AVS-600
APLEX Vertical Application System 8/9th Gen. Intel Core-I and Xeon® E Platform
User Manual

Release Date	Revision
FEB 2022	V1.0

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Revision History

Reversion	Date	Description
1.0	2022/02/24	Official Version

Warning!_____

This equipment will generate, use and 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 is 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 with its 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.

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.

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Chapter 1 Getting Started

1.1 Features

- Vertical System for Artificial Intelligent applications such as Machine Vision, Edge Computing, Machine Learning/Inference, Robotic Control, Automation, and so on.
- High performance CPU of Intel 8/9th Gen. Core-i Processor and Xeon® E Processors.
- Large memory support with DDR4 (2400MHz) SO-DIMM up to 64GB.
- Removable Drive-bays for easy data storage maintenance.
- Support extensive GPU Card expansion for Hard-computing requirement (with GPU Card Holder).
- Mainboard CPU Fan-less Design and GPU Card Expansion with Smart Fan support.
- Flexible expansion features through I/O module design with mini-PCIe and PCIe/PCI Add-on card support.
- DC Power Inputs for High-power GPU Expansion and POE device support.

1.2 Specifications

	AVS-600
System	
CPU	Intel 9th Gen. Core i3/i5/i7 Processors (without turbo operation), LGA 1151 Socket H4: Core i7-9700TE (35W) Core i5-9500TE (35W) Core i3-9100TE (35W) Core i7-9700E (65W) Core i5-9500E (65W) Core i3-9100E (65W) Intel® Xeon® E Processors

	Xeon® E-2278GEL (35W)
Chipset	C246
Memory	2 x 260-pin stacked DDR4 (2400MHz) SO-DIMM memory sockets, Dual channel/bank, up to 64GB support.
Outside IO Port	
Default I/O Ports	4 x USB 3.1 Gen.2 (Type A, with Lock-hole) 2 x USB2.0 (typeA) 1 x USB2.0 (Internal Type A in backside for Dongle) 2 x GbE LAN RJ-45, LAN1 for PXE Boot-up 1 x DP 1.2 port 1 x HDMI port 2 x RS-232/422/485 (COM1/COM2, DB9, default RS-232) 1 x Line-out 1 x Mic-in via TB-595 1 x 8-bit GPIO (4 x in, 4 x out, Isolated 2500Vrms, NPN/PNP Selected, Default NPN) via TB-595
Storage Space	
Storage	Mainboard Backside connectors: 4x SATA3 channels (RAID 0/1/5/10): (a) 2 x 2.5” SATA3 HDD/SSD with Removable Drive-bays by default (for 5~7mm HDD/SSD) (b) 2 x 2.5” SATA3 HDD/SSD for expansion, Drive-bay optional (for 5~7mm HDD/SSD) 1 x M.2 Key (2242/2280, for PCIe x 4 NVMe support)
Expansion	
Expansion Slot	Mainboard Backside Expansion: 2 x Full-size mini-PCIe slots 1 x micro SIM socket 1 x PCIe-4 in x8 socket (slot#1, GEN.2) 1 x PCIe-4 in x8 socket (slot#2, GEN.2) 1 x PCIe-16 (slot#3, GEN.2)
Power	
Power Input	1 x 3-Pin Terminal Block for 12~36V DC power input (MB Maximum Power support to 250W) 1 x Power Button with LED light 1 x 2-pin Power Switch Connector
Optional Add-on Card	

Add-on Card (optional)	TB-558 (4x PSE Expansion, in PCIe-4 slot), support PoE(Under 62W) TB-559 (4x USB3 Expansion, in PCIe-4 slot) TB-587 (4x Lightning CH, 16x DIO, 4x Trigger in, 4x Trigger out, in PCIe-1)	
Misc		
Misc	1 x TPM2.0 1 x Watchdog Timer (256 steps) 1 x Thermal Copper for PCBA Thermal Detection 3 x SMA holes for Wi-Fi or Wireless 4G LTE/GPS antennas BIOS turbo mode default off	
Mechanical		
Construction	Titanic Metal color for the aluminum Heat-sink. Standard Black for the metal steel chassis.	
Mounting	Mount Kit (Default)	
Dimensions	350 x 200 x 200 mm (LxWxH)	
Net Weight	6.5Kg	
Ventilation	3 x 80x80mm Ventilation windows (Default) 2 x 80x80mm Smart Fans on the top side for hot-air out (Default) 1 x 120x120mm Smart Fan outside on top of Heat-sink for CPU hot-air blow (Optional)	
Environmental		
Operating Temperature	0~50°C(Fanless)	-20~60°C(with air flow)
Storage Temperature	-40~85°C	
Operating Humidity	10 to 90% @ 30°C, non-condensing	
Storage Humidity	10 to 90% @ 40°C, non-condensing	
Certification	CE / FCC Class A(CCC, UL, and other options by request)	
Operating System Support	Microsoft® Win10 IoT, Linux 4.20.2	

1.3 Dimensions

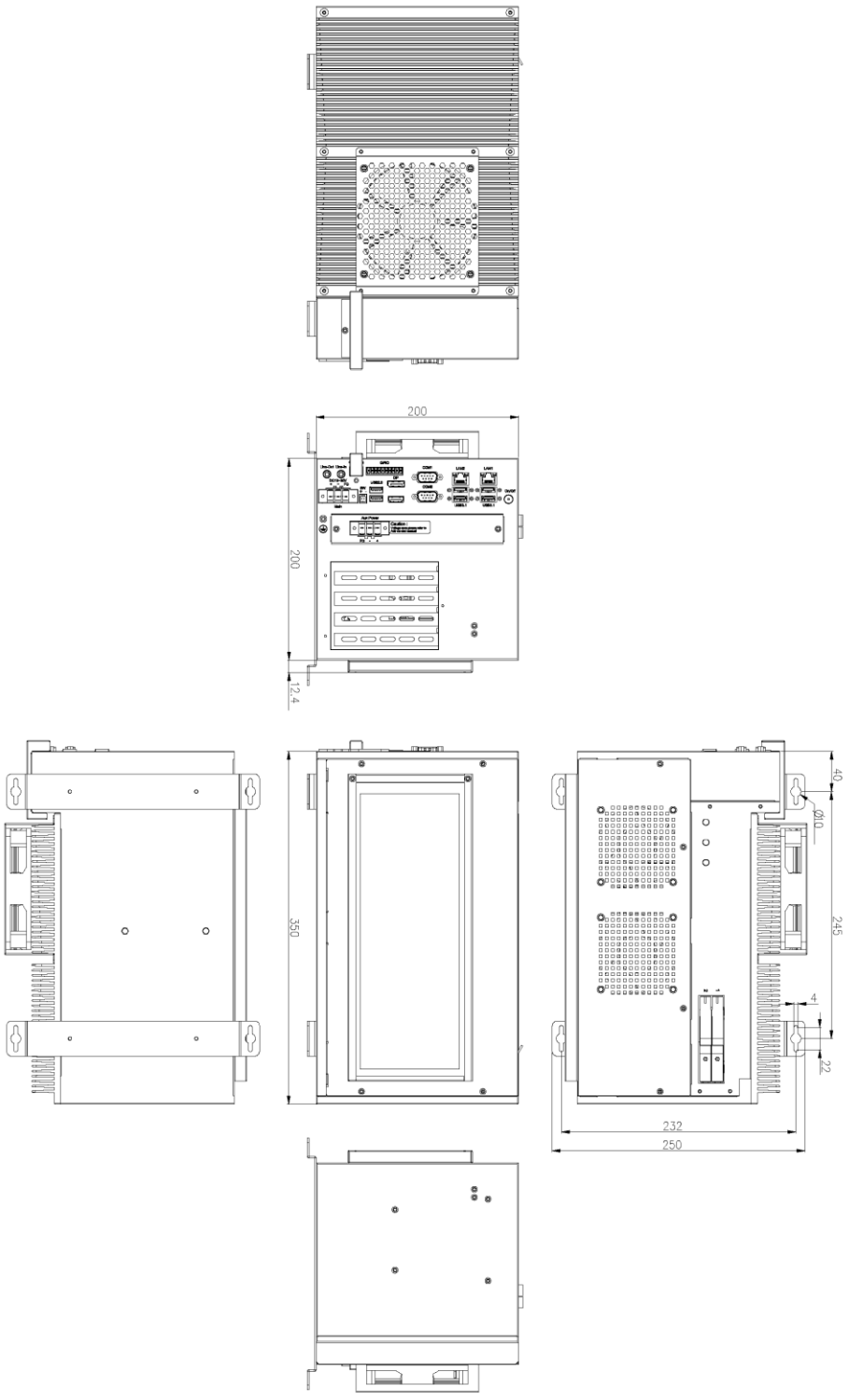


Figure 1.1: Dimension of AVS-600

1.4 Brief Description of AVS-600

AVS-600 is designed with MB CPU fan-less and GPU card expansion with smart fan support. It is powerful with Intel 9th Generation Core i3/i5/i7 processor and Intel Xeon-E processors, and it supports 2 x 260-pin DDR4 SO-DIMM up to 64GB memory. They come with 4 x USB 3.1 Type A, 2 x USB 2.0 Type A, 2 x GbE LAN, 1 x DP, 1 x HDMI, 2 x COM ports, 1 x Line-out, and 1 x Mic-in. AVS-600 supports easy-accessible 4 x 2.5" SATA3 HDD space (include external and internal) and 12~36V DC wide-ranging power input. AVS-600 has up to 2 x full-size mini-PCIe slot and 1 x micro SIM socket for expansion. It is plating titanium metal aluminum heatsink and black steel chassis design, and can be placed on desktop-mounted. AVS-600 works well with our other products and it can provide an absolute easy way to perform control maintenance.

Figure 1.4: Appearance of AVS-600

Chapter 2 Hardware

2.1 Motherboard Introduction

ASB-M8371 is a Non-standard industrial motherboard developed on the basis of Intel C246, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features two GbE ports, 6-COM ports and two Mini PCIE configuration. To satisfy the special needs of high-end customers, this motherboard is designed with 164Pin PCIe x16 Slot expansion interface, 98Pin five PCIe x8 Slot interface and 64Pin five PCIe x4 Slot interface. The product is widely used in various sectors of industrial control. It can also be used in high-end visual control system.

2.2 Specifications

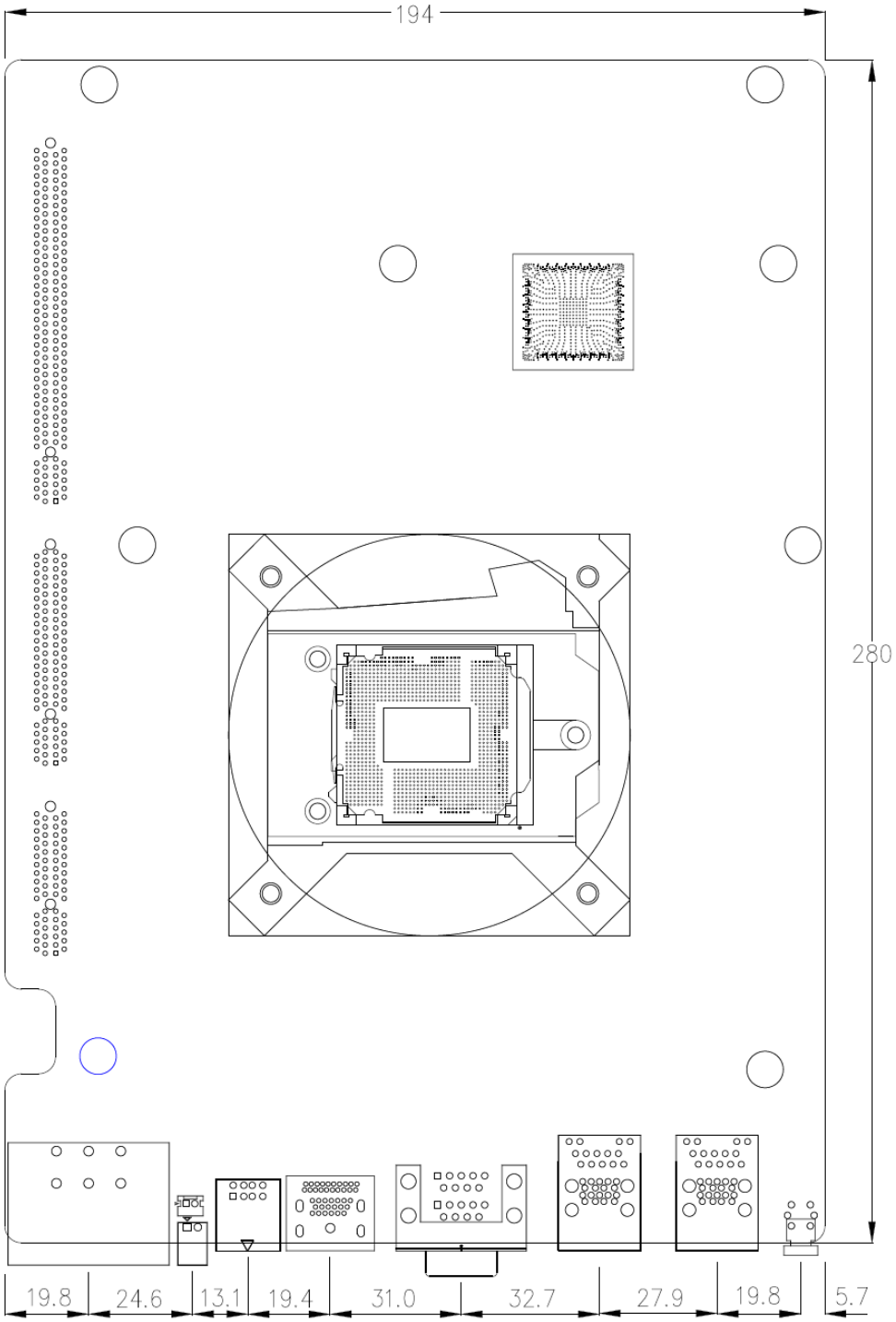
Specifications	
Board Size	194mm x 280mm
CPU Socket	LGA 1151 Socket
CPU Support	Intel 8th Core i3/i5/i7 Processor Intel® Core™ I7-8700T 2.40GHz (up to 4.00GHz)35W Intel® Core™ I7-8700, 3.20GHz (up to 4.60GHz)65W Intel 9th Core i3/i5/i7 Processor Intel® Core™ I3-9100TE 2.20GHz (up to 3.30 GHz)35W Intel® Core™ I3-9100E 3.10GHz (up to 3.70GHz)65W Intel® Core™ I5-9500TE 2.20GHz (up to 3.60GHz)35W Intel® Core™ I5-9500E 3.00GHz (up to 4.20GHz)65W Intel® Core™ I7-9700TE 1.80GHz (up to 3.80GHz)35W Intel® Core™ I7-9700E 2.60GHz (up to 4.40GHz)65W Intel Xeon E Processor Intel® Xeon E-2278GEL 2.00GHz (up to 3.90 GHz) 35W
Chipset	Intel®C246 Chipset
Memory Support	2 x SO-DIMM (260pins) up to 64GB DDR4 2666 MHz FSB(I7-8700T/I7-8700) up to 32GB DDR4 2400 MHz FSB (I3-9100TE/I3-9100E) up to 64GB DDR4 2666 MHz FSB (I5-9500TE/I5-9500E/I7-9700TE/I7-9700E)

	up to 64GB DDR4 2666 MHz FSB (E-2278GEL)
Graphics	Intel® UHD Graphics 630
Display Mode	1 x HDMI interface (HDMI 1.4) 1 x DP interface
Support Resolution	Up to 4096 x 2304 for HDMI (I7-8700T/I7-8700) Up to 4096 x 2160 for HDMI Up to 4096 x 2304 for DP
Double Display	HDMI + DP
Super I/O	Nuvoton NCT6106D
BIOS	AMI/UEFI BIOS
Storage	4 x SATA3.0 Connector (SATA1/SATA2/SATA3/SATA4) 1 x NGFF(M.2)M-Key, support 2242/2280
Ethernet	1 x PCIe GbE LAN via Intel I210AT 1 x PCIe GbE LAN via Intel I219-LM, Support Intel® AMT Technology (option)
USB	4 x USB 3.0/USB2.0 stack ports for external (USB 3.0: USB3-3/USB3-4/USB3-5/USB3-6) (USB 2.0: USB2-3/USB2-4/USB2-5/USB2-6) 2 x USB 2.0 stack ports for external (USB2.0: USB2-1/USB2-2) 1 x USB 2.0 Single port for internal (USB2-8) 2 x USB 2.0, 2x5Pin header(USB2-9/USB2-10) 2 x USB 2.0, 2x5Pin header(USB2-11/USB2-12) 1 x USB 2.0 internal for M-PCIE1 (USB2-13) 1 x USB 2.0 internal for M-PCIE2 (USB2-14)
Serial	1 x RS232/RS422/RS485 port, DB9 connector for external (COM1) Pin 9 w/5V/12V/Ring select 1 x RS232 port, DB9 connector for external (COM2) Pin 9 w/5V/12V/Ring select 4 x RS232 select header for internal MIO2 (COM3/4/5/6)
Digital I/O	8-bit digital I/O by pin header (MIO1) 4-bit digital input 4-bit digital output
Battery	Support CR2477 Li battery by 2-pin header (1000mAh)

