EBOX-TGL-35G7 Series
Fanless Box PC

User's Guide

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Safety Information

WARNING

- Read these Safety instructions carefully.
- Please carry the unit with both hands, handle carefully.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Input voltage DC +12V~+24V Power Adapter Only
- Operating temperature -20~+60°C.
- Please turn off power before inserting or removing M.2 devices, SO-DIMM DRAM module and WLAN module.
- Do not open the cabinet during use to avoid electrical shock.
  Refer to your nearest dealer for qualified personnel servicing.
- Do not expose EBOX to rain or moisture, in order to prevent shock and fire hazard.
- Never install EBOX in wet locations, Keep EBOX away from humidity.
- Never touch un-insulated terminals or wire unless power adaptor and display monitor are disconnected.
- Locate EBOX as close as possible to the socket outline for easy access and to avoid force caused by entangling of your arms with surrounding cables from the EBOX.
- When using EBOX, avoid using or installing the modem during a storm or a lightning.
- USB connectors are supplied with Limited Power Sources.

DO NOT ATTEMPT TO DISASSEMBLE THE CHASSIS (ENCASING) OF THIS PRODUCT. PLEASE CONTACT YOUR NEAREST DEALER FOR SERVICING FROM QUALIFIED TECHNICIAN.

Contents

Chapter 1

1.1 Unpacking EBOX Fanless Box PC

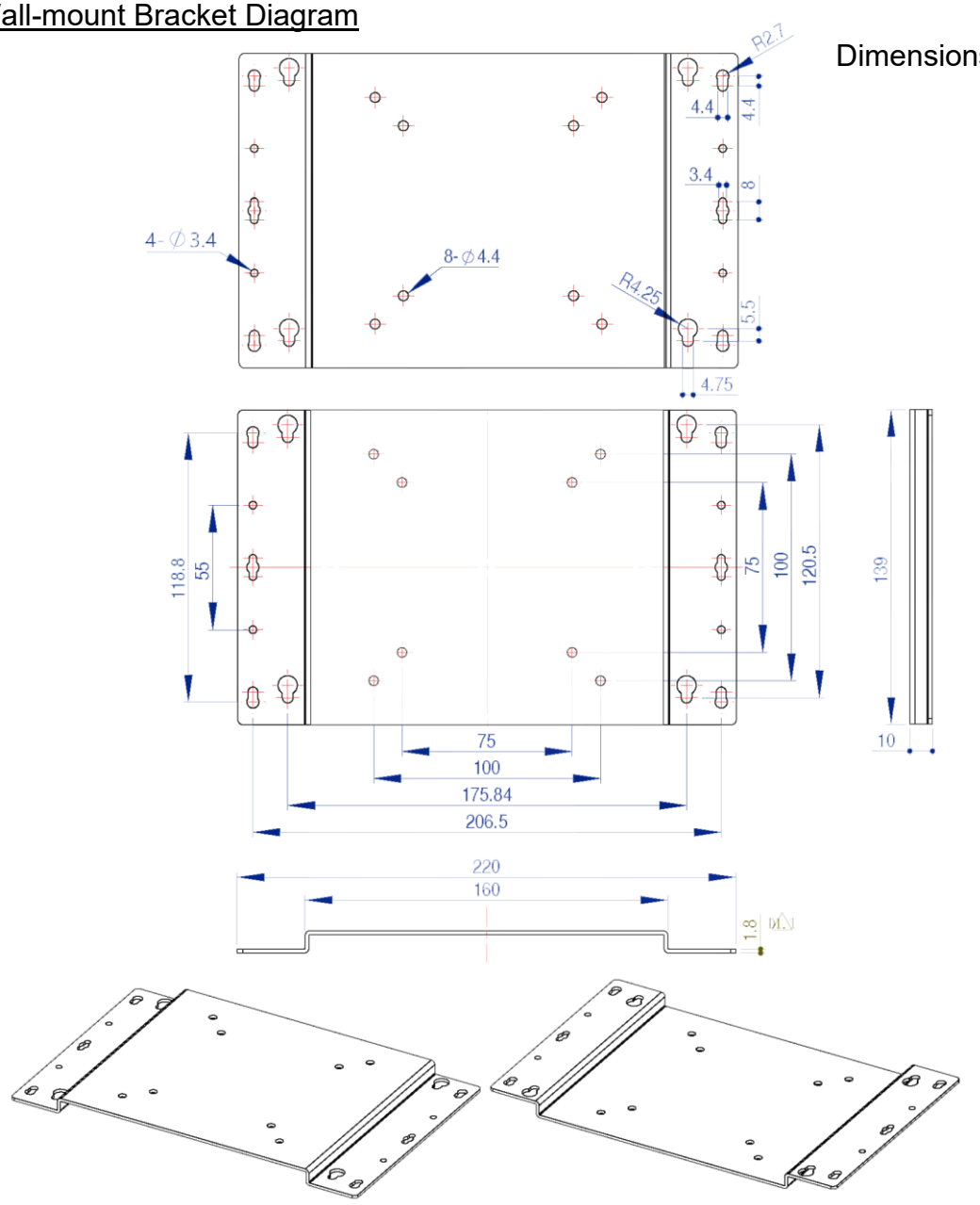
Component List:

Item No.	Description	Quantity
1	EBOX-TGL-35G7 Series Fanless Box PC	x1
2	Power Adaptor 90W; Vin: 100~240V AC 50~60Hz (Optional)	x1
3	Power cord US/UK/EU/AU types (Optional)	x1
4	VESA & Wall-mount Rack (Optional)	x1

Note:
* The accessories are subject to change without immediate notice.

VESA & Wall-mount Bracket Diagram

Dimensions unit: mm



1.2 Preface

EBOX-TGL-35G7 Series Fanless Box PC

Unparalleled Performance in a Compact Design
The new Fanless Box PC is equipped with an Intel® Tiger Lake i5-1135G7 processor running at 2.40GHz, delivering robust processing power for a wide range of tasks. With support for up to 64GB of DDR4 3200MHz memory through dual-channel SO-DIMM slots, this system ensures seamless multitasking and high-speed data processing, even in the most challenging environments.

Superior Display Capabilities features two HDMI 2.0 ports and two DP 1.4 ports, supporting up to four 4K HDR displays or a single 8K SDR display.

Expansion options, including an M.2 M-key slot (2242/2280) that supports PCIe Gen.4 NVMe storage for ultra-fast data access and an M.2 E-key (2230) slot with USB2.0/PCIe interface support for CNVi modules. It also includes a comprehensive array of I/O ports, such as four USB3.2 (Gen.2) Type-A ports, two USB2.0 Type-A ports, one GPIO and up to six COM ports.

The system is equipped with at least two Ethernet ports, including one Intel® i219-LM 1.0GbE RJ45 port and one Intel® i226 2.5GbE RJ45 port or up to three Intel® i226 2.5GbE RJ45 ports.

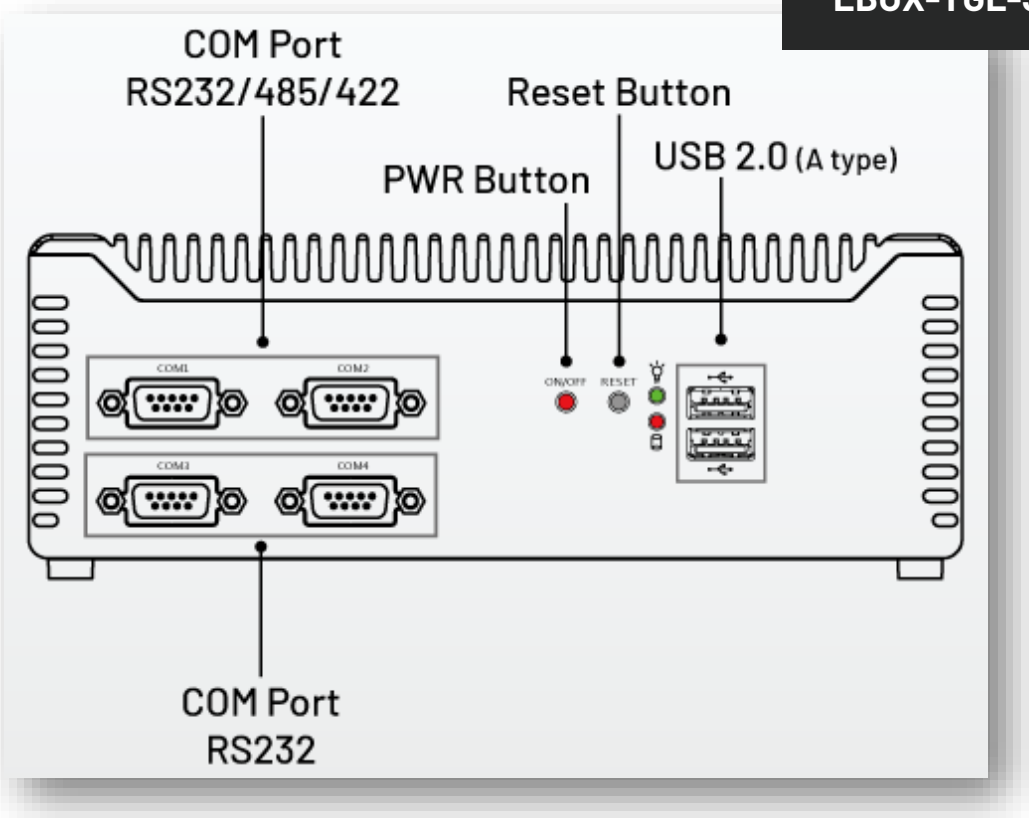
Supports a variety of operating systems, including Windows 10, Windows 11 (64-bit), and Linux, offering flexibility and ease of integration into different software ecosystems.

