



IEI Technology Corp.



**MODEL:  
ROCKY-4786EV/EVG**

**PICMG Socket 478 CPU Card, Intel® Pentium® 4 Processor  
Support, Gigabit Ethernet, USB 2.0, VGA, SATA  
RoHS Compliant**

# User Manual

Rev. 4.10 – 24 March, 2010



# Revision

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Date	Version	Changes
24 March, 2010	4.10	Update Northbridge to Intel® 865G
May 2006	1.00	Initial release

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Chapter

1

# Introduction

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## **1.1 ROCKY-4786EV/EVG CPU Board Overview**

The PICMG 1.0 form factor ROCKY-4786EV/EVG Pentium 4 CPU platform is fully equipped with a high performance processor and advanced multi-mode I/Os. The ROCKY-4786EV/EVG is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

### **1.1.1 ROCKY-4786EV/EVG CPU Board Applications**

The ROCKY-4786EV/EVG CPU board has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

### **1.1.2 ROCKY-4786EV/EVG CPU Board Benefits**

Some of the ROCKY-4786EV/EVG CPU board benefits include,

- providing access to multiple PCI and ISA expansion slots for easy system expansion
- operating reliably in harsh industrial environments with ambient temperatures as high as 60°C
- rebooting automatically if the BIOS watchdog timer detects that the system is no longer operating

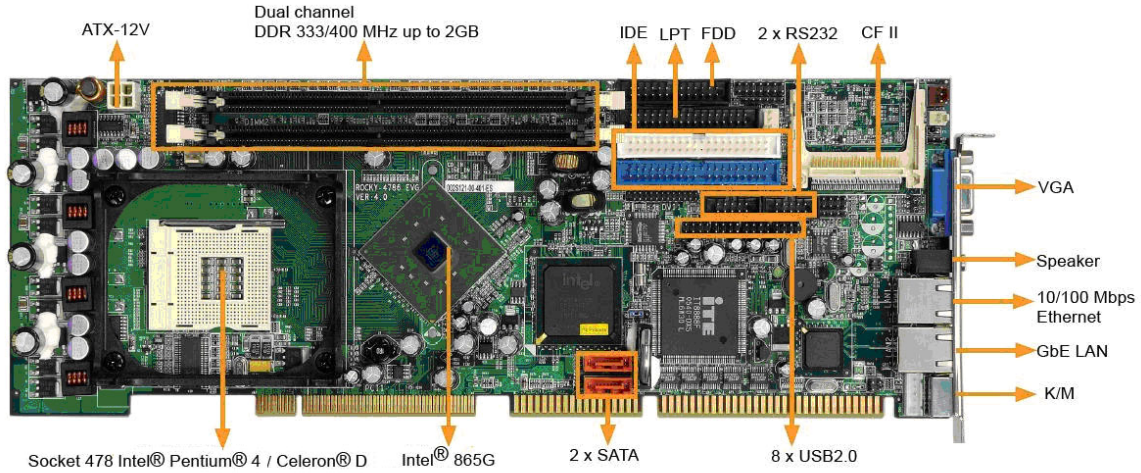
### **1.1.3 ROCKY-4786EV/EVG CPU Board Features**

Some of the ROCKY-4786EV/EVG CPU board features are listed below:

- Complies with PICMG 1.0
- Complies with RoHS
- Supports socket 478 Intel® Pentium 4 CPUs
- Supports a maximum front side bus (FSB) speed up to 800 MHz
- Supports up to 2 GB of 333 MHz or 400 MHz single channel DDR memory
- Comes with one high performance gigabit Ethernet (GbE) controller
- Supports two SATA channels with transfer rates up to 150 MB/s
- Supports eight USB 2.0 connectors

## 1.2 Connectors

The connectors on the ROCKY-4786EV/EVG are shown in the figure below.



**Figure 1-1 Connectors**

## 1.3 Dimensions

The dimensions of the board are listed below:

- **Length:** 338 mm
- **Width:** 122 mm

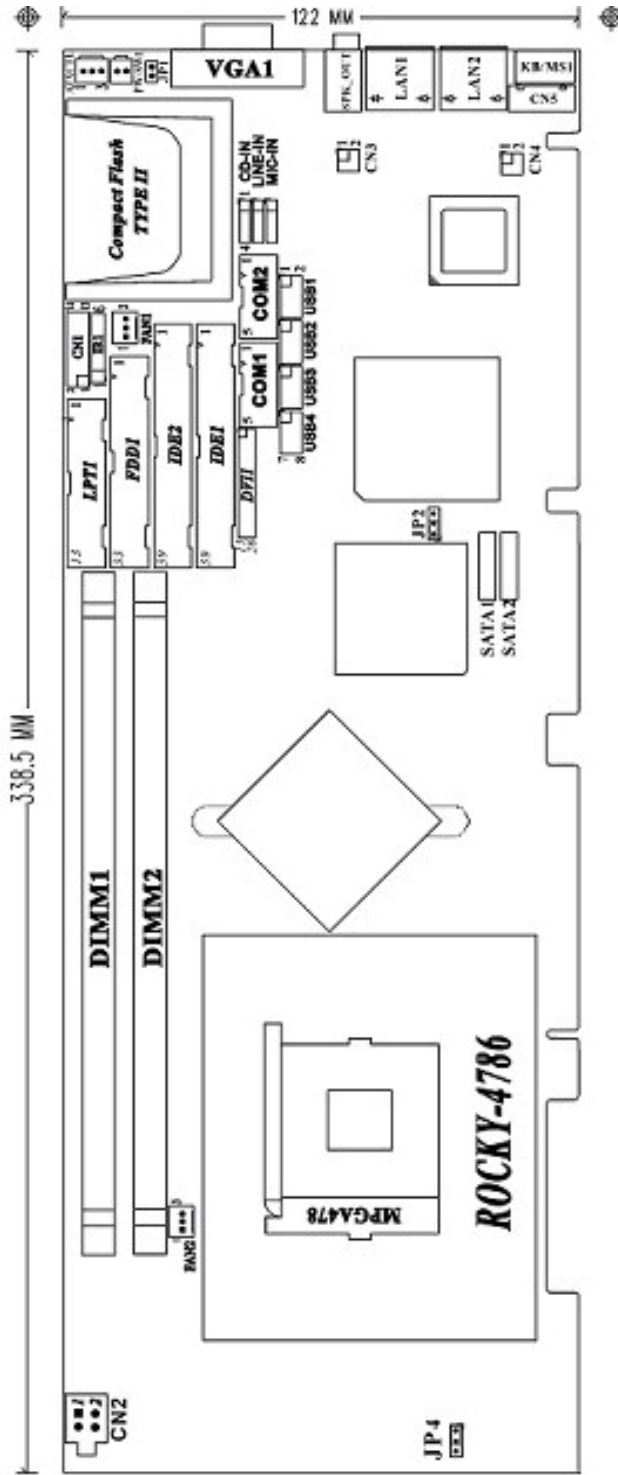


Figure 1-2: ROCKY-4786EV/EVG Dimensions (mm)

### 1.4 Data Flow

Figure-1-3 shows the data flow between the two onboard chipsets and other components installed on the CPU board and described in the following sections of this chapter.

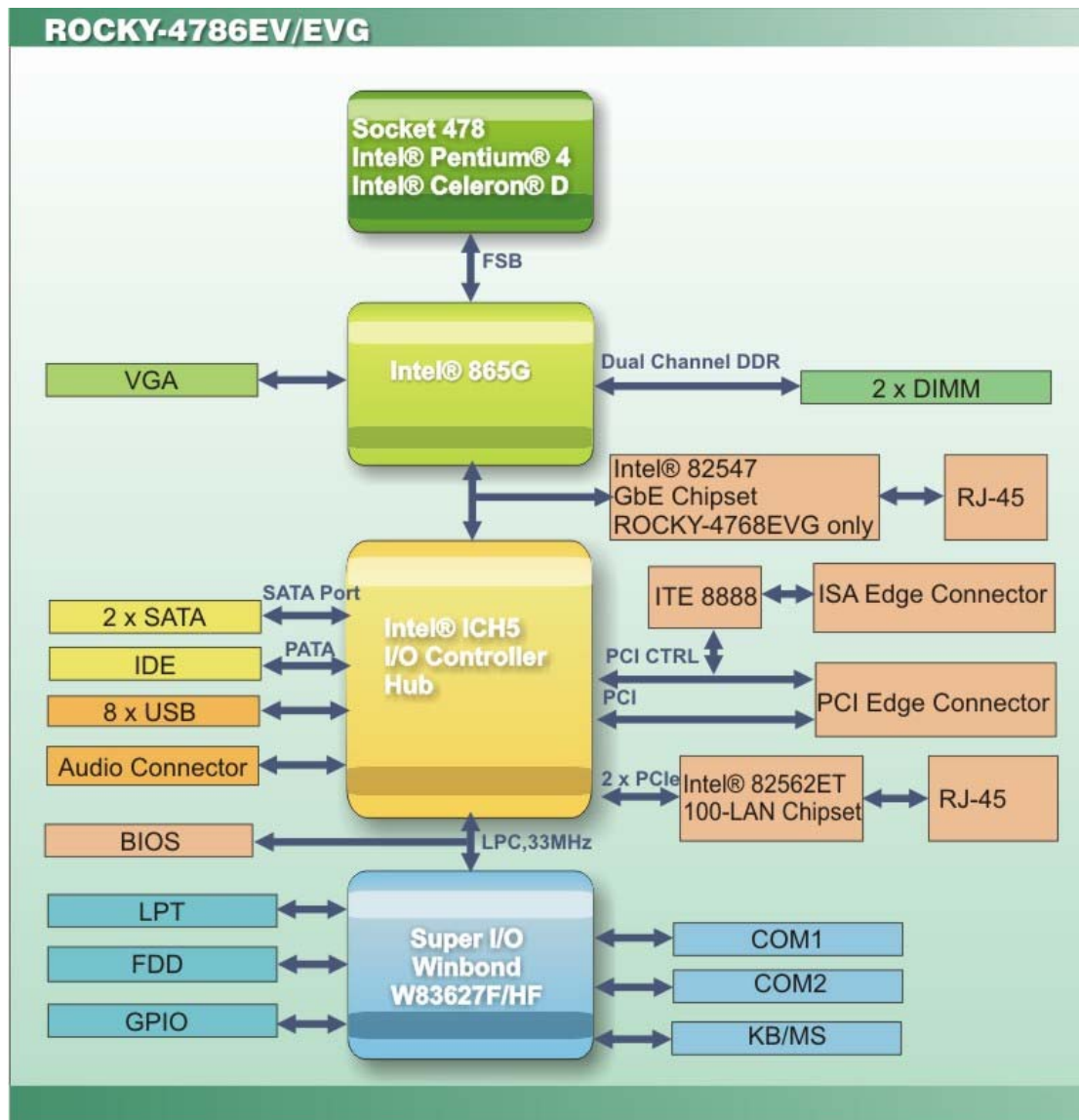


Figure-1-3: Data Flow Block Diagram

### 1.4.1 Technical Specifications:

ROCKY-4786EV/EVG CPU board technical specifications are listed in **the table below**.

SPECIFICATION	
<b>CPUs Supported</b>	Intel® Pentium® 4 Intel® Celeron® D
<b>Chipsets</b>	Northbridge: Intel® 865G Southbridge: Intel® ICH5
<b>Super I/O</b>	Winbond W83627F/HF
<b>Graphics Support</b>	Intel® Extreme Graphic II integrated graphic engine
<b>Memory</b>	Two 184-pin DDR 333 MHz or 400 MHz SDRAM DIMM memory modules (Max. 2GB)
<b>PCI Bus Interface</b>	33MHz, Revision 2.3
<b>Display</b>	One VGA port
<b>Serial ATA (SATA)</b>	Two SATA channels with 150 MB/s transfer rates
<b>HDD Interface</b>	Two IDE channels supports four Ultra ATA 100/66/33 devices
<b>LPT</b>	One internal parallel port connector
<b>Floppy Disk Drive (FDD)</b>	Supports FDD
<b>USB Interfaces</b>	Eight USB 2.0 via internal pin headers
<b>Serial Ports</b>	Two RS-232 serial ports
<b>Keyboard/Mouse</b>	One PS/2 port One KB/MS (internal) connector
<b>Real Time Clock</b>	256-byte battery backed CMOS RAM
<b>Hardware Monitoring</b>	Cooling fans, temperature and system voltages



SPECIFICATION	
Power Management	Supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 2.0
Infrared Support	One Infrared Data Association (IrDA) interface
Ethernet	RJ-45 10/100BaseT RJ-45Gigabit Ethernet (GbE) with ASF 2.0 remote control support (ROCKY-4768EVG only)
BIOS	Award BIOS
Audio Interfaces	One Audio Codec '97 (AC'97) version 2.2 connector
Physical Dimensions	338 mm x 122 mm (length x width)
Weight	1.1 kg
Power Supply	AT/ATX supported
Power Consumption	5V @ 6.98A, 12V @ 7.52A (Intel® Pentium® 4 CPU 3.00GHz 800 MHz FSB with 2GB DDR 400MHz)
Operating Temperature	Minimum: 0°C (32°F) Maximum: 60°C (140°F)
Humidity (operating)	5% ~ 95% (non-condensing)

Table-1-1: Technical Specifications

Chapter

2

# Unpacking

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## 2.1 Anti-static Precautions

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### WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

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Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband:** Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding:** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad:** When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB:** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

## 2.2 Unpacking Precautions

When the ROCKY-4786EV/EVG is unpacked, please do the following:







- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

## 2.3 Packing List



**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the ROCKY-4786EV/EVG was purchased from or contact an IEI sales representative directly by sending an email to [sales@iei.com.tw](mailto:sales@iei.com.tw).

The ROCKY-4786EV/EVG is shipped with the following components:



Quantity	Item and Part Number	Image
1	ROCKY-4786EV/EVG CPU card (P/N: ROCKY-4786EV-RS-R41) (P/N: ROCKY-4786EVG-RS-R41)	
1	SATA power cable (P/N: 32102-000100/200-RS)	
2	SATA cable (P/N: 32000-062800-RS)	
1	AT 12V Cable (P/N: 32100-087100-RS)	
1	Dual USB cable (w bracket) (P/N: CB-USB02-RS)	
1	ATA 66/100 flat cable (P/N: 32200-000052-RS)	



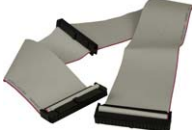

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1	<b>Keyboard/mouse PS/2 Y-cable</b> (P/N: 32000-133200-RS)	
1	<b>Dual RS-232 cable</b> (P/N: 19800-000051-RS)	
1	<b>Mini jumper pack (2.0mm)</b> (P/N: 33100-000033-RS)	
1	<b>Utility CD</b>	
1	<b>Quick Installation Guide</b>	

### 2.3.1 Optional Items

The following components are options for the ROCKY-4786EV/EVG:

Item and Part Number	Image
CPU cooler (up to 115 W) (P/N: CF-478A-RS)	
CPU cooler (P/N: CF-478B-RS)	

<p>CPU cooler (P/N: CF-514-RS)</p>	
<p>CPU cooler (P/N: CF-519-RS)</p>	
<p>FDD cable (P/N: 32200-000017-RS)</p>	
<p>Parallel port cable (P/N:19800-000049-RS)</p>	

Chapter

3

# Connectors

---

### 3.1 Peripheral Interface Connectors

The locations of the peripheral interface connectors are shown in **Section 3.1.1**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.2**.

#### 3.1.1 ROCKY-4786EV/EVG CPU Board Layout

**Figure 3-1** shows the onboard peripheral connectors, backplane peripheral connectors and onboard jumpers.

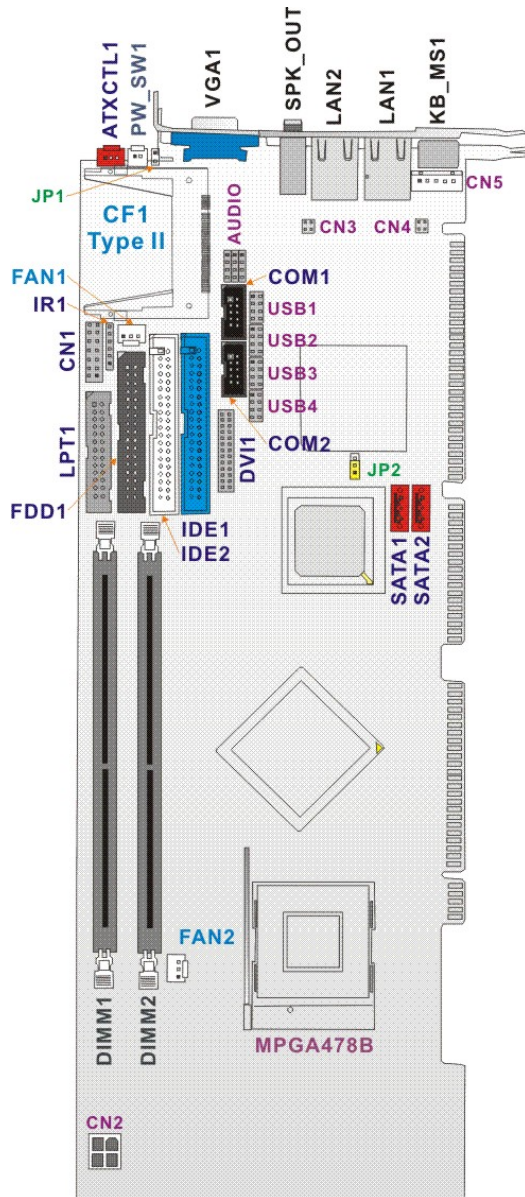


Figure 3-1: Connector and Jumper Locations



### 3.1.2 Peripheral Interface Connectors

**Table 3-1** shows a list of the peripheral interface connectors on the ROCKY-4786EV/EVG CPU board. Detailed descriptions of these connectors can be found in **Section 3.2**.

Label	Connector	Type
IDE1	Primary & Secondary IDE connectors	40-pin header
IDE2	Primary & Secondary IDE connectors	40-pin header
FDD1	Floppy drive	34-pin header
LPT1	Parallel port connector	26-pin header
COM1	Serial port connectors	5-pin header
COM2	Serial port connectors	5-pin header
CF1	Compact Flash Storage Card Type II connector	50-pin header
IR1	IrDA infrared interface port	5-pin header
USB1	USB dual port connector	8-pin header
USB2	USB dual port connector	8-pin header
USB3	USB dual port connector	8-pin header
USB4	USB dual port connector	8-pin header
CN5	External Keyboard Connector	5-pin header
FAN1	System Fan connector	3-pin header
FAN2	CPU Fan connector	3-pin header
SATA1	Serial ATA connectors	SATA disk drive port
SATA2	Serial ATA connectors	SATA disk drive port
CN1	Front Panel Connector	4-pin header
CN2	ATX +12V Power connector	4-pin header

<b>CN3</b>	<b>LAN State LED connectors</b>	<b>4-pin header</b>
<b>CN4</b>	<b>LAN State LED connectors</b>	<b>4-pin header</b>
<b>CD-IN</b>	<b>Audio CD in connector</b>	<b>4-pin header</b>
<b>LINE-IN</b>	<b>Audio LINE in connector</b>	<b>4-pin header</b>
<b>MIC-IN</b>	<b>Audio MIC in connector</b>	<b>4-pin header</b>
<b>PW-SW1</b>	<b>ATX Power Button connector</b>	<b>2-pin header</b>
<b>ATXCTL1</b>	<b>Backplane to Main board ATX power control Connector</b>	<b>3-pin header</b>

**Table 3-1: Peripheral Interface Connectors**

### 3.1.3 Rear Panel Connectors

**Table 3-2** lists the rear panel connectors on the ROCKY-4786EV/EVG CPU card. Detailed descriptions of these connectors can be found in **Section 3.3**.

<b>Label</b>	<b>Connector</b>	<b>Type</b>
<b>KB/MS1</b>	<b>Keyboard or Mouse connector</b>	<b>PS/2</b>
<b>LAN1</b>	<b>Ethernet connector</b>	<b>RJ-45</b>
<b>LAN2</b>	<b>Ethernet connector</b>	<b>RJ-45</b>
<b>SPK_OUT</b>	<b>AUDIO connector</b>	<b>LINE OUT</b>
<b>VGA1</b>	<b>VGA connector</b>	<b>15-pin VGA connector</b>

**Table 3-2: Peripheral Interface Connectors**

## 3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the CPU card and are only accessible when the CPU board is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the ROCKY-4786EV/EVG CPU board.

