IOPS-302

Open Pluggable Specification Digital Signage Player

User's Manual

Version 1.0
(May 2018)

iBASE

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Compliance

CE

The product described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

FC

This product has been tested and found to comply with the limits for a Class B 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 complies with the current RoHS directives restricting the use of the following substances in concentrations not to exceed 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)

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Important Safety Information

Carefully read the following safety information before using this device.

Setting up your system:

- Put the device horizontally on a stable and solid surface.
- Do not use this product near water or any heated source.
- Leave plenty of space around the device and do not block the ventilation openings. Never drop or insert any objects of any kind into the openings.
- Use this product in environments with ambient temperatures between 0˚C and 45˚C.

Care during use:

- Do not place heavy objects on the top of the device.
- Make sure to connect the correct voltage to the device. Failure to supply the correct voltage could damage the unit.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure the total ampere rating of all devices plugged into the extension cord does not cord's ampere rating.
- Do not spill water or any other liquids on your device.
- Always unplug the power cord from the wall outlet before cleaning the device.
- Only use neutral cleaning agents to clean the device.
- Vacuum dust and particles from the vents by using a computer vacuum cleaner.

Product Disassembly

Do not try to repair, disassemble, or make modifications to the device. Doing so will void the warranty and may result in damage to the product or personal injury.

CAUTION

Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries by observing local regulations.

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 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adaptor, display panel and touch screen.

* 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 encounter any technical problems and require assistance from your distributor or sales representative, please prepare and send the following information:

   - Product model name
   - Product serial number
   - Detailed description of the problem
   - Error messages in text or screenshots if any
   - The arrangement of the peripherals
   - Software used (such as OS and application software)

3. If repair service is required, please download the RMA form at http://www.ibase.com.tw/english/Supports/RMAService/.
   Fill out the form and contact your distributor or sales representative.

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Optional Accessories
- Overview
- Dimensions

1.1 Introduction

The IOPS-302 is a slot-in digital signage player compliant with OPS (Open Pluggable Specification). It is powered by AMD 3rd Generation R & G series processors, supports HDMI high definition video playback, and provides outstanding performance. It is fully compatible with large format OPS displays and monitors and allows cableless deployment and easy maintenance.

1.2 Features

- Supports 3rd Gen. AMD Embedded R & G series APU.
- 1 or 2 x DDR4-2133 SO-DIMM, expandable to 32GB
- HDMI display output and audio jacks for line-out and Mic-in
- 1 x RJ45 for GbE LAN, 1 x RJ50 for RS-232 serial COM port
- 2 x USB 3.0 ports, 2 x USB 2.0 ports
- 1 x M.2 E2230 for Wi-Fi or Bluetooth options

1.3 Packing List

Your product package should include the items listed below. If any of the items below is missing, contact the distributor or the dealer from whom you have purchased the product. Drivers and this user manual are downloadable from our website.

- IOPS-302 OPS Digital Signage Player

1.4 Optional Accessories

IBASE provides optional accessories as listed below. Please contact us or your dealer if you would like to order any item(s).

- IOPS-DK1-SYS docking kit with two screws
- Power adaptor & power cord

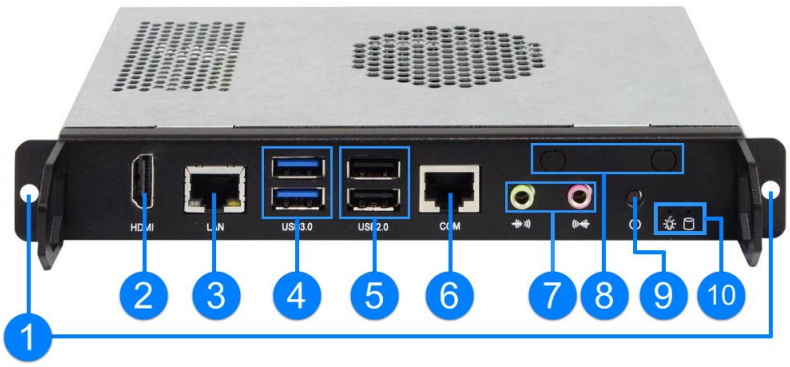
1.5 Specifications

Product	IOPS-302 / IOPS-302-N224
System	
Mainboard	OPS302
Operating System	• Windows 10 IoT Enterprise (64-bit) • Windows 10 (64-bit), 8.1 (64-bit) & 7 (32-bit / 64-bit) • Windows Embedded Standard 8 (32-bit / 64-bit) & Windows 7 (32-bit / 64-bit) • Linux Open Source (64-bit)
CPU	AMD R & G -Series 28 nm QC / DC APU FP4 BGA package, 37 x 29 mm, 0.8 mm pitch
Chipset	AMD integrated SoC
Memory	**IOPS-302:** 2 x DDR4-2133 SO-DIMM, dual channel, Max. 32GB **IOPS-302-N224:** 1 x DDR4-2133 SO-DIMM, single channel, Max. 16GB
Graphics	Next-gen. AMD Radeon™ HD GPU integrated
Network Controller	Realtek RTL8111G Gigabit LAN controller
Super I/O	Fintek F81846AD
Storage	1 x M.2 M2280 slot for SATA SSD
Power Requirement	12V ~ 19V DC-in (Intel® OPS standard)
Watchdog	Watchdog Timer 256 segments, 0, 1, 2…255 sec/min
Chassis	SGCC, black & gray
Mounting	OPS standard bracket
Dimensions (W x H x D)	200 x 30 x 119 mm (7.87” x 1.18” x 4.69”)
Net Weight	0.9 kg (1.98 lb)
Compliance	CE, FCC class B
I/O Ports	
HDMI	1 x HDMI 1.4b
LAN	1 x GbE RJ45 LAN port
Serial	1 x RJ50 for COM1 RS-232 port
USB	• 2 x USB 3.0 • 2 x USB 2.0

Audio Jack	• 1 x Line-Out • 1 x Mic-In
Expansion	1 x M.2 E2230 for WiFi or BT options
Environment	
Temperature	• **Operating:** 0 ~ 45 °C (32 ~ 113 °F) • **Storage:** -20 ~ 80 °C (-4 ~ 176 °F)
Relative Humidity	5 ~ 90% at 45°C (non-condensing)
Vibration	SSD: 5 grms / 5~500Hz / random operation

All specifications are subject to change without prior notice.

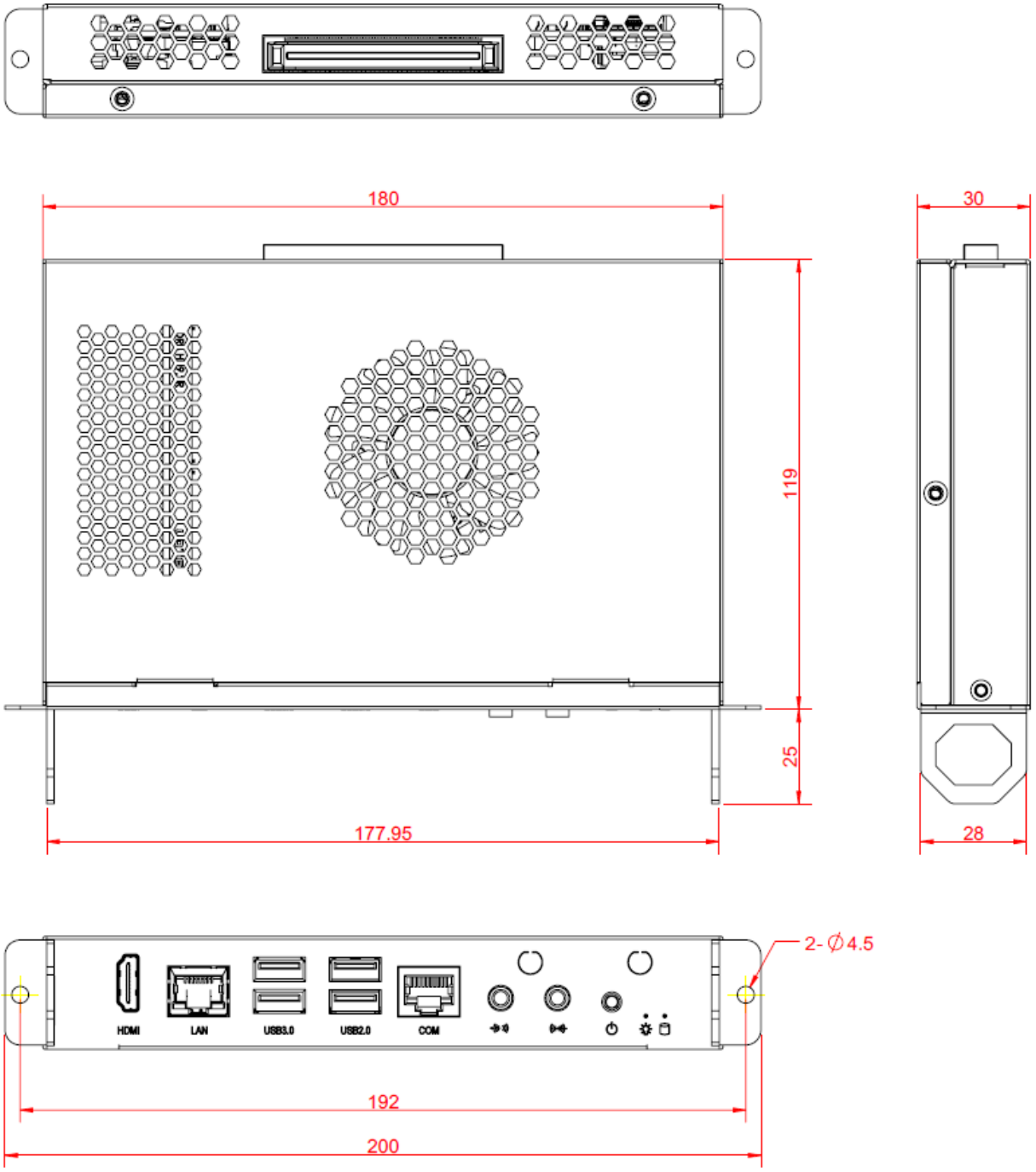
1.6 Overview



No.	Name	No.	Name
1	Screw Holes (for the optional docking kit)	6	RJ50 COM RS-232 Port
2	HDMI Port	7	Audio Jacks (From left to right: Line-Out, Mic-In)
3	GbE LAN Port	8	Antenna Holes
4	USB 3.0	9	Power Button
5	USB 2.0	10	LED Indicators (From left to right: for power, for HDD)