Chapter 2

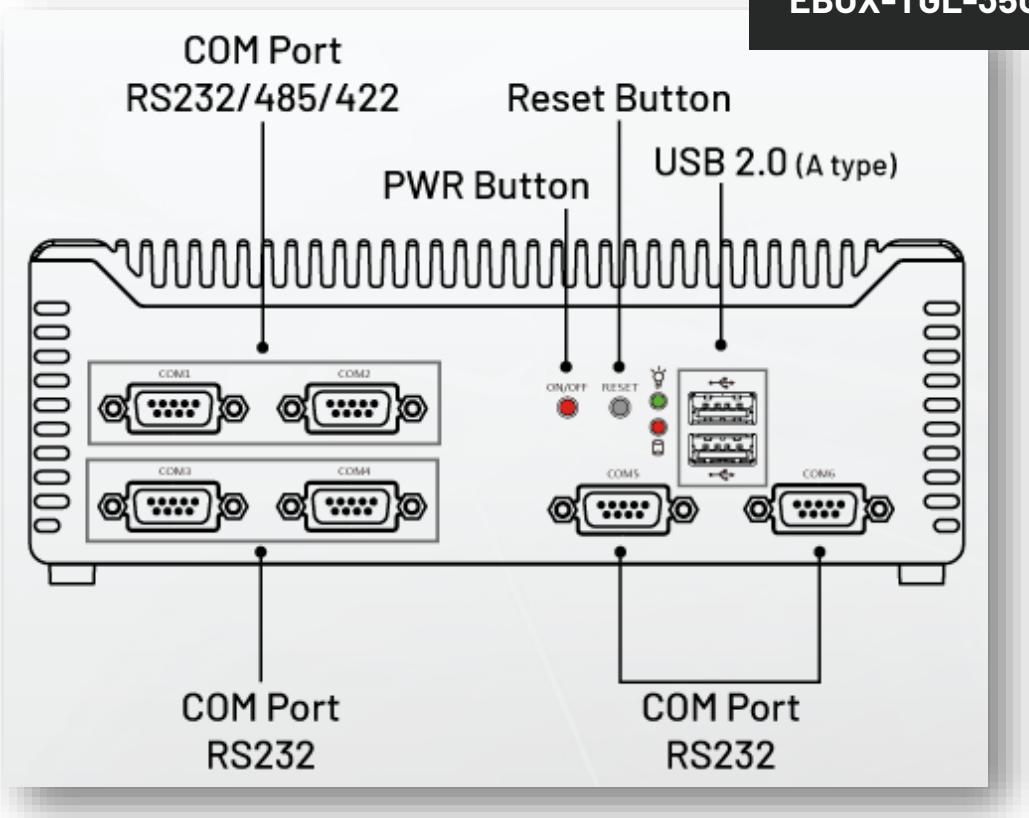
2.1 External I/O

Front IO

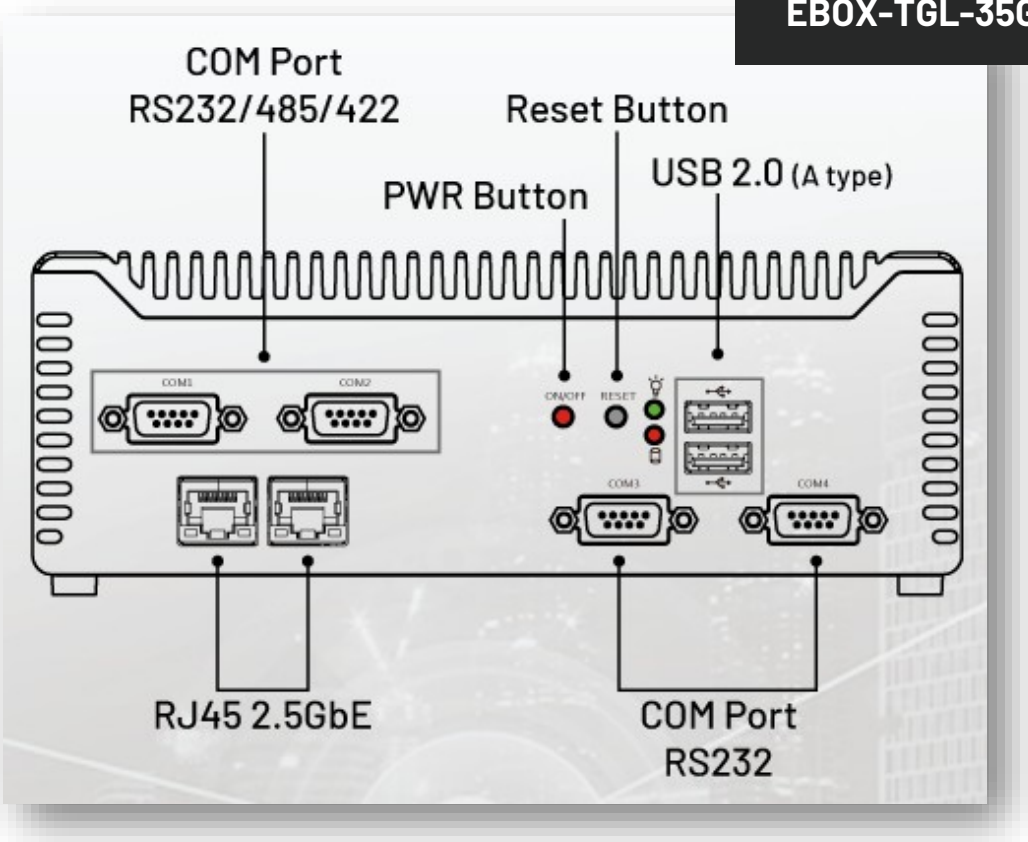
EBOX-TGL-35G7



EBOX-TGL-35G7-C6

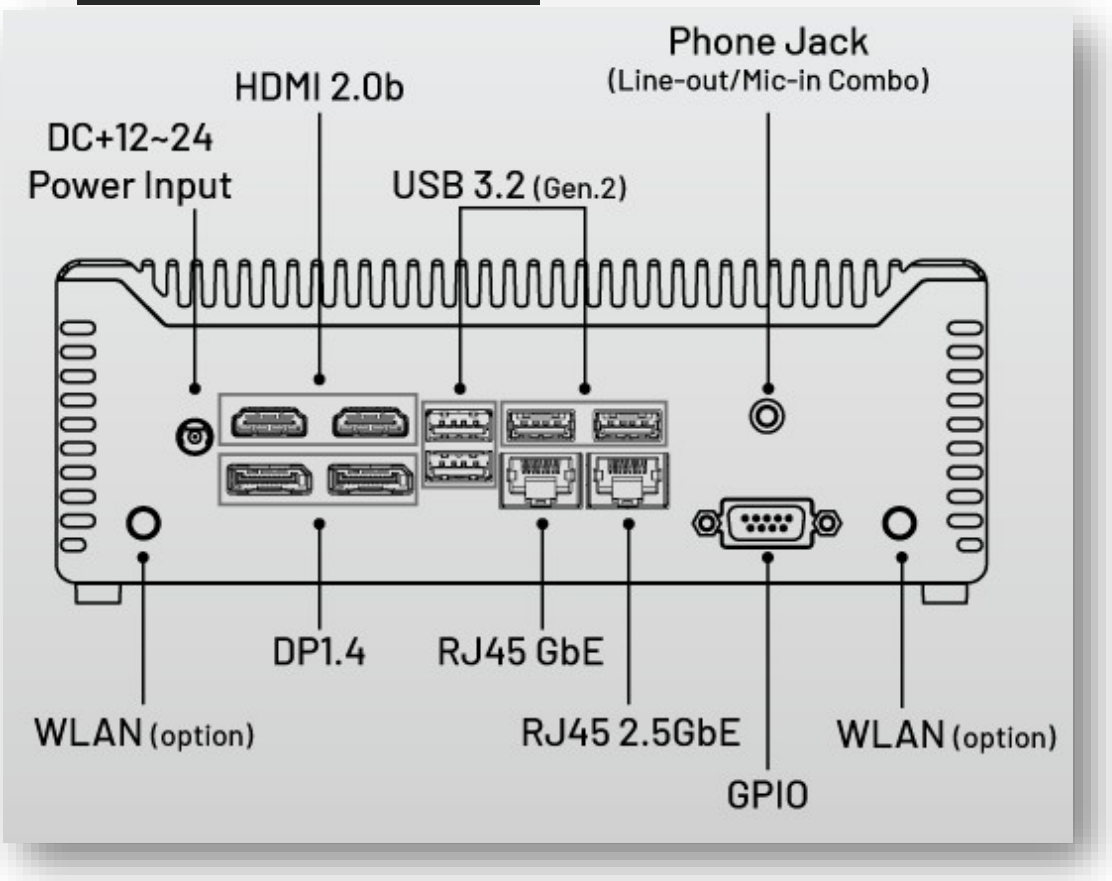


EBOX-TGL-35G7-L4



Rear I/O

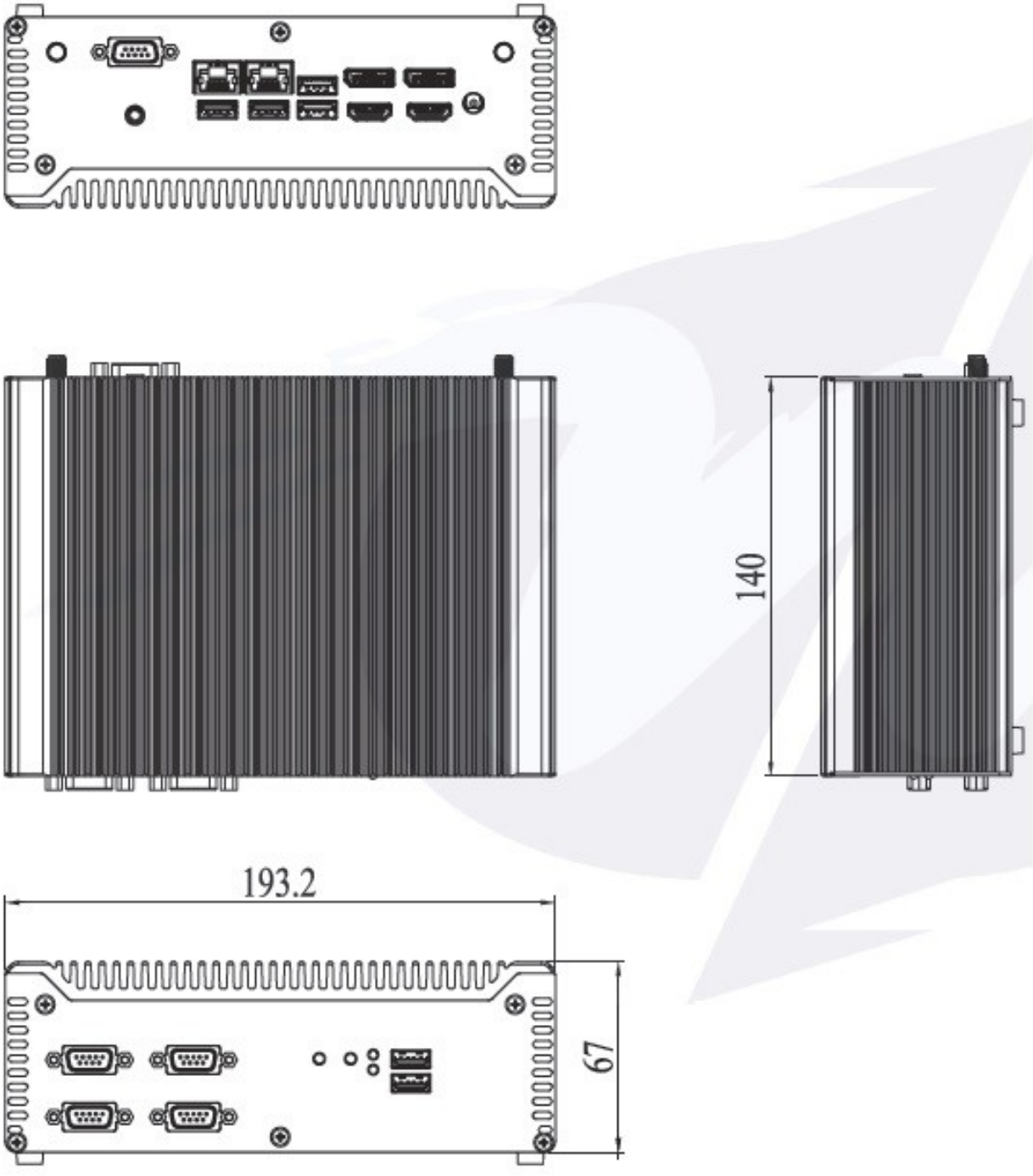
EBOX-TGL-35G7 SERIES



2.2

Specifications			
Model type	**EBOX-TGL-35G7**	**EBOX-TGL-35G7-C6**	**EBOX-TGL-35G7-L4**
Processor	Intel® Tiger Lake i5-1135G7 Processor (Quad core 2.4GHz)		
System RAM	DDR4 3200MHz Dual Channel SO-DIMM x2, memory up to 64GB		
BIOS	AMI BIOS		
Storage	M.2 M-key x1 (2242/2280) PCIe Gen.4 support NVMe SSD	SATAIII x1 (2.5” SATA SSD, SATA DOM)	
Expansion	M.2 E-key x1 (2230), USB2.0/PCIe interface (CNVi supported) WLAN/BT		
Display	Intel® HD Graphics, shared memory		
	HDMI 2.0b x2 (Max. 4096x2160@60Hz)		
	DP 1.4 x2 (Max. 4096x2304@60Hz)		
	Support Four Displays (4K HDR Displays or One 8K SDR Displays (DP)		
Ethernet	Intel® i219-LM 1.0GbE x1		
	Intel® i226 2.5GbE x1		Intel® i226 2.5GbE x3
Audio	HD Audio Realtek ALC888S-VD2		
Front I/O	Power button x1/Reset button x1/Power LED x1/SSD LED x1/USB 2.0 x2		
	COM x4	COM x6	COM x4 + RJ45 x2
	RS232/485/422 x2 RS232 x2	RS232/485/422 x2 RS232 x4	RS232/485/422 x2 RS232 x2
Rear I/O	USB 3.2 (Gen2) x4/RJ45 x2/HDMI x2/DP x2/Mic-in & Line -out Combo x1/GPIO x1		
OS support	Windows 11 & IoT, Windows 10 & IoT, Linux		
Mechanical & Environment			
Power Requirement	DC +12~24V Power adapter only (2.5ø)		
Power adapter	+12V7.5A (90W)		
Operating Temperature	-20~+60°C		
Storage Temperature	-30~+70°C		
Net Weight	2.2kgs		
Dimension (W x D x H)	193.2 x 140 x 67mm		
Certificates	CE, UKCA, FCC, VCCI		
Order information			
EBOX-TGL-35G7	Intel® Tiger Lake i5-1135G7 Fanless Box PC w/ COM x4, LAN x2		
EBOX-TGL-35G7-C6	Intel® Tiger Lake i5-1135G7 Fanless Box PC w/ COM x6, LAN x2		
EBOX-TGL-35G7-L4	Intel® Tiger Lake i5-1135G7 Fanless Box PC w/ COM x4, LAN x4		
POWER-90W-TGL	AC-DC power adapter DC12V@7.5A (AC 100~240V Input) (Optional)		
POWERCABLE(A)(G)(EN)(AU)	Power cord US/EU/UK/AU&NZ types (Optional)		
CASE-35-VESA	VESA Rack (Optional)		

2.3 Appearance Diagram



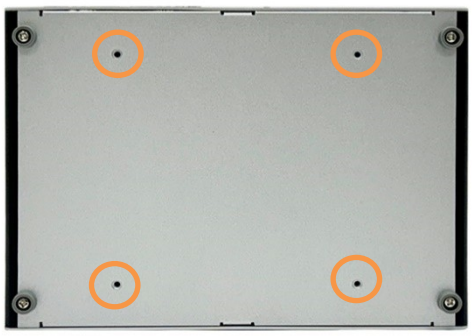
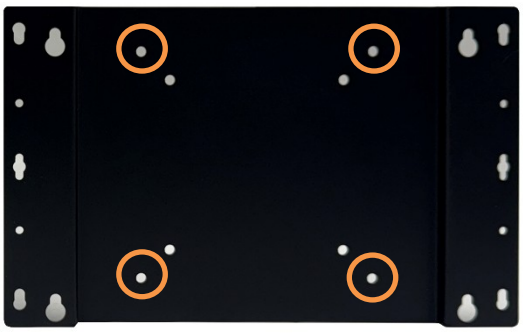
2.4 Mounting instruction

The optional VESA Rack allow EBOX can be Wall-mount and VESA-mount supported.

2.4.1 Wall-mount installation

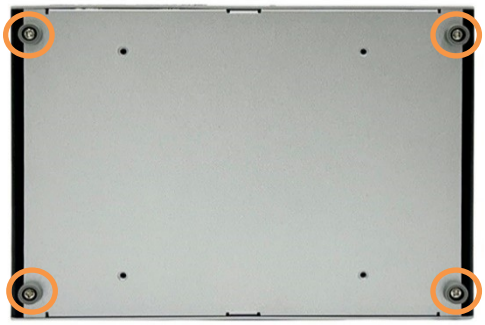
1. Secure the convex surface rack to the EBOX bottom.

2. Utilize the round head screws included in the accessory package to fasten the rack, then, EBOX can be mounted to the wall with the rack.

