

# AIMB-506

**Intel® 8th 9th Gen Core™ i7/i5/i3  
LGA1151 MicroATX with VGA/DP/DVI-D/  
eDP(LVDS), 14 COM, 8 USB 3.0,  
12 USB 2.0, Dual LAN**

## Preliminary



## Features

- Supports Intel® 8th/9th Gen Core i7/i5/i3 processor with H310 chipset
- Supports up to 14 COM, 8 USB 3.0, 12 USB 2.0, TPM 1.2/2.0 (optional)
- Supports Dual display of VGA, DP, DVI, eDP, LVDS (optional) and two GbE LAN
- Two DIMM sockets support up to 64 GB DDR4 2666 MHz SDRAM
- Supports WISE PaaS/Device-On, McAfee, Acronis and Embedded Software APIs

### Software APIs:



SMBus



H/W Monitor



Watchdog



GPIO

### Utilities:



BIOS flash

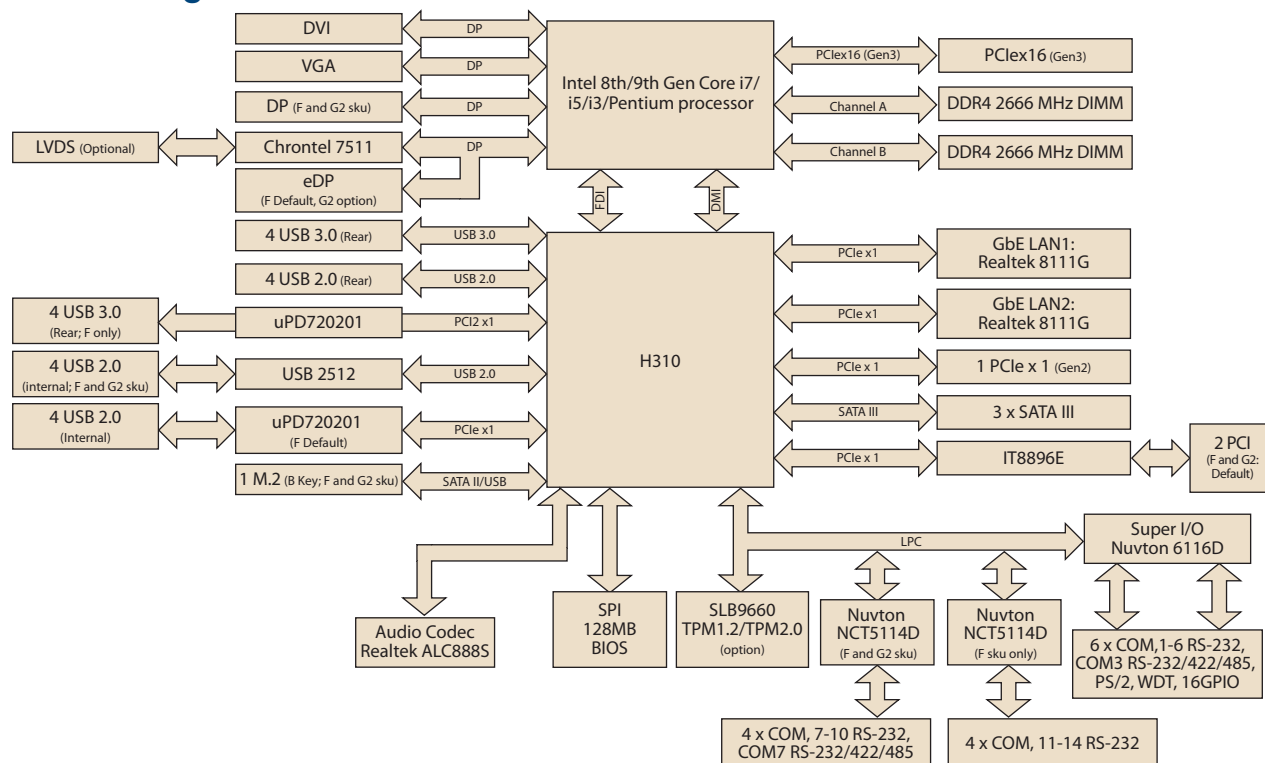


Monitoring

## Specifications

| Processor System         | CPU                              | I7-9700E/<br>I7-9700TE                                                                                                                                                                                                                                                                                                                                                                                  | I7-8700/<br>I7-8700T | I5-9500E/<br>I5-9500TE | I5-8500/<br>I5-8500T | I3-9100E/<br>I3-9100TE | I3-8100/<br>I3-8100T | Pentium<br>G4400/G4400TE | Celeron<br>G4900/G4900T |
|--------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|--------------------------|-------------------------|
|                          | Core Number                      | 8/8                                                                                                                                                                                                                                                                                                                                                                                                     | 6/6                  | 6/6                    | 6/6                  | 4/4                    | 4/4                  | 2/2                      | 2/2                     |
|                          | Max. Speed                       | 2.6GHz/<br>1.8GHz                                                                                                                                                                                                                                                                                                                                                                                       | 3.2 GHz/<br>2.4 GHz  | 3.0GHz/<br>2.2GHz      | 3.0 GHz/<br>2.1 GHz  | 3.1GHz/<br>2.2GHz      | 3.6GHz/<br>3.1GHz    | 3.7GHz/<br>3.1GHz        | 3.1GHz/<br>2.9GHz       |
|                          | L3 Cache                         | 12M/12M                                                                                                                                                                                                                                                                                                                                                                                                 | 12M/12M              | 9M/9M                  | 9M/9M                | 6M/6M                  | 6M/6M                | 2M/2M                    | 2M/2M                   |
|                          | TDP (W)                          | 65W/35W                                                                                                                                                                                                                                                                                                                                                                                                 | 65W/35W              | 65W/35W                | 65W/35W              | 65W/35W                | 65W/35W              | 65W/35W                  | 65W/35W                 |
|                          | Chipset                          | H310                                                                                                                                                                                                                                                                                                                                                                                                    |                      |                        |                      |                        |                      |                          |                         |
|                          | BIOS                             | AMI EFI 128 Mbit SPI                                                                                                                                                                                                                                                                                                                                                                                    |                      |                        |                      |                        |                      |                          |                         |
| Expansion Slot           | PCI                              | 32-bit/33 MHz, 2 slot (F sku; G2 sku)                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                      |                        |                      |                          |                         |
|                          | PCIe x 1 (Gen2)                  | 0.5 GB/s per direction, 1 slot                                                                                                                                                                                                                                                                                                                                                                          |                      |                        |                      |                        |                      |                          |                         |
|                          | PCIe x16 (Gen3)                  | 16 GB/s per direction, 1 slot                                                                                                                                                                                                                                                                                                                                                                           |                      |                        |                      |                        |                      |                          |                         |
| Memory                   | Technology                       | Dual Channel DDR4 2666 MHz SDRAM                                                                                                                                                                                                                                                                                                                                                                        |                      |                        |                      |                        |                      |                          |                         |
|                          | Max. Capacity                    | 64 GB/32 GB per DIMM                                                                                                                                                                                                                                                                                                                                                                                    |                      |                        |                      |                        |                      |                          |                         |
