Manual

IBASE

IB811

**3,5" Single-Board Computer with Intel® Atom™ Apollo Lake
Pentium® N4200, Celeron® N3350 und Atom™ E39xx Processor,
1x LVDS, 1x DisplayPort, COMs, up to -40°..+85°C**

FORTEC
UNITED STATES

FORTEC
INTEGRATED

FORTEC
UNITED KINGDOM

IB811LF Series

**Intel® Pentium® / Celeron® /
Atom™ x7 / x5 SoC
3.5" Disk-Size SBC**

User's Manual

Version 3.0
(April 2022)

iBASE

Copyright

Disclaimer

Trademarks

Compliance

CE

This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the European Union (EU). In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.

FC

This product has been tested and found to comply with the limits for a Class 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)

iBASE

Important Safety Information

Carefully read the precautions before using the board.

Environmental conditions:

- Use this product in environments with ambient temperatures between 0˚C and 60˚C, or -40 and 85 ˚C.
- Do not leave this product in an environment where the storage temperature may be below -40° C or above 110° C. To prevent from damages, the product must be used in a controlled environment.

Care for your IBASE products:

- Before cleaning the PCB, unplug all cables and remove the battery.
- Clean the PCB with a circuit board cleaner or degreaser, or use cotton swabs and alcohol.
- Vacuum the dust with a computer vacuum cleaner to prevent the fan from being clogged.

⚠️ **WARNING**

Attention during use:

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

Anti-static precautions

- Wear an anti-static wrist strap to avoid electrostatic discharge.
- Place the PCB on an anti-static kit or mat.
- Hold the edges of PCB when handling.
- Touch the edges of non-metallic components of the product instead of the surface of the PCB.
- Ground yourself by touching a grounded conductor or a grounded bit of metal frequently to discharge any static.

⚠️ **CAUTION**

Danger of explosion if the 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 or recycle them at a local recycling facility or battery collection point.

Warranty Policy

- **IBASE standard products:**

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

- **3rd-party parts:**

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

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

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.

    - Product model name
    - Product serial number
    - Detailed description of the problem
    - The error messages in text or in screenshots if there is any
    - The arrangement of the peripherals
    - Software in use (such as OS and application software, including the version numbers)

3. If repair service is required, please log in to the RMA system of the website or and contact your distributor or sales representative for assistance.

Table of Contents

iBASE

Chapter 1
General Information

The information provided in this chapter includes:

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

iBASE

1.1 Introduction

IB811LF is a 3.5" disk-size single board computer based on the platform of Intel® Atom™x7/x5, Pentium® or Celeron® processors. Video display is supported by DisplayPort and HDMI ports and onboard headers for 24-bit dual channel LVDS interfaces. The SBC features ambient operating temperature ranging from 0°C ~ 60°C, and -40°C ~ 85 °C for models with wide temperature support.

IB811LF

1.2   Features

- 3.5" disk-size SBC with Intel® Atom™ x7-E3950 / x5 E3940/ x5-E3930/ Pentium® N4200 / Celeron® N3350

- 2 x DDR3L-1600/1866 SO-DIMM slots, expandable up to 16GB

- 1 x HDMI, 1 x DisplayPort, 24 bit dual channel LVDS

- 2 x GbE LAN, 4 x USB 3.0, 2 x USB 2.0, 4 x COM, 2 x SATA III,

  1 x Mini PCIe slot (full-size), 1 x M.2 (B-key)

- Configurable watchdog timer and digital I/O, mSATA, EuP/ErP

- Wide temperature supported by IB811LF-I50 and IB811LF-I40 and IB811LF-I30

iBASE

1.3   Packing List

Your IB811LF package should include the items listed below. If any of the items below is missing, contact the distributor or dealer from whom you purchased the product.

- IB811LF SBC   x 1

1.4   Optional Accessories

IBASE provides the following optional accessories:

- Cable Kit (IB76A-1)

  SATA cable (SATA-53A)   x 1
  Power cable (PW87)   x 1
  COM ports cable (PK1H)   x 1
  USB cable (USB29)   x 1

- Heatsink for IB811LF-I50/IB811LF-I40/IB811LF-I30 (HSIB811-A)

- Heatsink for IB811LF-420 / IB811LF-335 (HSIB811-B)

- Audio cable (Audio-18)

- COM1 RJ50 cable (PK105)

1.5   Specifications

Product Name	• IB811LF-I50 • IB811LF-I40 • IB811LF-I30	• IB811LF-420 • IB811LF-335
Form Factor	3.5" disk-size SBC	
System		
Operating System	• Windows 10 Enterprise (64-bit) • Windows 10 IoT Core (64-bit) • Linux Ubuntu	
CPU Type	• Intel® Atom™ QC x7 / E3950 (IB811LF-I50) • Intel® Atom™ DC x5 / E3940 (IB811LF-I40) • Intel® Atom™ DC x5 / E3930 (IB811LF-I30)	• Intel® Pentium® QC N4200 (IB811LF-420) • Intel® Celeron® DC N3350 (IB811LF-335)
CPU Speed	1.6~2.0GHz 1.6~1.8GHz 1.3~1.8GHz	1.1~2.5GHz 1.1~ 2.4GHz
Cache	2 MB	
Chipset	Integrated	
Memory	2 x DDR3L-1600/1866 SO-DIMM, expandable up to 16 GB (Non-ECC)	
Storage	1 x mSATA SSD	
Graphics	Intel® SoC integrated Gen. 9	
Network	2 x Intel® I210IT PCIe Gigabit Ethernet	2 x Intel® I211AT PCIe Gigabit Ethernet
TPM2.0	Infineon SLB9670**X**Q	Infineon SLB9670**V**Q
Super I/O	Fintek F81964	
Audio Codec & Controller	Intel® SoC built-in HD audio controller Realtek ALC888S codec Speaker amplifier TI TPA2012D2	
Power Requirement	9~36V DC-In (jumper-selectable ATX / AT power mode)	
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec / min)	
BIOS	AMI BIOS	
H/W Monitor	Yes	

iBASE

Smart Control	• EuP/ErP • Power failure detection by a jumper connector • LVDS brightness control
Dimensions	102.22 x 147.01 mm (4.02" x 5.8")
RoHS	Yes
Certification	CE, FCC Class B, LVD
I/O Ports	
Display	• **1 x HDMI** (1.4b), 3840 x 2160 at 30 Hz • **1 x DisplayPort** (1.2), 4096 x 2160 at 60 Hz • **24-bit dual channel LVDS** LVDS: 1920 x 1200 at 60 Hz
LAN	2 x RJ45 GbE LAN
USB	• **4 x USB 3.0:** I/O coastline connectors • **2 x USB 2.0:** via an on-board pin headers
Serial	**4 x COM ports:** • COM1: RS-232/422/485 (I/O coastline RJ50 connector, jumper-less selection) • COM2, COM3, COM4: RS-232 only (via on-board box-headers)
SATA	2 x SATA III
Audio	Onboard audio connector for Line-In, Line-Out, and Mic-In
Digital IO	4-In & 4-Out
Expansion Slots	• 1 x Mini PCIe slot (full-size) with USB and mSATA • 1 x M.2 (B key) 3042 Slot with PCIe (x1), USB and SATA

Product Name	• IB811LF-I50 • IB811LF-I40 • IB811LF-I30	• IB811LF-420 • IB811LF-335
Environment		
Temperature	• Operating: -40 ~ 85 °C (-40 ~ 185 °F) • Storage: -40 ~ 110 °C (-40 ~ 230 °F)	• Operating: 0 ~ 60 °C (32 ~ 140 °F) • Storage: -40 ~ 110 °C (-40 ~ 230 °F)
Relative Humidity	0 ~ 90 %, non-condensing at 60 °C	

All specifications are subject to change without prior notice.

iBASE

1.6   Block Diagram

Block diagram of IB811LF Series motherboard showing Intel Atom x7/x5 Pentium/Celeron Processor with:
- LVDS DF20-20 socket (LVDS / eDP to LVDS)
- DP Connector (DDI 0)
- HDMI Connector (DDI 1)
- LAN1 RJ45 Connector — GbE (LAN1) Intel I210I/I211AT — PCIe(1x)
- LAN2 RJ45 Connector — GbE (LAN2) Intel I210IT/I211AT — PCIe(1x)
- Audio Headers L-out/L-in/Mic — Realtek HD Audio ALC888S (HD Audio)
- M.2 slot (B Key) — 1x SATA3/PCIe/USB 2.0
- mSATA 1x Mini PCIe slot — 1x SATA3/PCIe/USB 2.0
- Channel A / Channel B — DDR3L 1866 SO-DIMM x2
- 4x USB 3.0 ports (Port 0/1/2/3) — USB 3.0 2x stack Type-A Connectors
- 2x USB 2.0 ports (Port 5/6) — USB 2.0 2x 4-pin Headers
- SATA #0/#1 — SATA 3.0 SATA Connector
- SPI I/F — SPI Flash / TPM
- LPC I/F — LPC I/O Fintek F81964D-I:
  - Fintek F81439AN RS232/422/485 — COM1 — COM1 RJ-45 Conn.
  - SP3243 Transceiver RS232 — COM 2,3,4 — COM2~4 2x5-pin Box Headers
  - Digital I/O 4 in / 4 out
  - H/W Monitor Thermal input x2

1.7 Product View

Top View

Bottom View

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

iBASE

I/O View
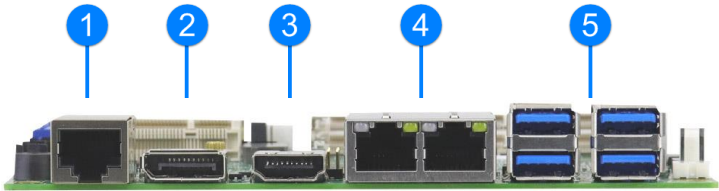
No.	Name	No.	Name
1	COM1 (RJ50) Port	4	LAN Port
2	DisplayPort	5	USB 3.0 Port
3	HDMI Port		

