MBD301

AMD Ryzen™ Desktop Processor
Mini-ITX Motherboard

User's Manual

Version 1.0
(November 2019)

Compliance

CE

This is a class B product. In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.

FC

This product has been tested and found to comply with the limits for a Class A device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE

This product is compliant with the current RoHS restrictions and prohibits use of the following substances in concentrations exceeding 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

Important Safety Information

Carefully read the precautions before using the board.

Environmental conditions:

- Use this product in environments with ambient temperatures within the parameters in the product specifications (0° C to 60°C).

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on this product.
- Do not place heavy objects on the top of this product.

Precaution against Electrostatic Discharge or ESD

- To prevent the damage caused by ESD, it is important to ground yourself. Wear an anti-static wrist strap to avoid electrostatic discharge damage to the board or other sensitive components.
- Place the board or system on an anti-static mat or on the foam pad that it was shipped in.
- Always switch off and unplug the system when working inside the case.
- Always put sensitive components in anti-static bags to keep them safe from ESD.
- When handling components such as memory modules, do not touch the gold edge contacts. Hold the edge of components away from electrical contacts or pins.

CAUTION

There is a danger of explosion if the battery is incorrectly installed. Replace only with the same or equivalent type recommended by the manufacturer. For your safety, never attempt to recharge or disassemble the old battery. Dispose of used batteries according to the manufacturer's instructions.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

  12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

* PRODUCTS, HOWEVER, THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.
   - Product model name
   - Product serial number
   - Detailed description of the problem
   - The error messages in text or in screenshots if there is any
   - The arrangement of the peripherals
   - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, you can download the RMA form at http://www.ibase.com.tw/english/Supports/RMAService/. Fill out the form and contact your distributor or sales representative.

iBASE

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Block Diagram
- Board View
- Board Dimensions

1.1 Introduction

The MBD301 is a Mini-ITX motherboard based Ryzen™ processors with Radeon™ Vega graphics that offers high performance in a small form factor. The board features two DDR4 2400 slots, a Gigabit Ethernet, and an mSATA SSD slot for storage. The 170mm by 170 mm platform has connectors for a DisplayPort 1.2 video interface, six USB 3.0, two USB 2.0, four COM, three SATA III and HD audio.

MBD301

1.2 Features

- AMD Ryzen™ Desktop Processor with Vega Graphics Processors
- 2 x DDR4 2400 SO-DIMM, expandable to 64 GB
- DisplayPort via 2nd Gen. AMD APU
- 1x PCIe (x16) or 2x PCIe (x8) slots, 6x USB 3.0, 4x COM, GbE
- M.2 E2230 slot, full-size Mini PCIe slot, SIM socket
- Configurable watchdog timer and digital I/O
- IBASE technologies* including iControl, Observer and iSMART

* IBASE iCONTROL is an intelligent technology featuring auto power on/off scheduler. IBASE Observer is a hardware remote monitoring utility used for monitoring voltages, temperature sensors and fan speeds. IBASE iSMART allows users to configure systems to auto start and shut down at specific times. It allows the MCU to restart the system after a power failure. It is an intelligent energy-saving technology providing automatic power on/off scheduling and helps systems boot up even under extreme low temperature conditions. It can also confine system power consumption in on/off mode state under or equal to 0.5W through the BIOS.

1.3 Packing List

Your product package should include the items listed below. If any of the items below is missing, contact your sales representative.

- MBD301 motherboard
- I/O shield
- This user's manual
- Disk (including chipset drivers)

1.4 Optional Accessories

IBASE provides the following optional accessories:

- Audio cable (Audio-34)
- USB cable (USB-29)
- COM port cable (PK1-1H)

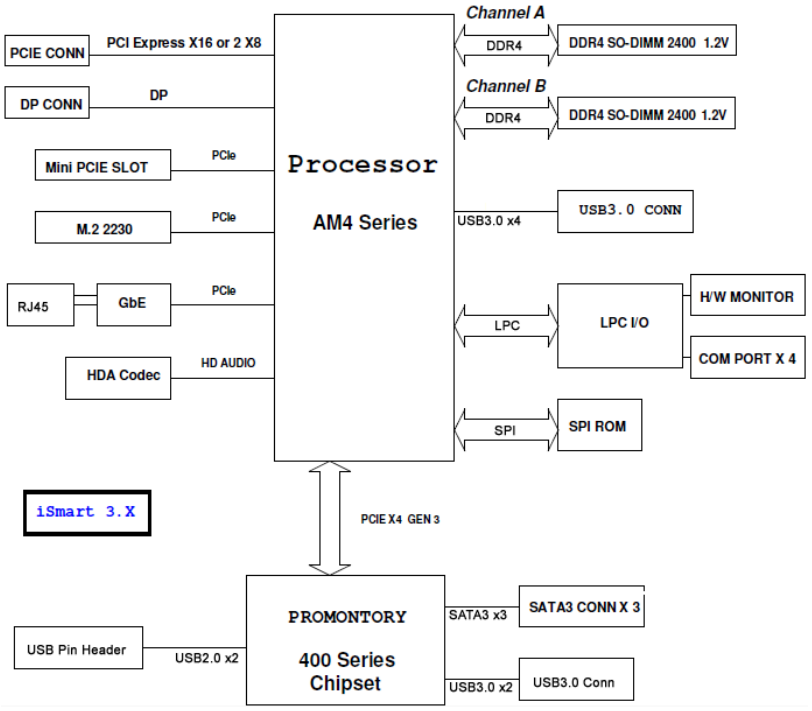
1.5 Specifications

Product Name	MBD301
Form Factor	Mini-ITX motherboard
CPU & Chipset	AMD AM4 Ryzen™ desktop processor AMD 400 Series chipset
Memory	2 x DDR4 SO-DIMM 2400, dual channel, expandable to 64GB
Storage	mSATA SSD slot
Graphics	AMD Radeon™ Vega GPU integrated for APU series
Network	1 x Realtek RTL8111H GbE LAN controller
Super I/O	Fintek F81846AD-I
Digital I/O	4-In / 4-Out
Audio Codec	Built-in HD audio with Realtek ALC662 codec for 5.1 channel
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec / min)
BIOS	AMI BIOS

iSMART	Yes
RAID	RAID 0 / 1
EuP / ErP	Compliant
Dimensions	170 x 170 mm (6.7” x 6.7”)
RoHS	Yes
Certification	CE, FCC Class A
I/O Ports	
Display	1 x DisplayPort 1.2 for AMD AM4 APU series (3840 x 2160 at 60 Hz)
LAN	1 x RJ45 GbE LAN
USB	• 6 x USB 3.0 (I/O coastline connectors) • 2 x USB 2.0 (via an onboard pin-header)
Serial	**4 x COM:** • COM1: RS-232/422/485 (edge I/O connector) • COM2: RS-232 (edge I/O connector) • COM3 ~ COM4: RS-232 only (via onboard box-headers)
SATA	3 x SATA III
Audio Jack	1 x Line-In, 1 x Line-Out, 1 x Mic-In
Expansion Slots	• 1 x PCIe (x16) slot • M.2 E2230 • 1 x SIM card slot
Environmental	
Temperature	• **Operating:** 0 ~ 60 °C (32 ~ 140 °F) • **Storage:** -20 ~ 80 °C (-4 ~ 176 °F)
Relative Humidity	0 ~ 90 %, non-condensing at 60 °C

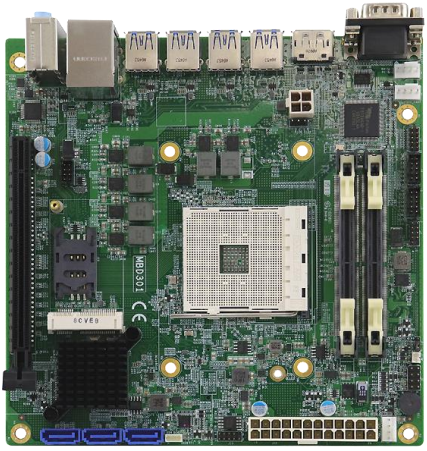
All specifications are subject to change without prior notice.

1.6 Block Diagram



1.7 Board View

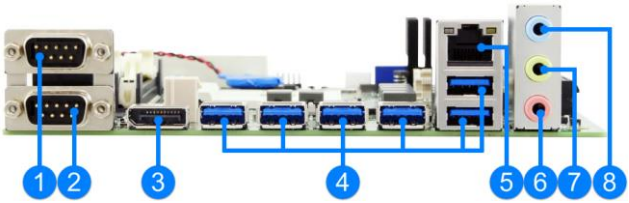
Top View



Bottom View

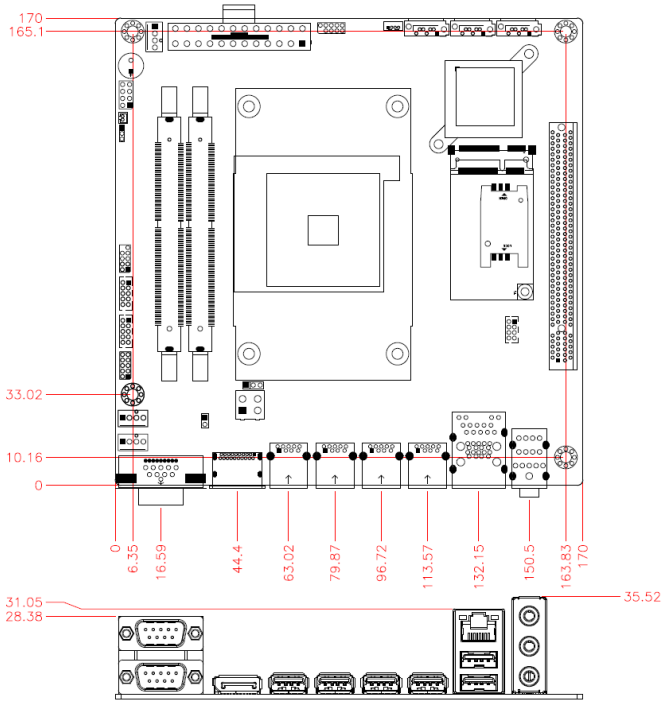
* The photos above are for reference only. Some minor components may differ.