1.7 Dimensions

Unit: mm



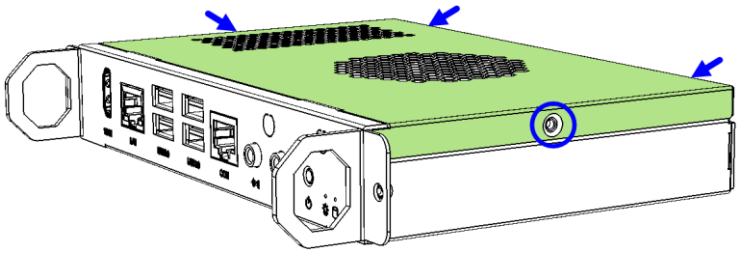
Chapter 2
Hardware Configuration

This section contains general information about:

- Installations
- Jumper and connectors

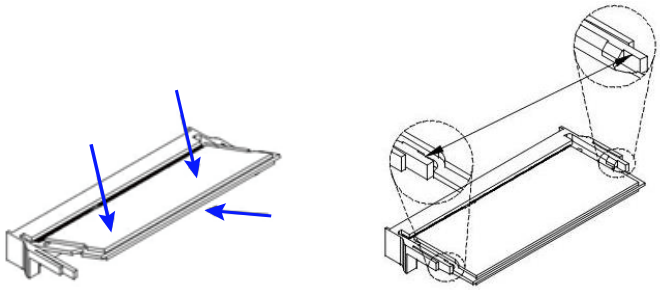
2.1 Installations

Before installing any card or module into the device, remove the screws shown in the picture below to pull out the cover.



2.1.1 Memory Module Installation

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

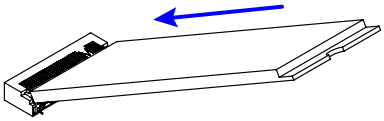


1. Align the key of the memory module with that on the memory slot and insert the module slantwise.
2. Gently push the module in an upright position until the clips of the slot close to hold the module in place when the module touches the bottom of the slot.

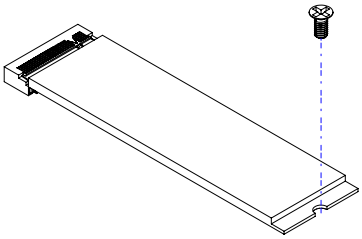
To remove a module, use your fingers to press the clips outwards until the module pops up. Grab the module gently and pull it out of the slot.

2.1.2 M.2 Cards Installation

1. Align the bus connector of the M.2 card with that of the M.2 slot, and insert the card slantwise.



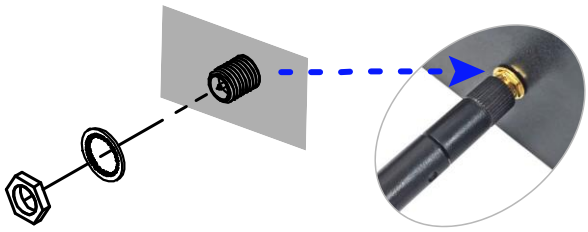
2. Push the M.2 card downwards as shown in the picture below, and fix it with a screw.

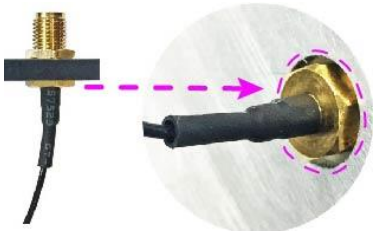


2.1.3 WiFi / 3G / 4G Antenna Installation

Insert the WiFi / 3G / 4G antenna extension cable through the antenna hole of the front I/O cover and fasten the antenna as shown below. Then apply adhesive around the hex nut behind the front I/O cover to prevent the extension cable from falling off if the cable becomes loose.

1. Fasten the hex nut and the washer. Then install the antenna.
2. Apply adhesive around here.





Info: The diameter of the nut is around 6.35 mm (0.25”-36UNC).

2.2 Pin Assignment for COM RS-232 Port

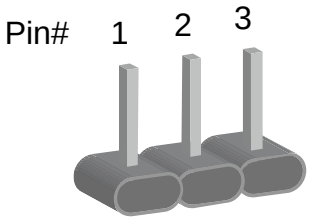
Pin	Signal Name	Pin	Signal Name
1	DSR (Data set ready)	6	DCD (Data carrier detect)
2	Ground	7	DTR (Data terminal ready)
3	Ground	8	CTS (Clear to send)
4	TX (Transmit)	9	RTS (Request to send)
5	RX (Receive)	10	RI (Ring indicator)

2.3 Setting the Jumpers

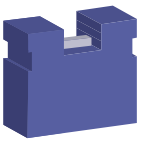
Configure your device by using jumpers to enable the features that you need based on your applications. Contact your supplier if you have doubts about the best configuration for your use.

2.3.1 How to Set Jumpers

Jumpers are short-length conductors consisting of several metal pins with a base mounted on the circuit board. Jumper caps are placed (or removed) on the pins to enable or disable functions or features. If a jumper has 3 pins, you can connect Pin 1 with Pin 2 or Pin 2 with Pin 3 by shorting the jumper.

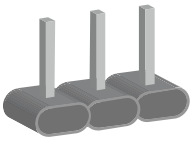
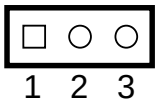
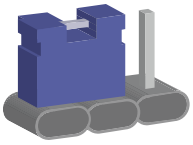
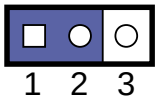
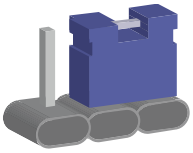
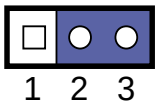


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

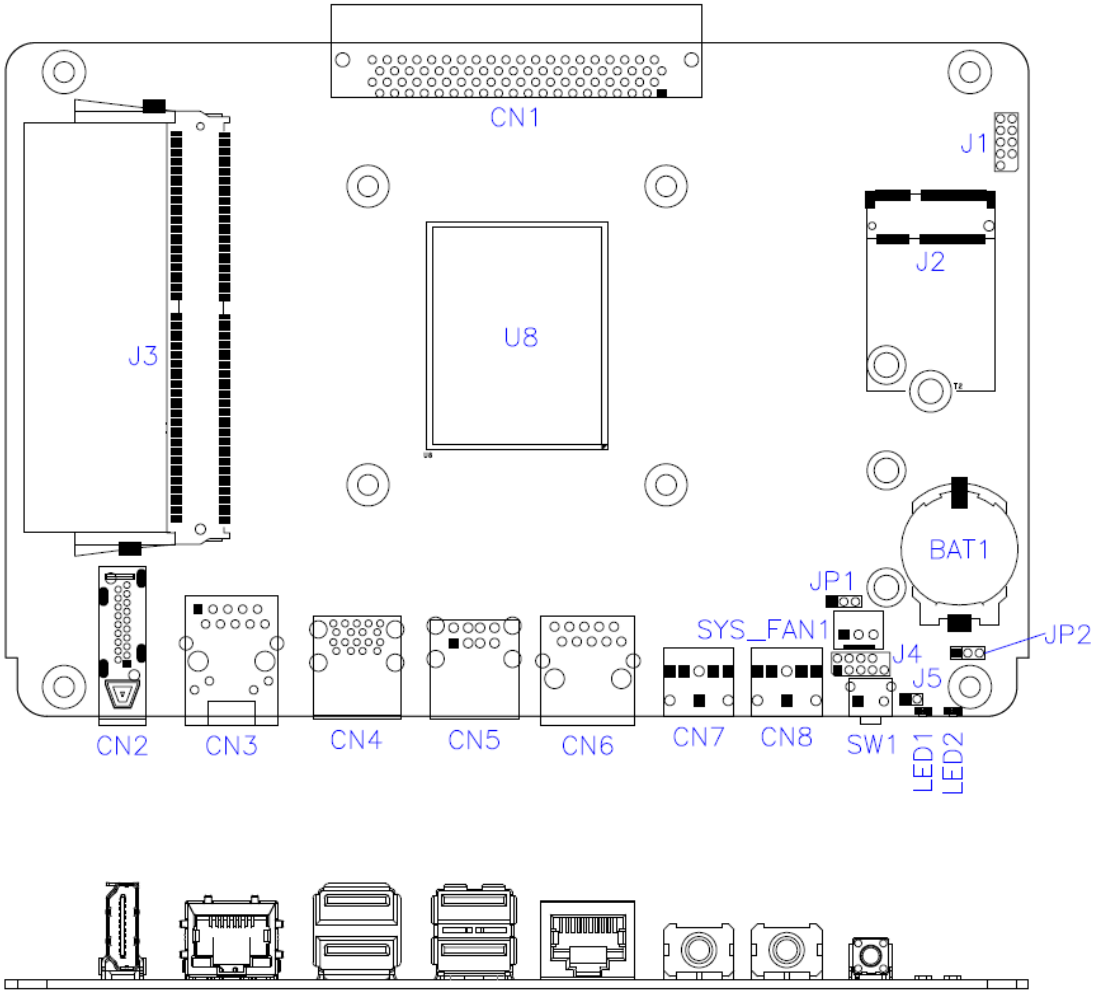
Pin closed	Oblique view	Illustration in the manual
Open		
1-2		
2-3		

