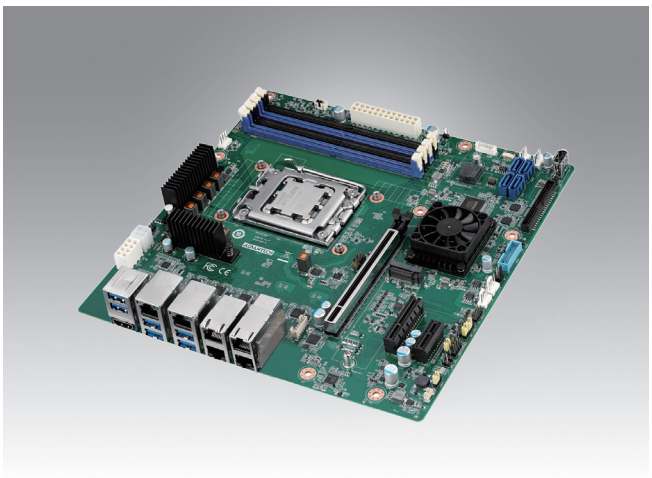
# AIMB-523E

## Micro-ATX Motherboard AMD EPYC™ Embedded 4005 Series Processors



## Features

- AMD EPYC™ Embedded 4005 Series processors with B650 chipset
- 6 LAN ports with 2.5GbE
- High-speed expansions: PCIex16 Gen5, 8 USB 3.2, 1 M.2 M-key (PCIe Gen4 x4)
- 1 internal USB2.0 type A to support USB keylock functions
- Support Windows Server

