# **Table of Contents**

Disclaimers	5	ii			
Safety Precautionsi					
Classificationsi					
<b>General Cle</b>	General Cleaning Tips				
Scrap Com	puter Recycling	. vi			
SECTION <sup>•</sup>	1 INTRODUCTION	1			
1.1	General Descriptions	1			
1.2	System Specifications	2			
1.2.1	CPU	2			
1.2.2	I/O Svstem	2			
1.2.3	System Specifications	4			
1.2.4	Driver CD Contents	5			
1.3	Dimensions	6			
1.3.1	System Dimensions	6			
1.3.2	Wall-mount Bracket Dimensions	7			
1.3.3	DIN-Rail Bracket Dimensions	9			
1.4	I/O Outlets	10			
1.5	Packing List	12			
16	Model List	12			
SECTION	2 HARDWARE INSTALLATION	13			
2.1	Installation of SO-DIMM	13			
2.2	Installation of Mini PCIe Module (Full-Size)	15			
2.3	Installation of NVMe storage (M.2 Key M)	17			
2.4	Installation of 2.5" SATA Device	18			
2.5	Installation of SIM Card	19			
SECTION	3 JUMPER & CONNECTOR SETTINGS	21			
3.1	Locations of Jumpers & Connectors	21			
3.2	Summary of Jumper Settings	22			
3.2.1	Restore BIOS Optimal Defaults (JP1)	. 22			
3.2.2	COM1 Data/Power Selection (JP3)	. 23			
3.2.3	COM2 Data/Power Selection (JP4)	. 23			
3.2.4	Auto Power On (SW1)	. 23			
3.3	Connectors	24			
3.3.1	DC-in Phoenix Power Connector (CN22)	. 25			
3.3.2	HDMI Connector (CN17,CN18)	. 25			
3.3.3	DisplayPort++ (CN21)	. 26			
3.3.4	RS232/422/485 Serial Port Connector (CN23,CN24)	. 26			
3.3.5	Ethernet + USB 3.2 Connector (CN15)	. 27			
3.3.6	USB 2.0 Connector (USB1 , USB2)	. 28			
3.3.7	USB 3.2 Connector (CN19)	. 28			
3.3.8	Ethernet Port (CN20)	. 29			
3.3.9	8-CH Digital IO (CN2)	. 29			
3.3.10	ATX Power on/off (SW3)	. 30			
3.3.11	Reset Button (SW2)	. 30			
3.3.12	Remote Power Switch Connector (PWRBT1)	. 30			
3.3.13	AT/ATX Switch	.30			
3.3.14	Audio Connector (CN3, CN4)	. 31			

3.3.15	RS-232 Serial Port Connector (CN16, CN12)	. 31
3.3.16	SATA Connector (SATA 1 & 2)	. 32
3.3.17	SATA Power Connector (CN13,CN14)	. 32
3.3.18	SIM Slot (CN9, CN5)	. 32
3.3.19	Full-Size PCI Express Mini Card Slot (CN8)	. 33
3.3.20	M.2 2280 Key M (CN6)	. 34
3.3.21	M.2 2230 Key E (CN7)	. 35
SECTION	4 BIOS SETUP UTILITY	37
4.1	Starting	37
4.2	Navigation Keys	37
4.3	Main Menu	38
4.4	Advanced Menu	39
4.5	Chipset Menu	52
4.6	Boot Menu	59
4.7	Save & Exit Menu	60
APPENDI)	( A WATCHDOG TIMER	63
About V	Vatchdog Timer	63
Sample	Program	64
APPENDI)	( B Configuration of RAID	65
B.1	Configuring SATA Hard Drive(s) for RAID	65

## SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the 1 consist of the following sub-sections:

. Section

- General DescriptionsSystem Specifications
- System Specifica
  Dimensions
- Dimensions
- I/O Outlets
- Packing List
- Model List

#### **1.1 General Descriptions**

The Series features 11th gen Intel<sup>®</sup> Core<sup>™</sup> i7/i5/i3 or Celeron<sup>®</sup> Quad-core ULT processor (Tiger Lake UP3), high performance yet low power consumption, fan-less slim type design, -40°C to +60°C extended operating temperature, and 9V to 48V wide range DC power input with industrial-grade reliability. Highly integrated and with rich IO configuration, the A is perfectly suitable for Edge Computing, Machine vision, Embedded controller, Robotics applications.

#### Features

- 11th gen Intel<sup>®</sup> Core<sup>™</sup> i7/i5/i3 or Celeron<sup>®</sup> Quad-core ULT processor (Tiger Lake UP3)
- Dual-channel DDR4-3200 SO-DIMM for up to 64GB of memory
- Supports 3x 2.5 GbE, 6 USB, 4 COM
- -40°C to +60°C wide operating temperatures
- 9 to 48 VDC wide range DC power input
- Supports triple displays with 2 HDMI, and 1 DisplayPort++
- Intel® Iris<sup>®</sup> Xe integrated graphics (i7 & i5 SKUs)
- Trusted platform module (TPM 2.0 onboard)

#### **Reliable and Stable Design**

The embedded system supports 11th gen Intel<sup>®</sup> Core<sup>™</sup> i7/i5/i3 or Celeron<sup>®</sup> Quad-core ULT processor, along with the features of high performance, industrial-grade operation temperature/power input and multi-functional design that make it the best solution factory automation, machine vision, Edge Computing, Robotics applications.

#### **Rich IO Connectivity**

The comes with rich I/O interfaces including two RS-232/422/485 ports, two RS-232, four USB 3.2 ports, two USB 2.0 ports, three 2.5G high speed ethernet, two HDMI 1.4b, one DisplayPort++,one 8-CH TTL DIO, and one front access SIM slot socket supported.

#### **Embedded O.S. Supported**

The with 11th generation platform supports Windows<sup>®</sup> 10 IoT, Windows<sup>®</sup>11 IoT.

#### High data security Supported.

The is equipped with two swappable 2.5" SATA storage drive bays that can support RAID 0/1 for data backup.

