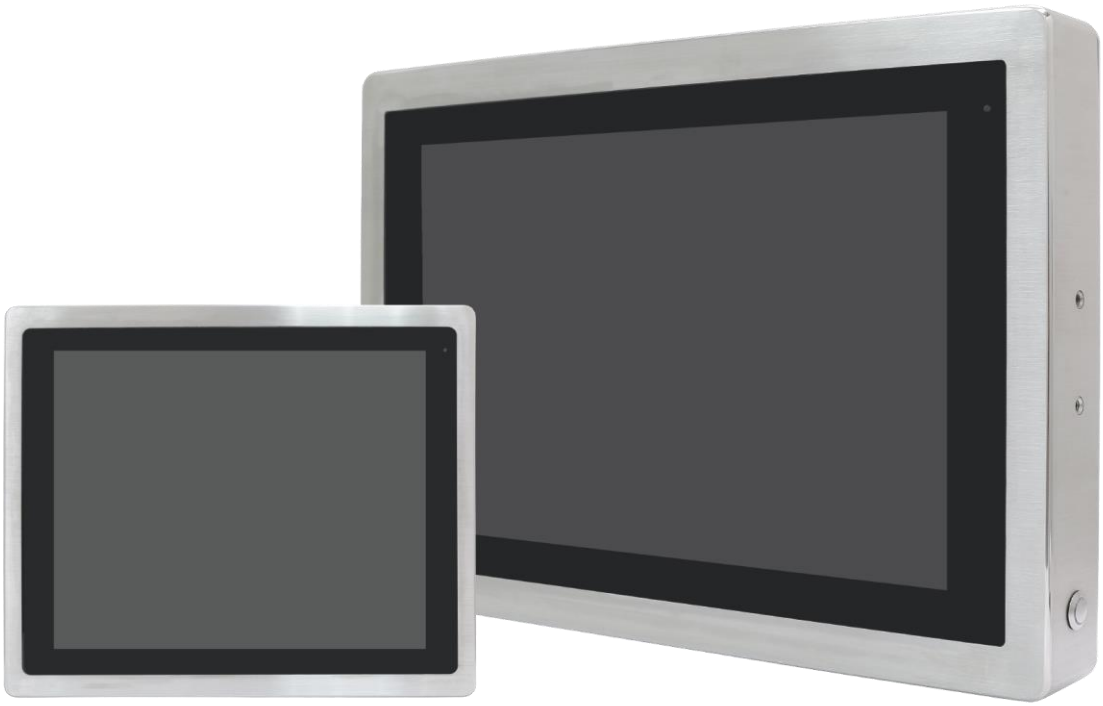

VITAM-9XXB Series

Fanless Stainless Steel Panel PC

User Manual

Release Date	Revision
June 2022	V1.0

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Revision History

Reversion	Date	Description
1.0	2022/06/14	Official Version

Warning!_____

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

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

Caution

Risk of explosion if the battery is replaced with an incorrect type.
Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.

Disclaimer

This information in this document is subject to change without notice. In no event shall Aplex Technology Inc. be liable for damages of any kind, whether incidental or consequential, arising from either the use or misuse of information in this document or in any related materials.

Packing List

Accessories (as ticked) included in this package are:
☐ Adaptor ☐ Driver & manual CD disc ☐ Other._____(please specify)

Safety Precautions

Follow the messages below to prevent your systems from damage:

- Avoid your system from static electricity on all occasions.
- Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.
- Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

Dear Valued Partners

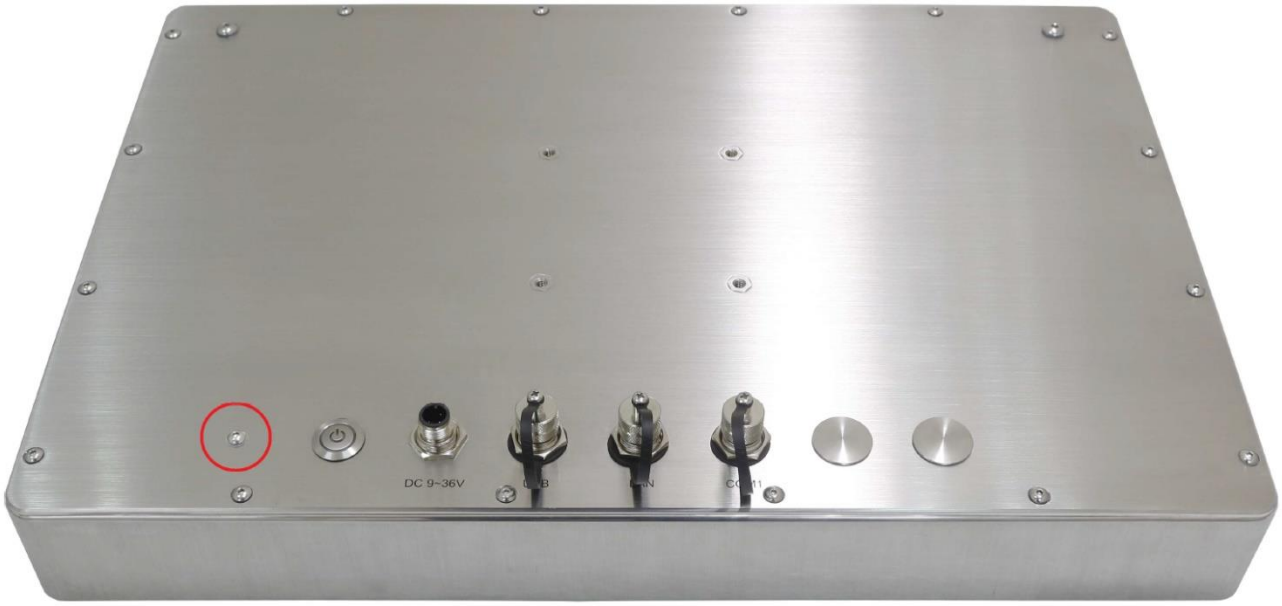
Thank you for supporting APLEX Technology. Kindly note for ViTAM series, the pressure testing screw is loosen for half turn before shipment. The purpose is to avoid potential quality concerns caused by radical air pressure change during transportation. This especially applies to air shipment with unpressurized cabin.

Upon receiving the system, please tighten the pressure testing screw before deployment to ensure 100% functionality.

Here is our suggestion:
1. Prepare a 3mm hex screwdriver
2. Tighten the screw (indicated in circle) clockwise until it is well in place
3. Recommend torque is 8~10 kgf-cm

Apologies for any inconveniences caused and thank you for your cooperation.

Yours Sincerely



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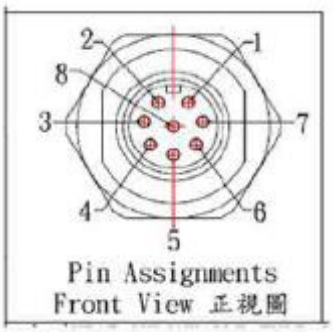
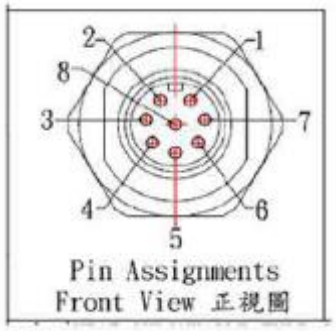
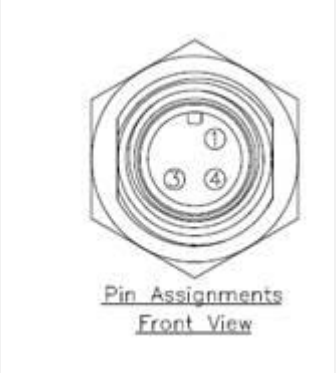
1.1 Features

- Intel®8th Gen. Fanless Stainless Steel Panel PC
- IP66/IP69K Full Sealed with Anti-Corrosion Enclosure
- Grade Stainless 304/316 for anti-corrosion
- Totally IP66/IP69K for meet indoor/semi-outdoor waterproof applications
- Support Resistive Touch(No for 23.8” models) and Projected Capacitive Touch
- M12 Connectors with waterproof cover and chain
- 9~36V wide-rage power input

1.2 Specifications

<table>
<tr><th></th><th>VITAM-915 BP/R(H)</th><th>VITAM-916 BP/R(H)</th><th>VITAM-917 BP/R(H)</th><th>VITAM-919 BP/R(H)</th><th>VITAM-921 BP/R(H)</th><th>VITAM-924 BP(H)</th></tr>
<tr><td colspan="7">System</td></tr>
<tr><td>CPU</td><td colspan="6">Intel Core i5-8365UE Processor(6M Cache, up to 1.60 GHz, 15W TDP)
Intel Core i3-8145UE Processor(4M Cache, up to 2.20 GHz, 15W TDP)</td></tr>
<tr><td>Chipset</td><td colspan="6">SoC</td></tr>
<tr><td>Memory</td><td colspan="6">2 x 260-pin SO-DIMM up to 64GB DDR4 2400MHz(32GB per DIMM)</td></tr>
<tr><td>Graphics</td><td colspan="6">Intel UHD Graphics 620 (300-1100 MHz)</td></tr>
<tr><td colspan="7">Outside IO Port – Standard M12 I/O Connector on the Rear Side</td></tr>
<tr><td>USB</td><td colspan="3">1 x M12 8-pin for 2x USB2.0 with waterproof cover and chain
USB1/2:
<table><tr><th>CN1</th><th>Pin Define</th></tr><tr><td>1</td><td>USB1 5V</td></tr><tr><td>3</td><td>D1-</td></tr><tr><td>4</td><td>D1+</td></tr><tr><td>7</td><td>GND</td></tr><tr><td>2</td><td>USB2 5V</td></tr><tr><td>5</td><td>D2-</td></tr><tr><td>6</td><td>D2+</td></tr><tr><td>8</td><td>GND</td></tr></table></td><td colspan="3">  </td></tr>
<tr><td>Serial/Parallel</td><td colspan="3">1 x M12 8-pin COM1, RS-232/422/485, Default RS-232,</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td></td><td>with waterproof cover and chain
<table><tr><td></td><td>Pin Define</td></tr><tr><td>1</td><td>DCD</td></tr><tr><td>2</td><td>RXD</td></tr><tr><td>3</td><td>TXD</td></tr><tr><td>4</td><td>DTR</td></tr><tr><td>5</td><td>GND</td></tr><tr><td>6</td><td>DSR</td></tr><tr><td>7</td><td>RTS</td></tr><tr><td>8</td><td>CTS</td></tr></table></td><td> 
</td></tr>
<tr><td>LAN</td><td>1 x M12 8-pin for LAN with waterproof cover and chain
LAN:
<table><tr><td></td><td>Pin Define</td></tr><tr><td>1</td><td>LAN1_0+</td></tr><tr><td>2</td><td>LAN1_0-</td></tr><tr><td>3</td><td>LAN1_1+</td></tr><tr><td>4</td><td>LAN1_1-</td></tr><tr><td>5</td><td>LAN1_2+</td></tr><tr><td>6</td><td>LAN1_2-</td></tr><tr><td>7</td><td>LAN1_3+</td></tr><tr><td>8</td><td>LAN1_3-</td></tr></table></td><td> 
</td></tr>
<tr><td>Power</td><td>1 x M12 3-pin for DC power with waterproof cover and chain
<table><tr><td></td><td>Pin Define</td></tr><tr><td>1</td><td>NC</td></tr><tr><td>3</td><td>VCC</td></tr><tr><td>4</td><td>GND</td></tr></table></td><td> 
</td></tr>
<tr><td>Others</td><td colspan="2">1 x Power Switch on the rear
1 x Touch on/off button at the side (Touch on-default/Touch off-option_press downward)</td></tr>
<tr><td colspan="3">Option I/O Port (Either two)</td></tr>
<tr><td></td><td colspan="2">2 x optional blank M12 connectors with waterproof cap for selecting two from the following options:</td></tr>
</table>

Option	2 x USB 2.0 1 x USB 3.2 Gen1 1 x LAN (POE for option) 1 x COM 1 x HDMI					
Storage Space						
Storage	1 x 2.5” SATA3 HDD (option) M.2 B-Key 2280 (SATA as default, select by BIOS)					
Expansion						
Expansion Slot	1 x M.2 2230 E-Key (PCIex2+USB2.0) socket for WIFI/BT and Antenna at rear side (option) 1 x Full-size mPCIe/mSATA with NANO-SIM (mPCIe as default, select by BIOS)					
RFID module	RFID module design on the front side (option)					
Display – Standard LCD						
Display Type	15” TFT LCD	15.6” TFT LCD	17” TFT LCD	19” TFT LCD	21.5” TFT LCD	23.8” TFT LCD
Max. Resolution	1024 x 768	1366 x 768	1280 x 1024	1280 x 1024	1920 x 1080	1920 x 1080
Max. Color	16.2M/16.7M			16.7M		
Luminance (cd/m^2)	300	300	350	350	250	250
Contrast Ratio	2000:1	500:1	1000:1	1000:1	3000:1	3000 : 1
Viewing Angle(H/V)	168/168	160/160	170/160	170/165	178/178	178/178
Backlight Lifetime	50,000hrs	50,000hrs	30,000hrs	50,000hrs	30,000hrs	30,000 hrs
Option	Optical bonding					
Display – High Brightness LCD (option)						
Display Type	15” TFT LCD	15.6” TFT LCD	17” TFT LCD	19” TFT LCD	21.5” TFT LCD	23.8”TFT LCD
Max. Resolution	1024 x 768	1366 x 768	1280 x1024	1280 x 1024	1920 x 1080	1920 x 1080
Max. Color	16.2M	16.7M				
Luminance (cd/m^2)	1000	1000	1000	1000	1000	1000
Contrast Ratio	800:1	500:1	1000:1	1000:1	3000:1	3000:1
Viewing Angle(H/V)	160/150	160/160	170/160	170/160	178/178	178/178
Backlight Lifetime	50,000hrs	50,000hrs	50,000hrs	50,000hrs	50,000hrs	30,000hrs
Option	Optical bonding					
Touch Screen						
Type	Resistive touch window (for R model) **(not available for 23.8”)** Projected capacitive touch screen (for P model)					
Interface	USB					

Light Transmission	Resistive touch window: over 80% Projected capacitive touch screen: over 90%					
Glass Type						
Type	AR					
Light Transmission	Over 90%					
Power						
Power Input	DC 9~36V					
Power Consumption	MAX:43.4W (915BR) MAX:34.6W (915BP)	MAX:TBD (916BR) MAX:TBD (916BP)	MAX:66.4W (917BR) MAX:TBD (917BP)	MAX:43.4W (919BR) MAX:TBD (919BP)	MAX:TBD (921BR) MAX:39.8W (921BP)	MAX:TBD (924BP)
Mechanical						
Color	304 Stainless steel enclosure (default) 316 Stainless steel enclosure (option)					
Construction	Stainless steel enclosure					
Mounting	VESA mount 75 x 75, Yoke mount			VESA mount 100 x 100, Yoke mount		VESA mount 200 x 100, Yoke mount
IP Rating	IP66/IP69K					
Dimension (mm)	399 x 324 x 53	440 x 290 x 55	432 x 358 x 55	470 x 388.6 x 60	571 x 362 x 55	656 x 423 x 53
Net Weight	6.7 Kg	TBD	7.1	9.68 Kg	10 Kg	TBD
Environmental						
Operating temperature	0~50°C	0~50°C	0~50°C	0~50°C	0~50°C 0~40°C (For High Brightness model)	0~50°C
Storage temperature	-30~70°C					
Storage humidity	10 to 90% @ 40°C, non- condensing					
Certification	Meet CE / FCC Class A					
Operating System Support	Windows 10 IoT ENT LTSC					

1.3 Dimensions

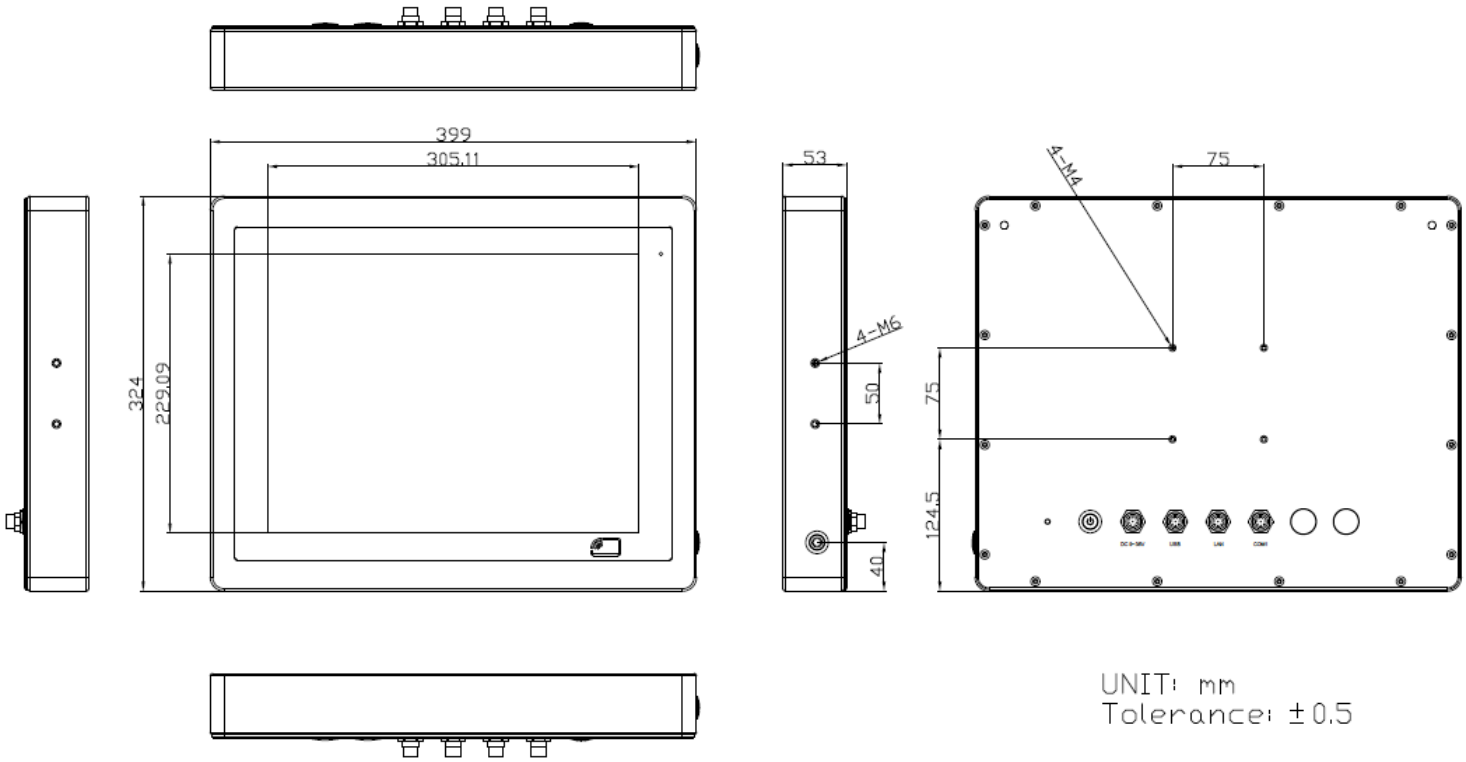


Figure 1.1: Dimensions of VITAM-915BP/R(H)

