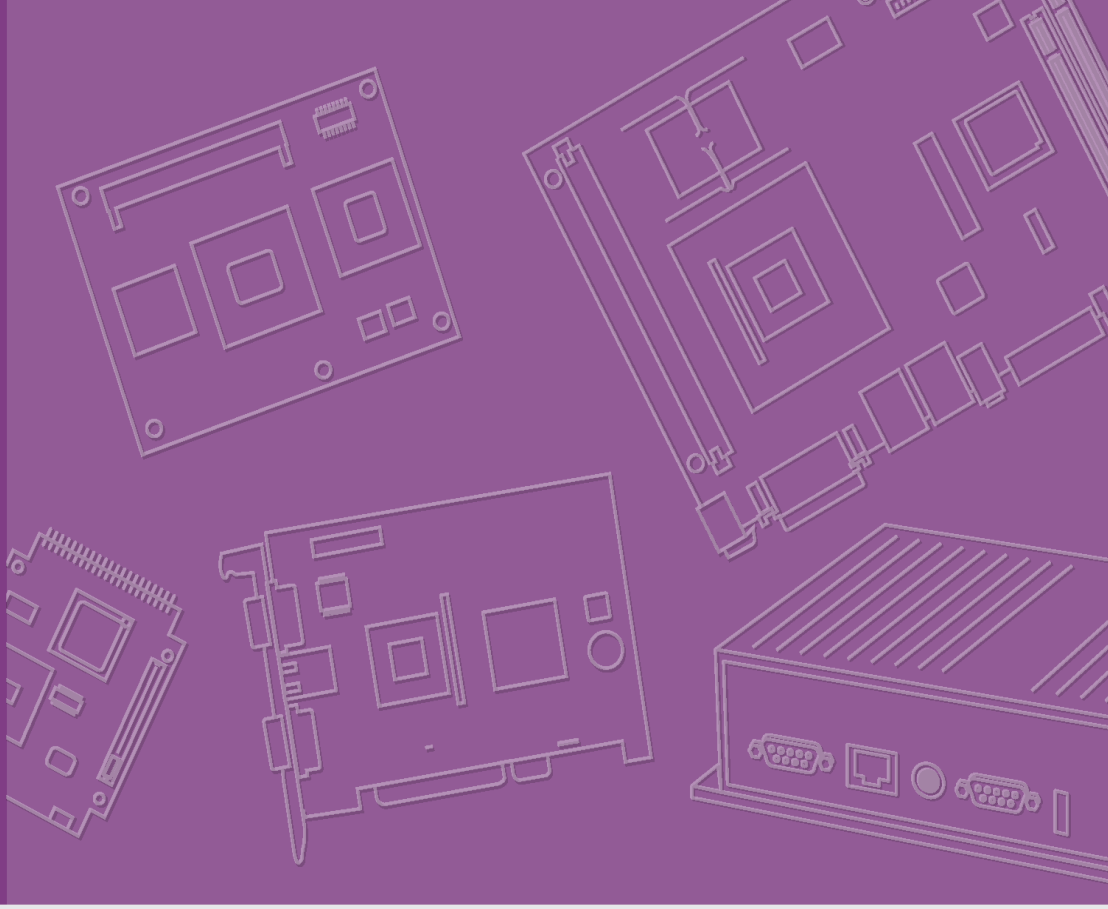

User Manual

SOM-5788

Copyright

Acknowledgements

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Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Product Warranty (2 years)

The manufacturerwarrants 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 the manufacturer, or which have been subject to misuse, abuse, accident or improper installation. The manufacture assumes no liability under the terms of this warranty as a consequence of such events.

Because of the manufacture's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If a 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, 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.

Part No. 2006578800 Edition 1

Printed in Taiwan May 2010

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the EMAC web site at www.emacinc.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative 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

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- SOM-5788 module x1
- Heatspreader x1

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.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. The manufacturer disclaims all responsibility for the accuracy of any statements contained herein.

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.

Contents

Chapter 1

General Information

This chapter gives background information on the SOM-5788 COM-Express Basic Module.

Sections include:

- Introduction
- Specification

1.1 Introduction

SOM-5788 is a COM-Express Basic Module with type 2 pin-outs that fully comply with the PCI Industrial Computer Manufactures PICMG COM Express standard. The new CPU module integrates Intel Arrandale CPU with Ibex Peak-M chipset which supports Intel Embedded Gen5.75 GFx with 12 execution units, full AVC, VC-1, and MPEG2 HW decode features. In a basic form factor of 125mm x 95mm, the SOM-5788 provides a scalable high performance and easy to integrate solution for customers' applications by utilizing a plug-in CPU module on an application-specific customer solution board. The SOM-5788 with advanced I/O capacity incorporates serial differential signaling technologies such as PCI Express, Serial ATA, USB 2.0, LVDS and HD Audio interfaces. SOM-5788 offers design partners more choices for their own applications needing higher computing speeds while maintaining a compact form factor.

SOM-5788 complies with the "Green Function" standard and supports Doze, Standby and Suspend modes. The basic module size (125 mm x 95 mm) and use of one high capacity connector based on the proven COM-Express Basic Module form factor, allow the modules to be easily and securely mounted onto a customized solution board or our standard SOM-DB5700 development board.

The SOM-5788 is a highly integrated multimedia COM module that combines audio, video, and network functions. It provides high processing capability via Intel® Core i7 / i5 processors, dual channel LVDS, HDMI, DVI and TV-out for four independent display support with hybrid multi-monitor capability (integrated and discrete graphics working simultaneously), DDR3 memory up to 8 GB, and high definition audio interface (AC97/Azalia).

1.2 Specifications

1.2.1 Standard COM Module Features

- **Processor:** Onboard Intel® Core i7 / i5 processors
  (Detail CPU support information please contact your sales representative)
- **BIOS:** AMI EFI 8MB Flash
- **Chipset:** Intel® QM57 chipset
- **Cache Memory:** Intel® Core i7 integrated 4MB LLC
  Intel® Core i5 integrated 3MB LLC
- **System Memory:** 200-pin SODIMM 800/1066MHz DDR3 up to 8GB
- **Power Management:** Supports enhanced Intel SpeedStep technology, S0, S1, S3, S4, S5 and C0 ~ C6 with ACPI 2.0 and APM 1.2 compliant
- **SATA Interface:** 4 SATAII Channels up to 300MB / s
- **PATA Interface:** 1 EIDE Channel up UDMA100
- **WatchDog Timer:** 6554 levels timer interval, from 0 to 6553 sec multi-level and multi-option WatchDog Timer
- **USB Interface:** Support 8 USB 2.0 ports
- **Expansion Interface:** Supports LPC, PEG x16, 6 PCIe x1 (PCIe x4 option), 4 PCI masters

1.2.2 Display Interface

- **Chipset:** Intel QM57, Gen 5.75 with 12 Execution Units, DirectX 10, OpenGL 2.1, full AVC, VC-1, and MPEG2 HW decode.
- **Display Type:** VGA, LVDS, HDMI, DVI, Displayport, TV-out
- **Display Mode:** VGA port (2048 x 1536)
  LVDS dual channels, 18/24 bits
  HDMI / DVI (1920x1200)
  Displayport (2560 x 1600)
  TV-out (thru SDVO)
  GMA driver supports up to 2 independent display.
  Four independent display support with hybrid multi-monitor capability (integrated and discrete graphics working simultaneously).

1.2.3 Audio Function

Audio interface: Intel high definition audio interface

1.2.4 Ethernet

Chipset: Intel 82577LM Gigabit Ethernet. Base on IEEE 10BASE-T, 100BASE-TX and 1000BASE-T standard.

