ROCKY – P248SV
Pentium® II,III with Ultra2
SCSI & AGP VGA SBC

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Introduction

Welcome to the ROCKY-P248SV Pentium® II,III with Ultra2 SCSI and AGP VGA Single Board Computer. The ROCKY-P248SV board is an ISA/PCI form factor board, which comes equipped with high performance Pentium® II,III Processor and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

This board has a built-in DiskOnChip™(DOC) Flash Disk socket for embedded application. The DOC Flash Disk is software compatible to hard disk. User can use any DOS command without any extra software utility. The DOC currently is available from 2MB to 72MB.

An advanced high performance Adaptec 7890 Ultra2 SCSI controller is used in the ROCKY-P248SV board. This board provides three SCSI connectors for 80Mbps, 40Mbps and 20Mbps SCSI devices. And up to 15 SCSI devices can be used together by this board.

In addition, the ROCKY-P248SV provides S3 AGP VGA on board. The VGA chip is S3 Trio 3D graphics chipset which provides up to 1600x1024 color resolution. The VGA memory on board is 4MB SDRAM RAM, optional to 8MB.

ROCKY-P248SV uses the advanced INTEL Chipset,440BX which is 100% ISA/PCI compatible chipset with PCI 2.1 standard.

1.1 Specifications :

- **Processor** : Single Slot 1 socket supports Intel Pentium® II/III up to 600Mhz Processor
- **Bus** : ISA bus and PCI 32-bit local bus, PCI 2.1 standard
- **DMA channels** : 7
- **Interrupt levels** : 15
- **Chipset** : Intel 440BX
- **Real-time clock/calendar** : in 440BX chipset, backup by industrial Li-battery,3V/850mAH.
- **System memory** : Three 168-pin DIMM sockets support SDRAM and EDO RAM module. The max. memory is up to 768MB.
- **Second cache memory** : 512KB Pipelined Burst SRAM in CPU.
- **Ultra DMA/33 IDE Interface** : up to four PCI Enhance IDE hard drives. The Ultra DMA/33 IDE can handle data transfer up to 33MB/s. The best of all is that is new technology is compatible with existing ATA-2 IDE specifications. So there is no need to do any change for customer' s current accessory.
- **Floppy disk drive interface** : two 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drives.
- **Two high speed Series ports** : NS16C550 compatible UARTs
- **Bi-directional Parallel Port**
- **Built-in LM78 to monitor power supply voltage and fan speed status.**
- **IrDA port : Support Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.**
- **USB port : Support two USB ports for future expansion.**
- **Watch-dog timer** : can be set by 1,2,10,20,110 or 220 seconds period. Reset or NMI will be generated when CPU does not periodically trigger the timer. The program uses hex 043 and 443 to control the watch-dog and generate a system reset.

- **VGA Controller :** S3 Trio 3D graphics chipset w/ 4MB SDRAM RAM. Screen Resolution : up to 1600x1200x4/8
- **Ultra2 SCSI Controller :** Adaptec 7890 Chipset . support 80/40/20Mbps SCSI interface
- **Flash Disk - DiskOnChip™:** The Flash Disk provide software compatibility with hard disk. The built-in TrueFFS Transparent Flash Block Management and Space Reclamation will let customer to use the Flash Disk with DOS command, no need any extra software utility.
- **Keyboard connector**
- **Mouse** : PS/2 Mouse Port on-board.
- **Power Consumption** : +5V @ 8A

  (Pentium® II 400MHz,32MB EDO RAM)

  +12V @ 240mA ,-12V @40mA
- **Operating Temperature** : 0° ~ 55° C (CPU needs Cooler)

1.2 Package Content

In addition to this *User's Manual*, the ROCKY-P248SV package includes the following items:

- ROCKY-P248SV Single Board Computer
- Serial & Parallel Ribbon Cable and Port Bracket
- FDD/HDD Cable Sets
- 6-pin Mini-Din to one 5-pin Mini-Din for Keyboard and one 6-pin Mini-Din for PS/2 Mouse Adapter Cable.
- one support disk contains of the needed drivers

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

2

Installation

This chapter describes how to install the ROCKY-P248SV. At first, the layout of ROCKY-P248SV is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the ROCKY-P248SV's configuration, such as CPU type selection, system clock setting, and watch dog timer, are also included.

2.1 ROCKY – P248SV's Layout

< please, refer to next page >

2.2 Unpacking Precautions

Some components on ROCKY-P248SV SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- ✓ Ground yourself to remove any static charge before touching your ROCKY-P248SV SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- ✓ Handle your ROCKY-P248SV SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.
- ✓ Do not plug any connector or jumper while the power is on.
- ✓ Do not put your ROCKY-P248SV SBC unprotected on a flat surface because it has components on both sides.

2.3 Setting the CPU of ROCKY-P248SV

- **JP7/8 CPU Clock Setting :**

CPU Speed/Clock	JP7	JP8
66MHz	2-3	1-3 , 2-4
100MHz	**1-2**	**1-3 , 2-4**

- **JP1 : CPU to Bus Multiplier :**

Multiplier	1-2	3-4	5-6	7-8
3.0 x	ON	OFF	ON	ON
3.5 x	ON	OFF	OFF	ON
4.0 x	**OFF**	**ON**	**ON**	**ON**
4.5 x	OFF	ON	OFF	ON
5.0 x	OFF	OFF	ON	ON
5.5x	OFF	OFF	OFF	ON
6.0x	ON	ON	ON	OFF
6.5x	ON	ON	OFF	OFF

2.4 SCSI Terminator Setting

You may enable or disable the on board SCSI Terminator by JP4.

