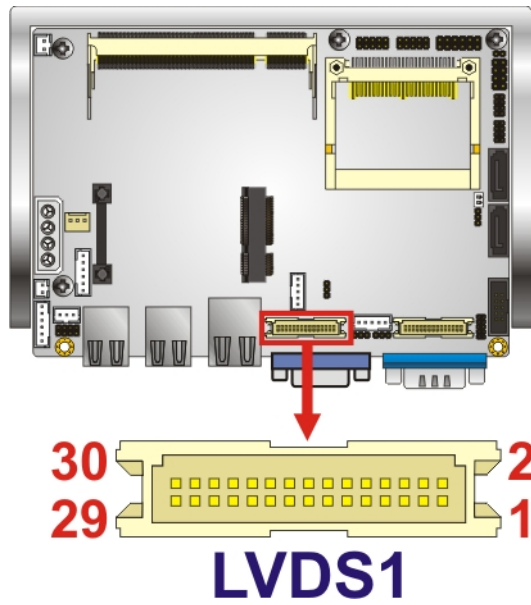


Figure 3-11: LVDS1 Location

Pin	Description	Pin	Description
1	GND1	2	GND2
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	NC	12	NC
13	GND3	14	GND4
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	NC	24	NC
25	GND5	26	GND6
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

Table 3-12: LVDS1 Pinouts

3.3.11 LVDS1 Inverter Connector

- CN Label:** **INVERTER1**
- CN Type:** 5-pin wafer (1x5)
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-13

Provides power to an LVDS monitor.

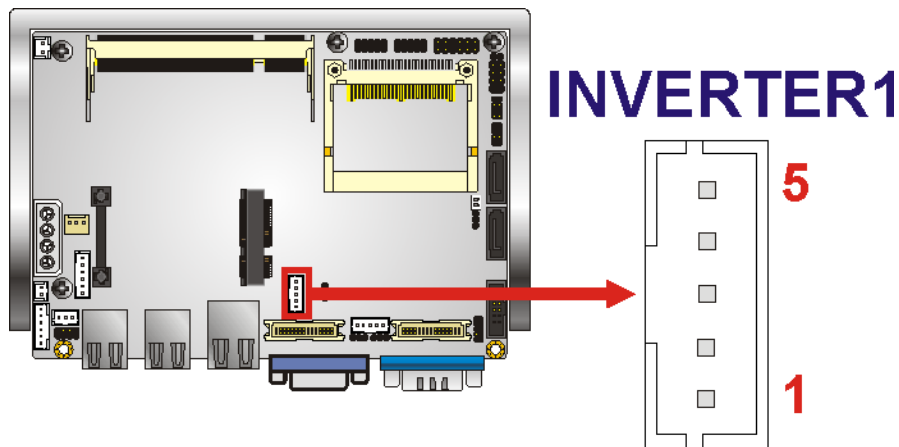


Figure 3-12: Backlight Connector Pinout Locations

Pin	Description
1	LCD Backlight Control
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT Enable

Table 3-13: Backlight Connector Pinouts

3.3.12 LVDS2 LCD Connector

- CN Label:** **LVDS2**
- CN Type:** 30-pin crimp (2x15)
- CN Location:** See **Figure 3-13**

WAFER-945GSELVDS2

CN Pinouts: See Table 3-14

The 18-bit, dual-channel LVDS connector can be attached to any compatible LVDS monitor.

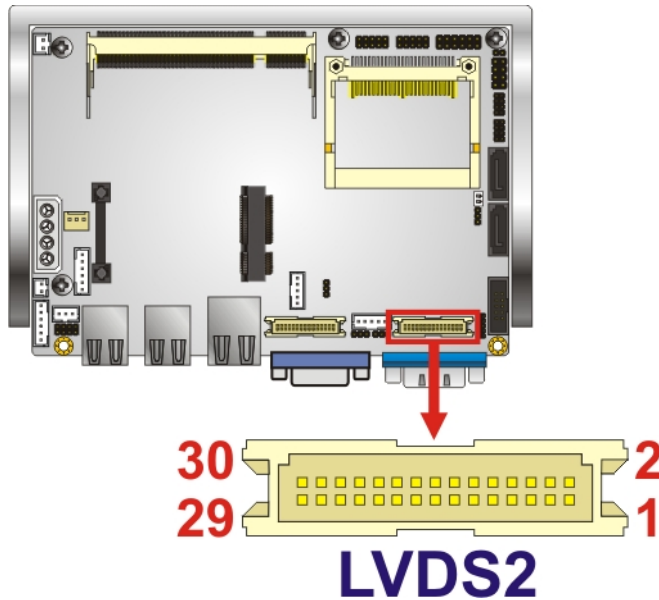


Figure 3-13: LVDS2 Location

Pin	Description	Pin	Description
1	GND1	2	GND2
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND3	14	GND4
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND5	26	GND6
27	VCC_LCD	28	VCC_LCD

Pin	Description	Pin	Description
29	VCC_LCD	30	VCC_LCD

Table 3-14: LVDS2 Pinouts

3.3.13 LVDS2 Inverter Connector

- CN Label:** INVERTER2
- CN Type:** 5-pin wafer (1x5)
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-13

Provides power to an LVDS monitor.

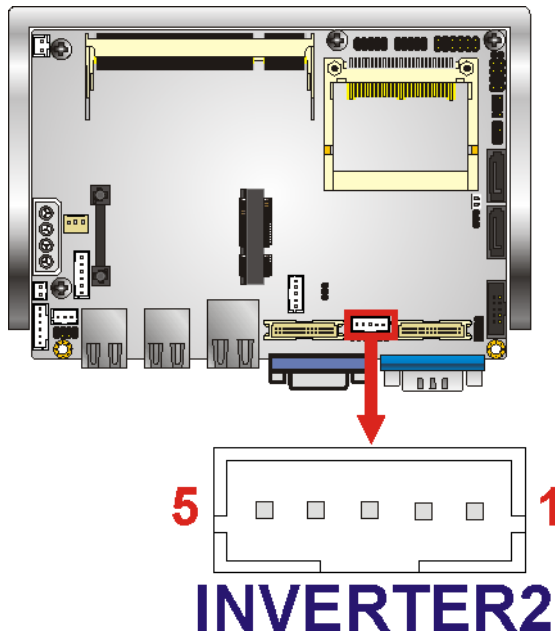


Figure 3-14: Backlight Connector Pinout Locations

Pin	Description
1	LCD Backlight Control
2	GROUND
3	+12V
4	GROUND

WAFER-945GSELVDS2

Pin	Description
5	BACKLIGHT Enable

Table 3-15: Backlight Connector Pinouts

3.3.14 PCIe Mini Card Slot

CN Label:	CN4
CN Type:	52-pin Mini PCIe Card Slot
CN Location:	See Figure 3-15
CN Pinouts:	See Table 3-16

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards.

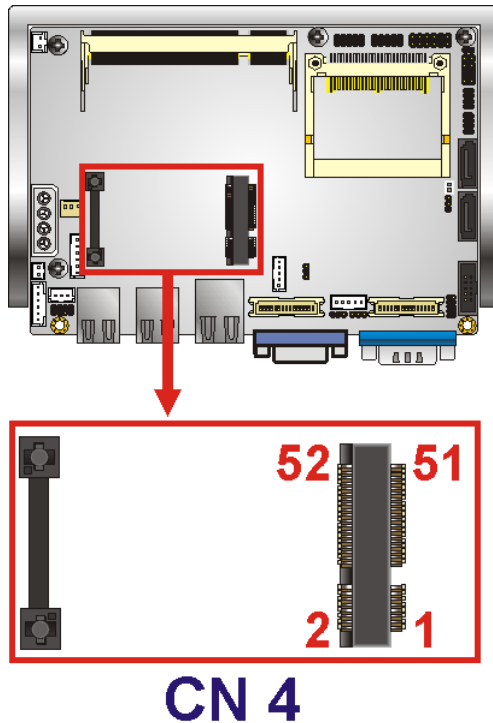


Figure 3-15: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V

Pin	Description	Pin	Description
7	CLKREQ#	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-16: PCIe Mini Card Slot Pinouts

3.3.15 Power Button Connector

- CN Label:** PWRBTN1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See Figure 3-16
- CN Pinouts:** See Table 3-17

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Turns the system on and off when the system is set to ATX power mode.

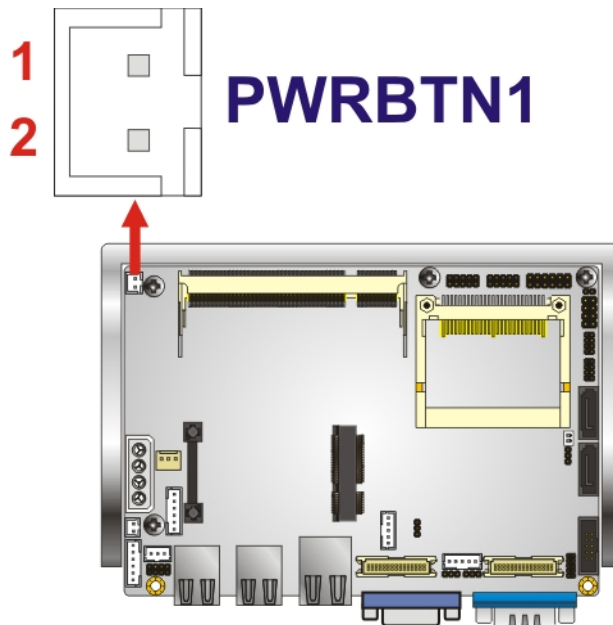


Figure 3-16: Power Button Connector Location

Pin	Description
1	Power Switch
2	GND

Table 3-17: Power Button Connector Pinouts

3.3.16 Reset Button Connector

- CN Label:** RESET1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See Figure 3-17
- CN Pinouts:** See Table 3-18

Used to reset the system when set to use ATX power.

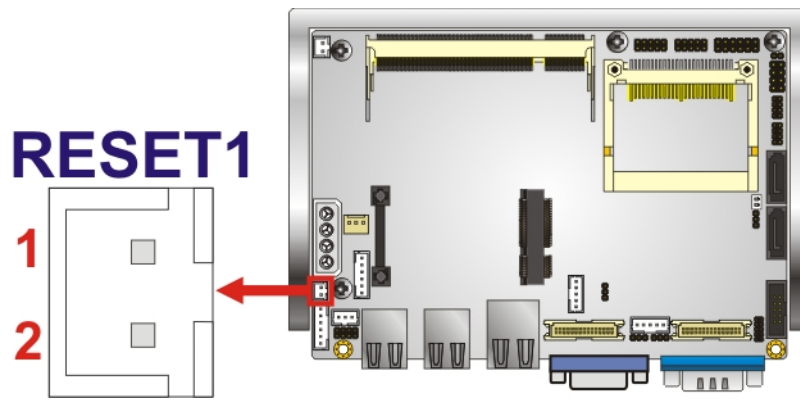


Figure 3-17: Reset Button Connector Locations

Pin	Description
1	Reset Switch
2	GND

Table 3-18: Reset Button Connector Pinouts

3.3.17 SATA Drive Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See Figure 3-18
- CN Pinouts:** See Table 3-19

The SATA drive connectors can be connected to SATA drives and support up to 3.0 Gb/s data transfer rate.

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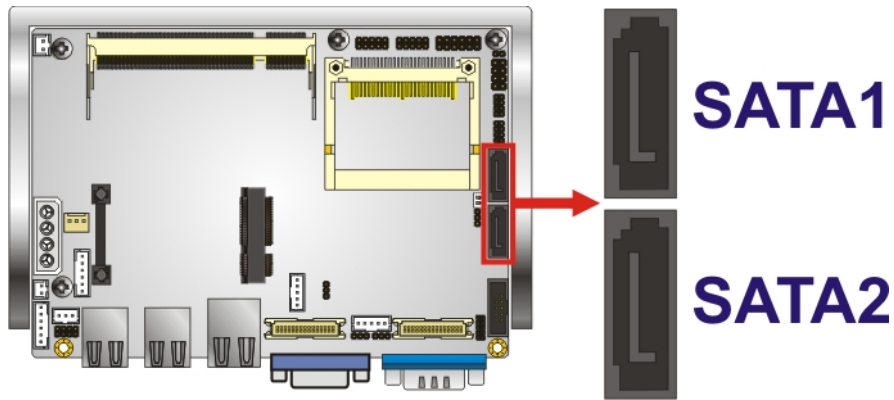


Figure 3-18: SATA Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-19: SATA Drive Connector Pinouts

3.3.18 Serial Port Connector

- CN Label:** COM3, COM4
- CN Type:** 10-pin header
- CN Location:** See Figure 3-19
- CN Pinouts:** See Table 3-20

Provide an RS-232 communications connection.