1.2.5 iManager

- **Chipset:** ITE 8516 Embedded Controller
- **Features:**
  Board information
  Single Stage WDT or Multi-level Stage WDT (IRQ, SCI, Power off and H/W restart)
  Hardware Monitor for +12V, +5Vsb, COMS Battery and CPU temperature
  Smart Fan (Full speed, Manual speed, Auto speed)
  SMBus / I2C
  Deep Sleep mode in S4 / S5

1.2.6 Mechanical and Environmental

- **Dimensions:** COM-Express Basic Module, 125 mm x 95 mm (4.92" x 3.74")
- **Power supply voltage:** +12 V power only (+5VSB is need for ACPI and ATX power)
- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F)
- **Operating humidity:** 0% ~ 90% relative humidity, non-condensing
- **Weight:** 0.103 Kg (weight of total package)

Chapter 2

Mechanical Information

This chapter gives mechanical and connector information on the SOM-5788 COM-Express Basic Module.

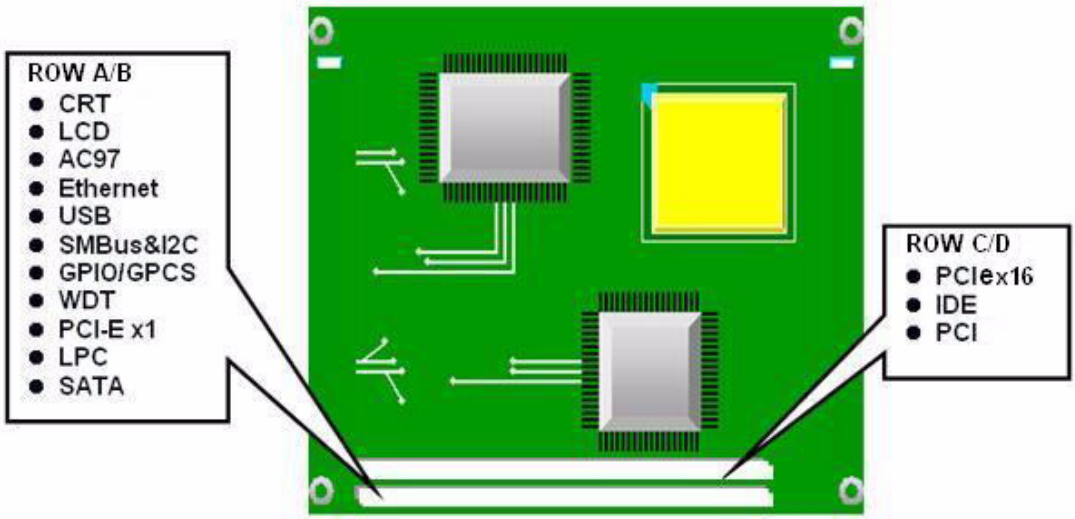
Sections include:

- Connector Information
- Mechanical Drawing

2.1 Connectors

2.1.1 Board Connector

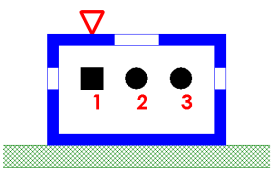
There are two 220-pin connectors at the rear side of SOM-5788 for connecting to carrier board.



Pin Assignments for ROW A/B/C/D

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

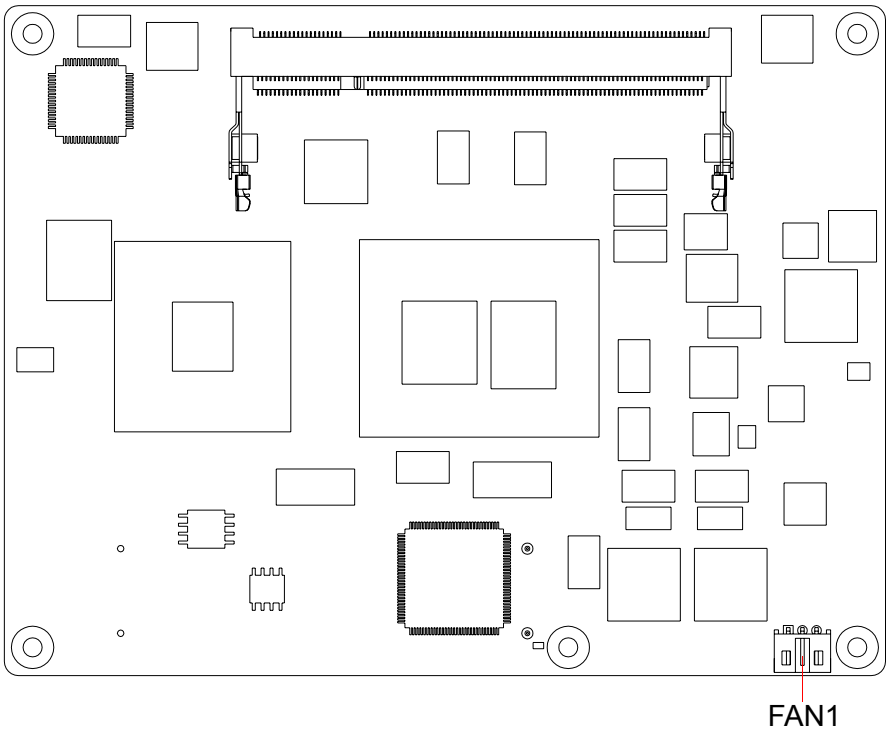


Figure 2.1 Board Layout (front side)

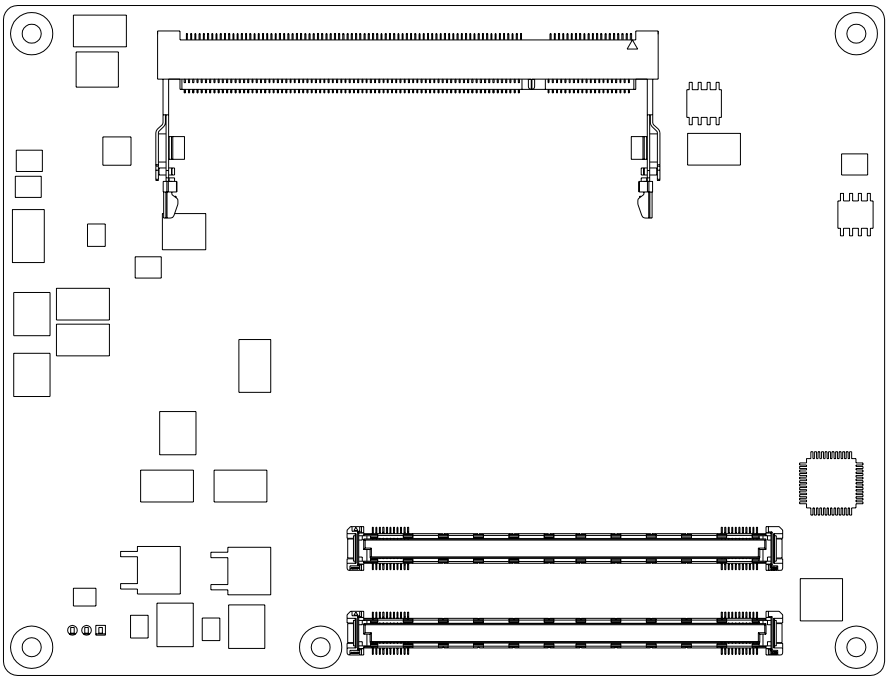


Figure 2.2 Board Layout (rear side)