- **JP4 : SCSI Terminator Setting**

PIN NO.	DESCRIPTION
2-3	Disable Terminator
1-2	**Enable Terminator**

2.5 PS/2 Mouse Setting

Customer can disable the on board PS/2 Mouse to release the IRQ12 for other application.

- **JP6 : PS/2 Mouse Setting**

JP6	DESCRIPTION
ON	**Enable PS/2 Mouse**
OFF	Disable PS/2 Mouse free IRQ12

2.6 Watch-Dog Timer

The Watch-Dog Timer is enabled by reading port 443H. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a reset signal to start again or activate NMI to CPU. The Watch-Dog Timer is disable by reading port 043H.

• JP10 : Watch-Dog Active Type Setting

PIN NO.	DESCRIPTION
2-3	**RESET WHEN WDT TIME-OUT**
1-2	ACTIVATE NMI TO CPU WHEN WDT TIME-OUT
OPEN	DISABLE WDT

• JP9 : WDT Time-Out Period

PERIOD	1-2	3-4	5-6	7-8
1 sec.	OFF	OFF	ON	OFF
2 sec.	OFF	OFF	ON	ON
10 sec.	**OFF**	**ON**	**OFF**	**OFF**
20 sec.	OFF	ON	OFF	ON
110 sec.	ON	OFF	OFF	OFF
220 sec.	ON	OFF	OFF	ON

2.7 DiskOnChip™ Flash Disk

The DOC is software compatible to hard disk and DOS. Customer doesn‘ t need any extra software utility. It is just “plug and play”, easy and reliable. The DOC occupies 8KB of memory address.

• JP13 : DiskOnChip Memory Address Setting

Address	JP13
CE000 - CFFFFH	1-2
D6000 - D7FFFH	**3-4**
DE000 - DFFFFH	5-6

2.8 Clear CMOS Setup

If you forget the CMOS password, you can clear or reset it by closing the **JP5 pin 3-4** for about 3 seconds. After the password has been cleared from your CMOS, set it back to normal operation mode by setting it back to normal operation by closing pin 2-3.

- **JP5 : Clear CMOS Setup (Reserve Function)**

PIN NO.	DESCRIPTION
2-3	**Normal Operation**
3-4	Clear CMOS

3

Connection

This chapter describes how to connect peripherals, switches and indicators to the ROCKY- P248SV board.

3.1 Floppy Disk Drive Connector

ROCKY-P248SV board equipped with a 34-pin daisy-chain driver connector cable.

- **CN7 : FDC CONNECTOR**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	GROUND	34	DISK CHANGE#

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) hard disk drives to the ROCKY-P248SV IDE controller.

CN4 (IDE 1) : Primary IDE Connector
CN5 (IDE 2) : Secondary IDE Connector

- **CN4/CN5 : IDE Interface Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
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	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE - DEFAULT
29	N/C	30	GROUND - DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

3.3 Parallel Port

This port is usually connected to a printer, The ROCKY-P248SV includes an on-board parallel port, accessed through a 26-pin flat-cable connector CN8.

- **CN8 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND		

3.4 Serial Ports

The ROCKY-P248SV offers two high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports.

- **CN15 : Serial Port DB-9 Connector (ACE0)**

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- **CN10 : Serial Port 10-pin Header (ACE1)**

Pin No.	Description	Pin No.	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

3.5 Keyboard/Mouse Connector

The ROCKY-P248SV provides two keyboard/mouse connectors.

- **CN14 : 6-pin Mini-DIN PS2 Mouse Connector**

PIN NO.	DESCRIPTION
1	MOUSE DATA
2	N/C
3	GROUND
4	+5V
5	MOUSE CLOCK
6	N/C

- **CN1 : 5-pin Header Keyboard Connector**

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

- **CN18 : 6-pin Mini-DIN Keyboard Connector**

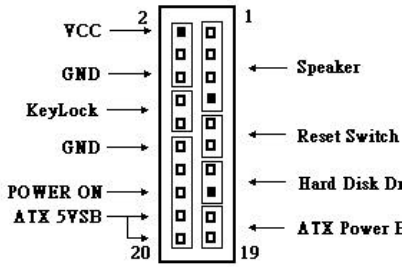
PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	N/C
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	N/C

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN12 connector.

- **CN12 Pin Assignment :**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2.	+5V	1	Speaker
4.	N/C	3.	N/C
6.	Ground	5.	N/C
8.	Key Lock Signal	7.	+5V
10.	Ground	9.	Reset SW
12.	Ground	11.	GND
14	N/C	13.	IDE LED
16.	ATX Power ON	15.	+5V
18.	+5Vsb	17.	ATX Power
20.	+5Vsb	19.	ATX 5VSB



3.7 USB Port Connector

The ROCKY- P248SV built-in two USB ports for the future new I/O bus expansion.

CN17 : 2 ports USB Connector

Pin 1-4 for USB 0

Pin 5-8 for USB 1

1.	VCC	5.	GROUND
2.	SBD0-	6.	SBD1+
3.	SBD0+	7.	SBD1-
4.	GROUND	8.	VCC

3.8 IrDA Infrared Interface Port

The ROCKY-P248SV built-in a IrDA port which support Serial Infrared(SIR) or Amplitude Shift Keyed IR(ASKIR) interface. When use the IrDA port have to set SIR or ASKIR model in the BIOS' s Peripheral Setup' s COM 2. Then the normal RS-232 COM 2 will be disabled.

- **CN9 : IrDA connector**

PIN NO.	DESCRIPTION
1	VCC
2	FIR-RX
3	IR-RX
4	Ground
5	IR-TX
6	CIRRX

3.9 Fan Connector

The ROCKY-P248SV provides CPU cooling fan connector, chassis fan connector. These connectors can supply 12V/500mA to the cooling fan. In the connector there is a "rotation" pin . The rotation pin will send the fan' s rotation signal to system. So the system BIOS can recognize the fan speed. Please note that only specified fan offers the rotation signal.

