

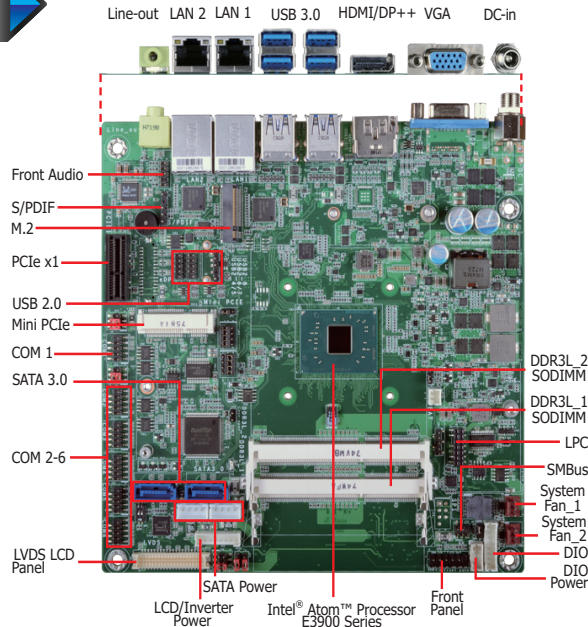


## Intel® Atom™ Processor E3900 Series Mini-ITX



# AL171/AL173

Atom



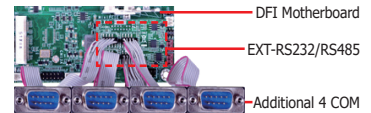
\* The photos above refer to AL173.

### Features

- 2 DDR3L 1867MHz SODIMM up to 8GB
- Three independent displays: (VGA/DP++) + (HDMI/DP++) + (LVDS/eDP)
- DP++ resolution supports up to 4096x2160 @ 60Hz
- Multiple expansion: 1 M.2 B key, 1 PCIe x1, 1 Mini PCIe
- LPC EXT-RS232/485 module extends additional 4 COM ports
- Rich I/O: 2 Intel GbE, 6 COM, 4 USB 3.0, 5 USB 2.0



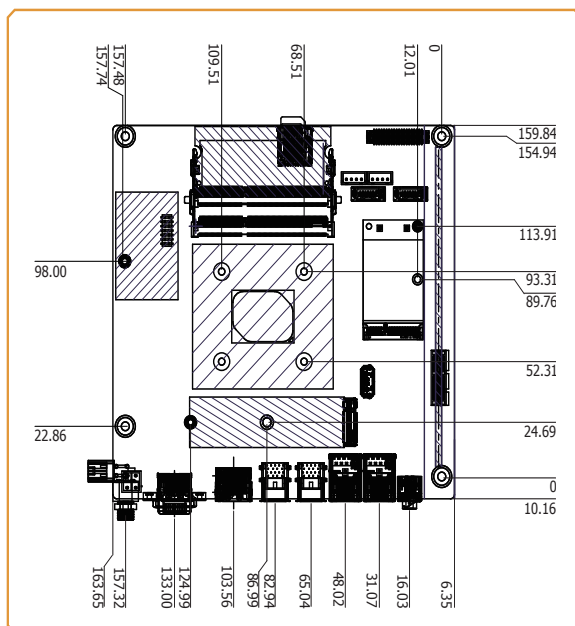
### 2 Extension Modules for Additional 4 COM Ports (via the LPC connector)



