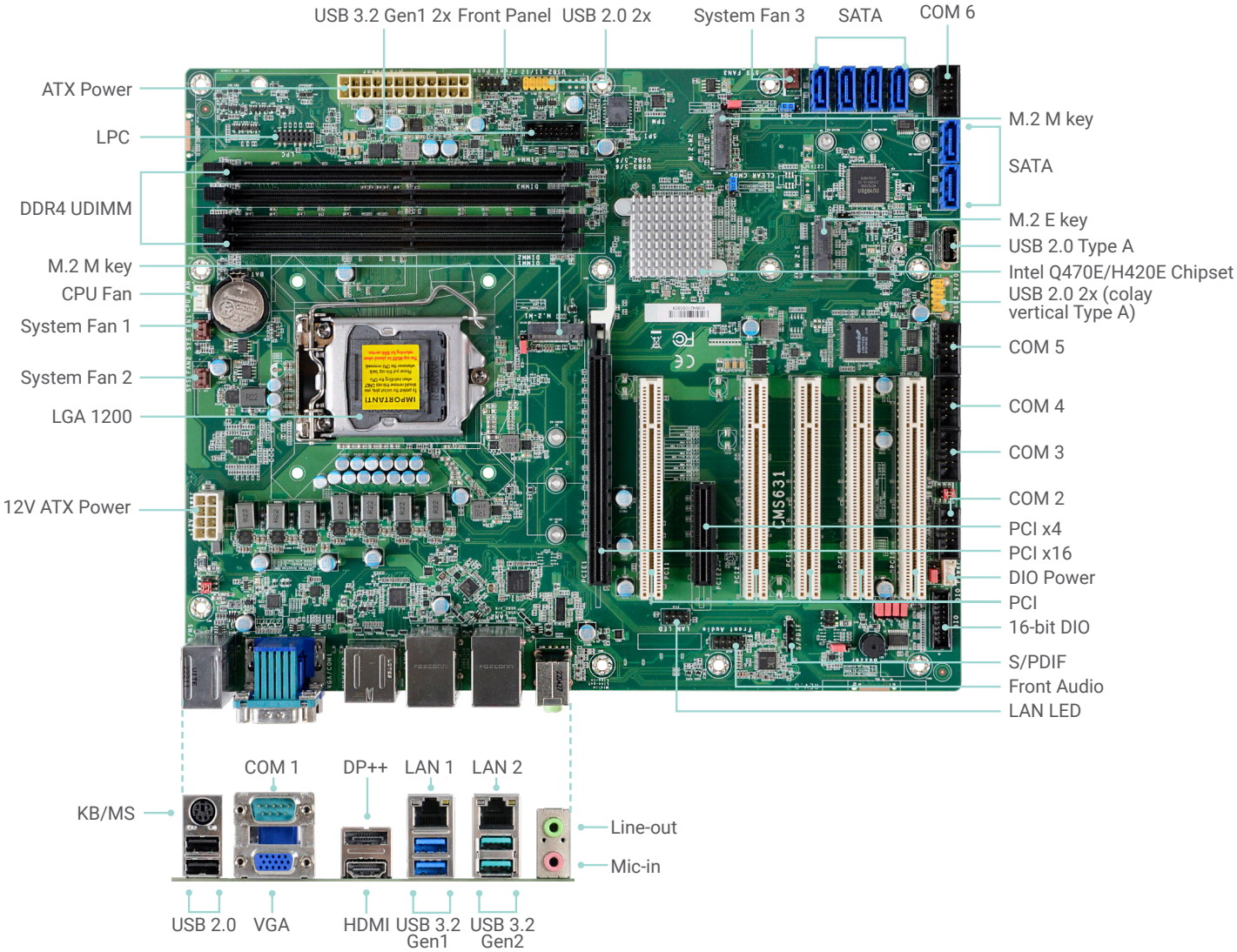
CMS631-Q470E
CMS631-H420E

Desktop

10th Gen Intel® Core™
ATX

intel IoT Solutions Alliance



Top View (CMS631-Q470E)

