

MI959

**AMD® R-series APC / A70M FCH
Mini-ITX Motherboard**

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The MI959 Mini ITX motherboard is based on the AMD A70M chipset that supports AMD R-series APU. The AMD R-series APU comes with integrated memory controller. MI959 has two DDR3 SO-DIMM sockets to accommodate up to 8GB of DDR3 1600 memory modules. The board comes with the Radeon HD7000 graphics engine that is built in the AMD 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 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 R-Series APU, applications that previously required a discrete graphics card can be developed in smaller form factors with lower power and cost.

MI959 has dual PCI-E Ethernet controllers, four USB 3.0, four USB 2.0, six serial ports, PCI-e(x16) slot and two full-size MiniPCIe sockets.

MI959F FEATURES:

- Supports AMD R-Series socket, up to 3.1GHz processors
- 2x DDR3 SO-DIMM, Max. 8GB
- iSMART - auto-scheduler and power resume
- 2x PCI-E Gigabit LAN
- Supports triple displays, watchdog timer, digital I/O
- 5x SATA III, 4x USB 3.0, 4x USB 2.0, 6x COM,
- 1x PCIe(x16), 2x Mini PCI-E (one support mSATA)

Checklist

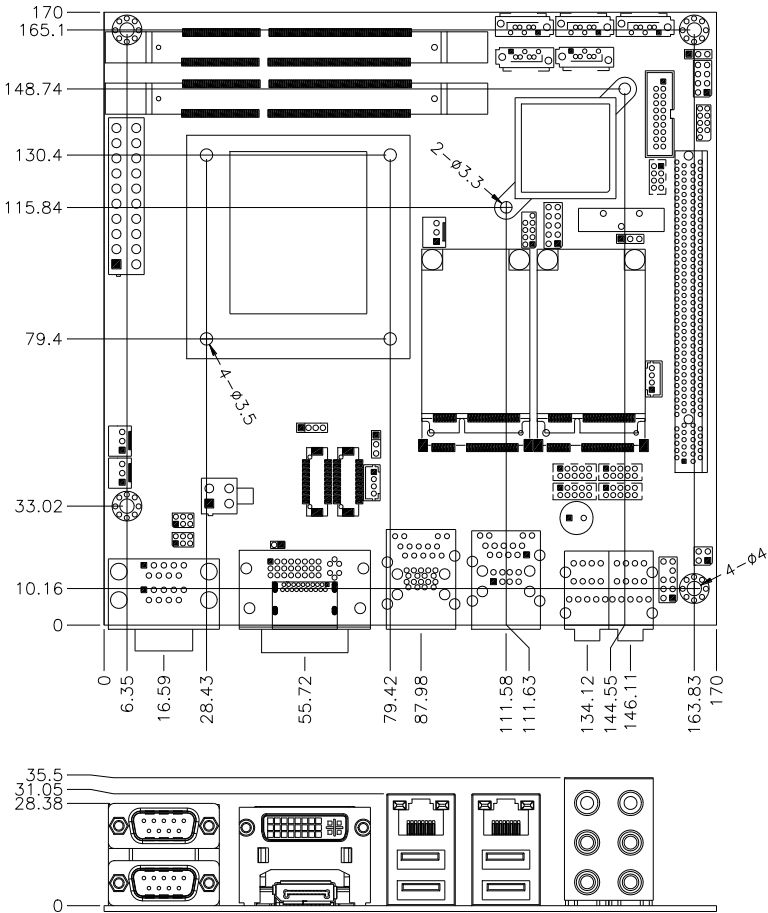
Your MI959 package should include the items listed below.

