USER MANUAL

COMe-9X90

Computer-On-Module Express

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FCC-A Radio Frequency Interference Statement

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 personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Notice 3

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Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Battery Recycling and Disposal

- ☐ Only use the appropriate battery specified for this product.
- ☐ Do not re-use, recharge, or reheat an old battery.
- ☐ Do not attempt to force open the battery.
- ☐ Do not discard used batteries with regular trash.
- ☐ Discard used batteries according to local regulations.

Safety Precautions

- ☐ Always read the safety instructions carefully.
- ☐ Keep this User's Manual for future reference.
- ☐ All cautions and warnings on the equipment should be noted.
- ☐ Keep this equipment away from humidity.
- ☐ Lay this equipment on a reliable flat surface before setting it up.
- ☐ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- ☐ Place the power cord in such a way that people cannot step on it.
- ☐ Always unplug the power cord before inserting any add-on card or module.
- ☐ If any of the following situations arises, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- ☐ Do not leave this equipment in an environment unconditioned or in a storage temperature above 60°C (140°F). The equipment may be damaged.
- ☐ Do not leave this equipment in direct sunlight.
- ☐ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- ☐ Do not place anything over the power cord.
- ☐ Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating.

Box Contents

COMe-9X90

- ☐ 1 x COMe-9X90 module
- ☐ 1 x Screw bag
- ☐ 1 x Heatsink with fan (fansink)

Ordering Information

Model Name	Description
COMe-9X90	COM Express module with 1.2GHz VIA Nano® X2 E-Series CPU with 2 x HDMI® or 2 x DisplayPort, VGA, LVDS, 2 x USB 3.0, 6 x USB 2.0, Gigabit Ethernet, 2 x SATA, 4 x PCIe x1, ATX power connector
COMEDB4	COMe-9X90 evaluation carrier board
99G42-01380A	Heatsink with fan for COMe-9X90

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1. Product Overview

The VIA COMe-9X90 is a compact and highly integrated COM Express module. It comes with an integrated 1.2GHz VIA Nano® X2 E-Series (or 1.0GHz VIA QuadCore E-Series) processor, boasting of ultra-low power consumption, cool and quiet operation, and enhanced multi-tasking ability.

The COMe-9X90 is based on the VIA VX11 chipset featuring the Integrated VIA C-640/645 DirectX11 graphics processor and unified video decoding accelerator that offers rich visual and 3D/2D contents for immersive environments. It provides support for extensive connectivity options, including audio, USB, DisplayPort, COM port, Ethernet, and graphics, through board-to-board connectors to an I/O carrier board.

1.1. Key Components

1.1.1. VIA Nano® X2 E-Series Processor

The VIA Nano® X2 E-Series is a dual-core processor and 64-bit superscalar processor in x86 platform using a 40 nanometer process technology. It delivers an energy-efficient, powerful performance, with cool and quiet operation all within an ultra-compact NanoBGA2 package measuring 21mm x 21mm.

VIA Nano® X2 E-Series processor offers an excellent performance on multitasking application that makes it perfect for embedded system applications such as industrial PCs, test machines, measuring equipment, digital signage, medical PCs, monitoring systems, gaming machines, in-vehicle entertainment, and etc. The VIA Nano® X2 E-Series processor also boasts of immersive multimedia performance, connectivity and computing applications

1.1.2. VIA VX11 System Chipset

The VIA VX11 is the fourth generation, highly integrated Media System Processor which provides high quality digital video streaming and high definition video playback. It features the VIA C- 640/645 DX11 3D/2D graphics and video processor, High Definition video decoder supports DDR3 1333 controller and USB 3.0 interface.

The VIA VX11 offers superb-graphics performance, immersive visual experience, and supports DirectX 11.0 that allows realistic 3D rendering and increased visual acuity. The VIA VX11 is based on a highly sophisticated power efficient architecture that enables such rich integration into a compact package.

1.2. Product Specifications

Core

Processor

- 1.2GHz VIA Nano® X2 E-Series processor
  - 1MB L2 Cache
  - 1066MHz FSB
- 1.0GHz VIA QuadCore E-Series processor (manufacturing option)
  - 1MB L2 Cache
  - 800MHz FSB

Chipset

- VIA VX11 Media System Processor

System Memory

- 2 x DDR3 1333/1066 SODIMM slots
- Supports up to 16GB memory size

BIOS

- AMI eEFI BIOS,
- 32Mbit SPI flash memory

Operating System

- Windows 7
- Windows XP
- Windows XPe
- Windows Embedded System 7
- Windows CE6.0
- Linux

Hardware Monitoring

- CPU temperature reading
- CPU fan speed reading
- System voltage monitoring

Expansion Bus

- 4 x PCIe x1

System Monitoring and Management

- Wake-on-LAN
- System power management
- AC power failure recovery
- Watchdog Timer (software programmable)

Video

Graphics processor

- Integrated VIA C-645/640 DX11 3D/2D graphics with MPEG-2, VC1 and H.264 video decoding acceleration

Graphics memory

- Optimized Unified Memory Architecture (UMA) supports frame buffer size from 64MB to 1GB (BIOS)

CRT Interface

- 1 x Analog VGA port supports up to 2048 x 1536 resolution

LVDS Interface

- 1 x LVDS channel supports dual-channel 18-bit or 24-bit LVDS panel (VIA VT1636 or Chrontel CH7305)

DisplayPort Interface

- DisplayPort 1 : Supports DisplayPort/HDMI® interface
- DisplayPort 2 : Supports DisplayPort/HDMI® interface

Audio

Controller

- VT2021 High Definition Audio Codec

Ethernet

Controller

- Realtek RTL8111G/GS 10/100/1000M PCIe Gigabit Ethernet controller

Input/Output

Audio

- Supports 1 High Definition audio digital interface

LAN

- Supports 1 Gigabit Ethernet port

USB

- Supports up to 2 USB 3.0 ports
- Supports up to 6 USB 2.0 ports

SATA

- Supports up to 2 SATA 3.0 Gbps ports

Serial

- Supports 2 serial ports with TX and RX signal

DisplayPort

- Supports 2 DisplayPort

Expansion Buses

- Supports 1 SMBus interface
- Supports 1 I^2C bus
- Supports 1 SDIO interface as default (shared with GPIO 4 INs and 4 OUTs)
- Supports 1 LPC bus interface
- Supports SPI
- Supports ExpressCard, speaker out, reset function, thermal protection, suspend/wake signals, power button, and fan control signals

Mechanical and Environment

COM Express Compliance

- COM Express™ Type 6, Basic Module

Dimension

- 95mm x 125mm (3.73" x4.92")

Operating Temperature

- 0°C ~ 60°C

Storage Temperature

- -40°C ~ 70°C

Operating Humidity

- 0% ~ 95% (relative humidity; non-condensing)

Compliance

- CE
- FCC
- BSMI
- RoHS

Note:

As the operating temperature provided in the specifications is a result of the test performed in VIA's chamber, a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly suggested to execute a solid testing and take all the variables into consideration when building the system. Please ensure that the system runs well under the operating temperature in terms of application.

1.3. Layout Diagram

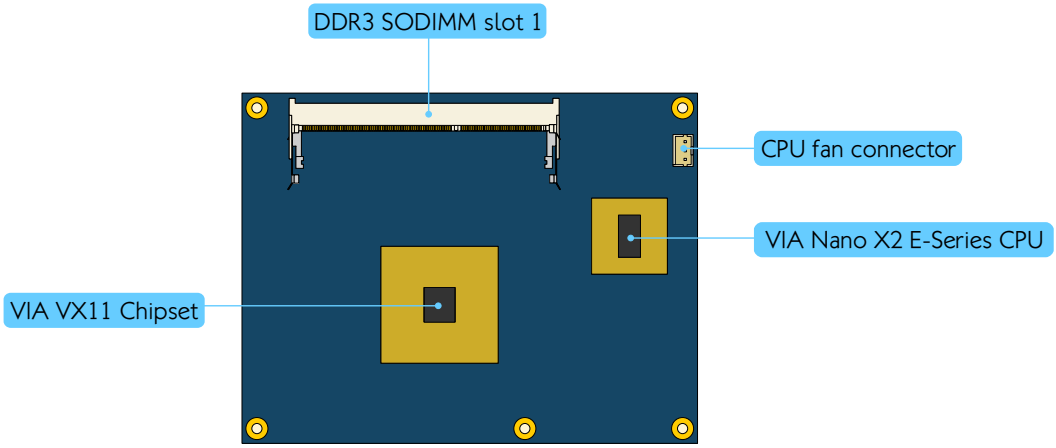


Figure 1: Layout diagram of the COMe-9X90 module (top view)

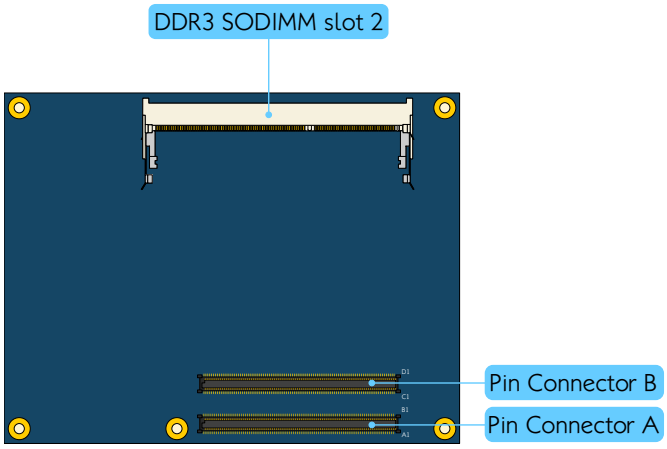


Figure 2: Layout diagram of the COMe-9X90 module (bottom view)

2. Hardware Installation

2.1. CPU

The VIA COMe-9X90 module is designed with the VIA Nano® X2 E-Series 1.2GHz processor. Other processor options (e.g., VIA QuadCore E-Series 1.0GHz processor) are also available as manufacturing options. The VIA Nano® X2 E-Series processor requires a heatsink with fan to provide sufficient cooling.

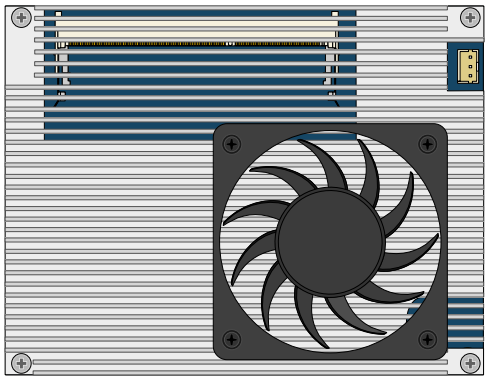


Figure 3: CPU with heatsink and fan

2.1.1. CPU Fan Connector: CPUFAN

CPU fan runs on +12V and maintains system cooling.

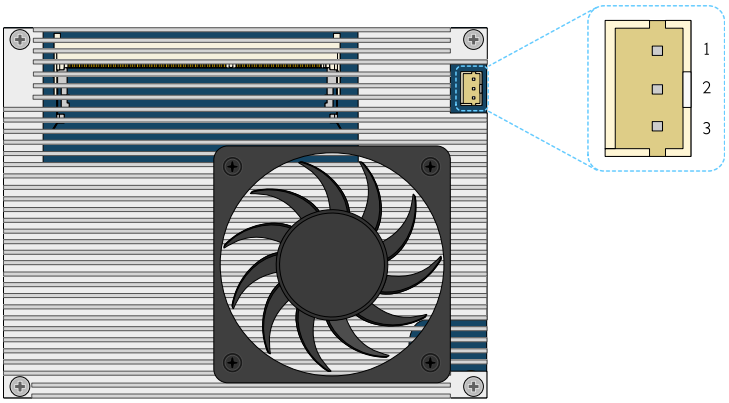


Figure 4: CPU fan connector diagram

Pin	Signal
1	FAN_IN
2	PWM_OUT
3	GND

Table 1: CPU fan connector pinout

2.2. Memory Module Installation

2.2.1. Memory Slot: SODIMM

The VIA COMe-9X90 has two DDR3 SODIMM memory (horizontal type) slots that can accommodate a maximum of 16GB memory size. The memory slots are labeled as "SODIMM1" and "SODIMM2". The SODIMM1 slot is located at the top side of the module while the SODIMM2 slot is located at the bottom side. The location of the DDR3 memory slots are shown below.