KEY FEATURES

DDR4

Q470E: 2 DDR4 UDIMM up to 128GB
H420E: 2 DDR4 UDIMM up to 64GB

4K High Resolution

Supports 4K/ 2K resolution

Multiple Displays

Q470E: VGA + DP++ + HDMI
H420E: VGA + DP++, VGA + HDMI, DP++ + HDM

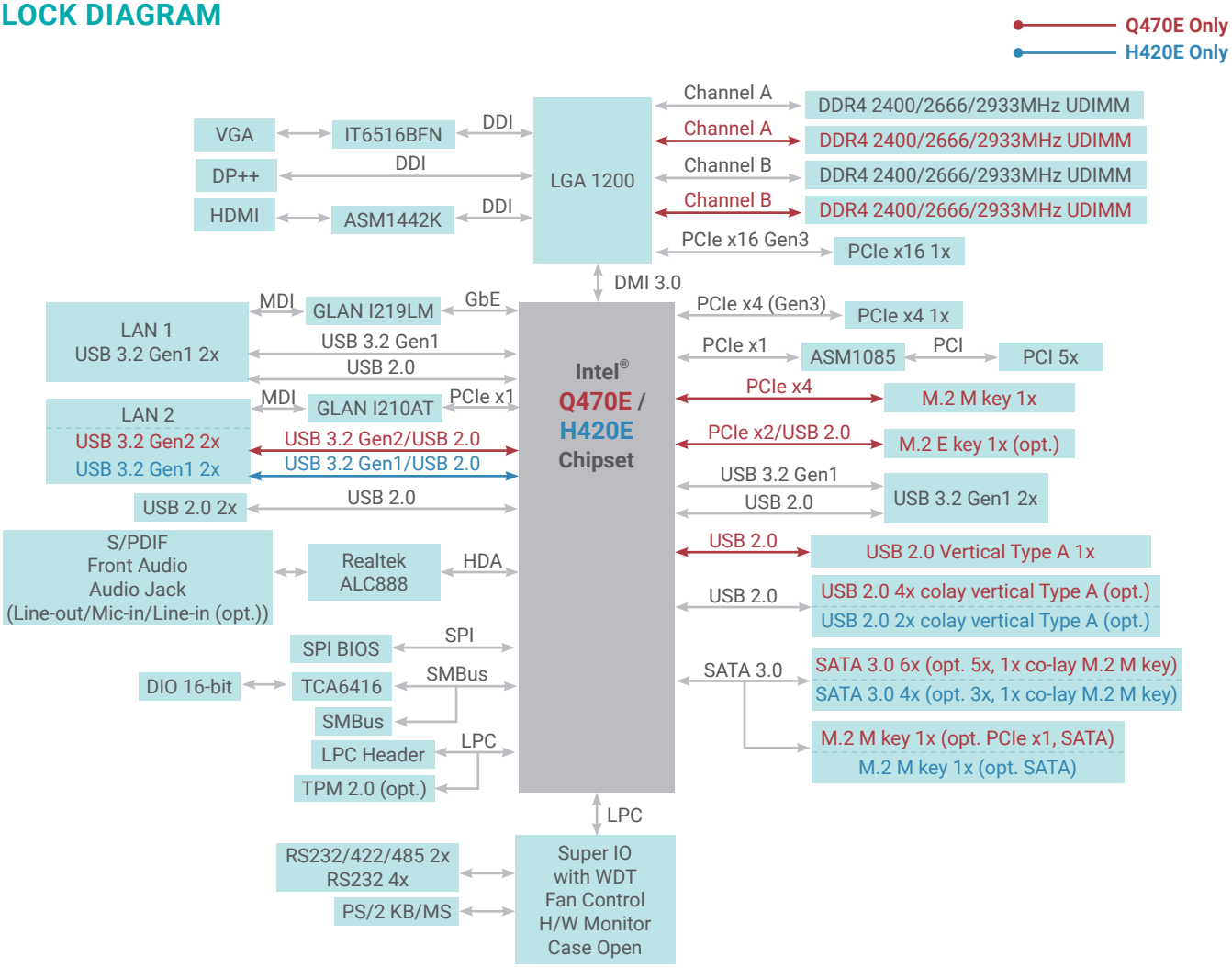
Multiple Expansion

1 PCIe x16, 1 PCIe x4, 5 PCI, 1 M.2 M key, 1 M.2 E key

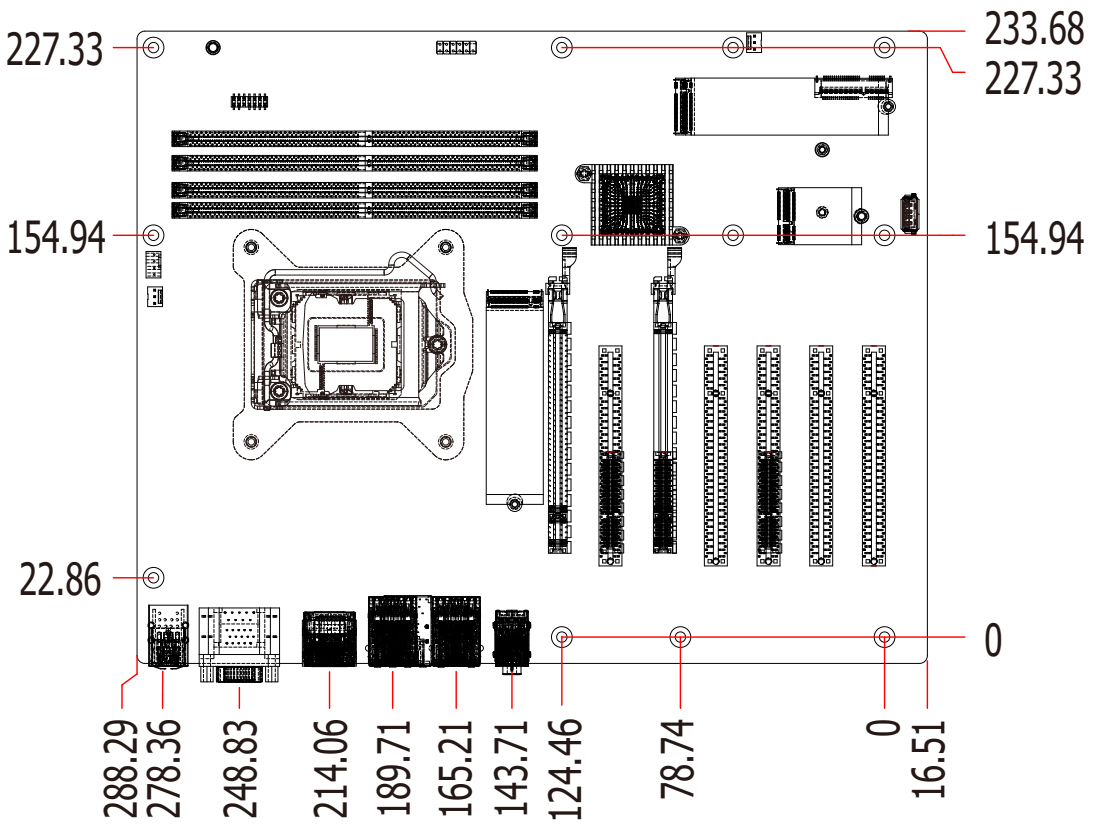
Rich I/O

2 Intel GbE, 6 COM
Q470E: 13 USB
H420E: 10 USB

BLOCK DIAGRAM



MECHANICAL DRAWING



SPECIFICATION

Model Name		CMS631-Q470E	CMS631-H420E
SYSTEM	**Processor**	10th Generation Intel® LGA 1200 Socket Processors, TDP support up to 125W Intel® Core™ i9-10900E (10 Cores, 20M Cache, up to 4.7 GHz); 65W Intel® Core™ i9-10900TE (10 Cores, 20M Cache, up to 4.5 GHz); 35W Intel® Core™ i7-10700E (8 Cores, 16M Cache, up to 4.5 GHz); 65W Intel® Core™ i7-10700TE (8 Cores, 16M Cache, up to 4.4 GHz); 35W Intel® Core™ i5-10500E (6 Cores, 12M Cache, up to 4.2 GHz); 65W Intel® Core™ i5-10500TE (6 Cores, 12M Cache, up to 3.7 GHz); 35W Intel® Core™ i3-10100E (4 Cores, 8M Cache, up to 3.8 GHz); 65W Intel® Core™ i3-10100TE (4 Cores, 8M Cache, up to 3.6 GHz); 35W Intel® Pentium® G6400E (2 Cores, 4M Cache, 3.8 GHz); 58W Intel® Celeron® G5900E (2 Cores, 2M Cache, 3.2 GHz); 58W Intel® Celeron® G5900TE (2 Cores, 2M Cache, 3.0 GHz); 35W	
	Chipset	Intel® Q470E Chipset	Intel® H420E Chipset