- The MI959 Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Serial ATA cable

MI959 Specifications

Product Name	MI959F
Form Factor	Mini ITX
CPU Type	AMD R-series APU, 32nm, FS1r2 PGA-722 package (35mm x 35mm)
CPU Models	R-464L , 2.3GHz (QC) , TDP= 35W R-460H, 2.1 GHz (QC) , TDP=35W R-272F, 2.6GHz (DC) , TDP =35W
Cache	4MB L2 cache
BIOS	AMI BIOS [4MB SPI ROM]
Chipset	AMD A70M FCH "Hudson-M3" (TDP=7.4W) FCBGA package 656 balls (24.5 mm x 24.5 mm)
Memory	AMD R-series APU integrated memory controller DDR3 SO-DIMM x 2, Max. 8GB, up to DDR3-1600MHz (Non-ECC)
Display	AMD R-series APU built-in GPU (Radeon™ HD7000 series) - 24-bit LVDS dual-channel (via DP#0 thru Analogix ANX3110) - 1 x DVI-I - 1 x DP
Expansion Slots	PCIe(16x) slot x 1 MiniPCIe(1x) x 2 [Full-sized x2 w/USB , only 1 support mSATA]
LAN	Realtek 8111E-VL-CQ PCI-Express GbE x 2 (Thru A70M PCIe lanes) **Only LAN #1 support ErP**
USB	AMD A70M FCH built-in USB host controller, support total 10 ports: - USB 3.0 x 4 ports (2 ports via rear I/O connectors; 2 ports thru onboard pin-header) - USB 2.0 x 4 ports (2 ports via rear I/O connectors; 2 ports thru onboard pin-header) - USB 2.0 x 2 ports via MiniPCIe
Audio	AMD A70M FCH built-in HD interface + Realtek ALC892 Codec Support 7.1 channel
Serial ATA	A70M FCH built-in SATA III Controller for 6 ports
LPC I/O	Nuvoton NCT6106D [128-pin LQFP , -40~+85 degree C] COM1(RS232/422/485), COM2 ~ COM6 (RS232 only), Hardware Monitor (2 thermal inputs,4 voltage monitor inputs & 3 Fan headers) [DC FAN, 3-pin type] COM1/2 with pin-9 with power for 2 ports (500 mA for each port)
Digital IO	4 in & 4 out thru LPT
Edge Connector	Dual DB9 stack connector x 1 for COM #1, #2 DVI-I + DP stack connector x 1 RJ-45 GbE LAN + dual USB 3.0 stack connector x1 RJ-45 GbE LAN + dual USB 2.0 stack connector x1 Double triplet jack 3 x 2 for HD Audio 7.1 CH
Onboard Headers	DF13 LVDS x 2 for 24-bit dual channel DF11 2 x 4 pins header x 1 for 2 ports USB 2.0 DF11 2 x 5 pins header x 4 for COM3~COM6 2 x 10 pins box-header x 1 for 2 ports USB3.0 2 x 5 pins pin-header x1 for Digital I/O 1 x 4 pins box-header x 1 for LCD backlight control SATA connector x 5 (Blue color)
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	Yes
iSMART	Remote On/Off control & power fail resume (Thru TI MSP430G2433) ErP function supporting (Thru NCT6106D) AT24C02 EEPROM [SO8 type] via SMBus (optional)
Board Size	170mm x 170mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the MI959 in order to set up a workable system. The topics covered are:

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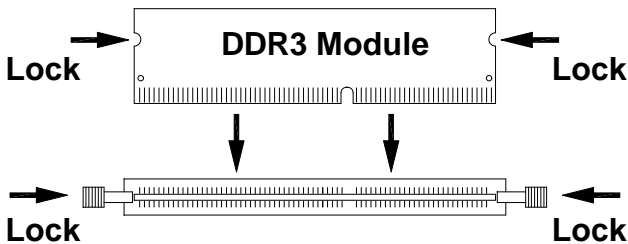
Installing the Memory

The MI959 board supports two DDR3 memory socket for a maximum total memory of 8GB 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.

