ACP-GM45

Mini-ITX" IntelGM45

User's Manual

1st Ed – 17 May 2009

Part No.

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

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Avalue warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Avalue, or which have been subject to misuse, abuse, accident or improper installation. Avalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Avalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Avalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Contents

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

Before you begin installing your single board, please make sure that the following parts have been shipped.

- 1 x Intel GM45 Mini ITXe Main board
- 1 x CD-ROM contains the followings:
  - QIG in PDF file
  - Drivers
- 1 x IDE Cable(40pin)
- 1 x COM cable(2.0mm pitch)
- 1 x SATA & Power cable

If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	Comment
1st	May. 2009	Initial Release

1.4 Manual Objectives

This manual describes in detail the Avalue Technology ACP-GM45 industry motherboard.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to interface with ACP-GM45 series or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

Specifications	
System	
CPU	Intel® GM45 Supports Intel®µFC-PGA/BGA Socket-P Core™ 2 Duo CPU
FSB	677 / 800 / 1066 MHz
BIOS	Award 16 Mb SPI Flash BIOS
System Chipset	Intel® GM45 / ICH9-M
I/O Chipset	Winbond W83627DHG
Memory	Two 200-pin SODIMM sockets support up to 4 GB DDR2 667/800 SDRAM
SSD	One CompactFlash Type I/II socket
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring CPU temperature and fan status with auto throttling control
SRAM	Dual 512KB Battery Backup SRAM
Battery	Rechargeable LIR2477 mA/hr, 1 for System, 1 for MCU, SRAM, RNG, Timer, RTC, iButton
RTC	2 sets
Expansion Slots	1 x PCI slot (PCI Rev. 2.3 compliant)
Display	
Chipset	Intel® GM45 Integrated Graphic Media Accelerator 4500MHD
Display Memory	Intel® DVMT 5.0
Dual Display	CRT+LVDS, or CRT+CRT
LVDS	2-CH 18/24-bit LVDS
Resolution	CRT mode: 2048x1536
VGA Chip	Chrontel CH7317A(SDVO)
Ports	Dual VGA External Ports
IO	
MIO	1xIDE, 4xSATAII, 1xRS-232/482/485, 2xRS-232, 2xRS232/CC Talk, 1xPS/2 Keyboard, 1xPS/2 Mouse
USB	8xUSB 2.0(4 on edge, 4 pin-header)
DI	32-bit Isolation Input (ESD Protected)
DO	32-bit Darlington Output (High Current)
Gamming IO	JAMMA Interface
Timer	4x16-bit Interruptible Timer
Security	

EEPROM	64 KB for Storage of Serial Numbers
Security Chip	Microchip HCS300 KEELOQ Code Hopping Encoder
iButton	Bi-Directional, programmable GPIO header for iButton (Dallas 1-Wired Interface)
Data Security	Hardware Random Number Generator(RNG)
Intrusion Detection	One Intrusion Detection line for Logger with Data/Time/Events

Audio

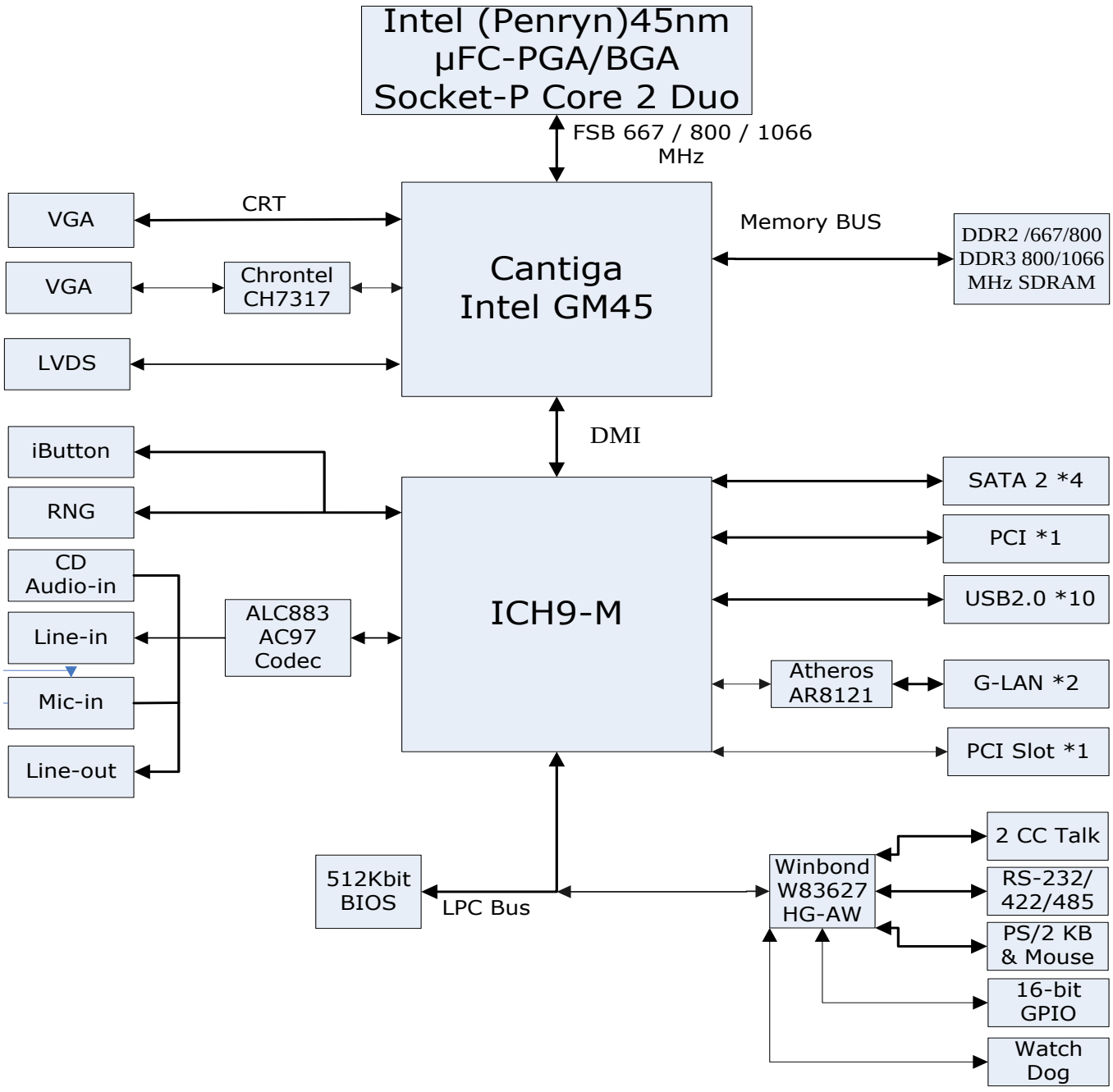
Audio Chip	Intel® ICH9-M Integrated
AC97 Codec	Realtek® ALC888 supports 7.1+2-CH Independent Audio Streams
Audio Amplifier	TPA3005D2 6W (per front channel) stereo amplifier

Ethernet

LAN1	Atheros AR8121 Gigabit LAN, supports Wake on LAN
LAN2	Atheros AR8121 Gigabit LAN, supports Wake on LAN
Ethernet Interface	10/100/1000Base-Tx Fast Ethernet compatible

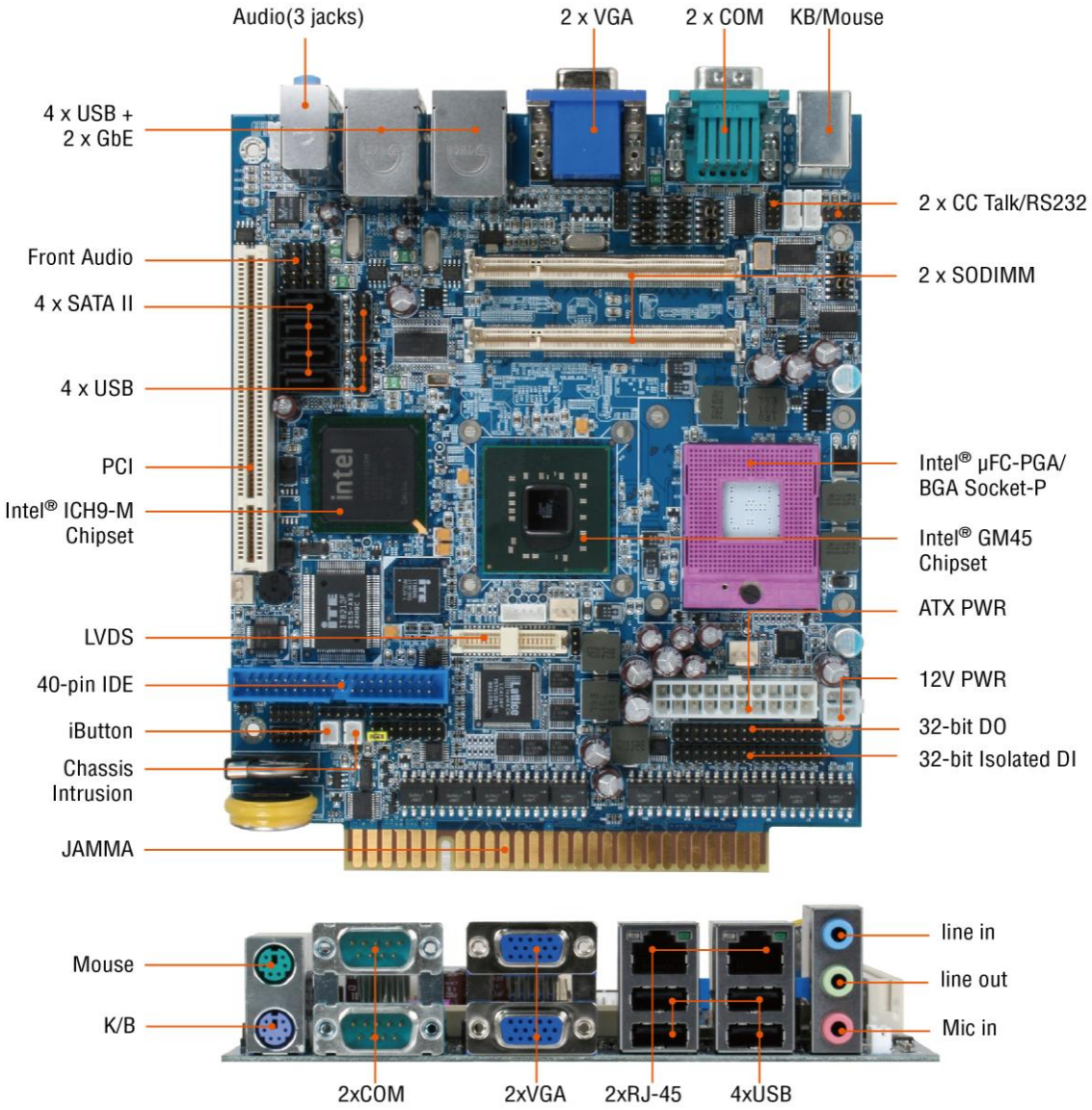
1.6 Architecture Overview – Block Diagram

The following block diagram shows the architecture and main components of ACP-GM45.



2. Hardware Configuration

2.1 Product Overview



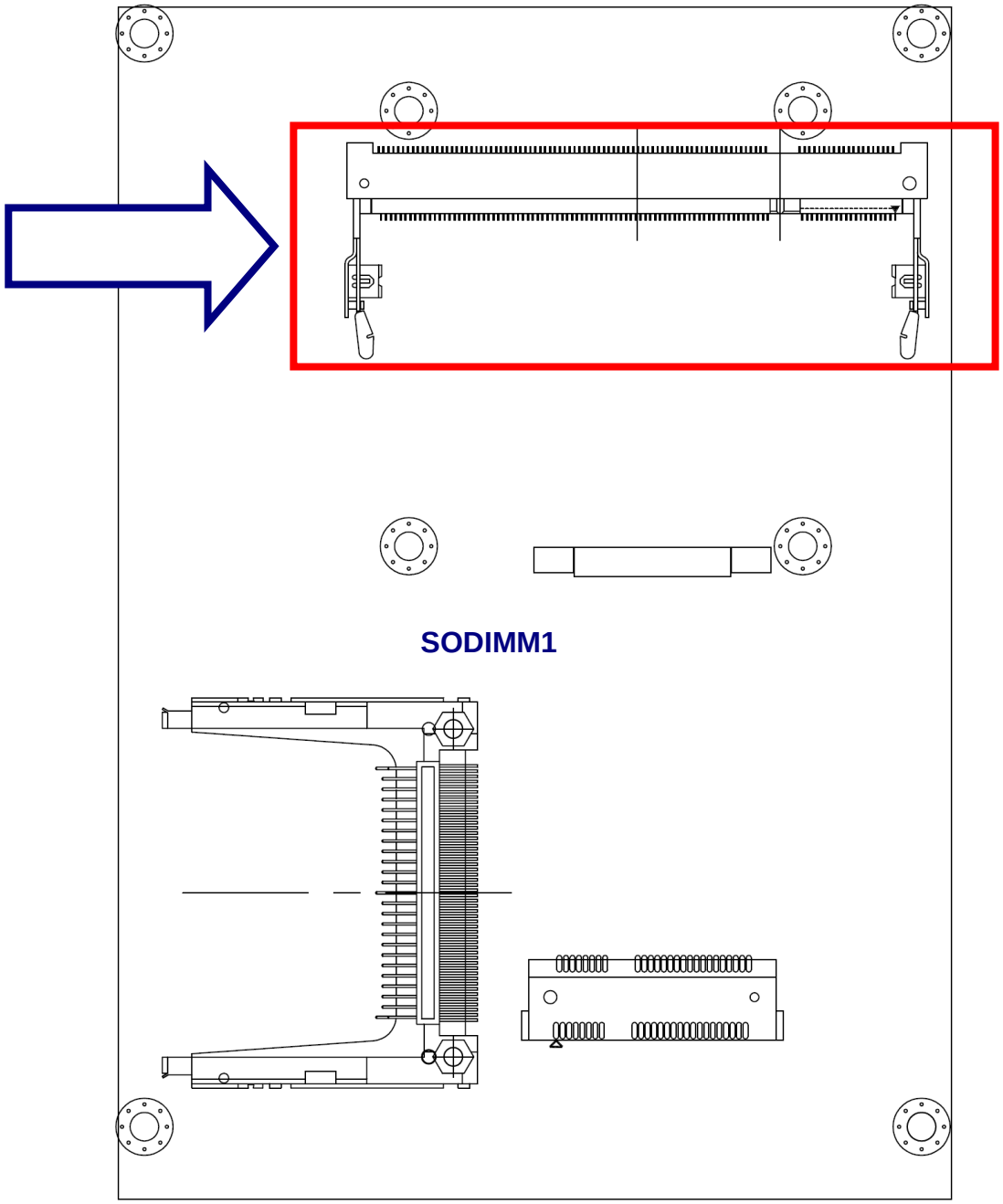
2.2 Installation Procedure

This chapter explains you the instructions of how to setup your system.

1. Turn off the power supply.
2. Insert the SODIMM module (be careful with the orientation).
3. Insert all external cables for hard disk, floppy, keyboard, mouse, USB etc. except for flat panel. A CRT monitor must be connected in order to change CMOS settings to support flat panel.
4. Connect power supply to the board via the ATXPWR.
5. Turn on the power.
6. Enter the BIOS setup by pressing the delete key during boot up. Use the “LOAD BIOS DEFAULTS” feature. The ***Integrated Peripheral Setup*** and the ***Standard CMOS Setup*** Window must be entered and configured correctly to match the particular system configuration.
7. If TFT panel display is to be utilized, make sure the panel voltage is correctly set before connecting the display cable and turning on the power.

2.2.1 Main Memory

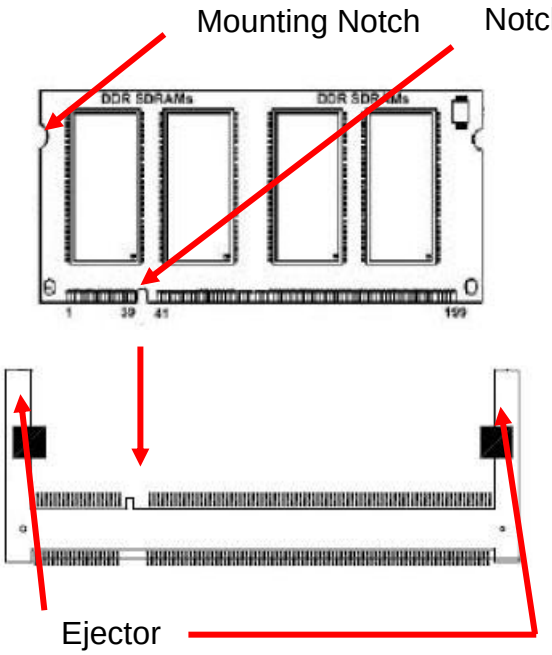
ACP-GM45 provides one 200-pin SODIMM sockets to support DDR2 SDRAM. The total maximum memory size is 2GB.



(Rear side)

Make sure to unplug the power supply before adding or removing SODIMMs or other system components. Failure to do so may cause severe damage to both the board and the components.

- Locate the SODIMM socket on the board.
- Hold two edges of the SODIMM module carefully. Keep away of touching its connectors.
- Align the notch key on the module with the rib on the slot.
- Firmly press the modules into the socket automatically snaps into the mounting notch. Do not force the SODIMM module in with extra force as the SODIMM module only fit in one direction.



200-pin DDRSODIMM

- To remove the SODIMM modules, push the two ejector tabs on the slot outward simultaneously, and then pull out the SODIMM module.

Note:

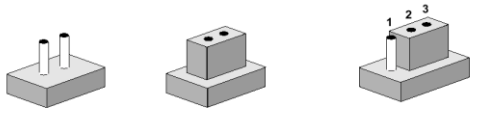
(1) Please do not change any DDR2 SDRAM parameter in BIOS setup to increase your system's performance without acquiring technical information in advance.

(2) Static electricity can damage the electronic components of the computer or optional boards. Before starting these procedures, ensure that you are discharged of static electricity by touching a grounded metal object briefly.

