SI-613
Book-Size Digital Signage Player

User's Manual

Version 1.0b
(May 2018)

iBASE

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Trademarks

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Compliance

CE

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)

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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.
- Use this product in environments with ambient temperatures between 0˚C and 45˚C (CPU TDP ≤ 45W), or between 0˚C and 40˚C (CPU TDP = 65W).
- DO NOT LEAVE THIS DEVICE IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY IS BELOW -20° C OR ABOVE 80° 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. Doing so could generate hazards and cause damage to the device, even bodily injury or property damage, and will void any warranty.

CAUTION

There is 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, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

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

Technical Support & Services

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

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

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

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Table of Contents

Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Overview
- Dimensions

1.1 Introduction

SI-613, a product code of IBASE digital signage player series, is a mid-range system with iSMART and capable of auto-scheduling for general applications. It is slim with a segregated ventilation design. The device is designed with the Intel® 6th Gen. Core™ processor, and outputs through HDMI 4K ultra high definition video playback at 60 Hz. The device is able to be operated at the ambient operating temperature ranging from 0 ~ 45 °C (CPU TDP ≤ 45W), and even lower from -20 ~ 80 °C for storage.

1.2 Features

- iSMART for auto-scheduler and power resume
- TPM 1.2, and watchdog timer
- Intel® 6th Gen. Core™ processor with H170 co-lay Q170
- Integrated Intel® HD Graphics 530
- Display via HDMI 2.0 (3 ports) for 4K at 60 Hz with EDID emulation
- Gigabit Ethernet & RS-232 COM port
- Dual DDR4 SO-DIMM, 2133 MHz at 1.2V, expandable up to 32 GB
- WiFi networks, Bluetooth, and SIM card slot
- iAMT 11.0 with vPro for SI-613-QT
- Options of 4G LTE or TV tuner
- Slim and segregated ventilation design

1.3 Packing List

Your SI-613-N 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.

- SI-613 Digital Signage Player x 1
- Power Adapter x 1
- Power Cord x 1

1.4 Optional Accessories

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

- WiFi Cable Kit

1.5 Specifications

Product	SI-613	SI-613-QT
System		
Mainboard	MBD613	
Operating System	Windows 7 / 8.1 / 10	
CPU	Intel® 6 Gen. Core™ processor with TDP up to 65W LGA1151 (socket H4)	
Chipset	H170	Q170
Cache	Up to 8 MB	
Memory	2 x DDR4 SO-DIMM 4GB 2133 MHz, expandable up to 32GB	
Graphics	Integrated Intel® HD Graphics 530	
Super I/O	Fintek F81846AD	
Storage	• 1 x NGF M.2 (3042) B key • 1 x NGFF M.2 (2280) M key	
Power Requirement	12V DC-in	
Power Supply	150W power adapter	
Wireless	WiFi module 802.11 a/b/g/n (Optional)	
Watchdog	Watchdog Timer 256 segments, 0, 1, 2…255 sec/min	
iSMART	V3.x	
iAMT	N/A	iAMT 11.0
TPM	N/A	Yes
System Fan	1 x CPU fan	
Chassis	Aluminum and SGCC, black & white	
Mounting	Slim design with wall mount holes	
Dimensions (W x H x D)	215.6 x 40 x 215.6 mm (8.49” x 1.57” x 8.49”)	
Net Weight	2.2 kg (4.85 lb)	
Certificate	CE, FCC, cULus, CCC	
I/O Ports		
HDMI	3 x HDMI 2.0 (4K at 60 Hz)	
LAN	1 x GbE RJ45	
Serial	1 x RJ45 for COM port (RS-232)	

USB	• 2 x USB 3.0 • 2 x USB 2.0
Audio Jack	1 x Line-Out 1 x Microphone Input
Power Jack	1 x DC-in power jack
Expansion	• 1 x M.2 (3042) B Key with PCIe (x2) for storage / WiFi / BT / 4G LTE options • 1 x M.2 (2280) M Key with SATA & PCIe (x4) • 1 x Mini-PCIe (x1) for WiFi / BT / TV tuner / 4G LTE options • 1 x SIM card slot
Environment	
Temperature	• **Operating:** CPU TDP ≤ 45W: 0 ~ 45 °C (32 ~ 113 °F) CPU TDP = 65W: 0 ~ 40 °C (32 ~ 104 °F) • **Storage:** -20 ~ 80 °C (-4 ~ 176 °F)
Relative Humidity	5 ~ 90% at 45 °C (non-condensing)
Vibration Protection	M.2: Operating, random vibration 5 grms (5~500Hz)

All specifications are subject to change without prior notice.

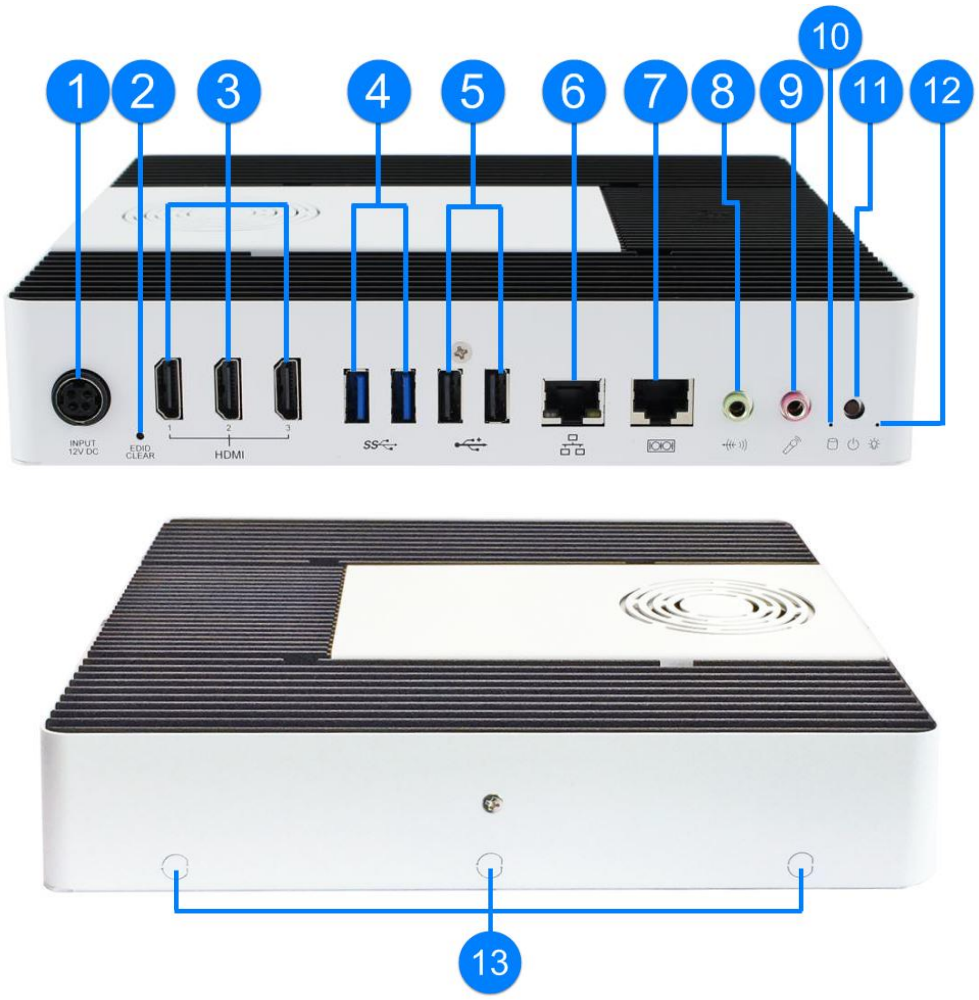
Note: The product performance relies on the system functioning as a whole. The level of CPU/APU/GPU processor, the interaction among the processor and the memory and storage bandwidth, or the functionality of the digital signage application software may affect the product performance.

1.6 Overview

Top View

Oblique View

I/O View

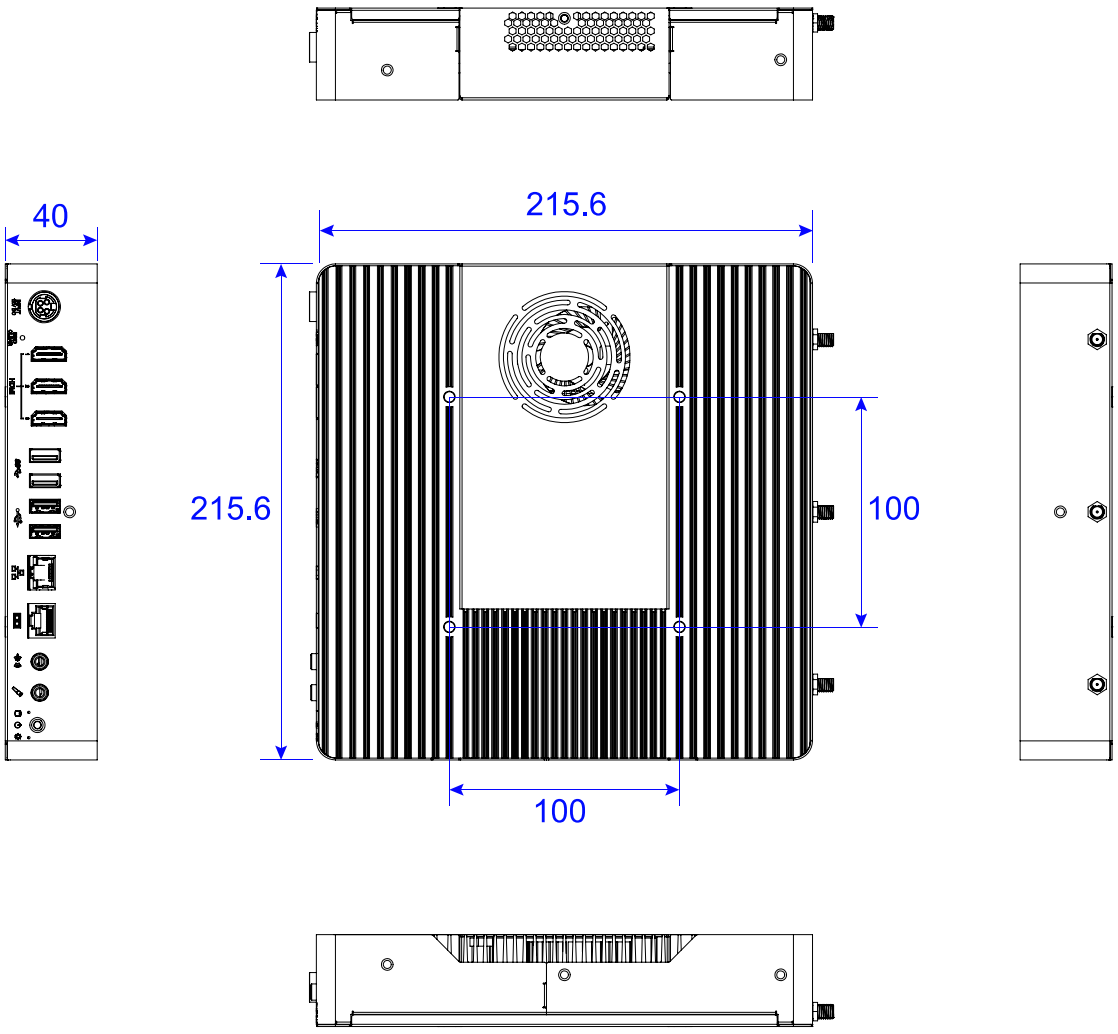


No.	Name	No.	Name
1	DC Power Input	8	Audio Line-Out
2	EDID Clearance Button*	9	Microphone Input
3	HDMI 2.0 Port	10	LED Indicator for HDD
4	USB 3.0	11	Power Button
5	USB 2.0	12	LED Indicator for Power
6	LAN Port	13	Antenna Hole
7	COM Port		

* Be sure to press the EDID Clearance Button shortly so as to clear the EDID register when you replace the display/monitor, when the connected display/monitor is unable to be recognized, or when the image displayed cannot not be resampled to fit the screen.

1.7 Dimensions

Unit: mm



Chapter 2
Hardware Installation & Motherboard Information

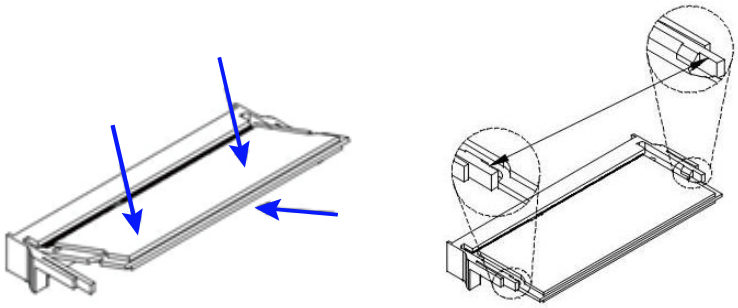
The information provided in this chapter includes:

- Installation of memory, M.2 and mini PCIe card
- Information and locations of connectors

2.1 Essential Installation Before You Begin

2.1.1 Memory Installation

There are two SO-DIMM DDR4 memory slots inside SI-613 for a maximum total memory of 32 GB. If you need to install or replace a memory module, locate the memory slot inside the device and perform the following steps.



1. Align the key of the memory module with that of 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.

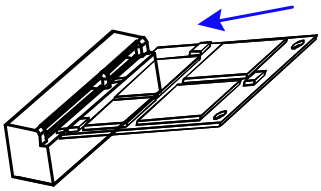
To remove the module, press the clips outwards with both hands.

2.1.2 Mini-PCIe & M.2 Network Cards Installation

If you need to replace or install the mini PCIe or M.2 card, locate the mini-PCIe slot inside the device and perform the following steps.

