

AIMB-587

**Intel® Xeon® W/Core™ i9/i7/i5/i3
LGA1200 MicroATX with triple
Display, Dual GbE LAN, Dual
10GbE LAN, DDR4, SATAIII and
USB 3.2 Gen2**

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CPU Compatibility

CPU Family	Core Number	Power	Freq (GHz)	Mfg-Tech	Smart cach (L3)	Package Type	Supports Model
Intel W1290E	10	95W	3.5G	14nm	20MB	LGA1200	F/WG2
Intel W1290TE	10	35W	1.8G	14nm	20MB	LGA1200	F/WG2
Intel W1270E	8	80W	3.4G	14nm	16MB	LGA1200	F/WG2
Intel W1270TE	8	35W	2.0G	14nm	16MB	LGA1200	F/WG2
Intel W1250E	6	80W	3.5G	14nm	12MB	LGA1200	F/WG2
Intel W1250TE	6	35W	2.4G	14nm	12MB	LGA1200	F/WG2
Intel i9-10900E	10	65W	2.8G	14nm	20MB	LGA1200	QG2/F/WG2/L
Intel i9-10900TE	10	35W	1.8G	14nm	20MB	LGA1200	QG2/F/WG2/L
Intel i7-10700E	8	65W	2.9G	14nm	16MB	LGA1200	QG2/F/WG2/L
Intel i7-10700TE	8	35W	2.0G	14nm	16MB	LGA1200	QG2/F/WG2/L
Intel i5-10500E	6	65W	3.1G	14nm	12MB	LGA1200	QG2/F/WG2/L
Intel i5-10500TE	6	35W	2.3G	14nm	12MB	LGA1200	QG2/F/WG2/L
Intel i3-10100E	4	65W	3.2G	14nm	6MB	LGA1200	QG2/F/WG2/L
Intel i3-10100TE	4	35W	2.3G	14nm	6MB	LGA1200	QG2/F/WG2/L
Intel Pentium® Processor G6400E	2	58W	3.8G	14nm	4MB	LGA1200	QG2/F/WG2/L
Intel Pentium® Processor G6400TE"	2	35W	3.2G	14nm	4MB	LGA1200	QG2/F/WG2/L
Intel Celeron® Processor G5900E"	2	58W	3.2G	14nm	2MB	LGA1200	QG2/F/WG2/L
Intel Celeron® Processor G5900TE"	2	35W	3.0G	14nm	2MB	LGA1200	QG2/F/WG2/L

Ordering Information

P/N	Chipset	USB3.2 Gen2	USB3.2 Gen1	USB2.0	DP/VG	eDP	GbE LAN	10GbE LAN	SATA III	COM	PCIe x16	PCIe x8	PCIe x4	PCIe x1	M.2 M-key	TPM	Dual BIOS
AIMB-587QG2-00A1E	Q470E	4	2+(4)**	6	2/(1)	1	2	(2)	6	6	1	1	1	1	1	(1)	No
AIMB-587F-00A1E	W480E	4	6	6	2/1	1	2	2	8	6	1	1	1	1	1	1 (2.0)	Yes
AIMB-587WG2-00A1E	W480E	4	2+(4)**	6	2/(1)	(1)	2	(2)	8	2+(4)	1	1	1	1	1	1 (2.0)	No
AIMB-587L-00A1E	H420E	0	6+(4)	2	2/(1)	(1)	1+ (1)	0	4	2	1	0	1	0	0	(1)	No

* () means BOM option on MP version.

** (PCIEX16_1 / PCIEX8_1: single at x16 (PCIEX16_1); dual at x8 (PCIEX16_1)/ x8 (PCIEX8_1)

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- 1 x AIMB-587 Intel LGA 1200 Micro ATX Motherboard
- 2 x SATA HDD cable
- 2 x SATA Power cable
- 1 x I/O port bracket
- 1 x Startup manual
- 1 x Warranty card
- 2 x M.2 screws (F/QG2/WG2)

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-587 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-587, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

General Information

1.1 Introduction

AIMB-587 is designed with the Intel Q470E/W480E/H420E for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel Xeon W series; Intel Core i9/i7/i5/i3; Pentium and Celeron processor up to 20 MB L3 cache and DDR4 3200 MHz up to 128GB, per slot up to 32 GB. A rich I/O connectivity of 6 serial ports, 6 USB 2.0, 4 USB 3.2 Gen2, 6 USB 3.2 Gen1 and up to dual GbE LAN dual 10GbE LAN, up to 8 SATA III ports.

1.2 Features

- **Rich I/O connectivity:** up to dual GbE LAN via PCIe x1 bus, up to dual 10GbE LAN via PCIe x4, 1 x PCIe x16 slot (Gen 3) BOM option to 2 x PCIe x8 slot (Gen 3), 1 x PCIe x4 slot (Gen 3), 1 x PCIe x1 slot (Gen 3), 6 USB 2.0 ports and 4 USB 3.2 Gen2, 6 USB 3.2 Gen1.
- **Standard Micro ATX form factor with industrial features:** The AIMB-587 is a full featured Micro ATX motherboard with balanced expandability and performance.
- **Wide selection of storage devices:** SATAIII HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity.
- **Optimized integrated graphic solution:** With Intel® Flexible Display Interface, it supports versatile display options and 32-bit 3D graphics engine.

1.3 Specifications

1.3.1 System

- **CPU:** Intel 10th generation Xeon W and Core i9/i7/i5/i3 processor
- **BIOS:** AMI EFI 256 Mbit SPI BIOS
- **System chipset:** Intel® W480E/Q470E/H420E
- **SATA hard disk drive interface:** On-board SATA connectors with data transmission rate up to 600 MB (QG2:6 / WG2,F:8 / L:4)

1.3.2 Memory

- **RAM:** Up to 128 GB in 4 slots 288-pin DIMM sockets. Supports dual-channel DDR4 3200/2666/2400MHz SDRAM.
 - AIMB-587QG2 & AIMB-587L supports non-ECC unbuffered DIMMs and do not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs.
 - AIMB-587WG2 & AIMB-587F supports ECC & non-ECC buffered DIMMs.

1.3.3 Input/Output

- **PCIe slot:** 1 PCIe x16 expansion slot BOM option to 2 PCIe x 8 expansion slot, 1 PCIe x4 expansion slot, 1 PCIe x1 expansion slot
- **Serial port:** Six serial ports, one is RS-232/422/485 with hardware auto-flow control and five are RS-232.
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to PS/2 keyboard and mouse.
- **USB port:** Supports up to 6 USB 2.0 ports with transmission rates up to 480 Mbps and 6 USB 3.2 Gen1 ports with transmission rates up to 5 Gbps, 4 USB 3.2 Gen2 ports with transmission rates up to 10 Gbps.
- **GPIO:** AIMB-587 supports 16-bit GPIO from super I/O for general purpose control application.

1.3.4 Graphics

- **Controller:** Intel® HD Graphics
- **Display memory:** 1 GB maximum shared memory with 2GB and above system memory installed
- **VGA:** VGA up to resolution 1920 x 1200 @ 60Hz refresh rate
- **Display Port:** 2, Supports max resolution 4096 x 2304 @60Hz
- **eDP:** Support max resolution 3840 x 2160 @ 60Hz
- **Triple Display:** VGA+DP+DP, DP+DP+eDP, eDP+DP+VGA
- **Dual Display:** VGA+eDP, eDP+DP, DP+VGA, DP+DP

1.3.5 Ethernet LAN

- Supports up to dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate and up to dual 10/100/1000/10000 Mbps Ethernet port (s) via PCI Express x4 bus
- **Controller:** LAN1: Intel I219LM; LAN2: Intel I211AT/Intel I210AT(WG2/F); LAN3/LAN4: Intel X550 AT2

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -40 ~ 85° C (-40 ~ 185° F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
- **Power consumption:**
LAG1151 Core i7-8700 3.4 GHz, 12MB L3 Cache, 4pcs 8GB DDR4 2666MHz memory

+5 V	3.3 V	12 V	5 Vsb	-12 V
1.6 A	0.47 A	0.365 A	0 A	0 A

Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
- **Board size:** 244 mm x 244 mm (9.6" x 9.6")
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-587 motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.1: Jumpers

Label	Function
JFP1	Power Switch/ Reset/ External Speaker/ SATA HDD LED/MBus connector
JFP2	Power LED/ Keyboard Lock
JSETCOM2	Serial port: RS232/RS422/RS485 jumper setting
JCMOS1	CMOS clear (default 1-2 pin)
JCASEOP_SW1	Case open selection pin header
JEDP1	EDP Panel Voltage Selection
JOBS1+JWDT1	Watchdog timer output and OBS beep
PSO1	AT / ATX Mode selection
JSETCOM3_V1	COM3 RI# selection pin header
JME1	Intel ME header
JUSBPWR1	USB Power selection for USB910, USB1112, USB1314, USB1516
JUSBPWR2	USB Power selection for LAN1_USB12, LAN2_USB34, USB56, USB78

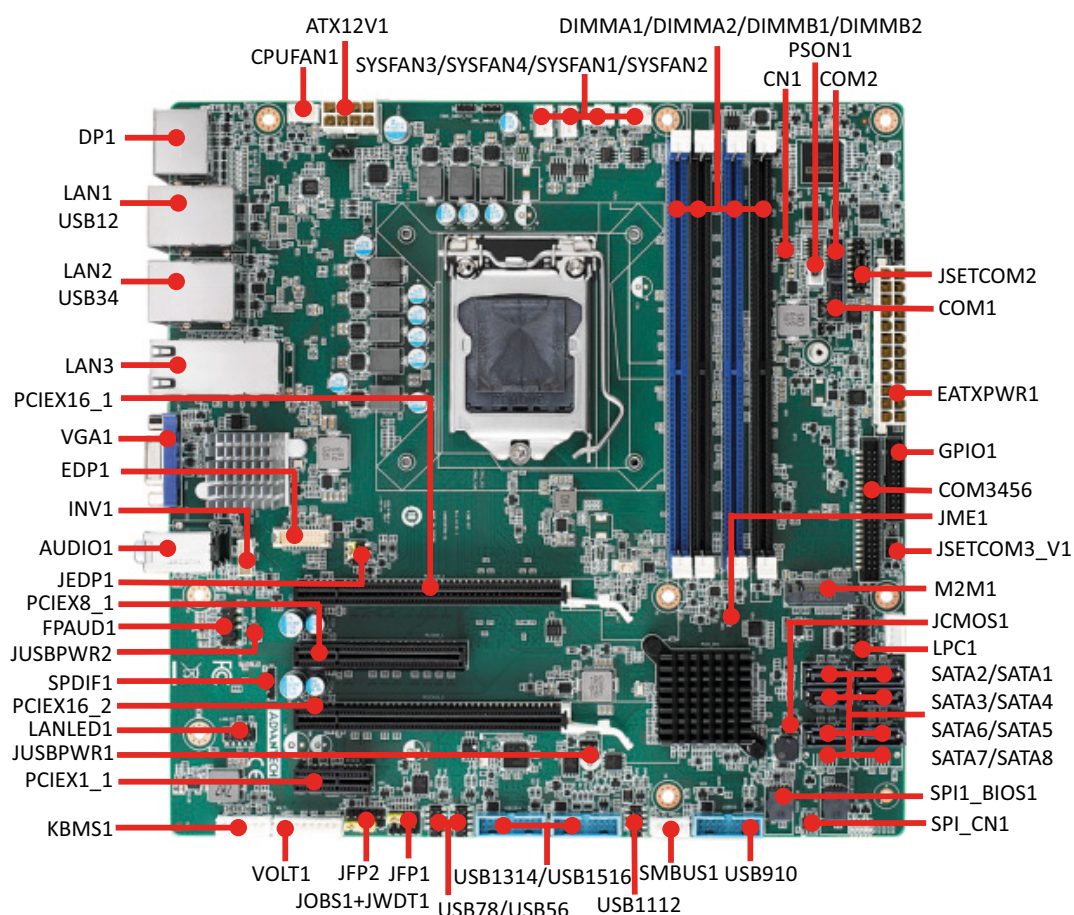
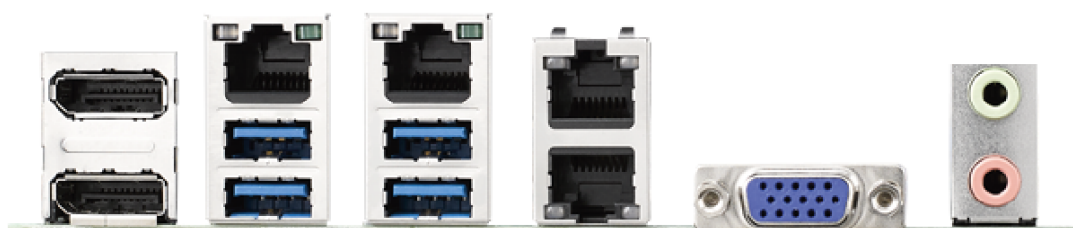
Table 1.2: Connectors

Label	Function
DP1	DisplayPort 1, 2 port connector
LAN1_USB12	LAN1 & USB12 Connector
LAN2_USB34	LAN2 & USB34 Connector
LAN3	LAN 3, 4 (10GbE)
VGA1	VGA port connector
EDP1	eDP port connector
AUDIO1	Line Out, Mic IN connector
INV1	EDP Backlight Inverter Power Connector
FPAUDIO1	Front Panel audio connector (FP_AU-DIO)
SPDIF1	Digital Audio connector 4 x 1 header pitch = 2.54 mm
LANLED1	Front Panel LAN Indicator connector
USB56/78	USB 2.0 Pinhead (internal 2 x 5 pin header on board) pitch = 2.00 mm
USB910/1112/1314	USB 3.0 Pinhead (internal 2x10 pin header on board), USB 1314/ 1516 optional
SMBUS1	SMBUS expansion pin header 1 x 4 p
SATA1-8	Serial ATA connector
SPI_CN1	SPI flash programming connector
LPC1	Low pin count interface (2 x 7 pin header)
M2M1	M.2 M Key connector
COM1	Serial Port 1 (RS-232)

Table 1.2: Connectors

COM2	Serial Port COM2, pin header 2 x 5, COM2 supports RS232/422/485
COM3/4/5/6	Serial port: COM 3/4/5/6, box header 2x 20
GPIO1	GPIO pin header (SMD pitch=2.0 mm)
EATXPWR1	ATX 24pin power connector
ATX12V1	ATX 8pin 12V Auxiliary power connector
CN1	EC programming header
CPUFAN1	CPU FAN connector (4 pin)
SYSFAN1/2/3/4	System FAN Power Connector (4 pin) (Fan3/Fan4 Optional)
VOLT1	Voltage Display connector
KBMS1	On board external keyboard and Mouse connector

1.5 Board layout: Jumper and Connector Locations

**Figure 1.1 Jumper and Connector Location****Figure 1.2 I/O Connectors**

1.6 AIMB-587 Board Diagram

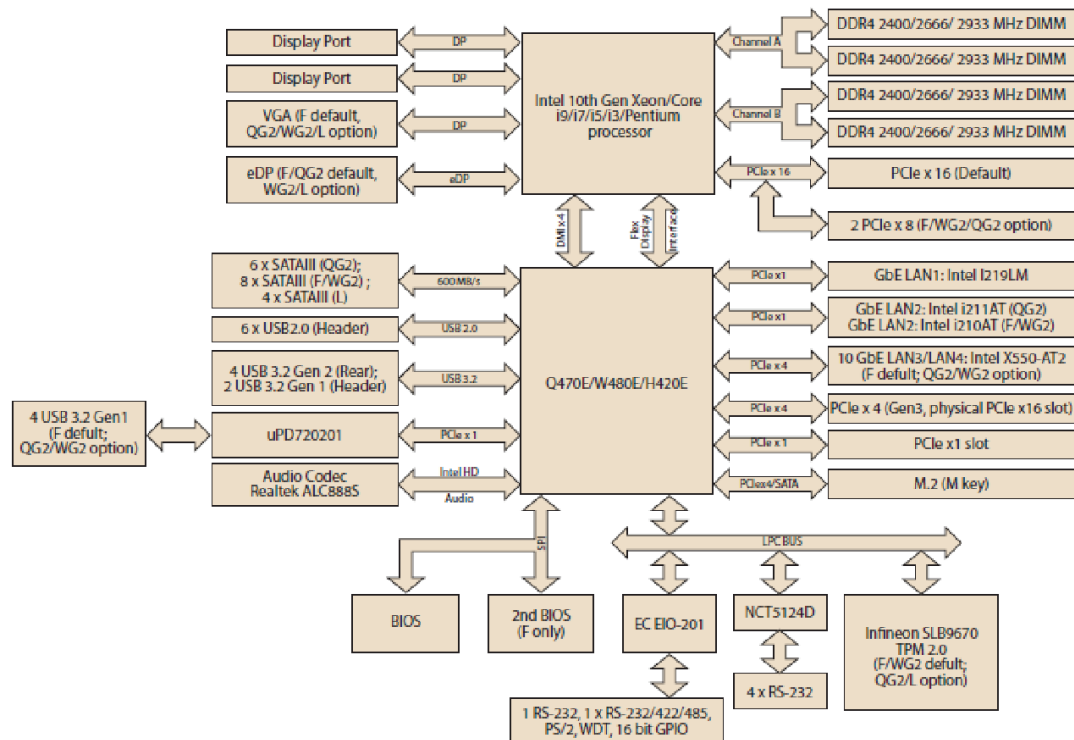


Figure 1.3 AIMB-587 Block Diagram

1.7 Safety Precautions

Warning! Always completely disconnect the power cord from chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Caution! Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electrostatic discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.



Caution! The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.



Caution! There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.



1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboards's default settings and your options for each jumper.

1.8.1 How to Set Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, you connect the pins with the clip. To “open” (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS Clear (JCMOS1)

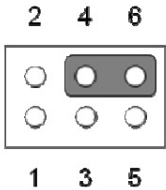
The AIMB-587 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.3: CMOS1

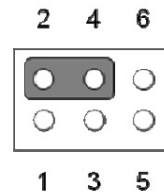
Function	Jumper Setting
*Keep CMOS data	 1-2 closed
Clear CMOS data	 3-4 closed
* Default	

1.8.3 JEDP1: eDP Power 3.3 V/ 5 V/ 12 V Selector

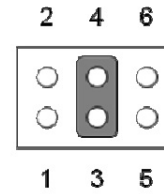
Table 1.4: JeDP1: eDP Power 3.3 V/5 V/ 12 V Selector

Closed Pins	Result
*JEDP1, 4-6	Jumper for +3.3 V
EDP1, 2-4	Jumper for +V5
JEDP1, 3-4	Jumper for +12 V
*Default	
Jumper position for +3.3V (Default)	

Jumper position for +5V



Jumper position for +12V



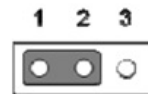
1.8.4 JUSBPWR1-2 (USB Power Selection Connector)

JUSBPWR1: selection for USB910, USB1112, USB1314, USB1516

JUSBPWR2: selection for LAN1_USB12, LAN2_USB34, USB56, USB78

Table 1.5: JUSBPWR1-2 (USB Power Selection Connector)

Pin	Pin Name
1	+V5_Vsb
2	+V5_USB
3	+V5



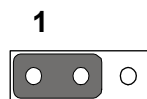
Default: 1-2 Pin (+5 VSB)

1.8.5 PSON1: ATX, AT Mode Selector

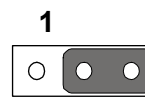
Table 1.6: PSON1: ATX, AT Mode Selector

Closed Pins	Result
1-2	AT Mode
2-3*	ATX Mode

*Default



AT Mode
1-2 closed



ATX Mode
2-3 closed

1.8.6 JOBS1+JWDT1: Watchdog timer output and OBS beep

Table 1.7: JOBS1+JWDT1: Watchdog timer output and OBS beep

Pin	Pin Name
1	NC
2	Watch Dog Reset# output
3	System Reset input#

Table 1.7: JOBS1+JWDT1: Watchdog timer output and OBS beep

4	SIO Warning Beep output
5	SP1 Buzzer Beep input

Default 2-3. 4-5.

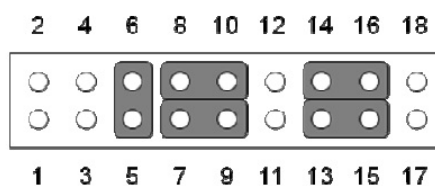


1.8.7 JSETCOM2: COM2 RS232, RS422, RS485 Selection

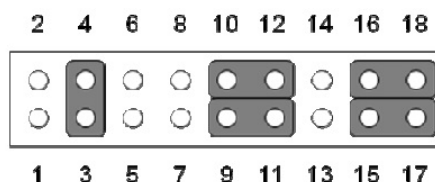
Table 1.8: COM2 RS232, RS422, RS485 Selection

Pin	Signal	Pin	Signal
1	UART_SIN [2]	2	RXD_RS485
3	UART_SIN [2]	4	RXD_RS422
5	UART_SIN [2]	6	RXD_RS232
7	DCDB	8	SOUT [2]
9	COM2_DCD#	10	COM2_SOUT
11	COM2_TXD485-	12	COM2_RXD485+
13	SIN [B]	14	DTR [B]
15	COM2_SIN	16	COM2_DTR#
17	COM2_TXD485+	18	COM2_RXD485-

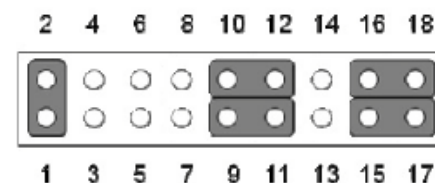
RS-232 Mode (Default)
(5-6) (7-9) (8-10) (13-15) (14-16)



RS-422 Mode
(3-4) (9-11) (10-12) (15-17) (16-18)



RS-485 Mode
(1-2) (9-11) (10-12) (15-17) (16-18)

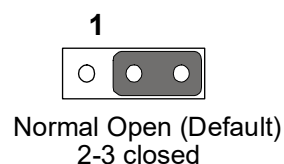
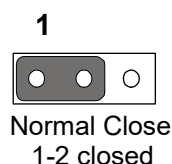


1.8.8 JCASEOP_SW1: Case Open Selection Pin Header

Table 1.9: JCASEOP_SW1: Case Open Selection Pin Header

Closed Pins	Result
1-2	Normal Mode
2-3*	Normal Open (Default)

*Default



1.8.9 JSETCOM3_V1: COM3_RI# Pin RI# / 5V / 12V

Jumper position for RI# (Default)	2 4 6 1 3 5
Jumper position for +5V	2 4 6 1 3 5
Jumper position for +12V	2 4 6 1 3 5

1.9 System Memory

AIMB-587 has four 288-pin memory sockets for 2933/2666/2400 MHz memory modules with maximum capacity of 128 GB (Maximum 32 GB for each DIMM). AIMB-587QG2/L supports only non-ECC DDR4 memory modules and do not support registered DIMMs (RDIMMs). AIMB-587F/WG2 can support ECC/non-ECC DDR4 memory module.

