

# **MI977**

**AMD® 2nd Gen. R-series APC / A77E FCH  
Mini-ITX Motherboard**

## **USER'S MANUAL**

**Version 1.0a**

---

## Acknowledgments

AMI is a registered trademark of American Megatrends Inc.  
PS/2 is a trademark of International Business Machines Corporation.

AMD and AMD® 2nd Gen. R-series Mobile Processor are registered trademarks of Advanced Micro Devices, Inc.

Microsoft Windows is a registered trademark of Microsoft Corporation.

Fintek is a registered trademark of Fintek Technology Corporation.

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

---

# Table of Contents

<b>Introduction .....</b>	<b>1</b>
Product Description .....	1
Checklist .....	2
MI977 Specifications .....	3
Board Dimensions .....	5
<b>Installations .....</b>	<b>6</b>
Installing the Memory .....	7
Setting the Jumpers .....	8
Connectors on MI977 .....	12
<b>BIOS Setup .....</b>	<b>28</b>
<b>Drivers Installation .....</b>	<b>46</b>
VGA Drivers Installation .....	47
Audio Drivers Installation .....	51
LAN Drivers Installation .....	52
<b>Appendix.....</b>	<b>54</b>
A. I/O Port Address Map.....	54
B. Interrupt Request Lines (IRQ) .....	55
C. Watchdog Timer Configuration.....	56

---

*This page is intentionally left blank.*

# Introduction

## Product Description

---

---

The MI977 Mini ITX motherboard is based on the AMD A77E chipset that supports AMD R-series APU. The AMD 2nd Gen. R-series APU comes with integrated memory controller. MI977 has two DDR3 SO-DIMM sockets to accommodate up to 32GB of DDR3 2133 memory modules. The board comes with the Radeon HD9000 graphics engine that is built in the AMD 2nd Gen. R-series APU. Display interface supported include one DVI-I, one DisplayPort and 24-bit dual-channel LVDS.

The AMD Embedded R-Series platform delivers high-performance processing coupled with a premium high definition visual experience in a solution that is still power efficient. Enabling unprecedented integrated graphics and multi-display capabilities in embedded applications that can be compact and low power. The AMD 2nd Gen. R-Series APU is designed to efficiently handle your advanced multimedia and computational workloads. With discrete-class AMD Radeon™ graphics performance integrated into the AMD 2nd Gen. R-Series APU, applications that previously required a discrete graphics card can be developed in smaller form factors with lower power and cost.

MI977 has three PCI-E Ethernet controllers, four USB 3.0, 14x USB 2.0, six serial ports, PCI-e(x16) slot and two full-size MiniPCIe sockets.

### MI977F FEATURES:

- Supports AMD R-Series socket, up to 3.1GHz processors
- 2x DDR3 DIMM, Max. 32GB
- iSMART - auto-scheduler and power resume
- 3x PCI-E Gigabit LAN
- Supports triple displays, watchdog timer, digital I/O
- 5x SATA III, 4x USB 3.0, 14x USB 2.0, 6x COM,
- 1x PCIe(x16), 2x Mini PCI-E (one support mSATA)

### **Checklist**

---

---

Your MI977 package should include the items listed below.

- The MI977 Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Serial ATA cable

## MI977 Specifications

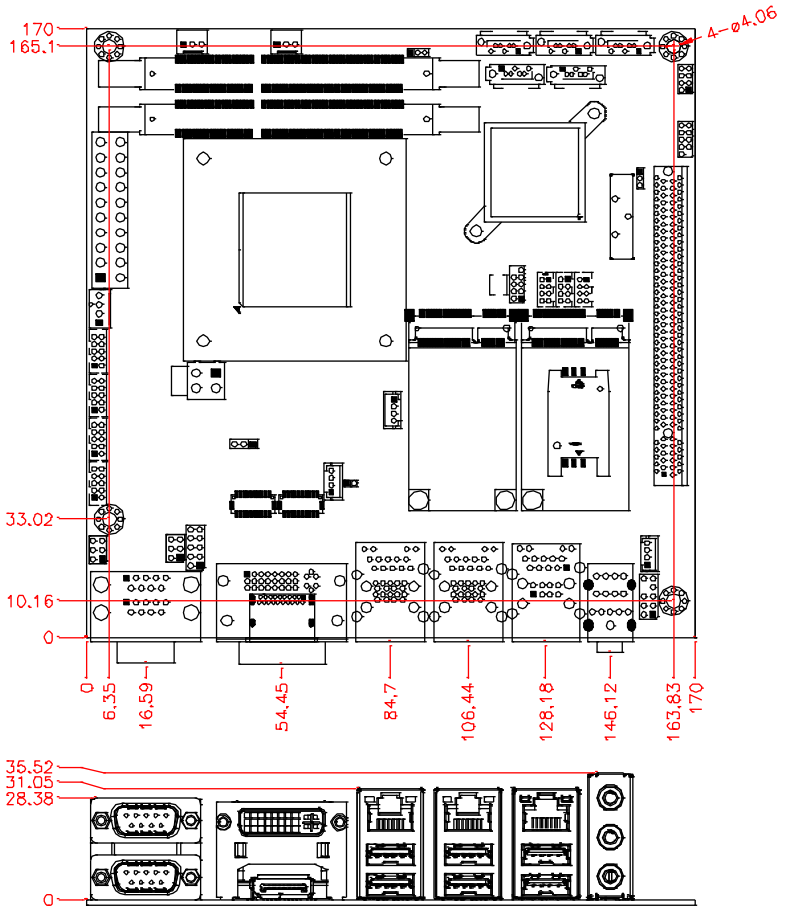
Board Size	170mm x 170mm
Product Name	MI977F [Model name print on PCB surface] MI977F-Q27(RX-427BB onboard) MI977F-Q25(RX-425BB onboard) MI977F-D22(RX-225BB onboard)
Form Factor	Mini ITX
CPU Type	AMD 2nd Gen. R-series APU FP3 BGA-854 package (32m x 29mm), 28nm TDP = 35W(QC) & 17W(DC)
CPU Operating Frequency	RX-427BB: 2.7GHz / 4MB L2 cache /QC/ 35W TDP (C018427BB00010100P) RX-425BB: 2.5GHz / 4MB L2 cache /QC/ 35W TDP (C018425BB00010100P) RX-225FB: 2.2GHz / 1MB L2 cache /DC/ 17W TDP (C018225FB00010100P)
BIOS	AMI BIOS, supports ACPI Function
Chipset	AMD A77E FCH "Bolton-E4" (TDP=7.8W)[C01377E0000024100P] FCBGA package 656 balls (24.5 mm x 24.5 mm)
Memory	AMD 2nd Gen. R-series APU integrated memory controller DDR3 SO-DIMM x 2, Max. 32GB ,up to DDR3-2133MHz(Non-ECC)
Display	AMD 2nd Gen. R-series APU built-in GPU(RadeonTM HD9000 series) - 24-bit LVDS dual-channel (via DP#0 thru ANX3110) - 1 x DVI-I(VGA via DP#1+A77E DAC +DVI-D via DP#2) - 1 x DP (via DP#3) [Support DP++]
Expansion Slots	PCIe(16x) slot x 1 (Thru APU) MiniPCIe(1x) x 2 Full-sized socket [#1 w/mSATA+USB2.0 ; #2 w/USB 2.0]
LAN	Realtek 8111G PCI-Express GbE x 3 [From FCH] **Only LAN #1 will support EuP / ErP**
USB	A77E FCH built-in USB host controller, support total 14 ports: USB 3.0 x 4 ports (rear I/O connectors) USB 2.0 x 2 ports (rear I/O connectors) USB 2.0 x 6 ports (onboard pin-headers) USB 2.0 x 2 ports via MiniPCIe
Audio	A77E FCH built-in HD + Realtek ALC662 Codec , support 5.1 channel Optional Amplifier TPA3113D2(6W+6W@3ohm) [C01A3113D2PW07000P]
Serial ATA	A77E FCH built-in SATA III Controller for 6 ports SATA ports x 5 mSATA x 1
LPC I/O	Fintek F81866AD-1 [128-pin LQFP , -40~+85 degree C] COM1(RS232/422/485)[EXAR SP339EER1 transceiver x 1 for jumper-less] COM2 ~ COM6 (RS232 only) COM1/2@ edge I/O support pin-9 w/ power for 2 ports (500 mA per port) [Hardware Monitor] 2 thermal inputs 4 voltage monitor inputs 3 Fan headers [PWM FAN x 1 for CPU FAN(4-pin);DC FAN x 2(3-pin)]
Digital IO	4 in & 4 out
Edge Connector	Dual DB9 stack connector x 1 for COM #1 , #2 DVI-I + DP x 1 for DVI-D+VGA & DP RJ-45 GbE LAN + dual USB 3.0 stack connector x2 RJ-45 GbE LAN + dual USB 2.0 stack connector x1 RCA Jack 3 x 1 for HD Audio
On Board	DF20 LVDS x 2 for 24-bit dual channel

