CSB200-818

Slim & Fanless SBC System

User's Manual

Version 1.1
(May 2019)

iBASE

Disclaimer

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Compliance

CE

This is a class B product. This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the Union European (EU). If users modify and/or install other devices in this equipment, the CE conformity declaration may no longer apply.

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 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 device.

Environmental conditions:

- Lay the device horizontally on a stable and solid surface in case the device may fall, causing serious damage.
- Leave plenty of space around the device and do not block the openings for ventilation. NEVER DROP OR INSERT ANY OBJECTS OF ANY KIND INTO THE VENTIILATION OPENINGS.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the device for ventilation. NEVER INSERT OBJECTS OF ANY KIND INTO THE VENTILATIN OPENINGS.
- Use this product in environments with ambient temperatures between -30˚C and 65˚C for SSD, and between -10˚C and 45˚C for HDD.
- DO NOT LEAVE THIS DEVICE IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -40˚C OR ABOVE 85˚C. This could damage the device. The device must be used in a controlled environment.

Care for your IBASE products:

- Before cleaning the device, turn it off and unplug all cables such as power in case a small amount of electrical current may still flow.
- Use neutral cleaning agents or diluted alcohol to clean the device chassis with a cloth. Then wipe the chassis with a dry cloth.
- Vacuum the dust with a computer vacuum cleaner to prevent the air vent or slots from being clogged.

WARNING

Attention during use:

- Do not use this product near water.
- Do not spill water or any other liquids on your device.
- Do not place heavy objects on the top of the device.
- Operate this device from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your distributor or local power company.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure that the total ampere rating of the product plugged into the extension cord does not exceed its limits.

Avoid Disassembly

Do not disassemble, repair or make any modification to the device. Disassembly, modification, or any attempt at repair could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

Danger of explosion if internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. 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, memory, HDD, power adapter, panel and touchscreen.

* PRODUCTS, HOWEVER, THAT FAILS 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.

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Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Overview
- Dimensions

1.1 Introduction

The CSB200-818 Is applicable to thin clients, smart industrial automation or controller, and retail equipment. It is slim and fanless with an Intel® Atom™ E3930 / Pentium® N4200 / Celeron® N3350 processor. This system is built with an easily removable HDD at the bottom and features rich peripheral ports for data transmission or receiving. The power connector is a 3-pin terminal block by default but a DC jack is available for option too.

1.2 Features

- Fanless system with IBASE IB818 3.5” disk-size SBC
- Onboard Intel® Atom™ processors E3930 / Pentium® N4200 / Celeron® N3350 Series
- Wide-range operating temperature from -30°C to 65°C
- 12V ~ 24V DC power input
- Wall mount kit included

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 purchased the product.

- CSB200-818 x 1
- Wall Mount Kit (2 brackets) x 1
- Screws for Wall Mount Kit x 4
- 3-Pin Female Terminal Block x 1
  (For power connector. If the optional DC Jack is used, this terminal block will not be enclosed.)
- DVD Disk (including drivers) x 1
- Motherboard IB818 User's Manual x 1
  (You can download CSB200-818 User's Manual from our website.)

1.4 Optional Accessories

IBASE provide optional accessories as follows. Please contact us or your dealer if you need any.

- 12V Power Adapter
- Power Cord

1.5 Specifications

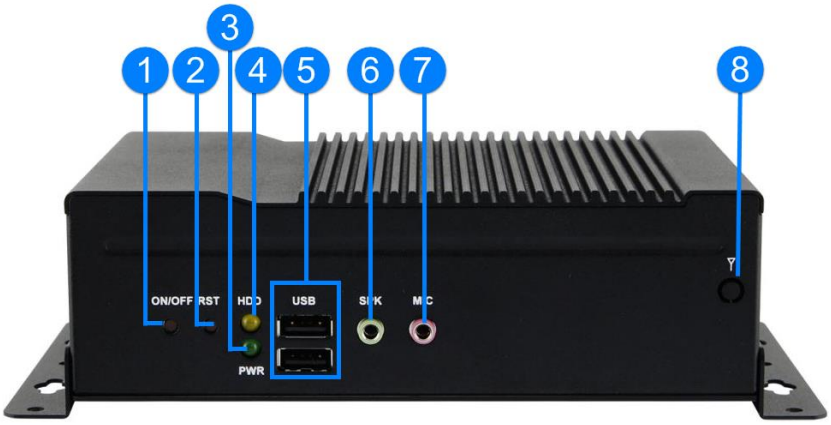
Product Name	CSB200-818
System	
Motherboard	IB818F 3.5” disk-size SBC
Operating System	• Windows 10 Enterprise (64-bit) • Windows 10 IoT Core (64-bit) • Linux Ubuntu
CPU	Intel® Atom™ DC Processor E3930 / Pentium® N4200 / Celeron® N3350 Series
System Speed	Up to 2.5 GHz
Chipset	Integrated
Memory	1 x DDR3L-1866 SO-DIMM 4 GB, expandable to 8 GB
Graphics	Intel® SoC integrated Gen. 9
Super I/O	Fintek F81964D-I
Storage	1 x 2.5” HDD or SSD (removable from the bottom)
Audio Codec	Intel® SoC built-in HD audio controller Realtek ALC283QHD codec with speaker amplifier
Network	Intel® I210IT / I211AT GbE LAN
Power Supply	60W power adaptor (Optional)
BIOS	AMI BIOS
Watchdog	Watchdog Timer 256 segments, 0, 1, 2…255 sec/min
Chassis	Aluminum & steel, black
Mounting	Desktop or wall mount (wall mount kit is included.)
Dimensions (W x H x D)	172 x 53 x 111.6 mm (6.77” x 2.09” x 4.39”)
Net Weight	1.1 kg (2.43 lb)
Certificate	CE / LVD / FCC Class B
I/O Ports	
DC Input	Terminal block for 12V ~ 24V DC-In (DC Jack type is optional.)
LAN	2 x RJ45 GbE LAN
USB	• 4 x USB 3.0 • 2 x USB 2.0
Serial	4 x COM ports: • COM1 RS-232/422/485 port • COM2, COM3, COM4 RS-232 ports

Display	1 x HDMI Port
Audio Jack	• 1 x Microphone Input • 1 x Line-Out
SATA	2 x SATA III connector
Expansion	• 1 x Mini PCIe slot (full-sized, with USB 2.0 and SATA) • 1 x Mini PCIe slot (half-sized, with USB 2.0)
Environment	
Temperature	• **Operating:** (With air flow) **For N-Series CPU, with HDD:** -10 ~ 45 °C (14 ~ 113 °F) **For E3930 CPU, with SSD:** -30 ~ 65 °C (22 ~ 149 °F) • **Storage:** -40~ 85 °C (-40 ~ 185 °F)
Relative Humidity	5 ~ 90% at 45 °C (non-condensing)
Vibration Protection	• **Operating:** 1.0 Grms / 5 ~ 500 Hz, random operation • **Non-operating:** 2.0 Grms / 5 ~ 500Hz, ramdom operation
Shock Protection	• **Operating:** 20 g / 11 ms • **Non-operating:** 30 g / 11 ms

All specifications are subject to change without prior notice.

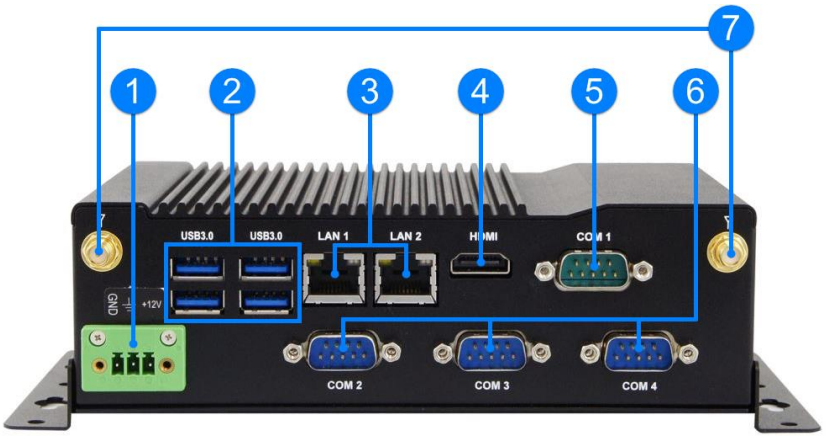
1.6 Overview

Front View



No.	Name	No.	Name
1	Power Button	5	USB 2.0 Ports
2	Reset Button	6	Audio Line-Out Jack
3	Power LED Indicator	7	Microphone Input Jack
4	HDD LED Indicator	8	Antenna Hole

Rear View

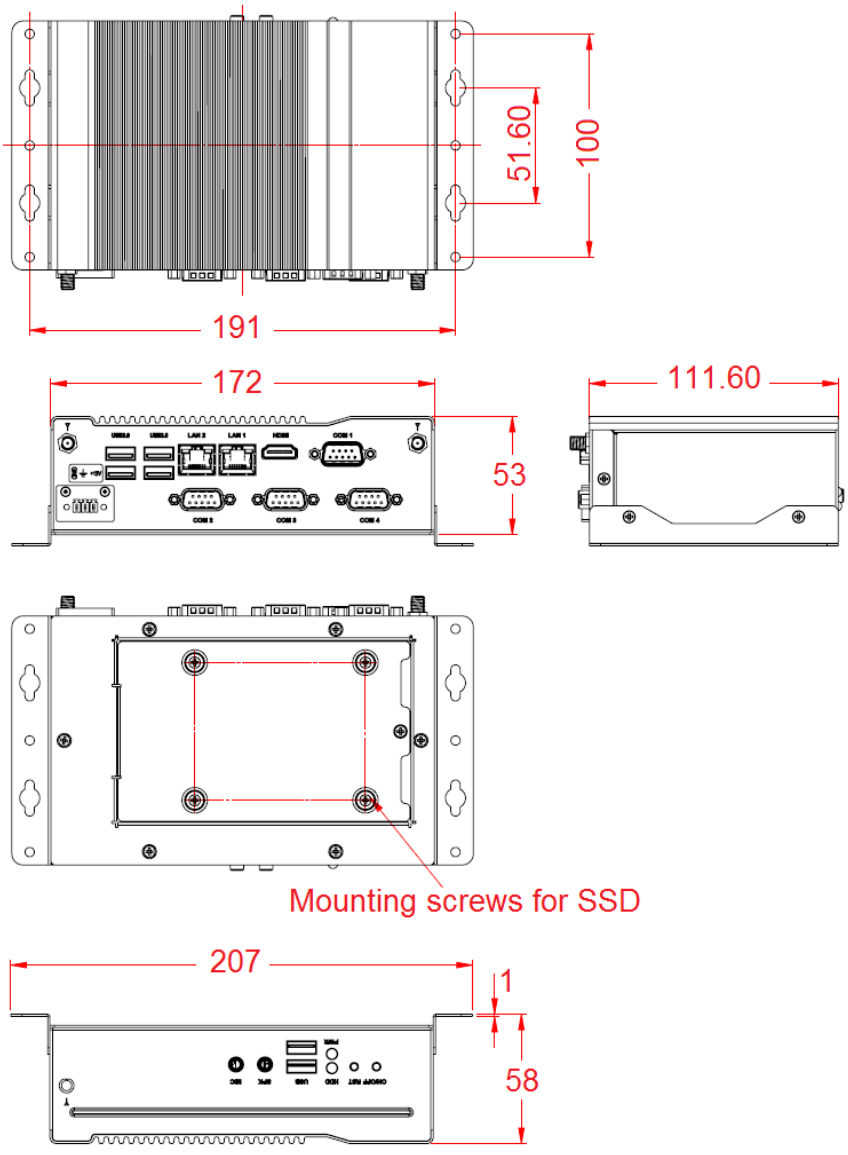


No.	Name	No.	Name
1	DC-In Power Connector	5	COM1 RS-232/422/485 Port
2	USB 3.0 Ports	6	COM2 ~ COM4 RS-232 Ports
3	GbE LAN Ports	7	Antenna Holes
4	HDMI Port	8	

Oblique View

1.7 Dimensions

Unit: mm



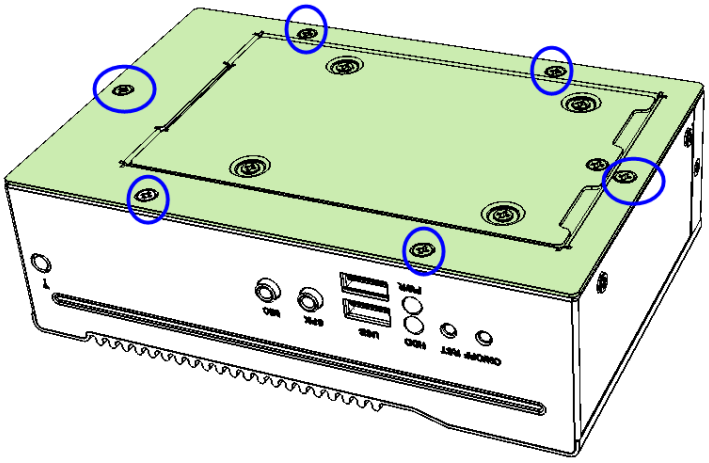
Chapter 2
Hardware Configuration

The information provided in this chapter includes:

- Installation / Replacement
- Information and locations of connectors

2.1 Installation / Replacement

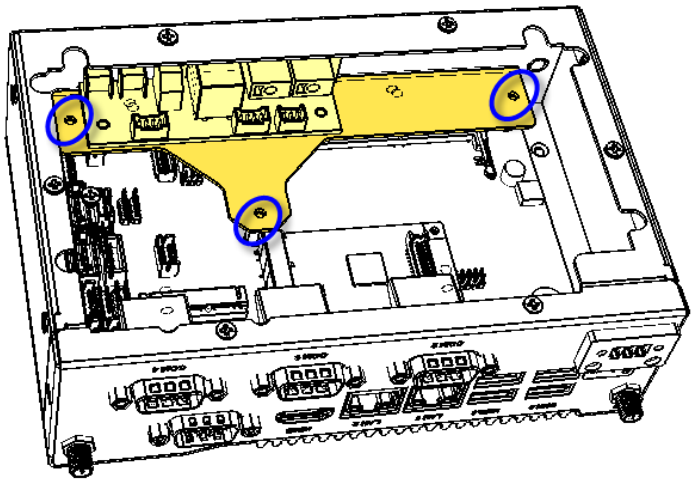
Before installations, you need to turn your device upside down and remove the bottom chassis base by removing 6 screws as indicated below.



