

# **USER MANUAL**

**IV-Z318**

**Intel® 11th Gen. Core™ i7/i5/i3  
Processor Compact and Fanless  
In-Vehicle Embedded PC**

**IV-Z318 M3**

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# *IV-Z318*

## *Intel<sup>®</sup> 11th Gen. Core<sup>™</sup> i7 / i5 / i3 Processor Compact and Fanless In-Vehicle Embedded PC*

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### **DISCLAIMER**

This user's manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

### **CE NOTICE**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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## FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

	<p><b>CAUTION:</b> Danger of explosion may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.</p>
	<p><b>WARNING:</b> Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.</p>
	<p><b>WARNING:</b> Please keep the system away from human bodies while the system is active and in operation. If engineers need to service or move the system, please power off the system and wait for the system to cool down and then engineers can conduct the servicing safely.</p>

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## Revision History

The revision history of IV-Z318 User Manual is described below:

Version No.	Revision History	Date
M3	Added the dimension information for the Top View and Left Side View pictures in Section 2.2 System Overview on Page 2-4 and Page 2-5.	2022/12/21
M2	Revised the “ <b>Operating System</b> ” information in Section 2.3 System Specifications on Page 2-6.	2022/09/19
M1	Initial Release	2022/08/04

# 1

## Introduction

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This chapter provides the introduction for IV-Z318 system as well as the framework of the user manual.

The following topic is included:

- About This Manual

## **1.1 About This Manual**

Thank you for purchasing our IV-Z318 system. The IV-Z318 system is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The IV-Z318 system provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. Users can configure the system according to their own needs. This user manual is intended for service personnel with strong hardware background. It is not intended for general users. The following section describes the structure of this user manual.

### ***Chapter 1 Introduction***

This chapter introduces the framework of this user manual.

### ***Chapter 2 Getting Started***

This chapter describes the package contents and system specifications, and illustrates the physical appearances for IV-Z318 system. Read the safety reminders carefully on how to take care of your system properly.

### ***Chapter 3 System Configuration***

This chapter describes the locations and functions of the system motherboard components. You will learn how to properly configure the connectors and system configuration jumpers on the motherboard and configure the system to meet your own needs.

### ***Chapter 4 Software Utilities***

This chapter guides user how to install driver utilities for IV-Z318 system.

### ***Chapter 5 System Installation***

This chapter guides users how to install Wall Mount, VESA Mount and DIN Rail (optional), memory and M.2 module and HDD easy maintenance:

### ***Chapter 6 BIOS Setup***

This chapter provides BIOS setup information.

### ***Chapter 7 Ignition Power Management***

This chapter provides ignition power management information.

### ***Appendix A System Assembly***

This appendix provides the exploded diagrams and part numbers of IV-Z318 system.

### ***Appendix B Technical Summary***

This appendix provides the information about the system block diagram, allocation maps for system resources, Watchdog Timer Configuration and Flash BIOS Update.



# 2

## Getting Started

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This chapter provides the information for IV-Z318 system. It describes how to set up the system quickly and outlines the system specifications.

The following topics are included:

- Package List
- System Overview
- System Specification
- Safety Precautions

**Experienced users can go to Chapter 3 System Configuration on page 3-1 for a quick start.**

## **2.1 Package List**

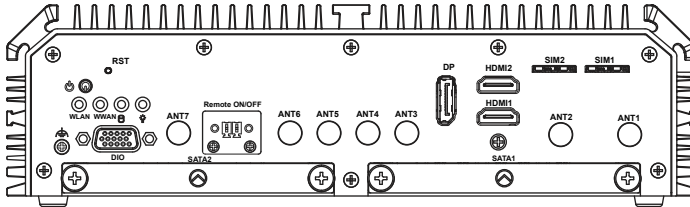
If you discover any of the items listed below are damaged or lost, please contact your local distributor immediately.

<b>Item</b>	<b>Q'ty</b>
IV-Z318 System	1
Quick Manual	1
Driver DVD	1
3-Pin Terminal Block	1
M2 Screw	4
M3 Screw	1
Wall Mount Bracket	2
M3 Fillister Head Screw	4
Rubber Washer	4

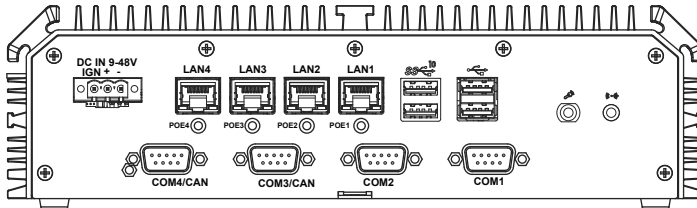
## 2.2 System Overview

Unit: mm

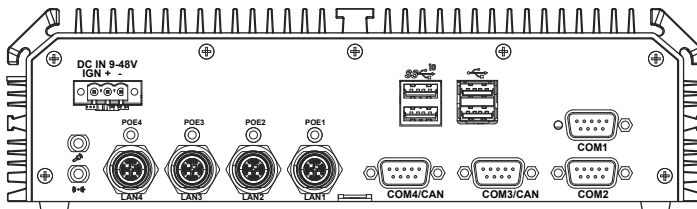
### 2.2.1 Front View



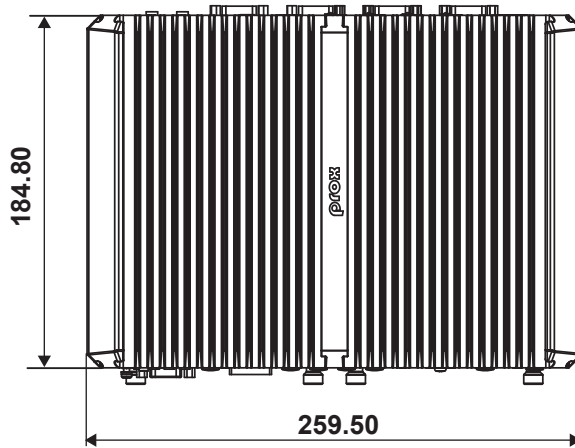
### 2.2.2 Rear View (RJ45)



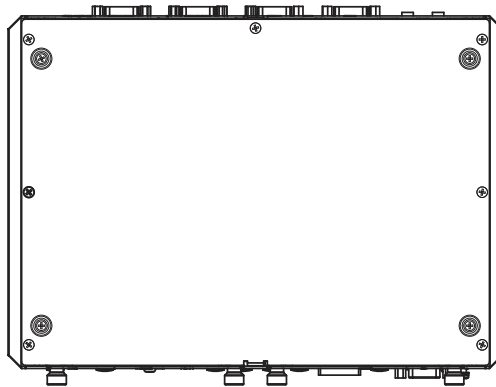
### 2.2.3 Rear View (M12)



2.2.4 Top View



2.2.5 Bottom View





## 2.3 System Specifications

System	
<b>CPU Support</b>	➤ Intel® 11th Gen. Core™ i7 / i5 / i3 processor
<b>Memory Support</b>	➤ 2 x DDR4-3200 SO-DIMM up to 32 GB
<b>Graphics</b>	➤ Intel® Iris® Xe Graphics (for i7 and i5) ➤ Intel® UHD Graphics (for i3)
<b>Watchdog</b>	➤ 1~255 seconds watchdog timer selectable
<b>Power Input</b>	➤ DC In 9~48V (with ignition)
<b>Expansion Slots</b>	➤ 1 x full-sized Mini PCIe slot 1 (USB2.0 and SIM signal) ➤ 1 x full-sized Mini PCIe slot 2 (PCIe and USB 2.0 signal) ➤ 1 x M.2 3042/3052-D2-B slot (PCIe, USB 3.0 and USB 2.0 and SIM signal) ➤ 1 x M.2 2230-D2-E slot (PCIe and USB 2.0 signal) ➤ 1 x M.2 2280-D2-M slot (PCIe Gen4 x 4 signal)
<b>TPM</b>	➤ TPM 2.0
<b>Mounting Support</b>	➤ Wall Mount (default) ➤ VESA Mount (75x75) ➤ DIN Rail (optional)
<b>Operating System</b>	➤ Windows 10 LTSC 2019/2021 ➤ Windows 11 IoT Enterprise (GAC) ➤ Ubuntu 20.04 LTS
<b>System Weight</b>	➤ 3.2kg
<b>Dimensions (W x H x D)</b>	➤ 259.5 x 72 x 184.8mm
<b>Certifications</b>	➤ FCC / CE / E13
I/O Ports	
<b>Drive Bay</b>	➤ 2 x 2.5" SATA SSD (Support RAID 0/1)
<b>USB</b>	➤ 2 x USB 3.2 Gen 2 and 2 x USB 2.0
<b>LAN</b>	➤ 4 x RJ45 / M12-X-coded GbE with optional PoE (IEEE 802.3af) ➤ Supports Wake-On-LAN/PXE
<b>Serial Ports</b>	➤ COM 1/2 for RS-232/422/485 with 3KVrms isolation ➤ COM 3/4 for RS-232 (optional with CAN Bus)
<b>Display</b>	➤ 2 x HDMI 2.0: Max. resolution 4K @ 60Hz ➤ 1 x DP1.4: Max. resolution 4K @ 60Hz
<b>Audio</b>	➤ 1 x Line Out, 1 x Mic In
<b>Digital I/O</b>	➤ 4 x in / 4 x out with 3KVrms isolation
<b>SIM Card Sockets</b>	➤ 2 x Nano SIM card slots

<b>Antenna Holes</b>	➤ 7 x Antenna holes
<b>LED</b>	➤ 1 x System LED, 1 x HDD LED, 1 x WWAN LED ➤ 1 x WLAN LED, 4 x PoE LED
<b>Power On / Off</b>	➤ 1 x Power Button ➤ 1 x Reset Button ➤ 1 x Remote Switch
<b>Ground</b>	➤ 1 x M3 hole
<b>Environment</b>	
<b>Operating Temp. (Ambient with airflow)</b>	➤ -40°C~70°C (32°F~158°F)
<b>Storage Temp.</b>	➤ -40°C~85°C (-4°F~185°F)
<b>Humidity</b>	➤ 20%~ 90%
<b>Vibration (Random)</b>	➤ IEC60068-2-64, random, 2.5G@5~500Hz, 1hr/axis with SSD
<b>Vibration (Operating)</b>	➤ MIL-STD-810G, 514.6C Procedure 1, Category 4
<b>Vibration (Storage)</b>	➤ MIL-STD-810G, 514.6E Procedure 1, Category 24
<b>Shock (Operating)</b>	➤ MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers=40G
<b>Shock (Non-Operating)</b>	➤ MIL-STD-810G, 516.6, Procedure V, crash hazard shock test=100G

## **2.4 Safety Precautions**

Before operating this system, read the following information carefully to protect your systems from damages, and extend the life cycle of the system.

### **1. Check the Line Voltage**

- The operating voltage for the power supply should be 9~48V DC; otherwise, the system may be damaged.

### **2. Environmental Conditions**

- Place your IV-Z318 system on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
- Avoid installing your IV-Z318 system in extremely hot or cold places.
- Avoid direct sunlight exposure for a long period of time (for example, in a closed car in summer time. Also avoid the system from any heating device.). Or do not use IV-Z318 system when it has been left outdoors in a cold winter day.
- Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
- Protect your IV-Z318 system from strong vibrations which may cause hard disk failure.
- Always shut down the operating system before turning off the power.
- Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.

### **3. Handling**

- Please keep the system away from human bodies while the system is active and in operation. If engineers need to service or move the system, please power off the system and wait for the system to cool down and then engineers can conduct the servicing safely.
- Avoid placing heavy objects on the top of the system.
- Do not turn the system upside down. This may cause the hard drive to malfunction.
- Do not allow any objects to fall into this device.

### **4. Good Care**

- When the outside case gets stained, remove the stains using neutral washing agent with a dry cloth.
- Never use strong agents such as benzene and thinner to clean the surface of the case.
- If heavy stains are present, moisten a cloth with diluted neutral washing agent or alcohol and then wipe thoroughly with a dry cloth.
- If dust is accumulated on the case surface, remove it by using a special vacuum cleaner for computers.



# 3

## System Configuration

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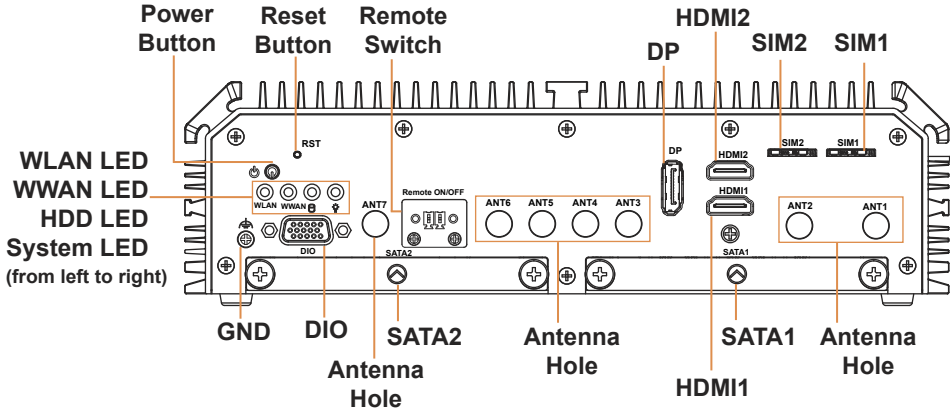
This chapter contains helpful information about the jumper & connector settings, and component locations for the main board and daughter board.

The following topics are included:

- External I/O Ports Diagrams
- Connector & Jumper Quick Reference Table
- System Main Board Component Locations
- How to Set Jumpers
- Setting Main Board Connectors and Jumpers
- Daughter Board Component Locations
- Setting Daughter Board Jumper
- Setting External M12 Connectors  
(for M12 SKU only)

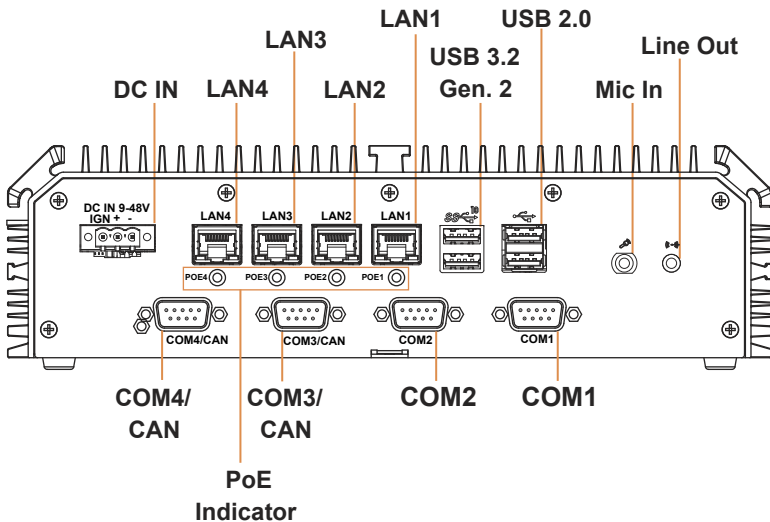
### 3.1 External I/O Ports Diagrams

#### 3.1.1 Front I/O Ports Diagram

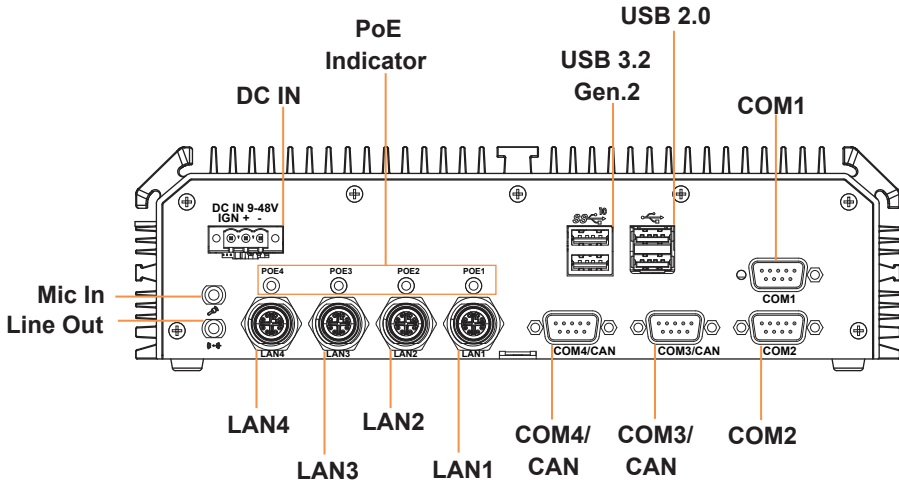


- Note:**
1. The SIM card sockets do not support hot-plug. Please make sure to power off the system before inserting the SIM card(s).
  2. SIM1/SIM2/DIO/ANT1~7 Port must be serviced, set by professional and not for general consumer use.

#### 3.1.2 RJ45 Rear I/O Ports Diagram



### 3.1.3 M12 Rear I/O Ports Diagram



**3.2 Main Board Jumper & Connector Reference Table**

<b>JUMPER Description</b>	<b>NAME</b>
Clear ME RTC Register and CMOS Data Selection	JCMOS_RTC1

<b>CONNECTOR Description</b>	<b>NAME</b>
COM Connector	COM1, COM2, COM3, COM4
HDMI Port Connector	HDMI1, HDMI2
DisplayPort Connector	DP1
4 x LAN Ports (Rear)	LAN1, LAN2, LAN3, LAN4
Dual USB 2.0 Port (Rear)	USB1
Dual USB 3.0 Ports (Rear)	USB2
Internal COM Connector	JCOM1, JCOM2, JCOM3, JCOM4
Internal USB 2.0 Wafer	JUSB1
Digital Input / Output Wafer	JDIO1
Mini PCI Express Slot 1	M_PCIE1
Mini PCI Express Slot 2	M_PCIE2
M.2 PCI Express Slot	M2_PCIE1
M.2 B-Key Slot	M2_B1
M.2 E-Key Slot	M2_E1
HD Audio Wafer	JAUDIO1
12V Power Output Wafer	J12VOUT1
RTC Battery Wafer	JBAT1
Power Button Wafer	PWRBTN2
Low Battery Detection Wafer	JLOWBATDET
SATA 3.0 Connector	SATA1, SATA2
SATA Power Connector	SATA_PWR1, SATA_PWR2
LED for Wireless Wide Area Network	JLED_WWAN1
LED for Wireless Local Area Network	JLED_WWAN2
HDD LED Wafer	JLED_HDD1
System LED Wafer	JSYS_HDD1
Power Sourcing Equipment Connector (connected to IR-Z318)	JPSE1
Clear ME RTC Register and CMOS Data Wafer	JCMOS_RTC1

### 3.3 Component Locations Of System Main Board

#### 3.3.1 Top View of System Main Board

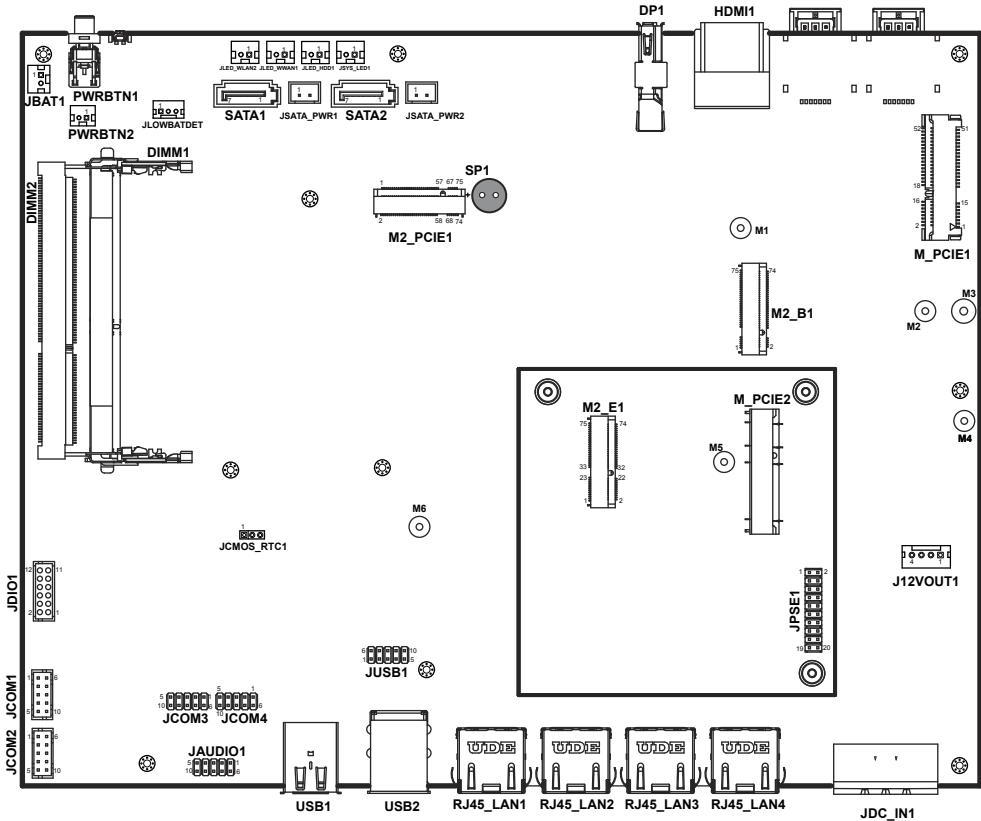





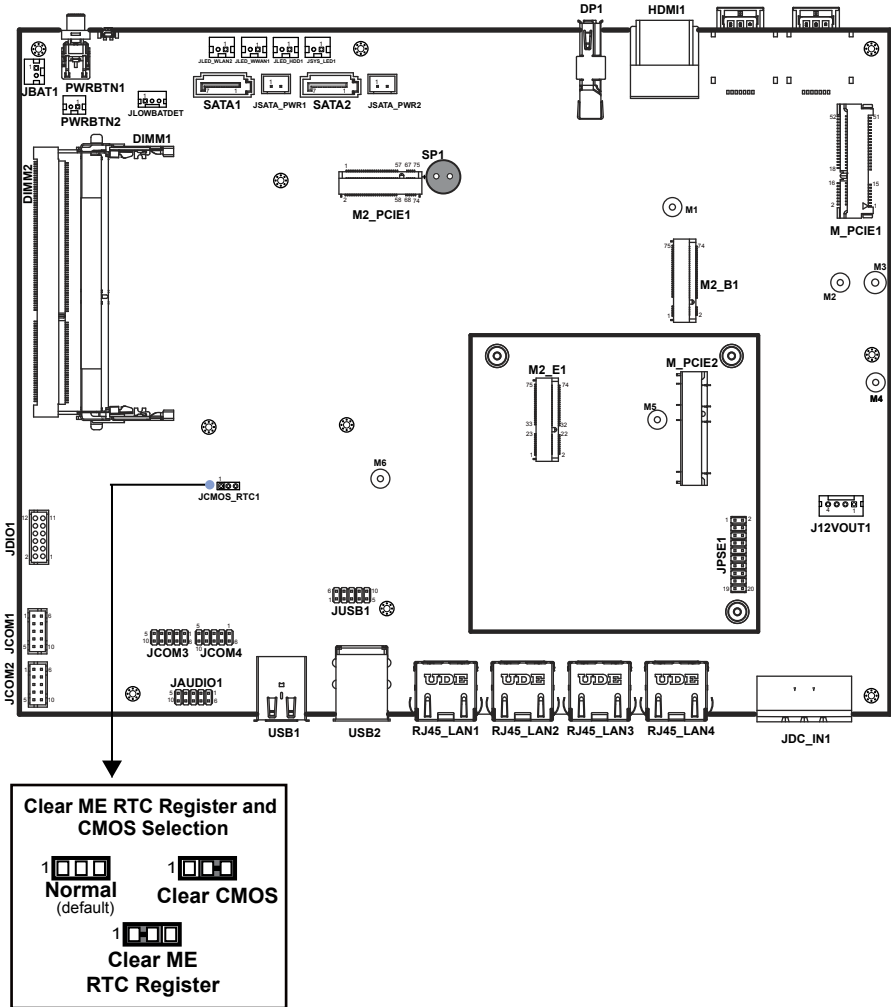
Figure 3-1. Main Board Component Location (Top View)

**Notes:**

1. In order to have ignition power control for in-vehicle usage, you need to supply IGN signal to the system before enabling “Power On/Off Function” in BIOS.
2. How to set up Power Cable for Ignition Function: The power terminal block connector of IV-Z318 has 3 pins: GND/ VCC/ Ignition. When using power from battery, Ignition has to be in contact with the VCC pin. Or you can simulate vehicle engine start, and then the ignition pin can connect a switch to start the system.

	<p><b>WARNING:</b> Always disconnect the power cord when you are working with connectors and jumpers on the main board. Make sure both the system and peripheral devices are turned OFF as sudden surge of power could damage sensitive components. Make sure the main board is properly grounded.</p>
	<p><b>CAUTION:</b> Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while you are working on the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.</p>
	<p><b>CAUTION:</b> Always touch the main board components by the edges. Never touch components such as a processor by its pins. Take special cares while you are holding electronic circuit boards by the edges only. Do not touch the main board components.</p>

### 3.3.2 Jumper Settings



3.3.3 Bottom View of System Main Board

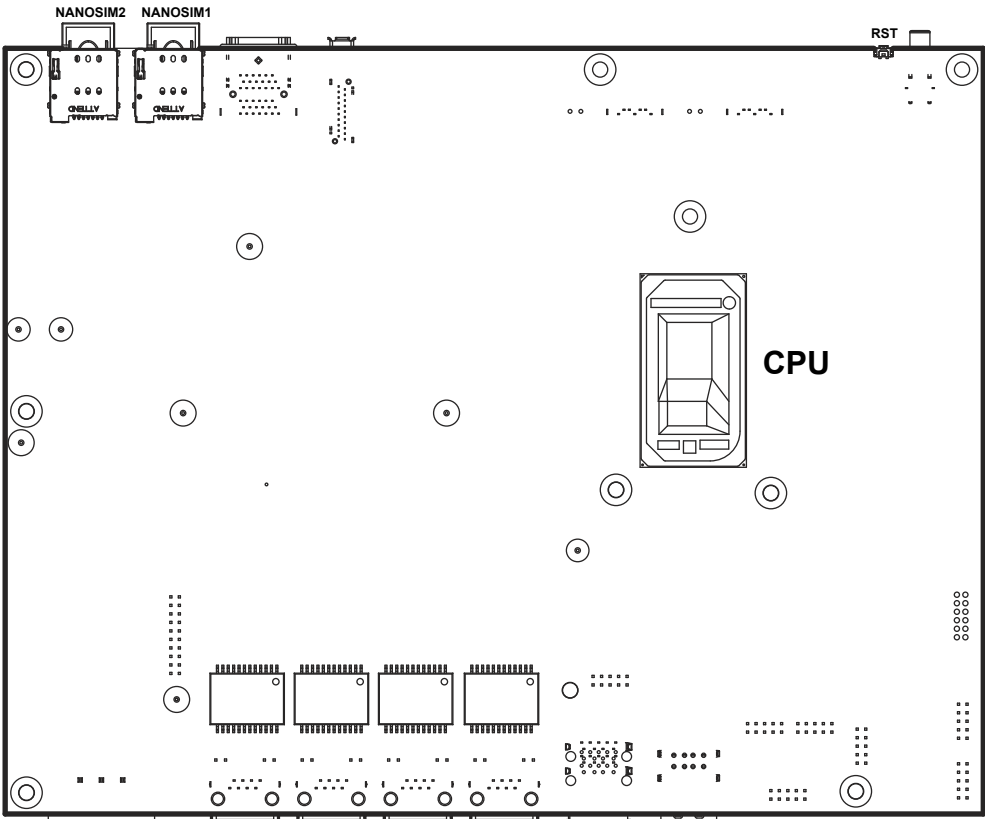


Figure 3-2. Main Board Component Location (Bottom View)

**Note:** The SIM card sockets do not support hot-plug. Please make sure to power off the system before inserting the SIM card(s).

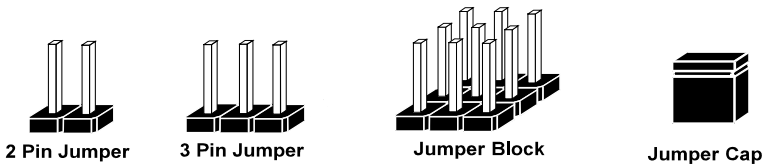


### 3.4 How To Set Jumpers

You can configure your board by setting the jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card. By using a small plastic "cap", also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can configure your hardware settings by "opening" or "closing" jumpers.

Jumpers can be combined into sets that are called jumper blocks. When jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows what this looks like.

#### Jumpers & Caps

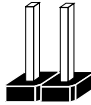


If a jumper has three pins, for example, labeled 1, 2 and 3. You can connect pins 1 and 2 to create one setting and shorting. You can also select to connect pins 2 and 3 to create another setting. The format of the jumper picture will be illustrated throughout this manual. The figure below shows different types of jumpers and jumper settings.