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the DIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

1.11 Cache Memory

The AIMB-587 supports a CPU with one of the following built-in full speed L3 caches:

20MB for Intel Xeon W-1290E/ TE

16MB for Intel Xeon W-1270E/ TE

12MB for Intel Xeon W-1250E/ TE

20MB for Intel Core i9-10900E/ TE

16MB for Intel Core i7-10700E/ TE

12MB for Intel Core i5-10500E/ TE

6MB for Intel Core i3-10300E/ TE

4MB for Intel Pentium G6400E/G6400TE

2MB for Intel Celeron G5900/G5900TE

The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

1.12 Processor Installation

The AIMB-587 is designed for LGA1200, Intel Xeon and Intel Core i9/Core i7/Core i5/ Core i3/Pentium/Celeron processor.

Chapter 2

Connecting
Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 USB Ports (LAN1_USB12/LAN2_USB34/LAN3/LAN4/USB56/78/910/1112/1314/1516

The AIMB-587 provides up to 16 USB ports. The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480 Mbps and Rev 3.0 supporting transmission rate up to 5 Gbps, Rev 3.1 Gen2 supporting transmission rate up to 10 Gbps and is fuse protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-587 is equipped with up to two high-performance 1000 Mbps Ethernet LAN adapters and two 10G Mbps Ethernet LAN adapters both of which are supported by all major network operating systems.

The RJ-45 jacks on the rear panel provides convenient LAN connection.

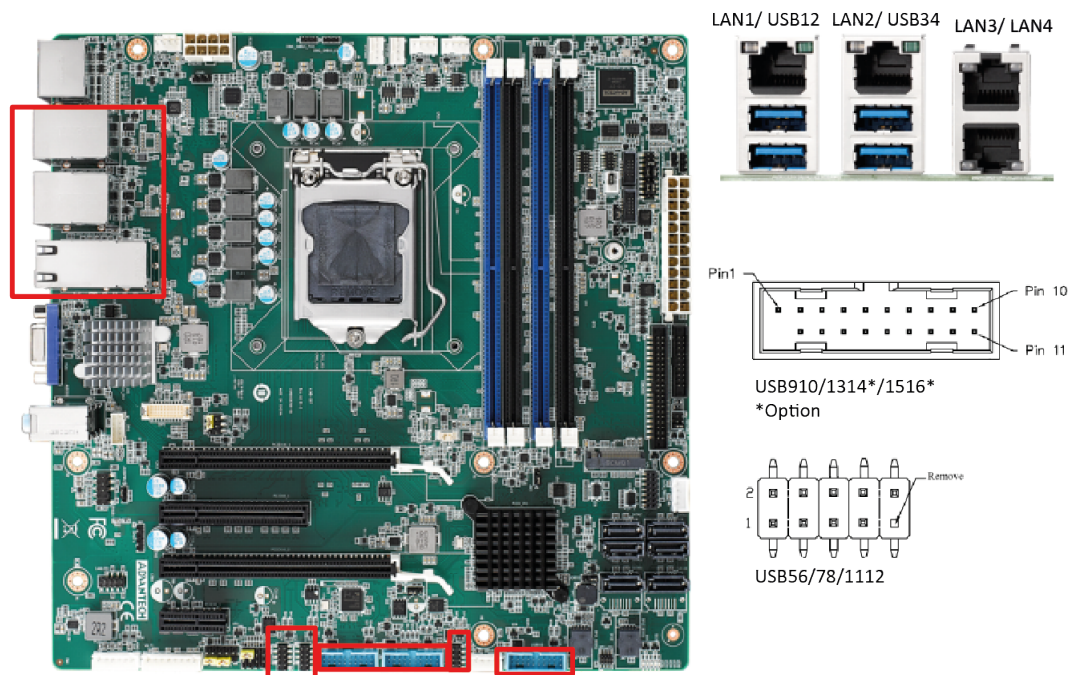
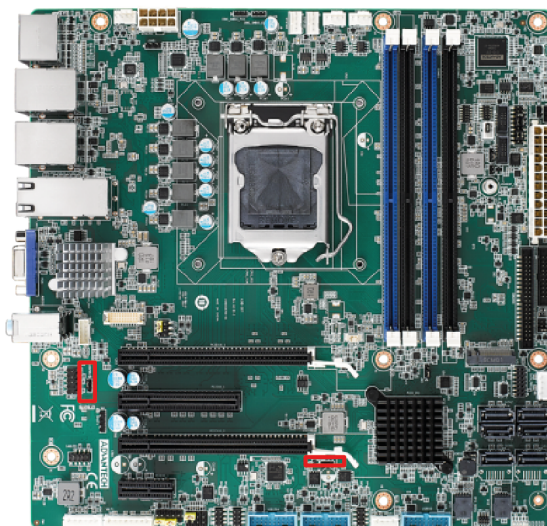


Table 2.1: LAN LED Indicator

LAN Mode	LAN Indicator	
LAN1/LAN2 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	100 Mbps (On) / 10 Mbps (Off); Color: Orange
	LED2 (Left)	1000 Mbps (On); Color: Green
LAN3/LAN4 indicator	LED1 (Right)	off for mal-link; Link (On) / Active (Flash)
	LED2 (Left)	10GMbps (On) / 100 Mbps (Flash); Color: Orange
	LED2 (Left)	1000 Mbps (On); Color: Green

2.3 USB Power Switch (JUSBPWR1/JUSBPWR2)

AIMB-587 allows users to set USB power between +5 VSB and +5 V. When the jumper is set as +5 V (2-3 pin), the board doesn't support wake from S3 via keyboard or mouse. If you need to set it to +5 Vsb, you need to modify the jumper (default 1-2 pin) . There is another way to control USB power by GPIO. But this kind of behavior need to apply BOM option by HW design. Each GPIO can control all rear USB ports or all USB ports on board pin header.

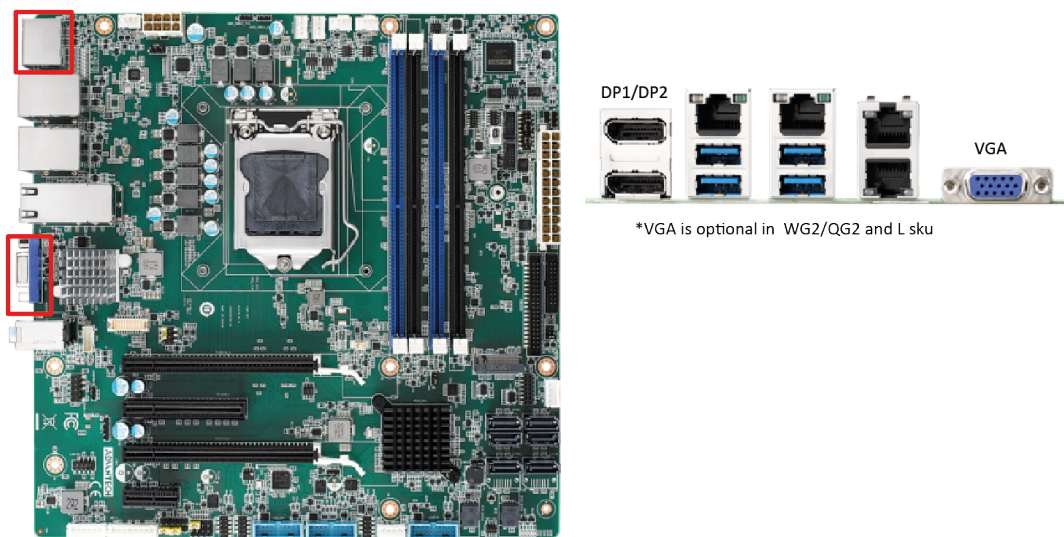


Function	Jumper Setting
Set USB VBUS as +5VSB (Default)	1 2 3
Set USB VBUS as +5V	1 2 3

Note! When USB power is switched to +5V, it can't be connected with power KVM.



2.4 VGA/DP1/DP2 Connector



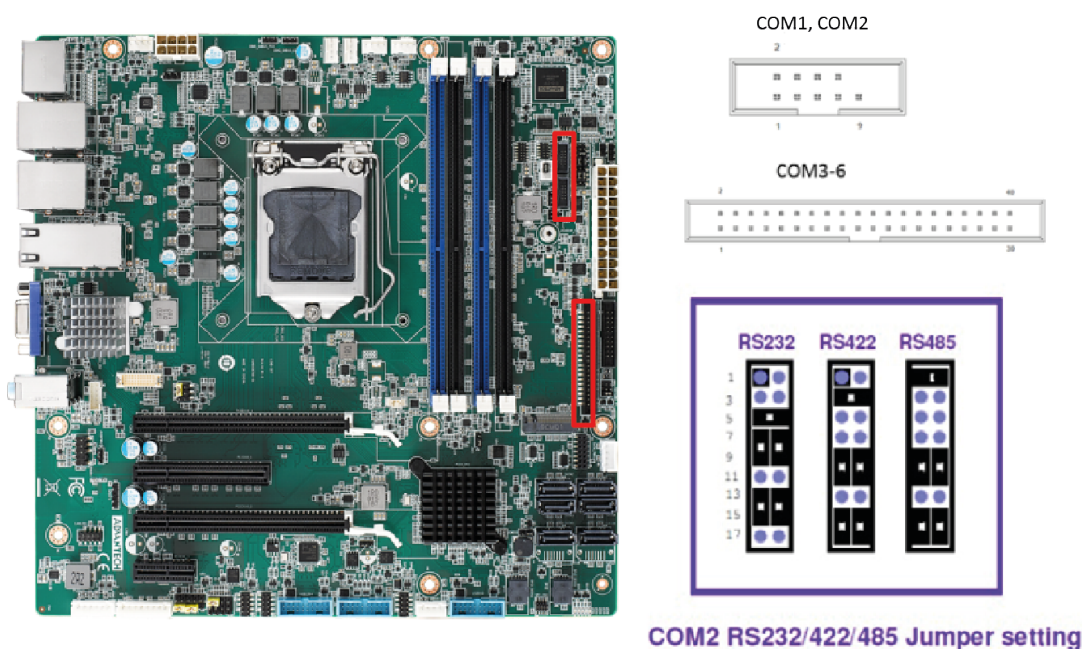
AIMB-587 includes VGA, DP interfaces that can drive conventional displays.

Pin assignments for COM1 and HDMI, DP connectors are detailed in Appendix B.

DP max resolution support to 4096 x 2304 @ 60 Hz

VGA max resolution support to 1920 x 1200 @ 60 Hz

2.5 Serial Ports (COM1~COM6)



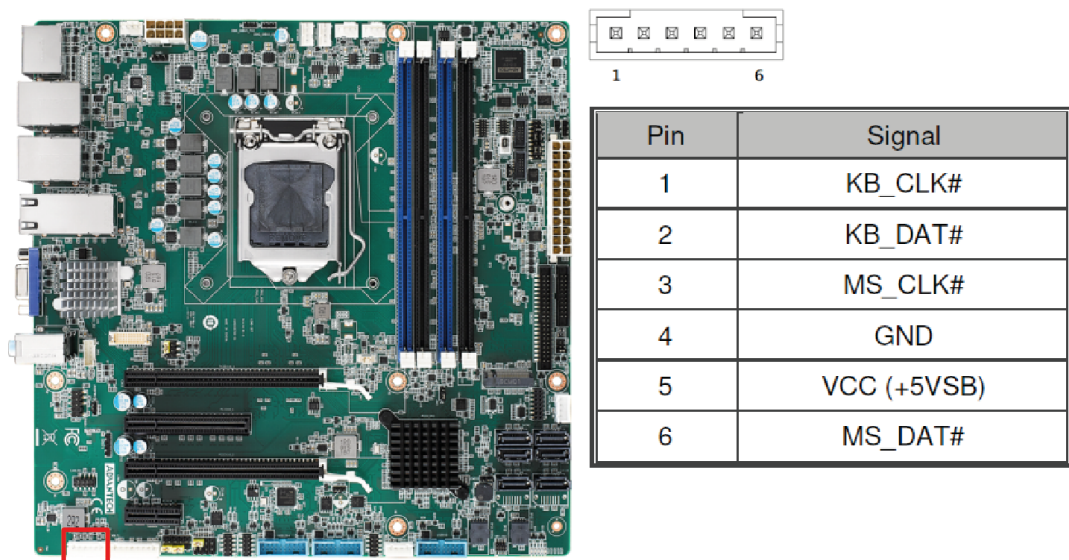
AIMB-587 supports six serial ports. COM1, COM2, COM3-6 supports RS-232. COM2 supports RS-232/422/485. JSETCOM2 is used to select the RS-232/422/485 mode for COM2.

These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup.

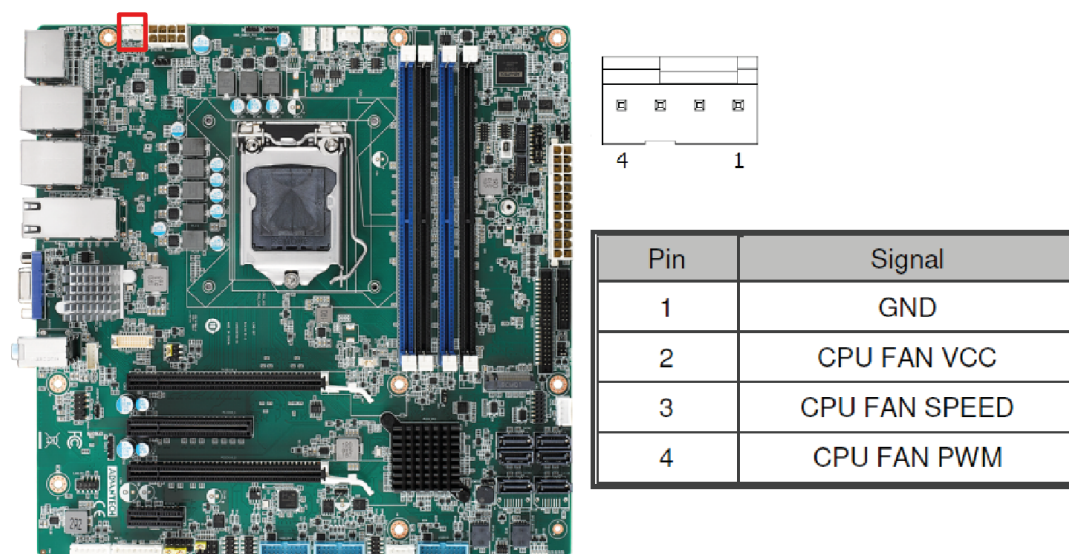
Different devices implement the RS-232 standards in different ways. If you have problems with a serial device, be sure to check the pin assignments for the connector.

2.6 PS/2 Keyboard and Mouse Connector



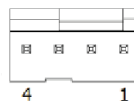
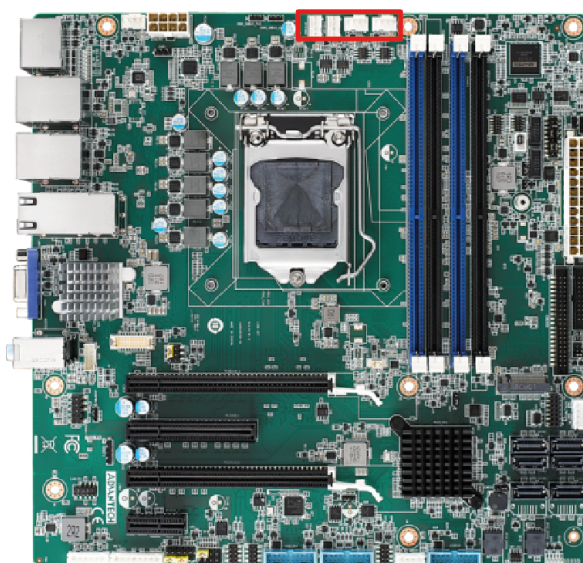
6-pin mini-DIN connectors (KBMS1, 2.54pitch) is for supporting the PS/2 keyboard and PS/2 mouse by a cable P/N 1700018699.

2.7 CPU Fan Connector (CPUFAN1)



If a fan is used, this connector supports cooling fans of 1500 mA (18 W) or less.

2.8 System FAN Connector (SYSFAN1/2/3/4)

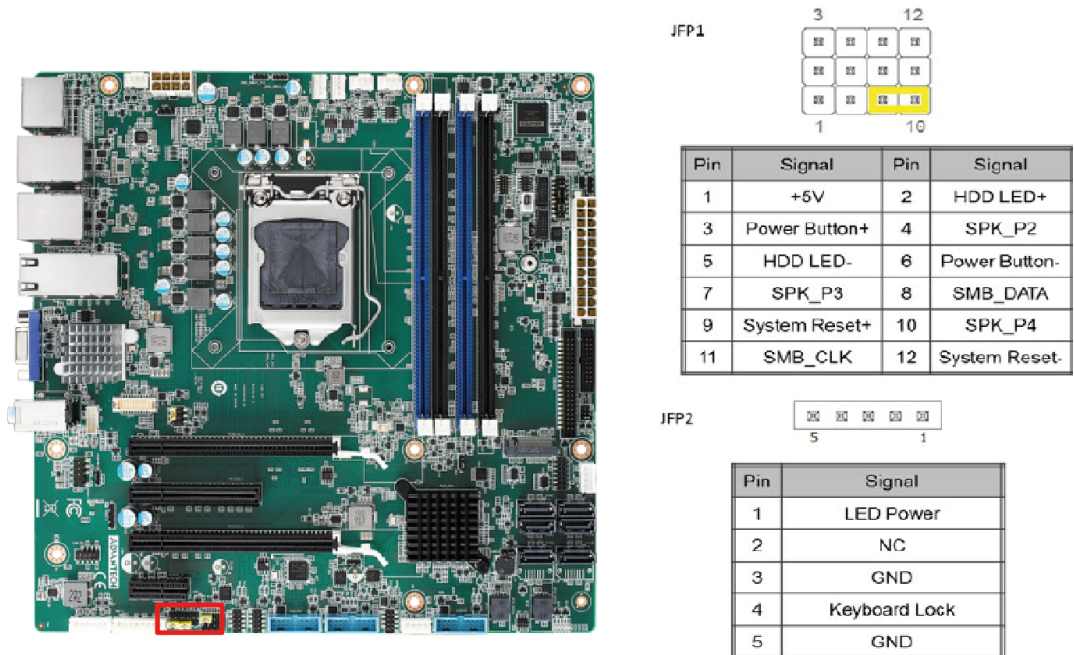


Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

If a fan is used, this connector supports cooling fans of 1500 mA (18 W) or less. Default only with System fan 1 & System fan 2. System fan 3 and System fan 4 are BOM optional. Please notice that, system fan 3 and system fan 4 can't be read rotational speed in BIOS. And system fan 3 will be controlled with system fan 1, system fan 4 will be controlled with system fan 2.

2.9 Front Panel Connectors (JFP1/JFP2)

There are several headers for monitoring and controlling the AIMB-587.



2.9.1 ATX soft power switch (JFP1/PWR_SW)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to (JFP1/ PWR_SW), for convenient power on and off.

2.9.2 Reset (JFP1/RESET)

Many computer cases offer the convenience of a reset button. Connect the wire for the reset button.

2.9.3 HDD LED (JFP1/HDDLED)

You can connect an LED to connector (JFP1/HDDLED) to indicate when the HDD is active.

2.9.4 External speaker (JFP1/SPEAKER)

JFP2/SPEAKER is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-587 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 7 & 10 as closed.

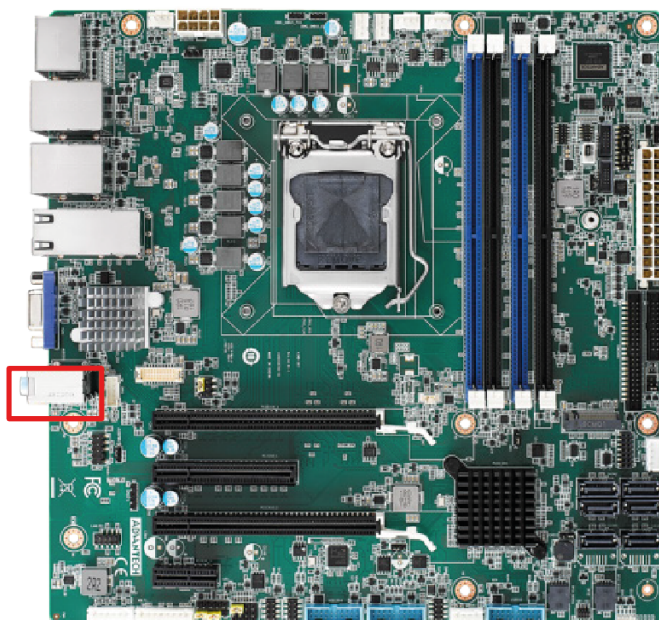
2.9.5 Power LED and keyboard lock connector (JFP2/PWR_LED & KEY LOCK)

(JFP2/PWR_LED & KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. Refer to Appendix B for detailed information on the pin assignments. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5. There are 3 modes for the power supply connection. The first is "ATX power mode"; the system turns on/off by a momentary power button. The second is "AT Power Mode"; the system turns on/off via the power supply switch. The third is another "AT Power Mode" which makes use of the front panel power switch. The power LED status is indicated in the following table:

Table 2.2: ATX Power Supply LED Status (No support for AT power)

Power mode	LED (ATX Power Mode) (On/off by momentary button)	LED (AT power Mode) (On/off by switching power supply)	LED (AT power Mode) (On/off by front panel switch)
PSON1 (on back plane) jumper setting	pins 2-3 closed	pins 1-2 closed	Connect pins 1 & 2 to panel switch via cable
System On	On	On	On
System Off	Off	Off	Off
S3	Fast flashes	N/A	N/A
S4	Slow flashes	N/A	N/A

2.10 Line Out, Mic In Connector (AUDIO1)



Pin	Signal
1	MIC IN
2	LINE OUT

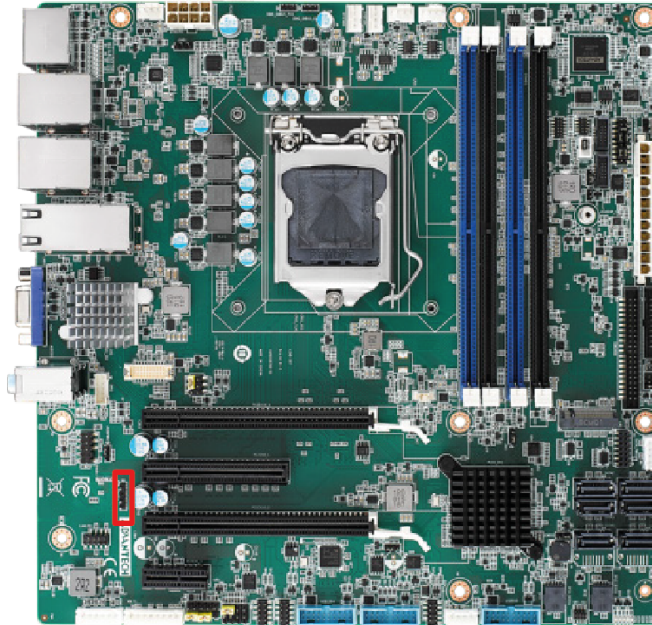
Note! Note: default audio support 2 ports.



