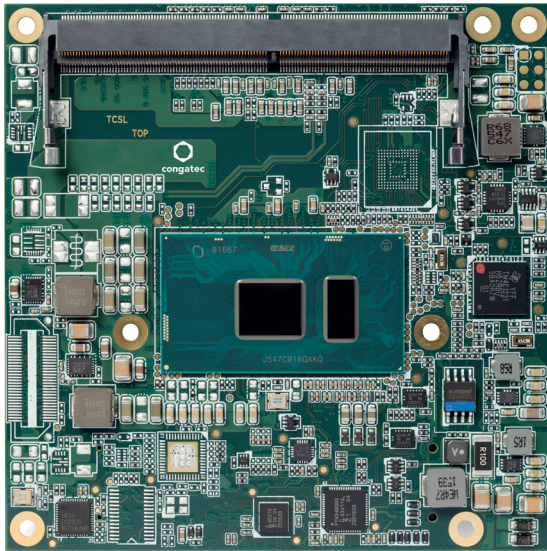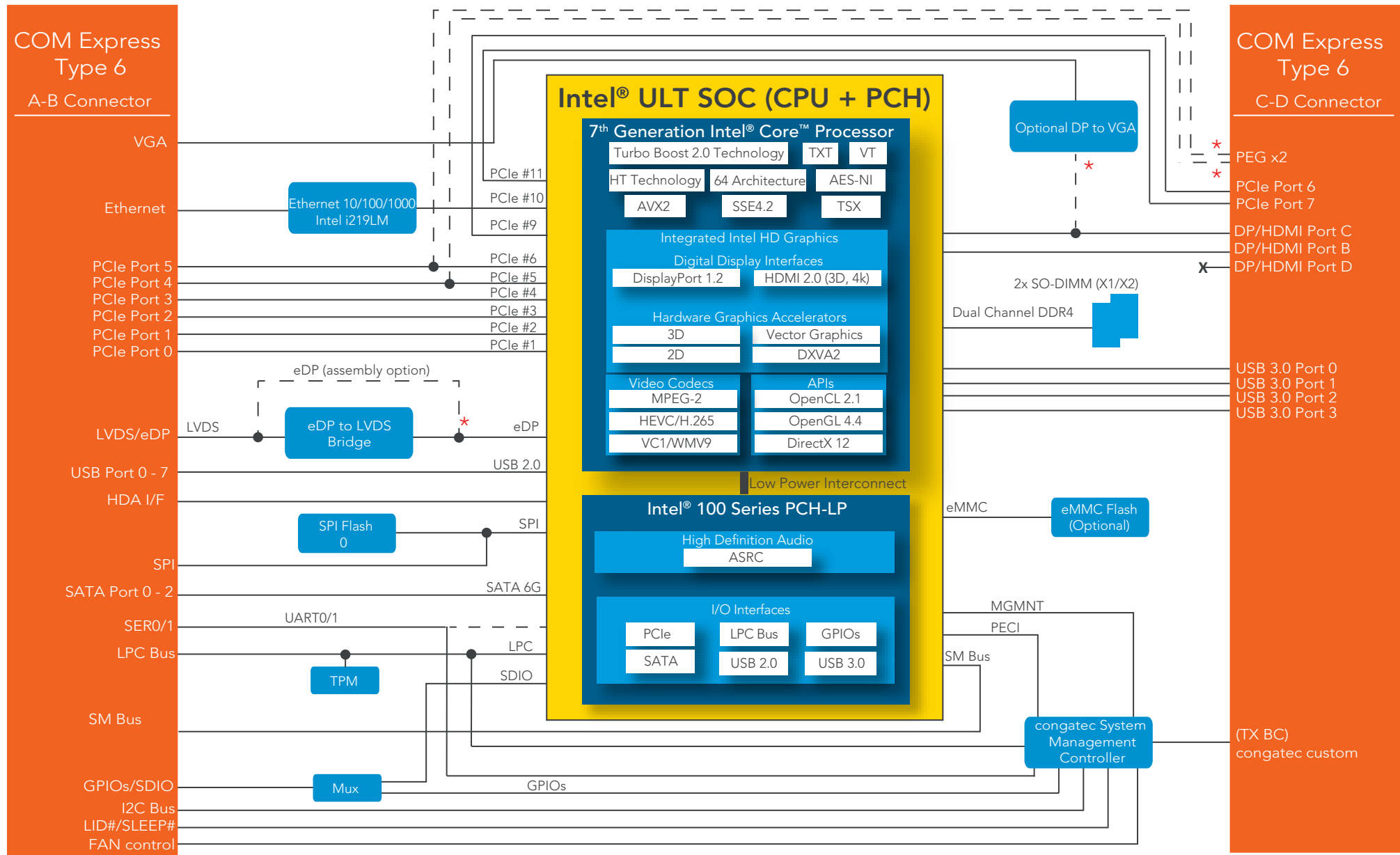# FAST AND COMPACT

conga-TC175

- 7th Generation Intel® Core™ SOC processor

- Intel® Gen9 HD Graphics with HEVC (H.265) support

- Intel® Optane™ memory can be connected via PCI Express Gen 3.0

- Low power consumption (TDP 15W, cTDP 7.5W)