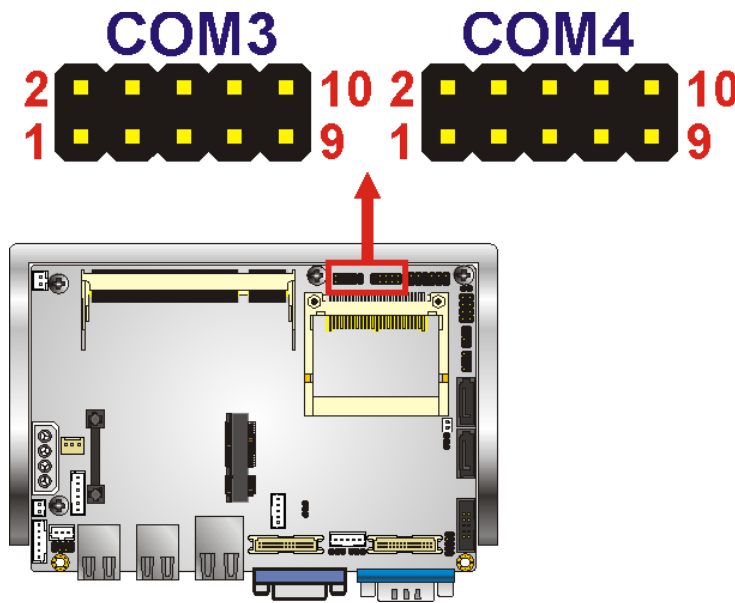


Figure 3-19: Serial Port Connector Location

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

Table 3-20: Serial Port Pinouts

3.3.19 Serial Port Connector (RS-232/422/485)

- CN Label:** COM2
- CN Type:** 14-pin header (2x7)
- CN Location:** See Figure 3-20
- CN Pinouts:** See Table 3-21

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multi function channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

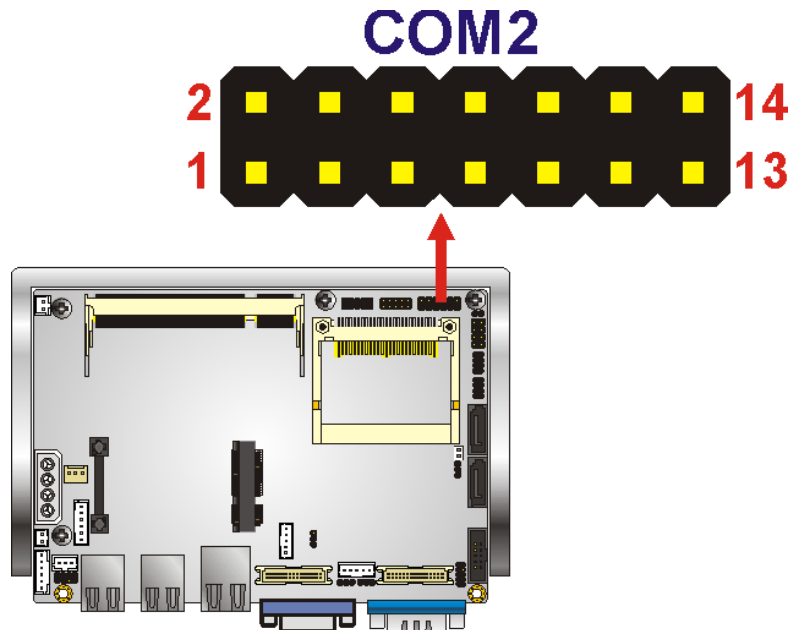


Figure 3-20: RS-232/422/485 Serial Port Connector Location

Pin	Description	Pin	Description
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND	10	N/C
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 3-21: RS-232/RS-485 Serial Port Connector Pinouts

3.3.20 USB Connector

- CN Label:** USB01
- CN Type:** 8-pin header (2x4)
- CN Location:** See Figure 3-21
- CN Pinouts:** See Table 3-22

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

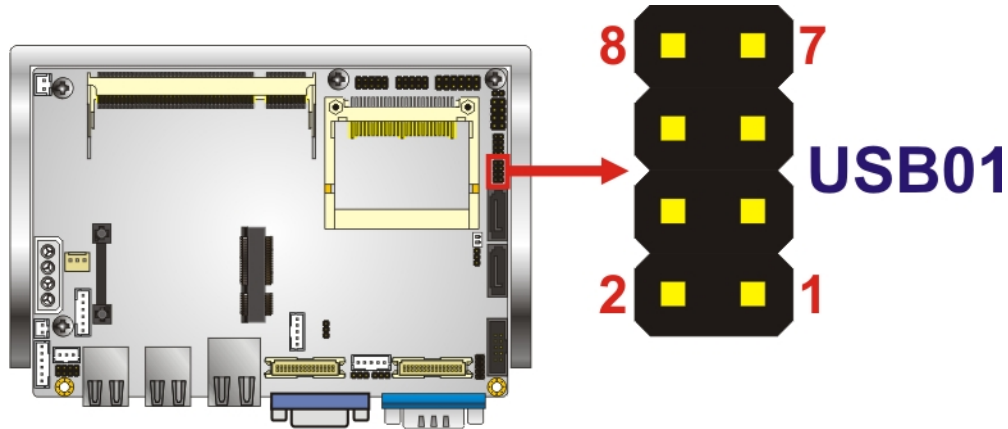


Figure 3-21: USB Connector Pinout Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-22: USB Port Connector Pinouts

3.4 External Peripheral Interface Connector Panel

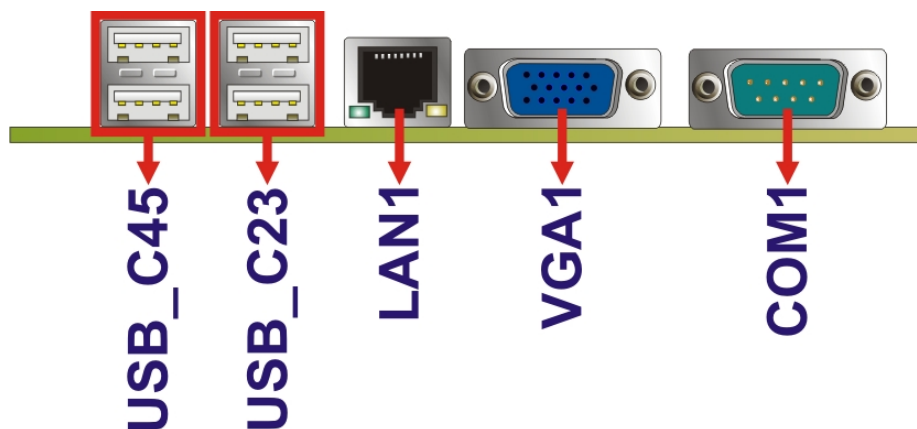


Figure 3-22: WAFER-945GSELVDS2 External Peripheral Interface Connector

WAFER-945GSELVDS2

3.4.1 LAN Connectors

- CN Label:** LAN1
- CN Type:** RJ-45
- CN Location:** See Figure 3-22
- CN Pinouts:** See Table 3-23

The WAFER-945GSELVDS2 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-23: LAN Pinouts

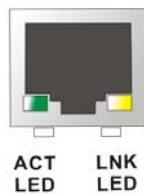


Figure 3-23: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-24**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
Green	Activity	Yellow	Linked

Table 3-24: RJ-45 Ethernet Connector LEDs

3.4.2 Serial Port Connector

- CN Label:** COM1
- CN Type:** DB-9 connectors
- CN Location:** See Figure 3-22
- CN Pinouts:** See Table 3-25 and Figure 3-24

The 9-pin DB-9 serial port connectors are connected to RS-232 serial communications devices.

Pin	Description	Pin	Description
1	DCD#	6	DSR#
2	RX	7	RTS#
3	TX	8	CTS#
4	DTR#	9	RI#
5	GND		

Table 3-25: Serial Port Pinouts

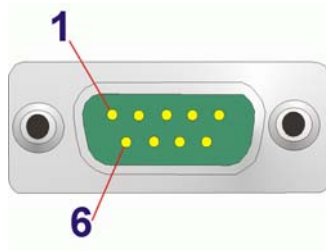


Figure 3-24: Serial Port Pin Location

3.4.3 USB Connectors

- CN Label:** USB_C45
- CN Type:** Dual USB port
- CN Location:** See Figure 3-22
- CN Pinouts:** See Table 3-26

The WAFER-945GSELVDS2 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

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Pin	Description	Pin	Description
1	VCC (+5V)	5	VCC (+5V)
2	DATA4-	6	DATA5-
3	DATA4+	7	DATA5+
4	GND	8	GND

Table 3-26: USB Port Pinouts

3.4.4 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See Figure 3-22
- CN Pinouts:** See Figure 3-25 and Table 3-27

The WAFER-945GSELVDS2 has a single 15-pin female connector for connectivity to standard display devices.

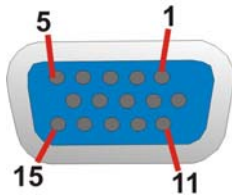


Figure 3-25: VGA Connector

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	CRT_PLUG-
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-27: VGA Connector Pinouts



Chapter

4

Installation

WAFER-945GSELVDS2

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the WAFER-945GSELVDS2 may result in permanent damage to the WAFER-945GSELVDS2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-945GSELVDS2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WAFER-945GSELVDS2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:***- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the WAFER-945GSELVDS2, place it on an anti-static pad. This reduces the possibility of ESD damaging the WAFER-945GSELVDS2.
- ***Only handle the edges of the PCB:-:*** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the WAFER-945GSELVDS2 is installed. All installation notices pertaining to the installation of the WAFER-945GSELVDS2 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the WAFER-945GSELVDS2 and injury to the person installing the motherboard.

4.2.1 Installation Notices



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the WAFER-945GSELVDS2, WAFER-945GSELVDS2 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the WAFER-945GSELVDS2 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the WAFER-945GSELVDS2 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.

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- Turn all power to the WAFER-945GSELVDS2 off:
 - When working with the WAFER-945GSELVDS2, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the WAFER-945GSELVDS2 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the WAFER-945GSELVDS2 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The WAFER-945GSELVDS2 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
 - SATA drives
 - Power supply
 - USB cable
 - Serial port cable
 - Keyboard and mouse cable
- The following external peripheral devices are properly connected to the chassis:
 - VGA screen
 - USB devices

4.3 Unpacking

When the WAFER-945GSELVDS2 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the WAFER-945GSELVDS2 vendor reseller/vendor where the WAFER-945GSELVDS2 was purchased or contact an IEI sales representative.

4.4 SO-DIMM Installation



WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the WAFER-945GSELVDS2. Please make sure the purchased SO-DIMM complies with the memory specifications of the WAFER-945GSELVDS2. SO-DIMM specifications compliant with the WAFER-945GSELVDS2 are listed in Chapter 2.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 4-1**.

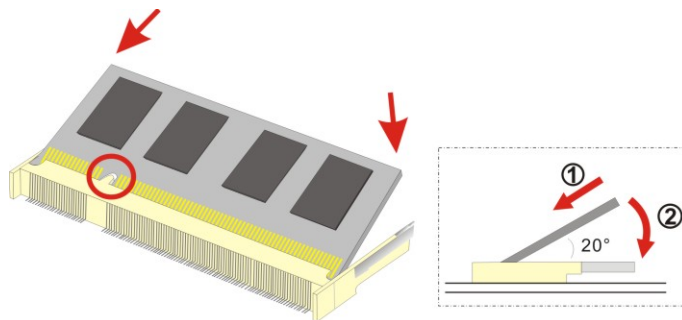


Figure 4-1: SO-DIMM Installation

- Step 1:** **Locate the SO-DIMM socket.** Place the WAFER-945GSELVDS2 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the SO-DIMM with the socket.** The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

WAFER-945GSELVDS2

- Step 3: Insert the SO-DIMM.** Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-1**)
- Step 4: Open the SO-DIMM socket arms.** Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 4-1**)
- Step 5: Secure the SO-DIMM.** Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

4.5 CF Card Installation



NOTE:

The WAFER-945GSELVDS2 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to Chapter 2.

To install the a CF card (Type 1 or Type 2) onto the WAFER-945GSELVDS2, please follow the steps below:

- Step 1: Locate the CF card socket.** Place the WAFER-945GSELVDS2 on an anti-static pad with the solder side facing up. Locate the CF card.
- Step 2: Align the CF card.** Make sure the CF card is properly aligned with the CF socket.
- Step 3: Insert the CF card.** Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 4-2**.

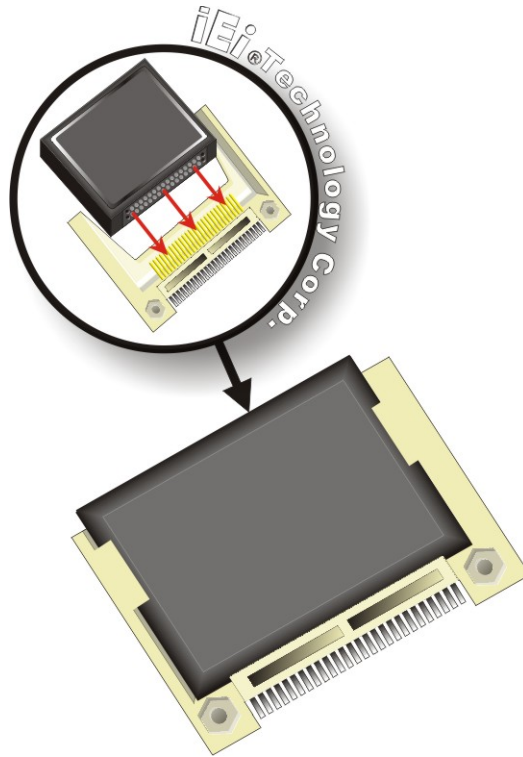


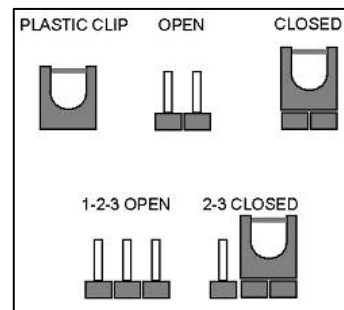
Figure 4-2: CF Card Installation

4.6 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



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Before the WAFER-945GSELVDS2 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the WAFER-945GSELVDS2 are listed in **Table 4-1**.

Description	Label	Type
AT Power Mode Setting	ATXCTL1	2-pin header
Audio Power Source	JP2	3-pin header
CF Card Setting	JCF1	2-pin header
Clear CMOS	J_CMOS1	3-pin header
COM2 Mode Setting	JP1	6-pin header
LVDS1 Panel Resolution	J_LCD_TYPE1	8-pin header
LVDS1 voltage selection	J_VLVDS1	3-pin header
LVDS2 voltage selection	J_VLVDS2	3-pin header

Table 4-1: Jumpers

4.6.1 AT Power Select Jumper Settings



NOTE:

The AT Power Select Jumper is the same as the ATX Enable connector.

Jumper Label:	ATXCTL1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-3

Sets the system to use AT or ATX power. When set to ATX power, the power switch cable must be connected to this jumper.

Pin	Description
2-3	Use AT power

Pin	Description
Open	Use ATX power

Table 4-2: AT Power Select Jumper Settings

The location of the AT Power Select jumper is shown in Figure 4-3 below.

