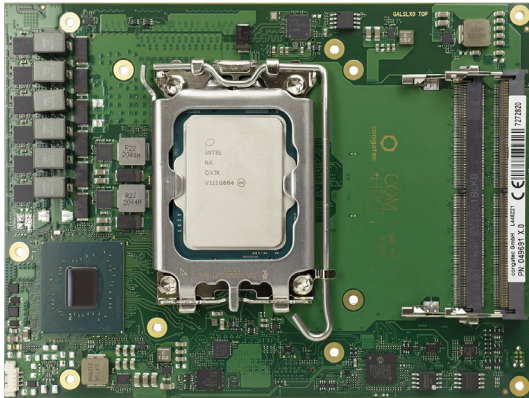# 12th Gen Intel® Core™ Embedded Desktop Processors
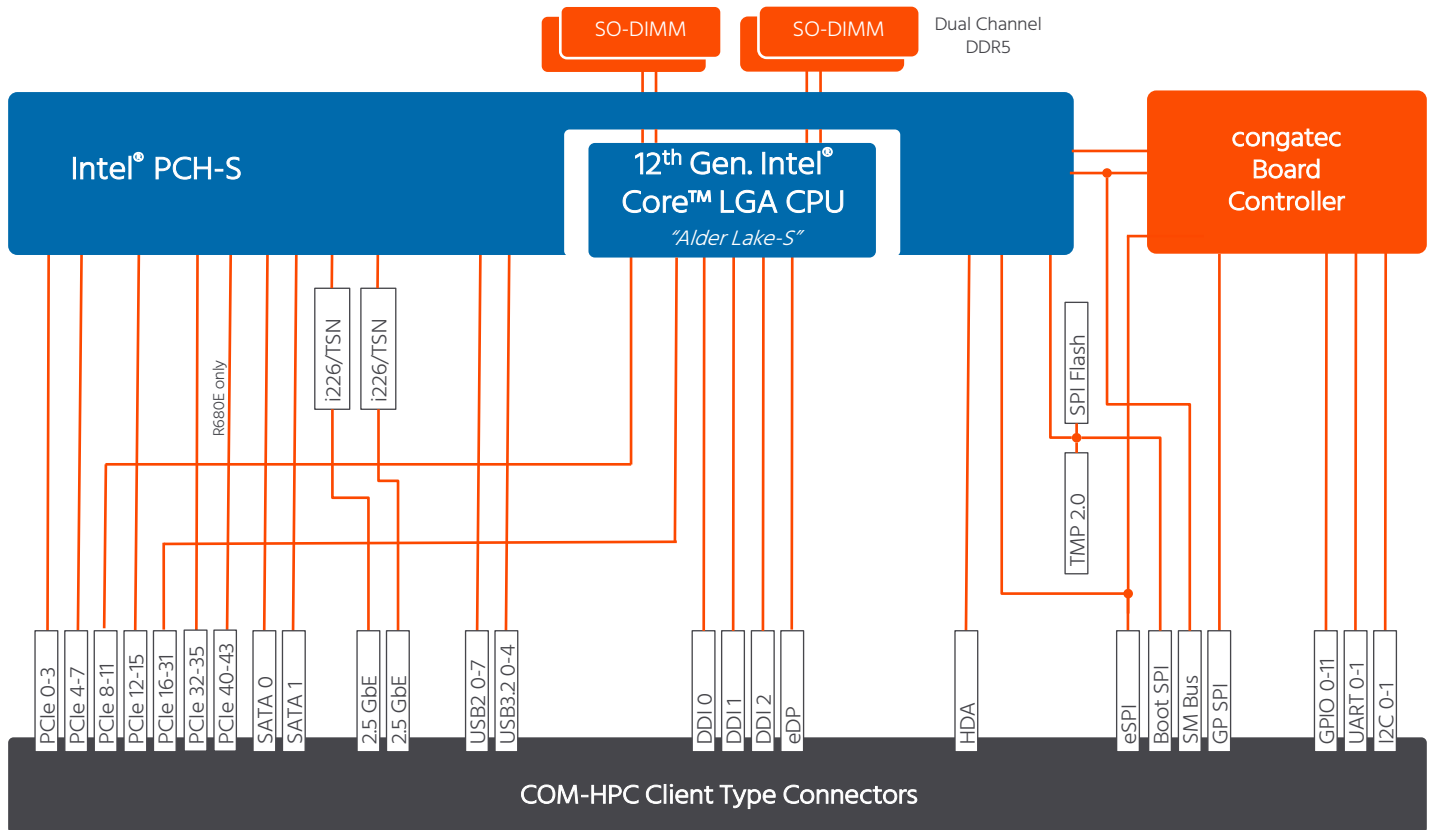
conga-HPC/cALS