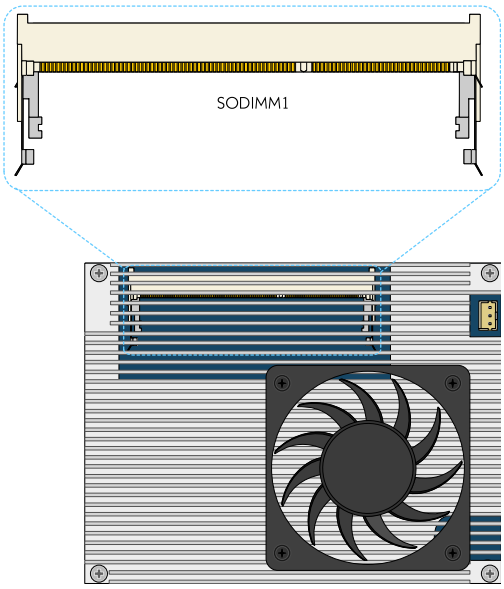


Figure 5: DDR3 SODIMM1 slot diagram (top side)

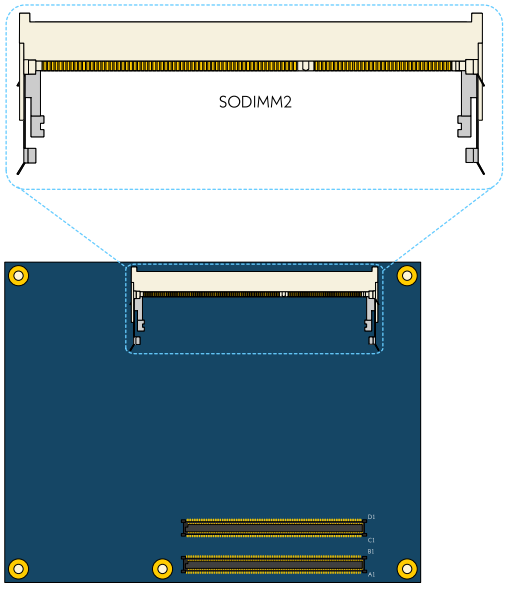


Figure 6: DDR3 SODIMM2 slot diagram (bottom side)

Note:

Due to the limitation of the component height at the bottom side of COMe-9X90, the SODIMM memory module installed (SODIMM2 slot) cannot be bundled with heatsink or thermal pad.

2.2.2. Installing the Memory

Step 1

Align the notch on the memory module with the protruding wedge on the SODIMM slot. Insert the memory module into the slot at 30 degrees angle.

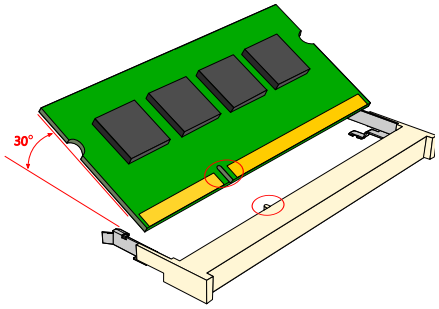


Figure 7: Inserting the memory module

Step 2

Push down until the memory module snaps into place. The memory slot has two locking mechanisms that will click once the memory module has been fully inserted.

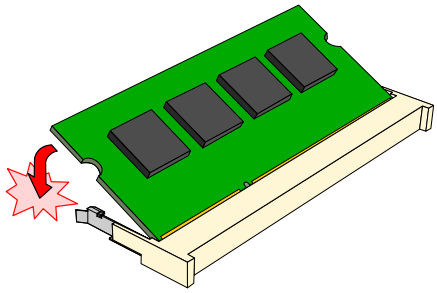


Figure 8: Locking the memory module

2.2.3. Removing a Memory Module

Step 1

Disengage the locking clasps at both ends of the memory slot.

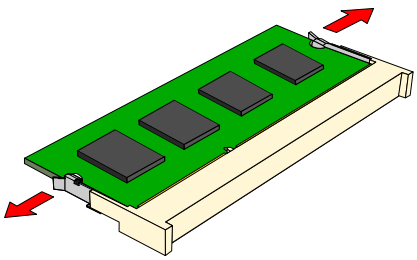


Figure 9: Disengaging the SODIMM locking clips

Step 2

When the locking clips have cleared, the SODIMM memory module will automatically pop up. Remove the memory module.

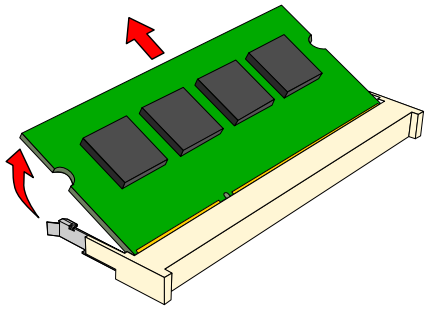


Figure 10: Removing the memory module

2.3. Installing COMe-9X90 module to COMEDB4 carrier board

Step 1

Locate the carrier board mounting points (x5) and the connectors (x2).

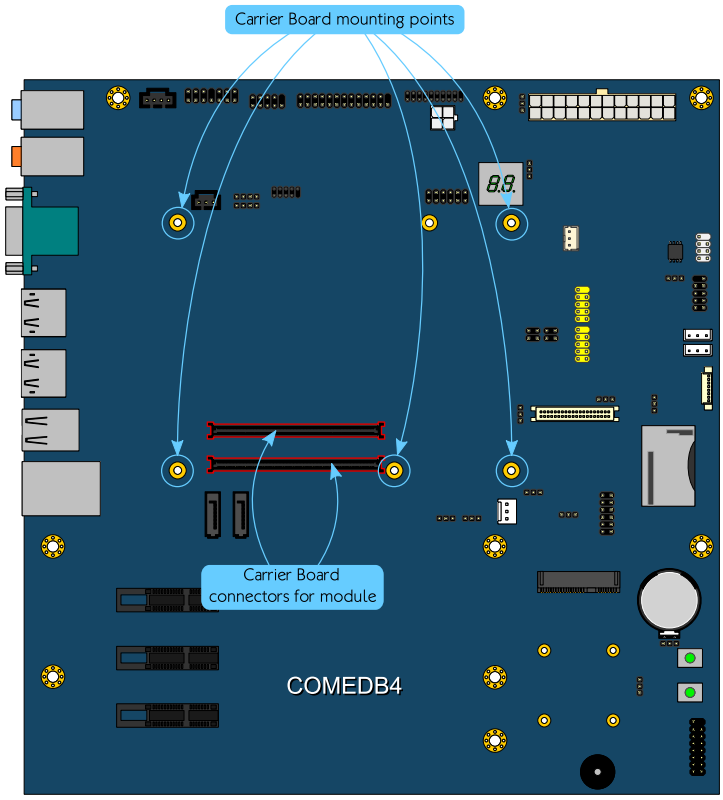


Figure 11: Carrier board mounting points and connectors

Step 2

Install five hex spacers onto the carrier board. The hex spacers must be placed on top of the board. From the bottom of the board, tighten the hex spacers by using the M2.5x4mm screws (x5).

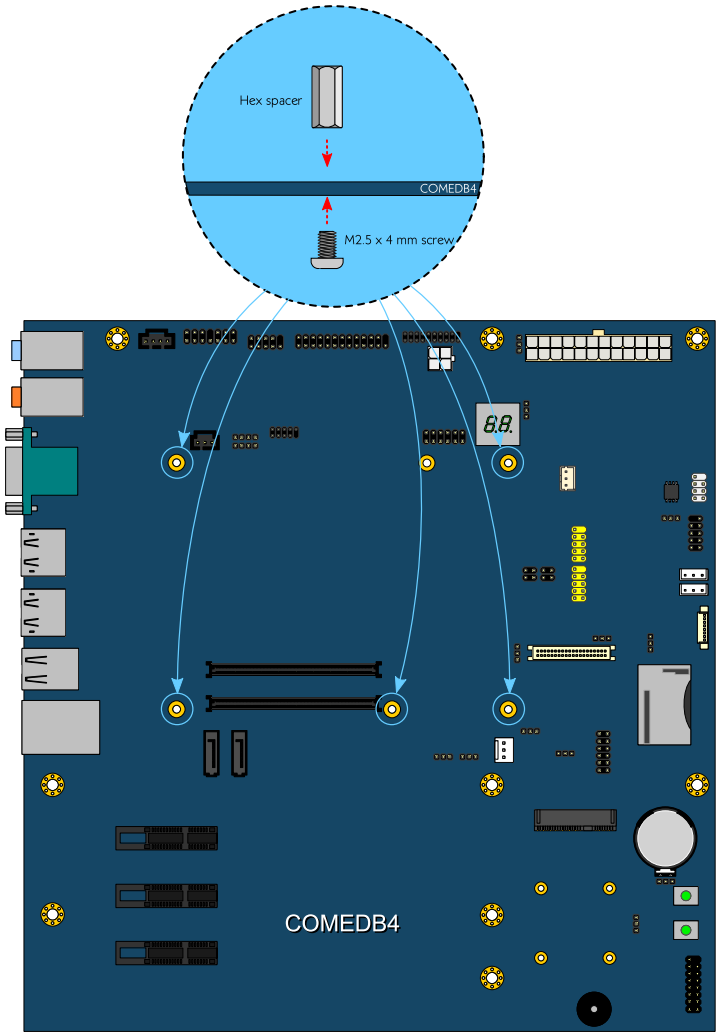


Figure 12: Installing carrier board hex spacers

Step 3

Align the pin connectors and mounting points of the COMe-9X90 module into the connectors and hex spacers on the carrier board respectively. Then press down the COMe-9X90 module until the pin connectors have been fully inserted into the connectors.

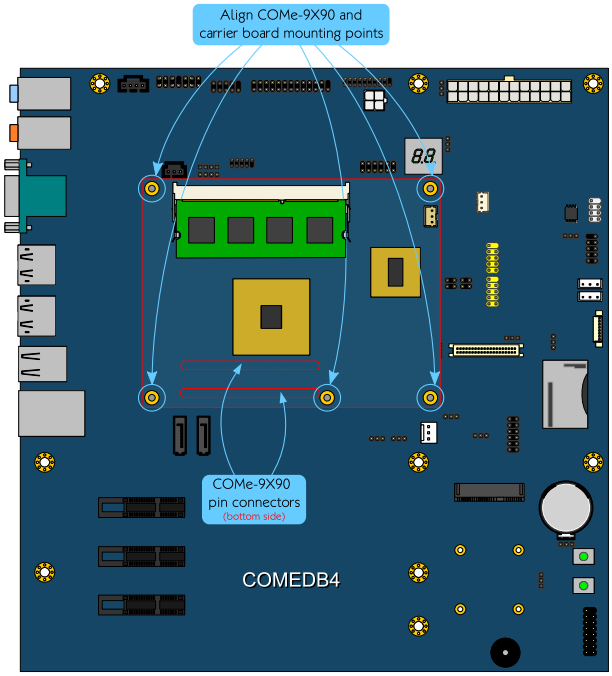


Figure 13: Installing COMe-9X90 module

Step 4

Secure the COMe-9X90 module using M2.5x4mm screw. Then apply the thermal paste on top of the processor and chipset.

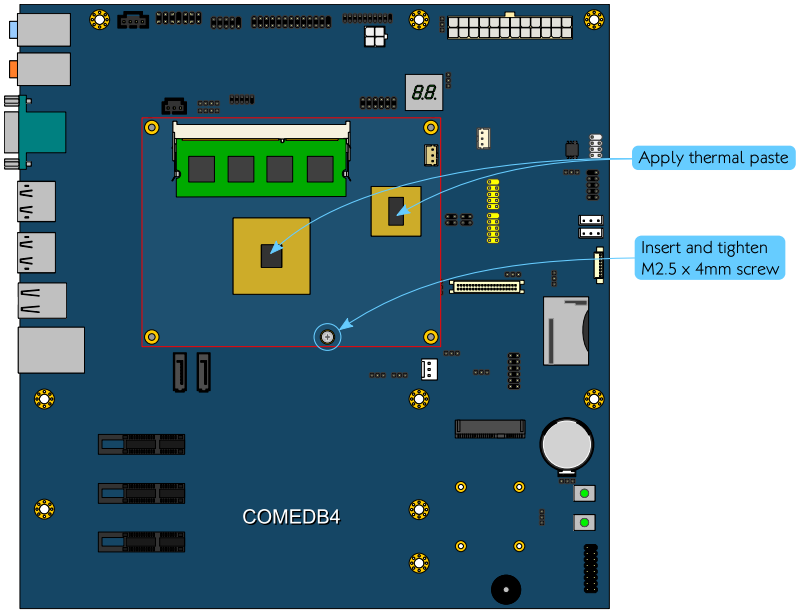


Figure 14: Securing the COMe-9X90 module and applying the thermal paste

Step 5

Install the heatsink on COMe-9X90 module. Secure it with four M2.5x15mm screws (with 3mm plastic washer).

