

# » Universal Cooling Solutions «



## Universal Cooling Solutions for COM Express® and ETX®

- » Standardized cooling solution
- » Price-efficient cooling solution for low power CPUs
- » Simplify stock keeping and SKU administration

# Universal Cooling Solutions for COM Express® and ETX®

## New: Uni Cooler

Kontron recently introduced further options for cooling solutions. The new Uni Cooler solution are constructed in a modular fashion and are designed for thermal heat dissipation for modules **up to 20 watts TDP maximum**.

The Cooling Solution consists of an active (with fan) or passive (w/o fan) standardized cooling element which is mounted on top of the regular heatspreader.

Due to scale effects and usage of standardized products, Kontron's Uni Cooler solution offers on one hand significant price benefits and, on the other, optimization of your stock-keeping or SKU administration.

Uni Coolers are available for several COM Express® basic, compact, mini and ETX® products. COM Express® basic,

compact and ETX® are mechanically the same Uni Cooler unit, but differ in the power supply voltage (COM Express® 12V, ETX® 5V). The Uni Cooler for COM Express® mini has smaller dimensions and uses a smaller connector for the power supply. Active Uni Coolers for the COM Express® mini can be connected directly to the fan pin-header which is populated on all Kontron's COM Express® mini modules.

## Packaging

Uni Coolers are shipped without a heatspreader. Please order a heatspreader that mates to your selected Computer-on-Module. The Uni Cooler is shipped with thermal grease and screws to mount the Uni Cooler onto the regular heatspreader. Appropriate mounting holes are already drilled into the COM Express® heatspreaders and the ETX®-OH heatspreader by default.

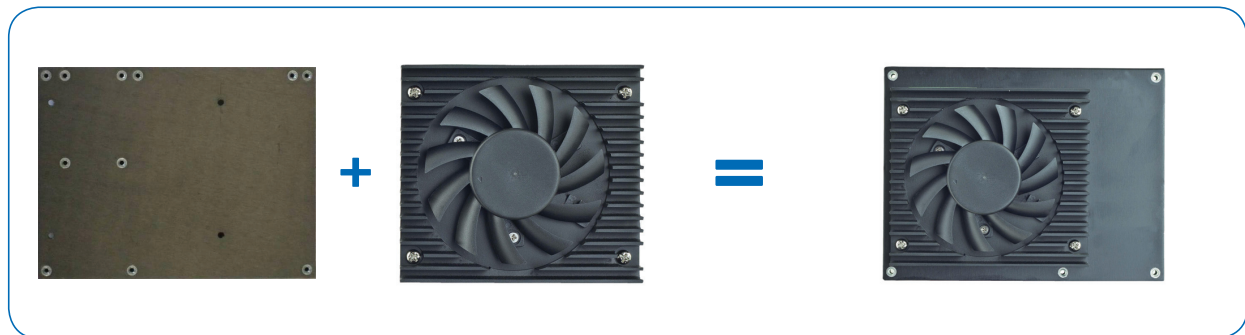


Image 1: Regular heatspreader

Image 2: Active Uni Cooler (with fan)

Image 3: Build a Cooling Solution: Active Uni Cooler mounted onto regular heatspreader

## Where can I find the CPU's TDP?

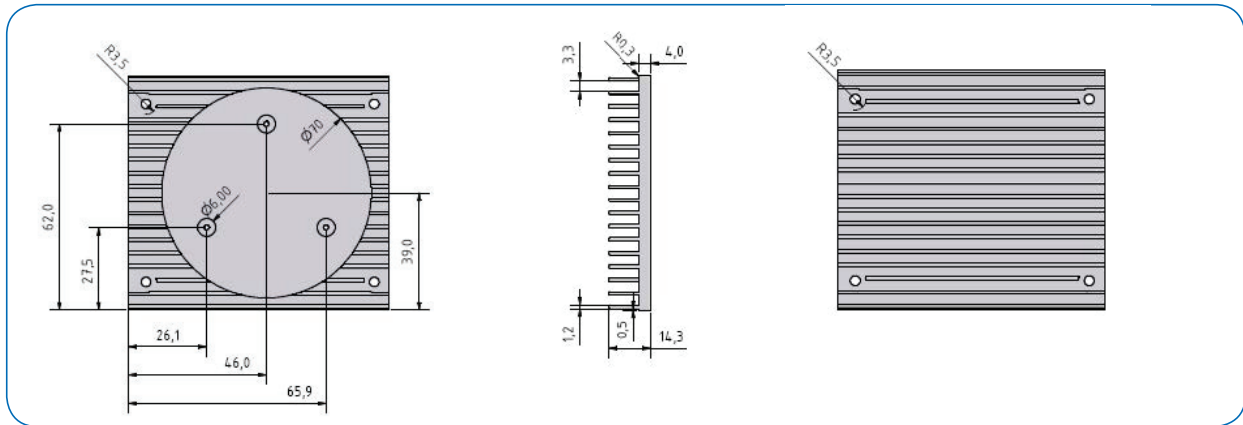
Please read the specific manual to find an overview table that lists all CPUs available including their TDPs. Select the most appropriate cooling solution accordingly.

