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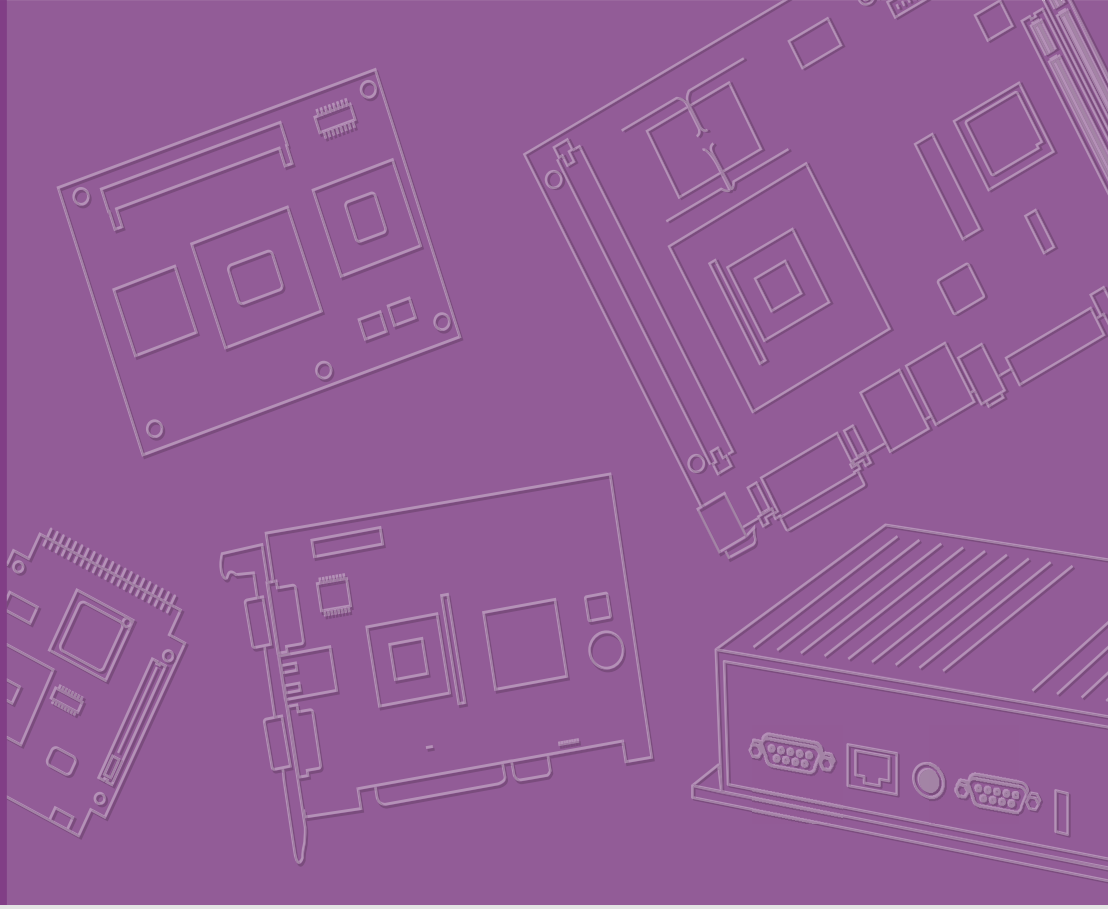
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User Manual

PCM-3365

Intel® Atom™ E3825 / E3845 & Celeron® N2930, PC/104-Plus SBC, ISA, VGA, HDMI/DVI, LVDS, 6 USB, mSATA or Onboard Flash

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This manual is for the PCM-3365.

Part No. 2006M33610 Edition 1

Printed in China May 2016

Product Warranty (2 years)

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

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

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3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

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

FCC Class A

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

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 manflatterer. Discard used batteries according to the manufacturer's instructions.*

Battery Information

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste.

Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.



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-3365 SBC
- 1 x Startup Manual (p/n: 2006M33600)
- 1 x ATX Power Cable 13cm (p/n: 1700002332)
- 1 x AT Power Cable 15cm (p/n: 1700003491)
- 1 x LAN Cable 15cm (p/n: 1700017863)
- 1 x SATA Cable 100cm (p/n: 1700071000)
- 1 x SATA Power Cable 10cm (p/n: 1700022749-11)
- 3 x 2 Ports USB Cable 26cm (p/n: 1703100260)
- 1 x RS-232/422/485 Cable 30cm (p/n: 1700019414)
- 1 x 2 Ports RS-232 Cable 22cm (p/n: 1701200220)
- 1 x VGA Cable 15cm (p/n: 1700000898)
- 1 x Mini Jumper Pack (p/n: 9689000002)
- 1 x Heatsink for E3845 (77.98 x 79.66 x 17.58 mm) (p/n: 1960073365T001)
- 1 x Heatsink for E3825/N2930 (79.66 x 77.98 x 12 mm) (p/n: 1960071977T001)
- 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
1960075183T001	Heat spreader (79.66 x 77.98 x 10.68 mm)
1653130421	PCI-104 connector 120-pin (Long pin)
165313222B	PC/104 connector 64-pin (Long pin)
165312022B	PC/104 connector 40-pin (Long pin)
1700025501-01	15cm DVI cable
1700025492-01	10cm HDMI cable
PCA-AUDIO-HDB1E	Audio extension module
1700025491-01	30cm audio cable connecting PCM-3365 and audio extension module

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Chapter 1

General Information

This chapter gives background information on the PCM-3365.

Sections include:

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

1.1 Introduction

PCM-3365 is PC/104-Plus form factor (96 x 90 mm) and powered by the latest generation of Intel® Celeron® N2930 and Atom™ E3825/E3845 processors which have low power features but also good computing performance, especially for multimedia capabilities compared to earlier generations. PCM-3365 offers flexible expansion possibilities: one full-size mini PCIe, PC/104, PCI-104, and various capacities of on-board flash by request.

PCM-3365 supports multiple display interfaces including HDMI/DVI, VGA, and 24-bit LVDS, and rich I/O: 1 x GbE, SATA, 3 x Serial Ports, 6 x USB 2.0 and mSATA, on-board flash by request.

1.2 Specifications

1.2.1 Functional Specifications

- **Processor:**
  - Celeron® N2930 1.83GHz (burst frequency 2.16GHz), quad core, four threads
  - Atom™ E3845 1.91GHz, quad core, four threads
  - Atom™ E3825 1.33GHz, dual core, two threads
  - Cache Hierarchy
    * 32 KB 8-way L1 instruction cache and 24 KB 6-way L1 data cache per core
    * 1 MB, 16-way L2 cache, shared per two cores
  - Supported C-states: C0, C1, C6, C7
  - 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 204-pin SODIMM
  - 64-bit data bus
  - DDR3L with 1066 MT/s data rates for E3825, total memory bandwidth 8.5GB/s
  - DDR3L with 1333 MT/s data rates for N2930/E3845, total memory bandwidth can be scalable to 21.3GB/s
  - Aggressive power management to reduce power consumption
- **Graphic and Media Engine**
  - Intel® 7th generation (Gen 7) graphics and media encode/decode engine
  - GFX: Normal 688 MHz / Burst 854 MHz for N2930, Normal 533 MHz for E3825
  - Graphic Features:
    * 3D HW Acceleration: DirectX11, OpenGL3.2, OpenCL1.1
    * HW Video Decode: H.264, MPEG2/4, VC-1, WMV9, MJPEG and VP8
    * HW Video Encode: H.264, MPEG2
  - Multi-display interfaces: VGA, HDMI/DVI, 24-bit LVDS.
    * Supports Extend/ Clone Mode with multi-display device
    * Dual display: any two combination between VGA, HDMI/DVI, LVDS

- Specification and Resolution
  * VGA: 2560 x 1600 at 60Hz
  * HDMI 1.4a for HD video playback, 1080P at 60Hz, up to 1920 x 1080
  * DVI 1.0 (DVI-D), up to 1920 x 1080
  * LVDS: 24-bit dual channel LVDS up to WUXGA 1920x1200 at 60Hz
  * Inverter power: 1A @ 5V/12V for inverter

- **Gigabit Ethernet**
  - Controller: Intel I210
    * 10/100/1000 BASE-T
    * IEEE 802.3az Energy Efficient Ethernet (EEE), which defines Low Power Idle (LPI) state
    * 9 KB Jumbo frames supported (Full-duplex)
    * Flow control supported

- **Peripheral interface**
  - 1 Serial-ATA port, up to 3.0Gb/s transfer rate (300 MB/s), supports independent DMA operation
  - 6 x USB2.0
    * Six internal USB2.0
    * Power supply: 0.5A @ 5V for USB2.0
  - 1 RS-232/422/485 for COM1, 2 RS-232 for COM2/3 (ESD protection: air gap ±15kV, contact ±8kV
  - 8-bit Programmable General Purpose Input/ Output from iManager (5V tolerance)
  - 1 SMBus / I^2C channel
  - Watchdog timer: Output System Reset, Programmable counter from 1 ~ 255 minutes/ seconds
  - mSATA/ Mini PCIe
    * 1 Full-size Mini PCIe (with SATA, USB and PCIe interface, PCIe interface is supported by request)
  - - On-board Flash*
    * 16GB, read/write: 66/14 (MB/s, reference)
    * 32GB, read/write: 69/22 (MB/s, reference)
    * 64GB, read/write: 114/27 (MB/s, reference)

- **BIOS**
  - AMI UEFI 64 Mbit, BIOS for 64 or 32-bit is different, default version is for 64-bit.
  - Default setting is Legacy boot, that can be manually changed to UEFI boot. If default setting to UEFI is needed, that can be done by T-P/N.

* The specification is supported by request.

1.2.2 OS support

PCM-3365 supports Win10, Win8, Win7, WES8, WES7, WEC7, Linux kernel 3.x, VxWorks 6.9.3.3, Android Kit Kat 4.4

Win7 only supports Legacy mode and Win8 for UEFI mode.

For further information about OS support of PCM-3365, please check Advantech website:
http://support.advantech.com.tw/ or contact the technical support center.

1.2.3 Mechanical Specifications

- **Dimensions:** 96 x 90 mm (3.8" x 3.5")
- **Height:** top side 14.4mm (N2930, E3825), 19.4mm (E3845), PCB 1.6mm, bottom side 7.8mm, total 23.8mm (N2930, E3825), 28.8mm (E3845)
- **Weight:** 0.735 kg (1.62 lb) (with heat-sink)

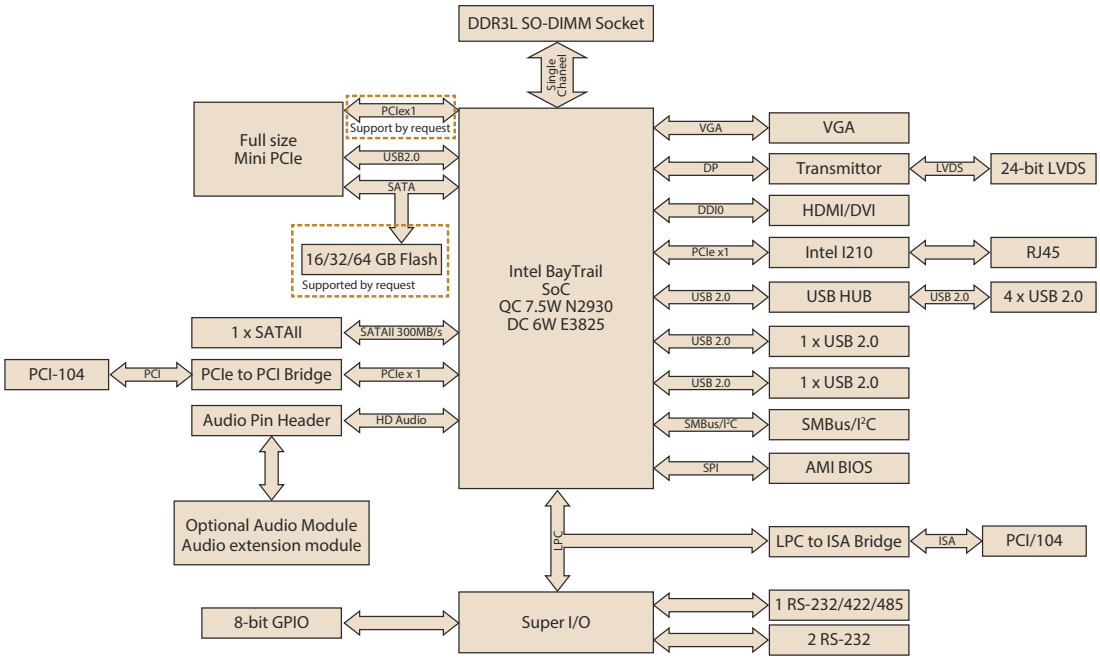
1.2.4 Electrical Specifications

- **Power Requirement:** 5V ± 5% power input
- **Power Consumption:**
  - Max load
    * N2930: 1.331A@+5V, 0.009A@+12V, 0.016A@+5VSB (6.843W)
    * E3845: 1.493@+5V, 0.008A@+12V, 0.025A@+5VSB (7.686W)
    * E3825: 1.107A@+5V, 0.008A@+12V, 0.008A@+5VSB (5.671W)
  - Idle mode
    * N2930: 0.866A@+5V, 0.006A@+12V, 0.003A@+5VSB (4.417W)
    * E3845: 0.923@+5V, 0.007A@+12V, 0.004A@+5VSB (4.719W)
    * E3825: 0.877A@+5V, 0.006A@+12V, 0.003A@+5VSB (4.472W)
- **Power Consumption Conditions:**
  - Test software: Burn In Test V7.1Pro
  - 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 @ 95% 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

