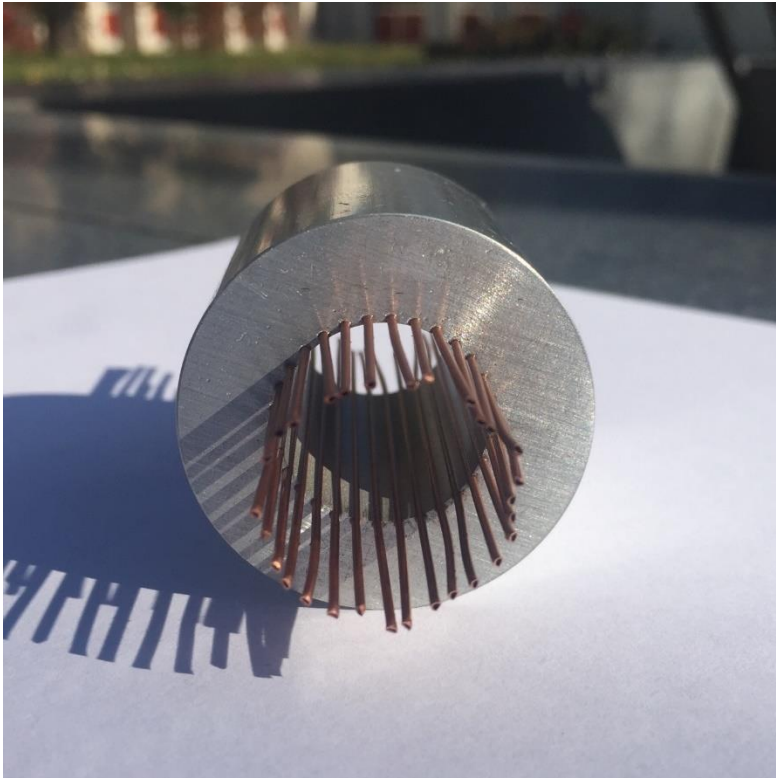


MICROCHANNEL HEAT EXCHANGER SYSTEM



PRIORITY NUMBER:

MI2014A000805

KEYWORDS:

Microchannels

Heat Exchanger

Conduction

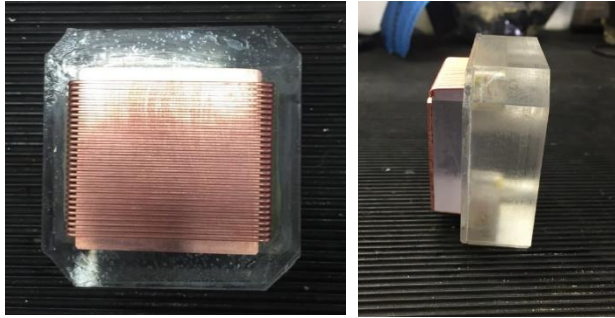
Convection

Power dissipation

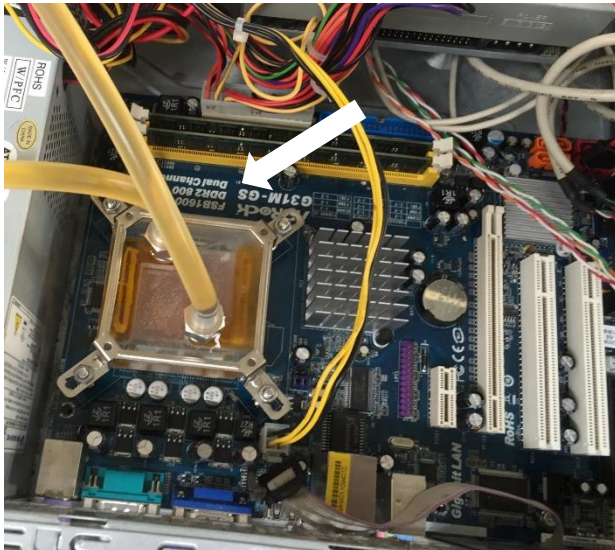
Microchannel technology, applied to heat dissipation systems, allows both the use of high refrigerant pressures, improving the convection coefficient, and the realization of very thin channels, increasing the conduction mechanism. Also, the simplicity of construction allows the realization of various geometries, adaptable to the different devices to be cooled.



MICROCHANNEL HEAT EXCHANGER SYSTEM



Application of microchannel heat exchanger to CPU cooling



DESCRIPTION :

To meet the need for always more performing electronic devices, high power integrated circuits are currently used. While quickly ensuring the performances of their functions, those circuits can generate heat flows that, if not properly disposed of, can damage them.

The developed technology concerns a manufacturing technique for high efficiency heat exchanger. The final product consists in a series of microchannels arranged in configurations that can be adapted to the particular condition of use. Made by electro-erosion or milling techniques, the microchannels have diameter sections of few μm , spaced less than 1 mm apart. This configuration gives the device an high cooling capacity per cm^2 . Realized in small scale it can be placed in contact or integrated directly to the device to be cooled.

ADVANTAGES:

- Better heat convection
- High conduction coefficient
- Customizable geometries
- Opportunity to create integrated heat sinks
- Robustness
- Possibility of using different materials

APPLICATIONS:

In general, fields requiring high specific power dissipation:

- Computer CPU
- Production of X-rays, neutrons or radioisotopes
- Solar and photovoltaic energy
- Welder and laser cooling systems
- Electronic devices to be miniaturized
- Automotive, both for thermal and electric traction