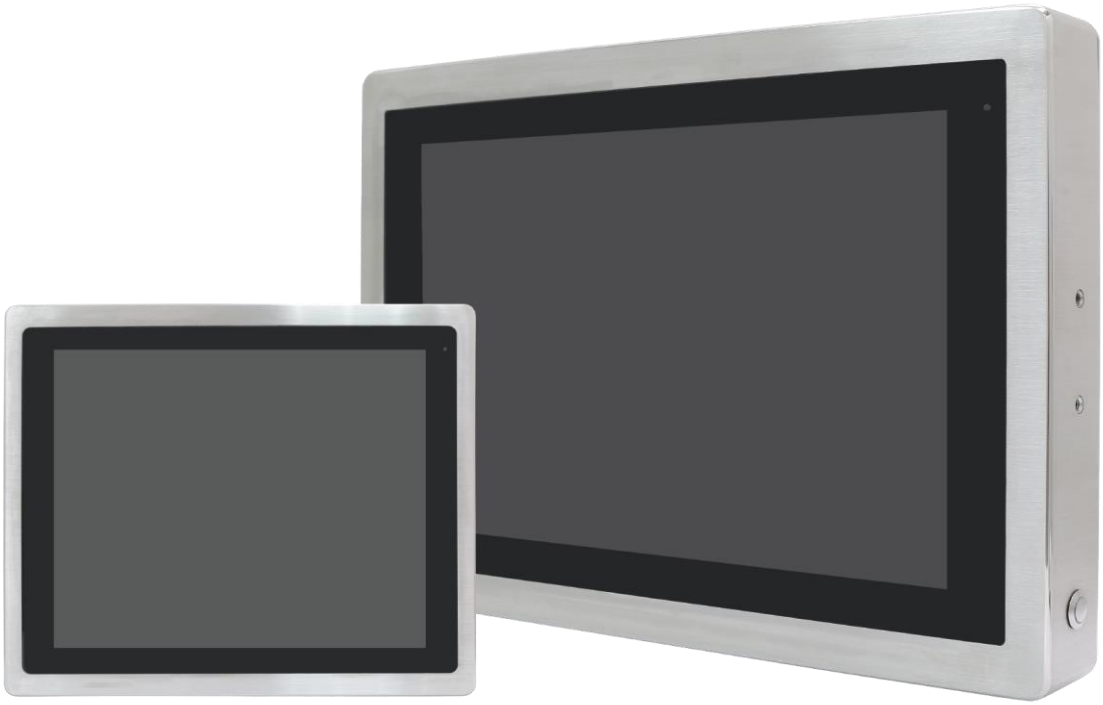

VITAM-9XXB Series

Fanless Stainless Steel Panel PC

User Manual

Release Date	Revision
JAN 2025	V1.2

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Revision History

Reversion	Date	Description
1.0	2022/06/14	Official Version
1.1	2023/08/10	MB change to SBC-7124
1.2	2025/1/22 2025/1/23	Add UL on page 10 Update Memory on page 7 Update Expansion slot on page 9 Correct dimension on page 10 Delete pressure screw notification

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.

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.

Table of Contents

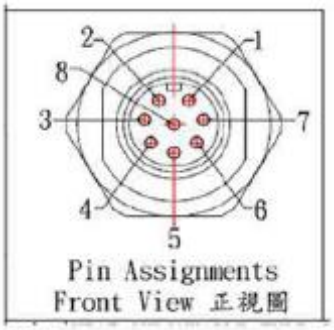
Figures

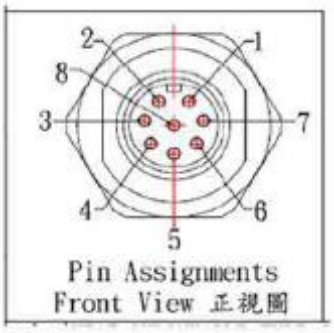
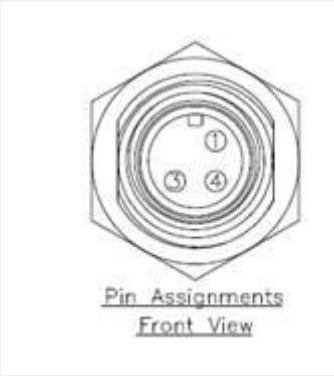
Chapter 1 Getting Started

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">1 x 260-pin SO-DIMM up to 32GB DDR4 2400MHz</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,
with waterproof cover and chain</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td></td><td><table>
<tr><th></th><th>Pin Define</th></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><th></th><th>Pin Define</th></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><th></th><th>Pin Define</th></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:
2 x USB 2.0</td></tr>
</table>

Option	1 x USB 3.2 Gen1 1 x LAN 1 x POE (via TB-528E1U2UPOE) 1 x COM port 1 x HDMI(M25) 1 x COM (via TB-528C2I, RS-422/485 isolated) 1 x LAN/2 x USB2(via TB-528E1U2) 1 x COM (viaTB-528C1U2, RS-422)					
Storage Space						
Storage	M.2 M-Key 2280 (PCIex4/SATAIII auto detect, support 2242 as default) (2280 for option, and can't use with TB-528 series, and use bracket for 2280 extension) 1 x 2.5" SATA3 HDD (option)					
Expansion						
Expansion Slot	1 x Mini-PCIe slot (PCIe/ USB2.0) for optional Wi-Fi/BT/LTE module 1 x Nano SIM card onboard					
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	450	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 1920 x 1080	1280 x1024	1280 x 1024	1920 x 1080	1920 x 1080
Max. Color	16.2M	16.7M/16.2M	16.2M	16.7M		
Luminance (cd/m^2)	1000	1000	1000	1000	1000/1500	1000
Contrast Ratio	800:1	500:1	1000:1	1000:1	3000:1	3000:1
Viewing Angle(H/V)	160/150	160/160 170/170	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%					
Power						
Power Input	DC 9~36V					
Power Consumption	MAX:43.4W (915BR) MAX:34.6W (915BP)	MAX:40.28W (916BR) MAX:38.52W (916BP)	MAX:66.4W (917BR) MAX:TBD (917BP)	MAX:43.4W (919BR) MAX:TBD (919BP)	MAX:TBD (921BR) MAX:39.8W (921BP)	MAX:42.54W (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 52.8	440 x 290 x 55	432 x 358 x 55.3	470 x 388.6 x 60	571 x 362 x 55	656 x 423 x 53
Net Weight	6.7 Kg	6.64kg	7.1	9.68 Kg	10 Kg	13kg
Environmental						
Operating temperature	0~50°C (-20~60°C for option)				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	CE / FCC Class A, UL					
Operating System Support	Windows 10 IoT ENT LTSC					

1.3 Dimensions

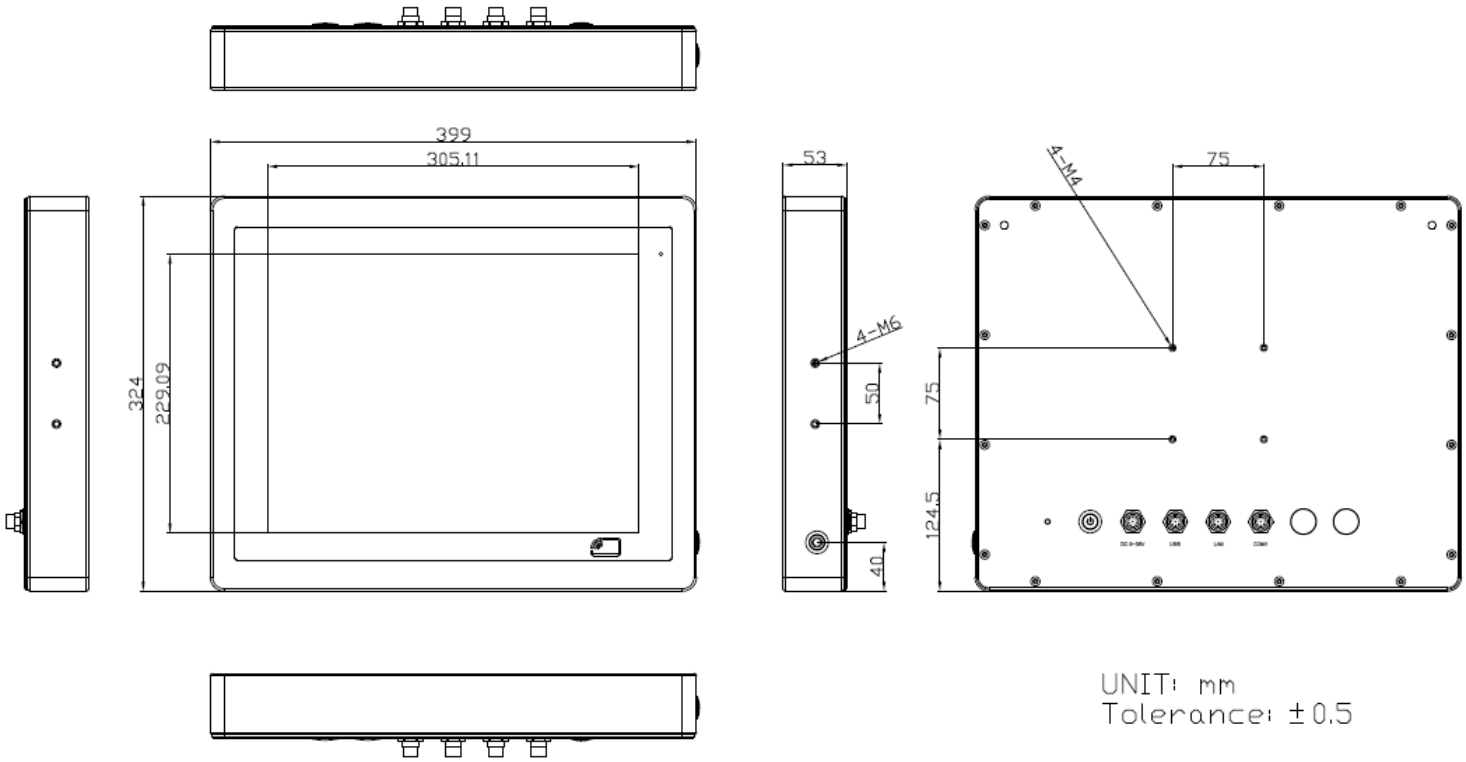


Figure 1.1: Dimensions of VITAM-915BP/R(H)

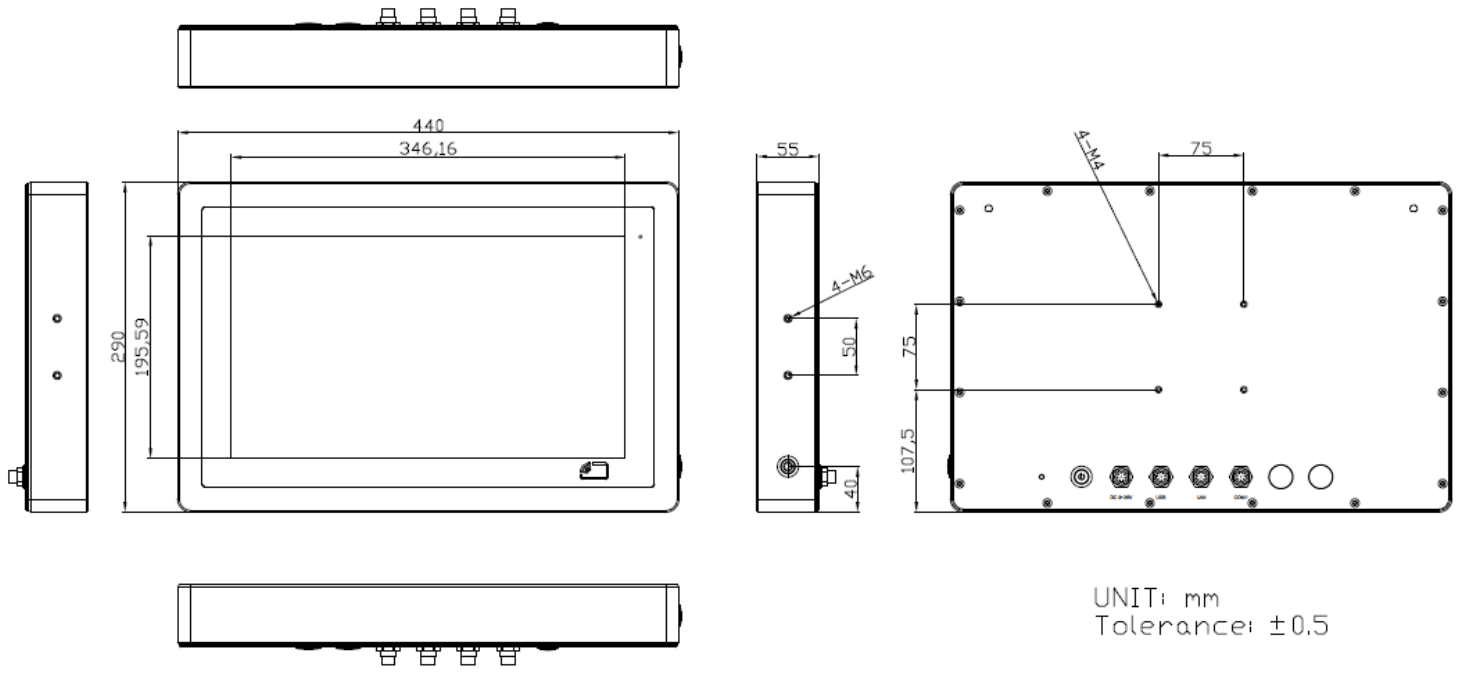


Figure 1.2: Dimensions of VITAM-916BP/R(H)

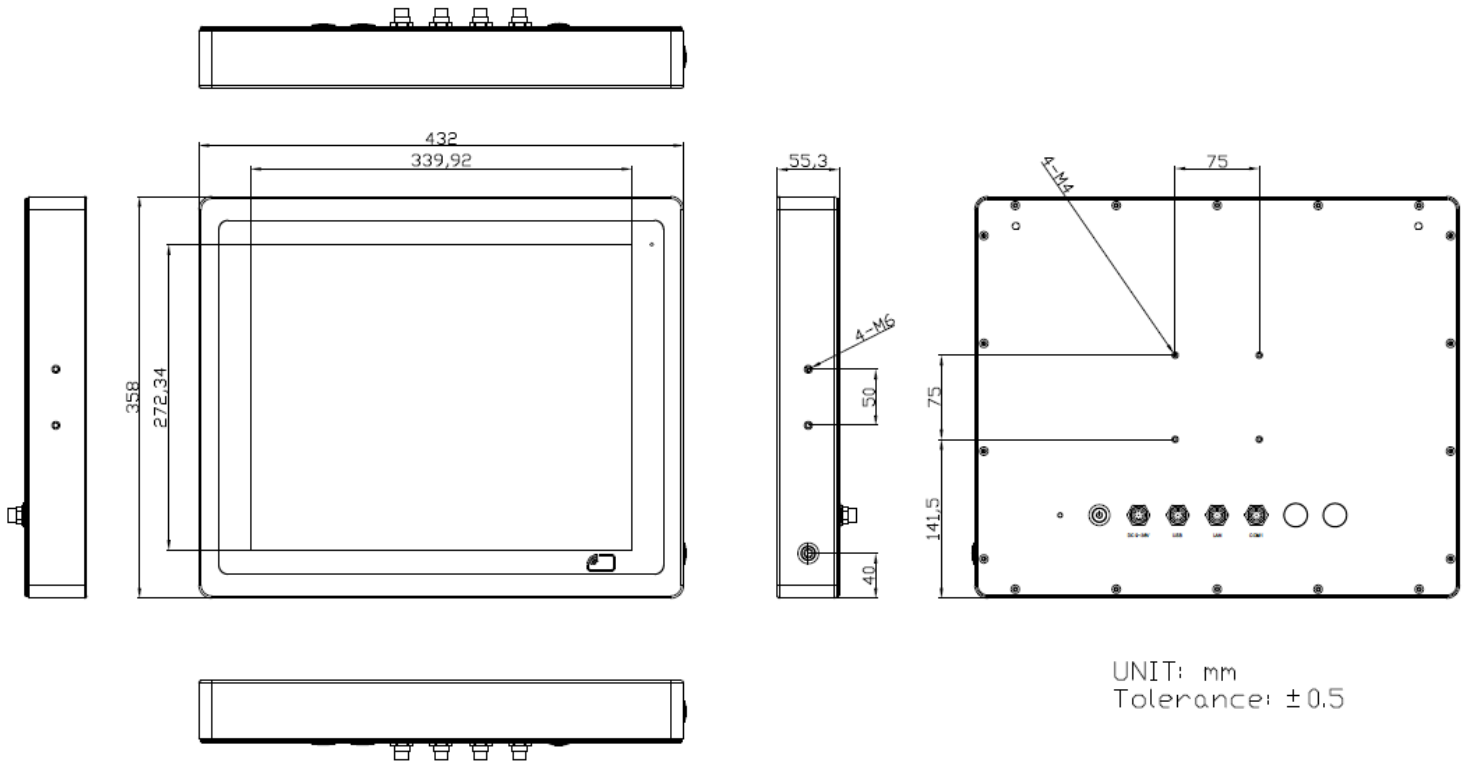


Figure 1.3: Dimensions of VITAM-917BP/R(H)

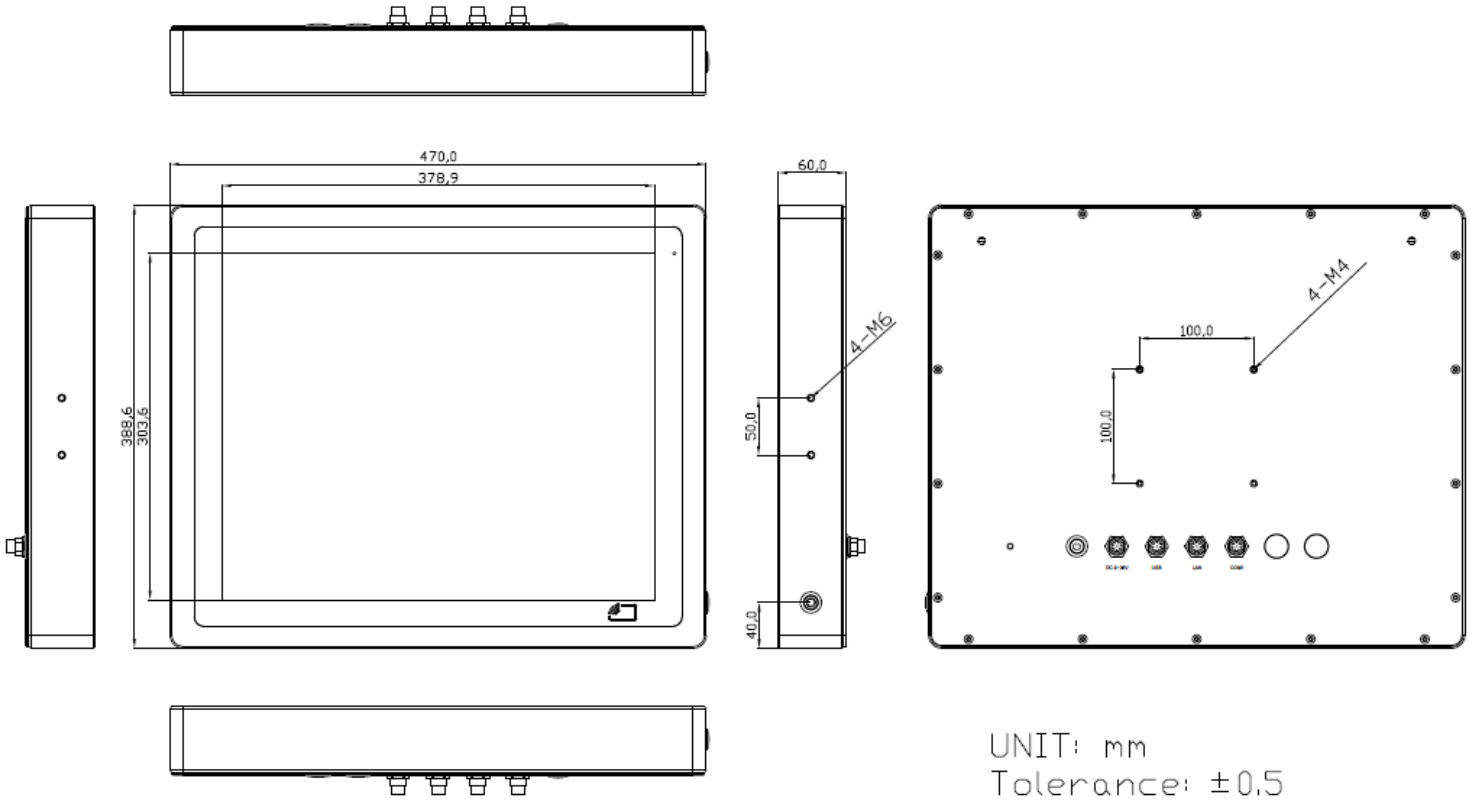


Figure 1.4: Dimensions of VITAM-919BP/R(H)

