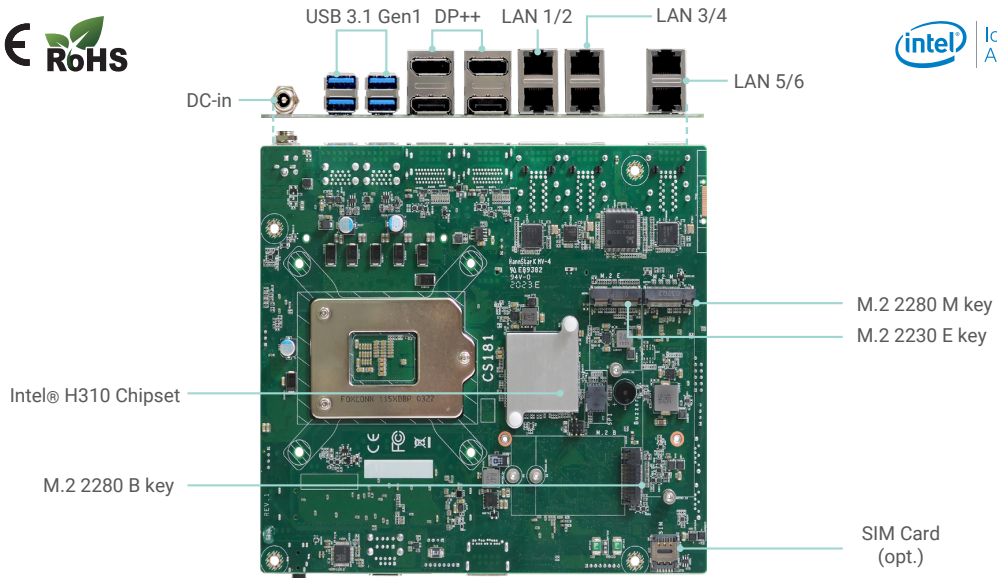
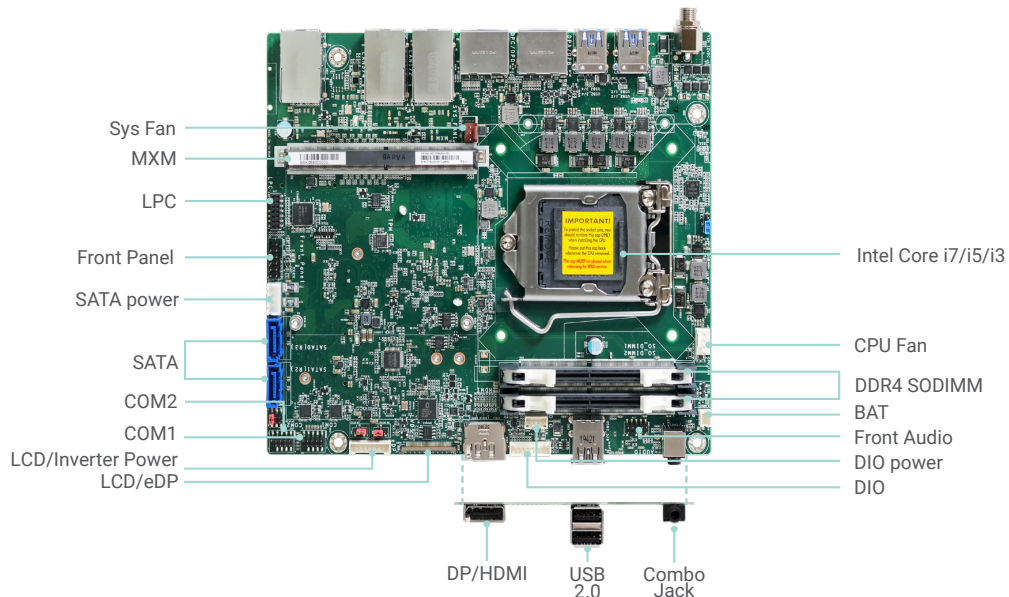


