



## Technology information

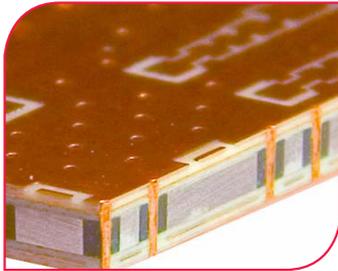
### — Metal Core PCBs IMS, MCS (Cu, Al)

#### — 1. General

Applications for this technology include all types of high-current applications, including power LEDs and power transistors, Motor controls or inverters.

The high thermal conductivity allows for a quick and effective transmission of occurring heat. For some time now, the automobile industry utilizes IMS circuit boards in increasing amounts.

#### — 2. Substrate



Possibilities to efficiently „manage“ heat are made possible even with simple designs. The metal core substrate is available in the grades 1.00 - 1.50 - 2.00 and 3.00 mm.

Thermal conductivity [W/mK]	Dielectric [ $\mu\text{m}$ ]
1.0	100
2.0	100
3.0	75

The copper thickness is dependent on further requirements and is available from 18  $\mu\text{m}$  to 210  $\mu\text{m}$ . The insulation between copper and aluminum is 50 - 150  $\mu\text{m}$ .

The most cost effective version is confined to a single-sided circuit which exhibits the above mentioned thermal conductivity.

#### — 3. Combination alternatives

Furthermore, there are several possibilities of combination: For example multilayer circuits with aluminum core, or aluminum substrate applied subsequently from outside in connection with heatsink filled vias in arbitrary amounts of layers. But a drawback is that the thermal conductivity sinks decidedly in comparison to the above mentioned values. On the one hand, this results from a combination with FR4 material (thermal conductivity only approx. 0.3 W/mK), and on the other hand it is much harder to transmit heat from an aluminum core placed inside.

#### — 4. Comparison

The advantage of the externally mounted metal core variant is that the „finished“ circuit is pressed onto the metal core using special heat-conducting prepregs. This allows the layouter a much greater scope for design. Here, vias filled with heatsink paste represent a thermally acceptable heat transfer to the metal core. This technology is the most effective to take away the heat when a more complex circuit is unavoidable.

For optimal planning of the layout, we recommend you contact our CONTAG-team as early as possible. Tel. 030 / 351 788-300 or team@contag.de

We are glad to offer our advice for your development.