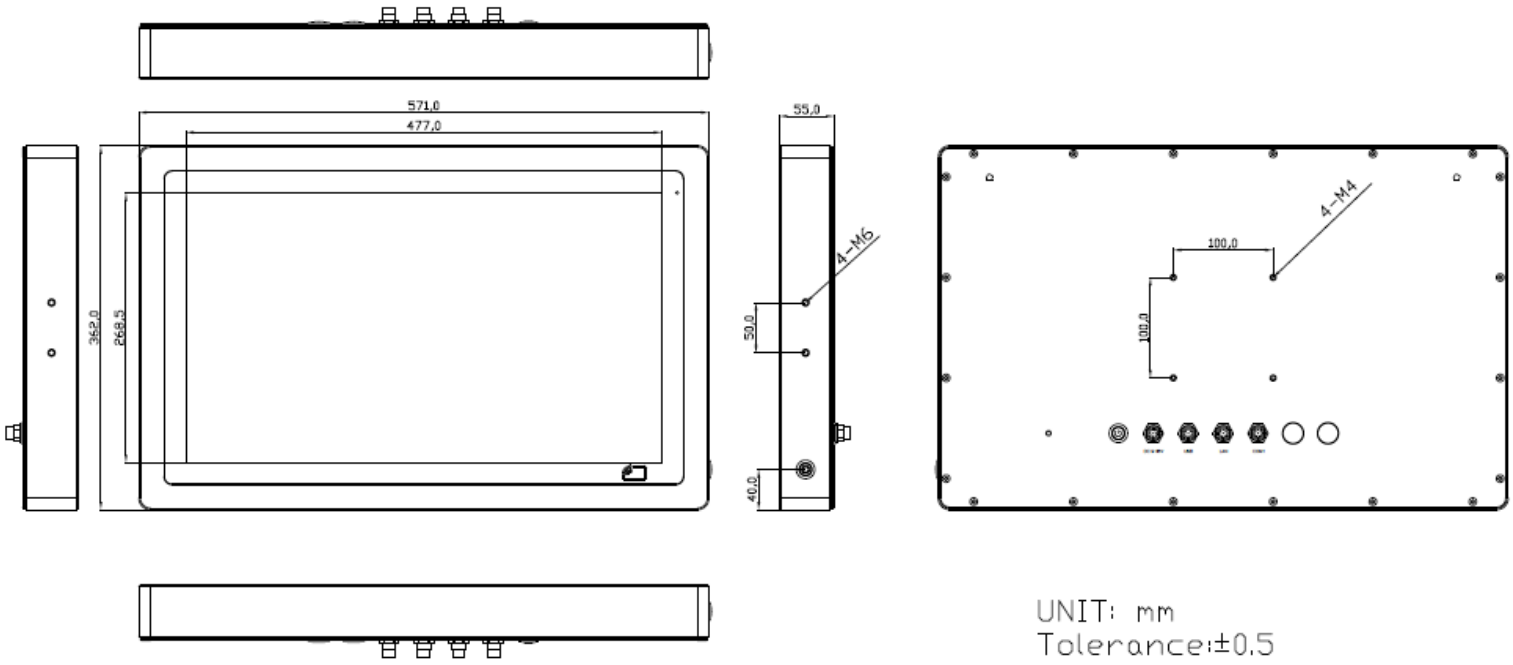


Figure 1.5: Dimensions of VITAM-921BP/R(H)

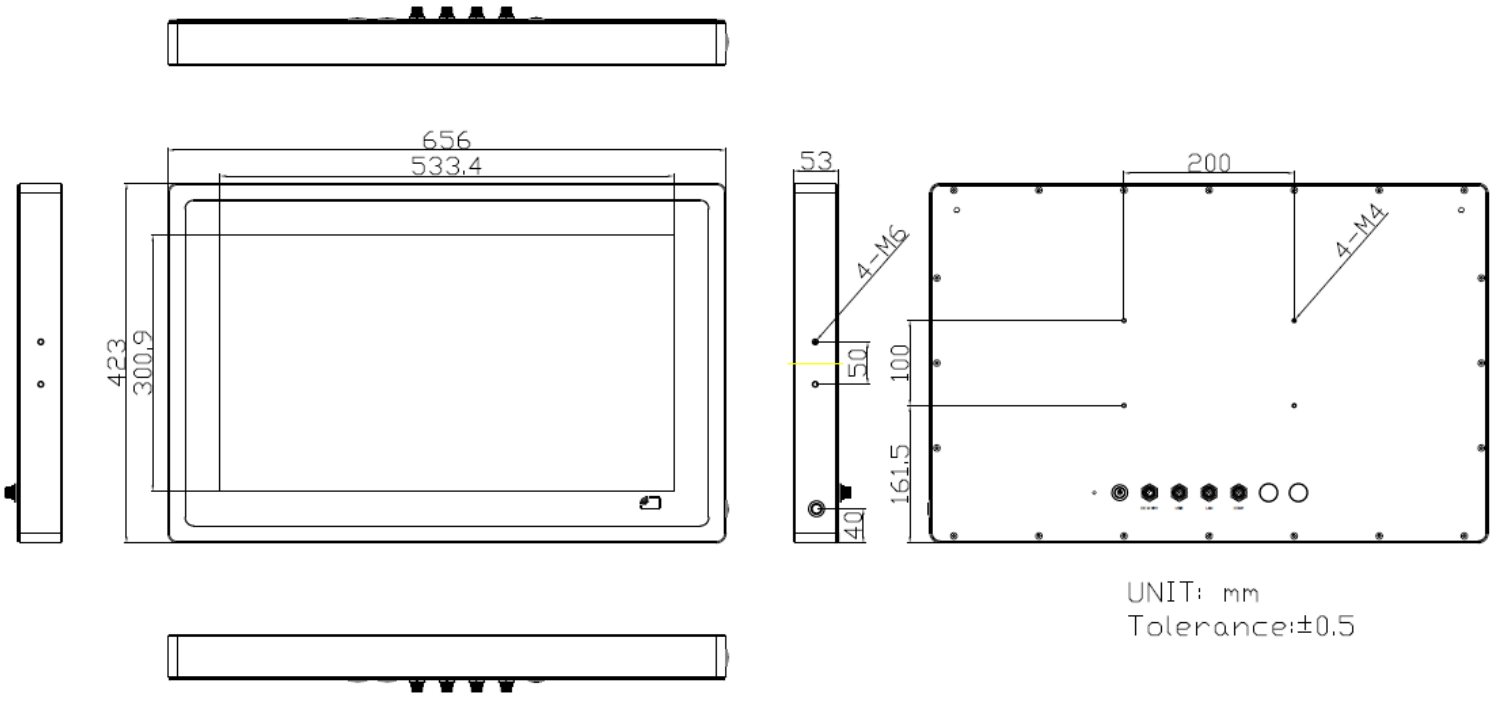


Figure 1.6: Dimensions of VITAM-924BP(H)

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, 1 x 260-pin SO-DIMM up to 32GB DDR4 2400MHz memory, and 1 x M.2 M-Key 2242 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.

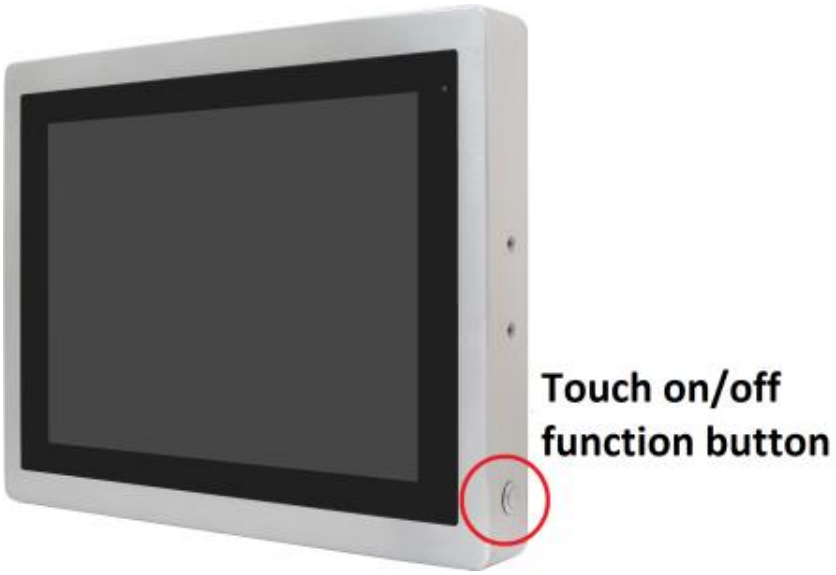


Figure 1.7: Front View and Touch on/off Button of VITAM-9XXB Series

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

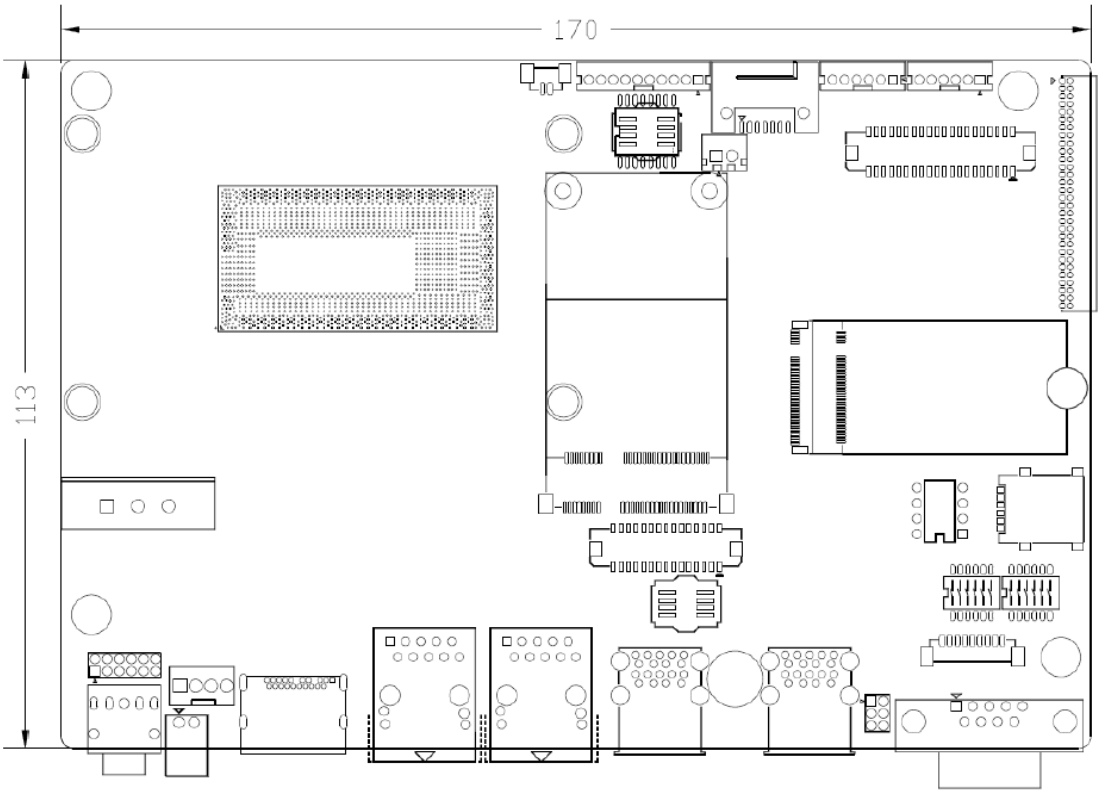
SBC-7124 is a 4” industrial motherboard developed on the basis of Intel Whiskey Lake-U Processor, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features dual GbE ports, 6xCOM ports and one M.2 M-Key configuration, one DP Port and one LVDS interface.

2.2 Specifications & Dimensions

Specifications	
Board Size	170mm x 113mm
CPU Support	Intel® Core™ i3-8145UE (2.20GHz, up to 3.90GHz) Intel® Core™ i5-8365UE (1.60GHz, up to 4.10GHz) (option) Intel® Core™ i7-8665UE (1.70GHz, up to 4.40GHz) (option)
Chipset	SOC
Memory Support	1 x SO-DIMM (260 pins), up to 32GB DDR4 2400MHz FSB (i3-8145UE/i5-8365UE/i7-8665UE)
Graphics	Intel® UHD Graphics 620 (i3-8145UE/i5-8365UE/i7-8665UE)
Display Mode	1 x LVDS (18/24-bit dual LVDS) 1 x DP Port
Support Resolution	Up to 4096 x 2304 for DP1 Up to 1920 x 1200 for LVDS (PS8625)
Dual Display	LVDS + DP1
Super I/O	Nuvoton NCT6106D
BIOS	AMI/UEFI
Storage	1 x SATAIII Connector (7Pin) 1 x M.2 M-Key (PCIex4/SATAIII Auto Detect), Support 2242 NVME SSD
USB	4 x USB 3.2 Gen1 (Type A) Stack Ports (USB3_1/USB3_2) (USB3.0:USB3-1/USB3-2/USB3_3/USB3_4, USB2.0:USB1/2/3/4) 2 x USB 2.0 Pin header for CN3 (USB5/USB6) 1 x USB 2.0 Pin header for CN1 (USB7)

	1 x USB 2.0 Pin header for CN2 (USB8) 1 x USB 2.0 for M-PCIE1 (USB9) 1 x USB 2.0 for PM6000 (USB10)
Serial	1 x DB9-M Connector for external (COM1) 1 x RS232 port, Pin1 w/5V/12~14VRTS select (COM1-1) 1 x RS232/RS422/RS485 port (COM1-2) 2 x UART for CN3 (COM3, COM4) 2 x RS422/485 header for CN2 (COM5/COM6)
Digital I/O	8-bit digital I/O (CN2) 4-bit digital Input 4-bit digital Output 4-bit digital I/O (CN3) 2-bit digital Input 2-bit digital Output
Battery	Support CR2477 Li Battery by 2-pin header
Smart Battery	1 x Smart Battery Support 3 Serial Li battery by 10-pin header (BAT2)
Audio	Support Audio via Realtek ALC888S-VD2 audio codec Support Line-out by JACK (LINE_OUT1) Support Line-in, Line-out, MIC by 2x6-pin header
Expansion Bus	1 x mini-PCI-express slot for M-PCIE1 1 x PCI-express for CN3
Touch Ctrl	1 x Touch ctrl header for TCH1 (USB10)
Power Management	Wide Range DC+9V~36V 1 x 3-pin power input connector
Switches and LED Indicators	1 x Power on/off switch (BT1/CN2/CN3) 1 x Reset (CN2) 1 x HDD LED status (CN2) 1 x Power LED status (CN1) 1 x Buzzer
External I/O port	1 x COM Ports (COM1-1/COM1-2) 4 x USB 3.2 Gen 1 Ports (stack) 2 x RJ45 GbE LAN Ports 1 x DP Port

	1 x Audio Jack (Line out)
TPM	Infineon's Trusted Platform Module (TPM 2.0) ***Note: Only support Windows 10 IOT***
Temperature	Operating: -20℃ to 70℃ Storage: -40℃ to 85℃
Humidity	10% - 90% relatively, non-condensing, operating
Power Consumption	24V/1.6A (Intel i3-8145UE Processor with 16GB DDR4/HDD) 24V/2.0A (Intel i5-8365UE Processor with 16GB DDR4/HDD)
EMI/EMS	Meet CE/FCC class A



(Unit: mm)

Figure 2.1: Motherboard Dimensions

2.3 Jumpers and Connectors Location

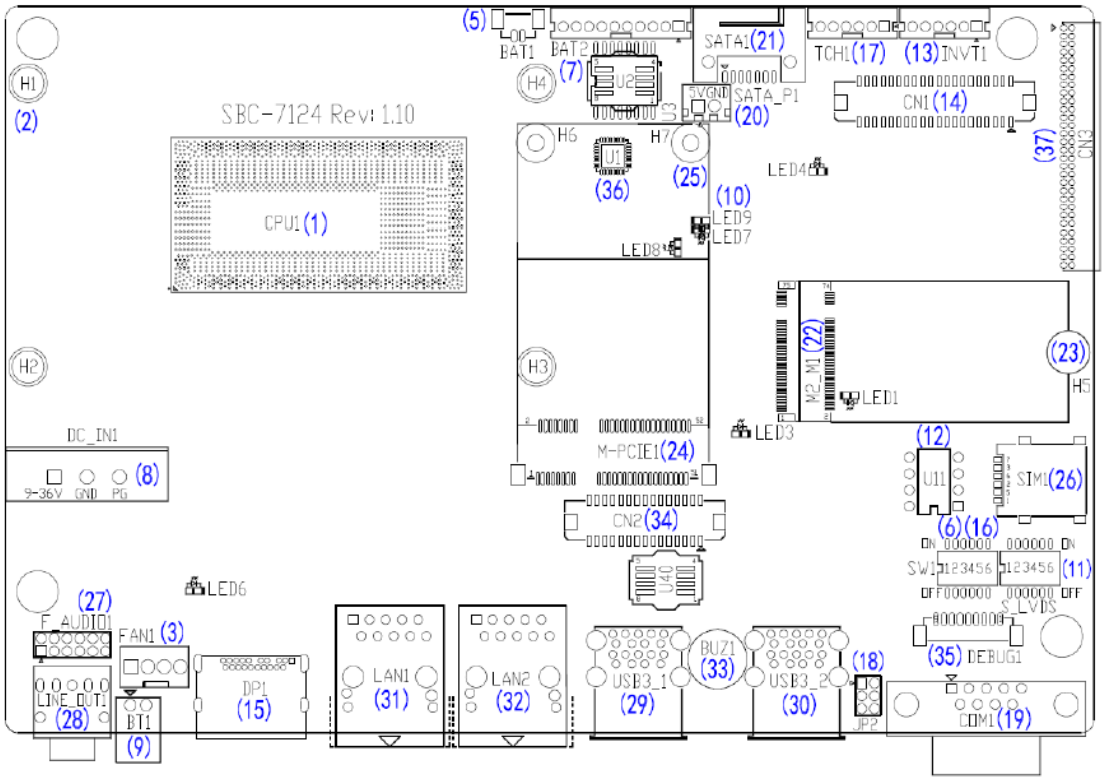


Figure 2.2: Jumpers and Connectors Location- Board Top

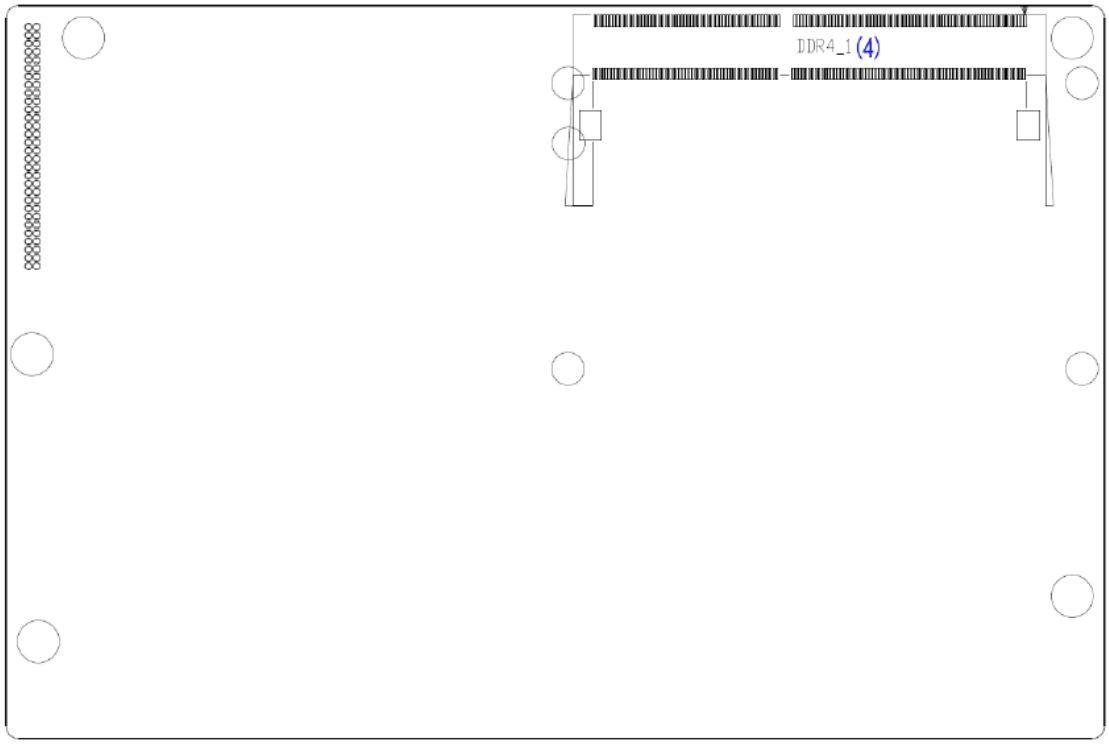


Figure 2.3: Jumpers and Connectors Location- Board Bottom

2.4 Jumpers Setting and Connectors

1. CPU1:

(FCBGA1528), onboard Intel Whiskey Lake-UE Processors.