But can BOM option to support 3 ports.(line-in/line out/ Mic in)

2.11 Digital Audio Connector (SPDIF_OUT1)

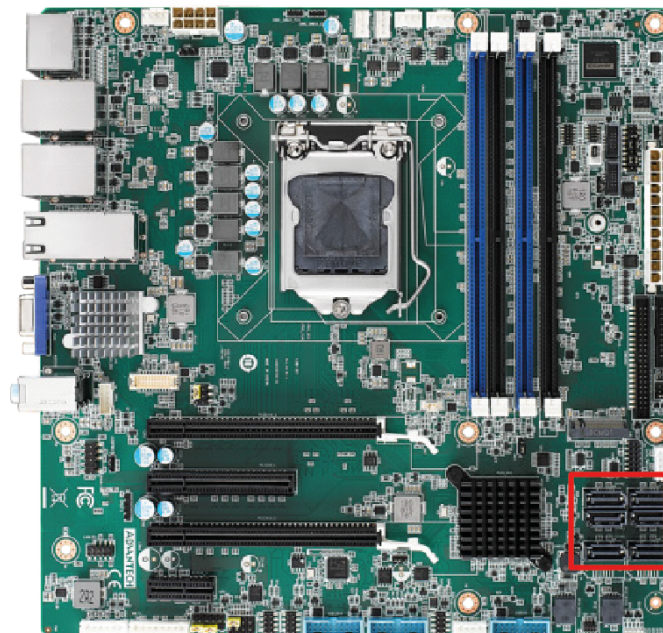
This connector is for the S/PDIF audio module to allow digital output sound. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.



Note! The S/PDIF module should be purchased separately by end user.



2.12 Serial ATA Interface (SATA1 ~ SATA8)



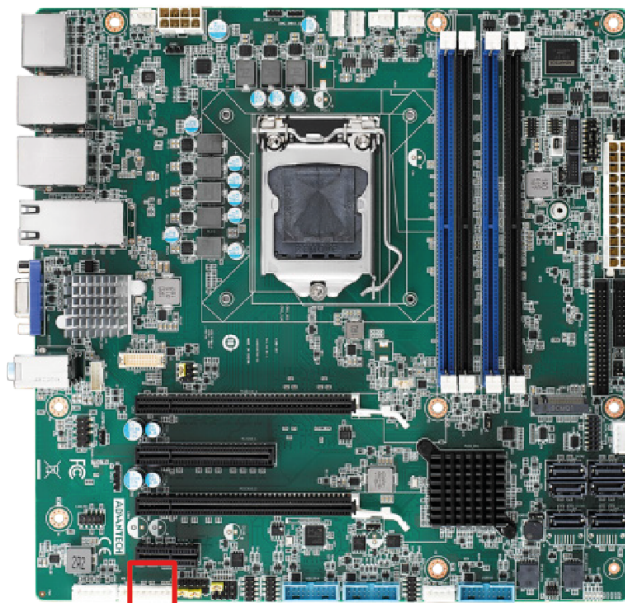
AIMB-587 features a high performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables. In QG2, WG2 sku.

- AIMB-587QG2-00A1E: support SATA 1~ SATA6
- AIMB-587F-00A1E/ AIMB-587WG2-00A1E: support SATA 1~ SATA8
- AIMB-587L-00A1E: support SATA1~SATA4

Note! QG2, WG2 sku can support Intel RAID.



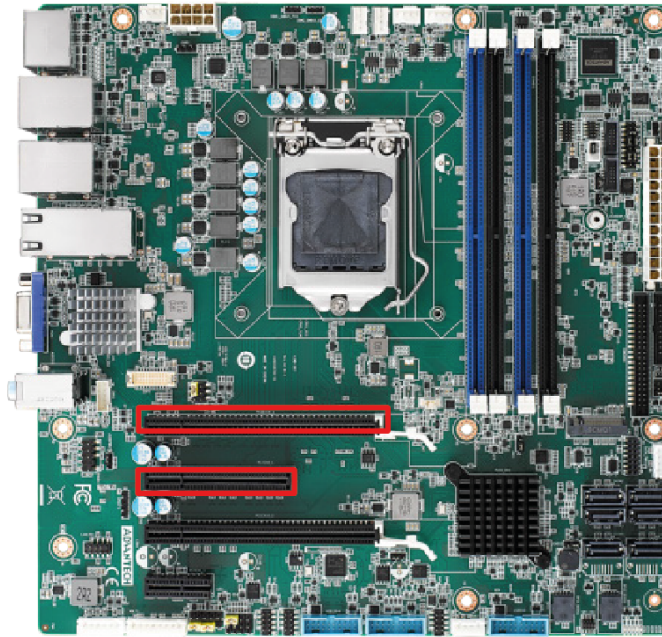
2.13 8-pin Alarm Board Connector (VOLT1)



Pin	Signal
1	+5VSB
2	GND
3	GND
4	-5V
5	+5V
6	+3.3V
7	-12V
8	+12V

VOLT1 connects to the alarm board on the chassis. These alarm boards give warnings if a power supply or fan fails, or if the chassis overheats.

2.14 PCI Express x16 Slot / PCI Express x 8



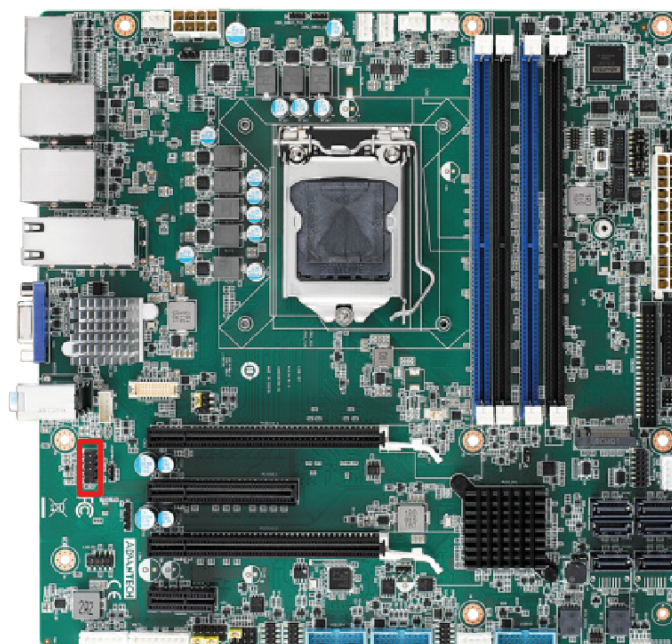
AIMB-587 provides a PCIe x16 slot ,which can BOM option to 2 PClex8 for users to install add-on cards when their applications require higher graphic performance than the CPU embedded graphics controller can provide.

Note! BOM option to 2 PClex8, When PCIe x8 slot is used, PCIe x16 slot only supports x8 bandwidth.



2.15 Front Panel Audio Connector (FPAUD1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 (optional) audio standard. Connect this connector with the front panel audio I/O module cable.

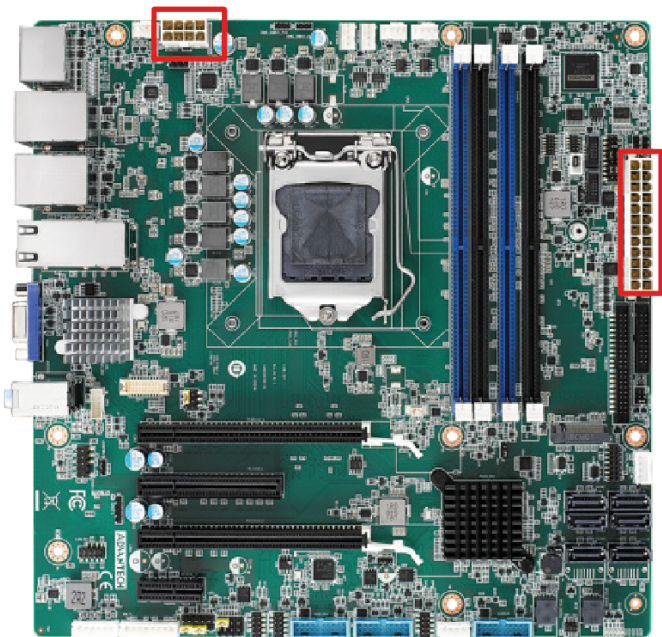


Note! *For motherboards with the optional HD Audio feature, we recommend that you connect a high-definition front panel audio module to this connector to take advantage of the motherboard's high definition audio capability.*



2.16 ATX Power Connector (EATXPWR1, ATX12V1)

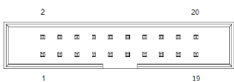
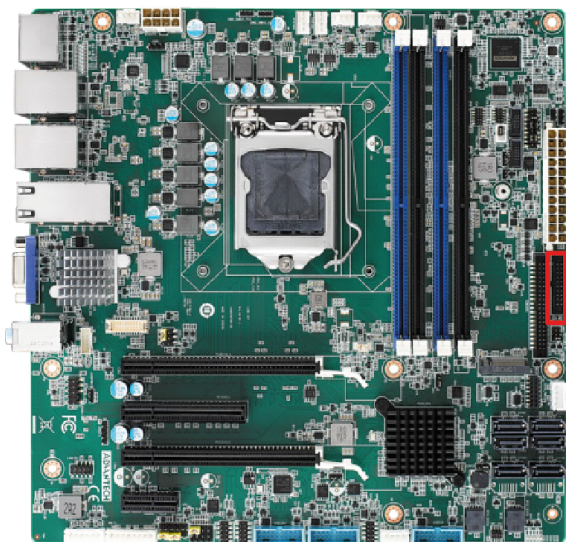
This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.



- Note!**
1. Please connect the ATX12V1 connector with the PSU ATX 12V 8-pin connector.
 2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 180 W.

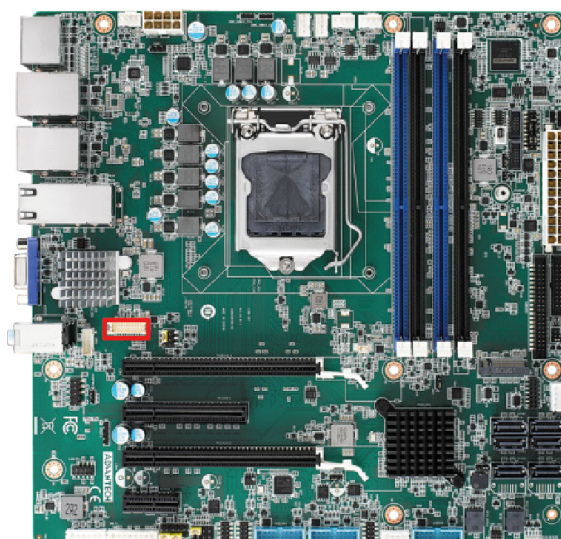


2.17 General purpose I/O Connector (GPIO1)



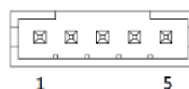
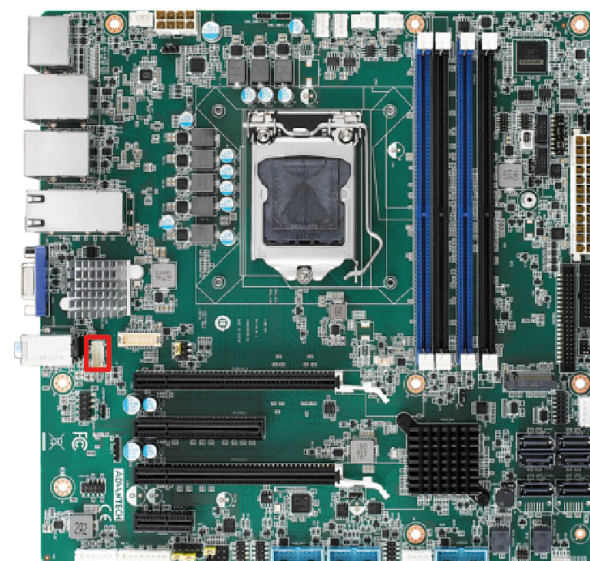
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	+5VSB	18	GND
19	+5VSB	20	GND

2.18 eDP/LVDS Connector (eDP1)



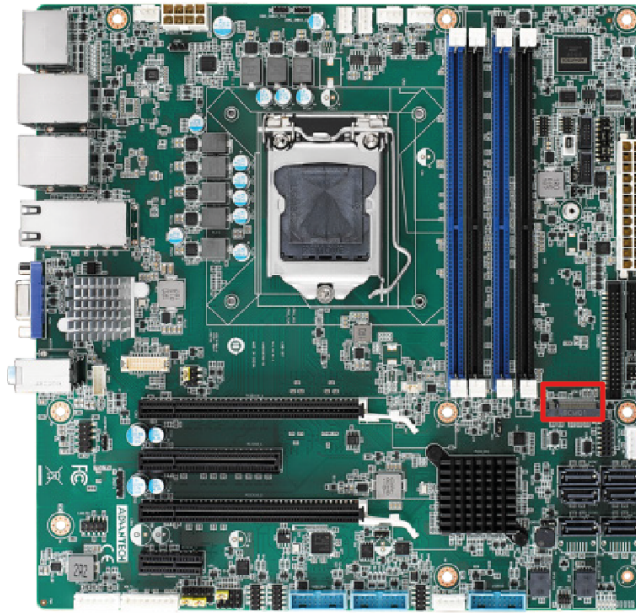
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	+5VSB	18	GND
19	+5VSB	20	GND

2.19 EDP Backlight inverter(INV1)



Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

2.20 M.2 (E-key)/ M.2 (M-key)



- M.2 M-key: 2280, support SATA or PCIe x4 interface, and can support NVMe devices.

Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS has been integrated into many motherboards, and has been very popular for over a decade. With the AMI BIOS Setup program, you can modify BIOS settings to control the special features of your computer. The Setup program uses a number of menus for making changes. This chapter describes the basic navigation of the AIMB-587 setup screens.

3.2 BIOS Setup

The AIMB-587 Series system has AMI BIOS built in, with a SETUP utility that allows users to configure required settings or to activate certain system features.

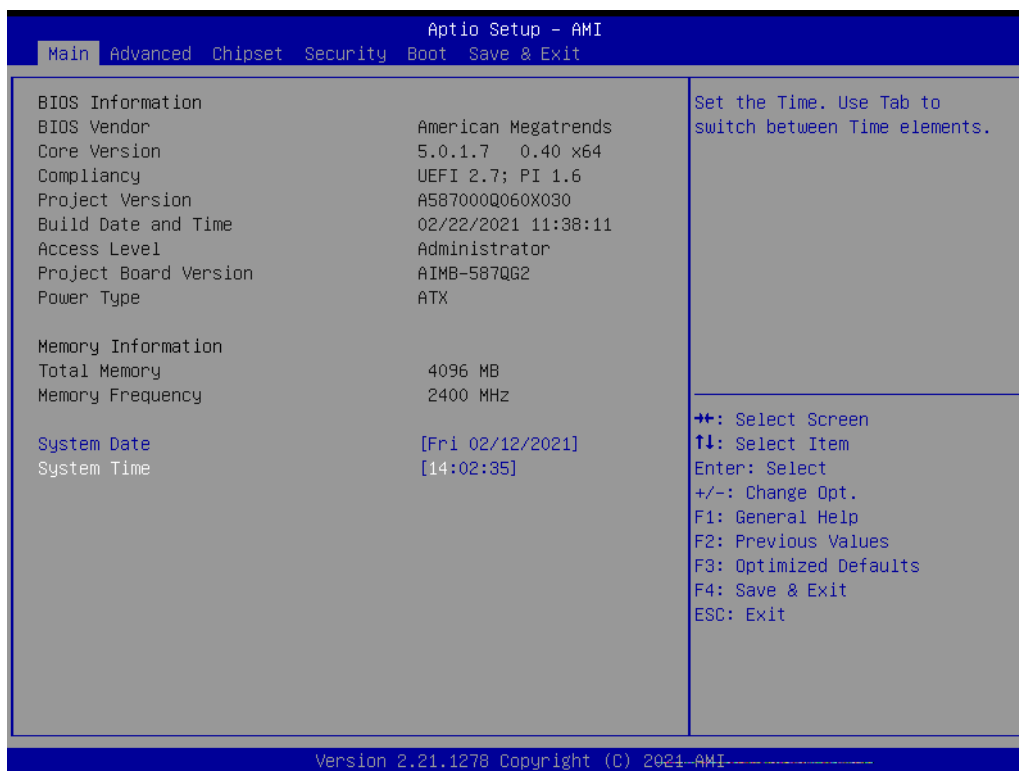
The SETUP saves the configuration in the FLASH of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the FLASH.

When the power is turned on, press the or <Esc> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
< ← > > → >	Select Screen
< ↑ > > ↓ >	Select Item
<Enter>	Select
<+/->	Change Opt
<F1>	General help
<F2>	Previous Values
<F3>	Optimized Defaults
<F4>	Save & Exit
<Esc>	Exit

3.2.1 Main Menu

Press or <Esc> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

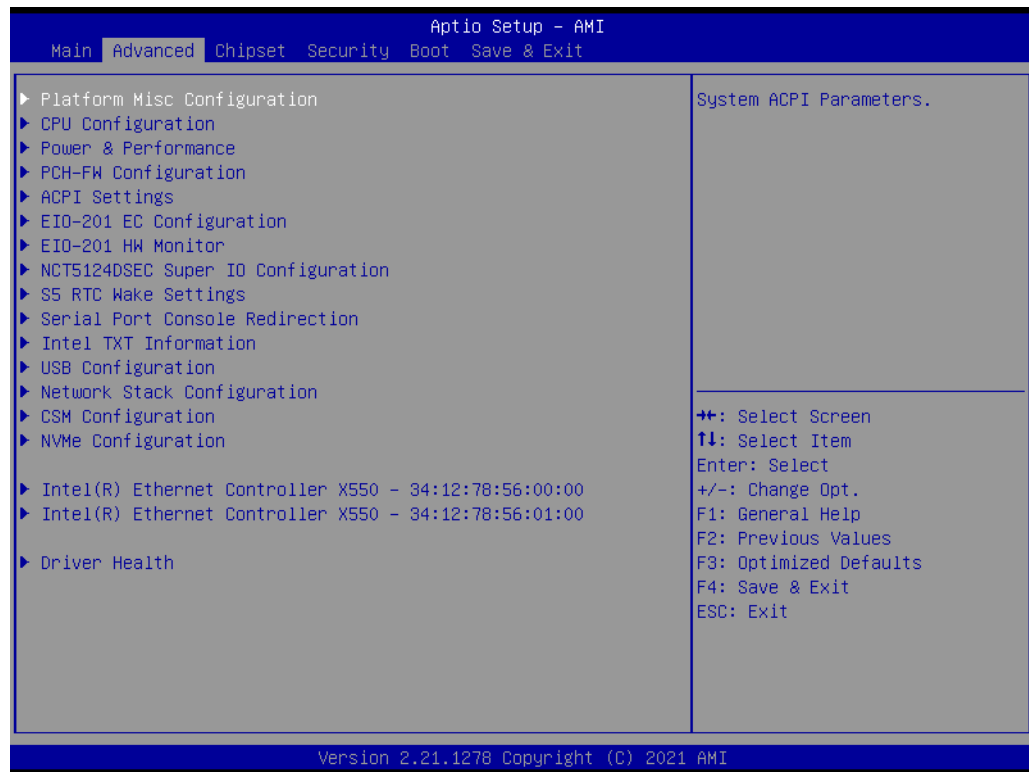
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System time / System date

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

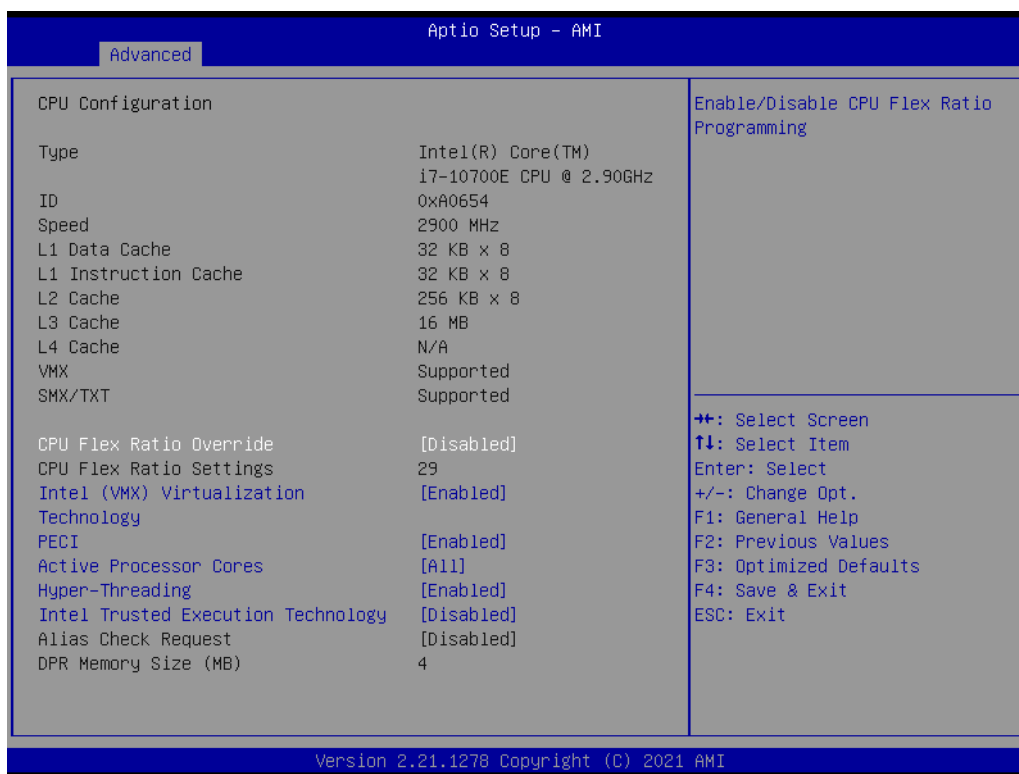
3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-587 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration and go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



3.2.2.1 CPU Configuration

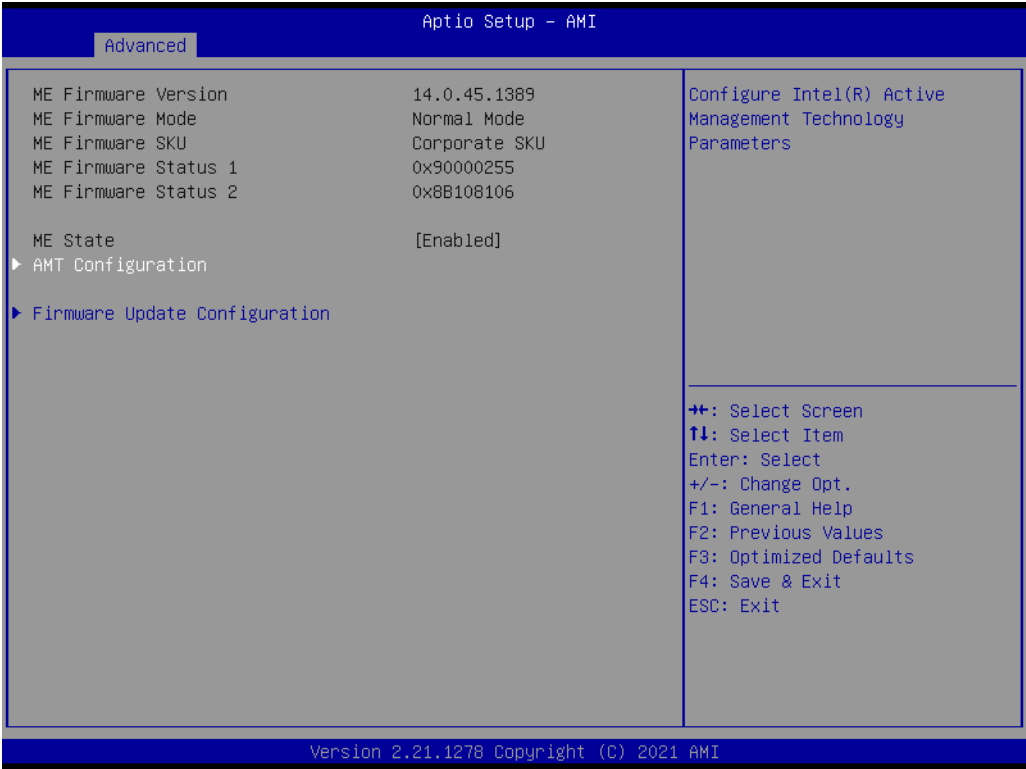
The item shows you CPU specification and feature, the content would be different for different CPU.



