IEI Integration Corp.

MODEL:
ECW-281B/B2-D525

IEI Intel® Atom™ Fanless Embedded System

RoHS Compliant, Dual GbE LAN, COM Ports, USB 2.0

User Manual

Rev. 1.04 – March 12, 2015

RoHS Lead Free

Revision

Date	Version	Changes
March 12, 2015	1.04	Changed the label of the on-board RS-232/422/485 connector from COM2 to COM6.
October 19, 2012	1.03	Added bottom cover screw torque warning
October 24, 2011	1.02	Modified COM port locations in **Section 2.3.2** Updated **Chapter 5: BIOS**
May 17, 2011	1.01	Added **Section A.1.3 Product Disposal**
December 7, 2010	1.00	Initial release

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WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/ TV technician for help.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: ECW-281B/B2-D525 Series Embedded System

There are four WAFER-PV-D5252 Intel® Atom™ based embedded solutions in the ECW-281B/B2-D525 series. All fanless motherboards have been optimized for multimedia applications that require minimum installation space. The WAFER-PV-D5252 motherboard supports a full range of functions for an AT/ATX-compatible industrial computer. ECW-281B/B2-D525 embedded subsystems are all capable of supporting one 2.5" SATA hard disk drive. The W models also have a built-in 802.11 b/g/n wireless module.

1.1.1 Benefits

The ECW-281B/B2-D525 embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Secure storage with one SATA hard drive supported
- Compact size saves space
- Powerful preinstalled Intel® Atom™ D525 CPU and motherboard ensures rigorous processing needs can be met

1.1.2 Features

The ECW-281B/B2-D525 has the following features

- RoHS compliant design
- Fanless system
- 1.8 GHz Intel® Atom™ D525 CPU supported

- ■ Dual GbE LAN for high speed network applications
- ■ One SATA hard drive supported
- ■ Wall mount and DIN mount supported.

1.2 Model Variations

There are six models in the ECW-281B/B2-D525 embedded system series. The six models are all preinstalled with an Intel® Atom™ D525 processor and 1 GB DDR3 memory. The model variations are listed in **Table 1-1** below.

ECW-281B Series	Power	Wireless	VGA	COM Ports
ECW-281B-R10/D525/1GB	12V DC input (60 W adaptor)	No	1 x VGA	5 x RS-232 1 x RS-232 or optional RS-422/485
ECW-281BW-R10/D525/1GB	12V DC input (60 W adaptor)	Yes		
ECW-281BWD-R10/D525/1GB	9V~36V DC input	No		
ECW-281BWDW-R10/D525/1GB	9V~36V DC input	Yes		
ECW-281B2 Series	Power	Wireless	VGA	COM Ports
ECW-281B2-R10/D525/1GB	12V DC input (60 W adaptor)	No	2 x VGA	5 x RS-232
ECW-281B2W-R10/D525/1GB	12V DC input (60 W adaptor)	Yes		
ECW-281B2WD-R10/D525/1GB	9V~36V DC input	No		
ECW-281B2WDW-R10/D525/1GB	9V~36V DC input	Yes		

Table 1-1: Model Variations

1.3 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	ECW-281B-D525	ECW-281B2-D525
CPU	Preinstalled 1.8 GHz Intel® Atom™ Processor D525 with 1 MB L2 cache	
System Chipset	Intel® ICH8M	
System Memory	Preinstalled 1.0 GB DDR3 SDRAM SO-DIMM (system max. 2 GB)	
Ethernet	Dual Realtek RTL8111E GbE controllers Built-in 802.11 b/g/n wireless module for the wireless models	
Display	One VGA port	Two VGA port § VGA1: 2048 x 1536 (max.) § VGA2: 1024 x 768 (max.)
Serial Port	Five RS-232 One RS-232 or RS-422/485 (optional)	Five RS-232
USB	Four USB 2.0 ports	
Audio	One audio out	
Storage	One 2.5" SATA hard drive supported One internal CF card slot	
Chassis Construction	Aluminum Alloy	
Power Supply	**9 V – 36 V DC** (WD series models): Internal DC-to-DC power converter **12 V DC models:** External power adapter, 90V AC ~ 264V AC @ 47Hz ~ 63Hz, 60 W	
Operating Shock	Half-sine wave shock 3G; 11ms; 3 shocks per axis	
Operating Vibration	MIL-STD-810F 514.5C-1 (HDD) MIL-STD-810F 514.5C-2 (CF)	

Operating Temperature	-20ºC ~ 65ºC with SATA SSD, air flow* -10ºC ~ 50ºC with SATA HDD in wireless model, air flow* *Ambient air speed per IEC-68-2-2 standard
Color	Black
Mounting	DIN mount VESA MIS-D 75 wall mount
Weight (Net/Gross)	2.1 kg/3.9 kg
Dimensions (D x W x H)	132 mm x 229 mm x 64 mm
EMC	FCC Class A, CE

Table 1-2: Technical Specifications

1.4 Power Module Specifications (Optional)

A DC-to-DC power module is preinstalled in the WD series model to provide 9 V~36 V power input. The specifications for the IDD-936260A are shown in **Table 1-3**.

Model Name:	IDD-936260A
Input	9 V DC~36 V DC
Output:	
12V	3 A (Max.)
5V	10 A (Max.)
5VSB	0.5 A (Max.)
Max. Total Output:	60 W
Performance Characteristics:	
Noise & Ripple:	< 240 mV
Line Regulation:	< 20 mV
Load Regulation	<60 mV
Efficiency:	Up to 90%
Dimensions:	40 mm x 100 mm
Weight:	58 g
Operating Temperature:	-40°C~85°C

Table 1-3: DC-to-DC Power Module Specifications

1.5 Power Adapter (Optional)

The ECW-281B/B2-D525 series models that feature 12 V DC input are shipped with a 60W power adapter.

Figure 1-2: Power Adapter

The specifications for the adapter are listed in **Table 1-4**:

Input Voltage	90 V ~ 264 V AC
Input Frequency	47 Hz ~ 63 Hz
Output Voltage	12 V
Output Current	5 A
Efficiency	87%
Operating Temperature	0 ºC ~ 40 ºC
Storage Temperature	-20 ºC ~ 65 ºC

Table 1-4: Power Adapter Specifications

Chapter

2

Mechanical Description

2.1 Mechanical Overview

The ECW-281B/B2-D525 RoHS compliant, Intel® Atom™ fanless embedded system features industrial grade components that offer longer operating life, high shock/vibration resistance and endurance over a wide temperature range. The ECW-281B/B2-D525 combines these features in an aluminum enclosure. Featuring two LAN, four USB, six serial communication ports, as well as audio, and VGA, the ECW-281B/B2-D525 offers system integrators and developers the best selection of robust and high performance computing system platforms. An internal bracket supports one 2.5" SATA hard drives.

2.2 Physical Dimensions

The dimensions of the ECW-281B/B2-D525 are listed below and shown in **Figure 2-1**.

- **Height**: 64.00 mm
- **Width**: 229.00 mm
- **Length**: 132.00 mm
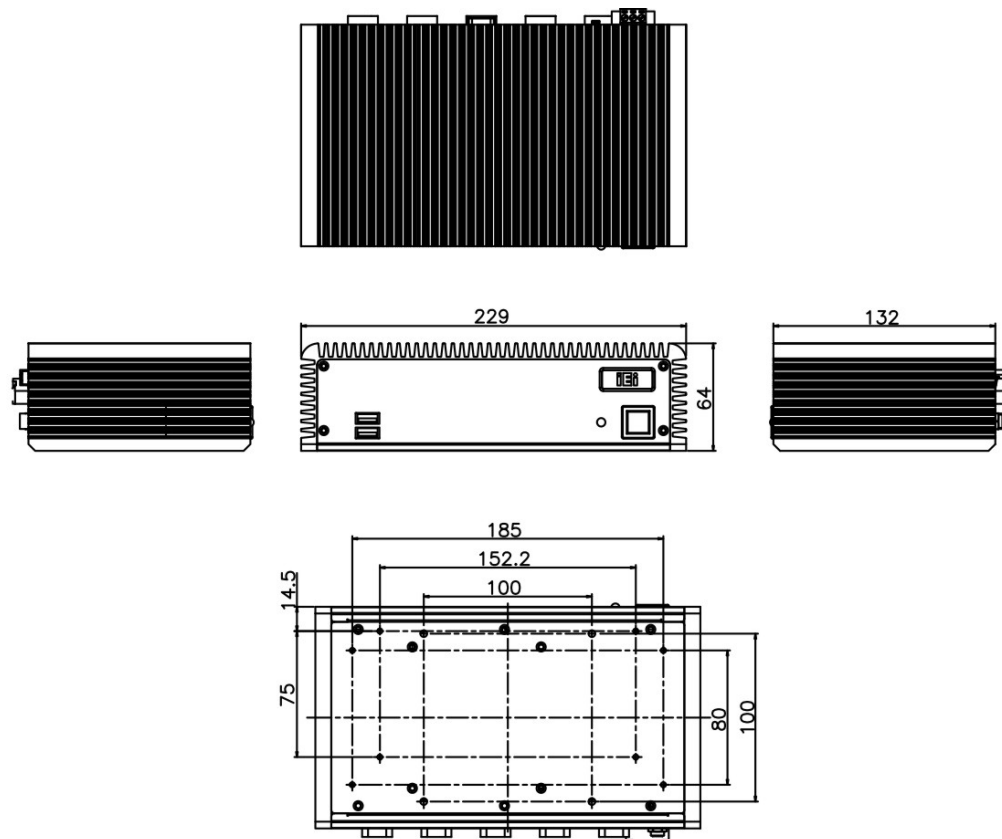
Figure 2-1: ECW-281B/B2-D525 Dimensions (mm)

2.3 External Overview

2.3.1 Front Panel

The ECW-281B/B2-D525 front panel contains:

- 2 x USB port connectors
- 1 x HDD LED indicator
- 1 x Power button

An overview of the front panel is shown in **Figure 2-2** below.

USB ports   HDD LED

Power button

Figure 2-2: ECW-281B/B2-D525 Front Panel

2.3.2 Rear Panel

2.3.2.1 ECW-281B-D525 Rear Panel

The rear panel of the ECW-281B-D525 provides access to the following external I/O connectors.

- 2 x USB port connectors
- 2 x RJ-45 Ethernet connector
- 1 x VGA connector
- 1 x RS-232 or RS-422/485 (optional) serial port
- 5 x RS-232 serial ports
- 1 x Speaker out
- 1 x 3-pin power terminal block
- 1 x 12V DC power jack

▪ 1 x Wireless antenna connector (for wireless models only)

An overview of the rear panel is shown in **Figure 2-3**.
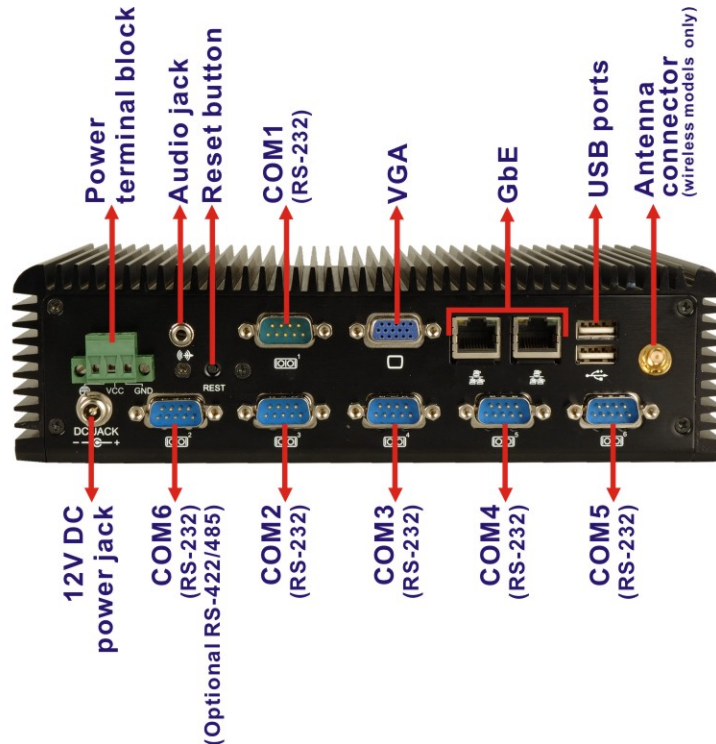
Figure 2-3: ECW-281B-D525 Rear Panel

2.3.2.2 ECW-281B2-D525 Rear Panel

The rear panel of the ECW-281B2-D525 provides access to the following external I/O connectors.