2.1.1 Memory Installation / Replacement

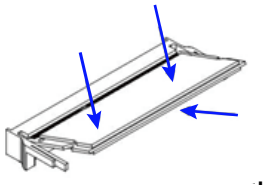
If you need to install or replace a memory module, you will have to remove the interior plate carrying a small PCB with I/O module locating above the memory slot as shown below. Follow the instructions to remove the plate.

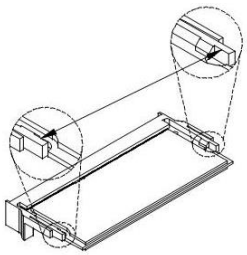
1. Loosen the 3 screws to free up interior plate.



2. Take out the interior plate along with the small PCB and I/O module carefully.
3. Align the key of your memory module with that on the memory slot and insert the module slantwise.

4. Gently push the module in an upright position until the clips of the slot click to hold the module in place when the module touches the bottom of the slot.



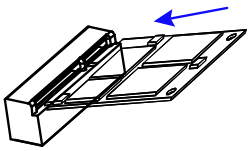


To remove the module, press the clips outwards with your thumb and index finger of both hands.

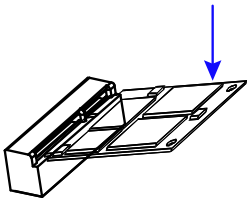
2.1.2 Mini PCIe Card Installation / Replacement

If you are using a model type of CSB200-818 that doesn't include a mini-PCIe card, follow the instructions below to install a mSATA card.

1. Loosen 6 screws to from the bottom chassis and remove it carefully.
2. Locate the half-size or full-size mini-PCIe slot.
3. Align the key of your mini PCIe card to the interface, and insert the card slantwise.



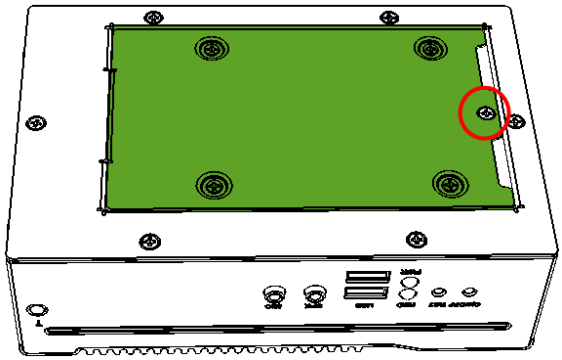
4. Push the card down and fix it with the a screw..



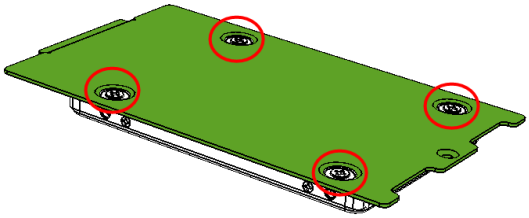
5. Secure the bottom chassis back.

2.1.3 HDD/SSD Installation / Replacement

1. Remove one screw as indicated below to remove the HDD/SSD plate.



2. Remove 4 screws to free the HDD/SSD from the plate.
3. Unplug all the SATA cables if a HDD/SSD is pre-installed.
4. Attach a new HDD/SSD and tighten these screws to fix the HDD/SSD. Then connect the SATA cables.

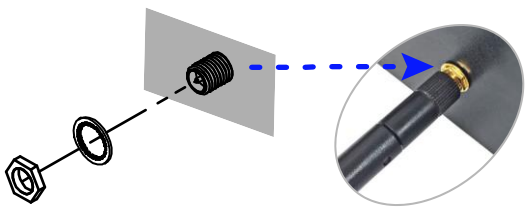


5. Secure the plate along with the new HDD/SSD back to the system.

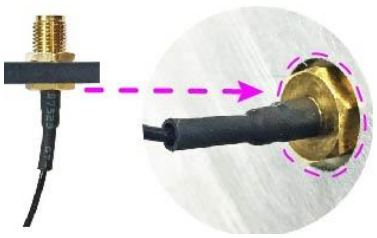
2.1.4 WiFi / 3G / 4G Antenna Installation

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

1. Thread and 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).

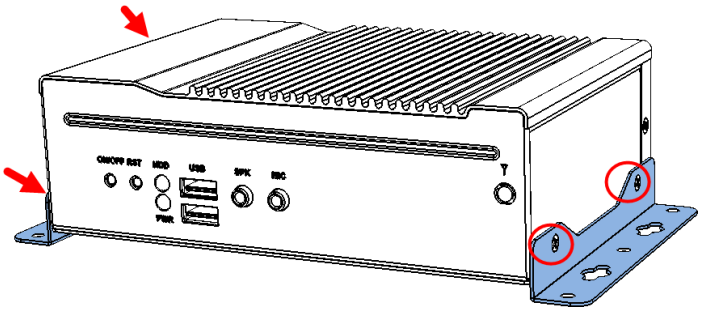
2.1.5 Mounting Installation

Requirements

Before mounting the system, ensure that you have enough room for the power adaptor and signal cable routing, and have good ventilation for the power adaptor. The method of mounting must be able to support weight of the product plus the weight of the suspending cables attached to the system. Use the following methods for mounting your system:

Wall Mounting Installation

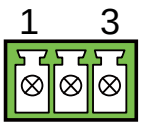
1. Attach the mounting kit (2 brackets) to the your product, and secure with the supplied four screws as below.



2. Then prepare at least four screws (M3, 6 mm) to mount the device on wall .

2.2 Pinout for DC Power Input Connector

- **DC Power Input (terminal block)**



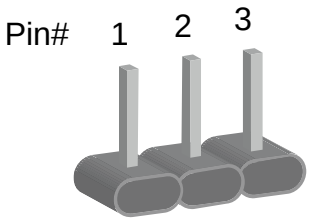
Pin	Signal Name	Pin	Signal Name
1	GND	3	12V~24V
2	Chassis GND		

2.3 Setting the Jumpers

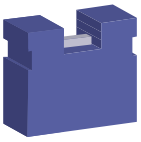
Set up and configure your CSB200-898 by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

2.3.1 How to Set Jumpers

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

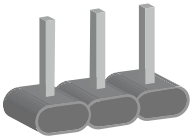
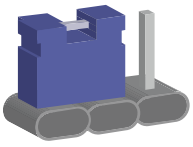
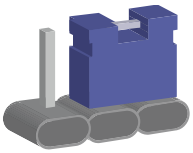
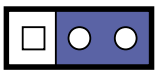


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

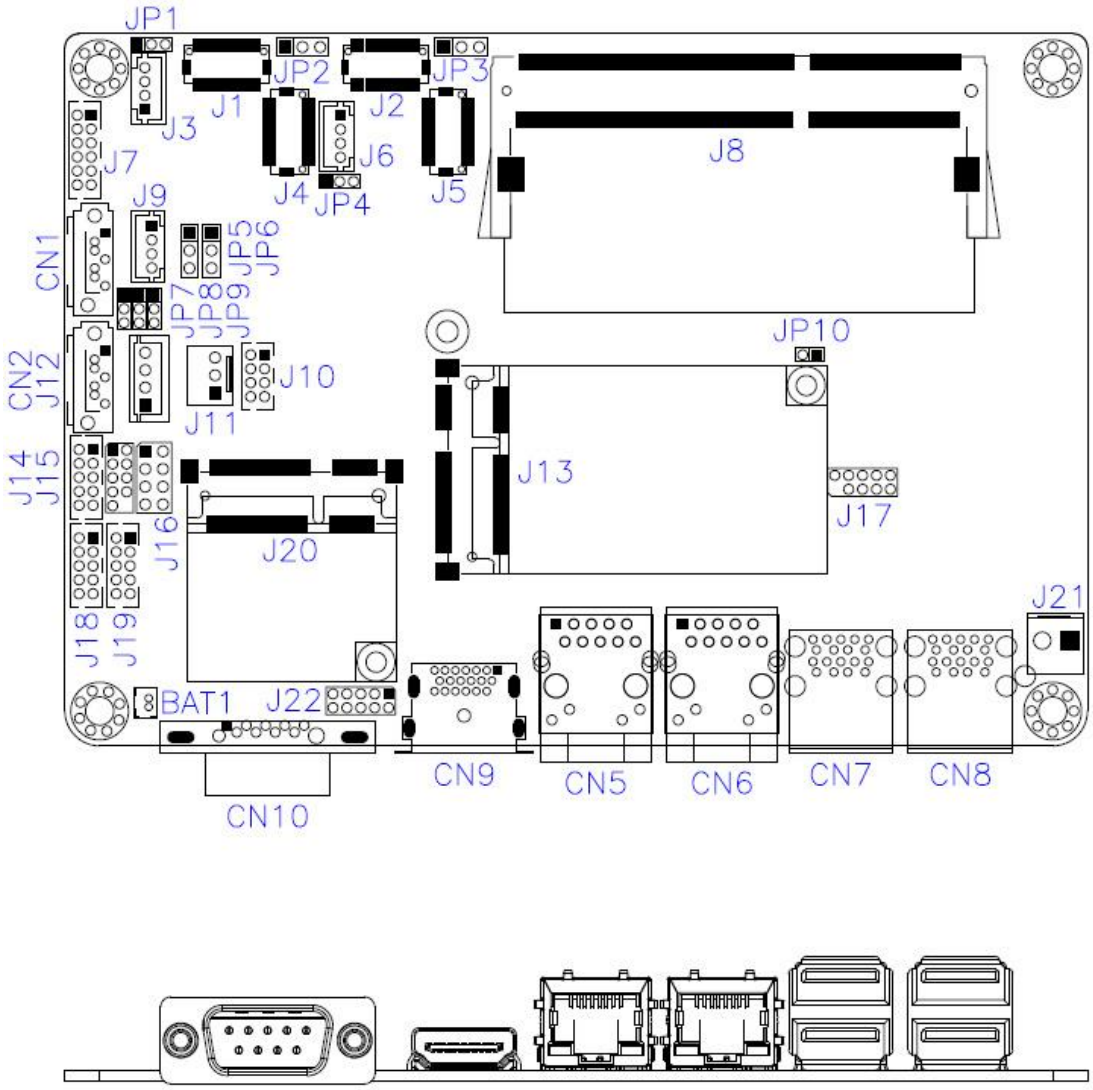
Pin closed	Oblique view	Schematic illustration in the manual
Open		
1-2		
2-3		

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

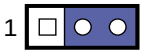
Motherboard: IB818F



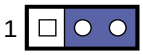
2.5 Jumpers Quick Reference

Function	Connector Name	Page
LCD Panel Brightness Selection	JP1, JP4	15
LVDS Panel Power Selection	JP2, JP3	15
LCD Panel Backlight VCC	JP5, JP6	15
ATX / AT Power Selection	JP7	16
Clearing CMOS Data	JP8	16
Clearing ME Register	JP9	16
Factory Use Only	JP10	- -

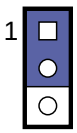
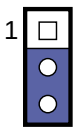
2.5.1 LVDS Panel Brightness Selection (JP1, JP4)

Function	Pin closed	Illustration
3.3V (default)	1-2	
5V	2-3	

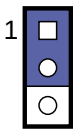
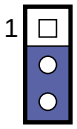
2.5.2 LVDS Panel Power Selection (JP2, JP3)

Function	Pin closed	Illustration
3.3V (default)	1-2	
5V	2-3	

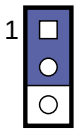
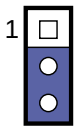
2.5.3 LCD Panel Backlight VCC (JP5, JP6)

Function	Pin closed	Illustration
5V (default)	1-2	
12V	2-3	

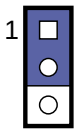
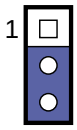
2.5.4 ATX / AT Power Selection (JP7)

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

2.5.5 Clearing CMOS Data (JP8)

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

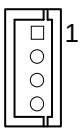
2.5.6 Clearing ME Register (JP9)

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

2.6 Connectors Quick Reference

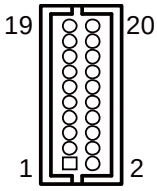
Function	Connector Name	Page
SATA III	CN1, CN2	- -
LAN Ports	CN5, CN6	- -
USB 3.0	CN7, CN8	- -
HDMI	CN9	- -
LCD Backlight	J3,J6	17
LVDS	CH1: J4, J5 CH2: J1, J2	18
Audio	J7	18
DDR3L SO-DIMM	J8	- -
USB 2.0	J10	18
Amplifier	J9	19
SATA HDD Power	J12	19
COM2 / COM3 / COM4 RS-232	J18, J19, J14	19
Mini PCIe / mSATA	J13 (shared with CN2)	- -
Mini PCIe	J20	- -
Front Panel	J16	19
COM Digital I/O	J22	20
DC Power Input	J21	20
COM1 RS-232/422/485	CN10	20
Factory Use Only	J17,J15	- -

2.6.1 LCD Backlight Connector (J3, J6)



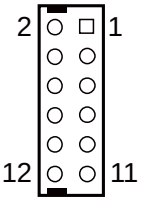
Pin	Signal Name	Pin	Signal Name
1	+12V / +5V	3	Brightness Control
2	Backlight Enable	4	Ground

2.6.2 LVDS Connector (CH1: J4, J5, CH2: J1, J2)



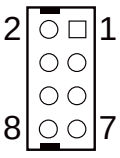
Pin	Signal Name	Pin	Signal Name
1	TX0P	2	TX0N
3	Ground	4	Ground
5	TX1P	6	TX1N
7	Ground	8	Ground
9	TX2P	10	TX2N
11	Ground	12	Ground
13	CLKP	14	CLKN
15	Ground	16	Ground
17	TX3P	18	TX3N
19	VDD	20	VDD