I/O View



No.	Name	No.	Name
1	COM1 Port	5	GbE Ports
2	COM2 Port	6	Microphone
3	DisplayPort	7	Line-Out
4	USB 3.0 Ports	8	Line-In

1.8 Dimensions



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Chapter 2
Hardware Configuration

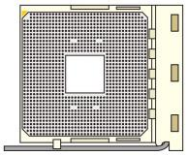
This section provides information on jumper settings and connectors on the board in order to set up a workable system. The topics covered are:

- Installing the CPU, memory, Mini-PCIe cards and M.2 cards
- Jumper and connector locations
- Jumper settings and connectors information

2.1 Installations

2.1.1 Installing the CPU

1. To unlock the CPU socket, lift the ZIF lever to release the clamping pressure on the socket. Keep the lever arm upright.
2. Position the CPU above the socket such that the CPU corner aligns with the gold triangle matching the socket corner with a small triangle.



3. Carefully put the CPU onto the socket and push down the lever arm to secure the CPU. Then install the CPU cooler.

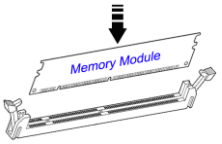
Note: Ensure that the CPU cooler and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or become unstable.

2.1.2 Installing the Memory

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

1. Press the ejector tab of the memory slot outwards with your fingertips.

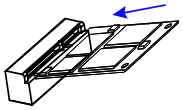
2. Hold the memory module and align the key of the module with that on the memory slot.
3. Gently push the module into the slot until the ejector levers return completely to closed position, holding the module in place when the module touches the bottom of the slot.



To remove the module, press the ejector levers outwards to unseat the module.

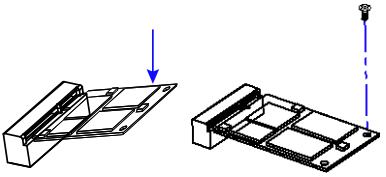
2.1.3 Installing Mini-PCIe & M.2 Cards

1. Locate the mini-PCIe or M.2 slot.
2. Align the key of the mini-PCIe card to the mini-PCIe interface, and insert the card slantwise. (Insert M.2 cards in the same way.)

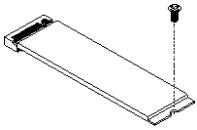


3. Push the mini-PCIe card down and fix it with the an M2 screw. (Fix the M.2 network card with an M3 screw.)

Mini-PCIe:



M.2:

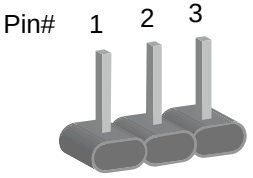


2.2 Setting the Jumpers

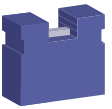
Set up and configure your product by using jumpers to match the needs of your applications. Contact your sales representative if you have doubts about the best configuration for your use.

2.2.1 How to Set Jumpers

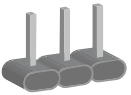
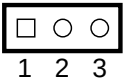
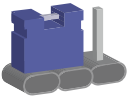
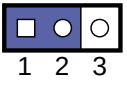
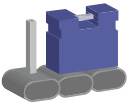
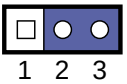
Jumpers consist of a set of short pins that can be covered with a small plastic box (jumper cap) as illustrated below. Jumpers allow the closing of an electrical circuit, so that current can flow to certain sections of the circuit board. If a jumper has 3 pins, you can connect either pin 1 to pin 2 or pin 2 to pin 3 by shorting.



A 3-pin jumper



A jumper cap

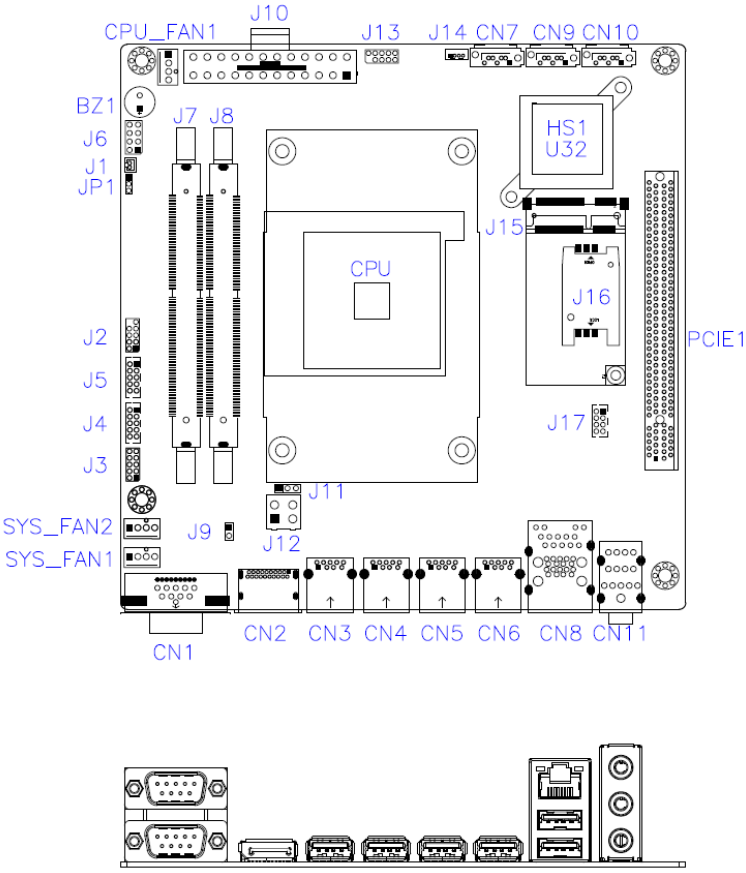
Pin closed	Jumper	Illustration
Open		
1-2		
2-3		

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations

MBD301:



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2.4 Jumpers & Connectors Quick Reference

Jumpers:

Function	Jumper	Page
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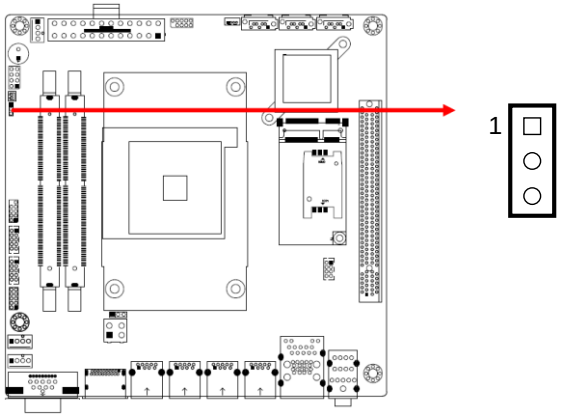
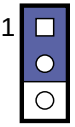
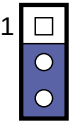
Connectors:

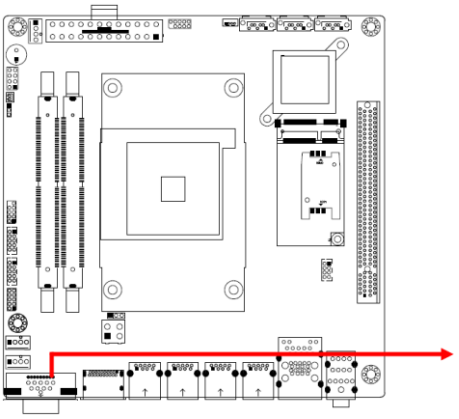
Function	Jumper	Page
COM1 & COM2 Ports	CN1	16
COM3 & COM4 Ports	J5 (COM3), J4 (COM4)	17
RTC Battery Connector	J1	17
Digital I/O Connector	J3	18
Front Panel Settings Connector	J6	18
Dual USB 2.0 Connector	J17	19
Fan Power Connectors	CPU_FAN1, SYS_FAN1, SYS_FAN2	19
ATX Power Connectors	J10, J12	20
DisplayPort	CN2	--
USB 3.0 Connectors	CN3, CN4, CN5, CN6	--
SATA 3.0 Connectors	CN7, CN9, CN10	--
Dual USB 3.0 & RJ45 LAN Ports	CN8	--
Audio Jacks	CN11	--
DDR4 SO-DIMM Connectors	J7, J8	--
Mini-PCIe Slot	J15	--
SIM Card Socket	J16	--
M.2 E2230 Slot	J18	--
Factory Use Only	J2, J13, J14	--

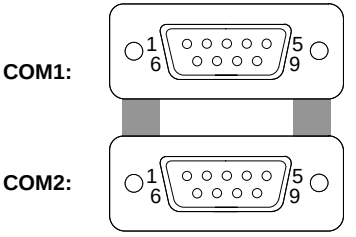
2.4.1 Clearing CMOS Data (JP1)



Function	Pin closed	Illustration
Normal (default)	1-2	
Clear CMOS	2-3	

2.4.2 COM1 RS-232/422/485 & COM2 RS-232 Ports (CN1)





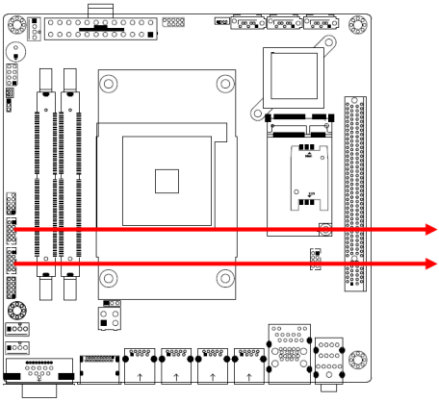
COM1:

Pin	Signal Name		
	RS-232	RS-422	RS-485
1	DCD, Data carrier detect	TX-	DATA-
2	RXD, Receive data	TX+	DATA+
3	TXD, Transmit data	RX+	NC
4	DTR, Data terminal ready	RX-	NC
5	Ground	Ground	Ground
6	DSR, Data set ready	NC	NC
7	RTS, Request to send	NC	NC
8	CTS, Clear to send	NC	NC
9	RI, Ring indicator	NC	NC

COM2:

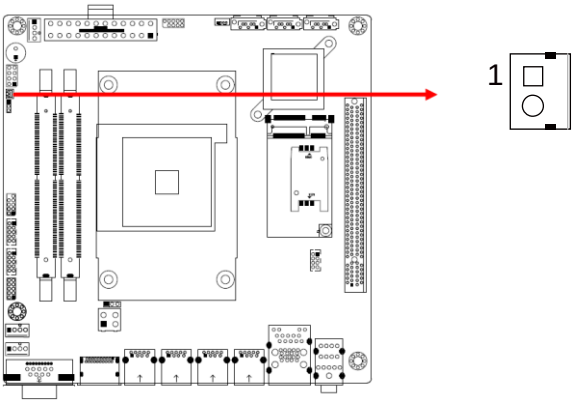
Pin	Signal Name	Pin	Signal Name
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	RI, Ring indicator
5	Ground		