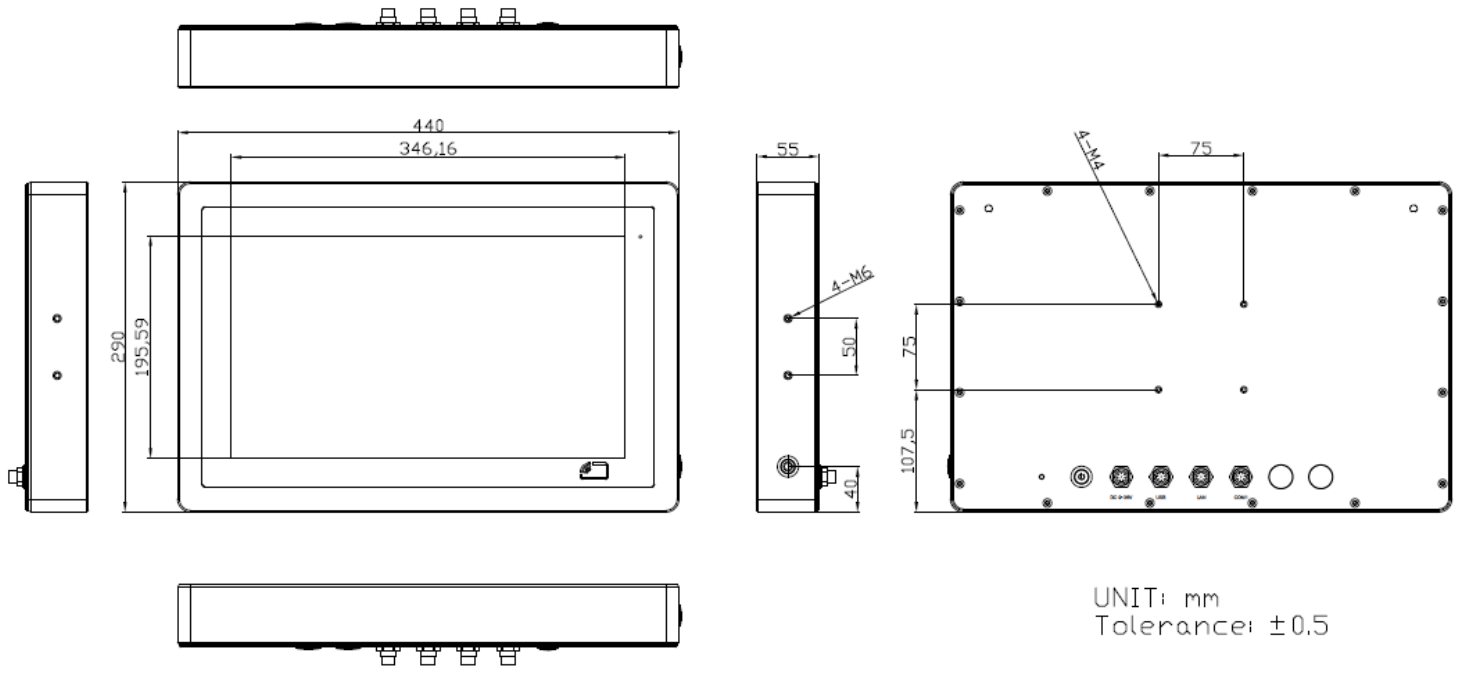


Figure 1.2: Dimensions of VITAM-916BP/R(H)

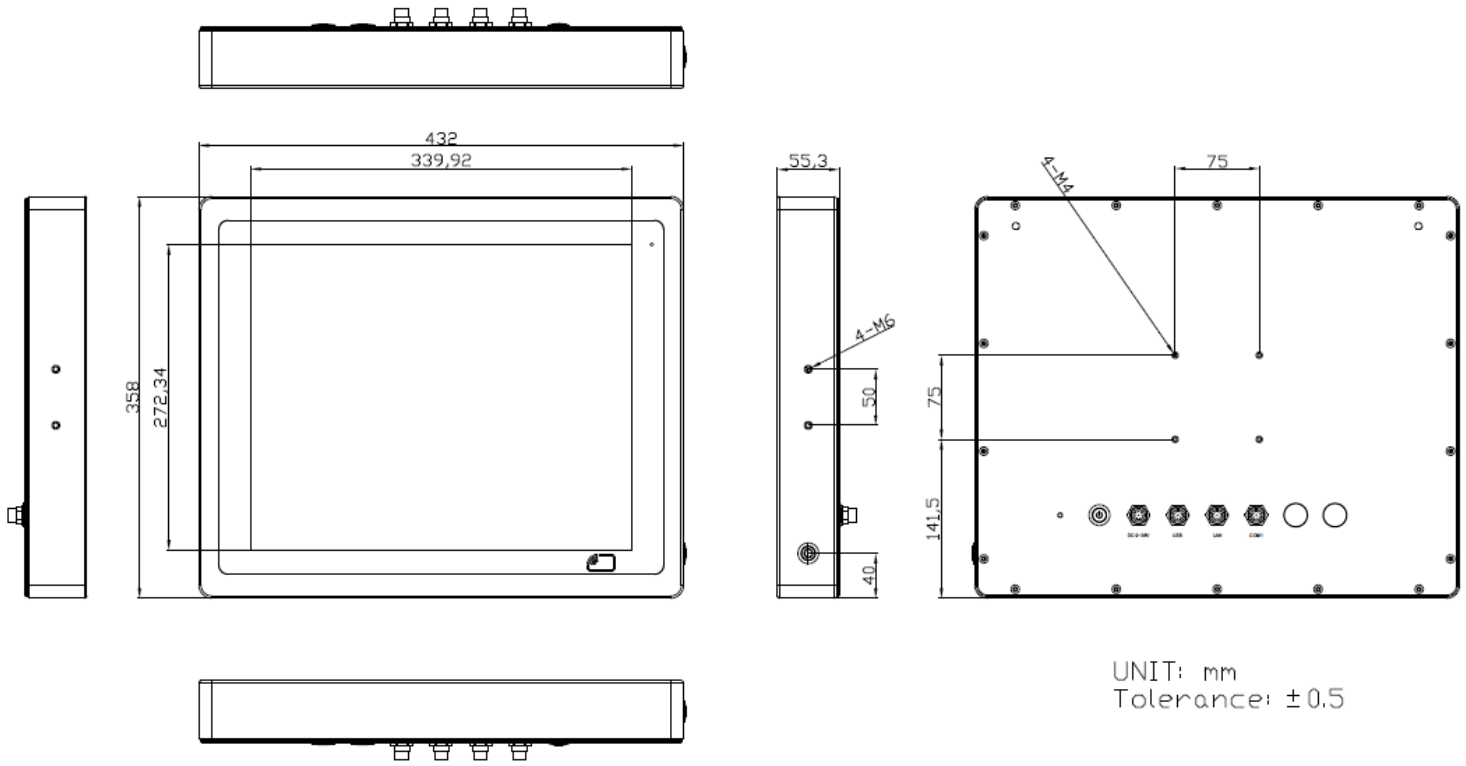


Figure 1.3: Dimensions of VITAM-917BP/R(H)

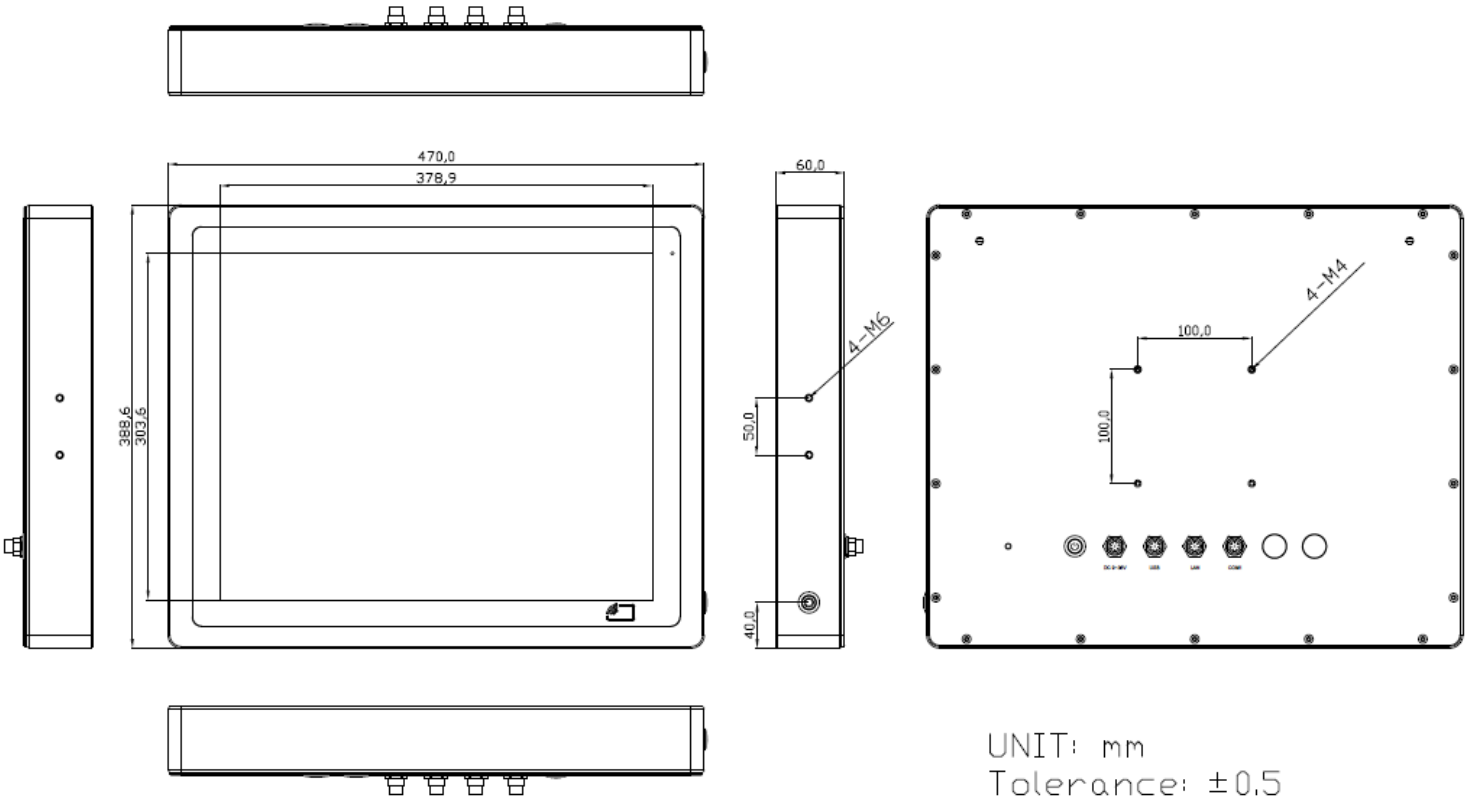


Figure 1.4: Dimensions of VITAM-919BP/R(H)

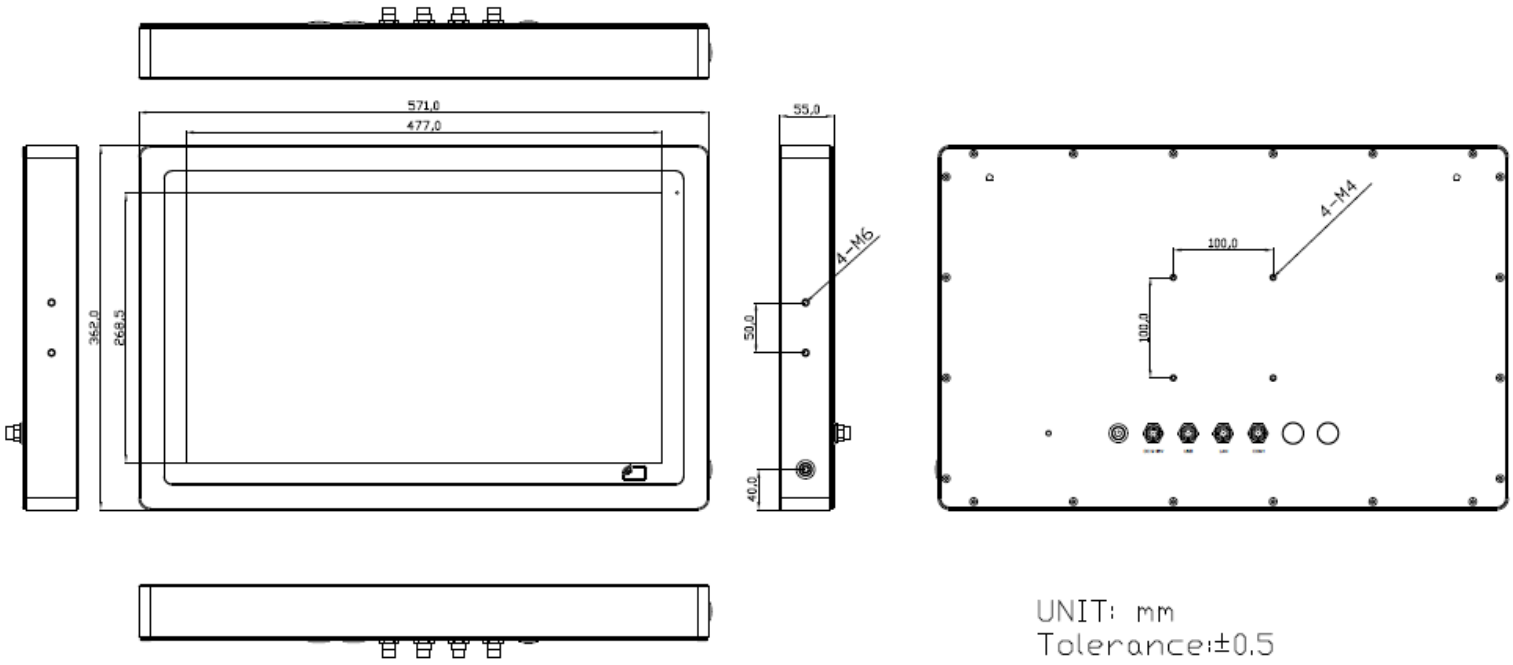


Figure 1.5: Dimensions of VITAM-921BP/R(H)

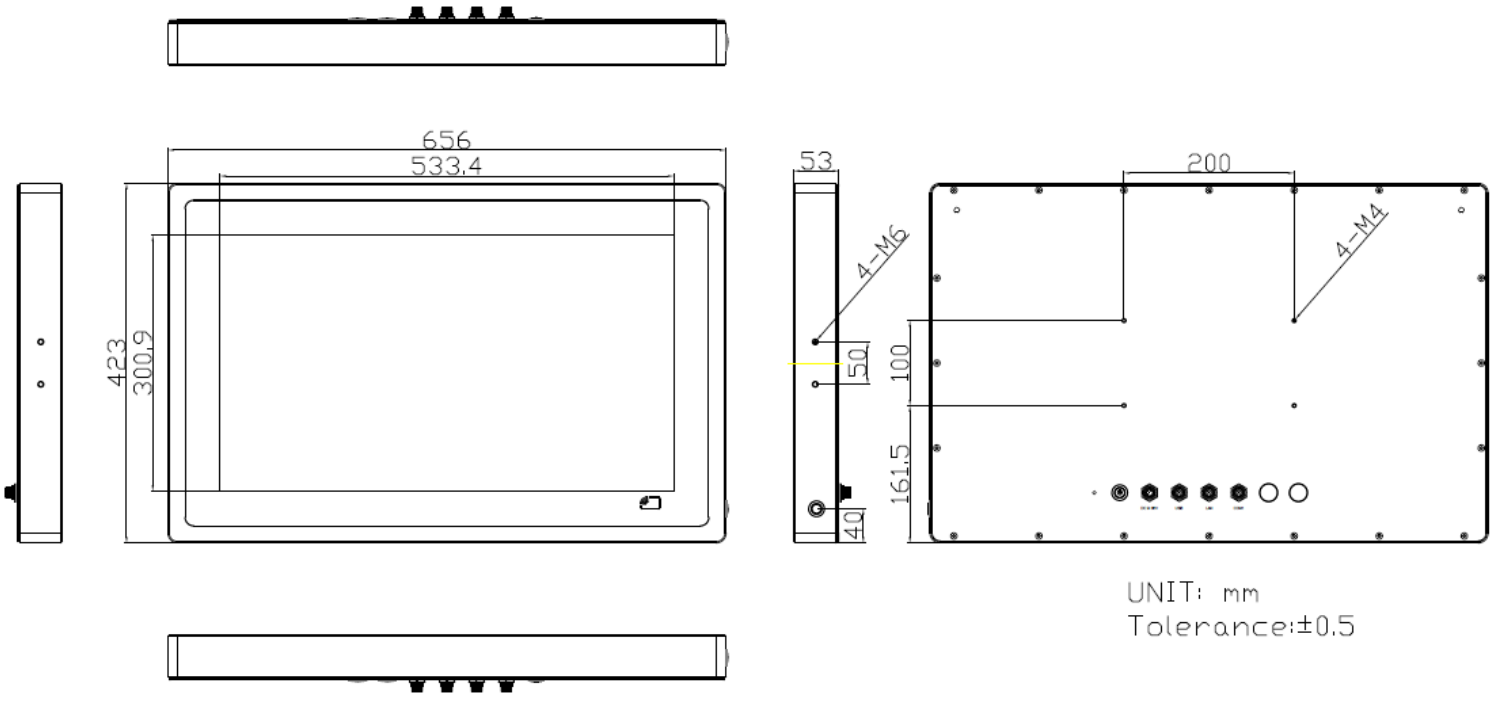


Figure 1.6: Dimensions of VITAM-924BP(H)

1.4 Brief Description of VITAM-9XXB Series

There are 15”, 15.6”, 17”, 19”, 21.5”, and 23.8” new generation adopt the SUS304 grade stainless steel housing (SUS316 grade for option) panel PC in VITAM-9XXB series, which comes with 100% dust and waterproof guarantee, and the all-in-one fanless design. It is powered by 8th Gen. Intel Core i3-8145UE/i5-8365UE processor, 2 x 260-pin SO-DIMM up to 64GB DDR4 2400MHz memory, and 1 x M.2 B-Key 2280 space for storage. VITAM-9XXB series is wide range DC 9~36V power input and IP66/IP69K rated with M12 connectors. Furthermore, the models support resistive touch and projected capacitive touch for option, and can be high brightness LCD and optical bonding designed for option. It supports touch on/off button on the side edge for hygienic cleaning and ergonomic versatile mounting: Yoke mounting and space-saving VESA mounting.

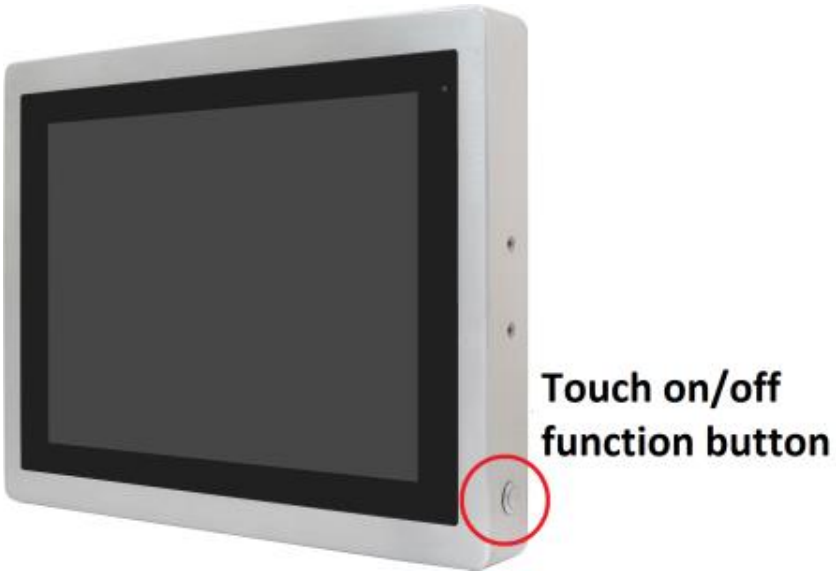


Figure 1.7: Front View and Touch on/off Button of VITAM-9XXB Series

Figure 1.8: Rear View of VITAM-9XXB Series

1.5 Yoke Mounting and VESA Mounting

The VITAM-9XXB Series model can be Yoke mounted and VESA mounted as shown in Picture below.