## **1.2 System Specifications**

#### 1.2.1 CPU

- CPU
  - Intel<sup>®</sup> Core<sup>™</sup> i7-1185G7E
  - Intel<sup>®</sup> Core<sup>™</sup> i5-1145G7E
  - Intel<sup>®</sup> Core<sup>™</sup> i3-1115G4E
  - Intel<sup>®</sup> Core<sup>™</sup> Celeron<sup>®</sup> 6305E
- Chipset
  - SoC
- BIOS
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface BIOS.
- System Memory
  - 2 x 260-pin DDR4-3200 SO-DIMM, up to 64GB

#### 1.2.2 I/O System

- Display
  - 2 x HDMI 1.4b (3840 x 2160@30 Hz)
  - 1 x DisplayPort++ 1.2a (4096X2160@60 Hz)

- Ethernet
  - 3 x 2.5GbE(PoE\* by option) (2 x Intel<sup>®</sup> I226-IT, 1 x Intel<sup>®</sup> I226-LM)
- USB Ports
  - 4 x USB 3.2 Gen 1
  - 2 x USB 2.0
- Serial Ports
  - 2 x RS-232/422/485 (COM1/COM2) (+5V / +12V powered)
  - 2 x RS-232 (COM3/COM4) (+5V / +12V powered)
  - Baud rate max. up to 115200
- DIO Port
  - 1 x 8-CH TTL DIO (DB9 female connector , 4 in & 4 out)
- Mini PCIe Interface
  - 1 x Full-size PCI Express Mini Card (USB + PCIe signal)
  - 1 x M.2 Key E 2230 (for Wi-Fi)
  - 1 x M.2 Key M 2280 (for NVMe storage , PCIex4 signal only)

#### • Storage

 2 x 2.5" swappable SATA HDD/SSD drive bays, up to 9.5mm in height (Software RAID 0,1)

#### • Indicator

- 1 x Green LED as indicator for PWR status
- 1 x Amber LED as indicator for HDD/SSD active
- Switch
  - 1 x ATX PWR switch
  - 1 x Remote PWR switch
  - 1 x AT/ATX Quick switch
  - 1 x Reset connector
- Antenna & SIM
  - 4 x SMA type connector openings for antenna
  - 1 x front access SIM slot + 1 internal SIM slot

- TPM 2.0
  - 1 x ST33HTPH2X32AHD8

#### 1.2.3 System Specifications

- Watchdog Timer
  - 1-255 seconds or minutes; up to 255 levels.
- Power Supply
  - 9V-48V DC input

#### • Operation Temperature

Ethernet version :

 -40°C to +60°C (-40°F to +140°F) with 0.5 m/s air flow (with W.T. DRAM & SSD,CPU TDP 15W)

PoE version (optional) :

 -40°C to +50°C (-40°F to +122°F) with 0.7 m/s air flow (with W.T. DRAM & SSD,CPU TDP 15W)

#### • Storage Temperature

- -40°C to +80°C (-40 °F to +176°F)
- Humidity
  - 10% to 95% (non-condensation)
- Shock
  - IEC 60068-2-27 (w/SSD: 50G, half sine,11 ms duration)
- Vibration Endurance
  - IEC 60068-2-64 (w/SSD: 3Grms STD, random, 5 500 Hz,1 hr/axis)
- Weight
  - 2.4 kg (5.29 lb) without package
  - 3.2 kg (7.0 lb) with package
- Dimension
  - 250mm (9.84") (W) x 170mm (6.69") (D) x 60mm (2.36") (H)

### **1.2.4 Driver CD Contents**

Please download the following

- Ethernet
- Chipset
- Graphic
- Audio
- Intel<sup>®</sup> ME
- Intel<sup>®</sup> Rapid Storage technology

## 1.3 Dimensions

The following diagrams show dimensions and outlines of the

## 1.3.1 System Dimensions



### 1.3.2 Wall-mount Bracket Dimensions

From the accessories box, users can get 4pcs of truss head M3\*6L screws for fixing the wall mount kit.

Note: When users install the wall mount kit, please turn the LAN ports side outlet towards the floor.





#### Wall-mount Bracket Assembly Drawing

From the accessories box, users can get 4pcs of truss head M3\*6L screws for fixing the wall mount kit.



Note : If users install the screws in drywall, use the hollow wall anchors to ensure that the unit does not pull away from the wall due to prolonged strain between the cable and the power connector.



#### 1.3.3 DIN-Rail Bracket Dimensions

From the accessories box, users can get 4pcs of truss head M3\*6L and 6pcs of M3\*4L countersunk flat head screws for fixing the DIN-rail mount kit.



### **DIN-Rail Bracket Assembly Drawing**

From the accessory box, users can get 6pcs of truss head M3\*6L screws for fixing the wall mount kit.

## 1.4 I/O Outlets

The following figures show I/O outlets on the

## Front View



1	2 x Antenna opening	7	1 x Remote power switch
2	2 x Swappable HDD drive bay	8	1 x AT/ATX quick switch
3	2 x Antenna opening	9	2 x USB 2.0
4	LEDs	10	1 x Front access SIM slot
5	1 x Power button	11	1 x Audio (Mic in/Line out)
6	1 x Reset switch	12	1 x 8-CH DIO (DB9 female,4IN & 4OUT)

#### **Rear View**



13	1 x Grounding screw	19	RS-232/422/485 (COM2)
14	1 x LAN (i226-LM)	20	2 x HDMI 1.4b
15	1 x Antenna opening	21	1 x DisplayPort++
16	RS-232 (COM4)	22	4 x USB 3.2 Gen 1
17	RS-232 (COM3)	23	2 x LAN (i226-IT)
18	RS-232/422/485 (COM1)	24	1 x Phoenix type power input

## 1.5 Packing List

The comes with the following bundle package:

- system unit x 1
- DRAM Thermal Pad x 3
- DRAM Bracket x 1
- Remote power switch Cable x 1
- 3-pin Terminal block connector x 1
- Foot Pad x 4
- Screw pack x 1
- M.2 Bracket x 1
- M.2 Thermal pad x 3

## SECTION 2 HARDWARE INSTALLATION

The is convenient for various hardware configurations, such as CPU, DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive), PCI Express Mini card modules and optional MXM graphic module. Section 2 contains guidelines for hardware installation.

## 2.1 Installation of SO-DIMM

- Step 1 Turn off the system and unplug the power cord.
- Step 2 Turn the system unit upside down and loosen two screws on the bottom cover of the chassis and pull up the bottom cover.



Step 3 Pull and open the bottom cover back, then located the dual DDR4 SO-DIMM sockets on main board as red marked.



Step 4 Locate the memory module, place the thermal pad on the bottom of the DRAM socket, then insert a gold colored contact into the socket and push the module down until it is locked in place by the two end latches. And then place another thermal pad on top of the DRAM module.

thermal pad for DIMM 1

thermal pad for DIMM 2



Step 5 Place a thermal pad on the DRAM bracket and screw it on top of the DRAM.



Step 6 Put the bottom cover back and fasten two screws back onto the system.

## 2.2 Installation of Mini PCIe Module (Full-Size)

- Step 1 Turn off the system and unplug the power cord.
- Step 2 Turn the system upside down to locate screws at the bottom and loosen two screws as red marked.



