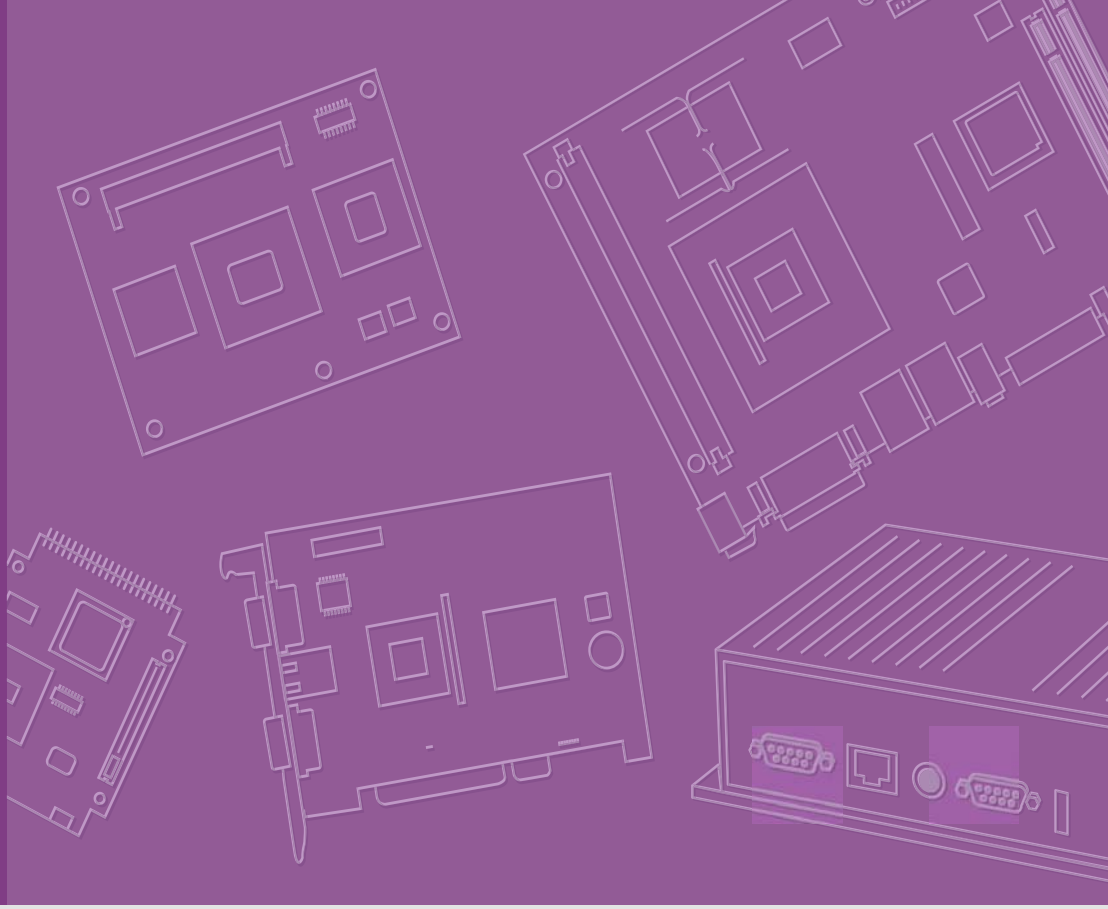

User Manual

SOM-6761/5761

Trusted ePlatform Services

ADVANTECH

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Printed in Taiwan March 2009

Product Warranty (2 years)

Advantech 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.

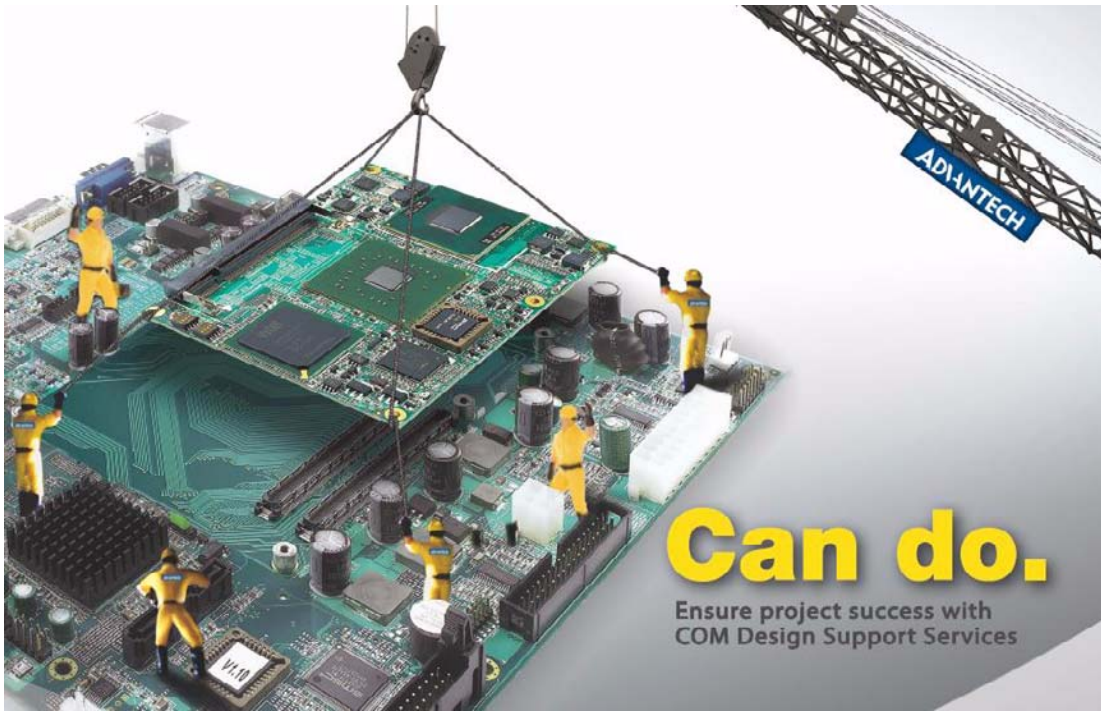
This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product 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 speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed 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.

COM Design Support



A Series of Value-Added Services for Carrier Board Development

Advantech COM Design Support Services help customers to reduce the time and work involved with designing new carrier boards. We handle the complexities of technical research and greatly minimize the development risk associated with carrier boards.

COM Product & Support Services

- Full Range of COM Product Offerings
- Comprehensive Document Support

Design Assistance Services

- Schematic Review
- Placement and Layout Review
- Debugging Assistance Services
- General/Special Reference Design Database

Thermal Solution Services

- Standard Thermal Solutions
- Customized Thermal Solutions

Embedded Software Services

- Embedded OS
- BIOS Customization
- Application Library: SUSI (Secure and Unified Smart Interface)

A Series of Value-Added Services for Carrier Board Development

Advantech COM Design Support Services help customers to reduce the time and work involved with designing new carrier boards. We handle the complexities of technical research and greatly minimize the development risk associated with carrier boards.

COM Product & Support Services

Advantech provides a full range of Computer on Modules including COM-Express, ETX, XTX and COM-Micro to fulfill diverse customer applications. Advantech also serves comprehensive document support to clients for project development.

Design Assistance Services

The Design Assistance Service is created to offer essential help to complete crucial development tasks: schematic review, placement review, debugging and a general/special database of technologies for reference purposes. All services reduce design risks associated with completing customer carrier boards.

Thermal Solution Services

In order to provide quicker and more flexible solutions for customer's thermal designs. Advantech provides thermal solution services including modularized thermal solutions and customized thermal solutions.

Embedded Software Services

Advantech provides Embedded Software Services to customers who integrate Advantech hardware products. Advantech Embedded Software Services include Embedded BIOS services, OS services and API Library (SUSI), Embedded Software Services help decrease design effort and project complexity, and accelerate product development.

COM Design Support Zone: http://com.advantech.com/

Advantech reserves the right to determine, on a case by case basis, whether or not COM Design Support Services are appropriate.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Packing List

Before installation, please ensure the following items have been shipped:

- 1 SOM-5761 or 6761 CPU module
- 1 Utility CD (Including manual and driver)
- 1 heatspreader 95*95*11mm

Development board

Part No.	Description
SOM-DB5700G-00A2E	Development board for COM-Express with GLAN

For more information please refer to "Advantech Baseboard Check List" and "Evaluation Board Reference Schematic".

You could download "Advantech Baseboard Check List" and "Evaluation Board Reference Schematic" from http://com.advantech.com.

Ordering information

Model Number Description

Part No.	CPU	L2 Cache	Chipset	LVDS	VGA	SDVO	TV out	Giga LAN	HD Audio	PCIe	PCI	USB 2.0	SATA	LPC	SMBUS	ATX Power	AT Power	Thermal Solution	Operating Temp.
SOM-6761FG-S6A1E	ATOM N270 1.6 GHz	512K L2	945GSE	36-bit	Yes	1	Yes	1	Yes	See Note 1	4	8	2	1	1	Yes	Yes	Passive	0 ~ 60° C

Note 1: Supports 1 PCIe x4 or 4 PCIe x1. Preserve 1 PCIe x4 circuit if no need to use PCIe Giga LAN (BOM option, either one, default PCIe x1 for Giga LAN and 3 PCIe x1)

Part No.	CPU	L2 Cache	Chipset	LVDS	VGA	SDVO	TV out	Giga LAN	HD Audio	PCIe	PCI	USB 2.0	SATA	LPC	SMBUS	ATX Power	AT Power	Thermal Solution	Operating Temp.
SOM-5761FG-S6A1E	ATOM N270 1.6 GHz	512K L2	945GSE	36-bit	Yes	1	Yes	1	Yes	See Note 1	4	8	2	1	1	Yes	Yes	Passive	0 ~ 60° C

Note 1: Supports 1 PCIe x4 or 4 PCIe x1. Preserve 1 PCIe x4 circuit if no need to use PCIe Giga LAN (BOM option, either one, default PCIe x1 for Giga LAN and 3 PCIe x1)

Contents

Chapter 1

General Introduction

This chapter gives background information on the SOM-6761/5761.

Sections include:

- Introduction
- Specifications

1.1 Introduction

SOM-6761 is an embedded COM-Micro Type 2 CPU module. The new CPU module supports Intel N270 1.6GHz processor by Intel 945GSE and ICH7M chipsets. SOM-6761 integrates graphic engine: Intel GMA950, Microsoft DirectX 9.1 with good graphic performance. In a basic form factor of 95 mm x 95 mm, the SOM-6761 provides a scalable high performance with lower power consumption and easy to integrate solution for customers' applications by utilizing a plug-in CPU module on an application-specific customer solution board.

SOM-6761 with advanced I/O capacity incorporates serial differential signaling technologies such as 3 PCIe x 1 or 1 PCIe x 4(non-LAN), PCI Masters x 4, SATA x 2 ports, USB 2.0 x 8 ports, VGA, 36-bit LVDS, SDVO, TV out, HD audio and 10/100/1000 LAN. SOM-6761 offers design partners more choices for their own applications need lower power consumption while maintaining a compact form factor.

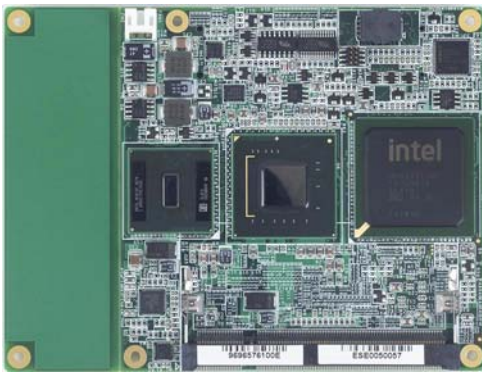
SOM-6761 complies with the "Green Function" standard and supports Idle, Standby and Suspend modes. The small size (95 mm x 95 mm) and use of two high capacity connectors based on the proven COM-Micro form factor, allow the COM-Micro modules to be easily and securely mounted onto a customized solution board or our standard SOM-DB5700G development board.

The SOM-6761 is a highly integrated multimedia COM that combines audio, video, and network functions. It provides good calculated ability but with lower power consumption, dual channel 18-bit LVDS interface for small/ middle size TFT LCD display, DDR2 memory up to 2 GB, high definition audio interface (AC97/Azalia). Major onboard devices adopt PCI technology, to achieve computing performance when customer adopts SOM-6761 to establish their own application.

SOM-5761 functions are all the same as SOM-6761 and only in different form factors and dimensions.

Difference between SOM-6761 and SOM-5761

Table 1.1: Difference between SOM-6761 and SOM-5761

Model Name	SOM-6761	SOM-5761
		
Dimension	95 x 95mm	125 x 95mm
Form Factor	COM-Micro	COM-Express
Function	Functions and pin definition are all the same on the two models	
Performance	Performance are all the same on the two models	

1.2 Product Specifications

Table 1.2: Product feature of SOM-6761		
Features		
Features	**1**	Embedded Intel ATOM N270 1.6 GHz processor with low power consumption
	2	Intel Atom N270+ 945GSE+ ICH7M
	3	Intel GMA950, Microsoft DirectX* 9.1
	4	Support multiple display: VGA, LVDS, SDVO, TV out
	5	Intel 10/100/1000 Mbps LAN
	6	Supports 3 PCIe x 1 or 1 PCIe x 4, 4 PCI devices
	7	Supports 2 SATA ports, 8 USB2.0 ports
Specifications		
Form Factor	COM-Micro, Module Pin-out Type II	
Processor System	**CPU**	Embedded Intel ATOM N270 1.6 GHz processor
	Front Side Bus	533 MHz FSB
	System Chipset	Intel 945GSE/ ICH7M
	BIOS	AWARD™ 8 Mbit Flash BIOS
Memory	**Technology**	DDR2 400/533 MHz
	Max. Capacity	up to 2 GB
	Socket	1 x 200-pin SODIMM socket
Display	**Chipset**	Intel 945GSE
	VRAM	DVMT 3.0 support up to 224 MB
	Graphic Engine	Intel GMA950, Microsoft DirectX* 9.1
	LVDS	36-bit LVDS
	VGA	up to 2048 x 1536
	DVI	N/A
	TV Out	Supports NTSC/PAL, S-Video and Composite Output interfaces
	SDVO	1 SDVO Port
	Dual Display	CRT + LVDS, TV out + LVDS, TV out + CRT (Note: SDVO function is supported by customized BIOS)
Ethernet	**Chipset**	Intel 82574L Gigabit Ethernet
	Speed	10/100/1000Base-T
WatchDog Timer	256 levels timer interval, from 0 to 255 sec or min setup by software, jumper-less selection, generates system reset	
Expansion	LPC, SMBUS, 3 PCIe x 1 or 1 PCIe x 4, 4 PCI master	
I/O	**PATA**	1 x EIDE (UDMA 100)
	SATA	2 x SATA, data transfer rates up to 150 MB/s
	USB	8 x USB 2.0
	Audio	High definition audio interface
	GPIO	8-bit GPIO

Table 1.2: Product feature of SOM-6761		
Power	**Power Type**	ATX, AT
	Power Supply Voltage	+12 V and +5 VSB for ATX, +12V for AT
	Power Consumption (Typical)	Typical: (1 GB DDR2 533) +12 V @ 0.62 A
	Power Consumption (Max, test in HCT)	Max: (1 GB DDR2 533) +12 V @ 0.9 A
Environment	**Operating Temperature**	0 ~ 60°C (32 ~ 140°F)
	Operation Humidity	0% ~ 90% relative humidity, non-condensing
Mechanical	**Dimension**	95 x 95 mm (3.74" x 3.74"),