Figure 1.9: Yoke mounting of VITAM-9XXB Series

Figure 1.10: VESA mounting of VITAM-9XXB Series

Chapter 2 Hardware

2.1 Motherboard Introduction

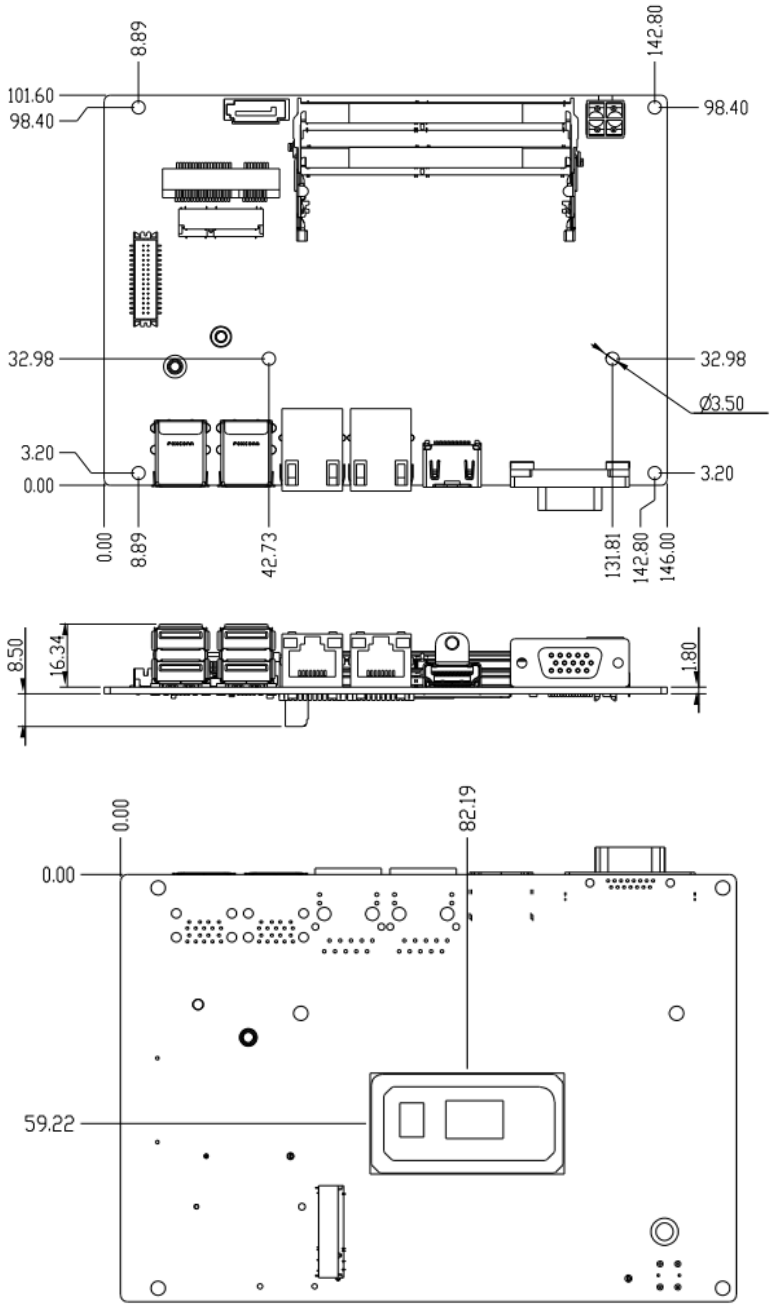
Standard 3.5" subcompact board developed on the basis of Intel 8th Generation Core™ Processor, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features one mPCIe/mSATA, dual GbE ports, 2-COM and 4 x USB3.2 Gen 2 Ports; one HDMI, one VGA and one LVDS interface.

2.2 Specifications & Dimensions

Specifications	
Board Size	146mm x 107.7mm
CPU Support	Intel® Core™ i3-8145UE(2C/4T, 2.20GHz, up to 3.90GHz, 15W, up to 25W) Intel® Core™ i5-8365UE(4C/8T, 1.60GHz, up to 4.10GHz, 15W, up to 25W)
Chipset	SOC
Memory Support	DDR4 up to 2400MHz, Dual Channel SODIMM x2, up to 64GB, NON-ECC
Graphics	Intel® UHD Graphics 620 (300-1100MHz)
Display Mode	1 x HDMI 2.0a 1 x LVDS (18/24-bit dual LVDS) (optional: eDP1.4) 1 x VGA
Multi Display	3 Simultaneous Displays
Super I/O	Nuvoton NCT6106D
BIOS	UEFI
SATA	1 x SATAIII (6.0Gbps) 1 x +5V SATA Power Connector
Video	LVDS/ eDP x 1 (default: LVDS)
USB	2 x USB 2.0
Serial	1 x RS232/RS422/RS485 port, support RI(COM1) 1 x RS232/RS422/RS485 port, support 5V/12V/RI(COM2)
Digital I/O	8-bit digital I/O

	4-bit digital Input 4-bit digital Output
Battery	Lithium Battery 3V/240mAh
SMBus/I2C	I2C/SMBus x 1 (Default: I2C)
SIM	Nano-SIM x 1
Audio	Support Audio via Realtek ALC897/892 audio codec Audio Interface: Line-in/Line-out/MIC 1x Audio Header
Expansion Bus	1 x Full-size mPCIe/mSATA slot with NANO-SIM(mPCIe as default, , select by BIOS) M.2 B-Key 2280 x 1 (SATA as default, select by BIOS) M.2 E-Key 2230 x 1 (PCIe, USB2.0)
FAN	DC Fan x 1 (optional: Smart Fan)
Touch Ctrl	4/5/8-wire touch controller(option)
Power Management	Wide Range DC+9V~36V (+12V option) 1 x 2-pin Phoenix connector Power supply type: AT/ATX
Switches and LED Indicators	1 x Power on/off switch 1 x Reset 1 x HDD LED status 1 x Power LED status 1 x Buzzer
External I/O port	4 x USB 3.2 Gen 2 Ports 2 x RJ45 GbE LAN Ports 1 x HDMI 2.0a 1 x VGA
Temperature	Operating: 0℃ to 60℃ Storage: -40℃ to 80℃
Humidity	0% - 90% relatively, non-condensing, operating
Power Consumption	Typical: 4.83A at +12V with Intel® i7-8665UE, DDR4L 2400MHz 16GB memory Maximum: 7.30A at +12V with Intel® i7-8665UE, DDR4L 2400MHz 16GB memory

MTBF (Hrs)	354,194
EMI/EMS	CE/FCC class A



(Unit: mm)

Figure 2.1: Motherboard Dimensions

2.3 Jumpers and Connectors Location

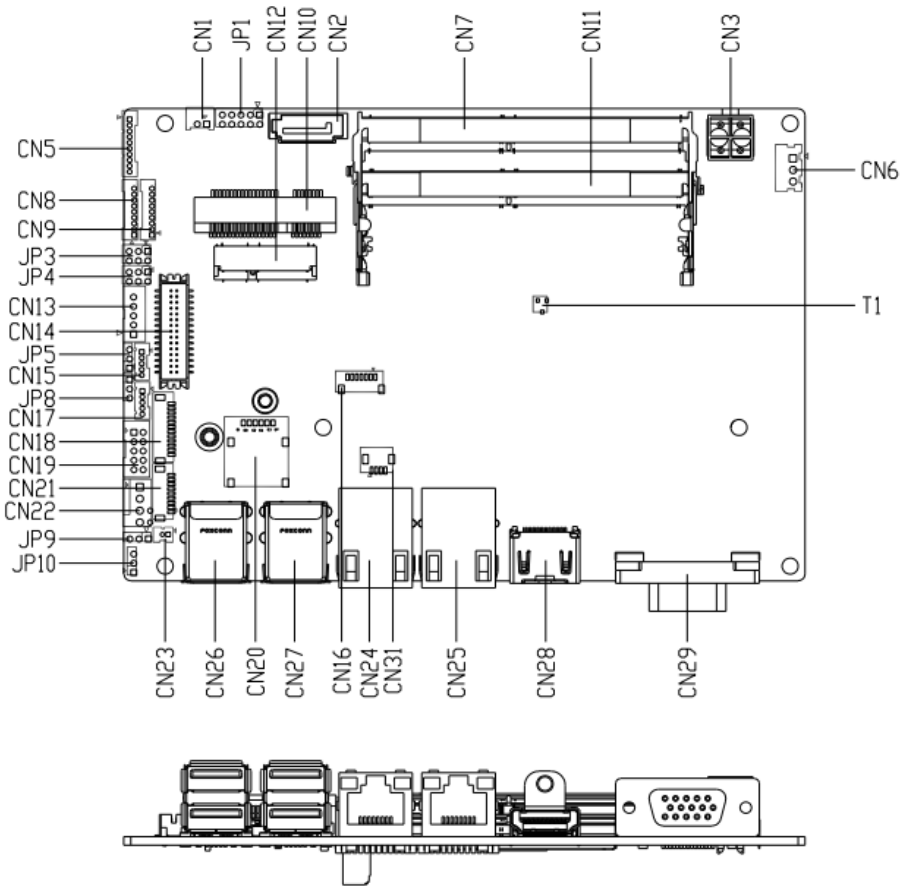


Figure 2.2: Jumpers and Connectors Location- Board Top

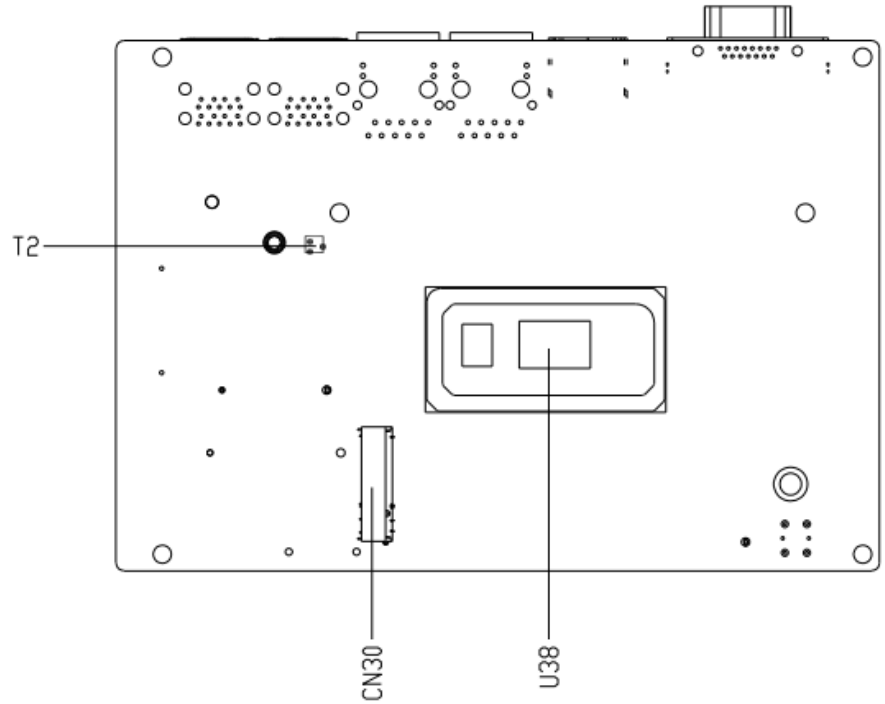


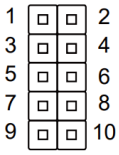
Figure 2.3: Jumpers and Connectors Location- Board Bottom

2.4 Jumpers Setting and Connectors

Please refer to the table below for all of the board's jumpers that you can configure for your application

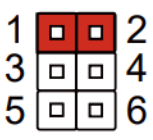
Label	Function
JP1	Front Panel Connector
JP3	COM2 Pin8 Function Selection
JP4	LVDS/eDP Port Backlight Inverter VCC Selection and Operating VDD Selection
JP5	LVDS/eDP Port Backlight Lightness Control Mode Selection
JP8	Touch Screen 4/5/8-wire Mode Selection
JP9	Clear CMOS Jumper
JP10	Auto Power Button Enable/Disable Selection

1. Front Panel Connector (JP1):

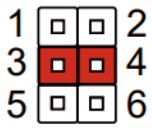


Pin	Function	Pin	Function
Pin 1	PWR_BTN-	Pin 2	PWR_BTN+
Pin 3	HDD_LED-	Pin 4	HDD_LED+
Pin 5	SPEAKER-	Pin 6	SPEAKER+
Pin 7	PWR_LED-	Pin 8	PWR_LED+
Pin 9	H/W RESET-	Pin 10	H/W RESET+

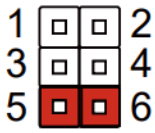
2. COM2 Pin8 Function Selection (JP3):



+12V

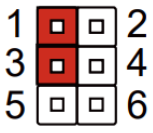
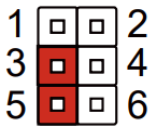
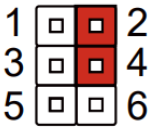
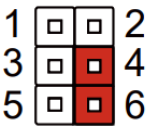


Ring (**Default**)



+5V

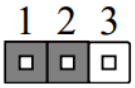
3. LVDS/eDP Port Backlight Inverter VCC and VDD Selection (JP4):

VCC Selection		VDD Selection	
			
+12V	+5V (**Default**)	+3.3V (**Default**)	+5V

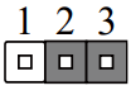
Note:

JP4 Default is two (2) jumpers placed on pins 3-5 and pins 2-4.

4. LVDS/eDP Port Backlight Lightness Control Mode Selection (JP5):

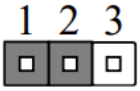


VR Mode

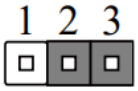


PWM Mode (**Default**)

5. Touch Screen 4,5,8 Wire Selection (JP8):

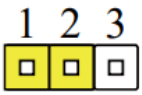


4/8 Wires Mode (**Default**)

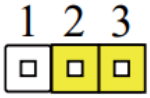


5 Wires Mode

6. Clear CMOS Jumper (JP9):

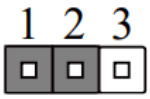


Normal (**Default**)

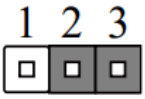


Clear CMOS

7. Auto Power Button Enable/Disable Selection (JP10):



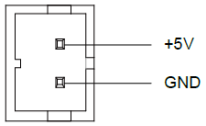
Disable/ATX



Enable/AT (**Default**)

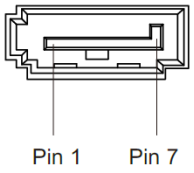
Label	Function
CN1	+5V Output for SATA HDD
CN2	SATA Port
CN3	External Power Input
CN5	Audio I/O Port
CN6	External +5VSB Input
CN7	DDR4 SO-DIMM Slot
CN8	COM Port 1 RS-232/422/485
CN9	COM Port 2 RS-232/422/485
CN10	Mini-Card Slot (Full-Size)
CN11	DDR4 SO-DIMM Slot
CN12	M.2 E-Key 2230
CN13	LVDS/eDP Port Inverter /Backlight Connector
CN14	LVDS/eDP Port
CN15	USB 2.0 Port 5
CN16	SPI Debug Port
CN17	USB 2.0 Port 6
CN18	LPC Port
CN19	Digital I/O Port
CN20	Nano SIM Card Socket
CN21	Touch Screen Connector (Optional)
CN22	CPU FAN
CN23	Battery Connector
CN24	LAN (RJ-45) Port2
CN25	LAN (RJ-45) Port1
CN26	Dual USB3.1 Port 0/Port 1
CN27	Dual USB3.1 Port 2/Port 3
CN28	HDMI Connector
CN29	VGA Port
CN30	M.2 B-Key 2280
CN31	LAN SDP CONN

8. +5V Output for SATA HDD (CN1):



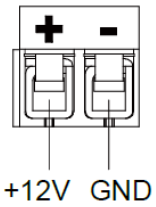
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V at 1A
2	GND	GND	

9. SATA Port (CN2):



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

10. External Power Input (CN3):

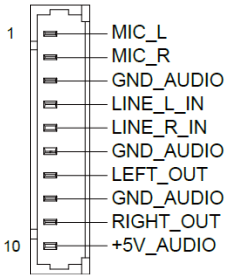


Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	+9~+36V (or +12V) at 8A
2	GND	GND	

Note:

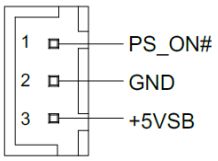
There are two types of power input, 9~36V or 12V (by BOM option).

11. Audio I/O Port (CN5)：



Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

12. External +5VSB Input (CN6):

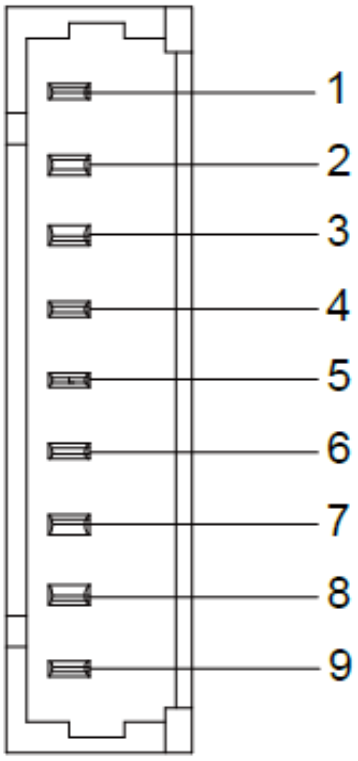


Pin	Pin Name	Signal Type	Signal Level
1	PS_ON#	OUT	+5V
2	GND	GND	
3	+5VSB	PWR	+5V at 2A

13. DDR SO-DIMM Slot (CN7):

Standard Specifications

14. COM Port1 (CN8):

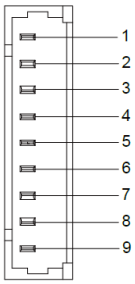


RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD1	IN	
2	DSR1	IN	
3	RX1	IN	
4	RTS1	OUT	±5V
5	TX1	OUT	±5V
6	CTS1	IN	
7	DTR1	OUT	±5V
8	RI1	IN	
9	GND	GND	

RS-485			
Pin	Pin Name	Signal Type	Signal Level
1	RS485_ D-	I/O	±5V
2	NC		
3	RS485_D+	I/O	±5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC		
9	GND	GND	

RS-422			
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	NC		
3	RS422_TX+	OUT	±5V
4	NC		
5	RS422_RX+	IN	
6	NC		
7	RS422_RX-	IN	
8	NC		
9	GND	GND	

15. COM Port 2 (CN9):



RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD2	IN	
2	DSR2	IN	
3	RX2	IN	
4	RTS2	OUT	±5V
5	TX2	OUT	±5V
6	CTS2	IN	
7	DTR2	OUT	±5V
8	RI2	IN	
9	GND	GND	

RS-485			
Pin	Pin Name	Signal Type	Signal Level
1	RS485_ D2-	I/O	±5V
2	NC		
3	RS485_D2+	I/O	±5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V at 0.5A
9	GND	GND	

RS-422			
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX2-	OUT	±5V
2	NC		
3	RS422_TX2+	OUT	±5V
4	NC		
5	RS422_RX2+	IN	
6	NC		
7	RS422_RX2-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V at 0.5A
9	GND	GND	

Note:

1. COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.
2. Pin8 function can be set by JP3(No.2 at P.21)

16. Mini-Card Slot (Full-Mini Card) (CN10):

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	UIM_PWR	PWR	
9	GND	GND	
10	UIM_DATA	I/O	
11	PCIE_REF_CLK-	DIFF	
12	UIM_CLK	IN	
13	PCIE_REF_CLK+	DIFF	
14	UIM_RST	IN	
15	GND	GND	
16	UIM_VPP	PWR	
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V

25	PCIE_RX+	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

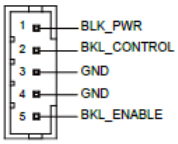
17. DDR SO-DIMM Slot (CN11):

Standard Specification

18. M.2 E-Key 2230 (CN12):

Standard Specification

19. LVDS/eDP Port Inverter/Backlight Connector (CN13):

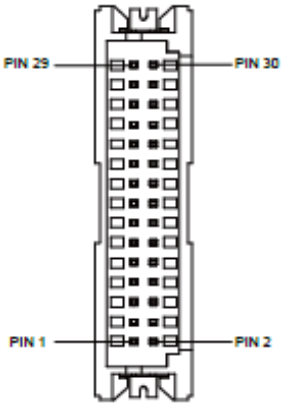


Pin	Pin Name	Signal Type	Signal level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+3.3V

Note:

1. LVDS BKL_PWR can be set to +5V or +12V by JP4. (See No.3 at P.21)
2. LVDS BKL_PWR supports current of 1.5A
3. LVDS BKL_CONTROL can be set by JP5. (See No.4 at P22)

20. LVDS/eDP Port (CN14):

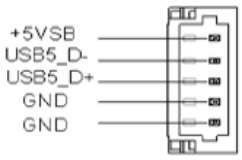


Note:

1. LVDS LCD_PWR can be set to +3.3V or +5V by JP4 (See No.3 at P21)
2. LVDS LCD_PWR supports current of 2A

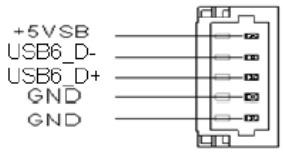
Pin	LVDS	eDP	Signal Type	Signal Level
1	BKL_ENABLE	BKL_ENABLE	OUT	
2	BKL_CONTROL	BKL_CONTROL	OUT	
3	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	GND	
5	LVDS_A_CLK-	eDP_TXN3	DIFF	
6	LVDS_A_CLK+	eDP_TXP3	DIFF	
7	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	GND	
9	LVDS_DA0-	eDP_TXN2	DIFF	
10	LVDS_DA0+	eDP_TXP2	DIFF	
11	LVDS_DA1-	eDP_TXN1	DIFF	
12	LVDS_DA1+	eDP_TXP1	DIFF	
13	LVDS_DA2-	eDP_TXN0	DIFF	
14	LVDS_DA2+	eDP_TXP0	DIFF	
15	LVDS_DA3-	NC	DIFF	
16	LVDS_DA3+	eDP_HPD	DIFF	
17	DDC_DATA	eDP_AUX_N	I/O	+3.3V
18	DDC_CLK	eDP_AUX_P	I/O	+3.3V
19	LVDS_DB0-	NC	DIFF	
20	LVDS_DB0+	NC	DIFF	
21	LVDS_DB1-	NC	DIFF	
22	LVDS_DB1+	NC	DIFF	
23	LVDS_DB2-	NC	DIFF	
24	LVDS_DB2+	NC	DIFF	
25	LVDS_DB3-	NC	DIFF	
26	LVDS_DB3+	NC	DIFF	
27	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	GND	
29	LVDS_B_CLK-	NC	DIFF	
30	LVDS_B_CLK+	NC	DIFF	