**Software APIs:** SMBus, H/W Monitor, Watchdog, GPIO

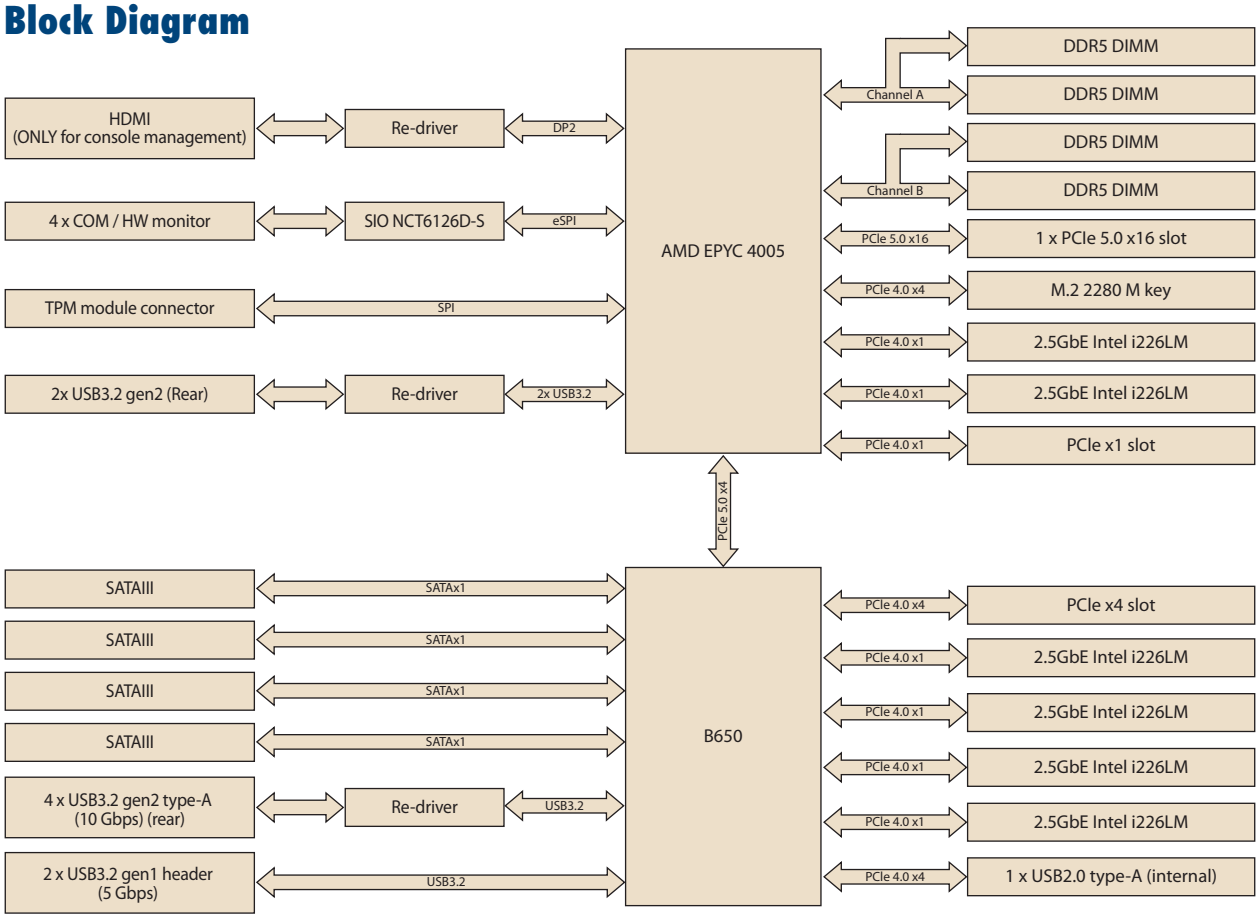
**Utilities:** BIOS flash, Monitoring

Windows Server WISE-DeviceOn CE FCC

## Specifications

| | | | | | | |
|---|---|---|---|---|---|---|
| AMD Ryzen™ Embedded 9000 Processors | CPU | 4565P | 4545P | 4465P | 4345P | 4245P |
| | Core | 16 | 16 | 12 | 8 | 6 |
| | Base frequency (GHz) | 4.3 | 3 | 3.4 | 3.8 | 3.9 |
| | Max Speed (GHz) | 5.7 | 5.4 | 5.4 | 5.5 | 5.4 |
| | L3 Cache (MB) | 64 | 64 | 64 | 32 | 32 |
| | TDP (W) | 170 | 65 | 65 | 65 | 65 |
| Processor System | Chipset | B650 | | | | |
| | BIOS | AMI EFI 256 Mbit SPI | | | | |
| Memory | Technology | DDR5, Dual Channel, support UDIMM | | | | |
| | Frequency | 5600MT/s (2SPC, 1DCP, non-ECC), 5200MT/s (2SPC, 1DCP, ECC), 3600MT/s (2SPC, 2DPC, non-ECC) | | | | |
| | Max. Capacity | 192GB (up to 48GB per DIMM) | | | | |
| | ECC Support | Yes | | | | |
| | Socket | 4 x 288-pin DDR5 UDIMM sockets | | | | |
| Graphics | Controller | Radeon™ Graphics | | | | |
| | HDMI | 1, up to 3840 x 2160@60Hz (ONLY for console management) | | | | |
| Network | Ethernet | 10/100/1000/2500 Mbps | | | | |
| | Controller | 6 x Intel I226LM 2.5 GbE | | | | |
| | Connector | 6 x RJ45 | | | | |
| SATA | Max data transfer rate | Max. 600 MB/s | | | | |
| | Channel | 4 | | | | |
| Expansion Slot | M.2 | 1 x M-key (2280, for NVMe SSD, PCIe gen4x4) | | | | |
| | PCIe x1 | 1 x PCIe x1 slot with x1 Gen4 lanes | | | | |
| | PCIe x4 | 1 x PCIe x4 slot with x4 Gen4 lanes | | | | |
| | PCIe x16 | 1 x PCIe x16 slot with x16 Gen5 lanes | | | | |
| Rear I/O | HDMI | 1 (ONLY for console management) | | | | |
| | RJ45 | 6 x RJ45 | | | | |
| | USB | 6 x USB3.2 Gen2 type A | | | | |
| Internal Connector | USB | 2 x USB3.2 Gen1 (one box header)<br>1 x USB 2.0 type A vertical connector | | | | |
| | Serial | 4, COM1&2 support RS-232/422/485; COM3&4 support RS-232 | | | | |
| | SATA | 4 | | | | |
| | GPIO | 1 x 8-bit | | | | |
| | Intrusion Protection | 1 | | | | |
| | M.2 | 1 x M-key | | | | |
| | CPU & System Fan Connector | 1 x PWM CPU FAN<br>4 x PWM SYS FAN | | | | |
| | Power Connector | 1 x ATX PSU 24pin power connector<br>1 x ATX PSU 8pin power connector for CPU/APU | | | | |
| Watchdog Timer | Output | System reset | | | | |
| | Interval | Programmable 1 ~ 255 (second or minute) | | | | |
| Power Requirements | Input voltage | ATX | | | | |
| | Connector | 1 x ATX PSU 24pin power connector<br>1 x ATX PSU 8pin power connector for CPU/APU | | | | |
| | Operation | +5V | 3.3V | 12V | 12V_8P | |
| | Configuration: AMD EPYC 4565P 16-Core Processor 4.3GHz with UDIMM DDR5 5600 48GB*4pcs | 4.56920A | 1.45071A | 2.27760A | 24.12390A | |
| | Standby (5Vsb) | 3A | | | | |
| Environment | Temperature | Operating: 0 ~ 60° C (32 ~ 140° F), depends on CPU speed and cooler solution | | | | |
| | Storage | Non-Operating: -40 ~ 85° C (-40 ~ 185° F) | | | | |
| Physical Characteristics | Dimensions | 244 mm x 244 mm (9.6" x 9.6") | | | | |

## Block Diagram




## Ordering Information

| P/N | Chipset | Support CPU TDP | Memory slot | USB 3.2 Gen2 | USB 3.2 Gen1 | USB 2.0 Internal TypeA | PCIe x16 (Gen 5 ) | PCIe x4 (Gen 4 ) | PCIe x1 (Gen 4) | M.2 (Gen 4) | 2.5 GbE LAN PSE Support | 2.5 GbE LAN | HDMI | SATA III | COM | TPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIMB-523E-PAA1 | B650 | 65~170W | 4 | 6 | 2 | 1 | 1 | 1 | 1 | 1 | 2* | 4 | 1** | 4 | 4 | (1)*** |

() means BOM option
*Please refer to the Optional Accessories for MIOe-PSE module to support PSE function (a module supports two PSE LAN)
**ONLY for console management
***Please refer to the Optional Accessories for TPM module

## Packing List

| Part Number | Description | Quantity |
|---|---|---|
| 1700003194 | SATA HDD cable | 2 |
| 1700000447 | 1-to-4 serial ports cable | 1 |
| 1960116132T001 | I/O port bracket | 1 |
| 1930005673-11 | M.2 screws | 1 |
| 2046052300 | AIMB-523 Startup manual | 1 |

## Optional Accessories

| Part Number | Description |
|---|---|
| AIMB-TPMSPI-0IA1 | TPM 2.0 SPI module (SLB9672 FW15.23) |
| MIOE-PSE-DPA1 | MIOe-PSE Dual Port 15.4W PoE PSE module |
| 1970005287T001 | AMD AM5 CPU cooler H: 79.55mm (for TDP 65W, Operating Ta 60°C) |

## Embedded OS/API

| OS/API | P/N | Description |
|---|---|---|
| Windows Server | 20706WS25S0001 | img Win Server 64b 2025 ENU |

## I/O view



AIMB-523E-PAA1