Table 1.3: Product feature of SOM-5761		
Features		
Features	**1**	Embedded Intel ATOM N270 1.6 GHz processor with low power consumption
	2	Intel Atom N270+ 945GSE+ ICH7M
	3	Intel GMA950, Microsoft DirectX* 9.1
	4	Support multiple display: VGA, LVDS, SDVO, TV out
	5	Intel 10/100/1000 Mbps LAN
	6	Supports 3 PCIe x 1 or 1 PCIe x 4, 4 PCI devices
	7	Supports 2 SATA ports, 8 USB2.0 ports
Specifications		
Form Factor	COM-Express, Module Pin-out Type II	
Processor System	**CPU**	Embedded Intel ATOM N270 1.6 GHz processor
	Front Side Bus	533 MHz FSB
	System Chipset	Intel 945GSE/ ICH7M
	BIOS	AWARD™ 8 Mbit Flash BIOS
Memory	**Technology**	DDR2 400/533 MHz
	Max. Capacity	up to 2 GB
	Socket	1 x 200-pin SODIMM socket
Display	**Chipset**	Intel 945GSE
	VRAM	DVMT 3.0 support up to 224 MB
	Graphic Engine	Intel GMA950, Microsoft DirectX* 9.1
	LVDS	36-bit LVDS
	VGA	up to 2048 x 1536
	DVI	N/A
	TV Out	Supports NTSC/PAL, S-Video and Composite Output interfaces
	SDVO	1 SDVO Port
	Dual Display	CRT + LVDS, TV out + LVDS, TV out + CRT (Note: SDVO function is supported by customized BIOS)
Ethernet	**Chipset**	Intel 82574L Gigabit Ethernet
	Speed	10/100/1000Base-T
WatchDog Timer	256 levels timer interval, from 0 to 255 sec or min setup by software, jumper-less selection, generates system reset	
Expansion	LPC, SMBUS, 3 PCIe x 1 or 1 PCIe x 4, 4 PCI master	

Table 1.3: Product feature of SOM-5761		
I/O	**PATA**	1 x EIDE (UDMA 100)
	SATA	2 x SATA, data transfer rates up to 150 MB/s
	USB	8 x USB 2.0
	Audio	High definition audio interface
	GPIO	8-bit GPIO
Power	**Power Type**	ATX, AT
	Power Supply Voltage	+12 V and +5 VSB for ATX, +12 V for AT
	Power Consumption (Typical)	Typical: (1 GB DDR2 533) +12 V @ 0.62 A
	Power Consumption (Max, test in HCT)	Max: (1 GB DDR2 533) +12 V @ 0.9 A
Environment	**Operating Temperature**	0 ~ 60°C (32 ~ 140°F)
	Operation Humidity	0% ~ 90% relative humidity, non-condensing
Mechanical	**Dimension**	125 x 95 mm (4.92" x 3.74"),

1.3 Mechanical Specifications

1.3.1 Dimension(mm)

COM-Micro form factor, 95mm(L)*95mm(W) on SOM-6761
COM-Express form factor, 125mm(L)*95mm(W) on SOM-5761

1.3.2 Height on Top(mm)

Under 8 mm base on SPEC definition (without Heatsink)

1.3.3 Height on Bottom(mm)

Under 3.8 mm base on SPEC definition

1.3.4 Heat Spreader Dimension(mm)

L95mm*W95mm*H11mm (Heat Spreader)

1.3.5 Weight(g) with Heatsink

350 g (weight of total package)

1.4 Electrical Specifications

1.4.1 Power supply Voltage

Voltage requirement:

+12 V and +5 VSB for ATX, +12 V for AT

1.4.2 Power supply Current

+12V	HCT 11.2	BIOS	Idle	Stanby(S1)
SOM-6761 Intel Atom N270 1.60GHz	0.9(HCT)	0.66	0.62	0.52
SOM-5761 Intel Atom N270 1.60GHz	0.9(HCT)	0.66	0.62	0.52

1.5 Environmental Specifications

1.5.1 Operating temperature

Operating temperature: 0 ~ 60°C (32~140°F)

The operating temperature means the environment temperature for the model. Please make sure the heat spreader temperature for SOM-6761/5761 should under below 60C.

1.5.2 Operating Humidity

Operating Humidity:10% ~ 90% Relative Humidity, non-condensing

1.5.3 Storage temperature

Standard products (0 ~ 60°C)

Storage temperature: -40~85°C

1.5.4 Storage humidity

Standard products (0 ~ 60°C)

Relative Humidity: 95% @ 60°C

Chapter 2

H/W installation

This chapter gives mechanical and connector information on the SOM-6761/5761 CPU Computer on Module.

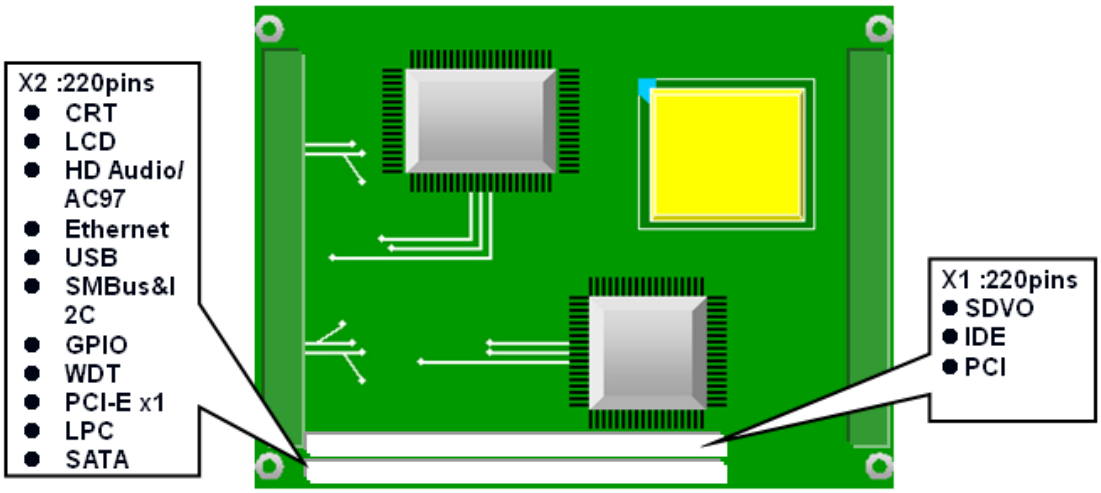
Sections include:

- Connector Information
- Mechanical Drawing

2.1 Connectors

2.1.1 Board Connector

There are two connectors at the rear side of SOM-6761/5761 for connecting to carrier board.



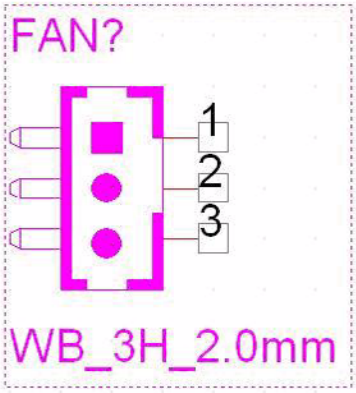
Pin Assignments for X1/2 connectors

Please refer to Advantech_COM_Express_Design Guide, Chapter 2.

You could download Advantech_COM_Express_Design Guide from http://com.advantech.com/

2.1.2 Connector List

Table 2.1: FAN1 Fan	
FAN1	**Fan**
Description	Wafer 2.0mm 3P 90D(M)DIP 2001-WR-03-LF W/Lock
Pin	**Pin Name**
1	Fan Tacho-Input
2	Fan Out
3	GND



2.2 Mechanical

2.2.1 Jumper and Connector Location

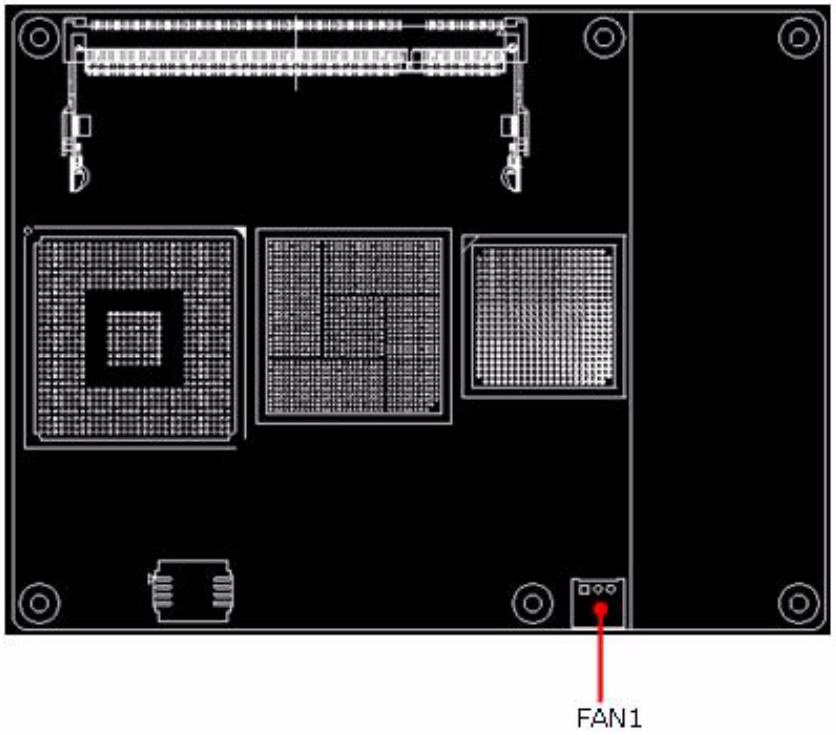


Figure 2.1 Board layout (Component side)

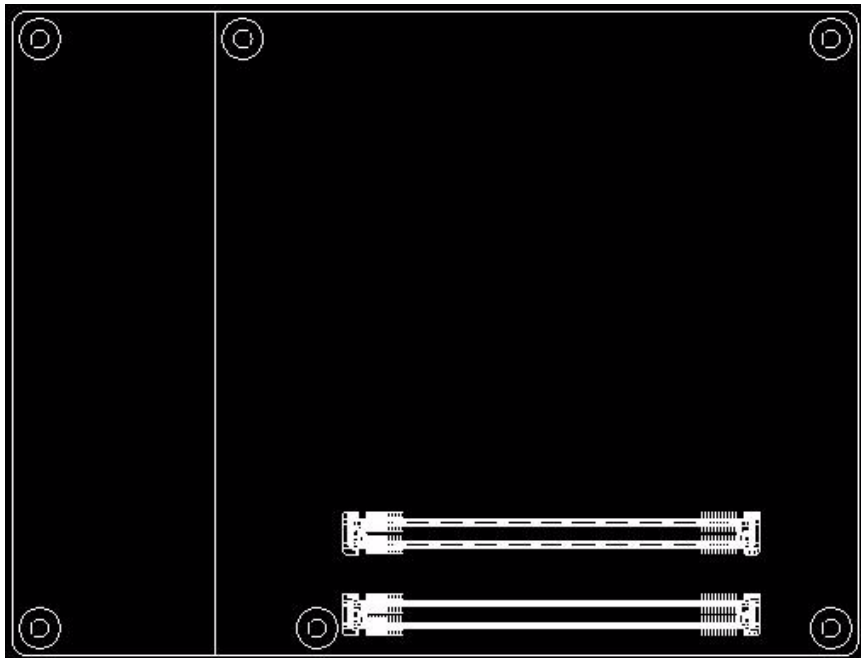


Figure 2.2 Board layout (Solder side)

2.2.2 Board Dimension

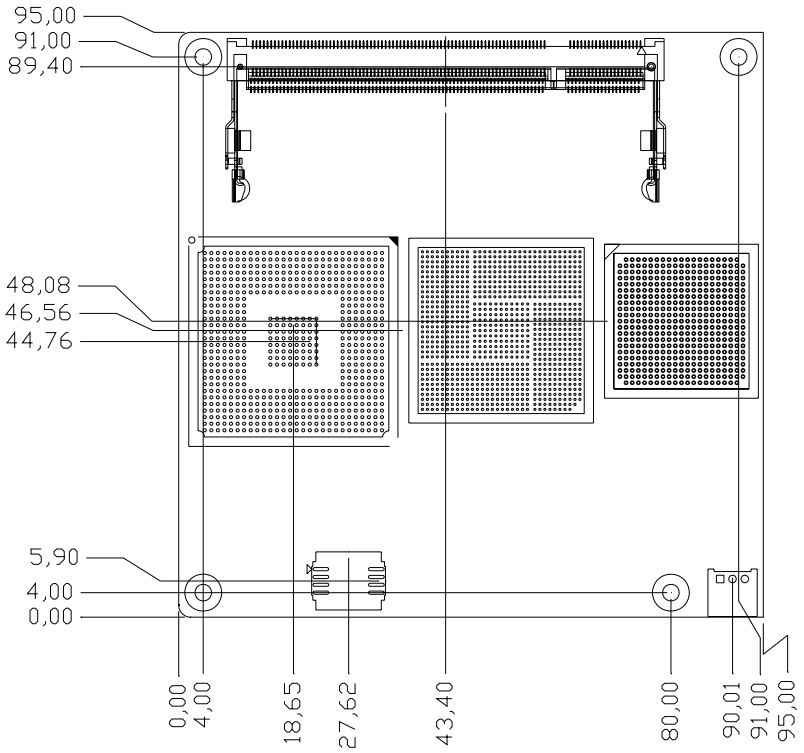


Figure 2.3 SOM-6761 Board Dimension layout (Component side)

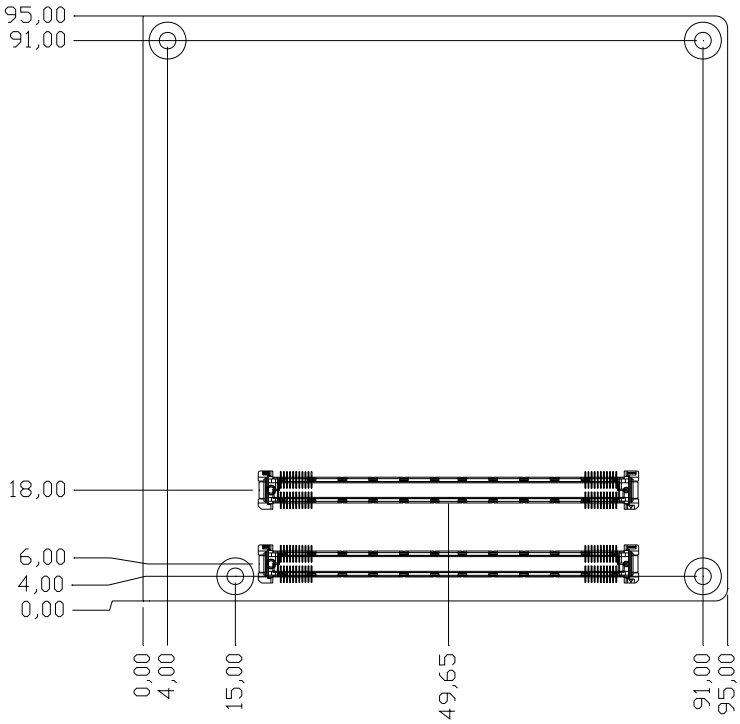


Figure 2.4 SOM-6761 Board Dimension layout (Solder side)