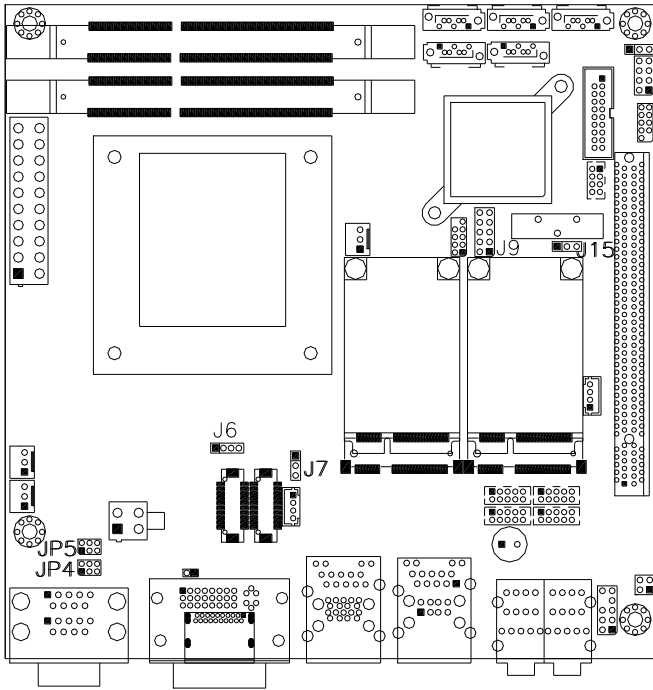


Setting the Jumpers

Jumpers are used on MI959 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 MI959 and their respective functions.



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Jumper Locations on MI959

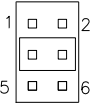


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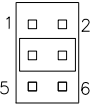
J15: Clear CMOS Contents

J15	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS



JP4: COM1 RS232 RI/+5V/+12V Power Setting

JP4	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

JP5: COM2 RS232 RI/+5V/+12V Power Setting

JP5	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

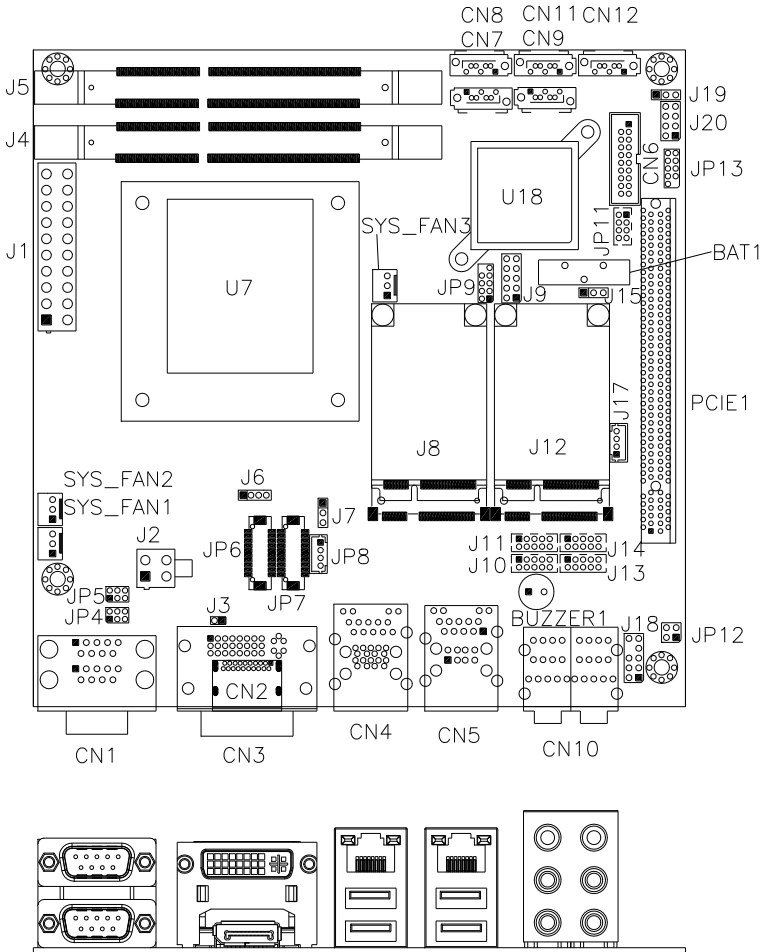
J7: LCD Panel Power Selection

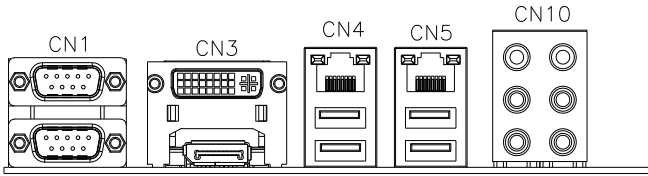
J7	LCD Panel Power
	3.3V
	5V

Connectors on MI959

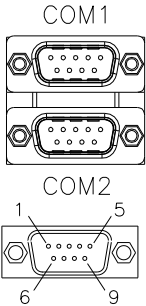
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Connector Locations on MI959