▪ 2 x USB port connectors

▪ 2 x RJ-45 Ethernet connector

▪ 2 x VGA connectors

▪ 5 x RS-232 serial ports

▪ 1 x Speaker out

▪ 1 x 3-pin power terminal block

▪ 1 x 12V DC power jack

▪ 1 x Wireless antenna connector (for wireless models only)

An overview of the rear panel is shown in **Figure 2-4**.
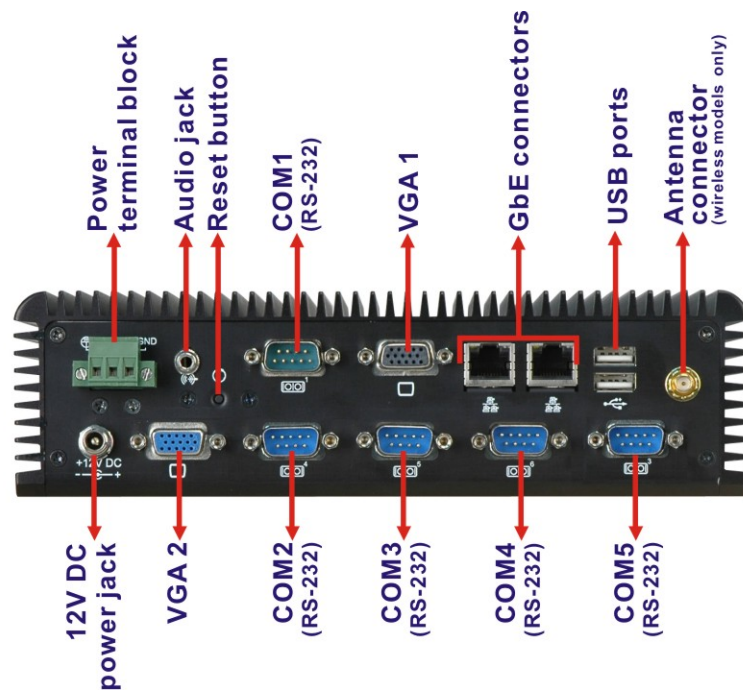
Figure 2-4: ECW-281B2-D525 Rear Panel

2.3.3 Bottom Surface

![Warning] **WARNING:**

> Never remove the bottom access panel from the chassis while power is still being fed into the system. Before removing the bottom access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom surface of the ECW-281B/B2-D525 contains the retention screw holes for the VESA MIS-D 100 wall-mount kit, two-side mounting brackets and DIN mount bracket.
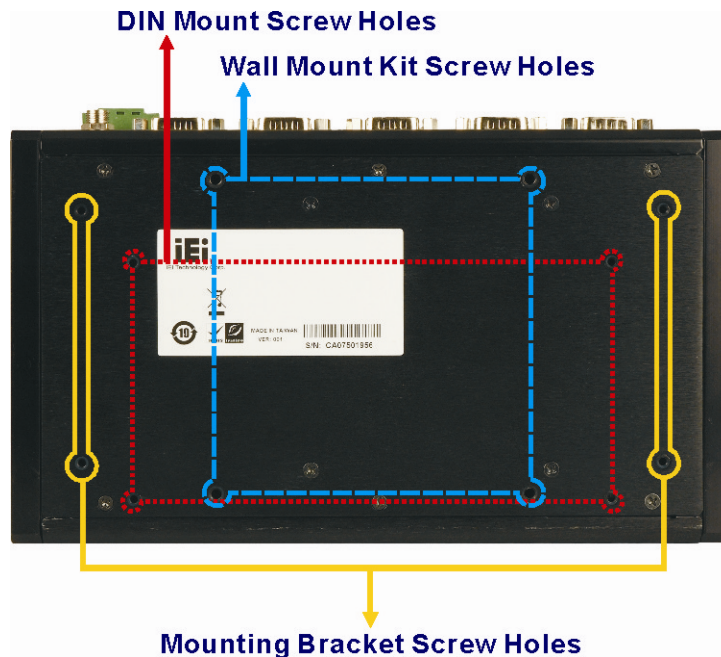
Figure 2-5: Bottom Surface

2.4 Internal Overview

The ECW-281B/B2-D525 internal components are listed below:

- 1 x IEI WAFER motherboard (preinstalled)
- 1 x IEI power module (WD modesls only)
- 1 x SO-DIMM module (preinstalled)
- 1 x Hard drive bracket and SATA cable support one SATA hard disk

All the components are accessed by removing the bottom surface.

Figure 2-6: Internal Overview

Chapter

3

System Components

3.1   Embedded System Motherboard

NOTE:

The jumpers and connectors shown in the section below are those jumpers

and connectors that are relevant to the configuration and installation of the

embedded system. For a complete list of jumpers and connectors on the

WAFER-PV-D5252 motherboard, please refer to the WAFER-PV-D5252 user

manual.

The ECW-281B/B2-D525 models have a WAFER-PV-D5252 motherboard installed in the system. The following sections describe the relevant connectors and jumpers on the motherboard.

3.1.1 WAFER-PV-D5252 Motherboard Overview

The locations of the WAFER-PV-D5252 jumpers and connectors used on the ECW-281B/B2-D525 are shown in **Figure 3-1** below.
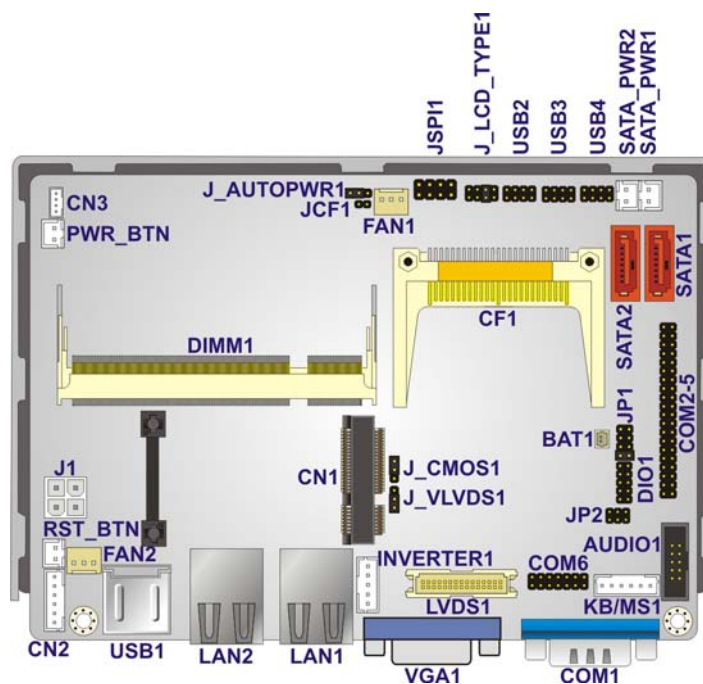
Figure 3-1: WAFER-PV-D5252 Jumper and Connector Locations

3.1.2 CPU Support

![NOTE icon] **NOTE:**

The ECW-281B/B2-D525 series has a preinstalled Intel® Atom™

1.8 GHz CPU on-board. If the CPU fails, the motherboard has to be

replaced. Please contact the IEI reseller or vendor you purchased the

ECW-281B/B2-D525 from or contact an IEI sales representative directly.

To contact an IEI sales representative, please send an email to

sales@iei.com.tw.

The ECW-281B/B2-D525 comes with an embedded 45 nm 1.8 GHz Intel® Atom™ processor D525. It is a dual-core processor with 1 MB L2 cache.

3.2 Peripheral Interface Connectors

Section 3.2.1 lists all the peripheral interface connectors seen in Section 3.1.1.

3.2.1 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the WAFER-PV-D5252 that are used for the ECW-281B/B2-D525. Detailed descriptions of these connectors can be found in Section 3.3.

Connector	Type	Label
ATX power connector	4-pin ATX	J1
Audio connector	10-pin box header	AUDIO1
Battery connector	2-pin wafer	BT1
CompactFlash® socket	50-pin CF socket	CF1
LED connector	6-pin header	CN2
PCIe Mini Card slot	PCIe Mini Slot	CN1

Power button connector	2-pin wafer	PWR_BTN
Reset button connector	2-pin header	RST_BTN
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1
RS-232 serial port connector (COM3 – COM6)	40-pin header	COM
RS-232/422/485 serial port connector	14-pin header	COM6
USB 2.0 connector	8-pin header	USB4

Table 3-1: Peripheral Interface Connectors

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 the internal, peripheral connectors on the WAFER-PV-D5252 that are used for the ECW-281B/B2-D525.

3.3.1 ATX Power Connector

CN Label:	J1
CN Type:	4-pin power connector (1x4)
CN Location:	See **Figure 3-2**
CN Pinouts:	See **Table 3-2**

The 4-pin ATX power connector is connected to a DC-DC power module.
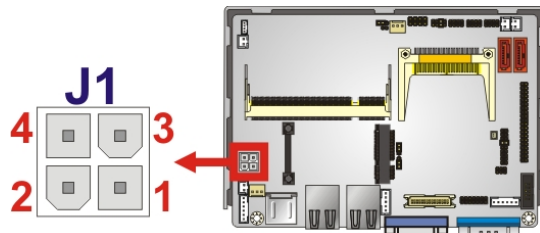
Figure 3-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+5V

Table 3-2: ATX Power Connector Pinouts

3.3.2 Audio Connector (10-pin)

CN Label:	**AUDIO1**
CN Type:	10-pin box header
CN Location:	See **Figure 3-3**
CN Pinouts:	See **Table 3-3**

The 10-pin audio connector is interfaced to an audio line-out connector and provides output of audio signals from the system.
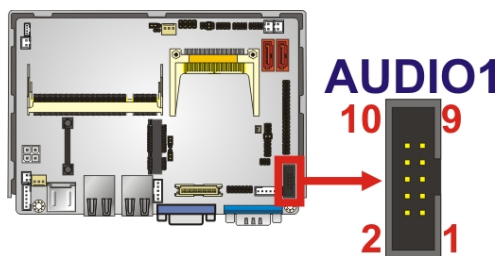
Figure 3-3: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUTR	2	LINEIN_R
3	GND_AUDIO	4	GND_AUDIO
5	LINE_OUTL	6	LINEIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MICIN	10	MICIN

Table 3-3: Audio Connector Pinouts (10-pin)

3.3.3 CompactFlash® Socket

CN Label:	CF1
CN Type:	50-pin header (2x25)
CN Location:	See **Figure 3-4**
CN Pinouts:	See **Table 3-4**

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the ECW-281B/B2-D525.
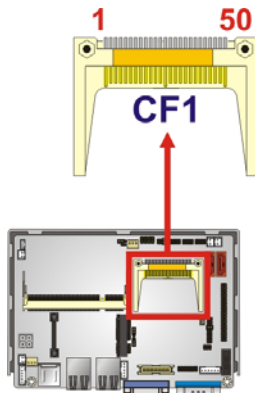
Figure 3-4: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	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#

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#
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 3-4: CF Card Socket Pinouts

3.3.4 LED Connector

CN Label:	**CN2**
CN Type:	6-pin wafer (1x6)
CN Location:	See **Figure 3-5**
CN Pinouts:	See **Table 3-5**

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.
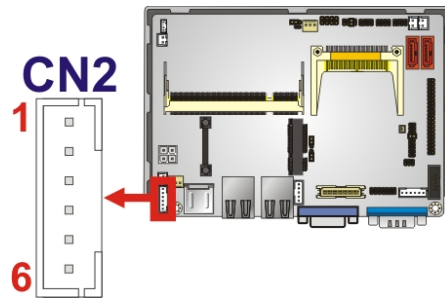
Figure 3-5: LED Connector Locations

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

Table 3-5: LED Connector Pinouts

3.3.5 PCIe Mini Card Slot

CN Label:	**CN1**
CN Type:	52-pin Mini PCIe Card Slot
CN Location:	See **Figure 3-6**
CN Pinouts:	See **Table 3-6**