2.4.3 COM3 & COM4 RS-232 Ports (J5, J4)



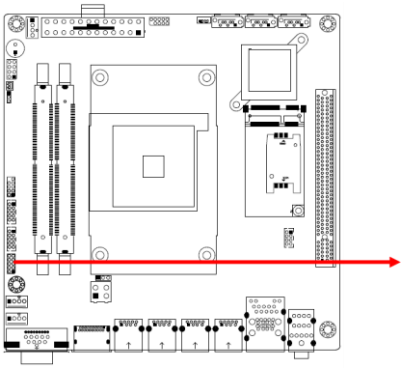
Pin	Signal Name	Pin	Signal Name
1	DCD, Data carrier detect	2	RXD, Receive data
3	TXD, Transmit data	4	DTR, Data terminal ready
5	Ground	6	DSR, Data set ready
7	RTS, Request to send	8	CTS, Clear to send
9	RI, Ring indicator	10	Key

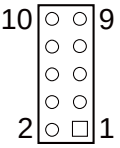
2.4.4 RTC Battery Connector (J1)



Pin	Signal Name	Pin	Signal Name
1	Battery+	2	Ground

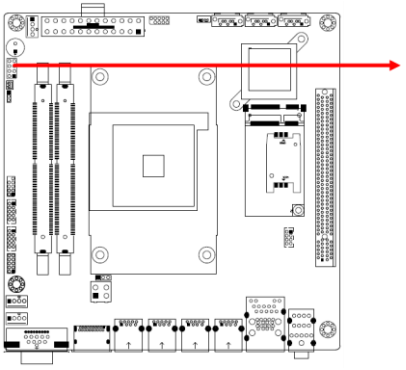
2.4.5 Digital I/O Connector (J3)

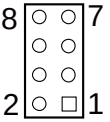




Pin	Signal Name	Pin	Signal Name
1	Ground	2	VCC5
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

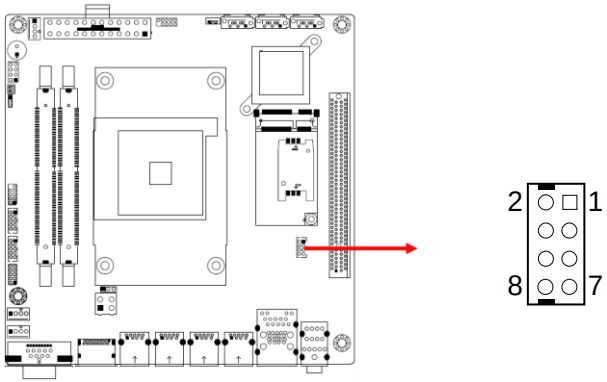
2.4.6 Front Panel Settings Connector (J6)





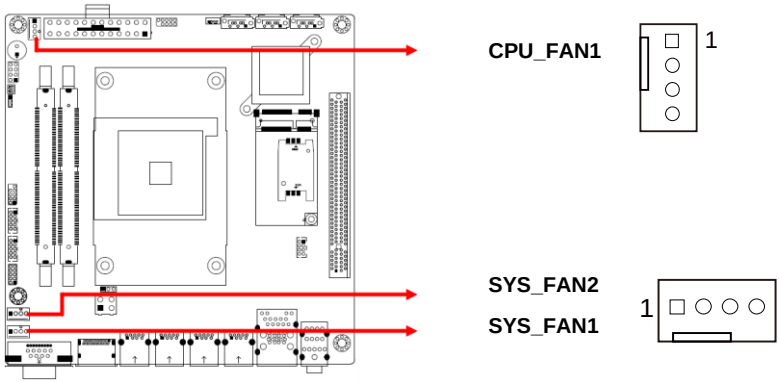
Pin	Signal Name	Pin	Signal Name
1	GND	2	PWR_BTN#
3	HDD LED+	4	HDD LED-
5	GND	6	RST_BTN#
7	PWR LED+	8	PWR LED-

2.4.7 Dual USB 2.0 Connector (J17)



Pin	Signal Name	Pin	Signal Name
1	+5V	2	GND
3	USB-	4	USB+
5	USB+	6	USB-
7	GND	8	+5V

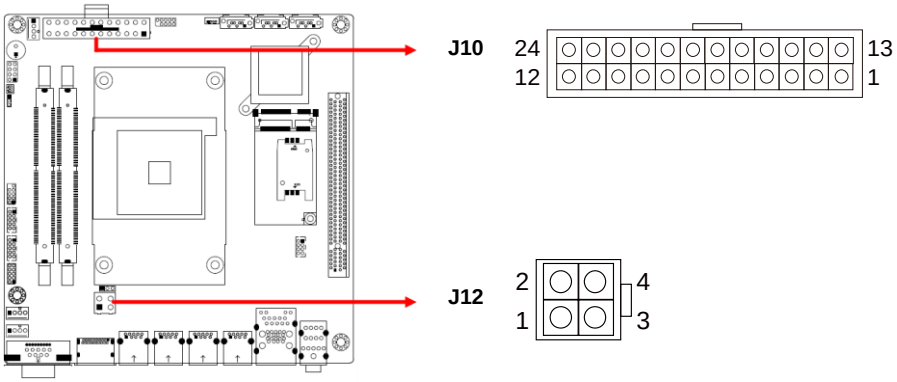
2.4.8 Fan Power Connectors (CPU_FAN1, SYS_FAN1, SYS_FAN2)



CPU_FAN1, SYS_FAN1 and SYS_FAN2 are PWM only.

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

2.4.9 ATX Power Connectors (J10, J12)



J10:

Pin	Signal Name	Pin	Signal Name
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS-ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

J12:

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

Chapter 3
Drivers Installation

This chapter introduces installation of the following drivers:

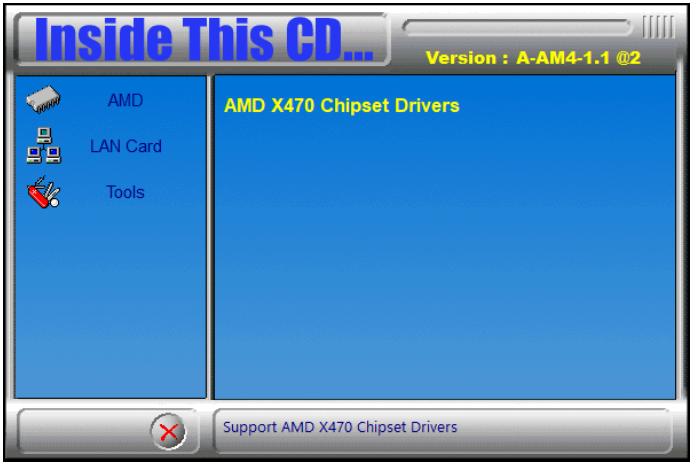
- Graphics Driver Installation
- HD Audio Driver Installation
- LAN Driver Installation

3.1 Introduction

This section describes the procedures to install software and drivers that can be found in the disk that came with the motherboard. If you find anything missing, please contact the distributor where you have made the purchase.

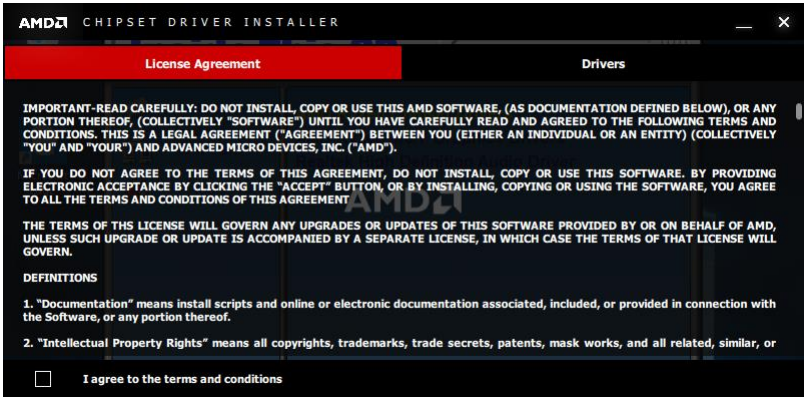
3.2 AMD Ryzen Chipset Drivers Installation

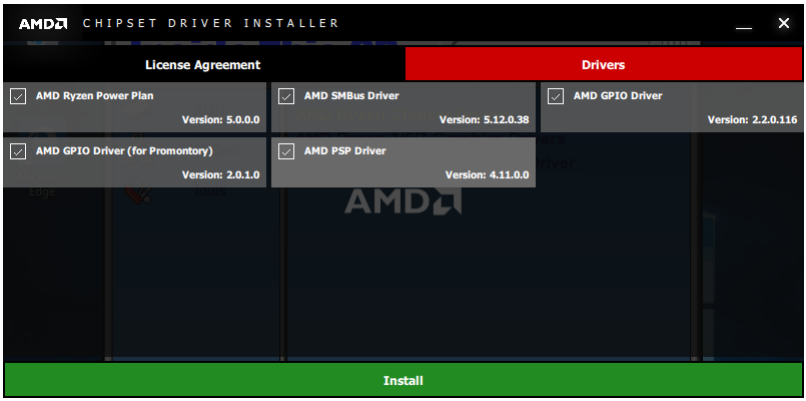
1. Insert the disk that came with your motherboard. Click on ***AMD*** and then click on ***AMD X470 Chipset Drivers***.



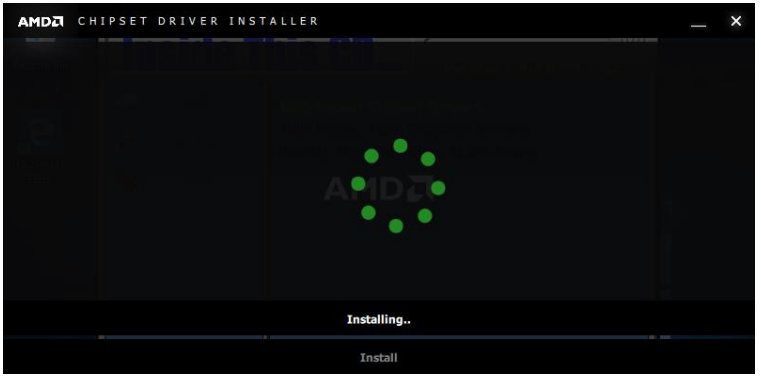
2. Click on ***AMD Ryzen Chipset Drivers***.