2.3 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



Open Closed Closed 2-3

The jumper settings are schematically depicted in this manual as follows:

Open Closed Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
JFTP1	Front Panel & CF jumper select	8 x 2 header, pitch 2.54mm
JP1	Audio Out to JAMMA jumper select	6 x 2 header, pitch 2.0mm
JP2	SRAM clear jumper	2 x 1 header, pitch 2.0mm
JP3	SRAM Address selection jumper	6 x 2 header, pitch 2.0mm
JP5	**CC Talk connector 2 & Serial port jumper select**	3 x 2 header, pitch 2.0mm
JP6	CC Talk connector 1 & Serial port jumper select	3 x 2 header, pitch 2.0mm
JP7	Serial port 2 pin-9 power jumper select	3 x 2 header, pitch 2.0mm
JP8	Serial port 3 pin-9 power jumper select	3 x 2 header, pitch 2.0mm
JP9	***Serial port jumper select for RS232/485/422***	2 x 6 header, pitch 2.0mm

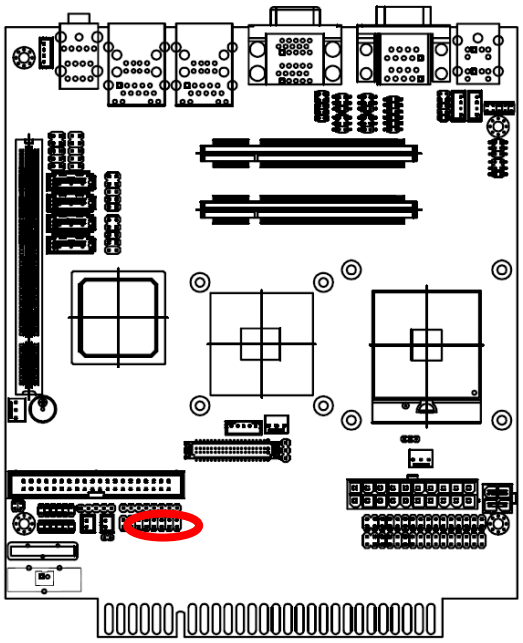
JP10	Serial port 1 pin-9 power jumper select	3 x 2 header, pitch 2.0mm
JP11	***Serial port jumper select for RS232/485/422***	3 x 2 header, pitch 2.0mm
JBT1	Clear CMOS jumper setting	2 x 2 header, pitch 2.54mm

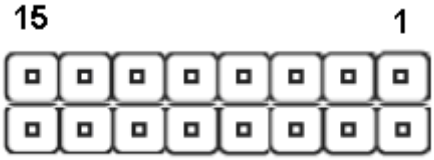
Connectors		
Label	Function	Note
BAT2	Battery charge connector	Battery 3.6V, 3 x 1 header
JBT1	Clear CMOS jumper setting	2 x 2 header, pitch 2.54mm
BZ1	Buzzer	85dB x 1, pitch 4.0mm, 50mA
CF1	Compact Flash card connector	
CN1	Case open connector	2 x 1 wafer, pitch 2.00mm
CN2	iButton connector	2 x 1 wafer, pitch 2.00mm
CN3	IDE connector	20 x 2 header, pitch 2.54mm
CN4	LVDS Inverter connector	5 x 1 wafer, pitch 2.0mm
CN5	USB connector 4 & 5	5 x 2 header, pitch 2.54mm
CN6	USB connector 6 & 7	5 x 2 header, pitch 2.54mm
CN7	Front Audio connector	5 x 2 header(w/o P8), pitch 2.54mm
CN8	Side Audio connector	5 x 2 header, pitch 2.54mm
CN9	Serial port connector 4	5 x 2 header, pitch 2.0mm
CN10	Serial port connector 5	5 x 2 header, pitch 2.0mm
CN11	Serial port connector 3	5 x 2 header, pitch 2.0mm
CN12	CC Talk connector 1	4 x 1 wafer, pitch 2.0mm
CN13	CC Talk connector 2	4 x 1 wafer, pitch 2.0mm
CN14	USB connector 2 & 3 & RJ45 connector 2	5 x 2 header, pitch 2.0mm
CN15	USB connector 0 & 1 & RJ45 connector 1	5 x 2 header, pitch 2.0mm
CN16	PS/2 keyboard & mouse connector	6-pin x 2, 90mmDIN
CN17	CD in connector	4 x 1 wafer, pitch 2.0mm
CN18	Audio Jack	Line in, line out, MIC in
CN19	JAMMA Interface	
COM1	Serial port connector 1 & 2	D-sub 9-pin, Male
DIMM1	200pin DDR2 SODIMM Socket	
DIMM2	200pin DDR2 SODIMM Socket	
DI1	General purpose I/O connector	16 x 2 header, pitch 2.54mm
DO1	General purpose I/O connector	16 x 2 header, pitch 2.54mm

FAN1	CPU fan connector	3 x 1 wafer, pitch 2.54mm
FAN2	System fan connector	3 x 1 wafer, pitch 2.54mm
FAN3	AUX fan connector	3 x 1 wafer, pitch 2.54mm
JP4	Penryn CPU setting connector	3 x 1 header, pitch 2.0mm
JTAG1	Random Number Generator	5 x 1 header, pitch 2.54mm
JTAG2	CPLD JTAG port	8 x 1 header, pitch 2.54mm
LVDS2	LVDS connector	For Cantige 1.05V
PCI1	PCI connector	
PWR1	ATX-12V power connector	2 x 2 header, 12V
PWR2	ATX power connector	10 x 2 header
SATA1	Serial ATA connector	SATA2
SATA2	Serial ATA connector	SATA2
SATA3	Serial ATA connector	SATA2
SATA4	Serial ATA connector	SATA2
VGA1	VGA connector 1 & 2	D-sub 15-pin, female
VR1	LVDS Back Light control connector	3 x 1 header, pitch 2.54mm

2.4 Setting Jumpers & Connectors

2.4.1 Front Panel & CF jumper select (JFTP1)



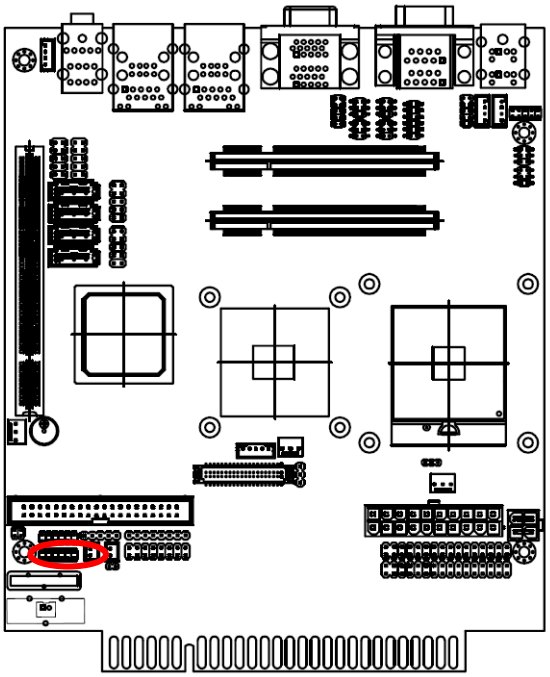


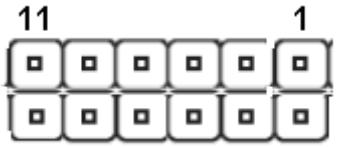
Signal	PIN	PIN	Signal
GND	1	2	CF_MASTER
N/A	3	4	GND
HDD_LED	5	6	GND
GND	7	8	BEEP_SPK
GND	9	10	PWR_LED+
POWER RESET	11	12	GND
POWER SWITCH	13	14	GND
GND	15	16	AT_POWER

2.4.2 Front Panel jumper select (JFTP1)

Jumper Select	Default Setting
Pin-2 and Pin-4	OPEN=CF SLAVE Mode
Pin-5 and Pin-7	HDD LED
Pin-6 and Pin-8	BUZZER
Pin-9 and Pin-11	RESET
Pin-10 and Pin-12	PWR LED
Pin-13 and Pin-15	PWRBTN
Pin-14 and Pin-16	SHORT=ATX MODE ON (OPEN=AT MODE ON)

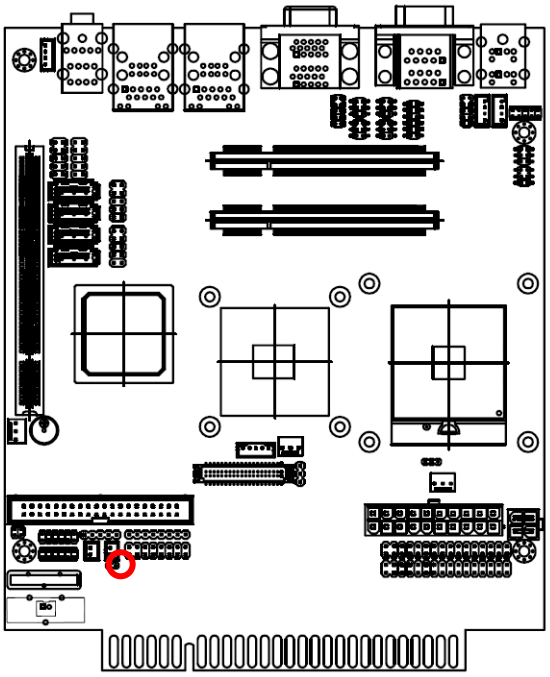
2.4.3 Audio Output to JAMMA jumper select (JP1)

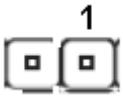




Signal	PIN	PIN	Signal
AMP_OUT_LP	1	2	AMP_OUT_RP
SPEAKER+	3	4	AUDIO+
LINE_L_OUT	5	6	LINE_R_OUT
AMP_OUT_LN	7	8	AMP_OUT_RN
SPEAKER-	9	10	GND
GND	11	12	GND

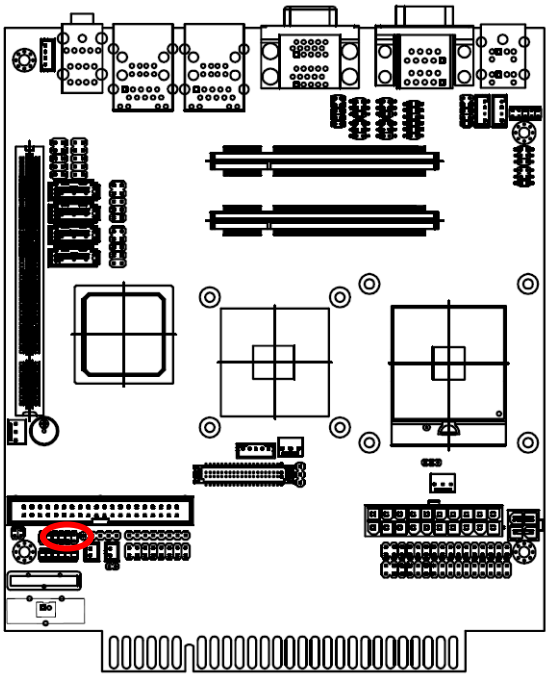
2.4.4 SRAM clear jumper (JP2)

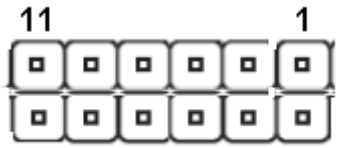




Signal	PIN	PIN	Signal
SRAM_VDD	1	2	GND

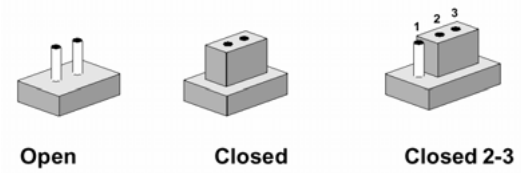
2.4.5 SRAM Address selection jumper (JP3)





Signal	PIN	PIN	Signal
GND	1	2	ROM_S0
GND	3	4	ROM_S1
GND	5	6	IO_S0
GND	7	8	IO_S1
GND	9	10	IRQ_S0
GND	11	12	IRQ_S1

1. * default setting
2. Jumper setting



1-2	3-4	Memory Base Address
Close	Close	D000H*
Close	Open	D800H
Open	Close	E000H
Open	Open	E800H

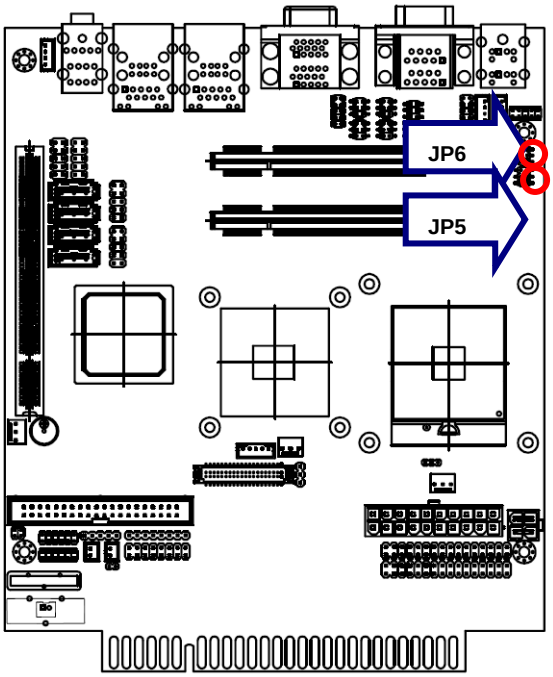
5-6	7-8	I/O Base Address
Close	Close	200H*
Close	Open	210H
Open	Close	220H
Open	Open	230H

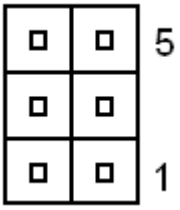
The SRAM on ACP-GM45 is divided into lots of banks. Each memory bank is 16K bytes in size. The number of memory bank depends on the size of memory chip used on the main-board. For example, if 512K bytes of memory are populated on board, the number of memory bank will start form 0 to 32. In order to access the memory, you have to assign the bank number at first. Then the data can be accessed form the pre-arranged memory base address.

Table Format of the Memory Bank Selection

Register	I/O BASE ADDRESS	I/O MODE	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
Bank Select	+0	W	A7	A6	A5	A4	A3	A2	A1	A0

2.4.6 CC Talk connector 2 & Serial port jumper select (JP5, JP6)



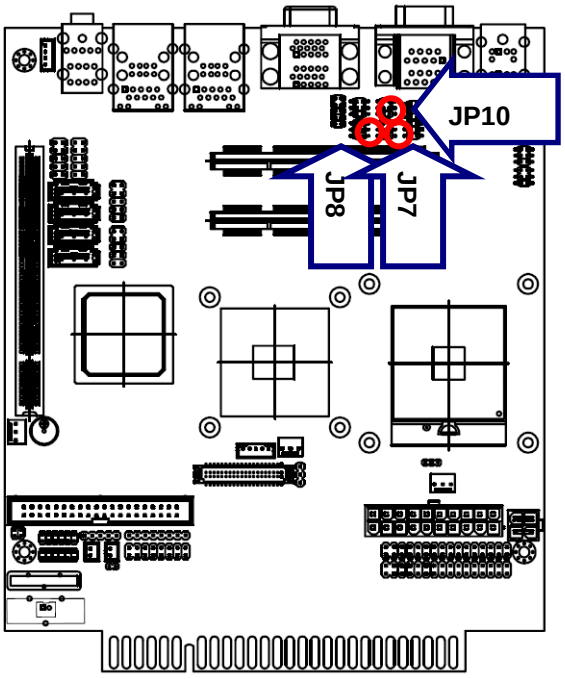


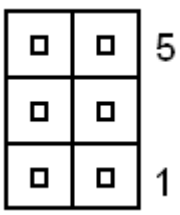
Signal	PIN	PIN	Signal
CCT_TXD4	1	2	CCT_RXD4
SOUT2	3	4	SIN2
232_TXD4	5	6	232_RXD4

JP6

Signal	PIN	PIN	Signal
CCT_TXD3	1	2	CCT_RXD3
SOUT2	3	4	SIN2
232_TXD3	5	6	232_RXD3

2.4.7 Serial port pin-9 power jumper select : (COM2-JP7, COM3-JP8, COM1-JP10)





JP7 : COM2 (default : 1-2)

Signal	PIN	PIN	Signal
NRI	1	2	NRI
+5V	3	4	NRI
+12V	5	6	NRI

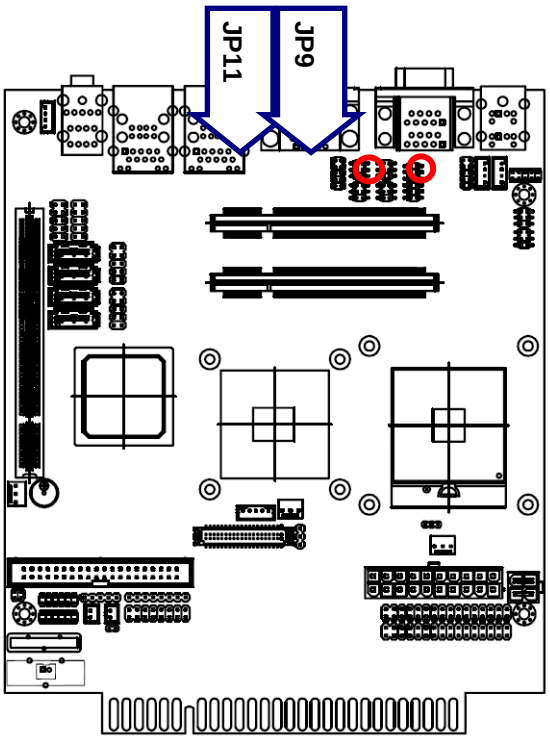
JP8 : COM3 (default : 1-2)

Signal	PIN	PIN	Signal
NRI	1	2	NRI
+5V	3	4	NRI
+12V	5	6	NRI

JP10 : COM1(default : 1-2)

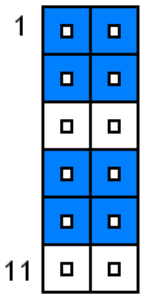
Signal	PIN	PIN	Signal
NRI	1	2	NRI
+5V	3	4	NRI
+12V	5	6	NRI

2.4.8 Serial port jumper select for RS232/485/422 (JP9, JP11)

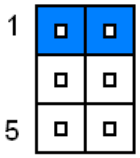


RS-232

JP9



JP11

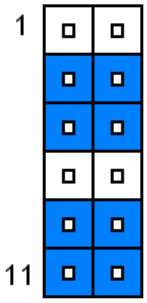


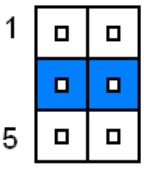
RS-422/485

RS-422

JP11

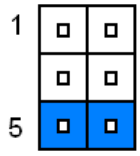
JP9



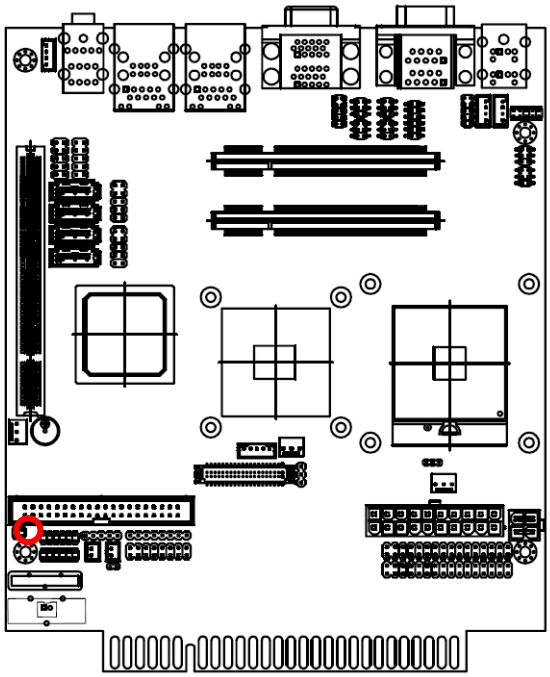


RS-485

JP11



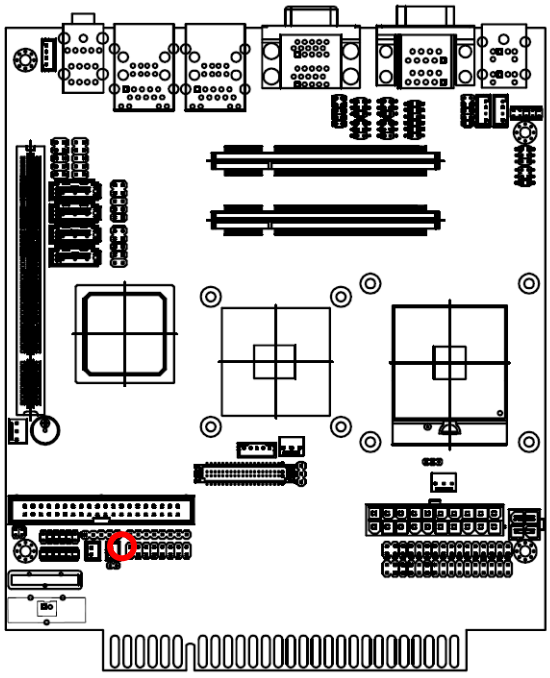
2.4.9 Clear CMOS jumper setting (JBT1)

