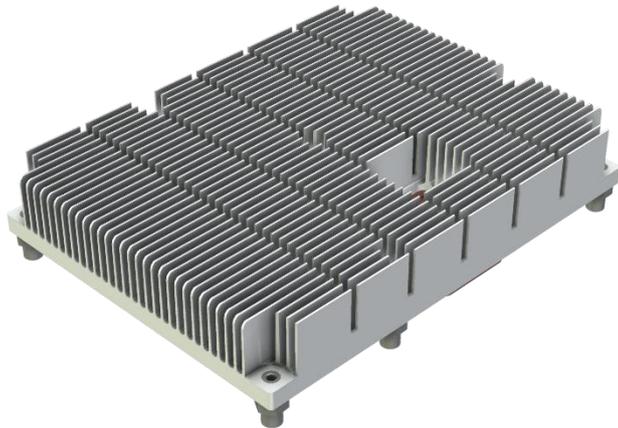


Passive Cooling Solution

conga-TS170/CSP



- congatec standard passive cooling solution for high performance COM Express Type 6 modules
- Supports CPUs up to 45W TDP
- Heatpipe based cooling with 15 mm high fins
- Compliant to the PICMG COM Express Specification
- Bore hole and threaded standoff variants



The heat from the CPU/PCH transfers through a phase change material that melts at $\sim 45^{\circ}\text{C}$. Then the heat from the CPU is transmitted through a copper heatstack that is attached to two high conductive heatpipes that transfer the heat to the heatsink. The heat dissipation of the PCH is much lower compared to the CPU. It's transferred through an aluminum heatstack that uses a 2mm thick thermal pad to attach it directly to the heatsink. The heatsink, heatpipes and copper heatstack are soldered together with low temperature RoHS compliant soldering paste.

Thermal contact between the CPU and the heatsink is ensured by four springs that generate the proper force onto the CPU die. Thermal contact between the PCH and the heatsink is ensured by using a thermal pad that generates the proper force required for optimized heat transfer on the PCH die.

For the passive cooling solutions, it is highly recommended that a proper air flow is implemented within the system.

conga-TS170/CSP | Construction Details

Heatsink

- Aluminum EN AW-6060 T66 (AlMgSi0.5)
- Thermal conductivity 205W/mK
- Nickel plated

Standoffs

- Tempered medium carbon steel
- Bore hole 2.7mm or thread M2.5
- Nickel plated

Springs

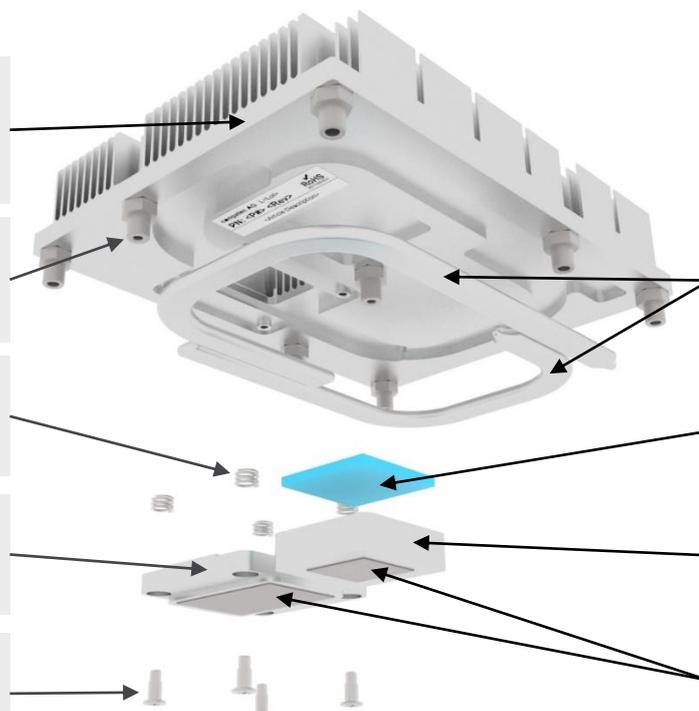
- Spring steel
- Spring constant 6N/mm
- Nickel plated

Heat Stack CPU

- Copper C1100
- Thermal conductivity 385W/mK
- Nickel plated

Collar Screws

- Tempered medium carbon steel
- M2.5 thread
- Nickel plated



Heatpipes

- Copper casing
- Thermal conductivity 1500W/mK
- Sintered copper powder wick structure
- Nickel plated