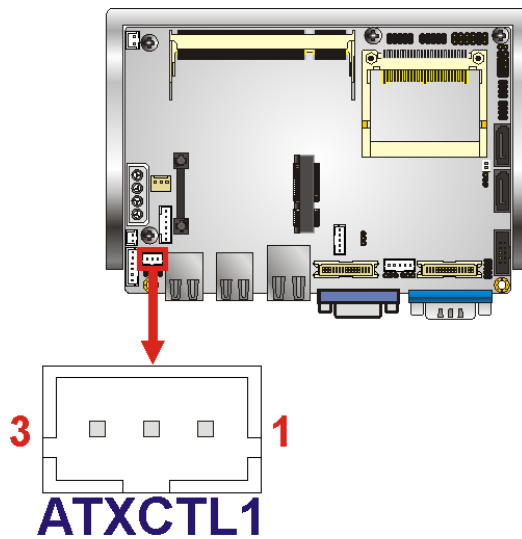


Figure 4-3: AT Power Select Jumper Location

4.6.2 Audio Power Source

- Jumper Label:** JP2
- Jumper Type:** 3-pin header
- Jumper Settings:** See Table 4-3
- Jumper Location:** See Figure 4-4

Sets the power source for the onboard audio. The 12 V power converted to 5 V through a regulator may provide a cleaner power signal, which will in turn give an audio signal with less background noise.

Pin	Description
1-2	Power through 5 V
2-3	Power through 12 V to 5 V regulator

Table 4-3: Audio Power Source

WAFER-945GSELVDS2

The location of the audio power source selection jumper is shown below.

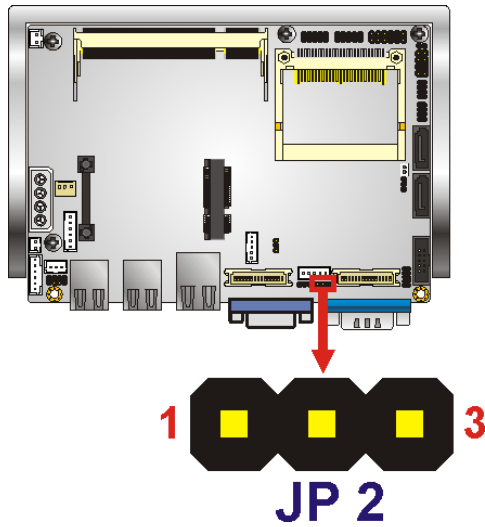


Figure 4-4: Audio Power Source

4.6.3 CF Card Setup

Jumper Label:	JCF1
Jumper Type:	2-pin header
Jumper Settings:	See Table 4-4
Jumper Location:	See Figure 4-5

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in Table 4-4.

Pin	Description
Open	Slave
Short	Master

Table 4-4: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 4-5.

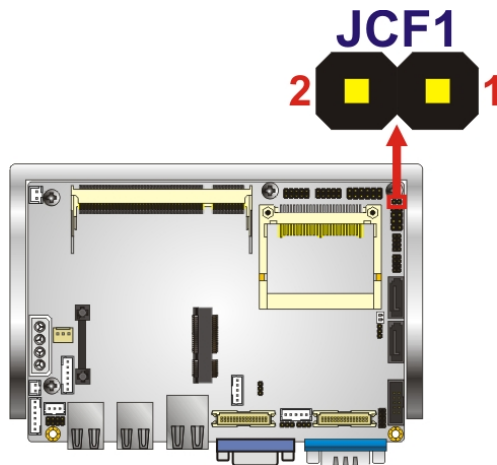


Figure 4-5: CF Card Setup Jumper Location

4.6.4 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-5
Jumper Location:	See Figure 4-6

If the WAFER-945GSELVDS2 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-5**.

WAFER-945GSELVDS2

Pin	Description
1-2	Keep CMOS Setup
2-3	Clear CMOS Setup

Table 4-5: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-6** below.

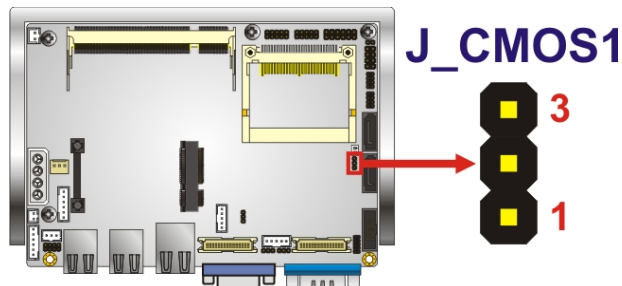


Figure 4-6: Clear CMOS Jumper

4.6.5 COM2 Mode Selection

Jumper Label:	JP1
Jumper Type:	8-pin header
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-7

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 4-6**.

Pin	Description
1-2	RS-232
3-4	RS-422
5-6	RS-485
5-6 & 7-8	RS-485 with RTS control

Table 4-6: COM 2 Function Select Jumper Settings

The COM 2 Function Select jumper location is shown in **Figure 4-7**.

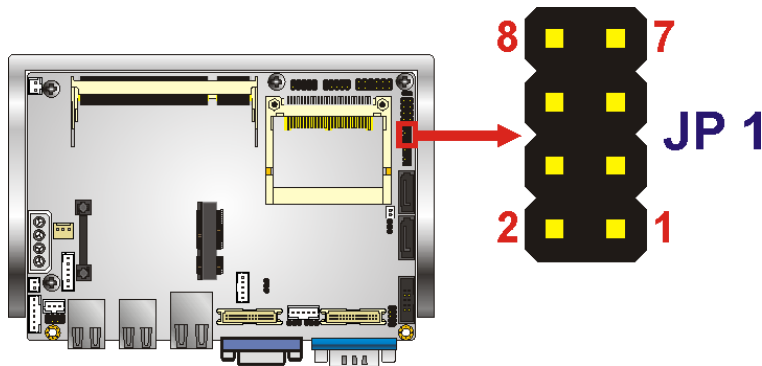


Figure 4-7: COM 2 Function Select Jumper Location

4.6.6 LVDS1 and LVDS2 Panel Resolution Jumper

- Jumper Label:** J_LCD_TYPE1
- Jumper Type:** 8-pin header
- Jumper Settings:** See Table 4-7
- Jumper Location:** See Figure 4-8

Sets the resolution of both LVDS1 and LVDS2 video channels.

Pin	LVDS1 Resolution
Open	800 x 600, 18-bit
1-2	1024 x 768, 18-bit
3-4	1280 x 1024, 36-bit
1-2, 3-4	1400 x 1050, 36-bit

Table 4-7: LVDS1 Panel Resolution

Pin	LVDS2 Resolution
Open	1024 x 768, 18-bit
5-6	1024 x 768, 24-bit
7-8	1280 x 1024, 36-bit
5-6, 7-8	1280 x 1024, 48-bit

Table 4-8: LVDS2 Panel Resolution

The LVDS Panel Resolution jumper location. is shown in Figure 4-8.

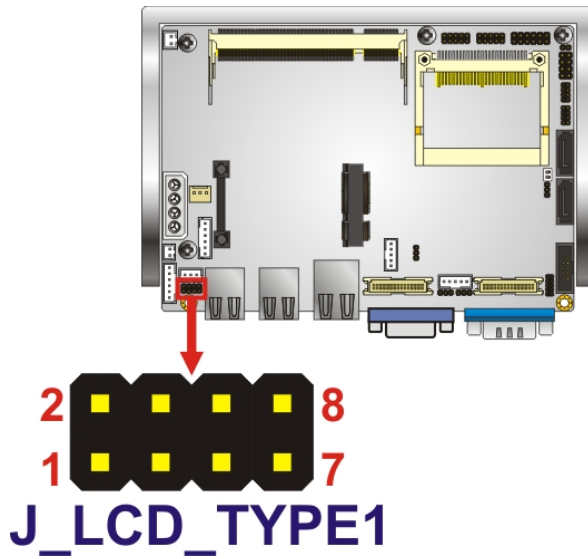


Figure 4-8:LVDS Panel Resolution Jumper Pinout Locations

4.6.7 LVDS1 Voltage Selection



WARNING:

Permanent damage to the screen and WAFER-945GSELVDS2 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

- Jumper Label:** J_VLVDS1
- Jumper Type:** 3-pin header
- Jumper Settings:** See Table 4-9
- Jumper Location:** See Figure 4-9

Sets the voltage provided to the monitor by LVDS1.

Pin	Description
1-2	+3.3V LVDS
2-3	+5V LVDS

Table 4-9: LVDS Voltage Selection Jumper Settings

The LVDS1 Voltage Selection jumper location. is shown in **Figure 4-9**.

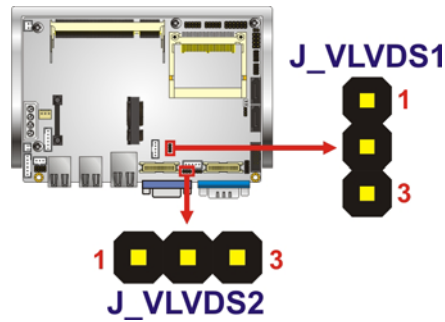


Figure 4-9: LVDS1 Voltage Selection Jumper Pinout Locations

4.6.8 LVDS2 Voltage Selection



WARNING:

Permanent damage to the screen and WAFER-945GSELVDS2 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

- Jumper Label:** J_VLVDS2
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 4-10**
- Jumper Location:** See **Figure 4-10**

Sets the voltage provided to the monitor connected to LVDS2

Pin	Description
1-2	+3.3V LVDS
2-3	+5V LVDS

Table 4-10: LVDS2 Voltage Selection Jumper Settings

The LVDS2 Voltage Selection jumper location. is shown in **Figure 4-9**.

WAFER-945GSELVDS2

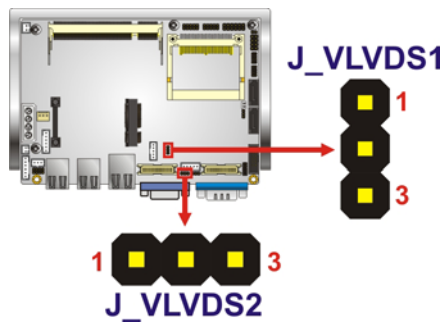


Figure 4-10: LVDS Voltage Selection Jumper Pinout Locations

4.7 Chassis Installation

4.7.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the WAFER-945GSELVDS2 must have air vents to allow cool air to move into the system and hot air to move out.

The WAFER-945GSELVDS2 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.



NOTE:

IEI has a wide range of backplanes available. Please contact your WAFER-945GSELVDS2 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieworld.com.tw>) to find out more about the available chassis.

4.7.2 Motherboard Installation

To install the WAFER-945GSELVDS2 motherboard into the chassis please refer to the reference material that came with the chassis.

4.8 Internal Peripheral Device Connections

Install the following cables to use the internal devices listed.

4.8.1 Audio Kit Installation

The Audio Kit that came with the WAFER-945GSELVDS2 connects to the audio connector on the WAFER-945GSELVDS2. The audio kit consists of three audio jacks. Mic-in connects to a microphone. Line-in provides a stereo line-level input to connect to the output of an audio device. Line-out, a stereo line-level output, connects to two amplified speakers. To install the audio kit, please refer to the steps below:

Step 1: Locate the audio connector. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: Align pin 1. Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot.

WAFER-945GSELVDS2

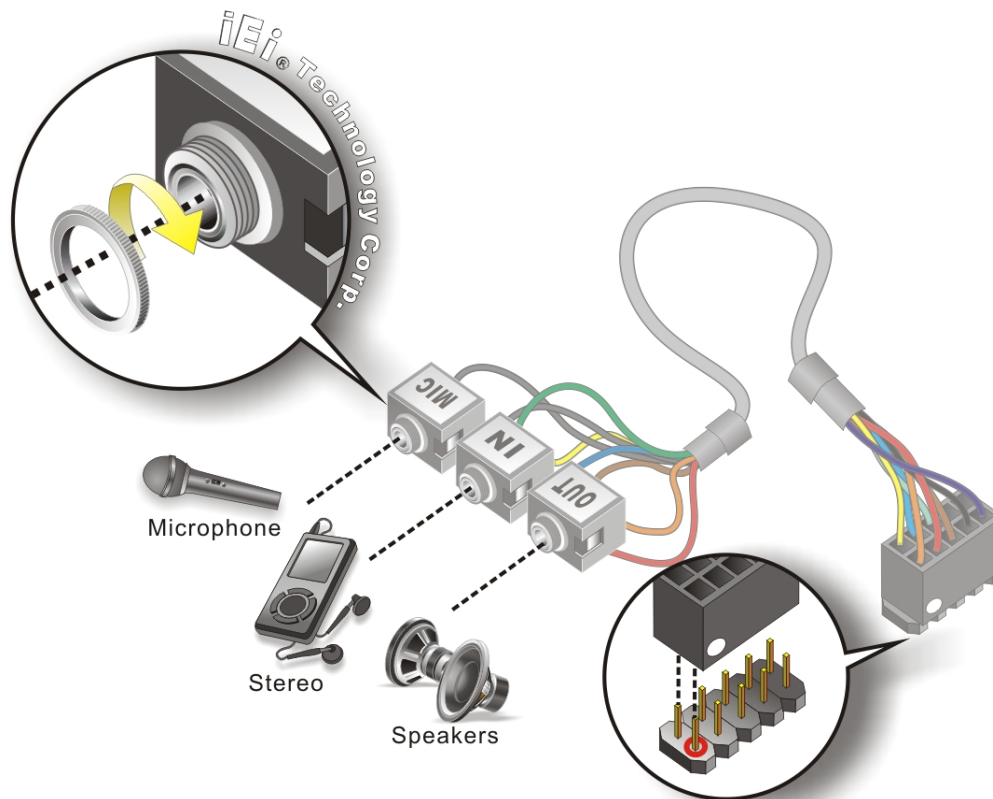


Figure 4-11: Audio Kit Cable Connection

Step 3: Connect the audio devices. Connect speakers to the line-out audio jack. Connect the output of an audio device to the line-in audio jack. Connect a microphone to the mic-in audio jack.

4.8.2 SATA Drive Connection

The WAFER-945GSELVDS2 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: Locate the connectors. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 4-12**.

