

User Manual

PCA-6763

**AMD T16R ISA Half-size SBC
with Dual Independent Display/
Dual GbE/ SATA/ USB/m-SATA/
COM/LPT**

ADVANTECH

Enabling an Intelligent Planet

Copyright

The documentation and the software included with this product are copyrighted 2014 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

AMIBIOS is a trademark of American Megatrends Inc.

Nuvoton is a trademark of Nuvoton Technology Corp.

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

Product Warranty (2 years)

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

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

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise 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

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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.*

A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known.

Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

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.



廢電池請回收



Memory Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Memory	Advantech PN
Transcend	1GB	DDR3 1066	SODIMM DDR3	N	TS128MSK64V1U	SEC K4B1G0846G- BCH9	96SD3- 1G1066NN-TR
Transcend	2GB	DDR3 1066	SODIMM DDR3	N	TS128MSK64V1U	SEC HCH9 K4B1G0846D (128x8)	96SD3- 2G1066NN-TR
Transcend	4GB	DDR3 1066	SODIMM DDR3	N	TS7KSN28420-1Y	HYNIX H5TQ2G83BFR (256x8)	96SD3- 4G1066NN-TR

Warning! Due to limited compatibility of onboard memory, Strongly suggest to choose above memory DIMM when extra 4GB is required.



Backplane Support

P/N	Segment	Slot	Size
PCA-6104-0C2E	1	4 ISA	94.7 x 186 mm (3.7" x 7.3")
PCA-6106-0B2E	1	6 ISA	142 x 175 mm (5.59" x 6.89")
PCA-6108E-0B2E	1	8 ISA	180 x 190 mm (7.09" x 7.48")

Operating System Support

Win XP(32/64), Win7, Linux, DOS, XPE, WinCE6.0, WinCE 7.0

Initial Inspection

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

- 1 PCA-6763 PICMG 1.0 Half-size single board computer
- 1 PCA-6763 startup manual P/N: 2006A67600
- 1 CD with utility P/N: 2066A67600
- 1 Serial ATA HDD data cable P/N: 1700003194
- 1 Serial ATA HDD power cable P/N: 1703150102
- 1 two-port COM cable (G2 SKU) P/N: 1700008762
- 1 LPT cable (G2 SKU) P/N: 1700002223
- 1 LPT+COM cable kit (VG SKU) P/N: 1700008954
- 1 four-port USB cable P/N: 1700014398
- Y cable for PS/2 keyboard, PS/2 mouse P/N: 1700060202
- ATX feature cable P/N: 1700002343
- 1 warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected PCA-6763 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack PCA-6763, check it for signs of shipping damage. If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter 1	Hardware Configuration.....	1
1.1	Introduction	2
1.2	Features & Benefits.....	2
1.3	Specifications	3
1.3.1	System	3
1.3.2	Memory	3
1.3.3	Input/Output	3
1.3.4	Graphics.....	4
1.3.5	Ethernet LAN	4
1.3.6	Industrial features	4
1.3.7	Mechanical and environmental specifications.....	4
1.4	Jumpers and Connectors	5
	Table 1.1: Jumper list	5
	Table 1.2: Connectors	5
1.5	Board Layout: Jumper and Connector Locations.....	6
	Figure 1.1 Jumper and connector locations.....	6
1.6	Block Diagram.....	7
	Figure 1.2 PCA-6763 Block Diagram.....	7
1.7	Safety Precautions	7
1.8	Jumper Settings	8
1.8.1	How to set jumpers	8
1.8.2	BIOS CMOS (JCMOS1).....	8
	Table 1.3: Clear BIOS CMOS (JCMOS1).....	8
1.8.3	AT/ATX mode HW selection (ATXF1).....	8
	Table 1.4: AT/ATX Mode HW Selection (ATXF1).....	8
1.8.4	LVDS Backlight setting (JVBR1) and LVDS panel voltage selection (JLVDS1)	9
	Table 1.5: LVDS Backlight Setting (VBR1).....	9
	Table 1.6: LVDS panel voltage selection (JLVDS1)	9
1.8.5	Hardware monitor alarm (JOBS1) and Watchdog timer output (JWDT1).....	10
	Table 1.7: H/W monitor alarm and Watchdog timer (JOBS1+JWDT1).....	10
1.9	Keyboard Lock and Buzzer Setting.....	10
	Table 1.8: Keyboard lock (KL1)	10
	Table 1.9: Buzzer setting (BZ1).....	10
Chapter 2	Connecting Peripherals	11
2.1	Introduction	12
2.2	Parallel Port (LPT1).....	12
2.3	USB Ports (USB12, USB34, USB56, USB7)	13
2.4	VGA Connector (VGA1)	13
2.5	DVI Connector (DVI 1)	14
2.6	LVDS (LVDS1)	14
2.7	LCD Inverter Connector (INV1).....	15
2.8	Serial Ports (COM12).....	16
2.9	PS/2 Keyboard and Mouse Connector (KBMS1)	16
2.10	Front Panel Connectors (JFP1)	17
	Table 2.1: Power LED status	17
2.11	H/W Monitor/Watchdog Timer/Infrared	18
2.11.1	H/W monitor alarm (JOBS1)	18
2.11.2	Watchdog timer (JWDT1)	18
2.11.3	Infrared interface (JIR1)	18

2.12	LAN Ports (LAN1 & LAN2).....	19
	Table 2.2: LAN LED Indicators.....	19
2.13	High Definition Audio Module Interface (HDAUD1)	20
	Figure 2.1 Jumper and connector locations of PCA-AUDIO-HDA1E	21
2.14	GPIO Header (GPIO1).....	22
2.15	Case Open Connector (JCASE1)	22
2.16	Front Panel LAN Indicator Connector (LANLED1).....	23
	Table 2.3: LAN LED Indicators.....	23
2.17	Serial ATA Interface (SATA1~SATA3).....	24
2.18	LPC Extension Interface (LPC1).....	24
2.19	12/5v power connector (PWR1).....	25
2.20	PC/104.....	25
Chapter 3	AMI BIOS Setup.....	27
3.1	Introduction	28
	Figure 3.1 Setup program initial screen.....	28
3.2	Entering Setup	29
3.2.1	Main Setup.....	29
	Figure 3.2 Main setup screen	29
3.2.2	Advanced BIOS Features Setup.....	30
3.2.3	Chipset Configuration	43
3.2.4	Boot Configuration	48
3.2.5	Security Configuration	49
3.2.6	Save & Exit	50
Chapter 4	Value-Added Software Services	51
4.1	Value-Added Software Services	52
4.1.1	Software API.....	52
Chapter 5	Chipset Software Installation Utility	53
5.1	Before You Begin.....	54
5.2	Windows® XP / Windows® 7 Driver Setup.....	54
Chapter 6	LAN Configuration	55
6.1	Introduction	56
6.2	Win XP /Win 7 Driver Setup (LAN)	56
Appendix A	Programming the Watchdog Timer .	57
A.1	Introduction	58
A.1.1	Watchdog timer overview	58
A.1.2	Programming the watchdog timer.....	58
	Table A.1: Watchdog timer registers	59
A.1.3	Example program	60
Appendix B	I/O Pin Assignments	65
B.1	Parallel Port Connector (LPT1).....	66
	Table B.1: Parallel port connector (LPT1)	66
B.2	VGA Connector (VGA1).....	66

	Table B.2: VGA connector (VGA1)	66
B.3	RS 232 Serial Port (G2: COM12, VG: COM1)	67
	Table B.3: RS-232 serial port (COM12).....	67
	Table B.4: RS-232 Serial Port (VG:COM1).....	68
B.4	USB 2.0 Header (USB12~56)	68
	Table B.5: USB Header (USB12~56, take USB 12 as example).....	68
B.5	PS/2 Keyboard/Mouse Connector (KBMS1)	69
	Table B.6: PS/2 keyboard/mouse connector (KBMS1).....	69
B.6	CPU Fan Power Connector (CPUFAN1)	69
	Table B.7: CPU fan power connector (CPUFAN1)	69
B.7	Reset Connector (JFP1 / RESET)	70
	Table B.8: Reset connector (FP1 / RESET)	70
B.8	Hi-definition Audio Link Connector (HDAUD1).....	70
	Table B.9: Hi-definition audio link connector (HDAUD1)	70
B.9	LAN1 and LAN2 LED Connector (LANLED1)	71
	Table B.10:LAN1 and LAN2 LED connector (LANLED1)	71
B.10	GPIO Header (GPIO1)	71
	Table B.11:GPIO header (GPIO1)	71
B.11	JIR1	72
	Table B.12:JIR1	72
B.12	JCASE1.....	72
	Table B.13:JCASE1	72
B.13	LPC1	73
	Table B.14:LPC1.....	73
B.14	PWR1.....	73
	Table B.15:PWR1	73
B.15	DVI1	74
	Table B.16:DVI1.....	74
B.16	LVDS1.....	75
B.17	System I/O Ports	76
	Table B.17:System I/O ports.....	76
B.18	DMA Channel Assignments	76
	Table B.18:DMA channel assignments.....	76
B.19	Interrupt Assignments	77
	Table B.19:Interrupt Assignments.....	77
B.20	1st MB Memory Map	77
	Table B.20:1st MB memory map	77

Appendix C Programming the GPIO79

C.1	Supported GPIO Register	80
C.2	GPIO Registers	80
C.3	GPIO Example Program-1	80

Chapter 1

Hardware
Configuration

1.1 Introduction

PCA-6763 is an AMD G-series T16R based, fanless ISA half-size single board computer. With AMD's fully legacy support, the product provides completed ISA function and is compatible with a variety of operation systems, such as, Win CE6.0, XPE, Windows XP and Windows 7, offering customers an ideal solution in manufacturing and factory automation.

Besides completed ISA and PC/104 support, the single board computer designed with onboard memory, m-SATA and fanless thermal module targets especially in low power and vibration concerned applications, such as motion control, and entry-level CNC. For customer requiring more than one GbE LAN and 1GB onboard memory, the model offers dual LAN SKU and extra SO-DIMM socket (up to 4GB) to get better flexibility.

As for I/O support, the single board computer provides four SATA III interface (600MB/s) for mainstream SSD, HDD, and ODD connections. It also has up to seven USB 2.0 ports for USB devices. Additionally, the two RS-232 ports can be used as reliable legacy device control interfaces. Users can purchase Advantech COM module (P/N: PCA-COM485-00A1E and PCA-COM232-00A1E) to have four extra serial ports with auto flow control capability.

In addition to board-level products, Advantech also offers a series of small form-factor wall-mount chassis. With the low power, compact sized, high-reliability, and system-level solutions, PCA-6763 is the ideal computing platform for modern industrial applications.

1.2 Features & Benefits

Features	Benefits
Fanless thermal design	Fanless design provides better product MTBF, and it also helps system integrators to build a quiet industrial environment.
Memory onboard design	The features targets especially for vibration concerned applications, such as motion control, and entry-level CNC, avoiding system shut down caused by memory DIMM disconnection or hard disk broken.
m-SATA support	
ISA and PC/104 support	With AMD's fully ISA support, PCA-6763 offers a completed ISA expansion for a variety of industrial applications.
Legacy I/O support	PCA-6763 supports one floppy disk, up to six COM232 ports/ four COM485 ports for legacy equipment connections (such as PLC).
DOS, Windows XP and WinCE support	With good OS compatibility, PCA-6763 offers a variety of OS support, including DOS and Windows embedded OS.

1.3 Specifications

1.3.1 System

- **CPU:** AMD G-Series Accelerated processing unit
- **L2 Cache:** 512 KB
- **BIOS:** AMI-EFI 32 Mbit SPI
- **System Chipset:** AMD Fusion controller hub A55E
- **ACPI Sleep state:** S4, S5

Note! AMD G-series APUs do not support S1.



1.3.2 Memory

- **RAM:** DDR3 1066 1GB onboard + DDR3 1066 up to 4GB on 1x204-pin SO-DIMM socket. (Due to limited compatibility of onboard memory, strongly suggest to choose memory DIMM listed in page.iv when extra 4GB is required.)

1.3.3 Input/Output

- **Backplane Support:** PCA-6104-0C2E, PCA-6106-0B2E, PCA-6108E-0B2E (For detailed information, please refer to backplane support list).
- **Enhanced parallel port:** This EPP/SPP/ECP port can be configured to LPT1, LPT2, LPT3 or disabled
- **Serial ports:** Two RS-232 serial ports on board. Extra four RS-232 or RS 422/485 serial ports supported by optional COM module via low pin count connector (P/N: PCA-COM232-00A1E/PCA-COM485-00A1E)
- **PS/2 keyboard and mouse connector:** 1 (6-pin DIN socket on bracket for PS/2 keyboard and mouse)
- **USB port:**
 - G2 SKU: USB 2.0 x7 (1 on bracket, 6 onboard)
 - VG SKU: USB 2.0 x6 (6 on board)
- **SATA:** Four SATA 3.0 ports (600 MB/s)
- **m-SATA:** One m-SATA device (600MB/s)
- **Floppy Disk Drive Interface:** One floppy drives, 5 1/4 (360KB and 1.2 MB), and/or 3 1/2 (720KB, and 1.44 MB) BIOS enable/ disable
- **HD audio:** One HD AUDIO interface for optional module: PCA-AUDIO-HDA1E
- **Low pin count:** One low pin count connector for optional module: PCA-COM232-00A1E/PCA-COM485-00A1E/PCA-TPM-00A1E
- **GPIO:** 8-bit GPIO support
- **ISA & PC/104:** Support full 16-bit ISA bus interface and one PC/104 connector

Note! UEFI BIOS code do not support ISA VGA expansion cards.



1.3.4 Graphics

- **Controller:** APU integrated (AMD GPU Radeon HD 6250)
- **Display memory:** Optimized shared memory architecture up to 384 MB system memory
- **Dual display support:** G2 SKU: Choosing two interface from VGA (Default), LVDS, and DVI
- **CRT:** Resolution can be up to 1920 x 1200 @60Hz
- **DVI (G2 SKU):** Resolution can be up to 1920 x 1200 @60Hz (Please place order on optional DVI cable: 1700008822)
- **LVDS:**
 - G2 SKU: 48 bit (Dual channel 24 bit) LVDS up to 1920 x 1200 @ 60Hz
 - VG SKU: 18 bit LVDS up to 1024 x 768@60Hz

1.3.5 Ethernet LAN

- G2 SKU: Supporting dual 10/100/1000 Mbps Ethernet ports with Realtek RTL8111E-VL-CG.
- VG SKU: Supporting single 10/100/1000 Mbps Ethernet port with Realtek RTL8111E-VL-CG.

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, +12 V, +5 V_{SB}
- **Power consumption:**

Voltage (V)	3.3	5	12	5VSB
Current (A)	1.54	1.05	3.8	0.24
Power consumption (W)	5.173	5.304	45.866	1.203
- **Board size:** 185 mm (L) X 122 mm (W) (7.3" x 4.8")
- **Board weight:** 0.33 kg

1.4 Jumpers and Connectors

Connectors on PCA-6763 single board computer link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumper list

Label	Function
JCMOS1	CMOS clear
JOBS1+JWDT1	Hardware monitor alarm+watchdog timer output selection
BZ1	Buzzer setting
KL1	Keyboard lock
ATXF1	AT/ATX mode selection
JVBR1	LVDS backlight setting
JLVDS1	LVDS panel voltage selection

Table 1.2: Connectors

Label	Function
LPT1	Parallel port, supports SPP/EPP/ECP mode
LAN1	Realtek RTL8111E-VL-CG
LAN2 (G2 SKU only)	Realtek RTL8111E-VL-CG
VGA1	VGA connector
KBMS1	External keyboard/mouse connector
KBMS2	Internal keyboard/mouse connector
COM12	Box header for RS-232*2
JIR1	Infrared connector
JFP1	Power Switch / Reset connector
JCASE1	Case Open
LANLED1	LAN1/2 LED connector
HDAUD1	HD audio extension module connector
USB12	USB port 1, 2
USB34	USB port 3, 4
USB56	USB port 5, 6
USB7	USB port 7
SATA1-4	Serial ATA 1-4 (SATA 3.0)
FDD1	Floppy drive connector
DIMMA1	Memory connector channel A
GPIO1	GPIO pin header
LPC1	Low pin count module expansion pin header
PWR1	12 V, 5 V power connector
DVI1	DVI connector
LVDS1	LVDS connector
INV1	LVDS inverter connector
SMBUS1	SMBUS connector
PC-104	PC/ 104 connector