Model	Processor						
	Number	PBF	Cores/ Threads	TDP	Embedded	Intel VPro	Remarks
SBC-7124-I3-8145UE	I3-8145UE	2.20 up to 3.90GHz	2/4	12.5W 25W	●	-	
SBC-7124-I5-8365UE	I5-8365UE	1.60 up to 4.10GHz	4/8	12.5W 25W	●	●	option
SBC-7124-I7-8665UE	I7-8665UE	1.70 up to 4.40GHz	4/8	12.5W 25W	●	●	option

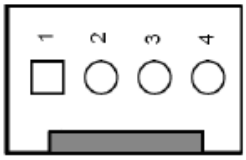
2. H1/H2/H3/H4 (option):

CPU1 Heat Sink Screw holes, four screw holes for Intel Whiskey Lake-UE Processors.

Heat Sink assembles.

3. FAN1:

(2.54mm Pitch 1x4 Pin Header), FAN connector, cooling fans can be connected directly for use. You may set the rotation condition of cooling fan in menu of BIOS CMOS Setup.



Pin#	Signal Name
1	Ground
2	VCC
3	SYS_FANTACH
4	SYS_FANPWM

Note:

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

4. DDR4_1:

(SO-DIMM 260Pin slot), DDR4 memory socket, the slot is located at the socket of the board and supports 260Pin 1.2C DDR4 2400MHz FSB SO-DIMM memory module up to 32GB.

Model	DDR4 Memory Types (FSB)
SBC-7124-I3-8145UE	2400MHz
SBC-7124-I5-8365UE	2400MHz
SBC-7124-I7-8665UE	2400MHz

5. BAT1:

(1.25mm Pitch 1x2 Wafer Pin Header, SMD) 3.0V Li battery is embedded to provide power for CMOS. CMOS clear operation will permanently reset old BIOS settings to factory defults.

Pin#	Signal Name
Pin1	Ground
Pin2	VBAT

6. SW1 (PIN1, PIN2, PIN3, PIN6):

SW1-6(Switch), ATX Power and Auto Power on jumper setting.

SW1 (Switch)	Mode
Pin6 (Off)	ATX Power
Pin6 (On)	**Auto Power on (Default)**

SW1-1(Switch), POE or DCIN input setting.

SW1 (Switch)	DC_IN1	BAT2 (PoE)
Pin1 (Off, Default)	●	-
Pin1 (On)	-	●

SW1-2, SW1-3 (Switch), CMOS clear switch, CMOS clear operation will permanently reset old BIOS setting to factory defaults.

SW1	CMOS
Pin2 (Off)	NORMAL (Default)
Pin2 (On)	Clear CMOS
Pin3 (Off)	NORMAL (Default)
Pin3 (On)	Clear CMOS


Procedures of CMOS clear:

a) Turn off the system and unplug the power cord from the power outlet.

b) To clear the CMOS settings, use the switch to Pin2 on for about 3 seconds then move the switch Pin2 and Pin3 off.
c) Power on the system again.
d) When entering the POST screen, press the <DEL> key to enter CMOS Setup Utility to load optimal defaults.
e) After the above operations, save changes and exit BIOS Setup.

7. BAT2:

(2.0mm Pitch 1x10 Wafer Pin Header), Smart battery Interface

Pin#	Signal Name
Pin1	VCC_BAT1
Pin2	VCC_BAT1
Pin3	VCC_BAT1
Pin4	SMB_DAT_SW
Pin5	SMB_CLK_SW
Pin6	BAT1_TEMP
Pin7	Ground
Pin8	Ground
Pin9	Ground
Pin10	NC

Function	Specifications
Nominal voltage (3S1P)	11.1~12.6V
Charge voltage	12.6V
Charge current	0.5C

8. DC_IN1:

(5.08mm Pitch 1x3 Pin Connector), DC9V~36V Sustem power input connector.

Pin#	Power Input
Pin1	DC_IN+ (DC+9V~36V)
Pin2	DC_IN- (Ground)
Pin3	FG

Model	DC_IN1
SBC-7124-I3-8145UE	180° Connector
SBC-7124-I5-8365UE	180° Connector
SBC-7124-I7-8665UE	180° Connector

Connector	Power input
DC_IN1 (Default)	DC_IN1
BAT2 (option)	BAT2
DC_IN1 + BAT2 (option)	DC_IN1

9. BT1:

Power on/off button, it is used to connect power switch button. The two pins are disconnected uncer normal condition. You may short them temporarily to realize system startup & shutdown or awaken the system from sleep state.

10. LED1/LED2/LED3/LED4/LED5/LED6/LED7/LED8/LED9:

LED1: LED STATUS. Green LED for M2_M1 Power status.

LED2: LED STATUS. Green LED for PM6000 Power status.

LED3: LED STATUS. Green LED for 3P3V_ALLS_EC Power status.

LED4: LED STATUS. Green LED for PM_S5_OK status.

LED5: LED STATUS. Green LED for PM_PCH_PWROK status.

LED6: LED STATUS. Green LED for H_CATERR status.

LED7: LED STATUS. Green LED for charge Power Good status.

LED8: LED STATUS. Green LED for charge Power Good status.

LED9: LED STATUS. Green LED for charge Complete status.

11. S_LVDS:

(Switch), LVDS jumper setting.

S_LVDS (Switch)	Function (DN1)
Pin1 (ON)	3.3V Level
Pin1 (OFF)	5V Level
Pin2 (ON)	Single channel LVDS
Pin2 (OFF)	Dual channel LVDS
Pin3 (ON)	8/24 bit
Pin3 (OFF)	6/18 bit
Pin4 (ON)	DC Mode
Pin4 (OFF)	PWM Mode
Pin5 (ON)	Enable PS8625
Pin5 (OFF)	Disable PS8625

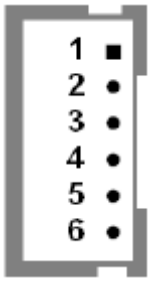
12. U11:

AT24C02-DIP8, The EEPROM IC(U11) is the set of LVDS resolution. If you need other resolution settings, please upgrade U11 data.

Model	LVDS resolution
SBC-7124-I3-8145UE SBC-7124-I5-8365UE SBC-7124-I7-8665UE	1280*1024 (Default)
	800*480 (option)
	800*600 (option)
	1024*768 (option)
	1920*1080 (option)
	……

13. INVT1:

(2.0mm Pitch 1x6 wafer Pin Header), Backlight control connector for LVDS.



Pin#	Signal Name
1	+DC12V_LVDS
2	+DC12V_LVDS
3	Ground
4	Ground
5	BKLT_EN_OUT
6	BKLT_PWM_OUT

14. CN1:

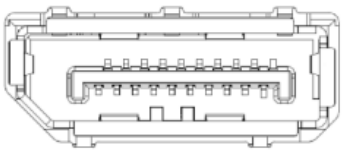
(1.25mm Pitch 2x20 Connectorm DF13-40P), for 18/24-bit LVDS output connector, fully supported by Parad PS8625 (DP to LVDS), the interface features dual channel 24-bit output. Low Voltage Differential Signalling, a high speed, low power data transmission standard used for display connections to LCD panels.

Function	Signal Name	Pin#		Signal Name	Function
LVDS Signal	12V_LVDS	2	1	12V_LVDS	LVDS Signal
	BKLT_EN_OUT	4	3	BKLT_CTRL	
	Ground	6	5	Ground	
	LVDS_VDD5	8	7	LVDS_VDD5	
	LVDS_VDD3	10	9	LVDS_VDD3	
	Ground	12	11	Ground	

	LA_D0_P	14	13	LA_D0_N	
	LA_D1_P	16	15	LA_D1_N	
	LA_D2_P	18	17	LA_D2_N	
	LA_D3_P	20	19	LA_D3_N	
	LA_CLKP	22	21	LA_CLKN	
	LB_D0_P	24	23	LB_D0_N	
	LB_D1_P	26	25	LB_D1_N	
	LB_D2_P	28	27	LB_D2_N	
	LB_D3_P	30	29	LB_D3_N	
	LB_CLKP	32	31	LB_CLKN	
USB7 (option)	Ground	34	33	Ground	
	USB7_P	36	35	USB7_N	
	5V_S5_USB	38	37	5V_S5	
Power LED	PWR_LED+	40	39	Ground	

15. DP1:

(DP Connector), Display Port Interface connector.



16. SW1 (Pin5):

SW1-5 (Switch), Touch jumper setting.

SW1(Switch)	Touch (TCH1)
SW1-5 OFF (Default)	Enable
SW1-5 ON (option)	Disable

17. TCH1:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin1~6 is used to select signal out of pin 1 of COM1 port.

Pin#	Signal Name
1	SENSE
2	X+
3	X-

4	Y+
5	Y-
6	GND_EARCH

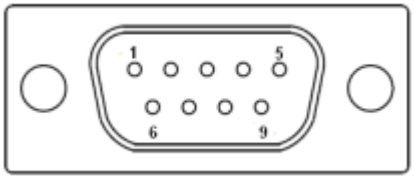
18. JP2:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin1~6 is used to select signal out of pin 1 of COM1 port.

JP1 Pin#	Function
Close 1-2	**COM1 Pin1 RTS (Default)**
Close 3-4	COM1 Pin1: DC+5V (option)
Close 5-6	COM1 Pin1: DC+12V~14V (option)

19. COM1:

(Type DB9M), Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices. COM1 port is controlled by pins No.1~6 of JP2, select output Signal RTS or 6V or 12V~14V, for details, please refer to description of JP2 setting.



Pin#	COM1(RS232)	COM2(RS232)	COM2(RS422)	COM2(RS485)
1	RTS-/5V/(12~14V)	5V/(12~14V)	5V/(12~14V)	5V/(12~14V)
2	RXD1	-	-	-
3	TXD1	-	-	-
4	CTS1-	-	-	-
5	Ground	Ground	Ground	Ground
6	-	TXD2	422_RX+	
7	-	DTR2-	422_RX-	
8	-	DCD2-	422_TX-	485-
9	-	RXD2	422_TX+	485+

COM1 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 1 Configuration:【RS-232】
COM2 BIOS Setup:
Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-232】
Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-422】

Advanced/NCT6106D Super IO Configuration/Serial Port 2 Configuration:【RS-485】

Caution:

Please Pay attention to pin1 pin definition. The power output might damage your device if is connected to the RTS port.

20. SATA_P1:

(2.5mm Pitch 1x2 box Pin Header), one onboard 5V output connector is reserved to provide power for SATA devices.

Pin#	Signal Name
1	5V_S0 (+DC5V output)
2	Ground

Note:

Output current of the connector must not be above 1A.

21. SATA1:

(SATA 7Pin), SATA Connectors, one SATA connector is proveded, with transfer speed up to 6.0Gb/s.

22. M2_M1:

(NGFF M.2 Socket), NGFF(M.2) M-Key, is located at the top, it supports M.2 M-Key devices with four PCIe or SATA signal, support 2242 size card.

23. H5:

M2_M1 SCREW HOLES, H5 for M2_M1 card assemble.

24. M-PCIE1:

(Socket 52Pin), mini PCIe socket, is located at the top, it supports mini PCIe devices with USB2.0 and SIM and SMBUS signal. MPCIe card size is 30x50.95mm.

Function	Support	Remarks
Mini PCIe (PCIe 13)	●	
SMbus	●	
SIM	●	
USB2.0 (USB9)	●	

25. H7:

M-PCIE1 SCREW HOLES, H7 for mini PCIE card (30mmx50.95mm) assemble.

26. SIM1:

(NANO-SIM Socket), Support nano SIM Card devices.

27. F_AUDIO1:

(2.0mm Pitch 2x6 Pin Header), front audio, an onboard Realtek ALC888C-VD2 codec is used to provide high-quality audio I/O ports. Line Out can be connected to a headphone or amplifier. Line in is used for the connection of external audio source via a Line in cable. MIC is the port for microphone input audio.

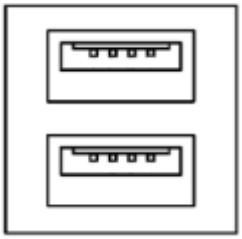
Signal Name	Pin#	Pin#	Signal Name
+5V_F_AUDIO	1	2	GND_AUD
LINE-OUT-L	3	4	LINE-OUT-R
FRONT_JD	5	6	LINE_IN_JD
LINE-IN-L	7	8	LINE-IN-R
MIC-IN-L	9	10	MIC-IN-R
GND_AUD	11	12	MIC1_JD

28. LINE_OUT1:

(Diameter 3.5mm Jack), HD Audio Port, an onboard Realtek ALC888S-VD2 codec is used to provide high quality audio I/O ports. Line out can be connected to a headphone or amplifier.

29. USB3_1:

USB3-1/USB3-2: (Double stack USB type A), rear USB connector, provodes up to two USB3.2 Gen1 ports, High-speed USB2.0 allows data transfer up to 480 Mb/s, USB3.2 Gen1 allows data transfer up to 5.0Gb/s, support USB full-speed and low-speed signaling.

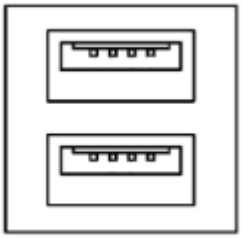


Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.

If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.

30. USB3_2:

USB3-3/USB3-4: (Double stack USB type A), rear USB connector, provides up to two USB3.2 Gen1 ports, High-speed USB 2.0 allows data transfer up to 480 Mb/s, USB 3.2 Gen1 allows data transfer up to 5.0Gb/s, support USB full-speed and low-speed signaling.



Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.

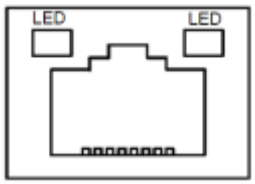
If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.

31. LAN1:

(RJ45 Connector), Rear LAN port, two standard 10/100/1000M RJ-45 Ethernet ports are provided. Intel I219-LM chipset is used, LINK LED (green) and ACTIVE LED (green or orange) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state iof LAN.

Corporate LAN product with support for Intel® AMT2 technology.

Model	Intel® AMT2 technology
SBC-7124-I3-8145UE	-
SBC-7124-I5-8365UE	●
SBC-7124-I7-8665UE	●

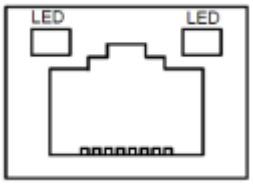


32. LAN2:

(RJ45 Connector), Rear LAN port, two standard 10/100/1000M RJ-45 Ethernet ports are provided. Intel I210AT chipset is used, LINK LED (green) and ACTIVE LED (green or orange) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state iof LAN.

Corporate LAN product with support for Intel® AMT2 technology.

Model	U17 (LAN2)
SBC-7124-I3-8145UE	I210AT
SBC-7124-I5-8365UE	I210AT
SBC-7124-I7-8665UE	I210AT



33. BUZ1:

Onboard buzzer

34. CN2:

(DF 13-30P Connector), for expand output connector, it provides eight GPIO, two RS-422 or RS-485, one USB2.0, one Power on/off, one Reset.

Function	Signal Name	Pin#		Signal Name	Function
5V	5V_S5	2	1	5V_S5	5V
SIO_GP31	GPIO_IN2	4	3	GPIO_IN1	SIO_GP30
SIO_GP33	GPIO_IN4	6	5	GPIO_IN3	SIO_GP32
SIO_GP35	GPIO_OUT2	8	7	GPIO_OUT1	SIO_CP34
SIO_CP27	GPIO_OUT4	10	9	GPIO_OUT3	SIO_GP36
	Ground	12	11	Ground	
485 or 422	485+_422TX5+	14	13	485-_422TX5-	485 or 422
(COM5)	422_RX5+	16	15	422_RX5-	(COM5)
485 or 422	485+_422TX6+	18	17	485-_422TX6-	485 or 422
(COM6)	422_RX6+	20	19	422_RX6-	(COM6)
5V	5V_S0	22	21	HDD_LED+	HDD LED
USB2.0	5V_S5	24	23	5V_S5	USB2.0
	USB8_P	26	25	USB8_N	
Power auto on	Ground	28	27	FP_RST-	RESET
	PWRBTN_ON	30	29	Ground	

COM5 BIOS Setup: Advanced/NCT6106D Super IO Configuration/Serial Port 5 Configuration:【RS-422】 Advanced/NCT6106D Super IO Configuration/Serial Port 5 Configuration:【RS-485】 COM6 BIOS Setup: Advanced/NCT6106D Super IO Configuration/Serial Port 6 Configuration:【RS-422】 Advanced/NCT6106D Super IO Configuration/Serial Port 6 Configuration:【RS-485】

35. DEBUG1 (option):

(1.25mm Pitch 1x9 Wafer Pin Header, SMD), Debug Port

Pin#	Signal Name
Pin1	3P3V_S0
Pin2	CLK_24M_SIO
Pin3	PLT_RST_BUF1-
Pin4	Ground
Pin5	LPC_AD0
Pin6	LPC_AD1
Pin7	APC_AD2
Pin8	APC_AD3
Pin9	LPC_FRAME-

36. U1(option):

Infineon's Trusted Platform Module (TPM2.0) SLM9670AQ is a fully standard compliant TPM based on the latest Trusted Computing Group (TCG) specification 2.0.

Note: only support Windows 10 IOT.