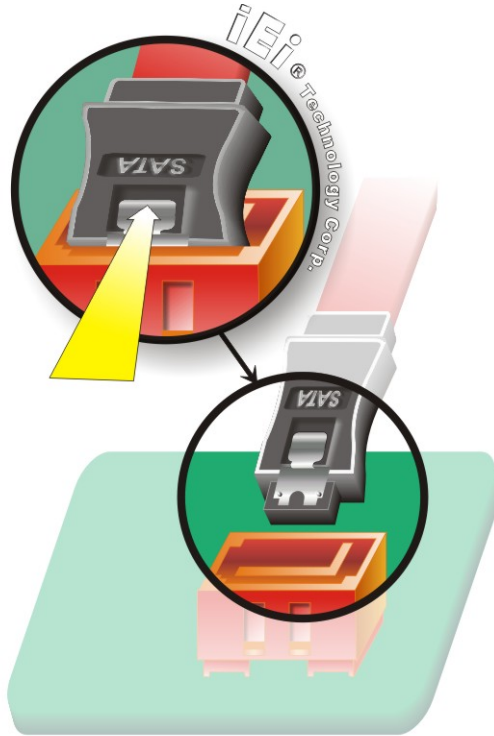


Figure 4-12: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-13**.



NOTE:

The SATA power cable described below is an optional item and must be pre-ordered. The SATA power cable is not shipped with the system.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-13**.

WAFER-945GSELVDS2



Figure 4-13: SATA Power Drive Connection

4.8.3 RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9-pin male connector. To install the dual RS-232 cable, please follow the steps below.

Step 1: Locate the connectors. The locations of the RS-232 connectors are shown in Chapter 3.

Step 2: Insert the cable connectors. Insert one connector into each serial port box headers. See Figure 5-13. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

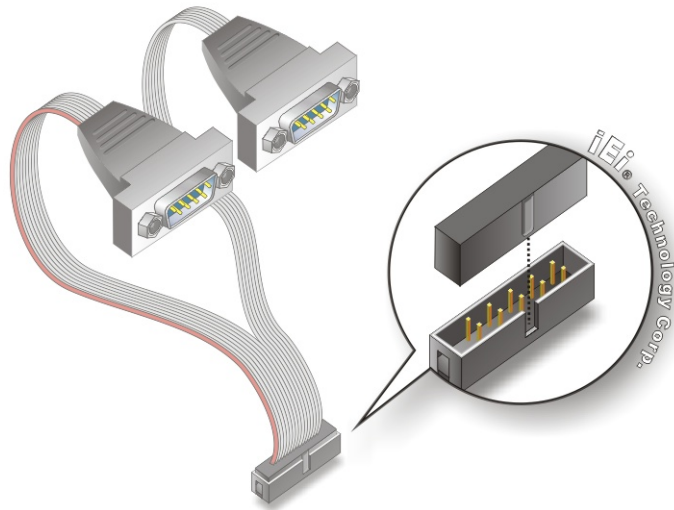


Figure 4-14: Dual RS-232 Cable Installation

- Step 3: Secure the connectors.** Both single RS-232 connectors have two retention screws that must be secured to a chassis or bracket.
- Step 4: Connect the serial device.** Once the single RS-232 connectors are connected to a chassis or bracket, a serial communications device can be connected to the system.

4.8.4 Keyboard/Mouse Y-cable Connector

The WAFER-945GSELVDS2 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the WAFER-945GSELVDS2 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector please follow the steps below.

- Step 1: Locate the connector.** The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.
- Step 2: Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on the WAFER-945GSELVDS2 keyboard/mouse connector. See **Figure 4-15**.

WAFER-945GSELVDS2

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the WAFER-945GSELVDS2, connect the cable connector to the on-board connectors. See **Figure 4-15**.

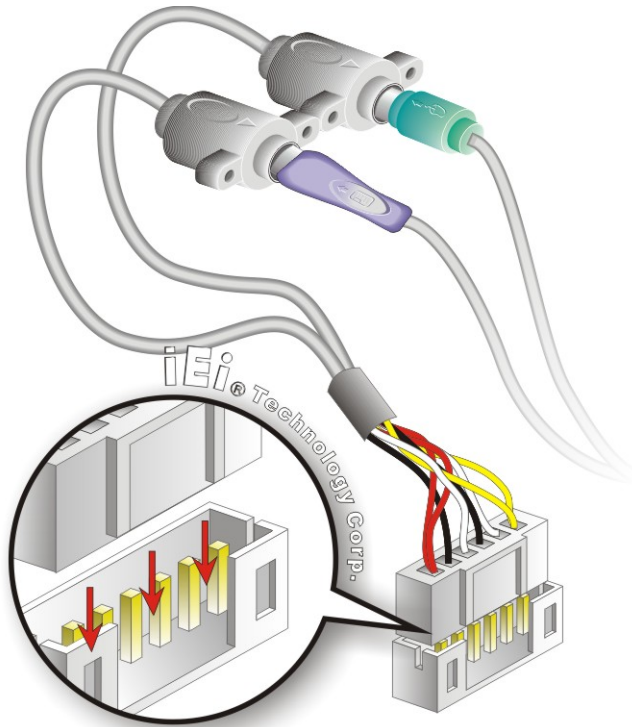


Figure 4-15: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis.** The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse.** Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.8.5 USB Cable

The WAFER-945GSELVDS2 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 3.



WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: Align the connectors. The cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the WAFER-945GSELVDS2 USB connector.

Step 3: Insert the cable connectors. Once the cable connectors are properly aligned with the USB connectors on the WAFER-945GSELVDS2, connect the cable connectors to the on-board connectors. See **Figure 4-16**.

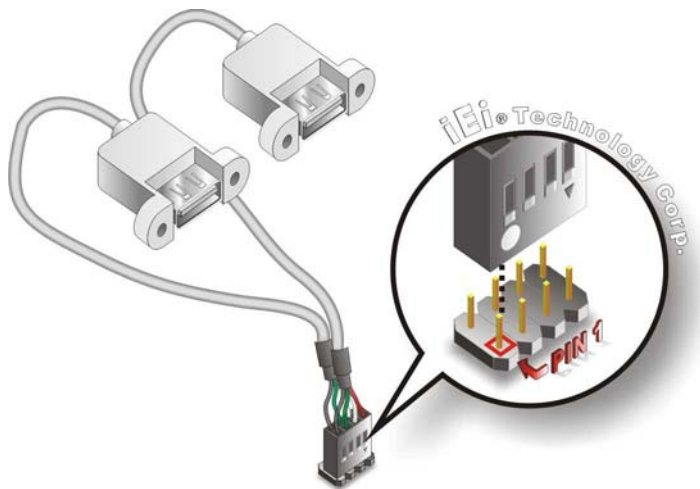


Figure 4-16: Dual USB Cable Connection

Step 4: Attach the USB connectors to the chassis. The USB 2.0 connectors each of two retention screw holes. To secure the connectors to the chassis please refer to the installation instructions that came with the chassis.

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4.9 External Peripheral Interface Connection

This section outlines the installation of devices to the external ports on the WAFER-945GSELVDS2.

4.9.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors.** The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the WAFER-945GSELVDS2. See **Figure 4-17**.

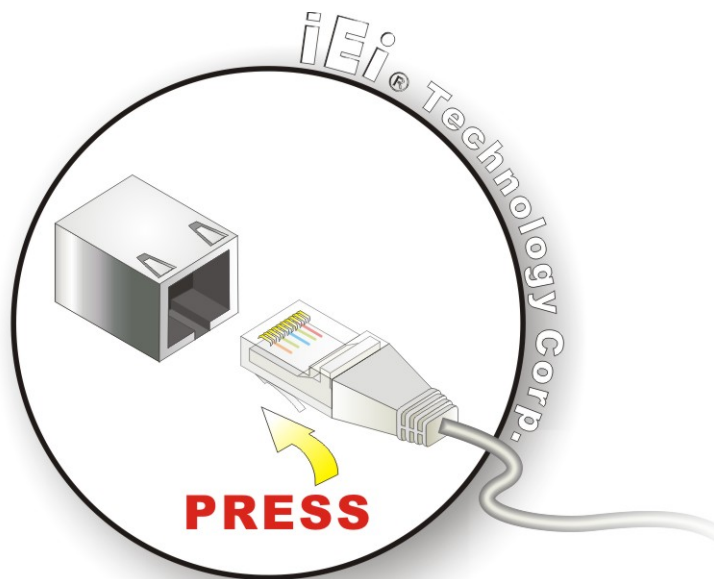


Figure 4-17: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

4.9.2 Serial Device Connection

The WAFER-945GSELVDS2 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the WAFER-945GSELVDS2.

Step 1: **Locate the DB-9 connector.** The location of the DB-9 connector is shown in Chapter 3.

Step 2: **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-18.

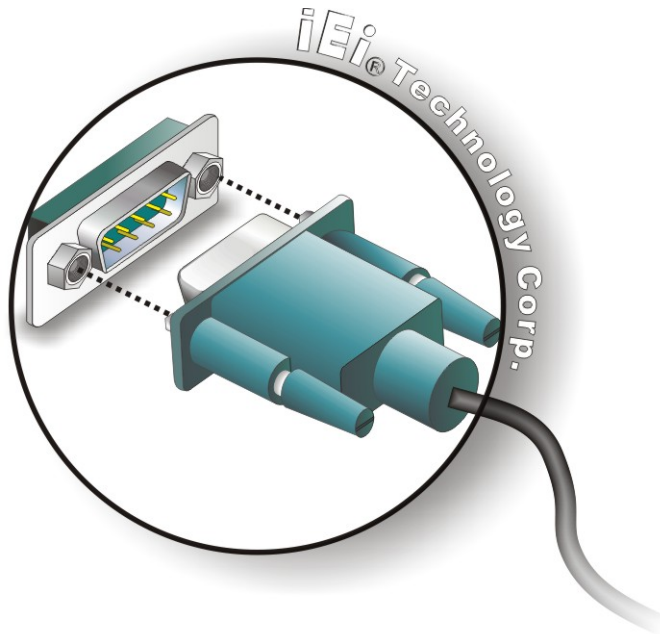


Figure 4-18: Serial Device Connector

Step 3: **Secure the connector.** Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector

4.9.3 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the WAFER-945GSELVDS2.

WAFER-945GSELVDS2

- Step 1:** Locate the USB Series "A" receptacle connectors. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.
- Step 2:** Insert a USB Series "A" plug. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-19**.

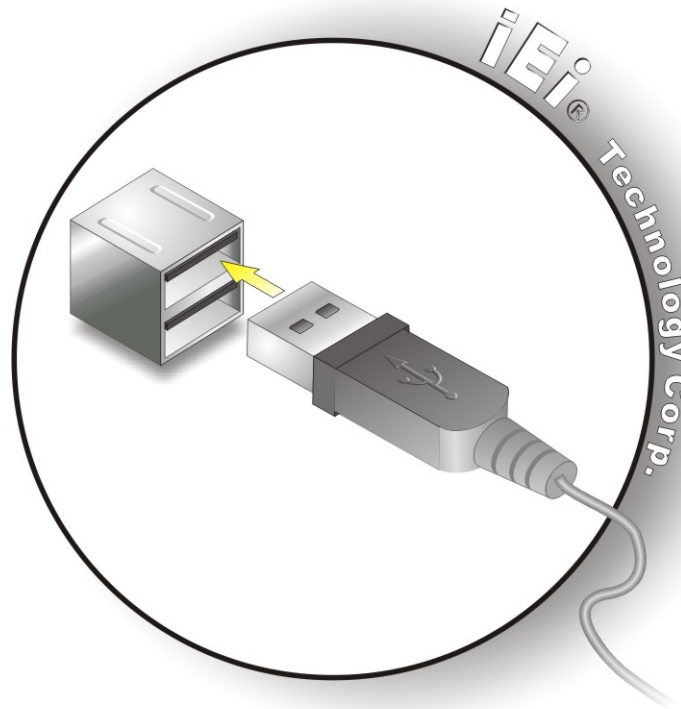


Figure 4-19: USB Connector

4.9.4 VGA Monitor Connection

The WAFER-945GSELVDS2 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the WAFER-945GSELVDS2, please follow the instructions below.

- Step 1:** Locate the female DB-15 connector. The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2:** Align the VGA connector. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: Insert the VGA connector. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the WAFER-945GSELVDS2. See **Figure 4-20**.

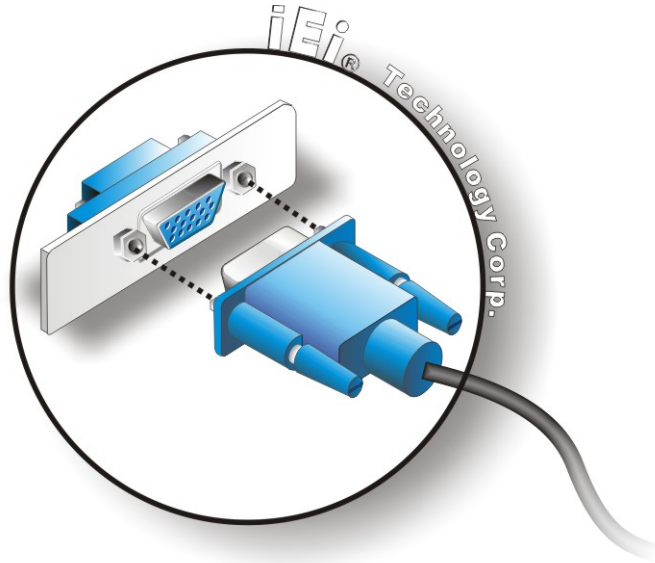


Figure 4-20: VGA Connector

Step 4: Secure the connector. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.10 Heat Sink Enclosure



WARNING:

Never run the WAFER-945GSELVDS2 without the heat sink secured to the board. The heat sink ensures the system remains cool and does not need addition heat sinks to cool the system.