Step 3has two mini card slots:Slot A : M.2 Key E for Wi-Fi (CN7) (USB + PCIe signal)Slot B : Mini PCIe slot for Wi-Fi or LTE (CN8) (PCIex1 signal)



Step 4 Slot A is used as the M.2 wireless mini card slot, assembly the pad on the bracket and insert the M.2 wireless mini PCIe module into the slot and fasten the screw, then secure the thermal pad bracket on top of the mini card module.



Step 5 Slot B is used as the wireless mini card slot, insert the Wi-Fi or LTE mini PCIe module into the slot and fasten the screw.



Step 6 And then connect the cable to antenna opening.

Step 7 Put the bottom cover and fasten all screws back onto the system.

## 2.3 Installation of NVMe storage (M.2 Key M)

- Step 1 Turn off the system and unplug the power cord.
- Step 2 Turn the system upside down to locate screws at the bottom and loosen two screws as red marked.



Step 3 Located the M.2 NVMe slot as red marked, assembly the pad on the bracket and insert the M.2 NVMe module into the slot and fasten the screw, then secure the thermal pad bracket on top of the NVMe module.



## 2.4 Installation of 2.5" SATA Device

- Step 1 Turn off the system and unplug the power cord.
- Step 2 Loosen two of the SATA drive tray's screws and pull out the SATA HDD drive tray.



Step 3 Turn the SATA drive tray upside down to install SSD/HDD and then fasten the four HDD screws to secure the SATA drive tray.



Step 4 Slide the SATA drive tray back into the system and fasten the screws firmly to complete the installation.



## 2.5 Installation of SIM Card

Step 1 Turn off the system and unplug the power cord.

Step 2 Loosen the screw of the SIM slot cover on chassis.



Step 3 Make sure the SIM card direction is correct and insert the SIM card firmly.



SIM card direction (contact side facing upward)

This page is intentionally left blank.

## SECTION 3 JUMPER & CONNECTOR SETTINGS

Proper jumper settings configure the to meet various application needs.-Hereby all jumpers settings along with their default settings are listed for devices onboard.

## 3.1 Locations of Jumpers & Connectors



#### PSB507 Top View

## 3.2 Summary of Jumper Settings

Proper jumper settings configure the to meet various application purposes. A table of all jumpers and their default settings is listed below.

Jumpers	Descripti	Settings	
JP2	Clear CMOS		Short 1-2
JP3	COM1 Data/Power Selection Default: RS-232 Data	CN23 Pin 1: DCD	3-5 Close
		CN23 Pin 9: RI	4-6 Close
JP4	COM2 Data/Power Selection Default: RS-232 Data	CN24 Pin 1: DCD	3-5 Close
		CN24 Pin 9: RI	4-6 Close



# [Note] : How to setup jumpers

Illustrations below show that a cap on a jumper is to "close" the jumper, whereas that off a jumper is to "open" the jumper.







[Pin1-2 Closed]

## 3.2.1 Restore BIOS Optimal Defaults (JP1)

Put the jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. This procedure is to restore BIOS optimal defaults.

Functions	Settings
Normal (Default)	1-2
Clear RTC	2-3

## 3.2.2 COM1 Data/Power Selection (JP3)

This is a 2x3-pin (pitch=2.0mm) jumper. The COM1 port has +5V level power capability on DCD and +12V level on RI by setting jumper JP3.

Functions	Settings
Power: Set CN21 pin 1 to +5V level	1-3 close
Data: Set CN21 pin 1 to DCD (Default)	3-5 close
Power: Set CN21 pin 9 to +12V level	2-4 close
Data: Set CN21 pin 9 to RI (Default)	4-6 close



## 3.2.3 COM2 Data/Power Selection (JP4)

This is a 2x3-pin (pitch=2.0mm) jumper. The COM2 port has +5V level power capability on DCD and +12V level on RI by setting jumper JP4.

Functions	Settings
Power: Set CN22 pin 1 to +5V level	1-3 close
Data: Set CN22 pin 1 to DCD (Default)	3-5 close
Power: Set CN22 pin 9 to +12V level	2-4 close
Data: Set CN22 pin 9 to RI (Default)	4-6 close



## 3.2.4 Auto Power On (SW1)

If SW1 is enabled for power input, the system will be automatically powered on without pressing the soft power button. If SW1 is disabled for power input, it is necessary to manually press the soft power button to power on the system.

Functions	Settings
Disable auto power on (Default)	1-2 close
Enable auto power on	2-3 close

_	1	2	3	
C	٥			

## 3.3 Connectors

Please refer to the below connector table to get information on pin assignments for individual connectors.

External Connectors	Sections
DC-in Phoenix Power (CN22)	3.3.1
HDMI (CN17, CN18)	3.3.2
DisplayPort (CN21)	3.3.3
RS232/422/485 (CN23, CN24)	3.3.4
Ethernet (i266-LM) + USB 3.2 (CN15)	3.3.5
USB 2.0 (USB1, USB2)	3.3.6
USB 3.2 (CN19)	3.3.7
Ethernet (i266-IT) (CN20)	3.3.8
8-CH DIO (CN2)	3.3.9
ATX power button (SW3)	3.3.10
Reset Switch (SW2)	3.3.11
Remote Power Switch (PWRBT1)	3.3.12
AT/ATX Quick Switch	3.3.13
Audio (CN3, CN4)	3.3.14
RS-232 (CN16, CN12)	3.3.15
Internal Connectors	Sections
SATA Signal Connector (SATA 1, 2)	3.3.16
SATA Power Connector (CN13, CN14)	3.3.17
SIM slot (CN9,CN5)	3.3.18
Full-Size Express Mini Card Slot (CN8)	3.3.19
M.2 2280 Key M (CN6)	3.3.20
M.2 2230 Key E (CN7)	3.3.21

## 3.3.1 DC-in Phoenix Power Connector (CN22)

The system supports 24V Phoenix DC-in connector for system power input.