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

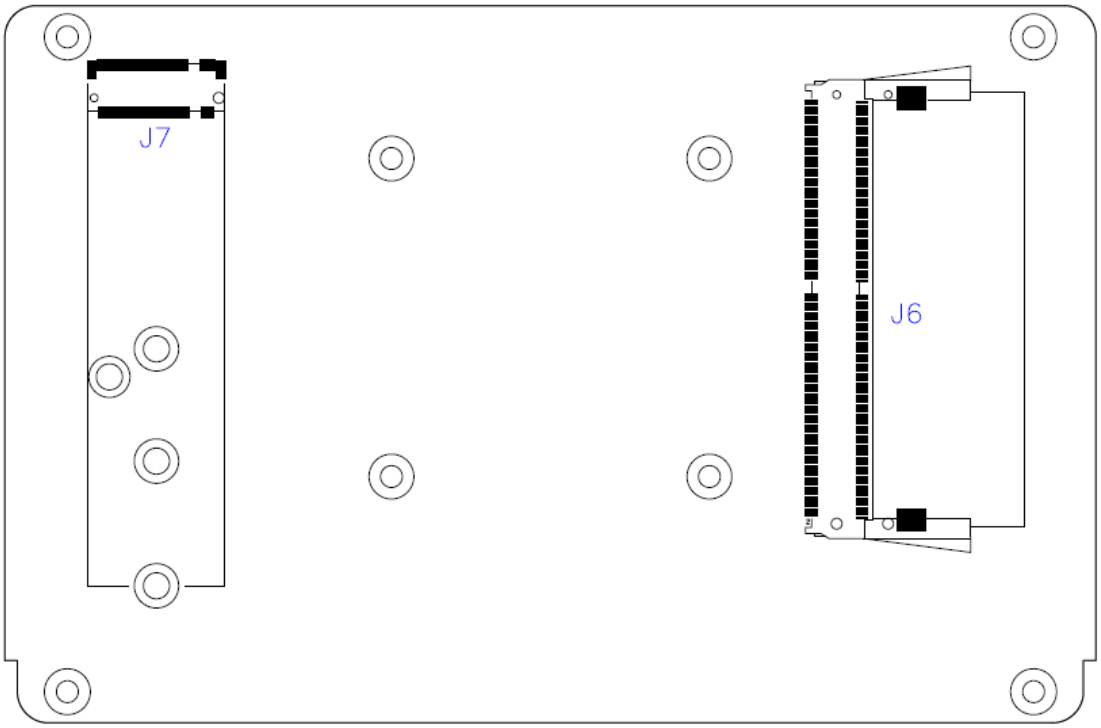
When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.4 Jumper & Connector Locations on Motherboard

Motherboard: OPS302



OPS302 – top view



OPS302 – bottom view

2.5 Jumper & Connectors Quick Reference

Jumper:

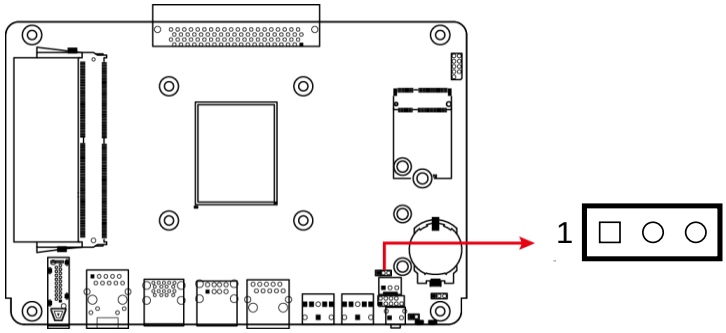
Function	Connector Name	Page
ATX & AT Mode Selection	JP1	14
Clearing CMOS Data	JP2	14

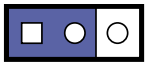
Connectors:

Function	Connector Name	Page
System Fan Connector	SYS_FAN1	15
Power Button	SW1	--
OPS Connector	CN1	--
HDMI Port	CN2	--
GbE LAN Port	CN3	--
Dual USB 3.0 Port	CN4	--
Dual USB 2.0 Port	CN5	--
COM RS-232 Port [1]	CN6	--
Audio Jack	CN7, CN8	--
DDR4 Memory Slot	J3, J6	--
M.2 E2230 Slot	J2	--
M.2 M2280 Slot	J7	--
LED Indicator	LED1 (for power), LED2 (for HDD)	--
Battery Socket	BAT1	--
Factory Use Only	J1, J4, J5	--

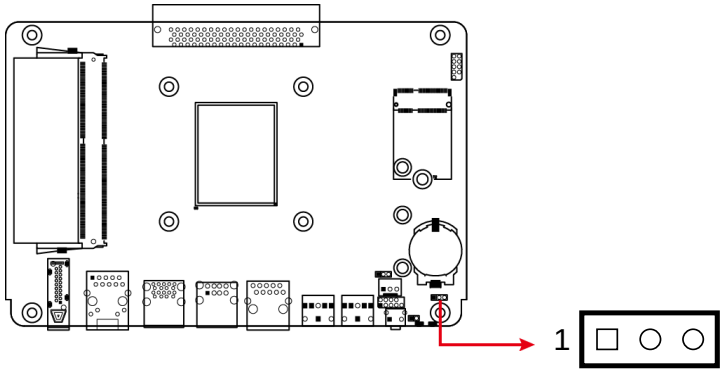
[1]: Refer to *2.2 Pin Assignment for COM RS-232 Port*.

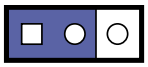
2.5.1 ATX & AT Mode Selection (JP1)



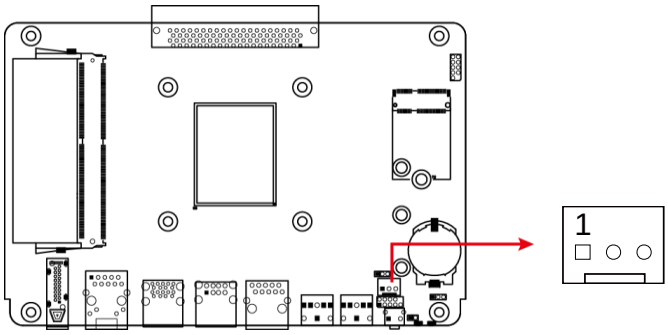
Function	Pin closed	Illustration
ATX Mode (default)	1-2	
AT Mode	2-3	

2.5.2 Clearing CMOS Data (JP2)



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

2.5.3 System Fan Power Connector (SYS_FAN1)



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

Chapter 3
Driver Installation

The information provided in this chapter includes:

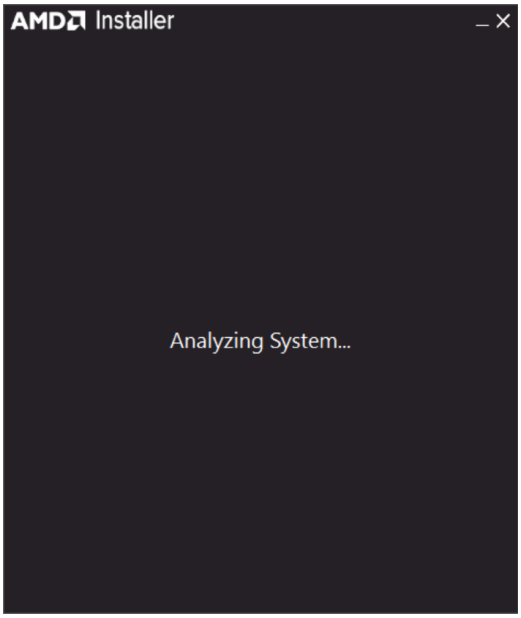
- AMD Merlin Falcon Graphics Drivers
- HD Audio Drivers
- LAN Network Drivers

3.1 Introduction

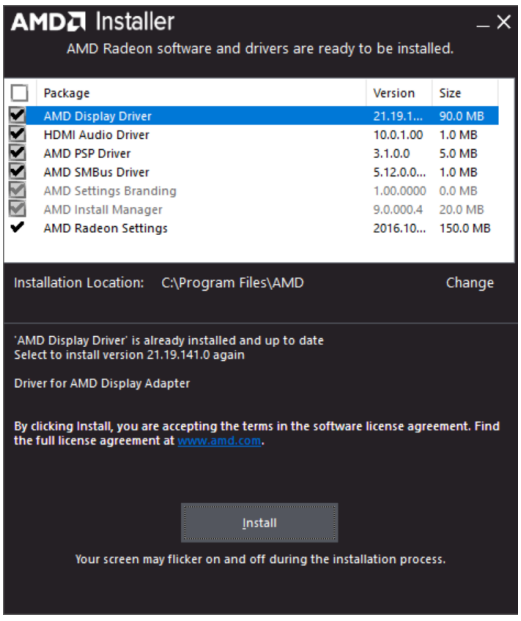
This section describes the installation procedures for software drivers. The software drivers are available on IBASE website www.ibase.com.tw. Register as a member on our website to download all the necessary drivers.

3.2 AMD Merlin Falcon Graphics Driver Installation

1. Run the **Setup.exe** file to start the installer.



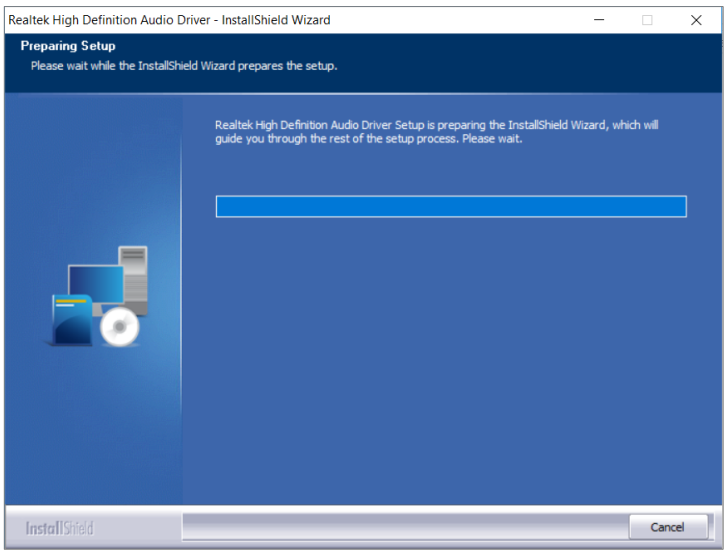
2. Tick the desired items and click **Install**.