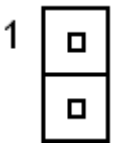


Clear CMOS

Clear ME RTC registers

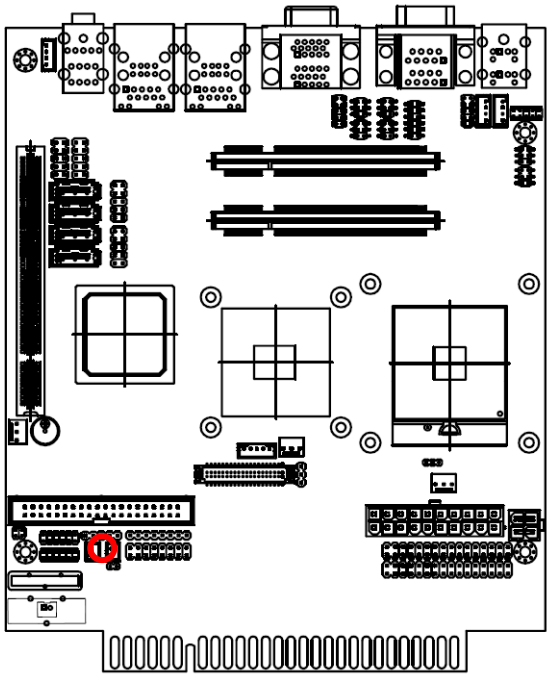
2.4.10 Case open connector (CN1)

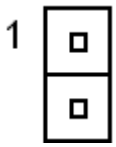




PIN	Signal
1	CASE_OPEN
2	GND

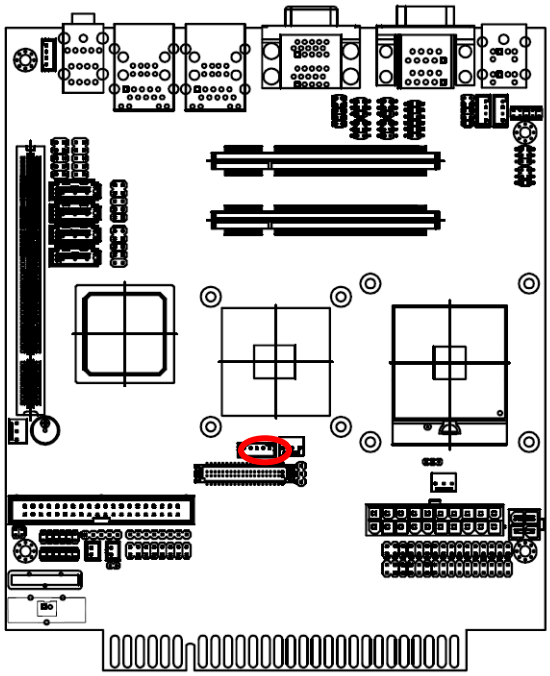
2.4.11 I-Button connector (CN2)

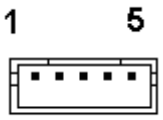




PIN	Signal
1	IO
2	GND

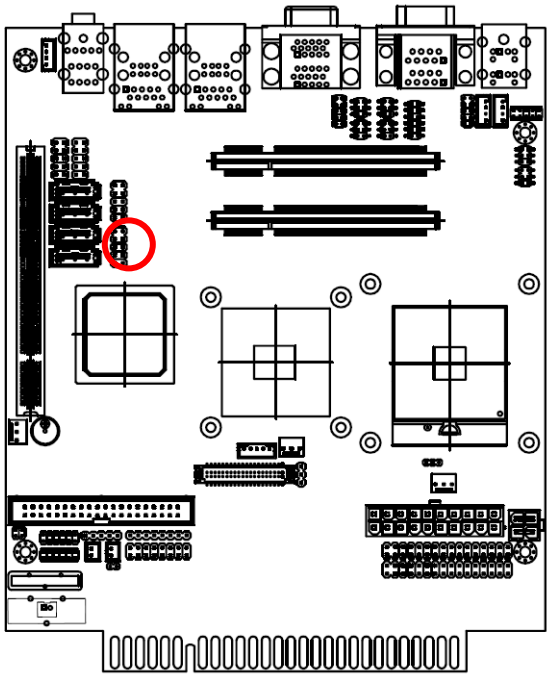
2.4.12 LVDS Inventor connector (CN4)

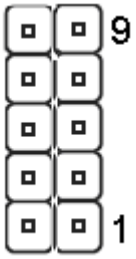




PIN	Signal
1	+12V
2	GND
3	ENBKL
4	VR
5	+5V

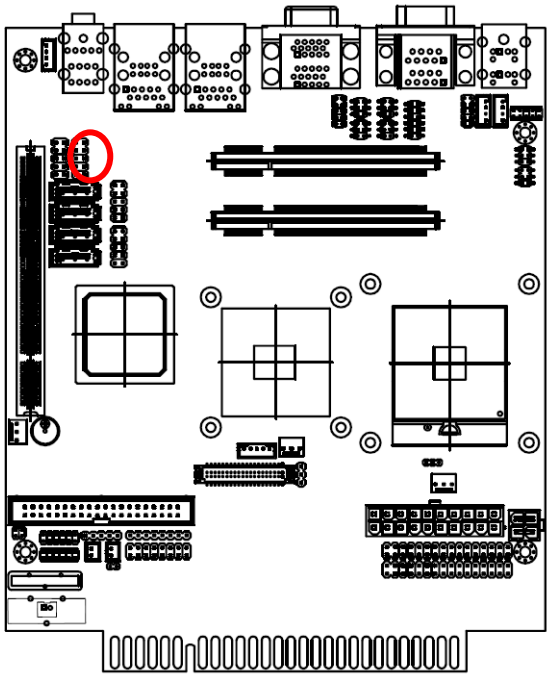
2.4.13 USB connector 4 & 5 (CN5) 6&7 (CN6)





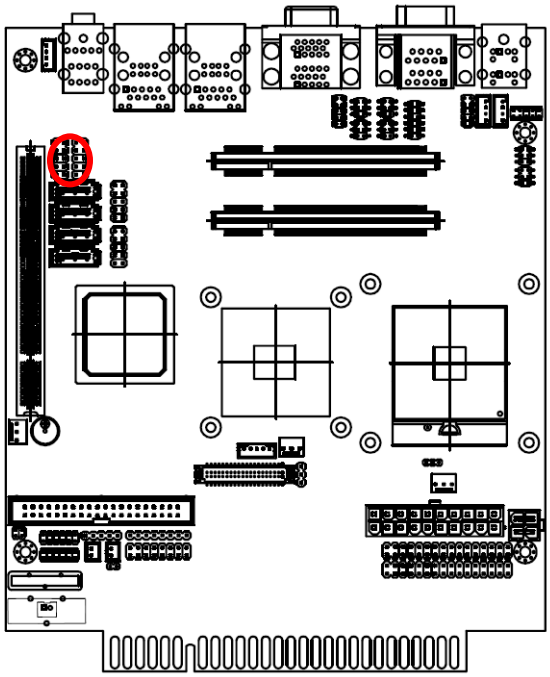
Signal	PIN	PIN	Signal
+5V	10	9	GND
D5-/D7-	8	7	GND
D5+/D7+	6	5	D4+/D6+
GND	4	3	D4-/D6-
GND	2	1	+5V

2.4.14 Front Audio connector (CN7)



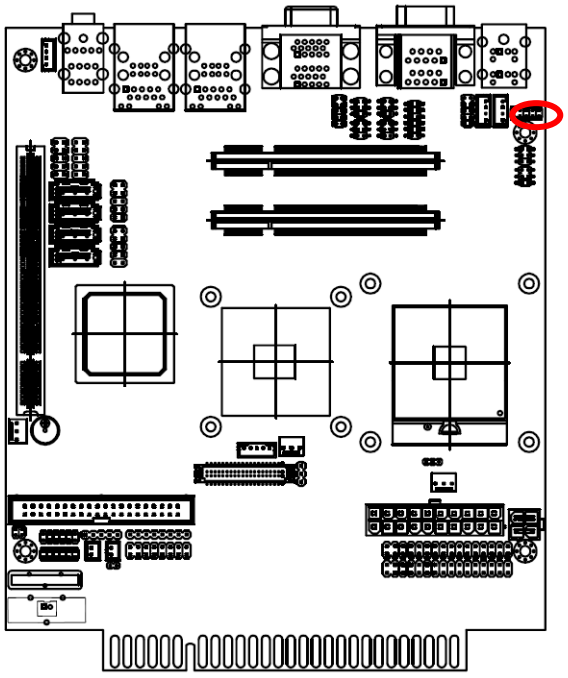
Signal	PIN	PIN	Signal
MIC_L	1	2	GND
MIC_R	3	4	+3.3V
LIN_R	5	6	MIC_JD
FRONT-IO-JD	7	8	NC
LIN_L	9	10	LIN_JD

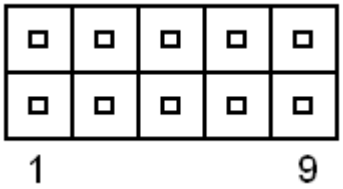
2.4.15 Side Audio connector (CN8)



Signal	PIN	PIN	Signal
LFE_OUT	1	2	GND
CEN_OUT	3	4	CEN_JD
SURR_ROUT	5	6	SIDE_R
SURR_JD	7	8	SIDE_JD
SURR_LOUT	9	10	SIDE_L

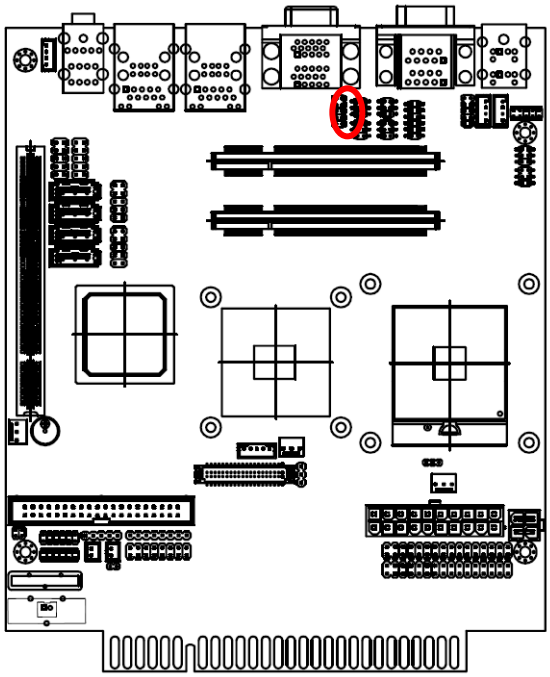
2.4.16 serial port connector 4 (CN9)

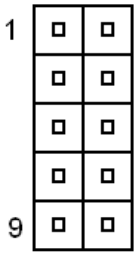




Signal	PIN	PIN	Signal
DCD	1	2	RxD
TxD	3	4	DRT
GND	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

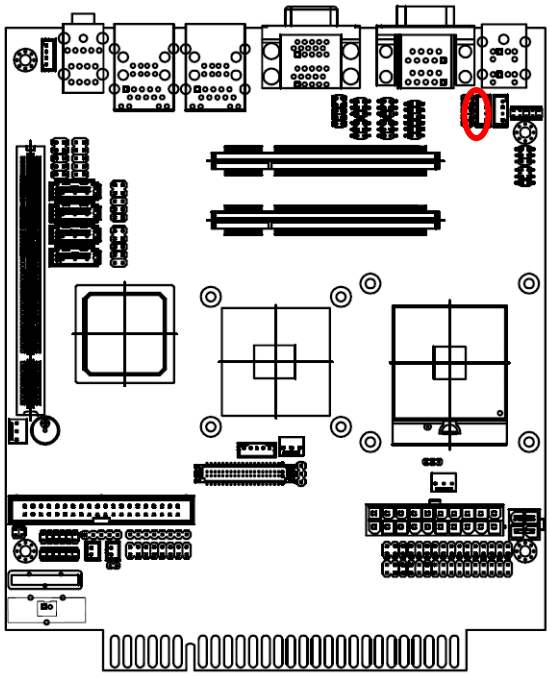
2.4.17 Serial port connector 5 (CN10)

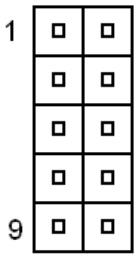




Signal	PIN	PIN	Signal
DCD	1	2	RxD
TxD	3	4	DRT
GND	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

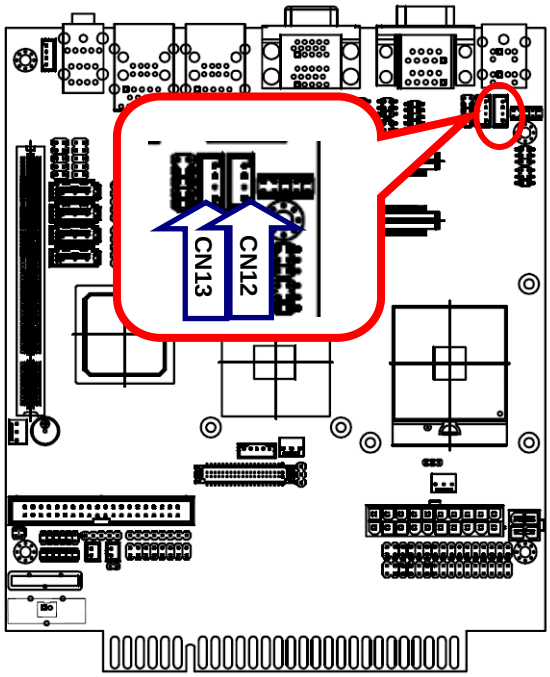
2.4.18 Serial port connector 3 (CN11)

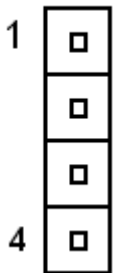




Signal	PIN	PIN	Signal
DCD	1	2	RxD
TxD	3	4	DRT
GND	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

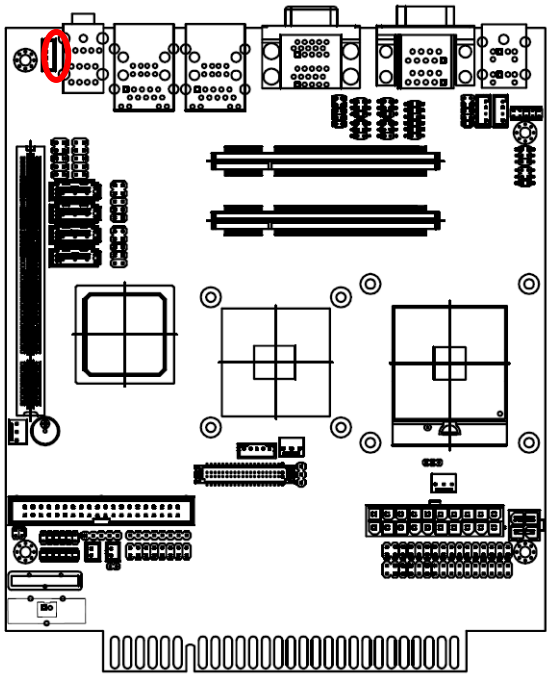
2.4.19 CC Talk connector 1 (CN12) /connector 2 (CN13)

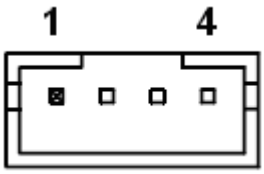




PIN	Signal
1	+5V
2	NC
3	GND
4	CT_DATA1/DATA2

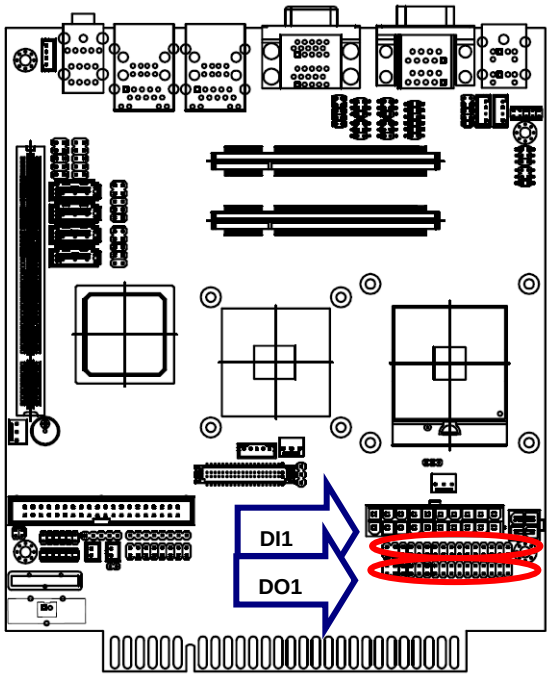
2.4.20 CD in connector (CN17)

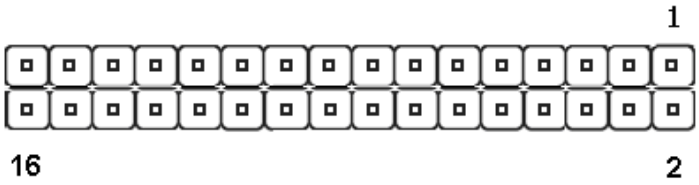




Signal	PIN
NC	1
CD_L	2
GND	3
CD_R	4

2.4.21 General purpose I/O connector (DI1, DO1)





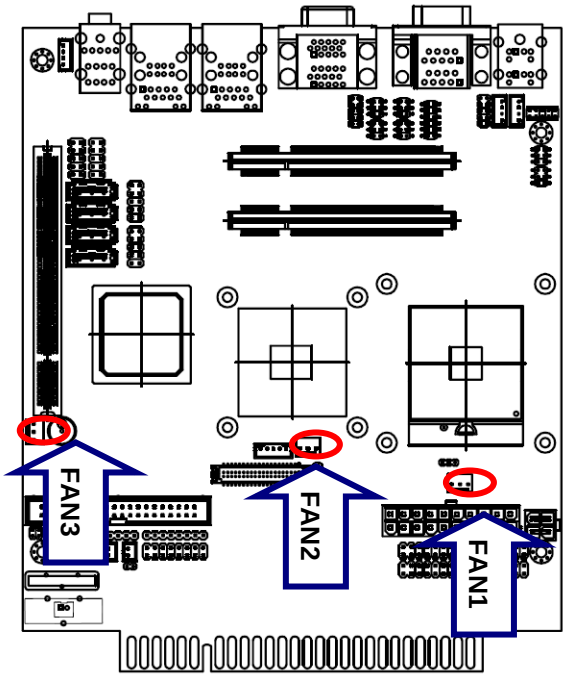
DI1

Signal	PIN	PIN	Signal
DI0	1	2	INPUT-I8
DI1	3	4	INPUT-I9
DI2	5	6	INPUT-I10
DI3	7	8	INPUT-I11
DI4	9	10	INPUT-I12
DI5	11	12	INPUT-I13
DI6	13	14	INPUT-I14
DI7	15	16	INPUT-I15
INPUT-I0	17	18	INPUT-I16
INPUT-I1	19	20	INPUT-I17
INPUT-I2	21	22	INPUT-I18
INPUT-I3	23	24	INPUT-I19
INPUT-I4	25	26	INPUT-I20
INPUT-I5	27	28	INPUT-I21
INPUT-I6	29	30	INPUT-I22
INPUT-I7	31	32	INPUT-I23