2.2.2 Board Dimension

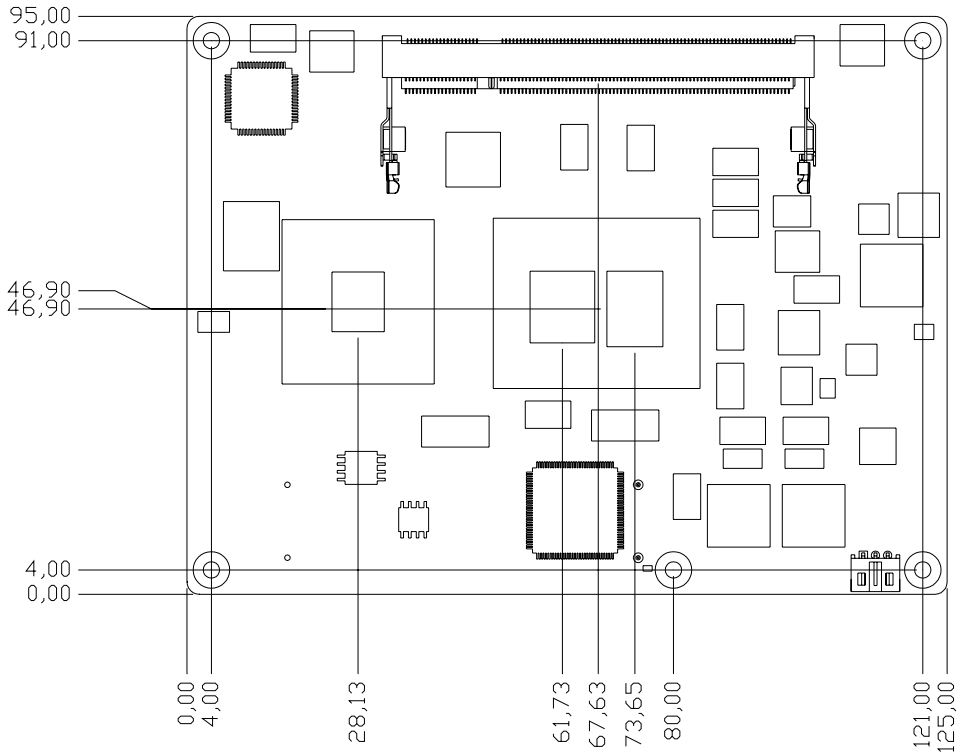


Figure 2.3 Board Dimension (front side)

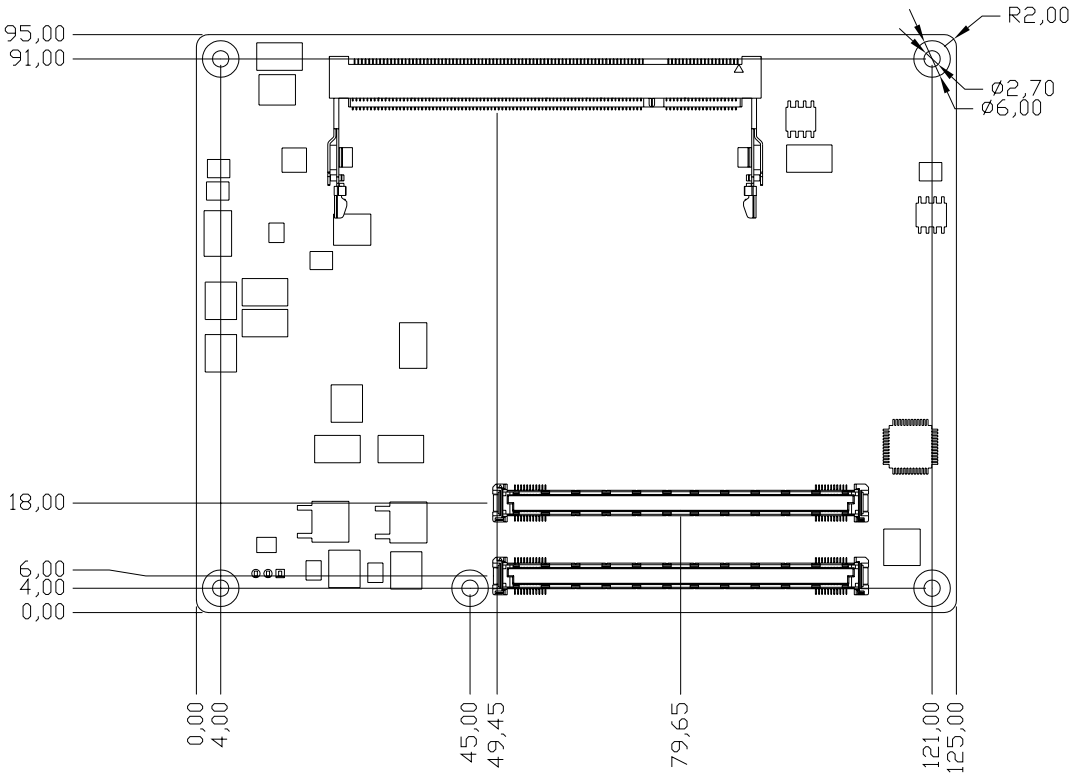


Figure 2.4 Board Dimension (rear side)

Chapter 3

BIOS settings

AMIBIOS has been integrated into many motherboards for over a decade. With the AMIBIOS Setup program, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the BIOS setup screens.

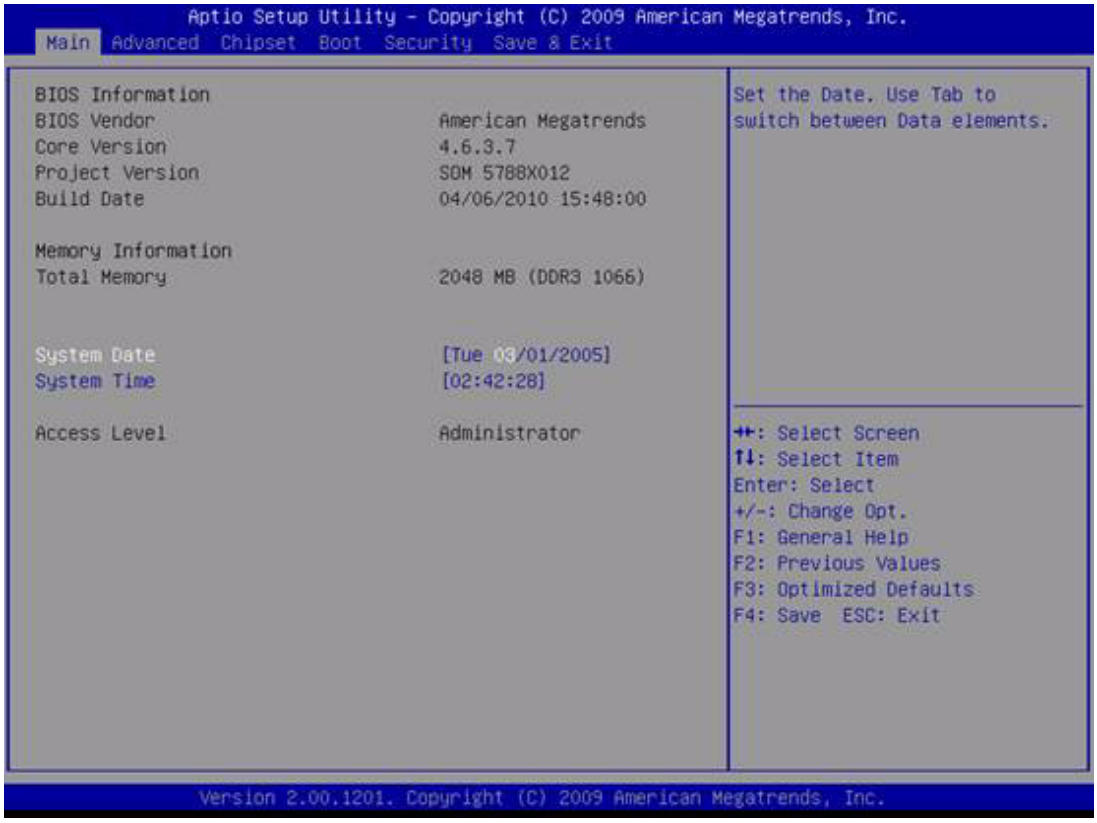


Figure 3.1 Setup program initial screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. Information is stored in NVRAM area and maintained during the period of power off.

3.1 Entering Setup

Turn on the computer and then press <F2> to enter BIOS setup menu.

3.2 Main Setup

When you enter the BIOS Setup Utility, you will see the main setup screen first. You can always return to Main setup screen by selecting the Main tab. There are two setup options. They are described in this section. The main BIOS setup screen is shown below.

Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1 System Date / System Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.3 Advanced BIOS Features Setup

Select the Advanced tab from the BIOS setup screen to enter the Advanced Setup screen. Users can select any item in the left frame of the screen, such as PCI Configuration, to go to the sub menu for that item. Users can display an Advanced Setup option by highlighting it using the <Arrow> keys. All Advanced Setup options are described in this section. The Advanced Setup screens are shown below. The sub menus are described on the following pages.