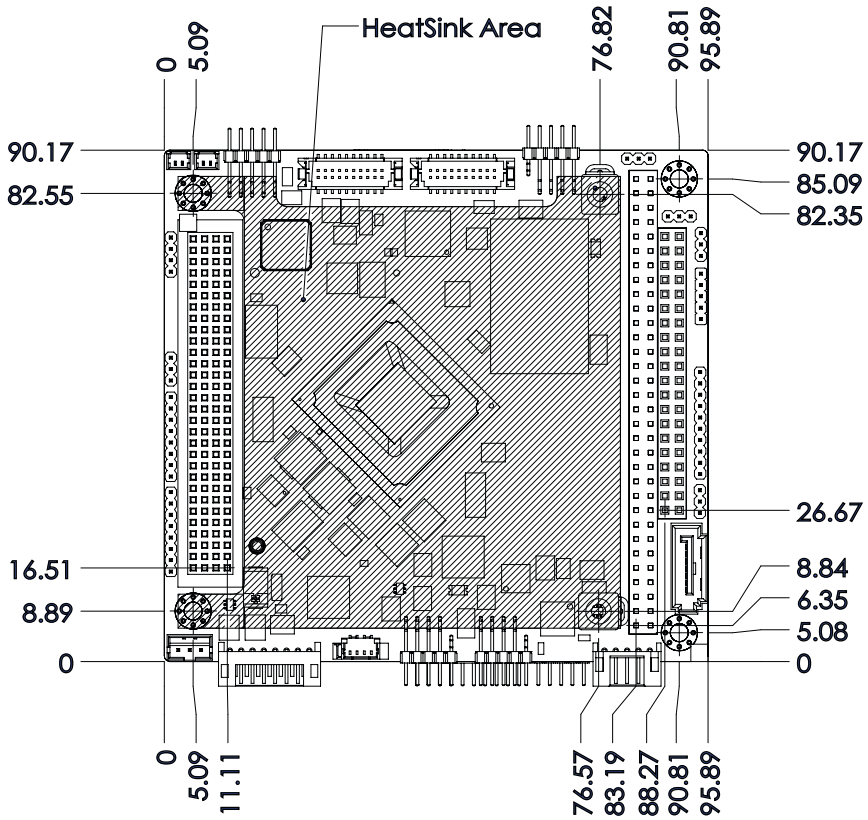


Figure 1.1 PCM-3365 Mechanical Drawing (Top Side)

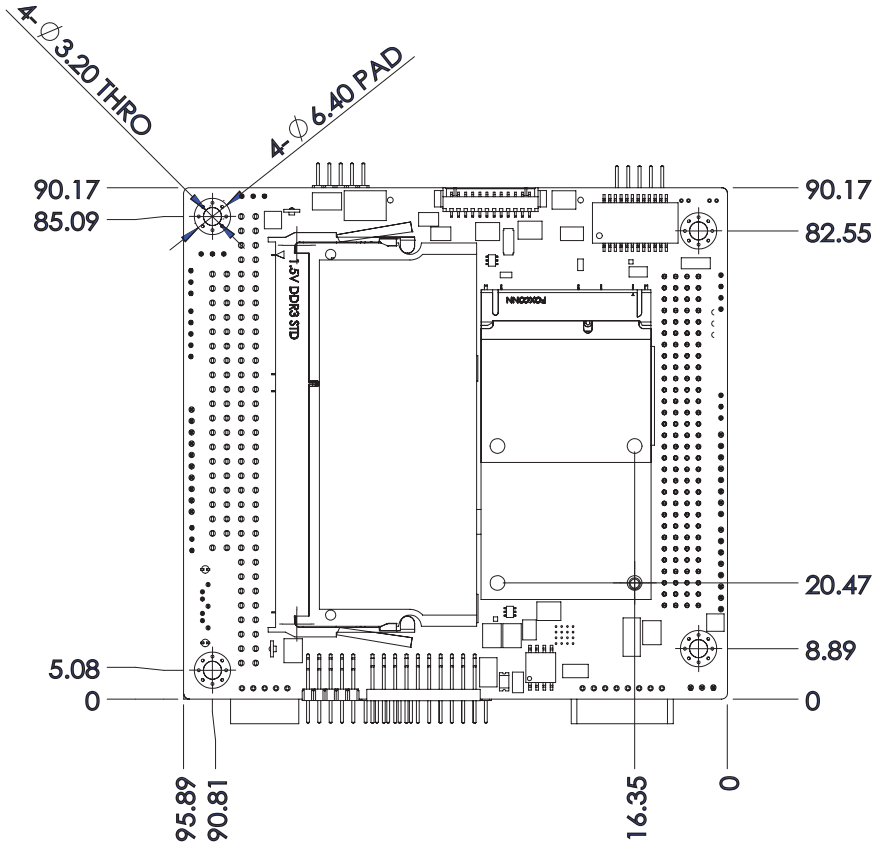


Figure 1.2 PCM-3365 Mechanical Drawing (Bottom Side)

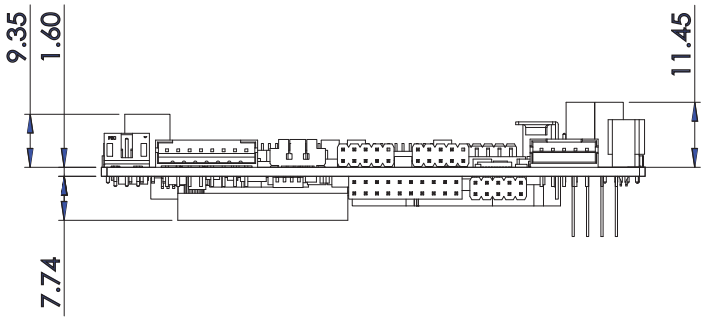


Figure 1.3 PCM-3365 Mechanical Drawing (Coastline)

Chapter 2

Installation

This chapter explains the setup procedures of the PCM-3365 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-3365 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	Clear CMOS
J2	PCI VIO Setting
J4	LVDS Panel Power Select
J6	LVDS JEIDA/VESA Selection Pin

2.2 Connectors

Onboard connectors link the PCM-3365 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	Power In Connecter
CN2	ATX Power In Connecter
CN3	HD Audio Connecter
CN4	Battery
CN5	SODIMM
CN6	GPIO Connecter
CN7	VGA Connector
CN8	HDMI Connector
CN9	-5V/-12V power connector
CN10	Front Panel Connecter
CN11	MINIPCIEXPRESS
CN13	Internal USB
CN16	Internal USB
CN17	Internal USB
CN18	COM1
CN19	COM2/COM3
CN20	LAN
CN21	LAN LED
CN23	Inverter Power Output
CN24	24 bits LVDS Panel
CN26	SSD debug port
CN27	PCI-104
CN28	PC104 32x2-pin
CN29	PC104 20x2-pin
CN30	Buzzer
CN32	SMBus
CN34	SATA

2.3 Locating Connectors

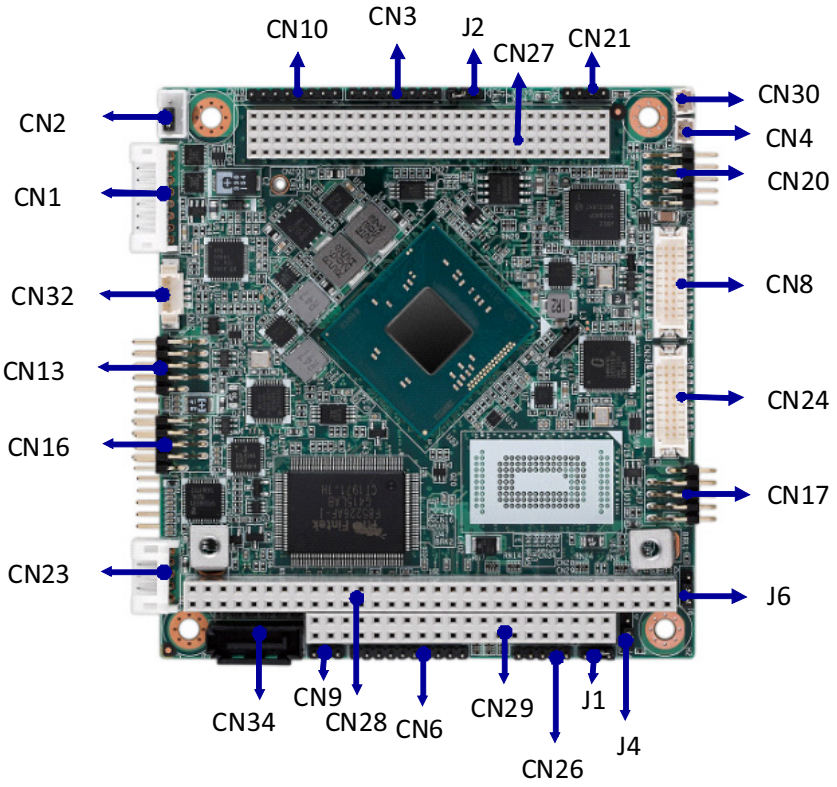


Figure 2.1 PCM-3365 Connector Locations (Top Side)

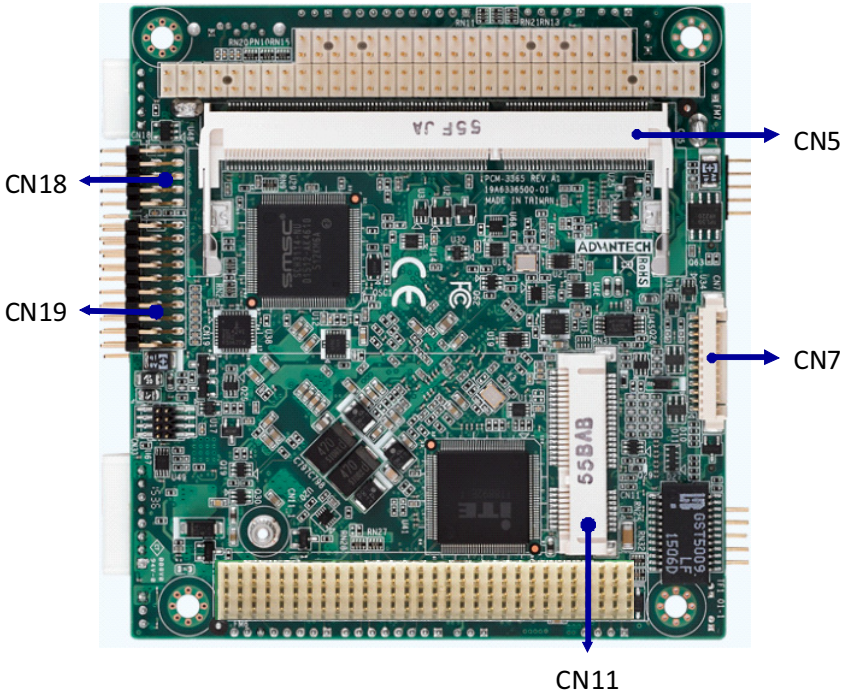
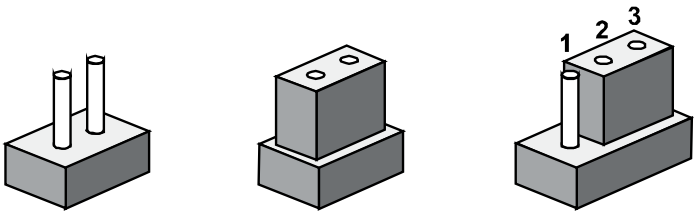


Figure 2.2 PCM-3365 Connector Locations (Bottom Side)

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:



open **closed** **closed 2-3**

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.

J1	**Clear CMOS**
Setting	Function
(1-2)*	Normal
(2-3)	Clear COMS



J2	**PCI VIO Setting**
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V



J4	LVDS Panel Power Select
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V



J6	LVDS JEIDA/VESA Selection Pin
Setting	Function
(1-2)	Pull-High to +V3.3(JEIDA or VESA base on panel definition)
(2-3)*	Pull-Low to GND (JEIDA or VESA base on panel definition)



Chapter 3

AMI BIOS Setup

3.1 Introduction

With the AMIBIOS Setup program, you can modify BIOS settings and control the various system features. This chapter describes the basic navigation of PCM-3365 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 <DEL> 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.

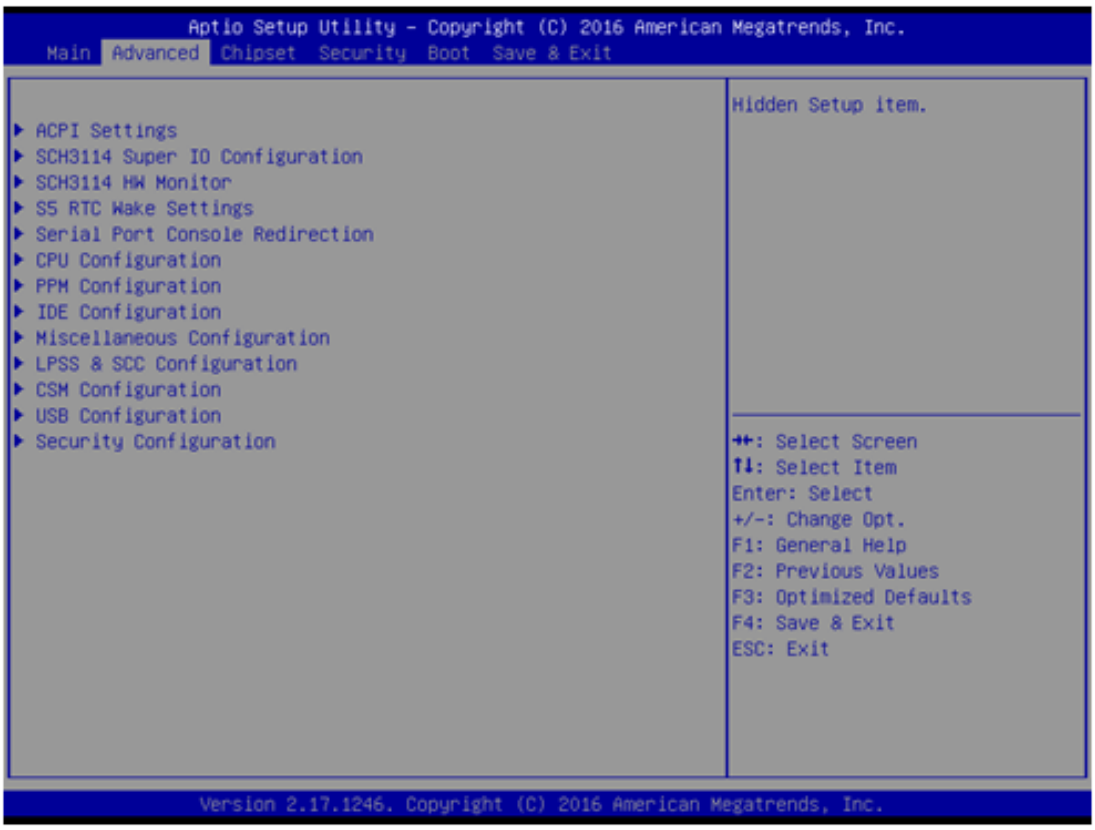
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System time / System date**

