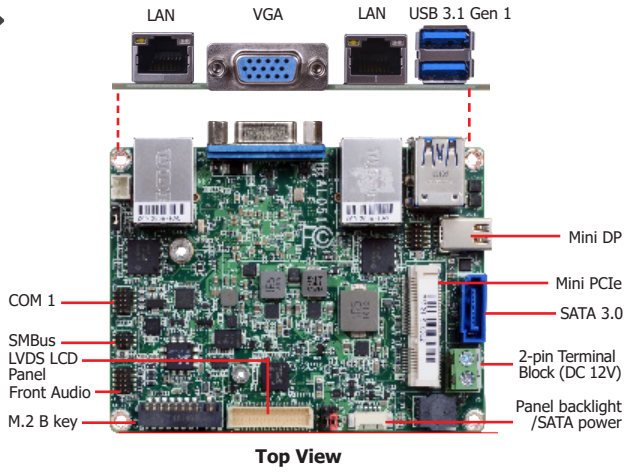
Intel Atom®/Pentium®/Celeron® Processor E3900 Series 2.5" Pico-ITX

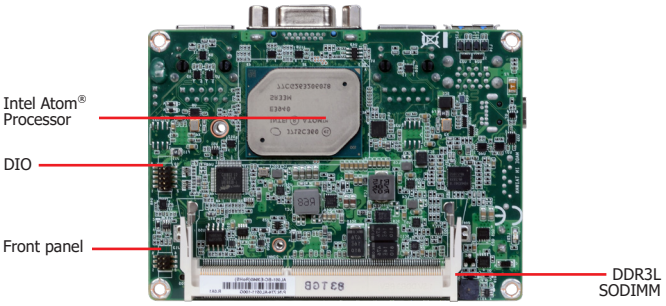
Intel IoT Solutions Alliance

AL051

Atom



Top View



Bottom View

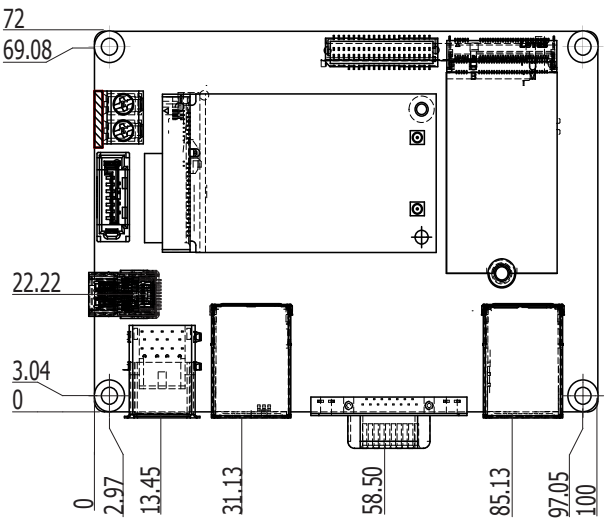
Features

- 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 3.1 Gen 1, 2 USB 2.0

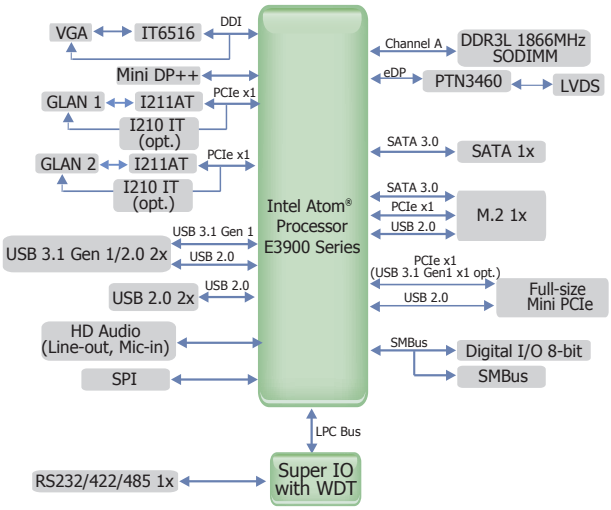
* Populated by default



Mechanical Drawing



Block Diagram



Specifications

SYSTEM	**Processor**	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 1920x1200 @ 60Hz LVDS: dual channel 18/24-bit, resolution up to 1920x1200 @ 60Hz	
	Triple Displays	VGA + Mini DP++ + LVDS	
EXPANSION	**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)	
AUDIO	**Audio Codec**	Realtek ALC262-VC2-GR	
ETHERNET	**Controller**	2 x Intel® I211AT PCIe (10/100/1000Mbps) 2 x Intel® I210IT PCIe (10/100/1000Mbps) (available upon request)	
REAR I/O	**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	
INTERNAL I/O	**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	**Output & Interval**	System Reset, Programmable via Software from 1 to 255 Seconds	
SECURITY	**TPM**	fTPM2.0	
POWER	**Type**	Single 12V +/-10% DC	
	Connector	2-pin Terminal Block	2-pin Vertical Type Connector (opt.)
	RTC Battery	CR2032 Coin Cell	
	Consumption	Typical: E3950:12V @ 0.51A (6.12Watt)	Max.: E3950:12V @ 2.00A (24.00Watt)
OS SUPPORT (UEFI Only)	**Microsoft/Linux**	Windows 10 IoT Enterprise (64-bit)	Linux
ENVIRONMENT	**Temperature**	Operating: 0 to 60°C, Option: -20 to 70°C/-40 to 85°C	Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH	Storage: 5 to 90% RH
	MTBF	497,857 hrs @ 25°C; 318,774 hrs @ 45°C ; 213,436 hrs @ 60°C	
MECHANICAL	**Dimensions**	2.5" Pico-ITX Form Factor	100mm (3.94") x 72mm (2.83")
	Height	PCB: 1.6mm	Top Side: 15mm, Bottom Side: 8mm
CERTIFICATIONS		CE, FCC, RoHS	

Ordering Information

Model Name	P/N	Processor	Memory	Display	GbE	RS-232/422/485	USB 3.1 Gen 1	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: 155mm)	A81-020016-018G
• 1 Y cable for SATA and inverter power (Length: 155mm)	A81-020016-018G
• 1 Heat spreader (Height: 11mm)	E Series CPU: A71-808308-010G N Series CPU: A71-808309-010G

Optional Items

• USB port cable (Length: 200mm)	A81-001084-016G
• 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
• 1 Audio cable (Length: 160mm)	A81-022013-016G
• Heat sink for E series CPU 0 to 60°C/wide temp (Height: 22.6mm)	A71-008111-000G
• Heat sink for N series CPU 0 to 60°C (Height: 19mm)	A71-008108-000G

DFI reserves the right to change the specifications at any time prior to the product's release. Changes thereafter will be based on the product's revision. Please contact your sales representative for the exact revision offered in your area. All product names mentioned are trademarks of their respective companies. © December 17, 2019 DFI Inc.