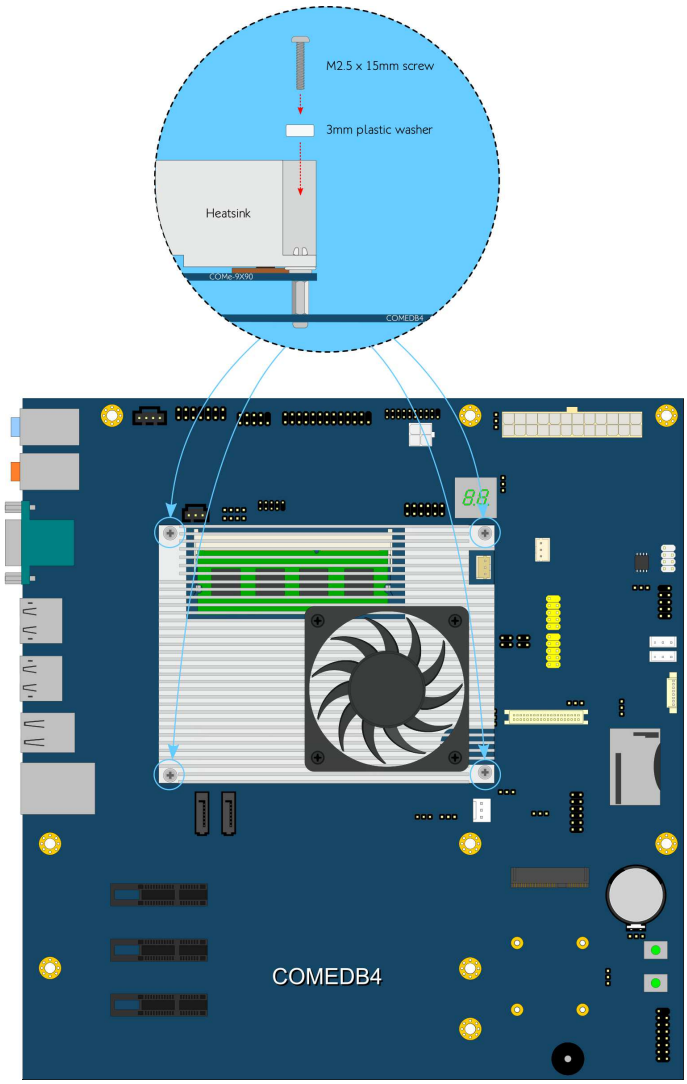


Figure 15: Installing and securing the heatsink

Step 6

Connect the CPU fan connector cable.

3. BIOS Setup Utility

3.1. Entering the BIOS Setup Utility

Power on the computer and press **Delete** during the beginning of the boot sequence to enter the BIOS Setup Utility. If the entry point has passed, restart the system and try again.

3.2. Control Keys

Up Move up one row

Down Move down one row

Left Move to the left in the navigation bar

Right Move to the right in the navigation bar

Enter Access the highlighted item / Select the item

Esc Jumps to the Exit screen or returns to the previous screen

Page up / +[1] Increase the numeric value

Page down / -[1] Decrease the numeric value

F1 General help[2]

F2 Restore the previous CMOS value

F3 Load optimized defaults

F4 Save all the changes and exit

Notes:

1. Must be pressed using the 10-key pad.
2. The General help contents are only for the Status Page and Option Page setup menus.

3.3. Navigating the BIOS Menus

The main menu displays all the BIOS setup categories. Use the <**Left**>/<**Right**> and <**Up**>/<**Down**> arrow keys to select any item or sub-menu. Descriptions of the selected/highlighted category are displayed at the bottom of the screen.

The small triangular arrowhead symbol next to a field indicates that a sub-menu is available (see figure below). Press <**Enter**> to display the sub-menu. To exit the sub-menu, press <**Esc**>.

3.4. Getting Help

The BIOS Setup Utility provides a "**General Help**" screen. This screen can be accessed at any time by pressing **F1**. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press **Esc** to exit the help screen.

3.5. Main Menu

The System Overview screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the "Main" label.

Figure 16: Illustration of the Main menu screen

3.5.1. BIOS Information

The content in this section of the screen shows the information about the vendor, the Core version, UEFI specification version, the project version and date & time of the project build.

3.5.2. Memory Information

This section shows the amount of memory that is installed on the hardware platform.

3.5.3. System Language

This option allows the user to configure the language that the user wants to use.

3.5.4. System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].

3.5.5. System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

3.6. Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

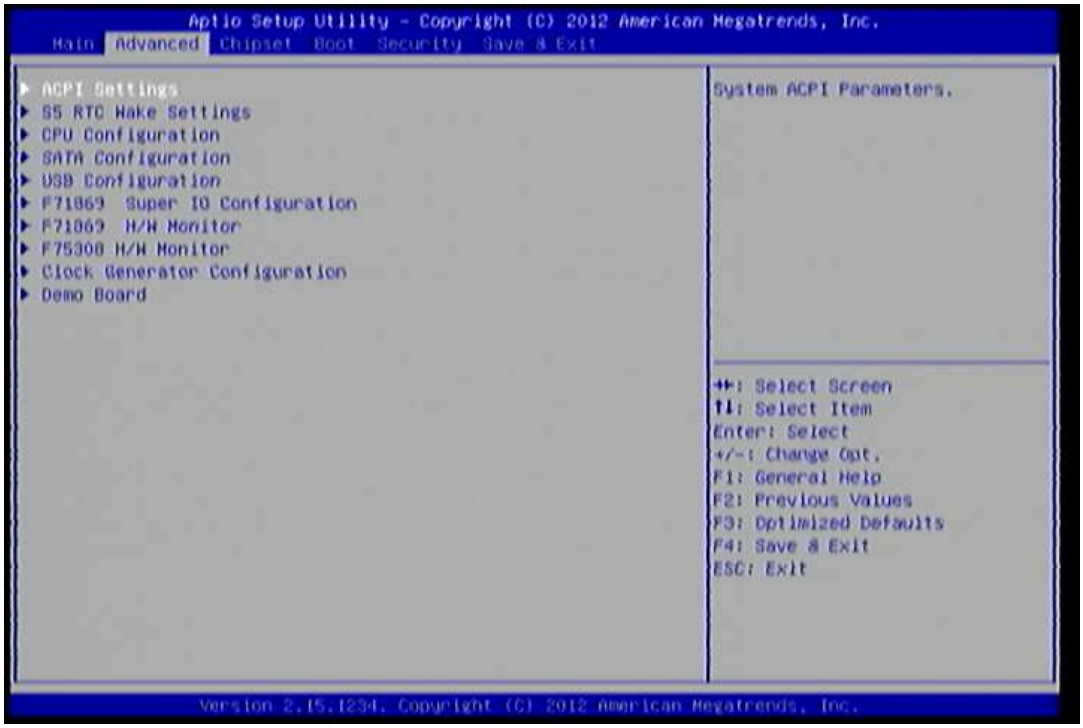


Figure 17: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- ACPI Settings
- S5 RTC Wake Settings
- CPU Information
- SATA Configuration
- USB Configuration
- F71869 Super IO Configuration
- F71869 H/W Monitor
- F75308 HW Monitor
- Clock Generator Configuration
- Demo Board

3.6.1. ACPI Settings

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

Figure 18: Illustration of the ACPI Settings screen

3.6.1.1. Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

3.6.1.2. ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed. Available options are: Suspend Disabled/S1 only (CPU Stop Clock)/S3 only (Suspend to RAM)/Both S1 and S3 available for OS to choose from.

3.6.2. S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

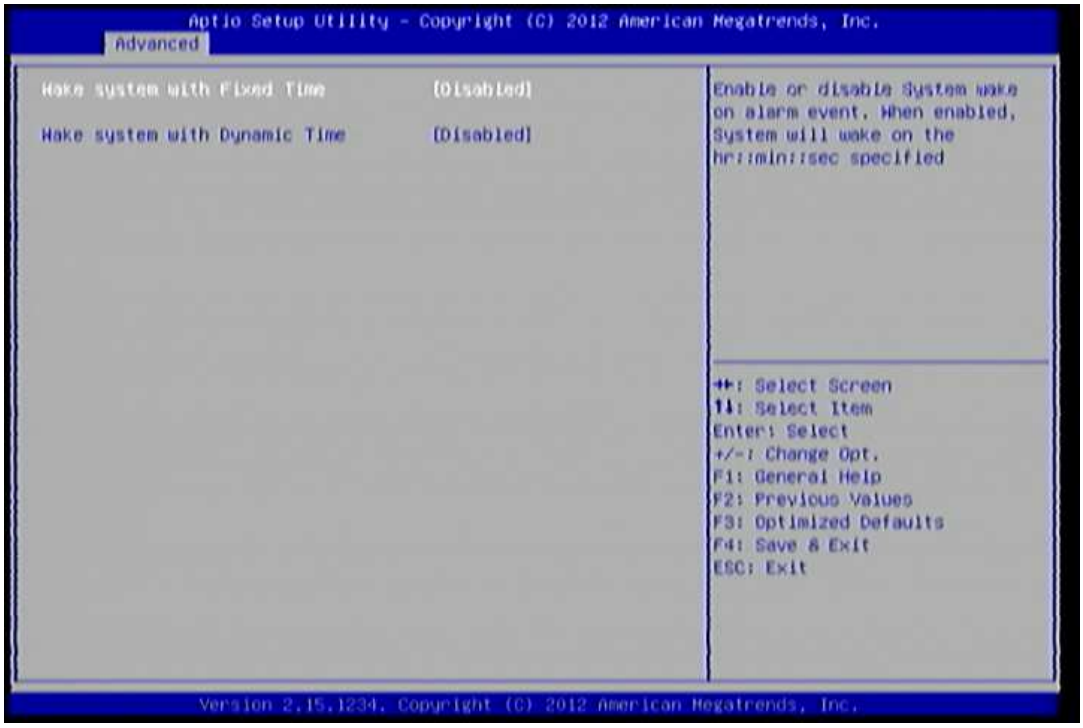


Figure 19: Illustration of S5 RTC Wake Settings screen

3.6.2.1. Wake system with Fixed Time

This feature has 2 options: Enable or Disable system wake on alarm event. When enabled, system will wake on the hr:min:sec specified.

3.6.2.2. Wake system with Dynamic Time

This feature has 2 options: Enable or Disable system wake on alarm event. When enabled, system will wake on the current time + increase minute(s).

3.6.3. CPU Information

The CPU Information screen shows detailed information about the built-in processor.

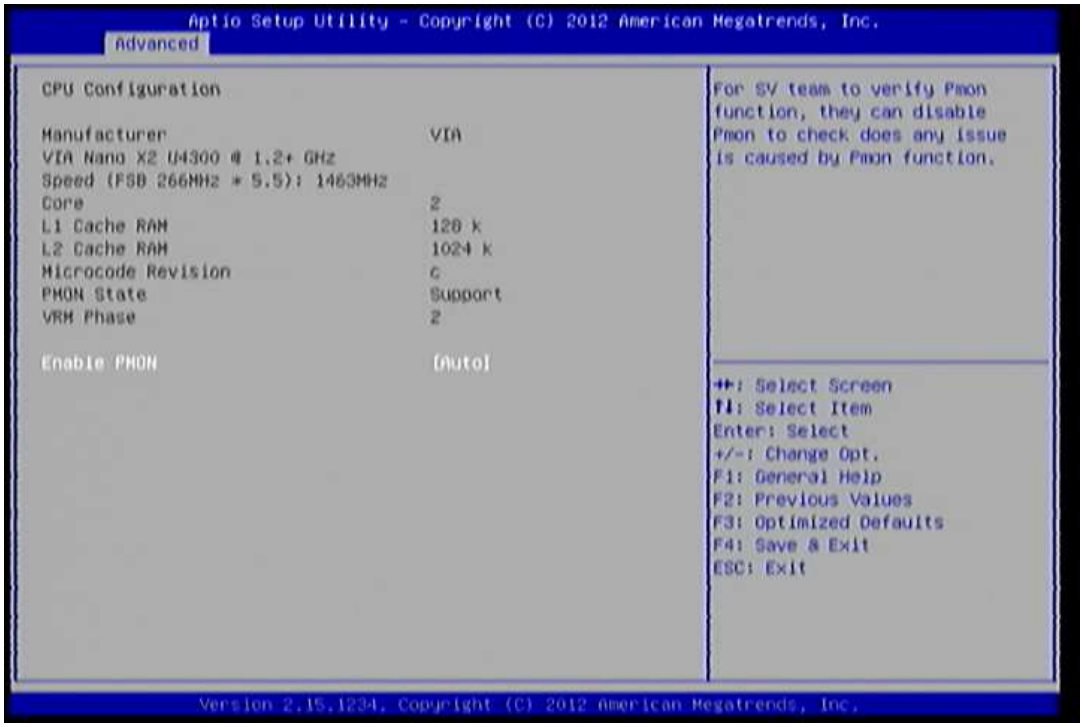


Figure 20: Illustration of CPU Information screen

3.6.3.1. Enable PMON

The CPU PMON Function has two settings: "Auto" and "Disabled". When set to "Auto", the PMON function will be enabled and controlled the CPU speed to perform automatically at best performance to comply with the given system applications.