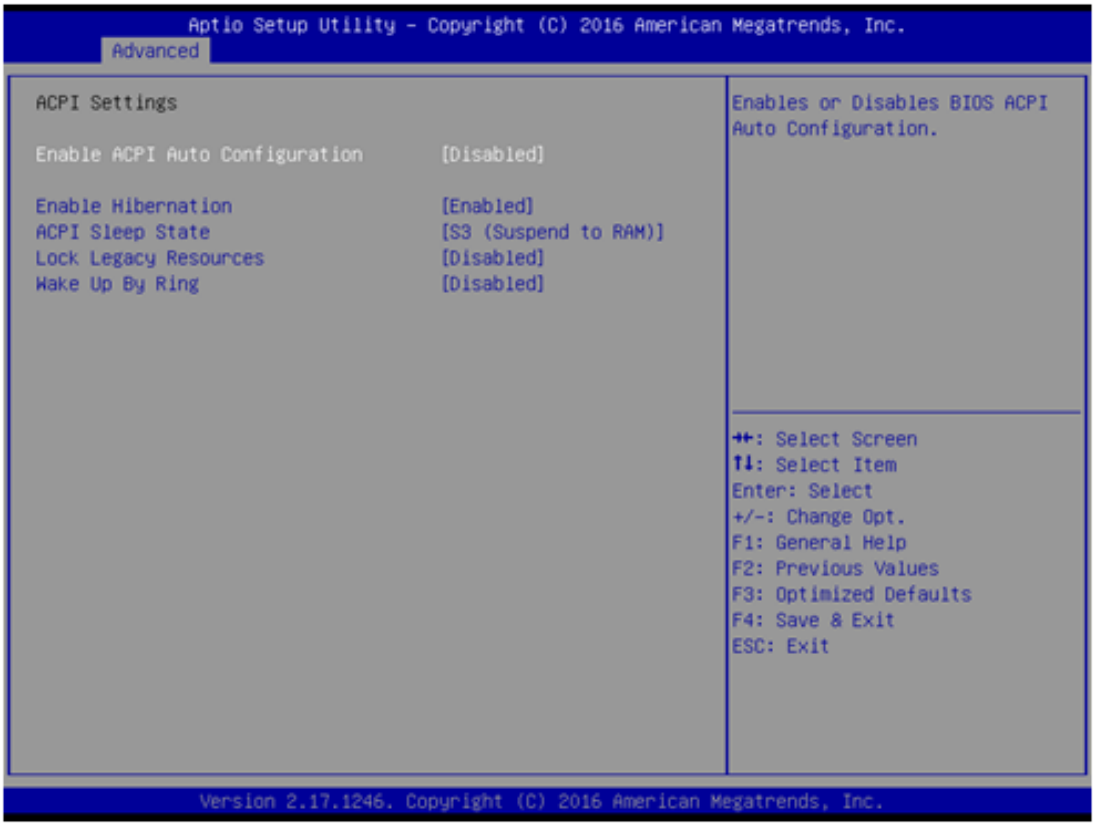
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIO-5251 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 are shown below. The sub menus are described on the following pages.

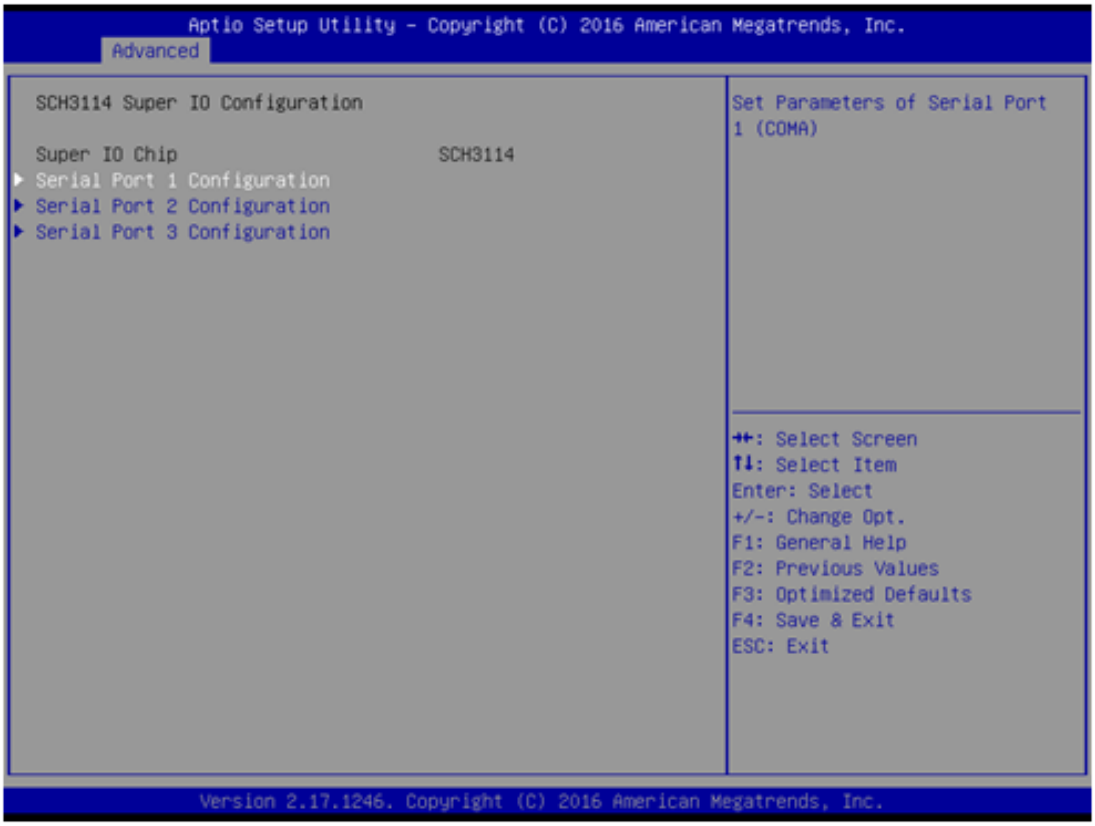


3.2.2.1 ACPI Settings



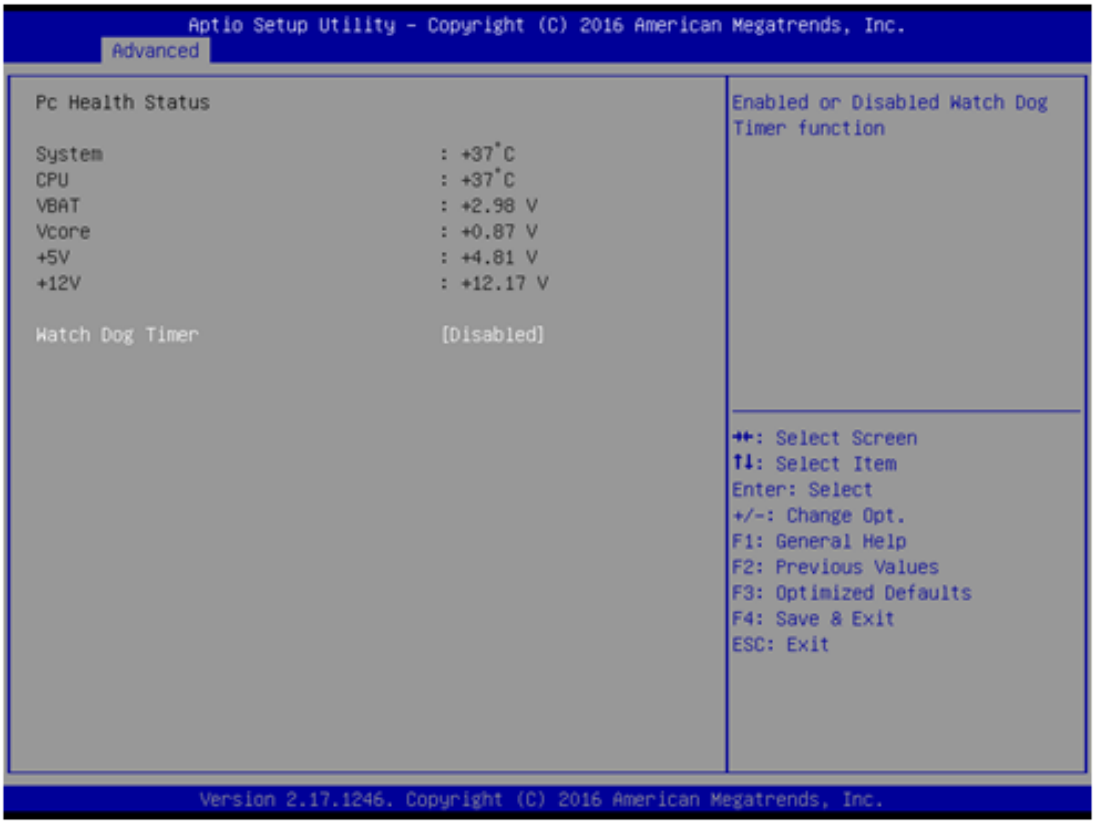
- **Enable ACPI Auto Configuration**
  Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State**
  Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
- **Lock Legacy Resources**
  Enables or Disables Lock of Legacy Resources.
- **Wake Up By Ring**
  Enables or Disables wake up by ring function under ACPI S3/S4/S5.

3.2.2.2 SCH3114 Super IO Configuration



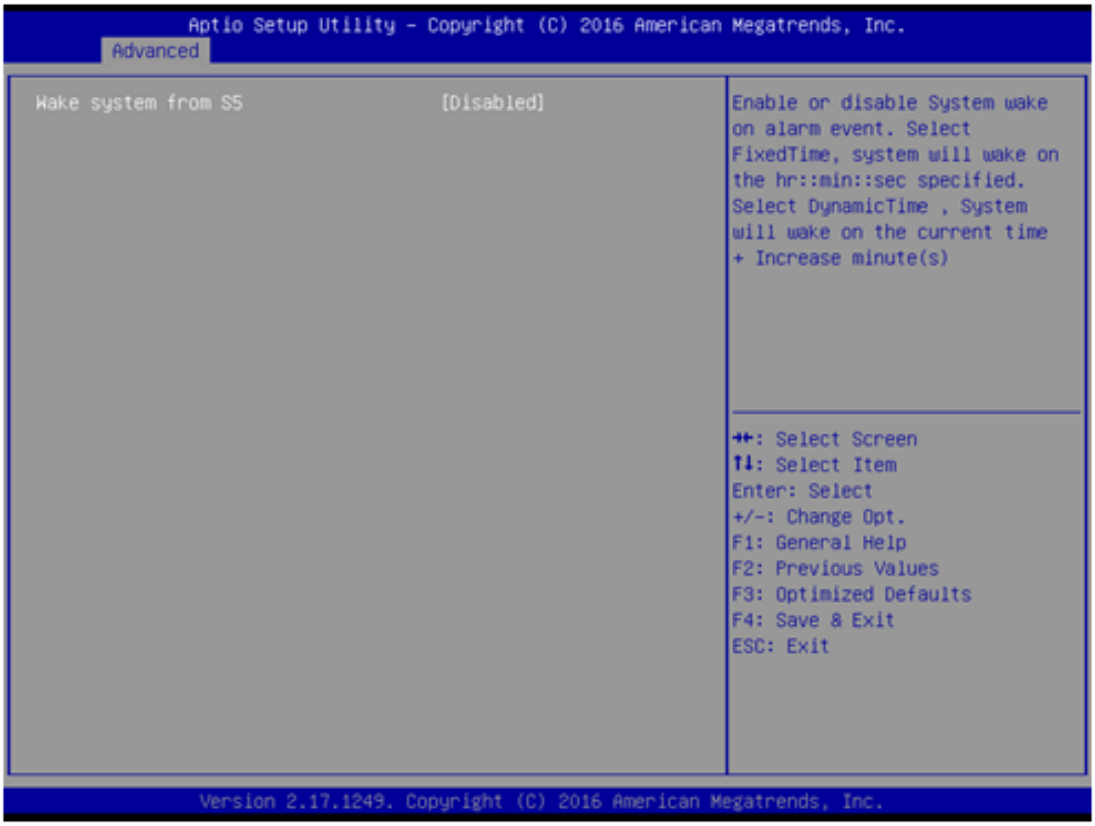
- **Serial Port 1 Configuration**
  Set Parameters of Serial Port 1 (COMA).
- **Serial Port 2 Configuration**
  Set Parameters of Serial Port 2 (COMB).
- **Serial Port 3 Configuration**
  Set Parameters of Serial Port 3 (COMC).

3.2.2.3 SCH3114 HW Monitor



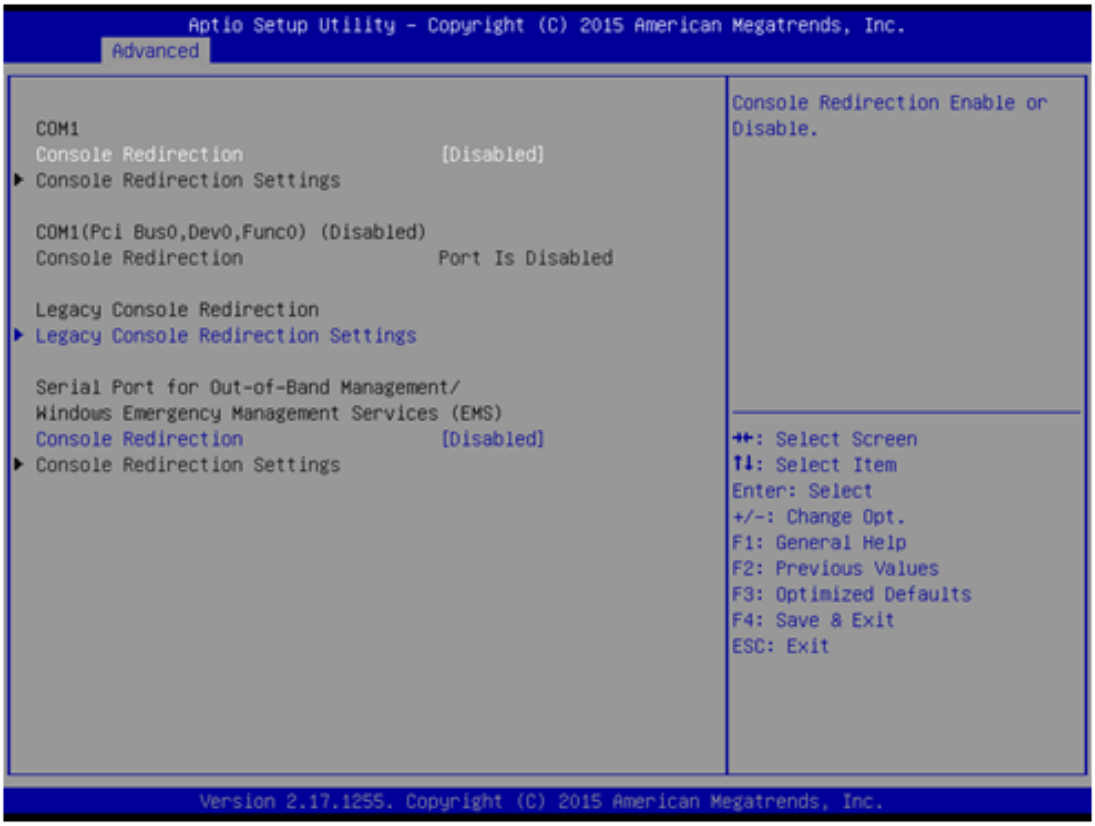
- **PC Health Status**
  This page displays all information about system Temperature/Voltage.
- **Watch Dog Timer**
  Enabled or Disabled Watch Dog Timer function.

