

PCM-9310

Intel® Celeron N3160/N3060 SoC,
3.5" SBC, DDR3L, VGA, HDMI,
48-bit LVDS/eDP*, 2GbE, Mini PCIe,
mSATA, SUSI API

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This manual is for the PCM-9310.

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
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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.

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 B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*



Technical Support and Assistance

1. Visit the Advantech website at <http://support.advantech.com> 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

Packing List

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

- 1 x PCM-9310 SBC
- 1 x SATA Cable 30cm (p/n: 1700006291)
- 1 x SATA Power Cable 35cm (p/n: 1700018785)
- 1 x Audio Cable 20cm (p/n: 1700019584)
- 2 x COM Cable 22cm (p/n: 1701200220)
- 1 x Heatsink (p/n: 1960071176T001)
- 1 x Startup manual (p/n: 2006931000)
- 1 x Mini Jumper Pack (p/n: 9689000002)
- 1 x Screw Kit (4pcs screws for miniPCle) (p/n: 9666525100E)
- 1 x SUSIAccess Pro package (p/n: 968EMLSAP1)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Optional Accessories

Part number	Description
1960075286T001	Heat spreader
1703100260	Internal USB cable

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Chapter 1

General Information

This chapter gives background information on the PCM-9310.

Sections include:

- Introduction
- Specifications
- Block diagram
- Board layout and dimensions

1.1 Introduction

PCM-9310 is designed using MI/O Extension form factor (compact series, 146 x 102 mm) and powered by the latest generation of Intel® Celeron® N3160 and N3060 processors which have low power features but also good performance computing, especially for multimedia capabilities compared to earlier generations. Meanwhile, PCM-9310 offers flexible expansion possibilities: two full-size mini PCIe, 1 x Full-size Mini PCIe w/ SIM holder, and 1 x Full-size mSATA, MIOe with PCIe1, SMBus, 3xUSB2.0, line out, DisplayPort, +12V/ +5V Power, and power interface.

PCM-9310 supports various display interfaces included HDMI, VGA, 48-bit LVDS/eDP*, and rich I/O: 2 x GbE, SATA, mSATA/SD card, 4xSerial Ports, 2 x USB 3.0 and 4 x USB 2.0.

*This specification is supported upon request.

1.2 Specifications

1.2.1 Functional Specifications

■ Processor:

- Celeron® N3160 1.6 GHz (burst frequency 2.24 GHz), Quad Cores, Four Threads
- Celeron® N3060 1.6GHz (burst frequency 2.48 GHz), Dual Cores, Two Threads
- L2 Cache: 2MB
- Advanced Technologies
 - * Intel® Virtualization Technology (VT-x)
 - * Intel® 64 Architecture
 - * Enhanced Intel SpeedStep Technology
 - * Intel® Trusted Execution Engine (TXE)
- Power Management
 - * ACPI 5.0
 - * System sleep states: S0, S3, S4, S5

■ System Memory Support

- Non-ECC, DDR3L SODIMM up to 8GB
- 64 bit wide channels
- x8 and x16 DDR3L SDRAM device data widths
- DDR3L with 1600 MT/s

■ Integrated Graphics Controller

- Controller: Intel® HD Graphics 400
- Graphics HFM (High Frequency Mode): 320MHz
- Graphic Features:
 - * 3D HW Acceleration: DirectX11.1, OpenGL4.2, OpenCL1.2
 - * HW Video Decode: H.265/HEVC @ level 5, H.264 @ Level 5.1, MPEG2, MVC, VC-1, WMV9, JPEG and VP8
 - * HW Video Encode: H.264 @ Level 5.1, MVC, JPEG
- Multi-display interfaces: VGA, HDMI, 48-bit LVDS/eDP¹
 - * Supports Extend/ Clone Mode with multi-display device
 - * Dual display: any two combination between: VGA, HDMI, LVDS
- Triple Display:
 - * VGA+HDMI+48-bit LVDS
- Specification and Resolution
 - * VGA: 1920 x 1200 at 60Hz

- * HDMI: HDMI 1.4b with audio, 2560 x 1600 at 60Hz
- * LVDS/eDP: 48-bit LVDS up to 1920x1200 at 60Hz, eDP is supported standard version 1.3 with audio up to 2560 x 1440 (optional) at 60Hz
- DirectX* Video Acceleration (DXVA) support for accelerating video processing
 - * Full AVC/VC1/MPEG2 Hardware Decode
- OpenGL4.0 support
- DirectX 11.1, DirectX 11, DirectX 10.1, DirectX 10, DirectX 9 support
- **Gigabit Ethernet**
 - Controller: RTL8111E
 - * 10/100/1000 Mbps
 - * Energy Efficient Ethernet (EEE) IEEE802.3az support [Low Power Idle (LPI) mode]
 - * IEEE 1588
 - * 9.5 KB Jumbo frames supported (Full-duplex)
 - * Flow Control supported
 - * Magic packet wake-up enable with unique MAC address
- **Peripheral interface**
 - MIOe Expansion
 - * DisplayPort¹
 - * 1 PCIe x1
 - * 3 USB 2.0
 - * LPC
 - * HD Audio: Line out
 - * SMBus
 - * Power: +5 Vsb/+12 Vsb, Power On, Reset
 - 2 Serial-ATA port, up to 6.0 Gb/s (600 MB/s)
 - * SATA Power: 5V / 12V
 - 2 USB 3.0 & 4 x USB2.0
 - * Two USB3.0 and two USB2.0 on rear I/O, two internal USB2.0
 - * Support wake-up from sleeping state S3
 - 2 RS-232 for COM1/2, 2 RS-232/422/485 for COM3/4 (ESD protection: air gap ±15kV, contact ±8kV)
 - 8-bit Programmable General Purpose Input/ Output from iManager
 - 1 SMBus / I²C channel from iManager
 - Watchdog timer: Output System Reset, Programmable counter from 1 ~ 255 minutes/ seconds
 - Mini PCIe / mSATA
 - * 1 Full-size Mini PCIe with SIM holder
 - * 1 Full-size mSATA
- **High Definition Audio:**
 - Intel[®] High Definition Audio Interface
 - High Definition Audio Codec with Realtek proprietary loss-less content protection technology
 - Supports 1 Line-input, 1 Line output, 1 Mic-input
- **BIOS**
 - AMI UEFI 64 Mbit, BIOS for 64 or 32bit is different, default version is for 64bit
 - Default setting is UEFI that can be done by T-P/N

¹: This specification is supported upon request.

1.2.2 OS support

PCM-9310 supports Win10, Win8.1, WES7, Linux kernel 4.1

Win7 only supports Legacy mode and Win8 for UEFI mode.

For further information about OS support of PCM-9310, please visit Advantech website:

<http://support.advantech.com.tw/> or contact the technical support center.

1.2.3 Mechanical Specifications

- **Dimensions:** 146 x 102 mm (5.7 x 4 inches)
- **Height:** top side 19mm, PCB 1.6mm, bottom side 6.8mm, total 27.4mm
- **Weight:** 0.6 kg (1.2 lb) (weight of total package)

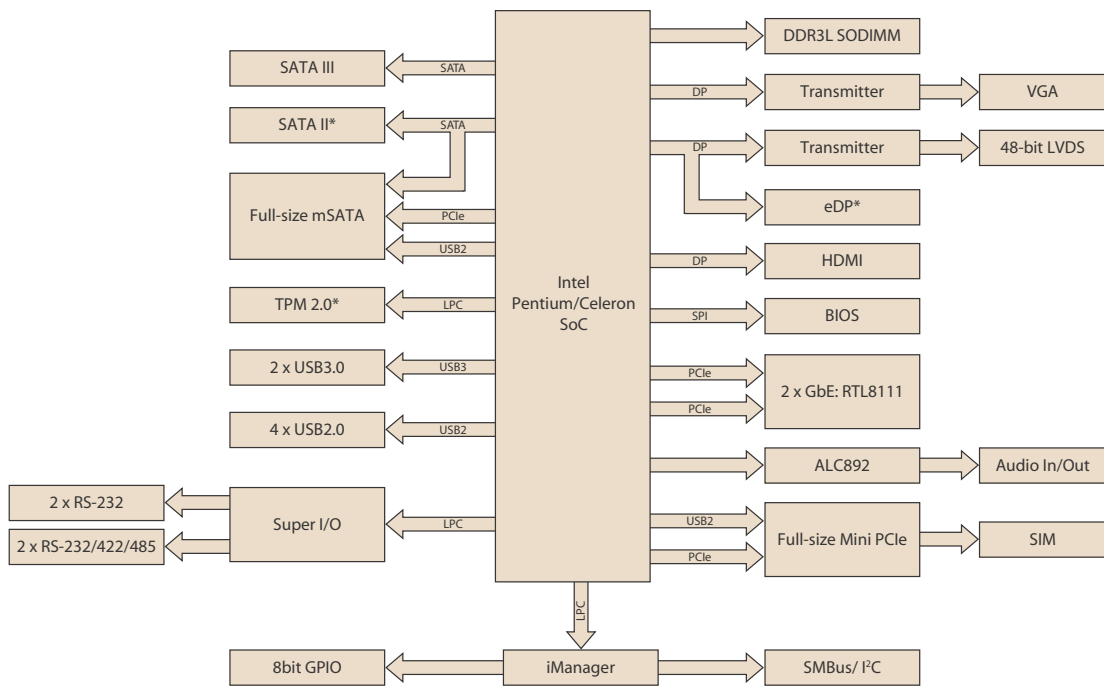
1.2.4 Electrical Specifications

- **Power Requirement:** +12 V \pm 10% (Default support 2x2pin ATX power connector, DC Jack by T-P/N)
- **Power Consumption:**
 - Typical in Window 8.1:
 - N3160: 0.58 A @ 12 V (7.05 W)
 - N3060: 0.38 A @ 12 V (4.55 W)
 - Max in HCT:
 - N3160: 1.03A @ 12 V (12.27 W)
 - N3060: 0.85A @12 V (10.20 W)
- **Power Consumption Conditions:**
 - Test software: 3DMark 2013
 - Max. load: Measure the maximum current value which system under maximum load (CPU: Top speed, RAM &Graphic: Full loading)
 - Idle mode: Measure the current value when system in windows mode and without running any program
- **RTC Battery:**
 - Typical Voltage: 3.0 V
 - Normal discharge capacity: 210 mAh

1.2.5 Environmental

- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F)
- **Operating Humidity:** 40°C @ 85% RH Non-Condensing
- **Storage Temperature:** Storage temperature: -40~85°C
- **Storage Humidity:** Relative humidity: 95% @ 60°C