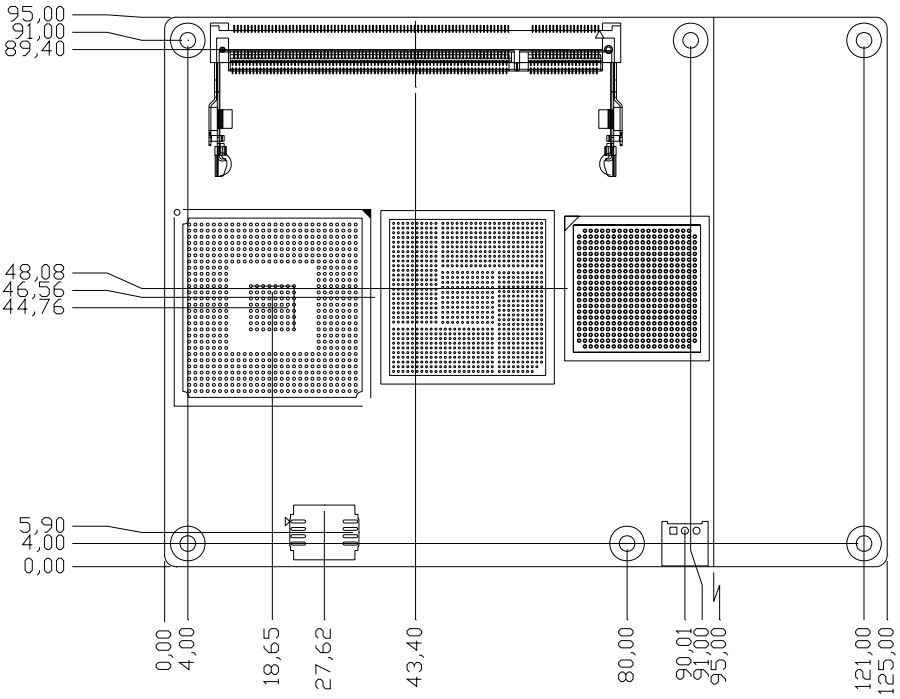


Figure 2.5 SOM-5761 Board Dimension layout (Component side)

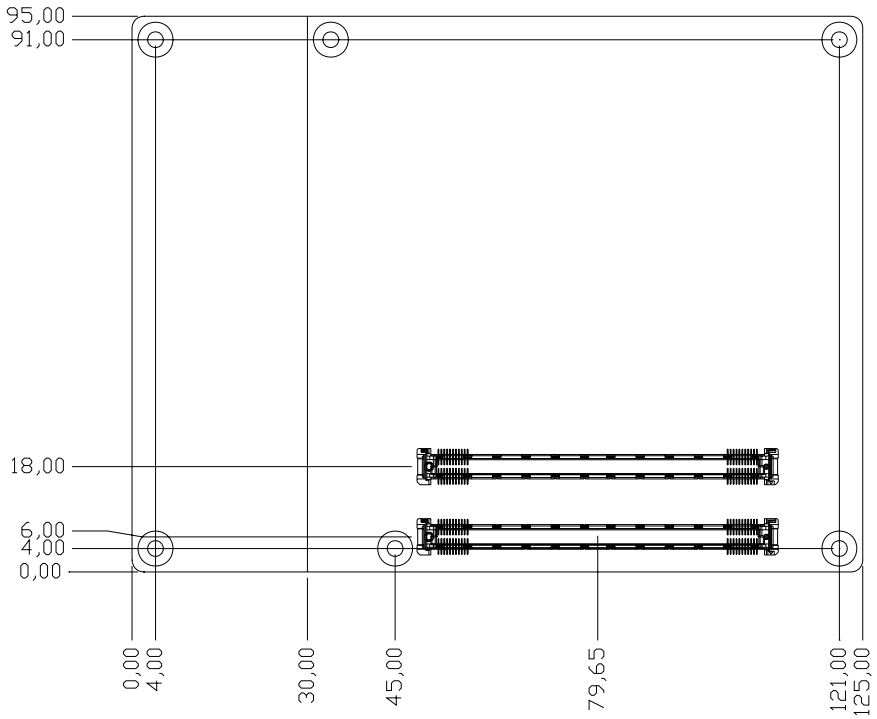


Figure 2.6 SOM-5761 Board Dimension layout (Solder side)

2.2.3 Heat spreader Dimension

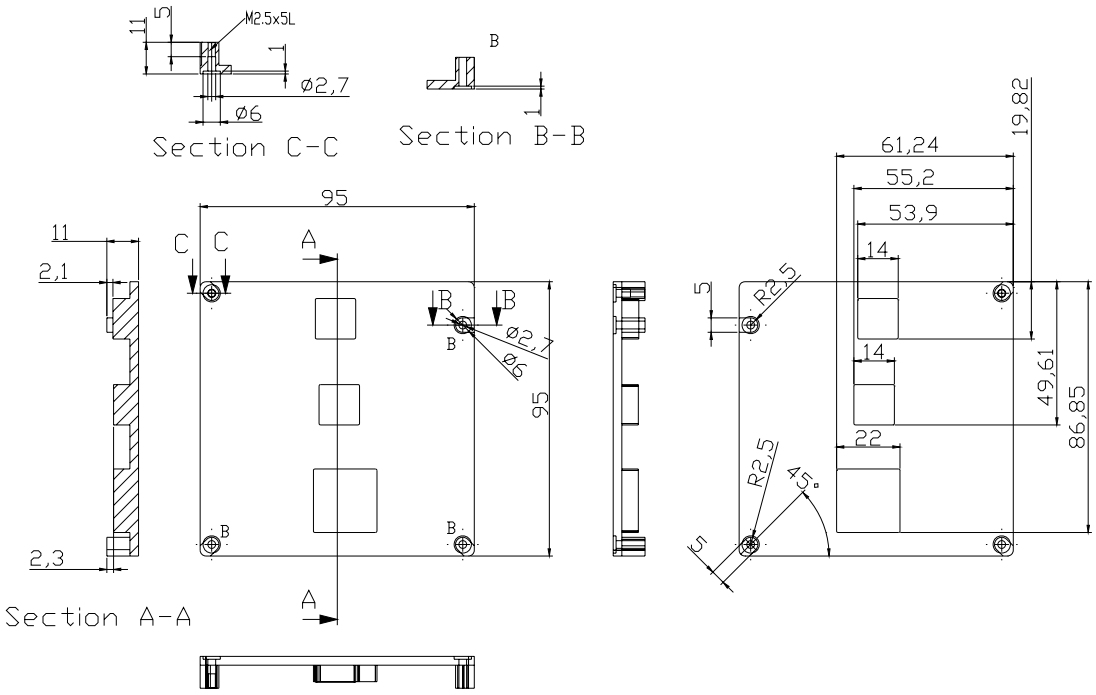


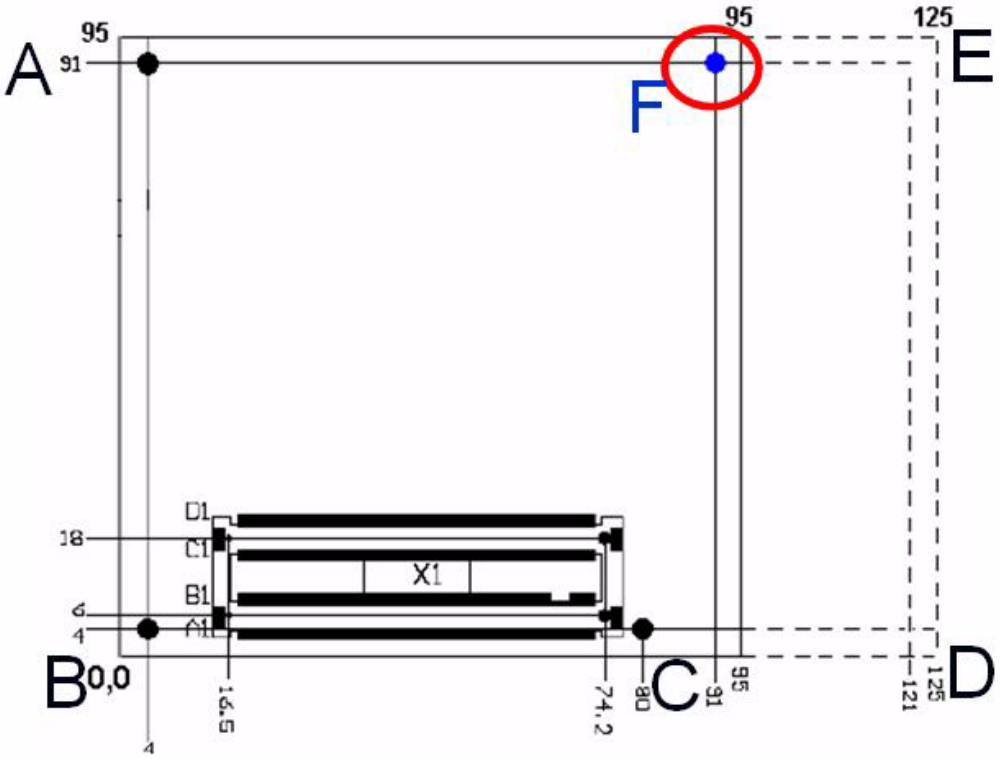
Figure 2.7 Drawing of Heatspreader for BGA type CPU

2.2.4 Thermal Solution

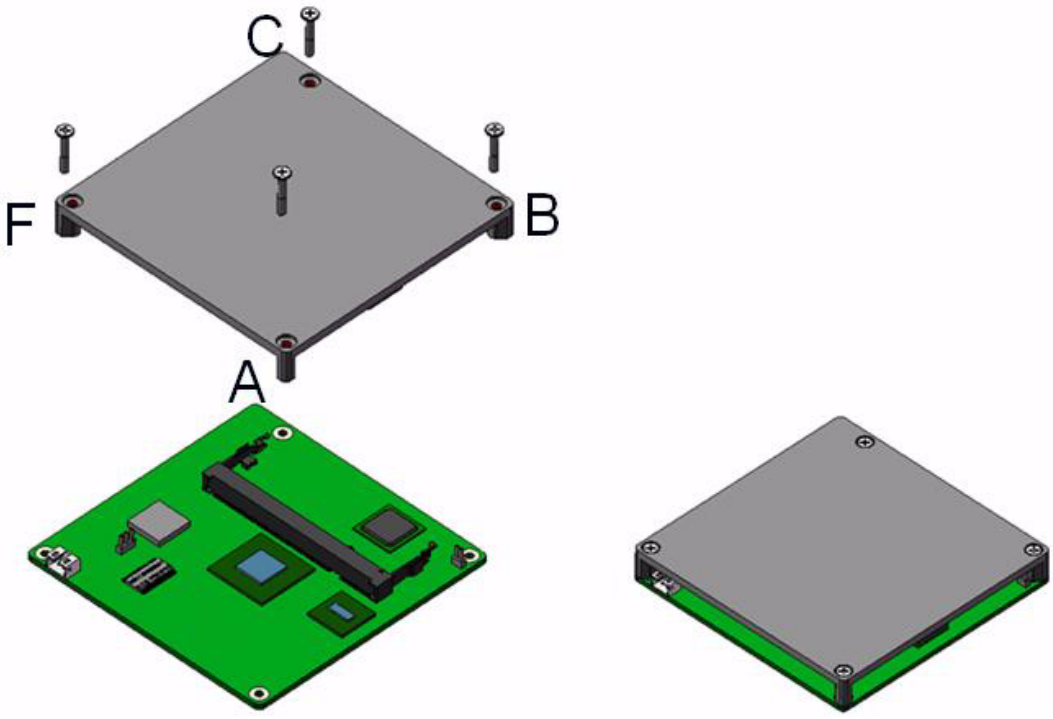
Important notice:

1. Please kindly be noticed, the heat-spreader shipped with Advantech SOM product is not a "COMPLETE" thermal solution. The function of this heat-spreader is for conducting heat from SOM module to customer's heat-sink or cooler which is added on this heat-spreader.
2. An extra efficient heat-sink or cooler is required to add on this heat-spreader for ensuring the SOM module can work appropriately.
3. An inefficient heat-sink or cooler may damage the SOM module. This kind of damage will invalidate the product warranty
4. Advantech is able to provide optional heat-sink or cooler for SOM module, please contact your sales representative for details
5. Please make sure the heat spreader temperature for CPU module should under 60°C.

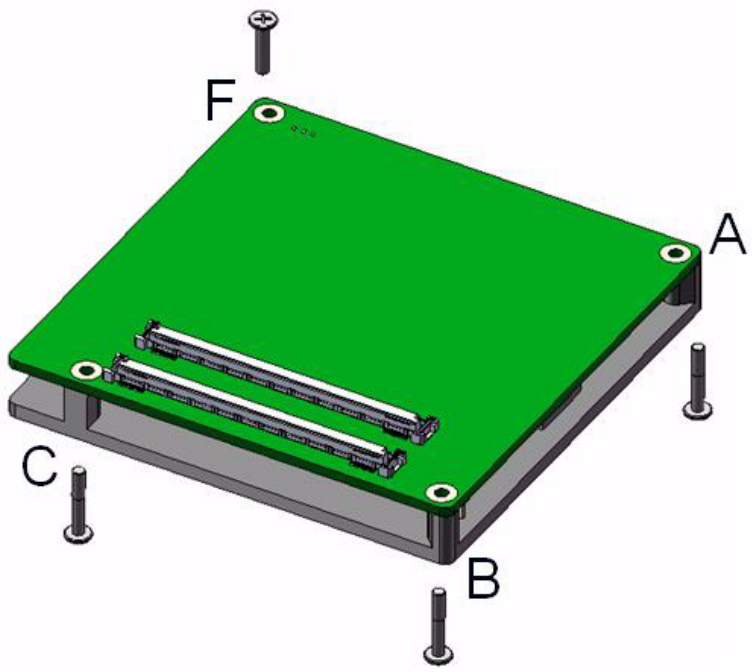
- **COM-Micro(95x95mm) Mounting hole**
  - There is additional mounting hole "F" compared with COM-Express (125 x 95mm)form factor.
  - There is suitable heat spreader and screw for carrier board with or without "F" mounting hole.



- **If the carrier board design following COM-Micro (with F mounting hole)**
  - 4 mounting holes on carrier board (A, B, C & F)
  - 4 screws(16mm) on A, B, C & F
  - Screw top down from heat spreader through COM module to baseboard

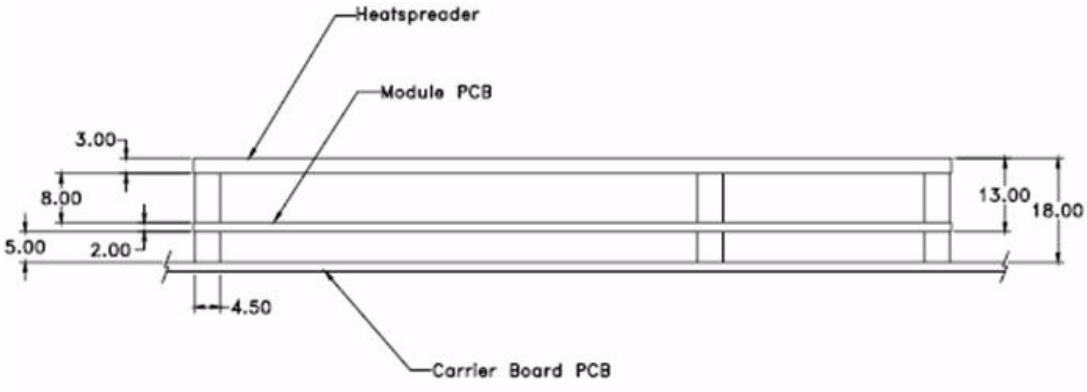


- **Carrier board design following COM-Express (W/O F mounting hole)**
  - 5 mounting holes on carrier board (A, B, C, D & F)
  - 3 screws(16mm) on A, B, C
    Screw top down from heat spreader through COM module to carrier board
  - 1 screws(6mm) on F
    Screw bottom up from COM module to heat-spreader



Module should be equipped with a heat-spreader. This heat-spreader by itself does not constitute the complete thermal solution for a module but provides a common interface between modules and implementation-specific thermal solutions.