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



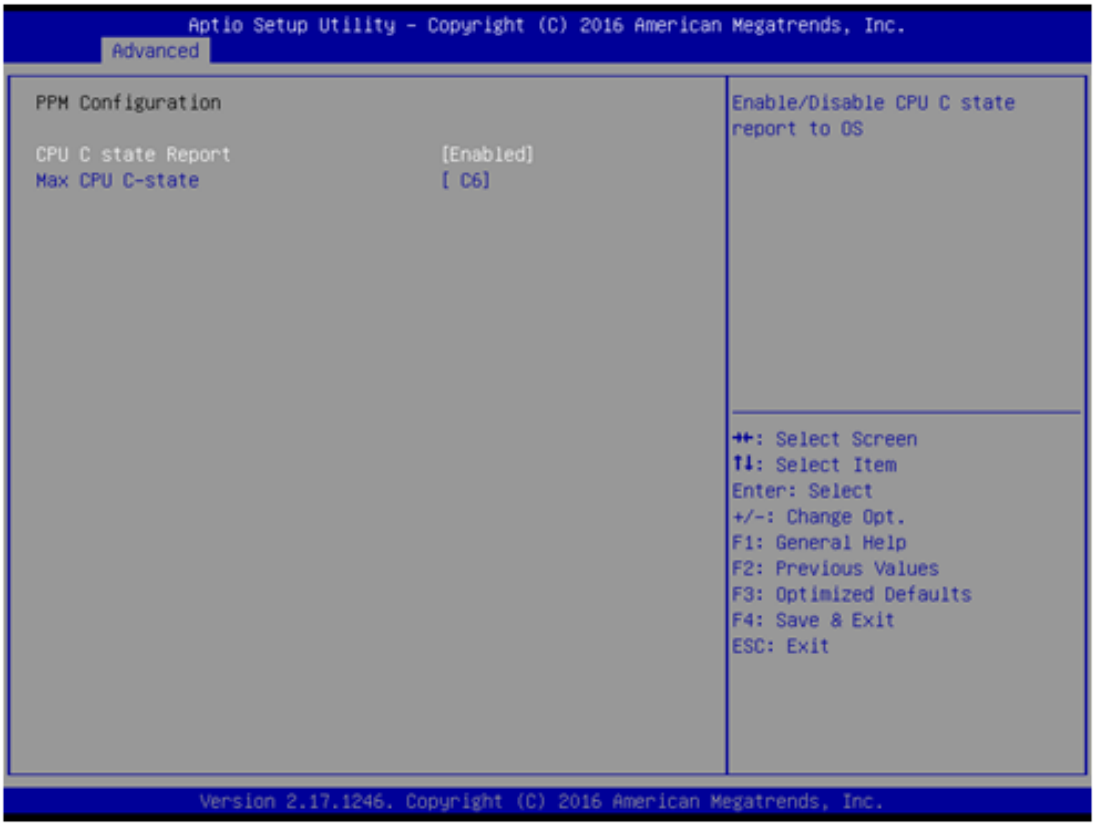
- **Console Redirection**
  This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).
- **Console Redirection**
  This item allows users to configuration console redirection detail settings.

3.2.2.6 CPU Configuration



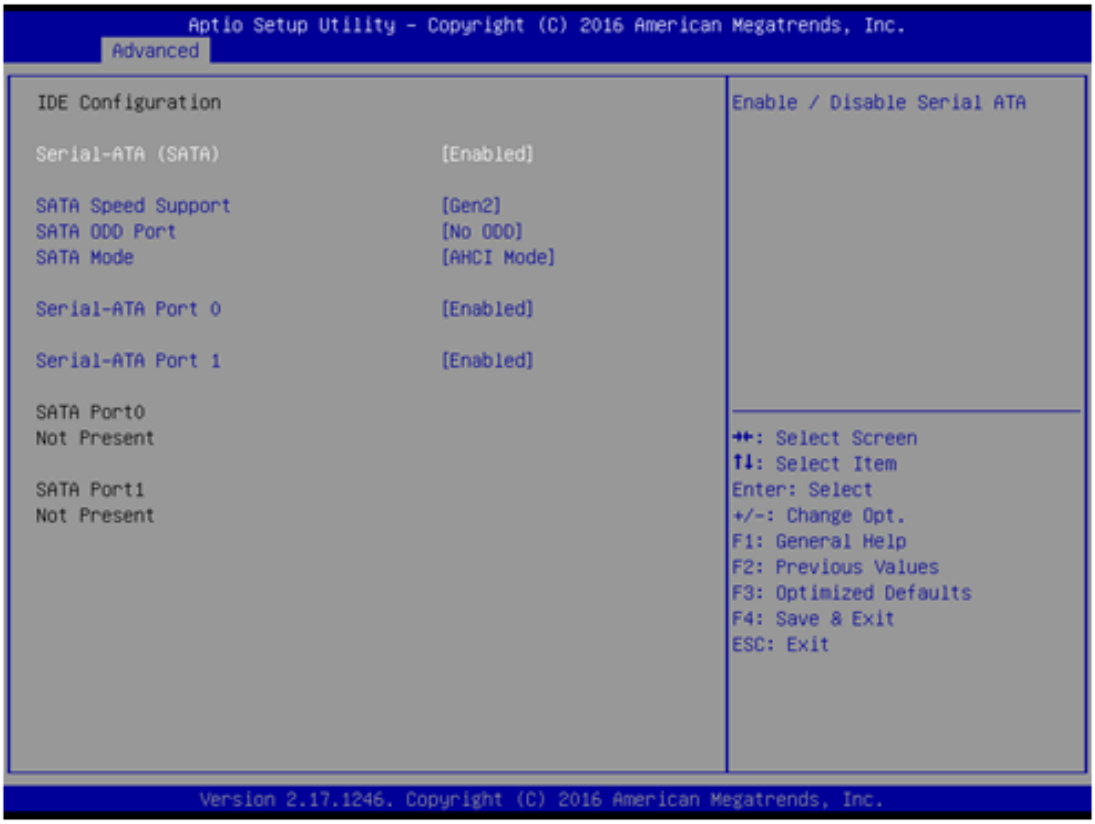
- **Limit CPUID Maximum**
  Disabled for Windows XP.
- **Execute Disable Bit**
  When XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 update 3.).
- **Intel Virtualization 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



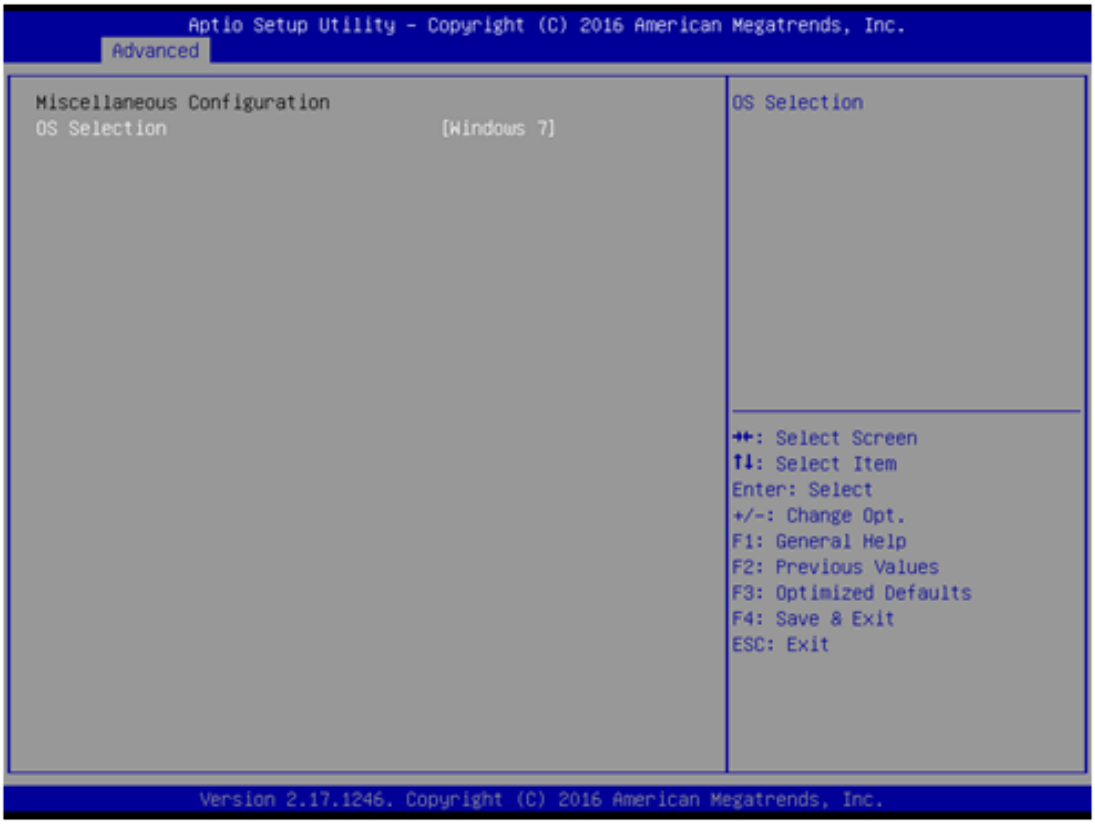
- **CPU C state Report**
  Enable/Disable CPU C state report to OS.
- **Max CPU C-state**
  This option controls Max C state that the processor will support.

3.2.2.8 IDE Configuration



- **Serial-ATA (SATA)**
  Enable / Disable Serial ATA.
- **SATA Speed Support**
  SATA Speed Support Gen1 or Gen2.
- **SATA ODD Port**
  SATA ODD is Port 0 or Port 1.
- **SATA Mode**
  Select IDE / AHCI.
- **Serial-ATA Port 0**
  Enable / Disable Serial ATA Port 0.
- **Serial-ATA Port 1**
  Enable / Disable Serial ATA Port 1.

3.2.2.9 Miscellaneous Configuration



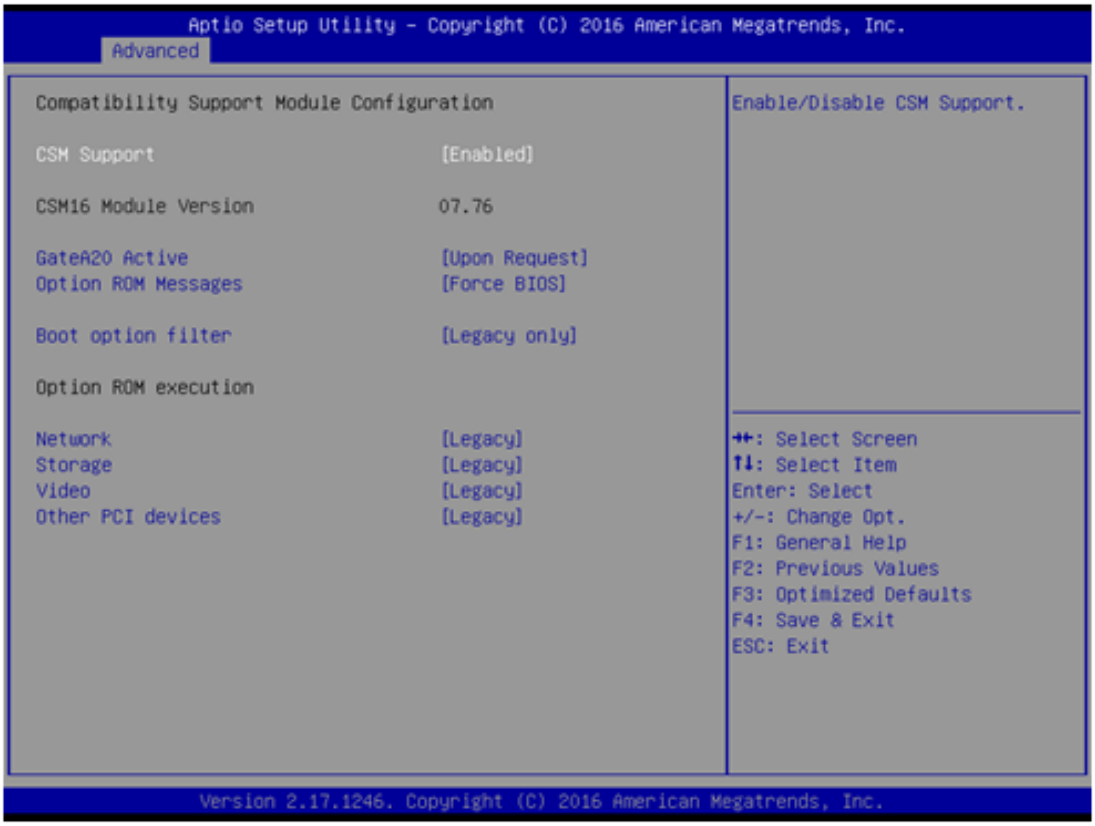
- **OS Selection**
  OS Selection.