21. USB 2.0 Port (CN15):



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V at 0.5A
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	
5	GND	GND	

22. USB2.0 Port (CN17):

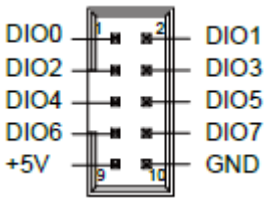


Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V at 0.5A
2	USB6_D-	DIFF	
3	USB6_D+	DIFF	
4	GND	GND	
5	G ND	GND	

23. LPC Port (CN18):

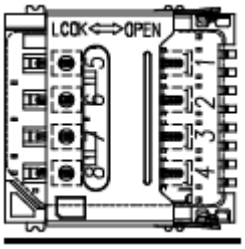
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	SMB_DATA/I2C_SDA	I/O	
11	SMB_CLK/I2C_CLK	OUT	
12	SMB_ALERT/SERIRQ	IN	+3.3V

24. Digital I/O Port (CN19):



Pin	Signal Description	Pin	Signal Description
1	PD0	2	PD1
3	PD2	4	PD3
5	PD4	6	PD5
7	PD6	8	PD7
9	+V5S (0.5A)	10	GND

25. Nano SIM Card Socket (CN20):

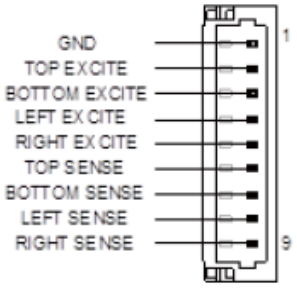


Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	NC		
5	GND	GND	
6	UIM_VPP	PWR	
7	UIM_DATA	I/O	
8	NC		

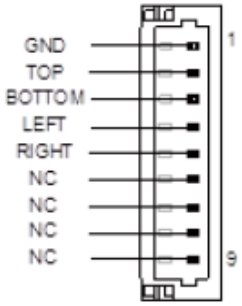
26. Touchscreen Connector (CN21):

Note:

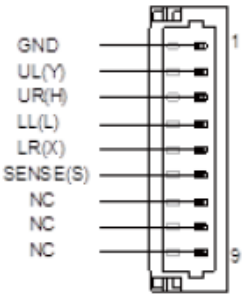
Touch mode can be set by BIOS



8-Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	RIGHT EXCITE	IN	
6	TOP SENSE	IN	
7	BOTTOM SENSE	IN	
8	LEFT SENSE	IN	
9	RIGHT SENSE	IN	

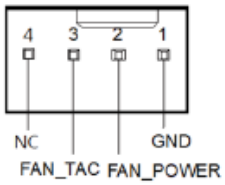


4-Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	TOP	IN	
3	BOTTOM	IN	
4	LEFT	IN	
5	RIGHT	IN	
6	NC		
7	NC		
8	NC		
9	NC		



5-Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	UL(Y)	IN	
3	UR(H)	IN	
4	LL(L)	IN	
5	LR(X)	IN	
6	SENSE(S)	IN	
7	NC		
8	NC		
9	NC		

27. CPU Fan (CN22):

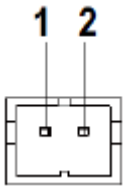


Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+12V at 1A
3	FAN_TAC	IN	
4	NC		

Note:

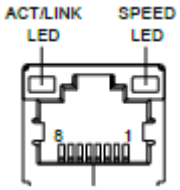
Max driving current is 1A

28. Battery Connector (CN23):



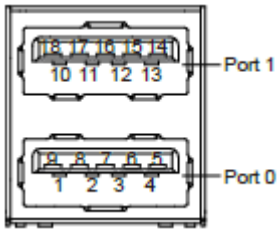
Pin	Pin Name	Signal Type	Signal level
1	+3.3V	PWR	3.3V
2	GND	GND	

29. LAN (RJ-45) Port1/Port2 (CN24/CN25):



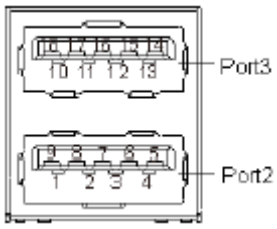
Pin	Pin Name	Signal Type	Signal level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

30. USB3.2 Gen2 Ports 0 & 1 (CN26):



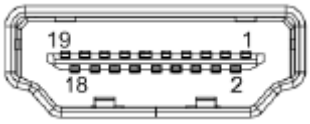
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V at 0.9A
2	USB0_D-	DIFF	
3	USB0_D+	DIFF	
4	GND	GND	
5	USB0_SSRX–	DIFF	
6	USB0_SSRX+	DIFF	
7	GND	GND	
8	USB0_SSTX–	DIFF	
9	USB0_SSTX+	DIFF	
10	+5VSB	PWR	+5V at 0.9A
11	USB1_D-	DIFF	
12	USB1_D+	DIFF	
13	GND	GND	
14	USB1_SSRX–	DIFF	
15	USB1_SSRX+	DIFF	
16	GND	GND	
17	USB1_SSTX–	DIFF	
18	USB1_SSTX+	DIFF	

31. USB 3.2 Gen 2 Ports 2 & 3 (CN27):



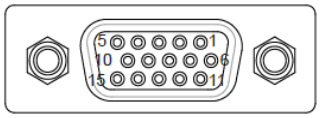
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V at 0.9A
2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	GND	
5	USB2_SSRX–	DIFF	
6	USB2_SSRX+	DIFF	
7	GND	GND	
8	USB2_SSTX–	DIFF	
9	USB2_SSTX+	DIFF	
10	+5VSB	PWR	+5V at 0.9A
11	USB3_D-	DIFF	
12	USB3_D+	DIFF	
13	GND	GND	
14	USB3_SSRX–	DIFF	
15	USB3_SSRX+	DIFF	
16	GND	GND	
17	USB3_SSTX–	DIFF	
18	USB3_SSTX+	DIFF	

32. HDMI (CN28):



Pin	Pin Name	Signal Type	Signal Level
1	HDMI_TX2+	DIFF	
2	GND	GND	
3	HDMI_TX2-	DIFF	
4	HDMI_TX1+	DIFF	
5	GND	GND	
6	HDMI_TX1-	DIFF	
7	HDMI_TX0+	DIFF	
8	GND	GND	
9	HDMI_TX0-	DIFF	
10	HDMI_CLK+	DIFF	
11	GND	GND	
12	HDMI_CLK-	DIFF	
13	NC		
14	NC		
15	DDC_CLK	I/O	+5V
16	DDC_DATA	I/O	+5V
17	GND	GND	
18	+5V	PWR	+5V
19	HDMI_HPD		

33. VGA Port (CN29):

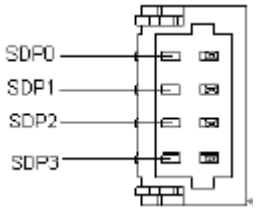


Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	NC		
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

34. M.2 B-Key 2280 (CN30):

Standard Specification

35. LAN SPD Connector (CN31):



Pin	Pin Name	Signal Type	Signal Level
1	SDP0	I/O	
2	SDP1	I/O	
3	SDP2	I/O	
4	SDP3	I/O	

Chapter 3 BIOS Setup

3.1 System Test and Initialization

The GENE-WHU6 board uses certain routines to perform testing and initialization during the boot up sequence. If an error, fatal or non-fatal, is encountered, the module will output a few short beeps or display an error message. The module can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory and BIOS NVRAM. If a system configuration is not found or an error is detected, the module will load the default configuration and reboot automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration was reset by the Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The system CMOS memory has an integral lithium battery backup for data retention. You will need to replace the battery unit when it runs down.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press <Del> or <ESC> immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Access advanced hardware settings and Hardware Monitor

Chipset – Chipset settings and options

Security – Set admin and user passwords, access secure boot options

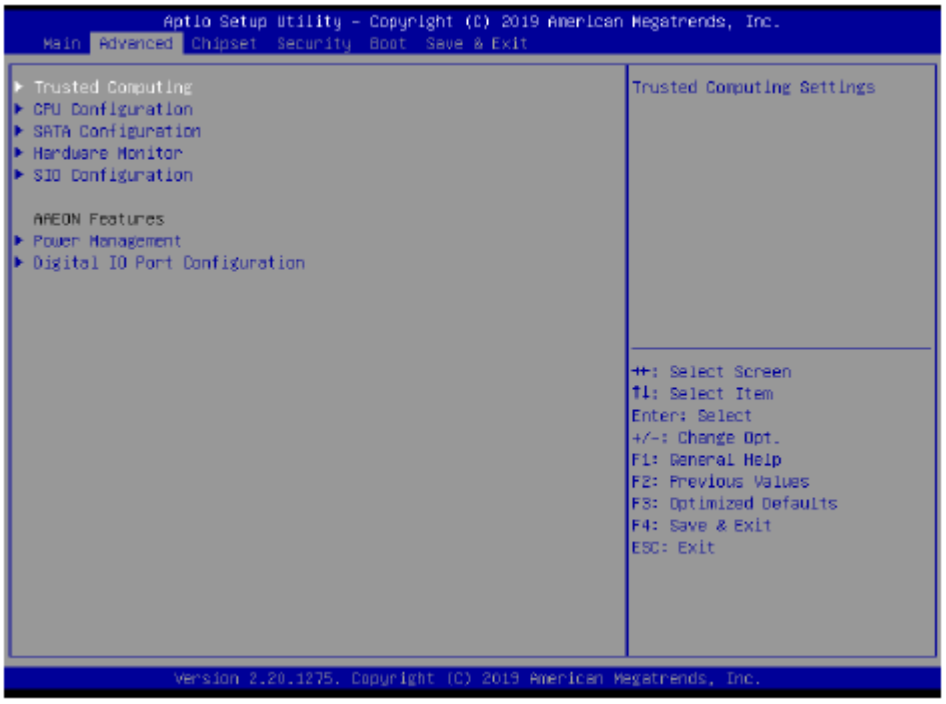
Boot – Boot options including BBS priority and Quiet Boot options

Save & Exit – Save your changes and exit the program

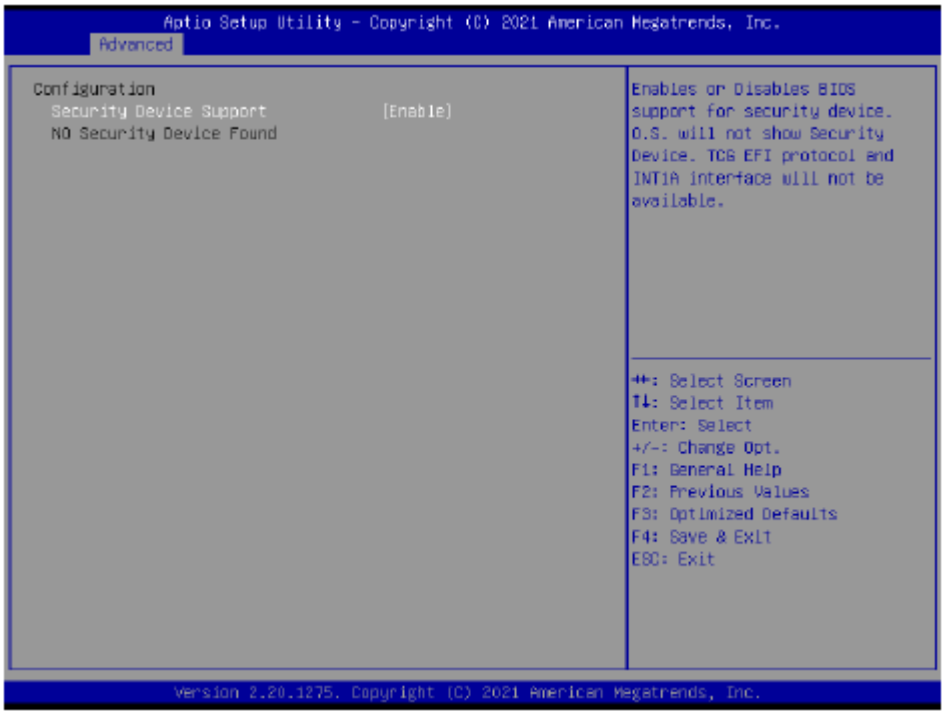
Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.

3.3 Setup Submenu:Main

3.4 Setup Submenu: Advanced



3.4.1 Trusted Computing



Options Summary		
Security Device Support	Disable	
	Enable	Optimal Default, Failsafe Default
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.		
SHA-1 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA-1 PCR Bank		
SHA256 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA256 PCR Bank		
Pending Operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.		

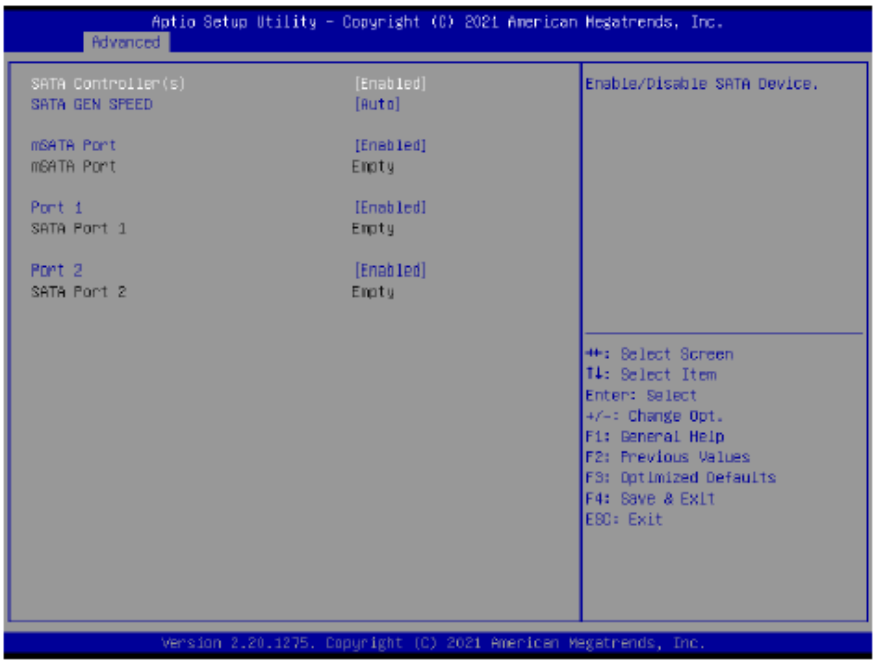
Options Summary		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable Platform Hierarchy		
Storage Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Storage Hierarchy		
Endorsement Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Endorsement Hierarchy		
TPM2.0 UEFI Spec Version	TCG_1_2	
	TCG_2	Optimal Default, Failsafe Default
Select the TCG2 Spec Version Support, TCG_1_2: Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later		
Physical Presence Spec Version	1.2	
	1.3	Optimal Default, Failsafe Default
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.		

3.4.2 CPU Configuration

Options Summary		
Hyper-Threading	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Hyper-Threading Technology		
Active Processor Cores	All	Optimal Default, Failsafe Default
	*	
Number of cores to enable in each processor package.		
Intel (VMX) Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
C-States	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable C States.		
Intel(R) SpeedStep(tm)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported.		

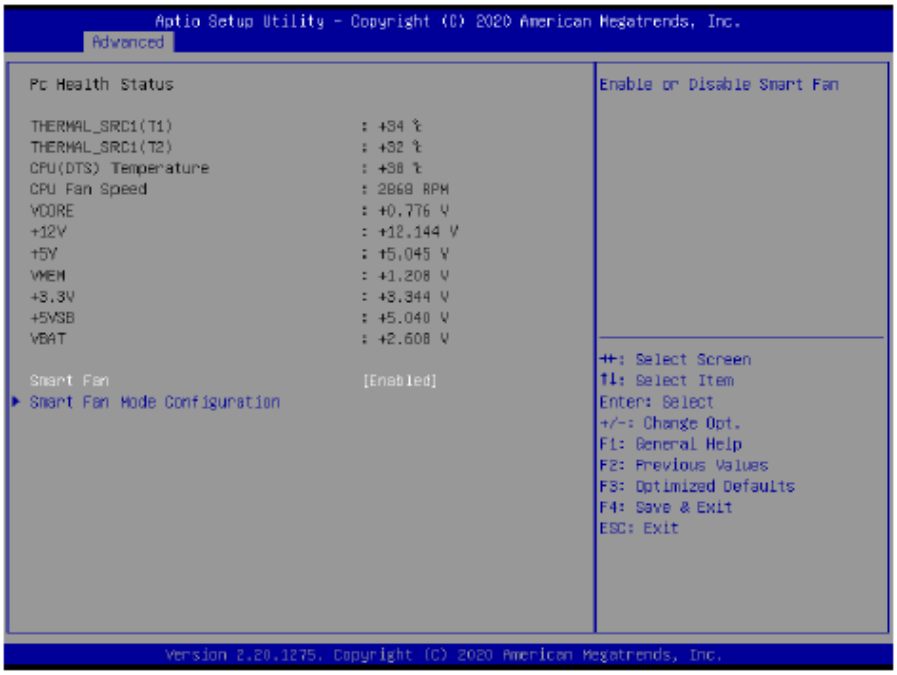
Options Summary		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Turbo mode		

3.4.3 SATA Configuration



Options Summary		
SATA Controller(s)	Disabled Enabled	Optimal Default, Failsafe Default
Enable/Disable SATA Device.		
SATA GEN SPEED	Auto	Optimal Default; Failsafe Default
	GEN1	
	GEN2	
	GEN3	
SATA GEN SPEED SELECTION		
mSATA port	Disabled Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		
Port *	Disabled Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		

3.4.4 Hardware Monitor



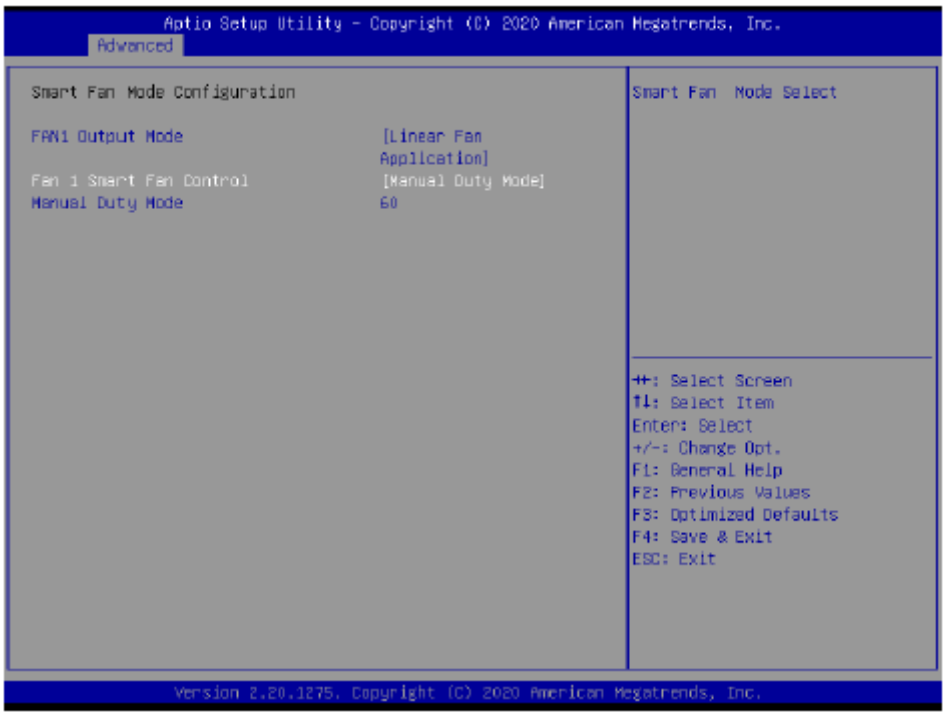
Options Summary		
Smart Fan	Disabled Enabled	Optimal Default; Failsafe Default
Enable or Disable Smart Fan		

