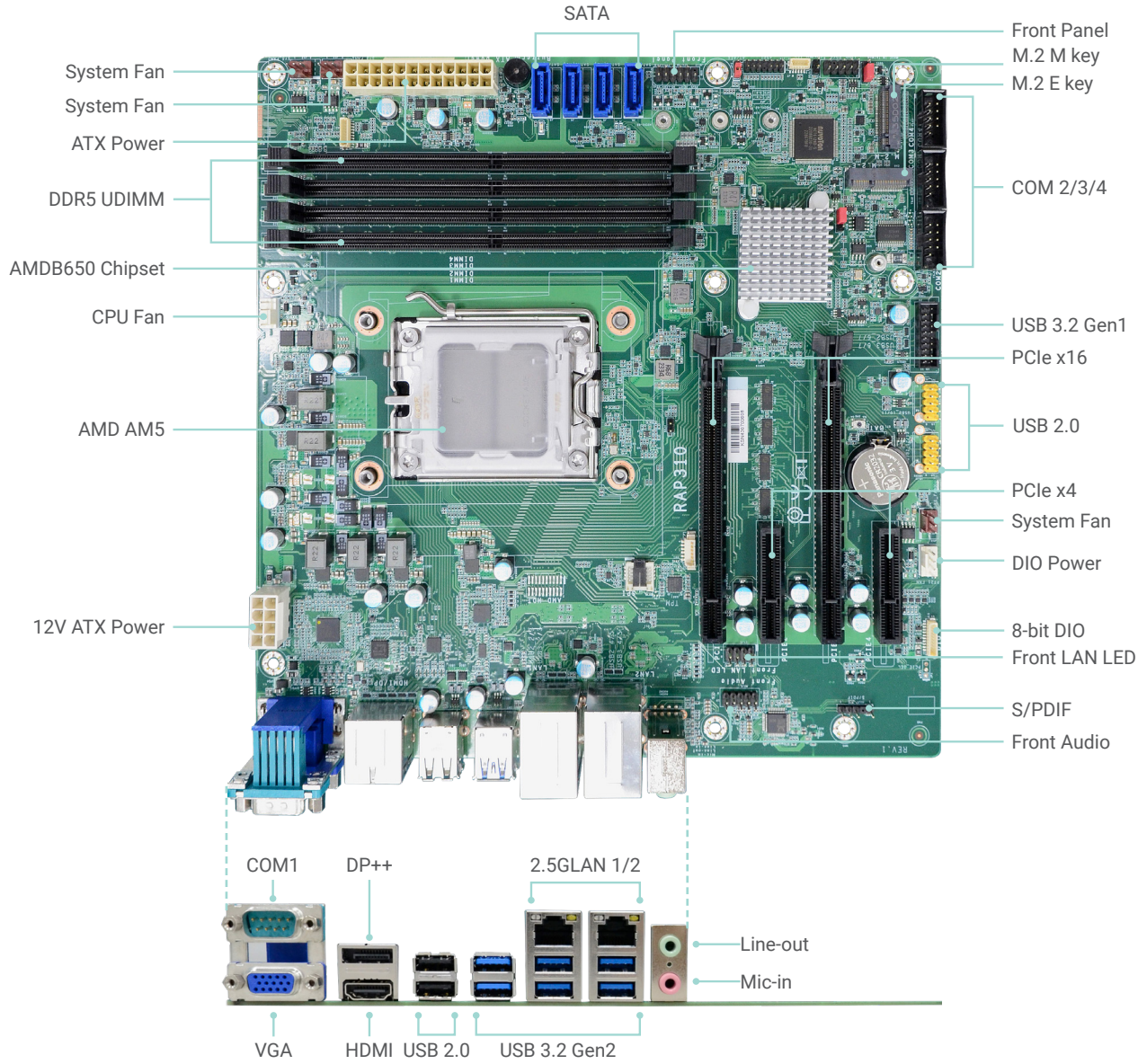
RAP310-B650

AMD® Ryzen™ 9000/7000/EPYC 4005 Series
microATX



Top View

KEY FEATURES

DDR5

4 DDR5 UDIMM up to 128GB

4K High Resolution

Supports 4K resolution

Triple Displays

1 VGA, 1 DP++, 1 HDMI

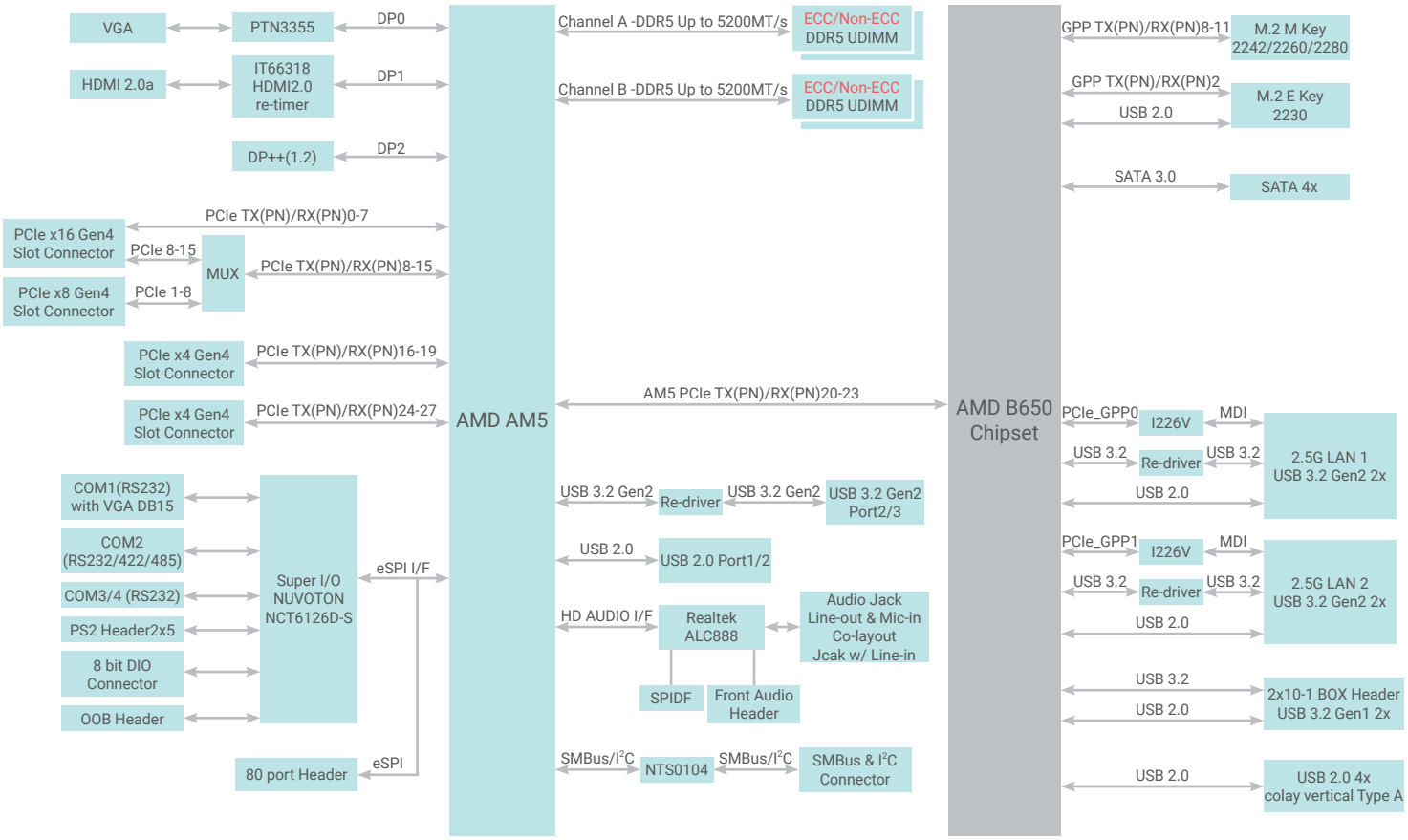
Multiple Expansion

2 PCIe x16, 2 PCIe x4,
1 M.2 E key, 1 M.2 M key,
4 SATA 3.0

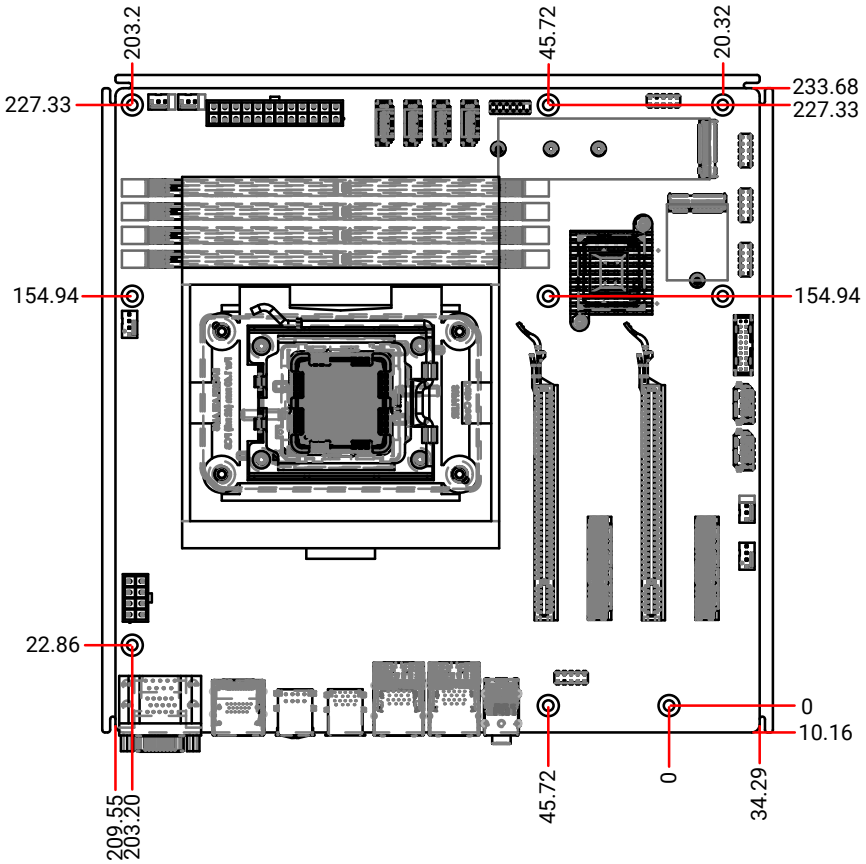
Rich I/O

2 Intel 2.5GbE, 4 COM,
6 USB 3.2 Gen 2,
2 USB 3.2 Gen 1,
6 USB 2.0

BLOCK DIAGRAM



MECHANICAL DRAWING



SPECIFICATION

SYSTEM	**Processor**	AMD® Ryzen™ 9000/7000/EPYC 4005 Series AM5 Socket Processors, TDP support up to 65W Ryzen™ 7 9700X (8 Cores, 32M Cache, up to 5.5 GHz); 65W (life cycle only to Q1' 29) Ryzen™ 5 9600X (6 Cores, 32M Cache, up to 5.4 GHz); 65W (life cycle only to Q1' 29) Ryzen™ 9 PRO 7945 (12 Cores, 64M Cache, up to 5.4 GHz); 65W Ryzen™ 7 PRO 7745 (8 Cores, 32M Cache, up to 5.3 GHz); 65W Ryzen™ 5 PRO 7645 (6 Cores, 32M Cache, up to 5.1 GHz); 65W EPYC™ 4545P (16 Cores, 64M Cache, up to 5.4 GHz); 65W EPYC™ 4465P (12 Cores, 64M Cache, up to 5.4 GHz); 65W EPYC™ 4345P (8 Cores, 32M Cache, up to 5.5 GHz); 65W EPYC™ 4245P (6 Cores, 32M Cache, up to 5.4 GHz); 65W