### 3.2.1 FDD Connector

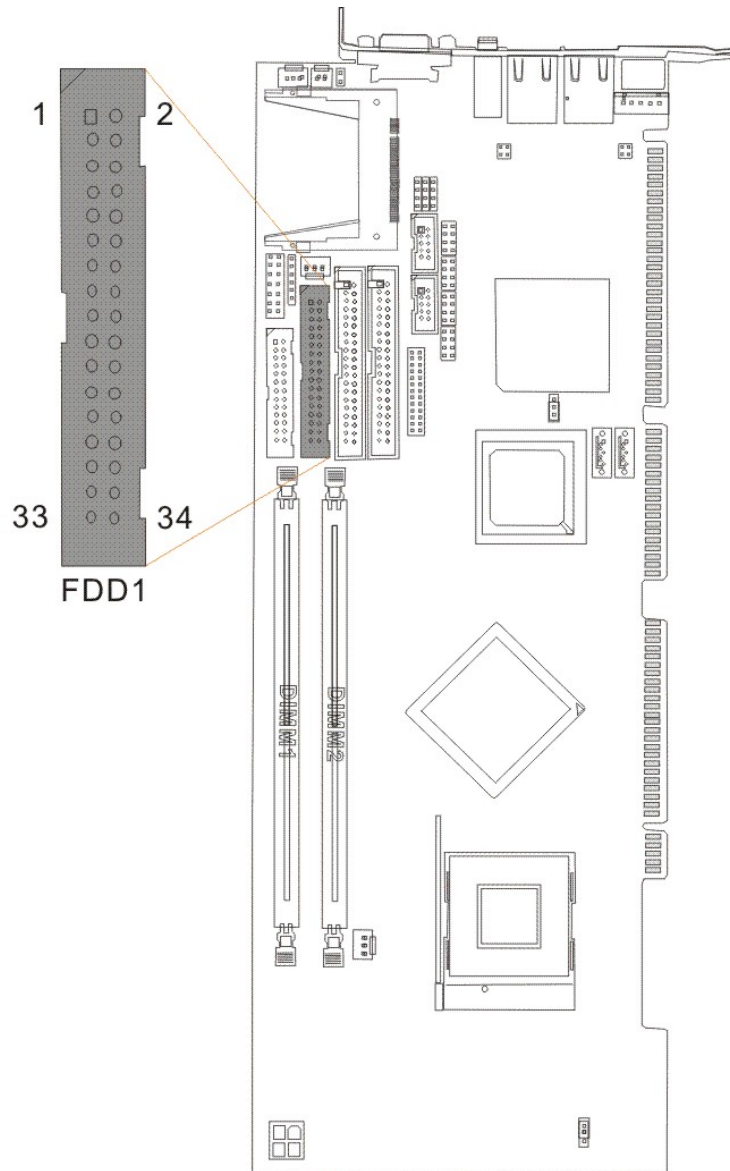
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- CN Label:** FDD1
- CN Type:** 2x17 pin header
- CN Location:** See Figure 3-2
- CN Pinouts:** See Table 3-3

The ROCKY-4786EV/EVG is shipped with a 34-pin daisy-chain drive connector cable. This cable can be connected to the FDD connector.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	HEAD#
33	GND	34	DISK CHANGE#

**Table 3-3: FDD Connector Pinouts**



**Figure 3-2: FDD Connector Location**

**3.2.2 IDE Connectors**

- CN Label:** IDE1 (primary) and IDE2 (secondary)
- CN Type:** 2x20 pin header
- CN Location:** See Figure 3-3
- CN Pinouts:** See Table 3-4: IDE Connector Pinouts

Two IDE connectors provide connectivity for four IDE devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	(KEY)
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	GND
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	P66DET
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

**Table 3-4: IDE Connector Pinouts**

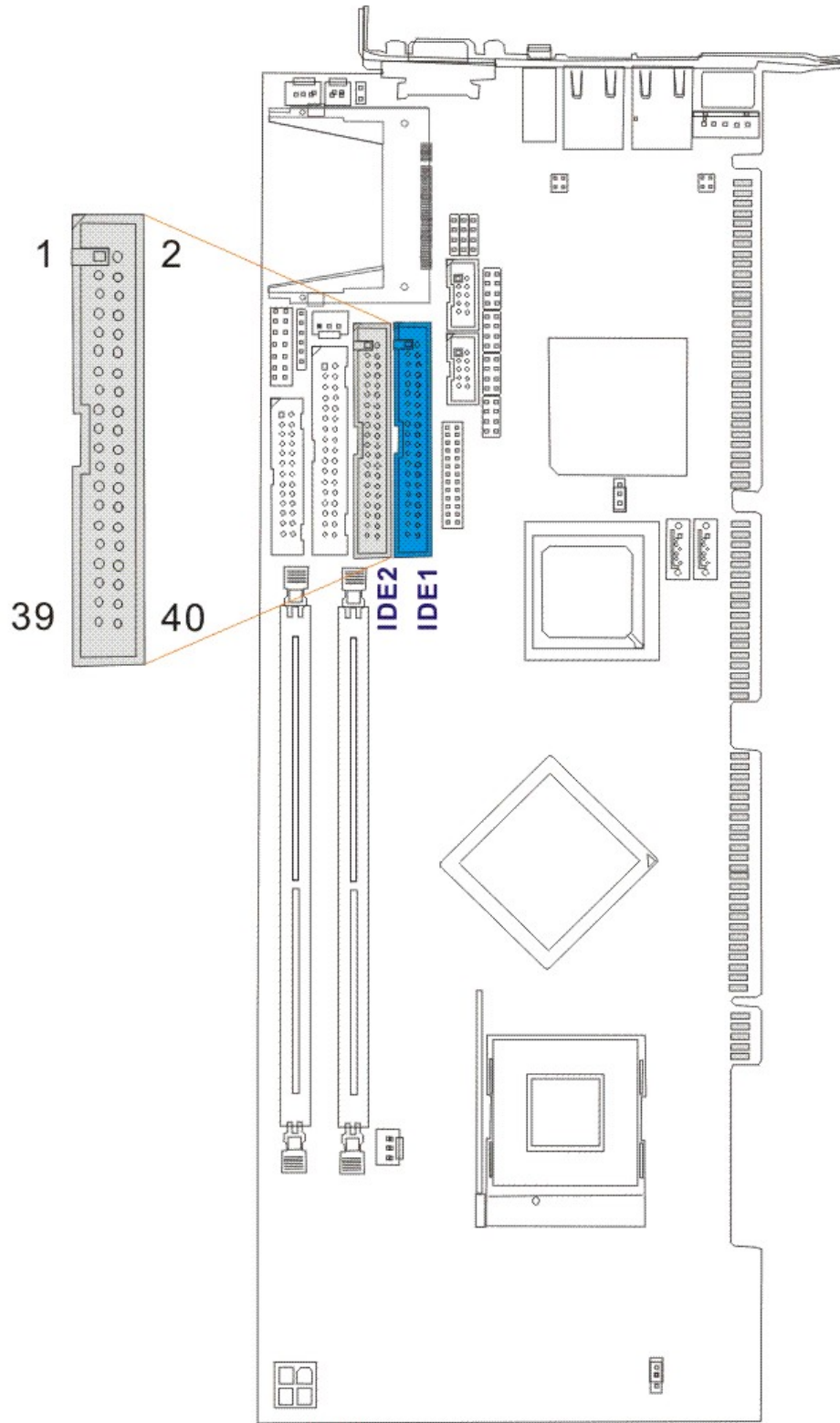


Figure 3-3: IDE Connector Locations

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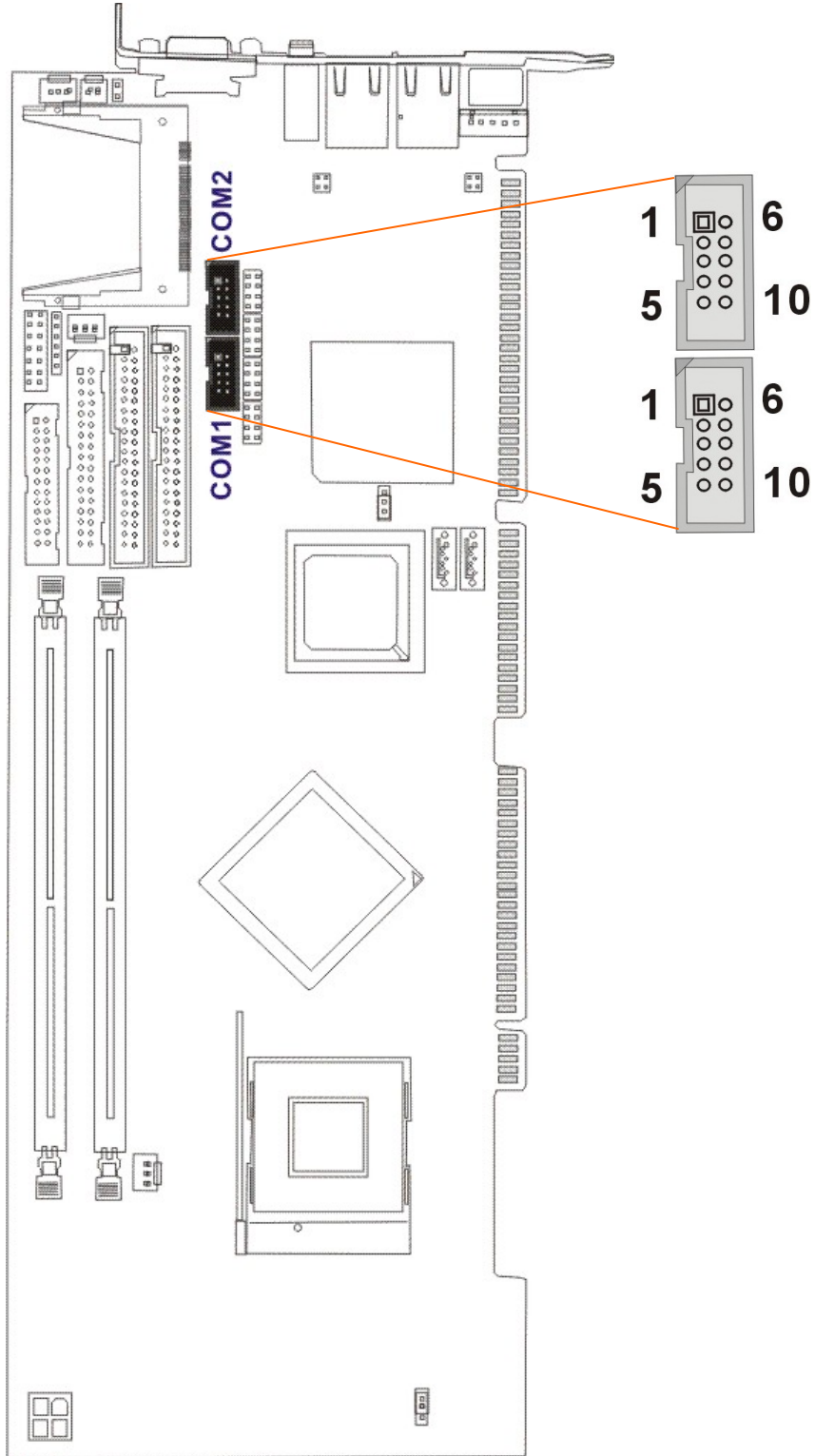
### 3.2.3 COM Ports

<b>CN Label:</b>	<b>COM1, COM2</b>
<b>CN Type:</b>	<b>2x5 pin headers</b>
<b>CN Location:</b>	<b>See</b>
<b>CN Pinouts:</b>	<b>See Table-3-5</b>

The ROCKY-4786EV/EVG offers two high speed NS16C550 compatible UART's with 16-byte Read/Receive FIFO serial ports.

<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	DATA CARRIER DETECT (DCD)	6	DATA SET READY (DSR)
2	RECEIVE DATA (RXD)	7	REQUEST TO SEND (RTS)
3	TRANSMIT DATA (TXD)	8	CLEAR TO SEND (CTS)
4	DATA TERMINAL READY (DTR)	9	RING INDICATOR (RI)
5	GND (GND)	10	GND (GND)

**Table-3-5: Internal COM Port Connector Pinouts**



**Figure 3-4 COM Port Locations**

### **3.2.4 Parallel Port**



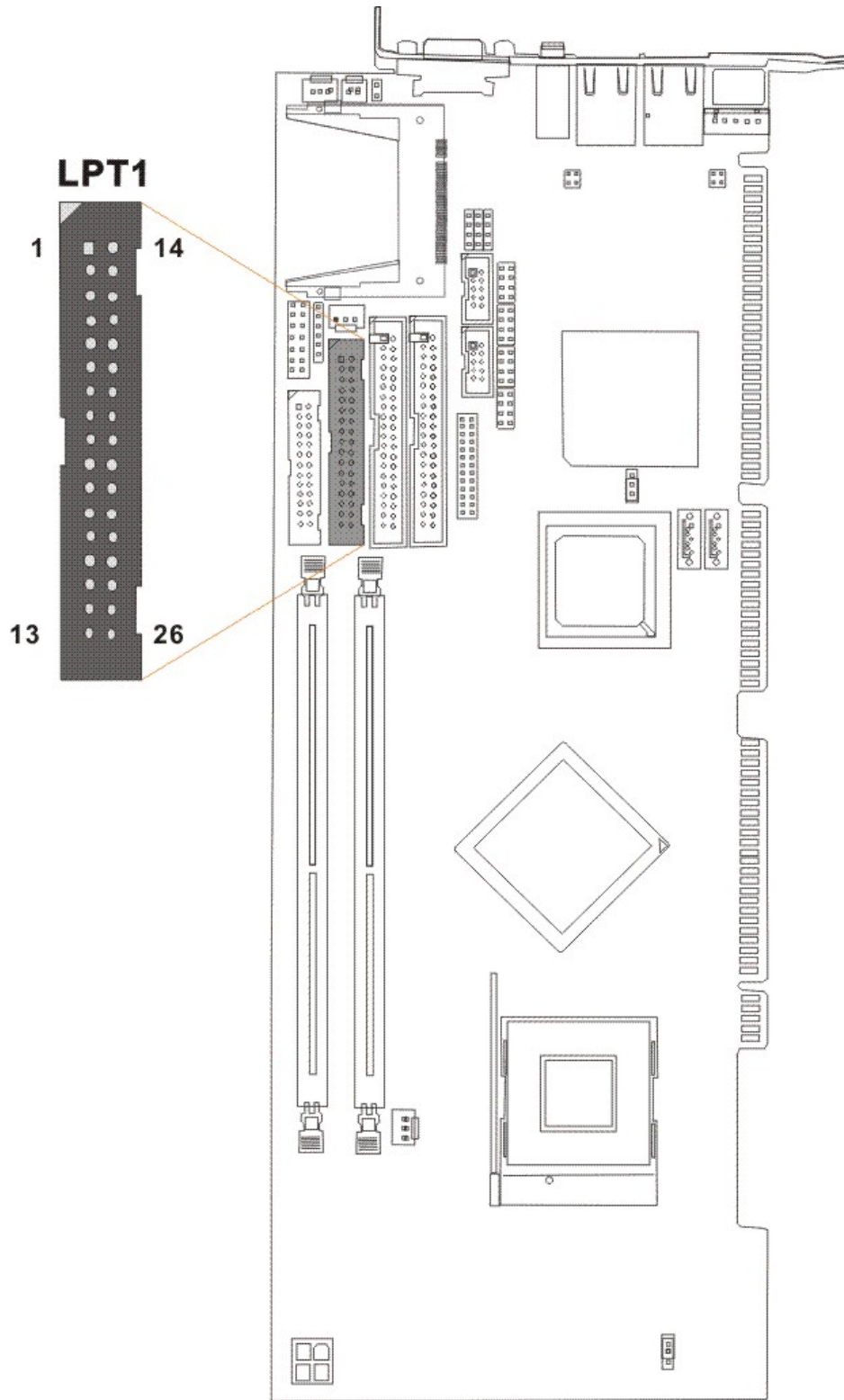
## ROCKY-4786EV/EVG User Manual

- CN Label:** LPT1
- CN Type:** 2x13 pin header
- CN Location:** See Figure-3-5
- CN Pinouts:** See Table-3-6

The parallel port is connected to a printer or other parallel device with a 26-pin flat-cable connector.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT		

**Table-3-6: LPT Connector Pinouts**



**Figure-3-5: LPT Connector Location**

### 3.2.5 Internal USB Connectors

**CN Label:** USB1, USB2, USB3, USB4

**CN Type:** 2x4 pin header

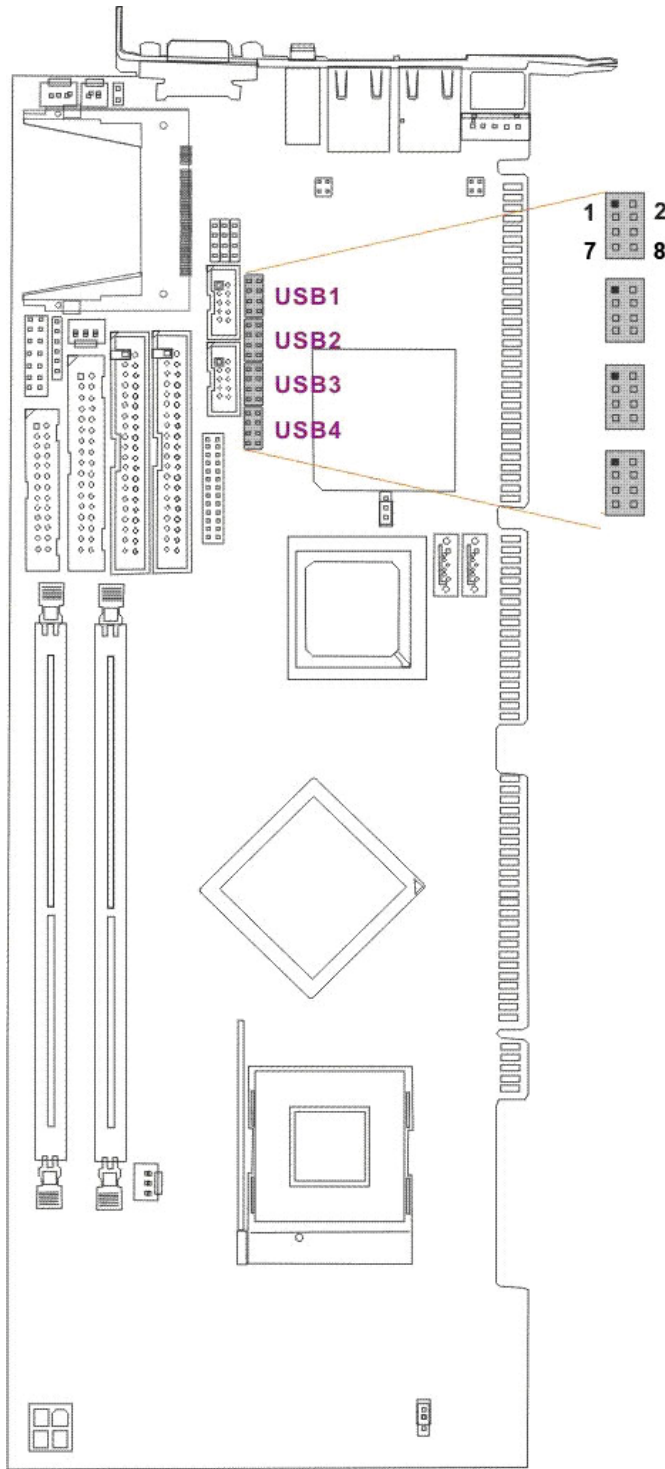
**CN Location:** See Figure-3-6

**CN Pinouts:** See Table-3-7

Four 2x4 pin connectors provide connectivity to eight USB 2.0 ports. The USB ports are used for I/O bus expansion.