3.2.2.10 LPSS & SCC Configuration



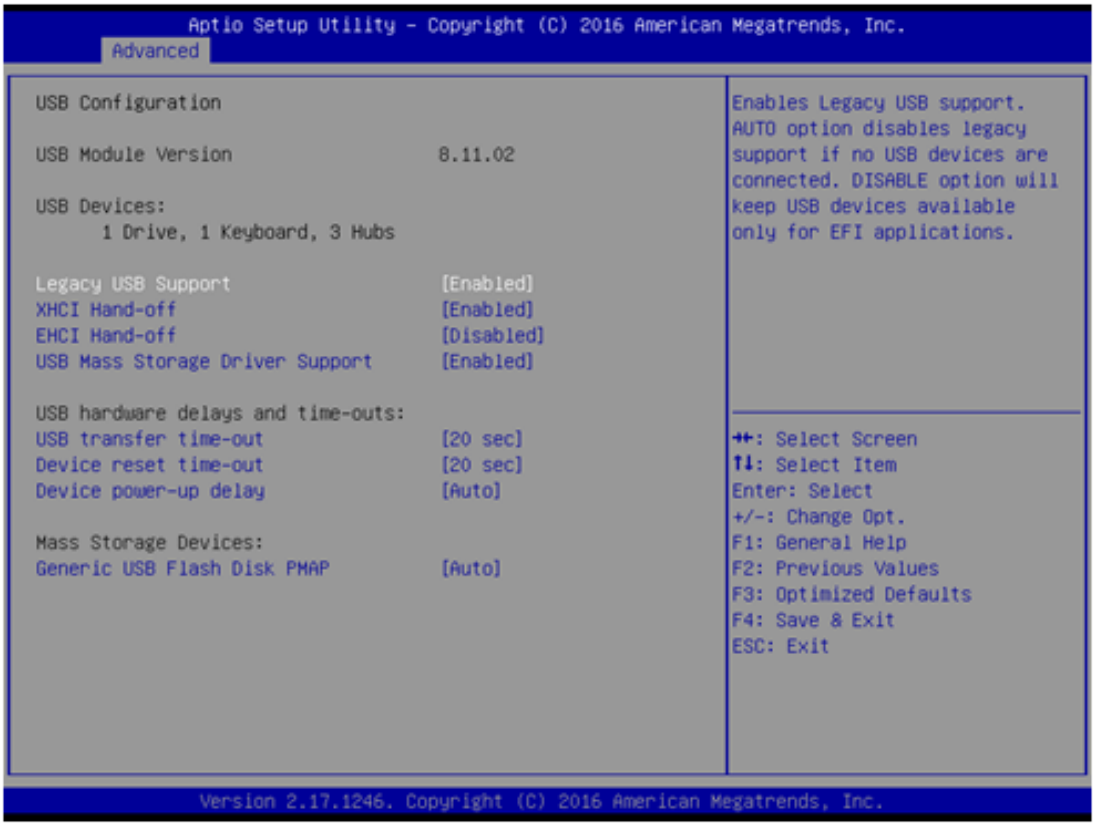
- **LPSS & SCC Devices Mode**
  LPSS & SCC Devices Mode Settings.
- **LPSS I2C Support**
  LPSS I2C Support Enable/Disable.

3.2.2.11 CSM Configuration



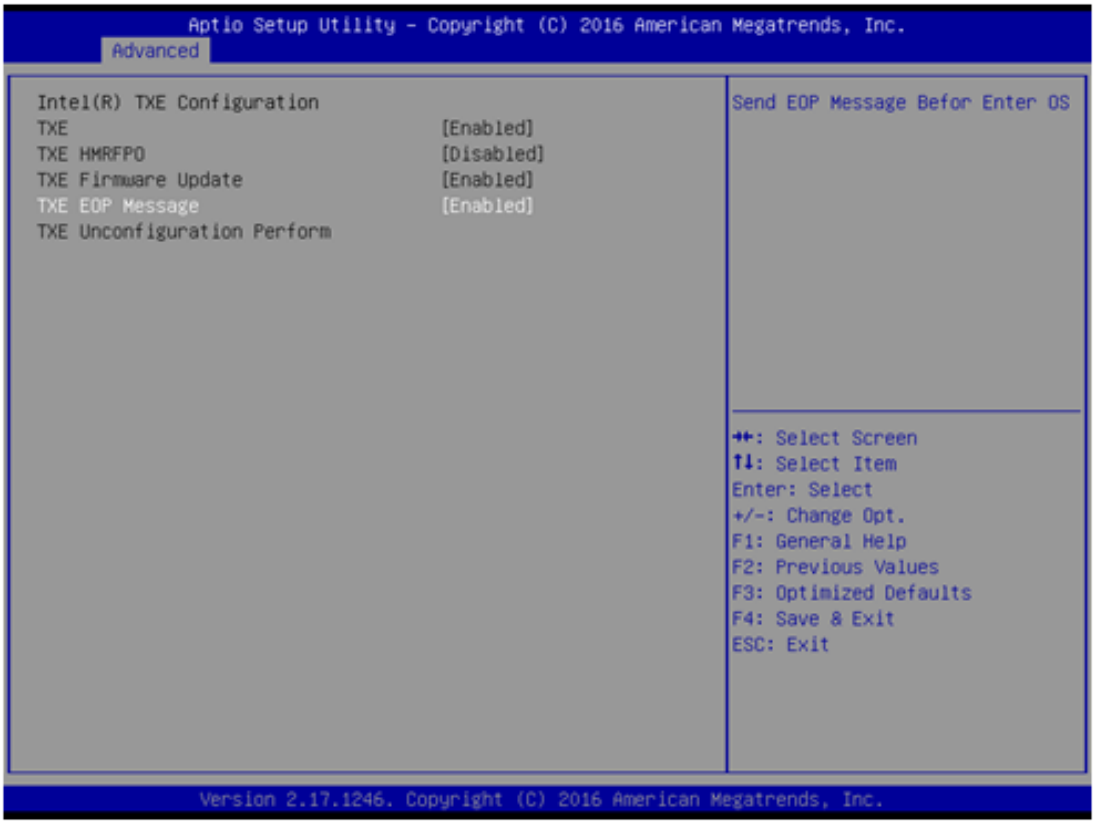
- **CSM Support**
  Enable/Disable CSM Support.
- **GateA20 Active**
  UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
- **Option ROM Message**
  BIOS Set display mode for Option ROM.
- **Boot 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 OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **EHCI Hand-off**
  This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
- **USB Mass Storage Driver Support**
  Enable/Disable USB Mass Storage Driver Support.
- **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



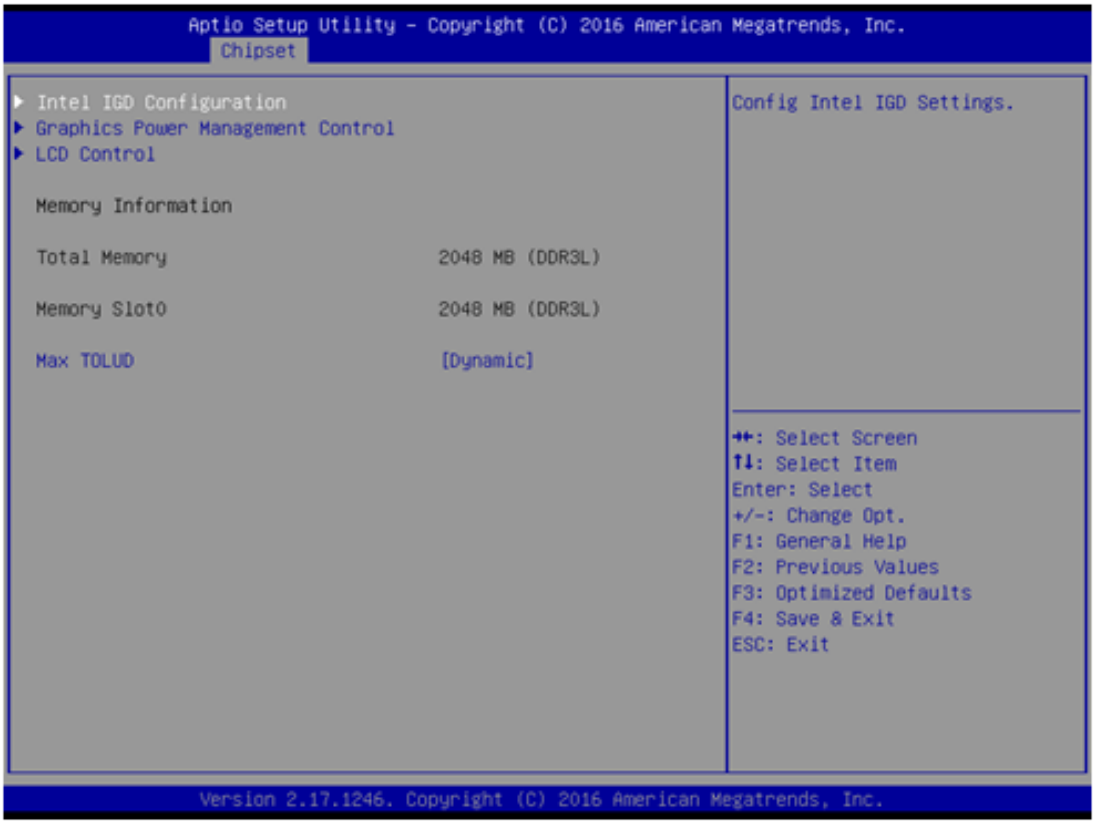
- **TXE HMRFPO Disable**
- **TXE Firmware Update**
- **TXE EOP Message**
  Send EOP Message Before Enter OS.
- **TXE Unconfiguration Perform**
  Revert TXE setting to factory defaults.

3.2.3 Chipset Configuration



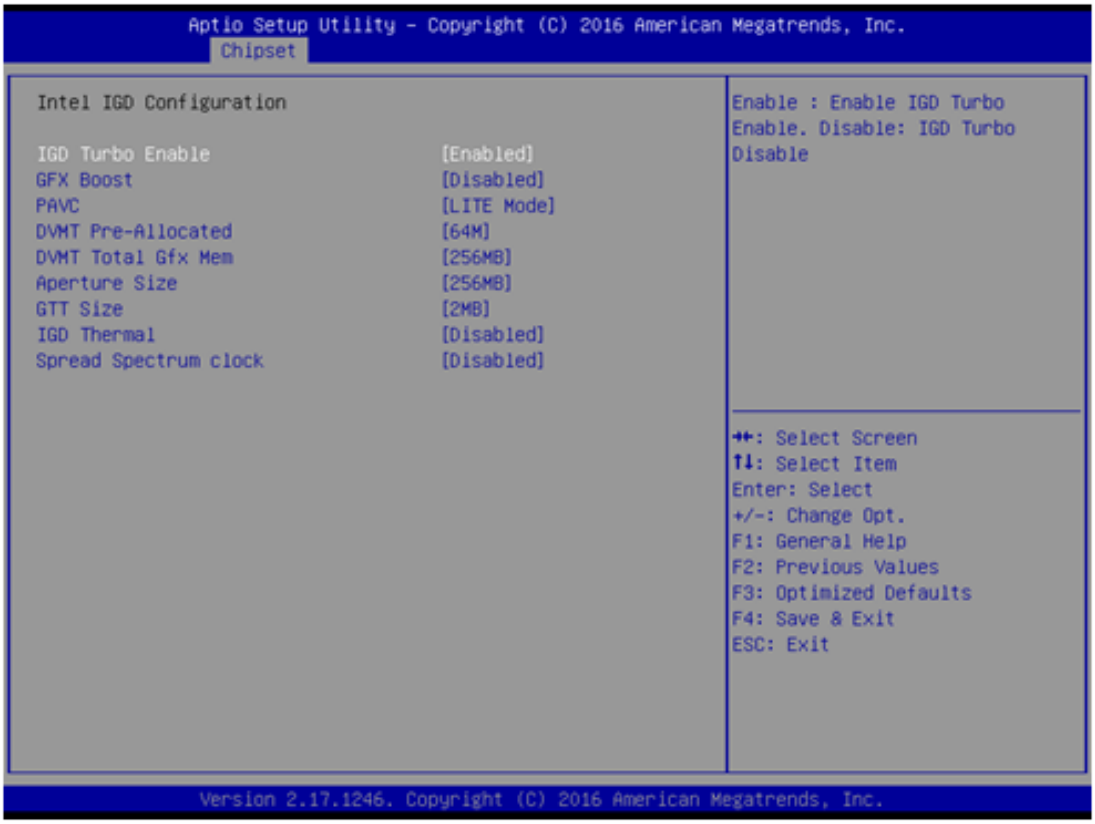
- **North Bridge**
  Details for North Bridge items.
- **South Bridge**
  Details for South Bridge items.

3.2.3.1 North Bridge



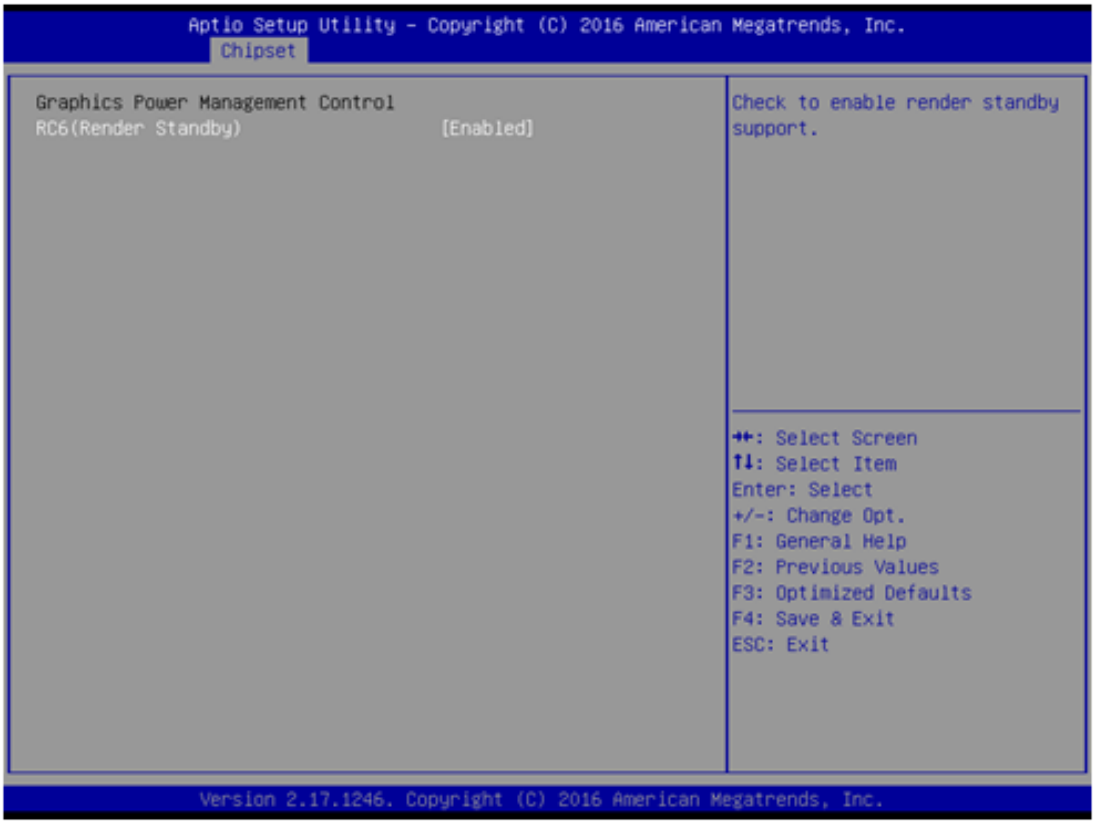
- **Intel IGD Configuration**
  Config Intel IGD Settings.
- **Graphics Power Management Control**
  Graphics Power Management Control Options.
- **LCD Control**
  LCD Control.
- **Max TOLUD**
  Maximum Value of TOLUD.