3.4.4.1 Smart Fan Mode Configuration

Auto Duty Cycle Mode

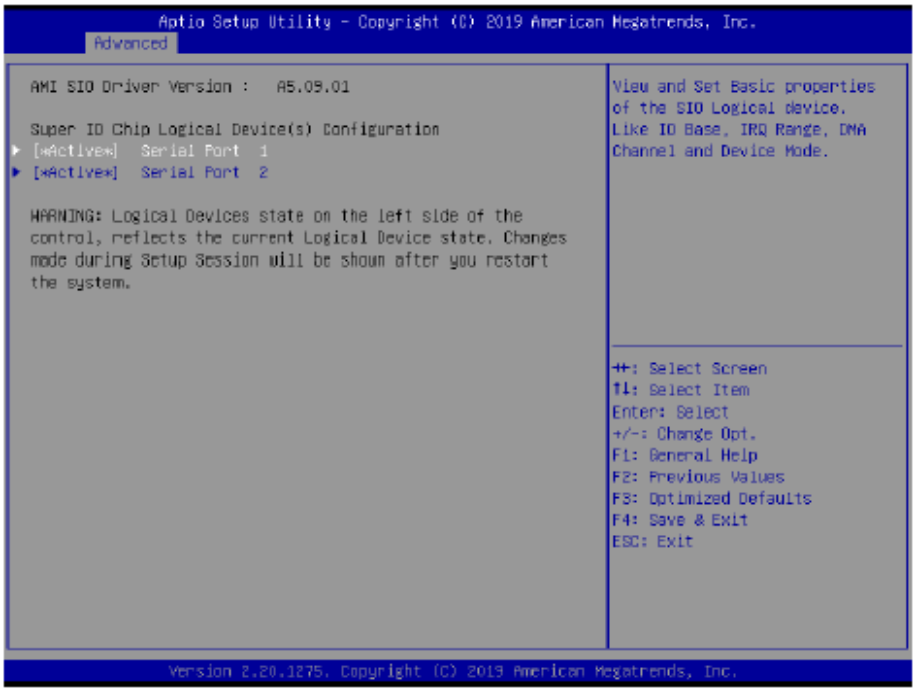
Options Summary		
FAN1 Output mode	Output PWM mode (open drain)	Optimal Default, Failsafe Default
	Linear Fan Application	
	Output PWM mode (push pull)	
FAN1 Output mode select: Output PWM mode (push pull) to control 4-wire fans. Linear fan application circuit to control 3-wire fan speed by fan's power terminal. Output PWM mode (open drain) to control Intel 4-wire fans.		
Fan 1 Smart Fan Control	Manual Duty Mode	Optimal Default, Failsafe Default
	Auto Cycle Mode	
Smart Fan Mode Select		
Temperature Source	CPU Temperature	Optimal Default, Failsafe Default
	System Temperature	
	System Temperature 2	
Select the monitored temperature source for this fan.		
Duty Cycle Temperature	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100	

Manual Duty Mode

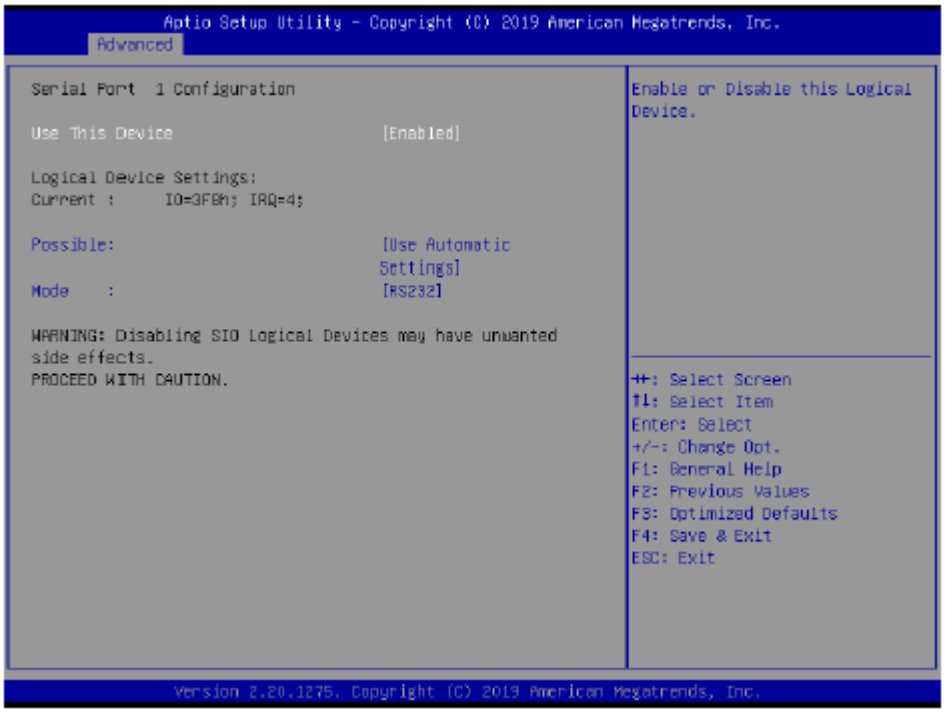


Options Summary		
Manual Duty Mode	60	Optimal Default, Failsafe Default
Manual mode fan control, user can write expected duty cycle (PWM fan type) 1-100		

3.4.5 SIO Configuration

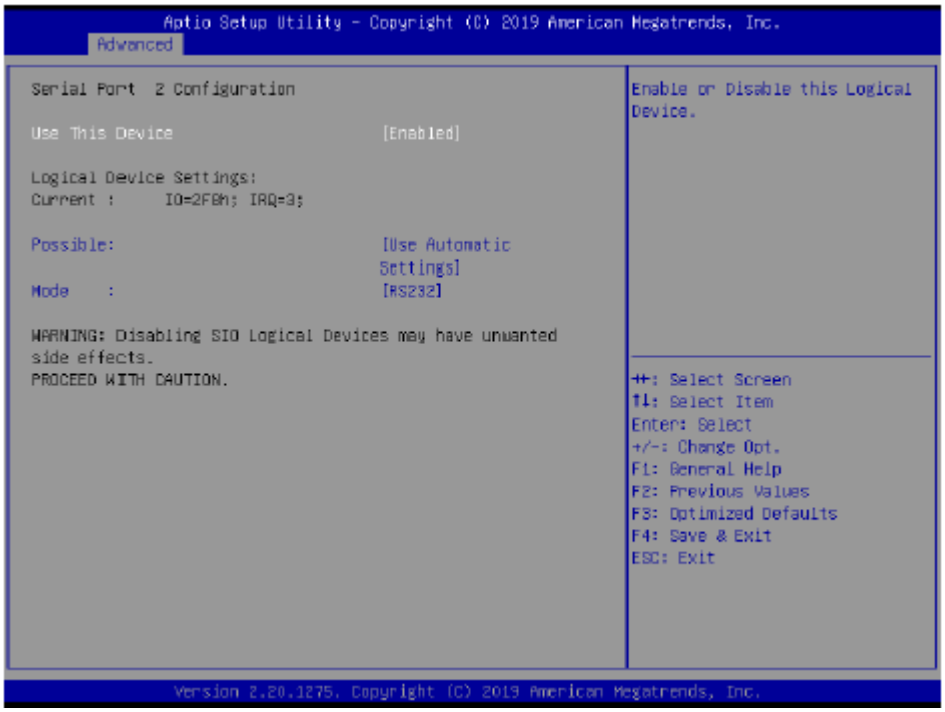


3.4.5.1 Serial Port 1 Configuration



Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection		

3.4.5.2 Serial Port 2 Configuration

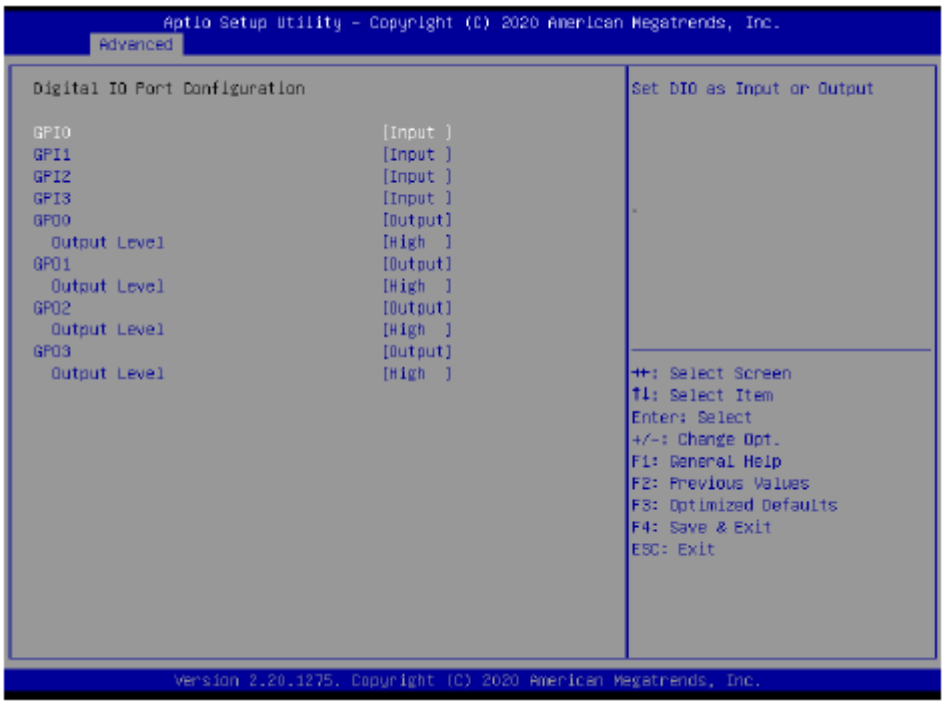


Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection		

3.4.6 Power Management

Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode		
Restore AC Power Loss	Last State	Optimal Default, Failsafe Default
	Always On	
	Always Off	
IO Restore AC power Loss		
RTC wake system from S5	Disable	Optimal Default, Failsafe Default
	Fixed Time	
	Dynamic Time	
Fixed Time: System will wake on the hr::min::sec specified./n Dynamic Time: System will wake on the current time + Increase minute(s)		
Wake on LAN Enable	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable integrated LAN to wake the system.		

3.4.7 Digital IO Port Configuration

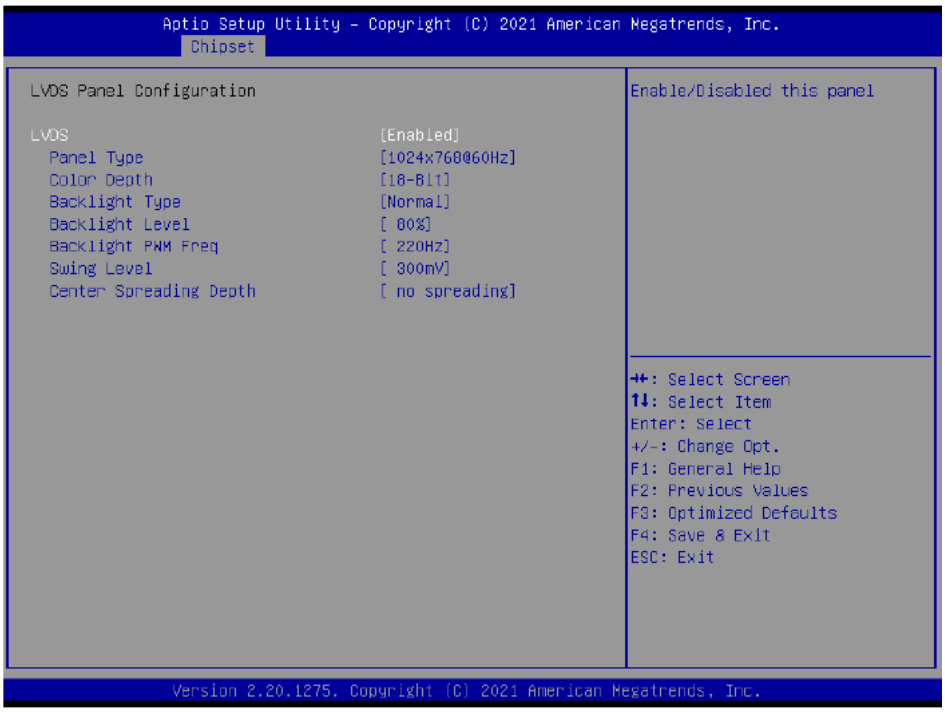


Options Summary		
GPI*	Output	
	Input	
Set DIO as Input or Output		
GPO*	Output	
	Input	
Set DIO as Input or Output		
Output Level	High	Optimal Default; Failsafe Default
	Low	
Set output level when DIO pin is output		

3.5 Setup Submenu: Chipset

3.5.1 System Agent （SA） Configuration

3.5.1.1 LVDS Panel Configuration

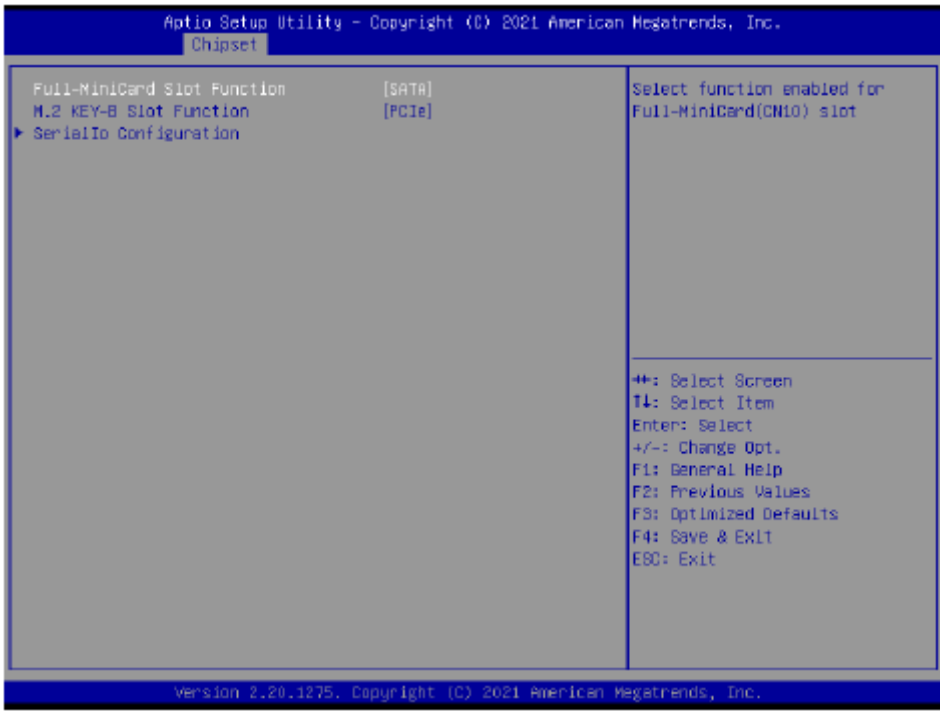


Options Summary		
LVDS	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable this panel.		
LVDS Panel Type	640X480@60HZ	
	800X480@60HZ	
	800X600@60HZ	
	1024X600@60HZ	
	1024X768@60HZ	Optimal Default, Failsafe Default
	1280X768@60HZ	
	1280X800@60HZ	
	1280X1024@60HZ	
	1366X768@60HZ	
	1440X900@60HZ	
	1600X1200@60HZ	
	1920X1080@60HZ	
	1920X1200@60HZ	

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.		
Color Depth	18-bit	Optimal Default, Failsafe Default
	24-bit	
	36-bit	
	48-bit	
Select color depth		
Backlight Type	Normal	Optimal Default, Failsafe Default
	Inverted	
Select backlight control signal type		
Backlight Level	0%	Optimal Default, Failsafe Default
	10%	
	20%	
	30%	
	40%	
	50%	
	60%	
	70%	
	80%	
	90%	
	100%	
Select backlight control level		
Backlight PWM Freq	100Hz	Optimal Default, Failsafe Default
	200Hz	
	220Hz	
	500Hz	
	1.1KHz	
	2.2KHz	
	6.5KHz	
Select PWM frequency of backlight control signal		
Swing Level	150mV	Optimal Default, Failsafe Default
	200mV	
	250mV	
	300mV	
	350mV	
	400mV	
	450mV	
Select Swing Level		

Center Spreading Depth	no spreading	Optimal Default, Failsafe Default
	0.5%	
	1.0%	
	1.5%	
	2.0%	
	2.5%	
Select Center Spreading Depth		

3.5.2 PCH-IO Configuration



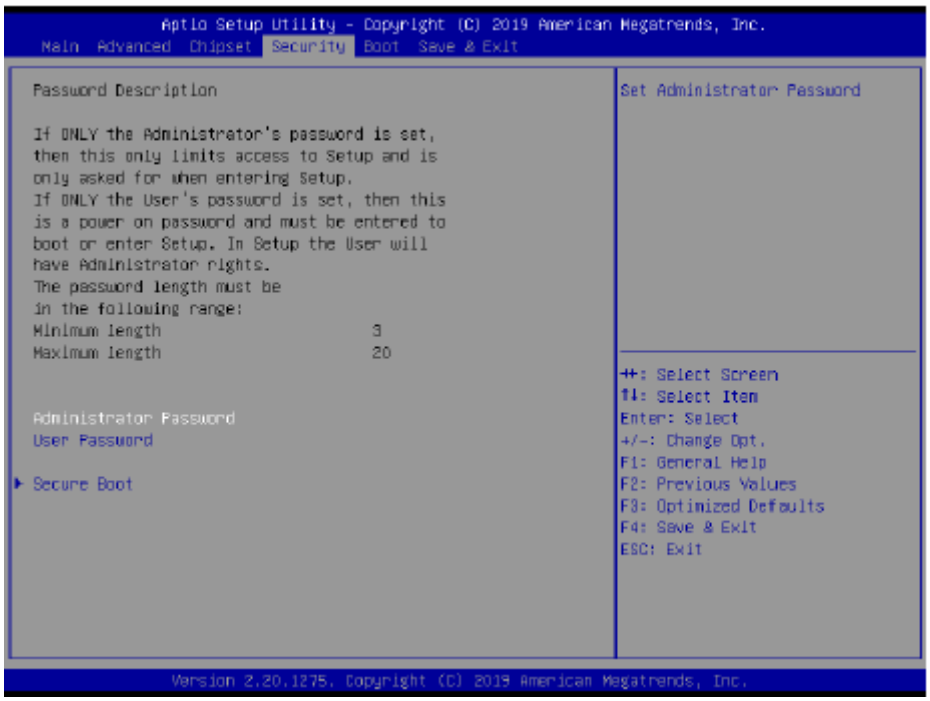
Options Summary		
Full-MiniCard Slot Function	SATA PCIe	Optimal Default, Failsafe Default
Select function enabled for Full-MiniCard(CN10) Slot		
M.2 KEY-B Slot Function	SATA PCIe	Optimal Default, Failsafe Default
Select function enabled for M.2 KEY-B(CN30) Slot		

3.5.2.1 Serial IO Configuration

Options Summary		
I2C3 Controller	Disabled	
	Enabled	Optimal Default, Failsafe Default

Enables/Disables Serial IO Controller
If given device is Function 0 PSF disabling is skipped. PSF default will remain and device PCI CFG Space will still be visible. This is needed to allow PCI enumerator access functions above 0 in a multifunction device. The following devices depend on each other:
I2C0 and I2C1,2,3
UART0 and UART1,SPI0,1
UART2 and I2C4,5
UART0 (00:30:00) cannot be disabled when:
1. Child device is enabled like CNVi Bluetooth (_SB.PCI0.UA00.BTH0)
UART0 (00:30:00) cannot be enabled when:
1. I2S Audio codec is enabled (_SB.PCI0.I2C0.HDAC)