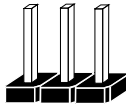
### Jumper diagrams



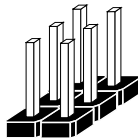
Jumper Cap looks like this



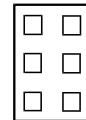
2 pin Jumper looks like this



3 pin Jumper looks like this



Jumper Block looks like this



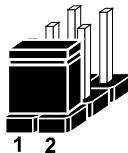
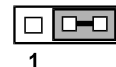
### Jumper settings



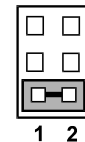
2 pin Jumper closed(enabled)  
looks like this



3 pin Jumper  
2-3 pin closed(enabled)  
looks like this



Jumper Block  
1-2 pin closed(enabled)  
looks like this

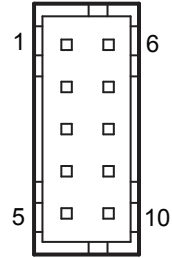


### 3.5 Setting Main Board Connectors and Jumpers

#### 3.5.1 COM Connector (JCOM1, JCOM2, JCOM3, JCOM4)

**JCOM1, JCOM2 (Default: RS-232) Connector Pin Assignment:**

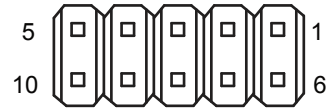
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM1/2_DCDJ_I	6	COM1/2_DSRJ_I
2	COM1/2_RX_I	7	COM1/2_RTSJ_I
3	COM1/2_TX_I	8	COM1/2_CTSJ_I
4	COM1/2_DTRJ_I	9	COM1/2_RI_R
5	GND_ISO	10	NC



**JCOM1/  
JCOM2**

**JCOM3, JCOM4 (RS-232) Connector Pin Assignment:**

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM3/4_DCDJ_I	6	COM3/4_DSRJ_I
2	COM3/4_RX_I	7	COM3/4_RTSJ_I
3	COM3/4_TX_I	8	COM3/4_CTSJ_I
4	COM3/4_DTRJ_I	9	COM3/4_RI_R
5	GND	10	NC



**JCOM3/  
JCOM4**

**Notes:**

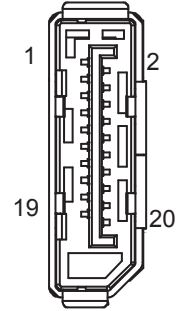
1. Isolated COM1, COM2 is selectable as RS-232, RS-422, RS-485 by BIOS setting.
2. Default setting is RS-232. Please see **Chapter 6 “Advanced – F81967 Super IO Configuration”** for selection details.

### 3.5.2 DisplayPort (DP) Port (DP1)

**Connector Location:** DP1

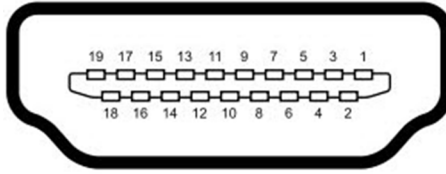
**Description:** DisplayPort Connector (front I/O)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DDID_LANE0_DP_C	11	GND
2	GND	12	DDID_LANE3_DN_C
3	DDID_LANE0_DN_C	13	DDID_OB_AUX_EN
4	DDID_LANE1_DP_C	14	DDID_DPCON_PIN14_PD
5	GND	15	DDID_DP_AUX_DP_C
6	DDID_LANE1_DN_C	16	GND
7	DDID_LANE2_DP_C	17	DDID_DP_AUX_DN_C
8	GND	18	DP_HPD
9	DDID_LANE2_DN_C	19	GND
10	DDID_LANE3_DP_C	20	V3P3S_DP



**DP1**

### 3.5.3 HDMI Port Connector (HDMI1, HDMI2)



#### HDMI1/ HDMI2

#### HDMI Connector (HDMI1) signals (front I/O, Downside):

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDMI2_P2_L	2	GND
3	HDMI2_N2	4	HDMI2_P1_L
5	GND	6	HDMI2_N1_L
7	HDMI2_P0_L	8	GND
9	HDMI2_N0_L	10	HDMI2_CLKP_L
11	GND	12	HDMI2_CLKN_L
13	NC	14	NC
15	HDMI2_SCL_5V	16	HDMI2_SDA_5V
17	GND	18	HDMI2_HPD
19	V5P0S_HDMI2	-	-

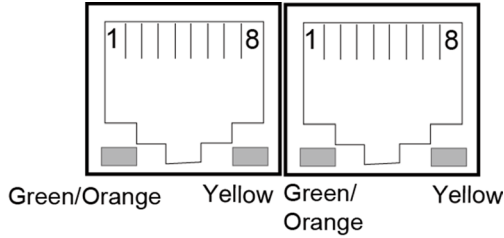
#### HDMI Connector (HDMI2) signals (front I/O, Upside):

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDMI_P2_L	2	GND
3	HDMI_N2_L	4	HDMI_P1_L
5	GND	6	HDMI_N1_L
7	HDMI_P0_L	8	GND
9	HDMI_N0_L	10	HDMI_CLKP_L
11	GND	12	HDMI_CLKN_L
13	NC	14	NC
15	HDMI_SCL_5V	16	HDMI_SDA_5V
17	GND	18	HDMI_HPD
19	V5P0S_HDMI	-	-

**3.5.4 LAN Port Connector (RJ45\_LAN1, RJ45\_LAN2, RJ45\_LAN3, RJ45\_LAN4)**

**Connector Location:** RJ45\_LAN1, RJ45\_LAN2, RJ45\_LAN3, RJ45\_LAN4

**Description:** LAN RJ-45 Port (rear I/O)



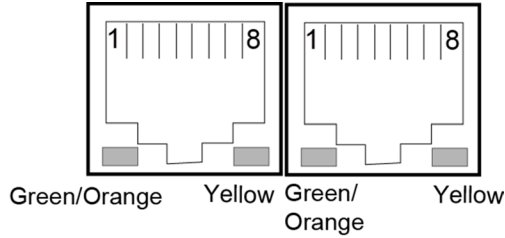
**RJ45\_LAN1 / RJ45\_LAN2**

**RJ45 LAN1 Pin Assignment**

PIN	ASSIGNMENT
R1	LAN1_MDI0_DP
R2	LAN1_MDI0_DN
R3	LAN1_MDI1_DP
R4	LAN1_MDI1_DN
R7	LAN1_MDI2_DP
R8	LAN1_MDI2_DN
R9	LAN1_MDI3_DP
R10	LAN1_MDI3_DN

**RJ45 LAN2 Pin Assignment**

PIN	ASSIGNMENT
R1	LAN2_MDI0_DP
R2	LAN2_MDI0_DN
R3	LAN2_MDI1_DP
R4	LAN2_MDI1_DN
R7	LAN2_MDI2_DP
R8	LAN2_MDI2_DN
R9	LAN2_MDI3_DP
R10	LAN2_MDI3_DN



### RJ45\_LAN3 /RJ45\_LAN4

**RJ45 LAN3 Pin Assignment**

PIN	ASSIGNMENT
R1	LAN3 MDI0 DP
R2	LAN3 MDI0 DN
R3	LAN3 MDI1 DP
R4	LAN3 MDI1 DN
R7	LAN3 MDI2 DP
R8	LAN3 MDI2 DN
R9	LAN3 MDI3 DP
R10	LAN3 MDI3 DN

**RJ45 LAN4 Pin Assignment**

PIN	ASSIGNMENT
R1	LAN4 MDI0 DP
R2	LAN4 MDI0 DN
R3	LAN4 MDI1 DP
R4	LAN4 MDI1 DN
R7	LAN4 MDI2 DP
R8	LAN4 MDI2 DN
R9	LAN4 MDI3 DP
R10	LAN4 MDI3 DN

### LAN LED Status

There are LAN LED indicators on the rear side of the mainboard. By observing their status, you can know the status of the Ethernet connection.

LAN LED Indicator	Color	Status	Description
Right Side LED	Yellow	Blink	LAN Message Active
	-	Off	No LAN Message Active
Left Side LED	Green	On	10/100Mbps LAN connection is enabled.
	Orange	On	Giga LAN connection is enabled.
	-	Off	No LAN switch/hub is connected

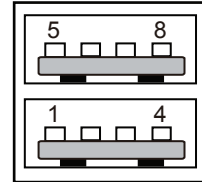
### 3.5.5 Dual USB 2.0 Port (USB1)

Connector Location: **USB1**

Description: Dual USB 2.0 port

USB 2.0 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	USB_PWR3	5	USB_PWR5
2	USB2_P3_DN	6	USB2_P5_DN
3	USB2_P3_DP	7	USB2_P5_DP
4	GND	8	GND



**USB1**

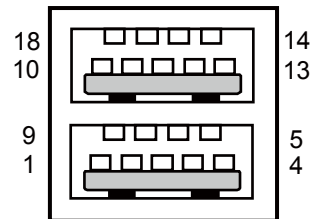
### 3.5.6 Dual USB 3.0 Port (USB2)

Connector Location: **USB2**

Description: USB 3.0 port x 2

USB 3.0 signals:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	USB_PWR1	10	USB_PWR2
2	USB2_P1_DN	11	USB2_P2_DN
3	USB2_P1_DP	12	USB2_P2_DP
4	GND	13	GND
5	USB31_P1_RX_DN	14	USB31_P2_RX_DN
6	USB31_P1_RX_DP	15	USB31_P2_RX_DP
7	GND	16	USB2_P5_DP
8	USB31_P1_TX_DN	17	USB31_P2_TX_DN
9	USB31_P1_TX_DP	18	USB31_P2_TX_DP



**USB2**



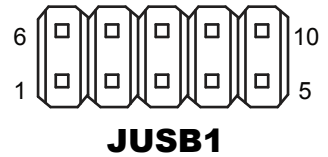
### 3.5.7 Internal USB 2.0 Wafer (JUSB1)

**Wafer Location:** JUSB1

**Description:** Internal USB 2.0 wafer

#### USB 2.0 signals

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	5V	6	5V
2	D-	7	D-
3	D+	8	D+
4	GND	9	GND
5	GND	10	GND

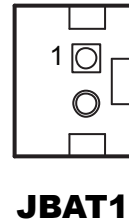


### 3.5.8 RTC Battery Wafer (JBAT1)

**Wafer Location:** JBAT1

**Description:** RTC Battery Wafer

PIN	ASSIGNMENT
1	VRTC_BATT
2	GND

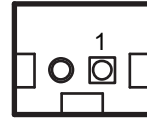


### 3.5.9 Power Button Wafer (PWRBTN2)

Wafer Location: PWRBTN2

Description: Power Button Wafer

PIN	ASSIGNMENT
1	PWRBTN_SW
2	GND



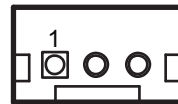
**PWRBTN2**

### 3.5.10 Low Battery Detection Wafer (JLOWBATDET)

Wafer Location: JLOWBATDET

Description: Low Battery Detection Wafer

PIN	ASSIGNMENT
1	LOW_BATTERY_IN
2	GND
3	FEEDBACK_LOW_BATTERY



**JLOWBATDET**

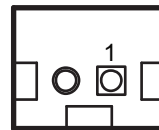
**Note:** Low Battery Detection is only for customized main board.

### 3.5.11 LED for Wireless Wide Area Network (JLED\_WWAN1)

Wafer Location: JLED\_WWAN1

Description: LED for Wireless Wide Area Network

PIN	ASSIGNMENT
1	5V
2	WWLAN_LED_N



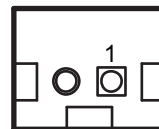
**JLED\_WWAN1**

### 3.5.12 LED for Wireless Local Area Network (JLED\_WLAN2)

Wafer Location: JLED\_WLAN2

Description: LED for Wireless Local Area Network

PIN	ASSIGNMENT
1	5V
2	M.2_WLAN_LED1_N



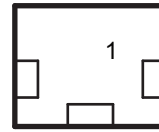
**JLED\_WLAN2**

### 3.5.13 HDD LED Wafer (JLED\_HDD1)

Wafer Location: JLED\_HDD1

Description: HDD LED indicator wafer

PIN	ASSIGNMENT
1	5V
2	SATA_LED_N



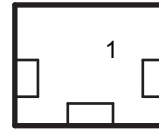
**JLED\_HDD1**

### 3.5.14 System LED Wafer (JSYS\_HDD1)

Wafer Location: JSYS\_HDD1

Description: System LED Wafer

PIN	ASSIGNMENT
1	5V
2	GND



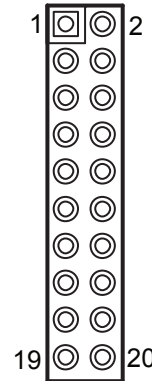
**JSYS\_HDD1**

### 3.5.15 Power Sourcing Equipment Connector (JPSE1)

Connector Location: JPSE1

Description: Power Sourcing Equipment Connector connected to IR-Z318

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	PSE1_OUT	2	GND
3	PSE2_OUT	4	GND
5	PSE3_OUT	6	V3P3S
7	PSE4_OUT	8	GND
9	VOUT_54V	10	GND
11	VOUT_54V	12	GND
13	VOUT_54V	14	GND
15	DCIN	16	DCIN
17	DCIN	18	DCIN
19	DCIN	20	DCIN



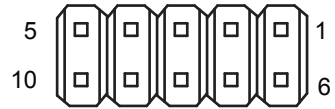
**JPSE1**

### 3.5.16 HD Audio Wafer (JAUDIO1)

Wafer Location: JAUDIO1

Description: HD Audio Wafer for Line In/Line Out/Mic In.

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HD_MIC1-L_L	6	HD_MIC1-R_L
2	GND_HD	7	MIC1-JD
3	NC	8	NC
4	FRONT-JD	9	GND_HD
5	LINE-OUT-L	10	LINE-OUT-R



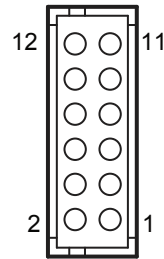
**JAUDIO1**

### 3.5.17 Digital Input / Output Wafer (JDIO1)

Wafer Location: JDIO1

Description: Digital Input / Output Wafer

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	EXT_COM	2	EXT_COM
3	DI1_EXT	4	DI1_EXT
5	DI2_EXT	6	DI2_EXT
7	DI3_EXT	8	DI3_EXT
9	DI4_EXT	10	DI4_EXT
11	GND_ISO	12	GND_ISO



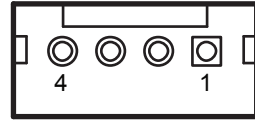
**JDIO1**

### 3.5.18 12V Power Output Wafer (J12VOUT1)

Wafer Location: J12VOUT1

Description: 12V Power Output wafer

PIN	ASSIGNMENT
1	12V
2	12V
3	GND
4	GND



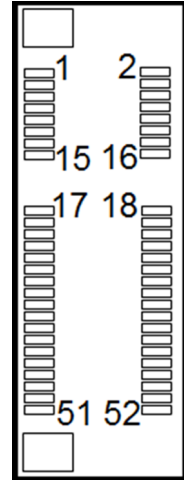
**J12VOUT1**

**3.5.19 Mini PCI Express Slot 1 (M\_PCIE1)**

**Connector Location:** M\_PCIE1

**Description:** Mini PCI Express Slot 1

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	2	V3P3_MPCIE
3	NC	4	GND
5	NC	6	V1P5_MPCIE
7	NC	8	SIM2_PWR
9	GND	10	SIM2_DATA
11	NC	12	SIM2_CLK
13	NC	14	SIM2_RESET
15	GND	16	NC
17	NC	18	GND
19	NC	20	MPCIE1_Disable
21	GND	22	BUF_PLT_RST_N
23	NC	24	V3P3_MPCIE
25	NC	26	GND
27	GND	28	V1P5_MPCIE
29	GND	30	SMB_CLK
31	NC	32	SMB_DATA
33	NC	34	NC
35	GND	36	NC
37	GND	38	NC
39	V3P3_MPCIE	40	NC
41	V3P3_MPCIE	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	M2_KEYM_CPU_SSD_RST_R_N
51	NC	52	GPPC_D5_SRCCLKREQ0_N



**M\_PCIE1**

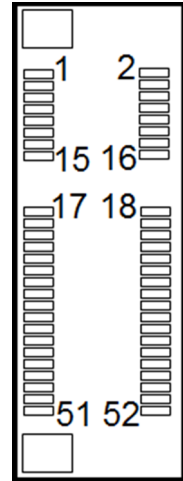
**Mini PCI Express** is the successor of the Mini PCI card and provides an increased data throughput. The cards have a detached network interface and are equipped with one lane. They are used in particular in embedded designs or compact box PCs.

### 3.5.20 Mini PCI Express Slot 2 (M\_PCIE2)

Connector Location: M\_PCIE2

Description: Mini PCI Express Slot 2

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	WAKE_N	2	V3P3_MPCIE2
3	NC	4	GND
5	NC	6	V1P5_MPCIE2
7	MPCIE2_CLKREQ62_R	8	NC
9	GND	10	NC
11	CLK_SRC62_DN_R	12	NC
13	CLK_SRC62_DP_R	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MPCIE2_Disable
21	GND	22	BUF_PLT_RST_N
23	PCIE3_P3_RX_DN	24	V3P3_MPCIE2
25	PCIE3_P3_RX_DP	26	GND
27	GND	28	V1P5_MPCIE2
29	GND	30	SMB_CLK
31	PCIE3_P3_TX_DN	32	SMB_DATA
33	PCIE3_P3_TX_DP	34	NC
35	GND	36	MPCIE2_USB2_P10_DN
37	GND	38	MPCIE2_USB2_P10_DP
39	V3P3_MPCIE	40	NC
41	V3P3_MPCIE	42	MPCIE2_LED_N
43	GND	44	NC
45	NC	46	NC
47	NC	48	V1P5_MPCIE2
49	NC	50	GND
51	NC	52	V3P3_MPCIE2



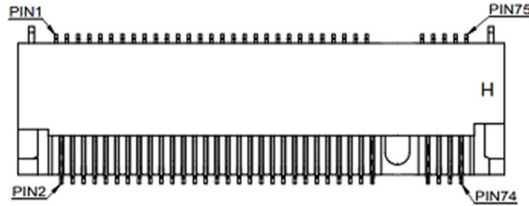
**M\_PCIE2**

**2**

**3.5.21 M.2 PCI Express Slot (M2\_PCIE1)**

**Connector Location:** M2\_PCIE1

**Description:** M.2 PCI Express Slot



**M2\_PCIE1**

PIN	ASSIGNMENT	PIN	ASSIGNMENT
2	V3P3S_M2_CPU	1	GND
4	V3P3S_M2_CPU	3	GND
6	NC	5	PCIE4_P3_M.2_SSD_RX_DN
8	NC	7	PCIE4_P3_M.2_SSD_RX_DP
10	M2_M_LED	9	GND
12	V3P3S_M2_CPU	11	PCIE4_P3_M.2_SSD_TX_DN
14	V3P3S_M2_CPU	13	PCIE4_P3_M.2_SSD_TX_DP
16	V3P3S_M2_CPU	15	GND
18	V3P3S_M2_CPU	17	PCIE4_P2_M.2_SSD_RX_DN
20	NC	19	PCIE4_P2_M.2_SSD_RX_DP
22	NC	21	GND
24	NC	23	PCIE4_P2_M.2_SSD_TX_DN
26	NC	25	PCIE4_P2_M.2_SSD_TX_DP
28	NC	27	GND
30	NC	29	PCIE4_P1_M.2_SSD_RX_DN
32	NC	31	PCIE4_P1_M.2_SSD_RX_DP
34	NC	33	GND
36	NC	35	PCIE4_P1_M.2_SSD_TX_DN
38	NC	37	PCIE4_P1_M.2_SSD_TX_DP
40	NC	39	GND
42	NC	41	PCIE4_P0_M.2_SSD_RX_DN
44	NC	43	PCIE4_P0_M.2_SSD_RX_DP
46	NC	45	GND
48	NC	47	PCIE4_P0_M.2_SSD_TX_DN
50	M2_KEYM_CPU_SSD_RST_R_N	49	PCIE4_P0_M.2_SSD_TX_DP

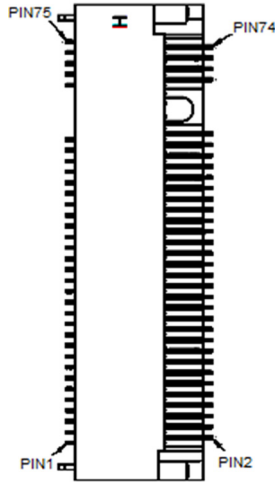


<b>PIN</b>	<b>ASSIGNMENT</b>	<b>PIN</b>	<b>ASSIGNMENT</b>
52	GPPC_D5_SRCCLKREQ0_N	51	GND
54	WAKE_N	53	CLK_SRC0_DN
56	NC	55	CLK_SRC0_DP
58	NC	57	GND
60	NC	59	M_KEY
62	NC	61	M_KEY
64	NC	63	M_KEY
66	NC	65	M_KEY
68	NC	67	NC
70	V3P3S_M2_CPU	69	PCIE_M.2_CPU_SSD_DETECT
72	V3P3S_M2_CPU	71	GND
74	V3P3S_M2_CPU	73	GND
76	-	75	GND

**3.5.22 M.2 B-Key Slot (M2\_B1)**

**Connector Location:** M2\_B1

**Description:** M.2 B Key Slot



**M2\_B1**

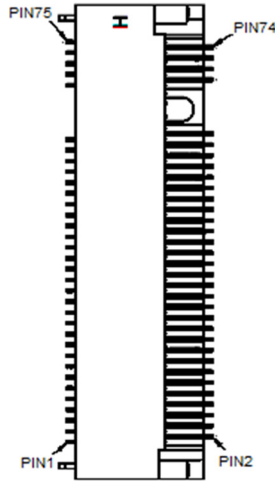
PIN	ASSIGNMENT	PIN	ASSIGNMENT
2	V3.3A_WWAN	1	M.2_WWAN_DET_1
4	V3.3A_WWAN	3	GND
6	GPPC_C11_WWAN_FCP_OFF_N	5	GND
8	GPPC_D15_M.2_WWAN_DISABLE_N	7	USB2_P4_DP
10	M.2_WWAN_LED_N	9	USB2_P4_DN
12	NC	11	GND
14	NC	13	NC
16	NC	15	NC
18	NC	17	NC
20	NC	19	NC
22	NC	21	NC
24	NC	23	NC
26	E-KEY	25	SAR_DPR_WWAN
28	E-KEY	27	GND
30	E-KEY	29	USB31_P4_RX_DN
32	NC	31	USB31_P4_RX_DP
34	NC	33	GND

<b>PIN</b>	<b>ASSIGNMENT</b>	<b>PIN</b>	<b>ASSIGNMENT</b>
36	NC	35	B1_USB3_TX_N
38	MLK_RST_N	37	B1_USB3_TX_P
40	MLK_DATA	39	GND
42	MLK_CLK	41	PCIE3_P9_RX_DN
44	NC	43	PCIE3_P9_RX_DP
46	NC	45	GND
48	NC	47	PCIE3_P9_TX_DN
50	SUS_CLK	49	PCIE3_P9_TX_DP
52	M.2_WLAN_PERST_R_N	51	GND
54	GPPC_A13_BT_RF_KILL_N	53	CLK_SRC61_DN_R
56	GPPC_B15_WIFI_RF_KILL_N	55	CLK_SRC61_DP_R
58	NC	57	GND
60	NC	59	NC
62	NC	61	NC
64	NC	63	NC
66	NC	65	NC
68	NC	67	GPPC_C10
70	NC	69	M2_WWAN_SSD_DET
72	V3.3A_WLAN	71	GND
74	V3.3A_WLAN	73	GND
76	-	75	M.2_WWAN_DET_75

**3.5.23 M.2 E-Key Slot (M2\_E1)**

**Connector Location:** M2\_E1

**Description:** M.2 E-key Slot



**M2\_E1**

PIN	ASSIGNMENT	PIN	ASSIGNMENT
2	V3.3A_WLAN	1	GND
4	V3.3A_WLAN	3	USB2_P9_DP
6	M.2_WLAN_LED1_N	5	USB2_P9_DN
8	NC	7	GND
10	NC	9	NC
12	NC	11	NC
14	NC	13	GND
16	M.2_BT_LED2_N	15	NC
18	GND	17	NC
20	NC	19	GND
22	NC	21	NC
24	E-KEY	23	NC
26	E-KEY	25	E-KEY
28	E-KEY	27	E-KEY
30	E-KEY	29	E-KEY
32	NC	31	E-KEY

<b>PIN</b>	<b>ASSIGNMENT</b>	<b>PIN</b>	<b>ASSIGNMENT</b>
34	NC	33	GND
36	NC	35	PCIE3_P10_UFS_11_TX_DP
38	MLK_RST_N	37	PCIE3_P10_UFS_11_TX_DN
40	MLK_DATA	39	GND
42	MLK_CLK	41	PCIE3_P10_UFS_11_RX_DP
44	NC	43	PCIE3_P10_UFS_11_RX_DN
46	NC	45	GND
48	NC	47	CLK_SRC5_DP
50	SUS_CLK	49	CLK_SRC5_DN
52	M.2_WLAN_PERST_R_N	51	GND
54	GPPC_A13_BT_RF_KILL_N	53	GPPC_H11_SRCCLKREQ5_N
56	GPPC_B15_WIFI_RF_KILL_N	55	GPPC_C23_WIFI_WAKE_N
58	NC	57	GND
60	NC	59	NC
62	NC	61	NC
64	NC	63	GND
66	NC	65	NC
68	NC	67	NC
70	NC	69	GND
72	V3.3A_WLAN	71	NC
74	V3.3A_WLAN	73	NC
76	-	75	GND

**3.5.24 SATA1 Connector (SATA1, SATA2)**

**Connector Location: SATA1**

**Description: SATA1 Connector**

PIN	ASSIGNMENT
1	GND
2	SATA_0_TX_DP
3	SATA_0_TX_DN
4	GND
5	SATA_0_RX_DN
6	SATA_0_RX_DP
7	GND



**SATA1/  
SATA2**

**Connector Location: SATA2**

**Description: SATA2 Connector**

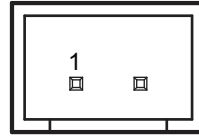
PIN	ASSIGNMENT
1	GND
2	SATA_1_TX_DP
3	SATA_1_TX_DN
4	GND
5	SATA_1_RX_DN
6	SATA_1_RX_DP
7	GND

### 3.5.25 SATA Power Connector (SATA\_PWR1, SATA\_PWR2)

Connector Location: SATA\_PWR1, SATA\_PWR2

Description: SATA Power Connectors

PIN	ASSIGNMENT
1	5V
2	GND



**SATA\_PWR1/  
SATA\_PWR2**

### 3.6 Clear ME RTC Register and CMOS Data Wafer (JCMOS\_RTC1)

Wafer Location: JCMOS\_RTC1

Description: Clear ME RTC Register and CMOS Data

PIN	ASSIGNMENT
1	SRTC_RST_N
2	GND
3	RTC_RST_N






**JCMOS\_RTC1**

### 3.7 Clear ME RTC Register and CMOS Data Selection (JCMOS\_RTC1)

**Jumper Location: JCMOS\_RTC1**

**Description:** Clear ME RTC Register and CMOS Data Selection

Selection	Jumper Setting (Pin Closed)	Jumper Illustration
RI	Open (Default Setting)	 <b>JCMOS_RTC1</b>
Clear ME RTC Register	1-2	 <b>JCMOS_RTC1</b>
Clear CMOS	2-3	 <b>JCMOS_RTC1</b>

**Note 1:** Manufacturing Default is **Normal**.

**Note 2:** To clear CMOS data, users must power off the computer and set the jumper to “Clear CMOS” as shown above. After 5 to 6 seconds, set the jumper back to “NC” and power on the computer.