1.8 Dimensions
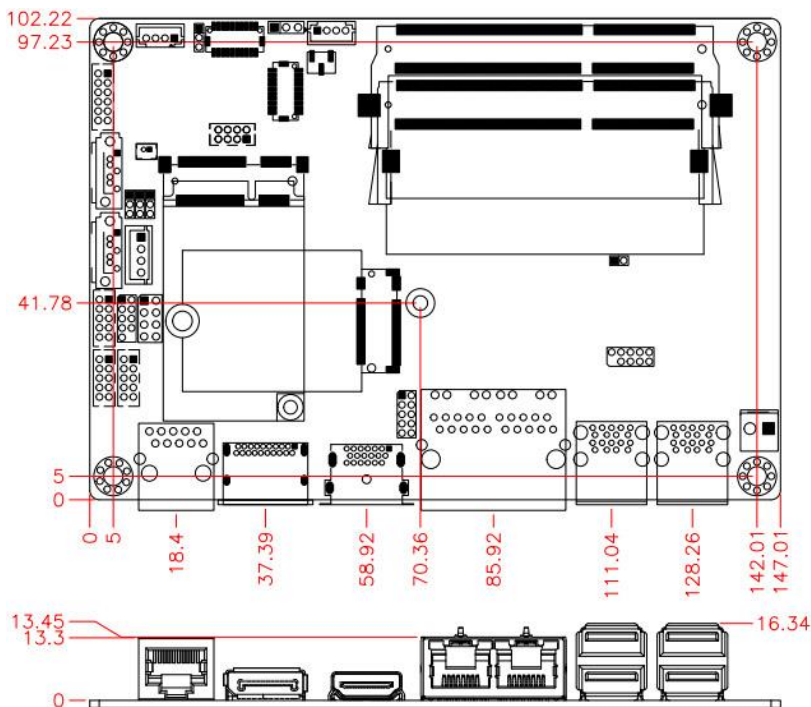
Chapter 2
Hardware Configuration

This section provides information on jumper settings and connectors on the IB811LF in order to set up a workable system. On top of that, you will also need to install crucial pieces such as the CPU and the memory before using the product. The topics covered are:

- Essential installations before you begin: CPU and the memory

- Jumper and connector locations

- Jumper settings and information of connectors

2.1   Essential Installations Before You Begin

Follow the instructions below to install the memory.

2.1.1   Installing the Memory

To install the modules, locate the memory slot on the board and perform the following steps:
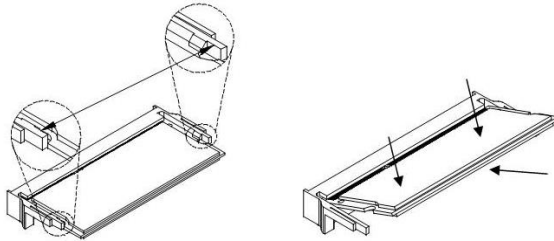
1.   Align the key of the memory module with that on the memory slot and insert the module slantwise.

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 the module, press the clips outwards with both hands, and the module will pop-up.

2.2   Setting the Jumpers

Set up and configure your IB811LF 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.

2.2.1   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.

Pin#   1   2   3
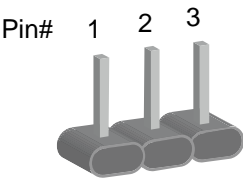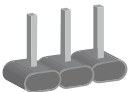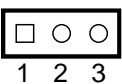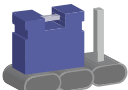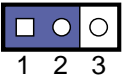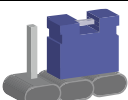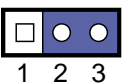
A 3-pin jumper   **A jumper cap**

Refer to the illustration below to set jumpers.

Pin closed	Oblique view	Illustration
Open		□ ○ ○ 1 2 3
1-2		□ ● ○ 1 2 3
2-3		□ ● ● 1 2 3

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

2.3 Jumper & Connector Locations

iBASE
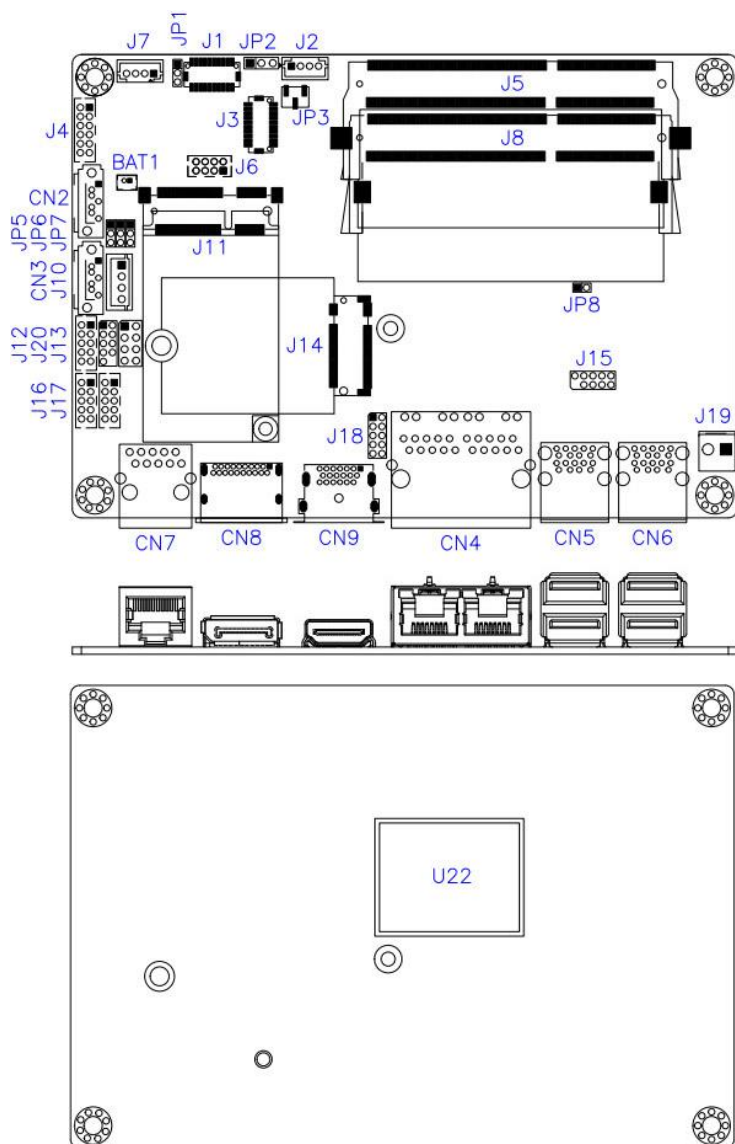
2.4 Jumpers Quick Reference

Function	Jumper	Page
LCD Panel Brightness Selection	JP1	17
LVDS Planel Power Selection	JP2	18
LVDS Brightness Control Selection	JP3	18
ATX / AT Power Selection	JP5	19
CMOS Data Clearance	JP6	20
ME Register Clearance	JP7	21
Factory Use Only	JP8	- -
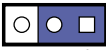
2.4.1 LVDS Panel Brightness Selection (JP1)
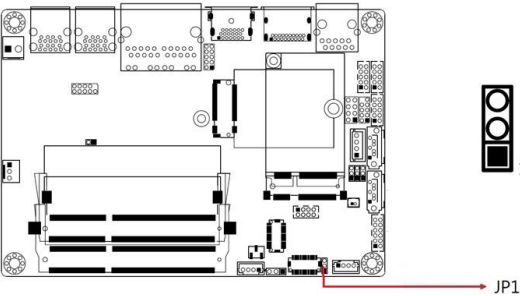
Function	Pin closed	Illustration
3.3V (default)	1-2	
5V	2-3	

2.4.2   LVDS Panel Power Selection (JP2)
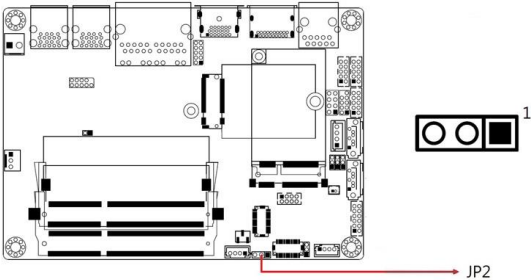
Function	Pin closed	Illustration
3.3V (default)	1-2	
5V	2-3	
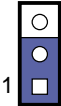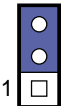
2.4.3   LVDS Brightness Control Selection (JP3)
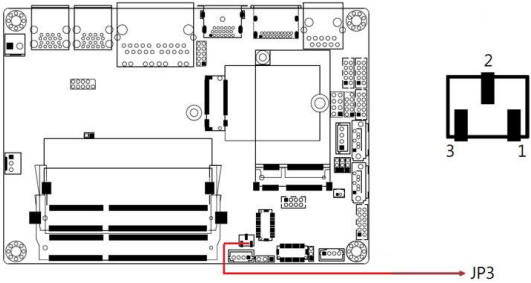
Function	Pin closed	Illustration
For super I/O (default)	1-2	
For CPU	2-3	
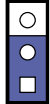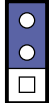
2.4.4   ATX / AT Power Selection (JP5)

JP5
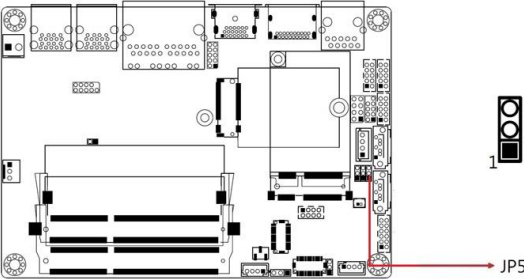
Function	Pin closed	Illustration
ATX (default)	1-2	
AT	2-3	

2.4.5   CMOS Data Clearance (JP6)
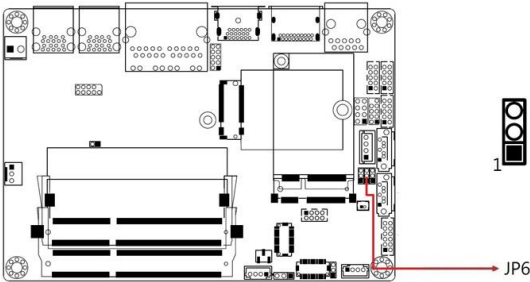
Function	Pin closed	Illustration
Normal (default)	1-2	
Clear CMOS	2-3	