Audio	Support Audio via Realtek ALC3202-GRT HD audio codec Support Line-in/Line-out/MIC-in by Pin header(MIO1) Support a stereo Class-D Speaker Amplifier with 2 watt per channel output power, by 4/4-pin header (SPK1)
Expansion Bus	1 x PCI-express x8 extend by 98 pin slot(PCIE8x_1) 1 x PCI-express x16 extend by 164 pin slot(PCIE16x_1) 1 x mini-PCI-express slot (MPCIE1) 1 x mini-PCI-express slot (MPCIE2)
Power Management	1x3-pin Connector (input) (Wide range DC+12V-36V, w/o: TB-594E42E161) (Wide range DC+14V-36V, w/: TB-594E42E161)
Switches and LED Indicators	Power on/off switch by PS_ON2 and BT1 and PS_ON1 Power LED status by PS_ON2
External I/O Port	2 x COM Ports(COM1/COM2) 4 x USB 3.0 Ports(stack) 2 x USB 2.0 Ports(stack) 2 x RJ45 GbE LAN Ports 1 x HDMI interface 1 x DP interface
SIM	1 x SIM Card holder (option)
TPM	Infineon's Trusted Platform Module(TPM2.0) Note: Only support Windows 10 IoT
FAN	3 x FAN connector: 2 x 1*4Pin wafer (FAN_1/FAN_2) 1 x Pin header bi MIO1 (CPU FAN)
Temperature	Operating: -20℃ to 70℃ (PCBA) Storage: -40℃ to 85℃ (PCBA) Operating: -20℃ to 60℃ (for AVS-600, WT1) Operating: 0℃ to 50℃ (for AVS-600, Fanless)
Humidity	10% - 90%, non-condensing, operating
Power Consumption	Total Power Design 400W
EMI/EMS	Meet CE/FCC class A
PB-429	Board Size: 100x65mm (R1.10)

	1x 3-Pin power input connector 2x 2*2 pin power output connector
TB-595	Board Size: 70x32mm (R0.20) 8-bit digital I/O by connector, w/Isolated (CN1) 4-bit digital input 4-bit digital output 1 x Switch, NPN/PNP mode select via dip Support Line-out by Jack Support Line-in by Jack 1 x 4Pin wafer for CPU FAN
TB-594E42E161	Board Size: 250x130mm (R1.00) 2x PCIe x4 Slot (98Pin) 1x PCIe x16 Slot (164Pin) 2x 2*4 pin power DC12V output connector

2.3 Motherboard Dimension



(units :mm)

Figure 2.1: Motherboard ASB-M8371 Dimensions

2.4 Jumpers and Connectors Location

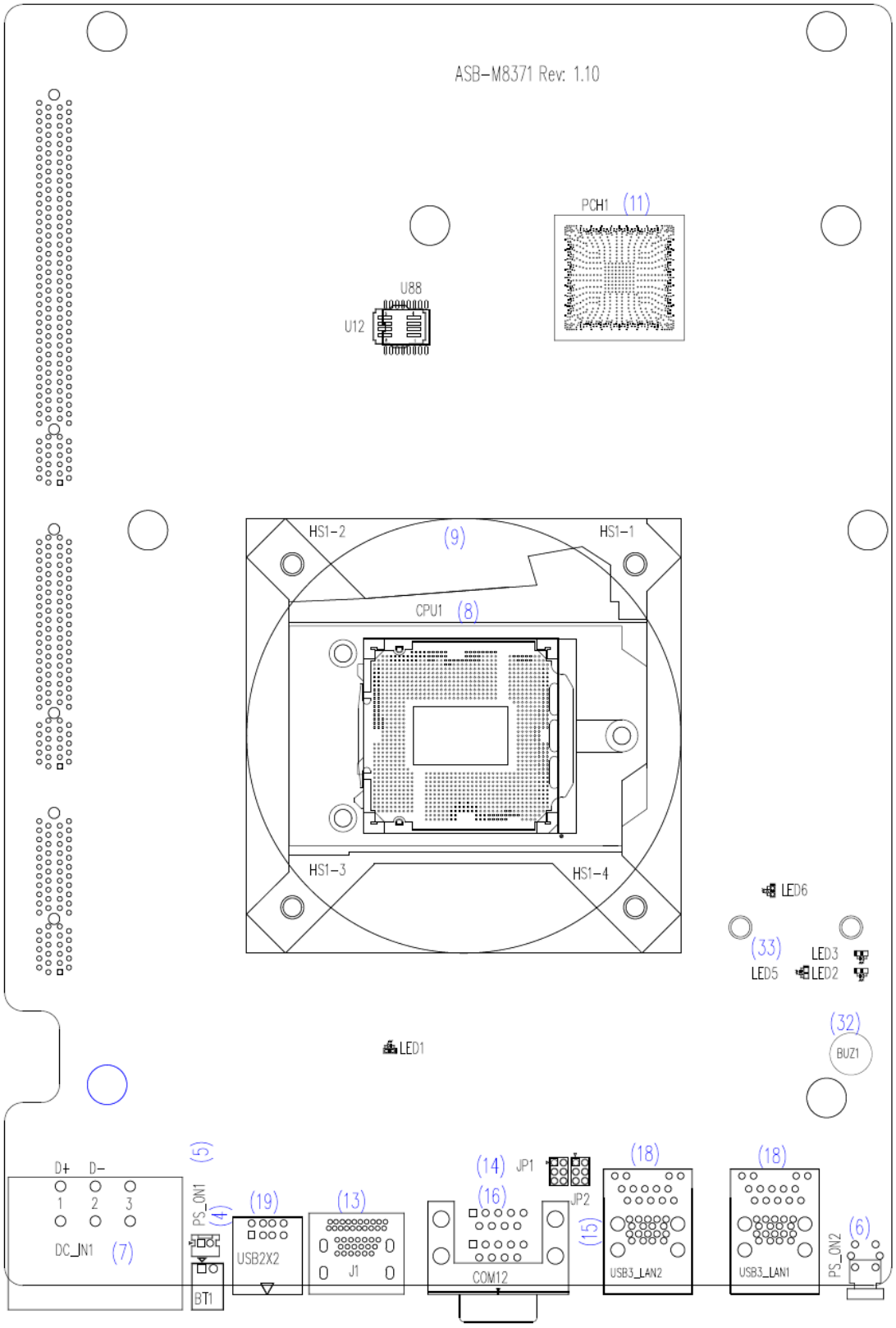


Figure 2.2: ASB-M8371 Jumpers and Connectors Location- Board Top

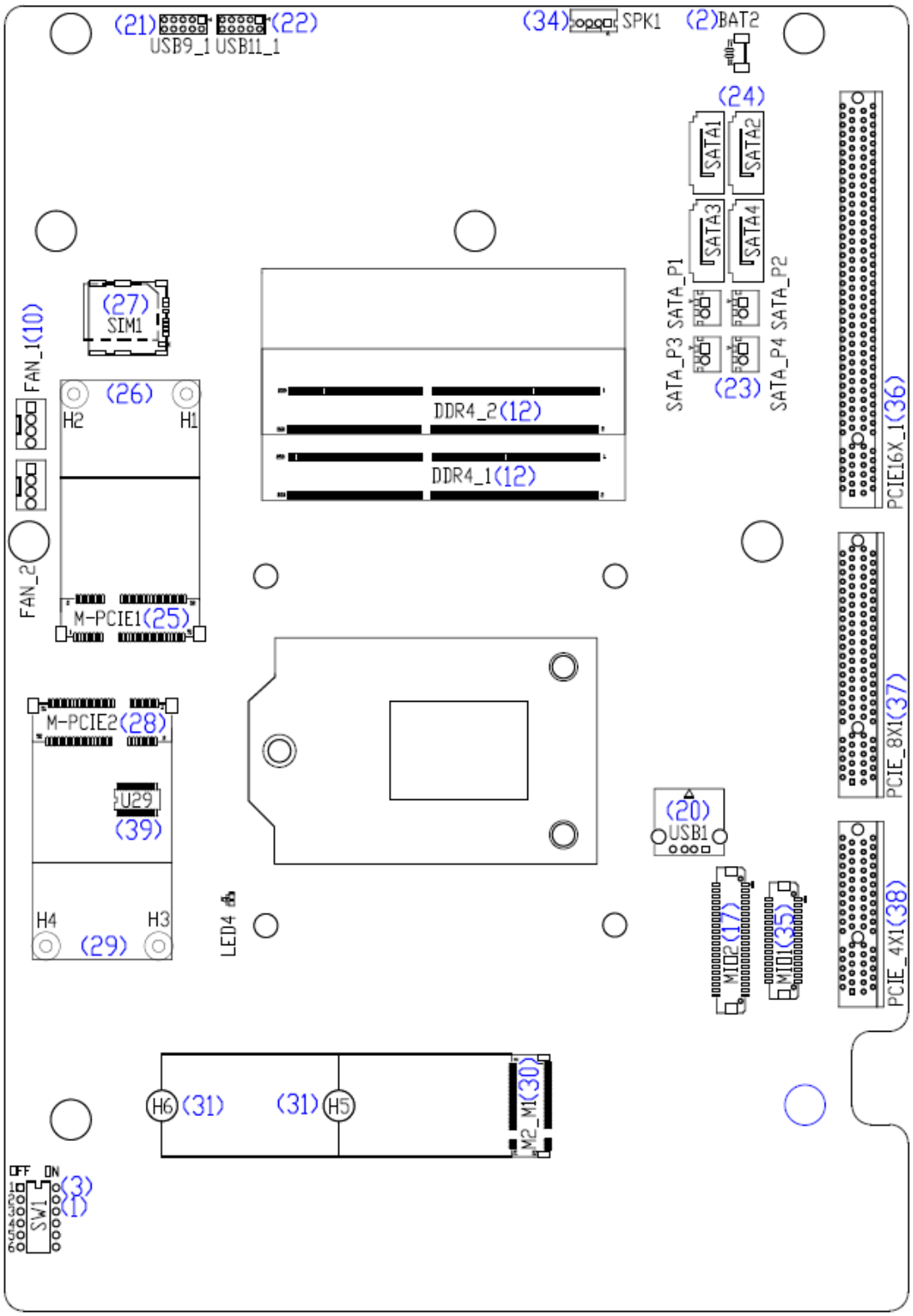


Figure 2.3: ASB-M8371 Jumpers and Connectors Location- Board Bottom

2.5 Jumpers Setting and Connectors

1. SW1-2/SW1-3:

CMOS clear switch, CMOS clear operation will permanently reset old BIOS settings 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.

2. BAT2:

(1.25mm Pitch 1x2 wafer Pin Header) 3.0V Li Battery is embedded to provide power for CMOS.

Pin#	Signal Name
Pin1	Ground
Pin2	VCC_RTC

3. SW1-1:

Switch, DC Power input setting, Power on/off button and Auto Power on switch setting.

SW1	Function（DC input /DC_IN1）
Pin1 ON	**Auto Power on (Default)**
Pin1 OFF	Power On/Off button (option)

Pin4 OFF	NC (Default)
Pin5 OFF	NC (Default)
Pin6 OFF	NC (Default)

4. BT1:

(2.5mm Pitch 1x2 Pin Connector) **Power on/off**, is use to connect power switch button. The two pins are disconnected under normal condition. You may short them temporarily to realize system startup& shutdown or awaken the system from sleep state.

5. PS_ON1 (option):

(2.0mm Pitch 1x2 Wafer Pin Header) **Power on/off**, is use to connect power switch button. The two pins are disconnected under normal condition. You may short them temporarily to realize system startup& shutdown or awaken the system from sleep state.

6. PS_ON2:

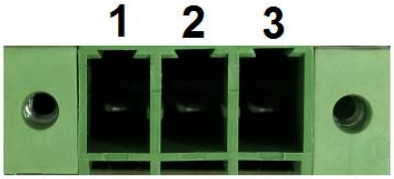
PW_SW: Power on/off Button, is use to connect power switch button. The two pins are disconnected under normal condition. You may short them temporarily to realize system startup& shutdown or awaken the system from sleep state.

PWR LED: POWER LED status.

7. DC_IN1:

(7.62mm Pitch 1x3 Pin Connector), DC12~36V system power input connector. Maximum power consumption of the whole machine is not more than 450 watts. If it is used in visual system of light control, please use DC24V power adapter.

Note: The power consumption of power supply needs different combination tests.



Pin#	Power Input（DC_IN1）
Pin1	DC+12V~36V
Pin2	Ground

Pin3	PG

Application	Power Adapter
Vision/ Light Control (DC24V)	**+DC24V input**
w/o: TB-594E42E161	DC+12V~36V input
w/: TB-594E42E161	DC+14V~36V input

8. CPU1:

(LGA1151 Socket), installing the 8th/9th Generation Intel Core i3/i5/i7 CPU Socket.

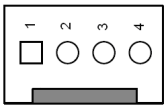
Processor					
Number	PBF/MTF	Cores/Threads	TDP	Embedded	Remarks
I7-8700T	2.40 up to 4.00GHz	6/12	35W	●	option
I7-8700	3.20 up to 4.60GHz	6/12	65W	●	option
I3-9100TE	2.20 up to 3.20GHz	4/4	35W	●	option
I3-9100E	3.10 up to 3.70GHz	4/4	65W	●	option
I5-9500TE	2.20 up to 3.60GHz	6/6	35W	●	option
I5-9500E	3.00 up to 4.20GHz	6/6	65W	●	option
I7-9700TE	1.80 up to 3.80GHz	8/8	35W	●	option
I7-9700E	2.60 up to 4.40GHz	8/8	65W	●	option
E-2278GEL	2.00 up to 3.90GHz	8/16	80W	●	option

9. HS1-1/HS1-2/HS1-3/HS1-4 (CPU SCREW HOLES):

CPU FAN SCREW HOLES, Four screw holes fixed CPU Cooler assemble.

10. FAN_1/FAN_2:

(2.54mm Pitch 1x4 Pin Header), FAN connector, cooling fans can be connected directly for use.



Pin#	Signal Name	FAN_1	FAN_2
1	**Ground**	●	●
2	**VCC**	●	●
3	**SYS_FANTACH**	●	○
4	**SYS_FANPWM**	●	●

Note:

Output power of cooling fan must be limited under 5W.

11. PCH1:

(BGA, Package Size: 23x24mm), Intel C246 Chipset.

Model	PCH1 (Chipset)	Remarks
ASB-M8371CBR1.00	Intel C246	(Default)

12. DDR4_1/DDR4_2:

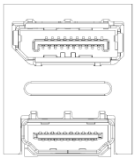
(SO-DIMM 260Pin socket), DDR4 memory socket, is located at top of the board and supports 260Pin 1.2V DDR4 SO-DIMM memory module up to 32/64GB. Max Memory Size (depend on memory type) support up to 64GB, system memory may require a BIOS update. Please contact your hardware provider regarding availability for your system.

CPU	Memory Types (FSB)	Max Memory Size
I7-8700T	2666MHz	64GB
I7-8700	2666MHz	64GB
I3-9100TE	2400MHz	32GB
I3-9100E	2400MHz	32GB
I5-9500TE	2666MHz	64GB
I5-9500E	2666MHz	64GB
I7-9700TE	2666MHz	64GB
I7-9700E	2666MHz	64GB
E-2278GEL	2666MHz	64GB

13. J1:

J1A (DP Connector), Display Port Interface connector.

J1B (HDMI 19P Connector), High Definition Multimedia Interface connector, supports version HDMI1.4.



14. JP1:

(2.0mm Pitch 2x3 Pin Header), COM1 jumper setting, pin1~6 are used to select signal out of pin 9 of COM1 port.

JP1 Pin#	Function
Close 1-2	**COM1 Pin9 RI (Ring Indicator) (Default)**
Close 3-4	COM1 Pin9 =+5V (option)

Close 5-6	COM1 Pin9 =+12V (option)

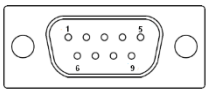
15. JP2:

(2.0mm Pitch 2x3 Pin Header), COM2 jumper setting, pin 1~6 are used to select signal out of pin9 of COM2 port.

JP2 Pin#	Function
Close 1-2	**COM2 Pin9 RI (Ring Indicator) (Default)**
Close 3-4	COM2 Pin9 =+5V/1A (option)
Close 5-6	COM2 Pin9 =+12V/1A (option)

16. COM12:

COM1(Type DB9), Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices.



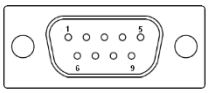
RS232 (Default)	
Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**JP1 select Setting (RI/5V/12V)**

RS422 (option)	
Pin#	Signal Name
1	422_TX-
2	422_TX+
3	422_RX+
4	422_RX-
5	Ground
6	NC
7	NC
8	NC
9	NC

RS485 (option)	
Pin#	Signal Name
1	485-
2	485+
3	NC
4	NC
5	Ground
6	NC
7	NC
8	NC
9	NC

BIOS Config:
[RS-232 Mode]
[RS-485 Mode]
[RS-422 Mode]

COM2(Type DB9), Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices.



RS232 (Default)	
Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**JP2 select Setting (RI/5V/12V)**

RS422 (option)	
Pin#	Signal Name
1	422_TX-

2	422_TX+
3	422_RX+
4	422_RX-
5	Ground
6	NC
7	NC
8	NC
9	NC

RS485 (option)	
Pin#	Signal Name
1	485-
2	485+
3	NC
4	NC
5	Ground
6	NC
7	NC
8	NC
9	NC

BIOS Config:
[RS-232 Mode]
[RS-485 Mode]
[RS-422 Mode]

17. MIO2:

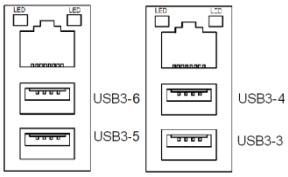
(DF 13-40P Connector), for expand output connector, it provides 6x RS-232 ports, via a dedicated cable connected to AVS-600 case.