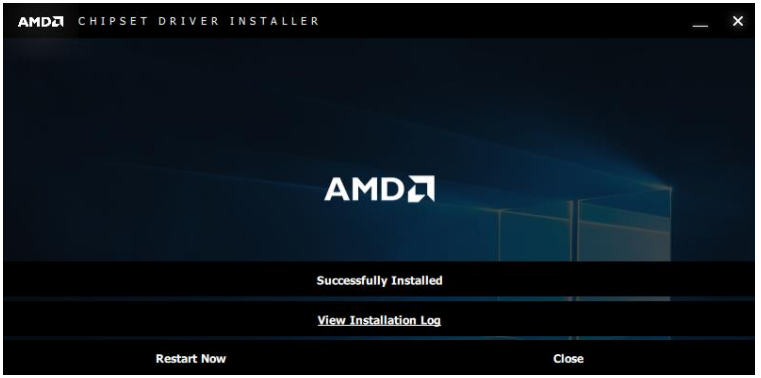
3. Click on the checkbox to agree with the terms and conditions. Now, click the ***Drivers*** tab on top. On the next screen, click on ***Install*** to install the AMD Ryzen Chipset Drivers.





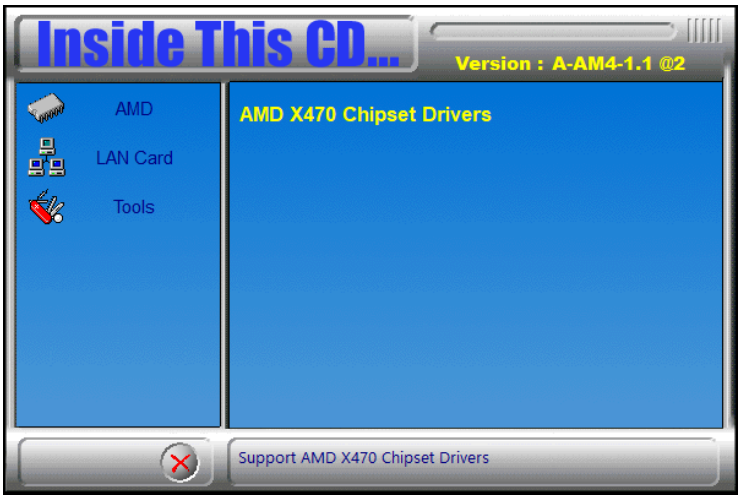
4. The ***CHIPSET DRIVER INSTALLER*** screen appears during the installation. Once the chipset drivers have been successfully installed, click ***Restart Now*** *for changes to take effect.*





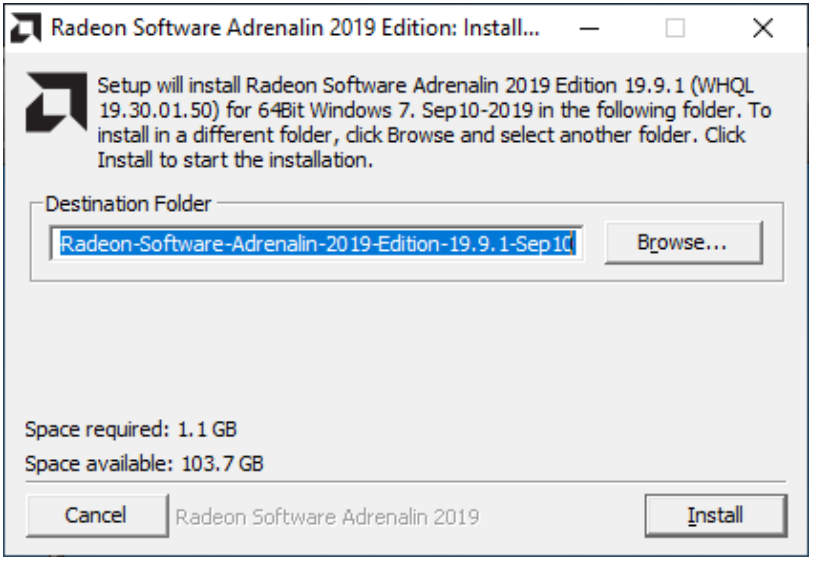
3.3 Graphics Driver Installation

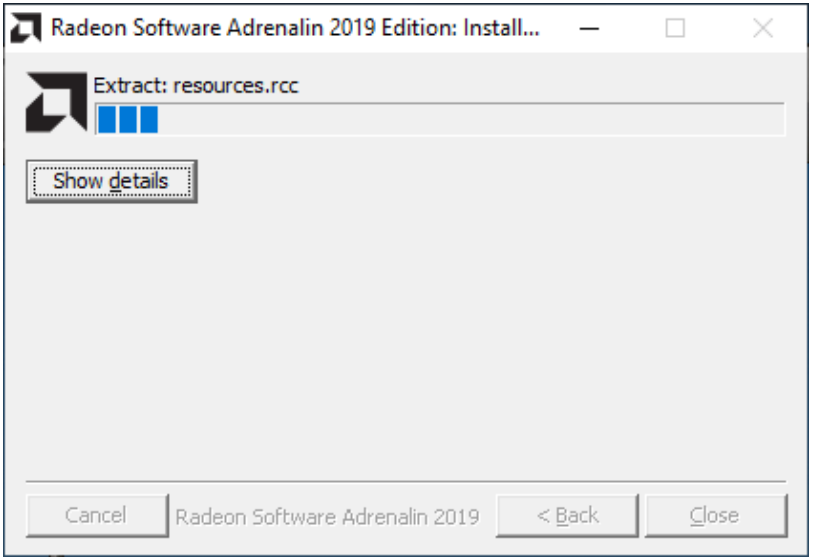
1. Insert the disk that came with your motherboard. Click on ***AMD*** and then click on ***AMD X470 Chipset Drivers***.



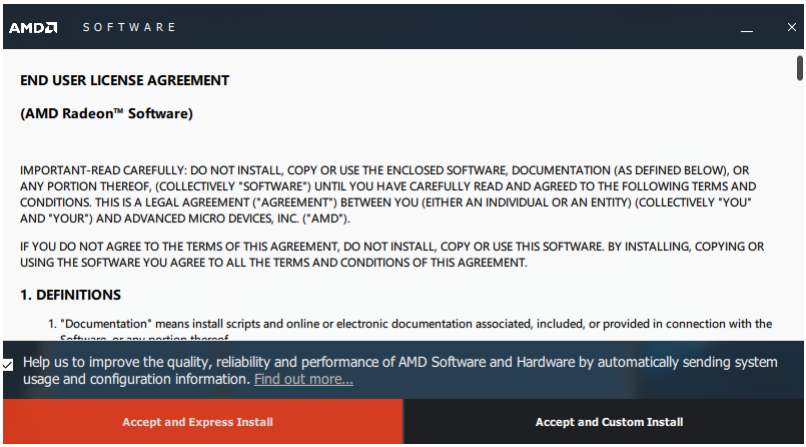
2. Click on ***AMD Ryzen 3/5/7 Graphics Drivers***.

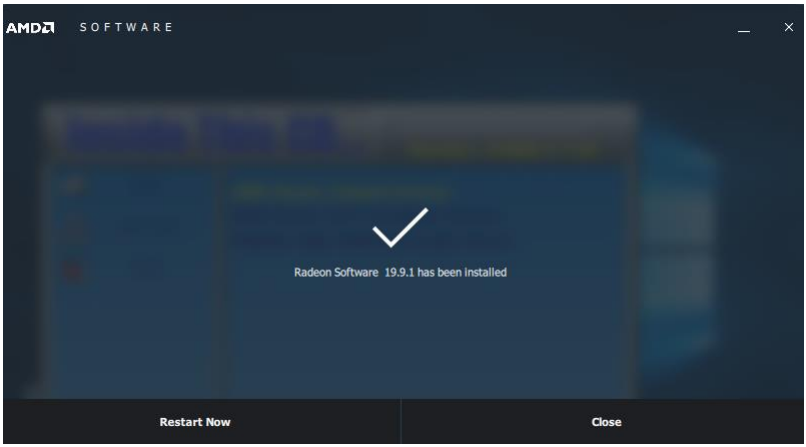
3. The next screen shows the ***Destination Folder*** for the ***Radeon Software Adrenalin 2019 Edition***. Click ***Install***.





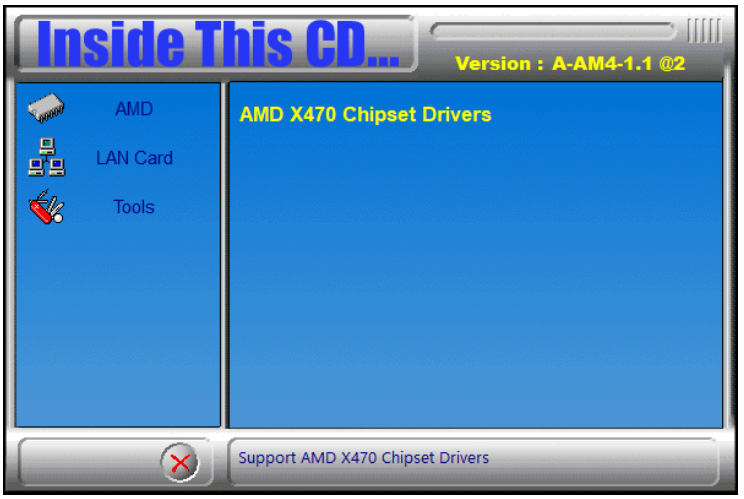
4. In the ***END USER LICENSE AGREEMENT*** screen, click ***Accept and Express Install*** for installation to start. When installation is finished, click ***Restart Now*** for the system to restart and changes to take effect.