3.6 Setup Submenu: Security



Change User/Administrator Password

You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

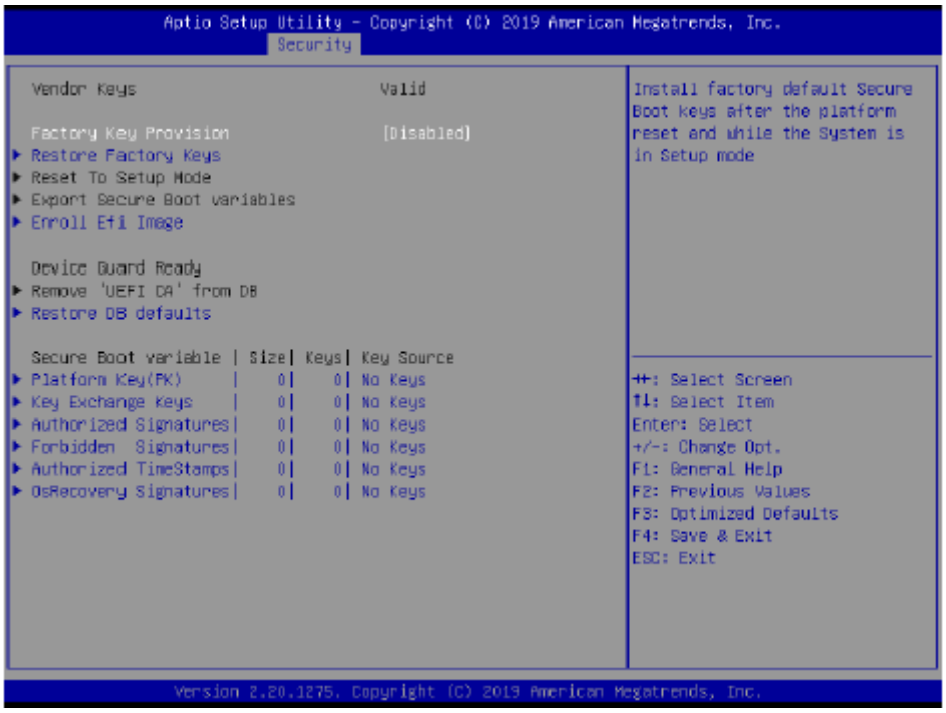
Removing the Password

Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Secure Boot

Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
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 Mode	Custom	Optimal Default, Failsafe Default
	Standard	
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		
Force System to User Mode. Install factory default Secure Boot key databases		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM		

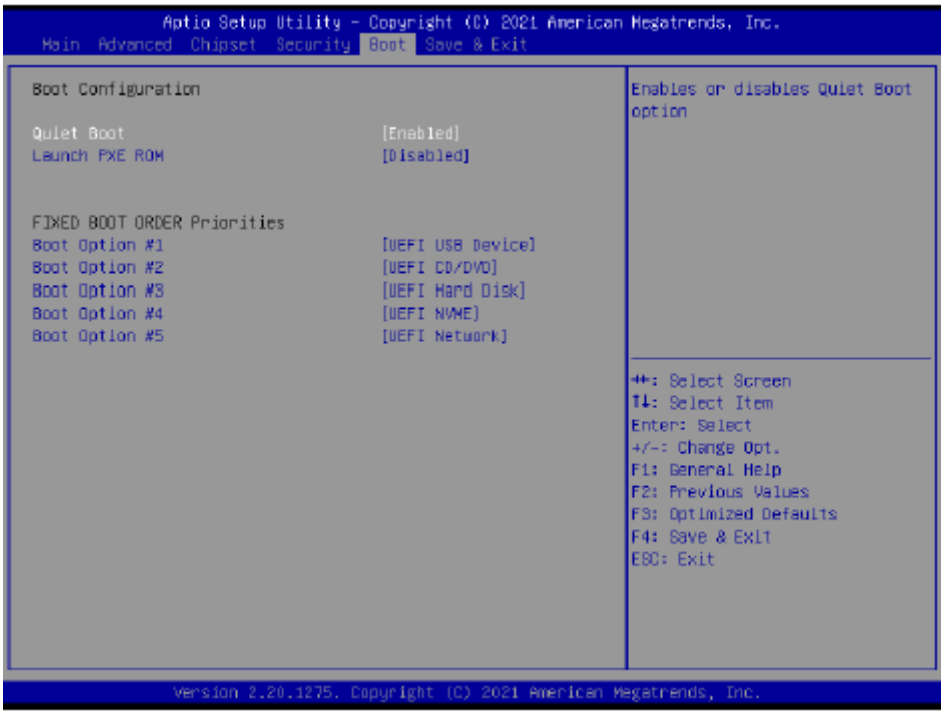
3.6.1.1 Key Management



Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
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		
Restore Factory Keys		
Force System to User Mode. Install factory default Secure Boot key databases		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM		
Export Secure Boot variables		
Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device		
Enroll Efi Image		
Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)		

Remove 'UEFI CA' from DB		
Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db)		
Restore DB defaults		
Restore DB variable to factory defaults		
Platform Key(PK)	Details	
	Export	
	Update	
	Delete	
Key Exchange Keys	Details	
	Export	
	Update	
	Append	
	Delete	
Authorized Signatures	Details	
	Export	
	Update	
	Append	
	Delete	
Forbidden Signatures	Details	
	Export	
	Update	
	Append	
	Delete	
Authorized TimeStamps	Update	
	Append	
Os Recovery Signatures	Update	
	Append	
Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2. Authenticated UEFI Variable 3. EFI PE/COFF Image (SHA256) Key Source: Factory, External, Mixed		

3.7 Setup Submenu: Boot



Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable showing boot logo.		
Launch PXE ROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
Controls the execution of UEFI Network OpROM		

3.8 Setup Submenu: Save & Exit

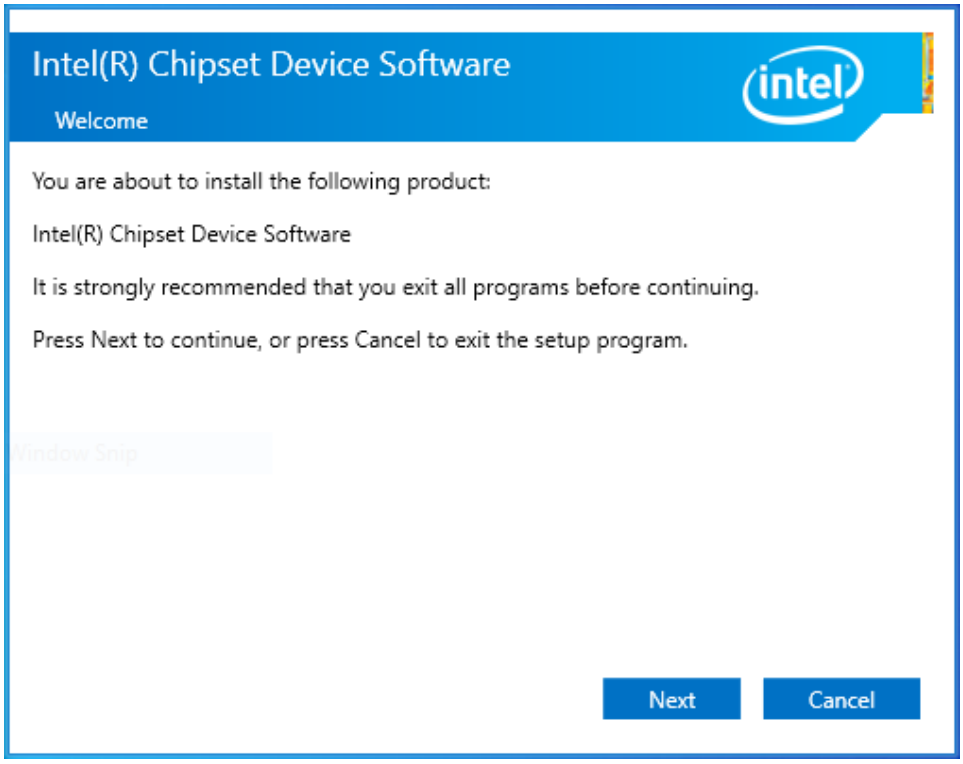
Chapter 4 Installation of Drivers

4.1 Intel® 8th Generation Core Chipset

To install the Intel® 8th Generation Core Chipset, please follow the steps below.

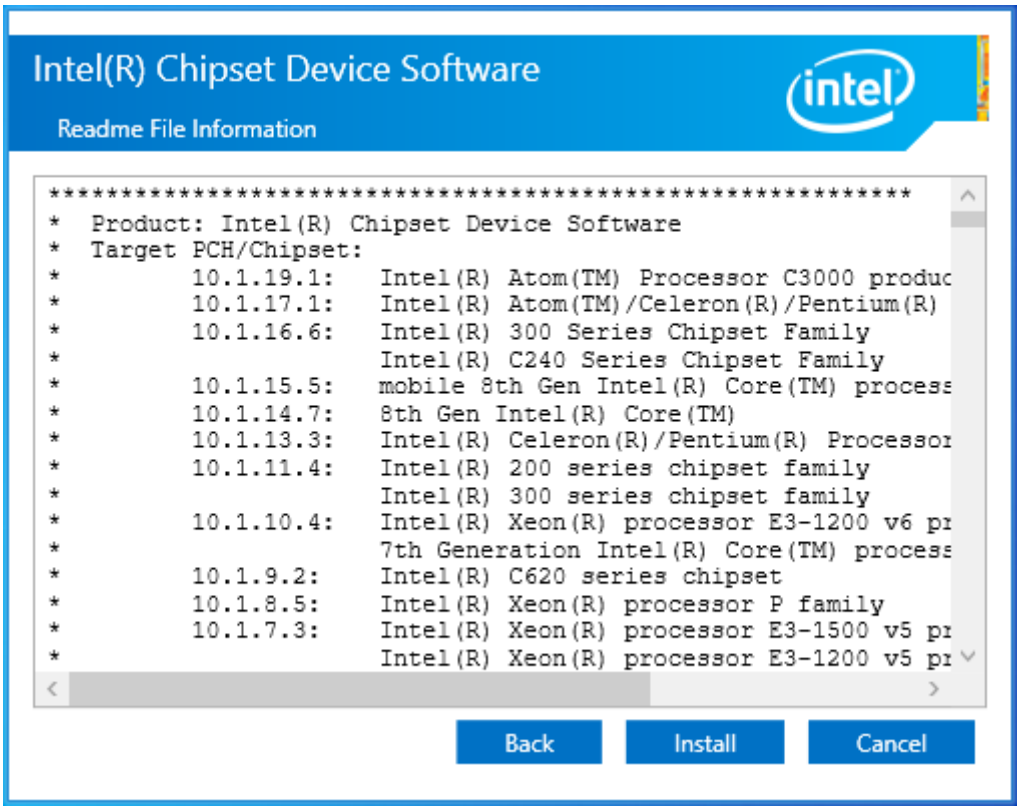
Step 1. Select **Intel® 8th Generation Core Chipset** from the list

Step 2. Here is welcome page. Please make sure you save and exit all programs before install**.** Click **Next.**



Step3. Read the license agreement. Click **Accept** to accept all of the terms of the license agreement.

Step4. Click **Install** to begin the installation.



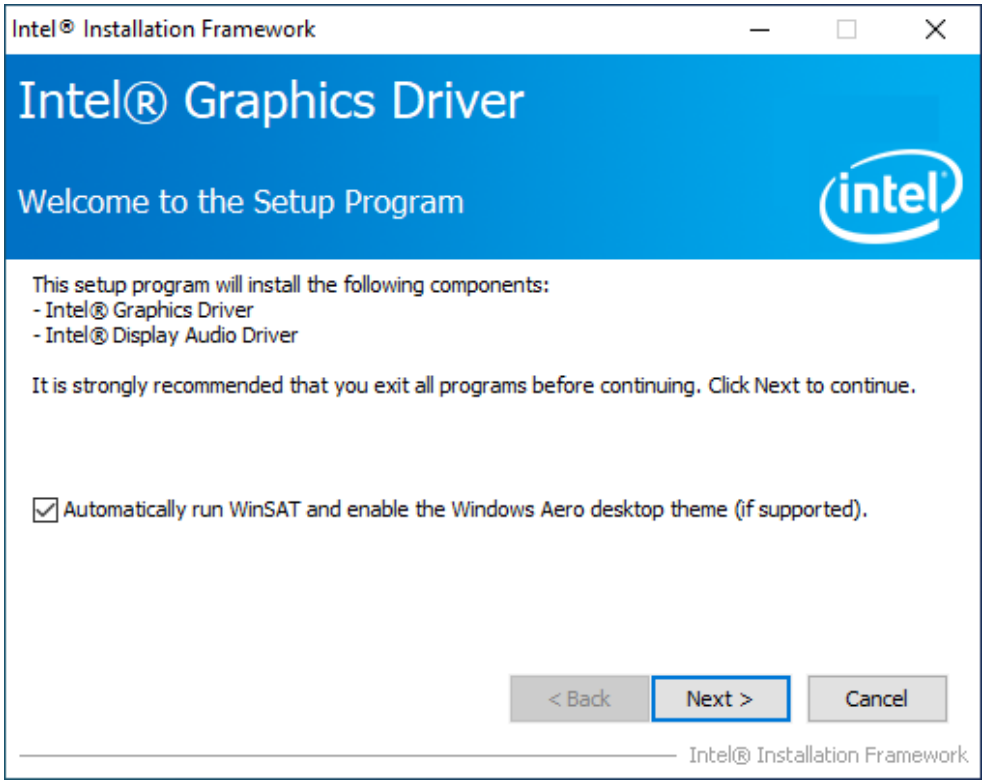
Step5. Select **Restart Now** to reboot your computer for the changes to take effect.

4.2 Intel® VGA Chipset

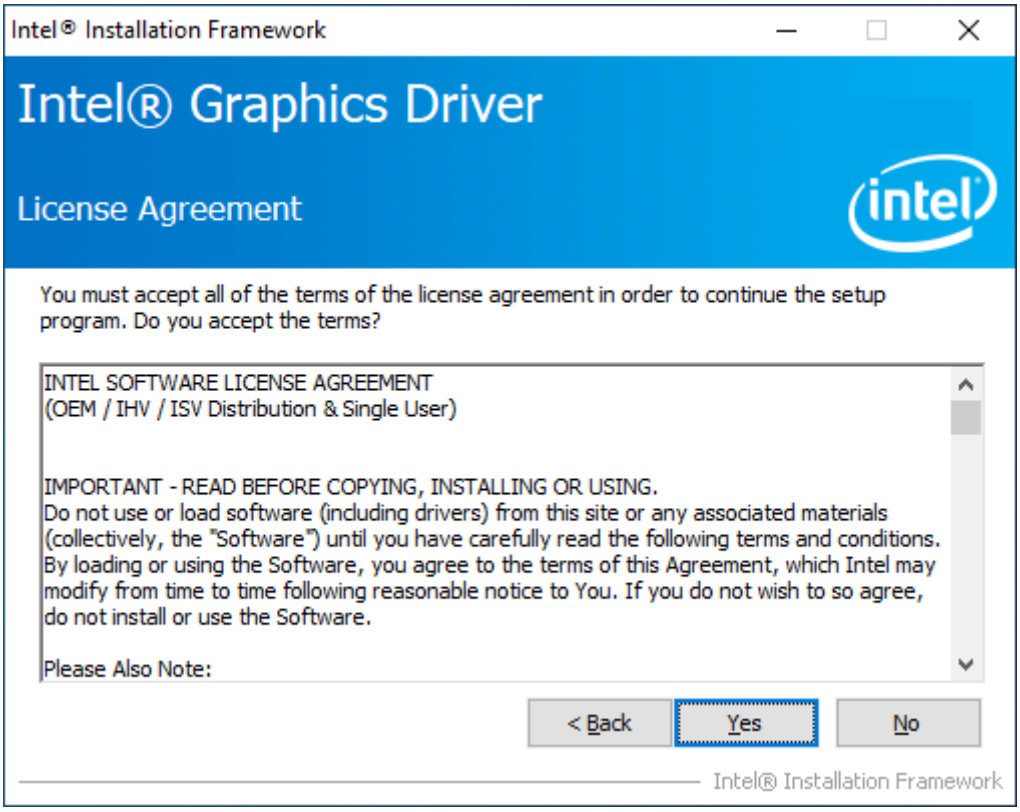
To install the Intel® VGA Chipset, please follow the steps below.

Step 1. Select **Intel® VGA Chipset** from the list**.**

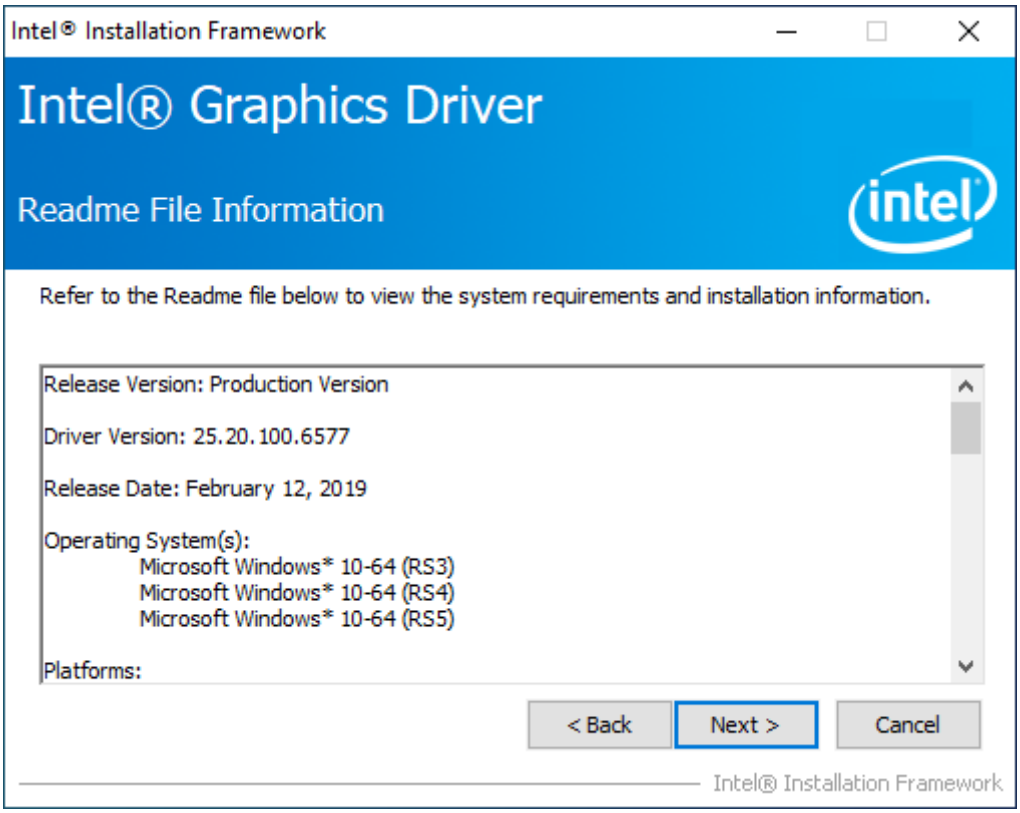
Step2. Click **Next.**



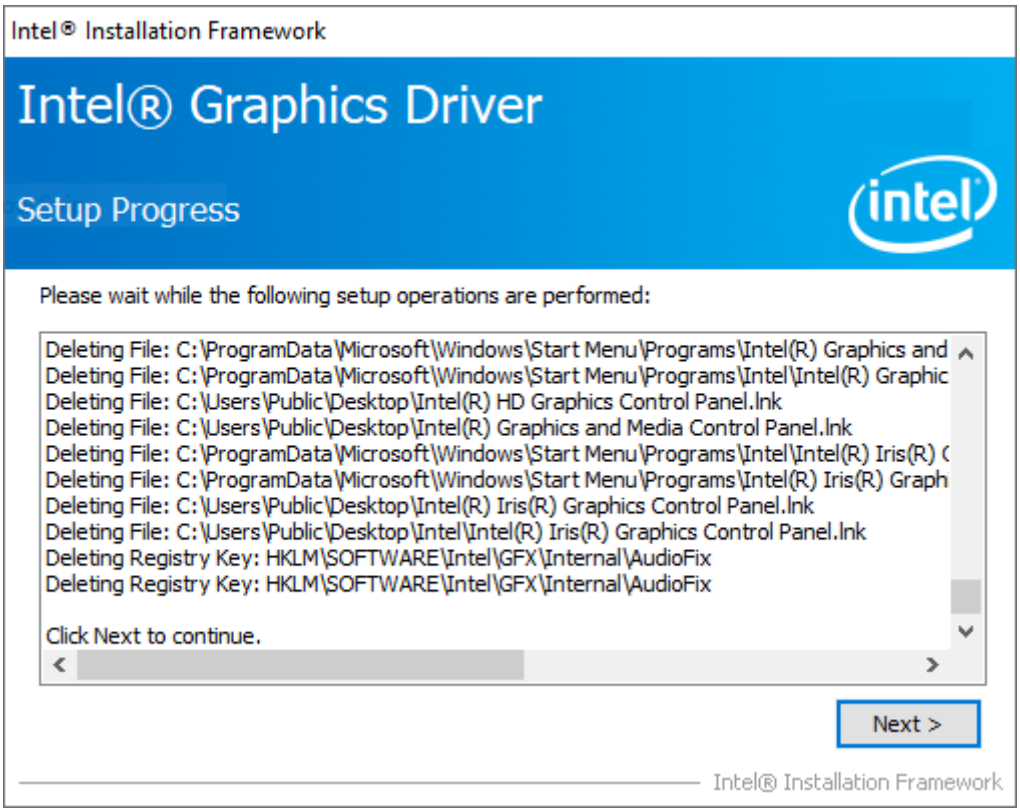
Step3. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



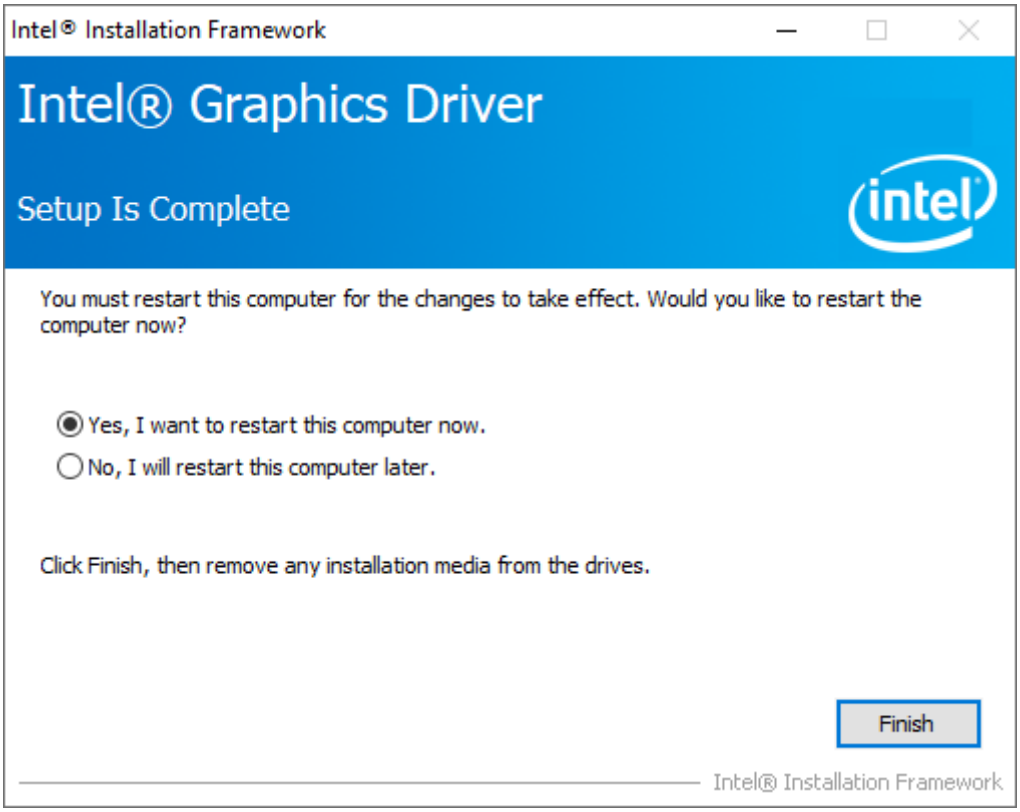
Step4. Click **Next** to continue.



