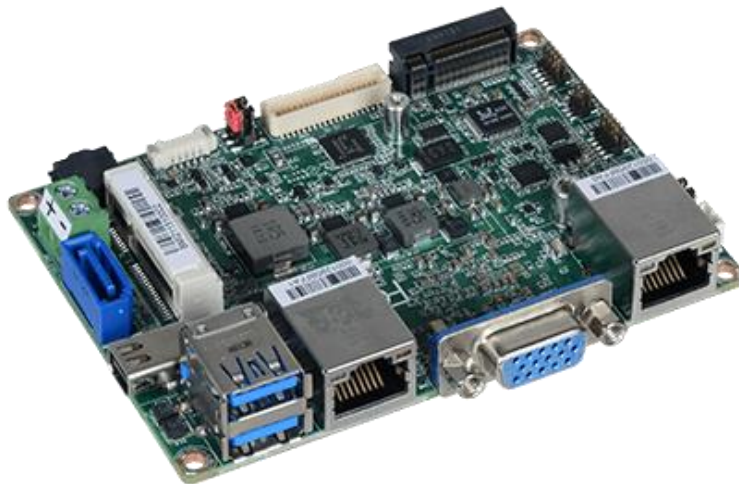


Single Board Computer AL051 – 2.5”SBC

Datasheet v1.0



AL051 is a 2.5” Single Board Computer based on the Intel Atom™ / Pentium® / Celeron® E3900 Series, ideal for many space-critical and thermally demanding applications where graphics performances are a must, such as medical, industrial automation, IOT and multimedia applications.

Featuring the latest processor with Goldmont architecture, the AL051 SBC offers improved computing power and low power consumption. This impressive SBC withstands a wide operating temperature range from -40 to +85°C, enabling impressive system integration and meeting the needs of the harshest industrial environments. It also features brilliant graphics performance with an improved graphics engine through hardware decoding of HEVC and VP9 codecs supporting high 4K resolution and three independent displays, making it ideal for demanding graphics applications.

In terms of storage, it supports high-speed SATA 3.0 drives, SSD and eMMC 5.0 options up to 128 GB. In particular, the advanced M.2 interface, which integrates multiple functions such as WLAN / LTE / mSATA, is the ideal choice for industrial automation, storage and design of IoT devices.

Key Features:

- Intel® Atom™ / Pentium® / Celeron® processor E3900
- 1 DDR3L SODIMM up to 8 GB
- Triple independent displays: VGA, Mini DP ++, LVDS
- Expansion and storage: 1 mini PCIe, 1 M.2, 1 SMBus
- Rich I/O: 2 Intel GbE, 1 COM, 2 USB 3.1 Gen 1, 2 USB 2.0
- 15 years CPU lifespan up to Q4'31 (based on Intel IOTG Roadmap)

AL051 – 2.5” SBC

CPU Core

Feature	Specification
CPU	Intel® Atom™ Processor E3900 Family, BGA 1296 Intel® Atom™ x7-E3950 Processor, Quad Core, 2M Cache, 1.6GHz (2.0GHz), 12W Intel® Atom™ x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9.5W Intel® Atom™ x5-E3930 Processor, Dual Core, 2M Cache, 1.3GHz (1.8GHz), 6.5W Intel® Pentium® Processor N4200, Quad Core, 2M Cache, 1.1GHz (2.5GHz), 6W Intel® Celeron® Processor N3350, Dual Core, 2M Cache, 1.1GHz (2.4GHz), 6W
Memory	One 204-pin SODIMM up to 8GB single channel DDR3L 1866MHz
BIOS	Insyde SPI 64Mbit (supports UEFI boot only)