Pins	Signals
1	DC+
2	GND
3	DC-



## 3.3.2 HDMI Connector (CN17,CN18)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pins	Signals	Pins	Signals
1	HDMI OUT_DATA2+	11	GND
2	GND	12	HDMI OUT Clock-
3	HDMI OUT_DATA2-	13	N.C.
4	HDMI OUT_DATA1+	14	N.C.
5	GND	15	HDMI OUT_SCL
6	HDMI OUT_DATA1-	16	HDMI OUT_SDA
7	HDMI OUT_DATA0+	17	GND
8	GND	18	+5V
9	HDMI OUT_DATA0-	19	HDMI_HTPLG
10	HDMI OUT Clock+		





## 3.3.3 DisplayPort++ (CN21)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pins	Signals	Pins	Signals
1	DPB_LANE0	11	GND
2	GND	12	DPB_LANE3#
3	DPB_LANE0#	13	Detect Pin
4	DPB_LANE1	14	GND
5	GND	15	DPB_AUX
6	DPB_LANE1#	16	GND
7	DPB_LANE2	17	DPB_AUX#
8	GND	18	DPB_HPDE
9	DPB_LANE2#	19	GND
10	DPB_LANE3	20	+3.3V



### 3.3.4 RS232/422/485 Serial Port Connector (CN23,CN24)

2x RS-232/422/485 ports (COM1/COM2). Please refer to Chapter 4 for the details of BIOS settings. COM1 and COM2 is equipped with +5V level power capability on DCD and +12V level on RI by setting JP3 and JP4 (see section 3.2.2 and 3.2.3).

#### **%COM1~2 (CN23,CN24)**

Pins	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	No use
4	DTR, Data Terminal Ready	RX-	No use
5	GND, Ground	No use	No use
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use



## 3.3.5 Ethernet + USB 3.2 Connector (CN15)

CN15 is designed for 1x Ethernet port (Intel i226-LM) & two USB 3.2 ports.

i226-LM LAN Port

Pins	LAN Signal	Pins	LAN Signal
L1	MDI0+	L5	MDI2+
L2	MDI0-	L6	MDI2-
L3	MDI1+	L7	MDI3+
L4	MDI1-	L8	MDI3-
A	Speed LED OFF: 10Mbps data rate OFF: 100Mbps data rate Amber: 1GMbps data rate Green: 2.5GMbps data rate		
В	Activity link LED(Amber) OFF: No link Blinking: Link established; data activity detected		



#### USB 3.2 port

Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data-	11	USB_Data-
3	USB_Data+	12	USB_Data+
4	GND	13	GND
5	SSRX-	14	SSRX-
6	SSRX+	15	SSRX+
7	GND	16	GND
8	SSTX-	17	SSTX-
9	SSTX+	18	SSTX+



## 3.3.6 USB 2.0 Connector (USB1, USB2)

The Universal Serial Bus connectors are compliant with USB 2.0 (480Mbps) and ideal for installing USB peripherals such as a keyboard, mouse, scanner, etc...

Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	3	USB_Data+
2	USB_Data-	4	GND



## 3.3.7 USB 3.2 Connector (CN19)

CN19 is designed for two USB 3.2 ports.

Pins	Signal USB Port 0	Pins	Signal USB Port 1
1	USB_VCC (+5V level standby power)	10	USB_VCC (+5V level standby power)
2	USB_Data-	11	USB_Data-
3	USB_Data+	12	USB_Data+
4	GND	13	GND
5	SSRX-	14	SSRX-
6	SSRX+	15	SSRX+
7	GND	16	GND
8	SSTX-	17	SSTX-
9	SSTX+	18	SSTX+



## 3.3.8 Ethernet Port (CN20)

One RJ-45 connector is designed by Intel i226-IT.

Pins	LAN Signal	Pins	LAN Signal		
L1	MDI0+	L5	MDI2+		
L2	MDI0-	L6	MDI2-		
L3	MDI1+	L7	MDI3+		
L4	MDI1-	L8	MDI3-		
	Speed LED				
	OFF: 10Mbps data rate				
А	OFF: 100Mbps da	os data rate			
	Amber: 1GMbps data rate				
	Green: 2.5GMbps data rate				
	Activity link LED(Amber)				
В	OFF: No link				
	Blinking: Link established; data activity detected				



## 3.3.9 8-CH Digital IO (CN2)

one 8-CH output connector (DIO1~8) , default : 4IN & 4OUT. Each bit can be set to function as input or output by software programming, and users can set up via BIOS setting.

Pins	Description
1	DIO1
2	DIO2
3	DIO3
4	DIO4
5	DIO5
6	DIO6
7	DIO7
8	DIO8
9	GND

Digital I/O



## 3.3.10 ATX Power on/off (SW3)

The ATX power button is on the I/O side. It can allow users to control A

A power on/off.

Functions	Descriptions
On	Turn on/off system
Off	Keep system status

## 3.3.11 Reset Button (SW2)

The Reset button can allow users to reset the system.

Functions	Descriptions	Devel
On	Reset system	Reset
Off	Keep system status	0

## 3.3.12 Remote Power Switch Connector (PWRBT1)

One 2-pin connector output for remote power on/off switch.

\* Connector specification: Male / Female: BTX 2P 3.0mm

Functions	Descriptions
Short (1-2)	Turn on/off system
Open	Keep system status

## 3.3.13 AT/ATX Switch

If you set AT/ATX switch to AT mode, the system will automatically power on without the need to press the soft power button during power input; users can use this switch to achieve auto power on demand.



## 3.3.14 Audio Connector (CN3, CN4)

The Audio jacks ideal for Audio Mic-In and Audio Line-out.

Pins	Signals				
1	Line Out				
2	Microphone In				



## 3.3.15 RS-232 Serial Port Connector (CN16, CN12)

supports 2x RS-232 ports (COM3/COM4). Please refer to Chapter 4 for the details of BIOS settings.

\*COM3~4 (CN16,CN12)

Pins	RS-232
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

## 3.3.16 SATA Connector (SATA 1 & 2)

These Serial Advanced Technology Attachment (Serial ATA or SATA) connectors are used for high-speed SATA interfaces. They are computer bus interfaces for connecting to devices such as hard disk drives. This board has two SATA 3.0 ports with 6Gb/s performance.

Pins	Signals			
1	GND			
2	SATA_TX+			
3	SATA_TX-			
4	GND			
5	SATA_RX-			
6	SATA_RX+			
7	GND			



## 3.3.17 SATA Power Connector (CN13,CN14)

Based on CN13  $\scriptstyle \times$  CN14 to offer the SATA power for SATA 2.5" HDD/SSD.

\*Connector specification: wafer 4P, P=2.5mm

Pins	Signals		
1	+12V level		
2	GND		
3	GND		
4	+5V level		

+12v		

## 3.3.18 SIM Slot (CN9, CN5)

includes two SIM slots: CN5 is on front side and CN9 in on internal of the system that support mini PCIe slot, it is mainly used in wireless network application on CN5/CN9.

