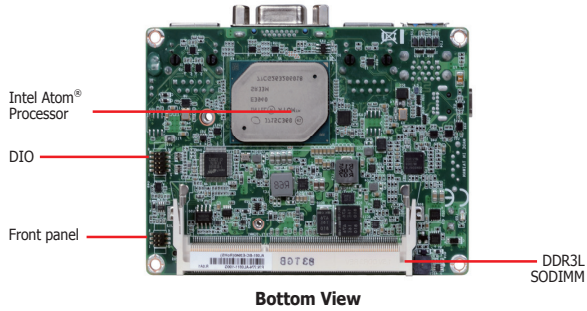
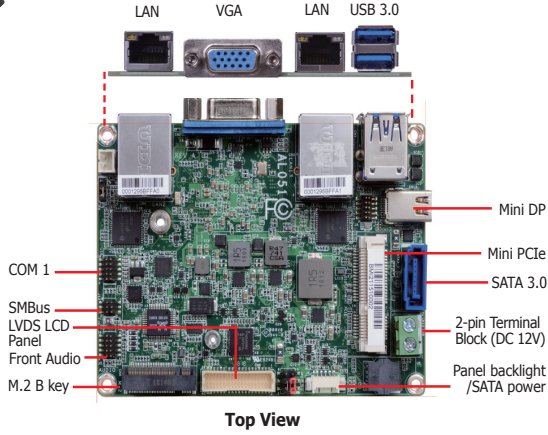




**Intel Atom®/Pentium®/Celeron® Processor E3900 Series**  
**2.5" Pico-ITX**



**AL051**



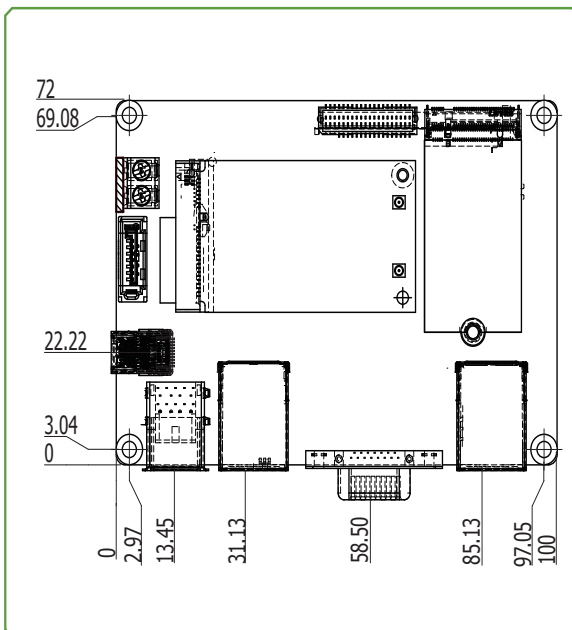
**Features**

- Small form factor 2.5" Pico-ITX for space-limited applications
- 1 DDR3L SODIMM up to 8GB
- 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 3.0, 2 USB 2.0