The overall module height from the bottom surface of the module board to the heat-spreader top surface shall be 13mm for COM-Micro modules. The module PCB and heat-spreader may be used which allows use of readily available standoffs.



All dimension in mm

Figure 2.8 Overall Height for Heat-Spreader in COM-Micro Modules

Tolerances (unless otherwise specified):

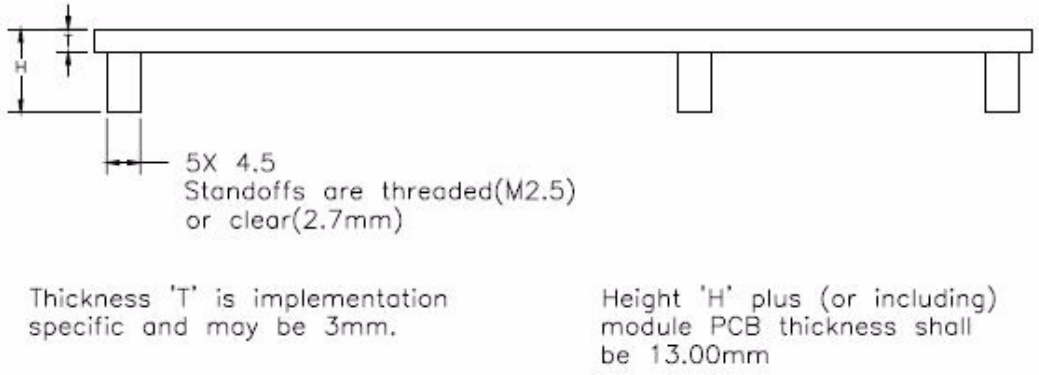
Z (height) dimensions should be ±0.8mm [±0.031"] from top of Carrier Board to top of heat-spreader.

Heat-spreader surface should be flat within 0.2mm [.008"] after assembly.

Interface surface finish should have a maximum roughness average (Ra) of 1.6μm[63μin].

The critical dimension in Figure 8-3 is the module PCB bottom side to heat-spreader top side. This dimension shall be 13.00mm ±0.65mm [±0.026"].

Figure 8-3 shows a cross section of a module and heat-spreader assembled to a Carrier Board using the 5mm stack height option. If 8mm Carrier Board connectors are used, the overall assembly height increases from 18.00mm to 21.00mm.



For more information please refer to Advantech_COM_Express_Design Guide, Chapter 8.

You could download Advantech_COM_Express_Design Guide from http://com.advantech.com/

Chapter 3

BIOS settings

3.1 BIOS Introduction

AwardBIOS 6.0 is a full-featured BIOS provided by Advantech to deliver superior performance, compatibility, and functionality to industrial PCs and embedded boards. Its many options and extensions let you customize your products to a wide range of designs and target markets.

The modular, adaptable AwardBIOS 6.0 supports the broadest range of third-party peripherals and all popular chipsets, plus Intel, AMD, nVidia, VIA, and compatible CPUs from 386 through Pentium, AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPUs.

You can use Advantech's utilities to select and install features that suit your needs and your customers' needs.

3.2 BIOS Setup

The SOM-6761/5761 system has AwardBIOS 6.0 built-in, which includes a CMOS SETUP utility that allows users to configure settings as required or to activate certain system features.

The CMOS SETUP saves configuration settings in the CMOS RAM of the motherboard. When the system power is turned off, the onboard battery supplies the necessary power to the CMOS RAM so that settings are retained.

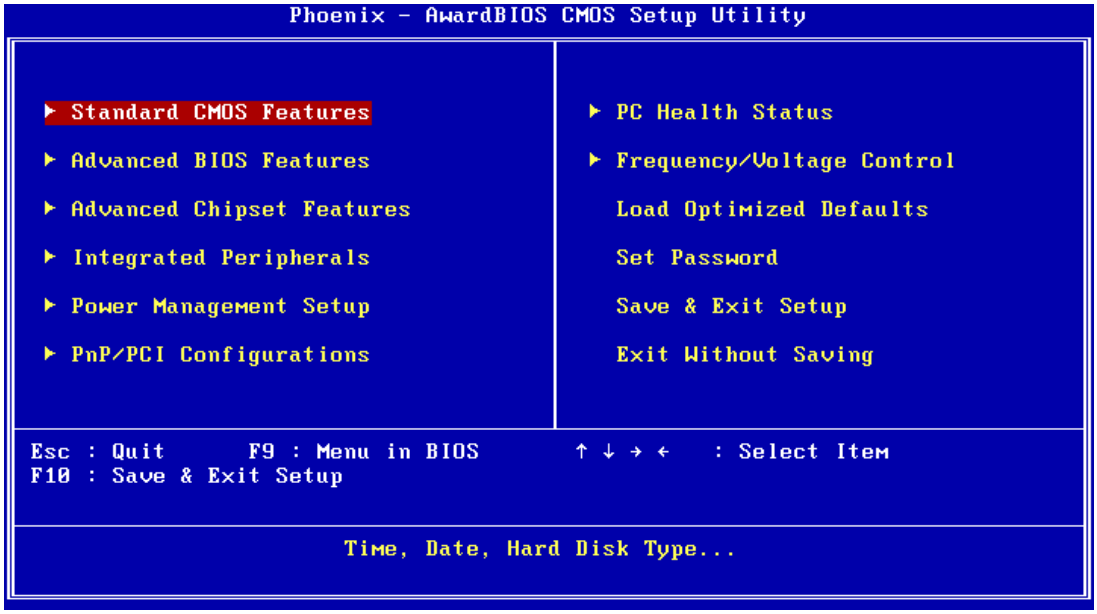
To access the CMOS SETUP screen, press the <Del> button during the power-on BIOS POST (Power-On Self Test).

CMOS SETUP Navigation and Control Keys:

< ↑ >< ↓ >< ← >< → >	Move to highlight item
<Enter>	Select Item
<Esc>	Main Menu - Start Quit sequence
	Sub Menu - Exit the current page and return to level above
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Optimized Default
<F10>	Save all CMOS changes

3.2.1 Main Menu

Press the <Del> key during startup to enter the BIOS CMOS Setup Utility; the Main Menu will appear on the screen. Use arrow keys to highlight the desired item, and press <Enter> to accept, or enter the sub-menu.



- **Standard CMOS Features**

This setup page includes all the features for standard CMOS configuration.

- **Advanced BIOS Features**

This setup page includes all the features for advanced BIOS configuration.

- **Advanced Chipset Features**

This setup page includes all the features for advanced chipset configuration.

- **Integrated Peripherals**

This setup page includes all onboard peripheral devices.

- **Power Management Setup**

This setup page includes all the power management items.

- **PnP/PCI Configurations**

This setup page includes PnP OS and PCI device configuration.

- **PC Health Status**

This setup page includes the system auto-detect CPU and system temperature, voltage.

- **Frequency/Voltage Control**

This setup page includes CPU host clock control.

- **Load Optimized Defaults**

This selection loads optimized values for best system performance configuration.

- **Set Password**

Establish, change or disable passwords.

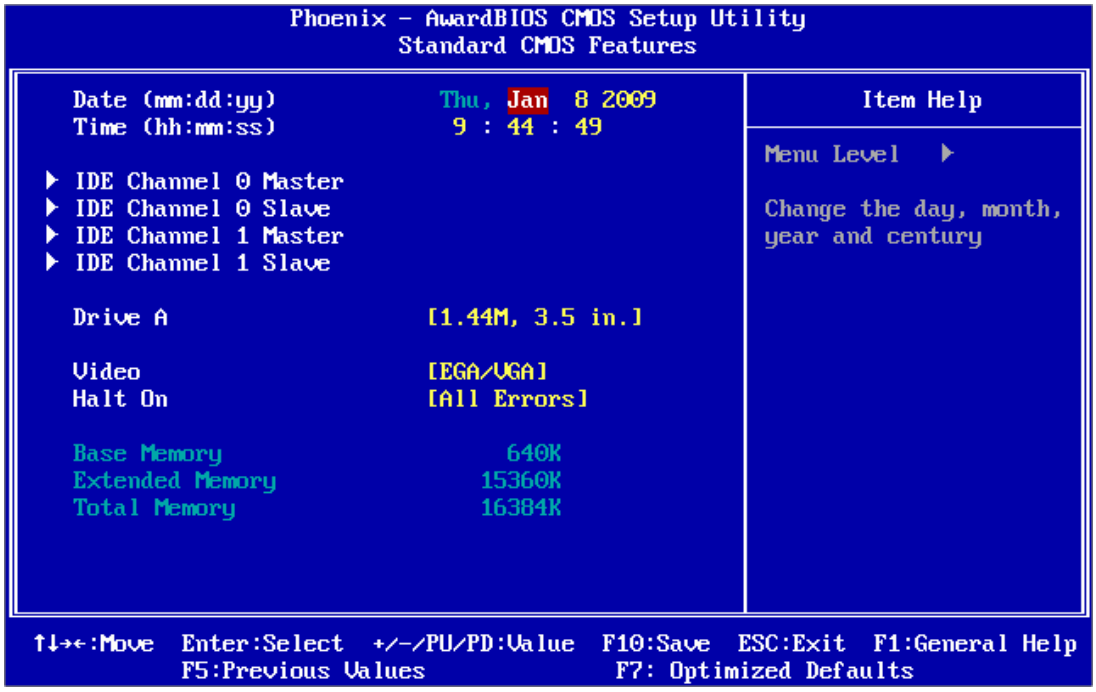
- **Save & Exit Setup**

Save CMOS value settings to CMOS and exit BIOS setup.

- **Exit Without Saving**

Abandon all CMOS value changes and exit BIOS setup.

3.2.2 Standard CMOS Features



- **Date**

  The date format is <weekday>, <month>, <day>, <year>.

Weekday	From Sun to Sat, determined and display by BIOS only
Month	From Jan to Dec.
Day	From 1 to 31
Year	From 1999 through 2098

- **Time**

  The times format in <hour> <minute> <second>, base on the 24-hour time.

- **IDE Channel 0/1 Master/Slave**

  IDE HDD Auto-Detection - Press "Enter" for automatic device detection.

- **Drive A**

  The Item identifies the types of floppy disk drive A or drive B

None	No floppy drive installed
360K, 5.25"	5.25 inch PC-type standard drive; 360K byte capacity
1.2M, 5.25"	5.25 inch AT-type high-density drive; 1.2M byte capacity
720K, 3.5"	3.5 inch double-sided drive; 720K byte capacity
1.44M, 3.5"	3.5 inch double-sided drive; 1.44M byte capacity
2.88M, 3.5"	3.5 inch double-sided drive; 2.88M byte capacity

- **Halt on**

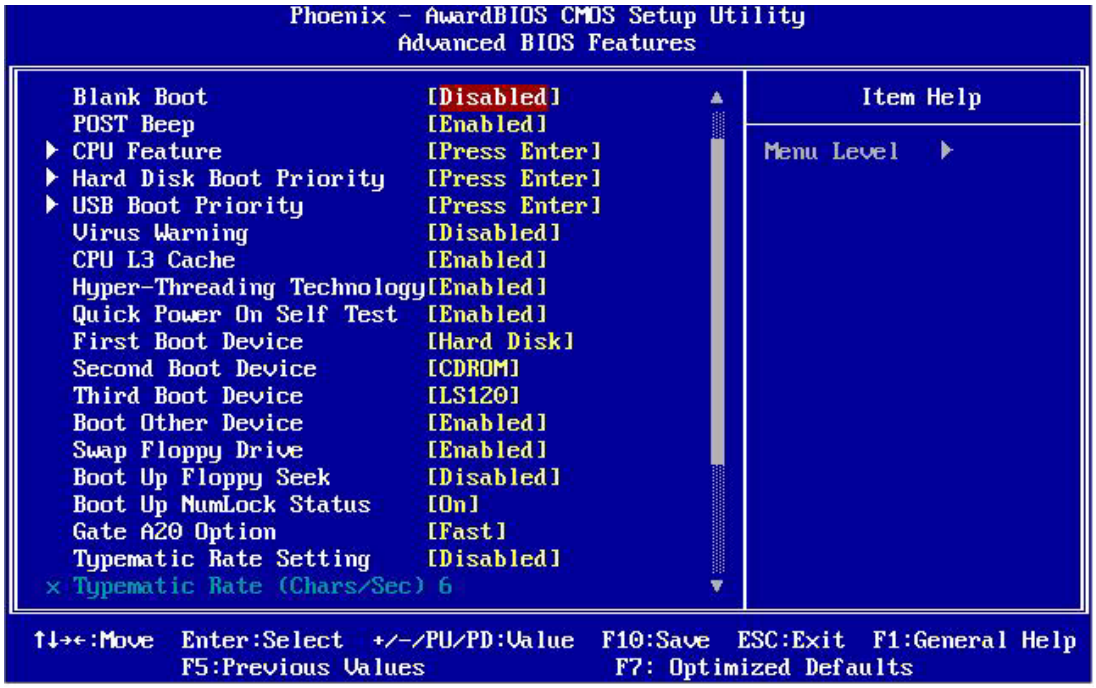
  This item determines whether the computer will stop if an error is detected during power up.

No Errors	The system boot process will not stop for any error
All Errors	Whenever the BIOS detects a non-fatal error the system boot process will be stopped.
All, But Keyboard	The system boot process will not stop for a keyboard error, but will stop for all other errors. (Default value)

All, But Diskette	The system boot process will not stop for a diskette error, but will stop for all other errors.
All, But Disk/Key	The system boot process will not stop for a keyboard or disk error, but will stop for all other errors.

- **Base Memory**
  Displays the amount of base (or conventional) memory installed in the system.
- **Extended Memory**
  Displays the amount of extended memory (above 1 MB in CPU's memory address map) installed in the system.
- **Total Memory**
  Displays the total system memory size.

3.2.3 Advanced BIOS Features



- **Blank Boot [Disabled]**
  This item allows user to enable/disable BIOS POST screen output.
- **POST Beep [Enabled]**
  This item allows user to enable/disable POST beep sound.
- **CPU Feature**
  This item allows the user to adjust CPU settings such as CPU ratio, VID and Thermal, and special features like XD flag.
- **Hard Disk Boot Priority**
  This item allows the user to select the boot sequence for system devices such as HDD, SCSI, and RAID.
- **USB Boot Priority**
  This item allows the user to select the boot sequence for USB devices.
- **CPU L3 Cache [Enabled]**
  This item allows the user to enable/disable CPU L3 cache.

- **Hyper-Threading Technology [Enabled]**

  This item allows the user to enable/disable Hyper-threading support for the Intel® Pentium® 4 processor with HT Technology.

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

  This field speeds up the Power-On Self Test (POST) routine by skipping re-testing a second, third and fourth time. The default setting is enabled.