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.
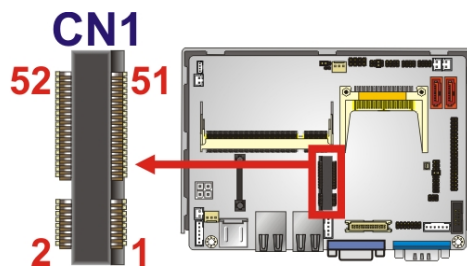
Figure 3-6: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	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 3-6: PCIe Mini Card Slot Pinouts

3.3.6 Power Button Connector

CN Label:	PWR_BTN
CN Type:	2-pin wafer (1x2)
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-7**

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.
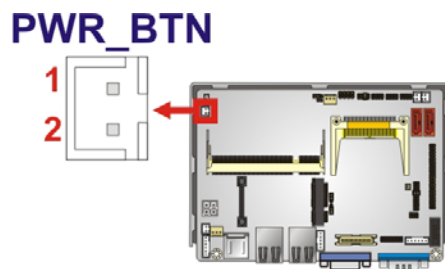
Figure 3-7: Power Button Connector Location

PIN NO.	DESCRIPTION
1	Power Switch-
2	GND

Table 3-7: Power Button Connector Pinouts

3.3.7 Reset Button Connector

CN Label:	RST_BTN
CN Type:	2-pin wafer (1x2)
CN Location:	See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.
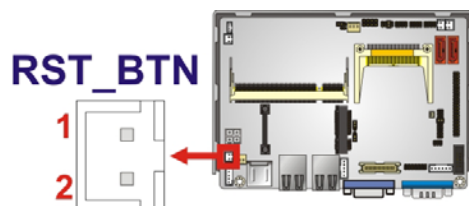
Figure 3-8: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

Table 3-8: Reset Button Connector Pinouts

3.3.8 SATA Drive Connectors

CN Label: **SATA1**, **SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

The SATA connectors connect to SATA hard drives or optical drives.
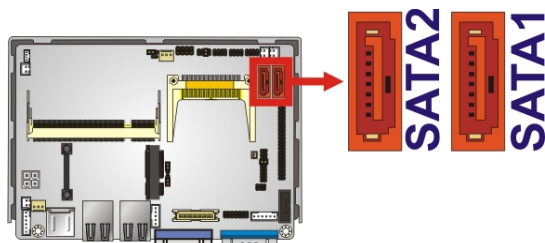
Figure 3-9: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-9: SATA Drive Connector Pinouts

3.3.9 Serial Port Connector (COM3, COM4, COM5 and COM6)

CN Label:	COM
CN Type:	40-pin header (2x20)
CN Location:	See **Figure 3-10**
CN Pinouts:	See **Table 3-10**

The 40-pin serial port connector contains the following four serial ports: COM3, COM4, COM5 and COM6. All these serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- COM3 is located on pin 1 to pin 10
- COM4 is located on pin 11 to pin 20
- COM5 is located on pin 21 to pin 30
- COM6 is located on pin 31 to pin 40
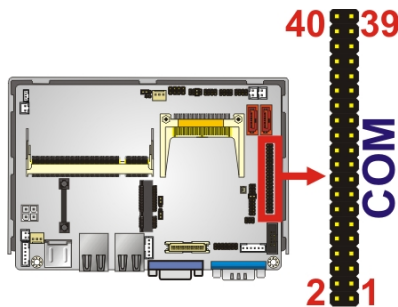
Figure 3-10: COM3 to COM6 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD3)	2	DATA SET READY (DSR3)
3	RECEIVE DATA (RXD3)	4	REQUEST TO SEND (RTS3)
5	TRANSMIT DATA (TXD3)	6	CLEAR TO SEND (CTS3)
7	DATA TERMINAL READY (DTR3)	8	RING INDICATOR (RI3)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD4)	12	DATA SET READY (DSR4)
13	RECEIVE DATA (RXD4)	14	REQUEST TO SEND (RTS4)
15	TRANSMIT DATA (TXD4)	16	CLEAR TO SEND (CTS4)
17	DATA TERMINAL READY (DTR4)	18	RING INDICATOR (RI4)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD5)	22	DATA SET READY (DSR5)
23	RECEIVE DATA (RXD5)	24	REQUEST TO SEND (RTS5)
25	TRANSMIT DATA (TXD5)	26	CLEAR TO SEND (CTS5)
27	DATA TERMINAL READY (DTR5)	28	RING INDICATOR (RI5)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD6	32	DATA SET READY (DSR6)
33	RECEIVE DATA (RXD6)	34	REQUEST TO SEND (RTS6)
35	TRANSMIT DATA (TXD6	36	CLEAR TO SEND (CTS6)
37	DATA TERMINAL READY (DTR6	38	RING INDICATOR (RI6)
39	GND	40	GND

Table 3-10: COM3 to COM6 Connector Pinouts

3.3.10 Serial Port Connector (COM6) (RS-232, RS-422 or RS-485)

CN Label:	COM6
CN Type:	14-pin header (2x7)
CN Location:	See **Figure 3-11**
CN Pinouts:	See **Table 3-11**

The 14-pin serial port connector connects to the COM6 serial communications channels. COM6 is a multi function channel. In default mode COM6 is an RS-232 serial

communication channel but, with the COM6 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.
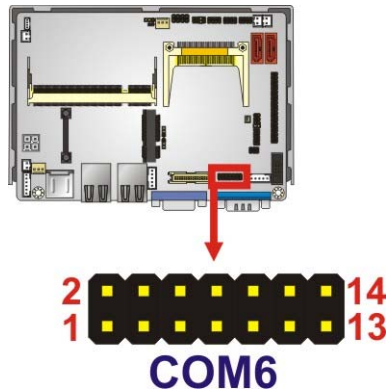
Figure 3-11: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	2	NDSR2
3	NRX	4	NRTS2
5	NTX	6	NCTS2
7	NDTR	8	NRI2
9	GND	10	GND
11	TXD422+/TXD485+	12	TXD422-/TXD485-
13	RXD422+	14	RXD422-

Table 3-11: RS-232/422/485 Serial Port Connector Pinouts

NOTE:

The RS-422/485 function is an optional choice of the ECW-281B-D525 Series. The COM6 connector on the rear panel of the standard ECW-281B-D525 Series only provides RS-232 serial communication.

3.3.11 USB Connectors (Internal)

CN Label:	USB4
CN Type:	8-pin header (2x4)
CN Location:	See **Figure 3-12**
CN Pinouts:	See **Table 3-12**

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.
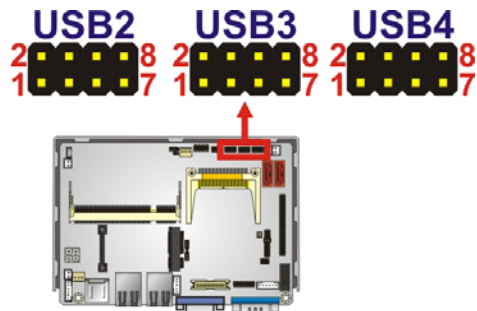
Figure 3-12: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-12: USB Port Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

⚠ **WARNING:**

If the following anti-static precautions are not followed, a user may be injured and the system irreparably damaged.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER series motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the ECW-281B/B2-D525 is opened and any electrical component 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.

4.2 Installation Procedure

4.2.1 Installation Procedure Overview

To properly install the ECW-281B/B2-D525, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Configure the jumper settings

Step 3: Install the SATA hard disk drive (HDD)

Step 4: Mount the ECW-281B/B2-D525

Step 5: Connect the front panel peripheral connectors

Step 6: Power the system up

4.2.2 Unpacking

After the ECW-281B/B2-D525 is received make sure the following components are included in the package. If any of these components are missing, please contact the ECW-281B/B2-D525 reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	ECW-281B/B2-D525 embedded system	
2	Mounting brackets	
1	Screw set	
1	DIN mount kit	
1	SATA and power cable	
1	Thermal pad for HDD	
1	Quick installation guide	
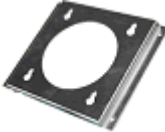
1	Driver and manual CD	
1	Wireless antenna (wireless model only)	
1	Power cord (optional for WD models)	
1	Power adapter with ERP and PSE certificates (optional for WD models) (P/N: 63000-FSP060DBAB1552-RS)	
1	VESA MIS-D 100 wall mount kit (optional)	

Table 4-1: Package List Contents

4.2.3 Bottom Surface Removal

WARNING:

Over-tightening bottom cover screws will cause damage to the bottom surface. Maximum torque for cover screws is 5 kg-cm (0.36 lb-ft/0.49 Nm).

Before the jumper settings can be configured and the hard disk drive can be installed, the bottom surface must be removed. To remove the bottom surface, please follow the steps below:

Step 1: Remove the bottom surface retention screws. The bottom surface is secured to the chassis with six retention screws (**Figure 4-1**). All six screws must be removed.

Figure 4-1: Bottom Surface Retention Screws

Step 2: Gently remove the bottom surface from the ECW-281B/B2-D525.

4.2.4 Configure the Jumper Settings

To configure the jumper settings, please follow the steps below.

Step 1: Remove the bottom surface. See **Section 4.2.3**.

Step 2: Locate the jumper settings on the embedded motherboard. See **Chapter 4.2.4.1**.

Step 3: Make the jumper settings in accordance with the settings described and defined in **Chapter 4.2.4.1**.

4.2.4.1 Jumpers

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.
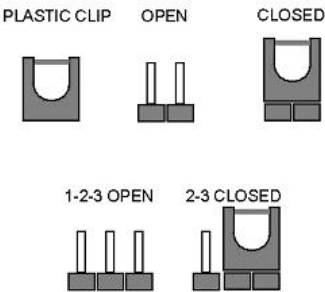
Figure 4-2: Jumpers

The WAFER-PV-D5252 motherboard has several onboard jumpers (**Table 4-2**).

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header
CompactFlash® master/slave selection	JCF1	2-pin header
COM6 RS-232/422/485 selection	JP1	8-pin header
COM1 pin-9 voltage selection	JP2	6-pin header

Table 4-2: Jumpers

4.2.4.2 CF Card Setup

Jumper Label:	JCF1
Jumper Type:	2-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-3**

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 4-3.

CF Card Setup	Description	
OFF	Slave	Default
Short 1-2	Master	

Table 4-3: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 4-3.
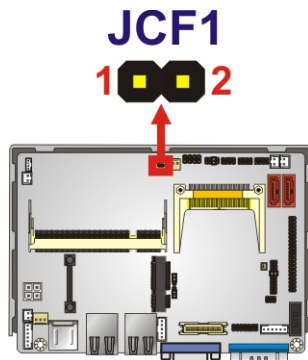
Figure 4-3: CF Card Setup Jumper Location

4.2.4.3 Clear CMOS Jumper

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

If the ECW-281B/B2-D525 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 4-4**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 4-4: Clear CMOS Jumper Settings

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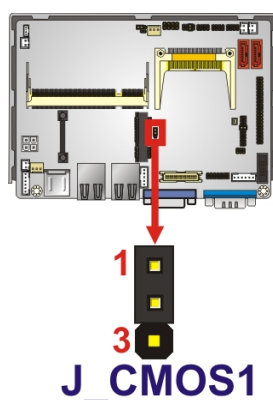
Figure 4-4: Clear CMOS Jumper

4.2.4.4 COM 6 Function Select Jumper (ECW-281B-D525 Series Only)

NOTE:

The RS-422/485 function is an optional choice of the ECW-281B-D525 Series. Please make sure the system you have has RS-422/485 function before making any further configuration.

Jumper Label:	JP1
Jumper Type:	8-pin header
Jumper Settings:	See **Table 4-5**
Jumper Location:	See **Figure 4-5**

The COM 6 Function Select jumper sets the communication protocol used by the second serial communications port (COM 6) as RS-232, RS-422 or RS-485. The COM 6 Function Select settings are shown in **Table 4-5**.

COM 6 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	
Short 5-6, 7-8	RS-485 with RTS control	

Table 4-5: COM 6 Function Select Jumper Settings

The COM 6 Function Select jumper location is shown in **Figure 4-5**.
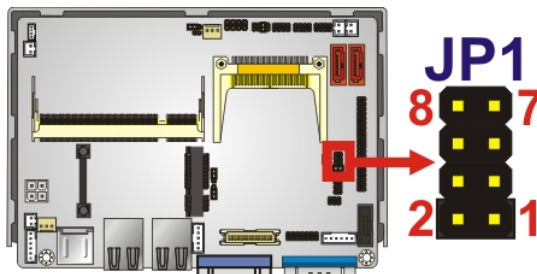
Figure 4-5: COM 2 Function Select Jumper Location

4.2.4.5 COM 1 Pin 9 Setting Jumper

Jumper Label:	**JP2**
Jumper Type:	6-pin header
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-6

The COM 1 Pin 9 Setting jumper configures pin 9 on COM 1 as either a +5 V, +12 V power source or as a ring-in (RI) line. The COM 1 Pin 9 Setting jumper selection options are shown in Table 4-6.