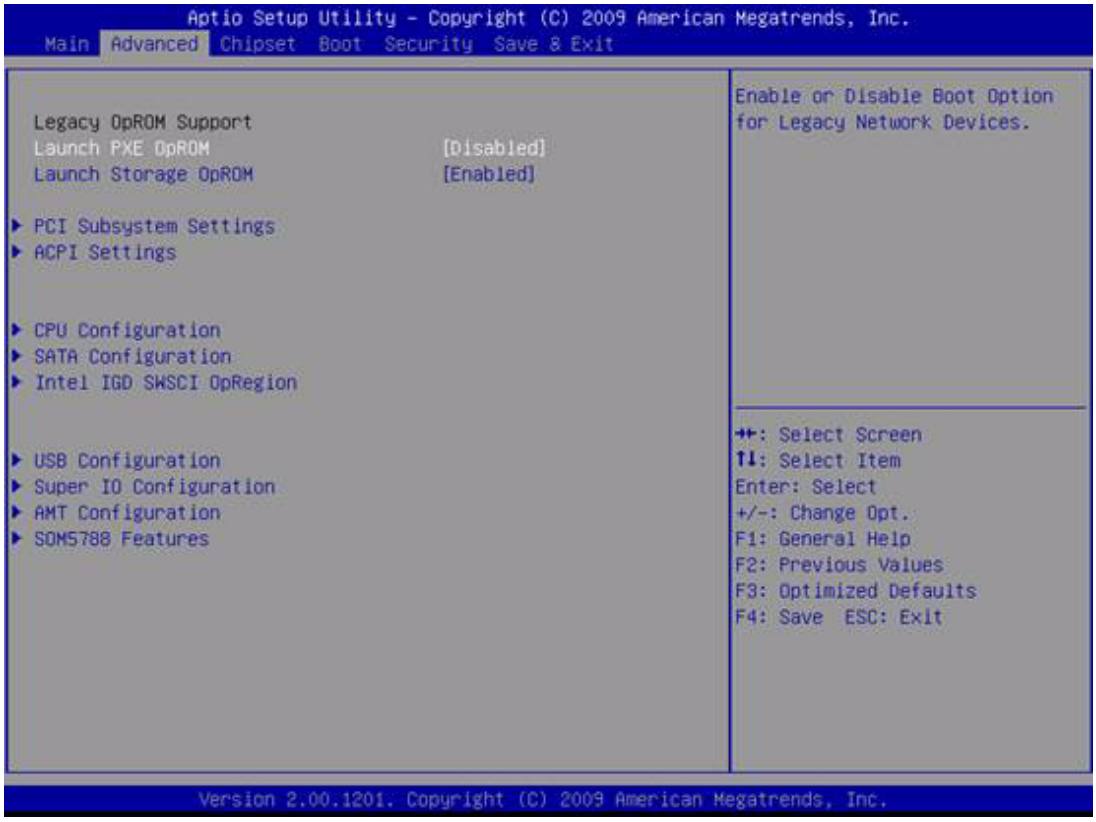


Figure 3.3 Advanced BIOS features setup screen

3.3.1 PCI Configuration

Figure 3.4 PCI Configuration

PCI ROM Priority

Specifies what PCI option ROM to launch.

3.3.2 ACPI Configuration

Figure 3.5 ACPI Configuration

Enable ACPI Auto Configuration

Enable or disable BIOS ACPI auto configuration.

Enable Hibernation

Enable or Disable system ability to OS/S4 sleep state.

ACPI Sleep State

Select the highest acpi sleep state the system will enter, when the Suspend button is pressed.

3.3.3 CPU Configuration

Figure 3.6 CPU Configuration

Processor Type

Processor name or processor model name.

Hyper-threading

When disabled, only one thread per core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Define the range limit of CPUID.

This item should be disabled for windows XP.

Execute Disable Bit

When enabled, can prevent certain classes of CPU malicious buffer overflow attacks when combined with a supporting OS.

Hardware Prefetcher

To turn on/off the MLC streamer pre-fetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by vanderpool technology.

Power Technology

Enable the power manager features.

3.3.4 SATA Configuration

Figure 3.7 SATA Configuration

SATA Port0 - SATA Port3

Show the SATA information if SATA device is plug in.

SATA Mode

Select the mode of SATA mode (IDE MODE / AHCI MODE / RAID MODE).

Serial-ATA Controller 0

Enable / Disable the SATA controller 0.

3.3.5 IGD Configuration

Figure 3.8 IGD Configuration

DVMT/FIXED Memory

Select the DVMT/FIXED mode memory size used by internal graphics devices.

IGD - Boot Type

Select the Video Device which will be activated during POST, this has no effect if external graphic does not present.

LCD Panel Type

Select LCD panel resolution used by the Internal Graphic Device.

Panel Scaling

Select the LCD panel scaling option used by the Internal Graphic Device.

Backlight Control

Select the backlight control setting.

BIA Control

Select the VGA BIA behavior.

Spread Spectrum Clock Chip

Select the spectrum control source.

HARDWARE: Spread is controlled by chip.

SOFTWARE: Spread is controlled by bios (clock gen setting or vbios).

TV1 Standard

Select the TV standard.

NTSC,PAL,HDTV,VBIOS DEFAULT.

3.3.6 USB Configuration

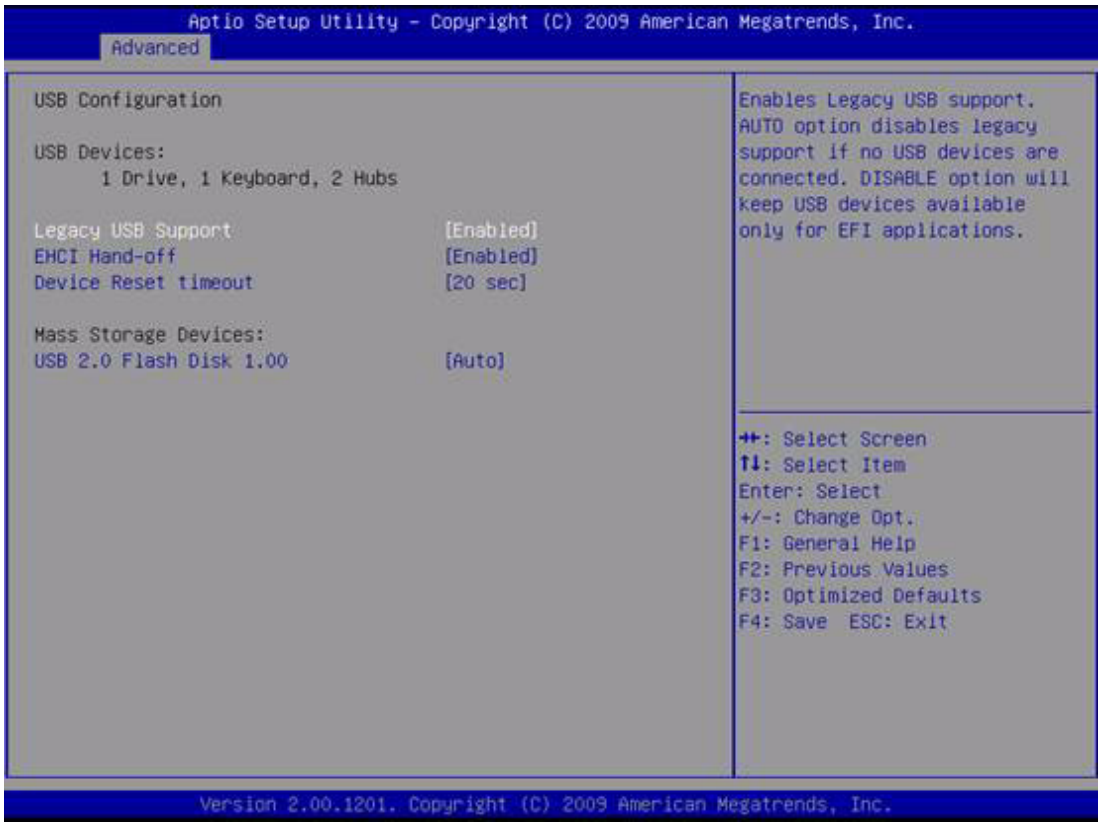


Figure 3.9 USB Configuration

Legacy USB Support

Disabling this item will prevent a USB device from functioning under DOS mode.