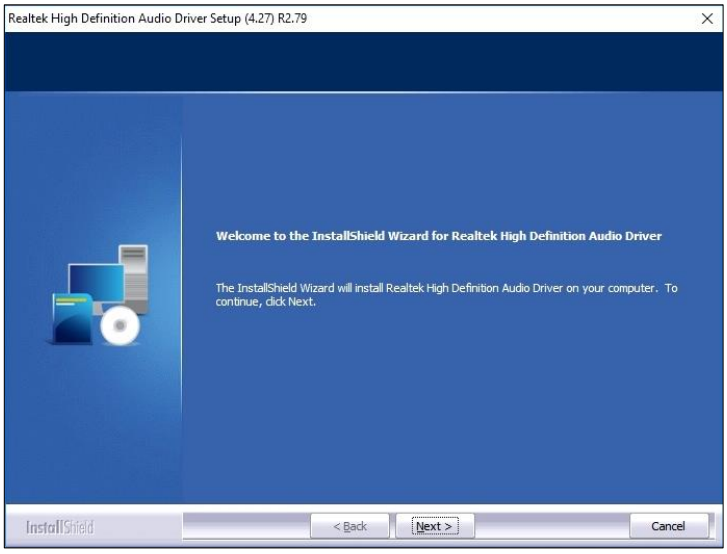
3. When the installation is complete, restart the system for changes to take effect.

3.3 HD Audio Driver Installation

1. Run the **Setup.exe** file and the wizard will start.



2. On the *Welcome* screen of the InstallShield Wizard, click **Next** to start installing the audio driver on your system.

