

# 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**



## 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:



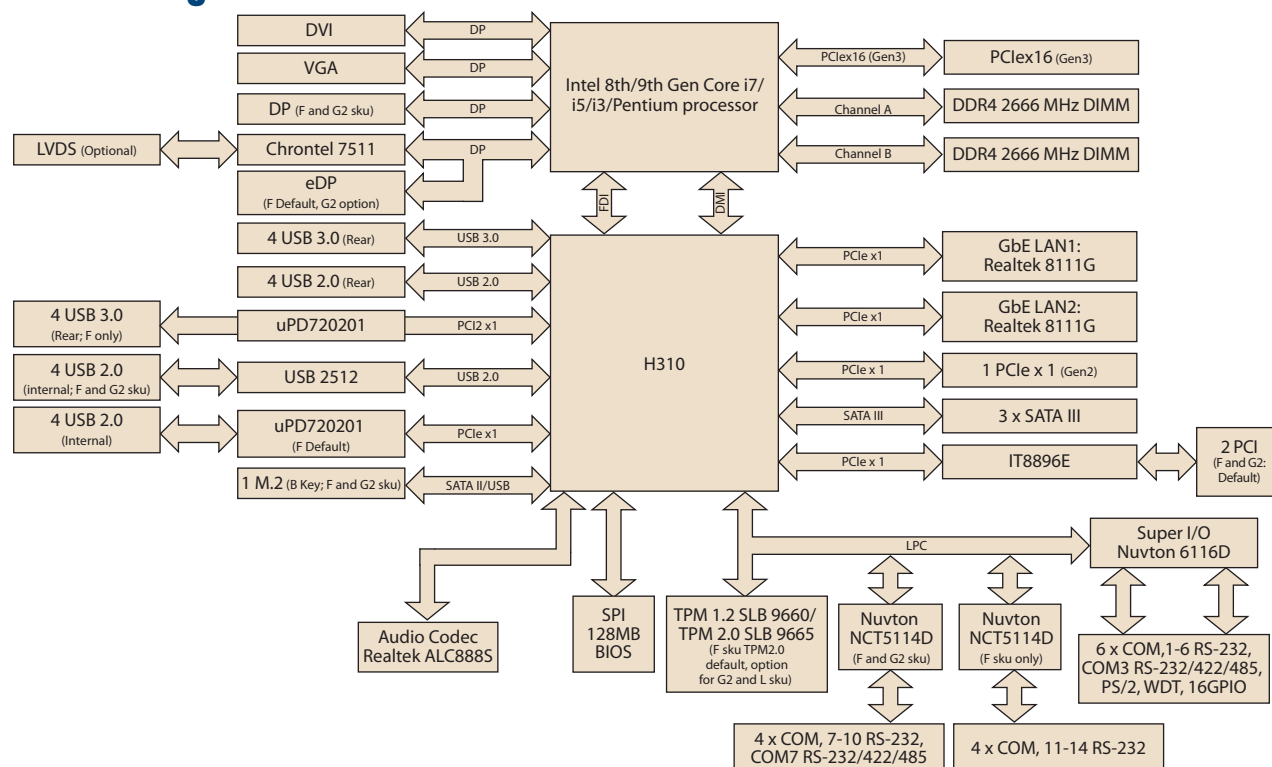
### Utilities:



## 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>G5400/G5400T | 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                          | 12MB/12MB                                                                                                                                                                                                                                                                                                                                                                                               | 12MB/12MB                    | 9MB/9MB                | 9MB/9MB              | 6MB/6MB                | 6MB/6MB              | 4MB/4MB                 | 2MB/2MB                 |  |
|                          | TDP (W)                           | 65W/35W                                                                                                                                                                                                                                                                                                                                                                                                 | 65W/35W                      | 65W/35W                | 65W/35W              | 65W/35W                | 65W/35W              | 58W/25W                 | 54W/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 (Gen3)                   | 1 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                                                                                                                                                                                                                                                                                                                                                                   |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Dual Display                      | DP+DVI-D, DP+VGA, DVI-D+VGA, DP+eDP (LVDS), DVI-D+eDP (LVDS), VGA+eDP (LVDS)                                                                                                                                                                                                                                                                                                                            |                              |                        |                      |                        |                      |                         |                         |  |
| Ethernet                 | Interface                         | 10/100/1000 Mbps                                                                                                                                                                                                                                                                                                                                                                                        |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Controller                        | GbE LAN1: Realtek RTL8111G<br>GbE LAN2: Realtek RTL8111G                                                                                                                                                                                                                                                                                                                                                |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Connector                         | RJ-45 x 2                                                                                                                                                                                                                                                                                                                                                                                               |                              |                        |                      |                        |                      |                         |                         |  |
| SATA                     | Max Data Transfer Rate            | 600 MB/s (SATA 3.0)                                                                                                                                                                                                                                                                                                                                                                                     |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Channel                           | 3                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
|                          | VGA                               | 1                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
| Rear I/O                 | DVI-D                             | 1                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Ethernet                          | 2 (F, G2 x2, L x1)                                                                                                                                                                                                                                                                                                                                                                                      |                              |                        |                      |                        |                      |                         |                         |  |
|                          | USB                               | 12 (8 USB 3.0, 4 USB 2.0 on F sku)<br>8 (4 USB 3.0, 4 USB 2.0 on G2 and L sku)                                                                                                                                                                                                                                                                                                                          |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Display port                      | 1 (F and G2 only)                                                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Audio                             | 2 (Mic-In, Line-out)                                                                                                                                                                                                                                                                                                                                                                                    |                              |                        |                      |                        |                      |                         |                         |  |
|                          | USB                               | 8 ( F sku, 8 USB 2.0)<br>4 (G2, L sku, 4 USB 2.0)                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
| Internal Connector       | 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                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Watchdog Timer                    | Output                                                                                                                                                                                                                                                                                                                                                                                                  | System reset                 |                        |                      |                        |                      |                         |                         |  |
|                          |                                   | Interval                                                                                                                                                                                                                                                                                                                                                                                                | Programmable 1 ~ 255 sec/min |                        |                      |                        |                      |                         |                         |  |
| Power Requirements       |                                   | Intel Core i7-9700E, 16 GB DDR4 x2 pcs                                                                                                                                                                                                                                                                                                                                                                  |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Power On                          | +5V<br>0.7A                                                                                                                                                                                                                                                                                                                                                                                             | +3.3V<br>0.78A               | 12V_4P<br>3.462A       | 12V<br>0.303A        | -12V<br>0A             | 5VSB<br>0.53A        |                         |                         |  |
| Environment              |                                   | Operating                                                                                                                                                                                                                                                                                                                                                                                               |                              |                        |                      |                        |                      |                         |                         |  |
|                          | Temperature                       | 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) |
| AIMB-506G2-00A1N** | H310 | Non ECC | 1   | 1   | 1   | (1)/(1)  | 4/8         | 10  | 3    | 2   | 1         | 1        | 1         | 2        | 1   |

\*(1) BOM options available on MP version.

\*\*no audio function.

## 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        |
| 1700031615-01       | 1-to-2 serial port cable, 50cm            | 1        |
| 1960094997T001      | I/O port bracket                          | 1        |
| 2046050600          | Startup manual                            | 1        |

\*Only for F and G2 Sku.

## 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                           |
| 1700018699     | A CABLE 1*6P-2.5/M-DIN 6P(F)*2 25cm                                 |

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                                                         |
|---------------|----------------|---------------------------------------------------------------------|
| Win10 IoT EnT | 20706WX9HS0057 | img W10 19HL                                                        |
|               | 20706WX9VS0061 | img W10 19VL                                                        |
|               | 20706WX9ES0071 | img W10 19EL                                                        |
| Ubuntu20.4    | 20706U20DS0044 | Ubuntu Desktop 20.04 LTS 64bit Image & license sticker for AIMB-506 |