3.2.2.2 Power & Performance



3.2.2.3 PCH FW Configuration



■ Firmware update Configuration



– ME FW Image Re-Flash [Disabled]

3.2.2.4 ACPI Settings

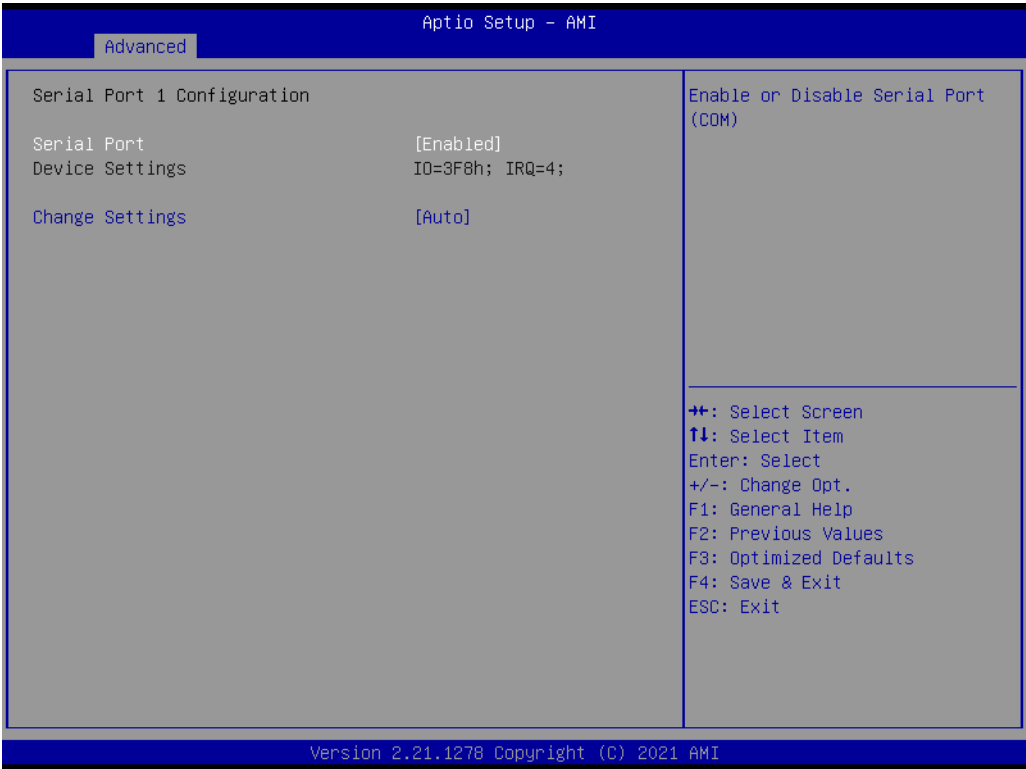


- **Enable ACPI Auto Configuration [Disabled]**
Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation [Enabled]**
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State [Auto]**
Select ACPI sleep state the system will enter when the SUSPEND button is pressed.
- **S3 Video Repost [Disabled]**
Enable or Disable S3 Video Repost

3.2.2.5 EIO-201 EC Configuration

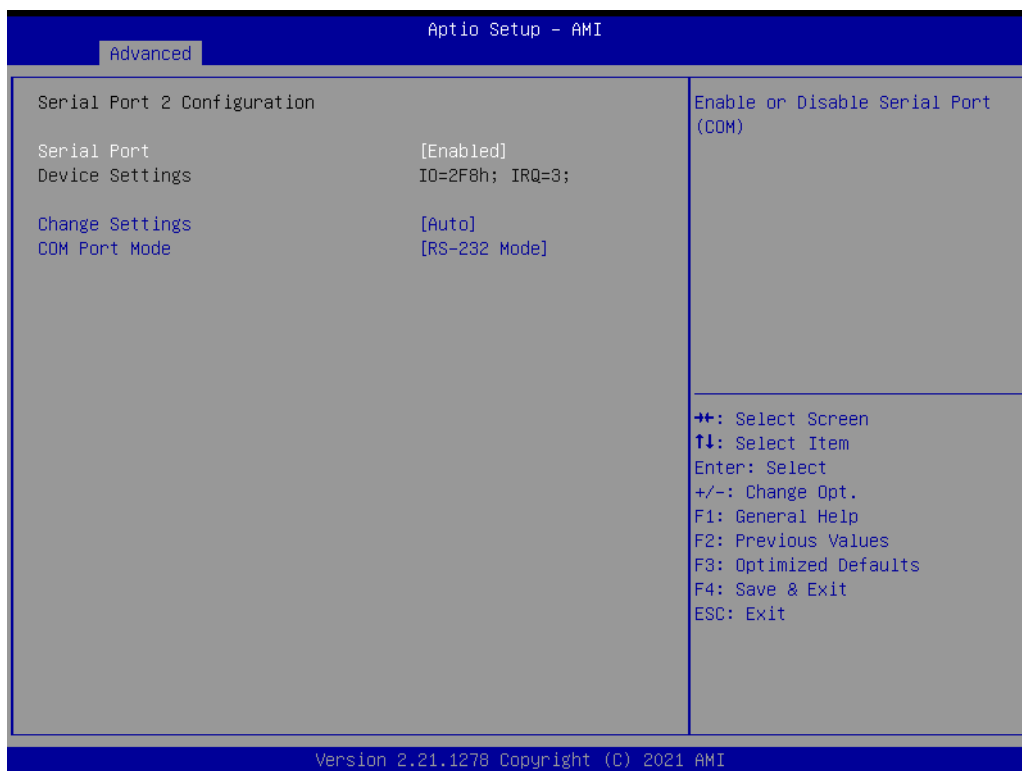


- **Embedded Controller [EIO-201]**
- **Serial Port 1 Configuration**



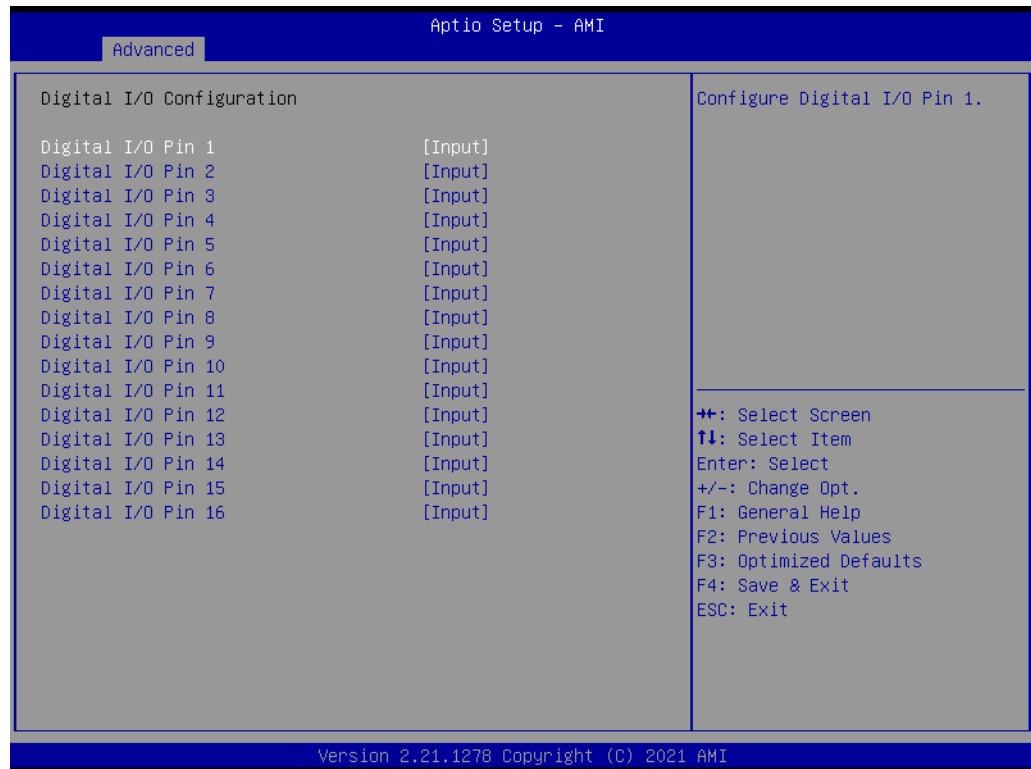
- **Serial Port [Enabled]**
- **Device Settings: IO=3F8h; IRQ =4**
- **Change Settings [Auto]**
To select an optimal setting for serial port 1.

■ Serial Port 1 Configuration



- **Serial Port [Enabled]**
- **Device Settings: IO=2F8h; IRQ =3**
- **Change Settings [Auto]**
- **COM Port Mode [RS-232 Mode]**
To select an optimal setting for serial port 1.

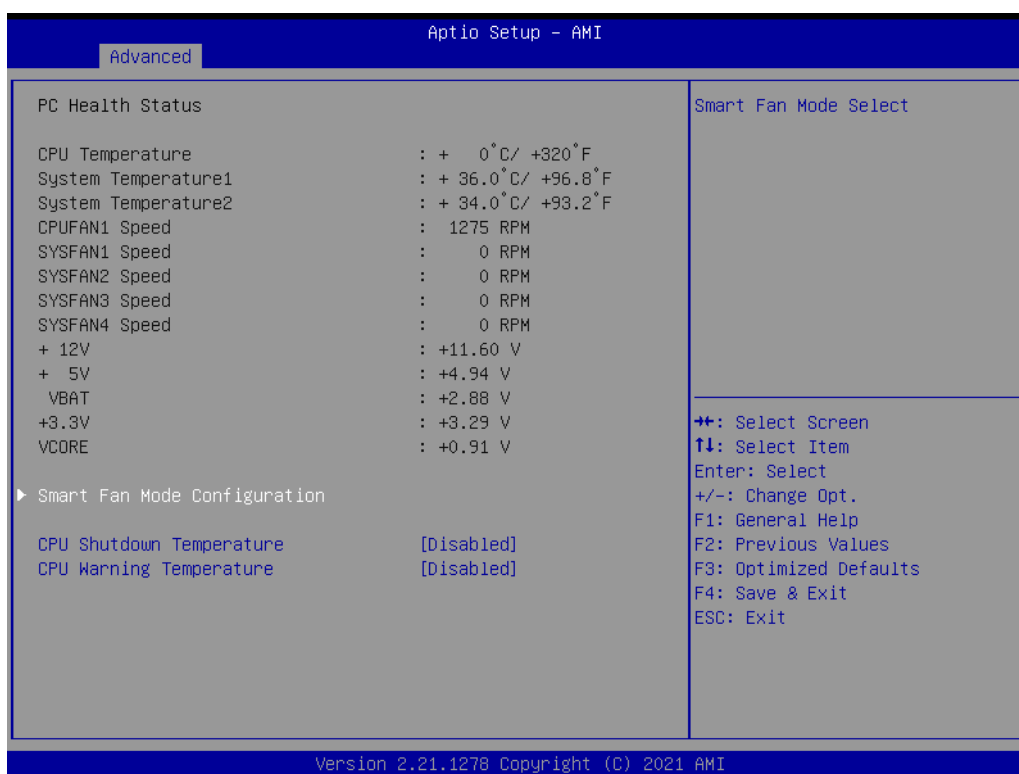
■ Digital I/O Configuration



– Digital I/O Pin 1 - 16 [Input]

3.2.2.6 EIO-201 HW Monitor

■ PC Health Status



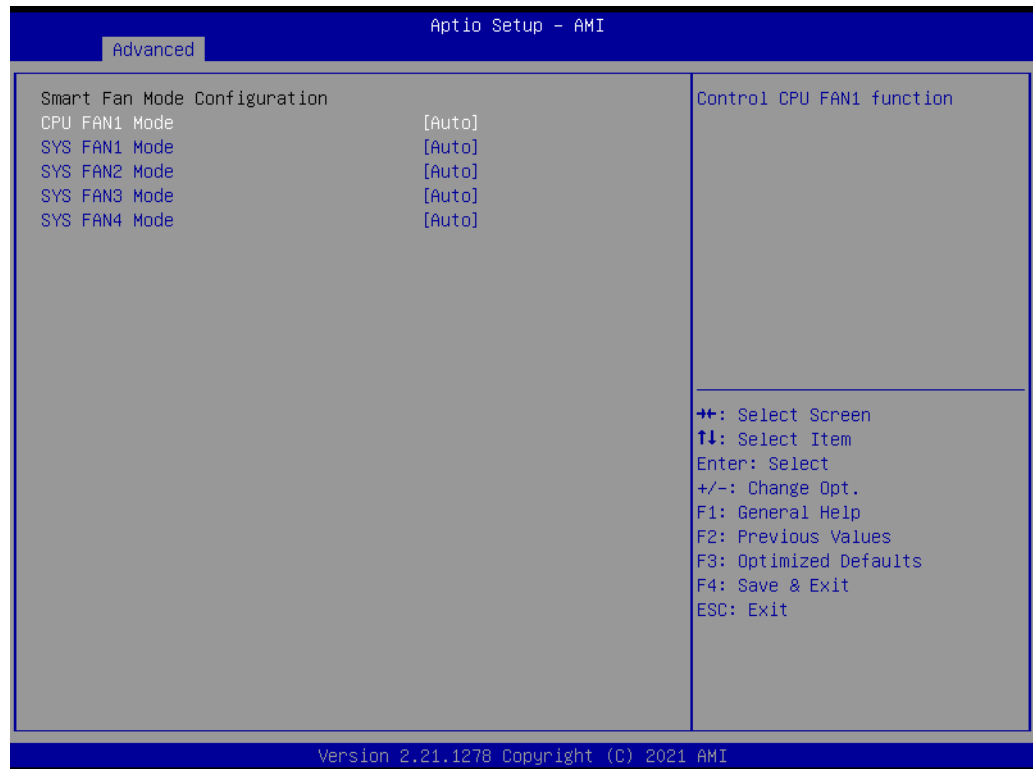
– **CPU Shutdown Temperature [Disabled]**

Use this to set the CPU shutdown temperature threshold. When the system reaches the shutdown temperature, it will be automatically shut down by ACPI OS to protect the system from overheating damage.

– **CPU Warning Temperature [Disabled]**

Use this to set the CPU warning temperature threshold. When the system reaches the warning temperature, the speaker will beep.

■ Smart Fan Mode Configuration



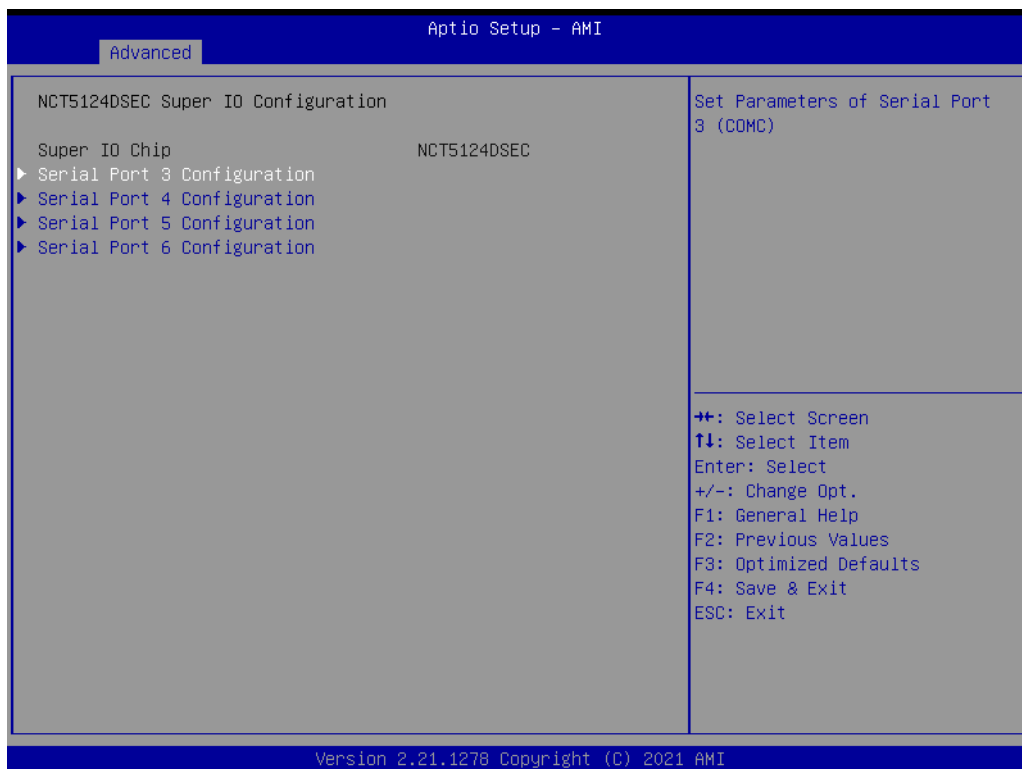
■ CPU FAN Mode [Auto]

The item shows you CPU temperature and fan speed (PWM) information.

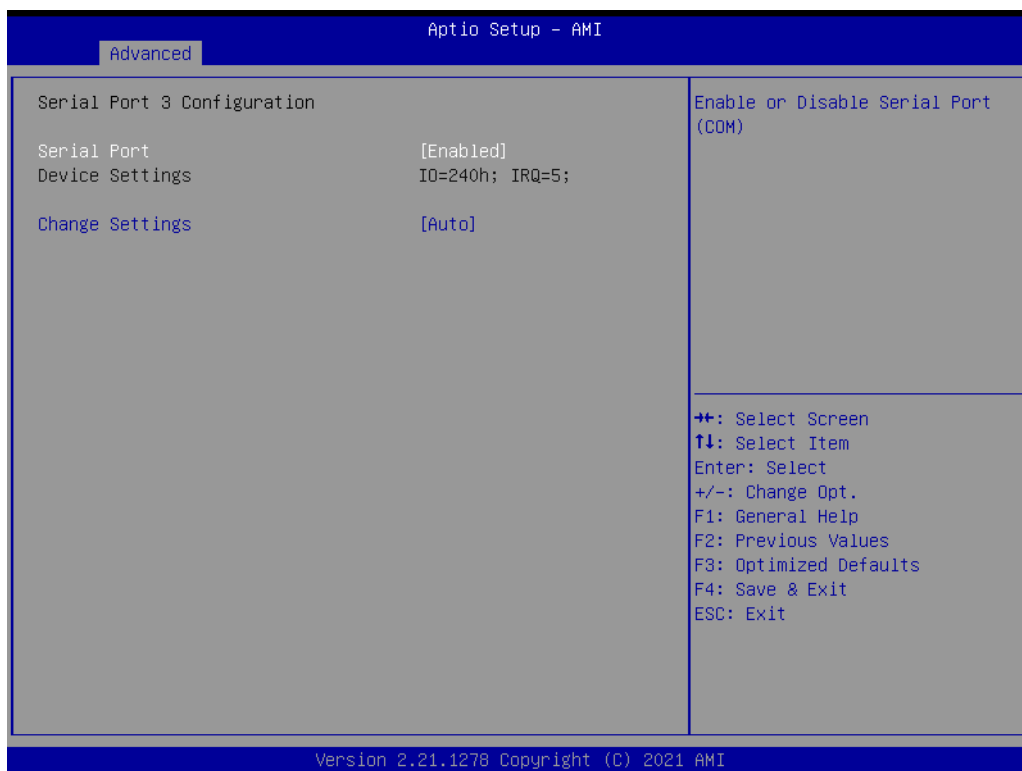
■ SYSFAN 1-4 Mode [Auto]

The item shows you system temperature and fan speed (PWM) information.