Pins	Signals				
1	PRW				
2	RST				
3	CLK				
4	NC				
5	GND				
6	VPP				
7	IO				
8	NC				





## 3.3.19 Full-Size PCI Express Mini Card Slot (CN8)

The supports one full-size PCI-Express Mini Card slots.CN8 is applying to either PCI-Express or USB 2.0 signal and complies with PCI-Express Mini Card Spec. V1.2.

CN8					
Pins	Signals	Pins	Signals		
1	WAKE#	2	+3.3VSB		
3	No use	4	GND		
5	No use	6	+1.5V		
7	CLKREQ#	8	SIM_PWR		
9	GND	10	SIM_DATA		
11	REFCLK-	12	SIM_CLK		
13	REFCLK+	14	SIM_REST		
15	GND	16	SIM_VPP		
17	No use	18	GND		
19	No use	20	W_DISABLE#		
21	GND	22	PERST#		
23	PE_RXN3/	24	+3.3VSB		
25	PE_RXP3/	26	GND		
27	GND	28	+1.5V		
29	GND	30	SMB_CLK		
31	PE_TXN3/	32	SMB_DATA		
33	PE_TXP3/	34	GND		
35	GND	36	USB_D8-		
37	GND	38	USB_D8+		
39	+3.3VSB	40	GND		
41	+3.3VSB	42	No use		
43	GND	44	No use		
45	No use	46	No use		
47	No use	48	+1.5V		
49	No use	50	GND		
51	No use	52	+3.3VSB		





## 3.3.20 M.2 2280 Key M (CN6)

The M.2 2280 Key M for NVMe storage.

Pins	Signals	Pins	Signals	Pins	Signals	Pins	Signals
1	GND	2	+3.3V	3	GND	4	+3.3V
5	PEX3_RX-	6	NC	7	PEX3_RX+	8	NC
9	GND	10	LED_1#	11	PEX3_TX-	12	+3.3V
13	PEX3_TX+	14	+3.3V	15	GND	16	+3.3V
17	PEX2_RX-	18	+3.3V	19	PEX2_RX+	20	NC
21	GND	22	NC	23	PEX2_TX-	24	NC
25	PEX2_TX+	26	NC	27	GND	28	NC
29	PEX1_RX-	30	NC	31	PEX1_RX+	32	NC
33	GND	34	NC	35	PEX1_TX-	36	NC
37	PEX1_TX+	38	DEV SLP	39	GND	40	NC
41	PEX0_RX-	42	NC	43	PEX0_RX+	44	NC
45	GND	46	NC	47	PEX0_TX-	48	NC
49	PEX0_TX+	50	PERST#	51	GND	52	CLKREQ#
53	PEX0_REFCLkn	54	PEWAKE#	55	PEX0_REFCLkp	56	NC
57	GND	58	NC	59	CONNECTOR KEY M	60	CONNECTOR KEY M
61	CONNECTOR KEY M	62	CONNECTOR KEY M	63	CONNECTOR KEY M	64	CONNECTOR KEY M
65	CONNECTOR KEY M	66	CONNECTOR KEY M	67	NC	68	NC
69	NC	70	+3.3V	71	GND	72	+3.3V
73	GND	74	+3.3V	75	GND		
# 3.3.21 M.2 2230 Key E (CN7)

The M.2 2230 Key E for Wi-Fi.

1	GND	2	+3.3V	3	USB_D+	4	+3.3V
5	USB_D-	6	NC	7	GND	8	NC
9	NC	10	NC	11	NC	12	NC
13	GND	14	NC	15	NC	16	NC
17	NC	18	GND	19	GND	20	NC
21	NC	22	NC	23	NC	24	CONNECTOR Key E
25	CONNECTOR Key E	26	CONNECTOR Key E	27	CONNECTOR Key E	28	CONNECTOR Key E
29	CONNECTOR Key E	30	CONNECTOR Key E	31	CONNECTOR Key E	32	NC
33	GND	34	NC	35	PETp0	36	NC
37	PETn0	38	NC	39	GND	40	NC
41	PERp0	42	NC	43	PERn0	44	NC
45	GND	46	NC	47	REFCLKp0	48	NC
49	REFCLKn0	50	SUSCLK	51	GND	52	PERST0#
53	CLKREQ#	54	MCP_BT_DISABLE	55	PEWAKE0#	56	MCP_WIFI_DISABLE
57	GND	58	M.2_E_SMB_DATA	59	PETp1	60	M.2_E_SMB_CLK
61	PETn1	62	NC	63	GND	64	M.2_E_REFCLK
65	PERp1	66	NC	67	PERn1	68	NC
69	GND	70	NC	71	REFCLKp1	72	+3.3V
73	REFCLKn1	74	+3.3V	75	GND		

This page is intentionally left blank.

# SECTION 4 BIOS SETUP UTILITY

This section provides users with detailed descriptions in terms of how to set up basic system configurations through the BIOS setup utility.

# 4.1 Starting

To enter the setup screens, follow the steps below:

- 1. Turn on the computer and press the <Del> key immediately.
- 2. After pressing the <Del> key, the main BIOS setup menu displays. Users can access other setup screens, such as the Advanced and Chipset menus, from the main BIOS setup menu.

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

# 4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include  $\langle F1 \rangle$ ,  $\langle F2 \rangle$ ,  $\langle Enter \rangle$ ,  $\langle ESC \rangle$ ,  $\langle Arrow \rangle$  keys, and so on.

Hot Keys	Descriptions
→← Left/Right	The Left and Right < Arrow> keys allow users to select a setup screen.
∕↑↓ Up/Down	The Up and Down <arrow> keys allow users to select a setup screen or sub- screen.</arrow>
+– Plus/Minus	The Plus and Minus <arrow> keys allow users to change the field value of a particular setup item.</arrow>
Tab	The <tab> key allows users to select setup fields.</tab>
F1	The <f1> key allows users to display the General Help screen.</f1>
F2	The <f2> key allows users to Load Previous Values.</f2>
F3	The <f3> key allows users to Load Optimized Defaults.</f3>
F4	The <f4> key allows users to save any changes they made and exit the Setup. Press the <f4> key to save any changes.</f4></f4>
Esc	The <esc> key allows users to discard any changes they made and exit the Setup. Press the <esc> key to exit the setup without saving any changes.</esc></esc>
Enter	The <enter> key allows users to display or change the setup option listed for a particular setup item. The <enter> key can also allow users to display the setup sub- screens.</enter></enter>

[Note] : Some of the navigation keys differ from one screen to another.