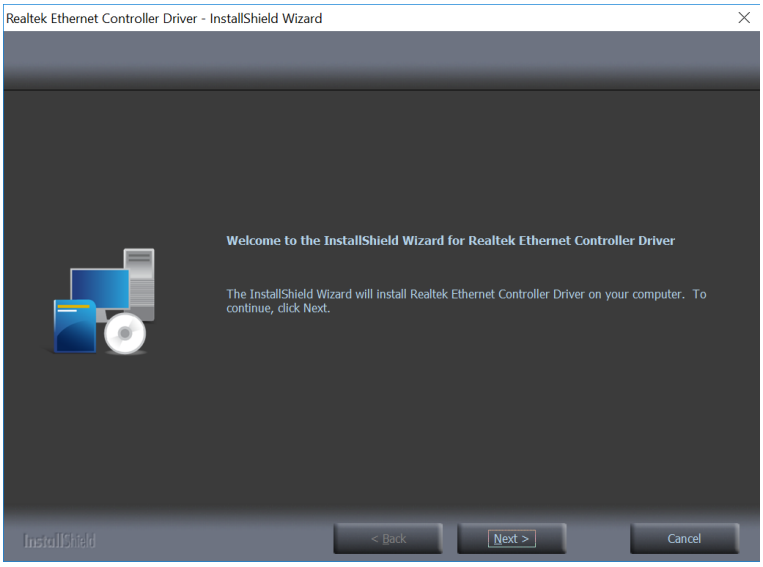


3. When installation is complete, restart the system for changes to take effect.

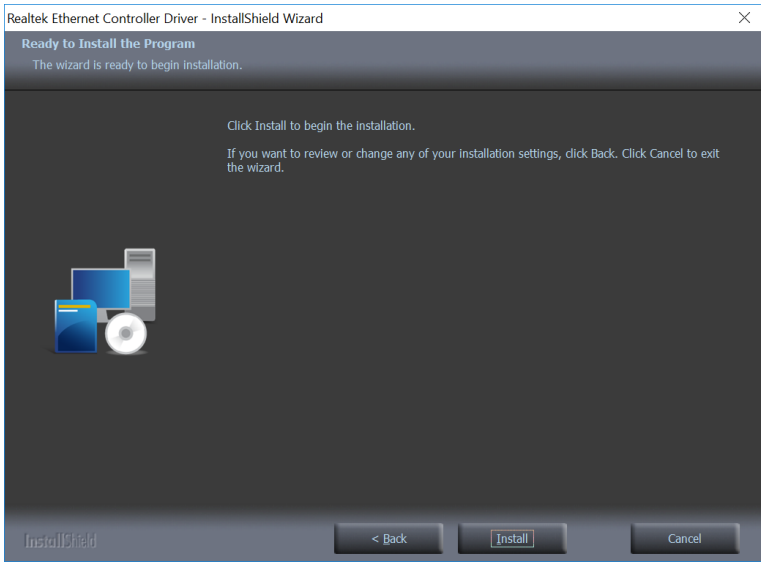
3.4 LAN Driver Installation

1. Run the **Setup.exe** file.

2. On the *Welcome* screen of the InstallShield Wizard, click **Next** to continue.



3. Click **Install**.



4. Installation is now complete. 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 supports Intel® processors. The BIOS 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. Press the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still 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
```

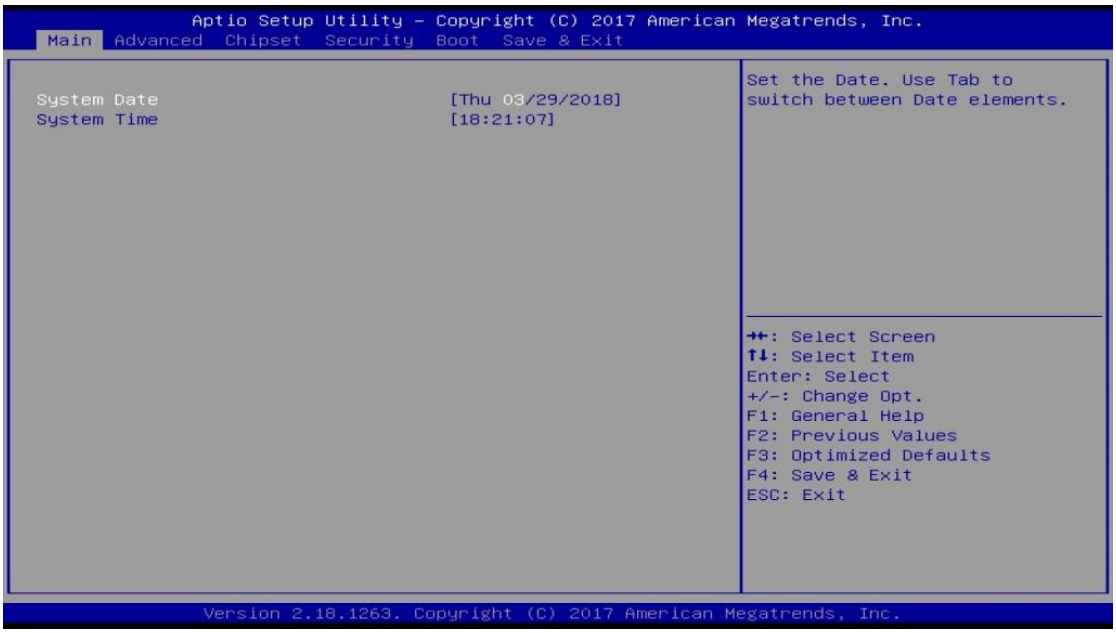
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

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.

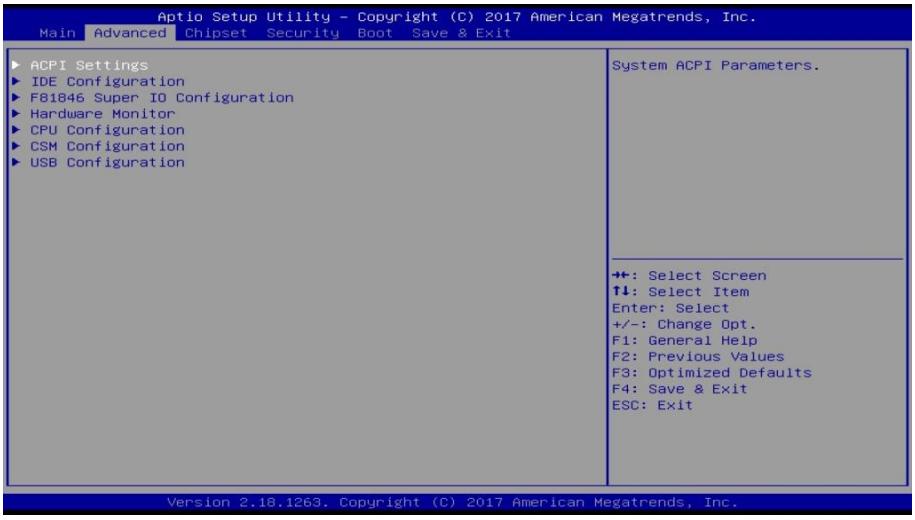
4.3 Main Settings



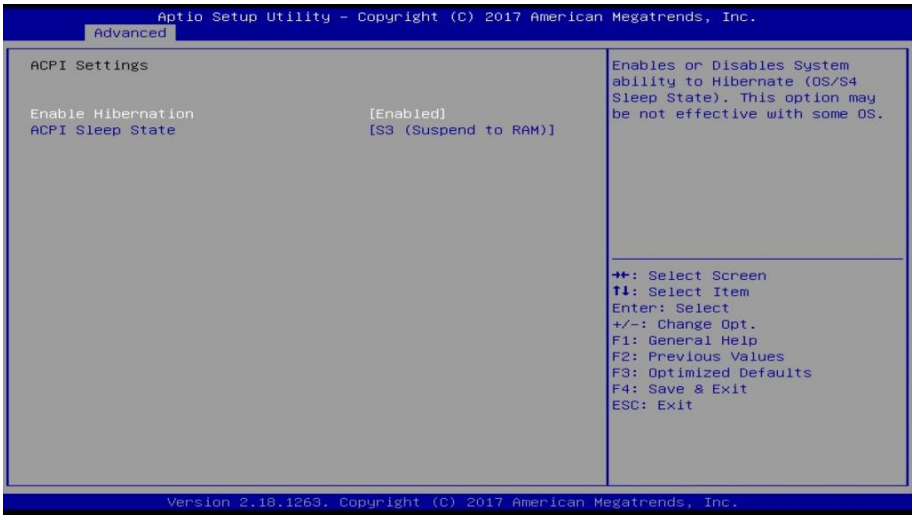
BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

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.



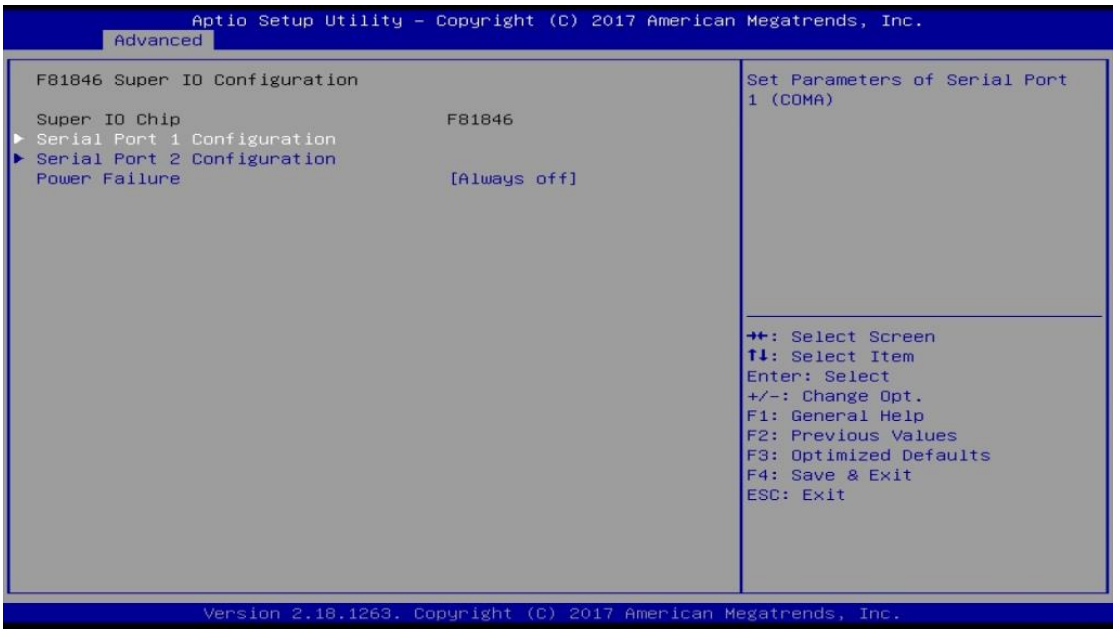
4.4.1 ACPI Settings



BIOS Setting	Description
Enable Hibernation	Enables / Disables System ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Selects the highest SCPI sleep state the system will enter when the SUSPEND button is pressed. Options: Suspend Disabled, S3 (Suspend to RAM)

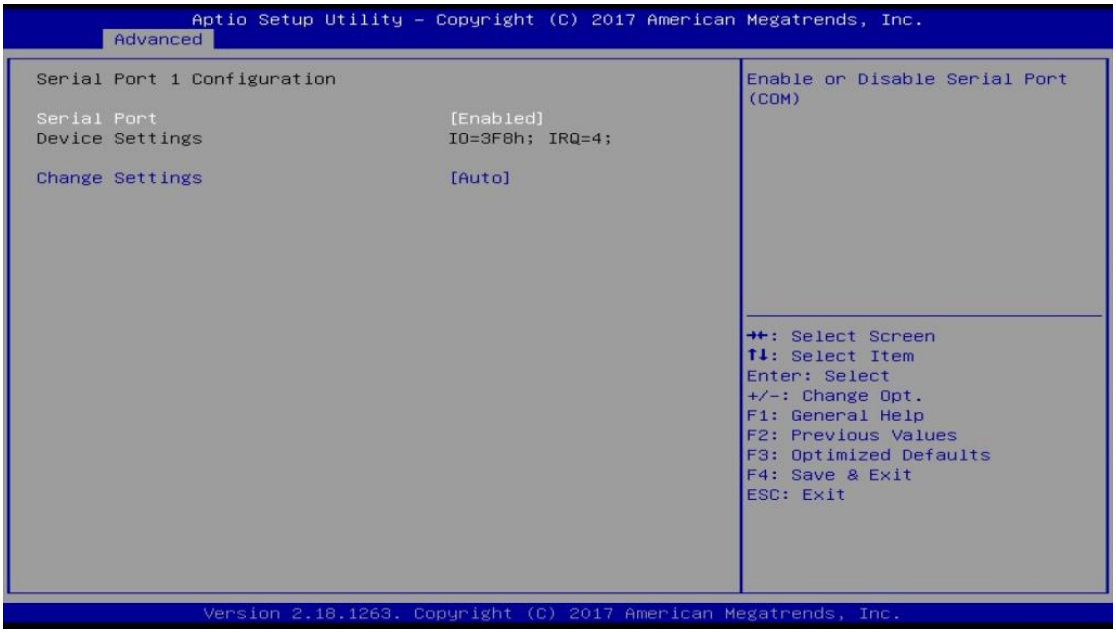
4.4.2 IDE Configuration

4.4.3 F81846 Super IO Configuration



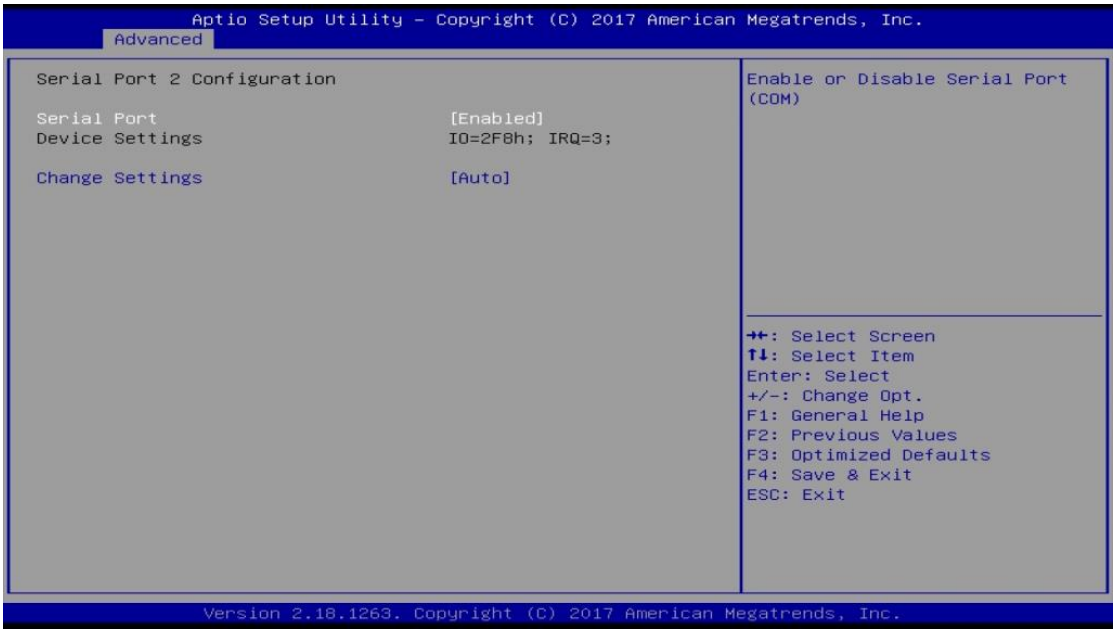
BIOS Setting	Description
Serial Port Configuration	Sets parameters of Serial Ports (COMA). Enables / Disables the serial port and select an optimal setting for the Super IO device.
Power Failure	Options: Always on, Always off

4.4.3.1. Serial Port 1 Configuration



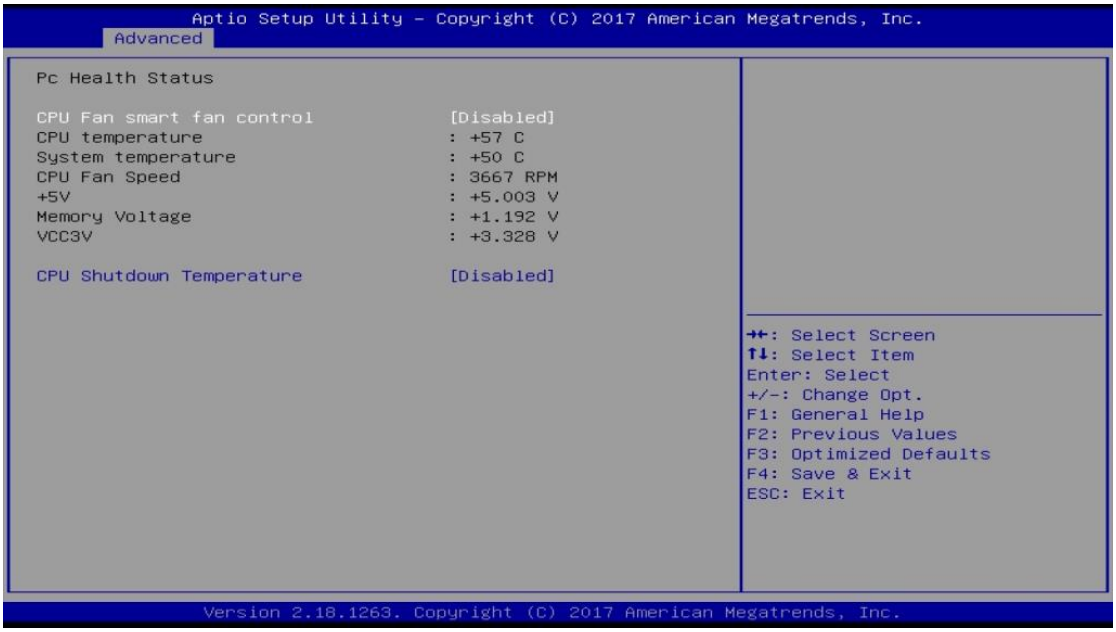
BIOS Setting	Description
Serial Port	Sets parameters of Serial Ports (COM).
Change Settings	Selects an optimal settings for Super I/O device. Options: • Auto • IO = 3F8h; IRQ = 4 • IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12

4.4.3.2. Serial Port 2 Configuration



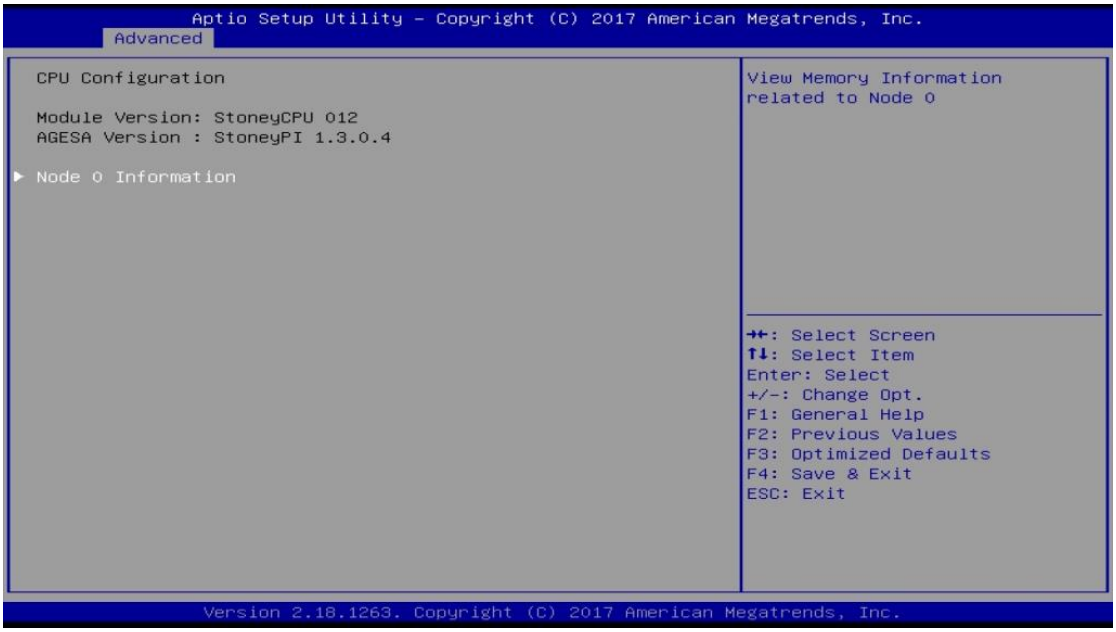
BIOS Setting	Description
Serial Port	Sets parameters of Serial Ports (COMA).
