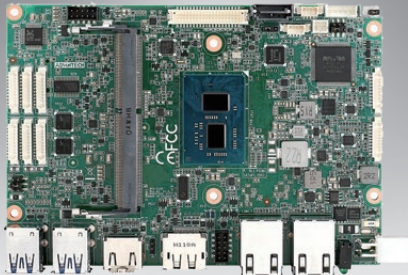


MIO-5152

Intel® Atom® x6000E series and Intel® Celeron® N and J series 3.5" SBC

Preliminary



Features

- Atom® x6000E series and Intel® Celeron® J and N series with Quad/Dual Cores, TDP 6W/ 10W/ 12W
- Single Channel DDR4-3200 up to 32GB
- 3 independent displays via LVDS, DP1.4, and HDMI 1.4 up to 4K@30Hz
- Dual GbE, 6 USB, 6 UART, TPM2.0
- CE/FCC Class B, Coastline I/O ESD 8KV/15KV Criteria A
- Support Windows 10 LTSC & Ubuntu 20.04 LTS, embedded software APIs, WISE-DeviceOn

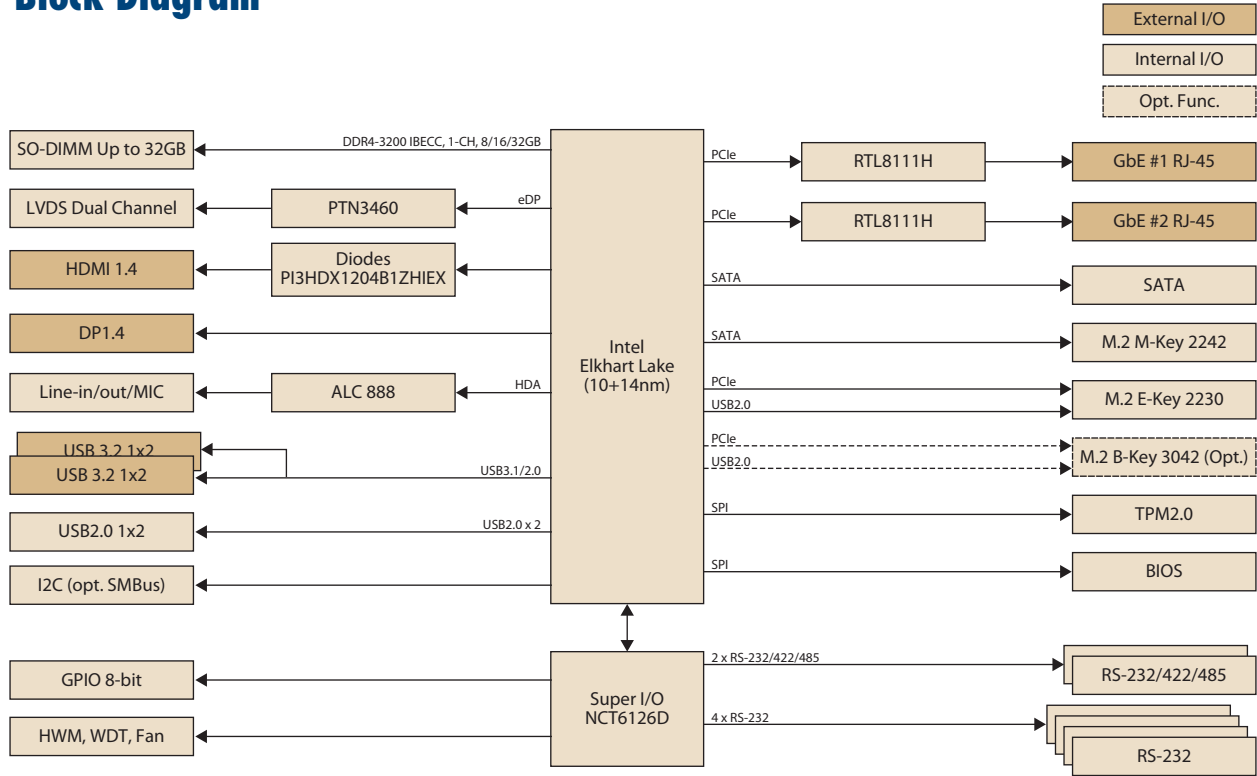
Software APIs:



Specifications

| | Processor | Intel® Celeron® J6412 | Intel® Celeron® N6210 | Intel Atom® x6425E |
|---------------|----------------------|--|-----------------------|------------------------------|
| Platform | Max Frequency | 2.6GHz | 2.6GHz | 3.0GHz |
| | Base Frequency | 2.0GHz | 1.2GHz | 2.0GHz |
| | Core/Thread | 4/4 | 2/2 | 4/4 |
| | LLC | L2 | L2 | L2 |
| | CPU TDP | 10W | 6.5W | 12W |
| | Chipset | Intel® Chipset (SoC Integrated) | | |
| | BIOS | AMI EFI 256Mbit | | |
| Memory | Technology | DDR4-3200 SDRAM | | |
| | Max Capacity | 32GB | | |
| | Channel/Socket | Single Channel/ 1 Socket | | |
| | ECC Support | N/A | N/A | In-Band ECC Supported by SoC |
| Graphic | Controller | Intel Gen11 Graphics Engines (SoC integrated) | | |
| | Max Frequency | 800MHz | 750MHz | 750MHz |
| | Base Frequency | 400MHz | 250MHz | 500MHz |
| | Graphic Memory | TBU | | |
| | 3D/HW Acceleration | DX12, OGL4.5, OCL1.2, Vulkan 1.1, MPEG2, H.264, JPEG/MJPEG, H.265 (HEVC) | | |
| Display I/F | LCD | 1 x LVDS: Dual Channel 18/24-bit, up to 1920 x 1200 | | |
| | HDMI/DP | 1 x HDMI 1.4, up to 4096 x 2160 x 24bpp@30Hz 1 x DP1.4a, up to 4096 x 2160 x 36bpp@60Hz | | |
| | Triple Display | 3 simultaneous displays with LVDS, HDMI, DP | | |
| External I/O | Ethernet | 2 x RJ-45; LAN1: Realtek RTL8111H, LAN2: Realtek RTL8111H | | |
| | HDMI/DP | 1/1 | | |
| | USB3.2 | 4 x TypeA; 4 x USB3.2 Gen2 (10Gbps) | | |
| | Power DC-Jack | Optional | | |
| Internal I/O | SATA | 1 x SATA GenIII 6.0 Gbps | | |
| | USB | 2 x USB2.0 | | |
| | Serial Bus | I2C | | |
| | COM Ports | 2 x RS-232/422/485 (Max baud rate: 1Mbps), 4 x RS-232 | | |
| | GPIO | 8-bit general purpose input output I/O | | |
| | Audio | Realtek ALC888S, Line-in/Line-out/MIC | | |
| | Inverter | 12V/5V | | |
| | SPI Bus | eSPI | | |
| | Fan | 4-wire smart fan | | |
| | Front Panel Control | Power-on, Reset, Buzzer, SATA LED, CaseOpen | | |
| Board Feature | Watchdog Timer | Programmable 1 ~ 255 sec/min | | |
| | TPM | TPM2.0 | | |
| Expansion | M.2 E-Key/B-Key | E-Key for wireless module (Type: 2230) optional B-Key for LTE module | | |
| | M.2 M-Key | M-Key support SATA M.2 2242 module | | |
| Power | Supply Voltage | Vin: DC 12V ± 10%; RTC Battery Lithium 3V/210mAh | | |
| | Connector | ATX 2x2pin 90D, optional DC-Jack | | |
| | Power Management | AT, ATX mode | | |
| | Max Consumption | 1.78 @12V (21.39Watt) | | |
| Environment | Idle Consumption | 0.61 @12V (7.31Watt) | | |
| | Temperature | Operating Standard: 0 ~ 60 °C (32 ~ 140 °F) | | |
| | Humidity | Operating: 40 @95% relative humidity, non-condensing | | |
| Certification | Vibration Resistance | 3.5 Grms | | |
| | EMC | CE, FCC Class B | | |
| Mechanical | Dimensions | 146 x 102 mm (5.7" x 4") | | |
| | Net weight | | | |