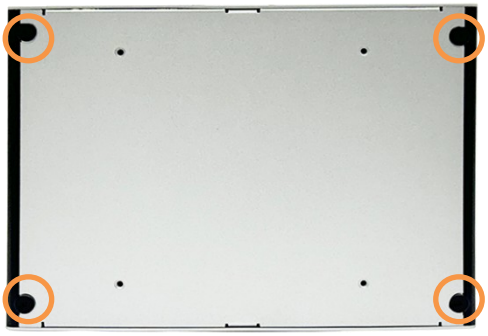




2.4.2 VESA-mount installation

1. Remove foot pad screws, replace by black capped screws.

2. Attach the VESA Rack to the VESA objects (For example: behind the monitor), and hook the EBOX onto the rack directly.

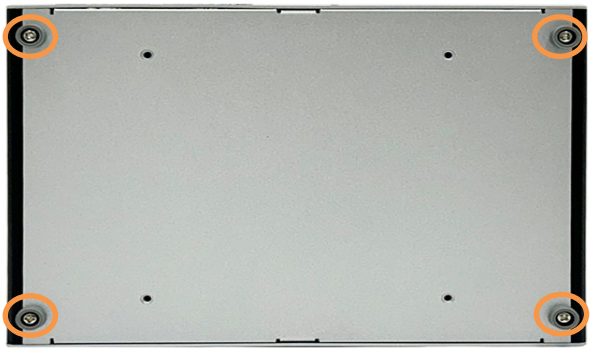



Chapter 3

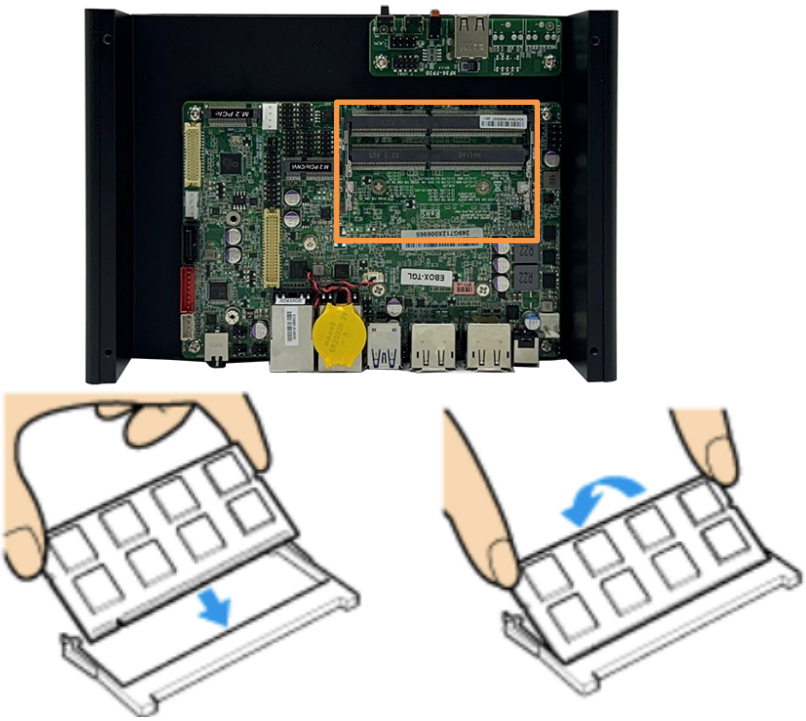
3.1 Installing RAM module

3.1.1 Remove the front and rear I/O panel screws.

3.1.2 Remove foot pad screws from the bottom.



3.1.3 Hold the DDR4 SO-DIMM memory module by its edge and slide it into the memory module slot, slightly press the SO-DIMM module down until a click sound securing the module in place.

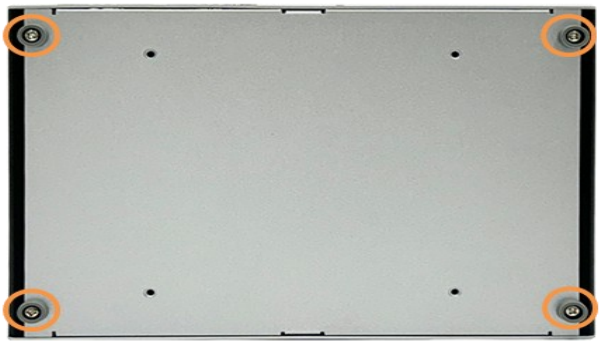


After memory module installed, reassemble by the disassembly steps in reverse order.

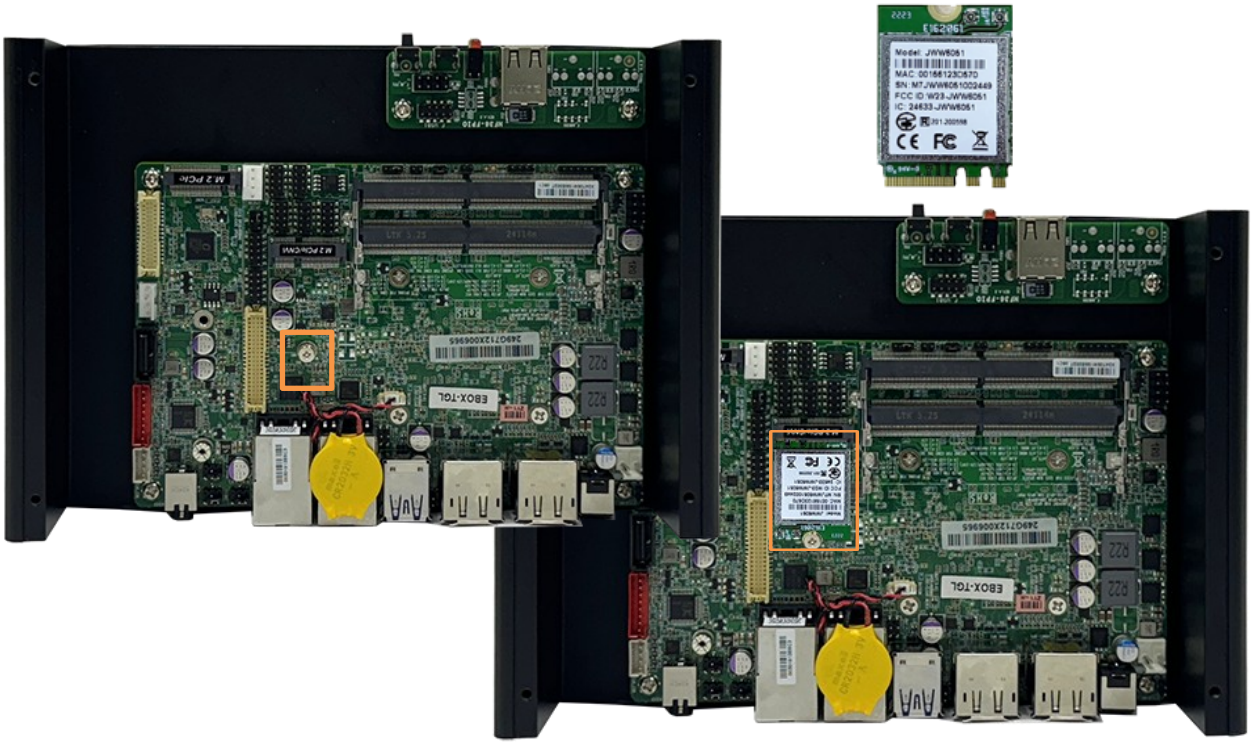
3.2 Installing the WLAN/BT Module

3.2.1 Remove the front and rear I/O panel screws.

3.2.2 Remove foot pad screws from the bottom.



3.2.3 Remove the default screw marked as below and slide the M.2 WLAN/BT module into the M.2 2230 PCIe slot. Use the default screw to fix the WLAN/BT module. And connecting module cable and install the antenna.

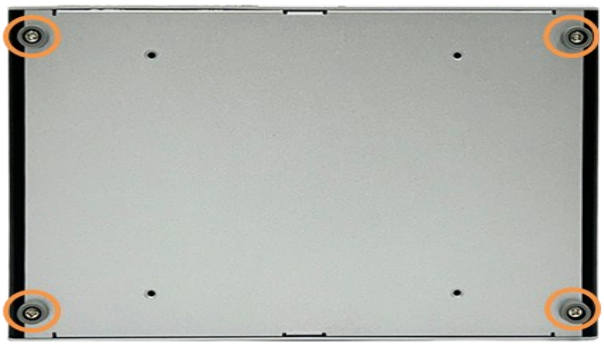


After WLAN/BT module installed, reassemble by the disassembly steps in reverse order.

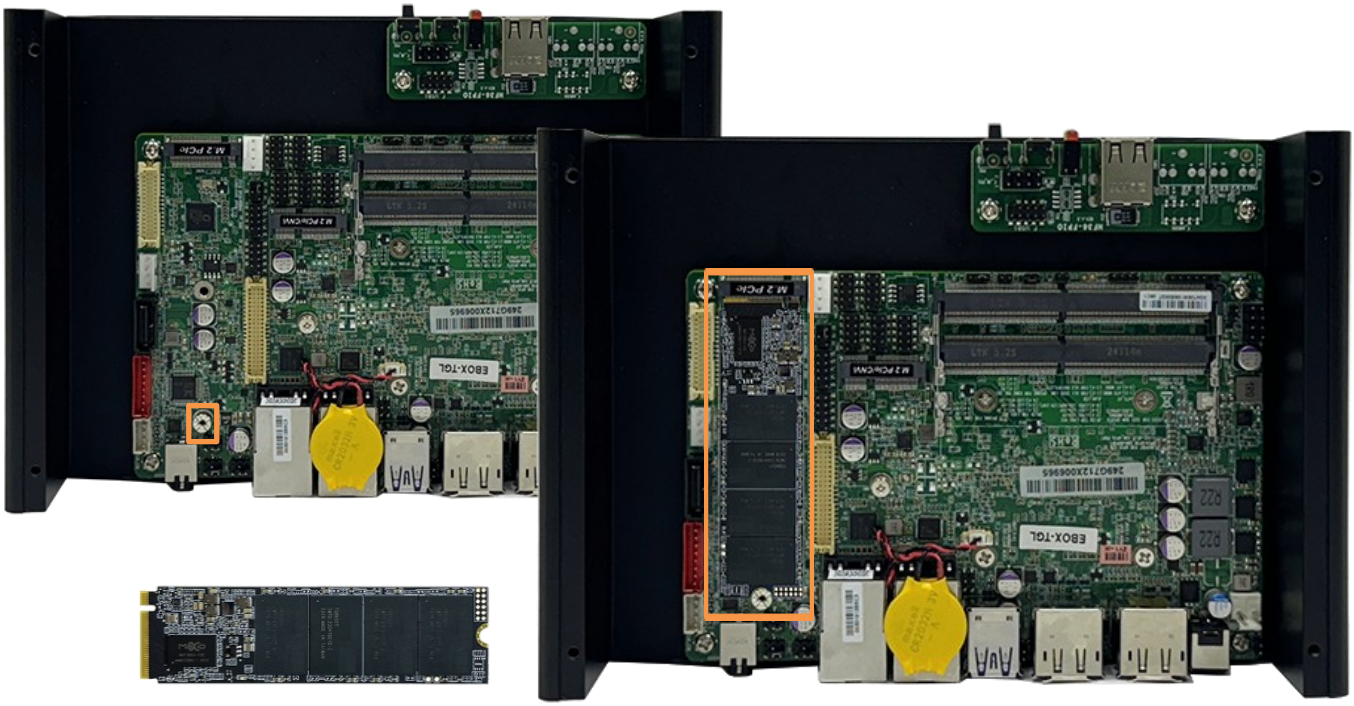
3.3 Installing the M.2 M-key (2242/2280) Storage

3.3.1 Remove the front and rear I/O panel screws.

3.3.2 Remove foot pad screws from the bottom.



3.3.3 Remove the default screw marked as below and slide the M.2 2280 SSD into the M.2 PCIe/SATA slot. Use the default screw to fix the M.2 2280 SSD.



After M.2 SSD installed, reassemble by the disassembly steps in reverse order.