# CS181-H310 Desktop

9th/8th Gen Intel® Core™  
Mini-ITX



**Bottom View**



**Top View**

## KEY FEATURES



### DDR4

2 DDR4 SODIMM up to 32GB



### 4K High Resolution

Supports 4K/ 2K resolution



### Multiple Displays

1 LVDS/eDP,  
1 DP++/HDMI (auto-detection)  
4 DP



### Multiple Expansion

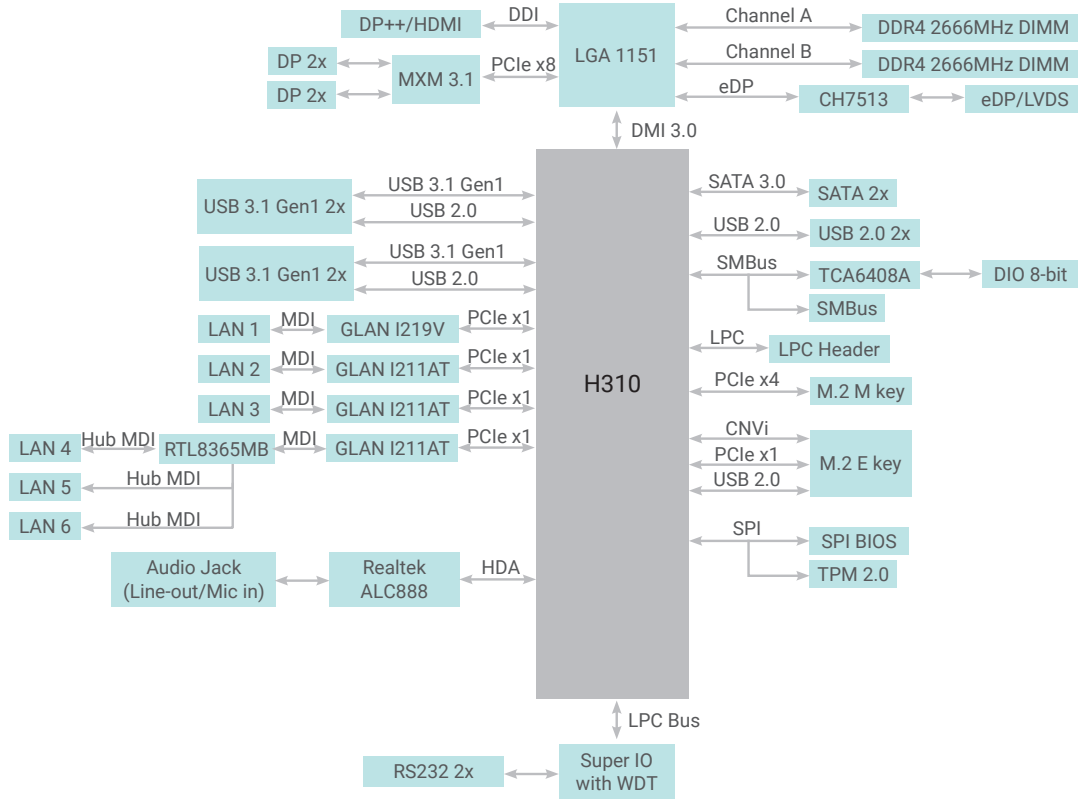
1 MXM Type-A/B,  
1 M.2 M Key,  
1 M.2 B Key,  
1 M.2 E Key