Thermal Pad

- Thickness 2mm
- Thermal conductivity 19W/mK

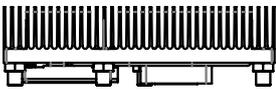
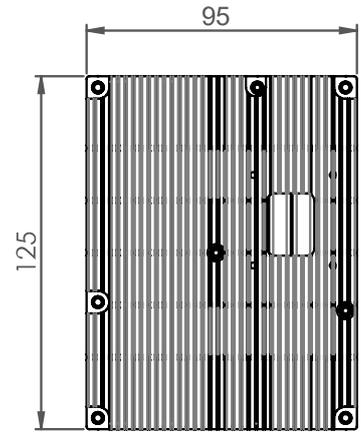
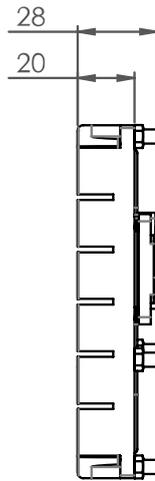
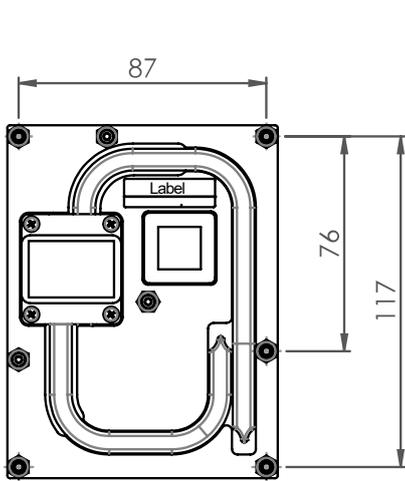
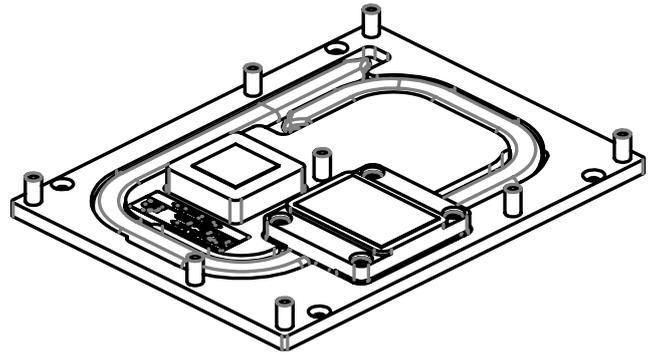
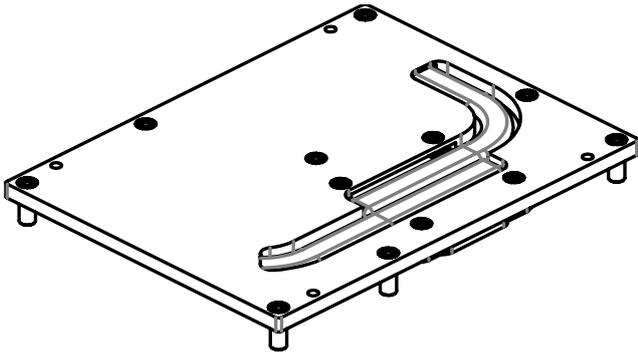
Heat Stack PCH

- Aluminum EN AW-6063 T5
- Thermal conductivity 200W/mK
- Nickel plated

Phase Change Material

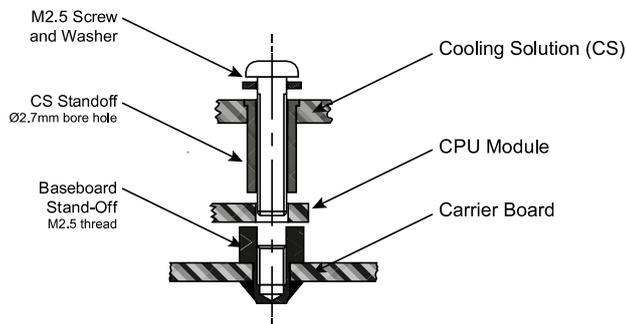
- Thermal conductivity 3.4W/mK
- Melting temperature $\sim 45^{\circ}\text{C}$

conga-TS170/CSP | Drawings

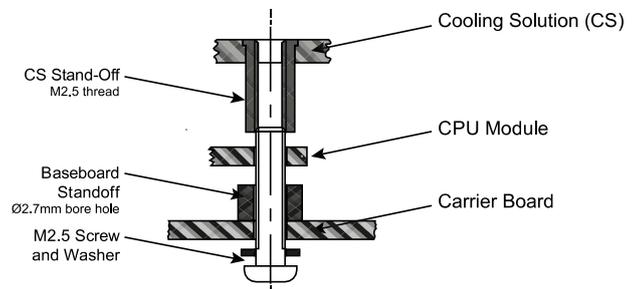


Mounting standoffs and holes are placed symmetrically [mm]