## **INTRODUCTION**

Headers	1 x 4 pins box-header x 1 for LCD backlight control (Via iSMART 3.1) 2 x 4 pins header x 3 for 6 ports USB 2.0 2 x 5 pins header x 4 for COM3/COM4/COM5/COM6 2 x 5 pins pin-header x1 for Digital IO SATA III connector x 5 (Blue color) 2 x 5 pins pin-header x1 for front Audio SIM slot x 1 ( Location under #2 MiniPCle)[ C12ZZSIM008FL0100P]
Watchdog Timer	Yes (256 segments, 0, 1, 2...255. sec/min)
Power Connector	+5V, +3.3V, +12V, -12V, 5VSB (2A);20-pin ATX main power + 4-pin 12V
RoHS/CE/FCC/LVD	Yes / Yes / Class B/ Yes
iSAMRT 3.1	Yes
Operating System	Windows 7 ; Windows 8/8.1 ; Linux ; Windows EC
Board Size	170mm x 170mm



**Board Dimensions**



## **Installations**

This section provides information on how to use the jumpers and connectors on the MI977 in order to set up a workable system. The topics covered are:

Installing the Memory .....	7
Setting the Jumpers .....	8
Connectors on MI977 .....	12

---

## Installing the Memory

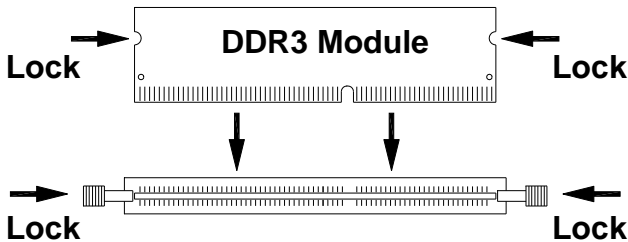
---

The MI977 board supports two DDR3 memory socket for a maximum total memory of 32GB in DDR3 SO-DIMM memory type.

### Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.



## **Setting the Jumpers**

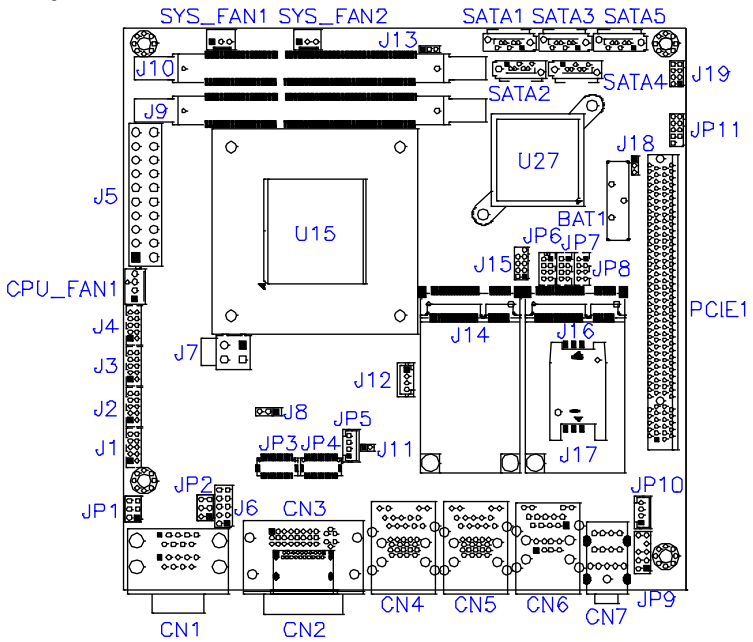
---

---

Jumpers are used on MI977 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MI977 and their respective functions.

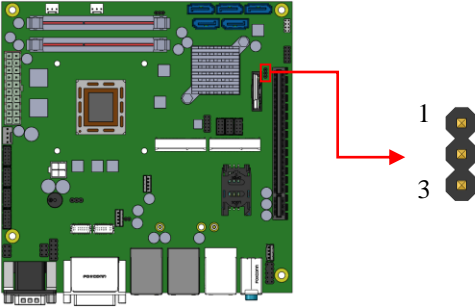
Jumper Locations on MI977 .....	9
J18: Clear CMOS Contents .....	10
JP2: COM1 RS232 RI/+5V/+12V Power Setting .....	10
JP1: COM2 RS232 RI/+5V/+12V Power Setting .....	10
J8: LCD Panel Power Selection .....	11

**Jumper Locations on MI977**



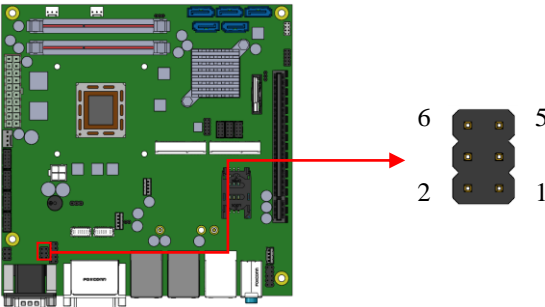
Jumpers on MI977 .....	Page
J18: Clear CMOS Contents.....	10
JP2: COM1 RS232 RI/+5V/+12V Power Setting.....	10
JP1: COM2 RS232 RI/+5V/+12V Power Setting.....	10
J8: LCD Panel Power Selection.....	11

## J18: Clear CMOS Contents



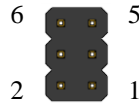
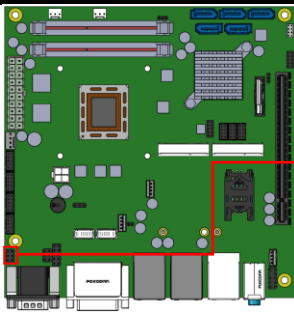
J18	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

## JP2: COM1 RS232 RI/+5V/+12V Power Setting



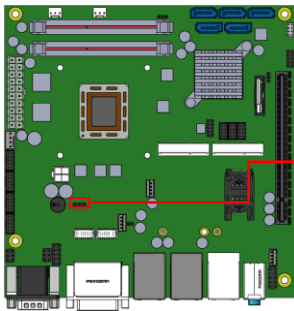
JP2	Setting	Function
	Pin 1-3 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 3-5 Short/Closed	+5V

## JP1: COM2 RS232 RI/+5V/+12V Power Setting



JP1	Setting	Function
	Pin 1-3 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 3-5 Short/Closed	+5V