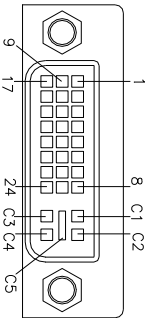


CN1: COM1 and COM2 Serial Ports

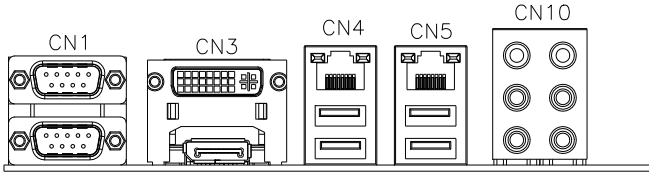


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

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

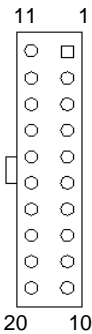


CN4: Gigabit + Dual USB Connector

CN5: Gigabit + Dual USB Connector

CN10: HD Audio Connector

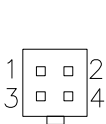
J1: ATX Power Supply Connector



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

J2: ATX 12V Power Connector

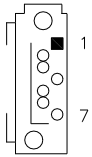
This connector supplies the CPU operating voltage.



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

INSTALLATIONS

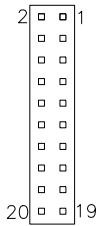
CN7, CN8, CN9, CN11, CN12: SATA3 Connectors



Pin #	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

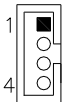
JP7, JP6: LVDS Connectors (1st channel, 2nd channel)

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



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

JP8: LCD Backlight Connector



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

J9: Digital I/O Connector (4 in, 4 out)

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

J10, J11, J13, J14: 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

JP11: USB Connectors

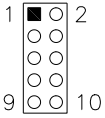
Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	GND
D0-	3	4	D1+
D0+	5	6	D1-
GND	7	8	VCC

JP12: SPDIF I/O

		Pin #	Signal Name
1	■	1	SPDIF IN
	□	2	Ground
3	□	3	SPDIF OUT
	□	4	Ground

INSTALLATIONS

J18: Audio Pin Header for Chassis Front Panel



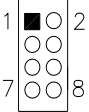
Signal Name	Pin #	Pin #	Signal Name
MIC IN_L	1	2	Ground
MIC IN_R	3	4	DET
LINE_R	5	6	Ground
Sense	7	8	KEY
LINE_L	9	10	Ground

J19: Power LED



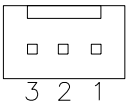
Pin #	Signal Name
1	VCC5
2	VCC5
3	GND

J20: Front Panel Function Connector



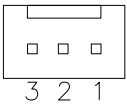
Signal Name	Pin #	Pin #	Signal Name
Power BTN	1	2	Power BTN
HDD LED+	3	4	HDD LED-
Reset BTN	5	6	Reset BTN
VCC5	7	8	5VDUAL

CPU_FAN1: CPU Fan Power Connector



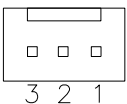
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

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:

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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 provides 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 key immediately allows you to enter the Setup utility. If you are a little bit late pressing the 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"> ▶ PCI Subsystem Settings ▶ ACPI Settings ▶ CPU Configuration ▶ EuP/ErP Power Saving Controller ▶ IDE Configuration ▶ Shutdown Temperature Configuration ▶ Auto Power On Schedule ▶ USB Configuration ▶ NCT6106D Super IO Configuration ▶ NCT6106D H/W Monitor 				→ ← 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		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
	PCI Common Settings				
	PCI Latency Timer		32 PCI Bus Clocks		
	VGA Palette Snoop		Disabled		
	PERR# Generation		Disabled		
	SERR# Generation		Disabled		

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					
	Enable Hibernation		Enabled		→ ← Select Screen
	ACPI Sleep State		S3 (Suspend to R...)		↑ ↓ Select Item
	Lock Legacy Resources		Disabled		Enter: Select
					+ - 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 standby power control		Keep standby power		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		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
	SATA Port1		Not Present		
	SATA Port2		Not Present		
	SATA Port3		Not Present		
	SATA Port4		Not Present		
	SATA Port5		Not Present		