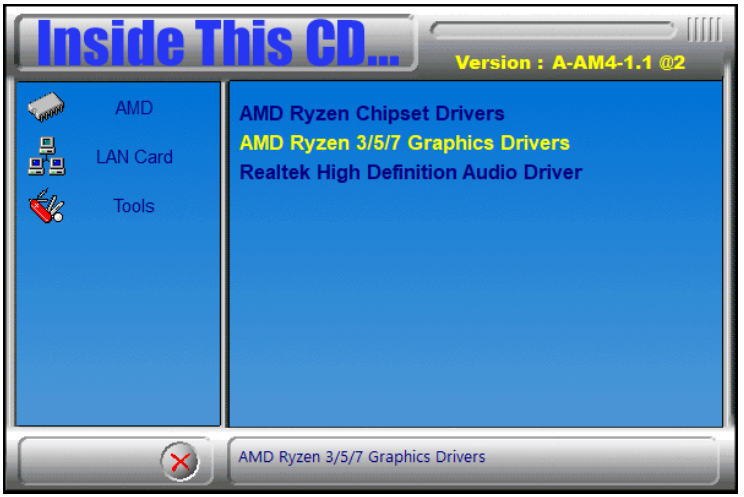


3.4 HD Audio Driver Installation

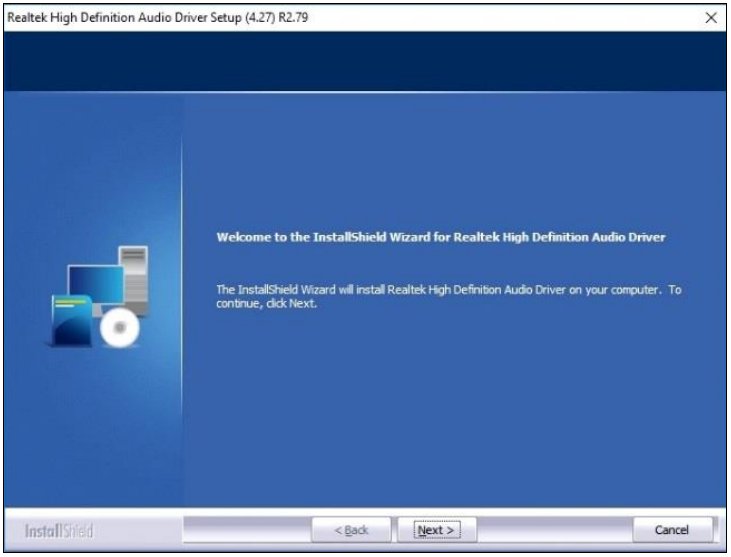
1. Insert the disk that came with your motherboard. Click on ***AMD*** and then click on ***AMD X470 Chipset Drivers***.

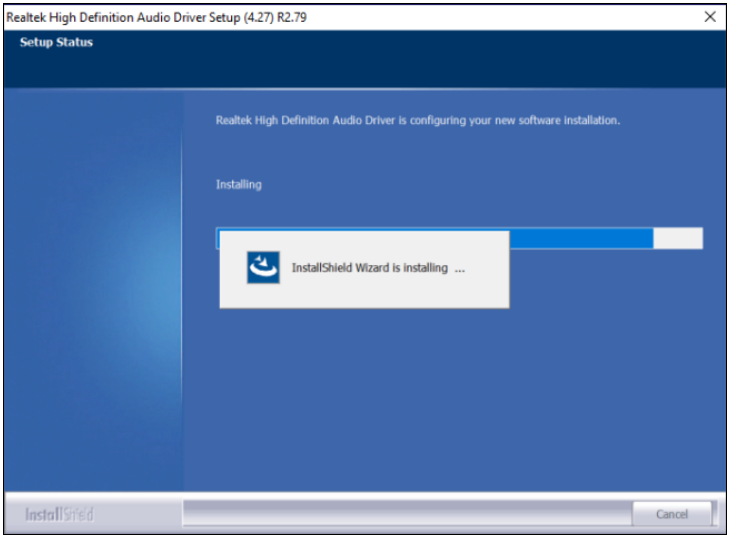


2. Click on ***Realtek High Definition Audio Driver***.



3. In the ***Welcome*** screen, click ***Next*** for the ***InstallShield Wizard*** to start the installation of the ***Realtek High Definition Audio Driver***. When the installation has been completed, restart the system for changes to take effect.

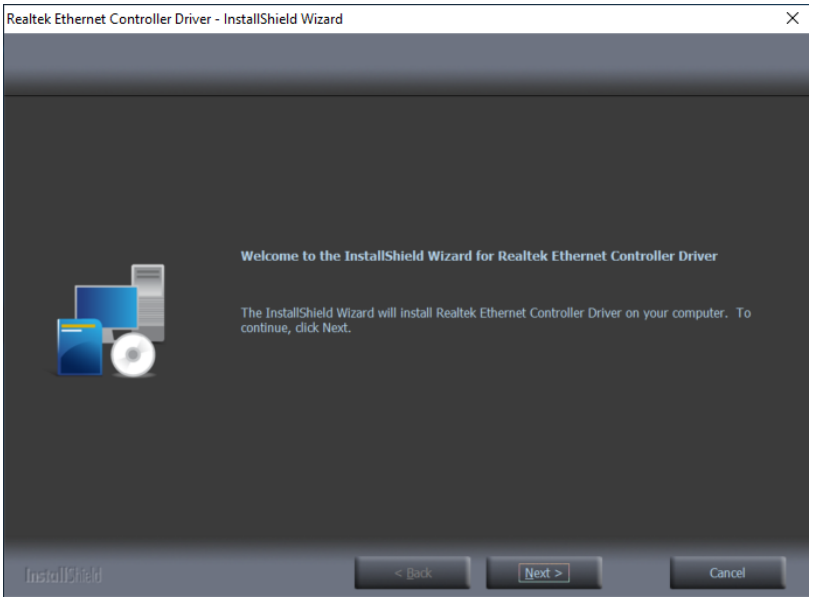




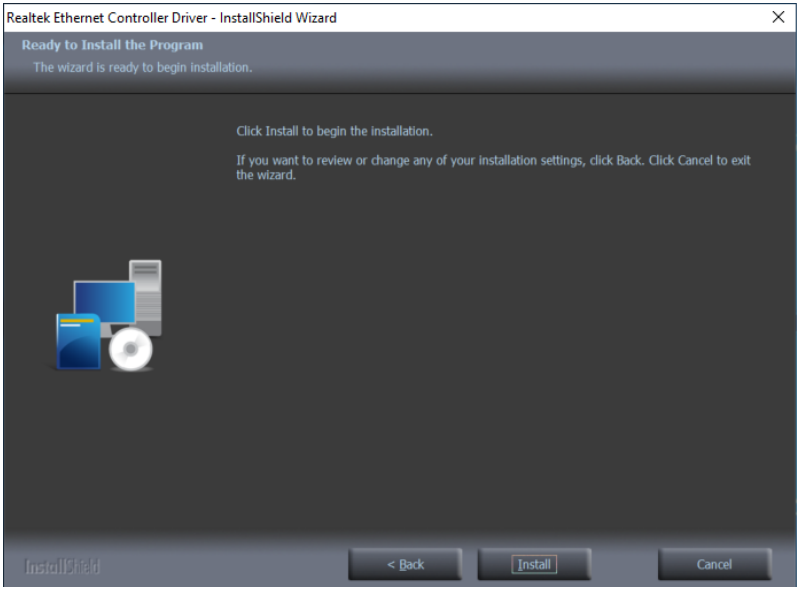
3.5 LAN Driver Installation

1. Insert the disk that came with your motherboard. Click on ***LAN Card***.

2. On the ***Welcome*** screen of the ***InstallShield Wizard*** for **Realtek Ethernet Controller Driver**, click ***Next***.



3. Now, click ***Install*** to begin the installation. When the driver has been successfully installed, restart the system for changes to take effect.



Chapter 4
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:

- Main Settings
- Advanced Settings
- Chipset Settings
- Security Settings
- Boot Settings
- Save & Exit

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system provides critical low-level support for standard devices 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.

4.2 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. You can also press <F7> to have the Boot menu pop up immediately.

