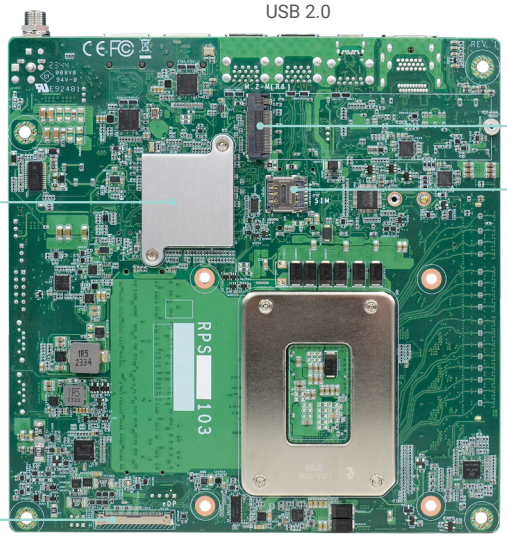
RPS101/RPS103-R680E
RPS101/RPS103-Q670E
RPS101/RPS103-H610E

BTL-S/14th/13th/12th Gen Intel® Core™
Thin Mini-ITX

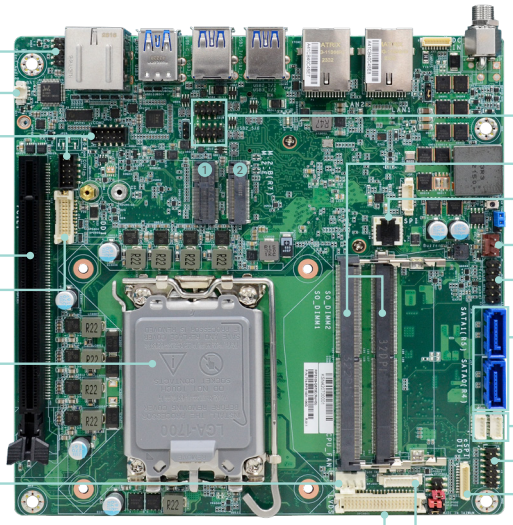
IoT Solutions Alliance

R680E/Q670E

H610E



Bottom View



Top View

KEY FEATURES

DDR5

2 DDR5 5600MHz SODIMM up to 64GB

4K High Resolution

Supports up to 4K resolution

Quad Displays

1 DP++, 1 HDMI,
1 USB Type C, 1 LVDS/eDP,
1 DFI display extension port (DP/HDMI/VGA available)

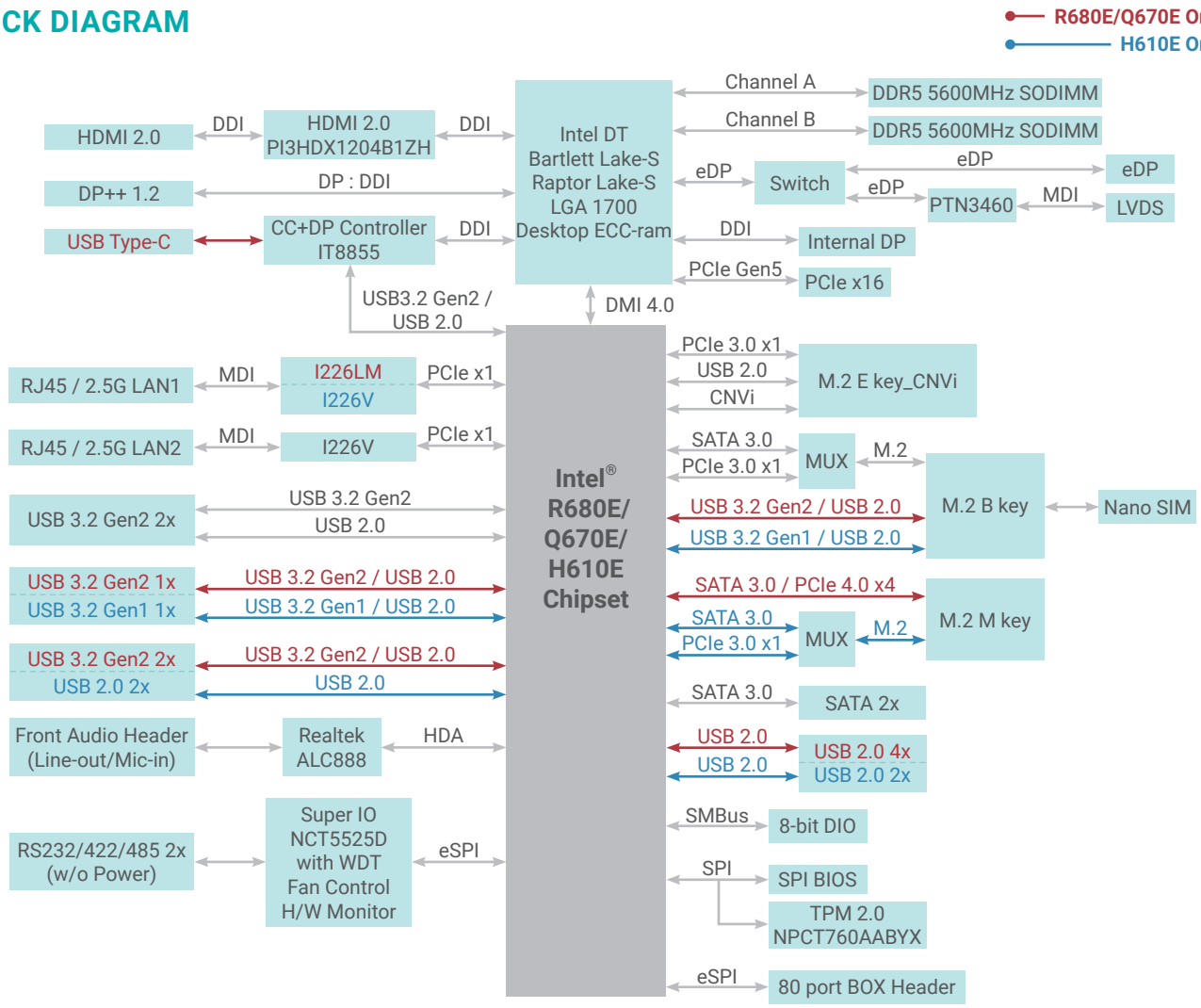
Multiple Expansion

1 PCIe x16,
1 M.2 E Key,
1 M.2 M Key,
1 M.2 B Key

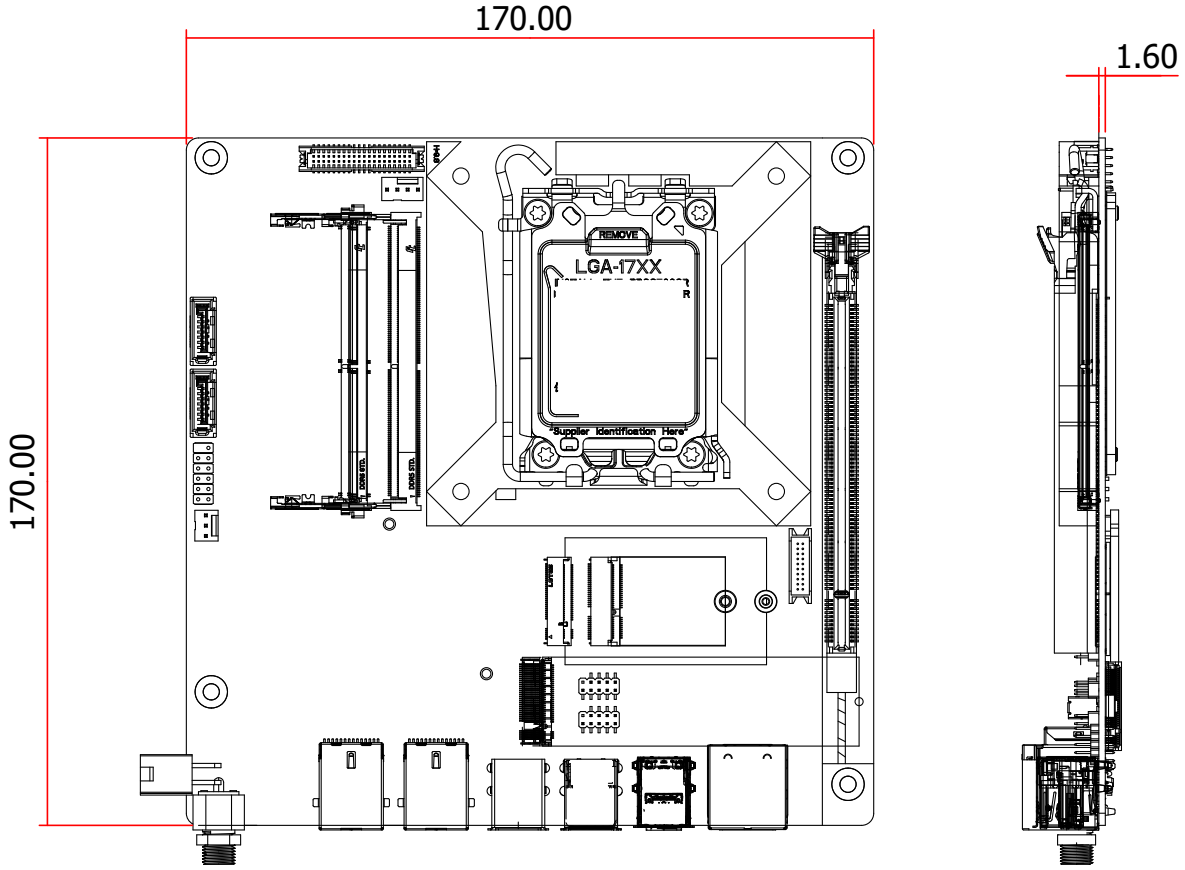
Rich I/O

2 Intel 2.5GbE , 2 COM,
6 USB 3.2 Gen2,
4 USB 2.0, 2 SATA 3.0

BLOCK DIAGRAM



MECHANICAL DRAWING



SPECIFICATION

Model Name		RPS101/RPS103-R680E	RPS101/RPS103-Q670E	RPS101/RPS103-H610E
SYSTEM	Processor	Intel® Bartlett Lake-S P-Core Only LGA 1700 Socket Processors, TDP support up to 65W Intel® Core™ 9 273PE (12 Cores, 36M Cache, up to 5.7 GHz); 65W Intel® Core™ 9 273PTE (12 Cores, 36M Cache, up to 5.5 GHz); 45W Intel® Core™ 7 