Model	U1 (TPM2.0)
SBC-7124-I3-8145UE	●
SBC-7124-I5-8365UE	●
SBC-7124-I7-8665UE	●

37. CN3:

(1.27mm Pitch 2x30 Female Header), for expand output connector, it provides four GPIO, two USB2.0, oneSPI, two UART, one PCIex1, one SMbus, connexts to the TB-528 card series.

Function	Signal Name	Pin#		Signal Name	Function
	5V_S5_USB	1	2	5V_S5_USB	
	5V_S5_USB	3	4	5V_S5_USB	
	USB0506_OC	5	6	PS_ON_ALL-	

USB5	USB5_N	7	8	USB5_P	USB5
USB6	USB6_N	9	10	USB6_P	USB6
	Ground	11	12	Ground	
SPI	PCH_SPI1_CLK	13	14	SPI1_MISO_PCH	SPI
	PCH_SPI1_CS0-	15	16	PCH_SPI1_MOSI	
COM4 (UART)	COM4_RI	17	18	COM4_DCD-	COM4 (UART)
	COM4_TXD	19	20	COM4_RXD	
	COM4_DTR	21	22	COM4_RTS-	
	COM4_DSR	23	24	COM4_CTS-	
	Ground	25	26	Ground	
COM3 (UART)	COM3_RI	27	28	COM3_DCD-	COM3 (UART)
	COM3_TXD	29	30	COM3_RXD	
	COM3_DTR	31	32	COM3_RTS-	
	COM3_DSR	33	34	COM3_CTS-	
	SIO_GP45	35	36	SIO_GP44	
	SIO_GP47	37	38	SIO_GP46	
	Ground	39	40	Ground	
PCIE14	PCIE14_TX_N0	41	42	PCIE14_TX_P0	PCIE14
	PCIE14_RX_N0	43	44	PCIE14_RX_P0	
	Ground	45	46	Ground	
	CLK_100M_PE4_N	47	48	CLK_100M_PE4_P	
	PCIE_WAKE_N	49	50	PLT_RST_BUF2-	
SMBUS	SMB_CLK_S0	51	52	SMB_DATA_S0	SMBUS
PCIE	CLKREQ_PE4	53	54	Ground	
	3P3V_S5	55	56	PWRBTN_ON-	Power Auto on
	3P3V_S5	57	58	3P3V_S5	
12V	12V_S0	59	60	12V_S0	12V

Chapter 3 BIOS Setup

3.1 Operation after POST Screen

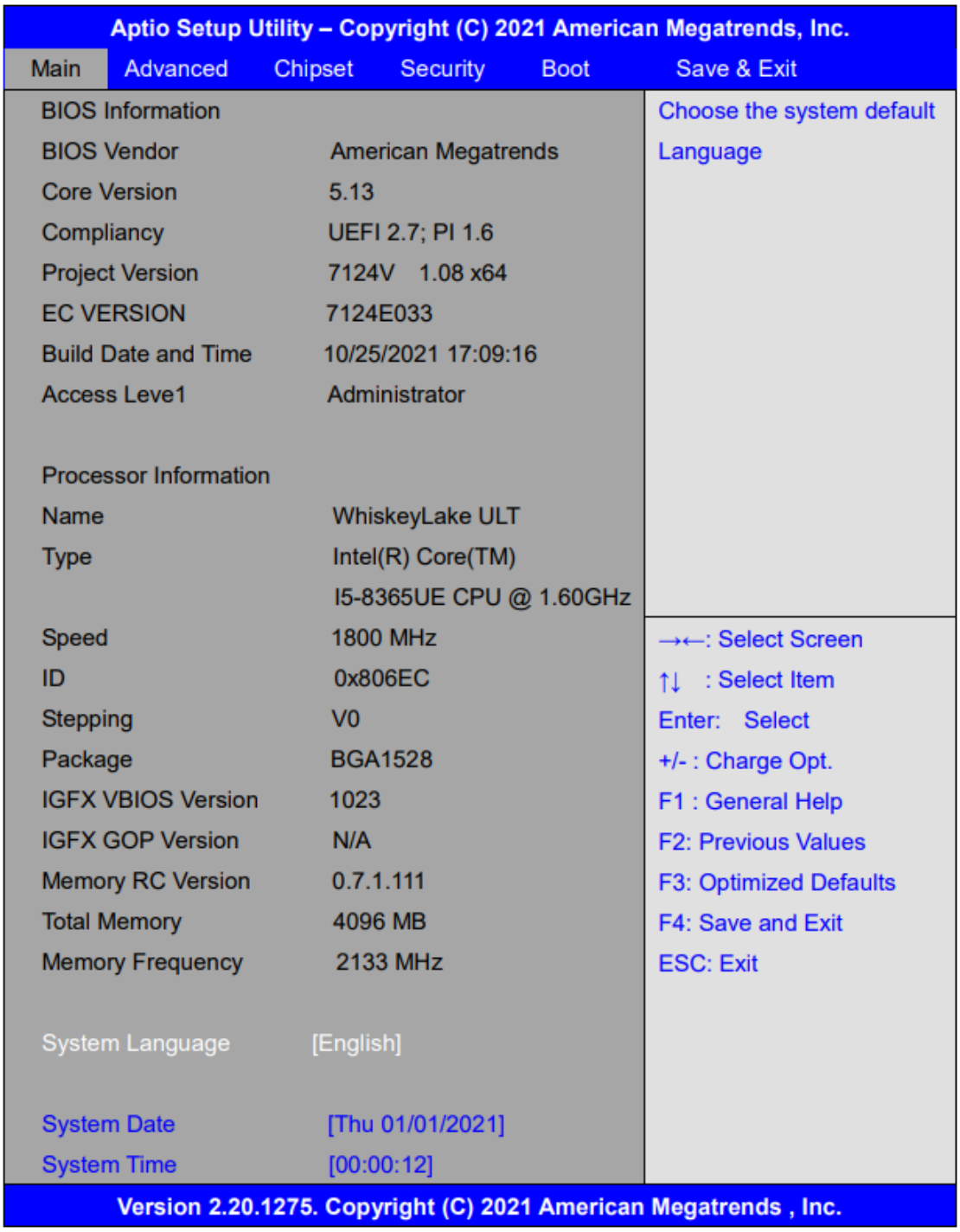
After CMOS discharge or BIOS flashing operation, press [Delete] key to enter CMOS Setup.

After optimizing and exiting CMOS Setup

3.2 BIOS SETUP UTILITY

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

3.3 Main Settings



System Time:

Set the system time, the time format is:

Hour: 0- to 23

Minute: 0 to 59

Second: 0 to 59

System Date:

Set the system date, the date format is :

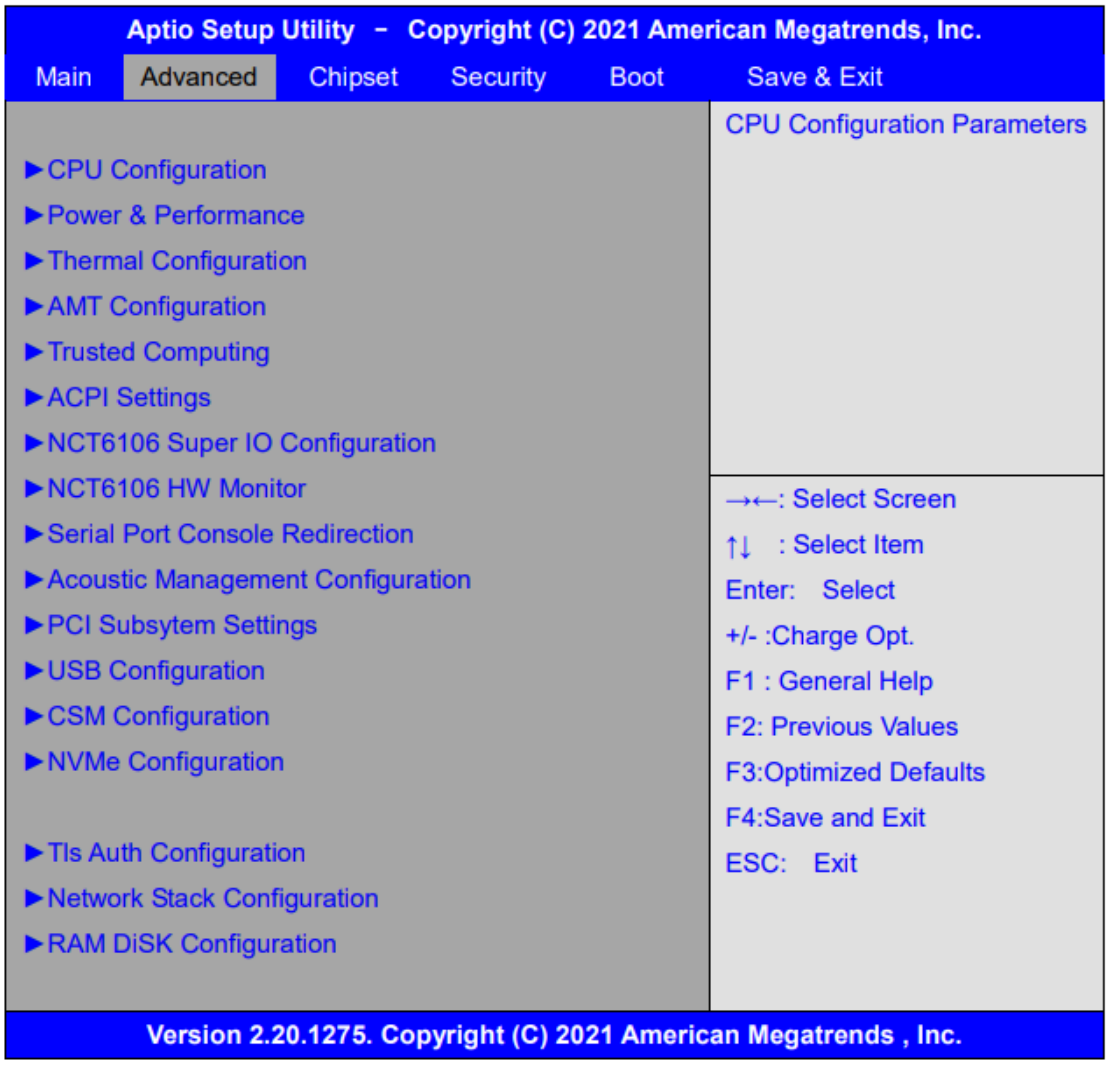
Day: Note that the 'Day' automatically changes when you set the date.

Month: 01 to 12

Date: 01 to 31

Year: 1998 to 2099

3.4 Advanced Settings



3.4.1 CPU Configuration

Type	Intel（R） Core（TM） I5-8365UE CPU@ 1.60GHz
ID	0x806EC
Speed	1800 MHz
L1 Date Cache	32 KB x 4
L1 Instruction Cache	32 KB x 4
L2 Cache	256 KB x 4
L3 Cache	6 MB
L4 Cache	N/A
VMX	Supported
SMX/TXT	Supported
C6DRAM	[Enabled]
SW Guard Extensions(SGX)	[Software Controlled]
Select Owner EPOCH input type	[No Change In Owner EPOCHs]
CPU Flex Ratio Override	[Disabled]
CPU Flex Ratio Settings	18

Hardware Prefetcher	[Enabled]
Adjacent Cache Line Prefetch	[Enabled]
Intel (VMX)Virtualization Technology	[Enabled]
PECI	[Enabled]
Active Processor Cores	[All]
BIST	[Disabled]
AP threads Idle Manner	[MWAIT Loop]
AES	[Enabled]
MachineCheck	[Enabled]
MonitorMWait	[Enabled]
Intel Trusted Execution Technology	[Disabled]
Alias Check Request	[Disabled]
DPR Memory Size（MB）	4
Reset AUX Content	[no]

►BIOS Guard

FCLK Frequency for Early Power On	[Auto]
Voltage Optimization	[Auto]

3.4.2 Power & Performance

►CPU – Power Management Control

Boot performance mode	[Max Non-Turbo Performance]
Intel(R) SpeedStep(tm)	[Enabled]
Race To Halt (RTH)	[Enabled]
Intel(R) Speed Shift Technology	[Enabled]
HDC Control	[Enabled]

► **View/Configure Turbo Options**

► **Config TDP Configurations**

►CPU VR Settings

Platform PL1 Enable	[Disabled]
Platform PL2 Enable	[Disabled]
Power Limit 4 Override	[Disabled]
C states	[Disabled]
Thermal Monitor	[Enabled]
Interrupt Redirection Mode Selection	[PAIR with Fixde Priority]
Timed MWAIT	[Disabled]

►Custom P-state Table

EC Turbo Control Mode	[Disabled]
Energy Performance Gain	[Disabled]
EPG DIMM Idd3N	26
EPG DIMM Idd3P	11

►Power Limit 3 Settings

Power Limit 3 Override	[Disabled]

►CPU Lock Configuration

CFG Lock	[Enabled]
Overclocking Lock	[Disabled]

►GT – Power Management Control

RC6(Render Standby)	[Enabled]
Maximum GT frequency	[Default Max Frequency]
Disabled Turbo GT frequency	[Disabled]

3.4.3 Thermal Configuration

►CPU Thermal Configuration

DTS SMM	[Disabled]
Tcc Activation Offset	0
Tcc offset Time Window	[Disabled]
Tcc offset Clamp Enable	[Disabled]
Tcc offset Lock Enable	[Disabled]
Bi-directional PROCHOT#	[Enabled]
Disable PROCHOT# Output	[Enabled]
Disable VR Thermal Alert# Output	[Disabled]
PROCHOT Response	[Disabled]
PROCHOT Lock	[Disabled]
ACPI T-States	[Disabled]
PECI Reset	[Disabled]
PECI C10 Reset	[Disabled]

►Platform Thermal Configuration

Automatic Thermal Reporting	[Disabled]
Critical Trip Point	[119 C (POR)]
Active Trip Point 0	[71 C]
Active Trip Point 0 Fan Speed	100
Active Trip Point 1	[55 C]
Active Trip Point 1 Fan Speed	75
Passive Trip Point	[95 C]
Passive TC1 Value	1
Passive TC2 Value	5
Passive TSP Value	10
Active Trip Points	[Enabled]
Passive Trip Poinst	[Disabled]
Critical Trip Points	[Enabled]
PCH Temp Read	[Enabled]
CPU Energy Read	[Enabled]
CPU Temp Read	[Enabled]

Alert Enable Lock	[Disabled]
CPU Temp	72
CPU Fan Speed	65

►DPTF Configuration

DPTF	[Disabled]

3.4.4 AMT Configuration

ASF Support	[Disabled]
USB Provisioning of AMT	[Disabled]

►CIRA Configuration
►ASF Configuration
►Secure Erase Configuration
►OEM Flags Settings
►MEBX Resolution Settings

3.4.5 Trusted Computing

TPM20 Device Found	
Firmware Version:	13.11
Vendor:	IFX
Security Device Support	[Enabled]
Active PCR banks	SHA-1 , SHA256
Available PCR banks	SHA-1 , SHA256
SHA-1 PCR Bank	[Enabled]
SHA256 PCR Bank	[Enabled]
Pending operation	[None]
Platform Hierarchy	[Enabled]
Storage Hierarchy	[Enabled]
Endorsement Hierarchy	[Enabled]
TPM2.0 UEFI Spec Version	[TCG_ 2]
Physical Presence Spec a Version	[1.3]
TPM 20 InterfaceType	[TIS]
Device Select	[Auto]

3.4.6 ACPI Settings

Enable ACPI Auto Configuration:	[Disabled] [Enabled]
Enable Hibernation:	[Enabled] [Disabled]
ACPI Sleep State:	[S3 (Suspend to RAM)] [Suspend Disabled]
Lock Legacy Resources:	[Disabled]
S3 Video Repost:	[Enabled] [Disabled] [Enabled]

3.4.7 NCT6106 Super IO Configuration

Super IO Chip	NCT6106D
►Serial Port 1 Configuration	
Serial port	[Enabled] [Disabled]
Device Settings	IO=3F8h； IRQ=4；
Change Settings	[Auto]
►Serial Port 2 Configuration	
Serial port	[Enabled] [Disabled]
Device Settings	IO=2F8h； IRQ=3；
Change Settings	
COM2 Mode Config	[RS-232 Mode] [RS-485 Mode] [RS-422 Mode]
►Serial Port 3 Configuration	
Serial port	[Enabled] [Disabled]
Device Settings	IO=3E8h； IRQ=6；
Change Settings	[Auto]
►Serial Port 4 Configuration	
Serial port	[Enabled] [Disabled]
Device Settings	IO=2E8h； IRQ=6；
Change Settings	[Auto]

▶Serial Port 5 Configuration	
Serial port	[Enabled]
	[Disabled]
Device Settings	IO=2F0h； IRQ=6；
Change Settings	[Auto]
COM5 Mode Config	[RS-485 Mode]
	[RS-422 Mode]
▶Serial Port 6 Configuration	
Serial port	[Enabled]
	[Disabled]
Device Settings	IO=2E0h； IRQ=6；
Change Settings	[Auto]
COM6 Mode Config	[RS-485 Mode]
	[RS-422 Mode]
WatchDog Controller Settings	
WatchDog Mode Select	[Disabled]

3.4.8 NC6106D Hardware Monitor

Pc Health Status

SYS temperature	: +39 C
CPU DIE temperature	: +52 C
CPU FAN Speed	: N/A
VORE	: +0.712 V
12V :	: +13.969 V
5V :	: +5.440 V
3.3V :	: +3.456 V

3.4.9 Serial Port Console Redirection

COMO

Console Redirection [Disabled]

►Console Redirection settings

COM1(Pci Bus0,Dev0,Func0) (Disabled)

Console Redirection Port Is Disabled

Legacy Console Redirection

►Legacy Console Redirection Settings

Redirecton COM Port [COMO]
[COM1 (PCI Bus0，Devo，Func0)(Disabled)]

Resolution [80x24]
[80x25]

Redirect After POST [Always Enable]
[BootLoader]

When Bootloader is selected,then Legacy Console Redirection is disabled before booting to legacy OS.When Always Enable is selected,then Legacy Console Redirecion is enabled for legacy OS.Default setting for this option is set to Always Enable.

Serial Port for Out-of-Band Management/
Windows Emergeny Management Services (EMS)

Console Redirection [Disabled]

►Console Redirection settings

3.4.10 Acoustic Management Configuration

3.4.11 PCI Subsystem Settings

AMI PCI Driver Version： A5.01.17
PCI Settings Common for all Devices：
BME DMA Mitigation [Disabled]
Change Settings of the Following PCI Devices：

WARNING: Changing PCI Device(S) Settings may
have unwanted side effects！ System may HANG!
PROCEED WITH CAUTION.