Change Settings	Selects an optimal settings for Super I/O device. Options: • Auto • IO = 2F8h; IRQ = 3 • IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 • IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12

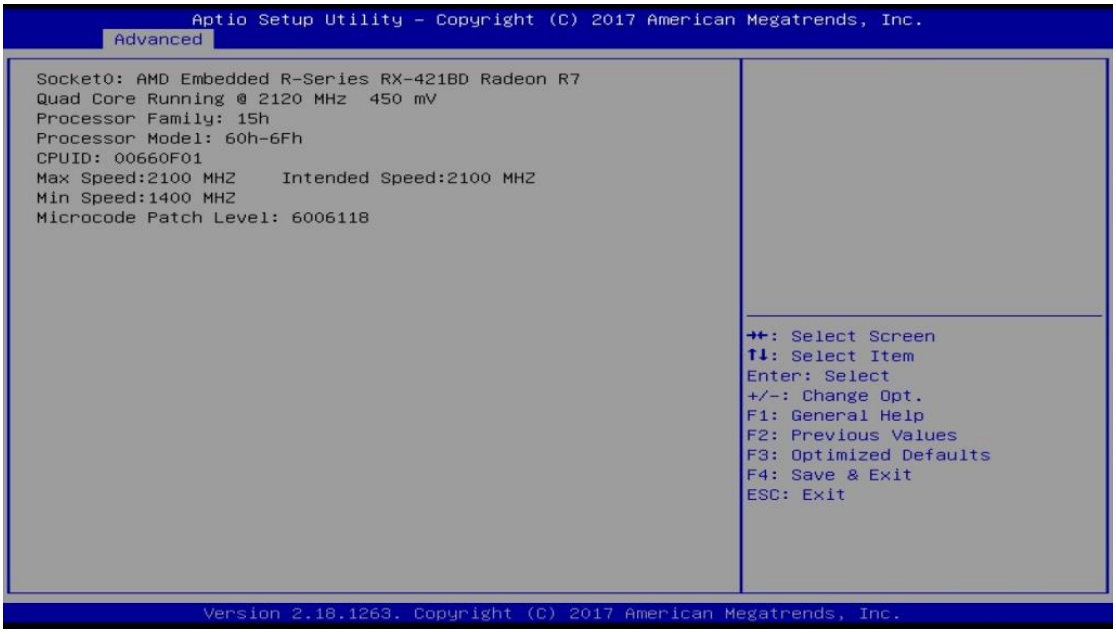
4.4.4 Hardware Monitor



BIOS Setting	Description
CPU Fan Smart Fan Control	Disables or selects a temperature threshold. 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 values as monitored by the system and show the PC health status.
CPU Shutdown Temperature	This field enables or disables the Shutdown Temperature Options: Disabled, 70°C, 75°C, 80°C, 85°C, 90°C, 95°C

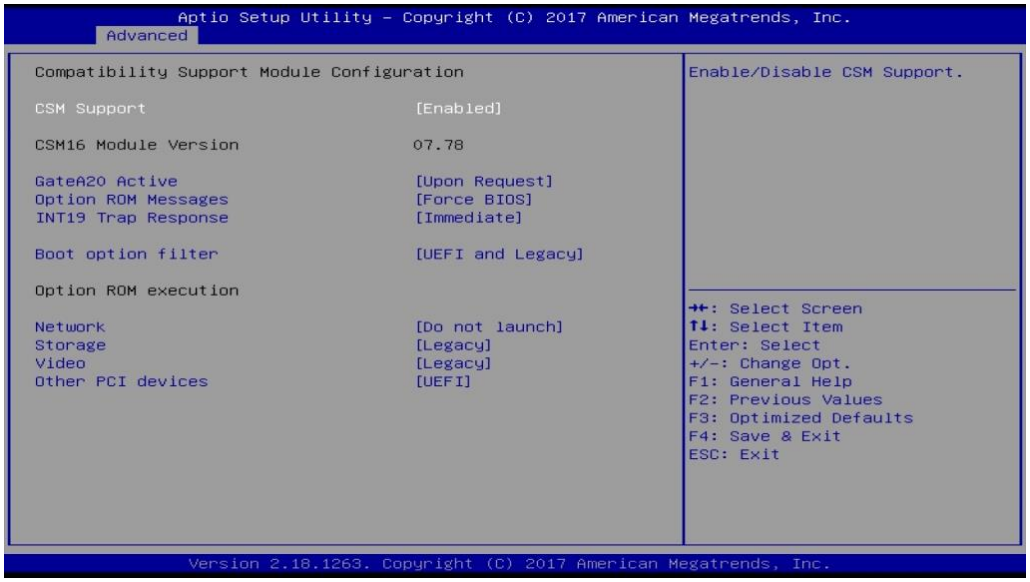
4.4.5 CPU Configuration





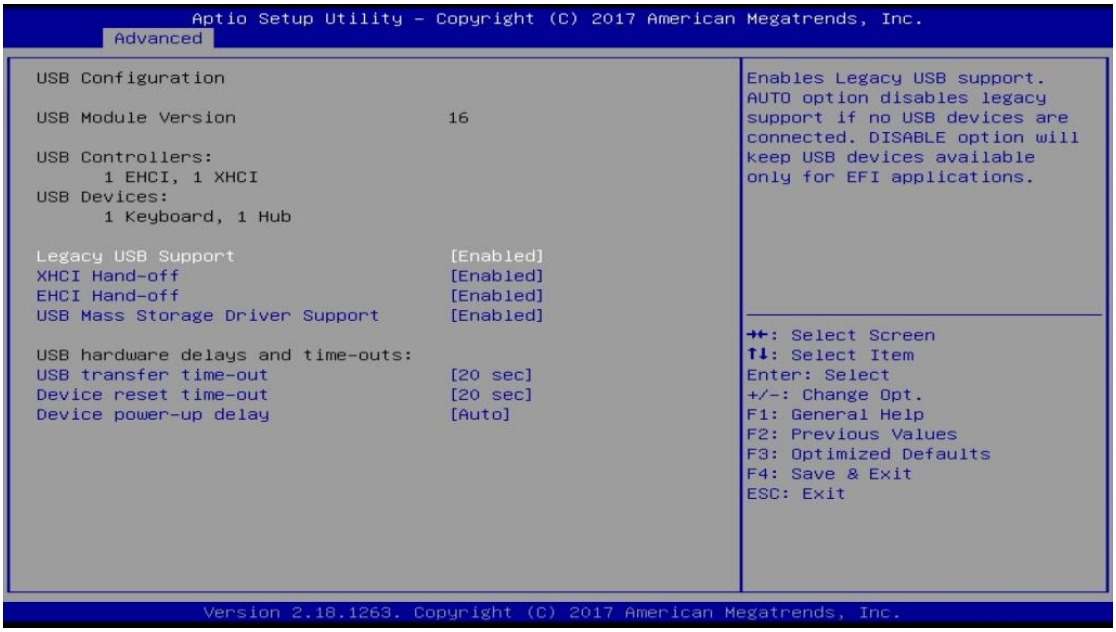
BIOS Setting	Description
Node 0 Information	When the function is enabled,a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

4.4.6 CSM Configuration



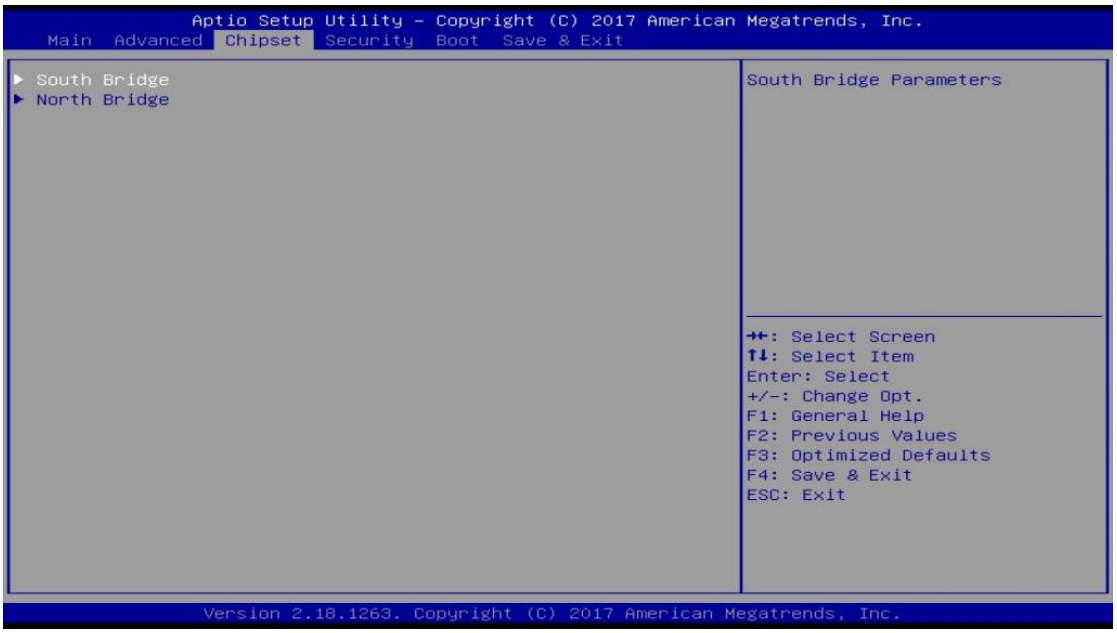
BIOS Setting	Description
CSM Support	Enables or disables CSM support.
GateA20 Active	• Upon Request disables GA20 when using BIOS services. • Always cannot disable GA20, but is useful when any RT code is executed above 1 MB.
Option ROM Messages	Sets the display mode for Option ROM. Options: Force BIOS, Keep Current
INT19 Trap Response	Sets how BIOS reacts on INT19 trap by Option ROM. • Immediate executes the trap right away. • Postponed executes the trap during legacy boot.
Boot option filter	Controls the priority of Legacy and UEFI ROMs.
Network	Controls the execution of UEFI and Legacy PXE OpROM. Options: Do not launch, Legacy
Storage	Controls the execution of UEFI and Legacy Storage OpROM. Options: Do not launch, UEFI, Legacy
Video	Controls the execution of UEFI and Legacy Video OpROM. Options: Do not launch, UEFI, Legacy
Other PCI devices	Determines OpROM execution policy for devices other than network, storage or video. Options: Do not launch, UEFI, Legacy

4.4.7 USB Configuration



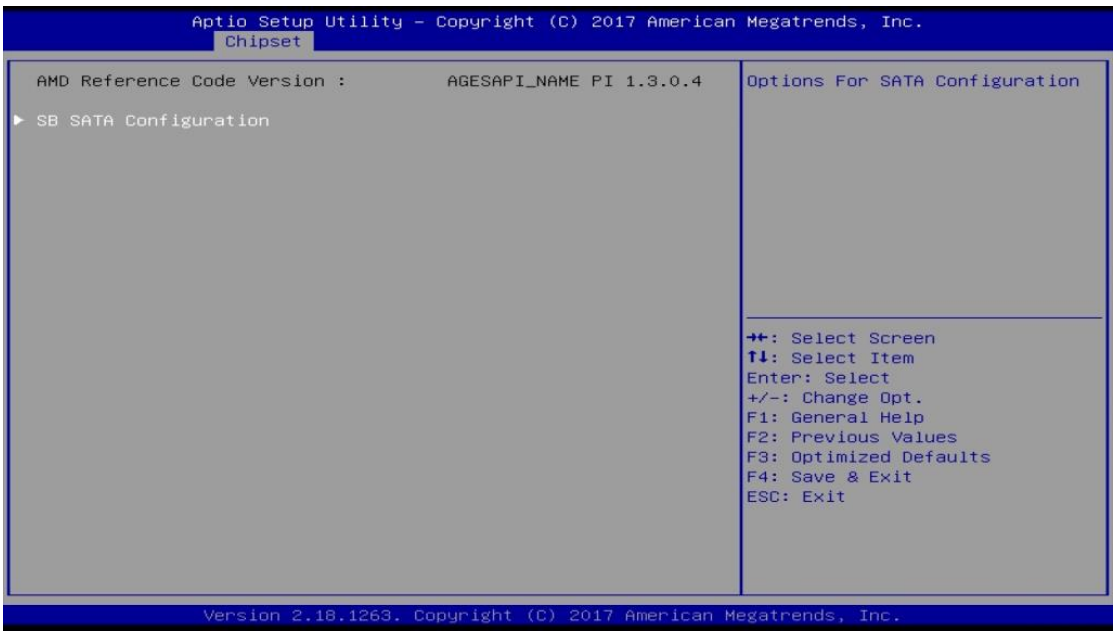
BIOS Setting	Description
Legacy USB Support	• **Enable:** Enables Ledacy USB Support. • **Auto:** Disables legacy support if no USB devices are connected. • **Disable:** Keeps USB devices available only for EFI applications.
XHCI / EHCI Hand-off	This is a workaround for OSes without XHCI / EHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