2.6.3 Audio Connector (J7)



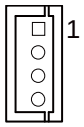
Pin	Signal Name	Pin	Signal Name
1	Lineout_L	2	Lineout_R
3	JD_FRONT	4	Ground
5	LINEIN_L	6	Linein_R
7	JD_LINEIN	8	Ground
9	MIC_L	10	MIC-R
11	JD_MIC1	12	Ground

2.6.4 USB 2.0 Connector (J10)



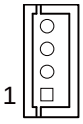
Pin	Signal Name	Pin	Signal Name
1	VCC	2	Ground
3	D0-	4	D1+
5	D0+	6	D1-
7	Ground	8	VCC

2.6.5 Amplifier Connector (J9)



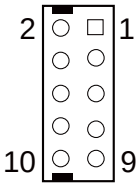
Pin	Signal Name	Pin	Signal Name
1	OUTL+	3	OUTR-
2	OUTL-	4	OUTR+

2.6.6 SATA HDD Power Connector (J12)



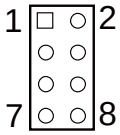
Pin	Signal Name	Pin	Signal Name
1	+5V	3	Ground
2	Ground	4	+12V

2.6.7 COM2 / COM3 / COM4 RS-232 Port (J18, J19, J14)



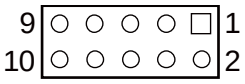
Pin	Signal Name	Pin	Signal Name
1	DCD, Data carrier detect	2	RXD, Receive data
3	TXD, Transmit data	4	DTR, Data terminal ready
5	Ground	6	DSR, Data set ready
7	RTS, Request to send	8	CTS, Clear to send
9	RI, Ring indicator	10	Not Used

2.6.8 Front Panel Connector (J16)



Pin	Signal Name	Pin	Signal Name
1	Ground	2	PWR_BTN
3	3.3V	4	HDD Active
5	Ground	6	Reset
7	+5V	8	Ground

2.6.9 Digital I/O Connector (J22)

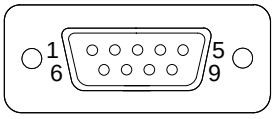


Pin	Signal Name	Pin	Signal Name
1	Ground	2	VCC
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

2.6.10 DC Power Input (J21)

Pin	Signal Name	Pin	Signal Name
1	+12V ~ +24V	2	Ground

2.6.11 COM1 RS-232/422/435 (CN10)



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		

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

Chapter 3
Driver Installation

The information provided in this chapter includes:

- Intel® Chipset Software Installation Utility
- Intel® Graphics Driver
- HD Audio Driver
- Intel® Trusted Execution Engine Installation
- Intel® Serial I/O Drivers
- LAN Driver

3.1 Introduction

This section describes the installation procedures for software drivers. The software drivers are in a disk enclosed with the product package. If you find anything missing, please contact the distributor where you made the purchase.

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

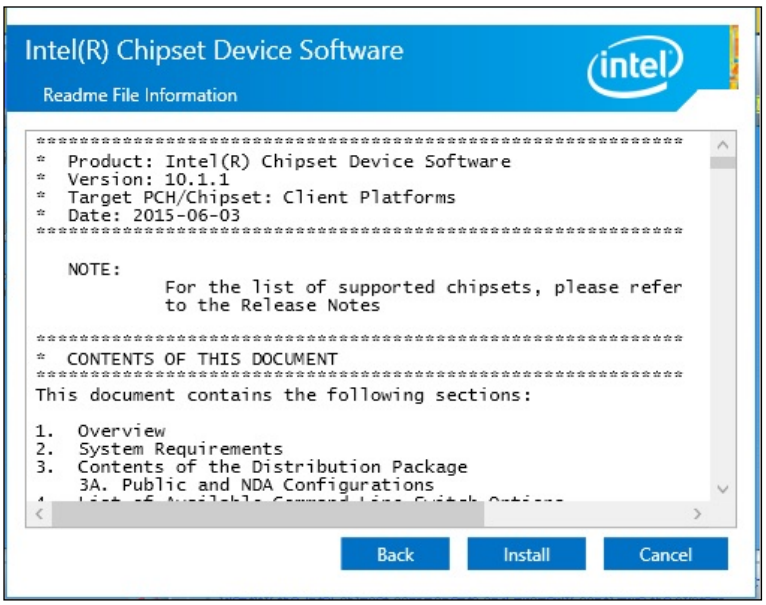
3.2 Intel® Chipset Software Installation Utility

The Intel® Chipset drivers should be installed first before the software drivers to install INF files for Plug & Play function for the chipset components. Follow the instructions below to complete the installation.

1. Insert the disk enclosed in the product package. Click **Intel** on the left pane and then **Intel(R) Apollolake Chipset Drivers** on the right.

2. Click **Intel(R) Chipset Software Installation Utility**.

3. When the *Welcome* screen to the Intel® Chipset Device Software appears, click **Next** to continue.
4. Click **Yes** to accept the software license agreement and proceed with the installation process.
5. On the *Readme File Information* screen, Click **Install** for installation.

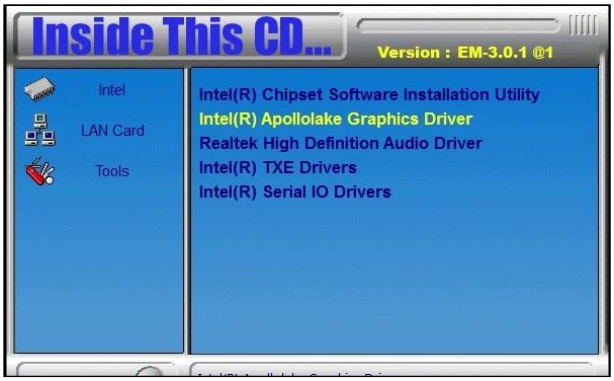


6. After the driver is completely installed, restart the computer for changes to take effect.

3.3 Intel® Graphics Driver Installation

1. Click **Intel** on the left pane and then **Intel(R) Apollolake Chipset Drivers** on the right.

2. Click **Intel(R) Apollolake Graphics Driver**.



3. When the *Welcome* screen appears, click **Next** to continue.

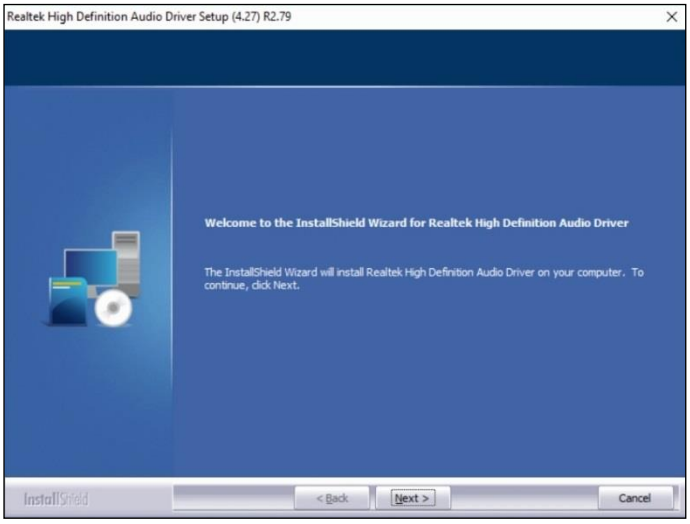
4. Click **Yes** to agree with the license agreement and click **Next** to continue.
5. After the driver is completely installed, restart the computer for changes to take effect.

3.4 HD Audio Driver Installation

1. Click **Intel** on the left and then **Intel(R) Apollolake Chipset Drivers** on the right.

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

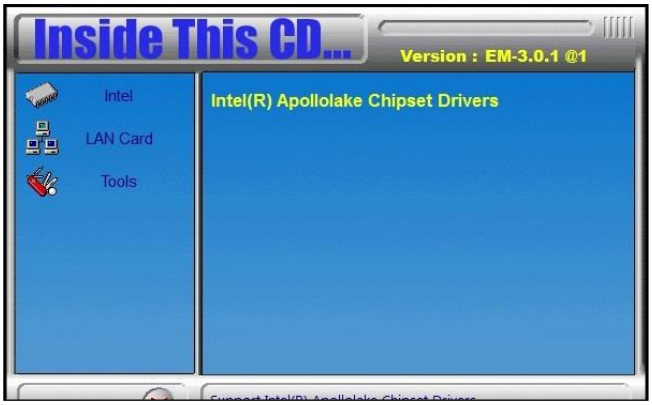
3. On the *Welcome* screen of the InstallShield Wizard, click **Next**.



4. Click **Next** until the installation starts.
5. After the driver is completely installed, restart the computer for changes to take effect.

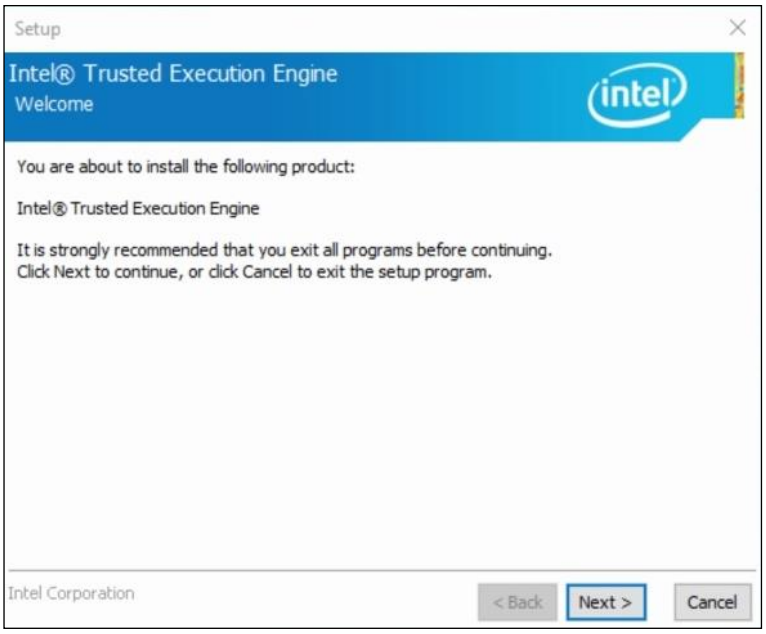
3.5 Intel® Trusted Execution Engine Installation

1. Click **Intel** on the left and then **Intel(R) Apollolake Chipset Drivers**.

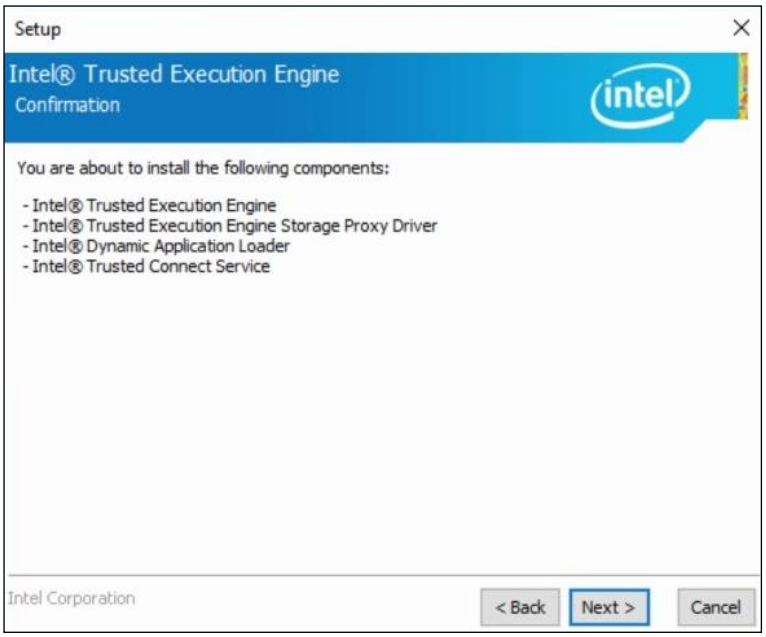


2. Click **Intel(R) TXE Drivers**.

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



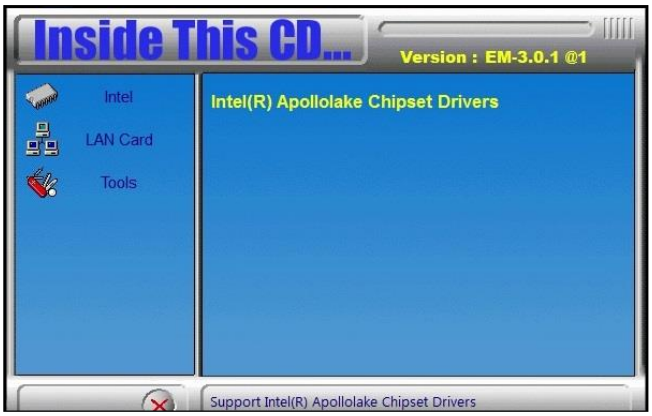
4. Accept the license agreement and click **Next.**
5. Click **Next** until the installation starts.



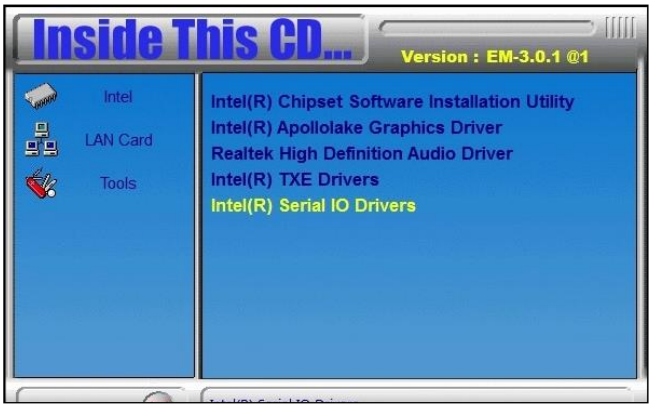
6. After the driver is completely installed, restart the computer for changes to take effect.