2.4.6 ME Register Clearance (JP7)
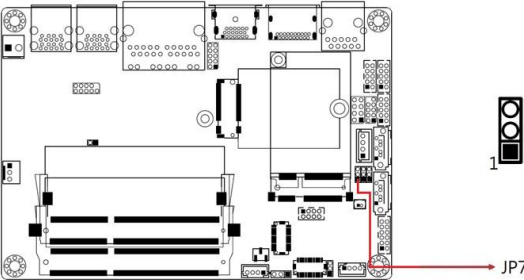
Function	Pin closed	Illustration
Normal (default)	1-2	
Clear ME	2-3	

2.5   Connectors Quick Reference

Function	Connector	Page
SATA III Connector	CN2 (shared with M.2 B-key) CN3 (shared with mSATA)	24
LAN Ports	CN4	24
USB 3.0 Ports	CN5, CN6 (USB Power Control)	24
Console COM1 (RJ50) RS-232/422/485 Port	CN7	25
DisplayPort	CN8	26
HDMI Port	CN9	26
LCD Backlight Connector	J2	26
LVDS Connector	J1, J3	27
Audio Connector	J4	28
DDR3L SO-DIMM Slot	J5, J8	28
USB 2.0 Connector	J6	29
Amplifier Connector	J7	29
SATA HDD Power Connector	J10	30
Mini PCIe / mSATA Slot	J11	30
COM2 / COM3 / COM4 RS-232 Port	J16, J17, J12	31
M.2 (B key) 3042 Slot	J14	31
Front Panel Connector	J13	32
Digital I/O Connector	J18	33
DC Power Input Connector	J19	33
Factory Use Only	J15, J20	- -

2.5.1   SATA III Connectors (CN2, CN3)
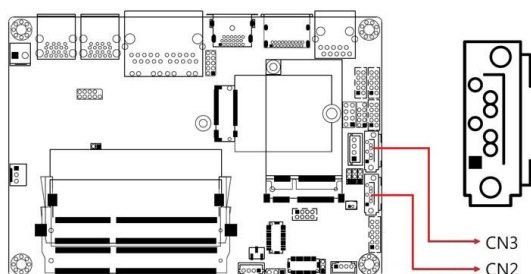
Remarks:
CN2: shared with M.2 B-key
CN3: shared with mSATA

2.5.2   LAN Ports (CN4)
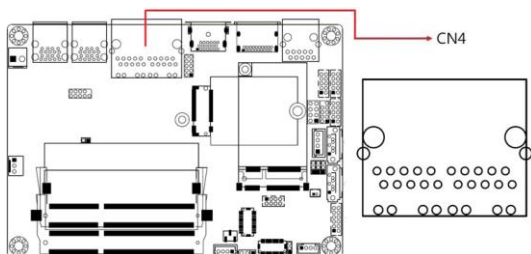
2.5.3   USB 3.0 Ports (CN5, CN6)
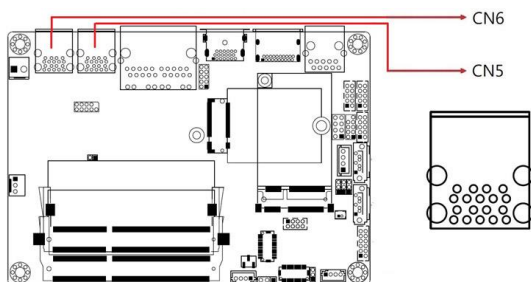
* USB Power Control

2.5.4 Console COM1 (RJ50) RS-232/422/485 Port (CN7)
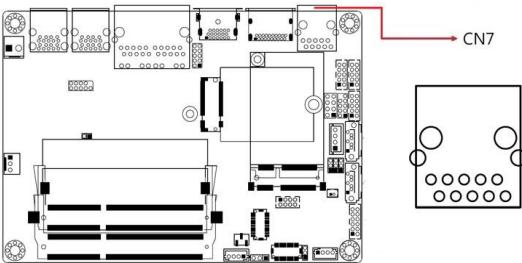
COM1 port is jumper-less and configurable in the BIOS.

Pin	Assignment	Pin	Assignment
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

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

2.5.5   DisplayPort (CN8)
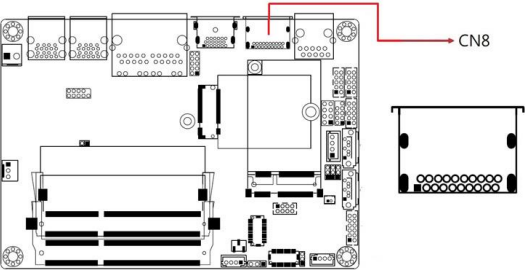
2.5.6   HDMI Port (CN9)
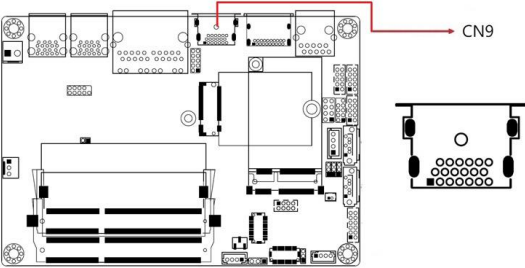
2.5.7   LCD Backlight Connector (J2)
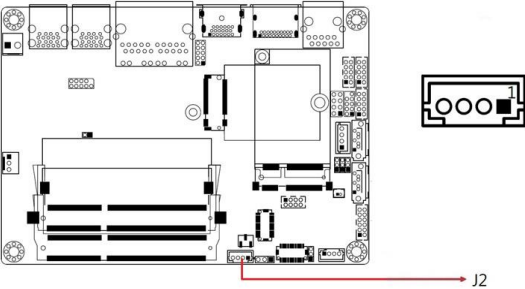
Pin	Assignment	Pin	Assignment
1	+12V	3	Brightness Control
2	Backlight Enable	4	Ground

2.5.8 LVDS Connector (J1, J3)
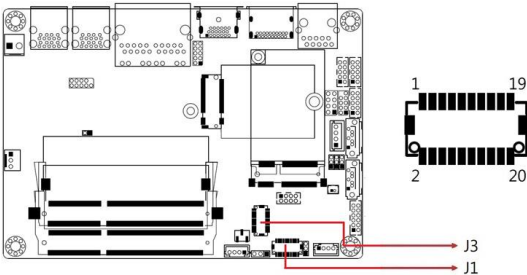
Remarks:
J1: 2nd channel
J3: 1st channel

Pin	Assignment	Pin	Assignment
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

2.5.9   Audio Connector (J4)
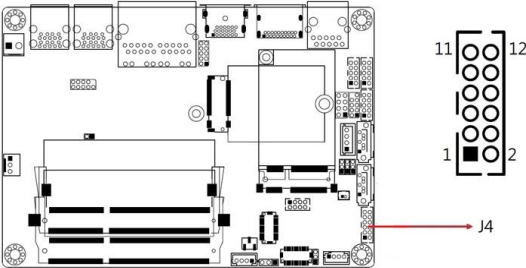
Pin	Assignment	Pin	Assignment
1	Lineout_L	2	Lineout_R
3	JD_FRONT	4	Ground
5	LINEIN_L	6	Linein_R
7	JD_LINEIN	8	Ground
9	MIC_L	10	MIC-R
11	JD_MIC1	12	Ground

2.5.10   DDR3L SO-DIMM Slot (J5, J8)
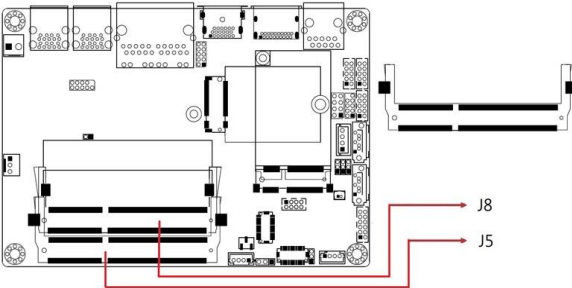
2.5.11 USB 2.0 Connector (J6)
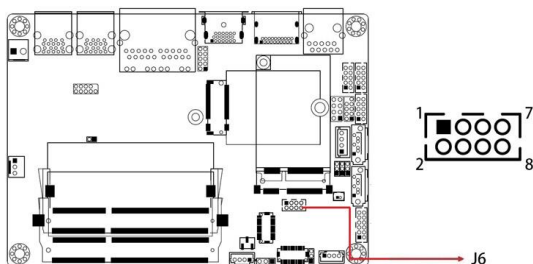
Pin	Assignment	Pin	Assignment
1	VCC	2	Ground
3	D0-	4	D1+
5	D0+	6	D1-
7	Ground	8	VCC

2.5.12 Amplifier Connector (J7)
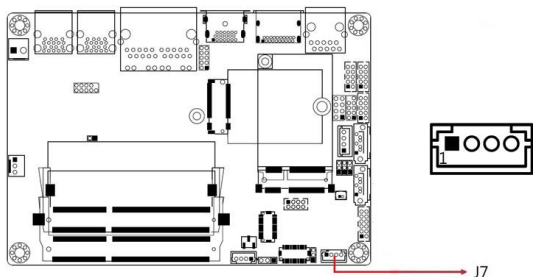
Pin	Assignment	Pin	Assignment
1	OUTL+	3	OUTR-
2	OUTL-	4	OUTR+

2.5.13 SATA HDD Power Connector (J10)
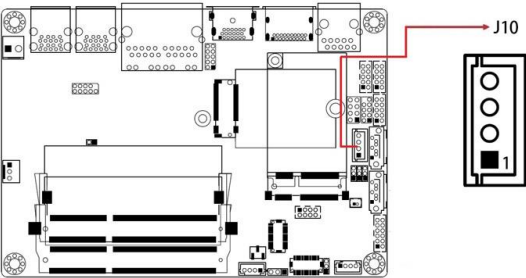
Pin	Assignment	Pin	Assignment
1	+5V	3	Ground
2	Ground	4	+12V