Shutdown Temperature Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
APCI 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					
Power-On after Power failure			Disable		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
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"> ▶ Serial Port 0 Configuration ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration ▶ Serial Port 3 Configuration ▶ Serial Port 4 Configuration ▶ Serial Port 5 Configuration 					→ ←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"> ▶ South Bridge ▶ North Bridge ▶ LVDS Panel Config Select 					<p>→ ← Select Screen</p> <p>↑ ↓ Select Item</p> <p>Enter: Select</p> <p>+ - Change Field</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Default</p> <p>F4: Save</p> <p>ESC: Exit</p>

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<p>AMD Reference code Version: Trinity PI 1.0.0.3</p> <ul style="list-style-type: none"> ▶ SB SATA Configuration 					<p>Options for SATA Configuration</p> <p>→ ← Select Screen</p> <p>↑ ↓ Select Item</p> <p>Enter: Select</p> <p>+ - Change Field</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Default</p> <p>F4: Save</p> <p>ESC: Exit</p>

Aptio Setup Utility

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

BIOS SETUP

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.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
North Bridge Configuration					
<ul style="list-style-type: none"> ▶ GFX Configuration Memory Information 					
<p>Total memory: 8176 MB (DDR3)</p> <ul style="list-style-type: none"> ▶ Socket 0 Information 					
			<p>→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit</p>		

Aptio Setup Utility

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

Primary Video Device

Select Primary Video Device

Integrated Graphics

Options are Auto Disabled and Force

BIOS SETUP

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Socket 0 Information					
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
Specify INT15 options for LVDS					
LVDS Control		Disable		→ ← Select Screen	
Per Color Mode		24 bit per color		↑ ↓ Select Item	
LVDS Panel Config Select		LVDS Option 2 1024*768		Enter: Select	
				+- Change Field	
				F1: General Help	
				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					→ ← Select Screen
Save Changes					↑ ↓ Select Item
Discard Changes					Enter: Select
					+ - Change Field
					F1: General Help
Restore Defaults					F2: Previous Values
Save as User Defaults					F3: Optimized Default
Restore User Defaults					F4: Save
					ESC: Exit
Boot Override					

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:

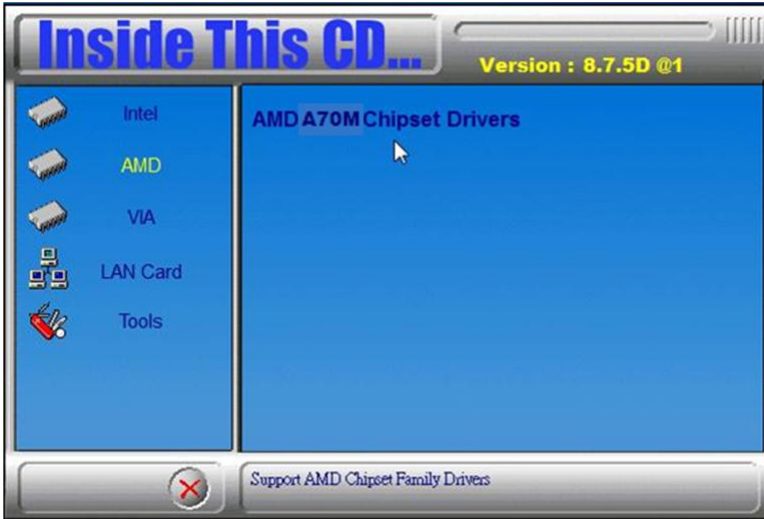
VGA Drivers Installation	36
Audio Drivers Installation	40
LAN Drivers Installation.....	41

IMPORTANT NOTE:

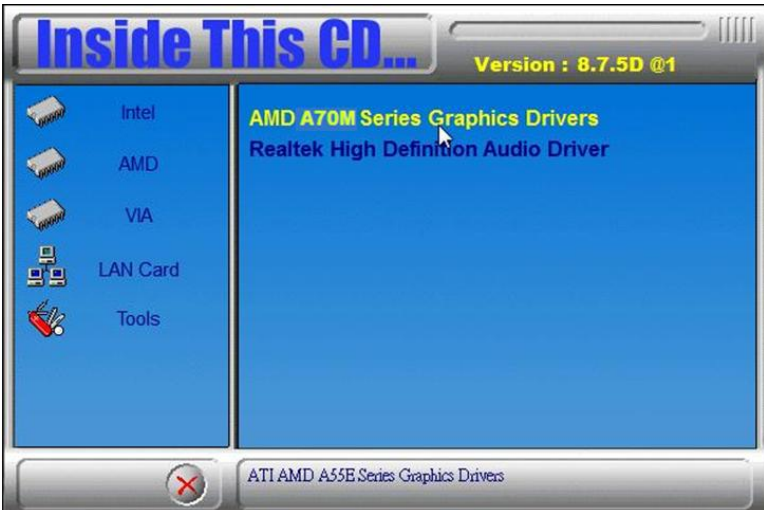
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

VGA Drivers Installation

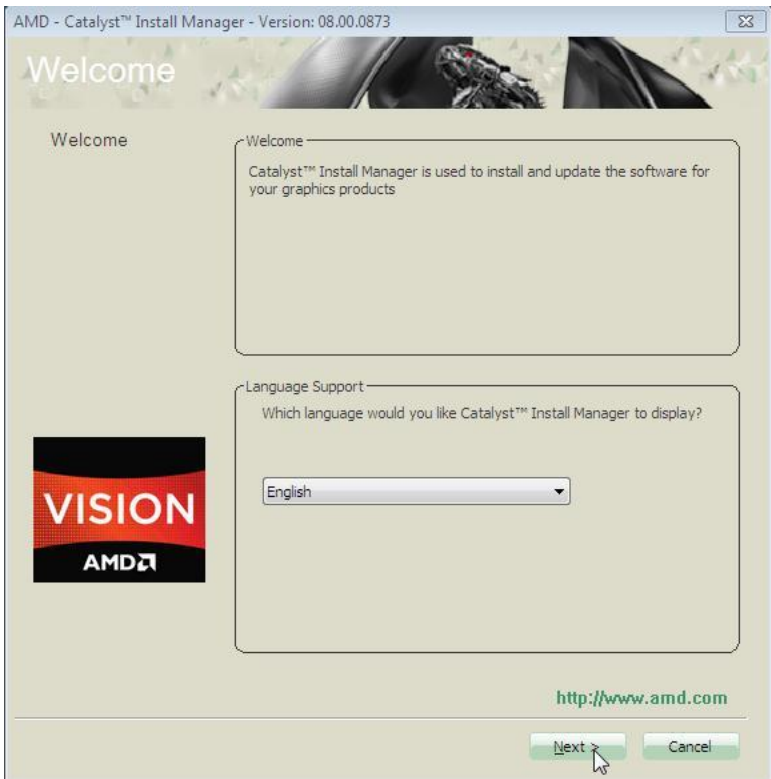
1. Insert the drivers DVD that comes with the board. Click **AMD**, then **AMD A70M Chipset Drivers**.