COM·HPC®

- Intel® hybrid design combines Performance-cores with Efficient–cores
- Intel® UHD Graphics 770 driven by Xe Architecture
- PCI Express Gen 4/5 | USB 3.2 Gen 2x2
- AI Acceleration based on Intel® Deep Learning
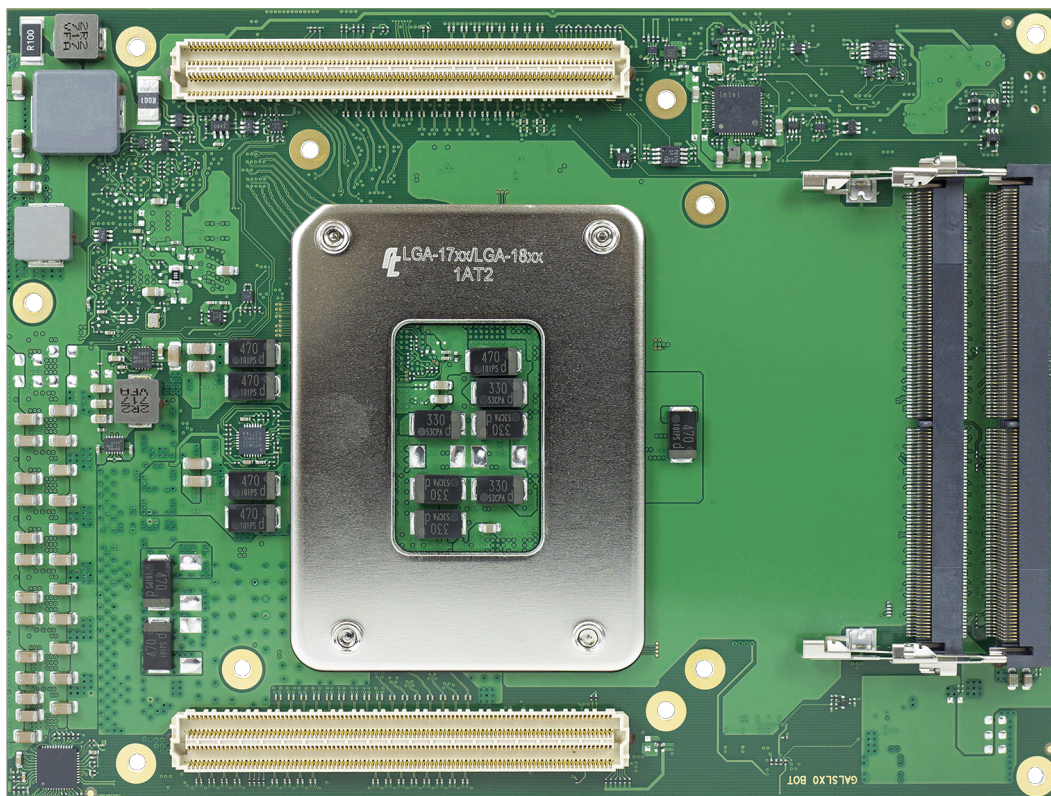- Embedded Use Condition SKUs