2.5.14 Mini PCIe / mSATA Slot (J11)
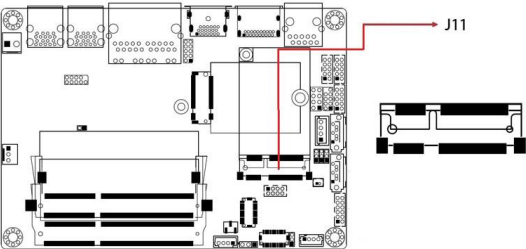
2.5.15   COM2 / COM3 / COM4 RS-232 Port (J16, J17, J12)
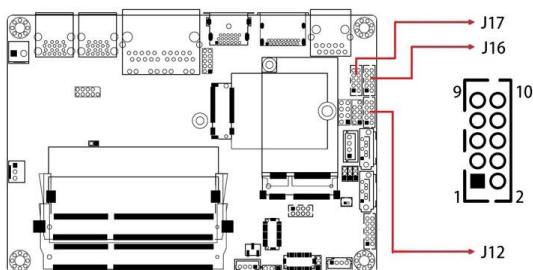
Pin	Assignment	Pin	Assignment
1	DCD, Data carrier detect	2	RXD, Receive data
3	TXD, Transmit data	4	DTR, Data terminal ready
5	Ground	6	DSR, Data set ready
7	RTS, Request to send	8	CTS, Clear to send
9	RI, Ring indicator	10	Not Used

2.5.16   M.2 (B key) 3042 Slot (J14)

iBASE
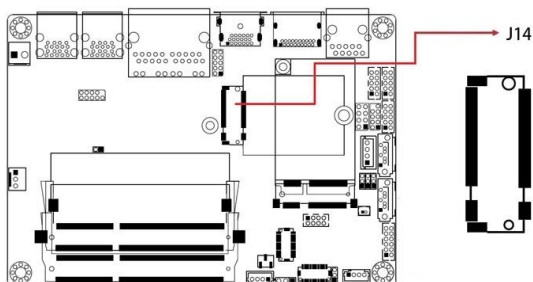
2.5.17   Front Panel Connector (J13)
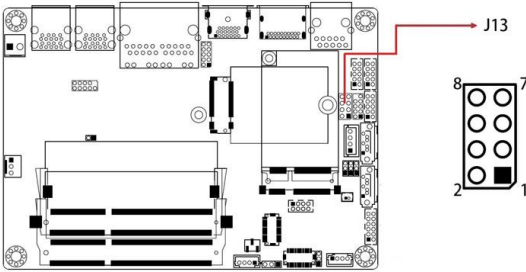
Pin	Assignment	Pin	Assignment
1	Ground	2	PWR_BTN
3	3.3V	4	HDD Active
5	Ground	6	Reset
7	+5V	8	Ground

J13 is utilized for system indicators to provide light indication of the computer activities and switches to change the computer status. It provides interfaces for the following functions.

- **ATX Power ON Switch (Pins 1 and 2)**

    The 2 pins makes an "ATX Power Supply On/Off Switch" for the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will power off the system.

- **Hard Disk Drive LED Connector (Pins 3 and 4)**

    This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

- **Reset Switch (Pins 5 and 6)**

    The reset switch allows you to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

- **Power LED: Pins 7 and 8**

    This connector connects to the system power LED on control panel. This LED will light when the system turns on.

2.5.18 Digital I/O Connector (J18)
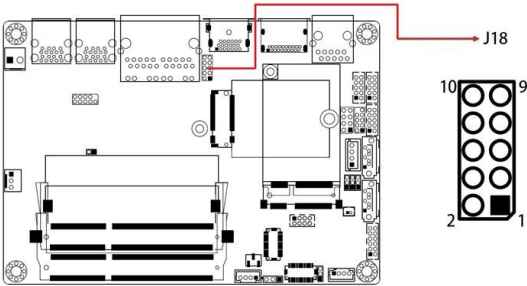
Pin	Assignment	Pin	Assignment
1	Ground	2	VCC
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

2.5.19 DC Power Input Connector (J19)
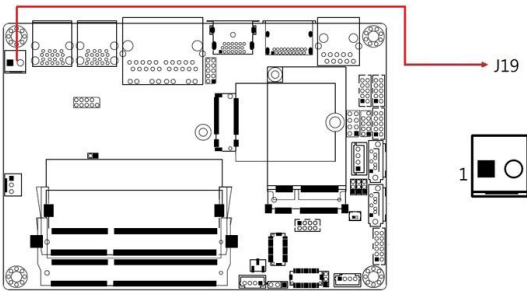
Pin	Assignment
1	+9V ~ +36V
2	Ground

Chapter 3
Drivers Installation

This chapter introduces installation of the following drivers:

- Intel® Chipset Software Installation Utility

- VGA Driver

- HD Audio Driver

- Intel® Trusted Execution Engine Installation

- LAN Driver

3.1   Introduction

This section describes the installation procedures for software and drivers. The contents of this section include the following:

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

---

iBASE

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 Intel chipset components. Follow the instructions below to complete the installation.

1. Go to the download page of the product. Copy the compressed drivers file to your computer. Double click the file to decompress it. Run "CDGuide" to go to the main drivers page as shown. Click **Intel** on the left pane and then **Intel(R) Apollolake Chipset Drivers** on the right pane.
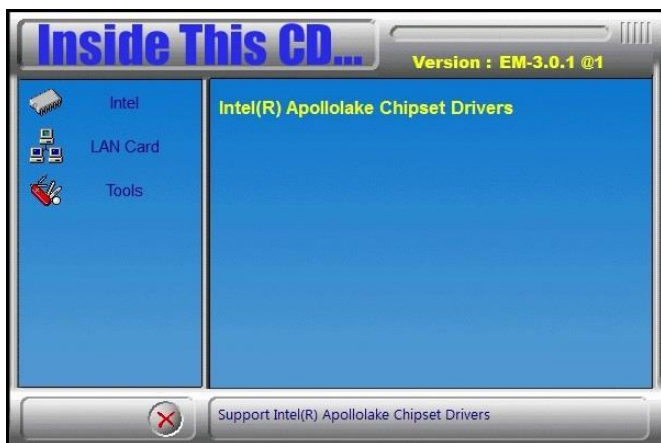
2. Click **Intel(R) Chipset Software Installation Utility**.

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.
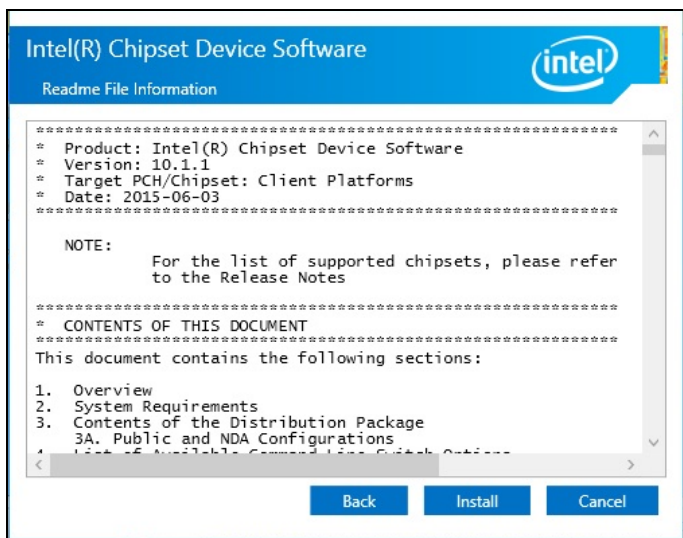
6. The driver has been completely installed. You are suggested to restart the computer for changes to take effect.

iBASE

3.3   VGA Driver Installation

1.   Click **Intel** on the left pane and then **Intel(R) Apollolake Chipset Drivers** on the right pane.
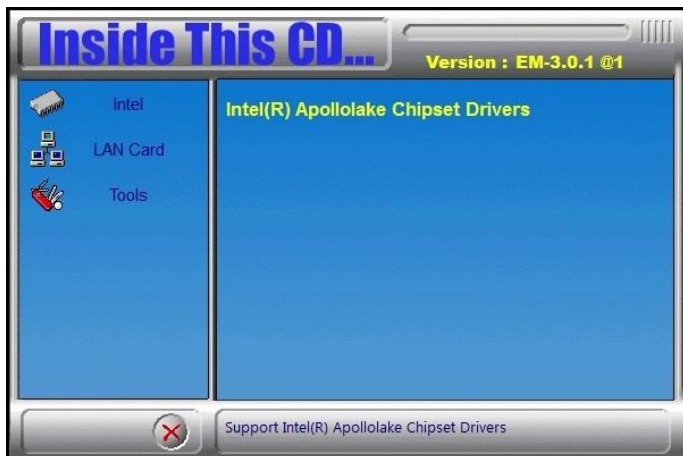
2.   Click **Intel(R) Apollolake Graphics Driver**.
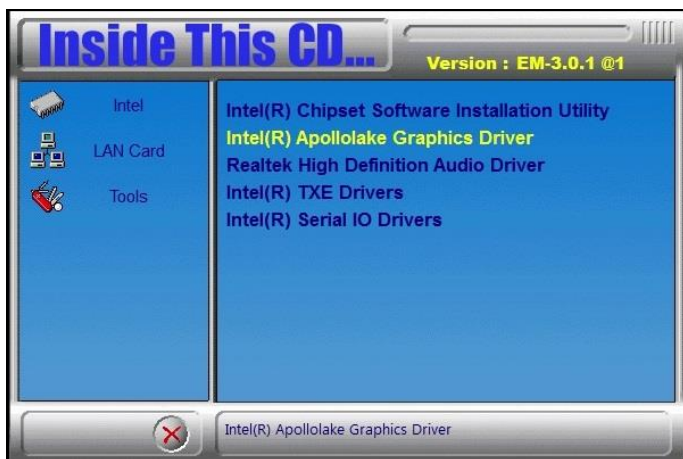
3. When the *Welcome* screen appears, click **Next** to continue.
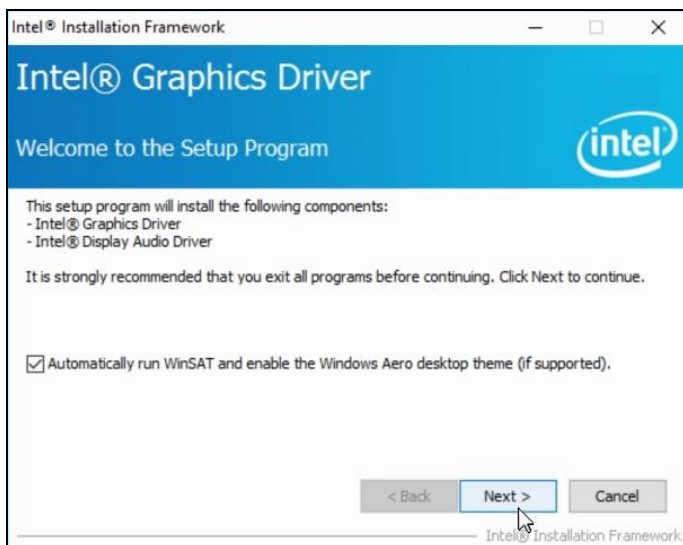
4. Click **Yes** to accept the license agreement and click **Next** until the installation starts.