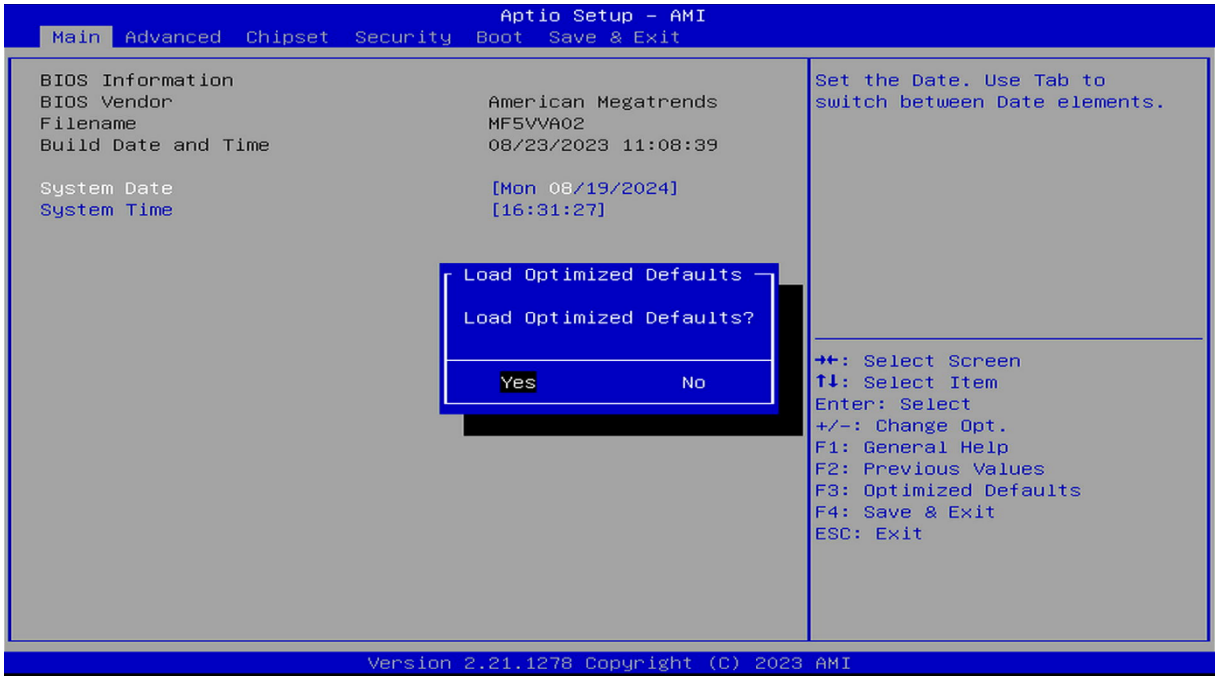
Chapter 4

4.1 BIOS Reconfiguring

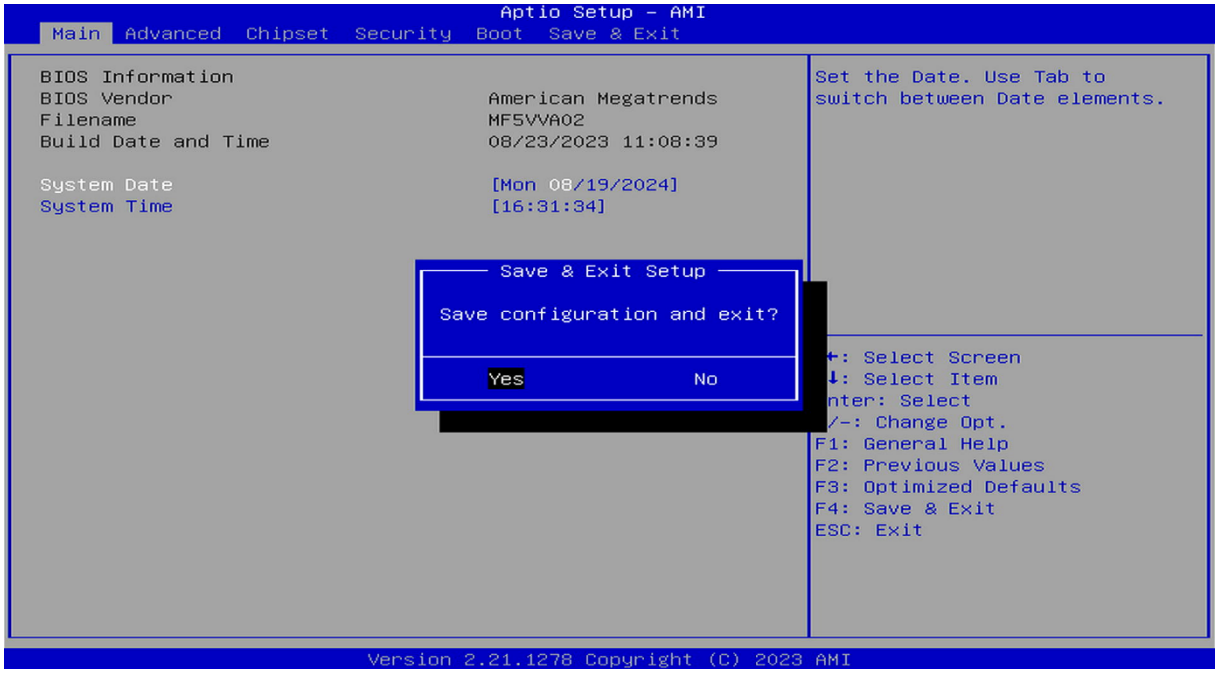
4.1.1 Load Default Setting

1. To reconfigure the hardware, press <Delete> during boot up to enter BIOS menu.

2. Press “F3” key to load optimized defaults as below:



3. After setting, press “F4” key to save & exit.

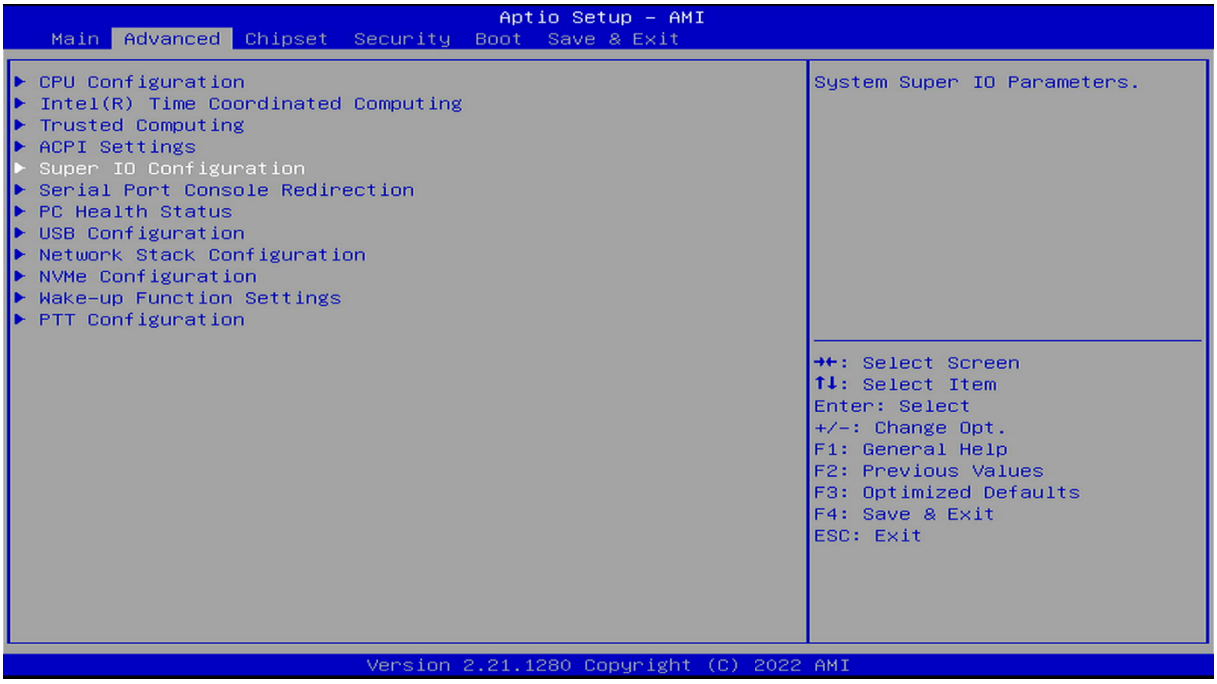


4.1.2 Hot key

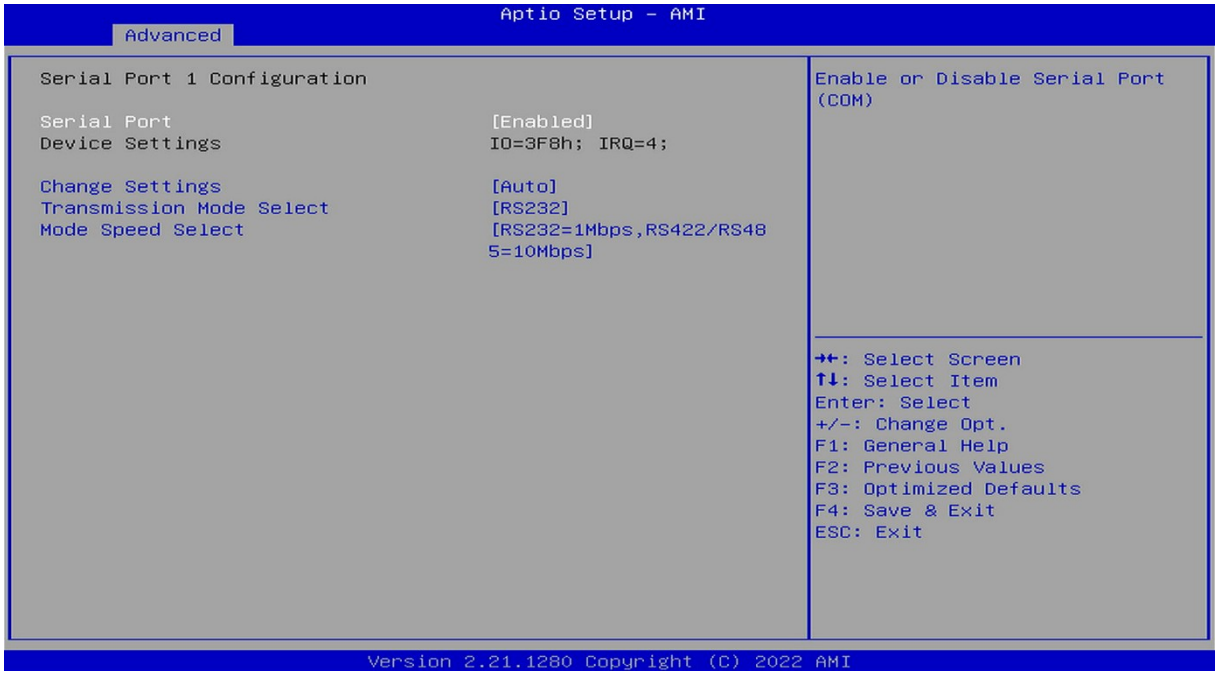
Press <F7> after boot up, a select menu will appear. Use direction key to select boot device.

4.2 BIOS COM Setting (COM1 &COM2:RS232/485/422)

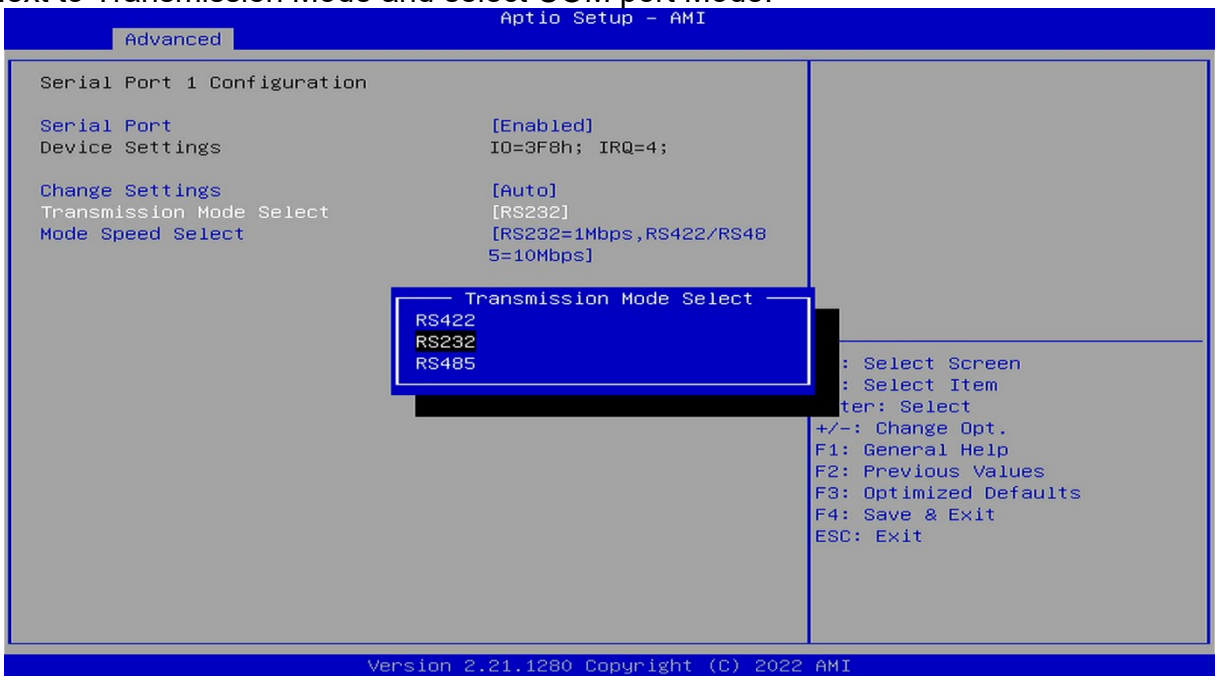
1. Press <Del> during boot up, enter BIOS menu, move to “Advanced” for “Super IO Configuration”.