253PE (10 Cores, 33M Cache, up to 5.5 GHz); 65W Intel® Core™ 7 253PTE (10 Cores, 33M Cache, up to 5.4 GHz); 45W Intel® Core™ 5 223PE (8 Cores, 24M Cache, up to 5.4 GHz); 65W Intel® Core™ 5 223PTE (8 Cores, 24M Cache, up to 5.4 GHz); 45W Intel® Core™ 5 213PE (8 Cores, 24M Cache, up to 5.2 GHz); 65W Intel® Core™ 5 213PTE (8 Cores, 24M Cache, up to 5.2 GHz); 45W		
		Intel® Bartlett Lake-S Hybrid LGA 1700 Socket Processors Intel® Core™ 7 251E (24 Cores, 36M Cache, up to 5.6 GHz); 65W Intel® Core™ 7 251TE (24 Cores, 36M Cache, up to 5.4 GHz); 45W Intel® Core™ 5 221E (14 Cores, 24M Cache, up to 5.2 GHz); 65W Intel® Core™ 5 221TE (14 Cores, 24M Cache, up to 5.0 GHz); 45W Intel® Core™ 5 211E (10 Cores, 20M Cache, up to 4.9 GHz); 65W Intel® Core™ 5 211TE (10 Cores, 20M Cache, up to 4.8 GHz); 45W Intel® Core™ 3 201E (4 Cores, 12M Cache, up to 4.8 GHz); 60W Intel® Core™ 3 201TE (4 Cores, 12M Cache, up to 4.6 GHz); 45W Intel® 300 (2 Cores, 6M Cache, up to 3.9 GHz); 45W Intel® 300T (2 Cores, 6M Cache, up to 3.4 GHz); 35W		