<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>
1	VCC	2	GND
3	DATA0-	4	DATA1+
5	DATA0+	6	DATA1-
7	GND	8	VCC

**Table-3-7: USB Port Connector Pinouts**



**Figure-3-6: USB Port Connector Location**

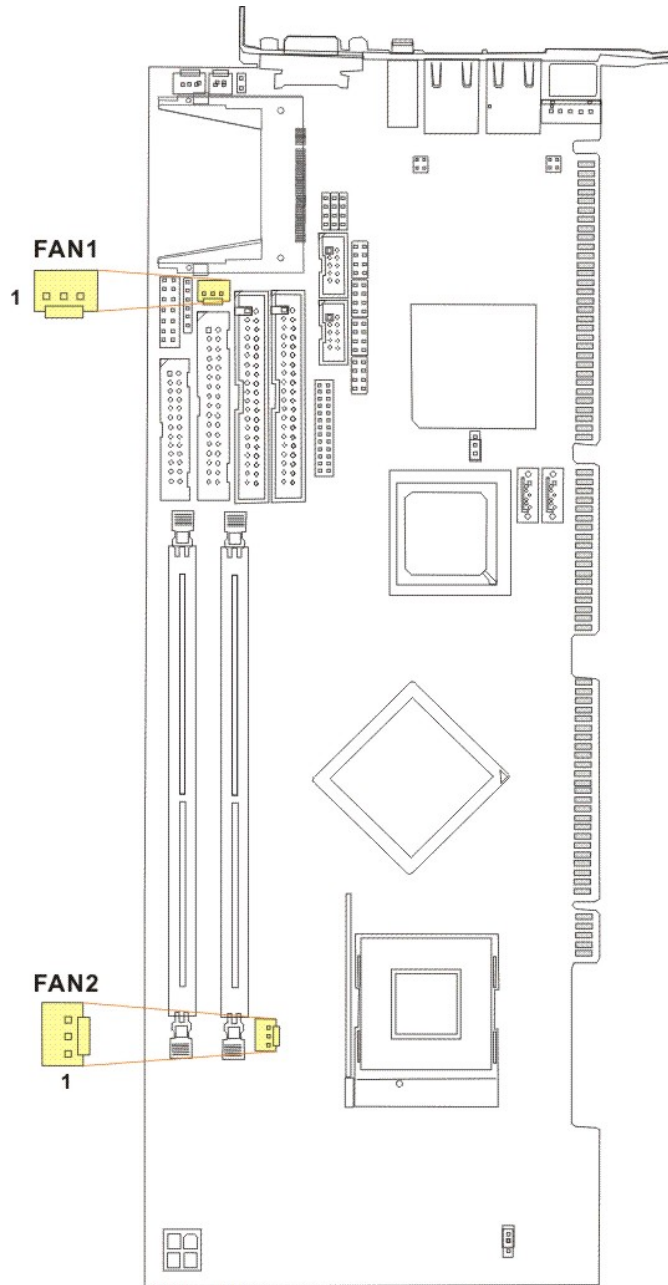
**3.2.6 Cooling Fan Connector**

- CN Label:** FAN1, FAN2
- CN Type:** 1x3 pin header
- CN Location:** See Figure 3-7
- CN Pinouts:** See Table 3-8

The FAN1 and FAN2 cooling fan connectors provide a 12V, 350mA ~ 740mA or 1A ~ 2.2A current to the cooling fans. Each connector has a “rotation” pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only certain fans can issue the rotation signals.

<b>PIN</b>	<b>DESCRIPTION</b>
1	GND
2	+12V
3	Sense Pulse

**Table 3-8 Cooling Fan Connector Pinouts**



**Figure 3-7 Cooling Fan Connector Locations**

### **3.2.7 Backplane to Mainboard ATX Connector**

- CN Label:** ATXCTL1
- CN Type:** 1x3 pin header
- CN Location:** See Figure 3-8

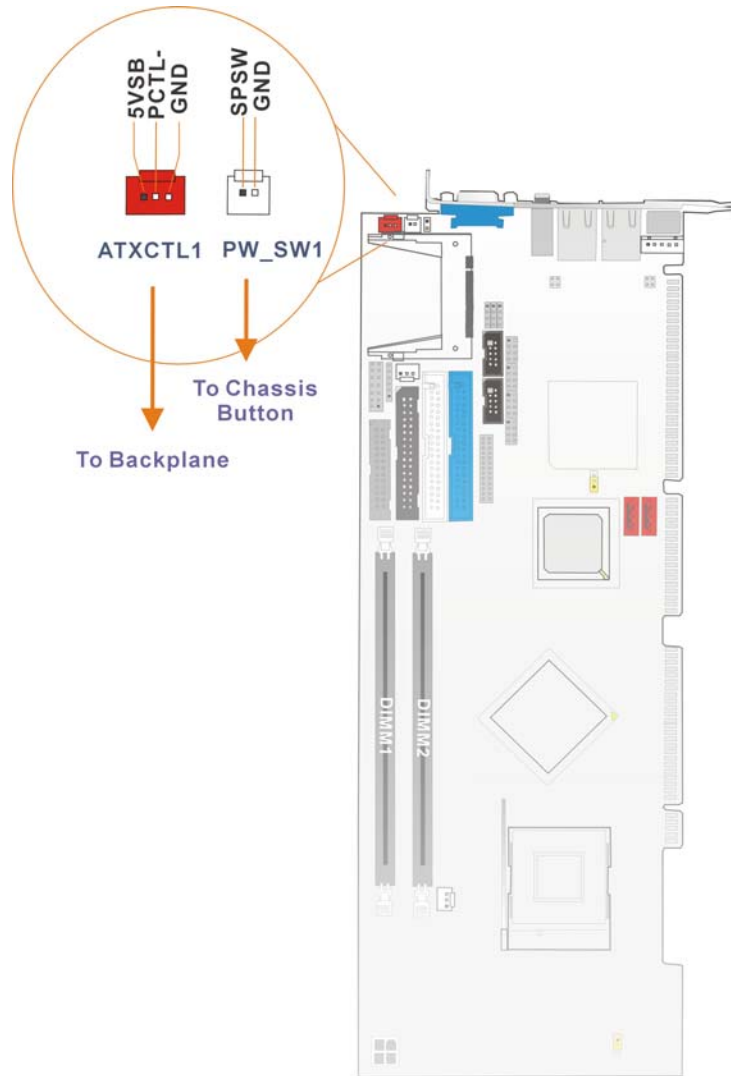
## ROCKY-4786EV/EVG User Manual

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

Connects a power source from a backplane with an ATX Connector.

PIN NO.	DESCRIPTION
1	5VSB
2	ATX-ON
3	GND

**Table 3-9: CN7 Connector Pin Outs**



**Figure 3-8: ATXCTL Connector Locations**



**3.2.8 System Front Panel Connector**

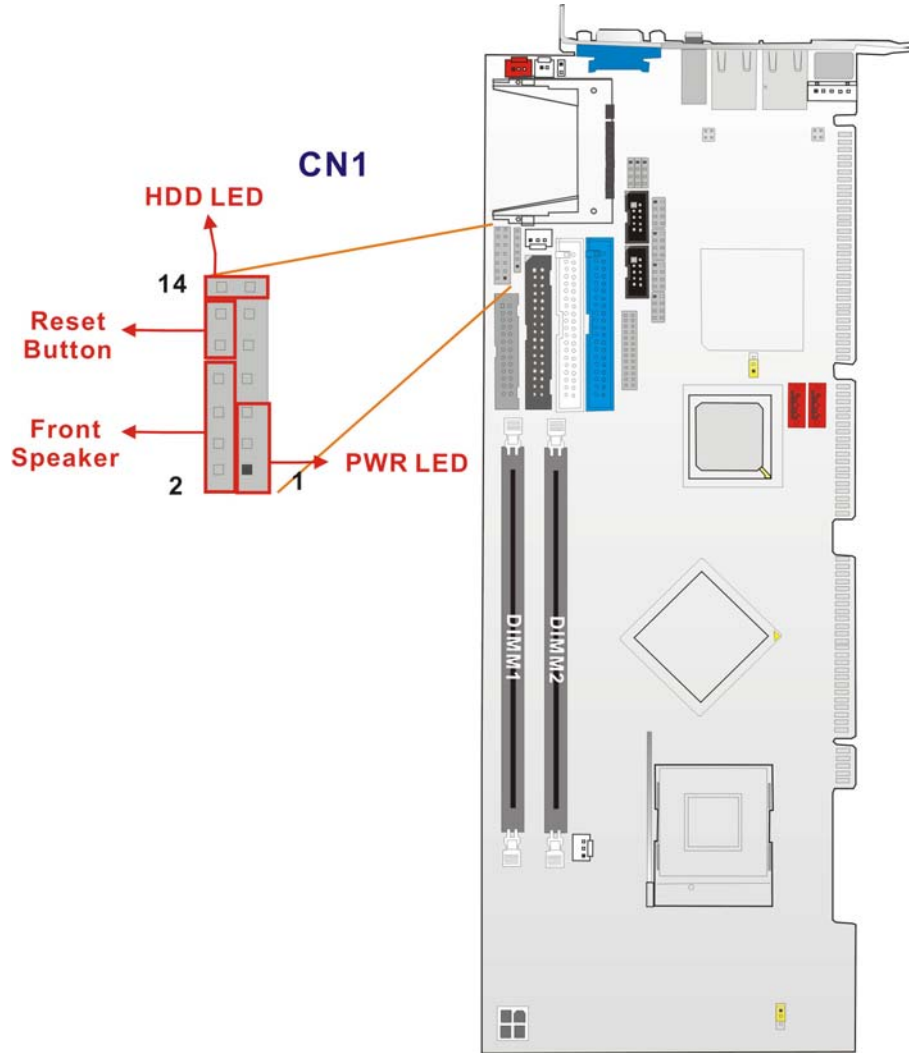
- CN Label:** CN1
- CN Type:** 2x7 pin header
- CN Location:** See Figure 3-9
- CN Pinouts:** See Table 3-9

The system panel connector connects to:

- the system chassis front panel LEDs
- the chassis speaker
- the power switch
- the reset button.

	<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>	
Power LED	1	+5V	2	Speaker+	Speaker
	3	N/C	4	N/C	
	5	GND	6	N/C	
	7	N/C	8	Speaker-	Reset Button
	9	N/C	10	Reset PIN1	
	11	GND	12	Reset PIN2	
HDD LED	13	HDD LED+	14	HDD LED-	HDD LED

**Table 3-10: System Panel Connector Pinouts**



**Figure 3-9: System Panel Connector Location**

### **3.2.9 IrDA Connector**

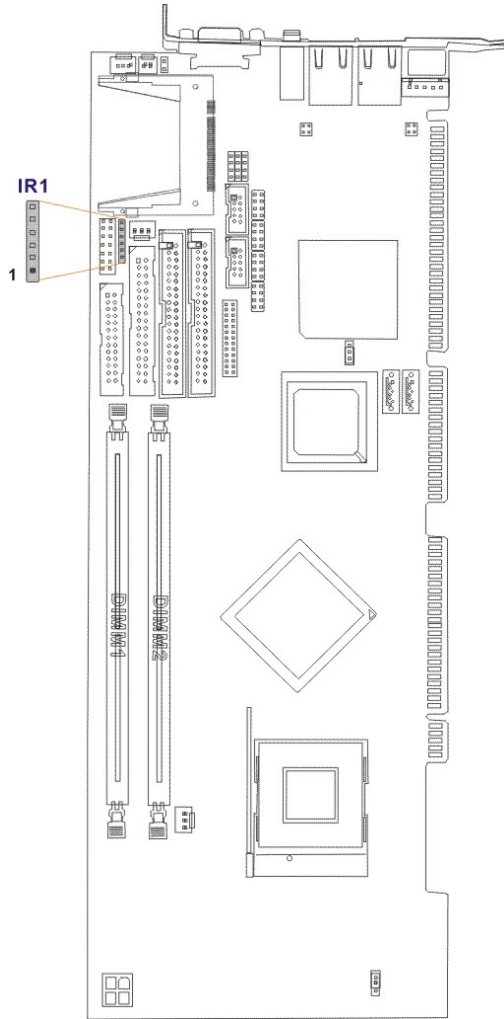
- CN Label:** IR1
- CN Type:** 1x6 pin header
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-11

## ROCKY-4786EV/EVG User Manual

The integrated IrDA connector supports both the SIR and ASKIR infrared protocols.

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX
6	CIRRX

**Table 3-11: IrDA Connector Pinouts**



**Figure 3-10: IrDA Connector Location**

### **3.2.10 SATA Drive Connectors**

- CN Label:** SATA1, SATA2
- CN Type:** 1x7 pin port
- CN Location:** See Figure 3-11
- CN Pinouts:** See Table 3-12

The SATA drive ports provide connectivity to SATA drives with a maximum data transfer rate of 150MB/s.

## ROCKY-4786EV/EVG User Manual

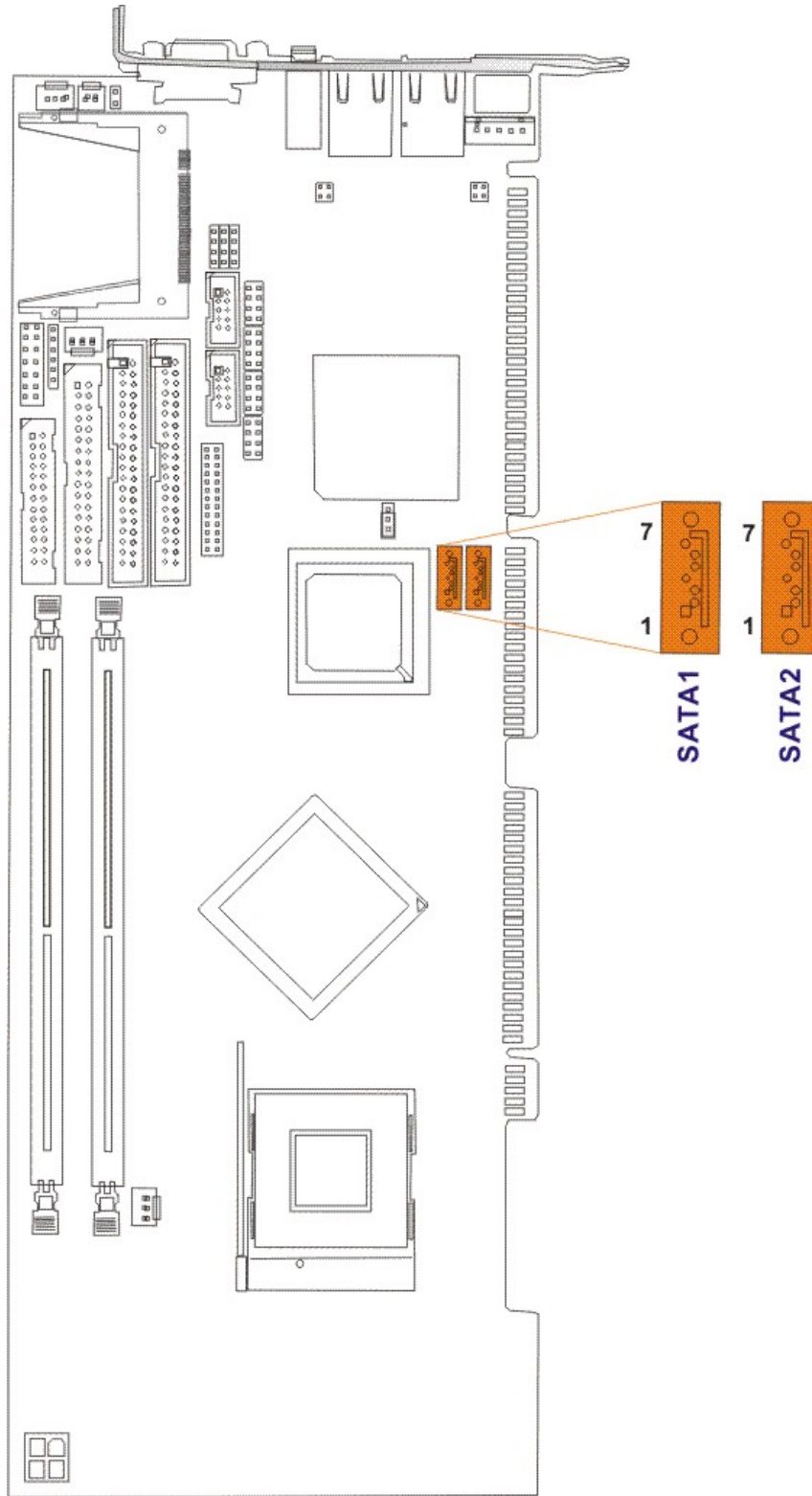
PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND		

**Table 3-12: SATA Connector Pinouts**



### CAUTION!

Your SATA hard drives may come with both a 4P power connector and a SATA power interface. Attach either the 4P connector or the included SATA power cable to your SATA hard drives. **DO NOT** attach both the power connectors to your SATA hard drives at the same time! Doing so will cause damage.



**Figure 3-11: SATA Connector Locations**



**NOTE:**

1. SATA is supported by:
  - Windows 2000 SP4
  - Windows XP SP1
  - Windows 2003, or later versions.
2. Older OSes, such as Windows 98SE or ME, do not support the SATA interface.

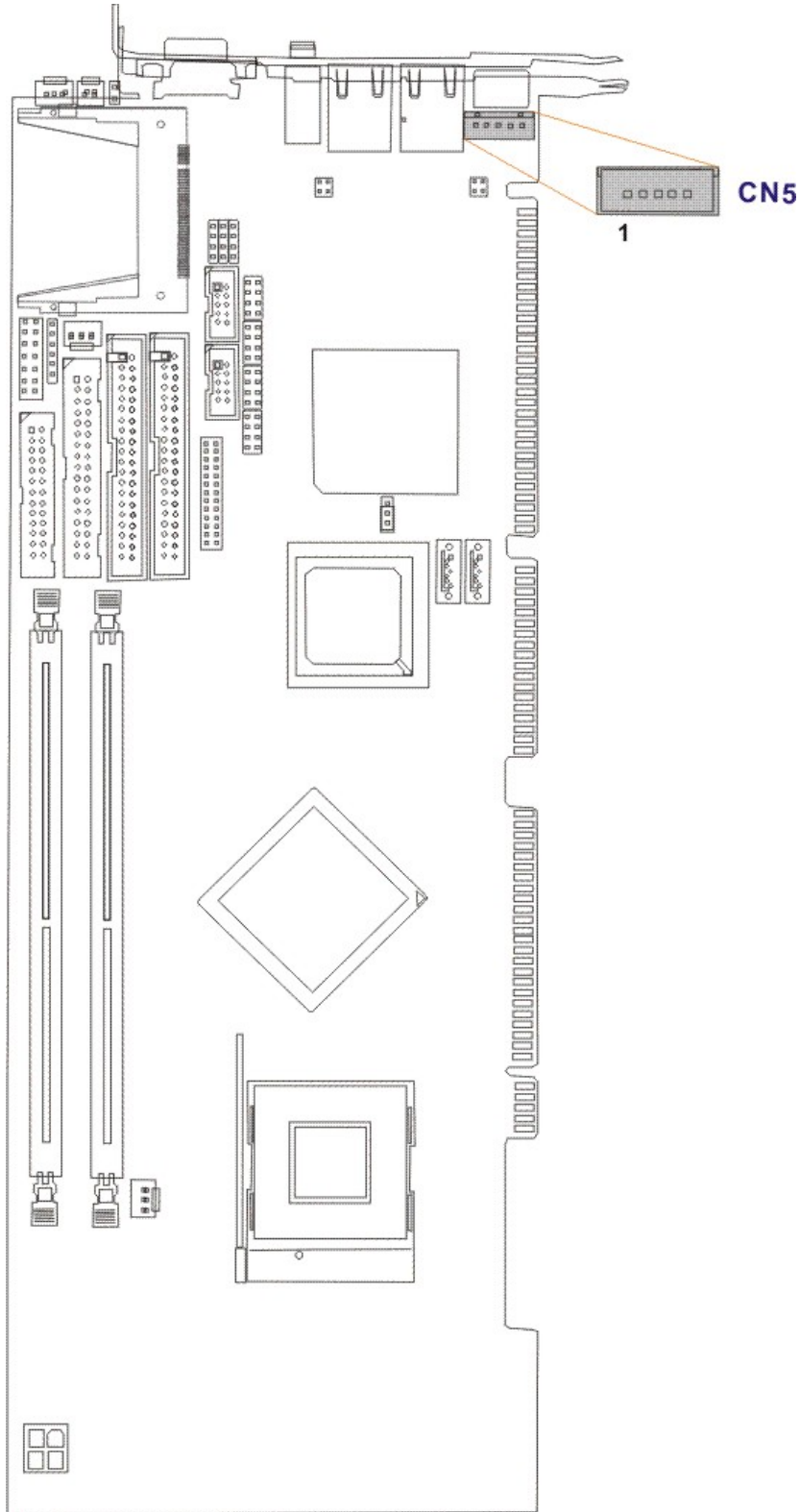
### 3.2.11 Keyboard Connector

- CN Label:** CN5
- CN Type:** 1x5 pin header
- CN Location:** See Figure 3-12
- CN Pinouts:** See Table 3-13

For alternative application, a keyboard pin header connector is also available on board.