3.2.3.2 Intel IGD Configuration



- **IGD Turbo Enable**
  Enable: IGD Turbo Enable. Disable: IGD Turbo Disable.
- **GFX Boost**
  Enable/Disable GFX Boost.
- **PAVC**
  Enable/Disable Protected Audio Video Control.
- **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.
- **IGD Thermal**
  Enable/Disable IGD Thermal.
- **Spread Spectrum clock**
  Enable/Disable Spread Spectrum clock.

3.2.3.3 Graphics Power Management Control



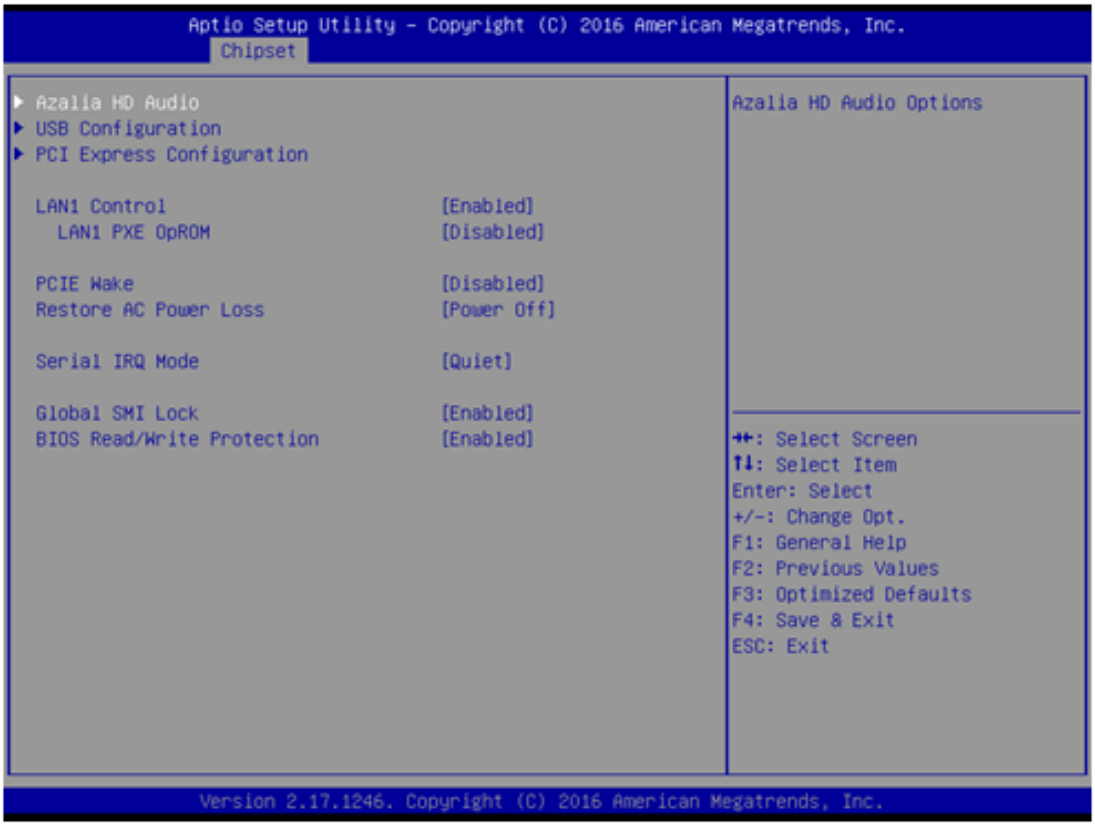
- **RC6 Render Standby)**
  Check to enable render standby support.

3.2.3.4 LCD Control



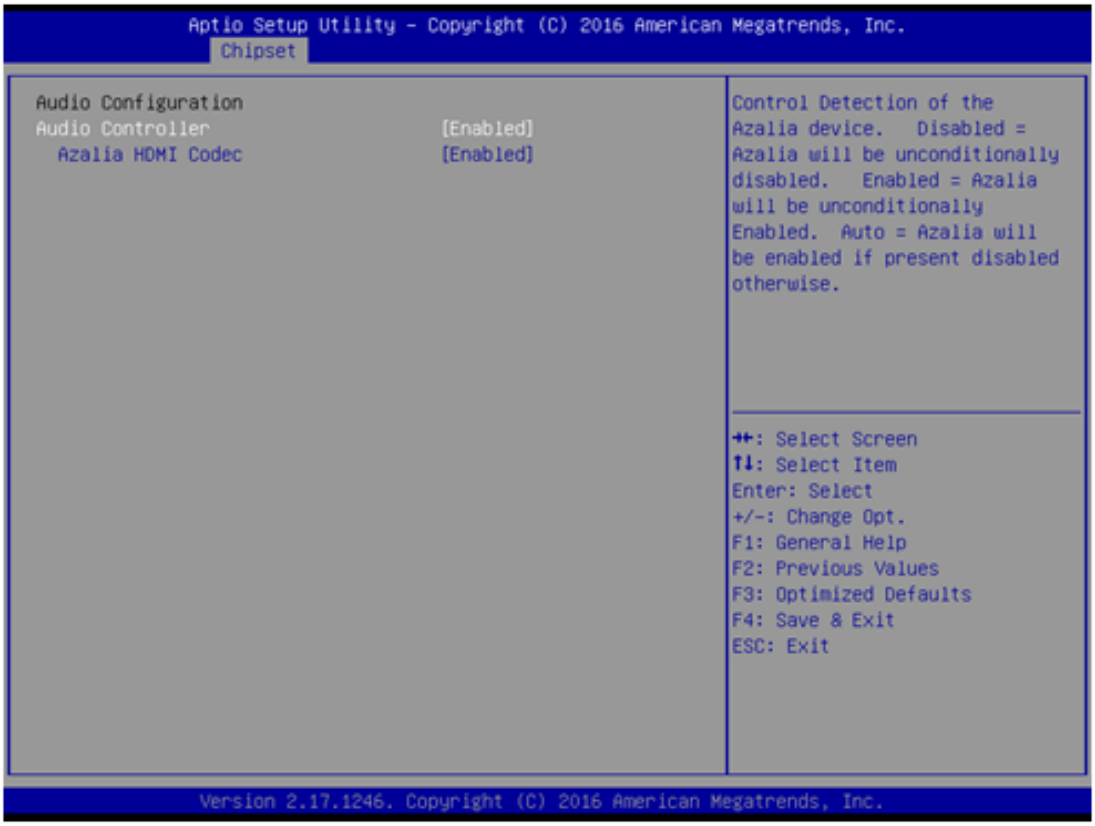
- **Primary IGFX Boot Display**
  Select the Video Device which will be activated during POST. This has no effect if an external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
- **LVDS Panel Type**
  This item allow user to select LVDS panel type.

3.2.3.5 South Bridge



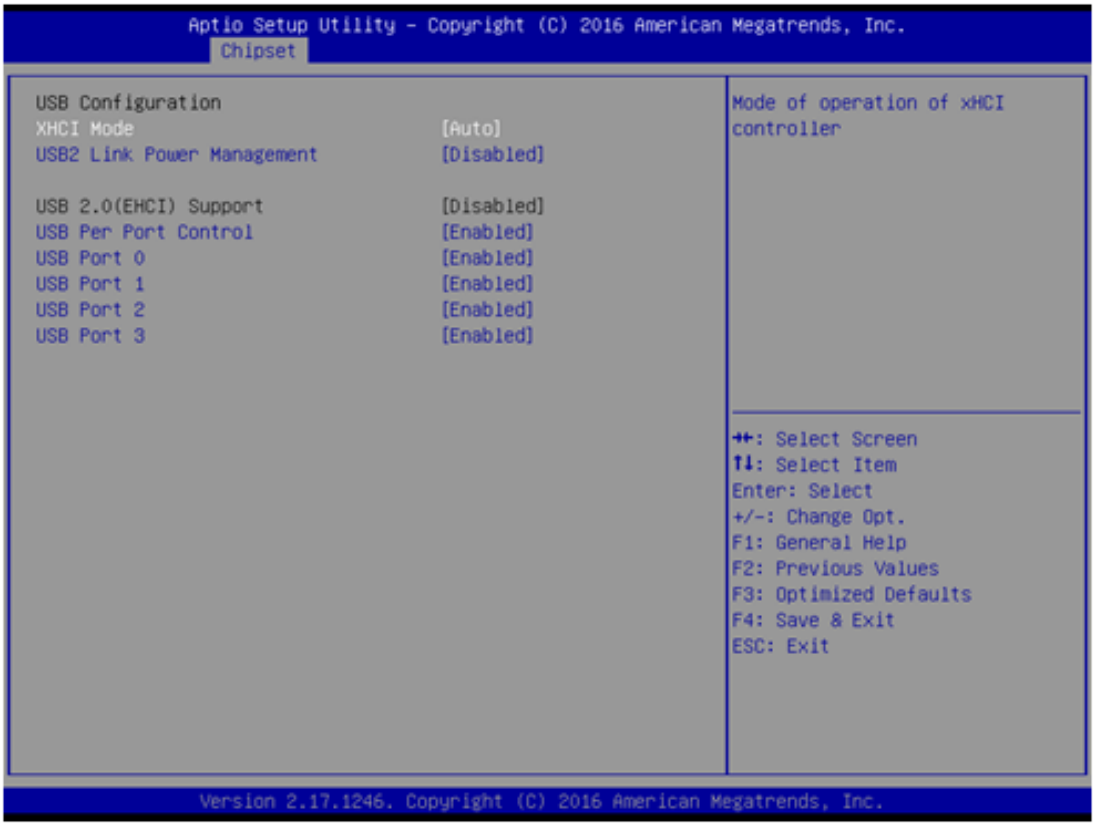
- **Azalia HD Audio**
  Azalia HD Audio Options.
- **USB Configuration**
  USB Configuration Settings.
- **PCI Express Configuration**
  PCI Express Configuration settings.
- **LAN1 Control**
  Enable or Disable the LAN1.
- **LAN1 PXE OpROM**
  Enable or Disable boot option for LAN1 controller.
- **PCIE Wake**
  Enable or Disable PCIE to wake the system from S5.
- **Restore AC Power Loss**
  Select AC power state when power is re-applied after a power failure.
- **Serial IRQ Mode**
  Configure Serial IRQ Mode.
- **Global SMI Lock**
  Enable or Disable SMI lock.
- **BIOS Read/Write Protection**
  Enable or Disable BIOS SPI region read/write protect.

3.2.3.6 Azalia HD Audio



- **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

3.2.3.7 USB Configuration



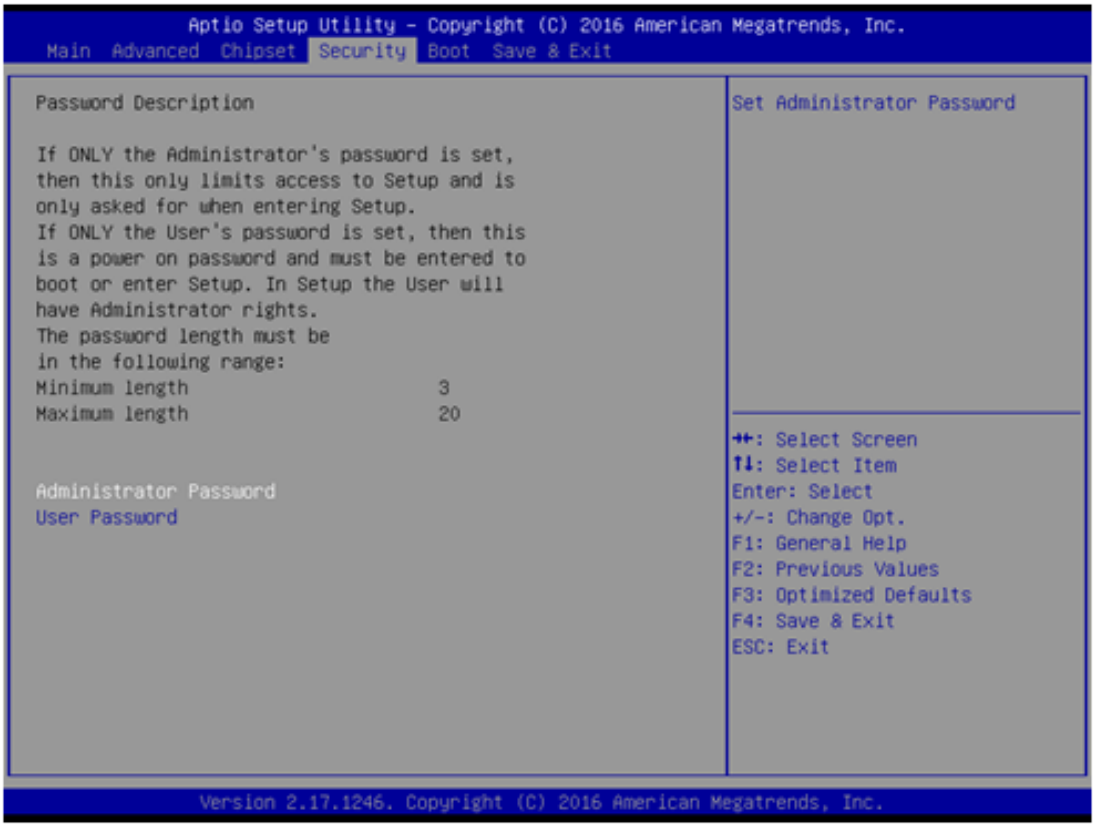
- **XHCI Mode**
  Mode of operation of xHCI controller.
- **USB2 Link Power Management**
  Enable/Disable USB2 Link Power Management.
- **USB 2.0(EHCI) Support**
  Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.
- **USB Per Port Control**
  Control each of the USB ports (0~3). Enable: Enable USB per port; Disable: Use USB port X settings.