	Memory	Four 288-pin Non-ECC UDIMM up to 128GB Dual Channel DDR4 2400/2666/2933MHz	Two 288-pin Non-ECC UDIMM up to 64GB Dual Channel DDR4 2400/2666/2933MHz
	BIOS	AMI	AMI
GRAPHICS	**Controller**	Intel® HD Gen 9 Graphics	Intel® HD Gen 9 Graphics
	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:** MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9	OpenGL 4.5, DirectX 12, OpenCL 2.1 **HW Decode:** AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 **HW Encode:** MPEG2, AVC/H264, JPEG, HEVC/H265, VP8, VP9
	Display	1 x VGA 1 x DP++ 1 x HDMI 1.4b **VGA:** resolution up to 1920x1200 @ 60Hz **DP++:** resolution up to 4096x2160 @ 60Hz **HDMI:** resolution up to 4096x2160 @ 24Hz	1 x VGA 1 x DP++ 1 x HDMI 1.4b **VGA:** resolution up to 1920x1200 @ 60Hz **DP++:** resolution up to 4096x2160 @ 60Hz **HDMI:** resolution up to 4096x2160 @ 24Hz
	Multiple Displays	**Triple Display:** VGA + DP++ + HDMI	**Dual Display:** VGA + DP++ / VGA + HDMI / DP++ + HDMI
EXPANSION	**Interface**	1 x PCIe x16 (Gen 3) 1 x PCIe x4 (Gen 3) 5 x PCI	1 x PCIe x16 (Gen 3) 1 x PCIe x4 (Gen 3) 5 x PCI
	M.2	1 x M.2 2242/2260/2280 M key (PCIe Gen3 x4 NVMe/SATA/Intel® Optane Memory support) 1 x M.2 2242/2260/2280 M key (PCIe Gen3 x1/SATA as option, MOQ required) 1 x M.2 2230 E key (PCIe Gen3 x2/USB 2.0 as option, MOQ required)	1 x M.2 2242/2260/2280 M key (SATA as option, MOQ required)
AUDIO	**Audio Codec**	Realtek ALC888	Realtek ALC888