### 3.8 Bottom View of System Daughter Board

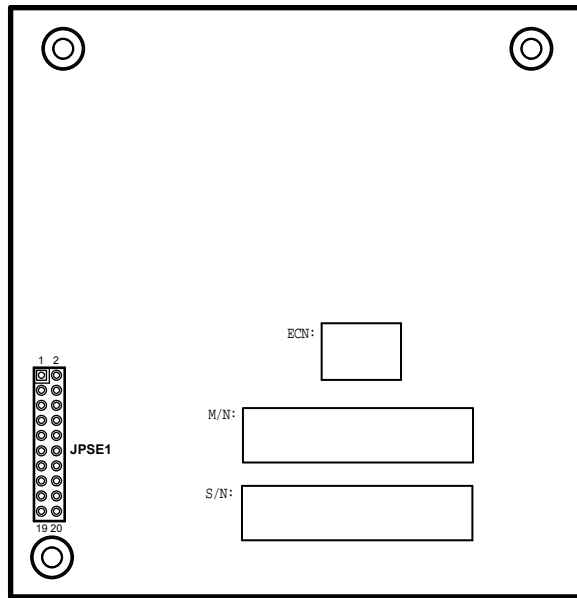


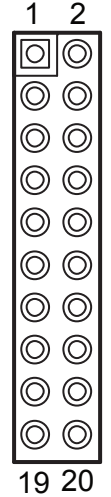
Figure 3-3. Daughter Board Component Location (Bottom View)

**3.8.1 Power Sourcing Equipment Connector (JPSE1)**

**Wafer Location: JPSE1**

**Description:** Power Sourcing Equipment connector connected to the main board IB-Z318 (bottom side)

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	SYS_G	2	POE_OUT1_L
3	SYS_G	4	POE_OUT2_L
5	V3P3S	6	POE_OUT3_L
7	SYS_G	8	POE_OUT4_L
9	SYS_G	10	V54P0A_L
11	SYS_G	12	V54P0A_L
13	SYS_G	14	V54P0A_L
15	DCIN	16	DCIN
17	DCIN	18	DCIN
19	DCIN	20	DCIN



**JPSE1**

### 3.9 External Function Button & I/O Connectors

#### 3.9.1 LAN1, LAN2, LAN3, LAN4 Ports (for M12 SKU only)

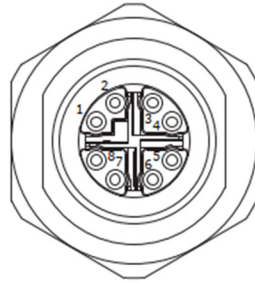
**Connector Location:** LAN1, LAN2, LAN3, LAN4

**Description:** LAN1, LAN2 Port

**Remark:** for M12 SKU only

##### LAN1 Pin Assignment:

PIN	ASSIGNMENT
1	LAN1_TD1P
2	LAN1_TD1N
3	LAN1_TD2P
4	LAN1_TD2N
5	LAN1_TD3N
6	LAN1_TD3P
7	LAN1_TD4N
8	LAN1_TD4P



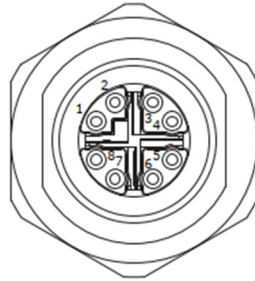
**LAN1 / LAN2**

##### LAN2 Pin Assignment:

PIN	ASSIGNMENT
1	LAN2_TD1P
2	LAN2_TD1N
3	LAN2_TD2P
4	LAN2_TD2N
5	LAN2_TD3N
6	LAN2_TD3P
7	LAN2_TD4N
8	LAN2_TD4P

**LAN3 Pin Assignment:**

PIN	ASSIGNMENT
1	LAN3_TD1P
2	LAN3_TD1N
3	LAN3_TD2P
4	LAN3_TD2N
5	LAN3_TD3N
6	LAN3_TD3P
7	LAN3_TD4N
8	LAN3_TD4P



**LAN3 / LAN4**

**LAN4 Pin Assignment:**

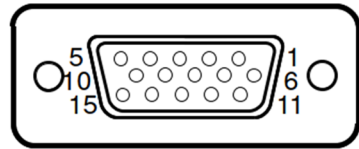
PIN	ASSIGNMENT
1	LAN4_TD1P
2	LAN4_TD1N
3	LAN4_TD2P
4	LAN4_TD2N
5	LAN4_TD3N
6	LAN4_TD3P
7	LAN4_TD4N
8	LAN4_TD4P

### 3.9.2 DIO Connector (DIO)

#### Connector Location: DIO

Description: Digital Input and Digital Output connector (front I/O)

PIN	ASSIGNMENT
1	EXT_COM
2	DIO_PWR
3	DI1
4	DO1
5	DI2
6	DO2
7	DI3
8	DO3
9	DI4
10	DO4
11	GND
12	GND
13	NC
14	NC
15	NC



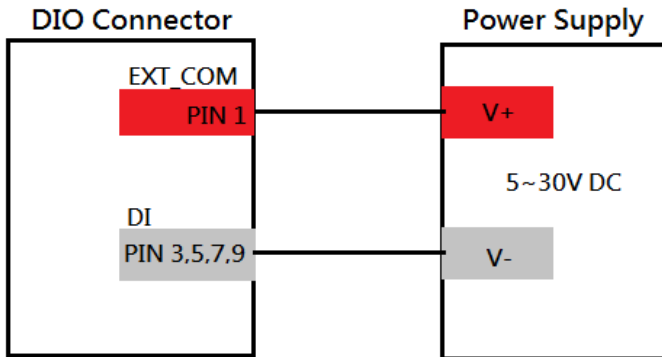
**DIO**

#### 3.9.2.1 Isolated DIO Connections

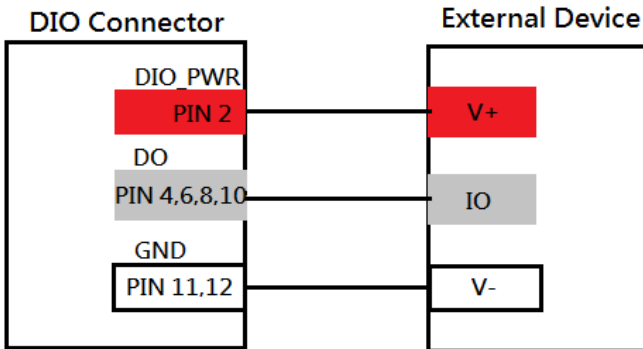
##### Isolated Digital Inputs

IV-Z318 offers 4 channels of isolated digital Input and 4 channels of isolated digital output. The direction of DIO is fixed by hardware design and can't be changed.

The figure below shows the connections between an external input source and isolated digital input channels for Wet contact.



The figure below shows the connections between an external output load and the isolated output channels.

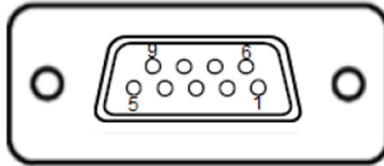


### 3.9.3 COM Connector (COM1, COM2, COM3, COM4)

Connector Location: COM1, COM2, COM3, COM4

Description: External COM1 ~ COM4 DSUB9 connector

Pin Assignment:



## COM1 ~ COM4

### Isolated COM1 (RS-232/422/485) Connector

PIN	ASSIGNMENT		
	RS-232 (Default Setting)	RS-422	RS-485
1	COM1_DCDJ_I	TX-	D-
2	COM1_RX_I	TX+	D+
3	COM1_TX_I	RX-	NC
4	COM1_DTRJ_I	RX+	NC
5	GND_ISO	GND	GND
6	COM1_DSRJ_I	NC	NC
7	COM1_RTSJ_I	NC	NC
8	COM1_CTSJ_I	NC	NC
9	COM1_RI_R	NC	NC

**Isolated COM2 (RS-232/422/485) Connector**

PIN	ASSIGNMENT		
	RS-232 (Default Setting)	RS422	RS484
1	COM2_DCDJ_I	TX-	D-
2	COM2_RX_I	TX+	D+
3	COM2_TX_I	RX-	NC
4	CrOM2_DTRJ_I	RX+	NC
5	GND_ISO	GND	GND
6	COM2_DSRJ_I	NC	NC
7	COM2_RTSJ_I	NC	NC
8	COM2_CTSJ_I	NC	NC
9	COM2_RI_R	NC	NC

**COM3 (RS-232) Connector**

PIN	ASSIGNMENT
1	COM3_DCDJ_I
2	COM3_RX_I
3	COM3_TX_I
4	COM3_DTRJ_I
5	GND
6	COM3_DSRJ_I
7	COM3_RTSJ_I
8	COM3_CTSJ_I
9	COM3_RI_R



### COM4 (RS-232) Connector

PIN	ASSIGNMENT
1	COM4_DCDJ_I
2	COM4_RX_I
3	COM4_TX_I
4	COM4_DTRJ_I
5	GND
6	COM4_DSRJ_I
7	COM4_RTSJ_I
8	COM4_CTSJ_I
9	COM4_RI_R

### 3.9.4 Power Button

To turn on the system, press the power button on the front I/O panel briefly.

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V

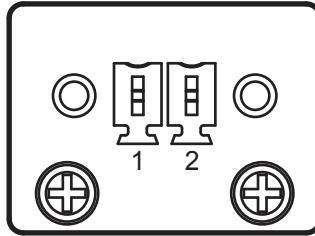


**Power  
Button**

**3.9.5 Remote ON/OFF Connector (Remote ON/OFF)**

**Connector Location:** Remote ON/OFF

**Description:** External Remote ON/OFF connector (front I/O)



**Remote ON/OFF**

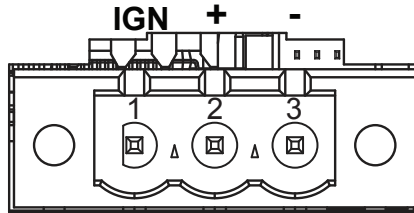
**Pin Assignment:**

PIN	ASSIGNMENT
1	PWRBTN_SW
2	GND

### 3.9.6 DC Power Input Connector (DC IN 9-48V)

Connector Location: DC IN 9-48V

Description: External DC IN Connector



**DC IN 9-48V**

PIN	ASSIGNMENT
1	GND
2	VCC
3	IGNITION

**Note:**

How to set up Power Cable for Ignition Function: The power terminal block connector of IV-Z318 has 3 pins: GND / VCC / Ignition. When using power from battery, Ignition has to be in contact with the VCC pin. Or you can simulate vehicle engine start, and then the ignition pin can connect a switch to start the system.

# 4

## Software Utilities

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This chapter provides the detailed information that guides users to install driver utilities for the system. The following topics are included:

- Installing Intel<sup>®</sup> Chipset Software Installation Utility
- Installing Intel<sup>®</sup> Management Engine Firmware Driver Utility
- Installing Graphics Driver Utility
- Installing LAN Driver Utility
- Installing Sound Driver Utility
- Installing Intel<sup>®</sup> Serial I/O Driver Utility
- Installing Intel<sup>®</sup> Rapid Storage Technology Utility

## 4.1 Introduction

Enclosed with IV-Z318 Series package is our driver utilities contained in a DVD-ROM disk. Refer to the following table for driver locations:

### For Windows 10 2019 64-bit OS:

Filename (Assume that DVD-ROM drive is D :)	Purpose
D:\Driver\Platform\1_Main Chip	Intel® Chipset Device Software Installation Utility
D:\Driver\Platform\2_Graphics	Intel® Graphics Driver installation
D:\Driver\Platform\3_ME	Intel® Management Engine Firmware
D:\Driver\Platform\4_Sound Codec	Realtek High-Definition Audio driver installation
D:\Driver\Platform\5_LAN Chip	Intel® Network Connections Software
D:\Driver\Platform\6_Serial IO	Intel® Serial IO Driver
D:\Driver\Platform\7_RAID	Intel® Rapid Storage Technology

### Notes:

1. Install the driver utilities immediately after the OS installation is completed.
2. After the Intel® RST Utility is installed, you must execute Windows 10 LTSC 2019 update procedure. The Intel® RST Utility can be activated successfully only after the Windows Update procedure is finished.

## 4.2 Installing Intel® Chipset Software Installation Utility

### Introduction

The Intel® Chipset Software Installation Utility installs the Windows \*.INF files to the target system. These files outline to the operating system how to configure the Intel chipset components in order to ensure that the following functions work properly:

- Core PCI and ISAPNP Services
- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

### Intel® Chipset Software Installation Utility

The utility pack is to be installed only for Windows 10 64bit, and it should be installed immediately after the OS installation is finished. Please follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Enter **Main Chip** folder where the Chipset driver is located
- 3** Click **SetupChipset.exe** file for driver installation.
- 4** Follow the on-screen instructions to install the driver.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effect.

### 4.3 Installing Intel® Trusted Execution Engine Installation Utility

To install the utility, simply follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Enter the **ME** folder where the driver is located.
- 3** Click the **SetupME.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effect.

## 4.4 Installing Graphics Driver Utility

The GRAPHICS interface embedded in IV-Z318 can support a wide range of display types.

To install the Graphics driver utility, follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Enter the **Graphics** folder where the driver is located.
- 3** Click the **igxpin.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effect.



## **4.5 Installing LAN Driver Utility**

Enhanced with LAN function, IV-Z318 supports various network adapters. To install the LAN Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Enter the **LAN Chip** folder where the driver is located.
- 3** Click **PROWinx64.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effect.

**For more details on the installation procedure, refer to the Readme.txt file that you can find on LAN Driver Utility.**

## 4.6 Installing Sound Driver Utility

The sound function enhanced in this system is fully compatible with Windows® 10 64bit.

To install the Sound Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Open the **Sound Codec** folder where the driver is located.
- 3** Click **Setup.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effects.

## **4.7 Installing Intel® Serial I/O Driver Utility**

To install the Serial I/O Driver, follow the steps below:

- 1** Connect the USB DVD-ROM device to IV-Z318 and insert the driver disk.
- 2** Open the **Serial IO** folder where the driver is located.
- 3** Click **SetupSerialIO.exe** file for driver installation.
- 4** Follow the on-screen instructions to complete the installation.
- 5** Once the installation is completed, shut down the system and restart IV-Z318 for the changes to take effects.

## 4.9 Installing Intel® Rapid Storage Utility

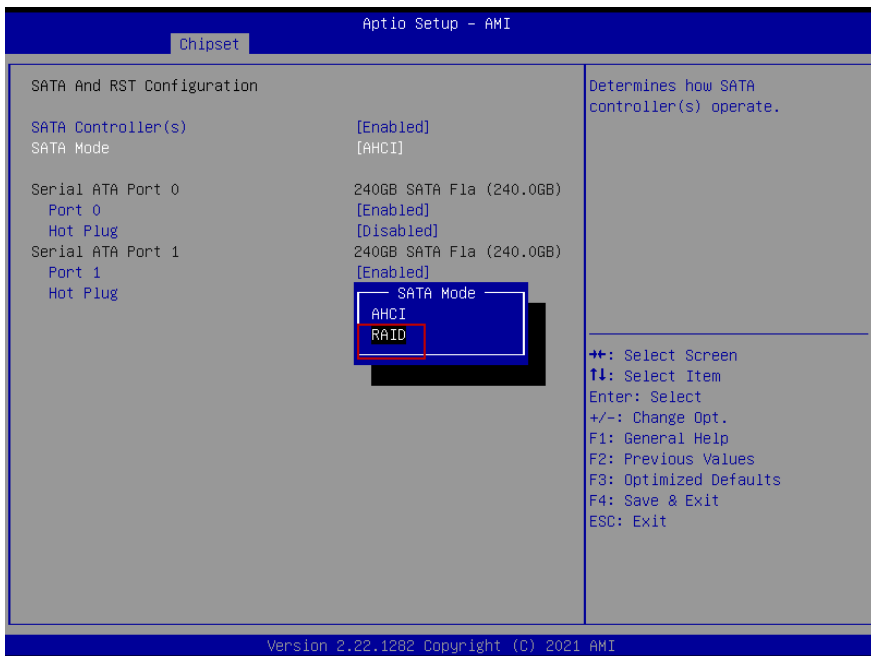
The Intel® Rapid Storage Technology option ROM provides the following functions:

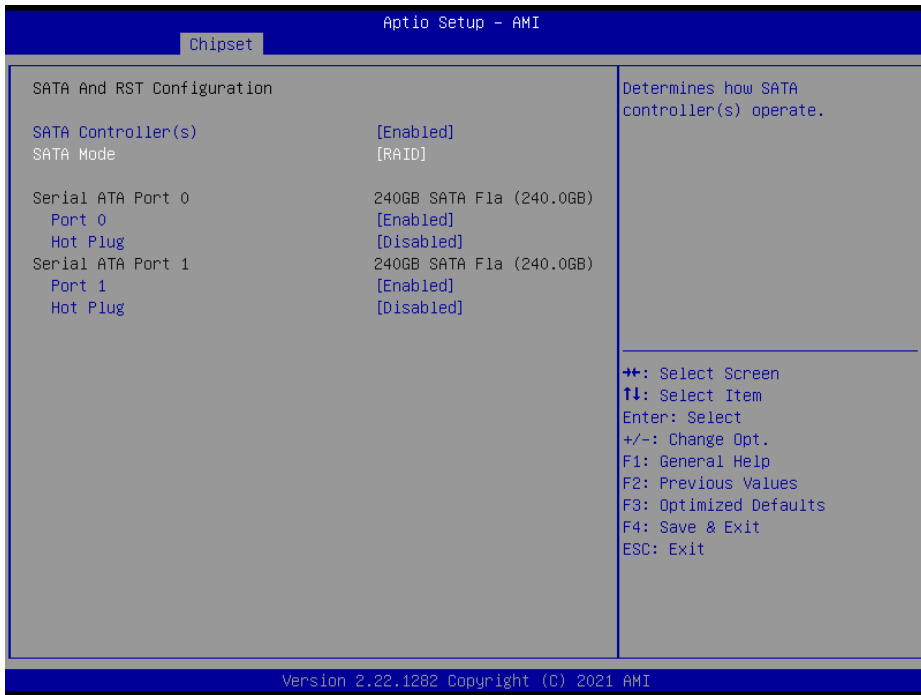
- Pre-operating system user interface for RAID volume management
- Ability to create, delete and reset RAID volumes
- RAID recovery

### Entering option ROM User Interface from BIOS Setup Utility

Follow the instructions below to enter the Intel® Rapid Storage Technology option ROM user interface:

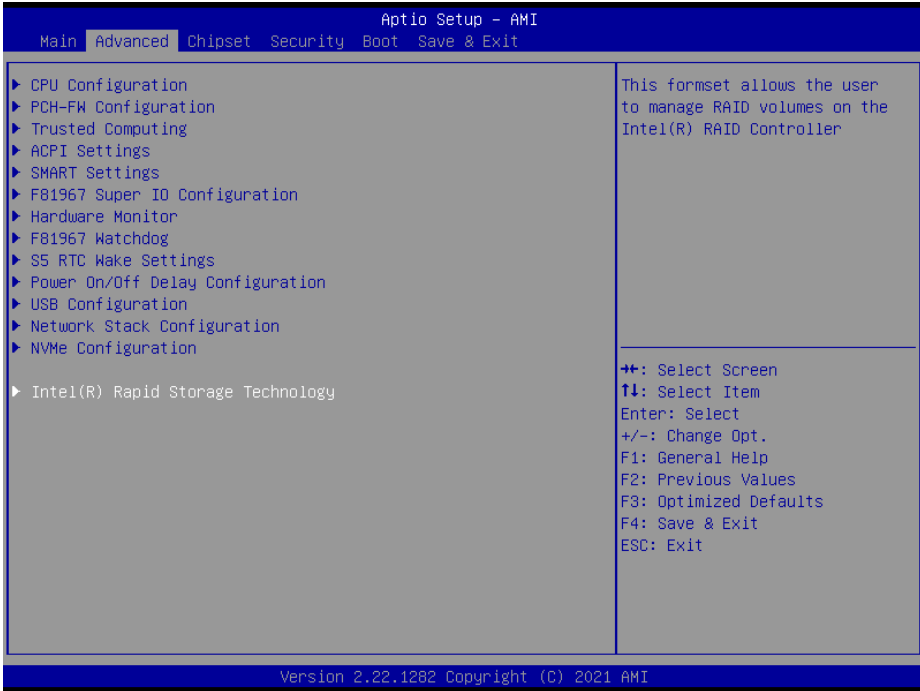
- 1 Press <Del> to access the BIOS Setup Utility program when prompted during the Power-On Self-Test (POST).
- 2 Enter **Chipset > PCH-IO Configuration > SATA and RST Configuration** menu screen and select “RAID” option for **SATA Mode** option item. See the pictures below:



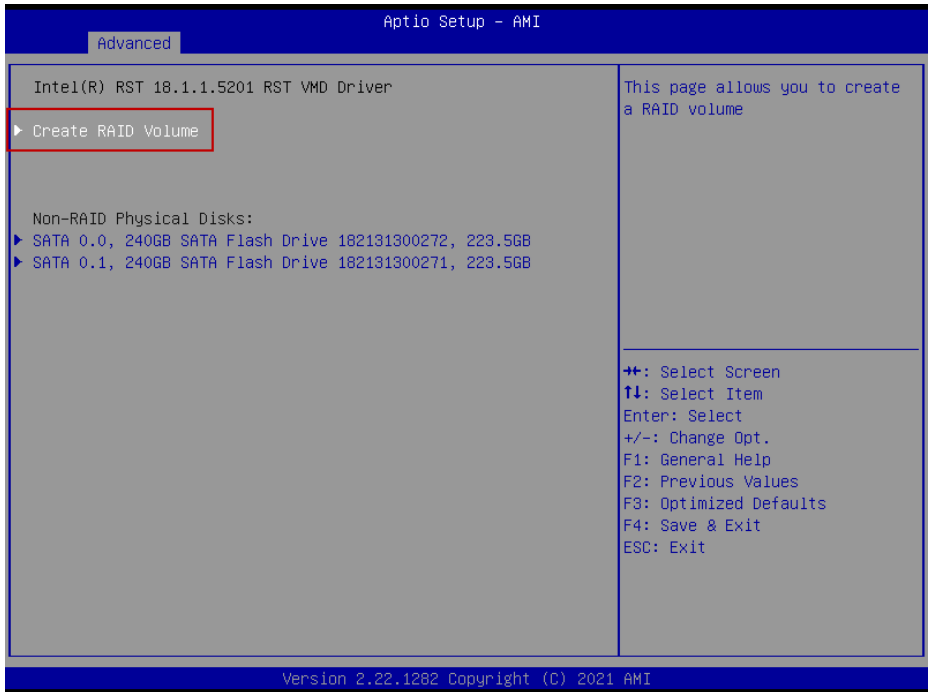


- 3 Press **F4** to save and validate the changed BIOS configuration and reset the system.

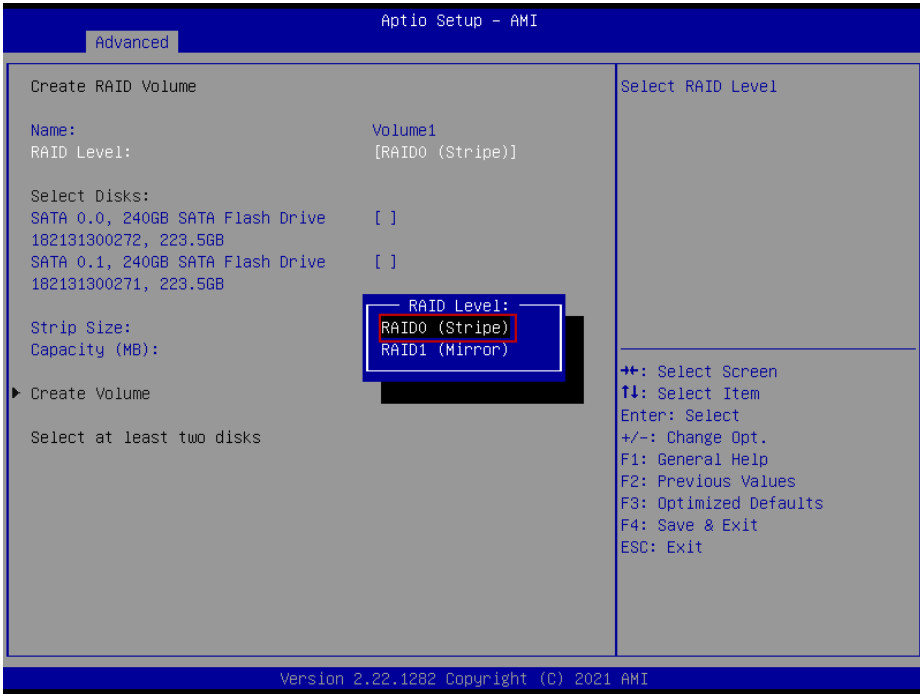
- 4 Press <Del> to enter the BIOS Setup Utility program again and the **Intel(R) Rapid Storage Technology** option item will display under the **Advanced** menu screen as below:



- 5 Select the **Intel(R) Rapid Storage Technology** option item and press<Enter>, and the following screen will display. Select **Create RAID Volume** option.



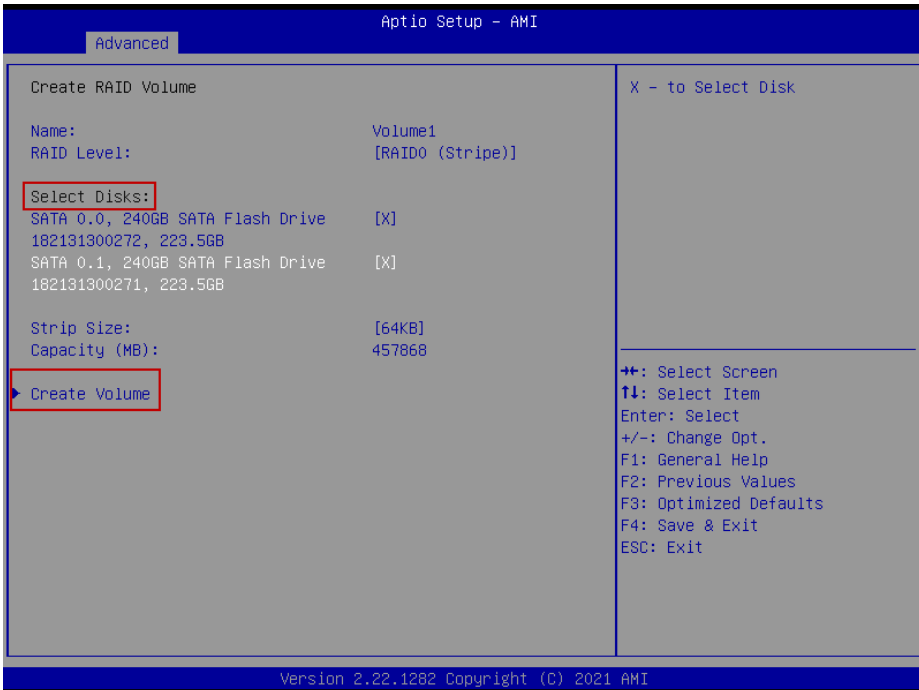
6 Select the **RAID0 (Stripe)** level as shown and press <Enter>.





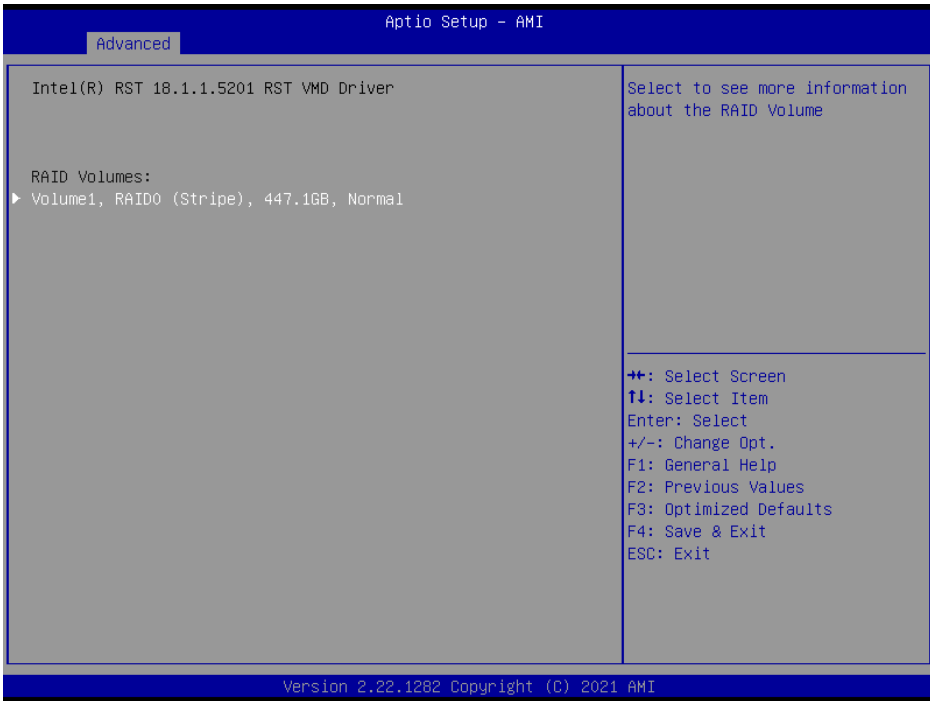
7 The hard drive(s) and hard drive information of the RAID level you selected in the previous step will display:

Press the "space bar" one time on the keyboard, select **Disks[x]**, and select **Create Volume**.



Heed that in the user interface, the hard drive(s) and hard drive information listed for your system will differ from the example above.

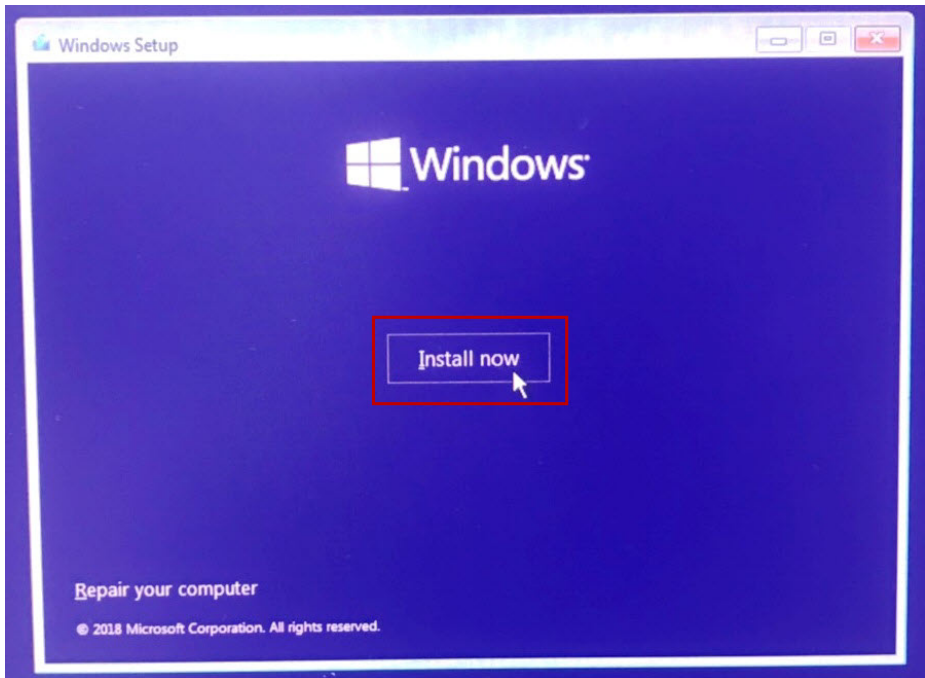
## 8 Save the configuration and exit.