- Up to 32 GByte dual channel DDR4 memory

- COM Express Compact Type 6 module 95x95 mm²

COM + Express®

Formfactor	COM Express® Compact, (95 x 95 mm), Type 6 Connector Pinout						
CPU	Intel® Core™ i7-7600U	3.9 GHz (Burst) | 2.8 GHz Clock	Dual Core	4MB cache	15W TDP	7.5W cTDP#	Intel® HD Graphics 620
	Intel® Core™ i5-7300U	3.5 GHz (Burst) | 2.6 GHz Clock	Dual Core	3MB cache	15W TDP	7.5W cTDP	Intel® HD Graphics 620
	Intel® Core™ i3-7100U	2.4 GHz Clock	Dual Core	3MB cache	15W TDP	7.5W cTDP	Intel® HD Graphics 620
	Intel® Celeron® 3965U	2.2 GHz Clock	Dual Core	2MB cache	15W TDP	10W cTDP	Intel® HD Graphics 610

	Intel® Turbo Boost Technology | Intel® Hyper-Threading Technology (HT) | Intel® Advanced Vector Extensions 2.0 (AVX2) Intel® Advanced Encryption Standard New Instructions (AES-NI) | Integrated dual channel memory controller up to 34,1 GByte/sec. memory bandwidth | Integrated Intel® Gen9 HD Graphics with frequency up to 1.05 GHz | Intel® Clear Video HD Technology | Intel® Virtualization Technology (VT) | Intel® Trusted Execution Technology (TXT) | Intel® Secure Key
DRAM	2 Sockets, SO-DIMM DDR4 up to 2133 MT/s and 32 GByte dual channel
Chipset	Integrated PCH-LP
Ethernet	Intel® i219-LM GbE LAN Controller with AMT 11.6 support
I/O Interfaces	8x PCI Express GEN. 3.0 lanes | 3x Serial ATA® Gen 3 (can be configured as RAID) | 4x USB 3.0 (XHCI) | 8x USB 2.0 (XHCI) | LPC bus (no DMA) I²C bus (fast mode, 400 kHz, multi-master) | 2x UART
Sound	Digital High Definition Audio Interface with support for multiple audio codecs
Graphics	Intel® Gen9 HD Graphics Engine with OpenCL 2.1, OpenGL 5.0 and DirectX12 (for Windows 10) support | up to three independent displays: HDMI 1.4a / DisplayPort 1.2 / eDP 1.3 | High performance hardware MPEG-2 decoding | WMV9 (VC-1) and H.265 (HEVC) support Blu-ray support @ 40 MBit/s | HEVC, VP9 and VDENC encoding
LVDS (eDP optional)	Dual channel LVDS transmitter, Supports flat panels 2x24 Bit interface | VESA and openLDI colour mappings | resolutions up to 1920x1200 Automatic Panel Detection via EDID/EPI
Digital Display Interface (DDI)	2x TMDS (HDMI) / DisplayPort 1.2 with support for Multi-Stream Transport (MST) | resolutions up to 4k | VGA (optional)
congatec Board Controller	Multi Stage Watchdog | non-volatile User Data Storage | Manufacturing and Board Information | Board Statistics | BIOS Setup Data Backup I²C bus (fast mode, 400 kHz, multi-master) | Power Loss Control
Embedded BIOS Features	AMI Aptio® UEFI 2.x firmware | 8/16 MByte serial SPI firmware flash
Security	The conga-TC175 can be optionally equipped with a discrete "Trusted Platform Module" (TPM 1.2 / 2.0). It is capable of calculating efficient hash and RSA algorithms with key lengths up to 2,048 bits and includes a real random number generator. Security sensitive applications such as gaming and e commerce will benefit also with improved authentication, integrity and confidence levels.
Power Management	ACPI 4.0 with battery support
Operating Systems	Microsoft® Windows 10 (64bit only) | Fedora 24 | Ubuntu | SuSe | Red Hat Enterprise | Yocto Project v2.2 | Chromium 2 | Wind River VxWorks
Power Consumption	See User's Guide for full details
Temperature	Operating: 0 .. +60°C Storage: -40 .. +85°C
Humidity	Operating: 10 - 90% r. H. non cond. Storage: 5 - 95% r. H. non cond.
Size	95 x 95 mm (3.74" x 3.74")

conga-TC175 | Block diagram

COM Express Type 6
A-B Connector

- VGA
- Ethernet
- PCIe Port 5
- PCIe Port 4
- PCIe Port 3
- PCIe Port 2
- PCIe Port 1
- PCIe Port 0
- LVDS/eDP
- USB Port 0 - 7
- HDA I/F
- SPI
- SATA Port 0 - 2
- SER0/1
- LPC Bus
- SM Bus
- GPIOs/SDIO
- I2C Bus
- LID#/SLEEP#
- FAN control

Ethernet 10/100/1000 Intel i219LM

eDP (assembly option)

eDP to LVDS Bridge

LVDS   eDP   *

SPI Flash 0

TPM

Mux

- PCIe #11
- PCIe #10
- PCIe #9
- PCIe #6
- PCIe #5
- PCIe #4
- PCIe #3
- PCIe #2
- PCIe #1