Function	Signal Name	Pin#		Signal Name	Function
	5V_S0	2	1	12V_S0	
	5V_S0	4	3	12V_S0	
COM3(RS232)	CTS3-	6	5	CTS4-	COM4(RS232)
	DSR3-	8	7	DSR4-	
	RTS3-	10	9	RTS4-	
	DTR3-	12	11	DTR4-	
	RXD3	14	13	RXD4	

	TXD3	16	15	TXD4	
	DCD3-	18	17	DCD4-	
	RI3-	20	19	RI4-	
	Ground	22	21	Ground	
COM5(RS232)	CTS5-	24	23	CTS6-	COM6(RS232)
	DSR5-	26	25	DSR6-	
	RTS5-	28	27	RTS6-	
	DTR5-	30	29	DTR6-	
	RXD5	32	31	RXD6	
	TXD5	34	33	TXD6	
	DCD5-	36	35	DCD6-	
	RI5-	38	37	RI6-	
	Ground	40	39	Ground	

18. USB3_LAN1/USB3_LAN2:

USB3-3/USB3-4/USB3-5/USB3-6: (Double stack USB type A), Rear USB connector, it provides up to 4x USB3.0 ports, which allows data transfer speed up to 5.0Gb/s and full-speed and low-speed signaling for USB 2.0 use.

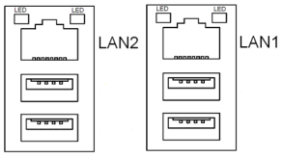


Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.
If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

LAN1: (RJ45 Connector), Rear LAN port, one standard 10/100/1000M RJ-45 Ethernet port are provided. Use Intel I219-LM chipset.
Corporate LAN product with support for Intel® AMT2 technology

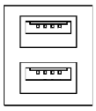
BIOS (U12/U88)	Intel AMT2 Technology	Remarks
U88 (32MB)	○	Default
U88 (32MB)	●	option

LAN2: (RJ45 Connector), Rear LAN port, one standard 10/100/1000M RJ-45 Ethernet port are provided. Use Intel I210AT chipset.



19. USB2x2:

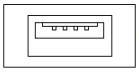
USB2_1/E-USB2_2: (Double stack USB type A), Rear USB 2.0 connector, it provides up to 2x USB2.0 ports. USB2.0 allows data transfer up to 480Mb/s, with full-speed and low-speed signaling.



Each USB Type A Receptacle (2 Ports) Current limited value is 2.0A.
If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

20. USB1:

USB2_8: (Single USB type A), I/O USB 2.0 connector, it provides up to 1x USB2.0 port, which allows data transfers up to 480Mb/s, and supports full-speed and low-speed signaling.



Each USB Type A Receptacle (1 Port) Current limited value is 2.0A.
If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

21. USB9_1:

(2.0mm Pitch 2x5 Pin Header), USB2.0 connector, it provides two USB ports via a dedicated USB cable, speed up to 480Mb/s.

Function	Signal Name	Pin#		Signal Name	Function
USB9	5V_USB0910	1	2	5V_USB0910	USB10
	USB9_DN	3	4	USB10_DN	
	USB9_DP	5	6	USB10_DP	
	Ground	7	8	Ground	
	NC	9	10	Ground	

Note:

Before connection, make sure that pinout of the USB cable is in accordance with that of the said tables. Any inconformity may cause system down and even hardware damages.

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

If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

22. USB11_1

(2.0mm Pitch 2x5 Pin Header), USB2.0 connector, it provides two USB ports via a dedicated USB cable, speed up to 480Mb/s.

Function	Signal Name	Pin#		Signal Name	Function
USB11	5V_USB1112	1	2	5V_USB1112	USB12
	USB11_DN	3	4	USB12_DN	
	USB11_DP	5	6	USB12_DP	
	Ground	7	8	Ground	
	NC	9	10	Ground	

Note:

Before connection, make sure that pinout of the USB cable is in accordance with that of the said tables. Any inconformity may cause system down and even hardware damages.

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

If the external USB device current exceeds 2.0A, please separate connectors into different Receptacle.

23. SATA_P1/SATA_P2/SATA_P3_SATA_P4:

(2.50mm Pitch 1x2 Wafer Pin Header), Four onboard 5V output connectors are reserved to provide power for SATA devices.

Pin#	Signal Name
1	+DC5V_S0
2	Ground

Note:

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

24. SATA1/SATA2/SATA3/SATA4:

(SATA 7P), SATA Connectors, Four SATA connectors are provided, SATA1, SATA2, SATA3 and SATA4 transfer speed up to 6.0Gb/s.

RAID controller supports: RAID0/RAID1/RAID5/RAID10.

25. M-PCIE1:

(Socket 52Pin), mini PCIe socket, it is located at the bottom. It supports mini PCIe devices with USB2.0 and SIM and SMBUS signal. MPCIe card size is 30 x 50.95mm.

Function	Support	Remarks
Mini PCIe(PCIe7)	●	
SMbus	●	
SIM	●	
USB2.0 (USB13)	●	

26. H1:

M-PCIE SCREW HOLES, H4 for M-PCIE card (30mm x 50.95mm) assemble.

27. SIM1:

(Micro SIM Socket), Support micro SIM Card devices.

28. M-PCIE2:

(Socket 52Pin), mini PCIe socket, it is located at the bottom, it supports mini PCIe devices with USB2.0 and SMBUS and PCIe and LPC signal. MPCIe card size is 30 x 50.95mm.

Function	Support	Remarks
Mini PCIe(PCIe8)	●	
SMbus	●	
SIM	●	
USB2.0 (USB14)	●	

29. H4:

M-PCIE2 SCREW HOLES, H5 for M-PCIE2 card (30mm x 50.95mm) assemble.

30. M2_M1:

(NGFF M.2 Socket), NGFF (M.2) M-Key, it is located at the bottom, and supports M.2 M-Key devices with four PCIe and SATA and SMbus signal. It also supports 2242/2280 size cards.

31. H5/H6:

M2_M1 SCREW HOLES, H5 and H6 for M2_M1 card (30mm x 50.95mm) assemble.

The height can be adjusted according to the equipment.

M2_M1 Card size	H5/H6 (height)	Remarks
2242	H5=6.45mm H6=2.45mm	
2280	H6=6.45mm H5=2.45mm	

32. BUZ1:

Onboard buzzer

33. LED1/LED2/LED3/LED4/LED6:

LED1 STATUS: Green LED for M.2 status.

LED2 STATUS: Green LED for Motherboard Power Supply 3.3V_S5 status.

LED3 STATUS: Green LED for Motherboard Power Supply 3.3V_S0 status.

LED5 STATUS: Green LED for CPU Power status.

LED6 STATUS: Green LED for Motherboard Standby Power Good status.

34. SPK1:

(2.0mm Pitch 1x4 Wafer Pin Header), support a stereo Class-D Speaker Amplifier with 2 watt per channel output power.

Pin#	Signal Name
1	SPK_OUTL_P
2	SPK_OUTL_N
3	SPK_OUTR_N
4	SPK_OUTR_P

35. MIO1:

(DF13-40P Connector), connector for output expansion. It supports one CPU FAN port, one CPU FAN port, 8 GPIO ports, via a dedicated cable connected to **TB-595 MIO1**.

Function	Signal Name	Pin#	Signal Name	Function

	3P3V_S5	2	1	12V_S5	
	3P3V_S5	4	3	3P3V_S0	
	Ground	6	5	Ground	
(F75111RG) GPIO	FT_GPIO_20	8	7	FT_GPIO_24	(F75111RG) GPIO
	FT_GPIO_21	10	9	FT_GPIO_25	
	FT_GPIO_22	12	11	FT_GPIO_26	
	FT_GPIO_23	14	13	FT_GPIO_27	
CPU FAN	Ground	16	15	FT_GPIO_33	PNP or NPN judgment
	CPUFAN_PWM	18	17	CPUFAN_TACH	CPU FAN
	CPUFAN_PWR	20	19	GND_AUD	Audio
Audio	GND_AUD	22	21	MIC_IN-R	
	MIC-IN-L	24	23	MIC1-JD	
	HPOUT-JD	26	25	LINE-IN-R	
	OUT-R	28	27	LINE-IN-L	
	OUT-L	30	29	LINE-IN-JD	

36. PCIE_16x1(option):

(PCIe 164 Pin slot), Riser Card expansion connector. It can expand to support one PCIex16 or two PCIex8 Signal. PCI express x16 supports GEN1, GEN2 and GEN3 mode. PCI express x8 supports GEN1, GEN2 and GEN3 mode.

ASB-M8371CB: PCIE_16x1 slot is located at the bottom.

Model	PCIE_16x1 slot
ASB-M8371CB	Bottom
ASB-M8371QB	Bottom (option)

Riser Card	Function	ASB-M8371CB
TB-594E42E161	PCIex4 (98Pin slot)*1 PCIex4 (98Pin slot)*1 PCIex16 (164Pin slot)*1	●
Note: **Please correctly assemble the riser card, otherwise it will burn out the motherboard! If you do not know how to assemble, please contact technical support.**		

37. PCIE_8x1 (option):

(PCIe 98 Pin slot), Riser Card expansion connector. It can expand to supports one PCIex8 or two PCIex4 Signals. PCI express x8 supports GEN1 and GEN2 and GEN3 mode. PCI express x4 supports GEN1 and GEN2 and GEN3 mode.

Model	PCIE_8x1 slot

ASB-M8371CB	Bottom

Riser Card	Function	ASB-M8371CB
TB-594E42E161	PCIex4 (98Pin slot)*1 PCIex4 (98Pin slot)*1 PCIex16 (164Pin slot)*1	●
Note: **Please correctly assemble the riser card, otherwise it will burn out the motherboard! If you do not know how to assemble, please contact technical support.**		

38. PCIE_4x1:

(PCIe 64 Pin slot), Riser Card expansion connector. Supply power output to TB-594xx. ASB-M8371CB: PCIE_4x1 slot is located at the Bottom.

This DC_IN1 input power supply is directly connected to the PCIE_4x1 output power supply, and the input voltage is equal to the output voltage.

PCIE_4x1 (output)	DC_IN1 (input)	Signal Name	Pin#		Signal Name	DC_IN1 (input)	PCIE_4x1 (output)
DC9~36V+	DC9~36V+	12-36V_S5	B1	A1	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B2	A2	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B3	A3	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B4	A4	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B5	A5	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B6	A6	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B7	A7	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B8	A8	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B9	A9	9-36V_S5	DC9~36V+	DC12~36V+

DC9~36V+	DC9~36V+	12-36V_S5	B10	A10	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B11	A11	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B12	A12	9-36V_S5	DC9~36V+	DC12~36V+
DC9~36V+	DC9~36V+	12-36V_S5	B13	A13	9-36V_S5	DC9~36V+	DC12~36V+
DC_IN-	DC_IN-	DC_IN-	B14	A14	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B15	A15	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B16	A16	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B17	A17	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B18	A18	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B19	A19	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B20	A20	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B21	A21	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B22	A22	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B23	A23	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B24	A24	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B25	A25	DC_IN-	DC_IN-	DC_IN-
DC_IN-	DC_IN-	DC_IN-	B26	A26	DC_IN-	DC_IN-	DC_IN-
		Ground	B27	A27	DC_IN-	DC_IN-	DC_IN-
		CPU_CFG5	B28	A28	Ground		

		CLK_100M_PE16_N	B29	A29	CPU_CFG6		
		CLK_100M_PE16_P	B30	A30	CLKREQ_PE16-		
		PS_ON_ALL-	B31	A31	CLK_100M_PE11_N		
		CLKREQ_PE11-	B32	A32	CLK_100M_PE11_P		

Model	PCIE_4x1 slot
ASB-M8371CB	Bottom

Riser Card	Function	ASB-M8371CB
TB-594E42E161	PCIex4 (98Pin slot)*1 PCIex4 (98Pin slot)*1 PCIex16 (164Pin slot)*1	●
Note: **Please correctly assemble the riser card, otherwise it will burn out the motherboard! If you do not know how to assemble, please contact technical support.**		

39. U29 (option):

Infineon's Trusted Platform Module (TPM2.0) SLB9665 is a fully standard compliant TPM based on the latest Trusted Computing Group (TCG) specification 2.0.

*Note: Only support Windows 10 IoT

U29	SLB 9665 TT2.0
MODEL	TPM Function
ASB-M8371CB	●

40. PB-429 R1.10 (option):

This board provides power for AVS-600 expansion cards.

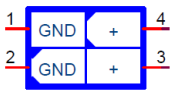
DC_IN1:

(7.62mm Pitch 1x3 Pin Connector), DC 12~36V System power input connector.

Pin#	Power Input (DC_IN1)
Pin1	DC+12~36V
Pin2	Ground
Pin3	PG

ATX_DCOUT1:

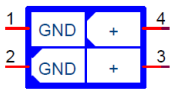
(4.20mm Pitch 2x2 Pin Connector), DC12~36V System power output connector.



Pin#	Power Input (ATX_DCOUT1)
Pin1	Ground
Pin2	Ground
Pin3	DC+9~36V
Pin4	DC+9~36V

ATX_DCOUT2:

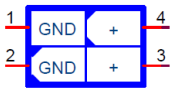
(4.20mm Pitch 2x2 Pin Connector), DC9~36V System power output connector.



Pin#	Power Input (ATX_DCOUT2)
Pin1	Ground
Pin2	Ground
Pin3	DC+12~36V
Pin4	DC+12~36V

ATX_DCOUT3:

(4.20mm Pitch 2x2 Pin Connector), DC12~36V System power output connector.

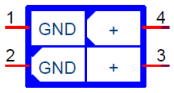


Pin#	Power Input (ATX_DCOUT3)
Pin1	Ground
Pin2	Ground
Pin3	DC+12~36V

Pin4	DC+12~36V

ATX_DCOUT4:

(4.20mm Pitch 2x2 Pin Connector), DC12~36V System power output connector.



Pin#	Power Input (ATX_DCOUT4)
Pin1	Ground
Pin2	Ground
Pin3	DC+12~36V
Pin4	DC+12~36V

41. TB-595 R0.20 (option):

I/O Expansion Board for AVS-600, via a dedicated cable connected to ASB-M8371 MIO1.

MIO1:

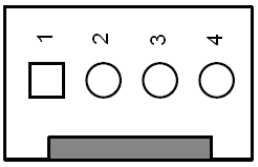
(DF13-40P Connector), for expand output connector, it provides one CPU FAN port, one CPU FAN port, 8 GPIO ports, via a dedicated cable connected to **ASB-M8371 MIO1**.

Function	Signal Name	Pin#		Signal Name	Function
	3P3V_S5	2	1	12V_S5	
	3P3V_S5	4	3	3P3V_S0	
	Ground	6	5	Ground	
(F75111RG) GPIO	FT_GPIO_20	8	7	FT_GPIO_24	(F75111RG) GPIO
	FT_GPIO_21	10	9	FT_GPIO_25	
	FT_GPIO_22	12	11	FT_GPIO_26	
	FT_GPIO_23	14	13	FT_GPIO_27	
CPU FAN	Ground	16	15	FT_GPIO_33	PNP or NPN judgment
	CPUFAN_PWM	18	17	CPUFAN_TACH	CPU FAN
	CPUFAN_PWR	20	19	GND_AUD	Audio
Audio	GND_AUD	22	21	NC	
	NC	24	23	NC	
	HPOUT-JD	26	25	LINE-IN-R	
	OUT-R	28	27	LINE-IN-L	

	OUT-L	30	29	LINE-IN-JD	

FAN1:

(2.54mm Pitch 1x4 Pin Header), CPU FAN connector, cooling fans can be connected directly for use.



Pin#	Signal Name	FAN1
1	Ground	●
2	CPUFAN_PWR	●
3	CPUFAN_TACH	●
4	CPUFAN_PWM	●

Note:

Output power of cooling fan must be limited under 5W.

SW1:

Switch, GPIO NPN/PNP setting, use for CN1.

SW1	Function (SW1)
Pin1 ON	**NPN (Default)**
Pin1 OFF	PNP
Pin2 OFF	NC (Default)

CN1:

(3.5mm Pitch 1x10 Pin Connector), General-purpose input/output port, it provides 8 groups of self-programming interfaces to customers for flexible use.

Pin#	Function
1	24V_GND_GPIO
2	GND_24V_GPIO
3	GP_IN1
4	GP_IN2
5	GP_IN3

6	GP_IN4
7	GP_OUT1
8	GP_OUT2
9	GP_OUT3
10	GP_OUT4

LINE IN:

(Diameter 3.5mm Jack), High Definition Audio port, An onboard Realtek ALC269Q-VC3 codec is used to provide high quality audio I/O ports. Line In is used for the connection of external audio source via a Line in cable.

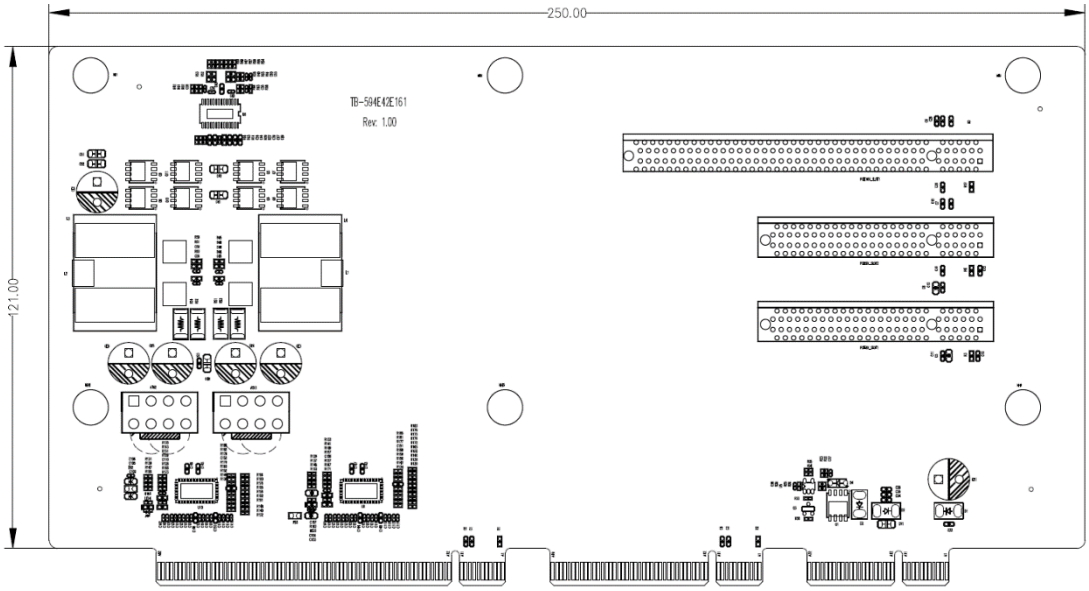
LINE OUT:

(Diameter 3.5mm Jack), High Definition Audio port, An onboard Realtek ALC269Q-VC3 codec is used to provide high quality audio I/O ports. Line Out can be connected to a headphone or amplifier.