Step7. Click **Next** to continue the program.



Step8. Select **Yes, I want to restart this computer now**. Click **Finish** to complete installation.

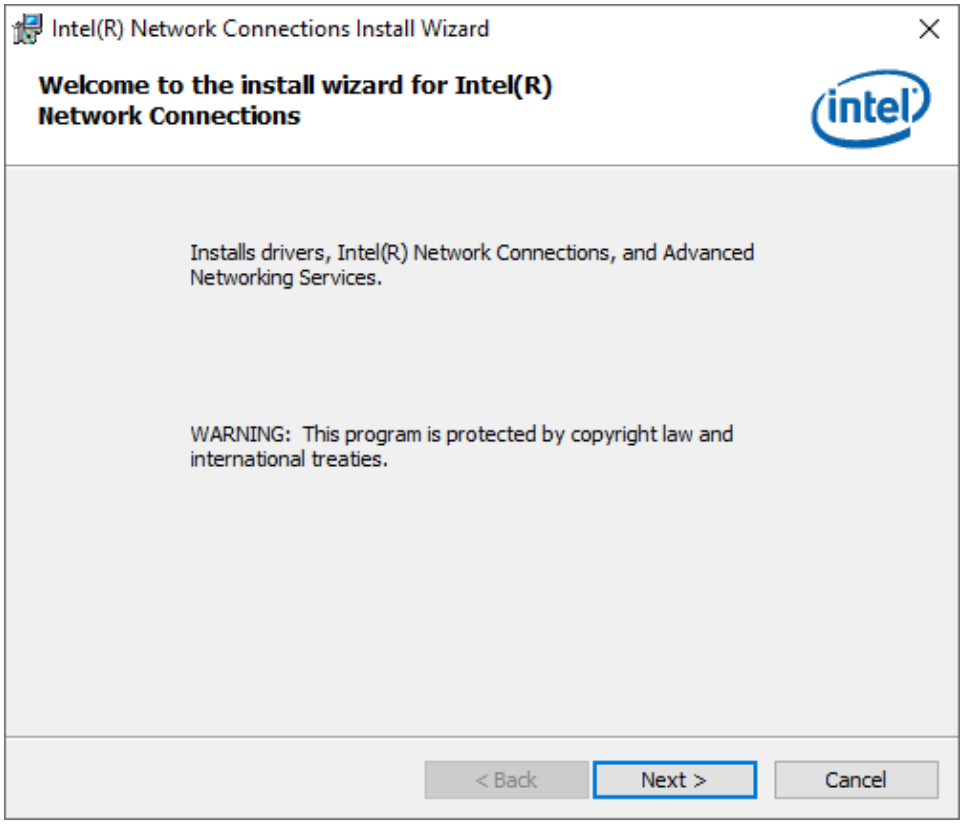


4.3 Intel® LAN Driver

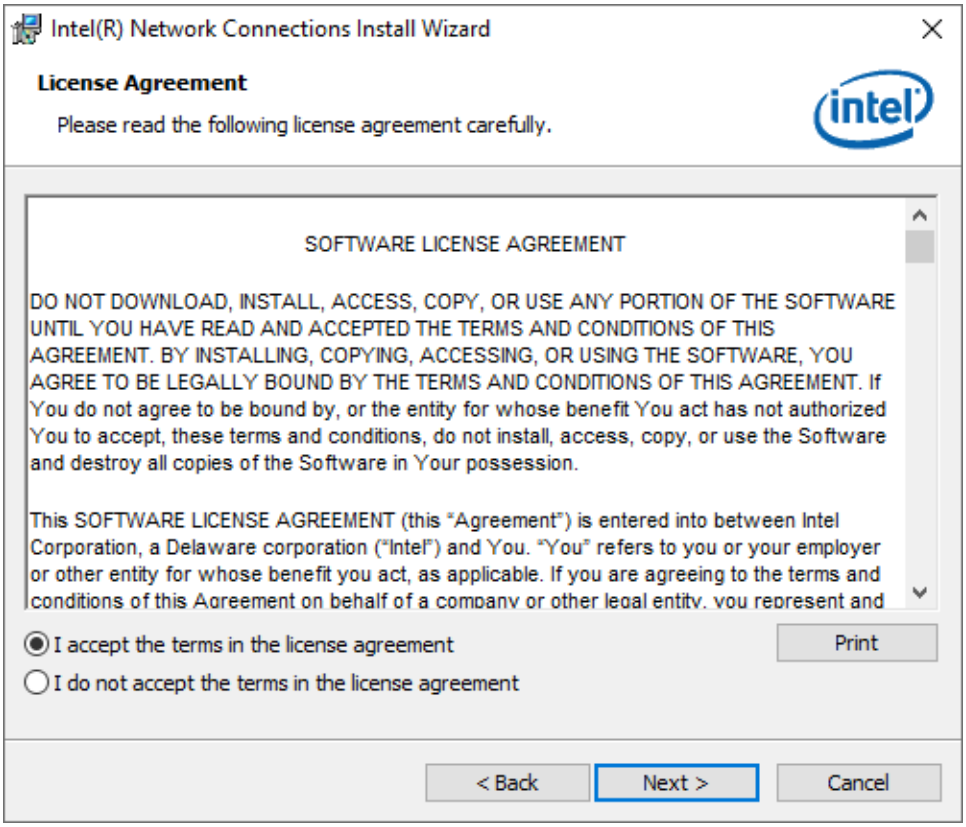
To install the Intel® LAN Driver, please follow the steps below.

Step1. Select **Intel® LAN Driver** from the list

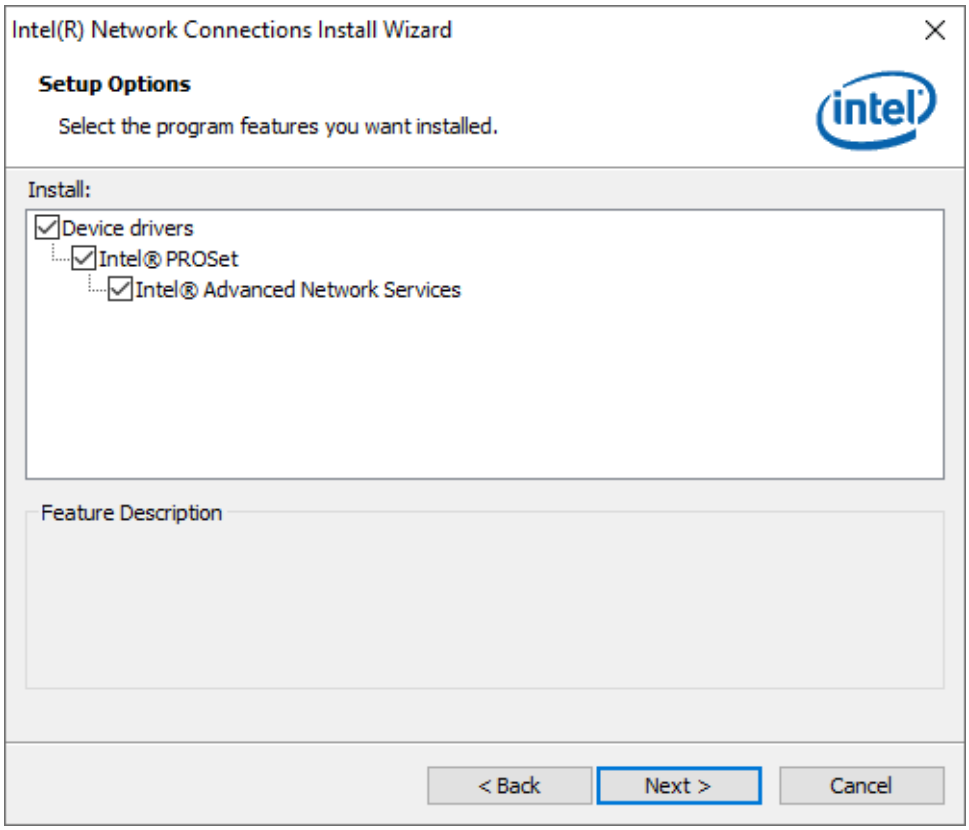
Step2. Click **Next** to continue.



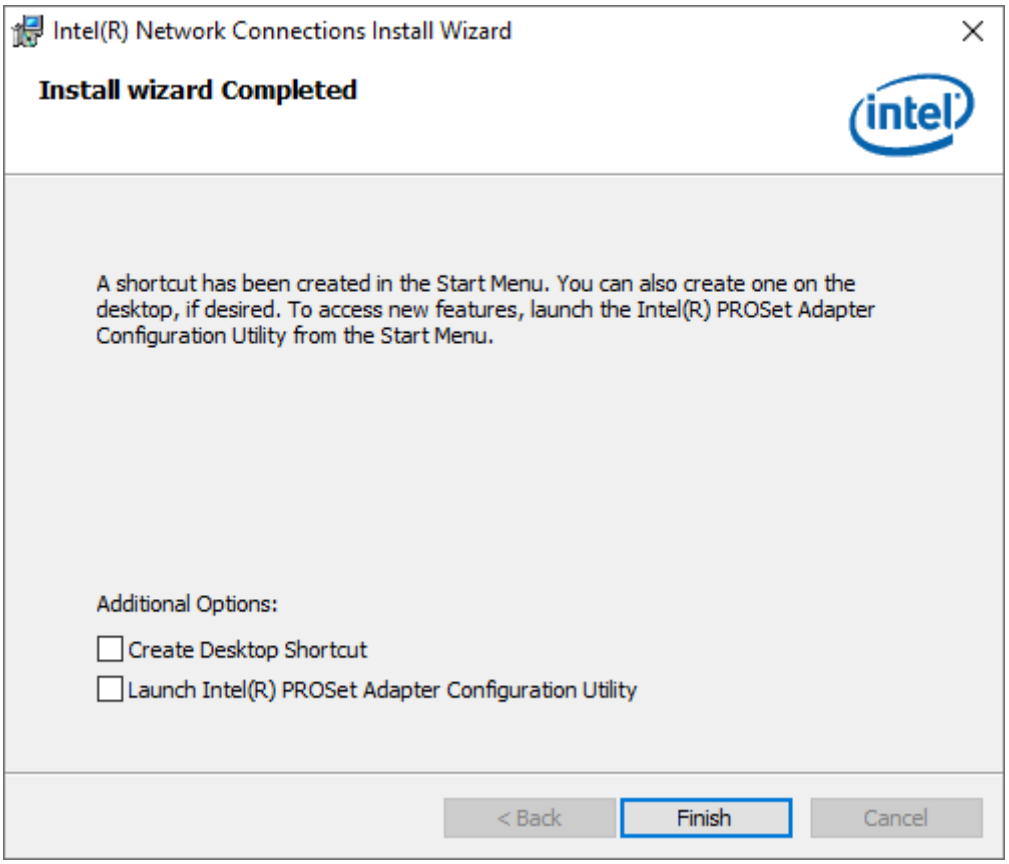
Step3. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



Step4. Click **Next** to continue.



Step5. Click **Finish** to complete the installation.

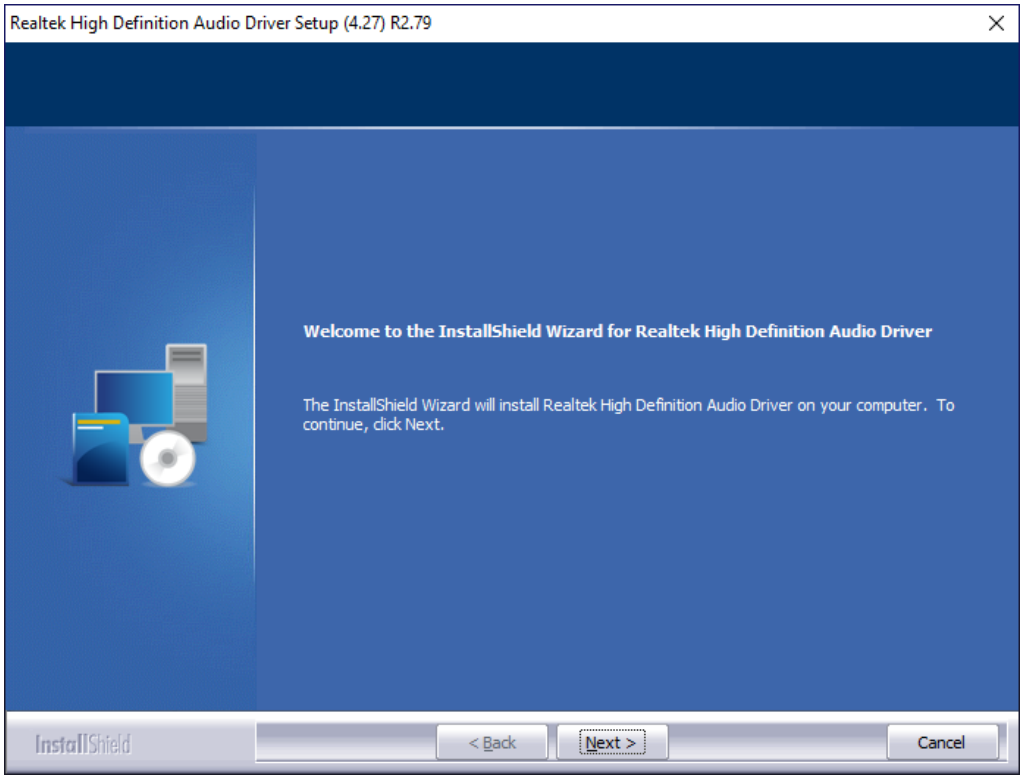


4.4 Realtek Audio Driver

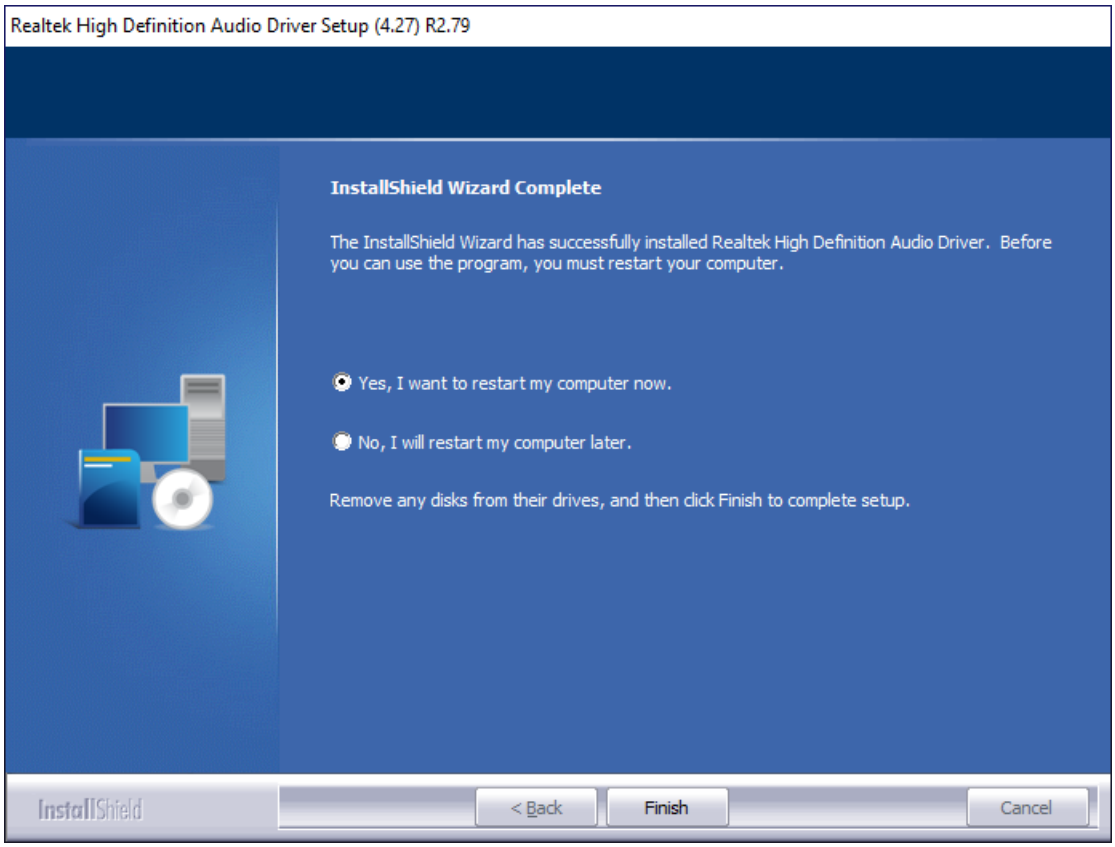
To install the Realtek Audio Driver, please follow the steps below.

Step1. Select **Realtek Audio Driver** from the list

Step2. Select setup language you need. Click **Next** to continue.



Step3. Click **Finish** to complete the installation.