conga-TS170/CSP | Mounting Options

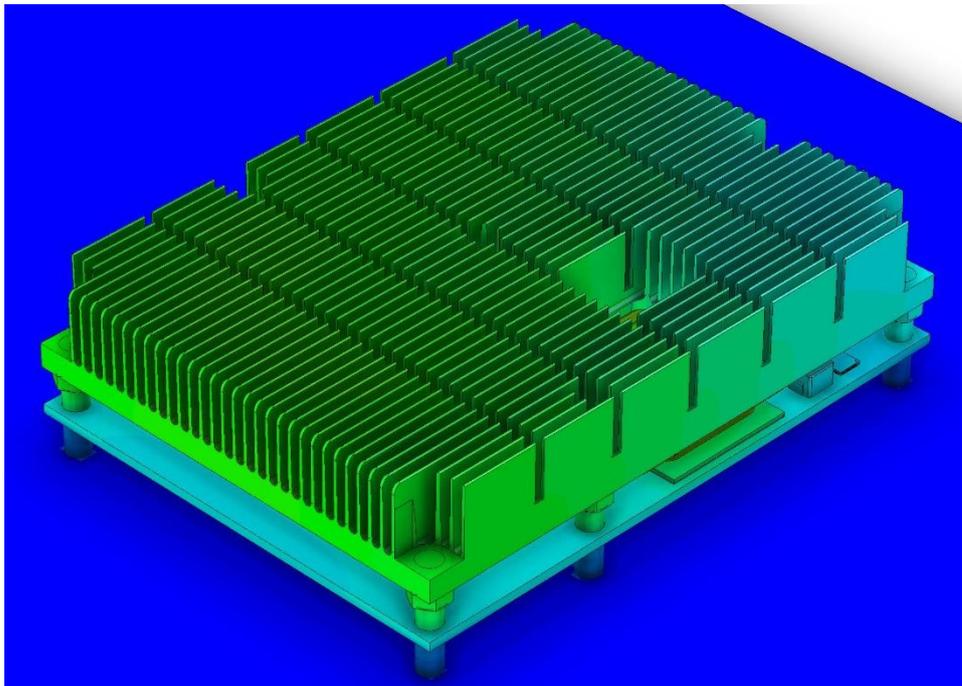
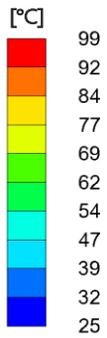


Top mounting scenario uses the bore hole version cooling solution and requires threaded standoffs on the carrier board.



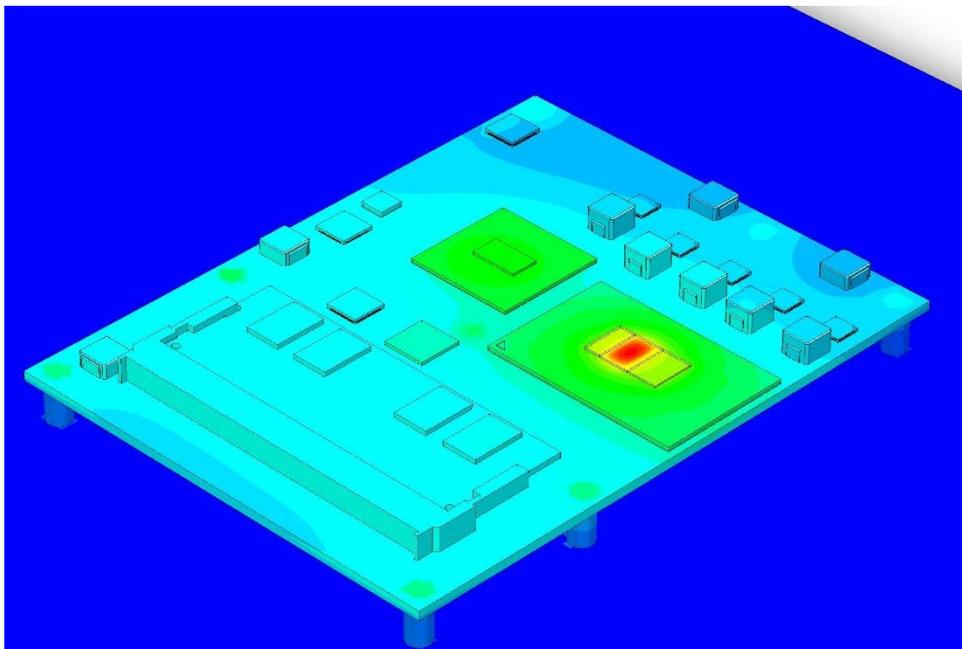
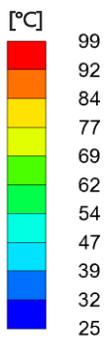
Bottom mounting scenario uses the threaded version cooling solution and requires bore hole standoffs on the carrier board.