1.5 Board Layout: Jumper and Connector Locations

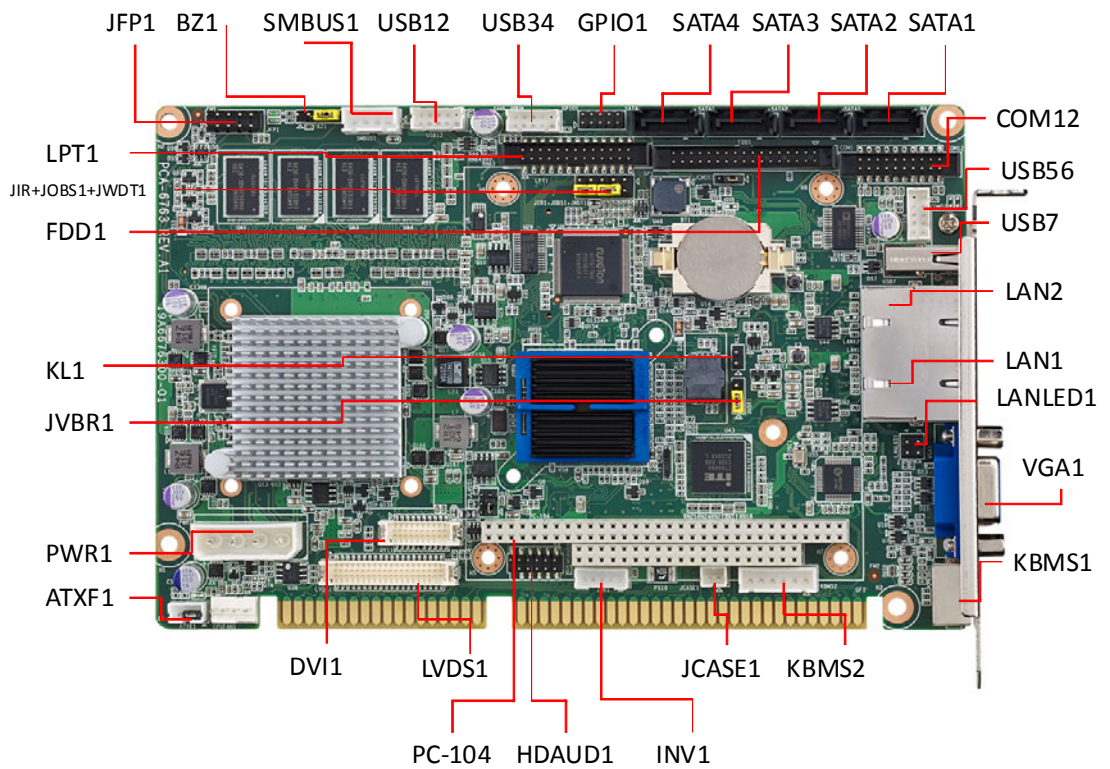


Figure 1.1 Jumper and connector locations

1.6 Block Diagram

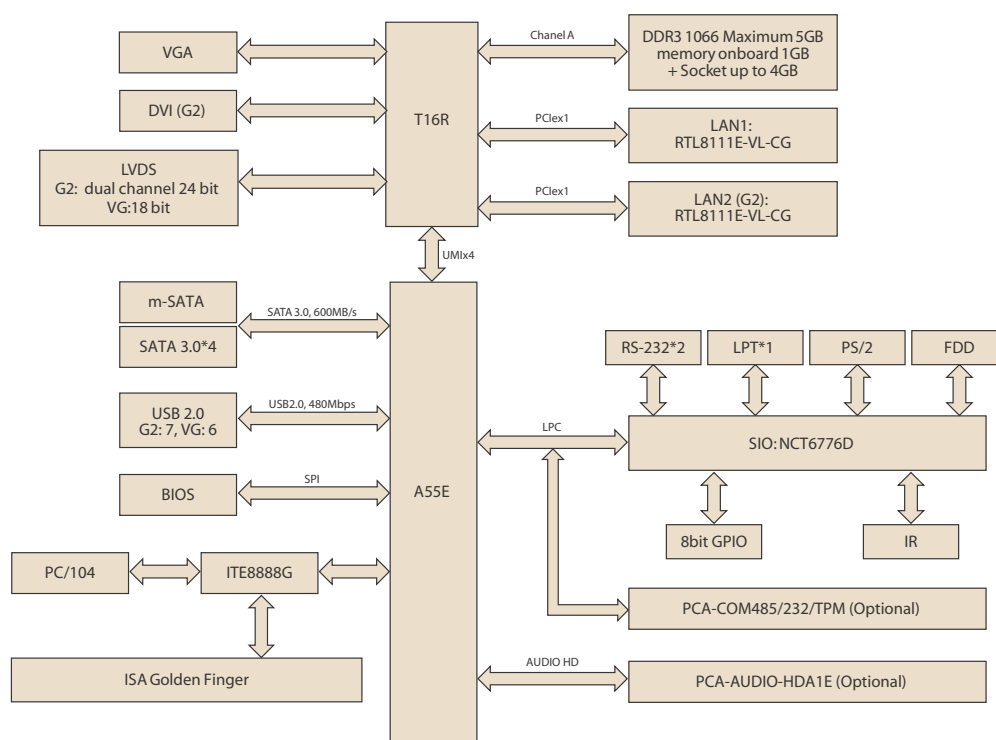


Figure 1.2 PCA-6763 Block Diagram

1.7 Safety Precautions

Warning! Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Caution! Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electrical discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.



Caution! The computer is provided with a battery-powered Real-time Clock. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



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.



1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard's default settings and your options for each jumper.

1.8.1 How to set jumpers

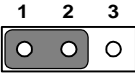
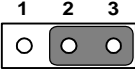
You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 BIOS CMOS (JCMOS1)

PCA-6763 CPU card contains a jumper that can erase BIOS CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset those data, set JCMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its last status or default setting.

Please note that both date and time information will be reset after short pin 2-3.

Table 1.3: Clear BIOS CMOS (JCMOS1)

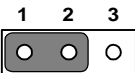
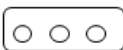
Function	Jumper Setting
*Keep BIOS CMOS data	 1-2 closed
Clear BIOS CMOS data	 2-3 closed
* Default setting	

1.8.3 AT/ATX mode HW selection (ATXF1)

The PCA-6763 can support an advanced soft power switch function. When using an ATX power supply, please follow the instructions below to enable ATX functions.

1. Find ATX feature cable (1700002343).
2. Connect the 3-pin plug of the cable to ATXF1 (ATX feature connector). And connect another plug to backplane HCN1 connector.
3. Connect the power on/off button cable of the chassis to pin 9 and pin 10 of JFP1. Default value is set ATXF1 to short pin1-2 to support AT power.

Table 1.4: AT/ATX Mode HW Selection (ATXF1)

Function	Jumper Setting
*AT mode	 1-2 closed
ATX mode	 Connecting to backplane with cable: 1700002343
* Default setting	

1.8.4 LVDS Backlight setting (JVBR1) and LVDS panel voltage selection (JLVDS1)

PCA-6763 with 18/ dual 24 bit panel offers jumper to set backlight mode and panel voltage.

Table 1.5: LVDS Backlight Setting (VBR1)

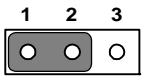
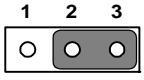
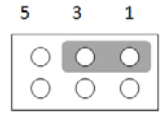
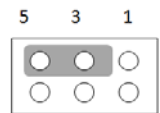
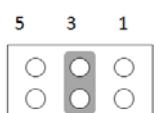
Function	Jumper Setting
* Linear way to control brightness	 1 2 3 1-2 closed
PWM to control brightness	 1 2 3 2-3 closed
* Default setting	

Table 1.6: LVDS panel voltage selection (JLVDS1)

Function	Jumper Setting
* 3.3V	 5 3 1 6 4 2 1-3 closed
5V	 5 3 1 6 4 2 3-5 closed
12V	 5 3 1 6 4 2 3-4 closed
* Default setting	

1.8.5 Hardware monitor alarm (JOBS1) and Watchdog timer output (JWDT1)

PCA-6763 contains a watchdog timer that will reset the CPU in the event the CPU stops processing. This feature means PCA-6763 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

PCA-6763 also provide jumper: JOBS1 to enable or disable hardware monitor function.

Table 1.7: H/W monitor alarm and Watchdog timer (JOBS1+JWDT1)

Function	Jumper Setting
*Enable watchdog timer	
*Enable H/W monitor alarm	
*default setting	

1.9 Keyboard Lock and Buzzer Setting

PCA-6763 provides jumpers for customer to enable keyboard lock and buzzer via hardware settings.

Table 1.8: Keyboard lock (KL1)

Function	Jumper Setting
*Disable keyboard lock	
Enable keyboard lock	
* default setting	

Table 1.9: Buzzer setting (BZ1)

Function	Jumper Setting
Connecting to external speaker	Connect 1 & 4
*Enable buzzer	
* default setting	

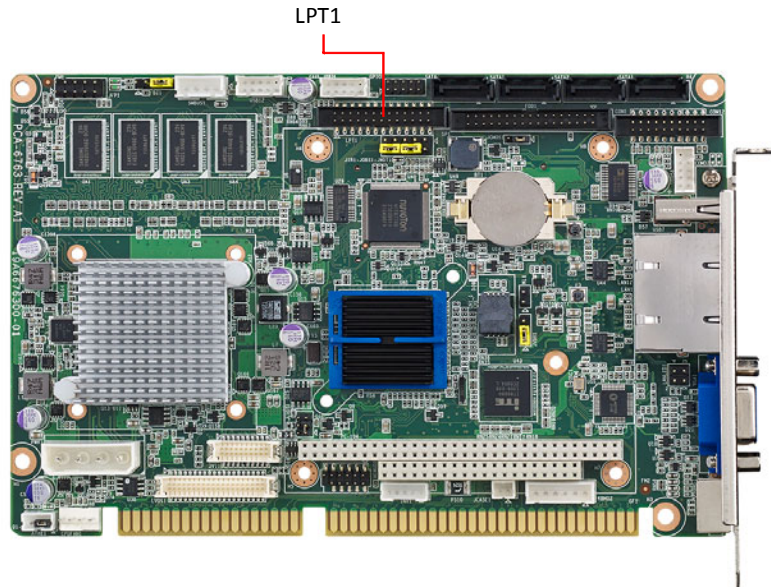
Chapter 2

Connecting
Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

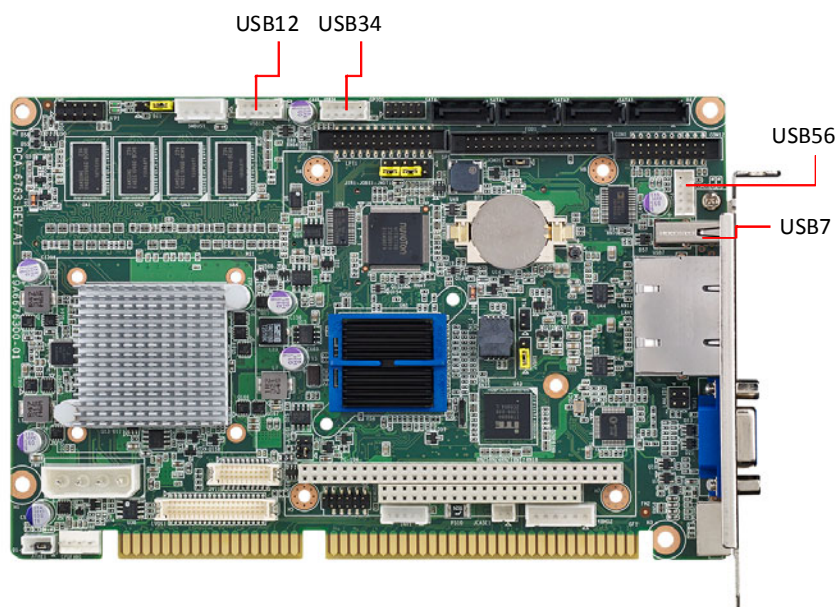
2.2 Parallel Port (LPT1)



The parallel port is normally used to connect the motherboard to a printer. PCA-6763 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1.

2.3 USB Ports (USB12, USB34, USB56, USB7)

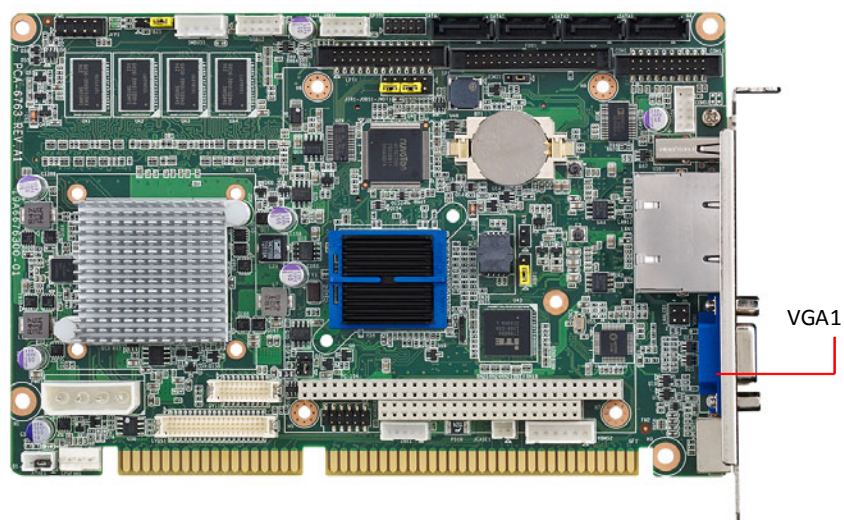
PCA-6763 provides up to 7 USB (Universal Serial Bus) on-board ports with complete Plug & Play and hot swap support for up to 127 external devices. These USB ports comply with USB Specification 2.0, support transfer rates up to 480 Mbps. USB 1-6 ports are located on board with box header and USB7 (G2) is on rear I/O bracket. The USB interface can be disabled in the system BIOS setup.



2.4 VGA Connector (VGA1)

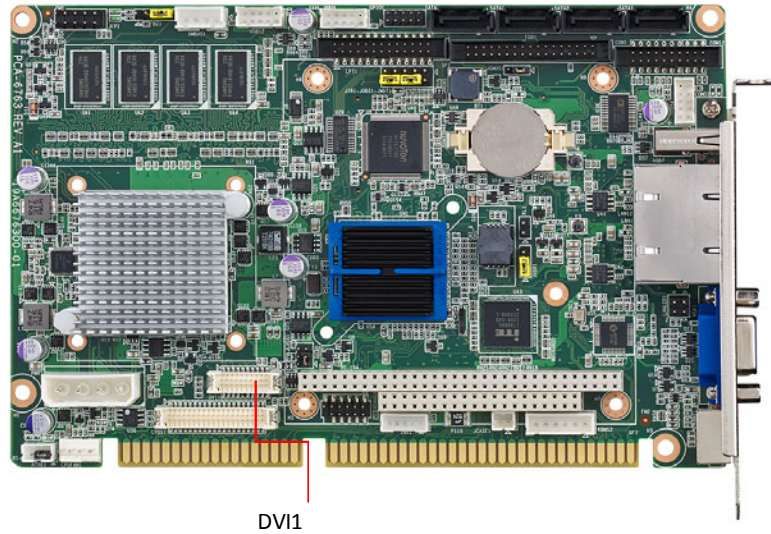
This CPU card has VGA outputs that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA.

AMD driver can help for both VGA extended and clone mode settings under Windows XP.



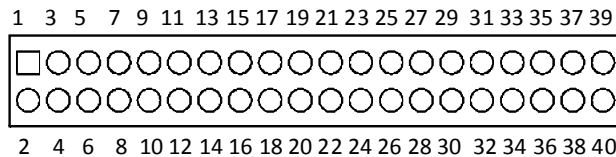
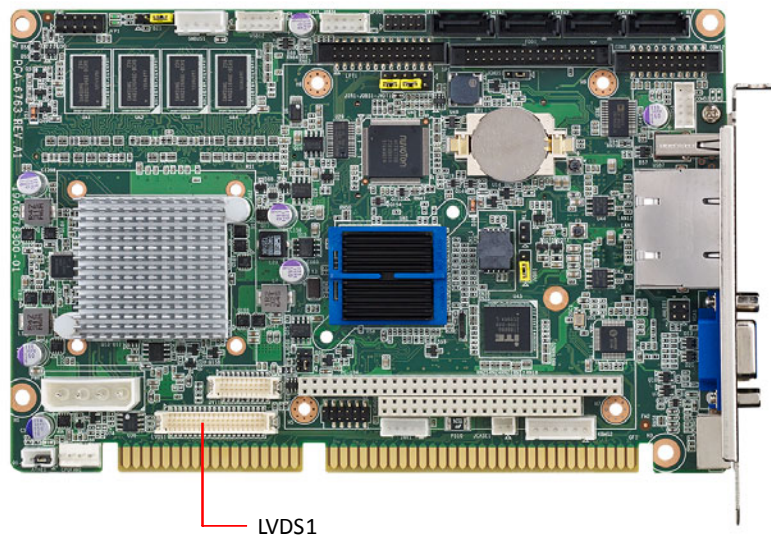
2.5 DVI Connector (DVI 1)

DVI 1 is a 20-pin connector, supporting resolution up to 1920x1080. Please place order no. 1700008822 for standard DVI connector on bracket.



2.6 LVDS (LVDS1)

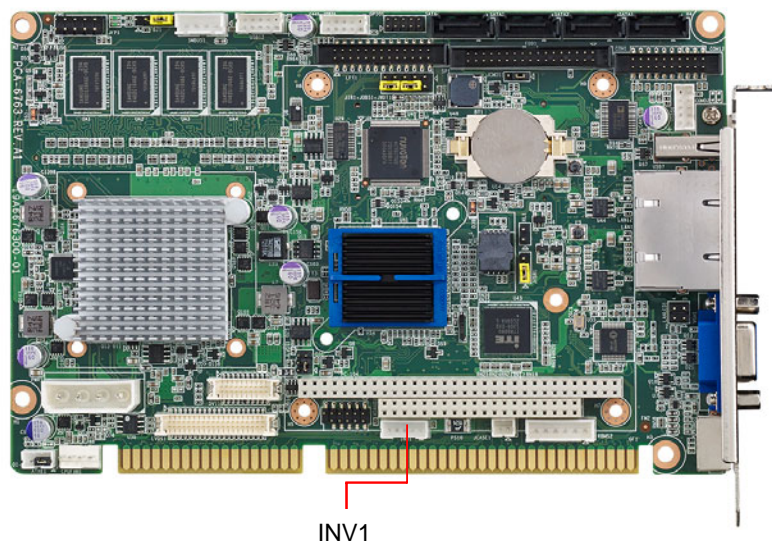
For G2 SKU, LVDS1 for dual channel 24-bit LVDS panel, and for VG SKU, LVDS1 is for 18-bit panel. Please check the pin define before installing your panel.



Pin	Signal	Pin	Signal
1	+V_LCD	21	LVDS0_D2+
2	+V_LCD	22	LVDS1_D2+
3	GND	23	GND
4	GND	24	GND
5	+V_LCD	25	LVDS0_CLK-
6	+V_LCD	26	LVDS1_CLK-
7	LVDS0_D0-	27	LVDS0_CLK+
8	LVDS1_D0-	28	LVDS1_CLK+
9	LVDS0_D0+	29	GND
10	LVDS1_D0+	30	GND
11	GND	31	LVDS0_DDC_CLK
12	GND	32	LVDS0_DDC_DAT
13	LVDS0_D1-	33	GND
14	LVDS1_D1-	34	GND
15	LVDS0_D1+	35	LVDS0_D3-
16	LVDS1_D1+	36	LVDS1_D3-
17	GND	37	LVDS0_D3+
18	GND	38	LVDS1_D3+
19	LVDS0_D2-	39	LVDS0_ENABKL
20	LVDS1_D2-	40	GND

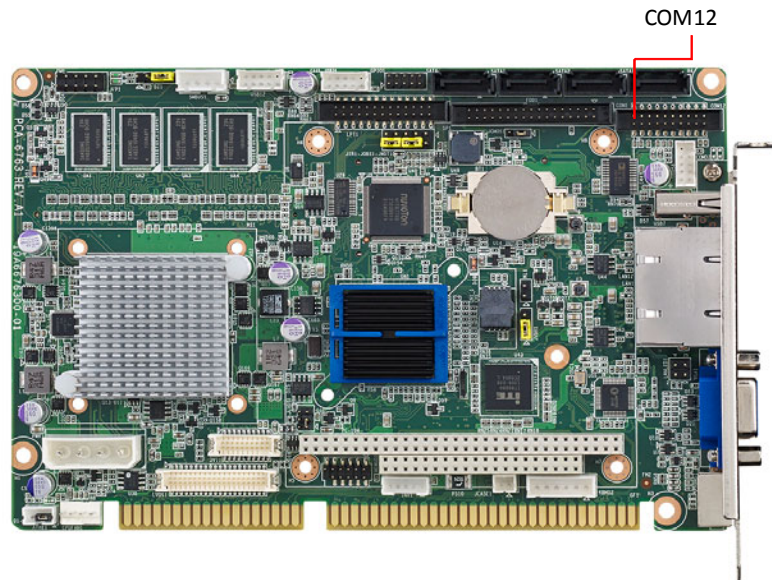
2.7 LCD Inverter Connector (INV1)

PCA-6763 provide a LCD panel inverter connector, INV1. Users can select the voltage from jumper: JLVDS1 from 3.3V, 5V to 12V.