1. Align the key of the mini-PCIe card to the mini-PCIe interface, and insert the card slantwise.

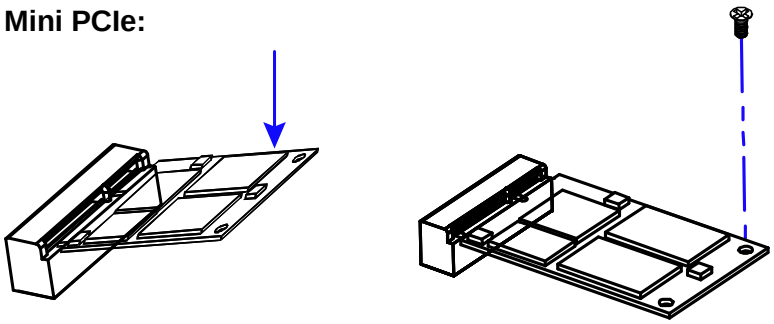
   (Insert the M.2 network card in the same way.)



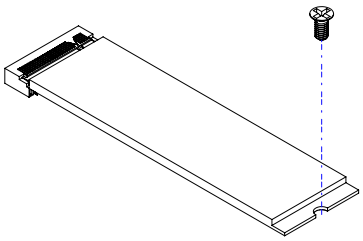
2. Push the mini-PCIe card down and fix it with the an M2 screw.

   (Fix the M.2 network card with an M3 screw.)

Mini PCIe:



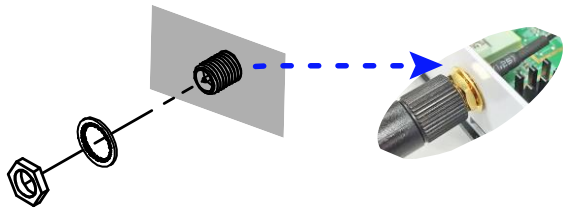
M.2:



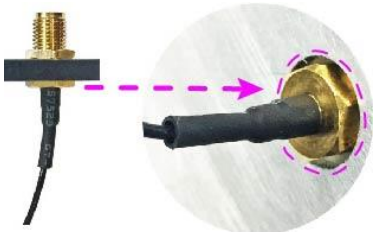
2.1.3 WiFi / 3G / 4G Antenna Installation

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.



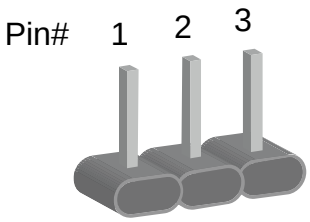
Info: The diameter of the nut is around 6.35 mm (0.25”-36UNC).

2.2 Setting the Jumpers

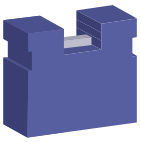
Set up and configure your SI-613 by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

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.

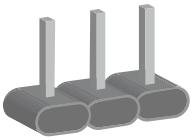
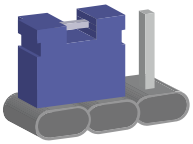
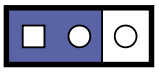
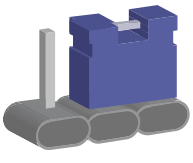
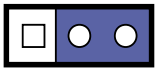


A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

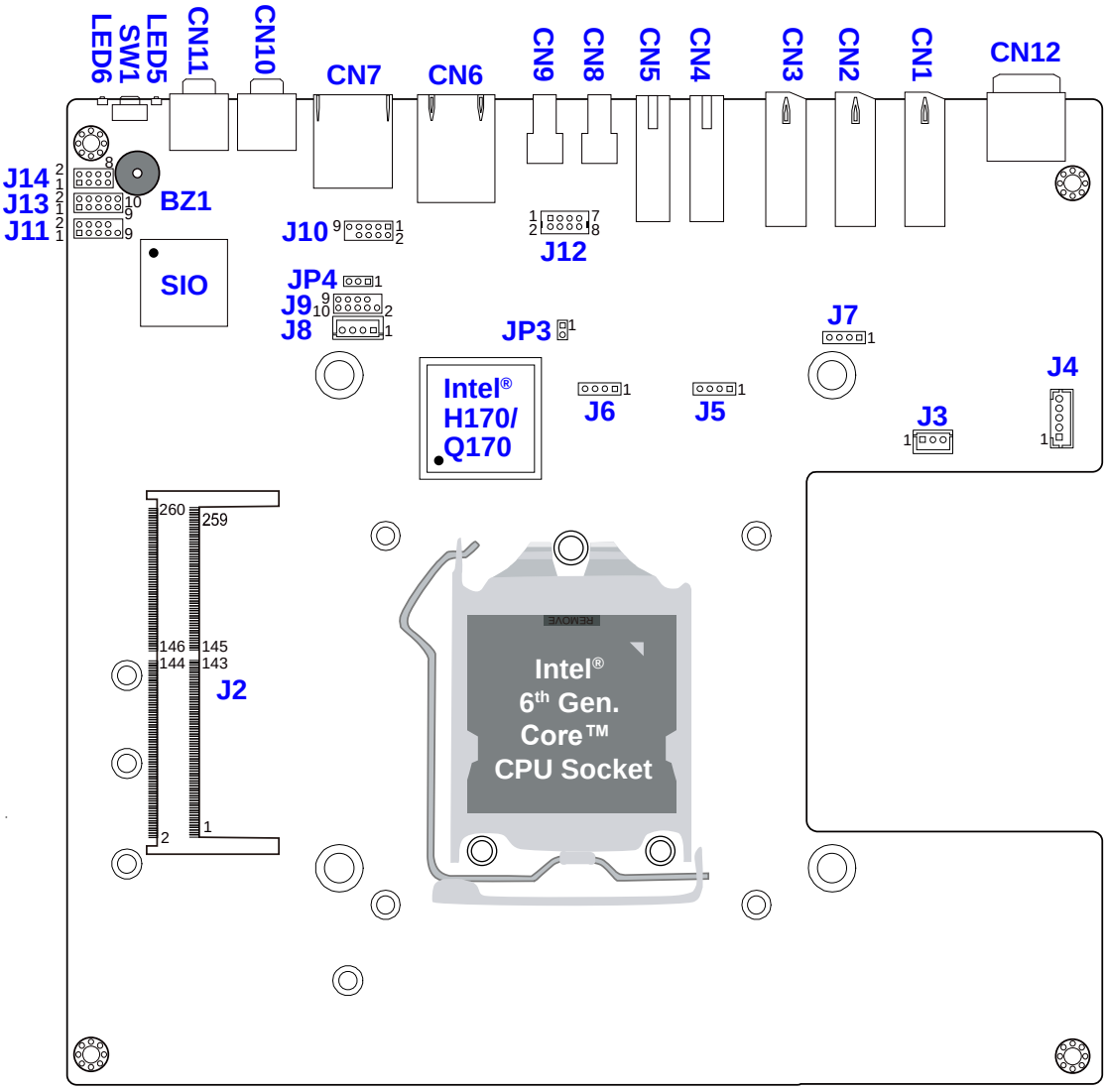
Pin closed	Oblique view	Schematic illustration in the manual
Open		
1-2		
2-3		

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

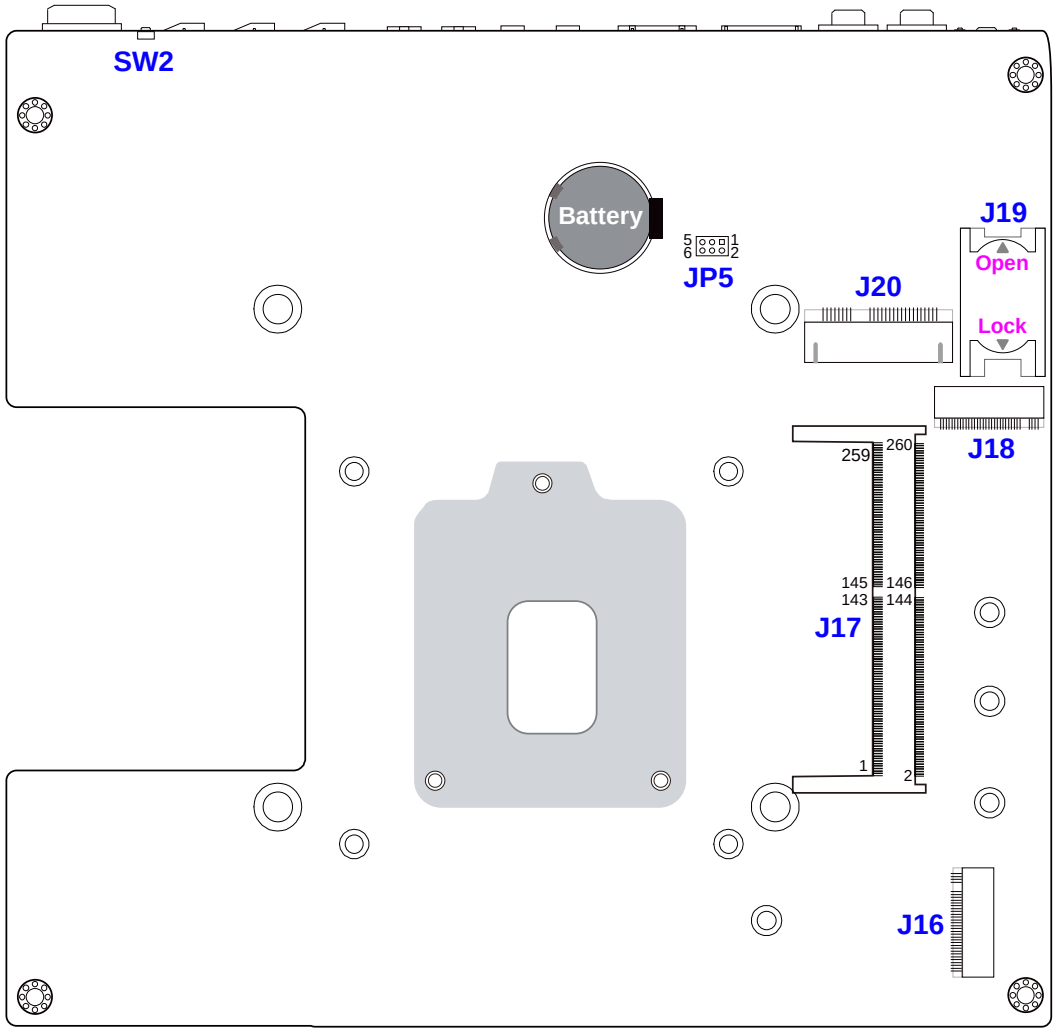
When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations on Motherboard

Motherboard: MBD613



MBD613 - top



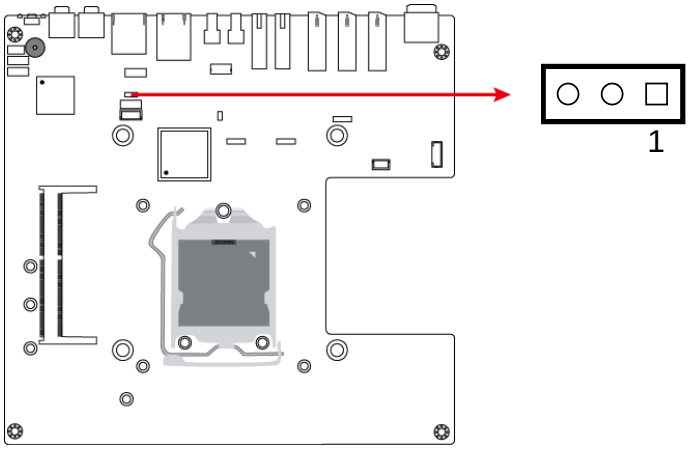
MBD613 - bottom

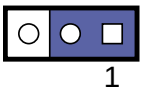
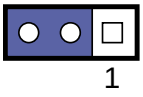
2.4 Jumpers Quick Reference

Jumper:

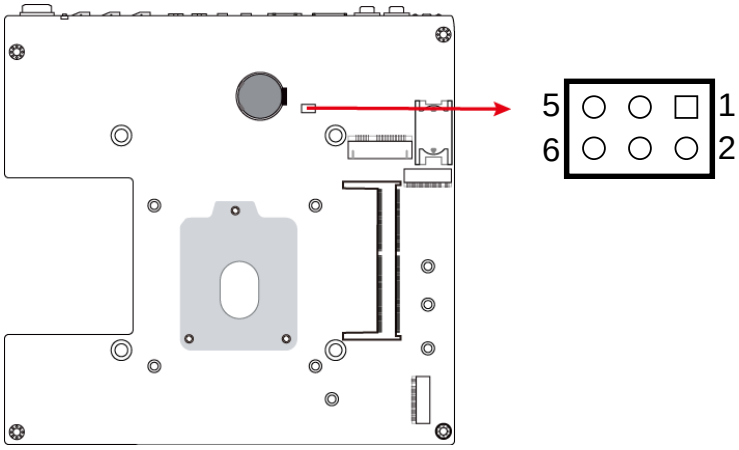
Function	Connector Name	Page
AT / ATX Power Mode Connector	JP4	16
CMOS Data & RTC Clearance	JP5	17

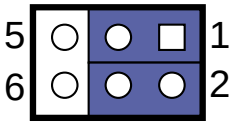
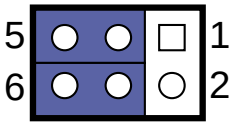
2.4.1 AT / ATX Power Mode Connector (JP4)



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

2.4.2 CMOS Data & RTC Clearance (JP5)



Function	Pin closed	Illustration
Normal (default)	1-3 (CMOS) 2-4 (RTC)	
Clear CMOS & RTC	3-5 (CMOS) 4-6 (RTC)	

2.5 Connectors Quick Reference

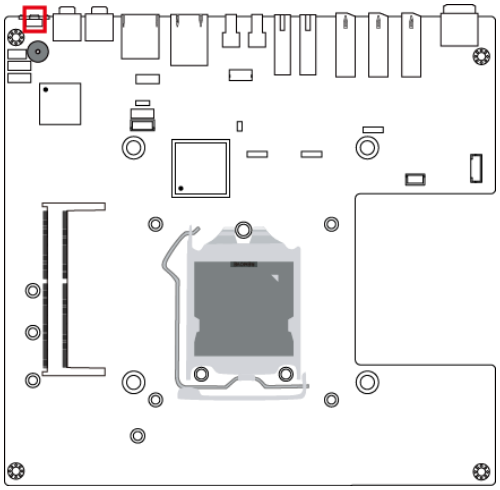
I/O coastline connectors:

Function	Connector Name	Page
Power Button	SW1	19
EDID Clearance Button	SW2	19
LED Indicator	LED5 (Green, for HDD) LED6 (Red, for Power)	20
DC Power Input	CN12	20
HDMI 2.0 Port	CN1,CN2,CN3	21
LAN Port (GbE)	CN6	21
USB 3.0 Port	CN4, CN5	21
USB 2.0 Port	CN8,CN9	22
COM1 Port	CN7	22
Audio Jack	CN10 (Line-out) CN11 (Microphone Input)	23

On-board connectors:

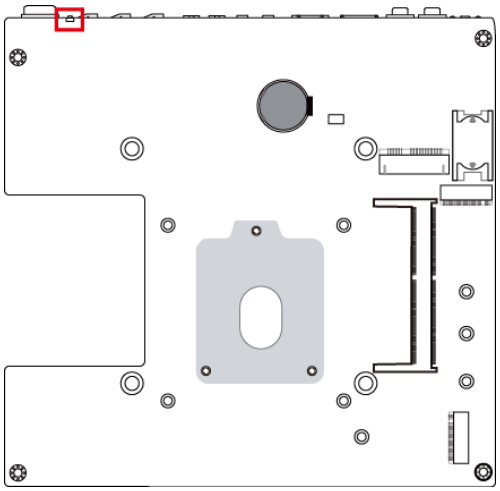
Function	Connector Name	Page
CPU Fan Power Connector	J3	24
USB 2.0 Ports Header	J12	24
COM2 RS232 Port	J10:	25
System Function Connector	J14	25
SIM Card Socket	J19	26
Digital I/O Header	J13	26
NGFF M.2 Connector	J16 (B-KEY 3042) J18 (M-KEY 2280)	27
Mini PCIE Connectors	J20	28
DDR4 SO-DIMM	J2, J17	28
Factory Use Only	J4, J5, J6, J7, J8, J9, J11	--

2.5.1 Power Button (SW1)

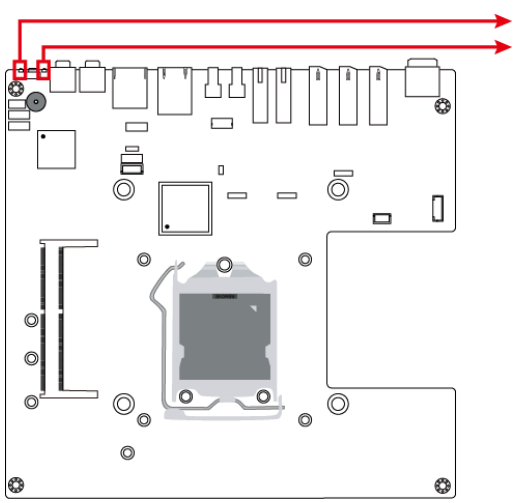


2.5.2 EDID Clearance Button (SW2)

Note: Be sure to press this button shortly so as to clear the EDID register if any connected display/monitor is unable to be recognized, or when the image displayed cannot not be resampled to fit the screen.



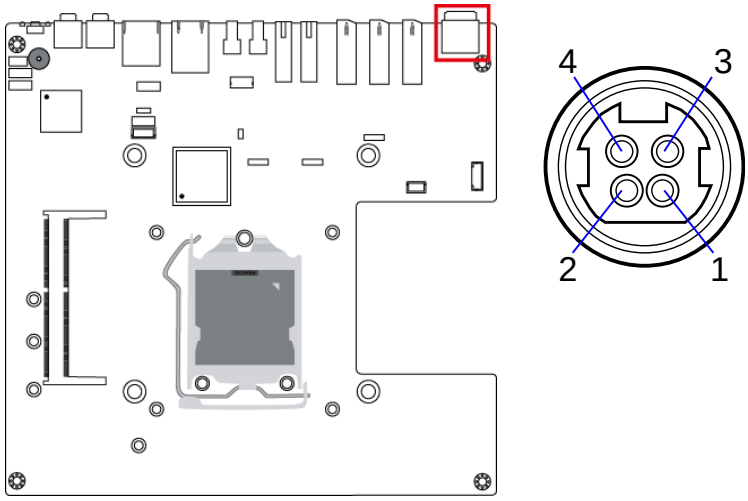
2.5.3 LED Indicators for HDD & Power (LED5, LED6)



LED5 is the green LED indicator for HDD. When HDD is being read, it blinks.

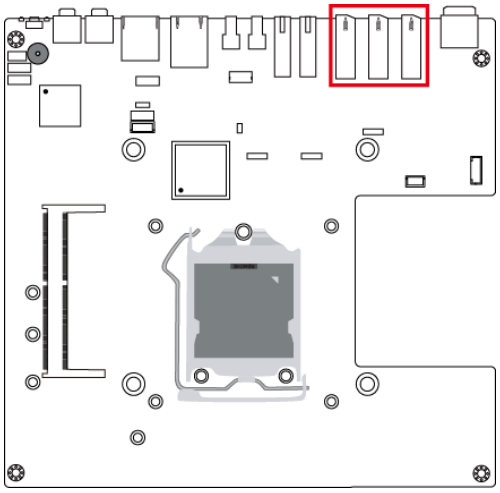
LED6 is the red LED indicator for power status. It stays on (not blinks) as the device is on.

2.5.4 DC Power Input (CN12)

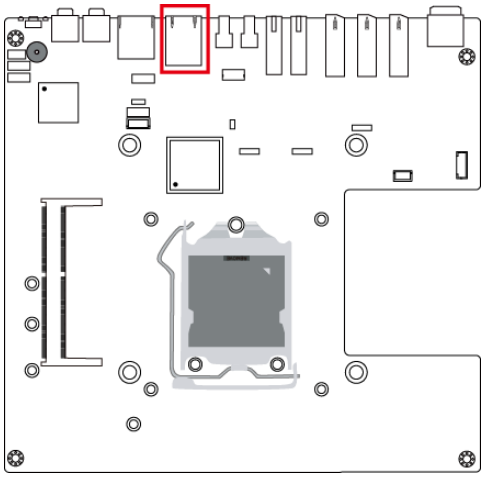


Pin	Assigment	Pin	Assigment
1	Ground	3	+12V
2	Ground	4	+12V

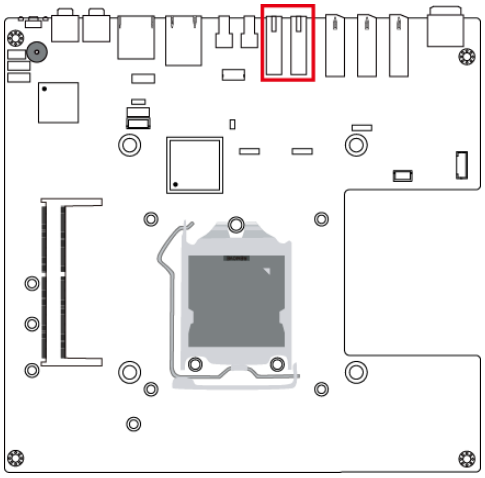
2.5.5 HDMI 2.0 Port (CN1, CN2, CN3)



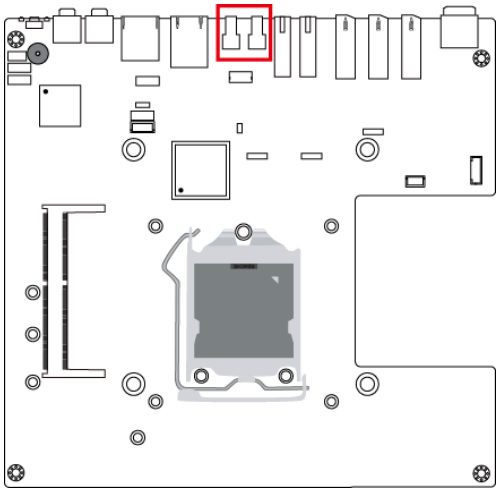
2.5.6 LAN Port (CN6)



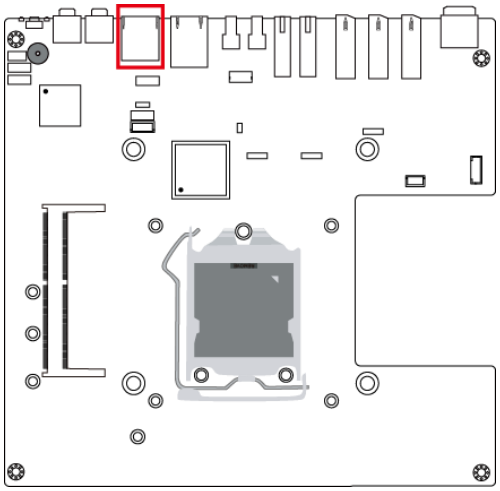
2.5.7 USB 3.0 Port (CN4, CN5)

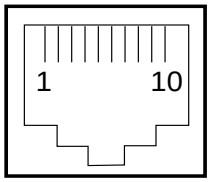


2.5.8 USB 2.0 Port (CN8, CN9)



2.5.9 COM1 Serial Port (CN7)

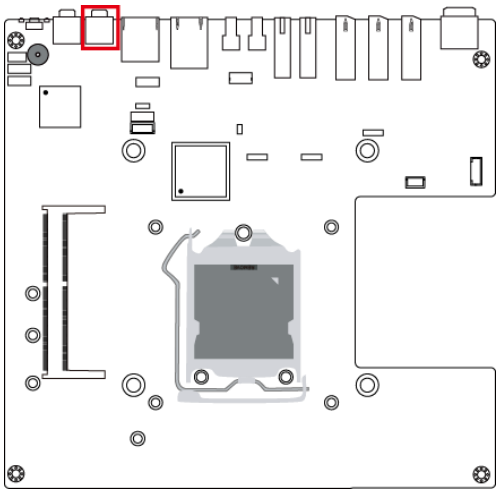




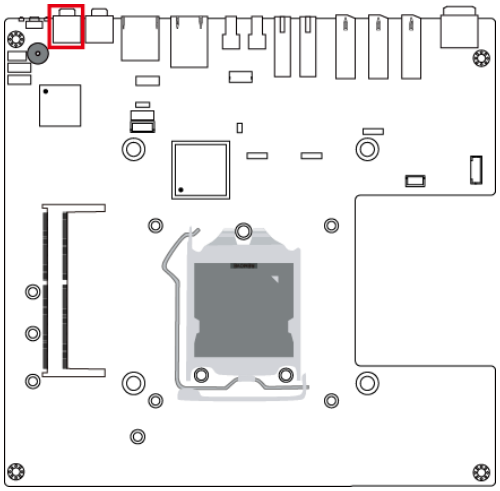
Pin	Assigment	Pin	Assigment
1	DSR	6	DCD
2	Ground	7	DTR
3	Ground	8	CTS
4	TX	9	RTS
5	RX	10	RI

2.5.10 Audio Jack (CN10, CN11)

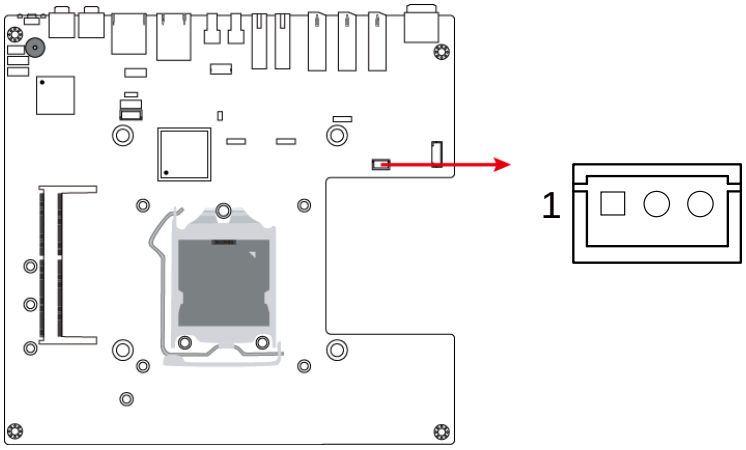
CN10: Line-out



CN11: Microphone Input

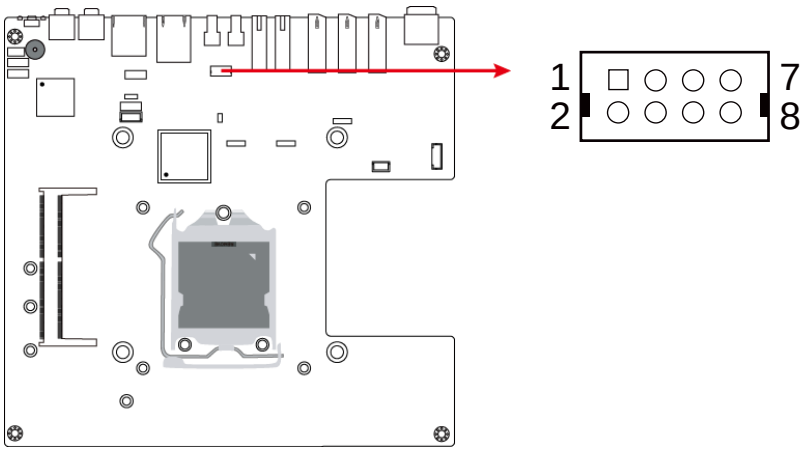


2.5.11 CPU Fan Power Connector (J3)



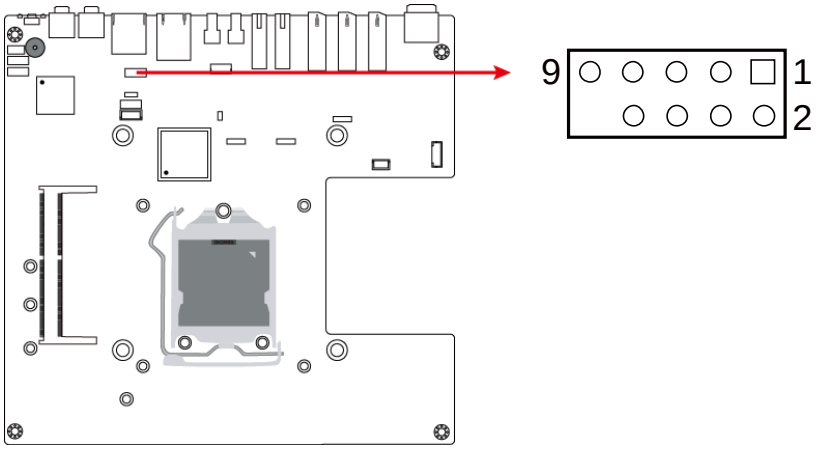
Pin	Assigment
1	Ground
2	+12V
3	Rotation detection