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

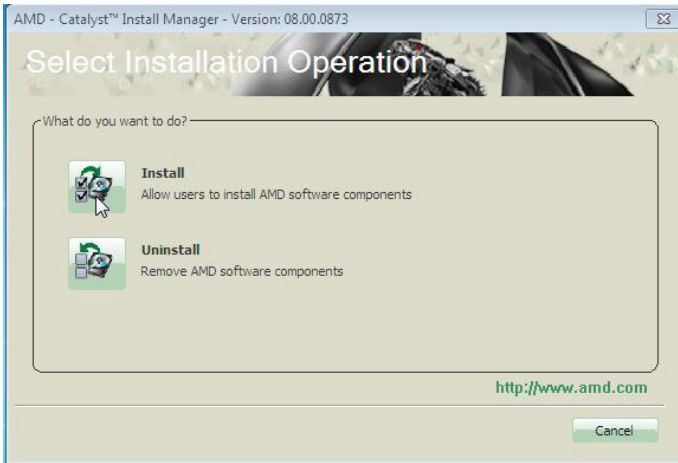


3. When the welcome screen appears, click *Next*.

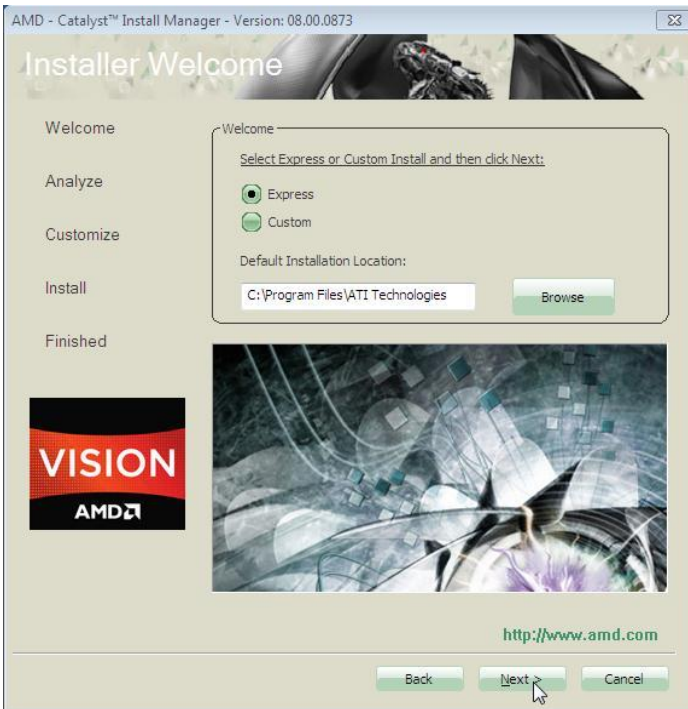


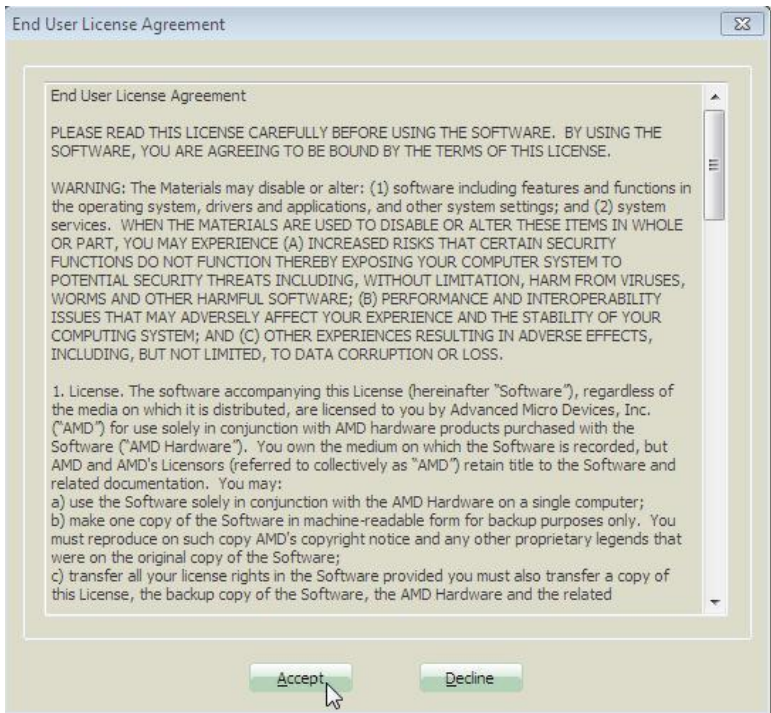
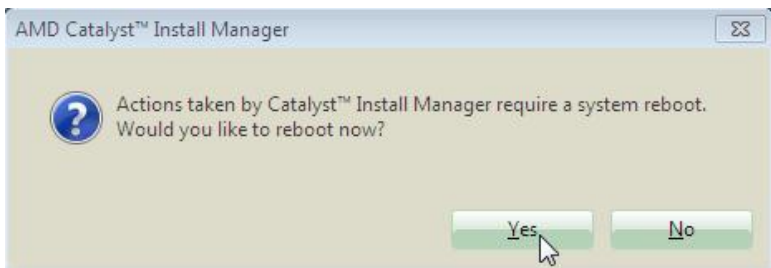
4. Select the language you would like to be displayed and click *Next*.

