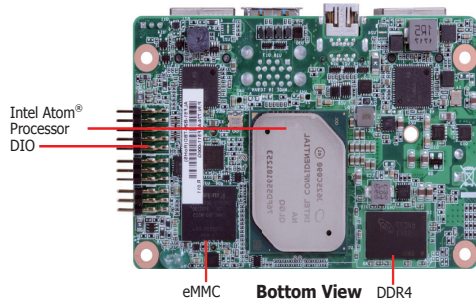
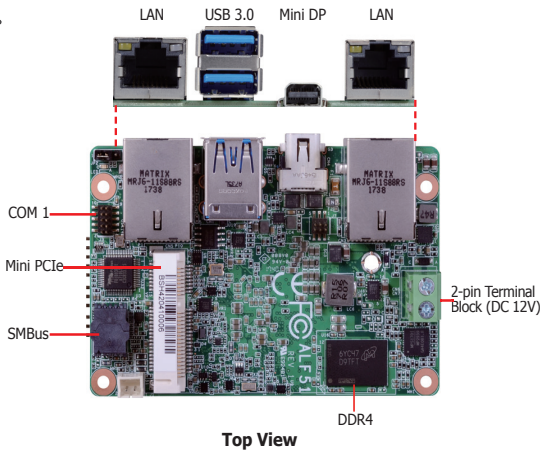




**Intel Atom® Processor E3900 Series
1.8" SBC**



ALF51



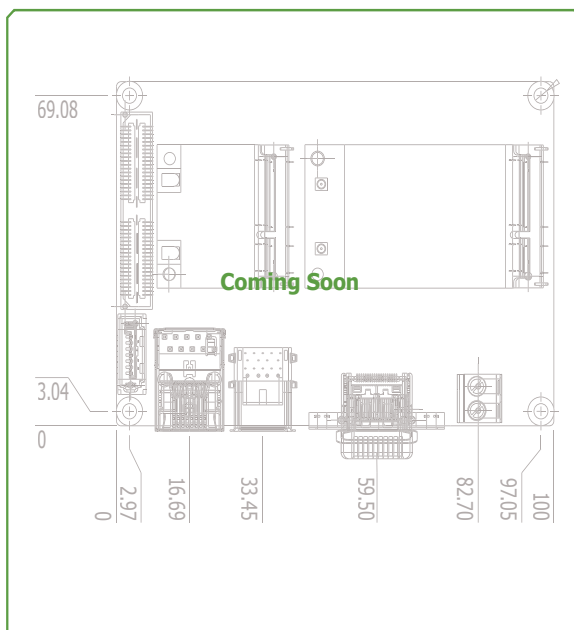
Features

- Small form factor 1.8" SBC for space-limited applications
- Single Channel LPDDR4 Memory Down up to 4GB
- DP++ resolution supports up to 4096x2160 @ 60Hz
- Expansion and Storage: 1 Mini PCIe, 1 SMBus
- Rich I/O: 2 Intel GbE, 1 COM, 2 USB 3.0, 1 USB 2.0

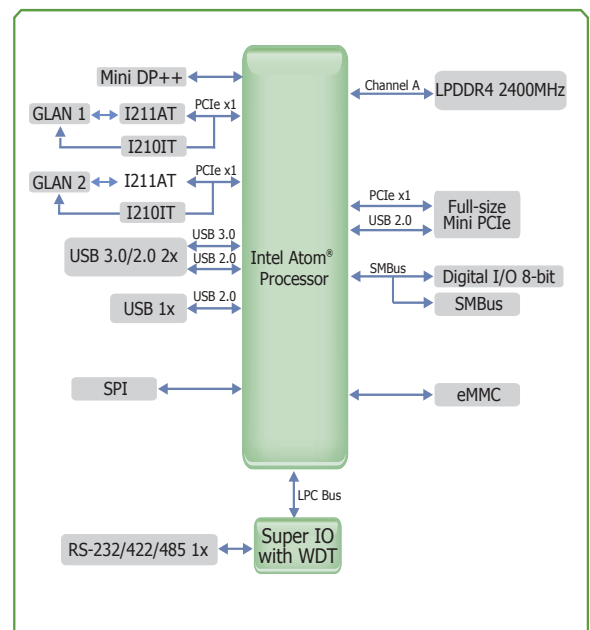
* Populated by default



Mechanical Drawing



Block Diagram





Specifications

SYSTEM	Processor	Intel Atom® Processor E3900 Family, BGA 1296 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
	Memory	2GB/4GB DDR4 Memory Down Single Channel LPDDR4 2400MHz
	BIOS	Insyde SPI 128Mbit (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++ Mini DP++: resolution up to 4096x2160 @ 60Hz HDMI: resolution up to 3840x2160 @30Hz
EXPANSION	Interface	1 x Full-size Mini PCIe (PCIe/USB 2.0)
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 3.0
	Display	1 x Mini DP++
INTERNAL I/O	Serial	1 x RS-232/422/485 (1.25mm pitch, right angle type)
	USB	1 x USB 2.0 (1.27mm pitch)
	DIO	1 x 8-bit DIO
	SMBus	1 x SMBus
STORAGE	eMMC	1 x 16GB/32GB/64GB eMMC
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	TPM	Available Upon Request
POWER	Type	Single 12V +/-10% DC
	Connector	2-pin Terminal Block
	RTC Battery	CR2032 Coin Cell
OS SUPPORT (UEFI Only)	Microsoft/Linux	Windows 10 IoT Enterprise 64-bit Ubuntu 16.04
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

Ordering Information

Model Name	P/N	Processor	Memory	eMMC	Display	GbE	RS-232/422/485	USB 3.0	USB 2.0	Power	Thermal	Temp.
ALF51-BN-23E30	770-ALF511-100G	X5-E3930	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	0 to 60°C
ALF51-BN-23E40	770-ALF511-000G	X5-E3940	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	0 to 60°C
ALF51-EN-23E30	770-ALF511-400G	X5-E3930	2 GB	32 GB	Mini DP++	2	1	2	1	12VDC	Fanless	-20to 70°C

Packing List

• 1 ALF51 board	
• 1 Serial ATA data cable (Length: TBD)	TBD
• 1 Heat spreader (Height: 11mm)	TBD

Optional Items

• USB port cable (Length: TBD)	TBD
• 1 COM port cable	TBD
• Power adapter (60W, 12V)	TBD
• Heat sink (Height: TBD)	TBD

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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