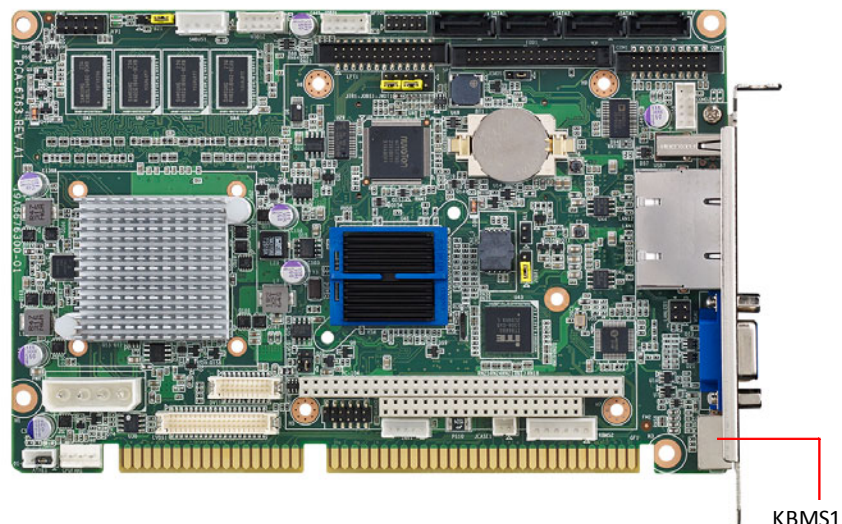
2.8 Serial Ports (COM12)

PCA-6763 offers two serial ports. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network. The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.



2.9 PS/2 Keyboard and Mouse Connector (KBMS1)

Two on-board 6-pin mini-DIN connectors (KBMS1) provide connection to PS/2 keyboard.



2.10 Front Panel Connectors (JFP1)

FP1 is a 10-pin connector which connects to the front panel switch to control system power on/off and reset.

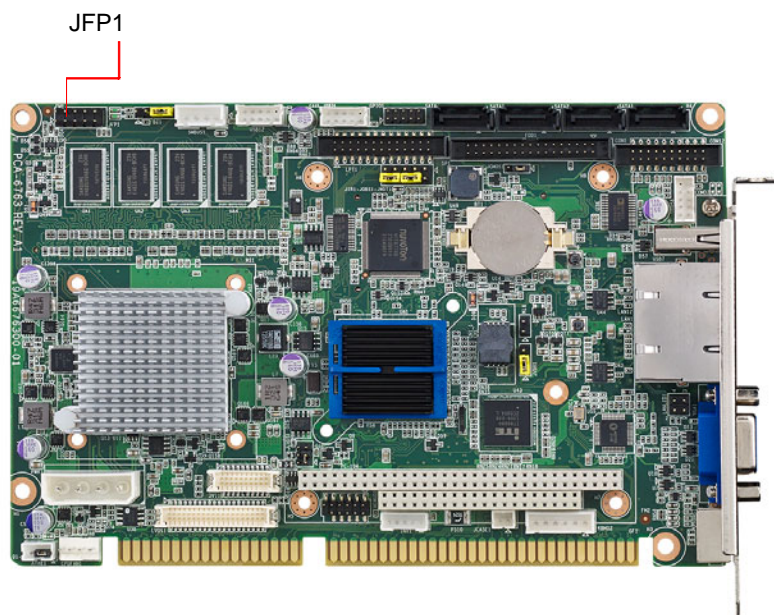
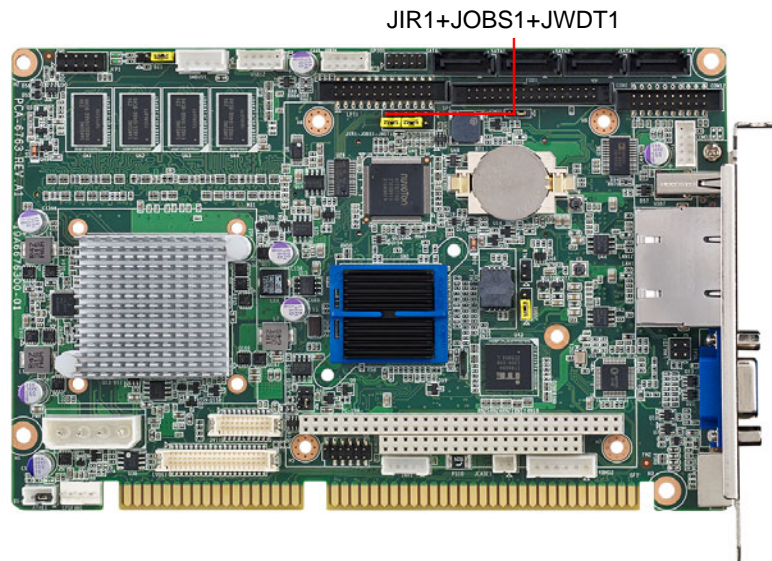


Table 2.1: Power LED status

Power mode	LED
System On	On
System Suspend	Fast flashes
System Off	Off
System Off in deep sleep	Off

2.11 H/W Monitor/Watchdog Timer/Infrared



JWDT1		JOBS1		
2	4	6	8	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	3	5	7	9

JIR1

2.11.1 H/W monitor alarm (JOBS1)

This 2-pin header is for enabling/disabling H/W monitor alarm function.

8-10 Closed: Enables hardware monitor alarm (Default)

8-10 Open: Disables hardware monitor alarm

2.11.2 Watchdog timer (JWDT1)

This is for an setting action trigger on the watchdog timer.

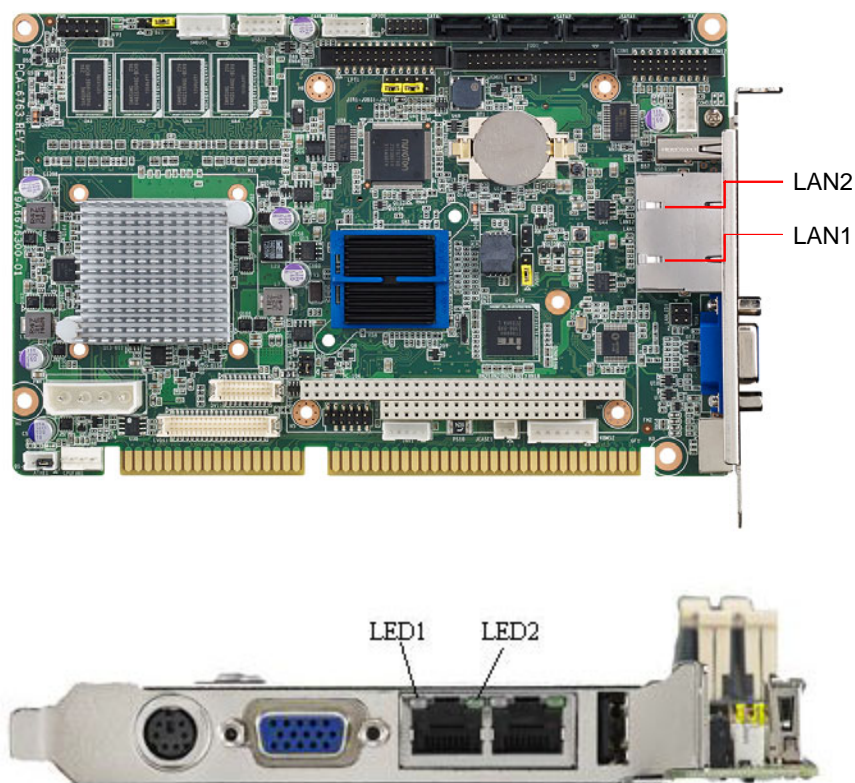
4-6 Close: Enable watchdog timer (Default)

4-6 Open: No action

2.11.3 Infrared interface (JIR1)

This is a 5-pin header for an infrared device.

2.12 LAN Ports (LAN1 & LAN2)

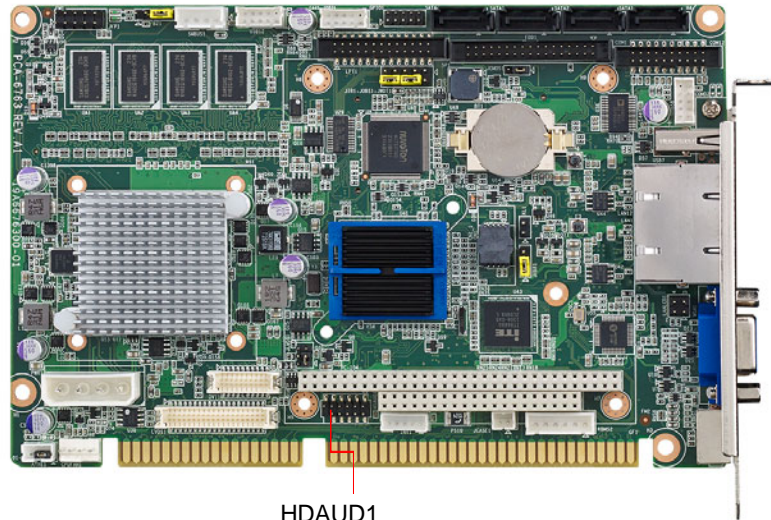


PCA-6763 is equipped with one or two high-performance 1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient connectivity.

Table 2.2: LAN LED Indicators

LAN Mode	LED1	LED2
1000Mbps Link On	Green On	On
1000Mbps Active	Green on	Flash
1000Mbps Link Off	Off	Off
100Mbps Link On	Orange On	On
100Mbps Active	Orange On	Flash
100Mbps Link Off	Off	Off
10Mbps Link On	Off	On
10Mbps Active	Off	Flash
10Mbps Link Off	Off	Off

2.13 High Definition Audio Module Interface (HDAUD1)



HDAUD1

This HDAUD1 pin header is the connection interface to Advantech's 7.1 channel high definition audio module.

Note! Advantech 7.1 channel high definition audio module ordering information.



P/N: PCA-AUDIO-HDA1E

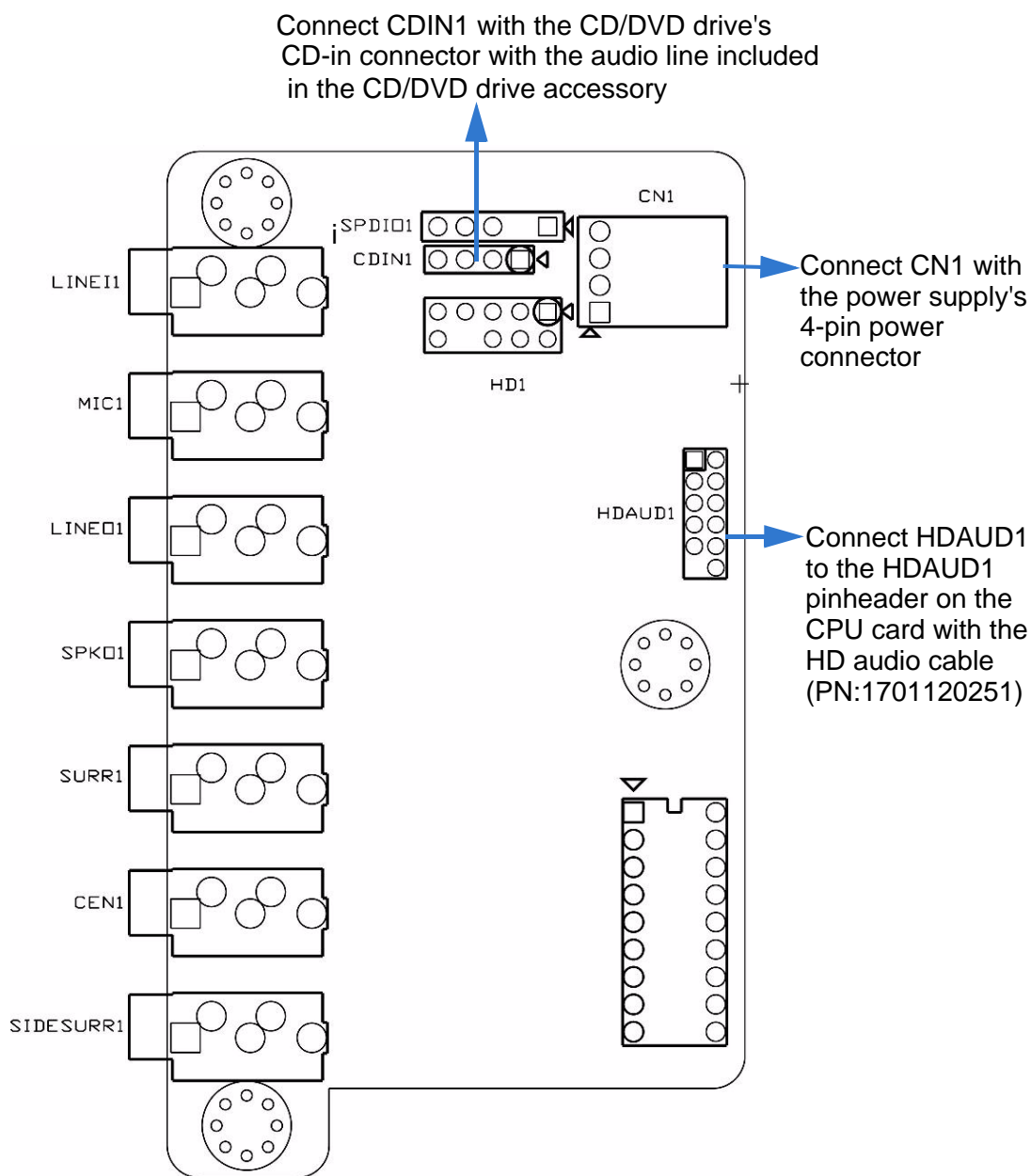
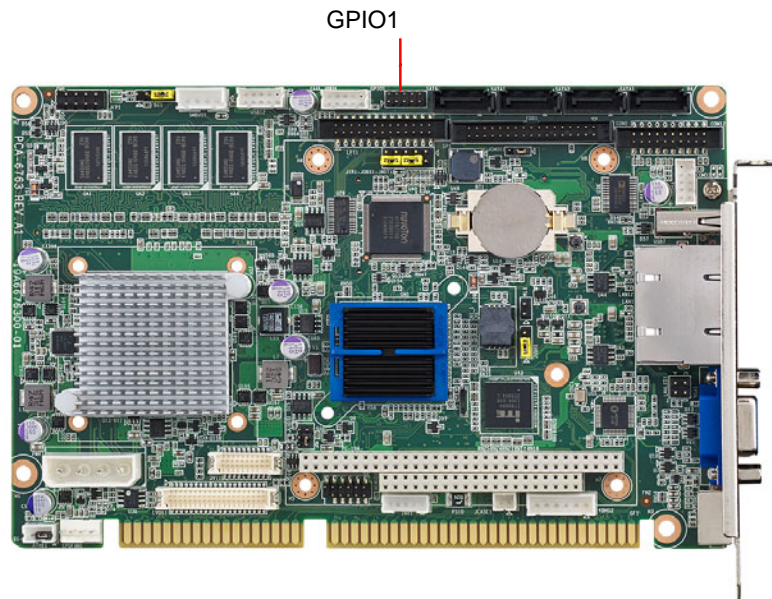


Figure 2.1 Jumper and connector locations of PCA-AUDIO-HDA1E

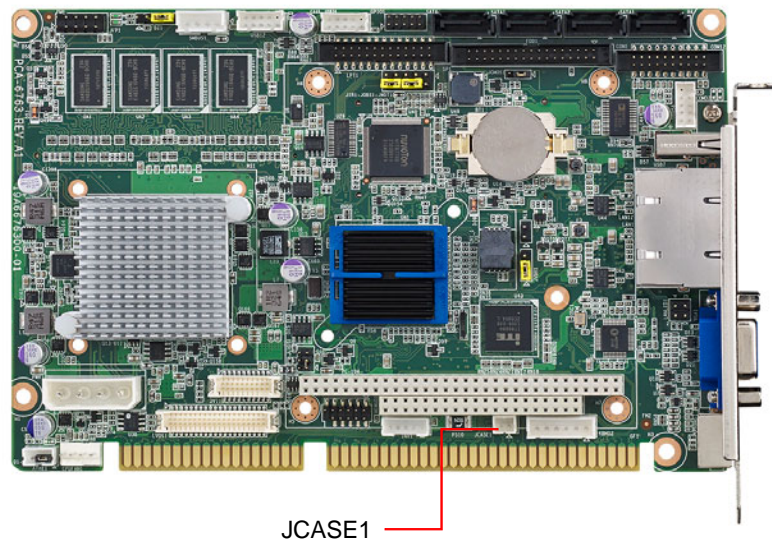
2.14 GPIO Header (GPIO1)

PCA-6763 provides 10-Pin pin header for 8-bit Digital I/O usage. Refer to Appendix B for detailed information on the pin assignments and programming guide in Appendix C.