DO1

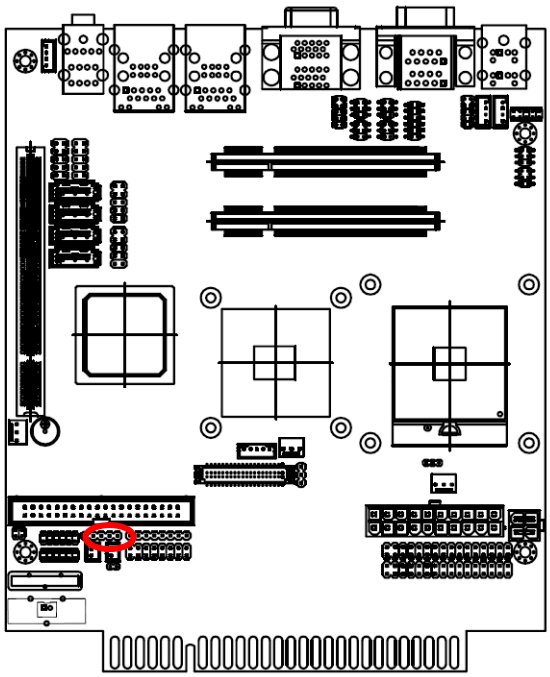
Signal	PIN	PIN	Signal
DO0	1	2	DO16
DO1	3	4	DO17
DO2	5	6	DO18
DO3	7	8	DO19
DO4	9	10	DO20
DO5	11	12	DO21
DO6	13	14	DO22
DO7	15	16	DO23
DO8	17	18	DO24
DO9	19	20	DO25
DO10	21	22	DO26
DO11	23	24	DO27
DO12	25	26	DO28
DO13	27	28	DO29
DO14	29	30	DO30
DO15	31	32	DO31

2.4.22 Fan connector (FAN1, FAN2, FAN3)



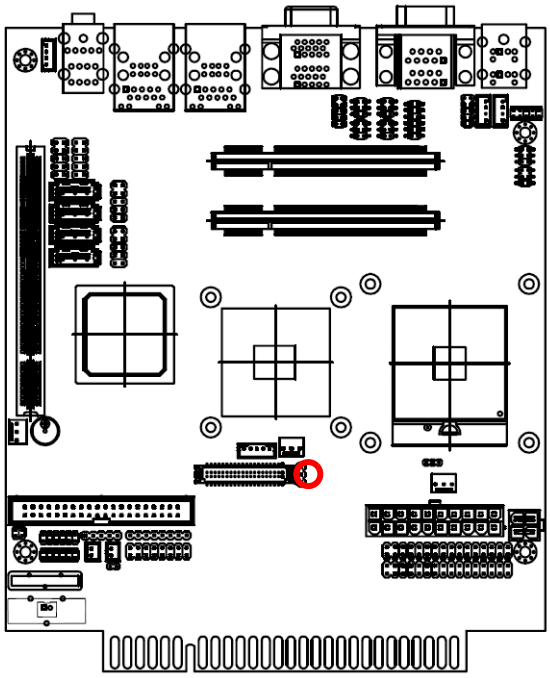
Signal	PIN
GND	1
+12V	2
TAC	3

2.4.23 Random Number Generator (JTAG1)

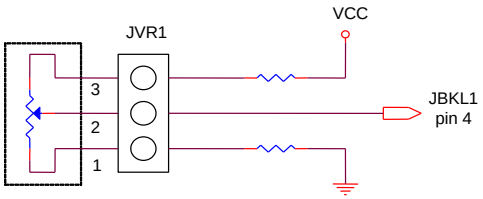


Signal	PIN
+3.3V	1
ICSPDAT	2
ICSPCLK	3
MCLR	4
GND	5

2.4.24 LVDS Back Light control connector (VR1)



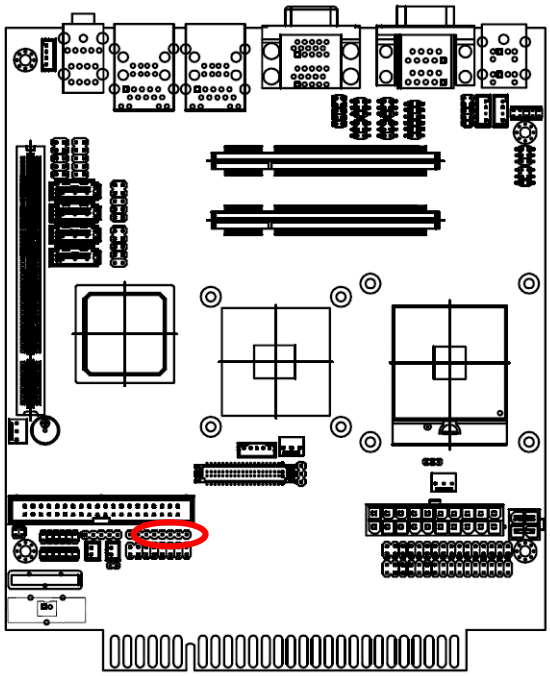
Signal	PIN
+5V	3
VBR	2
GND	1

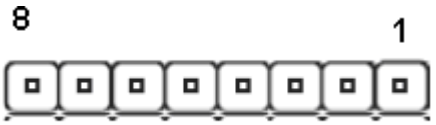


Variation Resistor

(Recommended: 4.7KΩ, >1/16W)

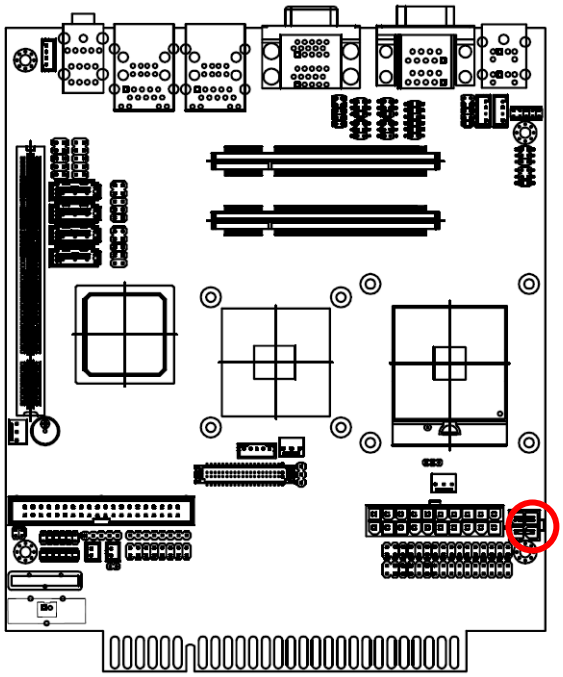
2.4.25 CPLD JTAG port (JTAG2)





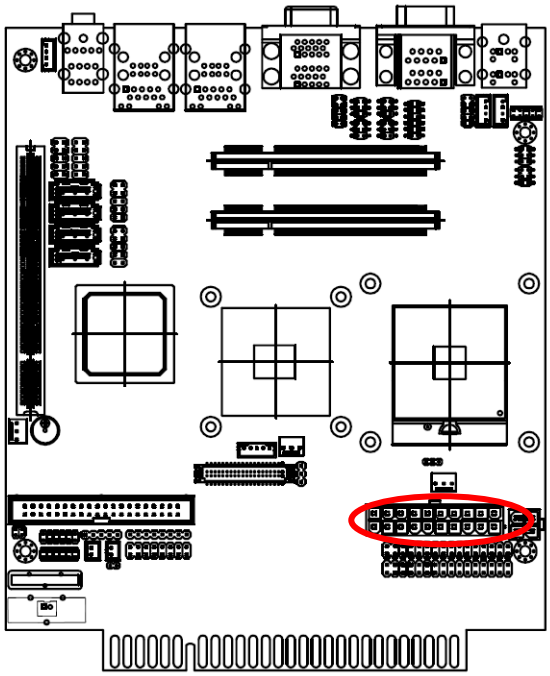
Signal	PIN
+3.3V	1
CPLD-TDO	2
CPLD-TDi	3
NC	4
NC	5
CPLD-TMS	6
GND	7
CPLD-TCK	8

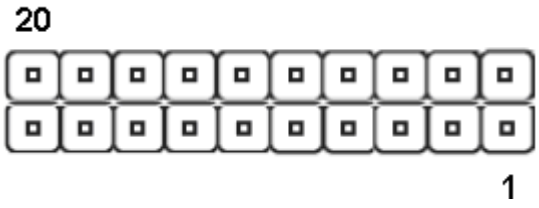
2.4.26 ATX-12V power connector (PWR1)



Signal	PIN	PIN	Signal
GND	2	3	+12V
GND	1	4	+12V

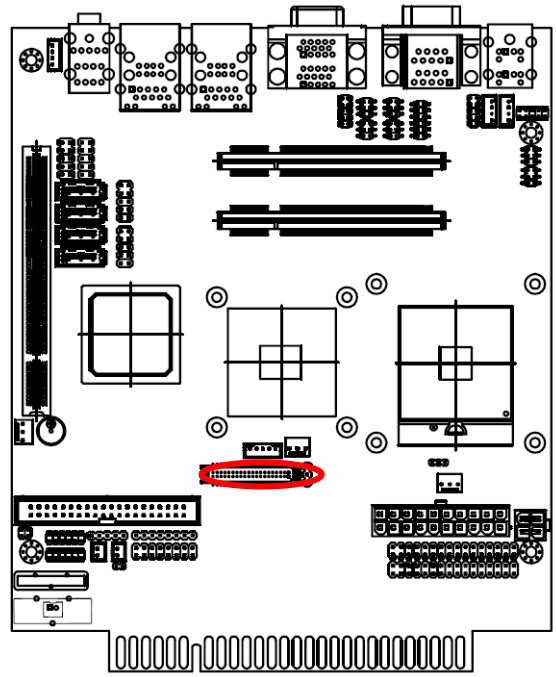
2.4.27 ATX power connector (PWR2)

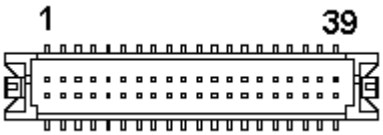




Signal	PIN	PIN	Signal
NC	11	1	NC
NC	12	2	NC
GND	13	3	GND
PS_ON	14	4	+5V
GND	15	5	GND
GND	16	6	+5V
GND	17	7	GND
-5V	18	8	NC
+5V	19	9	+5V_SB
+5V	20	10	+12V

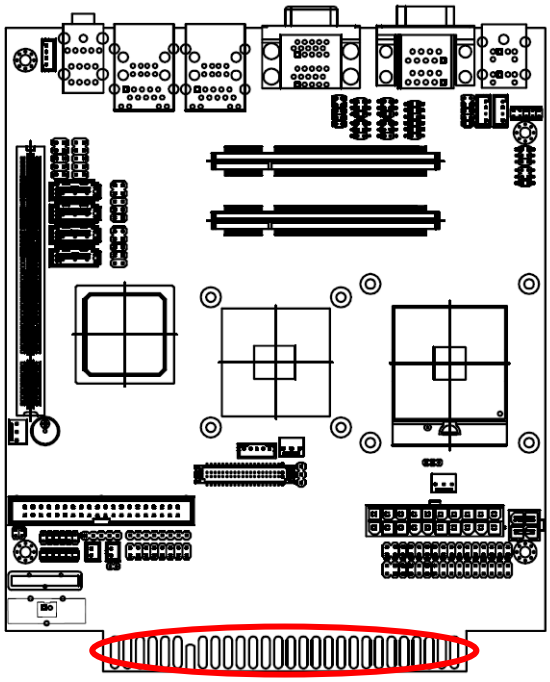
2.4.27 LVDS connector (LVDS2)





Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
I^2C_DAT	6	5	I^2C_CLK
GND	8	7	GND
Txout0	10	9	Txout1
Txout0#	12	11	Txout1#
GND	14	13	GND
Txout2	16	15	Txout3
Txout2#	18	17	Txout3#
GND	20	19	GND
E_Txout0	22	21	E_Txout1
E_Txout0#	24	23	E_Txout1#
GND	26	25	GND
E_Txout2	28	27	E_Txout3
E_Txout2#	30	29	E_Txout3#
GND	32	31	GND
Txclk	34	33	E_Txclk
Txclk#	36	35	E_Txclk#
GND	38	37	GND
+12V	40	39	+12V

2.4.28 JAMMA Interface (CN19)



Solder Side			Parts Side
GND	B1	A1	GND
GND	B2	A2	GND
+5V	B3	A3	+5V
+5V	B4	A4	+5V
-5V	B5	A5	-5V
+12V	B6	A6	+12V
METER2	B8	A8	METER1
LOCKOUT2	B9	A9	LOCKOUT1
SPEAKER-	B10	A10	SPEAKER+
AGND	B11	A11	AUDIO+
GREEN	B12	A12	RED
CSYNC	B13	A13	BLUE
SERVI_SW	B14	A14	GND
TILT_SW	B15	A15	TEST_SW
COIN2	B16	A6	COIN1
2P_START	B17	A17	1P_START
2P_UP	B18	A18	1P_UP
2P_DOWN	B19	A19	1P_DOWN
2P_LEFT	B20	A20	1P_LEFT
2P_RIGHT	B21	A21	1P_RIGHT
2P_BTN1	B22	A22	1P_BTN1
2P_BTN2	B23	A23	1P_BTN2
2P_BTN3	B24	A24	1P_BTN3
2P_BTN4	B25	A25	1P_BTN4
NC	B26	A26	NC
GND	B27	A27	GND
GND	B28	A28	GND

Note:

When ACP-GM45 gets +12V power through A6 and B6 and +5V through A3~A5 and B3~B5, MUST be careful for:

1. The input voltage must be within +/- 5% or ACP-GM45 might be damaged
2. PWR1 (ATX-12V power connector) need to get +12V from your power supplier for CPU usage
3. At this moment PWR2(ATX power connector) CAN NOT connect to other ATX power supply or ACP-GM45 might be damaged

2.5.1 ACP-GM45 JAMMA and DI/O Address Table

Table 1. JAMMA Connector pin-out

JAMMA Connector pin-out			
Solder Side		Parts Side	
Ground	A	1	Ground
Ground	B	2	Ground
+5V	C	3	+5V
+5V	D	4	+5V
-5V	E	5	-5V
+12V	F	6	+12V
Key	H	7	Key
Meter 2	J	8	Meter 1
Lockout 2	K	9	Lockout 1
Speaker -	L	10	Speaker +
Audio Ground	M	11	Audio +
Video Green	N	12	Video Red
Video Sync	P	13	Video Blue
Service Switch	R	14	Video Ground
Tilt Switch	S	15	Test Switch
Coin 2	T	16	Coin 1
Player 2 start	U	17	Player 1 start
Player 2 Up	V	18	Player 1 Up
Player 2 Down	W	19	Player 1 Down
Player 2 Left	X	20	Player 1 Left
Player 2 Right	Y	21	Player 1 Right
Player 2 Button 1	Z	22	Player 1 Button 1
Player 2 Button 2	Aa	23	Player 1 Button 2
Player 2 Button 3	Ab	24	Player 1 Button 3
Player 2 Button 4	Ac	25	Player 1 Button 4
Not used	Ad	26	Not used
Ground	Ae	27	Ground
Ground	Af	28	Ground

Note:

When ACP-GM45 gets +12V power through A6 and B6 and +5V through A3~A5 and B3~B5, MUST be careful for:

4. The input voltage must be within +/- 5% or ACP-GM45 might be damaged
5. PWR1 (ATX-12V power connector) need to get +12V from your power supplier for CPU usage

At this moment PWR2(ATX power connector) CAN NOT connect to other ATX power

supply or ACP-GM45 might be damaged

2.5.2 Table 2. Bit Map of JAMMA I/O

I/O BASE ADDRESS	I/O MODE	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
JP3+7	W	--	--	--	--	Lockout2(Pin-K)	Meter2 (Pin-J)	Lockout1 (Pin-9)	Meter1 (Pin-8)
JP3 +0C	R	Player 2 Right (Pin-Y)	Player 2 Left (Pin-X)	Player 2 Down (Pin-W)	Player 2 Up (Pin-V)	Player 2 Start (Pin-U)	Coin2 (Pin-T)	Tilt Switch (Pin-S)	Service Switch (Pin-R)
JP3 +0D	R	Player 1 Up (Pin-18)	Player 1 Start (Pin-17)	Coin1 (Pin-16)	Test Switch (Pin-15)	Player 2 Button4 (Pin-Ac)	Player 2 Button3 (Pin-Ab)	Player 2 Button2 (Pin-Aa)	Player 2 Button1 (Pin-Z)
JP3+0E	R	--	Player 1 Button4 (Pin-25)	Player 1 Button3 (Pin-24)	Player 1 Button2 (Pin-23)	Player 1 Button1 (Pin-22)	Player 1 Right (Pin-21)	Player 1 Left (Pin-20)	Player 1 Down (Pin-19)

Note:

1. I/O Mode: R – Read, W – Write

I/O base address +0D = 20Dh, if I/O base address is 200h

Table 3. Bit Map of Digital I/O

I/O BASE ADDRESS	I/O MODE	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
JP3+8	W	DO7	DO6	DO5	DO4	DO3	DO2	DO1	DO0
JP3+9	W	DO15	DO14	DO13	DO12	DO11	DO10	DO9	DO8
JP3+0A	W	DO23	DO22	DO21	DO20	DO19	DO18	DO17	DO16
JP3+0B	W	DO31	DO30	DO29	DO28	DO27	DO26	DO25	DO24
JP3+0C	R	DI7	DI6	DI5	DI4	DI3	DI2	DI1	DI0
JP3+0D	R	DI15	DI14	DI13	DI12	DI11	DI10	DI9	DI8
JP3+0E	R	DI23	DI22	DI21	DI20	DI19	DI18	DI17	DI16
JP3+0F	R	DI31	DI30	DI29	DI28	DI27	DI26	DI25	DI24

Note:

1. Some digital I/O are multiplexed with the JAMMA I/O

3. BIOS Setup

3.1 Starting Setup

The AwardBIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <Del> immediately after switching the system on, or

By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.2 Using Setup

In general, you 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. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

- **Navigating Through The Menu Bar**

  Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.3 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.4 In Case of Problems