3.6.4. SATA Configuration

The SATA Configuration screen allows the user to view and configure the settings of the SATA configuration settings.

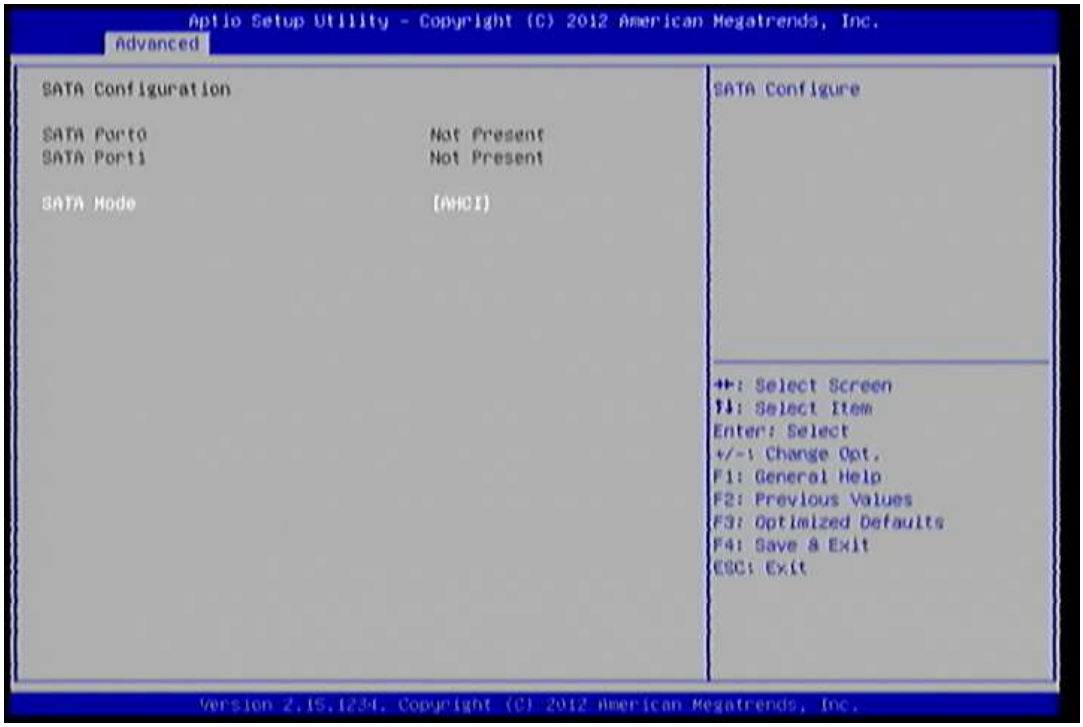


Figure 21: Illustration of SATA Configuration screen

3.6.4.1. SATA Mode

This option allows the user to manually configure SATA controller for a particular mode.

IDE Mode

Set this value to change the SATA to IDE mode.

AHCI Mode

Set this value to change the SATA to AHCI mode.

3.6.5. USB Configuration

The USB Configuration screen allows the user to configure the USB configuration settings.

Figure 22: Illustration of USB Configuration screen

3.6.5.1. Legacy USB Support

The Legacy USB Support feature enables environments that do not have native USB support to use USB devices. This feature has three options.

Auto

The Auto option automatically disables legacy support if no USB devices are connected.

Enabled

The Enabled option keeps the Legacy USB Support feature on at all times.

Disabled

The Disabled option keeps the Legacy USB Support feature off at all times.

3.6.5.2. USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

3.6.5.3. XHCI Hand-off

This is a workaround for Operating Systems without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

3.6.5.4. EHCI Hand-off

This is a workaround feature for Operating Systems without EHCI hand-off support. The EHCI ownership must be claimed by EHCI Driver.

Enabled

This option enables EHCI hand-off support.

Disabled

This option disables EHCI hand-off support.

3.6.5.5. USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

USB hardware delays and time-outs:

3.6.5.6. USB transfer time-out

The time-out value for Control, Bulk and Interrupt transfers. This feature has 4 options: 1 sec/5 sec/10 sec/20 sec.

3.6.5.7. Device reset time-out

This feature enables user to set Device Rest Timeout at various time intervals. The options are: 10 sec/20 sec/30 sec/40 sec.

3.6.5.8. Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. This feature has 2 options: Auto/Manual. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

3.6.6. F71869 Super IO Configuration

The F71869 Super IO Configuration screen allows the user to set system Super IO Chip parameters.

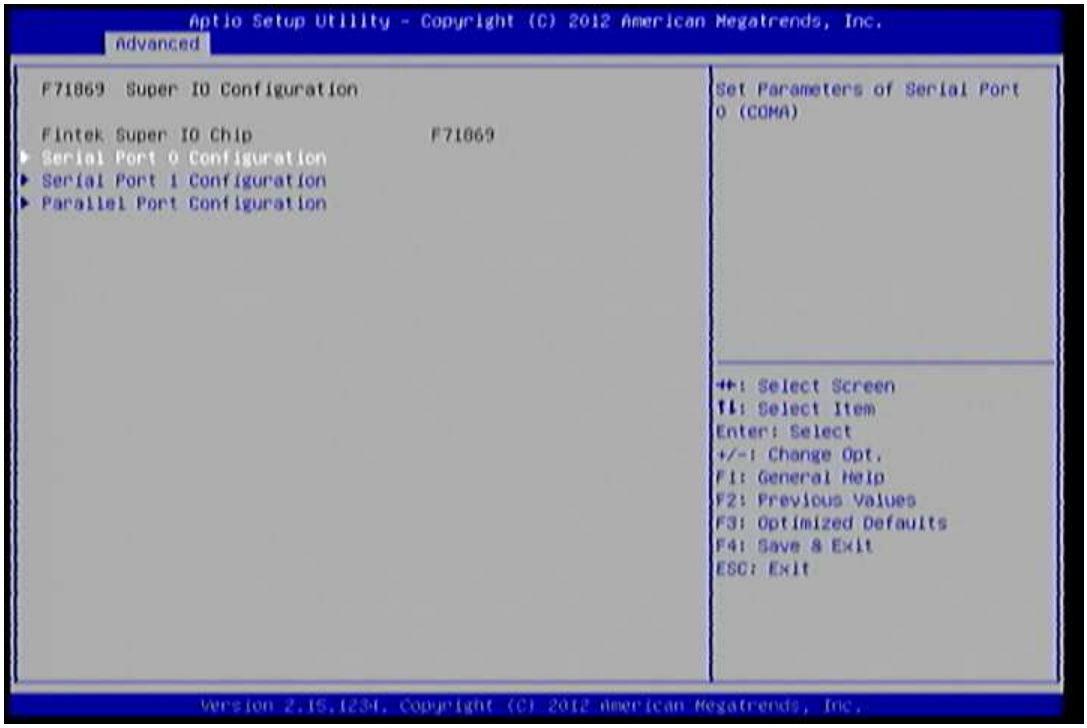


Figure 23: Illustration of F71869 Super IO Configuration screen

3.6.6.1. Serial Port 0 Configuration

Set parameters of Serial Port 0 (COMA).

3.6.6.1.1. Serial Port

This feature has 2 options: Enable or Disable Serial Port (COM).

3.6.6.2. Serial Port 1 Configuration

Set parameters of Serial Port 1 (COMB)

3.6.6.2.1. Serial Port

This feature has 2 options: Enable or Disable Serial Port (COM).

3.6.6.3. Parallel Port Configuration

Set parameters of Parallel Port (LPT/LPTE)

3.6.6.3.1. Parallel Port

This feature has 2 options: Enable or Disable Parallel Port (LPT/LPTE).

3.6.6.3.2. Change Settings

Select an optimal setting for Super IO device.

3.6.6.3.3. Device Mode

Change the Printer Port mode.

3.6.7. F71869 H/W Monitor

F71869 H/W Monitor shows Monitor hardware status.

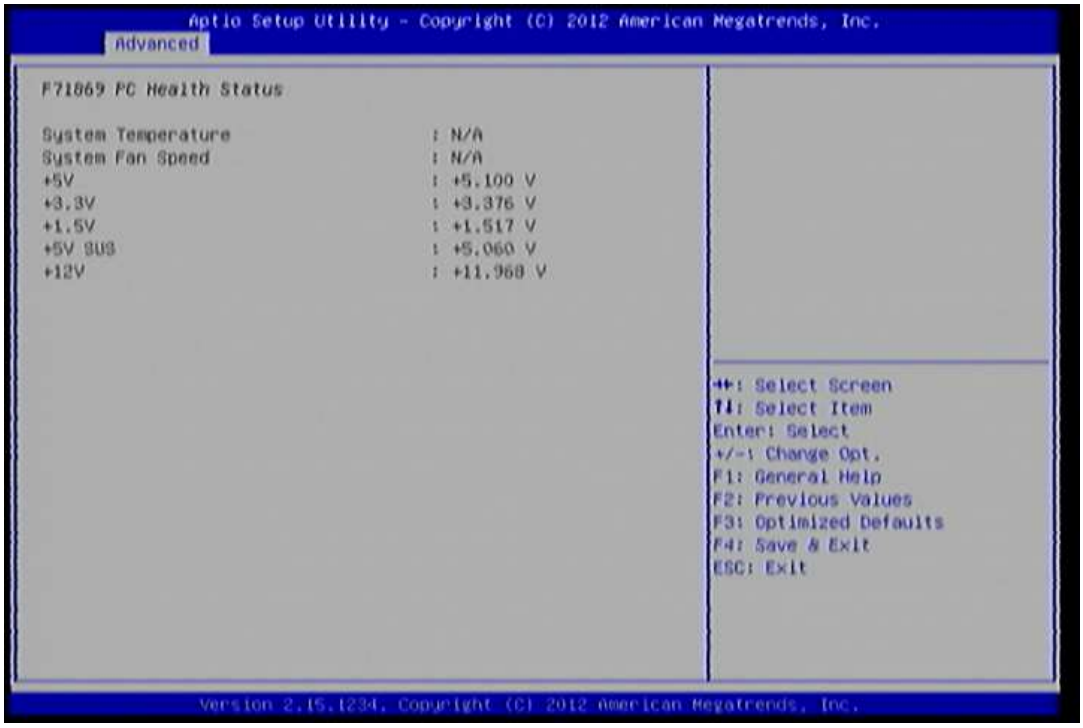


Figure 24: Illustration of F71869 H/W Monitor screen

3.6.8. F75308 H/W Monitor

F75308 H/W Monitor shows PC health status.

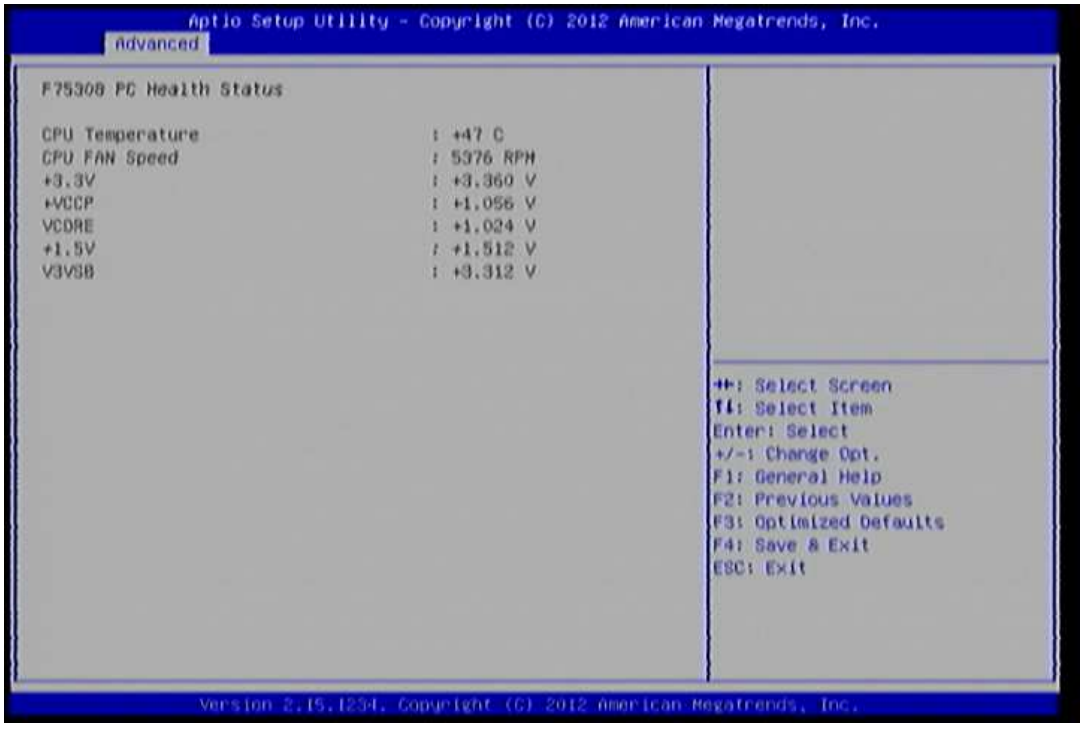


Figure 25: Illustration of F75308 H/W Monitor screen

3.6.9. Clock Generator Configuration

The Clock Generator Configuration screen enables access to the Spread Spectrum Setting feature.