Setting	Description
Short 1-3	COM 1 RI Pin use +5 V
Short 3-5	COM 1 RI Pin use +12 V
Short 3-4	COM 1 RI Pin use RI (Default)

Table 4-6: COM 1 Pin 9 Setting Jumper Settings
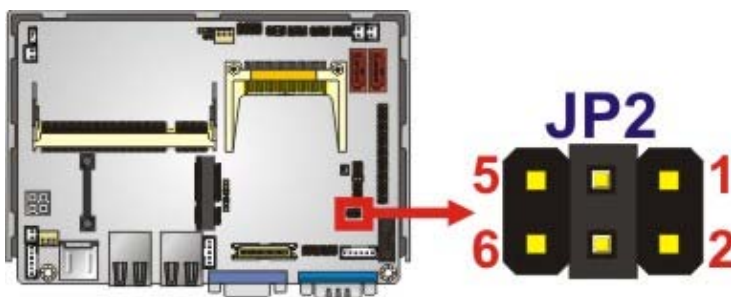
Figure 4-6: COM 1 Pin 9 Setting Jumper Location

4.2.5 Hard Drive Installation

One 2.5" SATA hard drive supported. The SATA drive is installed into a hard drive bracket attached on the inside of the bottom panel (**Figure 4-7**).

Figure 4-7: Hard Drive Bracket

To install the hard drive into the system, please follow the steps below.

Step 1: Remove the bottom surface See Section 4.2.3.

Step 2: Remove the hard drive bracket from the bottom surface by removing the four
retention screws that secure the bracket to the bottom surface. (**Figure 4-8**)

Figure 4-8:HDD Bracket Retention Screws

Step 3: Place the HDD into the bracket.

Step 4: Align the retention screw holes in the HDD with those in the bottom of the bracket.

Step 5: Secure the HDD with the bracket by inserting four retention screws into the bottom of the bracket (**Figure 4-9**).

Figure 4-9: HDD Retention Screws

Step 6: Locate the breather hole of the HDD. Cut off the corresponding area of the breather hole from the thermal pad.

Step 7: Adhere the thermal pad to the HDD. Make sure there is no obstacle covering the breather hole (**Figure 4-10**).

⚠ **CAUTION:**

Make sure the breather hole of the HDD is not covered. Covering the breather hole may cause damage to the HDD.

Cut-off hole for
HDD breather hole
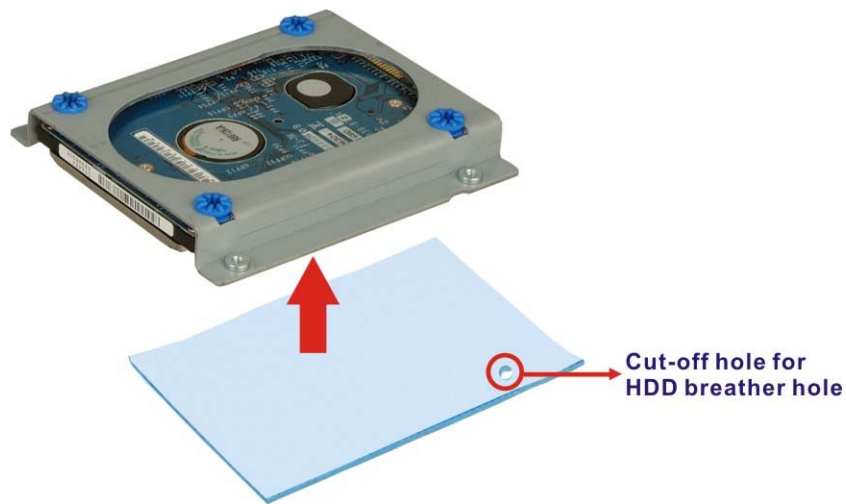
Figure 4-10: HDD Thermal Pad

Step 8: Replace the HDD bracket onto the bottom surface by aligning the four retention screw holes in the HDD bracket with those in the back of the bottom surface.

Step 9: Reinsert the four previously removed retention screws.

Step 10: Connect the SATA cable connector in the ECW-281B/B2-D525 to the HDD.

Step 11: Replace the bottom surface to the bottom panel by reinserting the six previously removed retention screws.

![Warning icon] **WARNING:**

Over-tightening bottom cover screws will cause damage to the bottom surface. Maximum torque for cover screws is 5 kg-cm (0.36 lb-ft/0.49 Nm).

4.2.6 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface.

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket.

Figure 4-11: Mounting Bracket Retention Screws

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

4.2.7 Mounting the System with Wall Mount Kit

To mount the embedded system onto a wall using the VESA MIS-D 100 wall mount kit, please follow the steps below.

Step 1: Select the location on the wall for the wall-mounting bracket.

Step 2: Carefully mark the locations of the four bracket screw holes on the wall.

Step 3: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 4: Align the wall-mounting bracket screw holes with the pilot holes.

Step 5: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 4-12**).
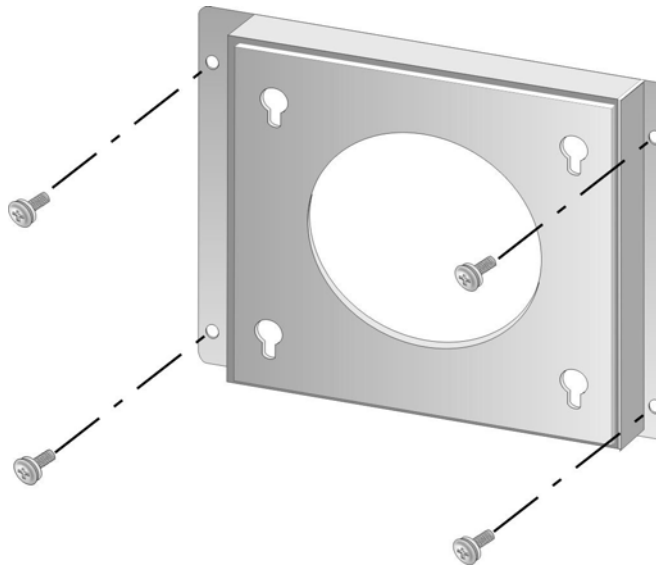
Figure 4-12: Wall-mounting Bracket

Step 6: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (760H760HFigure 4-13).

Step 7: Align the mounting screws on the ECW-281B/B2-D525 bottom panel with the mounting holes on the bracket.

Step 8: Carefully insert the screws through the holes and gently pull the monitor downwards until the ECW-281B/B2-D525 rests securely in the slotted holes (**Figure 4-13**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.
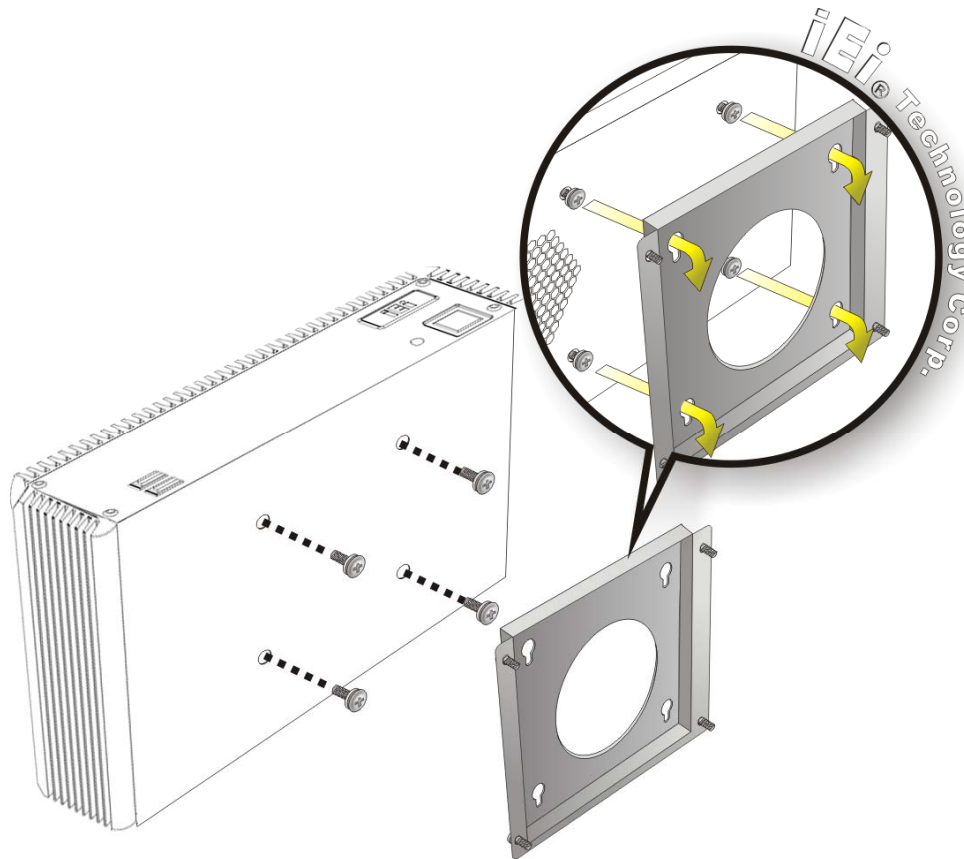
Figure 4-13: Mount the Embedded System

4.2.8 DIN Mounting

To mount the ECW-281B/B2-D525 embedded system onto a DIN rail, please follow the

steps below.

Step 1: Attach the DIN rail mounting bracket to the bottom panel of the embedded system. Secure the bracket to the embedded system with the supplied retention screws (**Figure 4-14**).
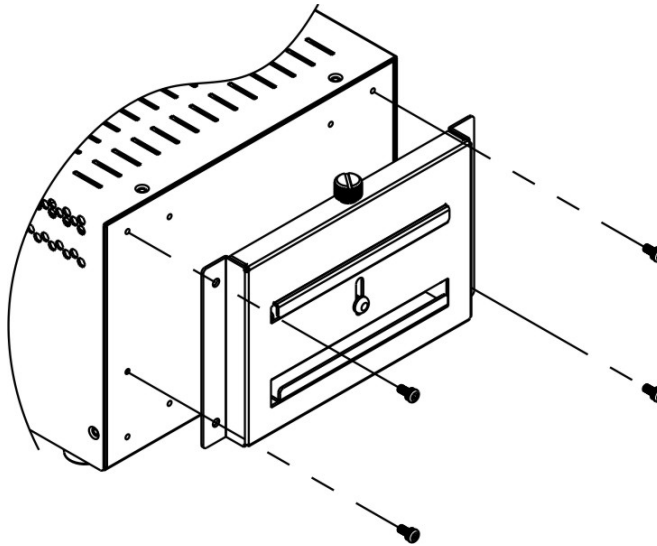
Figure 4-14: DIN Rail Mounting Bracket

Step 2: Make sure the inserted screw in the center of the bracket is at the lowest position of the elongated hole (**Figure 4-15**).
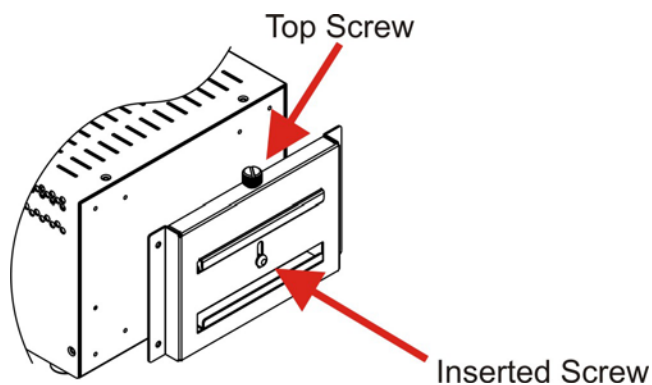
Figure 4-15: Screw Locations