		14th Generation Intel® LGA 1700 Socket Processors, TDP support up to 65W Intel® Core™ I9-14900 (24 Cores, 36M Cache, up to 5.8 GHz); 65W Intel® Core™ I9-14900T (24 Cores, 36M Cache, up to 5.5 GHz); 35W Intel® Core™ I7-14700 (20 Cores, 33M Cache, up to 5.4 GHz); 65W Intel® Core™ I7-14700T (20 Cores, 33M Cache, up to 5.2 GHz); 35W Intel® Core™ I5-14500 (14 Cores, 24M Cache, up to 5.0 GHz); 65W Intel® Core™ I5-14500T (14 Cores, 24M Cache, up to 4.8 GHz); 35W Intel® Core™ I5-14400 (10 Cores, 20M Cache, up to 4.7 GHz); 65W Intel® Core™ I5-14400T (10 Cores, 20M Cache, up to 4.5 GHz); 35W Intel® Core™ I3-14100 (4 Cores, 12M Cache, up to 4.7 GHz); 60W Intel® Core™ I3-14100T (4 Cores, 12M Cache, up to 4.4 GHz); 35W Intel® 300 (2 Cores,6M Cache, 3.9 GHz); 46W Intel® 300T (2 Cores, 4M Cache, 3.4 GHz); 35W		
		13th Generation Intel® LGA 1700 Socket Processors, TDP support up to 65W Intel® Core™ I9-13900E (24 Cores, 36M Cache, up to 5.2 GHz); 65W Intel® Core™ I9-13900TE (24 Cores, 36M Cache, up to 5.0 GHz); 35W Intel® Core™ I9-13900 (24 Cores, 36M Cache, up to 5.6 GHz); 65W Intel® Core™ I7-13700E (16 Cores, 30M Cache, up to 