2.15 Case Open Connector (JCASE1)

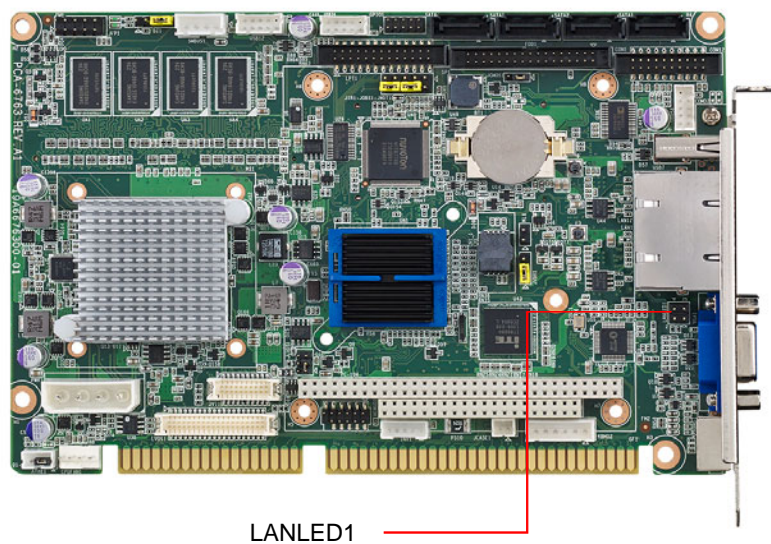
The 2-pin case open connector is for chassis with a case open sensor. When the case is open, the buzzer on motherboard will beep.



2.16 Front Panel LAN Indicator Connector (LANLED1)

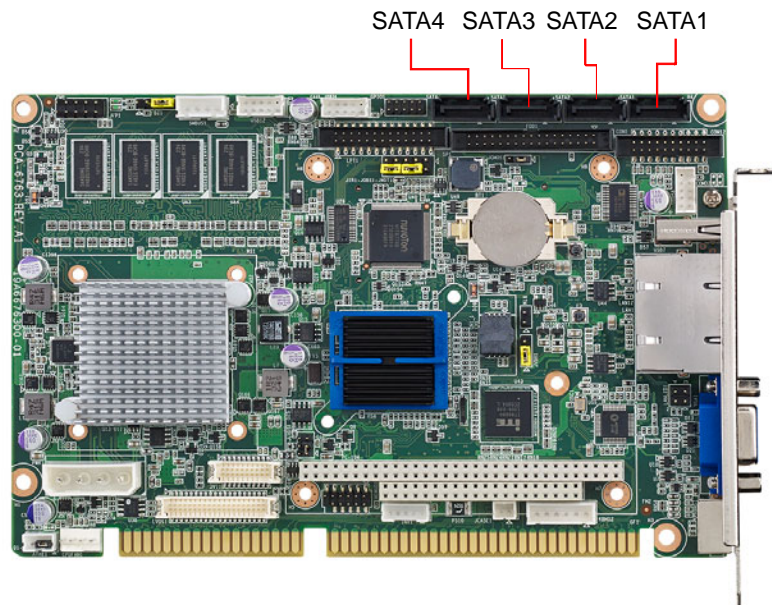
Table 2.3: LAN LED Indicators

LAN Mode	LED
1000Mbps Link On	On
1000Mbps Active	Flash
1000Mbps Link Off	Off
100Mbps Link On	On
100Mbps Active	Flash
100Mbps Link Off	Off
10Mbps Link On	On
10Mbps Active	Flash
10Mbps Link Off	Off

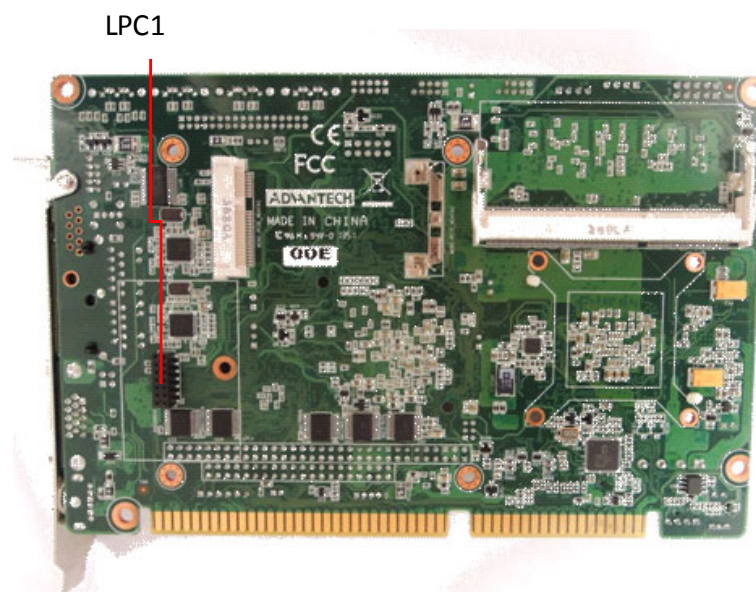


2.17 Serial ATA Interface (SATA1~SATA3)

PCA-6763 features high performance serial ATA interface (600MB/s) which eases cabling to hard drivers or CD/DVD drivers with long cables.

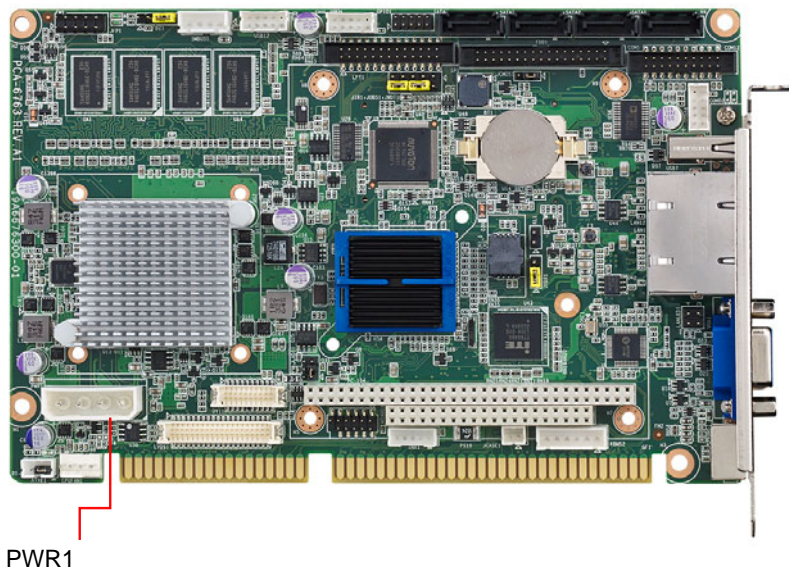


2.18 LPC Extension Interface (LPC1)



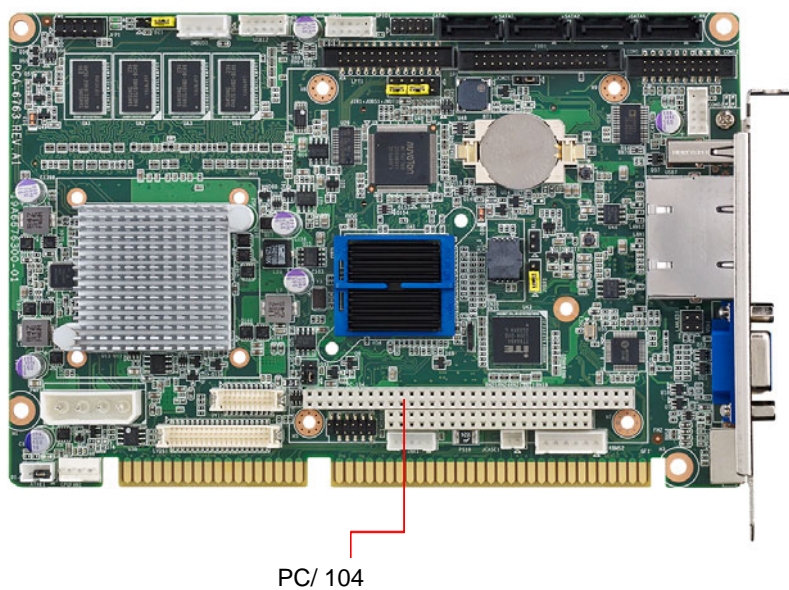
LPC1 is a 14-pin female pinheader for adopting Advantech LPC module, such as PCA-COM232-00A1E, PCA-COM485-00A1E, PCA-TPM-00A1E.

2.19 12/5v power connector (PWR1)



2.20 PC/104

PCA-6763 provide PC/104 connector for customer's module applications.



Note! UEFI code do not support PC/ 104 VGA module.



Chapter 3

AMI BIOS Setup

3.1 Introduction

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of PCA-6763 setup screens.

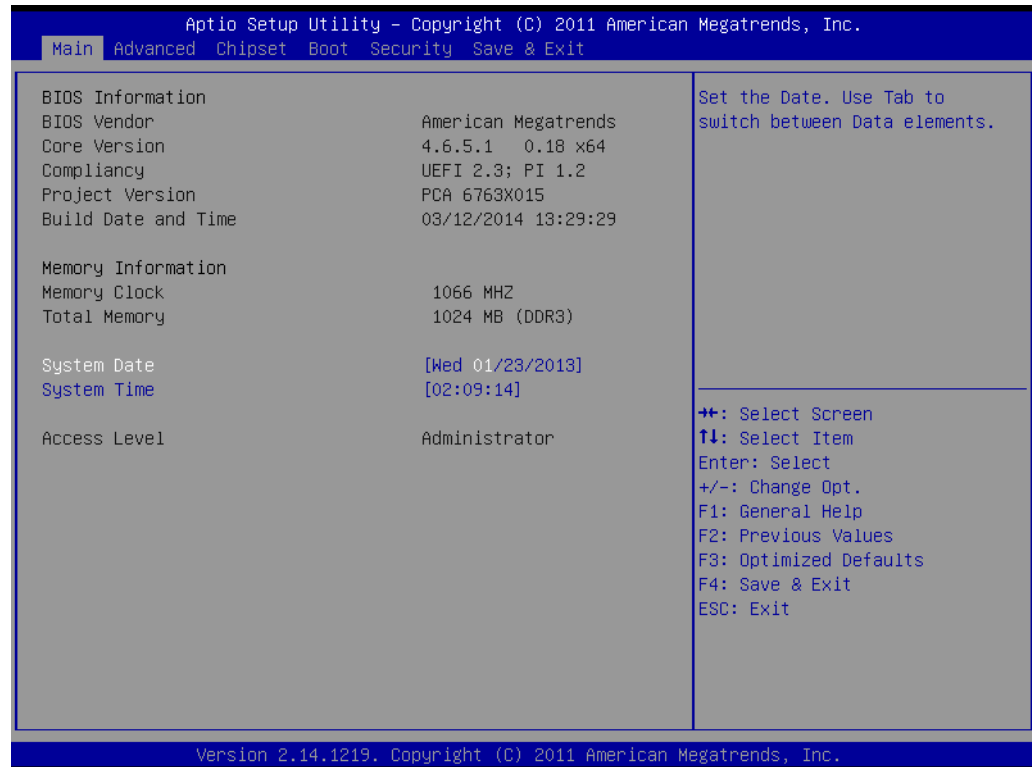


Figure 3.1 Setup program initial screen

3.2 Entering Setup

Turn on the computer and during POST startup the BIOS setup program can be triggered by pressing "DEL" or "F2" key.

Note! *If the message disappears before you press the "DEL" or "F2" key, please restart the computer and try again.*



3.2.1 Main Setup

When you first enter the BIOS Setup Utility, you will enter 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.



Figure 3.2 Main setup screen

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

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

■ System Time / System Date

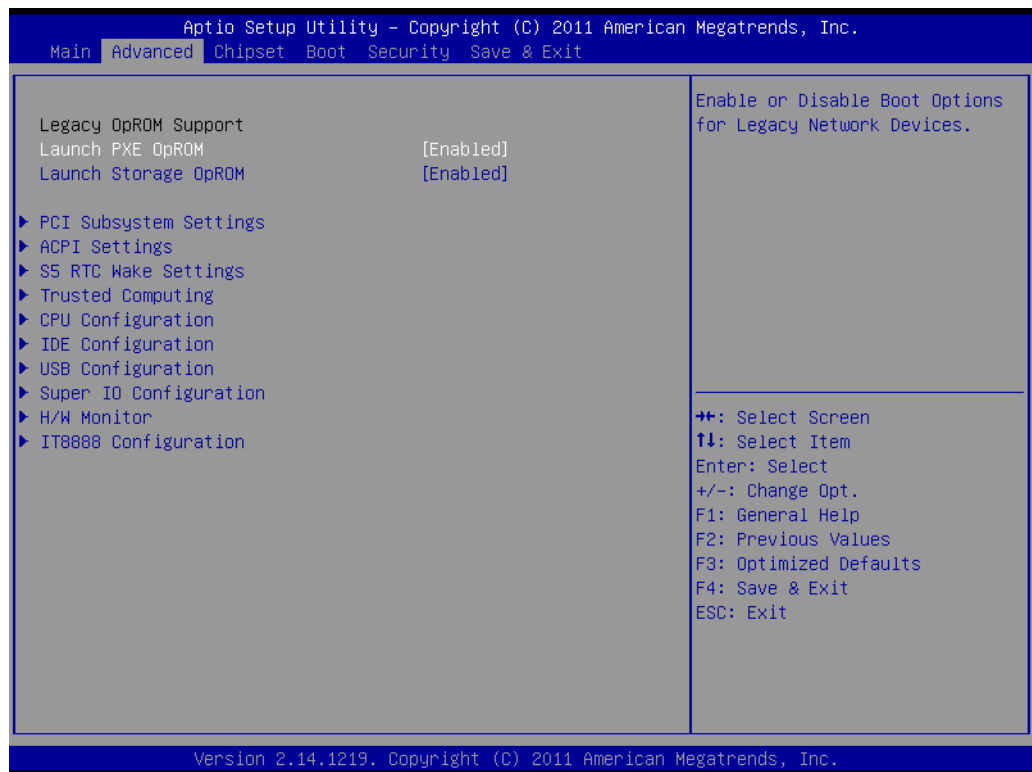
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

Note! Both system time and system date data will be reset after clearing CMOS.



3.2.2 Advanced BIOS Features Setup

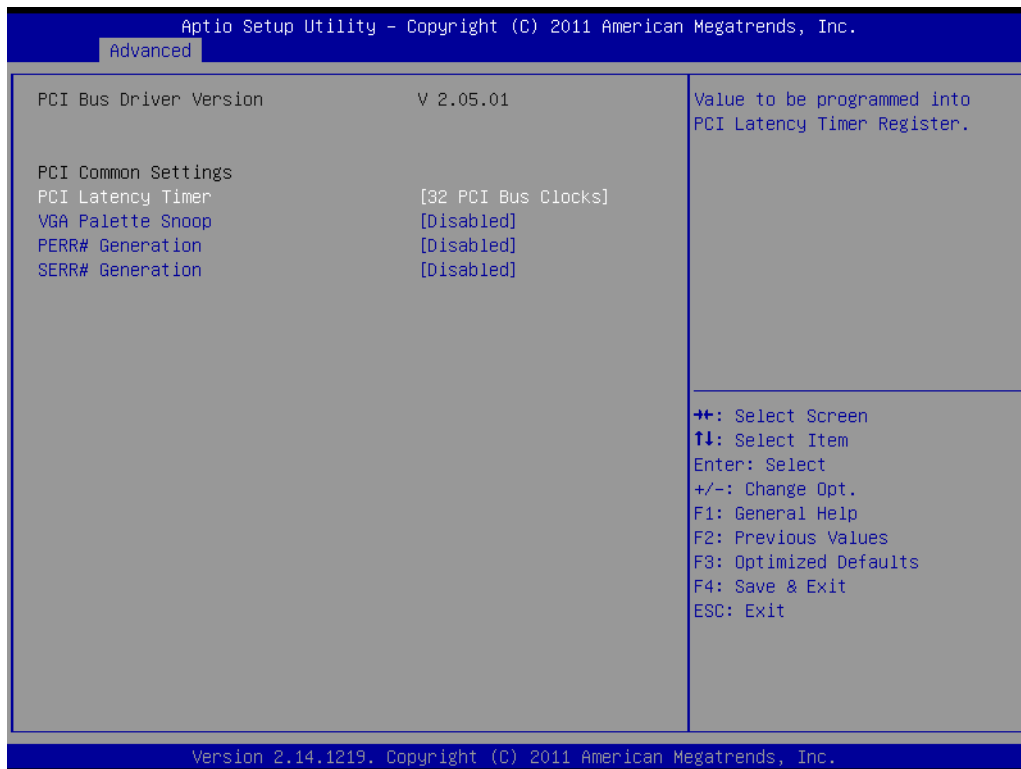
Select the Advanced tab from the PCA-6763 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <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 Legacy OpROM support

- **Launch PXE OpROM**
Enable or disable boot options for legacy network devices. The item works simultaneously on LAN1 and LAN2.
- **Launch Storage OpROM**
Enable or disable boot options for legacy mass storage devices with option ROM.

3.2.2.2 PCI Subsystem Settings Configuration



- **PCI Latency Timer**
This item allows you to select the 32/64/96/128/160/192/224/248 PCI bus clocks.
- **VGA Palette Snoop**
Enabled or disable VGA palette registers snooping.
- **PERR# Generation**
Enabled or disable PCI device to generation PERR#.
- **SERR# Generation**
Enabled or disable PCI device to generation SERR#.

3.2.2.3 ACPI Settings Configuration



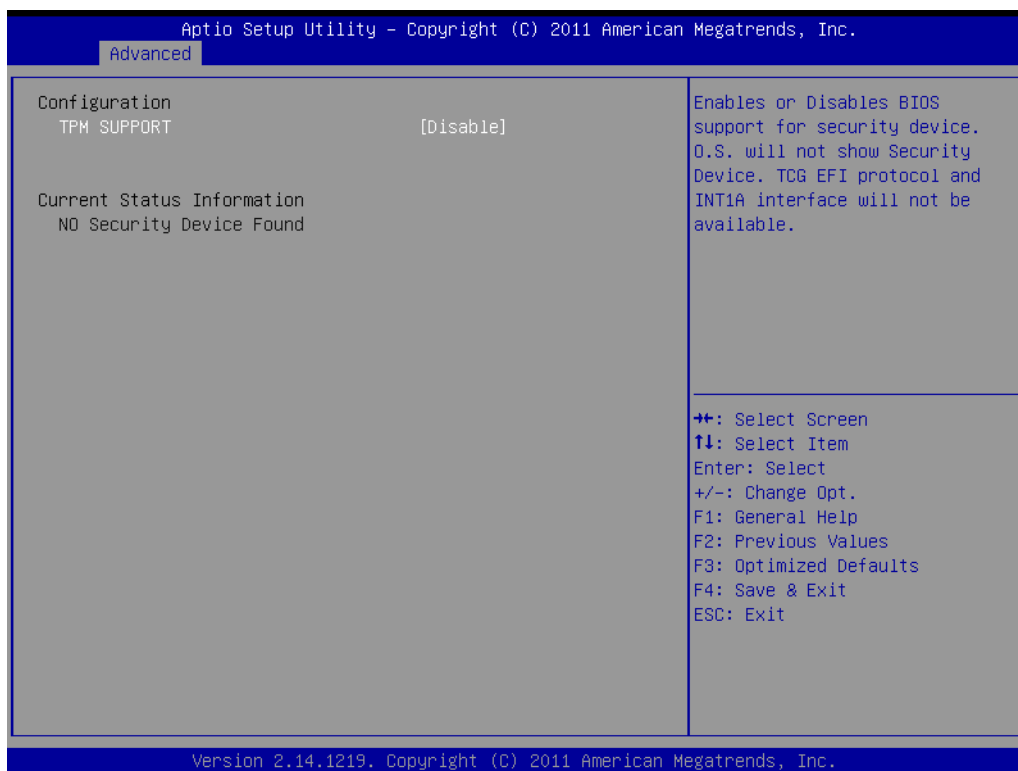
- **Power Type**
Choosing this item correspond with your power supply type, AT or ATX.
- **Enable Hibernation**
Enable or disable hibernation function if OS support.