- **CN16/CN19 : CPU Fan Connector**

PIN NO.	DESCRIPTION
1	GROUND
2	12V
3	FAN SENSOR

3.10 VGA Connector

The ROCKY-P248SV built-in 15-pin VGA connector directly to your CRT monitor.

- **CN11 : 15-pin Female Connector**

1	RED	2	GREEN
3	BLUE	4	NC
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	NC	10	GROUND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

3.11 SCSI Connector

The ROCKY-P248SV provides three SCSI connectors for 80Mbps, 40Mbps and 20Mbps SCSI devices.

- **CN2 : Ultra Wide SCSI Connector, 68-pin**
  Support 40Mbps SCSI devices

- **CN3 : Ultra2 SCSI Connector, 68-pin**
  Support 80Mbps SCSI devices

- **CN6 : SCSI2 Connector, 50-pin**
  Support 20Mbps SCSI devices

- **CN2 : Ultra Wide SCSI Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	35	CHA_SCD12
2	GND	36	CHA_SCD13
3	GND	37	CHA_SCD14
4	GND	38	CHA_SCD15
5	GND	39	CHA_SCDPH
6	GND	40	CHA_SCD0
7	GND	41	CHA_SCD1
8	GND	42	CHA_SCD2
9	GND	43	CHA_SCD3
10	GND	44	CHA_SCD4
11	GND	45	CHA_SCD5
12	GND	46	CHA_SCD6
13	GND	47	CHA_SCD7
14	GND	48	CHA_SCDPL
15	GND	49	GND
16	GND	50	GND
17	N/C	51	RTPWR
18	N/C	52	RTPWR
19	N/C	53	N/C
20	N/C	54	GND
21	GND	55	CHA_ATN
22	GND	56	GND
23	GND	57	CHA_BSY
24	GND	58	CHA_ACK
25	GND	59	CHA_RST
26	GND	60	CHA_MSG
27	GND	61	CHA_SEL
28	GND	62	CHA_CD
29	GND	63	CHA_REQ
30	GND	64	CHA_IO
31	GND	65	CHA_SCD8
32	GND	66	CHA_SCD9
33	GND	67	CHA_SCD10
34	GND	68	CHA_SCD11

- **CN3 : Ultra-2 SCSI Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CHA_SCDP12	35	CHA_SCDM12
2	CHA_SCDP13	36	CHA_SCDM13
3	CHA_SCDP14	37	CHA_SCDM14
4	CHA_SCDP15	38	CHA_SCDM15
5	CHA_SCDPHP	39	CHA_SCDPHM
6	CHA_SCDP0	40	CHA_SCDM0
7	CHA_SCDP1	41	CHA_SCDM1
8	CHA_SCDP2	42	CHA_SCDM2
9	CHA_SCDP3	43	CHA_SCDM3
10	CHA_SCDP4	44	CHA_SCDM4
11	CHA_SCDP5	45	CHA_SCDM5
12	CHA_SCDP6	46	CHA_SCDM6
13	CHA_SCDP7	47	CHA_SCDM7
14	CHA_SCDPLP	48	CHA_SCDPLM
15	GND	49	GND
16	CHA_DIFFSENSE	50	N/C
17	TRMPWRS	51	TRMPWRS
18	TRMPWRS	52	TRMPWRS
19	N/C	53	N/C
20	GND	54	GND
21	CHA_ATNP	55	CHA_ATNM
22	GND	56	GND
23	CHA_BSYP	57	CHA_BSYM
24	CHA_ACKP	58	CHA_ACKM
25	CHA_RSTP	59	CHA_RSTM
26	CHA_MSGP	60	CHA_MSGM
27	CHA_SELP	61	CHA_SELM
28	CHA_CDP	62	CHA_CDM
29	CHA_REQP	63	CHA_REQM
30	CHA_IOP	64	CHA_IOM
31	CHA_SCD8P	65	CHA_SCDM8
32	CHA_SCD9P	66	CHA_SCDM9
33	CHA_SCD10P	67	CHA_SCDM10
34	CHA_SCD11P	68	CHA_SCDM11

- **CN6 : SCSI2 Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	CHA_SCD0
3	GND	4	CHA_SCD1
5	GND	6	CHA_SCD2
7	GND	8	CHA_SCD3
9	GND	10	CHA_SCD4
11	GND	12	CHA_SCD5
13	GND	14	CHA_SCD6
15	GND	16	CHA_SCD7
17	GND	18	CHA_SCDPL
19	GND	20	GND
21	GND	22	GND
23	GND	24	N/C
25	GND	26	RTPWR
27	GND	28	N/C
29	GND	30	GND
31	GND	32	CHA_ATN
33	GND	34	GND
35	GND	36	CHA_BSY
37	GND	38	CHA_ACK
39	GND	40	CHA_RST
41	GND	42	CHA_MSG
43	GND	44	CHA_SEL
45	GND	46	CHA_CD
47	GND	48	CHA_REQ
49	GND	50	CHA_IO