|                          | Socket                           | 2 x 288-pin DIMM (Non-ECC)                                                                                                                                                                                                                                                                                                                                                                              |                      |                        |                      |                        |                      |                          |                         |
| Graphics                 | Controller                       | Intel HD Graphics                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
|                          | LVDS                             | Supports dual channel 48 bit and up to 1920 x 1200 (optional)                                                                                                                                                                                                                                                                                                                                           |                      |                        |                      |                        |                      |                          |                         |
|                          | eDP                              | Internal pin header, supports max. resolution 3840 x 2160 @ 60 Hz (F sku on board, G2 sku optional)                                                                                                                                                                                                                                                                                                     |                      |                        |                      |                        |                      |                          |                         |
|                          | VGA                              | Yes, Max resolution 1920 x 1200 @ 60 Hz                                                                                                                                                                                                                                                                                                                                                                 |                      |                        |                      |                        |                      |                          |                         |
|                          | DP                               | Supports max resolution 4096 x 2304 @ 60 Hz                                                                                                                                                                                                                                                                                                                                                             |                      |                        |                      |                        |                      |                          |                         |
|                          | DVI-D                            | Up to 1920 x 1200 @ 60Hz refresh rate                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                      |                        |                      |                          |                         |
| Ethernet                 | Dual Display                     | DP+DVI-D, DP+VGA, DVI-D+VGA, DP+eDP (LVDS), DVI-D+eDP (LVDS), VGA+eDP (LVDS)                                                                                                                                                                                                                                                                                                                            |                      |                        |                      |                        |                      |                          |                         |
|                          | Interface                        | 10/100/1000 Mbps                                                                                                                                                                                                                                                                                                                                                                                        |                      |                        |                      |                        |                      |                          |                         |
|                          | Controller                       | GbE LAN1: Realtek RTL8111G<br>GbE LAN2: Realtek RTL8111G                                                                                                                                                                                                                                                                                                                                                |                      |                        |                      |                        |                      |                          |                         |
| SATA                     | Connector                        | RJ-45 x 2                                                                                                                                                                                                                                                                                                                                                                                               |                      |                        |                      |                        |                      |                          |                         |
|                          | Max Data Transfer Rate           | 600 MB/s (SATA 3.0)                                                                                                                                                                                                                                                                                                                                                                                     |                      |                        |                      |                        |                      |                          |                         |
|                          | Channel                          | 3                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
| Rear I/O                 | VGA                              | 1                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
|                          | DVI-D                            | 1                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
|                          | Ethernet                         | 2 (F, G2 x2, L x1)                                                                                                                                                                                                                                                                                                                                                                                      |                      |                        |                      |                        |                      |                          |                         |
|                          | USB                              | 12 (8 USB 3.0, 4 USB 2.0 on F sku and G2 sku)<br>8 (4 USB 3.0, 4 USB 2.0 on L)                                                                                                                                                                                                                                                                                                                          |                      |                        |                      |                        |                      |                          |                         |