Line out

42. TB-594E42E161 R1.00 (option):

TB-594E42E161 connects to ASB-M8371 PCIE_16x1 and PCIE_8x1 and PCIE_4x1 connectors that are located at the bottom. This transfer board provides two PCIEx4 slots and one PCIEx16 slot.

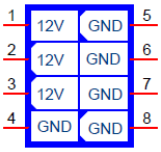


Slot#	Connect	Signal Name
1	98Pin Slot	PCIex4
2	98Pin Slot	PCIex4

3	164Pin Slot	PCIex16

ATX1:

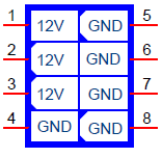
(4.20mm Pitch 2x4Pin Connector), DC12V power output connector.



Pin#	Power output (ATX1)
Pin1	DC+12V
Pin2	DC+12V
Pin3	DC+12V
Pin4	Ground
Pin5	Ground
Pin6	Ground
Pin7	Ground
Pin8	Ground

ATX2:

(4.20mm Pitch 2x4Pin Connector), DC12V power output connector.

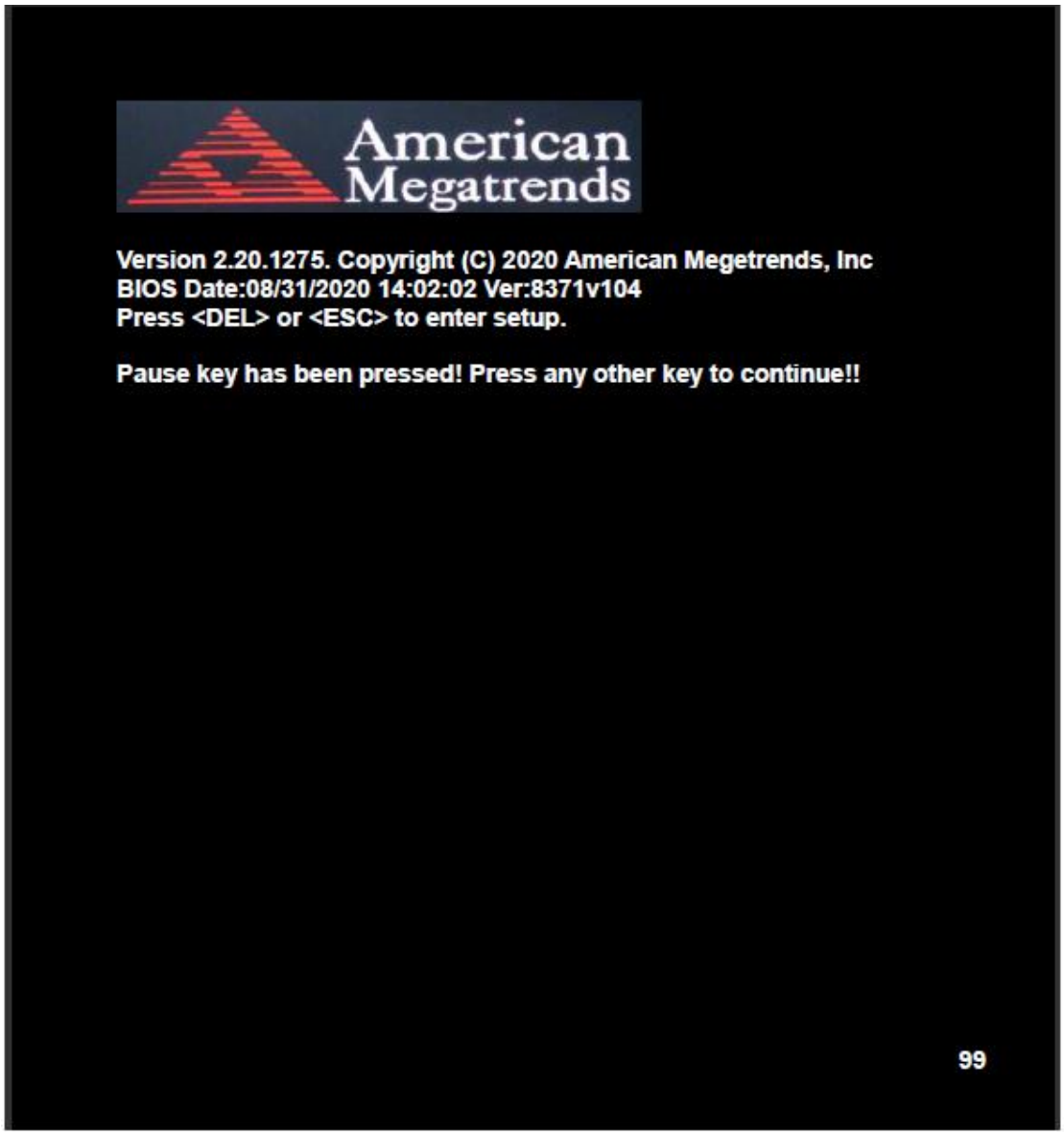


Pin#	Power output (ATX2)
Pin1	DC+12V
Pin2	DC+12V
Pin3	DC+12V
Pin4	Ground
Pin5	Ground
Pin6	Ground
Pin7	Ground
Pin8	Ground

Chapter 3 BIOS Setup

3.1 Operations after POST Screen

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

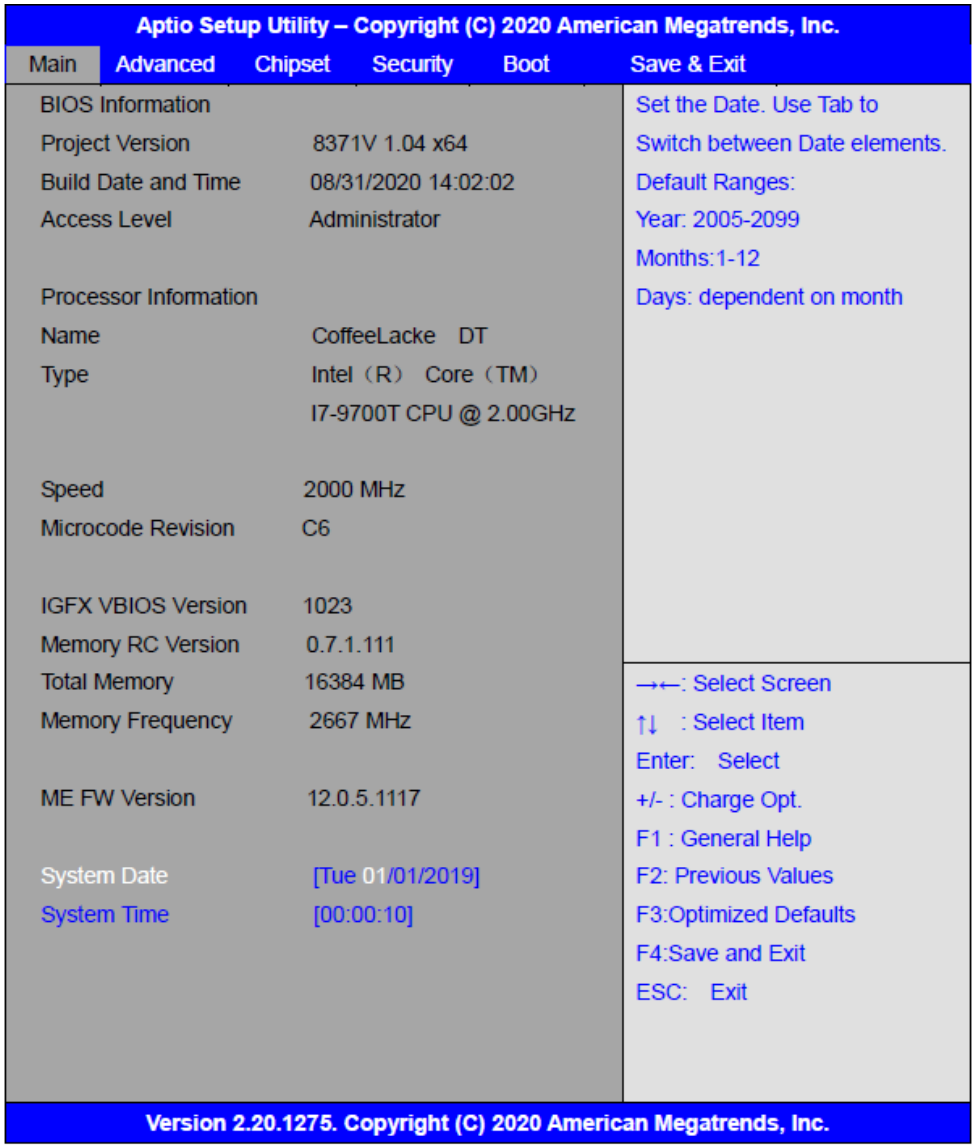


After optimizing, exits CMOS Setup.

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:

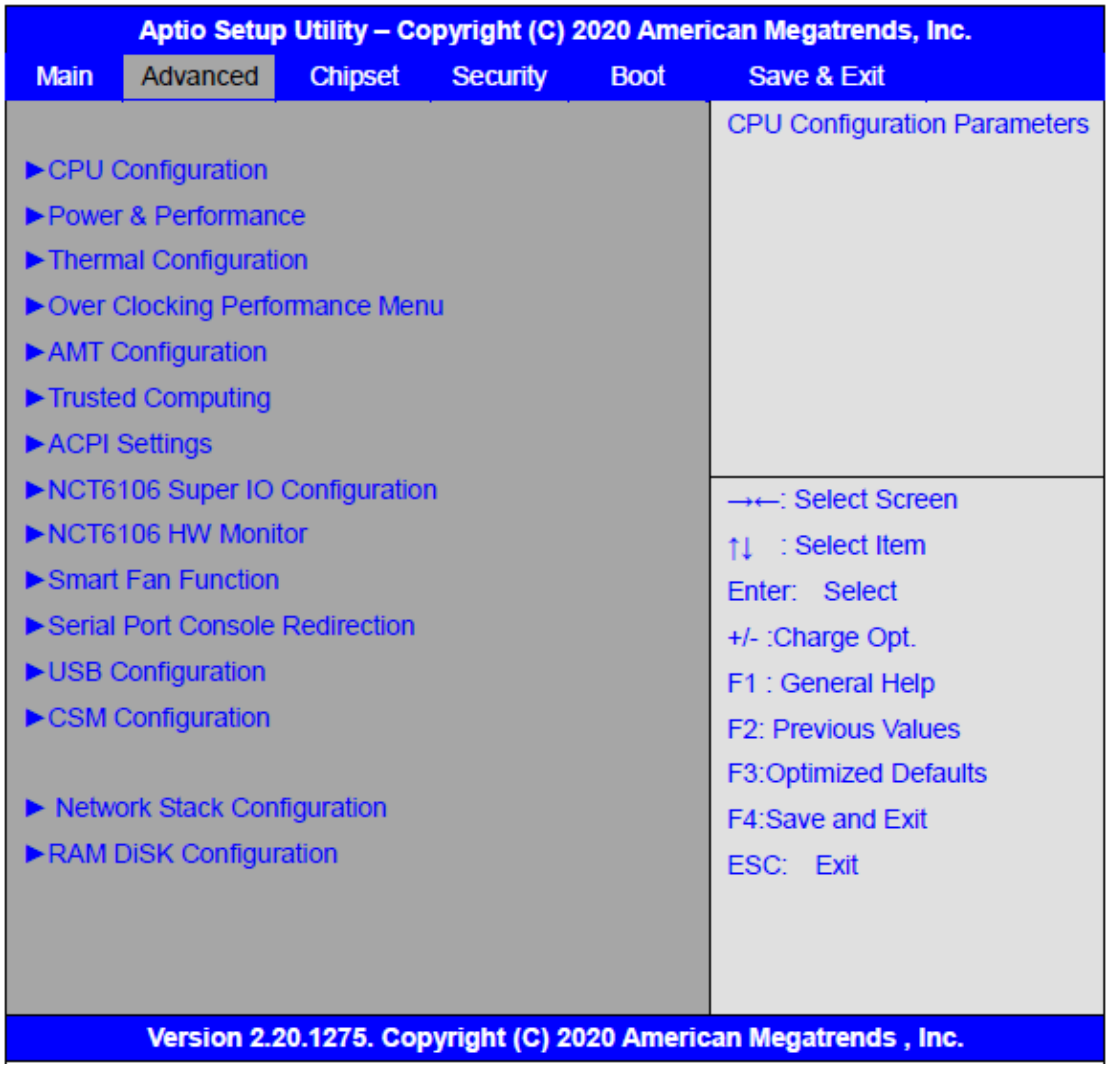
Day: Note that the 'Day' automatically changes when you set the date.

Month: 01 to 12

Date: 01 to 31

Year: 1998 to 2099

3.4 Advanced Settings



3.4.1 CPU Configuration

Type	Intel® Core™i7-9700T CPU@2.00GHz
ID	0x906ED
Speed	2000MHz
L1 Date Cache	32KBx8
L1 Instruction Cache	32KBx8
L2 Cache	256KBx8
L3 Cache	12MB
L4 Cache	N/A
VMX	Supported
SMX/TXT	Not Supported

C6DRAM	[Enabled]
SW Guard Extension (SGX)	[Software Controlled]
Select Owner EPOCH input type	[No Change in Owner EPOCHS]
CPU Flex Ratio Override	[Disabled]
CPU Flex Ratio Settings	20
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]
Machine Check	[Enabled]
Monitor MWAIT	[Enabled]
Intel Trusted Execution Technology	[Disabled]
Alias Check Request	[Disabled]
DPR Memory Size (MB)	4
Reset AUX Content	[NO]
►BIOS Guard	
BIOS Guard	[Disabled]
Enable Tools Interface	[Enabled]
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® SpeedStep™	[Enabled]
Race To Halt (RTH)	[Enabled]
Intel® Speed Shift Technology	[Enabled]
HDC Control	[Enabled]

► View/Configure Turbo Options

Configure Turbo Settings

Max Turbo Power Limit	4095.875
Min Turbo Power Limit	0.0
Package TDP Limit	35.0
Power Limit 1	35.0
Power Limit 2	92
1-core Turbo Ratio	43
2-core Turbo Ratio	42
3-core Turbo Ratio	42
4-core Turbo Ratio	41
5-core Turbo Ratio	40
6-core Turbo Ratio	39
7-core Turbo Ratio	37
8-core Turbo Ratio	36
Energy Efficient P-state	[Enabled]
Package Power Limit MSR Lock	[Disabled]
Power Limit 1 Override	[Disabled]
Power Limit 2 Override	[Enabled]
Power Limit 2	0
1-Core Ratio Limit Override	0
2-Core Ratio Limit Override	0
3-Core Ratio Limit Override	0
4-Core Ratio Limit Override	0
5-Core Ratio Limit Override	0
6-Core Ratio Limit Override	0
7-Core Ratio Limit Override	0
8-Core Ratio Limit Override	0
Energy Efficient Turbo	[Enabled]
►Config TDP Configurations	
Configurable TDP Boot Mode	[Nominal]
Configurable TDP Lock	[Disabled]
CTDP BIOS control	[Disabled]
Config TDP Levels	2
Config TDP Turbo Activation Ratio	19(Unlocked)
Power Limit 1	35.0W (MSR: 35.0)
Power Limit 2	92.0W (MSR: 92.0)

Custom Settings Nominal	
config TDP Nominal	Ratio :20 TAR : 19
	PL1 :35.0W
Power Limit 1	0
Power Limit 2	0
Power Limit 1 Time Window	[0]
Config TDP Turbo Activation Ratio	0
Custom Settings Down	
Config TDP Level11	Ratio :15 TAR : 14
	PL1 :25.0W
Power Limit 1	0
Power Limit 2	0
Power Limit 1 Time Window	[0]
Config TDP Turbo Activation Ratio	0

►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 Fixed Priority]
Timed MWAIT	[Disabled]

►Custom P-state Table

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 Over Clocking Performance Menu

Over Clocking Features	[Enabled]
WDT Enable	[Enabled]
BCLK Frequency (Pcode)	99.731MHz
XTU Interface	[Disabled]
BCLK Aware Adaptive Voltage	[Enabled]

►Processor
►Ring
►GT
►Uncore
►Voltage PLL Trim Controls
►Platform Voltage Overrides
►Memory

3.4.5 AMT Configuration

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

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

3.4.6 Trusted Computing

TPM20 Device Found	
Firmware Version:	5.62
Vendor:	IFX

Security Device Support [Enabled]
Active PCR banks SHA-1, SHA256
Available PCR banks SHA-1, SHA256

Platform Hierarchy [Enabled]
Storage Hierarchy [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]
TPM20 Interface Type [TIS]
Device Select [Auto]

3.4.7 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]
[Enabled]
S3 Video Repost: [Disabled]
[Enabled]

3.4.8 NCT6106 Super IO Configuration

Super IO Chip NCT6106
►Serial Port 1 Configuration
Serial port [Enabled]
[Disabled]
Device Settings IO=3F8h IRQ=4；

Change Settings [Auto]

COM1 Config

[RS-232 Mode]

[RS-485 Mode]

[RS-422 Mode]

►Serial Port 2 Configuration

Serial port [Enabled]

[Disabled]

Device Settings IO=2F8h；
IRQ=3；

Change Settings [Auto]