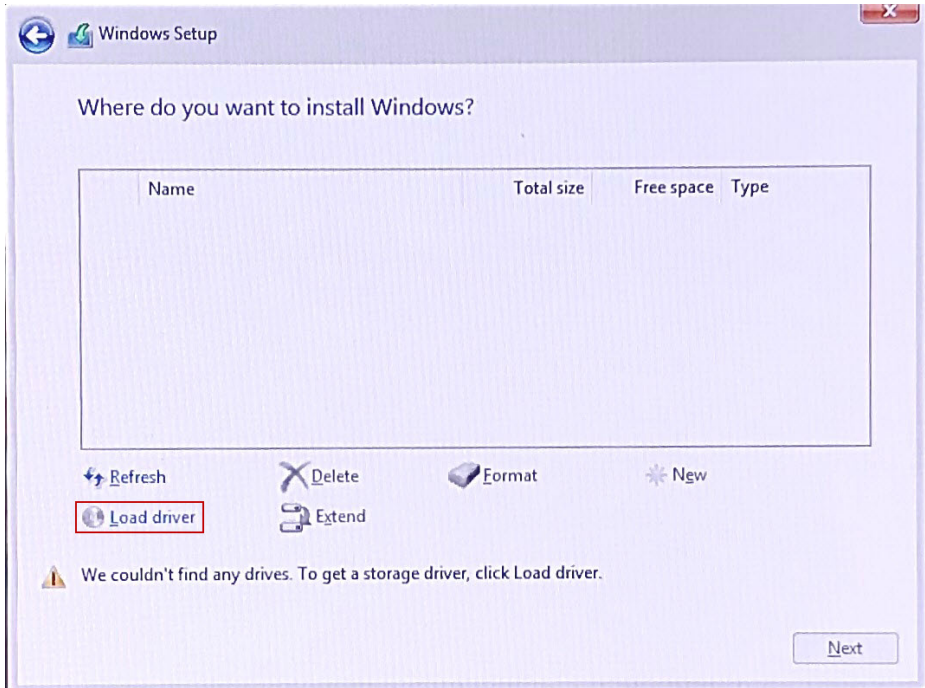
### Installing the OS (Microsoft Windows 10)

Please execute Windows 10 LTSC 2019 update procedure. The Intel® RST Utility can be activated successfully only after the Windows Update procedure is finished. Please follow the instructions below to install the Windows 10 LTSC 2019 OS.

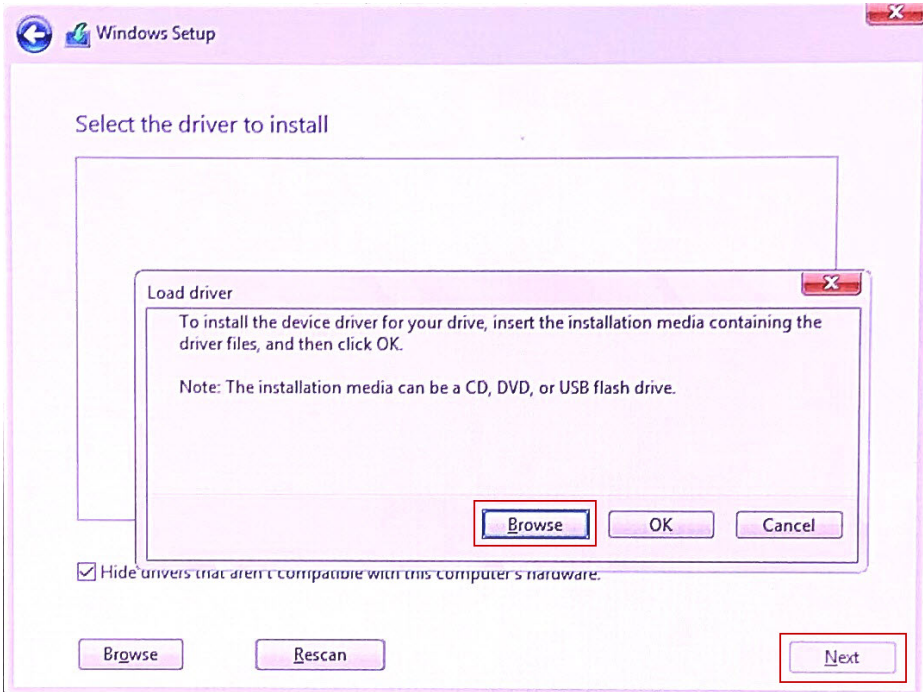
**I** Click **Install Now**.



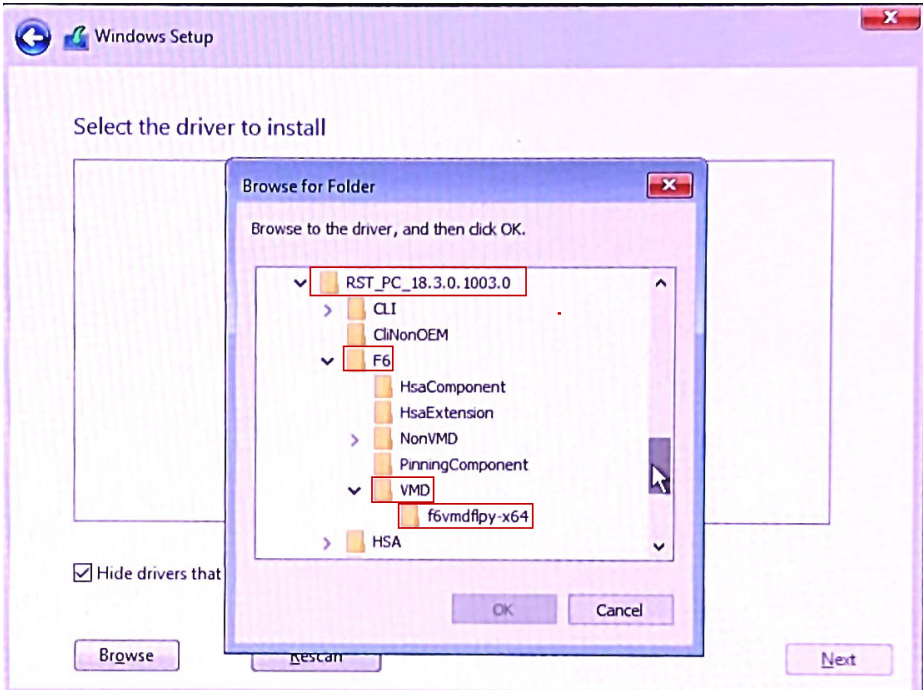
2 Click “Load Driver”.



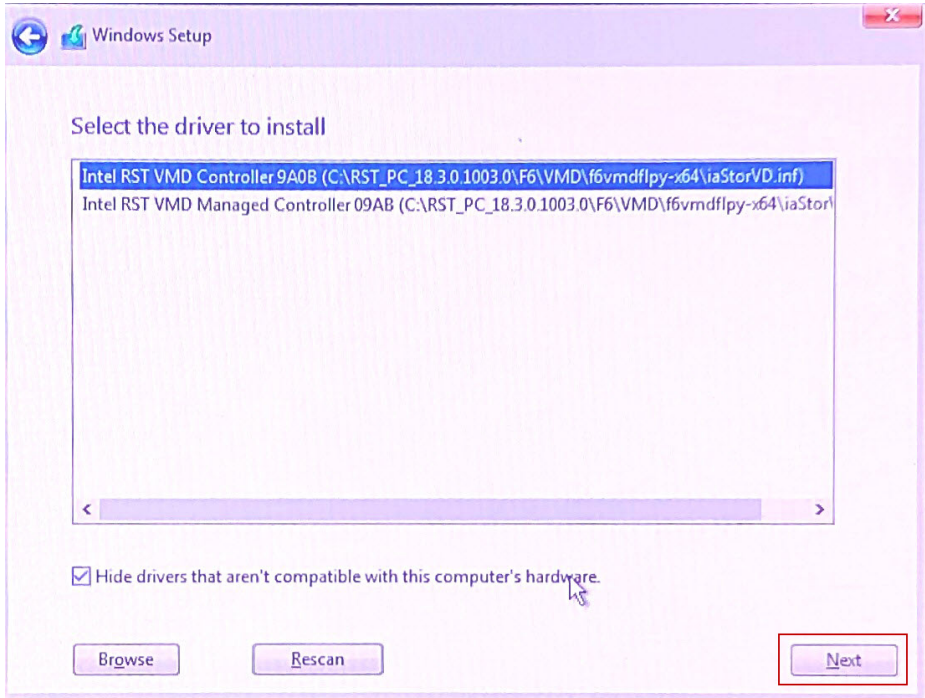
3 Click “Browse”.



- 4 Select the folder “RST\_PC\_18.3.0.1003.0” -> F6 -> VMD -> f6vmdflpy-x64” and click ”OK”-> press “Next”.

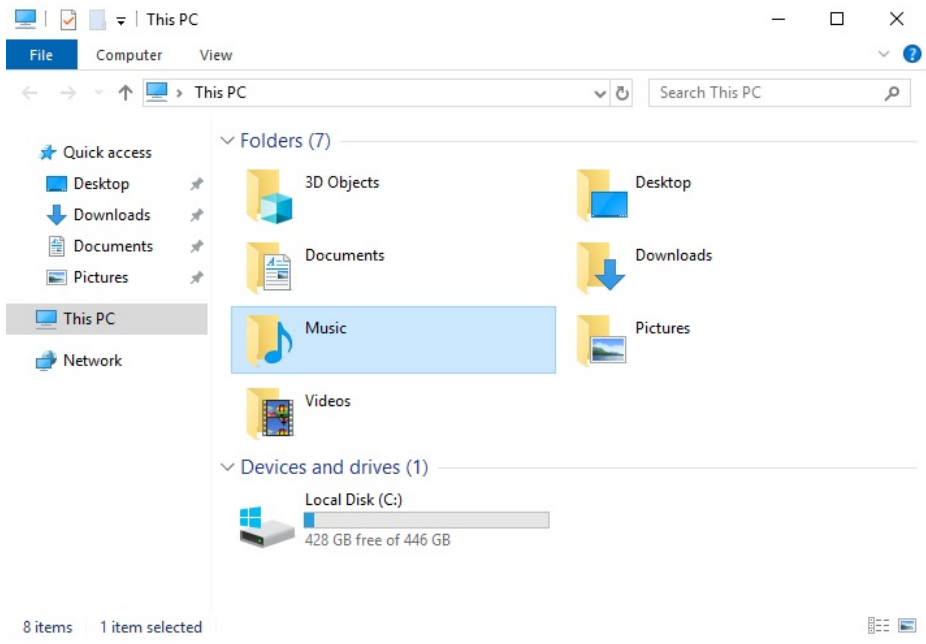


- 5 Click “Next” and complete the Windows 10 LTSC 2019 OS installation.



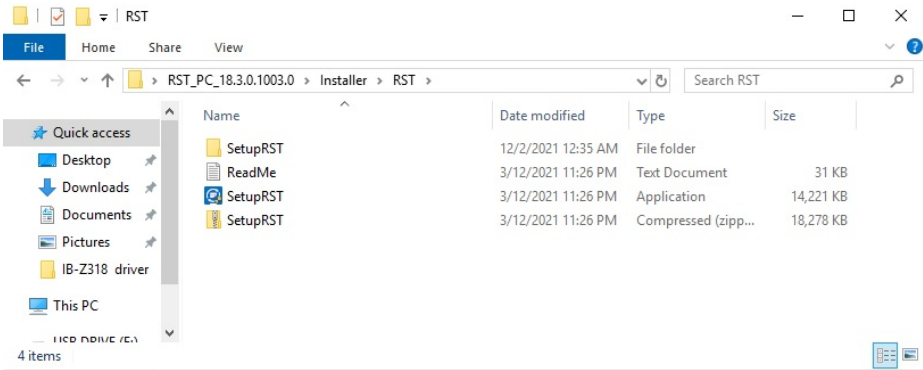
## Installing Intel® Rapid Storage Technology (Intel® RST) Utility

**I** After OS installation is completed, select the computer Hard Disk. You should see only one hard disk displayed.

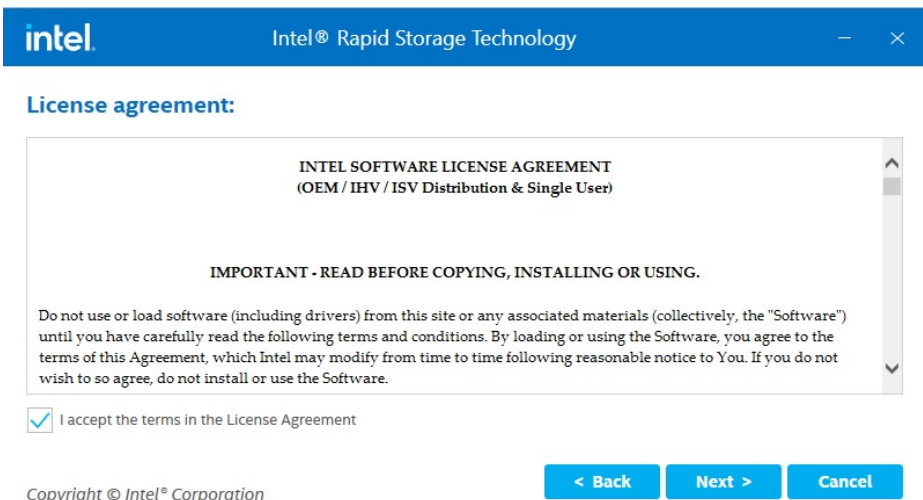




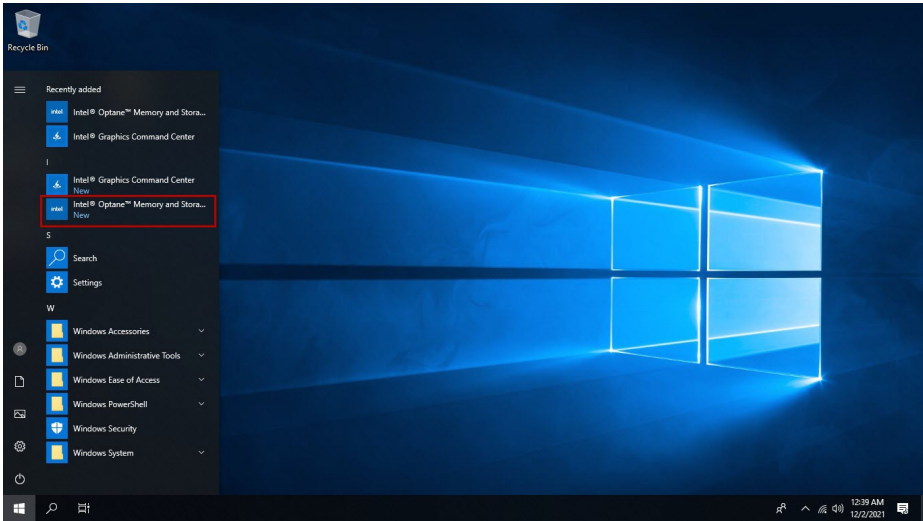
- 2 Select the folder “RST\_PC\_18.3.0.1003.0” -> Installer->RST. Click SetupRST.exe file for utility installation.



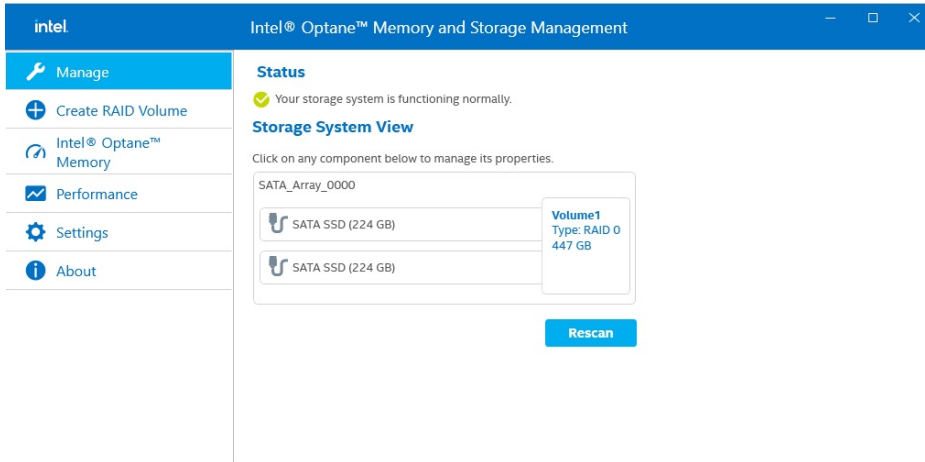
- 3 Please connect the Internet first and install RAID driver and then restart IV-Z318 for the changes to take effect.



## 4 Open “Intel Optane Memory and Storage Management”.



## There are two Hard Disks in Intel Optane Memory and Storage Management and Type is RAID 0.



# 5

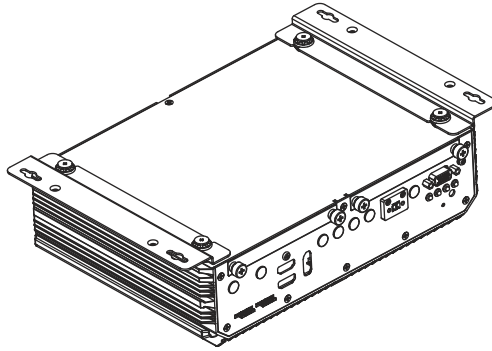
## System Installation

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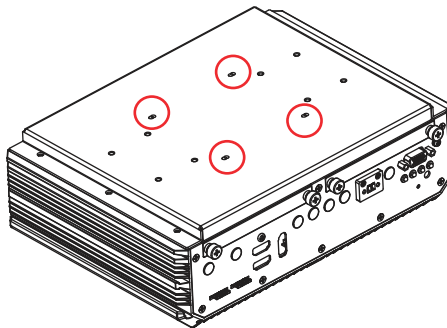
This chapter guides users how to install the accessories, including the installation of Wall Mount, VESA Mount and DIN Rail (optional), memory and M.2 module as well as HDD easy maintenance:

- Installing Wall Mount
- Installing VESA Mount
- Installing DIN Rail (optional)
- HDD Easy Maintenance
- Installing Memory and M.2 Module

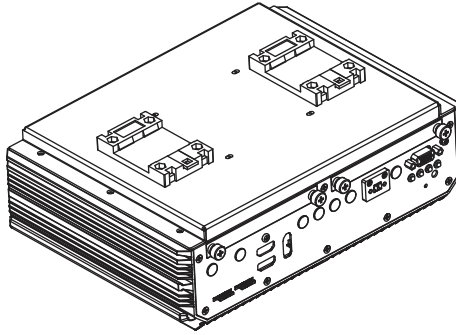
## **5.1 Installing Wall Mount**



## **5.2 Installing VESA Mount**



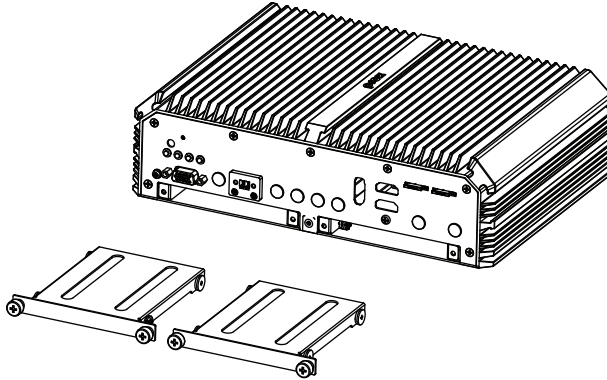
### **5.3 Installing DIN Rail (optional)**



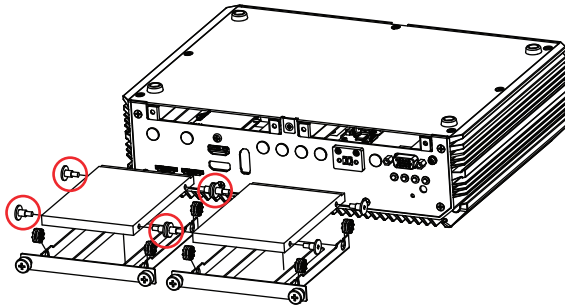
## 5.4 HDD Easy Maintenance

**Step 1.** Release the 2 screws of each HDD Tray.

**Step 2.** Pull out HDD Tray.



**Step 3.** Release the 4 screws of each HDD Tray as indicated below to complete.



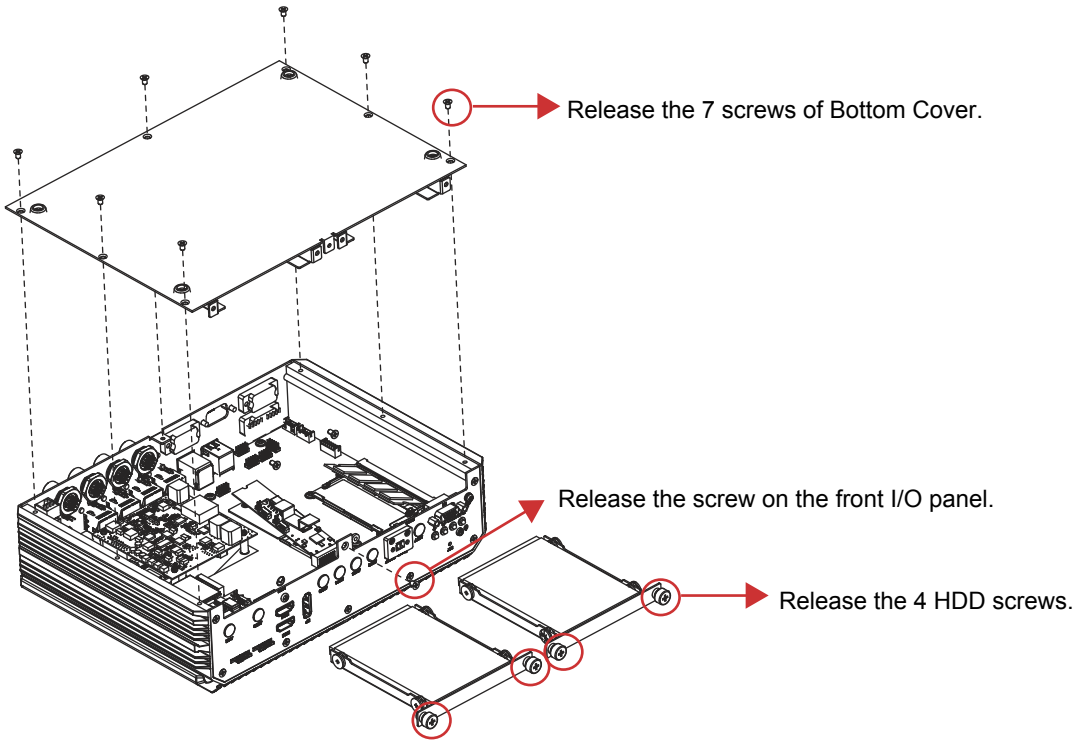
**Note:** Heed the mark should be directed upwards when you push back HDD tray.

## 5.5 Installing Memory and M.2 Module

**Step 1.** Release the 4 HDD screws and pull out the 2 HDD Trays.

**Step 2.** Release the 7 screws of the bottom cover and the screw on the front I/O panel as shown.

**Step 3.** Install the Memory or M.2 module to complete.





# 6

## BIOS SETUP

---

This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in BIOS NVRAM so that the Setup information is retained when the system is powered off. The BIOS Setup Utilities consist of the following menu items:

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

## 6.1 Introduction

The **IB-Z318** board uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the built-in BIOS setup program, Power-On Self-Test (POST), PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between the operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These elements have combined to provide a standard environment for booting the operating system and running pre-boot applications.

The diagram below shows the Extensible Firmware Interface's location in the software stack.

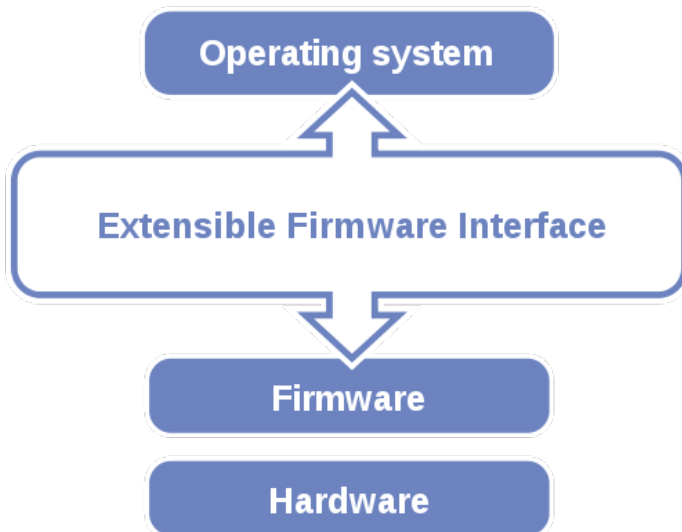


Figure 6-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface that allows you to modify hardware configuration, e.g. change the system date and time, enable/disable a system component, determine bootable device priority, set up personal password, etc., which is convenient for engineers to perform modifications and customize the computer system and allows technicians to troubleshoot the occurred errors when the hardware is faulty.

The BIOS setup menu allows users to view and modify the BIOS settings for the computer. After the system is powered on, users can access the BIOS setup menu by pressing <Del> or <Esc> immediately while the POST message is running before the operating system is loading.

All the menu settings are described in details in this chapter.

## 6.2 Accessing Setup Utility

After the system is powered on, BIOS will enter the Power-On Self-Test (POST) routines and the POST message will be displayed:

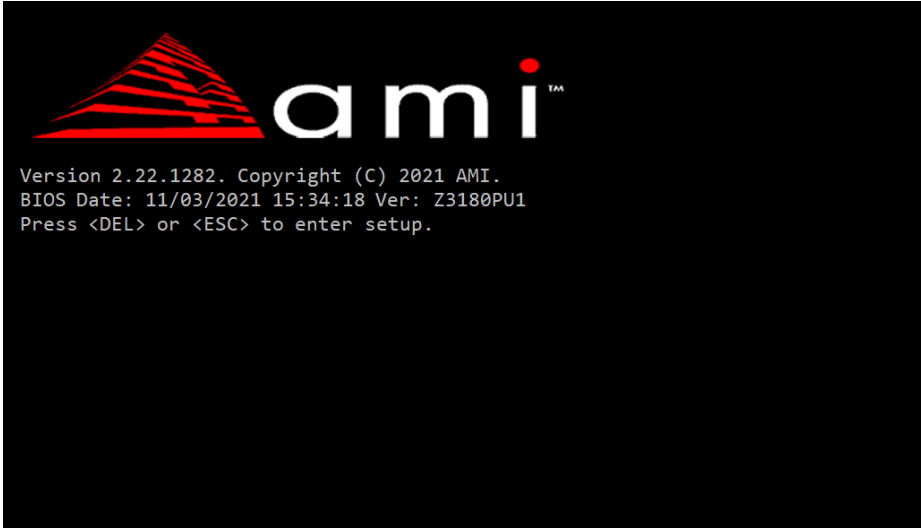
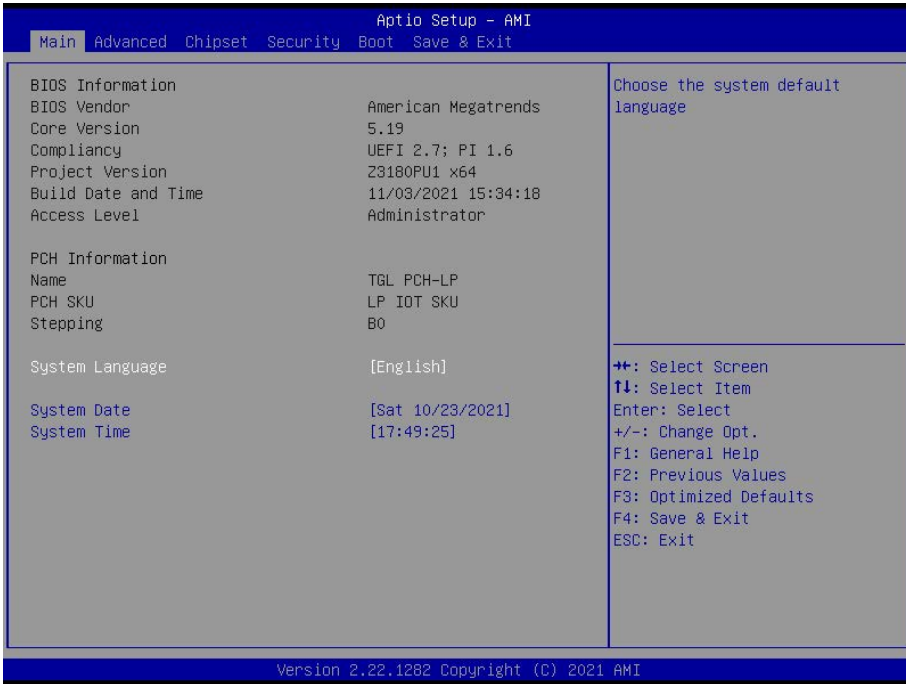


Figure 6-2. POST Screen with AMI Logo

Press **<Del>** or **<Esc>** to access the Setup Utility program and the **Main** menu of the Aptio Setup Utility will appear on the screen as below:



### BIOS Setup Menu Initialization Screen

You may move the cursor by <↑> and <↓> keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear on the right side of the screen.

The language of the BIOS setup menu interface and help messages are shown in US English. You may use <↑> or <↓> key to select among the items and press <Enter> to confirm and enter the sub-menu. The following table provides the list of the navigation keys that you can use while operating the BIOS setup menu.

<b>BIOS Setup Navigation Key</b>	<b>Description</b>
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from the selected item upwards or downwards)
<Enter>	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

## 6.3 Main

Menu Path *Main*

The **Main** menu allows you to view the BIOS Information, change the system date and time, and view the user access privilege level. Use tab to switch between date elements. Use <↑> or <↓> arrow keys to highlight the item and enter the value you want in each item. This screen also displays the BIOS version (project) and BIOS Build Date and Time.