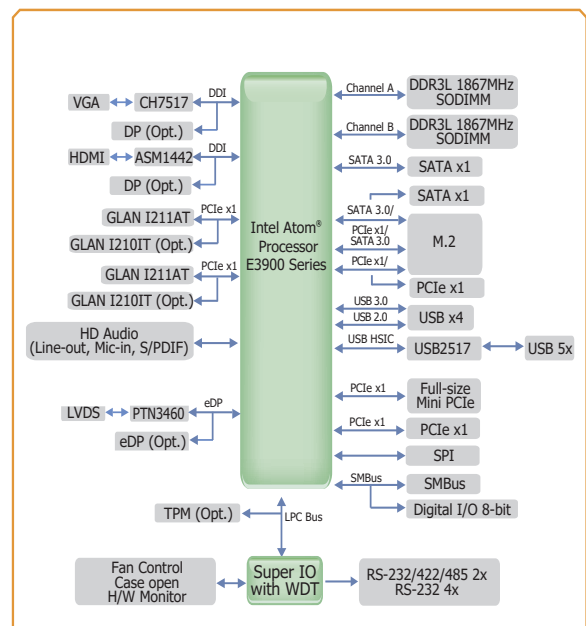
### Ordering Information

| Model Name     | P/N             | Processor | Memory   | VGA/DP++ | HDMI/DP++ | LVDS/eDP | RS-232/422/485 | RS-232 | USB 3.0 | USB 2.0 | Power     | Thermal | Temp.       |
|----------------|-----------------|-----------|----------|----------|-----------|----------|----------------|--------|---------|---------|-----------|---------|-------------|
| AL171-CB-N4200 | 770-AL1712-000G | N4200     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 12V DC    | Fanless | 0 to 60°C   |
| AL171-CT-E3930 | 770-AL1712-100G | E3930     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 12V DC    | Fanless | -40 to 85°C |
| AL171-CB-E3950 | 770-AL1712-300G | E3950     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 12V DC    | Fanless | 0 to 60°C   |
| AL171-CT-E3950 | 770-AL1712-800G | E3950     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 12V DC    | Fanless | -40 to 85°C |
| AL173-CB-N4200 | 770-AL1732-000G | N4200     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 15-36V DC | Fanless | 0 to 60°C   |
| AL173-CT-E3930 | 770-AL1732-100G | E3930     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 15-36V DC | Fanless | -40 to 85°C |
| AL173-CT-E3950 | 770-AL1732-800G | E3950     | 2 SODIMM | VGA      | DP++      | LVDS     | 2              | 4      | 4       | 5       | 15-36V DC | Fanless | -40 to 85°C |