EHCI Hand-off

This is just a workaround item under OS without EHCI hand-off support.

Device Reset Timeout

USB mass storage device start unit command timeout.

Mass Storage Devices

Show the USB mass storage device detail information.

3.3.7 Super IO Configuration

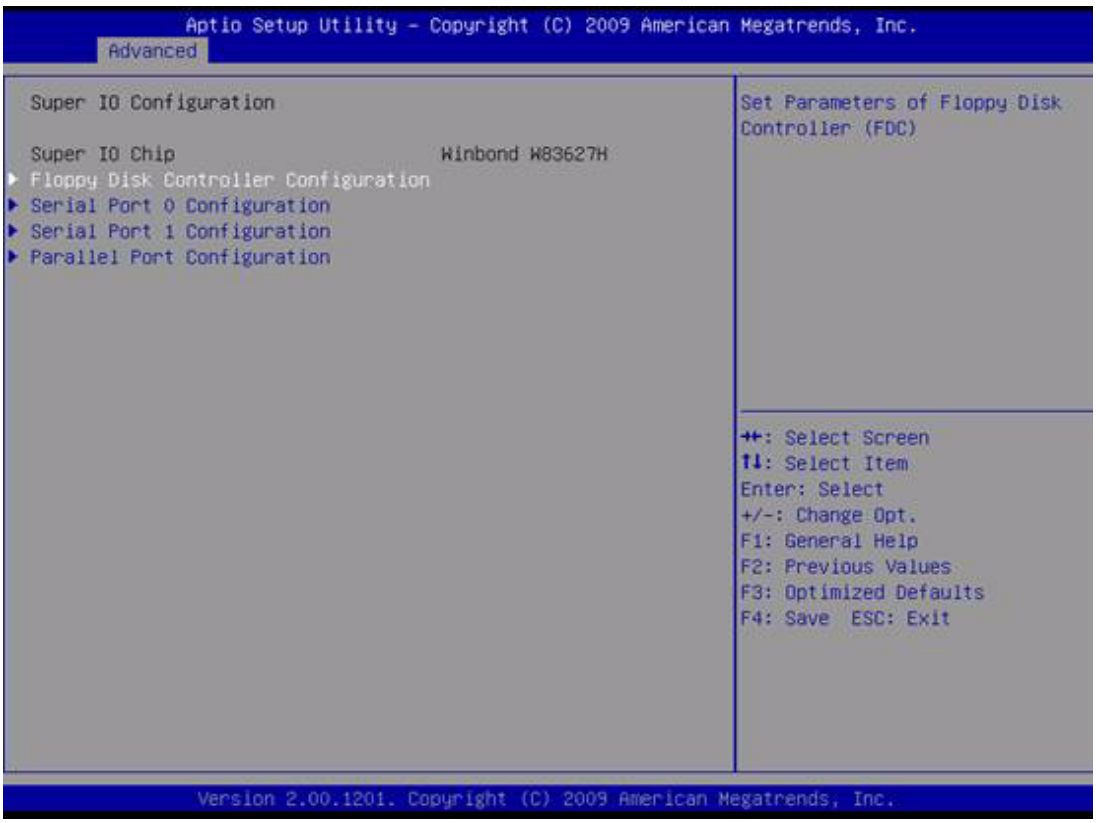


Figure 3.10 Super IO Configuration

Floppy Disk Controller Configuration

Disable/Enable the FLOPPY disk controller can configure its mode.

Serial Port 0/1 Configuration

COM PORT 0 IRQ /IO/ mode resource configuration. Users can choose IRQ ,IO and MODE.

Parallel Port Configuration

PRINT PORT IRQ/IO resource configuration. Set printer mode (EPP/ECP/STD/SPP) MODE.

3.3.8 AMT Configuration

Figure 3.11 AMT Configuration

AMT

Disable / enable AMT function.

Unconfiguration AMT/ME

Reset “Unconfiguration AMT/ME” without password.

WatchDog Timer

Enable/Disable the watchdog timer.

3.3.9 Features Configuration

Figure 3.12 Features Configuration

DISPLAY PORT C/D

Enable/disable digital display port C /D ports function.

EBRAIN WATCHDOG IRQ NUMBER

User can choose the IRQ number for iManager utility watchdog function.

CPU TEMPERATURE

The temperature of CPU.

STANDBY VOLTAGE

The system standby voltage value.

12V VOLTAGE

The system 12 V real voltage.

BATTARY VOLTAGE

The battery voltage real value.

POWER SAVING MODE

Users can choose power saving mode, deep sleep mode will provide the best power saving behavior.

3.4 Chipset Configuration

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI Configuration, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

Figure 3.13 Chipset Configuration

Configuration

1: North Bridge

2: South Bridge

3: ME Subsystem

3.4.1 Chipset North Bridge Configuration

Figure 3.14 Chipset North Bridge Configuration

Total Memory

Total memory size on this system.

Memory Slot 0/1

Detailed memory and size status on slot 0 and slot 1.

Low MNIO Align

Low MNIO resource align at 64MB/1024MB.

Initial Graphic Adapter

Select which graphics controller to use as the primary boot device.

PEG: PCI EXPRESS display Device.

IGD: Internal graphic device.

PCI: PCI graphic device.

PCI Express Port

Disable /Enable the north bridge pci express ports.

IGD Memory

Internal graphic shared memory size (32M / 64M / 128M).

PAVP Mode

Select the PAVP mode used by the internal graphics device.

3.4.2 Chipset South Bridge Configuration

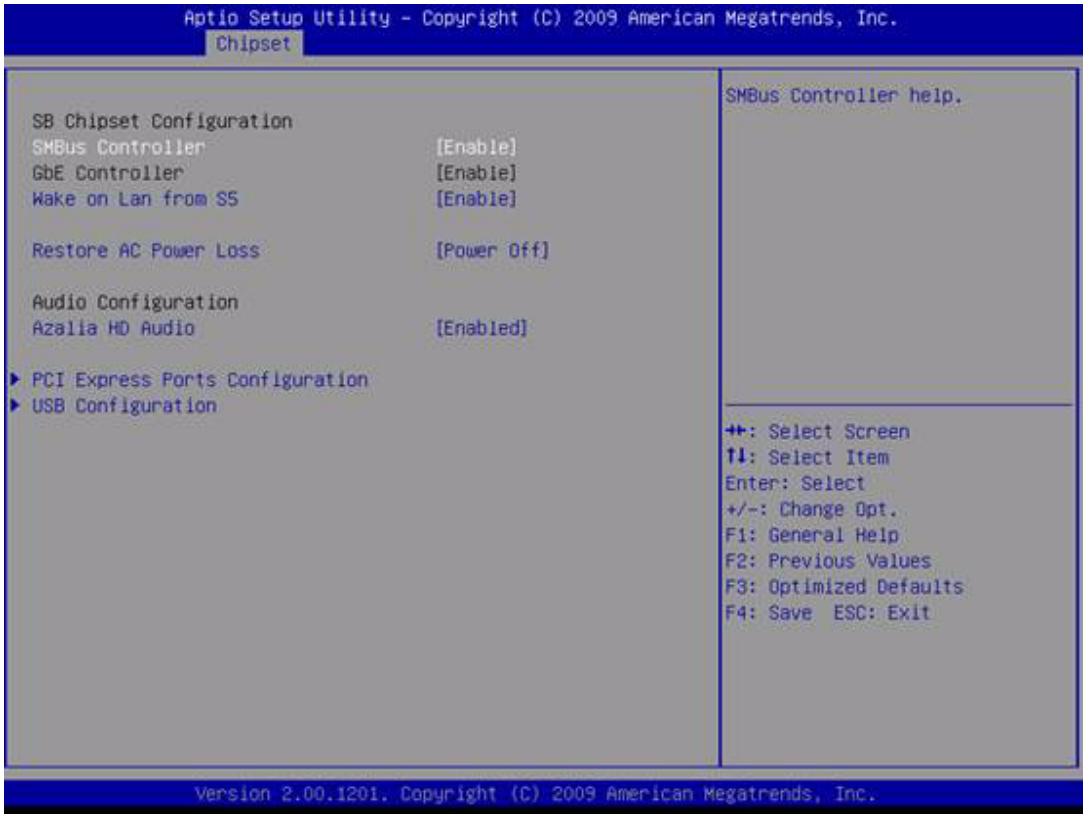


Figure 3.15 Chipset South Bridge Configuration

SMBus Controller

Disable/enable the system SMBUS function.