5. The driver has been completely installed. You are suggested to restart the computer for changes to take effect.

3.4   HD Audio Driver Installation

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

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

3. On the *Welcome* screen of the InstallShield Wizard, click **Next** for installation.
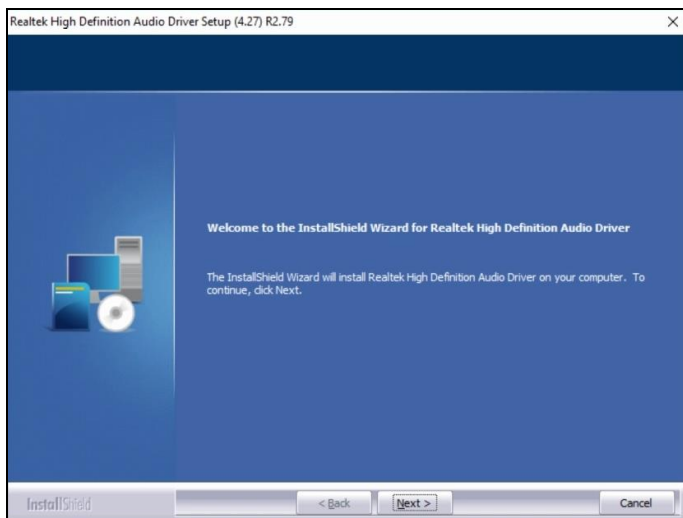
4. Click **Next** until the installation starts.

5. The driver has been completely installed. You are suggested to restart the computer for changes to take effect.

3.5 Intel® Trusted Execution Engine Drivers

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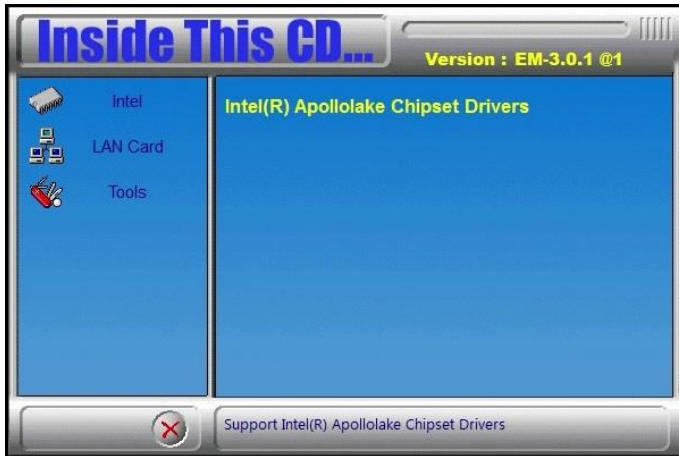
2. Click **Intel(R) TXE Drivers**.

3. When the *Welcome* screen appears, click **Next**.
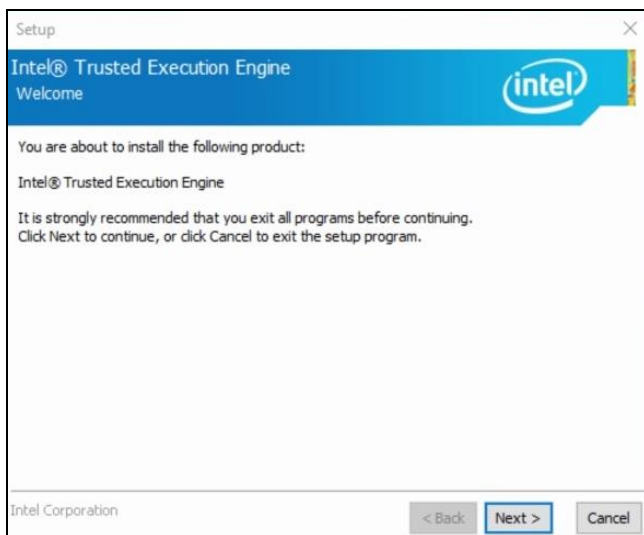
4. Accept the license agreement and click **Next**.

5. Click **Next** for installation.
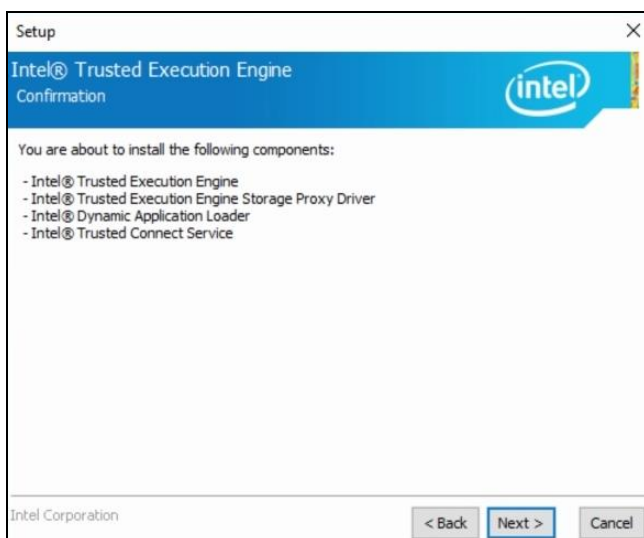
6. As the driver has been sccessfully installed, you are suggested to restart the computer for changes to take effect.

3.6 Intel® Serial IO Drivers

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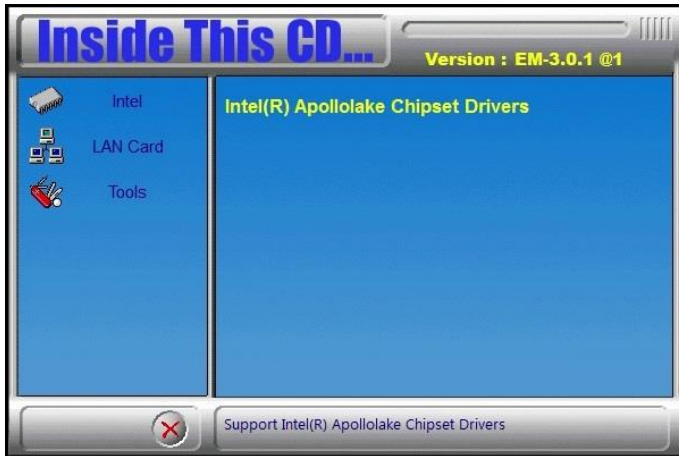
2. Click **Intel(R) Serial IO Drivers**.

3. When the *Welcome* screen to the InstallShield Wizard appears, click **Next**.
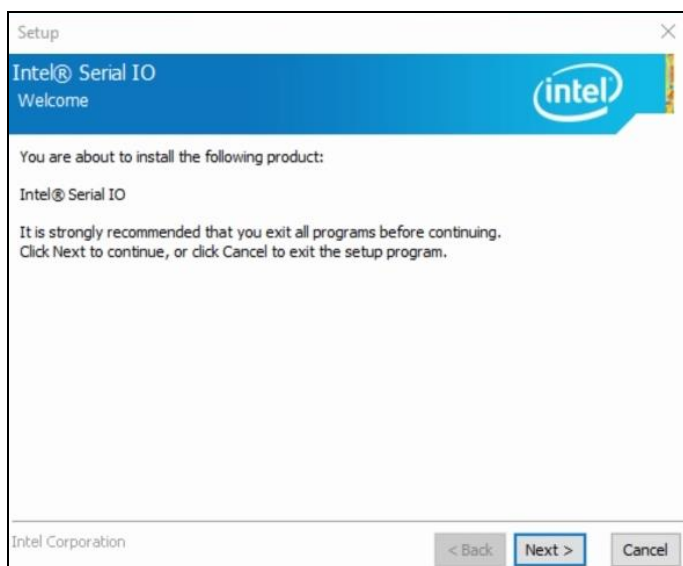
4. Accept the license agreement and click **Next**.

5. After reading the *Readme File Information*, click **Next** for installation.

6. As the driver has been sccessfully installed, you are suggested to restart the computer for changes to take effect.

iBASE

3.7   LAN Driver Installation

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

2.   Click **Intel(R) I21x Gigabit Network Drivers.**.
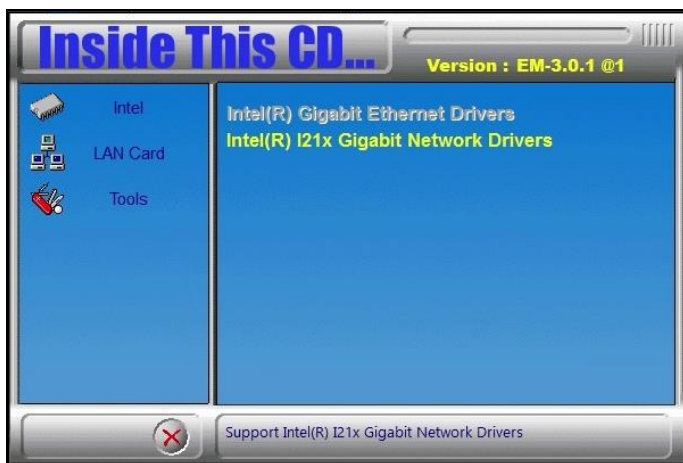
3.   When the *Welcome* screen appears, click **Next**.
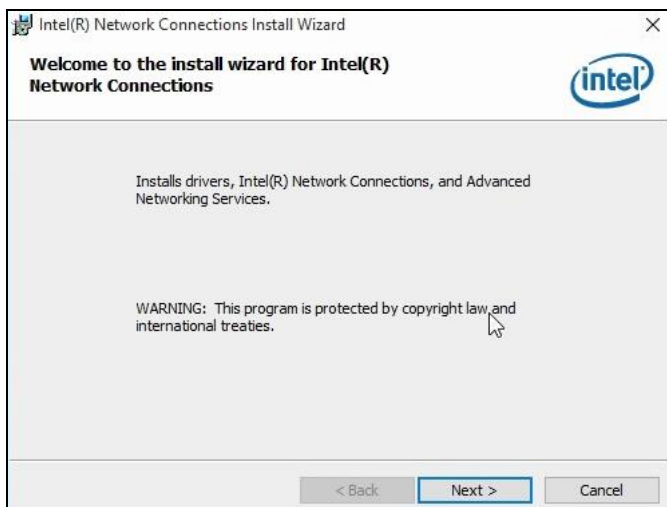
4.   Accept the license agreement and click **Next**.