Step 3: Place the DIN rail flush against the back of the mounting bracket making sure the edges of the rail are between the upper and lower clamps (**Figure 4-16**).
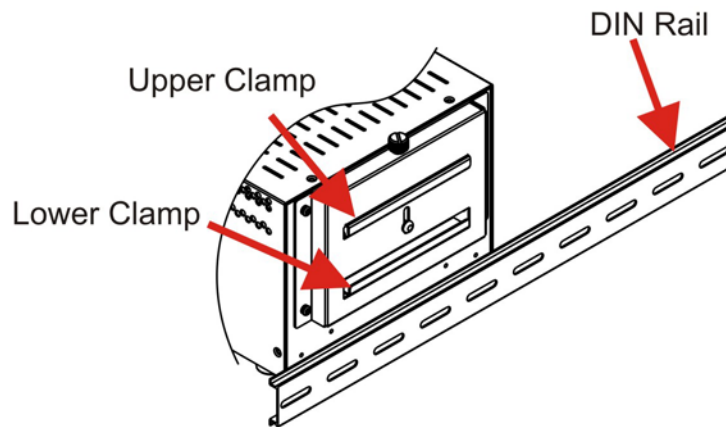
Figure 4-16: Mounting the DIN RAIL

Step 4: Secure the DIN rail to the mounting bracket by turning the top screw clockwise. This draws the lower clamp up and secures the embedded system to the DIN rail (**Figure 4-17**).
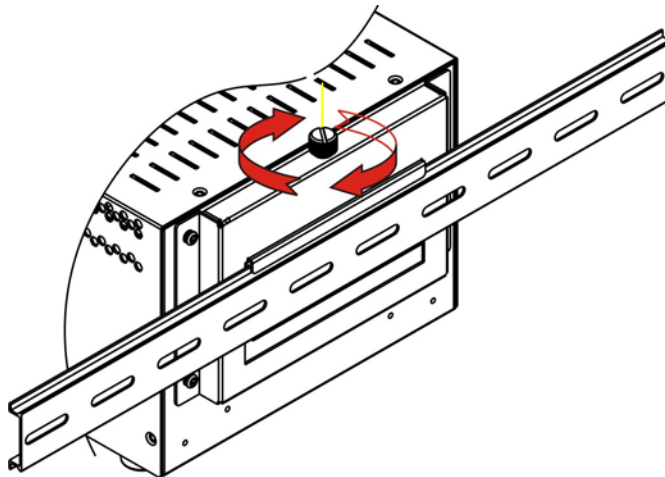
Figure 4-17: Secure the Assembly to the DIN Rail

4.2.9 Wireless Antenna Installation (Wireless Models Only)

To install an antenna to the wireless ECW-281B/B2-D525 series for efficient wireless network transmission, follow the steps below.

Step 1: Locate the antenna connector on the rear panel of the embedded system (refer to **Figure 2-3**).

Step 2: Install the antenna to the antenna connector (**Figure 4-18**).

Figure 4-18: Wireless Antenna Installation

4.2.10 Cable Connections

Once the system has been mounted on the wall, the following connectors can be connected to the system.

- VGA cable connector
- Serial port connectors
- RJ-45 connectors
- USB devices can be connected to the system.

The cable connection locations are shown in **Figure 2-3**.

4.3 Power-On Procedure

4.3.1 Installation Checklist

![warning icon] **WARNING:**

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

To power on the embedded system please make sure of the following:

- The bottom surface panel is installed

- All peripheral devices (VGA monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

4.3.2 Terminal Block Pinouts

The terminal block pinouts are shown in **Figure 4-19**.
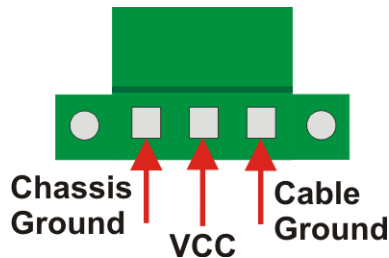
Figure 4-19: Terminal Block Pinouts

The chassis ground is connected to the ECW chassis internally. The cable ground is connected to the ground pin on the input power connector of the power module.

4.3.3 Power-on Procedure

To power-on the ECW-281B/B2-D525 please follow the steps below:

Step 1: Push the power button.

Step 2: Once turned on, the power button should turns to blue. See **Figure 4-20**.

Figure 4-20: Power Button

Chapter

6

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

1. Press the **F2** key as soon as the system is turned on or
2. Press the **F2** key when the "**Press F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **F2** 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 the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page

Key	Function
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F9	Load optimized defaults
F10	Save changes and Exit BIOS

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 changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **4**.

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.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & 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 (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.
The **Main** menu gives an overview of the basic system information.

```
         Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main    Advanced   Chipset     Boot     Security  Save & Exit

 BIOS Information                                      Set the Time. Use Tab to
 BIOS Vendor                   American Megatrends     switch between Time
 Core Version                  4.6.4.0 0.20            elements.
 Compliency                    UEFI 2.0
 Project Version               E338AR14.ROM
 Build Date                    09/03/2010 15:39:09     ---------------------


                                                       ←→: Select Screen
 System Date                   [Tue 05/06/2008]        ↑ ↓: Select Item
 System Time                   [14:20:27]              EnterSelect
                                                       F1   General Help
 Access Level                  Administrator           F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save
                                                       ESC  Exit
         Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 1: Main

➔ **BIOS Information**

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date:** Date the current BIOS version was made

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

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

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

 WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

```
         Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced   Chipset    Boot    Security  Save & Exit

 > ACPI Settings                                    System ACPI Parameters
 > CPU Configuration
 > IDE Configuration
 > USB Configuration
 > Super IO Configuration                           ---------------------
 > H/M Monitor
 > Serial Port Console Redirection                  ←→: Select Screen
 > IEI Feature                                      ↑↓: Select Item
                                                    EnterSelect
                                                    F1   General Help
                                                    F2   Previous Values
                                                    F3    Optimized
                                                    Defaults
                                                    F4    Save
                                                    ESC   Exit
          Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.

```
        Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
           Advanced

ACPI Sleep State                    [S1 (CPU Stop Clock)]   Select the highest ACPI
                                                            sleep state the system
                                                            will enter, when the
                                                            SUSPEND button is
                                                            pressed.


                                                            ----------------------

                                                            ←→: Select Screen
                                                            ↑↓: Select Item
                                                            Enter Select
                                                            F1    General Help
                                                            F2    Previous Values
                                                            F3    Optimized
                                                            Defaults
                                                            F4    Save
                                                            ESC   Exit
        Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```
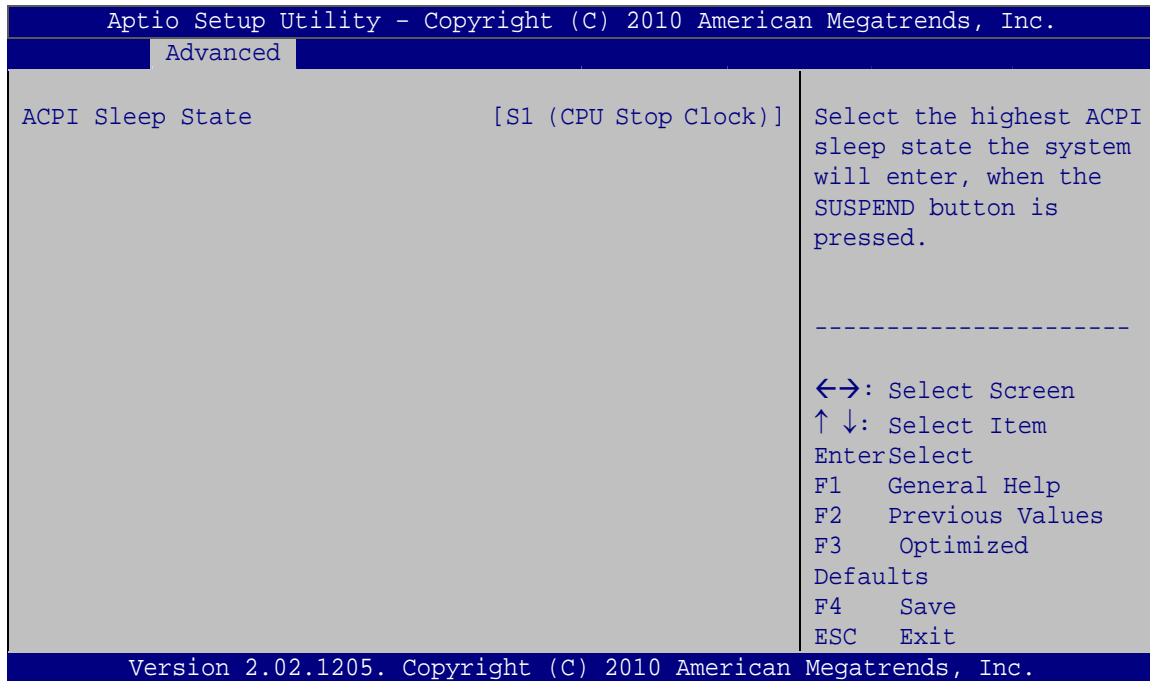
BIOS Menu 3: ACPI Configuration

➔ **ACPI Sleep State [S1 (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (CPU Stop** DEFAULT **Clock)**

The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (Suspend to RAM)**

The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 4**) to view detailed CPU specifications and configure the CPU.

```
         Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
           Advanced

 CPU Configuration

 Processor Type              Intel(R) Atom(TM)
                             CPU D525 @1.80GHz
 EMT64                       Supported
 Processor Speed             1800 MHz                  --------------------
 System Bus Speed            800 MHz
 Ratio Status                9                         ←→: Select Screen
 Actual Ratio                9                         ↑ ↓: Select Item
 Processor Stepping          106ca                     Enter Select
 Microcode Revision          263                       F1   General Help
 L1 Cache RAM                2x56 k                     F2   Previous Values
 L2 Cache RAM                2x512 k                    F3    Optimized
 Processor Cores             Dual                       Defaults
 Hyper-Threading             Supported                  F4    Save
                                                        ESC   Exit
 Hyper-Threading             [Enabled]

         Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 4: CPU Configuration

The CPU Configuration menu (**BIOS Menu 4**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- EMT64: Indicates if the EM64T is supported by the CPU.
- Processor Speed: Lists the CPU processing speed
- Actual Ratio: Lists the ratio of the frequency to the clock speed
- Processor Stepping: Lists the CPU processing stepping
- Microcode Revision: Lists the microcode revision
- L1 Cache RAM: Lists the CPU L1 cache size
- L2 Cache RAM: Lists the CPU L2 cache size
- Processor Cores: Lists the number of the processor core
- Hyper-Threading: Indicates if the Intel HT Technology is supported by the CPU.

➔ **Hyper Threading [Enabled]**

Use the Hyper Threading function to enable or disable the CPU hyper threading function.

➔ **Disabled**   Disables the use of hyper threading technology

➔ **Enabled**   DEFAULT   Enables the use of hyper threading technology

5.3.3 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 5**) to change and/or set the configuration of the IDE devices installed in the system.

```
          Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
          Advanced

SATA Configuration                                         Select ATA/IDE
                                                           Configuration.
SATA Port0                      Not Present
SATA Port1                      Not Present
SATA Port2                      Not Present                --------------------
SATA Port3                      Not Present
                                                           ←→: Select Screen
ATA/IDE Configuration           [Enhanced]                 ↑↓: Select Item
  Configure SATA as             [IDE]                       Enter Select
                                                           F1   General Help
                                                           F2   Previous Values
                                                           F3    Optimized
                                                           Defaults
                                                           F4    Save
                                                           ESC   Exit
          Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```
BIOS Menu 5: IDE Configuration

➔ **ATA/IDE Configurations [Enhanced]**

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.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** DEFAULT Configures SATA devices as normal IDE device.

➔ **AHCI** Configures SATA devices as normal AHCI device.

5.3.4 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 6**) to read USB configuration information and configure the USB settings.

```
        Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
            Advanced

USB Configuration                                       Enables Legacy USB
                                                        support. AUTO option
USB Devices:                                            disables legacy support
        1 Keyboard, 2 Hubs                              if no USB devices are
                                                        connected. DISABLE
Legacy USB Support                   [Enabled]          option will keep USB
                                                        devices available only
                                                        for EFI applications.

                                                        --------------------
                                                        ←→: Select Screen
                                                        ↑↓: Select Item
                                                        EnterSelect
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3    Optimized
                                                        Defaults
                                                        F4    Save
                                                        ESC   Exit
        Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 6: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **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.