<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GND
5	+5V

**Table 3-13: CN5 Connector Pinouts**



**Figure 3-12: CN5 Connector Location**



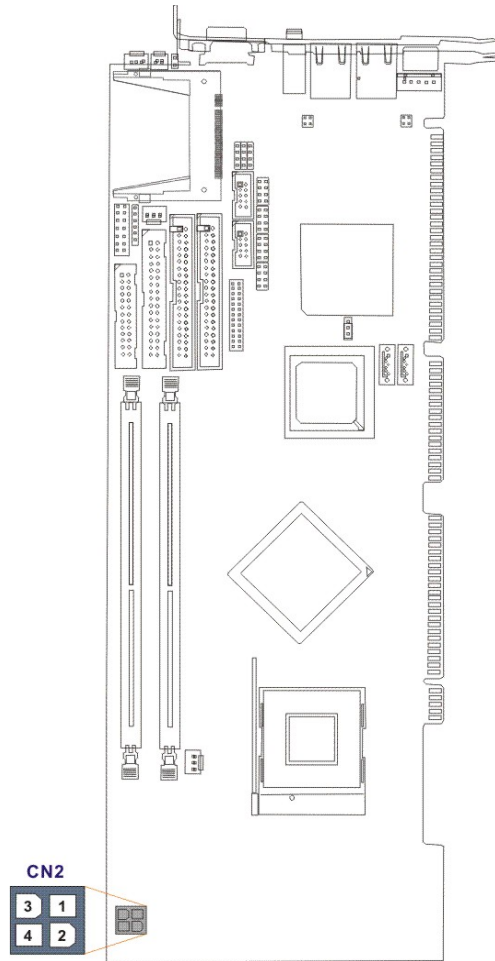
### 3.2.12 ATX-12V Power Source Connector

- CN Label:** CN2
- CN Type:** 2x2 pin header
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-14

This connector supports the ATX-12V power supply.

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

**Table 3-14: CN2 Connector Pinouts**



**Figure 3-13: ATX Connector Location**

### 3.3 External (Rear Panel) Connectors

**Figure 3-14** shows the ROCKY-4786EV/EVG CPU board rear panel. The peripheral connectors on the back panel can be connected to devices externally when the CPU card is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x PS/2 keyboard connector
- 2 x RJ-45 GbE connectors
- 1 x Line-out connector
- 1 x VGA connector

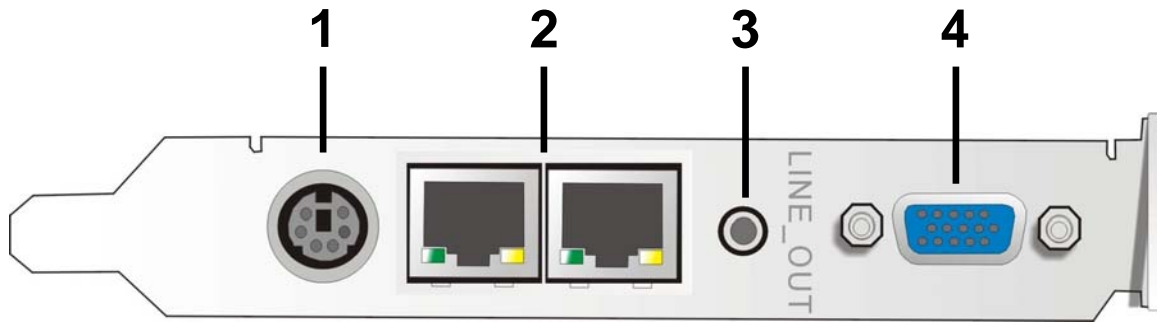


Figure 3-14: ROCKY-4786EV/EVG CPU Board Rear Panel

### 3.3.1 PS/2 Connector

**CN Label:** KB\_MS1

**CN Type:** PS/2

**CN Location:** See Figure 3-14 (labeled number 1)

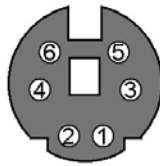
**CN Pinouts:** See Table 3-15

Figure 3-15 shows PS/2 Pinout locations

The PS/2 mouse and keyboard connectors are connected to a mouse and keyboard

PIN	DESCRIPTION	PIN	DESCRIPTION
1	KB Data	2	N/C
3	GND	4	+5V
5	Clock	6	N/C

**Table 3-15: PS/2 Pinouts**



**Figure 3-15: PS/2 Pinout locations**

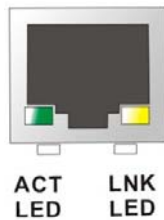
### 3.3.2 Ethernet Connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 3-14 (labeled number 2)
- CN Pinouts:** See Table 3-16

Two 1Gb connections can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub. An RJ-45 Ethernet connector is shown in **Figure 3-16**.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXD+	8	GND
2	TXD-	9	GRN+
3	RXD+	10	GRN-
4	CT_TXD	11	YEL-
5	CT_RXD	12	YEL+
6	RXD-	13	S GND
7	N/C	14	S GND

**Table 3-16: RJ-45 Ethernet Connector Pinouts**



**Figure 3-16: RJ-45 Ethernet Connector**

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-17**.

SPEED LED		ACT/LINK LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
OFF	10 Mbps connection	OFF	No link
ORANGE	100 Mbps connection	YELLOW	Linked
GREEN	1 Gbps connection	BLINKING	Date activity

**Table 3-17: RJ-45 Ethernet Connector LEDs**

### 3.3.3 LINE OUT Connector

Connect an audio device to the line out connector on the rear panel Figure 3-14 (labeled number 3).

### 3.3.4 VGA Connector

**CN Label:** VGA1

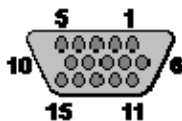
**CN Type:** See Figure 3-17

**CN Location:** See Figure 3-14 (labeled number 4)

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red	9	No Connect
2	Green	10	Ground
3	Blue	11	No Connect
4	No Connect	12	DDC DAT
5	Ground	13	Horizontal Synchronization
6	Ground	14	Vertical Synchronization
7	Ground	15	DDC Clock
8	Ground		

**Table 3-18: VGA Connector Pinouts**



**Figure 3-17: VGA Connector**

Chapter

4

# Installation

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## 4.1 Anti-static Precautions

---



### WARNING:

Failure to take ESD precautions during the installation of the ROCKY-4786EV/EVG may result in permanent damage to the ROCKY-4786EV/EVG and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ROCKY-4786EV/EVG. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ROCKY-4786EV/EVG or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the ROCKY-4786EV/EVG, place it on an anti-static pad. This reduces the possibility of ESD damaging the ROCKY-4786EV/EVG.
- **Only handle the edges of the PCB:** When handling the PCB, hold the PCB by the edges.

## 4.2 Installation Considerations

---



### NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

---





### **WARNING:**

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

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

- Read the user manual:
  - The user manual provides a complete description of the ROCKY-4786EV/EVG installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the ROCKY-4786EV/EVG on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the ROCKY-4786EV/EVG off:
  - When working with the ROCKY-4786EV/EVG, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the ROCKY-4786EV/EVG **DO NOT:**

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

### 4.3 ROCKY-4786EV/EVG CPU Card Installation

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**WARNING!**

1. Never run the CPU board without an appropriate heat sink and cooler that can be ordered from IEI Technology or purchased separately.
  2. Be sure to use the CPU 12V power connector (CN10007) for the CPU power.
- 
- 

**WARNING!**

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the CPU Card components and injury to you.

---

---

**WARNING!**

When installing electronic components onto the CPU Card always take the following anti-static precautions in order to prevent ESD damage to your board and other electronic components like the CPU and DIMM modules

---

The following components must be installed onto the CPU Card or connected to the CPU Card during the installation process.

- CPU
- CPU cooling kit
- DIMM modules
- Peripheral device connection

### 4.3.1 CPU Installation

---



#### **WARNING!**

CPUs are expensive and sensitive components. When you install the CPU, please be careful not to damage it in anyway. Make sure you install it properly and ensure that a heat sink and CPU cooling fan is properly installed before you run the CPU Card or else both the CPU and the board will be damaged.

---

To install Intel 478-pin CPU onto your motherboard, follow the steps below:

- Step 1:** **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 2:** **Correctly position the CPU.** Make sure the pin 1 mark matches the cut edge on the CPU socket. Carefully place the CPU on top of the socket. When properly placed, the CPU should be easily inserted into the socket.
- Step 3:** **Insert the CPU.** To insert the CPU into the socket, first lift the lever on the side of the CPU socket (See **Figure 4-1**) and then follow the instructions below:
- Step 4:** Correctly orientate the CPU with the IHS (Integrated Heat Sink) side facing upward.
- Step 5:** Locate the pin 1 mark on the CPU.
- Step 6:** Gently insert the CPU into the socket.
- Step 7:** Lower the lever into the locked position.

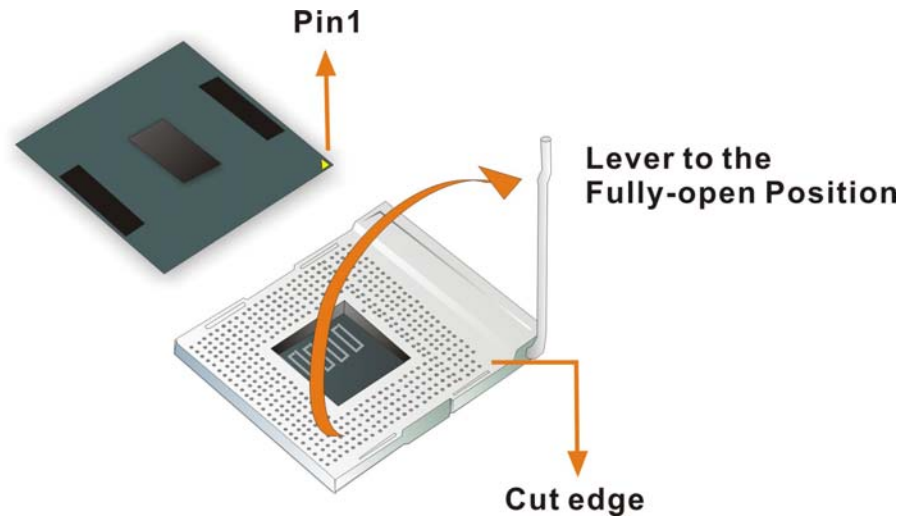


Figure 4-1: Locking the CPU into the CPU Socket

### 4.3.2 Cooling Kit CF-519 Installation

IEI provides a cooling kit designed for socket 478 CPUs. The cooling kit is comprised of a CPU heat sink and a cooling fan.



#### NOTE:

The CF-519 heat sink comes with a sprayed layer of thermal paste. Make sure you do not accidentally wipe away the thermal paste while unpacking or installing the heat sink. Thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-519 cooling kit, please follow the steps below.

**Step 1: Install the cooling kit bracket.** A cooling kit bracket is installed on the rear of the CPU card. Align the bracket with the four retention holes at the back of the CPU card. Once properly aligned, insert four retention screws from the front of the CPU card.

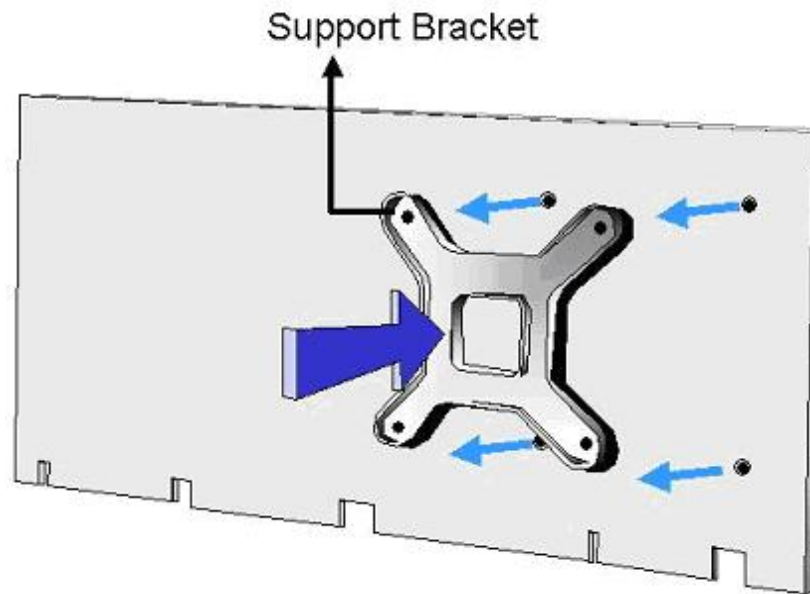


Figure 4-2: Cooling Kit Support Bracket

**Step 2:** Open the lever at the top of the heat sink. Lift the lever at the top of the cooling kit to loosen the cooling kit clamps.

**Step 3:** Secure the cooling kit. Gently place the heat sink and cooling kit onto the CPU. Make sure the hooks are properly secured to the bracket. To secure the cooling kit, close the top lever.

### 4.3.3 DIMM Module Installation

#### 4.3.3.1 Purchasing the Memory Module

When you purchase your DIMM modules, the following considerations should be taken into account:

- Each DIMM module can support a memory chip with a maximum size of 1GB
- It is recommended that you use memory modules of identical brand, size, chips, and speed.
- DIMMs must use the same density memory chips
- Both DIMMs must use the same DRAM bus width
- Both DIMMs must be either single-sided or dual-sided.

#### 4.3.3.2 DIMM Module Installation

The ROCKY-4786EV/EVG CPU Board has two DDR SDRAM DIMM sockets. To install the DIMM modules, follow the instructions below.

**Step 4:** Pull the two white handles on either side of the DIMM socket down.

**Step 5:** Align the DIMM module with the DIMM socket making sure the matching pins are correctly aligned.

**Step 6:** Insert the DIMM module slowly. Once you are sure it is correctly inserted, push down firmly. The white handles on either side of the socket will move back up and lock the module into the socket.

#### 4.3.4 Backplane Installation

Before the ROCKY-4786EV/EVG can be installed into the chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis to see how to install the backplane into the chassis.



#### **NOTE:**

IEI has a wide range of backplanes available. Please contact your ROCKY-4786EV/EVG vendor, reseller or and IEI sales representative at [sales@iei.com.tw](mailto:sales@iei.com.tw) or visit the IEI website at <http://www.ieworld.com> to find out more about the available chassis.

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#### 4.3.5 CPU Card Installation

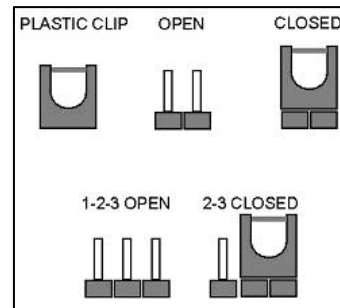
To install the ROCKY-4786EV/EVG CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

## 4.4 Jumper Settings



**NOTE:**

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



The ROCKY-4786EV/EVG includes one jumper shown in **table and figure below**.

Description	Label	Type
CF Setup	JP1	2-pin header
Clear CMOS jumper	JP2	3-pin header

**Table 4-1: Jumpers**

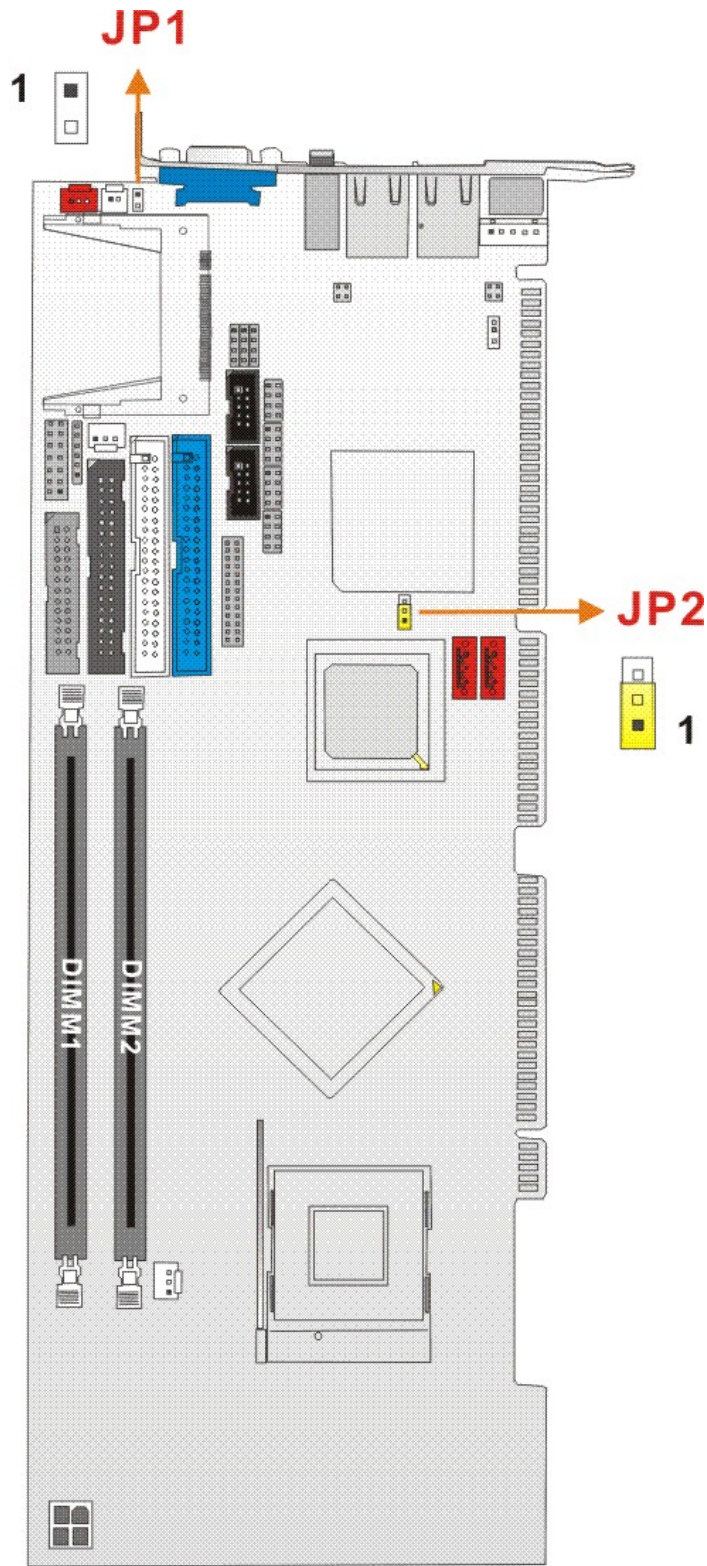


Figure 4-3: Jumper Locations



## 4.4.1 CF Card Setup

- Jumper Label:** JP1
- Jumper Type:** 2-pin header
- Jumper Settings:** See Table 4-2
- Jumper Location:** See Figure 4-3

The CompactFlash® slot is connected through an IDE connection. This jumper sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
Open	Slave
Closed	Master

**Table 4-2: CompactFlash® Setup Jumper Settings**

## 4.4.2 Reset CMOS Jumper

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

If the CPU Card fails to boot due to improper BIOS setting, use this jumper to clear the CMOS data and reset 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 displays during the boot up process, you may then try to correct the fault by pressing the F1 to enter the CMOS Setup menu. You may then do one of the following:

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

After you have done one of the above, save your changes and exit the CMOS Setup menu.

JP2	CLEAR CMOS
1-2 closed	Normal (default)
2-3 closed	Clear CMOS

**Table 4-3: Reset CMOS Jumper Settings**

## 4.5 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

### 4.5.1.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the CPU card to the IDE HDD is a standard 44-pin ATA 66/100 flat cable. To connect an IDE HDD to the CPU Card, follow the instructions below.

- Step 1:** Find the ATA 66/100 flat cable in the kit that came with the CPU Card.
- Step 2:** Connect one end of the cable to the IDE1 connector on the CPU card. A keyed pin on the IDE connectors prevents it from being connected incorrectly.
- Step 3:** Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.
- Step 4:** Connect the other side of the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.



#### **NOTE:**

When two EIDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

---

#### 4.5.1.2 Floppy Drive Connector (FDD1)

This connector provides access to two externally mounted 3.5" floppy drives. To connect the CPU Card to a FDD, follow the instructions below.

**Step 1:** Insert one side of the cable into the FDC making sure that the red wire on the cable corresponds to pin one on the connector.

**Step 2:** Attach the connector on the other side of the cable to the floppy drive(s). You can only use one connector in the set. The connection sequence determines which of the two connected floppy drives is drive A: and which is drive B.