2.5.12 USB 2.0 Ports Header (J12)



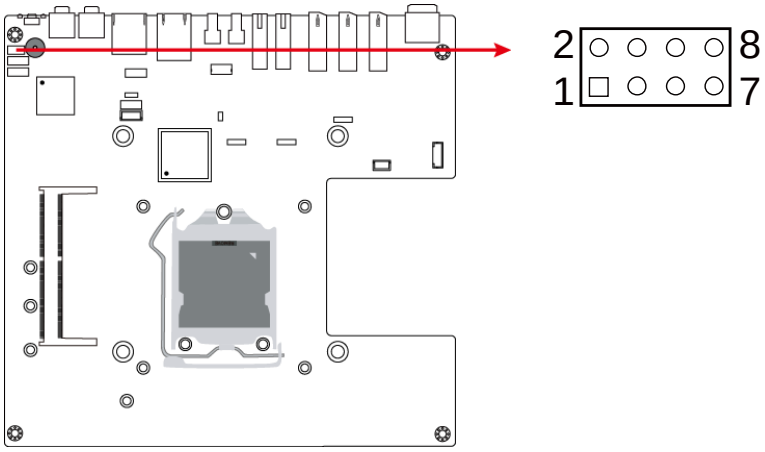
Pin	Assigment	Pin	Assigment
1	+5V	2	+5V
3	Data- (Port 1)	4	Data- (Port 2)
5	Data+ (Port 1)	6	Data+ (Port 2)
7	Ground	8	Ground

2.5.13 COM2 RS-232 Port (J10)



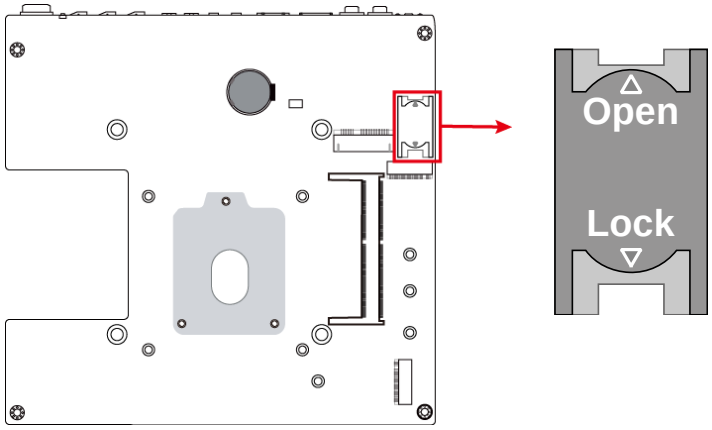
Pin	Assigment	Pin	Assigment
1	DCD (Data carrier detect)	2	DSR (Data set ready)
3	RXD (Receive data)	4	RTS (Request to send)
5	TXD (Transmit data)	6	CTS (Clear to send)
7	DTR (Data terminal ready)	8	RI (Ring indicator)
9	Ground		

2.5.14 System Function Connector (J14)

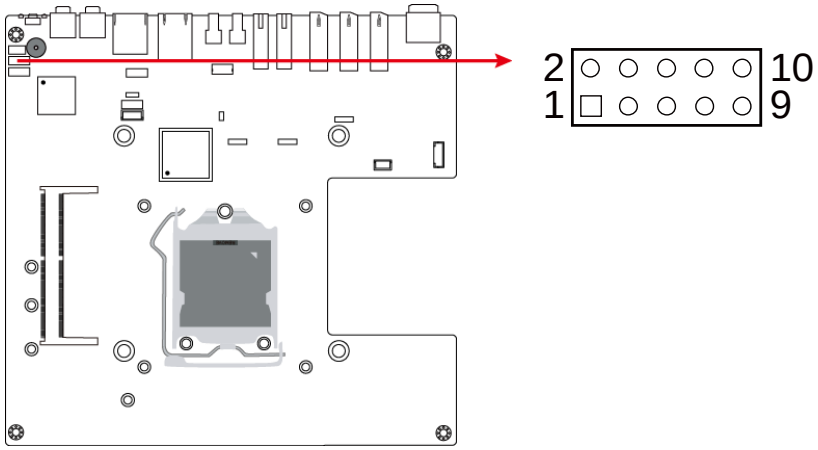


Pin	Assigment	Pin	Assigment
1	Power BTN	2	Power BTN
3	HDD LED+	4	HDD LED-
5	Reset BTN	6	Reset BTN
7	+5V	8	+5VSB

2.5.15 SIM Card Socket (J19)



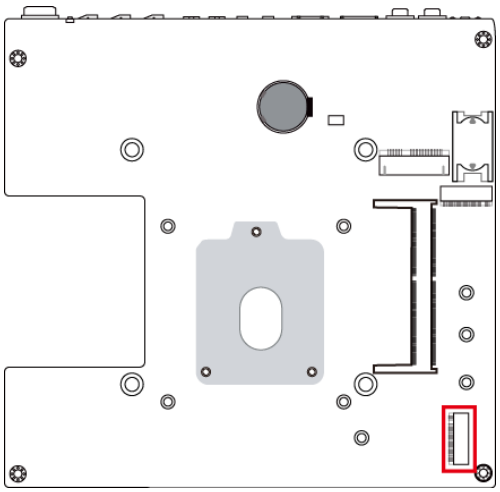
2.5.16 Digital I/O Connector (J13)



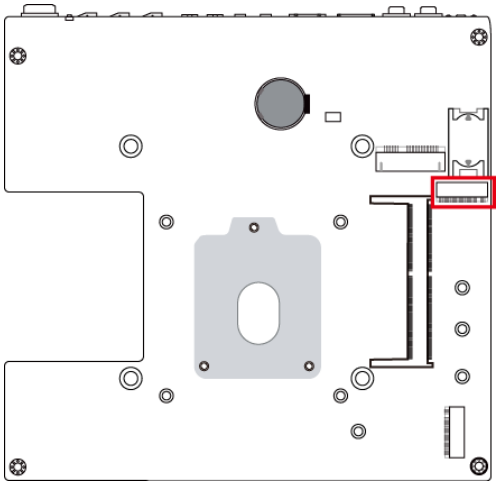
Pin	Assigmentd	Pin	Assigment
1	Ground	2	+5V
3	OUT3	4	OUT1
5	OUT2	6	OUT0
7	IN3	8	IN1
9	IN2	10	IN0

2.5.17 NGFF M.2 Connector (J16, J18)

J16 is a M.2 B-Key (3042) connector with PCIe (x2) , USB 2.0, USB 3.0, and SATA.

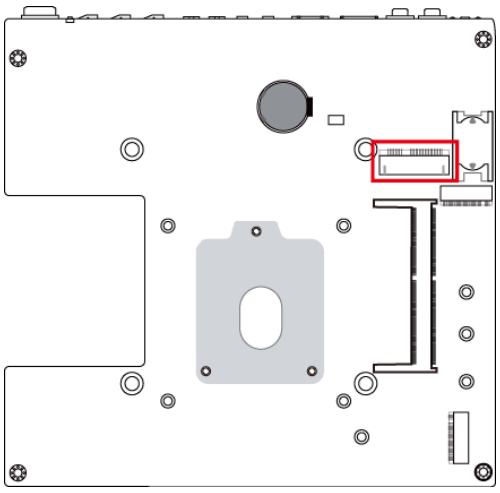


J18 is a M.2 M-Key (2280) connector with SATA and PCIe (x4).



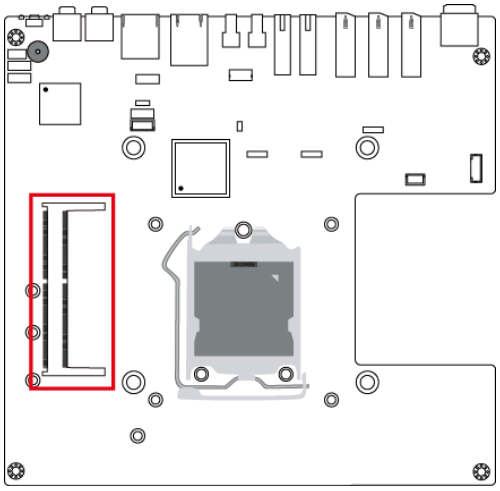
2.5.18 Mini PCIe Connector (J20)

J20 is a Mini PCIe connector with PCI-e, USB and SIM.

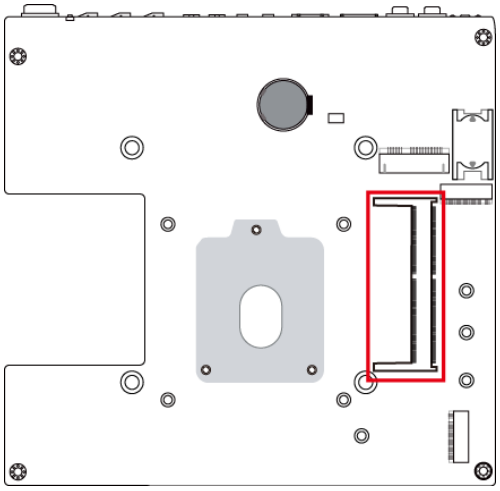


2.5.19 DDR4 SO-DIMM (J2, J17)

J2:



J17:



Chapter 3
Driver Installation

The information provided in this chapter includes:

- Intel® Chipset Software Installation Utility
- Intel® Graphics Driver Installation
- HD Audio Driver Installation
- LAN Driver Installation
- Intel® Trusted Execution Engine Installation
- USB 3.0 Driver Installation

3.1 Introduction

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

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

2. When the *Welcome* screen to the Intel® Chipset Device Software appears, click **Next** to continue.

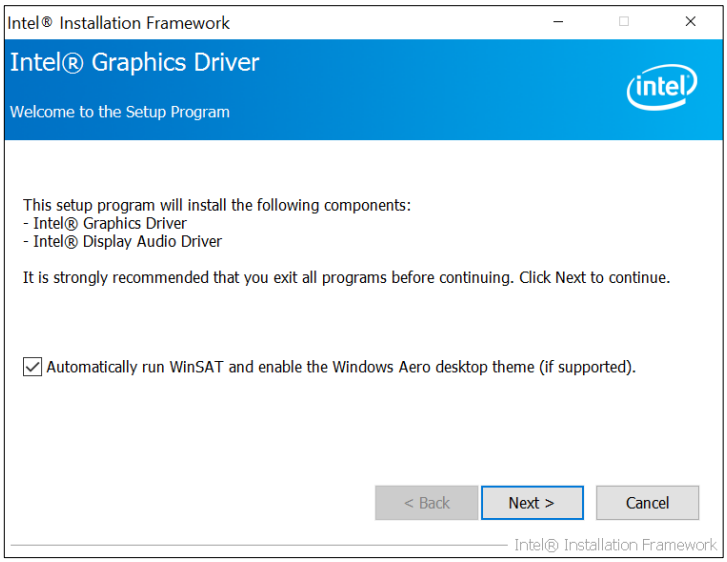
3. Accept the license agreement and proceed with the installation process.

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

3.3 Intel® Graphics Driver Installation

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

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



3. Click **Yes** to agree with the license agreement and continue the installation.

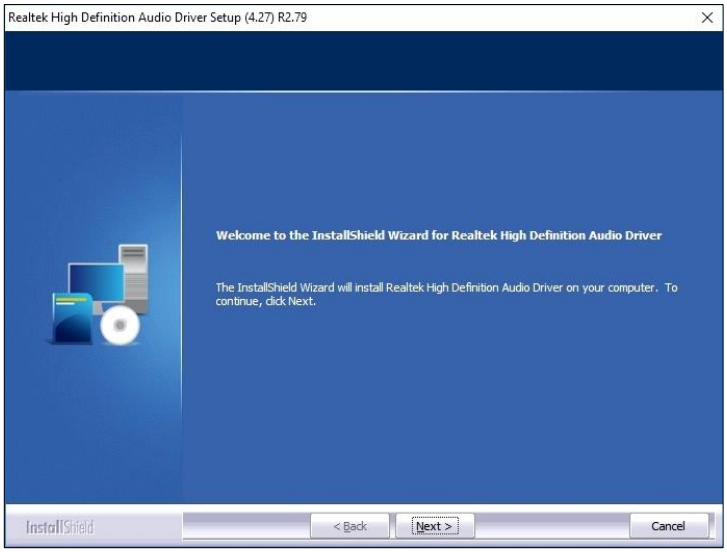
4. On the *Readme File Information* screen, click **Next** for installation.