ETHERNET	**Controller**	1 x Intel® I210AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM/I219V with iAMT12.0 (10/100/1000Mbps) (only Core i9/i7/i5 supports iAMT)	1 x Intel® I210AT PCIe (10/100/1000Mbps) 1 x Intel® I219LM/I219V (10/100/1000Mbps)
REAR I/O	**Ethernet**	2 x GbE (RJ-45)	2 x GbE (RJ-45)
	Serial	1 x RS-232/422/485 (RS-232 w/ power) (DB-9)	1 x RS-232/422/485 (RS-232 w/ power) (DB-9)
	USB	2 x USB 3.2 Gen2 2 x USB 3.2 Gen1 2 x USB 2.0	4 x USB 3.2 Gen1 2 x USB 2.0
	Display	1 x VGA 1 x DP++ 1 x HDMI	1 x VGA 1 x DP++ 1 x HDMI
	Audio	1 x Line-out 1 x Mic-in 1 x Line-in (opt., MOQ required)	1 x Line-out 1 x Mic-in 1 x Line-in (opt., MOQ required)
INTERNAL I/O	**Serial**	1 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch) 4 x RS-232 (2.54mm pitch)	1 x RS-232/422/485 (RS-232 w/ power) (2.54mm pitch) 4 x RS-232 (2.54mm pitch)
	USB	2 x USB 3.2 Gen 1 4 x USB 2.0 (2.54mm pitch, colay vertical Type A, opt.: MOQ required) 1 x USB 2.0 vertical Type A	2 x USB 3.2 Gen 1 2 x USB 2.0 (2.54mm pitch, colay vertical Type A, opt.: MOQ required)
	Audio	1 x Front Audio Header 1 x S/PDIF	1 x Front Audio Header 1 x S/PDIF
	SATA	6 x SATA 3.0 (up to 6Gb/s) one SATA port share with M.2 M-key RAID 0/1/5/10	4 x SATA 3.0 (up to 6Gb/s) one SATA port share with M.2 M-key
	PS/2	1 x PS/2 (mini-DIN-6)	1 x PS/2 (mini-DIN-6)
	LPC	1 x LPC Supports LPC EXT-RS232/RS485 module	1 x LPC Supports LPC EXT-RS232/RS485 module
	DIO	1 x 16-bit DIO	1 x 16-bit DIO