### 4.6 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the ROCKY-4786EV/EVG.

#### 4.6.1 Audio Line-out Connector

The audio jack on the external peripheral interface enables the ROCKY-4786EV/EVG to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

**Step 1: Identify the audio plugs.** The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

**Step 2: Plug the audio plugs into the line-out audio jack.** Plug the audio plugs into the audio jack. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port:** Connects to headphones or speakers.

**Step 3: Check audio clarity.** Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

#### 4.6.2 LAN Connection

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

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

**Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the ROCKY-4786EV/EVG. See **Figure 4-4**.

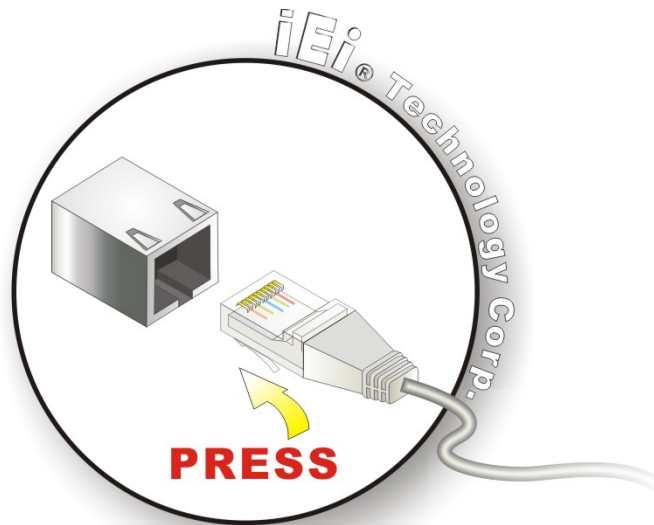


Figure 4-4: LAN Connection

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

#### 4.6.3 VGA Monitor Connection

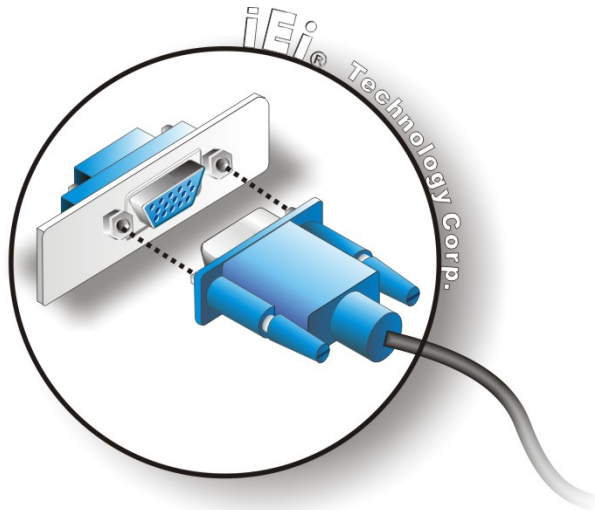
The ROCKY-4786EV/EVG has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the ROCKY-4786EV/EVG, please follow the instructions below.

**Step 1:** **Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.

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**Step 2: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

**Step 3: Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the ROCKY-4786EV/EVG. See **Figure 4-5**.



**Figure 4-5: VGA Connector**

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

### 4.7 Software Installation

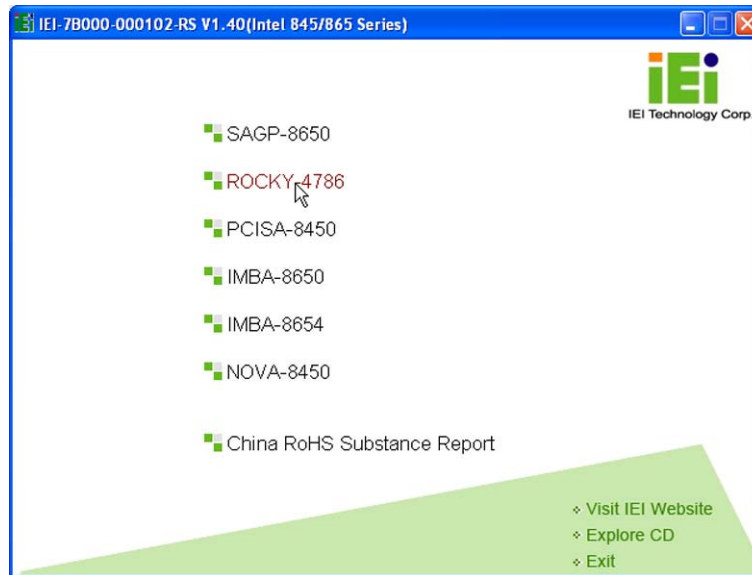
All the drivers for the ROCKY-4786EV/EVG are on the CD that came with the system. To install the drivers, please follow the steps below.

**Step 1:** Insert the CD into a CD drive connected to the system.

**NOTE:**

If the installation program doesn't start automatically:  
Click "Start->My Computer->CD Drive->autorun.exe"

**Step 2:** The driver main menu appears (**Figure 4-6**).

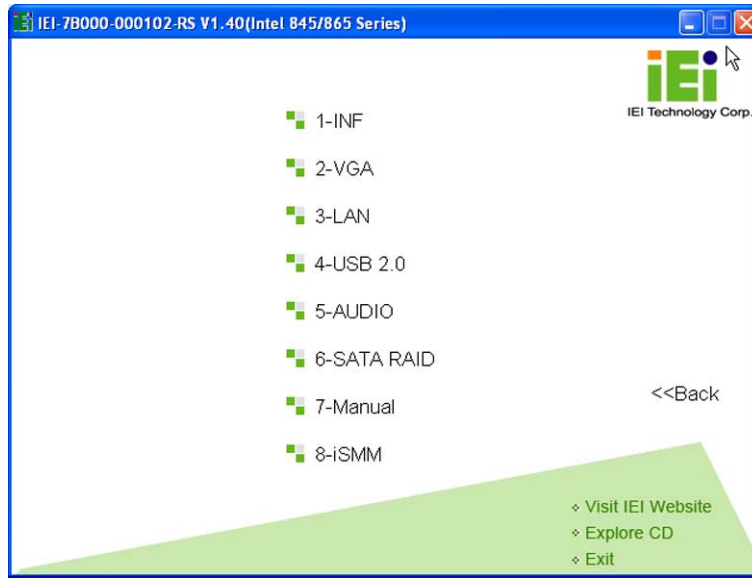


**Figure 4-6: Introduction Screen**

**Step 3:** Click ROCKY-4786EV/EVG.

**Step 4:** A new screen with a list of available drivers appears (**Figure 4-7**).

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**Figure 4-7: Available Drivers**

**Step 5:** Install all of the necessary drivers in this menu.

Chapter

5

# Award BIOS Setup

---



## 5.1 Introduction

A licensed copy of Phoenix Award BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options you may change.

### 5.1.1 Starting Setup

The Phoenix Award BIOS is activated when you turn on the computer. The setup program can be activated in one of two ways.

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

If the message disappears before you respond, you must restart your 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
+ /Page up	Increase the numeric value or make changes
- /Page down	Decrease the numeric value or make changes
Esc	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu

F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Item help
F5	Previous values for the page menu items
F6	Fail-safe defaults for the current page menu items
F7	Optimized defaults for the current page menu items
F9	Menu in BIOS
F10	Save changes and Exit BIOS

**Table 5-1: BIOS Navigation Keys**

### 5.1.3 Getting Help

When you press **F1** 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 the **Esc** key again.

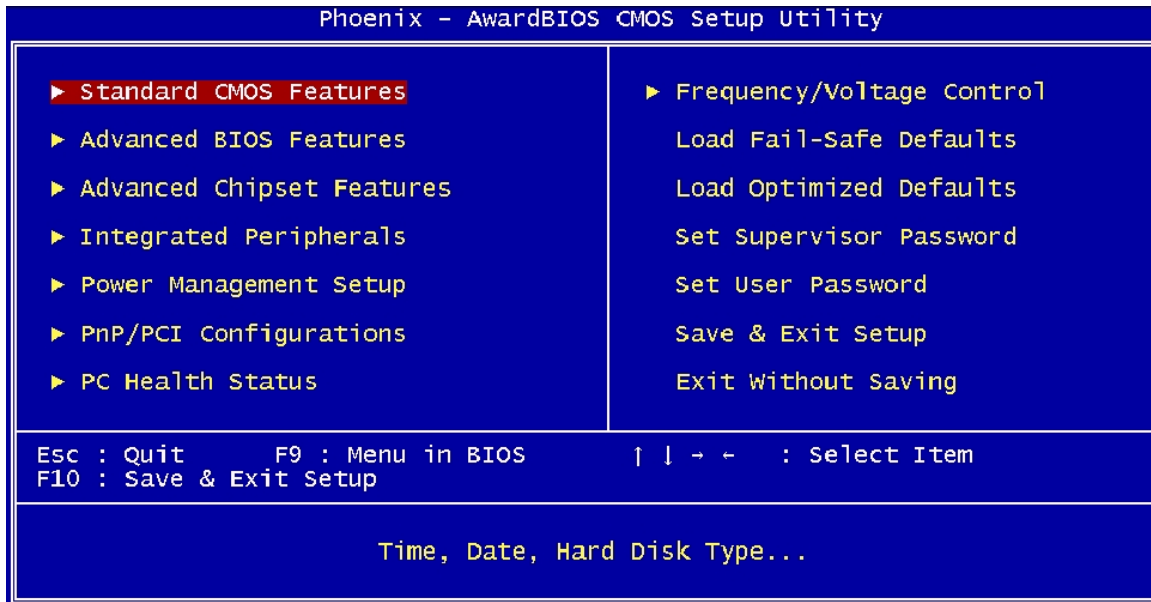
### 5.1.4 Unable to Reboot After Configuration Changes

If you are unable to boot your computer after you have made changes to the system configuration, you must restore the CMOS defaults. Use the jumper described in **Section 4.4.2**.

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### 5.1.5 Main BIOS Menu

Once the BIOS opens, the main menu (**BIOS Menu 1**) appears.



#### BIOS Menu 1: Award BIOS CMOS Setup Utility



#### NOTE:

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS Menu 1**.

- **Standard CMOS Features:** Changes the basic system configuration.
- **Advanced BIOS Features:** Changes the advanced system settings.
- **Advanced Chipset Features:** Changes the chipset configuration features
- **Integrated Peripherals:** Changes the settings for integrated peripherals
- **Power Management Setup:** Changes power saving options

- **PCIPnP Configurations:** Changes the advanced PCI/PnP Settings
- **PC Health Status:** Monitors essential system parameters
- **Frequency/Voltage Control:** Configures the CPU Clock Ratio, Auto Detect DIMM/PCI CLK and Spread Spectrum settings

The following user configurable options are also available in the BIOS Main Menu

→ **Load Fail-Safe Defaults**

This option allows you to load failsafe default values for each of the parameters on the Setup menus. **F6 key can be used for this operation on any page.**

→ **Load Optimized Defaults**

This option allows you to load optimal default values for each of the parameters on the Setup menus. **F7 key can be used for this operation on any page.**

→ **Set Supervisor Password**

By default, no **Supervisor Password** is set. If you wish to install a supervisor password, select this field and enter the password. After this option has been selected, a red dialogue box with “**Enter Password:** ” will appear. You will be asked to confirm your password. Retype the original password into the “**Confirm Password:** ” dialogue box and press enter.

→ **Set User Password**

By default, no **User Password** is set. If you wish to install a user password, select this field and enter the password. After this option has been selected, A red dialogue box with “**Enter Password:** ” will appear. You will be asked to confirm your password. Retype the original password into the “**Confirm Password:** ” dialogue box and press enter.

→ **Save & Exit Setup**

If you have finished making the configuration changes and wish to save them and exit the BIOS menus, select this option.

## ➔ Exit Without Saving

If you have finished making configuration changes but do not want to save them and you want to exit the BIOS menus, select this option.

## 5.2 Standard CMOS Features

The Standard CMOS Features menu (**BIOS Menu 2**) changes basic BIOS configuration options.



### BIOS Menu 2: Standard CMOS Features

The **Standard CMOS Features** menu allows you to set both the date and the time field:

- **Date [mm:dd:yy]:** Allows you to set the system date.
- **Time [Day hh/mm/ss]:** Allows you to set the system time.

## ➔ IDE Master and IDE Slave

When entering setup, BIOS auto detects the presence of IDE devices. This displays the status of the auto detected IDE devices. The following IDE devices will be detected and are shown in the **Standard CMOS Features** menu:

- Primary IDE Master

- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The IDE Configuration menu (**BIOS Menu 3**) allows you to set or change the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.2.1** appear.

→ **Drive A [1.44M, 3.5in]**

The **Drive A** configuration option determines the type of floppy drive installed in the system. The floppy drive configuration options are listed below.

- None
- 360K, 5.25 in
- 1.2M, 5.25 in
- 720K, 3.5 in
- 1.44M, 3.5 in (DEFAULT)
- 2.88M, 3.5in

→ **Drive B [1.44M, 3.5in]**

The **Drive B** configuration option determines the type of floppy drive installed in the system. The floppy drive configuration options are listed below.

- None
- 360K, 5.25 in
- 1.2M, 5.25 in
- 720K, 3.5 in
- 1.44M, 3.5 in (DEFAULT)
- 2.88M, 3.5in

→ **Video [EGA/VGA]**

The **Video** configuration option allows you to select the adapter for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in the BIOS setup. Video configuration options are listed below.

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- **EGA/VGA** (DEFAULT) Selected when the adapter for the primary system monitor is one of the following:
  - **EGA**
  - **VGA**
  - **SEGA**
  - **SVGA**
  - **PGA**
- **CGA 40** The system will power up in 40 column mode
- **CGA 80** The system will power up in 80 column mode
- **MONO** A monochrome monitor is used. High-resolution monochrome monitors are also supported.

### → **Halt On**

The **Halt On** category allows users to determine whether the computer will stop if an error is detected during power up.

- **All Errors** (DEFAULT) Whenever BIOS detects a non-fatal error the system will be stopped and you will be prompted.
- **No Errors** The system boot will not be stopped for any errors that may be detected
- **All, But Keyboard** The system boot will not stop for a keyboard error; it will stop for all other errors.
- **All, But Diskette** The system boot will not stop for a disk error; it will stop for all other errors.
- **All, But Disk/Key** The system boot will not stop for a keyboard or a disk error; it will stop for all other errors.

### → **Base Memory:**

The **Base Memory** is NOT user configurable. The POST will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the CPU card or 640K for systems with 640K or more memory installed on the motherboard.

➔ **Extended Memory**

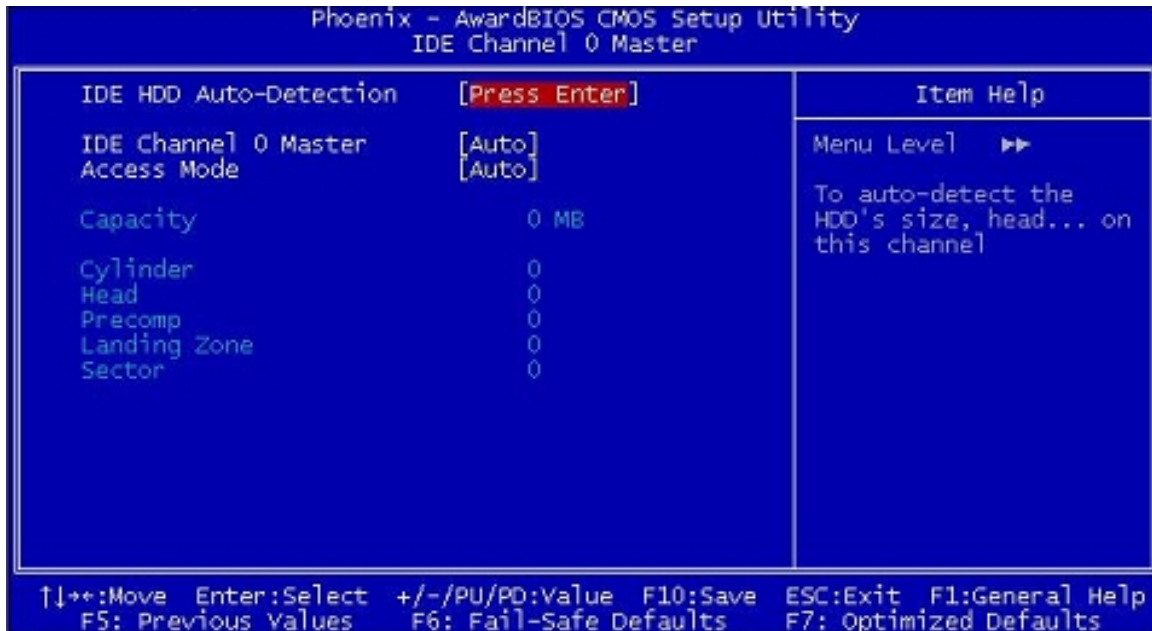
The **Extended Memory** is NOT user configurable. The BIOS determines how much extended memory is present during the POST. This is the amount of memory above 1MB located in the memory address map of the CPU.

➔ **Total Memory**

The **Total Memory** is NOT user configurable.

### 5.2.1 IDE Channel Master

The **IDE Channel Master** menu (**BIOS Menu 3**) allows you to set or change the configurations for the master and slave IDE devices for both channel 0 and channel 1.



#### BIOS Menu 3: IDE Channel Master

➔ **IDE HDD Auto-Detection [Press Enter]**



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Selecting **IDE HDD Auto-Detection** option and pressing the “ENTER” key will enable the BIOS to automatically detect the HDD type. Do not set this option manually.

### → IDE Channel 0/1 Master/Slave [Auto]

The **IDE Channel** option allows you to activate or deactivate the following drive channels:

- Channel 0 Master
- Channel 0 Slave
- Channel 1 Master
- Channel 0 Slave

- **None** If no drives are connected to the IDE channel select this option. Once set, this IDE channel will become inaccessible and any drives attached to it undetected.
- **Auto** (DEFAULT) Setting this option allows the device to be automatically detected by the BIOS
- **Manual** Selecting this option allows you to manually configure the device on the IDE channel in BIOS.

### → Access Mode [Auto]

The **Access Mode** option allows you to determine the hard disk BIOS translation modes. Most systems now use hard drives with large capacities and therefore either the LBA translation mode or auto mode should be selected.

- **CHS** Select this mode if the HDD capacity is less than 504MB.
- **LBA** Select this mode if the HDD capacity is more than 8.4GB.
- **Large** This mode is an extended ECHS mode and while it supports HDDs larger than 504MB, it is not recommended.
- **Auto** (DEFAULT) If you are unsure of what access mode to set, select this option

→ **Capacity**

The **Capacity** specification tells the user the storage capacity of the HDD installed in the system.

→ **Cylinder**

The **Cylinder** specification shows the number of cylinders (tracks) on the HDD installed in the system.

→ **Head**

The **Head** specification shows the number of logical heads on the HDD installed in the system.

→ **Precomp**

The **Precomp** specification indicates on which track the write precompensation begins.

→ **Landing Zone**

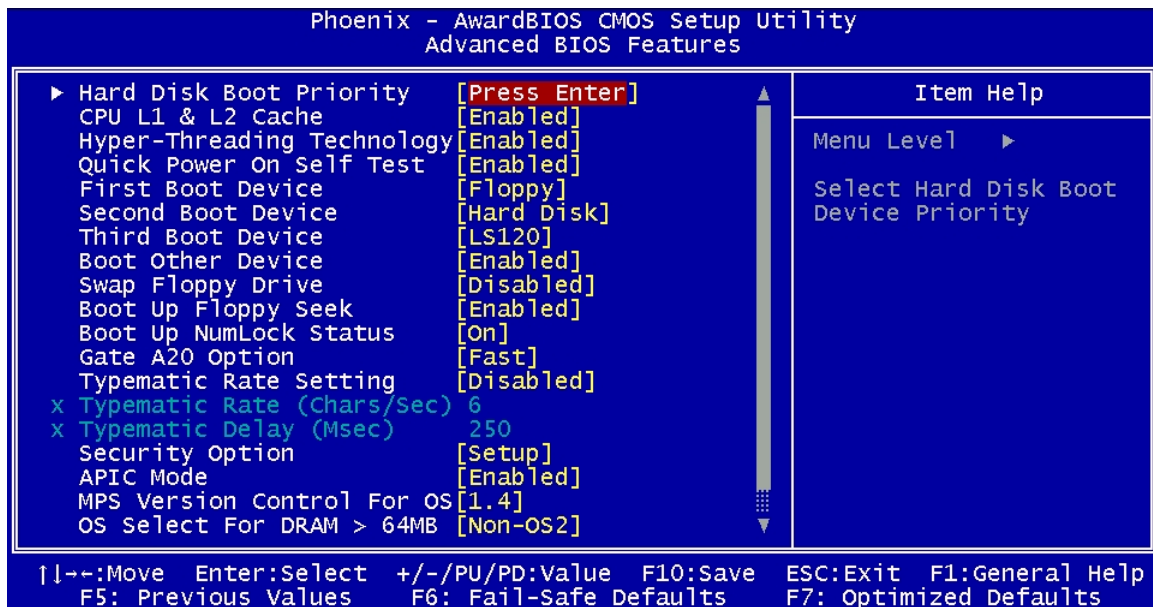
The **Landing Zone** specification tells the user where the disk head will park itself after the system powers off.