	Chipset	AMD B650
	Memory	Four 288-pin UDIMM up to 128GB (ECC/Non-ECC) Dual Channel DDR5 5200 MHz ***Speed support list follow User's Manual**
	BIOS	AMI SPI 256Mbit
GRAPHICS	**Controller**	Navi2 Graphics
	Feature	1WGP @2.2GHz max
	Display	1 x VGA 1 x DP++ 1 x HDMI 2.0 **VGA:** resolution up to 1920x1200 @ 60Hz **DP++:** resolution up to 3840x2160 @ 60Hz **HDMI:** resolution up to 4096x2160 @ 60Hz
	Triple Displays	1 VGA + 1 DP++ + 1 HDMI 2.0
EXPANSION	**Interface**	2 x PCIe x16 (Gen 4, x16 or x8+x8) -Support PCIE1/PCIE3 : single at x16(PCIE1) -Support PCIE1/PCIE3 : dual at x8(PCIE1)/x8(PCIE3) -Support PCIE1 : Riser card x16 or x8/x8 selected by Jumper 2 x PCIe x4 (Gen 4)
		1 x M.2 2230 E key (PCIe/USB 2.0/Intel CNVi/Discrete Wifi 6E support) 1 x M.2 2242/2260/2280 M key (PCIe x4 Gen4 NVMe support)
AUDIO	**Audio Codec**	Realtek ALC888
ETHERNET	**Controller**	2 x Intel® I226V
REAR I/O	**Ethernet**	2 x 2.5GbE (RJ-45)
	Serial	1 x RS232
	USB	6 x USB 3.2 Gen 2 2 x USB 2.0
	Display	1 x VGA 1 x DP++ 1 x HDMI
	Audio	1 x Line-out 1 x Mic-in 1 x Line-in (opt. by request, MOQ required)