**Main Screen**

BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the name of the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliance	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date that the current BIOS version is built.
Name	No changeable options	Displays the name of the PCH.
PCH SKU	No changeable options	Displays the SKU for the PCH.
Stepping	No changeable options	Displays the stepping of the PCH

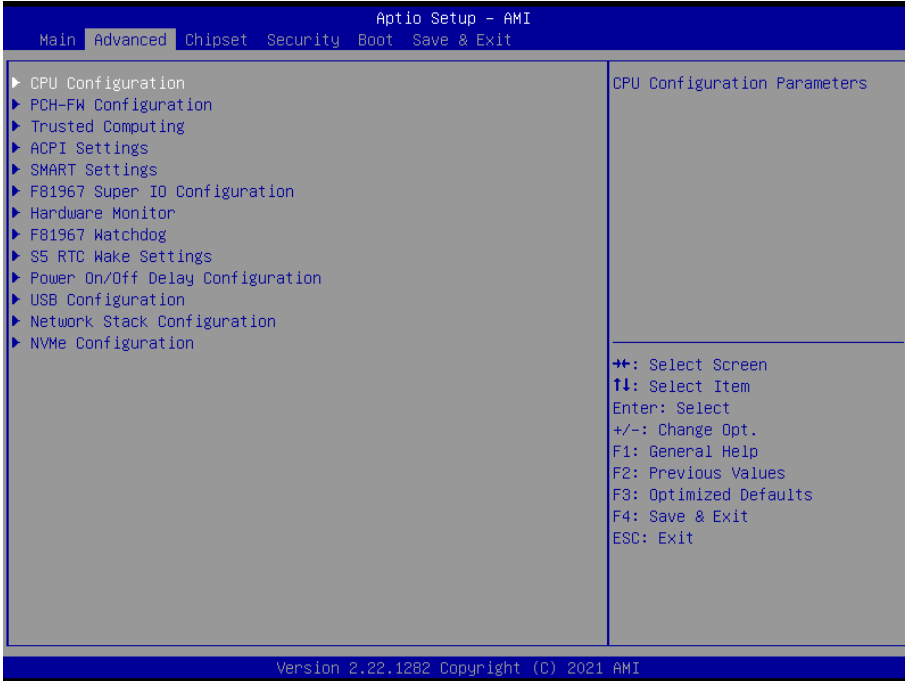
<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
System Date	Month, day, year	Sets the system date. The format is [Day Month/ Date/ Year]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it. The “Day” is automatically changed.
System Time	Hour, minute, second	Sets the system time. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.



## 6.4 Advanced

Menu Path *Advanced*

This menu provides advanced configurations such as CPU Configuration, PCH-FW Configuration, Trusted Computing, ACPI Settings, SMART Settings, F81967 Super IO Configuration, Hardware Monitor, F81967 Watchdog, SR RTC Wake Settings, Power On/Off Delay Configuration, USB Configuration, Network Stack Configuration and NVMe Configuration.



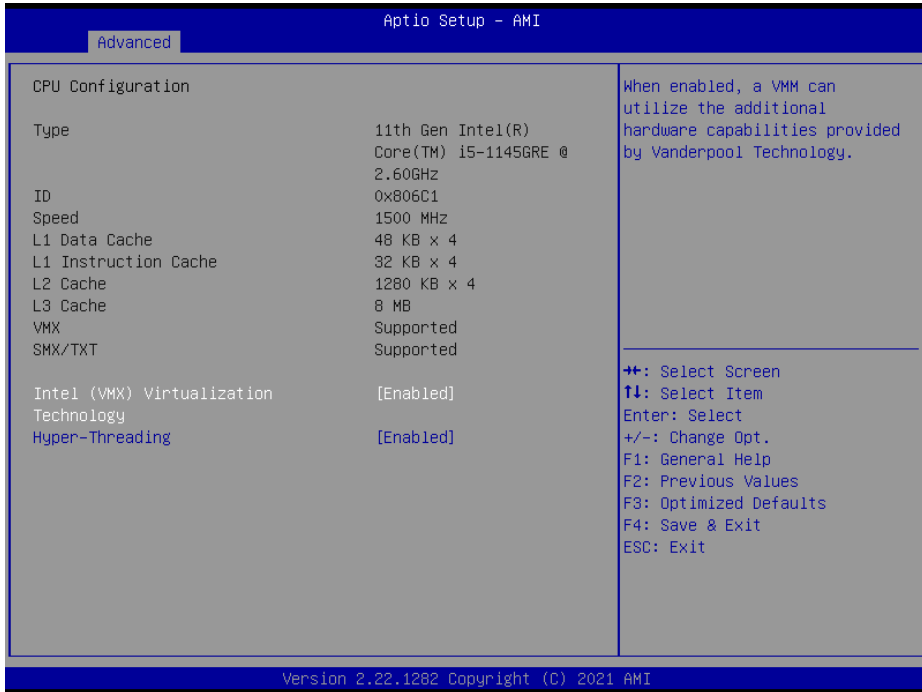
**Advanced Menu Screen**

BIOS Setting	Options	Description/Purpose
CPU Configuration	Sub-Menu	CPU Configuration Parameters.
PCH-FW Configuration	Sub-Menu	Management Engine Technology Parameters.
Trusted Computing	Sub-Menu	Trusted Computing Settings.
ACPI Settings	Sub-Menu	System ACPI Parameters.
Hardware Monitor	Sub-Menu	Monitor hardware status
Super IO Watchdog	Sub-Menu	Super IO Watchdog Parameters.
S5 RTC Wake Settings	Sub-Menu	S5 RTC Wake Parameters.
Super IO Configuration	Sub-Menu	System Super IO Chip Parameters
USB Configuration	Sub-Menu	USB Configuration Parameters.
Network Stack Configuration	Sub-Menu	Network Stack Settings

## 6.4.1 Advanced – CPU Configuration

Menu Path *Advanced > CPU Configuration*

The **CPU Configuration** provides advanced CPU settings and some information about CPU.



**CPU Configuration Screen**

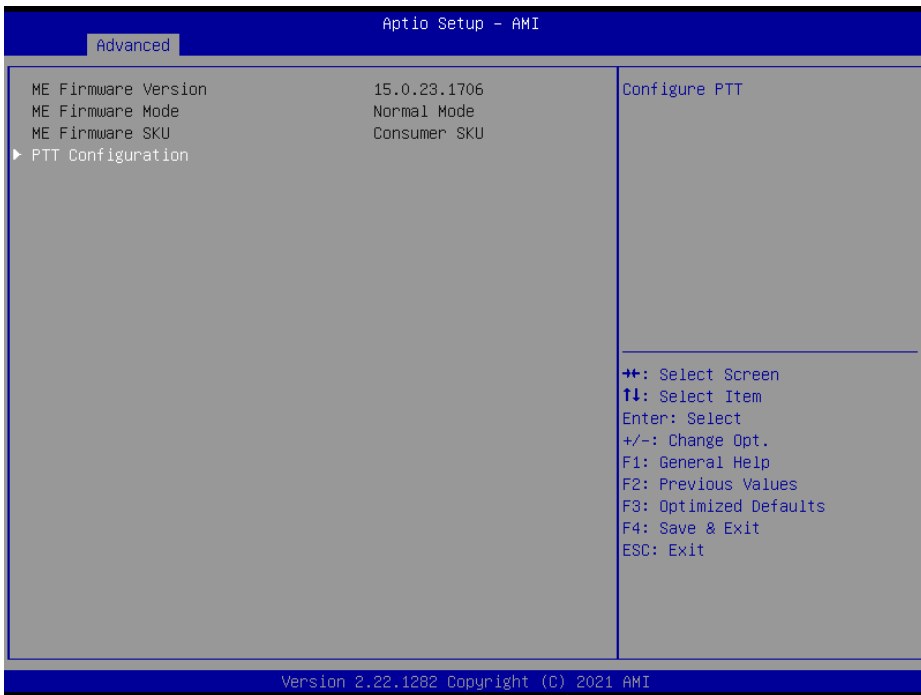
BIOS Setting	Options	Description/Purpose
Type	No changeable options	Displays the CPU Type.
ID	No changeable options	Displays the CPU ID.
Speed	No changeable options	Displays the CPU Speed.
L1 Data Cache	No changeable options	L1 Data Cache Size
L1 Instruction Cache	No changeable options	L1 Instruction Cache Size
L2 Cache	No changeable options	L2 Cache Size
L3 Cache	No changeable options	L3 Cache Size
VMX	No changeable options	CPU VMX hardware support for virtual machines.
SMX/TXT	No changeable options	Secure Mode extensions support.
Intel Virtualization Technology	- Disabled - Enabled [Default]	When enabled, VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

BIOS Setting	Options	Description/Purpose
Hyper-threading	- Disabled - Enabled [Default]	When disabled, only one thread per enabled core is enabled.

## 6.4.2 Advanced – PCH Configuration

Menu Path *Advanced > PCH Configuration*

The **PCH-FW** allows users to view the information about ME (Management Engine) firmware information, such ME firmware version, firmware mode and firmware SKU.



**PCH-FW Configuration Screen**

BIOS Setting	Options	Description/Purpose
ME Firmware Version	No changeable options	Displays the ME Firmware Version.
ME Firmware Mode	No changeable options	Displays the ME Firmware Mode.
ME Firmware SKU	No changeable options	Displays the ME Firmware SKU.
PTT Configuration	Sub-Menu	Configures PTT settings.

6.4.2.1 Advanced – PCH Configuration – PTT Configuration

Menu Path *Advanced > PCH Configuration > PTT Configuration*



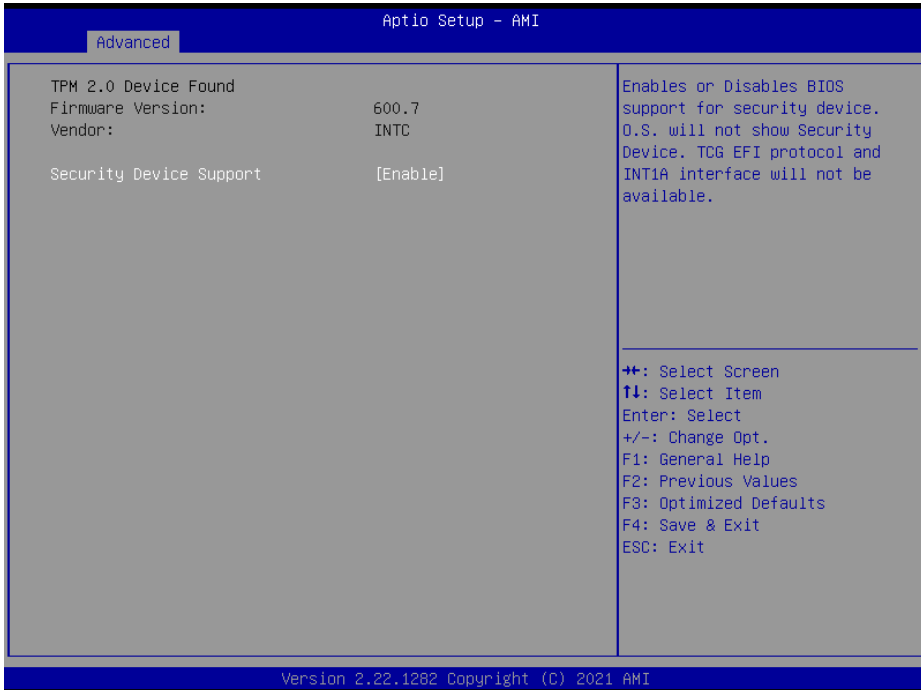
PTT Configuration Screen

BIOS Setting	Options	Description/Purpose
TPM Device Selection	- dTPM - PTT [Default]	Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr <b>Warning!</b> PTT/dTPM will be disabled and all data saved on it will be lost.

### 6.4.3 Advanced – Trusted Computing

Menu Path *Advanced > Trusted Computing*

The Trusted Computing allows users to enable/disable BIOS support for security device. The operating system will now show Security Device. The TCG EFI protocol and INT1A interface will not be available.



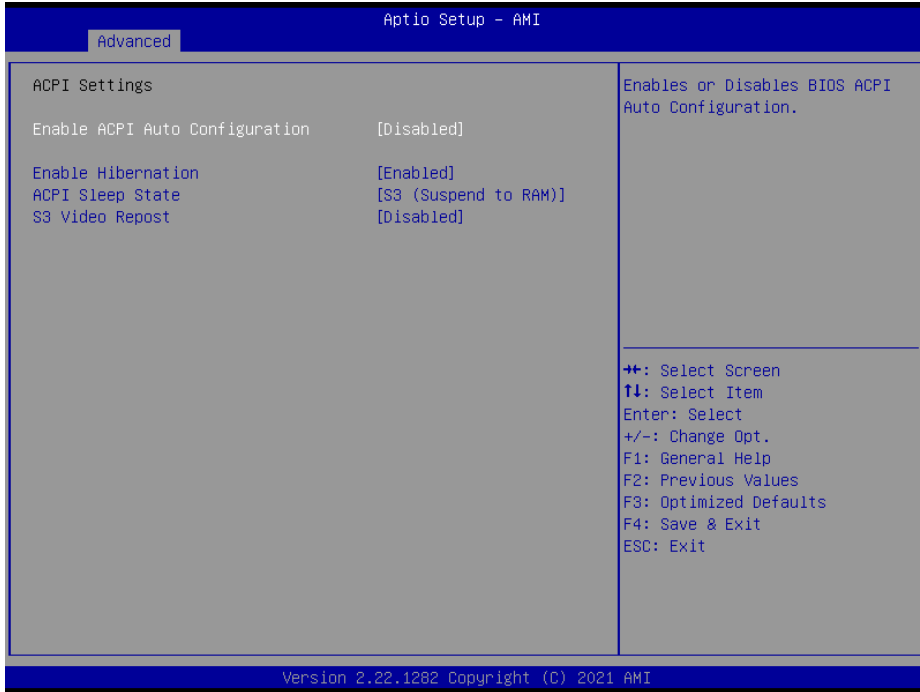
**Trusted Computing Screen**

BIOS Setting	Options	Description/Purpose
Security Device Support	- Enable [Default] - Disable	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

## 6.4.4 Advanced – ACPI Settings

Menu Path *Advanced > ACPI Settings*

The **ACPI Settings** allows users to configure relevant ACPI (Advanced Configuration and Power Management Interface) settings, such as enable/disable Hibernation, ACPI Sleep State, Lock legacy resources and S3 Video Repost.

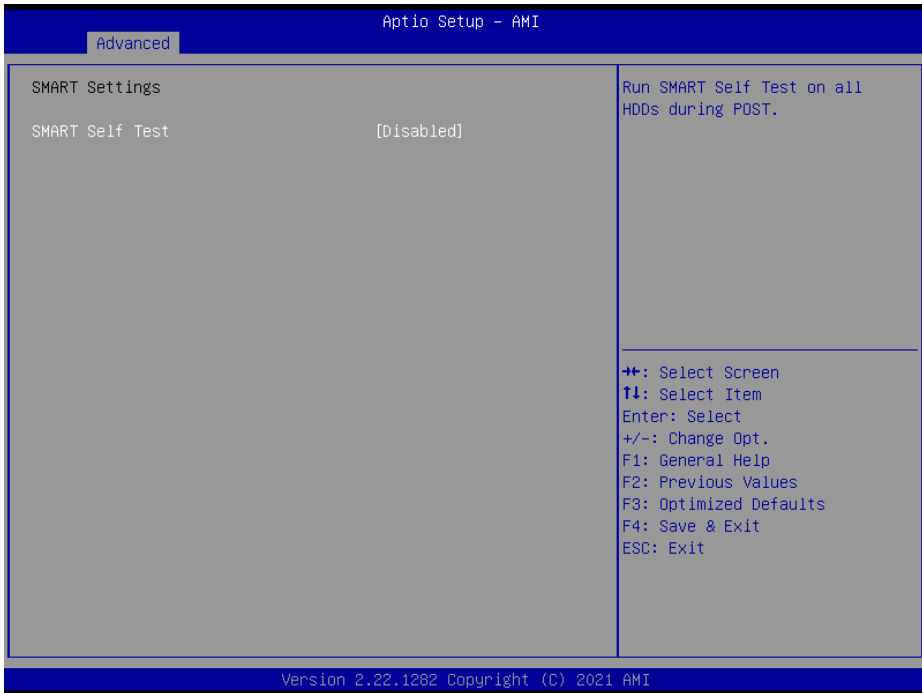


**ACPI Settings Screen**

BIOS Setting	Options	Description/Purpose
Enable ACPI Auto Configuration	- Disabled [Default] - Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	- Disabled - Enabled [Default]	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	- Suspend Disabled - S3 (Suspend to RAM) [Default]	Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
S3 Video Repost	- Disabled [Default] - Enabled	Enables or Disables S3 Video Repost.

## 6.4.5 Advanced – SMART Settings

Menu Path *Advanced > SMART Settings*



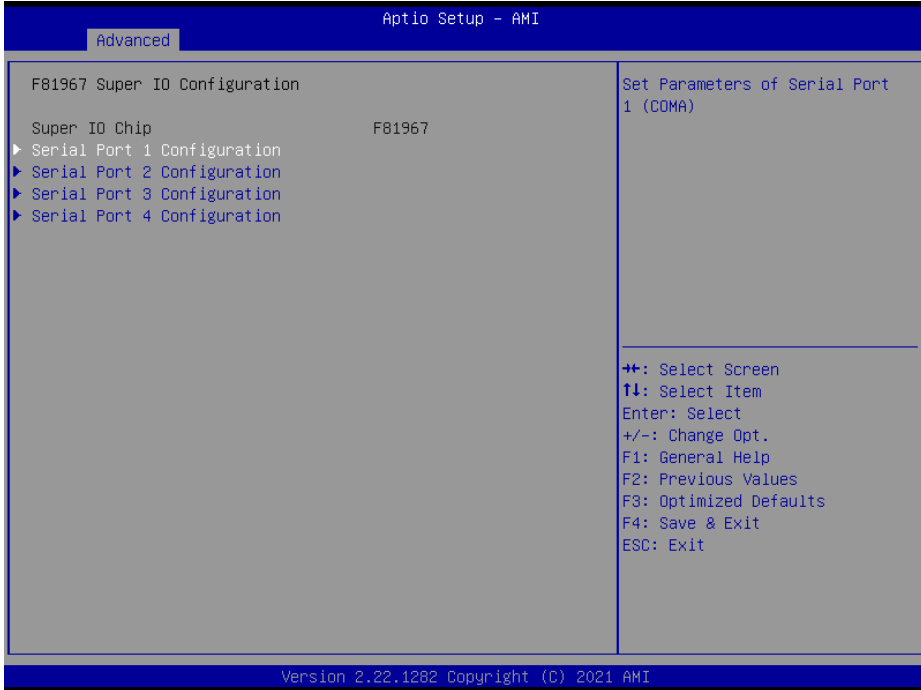
**SMART Settings Screen**

BIOS Setting	Options	Description/Purpose
SMART Self Test	- Disabled [Default] - Enabled	Runs SMART Self Test on all HDDs during POST.

## 6.4.6 Advanced – F81967 Super IO Configuration

Menu Path *Advanced > F81967 Super IO Configuration*

The **F81967 Super IO Configuration** allows users to configure the serial ports 1-4.



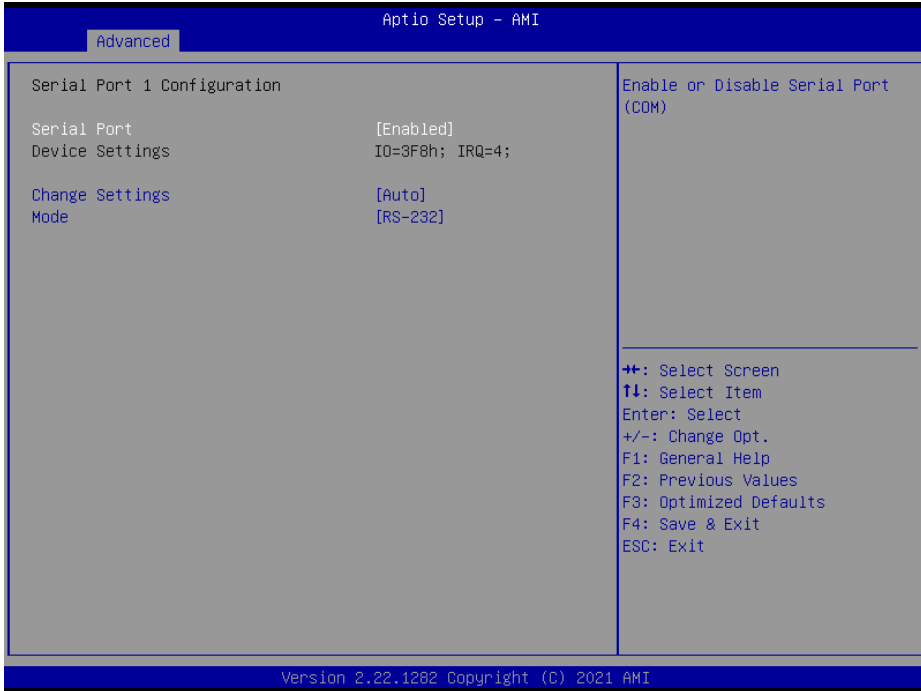
**F81967 Super IO Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port 1 Configuration	Sub-Menu	Configures Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Sub-Menu	Configures Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Sub-Menu	Sets Parameters of Serial Port 3 (COMC)
Serial Port 4 Configuration	Sub-Menu	Sets Parameters of Serial Port 4 (COMD)



**6.4.6.1 F81967 Super IO Configuration – Serial Port 1 Configuration**

Menu Path *Advanced > F81967 Super IO Configuration > Serial Port 1 Configuration*

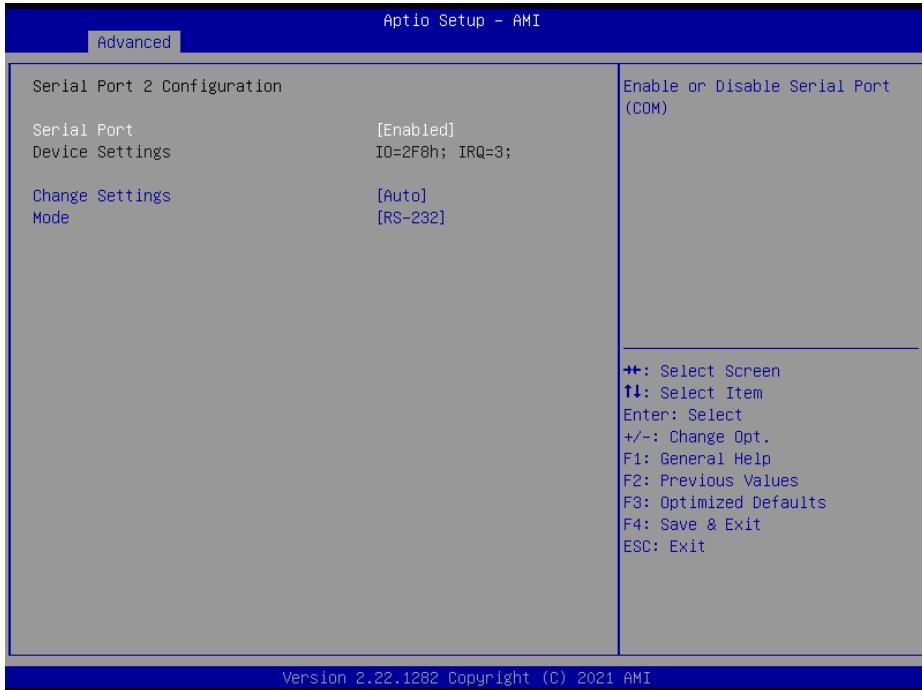


**Serial Port 1 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled [Default]	Enables or Disables Serial Port 1.
Device Settings	No changeable options	Displays the current settings of Serial Port 1.
Change Settings	- Auto [Default] - 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;	Selects IRQ and I/O resource settings for Serial Port 1.
Mode	- RS-232 [Default] - RS-422 - RS-485	Selects COM mode.

### 6.4.6.2 F81967 Super IO Configuration – Serial Port 2 Configuration

Menu Path *Advanced > F81967 Super IO Configuration > Serial Port 2 Configuration*

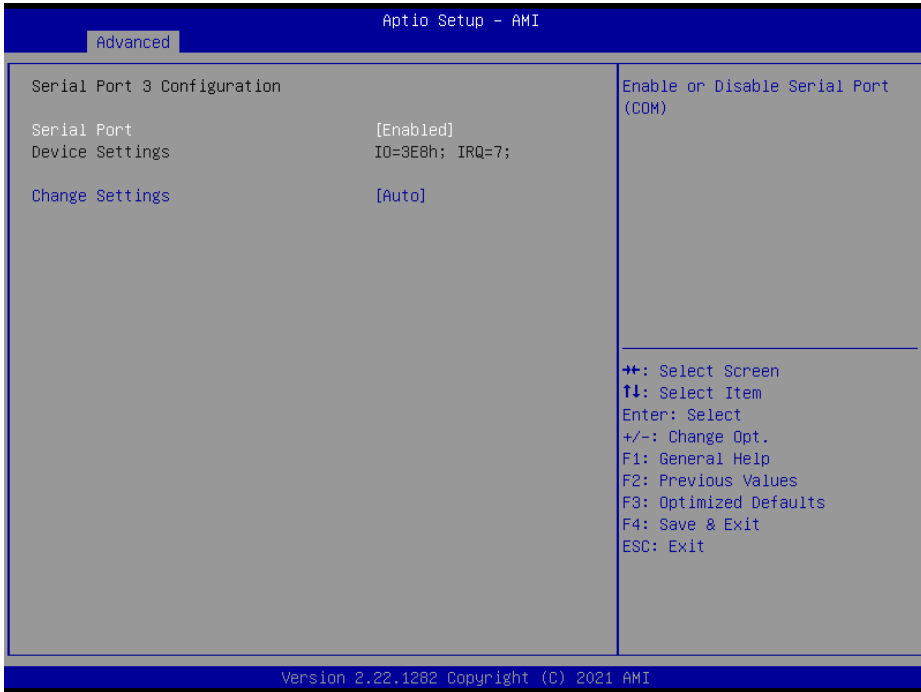


**Serial Port 2 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled [Default]	Enables or Disables Serial Port 2.
Device Settings	No changeable options	Displays the current settings of Serial Port 2.
Change Settings	- Auto [Default] - IO=2F8h; IRQ=3; - IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Selects IRQ and I/O resource settings for Serial Port 2.
Mode	- RS-232 [Default] - RS-422 - RS-485	Selects COM mode.

**6.4.6.3 F81967 Super IO Configuration – Serial Port 3 Configuration**

Menu Path *Advanced > F81967 Super IO Configuration > Serial Port 3 Configuration*

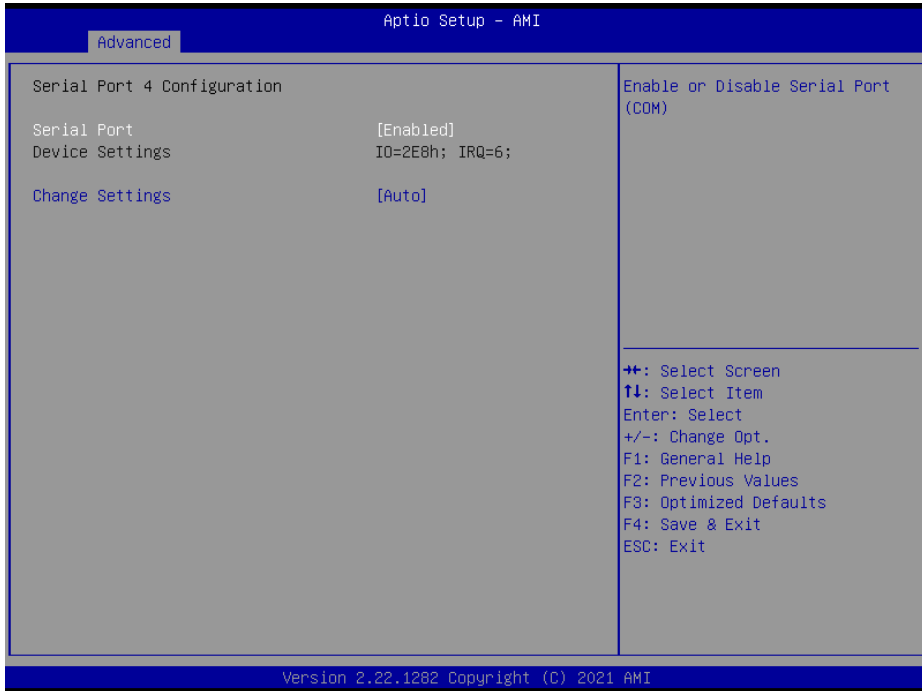


**Serial Port 3 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled [Default]	Enables or Disables Serial Port 3.
Device Settings	No changeable options	Displays the current settings of Serial Port 3.
Change Settings	- Auto [Default] - IO=3E8h; IRQ=7; - IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	Selects IRQ and I/O resource settings for Serial Port 3.