➔ **Enabled**   D<small>EFAULT</small>   Legacy USB support enabled

➔ **Disabled**   Legacy USB support disabled

➔ **Auto**   Legacy USB support disabled if no USB devices are connected

5.3.5 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
          Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
            Advanced

Super IO Configuration                                       Set Parameters of Serial
                                                             Port 0 (COMA)
Super IO Chip                    Finteck F81865
> Serial Port 1 Configuration
> Serial Port 3 Configuration                                --------------------
> Serial Port 4 Configuration                                ←→: Select Screen
> Serial Port 5 Configuration                                ↑↓: Select Item
> Serial Port 6 Configuration                                Enter Select
> Serial Port 2 Configuration                                F1   General Help
                                                             F2   Previous Values
                                                             F3    Optimized
                                                             Defaults
                                                             F4    Save
                                                             ESC   Exit
          Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 7: Super IO Configuration

5.3.5.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 8**) to configure the serial port n.

```
         Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
            Advanced

Serial Port 1 Configuration                            Enable or Disable Serial
                                                       Port (COM)
Serial Port                        [Enabled]
Device Settings                    IO=3F8h; IRQ=4
                                                       --------------------
Change Settings                    [Auto]              ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       EnterSelect
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3    Optimized
                                                       Defaults
                                                       F4    Save
                                                       ESC   Exit
         Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 8: Serial Port n Configuration Menu

5.3.5.1.1 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled** DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** DEFAULT   The serial port IO port address and interrupt address are automatically detected.

➔ **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
   IRQ=4   address is IRQ4

➔ **IO=3F8h;**   Serial Port I/O port address is 3E8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

5.3.5.1.2 Serial Port 3 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt
address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address
                              are automatically detected.

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3   address is IRQ3

➔ **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

5.3.5.1.3 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled** DEFAULT Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** DEFAULT The serial port IO port address and interrupt address are automatically detected.

➔ **IO=3E8h; IRQ=11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ11

➔ **IO=3E8h; IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11

➔ **IO=2E8h; IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.5.1.4 Serial Port 5 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** DEFAULT Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** DEFAULT The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2E8h;**   Serial Port I/O port address is 2E8h and the interrupt
    IRQ=10   address is IRQ10

➔ **IO=3E8h;**   Serial Port I/O port address is 3E8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **IO=2E8h;**   Serial Port I/O port address is 2E8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

5.3.5.1.5 Serial Port 6 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   **DEFAULT**   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   **DEFAULT**   The serial port IO port address and interrupt address
                               are automatically detected.

➔ **IO=2C0h;**   Serial Port I/O port address is 2C0h and the interrupt
    IRQ=11   address is IRQ11

➔ **IO=2C0h;**   Serial Port I/O port address is 2C0h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **IO=2C8h;**   Serial Port I/O port address is 2C8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

5.3.5.1.6 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2C8h; IRQ=10**   Serial Port I/O port address is 2C8h and the interrupt address is IRQ10

➔ **IO=2C0h; IRQ=10, 11**   Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11

➔ **IO=2C8h; IRQ=10, 11**   Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11

5.3.6 H/W Monitor

The H/W Monitor menu (**BIOS Menu 9**) shows the operating temperature, fan speeds and system voltages.

```
         Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
            Advanced

PC Health Status

CPU Temperature                     :+53 C
Accuracy:1.(-5~+10)degree around 100 degree
        2.(-10~+15)degree around 50 degree
SYS Temperature                     :+37 C
CPU FAN Speed                       :N/A
SYS FAN Speed                       :N/A            ---------------------
VCC3C                               :+3.312 V       ←→: Select Screen
V_core                              :+1.160 V       ↑ ↓: Select Item
V1_05V                              :+1.040 V       EnterSelect
VCC3V                               :+3.288 V       F1    General Help
Vcc                                 :+5.003 V       F2    Previous Values
VSB3V                               :+3.328 V       F3    Optimized
VBAT                                :+3.216 V       Defaults
CPU Smart Fan control         [Auto Mode]           F4    Save
Temperature Bound 1           60                    ESC   Exit
Temperature Bound 2           50
Temperature Bound 3           40
Temperature Bound 4           30
SYS Smart Fan control         [Auto Mode]
Temperature Bound 1           60
Temperature Bound 2           50
Temperature Bound 3           40
Temperature Bound 4           30


         Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 9: Hardware Health Configuration

➔   **PC Health Status**

The following system parameters and values are shown. The system parameters that are monitored are:

- ▪ System Temperatures:
  - ○ CPU Temperature
  - ○ System Temperature
- ▪ Fan Speeds:

- o   CPU Fan Speed
- o   System Fan Speed
- ▪   Voltages:
  - o   VCC3V
  - o   V_core
  - o   V1_05V
  - o   VCC3V
  - o   Vcc
  - o   VSB3V
  - o   VBAT

➔   **CPU Smart Fan control [Auto Mode]**

Use the **CPU Smart Fan control** option to configure the CPU fan.

➔	**Auto Mode**	The fan adjusts its speed using these settings:
		Temperature Bound 1
		Temperature Bound 2
		Temperature Bound 3
		Temperature Bound 4
➔	**Manual Mode**	The fan spins at the speed set in:
		Manual Duty Cycle Setting

5.3.7 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 10**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

```
        Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced

  COM1                                                     Console Redirection
    Console Redirection          [Disabled]                Enable/Disable
 > Console Redirection Settings

  COM3
    Console Redirection          [Disabled]
 > Console Redirection Settings

  COM4
    Console Redirection          [Disabled]                --------------------
 > Console Redirection Settings
                                                           ←→: Select Screen
  COM5                                                     ↑ ↓: Select Item
    Console Redirection          [Disabled]                Enter Select
 > Console Redirection Settings                            F1   General Help
                                                           F2   Previous Values
  COM6                                                     F3    Optimized
    Console Redirection          [Disabled]                Defaults
 > Console Redirection Settings                            F4   Save
                                                           ESC   Exit
  COM2
    Console Redirection          [Disabled]
 > Console Redirection Settings

        Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 10: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled** **DEFAULT** Disabled the console redirection function

➔ **Enabled** Enabled the console redirection function

➔ **Terminal Type [ANSI]**

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

➔ **VT100** The target terminal type is VT100

➔ **VT100+** The target terminal type is VT100+

➔ **ANSI** **DEFAULT** The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the bits per second.

- ▪ 9600
- ▪ 19200
- ▪ 57600
- ▪ 115200 **DEFAULT**

5.3.8 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 11**) to configure One Key Recovery function.

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

 iEi Feature
 _____

 Auto Recovery Function          [Disabled]



                                               ←→    Select Screen
                                               ↑↓    Select Item
                                               Enter Go to SubScreen
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit
         v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```
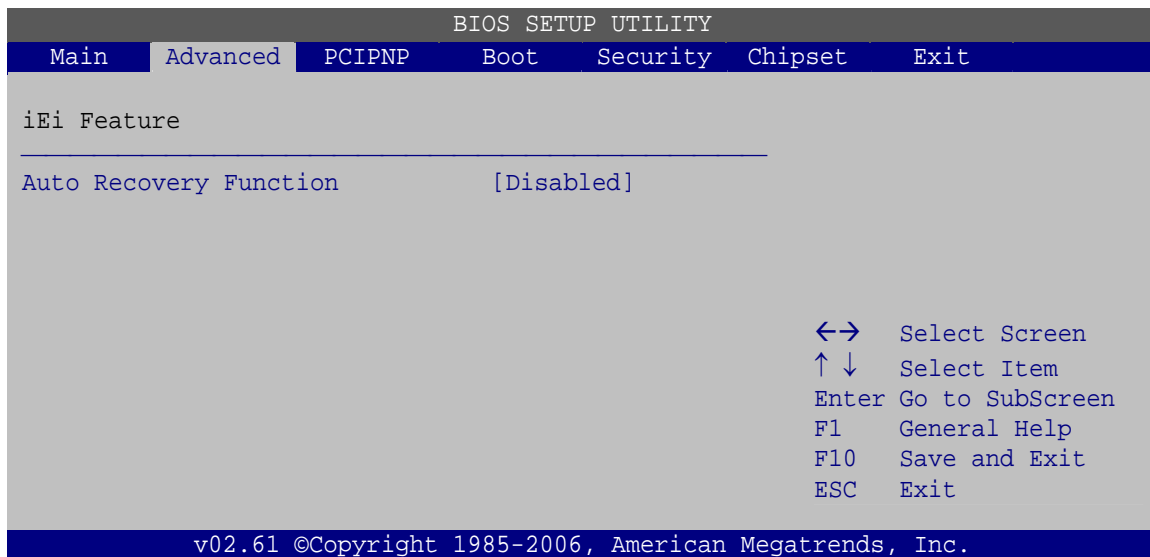
BIOS Menu 11: IEI Feature

➔ **Auto Recovery Function [Disabled]**

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

➔ **Disabled** **DEFAULT** Auto recovery function disabled

➔ **Enabled** Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 12**) to access the Northbridge and Southbridge configuration menus

---

![warning icon] **WARNING!**

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.
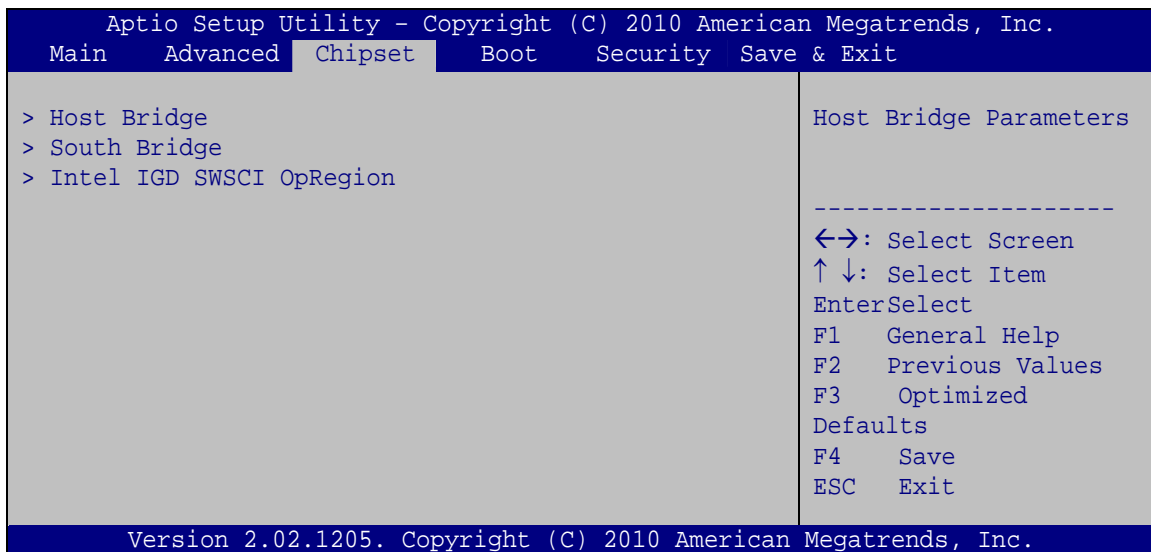
```
        Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced  Chipset    Boot    Security  Save & Exit

 > Host Bridge                                    Host Bridge Parameters
 > South Bridge
 > Intel IGD SWSCI OpRegion
                                                  ---------------------
                                                  ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  Enter Select
                                                  F1   General Help
                                                  F2   Previous Values
                                                  F3    Optimized
                                                  Defaults
                                                  F4    Save
                                                  ESC   Exit

        Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```
BIOS Menu 12: Chipset

5.4.1 Host Bridge

Use the **Host Bridge** menu (**BIOS Menu 13**) to configure the host bridge chipset.

```
         Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                     Chipset

> OnChip VGA Configuration                            Config On Chip VGA
  Initiate Graphic Adapter         [IGD]              Settings

******* Memory Information ********
Memory Frequency                    800 Mhz
                                                      --------------------
Total Memory                        2048 MB           ←→: Select Screen
                                                      ↑ ↓: Select Item
DIMM#0                              2048 MB            Enter Select
DIMM#1                             Not present         F1   General Help
                                                      F2   Previous Values
                                                      F3    Optimized
                                                      Defaults
                                                      F4    Save
                                                      ESC   Exit
         Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```
   BIOS Menu 13:Host Bridge Configuration

➔   **Initiate Graphic Adapter**

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD   DEFAULT

5.4.1.1 OnChip VGA Configuration

Use the **OnChip VGA Configuration** menu (**BIOS Menu 13**) to configure the OnChip VGA.