SPECIFICATION

Model Name		CMS631-Q470E	CMS631-H420E
INTERNAL I/O	**SMBus**	1 x SMBus	1 x SMBus
WATCHDOG TIMER	**Output & Interval**	System Reset, Programmable via Software from 1 to 255 Seconds	System Reset, Programmable via Software from 1 to 255 Seconds
SECURITY	**TPM**	Infineon TPM2.0 (opt., MOQ required)	Infineon TPM2.0 (opt., MOQ required)
Power	**Type**	ATX	ATX
	Connector	8-pin ATX 12V power 24-pin ATX power	8-pin ATX 12V power 24-pin ATX power
	Consumption	**Typical:** i9-10900K: 3.3V @ 0.13A (0.429W); 5V @ 0.7A (3.5W); 12V @ 0.44A (5.28W) **Max.:** i9-10900K: 3.3V @ 0.18A (0.594W); 5V @ 1.59A (7.95W); 12V @ 14.22A (170.64W)	**Typical:** i9-10900K: 3.3V @ 0.13A (0.429W); 5V @ 0.7A (3.5W); 12V @ 0.44A (5.28W) **Max.:** i9-10900K: 3.3V @ 0.18A (0.594W); 5V @ 1.59A (7.95W); 12V @ 14.22A (170.64W)
	RTC Battery	CR2032 Coin Cell	CR2032 Coin Cell
OS Support	**Microsoft**	Windows 10 IoT Enterprise 64-bit Windows 11 GAC	Windows 10 IoT Enterprise 64-bit Windows 11 GAC
	Linux	Linux Ubuntu 20.04	Linux Ubuntu 20.04
Environment	**Temperature**	**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
	MTBF	504,168 hrs @ 25°C ; 278,849 hrs @ 45°C ; 172,277 hrs @ 60°C ; 146,454 hrs @ 65°C **Calculation Model:** Telcordia Issue 4 **Environment:** GB, GC - Ground Benign, Controlled	521,024 hrs @ 25°C ; 292,119 hrs @ 45°C ; 181,960 hrs @ 60°C ; 155,038 hrs @ 65°C **Calculation Model:** Telcordia Issue 4 **Environment:** GB, GC - Ground Benign, Controlled
Mechanism	**Dimensions**	ATX Form Factor 305mm (12") x 244mm (9.6")	ATX Form Factor 305mm (12") x 244mm (9.6")
	Height	**PCB:** 1.6mm **Top Side:** 37.7mm **Bottom Side:** 3mm	**PCB:** 1.6mm **Top Side:** 37.7mm **Bottom Side:** 3mm
Certifications	**Certifications**	CE, FCC Class B, RoHS, UKCA	CE, FCC Class B, RoHS, UKCA

ORDERING INFORMATION

Model Name	P/N	Memory	GbE	M.2	RS-232 /422/485	USB 3.2 Gen2	USB 3.2 Gen1	USB 2.0	SATA	TPM 2.0	Power	Temp.
CMS631-H420EC	770-CMS6313-000G	2 DDR4 UDIMM	2	0	2	0	6	4	4	0	24-pin ATX/ 8-pin ATX 12V	-5 to 65°C
CMS631-Q470ECRM	770-CMS6313-100G	4 DDR4 UDIMM		1		2	4	7	6	0		
CMS631-H420EC	770-CMS6313-200G	2 DDR4 UDIMM		0		0	6	4	4	1		
CMS631-Q470ECRM	770-CMS6313-300G	4 DDR4 UDIMM		1		2	4	7	6	1		
CMS631-H420EC	770-CMS6313-400G	2 DDR4 UDIMM		1		0	6	4	3	0		

PACKING LIST

• 1 CMS631 motherboard	
• 1 COM port cables (Length: 300mm, 2 x COM ports)	A81-015026-023G
• 1 Serial ATA data cable (Length: 500mm)	332-553001-005G
• 1 I/O shield	A49-CMS631-000G

OPTIONAL ITEMS

• USB 2.0 port cable (Length: 350/398mm)	A81-001066-016G
• USB 3.1 Gen1 port cable (Length: 320mm)	A81-001052-023G
• USB 3.2 Gen2 port cable (Length: 300mm)	A81-001075-017G
• 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 (For 35W, Height: 37.3mm)	A71-101107-000G
• Thermal solution (For 65W, Height: 74.47mm)	A71-101158-000G
• Thermal solution (For 95W, Height: 76.6mm)	A71-101143-000G
• DP to HDMI Dongle	612-D2H13M-000G
• EXT-RS232 (4 ports RS-232 LPC module)	770-EXTRS1-000G
• EXT-RS485 (4 ports RS-485 LPC module)	770-EXTRS1-100G
• M.2-COM4 (M.2 serial port module)	770-M2COM1-000G
• M.2-2LAN (M.2 LAN port module)	770-M22LN2-000G
• M.2-2PSE (M.2 PSE module)	770-M22PS2-000G

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