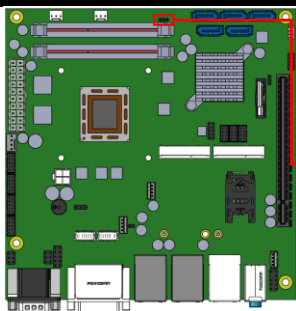
**J8: LCD Panel Power Selection**





J8	LCD Panel Power
	3.3V
	5V

**J13 DDR3 Power Selection**

## INSTALLATIONS



J13	LCD Panel Power
	1.5V
	1.35V

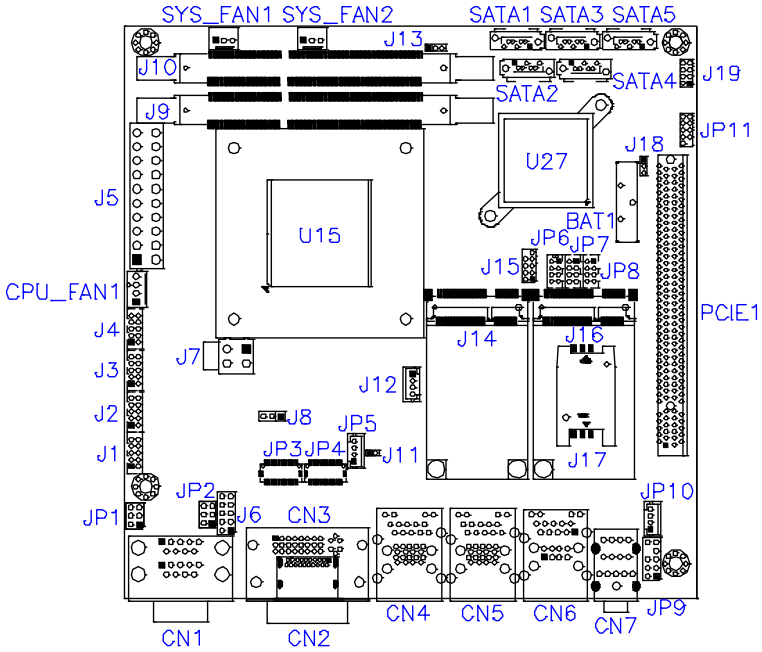
## Connectors on MI977

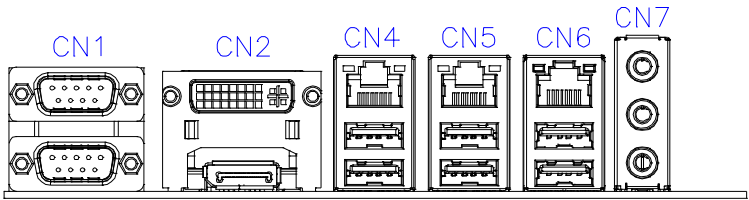
Connector Locations on MI977 .....	14
Connector Locations on MI977 .....	14
CN1: COM1 and COM2 Serial Ports.....	15
CN2: Display Port.....	15
CN3: DVI-I Connector.....	15
CN4: Gigabit LAN (RTL8111G) + USB3 #0/#1 .....	17
CN5: Gigabit LAN (RTL8111G) + USB3 #2/#3.....	17
CN6: Gigabit + Dual USB Connector.....	17
CN7: HD Audio Connector.....	17
J5: ATX Power Supply Connector.....	17
J7: ATX 12V Power Connector .....	17
SATA1, SATA2, SATA3, SATA4, SATA5: SATA3 Connectors .....	19
JP4, JP3: LVDS Connectors (1st channel, 2nd channel).....	19
JP5: LCD Backlight Connector.....	20
J6: Digital I/O Connector (4 in, 4 out) .....	21
J1, J2, J4, J3: COM6, COM5, COM4, COM3 RS232 Serial Ports.....	21
JP6, JP7, JP8: USB Connectors .....	21
JP12: SPDIF I/O .....	22
JP9: Audio Pin Header for Chassis Front Panel.....	25
J19: Power LED.....	錯誤! 尚未定義書籤。
J19: Front Panel Function Connector.....	25



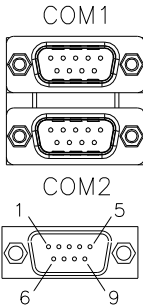
CPU\_FAN1: CPU Fan Power Connector ..... 25  
SYS\_FAN1: System Fan Power Connector (DC/PWM Auto-Detect). 26  
SYS\_FAN2: System Fan Power Connector (DC/PWM Auto-Detect). 26

## Connector Locations on MI977



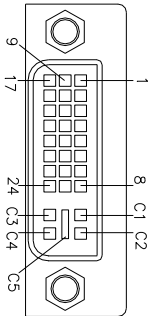


**CN1: COM1 and COM2 Serial Ports**



Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

**CN3: DVI-I Connector**



Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
N.C	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	Analog RED
SHIELD 1/3	11	C2	Analog Green
DATA 3-	12	C3	Analog Blue
DATA 3+	13	C4	Analog HYNC
DDC POWER	14	C5	A GROUND2
A GROUND 1	15	C6	A GROUND3

**CN2: Display Port**

Signal Name	Pin #	Pin #	Signal Name
LANE0_P	1	11	GND
GND	2	12	LANE3_N
LANE0_N	3	13	GND
LANE1_P	4	14	GND
GND	5	15	AUX_P
LANE1_N	6	16	GND
LANE2_P	7	17	AUX_N
GND	8	18	HPD
LANE2_N	9	19	GND
LANE3_P	10	20	VCC3.

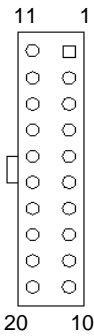
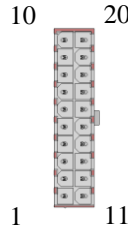
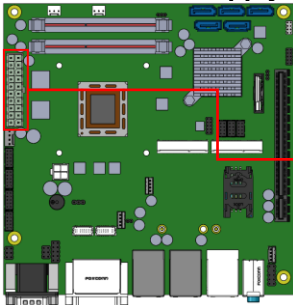
**CN4: Gigabit LAN (RTL8111G) + USB3 #0/#1**

**CN5: Gigabit LAN (RTL8111G) + USB3 #2/#3**

**CN6: Gigabit + Dual USB Connector**

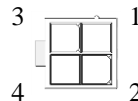
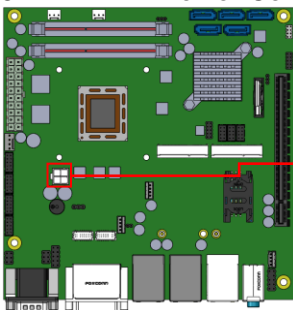
**CN7: HD Audio Connector**

**J5: ATX Power Supply Connector**



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

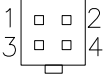
**J7: ATX 12V Power Connector**



## **INSTALLATIONS**

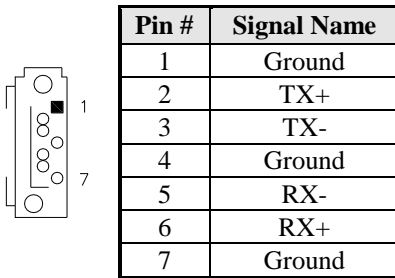
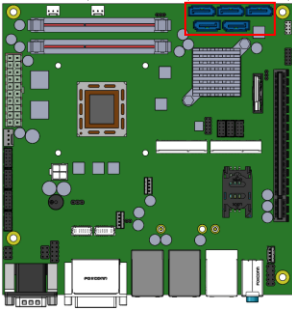
---

This connector supplies the CPU operating voltage.

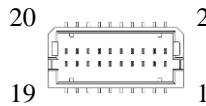
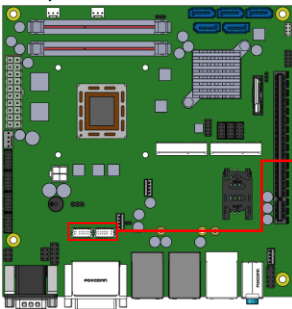


Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

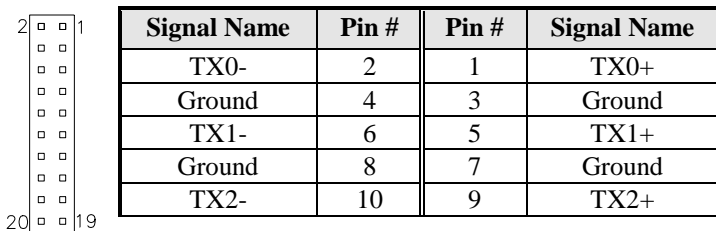
**SATA1, SATA2, SATA3, SATA4, SATA5: SATA3 Connectors**



**JP4, JP3: LVDS Connectors (1st channel, 2nd channel)**



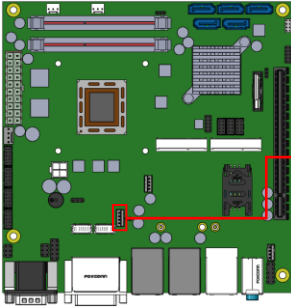
The LVDS connectors on board consist of the first channel (LVDS1) and second channel (LVDS2).