WAFER-945GSELVDS2



WARNING:

When running the WAFER-945GSELVDS2, do not put the WAFER-945GSELVDS2 directly on a surface that can not dissipate system heat, especially the wooden or plastic desk. It is highly recommended to run the WAFER-945GSELVDS2

→ on a heat dissipation surface or

→ using copper pillars to hold the board up from the desk below

When the WAFER-945GSELVDS2 is shipped it is secured to a heat sink with five retention screws. If the WAFER-945GSELVDS2 must be removed from the heat sink, the five retention screws must be removed.

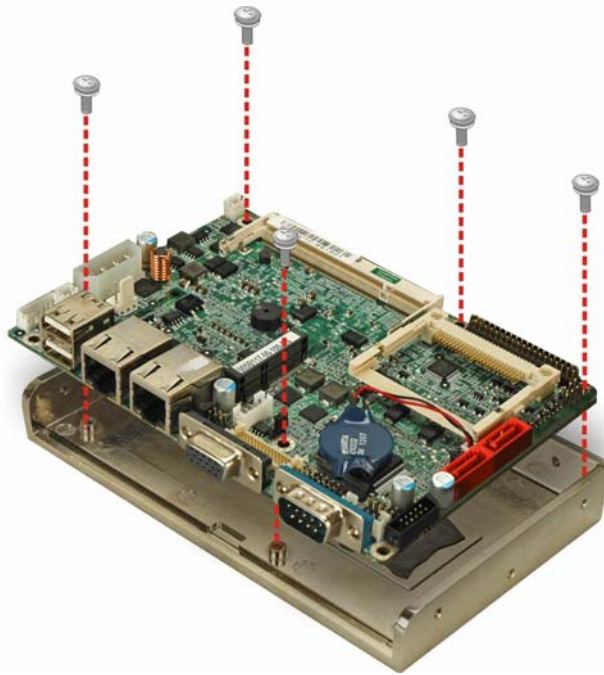


Figure 4-21: Heat Sink Retention Screws

4.11 Installing Drivers

To access the driver installation programs, please do the following.

Step 1: Insert the CD-ROM that came with the system into a CD-ROM drive attached to the system.

Step 2: The screen in Figure 4-22 appears.

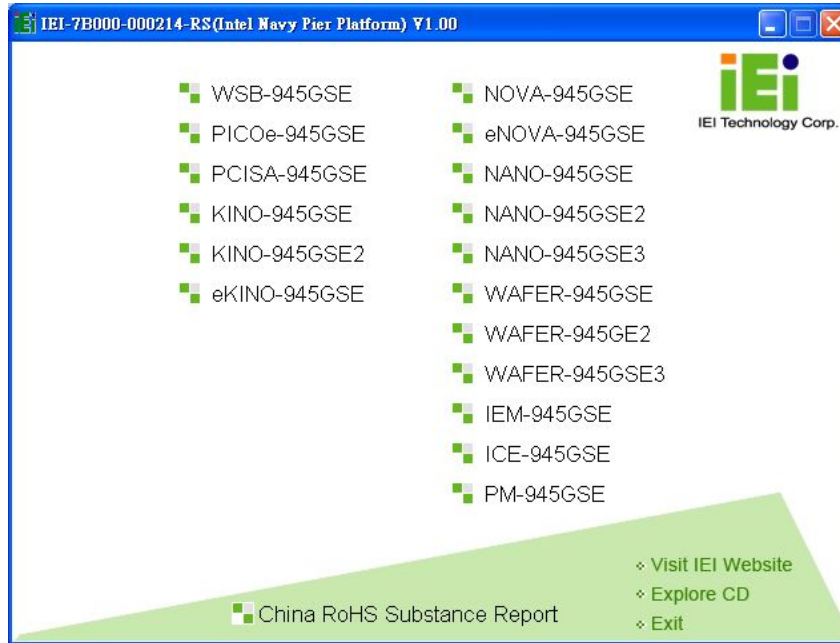


Figure 4-22: Start Up Screen

WAFER-945GSELVDS2

Step 3: Select the operating system.

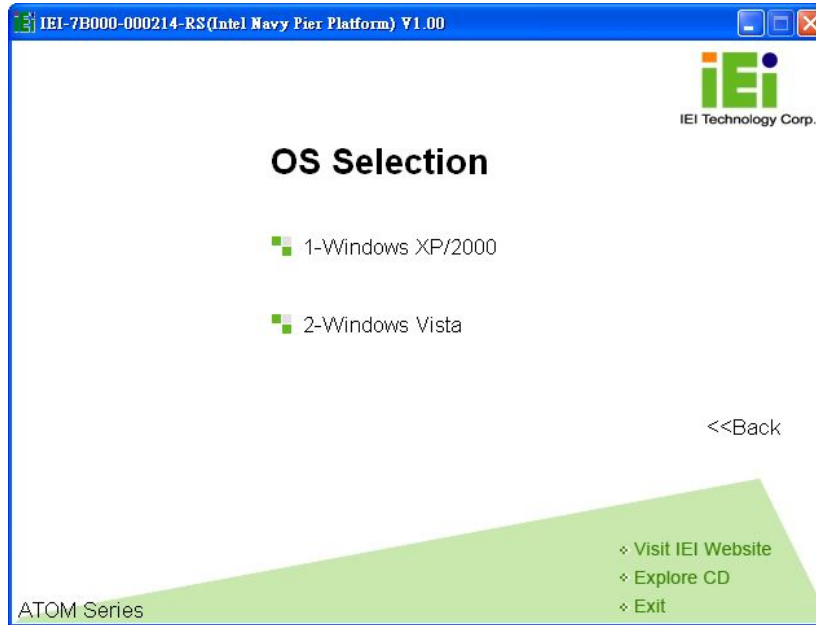


Figure 4-23: Select Operating System

Step 4: Install all the drivers from the list.

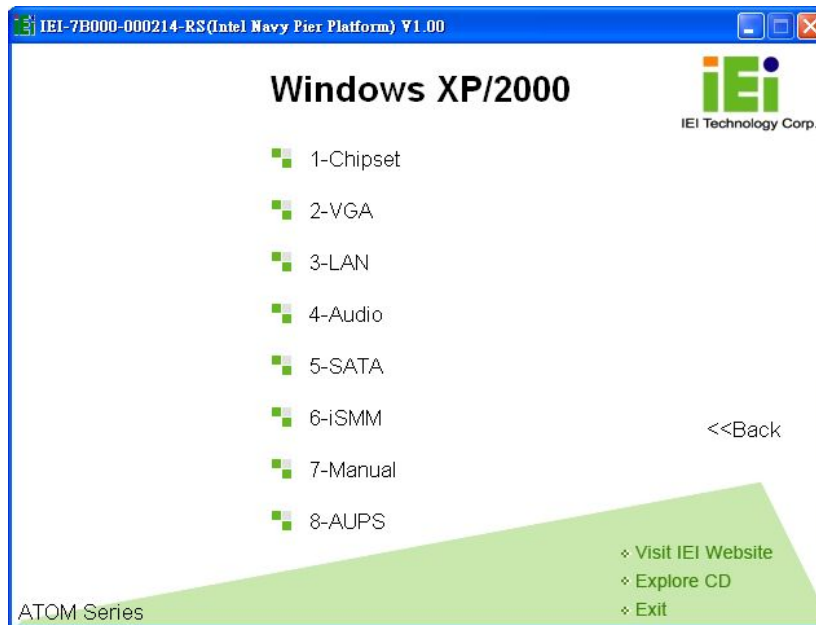


Figure 4-24: Drivers



Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the “**Press Del to enter SETUP**” message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after BIOS changes are made, the BIOS will either automatically reset to default settings, or can be manually reset using the "Clear CMOS" jumper.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit

System Overview
-----
AMIBIOS
Version      :08.00.15
Build Date   :06/23/09
ID:          :B157MR14

Processor
Genuine Intel® CPU N270 @ 1.60GHz
Speed        :1600MHz
Count        :1

System Memory
Size         :1016MB

System Time      [14:20:27]
System Time      [Tue 05/06/2008]

Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system time.

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

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```

BIOS Menu 1: Main

- **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
 - **Version:** Current BIOS version
 - **Build Date:** Date the current BIOS version was made
 - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
 - **Type:** Names the currently installed processor
 - **Speed:** Lists the processor speed
 - **Count:** The number of CPUs on the motherboard
- System Memory: Displays the auto-detected system memory.
 - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

- **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

- **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

Use the **Advanced** menu to configure the CPU and peripheral devices through the following sub-menus:

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Advanced Settings  Configure CPU
-----
WARNING: Setting wrong values in below sections may
cause system to malfunction

> CPU Configuration
> IDE Configuration
> SuperIO Configuration
> Hardware Health Configuration
> Power Configuration
> Remote Access Configuration
> USB Configuration

<=> Select Screen
↑↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit

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```

BIOS Menu 2: Advanced

WAFER-945GSELVDS2

5.3.1 CPU Configuration

Use the **CPU Configuration** menu to view detailed CPU specifications and configure the CPU.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Configure Advanced CPU Settings
Module Version:3F.10
-----
Manufacturer   :Intel@
Genuine Intel@ CPU N270 @ 1.60GHz
Frequency      :1.60GHz
FSB Speed      :532Hz

Cache L1       :24 KB
Cache L2       :512 KB

Ratio Actual Value:12

<=> Select Screen
↑↓ Select Item
Enter Go to SubScreen
F1  General Help
F10 Save and Exit
ESC Exit

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```

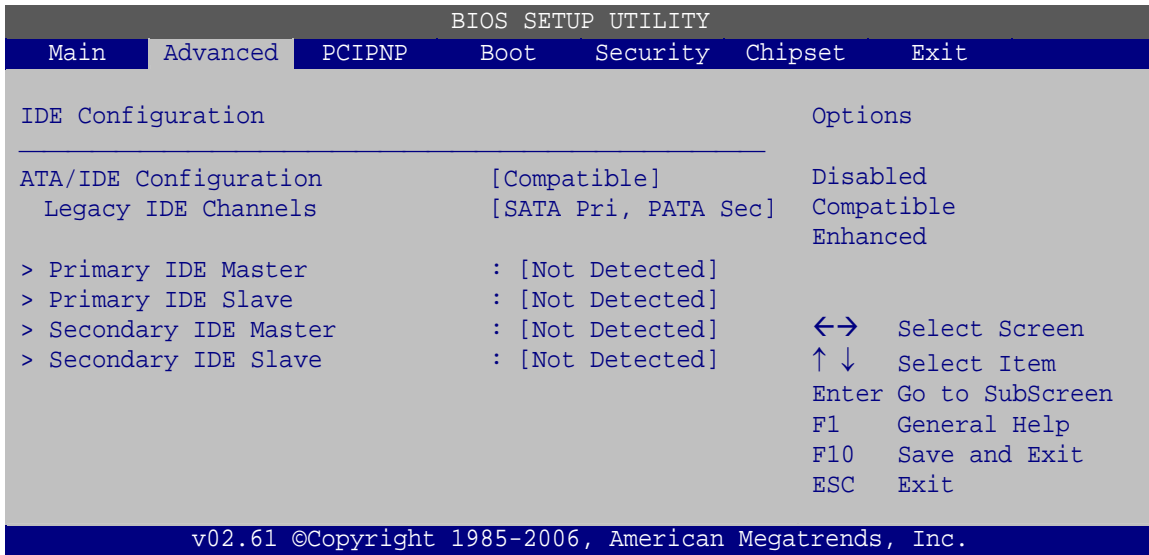
BIOS Menu 3: CPU Configuration

The CPU Configuration menu lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size
- Ratio actual value is the ratio of the frequency to the clock speed

5.3.2 IDE Configuration

Use the **IDE Configuration** menu to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

- **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

- ➔ **Disabled** Disables the on-board ATA/IDE controller.
- ➔ **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.
- ➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

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- **Legacy IDE Channels [PATA Pri, SATA Sec]**
 - ➔ **SATA Only** Only the SATA drives are enabled.
 - ➔ **PATA Pri, SATA Sec** **DEFAULT** The IDE drives are enabled on the Primary IDE channel. The SATA drives are enabled on the Secondary IDE channel.
 - ➔ **PATA Pri., PATA Sec** The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

- **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Primary IDE Master          Select the type of device
                             connected to the system
Device      :Not Detected

Type                [Auto]
LBA/Large Mode     [Auto]
Block (Multi-Sector Transfer) [Auto]
PIO Mode           [Auto]
DMA Mode           [Auto]
S.M.A.R.T.         [Auto]
32Bit Data Transfer [Enabled]

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

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```

BIOS Menu 5: IDE Master and IDE Slave Configuration

- **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- 32Bit Data Transfer: Enables 32-bit data transfer.