3.2.3.8 PCI Express Configuration



- **PCI Express Port 2**
  Enable or Disable the PCI Express Port 2 in the Chipset.
- **Speed**
  Configure PCIe Port Speed.

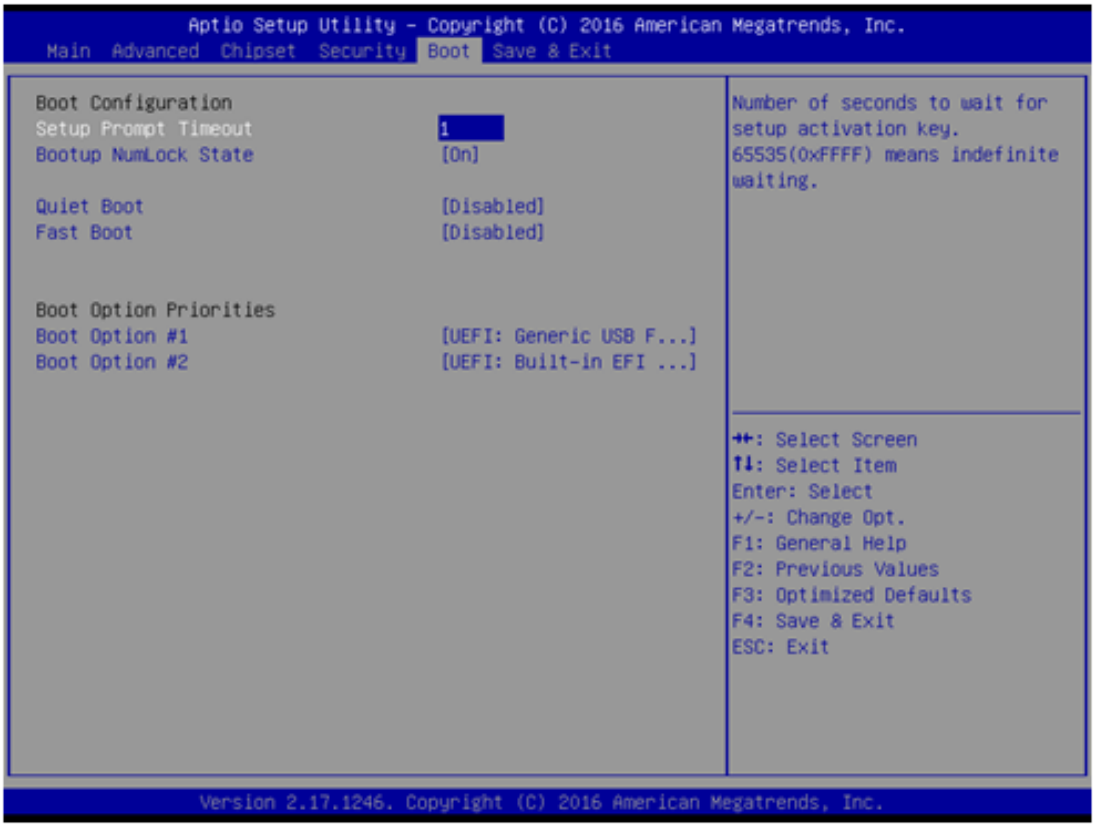
3.2.4 Security



Select Security Setup from the PCM-3365 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>:

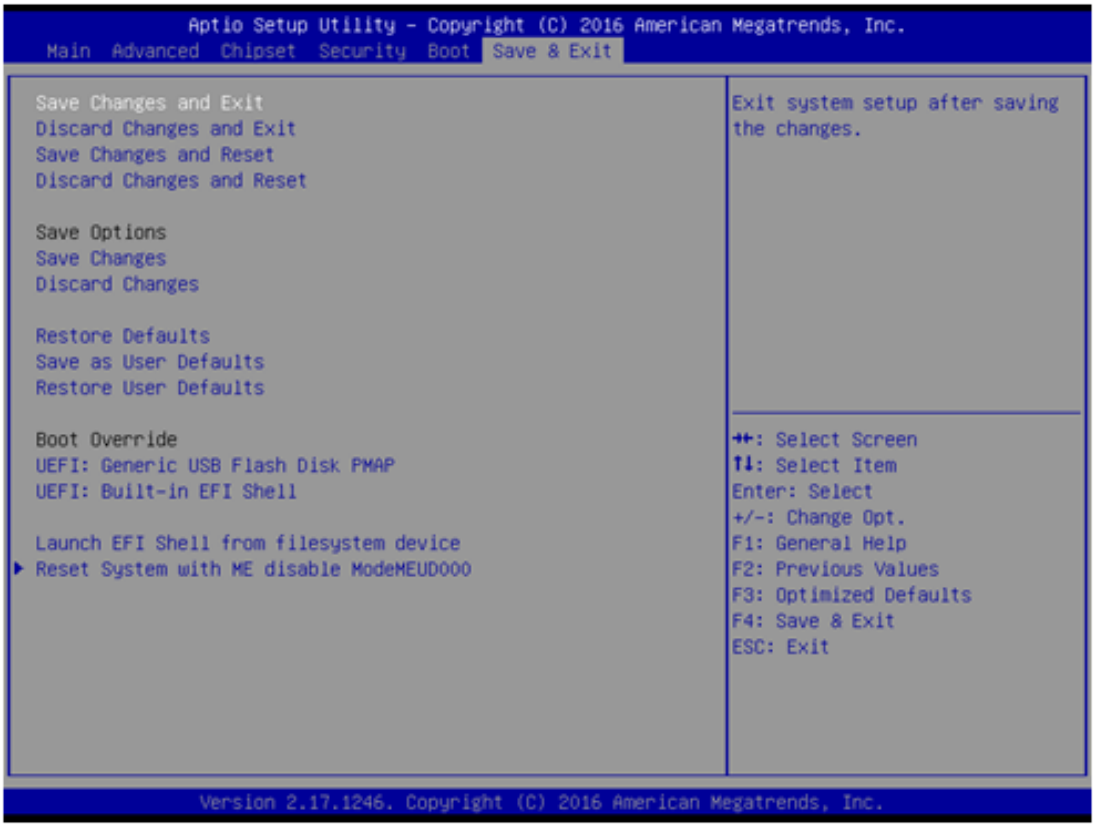
- **Change Administrator / User Password**
  Select this option and press <ENTER> to access the sub menu, and then type in the password.

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.

Appendix A

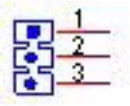
Pin Assignments

This appendix contains information of a detailed or specialized nature.
Sections include:

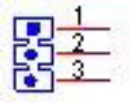
- Jumper and Connector Tables

A.1 Jumper List

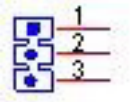
J1	Clear CMOS
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)*	Normal
(2-3)	Clear COMS



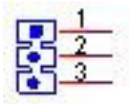
J2	PCI VIO Setting
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V



J4	LVDS Panel Power Select
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V

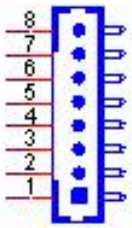


J6	LVDS JEIDA/VESA Selection Pin
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)	Pull-High to +V3.3(JEIDA or VESA base on panel definition)
(2-3)*	Pull-Low to GND (JEIDA or VESA base on panel definition)

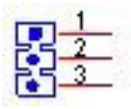


A.2 Connector Pin Definition

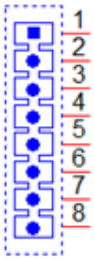
CN1	Power In Connecter
Part Number	1655308120
Footprint	WHL8H-2M
Description	Wafer Box 2.0mm 8P 90D Male W/Lock
Pin	Pin Name
1	+V5_ATX
2	+V5_ATX
3	+V5_ATX
4	GND
5	GND
6	GND
7	GND
8	+V12



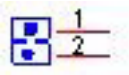
CN2	ATX Power In Connecter
Part Number	1655303020
Footprint	WHL3V-2M
Description	WAFER BOX 3P 2.0mm 180D(M) DIP 2001-WS-3
Pin	Pin Name
1	+V5SB
2	GND
3	PWR_PSON#



CN3	HD Audio Connecter
Part Number	1653008101-01
Footprint	HD_8x1P_79_D
Description	
Pin	Pin Name
1	+V5
2	GND
3	HDA_BCLK
4	HDA_SYNC
5	HDA_RST#
6	HDA_SDI0
7	HDA_SDO
8	+V12

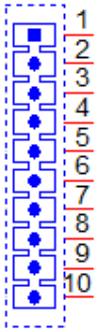


CN4	Battery
Part Number	1655902032
Footprint	WHL2V-125
Description	WAFER BOX 2P 1.25mm 180D(M) DIP 53047-0210
Pin	Pin Name
1	+3V
2	GND

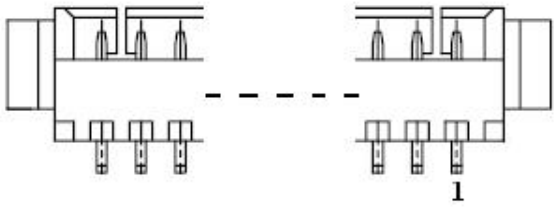


CN5	SODIMM
Part Number	1651002087-11
Footprint	DDR3_204P_AS0A626-N2S6-7H
Description	DDR3 SODIMM H=5.2mm STD 204P SMD AS0A626-H2S6-7H

CN6	GPIO Connecter
Part Number	1653010102-01
Footprint	HD_10x1P_79_D
Description	
Pin	Pin Name
1	+V5DUAL
2	GPIO0
3	GPIO1
4	GPIO2
5	GPIO3
6	GPIO4
7	GPIO5
8	GPIO6
9	GPIO7
10	GND

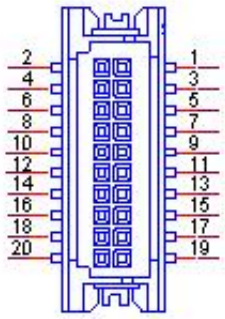


CN7	VGA Connector
Part Number	1655912120
Footprint	SP-12SMH
Description	WAFER BOX 12P 1.25mm 90D(M) SMD 85204-12001
Pin	Pin Name
1	GND
2	VGA_z_R
3	VGA_z_G
4	VGA_z_B
5	GND
6	+V5_VGA
7	VGA_z_DDAT
8	VGA_z_DCLK
9	GND
10	VGA_z_HS
11	VGA_z_VS
12	GND

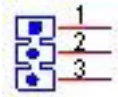


CN8	HDMI Connector
Part Number	1653910261
Footprint	SPH10X2
Description	B/B Conn 10x2P 1.25mm 180D(M)SMD DF13-20DP-1.25V
Pin	Pin Name
1	GND
2	GND
3	HDMI_TX2-
4	HDMI_CLK-
5	HDMI_TX2+
6	HDMI_CLK+
7	GND
8	HDMI_DDAT
9	HDMI_TX1-
10	HDMI_DCLK
11	HDMI_TX1+
12	NC
13	GND
14	NC
15	HDMI_TX0-

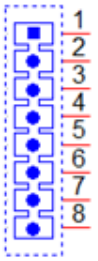
16	GND
17	HDMI_TX0+
18	DDP0_HPD
19	+V5_HDMI
20	+V5_HDMI



CN9	**-5V/-12V power connector**
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Pin	Pin Name
1	-5V
2	GND
3	-12V

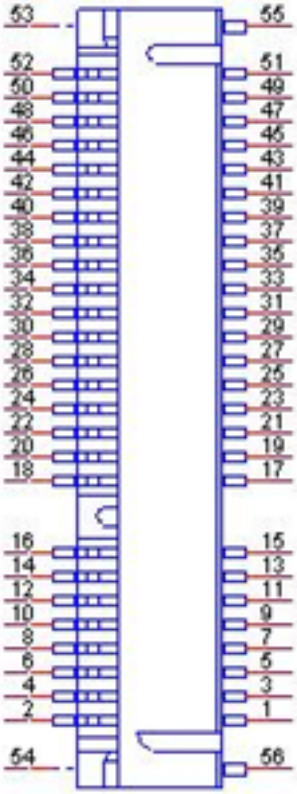


CN10	Front Panel Connecter
Part Number	1653008101-01
Footprint	HD_8x1P_79_D
Description	
Pin	Pin Name
1	FP_PSIN#
2	GND
3	FP_RST#
4	GND
5	Power LED+
6	Power LED-
7	HDD LED+
8	HDD LED-

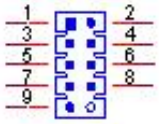


CN11	MINIPCIEXPRESS
Part Number	1654002538
Footprint	FOX_AS0B226-S68K7F
Description	MINI PCI E 52P 6.8mm 90D SMD AS0B226-S68Q-7H
Pin	Pin Name
1	WAKE#
2	+V3.3SB
3	NC
4	GND
5	NC
6	+V1.5
7	NC
8	NC
9	GND
10	NC
11	CLK_MINI_PCIE-
12	NC
13	CLK_MINI_PCIE+
14	NC
15	GND
16	GND
17	NC

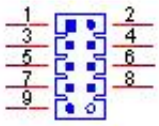
18	GND
19	NC
20	WIFI1_DISABLE#
21	GND
22	PLTRST#
23	mSATA_mPCIE_RX-
24	+V3.3SB
25	mSATA_mPCIE_RX+
26	GND
27	GND
28	+V1.5
29	GND
30	SMB_STB_CLK
31	mSATA_mPCIE_TX-
32	SMB_STB_DAT
33	mSATA_mPCIE_TX+
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+V3.3SB
40	GND
41	+V3.3SB
42	CLKOUT_a_LPC0
43	GND
44	LPC_a_FRAME#
45	LPC_a_AD0
46	NC
47	LPC_a_AD1
48	+V1.5
49	LPC_a_AD2
50	GND
51	LPC_a_AD3
52	+V3.3SB



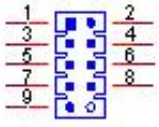
CN13	**Internal USB**
Part Number	1653003718
Footprint	HD_5x2P_79_RA_N10_21N22050
Description	PIN HEADER 5x2P 2.00mm 90D(M) SMD 21N22050
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



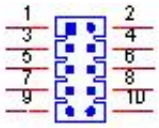
CN16	Internal USB
Part Number	1653003718
Footprint	HD_5x2P_79_RA_N10_21N22050
Description	PIN HEADER 5x2P 2.00mm 90D(M) SMD 21N22050
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