USB 2.0

SPI

SATA 6G

UART0/1

LPC

SDIO

GPIOs

Intel® ULT SOC (CPU + PCH)

7th Generation Intel® Core™ Processor

Turbo Boost 2.0 Technology	TXT	VT
HT Technology	64 Architecture	AES-NI
AVX2	SSE4.2	TSX

Integrated Intel HD Graphics
Digital Display Interfaces
| DisplayPort 1.2 | HDMI 2.0 (3D, 4k) |

Hardware Graphics Accelerators
| 3D | Vector Graphics |
| 2D | DXVA2 |

Video Codecs	APIs
MPEG-2	OpenCL 2.1
HEVC/H.265	OpenGL 4.4
VC1/WMV9	DirectX 12

Low Power Interconnect

Intel® 100 Series PCH-LP

High Definition Audio
| ASRC |

I/O Interfaces
| PCIe | LPC Bus | GPIOs |
| SATA | USB 2.0 | USB 3.0 |

Optional DP to VGA

*

2x SO-DIMM (X1/X2)

Dual Channel DDR4

eMMC

eMMC Flash (Optional)

MGMNT

PECI

SM Bus

congatec System Management Controller

COM Express Type 6
C-D Connector

- *
- PEG x2
- *
- PCIe Port 6
- PCIe Port 7
- DP/HDMI Port C
- DP/HDMI Port B
- X DP/HDMI Port D
- USB 3.0 Port 0
- USB 3.0 Port 1
- USB 3.0 Port 2
- USB 3.0 Port 3
- (TX BC) congatec custom

Note:

* Not supported by default. Only available as assembly option.

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Article	PN	Description
conga-TC175/i7-7600U	045250	COM Express Type 6 Compact module with Intel® Core™ i7-7600U dual core processor with 2.8GHz up to 3.9GHz, 4MB Intel® Smart Cache , GT2 graphics and 2133MT/s dual channel DDR4 memory interface (Intel Kaby Lake-U).
conga-TC175/i5-7300U	045251	COM Express Type 6 Compact module with Intel® Core™ i5-7300U dual core processor with 2.6GHz up to 3.5GHz, 3MB Intel® Smart Cache , GT2 graphics and 2133MT/s dual channel DDR4 memory interface (Intel Kaby Lake-U).
conga-TC175/i3-7100U	045252	COM Express Type 6 Compact module with Intel® Core™ i3-7100U dual core processor with 2.4GHz, 3MB Intel® Smart Cache , GT2 graphics and 2133MT/s dual channel DDR4 memory interface (Intel Kaby Lake-U).
conga-TC175/3965U	045253	COM Express Type 6 Compact module with Intel® Celeron® 3965U dual core processor with 2.2GHz, 2MB Intel® Smart Cache, GT1 graphics and 2133MT/s dual channel DDR4 memory interface (Intel Kaby Lake-U).
conga-TC87/HSP-B*	046953	Standard heatspreader for COM Express modules conga-TC87, TC97, TC170 and TC175. All standoffs are with 2.7mm bore hole.
conga-TC87/HSP-T*	046954	Standard heatspreader for COM Express modules conga-TC87, TC97 , TC170 and TC175. All standoffs are M 2.5 threaded.
conga-TC87/CSP-B*	046951	Standard passive cooling solution for COM Express modules conga-TC87, TC97 , TC170 and TC175. All standoffs are with 2.7mm bore hole.
conga-TC87/CSP-T*	046952	Standard passive cooling solution for COM Express modules conga-TC87, TC97 , TC170 and TC175. All standoffs are M 2.5 threaded
conga-TC87/CSA-B*	046955	Standard active cooling solution for COM Express Compact modules conga-TC87, TC97 , TC170 and TC175 with 70mm radial FAN. All stand-offs are with 2.7mm bore hole.
conga-TC87/CSA-T*	046956	Standard active cooling solution for COM Express module conga-TC87, TC97 and TC175 with 70mm radial FAN. All stand-offs are M2.5 threaded.
DDR4-SODIMM-2400 (4GB)	068790	4 GByte DDR4 SODIMM memory module with 2400 MT/s
DDR4-SODIMM-2400 (8GB)	068791	8 GByte DDR4 SODIMM memory module with 2400 MT/s
DDR4-SODIMM-2400 (16GB)	068792	16 GByte DDR4 SODIMM memory module with 2400 MT/s

* cooling solutions also for conga-TC175

Article	PN	Description
conga-TEVAL	065800	Evaluation carrier board for Type 6 COM Express modules
conga-LDVI/EPI	011115	LVDS to DVI converter board for digital flat panels with onboard EEPROM
COMe-carrier-socket-5	400007	Connector for COM-Express carrier boards, height 5mm, packing unit 4 pieces
COMe-carrier-socket-8	400004	Connector for COM-Express carrier boards, height 8mm, packing unit 4 pieces

Mouser Electronics

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conga-TC175/3965U conga-TC175/i3-7100U conga-TC175/i5-7300U conga-TC175/i7-7600U