|                          | Display port                     | 1 (F and G2 only)                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
|                          | Audio                            | 2 (Mic-In, Line-out)                                                                                                                                                                                                                                                                                                                                                                                    |                      |                        |                      |                        |                      |                          |                         |
| Internal Connector       | USB                              | 8 (F sku; 8 USB 2.0)<br>4 (G2, L sku, 4 USB 2.0)                                                                                                                                                                                                                                                                                                                                                        |                      |                        |                      |                        |                      |                          |                         |
|                          | Serial                           | 14 (G2-FL sku: 12 x RS-232, 2 x RS-232/422/485; COM 3 and COM 7 support RS-232/422/485 auto flow control; COM1 and COM 2 support 5V/12V by jumper selection)<br>10 (G2-00 sku: 8 x RS-232, 2 x RS-232/422/485; COM 3 and COM 7 support RS-232/422/485 auto flow control; COM1 and COM 2 support 5V/12V by jumper selection)<br>2 (L sku: 2 x RS-232, COM1 and COM 2 support 5V/12V by jumper selection) |                      |                        |                      |                        |                      |                          |                         |
|                          | M.2 (B Key)                      | 1 (2242/3042 with SIM card holder, F and G2 sku only)                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                      |                        |                      |                          |                         |
|                          | SATA                             | 3 x 600 MB/s (SATA 3.0)                                                                                                                                                                                                                                                                                                                                                                                 |                      |                        |                      |                        |                      |                          |                         |
|                          | Extended Display Port (eDP)/LVDS | 1 (F sku only; Default: eDP)                                                                                                                                                                                                                                                                                                                                                                            |                      |                        |                      |                        |                      |                          |                         |
|                          | GPIO                             | 16-bit GPIO                                                                                                                                                                                                                                                                                                                                                                                             |                      |                        |                      |                        |                      |                          |                         |
|                          | PS/2 (KBMS1)                     | 1                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                        |                      |                        |                      |                          |                         |
|                          | Output Interval                  | System reset<br>Programmable 1 ~ 255 sec/min                                                                                                                                                                                                                                                                                                                                                            |                      |                        |                      |                        |                      |                          |                         |
| Power Requirements       | Power On                         | Intel Core i7-9700E, 16 GB DDR4 x2 pcs                                                                                                                                                                                                                                                                                                                                                                  |                      |                        |                      |                        |                      |                          |                         |
|                          |                                  | +5V                                                                                                                                                                                                                                                                                                                                                                                                     | +3.3V                | 12V_4P                 | 12V                  | -12V                   | 5VSB                 |                          |                         |
| Environment              | Temperature                      | 0.7A                                                                                                                                                                                                                                                                                                                                                                                                    | 0.78A                | 3.462A                 | 0.303A               | 0A                     | 0.53A                |                          |                         |
|                          |                                  | Operating<br>0 ~ 60° C (32 ~ 140° F), depends on CPU speed and cooler solution                                                                                                                                                                                                                                                                                                                          |                      |                        |                      |                        |                      |                          |                         |
| Physical Characteristics | Dimensions                       | 244 mm x 244 mm (9.6" x 9.6")                                                                                                                                                                                                                                                                                                                                                                           |                      |                        |                      |                        |                      |                          |                         |