# 4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.

Main Adv	anced Chipset Security	Aptio Setup – AMI Boot Save & Exit		
Build Date Project Ve	and Time rsion	05/03/2023 17:07:34 PSB507 X014	Set the Time. Use Tab to switch between Time elements.	
Firmware I	nformation			
ME Firmwar	e Version	15.0.35.1951		
ME Firmwar	e Mode	Normal Mode		
ME Firmwar	e SKU	Corporate SKU		
Board Info	rmation			
Processor	Name	TigerLake ULT		
	Туре	11th Gen Intel(R)		
		Core(TM) i7–1185G7E @		
		2.80GHz		
	Stepping	BO	++: Select Screen	
			↑↓: Select Item	
PCH	Name	TGL PCH-LP	Enter: Select	
	SKU	U Premium	+/−: Change Opt.	
	Stepping	BO	F1: General Help	
Memory	Size	4096 MB	F2: Previous Values	
	Frequency	2400 MT/s	F3: Optimized Defaults	
Queter Det	-		F4: Save & Exit	
System Dati	e -	[Sat 05/06/2023]	ESU: EXIL	
System IIM		[00.14.01]		
Access Level		Administrator		
Version 2.22.1282 Copyright (C) 2023 AMI				

## **BIOS Information**

Display the auto-detected BIOS information.

#### System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

#### Access Level

Display the access level of current user.

# 4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

- Trusted Computing
- CPU Configurations
- Storage Configuration
- AMT Configuration
- ► F81966 Super IO Configuration
- ► Hardware Monitor
- Serial Port Console Redirection
- USB Configuration
- Device Configuration

For items marked with "▶", please press <Enter> for more options.



# **Trusted Computing**

If users install a security device, such as TPM, users will see the following information for the TPM device and status.

Advanced	Aptio Setup – AMI	
TPM 2.0 Device Found Firmware Version: Vendor:	1.258 STM	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG FEI protocol and
Security Device Support Active PCR banks Available PCR banks	[Enable] SHA256 SHA256	INT1A interface will not be available.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	1 2.22.1282 Copyright_(C) 20	23 AMI

## **CPU Configuration**

Aptio Setup – AMI Advanced CPU Configuration Enable or Disable Hyper-Threading Technology. 11th Gen Intel(R) Туре Core(TM) i7-1185G7E @ 2.80GHz ID 0x806C1 2800 MHz Speed L1 Data Cache 48 KB x 4 L1 Instruction Cache 32 KB x 4 L2 Cache 1280 KB × 4 L3 Cache 12 MB L4 Cache NZA. VMX. Supported SMX/TXT Supported ++: Select Screen ↑↓: Select Item Enter: Select Intel (VMX) Virtualization [Enabled] +/-: Change Opt. F1: General Help Technology [Enabled] Intel(R) SpeedStep(tm) F2: Previous Values Turbo Mode [Disabled] F3: Optimized Defaults F4: Save & Exit Configurable TDP Boot Mode [Nominal] ESC: Exit

This screen shows the CPU version and its detailed information.

#### Hyper-Threading

Use this item to enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking functions as two logical ones.

#### Intel<sup>®</sup> I Virtualization Technology

It allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

#### Intel<sup>®</sup> Speedstep<sup>™</sup>

Allows more than two frequency ranges to be supported.

#### **Turbo Mode**

This item is for enabling or disabling turbo mode. When enabled, it allows processor cores to run faster than marked frequency under certain conditions. The default is Disable Mode.

#### **Configurable TDP Boot Mode**

Config TDP Configurations.

#### **Storage Configuration**

Users can read the current installed hardware configurations from those SATA ports in the SATA and RST Configuration menu. During system boot up, BIOS will detect the present SATA devices automatically.



#### SATA Controller

Enable or disable the SATA Controller feature. The default is Enabled.

#### VMD Setup menu

Intel<sup>®</sup> VMD (Intel<sup>®</sup> Volume Management Device) is the new way to configure 11th Generation and greater Intel<sup>®</sup> Core<sup>™</sup> Processor-based platforms for Intel<sup>®</sup> RST management of RAID and Intel<sup>®</sup> Optane<sup>™</sup> memory volumes. please refer to Appendix B for how to set up and configure RAID function through VMD.

## **AMT Configurations**

Users can use this screen to configure AMT parameters.



## Intel<sup>®</sup> AMT

Enable or disable Intel<sup>®</sup> Active Management Technology BIOS Extension.

The default is enabled.

#### F81966 Super IO Configuration

Use this screen to select options for the F81966 Super IO Configurations and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "**>**", please press <Enter> for more options.

Advanced	Aptio Setup – AMI	
F81966 Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
Super IO Chip > Serial Port 1 Configuration > Serial Port 2 Configuration > Serial Port 3 Configuration > Serial Port 4 Configuration	F81966	++: Select Screen ++: Select Screen +I: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	2.22.1282 Copyright (C) 2023	AMI

#### Serial Port 1~4 (COM1~4) Configurations

Use these items to set parameters related to serial ports COM1/2 (RS232/422/485) Use these items to set parameters related to serial ports COM3/4 (RS232 only)

## Serial Port 1

Use this to set parameters of COM 1.



## **COM Port type**

Use this item to set parameters related to serial ports COM 1 (RS232/422/485)

## Serial Port 2

Use this to set parameters of COM 2.

Advanced	Aptio Setup – AMI	
Serial Port 2 Configuration		COM Port Type: RS232, RS422,
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	12403
COM Port Type	[RS232]	
	COM Port Type	
	RS422 RS485	++: Select Screen ↑↓: Select Item Enter: Select
		+/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1282 Copyright (C) 2023	3 AMI

## COM Port type

Use this item to set parameters related to serial ports COM 2 (RS232/422/485)

### Serial Port 3

Advanced	Aptio Setup – AMI	
Serial Port 3 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enab1ed] IO=3E8h; IRQ=5;	(COM) ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Venci	on 9 99 1909 Conuniaht (C)	DODD AWT

## Serial Port 4

Advanced	Aptio Setup – AMI	
Serial Port 4 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2E8h; IRQ=6;	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version	02.22.1282 Copyright (C) 2023	3 AMI

#### Hardware Monitor

This screen monitors hardware health status.

Advanced	Aptio Setup – AMI	
Pc Health Status		
CPU temperature System temperature VBAT +5V +3.3V +5V_SBY	: +100 % : +29 % : N/A : +5.045 V : +3.328 V : +5.088 V	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1282 Copyright (C)	2023 AMI

This screen displays the temperature of system and CPU as well as system voltages (VCORE, +5V\_STBY, VBAT, +5V and +3.3V).

## Serial Port Console Redirection

This screen allows you to set serial port console redirection.



#### **Console Redirection**

Console Redirection Enable or Disable.

#### **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

## **USB** Configurations



Display all detected USB devices.