- **First / Second / Third / Other Boot Drive**

Hard Disk	Sets boot priority for the hard disk.
USB devices	Sets boot priority forUSB devices.
CDROM	Sets boot priority for CDROM.
USB-FDD	Sets boot priority for USB-FDD.
USB-ZIP	Sets boot priority for USB-ZIP.
USB-CDROM	Sets boot priority for USB-CDROM.
LAN	Sets boot priority for LAN.
Disabled	Disables this boot function.

- **Boot Up NumLock Status [On]**

  This item allows the user to activate the Number Lock key at system boot.

- **Gate A20 Option [Fast]**

  This item allows the user to switch on or off A20 control by port 92.

- **Typematic Rate Setting**

  This item allows the user to set the two typematic control items.

  This field controls the speed of

  – Typematic Rate (Chars/Sec)

  This item controls the speed at which the system registers auto repeated keystrokes.

  The eight settings are: 6, 8, 10, 12, 15, 20, 24 and 30.

  – Typematic Delay (Msec)

  This item sets the key press delay time before auto repeat begins. The four delay rate options are: 250, 500, 750 and 1000.

- **Security Option [Setup]**

System	System requires correct password before booting, and also before permitting access to the Setup page.
Setup	System will boot, but requires correct password before permitting access to Setup. (Default value)

- **APIC Mode [Enabled]**

  This item allows the user to enable/disable the "Advanced Programmable Interrupt Controller". APIC is implemented in the motherboard and must be supported by the operating system; it extends the number of IRQs available.

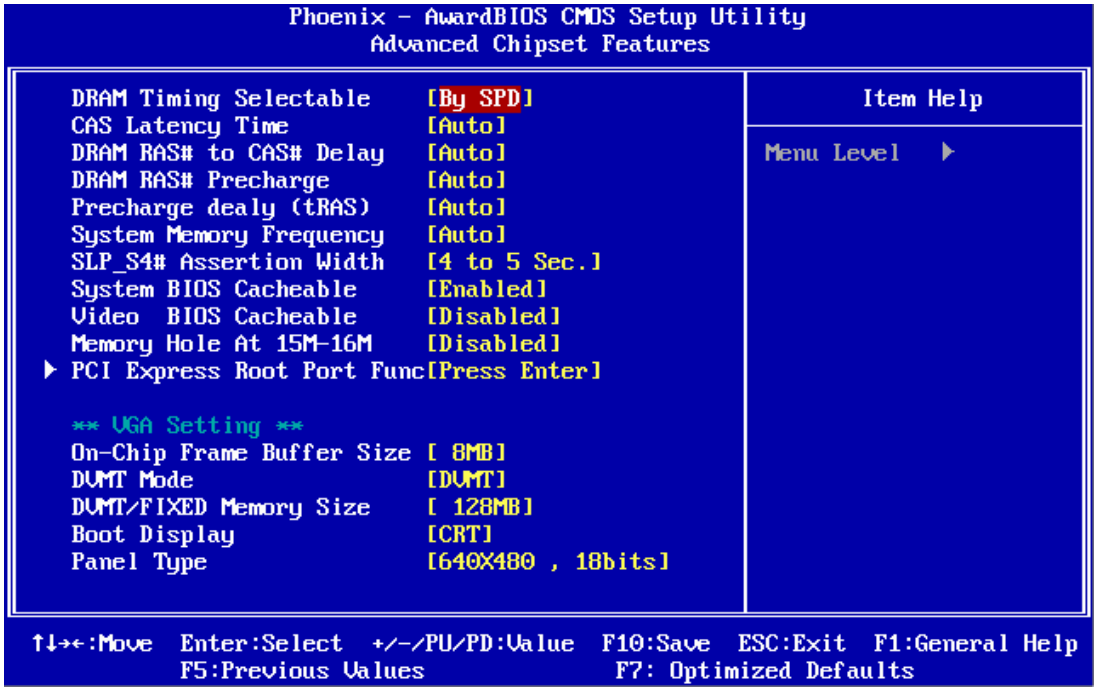
- **MPS Version Control for OS [1.4]**

  This item sets the operating system multiprocessor support version.

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

  Select OS2 only if the system is running the OS/2 operating system with greater than 64 MB of RAM on the system.

3.2.4 Advanced Chipset Features

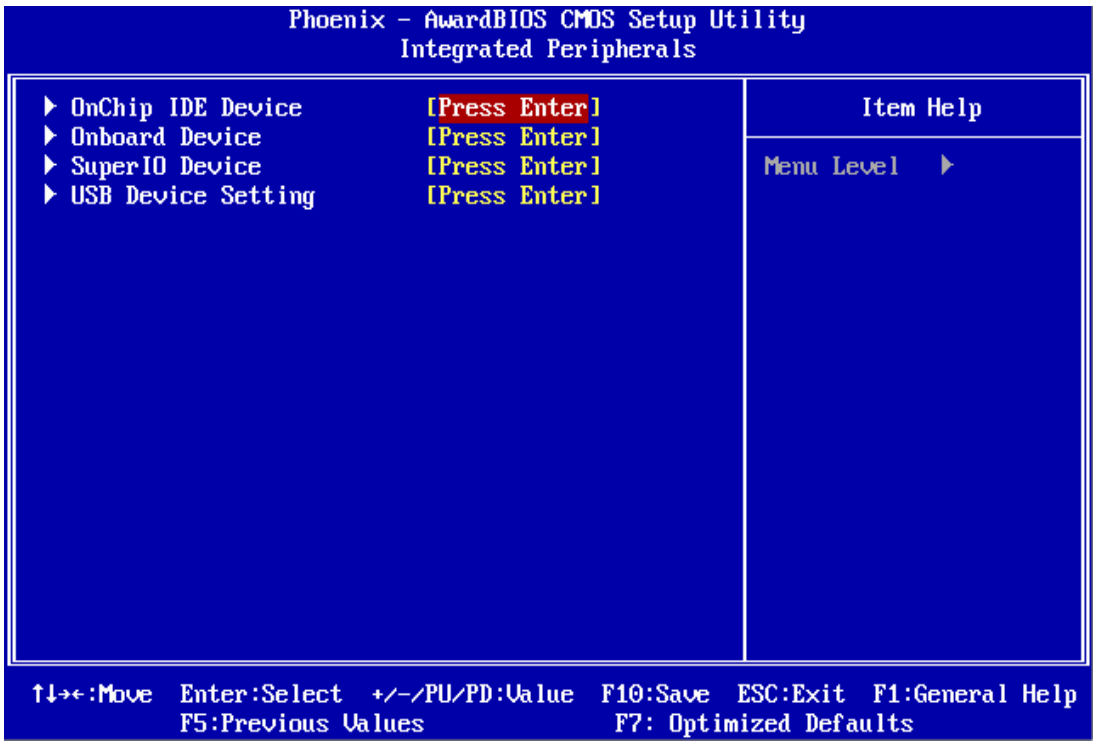


Note! *The "Advanced Chipset Features" screen controls the configuration of the board's chipset register settings and performance tuning - the options on this screen may vary depending on the chipset type. It is strongly recommended that only technical users make changes to the default settings.*

- **DRAM Timing Selectable [By SPD]**
  This item enables users to set the optimal timings for items 2 through 5, system default setting of "By SPD" to follow the SPD information and ensure the system running in stable and optimal performance.
- **CAS Latency Time [Auto]**
  This item enables users to set the timing delay in clock cycles before SDRAM start a read command after receiving it.
- **DRAM RAS# to CAS# Delay [Auto]**
  This item enables users to set the timing of the transition from RAS (row address strobe) to CAS (column address strobe) as both rows and column are separately addressed shortly after DRAM is refreshed.
- **DRAM RAS# Precharge [Auto]**
  This item enables users to set the DRAM RAS# precharge timing, system default is setting to "Auto" to reference the data from SPD ROM.
- **Precharge delay (tRAS) [Auto]**
  This item allows user to adjust memory precharge time
- **System Memory Frequency [Auto]**
  This item allows user to adjust memory frequency to improvement performance.
- **SLP_S4# Assertion Width [4 to 5 Sec]**
  This item allow user to set the SLP_S4# Assertion Width.
- **System BIOS Cacheable [Enabled]**
  This item allows the system BIOS to be cached to allow faster execution and better performance.

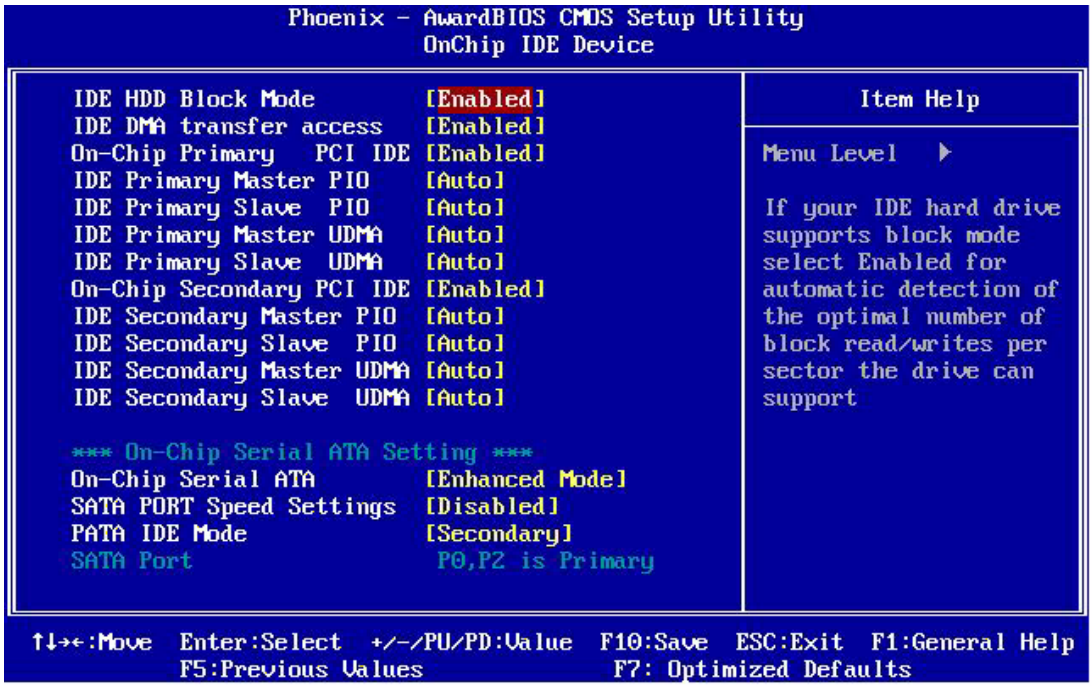
- **Video BIOS Cacheable [Disabled]**
  This item allows the video BIOS to be cached to allow faster execution and better performance.
- **Memory Hole At 15M-16M [Disabled]**
  This item reserves 15MB-16MB memory address space to ISA expansion cards that specifically require the setting. Memory from 15MB-16MB will be unavailable to the system because of the expansion cards can only access memory at this area.
- **PCI Express Root Port Func [Press Enter]**
  This item allows the user to adjust the PCIE port to on, off, or auto.
- **On-Chip Frame Buffer Size [8MB]**
  This item allows the user to adjust on-chip graphics of memory buffer.
- **DVMT Mode [DVMT]**
  This item allows the user to adjust Intel's Dynamic Video Memory Technology (DVMT).Bios provide three option to choose (DVMT,FIXED and Both).
- **DVMT/FIXED Memory Size [128MB]**
  This item allows the user to adjust DVMT/FIXED graphics memory size.
- **Boot Display [CRT]**
  This item allows the user to decide which display mode to use for the boot display.
- **Panel Type [640 x 480, 18bits]**
  This item allows the user to adjust panel resolution.

3.2.5 Integrated Peripherals

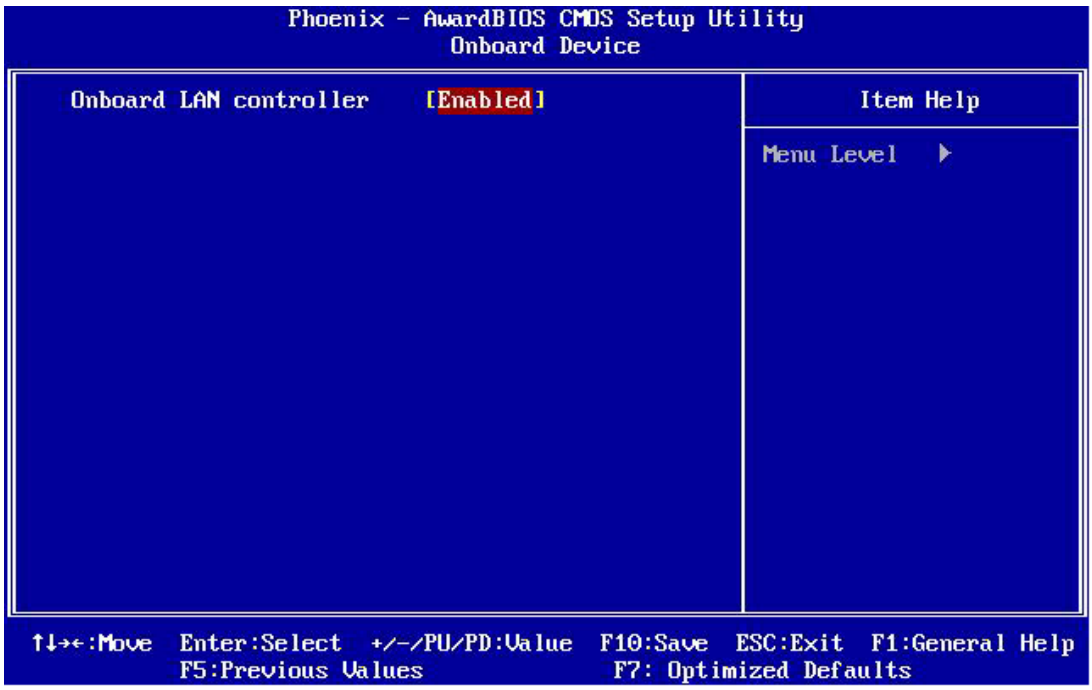


Note! *The "Integrated Peripherals" screen controls chipset configuration for IDE, ATA, SATA, USB, AC97, MC97 and Super IO and Sensor devices. The options on this screen vary depending on the chipset.*

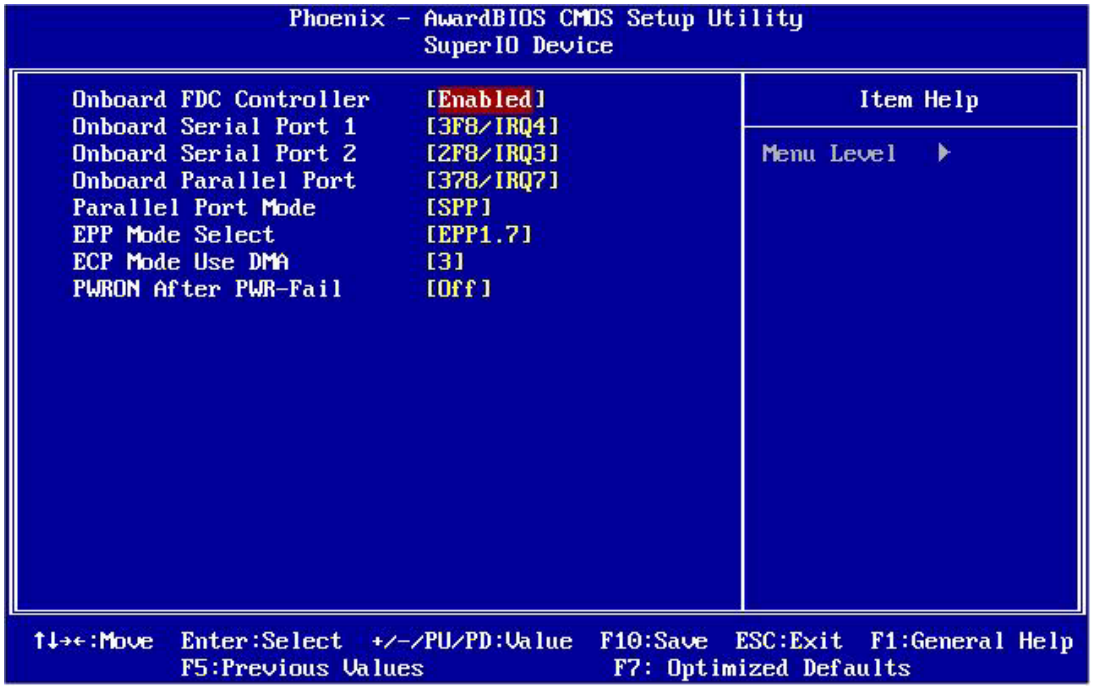
- **OnChip IDE Device**
  This item enables users to set the OnChip IDE device status, including IDE devices and setting PIO and DMA access modes. Some chipsets support newer SATA devices (Serial-ATA).
- **Onboard Device**
  This item enables users to set the Onboard device status, includes enable USB, AC97, MC97 and LAN devices.
- **Super IO Device**
  This item enables users to set the Super IO device status, includes enable Floppy, COM, LPT and Power fail status.
- **USB Device Setting**
  This item enables users to set the USB device type.