1.3 Block Diagram



1.4 Board layout: dimensions

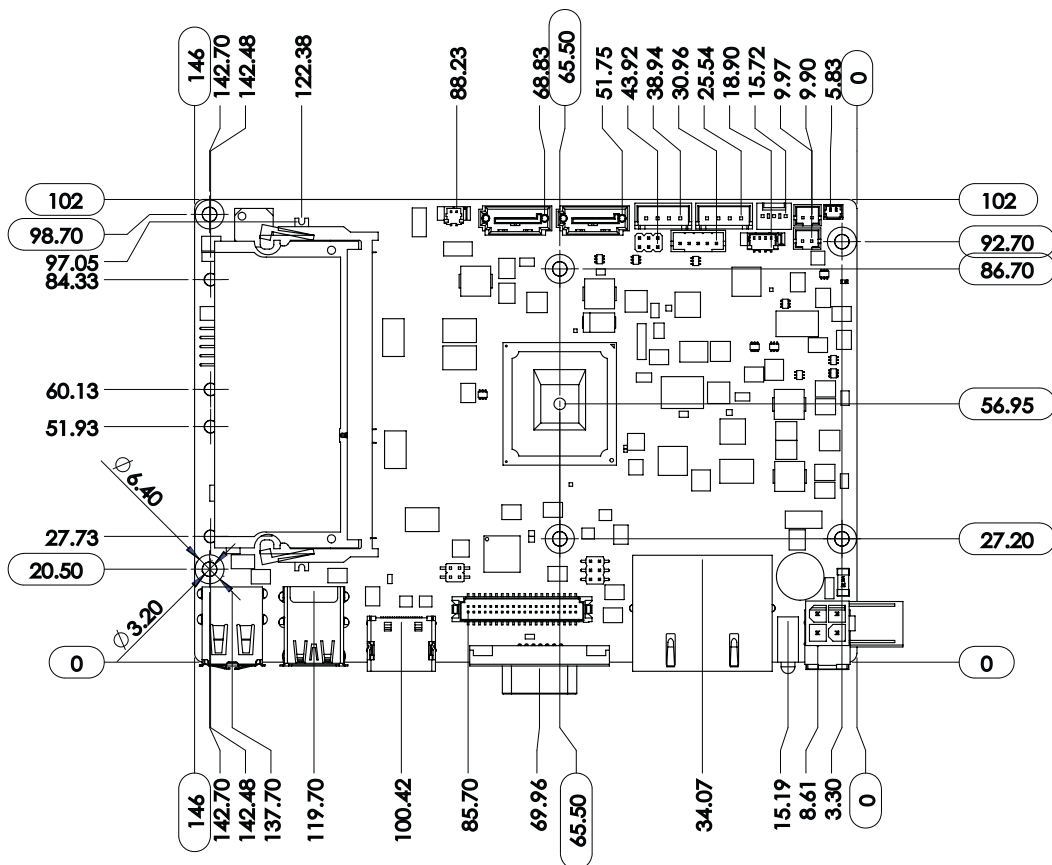


Figure 1.1 PCM-9310 Mechanical Drawing (Top Side)

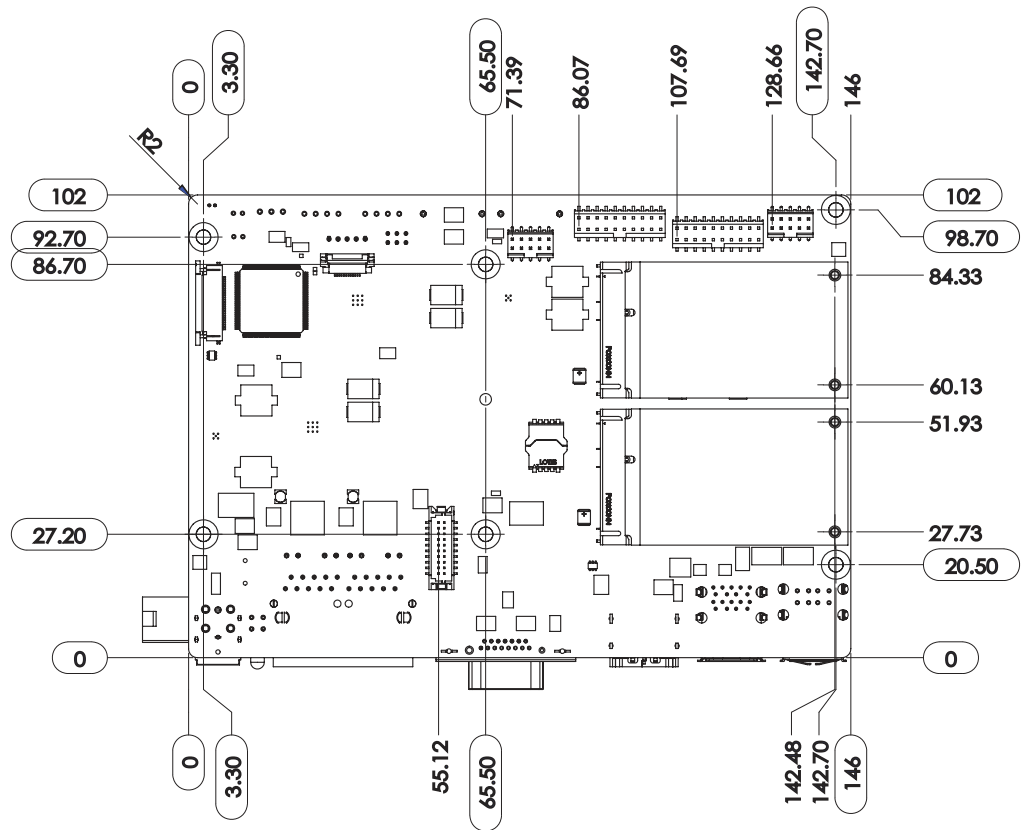


Figure 1.2 PCM-9310 Mechanical Drawing (Bottom Side)

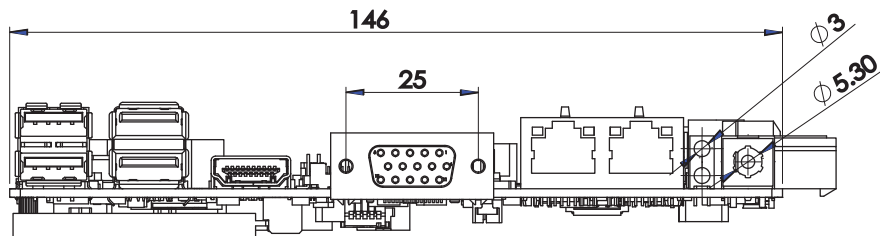


Figure 1.3 PCM-9310 Mechanical Drawing (Coastline)

Chapter 2

Installation

This chapter explains the setup procedures of the PCM-9310 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

2.1 Jumpers & Switches

The PCM-9310 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 2.1: Jumpers & Switches

J1	AT & ATX
J2	LCD Power
J3	LVDS VCON Setting

2.2 Connectors

Onboard connectors link the PCM-9310 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the connectors.

Table 2.2: Connectors

Label	Function
CN1	12V Power Input
CN2	12V Power Input (by request)
CN3	DC JACK (by request)
CN4	SO-DIMM
CN5	Power Switch
CN7	Reset
CN8	GPIO
CN9	Audio
CN11	LAN
CN13	VGA
CN14	(reserved) eDP**
CN15	HDMI
CN16	Inverter Power Output
CN17	48 bits LVDS Panel
CN18	mSATA
CN19	Mini PCIE
CN20	SIM
CN21	SATA
CN22	SATA Power
CN23	(reserved) SATA II Power**
CN24	(reserved) SATA II*
CN25	External USB
CN26	Internal USB
CN27	USB3.0x2_9H
CN28	COM3/COM4/RS422/RS485
CN29	COM1/COM2
CN31	System FAN
CN32	SMBus
CN33	Battery

2.3 Locating Connectors

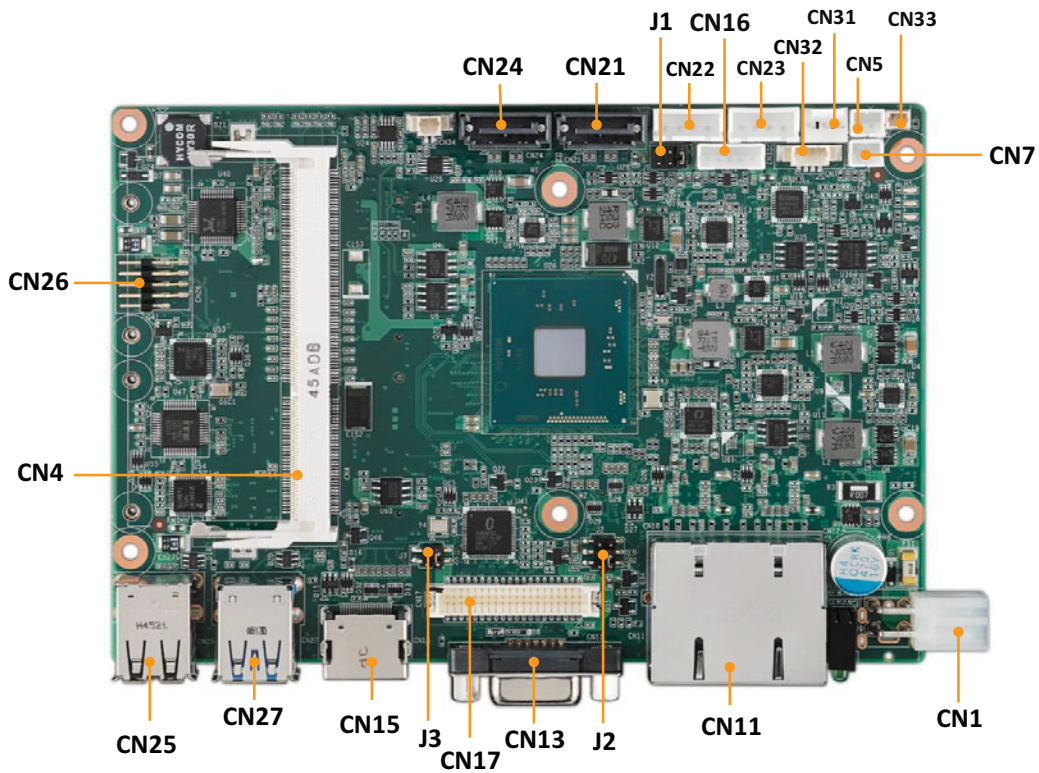


Figure 2.1 PCM-9310 Connector Locations (Top Side)