3.6 Intel® Serial I/O Drivers Installation

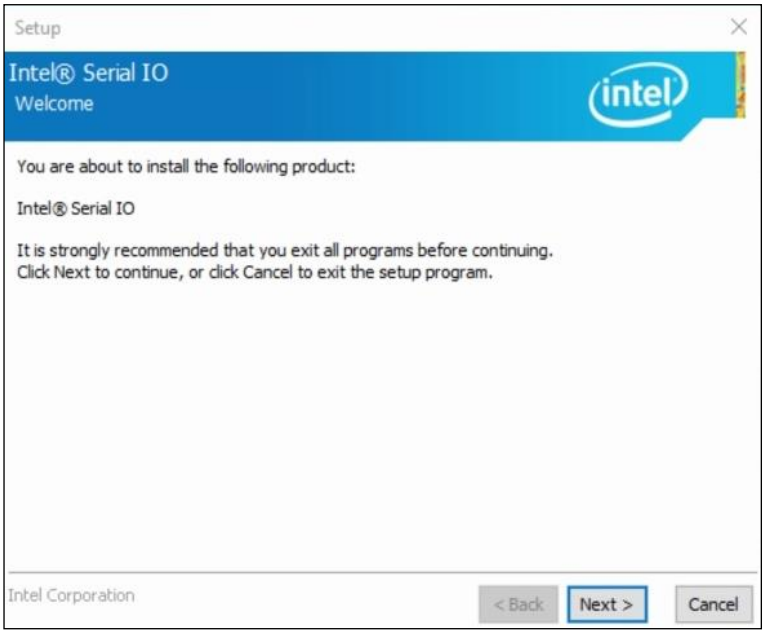
1. Click **Intel** on the left and then **Intel(R) Apollolake Chipset Drivers**.



2. Click **Intel(R) Serial I/O Drivers**.



3. On the *Welcome* screen, click **Next**.



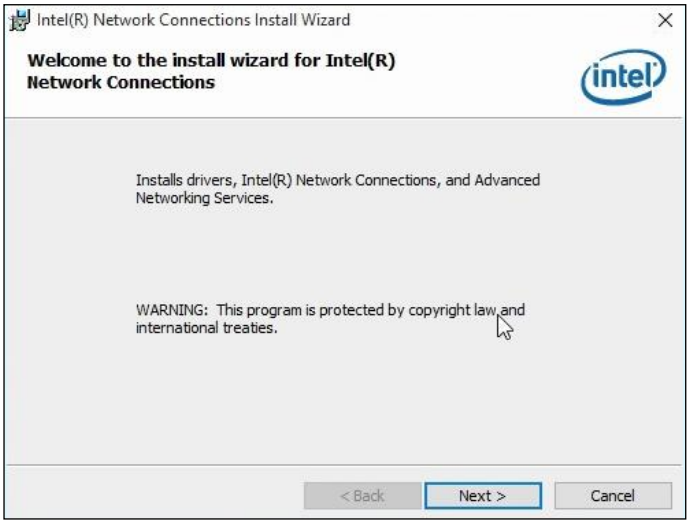
4. Accept the license agreement and click **Next**.
5. After reading the *Readme File Information*, click **Next** for installation.
6. After the driver is successfully installed, restart the computer for changes to take effect.

3.7 LAN Driver Installation

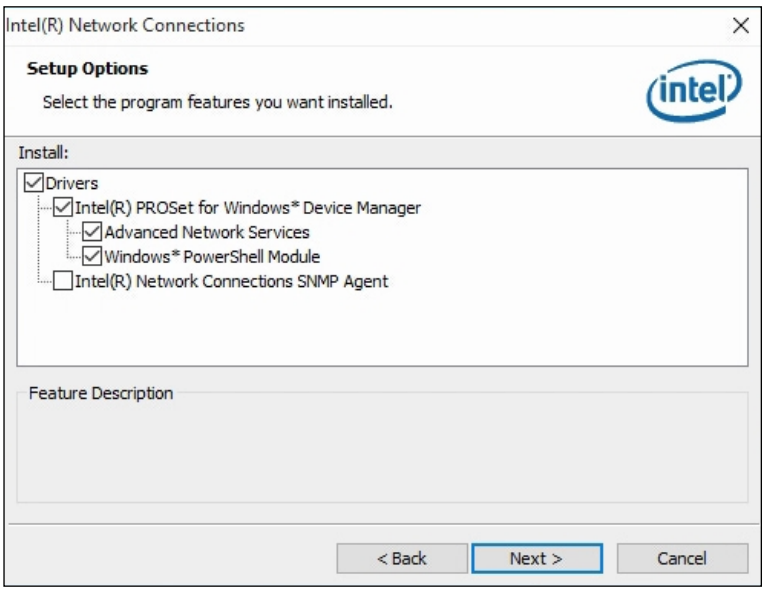
1. Click **LAN Card** on the left and then click **Intel LAN Controller Drivers**.

2. Click **Intel(R) I21x Gigabit Network Drivers**.

3. When the *Welcome* screen of the InstallShield Wizard appears, click **Next**.



4. Accept the license agreement and click **Next**.
5. On the *Setup Options* screen, select the desired driver(s) for installation. Then click **Next** to continue.