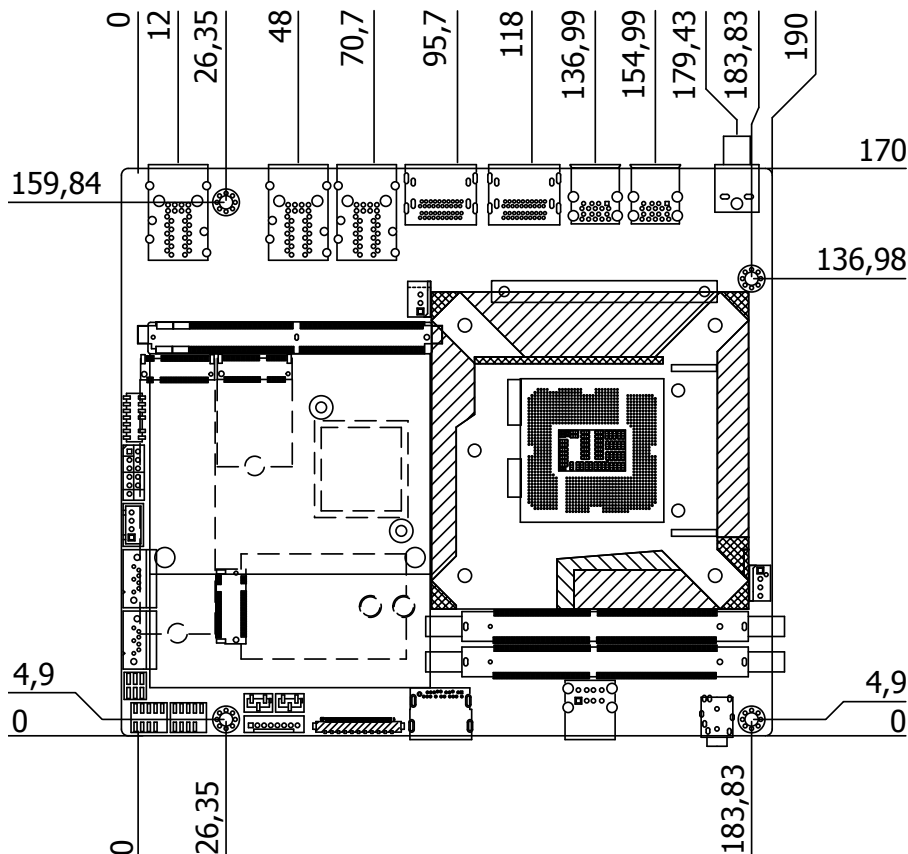
### Rich I/O

6 Intel GbE, 2 COM,  
4 USB 3.1 Gen2,  
6 USB 2.0

**BLOCK DIAGRAM**



**MECHANICAL DRAWING**



## SPECIFICATION

System	<b>Processor</b>	9th Generation Intel® Core™ Processors, LGA 1151 Socket, TDP up to 65W Intel® Core i7-9700E Processor (Core 8; Max speed 4.4 GHz; TDP 65W) Intel® Core i7-9700TE Processor (Core 8; Max speed 3.8 GHz; TDP 35W) Intel® Core i5-9500E Processor (Core 6; Max speed 4.2 GHz; TDP 65W) Intel® Core i5-9500TE Processor (Core 6; Max speed 3.6 GHz; TDP 35W) Intel® Core i3-9100E Processor (Core 4; Max speed 3.7 GHz; TDP 65W) Intel® Core i3-9100TE Processor (Core 4; Max speed 3.2 GHz; TDP 35W) 8th Generation Intel® Core™ Processors, LGA 1151 Socket, TDP up to 65W Intel® Core™ i7-8700 Processor (Core 6; Max speed 4.6 GHz; TDP 65W) Intel® Core™ i7-8700T Processor (Core 6; Max speed 4.0 GHz; TDP 35W) Intel® Core™ i5-8500 Processor (Core 6; Max speed 4.1 GHz; TDP 65W) Intel® Core™ i5-8500T Processor (Core 6; Max speed 3.5 GHz; TDP 35W) Intel® Core™ i3-8100 Processor (Core 4; Max speed 3.6 GHz; TDP 65W) Intel® Core™ i3-8100T Processor (Core 4; Max speed 3.1 GHz; TDP 35W) Intel® Pentium G5400 Processor (Core 2; Max speed 3.7 GHz; TDP 58W) Intel® Celeron G4900 Processor (Core 2; Max speed 3.1 GHz; TDP 54W)
	<b>Chipset</b>	Intel® H310 Chipset
	<b>Memory</b>	Two 260-pin SODIMM up to 32GB Dual Channel DDR4 2400/2666MHz
	<b>BIOS</b>	AMI SPI 128Mbit
	<b>Graphics</b>	<b>Controller</b> Intel® UHD Graphics 630 (Pentium G5400 and Celeron G4900 support Intel® UHD Graphics 610) <b>Feature</b> 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 <b>Display</b> 1 x LVDS/eDP (control by BIOS) 1 x DP++/HDMI (auto-detection) (located at front site) 4 x DP (support by MXM Type-A/B module) (located at rear site) LVDS: resolution up to 1920x1200 @ 60Hz eDP: resolution up to 4096x2304 @ 60Hz DP: resolution up to 4096x2304 @ 60Hz HDMI: resolution up to 4096x2160 @ 30Hz <b>Multiple Displays</b> Onboard: LVDS/eDP + DP++/HDMI Onboard+MXM module: LVDS/eDP + DP++/HDMI + DP + DP + DP + DP
<b>Expansion</b>	<b>Interface</b> 1 x MXM Type-A/B (support MXM module) (provide 4 x independent DP at rear site) 1 x M.2 2280 M Key (PCIe Gen2 x1/SATA3.0) (support NVMe) 1 x M.2 3042/3052 B Key (USB3.1 Gen1/PCIe Gen3 x1) (support 5G or storage module) 1 x M.2 2230 E Key (USB2.0/PCIe Gen3 x1) (support BT/Wi-Fi module)	
<b>Audio</b>	<b>Audio Codec</b> Realtek ALC888S-VD2-GR	