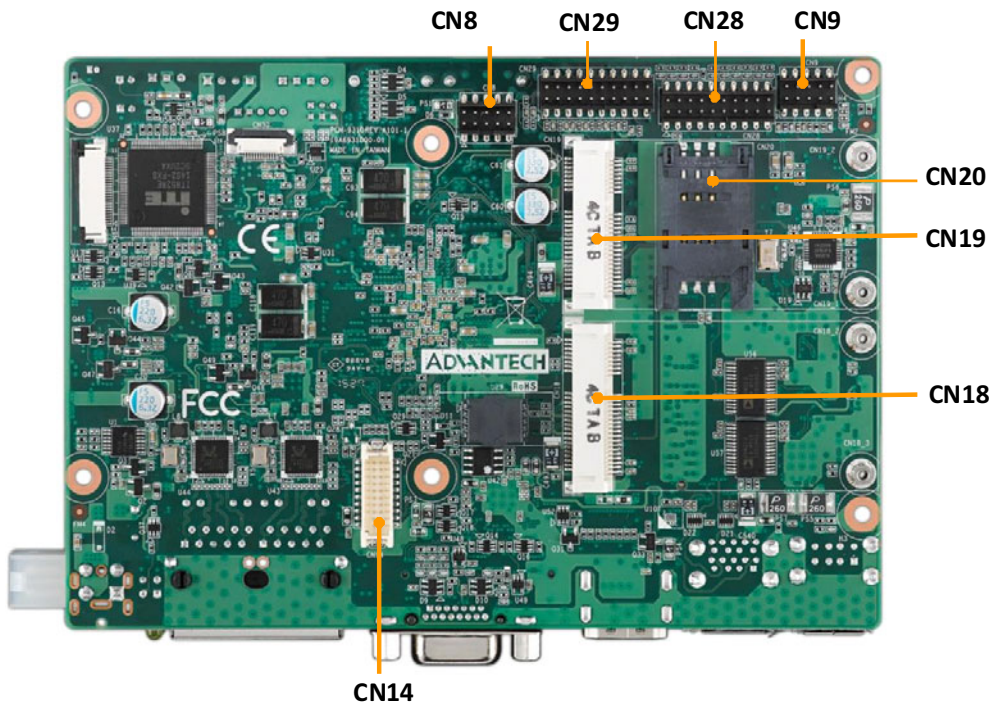
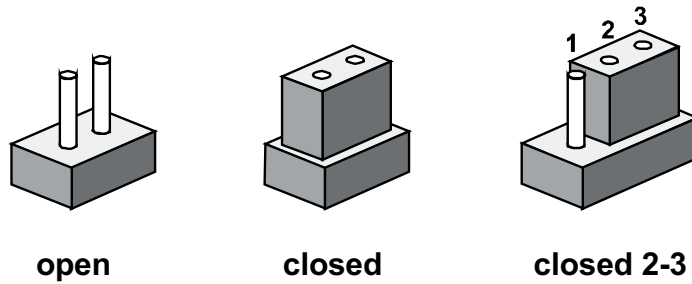


Figure 2.2 PCM-9310 Connector Locations (Bottom Side)

2.4 Setting Jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.

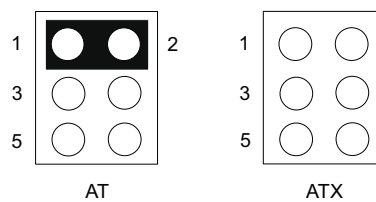
The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

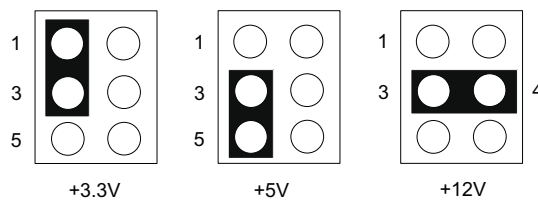
2.4.1 AT & ATX (J1)

J1	AT & ATX
Part Number	1653003201
Footprint	HD_3x2P_79_D
Description	PIN HEADER 3x2P 2.0mm 180D(M) DIP 21N22050
Setting	Function
(1-2)*	AT
(N/A)	ATX



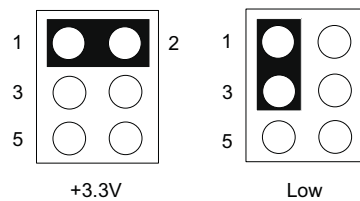
2.4.2 LCD Power (J2)

J2	LCD Power
Part Number	1653003260
Footprint	HD_3x2P_79
Description	PIN HEADER 3x2P 2.0mm 180D(M) SMD 21N22050
Setting	Function
(1-3)*	+3.3V
(3-5)	+5V
(3-4)	+12V



2.4.3 LVDS VCON Setting (J3)

J3	LVDS VCON Setting
Part Number	1653000014
Footprint	HD_2x2P_79
Description	PIN HEADER 2x2P 2.00mm 180D(M) SMD 21N22050
Setting	Function
(1-2)*	3.3V High for VCON on LVDS
(1-3)	Low for VCON on LVDS



* This specification is the default setting.

** This specification is supported upon request.

Chapter 3

AMI BIOS Setup

3.1 Introduction

AMIBIOS has been integrated into a plethora of motherboards for decades. With the AMIBIOS Setup program, you can modify BIOS settings and control the various system features. This chapter describes the basic navigation of the PCM-9310 BIOS setup screens.



AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed CMOS so it retains the Setup information when the power is turned off.

3.2 Entering Setup

Turn on the computer and check for the patch code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press and you will immediately be allowed to enter Setup.

3.2.1 Main Setup

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



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.

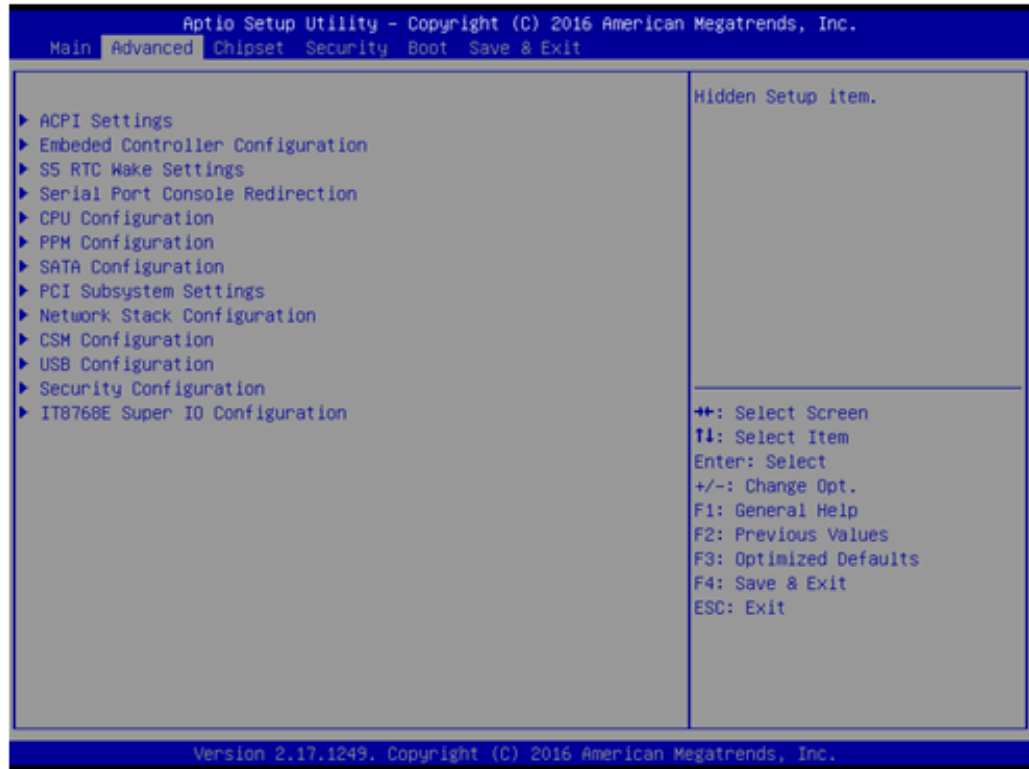
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System time / System date

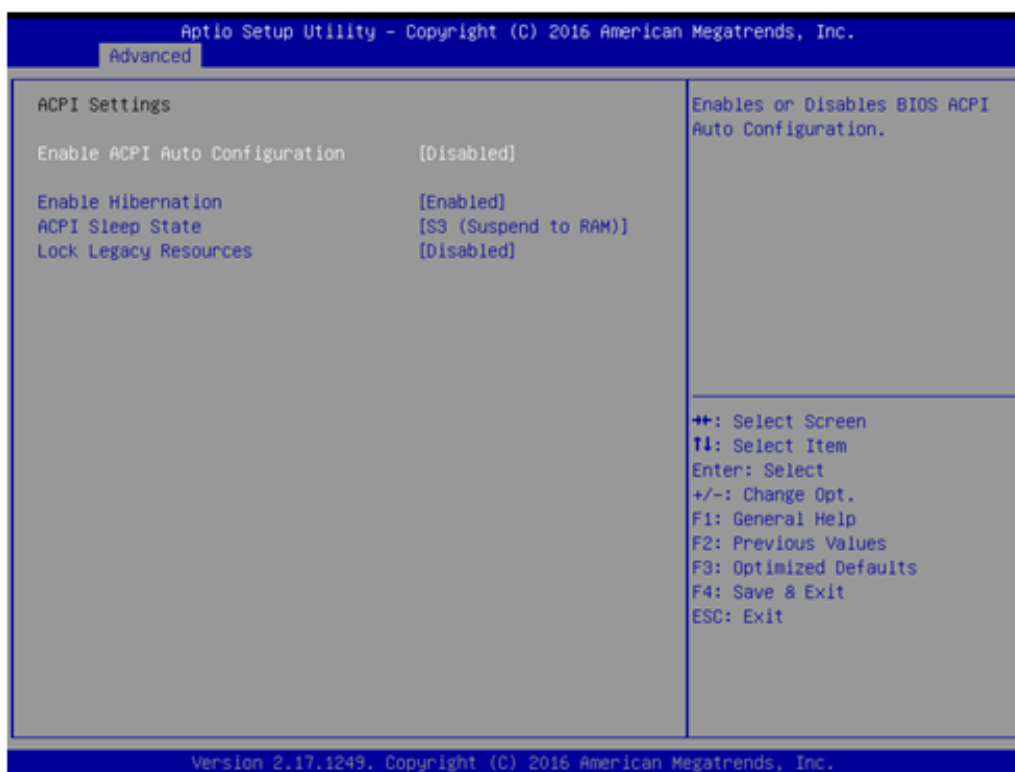
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the PCM-9310 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens is shown below. The sub menus are described on the following pages.



3.2.2.1 ACPI Settings



- **Enable ACPI Auto Configuration**
Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State**
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
- **Lock Legacy Resources**
Enables or Disables Lock of Legacy Resources

3.2.2.2 Embedded Controller Configuration



- **EC Hardware Monitor**
This page display all information about system Temperature/Voltage/Current.
- **Backlight Enable Polarity**
This item allows users to set backlight mode.
- **1st LVDS Backlight control**
This item allows users to switch Backlight Control for PWM or DC mode.
- **Power Saving Mode**
This item allows users to set board's power saving mode when off.
- **Watch Dog Timer**
This item allows users to select EC watchdog timer.

