

# HS-5010

## Pentium<sup>®</sup> VGA I.S.B.

Full Size Triton<sup>™</sup> VX All-in-one

PICMG<sup>™</sup> Bus Industrial Single Board Computer

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# Chapter-1

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## Introduction

The HS-5010 is an all-in-one full-size card with a full features in a small package for the industrial applications. The Intel VX chipset provides major core logic, in addition to the support for various CPU, it also includes Intel MMX.

The HS-5010' s integral switch system provides a wide range of power regulation from 2.8V to 3.45V to maintain a constant temperature between 50°C and 60°C. The HS-5010 has designed with a feature of on board temperature sensor. If the temperature range up to 60°C, then the warning buzzer alarm will be triggered until the temperatures stabilized.

The HS-5010 supports VGA equipped using S3 86C775 chipset with 2MB memory. The HS-5010 takes advantage of both 32bit PCI and 16bit ISA bus to provide high performance graphics accelerator. VGA resolution is supported up to 1024 by 768, at 256 colors, with a reserved internal 10pin VGA connector to the monitor.

The HS-5010 provides an optional DiskOnChip™ socket supports the memory up to 72MB. That means you can issue commands directly from DOS, and you don' t need any other driver or application.

USB and IR ports are also on board to r eserve the upgrade space for the interface transmission.

Additional safety features include the HS-5010 polyswitch resettable fuse system. In the event of the keyboard, PS/2 mouse, or USB circuit short, the fuse breaks the contact. Resumption of the normal power flow will, however, prompt an automatic reconnection without any reinstallation.

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## 1.1 Major Features

- ✂ CPU : Intel Pentium CPU 75~233MHz, AMD K5, K6, Cyrix M2, 6x86 or Intel MMX; Socket 7 ZIF socket.
- ✂ Bus Interface : PCI/ISA Bus; Comply to PICMG standard.
- ✂ Chipset : Intel Triton VX chipset.
- ✂ Data Bus : 64bit.
- ✂ Processing Ability : 64bit.
- ✂ VGA Controller : S3 86C775 chipset with 2MB memory, support resolutions up to 1280 x 1024 256u colors, reserved internal 10pin VGA connector.
- ✂ PCI Enhanced IDE Interface : Supports up to four IDE devices support mode3/4 hard disk, data transfer rate 11.1MB/sec minimum.
- ✂ RAM Memory : Up to 128MB, uses four 72pin SIMM or one DIMM sockets, supports BEDO, EDO, Fast Page DRAM and SDRAM.
- ✂ Cache Memory : 512KB pipeline burst cache memory.
- ✂ Floppy Disk Drive Interface : Supports up to two floppy disk drives.
- ✂ Parallel Port : One bi-directional parallel port. Supports SPP/ECP/EPP mode.
- ✂ Serial Port : Two RS-232 ports. Both use 16C550 UART with 16byte FIFO.
- ✂ BIOS : Award flash BIOS. Supports PnP, Green features.
- ✂ Watch-Dog Timer : Hardware circuit can be set to 1, 2, 10, 20, 110 or 220 seconds period. Reset or NMI were generated when CPU did not periodically trigger the timer.
- ✂ DMA Channel : 7.
- ✂ Interrupt Levels : 15.
- ✂ Keyboard : 6-pin Mini-din connector or 5pin header. Supports the standard PC/AT Keyboard.
- ✂ Mouse : 6-pin Mini-din connector support PS/2 standard mouse.
- ✂ USB : Supports 2 USB ports.
- ✂ IR Interface : Supports one IrDA TX/RX header.
- ✂ CMOS : Real-time clock/calendar and battery backup by DS12887 or equivalent devices.
- ✂ DiskOnChip™ : A socket provides for SSD up to 72MB.