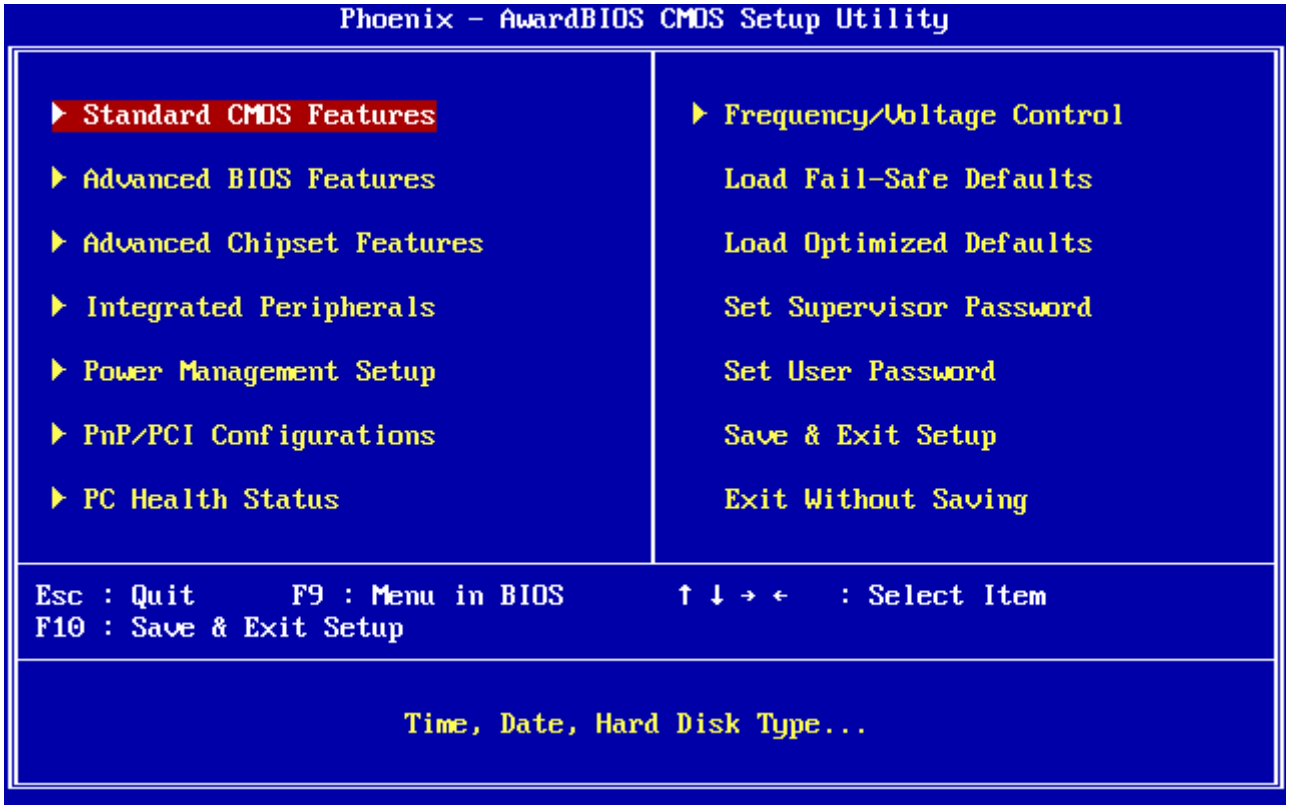
If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AwardBIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.5 Main Menu

Once you enter the AwardBIOS™ 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 accept and enter the sub-menu.

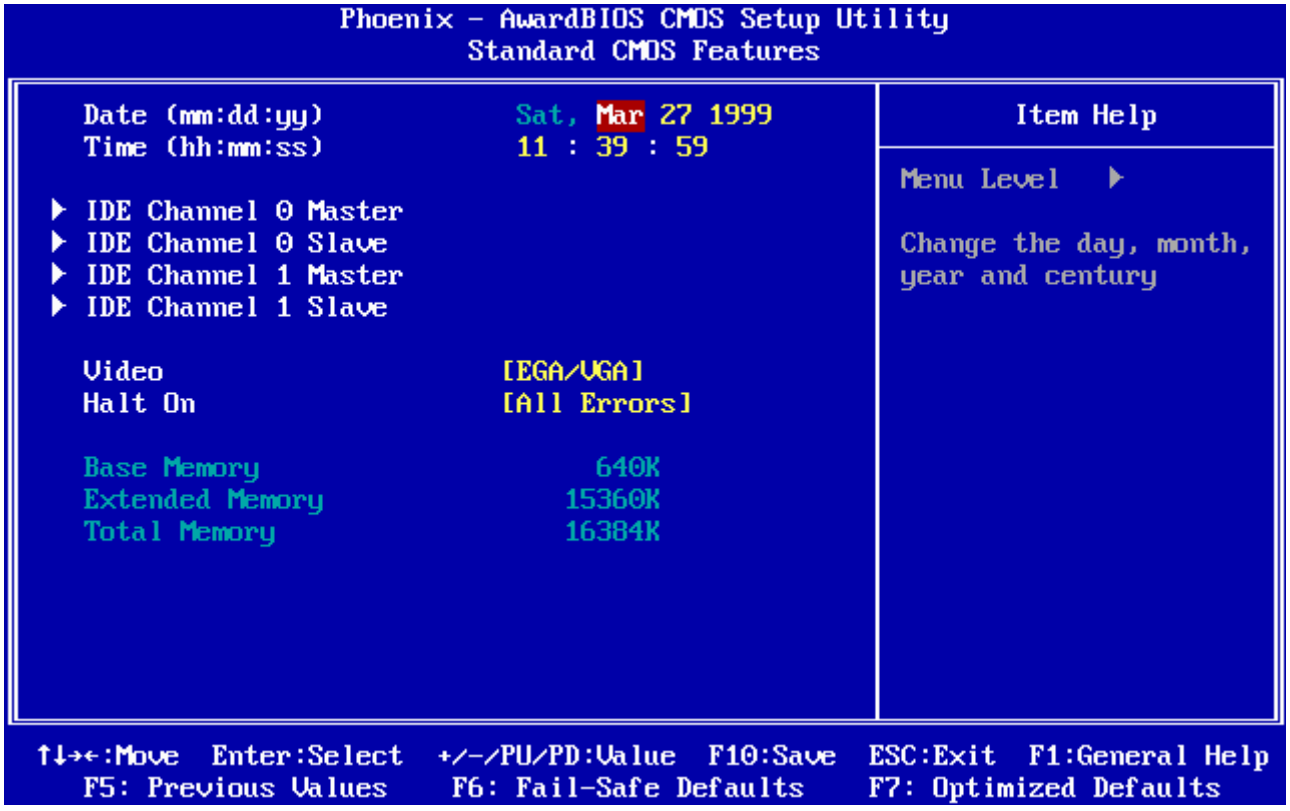
Note that a brief description of each highlighted selection appears at the bottom of the screen.



Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.5.1 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into few categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



3.5.1.1 Main Menu Selection

This reference table shows the selections that you may make on the Main Menu.

Item	Options	Description
Time	HH : MM : SS	Set the system time
IDE Channel 0 Master IDE Channel 0 Slave IDE Channel 1 Master IDE Channel 1 Slave	Options are in 3.5.1.2	Press <Enter> to enter the sub menu of detailed options
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard	Select the situation in which you want the BIOS to stop the POST process and notify you

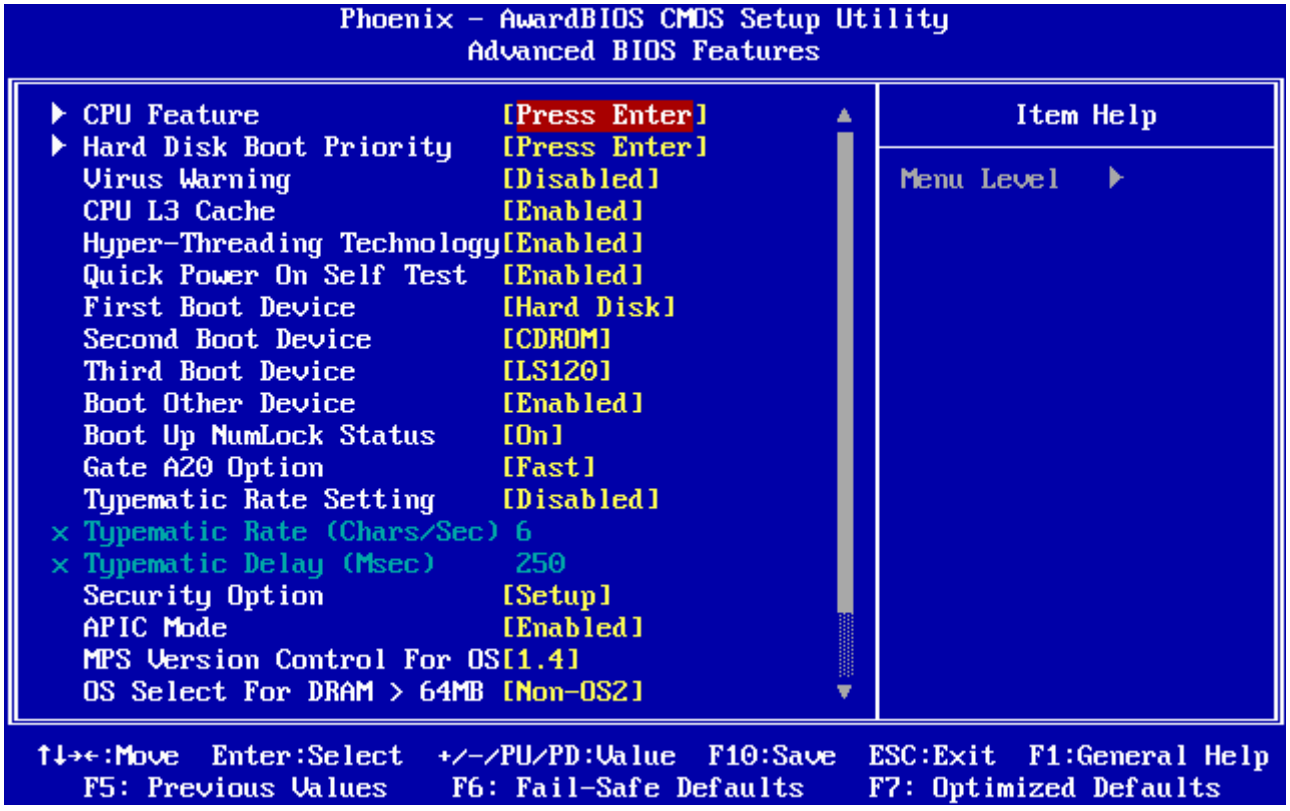
3.5.1.2 IDE Adapter Setup

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive. The below table will shows the IDE primary master sub menu.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master IDE Channel 0 Slave IDE Channel 1 Master IDE Channel 1 Slave	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Channel …' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

3.5.2 Advanced BIOS Features

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



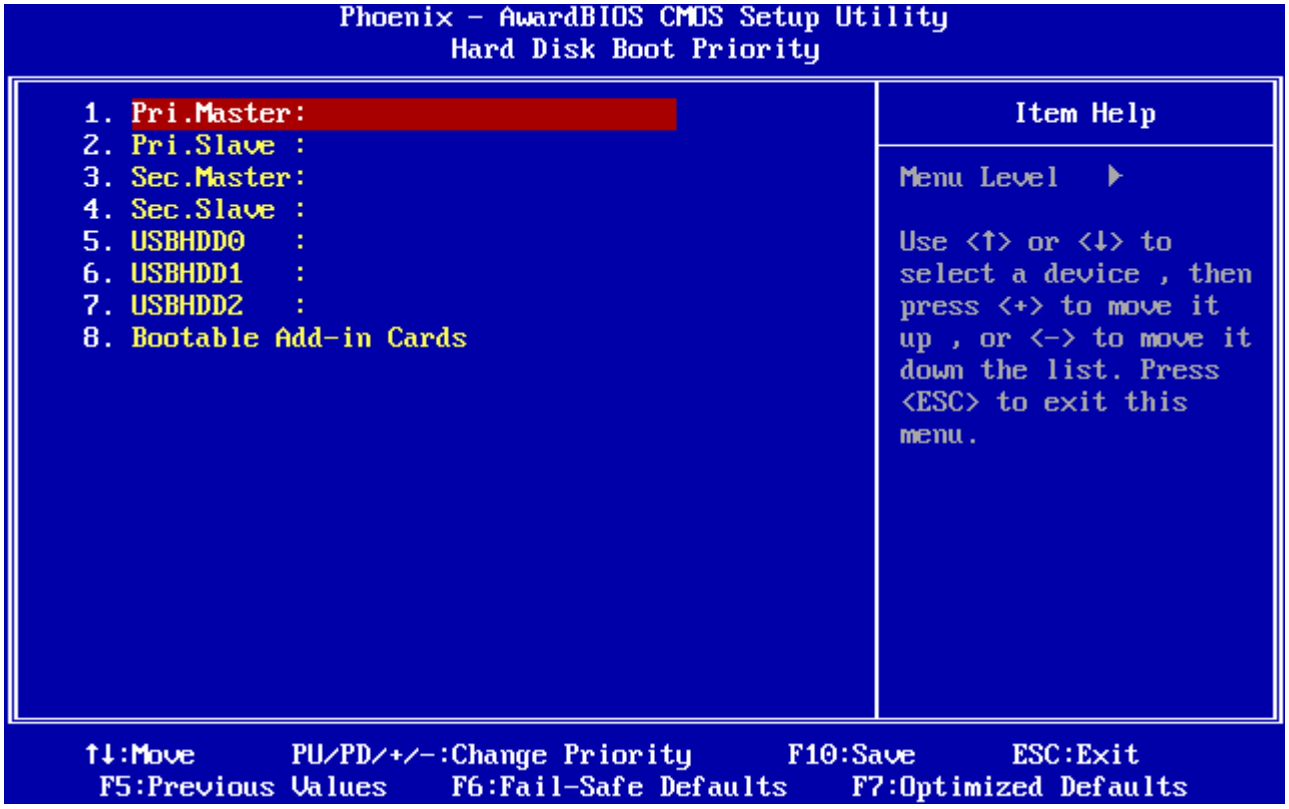
3.5.2.1 CPU Feature

This item allows you to setup the CPU thermal management function.

Item	Options	Description
Delay Prior to Thermal	4, 8, 16, 32 Min	Allow the Thermal Monitor to be activated of certain minutes in automatic mode after the system boots.
Thermal Management	Thermal Monitor 1 Thermal Monitor 2	Allow to choose the thermal management method of the monitor.
TM2 Bus Ratio	0~255	Represents the frequency. Bus ratio of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.
TM2 Bus VID	0.700 ~ 1.708	Represents the voltage of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot.
Limit CPUID MaxVal	Disable Enable	In order to mask the physical CPUID for Proscott core when running WinNT, Award BIOS provides "Limit CPUID MaxVal" feature. Enabling this feature will make the main board BIOS respond "suitable", "virtual" CPUID to OS kernel. So WinNT or the legacy OS can use the masked CPUID to work well with the new CPU design.
C1E Function	Auto, Disabled	The C1E function enables the Core 2

		Extreme to throttle back to its standard clock rate under light load
Execute Disable Bit	Enabled, Disabled	It can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.
Virtualization Technology	Enabled, Disabled	This BIOS feature is used to enable or disable the Intel Virtualization Technology (IVT) extensions that allow multiple operating systems to run simultaneously on the same system.

3.5.2.2 Hard Disk Boot Priority



This item allows you to set the boot priority of the hard drives installed in the system.

Item	Description
Pri./Sec. Master/Slave	Boot up from IDE Primary/Secondary Master/Slave Hard Disk
USBHDD 0/1/2	Boot up from 1st/2nd/3rd USB Hard Disk
Bootable Add-in Cards	Boot up from other Add-In Card Hard Disk Device.

3.5.2.3 Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Item	Description
Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

3.5.2.4 CPU L1 & L2 & L3 Cache

The item allows you to speed up memory access. However, it depends on CPU design.

Item	Description
Enabled	Enable cache
Disabled	Disable cache

3.5.2.5 Hyper-Threading Technology

The item allows you to enable HT Technology. However, it depends on CPU design.

Item	Description
Enabled	Enable cache
Disabled	Disable cache

3.5.2.6 Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Item	Description
Enabled	Enable quick POST
Disabled	Normal POST

3.5.2.7 First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Item	Description
LS120	LS120 Device
Hard Disk	Hard Disk Device
CDROM	CDROM Device
ZIP100	ZIP-100 Device
USB-FDD	USB Floppy Device
USB-ZIP	USB ZIP Device
USB-CDROM	USB CDROM Device
LAN	Network Device
Disabled	Disabled any boot device

3.5.2.8 Boot Up NumLock Status

Select power on state for NumLock.

Item	Description
On	Enable NumLock
Off	Disable NumLock

3.5.2.9 Gate A20 Option

Select if chipset or keyboard controller should control Gate A20.

Item	Description
Normal	A pin in the keyboard controller controls Gate A20
Fast	Lets chipset control Gate A20

3.5.2.10 Typematic Rate Setting

This feature enables you to control the keystroke repeat rate when you depress a key continuously. When enabled, you can manually adjust the settings using the two typematic controls (Typematic Rate and Typematic Delay). If disabled, the BIOS will use the default setting.

Item	Description
Enabled	Enable typematic rate/delay setting
Disabled	Disable typematic rate/delay setting

3.5.2.11 Typematic Rate (Chars/Sec)

This is the rate at which the keyboard will repeat the keystroke if you press it continuously. This setting will only work if Typematic Rate Setting is enabled..

Options: 6, 8, 10, 12, 15, 20, 24, 30

3.5.2.12 Typematic Delay (Msec)

This is the delay, in milliseconds, before the keyboard automatically repeats the keystroke that you have pressed continuously. This setting will only work if Typematic Rate Setting is enabled.

Options: 250, 500, 750, 1000

3.5.2.13 Security Option

Select whether the password is required every time the system boots or only when you enter setup.

Item	Description
System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	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 PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

3.5.2.14 APIC Mode

The BIOS supports versions 1.4 of the Intel multiprocessor specification. When enabled, The MPS Version 1.4 Control for OS can be activated.

The choice: Enabled/Disabled.

3.5.2.15 MPS Version Control For OS

This feature is only applicable to multiprocessor board as it specifies the version of the Multi-Processor Specification (MPS) that the board will use.

The choice: 1.4, 1.1.

3.5.2.16 OS Select for DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

Item	Description
Non-OS2	Disable OS for over 64 MB DRAM
OS2	Enable OS for over 64 MB DRAM

3.5.2.17 Report No FDD For WIN95

The original Windows95 requires the presence of a floppy. Unless the BIOS tells it to disregard the absence of the drive, it will generate an error message. For other operating systems as Win98 etc this field is without relevance.