→ **Sector**

The **Sector** specification tells the user how many logical sectors the HDD has been divided into.

### 5.3 Advanced BIOS Features

The Advanced BIOS Features menu (**BIOS Menu 4**) provides access to CPU and peripheral device configuration options.



## BIOS Menu 4: Advanced BIOS Features

Once the **Advanced BIOS Features** menu is selected, two menu options and a host of configuration options are available. The two menu options are:

- CPU Feature
- Hard Disk Boot Priority

To access these menus, use the arrow keys to select the menu option and press the “**ENTER**” button. The menu will appear. The menus are discussed fully in **Section 5.3.1: CPU Feature** and **Section 5.3.2: Hard Disk Boot Priority** below.

### ➔ Virus Warning [Disabled]

When the virus warning is enabled, the BIOS will monitor the boot sector and partition table of the HDD for any attempt at modification. If an attempt is made, the BIOS will halt the system and an error message will appear. Afterwards, if necessary, run an anti-virus program to locate and remove the problem before any damage is done.

- ➔ **Enabled**                      Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or HDD partition table.
- ➔ **Disabled (Default)**      No warning message will appear when anything attempts

to access the boot sector or HDD partition table.

**NOTE:**

Many disk diagnostic programs can cause the above warning message to appear when the program attempts to access the boot sector table. If you run such a program, it is recommended that you first disable the virus protection function before hand.

---

**→ CPU L1 & L2 Cache [Enabled]**

The **CPU L1 & L2 Cache** option allows users to select whether the CPU primary cache (L1) and secondary cache (L2) will be turned on or off.

- **Enabled** (DEFAULT) The L1 and L2 CPU caches are both turned on
- **Disabled** The L1 and L2 CPU caches are both turned off

**→ Quick Power On Self Test [Enabled]**

The **Quick Power On Self Test** configuration option speeds up the POST after you turn on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

- **Enabled** (DEFAULT) Quick POST will occur after the computer is turned on
- **Disabled** Normal POST will occur after the computer is turned on

**→ Boot Device**

There are three **Boot Device** configuration options. They are:

- First Boot Device [DEFAULT: Hard Disk]
- **Second Boot Device** [DEFAULT: Hard Disk]

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- Third Boot Device [DEFAULT: LS120]

The **Boot Device** configuration options allow you to select the order of devices the computer will boot from. Using the default values, the system will first look for an HDD to boot from. If an HDD is unavailable then the system will boot from a LS120 drive.

**Boot Device** configuration options are:

- Hard Disk
- CDROM
- ZIP100
- USB-FDD
- USB-ZIP
- USB-CDROM
- LAN
- Disabled
- Floppy
- LS120

### → **Boot Other Device [Enabled]**

The **Boot Other Device** option determines whether the CPU card will use a second or third boot device if the first boot device is not found.

- **Enabled** (DEFAULT) The system will look for second and third boot devices if the first one is not found.
- **Disabled** The system will not look for second and third boot device if the first one is not found.

### → **Swap Floppy Drive [Disabled]**

The **Swap Floppy Drive** option is effective only in systems with two floppy drives. Selecting **Enabled** assigns physical drive B to logical drive A, and physical drive A to logical drive B.

- **Enabled** Assigns physical drive B to logical drive A, and physical drive A to logical drive B.

→ **Disabled** (DEFAULT) Default physical/logical drive assignments.

→ **Boot Up Floppy Seek [Enabled]**

During the POST, BIOS will determine if the floppy disk drive installed has 40 or 80 tracks. 360K FDDs have 40 tracks while 760K, 1.2M and 1.44M FDDs all have 80 tracks

→ **Enabled** (DEFAULT) BIOS searches for a FDD to determine if it has 40 or 80 tracks. Note that BIOS cannot tell the difference between 720K, 1.2M or 1.44M drives as they all have 80 tracks.

→ **Disabled** BIOS does not search for the type of FDD drive by track number. Note that there will not be any warning message if the drive installed is 360K.

→ **Boot Up Numlock Status [On]**

The **Boot Up Numlock Status** option allows you to determine the default state of the numeric keypad.

→ **Off** The keys on the keypad will be arrow keys

→ **On** (DEFAULT) The keys on the keypad will be number keys

→ **Gate A20 Option [Fast]**

The **Gate A20 Option** option refers to the way the system addresses memory above 1 MB (extended memory). Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

→ **Fast** (DEFAULT) Lets the system chipset control Gate A20

→ **Normal** A pin in the keyboard controller controls Gate A20

→ **Typematic Rate Setting [Disabled]**

Disabling the **Typematic Rate Setting** configuration option only allows one character to appear onto the screen if a key is continuously held down. In other words, the BIOS will only report the key is down. When this option is enabled, the BIOS will report as before,

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but it will then wait a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. Such a feature would be used to accelerate cursor movements with the arrow keys.

- ➔ **Disabled** (DEFAULT) Disables the typematic rate
- ➔ **Enabled** Enables the typematic rate

### ➔ x Typematic Rate (Chars/sec) [6]

The **Typematic Rate** can only be configured if the **Typematic Rate Setting** is Enabled. The **Typematic Rate** configuration field determines the rate keys are accelerated.

- ➔ **6** (DEFAULT) 6 characters per second
- ➔ **8** 8 characters per second
- ➔ **10** 10 characters per second
- ➔ **12** 12 characters per second
- ➔ **15** 15 characters per second
- ➔ **20** 20 characters per second
- ➔ **24** 24 characters per second
- ➔ **30** 30 characters per second

### ➔ x Typematic Delay (Msec) [250]

The **Typematic Delay** can only be configured if the **Typematic Rate Setting** is enabled. The **Typematic Delay** configuration field allows you to select the delay between when the key was first depressed and when the acceleration begins.

- ➔ **250** (DEFAULT) 250 milliseconds
- ➔ **500** 500 milliseconds
- ➔ **750** 750 milliseconds
- ➔ **1000** 1000 milliseconds

### ➔ Security Option [Setup]

The **Security Option** configuration option allows you to limit access to the system and Setup or just to the Setup.

- ➔ **Setup** (DEFAULT) The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
- ➔ **System** The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

**NOTE:**

To disable security, select the password setting in the **Main Menu**. When asked to enter a password, do not type anything, press, “**ENTER**” and the security is disabled. Once the security is disabled, the system will boot and you can enter Setup freely.

---

**➔ APIC Mode [Enabled]**

The **APIC Mode** (Advanced Programmable Interrupt Controller mode) option is a BIOS setting made available to Windows 2000 and Windows XP systems that increases the number of IRQ (Interrupt Request) lines available to the processor from 16 to 23.

- ➔ **Enabled** (DEFAULT) IRQ lines increased from 16 to 23
- ➔ **Disabled** Only 16 IRQ lines are available to the CPU

**➔ MPS Version Control for OS [1.4]**

The **Multiprocessor Specification (MPS) for OS** specifies the MPS version to be used.

- ➔ **1.1** MPS version 1.1 is used
- ➔ **1.4** (DEFAULT) MPS version 1.4 is used



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### → OS Select For DRAM > 64MB [Non-OS2]

The **OS Select For DRAM > 64MB** option allows you to specify the operating system you are using.

→ **OS2** Only select this if you are using the OS/2 operating system

→ **Non-OS2 (DEFAULT)** If you are not using the OS/2 operating system then disable this function.

### → Small Logo (EPA) Show [Disabled]

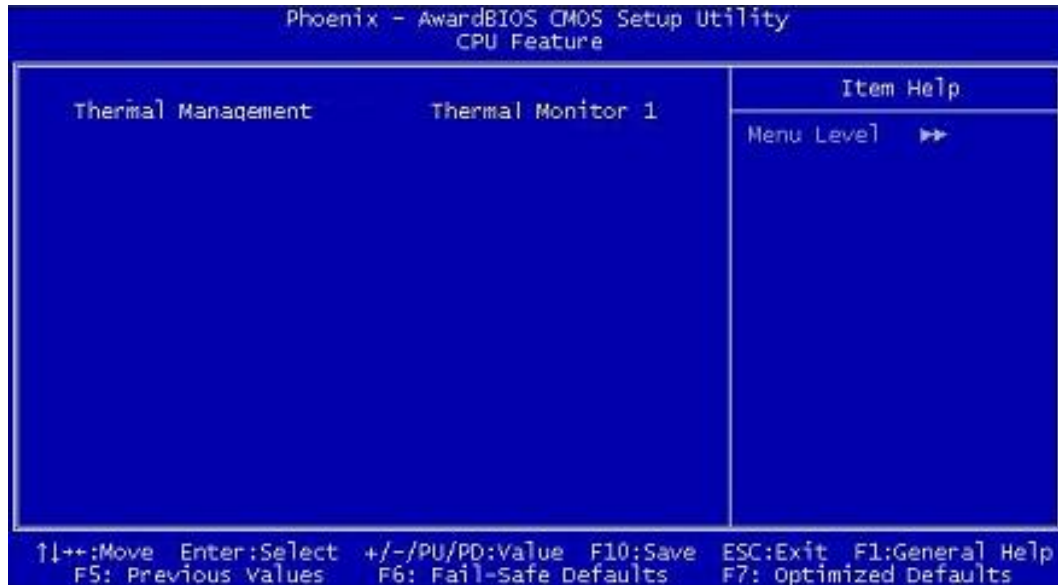
The **Small Logo (EPA) Show** option determines if the Environmental Protection Agency (EPA) logo will appear during the system boot-up process. If it is enabled then the boot up process may be delayed.

→ **Enabled** EPA logo will appear during the boot up process.

→ **Disabled (DEFAULT)** EPA logo will not appear during the boot up process.

## 5.3.1 CPU Feature

The CPU Feature menu (**BIOS Menu 5**) shows CPU configuration options.



### BIOS Menu 5: CPU Feature

#### → Thermal Management [Thermal Monitor 1]

The **Thermal Management** configuration option allows you to select the thermal monitor the CPU will use to monitor its own operating temperature. Once the thermal monitor detects that the CPU is reaching its maximum operating temperature, the thermal monitor will automatically throttle the CPU (reduce the number of CPU processing cycles) in order to cool the CPU down to a safe operating temperature. Once at a safe operating temperature, the CPU will continue to perform at its peak capacity.

- **Thermal Monitor 1** Thermal Monitor 1 uses an on-die temperature sensing circuit in the CPU that can act quickly in response to thermal issues. This circuit monitors the most active areas of the CPU-die at all times and will quickly lower the CPU temperature by throttling the internal CPU clock speed when the CPU approaches its maximum operating temperature.

### 5.3.2 Hard Disk Boot Priority

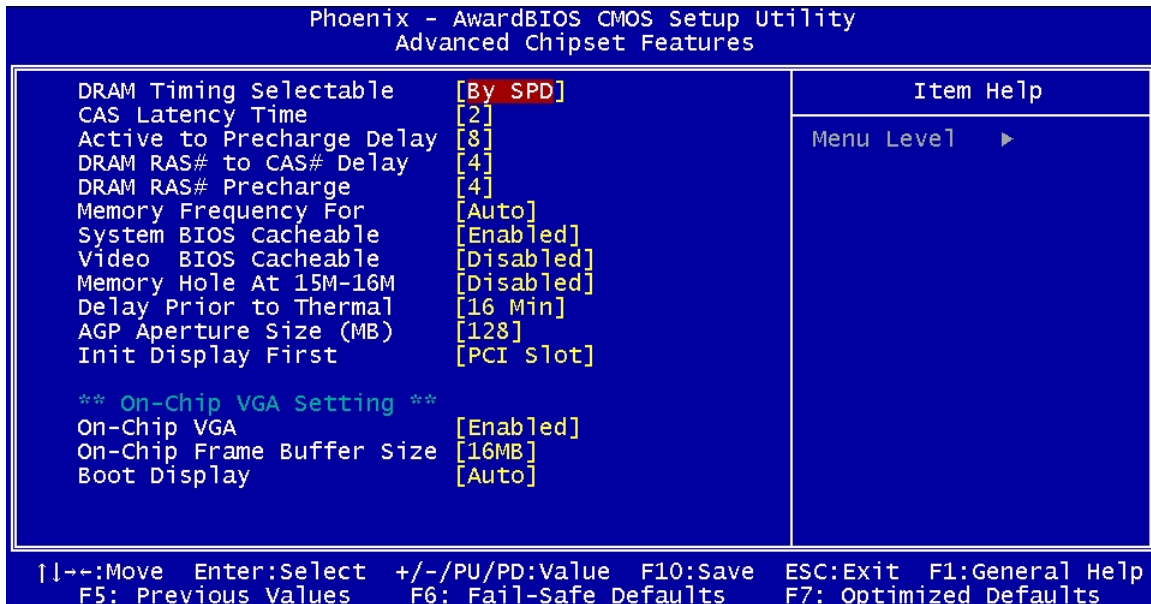
The Hard Disk Boot Priority menu (**BIOS Menu 6**) is shown below.



BIOS Menu 6: Hard Disk Boot Priority

## 5.4 Advanced Chipset Features

The Advanced Chipset Features menu (**BIOS Menu 7**) allows you to change the configuration for the chipset configuration options.



### BIOS Menu 7: Advanced Chipset Features

#### → DRAM Timing Selectable [Manual]

The **DRAM Timing Selectable** configuration option allows you to select whether the manufacturer recommended settings for the following DRAM configuration options are automatically detected by the BIOS or if you manually select the DRAM settings. The DRAM configuration options are:

- CAS Latency Time [2]
- Active to Precharge Delay [6]
- DRAM RAS# to CAS# Delay [3]
- DRAM RAS# Precharge [3]

→ **Manual** (DEFAULT) You set the above configuration options manually

→ **By SPD** The BIOS automatically detects the settings recommended by the manufacturer

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### → CAS Latency Time [2]

The **CAS Latency Time** configuration option refers to the Column Address Strobe (CAS) delay time. (To be able to change this configuration option the **DRAM Timing Selectable** configuration option must be set to “**Manual**”) The following configuration options are available

- 2 nanoseconds (DEFAULT)
- 2.5 nanoseconds
- 3 nanoseconds

### → Active to Precharge Delay [6]

This feature controls the memory bank's minimum row active time (**tRAS**). This constitutes the time when a row is activated until the time the same row can be deactivated. (To be able to change this configuration option the **DRAM Timing Selectable** configuration option must be set to “**Manual**”) The following configuration options are available

- 8 nanoseconds
- 7 nanoseconds
- 6 nanoseconds (DEFAULT)
- 5 nanoseconds

### → DRAM RAS# to CAS# Delay [3]

The **DRAM RAS# to CAS# Delay** option allows you to set the delay between the RAS and CAS signals. (To be able to change this configuration option the **DRAM Timing Selectable** configuration option must be set to “**Manual**”) The following configuration options are available

- 4 nanoseconds
- 3 nanoseconds (DEFAULT)
- 2 nanoseconds

### → DRAM RAS# Precharge [3 clocks]

The **DRAM RAS# Precharge** option indicates how fast your RAM can terminate the access of one row and start accessing another. (To be able to change this configuration

option the **DRAM RAS# Precharge** configuration option must be set to “**Manual**”) The following configuration options are available

- 4 clocks
- 3 clocks (DEFAULT)
- 2 clocks

➔ **Memory Frequency For [DDR266]**

The **Memory Frequency For** configuration option allows you to manually select the DDR type. The default value is DDR266. If you are not certain of what value to select, select “**Auto**” and the BIOS will automatically detect the DDR type. The following configuration options are available,

- DDR266 (DEFAULT)
- DDR333
- Auto

➔ **System BIOS Cacheable [Enabled]**

The **System BIOS Cacheable** option allows the system BIOS to be cached in the L2 cache.

- ➔ **Disabled** System BIOS is not cached in the L2 cache
- ➔ **Enabled** (DEFAULT) System BIOS is cached in the L2 cache

➔ **Video BIOS Cacheable [Disabled]**

The **Video BIOS Cacheable** option allows the video BIOS to be cached in the L2 cache.

- ➔ **Disabled** (DEFAULT) Video BIOS is not cached in the L2 cache
- ➔ **Enabled** Video BIOS is cached in the L2 cache

➔ **Memory Hole At 15M – 16M [Disabled]**

The **Memory Hole At 15M – 16M** reserves the memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If you

## ROCKY-4786EV/EVG User Manual

are using older ISA expansion cards, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- ➔ **Disabled** (DEFAULT) Memory is not reserved for ISA expansion cards
- ➔ **Enabled** Memory is reserved for ISA expansion cards

### ➔ **Delay Prior to Thermal [16 Min.]**

The **Delay Prior to Thermal** option controls when the thermal monitor can be activated in automatic mode after the system boots. The following configuration options are available,

- 4 Min
- 8 Min
- 16 Min (DEFAULT)
- 32 Min

### ➔ **AGP Aperture Size (MB) [128]**

The AGP Aperture Size option selects the size of the AGP aperture. The following configuration options are available,

- 4
- 8
- 16
- 32
- 64
- 128 (DEFAULT)
- 256

**→ Init Display First [PCI Slot]**

The **Init Display First** option selects whether to boot from the PCI slot or the onboard AGP.

- PCI Slot** (DEFAULT) The system will boot from the PCI graphics card.
- Onboard/AGP** The system will boot from the AGP graphics card

**→ On-Chip VGA [Enabled]**

The **On-Chip VGA** option is found on motherboards that have a built-in graphics processor as well as a PCI-E port. It allows you to select whether to use the onboard graphics processor or the PCI-E card.

- Enabled** (DEFAULT) The system will boot up using the on-chip graphics processor regardless of whether or not a PCI graphics card is installed.
- Disabled** The system will boot up using the installed PCI graphics card.

**→ On-Chip Frame Buffer Size [16MB]**

The **On-Chip Frame Buffer Size** option allows you to allocate a predetermined amount of system memory to the graphics processor when the system boots up.

- 1MB** 1MB of system memory is allocated to the graphics processor
- 8MB** 8MB of system memory is allocated to the graphics processor
- 16MB** (DEFAULT) 16MB of system memory is allocated to the graphics processor

**→ Boot Display [Auto]**

The **Boot Display** option allows you to select the display device the system will boot with.

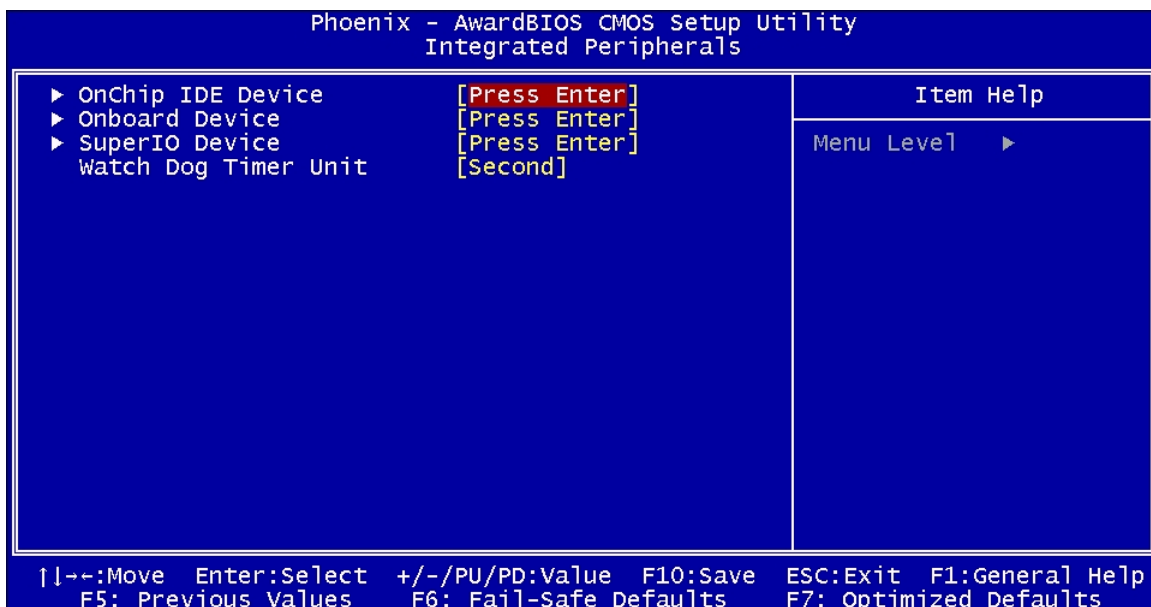


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- ➔ **Auto** (DEFAULT) The system will automatically determine the display device type.
- ➔ **CRT** The display device type will be set as CRT
- ➔ **EFP** The display device type will be set as EFP

### 5.5 Integrated Peripherals

The Integrated Peripherals menu (BIOS Menu 8) allows you to change the configuration option for peripheral devices.