4

AMI BIOS Setup

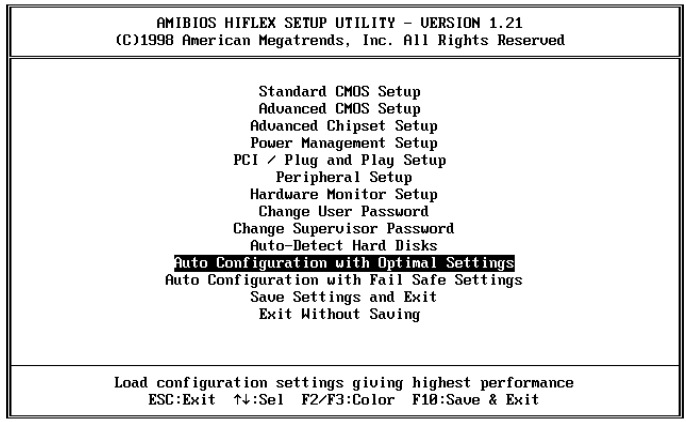
The ROCKY-P248SV uses the AMI PCI/ISA BIOS for system configuration. The AMI BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Start

When the system is turned on, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test, initialization and system configuration verification. After the POST routines are completed, the following message appears :

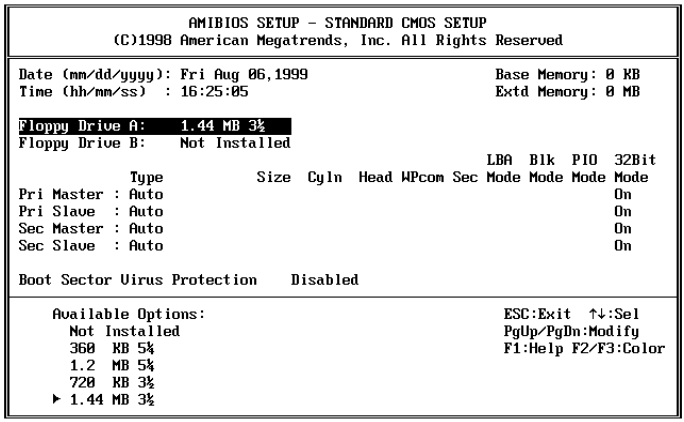
" Hit DEL if you want to run SETUP"

To access AMI PCI/ISA BIOS Setup program, press <Del> key. The following screen will be displayed at this time.



4.2 Standard CMOS Setup

The standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk setting. Please refer to the following screen for this setup



To set the Date, for example, press either the arrow or <Enter> button on your keyboard to select one of the fields (Months, Date or Year) then press either <PgUp> or <PgDn> to set it to the current Months, Date and Year. Do the same steps for Time setting.

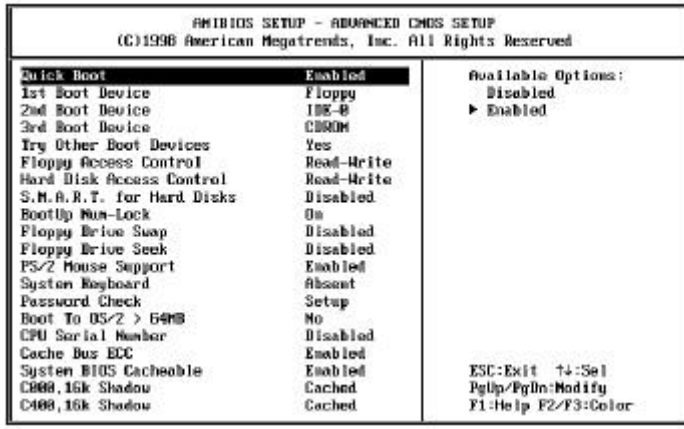
For IDE hard disk drive setup, please check the following possible setup procedure:

1. Use the Auto setting for detection during boot-up.
2. Use the Auto-Detect Hard Disk option in the main menu; the computer will automatically detect the HDD specifications.
3. Manually enter the specifications by yourself from the "User" option.

4.3 Advanced CMOS Setup

This Advanced CMOS Setup is designed for customer‘ s tuning best performance of the ROCKY-P248SV board. As for normal operation customers don‘ t have to change any default setting. The default setting is pre-set for most reliable operation.

The following screen will be displayed if you select Advanced CMOS Setup:



You can change the value of each options by using <PgUp> and <PgDn> key. The available values are shown on the right screen.

Quick Boot > *Enabled*: this will enable the BIOS to boot quickly when you turn on your computer. The BIOS will only check the first 1MB of the system memory.

Quick Boot > *Disabled:* the BIOS will test all system memory when it boots up. It will spend about 40 seconds until it receives a Ready signal from the HDD. It will also wait for you to press the <Del> key or not.

1st, 2nd, 3rd Boot Device > to define the sequence of boot drives after the routines check up completes. If the 1st Boot Device fails, the BIOS will attempt to boot from the 2nd or the 3rd device.

Try Other Boot Devices > the BIOS will try to boot from any other available device in the system if the 1st, 2nd and 3rd device fails to boot.

Floppy Access Control > to define the read/write access which is set when booting from a floppy drive.

Hard Disk Access Control > to define the read/write access which is set when booting from a HDD.

S.M.A.R.T. for Hard Disks > to allow BIOS to use the **S**ystem **Ma**nagement and **R**eporting **T**echnologies protocol for reporting server system information on a network

BootUp Num-Lock > to turn on/off the Num-Lock option on a enhanced keyboard when you boot. If you turn it off, the arrow keys on the numeric keypad can be used just as the other set of arrow keys on the keyboard and vice versa.

Floppy Drive Swap > this function enables you to swap the floppy disk drives via software or without moving the hardware.

Floppy Drive Seek > when this option is turned Enabled, BIOS will perform a Seek command on floppy drive A: before boot-up.

PS/2 Mouse Support > to testify whether or not a PS/2 mouse is supported.

System Keyboard > to configure the keyboard. If you set it Absent, BIOS will not report keyboard errors.

Password Check > to define if a password is necessary or not for access to the BIOS setup.