Figure 26: Illustration of Clock Generator Configuration screen

3.6.9.1. CPU Spread Spectrum

The Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has 3 options: Disable, +-0.25% and -0.5%.

3.6.9.2. PCIe Spread Spectrum

Select PCIe Spread Spectrum. This feature has 2 options: Disable and -0.5%.

3.6.10. Demo Board

The OnBoard Device Configuration screen has the following features.

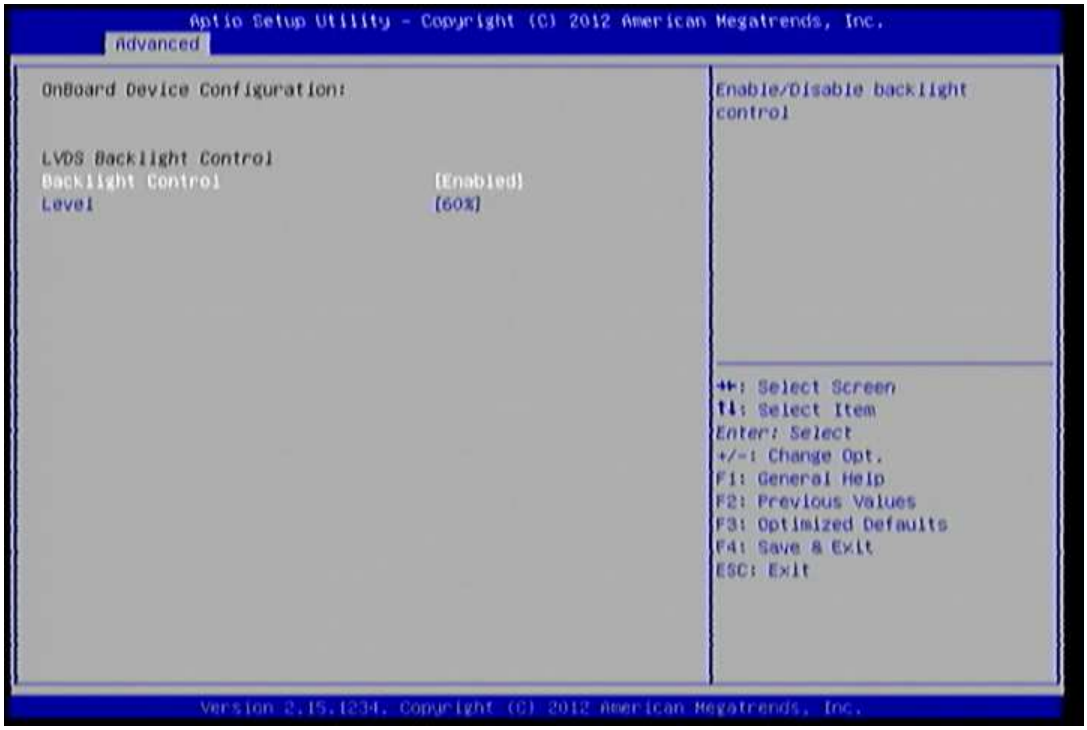


Figure 27: Illustration of Demo Board screen

LVDS Backlight Control

3.6.10.1. Backlight Control

The Backlight Control feature enables the user to control the brightness of the LVDS backlight. This feature has 2 options: Enabled/Disabled

3.6.10.2. Level

0%, 20%, 40%, 60%, 80% and 100%.

3.7. Chipset Settings

The Chipset Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

Figure 28: Illustration of Chipset Settings screen

The Chipset Settings screen contains the following links:

- North Bridge
- South Bridge

3.7.1. North Bridge

The North Bridge screen contains the following links:

- DRAM Configuration
- Video Configuration

Figure 29: Illustration of North Bridge screen

3.7.1.1. DRAM Configuration

The DRAM Configuration screen has two features for controlling the system DRAM. All other DRAM features are automated and cannot be accessed.

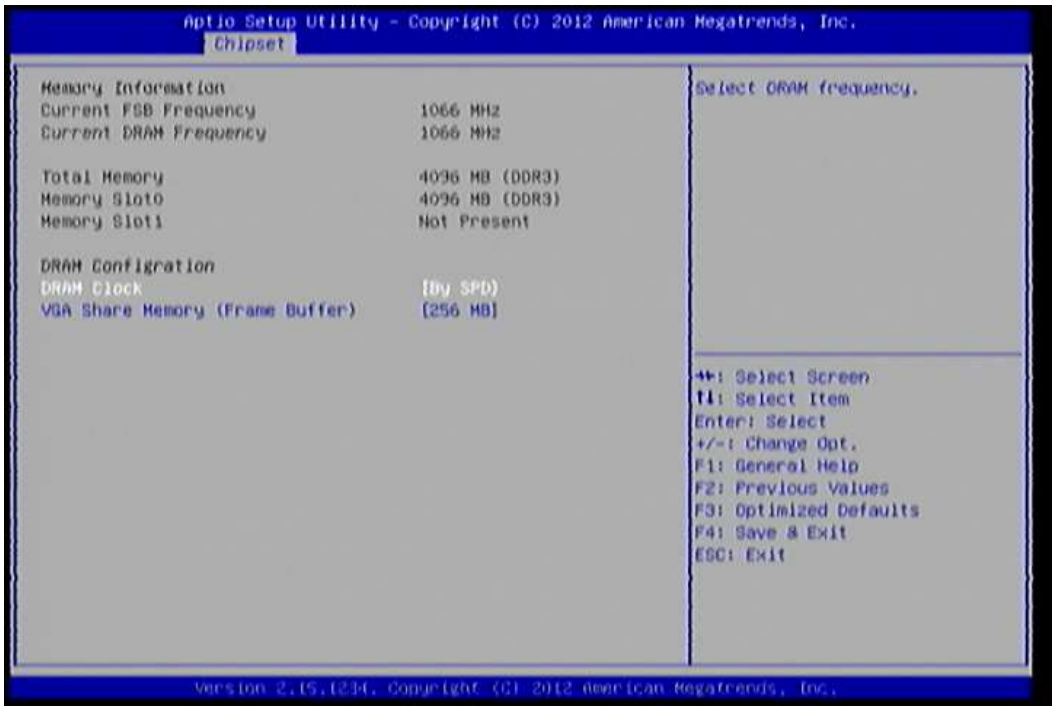


Figure 30: Illustration of DRAM Configuration screen

3.7.1.1.1. DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has eleven options.

By SPD

By SPD option enables the BIOS to select a compatible clock frequency for the installed memory.

400 MHz

The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.

533 MHz

The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.

566 MHz

The 566 MHz option forces the BIOS to be fixed at 1132 MHz for DDR3 memory modules.

600 MHz

The 600 MHz option forces the BIOS to be fixed at 1200 MHz for DDR3 memory modules.

633 MHz

The 633 MHz option forces the BIOS to be fixed at 1266 MHz for DDR3 memory modules.

667 MHz

The 667 MHz option forces the BIOS to be fixed at 1334 MHz for DDR3 memory modules.

700 MHz

The 700 MHz option forces the BIOS to be fixed at 1400 MHz for DDR3 memory modules

733 MHz

The 733 MHz option forces the BIOS to be fixed at 1466 MHz for DDR3 memory modules

766 MHz

The 766 MHz option forces the BIOS to be fixed at 1532 MHz for DDR3 memory modules

800 MHz

The 800 MHz option forces the BIOS to be fixed at 1600 MHz for DDR3 memory modules

3.7.1.1.2. VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 256MB and 512MB.

3.7.1.2. Video Configuration

The Video Configuration screen has features for controlling the integrated graphics controller in the VX11 chipset.

Figure 31: Illustration of Video Configuration screen

3.7.1.2.1. Select Display Device Control

Available selections are: Auto and Manual.

3.7.1.2.2. Select Display Device 1 and 2

The Select Display Device feature enables the user to choose a specific display interface. This feature has four options: CRT, LCD, DP2 and DP. If both Select Display Device 1 and Select Display Device 2 are set to the same interface, then any display device connected to the other interface will not function. For example, if both Select Display 1 and 2 are set to CRT, then no data will be sent to the LCD, DP2 and DP port.

3.7.1.2.3. Panel Type

The Panel Type feature enables the user to specify the resolution of the display being used with the system. The panel types are predefined in the VGA VBIOS.

Panel Type	Resolution
00	640 x 480
01	800 x 600
02	1024 x 768
03	1280 x 768
04	1280 x 1024
05	1400 x 1050
06	1440 x 900
07	1280 x 800

Panel Type	Resolution
08	800 x 480
09	1024 x 600
10	1366 x 768
11	1600 x 1200
12	1680 x 1050
13	1920 x 1200
14	1920 x 1080
15	1024 x 576

3.7.2. South Bridge

The South Bridge screen contains the following links:

Figure 32: Illustration of South Bridge screen

- UART Configuration
- SDIO_CR Configuration
- PMU_ACPI Configuration
- HDAC Configuration
- Others Configuration

3.7.2.1. UART Configuration

The UART Configuration screen allows the user to set UART configuration parameters.

Figure 33: Illustration of UART Configuration screen

3.7.2.1.1. PCI UART mode Selection

UART Module Selection. The setting for this feature is Legacy.

3.7.2.1.2. UART 2 Enable

This feature has 2 options: Enable/Disable UART 2.

3.7.2.1.3. Io Base

Select the Io Base of UART 2. This feature has 4 options: 3F8/2F8/3E8/2E8.

3.7.2.1.4. IRQ

Select the IRQ of UART 2. This feature has 2 options: 3/4/7/11.

3.7.2.1.5. UART 3 Enable

This feature has 2 options: Enable/Disable UART 3.

3.7.2.1.6. Io Base

Select the Io Base of UART 3. This feature has 4 options: 3F8/2F8/3E8/2E8.

3.7.2.1.7. IRQ

Select the IRQ of UART 3. This feature has 2 options: 3/4/7/11.

3.7.2.2. SDIO_CR Configuration

The SDIO_CR Configuration screen allows the user to set SDIO_CR configuration parameters.

Figure 34: Illustration of SDIO_CR Configuration screen

3.7.2.2.1. SDIO Host controller

This feature has 2 options: Enable or Disable SDIO Host controller.

3.7.2.2.2. Voltage Support 1.6v

This feature has 2 options: Enable or Disable Voltage Support 1.6v.

3.7.2.2.3. High Speed Support

This feature has 2 options: Enable or Disable High Speed Support.

3.7.2.2.4. Base Clock Frequency For SD Clock

This feature has 2 options: By FSB/200MHZ

By selecting "By FSB", the base clock frequency will be changed to FSB/B.

3.7.2.2.5. Driver Type Select

Select Driver Type from Type A/ Type B/ Type C/ Type D.

3.7.2.2.6. SDR50 Support

This feature has 2 options: Enable or Disable SDR50 Support.

3.7.2.2.7. SDR104 Support

This feature has 2 options: Enable or Disable SDR104 Support.

3.7.2.2.8. DDR50 Support

This feature has 2 options: Enable or Disable DDR50 Support.

3.7.2.2.9. SDR50 Tuning Enable

This feature has 2 options: Enable or Disable SDR50 Tuning Enable.

3.7.2.2.10. Timer Count for Re-Tuning

Set SDIO Timer count for re-tuning. Available options are: Re-tuning Timer Disabled/1 sec/2 secs/4 secs/8 secs/16 secs/32 secs/64 secs/128 secs/256 secs/512 secs/1024 secs/Get information from other source

3.7.2.3. PMU_ACPI Configuration

The PMU_ACPI Configuration screen can be used to set a number of power management related functions.

Figure 35: Illustration of PMU_ACPI Configuration screen

3.7.2.3.1. Other Control

Figure 36: Illustration of Other Control screen

3.7.2.3.1.1. AC Loss Auto-restart

AC Loss Auto-restart defines how the system will respond after AC power has been interrupted while the system is on. There are three options.

Power Off

The Power Off option keeps the system in an off state until the power button is pressed again.

Power On

The Power On option restarts the system when the power has returned.

Last State

The Last State option restores the system to its previous state when the power was interrupted.

3.7.2.3.1.2. USB S4 WakeUp

The USB S4 WakeUp enables the system to resume through the USB device port from S4 state. There are two options: "Enabled" or "Disabled".