- **IDE HDD Block Mode [Enabled]**
  This item allows the user to enable block mode for HDD.
- **IDE DMA transfer access [Enabled]**
  This item allows the user to enable block mode for DMA.
- **On-Chip Primary PCI IDE [Enabled]**
  This item allows the user to enable On-Chip IDE controller.
- **IDE HDD Primary Master/Slave PIO/UDMA [Auto]**
  This item allows the user to set PIO/UDMA mode for HDD.
- **On-Chip Secondary PCI IDE [Enabled]**
  This item allows the user to enable On-Chip IDE controller.
- **IDE HDD Secondary Master/Slave PIO/UDMA [Auto]**
  This item allows the user to set PIO/UDMA mode for HDD.
- **On-Chip Serial ATA [Enhanced Mode]**
  This item allows the user to set On-Chip serial ATA controller mode.
- **SATA Port Speed Settings [Disabled]**
  This item allows the user to manual set SATA port speed.
- **PATA IDE Mode [Secondary]**
  This item shows current PATA IDE mode.

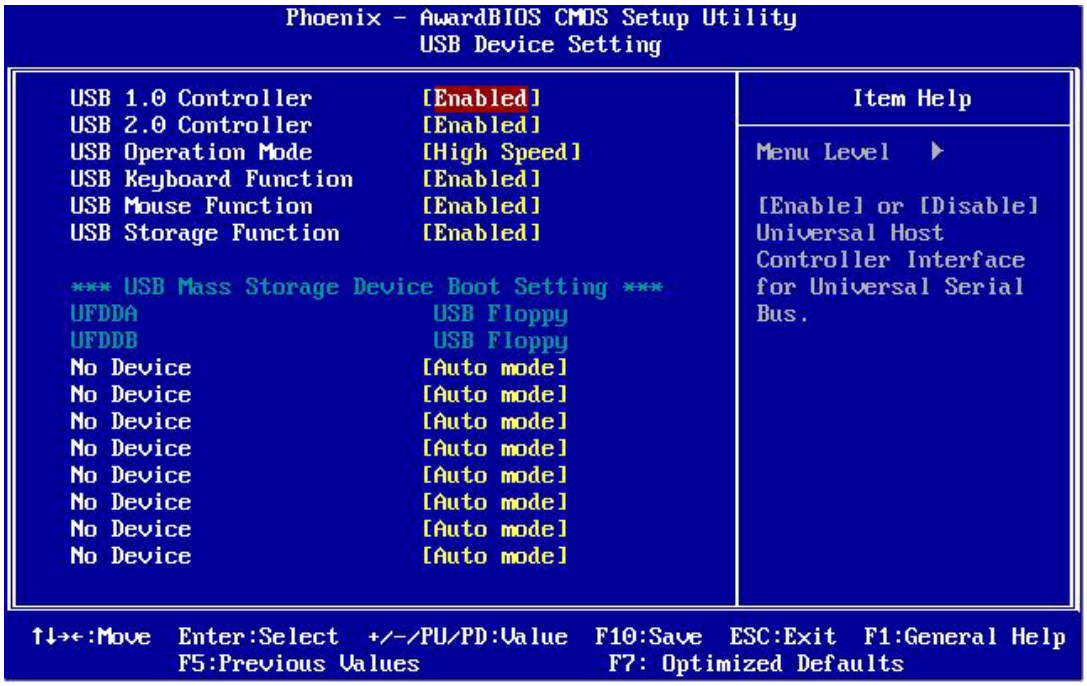


- **Onboard LAN Controller [Enabled]**
  This item allows the user to enable/disable Onboard LAN.



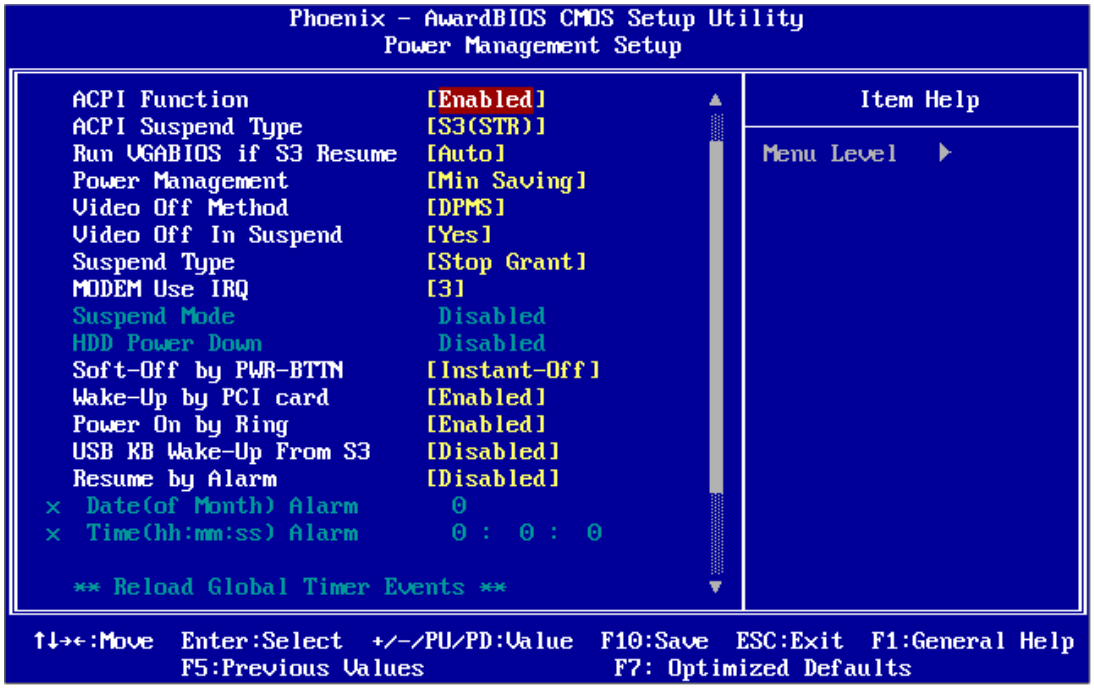
- **Onboard FDC Controller [Enabled]**
  This item allows the user to set FDC controller.
- **Onboard Serial port 2 [2F8/IRQ3]**
  This item allows the user to adjust serial port 2 address.
- **Onboard Parallel Port [378/IRQ7]**
  This item allows the user to adjust parallel port address and IRQ.
- **Parallel Port Mode [SPP]**
  This item allows the user to adjust parallel port mode.

- **EPP Mode Select [EPP1.7]**
  This item allows the user to select EPP mode standard.
- **ECP Mode Use DMA [3]**
  This item allows the user to adjust the ECP DMA resource.
- **PWRON After PWR-Fail [Off]**
  This item allows the user to select recovery after power fail function; this function depends on the chipset.



- **USB 1.0 Controller [Enabled]**
  This item allows the user to enable/disable USB 1.0 Controller.
- **USB 2.0 Contoller [Enabled]**
  This item allows the user to enable/disable USB 2.0 Controller.
- **USB Operation Mode [High Speed]**
  This item allows the user to adjust USB devices operate at High/Full/Low speed.
- **USB Keyboard Function [Enabled]**
  This item allows the user to enable/disable legacy support of USB Keyboard.
- **USB Mouse Function [Enabled]**
  This item allows the user to enable/disable legacy support of USB Mouse.
- **USB Storage Function [Enabled]**
  This item allows the user to enable/disable legacy support of USB Mass Storage
- **USB Mass Storage Device Boot Setting**
  This items list USB Mass Storage devices connected and allows user to set Mass Storage type.

3.2.6 Power Management Setup



Note! *The "Power Management Setup" screen allows configuration of the system for effective energy savings while still operating in a manner consistent with intended computer use.*

- **ACPI Function [Enabled]**

  This item defines the ACPI (Advanced Configuration and Power Management) feature that makes hardware status information available to the operating system, and communicate PC and system devices for improving the power management.

- **ACPI Suspend Type [S3 (STR)]**

  This item allows user to select sleep state state when the computer is in suspend mode.

S1 (POS)	The suspend mode is equivalent to a software power down.
S3 (STR)	The system shuts down with the exception of a refresh current to the system memory.

- **Run VGABIOS if S3 Resume° [Auto[**

  This item allows the user to enable run VGA bios if system resume from S3.

- **Power Management [Min Saving]**

  This item allows user to select system power saving mode.

Min Saving	Minimum power management. Suspend Mode=1 hr.
Max Saving	Maximum power management. Suspend Mode=1 min.
User Define	Allows user to set each mode individually. Suspend Mode= Disabled or 1 min ~1 hr.

- **Video Off Method [DPMS]**

  This item allows the user to determine the manner in which the monitor is blanked.

V/H SYNC+Blank	This option will cause the system to turn off vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

- **Video Off In Suspend [Yes]**

  This item allows user to turn off video during system enter suspend mode.

- **Suspend Type [Stop Grant]**

  This item allows user to determine the suspend type.

- **Modem use IRQ [3]**

  This item allows user to determine the IRQ which the MODEM can use.

- **Suspend Mode [1 Hour]**

  This item allows user to determine the time of system inactivity, all devices except the CPU will be shut off.

- **HDD Power Down Mode [15 Min]**

  This item allows user to determine the time of system inactivity, the hard disk drive will be powered down.

- **Soft-Off by PWR-BTTN [Instant-Off]**

  This item allows the user to define the power button functions.

Instant-Off	Press the power button to power off instantly.
Delay 4 Sec	Press and hold the power button for 4 sec to power off.

- **Wake-Up by PCI card [Enabled]**

  This item allows the user to enable and define how PCI cards wake the system up from suspend mode

- **Power On by Ring [Enabled]**

  This item allows user to define the system will resume by activating of modem ring.

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

  This item allows the user to enable and define how the system will wakeup by activation of the USB keyboard in S3 mode.

- **Resume by Alarm [Disabled]**

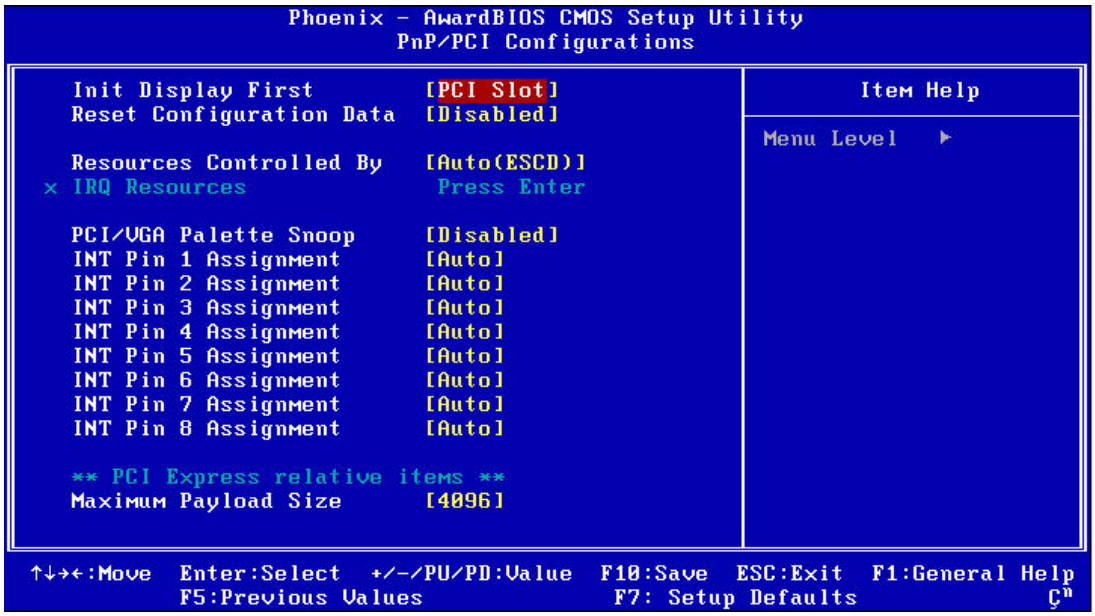
  This item allows user to enable and key in Date/time to power on system.

Disabled	Disable this function.
Enabled	Enable alarm function to power on system
Day (of month) Alarm	1-31
Time (HH:MM:SS) Alarm	(0-23) : (0-59) : 0-59)

- **Reload Global Timer Events**

  This item allows the user to select the events to reload global timer for legacy power management.

