

Single Board Computer

WL051 – 2.5" Pico-ITX SBC

Datasheet v1.0



WL051 is a 2.5" Pico-ITX Single Board Computer based on the 8th Gen Intel® Core™ Processors, ideal for many space-critical and thermally demanding applications where graphics performances are a must, such as medical, industrial automation, IOT and multimedia applications.

This impressive SBC withstands a wide operating temperature range from -30 to +80°C, enabling impressive system integration and meeting the needs of the harshest industrial environments. It also features brilliant graphics performance and supports high 4K resolution and dual independent displays, making it ideal for demanding graphics applications.

The WL051 SBC offers a wide range of I/O, including 2 Intel GbE, 1 COM, 2 USB 3.1 Gen 2, 2 USB 2.0. It also features expansion and storage. The advanced M.2 interface is the ideal choice for industrial automation, storage and design of IoT devices.

Key Features:

- 8th Gen Intel® Core™ Processors
- Small form factor 2.5" Pico-ITX for space-limited applications
- 1 DDR4 SODIMM up to 32GB
- Dual independent displays: DP++/HDMI + eDP
- Expansion and storage: 1 M.2 E key, 2 M.2 B key
- Rich I/O: 2 Intel GbE, 1 COM, 2 USB 3.1 Gen 2, 2 USB 2.0

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CPU Core

Feature	Specification
CPU	8th Generation Intel® Core™ Processors, BGA 1528 Intel® Core™ i7-8665UE, Quad Core, 8M Cache, 1.7GHz (4.4GHz), 15W Intel® Core™ i5-8365UE, Quad Core, 6M Cache, 1.6GHz (4.1GHz), 15W Intel® Core™ i3-8145UE, Dual Core, 4M Cache, 2.2GHz (3.9GHz), 15W Intel® Core™ Celeron® 4305UE, Dual Core, 2M Cache, 2.0GHz (2.0GHz), 15W
Memory	One 260-pin SODIMM up to 32GB Single Channel DDR4 up to 2400MHz
BIOS	AMI SPI 128Mbit

Graphics

Controller	Intel® UHD Graphics 620/ Intel® UHD Graphics 610 (for Celeron 4305UE)
Feature	OpenGL 4.5, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: AVC/H.264, MPEG2, JPEG, HEVC/H265, VP8, VP9
Display	1 x DP++/HDMI 1 x eDP DP++: resolution up to 4096x2304 @ 60Hz HDMI: resolution up to 4096x2160 @30Hz eDP: resolution up to 4096x2304 @ 60Hz
Dual display	DP++/HDMI + eDP

Extension

Interface	1 x M.2 E key 2230 (PCIe x2/USB 2.0) 2 x M.2 B key 3042/2242 (PCIe x1 or SATA 3.0/USB 3.1 Gen1/USB 2.0)
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Audio

Audio codec	Realtek ALC262-VC2-GR
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Ethernet

Feature	Specification
Controller	1 x Intel® I219V or I219LM (only Core i7/i5 supports iAMT) 1 x Intel® I211AT or I210IT

I/O

Rear	
Ethernet	2 x GbE (RJ-45)
USB	2 x USB 3.1 Gen 1
Display	1 x COMBO port (DP++/HDMI) 1 x eDP
Inside	
Serial	1 x RS-232/422/485 (1.27mm pitch)
USB	2 x USB 2.0 (1.27mm pitch)
Display	1 x eDP Connector
Audio	1 x audio (line-out / mic-in)
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
Power Consumption	Typical: 8665UE:12V @ 0.51A (6.12Watt) Max.: 8665UE:12V @ 2.26A (27.12Watt)
RTC Battery	CR2032 Coin Cell