►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]

►Serial Port 6 Configuration

Serial port [Enabled]

[Disabled]

Device Settings IO=2E0h； IRQ=6；

Change Settings [Auto]

WatchDog Controller Settings

WatchDog Mode Select [Disabled]

3.4.9 NCT6106D Hardware Monitor

PC Health Status

CPU DIE temperature ：+53 C

System temperature ：+35 C

SYS Fan Speed ： N/A

CPU Fan Speed ：1548 RPM

Vcore ：+0.800 V

12V ： ：+12.151 V

5V ： ：+5.120 V

1.5V ： ：+1.500 V

3.3V ： ： +3.344V

3.4.10 Smart FAN Function

PC Health Status

CPU Temperature1	50
CPU Temperature2	60
CPU Temperature3	65
CPU Temperature4	70
CPU Duty Cycle 1	100
CPU Duty Cycle 2	150
CPU Duty Cycle 3	200
CPU Duty Cycle 4	255
System Temperature 1	35
System Temperature 2	45
System Temperature 3	50

System Temperature 4 55
System Duty Cycle 1 100
System Duty Cycle 2 150
System Duty Cycle 3 200
System Duty Cycle 4 255

3.4.11 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
Redirection COM Port [COMO]
Resolution [80x24]
Redirect After POST [Always Enable]
[Boot Loader]

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

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

Console Redirection [Disabled]
►Console Redirection settings

3.4.12 USB Configuration

USB Module Version: 23

USB Controllers:
1XHCI

USB Devices:

1 Keyboard, 1Mouse

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]
Storage	[UEFI]
Video	[Legacy]
Other PCI devices	[UEFI]

3.4.14 Network Stack Configuration

Network Stack	[Disabled]

3.4.15 RAM DISK Configuration

Disk Memory Type: [Boot Service Data]

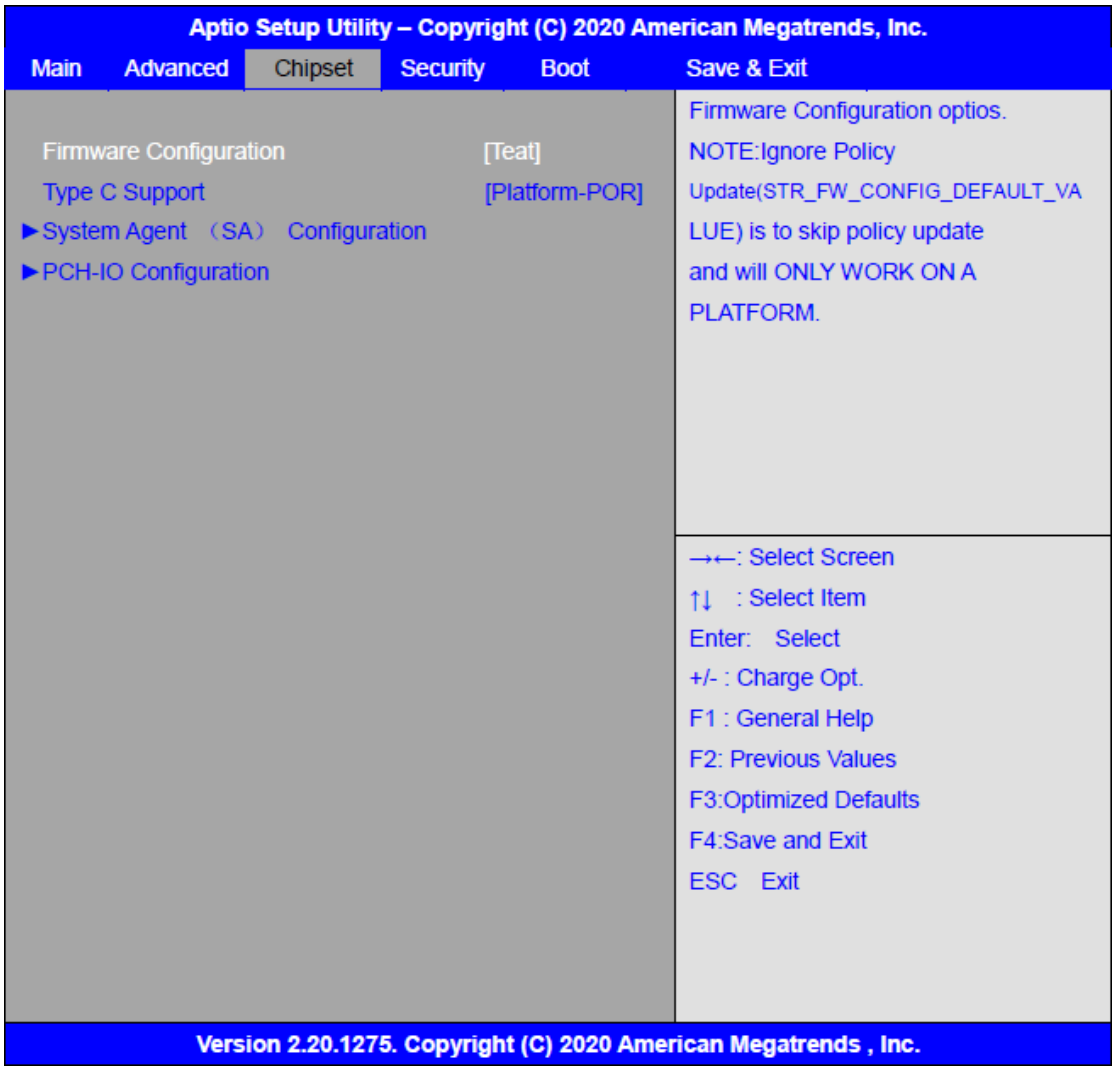
►**Create raw**

►**Create from file**

Created RAM disk list :

Remove selected RAM disk(s).

3.5 Chipset Settings



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	2667MHz
Memory Timings (Tcl-Trcd-TRP-TRAS)	19-19-19-43
Channel 0 Slot 0	Not Populated / Disabled
Channel 0 Slot 1	Not Populated / Disabled
Channel 1 Slot 0	Populated/&Enabled
Size	16384 MB (DDR4)
Number of Ranks	2
Manufacturer	Transcend
Channel 1 Slot 1	Not Present / Disabled
Memory ratio/reference clock Options moved to Overclock->Memory->Custom Profile menu	
MRC ULT Safe Config	[Disabled]
LPDDR Dqdqs Re-Training	[Enabled]
Safe Mode Support	[Disabled]
Memory Test on Warm Boot	[Enabled]
Maximum Memory Frequency	[Auto]
HOB Buffer Size	[Auto]
ECC Support	[Enabled]
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]
Training Tracing	[Disabled]
Lpddr Mem WL Set	[Set B]
BDAT ACPI Table Support	[Disabled]
BDAT Memory Test Type	[Enabled]
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 Scanning of External Gfx Card	[Disabled]
Primary Display	[Auto]
Select PCIE Card	[Auto]
►External GFx Primary Display 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]
Cdynmax Clamping Enable	[Enabled]
Cd Clock Frequency	[675 MHz]
Skip CD Clock Init in S3 Resume	[Disabled]
IUER Button Enable	[Disabled]

►DMI/OPI Configuration

DMI	X4 Gen3
DMI Max Link Speed	[Auto]
DMI Gen3 Eq Phase 2	[Auto]
DMI Gen3 Eq Phase 3 Method	[Auto]
Program Static Phase 1 Eq	[Enabled]

►Gen3 Root Port Preset value for each Lane

Lane 0	4
Lane 1	4
Lane 2	4
Lane 3	4

►Gen3 Endpoint Preset value for each Lane

Lane 0	7
Lane 1	7
Lane 2	7
Lane 3	7

►Gen3 Endpoint Hint value for each Lane

Lane 0	2
Lane 1	2
Lane 2	2

Lane 3	2
►Gen3 RxCTLE Control	
Bundle0	0
Bundle1	0
DMI Link ASPM Control	[LosL1]
DMI Extended Sync Control	[Disabled]
DMI De-emphasis Control	[-3.5 dB]
DMI IOT	[Disabled]
►PEG Port Configuration	
PEG 0:1:0	Not Present
Enable Root Port	[Auto]
Max Link Speed	[Auto]
PEG0 Slot Power Limit Value	75
PEG0 Slot Power Limit Scale	[1.0x]
PEG0 Slot Power Limit Number	1
PEG 0:1:1	Not Present
Enable Root Port	[Auto]
Max Link Speed	[Auto]
PEG1 Slot Power Limit Value	75
PEG1 Slot Power Limit Scale	[1.0x]
PEG1 Slot Power Limit Number	2
PEG 0:1:2	Not Present
Enable Root Port	[Auto]
Max Link Speed	[Auto]
PEG2 Slot Power Limit Value	75
PEG2 Slot Power Limit Scale	[1.0x]
PEG2 Slot Power Limit Number	3
PEG 0:6:0	Not Present
Enable Root Port	[Auto]
Max Link Speed	[Auto]
PEG2 Slot Power Limit Value	75
PEG2 Slot Power Limit Scale	[1.0x]

PEG2 Slot Power Limit Number	3

►PEG Port Feature Configuration

Detect Non-Compliance Device	[Disabled]
Program PCIe ASPM after opROM	[Disabled]
Program Static Phase1 Eq	[Enabled]

►Gen3 Root Port Preset value for each Lane

Lane 0	7
Lane 1	7
Lane 2	7
Lane 3	7
Lane 5	7
Lane 6	7
Lane 7	7
Lane 8	7
Lane 9	7
Lane 10	7
Lane 11	7
Lane 12	7
Lane 13	7
Lane 14	7
Lane 15	7

►Gen3 Endpoint Preset value for each Lane

Lane 0	7
Lane 1	7
Lane 2	7
Lane 3	7
Lane 5	7
Lane 6	7
Lane 7	7
Lane 8	7
Lane 9	7
Lane 10	7
Lane 11	7
Lane 12	7
Lane 13	7

Lane 14	7
Lane 15	7

►Gen3 Endpoint Hint value for each Lane

Lane 0	2
Lane 1	2
Lane 2	2
Lane 3	2
Lane 5	2
Lane 6	2
Lane 7	2
Lane 8	2
Lane 9	2
Lane 10	2
Lane 11	2
Lane 12	2
Lane 13	2
Lane 14	2
Lane 15	2

►Gen3 RxCTLE Control

Bundle0	0
Bundle2	0
Bundle3	0
Bundle4	0
Bundle5	0
Bundle6	0
Bundle7	0
PEG10 RxCTLE Override	[Disabled]
PEG11 RxCTLE Override	[Disabled]
PEG12 RxCTLE Override	[Disabled]
DMI PEG10 RxCTLE Override	[Disabled]

Gen3 Adaptive Software Equalization	
Always Attempt SW EQ	[Disabled]
Number of Presets to test	[Auto]
Allow PERST# GPIO Usage	[Enabled]

SW EQ Enable VOC	[Auto]
Jitter Dwell Time	3000
Jitter Error Target	2
VOC Dwell Time	10000
VOC Error Target	2
Generate BDAT PEG Margin Date	[Disabled]
PCIe Rx CEM Test Mode	[Disabled]
PCIe Spread Spectrum Clocking	[Enabled]

3.5.2 PCH-IO Configuration

►PCI Express Configuration

PCI Express Clock Gating	[Enabled]
DMI Link ASPM Control	[Auto]
PCIE Port assigned to LAN	5
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	
PCI Express Root Port 3	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM2	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]

Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1
►PCI Express Root Port 4	
PCI Express Root Port 4	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM3	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10

Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1
PCI Express Root Port 5	Reserved for Ethernet
►PCI Express Root Port 6	
PCI Express Root Port 6	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM5	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]

PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4

PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]

►Extra options

Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1

►PCI Express Root Port 7

PCI Express Root Port 7	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM6	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]

FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4

PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]

►Extra options

Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1

►PCI Express Root Port 8

PCI Express Root Port 8	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM7	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5

DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1
►PCI Express Root Port 9	
PCI Express Root Port 9	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]

Controller Power gating	
Connection Type	[Slot]
ASPM8	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10

Reserved Memory Alignment	1
Prefetchable Memory Alignment	1

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	Lane configured as USB/SATA
PCI Express Root Port 14	Lane configured as USB/SATA
PCI Express Root Port 15	Lane configured as USB/SATA
PCI Express Root Port 16	Lane configured as USB/SATA

►PCI Express Root Port 17

PCI Express Root Port 17	[Enabled]
Disable Gen2 P11 Shutdown and L1 Controller Power gating	[Disabled]
Connection Type	[Slot]
ASPM16	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]

Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1
PCI Express Root Port 18	Shadowed by x2/x4 Port
PCI Express Root Port 19	Shadowed by x2/x4 Port
PCI Express Root Port 20	Shadowed by x2/x4 Port
►PCI Express Root Port 21	
PCI Express Root Port 21	[Enabled]
Disable Gen2 P11 Shutdown and L1	[Disabled]
Controller Power gating	
Connection Type	[Slot]
ASPM20	[Auto]
L1 SubStates	[L1.1&L1.2]
Gen3 Eq Phase3 Method	[Software Search]
UPTP	5
DPTP	7
ACS	[Enabled]
PTM	[Enabled]
DRC	[Enabled]
EDPC	[Enabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]

CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Advanced Error Reporting	[Enabled]
PCIe Speed	[Auto]
Transmitter Half Swing	[Disabled]
Detect Timeout	0
Extra Bus Reserved	0
Reserved Memory	10
Reserved I/O	4
PCH PCIe LTR Configuration	
LTR	[Enabled]
Snoop Latency Override	[Auto]
Non-Snoop Latency Override	[Auto]
Force LTR Override	[Disabled]
►Extra options	
Detect Non-Compliance Device	[Disabled]
Prefetchable Memory	10
Reserved Memory Alignment	1
Prefetchable Memory Alignment	1
PCI Express Root Port 22	Shadowed by x2/x4 Port
PCI Express Root Port 23	Shadowed by x2/x4 Port
PCI Express Root Port 24	Shadowed by x2/x4 Port
►SATA And RST Configuration	
SATA Controller(s)	[Enabled]
SATA Mode Selection	[AHCI]
SATA Test Mode	[Disabled]
►Software Feature Mask Configuration	
HDD Unlock	[Enabled]
LED Locate	[Enabled]

Aggressive LPM Support	[Enabled]
Serial ATA Port 0	Empty
Software Preserve	Unknown
Port 0	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
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
Serial ATA Port 3	Empty
Software Preserve	Unknown
Port 3	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 3 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15
Serial ATA Port 4	Empty
Software Preserve	Unknown
Port 4	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 4 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15
Serial ATA Port 5	Empty
Software Preserve	Unknown
Port 5	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 5 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15

Serial ATA Port 6	Empty
Software Preserve	Unknown
Port 6	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 6 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15

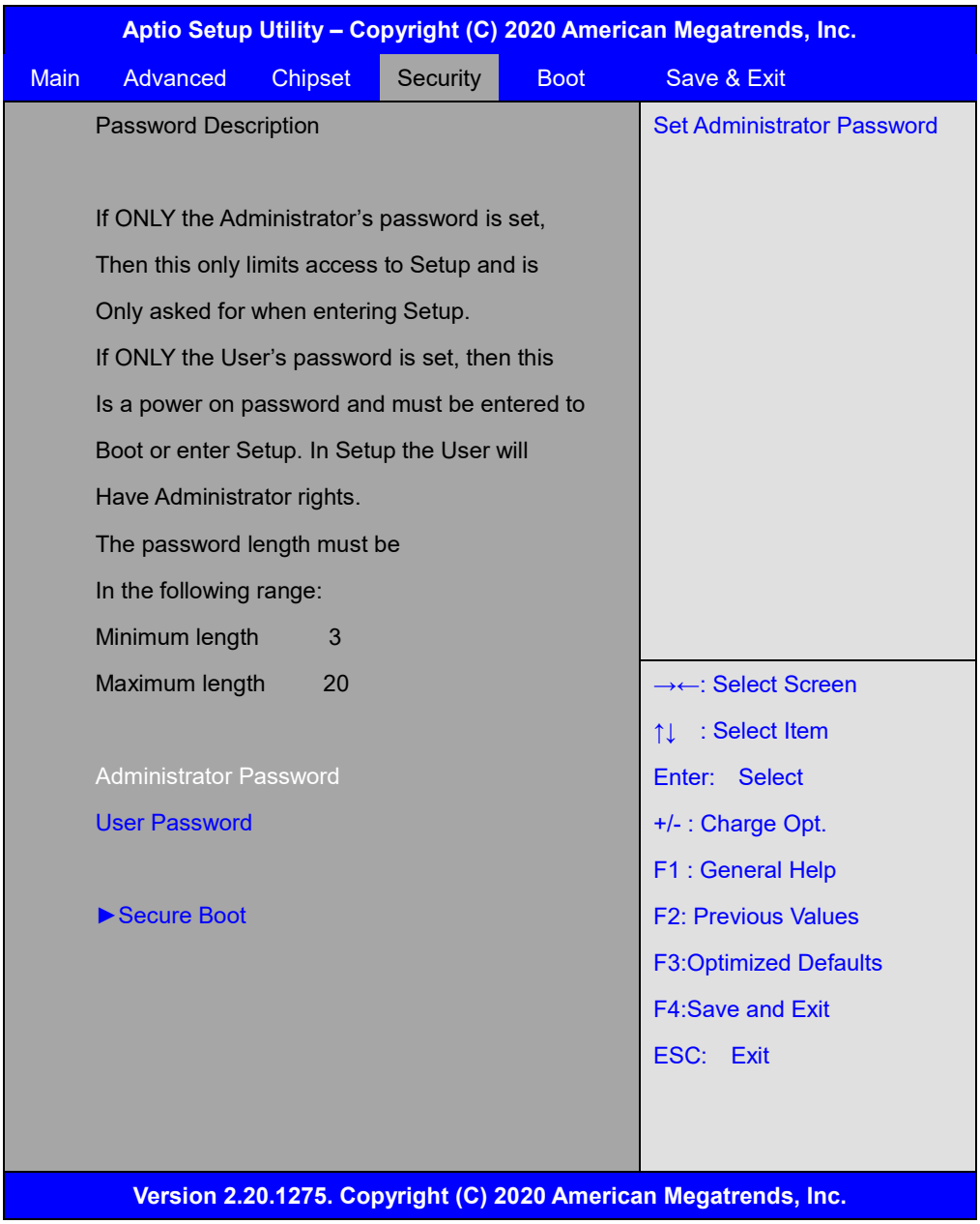
Serial ATA Port 7	Empty
Software Preserve	Unknown
Port 7	[Enabled]
Hot Plug	[Disabled]
Configured as ESATA	Hot Plug supported
Spin Up Device	[Disabled]
SATA Device Type	[Hard Disk Drive]
SATA Port 7 DevSlp	[Disabled]
DIT0 Configuration	[Disabled]
DIT0 Value	625
DM Value	15