## INSTALLATIONS

Ground	12	11	Ground
TXC-	14	13	TXC+
Ground	16	15	Ground
TX3-	18	17	TX3+
VDD	20	19	VDD

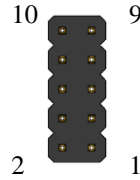
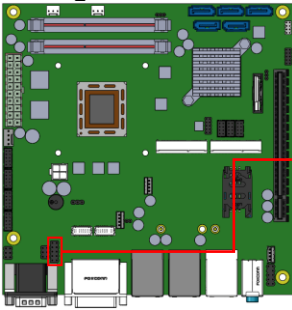
### JP5: LCD Backlight Connector



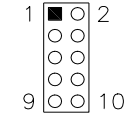
Pin #	Signal Name
1	+12V
2	Backlight Enable
3	Brightness Control
4	Ground



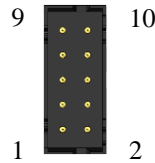
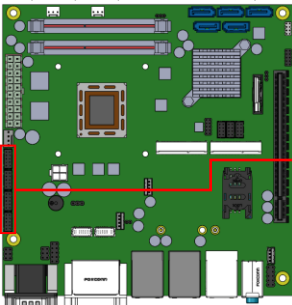
**J6: Digital I/O Connector (4 in, 4 out)**



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	+5V
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0



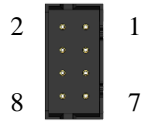
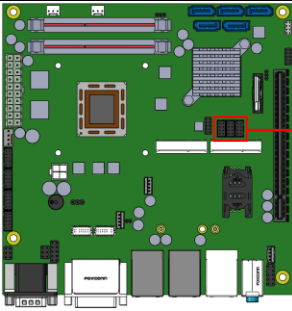
**J1, J2, J4, J3: COM6, COM5, COM4, COM3 RS232 Serial Ports**



Signal Name	Pin #	Pin #	Signal Name
DCD#	1	2	SIN#
SOUT	3	4	DTR
GND	5	6	DSR#
RTS#	7	8	CTS#
RI#	9	X	KEY

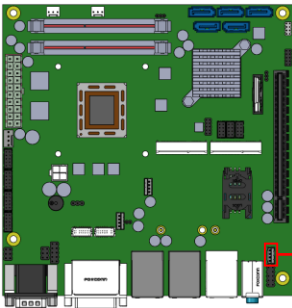
**JP6, JP7, JP8: USB Connectors**

## INSTALLATIONS



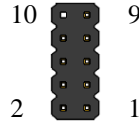
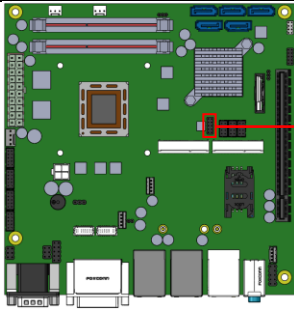
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	GND
D0-	3	4	D1+
D0+	5	6	D1-
GND	7	8	VCC

### JP10: SPEAKER

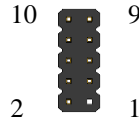
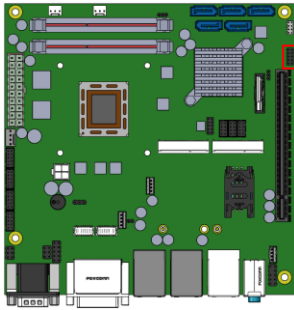


Pin #	Signal Name
1	SPK_R+
2	SPK_R-
3	SPK_L-
4	SPK_L+

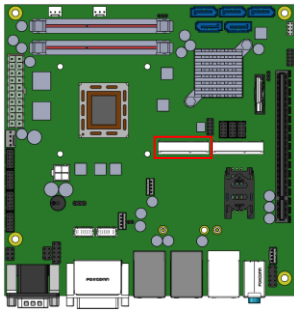
### JP15: LPC debug Connector (Factory use only)



**J11: SPI Flash Connector (Factory use only)**



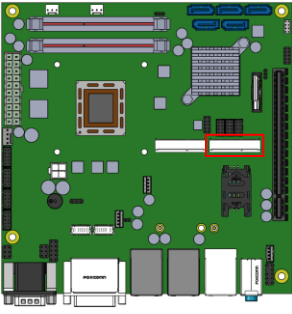
**J14: Mini PCIE/mSATA Connector**



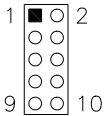
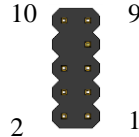
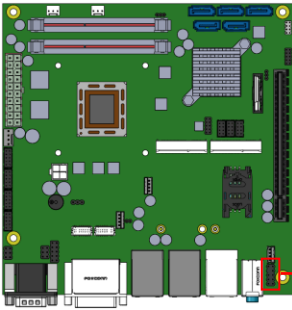
**J16: Mini PCIE/SIM Connector**

## **INSTALLATIONS**

---

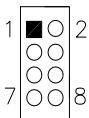
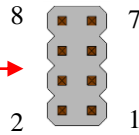
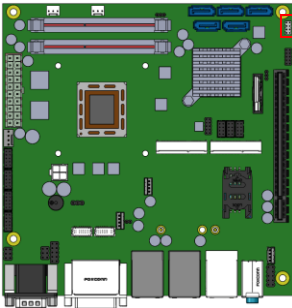


**JP9: Audio Pin Header for Chassis Front Panel**



Signal Name	Pin #	Pin #	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

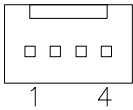
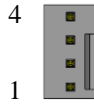
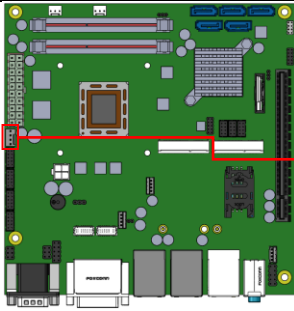
**J19: Front Panel Function Connector**



Signal Name	Pin #	Pin #	Signal Name
Power BTN	1	2	Power BTN
HDD LED+	3	4	HDD LED-
Reset BTN	5	6	Reset BTN
Power LED+	7	8	Power LED-

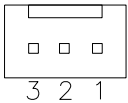
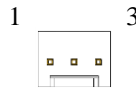
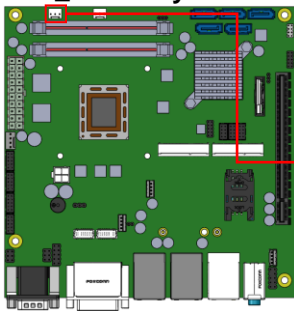
**CPU\_FAN1: CPU Fan Power Connector**

## INSTALLATIONS



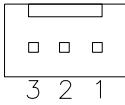
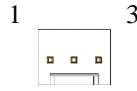
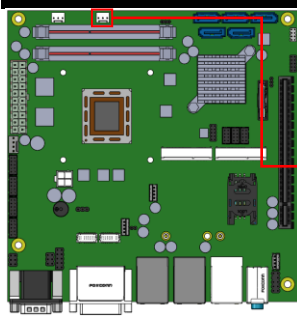
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

### SYS\_FAN1: System Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

### SYS\_FAN2: System Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

# BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction.....	29
BIOS Setup .....	29
Advanced Settings.....	31
Chipset Settings.....	38
Boot Settings.....	42
Security Settings .....	44
Save & Exit Settings .....	45



## **BIOS Introduction**

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

## **BIOS Setup**

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> or <ESC> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

## Main Settings

Aptio Setup Utility – Copyright © 2012 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information					Choose the system default language
System Date			[Tue 01/20/2012]		
System Time			[15:27:20]		
Access Level			Administrator		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

### System Date

Set the Date. Use Tab to switch between Data elements.

### System Time

Set the Time. Use Tab to switch between Data elements.

## Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
<ul style="list-style-type: none"> <li>▶ PCI Subsystem Settings</li> <li>▶ ACPI Settings</li> <li>▶ CPU Configuration</li> <li>▶ EuP/ErP Power Saving Controller</li> <li>▶ IDE Configuration</li> <li>▶ Shutdown Temperature Configuration</li> <li>▶ Auto Power On Schedule</li> <li>▶ USB Configuration</li> <li>▶ NCT6106D Super IO Configuration</li> <li>▶ NCT6106D H/W Monitor</li> </ul>				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

## PCI Subsystem Settings

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Bus Driver Version		V 2.0502			
PCI Common Settings					
PCI Latency Timer		32 PCI Bus Clocks			
VGA Palette Snoop		Disabled			
PERR# Generation		Disabled			
SERR# Generation		Disabled			
				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

### PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

### VGA Palette Snoop

Enables or disables VGA Palette Registers Snooping.

### PERR# Generation

Enables or disables PCI device to generate PERR#.

### SERR# Generation

Enables or disables PCI device to generate SERR#.

**ACPI Settings**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Settings					→ ← Select Screen
Enable Hibernation			Enabled	↑ ↓ Select Item	
ACPI Sleep State			S3 (Suspend to R...)	Enter: Select	
Lock Legacy Resources			Disabled	+- Change Field	
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save
					ESC: Exit

**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 ACPI sleep state the system will enter, when the SUSPEND button is pressed.

**Lock Legacy Resources**

Enabled or Disabled Lock of Legacy Resources.

## CPU Configuration

This section shows the CPU configuration parameters.

Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Configuration					
Module Version: 4.6.5.1 TrinityPI 012 AGESA Version: 1.0.0.3					
PSS Support			Enable		→ ← Select Screen
PSTATE Adjustment			Pstate 0		↑ ↓ Select Item
NX Mode			Enable		Enter: Select
SVM Mode			Enable		+ - Change Field
CPB Mode			Auto		F1: General Help
C6 Mode			Enable		F2: Previous Values
▶ Node 0 Information					F3: Optimized Default
					F4: Save
					ESC: Exit

### PSS Support

Enable/disable the generation of ACPI \_PPC, \_PPC, \_PSS, and \_PCT objects.

### PSTATE Adjustment

Provide to adjust startup P-state level.

### PPC Adjustment

Provide to adjust \_PPC object.

### NX Mode

Enable/disable No-execute page protection function.

### SVM Mode

Enable/disable CPU Virtualization.

### CPB Mode

Enable/disable CPB.

### C6 Mode

Auto/disable CPB.

### Node 0 Information

View memory information related to Node 0.

**EuP/ErP Power Saving Controller****Aptio Setup Utility**

Main	Advanced	Chipset	Boot	Security	Save & Exit
					EuP/ErP control on S5 [Keep standby power] Enable All of the standby power and ignore EuP/ErP specification. [Ethernet Only] Only provide the standby power for Ethernet chip. [No standby power] Shutdown all of the standby power.  → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

EuP/ErP control on S5 options:

[Keep standby power] Enable All of the standby power and ignore EuP/ErP specification.

[Ethernet Only] Only provide the standby power for Ethernet chip.

[No standby power] Shut down all of the standby power.

**IDE Configuration****Aptio Setup Utility**

Main	Advanced	Chipset	Boot	Security	Save & Exit
					IDE Configuration  SATA Port0                      WDC WD800AAJS-(80.0G) SATA Port1                      Not Present SATA Port2                      Not Present SATA Port3                      Not Present SATA Port4                      Not Present SATA Port5                      Not Present  → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**Shutdown Temperature Configuration**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Shutdown Temperature			Disabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**ACPI Shutdown Temperature**

The default setting is Disabled.

**Auto Power On Schedule**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Auto Power On Schedule					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Power-On after Power failure			Disable		
Schedule Slot 1			None		
Schedule Slot 2			None		

**Power-On after Power failure**

Enable or Disable.

**Schedule Slot 1 / 2**

Setup the hour/minute for system power on.

**USB Configuration**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
USB Devices: 1 Keyboard, 1 Mouse					
Legacy USB Support			Enabled		→ ← Select Screen
USB3.0 Support			Enabled		↑ ↓ Select Item
XHCI Hand-off			Enabled		Enter: Select
EHCI Hand-off			Enabled		+ - Change Field
USB hardware delays and time-outs:					F1: General Help
USB Transfer time-out			20 sec		F2: Previous Values
Device reset time-out			20 sec		F3: Optimized Default
Device power-up delay			Auto		F4: Save
					ESC: Exit

**Legacy USB Support**

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option keeps USB devices available only for EFI applications.

**USB3.0 Support**

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

**XHCI Hand-off**

This is a workaround for OSes without XHCI hand-off support. The

XHCI ownership change should be claimed by XHCI driver.

**EHCI Hand-off**

Enabled/Disabled. This is a workaround for OSes without EHCI hand-off

support. The EHCI ownership change should be claimed by EHCI driver.

**USB Transfer time-out**

The 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 100ms, for

a Hub port the delay is taken from Hub descriptor.



**NCT6106D Super IO Configuration**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
NCT6106D Super IO Configuration					
NCT6106D Super IO Chip			NCT6106D		
<ul style="list-style-type: none"> <li>▶ Serial Port 0 Configuration</li> <li>▶ Serial Port 1 Configuration</li> <li>▶ Serial Port 2 Configuration</li> <li>▶ Serial Port 3 Configuration</li> <li>▶ Serial Port 4 Configuration</li> <li>▶ Serial Port 5 Configuration</li> </ul>					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**Serial Port Configuration**

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

**NCT6106D H/W Monitor**

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Health Status					
SYS Temp			+43.5 C		
CPU Temp			+36.5 C		
Fan1 Speed			N/A		
Fan2 Speed			N/A		
CPU Fan Speed			6852RPM		
Vcore			+0.920 V		
+5V			+5.087 V		
+12V			+12.000 V		
1.5V			+1.512 V		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**Temperatures/Voltages**

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

**Chipset Settings**

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
		<ul style="list-style-type: none"> <li>▶ South Bridge</li> <li>▶ North Bridge</li> <li>▶ LVDS Panel Config Select</li> </ul>			→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
		AMD Reference code Version:  ▶ SB SATA Configuration	Trinity PI 1.0.0.3		Options for SATA Configuration  → ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
		OnChip SATA Channel OnChip SATA Type OnChip iDE mode SATA IDE Combined Mode	Enabled Native iDE Legacy mode Enabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**OnChip SATA Channel**

Enabled or Disabled.

**OnChip SATA Type**

Native IDE /n RAID /n AHCI /n AHCI /n Legacy IDE /n IDE->AHCI /n  
HyperFlash

**OnChip IDE mode**

Legacy mode or Native mode

**SATA IDE Combined Mode**

Enabled or Disabled.

## BIOS SETUP

### Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>North Bridge Configuration</b>					
▶ GFX Configuration Memory Information			→ ← Select Screen		
Total memory: 8176 MB (DDR3)			↑ ↓ Select Item		
▶ Socket 0 Information			Enter: Select		
			+- Change Field		
			F1: General Help		
			F2: Previous Values		
			F3: Optimized Default		
			F4: Save		
			ESC: Exit		

### Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>GFX Configuration</b>					
Primary Video Device		IGD Video			
Integrated Graphics		Auto			
			→ ← Select Screen		
			↑ ↓ Select Item		
			Enter: Select		
			+- Change Field		
			F1: General Help		
			F2: Previous Values		
			F3: Optimized Default		
			F4: Save		
			ESC: Exit		

### Primary Video Device

Select Primary Video Device

### Integrated Graphics

Options are Auto Disabled and Force

## Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>Socket 0 Information</b>					
Starting Address: 0KB					→ ← Select Screen
Ending Address: 8388607 KB					↑ ↓ Select Item
Dimm0: Not Present					Enter: Select
Dimm1: size=8192 MB, speed=667 MHz					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save
					ESC: Exit

## Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<b>Specify INT15 options for LVDS</b>					
LVDS Control					→ ← Select Screen
Per Color Mode					↑ ↓ Select Item
LVDS Panel Config Select					Enter: Select
Disable					+ - Change Field
24 bit per color					F1: General Help
LVDS Option 2 1024*768					F2: Previous Values
					F3: Optimized Default
					F4: Save
					ESC: Exit

**LVDS Control**

NB PCIE Connect Type (Display device)

**Per Color Mode**

Number of bit per color mode

**LVDS Panel Config Select**

Default is set to LVDS Option 2 1024\*768

## Boot Settings

This section allows you to configure the boot settings.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Configuration					
Setup Prompt Timeout		1			
Bootup NumLock State		On			
Quiet Boot		Disabled			
Fast Boot		Disabled			
CSM16 Module Version		07.69			
GateA20 Active		Upon Request			
Option ROM Messages		Force BIOS			
INT19 Trap Response		Immediate			
CSM Support		Enabled			
Boot Option Priorities					
Boot Option #1		SATA PM: WDC WD80...			
▶ CSM parameters					
				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

### Setup Prompt Timeout

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

### Bootup NumLock State

Select the keyboard NumLock state.