5.1 GHz); 65W Intel® Core™ I7-13700TE (16 Cores, 30M Cache, up to 4.8 GHz); 35W Intel® Core™ I7-13700 (16 Cores, 30M Cache, up to 5.2 GHz); 65W Intel® Core™ I7-13700T (16 Cores, 30M Cache, up to 4.9 GHz); 35W Intel® Core™ I5-13500E (14 Cores, 24M Cache, up to 4.6 GHz); 65W Intel® Core™ I5-13500TE (14 Cores, 24M Cache, up to 4.5 GHz); 35W Intel® Core™ I5-13500 (14 Cores, 24M Cache, up to 4.8 GHz); 65W Intel® Core™ I5-13500T (14 Cores, 24M Cache, up to 4.6 GHz); 35W Intel® Core™ I5-13400E (10 Cores, 20M Cache, up to 4.6 GHz); 65W Intel® Core™ I5-13400 (10 Cores, 20M Cache, up to 4.6 GHz); 65W Intel® Core™ I3-13100E (4 Cores, 12M Cache, up to 4.4 GHz); 65W Intel® Core™ I3-13100TE (4 Cores, 12M Cache, up to 4.1 GHz); 35W Intel® Core™ I3-13100 (4 Cores, 12M Cache, up to 4.5 GHz); 65W Intel® Core™ I3-13100T (4 Cores, 12M Cache, up to 4.2 GHz); 35W Intel® G7400E (2 Cores, 6M Cache, 3.6 GHz); 46W Intel® G7400TE (2 Cores, 6M Cache, 3.0 GHz); 35W Intel® G6900E (2 Cores, 4M Cache, 3.0 GHz); 46W Intel® G6900TE (2 Cores, 4M Cache, 2.4 GHz); 35W		