Boot to OS/2 > if you run the OS/2 operating system, this option must be set to yes. It means you permit BIOS to run properly if OS/2 or any other OS that does not support Plug and Play is found in your computer.

CPU Serial Number > this option is available only if you use Pentium® III processor**.**

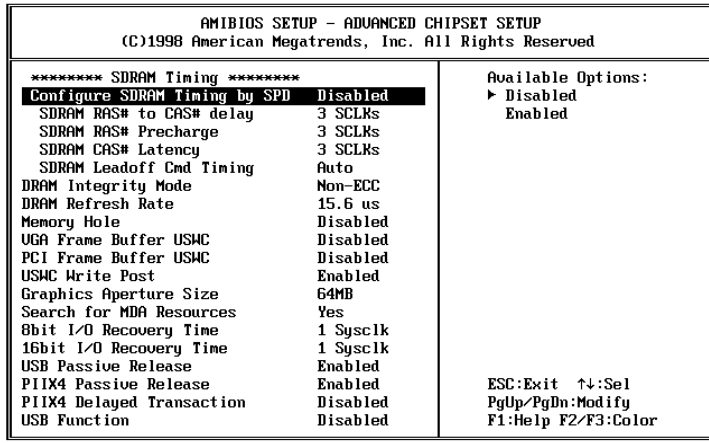
Cache Bus ECC > this option is available only if you use Pentium® III processor.

System BIOS Cacheable > to define whether or not the memory segment FOOOH can be read from or written to cache memory. Setting it Enabled will give faster execution in your system.

XXXX, 16k Shadow > ROM Shadow is a technique in which BIOS code is copied from slower ROM to faster RAM. If you enable it then the BIOS will be executed from the RAM. Each option allows 16KB segment to be shadowed to the RAM.

4.4 Advanced Chipset Setup

This setup functions are working mostly for Chipset (Intel 440BX). These options are used to change the Chipset' s registers. Please carefully change any default setting, otherwise the system will run unstably.



Configure SDRAM Timing by SPD > The **S**erial **P**resence **D**etect is a 2048bits EEPROM which contains of the data of the chip module, capacity, timing, voltage, etc. The system will configure the SDRAM timing according to the data in the SPD when it is set enabled.

SDRAM RAS# to CAS# delay > to specify the relative delay between row and column address strobe form SDRAM.

SDRAM RAS# Precharge > this option specifies the length of time for Row Address Strobe form SDRAW to precharge.

SDRAM CAS# Latency > to specify the CAS latency timing form SDRAM DRAM.

DRAM Integrity Mode > to choose DRAM Integrity Mode; *ECC/EC* will enable the **E**rror **C**hecking and **C**orrection DRAM integrity mode.

DRAM Refresh Rate > to specify the timing for DRAM Refresh

Memory Hole : to specify the location of a memory hole in the CMOS RAM. This setting reserves 15MB to 16MB memory address space for ISA expansion cards that specifically require this setting. Memory from 15MB and up will be unavailable to

the system because expansion cards can only access memory up to 16MB.

VGA Frame Buffer USWC > to specify whether or not a caching of the video A000-BFFF RAM is allowed. *Enabled* will give you better system performance.

PCI Frame Buffer USWC > to specify whether or not a caching of the PCI VGA frame buffer is allowed.

USWC Write Post > to Enable or Disable the use of Uncacheable, Speculatable, Write-Combined memory.

Graphics Aperture Size > to define the size of Graphics Aperture.

Search for MDA Resources > to allow the BIOS to search for MDA resources or not.

8bit I/O Recovery Time > to define the length of time for 8 bit I/O recovery.

16bit I/O Recovery Time > to define the length of time for 16 bit I/O recovery.

USB Passive Release > to specify whether or not PIIX4 is allowed to use Passive Release while transferring control data for USB transactions.

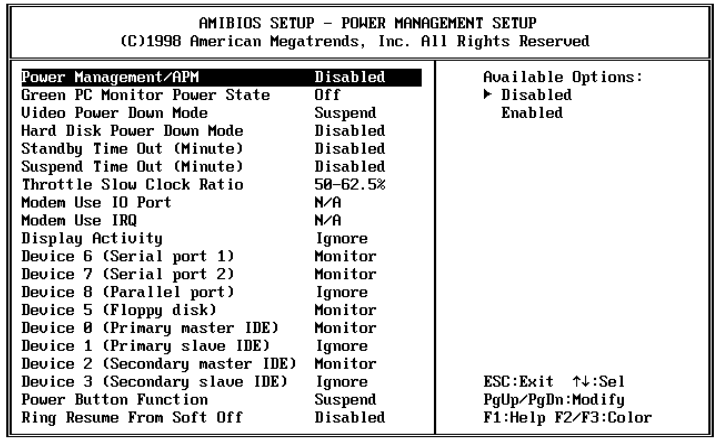
PIIX4 Passive Release > *Enabled* will let the Passive Release mechanism encoded when CPU to PCI bus accesses.

PIIX4 Delayed Transaction > to enable or disable the embedded 32-bit posted write buffer which supports delay transaction.

USB Function > to enable or disable the USB (Universal Serial Bus) functions.

4.5 Power Management Setup

Power Management Setup helps user to handle the ROCKY-P248SV board' s "green" function. The features can shut down the video display and hard disk to save energy for example. The power management setup screen is as following:



Power Management/APM > to enable or disable the Advanced Power Management feature.

Green PC Monitor Power State > to specify the power state of the monitor after the specified period of display-idle has ended.

Video Power Down Mode > to specify the power state of the VESA VGA video subsystem after the specified period of display-idle has ended.

Hard Disk Power Down Mode > to specify the power state of the hard disk after the specified period of hard drive-idle has ended.