►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]

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**

►**Renroll Efi Image**

Device Guard Ready

►**Remove 'UEFI CA' from DB**

►**Restore DB defaults**

Secure Boot variables | Size| Key#| Key Source

►**Platform Key(PK) |862| 1 | Test (AMI)**

► **Key Exchange Keys |1560| 1 | Factory**

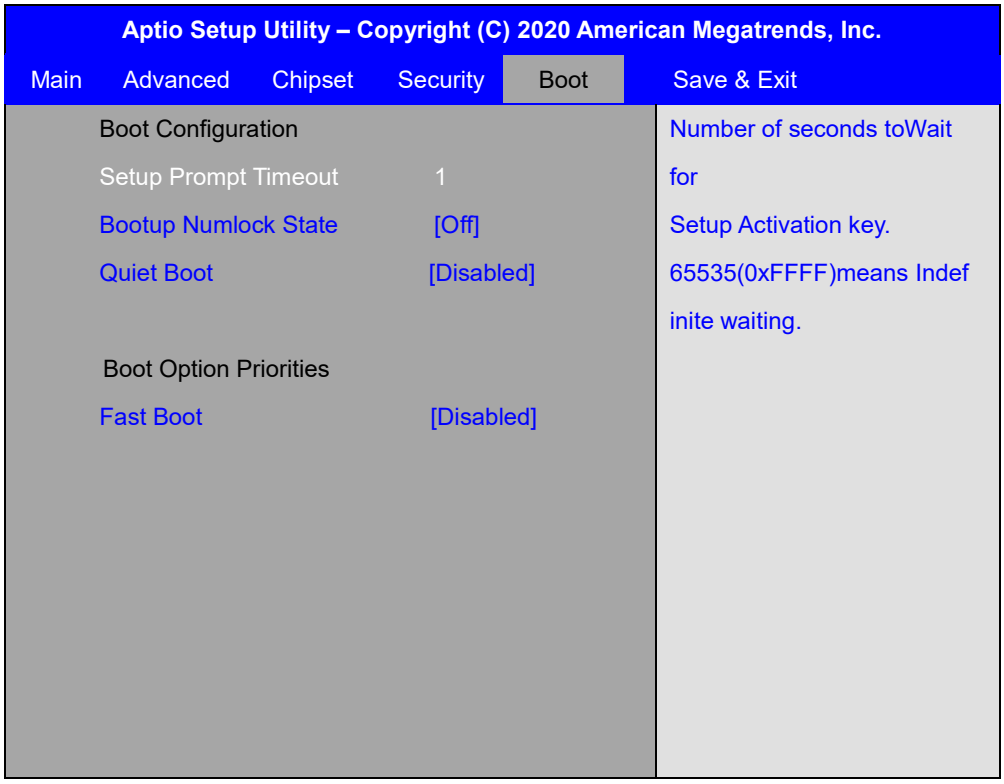
► **Authorized Signatures|3143| 2 | Factory**

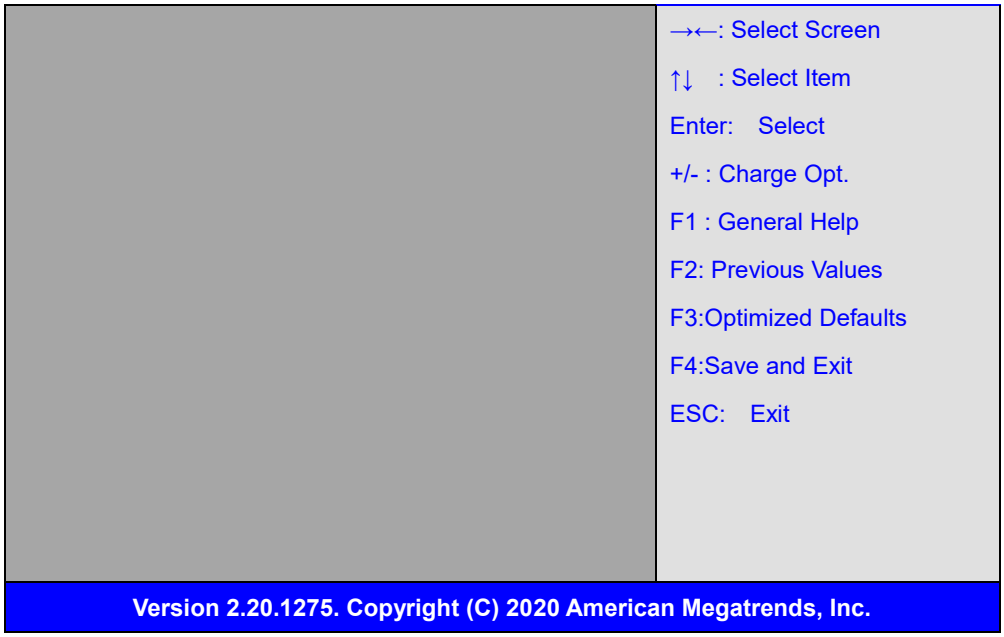
►**Forbidden Signatures |3724| 77 | Factory**

► **Authorized TimeStamps| 0 | 0 | No Key**

► **OS Recovery Signatures | 0 | 0 | No Key**

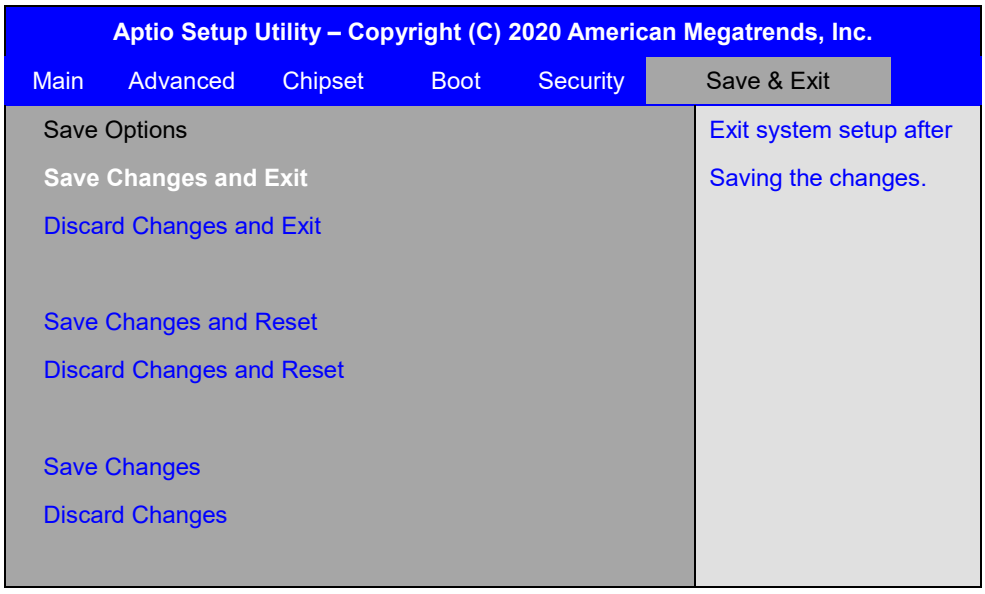
3.7 Boot Settings

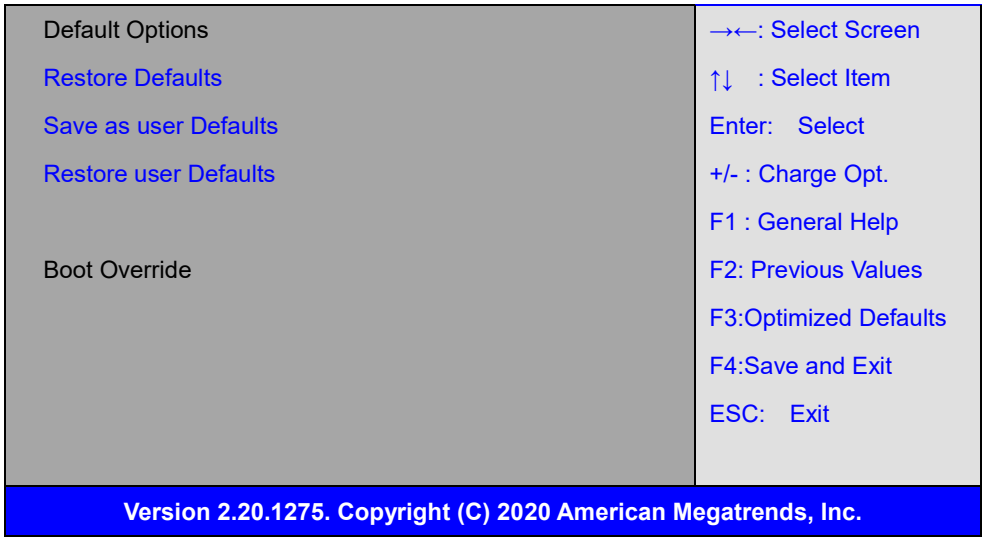




Setup Prompt Timeout	1
Bootup Numlock State	[Off]
Quiet Boot	[Disabled]
Boot Option Priorities	
Fast Boot	[Disabled]

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

This chapter describes the installation procedures for software and drivers under Windows 8.1 & 10. The software and drivers are included with the motherboard. The contents include **Intel H170, Graphics 530 chipset driver, Audio driver, Intel® management engine interface, and DPTF Driver Installation instructions are given below.**

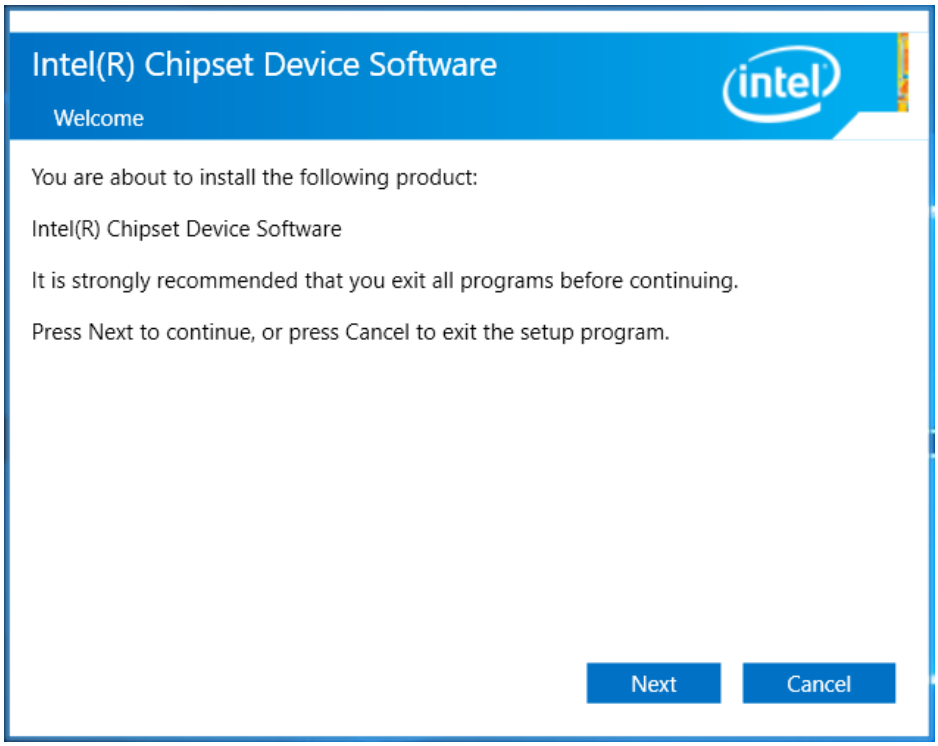
Important Note:
After installing your Windows operating system, you must install Intel Chipset Software Installation Utility before proceeding with the installation of drivers.

4.1 Intel® C246 Chipset

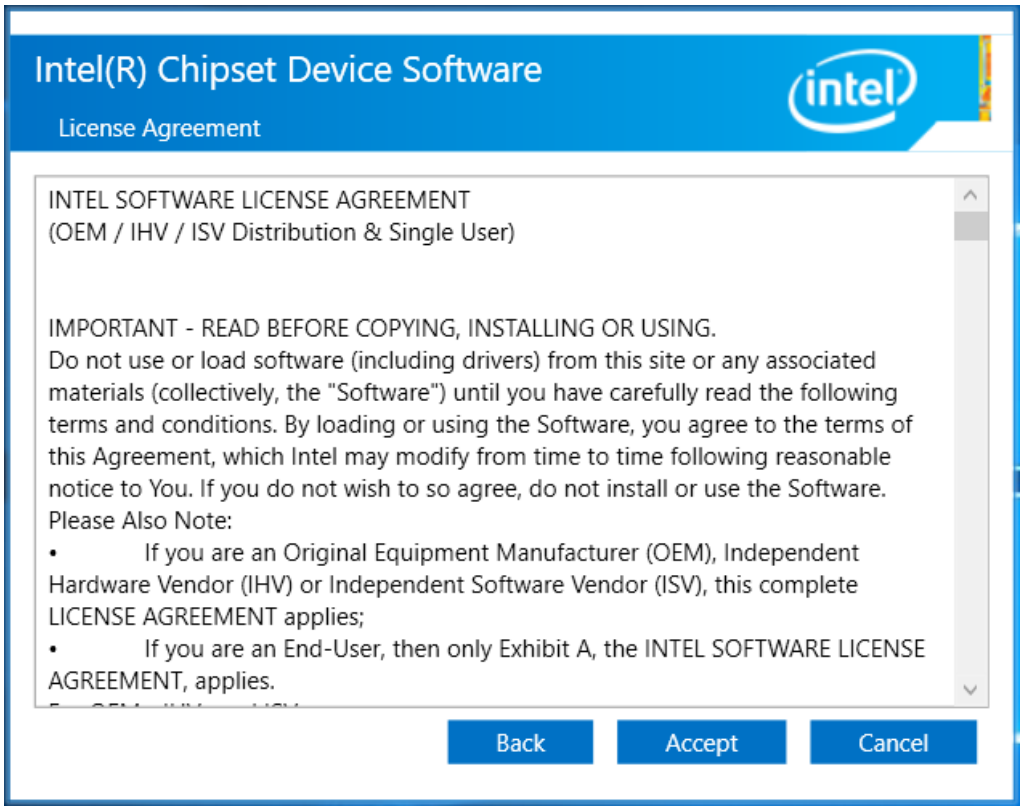
To install the Intel C246 chipset driver, please follow the steps below.

Step1. Select **Intel C246 Chipset** from the list

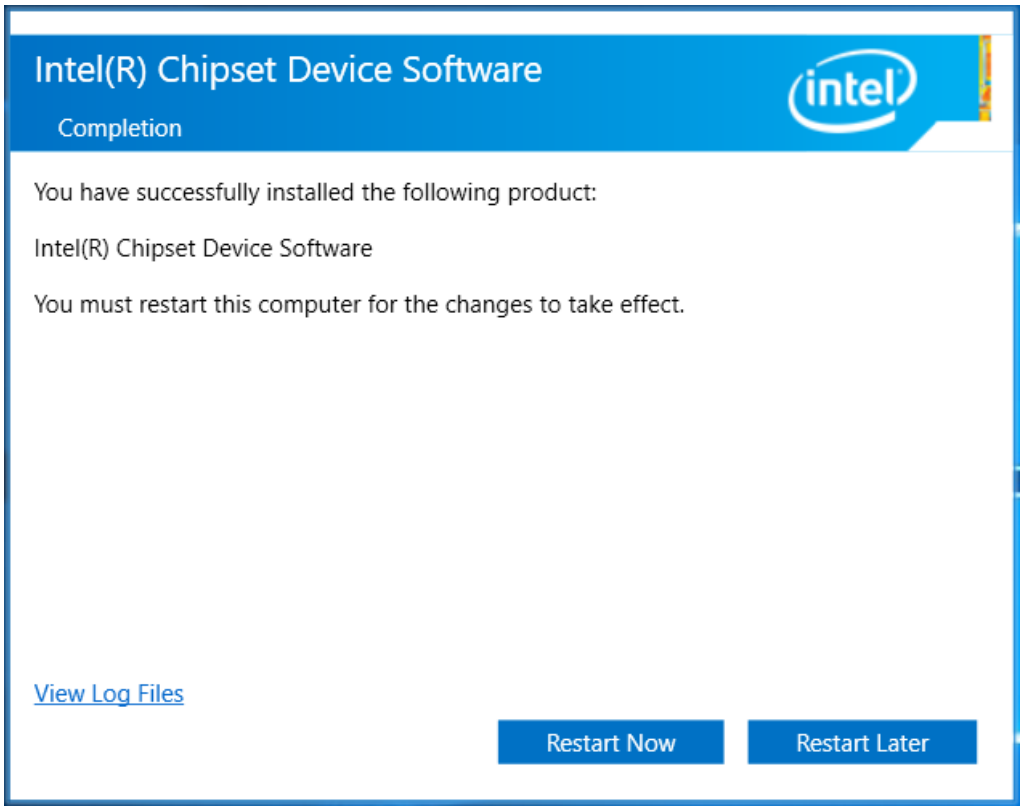
Step2. Click **Next** to setup program.