```
         Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

OnChip VGA Configuration                                    Select Share Memory
                                                            Size.
Share Memory Size                    [8 MB]
Multi-Monitor Support                [Enabled]




                                                            ---------------------
                                                            ←→: Select Screen
                                                            ↑↓: Select Item
                                                            Enter Select
                                                            F1   General Help
                                                            F2   Previous Values
                                                            F3    Optimized
                                                            Defaults
                                                            F4    Save
                                                            ESC   Exit
         Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```
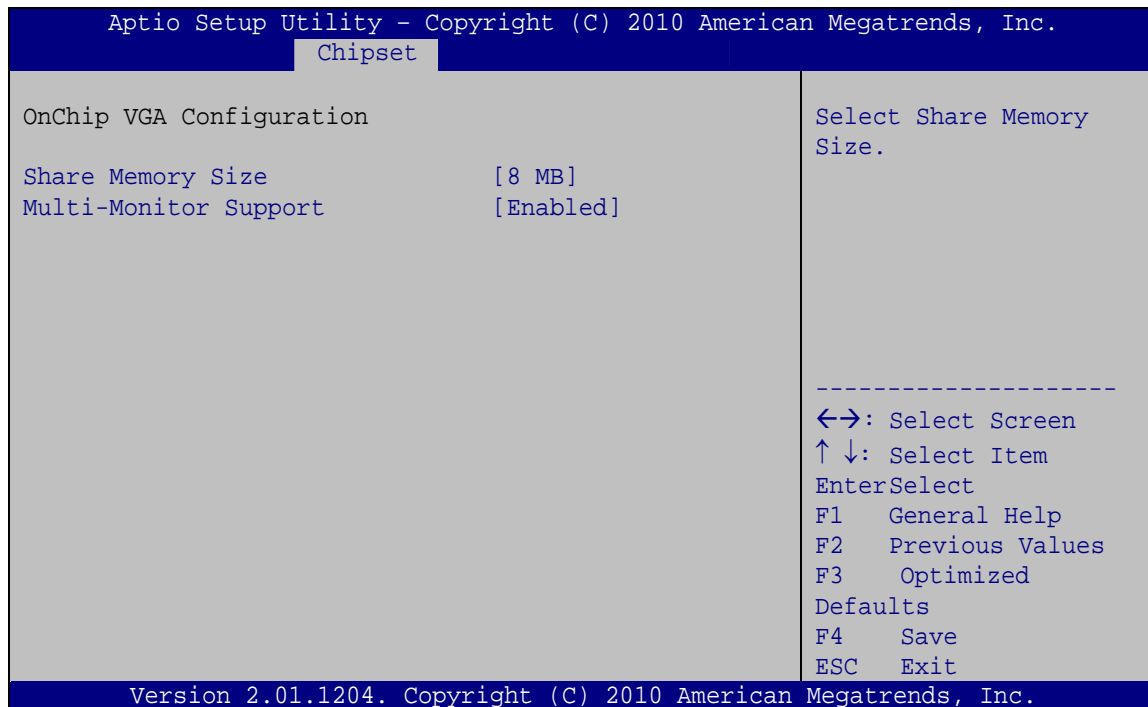
   BIOS Menu 14: OnChip VGA Configuration

➔   **Share Memory Size [8 MB]**

Use the **Share Memory Size** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- Disabled
- 1 MB
- 8 MB   **Default**

➔   **Multi-Monitor Support [Enabled]**

Use **Multi-Monitor Support** option to enable or disable the multi-monitor function.

➔   **Disabled**   Disabled the multi-monitor function

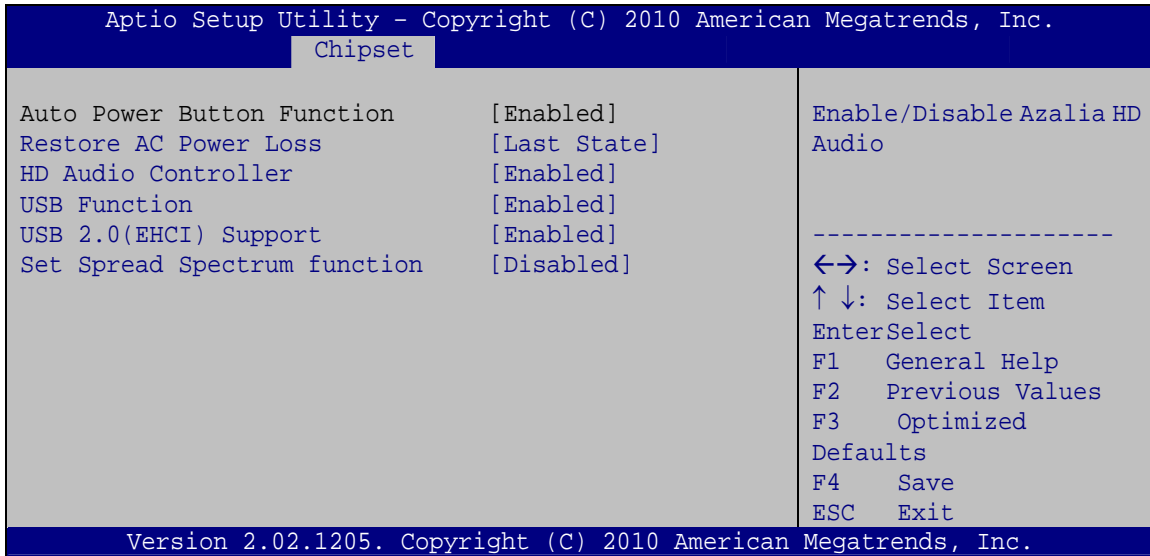➔   **Enabled**   DEFAULT   Enabled the multi-monitor function

5.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 15**) to configure the Southbridge chipset.

```
        Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

Auto Power Button Function       [Enabled]           Enable/Disable Azalia HD
Restore AC Power Loss            [Last State]        Audio
HD Audio Controller              [Enabled]
USB Function                     [Enabled]
USB 2.0(EHCI) Support            [Enabled]           --------------------
Set Spread Spectrum function     [Disabled]          ←→: Select Screen
                                                     ↑↓: Select Item
                                                     Enter Select
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3    Optimized
                                                     Defaults
                                                     F4    Save
                                                     ESC   Exit

        Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 15:Southbridge Chipset 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.

➔   **HD Audio Controller [Enabled]**

The **HD Audio Controller** option enables or disables the HD audio controller.

➔ **Enabled** DEFAULT The onboard HD audio controller automatically detected and enabled

➔ **Disabled** The onboard HD audio controller is disabled

➔ **USB Function [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled** USB function support disabled

➔ **Enabled** DEFAULT USB function support enabled

➔ **USB 2.0 (EHCI) Support [Enabled]**

Use the **USB 2.0 (EHCI) Support** BIOS option to enable or disable the USB 2.0 controller.

➔ **Enabled** DEFAULT USB 2.0 controller enabled

➔ **Disabled** USB 2.0 controller disabled
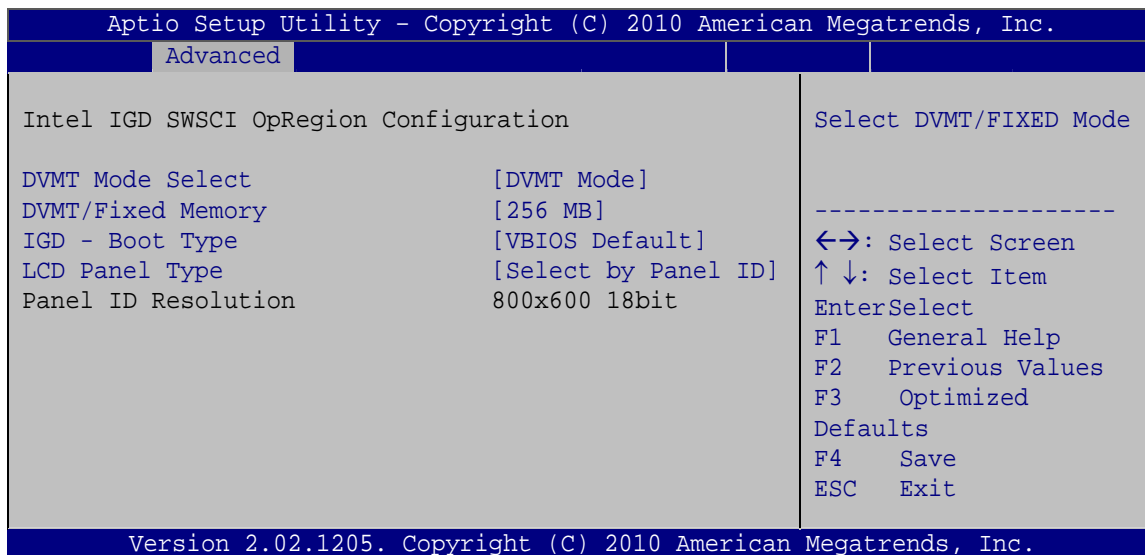
➔ **Set Spread Spectrum Function [Disabled]**

The **Set Spread Spectrum Function** option can help to improve CPU EMI issues.

➔ **Disabled** DEFAULT The spread spectrum function is disabled

➔ **Enabled** The spread spectrum function is enabled

5.4.3 Intel IGD SWSCI OpRegion

Use the **Intel IGD SWSCI OpRegion** menu to configure the video device connected to the system.

```
                Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
      Advanced

Intel IGD SWSCI OpRegion Configuration                  Select DVMT/FIXED Mode

DVMT Mode Select                    [DVMT Mode]
DVMT/Fixed Memory                   [256 MB]          --------------------
IGD – Boot Type                     [VBIOS Default]   ←→: Select Screen
LCD Panel Type                      [Select by Panel ID]  ↑ ↓: Select Item
Panel ID Resolution                 800x600 18bit     EnterSelect
                                                      F1   General Help
                                                      F2   Previous Values
                                                      F3    Optimized
                                                      Defaults
                                                      F4    Save
                                                      ESC   Exit

                Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 16: Intel IGD SWSCI OpRegion

➔ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**   A fixed portion of graphics memory is reserved as graphics memory.

➔ **DVMT Mode** DEFAULT   Graphics memory is dynamically allocated according to the system and graphics needs.

➔ **DVMT/FIXED Memory [256 MB]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB   **Default**
- Maximum

➔ **IGD - Boot Type [VBIOS Default]**

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

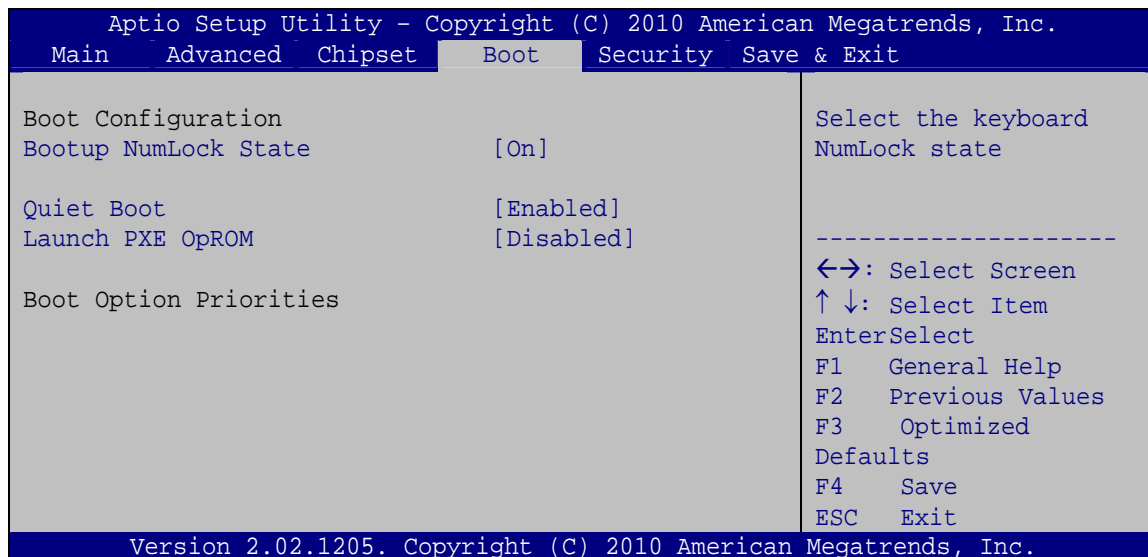- ▪ VBIOS Default **DEFAULT**

- ▪ CRT

- ▪ LFP

- ▪ CRT + LFP

➔ **LCD Panel Type [VBIOS Default]**

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- ▪ Select by Panel ID **DEFAULT**

- ▪ 640x480 18bit

- ▪ 800x480 18bit

- ▪ 800x600 18bit

- ▪ 1024x768 18bit

- ▪ 1280x1024 18bit

- ▪ 1366x768 18bit

- ▪ 1280x800 18bit

- ▪ 1280x600 18bit

5.5 Boot

Use the **Boot** menu (**BIOS Menu 17**) to configure system boot options.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced   Chipset    Boot    Security  Save & Exit

 Boot Configuration                                   Select the keyboard
 Bootup NumLock State            [On]                 NumLock state

 Quiet Boot                      [Enabled]
 Launch PXE OpROM                [Disabled]           ---------------------

                                                      ←→: Select Screen
 Boot Option Priorities                               ↑↓: Select Item
                                                      Enter Select
                                                      F1   General Help
                                                      F2   Previous Values
                                                      F3    Optimized
                                                      Defaults
                                                      F4    Save
                                                      ESC   Exit

      Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 17: Boot

➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **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.