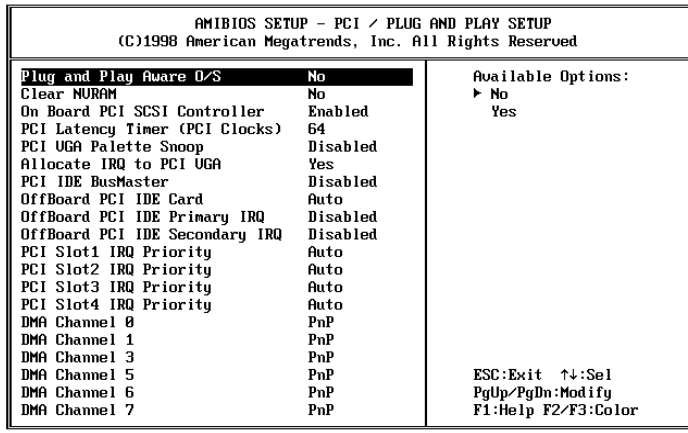
Standby Time Out (Minute) > to specify the length of the system-idle period while the system is in full power on state. After this period of time has ended, the system will go into Standby state.

Suspend Time Out (Minute) > to specify the length of the system-idle period while the system is in Standby state. After this period of time has ended, the system will go into Suspend state.

Throttle Slow Clock Ratio > to specify the speed of system clock under power saving state. The figure is a ratio between power conserving and normal state CPU clock.
Modem Use IO Port > to assign a port for modem.
Modem Use IRQ > to assign an IRQ for modem
Display Activity > to specify if BIOS has to monitor display activity or not.
Device X > to monitor specified device IRQ or Ignore.
Power Button Function > to specify how the power button on the chassis is operated.

4.6 PCI / Plug and Play Setup

The setup helps user to handle the ROCKY-P248SV board's PCI function. All PCI bus slots on the system use INTA#, thus all installed PCI slots must be set.



Plug and Play Aware O/S > Yes or No
When PNP OS is installed, interrupts will be reassigned by the OS when the setting is Yes. When a non-PNP OS is installed or to prevent reassigning of interrupt settings, select setting to No.
Clear NVRAM > if *yes*, BIOS will auto-clear NVRAM on every boot.
On Board PCI SCSI Controller > to enable and disable the on board PCI SCSI Controller

PCI Latency Timer (PCI Clocks) > to define the latency timing (PCI clock) for all PCI devices on the PCI bus.

PCI VGA Palette Snoop > this option is useful only for system with more than one VGA devices connected to it through different bus (one PCI and one ISA). To enable those various VGA devices to handle signal from the CPU on each set of palette registers of every video devices, it must be set *Enabled*.

Allocate IRQ to PCI VGA > to allocate IRQ to PCI VGA, answer Yes and vice versa.

Offboard PCI IDE Card > to specify if an offboard PCI IDE card is installed in your computer or not. You must specify the slot number on the board which will be used for the card.

Offboard PCI IDE Primary (/Secondary) IRQ > to specify the PCI interrupt that is assigned to the Primary (/Secondary) IDE channel on the offboard PCI IDE controller.

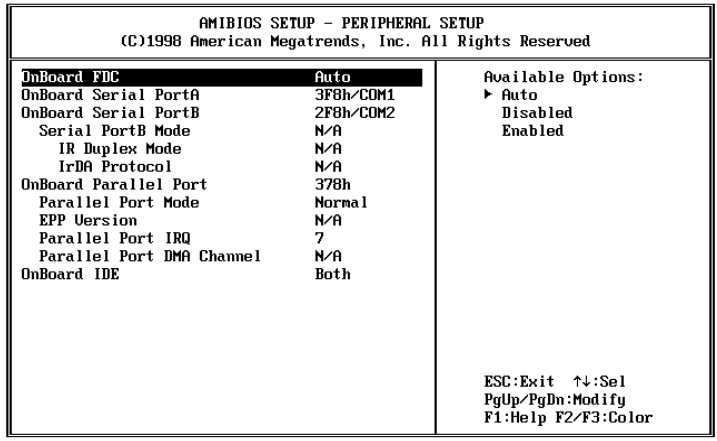
PCI Slot (1,2,3,4) IRQ Priority > to specify the IRQ priority to be used by the PCI devices on slot 1 to 4.

DMA Channel (0,1,3,5,6,7) > to indicate whether or not the DMA channel is assigned for a PnP or ISA card.

IRQ (3,4,5,7,9,10,11,14,15) > to assign the displayed IRQ to be used by a legacy ISA adapter card. The settings are ISA/EISA or PCI/PnP.

4.7 Peripheral Setup

This setup is working mostly on Multi-I/O Chip (W83977). The options are used to change the Chipset‘ s registers. Please carefully change any default setting to meet your application need perfectly. The only special concern is Onboard Serial Port 2. If you want to use the IrDA port, you have to configure the SIR or ASKIR model in the BIOS’ s Peripheral Setup’ s COM2; the RS-232 COM2 will be disabled.



Onboard FDC > to enable the FDC on your board. If you set it Auto, the BIOS will decide if the FDC should be enabled, automatically).

Onboard Serial Port A (/B) > to specify the I/O port address of the serial port 1(/2). If you set it Auto, the BIOS will decide the correct I/O port address, automatically.

Serial Port B Mode > to specify the mode of serial port 2.

IR Duplex Mode > to specify the mode of IR device that is connected to the IR port.

IrDA Protocol > to specify the function mode if an IrDA mode is selected.

Onboard Parallel Port > to specify the I/O port address of the parallel port.

