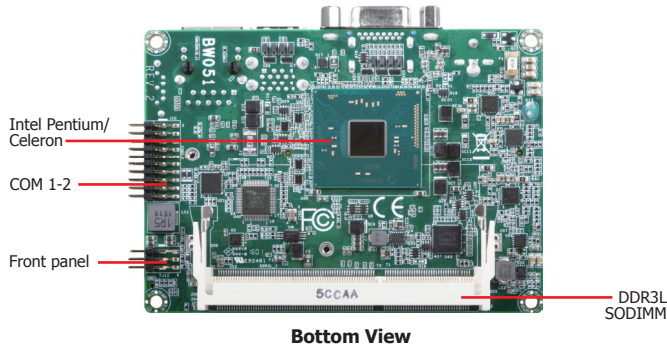
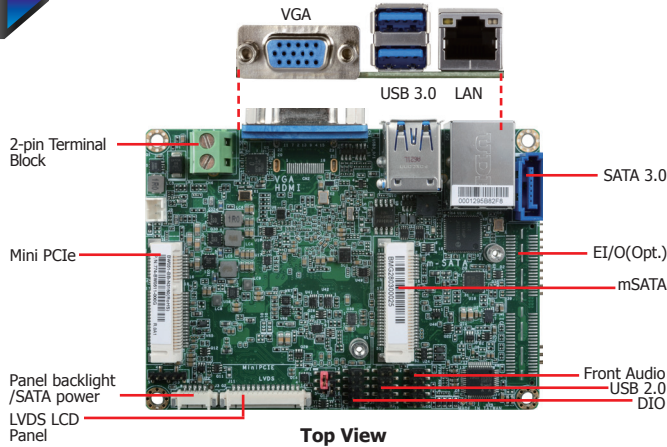


## BW051

Atom



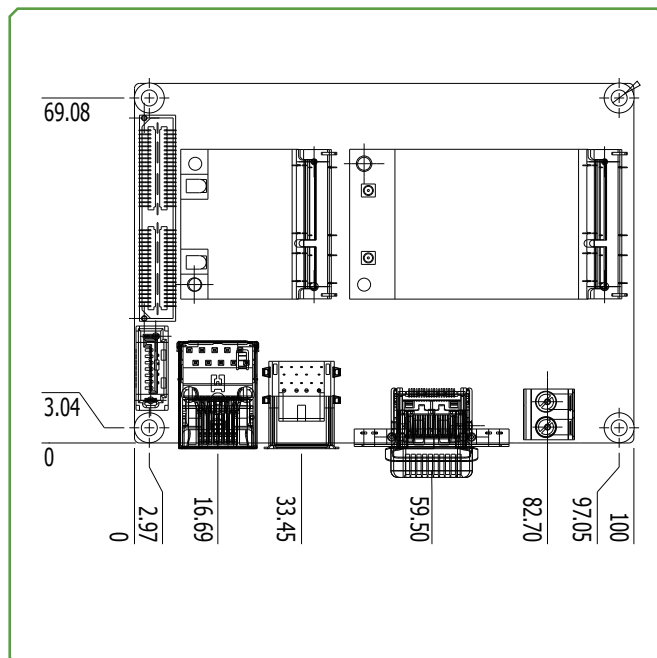
### Features

- Small form factor 2.5" Pico-ITX for space-limited applications
- 1 DDR3L SODIMM up to 8GB
- Dual independent displays: VGA\*/HDMI + LVDS
- Expansion and Storage: 1 Mini PCIe, 1 mSATA, 1 SATA 3.0
- Rich I/O: 1 Intel GbE, 2 COM, 2 USB 3.0, 2 USB 2.0