Block Diagram



Ordering Information

| Part Number | CPU | TDP | Max. Frequency | Core | GbE | USB3.1 | USB3.0 | USB2.0 | RS232/422/485 | RS232 | TPM2.0 | Thermal solution | Operating Temp |
|----------------|---------------------------------|------|----------------|------|-----|--------|--------|--------|---------------|-------|--------|------------------|----------------|
| MIO-5152J-U6A1 | Intel® Celeron® Processor J6412 | 10W | 2.6GHz | 4 | 2 | 2 | 2 | 2 | 2 | 4 | Y | Passive | 0 ~ 60° C |
| MIO-5152N-U6A1 | Intel® Celeron® Processor N6210 | 6.5W | 2.6GHz | 2 | 2 | 2 | 2 | 2 | 2 | 4 | Y | Passive | 0 ~ 60° C |
| MIO-5152A-POA1 | Intel Atom® x6425E Processor | 12W | 3.0GHz | 4 | 2 | 2 | 2 | 2 | 2 | 4 | Y | Passive | 0 ~ 60° C |

Packing List

| Part No. | Description | Quantity |
|----------------|--|----------|
| | MIO-5152 SBC | |
| | Startup Manual | |
| 1970005053T011 | MIO-5152 Passive Heatsink for Celeron series | 1 |
| 1970005053T001 | MIO-5152 Passive Heatsink for x6000E | 1 |
| 1700006291 | M Cable SATA 7P/SATA 7P 30cm C=R 180/90 | 1 |
| 1700031583-01 | M CABLE SATA 15P/1*2P-2.0 35cm | 1 |
| 1700030406-01 | M Cable 2*5P-2.0/USB-A 4P(F)*2 20cm | 1 |
| 1700030404-01 | F Cable D-SUB 9P(M)/1*10P-1.25 20cm | 6 |
| 1700019584-01 | A Cable 2*5P-2.0/Audio JACK*3 20cm | 1 |

Embedded OS/API

| OS | Part No. | Description |
|------------------|---------------------|-------------------------|
| Win10 | TBD | 64-bit (UEFI mode only) |
| Ubuntu 20.04 LTS | TBD | |
| Software API | Download by website | |

