

# CeramCool® Substrates

## Wherever things get hot!

The closer ceramic is placed to the heat source, the greater the cooling advantages it offers. This makes directly metalized CeramCool substrates one of the most efficient options for efficient thermal management. The advantages

of the CeramCool system grow with the packing density, so it's perfect for use wherever things get hot!

### **i** Chip on CeramCool®

- Most efficient area of heat dissipation
- Electrical insulation, thermal conductivity and electrical circuit
- Electrical circuits without thermal barrier directly on CeramCool
- Ceramic PCB with lowest  $R_{tt}$  total thermal resistance
- High break-through voltage

### **i** Alunitsubstrat vs. PCB-IMS

- Cut the substrate surface in half!
- Double the power density!

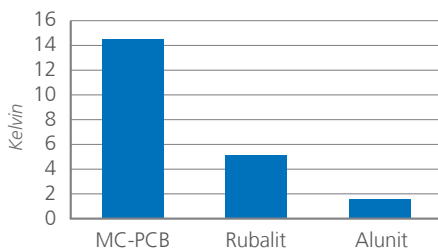
# CeramCool® Substrates – Most efficient heat dissipation

## Forget about it

Ceramic CeramCool substrates are electrically isolating, thermally conductive and can be metalized directly. No thermal barrier blocks optimal heat dissipation. This makes them perfect for replacing a conventional PCB IMS (insulated metal substrate). Using Rubalit substrates

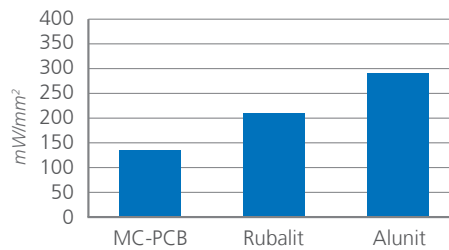
reduces the thermal resistance of the PCB by about 50%. With Alunit the thermal resistance is negligible, so you can forget about it and enjoy all the advantages.

## Reduce the thermal resistance



- Rubalit: Cuts thermal resistance in half
- Alunit: Thermal resistance is negligible

## Increase the power density



- Rubalit: up to 50% higher power density
- Alunit: up to twice the power density

## Multi-LED chips

Thermal resistance at 38W power density

	38W
MC PCB	15K
Rubalit	6k
Alunit	2k



Multi-LED chips work with high power densities. That is where ceramic is at its best. Using alunit substrates at 150mW/mm² and with MC-PCB reduces the thermal resistance from 15K to 2K.

LED chips are often placed on ceramic substrates made from Rubalit® alumina and Alunit® aluminum nitride. They have higher thermal conductivity than conventional PCBs. What's more, the expansion of the ceramic is the same in all directions. It produces virtually no thermal stress in the soldering layer between the unshipped chip and the ceramic substrate.

Customer-specific layouts can be printed directly onto ceramics. If both sides are metalized they can be connected by filled vias. With substrate dimensions suited for 3D pick-and-place machines, electronic components are mounted directly and easily. Then the finished panel is split into the final units.

**CeramTec**  
THE CERAMIC EXPERTS

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**Indexes and parameters for ceramic substances:** In order to profile ceramic substances certain parameters are indicated. The crystalline nature of these substances, statistical fluctuations in the composition of the substances and in the factors that impact on the production processes indicate that the figures quoted are typically mean values and hence the substance parameters quoted in this brochure are only standard, recommended or guide values that might differ given dissimilar dimensions and production processes.