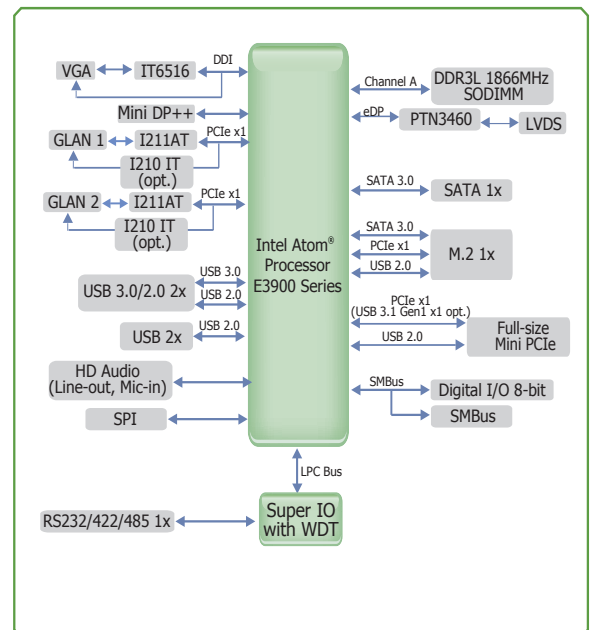
\* Populated by default



**Mechanical Drawing**



**Block Diagram**





**Specifications**

<b>SYSTEM</b>	<b>Processor</b>	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
	<b>Memory</b>	One 204-pin SODIMM up to 8GB Single Channel DDR3L 1866MHz
	<b>BIOS</b>	Insyde SPI 64Mbit (supports UEFI boot only)
<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Graphics
	<b>Feature</b>	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
	<b>Display</b>	1 x Mini DP++ 1 x VGA 1 x LVDS Mini DP++: resolution up to 4096x2160 @ 60Hz VGA: resolution up to 1920x1200 @ 60Hz LVDS: dual channel 18/24-bit, resolution up to 1920x1200 @ 60Hz
	<b>Triple Displays</b>	VGA + Mini DP++ + LVDS
<b>EXPANSION</b>	<b>Interface</b>	1 x Full-size Mini PCIe (PCIe/USB 2.0) 1 x M.2 B key 2242. (PCIe/USB 2.0/SATA 3.0)
<b>AUDIO</b>	<b>Audio Codec</b>	Realtek ALC262-VC2-GR
<b>ETHERNET</b>	<b>Controller</b>	2 x Intel® I211AT PCIe (10/100/1000Mbps) 2 x Intel® I210IT PCIe (10/100/1000Mbps) (available upon request)
<b>REAR I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)
	<b>USB</b>	2 x USB 3.0
	<b>Display</b>	1 x Mini DP++ 1 x VGA 1 x LVDS
<b>INTERNAL I/O</b>	<b>Serial</b>	1 x RS-232/422/485 (1.27mm pitch, right angle type)
	<b>USB</b>	2 x USB 2.0 (1.27mm pitch)
	<b>Display</b>	1 x LVDS LCD Panel Connector
	<b>Audio</b>	1 x Audio (Line-out/Mic-in)
	<b>SATA</b>	1 x SATA 3.0 (up to 6Gb/s)
	<b>DIO</b>	1 x 8-bit DIO
	<b>SMBus</b>	1 x SMBus
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds
<b>SECURITY</b>	<b>TPM</b>	fTPM2.0
<b>POWER</b>	<b>Type</b>	Single 12V +/-10% DC
	<b>Connector</b>	2-pin Terminal Block 2-pin Vertical Type Connector (opt.)
	<b>RTC Battery</b>	CR2032 Coin Cell
<b>OS SUPPORT (UEFI Only)</b>	<b>Microsoft/Linux</b>	Windows 10 IoT Enterprise (64-bit)      Ubuntu 16.04
<b>ENVIRONMENT</b>	<b>Temperature</b>	Operating: 0 to 60°C, Option: -20 to 70°C/-40 to 85°C Storage: -40 to 85°C
	<b>Humidity</b>	Operating: 5 to 90% RH      Storage: 5 to 90% RH
<b>MECHANICAL</b>	<b>Dimensions</b>	2.5" Pico-ITX Form Factor      100mm (3.94") x 72mm (2.83")
	<b>Height</b>	PCB: 1.6mm      Top Side: 15mm, Bottom Side: 8mm
<b>CERTIFICATIONS</b>		CE, FCC, RoHS

**Ordering Information**

Model Name	P/N	Processor	Memory	Display	GbE	RS-232/422/485	USB 3.0	USB 2.0	Power	Thermal	Temp.
AL051-BC-E3930	770-AL0511-000G	X5-E3930	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	0 to 60°C
AL051-BC-E3940	770-AL0511-100G	X5-E3940	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	0 to 60°C
AL051-BC-E3950	770-AL0511-200G	X7-E3950	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	0 to 60°C
AL051-BC-N3350	770-AL0511-300G	N3350	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	0 to 60°C
AL051-EC-E3930	770-AL0511-400G	X5-E3930	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	-20 to 70°C
AL051-TC-E3930	770-AL0511-500G	X5-E3930	1 SODIMM	VGA + LVDS + Mini DP++	2	1	2	2	12VDC	Fanless	-40 to 85°C

Note: N4200 is supported upon request with MOQ requirement.

**Packing List**

• 1 AL051 board	
• 1 Serial ATA data cable (Length: 500mm)	332-553002-005G
• 1 Y cable for SATA and inverter power (Length: 155mm)	A81-020016-018G
• 1 Heat spreader (Height: 11mm)	E Series CPU: A71-808308-000G N Series CPU: A71-808309-000G

**Optional Items**

• USB port cable (Length: 200mm)	A81-001061-016G
• 1 COM port cable (Length: 300mm)	A81-015038-016G
• Power adapter (60W, 12V, DC Jack)	671-106012-000G
• 2 pole terminal to DC Jack cable	A81-004013-000G
• Heat sink for 0 to 60°C (Height: 19mm)	E Series CPU: A71-008107-000G N Series CPU: A71-008108-000G
• 1 Audio cable (Length: 160mm)	A81-022013-016G
• Heat sink for up to 70/85°C / E Series CPU (Height: 23mm)	A71-008111-000G

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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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