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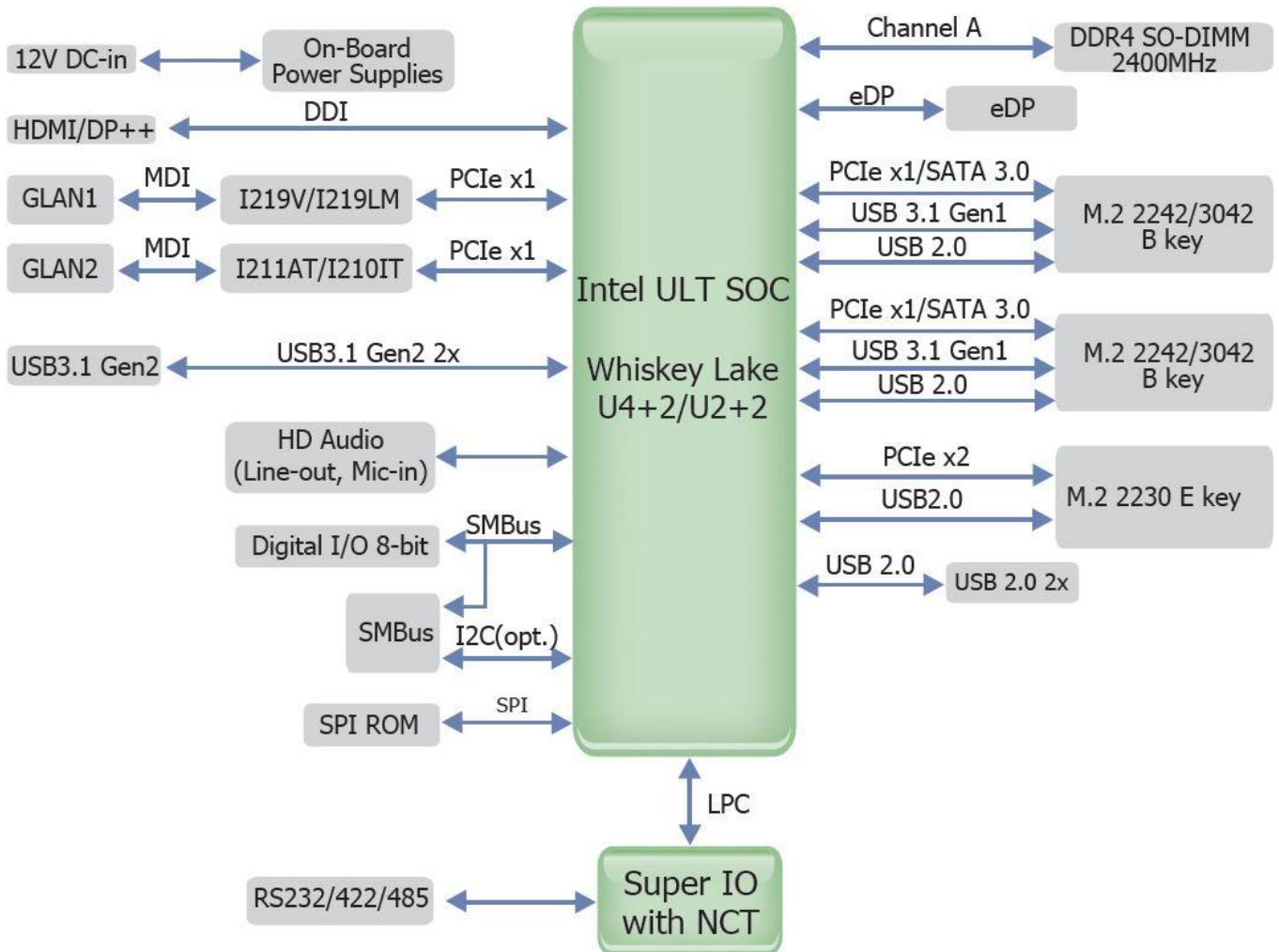
Feature	Specification
Dimensions	2.5" Pico-ITX Form Factor 100mm (3.94") x 72mm (2.83 ")
Height	PCB: 1.6mm Top Side: 15mm Bottom Side: 8mm
Operating temperature	Commercial: -5° to 65° C Industrial: -30° to 80° C
Storage temperature	-40° to 85° C
Relative humidity	5% to 90% RH (operating) 5% to 90% RH (storage)
MTBF	4305UE: 564,107 hrs @ 25°C 402,731 hrs @ 45°C 293,920 hrs @ 60°C 182,929 hrs @ 80°C Calculation model: Telcordia Issue 4 Environment: GB, GC – Ground Benign, Controlled
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