- **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

- ➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.
- ➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

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- ➔ **CD/DVD**

The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
- ➔ **ARMD**

This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

 - ZIP
 - LS-120
- **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

 - ➔ **Disabled**

BIOS is prevented from using the LBA mode control on the specified channel.
 - ➔ **Auto** **DEFAULT**

BIOS auto detects the LBA mode control on the specified channel.
- **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

 - ➔ **Disabled**

BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
 - ➔ **Auto** **DEFAULT**

BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

- **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

- ➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
- ➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
- ➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
- ➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
- ➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s
(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

- **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- ➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **SWDMA0** Single Word DMA mode 0, max transfer rate: 2.1 MB/s
- ➔ **SWDMA1** Single Word DMA mode 1, max transfer rate: 4.2 MB/s
- ➔ **SWDMA2** Single Word DMA mode 2, max transfer rate: 8.3 MB/s
- ➔ **MWDMA0** Multi Word DMA mode 0, max transfer rate: 4.2 MB/s
- ➔ **MWDMA1** Multi Word DMA mode 1, max transfer rate: 13.3 MB/s
- ➔ **MWDMA2** Multi Word DMA mode 2, max transfer rate: 16.6 MB/s
- ➔ **UDMA0** Ultra DMA mode 0, max transfer rate: 16.6 MB/s
- ➔ **UDMA1** Ultra DMA mode 1, max transfer rate: 25 MB/s

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- ➔ **UDMA2** Ultra DMA mode 2, max transfer rate: 33.3 MB/s
- ➔ **UDMA3** Ultra DMA mode 3, max transfer rate: 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4, max transfer rate: 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5, max transfer rate: 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

- **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

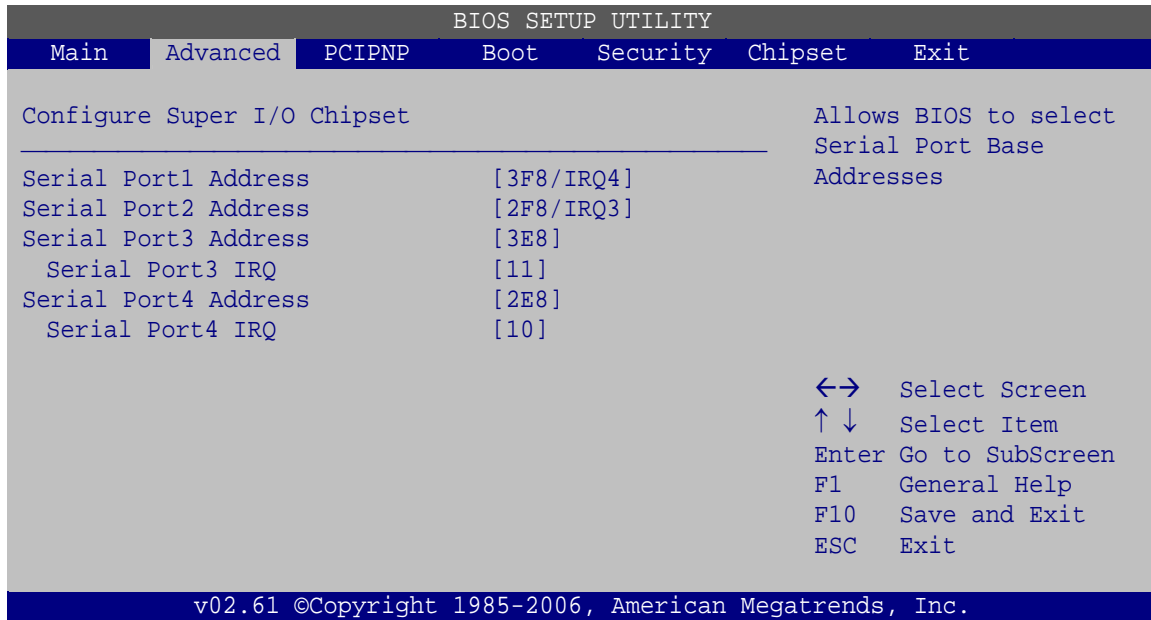
- **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

Use the **Super IO Configuration** menu to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

- **Serial Port1 Address [3F8/IRQ4]**

Sets the address of serial port 1.

- Disabled
- 3F8/IRQ4 **DEFAULT**
- 3E8/IRQ4
- 2E8/IRQ3

- **Serial Port2 Address [2F8/IRQ3]**

Sets the address of serial port .

- Disabled
- 2F8/IRQ3 **DEFAULT**
- 3E8/IRQ4
- 2E8/IRQ3

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- **Serial Port3 Address [3E8]**

Sets the address of serial port .

- Disabled
- 3E8 **DEFAULT**
- 2E8
- 2F0
- 2E0

- **Serial Port3 IRQ [11]**

Sets the IRQ of serial port .

- 10
- 11 **DEFAULT**

- **Serial Port4 Address [3F8]**

Sets the address of serial port .

- Disabled
- 3E8
- 2E8 **DEFAULT**
- 2F0
- 2E0

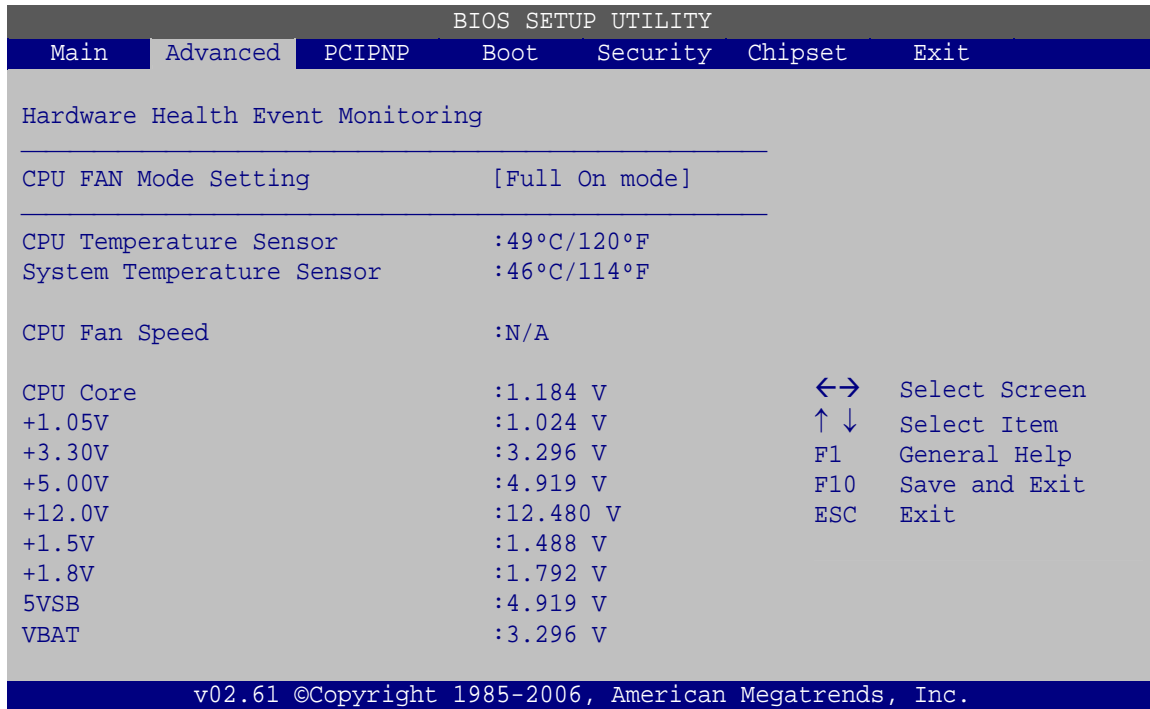
- **Serial Port4 IRQ [10]**

Sets the IRQ of serial port .

- 10 **DEFAULT**
- 11

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

- **Mode Setting [Full On Mode]**

Use the **Mode Setting** option to configure the second fan.

- ➔ **Thermal Mode**

The fan adjusts its speed using these settings:

- Temperature limit of Off
- Temperature limit of Start
- Startup Value
- Stop Value
- StopTime Value

- ➔ **Manual Mode**

DEFAULT

The fan spins at the set speed, max speed is at 255, full-off is at 0.

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- **CPU Temperature Limit of OFF [000]**



WARNING:

CPU failure can result if this value is set too high because the fan will turn off before the CPU has been cooled to the normal temperature range

The fan will turn off if the temperature falls below this value.

- Minimum Value: 0°C
- Maximum Value: 127°C

- **CPU Temperature Limit of Start [020]**



WARNING:

CPU failure can result if this value is set too high because permanent damage will be done before it turns on

The fan will start spinning when this temperature is reached.

- Minimum: 0
- Maximum: 127

- **Fan Start PWM [070]**

The fan initially starts at this speed.

- Minimum: 0
- Maximum: 127

- **Slope PWM [0.5 PWM]**

Sets how big each increase in the speed of the fan is. Lower settings mean finer tuning of the fan speed. Higher settings mean bigger jumps in speed as the fan speed changes.

- 0.125 PWM
- 0.25 PWM
- 0.5 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 15 PWM

5.3.5 Power Configuration

The **Power Configuration** menu configures the power settings of the system.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Power  Exit
-----
Power Configuration                                If set to BY HARDWARE
                                                    the status is set by
Select AT/ATX Power                                [BY HARDWARE]
Current Jumper Setting                             [AT Power]
                                                    the onboard jumper

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

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```

BIOS Menu 8: Power Configuration

- **Select AT/ATX Power [By Hardware]**

Sets the behavior of the power.

- AT Power
- ATX Power
- BY HARDWARE **DEFAULT**

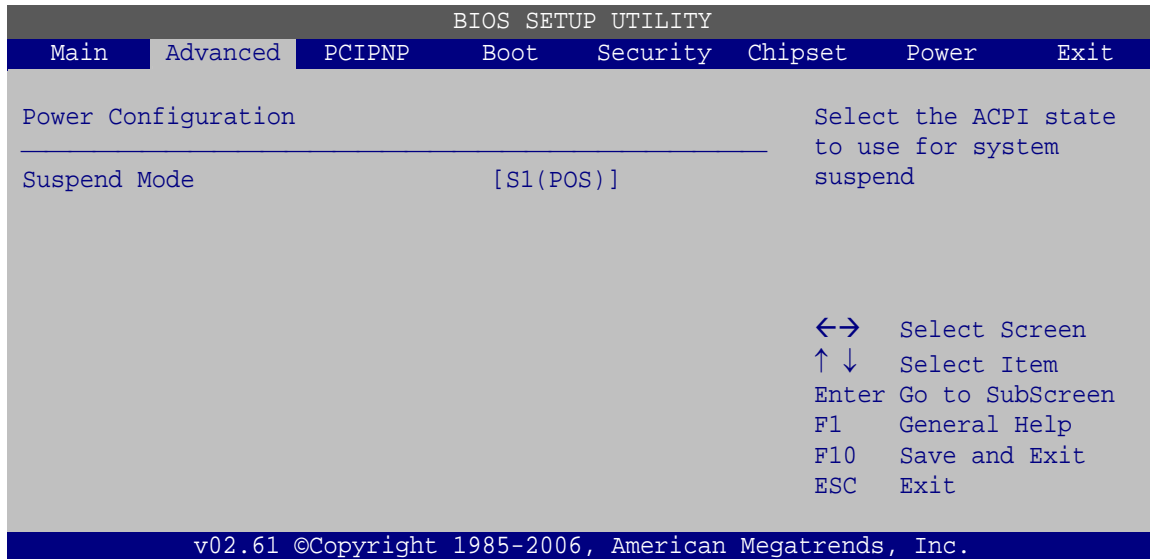
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- **Current Jumper Setting**

Displays the current power jumper setting.

5.3.5.1 ACPI configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI).



BIOS Menu 9: ACPI Configuration

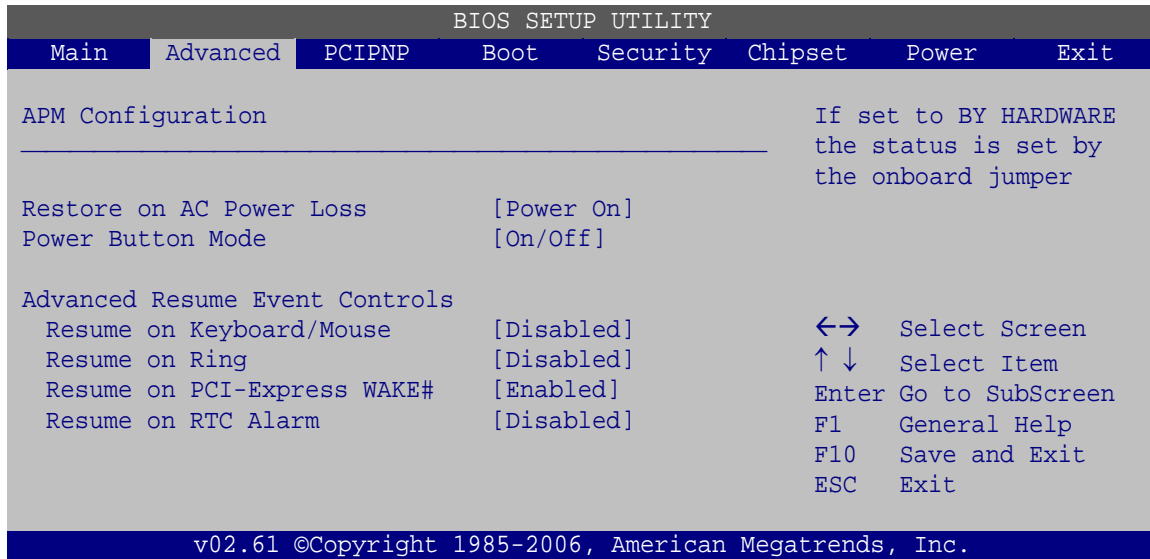
- **Suspend Mode [S1(POS)]**

Use the **Suspend Mode** BIOS option to specify the sleep state the system enters when it is not being used.

- ➔ **S1 (POS) DEFAULT** System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.5.2 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.



BIOS Menu 10: APM Configuration

- **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

- ➔ **Power Off** The system remains turned off
- ➔ **Power On** The system turns on
- ➔ **Last State DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

- **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

- ➔ **On/Off DEFAULT** When the power button is pressed the system is either turned on or off

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➔ **Suspend** When the power button is pressed the system goes into suspend mode

- **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

➔ **Disabled DEFAULT** Wake event not generated by activity on the keyboard or mouse

➔ **Enabled** Wake event generated by activity on the keyboard or mouse

- **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled DEFAULT** Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

- **Resume on PCI-Express WAKE# [Enabled]**

Use the **Resume PCI-Express WAKE#** BIOS option to enable activity on the PCI-Express WAKE# signal to rouse the system from a suspend or standby state.