6. When the wizard is ready for installation, click **Install**.
7. When the installation is complete, restart the computer 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 to enter the Setup utility and press <F7> to call the pop-up Boot menu. 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
```

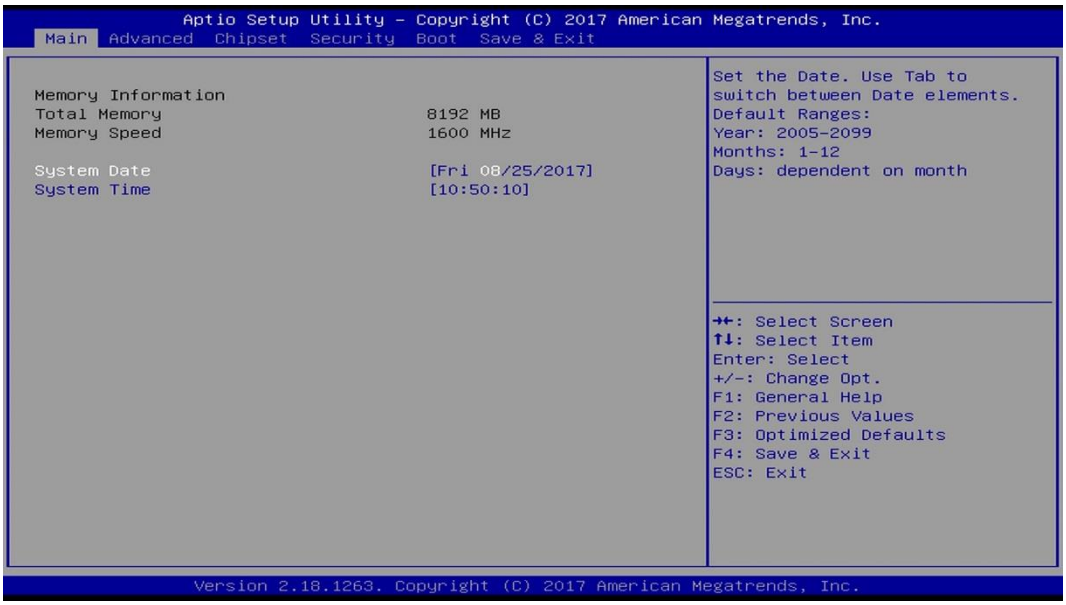
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

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.

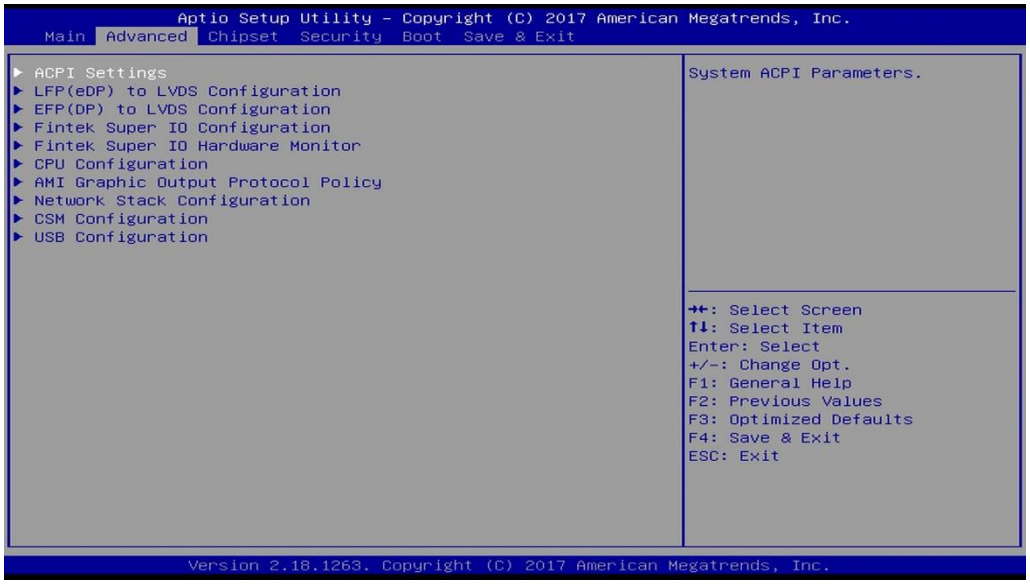
4.3 Main Settings



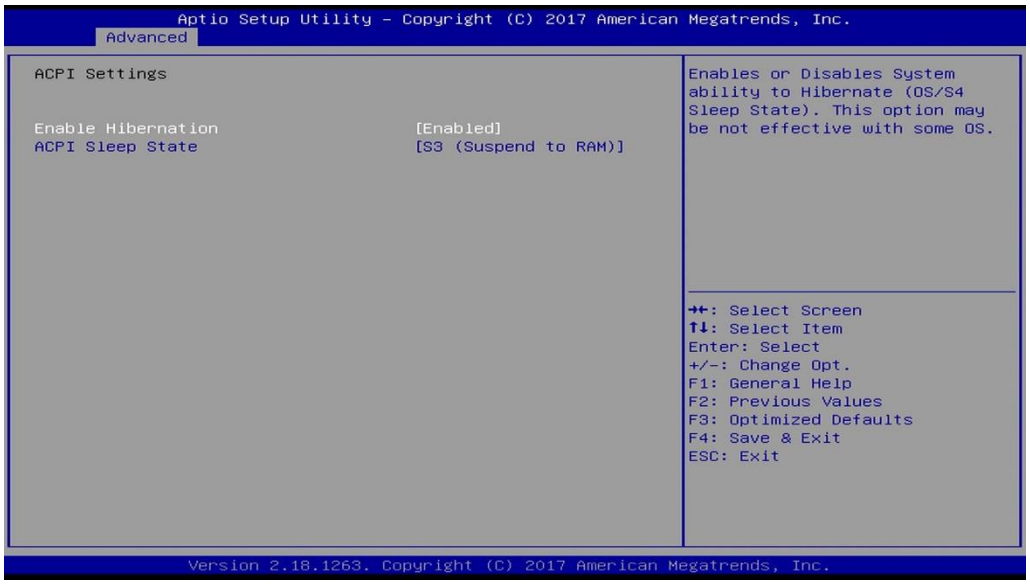
BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

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.

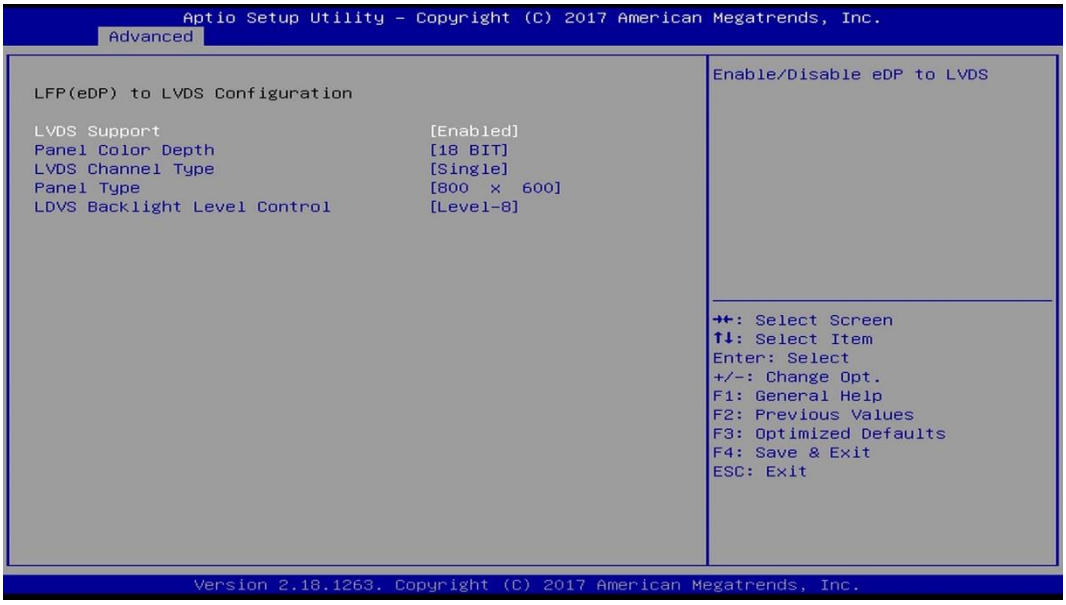


4.4.1 ACPI Settings



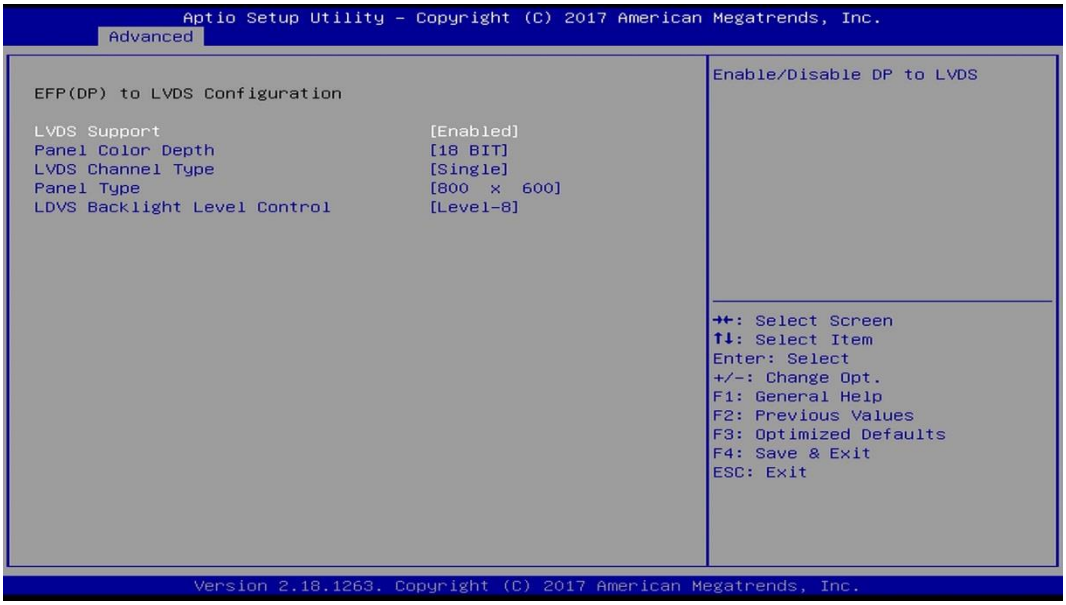
BIOS Setting	Description
Enable Hibernation	Enables / Disables the system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.
ACPI Sleep State	Selects a ACPI sleep state for the system to enter. Options: Suspend Disabled, S3 (Suspend to RAM)

4.4.2 LFP (eDP) to LVDS Configuration



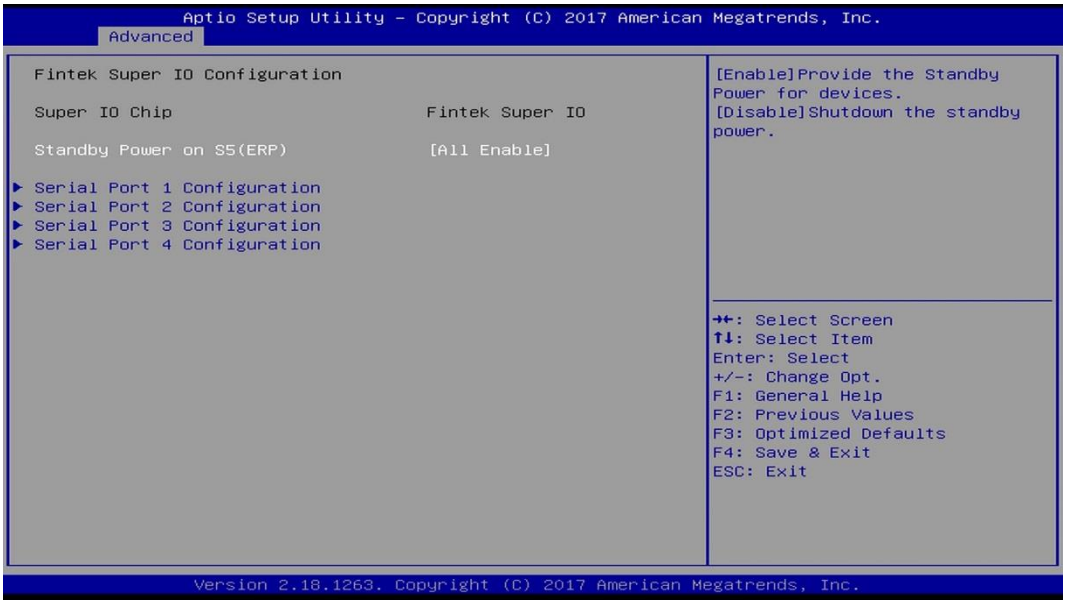
BIOS Setting	Description
LVDS Support	Enables / Disables eDP to LVDS.
Panel Color Depth	Selects a panel color depth as 18 or 24 (VESA or JEIDA) bit.
LVDS Channel Type	Sets the LVDS channel type as single or dual channel.
Panel Type	Selects a resolution that fits your panel. Options: 800 x 600 / 1024 x 768 / 1280 x 1024 / 1366 x 768 / 1440 x 900 / 1600 x 900 / 1920 x 1080
LVDS Backlight Level Control	Selects from Level 1 to Level 8 for the LVDS backlight.

4.4.3 EFP (DP) to LVDS Configuration



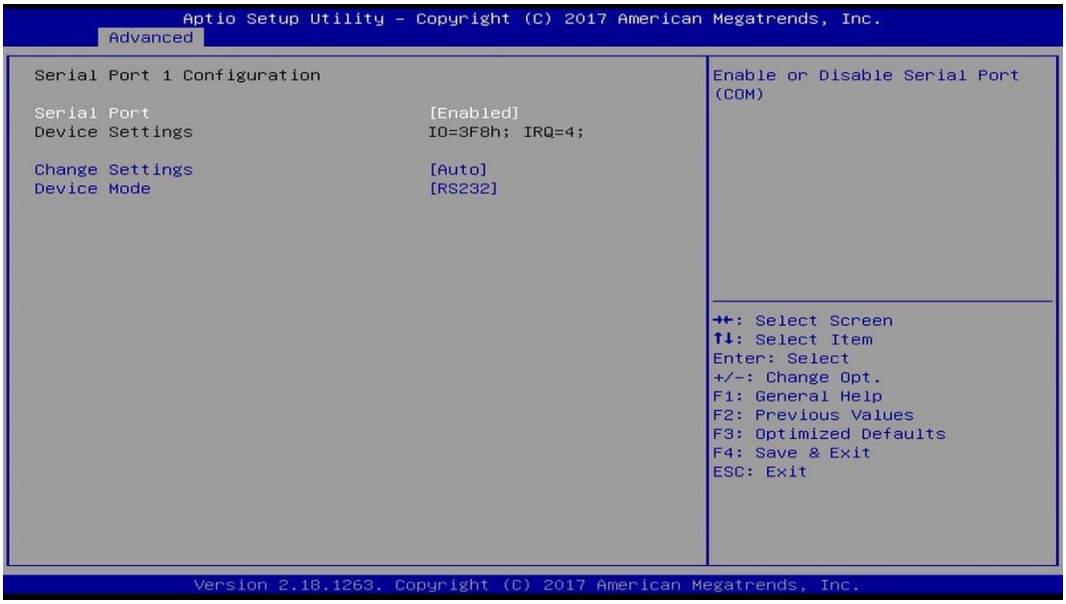
BIOS Setting	Description
LVDS Support	Enables / Disables DP to LVDS.
Panel Color Depth	Selects a panel color depth as 18 or 24 (VESA or JEIDA) bit.
LVDS Channel Type	Sets the LVDS channel type as single or dual channel.
Panel Type	Selects a resolution that fits your panel. Options: 800 x 600 / 1024 x 768 / 1280 x 1024 / 1366 x 768 / 1440 x 900 / 1600 x 900 / 1920 x 1080
LVDS Backlight Level Control	Selects from Level 1 to Level 8 for the LVDS backlight.

4.4.4 Fintek Super IO Configuration



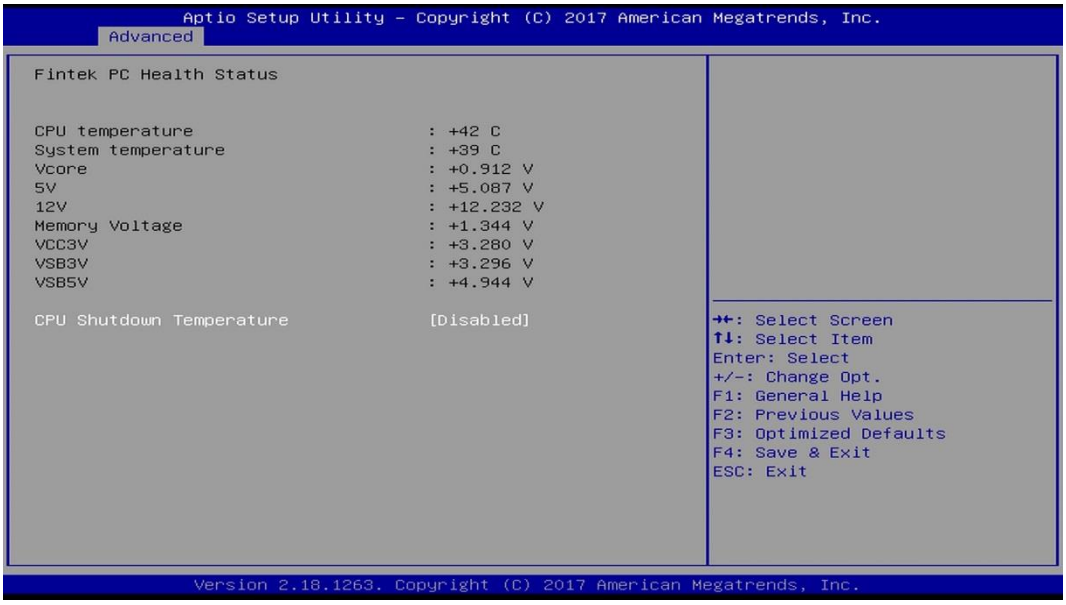
BIOS Setting	Description
Standby Power on S5 (ERP)	Enable the item to provide the standby power for devices. Disable the item to shut down the standby power. Options: All Enable / Enable Ethernet for WOL / All Disable
Serial Ports Configuration	Sets parameters of serial ports. Enables / Disables the serial port and select an optimal setting for the Super IO device.

4.4.4.1. Serial Port 1 Configuration



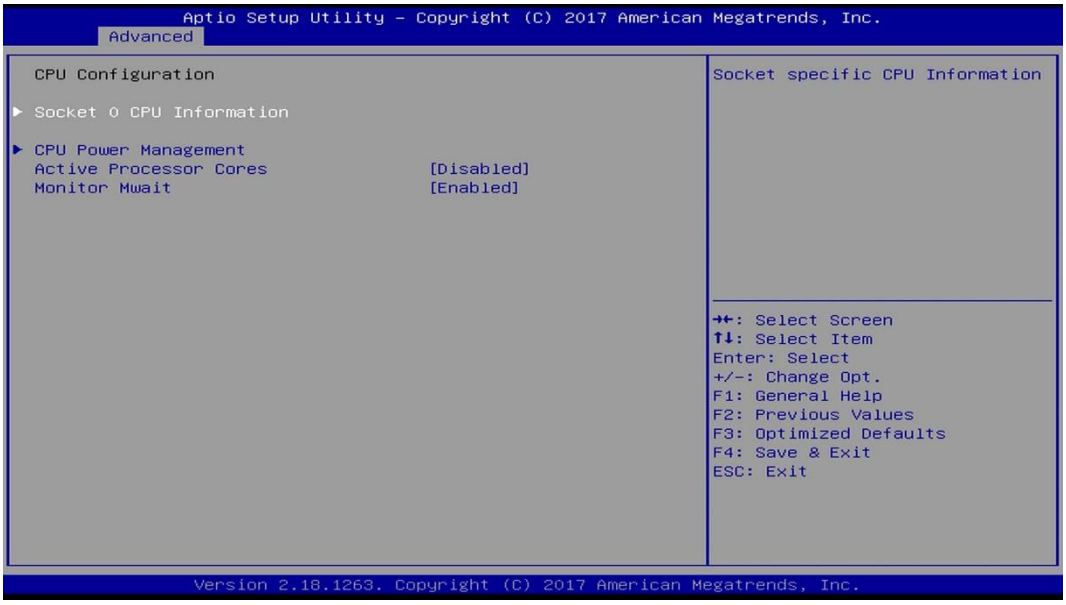
BIOS Setting	Description
Serial Port	Enables / Disables the serial port.
Change Settings	Selects an optimal settings for Super IO device.
Device Mode	Changes the serial port mode to: • RS232 • RS485 TX Low Active • RS485 with Termination TX Low Active • RS422 • RS422 with Termination

4.4.5 Fintek Super I/O Hardware Monitor



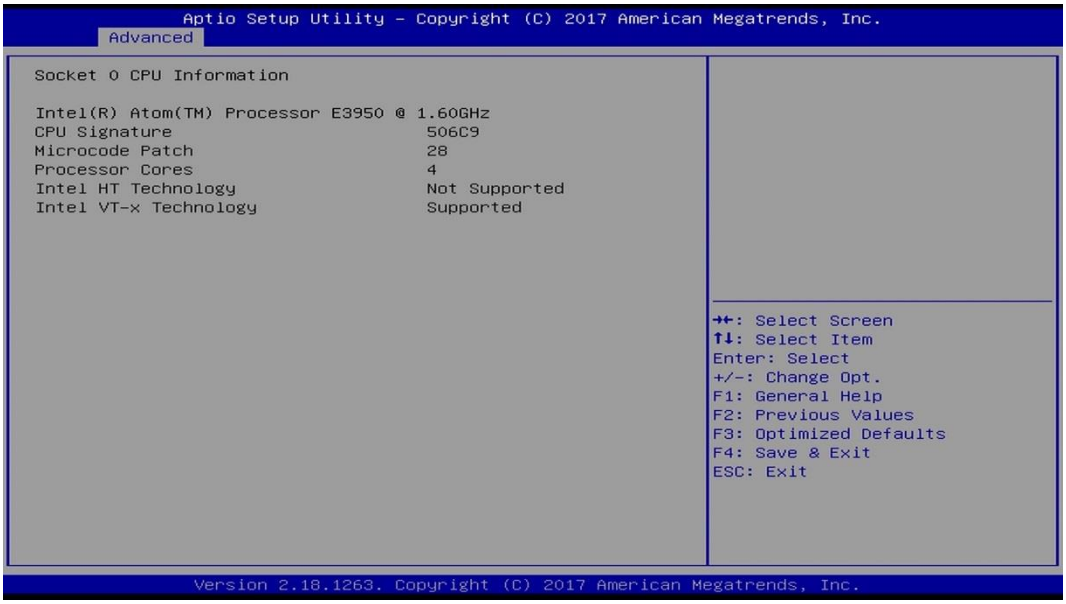
BIOS Setting	Description
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.
CPU Shutdown Temperature	Sets a threshold of temperature to shut down if CPU goes overheated. Options: Disabled / 70°C / 75°C / 80°C / 85°C / 90°C / 95°C

4.4.6 CPU Configuration

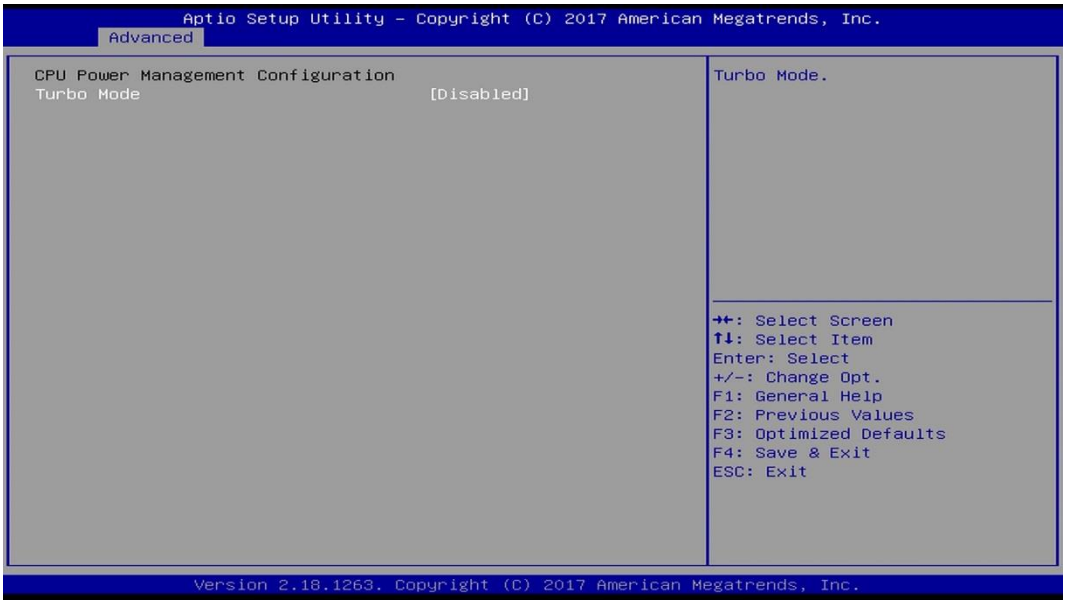


BIOS Setting	Description
Socket 0 CPU Information	Displays the socket specific CPU information.