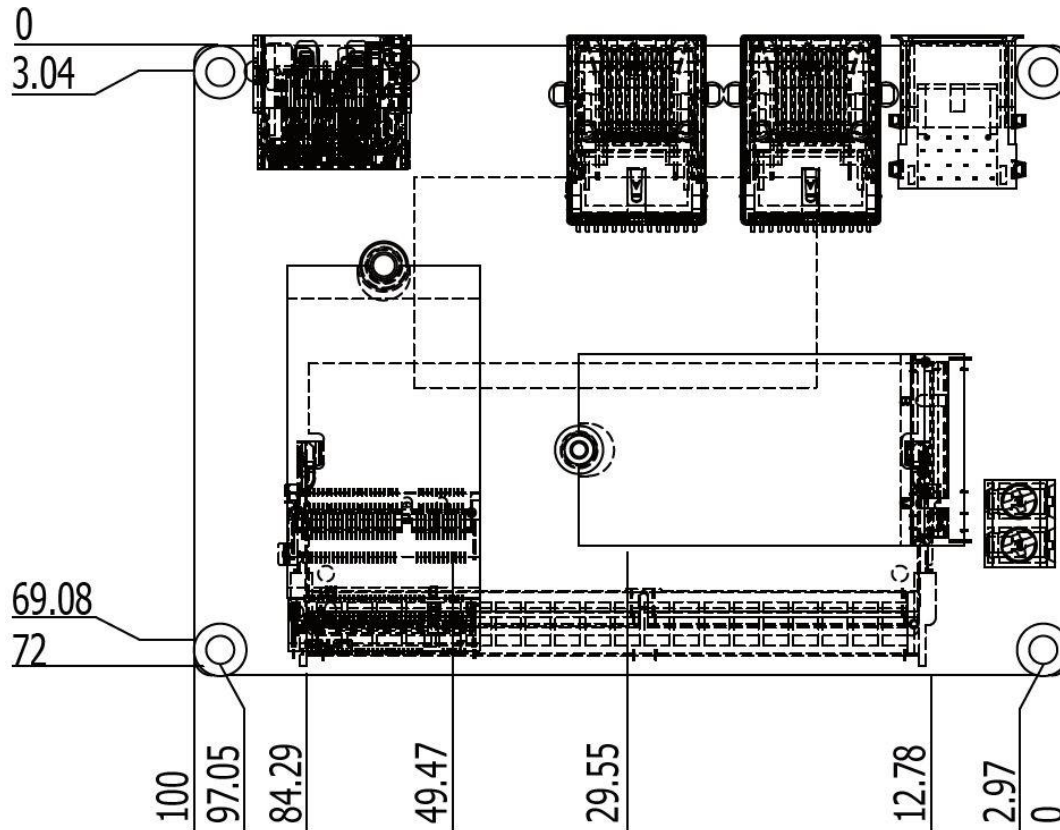
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Block Diagram