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



Step4. Click **Restart Now** to finish the installation.

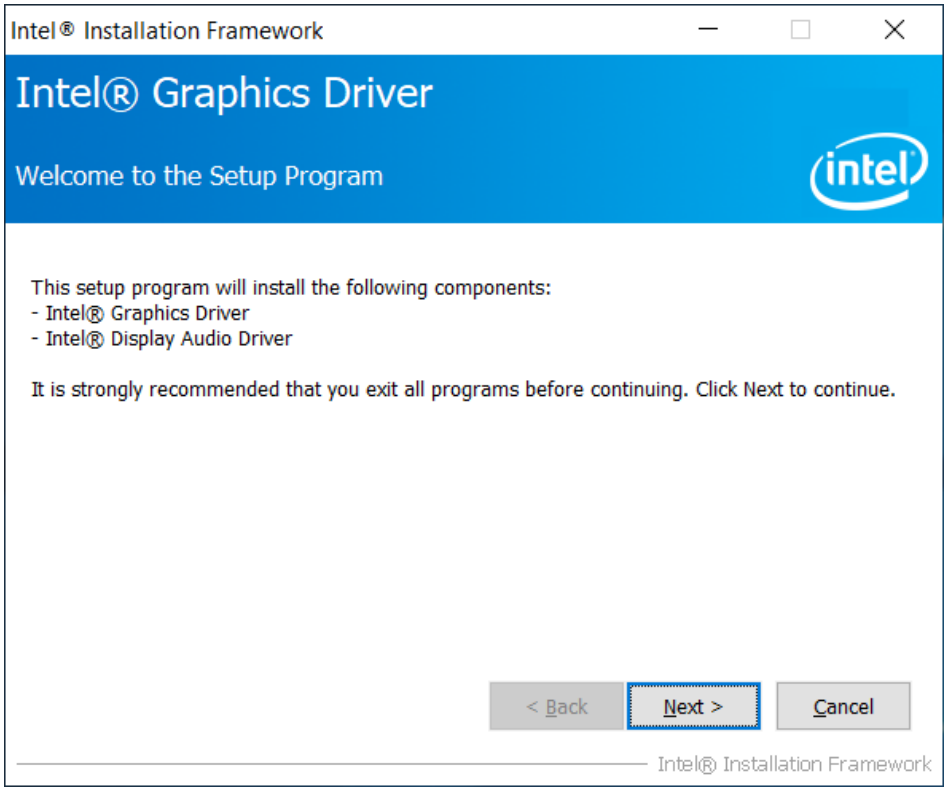


4.2 Intel® UHD Graphics 63 Chipset

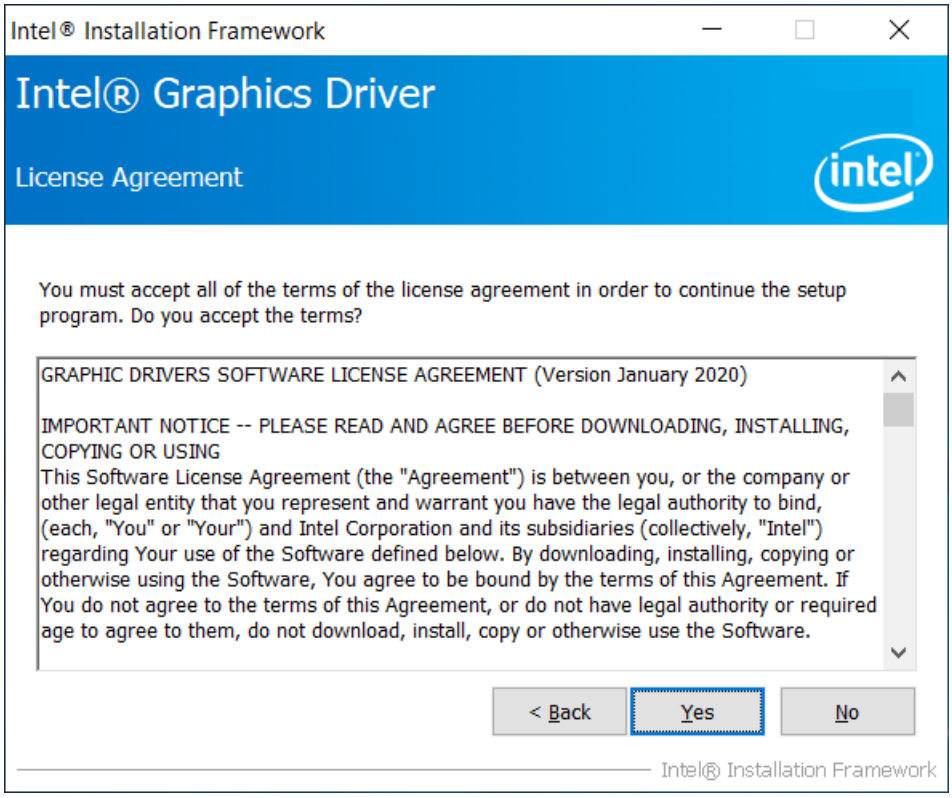
To install the Intel® UHD Graphics 63 Chipset, please follow the steps below.

Step1. Select **Intel® UHD Graphics 63 Chipset** from the list**.**

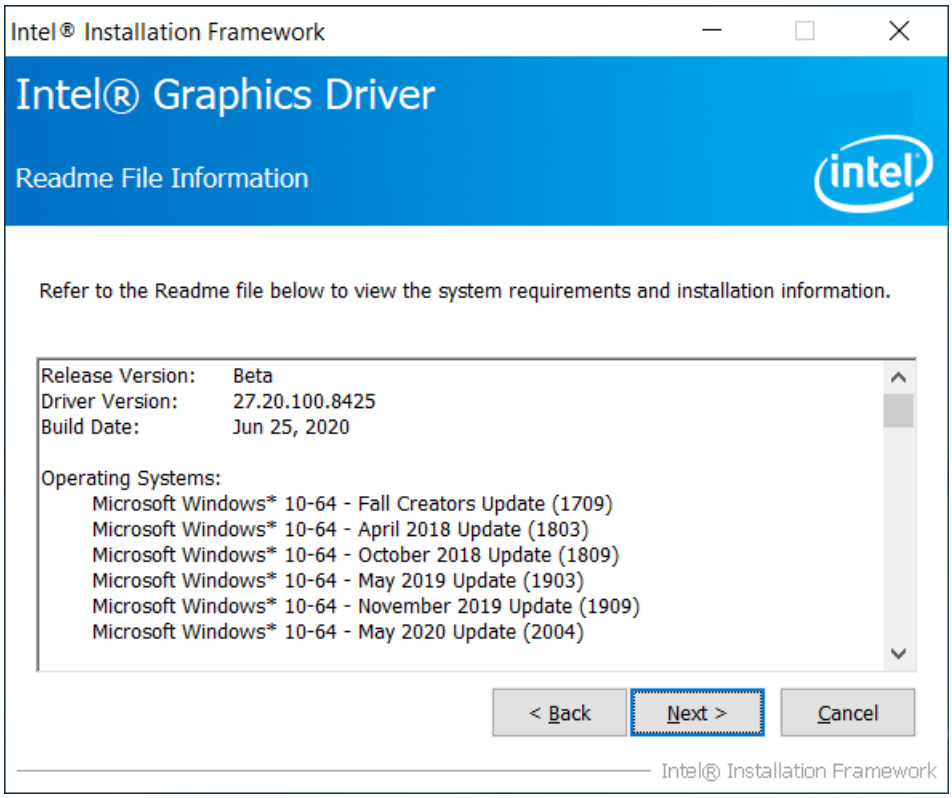
Step2. Click **Next.**



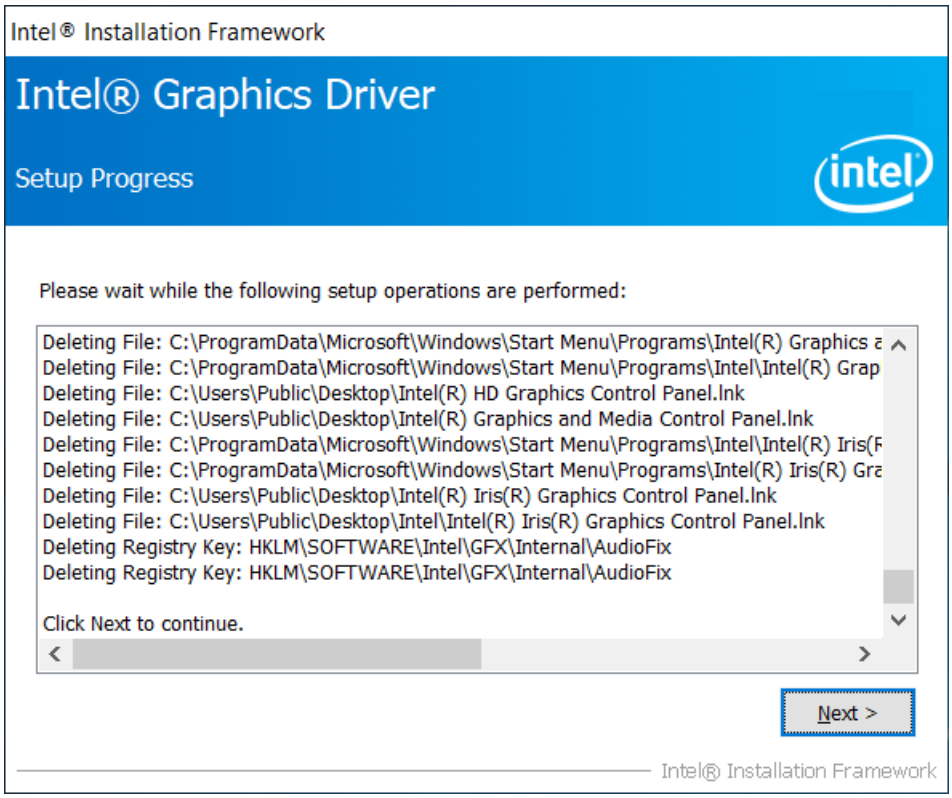
Step3. Read the license agreement. Click **Yes** to accept all of the terms of the license agreement.



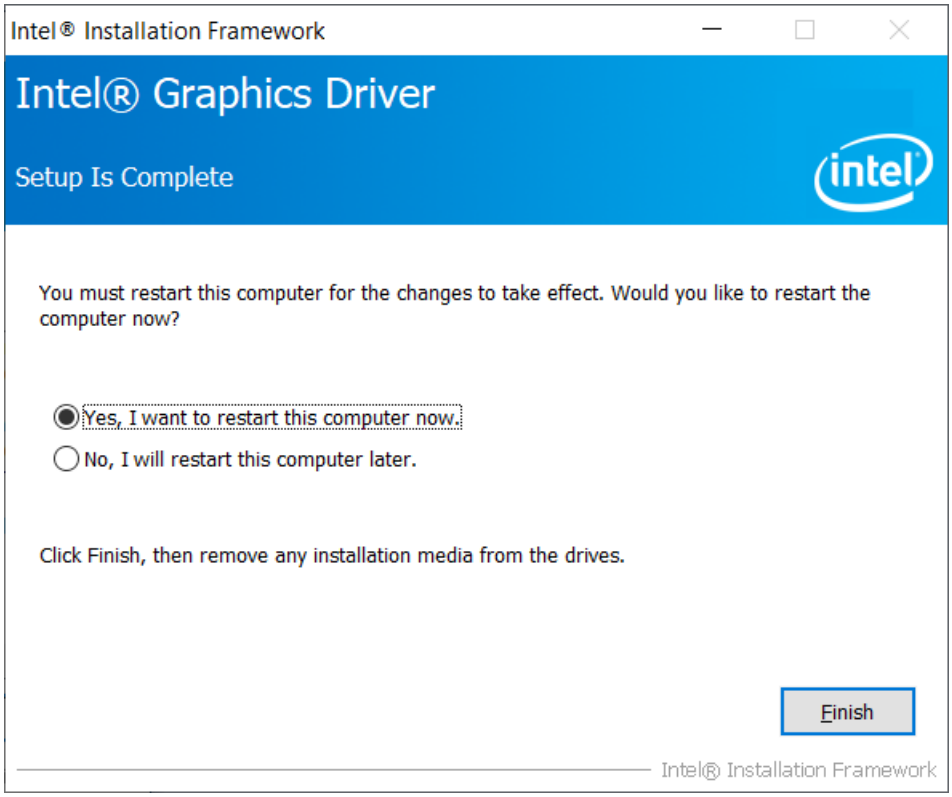
Step4. Read the Readme files. Click **Next** to continue.



Step5. Click **Next** to continue.



Step6. Select **Yes, I want to restart this computer now**. Click **Finish** to complete installation.

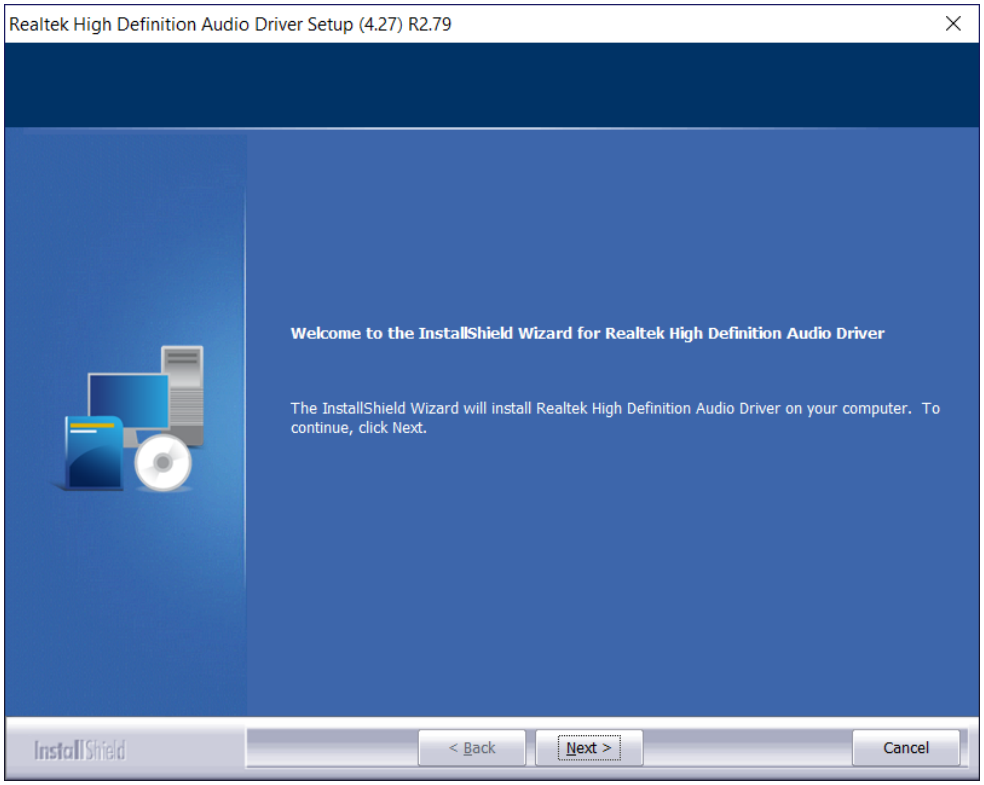


4.3 Realtek HD Audio Driver

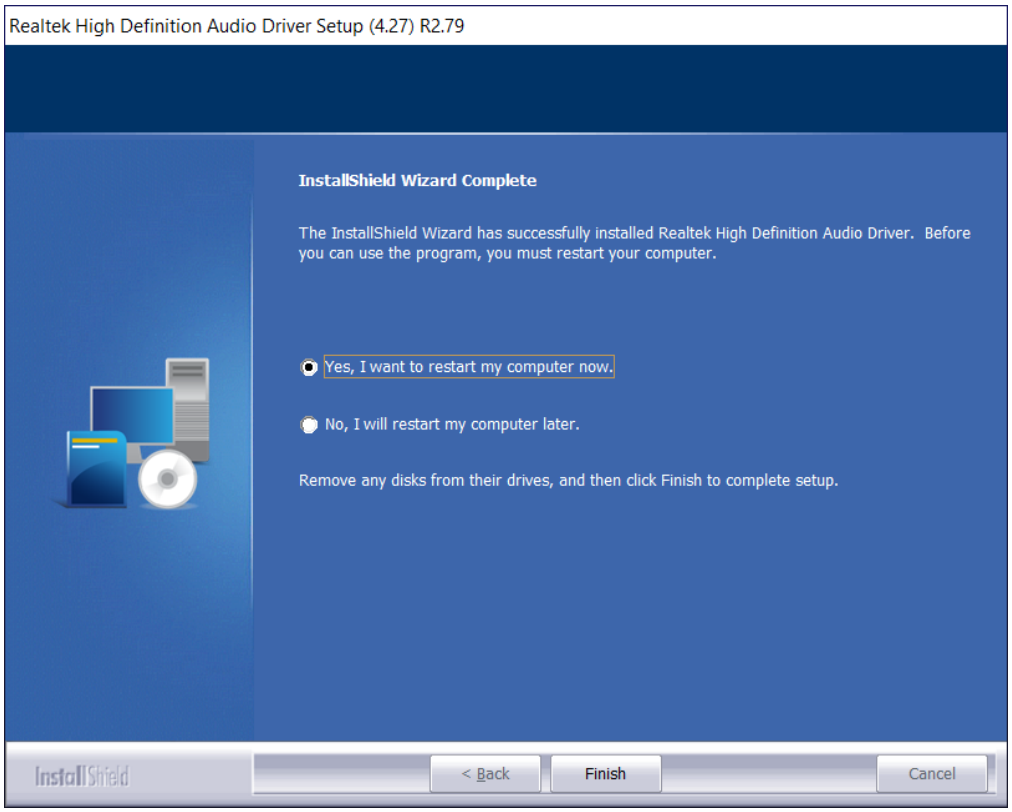
To install Realtek HD Audio Driver, please follow the steps below.