5. The driver has been completely installed. Restart the computer for changes to take effect.

3.4 HD Audio Driver Installation

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

2. On the *Welcome* screen of the InstallShield Wizard, click **Next** for installation.

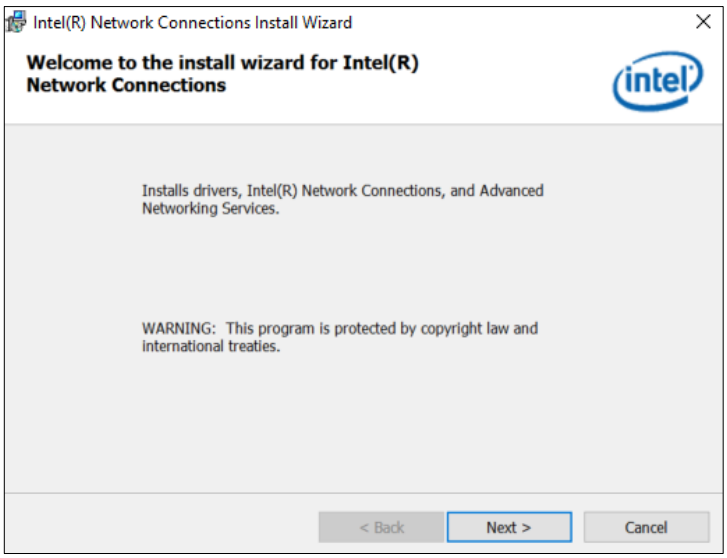


3. The driver has been completely installed. Restart the computer for changes to take effect.

3.5 LAN Driver Installation

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

2. On the *Welcome* screen of the InstallShield Wizard, click **Next** for installation.



3. Accept the license agreement and click **Next** to continue.

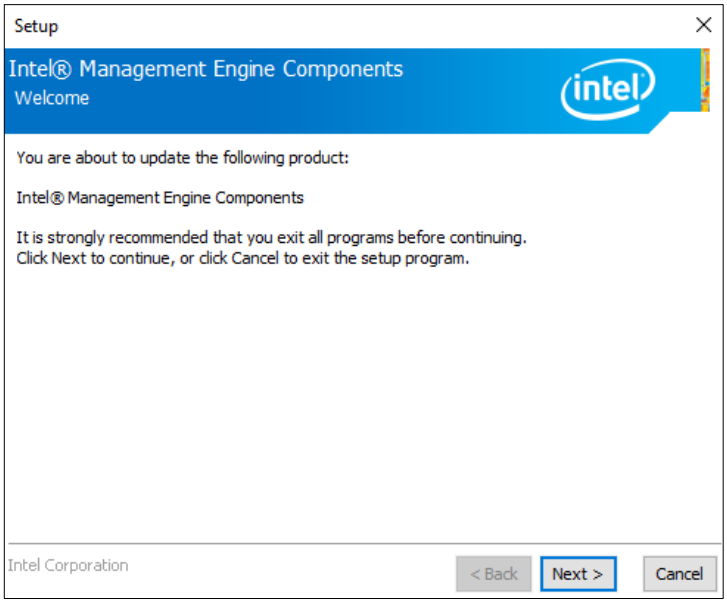
4. On the *Setup Options* screen, tick the checkbox to select the desired driver(s) and click **Next** for installation.

5. The driver has been completely installed. Restart the computer and for changes to take effect.

3.6 Intel® Management Engine Components Drivers Installation

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

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



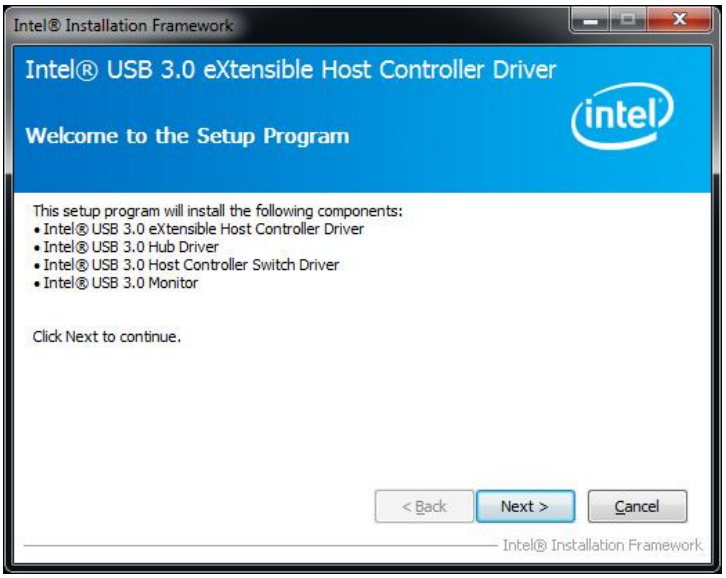
3. Accept the license agreement and click **Next** for installation.

4. The driver has been completely installed. Restart the computer and for changes to take effect.

3.7 Intel® USB 3.0 Driver Installation

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

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



3. Click **Yes** to agree with the license agreement.

4. On the *Readme File Information* screen, click **Next** for installation.

5. The driver has been completely installed. Restart the computer and for changes to take effect.

Chapter 4
BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

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

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives, serial ports and parallel ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Press the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still need to enter Setup, restart the system by pressing the ”Reset” button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

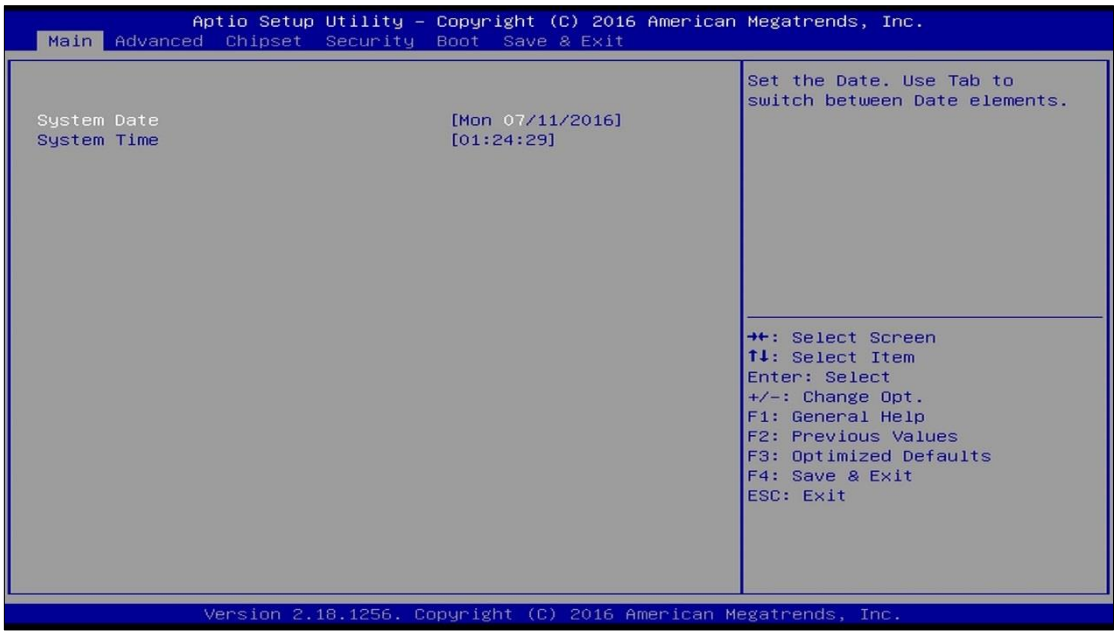
In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

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

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

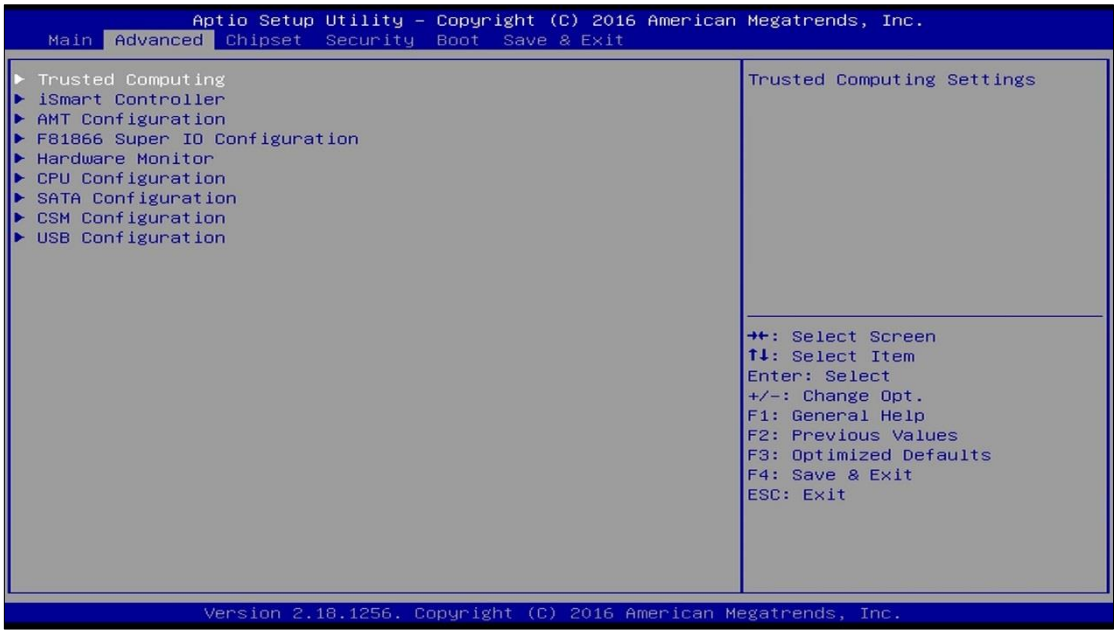
4.3 Main Settings



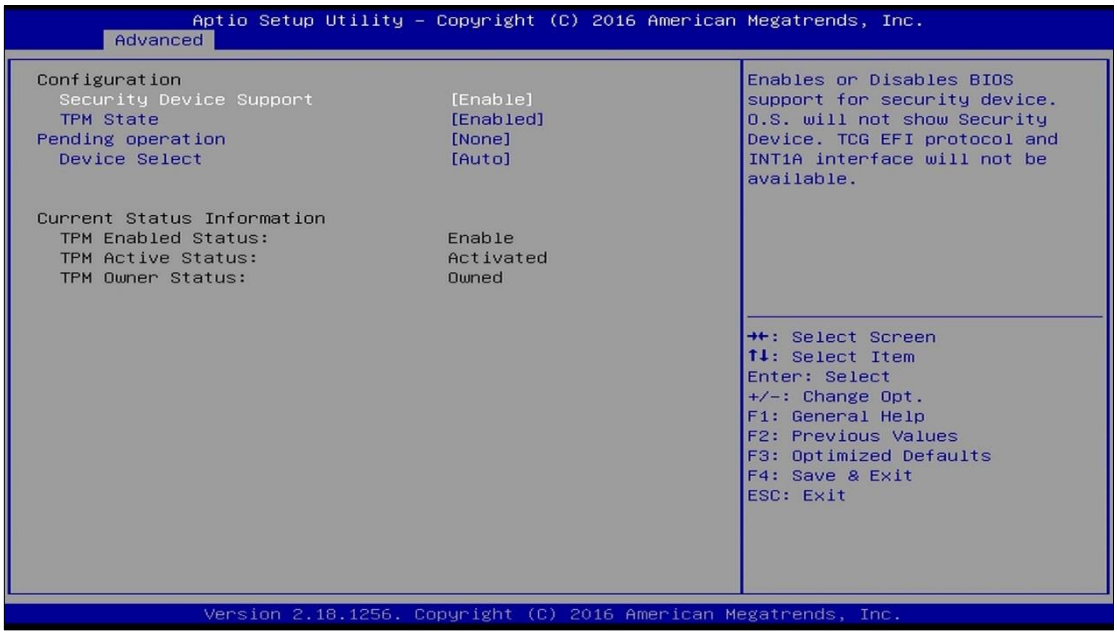
BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the data elements.
System Time	Set the time. Use the <Tab> key to switch between the data elements.

4.4 Advanced Settings

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

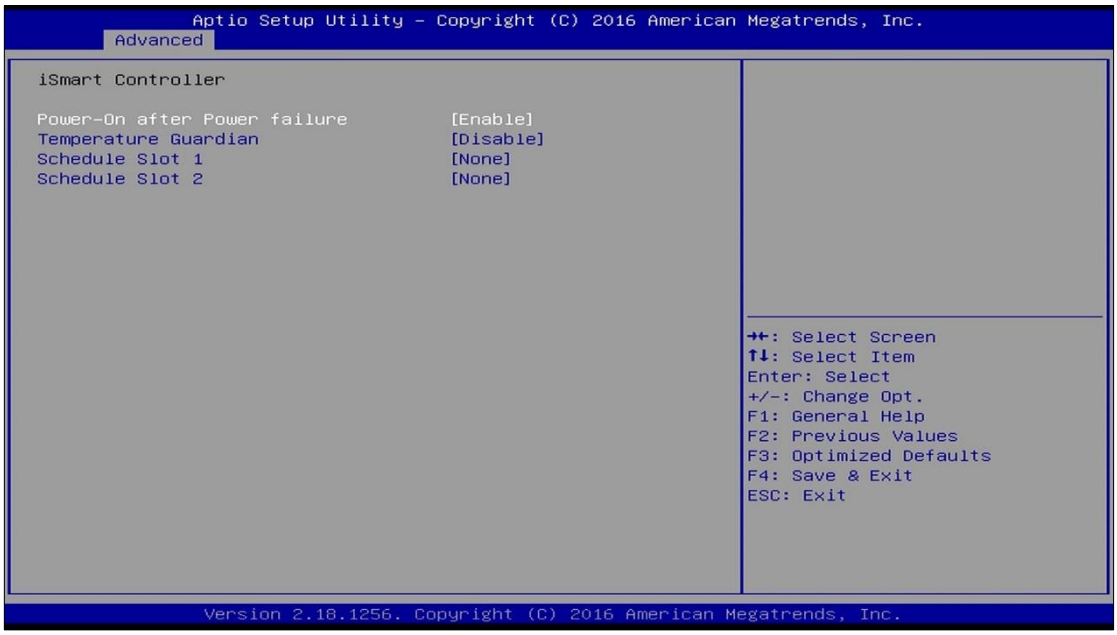


4.4.1 Trusted Computing



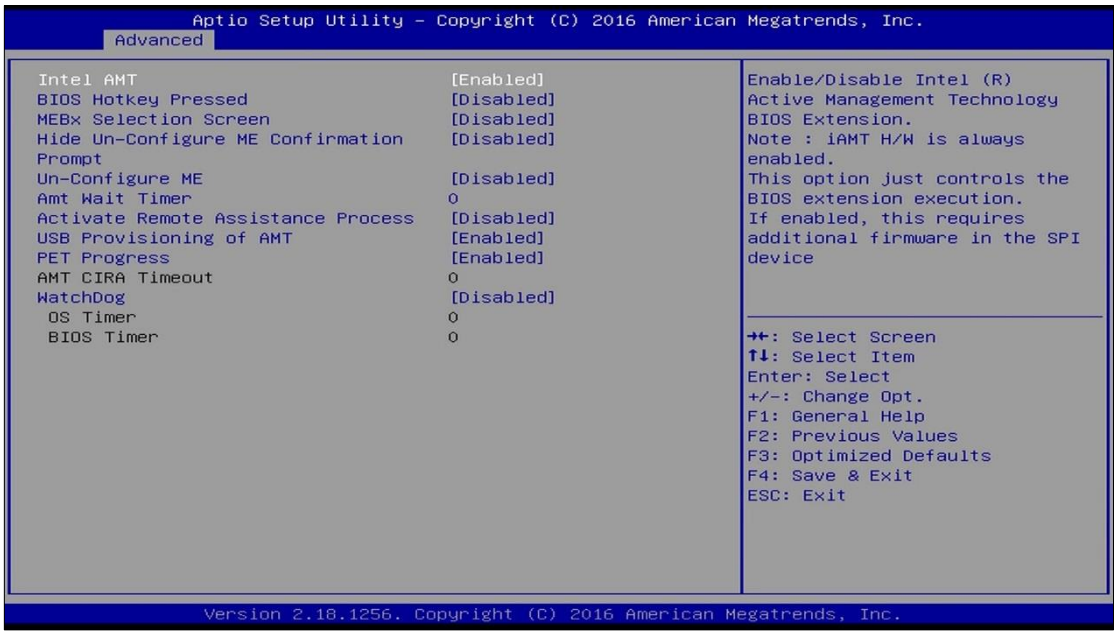
BIOS Setting	Description
Security Device Support	Enables / Disables BIOS support for security device. The operating system will not show security device. TCG EFI protocol and INT1A interface will not be available.