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.
Device reset time-out	Seconds of delaying execution of start unit command to USB mass storage device.
Device power-up delay	The 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. But for a Hub port, the delay is taken from Hub descriptor.

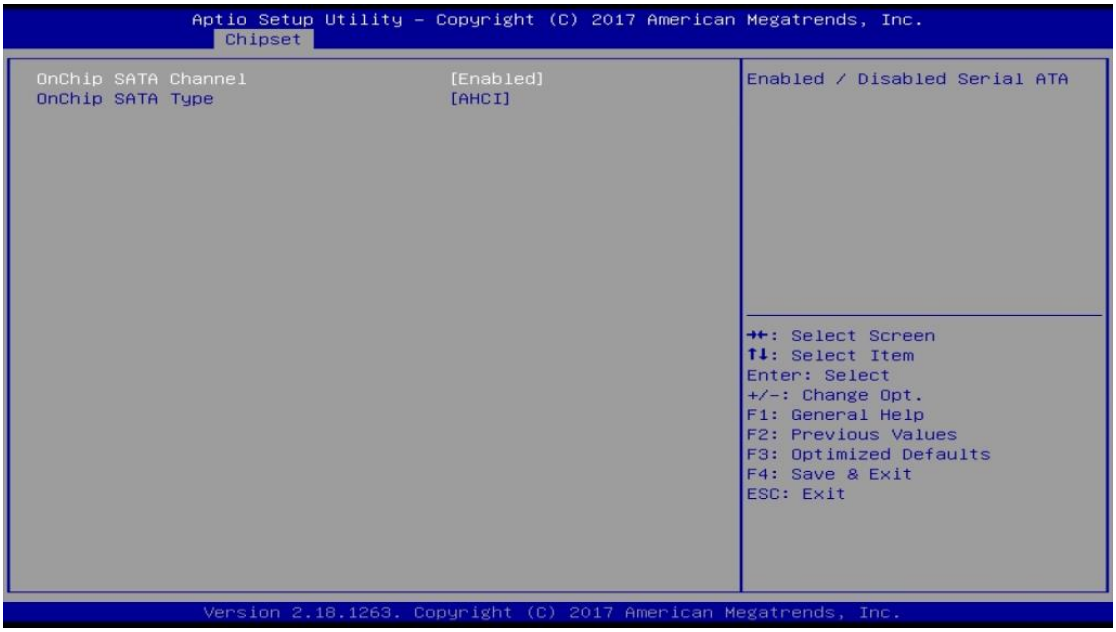
4.5 Chipset Settings



BIOS Setting	Description
South Bridge	System Agent parameters
North Bridge	North Agent parameters

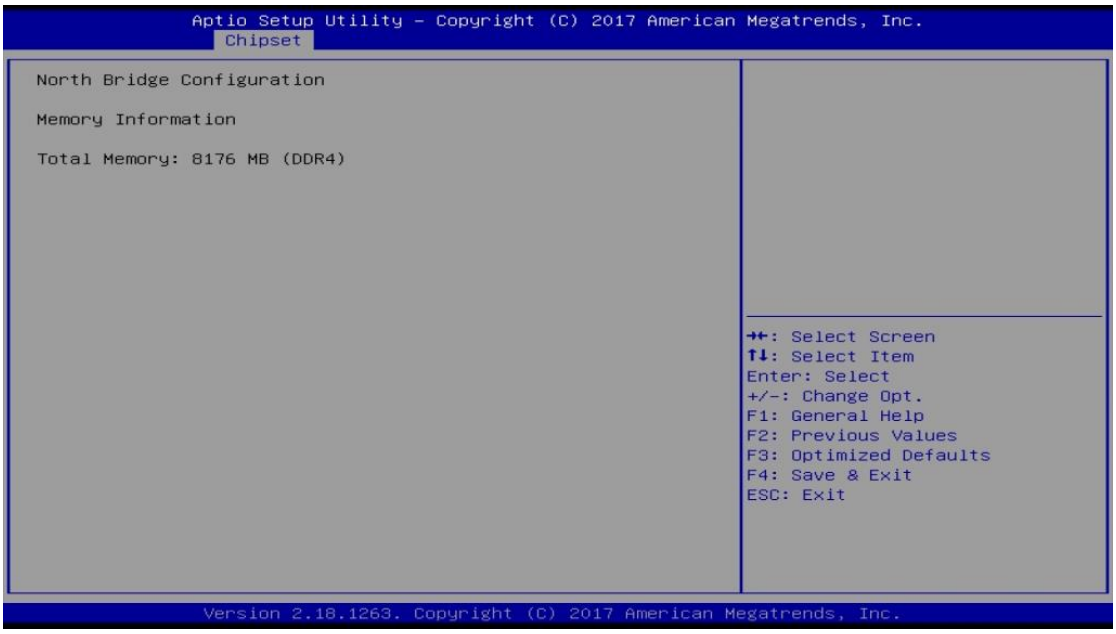
4.5.1 SB SATA Configuration



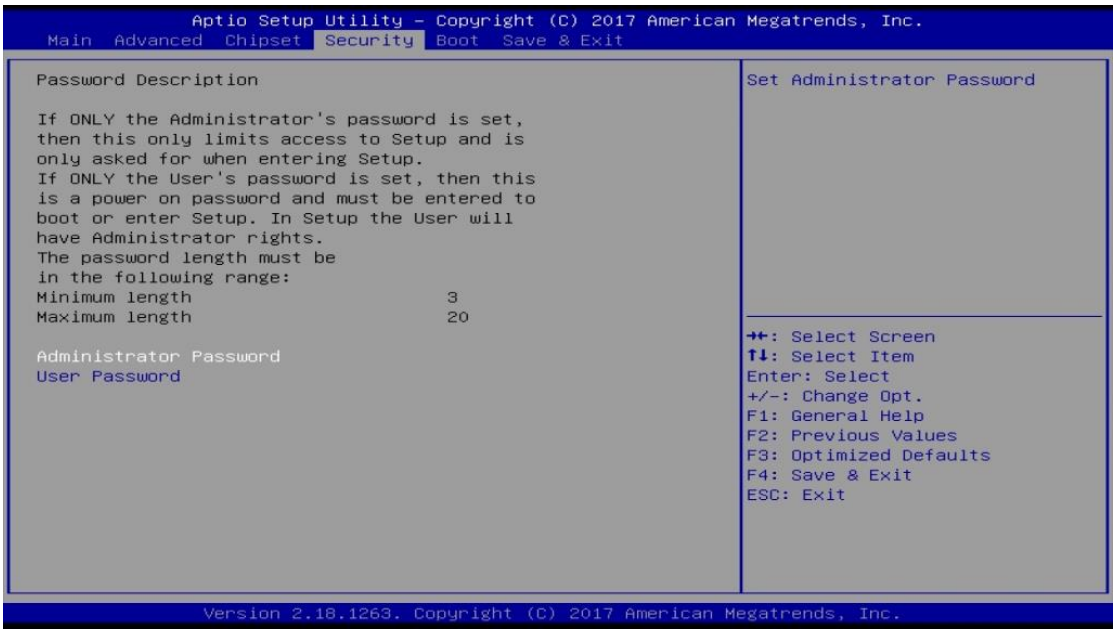


BIOS Setting	Description
OnChip SATA Channel	Enables / Disables the Serial ATA.
OnChip SATA Type	Options: Native IDE, AHCI

4.5.2 North Bridge

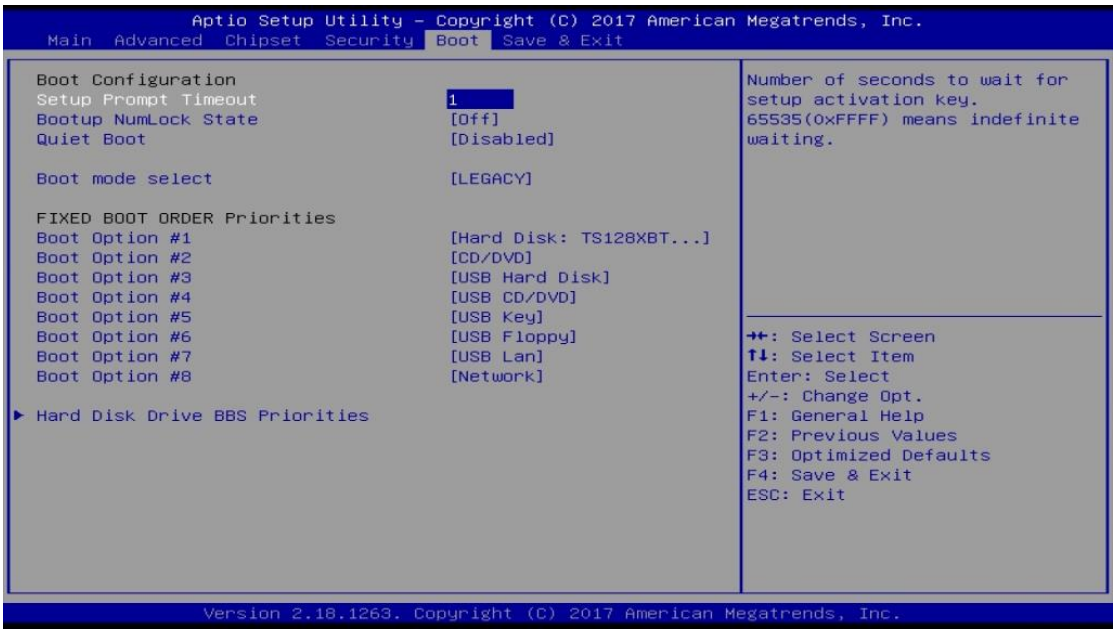


4.6 Security Settings



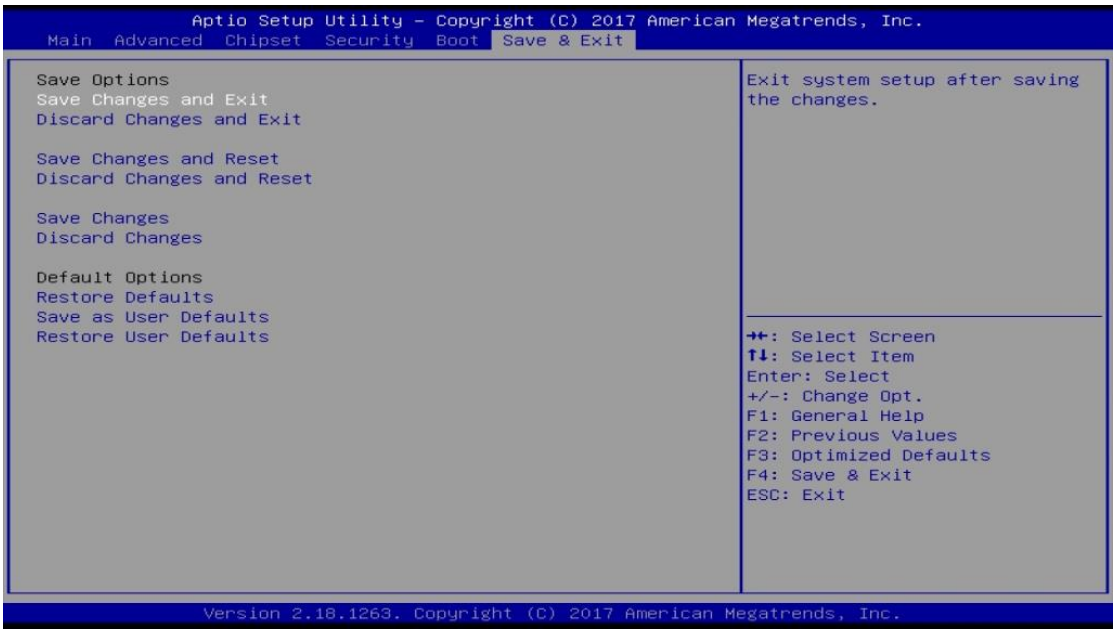
BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.

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	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Boot Mode Select	Selects a Boot mode.
Boot Option Priorities	Sets the system boot order priorities for hard disk, CD/DVD, USB, Network.

4.8 Save & Exit Settings



BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as user defaults.
Restore User Defaults	Restores the user defaults to all the setup options.

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

- I/O Port Address Map
- Interrupt Request Lines (IRQ)
- Watchdog Timer Configuration

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
0x00000A10-0x00000A1F	Motherboard resources
0x00000000-0x0000000F	Direct memory access controller
0x00000000-0x0000000F	PCI Express Root Complex
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
0x00000070-0x00000071	System CMOS/real time clock
0x0000E000-0x0000E0FF	Realtek PCIe GBE Family Controller
0x0000E000-0x0000E0FF	PCI Express Root Port
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x0000F140-0x0000F147	AMD SATA Controller
0x0000F130-0x0000F133	AMD SATA Controller
0x0000F120-0x0000F127	AMD SATA Controller
0x0000F110-0x0000F113	AMD SATA Controller
0x0000F100-0x0000F10F	AMD SATA Controller
0x00000020-0x00000021	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000003E0-0x00000CF7	PCI Express Root Complex
0x000003B0-0x000003DF	PCI Express Root Complex