2. Move to “Serial Port 1 Configuration”.



3. Next to Transmission Mode and select COM port Mode.

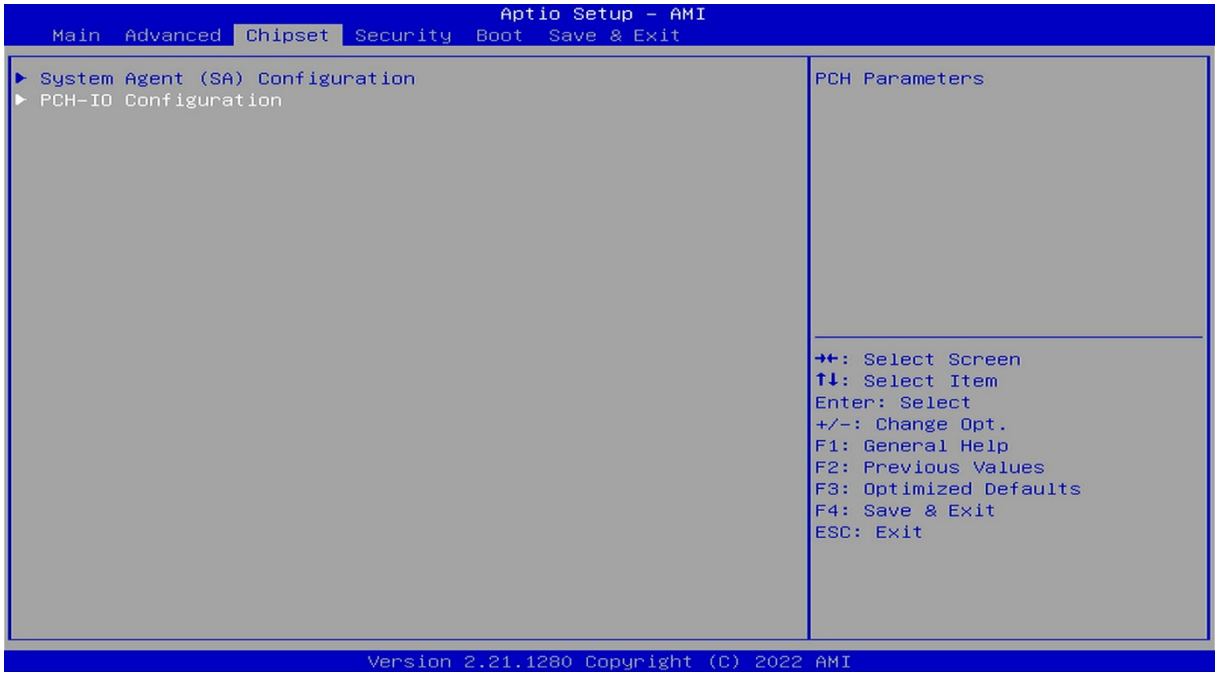


4. Press “F4” key to save & exit.

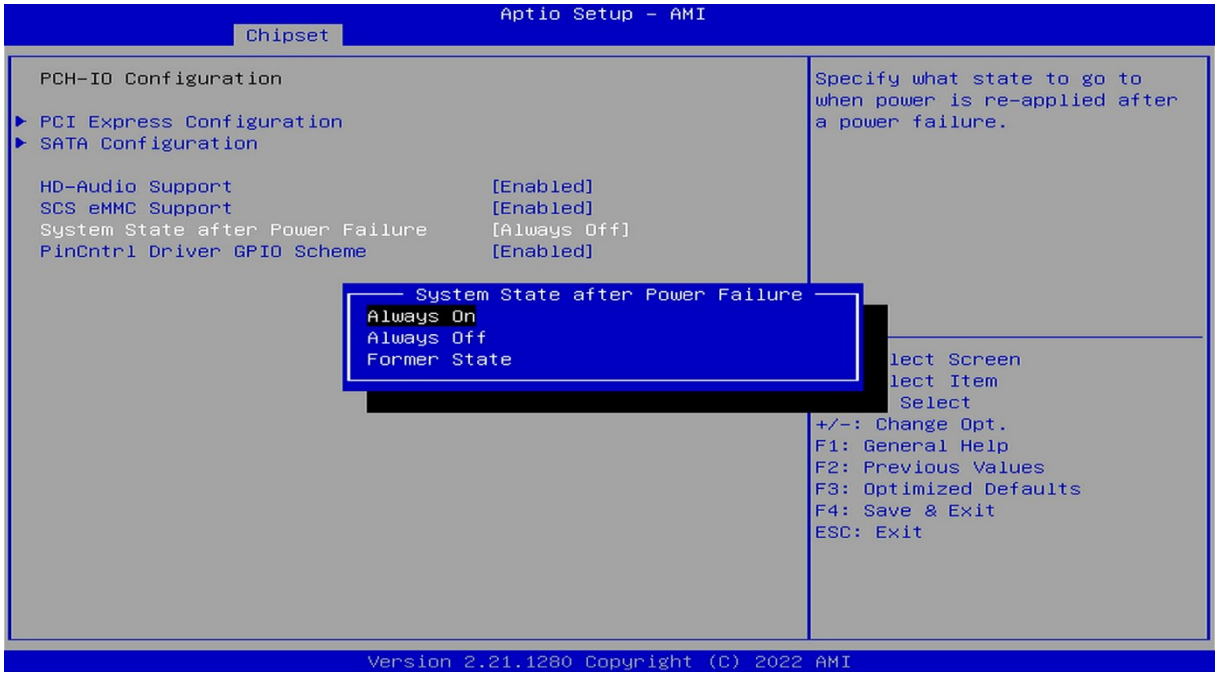
4.3 AT Mode Setting (Auto Power On Function)

EBOX-TGL-35G7 Series supports “Auto Power On function”, it’s a function allows system to boot up automatically after power restored.

1. In BIOS Menu, move to “Chipset” and “PCH-IO Configuration”.

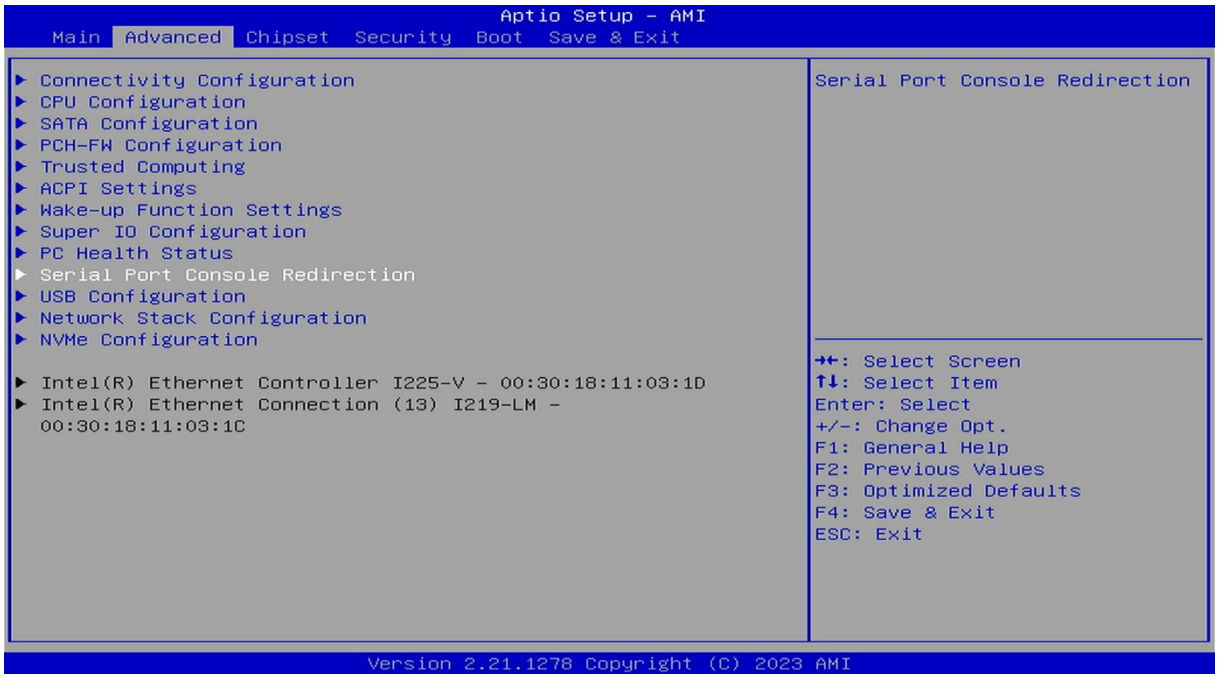


2. Set “System State after Power Failure” as “Always On”, press “F4” key to save & exit.

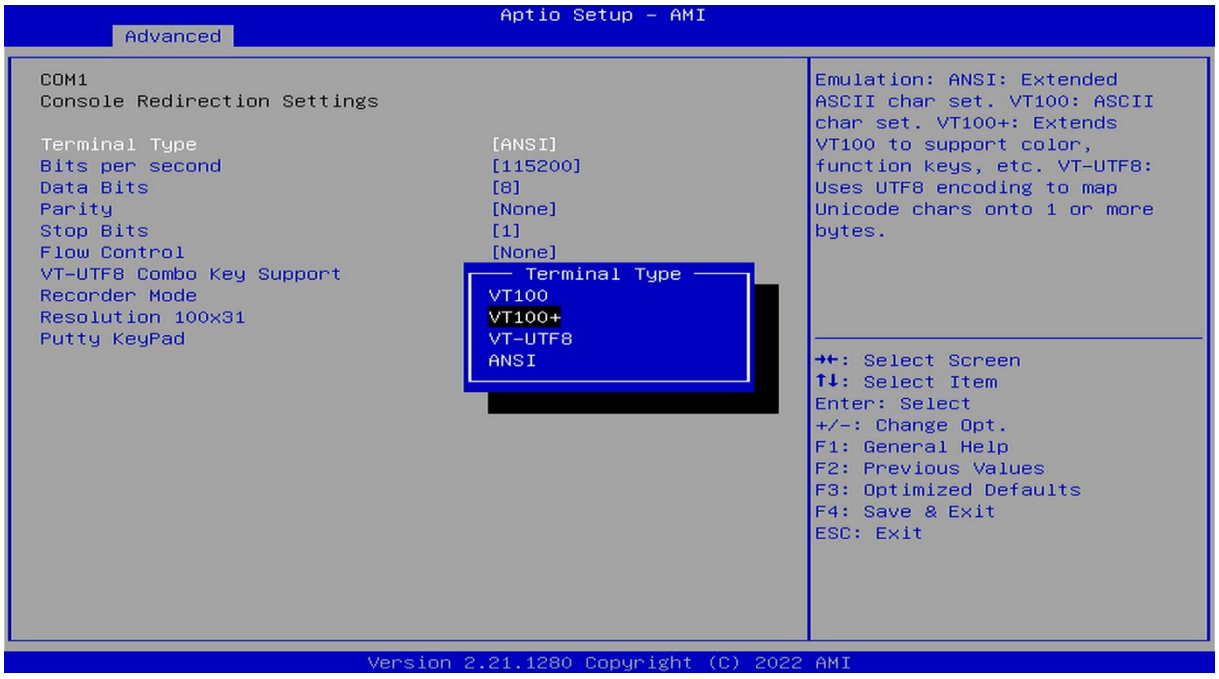


4.4 Serial Port Console Redirection

1. Move to “Advanced” and “Serial Port Console Redirection” set “Console Redirection” as “Enabled”.



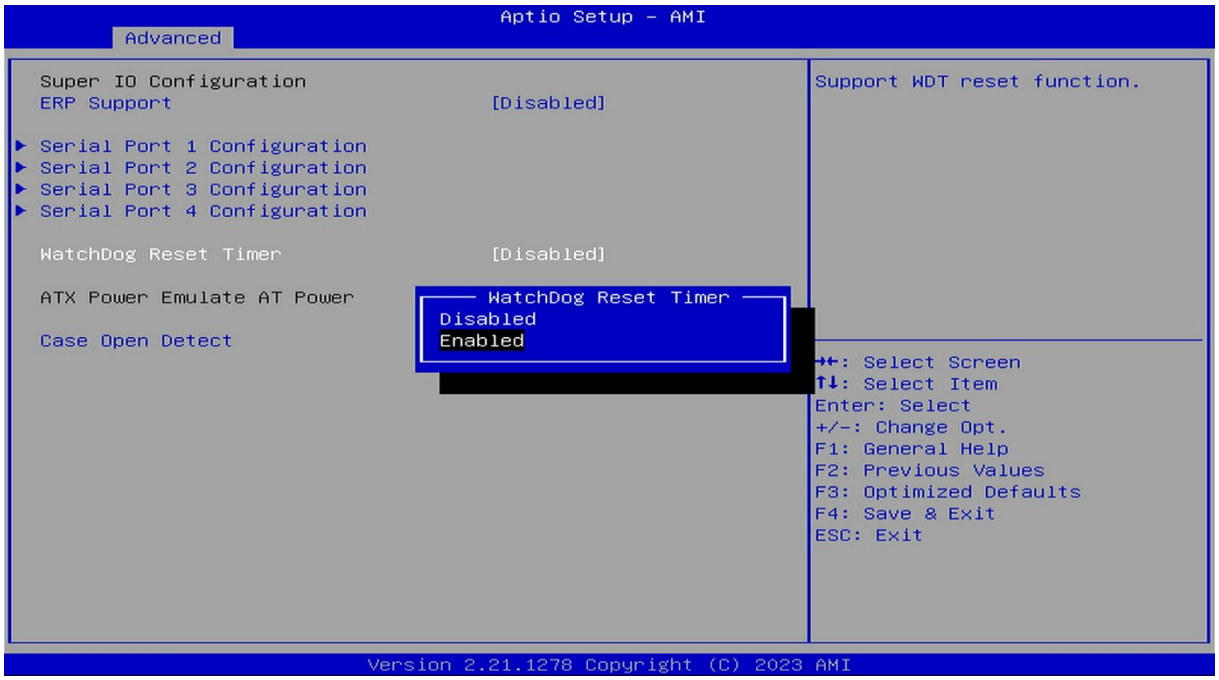
2. Set “Terminal Type” as “VT100+”, press “F4” key to save & exit.



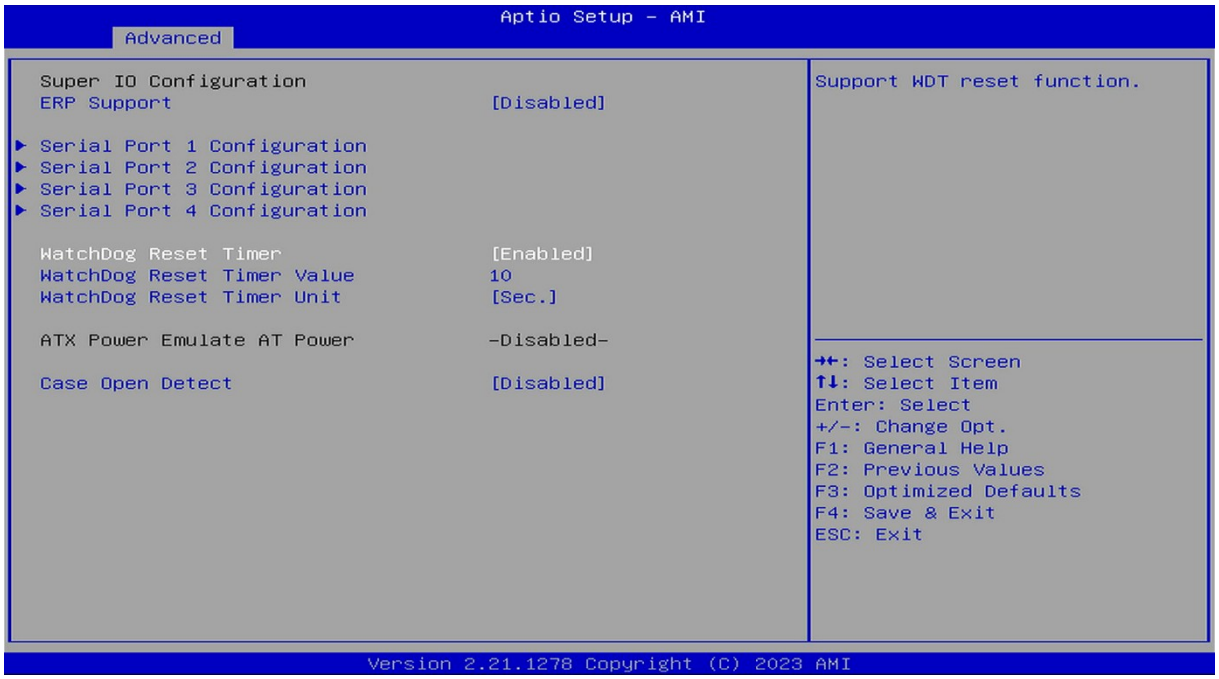
Terminal Type Emulation:
[ANSI]: Extended ASCII char set;
[VT100]: ASCII char set;
[VT100+]: Extended VT100 to support color, function keys, etc.
[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