3.7.2.4. HDAC Configuration

HDAC Configuration Parameters.

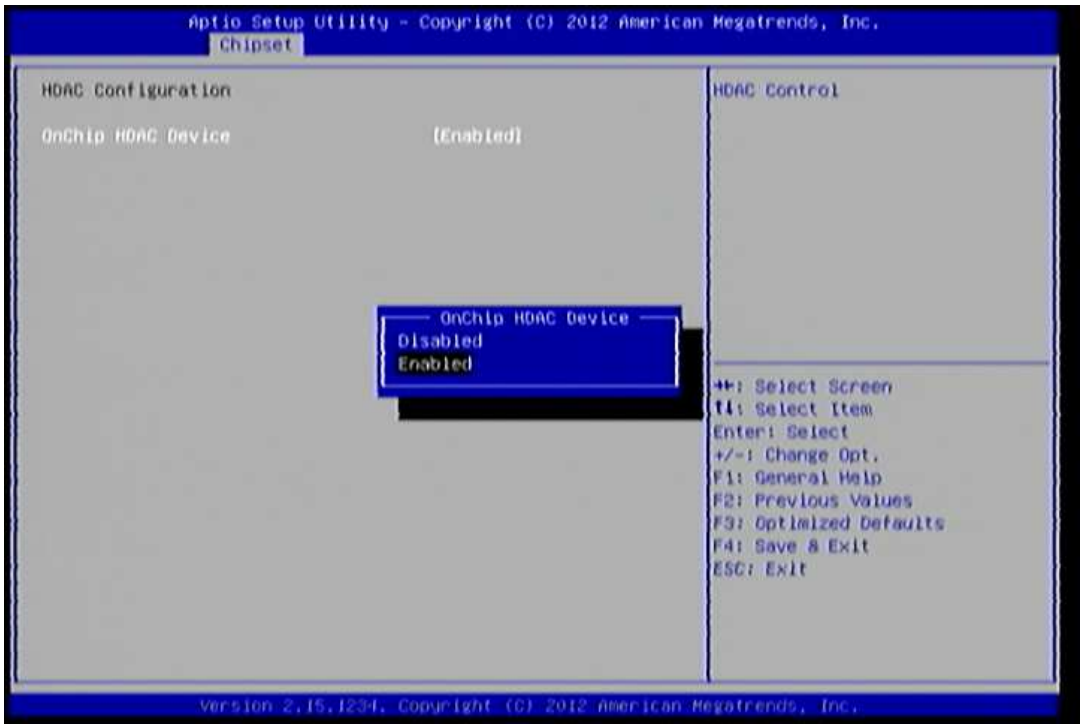


Figure 37: Illustration of HDAC Configuration screen

3.7.2.4.1. OnChip HDAC Device

This feature has 2 options: Enable or Disable HDAC Control.

3.7.2.5. Others Configuration

The Others Configuration screen can be used to set Watchdog Timer Configuration and Keyboard/Mouse Wakeup Configuration.

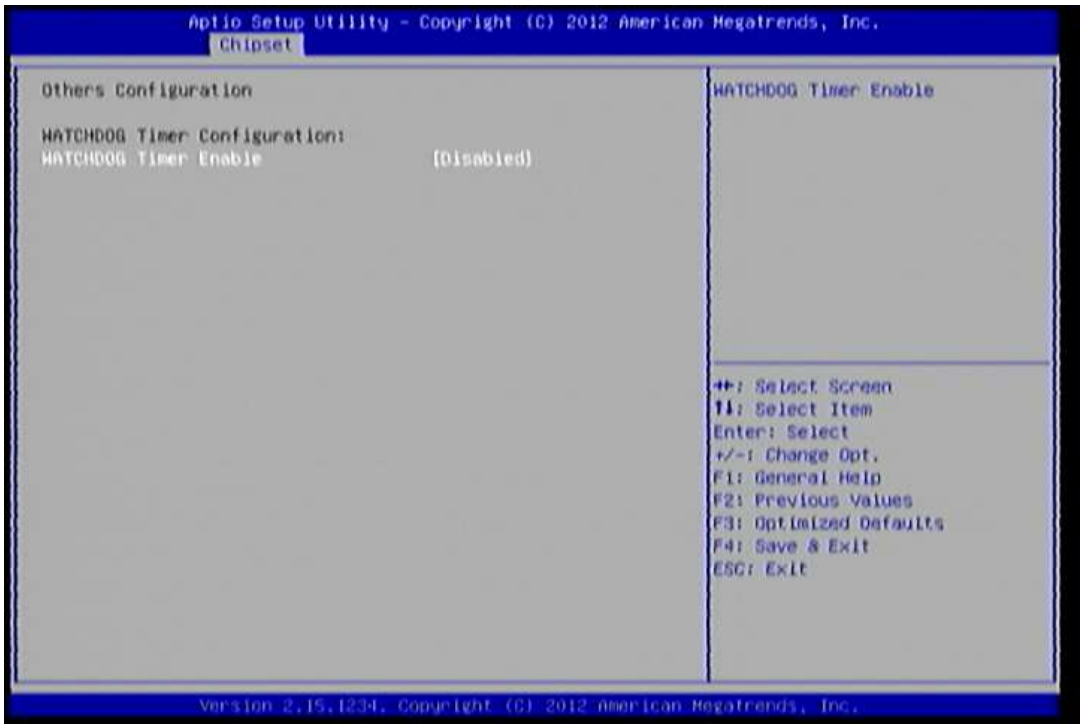


Figure 38: Illustration of Others Configuration screen

3.7.2.5.1. WATCHDOG Timer Enable

When this feature is enabled, an embedded timing device automatically prompts corrective action upon system malfunction detection.

3.8. Boot Settings

The Boot Settings screen has a single link that goes to the **Boot Configuration** and **Boot Option Priorities** screens.

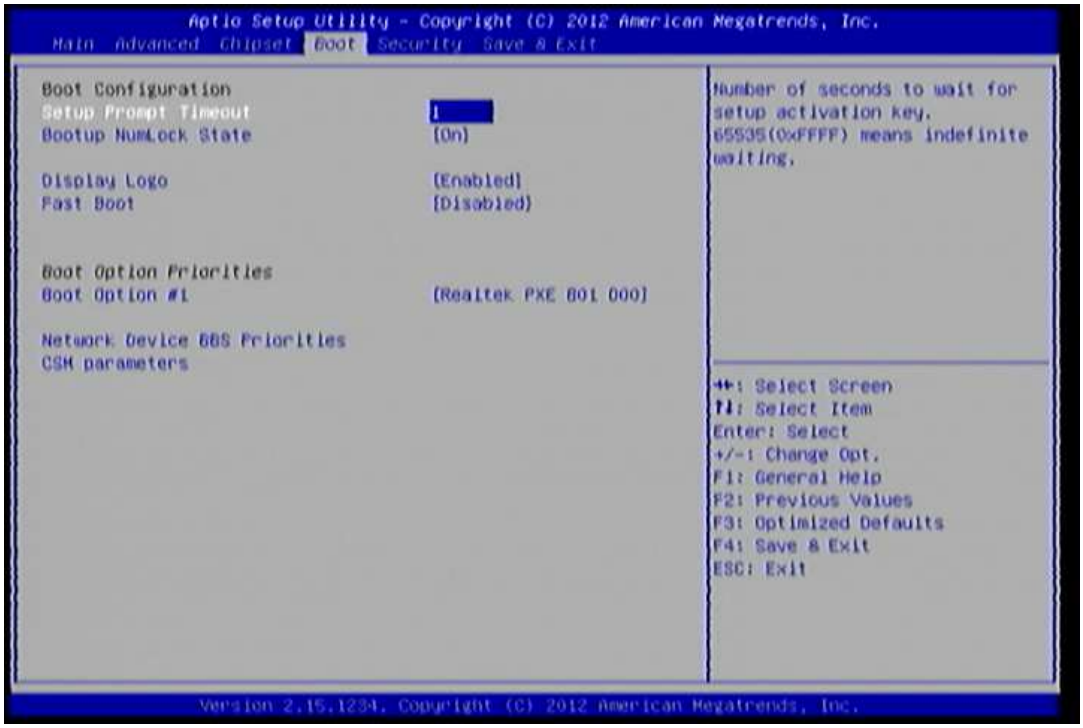


Figure 39: Illustration of Boot Settings screen

3.8.1. Boot Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

3.8.1.1. Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

3.8.1.2. BootupNumLock State

Select the keyboard NumLock state from On and Off.

3.8.1.3. Display Logo

The Display Logo feature hides all of the Power-on Self Test (POST) messages during the boot sequence. Instead of the POST messages, the user will see an OEM logo. This feature has two options: enabled and disabled.

3.8.1.4. Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. It has no effect for BBS boot options.

3.8.2. Boot Option Priorities

The Boot Option Priorities screen lists all bootable devices.

3.8.2.1. Boot Option #1

Sets the system boot order. This feature has two options: Realtek PXE 801 D00 /Disabled.

3.8.3. Network Device BBS Priorities

Set the order of the legacy devices in this group.

3.8.3.1. Boot Option #1

Set the system boot order. This feature has two options: Realtek PXE 801 D00 /Disabled.

3.8.4. CSM parameters

OpROM execution, boot options filter, etc.

3.8.4.1. Launch CSM

This option controls if CSM will be launched. This feature has two options: Enabled/Disabled.

3.8.4.2. Boot option filter

This option controls what devices system can boot to. This feature has 3 options: UEFI and Legacy/Legacy only/UEFI only.

3.8.4.3. Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM. This feature has 2 options: Do not launch/Legacy only.

3.8.4.4. Launch Storage OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM. This feature has 3 options: Do not launch/UEFI only/Legacy only.

3.8.4.5. Launch Video OpROM policy

Controls the execution of UEFI and Legacy Video OpROM. This feature has 3 options: Do not launch/UEFI only/Legacy only.

3.8.4.6. Other PCI device ROM priority

For PCI devices other than Network, Mass storage or video defines which OpROM to launch. This feature has 2 options: UEFI OpROM/Legacy OpROM.

3.9. Security Settings

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.

Figure 40: Illustration of Security Settings screen

3.9.1. Security Settings

3.9.1.1. Administrator Password / User Password

This option is for setting a password for accessing the BIOS setup utility. When a password has been set, a password prompt will be displayed whenever the BIOS setup utility is launched. This prevents an unauthorized person from changing any part of the system configuration.

When a supervisor password is set, the **Password Check** option will be unlocked.

3.9.1.2. Password Check

This feature is compulsory when the **Change Supervisor Password** option is set. The user will have up to three chances to enter the correct password before the BIOS forces the system to stop booting. If the user does not enter the correct password, the keyboard will also lock up. The only way to get past this is to do a hard reboot (i.e., use the system reset button or cut off the power to the system). A soft reboot (i.e., Ctrl+Alt+Del) will not work because the keyboard will be locked. This feature has two options.

Setup

The Setup option forces users to enter a password in order to access the BIOS Setup Utility.

Always

The Always option forces users to enter a password in order to boot up the system.

3.10. Save & Exit Options

The Save & Exit Configuration screen has the following features:

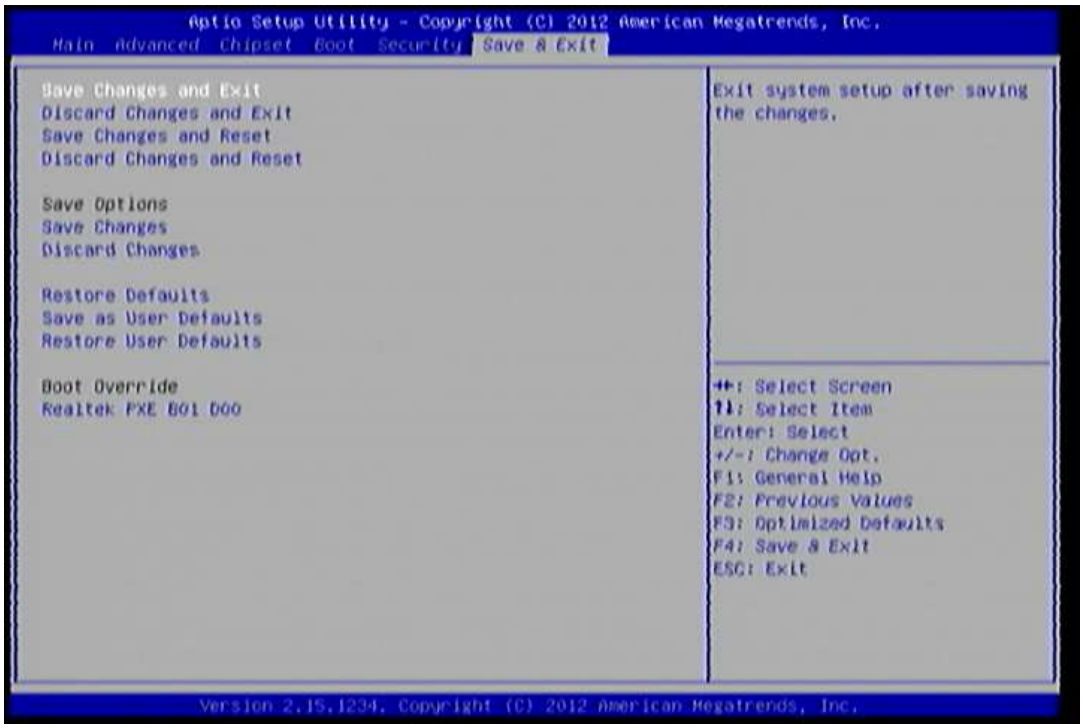


Figure 41: Illustration of Save & Exit Options screen

3.10.1. Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The "F4" hotkey can also be used to trigger this command.