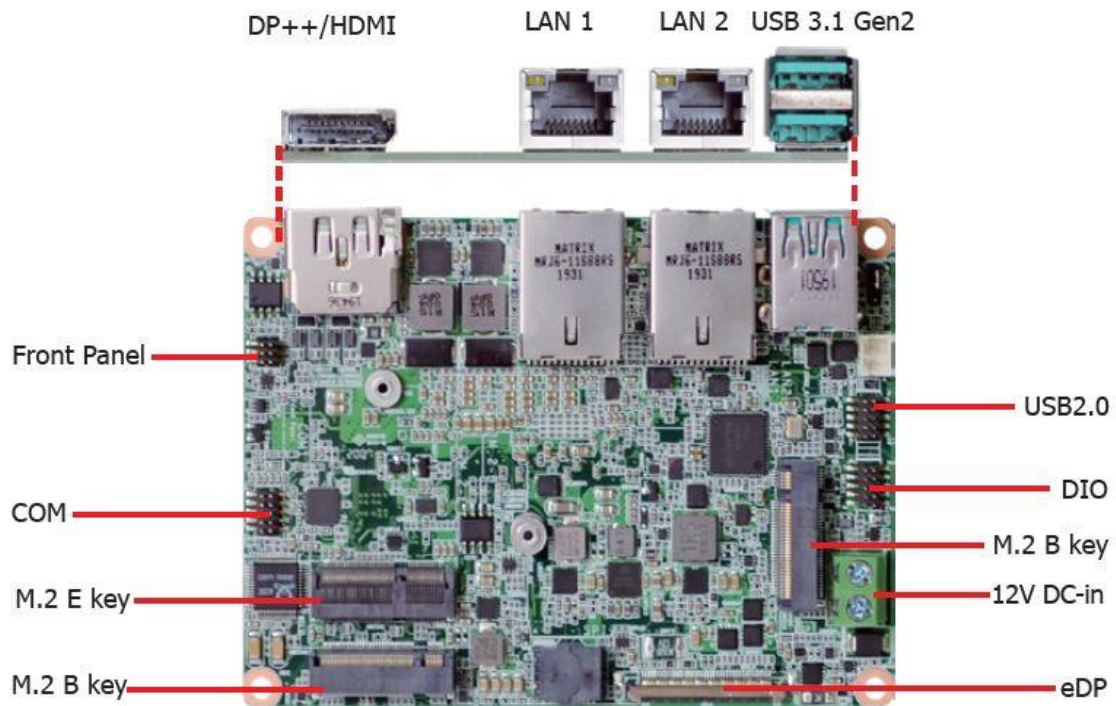
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Mechanical Drawings

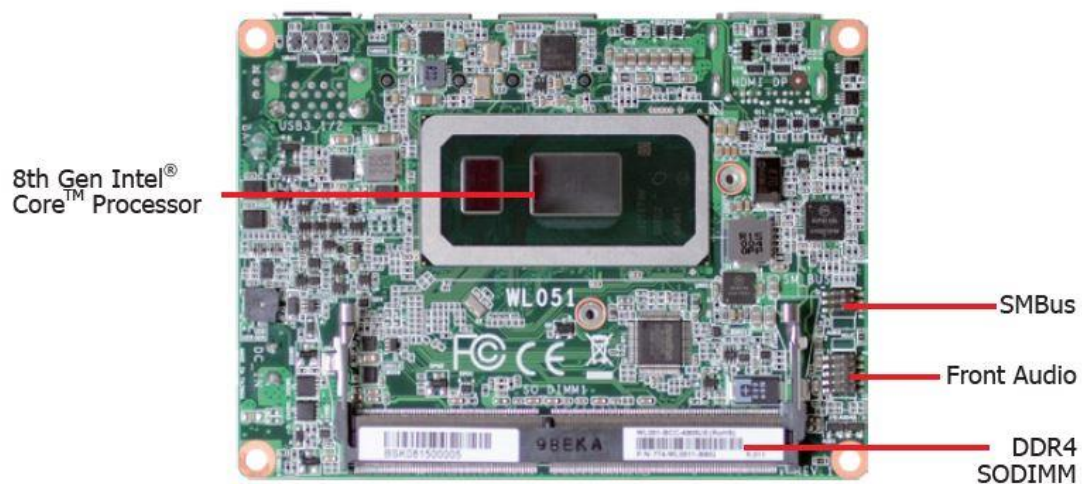


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Board Layout



Top View



Bottom View

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WL051 Packing list

- 1 WL051 board
- 1 Heat spreader (Height: 11mm)

Optional Items

- Power adapter (60W, 12V, DC Jack)
- 2 pole terminal to DC Jack cable
- USB 2.0 cable (Length: 200mm, 2 ports)
- COM cable (Length: 300mm, 1 port)
- Heat sink for -5 to 65°C (Height: 37.8mm)
- Heat sink for -30 to 80°C (Height: 37.8mm)
- DIO cable (Length: 160mm)
- SMBus cable (Length: 240mm)
- Audio cable (Length: 160mm)
- Front Panel cable (Length: 200mm)