Item	Description
No	Don’t generate error message
Yes	Generate error message

3.5.2.18 Small Logo (EPA) Show

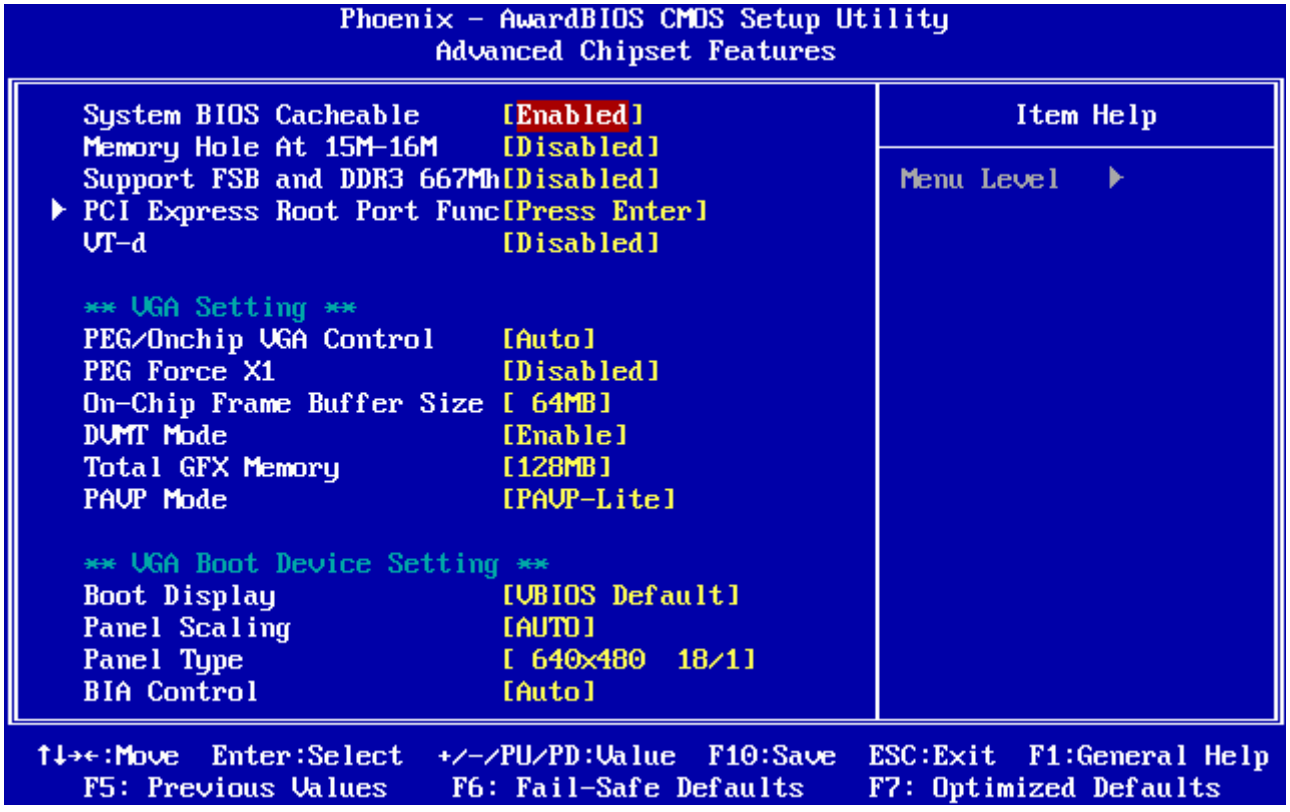
This item allows you enabled/disabled the small EPA logo show on screen at the POST step.

Item	Description
Enabled	EPA Logo show is enabled
Disabled	EPA Logo show is disabled

3.5.3 Advanced Chipset Features

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

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.



3.5.3.1 System BIOS Cacheable

Enabling this feature allows the caching of the motherboard BIOS ROM from **F0000h** to **FFFFFh** by the processor's **Level 2 cache**. This greatly speeds up accesses to the BIOS.

3.5.3.2 Memory Hole At 15M-16M

This item controls the time delay (in clock cycles - CLKs) that passes before the SDRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. In other words, the lower the

latency, the faster the transaction.
The choices: 5, 4, 3, 6, Auto.

3.5.3.3 Support FSB and DDR3 667Mh

This option allows you to insert a delay between the RAS (**Row Address Strobe**) and CAS (**Column Address Strobe**) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Naturally, reducing the delay improves the performance of the SDRAM while increasing it reduces performance.
The choices: 2, 3, 4, 5, 6, Auto.

3.5.3.4 PCI Express Boot Port Func

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. Reducing the precharge time to **2** improves SDRAM performance but if the precharge time of **2** is insufficient for the installed SDRAM, the SDRAM may not be refreshed properly and it may fail to retain data
So, for better SDRAM performance, set the **SDRAM RAS Precharge Time** to **2** but increase it to **3** if you face system stability issues after reducing the precharge time.
The choices: 2, 3, 4, 5, 6, Auto.

3.5.3.5 VT-d

It allows controlling 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. If the tRAS period is too long, it can reduce performance by unnecessarily delaying the deactivation of active rows. Reducing the tRAS period allows the active row to be deactivated earlier.
If the tRAS period is too short, there may not be enough time to complete a burst transfer. This reduces performance and data may be lost or corrupted.
The choices: Auto, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

3.5.3.6 PEG/Onchip VGA Control

It allows controlling the system memory frequency. The memory frequency will either be equal to or less than the processor system bus frequency.
The choices: Auto, 400MHz, 533MHz.

3.5.3.7 PEG force × 1

This BIOS feature allows you to convert a PCI Express X16 slot into a PCI Express X1 slot.When **enabled**, the PCI Express X16 slot will be forced to run in the PCI Express X1 mode.When **disabled**, the PCI Express X16 slot will be allowed to run in its normal PCI Express X16 mode.

3.5.3.8 On-Chip Frame buffer Size

This feature is only valid when the video BIOS is shadowed. It enables or disables the caching of the video BIOS ROM at **C0000h-C7FFFh** via the L2 cache. This greatly speeds up accesses to the video BIOS. However, this does **not** translate into better system performance because the OS bypasses the BIOS using the graphics driver to access the video card's hardware directly.

The Choice: Enabled, Disabled.

3.5.3.9 DVMT Mode

Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB.

The choice: Enable, Disable.

3.5.3.10 Total GFX Memory

3.5.3.11 PAVP Mode

3.5.3.12 Boot Display

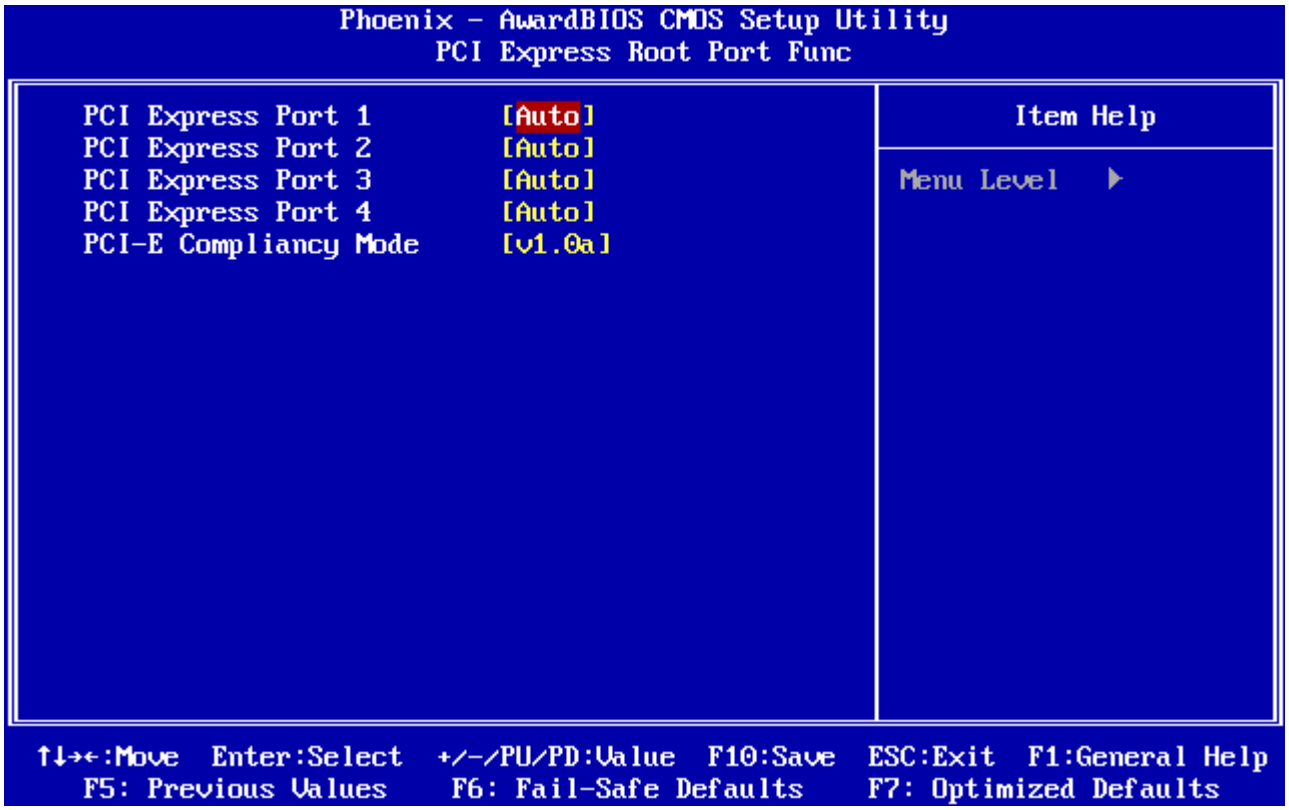
3.5.3.13 Panel Scaling

3.5.3.14 Panel Type

3.5.3.15 BIA Control

3.5.3.16 PCI Express Root Port Func

For the PCI Express root ports, the assignment of a function number to a root port is not fixed. This item allows you to re-assign the function numbers on a port by port basis. You can disable/hide any root port and have still have functions 0 thru N-1 where N is the total number of enabled root ports.



The choices: Auto, Enabled, Disabled.

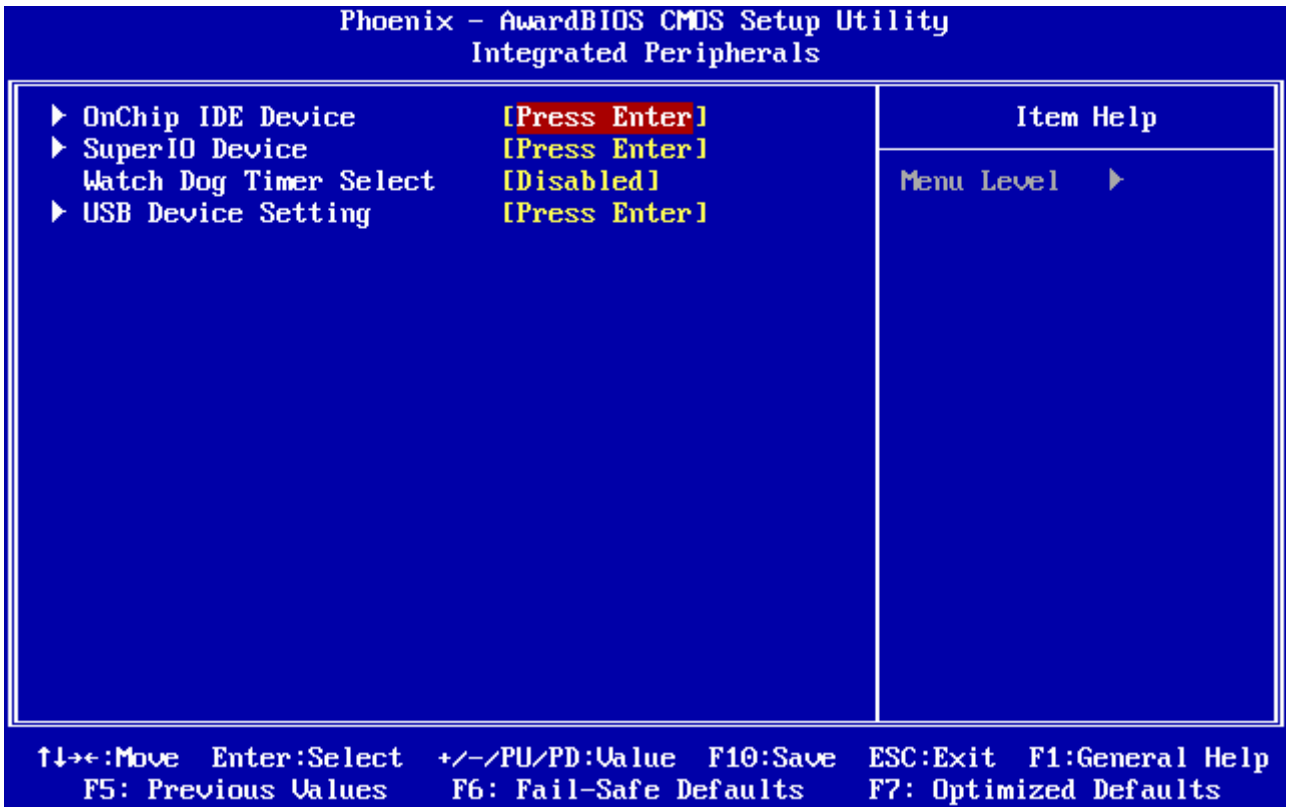
3.5.3.17 PCI-E Compliancy Mode

This feature is used to select the compliancy mode for PCI-E.

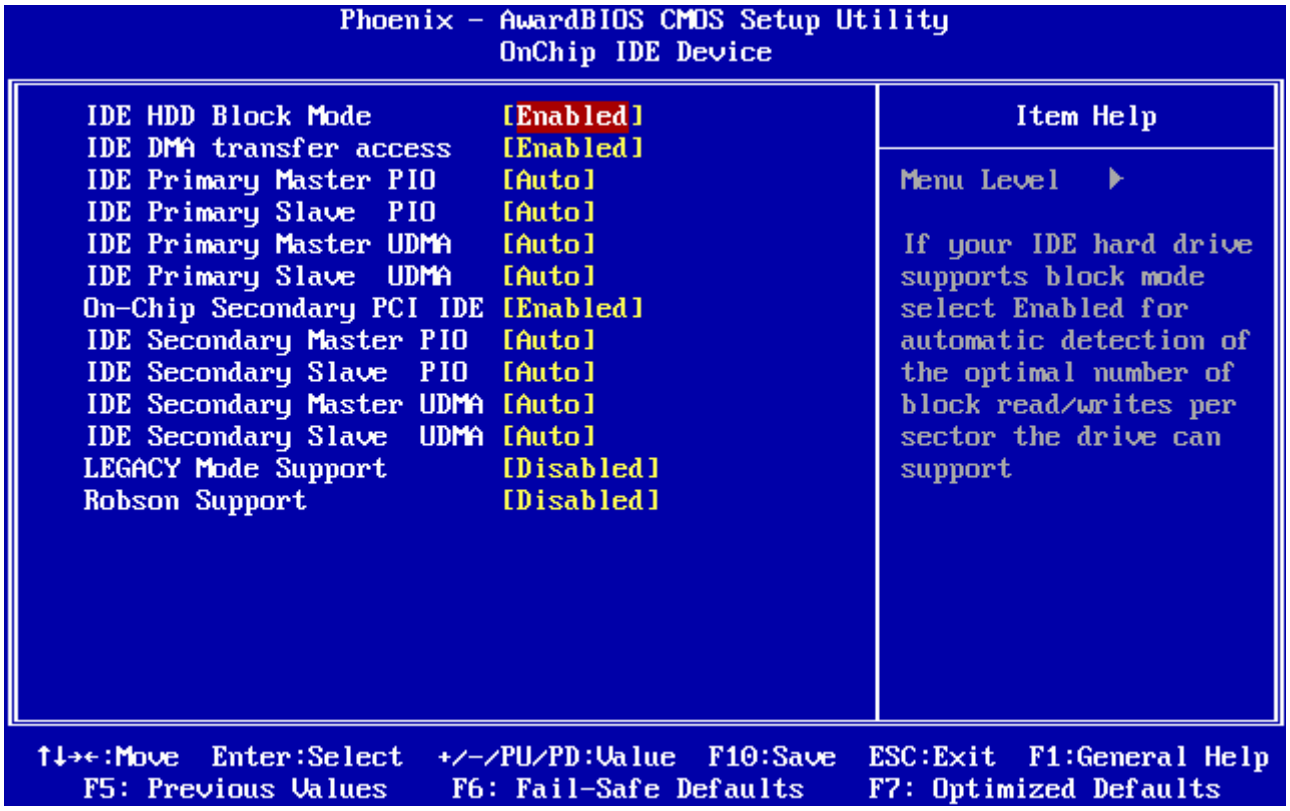
The choices: v.1.0a, v1.0

3.5.4 Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.



3.5.4.1 OnChip IDE Device



The chipset contains a PCI IDE interface with support for one IDE channel and two SATA

channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

Item	Options	Description
IDE HDD Block Mode	Enabled Disabled	Speeds up HDD access by transferring data from multiple sectors at once instead of using the old single sector transfer mode if the HDD supports block transfers and configure the proper block transfer settings for it. Up to 64KB of data can be transferred per interrupt with IDE HDD Block Mode enabled. (Virtually all HDDs now support block transfers.)
IDE DMA transfer access	Enabled Disabled	It allows you to enable or disable DMA (Direct Memory Access) support for all IDE devices. If you disable this BIOS feature, the BIOS will disable DMA transfers for all IDE drives. They will revert to PIO mode transfers. If you enable this BIOS feature, the BIOS will enable DMA transfers for all IDE drives. The proper DMA mode will be detected at boot-up. If the drive does not support DMA transfers, then it will use PIO mode instead.
On-Chip Primary/Secondary PCI IDE	Enabled Disabled	The integrated peripheral controller contains an IDE interface with support for two IDE channels. It allows you to activate each channel separately.
IDE Primary Master PIO **IDE Primary Slave PIO** **IDE Secondary Master PIO** **IDE Secondary Slave PIO**	Auto Mode 0 Mode 1 Mode 2 Mode 3 Mode 4	The IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
IDE Primary Master UDMA **IDE Primary Slave UDMA** **IDE Secondary Master UDMA** **IDE Secondary Slave UDMA**	Auto Disabled	Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If the hard drive and the system software both support Ultra DMA, select Auto to enable BIOS support.