GbE Controller

Disable/enable the GbE function.

Wake on LAN from S5

Enable / Disable the LAN ability to wake on S5.

Restore AC Power Loss

Define the power behavior after power loss.

1. Power off: The system will not power up after AC power is restored.
2. Power on: The system will power up after AC power has been restored.
3. Last State: The system will keep the last power state of ac power loss when the AC power re-active.

AZALIA HD Audio

Enable/Disable AZALIA function.

PCI Express Ports Configuration

Disable / Enable the PCI Express ports.

USB Configuration

Disable / Enable the USB controller (EHCI #1) and (EHCI #2) and allow users to disable/enable USB ports.

3.4.3 Chipset ME Subsystem Configuration

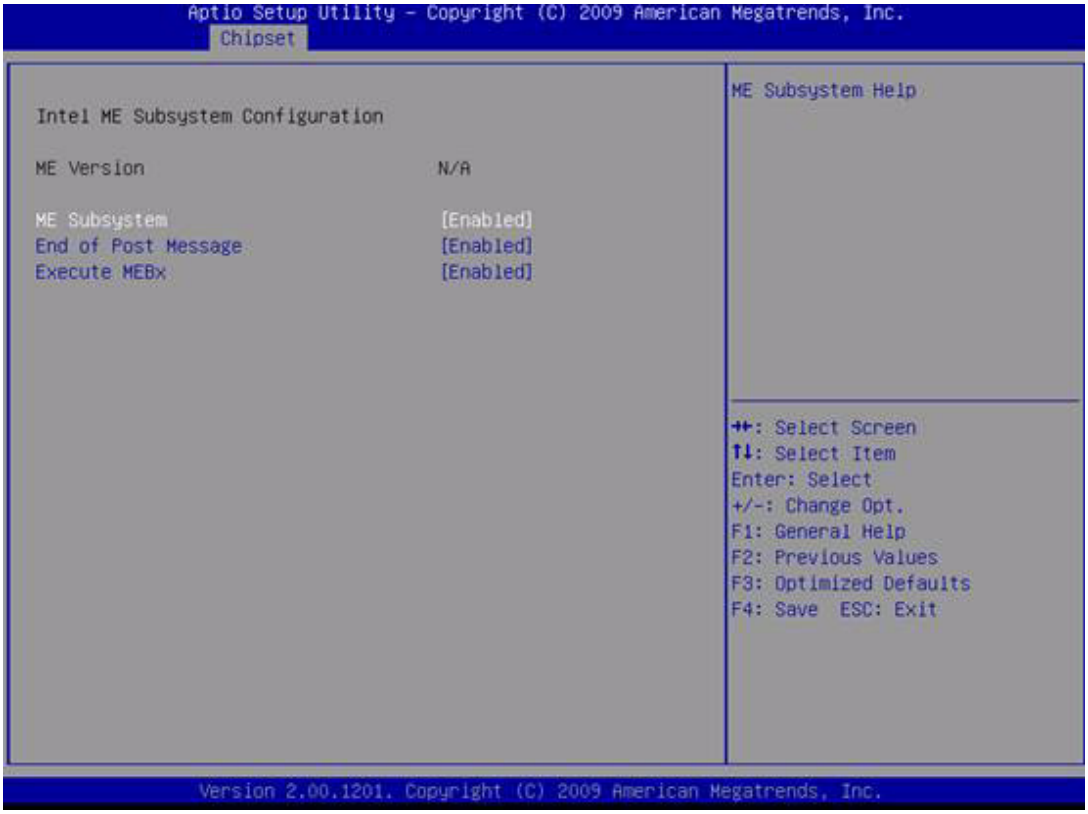


Figure 3.16 Chipset ME Subsystem Configuration

SME Version

The ME version information.

ME Subsystem

Disable / Enable the ME function.

Execute MEBx

Enable / Disable ME MEBx BIOS ROM.

3.5 Boot Configuration

Select the tab from the BIOS setup screen to enter the Boot Configuration screen. Users can select any item in the left frame of the screen, such as PCI Configuration, to go to the sub menu for that item. Users can display a Boot Configuration option by highlighting it using the <Arrow> keys. All Boot Configuration options are described in this section. The Boot Configuration screens are shown below. The sub menus are described on the following pages.

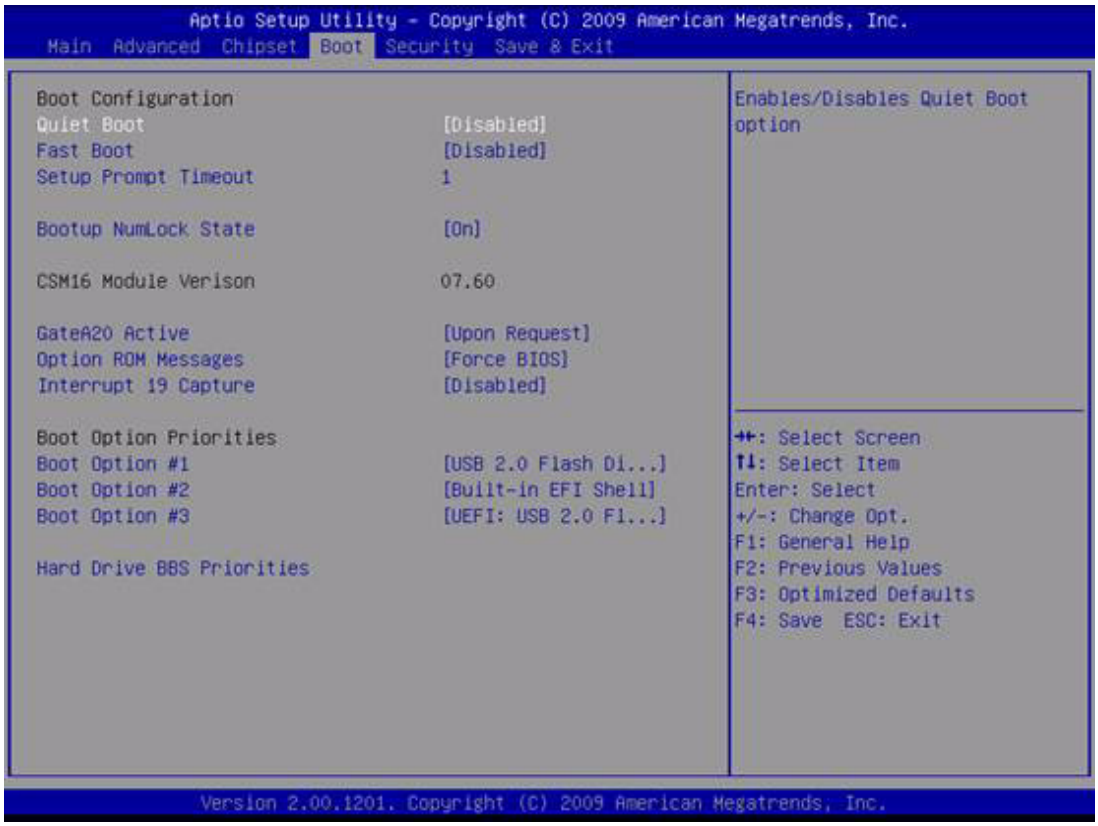


Figure 3.17 Boot Configuration

Quiet Boot

When disable, the system will show detail post information during post.