➔ **Disabled** Wake event not generated by PCI-Express WAKE# signal activity

➔ **Enabled DEFAULT** Wake event generated by PCI-Express WAKE# signal activity

- **Resume On RTC Alarm [Disabled]**

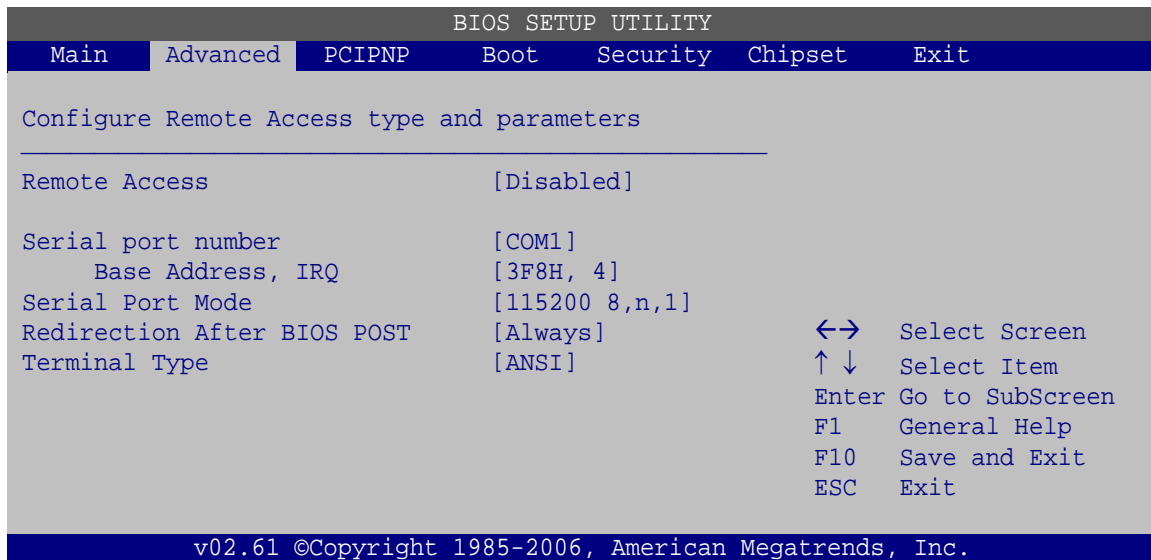
Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

- ➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

- ➔ **Enabled** If selected, the following appears with values that can be selected:
 - RTC Alarm Date (Days)
 - System Time
 After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.6 Remote Access Configuration

Use the **Remote Access Configuration** menu to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration

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- **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

- ➔ **Disabled** **DEFAULT** Remote access is disabled.
- ➔ **Enabled** Remote access configuration options shown below appear:

Serial Port Number

Serial Port Mode

Redirection after BIOS POST

Terminal Type

These configuration options are discussed below.

- **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

- **COM1** **DEFAULT**
- COM2
- COM3
- COM4
- COM5
- COM6

- **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

- **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- **115200 8,n,1** **DEFAULT**

- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1


NOTE:

Identical baud rate setting must be set on the host (a management computer running a terminal software) and the slave

- **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- | | | | |
|---|--------------------|----------------|--|
| → | Disabled | DEFAULT | The console is not redirected after POST |
| → | Boot Loader | DEFAULT | Redirection is active during POST and during Boot Loader |
| → | Always | DEFAULT | Redirection is always active (Some OSES may not work if set to Always) |

- **Terminal Type [ANSI]**

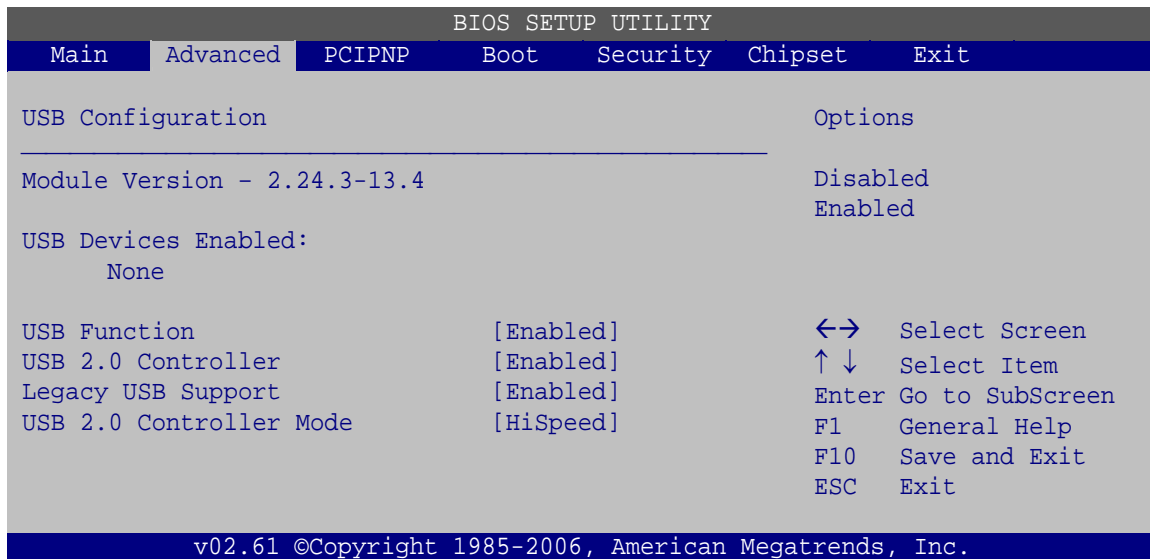
Use the **Terminal Type** BIOS option to specify the remote terminal type.

- | | | | |
|---|----------------|----------------|-------------------------------------|
| → | ANSI | DEFAULT | The target terminal type is ANSI |
| → | VT100 | DEFAULT | The target terminal type is VT100 |
| → | VT-UTF8 | DEFAULT | The target terminal type is VT-UTF8 |

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5.3.7 USB Configuration

Use the **USB Configuration** menu to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

- **USB Function [Enabled]**

Use the **USB Functions** to enabled and disabled the USB ports.

- ➔ **Disabled** USB ports disabled
- ➔ **USB 8 ports** Only the USB ports on the rear I/O panel are activated
- ➔ **Enabled** **DEFAULT** All the USB ports are enabled

- **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

- ➔ **Disabled** USB 2.0 controller disabled
- ➔ **Enabled** **DEFAULT** USB 2.0 controller enabled

- **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

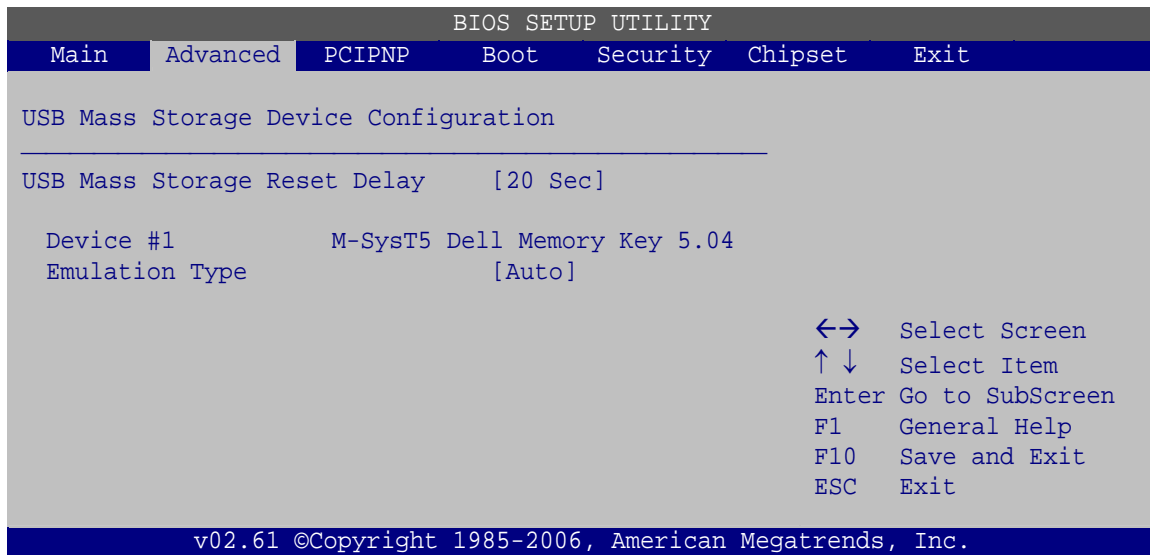
- **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

- ➔ **FullSpeed** The controller is capable of operating at 12 Mb/s
- ➔ **HiSpeed** **DEFAULT** The controller is capable of operating at 480 Mb/s

5.3.7.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (BIOS Menu 13) to configure USB mass storage class devices.



BIOS Menu 13: USB Mass Storage Device Configuration

- **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

- ➔ **10 Sec** POST waits 10 seconds for the USB mass storage device after the start unit command.
- ➔ **20 Sec** **DEFAULT** POST waits 20 seconds for the USB mass storage device after the start unit command.
- ➔ **30 Sec** POST waits 30 seconds for the USB mass storage device after the start unit command.
- ➔ **40 Sec** POST waits 40 seconds for the USB mass storage device after the start unit command.

- **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

- **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

- ➔ **Auto** **DEFAULT** BIOS auto-detects the current USB.
- ➔ **Floppy** The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
- ➔ **Forced FDD** Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
- ➔ **Hard Disk** Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
- ➔ **CDROM** Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

5.4 PCI/PnP

Use the **PCI/PnP** menu (BIOS Menu 14) to configure advanced PCI and PnP settings.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Advanced PCI/PnP Settings
-----
WARNING: Setting wrong values in below sections
         may cause system to malfunction

IRQ3           [Reserved]
IRQ4           [Reserved]
IRQ5           [Available]
IRQ7           [Available]
IRQ9           [Available]
IRQ10          [Reserved]
IRQ11          [Reserved]
IRQ14          [Available]
IRQ15          [Available]

DMA Channel 0  [Available]
DMA Channel 1  [Available]
DMA Channel 3  [Available]
DMA Channel 5  [Available]
DMA Channel 6  [Available]
DMA Channel 7  [Available]

Available: Specified
IRQ is available to be
used by PCI/PnP
devices
Reserved: Specified
IRQ is reserved for
use by legacy ISA
devices

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

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```

BIOS Menu 14: PCI/PnP Configuration

- **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

- ➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices
- ➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

- **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

- ➔ **Disabled** **DEFAULT** No memory block reserved for legacy ISA devices
- ➔ **16K** 16 KB reserved for legacy ISA devices
- ➔ **32K** 32 KB reserved for legacy ISA devices
- ➔ **64K** 64 KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu to configure system boot options.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Boot Settings                                     Configure settings
                                                during system boot.
> Boot Settings Configuration
> Boot Device Priority
> Hard Disk Drives
> CD/DVD Drives
> Removable Drives
                                                ←→  Select Screen
                                                ↑↓  Select Item
Enter  Go to SubScreen
F1    General Help
F10   Save and Exit
ESC   Exit