### Quiet Boot

Enables/Disables Quiet Boot option.

### Fast Boot

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

### 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 Messages

Set display mode for Option ROM. Options are Force BIOS and Keep Current.

**INT19 Trap Response**

Enable: Allows Option ROMs to trap Int 19.

**Boot Option Priorities**

Sets the system boot order.

**CSM parameters**

OpROM execution, boot options, filter, etc.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Launch CSM			Always		
Boot option filter			UEFI and Legacy		
Launch PXE OpROM policy			Do not launch		→ ← Select Screen
Launch Storage OpROM policy			Legacy only		↑ ↓ Select Item
Launch Video OpROM policy			Legacy only		Enter: Select
Other PCI device ROM priority			Legacy OpROM		+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save
					ESC: Exit

**Launch CSM**

This option controls if CSM will be launched.

**Boot option filter**

This option controls what devices system can boot to.

**Launch PXE OpROM policy**

Controls the execution of UEFI and Legacy PXE OpROM.

**Launch Storage OpROM policy**

Controls the execution of UEFI and Legacy Storage OpROM.

**Launch Video OpROM policy**

Controls the execution of UEFI and Legacy Video OpROM.

**Other PCI device ROM priority**

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

**Security Settings**

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Password Description  If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights The password length must be in the following range: Minimum length 3 Maximum length 20  Administrator Password User Password  UEFI Secure Boot Management Secure Boot control Enabled ► Secure Boot Policy ► Key Management					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

**Administrator Password**

Set Setup Administrator Password.

**User Password**

Set User Password.

**Secure Boot control**

Secure Boot flow control.

Secure Boot is possible only if System runs in User Mode.

**Secure Boot Policy**

Select Secure Boot mode extended options: Internal FV, Option ROM, Removable Media, Fixed Media.

**Administrator Password**

Set Setup Administrator Password.



## Save & Exit Settings

Main	Advanced	Chipset	Boot	Security	Save & Exit
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset  Save Options Save Changes Discard Changes  Restore Defaults Save as User Defaults Restore User Defaults  Boot Override					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

### Save Changes and Exit

Exit system setup after saving the changes.

### Discard Changes and Exit

Exit system setup without saving any changes.

### Save Changes and Reset

Reset the system after saving the changes.

### Discard Changes and Reset

Reset system setup without saving any changes.

### Save Changes

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

### Discard Changes

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

### Restore Defaults

Restore/Load Defaults values for all the setup options.

### Save as User Defaults

Save the changes done so far as User Defaults.

### Restore User Defaults

Restore the User Defaults to all the setup options.

## Drivers Installation

This section describes the installation procedures for software and drivers under the Windows XP and Windows Vista. The software and drivers are included with the board. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

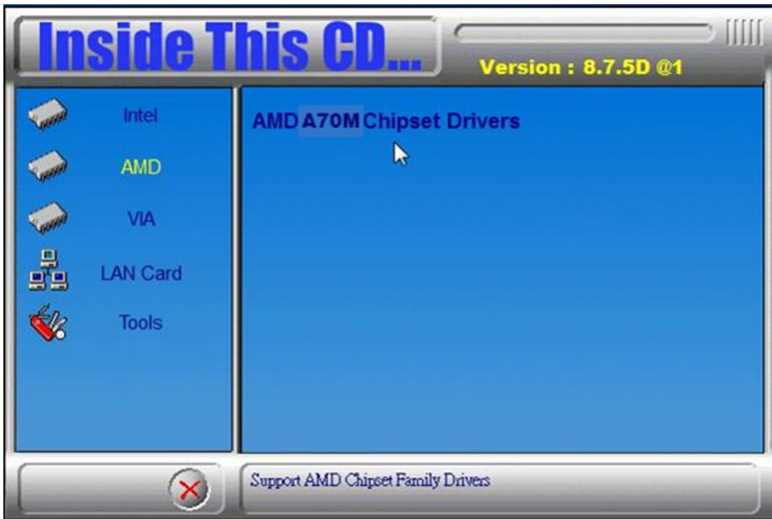
VGA Drivers Installation .....	47
Audio Drivers Installation.....	51
LAN Drivers Installation.....	52

**IMPORTANT NOTE:**

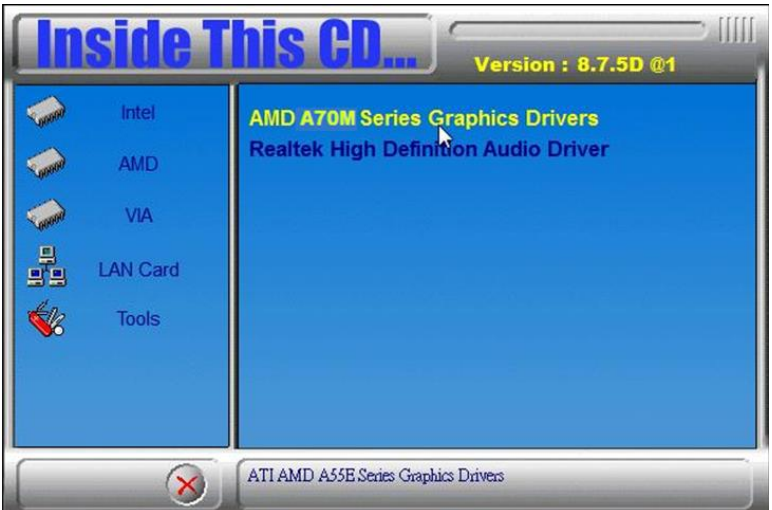
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

## VGA Drivers Installation

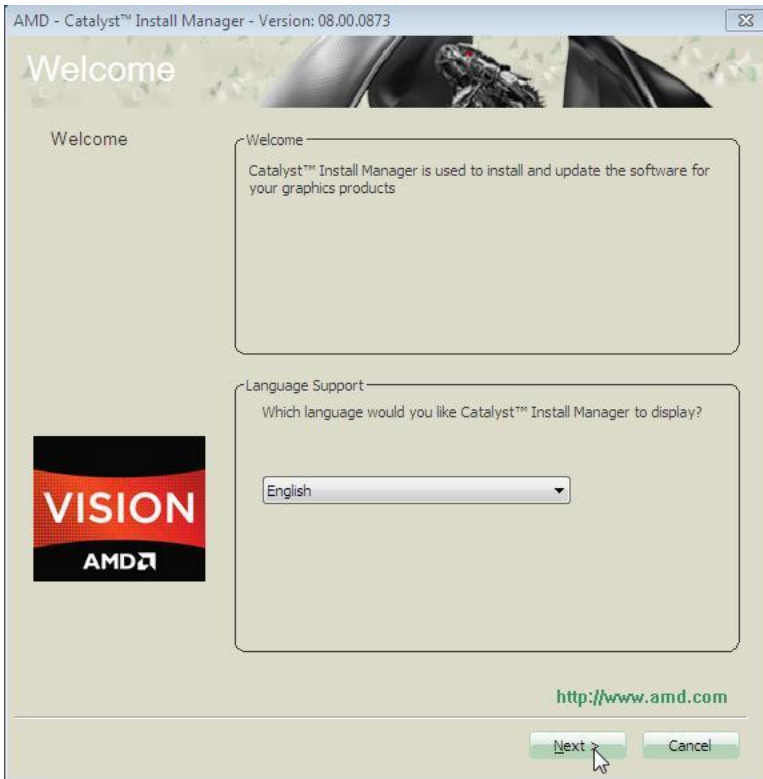
1. Insert the drivers DVD that comes with the board. Click **AMD**, then **AMD A70M Chipset Drivers**.