4.4.2 iSMART Controller



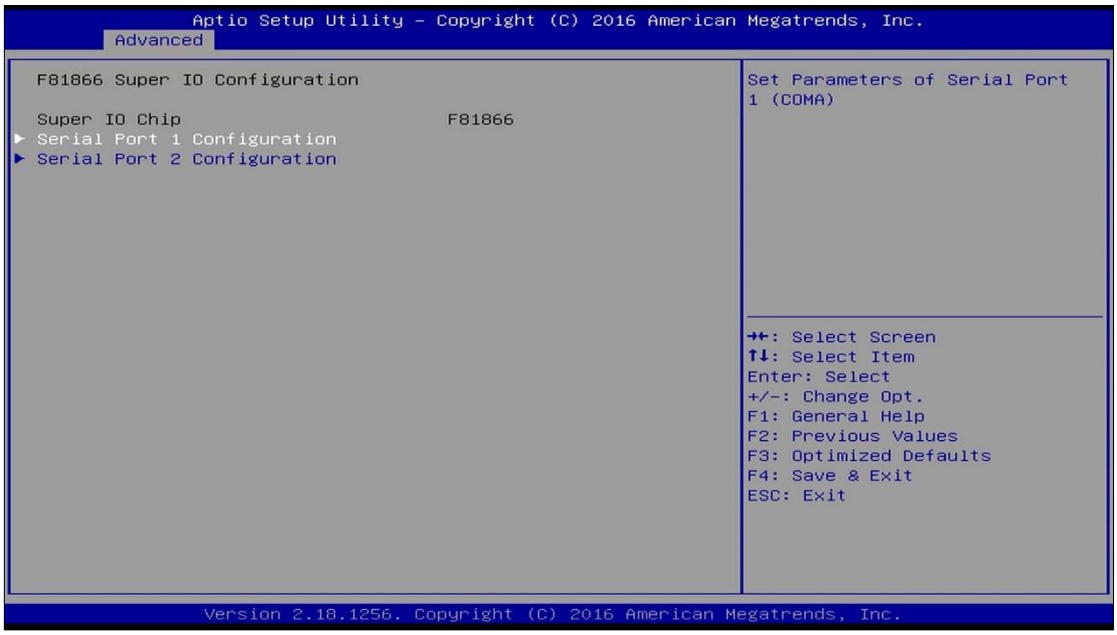
BIOS Setting	Description
Power-On after Power failure	Enables / Disables the system to be turned on automatically after a power failure.
Schedule Slot 1 / 2	Sets up the hour / minute for system powe-on. **Important:** If you would like to set up a schedule between adjacent days, configure two schedule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

4.4.3 AMT Configuration



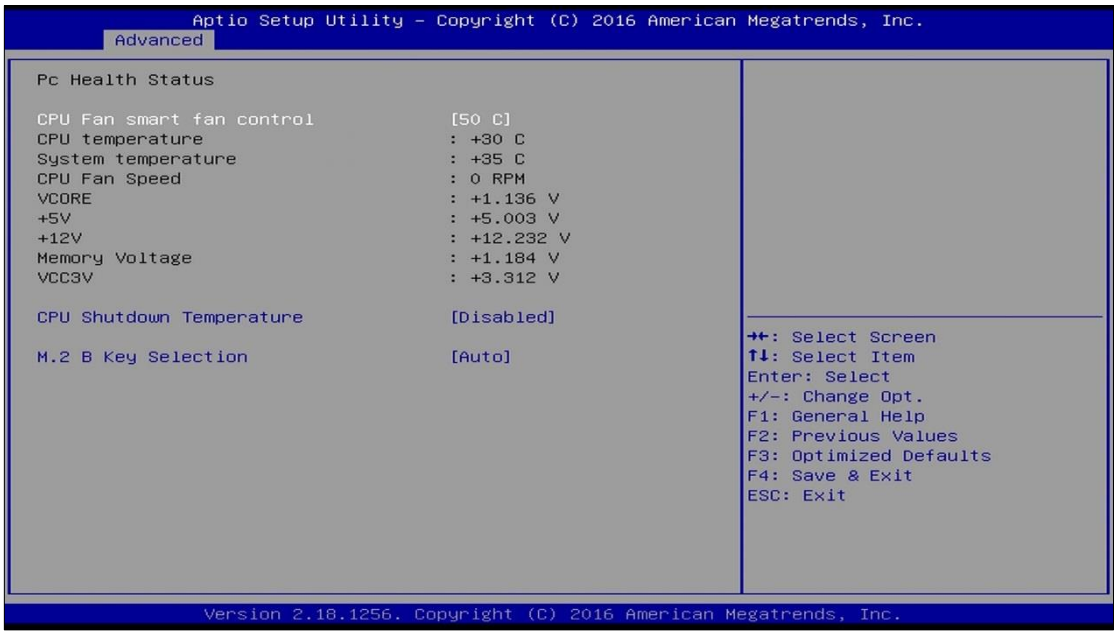
BIOS Setting	Description
Intel AMT	Enables / Disables Intel® Active Management Technology BIOS Extension. **Note:** iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, additional firmware in the SPI device will be required.
Unconfigure ME	Unconfigures AMT/ME without password operation.
Amt Wait Timer	Sets timer to wait before sending ASF_GET_BOOT_OPTIONS.
Activate Remote Assistance Process	Triggers CIRA boot.
PET Progress	Enables / Disables PET events progress to receive PET events.
Watchdog Timer	Enables / Disables Watchdog Timer.

4.4.4 Super IO Configuration



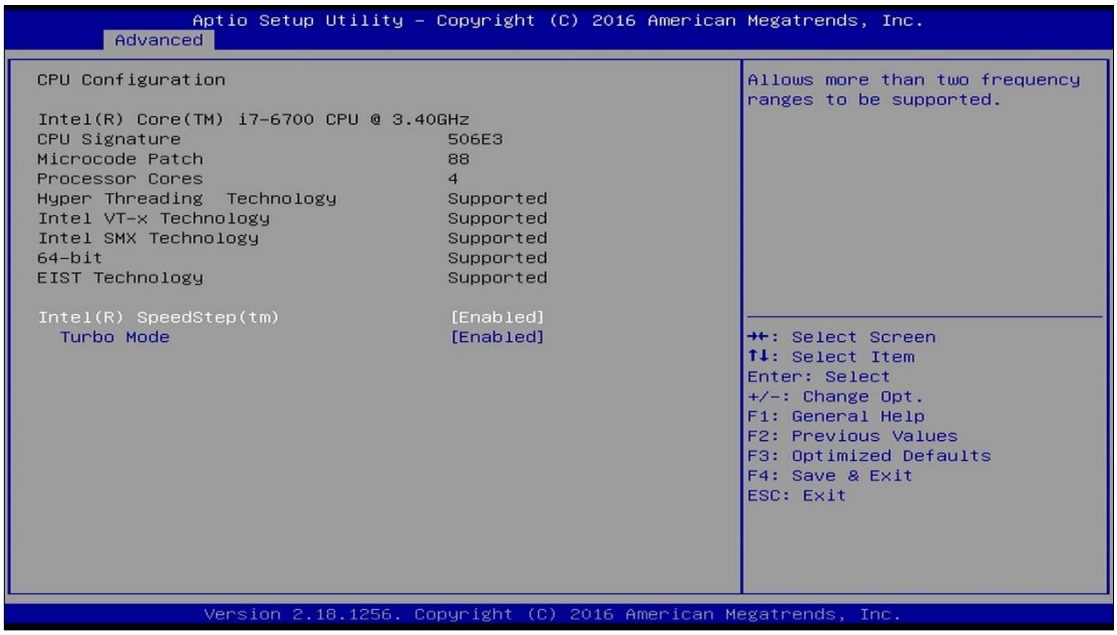
BIOS Setting	Description
Serial Port Configuration	Sets parameters of Serial Ports (COMA). Enables / Disables the serial port and select an optimal setting for the Super IO device.

4.4.5 Hardware Monitor



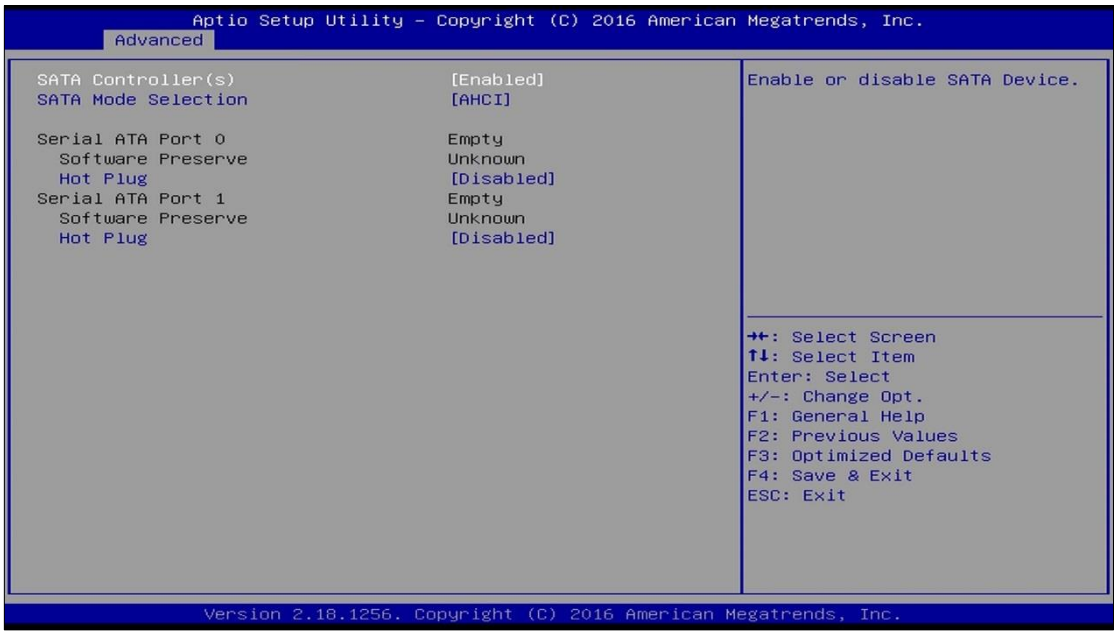
BIOS Setting	Description
CPU smart fan control	Enables / Disables the smart fan feature. Disabled (default) Options: 50 °C / 60 °C / 70 °C / 80 °C / 90 °C
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.
Shutdown Temperature	This field enables or disables the Shutdown Temperature

4.4.6 CPU Configuration



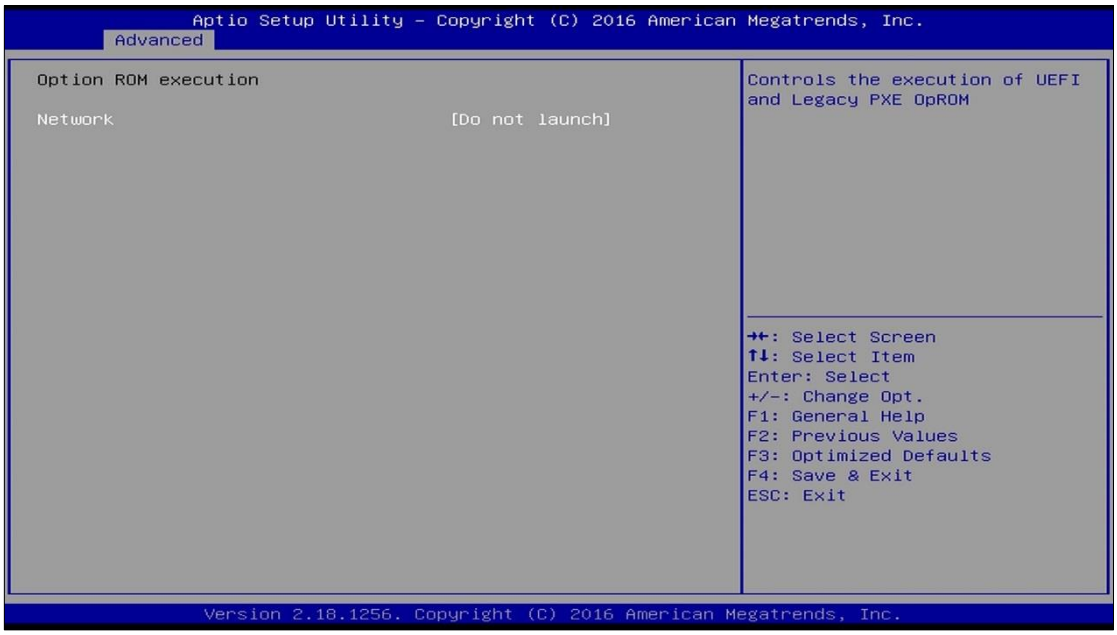
BIOS Setting	Description
Intel(R) SpeedStep(tm)	Supports more than two frquency ranges.