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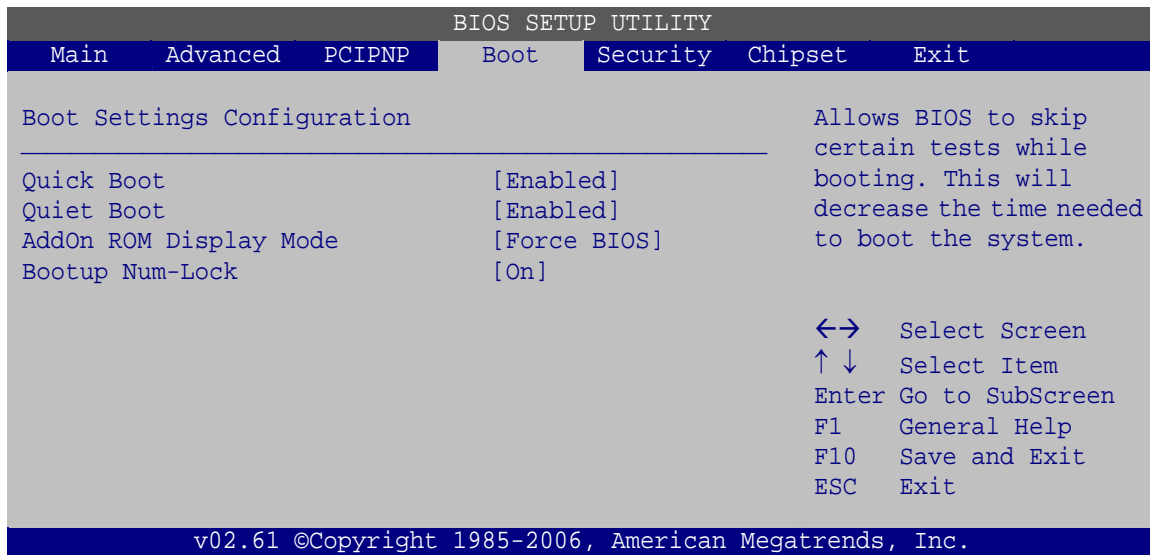
```

BIOS Menu 15: Boot

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5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (BIOS Menu 16) to configure advanced system boot options.



BIOS Menu 16: Boot Settings Configuration

- **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

- ➔ **Disabled** No POST procedures are skipped
- ➔ **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

- **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- ➔ **Disabled** **DEFAULT** Normal POST messages displayed
- ➔ **Enabled** OEM Logo displayed instead of POST messages

- **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

- ➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.
- ➔ **Keep Current** The system displays normal information during system boot.

- **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

- ➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
- ➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

- **Boot From LAN Support [Disabled]**

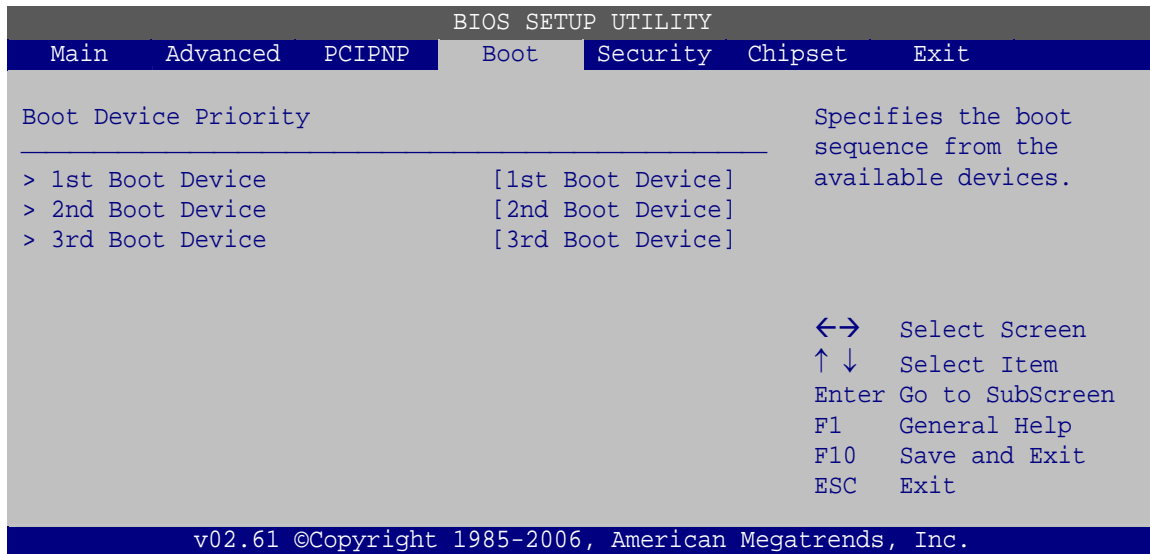
Use the **Boot From LAN Support** option to enable the Ethernet controller to boot the system.

- Enabled
- Disabled **DEFAULT**

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5.5.2 Boot Device Priority

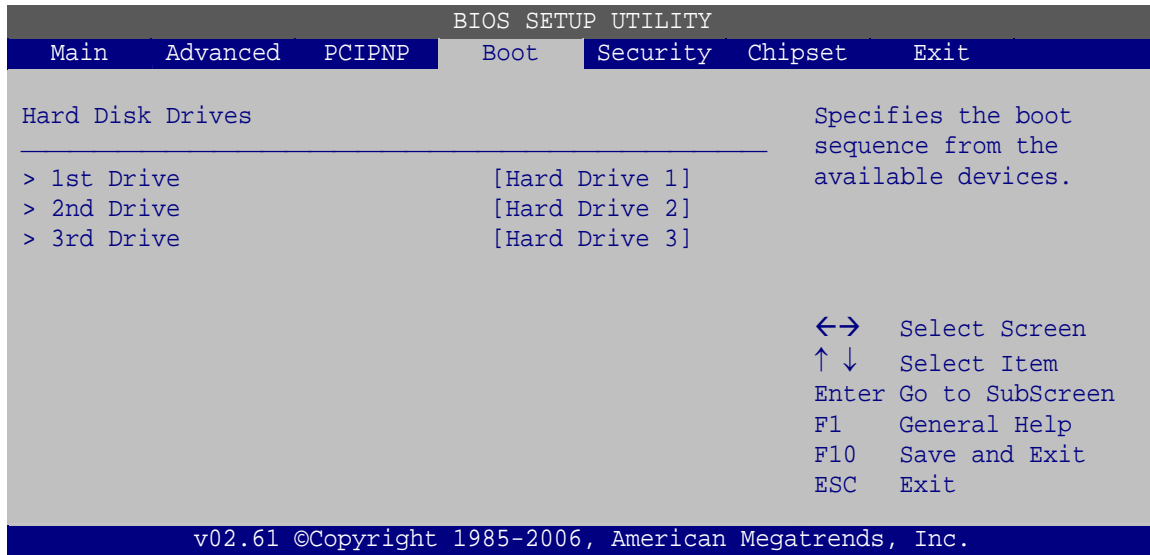
Use the **Boot Device Priority** menu to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.



BIOS Menu 17: Boot Device Priority Settings

5.5.3 Hard Disk Drives

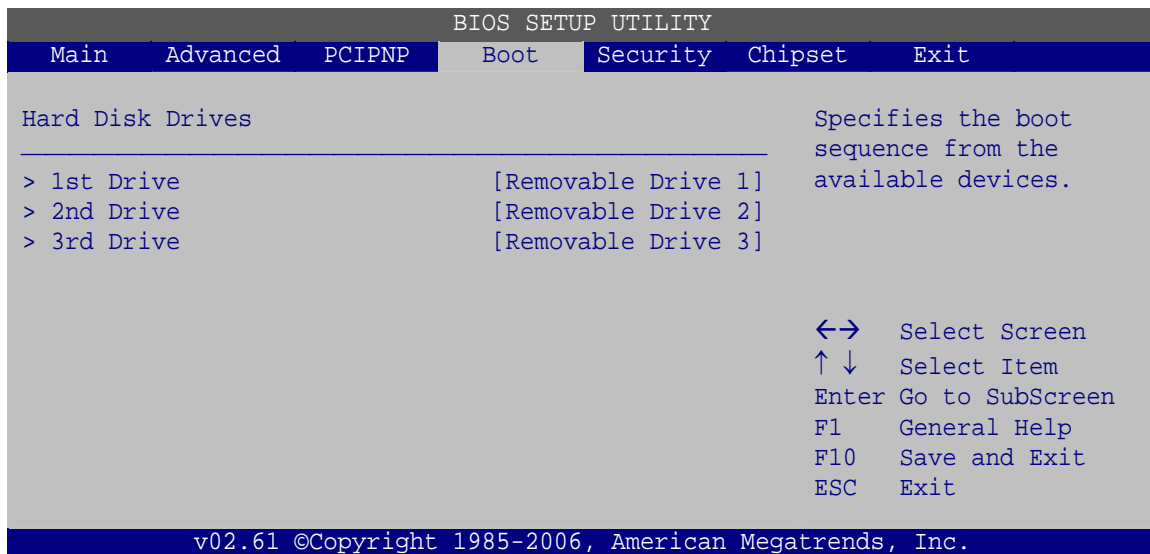
Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.



BIOS Menu 18: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (BIOS Menu 19) to specify the boot sequence of the removable drives. Only connected drives are shown.



BIOS Menu 19: Removable Drives

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5.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. Only connected drives are shown.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Hard Disk Drives
-----
> 1st Drive      [CD/DVD 1]
> 2nd Drive      [CD/DVD 2]
> 3rd Drive      [CD/DVD 3]

Specifies the boot
sequence from the
available devices.

<=>  Select Screen
↑↓   Select Item
Enter Go to SubScreen
F1   General Help
F10  Save and Exit
ESC  Exit

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```

BIOS Menu 20: CD/DVD Drives

5.6 Security

Use the **Security** menu to set system and user passwords.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Security Settings
-----
Supervisor Password :Not Installed
User Password       :Not Installed

Change Supervisor Password
Change User Password

<=>  Select Screen
↑↓   Select Item
Enter Go to SubScreen
F1   General Help
F10  Save and Exit
ESC  Exit

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```

BIOS Menu 21: Security

- **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

- **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipset

Use the **Chipset** menu to access the Northbridge and Southbridge configuration menus

```

                                BIOS SETUP UTILITY
Main    Advanced  PCIPNP    Boot    Security  Chipset  Exit
-----
Advanced Chipset Settings
-----
WARNING: Setting wrong values in below section
         may cause system to malfunction.

> Northbridge Configuration
> Southbridge Configuration

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

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```

BIOS Menu 22: Chipset

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5.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (BIOS Menu 23) to configure the Northbridge chipset.

BIOS SETUP UTILITY			
Main	Advanced	PCIPNP	Boot Security Chipset Exit
Northbridge Configuration		Options	
Memory Hole	[Disabled]	Disabled	
Internal Graphics Mode Select	[Enabled, 8MB]	15MB-16MB	
Video Function Configuration			
DVMT Mode Select	[DVMT Mode]	←→	Select Screen
DVMT/Fixed Memory	[128MB]	↑↓	Select Item
		Enter	Go to SubScreen
Boot Display Device	[CRT]	F1	General Help
LVDS1 Panel Type	[by H/W]	F10	Save and Exit
LVDS1 Current Jumper Setting	[1280x1024 36b]	ESC	Exit
LVDS2 Panel Type	[by H/W]		
LVDS2 Current Jumper Setting	[1024x768 18b]		
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BIOS Menu 23:Northbridge Chipset Configuration

- **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- ➔ **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards
- ➔ **15 MB-16 MB** Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

- **Internal Graphics Mode Select [Enable, 8 MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

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- **Boot Display Device**

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- CRT
- LVDS1
- LVDS2

- **LVDS1 Panel Type [by H/W]**

Selects the screen resolution of LVDS1.

- 640x480, 18-bit
- 800x480, 18-bit
- 800x600, 18-bit
- 1024x768, 18-bit
- 1280x1024, 36-bit
- 1400x1050, 36-bit
- 1440x900, 36-bit
- 1600x1200, 36-bit
- by H/W **DEFAULT**

- **LVDS1 Current Jumper Setting**

Shows the current hardware jumper setting for LVDS1.

- **LVDS2 Panel Type [by H/W]**

Selects the screen resolution of LVDS2.

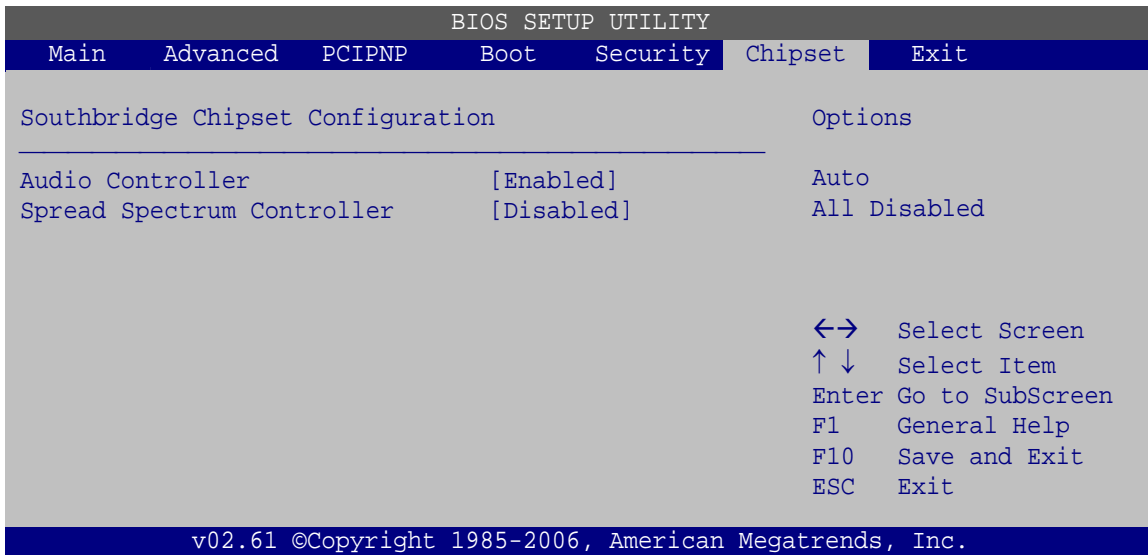
- 1024x768, 18-bit
- 1024x768, 24-bit
- 1280x1024, 36-bit
- 1280x1024, 48-bit
- by H/W **DEFAULT**

- **LVDS2 Current Jumper Setting**

Shows the current hardware jumper setting for LVDS2.

5.7.2 Southbridge Configuration

The **Southbridge Configuration** menu configures the Southbridge chipset.



BIOS Menu 24: Southbridge Chipset Configuration

- **Audio Controller Codec [Auto]**

This option enables and disables the audio controller. When disabled there will be no sound from the system and no sound input.

- ➔ **Enabled** **DEFAULT** Both audio output and microphone input are enabled
- ➔ **Disabled** All audio disabled

- **Spread Spectrum [Disabled]**

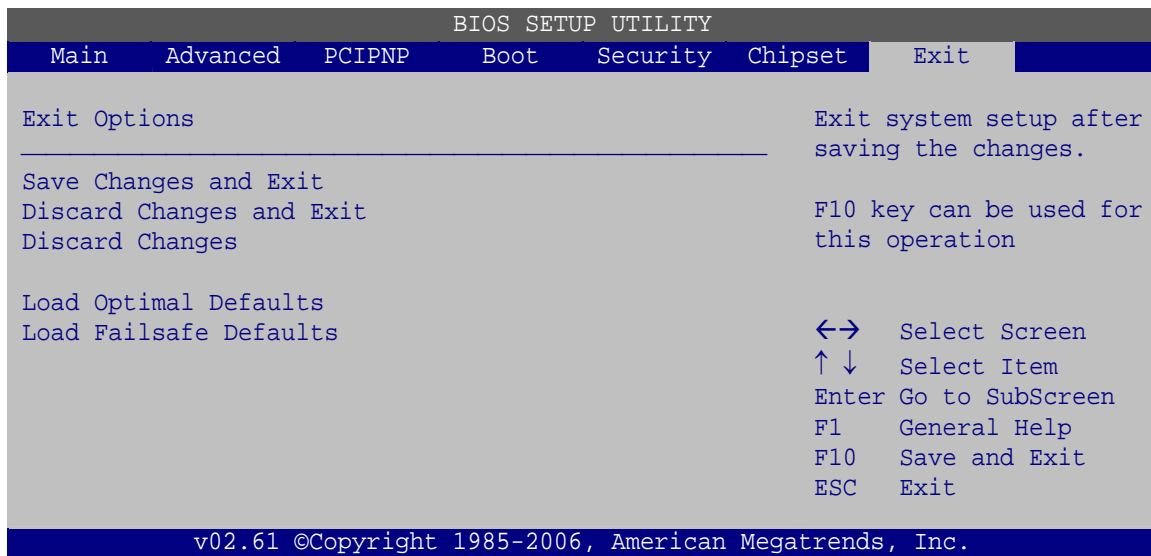
Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

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- ➔ **Disabled** **DEFAULT** EMI not reduced
- ➔ **Enabled** EMI reduced

5.8 Exit

Use the **Exit** menu to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 25:Exit

- **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

- **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

- **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

- **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

- **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

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Appendix

B

Terminology

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

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DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

C.1 Introduction

The DIO connector on the WAFER-945GSELVDS2 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call

Appendix

D

Watchdog Timer



NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer’s period.
BL:	Time-out value (Its unit-second is dependent on the item “Watchdog Timer unit select” in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.



NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

;

```

MOV      AX, 6F02H      ;setting the time-out value
MOV      BL, 30         ;time-out value is 48 seconds
INT      15H

```

;

; ADD THE APPLICATION PROGRAM HERE

;

```

CMP      EXIT_AP, 1     ;is the application over?
JNE      W_LOOP        ;No, restart the application

MOV      AX, 6F02H      ;disable Watchdog Timer
MOV      BL, 0         ;
INT      15H

```

;

; EXIT ;

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

WAFER-945GSELVDS2

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。