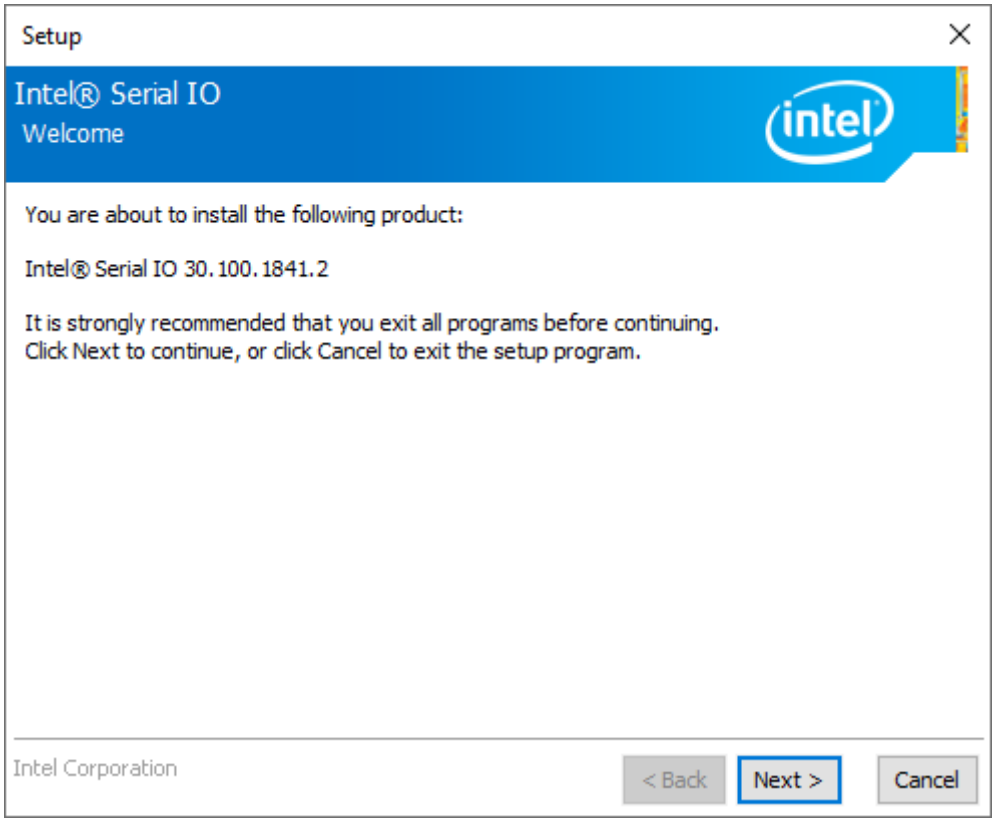


4.5 Intel Serial IO Driver

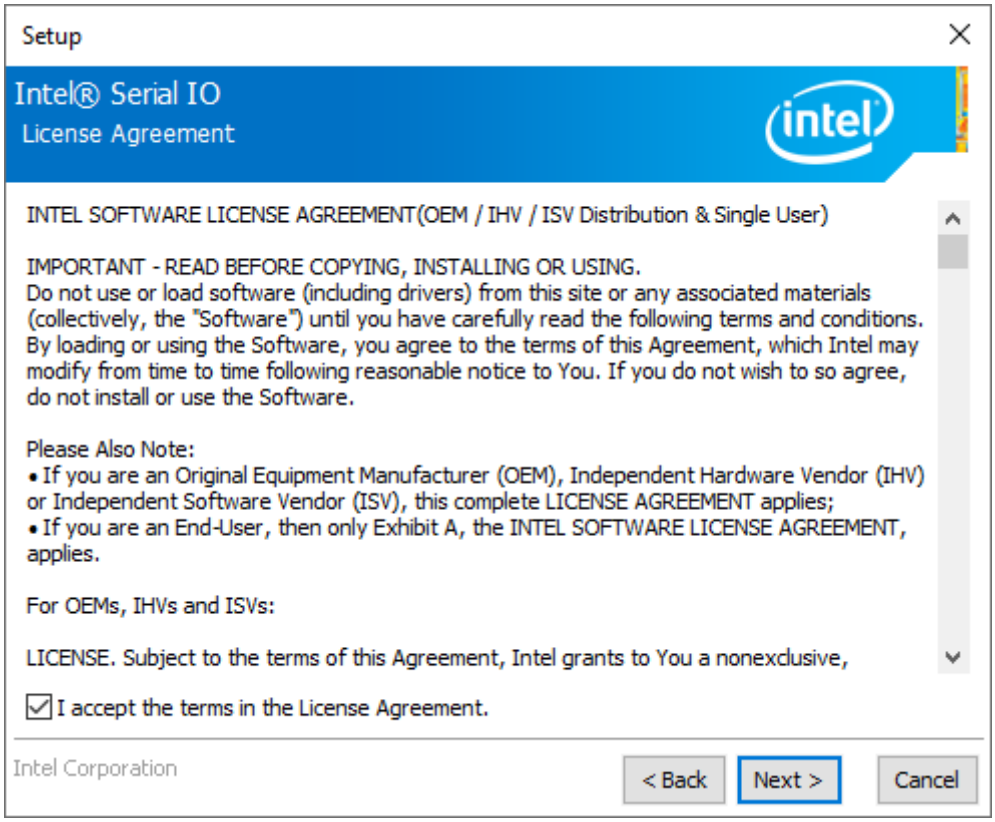
To install the Intel Serial IO Driver, please follow the steps below.

Step1. Select **Intel Serial IO Driver** from the list

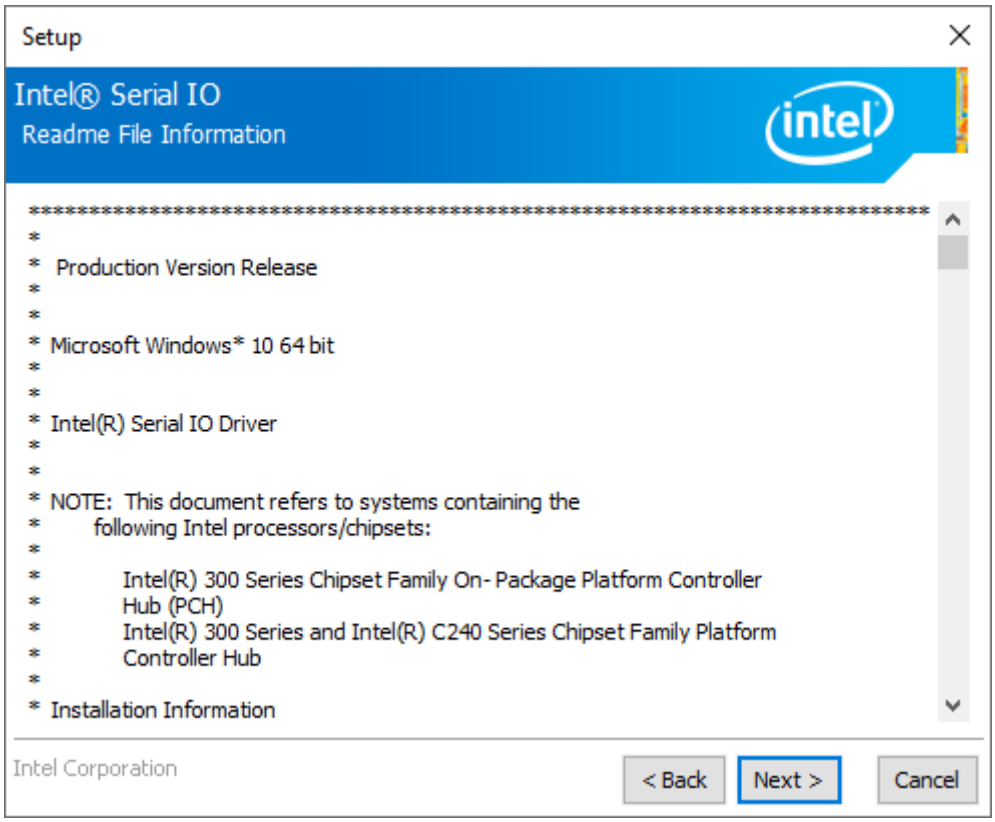
Step2. Click **Next** to continue.



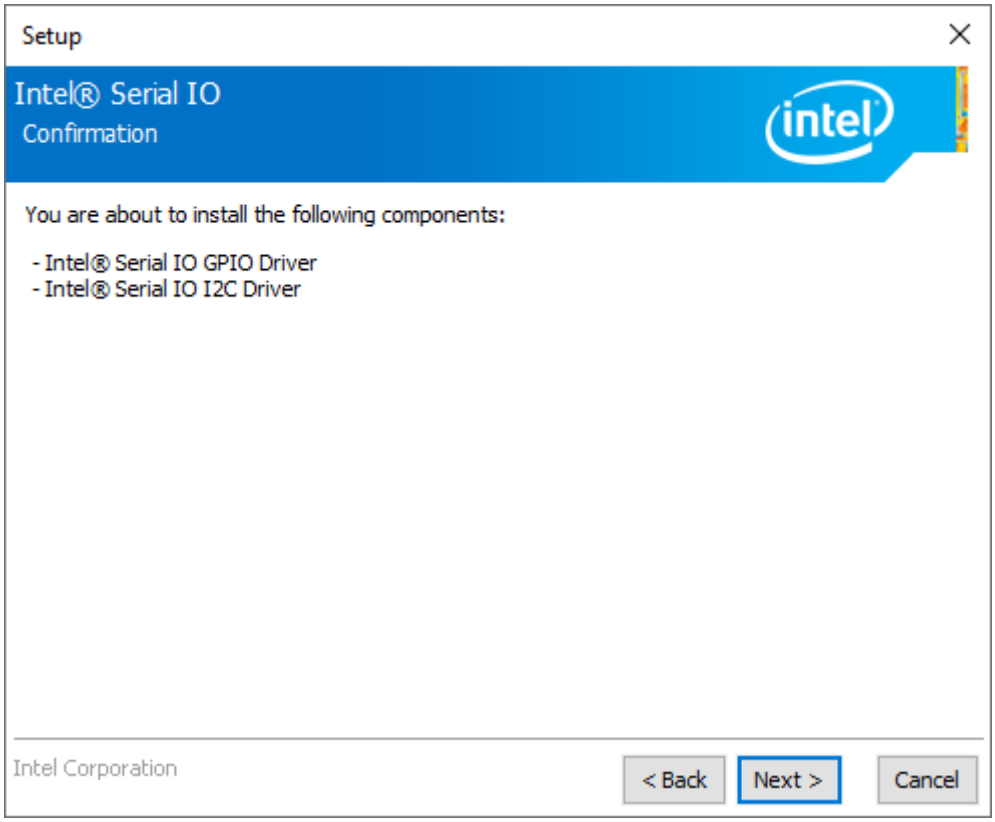
Step3. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



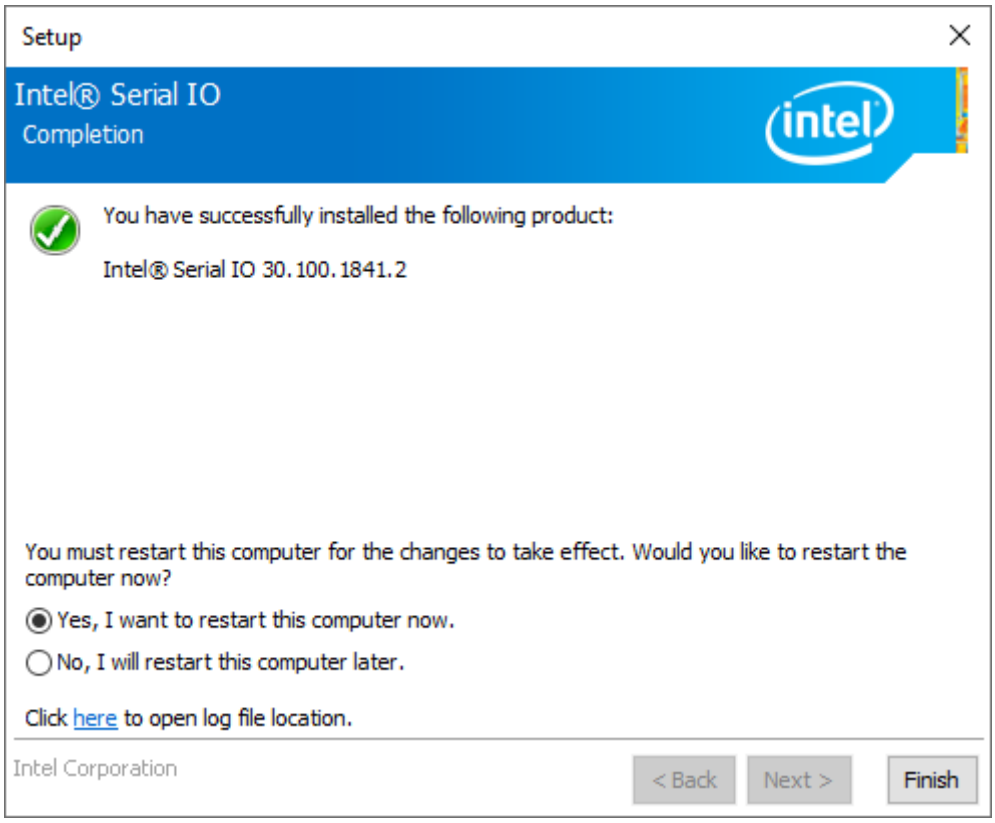
Step4. Click **Next** to continue.



Step5. Click **Install** to continue the installing.



Step6. Click **Finish** to complete the installation and **restart** computer immediately.

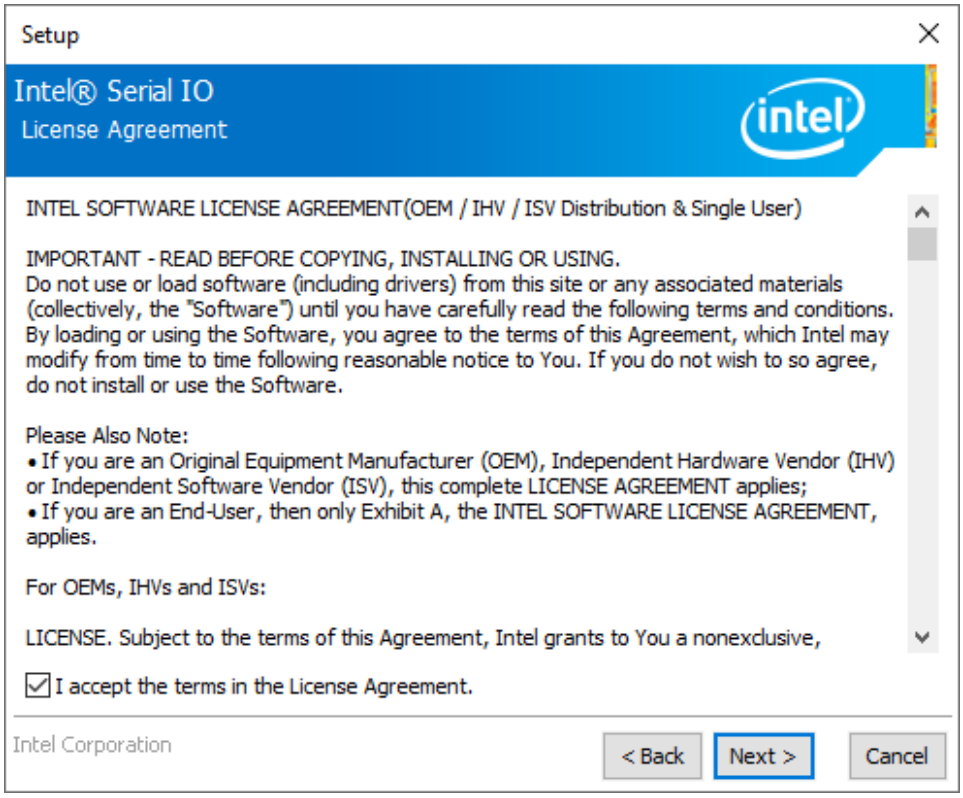


4.6 Resistive Touch Driver

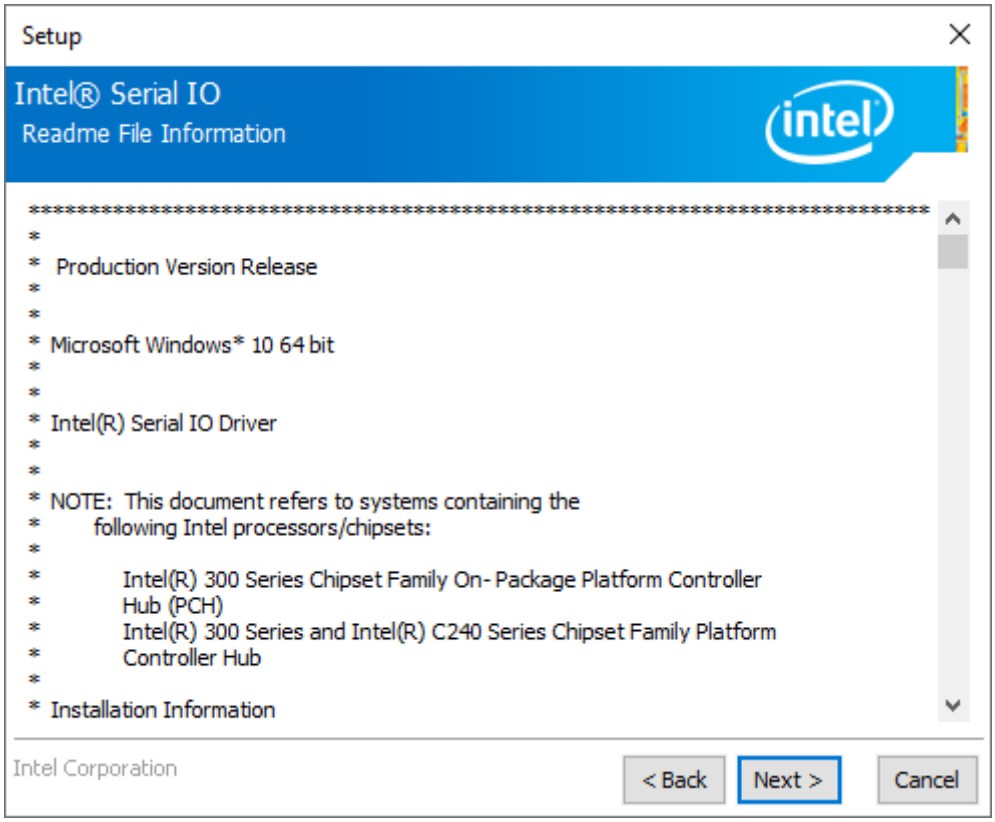
To install the **Resistive Touch Driver**, please follow the steps below.

Step1. Select **Resistive Touch Driver** from the list

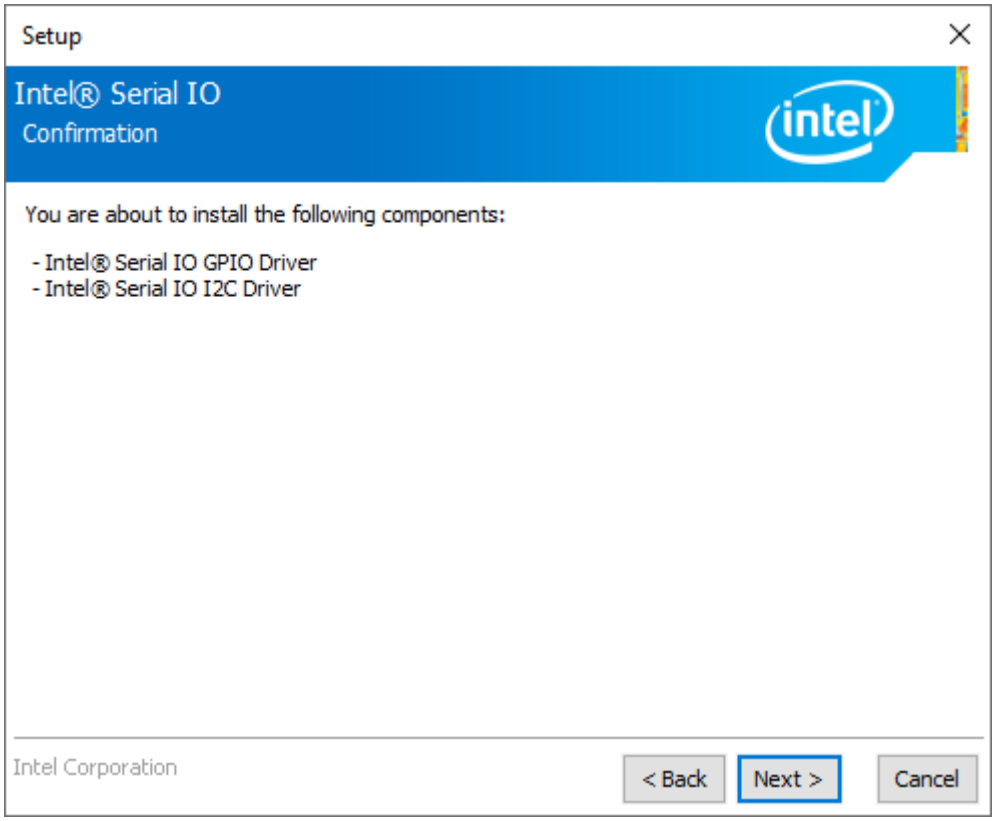
Step2. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



Step3. Click **Next** to continue.



Step4. Click **Next** to continue.



Step5. Click **Finish** to complete the installation and **restart** computer immediately.