3.2.2.3 Trusted Computing



- **Trusted Computing**

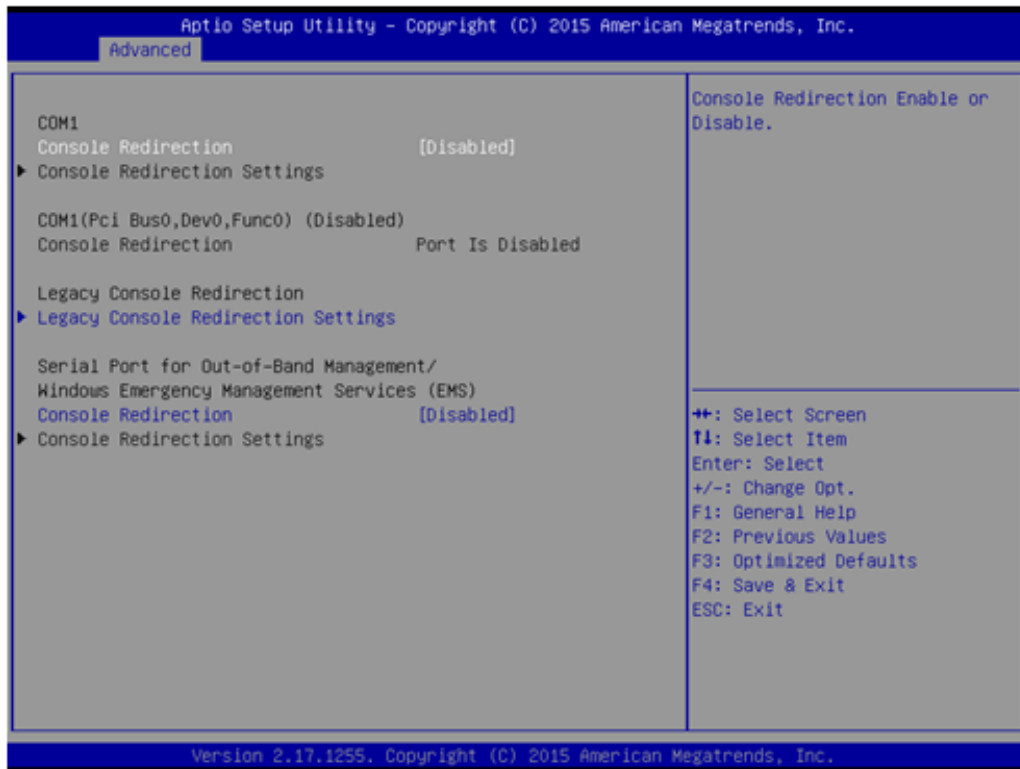
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.2.2.4 S5 RTC Wake Settings



- **Wake system from S5**
Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified.

3.2.2.5 Serial Port Console Redirection



- **Console Redirection**
This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).
- **Console Redirection**
This item allows users to configuration console redirection detail settings.

3.2.2.6 CPU Configuration



- **Limit CPUID Maximum**
Disabled for Windows XP.
- **Bi-directional PROCHOT**
When a processor thermal sensor trips (either core), the PROCHOT# will be driven. If bi-direction is enabled, external agents can drive PROCHOT# to throttle the processor.
- **Intel Virtualization Technology**
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
- **Power Technology**
Enable the power management features.

3.2.2.7 PPM Configuration



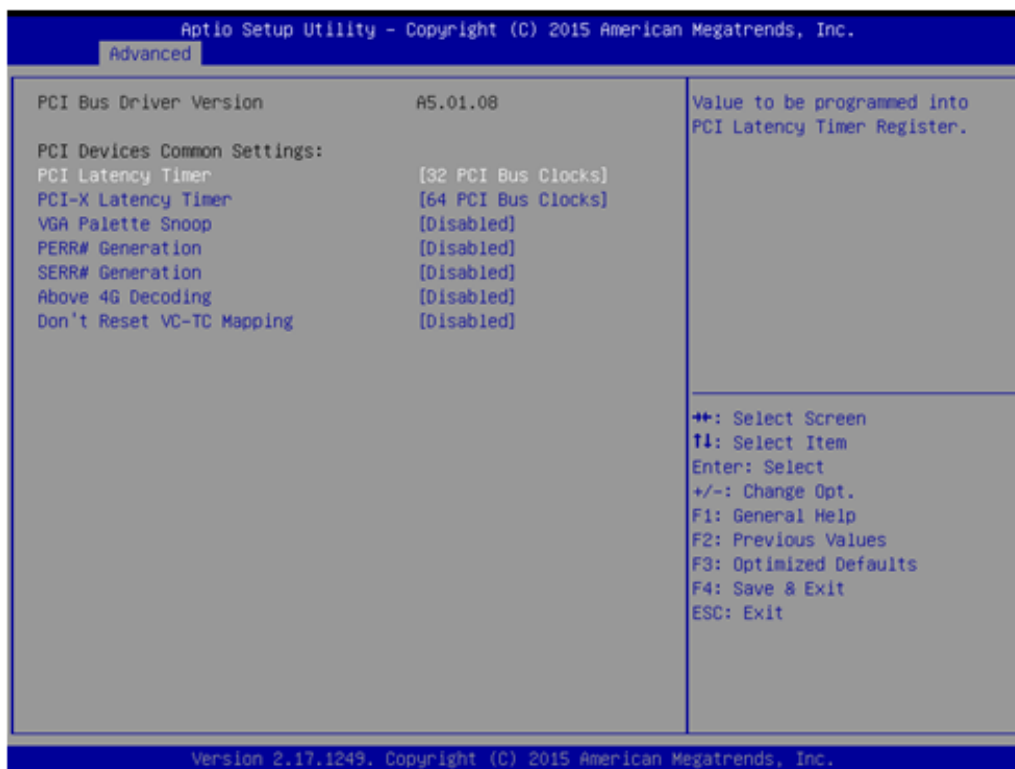
- **CPU C state Report**
Enable/Disable CPU C state report to OS.
- **Max CPU C-state**
This option controls Max C state that the processor will support.

3.2.2.8 SATA Configuration



- **SATA Controller**
Enable / Disable SATA Device.
- **SATA Mode Selection**
Determine how SATA controller operate.
- **SATA Interface Speed**
SATA Interface Speed Support Gen1, Gen2 or Gen3.
- **Aggressive LPM Support**
Enable PCH to aggressively enter link power state.
- **Port 1 / Port 2**
Enable / Disable Serial ATA Port 1 / Port 2.

3.2.2.9 PCI Subsystem Settings



- **PCI Latency Timer**
Value to be programmed into PCI Latency Timer Register.
- **PCI-X Latency Timer**
Value to be programmed into PCI Latency Timer Register.
- **VGA Palette Snoop**
Enables or Disables VGA Palette Registers Snooping.
- **PERR# Generation**
Enables or Disables PCI Device to Generate PERR#.
- **SERR# Generation**
Enables or Disables PCI Device to Generate SERR#.
- **Above 4G Decoding**
Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64bit PCI Decoding).
- **Don't Reset VC-TC Mapping**
If system has Virtual Channels, Software can reset Traffic Class mapping through Virtual Channels, to it's default state. Setting this option to Enabled will not modify VC Resources.

3.2.2.10 Network Stack Configuration



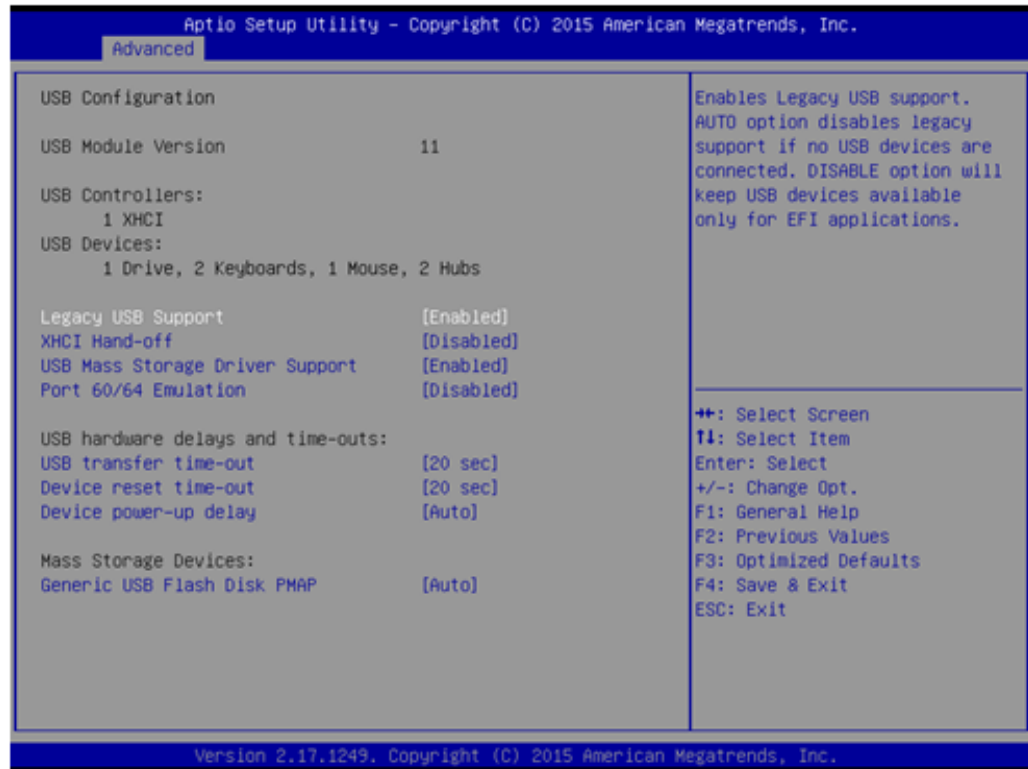
- **Network Stack**
Enable/Disable UEFI Network Stack.

3.2.2.11 CSM Configuration



- **CSM Support**
Enable/Disable CSM Support.
- **GateA20 Active**
UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
- **INT19 Trap Response**
BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.
- **Boot option filter**
This option controls Legacy/UEFI ROMs priority.
- **Network**
Controls the execution of UEFI and Legacy PXE OpROM.
- **Storage**
Controls the execution of UEFI and Legacy Storage OpROM.
- **Video**
Controls the execution of UEFI and Legacy Video OpROM.
- **Other PCI devices**
Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.2.2.12 USB Configuration



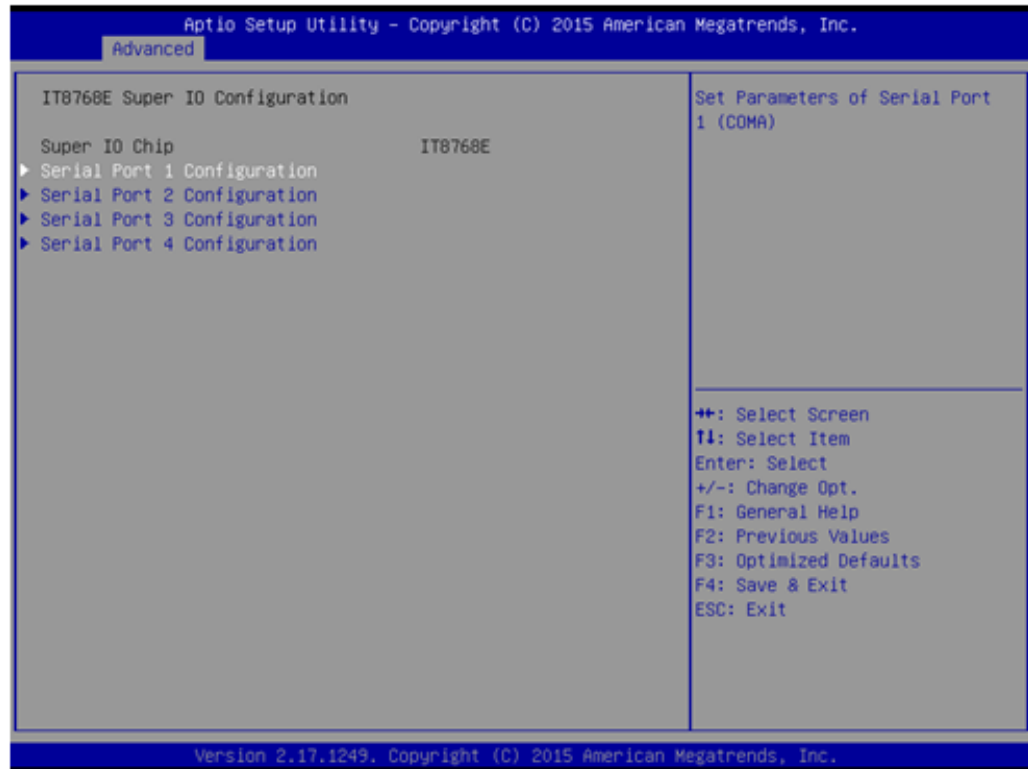
- **Legacy USB Support**
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
- **XHCI Hand-off**
This is a workaround for OSES without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**
Enable/Disable USB Mass Storage Driver Support.
- **Port 60/64 Emulation**
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSES.
- **USB transfer time-out**
Time-out value for control, Bulk, and interrupt transfers.
- **Device reset time-out**
USB mass storage device start unit command time-out.
- **Device power-up delay**
Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

3.2.2.13 Security Configuration



- **TXE HMRFP0 Disable**
- **TXE Firmware Update**
- **TXE EOP Message**
Send EOP Message Before Enter OS.