# **Device Configurations**

This item allows users to set the Digital I/O to Input or Output. Default is 4 IN & 4 OUT.

Advanced	Aptio Setup – AMI	
Onboard DIO Configuration DIO Modification ▶ DIO port 1-8	[Disabled]	Enabled or Disabled DIO Modification →+: Select Screen
		<pre>↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.	22.1282 Copyright (C) 2023	AMI

# 4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

- System Agent (SA) Configurations
- PCH-IO Configurations

For items marked with "▶", please press <Enter> for more options.

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit	
System Agent (SA) Configuration		
Graphics Configuration IGFX GOP Version	17.0.1052	
PCH-IO Configuration		
		↔: Select Screen ↑↓: Select Item
		Enter: Select +/−: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESU: EXIT
Version 2	22 1282 Conucidat (C) 2023	АМТ

System Agent (SA) Configurations This screen allows users to configure System Agent (SA) parameters. For items marked with "▶", please press <Enter> for more options.

Aptio Setup Chipset	Jtility – Copyright (C) 2020 Ameri	ican Megatrends, Inc.
SA PCIe Code Version VT-d	7.0.108.64 Supported	Memory Configuration Parameters
▶ Memory Configuration		
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.2	0.1275. Copyright (C) 2020 America	an Megatrends, Inc.

## **Memory Configuration**

Use this item to refer to the information related to system memory.

# Memory Configurations

This screen shows the system memory information.

Aptio Setup Utility - Chipset	Copyright (C) 2020 American	Megatrends, Inc.
Memory Configuration		
Memory RC Version Memory Size	0.7.1.111 8192 MB	
Channel O Slot O Size Number of Ranks Manufacturer Channel 1 Slot O	Populated & Enabled 8192 MB (DDR4) 2 UnKnown Not Populated / Disabled	<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.20.1275. C	opyright (C) 2020 American M	egatrends, Inc.

# **PCH-IO Configurations**

This screen allows users to set PCH parameters.

	Aptio Setup Utility – Chipset	Copyright (C) 2020 Americar	) Megatrends, Inc.
PCH LAN Contr Wake on LAN	oller(i219) Enable	[Enabled] [Enabled]	Enable/Disable onboard NIC.
			<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.20.1275. Co	opyright (C) 2020American M	legatrends, Inc.

#### **Security Menu**

Aptio Setup – AMI Main Advanced Chipset <mark>Security</mark> Boot Save & Exit		
Password Description		Set Administrator Password
If ONLY the Administrator's pas then this only limits access to only asked for when entering Se If ONLY the User's password is is a power on password and must boot or enter Setup. In Setup t have Administrator rights. The password length must be in the following range: Minimum length	sword is set, Setup and is tup. set, then this be entered to he User will 3	
Maximum length	20	
Administrator Password		14: Select Item
User Password		Enter: Select
▶ Secure Boot		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

#### **Administrator Password**

This item indicates whether an administrator password has been set (installed or uninstalled).

#### **User Password**

This item indicates whether a user password has been set (installed or uninstalled).

#### Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.

#### Secure Boot

	Aptio Setup – AMI Security	
System Mode	Setup	Secure Boot feature is Active if Secure Boot is Enabled.
Secure Boot	[Disabled] Not Active	Platform Key(PK) is enrolled and the System is in User mode.
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Custom]	platform reset
▶ Key Management		
		++: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit FSC: Fxit
	Version 2.22.1282 Copyright (C) 20	)23 AMI

#### Use this item to enable or disable support for Secure Boot.

#### Secure Boot Mode

Secure Boot mode options: Standard or Custom.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

#### **Restore Factory Keys**

Use this item to force System to User Mode, to install factory default SecureBoot key databases.

#### Reset To Setup Mode

Select Yes and press <Enter> to restore the manufacturer default Secure Boot keys. This will also reset the system to User mode. The options are Yes and No.

#### Key Management

Enables expert users to modify Secure Boot Policy variables without full authentication.

Key Management Install factory default Secure Boot key the platform rest and while the System is in Setup mode.

Aptio Setup – AMI Security		
Vendor Keys	Valid	Install factory default Secure
Factory Key Provision Restore Factory Keys Reset To Setup Mode Export Secure Boot vari Enroll Efi Image	[Disabled] Lables	reset and while the System is in Setup mode
Device Guard Ready Remove 'UEFI CA' from D Restore DB defaults	)B	
Secure Boot variable P latform Key(PK) Key Exchange Keys Authorized Signatures Forbidden Signatures Authorized TimeStamps OsRecovery Signatures	Size  Keys  Key Source 0  0  No Keys 0  0  No Keys	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.22.1282 Copyright (C) 2023 AMI		

# 4.6 Boot Menu

The Boot menu allows users to change boot options of the system.

Main Advanced Chipset	Aptio Setup – AMI Security <mark>Boot</mark> Save & Exit	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot Network Stack	1 [On] [Disabled] [Disabled]	Enables or disables Quiet Boot option
Boot Option Priorities Boot Option #1	[UEFI: JetFlashTranscend 64GB 1100, Partition 1 (JetFlashTranscend 64GB 1100)]	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
		F4: Save & Exit ESC: Exit

#### Setup Prompt Timeout

Use this item to set up number of seconds to wait for setup activation key where 65535(0xFFFF) means indefinite waiting.

#### Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.

#### **Quiet Boot**

Select to display either POST output messages or a splash screen during boot-up.

#### **Network Stack**

Enable/Disable UEFI Network Stack. Default setting is Enabled.

#### **Boot Option Priorities**

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

# 4.7 Save & Exit Menu

The Save & Exit menu allows users to load system configurations with optimal or fail-safe default values.

Aptio Setup – AMI Main Advanced Chipset Security Boot Save & Exit	
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes	Restore/Load Default values for all the setup options.
Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: JetFlashTranscend 64GB 1100, Partition 1 (JetFlashTranscend 64GB 1100)	<pre> ++: Select Screen  1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.22.1282 Copyright (C) 20	23 AMI

#### Save Changes and Exit

When users have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

#### **Discard Changes and Exit**

Select this option to quit Setup without making any permanent changes to the system configurations and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

#### Save Changes and Reset

Having completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

#### **Discard Changes and Reset**

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

#### Save Changes

Having completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

#### **Discard Changes**

Select this option to quit Setup without making any permanent changes to the system configurations. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

#### **Restore Defaults**

It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

#### Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

### Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

### **Boot Override**

Select a drive to immediately boot that device regardless of the current boot order.

This page is intentionally left blank.

# APPENDIX A WATCHDOG TIMER

# About Watchdog Timer

Software stability is major issue in most applications. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when a computer hangs. The system needs to be able to reset automatically when things go wrong. The watchdog timer gives us solutions in this regard.