		12th Generation Intel® LGA 1700 Socket Processors, TDP support up to 65W Intel® Core™ i9-12900E (16 Cores, 30M Cache, up to 5.0 GHz); 65W Intel® Core™ i9-12900TE (16 Cores, 30M Cache, up to 4.8 GHz); 35W Intel® Core™ i9-12900(16 Cores, 30M Cache, up to 5.0 GHz); 65W Intel® Core™ i7-12700E (12 Cores, 25M Cache, up to 4.8 GHz); 65W Intel® Core™ i7-12700TE (12 Cores, 25M Cache, up to 4.7 GHz); 35W Intel® Core™ i7-12700 (12 Cores, 25M Cache, up to 4.8 GHz); 65W Intel® Core™ i5-12500E (6 Cores, 18M Cache, up to 4.5 GHz); 65W Intel® Core™ i5-12500TE (6 Cores, 18M Cache, up to 4.3 GHz); 35W Intel® Core™ i5-12500 (6 Cores, 18M Cache, up to 4.6 GHz); 65W Intel® Core™ i5-12400 (6 Cores, 18M Cache, up to 4.4 GHz); 65W Intel® Core™ i3-12100E (4 Cores, 12M Cache, up to 4.2 GHz); 60W Intel® Core™ i3-12100TE (4 Cores, 12M Cache, up to 4.0 GHz); 35W Intel® Core™ i3-12100 (4 Cores, 12M Cache, up to 4.3 GHz); 60W Intel® G7400E (2 Cores, 6M Cache, 3.6 GHz); 46W Intel® G7400TE (2 Cores, 6M Cache, 3.0 GHz); 35W Intel® G6900E (2 Cores, 4M Cache, 3.0 GHz); 46W Intel® G6900TE (2 Cores, 4M Cache, 2.4 GHz); 35W		