3.2.2.14 IT8768E Super I/O Configuration



- **Serial Port 1 Configuration**
Set Parameters of Serial Port 1 (COMA).
- **Serial Port 2 Configuration**
Set Parameters of Serial Port 2 (COMB).
- **Serial Port 3 Configuration**
Set Parameters of Serial Port 3 (COMC).
- **Serial Port 4 Configuration**
Set Parameters of Serial Port 4 (COMD).

3.2.3 Chipset Configuration



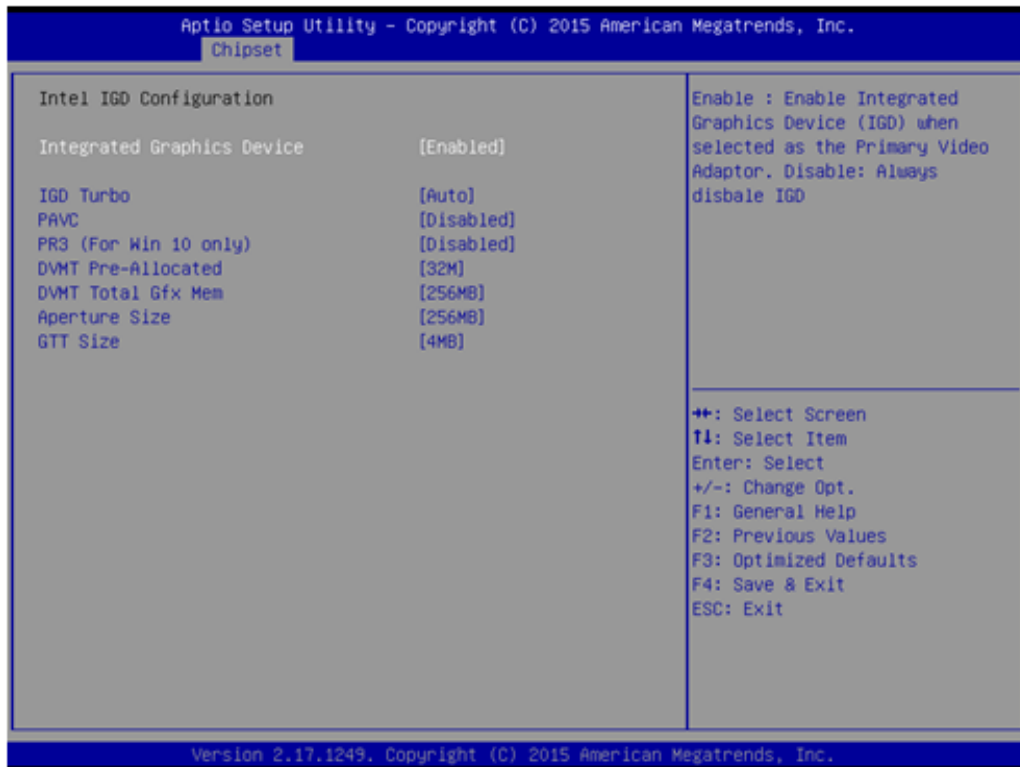
- **North Bridge**
Details for North Bridge items.
- **South Bridge**
Details for South Bridge items.

3.2.3.1 North Bridge



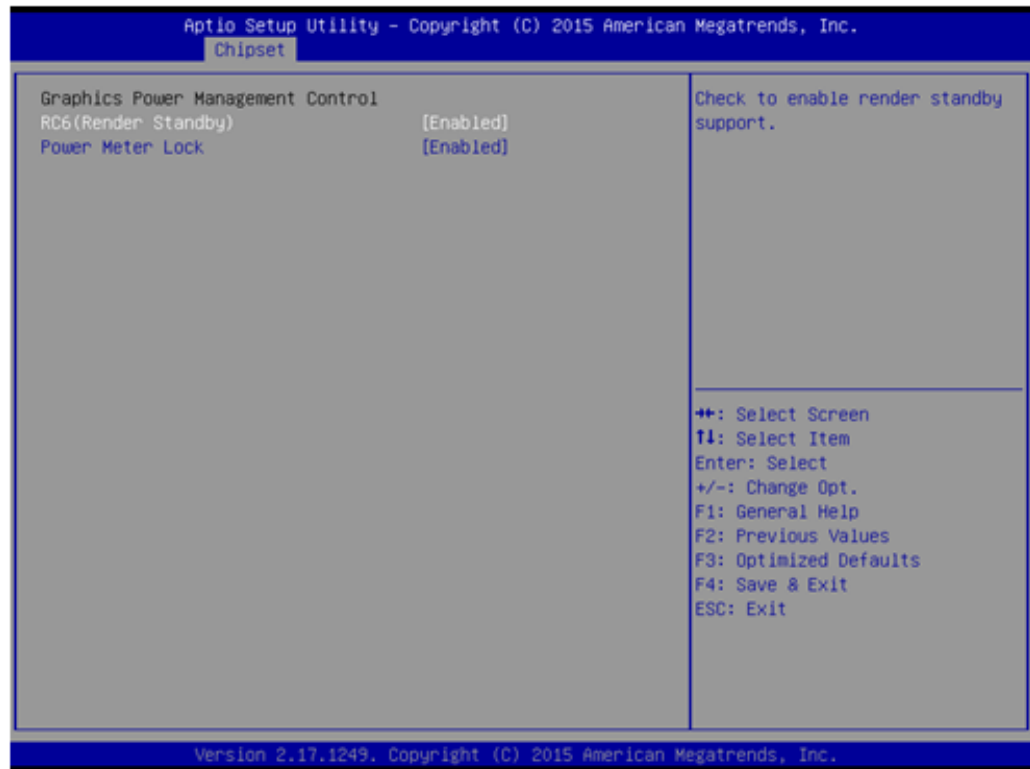
- **Intel IGD Configuration**
Config Intel IGD Settings.
- **Graphics Power Management Control**
Graphics Power Management Control Options.
- **Memory Configuration Options**
MRC EV Setup Option.
- **AMI Graphic Output Protocol Policy**
User Select Monitor Output by Graphic Output Protocol.
- **Max TOLUD**
Maximum Value of TOLUD.

3.2.3.2 Intel IGD Configuration



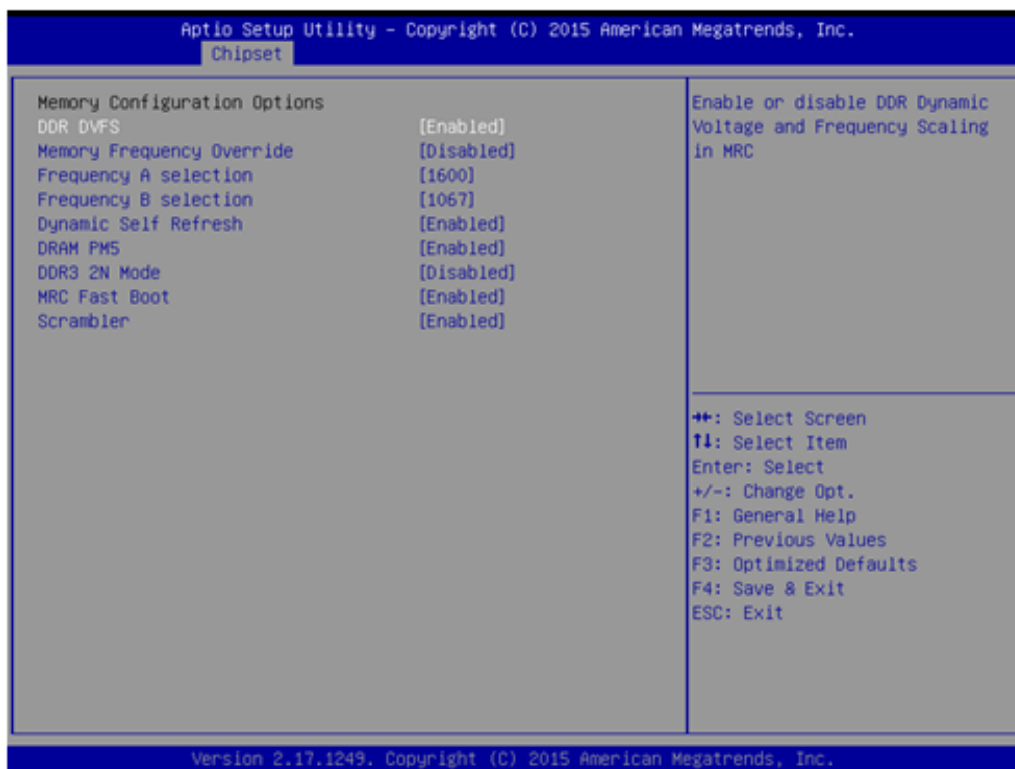
- **Integrated Graphics Device**
Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable : Always disable IGD.
- **IGD Turbo**
Select the IGD Turbo feature, if Auto selected, IGD Turbo will only be enabled when SOC stepping is B0 or above.
- **PAVC**
Enable/Disable Protected Audio Video Control.
- **PR3 (For Win 10 only)**
Enable/Disable PR3 (For Win 10 only).
- **DVMT Pre-Allocated**
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- **DVMT Total Gfx Mem**
Select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.
- **Aperture Size**
Select the Aperture Size.
- **GTT Size**
Select the GTT Size.

3.2.3.3 Graphics Power Management Control



- **RC6 Render Standby)**
Check to enable render standby support.
- **Power Meter Lock**
Enable/Disable Power Meter Lock.

3.2.3.4 Memory Configuration Options



- **DDR DVFS**
Enable or disable DDR Dynamic Voltage and Frequency Scaling in MRC.
- **Memory Frequency Override**
Allows override of memory frequency parameters that are automatically obtained from DDR3 DIMM SPD. May cause memory instability if the selected frequency is not supported by the memory device. This option has no effect on systems configured without "UseDIMMSpd" option.
- **Frequency A selection**
Frequency A selection.
- **Frequency B selection**
Option to Select Frequency B (Min DDR DVFS Frequency).
- **Dynamic Self Refresh**
Enable or disable PUNIT driven DUNIT DDR dynamic self refresh.
- **DRAM PM5**
Enable or disable DRAM PM5 PUNIT configuration.
- **DDR3 2N Mode**
Set the DDR3 mode to 2N. 1N mode is used by default.
- **MRC Fast Boot**
Enable/Disable MRC fast Boot. Forces MRC training to occur when disable.
- **Scrambler**
Enable/Disable Scrambler.