**6.4.6.4 F81967 Super IO Configuration – Serial Port 4 Configuration**

Menu Path *Advanced > F81967 Super IO Configuration > Serial Port 4 Configuration*



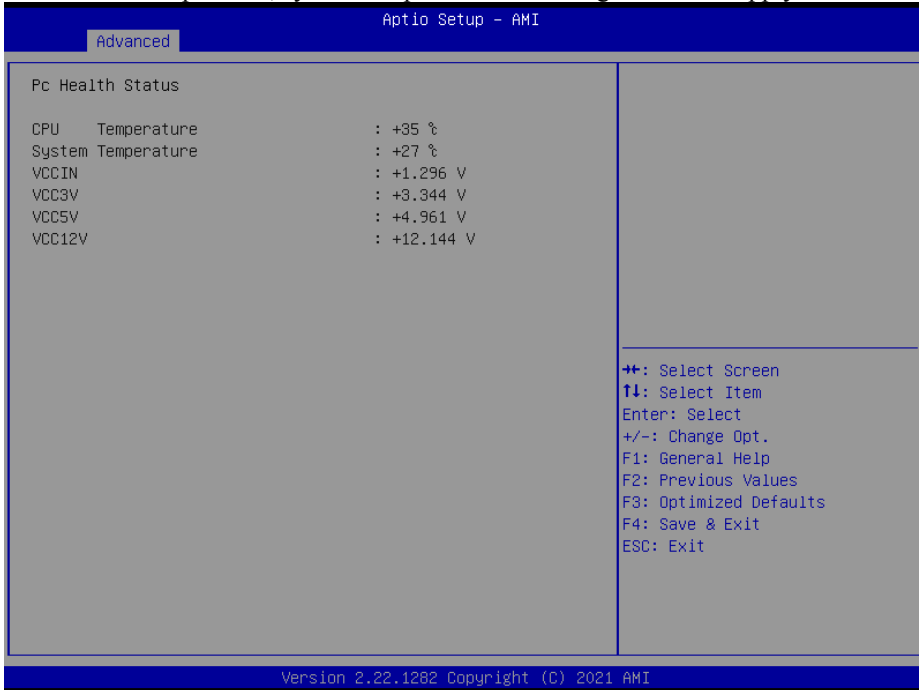
**Serial Port 4 Configuration Screen**

BIOS Setting	Options	Description/Purpose
Serial Port	- Disabled - Enabled [Default]	Enables or Disables Serial Port 4.
Device Settings	No changeable options	Displays the current settings of Serial Port 4.
Change Settings	- Auto [Default] - IO=2E8h; IRQ=6; - IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2F0h; IRQ=3,4,5,6,7,9,10,11,12; - IO=2E0h; IRQ=3,4,5,6,7,9,10,11,12;	Selects IRQ and I/O resource settings for Serial Port 4.

## 6.4.7 Advanced – Hardware Monitor

Menu Path *Advanced > Hardware Monitor*

The **Hardware Monitor** allows users to monitor the health and status of the system such as CPU temperature, system temperature and voltage levels in supply.



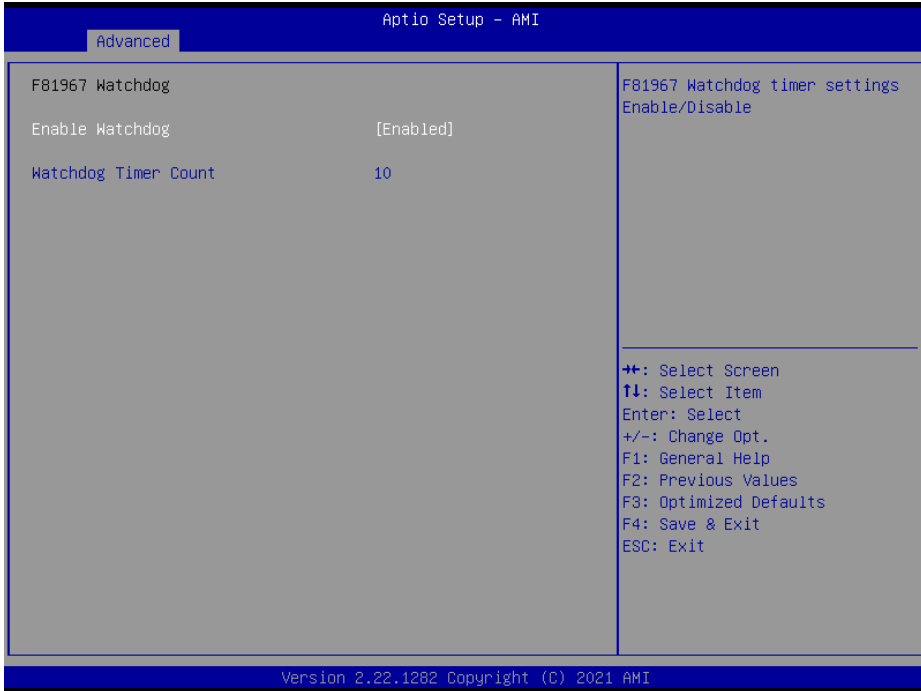
**Hardware Monitor Screen**

BIOS Setting	Options	Description/Purpose
CPU Temperature	No changeable options	Displays the processor's temperature.
System Temperature	No changeable options	Displays the system temperature.
VCCIN	No changeable options	Detects and displays the voltage level of the VCCIN in supply.
VCC3V	No changeable options	Detects and displays the voltage level of the VCC3V in supply.
VCC5V	No changeable options	Detects and displays the voltage level of the VCC5V in supply.
VCC12V	No changeable options	Detects and displays the voltage level of the VCC12V in supply.

## 6.4.8 Advanced – F81967 Watchdog

Menu Path *Advanced > F81967 Watchdog*

If the system hangs or fails to respond, enable the F81967 watchdog function to trigger a system reset via the 255-level watchdog timer.



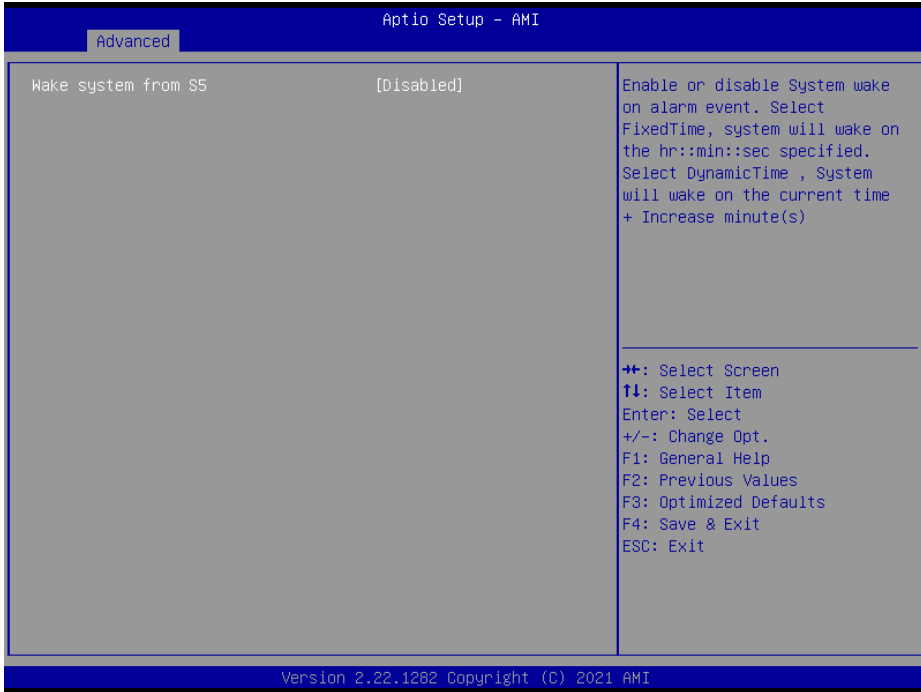
**F81967 Watchdog Screen**

BIOS Setting	Options	Description/Purpose
Enable WatchDog	- Enabled - Disabled [Default]	Super IO Watchdog timer settings enabled/disabled.
Count for Timer	Numeric (from 1 to 255)	Selects count of watchdog timer. Watchdog Timer = 1sec * Count

### 6.4.9 Advanced – S5 RTC Wake Settings

Menu Path *Advanced > S5 RTC wake Settings (Disabled)*

The **S5 RTC Wake Settings** enables/disables the system to wake up at a preset time of a day from S5 State using RTC alarm.

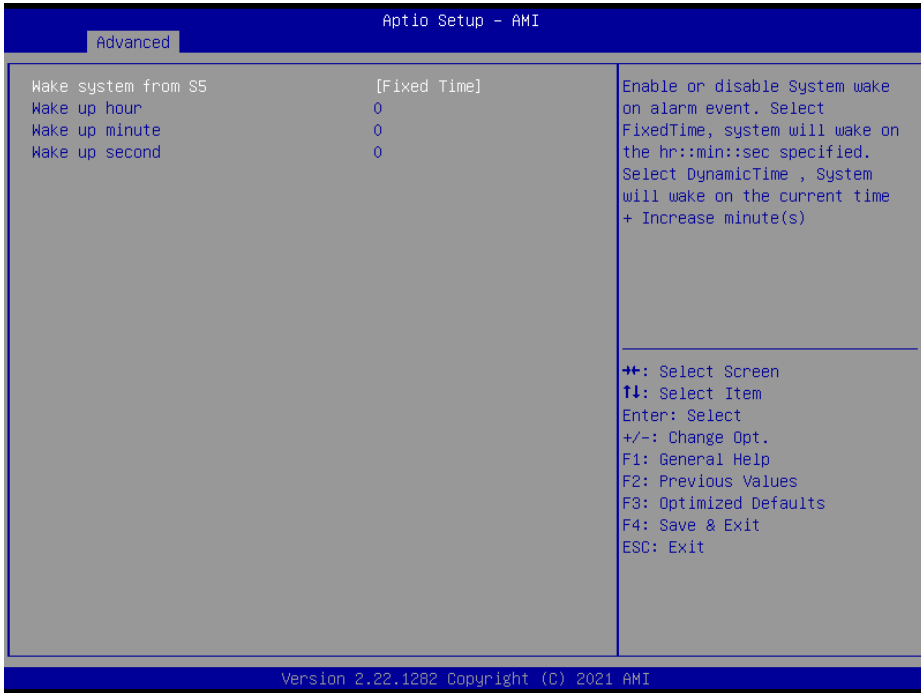


**S5 RTC Wake Settings Screen (Disabled)**

BIOS Setting	Options	Description/Purpose
Wake system from S5	- Disabled [Default] - Fixed Time - Dynamic Time	Allows enabling scheduled S5 to S0 (option <b>enabled</b> ). <ul style="list-style-type: none"> <li>• <b>Fixed Time:</b> System will wake on the hr::min::sec specified.</li> <li>• <b>Dynamic Time:</b> System will wake on the current time + Increase minute(s).</li> </ul>

6.4.9.1 S5 RTC Wake Settings [Fixed Time]

Menu Path *Advanced > S5 RTC Wake Settings [Fixed Time]*



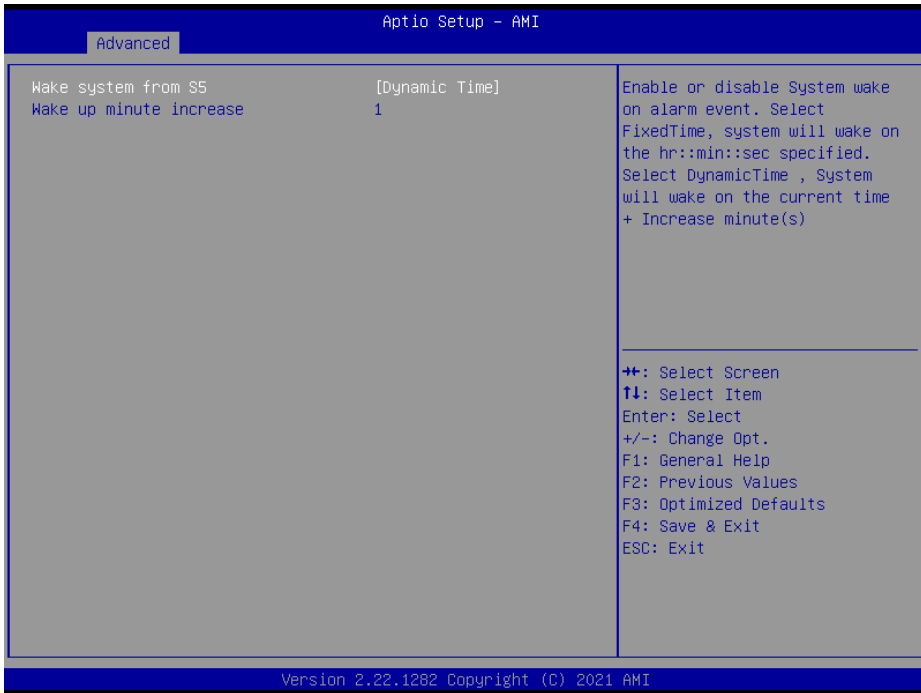
S5 RTC Wake Settings Screen (Fixed Time)

BIOS Setting	Options	Description/Purpose
Wake system from S5	- Disabled - Fixed Time - Dynamic Time	Allows enabling scheduled S5 to S0 (option: <b>enabled</b> ). <ul style="list-style-type: none"> <li>• <b>Fixed Time:</b> System will wake on the hr::min::sec specified.</li> <li>• <b>Dynamic Time:</b> System will wake on the current time + Increase minute(s).</li> </ul>
Wake up hour	Multiple options ranging from 0 to 23	Sets an hour for schedule power on event.
Wake up minute	Multiple options ranging from 0 to 59	Sets a minute for schedule power on event.
Wake up second	Multiple options ranging from 0 to 59	Sets a second for schedule power on event.



6.4.9.2 S5 RTC Wake Settings [Dynamic Time]

Menu Path *Advanced > S5 RTC Wake Settings [Dynamic Time]*



S5 RTC Wake Setting Screen (Dynamic Time)

BIOS Setting	Options	Description/Purpose
Wake system from S5	- Disabled - Fixed Time - Dynamic Time	Allows enabling scheduled S5 to S0 (option: <b>enabled</b> ). <ul style="list-style-type: none"> <li>• <b>Fixed Time:</b> System will wake on the hr::min::sec specified.</li> <li>• <b>Dynamic Time:</b> System will wake on the current time + Increase minute(s).</li> </ul>
Wake up minute increase	Multiple options ranging from 1 to 5	Sets a period of time (in minutes) after which the board wakes up from S5 state.

### 6.4.10 Advanced – Power On/Off Configuration

Menu Path *Advanced > Power On/Off Configuration*

The **Power On/Off Delay Configuration** allows users to configure the Power On/Off Delay time after the ignition signal is activated or not.



**Power On/Off Delay Configuration Screen**

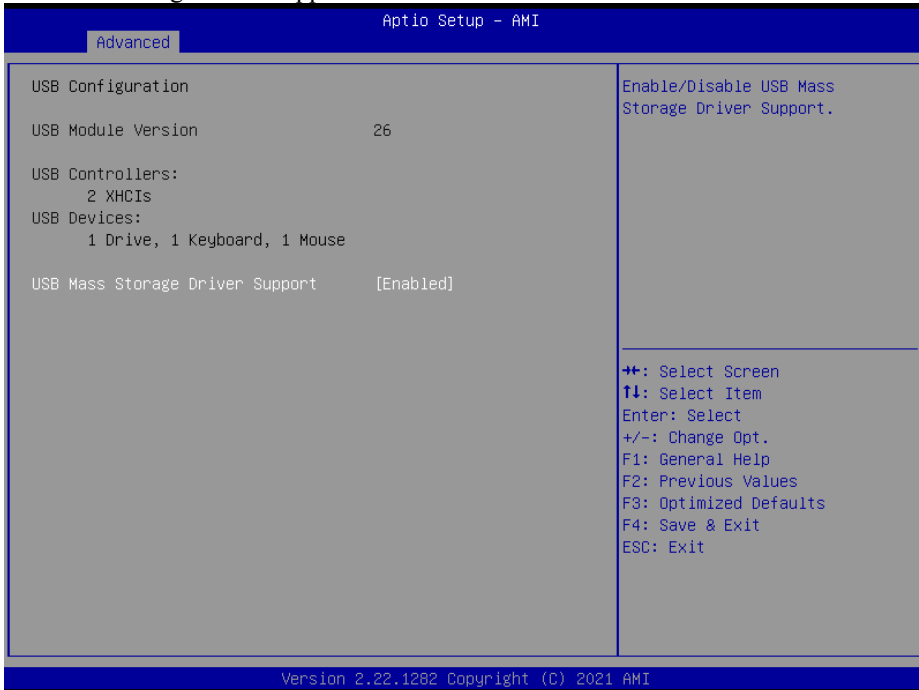
BIOS Setting	Options	Description/Purpose
Power On/Off function	- Disabled [Default] - Enabled	Enables or disables Power On/Off function.
Power On delay time	Multiple options ranging from 3 to 255	Selects count of Power On delay timer. Power On delay timer = 1sec * Count. If the ignition signal is activated, the count will start and the system will turn on automatically when the set count is reached.
Power Off delay time	Multiple options ranging from 3 to 255	Selects count of Power Off delay timer. Power Off delay timer = 1sec * Count. If the ignition signal is not active, the system will automatically

<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
		shut down and start counting when the shutdown procedure is completed. When the set count is reached, the system will cut off the power to achieve the purpose of power saving.
Force Reset delay support	- Disabled [Default] - Enabled	Enables or disables Force reset delay function. The system will force reset to the system at the end of the Force Reset delay time count.
Force Reset delay time	- 1 min [Default] - 2 min - 3 min - 4 min - 5 min - 6 min - 7 min - 8 min - 9 min - 10 min	Selects count of Force Reset delay timer.

## 6.4.11 Advanced – USB Configuration

Menu Path *Advanced > USB Configuration*

The **USB Configuration** allows users to configure advanced USB settings such as USB mass storage driver support.



**USB Configuration Screen**

BIOS Setting	Options	Description/Purpose
USB Mass Storage Driver Support	- Disabled - Enabled [Default]	Enable/Disable USB Mass Storage Driver Support.

## 6.4.12 Advanced – Network Stack Configuration

Menu Path *Advanced > Network Stack Configuration*

The **Network Stack Configuration** allows users to enable/disable UEFI Network Stack, IPv4/IPv6 PXE (Pre-Boot Execution) support and configure PXE boot wait time and detects the media presence.

PXE allows a workstation to boot from a server on a network prior to booting the operating system on the local hard drive. A PXE-enabled workstation connects its NIC to the LAN via a jumper, which keeps the workstation connected to the network even when the power is turned off.



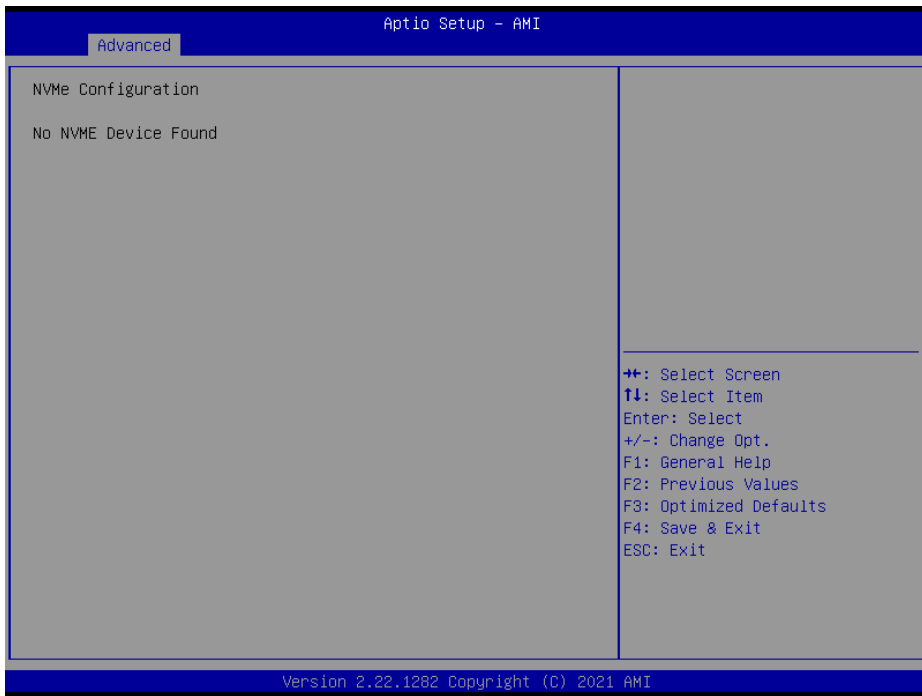
**Network Stack Configuration Screen**

BIOS Setting	Options	Description/Purpose
Network Stack	- Disabled [Default] - Enabled	Enables or Disables UEFI Network Stack.
Ipv4 PXE Support	- Disabled [Default] - Enabled	Enables Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.

BIOS Setting	Options	Description/Purpose
Ipv6 PXE Support	- Disabled [Default] - Enabled	Enables Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
PXE boot wait time	Numeric (from 0 to 5)	Number of seconds to wait for PXE boot to abort after the Esc key is pressed.
Media detect count	Numeric (from 1 to 50)	Number of times that the media presence will be checked.

### 6.4.13 Advanced – NVMe Configuration

Menu Path *Advanced > NVMe Configuration*



**NVMe Configuration Screen**

BIOS Setting	Options	Description/Purpose
NVMe Configuration	No changeable options	Displays NVMe device.

## 6.5 Chipset

Menu Path *Chipset*

This menu allows users to configure advanced Chipset settings such as System Agent (SA) and PCH-IO configuration parameters.

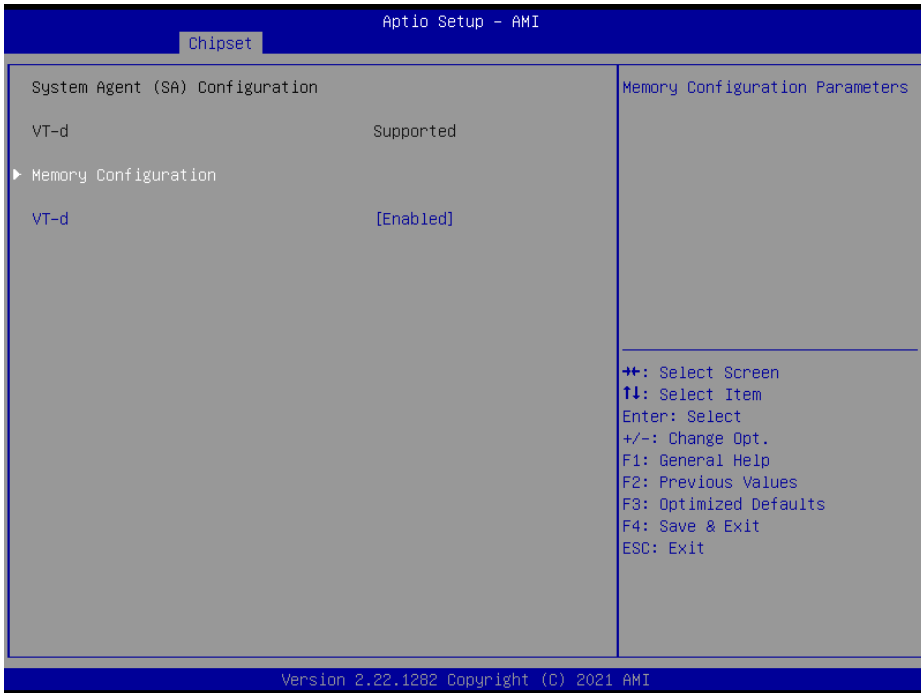


**Chipset Screen**

BIOS Setting	Options	Description/Purpose
System Agent (SA) Configuration	Sub-Menu	System Agent (SA) Parameters.
PCH-IO Configuration	Sub-Menu	PCH Parameters.

## 6.5.1 Chipset – System Agent (SA) Configuration

Menu Path *Chipset > System Agent (SA) Configuration*



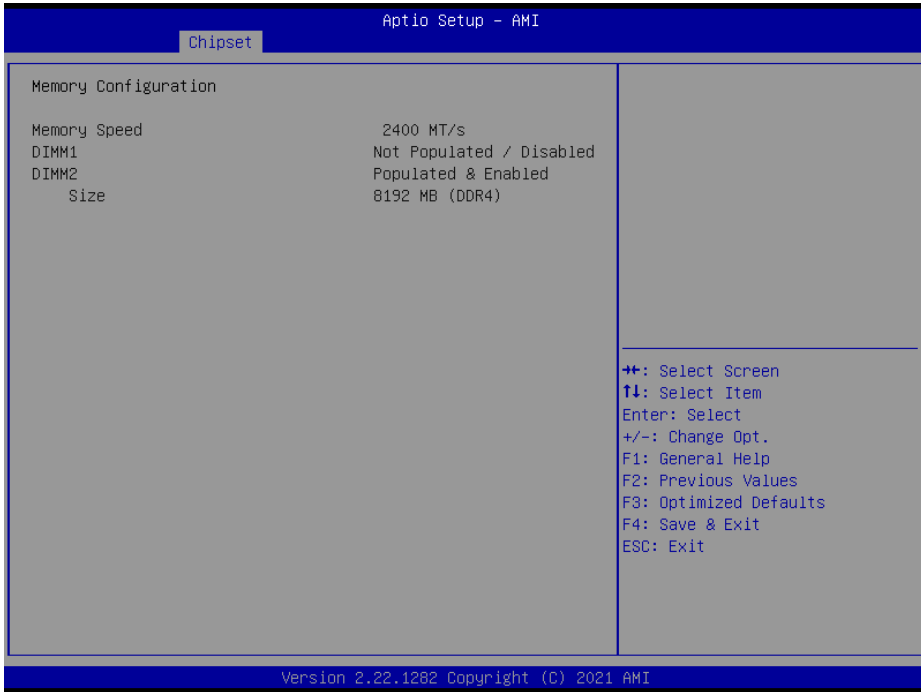
**System Agent (SA) Configuration Screen**

BIOS Setting	Options	Description/Purpose
Memory Configuration	Sub-Menu	Memory Configuration.
VT-d	- Disabled - Enabled [Default]	Enables or Disables VT-d function.



**6.5.1.1 System Agent (SA) Configuration – Memory Configuration**

Menu Path *Chipset > System Agent (SA) Configuration > Memory Configuration*



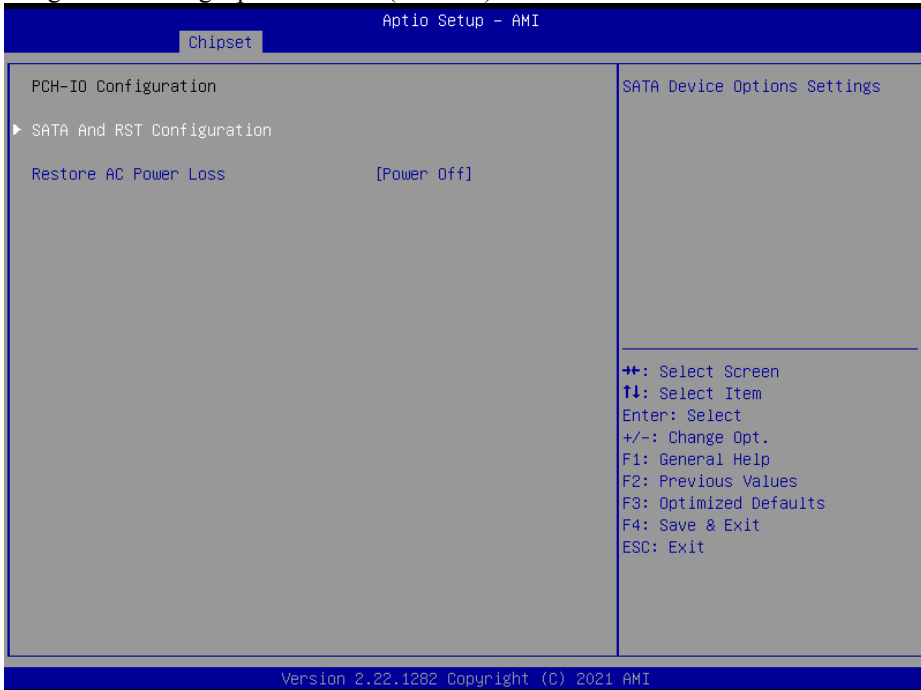
**Memory Configuration Screen**

BIOS Setting	Options	Description/Purpose
Memory Frequency	No changeable options	Displays the Frequency of Memory.
DIMM1	No changeable options	Displays the size of DIMM1.
DIMM2	No changeable options	Displays the size of DIMM2.

## 6.5.2 Chipset – PCH IO Configuration

Menu Path *Chipset > PCH-IO Configuration*

The **PCH-IO Configuration** allows users to configure North Bridge chipset, set SATA And RST Configuration and determine the power on/off state that the system will go to following a power failure (G3 state).