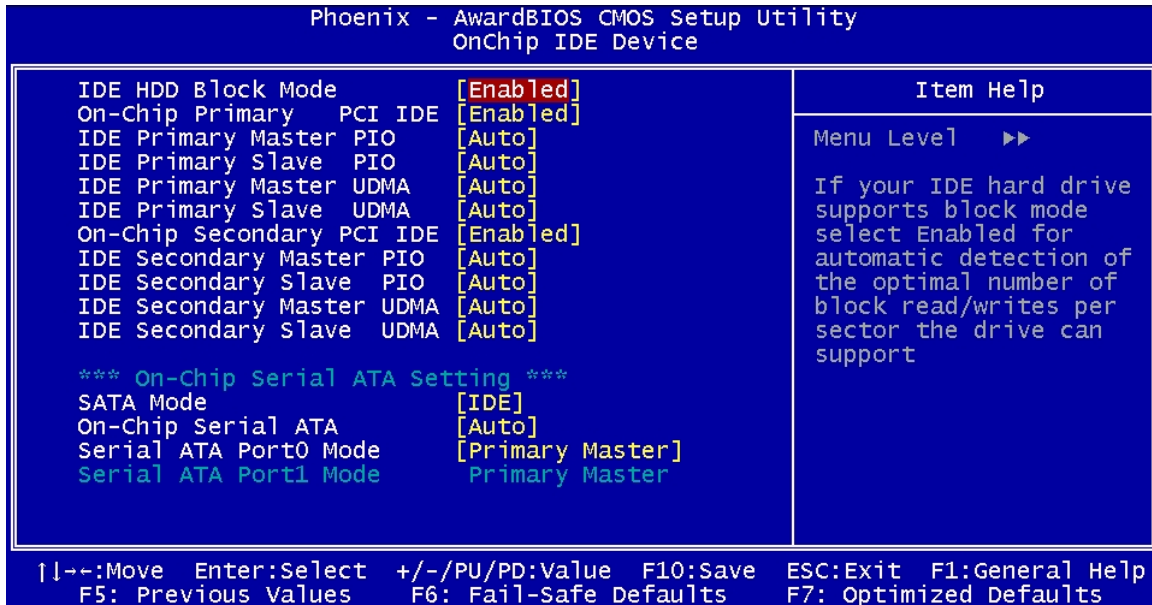
#### BIOS Menu 8: Integrated Peripherals

The Integrated Peripherals menu (BIOS Menu 8) has four options listed below:

- OnChip IDE Device
- Onboard Device
- Super IO Device
- Watch Dog Timer Unit

#### 5.5.1 OnChip IDE Device

The OnChip IDE Device menu (BIOS Menu 9) allows you to change the IDE device configurations.



### BIOS Menu 9: Integrated Peripherals

#### → IDE HDD Block Mode [Enabled]

The **IDE HDD Block Mode** option should only be enabled if your IDE HDD device supports block mode. Please refer to the documentation that came with your IDE HDD device to check the compatibility.

- **Disabled**                      The BIOS will not detect block data transfers.
- **Enabled**      (DEFAULT)    The optimal number of block read/writes per sector the drive can support will be automatically detected.

#### → On-Chip Primary PCI IDE [Enabled]

The **On-Chip Primary PCI IDE** option allows you to determine whether or not the ROCKY-4786EV/EVG will use the integrated primary IDE channel.

- **Disabled**                      The CPU card will not use the primary IDE channel
- **Enabled**      (DEFAULT)    The CPU card will use the primary IDE channel

#### → IDE PIO [Auto]

The Programmed Input/Output (PIO) mode for the following HDDs can all be selected.

## ROCKY-4786EV/EVG User Manual

- IDE Primary Master PIO
- IDE Primary Slave PIO
- IDE Secondary Master PIO
- IDE Secondary Slave PIO

- ➔ **Auto** (DEFAULT) Allows the computer to select the correct mode
- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- 1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- 2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- 3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps
- 4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

### ➔ IDE UDMA [Auto]

The Ultra DMA (UDMA) mode for the following HDDs can all be selected.

- IDE Primary Master UDMA
- IDE Primary Slave UDMA
- IDE Secondary Master UDMA
- IDE Secondary Slave UDMA

- ➔ **Auto** (DEFAULT) Allows the computer to select the correct UDMA
- ➔ **Disabled** Disables the UDMA for the HDD device

### ➔ On-Chip Secondary PCI IDE [Auto]

The **On-Chip Secondary PCI IDE** option allows you to determine if the motherboard should or should not use the integrated primary IDE channel. Disable this if you use an IDE adapter card for your IDE hard drives.

- ➔ **Disabled** The CPU card will not use the integrated primary IDE channel
- ➔ **Enabled** (DEFAULT) The CPU card will use the integrated primary IDE

channel

→ **On Chip Serial ATA [Disabled]**

The **On Chip Serial ATA** (SATA) option allows you to determine the operational status of the onboard SATA controller.

- **Disabled** (DEFAULT) The SATA controller is disabled
- **Auto** The SATA controller is automatically arranged by the BIOS
- **Combined Mode** PATA and SATA modes are combined together. A maximum of 2 IDE drives in each channel
- **Enhanced Mode** Enable both PATA and SATA. A maximum of 6 IDE drives are supported.
- **SATA Only** SATA is operating in legacy mode.

→ **x PATA IDE Mode [Secondary]**

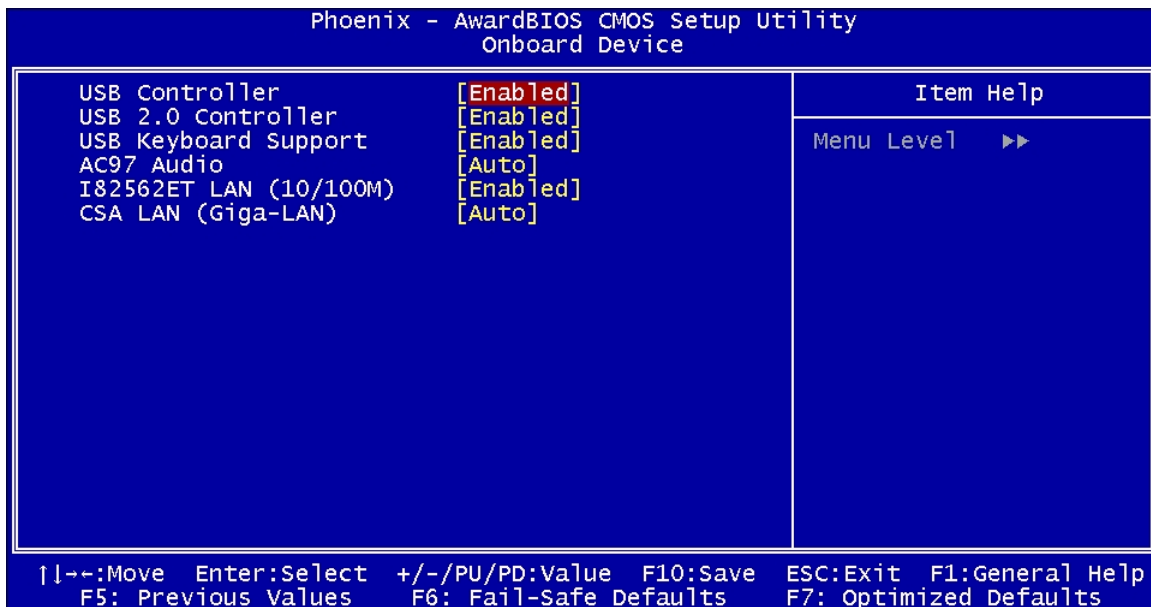
When the **On Chip Serial ATA** option is in the combined mode, the PATA IDE Mode will be selected as **secondary**.

→ **SATA Port**

The **SATA Port** parameter is automatically detected by the system BIOS and shown on the screen. This parameter is not user configurable.

### 5.5.2 Onboard Device

The **Onboard Device** menu (**BIOS Menu 10**) allows you to change the USB, Audio and LAN device configurations.



## BIOS Menu 10: OnBoard Device [Integrated Peripherals]

### ➔ USB Controller [Enabled]

The **USB Controller** option allows you to activate or deactivate the onboard USB controller.

- ➔ **Enabled** (DEFAULT) The USB controller is activated
- ➔ **Disabled** The USB controller is deactivated

### ➔ USB 2.0 Controller [Enabled]

The **USB 2.0 Controller** option allows you to activate or deactivate the onboard EHCI controller.

- ➔ **Enabled** (DEFAULT) The EHCI controller is activated
- ➔ **Disabled** The EHCI controller is deactivated

### ➔ USB Keyboard Support [Disabled]

The **USB Keyboard Support** is only applicable if you are using a USB keyboard. Some OSes do not support USB keyboards. Enabling this option in BIOS will allow users using an OS that does not support USB keyboard to implement a USB keyboard.

- ➔ **Disabled** (DEFAULT) USB keyboard support no provided by BIOS
- ➔ **Enabled** USB keyboard support is provided by BIOS

➔ **AC97 Audio Select [Auto]**

The **AC97 Audio Select** option allows the user to select the standard that will be used by the system.

- ➔ **Auto** (DEFAULT) The BIOS automatically detects the audio standard
- Disabled** No audio standard is set

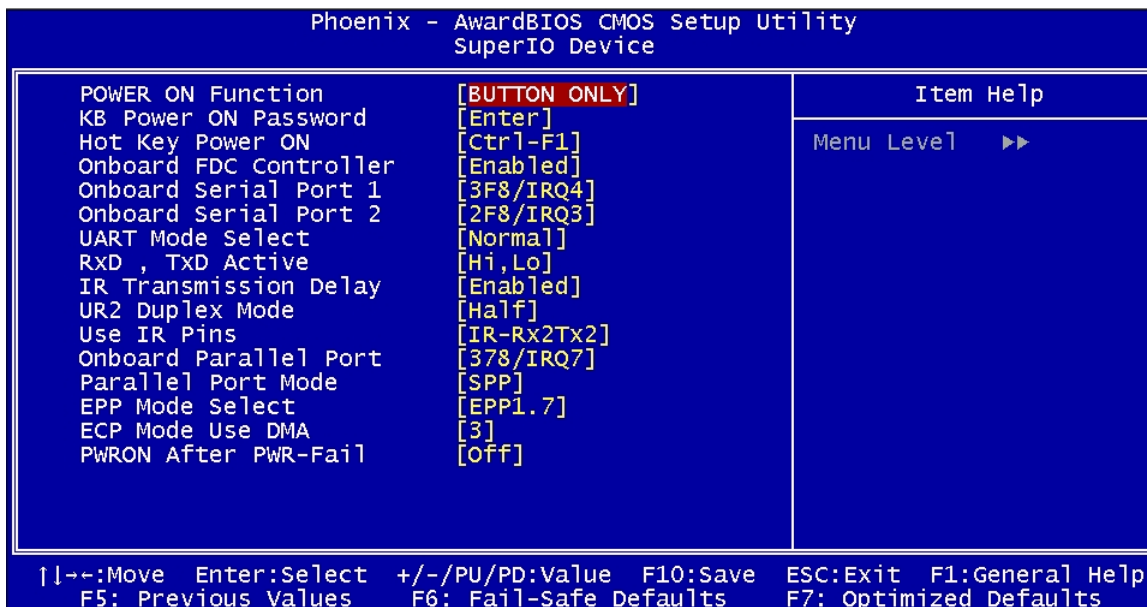
➔ **I82562ET LAN (10/100M) [Disabled]**

The **I82562ET LAN (10/100M)** allows you to boot your system from a LAN server. For this to be possible the LAN card installed on your system must have boot ROM. If you choose to boot your system from a server using the LAN boot ROM functionality, you do not need a boot disk installed on the system.

- ➔ **Disabled** (DEFAULT) If disabled, you will not be able to boot your system from a server.
- ➔ **Enabled** You will be able to boot your system from a server if the LAN card installed in the system has boot ROM

### 5.5.3 SuperIO Device

The SuperIO Device menu (BIOS Menu 11) allows you to change the super IO device configurations.



## BIOS Menu 11: SuperIO Device [Integrated Peripherals]

### → POWER ON Function [BUTTON ONLY]

The **POWER ON Function** option allows you to select the method you use to turn on the system.

- **Password** When you turn on the computer you will be prompted for a password (see the **KB Power ON Password option below**)
- **Hot KEY** You can use a pre-specified hot key to turn on your computer (see the **Hot Key Power ON option below**)
- **Mouse Left** Click the left mouse button to turn the system on
- **Mouse Right** Click the right mouse button to turn the system on
- **Any KEY** Click any key to turn the system on
- **BUTTON ONLY (DEFAULT)** The computer can only be turned on with the power button
- **Keyboard 98** If you are using Windows 98 or better and have the appropriate keyboard, you can use the

keyboard's wake-up or power-on button to start up the computer.

→ **x KB Power ON Password [Enter]**

The **KB Power ON Password** option can only be specified if you have selected the **Password** as the **POWER ON Function** option. To set the password, place the cursor on the password option and click “**ENTER.**” You will be prompted to enter a password. Select your password and press “**ENTER.**” You will be asked to confirm the password. Confirm it and then press “**ENTER**” and the password will be set.

→ **x Hot Key Power ON [Ctrl-F1]**

The **Hot Key Power ON** option can only be specified if you have selected the **Hot KEY** as the **POWER ON Function** option. The following key combinations can be selected as the hot keys that will turn your computer on.

- Ctrl-F1
- Ctrl-F2
- Ctrl-F3
- Ctrl-F4
- Ctrl-F5
- Ctrl-F6
- Ctrl-F7
- Ctrl-F8
- Ctrl-F9
- Ctrl-F10
- Ctrl-F11
- Ctrl-F12

→ **Onboard FDC Controller [Disabled]**

The **Onboard FDC Controller** allows you to select whether the onboard floppy controller will or will not be used.

- **Disabled** (DEFAULT) Disable this option if you use an adapter for your FDDs or if you have no FDDs connected



- ➔ **Enabled**                      Select this option if FDDs are connected to the board and will use the onboard FDD controller.

### ➔ **Onboard Serial Port 1 [3F8/IRQ4]**

The **Onboard Serial Port 1** option allows you to select the I/O address and IRQ for the onboard serial port. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The options are listed below:

- Disabled
- 3F8/IRQ4 (DEFAULT)
- 2F8/IRQ3
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

### ➔ **Onboard Serial Port 2 [2F8/IRQ4]**

The **Onboard Serial Port 2** option allows you to select the I/O address and IRQ for the onboard serial port. The serial port can be disabled or the I/O address and the IRQ can be automatically selected by the BIOS. The options are listed below:

- Disabled
- 3F8/IRQ4
- 2F8/IRQ3 (DEFAULT)
- 3E8/IRQ4
- 2E8/IRQ3
- Auto

### ➔ **UART Mode Select [Normal]**

The **UART Mode Select** option allows you to select the UART mode for the system.

- ➔ **IrDA**                      IrDA is set as the IR serial mode. If this option is selected, COM2 will be disabled.
- ➔ **ASKIR**                      ASKIR is set as the IR serial mode. If this option is selected, COM2 will be disabled.

→ **Normal** (DEFAULT) COM2 is enabled and the IR device disabled

→ **x RxD, TxD Active [Hi,Lo]**

The **RxD, TxD Active** BIOS option allows you to set the infra-red reception (RxD) and transmission (TxD) polarity. (This option can only be selected if the UART is set in IrDA mode or ASKIR mode.) The following configuration options are available,

- Hi, Hi
- Hi, Lo (DEFAULT)
- Lo, Hi
- Lo, Lo

→ **x IR Transmission Delay [Enabled]**

→ **Disabled**

→ **Enabled** (DEFAULT)

→ **UR2 Duplex Mode [Half]**

→ **Full**

→ **Half** (DEFAULT)

→ **Use IR Pins [IR-Rx2Tx2]**

→ **RxD2, TxD2**

→ **IR-Rx2Tx2** (DEFAULT)

→ **Onboard Parallel Port [378/IRQ7]**

The **Onboard Parallel Port** option allows you to select the I/O address and IRQ for the onboard parallel port. The following configuration options are available,

- Disabled
- 378/IRQ7 (DEFAULT)
- 278/IRQ5
- 3BC/IRQ7

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### → Parallel Port Mode [SPP]

The **Parallel Port Mode** selection allows you to select the mode the parallel port will operate in.

- **SPP** (DEFAULT) The parallel port will operate in the standard parallel port (SPP) mode. This parallel port mode will work with most parallel port devices but is slow.
- **EPP** The parallel port will operate in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.
- **ECP** The parallel port will operate in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.
- **ECP+EPP** The parallel port will be compatible with both ECP and EPP devices
- **Normal**

### → x EPP Mode Select

If the **EPP mode** is selected in the **Parallel Port Mode** configuration option, you will be able to configure the **EPP Mode Select** option. The EPP parallel port mode has two standards, EPP 1.7 and EP 1.9. This selection allows you to choose the standard the parallel port will operate in. Please refer to the parallel device that your system will be connected to and select the EPP mode accordingly.

- **EPP1.9** EPP 1.9 is selected as the EPP standard
- **EPP1.7** (DEFAULT) EPP 1.7 is selected as the EPP standard

### → x ECP Mode Use DMA [3]

If the **ECP mode** is selected in the **Parallel Port Mode** configuration option, you will be able to configure the **ECP Mode Use DMA** option. This option determines the DMA channel the parallel port uses when it is in the ECP mode.

- 1 Parallel port uses DMA Channel 1 in the ECP mode
- 3 (DEFAULT) Parallel port uses DMA Channel 3 in the ECP mode

→ **PWRON After PWR-Fail [Off]**

This **PWRON After PWR-Fail** option allows you to select the state the system will return to if there is a power failure or power to the system is suddenly cut off.

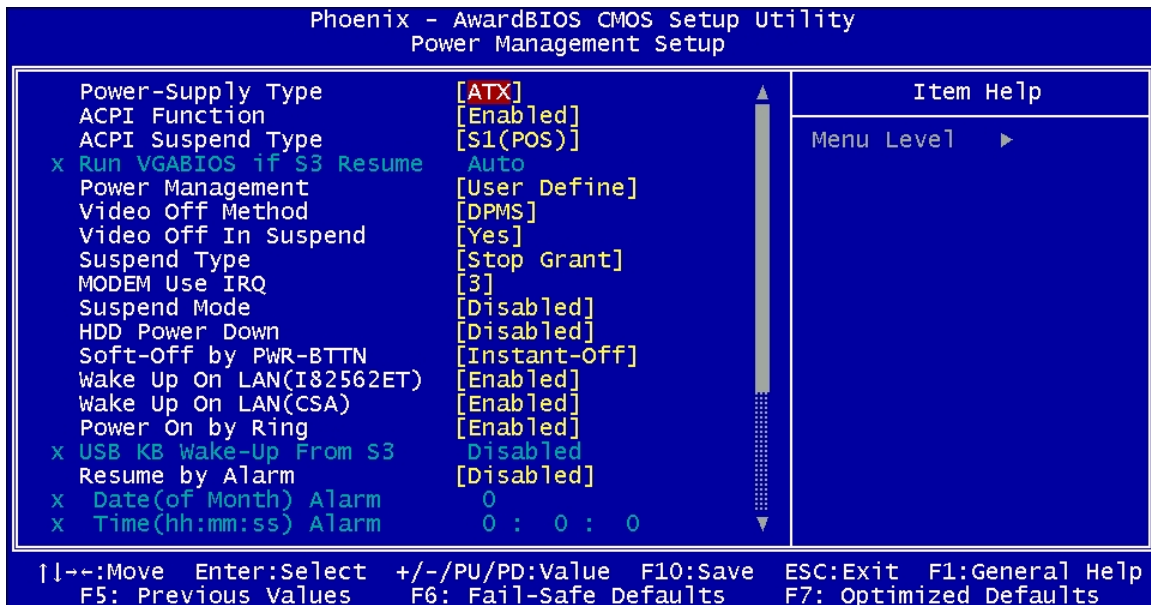
- **Off** (DEFAULT) After the power returns the system will remain off.
- **On** After the power returns, the system will turn on
- **Former-Sts** After the power returns the system will return to its original state. If it was off, it will remain off. If it was on, it will turn on again.