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



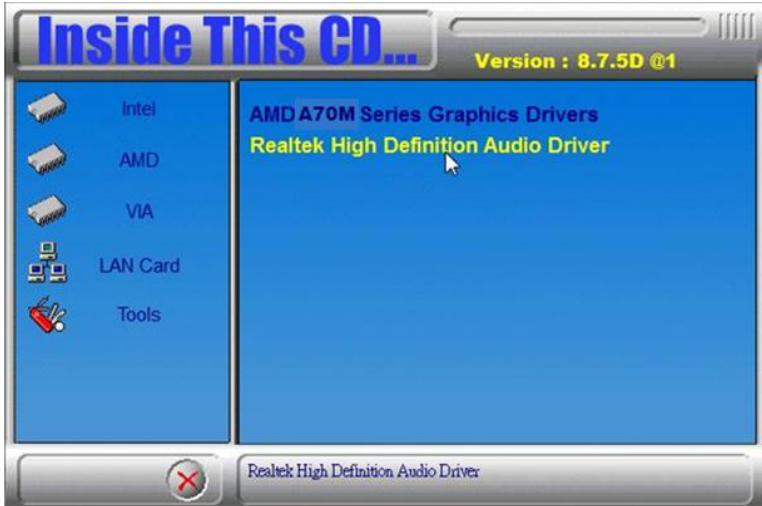
6. Select **Express** and the **installation location** and click **Next**.



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**.

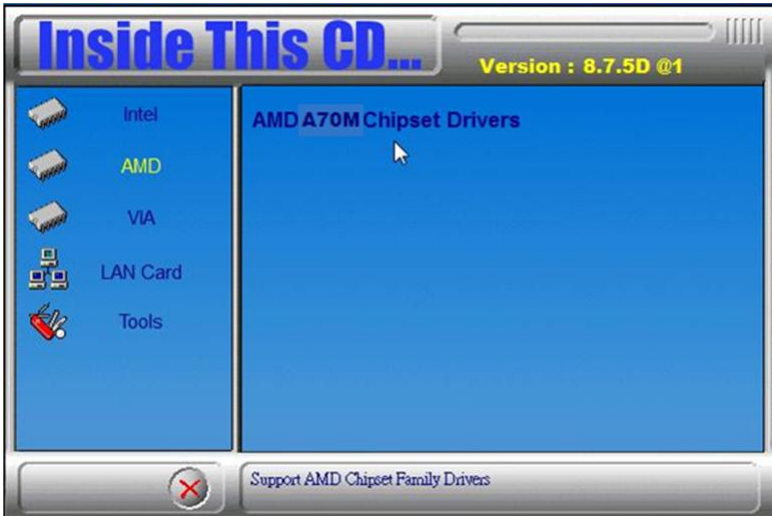


2. When the Welcome screen to the InstallShield Wizard appears, click **Next**.

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*.



DRIVERS INSTALLATION

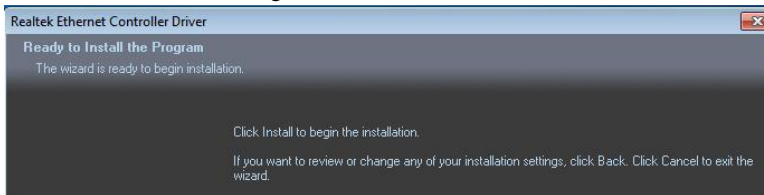
3. Click *Realtek RTL8111E LAN Drivers*.



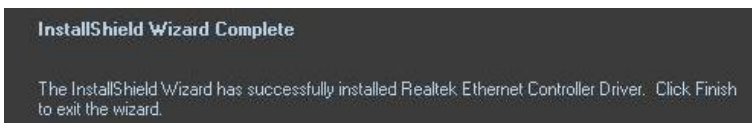
4. When the Welcome screen appears, click *Next*.



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.

Address	Device Description
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.

Level	Function
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);

}
//-----
```

```

//-----
//
// 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)

```

APPENDIX

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