3.2.3.5 AMI Graphic Output Protocol Policy



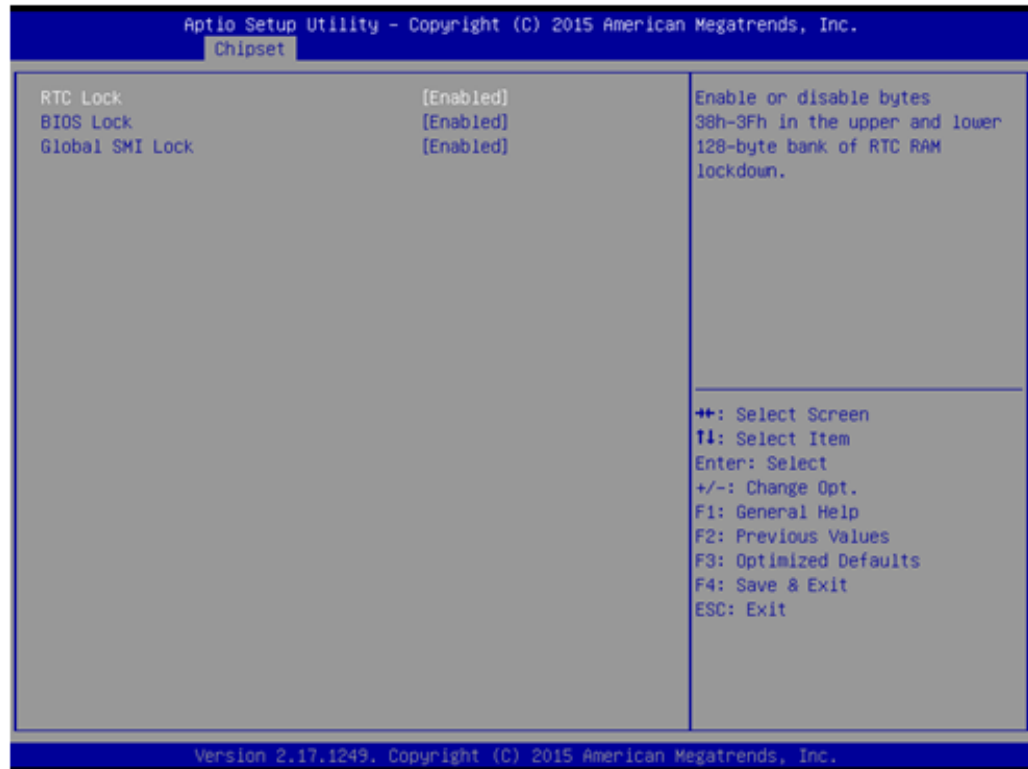
- **LVDS Panel Type**
Select LCD Panel Type.

3.2.3.6 South Bridge



- **Security Configuration**
Security Configuration settings.
- **Azalia Configuration**
Azalia HD Audio Options.
- **USB Configuration**
USB Configuration Settings.
- **PCI Express Configuration**
PCI Express Configuration settings.
- **Restore AC Power Loss**
Select AC power state when power is re-applied after a power failure.

3.2.3.7 Security Configuration



- **RTC Lock**
Enable or disable bytes 38h-3Fh in the upper and lower 128-byte bank of RTC RAM lockdown.
- **BIOS Lock**
Enable/Disable the BIOS Lock Enable feature.
- **Global SMI Lock**
Enable or Disable SMI Lock.

3.2.3.8 Azalia Configuration



- **Audio Controller**
Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled.
- **Azalia HDMI Codec**
Enable/Disable internal HDMI codec for Azalia.

3.2.3.9 USB Configuration



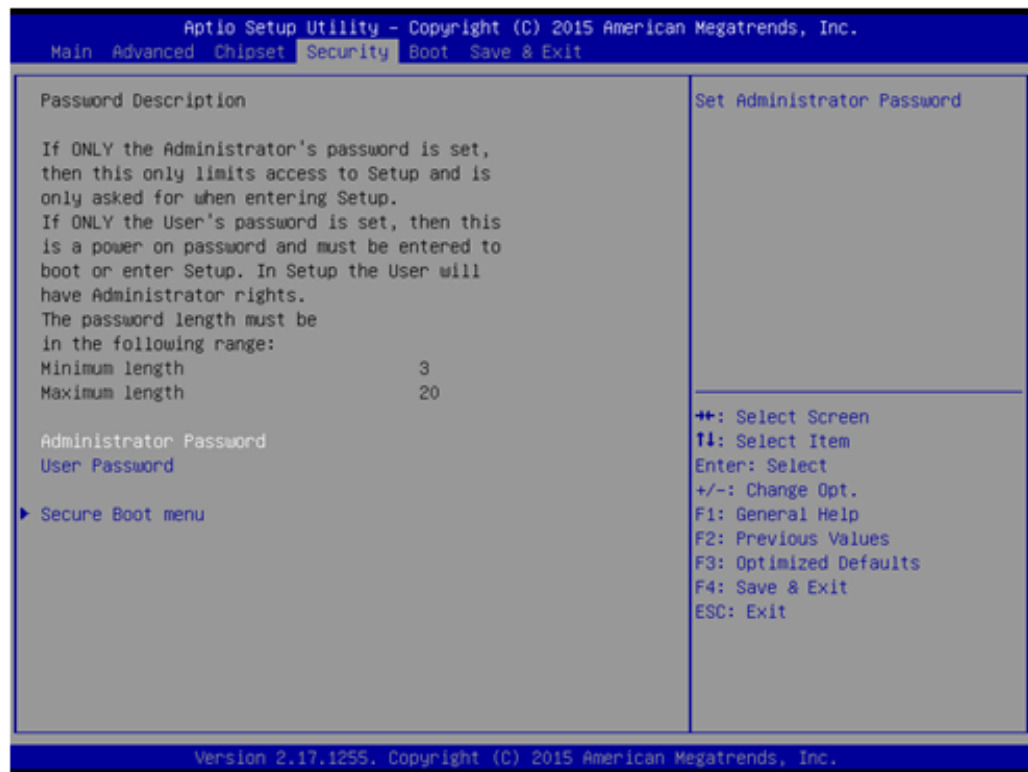
- **USB2 PHY Power Gating**
Configure USB2 PHY Power Gating.
- **USB3 PHY Power Gating**
Configure USB3 PHY Power Gating.

3.2.3.10 PCI Express Configuration



- **PCI Express Port 3 / Port 4**
Control the PCI Express Root Port.
- **Native PCIE Enable**
PCI Express Native Support Enable/Disable. This feature is only available in Vista.
- **PCIE Wake**
Enable or disable PCIE to wake the system from S5.
- **Onboard LAN1/LAN2 Controller**
Select to Enable or Disable Onboard LAN1/LAN2 Controller.
- **LAN Option ROM**
Enabled / Disabled Onboard LAN's PXE option ROM.

3.2.4 Security

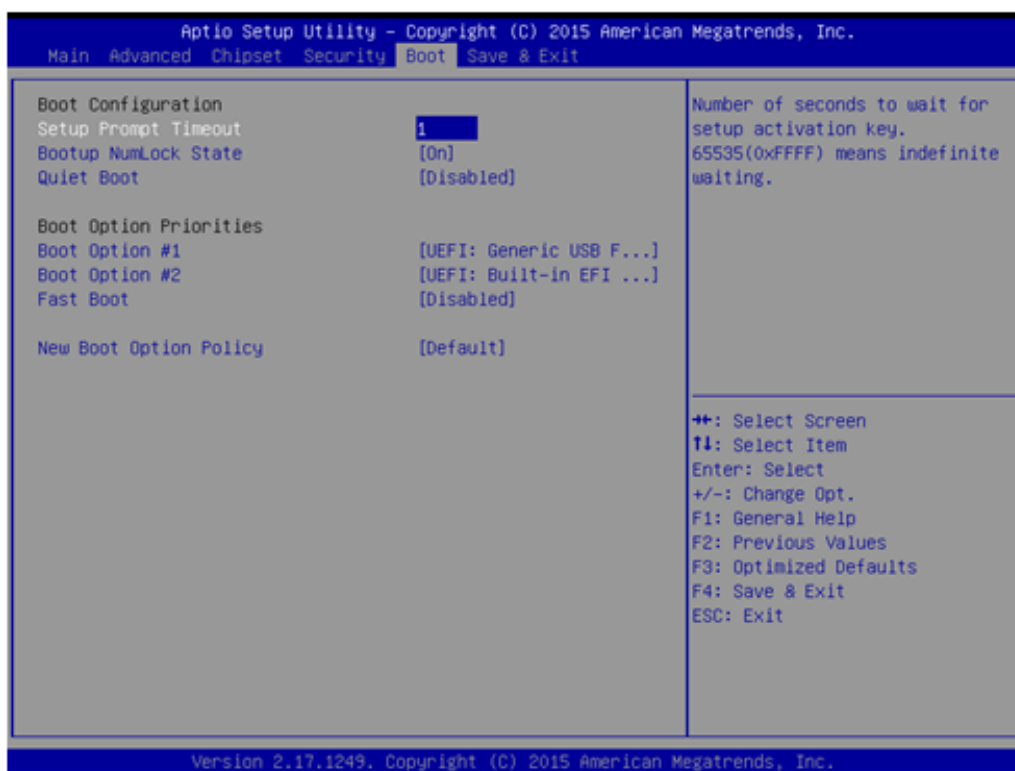


Select Security Setup from the PCM-9310 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- **Change Administrator / User Password**

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

3.2.5 Boot



- **Setup Prompt Timeout**
Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535(0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.
- **Bootup NumLock State**
Select the keyboard NumLock state.
- **Quiet Boot**
Enables or disables Quiet Boot option.
- **Boot Option #1**
Sets the system boot order.
- **Fast Boot**
Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
- **New Boot Option Policy**
Controls the placement of newly detected UEFI boot options.

3.2.6 Save & Exit



- **Save Changes and Exit**
This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**
This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
This item allows you to rest system setup without saving any changes.
- **Save Changes**
This item allows you to save changes done so far to any of the options.
- **Discard Changes**
This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
This item allows you to restore the user defaults to all the options.
- **Boot Override**
Boot device select can override your boot priority.