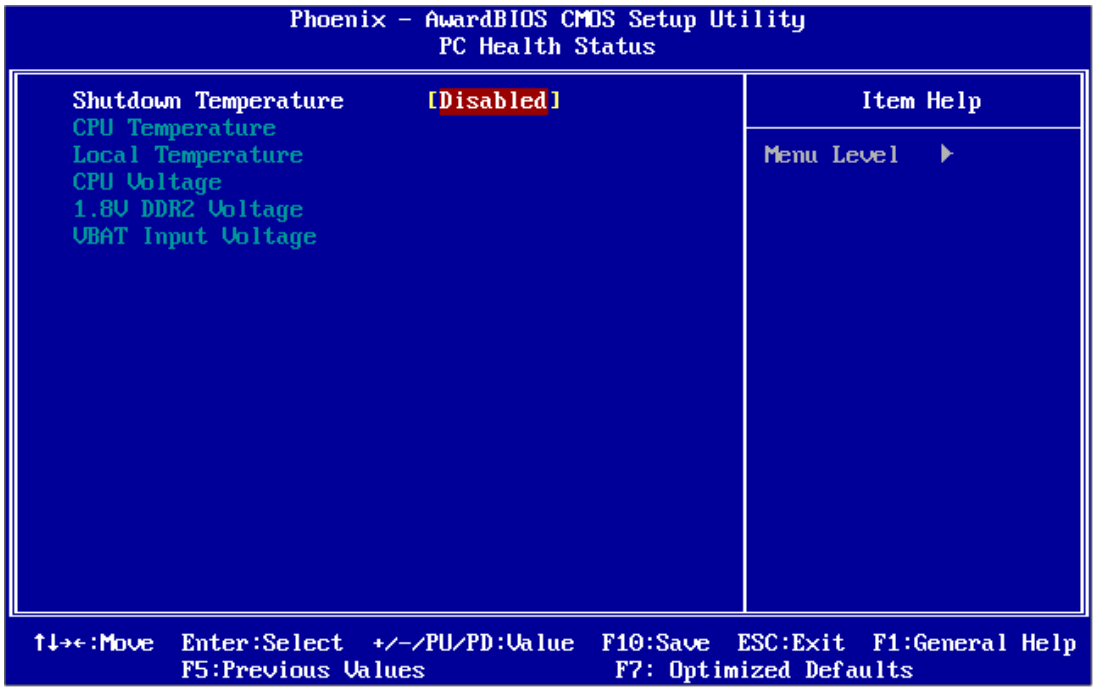
3.2.7 PnP/PCI Configurations



Note! *This "PnP/PCI Configurations" option sets up the IRQ and DMA (both PnP and PCI bus assignments).*

- **Init Display First [PCI Slot]**
  This item is setting for start up Video output from PCI or Onboard device.
- **Reset Configuration Data [Disabled]**
  This item allow user to clear any PnP configuration data stored in the BIOS.
- **Resources Controlled By [Auto (ESCD)]**
  - IRQ Resources
    This item allows you respectively assign an interruptive type for IRQ-3, 4, 5, 7, 9, 10, 11, 12, 14, and 15.
  - DMA Resources
    This item allows you respectively assign an interruptive type for DMA, 0, 1, 2, 3, 4, 5, 6, and 7.
- **PCI VGA Palette Snoop [Disabled]**
  The item is designed to solve problems caused by some non-standard VGA cards. A built-in VGA system does not need this function.
- **INT Pin 1~8 Assignment [Auto]**
  This item allows the user to select the interrupt request (IRQ) assigned to a device connected to the PCI interface on your system.
- **Maximum Payload Size [4096]**
  This item allows the user to adjust maximum TLP (Transaction Layer Packet) payload size.

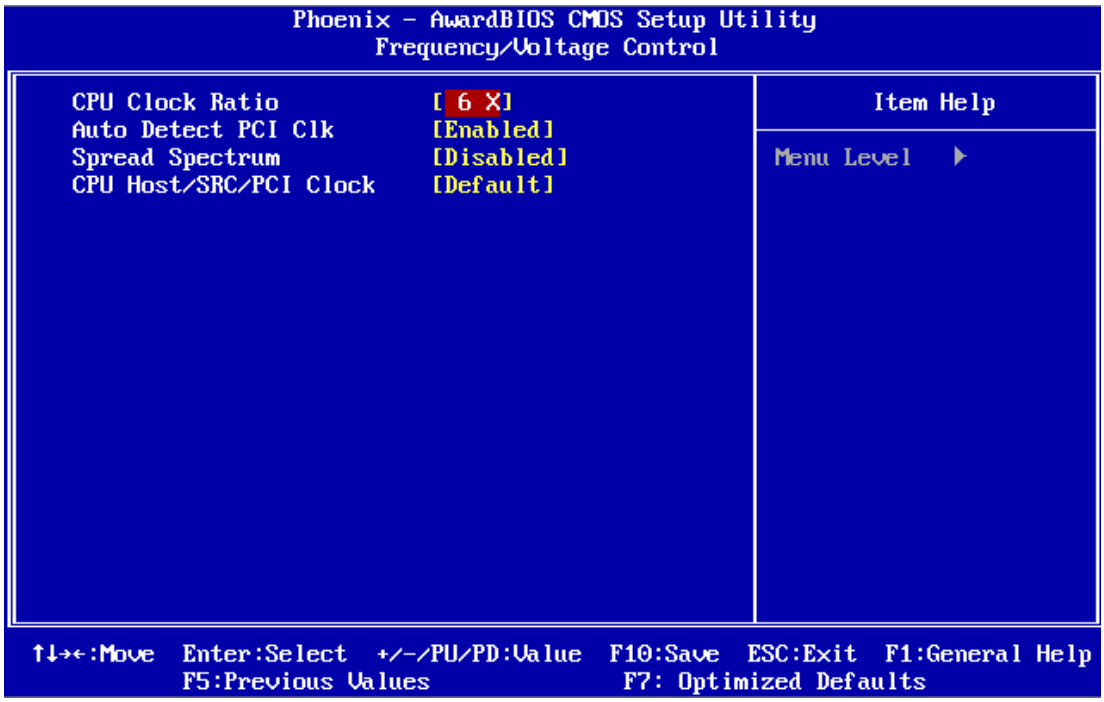
3.2.8 PC Health Status



Note! *This "PC Health Status" page reports the thermal, fan and voltage status of the board. This page may vary according to the chipset installed.*

- **CPU Temperature [Show Only]**
  This item displays current CPU temperature.
- **Local Temperature [Show Only]**
  This item displays current board temperature.
- **CPU/ 1.8 V/ VBAT [Show Only]**
  This item displays current CPU and system voltage.

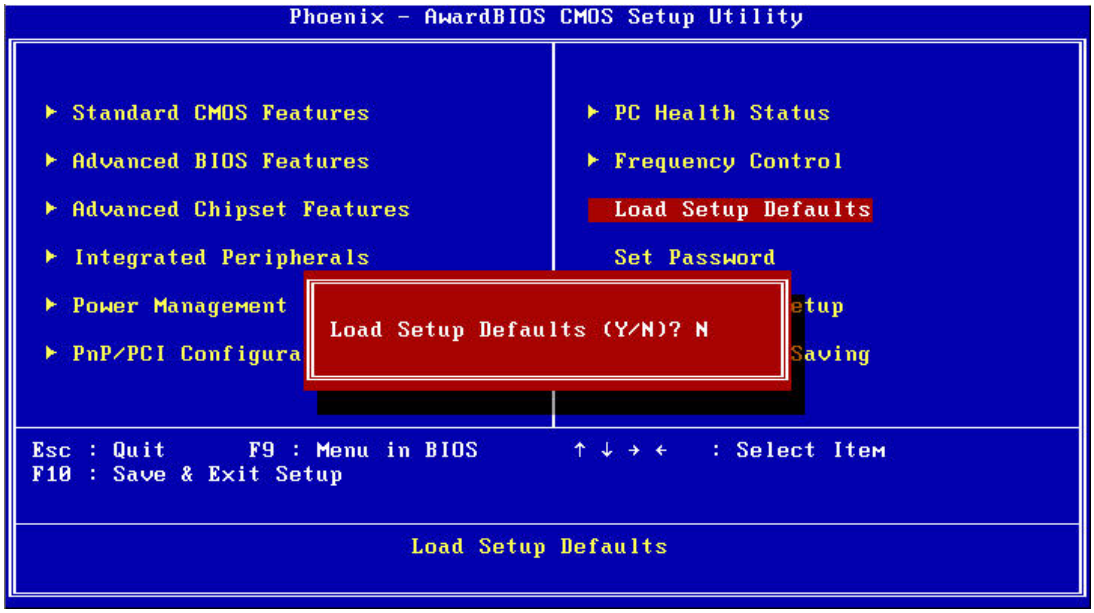
3.2.9 Frequency/Voltage Control



Note! *The "Frequency/Voltage Control" screen controls the CPU host and PCI frequency. The options on this page vary depending on the chipset; items show up according to installed CPU capacities.*

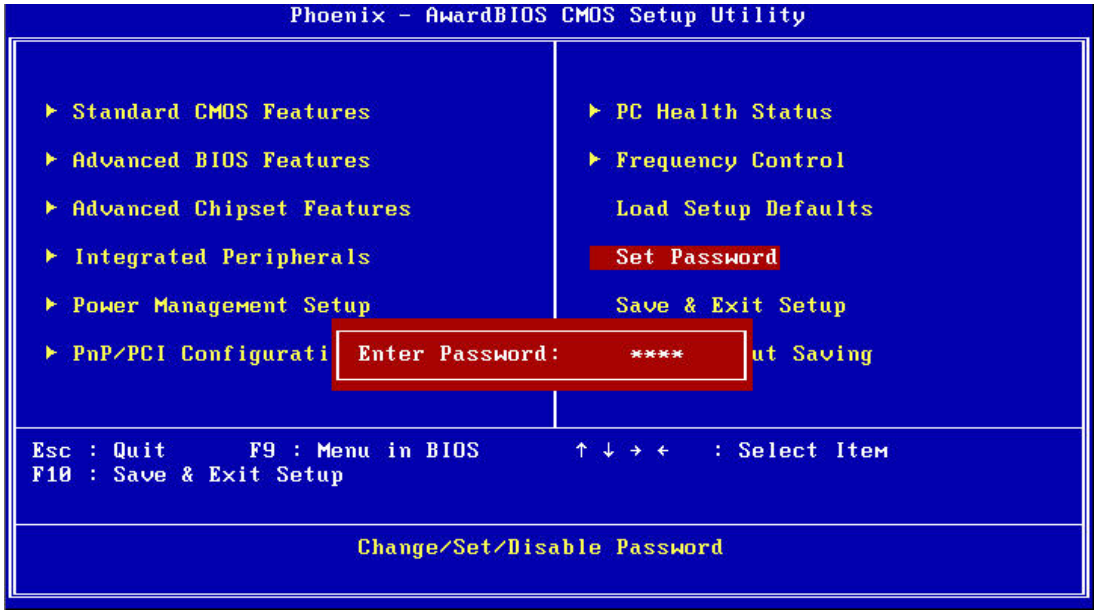
- **Auto Detect PCI Clk [Enabled]**
  This item enables users to set the PCI Clk either by automatic system detection or manually.
- **Spread Spectrum [Disabled]**
  This item enables users to set the spread spectrum modulation.
- **CPU Host/SRC/PCI Clock [Defautl]**
  This item enables users to set the CPUhost/SRC/PCI clock.

3.2.10 Load Optimized Defaults



Note! *"Load Optimized Defaults" loads the default system values directly from ROM. If the stored record created by the setup program should ever become corrupted (and therefore unusable), select Load Setup Defaults to have these default values load automatically for the next bootup.*

3.2.11 Set Password



Note! *To enable this feature, you should first go to the "Advanced BIOS Features" menu, choose the Security Option, and select either System or Setup, depending on which aspects you want password protected. System requires a password both to boot the system and to enter Setup. Setup requires a password only to enter Setup. A password may be at most 8 characters long.*

To Establish Password

1. Choose the **Set Password** option from the **CMOS Setup Utility** Main Menu and press <Enter>.
2. When you see **Enter Password**, enter the desired password and press <Enter>.
3. At the **Confirm Password** prompt, retype the desired password, then press <Enter>.
4. Select **Save to CMOS** and exit, type <Y>, then <Enter>.

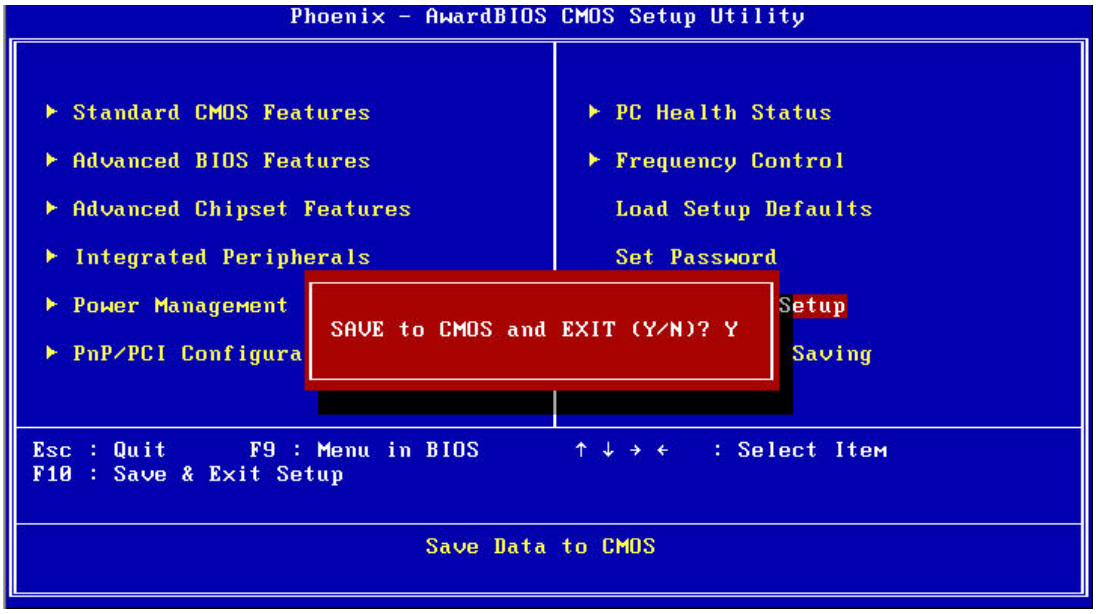
To Change Password

1. Choose the **Set Password** option from the **CMOS Setup Utility** main menu and press <Enter>.
2. When you see **Enter Password**, enter the existing password and press <Enter>.
3. You will see the **Confirm Password** prompt, type it in again, and press <Enter>.
4. Select **Set Password** again, and at the **Enter Password** prompt, enter the new password and press <Enter>.
5. At the **Confirm Password** prompt, retype the new password, and press <Enter>.
6. Select **Save to CMOS** and exit, type <Y>, then <Enter>.

To Disable a Password

1. Choose the **Set Password** option from the **CMOS Setup Utility** main menu and press <Enter>.
2. When you see the **Enter Password** prompt, enter the existing password and press <Enter>.
3. You will see **Confirm Password**, type it in again, and press <Enter>.
4. Select **Set Password** again, and at the **Enter Password** prompt, DO NOT enter anything - just press <Enter>.
5. At the **Confirm Password** prompt, again, DO NOT type in anything - just press <Enter>.
6. Select **Save to CMOS** and exit, type <Y>, then <Enter>.

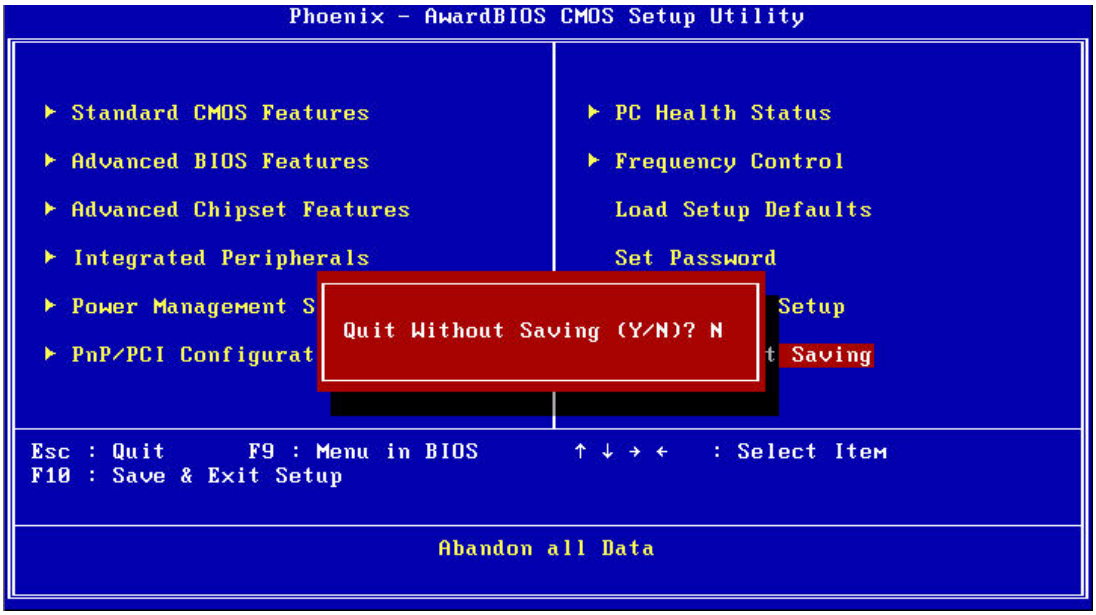
3.2.12 Save & Exit Setup



Note! *Typing "Y" will quit the BIOS Setup Utility and save user setup values to CMOS.*

Typing "N" will return to BIOS Setup Utility.