When enable, the system will hide detail post information during post.

Setup Prompt Timeout

Number of seconds to wait for setup activation key.

(65535 means indefinite waiting)

Bootup Numlock State

When "ON", the keyboard num lock state will stay "ON" after booting.

When "OFF", the keyboard num lock state will stay "OFF" after booting.

GateA20 Active

UPON REQUEST: GA20 can be disabled using BIOS services.

Always: do not allow disabled GA20

Interrupt19 Capture:

Enable/disable option for ROM to trap int 19.

Boot Option #1

Boot Option #2

Boot Option #3

.....

Show the boot device choices.

Hard Drive BBS Priorities:

Select the main Hard disk device type to be a boot hard drive.

3.6 Security Configuration

Select the tab from BIOS setup screen to enter the Security Setup screen. Users can select any item in the left frame of the screen. Users can display a Security Setup option by highlighting it using the <Arrow> keys. All Security Setup options are described in this section. The Security Setup screens are shown below. The sub menus are described on the following pages.

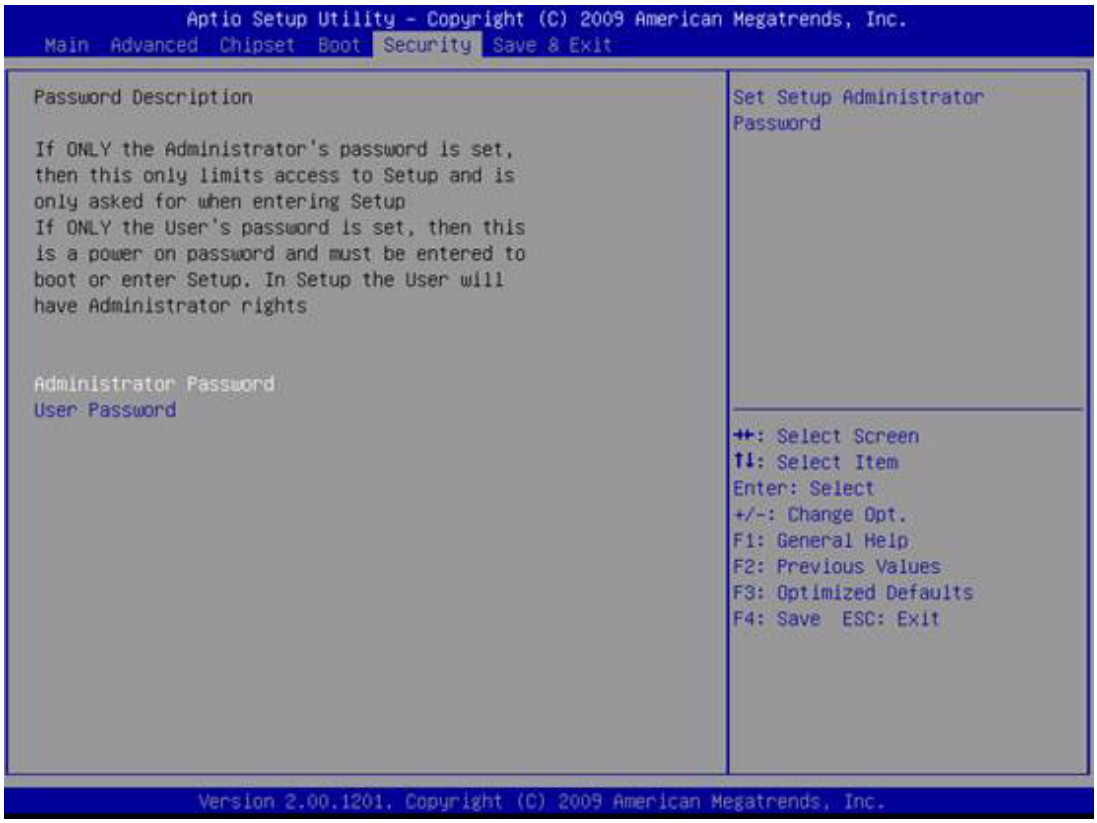


Figure 3.18 Security Configuration

Administrator Password

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the Administrator password.

User Password

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the User password.

3.7 Save & Exit Configuration

Select the tab from the BIOS setup screen to enter the Save & Exit Setup screen. Users can select any item in the left frame of the screen. Users can display a Save & Exit Setup option by highlighting it using the <Arrow> keys. All Save & Exit Setup options are described in this section. The Save & Exit Setup screens are shown below. The sub menus are described on the following pages.

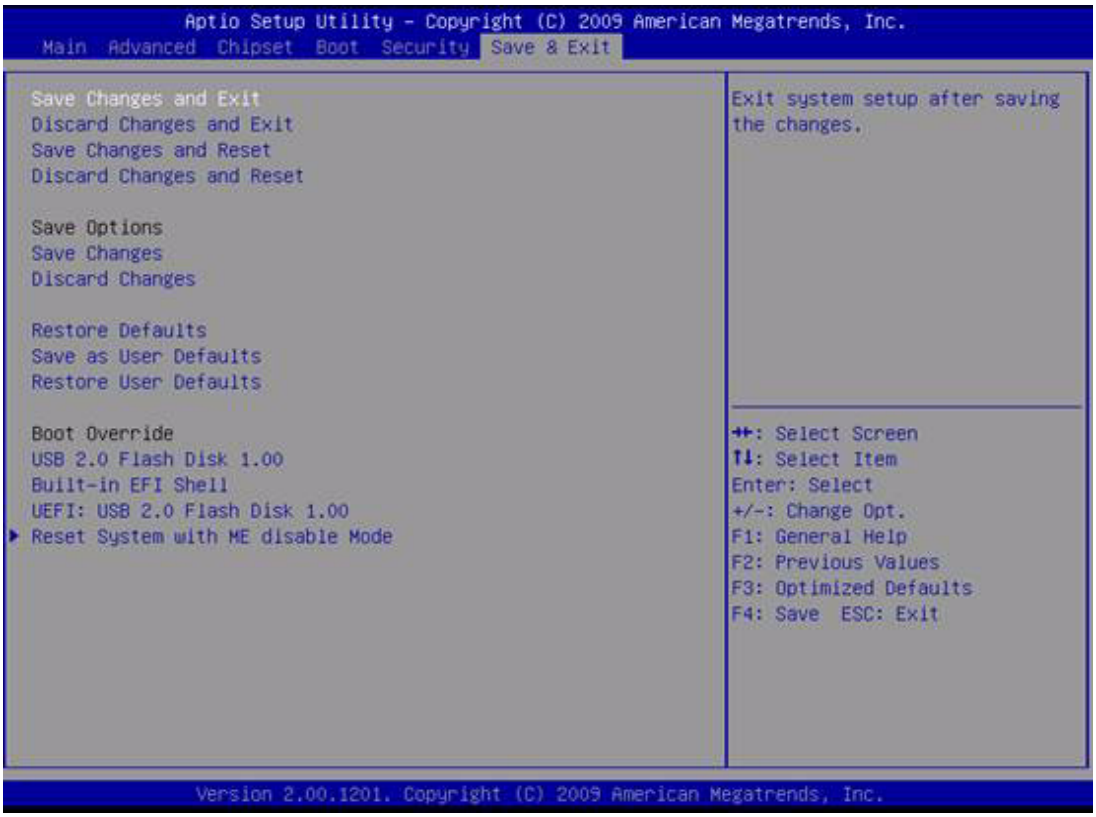


Figure 3.19 Save & Exit Configuration

Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select Ok or cancel.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select Ok to discard changes and exit. Discard Changes
   Select Discard Changes from the Exit menu and press <Enter>.

Restore Default

The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

Save as User Default

Save the all current settings as a user default

Restore User Default

Restore all settings to user default values

Boot Override

Shows the boot device types on the system

Chapter 4

S/W Introduction & Installation

4.1 S/W Introduction

The mission of the manufacturer's Embedded Software Services is to "Enhance quality of life with Embedded platforms and Microsoft Windows embedded technology." We enable Windows Embedded software products on Embedded 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 just insert the CD into CD-ROM, select the drivers that you want to install, then run .exe (setup) 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-5788 CPU System on Module.