CPU Power Management	Allows you to enable / disable Turbo Mode.
Active Processor Cores	Enables / Disables the cores in the processor package.
Monitor Mwait	Enables / Disables Monitor Mwait.

4.4.6.1. Socket 0 CPU Information

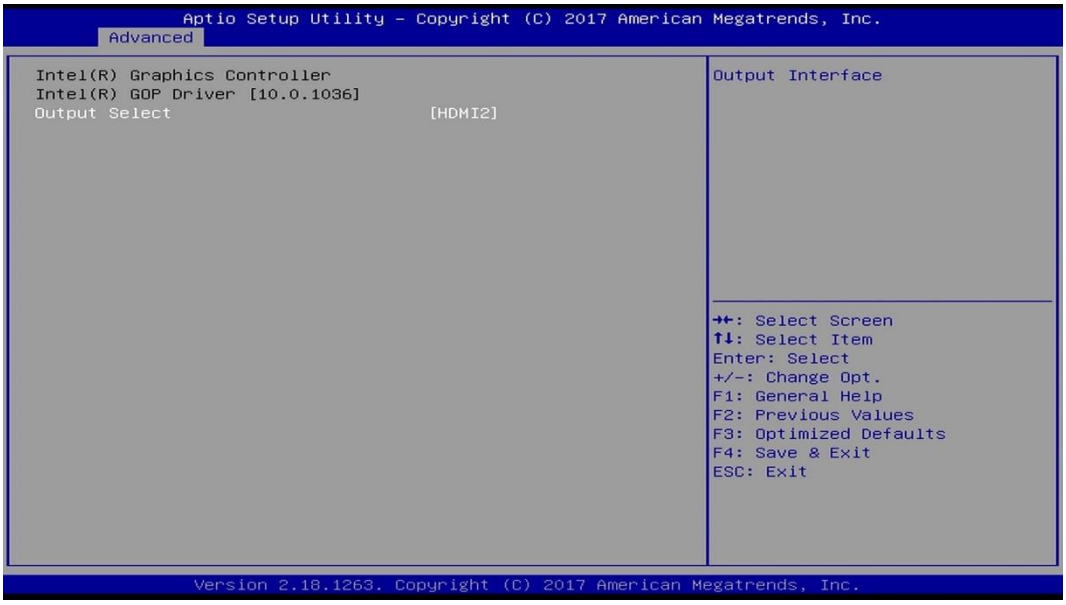


4.4.6.2. CPU Power Management Configuration



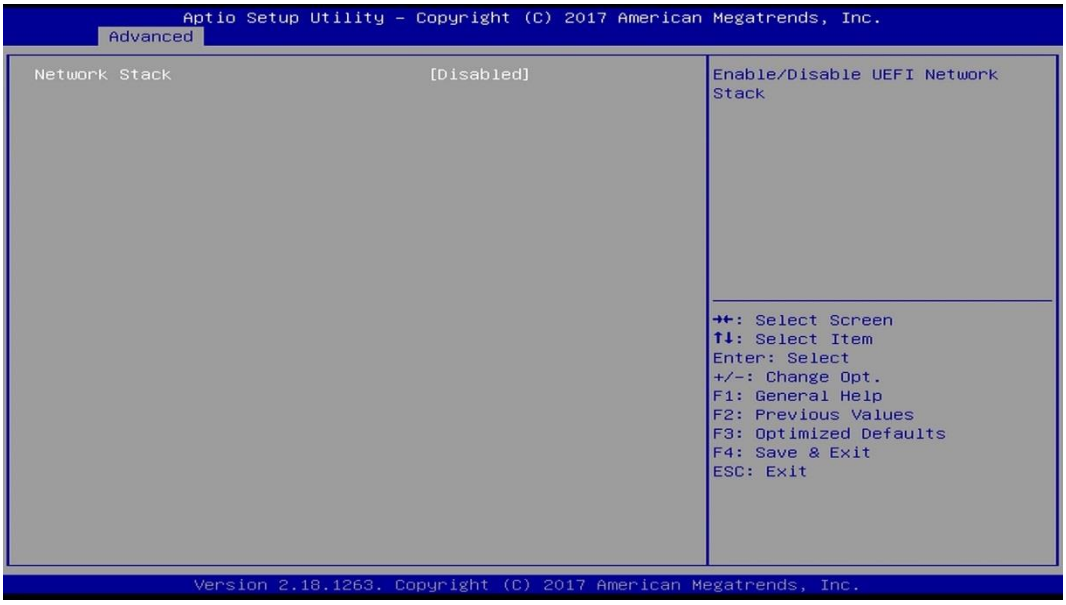
BIOS Setting	Description
Turbo Mode	Enables / Disables the turbo mode.

4.4.7 AMI Graphic Output Protocol Policy



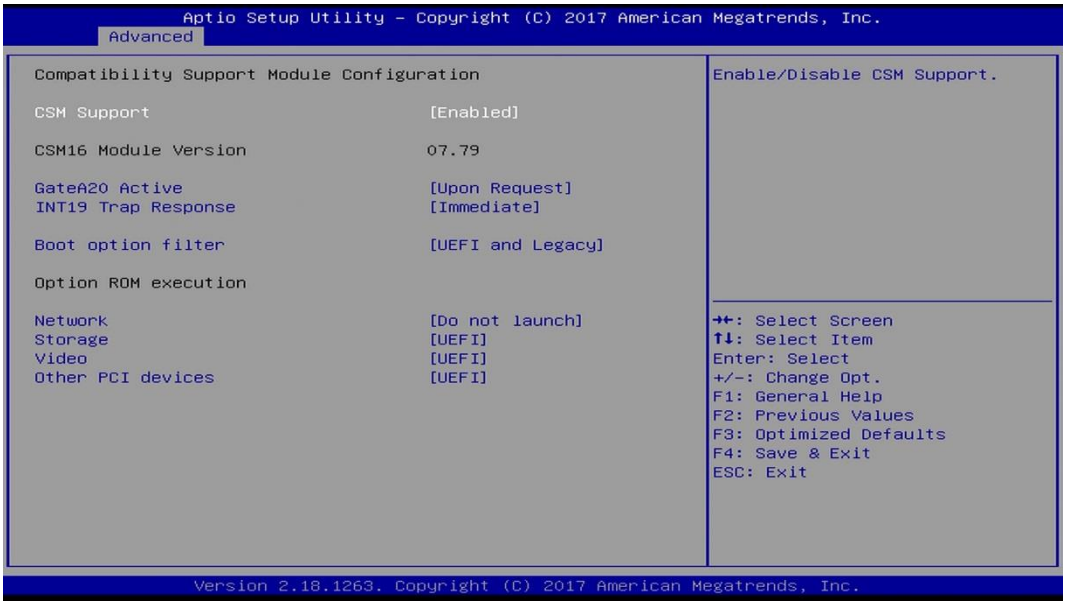
BIOS Setting	Description
Output Select	Outputs through HDMI interface.

4.4.8 Network Stack Configuration



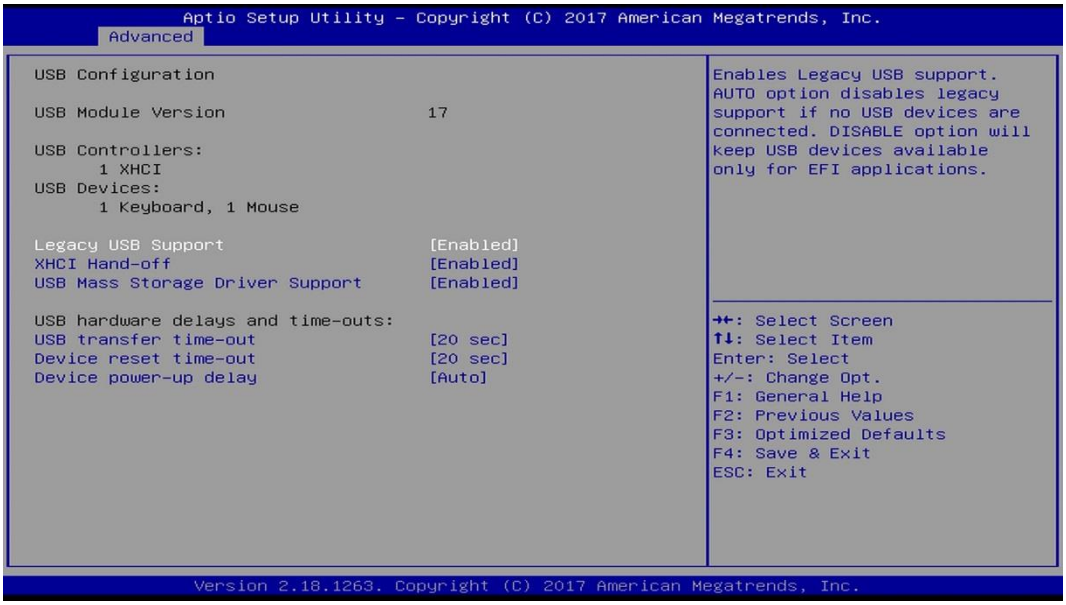
BIOS Setting	Description
Network Stack	Enables / Disables UEFI Network Stack.
IPv4 PXE Support	Enables / Disables IPv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
IPv4 HTTP Support	Enables / Disables IPv4 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
IPv6 PXE Support	Enables / Disables IPv6 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
IPv6 HTTP Support	Enables / Disables IPv6 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
PXE boot wait time	Assigns a period of time to press ESC key to abort the PXE boot.
Media detect count	Assigns a number of times to check the presence of media.

4.4.9 CSM Configuration



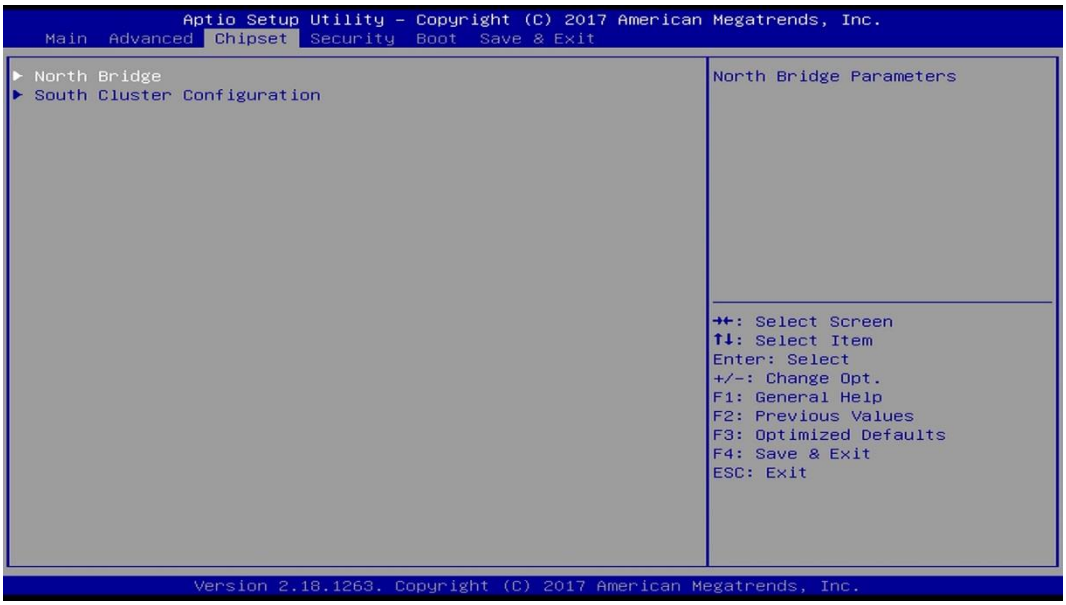
BIOS Setting	Description
CSM Support	Enables / Disables CSM support.
GateA20 Active	• Upon Request disables GA20 when using BIOS services. • Always cannot disable GA20, but is useful when any RT code is executed above 1 MB.
INT19 Trap Response	Sets how BIOS reacts on INT19 trap by Option ROM. • Immediate 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 0pROM.
Storage	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	Determines OpROM execution policy for devices other than network, storage or video.

4.4.10 USB Configuration

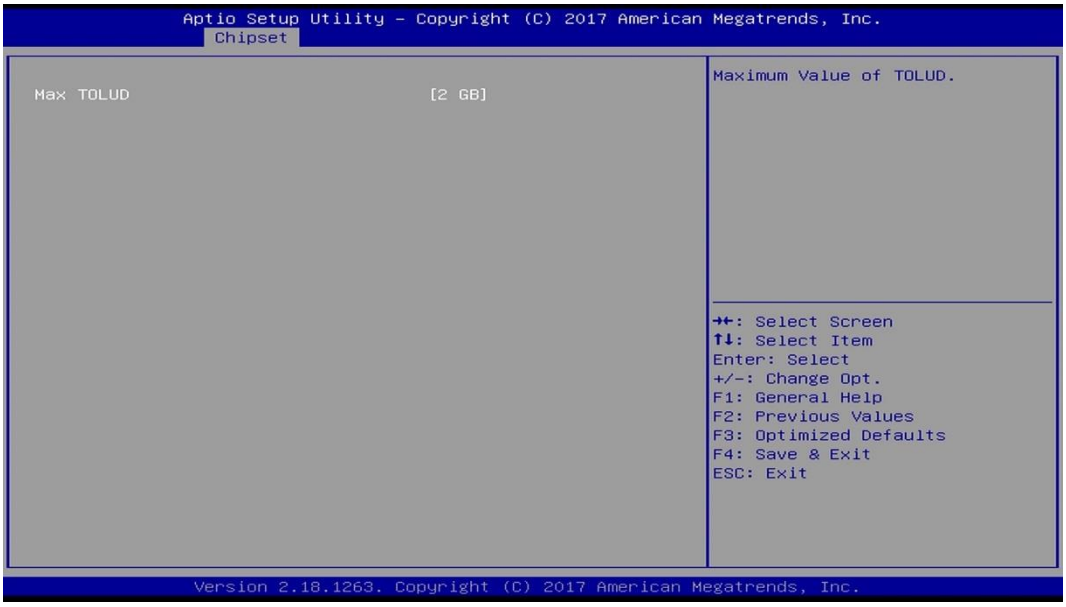


BIOS Setting	Description
Legacy USB Support	• Enabled enables Legacy USB support. • Auto disables legacy support if there is no USB device connected. • Disabled keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
USB Transfer time-out	The time-out value (1 / 5 10 / 20 secs) for Control, Bulk, and Interrupt transfers.
Device reset time-out	Gives seconds (10 / 20 / 30 / 40 secs) to delay 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

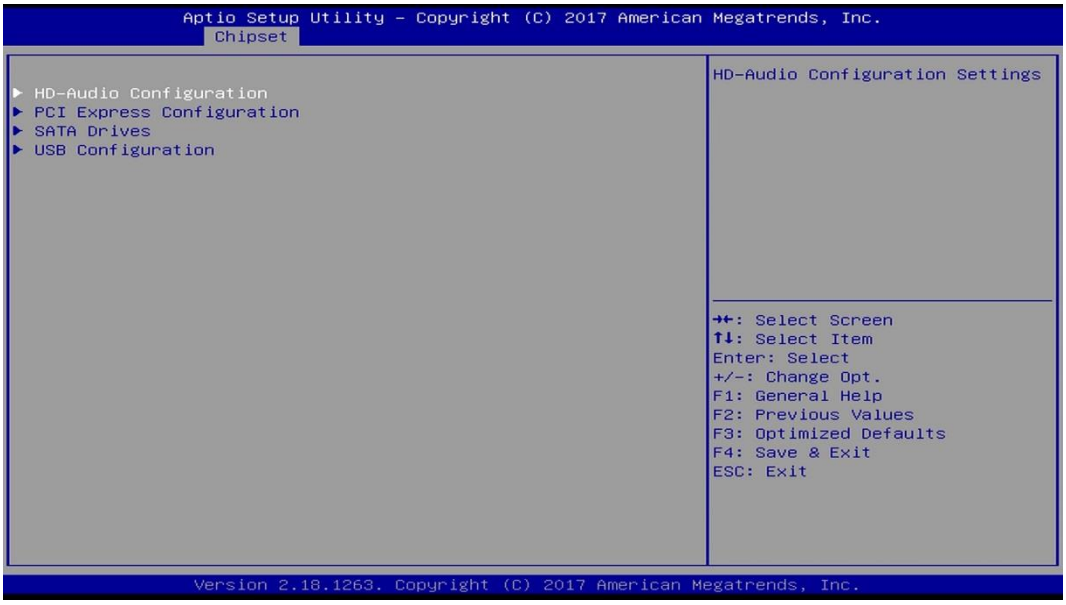


4.5.1 North Bridge

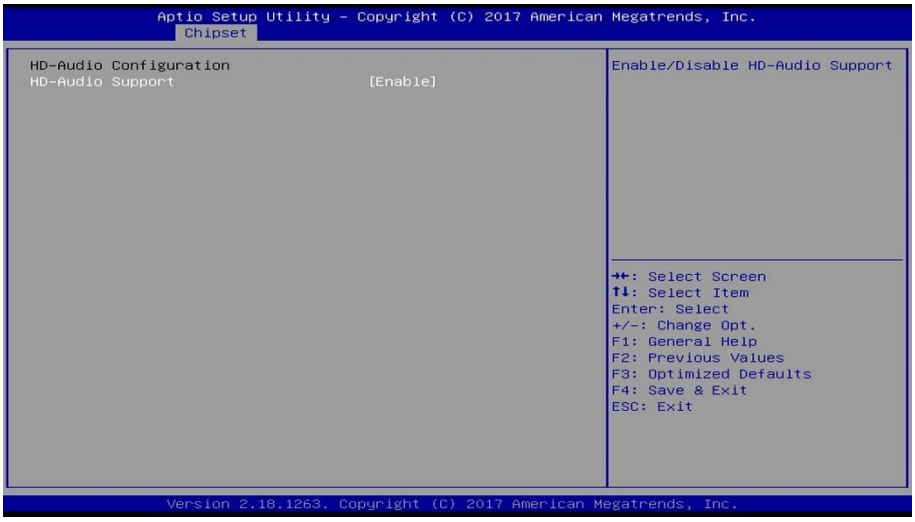


BIOS Setting	Description
Max TOLUD	Sets a maximum value of TOLUD.

4.5.2 South Cluster Configuration

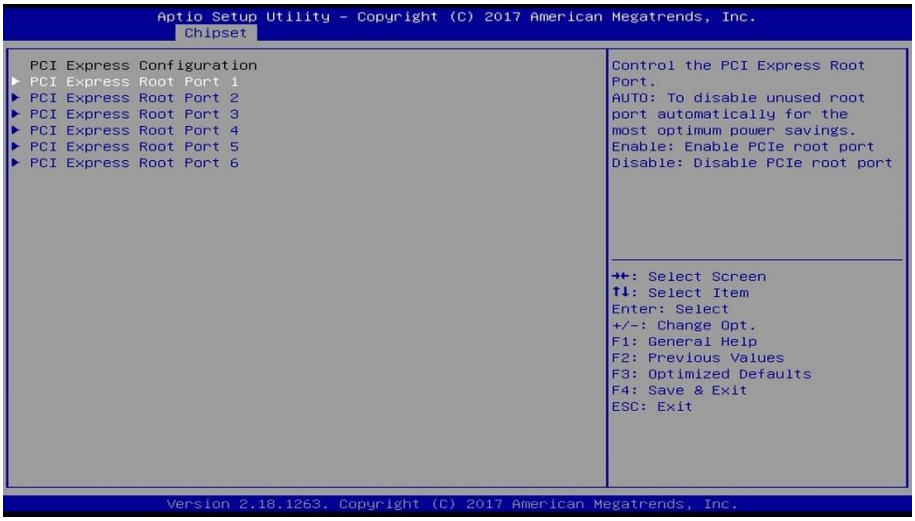


4.5.2.1. HD Audio Configuration

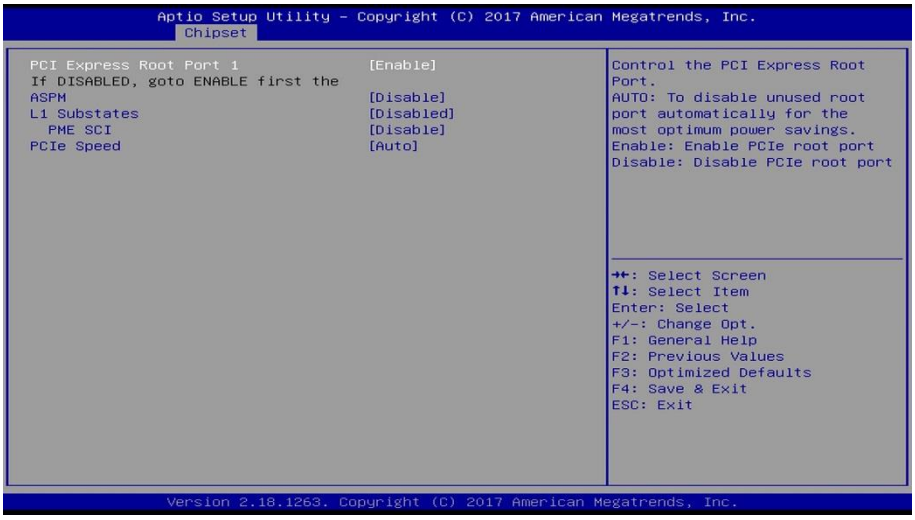


BIOS Setting	Description
HD-Audio Support	Enables / Disables HD-Audio support.

4.5.2.2. PCI Express Configuration

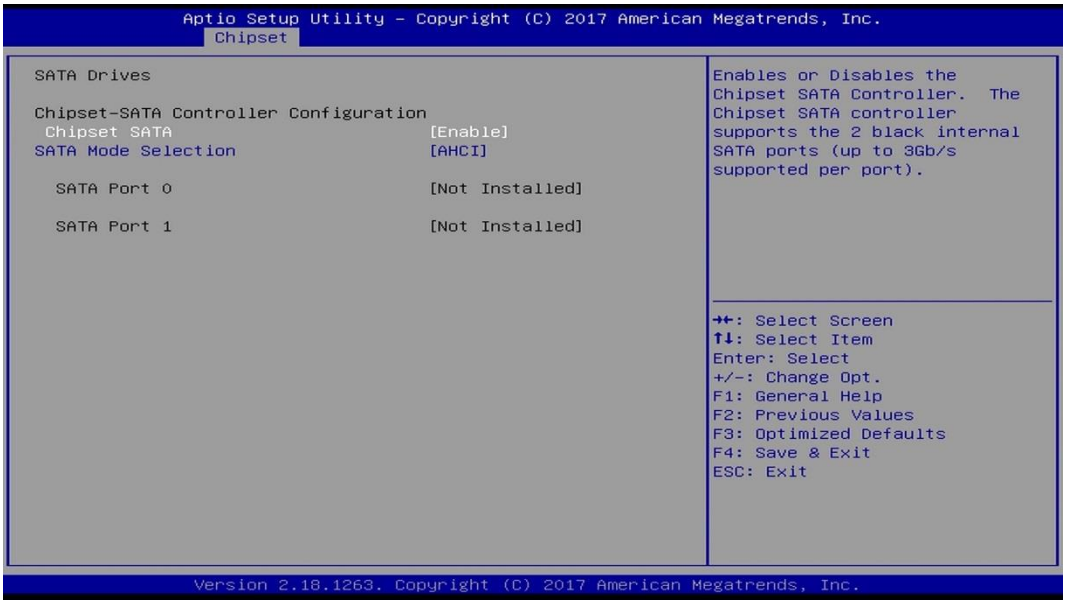


BIOS Setting	Description
PCI Express Root Ports 1 ~ 6	Accesses the control of the PCI Express Root Port.



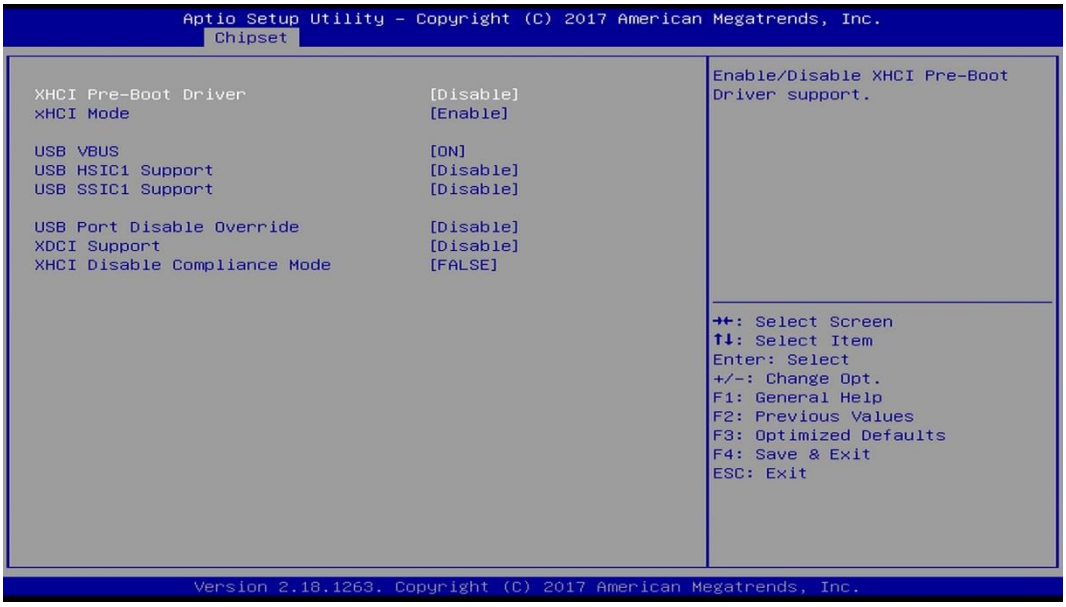
BIOS Setting	Description
PCI Express Root Port	Enables/ Disables the PCIe root port. Auto allows you to disable unused root port automatically for the most optimum power savings.
ASPM	Sets the PCIe active state power management. Options: Disable / L0s / L1 / L0SL1 / Auto
L1 Substates	Sets PCIe L1 substates. Options: Disables / L1.1 / L1.2 / L1.1 & L1.2
PME SCI	Enables / Disables PME SCI.