→ **Watch Dog Timer Unit [Second]**

The **Watch Dog Timer Unit** default is set to second and is non-configurable.

## 5.6 Power Management Setup

The Power Management Setup menu (**BIOS Menu 12**) allows you to set the power management and saving features in the BIOS.



## BIOS Menu 12: Power Management Setup

### ➔ Power-Supply Type [AT]

The following configuration options are available,

- AT (DEFAULT)
- ATX

### ➔ ACPI Function [Enabled]

The **ACPI Function** option allows you to enable or disable the ACPI function.

- ➔ **Disabled**                      The ACPI function is enabled
- ➔ **Enabled**      (DEFAULT)      The ACPI function is disabled

### ➔ ACPI Suspend Type [S1(POS)]

The **ACPI Suspend Type** option allows you to select the suspend state your computer will go into during the power conservation mode.

- ➔ **S1(POS)**      (DEFAULT)      System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

- **S3(STR)**                      System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.
- **S1&S3**                        The BIOS will be able to support both the S1 and the S3 suspend states described above.

→ **x Run VGABIOS if S3 Resume [Auto]**

If the **S3(STR)** or **S1&S3** option is selected in **ACPI Suspend Type** above, you will be able to configure the **Run VGABIOS if S3 Resume** option. This option allows you to select whether or not to run the VGA BIOS after the system wakes up from an S3 sleep state.

- **Auto**                      (DEFAULT)    The system BIOS automatically decides whether or not to run the VGA BIOS after the system resumes from a S3 sleep state.
- **Yes**                        The VGA BIOS will be run after the system resumes from a S3 sleep state.
- **No**                         The VGA BIOS will not be run after the system resumes from a S3 sleep state.

→ **Power Management [User Define]**

The **Power Management** option allows you to manually define the **Suspend Mode** and the **HDD Power Down** options. BIOS has preset minimum and maximum values for the **Suspend Mode** and the **HDD Power Down** options.

- **User Define**              (DEFAULT)    The user defines the **Suspend Mode** time and the **HDD Power Down** time.
- **Min. Saving**              BIOS automatically sets the **Suspend Mode** time and the **HDD Power Down** time for minimum power saving.
- **Max. Saving**              BIOS automatically sets the **Suspend Mode** time

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and the **HDD Power Down** time for maximum power saving.

The minimum and maximum power settings are shown below:

	<b>Suspend Mode</b>	<b>HDD Power Down</b>
<b>Min. Saving</b>	1 hour	15 minutes
<b>Max. Saving</b>	1 minute	1 minute

### ➔ Video Off Method [DPMS]

The **Video Off Method** option allows you to specify what happens to the monitor in a power down mode.

- ➔ **Blank Screen** Writes blanks to the video buffer and the monitor is black, but still active (not powered down).
- ➔ **V/H SYNC + Blank** Writes blanks to the video buffer and the monitor is black, but still active (not powered down)
- ➔ **DPMS (DEFAULT)** If your monitor supports Display Power Management Signaling, the monitor uses this to enter a power down mode.

### ➔ Video Off In Suspend [Yes]

The **Video Off In Suspend** option allows you to specify whether the display monitor is turned off or remains on when the systems enters a suspend state.

- ➔ **No** The display monitor will remain on when the system is in suspend mode.
- ➔ **Yes (DEFAULT)** The display monitor will be turned off when the system is in suspend mode.

### ➔ Suspend Type [Stop Grant]

The **Suspend Type** option allows you to determine what suspend state the CPU will go into when the system is in the suspend state.

➔ **Stop Grant** (DEFAULT) When the CPU is in the stop grant state the bus clock (BCLK) continues to run. Snoops and interrupts are also allowed in the stop grant state. Thus, the CPU can operate in a lower power state yet can respond to snoops and interrupts.

➔ **PwrON Suspend**

➔ **MODEM Use IRQ [3]**

The **MODEM Use IRQ** option tells the power management which IRQ it should monitor for modem wakeup. The following options can be selected.

- N/A
- 3 (Default)
- 4
- 5
- 7
- 9
- 10
- 11

➔ **Suspend Mode [Disabled]**

The **Suspend Mode** option allows you to specify how long the computer must wait for no activity before it goes into a suspend mode. If you disable this option the system will not go into a suspend mode. Note that if you selected max. or min. as the setting for the **Power Management** option, you will not be able to configure this setting. The following settings can be made.

- Disable (Default)
- 1 Min
- 2 Min
- 3 Min



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- 4 Min
- 8 Min
- 12 Min
- 20 Min
- 30 Min
- 40 Min
- 1 Hour

### → HDD Power Down [Disabled]

The **HDD Power Down** option allows you to specify how long the computer must wait for no activity before the HDD powers down. If you disable this option the HDD will not power down. Note that if you selected max. or min. as the setting for the **Power Management** option, you will not be able to configure this setting. The following settings can be made.

- Disable (Default)
- 1 Min
- 2 Min
- 3 Min
- 4 Min
- 5 Min
- 6 Min
- 7 Min
- 8 Min
- 9 Min
- 10 Min
- 11 Min
- 12 Min
- 13 Min
- 14 Min
- 15 Min

### → Soft -Off by PWR-BTTN [Instant-Off]

The **Soft –Off by PWR-BTTN** option allows you to define how the system responds when the power button is pushed. You may choose to allow the system to be either turned off completely or enter into a suspend mode.

- ➔ **Instant-Off** (DEFAULT) The system will be turned off as soon as the power button is pressed.
- ➔ **Delay 4 Sec** The power button must be pressed for more than four seconds before it is turned off. If it is pressed for less than four seconds the system will enter a suspend state.

➔ **Wake-Up On LAN(I82562ET) [Enabled]**

The **Wake-Up On LAN(I82562ET)** option allows users to wake a system in a suspended state through a network. A wakeup signal from a network can be routed directly through the PCI card.

- ➔ **Disabled** The system cannot be woken from a suspend state through the network via a PCI card
- ➔ **Enabled** (DEFAULT) The system can be woken from a suspend state through the network via a PCI card

➔ **Power On by Ring [Enabled]**

The **Power On by Ring** option allows users to determine whether or not the system can be roused from a suspend state when the modem rings.

- ➔ **Disabled** The system will not be woken from a suspend state when the modem rings
- ➔ **Enabled** (DEFAULT) The system will be woken from a suspend state when the modem rings

➔ **x USB KB Wake-Up From S3 [Disabled]**

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If you selected either the S3(STR) or the S1&S3 option in the **ACPI Suspend Type** option, you will be able to configure the **USB KB Wake-Up From S3**. This option allows you to wake the system from an S3 suspend state using the keyboard.

- ➔ **Disabled** (DEFAULT) Keyboard cannot be used to rouse the system from the S3 suspend state
- ➔ **Enabled** Keyboard can be used to rouse the system from the S3 suspend state

### ➔ **Resume by Alarm [Disabled]**

The **Resume by Alarm** option allows you tell the computer when it should be roused from a suspend state.

- ➔ **Disabled** (DEFAULT) No time is specified for when the computer should be roused from a suspend state
- ➔ **Enabled** The date and time the computer must be roused from a suspend state is specified

### ➔ **x Date(of Month) Alarm [0]**

The **Date(of Month) Alarm** option can only be configured if the **Resume by Alarm** option has been enabled. When you select this option you will be asked to enter a number between 0 and 31 to specify the date of the current month that you would like the system to be roused.

### ➔ **x Time(hh:mm:ss) Alarm [0 : 0 : 0]**

The **Time (hh:mm:ss) Alarm** option can only be configured if the **Resume by Alarm** option has been enabled. You will have to set the time you wish the computer to be roused. You will see three zeroes side by side. The first zero is for the hour, the second zero for the minutes and the third zero for the seconds.

- Hour (first zero): Select a number between 0 and 23
- Minute (second zero): Select a number from 0 to 59
- Second (third zero): Select a number from 0 to 59

**➔ Reload Global Timer Events**

The **Reload Global Timer Events** field has the following BIOS configuration options

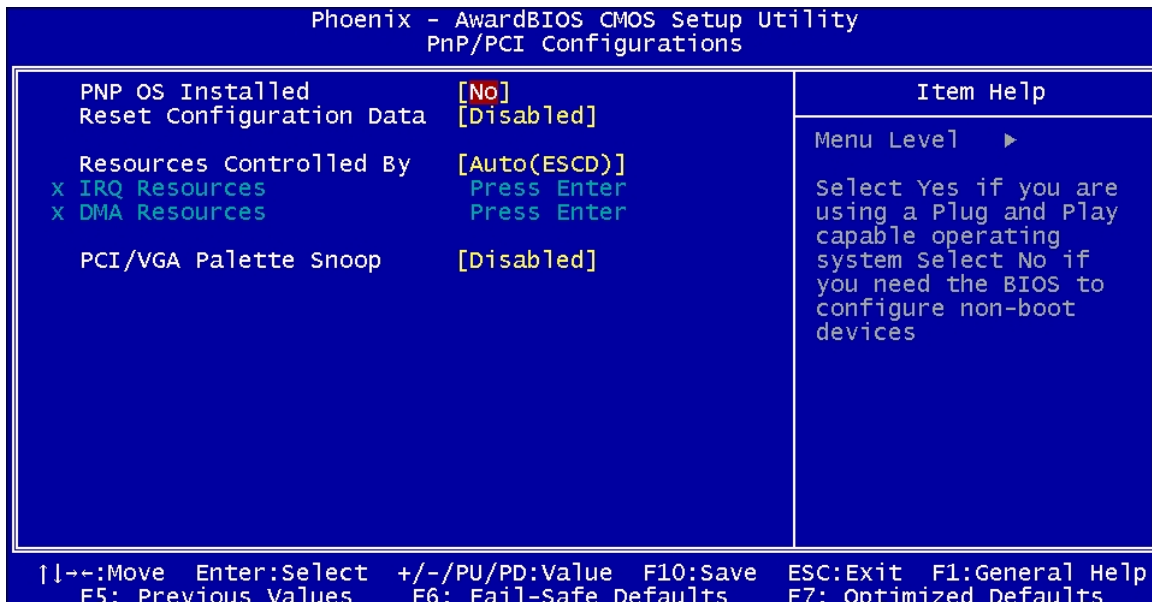
- Primary IDE 0
- Primary IDE 1
- Secondary IDE 0
- Secondary IDE 1
- FDD, COM, LPT Port
- PCI PIRQ[A-D]#

All the above options have “**Disabled**” as their default value. When disabled, if any activity occurs on these devices during a suspended state, the system will not be roused.

If “**Enabled**” is selected for any of the above devices, and if activity is recorded on an enabled device in the above list the system will be roused from its suspended state.

## 5.7 PnP/PCI Configurations

The PnP/PCI Configurations menu (**BIOS Menu 13**) allows you to set the plug and play, and PCI options.



**BIOS Menu 13: PnP/PCI Configurations**

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### → PNP OS Installed [No]

The **PNP OS Installed** option allows you to determine whether the Plug and Play devices connected to your system will be configured by the operating system or the BIOS.

- No (Default) If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.
- Yes This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

### → Reset Configuration Data [Disabled]

The **Reset Configuration Data** option allows you to reset the Extended System Configuration Data (ESCD) when you exit setup if you have problems booting the system up after you have installed a new add-on.

- **Disabled** (DEFAULT) ESCD will not be reconfigured
- **Enabled** ESCD will be reconfigured after you exit setup

### → Resources Controlled By [Auto (ESCD)]

The **Resources Controlled By** option gives you the option of manually configuring all the boot and plug and play devices, or allowing BIOS to configure these devices automatically. If you allow BIOS to configure it automatically you will not be able to select the IRQs, DMA and memory base address fields because BIOS will automatically assign them.

- **Auto(ESCD)** (DEFAULT) BIOS automatically configures plug and play devices as well as boot devices.
- **Manual** You manually configure the plug and play devices and any other boot devices

### → x IRQ Resources [Press Enter]

If you select manual in the **Resources Controlled By** option then you will be able to configure the **IRQ Resources**. To do this, select **IRQ Resources** and press **ENTER**. A new menu will appear (**BIOS Menu 14**).



**BIOS Menu 14: IRQ Resources**

The menu will have the following 12 BIOS configuration options:

- IRQ-3 assigned to
- IRQ-4 assigned to
- IRQ-5 assigned to
- IRQ-6 assigned to
- IRQ-7 assigned to
- IRQ-8 assigned to
- IRQ-9 assigned to
- IRQ-10 assigned to
- IRQ-11 assigned to
- IRQ-12 assigned to
- IRQ-13 assigned to
- IRQ-14 assigned to

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- IRQ-15 assigned to

The above options all have the same default and the same options. These are listed below.

- ➔ **PCI Device** (DEFAULT) The IRQ is assigned to legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PNP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
- ➔ **Reserved** The IRQ is reserved by BIOS

### ➔ **x DMA Resources [Press Enter]**

If you select manual in the **Resources Controlled By** option then you will be able to configure the **DMA Resources**. To do this, select **DMA Resources** and press **ENTER**. A new menu will appear.

The menu has the following 6 BIOS configuration options:

- DMA-0 assigned to
- DMA-1 assigned to
- DMA-3 assigned to
- DMA-5 assigned to
- DMA-6 assigned to
- DMA-7 assigned to

The above options all have the same default and the same options. These are listed below.

- ➔ **PCI/ISA PnP** (DEFAULT) For devices compliant with Plug and Play standard whether designed for PCI or ISA bus architecture.
- ➔ **Legacy ISA** Legacy ISA for devices compliant with the original PC AT bus specification.

➔ **PCI/VGA Palette Snoop [Disabled]**

The **PCI/VGA Palette Snoop** option allows you determine whether or not some special VGA cards, high-end hardware MPEG decoders and other similar devices are allowed to look at the VGA palette on the video card so these devices can determine what colors are in use. This option is only very rarely needed. It should be left at "Disabled" unless a video device specifically requires the setting enabled upon installation.

- ➔ **Disabled** (DEFAULT) Does not allow the graphics devices to examine the VGA palette on the graphics card
- ➔ **Enabled** Does allow the graphics devices to examine the VGA palette on the graphics card

## 5.8 PC Health Status

The **PC Health Status** menu (**BIOS Menu 15**) is a passive menu where you cannot alter any BIOS configurations. This menu shows system operating parameters that are essential to the stable operation of your system.

```

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status
-----
System Temperature
CPU Temperature
VCore (From VID)
CPU Vcore
+1.5 V
+3.3 V
+5 V
+12 V
-12 V
Fan1 Speed
Fan2 Speed
-----
Item Help
Menu Level1 ▶
-----
↑|←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults
    
```

### BIOS Menu 15: PC Health Status

The following system parameters are monitored by the PC Health Status menu (**BIOS Menu 15**).



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### → System Temperature

The following temperatures are monitored:

- System Temperature
- CPU Temperature

### → Voltages

The following voltages are monitored

- CPU Vcore
- +1.5 V
- +3.3 V
- +5 V
- +12 V
- -12 V

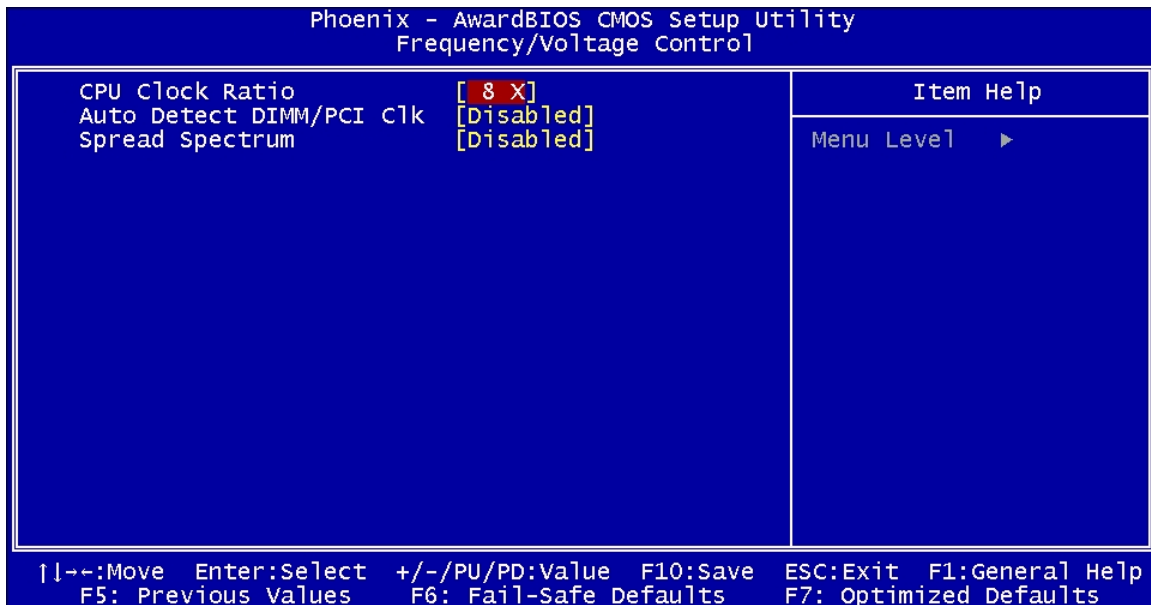
### → Fan Speeds

The following fan speeds are monitored:

- CPU an Speed
- System Fan Speed

## 5.9 Frequency/Voltage Control

The **Frequency/Voltage Control** menu (**BIOS Menu 16**) allows you to configure the Auto Detect DIMM/PCI CLk and Spread Spectrum settings.



### BIOS Menu 16: Frequency/Voltage Control

The following system parameters are controlled by the Frequency/Voltage Control menu (BIOS Menu 16).

#### ➔ Auto Detect DIMM/PCI CLK [Enabled]

The **Auto Detect DIMM/PCI CLK** option allows BIOS to monitor power consumption to the AGP, PCI and SDRAM DIMM slots and reduce EMI (Electromagnetic Interference) by turning them off when unoccupied or inactive.

➔ **Enabled** (DEFAULT) Bios will monitor and turn off any unoccupied or inactive AGP, PCI and SDRAM DIMM slots

➔ **Disabled** BIOS will not monitor AGP, PCI and SDRAM DIMM slots

#### ➔ Spread Spectrum [Disabled]

The **Spread Spectrum** option is used to reduce EMI (Electromagnetic Interference) generated by the system clock. This option is disabled by default so that EMI can be controlled by the **Auto Detect DIMM/PCI CLK** option.

➔ **Enabled** Monitors system clocking to reduce EMI (Electromagnetic Interference)

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➔ **Disabled** (DEFAULT)

Does not monitor system clocking

Appendix

A

# BIOS Options

---

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

<b>Load Fail-Safe Defaults .....</b>	<b>66</b>
<b>Load Optimized Defaults.....</b>	<b>66</b>
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<b>Set User Password .....</b>	<b>66</b>
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Appendix

**B**

# Terminology

---

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

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

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

Appendix

C

# Digital I/O Interface

---

## C.1 Introduction

The DIO connector on the ROCKY-4786EV/EVG is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



### NOTE:

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

## C.2 DIO Connector Pinouts

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

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

**Table C-1: Digital I/O Connector Pinouts**

### C.3 Assembly Language Samples

#### C.3.1 Enable the DIO Input Function

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

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

#### C.3.2 Enable the DIO Output Function

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

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

Appendix

D

# Watchdog Timer

---





**NOTE:**

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

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

INT 15H:

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

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

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

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



**NOTE:**

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

**EXAMPLE PROGRAM:**

**; INITIAL TIMER PERIOD COUNTER**

;

**W\_LOOP:**

;

```

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

```

;

**; ADD THE APPLICATION PROGRAM HERE**

;

```

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

```

```

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

```

;

**; EXIT ;**

Appendix

E

# Address Mapping

---

## E.1 I/O Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel(R) Graphics Controller
3C0-3DF	Intel(R) Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

**Table E-1: IO Address Map**

## E.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

**Table E-2: 1<sup>st</sup> MB Memory Address Map**

### E.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table E-3: IRQ Mapping Table

### E.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table E-4: IRQ Mapping Table

Appendix

**F**

# Hazardous Materials Disclosure

---

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

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

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

Please refer to the table on the next page.

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

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

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



## ROCKY-4786EV/EVG User Manual

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

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

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

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