➔ **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.

➔ **Quiet Boot [Enabled]**

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

➔ **Disabled**   Normal POST messages displayed

➔ **Enabled**   DEFAULT   OEM Logo displayed instead of POST messages

➔ **Launch PXE OpROM [Disabled]**
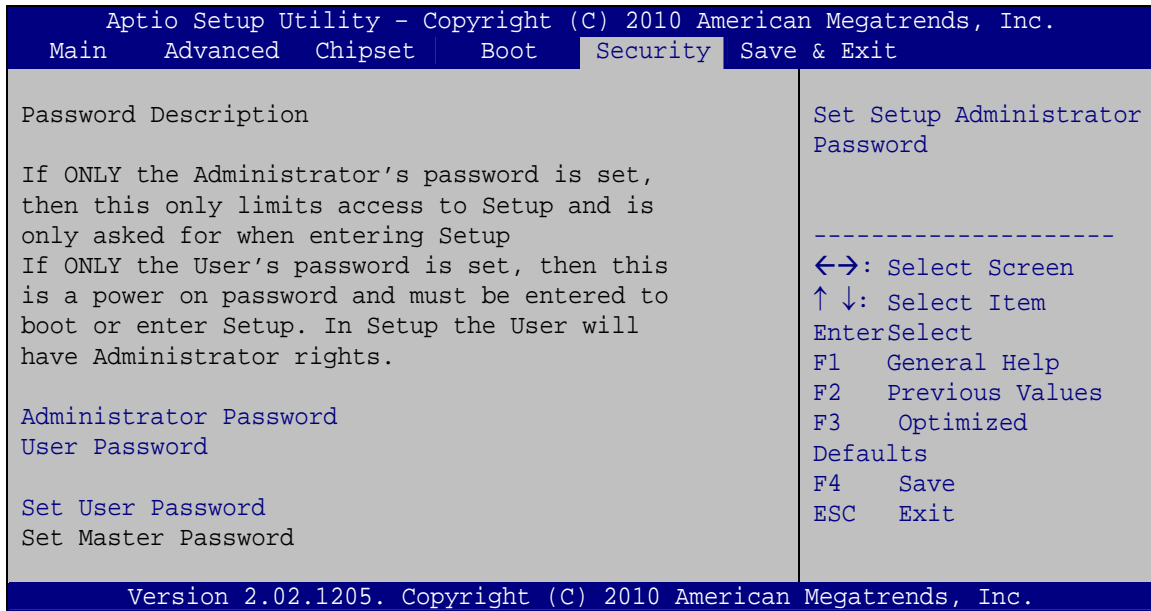
Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**   DEFAULT   Ignore all PXE Option ROMs

➔ **Enabled**   Load PXE Option ROMs.

5.6 Security

Use the **Security** menu (**BIOS Menu 18**) to set system and user passwords.

```
         Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main     Advanced   Chipset     Boot    Security  Save & Exit

Password Description                                    Set Setup Administrator
                                                        Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup                      --------------------
If ONLY the User's password is set, then this
is a power on password and must be entered to           ←→: Select Screen
boot or enter Setup. In Setup the User will             ↑ ↓: Select Item
have Administrator rights.                              Enter Select
                                                        F1   General Help
                                                        F2   Previous Values
Administrator Password                                  F3    Optimized
User Password                                           Defaults
                                                        F4    Save
Set User Password                                       ESC   Exit
Set Master Password

         Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 18: Security

➔ **Administrator Password**

Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
        Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main     Advanced   Chipset  |   Boot    Security  Save & Exit

   Save Changes and Reset                          Exit system setup after
   Discard Changes and Reset                       saving the changes.

   Restore Defaults
   Save as User Defaults
   Restore User Defaults
                                                   --------------------
                                                   ←→: Select Screen
                                                   ↑↓: Select Item
                                                   EnterSelect
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3    Optimized
                                                   Defaults
                                                   F4    Save
                                                   ESC   Exit
        Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 19:Exit

➔ **Save Changes and Reset**

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

➔ **Discard Changes and Reset**

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

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

6

Troubleshooting and Maintenance

 WARNING:

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 4.1**.

6.1 ECW-281B/B2-D525 System Maintenance Overview

 NOTE:

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the ECW-281B/B2-D525 embedded system, the system must be properly maintained. If embedded system components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

6.2 System Troubleshooting

This section provides some simple troubleshooting suggestions.

6.2.1 The System Doesn't Turn On

If after turning the system on, there is no power (indicated by the power button on the front panel not turning on) please do the following:

Step 1: Check that the power cable connector is properly connected to the terminal block or power socket on the system front panel.

Step 2: Check that the power cable connector is properly plugged into the power source.

Step 3: Make sure the power button is turned on.

Step 4: Plug the system into a monitor and check to see if anything appears on the screen. If the boot-up screen appears it means the power LED has become disconnected. To fix this problem, open the top cover and reconnect the power LED to the motherboard.

If the above steps have been completed and the system still doesn't turn on, please do the following.

Step 1: Open the bottom surface (**Section 4.2.3**)

Step 2: Check the terminal block/power socket power cable connector is properly connected to the power module or motherboard.

Step 3: Check that the power button cable connector is properly connected to the motherboard.

Step 4: Make sure the cable connecting to the terminal block/power socket are properly attached and have not become separated.

Step 5: Make sure the cable connecting the power button to the motherboard is still properly attached to the power button and has not been separated.

6.2.2 The System Doesn't Boot Up

If the system doesn't boot up please do the following:

Step 1: Check the power is turned on. See **Section 6.2.1** above.

Step 2: Make sure the SO-DIMM module is properly installed.

Step 3: Reset the system using the reset CMOS jumper.

6.2.3 More Troubleshooting

▪ ***Nothing appears on the monitor after booting up the system***: Make sure the monitor is properly connected to the system and the monitor is connected to a power supply and turned on.

 WARNING!

If all troubleshooting measures have been taken and the system still fails to start, contact the IEI reseller or vendor you purchased the ECW-281B/B2-D525 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

6.3 Component Replacement Procedure

 WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the ECW-281B/B2-D525 embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the ECW-281B/B2-D525 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The embedded system components listed below can all be replaced if they fail:

▪ SO-DIMM module
▪ Internal hard disk drive (see **Section 4.2.5**)

6.3.1 SO-DIMM Replacement

> **WARNING:**
>
> Using incorrectly specified SO-DIMM may cause permanently damage the ECW-281B/B2-D525. Please make sure the purchased SO-DIMM complies with the memory specifications of the ECW-281B/B2-D525.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: **Remove the bottom surface panel.** Place the ECW-281B/B2-D525 on an anti-static pad with the bottom panel facing up and the bottom surface removed. (see **Section 4.2.3**).

Step 2: **Locate the SO-DIMM** on the motherboard.

Step 3: **Remove the SO-DIMM** by releasing the arms on the SO-DIMM socket.

Step 4: **Align the new 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 (**Figure 6-1**).

Step 5: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle (**Figure 6-1**).
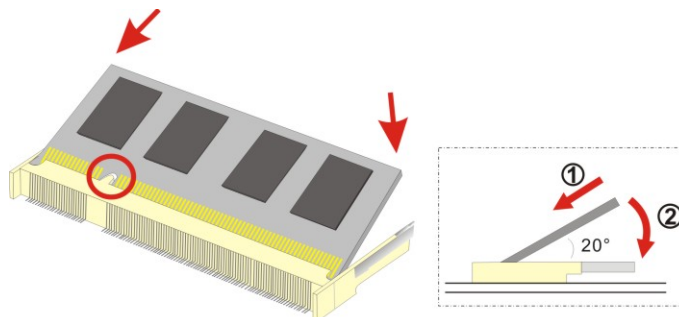
Figure 6-1: SO-DIMM Installation

Step 6: **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 6-1**)

Step 7: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into

place and secure the SO-DIMM in the socket.

Appendix

A

Safety Precautions

WARNING:

> The precautions outlined in this chapter should be strictly followed.
> Failure to follow these precautions may result in permanent damage to
> the ECW-281B/B2-D525.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- *Follow the electrostatic precautions* outlined below whenever the ECW-281B/B2-D525 is opened.
- *Make sure the power is turned off and the power cord is disconnected* whenever the ECW-281B/B2-D525 is being installed, moved or modified.
- *Do not apply voltage levels that exceed the specified voltage range*. Doing so may cause fire and/or an electrical shock.
- *Electric shocks can occur* if the ECW-281B/B2-D525 chassis is opened when the ECW-281B/B2-D525 is running.
- *Do not drop or insert any objects* into the ventilation openings of the ECW-281B/B2-D525.
- *If considerable amounts of dust, water, or fluids enter the ECW-281B/B2-D525*, turn off the power supply immediately, unplug the power cord, and contact the ECW-281B/B2-D525 vendor.
- **DO NOT**:
  - Drop the ECW-281B/B2-D525 against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ECW-281B/B2-D525 may result in permanent damage to the ECW-281B/B2-D525 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECW-281B/B2-D525. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECW-281B/B2-D525 is opened and any of the electrical components are 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 any electrical component.
- *Self-grounding*: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- *Use an anti-static pad*: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- *Only handle the edges of the electrical component*: When handling the electrical component, hold the electrical component by its edges.

A.1.3 Product Disposal

> ⚠️ **CAUTION:**
>
> Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.
>
> Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:
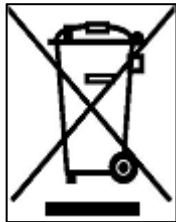
EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECW-281B/B2-D525, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECW-281B/B2-D525, please read the details below.

- The interior of the ECW-281B/B2-D525 does not require cleaning. Keep fluids away from the ECW-281B/B2-D525 interior.
- Be cautious of all small removable components when vacuuming the ECW-281B/B2-D525.
- Turn the ECW-281B/B2-D525 off before cleaning the ECW-281B/B2-D525.
- Never drop any objects or liquids through the openings of the ECW-281B/B2-D525.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECW-281B/B2-D525.
- Avoid eating, drinking and smoking within vicinity of the ECW-281B/B2-D525.

A.2.2 Cleaning Tools

Some components in the ECW-281B/B2-D525 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the ECW-281B/B2-D525.

- *Cloth* – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECW-281B/B2-D525.
- *Water or rubbing alcohol* – A cloth moistened with water or rubbing alcohol can be used to clean the ECW-281B/B2-D525.
- *Using solvents* – The use of solvents is not recommended when cleaning the ECW-281B/B2-D525 as they may damage the plastic parts.
- *Vacuum cleaner* – Using a vacuum specifically designed for computers is one of the best methods of cleaning the ECW-281B/B2-D525. Dust and dirt can restrict the airflow in the ECW-281B/B2-D525 and cause its circuitry to corrode.
- *Cotton swabs* - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- *Foam swabs* - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

BIOS Menu Options

B.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

Appendix

C

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 EMI 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 C-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. While 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 ;
```