0x000003B0-0x000003DF	AMD Radeon R7 Graphics
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000F000-0x0000F0FF	AMD Radeon R7 Graphics

Address	Device Description
0x000003C0-0x000003DF	AMD Radeon R7 Graphics
0x00000040-0x00000043	System timer
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard
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
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

Address	Device Description
0x00000CD8-0x00000CDF	Motherboard resources
0x00000800-0x0000089F	Motherboard resources
0x00000B00-0x00000B0F	Motherboard resources
0x00000B20-0x00000B3F	Motherboard resources
0x00000900-0x0000090F	Motherboard resources
0x00000910-0x0000091F	Motherboard resources
0x0000FE00-0x0000FEFE	Motherboard resources
0x00000061-0x00000061	System speaker

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	High precision event timer
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	High precision event timer
IRQ 12	Microsoft PS/2 Mouse
IRQ 18	Standard Enhanced PCI to USB Host Controller
IRQ 19	AMD SATA Controller
IRQ 31	High Definition Audio Controller
IRQ 46	High Definition Audio Controller
IRQ 54 ~ IRQ 204	Microsoft ACPI-Compliant System
IRQ 256 ~ IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967285	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967286	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967287	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967288	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967289	AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967290	Realtek PCIe GBE Family Controller
IRQ 4294967291	AMD Radeon R7 Graphics
IRQ 4294967292	AMD PSP 2.0 Device
IRQ 4294967293	AMD PSP 2.0 Device
IRQ 4294967294	PCI Express Root Port

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 the 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
//---------------------------------------------------------------------------
#defineF81846_INDEX_PORT   (F81846_BASE)
#defineF81846_DATA_PORT    (F81846_BASE+1)
//---------------------------------------------------------------------------
#defineF81846_REG_LD   0x07
//---------------------------------------------------------------------------
#define F81846_UNLOCK  0x87
#defineF81846_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
```