3.10.2. Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The "Esc" hotkey can also be used to trigger this command.

3.10.3. Save Changes and Reset

Save all changes to the BIOS and reboot the system. The new system configuration parameters will take effect.

3.10.4. Discard Changes and Reset

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

Save Options

3.10.5. Save Changes

Save Changes done so far to any of the setup options.

3.10.6. Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

Restore Default

3.10.7. Save as User Defaults

Save the changes done so far as User Defaults.

3.10.8. Restore User Defaults

Restore the User Defaults to all the setup options.

Boot Override

3.10.9. Realtek PXE B01 D00

4. Driver Installation

4.1. Microsoft Driver Support

The VIA COMe-9X90 mainboard is compatible with Microsoft operating systems. The latest Windows drivers can be downloaded from the VIA website at www.viatech.com.

For embedded operating systems, the related drivers can be found in the VIA website at www.viatech.com.

4.2. Linux Driver Support

The VIA COMe-9X90 mainboard is highly compatible with many Linux distributions.

Support and drivers are provided through various methods including:

- Drivers provided by VIA
- Using a driver built into a distribution package
- Visiting www.viatech.com for the latest updated drivers
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)

For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Contact VIA to submit a request.

Appendix A. COMEDB4 Carrier Board

A.1. Board Specifications

COM Express™ Module Type

- Support basic/compact form factor Type 6

Audio

- VIA VT2021 High Definition Audio Codec

Super I/O

- Fintek F71869ED

BIOS

- AMI BIOS
- 32Mbit SPI BIOS for uEFI

Front Panel I/O

- 1 x SD card slot (SDIO) as default, shared with DIO1 pin header

Rear Panel I/O

- 1 x VGA port
- 1 x COM port
- 2 x DisplayPort
- 2 x USB 2.0 ports
- 2 x USB 3.0 ports
- 1 x Gigabit Ethernet port
- 6 x Audio jacks (supports multi-channel audio outputs)

Onboard Slots, Buttons and Power Connectors

- 1 x AUX power connector (for AT mode)
- 1 x ATX power connector (for ATX mode)
- 1 x MiniPCIe slot
- 1 x Power button
- 1 x Reset button
- 3 x PCIe x1 slots
- 2 x SATA connectors

Onboard Pin Headers and Connectors

- 1 x CD-In connector
- 1 x Front Audio pin header
- 1 x COM2 pin header
- 1 x LPT pin header
- 1 x LPC pin header
- 1 x SPI pin header

- 1 x DIO1 pin header, shared with SDIO slot
- 1 x DIO2 pin header (from Fintek F71869ED)
- 1 x CPU fan connector
- 1 x Serial Port pin header
- 2 x SATA power connectors
- 1 x LVDS panel connector (dual-channel 18/24-bit)
- 1 x Inverter connector
- 1 x System fan connector
- 1 x SMBus pin header
- 1 x I^2C pin header
- 2 x USB 2.0 pin headers for four USB 2.0 ports
- 1 x Front LAN LED pin header
- 1 x Front Panel pin header (for HDD LED, Power LED, Switch and Speaker)
- 1 x S/PDIF connector

Onboard Jumpers

- 1 x Clear CMOS jumper
- 1 x Inverter power select jumper
- 1 x LCD panel power select jumper
- 1 x COM1 voltage select jumper (+5V/+12V power select option)
- 1 x COM2 voltage select jumper (+5V/+12V power select option)
- 1 x MiniPCIe slot enabled select jumper
- 1 x USB 2.0 port 3 enabled select jumper
- 1 x BIOS select jumper (for selecting module/carrier board BIOS)
- 5 x AT/ATX mode select jumpers
- 1 x EDID power select jumper

Form Factor and Dimension

- Micro-ATX
- 10" x 9.6"

Operating Temperature

- 0°C ~ 60°C

Storage Temperature

- -40°C ~ 70°C

Operating Humidity

- 0% ~ 95% relative humidity

A.2. External I/O Connectors

The COMEDB4 has a wide selection of interfaces. It includes a selection of frequently used ports as part of the external I/O coastline.

A.2.1. Front Panel I/O

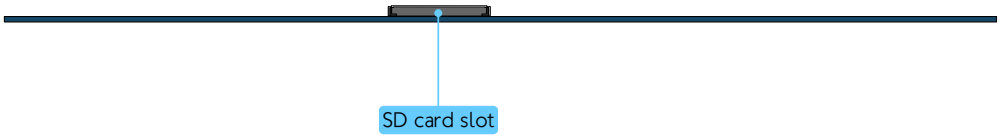


Figure 42: Front panel I/O

A.2.2. Rear Panel I/O

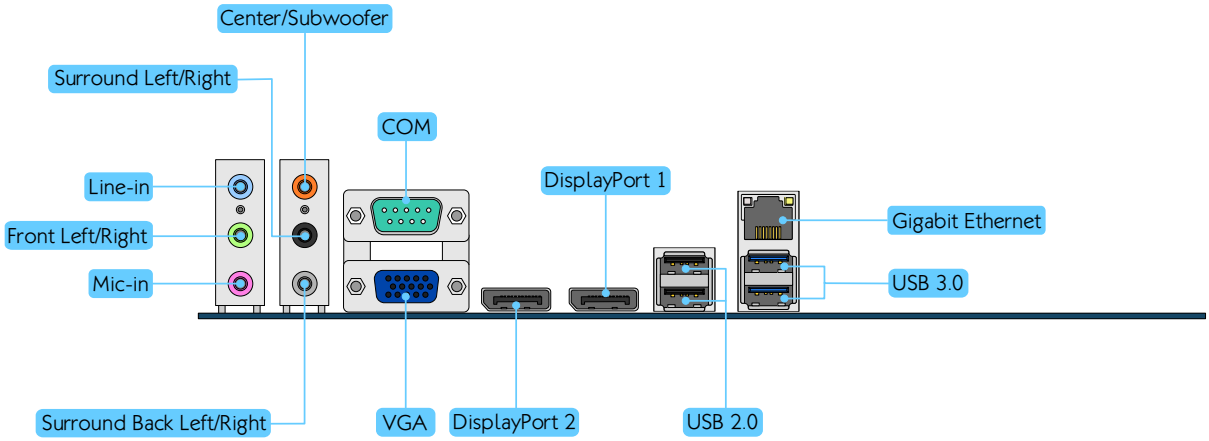


Figure 43: Rear panel IO

A.3. COMEDB4 Layout Diagram

A.3.1. Onboard Slots, Buttons and Power Connectors

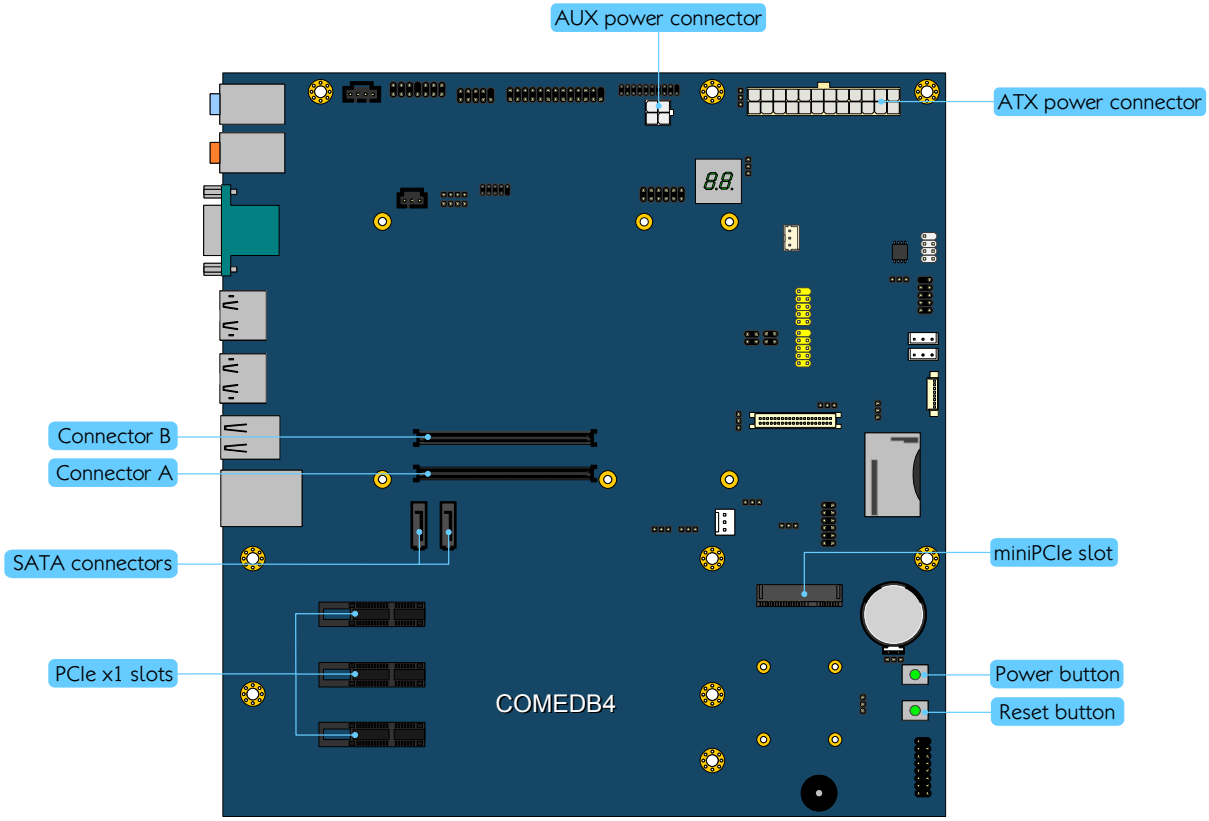


Figure 44: COMEDB4 slots, buttons, and power connectors layout

A.3.2. Onboard Pin headers and Connectors

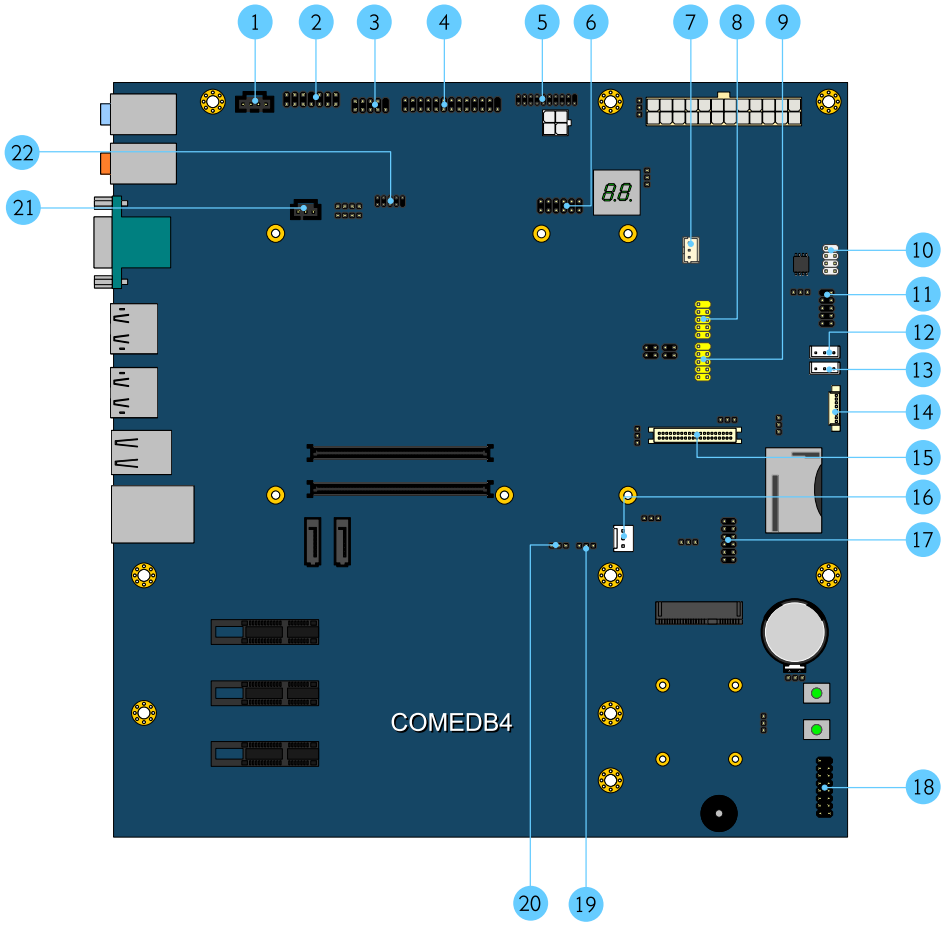


Figure 45: COMEDB4 pin headers and connectors layout

Item	Description
1	CD_IN: CD-In connector from CD drive
2	F_AUDIO: Front Audio pin header
3	COM2: COM2 pin header
4	LPT: LPT pin header
5	LPC: LPC pin header
6	DIO2: DIO2 pin header
7	CPUFAN: CPU fan
8	USB2_2/3: USB 2.0 pin header for port 2 and 3
9	USB2_0/1: USB 2.0 pin header for port 0 and 1
10	SPI: SPI pin header
11	SER_PORT: Serial Port pin header
12	S_PWR2: SATA power connector 2
13	S_PWR1: SATA power connector 1
14	INVERTER: Inverter connector
15	LVDS: LVDS panel connector
16	SYSFAN: System fan connector
17	DIO1: DIO1 pin header