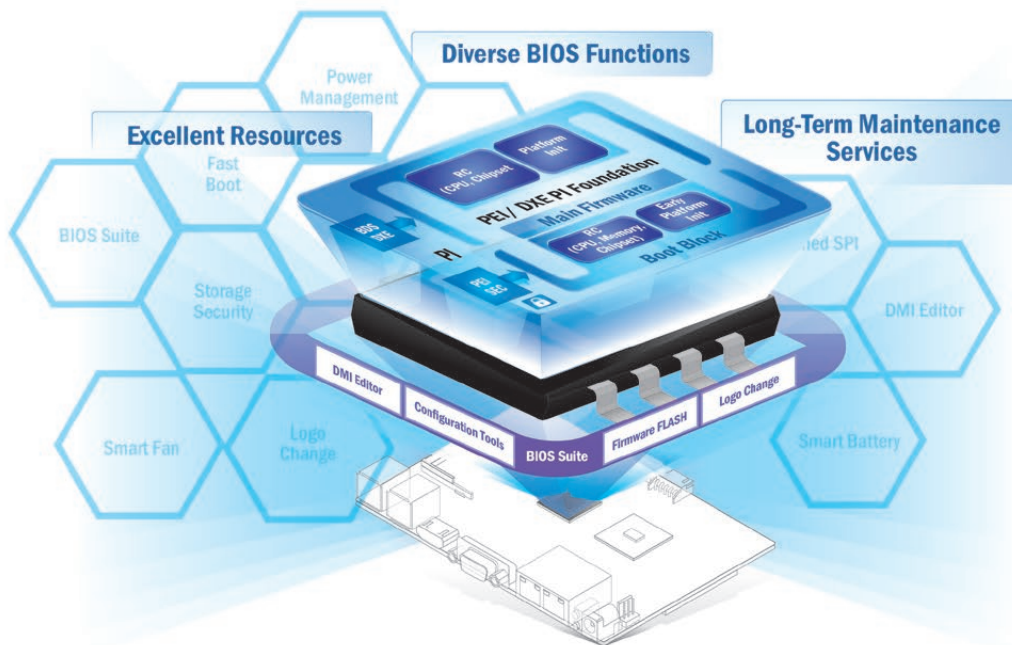
Rear IO View



Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.



Embedded BIOS Solution Advantages

Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

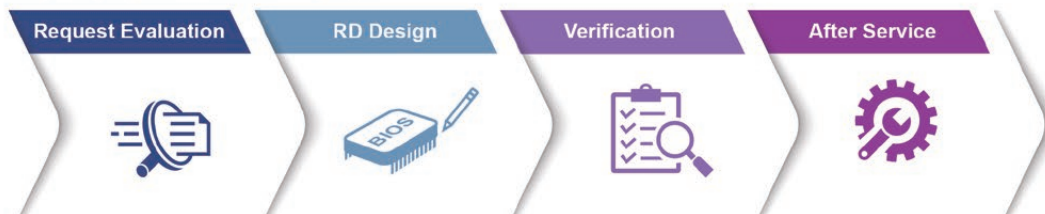
Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

Value-Added Customization Process



Embedded Linux Support and Design-in Services

Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.



Features

| Certified OS and BSP | Licensed Services | Numerous AI and Edge Resources | Local Partner Alliance |
|---|--|---|--|
| <ul style="list-style-type: none"> Platform compatibility tests Preloaded functional driver and software stacks | <ul style="list-style-type: none"> License authorized Canonical delivers 10-years of bug fixes and security updates In-house bundled service | <ul style="list-style-type: none"> Containerized technology for service provision and deployment AI resources from Caffe, TensorFlow, and mxnet | <ul style="list-style-type: none"> Embedded Linux and Android Alliance (ELAA) |

Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.



| 5x Performance Boost | All-in-one Installation | One Click AI Experience | Plug-and-play Environment | Discover Cost-effective Hardware |
|---|---|---|---|---|
| <ul style="list-style-type: none"> Integrated Intel® OpenVINO™ technology Boost AI using Advantech hardware | <ul style="list-style-type: none"> Build AI environment in under 5 minutes Ready-to-use configuration | <ul style="list-style-type: none"> User friendly configuration guidance One-click Benchmark acquisition | <ul style="list-style-type: none"> Easy access to 100+ AI inference extensions Software development package available | <ul style="list-style-type: none"> Diverse CPU/RAM options Find hardware solutions for AI development |

WISE-DeviceOn

Massive IoT Device Management Utility

IoT deployment and management typically involves numerous disparate devices installed on multiple sites. These devices require effective monitoring, managing, and tracking. Advantech's easy-to-use WISE-DeviceOn interface enables users to remotely monitor device health, troubleshoot problems, and send software/firmware updates over-the-air (OTA). In sum, DeviceOn empowers quick real-time responsiveness to emerging problems.



Features

| Comprehensive Management | Remote Access | Efficient Operations |
|--|--|--|
| <ul style="list-style-type: none"> • Devices status • Peripherals/firmware • Open for extension | <ul style="list-style-type: none"> • Real-time monitoring • Remote controls • Troubleshooting | <ul style="list-style-type: none"> • Zero-touch on-boarding • OTA updates • Batch control |

Product Highlights



SOM-6883

High-performance 11th Gen Intel[®] COMe Type 6 Module



MIO-5375

Compact 11th Gen Intel[®] Outdoor Focused 3.5" SBC



EPC-B5587

10th Gen Intel[®] Xeon[®] based Edge server



EPC-R3220

Arm based IoT Edge Gateway