Sections include:

- Watchdog Timer Programming

A.1 Programming the Watchdog Timer

Trigger Event	Note
IRQ	IRQ5, 7, 14 (default IRQ7) IRQ can be set in BIOS
NMI	N/A
SCI	Power button event
Power Off	Support
H/W Restart	Support
External WDT	Support

General Purpose I/O	Pin Type	Pwr Rail/ Tolerance	Description	Pin Availability
WDT	O CMOS	3.3V/3.3VSB	Output indicating that a watchdog time-out event has occurred.	All

For details, please refer to Section 6.2 *Watchdog (WDog) Functions Class* of iManager & Software API User Manual.

Appendix B

Programming GPIO

This Appendix gives the illustration of the General Purpose Input and Output pin setting.

Sections include:

- GPIO Register

B.1 GPIO Register

GPIO Byte Mapping	H/W Pin Name
BIT0	GPO0
BIT1	GPO1
BIT2	GPO2
BIT3	GPO3
BIT4	GPI0
BIT5	GPI1
BIT6	GPI2
BIT7	GPI3

General Purpose I/O	Pin Type	Pwr Rail/ Tolerance	Description	Pin Availability
GPO[0:3]	O CMOS	3.3V/3.3VSB	General purpose output pins. Upon a hardware reset, these outputs should be low	All
GPI[0:3]	I CMOS	3.3V/3.3VSB	General purpose input pins. Pulled high internally on the module.	All

For details, please refer to Section 6.3 *GPIO (I/O) Functions* of iManager & Software API User Manual.

Appendix C

System Assignments

This appendix gives you the information about the system resource allocation on the SOM-5788 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 - 000F	Direct memory access controller
0000 - 0CF7	PCI bus
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 - 0062	Microsoft ACPI-Compliant Embedded Controller
0062 - 0063	Motherboard resources
0064 - 0064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0065 - 006F	Motherboard resources
0066 - 0066	Microsoft ACPI-Compliant Embedded Controller
0070 - 0071	System CMOS/real time clock
0072 - 007F	Motherboard resources
0080 - 0080	Motherboard resources
0081 - 0083	Direct memory access controller
0084 - 0086	Motherboard resources
0087 - 0087	Direct memory access controller
0088 - 0088	Motherboard resources
0089 - 008B	Direct memory access controller
008C - 008E	Motherboard resources
008F - 008F	Direct memory access controller
0090 - 009F	Motherboard resources
00A0 - 00A1	Programmable interrupt controller
00A2 - 00BF	Motherboard resources
00C0 - 00DF	Direct memory access controller
00E0 - 00EF	Motherboard resources
00F0 - 00FF	Numeric data processor
0170 - 0177	Secondary IDE Channel
01F0 - 01F7	Primary IDE Channel
0274 - 0277	ISAPNP Read Data Port
0279 - 0279	ISAPNP Read Data Port
0290 - 029F	Motherboard resources
02F8 - 02FF	Communications Port (COM2)
0376 - 0376	Secondary IDE Channel
0378 - 037F	Printer Port (LPT1)
03B0 - 03BB	Intel(R) Graphic Media Accelerator HD
03C0 - 03DF	Intel(R) Graphic Media Accelerator HD
03F0 - 03F5	Standard floopy disk cintroller
03F6 - 03F6	Primary IDE Channel
03F7 - 03F7	Standard floopy disk cintroller
03F8 - 03FF	Communications Port (COM1)

Table C.1: System I/O ports	
0400 - 047F	System Board
04D0 - 04D1	Motherboard resources
0500 - 057F	System Board
0A79 - 0A79	ISAPNP Read Data Port
0D00 - FFFF	PCI bus
1180 - 119F	System Board
E000 - E00F	Standard Dual Channel PCI IDE Controller
E000 - EFFF	Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 5- 3B4A
E010 - E013	Standard Dual Channel PCI IDE Controller
E020 - E027	Standard Dual Channel PCI IDE Controller
E030 - E033	Standard Dual Channel PCI IDE Controller
E040 - E047	Standard Dual Channel PCI IDE Controller
F000 - F01F	Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
F020 - F03F	Intel(R) 82577LM Gigabit Network Connection
F040 - F04F	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F050 - F05F	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F060 - F063	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F070 - F077	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F080 - F083	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F090 - F097	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
F0A0 - F0AF	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2E
F0B0 - F0BF	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2E
F100 - F107	Intel(R) Active Management Technology - SOL (COM3)
F110 - F11F	Standard Dual Channel PCI IDE Controller
F120 - F123	Standard Dual Channel PCI IDE Controller
F130 - F137	Standard Dual Channel PCI IDE Controller
F140 - F143	Standard Dual Channel PCI IDE Controller
F150 - F157	Standard Dual Channel PCI IDE Controller
F160 - F157	Intel(R) Graphic Media Accelerator HD

C.2 DMA Channel Assignments

Table C.2: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Available
3	Available
4	Direct memory access controller
5	Available
6	Available
7	Available

C.3 Interrupt Assignments

Table C.3: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	System 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	Standard floopy disk controller
IRQ 7	Available
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
IRQ 11	Available
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Numeric data processor
IRQ 14	Primary IDE Channel
IRQ 15	Secondary IDE Channel
IRQ 16	Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 1 - 3B42
IRQ 16	Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 5- 3B4A
IRQ 16	Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B3C*
IRQ 16	Intel(R) Graphic Media Accelerator HD
IRQ 16	Intel(R) Management Engine Interface
IRQ 16	Standard Dual Channel PCI IDE Controller
IRQ 17	Intel(R) Active Management Technology - SOL (COM3)
IRQ 18	Intel(R) Turbo Boost Technology Driver
IRQ 18	Standard Dual Channel PCI IDE Controller

Table C.3: Interrupt assignments	
IRQ 19	Intel(R) 5 Series/3400 Series Chipset Family 2 port Serial ATA Storage Controller - 3B2D
IRQ 20	Intel(R) 82577LM Gigabit Network Connection*
IRQ 22	Microsoft UAA Bus Driver for High Definition Audio
IRQ 23	Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B34*

*USB and Ethernet IRQ is automatically set by the system

C.4 1st MB Memory Map

Table C.4: 1st MB memory map

Addr. range (Hex)	Device
000A0000 - 000BFFFF	Intel(R) Graphic Media Accelerator HD
000A0000 - 000BFFFF	PCI Bus
7C000000 - FFFFFFFF	PCI bus
D0000000 - DFFFFFFF	Intel(R) Graphic Media Accelerator HD
E0000000 - EFFFFFFF	System Board
FE000000 - FE3FFFFF	Intel(R) Graphic Media Accelerator HD
FE400000 - FE4FFFFF	Intel(R) 5 Series/3400 Series Chipset Family PCI Express Root Port 5 - 3B4A
FE500000 - FE51FFFF	Intel(R) 82577LM Gigabit Network Connection
FE520000 - FE523FFF	Microsoft UAA Bus Driver for High Definition Audio
FE524000 - FE524FFF	Intel(R) Turbo Boost Technology Driver
FE525000 - FE5250FF	Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
FE526000 - FE5263FF	Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B34
FE527000 - FE5273FF	Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller - 3B3C
FE528000 - FE528FFF	Intel(R) 82577LM Gigabit Network Connection
FE529000 - FE529FFF	Intel(R) Active Management Technology - SOL (COM3)
FE52A000 - FE52A00F	Intel(R) Management Engine Interface
FEC00000 - FECFFFFF	System board
FED00000 - FED003FF	High precision event timer
FED08000 - FED08FFF	System board
FED14000 - FED19FFF	System board
FED1C000 - FED1FFFF	System board
FED20000 - FED3FFFF	System board
FED90000 - FED93FFF	System board
FEE00000 - FEE0FFFF	System board
FF000000 - FFFFFFFF	System board