4.5 Watchdog Setting

1. Move to “Advanced” for “Super IO Configuration”, set “Watch Dog Reset Timer” [Enabled].

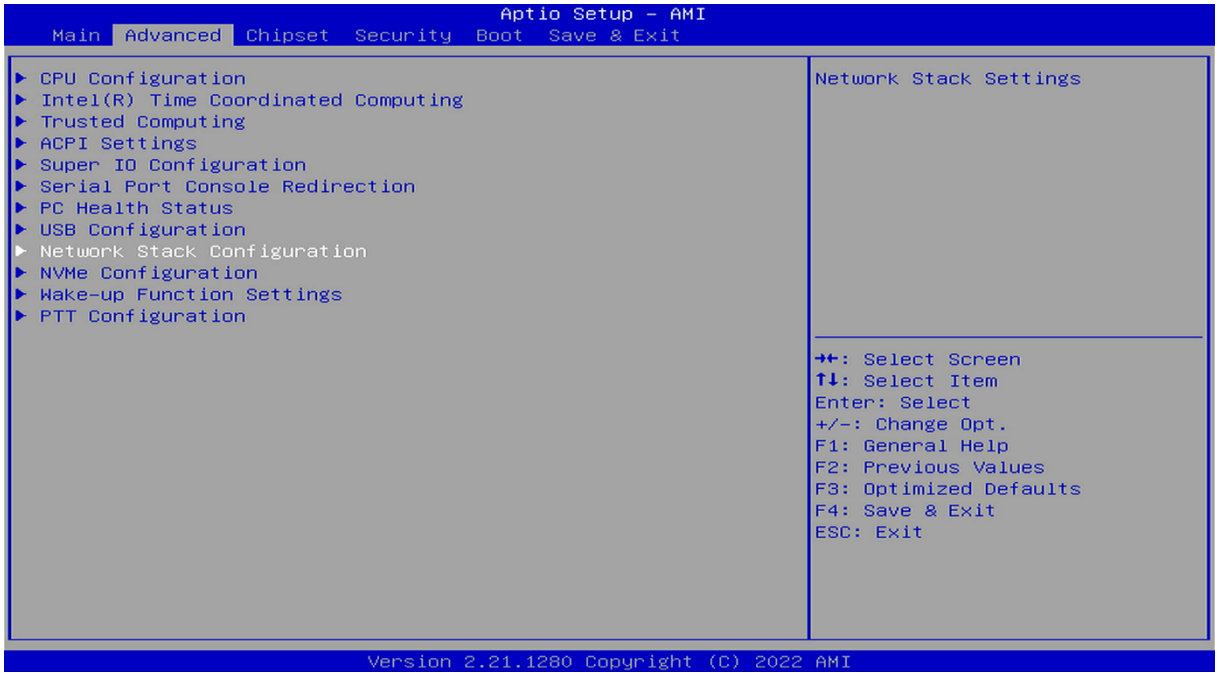


1. After Watch Dog Timer setting completed, press F4 to save and exit.

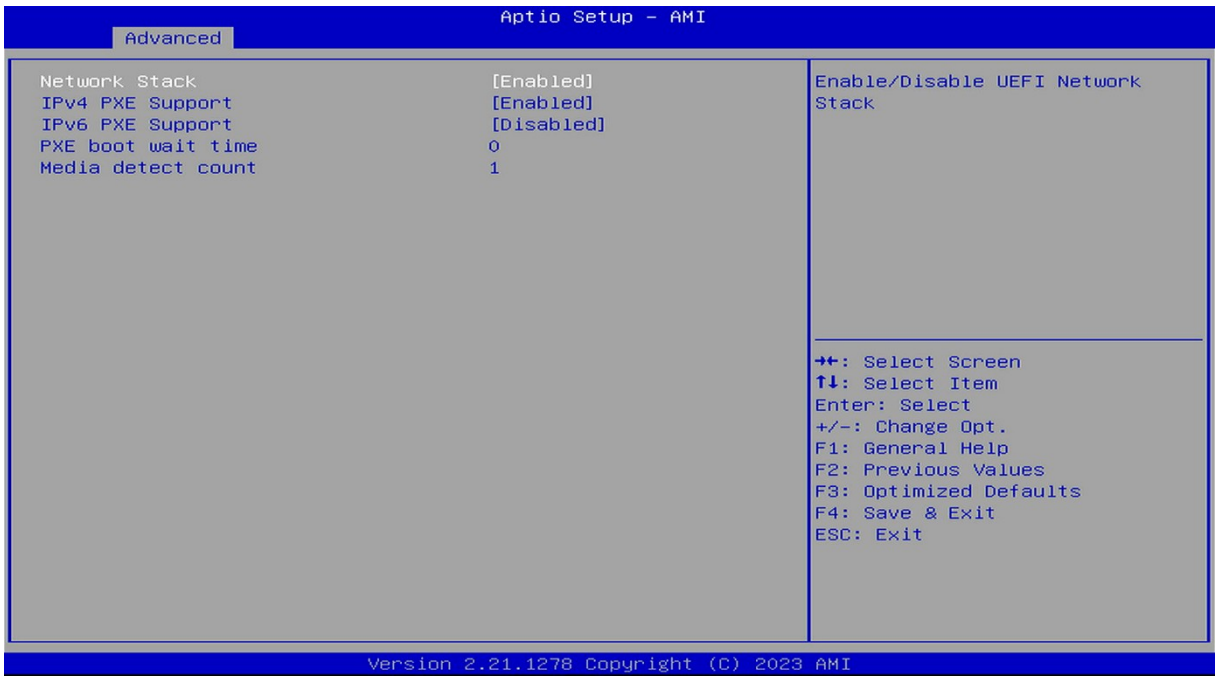


4.6 PXE diskless boot Selection

1. Move to “Advanced” for “Network Stack Configuration” and make further setting.



2. Set “Network Stack” Enabled and Ipv4 & Ipv6 PXE Support will appear.



Note: Ipv4 & Ipv6 stand for Internet Protocol version 4 & 6, when Network Stack set to Enabled, PXE diskless boot will be created.

Chapter 5

Drivers Installation guide

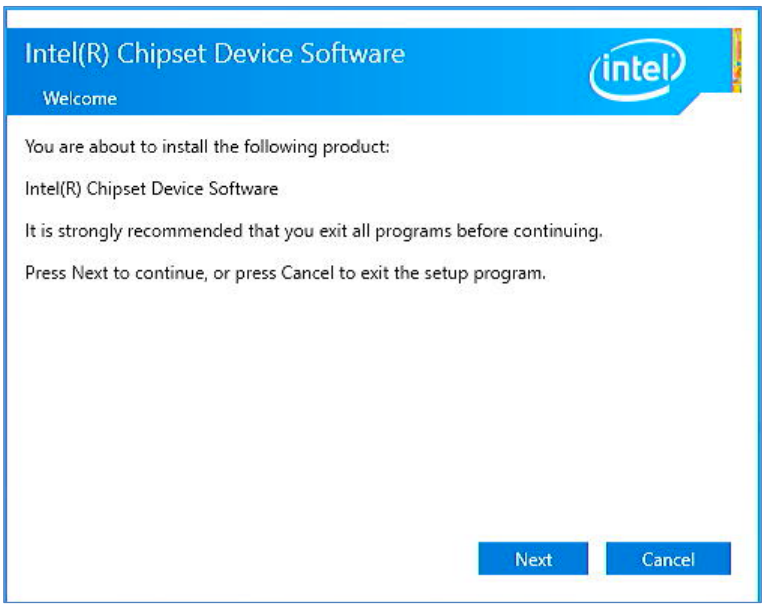
Under Windows 10, the following drivers need to be installed manually.

1. Chipset
2. Graphic
3. Audio
4. LAN
5. IME
6. Serial IO

Please download above drivers from EBOX website.

5.1 Chipset driver: (Intel® Chipset Device Software)

1. Unzip the downloaded file and execute SetupChip.exe, then click “Next” to install:

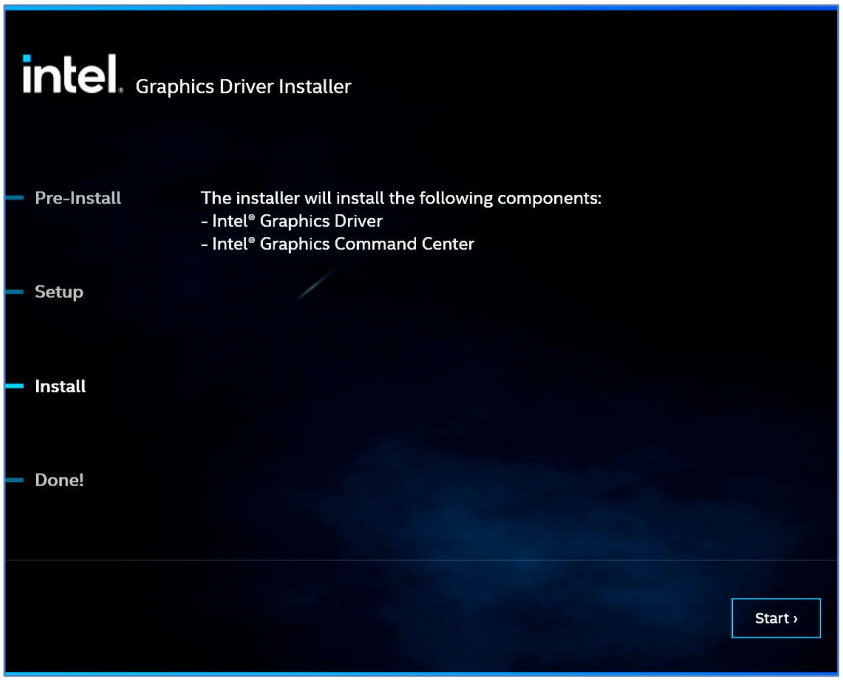


2. A license agreement message will pop out, click Accept and install.
3. Click Finish to complete the setup process.

5.2 Graphic driver:

1. Execute installer.exe and click “Begin installation” to install:

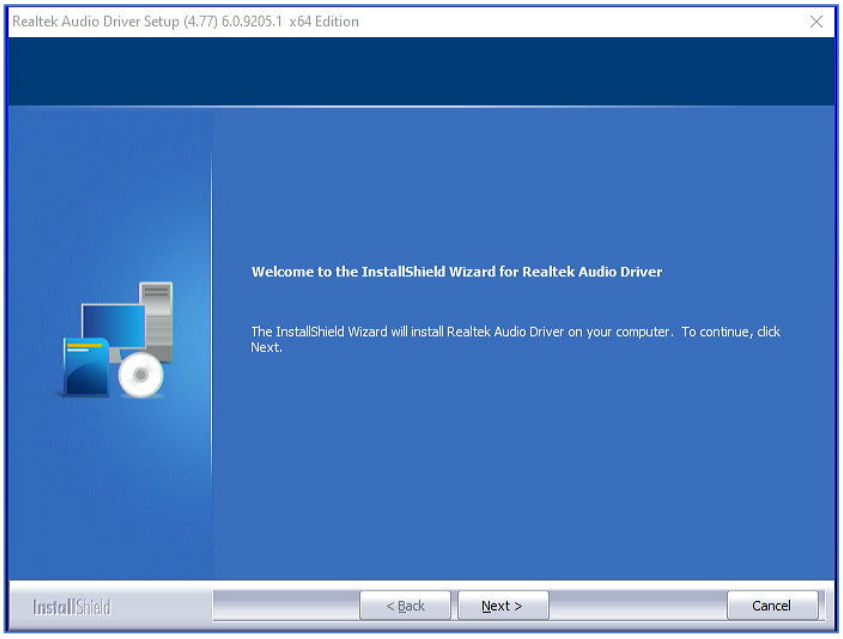
2. A license agreement message will pop out, click Start to install.



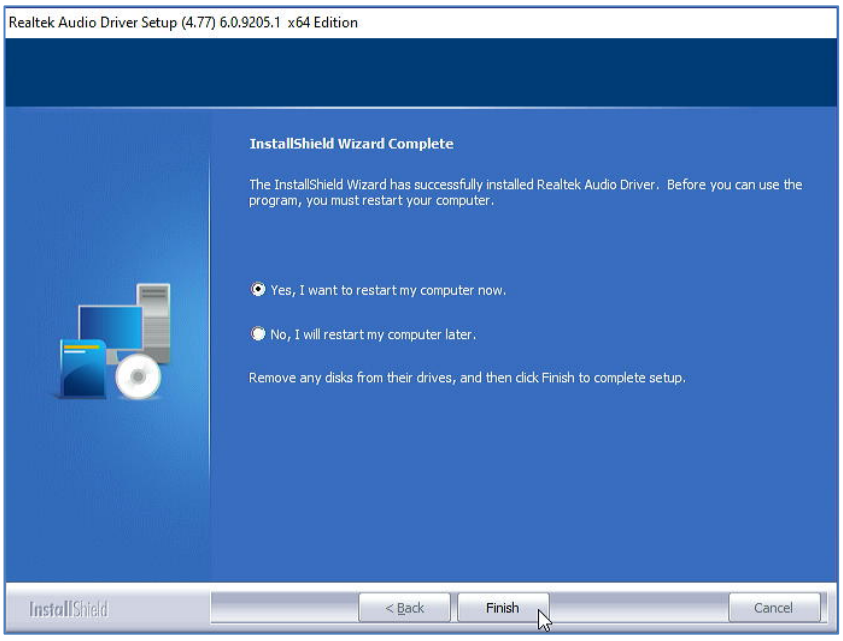
3. After installed, click Finish to complete.