3.2.2.4 S5 RTC Wake Settings



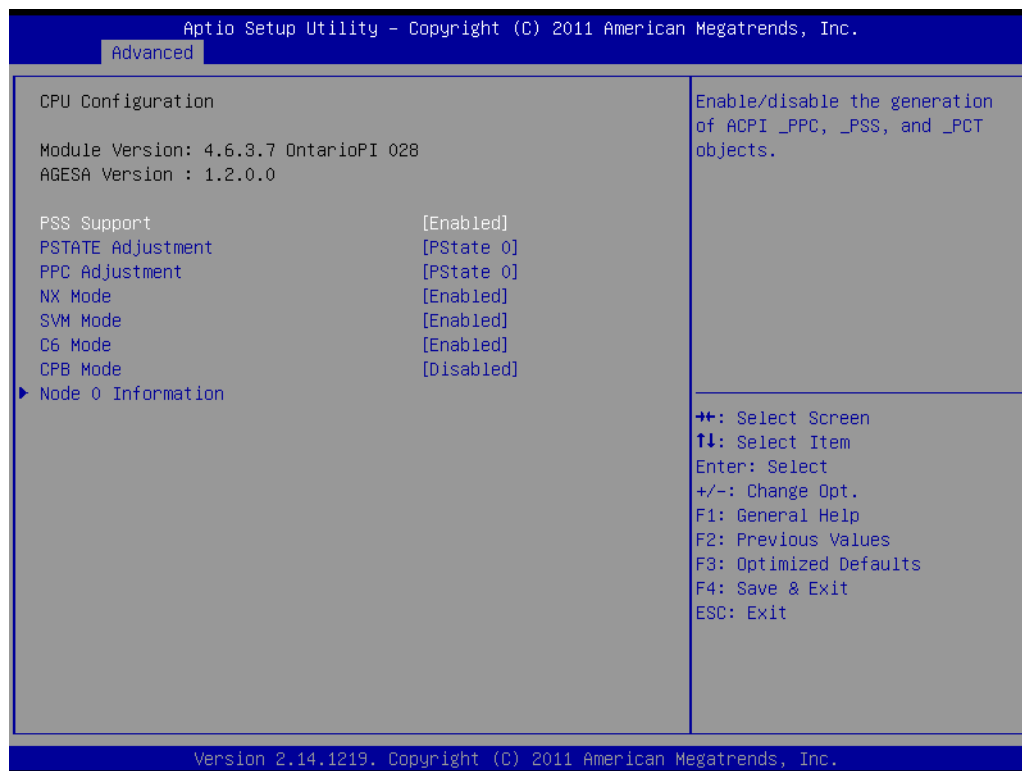
- **Wake system with Fixed Time**
Enable or disable system wake on alarm event by user define.

3.2.2.5 Trusted Computing



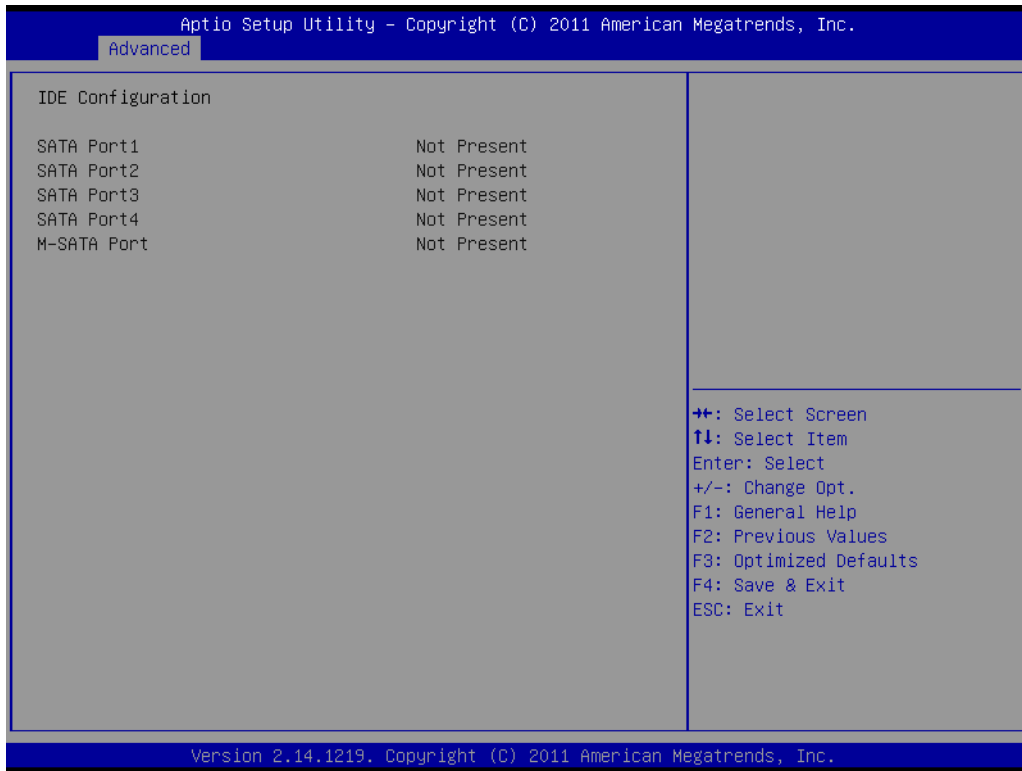
- **TPM Support**
Enable or disable BIOS support for security device.

3.2.2.6 CPU Configuration

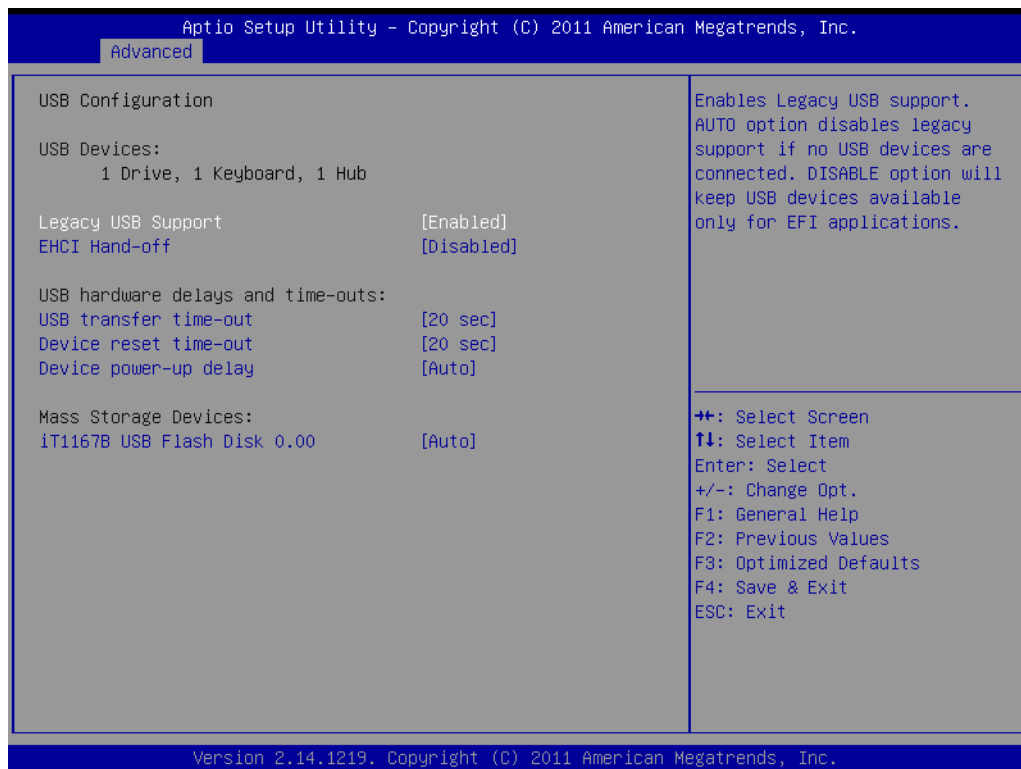


- **PPS Support**
This item allows you to enable or disable the ACPI _PPC, _PSS, and _PCT objects.
- **PSTATE Adjustment**
This item allows you to provide P-state level.
- **PPC Adjustment**
This item allows you to provide _PPC object.
- **NX Mode**
This item allows you to enable or disable the No-execute page protection function.
- **SVM Mode**
This item allows you to enable or disable the CPU virtualization.
- **C6 Mode**
This item allows you to auto or disable C6 function.
- **CPB Mode**
This item allows you to auto or disable CPB.
- **Node 0 Information**
View detail of memory information related to node 0.

3.2.2.7 IDE Configuration

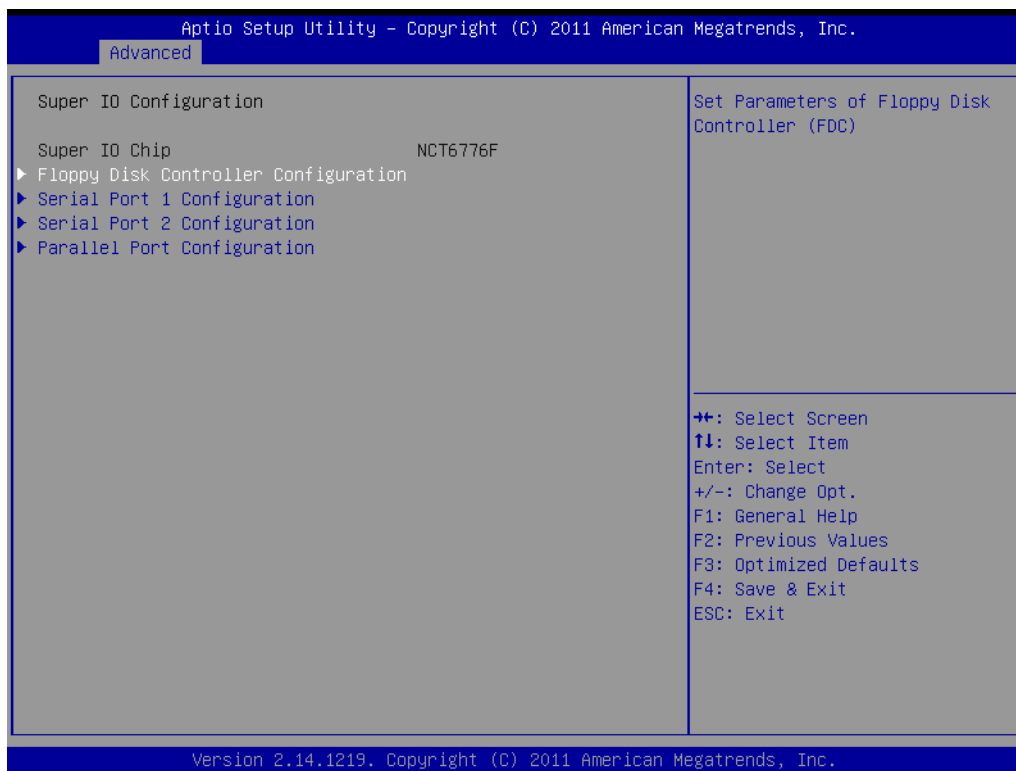


3.2.2.8 USB Configuration



- **Legacy USB Support**
Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
This is a workaround for OSeS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **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 report itself to the host controller.

3.2.2.9 Super I/O Configuration



3.2.2.9.1 Floppy Disk Controller Configuration

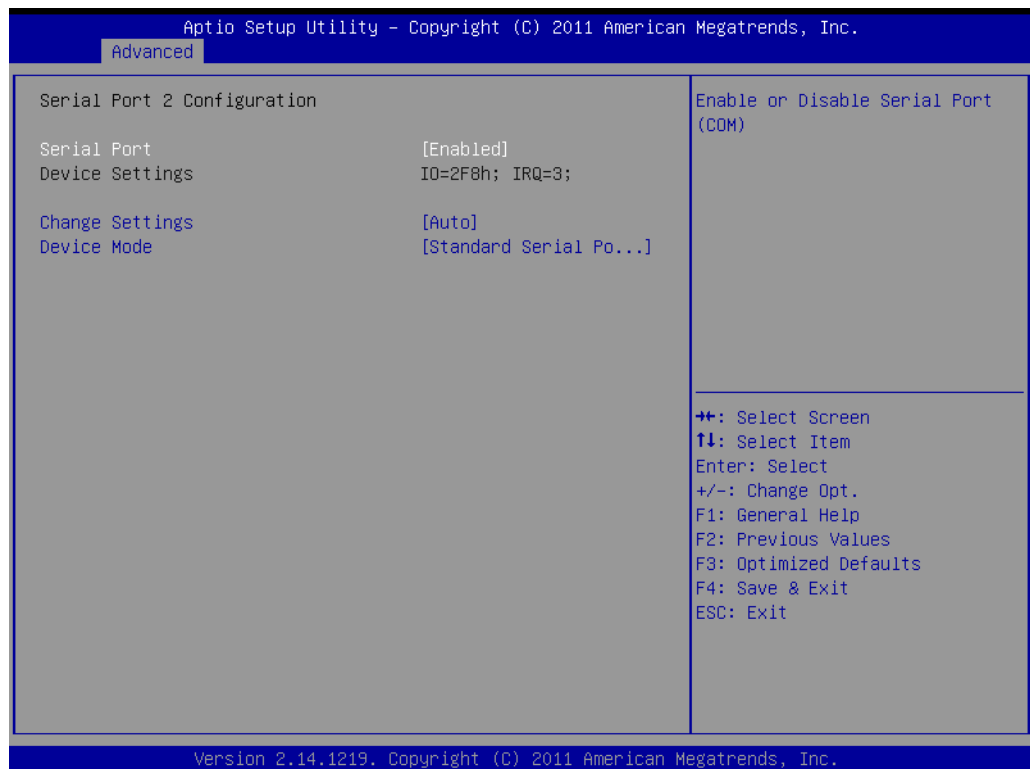
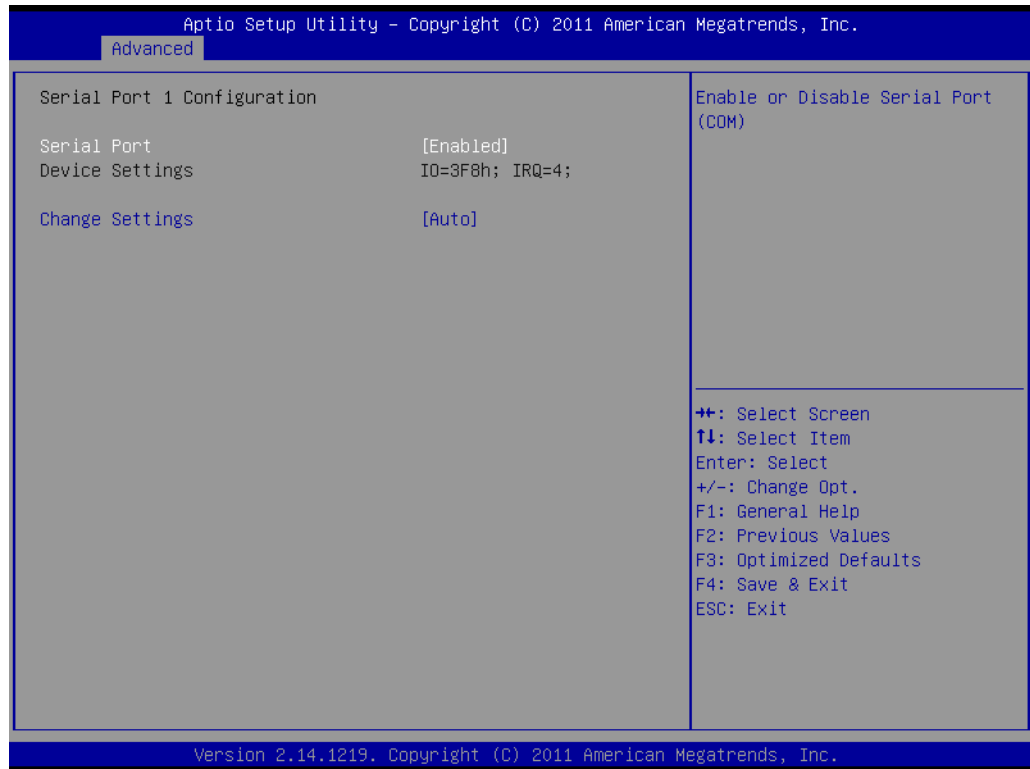


- **Floppy Disk Controller**
Enable or disable floppy disk controller
- **Change Settings**
Select an optimal setting for super I/O device.

- **Device Mode**

Change mode of floppy disk controller. Select "read write" for normal operation. Select "write protect" mode for read only operation.