- 
- ✂✂ CPU Temperature Alarm : Hardware circuit is designed via beeping alarm if CPU' s temperature is over heating 60°C limited.
  - ✂✂ Power Supply Voltage : +5V( 4.75 to 5.25V ), +12V/-12V power supply.
  - ✂✂ Max. Power Requirement : [+5V@6A](#), +12V/-12V power supply.
  - ✂✂ Operating Temperature : 0~55°C ( CPU needs a cooler ) .
  - ✂✂ Dimension : 13.26" ( L ) x 4.8" ( W ) ( 337mm x 122mm ) .
- 

## 1.2 What do you have

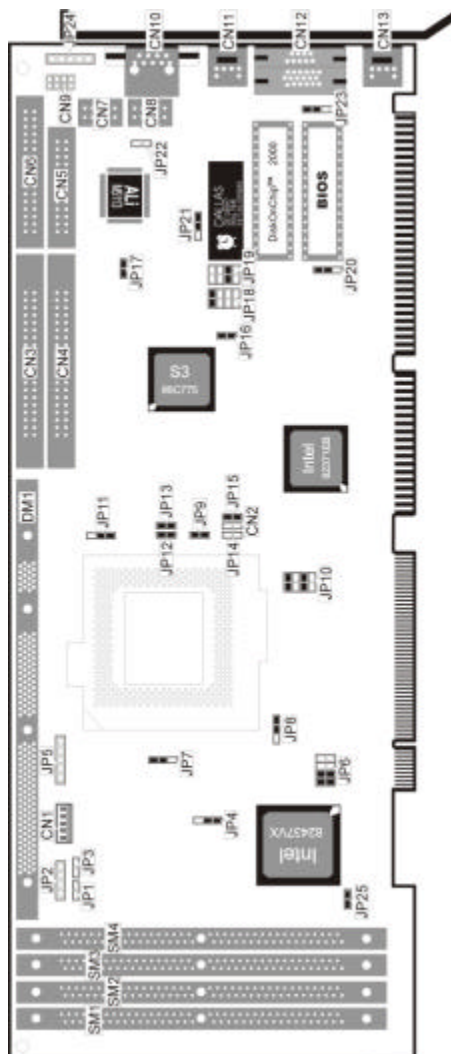
The HS-5010 package includes the following items :

- ✂✂ HS-5010 Industrial Single Board Computer.
- ✂✂ Printer port flat cable.
- ✂✂ IDE port flat cable.
- ✂✂ FDD port flat cable.
- ✂✂ COM port cable.
- ✂✂ 6-pin mini-din to 5-pin din keyboard adapter cable.
- ✂✂ VGA Utility Diskette.
- ✂✂ User' s Manual.

If any of these items are missing or damaged, please contact your dealer.  
Keep all the shipping materials and packing box in case you want to ship or store the product in feature.

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## 2.1 HS-5010's Layout





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## 2.2 Caution!

Your HS-5010 Industrial Single Board contains sensitive electronic components that can be easily damaged by the static electricity.

We have described the precautions in this section. And please pay attention when unpacking, as well as during installation. It is very important that the instructions to be followed correctly to avoid the static damage and to have a successfully installation.

The system board can be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

Be sure that there are no shipping and handling damages on the board before unpacking.

After opening the packing box, extract the board and place it only on a grounded anti-static surface material with the component side up.

Again, inspect the board for damages. Press all the sockets IC' s to make sure they are properly seated. Do this only when the board is placed on a anti-static' s firm and lat surface.

**Note :** DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your HS-5010 Industrial Single Board.

---

## 2.3 Jumper Description

This board's default jumpers are present at the factory. If you want to change the HS-5010's configuration, please follow the instructions.

A jumper switch is closed ( sometimes referred to as shorted with a plastic cap inserted over two pins of the jumper ) . A jumper is open with a plastic cap inserted over one or no pin of the jumper. Figure 2.2 below shows different jumper settings which will be used in this chapter.



---

## 2.4 Setting the CPU

All CPU Card provides all possibility in jumper setting for wide using all types of CPU with JP6, JP8, JP9, JP10, JP12, JP13, JP14 and JP15 setting in following.

The JP9, JP12, JP13 sets the multi-times ratio of the CPU' s specification. Please reference to the following table for all type CPU in used.

### **CPU' s Clock Ratio Select**

Clock Ratio			BF2	BF1	BF0
Intel		AMD	JP9	JP13	JP12
P54C	P55C	K6	1-2	1-2	1-2
2.5	2.5	*2.5	OFF	ON	ON
3.0	3.0	3.0	OFF	ON	OFF
2.0	2.0	2.0	OFF	OFF	ON
1.5	3.5	3.5	OFF	OFF	OFF
2.5	2.5	4.5	ON	ON	ON
3.0	3.0	5.0	ON	ON	OFF
1.5	2.0	4.0	ON	OFF	ON
2.5	3.5	5.5	ON	OFF	OFF

( \* ) : default setting

CPU Type	JP8
P54, P55	2-3
<b>*P55C Dual Voltage</b>	<b>1-2</b>

( \* ) : default setting

---

### **CPU Voltage Selection**

The HS-5010 provides all necessary setting for the all CPU operating. User may selected from 2.8V to 3.5V.