If you still need 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>  to  Enter  Setup
```

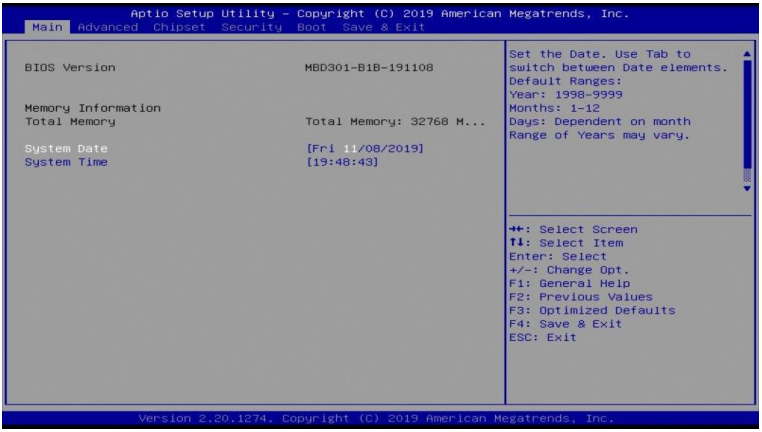
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS 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.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.

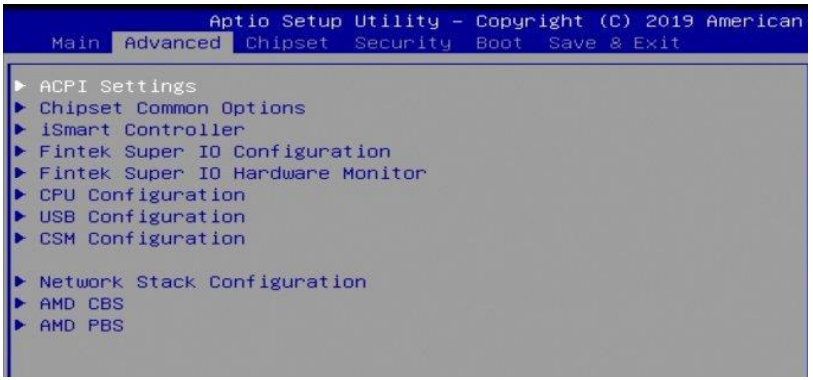
4.3 Main Settings



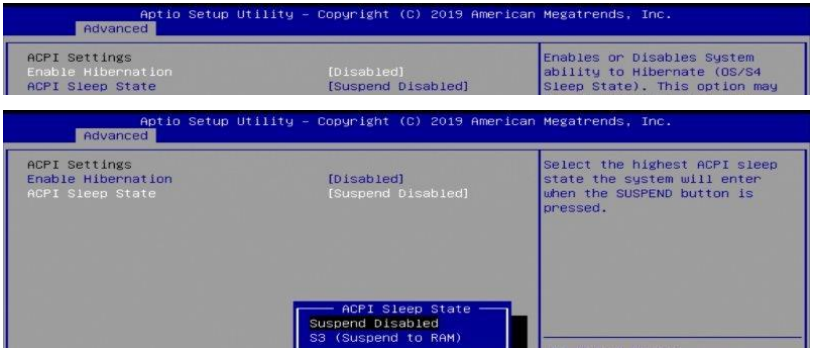
BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

4.4 Advanced Settings

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

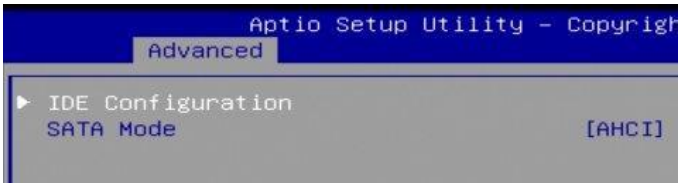


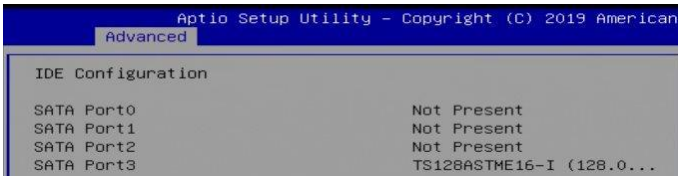
4.4.1 ACPI Settings

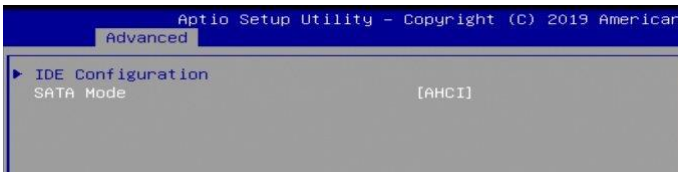


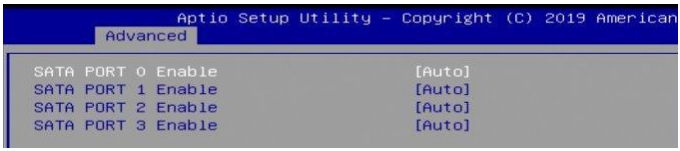
BIOS Setting	Description
Enable Hibernation	Enables / Disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
ACPI Sleep State	Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

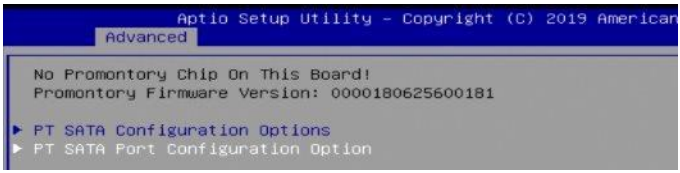
4.4.2 Chipset Common Options





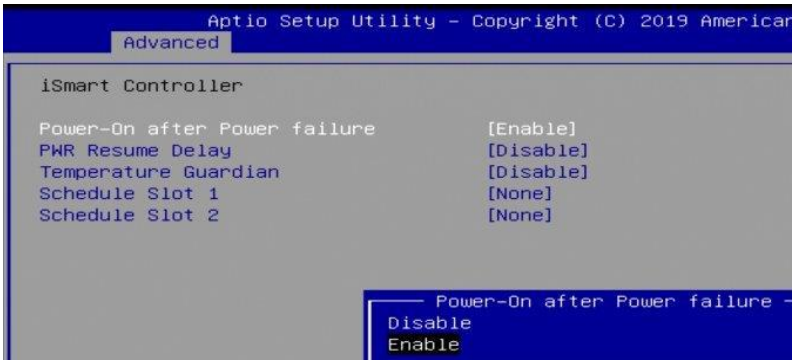






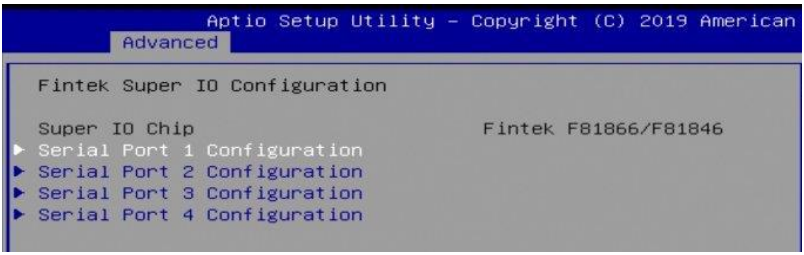
BIOS Setting	Description
IDE Configuration	Configures IDE Devices.
SATA Mode	Selects SATA Type. Options: AHCI, RAID, Auto

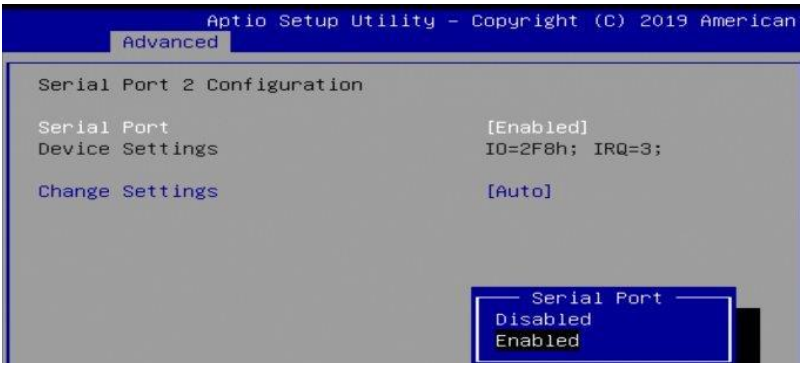
4.4.3 iSmart Controller



BIOS Setting	Description
Power-On after Power failure	Enables / Disables the system to be turned on automatically after a power failure.
PWR Resume Delay	Enables / Disables power on resume delay.
Temperature Guardian	Generates the reset signal when system hangs up on POST.
Schedule Slot 1 / 2	Sets up the hour / minute for system powe-on. Important: If you would like to set up a schedule between adjacent days, configure two schedule slots. For example, if setting up a schedule from Wednesday 5 p.m. to Thursday 2 a.m., configure two schedule slots. But if setting up a schedule from 3 p.m to 5 p.m. on Wednesday, configure only a schedule slot.

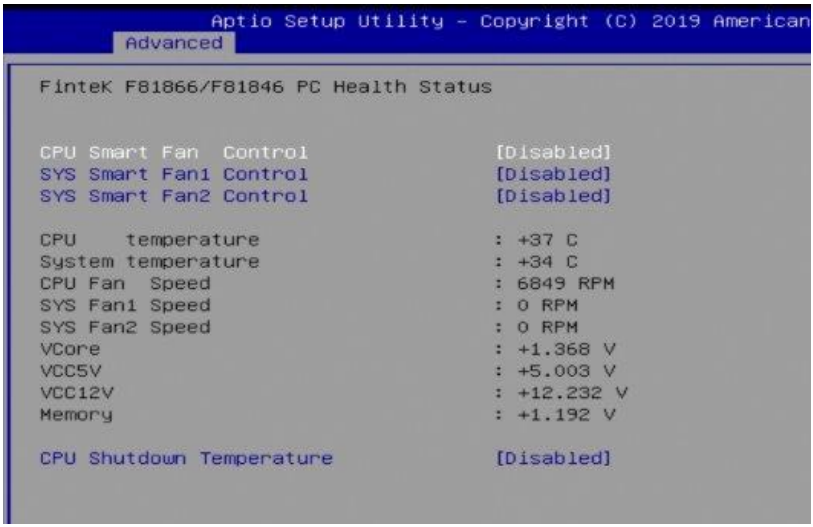
4.4.4 Fintek Super I/O Configuration





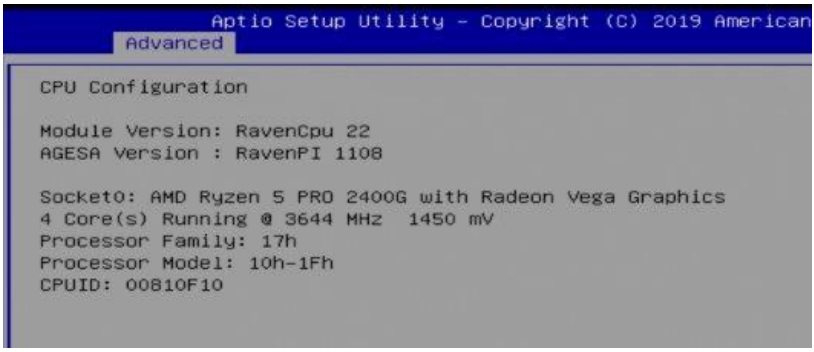
BIOS Setting	Description
Serial Port 1 ~ 4 Configuration	Sets parameters of Serial Ports. Enables / Disables the serial port and select an optimal setting for the Super IO device.

4.4.5 Fintek Super IO Hardware Monitor

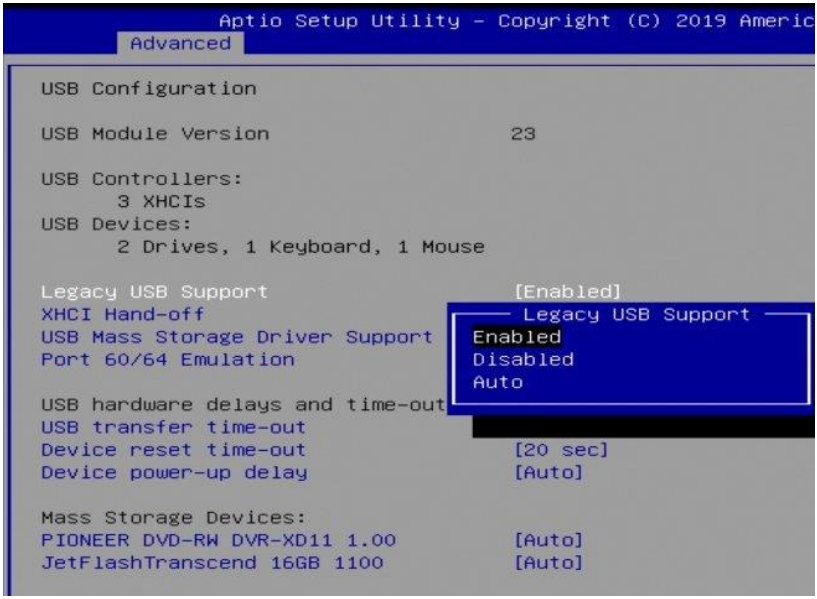


BIOS Setting	Description
CPU /System Smart Fan Control	Sets temperature at which fans are enabled. Options: Disabled, 50°C, 60°C, 70°C, 80°C
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only as monitored by the system and show the PC health status.
CPU Shutdown Temperature	Disables or sets system shutdown temperature to 70°C, 75°C, 80°C, 85°C, 90°C or 95°C.

4.4.6 CPU Configuration

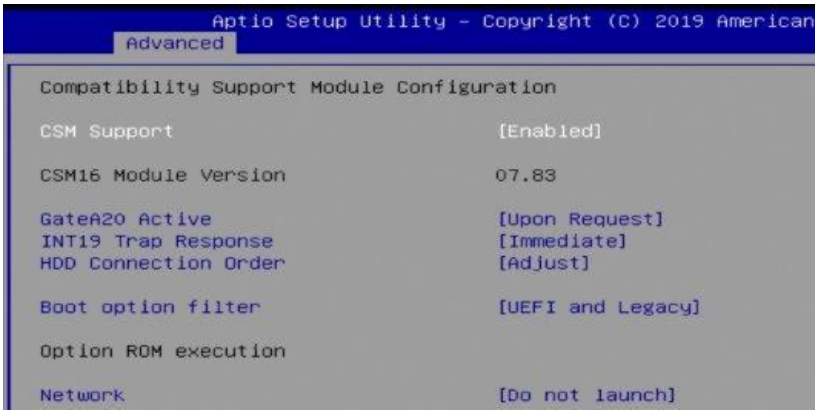


4.4.7 USB Configuration



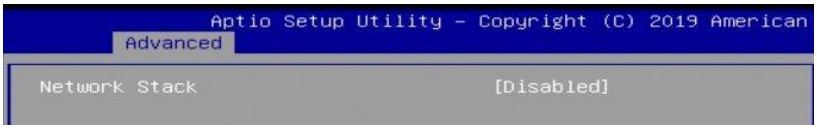
BIOS Setting	Description
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enable / Disable USB mass storage driver support.
Port 60/64 Emulation	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB Transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers. (Options: 1 / 5 / 10 / 20 sec)
Device reset time-out	Seconds of delaying execution of start unit command to USB mass storage device.
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.
Mass Storage Devices	Mass storage device emulation type. ‘AUTO’ enumerates devices according to their media format. Optical drives are emulated as ‘CDROM’, drives with no media will be emulated according to a drive type.

4.4.8 CSM Configuration



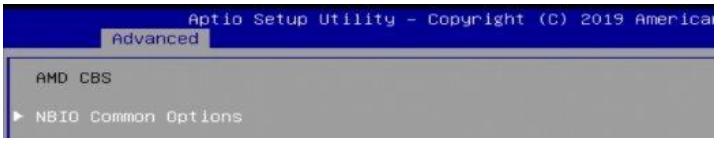
BIOS Setting	Description
CSM Support	Enable / disable CSM support.
GateA20 Active	• UPON REQUEST - GA20 can be disabled using BIOS services. • ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1 MB.
INT19 Trap Response	BIOS reaction on INT19 trapping by Option ROM: • IMMEDIATE - executes the trap right away. • POSTPONED - executes the trap during legacy boot.
HDD Connection Order	Some OS require HDD handles to be adjusted, i.e. OS is installed on drive 80h. Options: Adjust, Keep
Boot option filter	Controls the priority of Legacy / UEFI ROMs. Options: UEFI and Legacy, Legacy only, UEFI only
Network	Controls the execution of UEFI and Legacy Network OpROM. Options: Do not launch, UEFI, Legacy

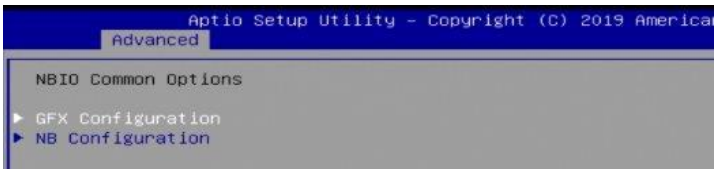
4.4.9 Network Stack Configuration

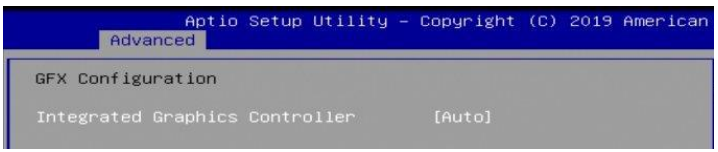


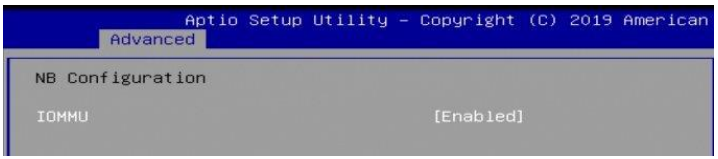
BIOS Setting	Description
Network Stack	Enable / Disable UEFI Network Stack

4.4.10 AMD CBS



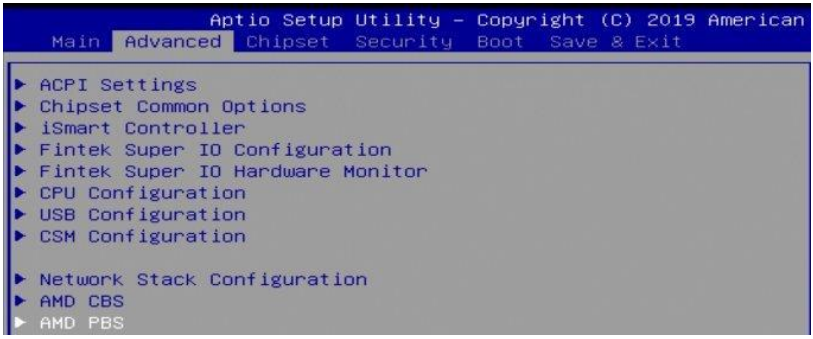


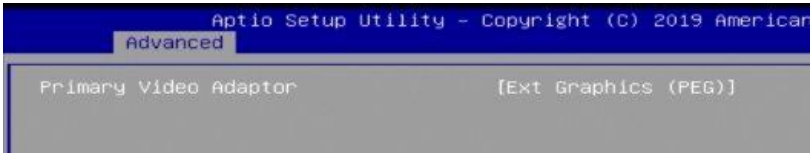




BIOS Setting	Description
NBIO Common Options	Configures GFx and NB
Integrated Graphics Controller	Enable Integrated Graphics controller
IOMMU	Enable/Disable IOMMU

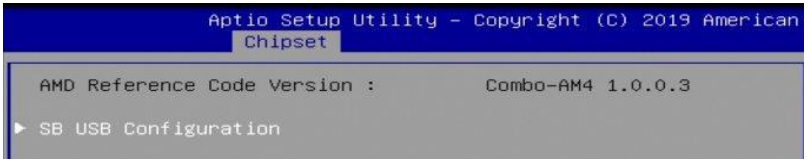
4.4.11 AMD PBS

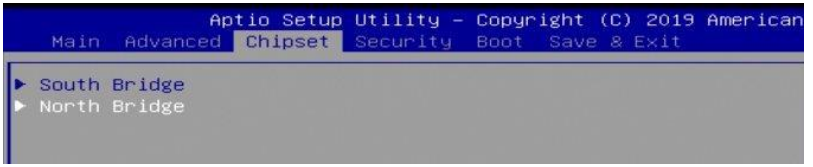


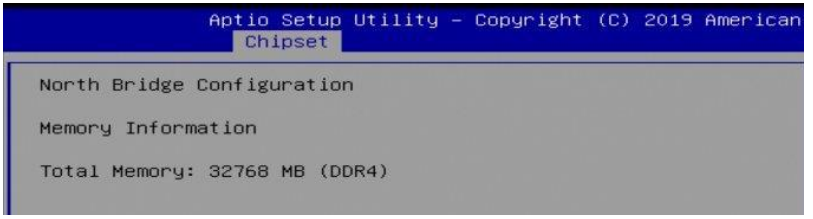


BIOS Setting	Description
Primary Video Adaptor	Selects Internal/External Graphics Options: Int Graphics (IGD), Ext Graphics (PEG)

4.5 Chipset Settings





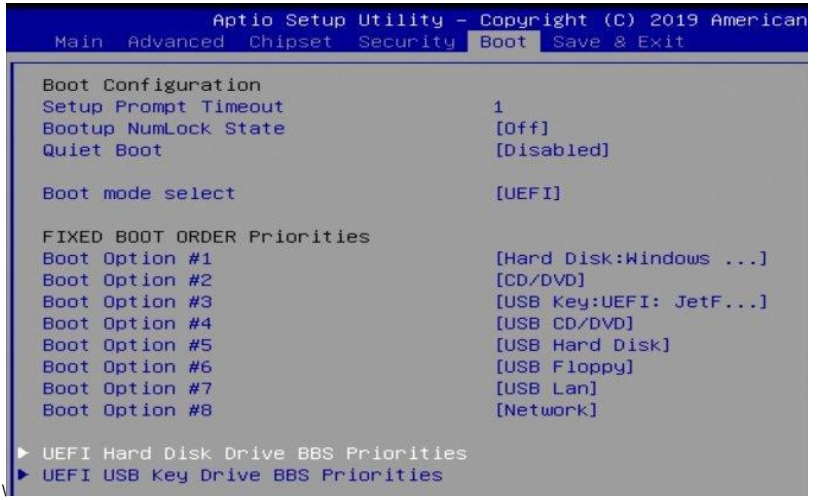


BIOS Setting	Description
SB USB Configuration	Options for SB USB Configuration
North Bridge	Displays the parameters of North Bridge.

4.6 Security Settings

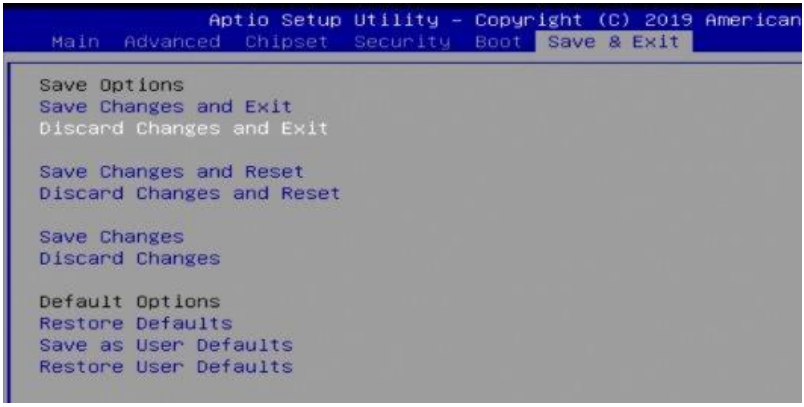
BIOS Setting	Description
Administrator Password	Set Administrator Password
User Password	Set User Password.