3.2.2.9.2 Serial Port1 and Serial Port2 Configuration

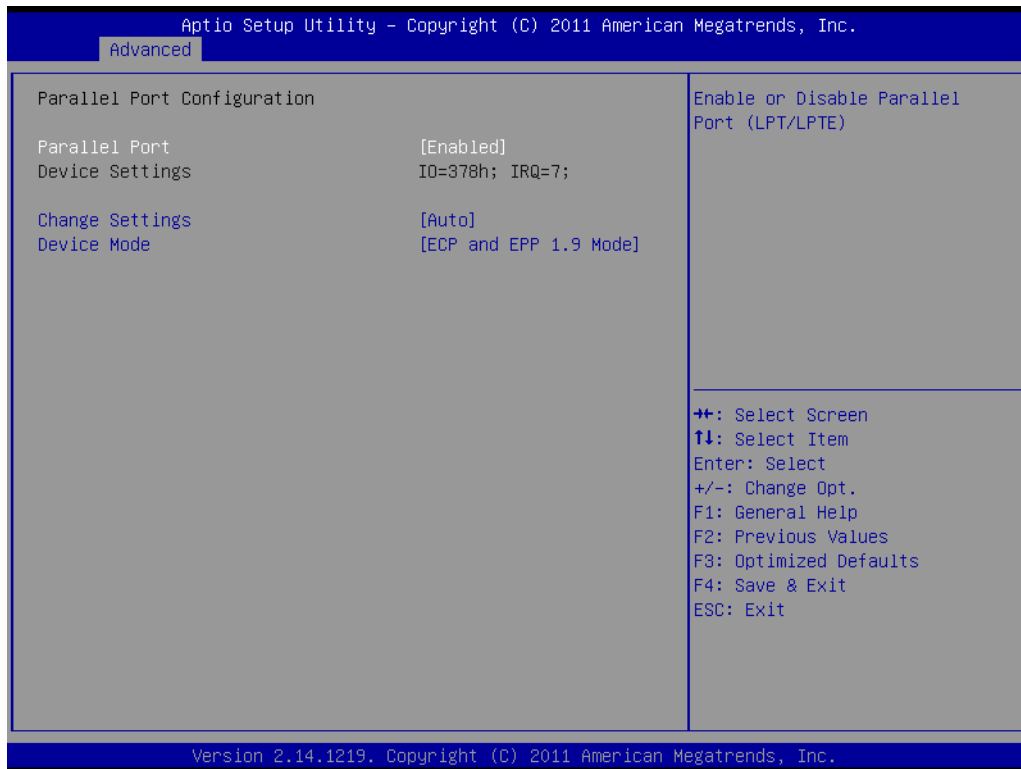


- **Serial Port**

Enable or disable serial port (COM)

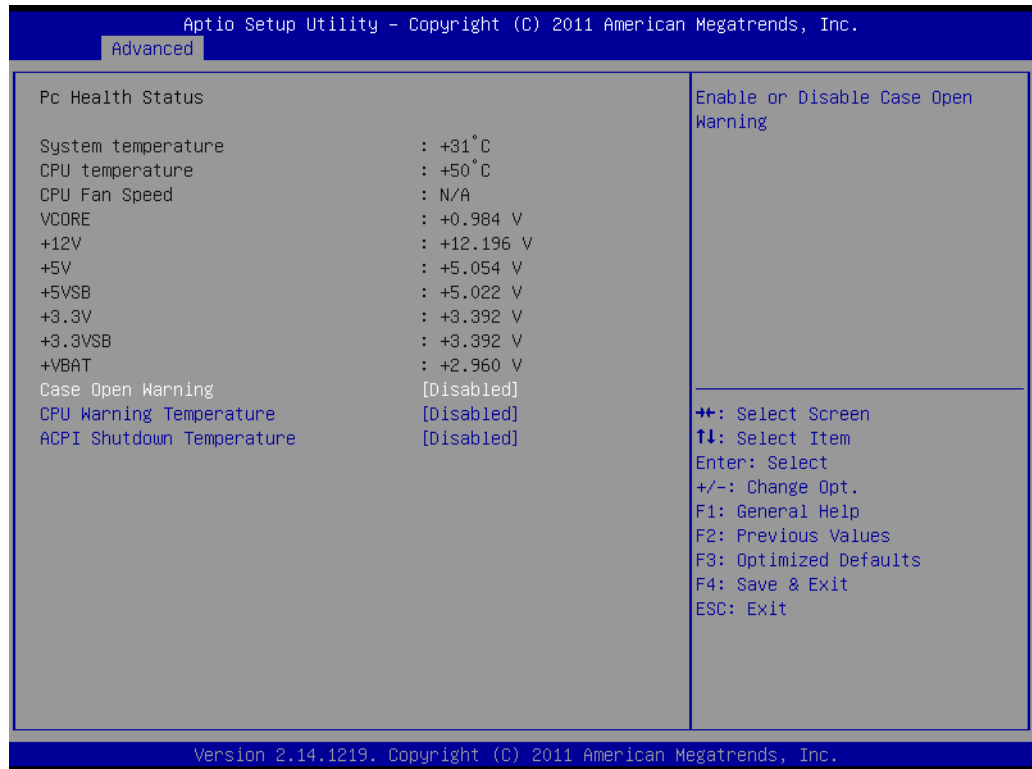
- **Change Settings**
Select an optimal setting for super I/O device.
- **Device mode**
Change the serial port mode

3.2.2.9.3 Parallel Port Configuration



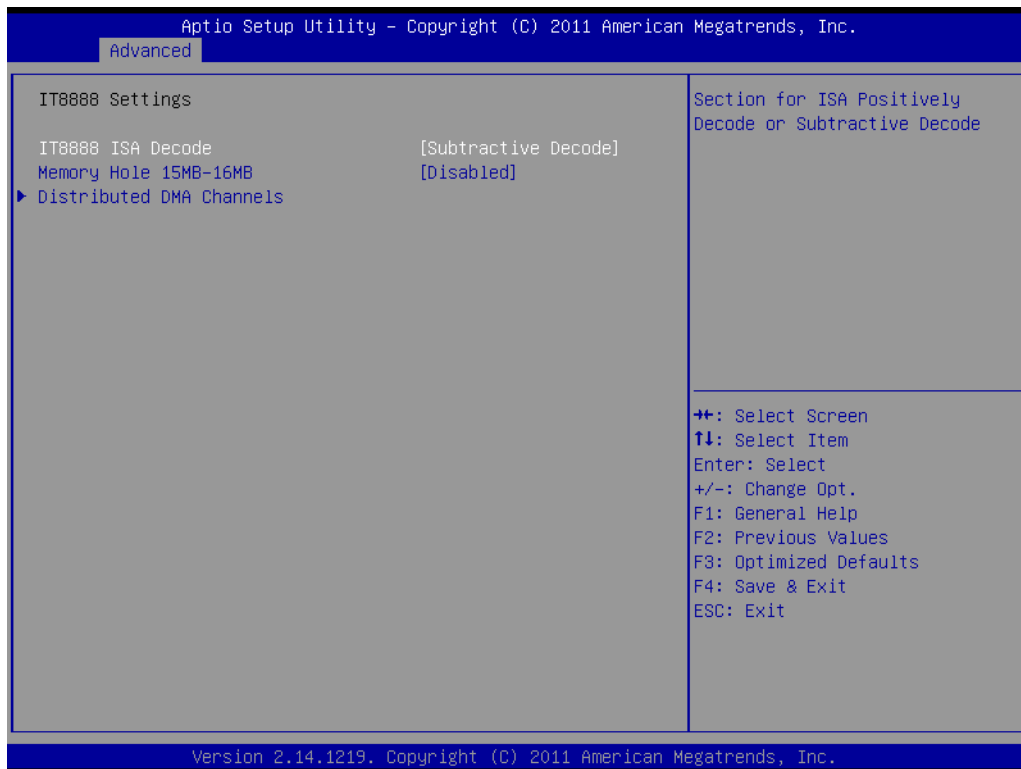
- **Parallel Port**
Enable or disable parallel port (LPT/LPTE)
- **Change Settings**
Select an optimal setting for super I/O device.
- **Device Mode**
Change the printer port mode.

3.2.2.10 H/W Monitor

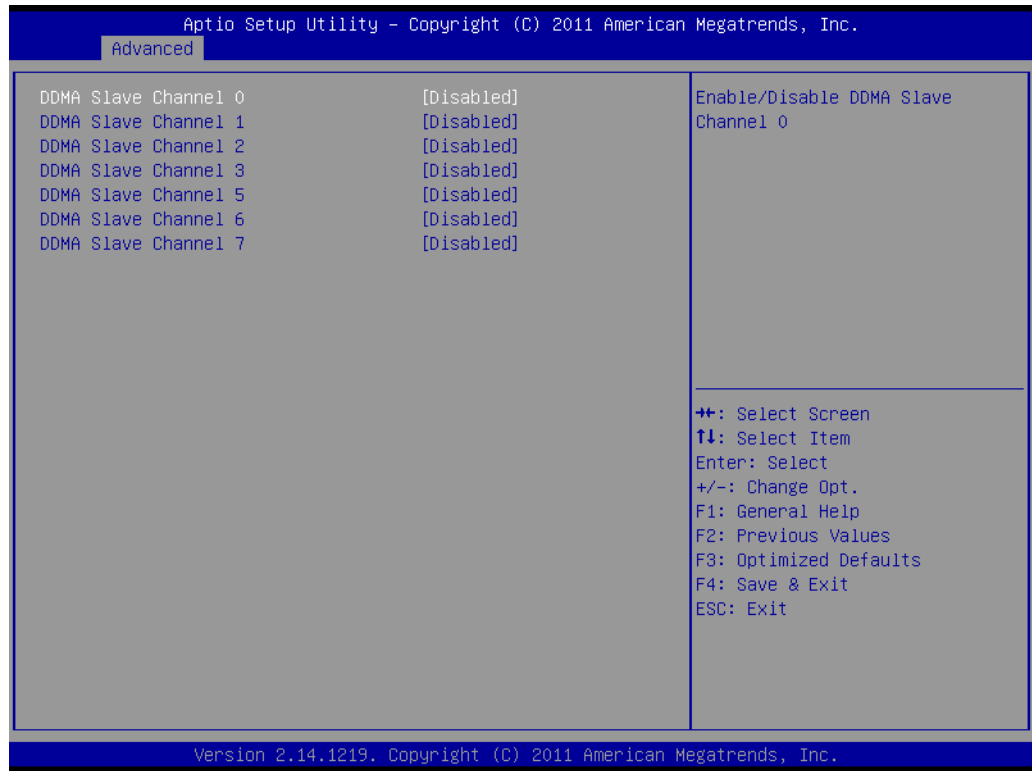


- **Case Open Warning**
Enable or disable case open warning.
- **CPU Warning Temperature**
Set CPU warning temperature.
- **ACPI Shutdown Temperature**
Set ACPI shutdown temperature.

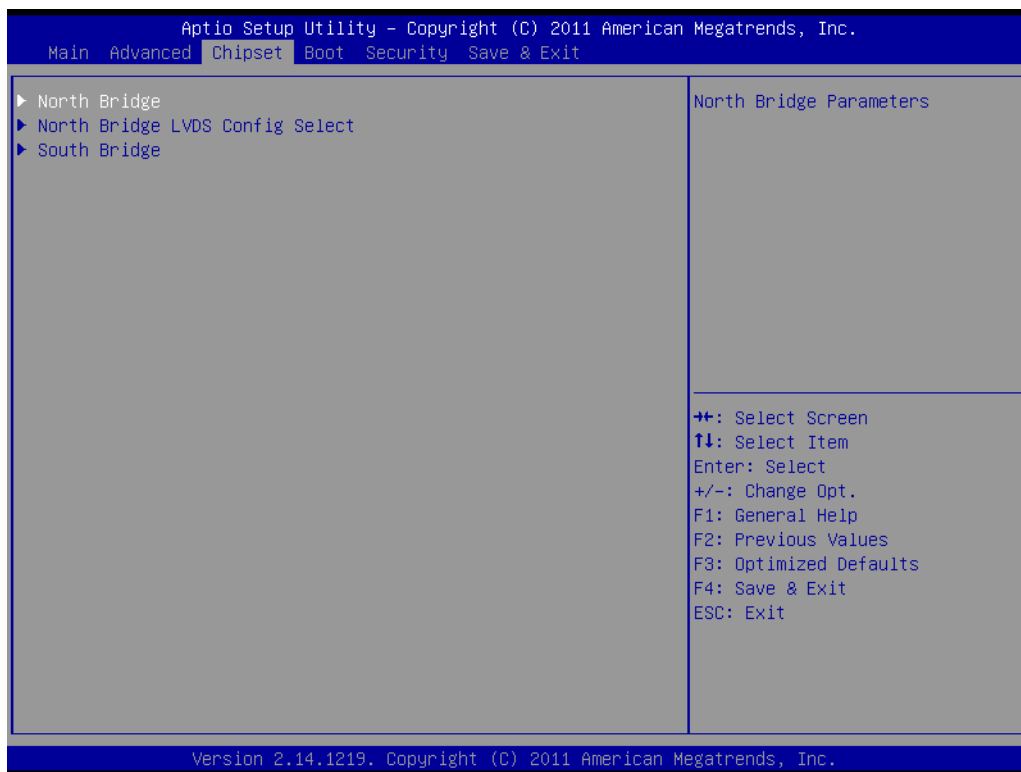
3.2.2.11 IT8888 Configuration



- **ITE8888 ISA Decode**
Section for ISA positively decode or subtractive decode
- **Memory Hole 15MB-16MB**
Enable or disable memory hole 15-16MB
- **Distributed DMA Channels**
Enable or disable DDMA slave channel 0.

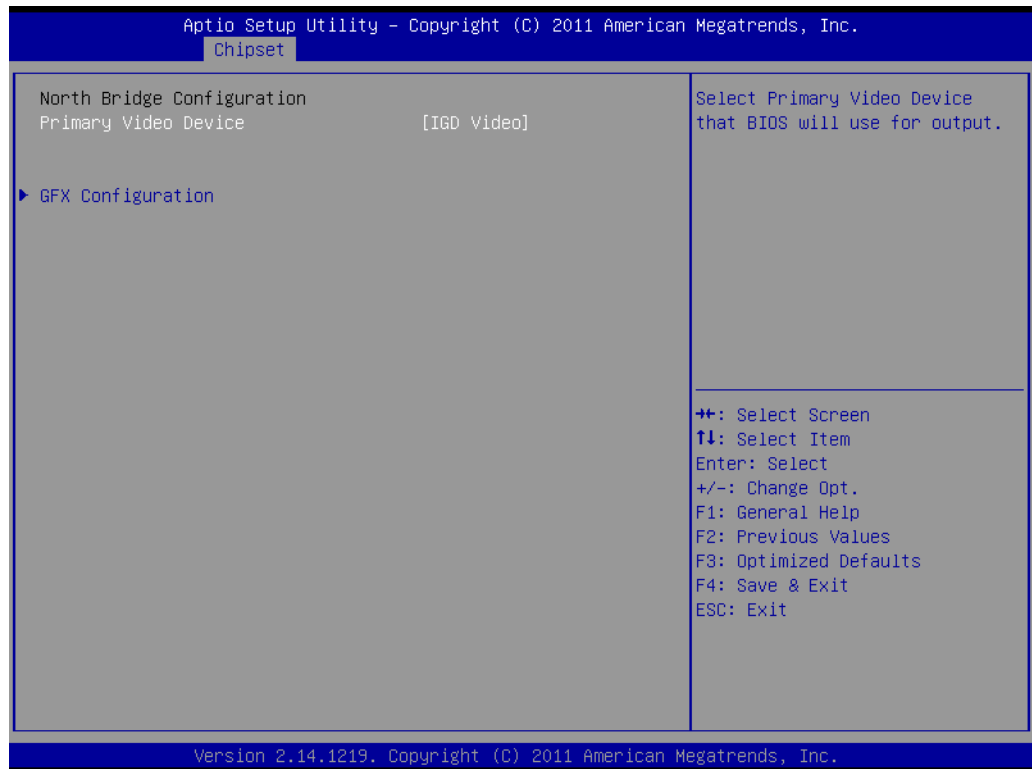


3.2.3 Chipset Configuration

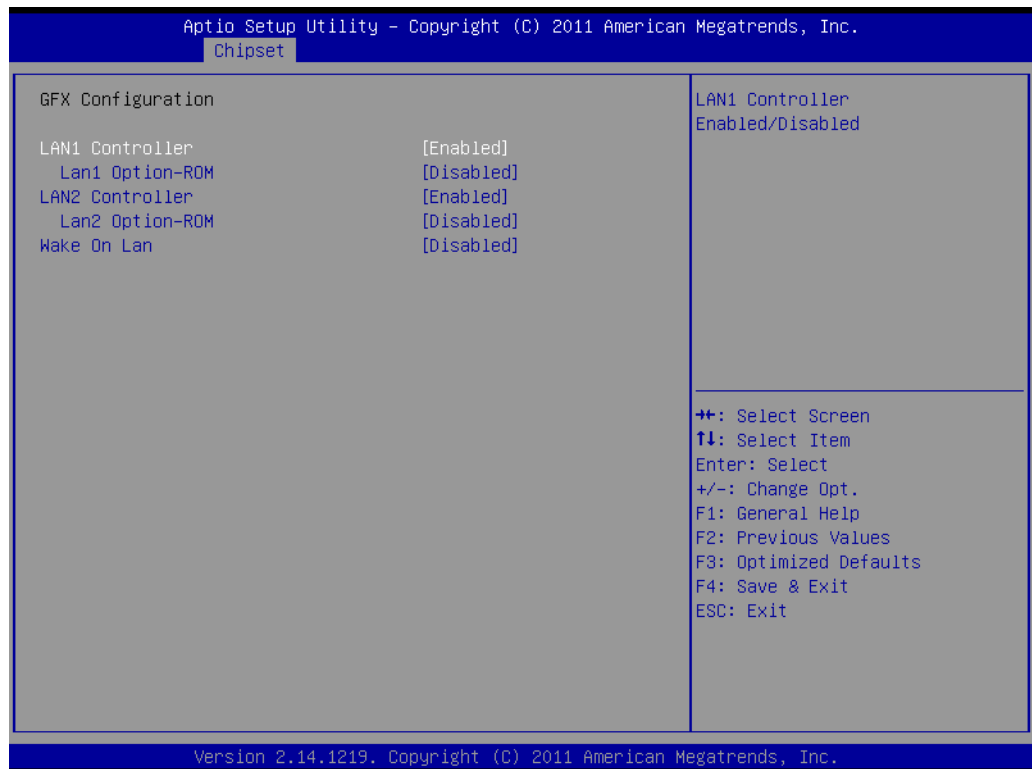


- **North Bridge**
Detail for North Bridge items.
- **North Bridge LVDS Config Select**
Detail for display items.
- **South Bridge**
Detail for South Bridge items.