SPECIFICATION

Model Name		RPS101/RPS103-R680E	RPS101/RPS103-Q670E	RPS101/RPS103-H610E
SYSTEM	Chipset	Intel® R680E Chipset	Intel® Q670E Chipset	Intel® H610E Chipset
	Memory	Two 262-pin SODIMM up to 64GB (ECC/Non-ECC) Dual Channel DDR5 5600 MHz	Two 262-pin SODIMM up to 64GB (Non-ECC) Dual Channel DDR5 5600 MHz	Two 262-pin SODIMM up to 64GB (Non-ECC) Dual Channel DDR5 5600 MHz
	BIOS	AMI SPI 256Mbit	AMI SPI 256Mbit	AMI SPI 256Mbit
GRAPHICS	Controller	Intel® UHD Graphics 700 series	Intel® UHD Graphics 700 series	Intel® UHD Graphics 700 series
	Feature	**3D graphics HW acceleration:** DX12, Open GL 4.6, Vulkan 1.2 **HW Video Decode:** 8K60 12b 4:2:0 HEVC/VP9/SCC; 8K30 10b 4:2:0 AV1; 5K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC **HW Video Encode:** 8K30 or 5K60 8b/10b 4:2:0 HEVC/VP9/SCC; 4K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC	**3D graphics HW acceleration:** DX12, Open GL 4.6, Vulkan 1.2 **HW Video Decode:** 8K60 12b 4:2:0 HEVC/VP9/SCC; 8K30 10b 4:2:0 AV1; 5K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC **HW Video Encode:** 8K30 or 5K60 8b/10b 4:2:0 HEVC/VP9/SCC; 4K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC	**3D graphics HW acceleration:** DX12, Open GL 4.6, Vulkan 1.2 **HW Video Decode:** 8K60 12b 4:2:0 HEVC/VP9/SCC; 8K30 10b 4:2:0 AV1; 5K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC **HW Video Encode:** 8K30 or 5K60 8b/10b 4:2:0 HEVC/VP9/SCC; 4K60 10b 4:4:4 HEVC/VP9/SCC; 4K60 8b 4:2:0 AVC
GRAPHICS	Display	1 x HDMI 2.0 1 x DP++ 1.2 1 x USB Type-C 1 x eDP/LVDS 1 x DFI display extension port (DP/HDMI/VGA available) **HDMI:** resolution up to 4096x2160 @ 60Hz **DP++:** resolution up to 4096x2304 @ 60Hz **USB Type C:** resolution up to 4096x2304 @ 60Hz **eDP:** resolution up to 4096x2160 @ 60Hz **LVDS:** resolution up to 1920x1200 @ 60Hz	1 x HDMI 2.0 1 x DP++ 1.2 1 x USB Type-C 1 x eDP/LVDS 1 x DFI display extension port (DP/HDMI/VGA available) **HDMI:** resolution up to 4096x2160 @ 60Hz **DP++:** resolution up to 4096x2304 @ 60Hz **USB Type C:** resolution up to 4096x2304 @ 60Hz **eDP:** resolution up to 4096x2160 @ 60Hz **LVDS:** resolution up to 1920x1200 @ 60Hz	1 x HDMI 2.0 1 x DP++ 1.2 1 x eDP/LVDS 1 x DFI display extension port (DP/HDMI/VGA available) **HDMI:** resolution up to 4096x2160 @ 60Hz **DP++:** resolution up to 4096x2304 @ 60Hz **eDP:** resolution up to 4096x2160 @ 60Hz **LVDS:** resolution up to 1920x1200 @ 60Hz
	Quad Displays	DP++ + HDMI + LVDS/eDP + USB Type C + DFI display extension port (DP/HDMI/VGA available)	DP++ + HDMI + LVDS/eDP + USB Type C + DFI display extension port (DP/HDMI/VGA available)	DP++ + HDMI + LVDS/eDP + DFI display extension port (DP/HDMI/VGA available)