INTERNAL I/O	**Serial**	1 x RS-232/422/485 2 x RS232
	USB	2 x USB 3.2 Gen1 4 x USB 2.0 (colay vertical Type A)
	Audio	1 x Front Audio Header 1 x S/PDIF
	SATA	4 x SATA 3.0 RAID 0/1/5/10
	DIO	1 x 8-bit DIO
	PS/2	1 x PS/2
	SMBus/ I^2C	1 x SMBus/ I^2C
WATCHDOG TIMER	**Output & Interval**	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	**TPM**	Nuvoton TPM 2.0
POWER	**Type**	ATX
	Connector	8-pin ATX 12V power
		24-pin ATX power
	Consumption	**Typical:** Ryzen 9 PRO 7945: 3.3V @ 0.14A (0.462W); 5V @ 0.96A (4.8W); 12V @ 0.66A (7.92W) **Max.:** Ryzen 9 PRO 7945: 3.3V @ 1.14A (3.762W); 5V @ 3.4A (17W); 12V @ 8.94A (107.28W)
	RTC Battery	CR2032 Coin Cell
OS SUPPORT	**Microsoft**	Windows 11 Enterprise Windows 10
	Linux	Ubuntu 22.04
ENVIRONMENT	**Temperature**	**Operating:** -5 to 65°C **Storage:** -40 to 85°C
	Humidity	**Operating:** 5 to 95% RH **Storage:** 5 to 95% RH
	MTBF	481,630 hrs @ 25°C; 277,744 hrs @ 45°C; 177,053 hrs @ 60°C; 130,262 hrs @ 70°C Calculation Model: Telcordia Issue 4 Environment: GB, GC - Ground Benign, Controlled

SPECIFICATION

MECHANISM	**Dimensions**	microATX Form Factor 244mm (9.6") x 244mm (9.6")