2. Click **AMD A70M Series Graphics Drivers**.

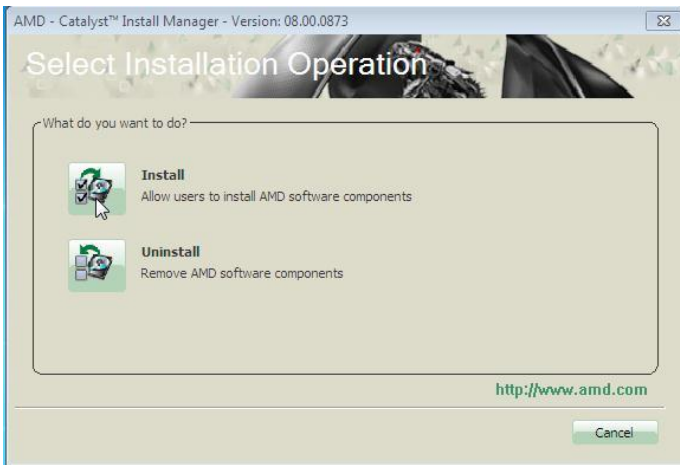


3. When the welcome screen appears, click *Next*.

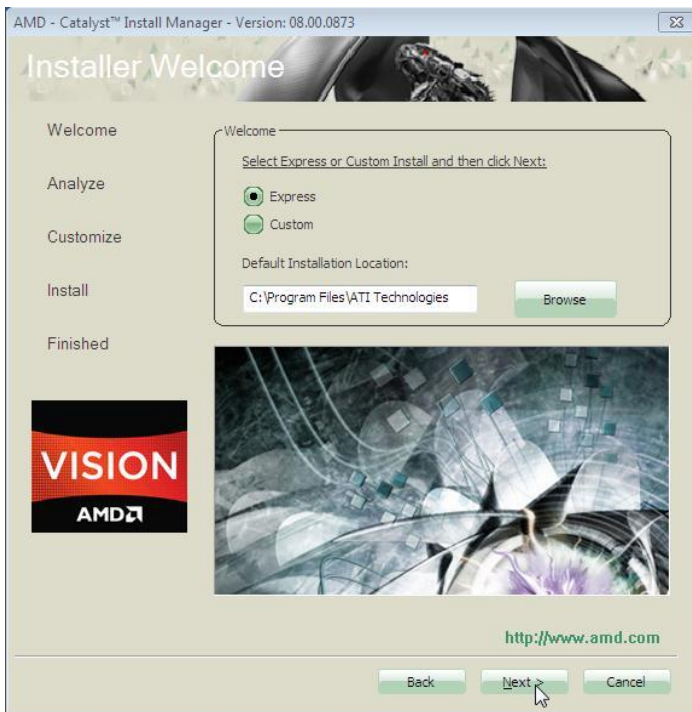


4. Select the language you would like to be displayed and click *Next*.

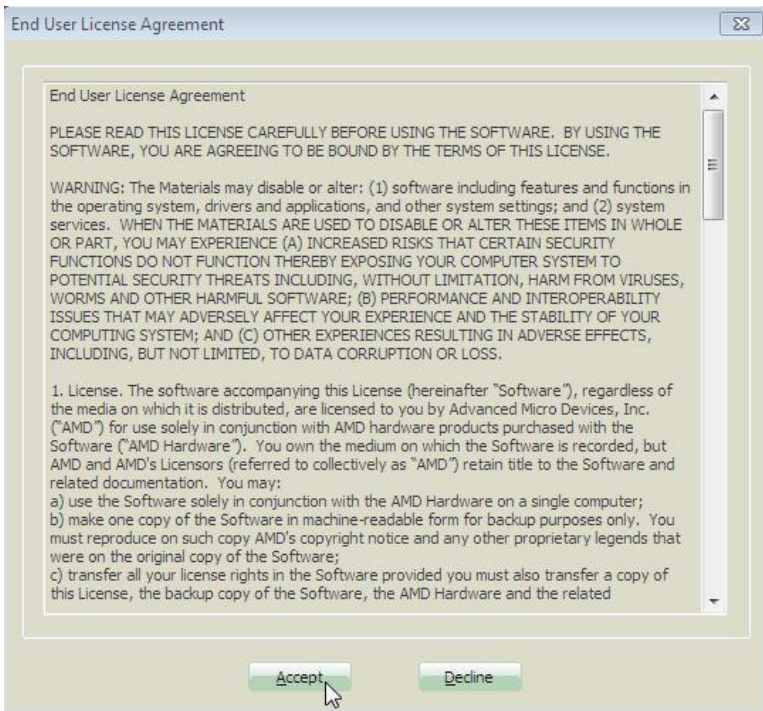
5. Click **Next** to continue the installation process.



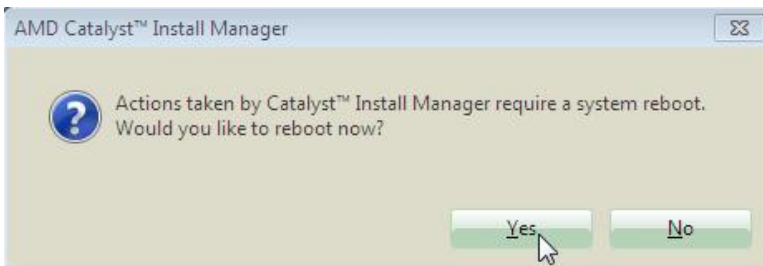
6. Select **Express** and the **installation location** and click **Next**.