3.2.2.7 NCT5124DSEC Super IO configuration

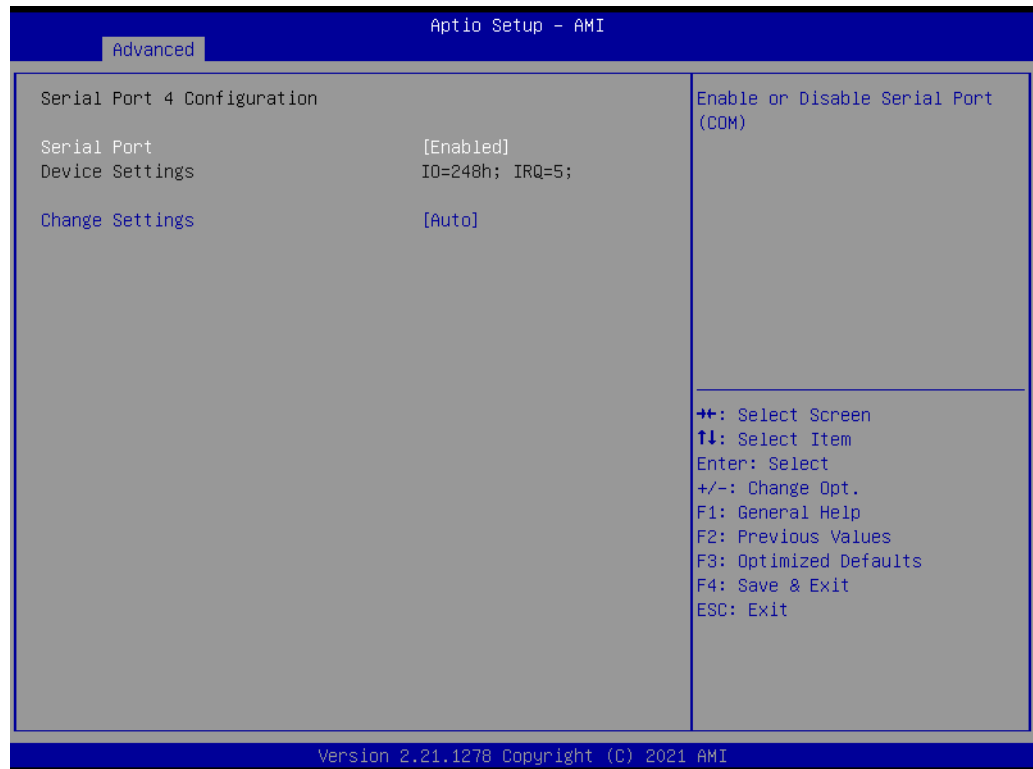


■ Serial Port 3 Configuration



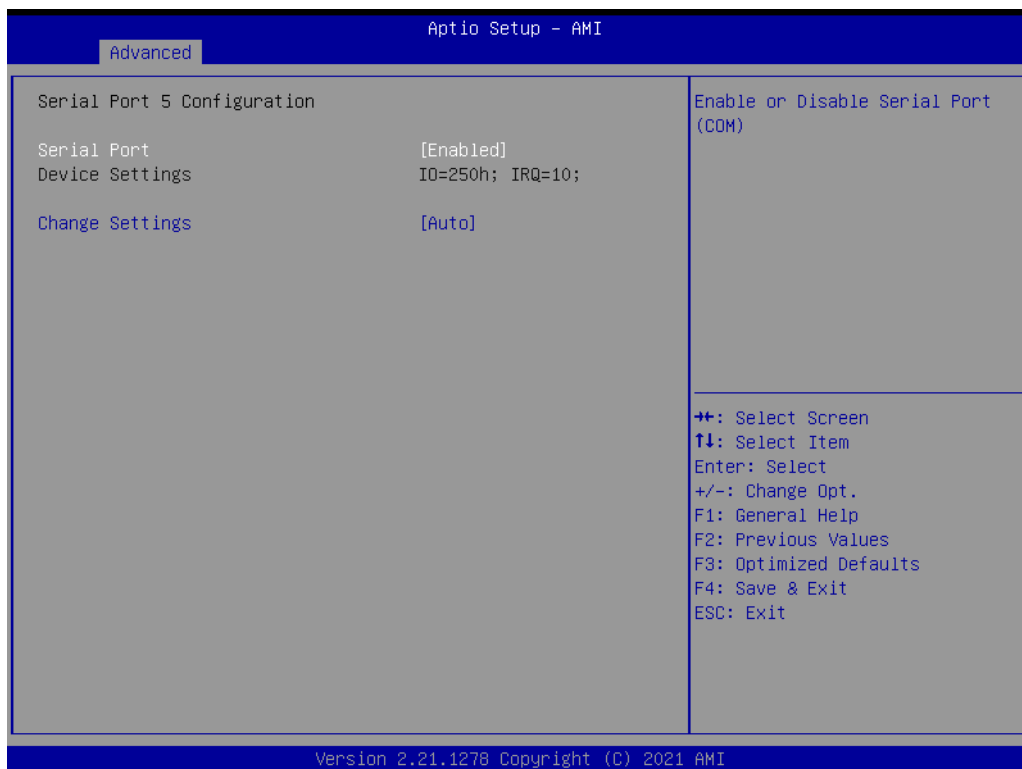
- **Serial Port [Enabled]**
- **Device Settings: IO=240h; IRQ =5**
- **Change Settings [Auto]**
To select an optimal setting for serial port 3

■ Serial Port 4 Configuration



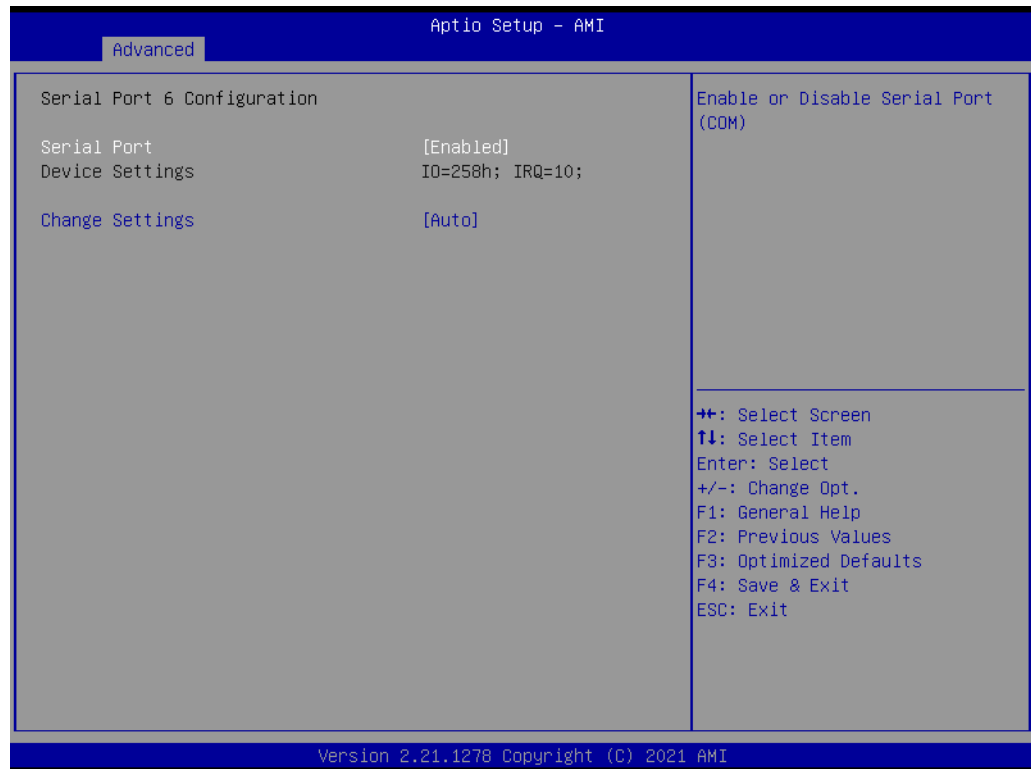
- **Serial Port [Enabled]**
- **Device Settings: IO=248h; IRQ =5**
- **Change Settings [Auto]**
 - To select an optimal setting for serial port 4

■ Serial Port 5 Configuration



- **Serial Port [Enabled]**
- **Device Settings: IO=250h; IRQ =10**
- **Change Settings [Auto]**
 - To select an optimal setting for serial port 5

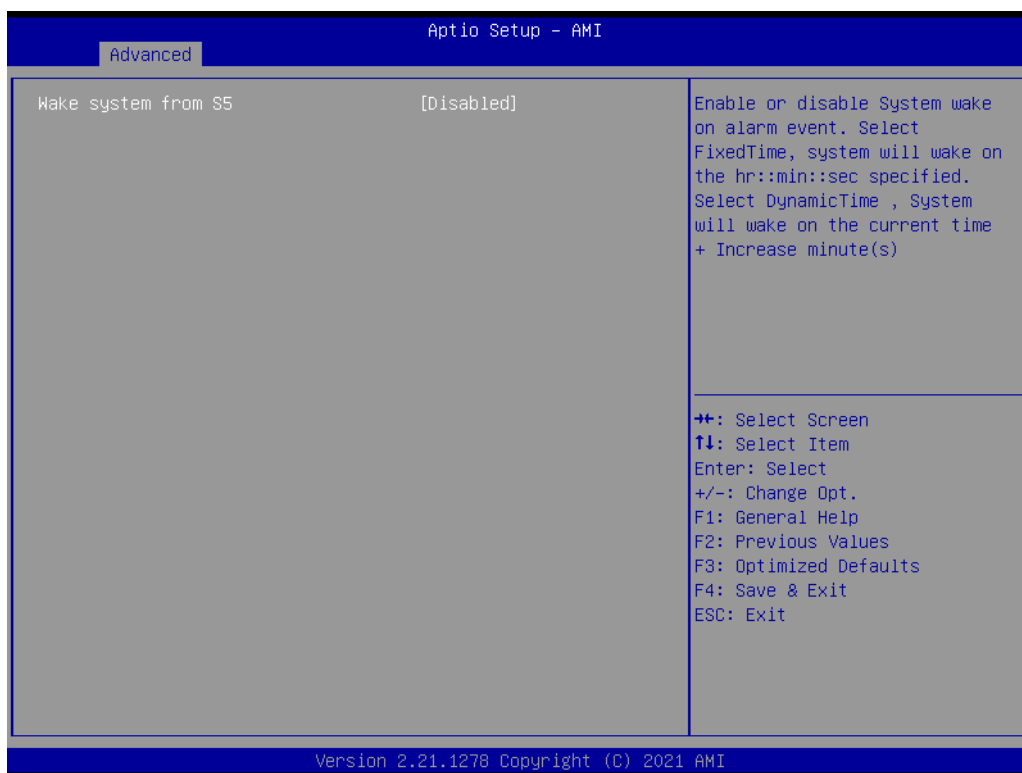
■ Serial Port 6 Configuration



- **Serial Port [Enabled]**
- **Device Settings: IO=258h; IRQ =10**
- **Change Settings [Auto]**
 - To select an optimal setting for serial port 6

3.2.2.8 S5 RTC Wake Settings

The item allows you enable or disable system wake up on alarm event.

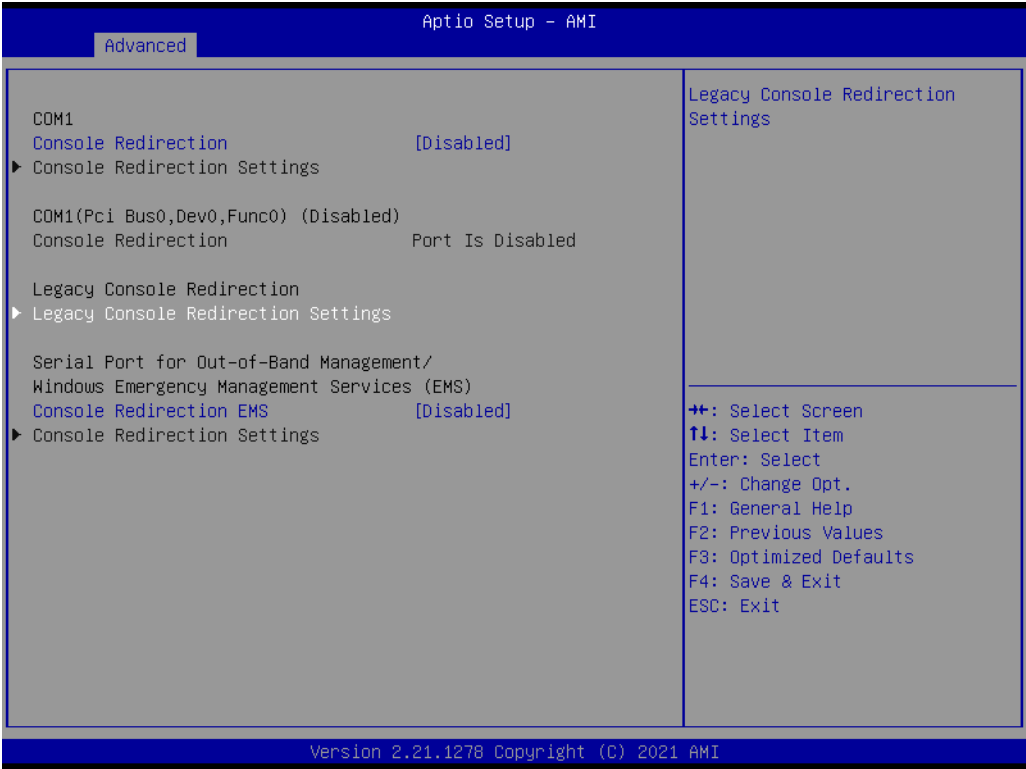


Wake system with Fixed Time [Disabled]

Note! When enabled, system will wake up on the specified time

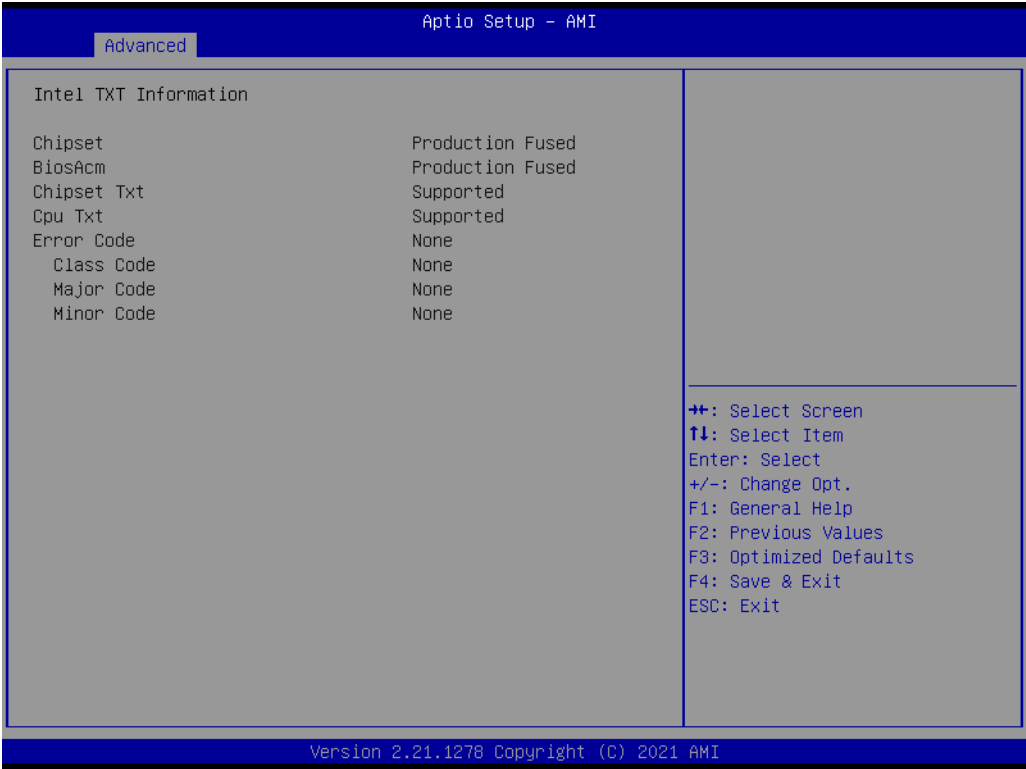


3.2.2.9 Serial Port Console Redirection

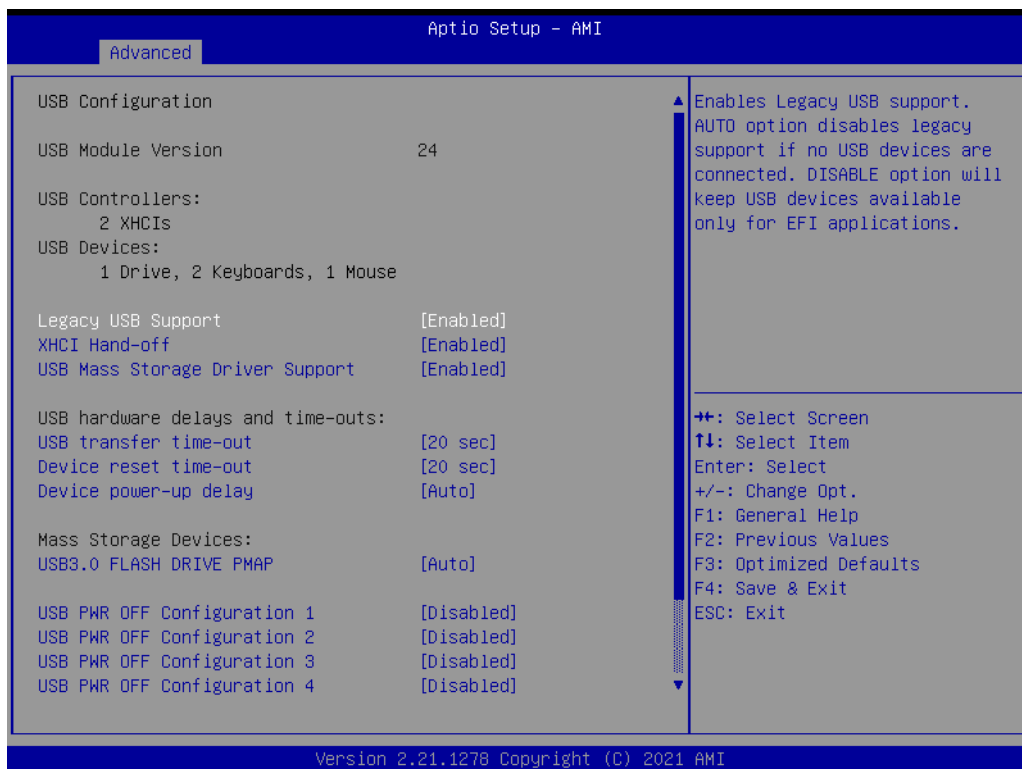


- **Console Redirection [Disabled]**
Enable or disable the console redirection feature

3.2.2.10 Intel TXT information



3.2.2.11 USB Configuration

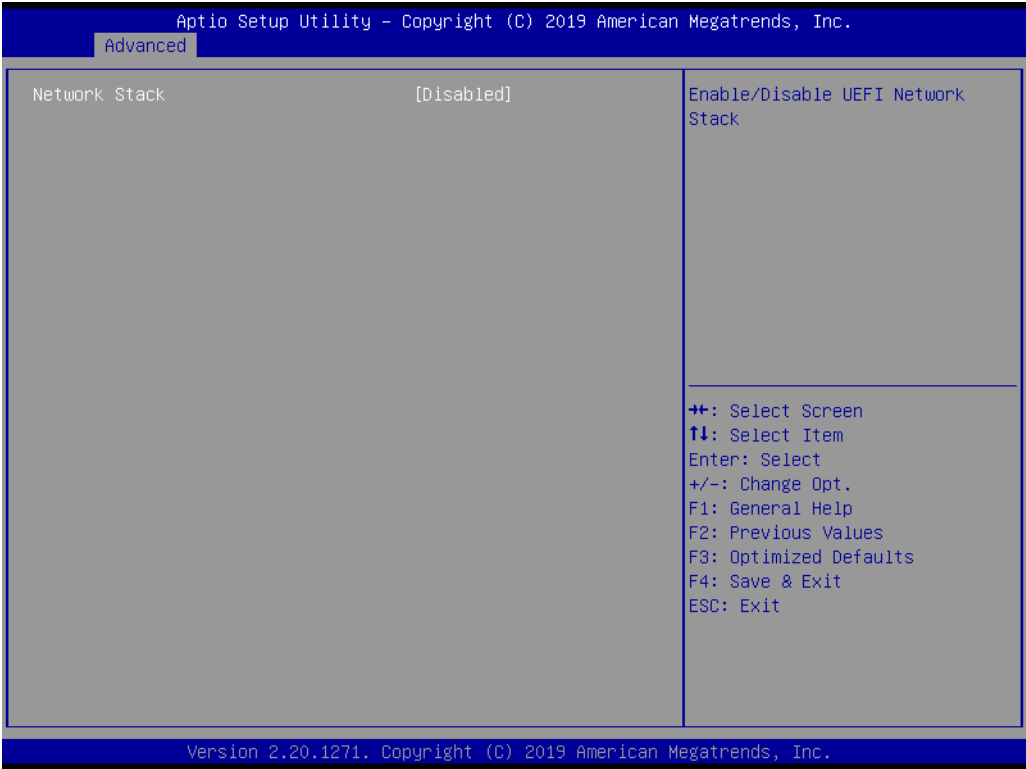


Legacy USB Support [Enabled]

Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.

- **XHCI Hand-off [Enabled]**
- **USB Mass Storage Driver Support [Enabled]**
- **USB hardware delays and time-outs**
USB Device transfer & reset time-out and delay setting.
- **Mass Storage Devices [Auto]**
Shows USB mass storage device information.
- **USB PWR OFF Configuration 1-8 [Disabled]**
Power off USB port 1-8 via BIOS setting.

3.2.2.12 Network Stack Configuration



Enable/Disable UEFI Network Stack

Note! When network stack [enable], item must enable: LANx PXE OpROM [enable]



3.2.2.13 CSM Configuration



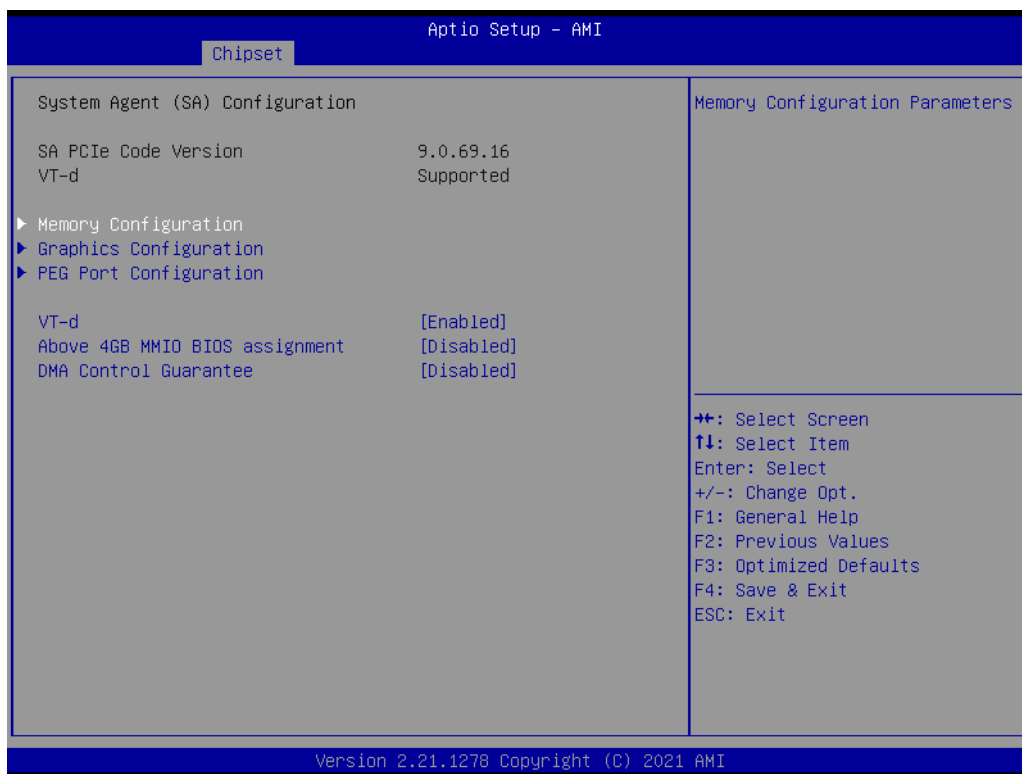
- **CSM Support [Disabled]**

3.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI express Configuration, to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub menus are described on the following pages.