EXPANSION	Interface	1 x PCIe x16 (Gen 5) (Max. 75W) (Bifurcation 1x16, 2x8)	1 x PCIe x16 (Gen 5) (Max. 75W) (Bifurcation 1x16, 2x8)	1 x PCIe x16 (Gen 5) (Max. 75W) (Bifurcation 1x16)
	M.2	1 x M.2 2230 E Key (USB 2.0x1/ CNVix1/PCIe3.0 x1) 1 x M.2 2242/3042/3052 B Key (PCIe 3.0 x1/SATA 3.0x1/USB 3.2 Gen2x1/USB 2.0x1) 1 x M.2 2280 M Key (PCIe 4.0x4 or SATA 3.0x1)	1 x M.2 2230 E Key (USB 2.0x1/ CNVix1/PCIe3.0 x1) 1 x M.2 2242/3042/3052 B Key (PCIe 3.0 x1/SATA 3.0x1/USB 3.2 Gen2x1/USB 2.0x1) 1 x M.2 2280 M Key (PCIe 4.0x4 or SATA 3.0x1)	1 x M.2 2230 E Key (USB 2.0x1/ CNVix1/PCIe3.0 x1) 1 x M.2 2242/3042/3052 B Key (PCIe 3.0x1/SATA3.0x1/USB 3.2 Gen1x1/USB 2.0x1) 1 x M.2 2280 M Key (PCIe 3.0x1/ SATA3.0x1)
AUDIO	Audio Codec	Realtek ALC888	Realtek ALC888	Realtek ALC888
ETHERNET	Controller	1 x Intel® I226-LM (Core i9/i7/i5 support iAMT) 1 x Intel® I226-V	1 x Intel® I226-LM (Core i9/i7/i5 support iAMT) 1 x Intel® I226-V	2 x Intel® I226-V
REAR I/O	Ethernet	2 x 2.5GbE (RJ-45)	2 x 2.5GbE (RJ-45)	2 x 2.5GbE (RJ-45)
	USB	5 x USB 3.2 Gen2 Type A 1 x USB 3.2 Gen2 USB Type C	5 x USB 3.2 Gen2 Type A 1 x USB 3.2 Gen2 USB Type C	2 x USB 3.2 Gen2 1 x USB 3.2 Gen1 2 x USB 2.0
	Display	1 x HDMI 2.0 1 x DP++ 1.2 1 x USB Type-C	1 x HDMI 2.0 1 x DP++ 1.2 1 x USB Type-C	1 x HDMI 2.0 1 x DP++ 1.2
INTERNAL I/O	Serial	2 x RS-232/422/485 (w/o Power) Box header (2.0mm pitch)	2 x RS-232/422/485 (w/o Power) Box header (2.0mm pitch)	2 x RS-232/422/485 (w/o Power) Box header (2.0mm pitch)
	USB	4 x USB 2.0 (2 2x5 2.0mm pitch header)	4 x USB 2.0 (2 2x5 2.0mm pitch header)	2 x USB 2.0 (1 2x5 2.0mm pitch header)
	Display	1 x eDP/LVDS 1 x DFI display extension port (DP/ HDMI/VGA available)	1 x eDP/LVDS 1 x DFI display extension port (DP/ HDMI/VGA available)	1 x eDP/LVDS 1 x DFI display extension port (DP/ HDMI/VGA available)
	Audio	1 x Front Audio Header (1 x Line-out, 1 x Mic-in)	1 x Front Audio Header (1 x Line-out, 1 x Mic-in)	1 x Front Audio Header (1 x Line-out, 1 x Mic-in)
	SATA	2 x SATA 3.0 (up to 6Gb/s) 2 x SATA Power RAID 0/1/5/10 (w/ M.2 Key-M/B slot + 2 SATA Conn.)	2 x SATA 3.0 (up to 6Gb/s) 2 x SATA Power RAID 0/1/5/10 (w/ M.2 Key-M/B slot + 2 SATA Conn.)	2 x SATA 3.0 (up to 6Gb/s) 2 x SATA Power
	SMBus	1 x SMBus	1 x SMBus	1 x SMBus
	DIO	1 x 8-bit DIO	1 x 8-bit DIO	1 x 8-bit DIO
WATCHDOG TIMER	Output & Interval	System Reset, Programmable via Software from 1 to 255 Seconds	System Reset, Programmable via Software from 1 to 255 Seconds	System Reset, Programmable via Software from 1 to 255 Seconds