3.4.12 USB Configuration

USB Module Version 23

USB Controllers:
1XHCI
USB Devices:
1 Keyboard,1 Mouse

Legacy USB Support [Enabled]
XHCI Hand-off [Enabled]
USB Mass Storage Driver Support [Enabled]

USB Hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]

3.4.13 CSM Configuration

Compatibility Support Module Configuration

CSM Support	[Enabled]
CSM16 Module Version	07.82
GateA20 Active	[Upon Request]
Option ROM Messages	[Force BIOS]
INT19 Trap Response	[Immediate]
HDD Connection Order	[Adjust]
Boot option filter	[UEFI and Legacy] [Legacy only] [UEFI only]
Option ROM execution	
Network	[Do not launch] [UEFI] [Legacy]
Storage	[UEFI]
Video	[Legacy]
Other PCI devices	[UEFI]

3.4.14 NVMe Configuration

3.4.15 TIs Auth Configuration

- ▶Server CA Configuration
- ▶Client Cert Configuration

3.4.16 Network Stack Configuration

Network Stack	[Disabled] [Enabled]

3.4.17 RAM DISK Configuration

Disk Memory Type: [Boot Service Data]
[Reserved]

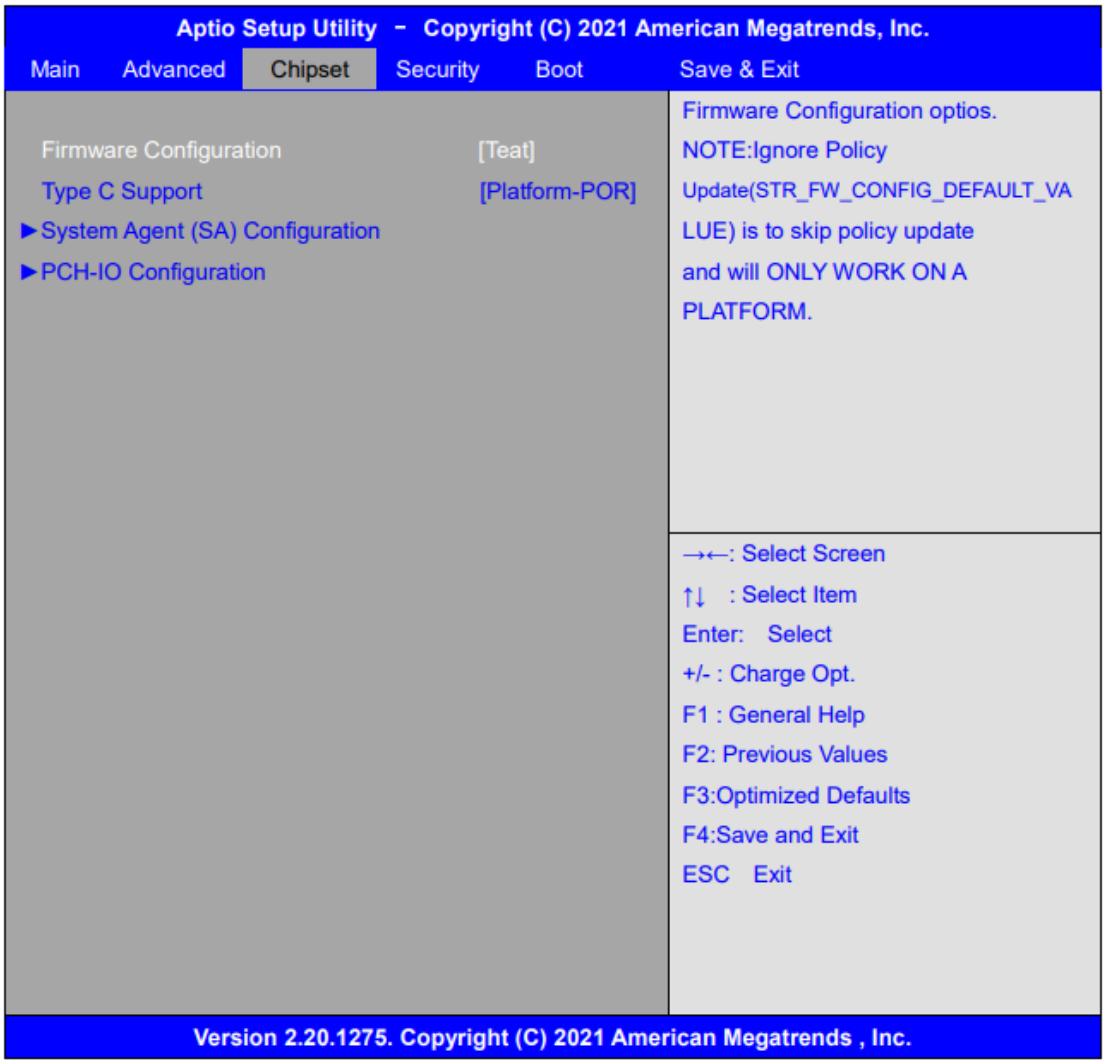
►Create raw
Size（Hex）: 1
The valid RAM Disk size should be multiples of the RAM disk block size.
Create & Exit
Discard & Exit

►Create from file
Created RAM disk list:
RAM Disk 0: [0X86BBFF18,0X86BBFF18] [Disabled]
[Enabled]

RAM Disk 1: [0X86C32018, 0X86C32018] [Disabled]
[Enabled]

RAM Disk 2: [0X86C41218, 0X86C41218] [Disabled]
[Enabled]

3.5 Chipset Setting



Firmware Configuration	[Test]
Type C Support	[Platform-FOR]

3.5.1 System Agent （SA） Configuration

SA PCIe Code Version	7.0.108.64
VT-d	Supported

►Memory Configuration

►Memory Thermal Configuration

►Memory Thermal Algorithms

Memory RC Version	0.7.1.111
Memory Frequency	2133 MHz
Memory Timings (Tcl-Trcd-TRP-TRAS)	15-15-15-36
Channel 0 Slot 0	Populated/&Enabled
Size	4096 MB (DDR4)
Number of Ranks	2
Manufacturer	Unknown
Channel 0 Slot 1	Not Populated / Disabled
Channel 1 Slot 0	Not Populated / Disabled
Channel 1 Slot 1	Not Present / Disabled
Memory ratio/reference clock Options moved to Overclock->Menmory->Custom Profile menu	
MRC ULT Safe Conifg	[Disabled]
LPDDR Dqdqs Re-Training	[Enabled]
Safe Mode Support	[Disabled]
Memory Test on Warm Boot	[Enabled]
Maximum Memory Frequency	[Auto]
HOB Buffer Size	[Auto]
Max TOLUD	[Dynamic]
SA GV	[Enabled]
SA GV Low Freq	[MRC default]
Retrain on Fast fail	[Enabled]
BER Support	[Enabled]
Enable RH Prevention	[Enabled]
Row Hammer Solution	[Hardware RHP]
RH Activation Probability	[1/2^11]
Exit On Failure (MRC)	[Enabled]
Probeless Trace	[Disabled]
Enable/Disable IED(Intel Enhanced Debug)	[Disabled]
Ch Hash Support	[Enabled]
Ch Hash Mask	0
Ch Hash Interleaved Bit	[BIT8]
VC1 Read Metering	[Enabled]

Strong Weak Leaker	7
Memory Scrambler	[Enabled]
Force ColdReset	[Disabled]
Channel A DIMM Control	[Enable both DIMMS]
Channel B DIMM Control	[Enable both DIMMS]
Force Single Rank	[Disabled]
Memory Remap	[Enabled]
Time Measure	[Disabled]
DLL Weak Lock Support	[Enabled]
Pwr Down Idle Timer	0
Fast Boot	[Enabled]
Train On Warm boot	[Disabled]
Rank Margin Tool Per Task	[Disabled]

C

Training Tracing	[Disabled]
Lpddr Mem WL Set	[Set B]
BDAT ACPI Table Support	[Disabled]
BDAT Memory Test Type	[Rank Margin Tool Rank]
Rank Margin Tool Loop Count	0
Lpddr Dram Odt	[Auto]
DDR4 Skip Refresh Enable	[Enabled]
Late Command Training Relaxed	[Disabled]
Reset	

►Graphics Configuration

Graphics Turbo IMON Current	31
Skip Scaning of External Gfx Card	[Disabled]

Primary Dispiay	[Auto]
Select PCIE Card	[Auto]
►External GFx Primary Dispiay Configuration	
Internal Graphics	[Auto]
GTT Size	[8MB]
Aperture Size	[256MB]
PSMI SUPPORT	[Disabled]
DVMT Pre-Allocated	[32M]
DVMT Total GFx Mem	[256M]
Intel Graphics Pei Display Peim VDD Enable	[Disabled]
VDD Enable	[Enabled]
PM Support	[Enabled]
PAVP Enable	[Enabled]
Cdynmax Clamping Enable	[Enabled]
Cd Clock Frequency	[675Mhz]
Skip CD Clock Init in S3 Resume	[Disabled]
IUER Button Enable	[Disabled]

►LCD Control

Primary IGFX Boot Display	[VBIOS Default]
	[DP]
	[LVDS]
LCD Panel Type	[VBIOS Default]
	[640x480 LVDS]
	[800x600 LVDS]
	[1024x768 LVDS]
	[1280x1024 LVDS]
	[1400x1050 LVDS1]
	[1400x1050 LVDS2]
	[1600x1200 LVDS]

	[1280x768 LVDS]
	[1680x1050 LVDS]
	[1920x1200 LVDS]
	[1600x900 LVDS]
	[1280x800 LVDS]
	[1280x600 LVDS]
	[2048x1536 LVDS]
	[1366x768 LVDS]
Panel Scaling	[Auto]
Backlight Control	[PWM Normal]
	[PWM Inverted]
Active LFP	[eDP Port-A]
	[No eDP]
Panel Color Depth	[18 Bit]
	[24 Bit]
Backlight Brightness	255
►Intel(R) Ultrabook Event Support	
IUER Slate Enable	[Disabled]
IUER Dock Enable	[Disabled]
►DMI/OPI Configuration	
►Display setup menu	
Stop Grant Configuration	[Auto]
VT-d	[Enabled]
CHAP Device（B0:D7:F0）	[Disabled]
Thermal Device（B0:D4:F0）	[Enabled]
GNA Device（B0:D8:F0）	[Enabled]
CRID Support	[Disabled]
Above 4GB MMIO BIOS assignment	[Disabled]
X2APIC Opt Out	[Disabled]
IPU Device（B0:D5:F0）	[Disabled]

3.5.2 PCH-IO Configuration

►PCI Express Configuration	
PCI Express Clock Gating	[Enabled]
DMI Link ASPM Control	[Auto]
PCIE Port assigned to LAN	7
Port8xh Decode	[Disabled]
Peer Memory Write Enable	[Disabled]
Compliance Test Mode	[Disabled]
PCIe-USB Glitch W/A	[Disabled]
PCIe function swap	[Enabled]

▶PCI Express Gen3 Eq Lanes	
PCIE1 Cm	6
PCIE1 Cp	2
PCIE2 Cm	6
PCIE2 Cp	2
PCIE3 Cm	6
PCIE3 Cp	2
PCIE4 Cm	6
PCIE4 Cp	2
PCIE5 Cm	6
PCIE5 Cp	2
PCIE6 Cm	6
PCIE6 Cp	2
PCIE7 Cm	6
PCIE7 Cp	2
PCIE8 Cm	6
PCIE8 Cp	2
PCIE9 Cm	6
PCIE9 Cp	2
PCIE10 Cm	6
PCIE10 Cp	2
PCIE11 Cm	6
PCIE11 Cp	2
PCIE12 Cm	6
PCIE12 Cp	2
PCIE13 Cm	6
PCIE13 Cp	2
PCIE14 Cm	6
PCIE14 Cp	2
PCIE15 Cm	6
PCIE15 Cp	2
PCIE16 Cm	6
PCIE16 Cp	2
PCIE17 Cm	6
PCIE17 Cp	2
PCIE18 Cm	6
PCIE18 Cp	2
PCIE19 Cm	6
PCIE19 Cp	2
PCIE20 Cm	6
PCIE20 Cp	2
PCIE21 Cm	6
PCIE21 Cp	2
PCIE22 Cm	6
PCIE22 Cp	2
PCIE23 Cm	6

PCIE23 Cp	2
PCIE24 Cm	6
PCIE24 Cp	2
Override SW EQ Settings	[Disabled]
▶**IMR Configuration**	
PCIe IMR	[Disabled]
PCI Express Root Port 1	Lane configured as USB/SATA
PCI Express Root Port 2	Lane configured as USB/SATA
PCI Express Root Port 3	Lane configured as USB/SATA
PCI Express Root Port 4	Lane configured as USB/SATA
▶PCI Express Root Port 5	
PCI Express Root Port 6	Lane configured as USB/SATA
PCI Express Root Port 7	Reserved for ethernet
▶PCI Express Root Port 8	
▶PCI Express Root Port 9	
PCI Express Root Port 10	Shadowed by x2/x4 Port
PCI Express Root Port 11	Shadowed by x2/x4 Port
PCI Express Root Port 12	Shadowed by x2/x4 Port
▶PCI Express Root Port 13	
▶PCI Express Root Port 14	
▶PCI Express Root Port 15	
PCI Express Root Port 16	Lane configured as USB/SATA
▶PCIE clocks	

►**SATA And RST Configuration**	
SATA Controller(s)	[Enabled]
SATA Mode Selection	[AHCI]
SATA Test Mode	[Disabled]
►Software Feature Mask Configuration	
Aggressive LPM Support	[Enabled]
Serial ATA Port 0	Empty
Software Preserve	Unknown
Port 0	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
External	[Disabled]
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 0 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15
Serial ATA Port 1	Empty
Software Preserve	Unknown
Port 1	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 1 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15
Serial ATA Port 2	Empty
Software Preserve	Unknown
Port 2	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 2 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15

►**USB Configuration**

XHCI Compliance Mode	[Disabled]
XDCI Support	[Disabled]
USB2 PHY Sus Well Power Gating	[Enabled]
USB Overcurrent	[Enabled]
USB Overcurrent Lock	[Enabled]
USB Port Disable Override	[Disabled]

►**Security Configuration**

►**SCS Configuration**

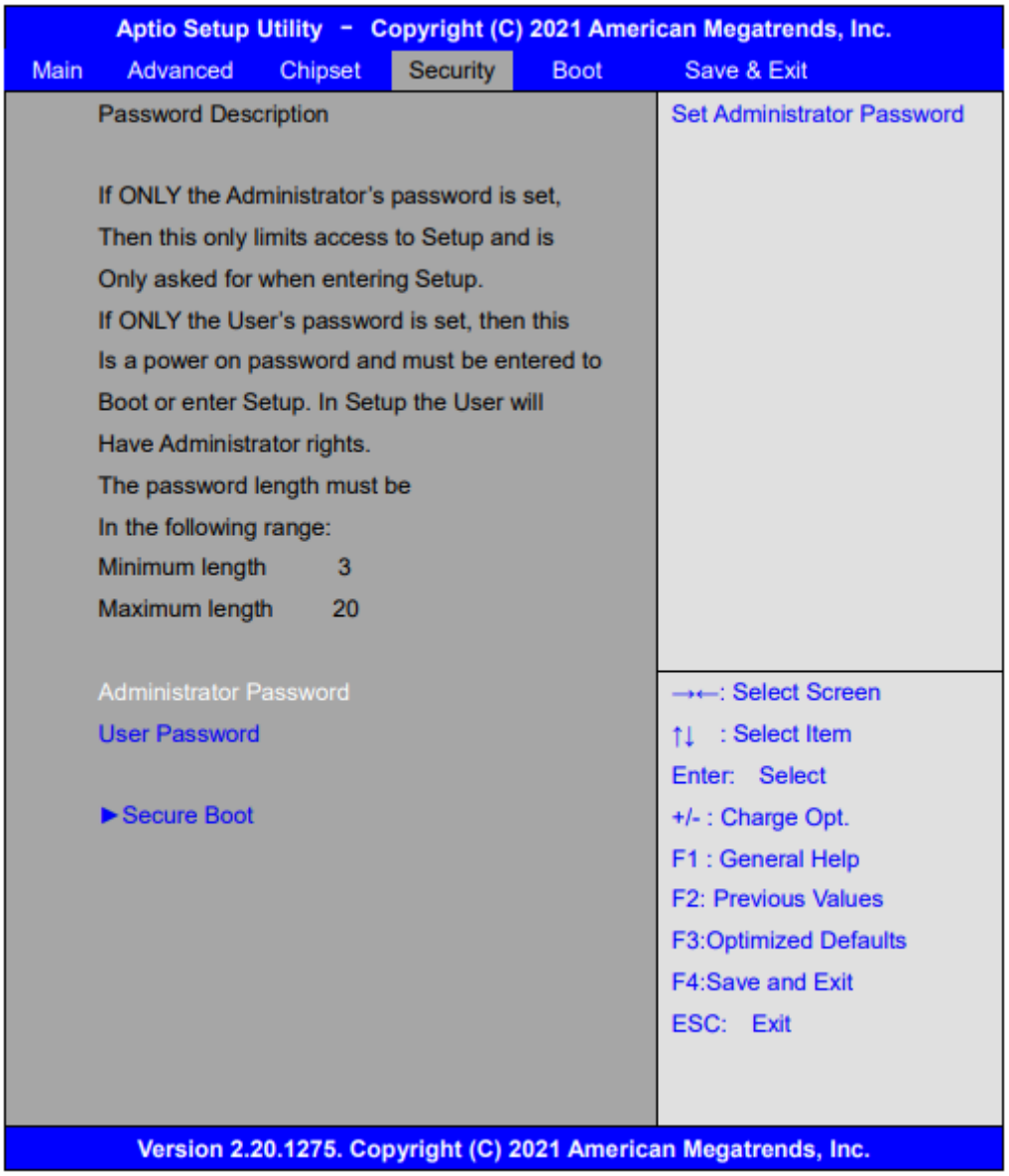
►**ISH Configuration**

►**Pch Thermal Throttling Control**

PCH LAN Control	[Enabled]
LAN Wake From Deepsx	[Enabled]
Wake on LAN Enable	[Enabled]
SLP_LAN# Low on DC Power	[Enabled]
Disaqualify GBE Disconnect And ModPhy PG	[Disabled]
Sensor Hub Type [None]	
Deepsx Power Policies	[Disabled]

Wake on WLAN and BT Enable	[Disabled]
Disable DSX ACPRESENT Pulldown	[Disabled]
CLKRUN# logic [Enabled]	
Serial IRQ Mode	[Continuous]
State After G3	[S0 State]
	[S5 State]

3.6 Security Settings



3.6.1 Administrator Password

3.6.2 User Password

Type the password with up to 20 characters and then press ≺Enter≻ key. This will clear all previously typed CMOS passwords. You will be requested to confirm the password. Type the password again and press ≺Enter≻ key. You may press ≺Esc≻ key to abandon password entry operation.
To clear the password, just press ≺Enter≻ key when password input window pops up. A confirmation message will be shown on the screen as to whether the password will be disabled. You will have direct access to BIOS setup without typing any password after system reboot once the password is disabled.

Once the password feature is used, you will be requested to type the password each time you enter BIOS setup. This will prevent unauthorized persons from changing your system configurations.

Also, the feature is capable of requesting users to enter the password prior to system boot to control unauthorized access to your computer. Users may enable the feature in Security Option of Advanced BIOS Features. If Security Option is set to System, you will be requested to enter the password before system boot and when entering BIOS setup; if Security Option is set to Setup, you will be requested for password for entering BIOS setup.