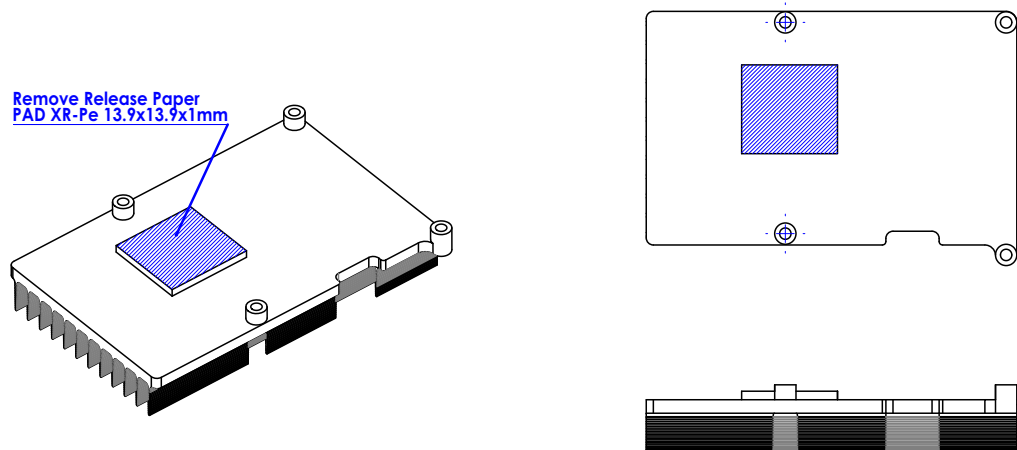
Chapter 4

MIOe Installation

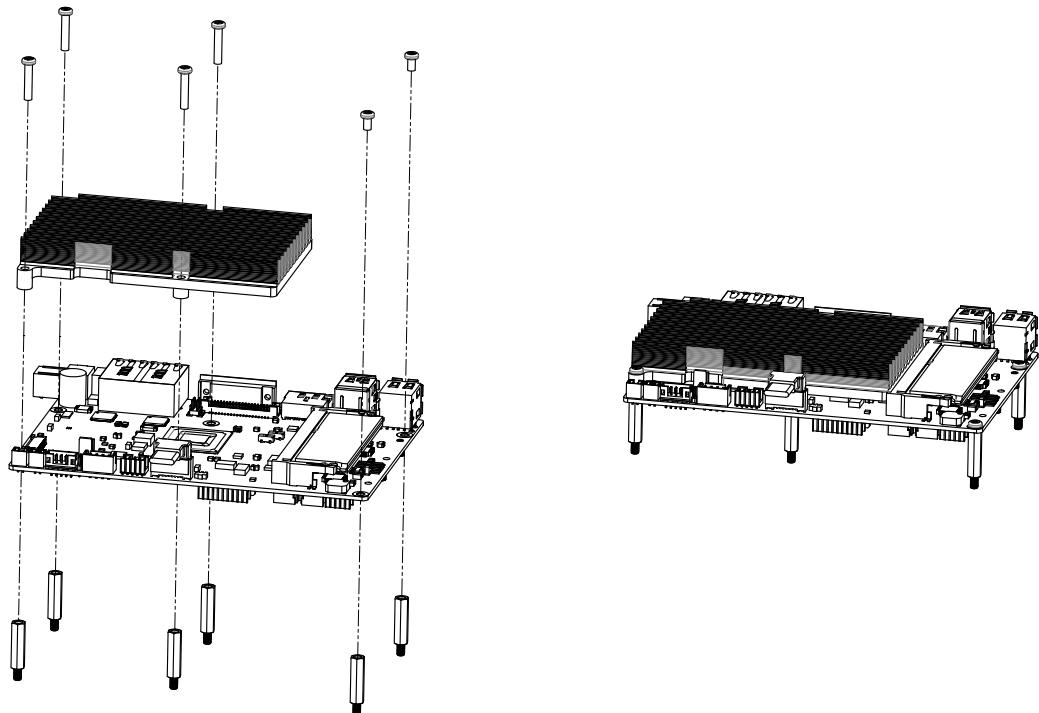
The MI/O compact form factor SBC is a new-generation SBC design with a variety of mechanical improvements. Here is the quick installation guide for our thermal design and MIOe module installation.

4.1 Quick Installation Guide:

1. There is a Heatsink / Cooler in the white box inside the package. Carefully remove the release paper from the thermal pad before installation.



2. There are six screws and six studs inside the white box, please install the heat-sink into place as per illustration below:



Appendix **A**

Pin Assignments

This appendix contains information of a detailed or specialized nature.

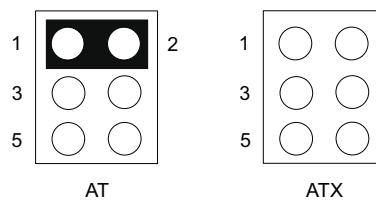
Sections include:

- Jumper and Connector Tables

A.1 Jumper List

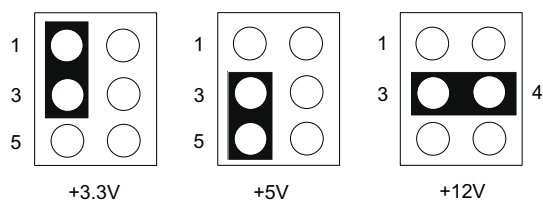
A.1.1 AT & ATX (J1)

J1	AT & ATX
Part Number	1653003201
Footprint	HD_3x2P_79_D
Description	PIN HEADER 3x2P 2.0mm 180D(M) DIP 21N22050
Setting	Function
(1-2)*	AT
(N/A)	ATX



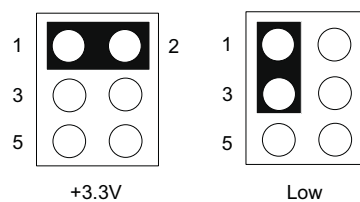
A.1.2 LCD Power (J2)

J2	LCD Power
Part Number	1653003260
Footprint	HD_3x2P_79
Description	PIN HEADER 3x2P 2.0mm 180D(M) SMD 21N22050
Setting	Function
(1-3)*	+3.3V
(3-5)	+5V
(3-4)	+12V



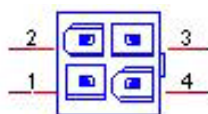
A.1.3 LVDS VCON Setting (J3)

J3	LVDS VCON Setting
Part Number	1653000014
Footprint	HD_2x2P_79
Description	PIN HEADER 2x2P 2.00mm 180D(M) SMD 21N22050
Setting	Function
(1-2)*	3.3V High for VCON on LVDS
(1-3)	Low for VCON on LVDS

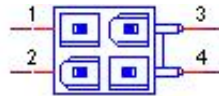


A.2 Connector Pin Definition

CN1	12V Power Input
Part Number	1655003865
Footprint	WF_2x2P_165_BOX_RA_D_740SP
Description	ATX PWRCONN 2x2P 4.2mm 90D(M) DIP 740-77-04TS50
Pin	Pin Name
1	GND
2	GND
3	+12V
4	+12V



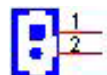
CN2	12V Power Input (by request)
Part Number	1655004584-01
Footprint	WF_2x2P_165_BOX_D
Description	ATX PWR CONN. 2x2P 4.2mm 180D(M) DIP 24W4310-04S
Pin	Pin Name
1	GND
2	GND
3	+12V
4	+12V



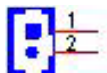
CN3	DCJACK (by request)
Part Number	1652005624
Footprint	PJ_2P_2DC-G213B200
Description	DC POWER JACK 2.5mm 90D(M) DIP 2DC-G213B200
Pin	Pin Name
1	+12V
2	GND

CN4	SO-DIMM
Part Number	1651002088
Footprint	SODIMMDDR3_204P_AS0A626-HA
Description	DDR3 SODIMM H=9.2mm 204P SMD AS0A626-HASN-7H
Pin	Pin Name

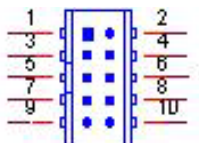
CN5	Power Switch
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	Pin Name
1	PSIN
2	GND



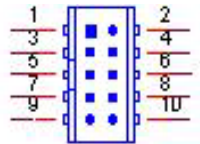
CN7	Reset
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	Pin Name
1	RESET#
2	GND



CN8	GPIO
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	+5V
2	GPIO4
3	GPIO0
4	GPIO5
5	GPIO1
6	GPIO6
7	GPIO2
8	GPIO7
9	GPIO3
10	GND

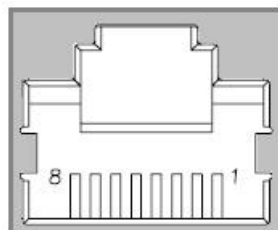


CN9	Audio
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	LOUTR
2	LINR
3	GND
4	GND
5	LOUTL
6	LINL
7	GND
8	GND
9	MIC1R
10	MIC1L

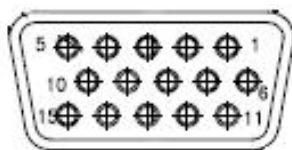


Matching Cable: 1703100152

CN11	LAN
Part Number	1652003274
Footprint	RJ45_28P_RTB-19GB9J1A
Description	PHONE JACK RJ45 28P DIP RTB-19GB9J1A
Pin	Pin Name
1	TX+(10/100),BI_DA+(GHz)
2	TX-(10/100),BI_DA-(GHz)
3	RX+(10/100),BI_DB+(GHz)
4	BI_DC+(GHz)
5	BI_DC-(GHz)
6	RX-(10/100),BI_DB-(GHz)
7	BI_DD+(GHz)
8	BI_DD-(GHz)



CN13	VGA
Part Number	1654000055
Footprint	DBVGA-VF5MS
Description	D-SUB Conn. 15P 90D(F) DIP 070242FR015S200ZU
Pin	Pin Name
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	NC
12	DDAT
13	HSYNC
14	VSYNC
15	DCLK

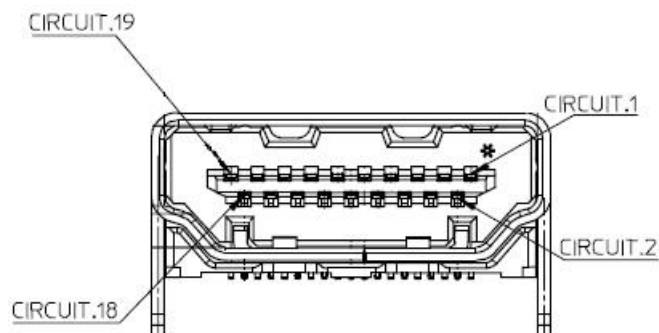


CN14	(reserved) eDP**
Part Number	00
Footprint	SPH10X2
Description	
Pin	Pin Name
1	GND
2	GND
3	EDP_PANEL_z_TX0-
4	EDP_PANEL_z_TX3-
5	EDP_PANEL_z_TX0+
6	EDP_PANEL_z_TX3+
7	GND
8	HDMI1_DDAT
9	EDP_PANEL_z_TX1-
10	HDMI1_DCLK
11	EDP_PANEL_z_TX1+
12	EDP_PANEL_z_AUX-
13	GND

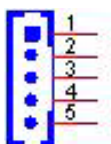
14	EDP_PANEL_z_AUX+
15	EDP_PANEL_z_TX2-
16	GND
17	EDP_PANEL_z_TX2+
18	EDP_PANEL_HPD
19	+V_eDP_CONN
20	+V_eDP_CONN

** This specification is supported upon request.

CN15	HDMI
Part Number	1654011175-01
Footprint	HDMI_19P_QJ51191-LFB4-7F
Description	
Pin	Pin Name
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2-
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1-
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0-
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock-
13	Reserved
14	Reserved
15	SCL
16	SDA
17	DDC Ground
18	+5V Power
19	Hot Plug Detect