STIBP	Single Thread Indirect Branch Predictor (STIBP) is a method to mitigate indirect branch target injection attacks on AMD products. Options: Disabled / Enabled
Secure Boot	Secure Boot configuration Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset. Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

4.7 Boot Settings



BIOS Setting	Description
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.
Boot Mode Select	Select boot mode: Legacy / UEFI.
FIXED BOOT ORDER Priorities	Sets the system boot order.
UEFI Hard Disk Drive BBS Priorities	Specifies the Boot Device Priority sequence from available UEFI Hard Disk Drives

4.8 Save & Exit Settings



BIOS Setting	Description
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.

Appendix

This section provides the mapping addresses of peripheral devices, the sample code of watchdog timer configuration, and types of on-board connectors.

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
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000070-0x00000071	System CMOS/real time clock
0x0000E000-0x0000EFFF	PCI Express Root Port
0x0000E000-0x0000EFFF	AMD Radeon(TM) Vega 8 Graphics
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x00000020-0x00000021	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x0000F000-0x0000F0FF	Realtek PCIe GBE Family Controller
0x0000F000-0x0000F0FF	PCI Express Root Port
0x00000000-0x000003AF	PCI Express Root Complex
0x00000000-0x000003AF	Direct memory access controller
0x000003E0-0x00000CF7	PCI Express Root Complex
0x000003B0-0x000003DF	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000040-0x00000043	System timer
0x00000010-0x0000001F	Motherboard resources
0x00000022-0x0000003F	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x0000006F	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources

Address	Device Description
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x000000A2-0x000000BF	Motherboard resources
0x000000B1-0x000000B1	Motherboard resources
0x000000E0-0x000000EF	Motherboard resources
0x000004D0-0x000004D1	Motherboard resources
0x0000040B-0x0000040B	Motherboard resources
0x000004D6-0x000004D6	Motherboard resources
0x00000C00-0x00000C01	Motherboard resources
0x00000C14-0x00000C14	Motherboard resources
0x00000C50-0x00000C51	Motherboard resources
0x00000C52-0x00000C52	Motherboard resources
0x00000C6C-0x00000C6C	Motherboard resources
0x00000C6F-0x00000C6F	Motherboard resources
0x00000CD0-0x00000CD1	Motherboard resources
0x00000CD2-0x00000CD3	Motherboard resources
0x00000CD4-0x00000CD5	Motherboard resources
0x00000CD6-0x00000CD7	Motherboard resources
0x00000CD8-0x00000CDF	Motherboard resources
0x00000800-0x0000089F	Motherboard resources
0x00000B00-0x00000B0F	Motherboard resources
0x00000B20-0x00000B3F	Motherboard resources
0x00000900-0x0000090F	Motherboard resources
0x00000910-0x0000091F	Motherboard resources
0x00000061-0x00000061	System speaker
0x00000081-0x00000083	Direct memory access controller
0x00000087-0x00000087	Direct memory access controller
0x00000089-0x0000008B	Direct memory access controller
0x0000008F-0x0000008F	Direct memory access controller
0x000000C0-0x000000DF	Direct memory access controller

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 4294967291	PCI Express Root Port
IRQ 0	High precision event timer
IRQ 0	System timer
IRQ 8	High precision event timer
IRQ 7	AMD GPIO Controller
IRQ 28	MZ0380 PCI
IRQ 4294967283	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967282	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967281	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967280	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967279	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 5	Communications Port (COM3)
IRQ 10	Communications Port (COM4)
IRQ 53	High Definition Audio Bus
IRQ 53	AMD Audio CoProcessor
IRQ 4294967285	Realtek PCIe GBE Family Controller
IRQ 54	AMD High Definition Audio Controller
IRQ 54 ~ IRQ 204	Microsoft ACPI-Compliant System
IRQ 256 ~ IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967294	PCI Express Root Port
IRQ 4294967293	PCI Express Root Port
IRQ 4294967292	PCI Express Root Port
IRQ 4294967273	AMD Radeon(TM) Vega 8 Graphics
IRQ 4294967272	AMD Radeon(TM) Vega 8 Graphics
IRQ 4294967271	AMD Radeon(TM) Vega 8 Graphics
IRQ 4294967290	PCI Express Root Port
IRQ 4294967289	Standard SATA AHCI Controller
IRQ 4294967288	Standard SATA AHCI Controller
IRQ 4294967284	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967278	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967277	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)

Level	Function
IRQ 4294967276	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967275	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967274	AMD USB 3.10 eXtensible Host Controller - 1.10 (Microsoft)
IRQ 4294967287	AMD PSP 10.0 Device
IRQ 4294967286	AMD PSP 10.0 Device

C. Watchdog Timer Configuration

The Watchdog Timer (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, you will need to 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 "F81846.H"
//---------------------------------------------------------------------------
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("Fintek 81846 watch dog program\n");
        SIO = Init_F81846();
        if (SIO == 0)
        {
                printf("Can not detect Fintek 81846, program abort.\n");
                return(1);
        }//if (SIO == 0)

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return (1);
        }