5.3 Audio driver:

1. Execute Setup.exe and installer will pop out, then click “Next” to install:

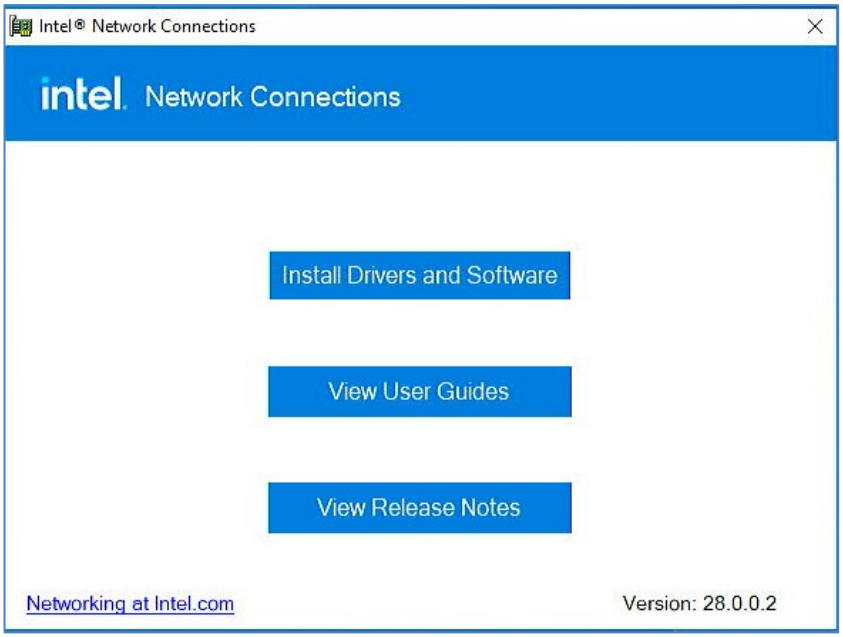


2. After installed, select “Yes, I want to restart this computer now” and click Finish to reboot.

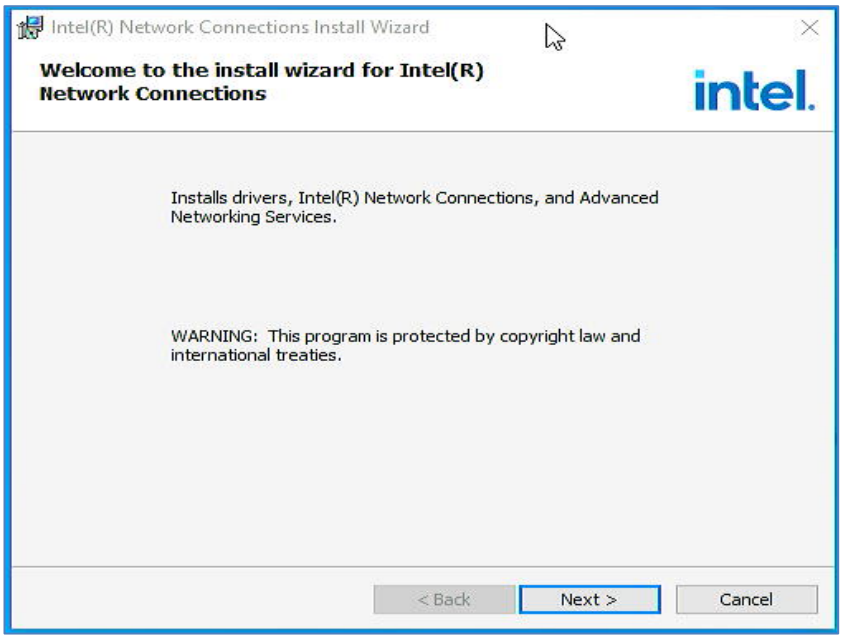


5.4 LAN driver:

1. Execute Setup.exe and installer will pop out, then click “Install Drivers and Software”.



2. Click “Next”, accept the terms and confirm setup options to install.

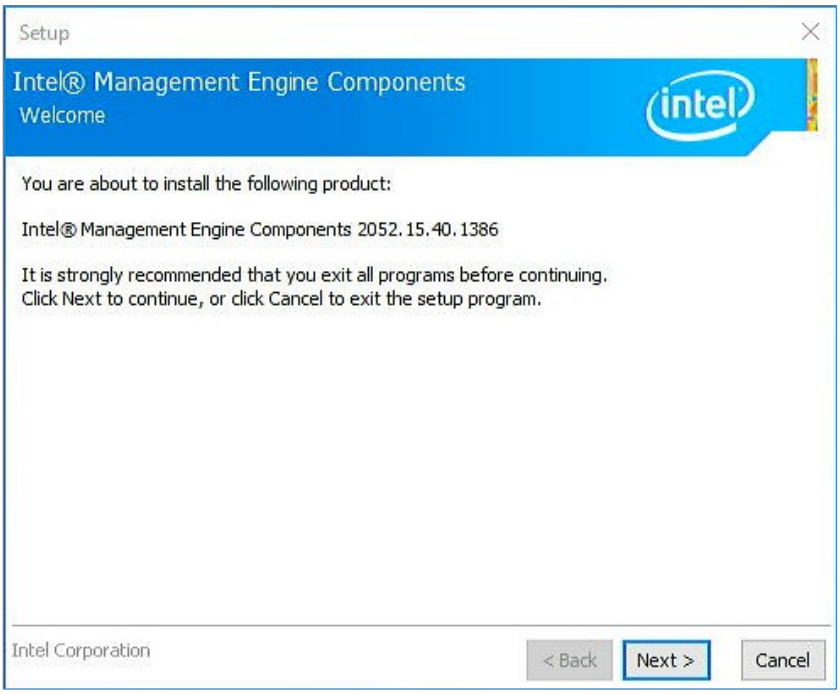


3. After installed, click “Finish” to exit the installer.

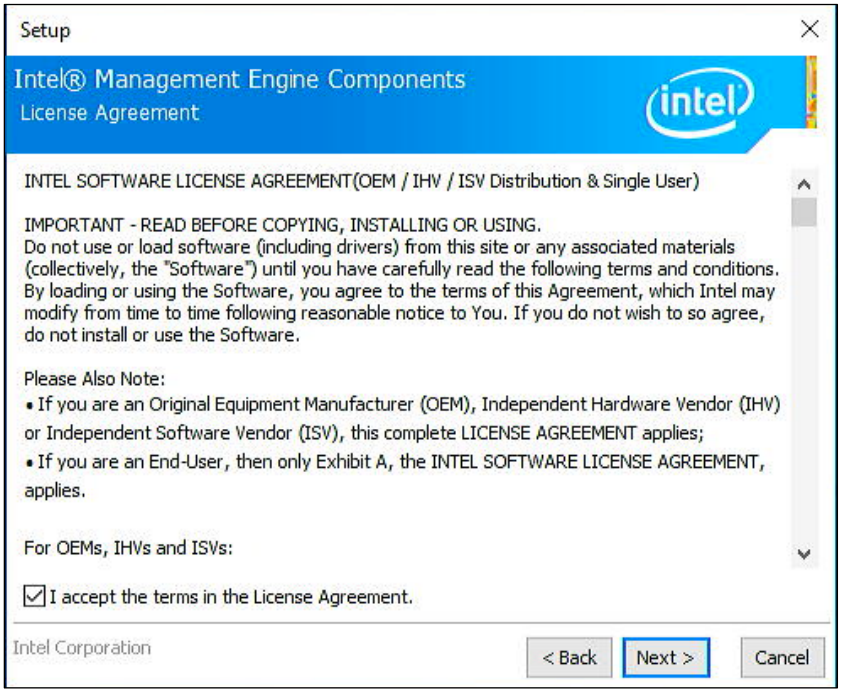
5.5 IME driver: (Intel® Management Engine Components)

The Intel® Management Engine, also known as the Intel Manageability Engine, is an autonomous subsystem that has been incorporated in virtually all of Intel's processor chipsets.

1. Execute SetupME.exe and click “Next” to install:



2. Check “I accept the term in the License Agreement and click “Next” to install.

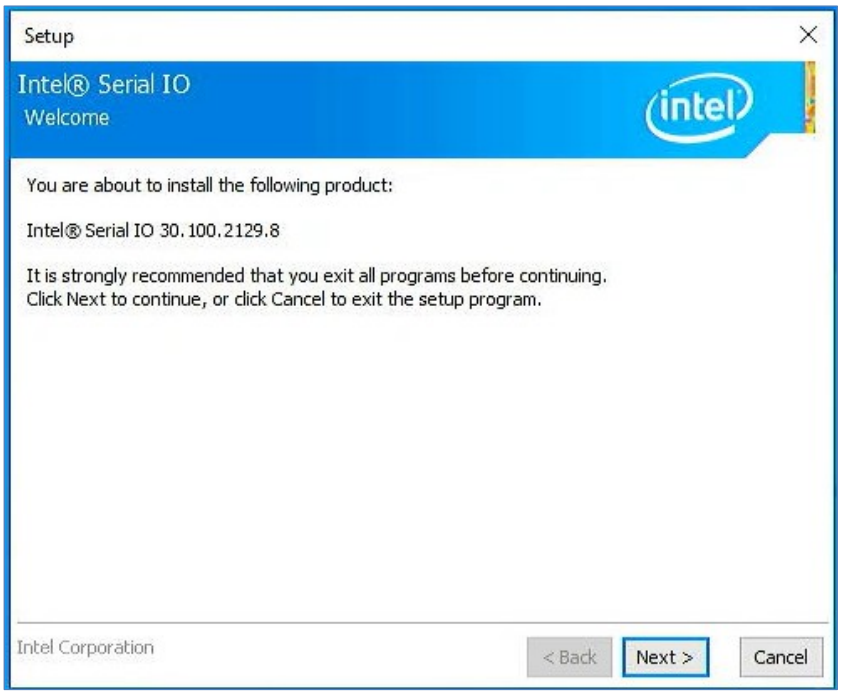


3. Click “Finish” after successfully installed.

5.6 Serial I/O driver:

The serial I/O driver is required if you plan to use the COM (RS232/485/422) or GPIO host controllers.

1. Execute SetupserialIO.exe and click “Next” to install:

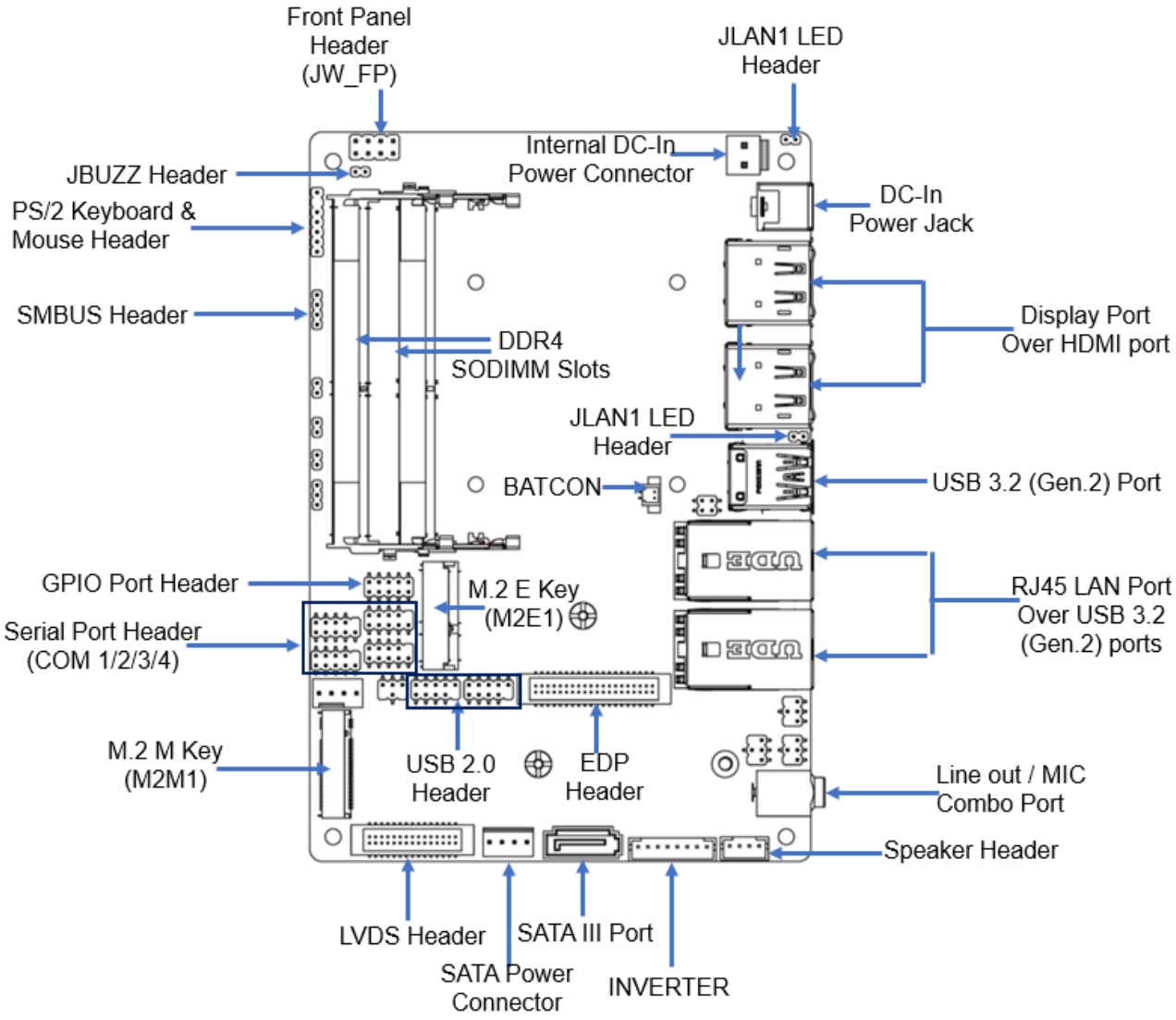


2. Check “I accept the term in the License Agreement and click “Next” to install.

3. Click “Finish” after successfully installed.

Chapter 6

6.1 Internal I/O



6.2 Onboard Connectors Summary

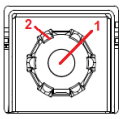
Summary Table for main Board

Interface Description	Type of Connections	Pin #
DDR4 3,200MHz SO-DIMM	SO-DIMM slot	260-pin
Power DC Jack	External DC Jack connector	2-pin
USB3.2 (Gen.2) Type-A x4	External USB3.1 Type-A connector	9-pin
USB2.0 Type-A x2	External USB2.0 Type-A connector	4-pin
HDMI 2.0 x 2	4K HDMI 2.0b connector	19-pin
Display port 1.4 x2	4K Display port connector	20-pin
2.5GbE RJ45 x3 [1]	2.5GbE RJ45 connector	8-pin
2.5GbE RJ45 x1	2.5GbE RJ45 connector	8-pin
1.0GbE RJ45 x1	1.0GbE RJ45 connector	8-pin
M.2 M Key support NVME x1	2242/2280 PCIe Gen.4	75-pin
M.2 E Key support CNVi x1	2230 USB2.0/PCIe interface	75-pin
COM1 & COM2 (RS232/485/422)	2.0mm 9-pin D-sub connector	9-pin
COM3 & COM4 (RS232)	2.0mm 9-pin D-sub connector	9-pin
COM5 & COM6 (RS232) [2]	2.0mm 9-pin D-sub connector	9-pin
GPIO	2.0mm 9-pin D-sub connector	9-pin
Audio jack	Mic in/Line out combo connector	2-pin

Reference:
1. Applicable only to the model type EBOX-TGL-35G7-L4.
2. Applicable only to the model type EBOX-TGL-35G7-C6.