3.6.3 Secure Boot

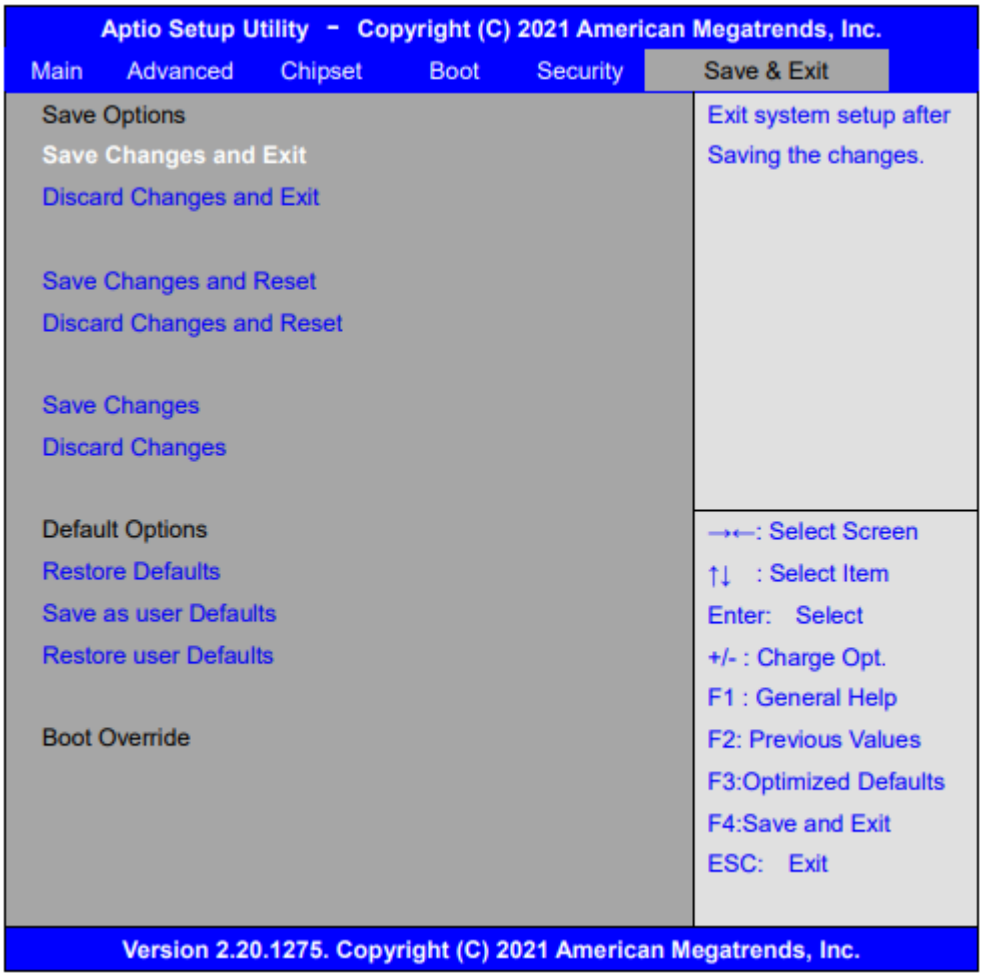
System Mode	Setup
Secure Boot	[Disabled]
	Not Active
Secure Boot Mode	[Custom]
►Restore Factory Keys	
►Restore To Setup Mode	
►Key Management	
Vendor Keys	Valid
Factory Key Provision	[Disabled]
►Restore Factory Keys	
►Restore To Setup Mode	
►Export Secure Boot variables	
►Enroll Efi Image	
Device Guard Ready	
►Remove 'UEFI CA' from DB	
►Restore DB defaults	

Secure Boot variables	Size	Keys	Key Source
►Platform Key(PK)	0	0	No Keys
►Key Exchange Keys	0	0	No Keys
►Authorized Signatures	0	0	No Keys
►Forbidden Signatures	0	0	No Keys
►Authorized TimeStamps	0	0	No Keys
►OsRecovery Signatures	0	0	No Keys

3.7 Boot Settings

Setup Prompt Timeout	1
Bootup Numlock State	[Off]
Quiet Boot	[Disabled]
Boot Option Priorities	
Fast Boot	[Disabled]

3.8 Save & Exit Settings



Save Options
Save Changes and Exit
Save & Exit Setup save Configuration and exit ?

[Yes]
[No]

Discard Changes and Ext
Exit Without Saving Quit without saving?

[Yes]
[No]

Save Changes and Reset
Save configuration and Reset

[Yes]
[No]

Discard Changes and Reset
Reset Without saving?

[Yes]
[No]

Save Changes
Save configuration?

[Yes]
[No]

Discard Changes
Load Previous Values?

[Yes]
[No]

Default Options
Restore Default
Load Optimized Defaults?

[Yes]
[No]

Save as User Default
Save configuration?

[Yes]
[No]

Restore User Default
Restore User Defaults?

[Yes]
[No]

Boot Override

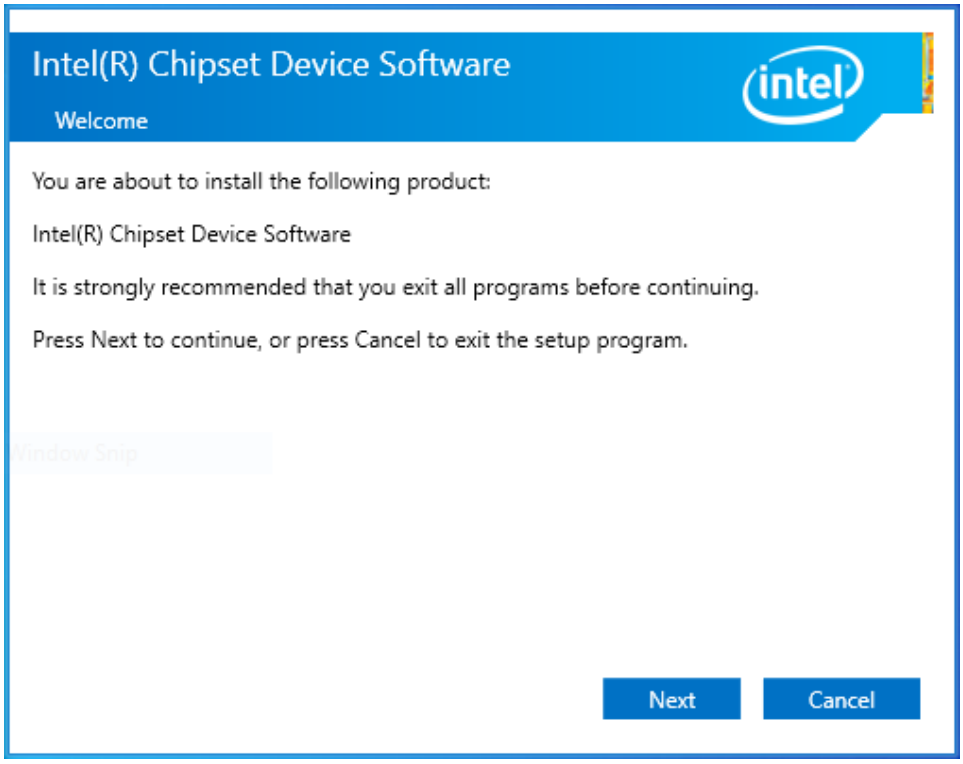
Chapter 4 Installation of Drivers

4.1 Intel® 8th Generation Core Chipset

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

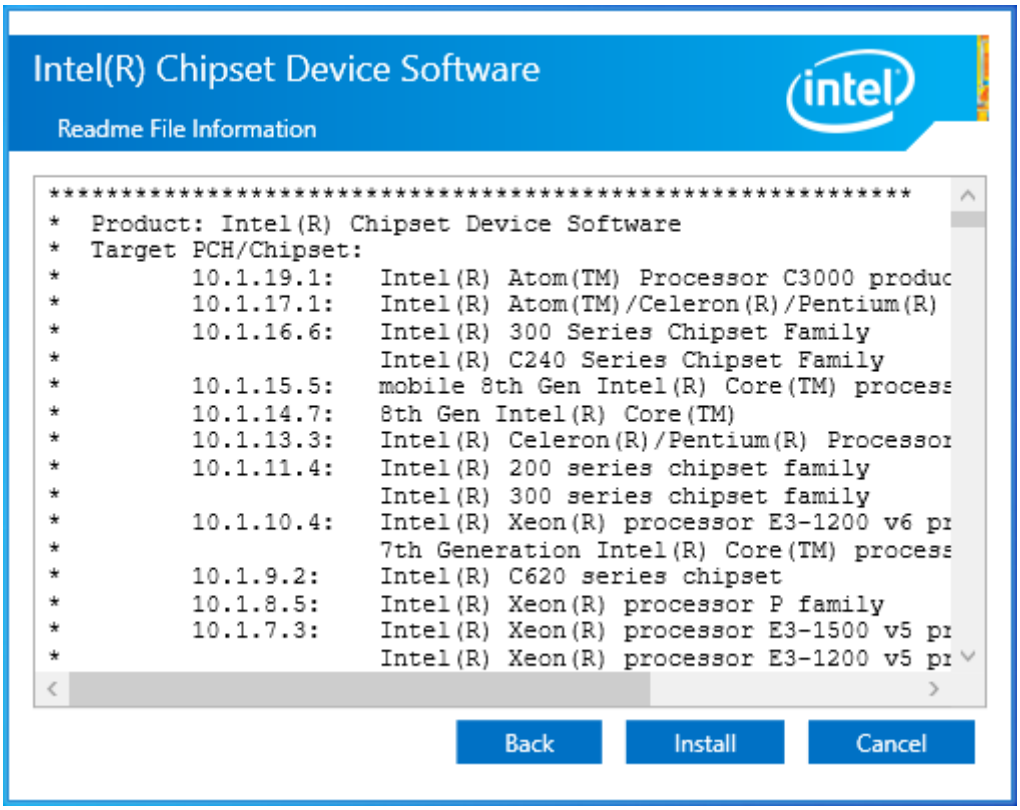
Step 1. Select **Intel® 8th Generation Core Chipset** from the list

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.



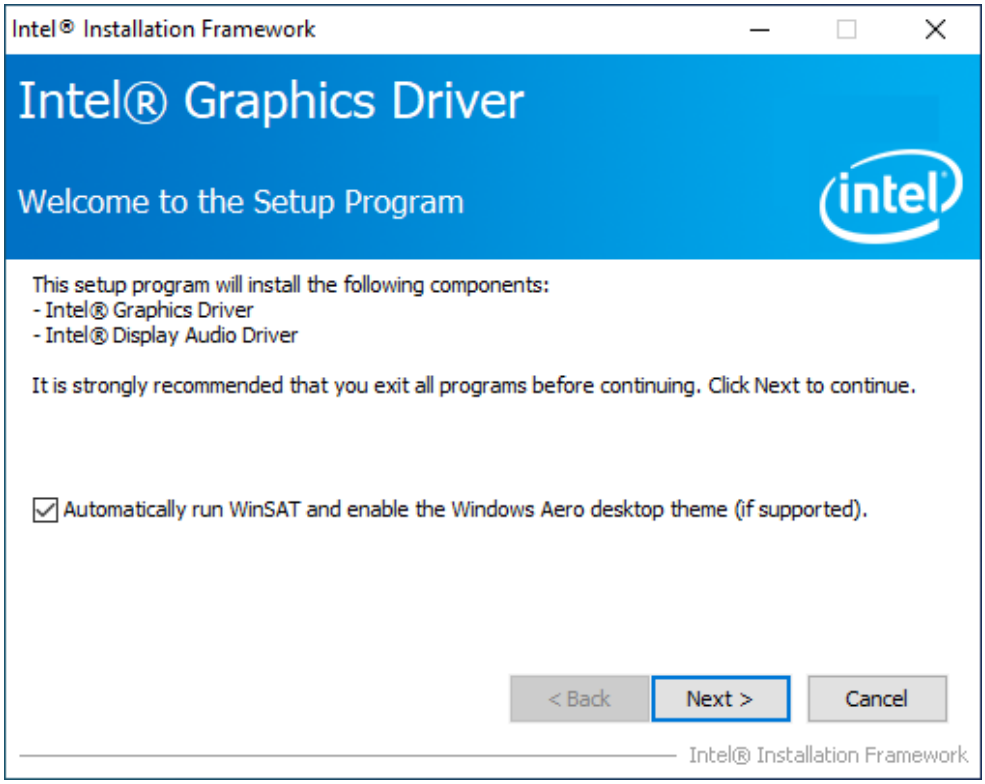
Step5. Select **Restart Now** to reboot your computer for the changes to take effect.

4.2 Intel® VGA Chipset

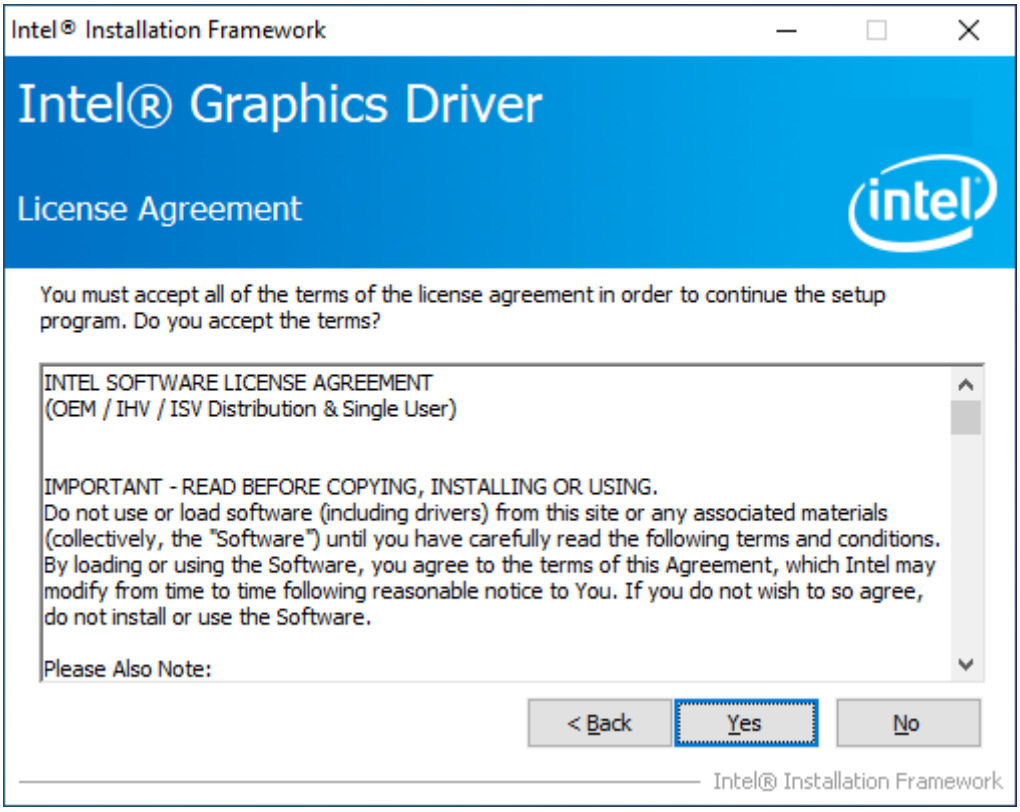
To install the Intel® VGA Chipset, please follow the steps below.

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

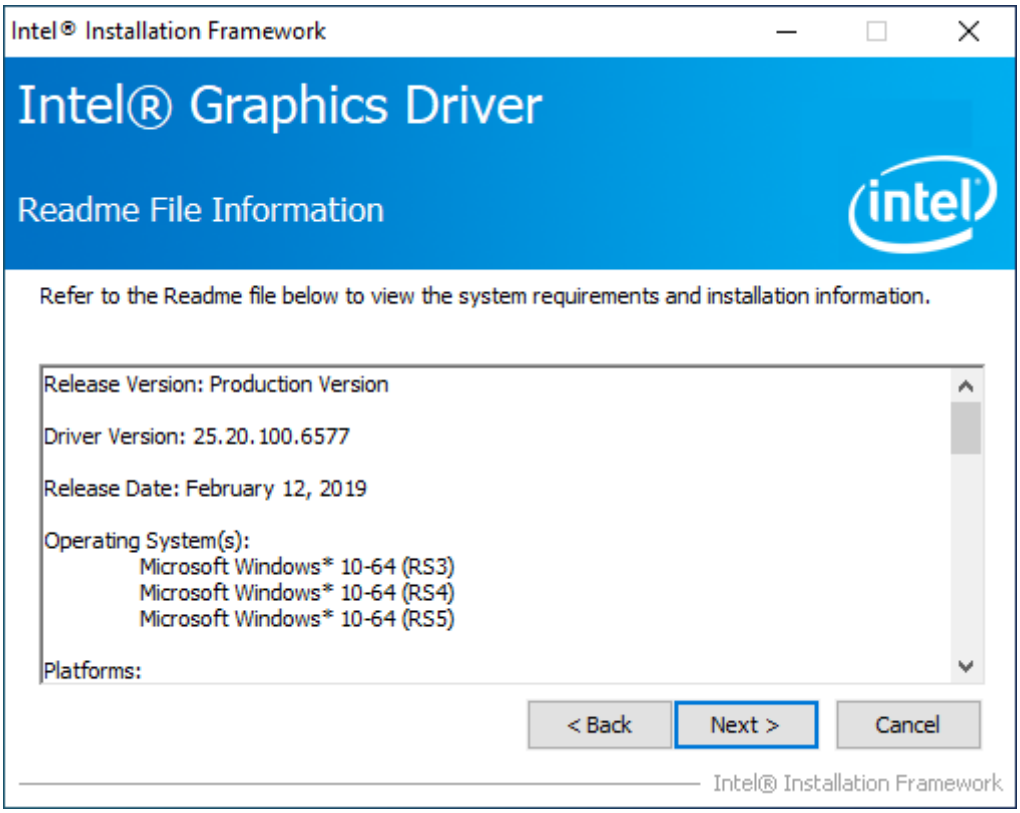
Step2. Click **Next.**



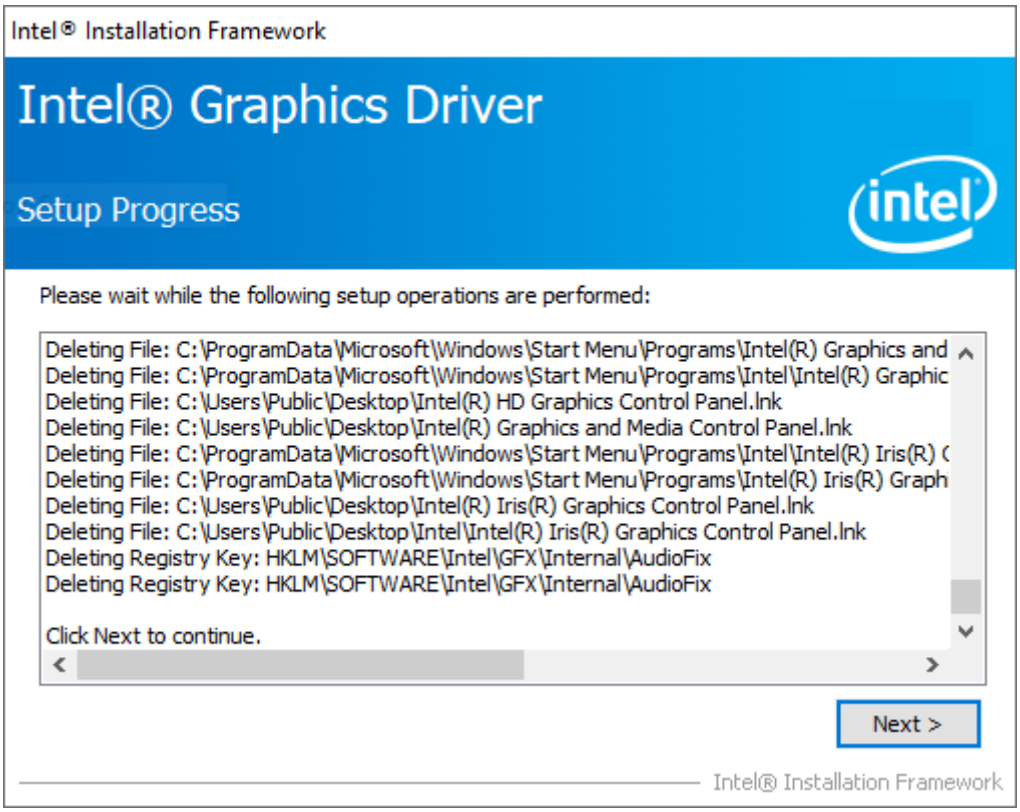
Step3. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



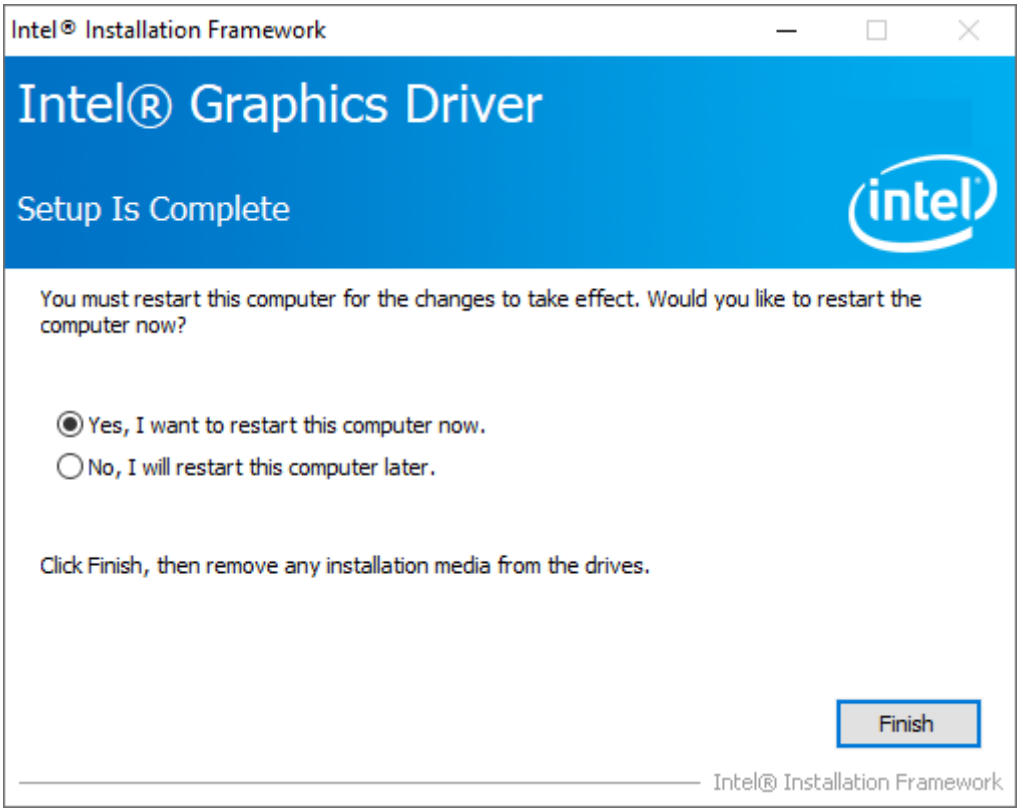
Step4. Click **Next** to continue.