defined surface for heat dissipation. Consequently, all COM Express® modules combined with the heatspreader have the same mechanical measurements.

| Intel®              | Core™     | Core™     | Core™     | Core™     | Core™     | Core™     | Celeron®  | Celeron®  | Celeron®  | Celeron®  |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| -                   | i7-2715QE | i7-2655LE | i7-2610UE | i5-2515E  | i3-2310E  | i3-2340UE | B810E     | 847E      | 827E      | 807UE     |
| # of Cores          | 4         | 2         | 2         | 2         | 2         | 2         | 2         | 2         | 1         | 1         |
| # of Threads        | 8         | 4         | 4         | 4         | 4         | 4         | 2         | 2         | 1         | 1         |
| Clock Speed         | 2100MHz   | 2200MHz   | 1500MHz   | 2500MHz   | 2100MHz   | 1300MHz   | 1600MHz   | 1100MHz   | 1400MHz   | 1000MHz   |
| Max Turbo Frequency | 3000MHz   | 2900MHz   | 2400MHz   | 3100MHz   | -         | -         | -         | -         | -         | -         |
| TDP                 | 45W       | 25W       | 17W       | 35W       | 35W       | 17W       | 35W       | 17W       | 17W       | 10W       |
| C-States            | C0-C7     | C0-C7     | C0-C7     | C0-C7     | C0-C7     | C0-C7     | C0-C3     | C0-C3     | C0-C3     | C0-C3     |
| Smart Cache         | 6MB       | 4MB       | 4MB       | 3MB       | 3MB       | 3MB       | 2MB       | 2MB       | 1.5MB     | 1MB       |
| Bus/Core Ratio      | 12-21     | 8-22      | 8-15      | 8-25      | 8-21      | 8-13      | 8-16      | 8-11      | 8-14      | 8-10      |
|                     | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 | DDR3-1066 |
|                     |           | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 | DDR3-1333 |
|                     |           |           | 16MB      | 16MB      | 16MB      | 16MB      |           |           |           |           |

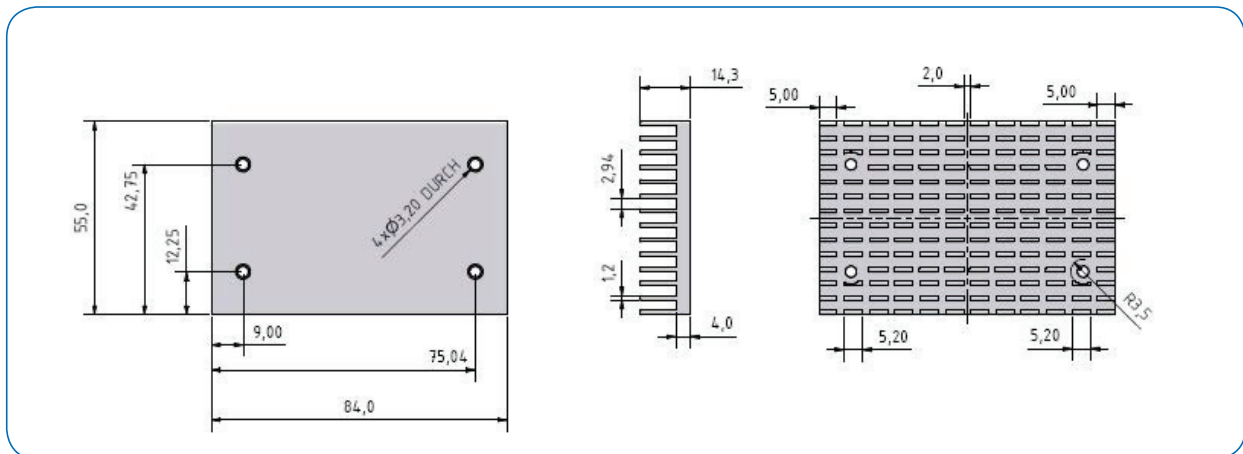
Table copied from COMe-bSC2 manual. Here you can detect how much TDP is generated by the various CPU versions.