3.2.13 Quit Without Saving



Note! *Typing "Y" will quit the BIOS Setup Utility without saving any changes to CMOS.*

Typing "N" will return to the BIOS Setup Utility.

Chapter 4

S/W Introduction & Installation

4.1 S/W Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft Windows? embedded technology." We enable Windows? Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows? Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Driver Installation

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured.

4.2.1 Windows XP professional

To install the drivers please just insert the CD into CD-ROM, select the drivers that you want to install, then run .exe (set up) file under each chipset folder and follow Driver Setup instructions to complete the installation.

4.2.2 Other OS

To install the drivers for Other Windows OS or Linux, please browse the CD to run the setup file under each chipset folder on the CD-ROM.

Appendix A

Watchdog Timer

This appendix gives you the information about the watchdog timer programming on the SOM-6761/5761 CPU System on Module.

Sections include:

- **Watchdog Timer Programming**

A.1 Programming the Watchdog Timer

1. SMBus Address: Pin 3 internal pull up 100K = 0X9C, External pull up 4.7K = 0X6E.
2. Enable WDT function: Configuration and function select register Index-03h.

Table A.1: Index-03h

1-0	PIN10_MODE	R/W	VSB3V	00:GPI010 01: LED10 IN this mode can use REG Ox06(bit1,0) to select LED frequency. 10,11 :WD_OUT

3. Watchdog Control: Watchdog Timer Control Register - Index 36h
   Power-on default [7:0] =0000_0000b

Table A.2: Watchdog Timer Index 36h

Bit	Name	P/W	PWR	Description
7	Reserved	RO	VSB3V	Reserved. Read will return 0.
6	STS WD TMOUT	R/W	VSB3V	Watchdog is timeout. When the watchdog is timeout, this bit will be set to one. If set to 1, write 1 will clear this bit. Write 0, no effect.
5	WD ENABLE	R/W	VSB3V	Enable watchdog timer.
4	WD PULSE	R/W	VSB3V	Watchdog output level or pulse. If set 0 (default), the pin of watchdog is level output, if write 1, the pin will output with a pulse.
3	WD UNIT	R/W	VSB3V	Watchdog unit select. Default 0 is select second. Write 1 to select minute.
2	WD HAC-TIVE	RW	VSB3V	Program WD2 output level. If set to 1 and watchdog asserted, the pin will be high. If set to 0 and watchdog asserted, this pin will drive low (default).
1-0	WD_PS WIDTH	RW	VSB3V	Watchdog pulse width selection. If the pin output is selected to pulse mode. The pulse width can be choice. 00b- 1m second. 01b- 20m second. 10b -100m second. 11b- 4 second.

4. Watchdog reset timing control: Watchdog Timer Range Register - Index 37h

Power-on default [7:0] =0000_0000b

Table A.3: Watchdog Timer Range - Index 37h

Bit	Name	P/W	PWR	Description
7-0	WD_TIME	RW	VSB3V	Watchdog timing range from 0 - 255. The unit is either second or minute programmed by the watchdog timer control register bits.

Appendix B

Programming GPIO

This Appendix gives the illustration of the General Purpose Input and Output pin set-ting.

Sections include:

- **System I/O ports**

B.1 GPIO Register

1. Configuration and function select Register - Index 03h

Table B.1: Index 03h

Bit	Name	P/W	PWR	Description
4-3	PIN12_MODE	RW	VSB3V	00: GPIO12 01: LED12 IN tills mode can use REG Ox06(bit5,4) to select LED frequency. 10: IRQ 11:WDTOUT11#:
2	PIN11_MODE	RW	VSB3V	0: GPI011 1: LED11 IN this mode can use REG Ox06(brt3,2) to select LED frequency.

2. Configuration and function select Register - Index 04h

Table B.2: Index 04h

Bit	Name	P/W	PWR	Description
1	PIN5_MODE	RW	VSB3V	0: GPI0171: LED17 IN this mode can use REG Ox07(bit7, 6) to select LED frequency.
0	PIN4_MODE	RW	VSB3V	0: GPIO161: LED16 IN this mode can use REG Ox07(bit5, 4) to select LED frequency.

3. Configuration and function select Register - Index 05h

Table B.3: Index 05h

Bit	Name	P/W	PWR	Description
2	PIN23_MODE	RW	VSB3V	0: GPIO241: LED24 IN this mode can use REG 0x09 (bit 1, 0) to select LED frequency.
1	PIN22_MODE	RW	VSB3V	0: GPI0251: LED25 IN this mode can use REG 0x09 (bit 3, 2) to select LED frequency.
0	PIN21_MODE	RW	VSB3V	0: GPIO261: LED26 IN this mode can use REG 0x09 (bit5, 4) to select LED frequency.

4. GPIOIx Output Control Register - Index 10h

Table B.4: Index 10h

Bit	Name	P/W	PWR	Description
7	GP17JX CTRL	RW	VSB3V	GPIO 17 output control. Set to 1 for output function. Set to 0 for input function (default).
6	GP16_O CTRL	RW	VSB3V	GPIO 16 output control. Set to 1 for output function. Set to 0 for input function (default).
2	GP12JD CTRL	RW	VSB3V	GPIO 12 output control. If this pin serves as IRQ/SMI#. this bit has no effect. Set to 1 for output function. Set to 0 for input function (default).
1	GP11_O CTRL	RW	VSB3V	GPIO 11 output control. Set to 1 for output function. Set to 0 for input function (default).mode can use REG 0x09 (bit5, 4) to select LED frequency.

5. GPIO2x Output Control Register - Index 20h

Table B.5: Index 20h

Bit	Name	P/W	PWR	Description
7	GP27_O CTRL	RW	VSB3V	GPIO 27 output control. Set to 1 for output function. Set to 0 for input function (default).
6	GP26_O CTRL	RW	VSB3V	GPIO 26 output control. Set to 1 for output function. Set to 0 for input function (default).
5	GP25_O CTRL	RW	VSB3V	GPIO 25 output control. Set to 1 for output function. Set to 0 for input function (default).
4	GP24_O CTRL	RW	VSB3V	GPIO 24 output control. Set to 1 for output function. Set to 0 for input function (default).
3	GP23_O CTRL	RW	VSB3V	GPIO 23 output control. Set to 1 for output function. Set to 0 for input function (default).
2	GP22_O CTRL	RW	VSB3V	GPIO 22 output control. Set to 1 for output function. Set to 0 for input function (default).
1	GP21_O CTRL	RW	VSB3V	GPIO 21 output control. Set to 1 for output function. Set to 0 for input function (default).
0	GP20_O CTRL	RW	VSB3V	GPIO 20 output control. Set to 1 for output function. Set to 0 for input function (default).

6. GPIOIx Output Data Register - Index 11h

Table B.6: Index 11h

Bit	Name	P/W	PWR	Description
7	GP17JD DATA	RW	VSB3V	GPIO 17 output data.
6	GP16_O DATA	RW	VSB3V	GPIO 16 output data.
5	GP15JD DATA	RW	VSB3V	GPIO 15 output data.
4	GP14JD DATA	RW	VSB3V	GPIO 14 output data.
3	GP13JD DATA	RW	VSB3V	GPIO 13 output data.
2	GP12_O DATA	RW	VSB3V	GPIO 12 output data. If this pin serves as IRQ/SMI*, this bit has no effect.
1	GP11_O DATA	RW	VSB3V	GPIO 11 output data.
0	GP10JD DATA	RW	VSB3V	GPIO 10 output data.

7. GPIOIx Input Status Register - Index 12h

Table B.7: Index 12h

Bit	Name	P/W	PWR	Description
7	GP17_P STS	RO	VSB3V	Read the GPIO17 data on the pin.
6	GP16_P STS	RO	VSB3V	Read the GPIO16 data on the pin.
5	GP15_P STS	RO	VSB3V	Read the GPIO15 data on the pin.
4	GP14_P STS	RO	VSB3V	Read the GPIO14 data on the pin..
3	GP13_P STS	RO	VSB3V	Read the GPIO13 data on the pin.
2	GP12_P STS	RO	VSB3V	Read the GPIO12 data on the pin.
1	GP11_P STS	RW	VSB3V	Read the GPIO11 data on the pin.
0	GP10_P STS	RW	VSB3V	Read the GPIO10 data on the pin.

Appendix C

System Assignments

This appendix gives you the information about the system resource allocation on the SOM-6761/5761 CPU System on Module

Sections include:

- **System I/O ports**
- **DMA Channel Assignments**
- **Interrupt Assignments**
- **1st MB Memory Map**

C.1 System I/O Ports

Table C.1: System I/O ports

Addr. range(Hex)	Device
0000 - 0CF7	PCI bus
0000 - 000F	Direct memory access controller
0010 - 001F	Motherboard resources
0020 - 0021	Programmable interrupt controller
0022 - 003F	Motherboard resources
0040 - 0043	System timer
0044 - 005F	Motherboard resources
0060 - 0060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0061 - 0061	System speaker
0062 - 0063	Motherboard resources
0064 - 0064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0065 - 006F	Motherboard resources
0070 - 0073	System CMOS/real time clock
0074 - 007F	Motherboard resources
0080 - 0090	Direct memory access controller
0091 - 0093	Motherboard resources
0094 - 009F	Direct memory access controller
00A0 - 00A1	Programmable interrupt controller
00A2 - 00BF	Motherboard resources
00C0 - 00DF	Direct memory access controller
00E0 - 00EF	Motherboard resources
00F0 - 00FF	Numeric data processor
01F0 - 01F7	Primary IDE Channel
0274 - 0277	ISAPNP Read Data Port
0279 - 0279	ISAPNP Read Data Port
02F8 - 02FF	Communications Port (COM2)
0378 - 037F	Printer Port (LPT1)
03B0 - 03BB	Intel Corporation US15 Embedded Graphics
03C0 - 03DF	Intel Corporation US15 Embedded Graphics
03F6 - 03F6	Primary IDE Channel
03F8 - 03FF	Communications Port (COM1)
04D0 - 04D1	Motherboard resources
0500 - 051F	Intel(R) SCH Family SMBus Controller
0778 - 077B	Printer Port (LPT1)
0880 - 088F	Motherboard resources
0A78 - 0A7B	Motherboard resources
0B78 - 0B7B	Motherboard resources
0BBC - 0BBF	Motherboard resources
0D00 - FFFF	PCI bus
0E78 - 0E7B	Motherboard resources
0F78 - 0F7B	Motherboard resources
0FBC - 0FBF	Motherboard resources
D000 - DFFF	Intel(R) SCH Family PCI Express Root Port 3 - 8112

Table C.1: System I/O ports	
DF00 - FF3F	Intel(R) PRO/100 VE Network Connection
E000 - EFFF	Intel(R) SCH Family PCI Express Root Port 1 - 8110
FB00 - FB0F	Standard Dual Channel IDE Controller
FC00 - FC1F	Intel(R) SCH Family USB Universal Host Controller - 8116
FD00 - FD1F	Intel(R) SCH Family USB Universal Host Controller - 8115
FE00 - FE1F	Intel(R) SCH Family USB Universal Host Controller - 8114
FF00 - FF07	Intel Corporation US15 Embedded Graphics

C.2 DMA Channel Assignments

Note! *SOM-6761/5761 does not support DMA function.*

C.3 Interrupt Assignments

Table C.2: Interrupt assignments	
Interrupt#	**Interrupt source**
NMI	Parity error detected
IRQ 0	System timer / High precision event timer
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 2	Available
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	Available
IRQ 6	Available
IRQ 7	Available
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Numeric data processor
IRQ 14	Primary IDE Channel
IRQ 15	Available
IRQ 16	Intel(R) SCH Family PCI Express Root Port 1 - 8110 Intel(R) SCH Family USB Universal Host Controller - 8114 Microsoft UAA Bus Driver for High Definition Audio SDA Standard Compliant SD Host Controller
IRQ 17	Intel(R) PRO/100 VE Network Connection Intel(R) SCH Family PCI Express Root Port 3 - 8112 Intel(R) SCH Family USB Universal Host Controller - 8115 SDA Standard Compliant SD Host Controller
IRQ 18	Intel(R) SCH Family USB Universal Host Controller - 8116 SDA Standard Compliant SD Host Controller IRQ 19 Intel(R) SCH Family USB2 Enhanced Host Controller - 8117
USB and Ethernet IRQ is automatically set by the system	

C.4 1st MB Memory Map

Table C.3: 1st MB memory map

Addr. range (Hex)	Device
00000000 - 0009FFFF	System board
000A0000 - 000BFFFF	PCI bus
000A0000 - 000BFFFF	Intel Corporation US15 Embedded Graphics
000C0000 - 000DFFFF	PCI bus
000E0000 - 000EFFFF	PCI bus
000F0000 - 000FFFFF	System board
00100000 - 7F6DFFFF	System board
7F6E0000 - 7F7FFFFF	System board
7F800000 - FEBFFFFF	PCI bus
D8000000 - DFFFFFFF	Intel Corporation US15 Embedded Graphics
E0000000 - EFFFFFFF	Motherboard resources
FDA00000 - FDCFFFFF	Intel(R) SCH Family PCI Express Root Port 3 - 8112
FDCC0000 - FDCDFFFF	Intel(R) PRO/100 VE Network Connection
FDCFF000 - FDCFFFFF	Intel(R) PRO/100 VE Network Connection
FDD00000 - FDEFFFFF	Intel(R) SCH Family PCI Express Root Port 1 - 8110
FDF00000 - FDF7FFFF	Intel Corporation US15 Embedded Graphics
FDFC0000 - FDFDFFFF	Intel Corporation US15 Embedded Graphics
FDFF8000 - FDFFBFFF	Microsoft UAA Bus Driver for High Definition Audio
FDFFC000 - FDFFC0FF	SDA Standard Compliant SD Host Controller
FDFFD000 - FDFFD0FF	SDA Standard Compliant SD Host Controller
FDFFE000 - FDFFE0FF	SDA Standard Compliant SD Host Controller
FDFFF000 - FDFFF3FF	Intel(R) SCH Family USB2 Enhanced Host Controller - 8117
FEC00000 - FEC00FFF	System board
FED00000 - FED000FF	System board
FED00000 - FED003FF	High precision event timer
FED13000 --FED1DFFF	System board
FED20000 - FED8FFFF	System board
FEE00000 - FEE00FFF	System board
FFB00000 - FFB7FFFF	System board
FFB80000 - FFBFFFFF	Intel(R) 82802 Firmware Hub Device
FFF00000 - FFFFFFFF	System board

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