        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        if (bTime)
        {       EnableWDT(bTime); }
        else
        {       DisableWDT(); }
        return 0;
}
//-----------------------------------------------------------------------------
void EnableWDT(int interval)
{
        unsigned char bBuf;

        bBuf = Get_F81846_Reg(0x2B);
        bBuf &= (~0x20);
        Set_F81846_Reg(0x2B,   bBuf);          //Enable WDTO

        Set_F81846_LD(0x07);                   //switch to logic device  7
        Set_F81846_Reg(0x30,   0x01);          //enable timer

        bBuf = Get_F81846_Reg(0xF5);
        bBuf &= (~0x0F);
        bBuf |= 0x52;
        Set_F81846_Reg(0xF5,   bBuf);          //count mode is second

        Set_F81846_Reg(0xF6,   interval);      //set timer

        bBuf = Get_F81846_Reg(0xFA);
        bBuf |= 0x01;
        Set_F81846_Reg(0xFA,   bBuf);          //enable WDTO output

        bBuf = Get_F81846_Reg(0xF5);
        bBuf |= 0x20;
        Set_F81846_Reg(0xF5,   bBuf);          //start counting
}
//-----------------------------------------------------------------------------
void DisableWDT(void)
{
        unsigned char bBuf;

        Set_F81846_LD(0x07);                   //switch to logic device 7
```

```
        bBuf = Get_F81846_Reg(0xFA);
        bBuf &= ~0x01;
        Set_F81846_Reg(0xFA,   bBuf);          //disable WDTO output

        bBuf = Get_F81846_Reg(0xF5);
        bBuf &= ~0x20;
        bBuf |= 0x40;
        Set_F81846_Reg(0xF5,   bBuf);          //disable WDT
}
//-----------------------------------------------------------------------------


//-----------------------------------------------------------------------------
//
// 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 "F81846.H"
#include <dos.h>
//-----------------------------------------------------------------------------
unsigned int F81846_BASE;
void Unlock_F81846 (void);
void Lock_F81846 (void);
//-----------------------------------------------------------------------------
unsigned int Init_F81846(void)
{
        unsigned int result;
        unsigned char ucDid;

        F81846_BASE = 0x4E;
        result = F81846_BASE;

        ucDid = Get_F81846_Reg(0x20);
        if (ucDid == 0x07)                     //Fintek 81846
        {       goto Init_Finish;              }

        F81846_BASE = 0x2E;
        result = F81846_BASE;

        ucDid = Get_F81846_Reg(0x20);
        if (ucDid == 0x07)                     //Fintek 81846
        {       goto Init_Finish;              }

        F81846_BASE = 0x00;
        result = F81846_BASE;

Init_Finish:
        return (result);
}
//-----------------------------------------------------------------------------
void Unlock_F81846 (void)
{
        outportb(F81846_INDEX_PORT, F81846_UNLOCK);
        outportb(F81846_INDEX_PORT, F81846_UNLOCK);
}
```

```
//---------------------------------------------------------------------------
void Lock_F81846 (void)
{
        outportb(F81846_INDEX_PORT, F81846_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81846_LD( unsigned char LD)
{
        Unlock_F81846();
        outportb(F81846_INDEX_PORT, F81846_REG_LD);
        outportb(F81846_DATA_PORT, LD);
        Lock_F81846();
}
//---------------------------------------------------------------------------
void Set_F81846_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_F81846();
        outportb(F81846_INDEX_PORT, REG);
        outportb(F81846_DATA_PORT, DATA);
        Lock_F81846();
}
//---------------------------------------------------------------------------
unsigned char Get_F81846_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_F81846();
        outportb(F81846_INDEX_PORT, REG);
        Result = inportb(F81846_DATA_PORT);
        Lock_F81846();
        return Result;
}
//---------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// 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.
//
//---------------------------------------------------------------------------
#ifndef   F81846_H
#define   F81846_H                      1
//---------------------------------------------------------------------------
#define         F81846_INDEX_PORT       (F81846_BASE)
#define         F81846_DATA_PORT        (F81846_BASE+1)
//---------------------------------------------------------------------------
#define         F81846_REG_LD           0x07
//---------------------------------------------------------------------------
#define         F81846_UNLOCK           0x87
#define         F81846_LOCK             0xAA
//---------------------------------------------------------------------------
unsigned int Init_F81846(void);
void Set_F81846_LD( unsigned char);
```

```
void Set_F81846_Reg( unsigned char,
unsigned char); unsigned char
Get_F81846_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif  //   F81846_H
```

D. On-Board Connector Types

Function	Connector Name	Onboard Type	Mating Type
COM3 & COM4 Ports	J5 (COM3), J4 (COM4)	HRS DF11-10DP-2DSA	HRS DF11-10DS-2C
RTC Battery Connector	J1	Molex 53047-0210	Molex 51021-0200
Digital I/O Connector	J3	E-call 0196-01-200-100	Dupont 10P 2mm pitch (female)
Front Panel Settings Connector	J6	E-call 0126-01-203-080	Dupont 8P 2.54 mm pitch (female)
Dual USB 2.0 Connector	J17	HRS DF11-8DP-2DSA	HRS DF11-8DS-2C
Fan Power Connector	CPU_FAN1, SYS_FAN1, SYS_FAN2	TECHBEST W2-03I104132S1WT(A)-L	Molex 47054-1000
ATX Power Connector	J10, J12	HAOGUO 01-0018-03 HAOGUO ATX4PT-NY46	Molex 39-01-2240 Molex 39-01-2040