conga-TS170/CSP | Thermal Simulation



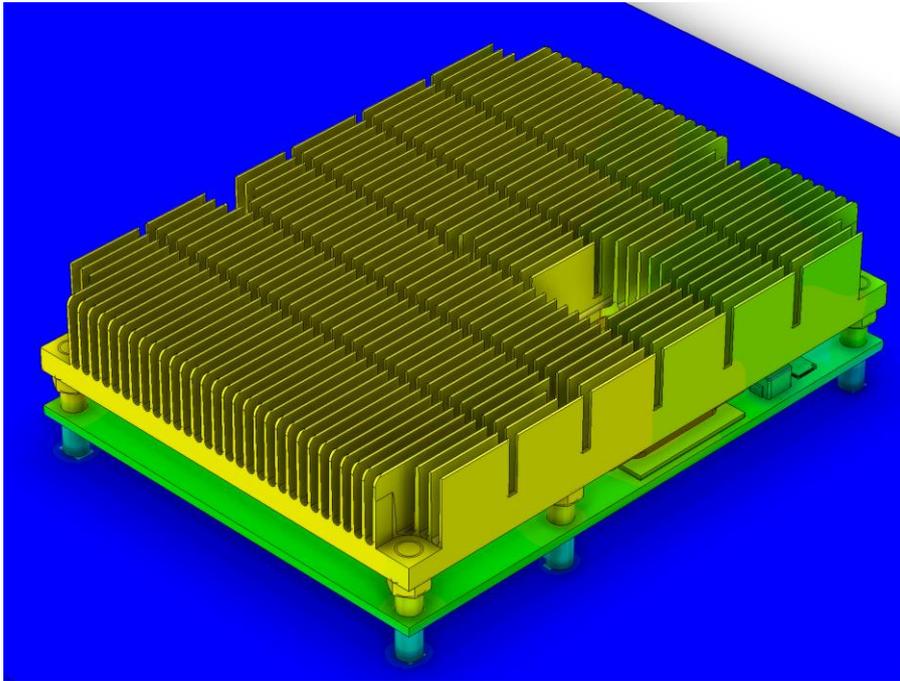
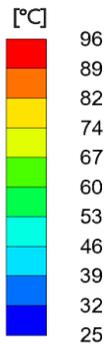
Ambient $\vartheta = 25^{\circ}\text{C}$
CPU $P = 45\text{W}$
Air flow $v = 1.8\text{m/s}$

Simulation of the conga-TS170/CSP at ambient temperature of 25°C and the CPU dissipating 45W of heat.



This shows the same simulation with a module only view to visualize the thermal state of the CPU and PCH. The hot spot is the CPU die, which does not exceed the allowed maximum temperature.

conga-TS170/CSP | Thermal Simulation



Ambient $\vartheta = 25^{\circ}\text{C}$
CPU $P = 25\text{W}$
Air flow $v = 0.6\text{m/s}$

Simulation of the conga-TS170/CSP at ambient temperature of 25°C and the CPU dissipating 25W of heat.

conga-TS170/CSP | Overview

Compatibility	The conga-TS170/CSP is compatible with all conga-TS170, conga-TS175 and conga-TS370 COM Express modules
Size	COM Express Basic size (95 x 125 mm) with 20 mm cooling fins COM Express specification compliant mounting positions
Weight	370g
Packaging	Single packaging Bulk packaging (available on request)
Accessories	Mounting materials included Bore hole version 9pcs flat washer, Ø2.7/5mm, h0.5mm, stainless steel 5pcs machined screw, M2.5x20mm, Phillips pan head A2-70 4pcs machined screw, M2.5x6mm, Phillips pan head A2-70 Threaded version 9pcs flat washer, Ø2.7/5mm, h0.5mm, Stainless Steel 5pcs machined screw, M2.5x16mm, Phillips pan head A2-70 4pcs machined screw, M2.5x6mm, Phillips pan head A2-70
RoHS	Directive 2011/65/EU and 2015/863/EU compliant

conga-TS170/CSP | Order Information

Article	PN	Description
conga-TS170/CSP-HP-B	045932	Standard passive cooling solution for high performance COM Express modules conga-TS170/TS175/TS370 with integrated heat pipes, 15mm silver fins and 20mm overall heat sink height. All standoffs are with 2.7mm bore hole.
conga-TS170/CSP-HP-T	045933	Standard passive cooling solution for high performance COM Express modules conga-TS170/TS175/TS370 with integrated heat pipes, 15mm silver fins and 20mm overall heat sink height. All standoffs are M2.5mm thread.