PCIe Speed	Configures the PCIe speed. Options: Auto, Gen1, Gen2

4.5.2.3. SATA Drivers



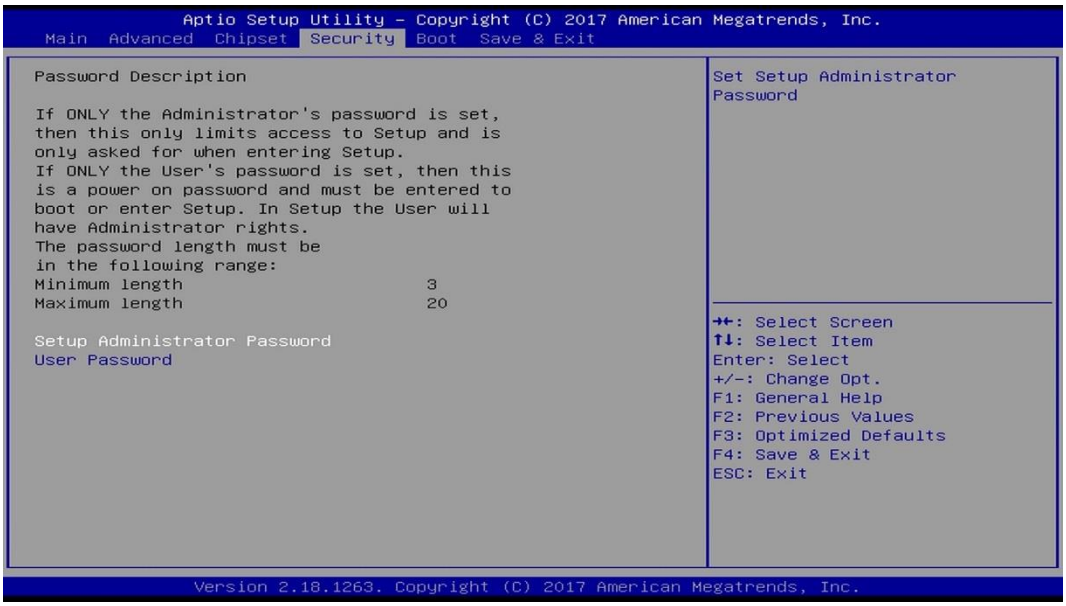
BIOS Setting	Description
Chipset SATA	Enables / Disables the Chipset SATA Controller. The Chipset SATA Controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
SATA Mode Selection	Determines how SATA controller(s) operate.

4.5.2.4. USB Configuration



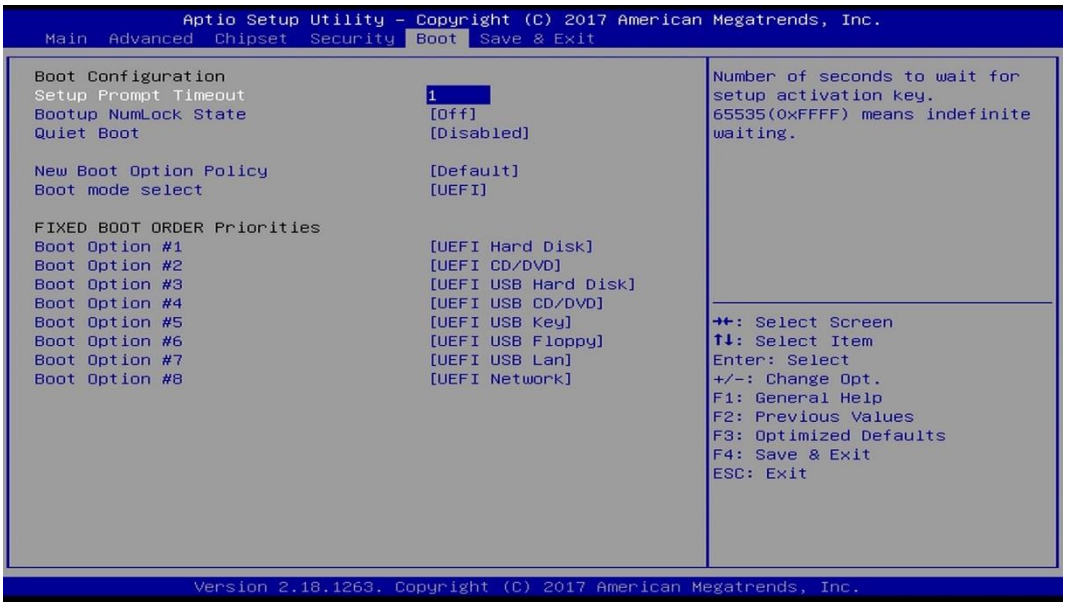
BIOS Setting	Description
XHCI Pre-Boot Driver	Enables / Disables the support for XHCI Pre-Boot Driver.
XHCI Mode	Enables / Disables XHCI mode. If disabled, XHCI controller would be disabled, and none of the USB devices are detectable or usable when systen is booted up in OS. Do NOT disable it unless for debug purpose.
USB VBUS	VBUS should be ON in HOST mode. It should be OFF in OTG device mode.
USB HSIC1 Support	Enables / Disables USB HSIC1.
USB SSIC1 Support	Enables / Disables USB SSIC1.
USB Port Disable Override	Selectively enables / disables the corresponding USB port from reporting a device connection to the controller.
XDCI Support	Enables / Disables XDCI.
XHCI Disable Compliance Mode	FALSE makes the XHCI Link Compliance Mode not disabled. TRUE disables the XHCI Link Compliance Mode.

4.6 Security Settings



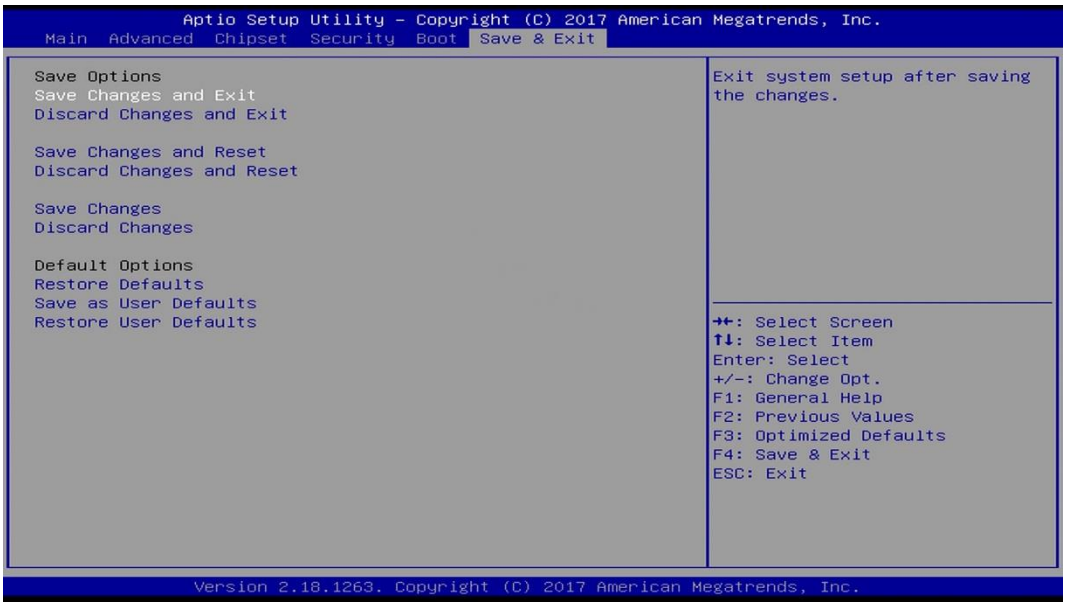
BIOS Setting	Description
Setup Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.

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.
New Boot Option Policy	Controls the placement of newly detected UEFI boot options. Options: Default, Place First, Place Last
Boot mode select	Selects a Boot mode, Legacy / UEFI / Dual.
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
0x00000A20-0x00000A2F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000400-0x0000047F	Motherboard resources
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x0000F040-0x0000F05F	Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
0x0000D000-0x0000DFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)

Address	Device Description
0x0000E000-0x0000EFFF	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
0x00000000-0x0000006F	PCI Express Root Complex
0x00000078-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x0000F000-0x0000F03F	Intel(R) HD Graphics
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F060-0x0000F07F	Standard SATA AHCI Controller
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer

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 25	High Definition Audio Controller
IRQ 4294967280 ~ IRQ 4294967285	Intel(R) I210 Gigabit Network Connection
IRQ 8	High precision event timer
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 5	Communications Port (COM3)
IRQ 10	Communications Port (COM4)
IRQ 4294967279	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 54 ~ IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967292	Intel(R) Trusted Execution Engine Interface
IRQ 4294967293	Intel(R) HD Graphics
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT3452
IRQ 4294967294	Standard SATA AHCI Controller
IRQ 4294967286 ~ IRQ 4294967291	Intel(R) I210 Gigabit Network Connection #2
IRQ 0	System timer

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 "F81964.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 81964 watch dog program\n");
SIO = Init_F81964();
if (SIO == 0)
{
printf("Can not detect Fintek 81964, 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_F81964_Reg(0x2B);