### Mechanical Drawing



### Block Diagram





## Specifications

|                        |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                        |
|------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYSTEM                 | Processor         | Intel Atom <sup>®</sup> Processor E3900 Family, BGA 1296<br>Intel Atom <sup>®</sup> x7-E3950 Processor, Quad Core, 2M Cache, 1.6GHz (2.0GHz), 12W<br>Intel Atom <sup>®</sup> x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9.5W<br>Intel Atom <sup>®</sup> x5-E3930 Processor, Dual Core, 2M Cache, 1.3GHz (1.8GHz), 6.5W<br>Intel <sup>®</sup> Pentium <sup>®</sup> N4200 Processor, Quad Core, 2M Cache, 1.1GHz (2.5GHz), 6W |                                                                                                                                                                                                                                        |
|                        | Memory            | Two 204-pin SODIMM up to 8GB                                                                                                                                                                                                                                                                                                                                                                                                               | Dual Channel DDR3L 1867MHz                                                                                                                                                                                                             |
|                        | BIOS              | Insyde SPI 128Mbit (supports UEFI boot only)                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                        |
|                        | Controller        | Intel <sup>®</sup> HD Graphics GT Series                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                        |
| GRAPHICS               | Feature           | OpenGL 5.0, DirectX 12, OpenCL 2.1<br>HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H.265, VP8, VP9, MVC<br>HW Encode: AVC/H.264, JPEG/MJPEG, HEVC/H.265, VP8, VP9, MVC                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                        |
|                        | Display           | 1 x VGA/DP++<br>1 x HDMI/DP++<br>1 x LVDS/eDP                                                                                                                                                                                                                                                                                                                                                                                              | VGA: resolution up to 1920x1200 @ 60Hz<br>LVDS: dual channel 48-bit, resolution up to 1920x1200 @ 60Hz<br>HDMI: resolution up to 3840x2160 @ 30Hz<br>DP++: resolution up to 4096x2160 @ 60Hz<br>eDP: resolution up to 3840x2160 @ 60Hz |
|                        | Triple Displays   | VGA + HDMI + LVDS<br>VGA + HDMI + eDP<br>DP + HDMI + LVDS<br>DP + HDMI + eDP                                                                                                                                                                                                                                                                                                                                                               | VGA + DP + LVDS<br>VGA + DP + eDP<br>DP + DP + LVDS<br>DP + DP + eDP                                                                                                                                                                   |
|                        | Interface         | 1 x PCIe x1 (Gen 2)<br>1 x M.2 B Key 2242/2280 (PCIe/SATA/USB)                                                                                                                                                                                                                                                                                                                                                                             | 1 x Full-size Mini PCIe (PCIe/USB)                                                                                                                                                                                                     |
| AUDIO                  | Audio Codec       | Realtek ALC262-VC2-GR                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                        |
| ETHERNET               | Controller        | -40~85°C: 2 x Intel <sup>®</sup> I210IT PCIe (10/100/1000Mbps) or<br>0~60°C: 2 x Intel <sup>®</sup> I211AT PCIe (10/100/1000Mbps)                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                        |
| REAR I/O               | Ethernet          | 2 x GbE (RJ-45)                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                        |
|                        | USB               | 4 x USB 3.0                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                        |
|                        | Display           | 1 x HDMI/DP++                                                                                                                                                                                                                                                                                                                                                                                                                              | 1 x VGA/DP++                                                                                                                                                                                                                           |
|                        | Audio             | 1 x Line-out                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                        |
| INTERNAL I/O           | Serial            | 2 x RS-232/422/485 (RS-232 w/ power) (2.0mm pitch)<br>4 x RS-232 (2.0mm pitch)                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                        |
|                        | USB               | 4 x USB 2.0 (2.0mm pitch)<br>1 x USB 2.0 (2.54mm pitch) or 1 x Vertical USB 2.0 (type A) (available upon request)                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                        |
|                        | Display           | 1 x LVDS LCD Panel Connector<br>1 x LCD/Inverter Power<br>1 x eDP LCD Panel Connector                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                        |
|                        | Audio             | 1 x S/PDIF<br>1 x Audio (Line-out/Mic-in)                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |
|                        | SATA              | 2 x SATA 3.0 (up to 6Gb/s)                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                        |
|                        | DIO               | 1 x 8-bit DIO                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                        |
|                        | LPC               | 1 x LPC (supports LPC EXT-RS232/RS485 module)                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                        |
|                        | SMBus             | 1 x SMBus                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |
|                        | Output & Interval | System Reset, Programmable via Software from 1 to 255 Seconds                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                        |
| WATCHDOG TIMER         | TPM               | dTPM2.0 (opt.)                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                        |
| SECURITY               | Type              | Single 12V +/-10% DC (AL171)                                                                                                                                                                                                                                                                                                                                                                                                               | Wide Range 15~36V (AL173)                                                                                                                                                                                                              |
| POWER                  | Connector         | DC-in Jack                                                                                                                                                                                                                                                                                                                                                                                                                                 | Right Angle Connector (4-pin) (available upon request)<br>Vertical Type Connector (4-pin) (available upon request)                                                                                                                     |
|                        | Consumption       | Idle: E3950 12W: 12V @ 0.59A (7.08W)<br>Max: E3950 12W: 12V @ 2.23A (26.76W)                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                        |
|                        | RTC Battery       | CR2032 Coin Cell                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                        |
|                        | Microsoft/Linux   | Windows 10 IoT Enterprise (64-bit)                                                                                                                                                                                                                                                                                                                                                                                                         | Linux                                                                                                                                                                                                                                  |
| OS SUPPORT (UEFI Only) | Temperature       | Operating: 0 to 60°C, -40 to 85°C                                                                                                                                                                                                                                                                                                                                                                                                          | Storage: -40 to 85°C                                                                                                                                                                                                                   |
| ENVIRONMENT            | Humidity          | Operating: 5 to 90% RH                                                                                                                                                                                                                                                                                                                                                                                                                     | Storage: 5 to 90% RH                                                                                                                                                                                                                   |
|                        | MTBF              | AL171: 364,946 hrs @ 25°C; 201,162 hrs @ 45°C; 122,570 hrs @ 60°C<br>AL173: 358,096 hrs @ 25°C; 197,806 hrs @ 45°C; 119,639 hrs @ 60°C<br>Calculation model: Telcordia Issue 2<br>Environment: GB, GC – Ground Benign, Controlled                                                                                                                                                                                                          |                                                                                                                                                                                                                                        |
|                        | Dimensions        | Mini-ITX Form Factor                                                                                                                                                                                                                                                                                                                                                                                                                       | 170mm (6.7") x 170mm (6.7")                                                                                                                                                                                                            |
| MECHANICAL             | Height            | PCB: 1.6mm                                                                                                                                                                                                                                                                                                                                                                                                                                 | Top Side: 16.34mm, Bottom Side: 3.30mm                                                                                                                                                                                                 |
| CERTIFICATION          | CE, FCC, RoHS, UL |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                        |

## Packing List

|                                                      |                 |
|------------------------------------------------------|-----------------|
| • 1 AL171/AL173 motherboard                          |                 |
| • 1 COM port cable (Length: 250mm, 1 x COM port)     | A81-015011-001G |
| • 1 Serial ATA data with power cable (Length: 300mm) | A81-002013-000G |
| • 1 Heatsink                                         |                 |

## Optional Items

|                                                    |                 |
|----------------------------------------------------|-----------------|
| • USB port cable (Length: 200mm)                   | A81-001032-016G |
| • COM port cable (Length: 250mm, 1 x COM port)     | A81-015011-001G |
| • Serial ATA data with power cable (Length: 300mm) | A81-002013-000G |
| • LPC EXT-RS232 module (4 x RS232 ports)           | 770-EXTRS1-000G |
| • LPC EXT-RS485 module (4 x RS485 ports)           | 770-EXTRS1-100G |
| • I/O shield (DP++)                                | A49-AL171D-000G |
| • I/O shield (VGA)                                 | A49-AL171V-000G |

## Assured Systems

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

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