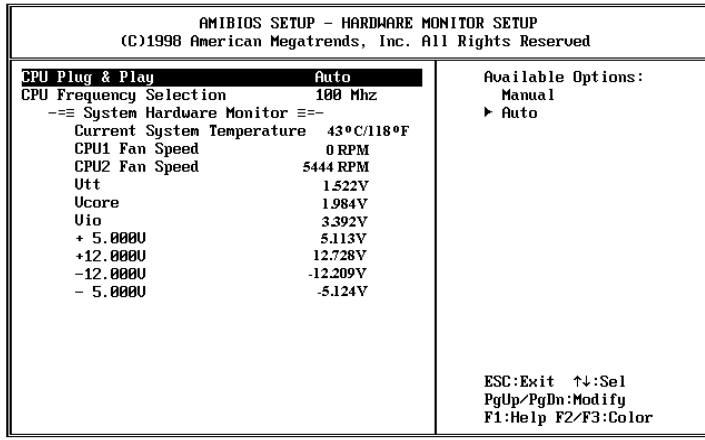
Parallel Port Mode > to specify the mode of parallel port. The options are:

Normal (normal parallel port mode),

Bi-Dir (supports bidirectional transfer),
EPP (supports devices that comply with the Enhanced Parallel Port specification),
ECP (supports devices that comply with the Extended Capabilities Port).
Parallel Port IRQ > to assign certain IRQ to the parallel port. The optimal and fail-safe settings are 7.
Parallel Port DMA Channel > available only if the parallel port mode is ECP. The optimal and fail-safe settings are 3.
Onboard IDE > to define which on-board IDE controller channel(s) to be used. Available options are: Primary, Secondary, Both and Disabled.

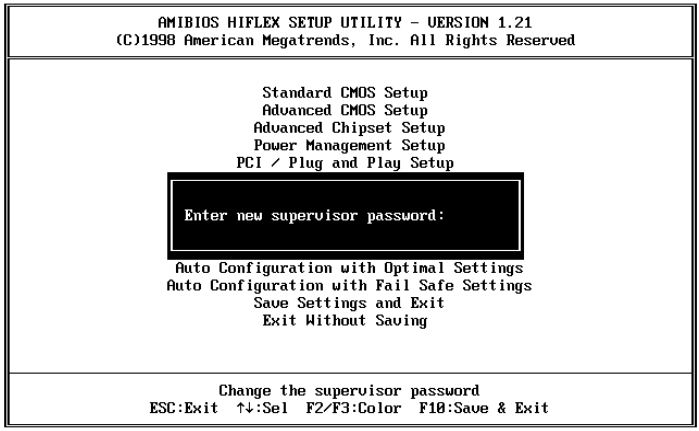
4.8 Hardware Monitor Setup

There is a LM78 chip on your board which can monitor on board system voltage and fan speed. The voltage monitoring will cover +5V,+12V,-12V,and –5V.



Note: normal CPU Fan RPM is over than 5000 RPM. If your CPU Fan RPM is less than that figure, something is wrong and the CPU will be in overheat condition. Make sure that the connection at CN19/CN16 is correct.

4.9 Change User/Supervisor Setup



This option sets a password that is used to protect your system and Setup Utility. Supervisor Password has higher priority than User Password. Once you setup the password, the system will always ask you to key-in password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with Supervisor Password, you can access every setup option on the main menu but with User Password you can only choose three setup options (USER PASSWORD, SAVE SETTING AND EXIT and EXIT WITHOUT SAVING). To disable these passwords, enter the BIOS SETUP menu with Supervisor Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pop-up.

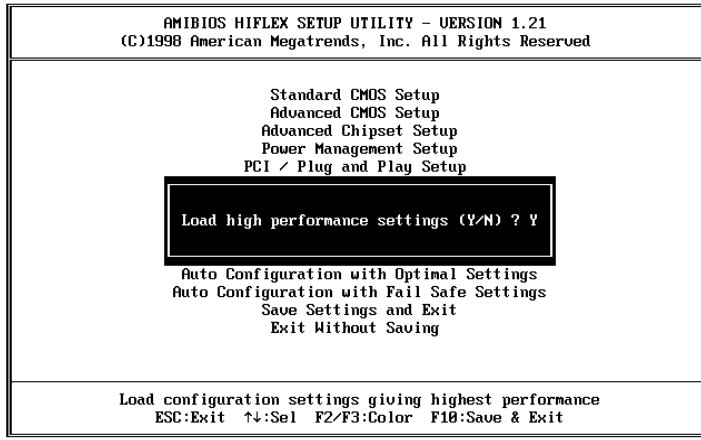
4.10 Auto-Detect Hard Disks

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 4 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press <N> to skip the next IDE drives.

Note: If your IDE HDD was formatted in previous older system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk.

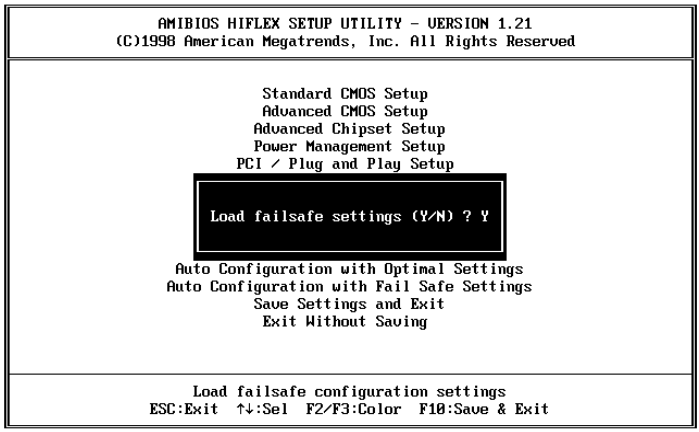
4.11 Auto Configuration with Optimal Settings

This option lets you load the *Optimal* default settings. These settings are *best-case values* which will provide the best performance. Whenever your CMOS RAM is damaged, this Optimal settings will be loaded automatically.