Graphics

Controller	Intel® HD Graphics
Feature	OpenGL 4.2, Direct X 11.1, OpenCL 1.2, OGL ES 3.0 HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4 HW Encode: H.264, MPEG2, MPEG4
Display	1 x Mini DP ++ 1 x VGA 1 x LVDS Mini DP ++: resolution up to 4096x2160 @ 60Hz VGA: resolution up to 2048x1536 @ 50Hz LVDS: dual channel 18/24-bit, resolution up to 1920x1200 @ 60Hz
Triple display	VGA + Mini DP ++ + LVDS

Extension

Interface	1 x full-size Mini PCIe (PCIe / USB 2.0, optional USB 3.1 Gen1 / USB 2.0) 1 x M.2 B key 2242. (PCIe / USB 2.0 / SATA 3.0)
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Audio

Audio codec	Realtek ALC262-VC2-GR
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AL051 – 2.5” SBC

Ethernet

Feature	Specification
Controller	2 x Intel® I211AT PCIe (10/100 / 1000Mbps) 2 x Intel® I210IT PCIe (10/100 / 1000Mbps) (available upon request)

I/O

Rear	
Ethernet	2 x GbE (RJ-45)
USB	2 x USB 3.1 Gen 1
Display	1 x Mini DP ++ 1 x VGA 1 x LVDS
Inside	
Serial	1 x RS-232/422/485 (1.27mm pitch)
USB	2 x USB 2.0 (1.27mm pitch)
Display	1 x LVDS LCD panel connector
Audio	1 x audio (line-out / mic-in)
SATA	1 x SATA 3.0 (up to 6Gb / s)
DIO	1 x 8-bit DIO
SMBus	1 x SMBus

Watchdog Timer and Safety

Output and interval	System reset, programmable via software from 1 to 255 seconds
TPM	fTPM 2.0

Electrical, Mechanical and Environmental Specifications

Supply Voltage	Single 12V +/- 10% DC
Connection	2-pin terminal block 2-pin Vertical Type Connector (opt.)
Power Consumption	Typical: E3950: 12V @ 0.51A (6.12Watt) Max .: E3950: 12V @ 2.00A (24.00Watt)
RTC Battery	CR2032 Coin Cell