SPECIFICATION

Model Name		RPS101/RPS103-R680E	RPS101/RPS103-Q670E	RPS101/RPS103-H610E
SECURITY	**TPM**	Nuvoton TPM 2.0	Nuvoton TPM 2.0	Nuvoton TPM 2.0
POWER	**Type**	**RPS101:** Single 12V +/-5% DC **RPS103:** Wide Range 12~28V	**RPS101:** Single 12V +/-5% DC **RPS103:** Wide Range 12~28V	**RPS101:** Single 12V +/-5% DC **RPS103:** Wide Range 12~28V
	Connector	DC-in Jack Right Angle Connector (4-pin) (available upon request) Straight Type Connector (4-pin) (available upon request)	DC-in Jack Right Angle Connector (4-pin) (available upon request) Straight Type Connector (4-pin) (available upon request)	DC-in Jack Right Angle Connector (4-pin) (available upon request) Straight Type Connector (4-pin) (available upon request)
	Consumption	**Idle:** i9-13900E 65W: 12V @ 8.5A (102W) **Max:** i9-13900E 65W: 12V @14.1A (169.2W) **Idle:** i9-14900E 65W: 12V @ 4.2A (50.4W) **Max:** i9-14900E 65W: 12V @ 13.8A (165.6W)	**Idle:** i9-13900E 65W: 12V @ 8.5A (102W) **Max:** i9-13900E 65W: 12V @14.1A (169.2W) **Idle:** i9-14900E 65W: 12V @ 4.2A (50.4W) **Max:** i9-14900E 65W: 12V @ 13.8A (165.6W)	**Idle:** i9-13900E 65W: 12V @ 8.5A (102W) **Max:** i9-13900E 65W: 12V @14.1A (169.2W) **Idle:** i9-14900E 65W: 12V @ 4.2A (50.4W) **Max:** i9-14900E 65W: 12V @ 13.8A (165.6W)
	RTC Battery	CR2032 Coin Cell	CR2032 Coin Cell	CR2032 Coin Cell
OS SUPPORT	**Microsoft**	Windows 10 IoT Enterprise 64-bit Windows 11 LTSC	Windows 10 IoT Enterprise 64-bit Windows 11 LTSC	Windows 10 IoT Enterprise 64-bit Windows 11 LTSC
	Linux	Linux	Linux	Linux
ENVIRONMENT	**Temperature**	**Operating:** -5 to 65°C **Storage:** -40 to 85°C	**Operating:** -5 to 65°C **Storage:** -40 to 85°C	**Operating:** -5 to 65°C **Storage:** -40 to 85°C
	Humidity	**Operating:** 5 to 90% RH **Storage:** 5 to 90% RH	**Operating:** 5 to 90% RH **Storage:** 5 to 90% RH	**Operating:** 5 to 90% RH **Storage:** 5 to 90% RH
	MTBF	TBD	TBD	TBD
MECHANISM	**Dimensions**	Mini-ITX Form Factor 170mm (6.7") x 170mm (6.7")	Mini-ITX Form Factor 170mm (6.7") x 170mm (6.7")	Mini-ITX Form Factor 170mm (6.7") x 170mm (6.7")
	Height	**Top Side:** 19mm **Bottom Side:** 4.5mm	**Top Side:** 19mm **Bottom Side:** 4.5mm	**Top Side:** 19mm **Bottom Side:** 4.5mm
CERTIFICATION	**Certification**	CE, FCC Class B, RoHS, UKCA	CE, FCC Class B, RoHS, UKCA	CE, FCC Class B, RoHS, UKCA

ORDERING INFORMATION

Model Name	P/N	Memory	Rear I/O			Internal I/O				TPM 2.0	Power	Operating Temp.
			Display	2.5 GbE	USB	M.2	RS-232/ 422/485	SATA	USB			
RPS101-R680E	770-RPS1011-000G	2 DDR5	DP/HDMI/ Type C	2	5 USB 3.2, 1 USB Type C	M.2 M/B/E Key	2	2	4 USB 2.0	dTPM	12VDC	-5 to 65°C
RPS101-Q670E	770-RPS1011-100G		DP/HDMI/ Type C		5 USB 3.2, 1 USB Type C				4 USB 2.0		12VDC	
RPS101-H610E	770-RPS1011-200G		DP/HDMI		3 USB 3.2, 2 USB 2.0				2 USB 2.0		12VDC	
RPS103-R680E	770-RPS1031-000G		DP/HDMI/ Type C		5 USB 3.2, 1 USB Type C				4 USB 2.0		12~28VDC	
RPS103-Q670E	770-RPS1031-100G		DP/HDMI/ Type C		5 USB 3.2, 1 USB Type C				4 USB 2.0		12~28VDC	
RPS103-H610E	770-RPS1031-200G		DP/HDMI		3 USB 3.2, 2 USB 2.0				2 USB 2.0		12~28VDC	

PACKING LIST

• 1 RPS101/RPS103 motherboard	
• 1 Serial ATA data & power cable (Length: 300mm)	A81-002144-018G
• 1 COM port cable (Length: 250mm, 1 x COM port)	A81-015011-001G
• 1 I/O shield - w/ icon (2LAN/5USB)	A49-RPS101-000G

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