bBuf &= (~0x20);
Set_F81964_Reg(0x2B,     bBuf);       //Enable WDTO

Set_F81964_LD(0x07);              //switch to logic device 7
Set_F81964_Reg(0x30,     0x01);       //enable timer

bBuf = Get_F81964_Reg(0xF5);
bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81964_Reg(0xF5,     bBuf);       //count mode is second

Set_F81964_Reg(0xF6,     interval);   //set timer

bBuf = Get_F81964_Reg(0xFA);
bBuf |= 0x01;
Set_F81964_Reg(0xFA,     bBuf);       //enable WDTO output

bBuf = Get_F81964_Reg(0xF5);
bBuf |= 0x20;
Set_F81964_Reg(0xF5,     bBuf);       //start counting
}
//---------------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;

Set_F81964_LD(0x07);              //switch to logic device 7

bBuf = Get_F81964_Reg(0xFA);
bBuf &= ~0x01;
Set_F81964_Reg(0xFA,     bBuf);       //disable WDTO output

bBuf = Get_F81964_Reg(0xF5);
bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81964_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 "F81964.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81964_BASE;
void Unlock_F81964 (void);
void Lock_F81964 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81964(void)
{
unsigned int result;
unsigned char ucDid;

F81964_BASE = 0x4E;
result = F81964_BASE;

ucDid = Get_F81964_Reg(0x20);
if   (ucDid == 0x07)          //Fintek 81964
{      goto     Init_Finish;    }

F81964_BASE = 0x2E;
result = F81964_BASE;

ucDid = Get_F81964_Reg(0x20);
if   (ucDid == 0x07)          //Fintek 81964
{      goto     Init_Finish;    }

F81964_BASE = 0x00;
result = F81964_BASE;

Init_Finish:
return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81964 (void)
{
outportb(F81964_INDEX_PORT, F81964_UNLOCK);
outportb(F81964_INDEX_PORT, F81964_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81964 (void)
{
outportb(F81964_INDEX_PORT, F81964_LOCK);
}
//---------------------------------------------------------------------------
```

```
void Set_F81964_LD( unsigned char LD)
{
Unlock_F81964();
outportb(F81964_INDEX_PORT, F81964_REG_LD);
outportb(F81964_DATA_PORT, LD);
Lock_F81964();
}
//----------------------------------------------------------------------
void Set_F81964_Reg( unsigned char REG, unsigned char DATA)
{
Unlock_F81964();
outportb(F81964_INDEX_PORT, REG);
outportb(F81964_DATA_PORT, DATA);
Lock_F81964();
}
//----------------------------------------------------------------------
unsigned char Get_F81964_Reg(unsigned char REG)
{
unsigned char Result;
Unlock_F81964();
outportb(F81964_INDEX_PORT, REG);
Result = inportb(F81964_DATA_PORT);
Lock_F81964();
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      F81964_H
#define       F81964_H              1
//----------------------------------------------------------------------
#define     F81964_INDEX_PORT      (F81964_BASE)
#define     F81964_DATA_PORT       (F81964_BASE+1)
//----------------------------------------------------------------------
#define     F81964_REG_LD      0x07
//----------------------------------------------------------------------
#define     F81964_UNLOCK      0x87
#define     F81964_LOCK  0xAA
//----------------------------------------------------------------------
unsigned int Init_F81964(void);
void Set_F81964_LD( unsigned char);
void Set_F81964_Reg( unsigned char,
unsigned char); unsigned char
Get_F81964_Reg( unsigned char);
//----------------------------------------------------------------------
#endif    //      F81964_H
```