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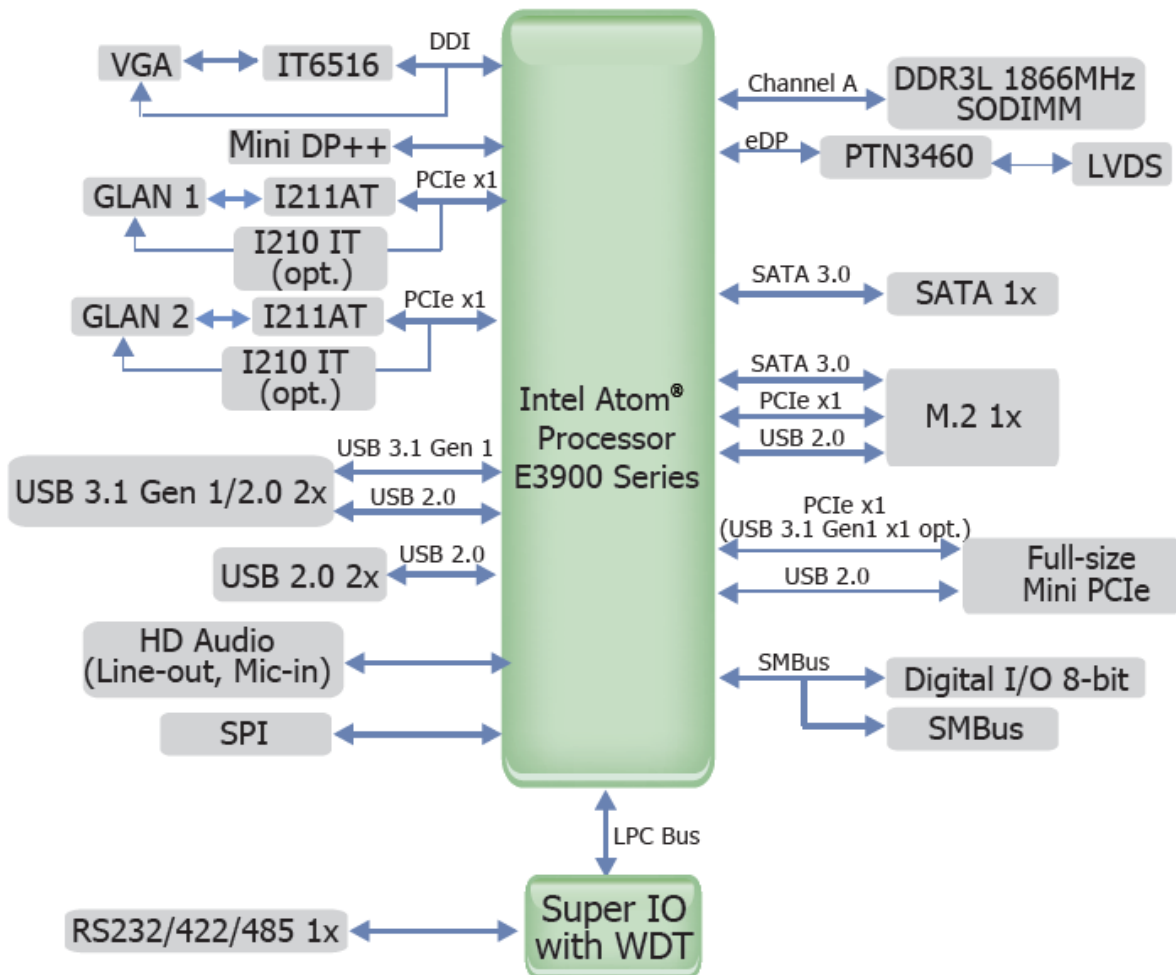
Feature	Specification
Dimensions	2.5 "Pico-ITX Form Factor 100mm (3.94") x 72mm (2.83 ")
Height	PCB: 1.6 mm Top Side: 7.9 mm Bottom Side: 16.34 mm
Operating temperature	Commercial: 0° to 60° C Industrial: -40° to 85° C
Storage temperature	-40° to 85° C
Relative humidity	5% to 90% (operating) 5% to 90% (storage)
MTBF	497.857 hrs @ 25 ° C 318.774 hrs @ 45 ° C 213.436 hrs @ 60 ° C
Certifications	CE, FCC, RoHS

Software

BSP	Full Board Support Package and ready-to-run images
OS Support (UEFI only)	Windows 10 IoT Enterprise (64-bit) Linux

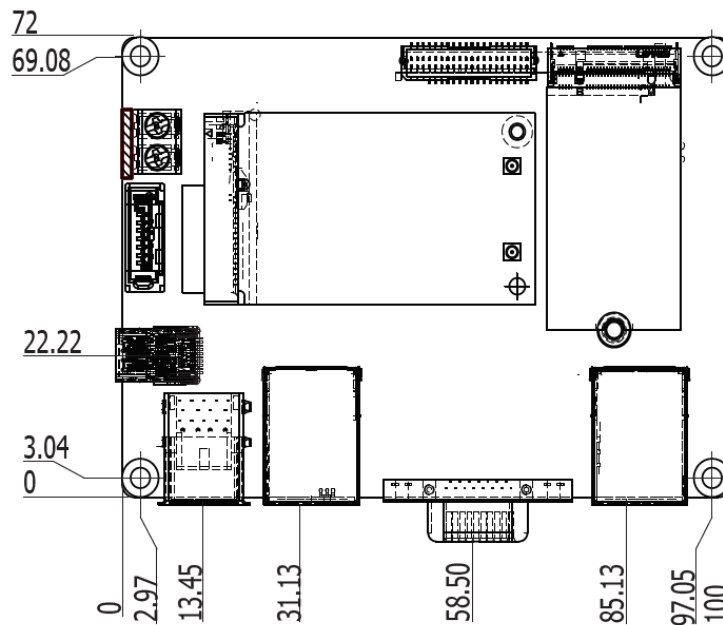
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Block Diagram