CPU Voltage	JP6
2.8V	7-8
*2.9V	5-6
3.2V	All Open
3.3V	1-2
3.5V	3-4

( \* ) : default setting

CPU Clock-in Select	JP10
50MHz	1-2, 3-4
55MHz	1-2, 3-4
60MHz	3-4, 5-6
*66MHz	1-2, 5-6
68MHz	All Open
75MHz	Off, 3-4
83MHz	1-2, Off

( \* ) : default setting

---

Refresh Based	JP14
60MHz	ON
*66MHz	OFF

( \* ) : default setting

Sysclk Configuration	JP15
Divided by 4	ON
*Divided by 3	OFF

( \* ) : default setting

---

## 2.5 System Memory DRAM ( EDO RAM supported )

There are four 72pin SIMM sockets to accept 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB memory modules.

The total capacity of on board memory are between 2MB to 128MB.

The HS-5010 requires at least 2pcs of the RAM modules on SIMM sockets SM1/SM2 or SM3/SM4 or 1pcs SDRAM module.

---

## 2.6 Watch-Dog Timer

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

JP23 determines the Watch-Dog Timer function. It can disable the Watch-Dog Timer or connect the Watch-Dog Timer to the reset trigger or NMI trigger.

### ⚡ JP23 : Watch-Dog Active Type Setting

JP23	Description
<b>*1-2</b>	<b>System Reset</b>
2-3	Active NMI
Open	Disable Watch-Dog Timer

( \* ) : default setting

### ⚡ JP19 : WDT Time-Out Period

Period	1-2	3-4	5-6	7-8
<b>*1 sec</b>	<b>Open</b>	<b>Open</b>	<b>Close</b>	<b>Open</b>
2 sec	Open	Open	Close	Close
10 sec	Open	Close	Open	Open
20 sec	Open	Close	Open	Close
110 sec	Close	Open	Open	Open
220 sec	Close	Open	Open	Close

( \* ) : default setting

---

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When the power of HS-5010 is turned on, the Watch-Dog Timer is disabled. The Watch-Dog Timer can be enabled by reading the Watch-Dog Timer enable/refresh control port ( 443H ) and disabled by reading the Watch-Dog Timer disable control port ( 43H ) . After the Watch-Dog Timer is enabled, the user must constantly refresh the Watch-Dog Timer by reading the Watch-Dog Timer enable/refresh port( 443H )every 1, 2, 10, 20, 110 or 220 seconds. If the user fails to do so or the system hangs, the Watch-Dog timer will automatically reset the system or issue a NMI ( Non-maskable interrupt ) .

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

443H	I/O Read	Enable/refresh the Watch-Dog Timer.
043H	I/O Read	Disable the Watch-Dog Timer.

The following program are the examples of how to enable, disable and refresh the Watch-Dog Timer :

```

WDT_EN_RF      EQU    0433H
WDT_DIS        EQU    0043H

WT_Enable      PUSH   AX                ; keep AX DX
                PUSH   DX
                MOV    DX,WDT_EN_RF    ; enable the watch-dog timer
                IN     AL,DX
                POP    DX                ; get back AX, DX
                POP    AX
                RET

WT_Refresh     PUSH   AX                ; keep AX, DX
                PUSH   DX
                MOV    DX,WDT_ET_RF    ; refresh the watch-dog timer
                IN     AL,DX
                POP    DX                ; get back AX, DX
                POP    AX
                RET

WT_DISABLE     PUSH   AX
                PUSH   DX
                MOV    DX,WDT_DIS      ; disable the watch-dog timer

```

```
IN      AL,DX
POP     DX      ; get back AX, DX
POP     AX
RET
```



---

## 2.7 VGA Controller

The HS-5010 has built-in a S3 VGA Controller. If you want to use the external VGA Card, the BIOS will automatically disable the on board VGA Controller and use the external one.