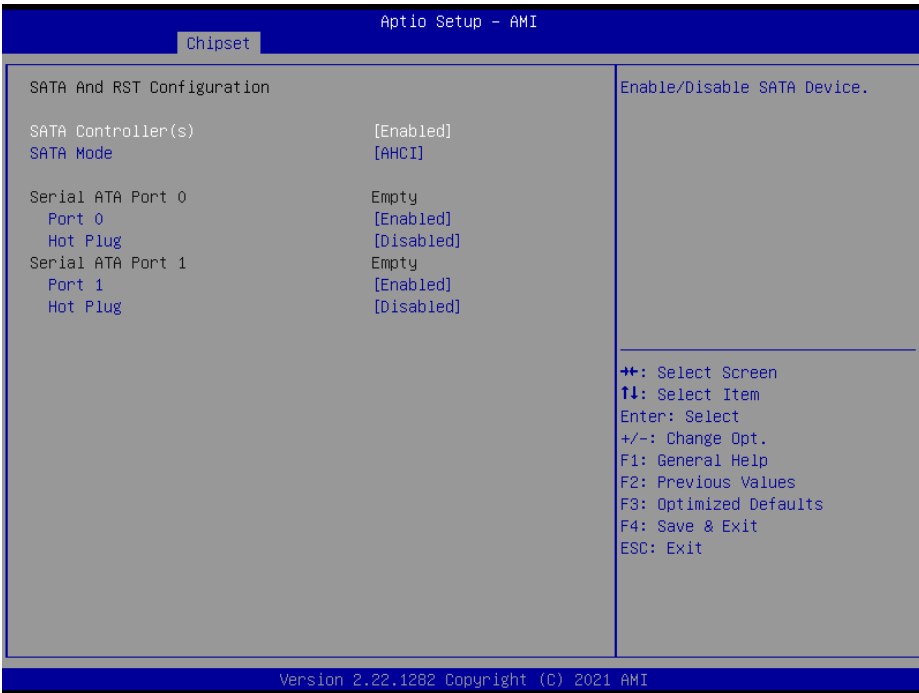
**PCH-IO Configuration Screen**

BIOS Setting	Options	Description/Purpose
SATA And RST Configuration	Sub-Menu	SATA Configuration settings.
Restore AC Power Loss	- Power On - Power Off [Default]	Specify what state to go to when power is re-applied after a power failure (G3 state).

**6.5.2.1 PCH-IO Configuration – SATA And RST Configuration**

Menu Path *Chipset > PCH-IO Configuration > SATA And RST Configuration*

The **SATA And RST Configuration** allows users to enable / disable the SATA controller as well as the operational mode after the SATA controller is enabled. The following screen indicates the functions available when the SATA controller is enabled and the AHCI mode is selected.



**SATA and RST Configuration Screen**

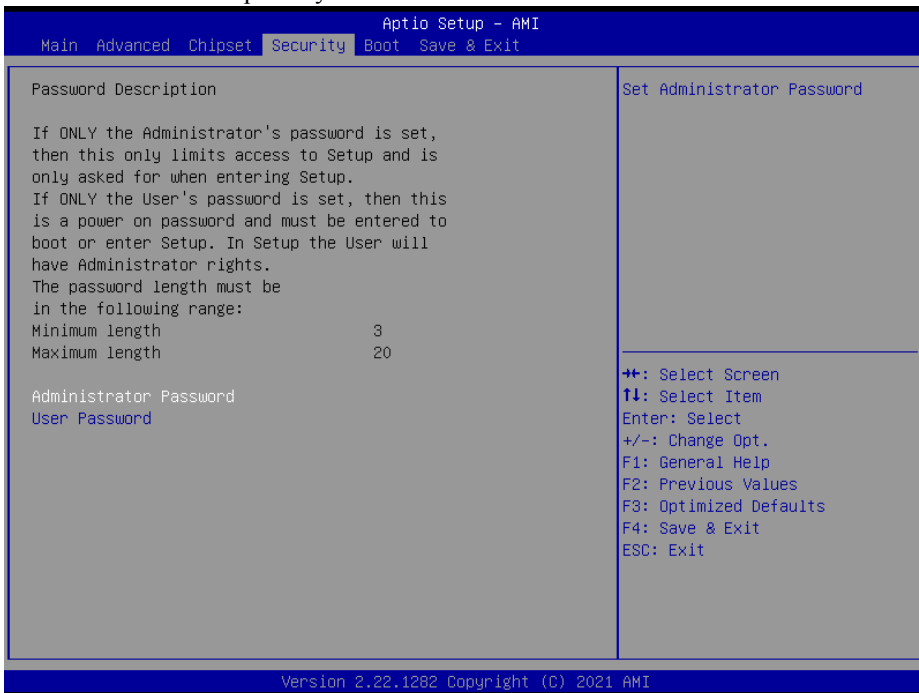
BIOS Setting	Options	Description/Purpose
SATA Controller(s)	- Disabled - Enabled [Default]	Enables or Disables SATA Device.
SATA Mode	- AHCI [Default] - RST	Determines how SATA controller(s) operate.
Serial ATA Port 0 – 1	No changeable options	Displays the SATA device’s name.
Port 0 - 1	- Disabled - Enabled [Default]	Enables or Disables SATA Port Device.
HotPlug	- Disabled [Default] - Enabled	Enables or Disables Hot Plug function to designate a SATA port device as hot-pluggable.

## 6.6 Security

Menu Path                      *Security*

From the **Security** menu, you are allowed to create, change or clear the administrator password. You will be asked to enter the configured administrator password before you can access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. An administrator has much more privileges over the settings in the Setup utility than a user. Heed that a user password does not provide access to most of the features in the Setup utility.



### Security Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies the administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies the user password.

**Create an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Enter the password you want to create. A password can be 3-20 alphanumeric characters. After you have configured the password, press <Enter> to confirm.
3. Type the new password again and press <Enter>.

**Change an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the Administrator Password or User Password that you want to change. A password can be 3-20 alphanumeric characters. After you have changed the password, press <Enter> to confirm.
3. Type the changed password again and press <Enter>.

**Remove an Administrator or User Password**

1. Select the **Administrator Password / User Password** option from the Security menu and press <Enter>, and the password dialog entry box appears.
2. Select the configured Administrator Password or User Password that you want to delete. Leave the dialog box blank and press <Enter>.
3. Press <Enter> again when the password confirmation box appears.

## 6.7 Boot

Menu Path *Boot*

This menu provides control items for system boot configuration such as setting setup prompt timeout, enabling/disabling quiet boot and fast boot, and changing the boot order from the available bootable device(s).



### Boot Screen

BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric (from 1 to 65535)	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On [Default] - Off	Specifies the power-on state of the NumLock Key.
Quiet Boot	- Disabled [Default] - Enabled	Enables or Disables Quiet Boot options.
Boot Option #1~#n	- [Drive(s)] - Disabled	Sets the system boot order.
Fast Boot	- Disabled [Default] - Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

## 6.8 Save & Exit

Menu Path *Save & Exit*

The **Save & Exit** allows users to save or discard changed BIOS settings as well as load factory default settings.

### Save Changed BIOS Settings

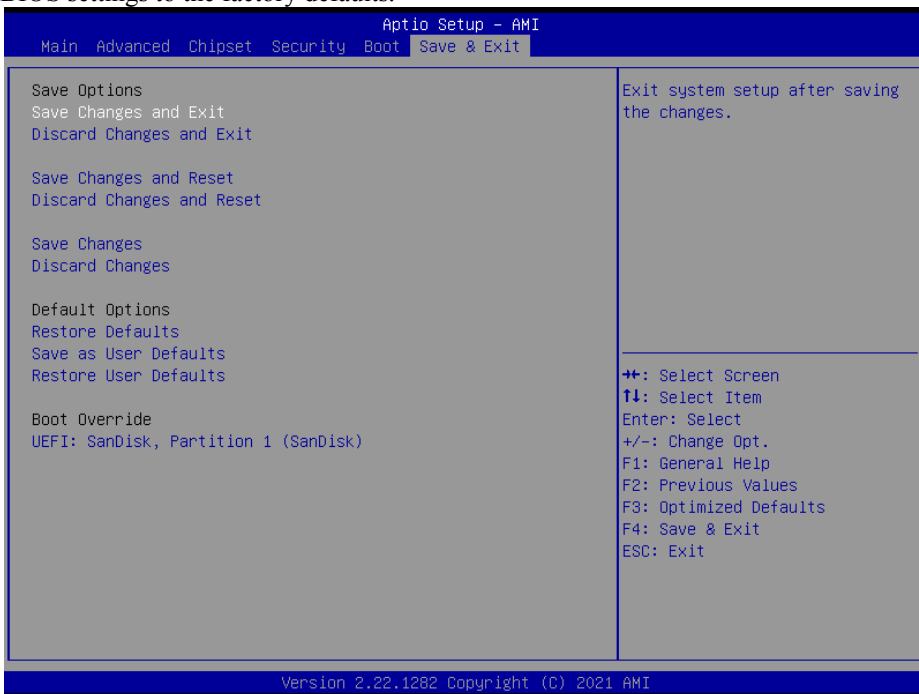
To save and validate the changed BIOS settings, select **Save Changes** from the **Save & Exit** menu, or you can select **Save Changes and Exit** (or press **F4**) to validate the changes and then exit the system. Select **Save Changes and Reset** to validate the changed BIOS settings and then restart the system

### Discard Changed BIOS Settings

To cancel the BIOS settings you have previously configured, select **Discard Changes and Exit** from this menu, or simply press **Esc** to exit the BIOS setup. You can also select **Discard Changes and Reset** to discard any changes you have made and restore the factory BIOS defaults.

### Load User Defaults

You may simply press **F3** at any time to load the **Optimized Values** which resets all BIOS settings to the factory defaults.



Save & Exit Screen

<b>BIOS Setting</b>	<b>Options</b>	<b>Description/Purpose</b>
Save Changes and Exit	No changeable options	Exits and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in NVRAM and resets.
Discard Changes and Reset	No changeable options	Resets without saving any changes made in BIOS settings.
Save Changes	No changeable options	Save Changes done so far to any of the setup options.
Discard Changes	No changeable options	Discard Changes done so far to any of the setup options.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Save as User Defaults	No changeable options	Save the changes done so far as User Defaults.
Restore User Defaults	No changeable options	Restore the User Defaults to all the setup options.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].



# 7

## Ignition Power Management

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This chapter explains the principle of ignition power ON/OFF control, force reset delay support, wiring ignition signal and the related setting of Windows.

The following topics are included:

- Ignition Power ON Control Flow
- Ignition Power OFF Control Flow
- Force Reset Delay Support
- Wiring Ignition Signal
- Configure Your Windows System

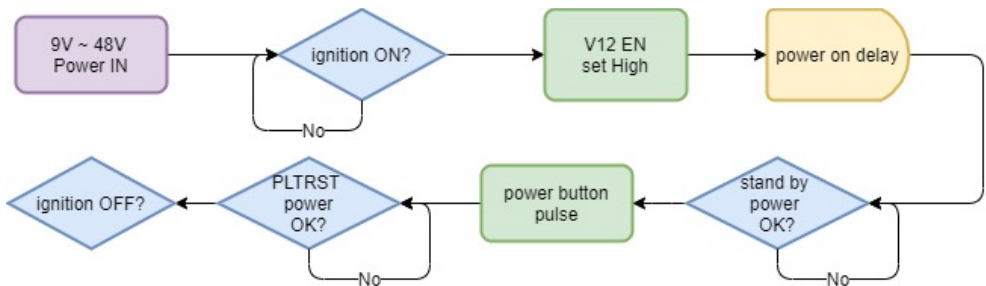
## 7.1 Ignition Power ON Control Flow

The ignition power control for in-vehicle application is implemented by MCU. MCU monitors the ignition signal and some related signals to turn on/off the system based on predefined power on/off delay setting in BIOS.

In this section, we will explain the principle of ignition power control, wiring and the related setting of Windows.

**The Ignition ON control flow is as follows:**

1. 9V ~ 48V Power IN.
  2. Check ignition signal.
  3. Enable 12V power.
  4. Run power on delay time.
  5. Check standby power OK signal.
  6. Send power button signal.
  7. Check PLTRST power OK signal.
  8. Waiting for Ignition OFF.
- The minimum Power on delay time is 3 seconds, and the maximum Power on delay time is 255 seconds. (Note. **Please refer to BIOS Setting for Power ON delay time setting.**)
  - There are 3 ways to shut down the system:
    - Ignition off
    - Use OS shut down
    - Press Power button to shut down

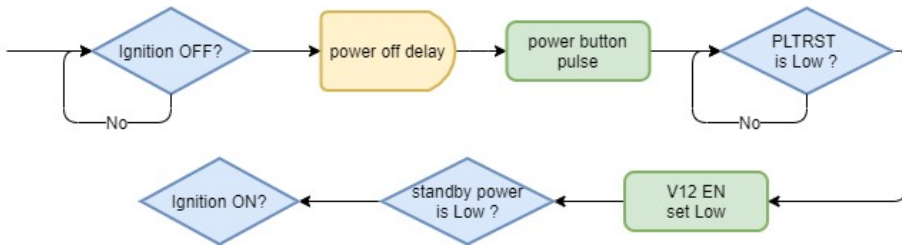


System Ignition Power ON Flow Chart

## 7.2 Ignition Power OFF Control Flow

The Ignition OFF Control Flow is as follows:

1. Check ignition signal.
  2. Run power off delay time.
  3. Send power button signal.
  4. Check PLTRST power OK signal.
  5. Disable 12V power.
  6. Check standby power OK signal.
  7. Waiting for Ignition ON.
- The minimum Power off delay time is 3 seconds, the maximum Power off delay time is 255 seconds. (Note. **Please refer to BIOS Setting for Power Off delay time setting.**)



System Ignition Power OFF Flow Chart

### 7.3 Force Reset Delay Support

- If users want to avoid abnormal power on process, they can set the force Reset delay support to enable. When time is up and the system is not powered on yet, the Force Reset function will restart the system in force.
- The setup range of force reset delay is 1 ~10 minutes.  
(Note. **Please refer to BIOS Setting for Force Reset delay time setting.**)

### 7.4 Wiring Ignition Signal

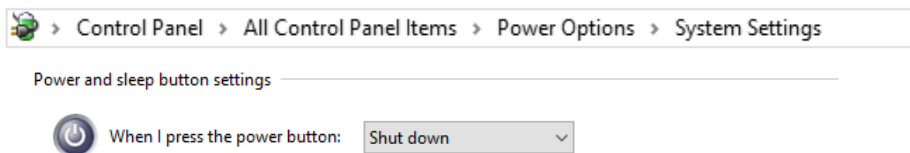
In order to enable ignition power control for in-vehicle usage, you have to supply the IGN signal to the system. The IGN input signal is located on the 3-pin pluggable terminal block which is marked with DC IN 9-48V.

Below is the typical wiring configuration for in-vehicle applications. Please make sure your DC power source and IGN signal share the same ground.

1. Connect power V+ line to “V+” of DC IN terminal block.
2. Connect V-/ GND line to “GND” of DC IN terminal block.
3. Connect ACC line to IGN.

### 7.5 Configuring Your Windows System

When the ignition control is in used, please check the Power and sleep button settings. The default Item of the power button is “**Sleep**”. In this setting, pressing the power button cannot shut down the system. And the power off control will not perform correctly. Please set the power button setting to “**Shut down**”.



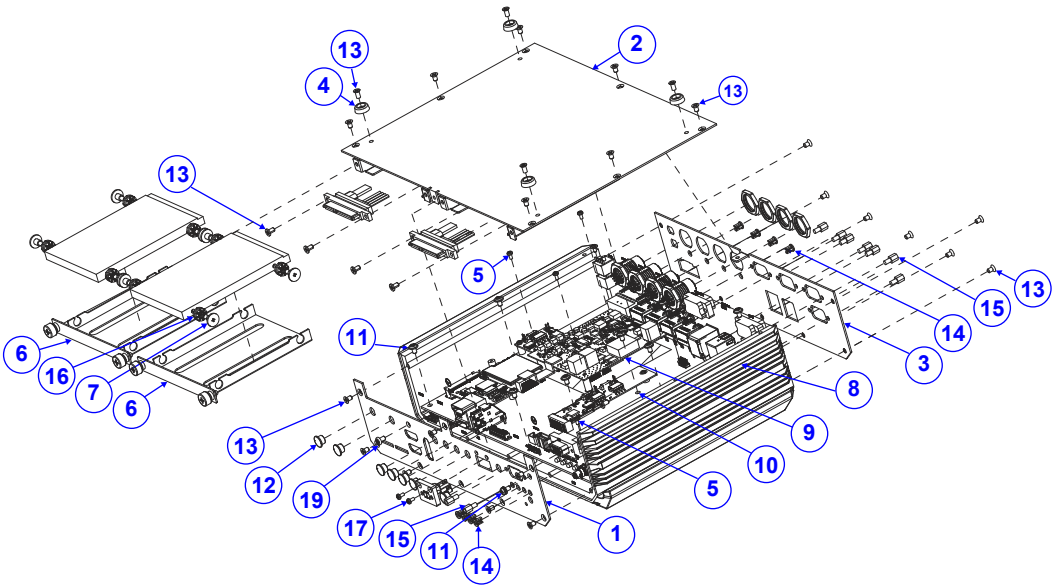
# **Appendix A System Assembly**

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This appendix includes the exploded diagrams of the system and the parts list as well as the part numbers of the IV-Z318 system.

- IV-Z318 LAN with PoE System Exploded Diagram
- IV-Z318 M12 X-Coded LAN with PoE System Exploded Diagram
- IV-Z318 Wall Mount Exploded Diagram
- IV-Z318 VESA Mount Exploded Diagram
- IV-Z318 DIN Rail Exploded Diagram (optional)

## IV-Z318 LAN with PoE System Exploded Diagram

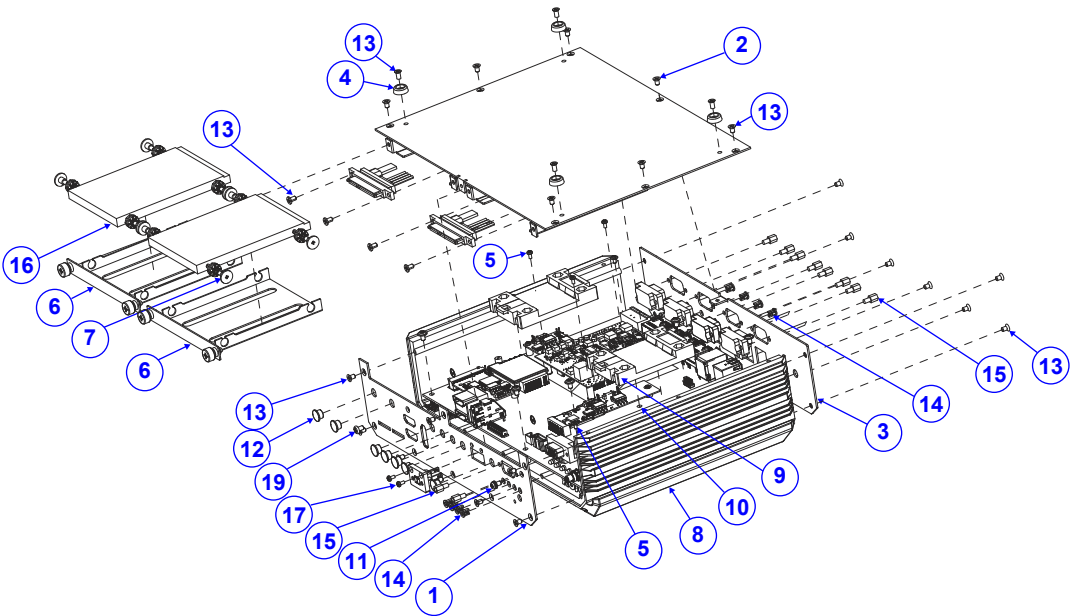


No.	Component Name	P/N No.	Q'ty
1	IV-Z318 Case Front Cover New BKT (w/Paint)(Black)	20-206-03066516	1
2	IV-Z318 Case Bottom Cover BKT (w/Paint)(Black)	20-206-03068516	1
3	IV-Z318 Case Back BKT (w/Paint)(Black)	20-206-03067516	1
4	Rubber Foot (Φ 11.1x3.96mm)(Black)	90-004-01400000	4
5	Round Washer Head Screw #1 / M2x0.4Px4mm	22-232-20004311	10
6	IV-Z318 HDD Tray BKT(w/Paint)(Black)	20-206-03063516	2
7	Fillister Head Screw M3x0.5Px4.8mm	82-272-30005013	8
8	IV-Z318 Case Top Cover (259.5x184.8x72mm)	21-002-16085001	1
9	IR-Z318-G1A-D1N	N/A	1
10	IB-Z318-G1A	N/A	1

**Appendix A System Assembly**

<b>No.</b>	<b>Component Name</b>	<b>P/N No.</b>	<b>Q'ty</b>
11	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	9
12	Hole Plug ( $\Phi$ 6.6mm)(Black)	90-067-01100000	7
13	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	30
14	PS-3100 LED Housing (Black)	30-014-04100165	8
15	HEX CU BOSS UNC No.4-40,L=4.8,H=7mm	22-692-40048051	10
16	Rubber Washer (OD= $\varphi$ 9.62mm, ID= $\varphi$ 3.9mmx5.8T) (Blue)	23-680-39580963	8
17	Round Head Screw M2x0.4Px4mm	22-232-20040011	2
18	HDD	N/A	2
19	Pan Head Screw #2 / M3x0.5Px4mm	22-222-30004311	1

## IV-Z318 M12 X-Coded LAN with PoE System Exploded Diagram



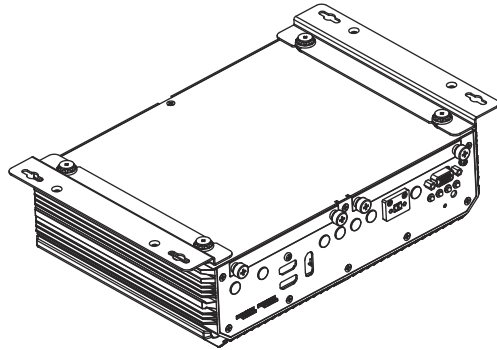
No.	Component Name	P/N No.	Q'ty
1	IV-Z318 Case Front Cover New BKT (w/Paint)(Black)	20-206-03066516	1
2	IV-Z318 Case Bottom Cover BKT (w/Paint)(Black)	20-206-03068516	1
3	IV-Z318 Case Back M12 BKT (w/Paint)(Black)	20-206-03065516	1
4	Rubber Foot (Φ 11.1x3.96mm) (Black)	90-004-01400000	4
5	Round Washer Head Screw #1 / M2x0.4Px4mm	22-232-20004311	10
6	IV-Z318 HDD Tray BKT (w/Paint)(Black)	20-206-03063516	2
7	Fillister Head Screw M3x0.5Px4.8mm	82-272-30005013	8
8	IV-Z318 Case Top Cover (259.5x184.8x72mm)	21-002-16085001	1
9	IR-Z318-G1A-D1N	N/A	1
10	IB-Z318-G1A	N/A	1



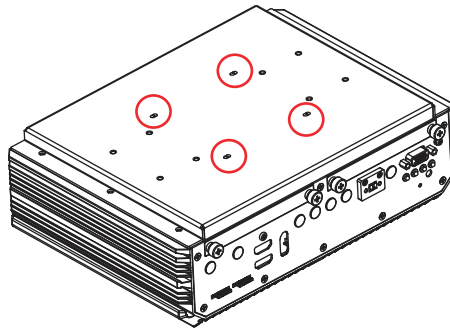
**Appendix A System Assembly**

<b>No.</b>	<b>Component Name</b>	<b>P/N No.</b>	<b>Q'ty</b>
11	Round Washer Head Screw M3x0.5Px5mm	22-242-30005311	9
12	Hole Plug ( $\Phi$ 6.6mm)(Black)	90-067-01100000	7
13	Flat Head Screw #2 / M3x0.5Px5mm	22-215-30005011	30
14	PS-3100 LED Housing (Black)	30-014-04100165	8
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16	Rubber Washer (OD= $\varphi$ 9.62mm,ID= $\varphi$ 3.9mmx5.8T) (Blue)	23-680-39580963	8
17	Round Head Screw M2x0.4Px4mm	22-232-20040011	2
18	HDD	N/A	2
19	Pan Head Screw #2 / M3x0.5Px4mm	22-222-30004311	1

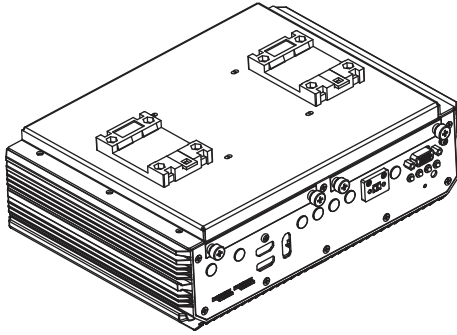
**IV-Z318 Wall Mount Diagram**



**IV-Z318 VESA Mount Diagram**



**IV-Z318 DIN Rail Diagram (optional)**



## **Appendix B Technical Summary**

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This appendix will give you a brief introduction of the allocation maps for the system resources.

The following topics are included:

- Interrupt Map
- I/O Map
- Memory Map
- Configuring WatchDog Timer
- Flash BIOS Update

**Interrupt Map**

<b>IRQ</b>	<b>Assignment</b>
IRQ 0	System timer
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 6	Communications Port (COM4)
IRQ 7	Communications Port (COM3)
IRQ 11	Communications Port (COM6)
IRQ 14	Intel(R) GPIO Controller - 34C5
IRQ 16	High-Definition Audio Controller
IRQ 54	Microsoft ACPI-Compliant System
IRQ 55	Microsoft ACPI-Compliant System
IRQ 56	Microsoft ACPI-Compliant System
IRQ 57	Microsoft ACPI-Compliant System
IRQ 58	Microsoft ACPI-Compliant System
IRQ 59	Microsoft ACPI-Compliant System
IRQ 60	Microsoft ACPI-Compliant System
IRQ 61	Microsoft ACPI-Compliant System
IRQ 62	Microsoft ACPI-Compliant System
IRQ 63	Microsoft ACPI-Compliant System
IRQ 64	Microsoft ACPI-Compliant System
IRQ 65	Microsoft ACPI-Compliant System
IRQ 66	Microsoft ACPI-Compliant System
IRQ 67	Microsoft ACPI-Compliant System
IRQ 68	Microsoft ACPI-Compliant System
IRQ 69	Microsoft ACPI-Compliant System
IRQ 70	Microsoft ACPI-Compliant System
IRQ 71	Microsoft ACPI-Compliant System
IRQ 72	Microsoft ACPI-Compliant System
IRQ 73	Microsoft ACPI-Compliant System
IRQ 74	Microsoft ACPI-Compliant System
IRQ 75	Microsoft ACPI-Compliant System
IRQ 76	Microsoft ACPI-Compliant System
IRQ 77	Microsoft ACPI-Compliant System
IRQ 78	Microsoft ACPI-Compliant System
IRQ 79	Microsoft ACPI-Compliant System
IRQ 80	Microsoft ACPI-Compliant System
IRQ 81	Microsoft ACPI-Compliant System
IRQ 82	Microsoft ACPI-Compliant System
IRQ 83	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 84	Microsoft ACPI-Compliant System
IRQ 85	Microsoft ACPI-Compliant System
IRQ 86	Microsoft ACPI-Compliant System
IRQ 87	Microsoft ACPI-Compliant System
IRQ 88	Microsoft ACPI-Compliant System
IRQ 89	Microsoft ACPI-Compliant System
IRQ 90	Microsoft ACPI-Compliant System
IRQ 91	Microsoft ACPI-Compliant System
IRQ 92	Microsoft ACPI-Compliant System
IRQ 93	Microsoft ACPI-Compliant System
IRQ 94	Microsoft ACPI-Compliant System
IRQ 95	Microsoft ACPI-Compliant System
IRQ 96	Microsoft ACPI-Compliant System
IRQ 97	Microsoft ACPI-Compliant System
IRQ 98	Microsoft ACPI-Compliant System
IRQ 99	Microsoft ACPI-Compliant System
IRQ 100	Microsoft ACPI-Compliant System
IRQ 101	Microsoft ACPI-Compliant System
IRQ 102	Microsoft ACPI-Compliant System
IRQ 103	Microsoft ACPI-Compliant System
IRQ 104	Microsoft ACPI-Compliant System
IRQ 105	Microsoft ACPI-Compliant System
IRQ 106	Microsoft ACPI-Compliant System
IRQ 107	Microsoft ACPI-Compliant System
IRQ 108	Microsoft ACPI-Compliant System
IRQ 109	Microsoft ACPI-Compliant System
IRQ 110	Microsoft ACPI-Compliant System
IRQ 111	Microsoft ACPI-Compliant System
IRQ 112	Microsoft ACPI-Compliant System
IRQ 113	Microsoft ACPI-Compliant System
IRQ 114	Microsoft ACPI-Compliant System
IRQ 115	Microsoft ACPI-Compliant System
IRQ 116	Microsoft ACPI-Compliant System
IRQ 117	Microsoft ACPI-Compliant System
IRQ 118	Microsoft ACPI-Compliant System
IRQ 119	Microsoft ACPI-Compliant System
IRQ 120	Microsoft ACPI-Compliant System
IRQ 121	Microsoft ACPI-Compliant System
IRQ 122	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 123	Microsoft ACPI-Compliant System
IRQ 124	Microsoft ACPI-Compliant System
IRQ 125	Microsoft ACPI-Compliant System
IRQ 126	Microsoft ACPI-Compliant System
IRQ 127	Microsoft ACPI-Compliant System
IRQ 128	Microsoft ACPI-Compliant System
IRQ 129	Microsoft ACPI-Compliant System
IRQ 130	Microsoft ACPI-Compliant System
IRQ 131	Microsoft ACPI-Compliant System
IRQ 132	Microsoft ACPI-Compliant System
IRQ 133	Microsoft ACPI-Compliant System
IRQ 134	Microsoft ACPI-Compliant System
IRQ 135	Microsoft ACPI-Compliant System
IRQ 136	Microsoft ACPI-Compliant System
IRQ 137	Microsoft ACPI-Compliant System
IRQ 138	Microsoft ACPI-Compliant System
IRQ 139	Microsoft ACPI-Compliant System
IRQ 140	Microsoft ACPI-Compliant System
IRQ 141	Microsoft ACPI-Compliant System
IRQ 142	Microsoft ACPI-Compliant System
IRQ 143	Microsoft ACPI-Compliant System
IRQ 144	Microsoft ACPI-Compliant System
IRQ 145	Microsoft ACPI-Compliant System
IRQ 146	Microsoft ACPI-Compliant System
IRQ 147	Microsoft ACPI-Compliant System
IRQ 148	Microsoft ACPI-Compliant System
IRQ 149	Microsoft ACPI-Compliant System
IRQ 150	Microsoft ACPI-Compliant System
IRQ 151	Microsoft ACPI-Compliant System
IRQ 152	Microsoft ACPI-Compliant System
IRQ 153	Microsoft ACPI-Compliant System
IRQ 154	Microsoft ACPI-Compliant System
IRQ 155	Microsoft ACPI-Compliant System
IRQ 156	Microsoft ACPI-Compliant System
IRQ 157	Microsoft ACPI-Compliant System
IRQ 158	Microsoft ACPI-Compliant System
IRQ 159	Microsoft ACPI-Compliant System
IRQ 160	Microsoft ACPI-Compliant System
IRQ 161	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 162	Microsoft ACPI-Compliant System
IRQ 163	Microsoft ACPI-Compliant System
IRQ 164	Microsoft ACPI-Compliant System
IRQ 165	Microsoft ACPI-Compliant System
IRQ 166	Microsoft ACPI-Compliant System
IRQ 167	Microsoft ACPI-Compliant System
IRQ 168	Microsoft ACPI-Compliant System
IRQ 169	Microsoft ACPI-Compliant System
IRQ 170	Microsoft ACPI-Compliant System
IRQ 171	Microsoft ACPI-Compliant System
IRQ 172	Microsoft ACPI-Compliant System
IRQ 173	Microsoft ACPI-Compliant System
IRQ 174	Microsoft ACPI-Compliant System
IRQ 175	Microsoft ACPI-Compliant System
IRQ 176	Microsoft ACPI-Compliant System
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IRQ 178	Microsoft ACPI-Compliant System
IRQ 179	Microsoft ACPI-Compliant System
IRQ 180	Microsoft ACPI-Compliant System
IRQ 181	Microsoft ACPI-Compliant System
IRQ 182	Microsoft ACPI-Compliant System
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IRQ 184	Microsoft ACPI-Compliant System
IRQ 185	Microsoft ACPI-Compliant System
IRQ 186	Microsoft ACPI-Compliant System
IRQ 187	Microsoft ACPI-Compliant System
IRQ 188	Microsoft ACPI-Compliant System
IRQ 189	Microsoft ACPI-Compliant System
IRQ 190	Microsoft ACPI-Compliant System
IRQ 191	Microsoft ACPI-Compliant System
IRQ 192	Microsoft ACPI-Compliant System
IRQ 193	Microsoft ACPI-Compliant System
IRQ 194	Microsoft ACPI-Compliant System
IRQ 195	Microsoft ACPI-Compliant System
IRQ 196	Microsoft ACPI-Compliant System
IRQ 197	Microsoft ACPI-Compliant System
IRQ 198	Microsoft ACPI-Compliant System
IRQ 199	Microsoft ACPI-Compliant System
IRQ 200	Microsoft ACPI-Compliant System