Form factor	COM-HPC Client Size C	Client Connector Pinout					
CPUs	CPU	TDP Target (W)	Cores count (P+E)	Processor Threads	P-cores Freq. GHz	E-cores Freq. GHz	GfX Execution Units
	i9-12900E	65W	16 (8+8)	24	2.3 / 5.0	1.7 / 3.8	32 EU
	i7-12700E	65W	12 (8+4)	20	2.1 / 4.8	1.6 / 3.6	32 EU
	i5-12500E	65W	6 (6+0)	12	2.9 / 4.5	- / -	32 EU
	i3-12100E	60W	4 (4+0)	8	3.2 /4.2	- / -	24 EU
Processor Socket	LGA 1700						
Chipset	Intel® R680E	Intel® Q670E						
DRAM	4 SO-DIMM sockets for DDR5 memory modules up to 32 GByte each (128 GByte system capacity)						
Graphics	Intel® UHD Graphics 730/770 driven by Xe Architecture	up to 32 EU						
Display	3x DDI	eDP						
Ethernet	2x 2.5 GbE with TSN support via Intel® i226 Ethernet controller series						
I/O Interfaces	1x16 PCIe Gen 5 (PEG port)	3x4 PCIe Gen 4	3x4 PCIe Gen 3	4x USB 3.2 Gen2x2	8x USB2.0	2x SATA 2x UART	12x GPIO						
Audio	High-Definition Audio						
congatec Board controller	Multi Stage Watchdog	non-volatile User Data Storage	Manufacturing and Board Information	Board Statistics I²C bus (fast mode, 400 kHz, multi-master)	Power Loss Control	Hardware Health Monitoring	POST Code redirection						
Embedded BIOS Feature	AMI Aptio® UEFI firmware	32 Mbyte serial SPI with congatec Embedded BIOS feature	OEM Logo	OEM CMOS default settings	LCD Control	Display Auto Detection	Backlight Control	Flash Update						
Security	Trusted Platform Module (TPM 2.0)						
Power Management	ACPI 6.0 with battery support						
Operating Systems	Microsoft® Windows 10	Microsoft® Windows 10 IoT Enterprise	Linux	Yocto	Real Time Systems Hypervisor						
Temperature	Operating Temp.: 0°C ... +60°C	Storage Temp.: -20°C ... +70°C					
Humidity	Operating.: 10% ... 90% r. H. non cond.	Storage.: 5% ... 95% r. H. non cond.					
Size	120 x 160 mm						

conga-HPC/cALS | Block Diagram

SO-DIMM

SO-DIMM

Dual Channel
DDR5

Intel® PCH-S

**12th Gen. Intel®
Core™ LGA CPU**
"Alder Lake-S"

**congatec
Board
Controller**

R680E only

i226/TSN

i226/TSN

SPI Flash

TMP 2.0

PCIe 0-3
PCIe 4-7
PCIe 8-11
PCIe 12-15
PCIe 16-31
PCIe 32-35
PCIe 40-43
SATA 0
SATA 1
2.5 GbE
2.5 GbE
USB2 0-7
USB3.2 0-4
DDI 0
DDI 1
DDI 2
eDP
HDA
eSPI
Boot SPI
SM Bus
GP SPI
GPIO 0-11
UART 0-1
I2C 0-1

COM-HPC Client Type Connectors

conga-HPC/cALS | Bottom Side View

congatec

conga-HPC/cALS | Order Information

Article	PN	Description
conga-HPC/cALS-i9-12900E	049600	COM-HPC Client module based on Intel® Core™ i9-12900E LGA 1700 processor with 8 P-cores 2.3GHz up to 5.0GHz and 8 E-cores 1.7GHz up to 3.8GHz | 30MB Intel® Smart Cache | Intel® UHD Graphics 770 with 32EUs | Dual channel DDR5 3600MT/s memory interface | Chipset R680E | Intel® code name: Alder Lake-S
conga-HPC/cALS-i7-12700E	049601	COM-HPC Client module based on Intel® Core™ i7-12700E LGA 1700 processor with 8 P-cores 2.1GHz up to 4.8GHz and 4 E-cores 1.6GHz up to 3.6GHz | 25MB Intel® Smart Cache | Intel® UHD Graphics 770 with 32EUs | Dual channel DDR5 3600MT/s memory interface | Chipset R680E | Intel® code name: Alder Lake-S
conga-HPC/cALS-i5-12500E	049602	COM-HPC Client module based on Intel® Core™ i5-12500E LGA 1700 processor with 6 P-cores 2.9GHz up to 4.5GHz | 18MB Intel® Smart Cache | Intel® UHD Graphics 770 with 32EUs | Dual channel DDR5 3600MT/s memory interface | Chipset R680E | Intel® code name: Alder Lake-S
conga-HPC/cALS-i3-12100E	049603	COM-HPC Client module based on Intel® Core™ i3-12100E LGA 1700 processor with 4 P-cores 3.2GHz up to 4.2GHz | 12MB Intel® Smart Cache | Intel® UHD Graphics 770 with 24EUs | Dual channel DDR5 3600MT/s memory interface | Chipset Q670E | Intel® code name: Alder Lake-S

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