5.   On the *Setup Options* screen, click the checkbox to select the desired driver(s) for installation. Then click **Next** to continue.
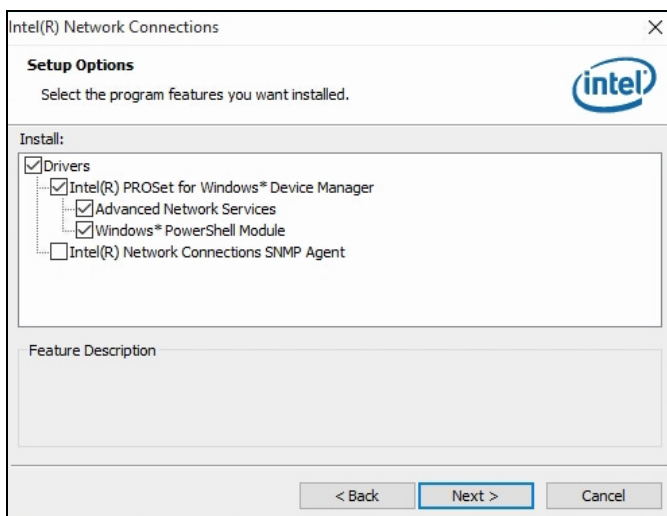
6.   The wizard is ready for installation. Click **Install**.

7.   As the installation is complete, you are suggested to 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

- Boot Settings

- Security 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.

iBASE

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

```
                Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

   Memory Information                                        Set the Date. Use Tab to
   Total Memory                         4096 MB              switch between Date elements.
   Memory Speed                         1600 MHz             Default Ranges:
                                                             Year: 2005-2099
                                                             Months: 1-12
   System Date                          [Mon 12/19/2016]     Days: dependent on month
   System Time                          [13:02:19]




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit


                Version 2.18.1263. Copyright (C) 2016 American Megatrends, Inc.
```

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

iBASE

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.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

   ▶ Trusted Computing                               Trusted Computing Settings
   ▶ ACPI Settings
   ▶ LVDS (eDP/DP) Configuration
   ▶ Fintek Super IO Configuration
   ▶ Fintek Super IO Hardware Monitor
   ▶ M.2 Setup
   ▶ CPU Configuration
   ▶ AMI Graphic Output Protocol Policy
   ▶ USB Configuration
   ▶ Network Stack Configuration
   ▶ CSM Configuration

                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

              Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

4.4.1 Trusted Computing

BIOS Setting	Description
Security Device Support	Enables / Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enable or Disable SHA1 PCR Bank
SHA256 PCR Bank	Enable or Disable SHA256 PCR Bank
SHA-1 PCR Bank	Enable or Disable SHA1 PCR Bank
Pending operation	Schedule an operation for the security device. NOTE: Your computer will reboot dring restart in order to change state of security device. Options: None, TPM Clear
Platform Hierarchy	Enable or Disable Platform Hierarchy
Storage Hierarchy	Enable or Disable Storage Hierarchy
Endorsement Hierarchy	Enable or Disable Endorsement Hierarchy
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later
Physical Presence Spec Version	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
Device Select	TPM 1.2 will restrict support to TPM 1.2 devices. TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both with the default sat to TPM 2.0 devices if not found. TPM 1.2 devices will be enumerated.

4.4.2   ACPI Computing

BIOS Setting	Description
Enable Hibernation	Enables / Disables the system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Selects an ACPI sleep state (Suspend Disabled or S3) where the system will enter when the Suspend button is pressed.

4.4.3 Fintek Super IO Configuration

BIOS Setting	Description
Standby Power on S5	Enables / Disables to provide the standby power for devices.
	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.

iBASE

4.4.4.1 Serial Port Configuration

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

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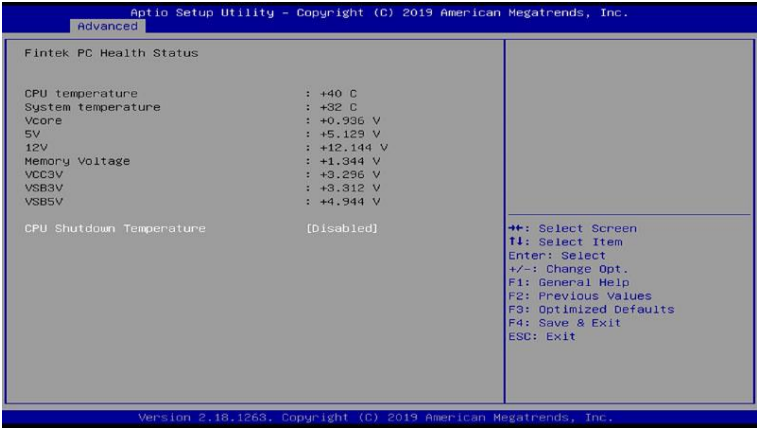
BIOS Setting	Description
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.
CPU Shutdown Temperature	Sets a threshold of temperature to shut down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

4.4.5 M.2 Setup
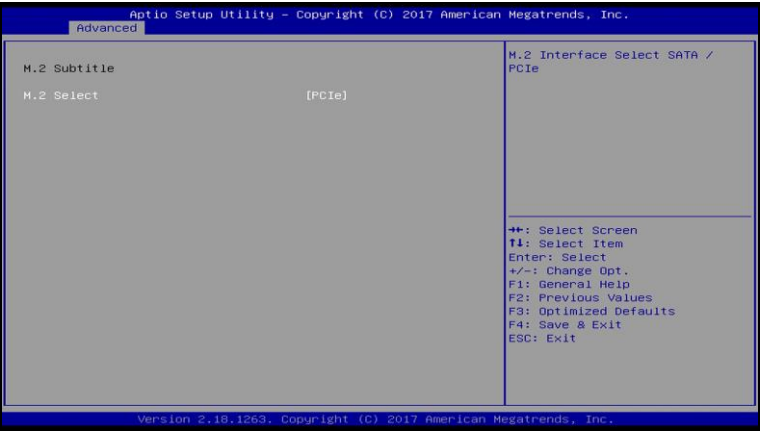
BIOS Setting	Description
M.2 Select	Selects the M.2 interface as SATA or PCIe.

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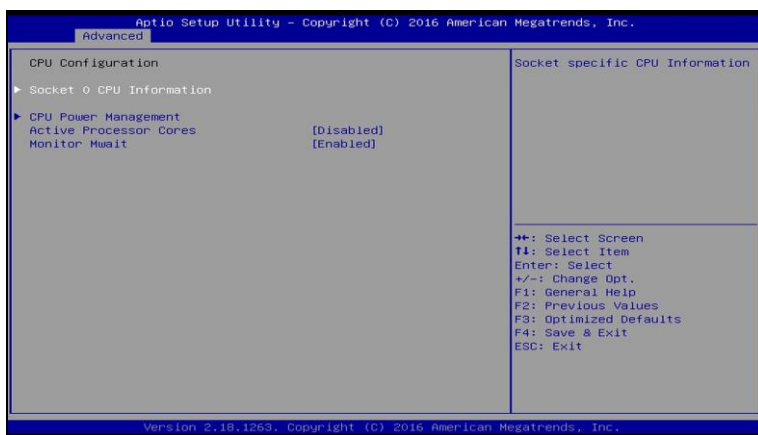
BIOS Setting	Description
Socket 0 CPU Information	Displays the socket specific CPU information.
CPU Power Management	Allows you to enable / disable Turbo Mode.
Active Processor Cores	Enables / Disables the cores in the processor package.
Monitor Mwait	Enables / Disables Monitor Mwait.

iBASE

4.4.7 AMI Graphic Output Protocol Policy

```
              Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
    Advanced

   Intel(R) Graphics Controller                              Output Interface
   Intel(R) GOP Driver [10.0.1035]
   Output Select                          [HDMI2]




                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


              Version 2.18.1263. Copyright (C) 2016 American Megatrends, Inc.
```
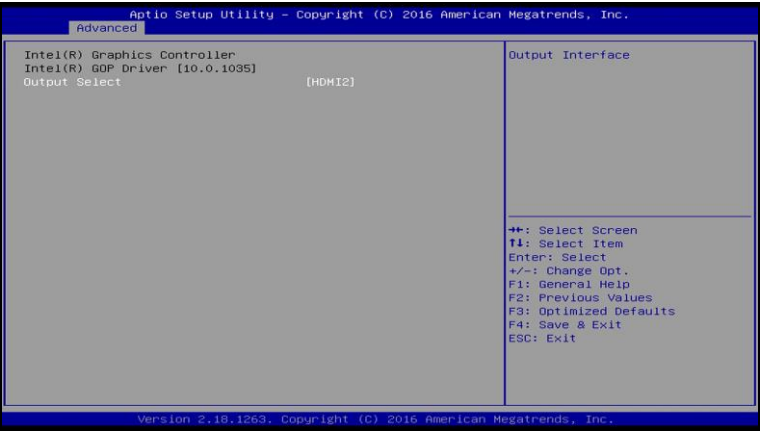
BIOS Setting	Description
Output Select	Outputs through HDMI interface.