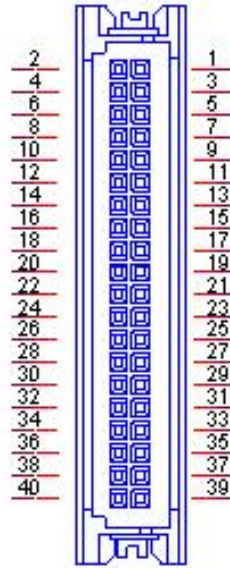


CN16	Inverter Power Output
Part Number	1655000453
Footprint	WHL5V-2M-24W1140
Description	WAFER BOX 2.0mm 5P 180D(M) DIP WO/Pb JIH VEI
Pin	Pin Name
1	+12V
2	GND
3	ENABKL
4	VBR
5	+5V



CN17	48 bits LVDS Panel
Part Number	1653920200
Footprint	SPH20X2
Description	B/B Conn. 40P 1.25mm 90D SMD DF13-40DP-1.25V(91)
Pin	Pin Name
1	+5V or +3.3V
2	+5V or +3.3V
3	GND
4	GND
5	+5V or +3.3V
6	+5V or +3.3V
7	LVDS0_D0-
8	LVDS1_D0-
9	LVDS0_D0+
10	LVDS1_D0+
11	GND
12	GND
13	LVDS0_D1-
14	LVDS1_D1-
15	LVDS0_D1+
16	LVDS1_D1+
17	GND
18	GND
19	LVDS0_D2-
20	LVDS1_D2-
21	LVDS0_D2+
22	LVDS1_D2+
23	GND

24	GND
25	LVDS0_CLK-
26	LVDS1_CLK-



CN17	48 bits LVDS Panel
Part Number	1653920200
Footprint	SPH20X2
Description	B/B Conn. 40P 1.25mm 90D SMD DF13-40DP-1.25V(91)
Pin	Pin Name
27	LVDS0_CLK+
28	LVDS1_CLK+
29	GND
30	GND
31	NC
32	NC
33	GND
34	GND
35	LVDS0_D3-
36	LVDS1_D3-
37	LVDS0_D3+
38	LVDS1_D3+
39	NC
40	VCON



CN18		mSATA	
Part Number	00A00000770		
Footprint	MINIPCIE_HALF_PICO_ITX		
Description			
Pin	Pin Name		
1	WAKE#		
2	+3.3VSB		
3	NC		
4	GND		
5	NC		
6	+1.5V		
7	NC		
8	UIM_PWR		
9	GND		
10	UIM_DATA		
11	REFCLK-		
12	UIM_CLK		
13	REFCLK+		
14	UIM_RESET		
15	GND		
16	UIM_VPP		
17	NC		
18	GND		
19	NC		
20	W_DISABLE#		
21	GND		
22	PERST#		
23	PERn0		
24	+3.3VSB		
25	PERp0		
26	GND		

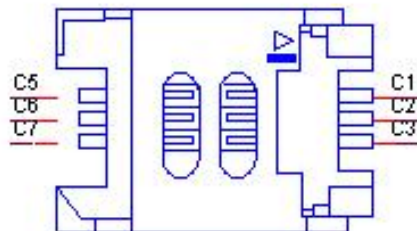
CN18	Mini PCIE
Part Number	00A00000770
Footprint	MINIPCIE_HALF_PICO_ITX
Description	
Pin	Pin Name
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	PETn0
32	SMB_DAT
33	PETp0
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	SEL
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB

CN19		Mini PCIE	
Part Number	00A00000770		
Footprint	MINIPCIE_HALF_PICO_ITX		
Description			
Pin	Pin Name		
1	WAKE#		
2	+3.3VSB		
3	NC		
4	GND		
5	NC		
6	+1.5V		
7	NC		
8	UIM_PWR		
9	GND		
10	UIM_DATA		
11	REFCLK-		
12	UIM_CLK		
13	REFCLK+		
14	UIM_RESET		
15	GND		
16	UIM_VPP		
17	NC		
18	GND		
19	NC		
20	W_DISABLE#		
21	GND		
22	PERST#		
23	PERn0		
24	+3.3VSB		
25	PERp0		
26	GND		

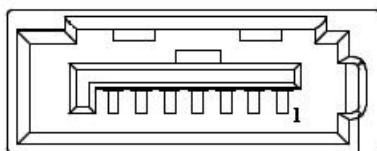
CN19		Mini PCIE	
Part Number	00A00000770		
Footprint	MINIPCIE_HALF_PICO_ITX		
Description			
Pin	Pin Name		
27	GND		
28	+1.5V		
29	GND		
30	SMB_CLK		
31	PETn0		
32	SMB_DAT		
33	PETp0		

34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	SEL
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB

CN20	SIM
Part Number	1654010809-01
Footprint	SIM_6P_5210622-SINR03
Description	SIM card conn. 6p 2.54mm 90D(F) SMD 5210622-SINR
Pin	Pin Name
C1	UIM_PWR
C2	UIM_RESET
C3	UIM_CLK
C5	GND
C6	UIM_VPP
C7	UIM_DATA



CN21	SATA
Part Number	1654011616-01
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

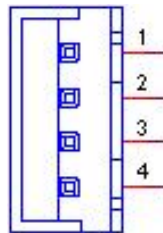


CN22	SATA Power
Part Number	1655001154
Footprint	WF_4P_98_BOX_R1_D
Description	
WAFER BOX 4P 2.50mm 180D(M) DIP 24W1170-04S10-01	
Pin	Pin Name
1	+5V
2	GND
3	GND
4	+12V



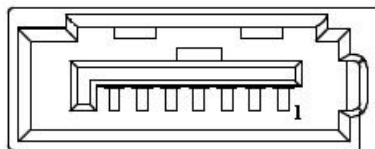
CN23	(reserved) SATA II Power**
Part Number	00
Footprint	WF_4P_98_BOX_R1_D
Description	
Pin	Pin Name
1	+5V
2	GND
3	GND
4	+12V

** This specification is supported upon request.

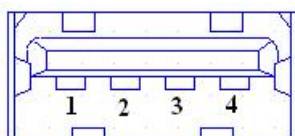


CN24	(reserved) SATA II**
Part Number	00
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

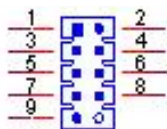
** This specification is supported upon request.



CN25	External USB
Part Number	1654009513
Footprint	USB_8P_UB1112C-8FDE-4F
Description	USB CONN. 8P 2.0mm 90D DIP UB1112C-8FDE-4F
Pin	Pin Name
1	+5V
2	D-
3	D+
4	GND

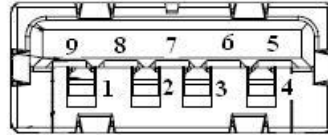


CN26	Internal USB
Part Number	1653003718
Footprint	HD_5x2P_79_RA_N10_21N22050
Description	PIN HEADER 5x2P 2.00mm 90D(M) SMD 21N22050
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND

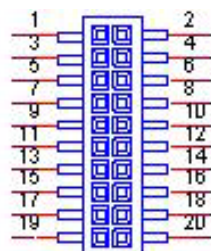


Matching Cable: 1703100121 1703100260

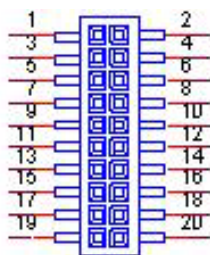
CN27	USB3.0x2_9H
Part Number	1654010969-01
Footprint	USB_9x2P_UEA1112C-8HS6-4F
Description	
Pin	Pin Name



CN28	COM3/COM4/RS422/RS485
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	
Pin	Pin Name
1	422TX3-/485D3-/DCD3#
2	DSR3#
3	422TX3+/485D3+/RXD3
4	RTS3#
5	422RX3+/TXD3
6	CTS3#
7	422RX3-/DTR3#
8	RI3#
9	GND
10	GND
11	422TX4-/485D4-/DCD4#
12	DSR4#
13	422TX4+/485D4+/RXD4
14	RTS4#
15	422RX4+/TXD4
16	CTS4#
17	422RX4-/DTR4#
18	RI4#
19	GND
20	GND

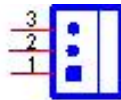


CN29	COM1/COM2
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	BOX HEADER 10x2P 2.0mm 180D(M)SMD 23N685B-20M10B
Pin	Pin Name
1	DCD1#
2	DSR1#
3	RXD1
4	RTS1#
5	TXD1
6	CTS1#
7	DTR1#
8	RI1#
9	GND
10	GND
11	DCD2#
12	DSR2#
13	RXD2
14	RTS2#
15	TXD2
16	CTS2#
17	DTR2#
18	RI2#
19	GND
20	GND

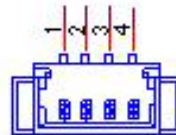


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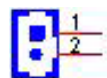
CN31	System FAN
Part Number	1655003010
Footprint	WHP3VA
Description	Wafer 2.54mm 3P 180D(M) DIP 22-27-2031
Pin	Pin Name
1	GND
2	+12V
3	NC



CN32	SMBus
Part Number	1655904020
Footprint	FPC4V-125M
Description	WAFER 4P 1.25mm 180D(M) SMD 85205-04001
Pin	Pin Name
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5V



CN33	Battery
Part Number	1655902032
Footprint	WHL2V-125
Description	WAFER BOX 2P 1.25mm 180D(M) DIP 53047-0210
Pin	Pin Name
1	+3V
2	GND



Appendix **B**

System Assignments

This appendix contains information of a detailed nature.

Sections include:

- System I/O Ports
- 1st MB Memory Map
- Interrupt Assignments

B.1 System I/O Ports

Table B.1: System I/O Ports

Addr. Range (Hex)	Device
20–2D	Interrupt Controller
2E – 2F	Motherboard resources
30 – 3D	Interrupt Controller
40 – 43	System timer
4E – 4F	Motherboard resources
50 – 53	System timer
60 – 67	Motherboard resources
70 - 7F	System CMOS/real time clock
80 - 92	Motherboard resources
A0 – AD	Interrupt Controller
B0 – BD	Interrupt Controller
272 – 273	Motherboard resources
290 – 29F	Embedded Controller resources
2E8 – 2EF	COM4
2F8 – 2FF	COM2
3B0 – 3DF	Intel® HD Graphics
3E8 – 3EF	COM3
3F8 – 3FF	COM1
400 – 47F	Motherboard resources
4D0 – 4D1	Interrupt Controller
500 – 57F	Motherboard resources

B.2 1st MB Memory Map

Table B.2: 1st MB Memory Map

Addr. Range (Hex)	Device
A0000h - BFFFFh	Intel® HD Graphics
A0000h - BFFFFh	PCI Bus
C0000h - DFFFFh	PCI Bus
E0000h - FFFFFh	PCI Bus
90400000 – 905FFFFFF	Intel® Trusted Execution Engine Interface
E0000000 - FEFFFFFF	System resources

B.3 Interrupt Assignments

Table B.3: Interrupt assignments

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ0	System timer
IRQ1	Using SERIRQ, Keyboard Emulation
IRQ2	Slave controller INTR output
IRQ3	Communications Port (COM2)
IRQ4	Communications Port (COM1)
IRQ5	Communications Port (COM3) / iManager WatchDog IRQ
IRQ6	Available
IRQ7	Communications Port (COM4)
IRQ8	Internal RTC or HPET
IRQ9	Microsoft ACPI-Compliant System
IRQ10	Available
IRQ11	Available
IRQ12	Available
IRQ13	Numeric data processor
IRQ14	SATA controller
IRQ15	SATA controller

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