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



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

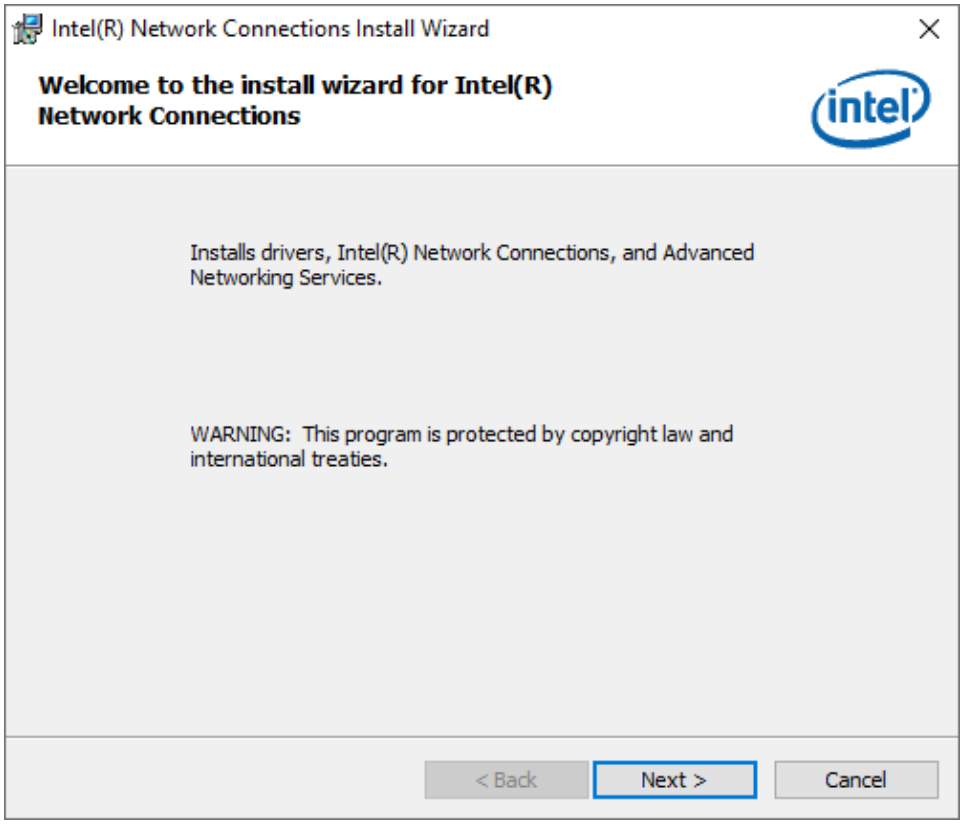


4.3 Intel® LAN Driver

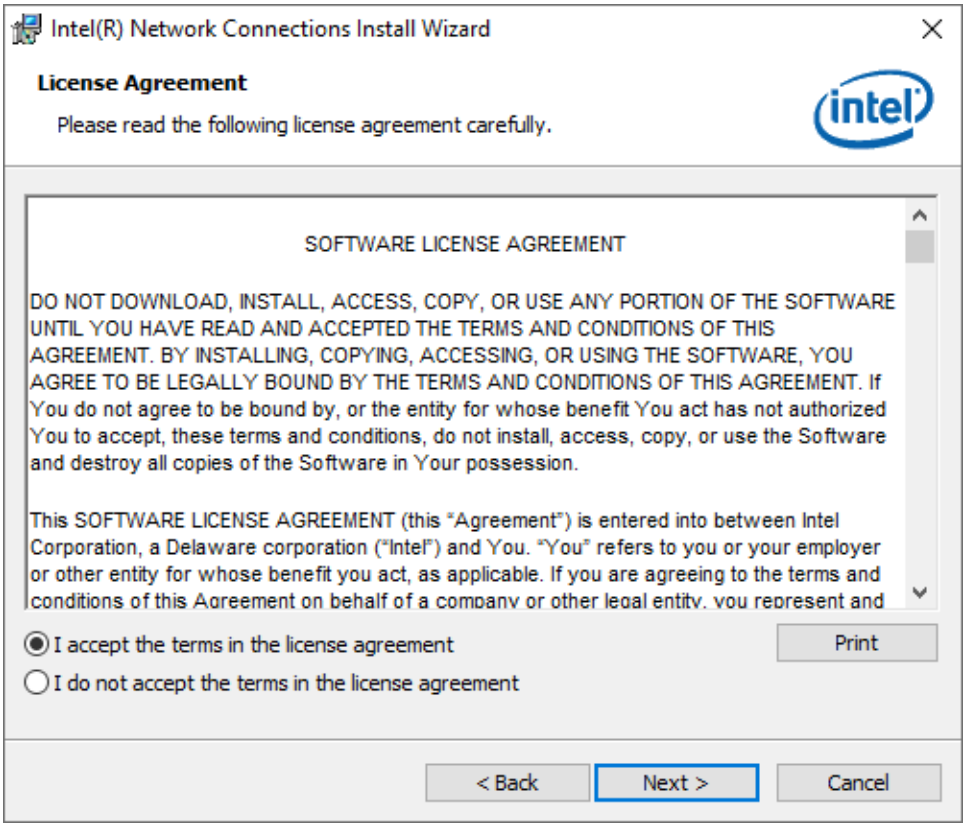
To install the Intel® LAN Driver, please follow the steps below.

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

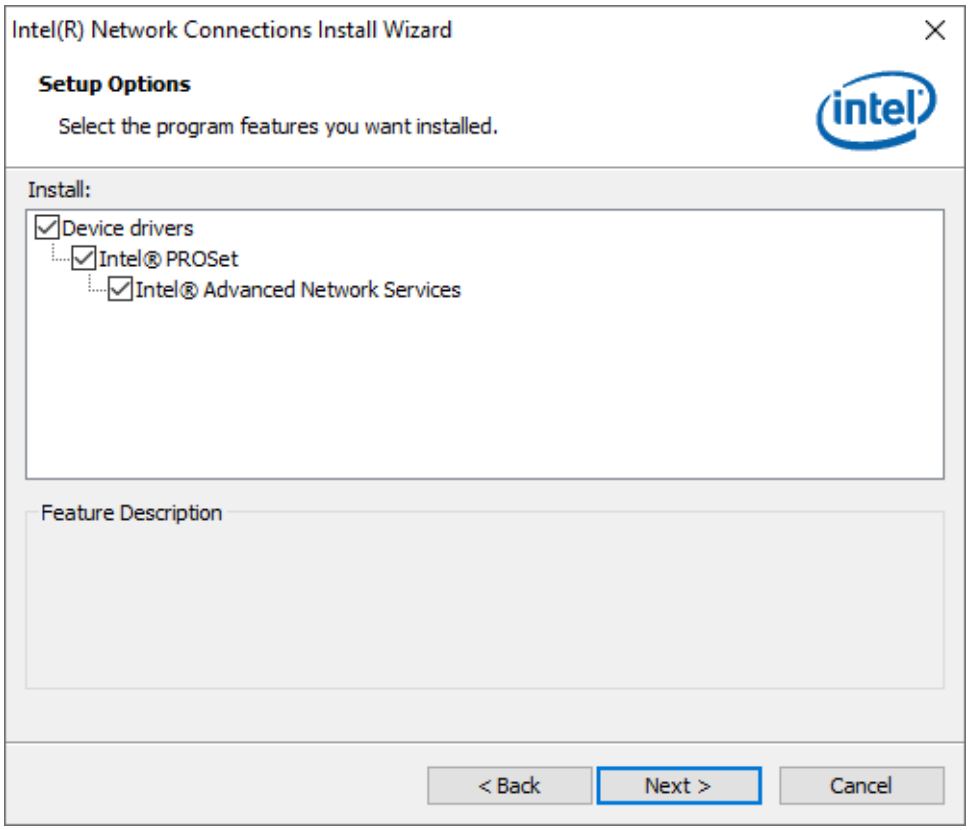
Step2. Click **Next** to continue.



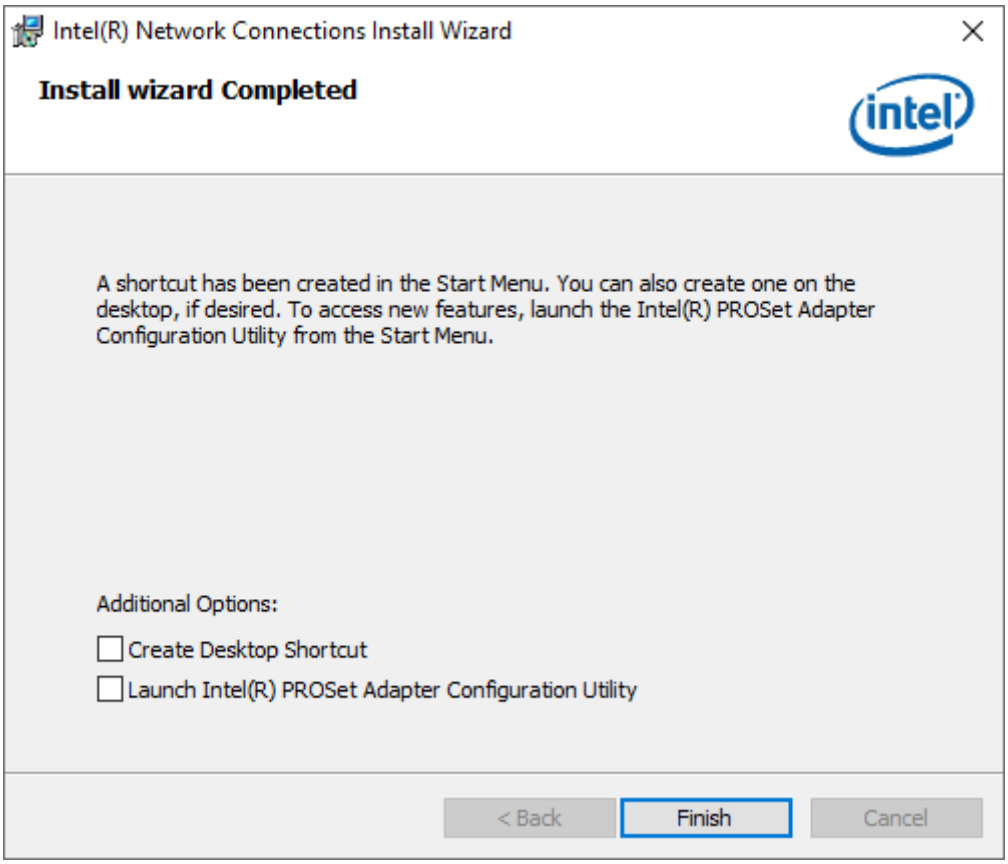
Step3. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



Step4. Click **Next** to continue.



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

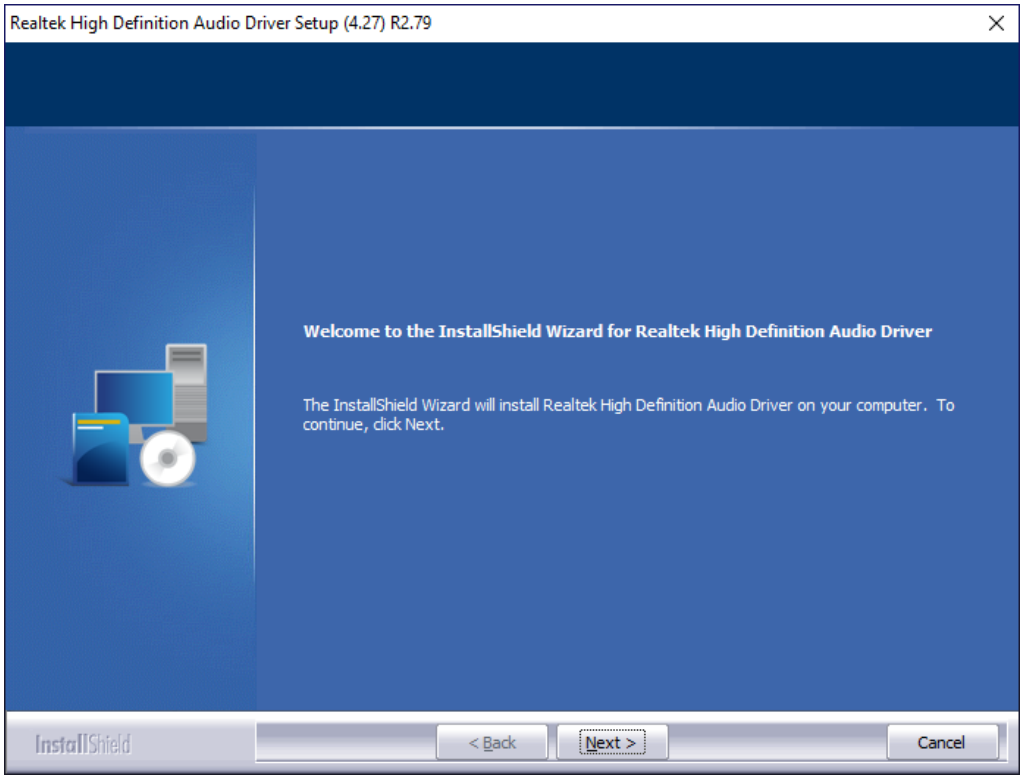


4.4 Realtek Audio Driver

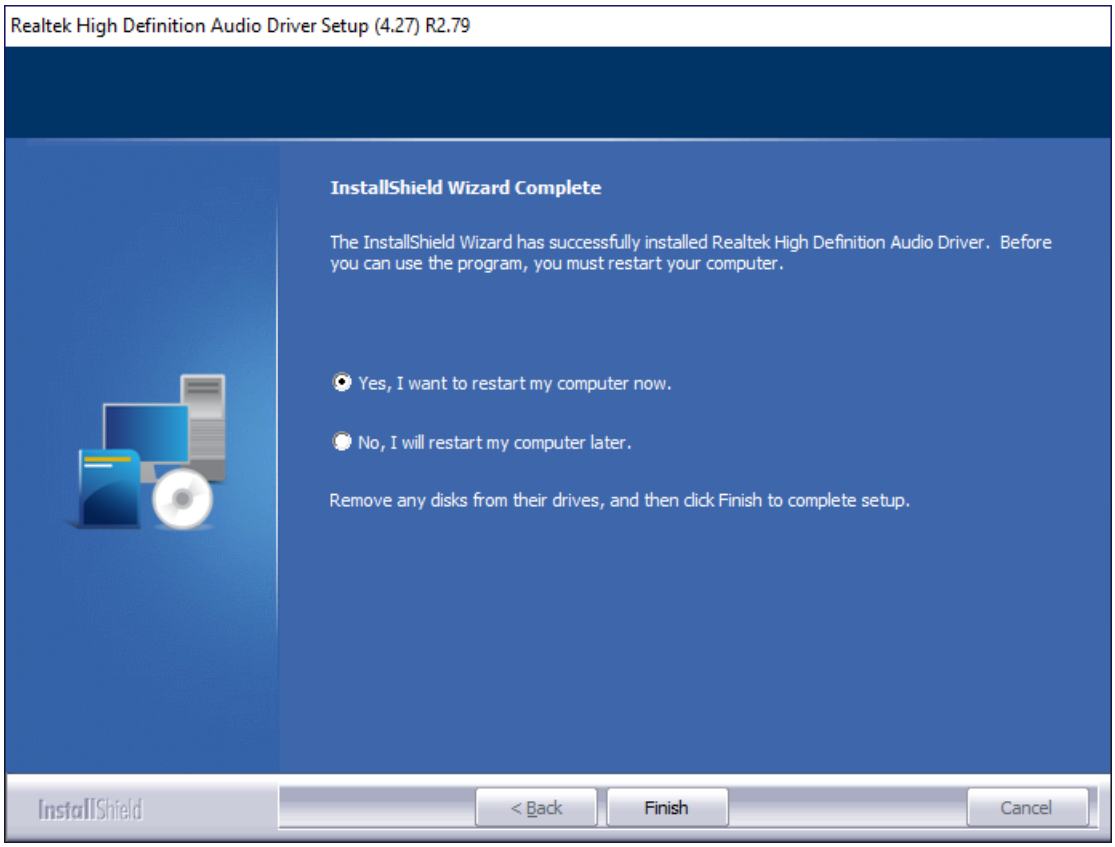
To install the Realtek Audio Driver, please follow the steps below.

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.