4.4.8   Network Stack Configuration
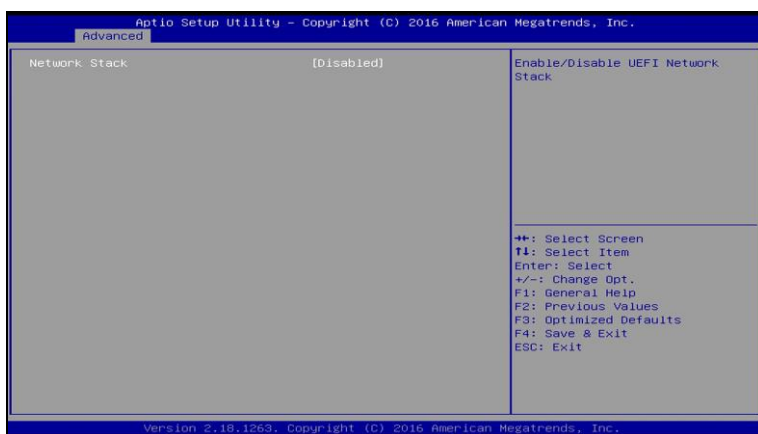
BIOS Setting	Description
Network Stack	Enables / Disables UEFI Network Stack.
IPv4 PXE Support	Enables / Disables IPv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
IPv4 HTTP Support	Enables / Disables IPv4 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
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
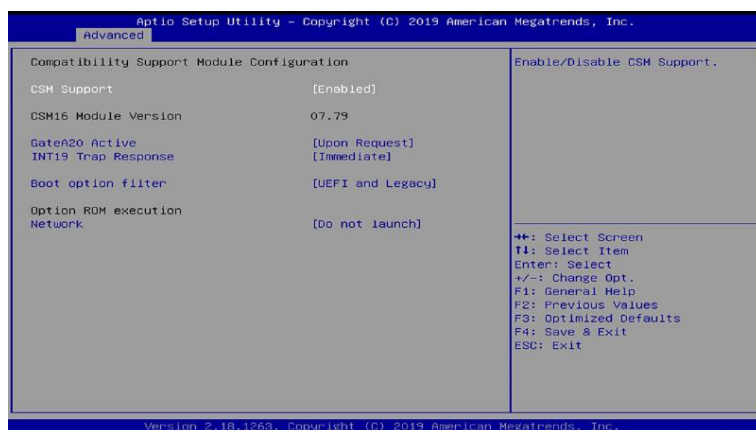
BIOS Setting	Description
CSM Support	Enables / Disables CSM support.
GateA20 Active	• **Upon Request** disables GA20 when using BIOS services. • **Always** cannot disable GA20, but is useful when any RT code is executed above 1 MB.
INT19 Trap Response	Sets how BIOS reacts on INT19 trap by Option ROM. • **Immediate** executes the trap right away. • **Postponed** executes the trap during legacy boot.
Boot option filter	Controls the priority of Legacy and UEFI ROMs.
Option ROM execution - Network	Controls the execution of UEFI and Legacy PXE Option ROM. Options: Do not launch/UEFI/ Legacy.

4.4.10   USB Configuration
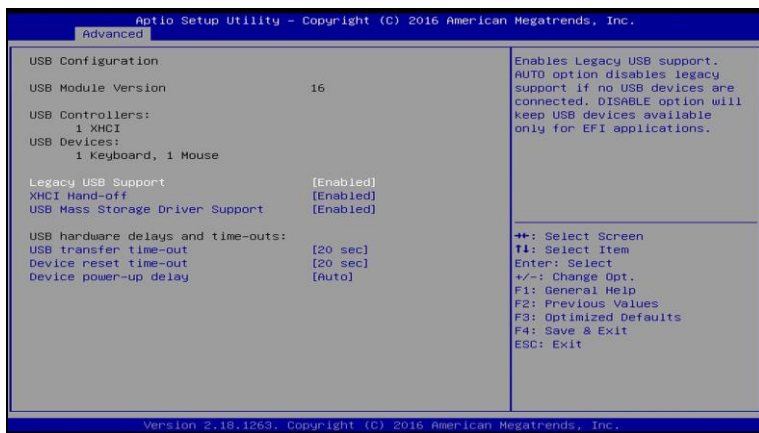
BIOS Setting	Description
Legacy USB Support	• **Enabled** enables Legacy USB support. • **Auto** disables legacy support if there is no USB device connected. • **Disabled** keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. 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.

iBASE

4.5 Chipset Settings
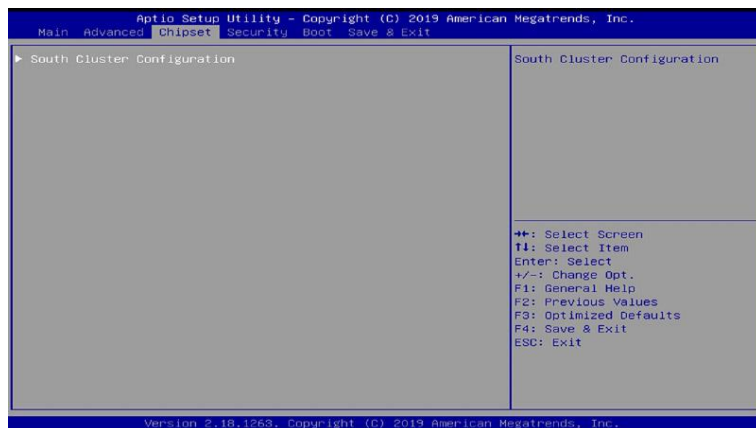
4.5.1 South Cluster Configuration

4.5.1.1 HD Audio Configuration

```
          Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
           Chipset

   HD-Audio Configuration                                Enable/Disable HD-Audio Support
   HD-Audio Support                    [Enable]




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


          Version 2.18.1263. Copyright (C) 2016 American Megatrends, Inc.
```

4.5.1.2 PCI Express Configuration

```
          Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
           Chipset

   PCI Express Configuration                             Control the PCI Express Root
 ▶ PCI Express Root Port 1                               Port.
 ▶ PCI Express Root Port 2                               AUTO: To disable unused root
 ▶ PCI Express Root Port 3                               port automatically for the
 ▶ PCI Express Root Port 4                               most optimum power savings.
 ▶ PCI Express Root Port 5                               Enable: Enable PCIe root port
 ▶ PCI Express Root Port 6                               Disable: Disable PCIe root port




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


          Version 2.18.1263. Copyright (C) 2016 American Megatrends, Inc.
```

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

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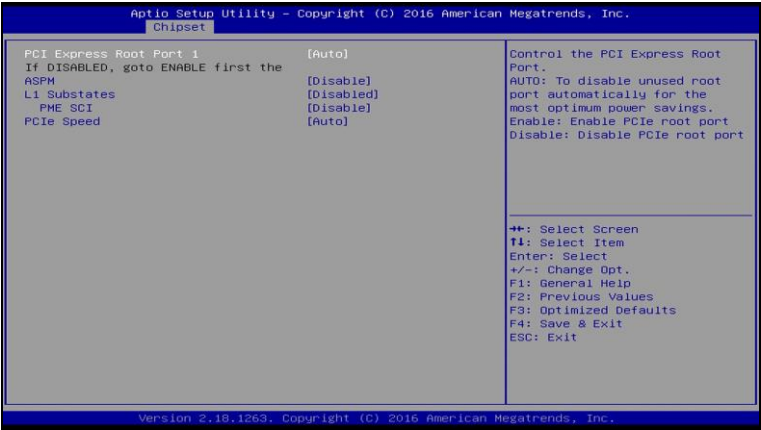
BIOS Setting	Description
PCI Express Root Port	Enables/ Disables the PCIe root port. **Auto:** To disable unused root port automatically for the most optimum power savings.
ASPM	Sets the PCIe active state power management. Options: Disable / L0s / L1 / L0SL1 / Auto
L1 Substates	Sets PCIe L1 substates.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

4.5.1.3 SATA Drivers

```
           Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
                   Chipset

  SATA Drives                                            Enables or Disables the
                                                         Chipset SATA Controller.  The
  Chipset-SATA Controller Configuration                  Chipset SATA controller
  Chipset SATA                        [Enable]           supports the 2 black internal
  SATA Mode Selection                 [AHCI]             SATA ports (up to 3Gb/s
                                                         supported per port).
    SATA Port 0                     [Not Installed]

    SATA Port 1                     [Not Installed]



                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit


           Version 2.18.1263. Copyright (C) 2016 American Megatrends, Inc.
```

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.

4.5.1.4 USB Configuration
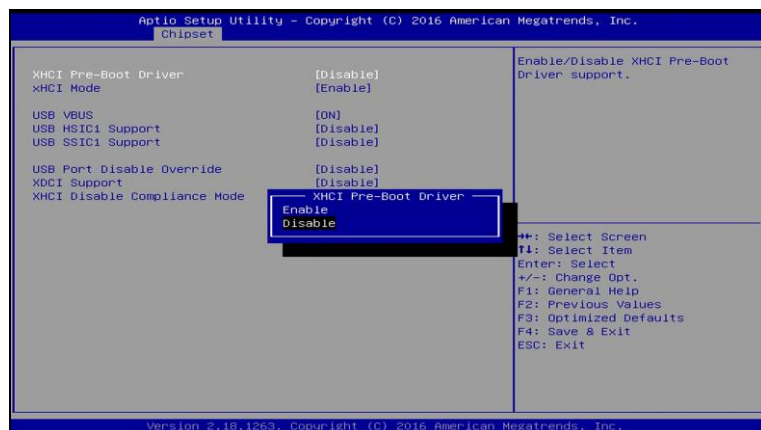
BIOS Setting	Description
XHCI Pre-Boot Driver	Enables / Disables the support for XHCI Pre-Boot Driver.
XHCI Mode	Enables / Disables XHCI mode. If disabled, XHCI controller would be disabled, and none of the USB devices are detectable or usable when systen is booted up in OS. Do NOT disable it unless 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

```
                Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    Password Description                              Customizable Secure Boot
                                                     settings
    If ONLY the Administrator's password is set,
    then this only limits access to Setup and is
    only asked for when entering Setup.
    If ONLY the User's password is set, then this
    is a power on password and must be entered to
    boot or enter Setup. In Setup the User will
    have Administrator rights.
    The password length must be
    in the following range:
    Minimum length                     3
    Maximum length                     20           →←: Select Screen
                                                     ↑↓: Select Item
    Setup Administrator Password                     Enter: Select
    User Password                                    +/-: Change Opt.
                                                     F1: General Help
  ▶ Secure Boot                                      F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit


                Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

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

iBASE
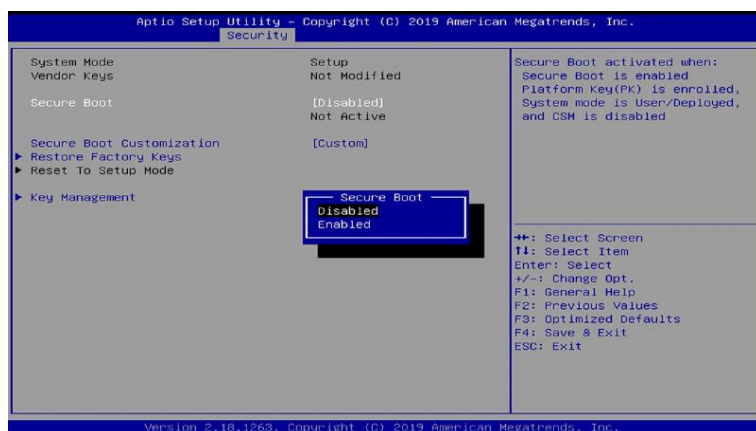
4.6.1   Secure Boot

BIOS Setting	Description
Secure Boot	Secure activated when: secure boot is enable, Platform Key(PK) is enrolled, system mode is User/Deployed, and CSM is disabled.
Secure Boot Customization	Secure Boot Mode – Custom & Standard, Set UEFI Secure Boot Mode to STANDARD mode or CUSTOM mode, this change takes effect after save. And after reset, the mode will return to STANDARD mode.
Restore Factory Keys	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Key Management	Enables expert users to modify Secure Boot Policy variables without full authentication

4.6.2   Key Management