## Block Diagram



## Ordering Information

| Part Number      | PCH  | Memory  | VGA | DVI | DP  | eDP/LVDS | USB 3.0/2.0 | COM | SATA | LAN | PCIe x 16 | PCIe x 1 | M.2 B-Key | PCI slot | AMP |
|------------------|------|---------|-----|-----|-----|----------|-------------|-----|------|-----|-----------|----------|-----------|----------|-----|
| AIMB-506F-00A1E  | H310 | Non ECC | 1   | 1   | 1   | 1/(1)    | 8/12        | 14  | 3    | 2   | 1         | 1        | 1         | 2        | 1   |
| AIMB-506G2-00A1E | H310 | Non ECC | 1   | 1   | 1   | (1)/(1)  | 4/8         | 10  | 3    | 2   | 1         | 1        | 1         | 2        | 1   |
| AIMB-506L-00A1E  | H310 | Non ECC | 1   | 1   | (1) | -/-      | 4/4         | 2   | 3    | 1   | 1         | 1        | 0         | 0        | (1) |

\*) BOM options available on MP version.

## Riser Card

| Part Number      | Description                             |
|------------------|-----------------------------------------|
| AIMB-RP10P-01A1E | 1U riser card with 1 PCI expansion      |
| AIMB-RP30P-03A1E | 2U riser card with 3 PCI expansion      |
| AIMB-RF10F-01A1E | 1U riser card with 1 PCIe x16 expansion |

## Packing List

| Part Number        | Description                               | Quantity |
|--------------------|-------------------------------------------|----------|
| 1700003194         | Serial ATA HDD data cable                 | 2        |
| 17AD14GS1400013V04 | 4 in 1 COM cable 500mm (IDE 40-pin 2.0mm) | 1        |
| 1701200220         | 1-to-2 serial port cable, 22cm            | 1        |
| TBD                | I/O port bracket                          | 1        |
| TBD                | Startup manual                            | 1        |

## I/O View



## Optional Accessories

| Part Number    | Description                                                                       |
|----------------|-----------------------------------------------------------------------------------|
| 1960053207N001 | LGA1150 CPU cooler for CPU TDP 65W, 92.9 (W) x 92.9 (L) x 46 (H) mm               |
| 1960060732N001 | LGA1150 CPU cooler for CPU TDP 45W, 80 (W) x 80 (L) x 32.2 (H) mm                 |
| 1700000447     | 1-to-4 serial ports cable kit, 45cm                                               |
| 1701400181     | 1-to-4 serial ports cable kit, 18cm                                               |
| 1700002204     | Dual port USB 2.0 cable 27cm with bracket                                         |
| 1703060191     | KBMS cable 1*6P-2.0/DIN-6P(F)*2, 22 cm                                            |
| 1700025715-01  | KBMS cable 1*6P WAFER/PS2*2 w/ BRACKET 35CM                                       |
| TBD            | 1U IO bracket for chassis ACP-1010MB & HPC-7120S (should order screws separately) |

Note: Purchasing AIMB-506's proprietary CPU cooler from Advantech is a must; other brands of CPU coolers are NOT compatible with AIMB-506.

## Embedded OS/API

| OS/API | Part No | Description |
|--------|---------|-------------|
| Win 10 | TBD     | image W10   |