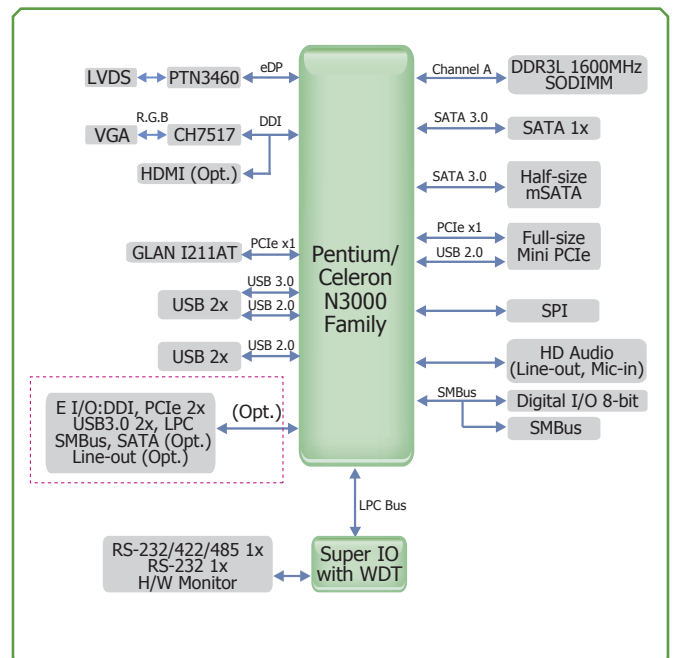
\* Populated by default



### Mechanical Drawing



### Block Diagram



**Specifications**

<b>SYSTEM</b>	<b>Processor</b>	Intel® Pentium®/Celeron® Processor N3000 Family, BGA 1170 Intel® Atom™ Processor x5-E8000, Quad Core, 2M Cache, 1.04GHz, 5W Intel® Pentium® Processor N3710, Quad Core, 2M Cache, 1.6GHz (2.56GHz), 6W Intel® Celeron® Processor N3160, Quad Core, 2M Cache, 1.6GHz (2.24GHz), 6W Intel® Celeron® Processor N3060, Dual Core, 2M Cache, 1.6GHz (2.48GHz), 6W Intel® Celeron® Processor N3010, Dual Core, 2M Cache, 1.04GHz (2.24GHz), 4W
	<b>Memory</b>	One 204-pin SODIMM up to 8GB Single Channel DDR3L 1600MHz
	<b>BIOS</b>	Insyde SPI 64Mbit
<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 VGA/HDMI (HDMI available upon request) 1 x LVDS VGA: resolution up to 1920x1200 @ 60Hz HDMI: resolution up to 1920x1080 @ 60Hz LVDS: single channel 24-bit, resolution up to 1366x768 @ 60Hz
	<b>Dual Displays</b>	VGA + LVDS HDMI + LVDS
<b>EXPANSION</b>	<b>Interface</b>	1 x Half-size mSATA (SATA) 1 x Full-size Mini PCIe (PCIe/USB) 1 x Extension I/O connector (available upon request)
<b>AUDIO</b>	<b>Audio Codec</b>	Realtek ALC888S-VD2-GR
<b>ETHERNET</b>	<b>Controller</b>	1 x Intel® I211AT PCIe (10/100/1000Mbps)
<b>REAR I/O</b>	<b>Ethernet</b>	1 x GbE (RJ-45)
	<b>USB</b>	2 x USB 3.0
	<b>Display</b>	1 x VGA/HDMI (HDMI available upon request)
	<b>INTERNAL I/O</b>	<b>Serial</b>
	<b>USB</b>	2 x USB 2.0 (2.0mm 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>	Available Upon Request
<b>POWER</b>	<b>Type</b>	Single 12V +/-10% DC
	<b>Connector</b>	2-pin Terminal Block
	<b>Consumption</b>	BW051 Typical: N3710:12V @ 0.47A (5.64Watt) Max.: N3710:12V @ 1.0864A (13.037Watt)
	<b>RTC Battery</b>	Lithium 3V (210mAH)
<b>OS SUPPORT</b>	<b>Microsoft/Linux</b>	Windows 7 (/WES7) 32/64-bit Windows 8.1 (64-bit) Windows 10 IoT Enterprise 32/64-bit Debian 8 (with VESA graphic driver) CentOS 7 (with VESA graphic driver) Ubuntu 15.10 (Intel graphic driver available)
<b>ENVIRONMENT</b>	<b>Temperature</b>	Operating: 0 to 60°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: 15.5mm, Bottom Side: 8.0mm

**Ordering Information**

Model Name	P/N	Processor	Memory	VGA/HDMI	GbE	RS-232/422/485	RS-232	USB 3.0	USB 2.0	Power	Thermal	Temp.
BW051-BB-E8000	770-BW0512-100G	x5-E8000	1 SODIMM	VGA	1	1	1	2	2	12V DC	Fanless	0 to 60°C
BW051-BB-N3160	770-BW0512-000G	N3160	1 SODIMM	VGA	1	1	1	2	2	12V DC	Fanless	0 to 60°C
BW051-BB-N3060	770-BW0512-200G	N3060	1 SODIMM	VGA	1	1	1	2	2	12V DC	Fanless	0 to 60°C

Note: N3710 and N3010 are supported upon request with MOQ requirement.

**Packing List**

• 1 BW051 board	
• 1 COM port cable (Length: 300mm, 2 x COM ports)	A81-015020-001G
• 1 Serial ATA data cable (Length: 152mm)	A81-002000-000G
• 1 Y cable for SATA and inverter power (Length: 155mm)	A81-020016-018G
• 1 DVD	
• 1 Heat sink (Height: 19mm)	A71-011065-000G

**Optional Items**

• USB port cable (Length: 200mm)	A81-001032-016G
• Power adapter (60W, 12V, DC jack)	671-106012-102G
• Heat spreader (Height: 11mm)	A71-808301-000G
• 1 Audio cable (Length: 160mm)	A81-022007-016G