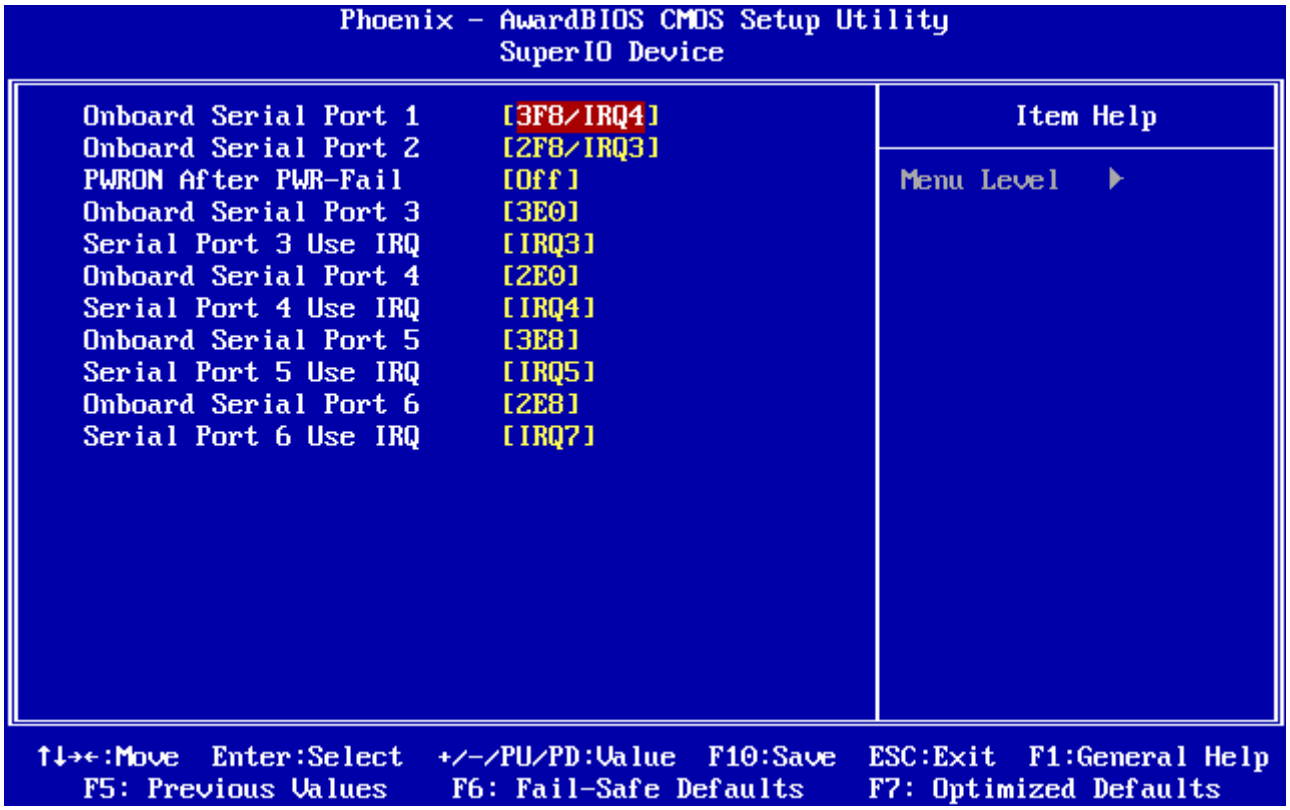
3.5.4.1.1 LEGACY Mode Support

Computing, legacy mode is a state in which a computer system, component, or software application behaves in a way different from its standard operation in order to support older software, data, or expected behavior. It differs from backward compatibility in that an item in this state will often sacrifice newer features or performance, or be unable to access data or run programs it normally could, in order to provide continued access to older data or functionality. Sometimes it can allow newer technologies that replaced the old to emulate them when running older operating systems

3.5.4.1.2 Robson Support

uses NAND flash memory modules to reduce the time it takes for a computer to power up, access programs, and write data to the hard drive

3.5.4.2 Super IO Device



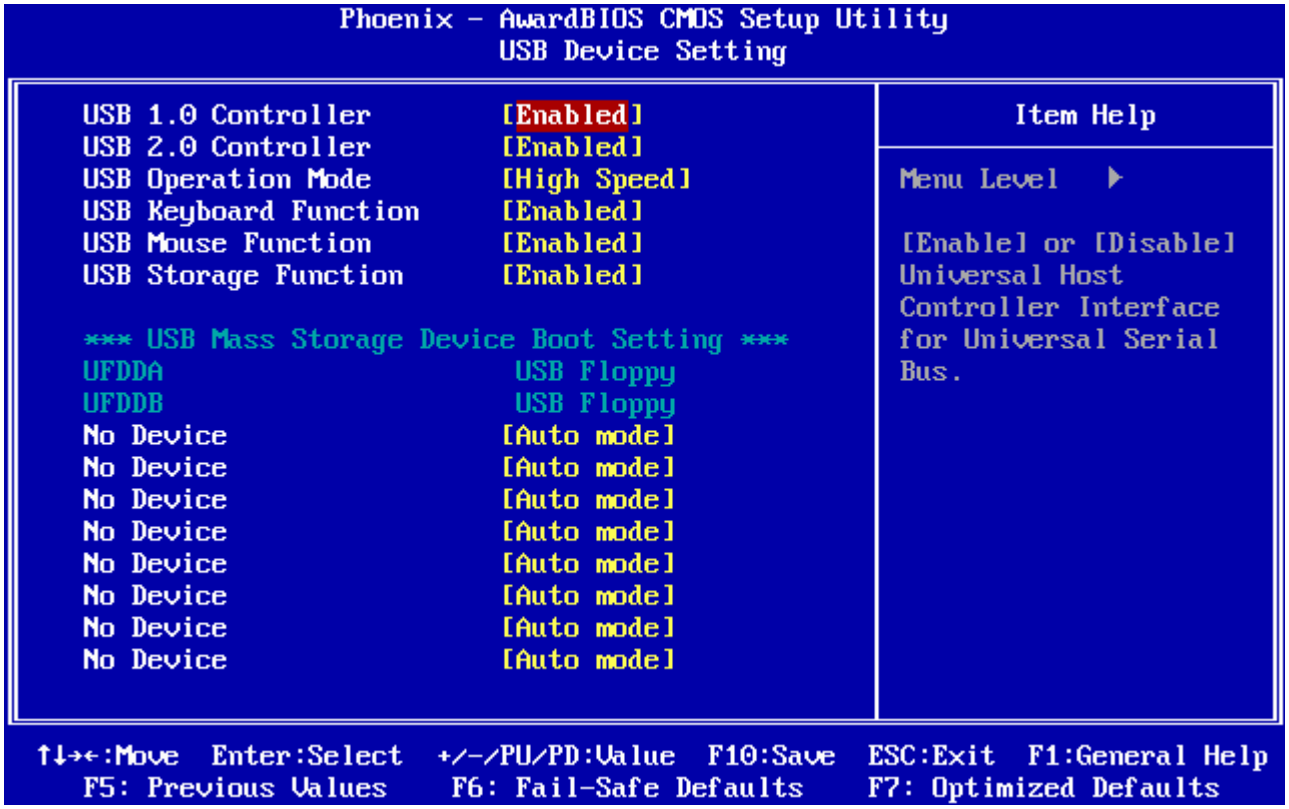
Item	Options	Description
Onboard Serial Port 1 Onboard Serial Port 2 Onboard Serial Port 3 Onboard Serial Port 4 Onboard Serial Port 5 Onboard Serial Port 6	Disabled, 3F8/IRQ4 2F8/IRQ3, 3E8/IRQ4 2E8/IRQ3, Auto	Select an address and corresponding interrupt for the first and second serial ports.
PWRON After PWR-Fail	On / Off	This BIOS feature allows you to set the PC to automatically start itself up after a power failure.When set to **On**, the PC will automatically start up when power is restored. When set to **Off**, the PC will remain powered off even when power is restored.
Serial Port 3 Use IRQ Serial Port 4 Use IRQ Serial Port 5 Use IRQ Serial Port 6 Use IRQ	IRQ3, IRQ4,IRQ5,IRQ7,IRQ9 ,IRQ10,IRQ11	Select an address and corresponding interrupt for the third to sixth serial ports.

3.5.4.3 Watch Dog Timer

This option will determine watch dog timer.

The choices: Disabled, 30,40,50,60 Sec, 1, 2, 4 Min.

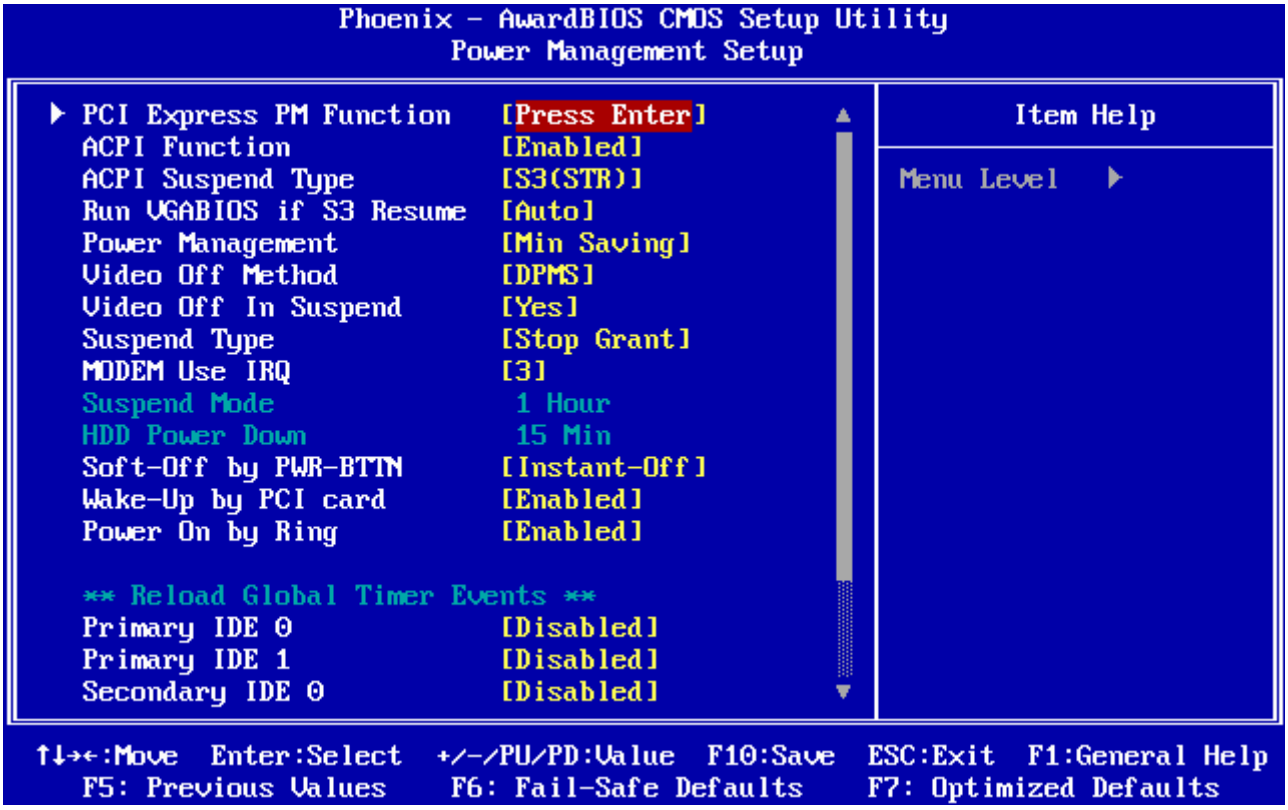
3.5.4.4 USB Device Setting



Item	Options	Description
USB 1.0 Controller	Disabled Enabled	This item enables you to use the onboard USB 1.0 controller to communicate with your USB devices
USB 2.0 Controller	Disabled Enabled	This item enables you to use the onboard USB 2.0 controller to communicate with your USB devices
USB Operation Mode	Full/Low Speed High Speed	This item allows you to select the USB mode.
USB Keyboard Function	Disabled Enabled	This BIOS feature determines if support for the USB keyboard should be provided by the operating system or the BIOS.
USB Mouse Function	Disabled Enabled	This BIOS feature determines if support for the USB mouse should be provided by the operating system or the BIOS.
USB Storage Function	Disabled Enabled	This BIOS feature determines if support for the USB Storage should be provided by the operating system or the BIOS.

3.5.5 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.



3.5.5.1 PCI Express PM Function

This item allows you to enable/disable the PCI Express PME Function.

The choices: Enabled, Disabled.

3.5.5.2 ACPI Function

This item allows you to enable/disable the ACPI function.

The choices: Enabled, Disabled.

3.5.5.3 ACPI Suspend Type

This item will set which ACPI suspend type will be used.

The choices: S1(POS), S3(STR).S1&S3.

3.5.5.4 Run VGABIOS if S3 Resume

There are 3 modes for you to decide to operate VGABIOS or not when the ACPI suspend type is S3.

The choices: Auto, Yes, No.

3.5.5.5 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

Item	Description
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Min. Saving	Minimum power management, HDD Power Down = 15 Min,
Max. Saving	Maximum power management, HDD Power Down =1 Min,

3.5.5.6 Video Off Method

This determines the manner in which the monitor is blanked.

The choices: Blank Screen, V/H SYNC+Blank, DPMS.

3.5.5.7 Video Off In Suspend

This determines the manner in which the monitor is blanked.

The choice: No, Yes.

3.5.5.8 Suspend Type

This function allows to select Suspend type.

The choices: Stop Grant, PwrOn Suspend.

3.5.5.9 MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choices: NA, 3, 4, 5, 7, 9, 10, 11.

3.5.5.10 Suspended Mode

It specifies the length of time of system inactivity while in full power on state before the computer enters suspend mode and motivates the enable 'Wake Up Events In Doze & Standby' / 'PM Events'.

The choices: Disabled, 1, 2, 4, 8, 12, 20, 30, 40 mins, 1 hr.

3.5.5.11 HDD Power Down

When enable and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choices: Disabled, 1 ~ 15 mins.

3.5.5.12 Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung".(Only could working on ATX Power supply)

The choices: Delay 4 Sec, Instant-Off.

3.5.5.13 Wake Up by PCI Card

This will enable the system to wake up through PCI Card peripheral.

The choices: Enable, Disabled.

3.5.5.14 Power On By Ring

This determines whether the system boot up if there's an incoming call from the Modem.

The choices: Enable, Disabled.

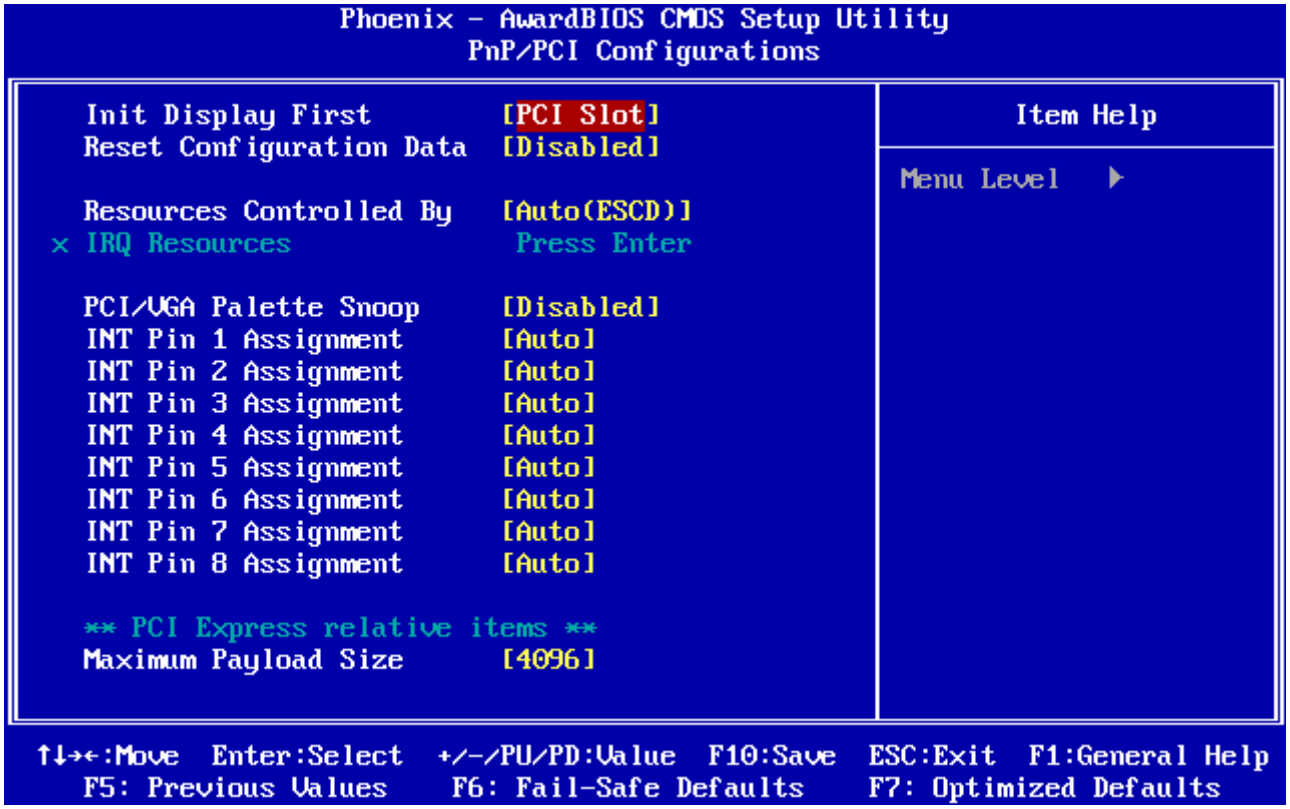
3.5.5.15 Primary/Secondary IDE 0/1, FDD,COM,LPT PORT, PCI PIRQ[A-D]#

Reload Global Timer events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awake the system from such a mode. In effect ,the system remain alert for anything which occurs to a device which is configured as Enabled ,even when the system is in a power down mode.

The choices: Enabled, Disabled.

3.5.6 PnP / PCI Configuration

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



3.5.6.1 Init Display First

It allows you to select whether to boot the system using the AGP graphics card or the PCI graphics card. This is particularly important if you have AGP and PCI graphics cards but only one monitor.

The choices: PCI Slot, Onboard, PCIEx.

3.5.6.2 Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

The choices: Enabled, Disabled.

3.5.6.3 Resources Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to “manual” choose specific resources by going into each of the sub menu that

follows this field (a sub menu is preceded by a "➢").

The choices: Auto(ESCD), Manual.

3.5.6.4 PCI / VGA Palette Snoop

Leave this field at Disabled.

The choices: Enabled, Disabled.

3.5.6.5 INT Pin 1/2/3/4/5/6/7/8 Assignment

This feature allows you to assign the PCI IRQ numbers for PCI slots. Selecting the default, Auto, allows the PCI controller to automatically allocate the IRQ numbers.

The choices: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15.