CN17	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

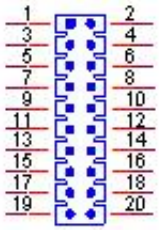


CN18	COM1
Part Number	1653003719
Footprint	HD_5x2P_79_RA_21N22050
Description	PIN HEADER 5x2P 2.00mm 90D(M) SMD 21N22050
Pin	Pin Name
1	DCD#
2	DTR#
3	RXD
4	RTS#
5	TXD
6	CTS#
7	DTR#
8	RI#
9	GND
10	GND

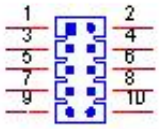


CN19	COM2/COM3
Part Number	1653003720
Footprint	HD_10x2P_79_RA
Description	PIN HEADER 10x2P 2.00mm 90D(M) SMD 21N22050-20J1
Pin	Pin Name
1	DCD2#
2	DSR2#
3	RXD2
4	RTS2#
5	TXD2
6	CTS2#
7	DTR2#
8	RI2#
9	GND
10	GND
11	DCD3#
12	DSR3#
13	RXD3
14	RTS3#
15	TXD3
16	CTS3#
17	DTR3#
18	RI3#
19	GND

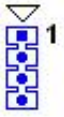
20	GND



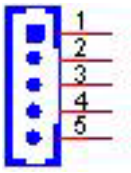
CN20	**LAN**
Part Number	1653003719
Footprint	HD_5x2P_79_RA_21N22050
Description	PIN HEADER 5x2P 2.00mm 90D(M) SMD 21N22050
Pin	Pin Name
1	GND
2	GND
3	LAN1_MDI3+
4	LAN1_MDI3-
5	LAN1_MDI2+
6	LAN1_MDI2-
7	LAN1_MDI1+
8	LAN1_MDI1-
9	LAN1_MDI0+
10	LAN1_MDI0-



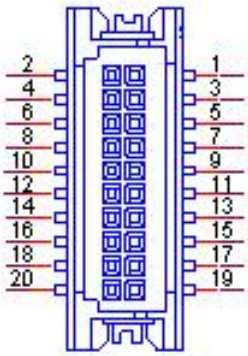
CN21	**LAN LED**
Part Number	1653004101
Footprint	HD_4x1P_79_D
Description	PIN HEADER 4x1P 2.0mm 180D(M) DIP 21N12050
Pin	Pin Name
1	+V3.3SB
2	LAN1_ACT#
3	LAN1_LINK100#
4	LAN1_LINK1000#



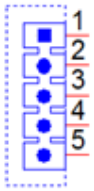
CN23	Inverter Power Output
Part Number	1655004802-01
Footprint	WF_5P_79_BOX_RA_D
Description	WAFER BOX 5P 2.0mm 90D(M) DIP 50387-0053N-001
Pin	Pin Name
1	+12V
2	GND
3	ENABKL
4	PWM
5	+5V



CN24	24 bits LVDS Panel
Part Number	1653910261
Footprint	SPH10X2
Description	B/B Conn 10x2P 1.25mm 180D(M)SMD DF13-20DP-1.25V
Pin	Pin Name
1	GND
2	GND
3	LVDS1_0_D0+
4	LVDS1_VCCON
5	LVDS1_0_D0-
6	NC
7	LVDS1_0_D1+
8	NC
9	LVDS1_0_D1-
10	NC
11	LVDS1_0_D2+
12	NC
13	LVDS1_0_D2-
14	NC
15	LVDS1_0_CLK+
16	LVDS1_0_D3+
17	LVDS1_0_CLK-
18	LVDS1_0_D3-
19	+5V or +3.3V
20	+5V or +3.3V



CN26	**SSD debug port**
Part Number	1653005101
Footprint	HD_5x1P_79_D
Description	PIN HEADER 5*1P 180D(M) SQUARE 2.0mm
Pin	Pin Name
1	SCIDOUT
2	SCIDIN
3	GND
4	SCIDCLK
5	+V3.3

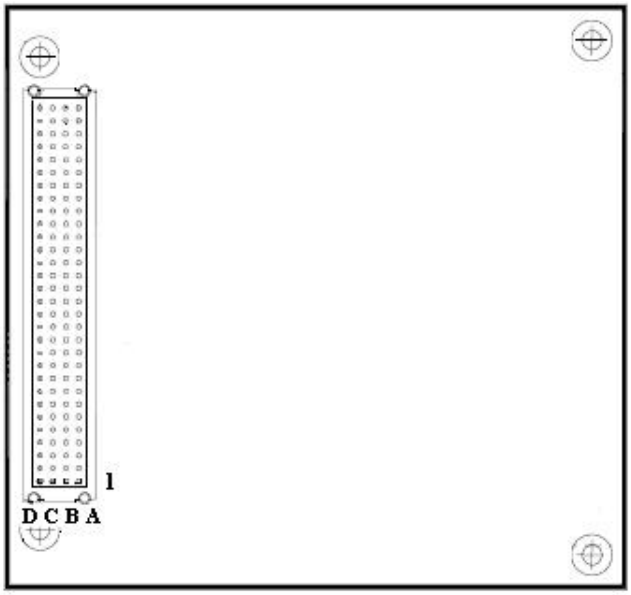


CN27	**PCI-104**
Part Number	1653130421
Footprint	PCI_PLUS_264-40303_PCM-3365
Description	PCB SKT 30x4P 2.00mm 180D(F) DIP 264-60303-12
Pin	Pin Name
PA1	GND
PA2	VI/O (+5V or +3.3V)
PA3	AD05
PA4	C/BE0#
PA5	GND
PA6	AD11
PA7	AD14
PA8	+3.3V
PA9	SERR#
PA10	GND
PA11	STOP#
PA12	+3.3V

PA13	FRAME#
PA14	GND
PA15	AD18
PA16	AD21
PA17	+3.3V
PA18	IDSEL0
PA19	AD24
PA20	GND
PA21	AD29
PA22	+5V
PA23	REQ0#
PA24	GND
PA25	GNT1#
PA26	+5V
PA27	CLK2
PA28	GND
PA29	+12V
PA30	-12V
PB1	NC
PB2	AD02
PB3	GND
PB4	AD07
PB5	AD09
PB6	VI/O (+5V or +3.3V)
PB7	AD13
PB8	C/BE1#
PB9	GND
PB10	PERR#
PB11	+3.3V
PB12	TRDY#
PB13	GND
PB14	AD16
PB15	+3.3V
PB16	AD20
PB17	AD23
PB18	GND
PB19	C/BE3#
PB20	AD26
PB21	+5V
PB22	AD30
PB23	GND
PB24	REQ2#
PB25	VI/O (+5V or +3.3V)
PB26	CLK0
PB27	+5V
PB28	INTD#
PB29	INTA#
PB30	REQ3#

PC1	+5V
PC2	AD01
PC3	AD04
PC4	GND
PC5	AD08
PC6	AD10
PC7	GND
PC8	AD15
PC9	NC
PC10	+3.3V
PC11	LOCK#
PC12	GND
PC13	IRDY#
PC14	+3.3V
PC15	AD17
PC16	GND
PC17	AD22
PC18	IDSEL1
PC19	VI/O (+5V or +3.3V)
PC20	AD25
PC21	AD28
PC22	GND
PC23	REQ1#
PC24	+5V
PC25	GNT2#
PC26	GND
PC27	CLK3
PC28	+5V
PC29	INTB#
PC30	GNT3#
PD1	AD00
PD2	+5V
PD3	AD03
PD4	AD06
PD5	GND
PD6	M66EN
PD7	AD12
PD8	+3.3V
PD9	PAR
PD10	NC
PD11	GND
PD12	DEVSEL#
PD13	+3.3V
PD14	C/BE2#
PD15	GND
PD16	AD19
PD17	+3.3V
PD18	IDSEL2

PD19	IDSEL3
PD20	GND
PD21	AD27
PD22	AD31
PD23	VI/O (+5V or +3.3V)
PD24	GNT0#
PD25	GND
PD26	CLK1
PD27	GND
PD28	RESET#
PD29	INTC#
PD30	GND



CN28	**PC104 32x2-pin**
Part Number	165313222B
Footprint	PC104_32x2P_100_EPT_H451_D
Description	PC/104 32x2P 2.54mm 180D(F) DIP 962-60322-12
Pin	Pin Name
PA1	ISA_IOCHCK#
PA2	ISA_SD7
PA3	ISA_SD6
PA4	ISA_SD5
PA5	ISA_SD4
PA6	ISA_SD3
PA7	ISA_SD2
PA8	ISA_SD1
PA9	ISA_SD0
PA10	ISA_IOCHRDY#
PA11	ISA_AEN
PA12	ISA_SA19

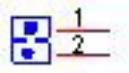
PA13	ISA_SA18
PA14	ISA_SA17
PA15	ISA_SA16
PA16	ISA_SA15
PA17	ISA_SA14
PA18	ISA_SA13
PA19	ISA_SA12
PA20	ISA_SA11
PA21	ISA_SA10
PA22	ISA_SA9
PA23	ISA_SA8
PA24	ISA_SA7
PA25	ISA_SA6
PA26	ISA_SA5
PA27	ISA_SA4
PA28	ISA_SA3
PA29	ISA_SA2
PA30	ISA_SA1
PA31	ISA_SA0
PA32	GND
PB1	GND
PB2	ISA_RSTDRV
PB3	+V5_ISA
PB4	ISA_IRQ9
PB5	-V5
PB6	ISA_DRQ2
PB7	-V12
PB8	ISA_NOWS#
PB9	+V12
PB10	GND
PB11	ISA_SMEMW#
PB12	ISA_SMEMR#
PB13	ISA_IOW#
PB14	ISA_IOR#
PB15	ISA_DACK#3
PB16	ISA_DRQ3
PB17	ISA_DACK#1
PB18	ISA_DRQ1
PB19	ISA_REFRESH#
PB20	ISA_a_BCLK
PB21	ISA_IRQ7
PB22	ISA_IRQ6
PB23	ISA_IRQ5
PB24	ISA_IRQ4
PB25	ISA_IRQ3
PB26	ISA_DACK#2
PB27	ISA_TC
PB28	ISA_ALE

PB29	+V5_ISA
PB30	CLK14M_a_ISACON
PB31	GND
PB32	GND

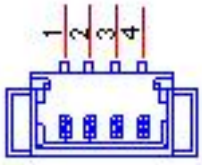
CN29	**PC104 20x2-pin**
Part Number	165312022B
Footprint	PC104_20x2P_100_EPT_H451_D
Description	PC/104 20x2P 2.54mm 180D(F) DIP 962-60202-12
Pin	Pin Name
PC1	GND
PC2	ISA_SBHE#
PC3	ISA_LA23
PC4	ISA_LA22
PC5	ISA_LA21
PC6	ISA_LA20
PC7	ISA_LA19
PC8	ISA_LA18
PC9	ISA_LA17
PC10	ISA_MEMR#
PC11	ISA_MEMW#
PC12	ISA_SD8
PC13	ISA_SD9
PC14	ISA_SD10
PC15	ISA_SD11
PC16	ISA_SD12
PC17	ISA_SD13
PC18	ISA_SD14
PC19	ISA_SD15
PC20	NC
PD1	GND
PD2	ISA_MEMCS16#
PD3	ISA_IOCS16#
PD4	ISA_IRQ10
PD5	ISA_IRQ11
PD6	ISA_IRQ12
PD7	ISA_IRQ15
PD8	ISA_IRQ14
PD9	ISA_DACK#0
PD10	ISA_DRQ0
PD11	ISA_DACK#5
PD12	ISA_DRQ5
PD13	ISA_DACK#6
PD14	ISA_DRQ6
PD15	ISA_DACK#7
PD16	ISA_DRQ7

PD17	+V5_ISA
PD18	ISA_MASTER#
PD19	GND
PD20	GND

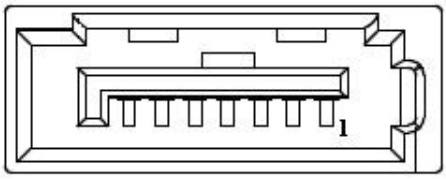
CN30	**Buzzer**
Part Number	1655902032
Footprint	WHL2V-125
Description	WAFER BOX 2P 1.25mm 180D(M) DIP 53047-0210
Pin	Pin Name
PC1	Buzzer_P
PC2	Buzzer_N



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



CN34	SATA
Part Number	1654004659
Footprint	SATA_7P_WATM-07DBN4A3B8UW_D
Description	Serial ATA 7P 1.27mm 180D(M) DIP WATM-07DBN4A3B8
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	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
61 – 67	Motherboard resources
70 - 77	System CMOS/real time clock
80 - 92	Motherboard resources
A0 – B1	Interrupt Controller
B2 – B3	Motherboard resources
B4 – BD	Interrupt Controller
272 – 273	Motherboard resources
2E8 – 2EF	COM3
2F8 – 2FF	COM2
3B0 – 3DF	Intel® HD Graphics
3F8 – 3FF	COM1
400 – 47F	Motherboard resources
4D0 – 4D1	Interrupt Controller
500 – 57F	Motherboard resources
A00 – A7F	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
D0400000 – D05FFFFF	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	USB Controller
IRQ6	Available
IRQ7	Communications Port (COM3)
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

Appendix C

Watchdog Timer Sample Code

C.1 Watchdog Timer sample code

```
EC_Command_Port = 0x29Ah
EC_Data_Port = 0x299h
Write EC HW ram = 0x89
Watch dog event flag = 0x57
Watchdog reset delay time = 0x5E
Reset event = 0x04
Start WDT function = 0x28
================================================
.model small
.486p
.stack 256
.data
.code
org 100h
.STARTup

mov dx, EC_Command_Port
mov al,89h          ;Write EC HW ram.
out dx,al

mov dx, EC_Data_Port
mov al, 5Fh         ;Watchdog reset delay time low byte (5Eh is high byte) index.
out dx,al

mov dx, EC_Data_Port
mov al, 30h         ;Set 3 seconds delay time.
out dx,al

mov dx, EC_Command_Port
mov al,89h          ;Write EC HW ram.
out dx,al

mov dx, EC_Data_Port
mov al, 57h         ;Watch dog event flag.
out dx,al

mov dx, EC_Data_Port
mov al, 04h          ;Reset event.
out dx,al

mov dx, EC_Command_Port
mov al,28h          ;Start WDT function.
out dx,al

.exit
END
```

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