4.4.7 SATA Configuration



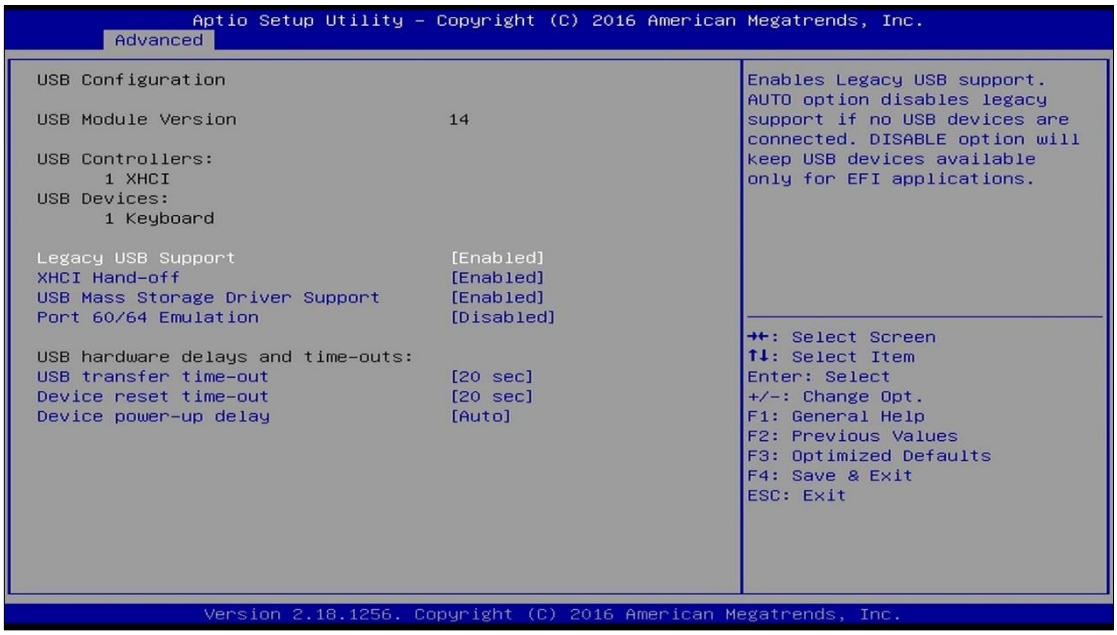
BIOS Setting	Description
SATA Controller(s)	Enables / Disables SATA devices.
SATA Mode Selection	Determines how the SATA controller(s) operate. Options: AHCI Mode / RAID Mode
Serial ATA Ports	Enables / Disables Serial Ports.
Hot Plug	Designates this port as Hot Pluggable.

4.4.8 CSM Configuration



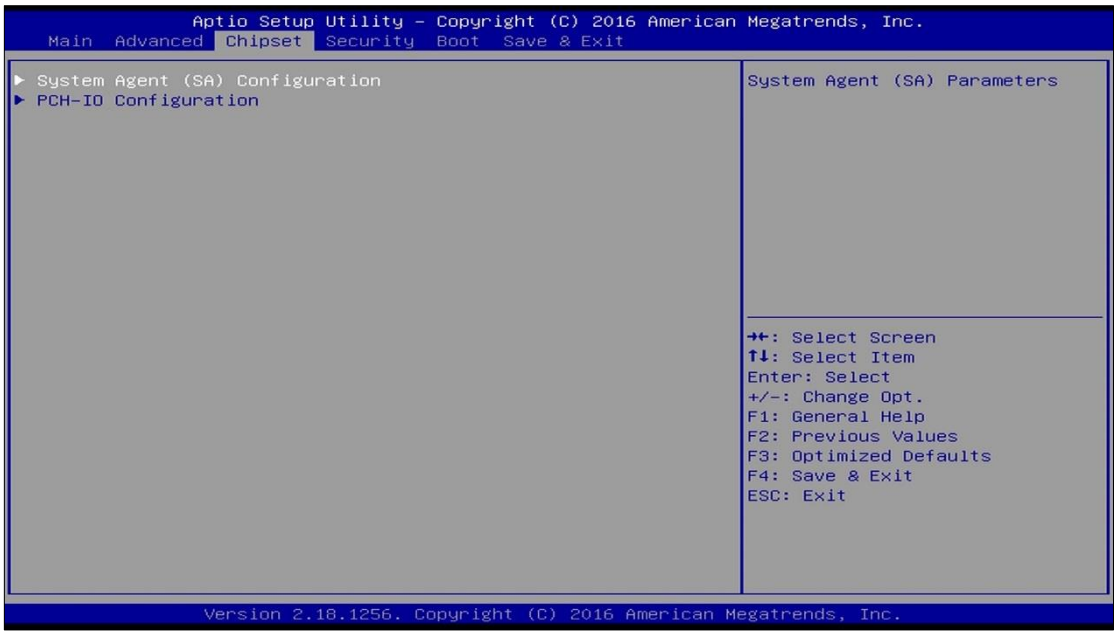
BIOS Setting	Description
Network SATA Controller(s)	Controls the execution of UEFI and legacy PXE OpROM.

4.4.9 USB Configuration



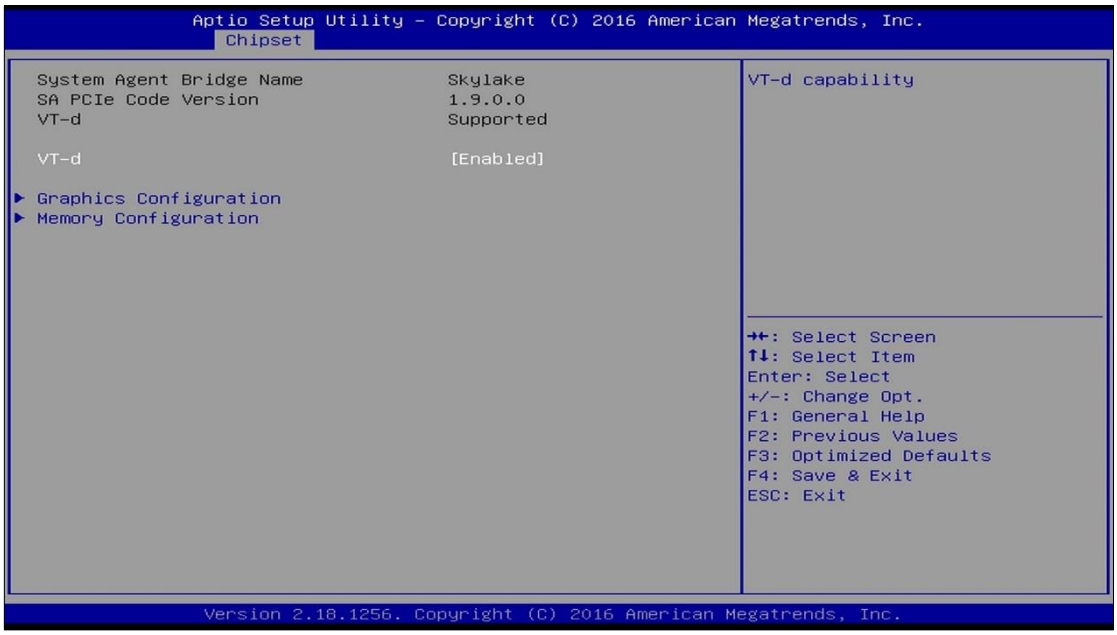
BIOS Setting	Description
Legacy USB SUpport	• **Enable:** Enables Ledacy USB Support. • **Auto:** Disables legacy support if no USB devices are connected. • **Disable:** Keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
Port 60/64 Emulation	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB Transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	Seconds of delaying execution of start unit command to USB mass storage device.
Device power-up delay	The maximum time the device will take before it properly reports itself to the Host Controller. “Auto” uses default value for a Root port it is 100ms. But for a Hub port, the delay is taken from Hub descriptor.

4.5 Chipset Settings



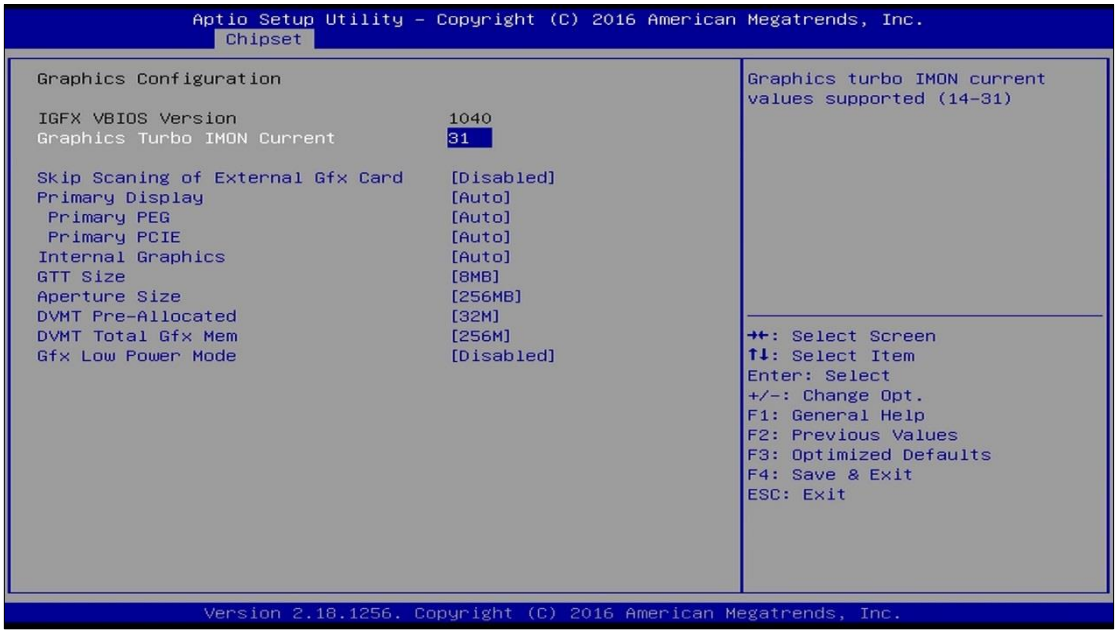
BIOS Setting	Description
System Agent (SA) Configuration	System Agent (SA) parameters
PCH-IO Configuration	PCH parameters

4.5.1 System Agent Bridge



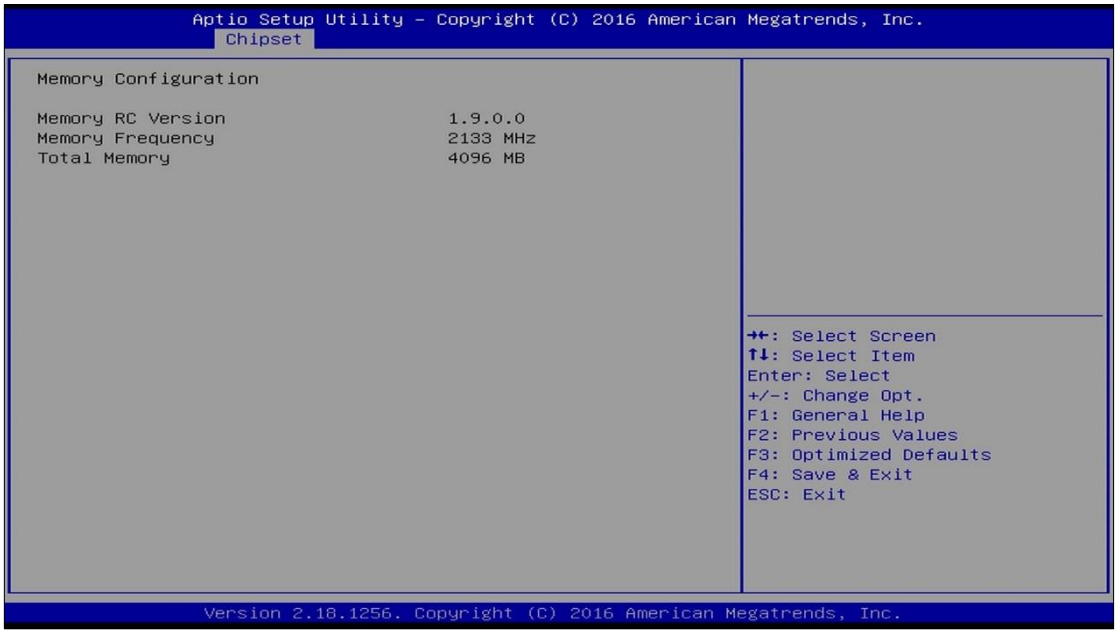
BIOS Setting	Description
VT-d	Checks if VT-d function on MCH is supported.