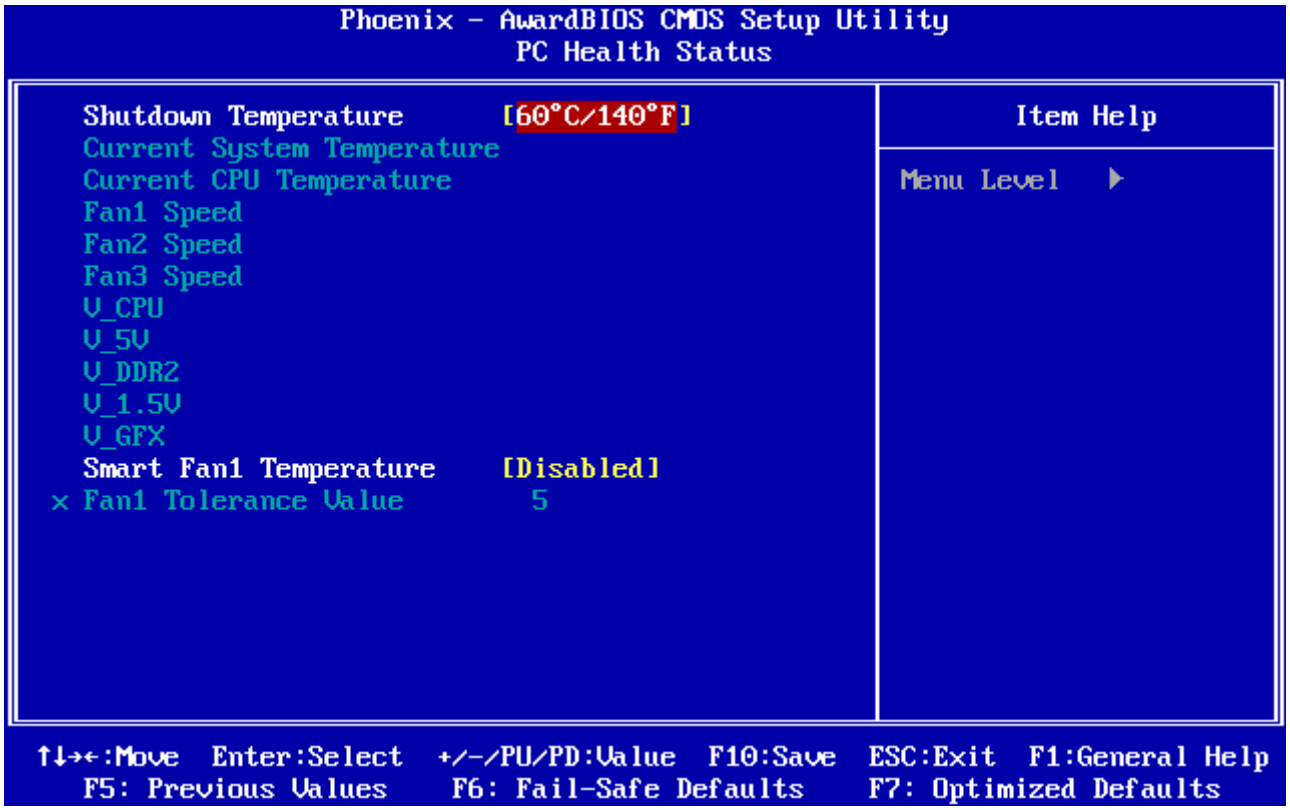
3.5.6.6 Maximum Payload Size

This setting defines the maximum payload size.

The choices: 128, 256, 512, 1024, 2048, 4096.

3.5.7 PC Health Status

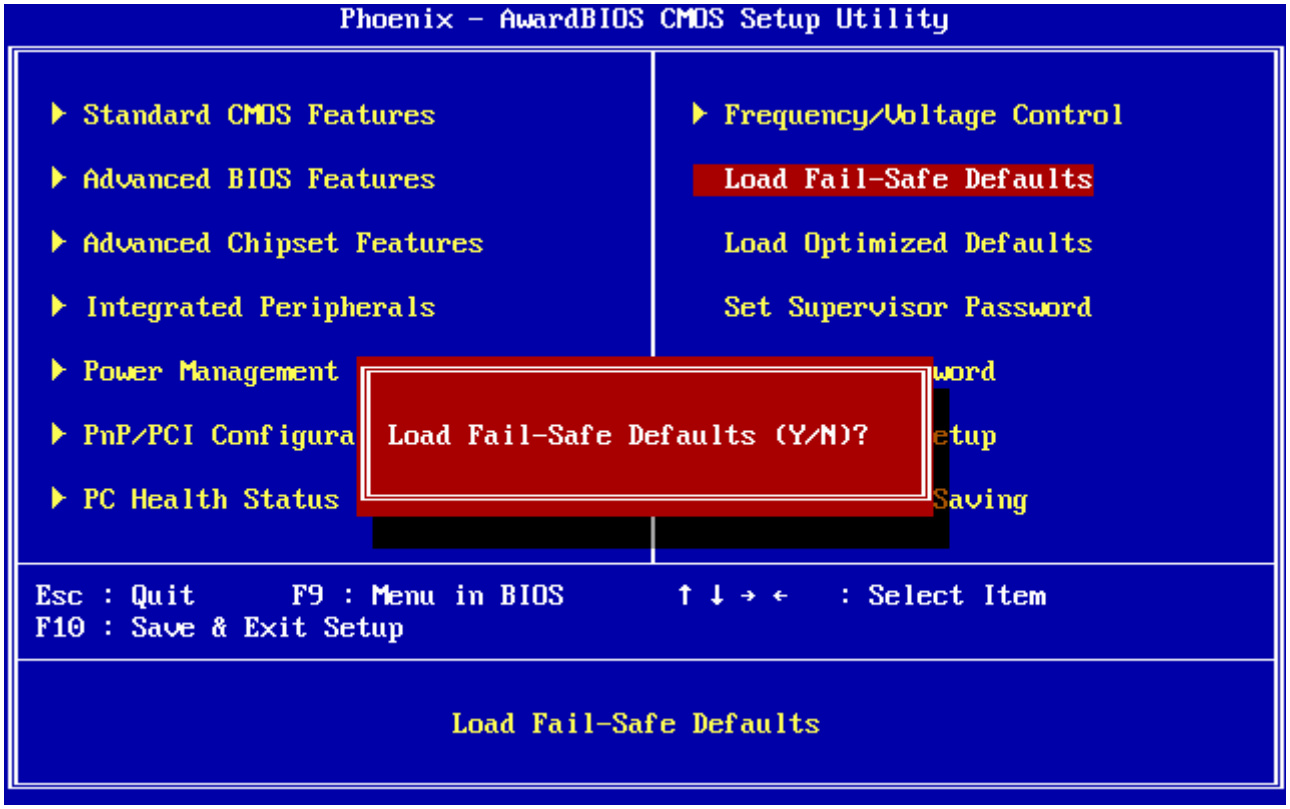
This section shows the status of your CPU, Fan & System.



Load Fail-Safe Defaults

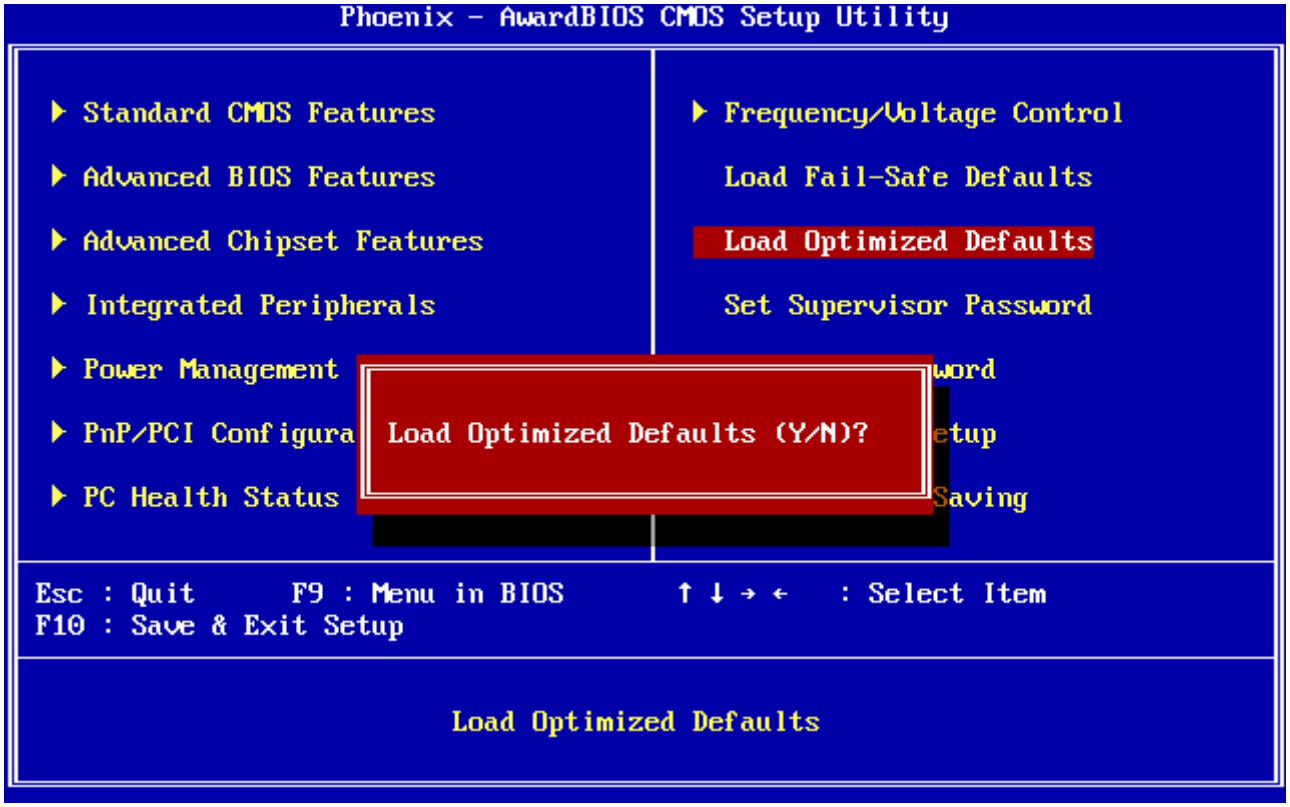
Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.



3.5.8 Load Optimized Defaults

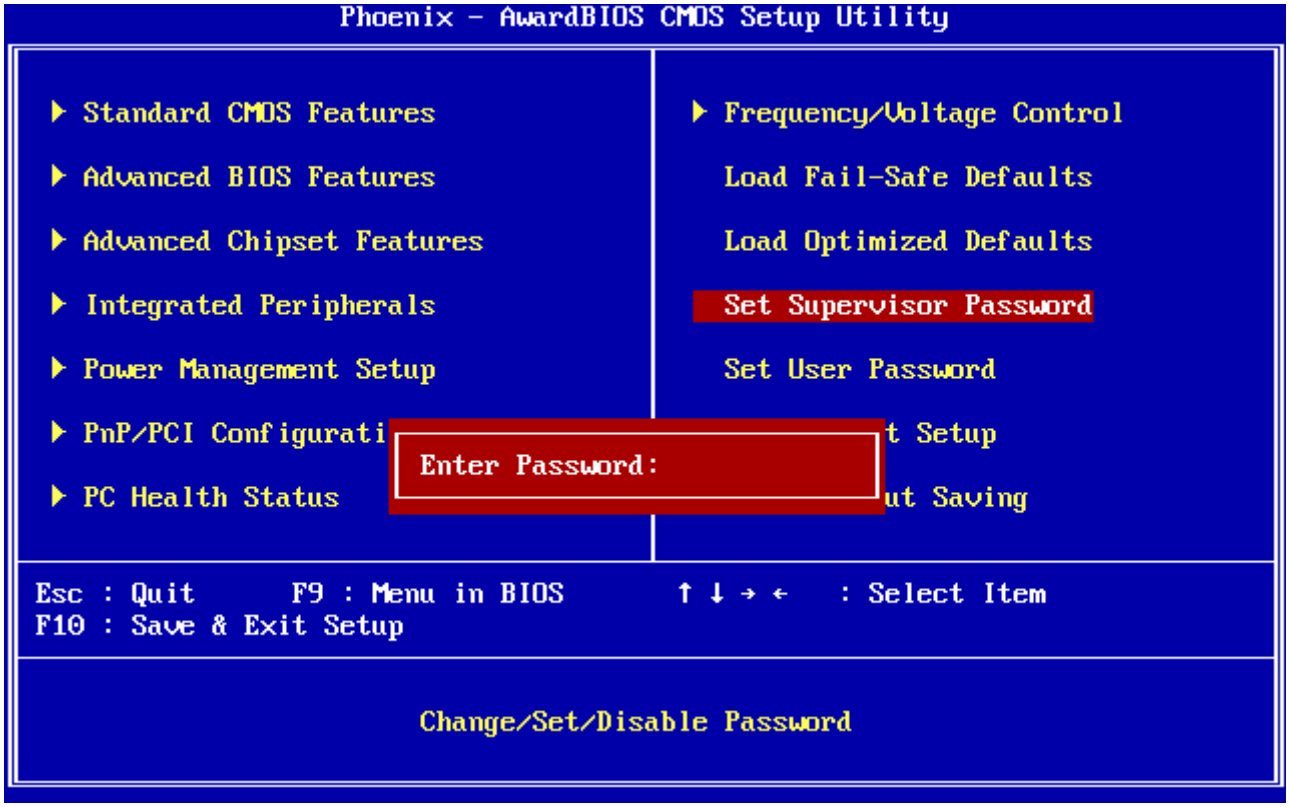
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.
Press <Y> to load the default values setting for optimal performance system operations.



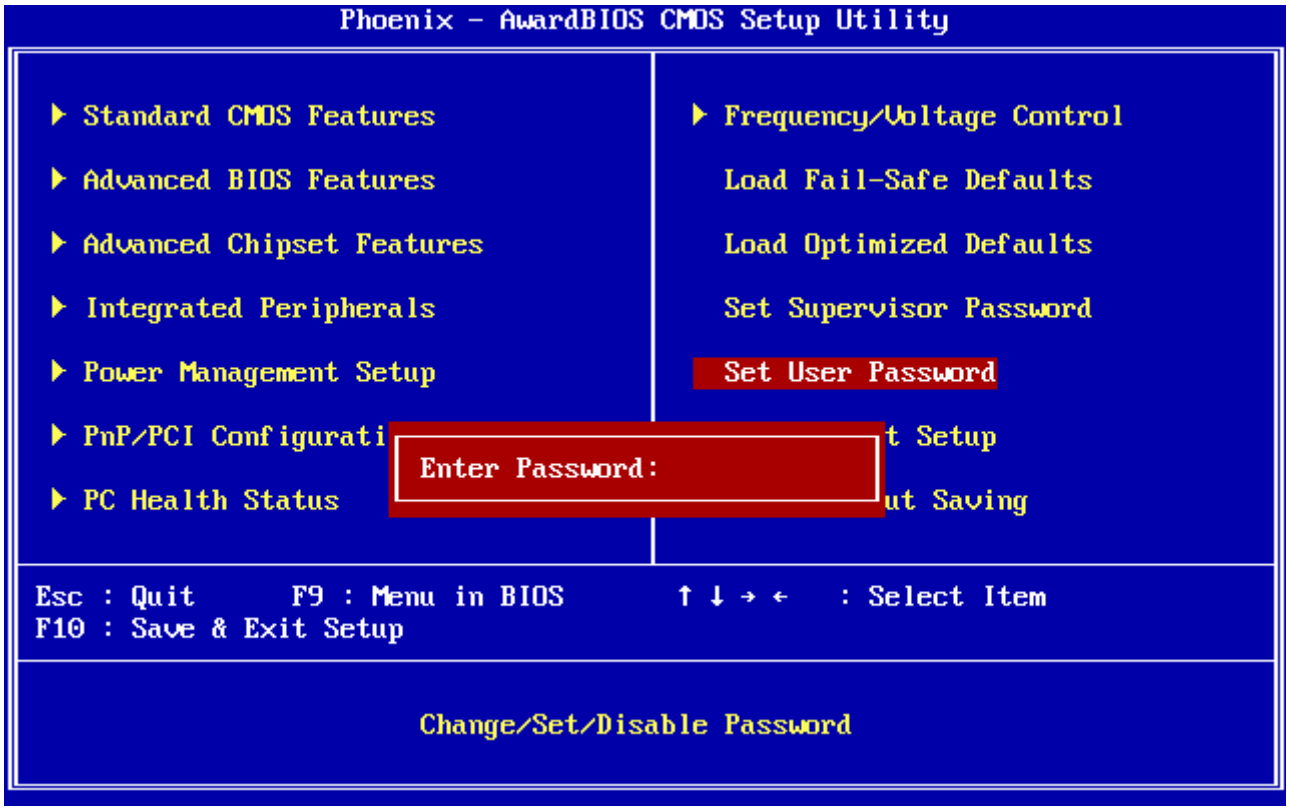
3.5.9 Set Supervisor / User Password

You can set either supervisor or user password, or both of them.

Supervisor Password: able to enter/change the options of setup menus.



User Password: able to enter but no right to change the options of setup menus.



Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

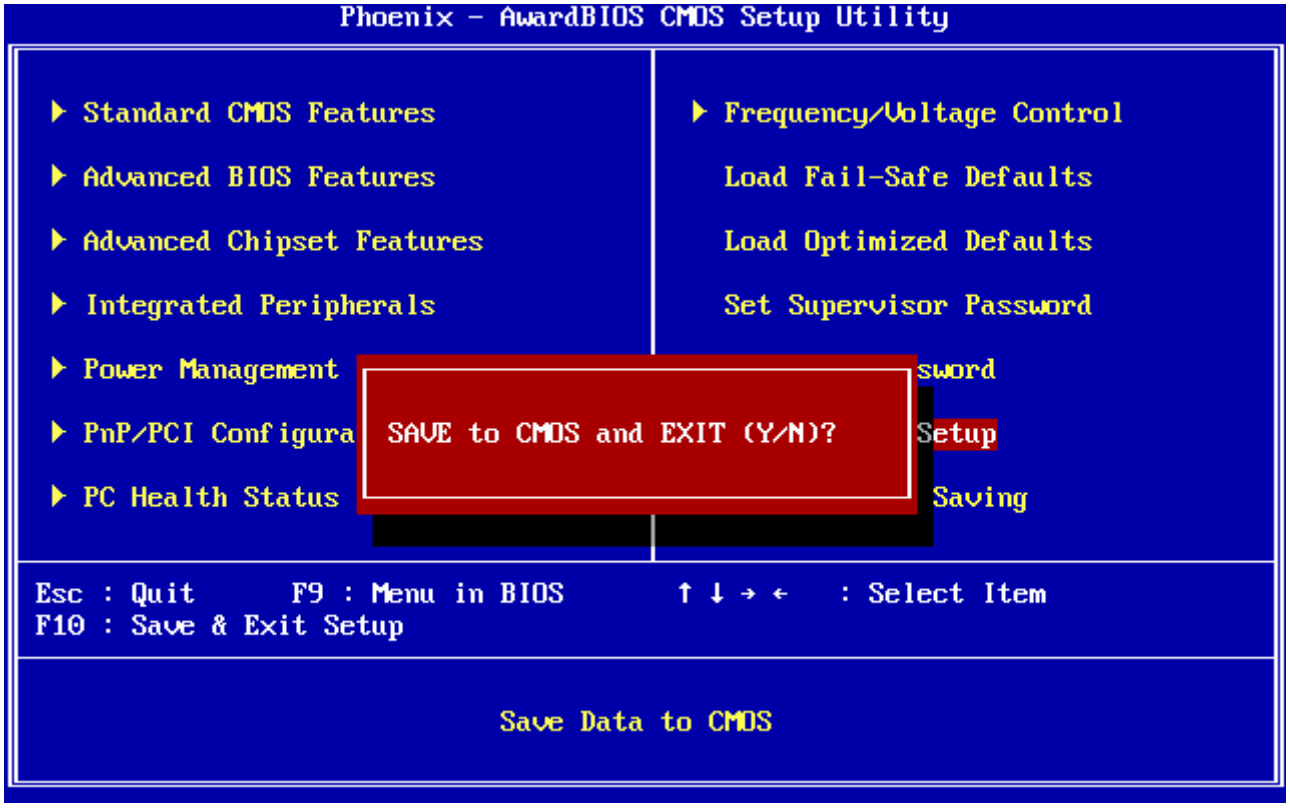
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration. Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer. You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup

3.5.10 Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Enter <Y> to store the selection made in the menus in CMOS, a special section in memory that stays on after turning the system off. The BIOS configures the system according to the Setup selection stored in CMOS when boot the computer next time.

The system is restarted after saving the values.



3.5.11 Exit Without Save

Abandon all CMOS value changes and exit setup, and the system is restarted after exiting.