### Video Modes

S3 86C775 Chipset with 2MB memory, support resolutions up to 1280 x 1024 256 colors, reserved internal 10pin VGA connector.

To get more VGA drivers information, please refer to the S3 Internet address : [www.s3.com](http://www.s3.com).

---

## 2.8 DiskOnChip™ Address Setting

Install the DiskOnChip™ in U21 socket.

Please select the memory address :

### **JP18 : DiskOnChip™ Address**

PIN NO.	Address
*1-2	D000
3-4	D800
5-6	E000
7-8	E800

( \* ) : default setting

---

## 2.9 CPU Temperature Alarm

If the CPU' s temperatures to rise above the 60°C will trigger the HS-5010' s warning buzzer alarm until temperatures stabilize.

### **JP25 : CPU Temperature Alarm Type Setting**

JP25	Description
*Close	Enable
Open	Disable

( \* ) : default setting

# Chapter-3

---

## Connection

This chapter describes how to connect the peripherals, switches and indicators to the HS-5010 board.

---

### 3.1 Floppy Disk Drive Connector

HS-5010 board is equipped with a 34pin daisy-chain driver connector cable.

#### *☞* CN6 : FDD Connector

DIN NO	DESCRIPTION	DIN 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 ENABL F A#
11	GROUND	12	DRIVE SEI FCT B#
13	GROUND	14	DRIVE SEI FCT A#
15	GROUND	16	MOTOR ENABL F B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STFP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE DATA#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	GROUND	30	READ DATA#
31	GROUND	32	SIDE 1 SEI FCT
33	GROUND	34	DISK CHANGE#

---

## 3.2 PCI E-IDE Drive Connector

The HS-5010 has on board IDE interface. It can be connected up to four IDE(Integrated Device Electronics) hard disk drives to the HS-5010 IDE controller.

CN3(IDE 1) : Primary IDE Connector

CN4(IDE 2) : Secondary IDE Connector

### ☞ CN3/CN4 : 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

The HS-5010 includes an on board parallel port which accesses through a 26pin flat cable connector CN5.

☞ **CN5 : 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	26	GROUND

---

### 3.4 Serial Ports

The HS-5010 offers two high speed NS16C550 compatible UARTs with Read/Receive 16byte FIFO serial ports.

☞ **CN12 : Serial Port DB9 Connector**

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)

---

**CN7 : Serial Port 10pin Header**

<b>PIN NO.</b>	<b>Description</b>	<b>PIN No.</b>	<b>Description</b>
1	DCD	2	DSR
3	RXD	4	RTX
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

---

### 3.5 Keyboard Connector

The HS-5010 provides two keyboard connector.

**CN1 : 5pin Header Keyboard Connector**

<b>PIN NO.</b>	<b>Description</b>
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	Ground
5	+5V

**CN13 : 6pin Mini-din Keyboard Connector**

<b>PIN NO.</b>	<b>Description</b>
1	Keyboard Data
2	N/C
3	Ground
4	+5V
5	Keyboard Clock
	N/C

---

## 3.6 External Switches and Indicators

There are many external switches and indicators to monitor and control the CPU board.

### *⚡* JP5 : Power LED & Keylock

PIN NO.	Description
1	Power LED Anode
2	Key
3	Ground
4	Keylock
5	Ground

### *⚡* JP1 : Reset Button

PIN NO.	Description
1	External Reset
2	Ground

### *⚡* JP3 : IDE LED Connector

PIN NO.	Description
1	+5V
2	HDD Active#

---

## 3.7 External Speaker

The HS-5010 has its own buzzer, and JP2 allows user to connect to the external speaker.

### *⚡* JP2 : Speaker Connector

PIN NO.	Description
1	Speaker Signal
2	N/C
3	Ground
4	+5V

---

---

## 3.8 6-pin Mini Din PS/2 Mouse Connector

The HS-5010 has a PS/2 mouse on board which uses IRQ12. If you do not use the PS/2 mouse and wish to assign IRQ12 for other purposes, you may change JP16 to disconnect PS/2 interrupt from IRQ12.

JP16	Description
Open	No Interrupt for PS/2
*Close	IRQ12

( \* ) : default setting

### ~~☞~~ CN11 : PS/2 Mouse Connector

PIN NO.	Description
1	MS Data
2	N/C
3	Ground
4	+5V
5	KBT1
6	N/C

---

## 3.9 VGA Connector

The HS-5010 has on board 15-pin external VGA connector.