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

Step2. Click **Next** to continue.



Step3. Click **Yes, I want to restart my computer now**. Click **Finish** to complete the installation.

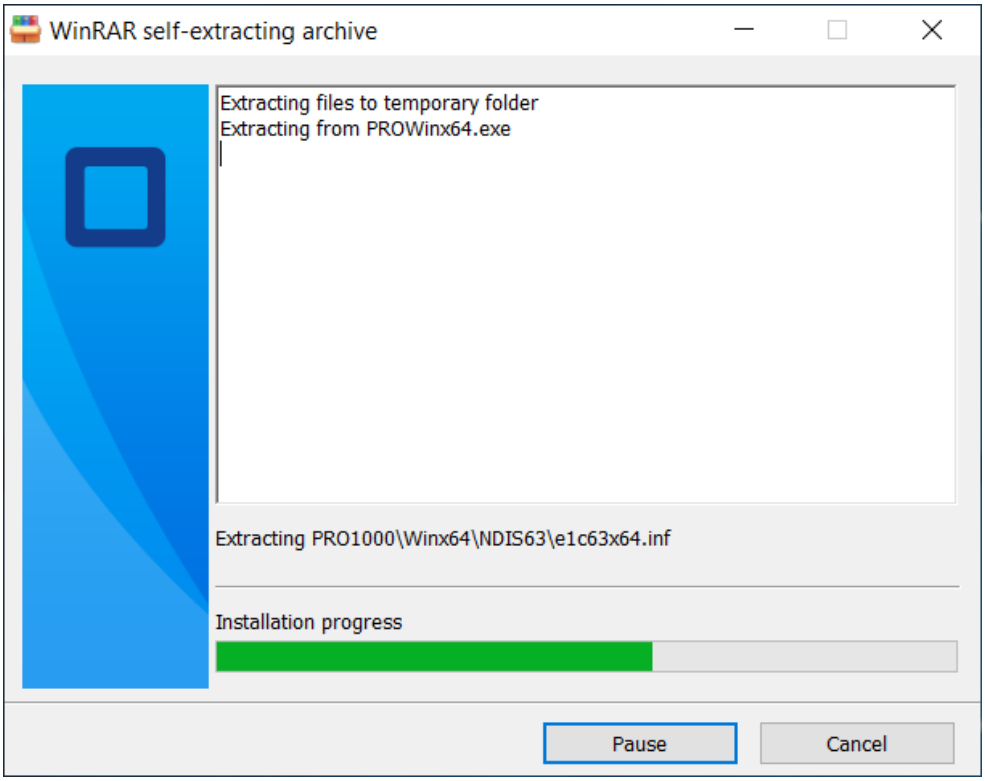


4.4 LAN Driver

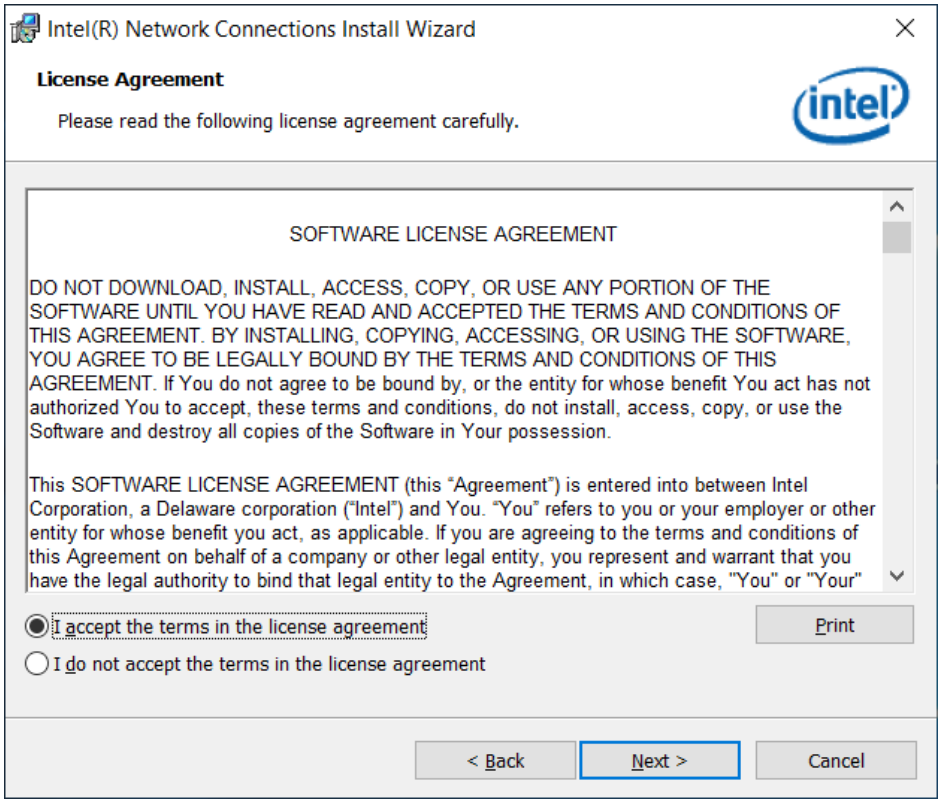
To install the LAN Driver, please follow the steps below.

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

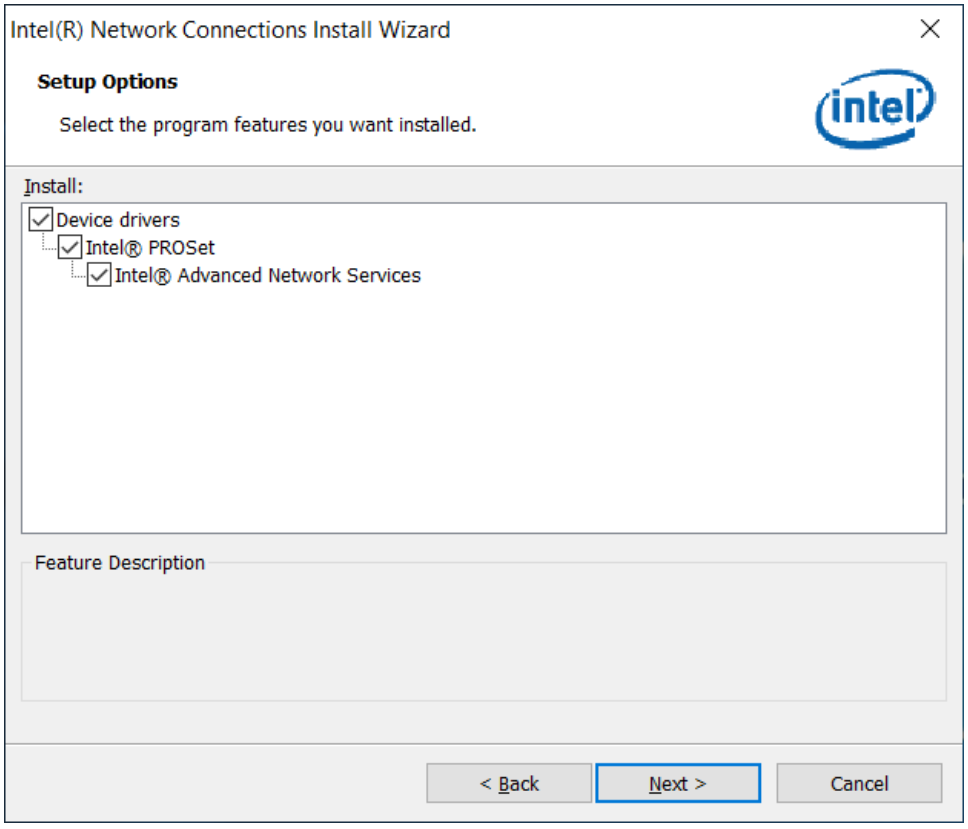
Step2. WinRAR self-extracting archive running.



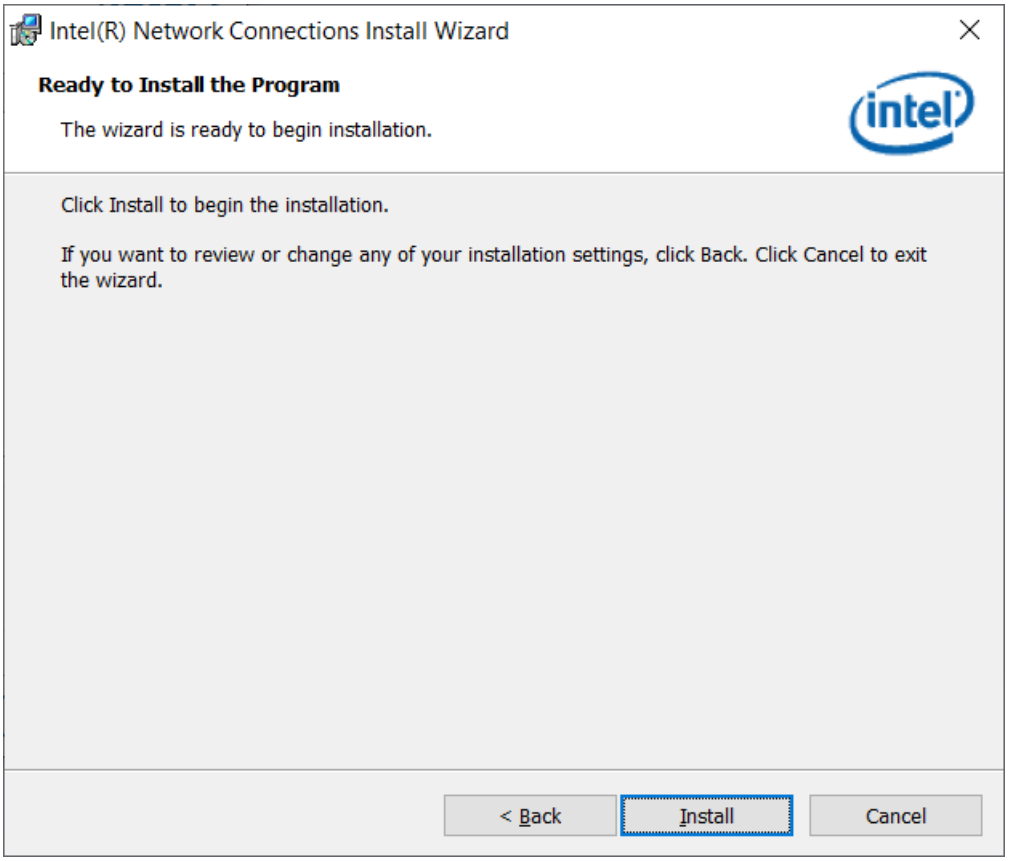
Step3. Choose **I accept the terms in the License Agreement** and click **Next** to begin the installation.



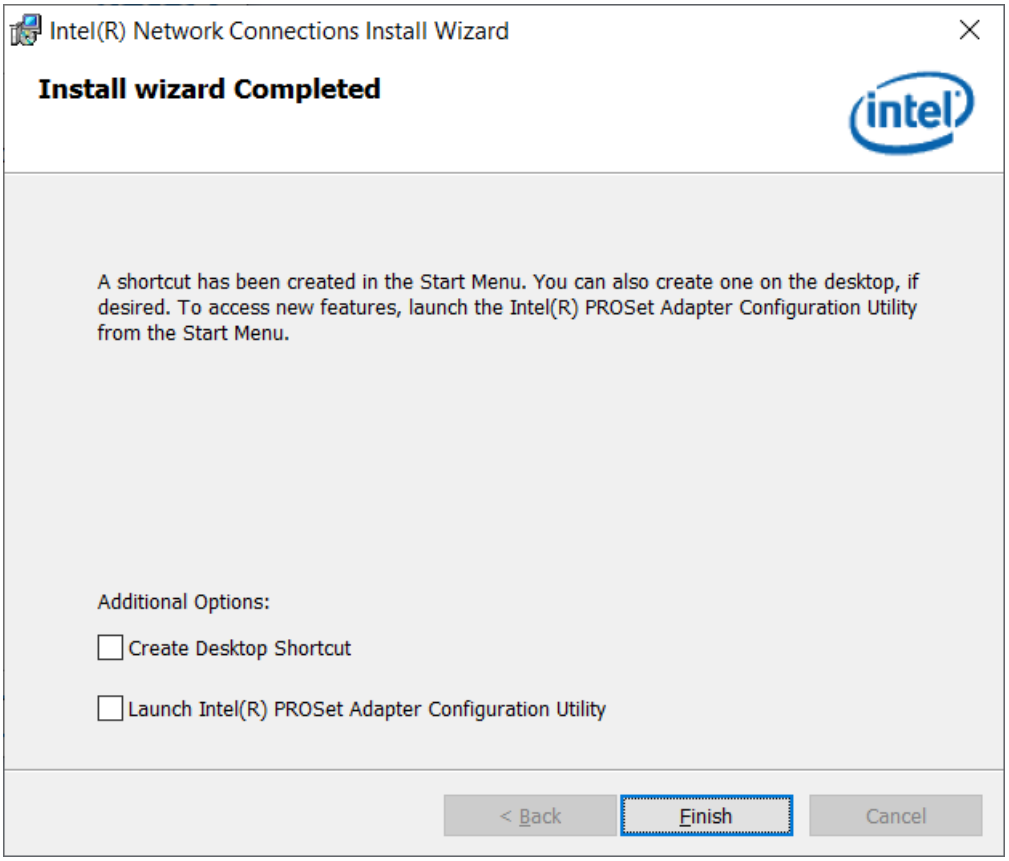
Step4. Click **Next** to continue.



Step5. Click **Install** to begin the installation.



Step6. Click **Finish** to complete the installation.



Chapter 5 Mounting Suggestions

5.1 Wall Mount

5.1.1 AVS-600 Wall Mount

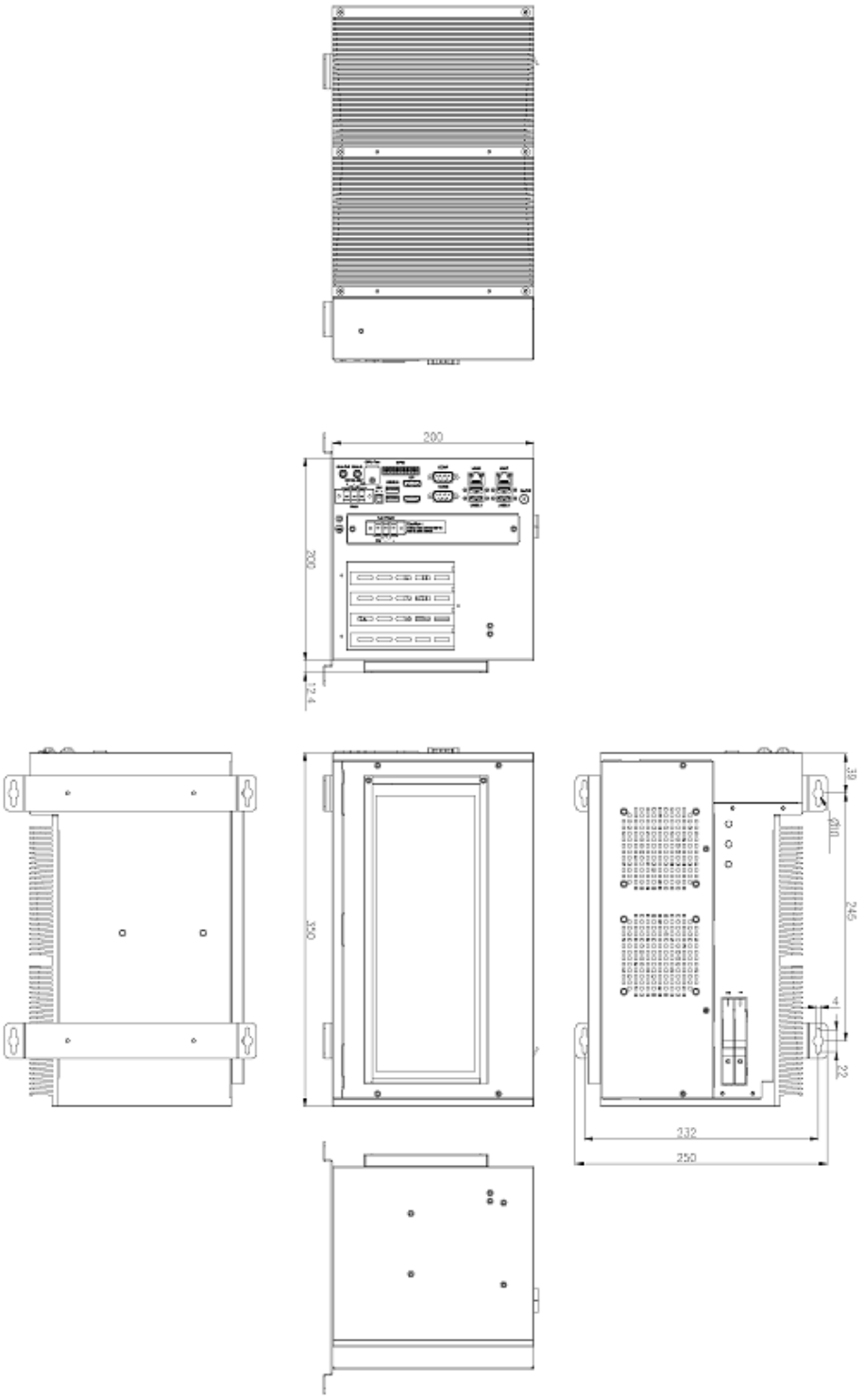


Figure 5.1 Wall Mount of AVS-600