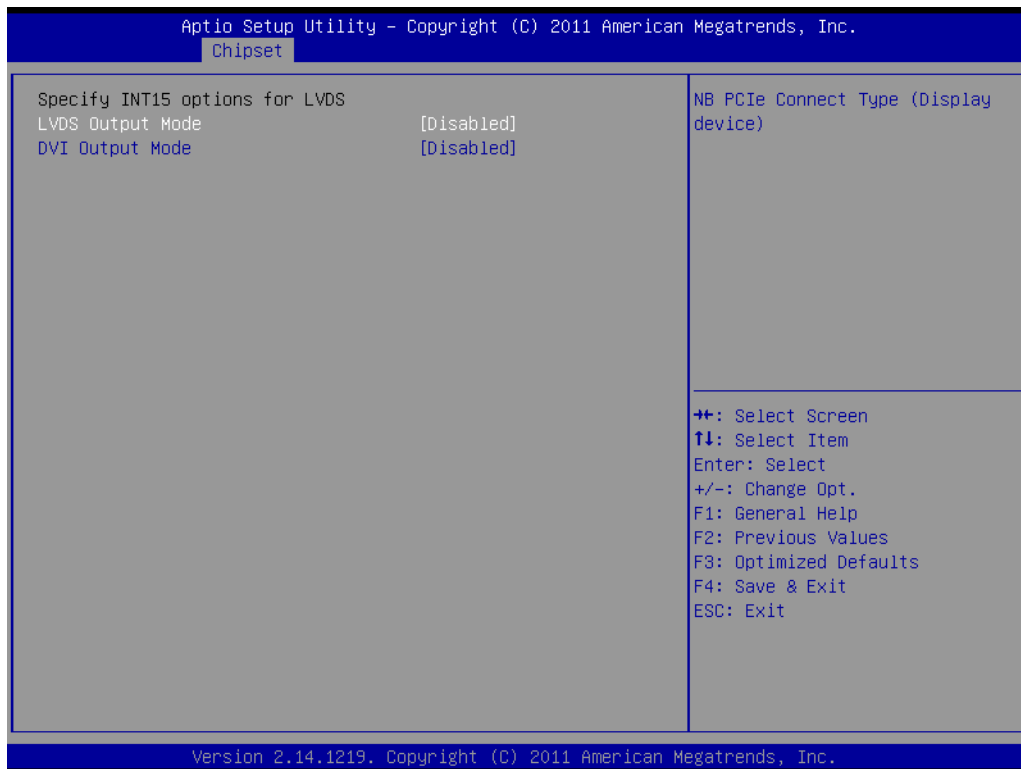
3.2.3.1 North Bridge Configuration



- **Primary Video Device**
Select primary video device that BIOS will use for output
- **GFX Configuration**
Detail of LAN1/LAN2/Mini PCIe, and PSPP Policy items.

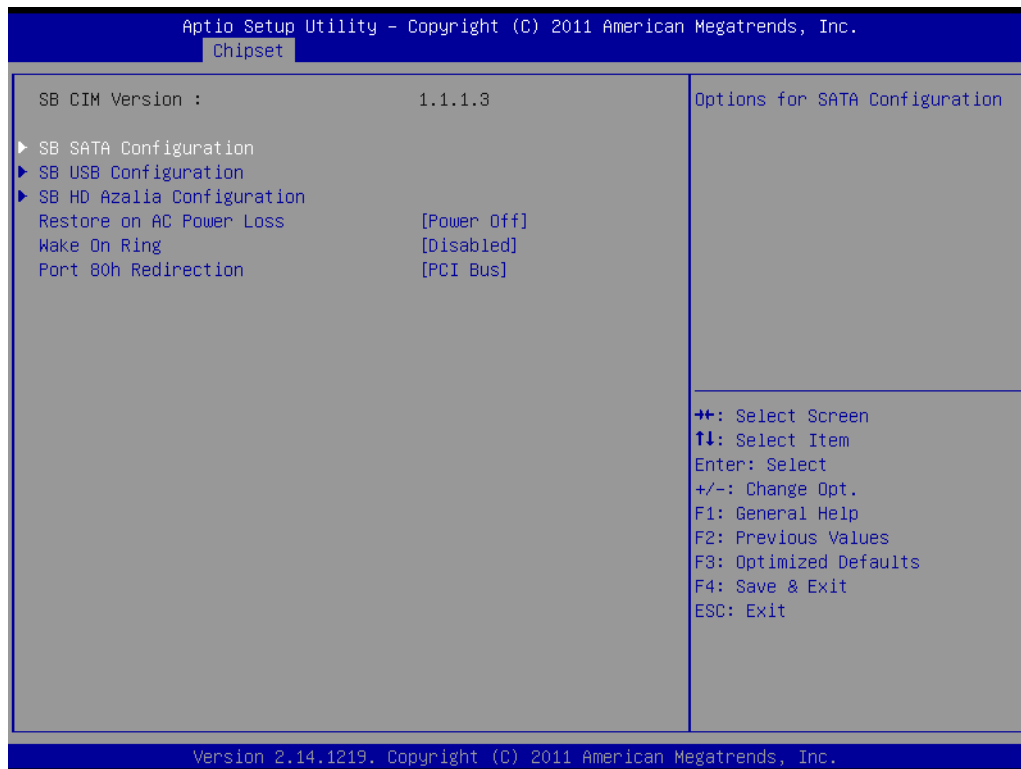


3.2.3.2 North Bridge LVDS Config Select

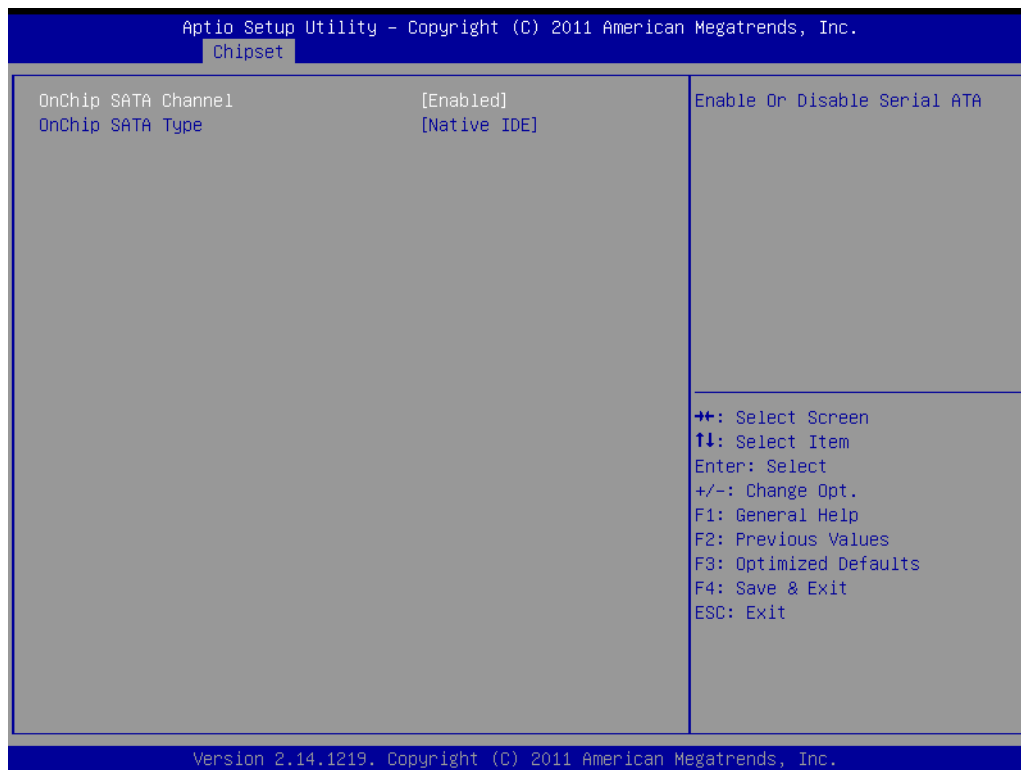


- **LVDS Output Mode**
NB PCIe connect type (display device)
- **DVI Output Mode**
Enable or disable DVI-D port.

3.2.3.3 South Bridge

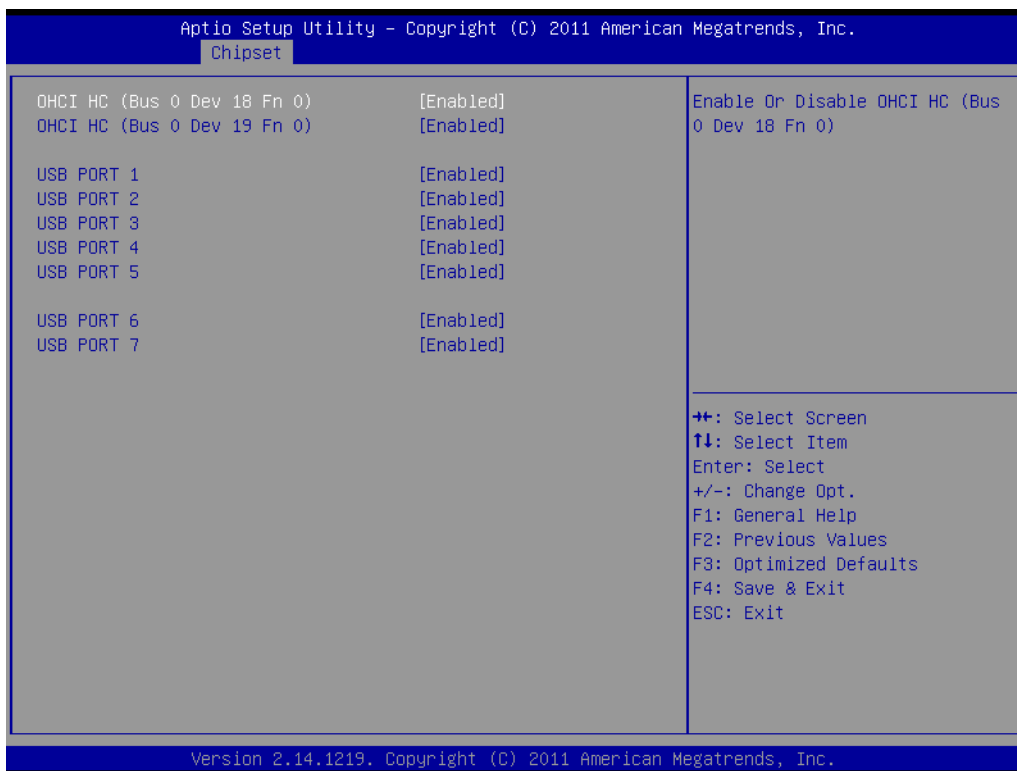


3.2.3.3.1 SB SATA Configuration



- **Onchip SATA Channel**
Enable or disable SATA
- **Onchip SATA Type**
Native IDE/n RAID /n AHCI /n AHCI /n Legacy IDE /n IDE/ AHCI /n HyperFlash

3.2.3.3.2SB USB Configuration



- **OHCI HC (Bus 0, Dev 18, Fn 0) and OHCI HC (Bus 0, Dev 19, Fn 0)**
Enable or disable OHCI HC
- **USB Port 1-7**
Enable or disable USB port 1-7

3.2.3.3.3SB HD Azalia Configuration



3.2.3.3.4 Restore on AC Power Loss

This item allows you to select system restore states if AC power loss.

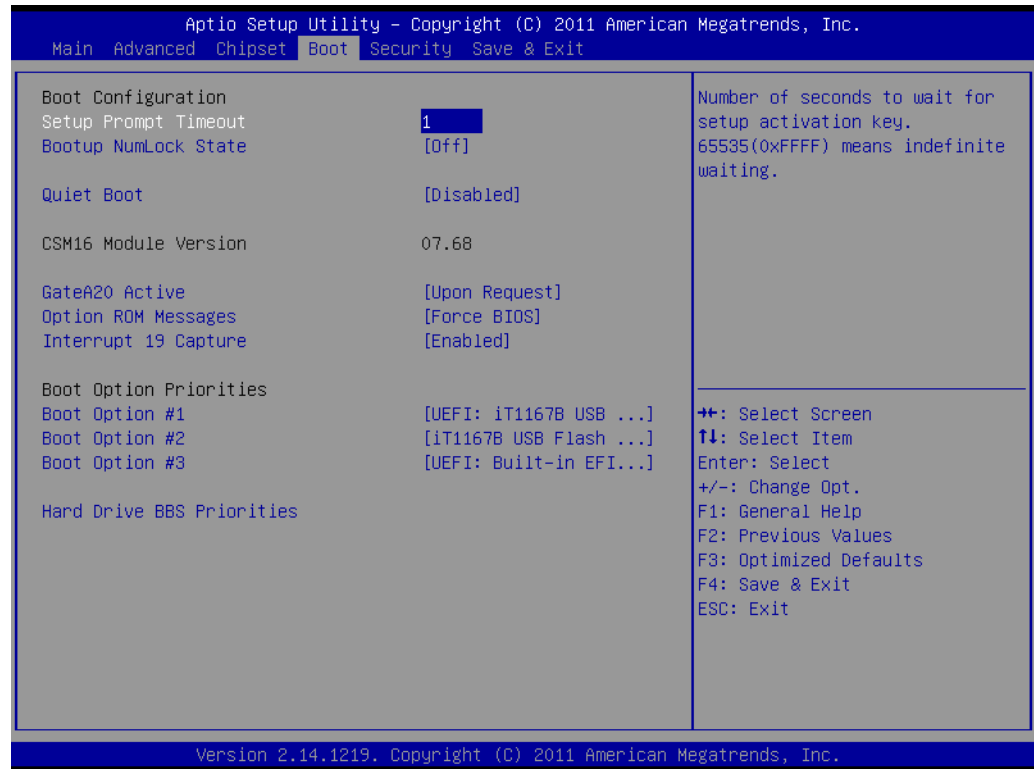
3.2.3.3.5 Wake On Ring

Enable or disable wake on ring.

3.2.3.3.6 Port 80h Redirection

Control where the port 80h cycles are sent.

3.2.4 Boot Configuration



- **Setup Prompt Timeout**
This item allows you to change number of seconds to wait for setup activation key.
- **Bootup NumLock State**
Select the Power-on state for Numlock.
- **Quiet Boot**
If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **GateA20 Active**
This item allows you to select Upon request or Always.
- **Option ROM Messages**
Set display mode for option ROM.
- **Interrupt 19 Capture**
This item allows option ROMs to trap interrupt 19.
- **Boot Option**
Sets the system boot order.

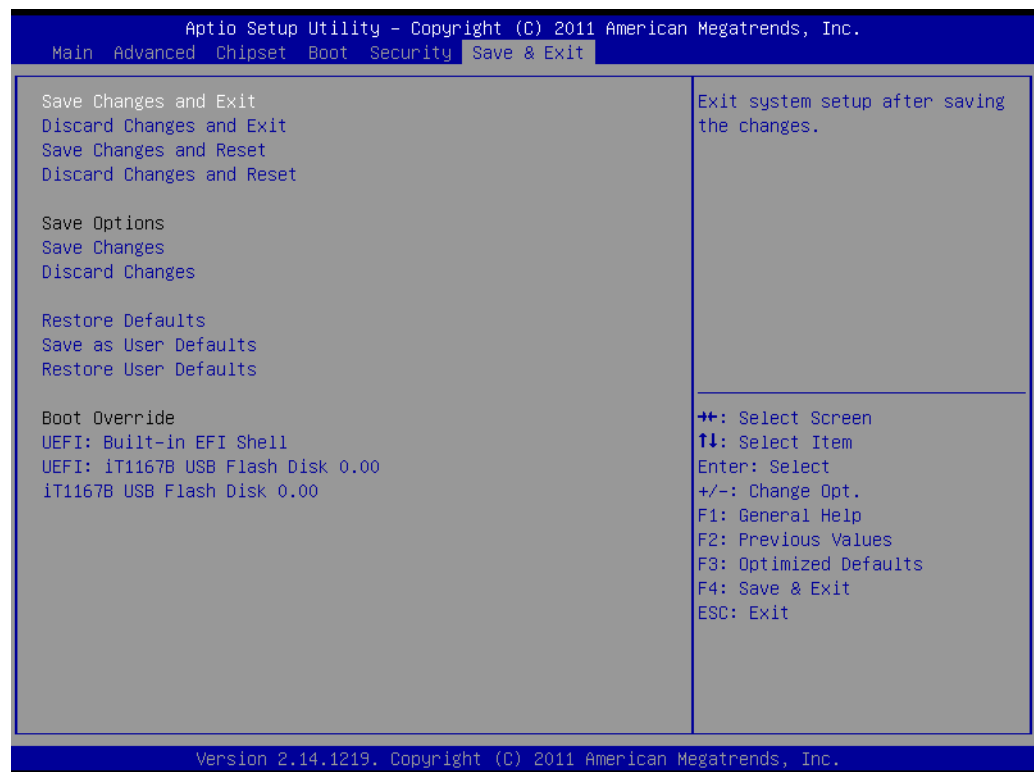
3.2.5 Security Configuration



Select Security Setup from the PCA-6763 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 Supervisor / User Password**

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 disccard 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

Value-Added Software Services

4.1 Value-Added Software Services

Software API are interface that define the ways in which an application program may request services from libraries and/or operating systems. They provide not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speed development, enhance security and offer add-on value for Advantech platforms. API plays the role of catalyst between developer and solution, and make Advantech embedded platforms easier and simpler to adopt and operate with customer applications. This API and utility is only for XP (32/64 bit) and Win7 (32/64bit), so if users needs Linux version API and utility, then contact an Advantech representative for support.

4.1.1 Software API

4.1.1.1 Control

GPIO



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus



SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. Today, SMBus is used in all types of embedded systems. The SMBus API allows a developer to interface a Windows XP or CE PC to a downstream embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.1.1.2 Monitor

Watchdog



A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor



The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

Chapter 5

Chipset Software
Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for PCA-6763 are located on the software installation CD. The driver in the folder of the driver CD will guide and link you to the utilities and drivers for Windows.

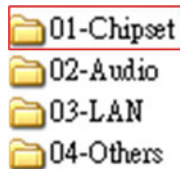
5.2 Windows® XP / Windows® 7 Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "01-Chipset/Windows 7 or XP" folder and click "setup.exe" to complete the installation of the driver.
2. Chip set drivers includes,
 - 1) AMD Embedded GPU and APU drivers
 - 2) AMD A55EA50M Controller Hub SATA AHCI/RAID Driver
 - 3) Dot Net Framework (For XP, please choose version 2.0; for Win7, please choose version 3.5 or 4.0)

Note! For 64 bit operation systems, AMD strongly suggests users to install Dot Net Framework before other driver installations.



Note! Please set SATA device as boot option #1 before installing AHCI driver under Win7.