4.12 Auto Configuration with Fail Safe Settings

This option lets you load the *Fail Safe* default settings when something happens to your computer so that it cannot boot normally. These settings are not the most optimal settings but are the most stable settings.



4.13 Save Settings and Exit

Select this option when you finish setting all the parameters and want to save them into the CMOS. Just simply press <Enter> key and all the configuration changes will be saved.

4.14 Exit Without Saving

Select this option if you want to exit the Setup without saving the changes that you made. Just simply press <Enter> key and you will exit the BIOS SETUP without saving the changes.

5

E^2 Key™Function

The ROCKY-P248SV provides an outstanding E^{2}KEY™function for system integrator. Based on the E^{2}KEY™you could free to store the ID Code, Pass Word, or Critical Data in the 1Kbit EEPROM. Because the EEPROM is nonvolatile memory, you don' t have to worry the losing of the very important data.

Basically the E^{2}KEY™is based on a 1Kbit EEPROM which is configured to 64 words(from 0 to 63). You could access (read or write) each word at any time.

When you start to use the E^{2}KEY™you should have the utility in the package. The software utility will include four files as follows,

README.DOC
E2KEY.OBJ
EKEYDEMO.C
EKEYDEMO.EXE.

The E2KEY.OBJ provides two library function for user to integrate their application with E^{2}KEY™function. These library **(read_e2key and write_e2key)** are written and compiled in C format. Please check the following statement, then you will know how to implement it easily.

unsigned int read_e2key(unsigned int address)

/* This function will return the E^{2}KEY™s data at address. The address range is from 0 to 63. Return data is one word,16 bits */

void write_e2key(unsigned int address,unsigned data)

/* This function will write the given data to E^{2}KEY™at address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

To easy start to use the function, please refer the include EKEYDEMO.C code at first.

Please note the E^{2}KEY™function is based on the working of parallel port. So you should enable the ROCKY-P248SV' s parallel port, otherwise will be not working.

Appendix A. Watch-Dog Timer

The Watch-Dog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a non-maskable interrupt (NMI) to bring the system back to a known state.

The Watch-Dog Timer is controlled by two I/O ports.

443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
043 (hex)	Read	Disable the Watch-Dog Timer.

To enable the Watch-Dog Timer, a read from I/O port 443H must be performed. This will enable and activate the countdown timer which will eventually time out and either reset the CPU or cause an NMI depending on the setting of JP10. To ensure that this reset condition does not occur, the Watch-Dog Timer must be periodically refreshed by reading the same I/O port 443H. This must be done within the time out period that is selected by jumper group JP9.

A tolerance of at least 30% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming. Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: when exiting a program it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.

Appendix B. I/O Information

IO Address Map

I/O address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
040-05F	8254 timer
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI (non-maskable interrupt) Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
200-207	Game I/O
278-27F	Parallel Printer Port 2 (LPT3)
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
294-295	LM78 Monitoring Chip
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
843 or 043	Watch dog timer disable

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-C7FFF	VGA BIOS
C8000-CFFFF	SCSI BIOS
* D6000-D7FFF	Default DOC 2000 address
E0000 – FFFFF	System BIOS
1000000-	Extend BIOS

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC Clock
IRQ1	Keyboard	IRQ9	Unused
IRQ2	Cascade to IRQ Controller	IRQ10	Unused
IRQ3	COM2/COM4	IRQ11	Unused
IRQ4	COM1/COM3	IRQ12	PS/2 mouse
IRQ5	Unused	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignments

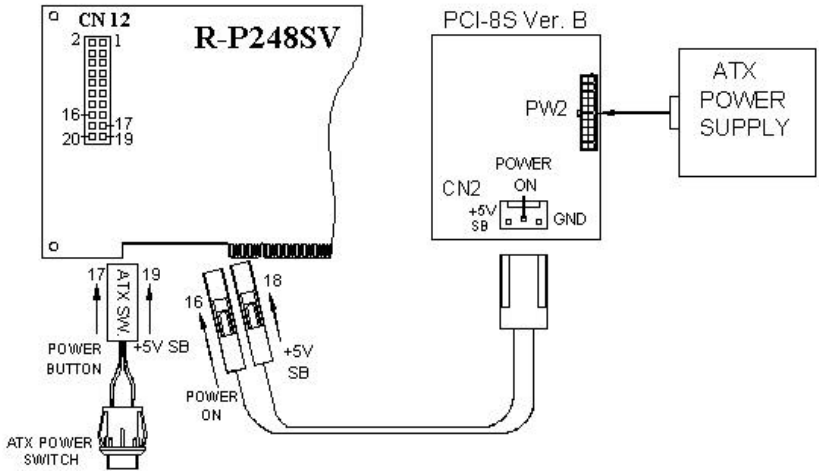
DMA Channel	Function
0	Available
1	Available
2	Floppy Disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix C. ATX Power

The following note and picture show how to connect ATX Power Supply to the backplane and ROCKY-P248SV SBC.

Please, disconnect the AC cord of the Power Supply from the AC source when you plug-in DC connector to prevent sudden electric surge to the board.

ROCKY-P248SV (through Power Button & +5VSB):



Connect the ATX power supply switch to the pin 17 (power button) and pin 19 (+5VSB) of CN12 (multi panel) on the board.

If you wish to turn off the power supply, please push the ATX power switch button for about 4 sec. And to turn ON the system, simply push the button once.