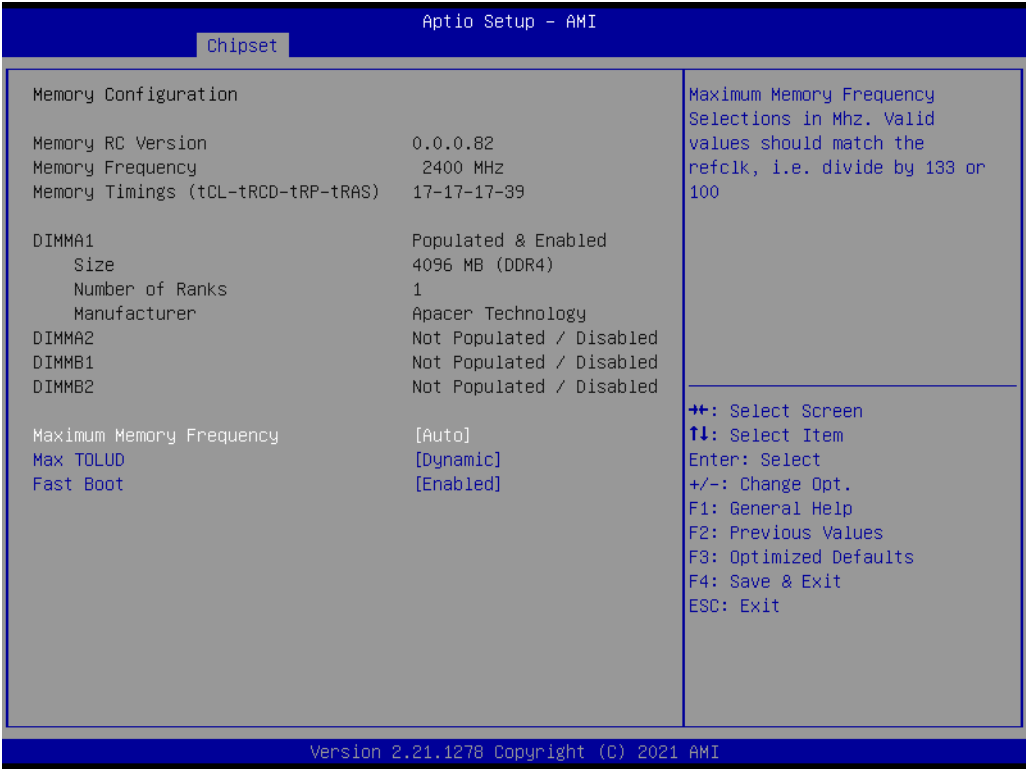


3.3.1 System Agent (SA) Configuration



- **VT-d [Enabled]**
Disable or enable VT-d function on MCH.

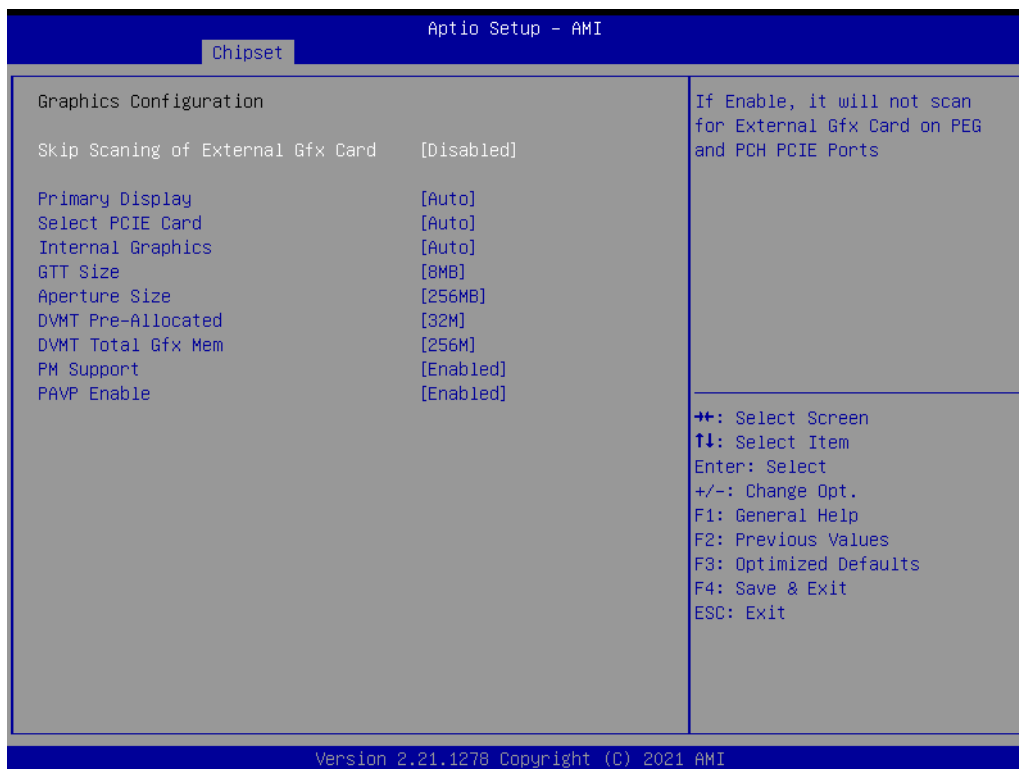
3.3.1.1 Memory Configuration



The item shows you memory specification included RC version, Frequency, size and voltage information etc.

- **Max TOLUD [Dynamic]**
Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller..
- **Fast Boot [Enabled]**
Enable or disable Fast Boot support

3.3.1.2 Graphics Configuration



- **Skip Scanning of External Gfx Card [Disabled]**
- **Primary Display [Auto]**
Select which of IGFX/PEG/PCI Graphics device should be Primary Display
- **Internal Graphics [Auto]**
Keep IGD enabled based on the setup options.
- **TT size [8MB]**
- **Aperture Size [256MB]**
- **DVMT Pre-Allocated [32M]**
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
- **DVMT Total Gfx Mem [256M]**
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Note! When BIOS set as "Auto", only a single display works under DOS.



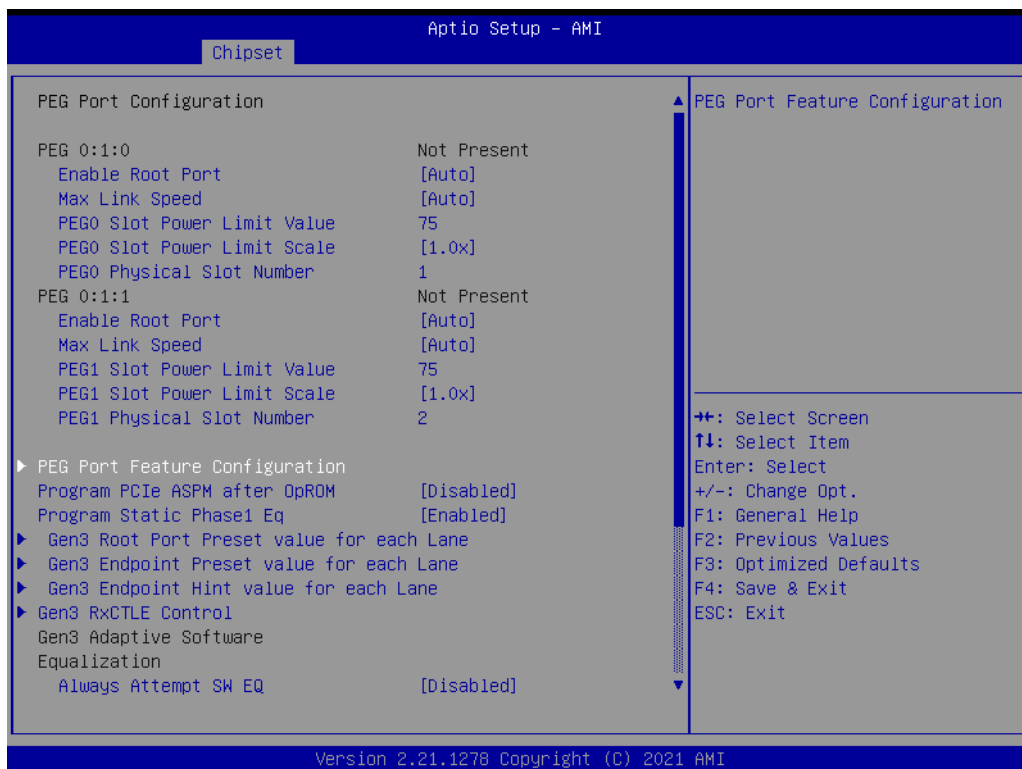
Note! The triple display can only work under Windows 10, the 2nd and 3rd cannot work under DOS



Below is the display combination table, all of these combinations are verified.

Display Combination List	BIOS	DOS	WES 10
Single Display			
VGA	PASS	PASS	PASS
DP1	PASS	PASS	PASS
DP2	PASS	PASS	PASS
EDP	PASS	PASS	PASS
Dual Display			
VGA+DP1/2	NA	NA	PASS
VGA+EDP	NA	NA	PASS
DP1/2+EDP	NA	NA	PASS
DP1+DP2	NA	NA	PASS
Triple Display			
VGA+DP1/2+EDP	NA	NA	PASS
VGA+DP1+DP2	NA	NA	PASS
DP1+DP2+EDP	NA	NA	PASS

3.3.1.3 PEG Port Configuration



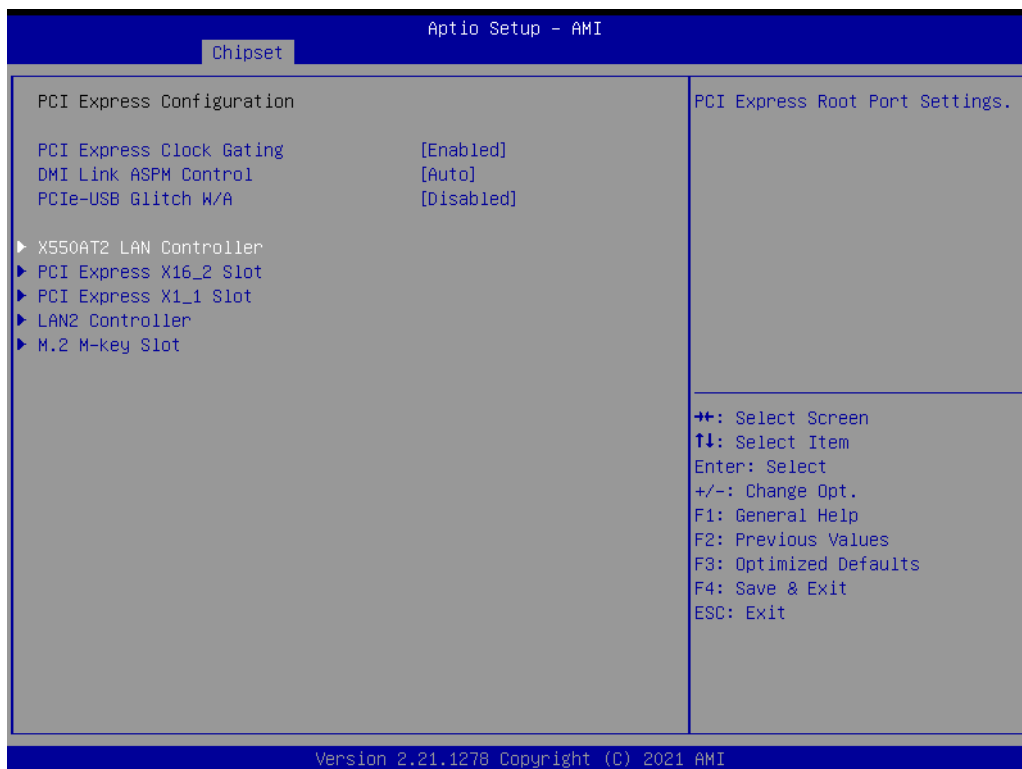
- **Enable Root Port [Auto]**
- **Max Link Speed [Auto]**
- **Program PCIe ASPM after OpROM [Disabled]**
 Enabled: PCIe ASPM will be programmed after OpROM.
 Disabled: PCIe ASPM will be programmed before OpROM.
- **Program Static Phase1 Eq [Enabled]**
- **Gen3 Root Port Preset Value for each Lane**
 Root Port Preset Value Per lane for Gen3 Equalization.
- **Gen3 Endpoint Preset Value for each Lane**
 Endpoint Preset Value Per lane for Gen3 Equalization.
- **Gen3 Endpoint Hint Value each Lane**
 Endpoint Hint Value Per lane for Gen3 Equalization.

3.3.2 PCH-IO Configuration



- **PCI Express Configuration**
Details of PCI Express items. (See 3.3.2.1)
- **SATA and RST Configuration**
Details of SATA items. (See 3.3.2.2)
- **Security Configuration**
Details of BIOS security items. (See 3.4)
- **LAN 1controller [Enabled]**
Enable or disable the LAN 1 controller.
- **LAN 2 controller [Enabled]**
- **PCIE Wake [Disabled]**
Enable or disable PCIE to wake the system from S5.
- **Restore AC power loss [Power Off]**
This item allows users to select off, on and last state.

3.3.2.1 PCI Express Configuration



- **PCI Express Clock Gating [Enabled]**
Enable or Disable PCI Express clock gating for each port.
- **DMI Link ASPM Control [Auto]**
- **PCIe-USB Glitch W/A [Disabled]**
PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG Port.

■ X550AT2 LAN Controller



- **USB3.0 External IC [Enabled]**
Control the PCI Express Root Port.
- **ASPM Support [Auto]**
Set the ASPM Level: Force L0s - Force all links to L0s State: AUTO – BIOS auto configure: DISABLE - Disables ASPM
- **L1 Substates PCI Express, Advanced Error Reporting [Enabled]**
- **PCIe Speed [Auto]**
Select PCI Express port speed.

Note! Items only shows in 10GbE LAN sku.



■ PCI Express x16_2 Slot



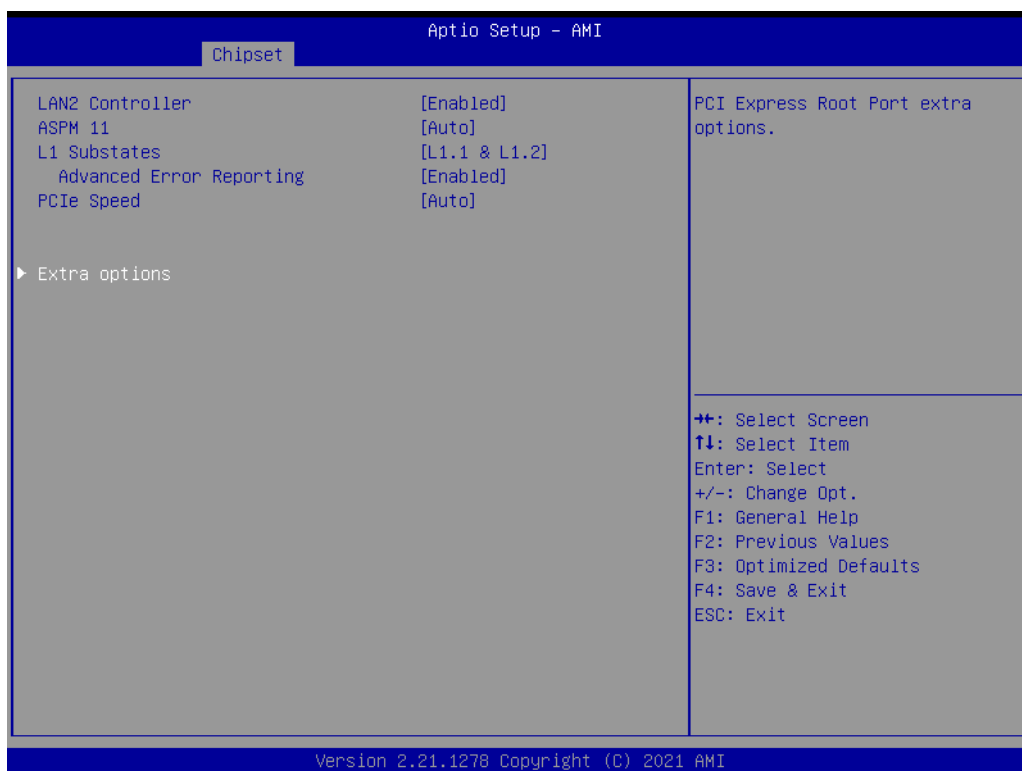
- **PCI Express x16_2 slot [Enabled]**
Control the PCI Express Root Port.
- **ASPM Support [Auto]**
Set the ASPM Level: Force L0s - Force all links to L0s State : AUTO – BIOS auto configure : DISABLE - Disables ASPM
- **L1 Substates PCI Express, Advanced Error Reporting [Enabled].**
- **PCIe Speed [Auto]**
Select PCI Express port speed.

■ PCI Express x1_1 slot



- **PCI Express X1_1 Slot [Enabled]**
Control the PCI Express Root Port.
- **ASPM Support [Auto]**
Set the ASPM Level: Force L0s - Force all links to L0s State : AUTO - BIOS auto configure : DISABLE - Disables ASPM
- **L1 Substates PCI Express L1 Substates settings.**
- **PCIe Speed [Auto]**
Select PCI Express port speed.

■ Lan2 Controller



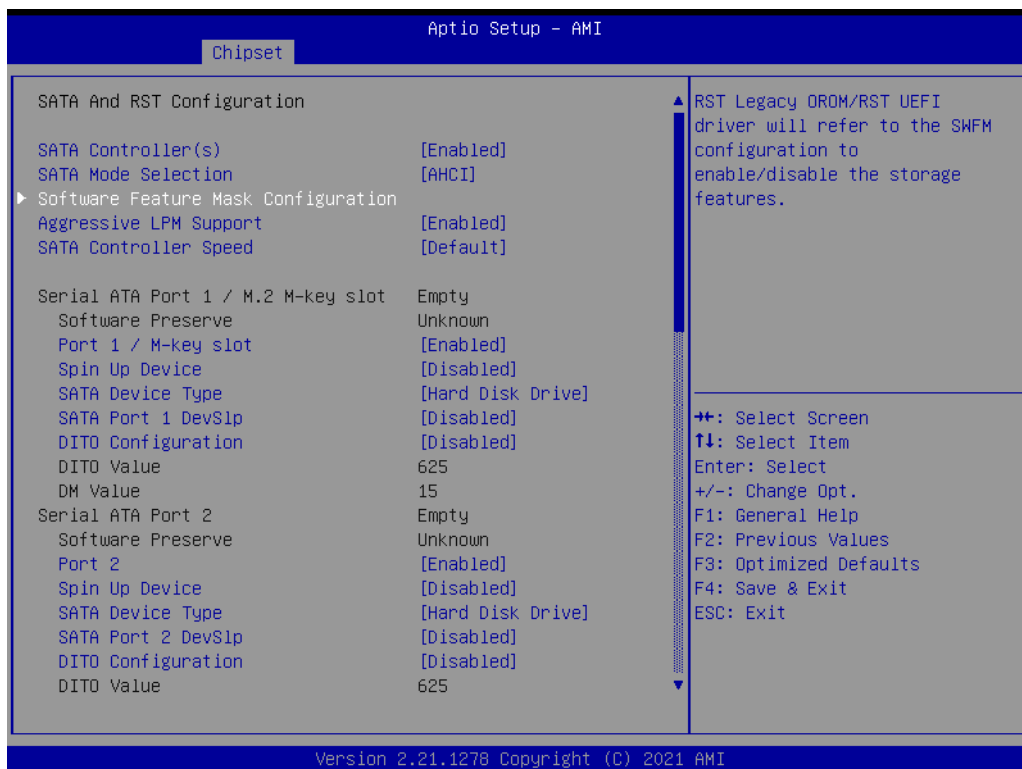
- **Lan2 Controller [Enabled]**
Control the PCI Express Root Port.
- **ASPM Support [Auto]**
Set the ASPM Level: Force L0s - Force all links to L0s State: AUTO - BIOS auto configure: DISABLE - Disables ASPM
- **L1 Substates PCI Express L1 Substates settings.**
- **PCIe Speed [Auto]**
Select PCI Express port speed.

■ M.2 M-Key Slot

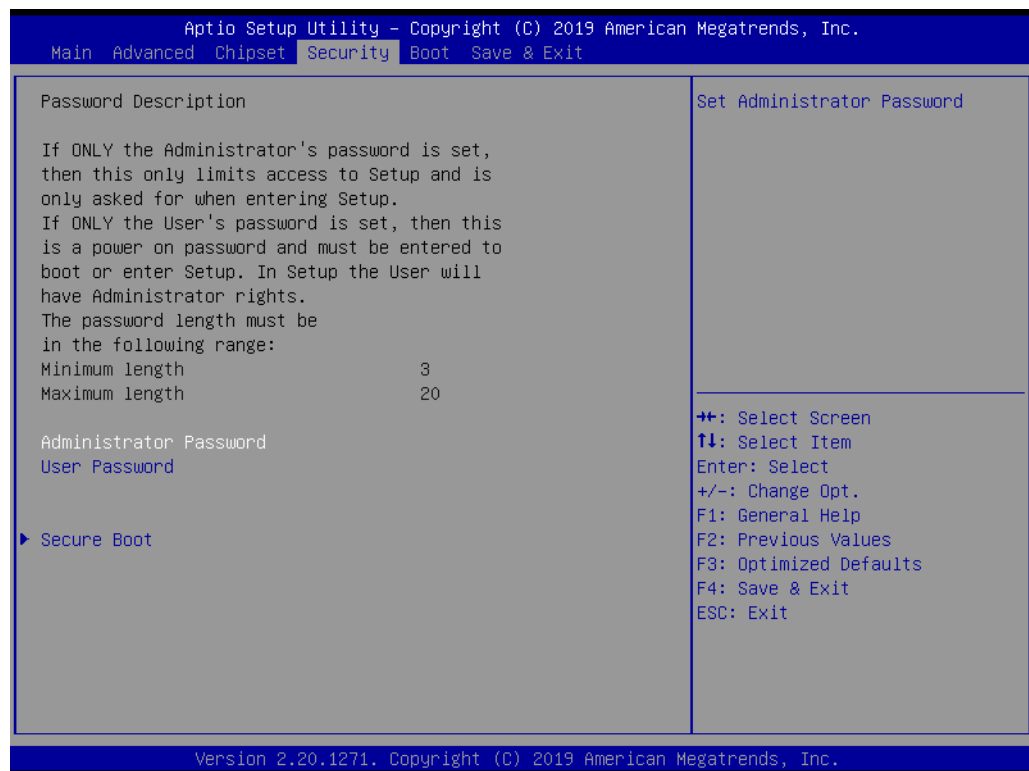


- **M.2 M-Key [Enabled]**
Control the PCI Express Root Port.
- **ASPM Support [Auto]**
Set the ASPM Level: Force L0s - Force all links to L0s State: AUTO - BIOS auto configure: DISABLE - Disables ASPM
- **L1 Substates PCI Express L1 Substates settings.**
- **PCIe Speed [Auto]**
Select PCI Express port speed.