<b>Ethernet</b>	<b>Controller</b> 1 x Intel® I219V PHY (10/100/1000Mbps) 5 x Intel® I211AT PCIe (10/100/1000Mbps) (port4~port6 provide by Lan hub)	
<b>Rear I/O</b>	<b>Ethernet</b> 6 x GbE (RJ-45) (dual type connector) (port4~port6 provide by Lan hub)	
	<b>USB</b> 4 x USB 3.1 Gen1 (dual type-A connector)	
	<b>Power</b> 1 x DC Jack	
<b>Front I/O</b>	<b>Display</b> 1 x DP++/HDMI (auto-detection)	
	<b>USB</b> 2 x USB2.0 (dual type-A connector)	
	<b>Audio</b> 1 x Audio Combo Jack	
<b>Internal I/O</b>	<b>Serial</b> 2 x RS-232 (support 5V/12V power) (2 x 5 10-pin 2.0mm pitch header)	
	<b>Display</b> 1 x LVDS/eDP (control by BIOS) 1 x LCD/Inverter Power	
	<b>Audio</b> 1 x Front Audio (2 x 5 10-pin 2.00mm pitch header)	
	<b>USB</b> 2 x USB 2.0 (2 x 5 10-pin 2.00mm pitch header)	
	<b>SATA</b> 2 x SATA 3.0 (up to 6Gb/s) RAID 0/1/5	
	<b>DIO</b> 1 x 8-bit DIO (1 x 8 8-pin 2.00mm pitch header) 1 x DIO Power (1x 4 4-pin 2.00mm pitch header)	
	<b>LPC</b> 1 x LPC (2 x 7 14-pin 2.00mm pitch female header)	
	<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> dTPM2.0 (default)		
<b>Power</b>	<b>Type</b> Single 12V +/-5% DC	
	<b>Connector</b> DC-in Jack Right Angle Connector (4-pin) (available upon request) Straight Type Connector (4-pin) (available upon request)	
	<b>Consumption</b> TBD	
	<b>RTC Battery</b> CR2032 Coin Cell	
<b>OS Support</b>	<b>Microsoft</b> Windows 10 IoT Enterprise 64-bit	
	<b>Linux</b> Linux	

Environment	Temperature	Operating: -5 to 65°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
	MTBF	TBD
Mechanism	Dimensions	195mm (7.7") x 170mm (6.7")
	Height	PCB: 1.6mm Top Side: 26mm, Bottom Side: 10mm

### PACKING LIST

1 CS181 motherboard	
1 Serial ATA data with power cable (Length: 300mm)	A81-002013-000G
1 COM port cable (Length: 250mm, 1 COM port)	A81-015011-001G
1 USB port cable (Length: 200mm)	A81-001032-016G
1 Driver DVD (EVT/DVT stage only)	
1 Bring Up (EVT/DVT stage only)	931-000000-000G

### OPTIONAL ITEMS

I/O shield	
COM port cable (Length: 250mm, 1 COM port)	A81-015011-001G
Serial ATA data cable (Length: 500mm)	332-553001-005G
Serial ATA power cable (Length: 300mm)	A81-002044-016G
Thermal solution (For 35W, Height: 37.3mm)	A71-103004-000G
Thermal solution (For 65W, Height: 72.8mm)	552-200049-000G
Aetina MXM M3N1050(NVIDIA GeForce GTX 1050, 50W) PN: TBD	
Aetina MXM M3N1060(NVIDIA GeForce GTX 1060, 78W) PN: TBD	

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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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