## Technical Drawings – ETX® and COM Express® basic, compact

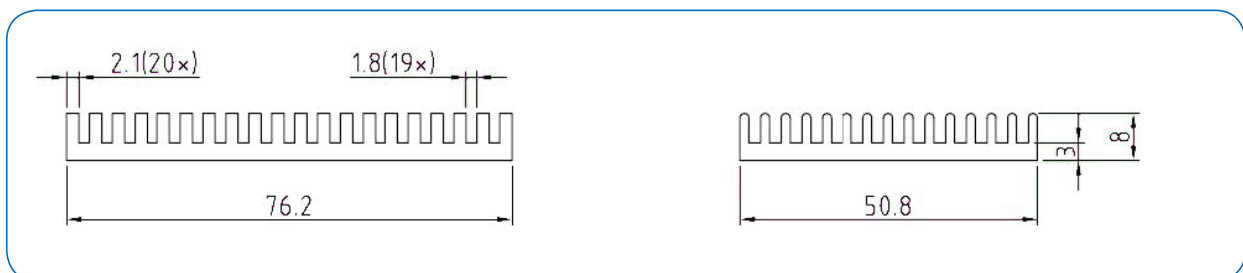


**Note:** ETX® and COM Express® Uni Coolers use different voltages for the fan.

## Technical Drawings – COM Express® mini



## Technical Drawings – COM Express® mini



**Note:** The low profile Uni Cooler for COM Express® mini has a height of just 8 mm instead of the 14.3 mm of the COM Express® basic, compact and ETX® Standard. Physical length and width are also slightly smaller.

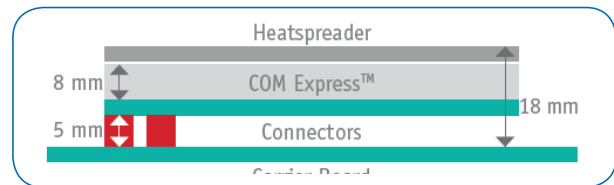
## Heatspreader and Heatsinks

Heatspreaders are plain metal plates which have on their underside COM-specific heat pads to attach to heat spots, for example in the CPU or chipset. Heat is dissipated and spread into the metal plate. The Uni Cooler can be mounted on top of the heatspreader and then results in a solution giving a heat dissipation of up to 20W. Alternatively, the heatspreader can be attached to the housing. Depending on the housing configuration, a heat dissipation of more than 20 W may be possible. Please note that heatspreaders on their own are usually neither effective nor sufficient for cooling. Heatsinks are like heatspreaders, but with additional cooling fins and therefore form a cooling solution. Active heatsinks have a separate fan integrated; passive heatsinks are only fitted with fins and need a guaranteed air flow. Kontron's heatsinks are still available and are highly recommended for cooling of Computer-on-Modules with more than 20 W TDP of CPU.



## COM Express® Heatspreader

The COM Express® standard itself defines the heatspreader to ensure exchangeability of COM Express® Computer-on-Modules. They form a sound mechanical unit and have a defined surface for heat dissipation. Consequently, all COM Express® modules combined with the heatspreader have the same mechanical measurements.



## Ordering Information

| Article                                  | Part-No.        | Description                                                                                                                                                                              |
|------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>COMe Active Uni Cooler</b>            | 36099-0000-99-0 | Active Uni Cooler w/ fan for Kontron COM Express® basic modules COMe-bSC#, COMe-bIP#, COMe-bPC2, COMe-bCD2 and compact modules COMe-cCT6, COMe-cPC2, COMe-cSP2 w/ max. 20 W TDP of CPU   |
| <b>COMe Passive Uni Cooler</b>           | 36099-0000-99-1 | Passive Uni Cooler w/o fan for Kontron COM Express® basic modules COMe-bSC#, COMe-bIP#, COMe-bPC2, COMe-bCD2 and compact modules COMe-cCT6, COMe-cPC2, COMe-cSP2 w/ max. 10 W TDP of CPU |
| <b>COMe mini Active Uni Cooler</b>       | 34099-0000-99-0 | Active Uni Cooler w/ fan for all Kontron COM Express® mini max. 10 W TDP of CPU                                                                                                          |
| <b>COMe mini Passive Uni Cooler</b>      | 34099-0000-99-1 | Passive Uni Cooler w/o fan for all Kontron COM Express® mini max 5 W TDP of CPU                                                                                                          |
| <b>COMe mini Passive Uni Cooler slim</b> | 34099-0000-99-2 | Passive Uni Cooler w/o fan, low profile (height of just 8mm instead of 14.3 mm) for all Kontron COM Express® mini max 5 W TDP of CPU                                                     |
| <b>ETX® Active Uni Cooler</b>            | 18099-0000-99-0 | Active Uni Cooler w/ fan for Kontron ETX®-OH                                                                                                                                             |

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