4.5.1.1. Graphics Configuration



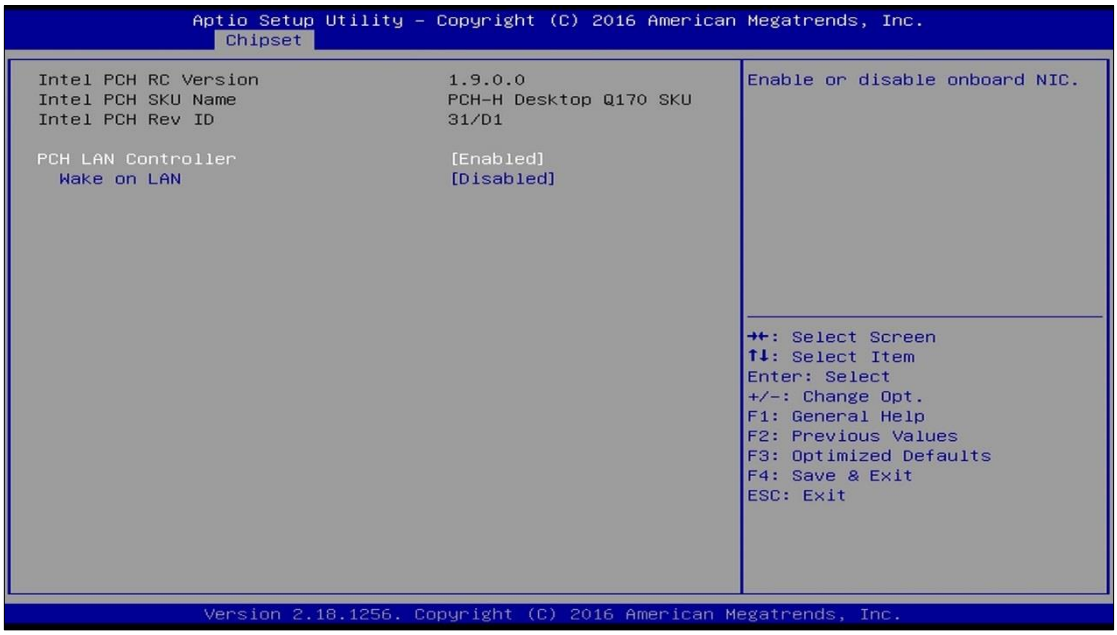
BIOS Setting	Description
Graphics Turbo IMON Current	Displays the current values supported (14~31).
Skip Scanning of External Gfx Card	If enabled, it will not scan for external Gfx Card on PEG and PCH PCIE ports.
Primary Display	Selects which of IGFX/PEG/PCI graphics device should be primary display, or selects SG for switchable Gfx.
Primary PEG	Selects PEGO/PEG1/PEG2/PEG3 Graphics device should be Primary PEG.
Primary PCIE	Selects PCIE0 / PCIE1 / PCIE2 / PCIE3 / PCIE4 / PCIE5 / PCIE6 / PCIE7 Graphics device should be primary PCIE.
Internal Graphics	Keeps IGD enabled based on the setup options.

4.5.1.2. Memory Configuration



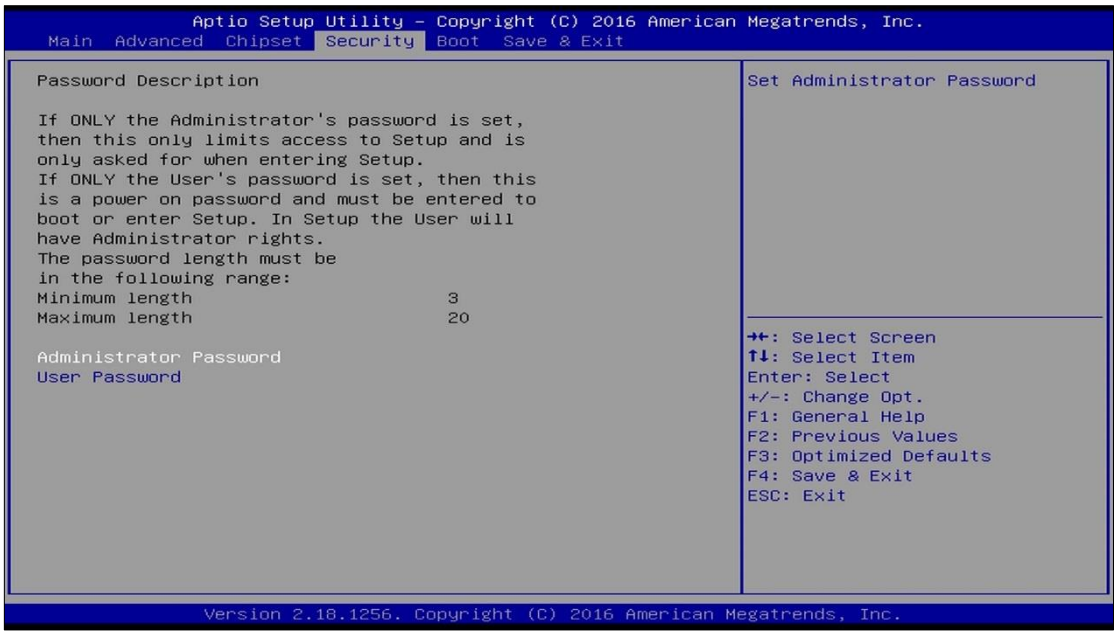
BIOS Setting	Description
Memory Configuration	Displays the RC version, frequency and total size of memory.

4.5.2 PCH-IO Configuration



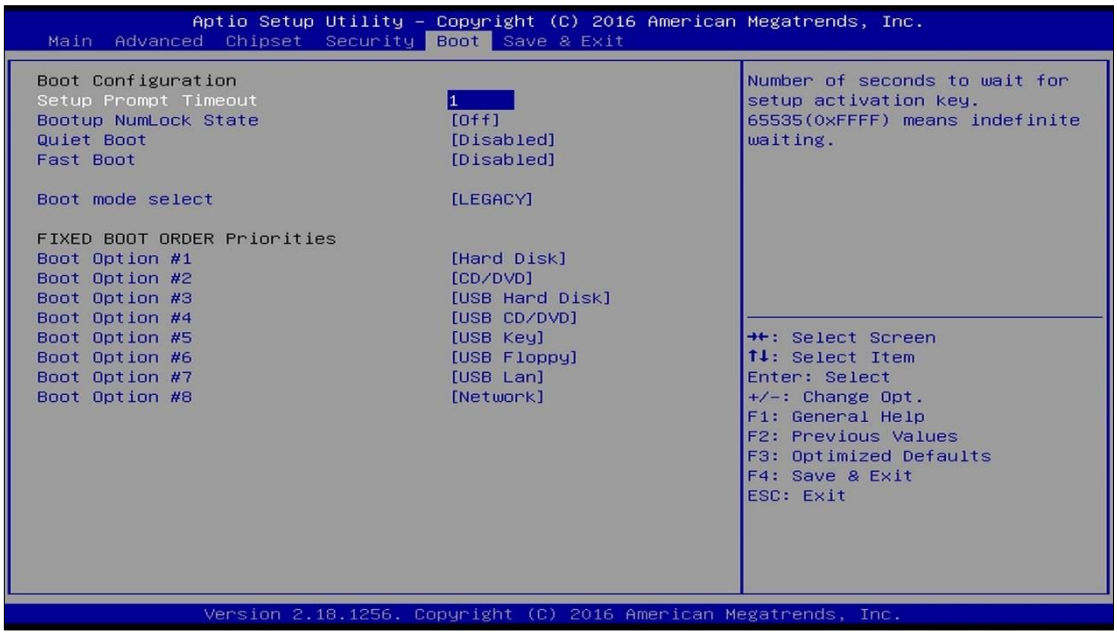
BIOS Setting	Description
PCH LAN Controller	Enables / Disables the on-board NIC.
Wake on LAN	Enables / Disables the integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

4.6 Security Settings



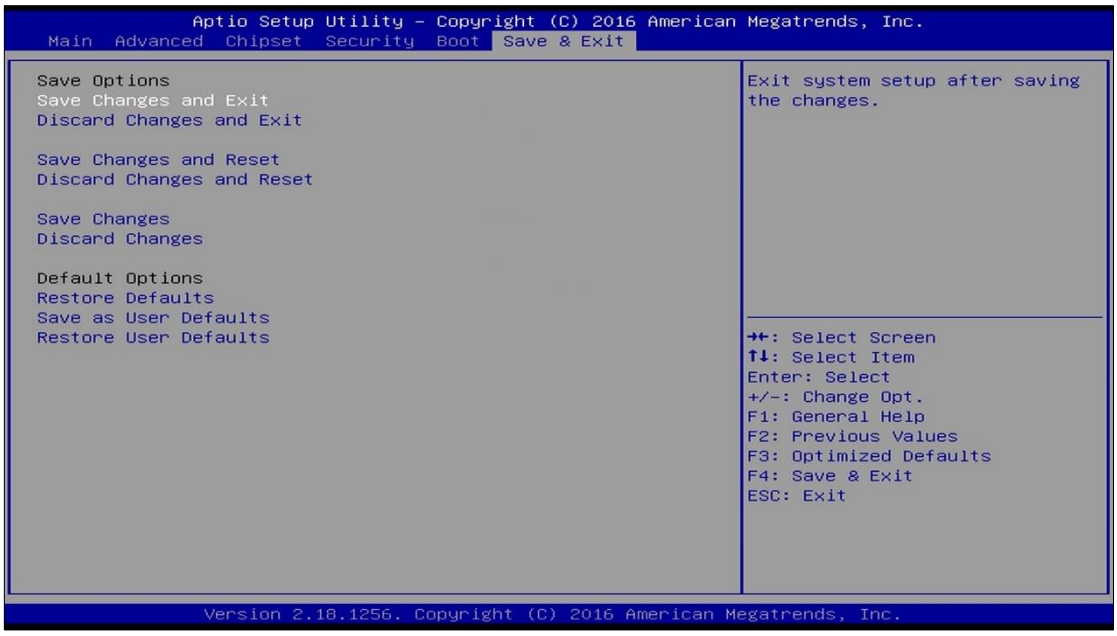
BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.

4.7 Boot Settings



BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Fast Boot	Enables / Disables boot with initialization of a minimal set of devices required to launch the active boot option. There no effect for BBS boot options.
Fixed Boot Order Priorities	Sets the system boot order.
Boot Option Priorities	Sets the system boot order.

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)
- Digital I/O Sample Code
- Watchdog Timer Configuration

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
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
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
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

Address	Device Description
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
0x00000800-0x0000087F	Motherboard resources
0x000000F0-0x000000F0	Numeric data processor
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F060-0x0000F07F	Standard SATA AHCI Controller
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x00001854-0x00001857	Motherboard resources
0x0000F000-0x0000F03F	Intel(R) HD Graphics 530
0x000003B0-0x000003BB	Intel(R) HD Graphics 530
0x000003C0-0x000003DF	Intel(R) HD Graphics 530
0x00000000-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000F0A0-0x0000F0A7	Intel(R) Active Management Technology - SOL (COM3)
0x0000FF00-0x0000FFFE	Motherboard resources
0x0000F040-0x0000F05F	Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System timer
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 8	System CMOS/real time clock
IRQ 11	Intel(R) 100 Series/C230 Series Chipset Family Integrated Sensor Hub - A135
IRQ 11	Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123
IRQ 11	Intel(R) 100 Series/C230 Series Chipset Thermal subsystem - A131
IRQ 12	Microsoft PS/2 Mouse
IRQ 13	Numeric data processor
IRQ 14	Motherboard resources
IRQ 16	High Definition Audio Controller
IRQ 19	Intel(R) Active Management Technology - SOL (COM3)
IRQ 54 – IRQ 204	Microsoft ACPI-Compliant System
IRQ 256 – IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967290	Intel(R) Management Engine Interface
IRQ 4294967291	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
IRQ 4294967292	Intel(R) HD Graphics 530
IRQ 4294967293	Intel(R) Ethernet Connection (2) I219-LM
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 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 "F81866.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 81866 watch dog program\n"); SIO = Init_F81866();
if (SIO == 0)
{
printf("Can not detect Fintek 81866, 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_F81866_Reg(0x2B); bBuf &= (~0x20);
Set_F81866_Reg(0x2B, bBuf);   //Enable WDTO

Set_F81866_LD(0x07);      //switch to logic device 7
Set_F81866_Reg(0x30, 0x01);   //enable timer

bBuf = Get_F81866_Reg(0xF5); bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81866_Reg(0xF5, bBuf);           //count mode is second  Set_F81866_Reg(0xF6,
interval);    //set timer
bBuf = Get_F81866_Reg(0xFA); bBuf |= 0x01;
Set_F81866_Reg(0xFA, bBuf);   //enable WDTO output

bBuf = Get_F81866_Reg(0xF5); bBuf |= 0x20;
Set_F81866_Reg(0xF5, bBuf);   //start counting
}
//---------------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;
Set_F81866_LD(0x07);      //switch to logic device 7  bBuf = Get_F81866_Reg(0xFA);
bBuf &= ~0x01;
Set_F81866_Reg(0xFA, bBuf);   //disable WDTO output

bBuf = Get_F81866_Reg(0xF5); bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81866_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 "F81866.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81866_BASE; void Unlock_F81866 (void); void Lock_F81866 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81866(void)
{
unsigned int result; unsigned char ucDid;

F81866_BASE = 0x4E;
result = F81866_BASE;

ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)      //Fintek 81866
{       goto Init_Finish; }

F81866_BASE = 0x2E;
result = F81866_BASE;

ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)      //Fintek 81866
{       goto Init_Finish; }

F81866_BASE = 0x00;
result = F81866_BASE;

Init_Finish:
return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_UNLOCK); outportb(F81866_INDEX_PORT,
F81866_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81866_LD( unsigned char LD)
{
Unlock_F81866();
outportb(F81866_INDEX_PORT, F81866_REG_LD);
outportb(F81866_DATA_PORT, LD);  Lock_F81866();
```

```
}
//---------------------------------------------------------------------------
void Set_F81866_Reg( unsigned char REG, unsigned char DATA)
{
Unlock_F81866(); outportb(F81866_INDEX_PORT, REG); outportb(F81866_DATA_PORT,
DATA); Lock_F81866();
}
//---------------------------------------------------------------------------
unsigned char Get_F81866_Reg(unsigned char REG)
{
unsigned char Result; Unlock_F81866();
outportb(F81866_INDEX_PORT, REG); Result = inportb(F81866_DATA_PORT);
Lock_F81866();
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       F81866_H
#define        F81866_H     1
//---------------------------------------------------------------------------
#defineF81866_INDEX_PORT   (F81866_BASE)
#defineF81866_DATA_PORT    (F81866_BASE+1)
//---------------------------------------------------------------------------
#defineF81866_REG_LD   0x07
//---------------------------------------------------------------------------
#define F81866_UNLOCK  0x87
#defineF81866_LOCK       0xAA
//---------------------------------------------------------------------------
unsigned int Init_F81866(void);
void Set_F81866_LD( unsigned char);
void Set_F81866_Reg( unsigned char, unsigned char); unsigned char
Get_F81866_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif //      F81866_H
```