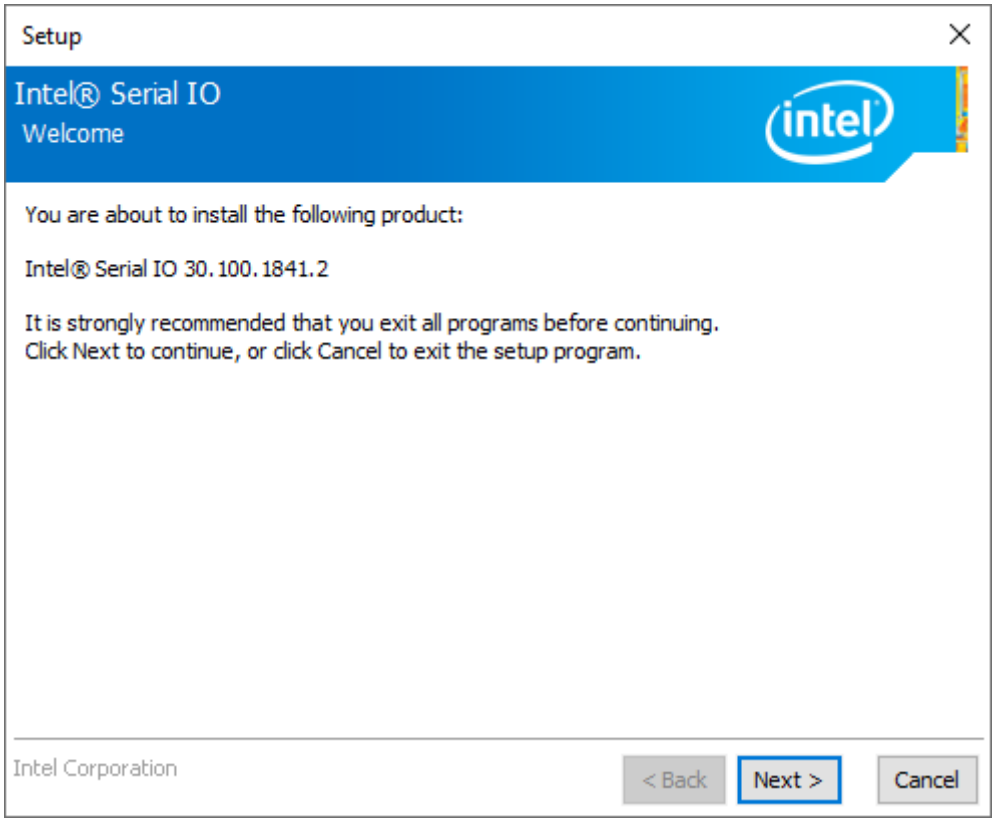


4.5 Intel Serial IO Driver

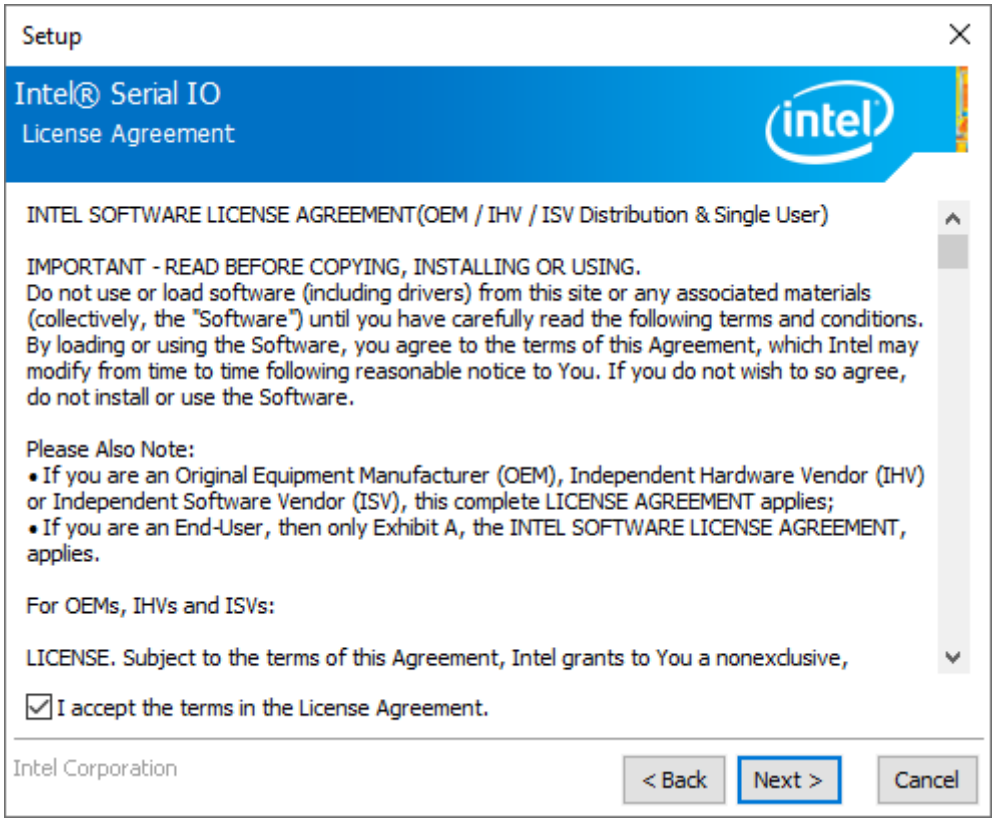
To install the Intel Serial IO Driver, please follow the steps below.

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

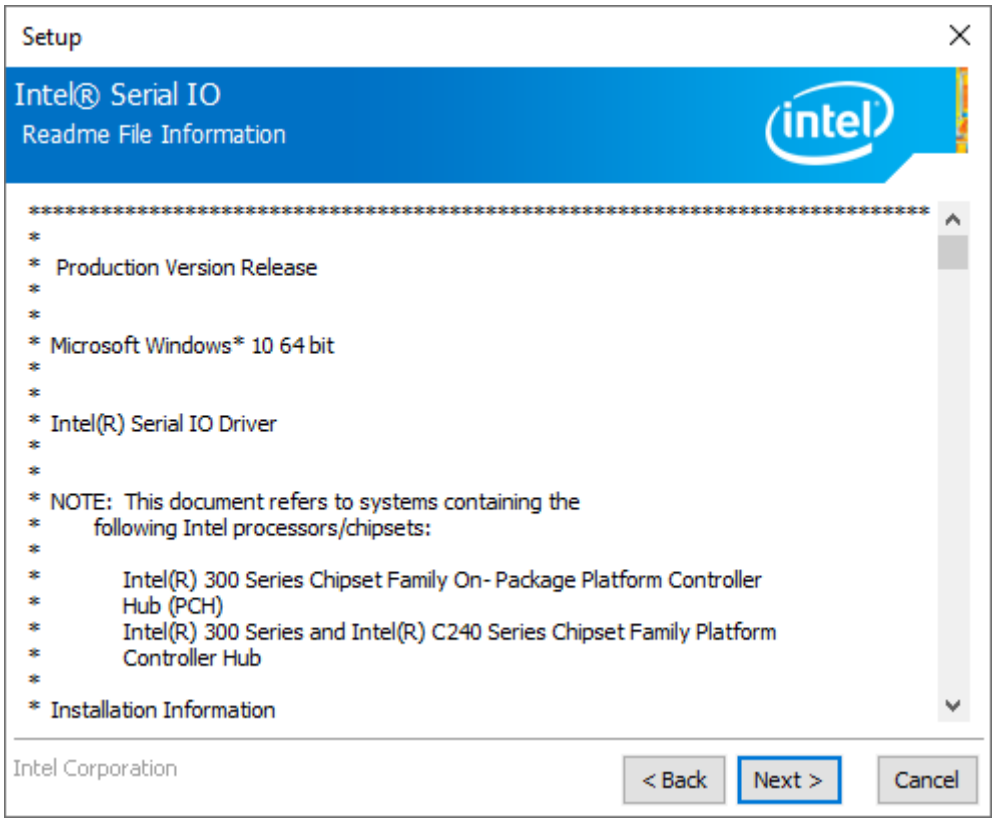
Step2. Click **Next** to continue.



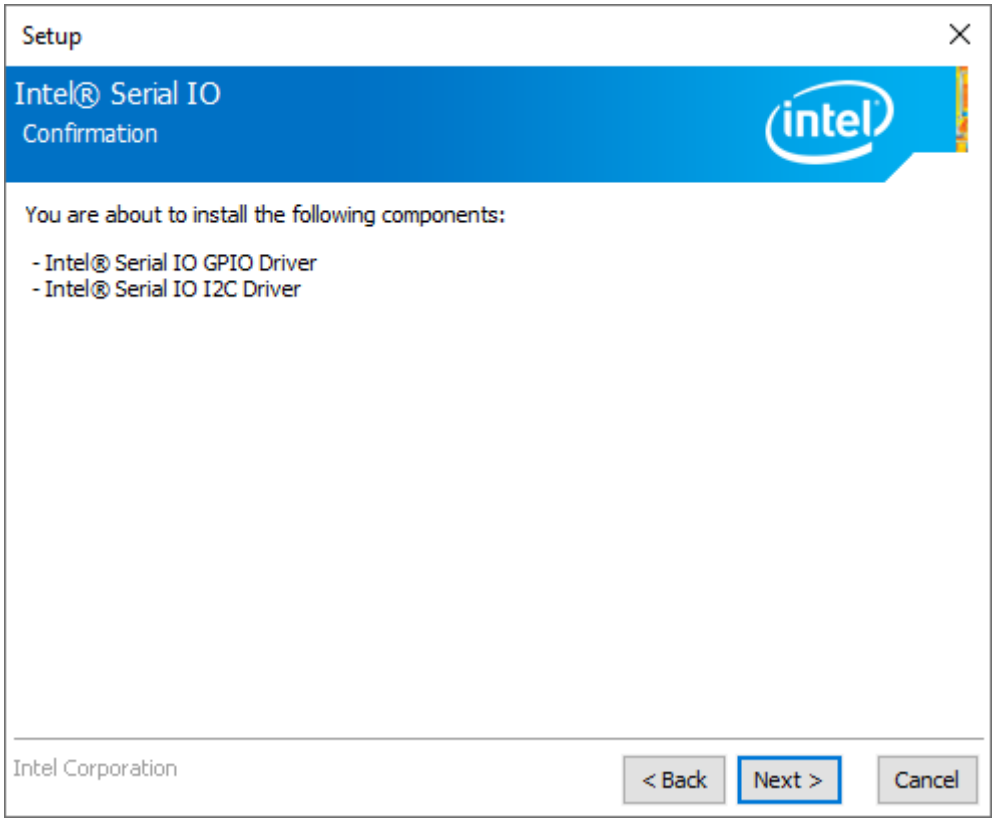
Step3. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



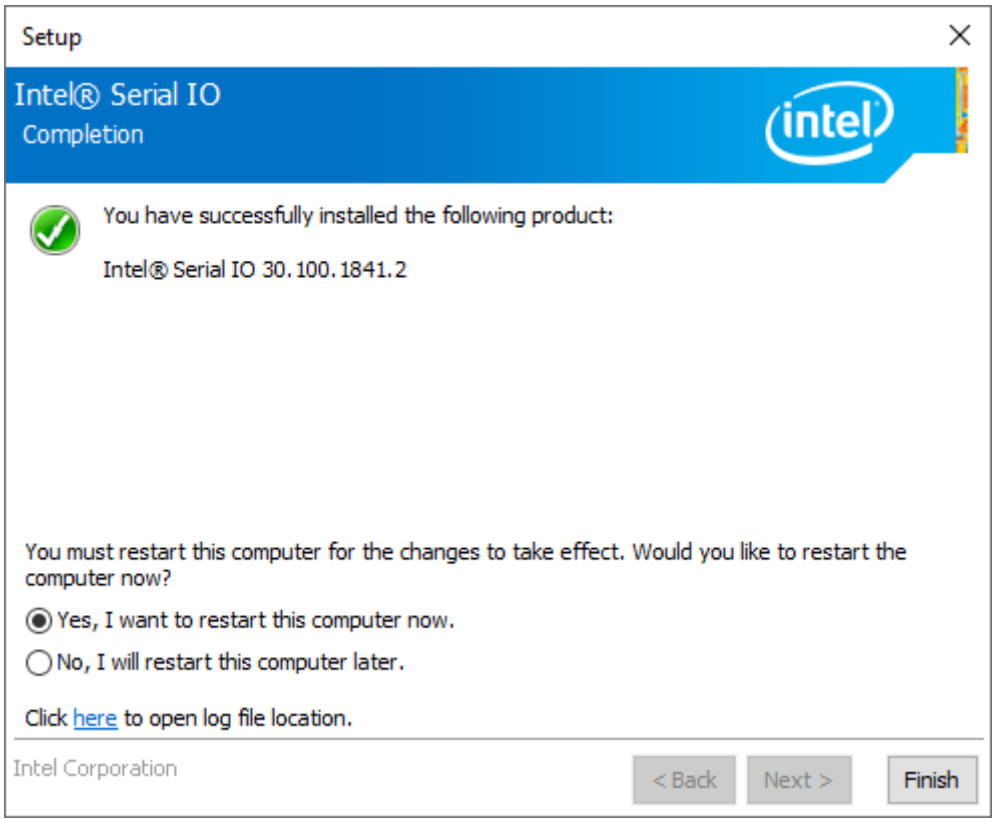
Step4. Click **Next** to continue.



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



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

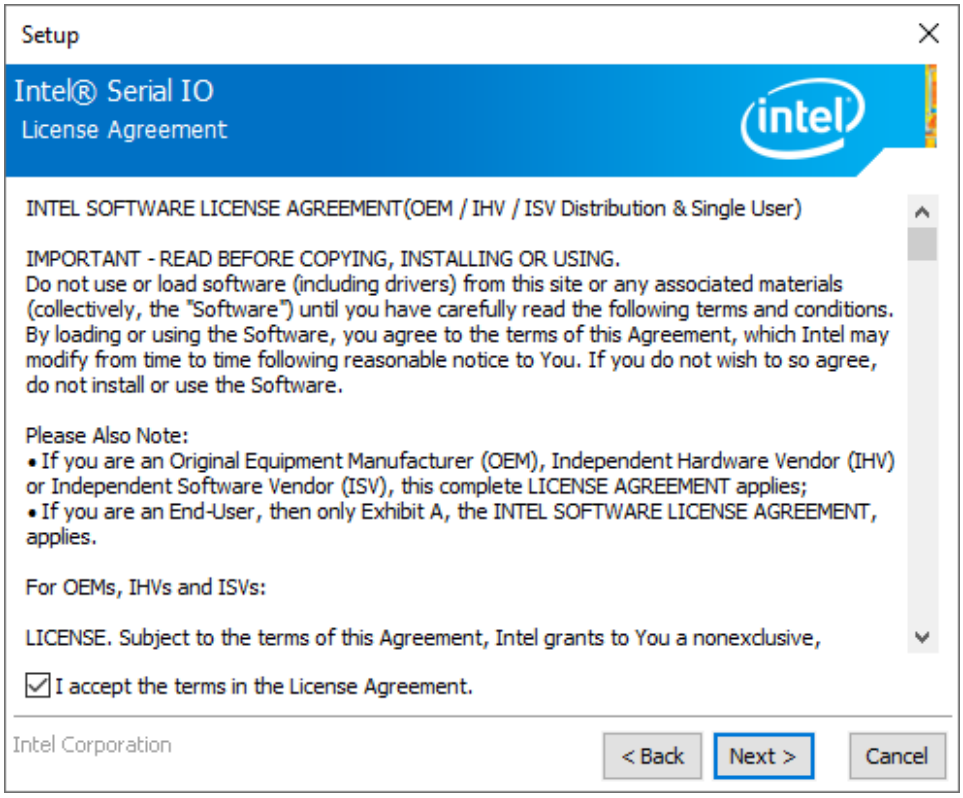


4.6 Resistive Touch Driver

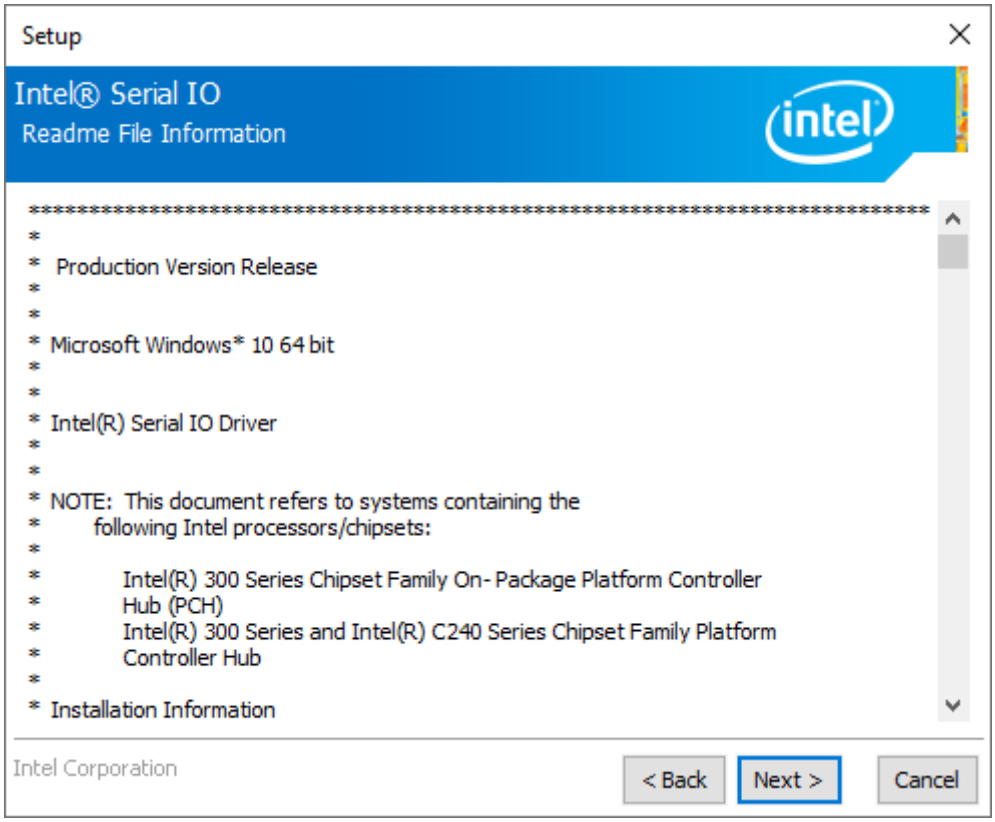
To install the **Resistive Touch Driver**, please follow the steps below.

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

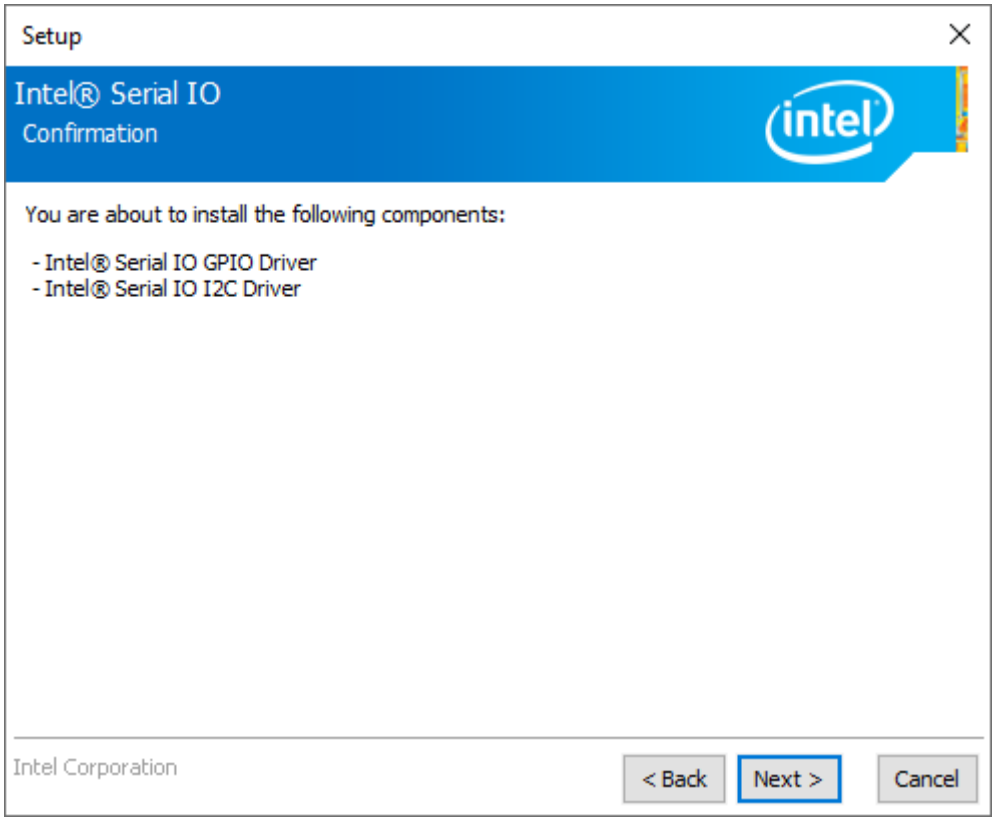
Step2. Read the license agreement. Choose **Accept** and click **Next** to accept all of the terms of the license agreement.



Step3. Click **Next** to continue.



Step4. Click **Next** to continue.



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