### ~~☞~~ CN10 : 15-pin Female VGA Connector

PIN NO.	Description	PIN NO.	Description
1	Red	2	Green
3	Blue	4	N/C
5	Ground	6	Ground
7	Ground	8	Ground
9	N/C	10	Ground
11	N/C	12	N/C
13	HSYNC	14	VSYNC
15	N/C		

---

### 3.10 USB Ports Connector

The HS-5010 provides two USB ports into one connector.

*☞* **CN9 : 8-pin Header USB Connector**

<b>PIN NO.</b>	<b>Description</b>	<b>PIN NO.</b>	<b>Description</b>
1	VCC	2	VCC
3	BD0-	4	BD1-
5	BD0+	6	BD1+
7	Ground	8	Ground

---

### 3.11 Internal VGA Connector

*☞* **CN8 : 10-pin Internal VGA Connector**

<b>PIN NO.</b>	<b>Description</b>	<b>PIN NO.</b>	<b>Description</b>
1	Red	2	Ground
3	Green	4	Ground
5	Blue	6	Ground
7	HSYNC	8	Ground
9	VSYNC	10	Ground

---

### 3.12 IR Connector

The HS-5010 provides a 5-pin internal IR communication connector. The JP24 provides for IrDA 1.0 specification application.

*☞* **JP24 : 5-pin IR Connector**

<b>PIN NO.</b>	<b>Description</b>
1	VCC
2	N/C
3	IRRX
4	Ground
5	IRTX



# *Chapter-4*

---

## AWARD BIOS Setup

The HS-5010 uses the Award PCI/ISA BIOS for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options which could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access Award PCI/ISA BIOS setup program, press < Del > key. The main menu will be displayed at this time.

---

## 4.1 Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press < Enter > to enter the sub-menu.

ROM PCI/ISA BIOS (2A59GD3G)  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit	↖↗↘↙ : Select Item
F10 : Save & Exit	(Shift)F2 : Change Color

Note that a brief description of each highlighted selection appears at the bottom of the screen.

## 4.2 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for the setup. When the IDE hard disk drive you are using is larger than 528MB, please set the HDD mode to LBA mode. Please use the IDE Setup Utility in BIOS Setup to install the HDD correctly.

ROM PCI/ISA BIOS (2A59GD3G)  
STANDARD CMOS SETUP  
AWARD SOFTWARE, INC.

Data (mm:dd:yy) : Fri, Oct 19 1999			
Time (hh:mm:ss) : 00:00:00			
		CYLS	HEAD
Primary Master	? Nono	0	0
Primary Slave	? Nono	0	0
Secondary Master	? Nono	0	0
Secondary Slave	? Nono	0	0
Drive A	: Nono		
Drive B	: None		
Video	: EGA/VGA		
Halt On	: All Errors		
		Base	Memory
		Extended	Memory
		Other	Memory
		Total	Memory
		:	0K
		:	0K
		:	512K
		:	512K
ESC : Quit	←←←← : Select Item		PU/PD/ + / - : Modify
F1 : Help	(Shift) F2: Change Color		

## 4.3 BIOS Features Setup

This section allows you to configure your system for the basic operation. You have the opportunity to select the system's default speed, boot up sequence, keyboard operation, shadowing and security.

ROM PCI/ISA BIOS (2A59GD3G)  
 BIOS FEATURES SETUP  
 AWARD SOFTWARE, INC.

Virus Warning	: Enabled	Video BIOS	Shadow	: Disabled
CPU Internal Cache	: Disabled	C8000-CBFFF	Shadow	: Disabled
External Cache	: Disabled	CC000-CFFFF	Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF	Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D4000-D7FFF	Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF	Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	DC000-DFFFF	Shadow	: Disabled
Boot Up NumLock Status	: Off			
Boot Up System Speed	: Low			
Gate A20 Option	: Normal			
Typematic Rate Setting	: Disabled			
Typematic Rate (Chars/Sec)	: 6			
Typematic Delay (Msec)	: 250			
Security Option	: Setup			
PCI/VGA Palette Snoop	: Disabled			
Assign IRQ For VGA	: Enabled	ESC	: Quit	←←←←: Select Item
OS Select For DRAM > 64MB	: Non-OS2	F1	: Help	PU/PD/+/-: Modify
		F5	: Old Values	(Shift) F2 : Color
		G6	: Load BIOS Defaults	
		G7	: Load Setup Defaults	