	Height	**PCB:** 1.6mm **Top Side:** 38mm **Bottom Side:** 3mm
STANDARDS AND CERTIFICATIONS	**Certifications**	CE, FCC Class B, RoHS, UKCA

ORDERING INFORMATION

Model Name	P/N	Memory	2.5 GbE	COM	USB 3.2 Gen2	USB 3.2 Gen1	USB 2.0	TPM 2.0	Power	Temp.
RAP310-B650	770-RAP3101-000G	4 DDR5 UDIMM	2	4	6	2	4	dTPM	24-pin ATX/ 8-pin ATX 12V	-5 to 65°C

PACKING LIST

1 RAP310-B650 motherboard	
1 COM port cable (Length: 300mm, 2 x COM ports)	A81-015026-023G
1 Serial ATA data cable (Length: 500mm)	332-553001-005G
1 I/O shield	A49-RAP310-000G

OPTIONAL ITEMS

USB 2.0 port cable (Length: 350/398mm)	A81-001066-016G
USB 3.2 Gen1 port cable (Length: 320mm)	A81-001196-023G
COM port cable (Length: 300mm, 2 x COM ports)	A81-015026-023G
Serial ATA data cable (Length: 500mm, W/LOCK)	332-553001-005G
Serial ATA data cable (Length: 500mm, W/LOCK, 90D)	A81-002128-017G
Thermal solution (Cooler)	A71-101159-001G
DP to HDMI Dongle	612-D2H13M-000G
M.2-COM4 (M.2 serial port module)	770-M2COM1-000G
M.2-2LAN (M.2 LAN port module)	770-M22LN1-000G
M.2-2PSE (M.2 PSE module)	770-M22PS1-000G

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