3.3.2.2 SATA and RST Configuration



3.4 Security Setting



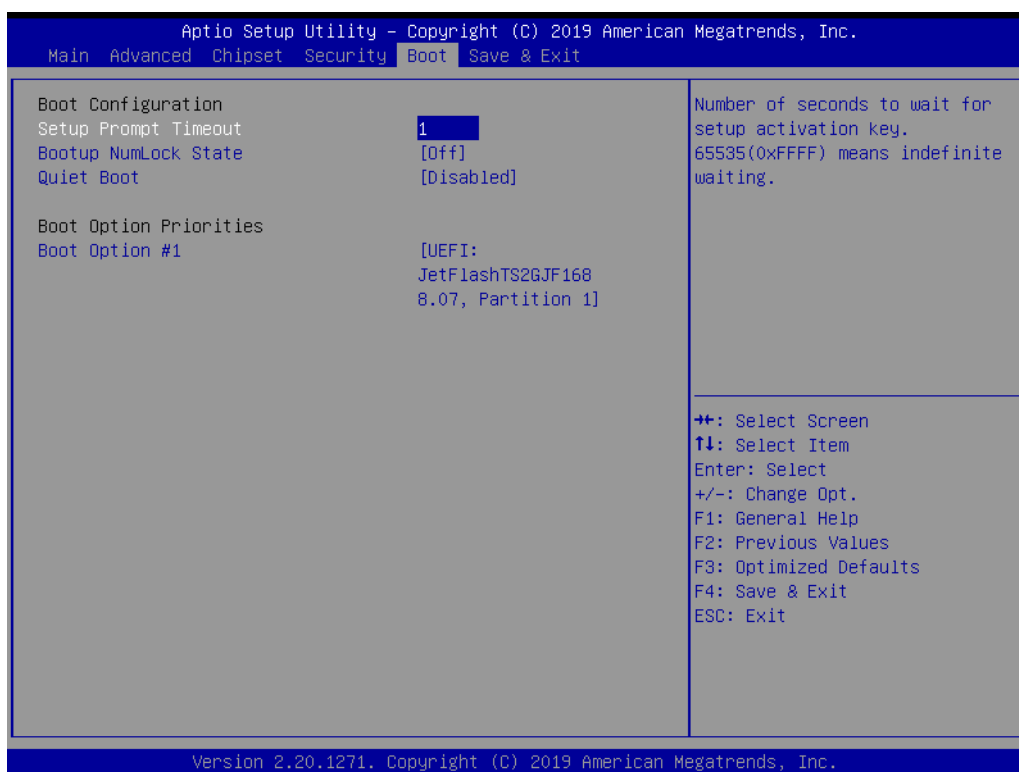
■ Administrator Password

Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the Administrator password.

■ User Password

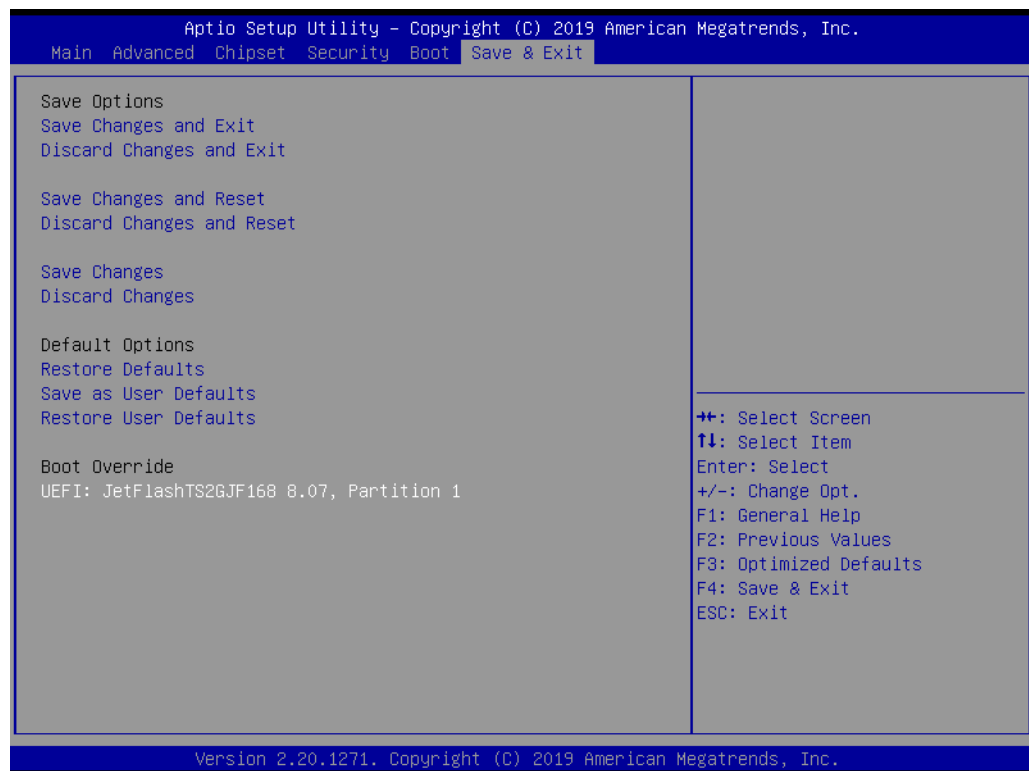
Select this option and press <ENTER> to access the sub menu, and then type in the password. Set the User Password.

3.5 Boot Setting



- **Setup Prompt Timeout**
User the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.
- **Bootup NumLock State [Off]**
On or Off power on state for the NumLock
- **Quiet Boot [Disabled]**
If this option is set to disabled, the BIOS displays normal POST messages. If enabled, an OEM logo is shown instead of POST messages.
- **Boot Option #1/#2**
Choose boot priority from boot device.

3.6 Save & Exit Configuration



■ Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect of all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select Ok or cancel.

■ Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select Ok to discard changes and exit. Discard Changes
Select Discard Changes from the Exit menu and press <Enter>.

■ Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect of all system configuration parameters.

1. Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select Ok or cancel.

■ Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Reset Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select Ok to discard changes and reset. Discard Changes Select Discard Changes from the Exit menu and press <Enter>.

■ **Restore Default**

The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

■ **Save as User Default**

Save the all current settings as a user default.

■ **Restore User Default**

Restore all settings to user default values.

Chapter 4

Software Introduction
& Service

4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

4.2.1 Software API

4.2.1.1 Control

GPIO



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus



SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

4.2.1.2 Display

Brightness Control



The Brightness Control API allows a developer to access embedded devices and easily control brightness.

Backlight



The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

4.2.1.3 Monitor

Watchdog



A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor



The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

4.2.1.4 Power Saving

CPU Speed



Makes use of Intel SpeedStep technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

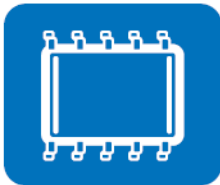
System Throttling



Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on the customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Monitoring



Monitoring is a utility for customers to monitor system health, like voltage, CPU and system temperature and fan speed. These items are important to a device, if critical errors occur and are not solved immediately, permanent damage may be caused.

Chapter 5

Chipset Software
Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for AIMB-587 are located on Advantech website. (<http://support.advantech.com/Support/>.) Updates are provided via Service Packs from Microsoft*.

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

5.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- Identification of Intel® chipset components in the Device Manager

Note! *This utility is used for the following versions of Windows, and it has to be installed **before** installing all the other drivers:*



- Windows 10 (64 bit)

5.3 Windows 10 Driver Setup

1. When enter the website of Advantech, then search product AIMB-587. There is "Chipset" driver inside.

Win10 driver for AIMB-587

2021-05-06 | Driver | Document No.1-4527162185

Related Product:

AIMB-587

Solution:

Win10(64bit) driver for AIMB-587

AIMB-587_Chip_Win10(64bit)

2021-05-06

Download

AIMB-587_Graphic_Win10(64bit)

2021-05-06

Download

AIMB-587_LAN_Win10(64bit)

2021-05-06

Download

AIMB-587_ME_Win10(64bit)

2021-05-06

Download

AIMB-587_Audio_Win10(64bit)

2021-05-06

Download

AIMB-587_Intel_RAID_Win10(64bit)

2021-05-06

Download

AIMB-587_Others_Win10(64bit)

2021-05-06

Download



Chapter 6

VGA Setup

6.1 Introduction

The Intel Xeon, Core i9/i7/i5/i3, Pentium and Celeron CPUs are embedded with an integrated graphics controller. You need to install the VGA driver to enable this function.

Optimized integrated graphic solution: With flexible Intel Graphics, versatile display options and 32-bit 3D graphics engine are supported. Dual independent displays and enhanced display modes for widescreen flat panels include extended, twin, and clone dual display modes, plus optimized 3D support delivers an intensive and realistic visual experience.

6.2 Windows 10 VGA Driver Installation

Note! *Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.*



When enter the website of Advantech, then search product AIMB-587. There is "Graphic" driver inside.

Win10(64bit) driver for AIMB-587	
AIMB-587_Chip_Win10(64bit) 2021-05-06	Download
AIMB-587_Graphic_Win10(64bit) 2021-05-06	Download
AIMB-587_LAN_Win10(64bit) 2021-05-06	Download
AIMB-587_ME_Win10(64bit) 2021-05-06	Download
AIMB-587_Audio_Win10(64bit) 2021-05-06	Download
AIMB-587_Intel_RAID_Win10(64bit) 2021-05-06	Download
AIMB-587_Others_Win10(64bit) 2021-05-06	Download

Chapter 7

LAN Configuration

7.1 Introduction

The AIMB-587 has dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel I219LM (LAN1), I211AT (LAN2), offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

In F sku, (QG2/ WG2 sku is optional) X550-AT2, LAN 3 LAN4 can support transmitting Ethernet frames at a rate of 10 gigabits per second.

7.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

7.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*



The AIMB-587's Intel i219LM (LAN1), i211AT (LAN2), Intel X550-AT2 (LAN3/ LAN4) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies from system to system. Please find and use the section that provides the driver setup procedure for the operating system you are using.

7.4 Windows® 10 Driver Setup (Intel I219LM/ Intel I211AT)

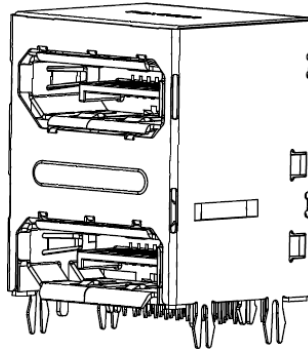
When enter the website of Advantech, then search product AIMB-587.
There is "LAN" driver inside.

Win10(64bit) driver for AIMB-587	
AIMB-587_Chip_Win10(64bit) 2021-05-06	Download
AIMB-587_Graphic_Win10(64bit) 2021-05-06	Download
AIMB-587_LAN_Win10(64bit) 2021-05-06	Download
AIMB-587_ME_Win10(64bit) 2021-05-06	Download
AIMB-587_Audio_Win10(64bit) 2021-05-06	Download
AIMB-587_Intel_RAID_Win10(64bit) 2021-05-06	Download
AIMB-587_Others_Win10(64bit) 2021-05-06	Download

Appendix **A**

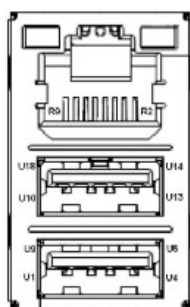
Pin Assignments

A.1 DisplayPort1 (DP1)



Pin	Signal	Pin	Signal
P1	DP1_0+	P21	DP2_0+
P2	GND	P22	GND
P3	DP1_0-	P23	DP2_0-
P4	DP1_1+	P24	DP2_1+
P5	GND	P25	GND
P6	DP1_1-	P26	DP2_1-
P7	DP1_2+	P27	DP2_2+
P8	GND	P28	GND
P9	DP1_2-	P29	DP2_2-
P10	DP1_3+	P30	DP2_3+
P11	GND	P31	GND
P12	DP1_3-	P32	DP2_3-
P13	DP1_AUX_EN#	P33	DP2_AUX_EN#
P14	GND	P34	GND
P15	DP1_AUX+	P35	DP2_AUX+
P16	GND	P36	GND
P17	DP1_AUX-	P37	DP2_AUX-
P18	DP1_HPD	P38	DP2_HPD
P19	GND	P39	GND
P20	+V3.3_DP1	P40	+V3.3_DP1

A.2 RJ45 + USB3.1 stack connector (LAN1_USB12)

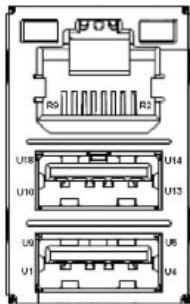


Pin	Signal	Pin	Signal
U1	VBUS (*)	U10	VBUS (*)
U2	D_1-	U11	D_2-
U3	D_1+	U12	D_2+
U4	GND	U13	GND
U5	RX_1-	U14	RX_2-
U6	RX_1+	U15	RX_2+
U7	GND	U16	GND
U8	TX_1-	U17	TX_2-
U9	TX_1+	U18	TX_2+

(*) Depends on JUSBPWR2 Jump Setting

Pin	Signal	Pin	Signal
R2	MDI_0+	R6	MDI_2+
R3	MDI_0-	R7	MDI_2-
R4	MDI_1+	R8	MDI_3+
R5	MDI_1-	R9	MDI_3-

A.3 RJ45 + USB3.0 stack connector (LAN2_USB34)

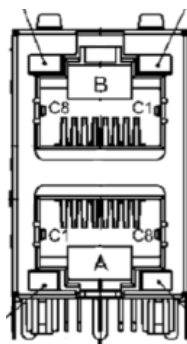


Pin	Signal	Pin	Signal
U1	VBUS (*)	U10	VBUS (*)
U2	D_3-	U11	D_4-
U3	D_3+	U12	D_4+
U4	GND	U13	GND
U5	RX_3-	U14	RX_4-
U6	RX_3+	U15	RX_4+
U7	GND	U16	GND
U8	TX_3-	U17	TX_4-
U9	TX_3+	U18	TX_4+

(*) Depends on JUSBPWR2 Jump Setting

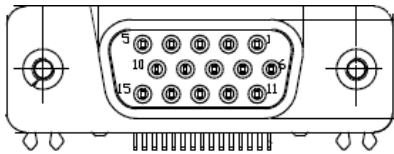
Pin	Signal	Pin	Signal
R2	MDI_0+	R6	MDI_2+
R3	MDI_0-	R7	MDI_2-
R4	MDI_1+	R8	MDI_3+
R5	MDI_1-	R9	MDI_3-

A.4 RJ45 Port 3/Port4 connector (LAN3)



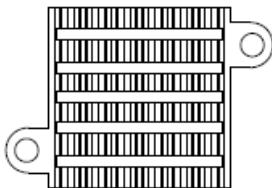
Pin	Signal	Pin	Signal
A1	MDI1_LAN3_D0+	B1	MDI0_LAN3_D0+
A2	MDI1_LAN3_D0-	B2	MDI0_LAN3_D0-
A3	GND	B3	GND
A4	MDI1_LAN3_D1+	B4	MDI0_LAN3_D1+
A5	MDI1_LAN3_D1-	B5	MDI0_LAN3_D1-
A6	GND	B6	GND
A7	MDI1_LAN3_D2+	B7	MDI0_LAN3_D2+
A8	MDI1_LAN3_D2-	B8	MDI0_LAN3_D2-
A9	GND	B9	GND
A10	MDI1_LAN3_D3+	B10	MDI0_LAN3_D3+
A11	MDI1_LAN3_D3-	B11	MDI0_LAN3_D3-
A12	GND	B12	GND
A13	MDI1_LAN3_D4+	B13	MDI0_LAN3_D4+
A14	MDI1_LAN3_D4-	B14	MDI0_LAN3_D4-
A15	GND	B15	GND
LA1	LAN3_P1_LED2_ACT#	LB1	LAN3_P0_LED2_ACT#
LA2	+V3.3_LAN3	LB2	+V3.3_LAN3
LA3	LAN3_P1_LED3_1G#	LB3	LAN3_P0_LED3_1G#
LA4	LAN3_P1_LED1_10G#	LB4	LAN3_P0_LED1_10G#

A.5 D-Sub connector (VGA1)

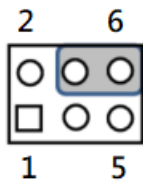


Pin	Signal	Pin	Signal
1	RED	9	VCC (+5V)
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC DAT
5	GND	13	HSYNC
6	Advantech define	14	VSYNC
7	GND	15	DDC CLK
8	GND		

A.6 10G LAN X550-AT heatsink (LU1_HS1)

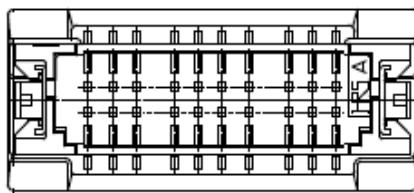


A.7 EDP Panel Voltage Selection (JEDP1)



Pin	Signal	Pin	Signal
1	NC	2	+5V
3	+12V	4	EDP1 VDD
5	NC	6	+3.3V

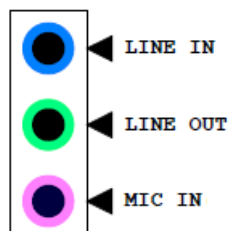
A.8 EDP connector (EDP1)



Pin	Signal	Pin	Signal
1	GND	2	GND
3	TX0-	4	TX3-
5	TX0+	6	TX3+
7	GND	8	NC
9	TX1-	10	GND
11	TX1+	12	AUX-
13	GND	14	AUX+
15	TX2-	16	GND
17	TX2+	18	EDP_HPDP
19	+VDD_EDP(*)	20	+VDD_EDP(*)

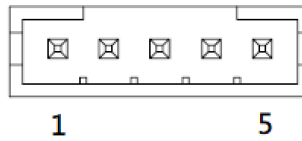
(*) Depends on JEDP1 Jump Setting

A.9 HD Audio Interface (AUDIO1)



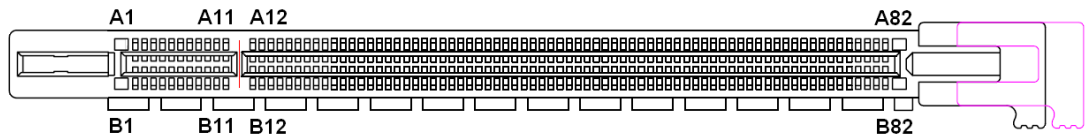
Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

A.10 EDP Backlight inverter power connector (INV1)



Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

A.11 PCI-Express x16 slot 1 (PCIEX16_1)

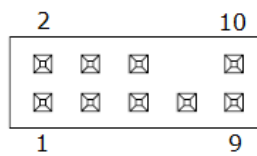


Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	Reserved	A17	RX0-
B18	DETECT#	A18	GND
B19	TX1+	A19	Advantech define
B20	TX1-	A20	GND
B21	GND	A21	RX1+
B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND

B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	Advantech define
B33	TX4+	A33	Reserved
B34	TX4-	A34	GND
B35	GND	A35	RX4+
B36	GND	A36	RX4-
B37	TX5+	A37	GND
B38	TX5-	A38	GND
B39	GND	A39	RX5+
B40	GND	A40	RX5-
B41	TX6+	A41	GND
B42	TX6-	A42	GND
B43	GND	A43	RX6+
B44	GND	A44	RX6-
B45	TX7+	A45	GND
B46	TX7-	A46	GND
B47	GND	A47	RX7+
B48	Reserved	A48	RX7-
B49	GND	A49	GND
B50	TX8+	A50	Reserved
B51	TX8-	A51	GND
B52	GND	A52	RX8+
B53	GND	A53	RX8-
B54	TX9+	A54	GND
B55	TX9-	A55	GND
B56	GND	A56	RX9+
B57	GND	A57	RX9-
B58	TX10+	A58	GND
B59	TX10-	A59	GND
B60	GND	A60	RX10+
B61	GND	A61	RX10-
B62	TX11+	A62	GND
B63	TX11-	A63	GND
B64	GND	A64	RX11+
B65	GND	A65	RX11-
B66	TX12+	A66	GND
B67	TX12-	A67	GND
B68	GND	A68	RX12+
B69	GND	A69	RX12-
B70	TX13+	A70	GND
B71	TX13-	A71	GND
B72	GND	A72	RX13+

B73	GND	A73	RX13-
B74	TX14+	A74	GND
B75	TX14-	A75	GND
B76	GND	A76	RX14+
B77	GND	A77	RX14-
B78	TX15+	A78	GND
B79	TX15-	A79	GND
B80	GND	A80	RX15+
B81	Reserved	A81	RX15-
B82	Reserved	A82	GND

A.12 Front panel audio pin header (FPAUD1)



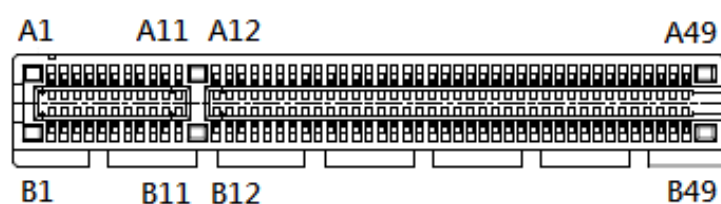
Pin	Signal	Pin	Signal
1	MIC IN-L	2	GND
3	MIC IN-R	4	FPAUD_DETECT#
5	LINE OUT-R	6	SENSE R1
7	SENSE	8	KEY
9	LINE OUT-L	10	SENSE R2

A.13 USB Power selection header #2(JUSBPWR2)



Pin	Signal
1	+VDUAL
2	Advantech define
3	+V5

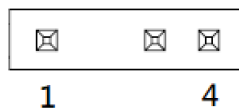
A.14 PCI-Express x8 slot (PCIEX8_1)



Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	Advantech define	A17	RX0-
B18	Advantech define	A18	GND
B19	TX1+	A19	Reserved
B20	TX1-	A20	GND
B21	GND	A21	RX1+
B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND
B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	Reserved
B33	TX4+	A33	Reserved
B34	TX4-	A34	GND
B35	GND	A35	RX4+
B36	GND	A36	RX4-
B37	TX5+	A37	GND
B38	TX5-	A38	GND

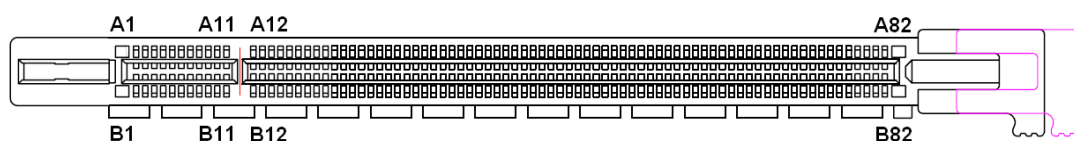
B39	GND	A39	RX5+
B40	GND	A40	RX5-
B41	TX6+	A41	GND
B42	TX6-	A42	GND
B43	GND	A43	RX6+
B44	GND	A44	RX6-
B45	TX7+	A45	GND
B46	TX7-	A46	GND
B47	GND	A47	RX7+
B48	Reserved	A48	RX7-
B49	GND	A49	GND