The watchdog timer is a counter that triggers a system to reset when it counts down to zero from a preset value. The software starts the counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

# Sample Program

The following example enables configurations using a debug tool.

Enable WDT	
Ļ	
Enable configuration:	
	O 2E 87; Un-lock super I/O
	O 2E 87
Ļ	
Select logic device:	
	O 2E 07
	O 2F 08
$\downarrow$	
WDT device enable:	
	O 2E 30
	O 2F 01
$\downarrow$	
Set timer unit:	
	O 2E F0
	O 2F 00 ; (00: Sec; 08:Minute)
↓	
Set base timer:	
	O 2E F1
	O 2F 0A; Set reset time (where 0A (hex) = 10sec)
Disable WDT	
$\downarrow$	
Enable configuration:	
	O 2E 87; Un-lock super I/O
	O 2E 87
$\downarrow$	
Select logic device:	
	O 2E 07
	O 2F 08
$\downarrow$	
WDT device disable:	
	O 2E 30
	O 2F 00

# APPENDIX B Configuration of RAID

# B.1 Configuring SATA Hard Drive(s) for RAID

Before you begin the SATA configuration, please prepare:

• Two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID with the SATA controller, you may prepare only one hard drive.

## Please follow up the steps below to configure SATA hard drive(s):

- 1. Install SATA hard drive(s) in your system.
- 2. Enter the BIOS Setup to configure SATA controller mode and boot sequence.
- 3. Configure RAID by the RAID BIOS.

#### 1. Installing SATA hard drive(s) in your system.

Connect one end of the SATA signal cable to the rear of the SATA hard drive, and the other end to available SATA port(s) on the board. Then, connect the power connector of power supply to the hard drive.

#### 2. Configuring SATA controller mode and boot sequence by the BIOS Setup.

You have to make sure whether the SATA controller is configured correctly by system BIOS Setup and set up BIOS boot sequence for the SATA hard drive(s).

2.1 Turn on your system, and then press the <Del> button to enter BIOS Setup during running POST (Power-On Self-Test). If you want to create RAID, just go to the Advanced Settings menu\Storage Configuration\SATA and RST Configuration\VMD setup menu, enabled the "Enable VMD controller", save and exit the BIOS Setup.

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit	
Trusted Computing     PPU Configuration     Storage Configuration	Trusted Computing Settings
<ul> <li>Storage Configuration</li> <li>HMT Configuration</li> <li>F81966 Super ID Configuration</li> <li>Hardware Monitor</li> <li>Serial Port Console Redirection</li> <li>USB Configuration</li> <li>Device Configuration</li> </ul>	++: Select Screen 11: Select Item Enter: Select
	<pre>HTTL: Barge Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.22.1282 Copyright (C) 2023	AMI

Aptio Setup -	AMI
Storage Configuration	SATA Device Options Settings
▶ SATA And RST Configuration	
	++: Select Screen ↑↓: Select Item
	Enter: Select +/-: Change Opt.
	F1: General Help F2: Previous Values
	F4: Save & Exit ESC: Exit
- Version 2.22.1282 Copyrig	ht (C) 2023 AMI

Advanced	Aptio Setup – AM:	I
SATA And RST Configuration		VMD Configuration settings
SATA Controller(s) ▶ VMD setup menu	[Enabled]	
Serial ATA Port 1 Serial ATA Port 2	Empty Empty	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
V	ersion 2.22.1282 Copyright	(C) 2023 AMI

Advanced	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD
Enable VMD controller	[Enabled]	controller
Enable VMD Global Mapping Map this Root Port under VMD Root Port BDF details Map this Root Port under VMD Root Port BDF details RAIDO RAID1	[Disabled] [Disabled] N/A [Enabled] N/A [Enabled] [Enabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versio	n 2.22.1282 Copyright (C) :	2023 AMI

2.2 After restart, press <Del> button to enter BIOS Setup Menu. In Advanced Page, choose Intel(R) Rapid Storage Technology.



2.3 Press Create RAID volume



2.4 Press <RAID level> to choose RAID 0 or 1 and then select the storage device that to be used for RAID function.



2.5 Please make sure that the storage device to be used for raid function is correct first. And press <Create RAID volume> to go to next step.

Advanced	Aptio Setup - AMI	
Create RAID Volume		X – to Select Dísk
Name: RAID Level:	Volume1 [RAIDO (Stripe)]	
Select Disks: SATA 0.0, AXIOMTEK CorpFSA128GMW5T 0219AA100565E0D0, 119.2GB SATA 0.1, AXIOMTEK CorpFSA128GMW5T 1126AA100252C303, 119.2GB	[X] [ ]	
Strip Size: Capacity (MB):	[16KB] 0	++: Select Screen ↑↓: Select Item Enter: Select
▶ Create Volume		+/−: Change Opt. F1: General Help
select at least two disks		F2: Frevious Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
V	ersion 2.22.1282 Copyright (C) 2023	AMI

Then, users can see the final RAID volume.

Aptio Setup - AMI Advanced	
Intel(R) RST 18.1.1.5201 RST VMD Driver	Select to see more information about the RAID Volume
RAID Volumes: ▶ Volume1, RAIDO (Stripe), 238.5GB, Normal	
	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.22.1282 Copyright (C) 2023	AMI

2.6 Install OS and Click Load Driver.

Name		Total size	Free space T	Гуре
€9 <u>R</u> efresh	Delete	Eormat	₩ N <u>e</u> w	
<ul> <li>Befresh</li> <li>Load driver</li> </ul>	Delete	Eormat	He New	
Selec	the driver to install			
-------	--			
	Load driver			
	To install the device driver for your drive, insert the installation media containing the driver files, and then click OK. Note: The installation media can be a CD, DVD, or USB flash drive.			
	Browse OK Cancel			

2.7 Click Browse, Find the VMD File.

rowse to the driver, and	then dick OK.	
V 📄 produc	tion	^
🗸 😽 Wi	ndows10-x64	
~	15063	
~	Drivers	
	AHCI	ALC: NOT
	HsaCompone	nt
	HsaExtension	
	PinningCompo	nent
	RAID	
	VMD	~
<		>

## 2.8 Press Next

Intel RST VMD Controller 9A0B (D:\Driver\EBOX630A\6. Intel RST Driver\RST\SetupRST\production				
Intel RST VMD Managed Controller 09AB (D:\Driver\EBOX630A\6. Intel RST Driver\RST\SetupRST\F				
<		>		

2.9 The storage will be detected after the previous steps and finished the OS install.