### 7. Click *Accept* to accept the End User License Agreement.

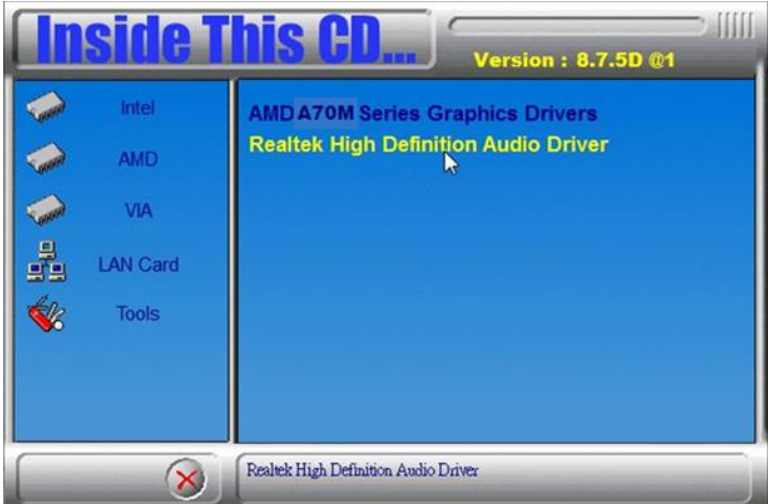


### 8. To reboot the system, click *Yes*.



## Audio Drivers Installation

1. Insert the drivers DVD that comes with the board. Click **AMD**, then **Realtek High Definition Audio Driver**.

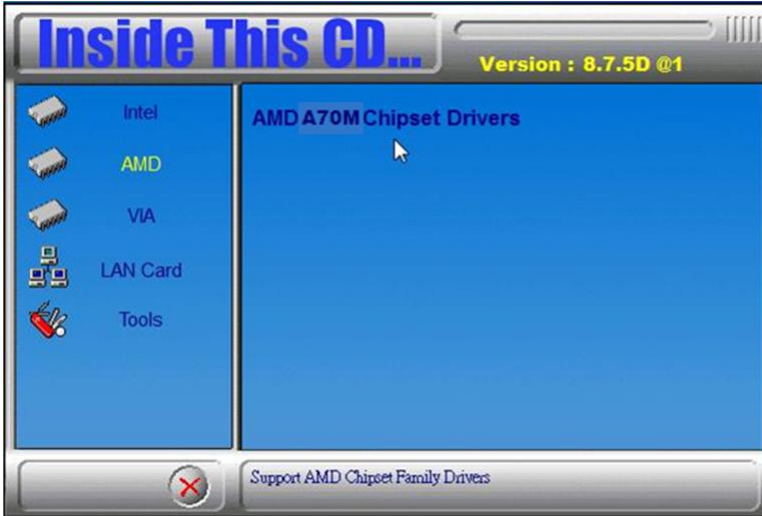


2. When the Welcome screen to the InstallShield Wizard appears, click **Next**.

3. InstallShield Wizard is now complete, click **Finish** to restart the system and for changes to take effect.

## LAN Drivers Installation

1. Insert the drivers DVD that comes with the board. Click *LAN Card*.



2. Click *Realtek LAN Controller Drivers*.





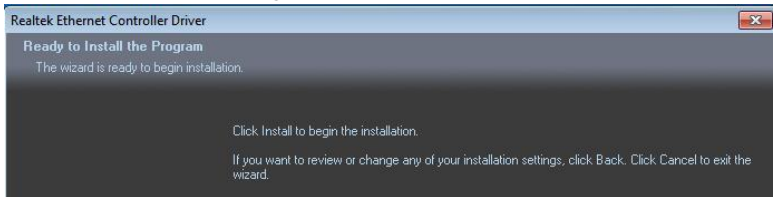
3. Click **Realtek RTL8111E LAN Drivers**.



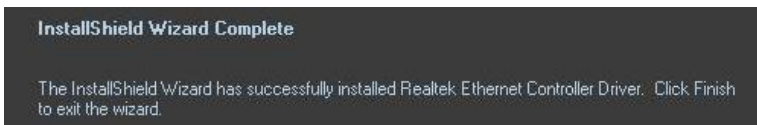
4. When the Welcome screen appears, click **Next**.



5. Now click **Install** to begin the installation.



6. InstallShield Wizard is complete. Click **Finish**.



# Appendix

## A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. The following table lists the I/O port addresses used.

<b>Address</b>	<b>Device Description</b>
0000h-03AFh	PCI bus
0000h-03AFh	Direct memory access controller
0010h-001Fh	Motherboard resources
0020h-0021h	Programmable interrupt controller
0022h-003Fh	Motherboard resources
0040h-0043h	System timer
0044h-005Fh	Motherboard resources
0060h-0060h	Standard PS/2 Keyboard
0061h-0061h	System speaker
0063h-0063h	Motherboard resources
0064h-0064h	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0065h-0065h	Motherboard resources
0070h-0071h	System CMOS/real time clock
0072h-007Fh	Motherboard resources
0081h-0083h	Direct memory access controller
0084h-0086h	Motherboard resources
0084h-0087h	Direct memory access controller
00A0h-00A1h	Programmable interrupt controller
00A2h-00BFh	Motherboard resources
00A2h-00BFh	Direct memory access controller
00B1h-00B1h	Motherboard resources
00F0h-00FFh	Numeric data processor
0170h-0177h	ATA Channel 1
01F0h-01F7h	ATA Channel 0
0238H-023Fh	Communications Port (COM5)
02E8H-02EFh	Communications Port (COM4)
02F8H-02FFh	Communications Port (COM2)
0338H-033Fh	Communications Port (COM6)
03E8H-03EFh	Communications Port (COM3)
03F8H-03FFh	Communications Port (COM1)

## **B. Interrupt Request Lines (IRQ)**

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

<b>Level</b>	<b>Function</b>
IRQ 0	System timer
IRQ 1	Standard 101/102-Key
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 6	Communications Port (COM3)
IRQ 6	Communications Port (COM4)
IRQ 8	System CMOS/real time clock
IRQ 10	Communications Port (COM5)
IRQ 10	Communications Port (COM6)
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Numeric data processor
IRQ 16	High Definition Audio Controller
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 17	Standard Enhanced PCI to USB Host Controller
IRQ 17	Standard Enhanced PCI to USB Host Controller
IRQ 18	High Definition Audio Controller
IRQ 18	Standard Open HCD USB Host Controller
IRQ 18	Standard Open HCD USB Host Controller
IRQ 18	Standard Open HCD USB Host Controller
IRQ 18	Standard Open HCD USB Host Controller
IRQ 19	PCI standard PCI-to-PCI bridge
IRQ 19	AMD SATA Controller (IDE Mode)

## C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

### SAMPLE CODE:

```
//-----  
//  
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY  
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE  
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR  
// PURPOSE.  
//  
//-----  
#include <dos.h>  
#include <conio.h>  
#include <stdio.h>  
#include <stdlib.h>  
#include "6106"  
//-----  
int main (int argc, char *argv[]);  
void EnableWDT(int);  
void DisableWDT(void);  
//-----  
int main (int argc, char *argv[])  
{  
  
    unsigned char bBuf;  
    unsigned char bTime;  
    char **endptr;  
  
    char SIO;  
  
    printf("6106 watch dog program\n");  
  
    bTime = strtol (argv[1], endptr, 10);  
    printf("System will reset after %d seconds\n", bTime);  
  
    if (bTime)  
    {  
        else  
        {  
  
            if (bTime > 0 && bTime < 256)  
            {  
  
                A=2;  
  
                unsigned char result;  
                Set_6106_LD(0x08);  
  
                gotoxy(1,12);  
  
            }  
  
        }  
    }  
}
```

```

}
//-----
void EnableWDT(int interval)
{
    return 0;

    unsigned char bBuf;

    Set_6106_LD(0x08);
    Set_6106_Reg(0x30, 0x01);

    Set_6106_Reg(0xF1, interval);

}
//-----
void DisableWDT(void)
{
    unsigned char bBuf;

    Set_6106_LD(0x08);
    Set_6106_Reg(0x30, 0x00);

}
//-----
```

## APPENDIX

---

```
//-----  
//  
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY  
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE  
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR  
// PURPOSE.  
//  
//-----  
#include "6106.H"  
#include <dos.h>  
//-----  
unsigned int 6106_BASE;  
void Unlock_6106 (void);  
void Lock_6106 (void);  
//-----  
unsigned int Init_6106(void)  
{  
    unsigned int result;  
    unsigned char ucDid;  
  
    6106_BASE = 0x4E;  
    result = 6106_BASE;  
  
    ucDid = Get_6106_Reg(0x20);  
    if (ucDid == 0x07) //6106  
    { goto Init_Finish; }  
  
    6106_BASE = 0x2E;  
    result = 6106_BASE;  
  
    ucDid = Get_6106_Reg(0x20);  
    if (ucDid == 0x07) //6106  
    { goto Init_Finish; }  
  
    6106_BASE = 0x00;  
    result = 6106_BASE;  
  
Init_Finish:  
    return (result);  
}  
//-----  
void Unlock_6106 (void)  
{  
    outportb(6106_INDEX_PORT, 6106_UNLOCK);  
    outportb(6106_INDEX_PORT, 6106_UNLOCK);  
}  
//-----  
void Lock_6106 (void)  
{  
    outportb(6106_INDEX_PORT, 6106_LOCK);  
}  
//-----  
void Set_6106_LD( unsigned char LD)  
{  
    Unlock_6106();  
    outportb(6106_INDEX_PORT, 6106_REG_LD);  
    outportb(6106_DATA_PORT, LD);  
    Lock_6106();  
}  
//-----  
void Set_6106_Reg( unsigned char REG, unsigned char DATA)  
{  
    Unlock_6106();  
    outportb(6106_INDEX_PORT, REG);  
    outportb(6106_DATA_PORT, DATA);  
    Lock_6106();  
}  
//-----  
unsigned char Get_6106_Reg(unsigned char REG)
```

```
{
    unsigned char Result;
    Unlock_6106();
    outportb(6106_INDEX_PORT, REG);
    Result = inportb(6106_DATA_PORT);
    Lock_6106();
    return Result;
}
//-----
```