```
                  Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                        Security

      Factory Key Provision              [Disabled]             Provision factory default keys
                                                                on next re-boot only when
    ▶ Restore Factory Keys                                      System in Setup Mode
    ▶ Reset To Setup Mode
    ▶ Export Secure Boot variables
    ▶ Enroll Efi Image

      Device Guard Ready
    ▶ Remove 'UEFI CA' from DB
    ▶ Restore DB defaults

      Secure Boot variable | Size| Keys| Key Source
    ▶ Platform Key(PK)     |    0|    0| No Keys
    ▶ Key Exchange Keys    |    0|    0| No Keys           ⭢⭠: Select Screen
    ▶ Authorized Signatures|    0|    0| No Keys           ⭡⭣: Select Item
    ▶ Forbidden  Signatures|    0|    0| No Keys           Enter: Select
    ▶ Authorized TimeStamps|    0|    0| No Keys           +/-: Change Opt.
    ▶ OsRecovery Signatures|    0|    0| No Keys           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



                  Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Setting	Description
Factory Key Provision	Provision factory default keys on next re-boot only when System in Setup Mode. Options available: Enabled/Disabled. Default setting is Disabled.
Restore Factory Keys	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Enroll Efi Image	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authoried Signature database (db)
Restore DB defaults Efi Image	Restore DB variable to factory defaults
Platform Key (PK)	Displays the current status of the Platform Key (PK). Options available: Update
Key Exchange Keys	Displays the current status of the Key Exchange Key Database (KEK). Options available: Update/Append.
Authorized Signatures	Displays the current status of the Authorized Signature Database. Options available: Update /Append.

Forbidden Signatures	Displays the current status of the Forbidden Signature Database. Options available: Update /Append.
Authorized TimeStamps	Displays the current status of the Authorized TimeStamps Database. Options available: Update /Append.
OsRecovery Signatures	Displays the current status of the OsRecovery Signature Database. Options available: Update /Append.

4.7 Boot Settings

```
            Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

     Boot Configuration                                    Number of seconds to wait for
     Setup Prompt Timeout            1                     setup activation key.
     Bootup NumLock State            [Off]                 65535(0xFFFF) means indefinite
     Quiet Boot                      [Disabled]            waiting.

     New Boot Option Policy          [Default]
     Boot mode select               [UEFI]

     FIXED BOOT ORDER Priorities
     Boot Option #1                  [Hard Disk]
     Boot Option #2                  [CD/DVD]
     Boot Option #3                  [USB Hard Disk]
     Boot Option #4                  [USB CD/DVD]          →←: Select Screen
     Boot Option #5                  [USB Key]             ↑↓: Select Item
     Boot Option #6                  [USB Floppy]          Enter: Select
     Boot Option #7                  [USB Lan]             +/-: Change Opt.
     Boot Option #8                  [Network]             F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

                  Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

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.
Fixed Boot Order Priorities	Sets the system boot order priorities for hard disk, CD/DVD, USB hard disk, USB CD/DVD, USB Key, USB Floppy, USB Lan, Network.

4.8 Save & Exit Settings
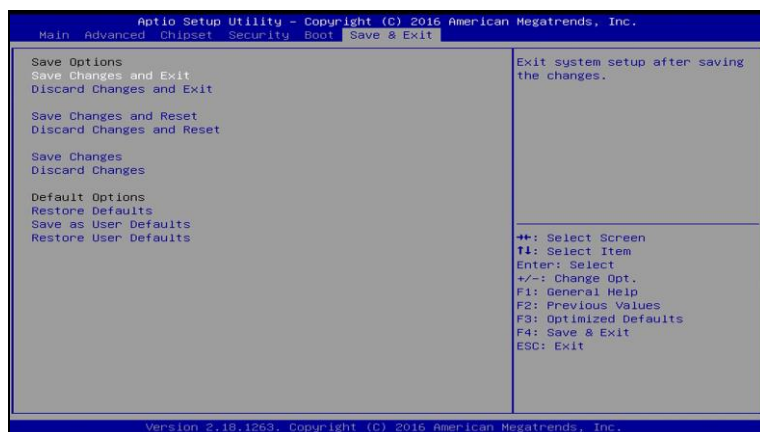
BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
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.

iBASE

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

Address	Device Description
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
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

iBASE

Address	Device Description
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 0	System timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 4	PCI Data Acquisition and Signal Processing Controller
IRQ 5	Communications Port (COM3)
IRQ 5	PCI Data Acquisition and Signal Processing Controller
IRQ 6	PCI Data Acquisition and Signal Processing Controller
IRQ 7	PCI Data Acquisition and Signal Processing Controller
IRQ 8	High precision event timer
IRQ 10	Communications Port (COM4)
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INT3452
IRQ 25	High Definition Audio Controller
IRQ 35	PCI Data Acquisition and Signal Processing Controller
IRQ 36	PCI Data Acquisition and Signal Processing Controller
IRQ 37	PCI Data Acquisition and Signal Processing Controller
IRQ 39	SDA Standard Compliant SD Host Controller
IRQ 54 ~ IRQ 204	Microsoft ACPI-Compliant System
IRQ 256 ~ IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967279	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)

iBASE

Level	Function
IRQ 4294967280 ~ IRQ 4294967285	Intel(R) I211 Gigabit Network Connection #2
IRQ 4294967286 ~ IRQ 4294967291	Intel(R) I211 Gigabit Network Connection
IRQ 4294967292	Intel(R) Trusted Execution Engine Interface
IRQ 4294967293	Intel(R) HD Graphics
IRQ 4294967294	Standard SATA AHCI Controller

C. Watchdog Timer Configuration

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

Sample Code:

```
//-------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "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;
}
```

iBASE

```
//-------------------------------------------------------------------------
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;
}
//-------------------------------------------------------------------------
```

iBASE

```
//-----------------------------------------------------------------------
//
// 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
```

D. Onboard Connector Reference Types

Function	Connector Name	Onboard Type	Compatible Mating Type
Audio Connector	J4	Hao Guo Xing Ye DF11-12S-PA66H	Hirose DF11-12DS-2C
SATA HDD Power Connector	J10	E-call 0110-071-040	JST XHP-4
Front Panel Setting Connector	J13	Dupon 2.54 mm-pitch pin header (Male)	Dupon 2.54 mm-pitch (Female)
USB 2.0 Connector	J6	Hao Guo Xing Ye DF11-8S-PA66H	Hirose DF11-8DS-2C
Battery Connector	BAT1	Molex 53047-0210	Molex 51021-0200
COM 2, COM3, COM4 RS-232 Ports	J12, J16, J17	Hao Guo Xing Ye DF11-10S-PA66H	Hirose DF11-10DS-2C
DC Power Input Connector	J19	Hao Guo Xing Ye WAFER396-2S-WV	JST VHR-2N
Digital I/O Connector	J18	Dupon 2.00 mm-pitch pin header (Male)	Dupon 2.00 mm-pitch (Female)
LCD Backlight Connector	J2	E-CALL 0110-161-040	JST PHR-4.
LVDS Connectors	J3 (1st channel), J1 (2nd channel)	Hirose DF20G-20DP-1V	Hirose DF20A-20DS-1C

iBASE

E.   Peripheral Device Power Control

This feature allows users to control the power of peripherals by software, considering that there is a security issue and the device needs to be disabled in certain cases. It is designed for users to simply turn off the peripheral power and then turn it on to make the peripheral working again. Please contact sales if you need the software API. The following are the connectors that can be controlled.

Function	Connector	Software Mapping
USB 3.0	CN6(A.B)	bit_0
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Remarks:
This feature is only available on the next board version – IB811LF USB 3.0A.

FORTEC
GROUP

Our company network supports you worldwide with offices in Germany, Austria, Switzerland, the UK and the USA. For more information please contact:

Headquarters

Germany

FORTEC GROUP

FORTEC Elektronik AG
Augsburger Str. 2b
82110 Germering

Phone: +49 89 894450-0
E-Mail: info@fortecag.de
Internet: www.fortecag.de

Fortec Group Members

Austria

FORTEC INTEGRATED

FORTEC Integrated GmbH Office Vienna
Nuschinggasse 12
1230 Wien

Phone: +43 1 8673492-0
E-Mail: info@fortec-integrated.de
Internet: www.fortec-integrated.de

Germany

FORTEC INTEGRATED

FORTEC Integrated GmbH
Augsburger Str. 2b
82110 Germering

Phone: +49 89 894363-0
E-Mail: info@fortec-integrated.de
Internet: www.fortec-integrated.de

Switzerland

FORTEC SWITZERLAND

FORTEC Switzerland AG
Bahnhofstraße 3
5436 Würenlos

Phone: +41 44 7446111
E-Mail: info@fortec.ch
Internet: www.fortec.ch

United Kingdom

FORTEC UNITED KINGDOM

FORTEC Technology UK Ltd.
Osprey House, 1 Osprey Court
Hinchingbrooke Business Park
Huntingdon, Cambridgeshire, PE29 6FN

Phone: +44 1480 411600
E-Mail: info@fortec.uk
Internet: www.fortec.uk

USA

FORTEC UNITED STATES

FORTEC US, Corp.
87 Raynor Avenue, Unit 1
Ronkonkoma, NY 11779

Phone: +1 631 5804360
E-Mail: info@fortec.us
Internet: www.fortec.us