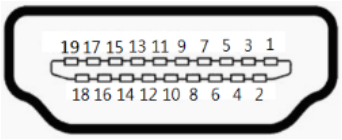
6.3 Pin Assignments

DC Power Input



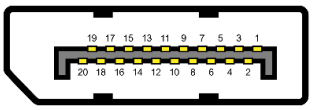
Pin #	Signal Name
1	DC+12~24V power Adapter Input
2	GND

HDMI 2.0



Pin #	Signal Name	Pin #	Signal Name
1	TMDS_Data2+	11	TMDS CLK Shield
2	TMDS_Data2_Shield	12	TMDS_CLK-
3	TMDS_Data2-	13	CEC
4	TMDS_Data1+	14	Reserved
5	TMDS_Data1_Shield	15	SCL
6	TMDS_Data1-	16	SDA
7	TMDS_Data0+	17	DDC/CEC_GND
8	TMDS_Data0_Shield	18	+5V Power
9	TMDS_Data0-	19	Hot Plug Detect
10	TMDS_CLK+		

Display port 1.4

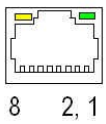


Pin #	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	ML_Lane 0 (p)	8	GND	15	AUX CH (p)
2	GND	9	ML_Lane 2 (n)	16	GND
3	ML_Lane 0 (n)	10	ML_Lane 3 (p)	17	AUX CH (n)
4	ML_Lane 1 (p)	11	GND	18	Hot Plug
5	GND	12	ML_Lane 3 (n)	19	Return
6	ML_Lane 1 (n)	13	CONFIG1	20	DP_PWR
7	ML_Lane 2 (p)	14	CONFIG2		

LEDS: POWER ON/OFF

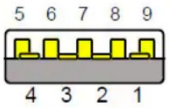
LED Color	State
Green	Power On

LAN: RJ45 connector



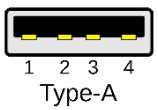
Pin #	Signal Name	Pin #	Signal Name
1	TP0+	5	TP2-
2	TP0-	6	TP1-
3	TP1+	7	TP3+
4	TP2+	8	TP3-

USB 3.2 Type-A connector



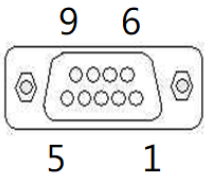
Pin #	Signal Name	Pin #	Signal Name
1	5V	6	Receive+
2	DATA-	7	GND
3	DATA+	8	Transmit-
4	GND	9	Transmit+
5	Receive-		

USB 2.0 Type-A connector



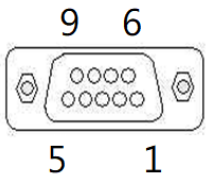
Pin #	Signal Name
1	5V
2	DATA-
3	DATA+
4	GND

RS232/485/422 9-pin D-Sub connector



Pin #	Signal Name	Pin #	Signal Name
1	DCD/RS422 TX-/RS485 DATA-	6	DSR1
2	RXD/RS422 TX+/RS485 DATA+	7	RTS1
3	TXD1/RS422 RX+	8	CTS1
4	DTR1/RS422 RX-	9	R|1
5	GND	- -	- -

GPIO 9-pin D-Sub connector



Pin #	Signal Name	Pin #	Signal Name
1	GPIO_80	6	GPIO_85
2	GPIO_81	7	GPIO_86
3	GPIO_82	8	GPIO_87
4	GPIO_83	9	GND
5	GPIO_84	- -	

6.4 GPIO Pin Voltage Information:

1. When the GPIO is used as an output, it provides a 3.3V voltage.

I/OOD 12st, 5v	3VCC	General purpose IO

2. When the GPIO is used as an output, how much current does it source or sink?
   1. The amount of current it sinks depends on the connected device.
   2. It can source up to 12mA.

Output Low Current	IOL	-12	mA	VOL = 0.4V
Output High Current	IOH	+12	mA	VOH = 2.4V

3. When the GPIO is used as an input, an input low voltage (VIL < 0.8V) is considered as 0, and an input high voltage (VIH > 2.0V) is considered as 1.
   If the voltage value lies between these two levels, it is undefined.

PARAMETER	SYM.	MIN.	MAX.	UNIT	CONDITIONS
I/O $_{12st,5v}$-TTL level bi-directional pin with Schmitt trigger, output with 12 mA sink capacity, 5V tolerance.					
Input Low Voltage	VIL		0.8	V	
Input High Voltage	VIH	2.0		V	

Note:
Maximum current limit is 1A while using 5V working voltage.

Chapter 7

Taking Care of EBOX

This section provides guidelines on using EBOX-TGL-35G7 Series – Safe using, Storing and Handling.

7.1 Storing

- Do not place EBOX in a location that is subject to:
  - Heating sources, such as stove, oven, heater, radiator or air duct
  - Direct contact from sunlight
  - Rain or moisture area
  - Excessive dust accumulation area
  - High humidity place
  - Constant or occasional mechanical movement, vibration or shock
  - Strong magnets or magnetic fields or magnetically unshielded speakers
  - Out of the operating temperature
- Do not place other electronic device or electrical equipment near EBOX. The electromagnetic field of EBOX may cause interference subjecting to malfunction.
- Provide adequate air ventilation (circulation) to prevent internal buildup of heat. Do not place EBOX near behind the curtains or draperies, between books that block its ventilation slots. Leave a space of at least 8 inches (20cm) behind the sides and back panel of the EBOX.
- Change of environmental temperature: Problems may occur with a sudden change of environmental temperature. If the EBOX is brought directly from a cold location to a warm one, moisture may condense inside EBOX. Turn off the device, and contact your nearest dealer.
- Check the surrounding appliance(s) before using EBOX. Since the EBOX uses high-frequency radio signal. It may interfere with radio or TV reception causing interference or poor signal display. When happens, relocate the EBOX by a suitable distance away from it.
- Do not drop EBOX from working table nor place heavy objects on top of it.

7.2 Cleaning EBOX

- Clean EBOX with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution.
- Do not use any type of abrasive pad, scouring powder, or solvent such as alcohol or benzene, as these may damage the finish of EBOX.
- When a solid object falls or a liquid spill onto EBOX, turn off EBOX immediately; unplug LAN and power cables. Contact your dealer to check the EBOX before you use it again.
- Always disconnect the power cord from the power source before cleaning EBOX.

7.3 Troubleshooting

This section describes the techniques of resolving some basic problems that you encounter when using EBOX. For more troubleshooting guidelines, please contact your nearest dealer for technical support.

Troubleshooting EBOX

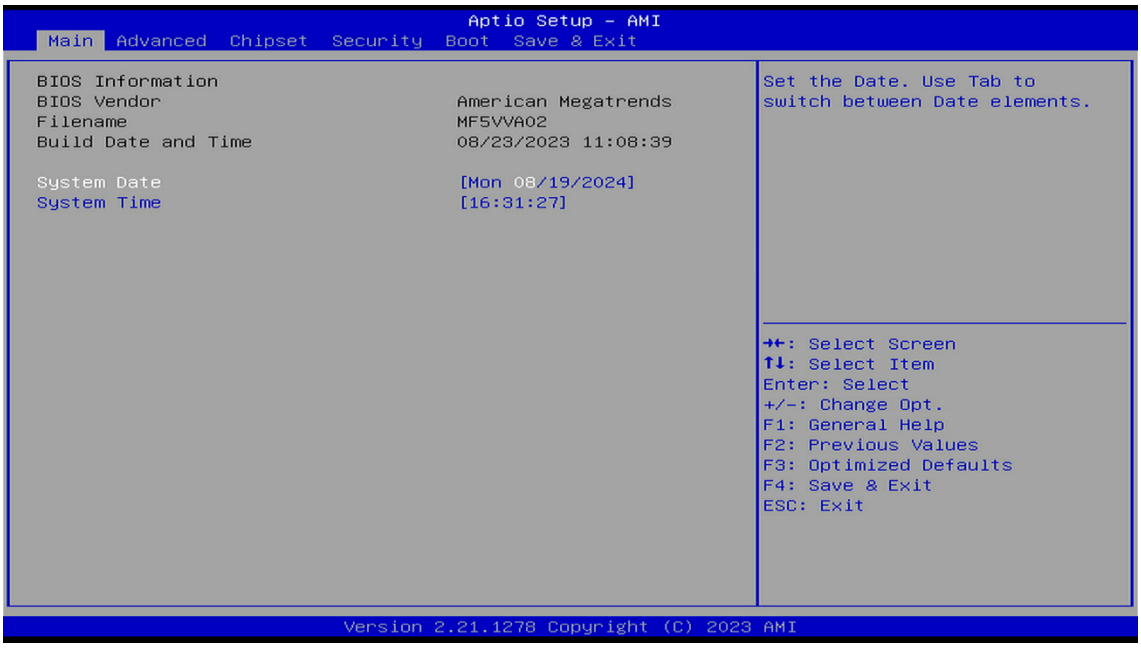
A. EBOX does not start –

- Make sure EBOX is properly secured and plugged into a power source before it is turned on.
- Make sure the power indicator shows the power is on.
- When EBOX unit is plugged into a power strip or UPS (Uninterruptible Power Supply), make sure power strip or UPS is turned on and working normally.
- Check if your display monitor is properly plugged into a power source and turned on. Make sure the brightness and contrast controls are adjusted correctly. Refer to monitor manual for details.
- Check if power control button function well by removing the AC adaptor. Wait for one minute, and then reattach all power connection before pressing the power button.
- Condensation may cause EBOX malfunction for a while. If happens, do not use EBOX for at least one hour.
- When all above guidelines checked and EBOX unit still not work. Remove the power adaptor from EBOX, unplug the power supply, and plug it in again. Then turn on the power.

B. BIOS Error Message –

BIOS error message appears when EBOX starts

If BIOS error message appears, press any key to resume or, press <DEL> to enter BIOS setup main menu, Press <F3> to load Optimized Defaults, then press F4 to save and exit.



C. "Operating System Not Found" –

A message indicating "Operating system not found" appear when unit starts (Windows won't start)

- Enter BIOS setup main menu by pressing <DEL> key, be sure that the C: drive is enabled.
- If Windows still does not start, follow these steps to initialize the BIOS:
  1. Turn off EBOX unit.
  2. Remove any peripheral devices connected to EBOX unit.
  3. Restart EBOX unit.
  4. Press <Del> or <Esc> to enter BIOS Setup main menu window.
  5. Follow the steps as written in item **B. BIOS error message.**
- If EBOX unit connected to a CD/DVD or USB Drivers, remove all peripherals. Restart to check if operating system starts properly. If EBOX unit continues to display "Operating system not found," please contact nearest dealer for servicing.

Chapter 8

Terms and Conditions

Warranty

The warranty terms for EBOX are twelve (12) months from the shipped month of the invoice.
During warranty, ICOP Technology will repair & replace the product covered under this limited warranty.

Service and Support

ICOP Technology Inc. provides the technical support for hardware problems throughout the warranty period. The technical support service is limited to configuration and operation of EBOX sold by ICOP Technology Inc. The technical support service does not offer software tutoring or training.

Return Merchandise Authorization (RMA) policy

If the DMP staff or dealer determines that a part is defective. Purchaser must call our technical support and obtain an RMA number before attempting to return any part.

To obtain an RMA number, Purchaser must follow procedures as below：

1. Complete the ICOP Technology Inc. standard RMA Form and email back to the RMA Department.
2. The RMA Number must be used within 7 DAYS.
3. The RMA Number must be shown clearly on your shipping label.
4. ICOP Technology Inc. must receive all Returns before a replacement will be sent.
5. Repair cost depends on the parts, damage reasons, and whether under warranty period…etc. The Seller will charge the Purchaser in a reasonable price.
6. A copy of the invoice for the RMA product(s) will also be shipped to Purchaser.
7. The freight of return to ICOP Technology Inc. is charged the Purchaser and accompanied by an RMA number. Any Returns with freight collect will be refused and returned to sender. After Repairing, the cost of freight will be paid by ICOP Technology Inc.
8. ICOP Technology Inc. must receive all returned goods within the warranty period.

Shipping Policy

The Purchaser must pre-pay shipping for any defective system or parts returned under the warranty. ICOP Technology Inc. shall not be liable for risk of loss or damage during shipment of the returned system or parts All products must be shipped back to ICOP Technology Inc. in original or equivalent packaging. ICOP Technology Inc. will ship the repaired or replacement product(s) to the Purchaser by prepaid freight. Purchaser assumes the risk of loss. ICOP Technology Inc. shall not be responsible for failure or on-time delivery.