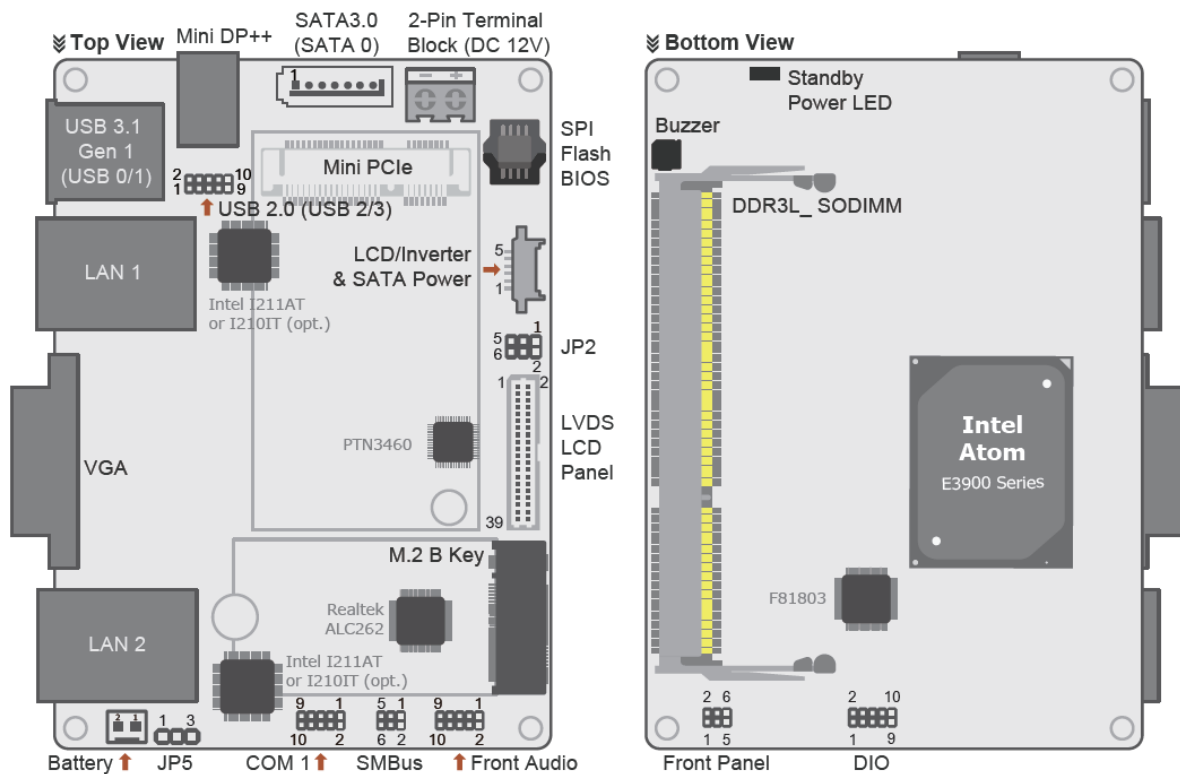


AL051 – 2.5" SBC

Mechanical Drawings



Board Layout



AL051 – 2.5” SBC

AL051 Packing list

- 1 AL051 board
- 1 Serial ATA data cable (Length: 155mm)
- 1 Y cable for SATA and inverter power (Length: 155mm)
- 1 Heat spreader (Height: 11mm) E Series CPU

Optional Items

- USB port cable (Length: 200mm)
- 1 COM port cable (Length: 300mm)
- Power adapter (60W, 12V, DC Jack)
- 2 pole terminal to DC Jack cable
- 1 Audio cable (Length: 160mm)
- Heat sink for E series CPU 0 to 60°C/wide temp (Height: 22.6mm)
- Heat sink for N series CPU 0 to 60°C