A.15 HD Audio interface (SPDIF1)



Pin	Signal
1	+5V
2	KEY
3	SPDIF OUT
4	GND

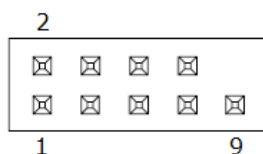
A.16 PCI Express x16 slot2 (PCIEX16_2)



Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	PRSNT2#	A17	RX0-
B18	GND	A18	GND
B19	TX1+	A19	Reserved
B20	TX1-	A20	GND
B21	GND	A21	RX1+
B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND
B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	Reserved
B33	NC	A33	Reserved
B34	NC	A34	GND
B35	GND	A35	NC
B36	GND	A36	NC
B37	NC	A37	GND
B38	NC	A38	GND
B39	GND	A39	NC

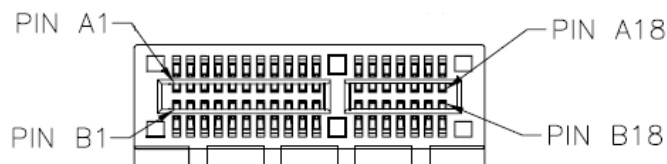
B40	GND	A40	NC
B41	NC	A41	GND
B42	NC	A42	GND
B43	GND	A43	NC
B44	GND	A44	NC
B45	NC	A45	GND
B46	NC	A46	GND
B47	GND	A47	NC
B48	Reserved	A48	NC
B49	GND	A49	GND
B50	NC	A50	Reserved
B51	NC	A51	GND
B52	GND	A52	NC
B53	GND	A53	NC
B54	NC	A54	GND
B55	NC	A55	GND
B56	GND	A56	NC
B57	GND	A57	NC
B58	NC	A58	GND
B59	NC	A59	GND
B60	GND	A60	NC
B61	GND	A61	NC
B62	NC	A62	GND
B63	NC	A63	GND
B64	GND	A64	NC
B65	GND	A65	NC
B66	NC	A66	GND
B67	NC	A67	GND
B68	GND	A68	NC
B69	GND	A69	NC
B70	NC	A70	GND
B71	NC	A71	GND
B72	GND	A72	NC
B73	GND	A73	NC
B74	NC	A74	GND
B75	NC	A75	GND
B76	GND	A76	NC
B77	GND	A77	NC
B78	NC	A78	GND
B79	NC	A79	GND
B80	GND	A80	NC
B81	Reserved	A81	NC
B82	Reserved	A82	GND

A.17 LAN LED (LANLED1)



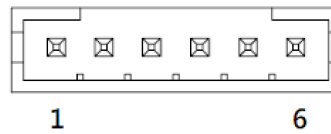
Pin	Signal	Pin	Signal
1	LAN1 ACTIVE	2	LAN2 ACTIVE
3	LAN1 LED PWR	4	LAN2 LED PWR
5	LAN1 LINK1000	6	LAN2 LINK1000
7	LAN1 LINK100	8	LAN2 LINK100
9	+3.3VSB		

A.18 PCI Express x1 slot (PCIEX1_1)



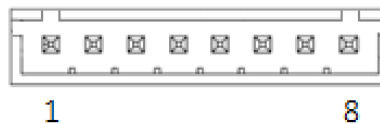
Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	PRSNT2#	A17	RX0-
B18	GND	A18	GND

A.19 Keyboard & Mouse connector (KBMS1)



Pin	Signal
1	KB_CLK#
2	KB_DAT#
3	MS_CLK#
4	GND
5	VCC (+5VSB)
6	MS_DAT#

A.20 Alarm Board/CMM Power Connector (VOLT1)



Pin	Signal	Pin	Signal
1	+5VSB	5	+5V
2	GND	6	+3.3V
3	GND	7	-12V
4	-5V	8	+12V

A.21 Watchdog timer output and OBS beep (JOBS1+JWDT1)



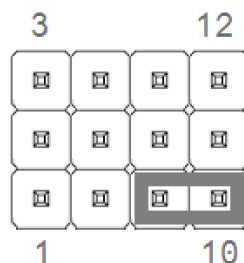
Pin	Signal	Pin	Signal
1	NC	4	SIO Warning Beep output
2	Watch Dog Reset# output	5	SP1 Buzzer Beep input
3	System Reset input#		

A.22 Power LED and keyboard lock pin header (JFP2)



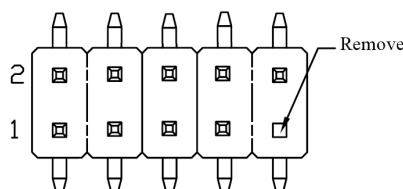
Pin	Signal	Pin	Signal
1	LED Power	4	Keyboard Lock
2	NC	5	GND
3	GND		

A.23 Power switch/HDD LED/SMBus/Speaker pin header (JFP1)



Pin	Signal	Pin	Signal
1	+5V	2	HDD LED+
3	Power Button+	4	SPK_P2
5	HDD LED-	6	Power Button-
7	SPK_P3	8	SMB_DATA
9	System Reset+	10	SPK_P4
11	SMB_CLK	12	System Reset-

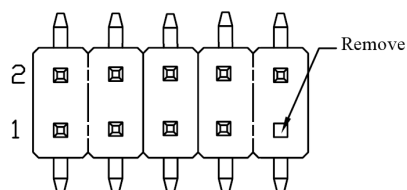
A.24 Universal Serial Bus Port 7 / 8 (USB78)



Pin	Signal	Pin	Signal
1	+V5_USB4 (*)	2	+V5_USB4 (*)
3	USB_D8-	4	USB_D7-
5	USB_D8+	6	USB_D7+
7	GND	8	GND
		10	NC

(*) Depends on JUSBPWR2 Jump Setting

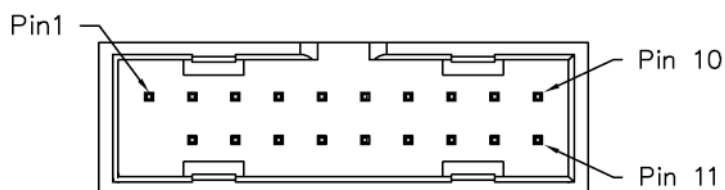
A.25 Universal Serial Bus Port 5 / 6 (USB56)



Pin	Signal	Pin	Signal
1	+V5_USB3 (*)	2	+V5_USB3 (*)
3	USB_D8-	4	USB_D7-
5	USB_D8+	6	USB_D7+
7	GND	8	GND
		10	NC

(*) Depends on JUSBPWR2 Jump Setting

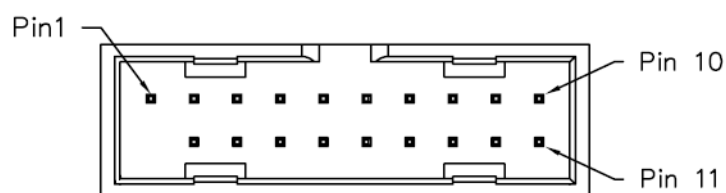
A.26 Dual port USB3.0 header (USB1314)



Pin	Signal	Pin	Signal
1	+V5_USB1314	11	USB_D4+
2	RX3-	12	USB_D4-
3	RX3+	13	GND
4	GND	14	TX4+
5	TX3-	15	TX4-
6	TX3+	16	GND
7	GND	17	RX4+
8	USB_D3-	18	RX4-
9	USB_D3+	19	+V5_USB1314
10	NC		

(*) Depends on JUSBPWR1 Jump Setting

A.27 Dual port USB3.0 header (USB1516)



Pin	Signal	Pin	Signal
1	+V5_USB1516(*)	11	USB_D2+
2	RX1-	12	USB_D2-
3	RX1+	13	GND
4	GND	14	TX2+
5	TX1-	15	TX2-
6	TX1+	16	GND
7	GND	17	RX2+
8	USB_D1-	18	RX2-
9	USB_D1+	19	+V5_USB1516(*)
10	NC		

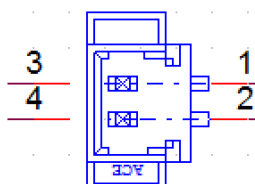
(*) Depends on JUSBPWR1 Jump Setting

A.28 USB Power selection header #1 (JUSBPWR1)



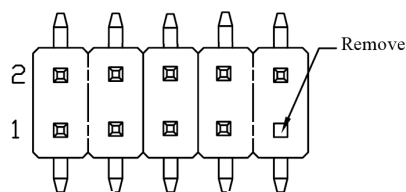
Pin	Signal
1	+VDUAL
2	Advantech define
3	+V5

A.29 CMOS battery connector (BAT1)



Pin	Signal
1	VBAT
2	GND

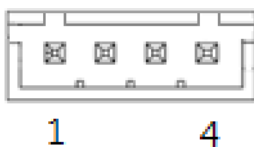
A.30 Universal Serial Bus Port 11 / 12 (USB1112)



Pin	Signal	Pin	Signal
1	+V5_USB5 (*)	2	+V5_USB5 (*)
3	USB_D12-	4	USB_D11-
5	USB_D12+	6	USB_D11+
7	GND	8	GND
		10	NC

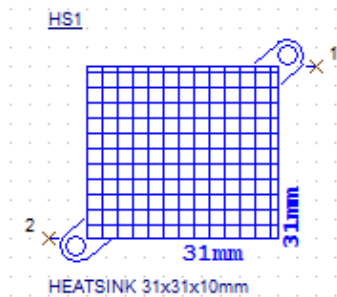
(*) Depends on JUSBPWR1 Jump Setting

A.31 SMBUS connector from PCH (SMBUS1)

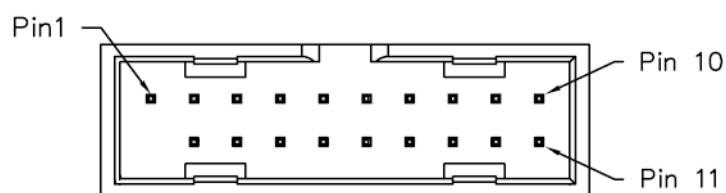


Pin	Signal
1	+5VSB
2	SMB CLK
3	SMB DAT
4	GND

A.32 PCH Heatsink (HS1)



A.33 Dual port USB3.0 header (USB910)



Pin	Signal	Pin	Signal
1	+V5_USB6(*)	11	USB_D10+
2	RX5-	12	USB_D10-
3	RX5+	13	GND
4	GND	14	TX6+
5	TX5-	15	TX6-
6	TX5+	16	GND
7	GND	17	RX6+
8	USB_D9-	18	RX6-
9	USB_D9+	19	+V5_USB6(*)
10	NC		

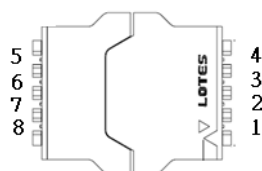
(*) Depends on JUSBPWR1 Jump Setting

A.34 Intel ME header (JME1)



Pin	Signal
1	NC
2	AZA_SDO_R
3	+V3.3_DUAL

A.35 SPI BIOS flash socket1 (SPI1)



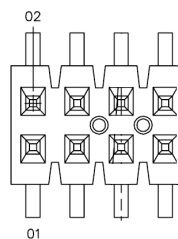
Pin	Signal	Pin	Signal
1	CS#	5	MOSI
2	MISO	6	SCLK
3	WP# / IO2	7	HOLD# / IO3
4	GND	8	+V3.3_SPI

A.36 COMS Mode selection (JCOMS1)



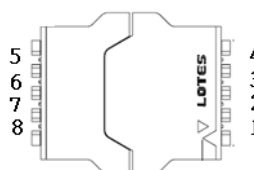
Pin	Signal
1	VBAT
2	RTC RESET#
3	GND

A.37 SPI Pin Header (SPI_CN1)



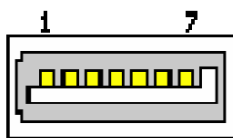
Pin	Signal	Pin	Signal
1	+3.3VSB	2	GND
3	CS#	4	SCLK
5	MISO	6	MOSI
		8	NC

A.38 SPI BIOS flash socket2 (SPI2)



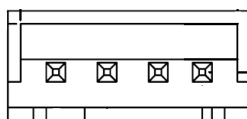
Pin	Signal	Pin	Signal
1	CS#	5	MOSI
2	MISO	6	SCLK
3	WP# / IO2	7	HOLD# / IO3
4	GND	8	+V3.3_SPI

A.39 Serial ATA interface connector (SATA1~8)



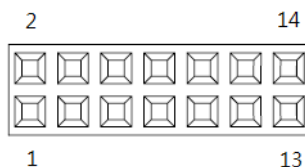
Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

A.40 SATA Power Connector (SATA_PWR1)



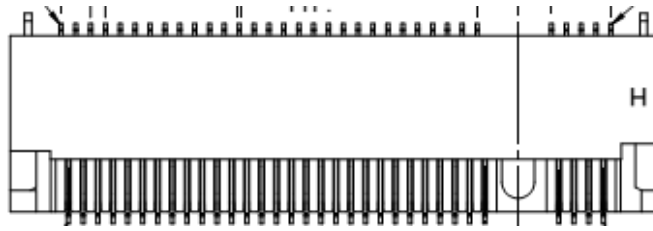
Pin	Signal
1	+V5
2	GND
3	GND
4	+V12

A.41 Low pin count interface connector (LPC1)



Pin	Signal	Pin	Signal
1	CLK (24MHz)	2	AD1
3	RESET#	4	AD0
5	FRAME#	6	+3.3V
7	AD3	8	GND
9	AD2	10	SMB CLK
11	SERIRQ	12	SMB DAT
13	+5VSB	14	+5V

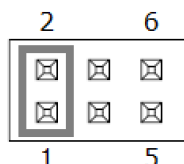
A.42 M.2 M Key connector (M2M1)



Pin	Signal	Pin	Signal
1	GND	2	3.3V
3	GND	4	3.3V
5	PERn3	6	N/C
7	PERp3	8	N/C
9	GND	10	DAS/DSS# (I/O)/LED1#
11	PETn3	12	3.3V
13	PETp3	14	3.3V
15	GND	16	3.3V
17	PERn2	18	3.3V
19	PERp2	20	N/C
21	GND	22	N/C
23	PETn2	24	N/C
25	PETp2	26	N/C
27	GND	28	N/C
29	PERn1	30	N/C
31	PERp1	32	N/C
33	GND	34	N/C
35	PETn1	36	N/C
37	PETp1	38	DEVSLP (O)
39	GND	40	N/C
41	PERn0/SATA-B+	42	N/C
43	PERp0/SATA-B-	44	N/C
45	GND	46	N/C
47	PETn0/SATA-A-	48	N/C
49	PETp0/SATA-A+	50	PERST# (O)(0/3.3V) or N/C
51	GND	52	CLKREQ# (I/O)(0/3.3V) or N/C
53	REFCLKn	54	PEWAKE# (I/O)(0/3.3V) or N/C
55	REFCLKp	56	N/C
57	GND	58	N/C
59	Connector Key	60	Connector Key
61	Connector Key	62	Connector Key
63	Connector Key	64	Connector Key
65	Connector Key	66	Connector Key
67	N/C	68	SUSCLK(32kHz) (O)(0/3.3V)

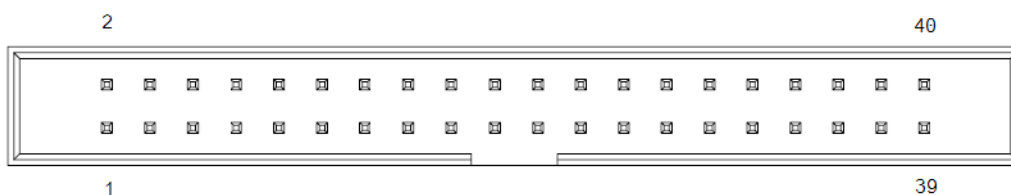
69	PEDET (NC-	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

A.43 COM3 RI# selection pin header (JSETCOM3_V1)



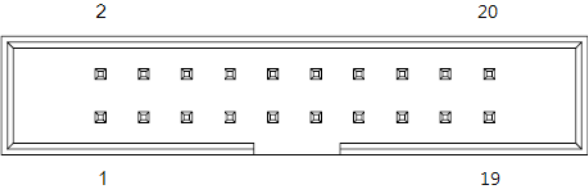
Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech define
3	Advantech define	4	+5V
5	+12V	6	Advantech define

A.44 COM3 ~ COM6 box header (COM3456)



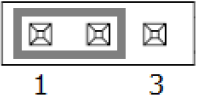
Pin	Signal	Pin	Signal
1	DCD# [3]	2	DSR# [3]
3	RXD [3]	4	RST# [3]
5	TXD [3]	6	CTS# [3]
7	DTR# [3]	8	RI# [3]
9	GND	10	GND
11	DCD# [4]	12	DSR# [4]
13	RXD [4]	14	RST# [4]
15	TXD [4]	16	CTS# [4]
17	DTR# [4]	18	RI# [4]
19	GND	20	GND
21	DCD# [5]	22	DSR# [5]
23	RXD [5]	24	RST# [5]
25	TXD [5]	26	CTS# [5]
27	DTR# [5]	28	RI# [5]
29	GND	30	GND
31	DCD# [6]	32	DSR# [6]
33	RXD [6]	34	RST# [6]
35	TXD [6]	36	CTS# [6]
37	DTR# [6]	38	RI# [6]
39	GND	40	GND

A.45 16-bits General Purpose I/O pin header (GPIO1)



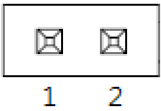
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO8
3	GPIO1	4	GPIO9
5	GPIO2	6	GPIO10
7	GPIO3	8	GPIO11
9	GPIO4	10	GPIO12
11	GPIO5	12	GPIO13
13	GPIO6	14	GPIO14
15	GPIO7	16	GPIO15
17	+5VSB	18	GND
19	+5VSB	20	GND

A.46 Case Open selection pin header (JCASEOP_SW1)



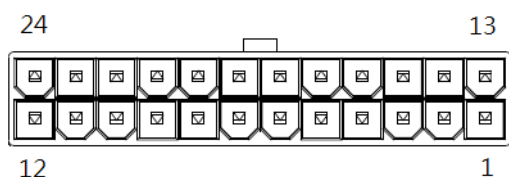
Pin	Signal
1	Normal Open
2	Advantech define
3	Normal Close

A.47 Case Open connector (JCASE1)



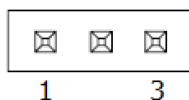
Pin	Signal
1	Case Open
2	GND

A.48 ATX 24pin power connector (EATXPWR1)



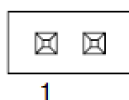
Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSO#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

A.49 EC debug header (J1)



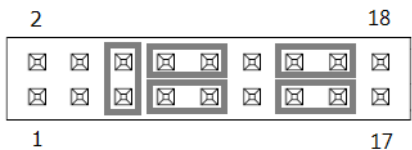
Pin	Signal
1	RX
2	TX
3	GND

A.50 System indicator LED (JFP3)



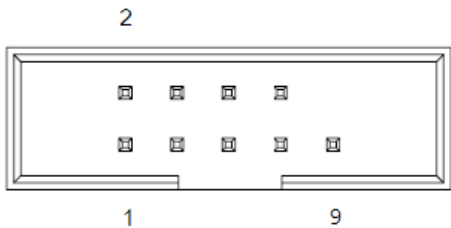
Pin	Signal
1	System indicator LED +
2	System indicator LED -

A.51 COM2 RS232?RS422?RS485 selection pin header (JSETCOM1)



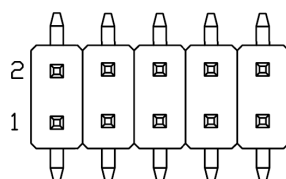
Pin	Signal	Pin	Signal
1	UART_SIN [2]	2	RXD_RS485
3	UART_SIN [2]	4	RXD_RS422
5	UART_SIN [2]	6	RXD_RS232
7	DCDB	8	SOUT [2]
9	COM2_DCD#	10	COM2_SOUT
11	COM2_TXD485-	12	COM2_RXD485+
13	SIN [B]	14	DTR [B]
15	COM2_SIN	16	COM2_DTR#
17	COM2_TXD485+	18	COM2_RXD485-

A.52 COM box header (COM1~2)



Pin	Signal	Pin	Signal
1	DCD#	2	DSR#
3	RXD	4	RST#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND		

A.53 iBMC GPIO header (GPIO2)



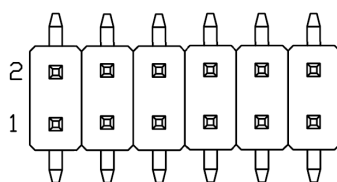
Pin	Signal	Pin	Signal
1	NC	2	SLP_S3#
3	GPIO0	4	GPIO1
5	GPIO2	6	GPIO3
7	Power Button	8	SYS_RESET#
9	NC	10	GND

A.54 AT/ATX Mode selection (PSON1)



Pin	Signal
1	AT
2	+3.3V
3	ATX

A.55 EC programming header (CN1)



Pin	Signal	Pin	Signal
1	GND	2	TMS
3	GND	4	TDI
5	GND	6	TDO
7	GND	8	TCK
9	GND	10	GND
11	GND	12	CLK

A.56 DDR4 U-DIMM socket B2 (DIMMB2)

Please see JEDEC STANDARD.

A.57 DDR4 U-DIMM socket B1 (DIMMB1)

Please see JEDEC STANDARD.

A.58 DDR4 U-DIMM socket A2 (DIMMA2)

Please see JEDEC STANDARD.

A.59 DDR4 U-DIMM socket A1 (DIMMA1)

Please see JEDEC STANDARD.

A.60 System Fan #2 connector (SYSFAN2)



Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

A.61 System Fan #1 connector (SYSFAN1)



Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

A.62 System Fan #4 connector (SYSFAN4)



Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

A.63 System Fan #3 connector (SYSFAN3)



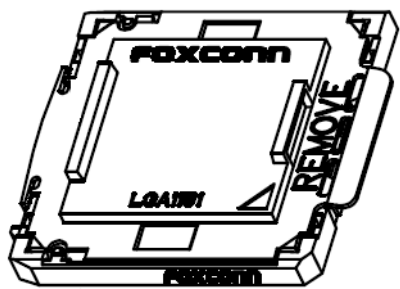
Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

A.64 iBMC SMBUS to EC header (IBMC_SMBUS_EC)



Pin	Signal
1	CLK
2	DATA
3	GND

A.65 iBMC SMBUS to PCH header (IBMC_SMBUS_PCH)

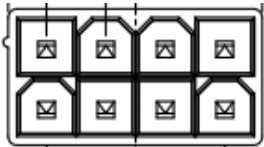


Pin	Signal
1	CLK
2	DATA
3	GND

A.66 CPU SCOKET LGA 1151 H4 (CPU1)



A.67 IMVP8 programming header (JSMB1)



Pin	Signal
1	CLK
2	GND
3	DATA

A.68 ATX 8 Pin main power connector (ATX12V1)

Pin	Signal	Pin	Signal
1	GND	2	+12V
3	GND	4	+12V
5	GND	6	+12V
7	GND	8	+12V



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