## 4.4 Chipset Features Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

ROM PCI/ISA BIOS (2A59GD3G)  
 CHIPSET FEATURES SETUP  
 AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Delayed Transaction	: Disabled
	:		
DRAM RAS# Precharge Time	: 3		
DRAM R/W Leadoff Timing	: 7		
Fast RAS To CAS Delay	: 3		
DRAM Read Burst (EDO/FP)	: x444/x444		
DRAM Write Burst Timing	: x444		
Fast MA to RAS# Delay CLK	: 2		
Fast EDO Path Select	: Disabled		
Refresh RAS# Assertion	: 4 Clks		
ISA Bus Clock	: PCI CLK/4		
SDRAM (CAS Lat/RAS-to-CAS)	: 3/3		
System BIOS Cacheable	: Disabled		
Video BIOS Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1	ESC	: Quit
Memory Hole At 15M-16M	: Disabled	F1	: Help
Peer Concurrency	: Disabled	F5	: Old Values
Passive Release	: Disabled	F6	: Load BIOS Defaults
		F7	: Load Setup Defaults
			ESC : Select Item
			PU/PD/+/-: Modify
			(Shift) F2 : Color

---

## 4.5 Integrated Peripherals

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship which is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

PIO means Programmed Input /Output. Rather than having the BIOS issue a series of commands to affect the transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is much simpler and more efficient (also faster).

ROM PCI/ISA BIOS (2A59GD3G)  
INTEGRATED PERIPHERALS  
AWARD SOFTWARE, INC.

IDE HDD Block Mode	:	Disabled	
	:		
	:		
	:		
On-Chip Primary PCI IDE	:	Disabled	
On-Chip Secondary PCI IDE	:	Disabled	
PCI Slot IDE 2 <sup>nd</sup> Channel	:	Disabled	
USB Controller	:	Disabled	
	:		
Onboard FDC Controller	:	Disabled	
OnBoard UART 1	:	Disabled	
OnBoard UART 2	:	Disabled	
	:		
OnBoard Parallel Port	:	Disabled	
			ESC : Quit <i>←←←←</i> : Select Item
			F1 : Help                    PU/PD/+/-: Modify
			F5 : Old Values            (Shif) F2 : Color
			F6 : Load BIOS Defaults
			F7 : Load Setup Defaults

## 4.6 Power Management Setup

The Power Management Setup allows user to configure the system for saving energy in a most effective way while operating in a manner consistent with his own style of computer use.

ROM PCI/ISA BIOS (2A59GD3G)  
POWER MANAGEMENT SETUP  
AWARD SOFTWARE, INC.

Power Management	: User Define	** Power Down & Resume Events **	
PM Control by APM	: No	IRQ3 (COM 2)	: OFF
Video Off Method	: Blank Screen	IRQ4 (COM 1)	: OFF
MODEM Use IRQ	: NA	IRQ5 (LPT 2)	: OFF
		IRQ6 (Floppy Disk)	: OFF
Doze Mode	: Disabled	IRQ7 (LPT 1)	: OFF
Standby Mode	: Disabled	IRQ8 (RTC Alarm)	: OFF
Suspend Mode	: Disabled	IRQ9 (IRQ2 Redir)	: OFF
HDD Power Down	: Disabled	IRQ10 (Reserved)	: OFF
		IRQ11 (Reserved)	: OFF
** Wake Up Events In Doze & Standby**		IRQ12 (PS/2 Mouse)	: OFF
IRQ3 (Wake-Up Event)	: OFF	IRQ13 (Coprocessor)	: OFF
IRQ4 (Wake-Up Event)	: OFF	IRQ14 (Hard Disk)	: OFF
IRQ8 (Wake-Up Event)	: OFF	IRQ15 (Reserved)	: OFF
IRQ12 (Wake-Up Event)	: OFF		
		ESC	: Quit <span style="float: right;">←←←←: Select Item</span>
		F1	: Help <span style="float: right;">PU/PD/+/-: Modify</span>
		F5	: Old Values <span style="float: right;">(Shift) F2 : Color</span>
		F6	: Load BIOS Defaults
		F7	: Load Setup Defaults