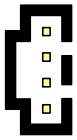
18	F_PANEL: Front Panel pin header
19	I2C_BUS: I^2C pin header
20	SMBUS: System Management Bus pin header
21	SPDIF: S/PDIF connector
22	FLAN_LED: Front LAN LED pin header

Table 2: Layout diagram description table of the COMEDB4 (pin headers and connectors)

A.3.2.1. Pin Headers and Connectors Pin Definition

1 CD_IN

1	CD_IN_L
2	CD_IN_GND
3	CD_IN_GND
4	CD_IN_R



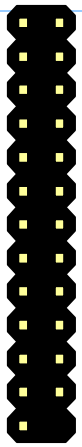
2 F_AUDIO

MIC2_FR_L	1	2	AGND
MIC2_FR_R	3	4	FNT_DET
HP_OUT_R	5	6	MIC2_JD
FNT_IO_SENSE	7	8	KEY
HP_OUT_L	9	10	LINE2_JD
+12V	11	12	+12V
AGND	13	14	AGND

3 COM2

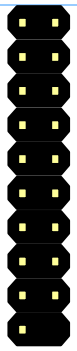
COM_DCD2	1	2	COM_RXD2
COM_TXD2	3	4	COM_DTR2
GND	5	6	COM_DSR2
COM_RTS2	7	8	COM_CTS2
COM_RI2	9	10	KEY

4 LPT



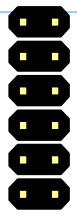
-LP_STB	1		2	-LP_AFD
LP_D0	3		4	-LP_ERR
LP_D1	5		6	-LP_INIT
LP_D2	7		8	-LP_SLIN
LP_D3	9		10	GND
LP_D4	11		12	GND
LP_D5	13		14	GND
LP_D6	15		16	GND
LP_D7	17		18	GND
-LP_ACK	19		20	GND
LP_BUSY	21		22	GND
LP_PE	23		24	GND
LP_SLCT	25		26	KEY

5 LPC



LPC_AD1	1		2	LPC_33M_CLK
-LPC_RESET	3		4	GND
LPC_AD0	5		6	NC
LPC_AD2	7		8	-LPC_FRAME
LPC_SERIRQ	9		10	LPC_AD3
-LPC_DRQ1	11		12	NC
+5V	13		14	+3.3V
+5V	15		16	+3.3V
GND	17		18	GND
GND	19		20	KEY

6 DIO2



5V_DIO2	1		2	12V_DIO2
GPO34	3		4	GPI50
GPO35	5		6	GPI51
GPO36	7		8	GPI52
GPO37	9		10	GPI53
GND	11		12	GND

7 CPUFAN

1	FANIO
2	FANPWM
3	GND

8 USB2_2/3

VUSB	1		2	VUSB
USBD_T2-	3		4	USBD_T3-
USBD_T2+	5		6	USBD_T3+
GND	7		8	GND
KEY	9		10	GND

9 USB2_0/1

VUSB	1		2	VUSB
USBD_T0-	3		4	USBD_T1-
USBD_T0+	5		6	USBD_T1+
GND	7		8	GND
KEY	9		10	GND

10 SPI

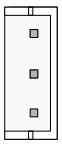
SPI_VCC	1		2	GND
-SPI_SS0	3		4	SPI_CLK
SPI_DI	5		6	SPI_DO
KEY	7		8	RESET

11 SER_PORT

SER0_TX_CON	1		2	SER0_RX_CON
NC	3		4	NC
GND	5		6	NC
SER1_TX_CON	7		8	SER1_RX_CON
NC	9		10	KEY

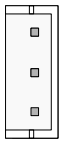
12 S_PWR2

1	+5V
2	+12V
3	GND



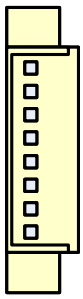
13 S_PWR1

1	+5V
2	+12V
3	GND



14 Inverter

1	IVDD_IN
2	IVDD_IN
3	BAKLITE_EN
4	BLT_CK
5	BAKLITE_EN
6	BLT_CTRL
7	GND
8	GND

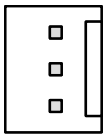


15 LVDS

-A4_L	1		2	PVDD
A4_L	3		4	PVDD
GND	5		6	GND
-A5_L	7		8	GND
A5_L	9		10	-A0_L
GND	11		12	A0_L
-A6_L	13		14	GND
A6_L	15		16	-A1_L
GND	17		18	A1_L
-CLK2_L	19		20	GND
CLK2_L	21		22	-A2_L
GND	23		24	A2_L
-A7_L	25		26	GND
A7_L	27		28	-CLK1_L
NC	29		30	CLK1_L
NC	31		32	GND
DDC_PWR	33		34	-A3_L
NC	35		36	A3_L
NC	37		38	SPCLK
NC	39		40	SPD

16 SYSFAN

1	FANIO
2	FANPWM
3	GND



17 DIO1

5V_DIO1	1		2	12V_DIO1
COM_GPO0	3		4	COM_GPI0
COM_GPO1	5		6	COM_GPI1
COM_GPO2	7		8	COM_GPI2
COM_GPO3	9		10	COM_GPI3
GND	11		12	GND

18 F_PANEL

FP_5V	1		2	FP_5V
FP_5V	3		4	-SATA_LED
-PLED	5		6	-PW_BTN
FP_5V	7		8	GND
NC	9		10	RST_SW
NC	11		12	GND
SPEAK	13		14	FP_5V
KEY	15		16	NC

19 I2C BUS

1	I2C_CLK
2	I2C_DATA
3	GND

20 SMBUS

1	SMB_CLK
2	SMB_DATA
3	GND

21 SPDIF

1	+5V
2	SPDIFO
3	GND

22 FLAN_LED

3VSUS	1		2	-LAN_ACT
3VSUS	3		4	NC
GND	5		6	W_LAN_LED
3VSUS	7		8	GND
KEY	9		10	GND

A.3.3. Onboard Jumpers

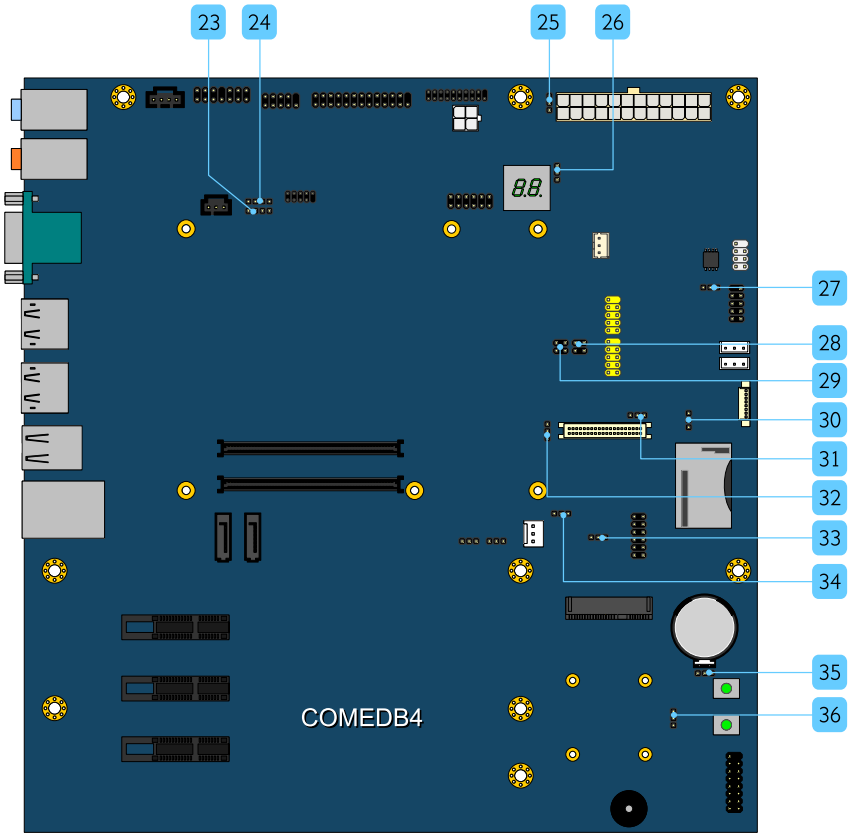


Figure 46: COMEDB4 jumpers layout

Item	Description
23	JP_COM1_VSEL: COM1 voltage select jumper
24	JP_COM2_VSEL: COM2 voltage select jumper
25	JP_AT/ATX_SEL5: AT/ATX mode select jumper
26	JP_AT/ATX_SEL2: AT/ATX mode select jumper
27	JP_AT/ATX_SEL3: AT/ATX mode select jumper
28	JP_USBP3_SEL: USB 2.0 port 3 enabled select jumper
29	JP_USBME_SEL: MiniPCIe slot enabled select jumper
30	IVDD: Inverter power select jumper
31	EDID_PWR: EDID power select jumper
32	JP_AT/ATX_SEL4: AT/ATX mode select jumper
33	BIOS_DIS1: BIOS select jumper (for selecting module/carrier board BIOS)
34	PVDD: LCD panel power select jumper
35	JP_AT/ATX_SEL1: AT/ATX mode select jumper
36	CLEAR_CMOS: Clear CMOS jumper

Table 3: Layout diagram description table of the COMEDB4 (jumpers)

A.3.3.1. Jumper Settings

23 JP_COM1_VSEL

Pins	Description
1-2	Enabled COM1 pin header to support +5V
2-3	Normal (default)
3-4	Enabled COM1 pin header to support +12V

24 JP_COM2_VSEL

Pins	Description
1-2	Enabled COM2 pin header to support +5V
2-3	Normal (default)
3-4	Enabled COM2 pin header to support +12V

25 JP_AT/ATX_SEL5

Pins	Description
1-2	ATX mode (default)
2-3	AT mode

26 JP_AT/ATX_SEL2

Pins	Description
1-2	ATX mode (default)
2-3	AT mode

27 JP_AT/ATX_SEL3

Pins	Description
1-2	ATX mode (default)
2-3	AT mode

28 JP_USBP3_SEL

Pins	Description
1-2	Enabled USB 2.0 port 3 pin header (default)
3-4	Enabled USB 2.0 port 3 pin header (default)

29 JP_USBME_SEL

Pins	Description
1-2	Enabled Mini PCIe slot
3-4	Enabled Mini PCIe slot

Note: For [29] JP_USBME_SEL to be activated, the [28] JP_USBP3_SEL pin header function has to be disabled.

30 IVDD

Pins	Description
1-2	Use +5V for the Inverter power.
2-3	Use +12V for the Inverter power (default)

31 EDID_PWR

Pins	Description
1-2	+3.3V (default)
3-4	+5V

32 JP_AT/ATX_SEL4

Pins	Description
1-2	ATX mode (default)
2-3	AT mode

33 BIOS_DIS1

Pins	Description
1-2	Select module SPI BIOS (default)
2-3	Select carrier board SPI BIOS

34 PVDD

Pins	Description
1-2	Use +5V for the LCD panel power.
2-3	Use +3.3V for the LCD panel power (default)

35 JP_AT/ATX_SEL1

Pins	Description
1-2	ATX mode (default)
2-3	AT mode

36 CLEAR_CMOS

Pins	Description
1-2	Keep CMOS setting (default)
2-3	Clear CMOS setting

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