Chapter 6

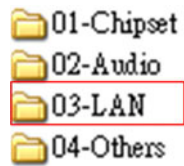
LAN Configuration

6.1 Introduction

PCA-6763 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel Realtek RTL8111E-VL-CG (LAN1 & LAN2) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

6.2 Win XP /Win 7 Driver Setup (LAN)

Insert the driver CD into your system's CD-ROM drive. Navigate to the "04-LAN" folder and click "Setup.exe" to complete the installation of the driver.



Appendix **A**

Programming the Watchdog Timer

A.1 Introduction

The PCA-6763's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

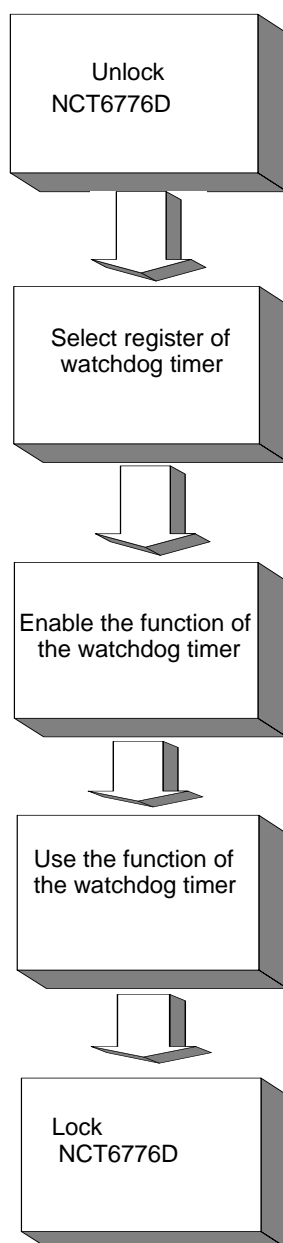
A.1.1 Watchdog timer overview

The watchdog timer is built in to the NCT6776D super I/O controller. It provides the following user programmable functions:

- Can be enabled and disabled via user's program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates a reset signal if the software fails to reset the timer before time-out

A.1.2 Programming the watchdog timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).


Table A.1: Watchdog timer registers

Address of register (2E)	Attribute Read/Write	Value (2F) & description
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the NCT6776D.
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit. Write 1 to bit 4: Watchdog timer count mode is 1000 times faster. If bit 3 is 0, the count mode is 1/1000 seconds mode. If bit 3 is 1, the count mode is 1/1000 minutes mode.

F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the NCT6776D.

A.1.3 Example program

1. Enable watchdog timer and set 10 sec. as timeout interval

```

;-----
Mov dx,2eh          ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h          ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx              ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
In al,dx
Or al,01h
Out dx,al
;-----
Dec dx              ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;-----
Dec dx              ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h

```

```

Out    dx,al
Inc    dx
Mov    al,10      ; 10 seconds
Out    dx,al

```

```

;-----

```

```

Dec dx          ; Lock NCT6776D
Mov    al,0aah
Out    dx,al

```

2. Enable watchdog timer and set 5 minutes as timeout interval

```

;-----

```

```

Mov dx,2eh      ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al

```

```

;-----

```

```

Mov al,07h      ; Select registers of watchdog timer
Out    dx,al
Inc    dx
In     al,dx
Or     al,08h
Out    dx,al

```

```

;-----

```

```

Dec dx          ; Enable the function of watchdog timer
Mov    al,30h
Out    dx,al
Inc    dx
Mov    al,01h
Out    dx,al

```

```

;-----

```

```

Dec dx          ; Set minute as counting unit
Mov    al,0f5h
Out    dx,al
Inc    dx
In     al,dx
Or     al,08h
Out    dx,al

```

```

;-----

```

```

Dec dx          ; Set timeout interval as 5 minutes and start counting
Mov    al,0f6h
Out    dx,al
Inc    dx
Mov    al,5      ; 5 minutes
Out    dx,al

```

```

;-----

```

```
Dec dx          ; Lock NCT6776D
Mov  al,0aah
Out  dx,al
```

3. Enable watchdog timer to be reset by mouse

```
-----
Mov dx,2eh      ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
-----
Mov al,07h      ; Select registers of watchdog timer
Out  dx,al
Inc  dx
Mov  al,08h
Out  dx,al
-----
Dec dx          ; Enable the function of watchdog timer
Mov  al,30h
Out  dx,al
Inc  dx
In   al,dx
Or   al,01h
Out  dx,al
-----
Dec dx          ; Enable watchdog timer to be reset by mouse
Mov  al,0f7h
Out  dx,al
Inc  dx
In   al,dx
Or  al,80h
Out  dx,al
-----
Dec dx          ; Lock NCT6776D
Mov  al,0aah
Out  dx,al
```

4. Enable watchdog timer to be reset by keyboard

```
-----
Mov dx,2eh      ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
-----
Mov al,07h      ; Select registers of watchdog timer
```



```

Out    dx,al
Inc    dx
Mov    al,08h
Out    dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov    al,30h
Out    dx,al
Inc    dx
Mov    al,01h
Out    dx,al
;-----
Dec dx          ; Enables watchdog timer to be strobe reset by keyboard
Mov    al,0f7h
Out    dx,al
Inc    dx
In     al,dx
Or    al,40h
Out    dx,al
;-----
Dec dx          ; Lock NCT6776D
Mov    al,0aah
Out    dx,al

5.  Generate a time-out signal without timer counting
;-----
Mov dx,2eh      ; Unlock NCT6776D
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h      ; Select registers of watchdog timer
Out    dx,al
Inc    dx
Mov    al,08h
Out    dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov    al,30h
Out    dx,al
Inc    dx
Mov    al,01h
Out    dx,al
;-----
Dec dx          ; Generate a time-out signal

```

```
Mov    al,0f7h
Out    dx,al    ;Write 1 to bit 5 of F7 register
Inc    dx
In     al,dx
Or    al,20h
Out    dx,al
;-----
Dec dx    ; Lock NCT6776D
Mov    al,0aah
Out    dx,al
```

Appendix **B**

I/O Pin Assignments

B.1 Parallel Port Connector (LPT1)

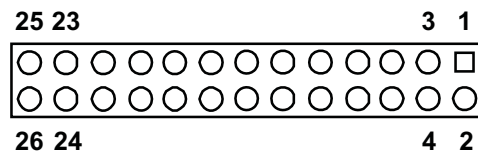


Table B.1: Parallel port connector (LPT1)

Pin	Signal	Pin	Signal
1	STROBE*	2	AUTOFD*
3	D0	4	ERR
5	D1	6	INIT*
7	D2	8	SLCTINI*
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK*	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N/C

* low active

B.2 VGA Connector (VGA1)

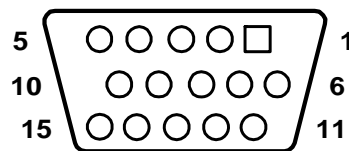


Table B.2: VGA connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.3 RS 232 Serial Port (G2: COM12, VG: COM1)

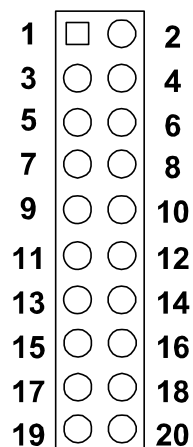


Table B.3: RS-232 serial port (COM12)

Pin	Signal
1	COM1_DCD
2	COM1_DSR
3	COM1_SIN
4	COM1_RTS
5	COM1_SOUT
6	COM1_CTS
7	COM1_DTR
8	COM1_RI
9	GND
10	GND
11	COM2_DCD
12	COM2_DSR
13	COM2_SIN
14	COM2_RTS
15	COM2_SOUT
16	COM2_CTS
17	COM2_DTR
18	COM2_RI
19	GND
20	GND

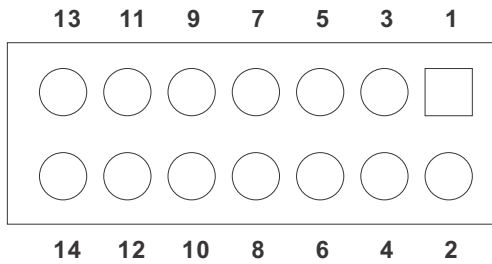


Table B.4: RS-232 Serial Port (VG:COM1)

Pin	Signal
1	COM1_DCD
2	COM1_DSR
3	COM1_SIN
4	COM1_RTS
5	COM1_SOUT
6	COM1_CTS
7	COM1_DTR
8	COM1_RI
9	GND
10	GND
11	COM2_DCD
12	COM2_DSR
13	COM2_SIN
14	COM2_RTS

B.4 USB 2.0 Header (USB12~56)

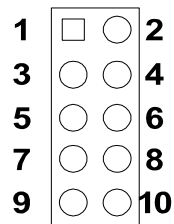


Table B.5: USB Header (USB12~56, take USB 12 as example)

Pin	Signal	Pin	Signal
1	USB1_VCC5	6	USB2_D+
2	USB2_VCC5	7	GND
3	USB1_D-	8	GND
4	USB2_D-	9	GND
5	USB1_D+	10	NC

B.5 PS/2 Keyboard/Mouse Connector (KBMS1)

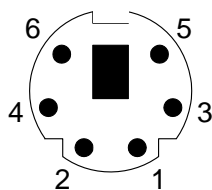


Table B.6: PS/2 keyboard/mouse connector (KBMS1)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.6 CPU Fan Power Connector (CPUFAN1)

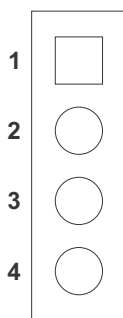


Table B.7: CPU fan power connector (CPUFAN1)

Pin	Signal
1	GND
2	+12V
3	Detect
4	NC

B.7 Reset Connector (JFP1 / RESET)

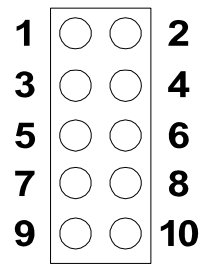


Table B.8: Reset connector (FP1 / RESET)

Pin	Signal
1	HDD_LED+
2	HDD_LED-
3	PW_LED
4	GND
5	SNMP_SCL
6	SNMP_SDA
7	RESET#
8	GND
9	PWR-BTN
10	GND

B.8 Hi-definition Audio Link Connector (HDAUD1)

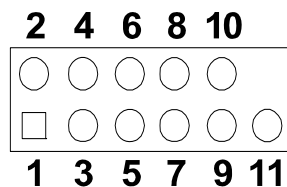


Table B.9: Hi-definition audio link connector (HDAUD1)

Pin	Signal	Pin	Signal
1	ACZ_VCC	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	-ACZ_RST
9	ACZ_12V	10	GND
11	GND	12	N/C

B.9 LAN1 and LAN2 LED Connector (LANLED1)

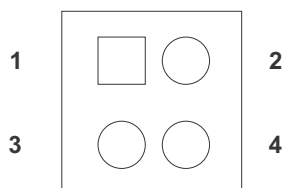


Table B.10: LAN1 and LAN2 LED connector (LANLED1)

Pin	Signal
1	#LAN1_ACT
2	#LAN2_ACT
3	V33_AUX
4	V33_AUX

B.10 GPIO Header (GPIO1)

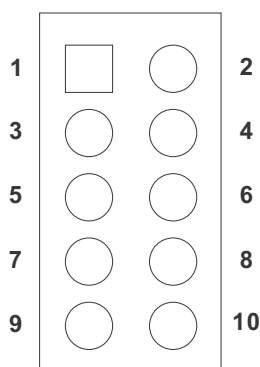


Table B.11: GPIO header (GPIO1)

Pin	Signal
1	SIO_GPIO0
2	SIO_GPIO4
3	SIO_GPIO1
4	SIO_GPIO5
5	SIO_GPIO2
6	SIO_GPIO6
7	SIO_GPIO3
8	SIO_GPIO7
9	VCC_GPIO
10	GND

B.11 JIR1

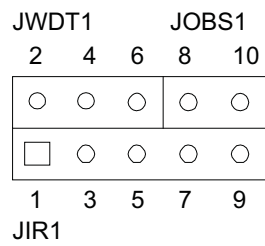


Table B.12: JIR1

Pin	Signal
1	5V
3	NC
5	IRRX_SIO
7	GND
9	IRTX_SIO

B.12 JCASE1

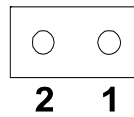


Table B.13: JCASE1

Pin	Signal
1	CASEOP#
2	GND

B.13 LPC1

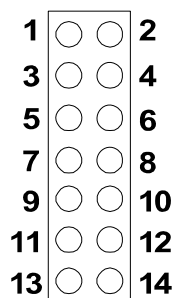


Table B.14: LPC1

Pin	Signal
1	CLK33M_LPC0
2	LPC_AD1
3	A_RST#
4	LPC_AD0
5	LPC_FRAME#
6	3.3V
7	LPC_AD3
8	GND
9	LPC_AD2
10	LPC1_SMB_CLK
11	LPC_SERIRQ
12	LPC1_SMB_DATA
13	+V5_DUAL
14	+V5

B.14 PWR1

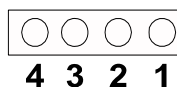


Table B.15: PWR1

Pin	Signal
1	12V
2	GND
3	GND
4	5V

B.15 DVI1

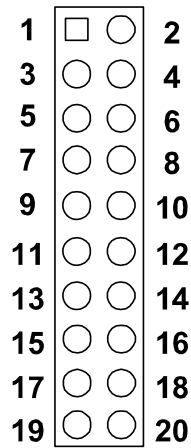
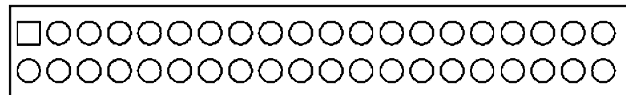


Table B.16: DVI1

Pin	Signal
1	TMDS1_Z_D0-
2	5V
3	TMDS1_Z_D0+
4	TMDS1_Z_CLK-
5	GND
6	TMDS1_Z_CLK+
7	TMDS1_Z_D1-
8	GND
9	TMDS1_Z_D1+
10	TMDS1_DDC_SC
11	GND
12	TMDS1_DDC_SD
13	TMDS1_Z_D2-
14	TMDS1_HPD
15	TMDS1_Z_D2+
16	NC
17	5V
18	NC
19	NC
20	NC

B.16 LVDS1

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39



2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

Pin	Signal	Pin	Signal
1	+V_LCD	21	LVDS0_D2+
2	+V_LCD	22	LVDS1_D2+
3	GND	23	GND
4	GND	24	GND
5	+V_LCD	25	LVDS0_CLK-
6	+V_LCD	26	LVDS1_CLK-
7	LVDS0_D0-	27	LVDS0_CLK+
8	LVDS1_D0-	28	LVDS1_CLK+
9	LVDS0_D0+	29	GND
10	LVDS1_D0+	30	GND
11	GND	31	LVDS0_DDC_CLK
12	GND	32	LVDS0_DDC_DAT
13	LVDS0_D1-	33	GND
14	LVDS1_D1-	34	GND
15	LVDS0_D1+	35	LVDS0_D3-
16	LVDS1_D1+	36	LVDS1_D3-
17	GND	37	LVDS0_D3+
18	GND	38	LVDS1_D3+
19	LVDS0_D2-	39	LVDS0_ENABKL
20	LVDS1_D2-	40	GND

B.17 System I/O Ports

Table B.17: System I/O ports

Addr. range (Hex)	Device
000-02F	DMA Controller
020-02D	Interrupt Controller
040-04F	System resource
050-052	Timer/Counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0FF	System resource
0C0-0DF	DMA controller
0F0-0FF	System resource
170-177	IDE Controller
1F0-1F7	IDE Controller
3C0-3DF	System resource
2F8-2FF	Serial port 2
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1
400-4FF	System resource
800-8FF	System resource
B00-B3F	System resource
C00-CFF	System resource
E00-E7F	System resource

B.18 DMA Channel Assignments

Table B.18: DMA channel assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.19 Interrupt Assignments

Table B.19: Interrupt Assignments

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ0	System timer
IRQ1	Keyboard
IRQ2	Interrupt from controller 2
IRQ3	Communication port (COM2)
IRQ4	Communication port (COM1)
IRQ5	Available
IRQ6	FDD1
IRQ7	LPT1
IRQ8	System COMS/Real-time clock
IRQ9	SCI IRQ
IRQ10	Available
IRQ11	Communication port (3-6) for PCA-COM232-00A1E module or Communication(8-11) for PCA-COM485-00A1E module
IRQ12	PS/2 mouse
IRQ13	Numeric data processor
IRQ14	Primary IDE
IRQ15	Secondary IDE

B.20 1st MB Memory Map

Table B.20: 1st MB memory map

Addr. range (Hex)	Device
F0000h - FFFFFh	System ROM
D0000h - E7FFFh	Unused (reserved for Ethernet ROM)
C0000h - CFFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
A0000h - B7FFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

Appendix **C**

Programming the
GPIO

C.1 Supported GPIO Register

Below are the detailed descriptions of the GPIO addresses and a programming sample.

C.2 GPIO Registers

Bank	Offset	Description
09h	30h	Write 1 to bit 7 to enable GPIO
07h	E0h	GPIO I/O Register When set to a '1', respective GPIO port is programmed as an input port. When set to a '0', respective GPIO port is programmed as an output port.
07h	E1h	GPIO Data Register If a port is programmed to be an output port, then its respective bit can be read/written. If a port is programmed to be an input port, then its respective bit can only be read.
07h	E2h	GPIO Inversion Register When set to a '1', the incoming/outgoing port value is inverted. When set to a '0', the incoming/outgoing port value is the same as in data register.

C.3 GPIO Example Program-1

Enter the extended function mode, interruptible double-write

```
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
```

Configure logical device, configuration register CRE0,CRE1,CRE2

```
MOV DX,2EH
MOV AL,09H
OUT DX,AC
DEC DX
MOV AL,30H
OUT DX,AL
INC DX
IN AL,DX
OR AL,10000000B
DEC DX
MOV AL,07H
OUT DX,AL
```

```
INC DX
MOV AL,07H ; Select logical device 7
OUT DX,AL ;
DEC DX
MOV AL,E0H
OUT DX,AL
INC DX
MOV AL,00H ; 1:Input 0:output for GPIO respective
OUT DX,AL
DEC DX
MOV AL,E2H ;
OUT DX,AL
INC DX
MOV AL,00H ;Set GPIO is normal not inverter
OUT DX,AL;
DEC DX
MOV AL,E1H
OUT DX,AL
INC DX
MOV AL,??H ; Put the output value into AL
OUT DX,AL

-----
Exit extended function mode |
-----

MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2014