<b>IRQ</b>	<b>Assignment</b>
IRQ 201	Microsoft ACPI-Compliant System
IRQ 202	Microsoft ACPI-Compliant System
IRQ 203	Microsoft ACPI-Compliant System
IRQ 204	Microsoft ACPI-Compliant System
IRQ 256	Microsoft ACPI-Compliant System
IRQ 257	Microsoft ACPI-Compliant System
IRQ 258	Microsoft ACPI-Compliant System
IRQ 259	Microsoft ACPI-Compliant System
IRQ 260	Microsoft ACPI-Compliant System
IRQ 261	Microsoft ACPI-Compliant System
IRQ 262	Microsoft ACPI-Compliant System
IRQ 263	Microsoft ACPI-Compliant System
IRQ 264	Microsoft ACPI-Compliant System
IRQ 265	Microsoft ACPI-Compliant System
IRQ 266	Microsoft ACPI-Compliant System
IRQ 267	Microsoft ACPI-Compliant System
IRQ 268	Microsoft ACPI-Compliant System
IRQ 269	Microsoft ACPI-Compliant System
IRQ 270	Microsoft ACPI-Compliant System
IRQ 271	Microsoft ACPI-Compliant System
IRQ 272	Microsoft ACPI-Compliant System
IRQ 273	Microsoft ACPI-Compliant System
IRQ 274	Microsoft ACPI-Compliant System
IRQ 275	Microsoft ACPI-Compliant System
IRQ 276	Microsoft ACPI-Compliant System
IRQ 277	Microsoft ACPI-Compliant System
IRQ 278	Microsoft ACPI-Compliant System
IRQ 279	Microsoft ACPI-Compliant System
IRQ 280	Microsoft ACPI-Compliant System
IRQ 281	Microsoft ACPI-Compliant System
IRQ 282	Microsoft ACPI-Compliant System
IRQ 283	Microsoft ACPI-Compliant System
IRQ 284	Microsoft ACPI-Compliant System
IRQ 285	Microsoft ACPI-Compliant System
IRQ 286	Microsoft ACPI-Compliant System
IRQ 287	Microsoft ACPI-Compliant System
IRQ 288	Microsoft ACPI-Compliant System
IRQ 289	Microsoft ACPI-Compliant System
IRQ 290	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 291	Microsoft ACPI-Compliant System
IRQ 292	Microsoft ACPI-Compliant System
IRQ 293	Microsoft ACPI-Compliant System
IRQ 294	Microsoft ACPI-Compliant System
IRQ 295	Microsoft ACPI-Compliant System
IRQ 296	Microsoft ACPI-Compliant System
IRQ 297	Microsoft ACPI-Compliant System
IRQ 298	Microsoft ACPI-Compliant System
IRQ 299	Microsoft ACPI-Compliant System
IRQ 300	Microsoft ACPI-Compliant System
IRQ 301	Microsoft ACPI-Compliant System
IRQ 302	Microsoft ACPI-Compliant System
IRQ 303	Microsoft ACPI-Compliant System
IRQ 304	Microsoft ACPI-Compliant System
IRQ 305	Microsoft ACPI-Compliant System
IRQ 306	Microsoft ACPI-Compliant System
IRQ 307	Microsoft ACPI-Compliant System
IRQ 308	Microsoft ACPI-Compliant System
IRQ 309	Microsoft ACPI-Compliant System
IRQ 310	Microsoft ACPI-Compliant System
IRQ 311	Microsoft ACPI-Compliant System
IRQ 312	Microsoft ACPI-Compliant System
IRQ 313	Microsoft ACPI-Compliant System
IRQ 314	Microsoft ACPI-Compliant System
IRQ 315	Microsoft ACPI-Compliant System
IRQ 316	Microsoft ACPI-Compliant System
IRQ 317	Microsoft ACPI-Compliant System
IRQ 318	Microsoft ACPI-Compliant System
IRQ 319	Microsoft ACPI-Compliant System
IRQ 320	Microsoft ACPI-Compliant System
IRQ 321	Microsoft ACPI-Compliant System
IRQ 322	Microsoft ACPI-Compliant System
IRQ 323	Microsoft ACPI-Compliant System
IRQ 324	Microsoft ACPI-Compliant System
IRQ 325	Microsoft ACPI-Compliant System
IRQ 326	Microsoft ACPI-Compliant System
IRQ 327	Microsoft ACPI-Compliant System
IRQ 328	Microsoft ACPI-Compliant System
IRQ 329	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 330	Microsoft ACPI-Compliant System
IRQ 331	Microsoft ACPI-Compliant System
IRQ 332	Microsoft ACPI-Compliant System
IRQ 333	Microsoft ACPI-Compliant System
IRQ 334	Microsoft ACPI-Compliant System
IRQ 335	Microsoft ACPI-Compliant System
IRQ 336	Microsoft ACPI-Compliant System
IRQ 337	Microsoft ACPI-Compliant System
IRQ 338	Microsoft ACPI-Compliant System
IRQ 339	Microsoft ACPI-Compliant System
IRQ 340	Microsoft ACPI-Compliant System
IRQ 341	Microsoft ACPI-Compliant System
IRQ 342	Microsoft ACPI-Compliant System
IRQ 343	Microsoft ACPI-Compliant System
IRQ 344	Microsoft ACPI-Compliant System
IRQ 345	Microsoft ACPI-Compliant System
IRQ 346	Microsoft ACPI-Compliant System
IRQ 347	Microsoft ACPI-Compliant System
IRQ 348	Microsoft ACPI-Compliant System
IRQ 349	Microsoft ACPI-Compliant System
IRQ 350	Microsoft ACPI-Compliant System
IRQ 351	Microsoft ACPI-Compliant System
IRQ 352	Microsoft ACPI-Compliant System
IRQ 353	Microsoft ACPI-Compliant System
IRQ 354	Microsoft ACPI-Compliant System
IRQ 355	Microsoft ACPI-Compliant System
IRQ 356	Microsoft ACPI-Compliant System
IRQ 357	Microsoft ACPI-Compliant System
IRQ 358	Microsoft ACPI-Compliant System
IRQ 359	Microsoft ACPI-Compliant System
IRQ 360	Microsoft ACPI-Compliant System
IRQ 361	Microsoft ACPI-Compliant System
IRQ 362	Microsoft ACPI-Compliant System
IRQ 363	Microsoft ACPI-Compliant System
IRQ 364	Microsoft ACPI-Compliant System
IRQ 365	Microsoft ACPI-Compliant System
IRQ 366	Microsoft ACPI-Compliant System
IRQ 367	Microsoft ACPI-Compliant System
IRQ 368	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 369	Microsoft ACPI-Compliant System
IRQ 370	Microsoft ACPI-Compliant System
IRQ 371	Microsoft ACPI-Compliant System
IRQ 372	Microsoft ACPI-Compliant System
IRQ 373	Microsoft ACPI-Compliant System
IRQ 374	Microsoft ACPI-Compliant System
IRQ 375	Microsoft ACPI-Compliant System
IRQ 376	Microsoft ACPI-Compliant System
IRQ 377	Microsoft ACPI-Compliant System
IRQ 378	Microsoft ACPI-Compliant System
IRQ 379	Microsoft ACPI-Compliant System
IRQ 380	Microsoft ACPI-Compliant System
IRQ 381	Microsoft ACPI-Compliant System
IRQ 382	Microsoft ACPI-Compliant System
IRQ 383	Microsoft ACPI-Compliant System
IRQ 384	Microsoft ACPI-Compliant System
IRQ 385	Microsoft ACPI-Compliant System
IRQ 386	Microsoft ACPI-Compliant System
IRQ 387	Microsoft ACPI-Compliant System
IRQ 388	Microsoft ACPI-Compliant System
IRQ 389	Microsoft ACPI-Compliant System
IRQ 390	Microsoft ACPI-Compliant System
IRQ 391	Microsoft ACPI-Compliant System
IRQ 392	Microsoft ACPI-Compliant System
IRQ 393	Microsoft ACPI-Compliant System
IRQ 394	Microsoft ACPI-Compliant System
IRQ 395	Microsoft ACPI-Compliant System
IRQ 396	Microsoft ACPI-Compliant System
IRQ 397	Microsoft ACPI-Compliant System
IRQ 398	Microsoft ACPI-Compliant System
IRQ 399	Microsoft ACPI-Compliant System
IRQ 400	Microsoft ACPI-Compliant System
IRQ 401	Microsoft ACPI-Compliant System
IRQ 402	Microsoft ACPI-Compliant System
IRQ 403	Microsoft ACPI-Compliant System
IRQ 404	Microsoft ACPI-Compliant System
IRQ 405	Microsoft ACPI-Compliant System
IRQ 406	Microsoft ACPI-Compliant System
IRQ 407	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 408	Microsoft ACPI-Compliant System
IRQ 409	Microsoft ACPI-Compliant System
IRQ 410	Microsoft ACPI-Compliant System
IRQ 411	Microsoft ACPI-Compliant System
IRQ 412	Microsoft ACPI-Compliant System
IRQ 413	Microsoft ACPI-Compliant System
IRQ 414	Microsoft ACPI-Compliant System
IRQ 415	Microsoft ACPI-Compliant System
IRQ 416	Microsoft ACPI-Compliant System
IRQ 417	Microsoft ACPI-Compliant System
IRQ 418	Microsoft ACPI-Compliant System
IRQ 419	Microsoft ACPI-Compliant System
IRQ 420	Microsoft ACPI-Compliant System
IRQ 421	Microsoft ACPI-Compliant System
IRQ 422	Microsoft ACPI-Compliant System
IRQ 423	Microsoft ACPI-Compliant System
IRQ 424	Microsoft ACPI-Compliant System
IRQ 425	Microsoft ACPI-Compliant System
IRQ 426	Microsoft ACPI-Compliant System
IRQ 427	Microsoft ACPI-Compliant System
IRQ 428	Microsoft ACPI-Compliant System
IRQ 429	Microsoft ACPI-Compliant System
IRQ 430	Microsoft ACPI-Compliant System
IRQ 431	Microsoft ACPI-Compliant System
IRQ 432	Microsoft ACPI-Compliant System
IRQ 433	Microsoft ACPI-Compliant System
IRQ 434	Microsoft ACPI-Compliant System
IRQ 435	Microsoft ACPI-Compliant System
IRQ 436	Microsoft ACPI-Compliant System
IRQ 437	Microsoft ACPI-Compliant System
IRQ 438	Microsoft ACPI-Compliant System
IRQ 439	Microsoft ACPI-Compliant System
IRQ 440	Microsoft ACPI-Compliant System
IRQ 441	Microsoft ACPI-Compliant System
IRQ 442	Microsoft ACPI-Compliant System
IRQ 443	Microsoft ACPI-Compliant System
IRQ 444	Microsoft ACPI-Compliant System
IRQ 445	Microsoft ACPI-Compliant System
IRQ 446	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 447	Microsoft ACPI-Compliant System
IRQ 448	Microsoft ACPI-Compliant System
IRQ 449	Microsoft ACPI-Compliant System
IRQ 450	Microsoft ACPI-Compliant System
IRQ 451	Microsoft ACPI-Compliant System
IRQ 452	Microsoft ACPI-Compliant System
IRQ 453	Microsoft ACPI-Compliant System
IRQ 454	Microsoft ACPI-Compliant System
IRQ 455	Microsoft ACPI-Compliant System
IRQ 456	Microsoft ACPI-Compliant System
IRQ 457	Microsoft ACPI-Compliant System
IRQ 458	Microsoft ACPI-Compliant System
IRQ 459	Microsoft ACPI-Compliant System
IRQ 460	Microsoft ACPI-Compliant System
IRQ 461	Microsoft ACPI-Compliant System
IRQ 462	Microsoft ACPI-Compliant System
IRQ 463	Microsoft ACPI-Compliant System
IRQ 464	Microsoft ACPI-Compliant System
IRQ 465	Microsoft ACPI-Compliant System
IRQ 466	Microsoft ACPI-Compliant System
IRQ 467	Microsoft ACPI-Compliant System
IRQ 468	Microsoft ACPI-Compliant System
IRQ 469	Microsoft ACPI-Compliant System
IRQ 470	Microsoft ACPI-Compliant System
IRQ 471	Microsoft ACPI-Compliant System
IRQ 472	Microsoft ACPI-Compliant System
IRQ 473	Microsoft ACPI-Compliant System
IRQ 474	Microsoft ACPI-Compliant System
IRQ 475	Microsoft ACPI-Compliant System
IRQ 476	Microsoft ACPI-Compliant System
IRQ 477	Microsoft ACPI-Compliant System
IRQ 478	Microsoft ACPI-Compliant System
IRQ 479	Microsoft ACPI-Compliant System
IRQ 480	Microsoft ACPI-Compliant System
IRQ 481	Microsoft ACPI-Compliant System
IRQ 482	Microsoft ACPI-Compliant System
IRQ 483	Microsoft ACPI-Compliant System
IRQ 484	Microsoft ACPI-Compliant System
IRQ 485	Microsoft ACPI-Compliant System

<b>IRQ</b>	<b>Assignment</b>
IRQ 486	Microsoft ACPI-Compliant System
IRQ 487	Microsoft ACPI-Compliant System
IRQ 488	Microsoft ACPI-Compliant System
IRQ 489	Microsoft ACPI-Compliant System
IRQ 490	Microsoft ACPI-Compliant System
IRQ 491	Microsoft ACPI-Compliant System
IRQ 492	Microsoft ACPI-Compliant System
IRQ 493	Microsoft ACPI-Compliant System
IRQ 494	Microsoft ACPI-Compliant System
IRQ 495	Microsoft ACPI-Compliant System
IRQ 496	Microsoft ACPI-Compliant System
IRQ 497	Microsoft ACPI-Compliant System
IRQ 498	Microsoft ACPI-Compliant System
IRQ 499	Microsoft ACPI-Compliant System
IRQ 500	Microsoft ACPI-Compliant System
IRQ 501	Microsoft ACPI-Compliant System
IRQ 502	Microsoft ACPI-Compliant System
IRQ 503	Microsoft ACPI-Compliant System
IRQ 504	Microsoft ACPI-Compliant System
IRQ 505	Microsoft ACPI-Compliant System
IRQ 506	Microsoft ACPI-Compliant System
IRQ 507	Microsoft ACPI-Compliant System
IRQ 508	Microsoft ACPI-Compliant System
IRQ 509	Microsoft ACPI-Compliant System
IRQ 510	Microsoft ACPI-Compliant System
IRQ 511	Microsoft ACPI-Compliant System
IRQ 4294967266	Intel(R) Management Engine Interface #1
IRQ 4294967267	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967268	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967269	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967270	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967271	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967272	Intel(R) I210 Gigabit Network Connection #4
IRQ 4294967273	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967274	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967275	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967276	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967277	Intel(R) I210 Gigabit Network Connection #2
IRQ 4294967278	Intel(R) I210 Gigabit Network Connection #2

<b>IRQ</b>	<b>Assignment</b>
IRQ 4294967279	Intel(R) I210 Gigabit Network Connection
IRQ 4294967280	Intel(R) I210 Gigabit Network Connection
IRQ 4294967281	Intel(R) I210 Gigabit Network Connection
IRQ 4294967282	Intel(R) I210 Gigabit Network Connection
IRQ 4294967283	Intel(R) I210 Gigabit Network Connection
IRQ 4294967284	Intel(R) I210 Gigabit Network Connection
IRQ 4294967285	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967286	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967287	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967288	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967289	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967290	Intel(R) I210 Gigabit Network Connection #3
IRQ 4294967291	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
IRQ 4294967292	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
IRQ 4294967293	Intel(R) Iris(R) Xe Graphics
IRQ 4294967294	Standard SATA AHCI Controller

Note: These resource information was gathered using Windows 10 (the IRQ could be assigned differently depending on OS).

### **I/O MAP**

<b>I/O</b>	<b>Assignment</b>
0x00000000-0x00000CF7	PCI Express Root Complex
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources



<b>I/O</b>	<b>Assignment</b>
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
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
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E0-0x000002E7	Communications Port (COM6)
0x000002E8-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000164E-0x0000164F	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x00001854-0x00001857	Motherboard resources
0x00002000-0x000020FE	Motherboard resources
0x00003000-0x00003FFF	Intel(R) PCI Express Root Port #8 - A0BF
0x00004000-0x00004FFF	Intel(R) PCI Express Root Port #7 - A0BE
0x00005000-0x00005FFF	Intel(R) PCI Express Root Port #6 - A0BD
0x00006000-0x00006FFF	Intel(R) PCI Express Root Port #5 - A0BC
0x00007000-0x0000703F	Intel(R) Iris(R) Xe Graphics
0x00007060-0x0000707F	Standard SATA AHCI Controller
0x00007080-0x00007083	Standard SATA AHCI Controller
0x00007090-0x00007097	Standard SATA AHCI Controller
0x0000EFA0-0x0000EFBF	Intel(R) SMBus - A0A3

## Memory Map

Map	Assignment
0xFEDC0000-0xFEDC7FFF	Motherboard resources
0xFEDA0000-0xFEDA0FFF	Motherboard resources
0xFEDA1000-0xFEDA1FFF	Motherboard resources
0xC0000000-0xCFFFFFFF	Motherboard resources
0xFED20000-0xFED7FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFFFF	Motherboard resources
0x1110000-0x111FFFFF	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
0xFED00000-0xFED003FF	High precision event timer
0x1100000-0x110FFFFF	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
0xFE000000-0xFE01FFFF	Motherboard resources
0xFE04C000-0xFE04FFFF	Motherboard resources
0xFE050000-0xFE0AFFFF	Motherboard resources
0xFE0D0000-0xFE0FFFFFFF	Motherboard resources
0xFE200000-0xFE7FFFFFFF	Motherboard resources
0xFF000000-0xFFFFFFFF	Motherboard resources
0xFD000000-0xFD68FFFF	Motherboard resources
0xFD6B0000-0xFD6CFFFF	Motherboard resources
0xFD6F0000-0xFDFFFFFFF	Motherboard resources
0x1129000-0x1129FFF	Intel(R) LPSS: SPI #1 - A0A8
0xFE010000-0xFE010FFF	Intel(R) SPI (flash) Controller - A0A4
0xFD6E0000-0xFD6EFFFF	Intel(R) GPIO Controller - 34C5
0xFD6D0000-0xFD6DFFFF	Intel(R) GPIO Controller - 34C5
0xFD6A0000-0xFD6AFFFF	Intel(R) GPIO Controller - 34C5
0xFD690000-0xFD69FFFF	Intel(R) GPIO Controller - 34C5
0xFED40000-0xFED44FFF	Trusted Platform Module 2.0
0xFFEFC000-0xFFEFFFFFFF	High Definition Audio Controller
0xFFF00000-0xFFFFFFFF	High Definition Audio Controller
0xFFEFB000-0xFFEFBFFF	Intel(R) Management Engine Interface #1
0x0000-0xFFFFFFFF	Intel(R) Iris(R) Xe Graphics
0x0000-0xFFFFFFFF	Intel(R) Iris(R) Xe Graphics
0x1128000-0x11280FF	Intel(R) SMBus - A0A3
0xA0000-0xBFFFF	PCI Express Root Complex
0xE0000-0xE3FFF	PCI Express Root Complex
0xE4000-0xE7FFF	PCI Express Root Complex

<b>Map</b>	<b>Assignment</b>
0xE8000-0xEBFFF	PCI Express Root Complex
0xEC000-0xEFFFF	PCI Express Root Complex
0xF0000-0xFFFFF	PCI Express Root Complex
0x50400000-0x504FFFFFF	Intel(R) PCI Express Root Port #8 - A0BF
0x50400000-0x504FFFFFF	PCI Express Root Complex
0x50400000-0x504FFFFFF	Intel(R) I210 Gigabit Network Connection #3
0x50480000-0x50483FFF	Intel(R) I210 Gigabit Network Connection #3
0x50500000-0x5057FFFF	Intel(R) I210 Gigabit Network Connection #4
0x50500000-0x5057FFFF	Intel(R) PCI Express Root Port #7 - A0BE
0x50580000-0x50583FFF	Intel(R) I210 Gigabit Network Connection #4
0x50600000-0x506FFFFFF	Intel(R) PCI Express Root Port #6 - A0BD
0x50600000-0x506FFFFFF	Intel(R) I210 Gigabit Network Connection #2
0x50680000-0x50683FFF	Intel(R) I210 Gigabit Network Connection #2
0x50700000-0x507FFFFFF	Intel(R) PCI Express Root Port #5 - A0BC
0x50700000-0x507FFFFFF	Intel(R) I210 Gigabit Network Connection
0x50780000-0x50783FFF	Intel(R) I210 Gigabit Network Connection
0x50800000-0x50801FFF	Standard SATA AHCI Controller
0x50802000-0x508027FF	Standard SATA AHCI Controller
0x50803000-0x508030FF	Standard SATA AHCI Controller

## **Configuring WatchDog Timer**

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

### **Configuration Sequence**

To program F81967 configuration registers, the following configuration sequence must be followed:

#### **(1) Enter the extended function mode**

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

#### **(2) Configure the configuration registers**

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

#### **(3) Exit the extended function mode**

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

**Code example for watch dog timer**

Enable the watchdog timer and set the timeout interval to **30** seconds.

```

;----- Enter to extended function mode -----
mov    dx,    2Eh
mov    al,    87h
out    dx,    al
out    dx,    al
;----- Select Logical Device 7 of watchdog timer -----
mov    al,    07h
out    dx,    al
inc    dx
mov    al,    07h
out    dx,    al
;----- Enable Watch dog feature -----
dec    dx
mov    al,    30h
out    dx,    al
inc    dx
mov    al,    01h
out    dx,    al
;----- Set timeout interval as 30seconds and start counting -----
dec    dx
mov    al,    F6h
out    dx,    al
inc    dx
mov    al,    1Eh
out    dx,    al
;----- Enable Watch PME-----
dec    dx
mov    al,    FAh
out    dx,    al
inc    dx
in     al,    dx
or     al,    51h
out    dx,    al
;----- Set second as counting unit -----
dec    dx
mov    al,    F5h
out    dx,    al
inc    dx
in     al,    dx
and   al,    DEh
out    dx,    al
;----- Start the watchdog timer -----
or     al,    20h
out    dx,    al
;----- Exit the extended function mode -----
dec    dx
mov    al,    AAh
out    dx,    al

```

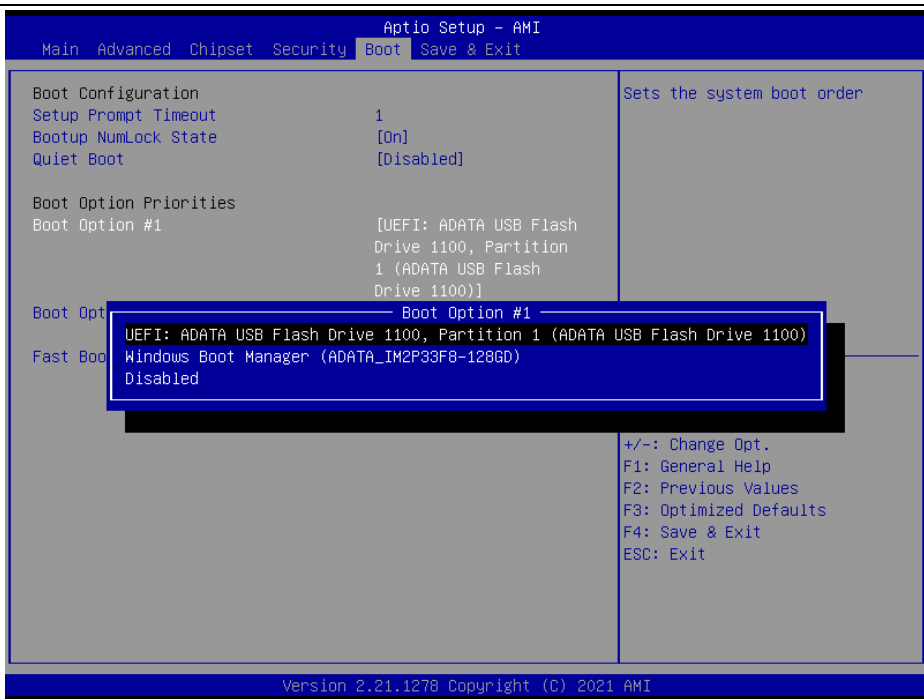
## Flash BIOS Update

### I. Prerequisites

Prepare a bootable media (e.g. USB storage device) which can boot the system to EFI Shell.

Note: Copy UEFI Shell into the storage device under specific directory path. (/efi/boot/bootx64.efi)

- 1** Download and save the BIOS file (Z3180PU1.bin) to the bootable device.
- 2** Copy AMI flash utility – AfuEfix64.efi (v5.14.01.0015) into a bootable device.
- 3** Make sure the target system can first boot to the bootable device.
  - (1) Connect the bootable USB device.
  - (2) Turn on the computer and press **<ESC>** or **<DEL>** during boot to enter BIOS Setup.
  - (3) Select **[Boot]** menu and set the USB bootable device to be the 1st boot device.
  - (4) Press **F4** to save the configuration and exit the BIOS setup menu.



## II. AFUEFI Command for System BIOS Update

### AFUEFI command for system BIOS update

AfuEfix64.efi is the AMI firmware update utility; the command line is shown as below:

**AfuEfix64** <ROM File Name> [option1] [option2]....

Users can type “AfuEfix64/ ?” to see all the definition of each control options. The recommended options for BIOS ROM update include following parameters:

- /P:** Program main BIOS image.
- /B:** Program Boot Block.
- /N:** Program NVRAM.
- /X:** Don't check ROM ID.

### III. BIOS Update Procedure

- 1 Use the bootable USB storage to boot up the system into the EFI Shell.
- 2 Type "**AfuEfix64 Z318xxxx.bin /p /b /n /x**" and press **Enter** to start the flash procedure.  
(Note that xxxx means the BIOS revision part, e.g. 0PM1...)
- 3 During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and make system unable to boot up next time.
- 4 After the BIOS update procedure is completed, the following messages will be shown:

```
Shell> fs0:
fs0:\>AfuEfix64 Z3180PU1.bin /p /b /n /x
+-----+
|               AMI Firmware Update Utility v5.14.02.0026               |
|               (C) 1985-2021 American Megatrends International LLC.       |
|               All Rights Reserved. Subject to AMI licensing agreement    |
+-----+
Reading flash ..... done
ME Data Size Checking . ok
FFS checksums ..... ok
Check RomLayout ..... ok.
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NVRAM Block ..... done
Updating NVRAM Block ..... done
Verifying NVRAM Block ..... done
Process completed.
fs0:\afuefix64>
```

- 5 Restart the system and boot up with the new BIOS configurations.
- 6 The BIOS Update is completed after the system is restarted.



- 7 Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.

