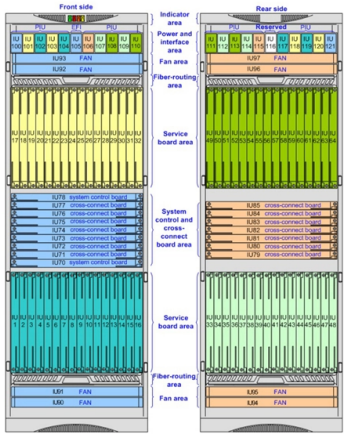
Micro-module enclosed thermal channel patent



Overview

Zhou, Feng, Dede, Ercan Mehmet, Ukegawa, Hiroshi, et al., "Asymmetric configurable double-sided manifold micro-channel cold plates," US 11,596,088, issued February 28, 2023. The utility model discloses a totally closed micromodule data center of cold and hot passageway, including rack, skylight subassembly, end door, row air conditioner, passageway braced frame, advance the rack and become to be listed as and put inside data center, the rack is listed as and is. Micro heat exchanger innovation spans data center cooling, aerospace thermal management, and HVAC miniaturisation — with AI-integrated control, additive manufacturing, and supercritical working fluids emerging as the defining frontiers for 2026 and beyond. This landscape maps the patent and. Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to. A microfluidic device having a channel within a first material to thermally couple with an IC die. The channel defines an initial fluid path between a fluid inlet port and a fluid outlet port.

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Article Content

Heat exchanger having winding micro-channels

A micro-channel heat exchanger suited for use in large-area cold plates includes a heat transfer member having winding micro-channels, a manifold, and a cover plate.

Integrated Microchannel Cooling for Power Electronic

This paper provides a brief introduction of power modules in conventional packaging design and a review of several new packaging structures

Thermal and hydrodynamic studies for micro-channel cooling for large ...

For thermal characterization, heat was distributed homogeneously across the device. A design cooling mainly the parts exposed to a heat flow was already demonstrated in the ALICE ITS

Micro heat exchanger technology landscape 2026 | PatSnap

BASF SE''s EP patent (2018, now inactive) established a monolithic co-fabrication paradigm: a sintered metal or ceramic powder micro heat exchanger body with integrally moulded

Micro-channel heat exchanger

The pressure drop can be reduced by subdividing the micro-channel into several sections and providing alternating inlet and outlet manifolds along the length of the cold plate, for example as

(PDF) Thermal Performance Optimization of Integrated

Then, the thermal performance of the microchannel cooling plate with a main channel and a secondary channel was analyzed and the design of

A critical review on recent developments and applications of ...

Abstract There is a rapid movement towards miniaturization in the field of micro-electronics, medical, defence, and space applications as well as an increase in thermal load density in the field of solar

Synergistic integration of micro-channels and thermal ...

Improving energy efficiency through the integration of micro-channel designs with thermal storage systems offers a promising approach for advanced heat transfer applications. Despite their

Direct Cooling of Power Modules Using Microchannel Structures

High-power modules require excellent thermal performance and dependability, therefore adequate cooling is critical to reliable operation. One solution is to use a microchannel copper structure.

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Innovative Cold Plate Designs, 2007-2012

Innovative Cold Plate Designs, 2007-2012 Qpedia continues its review of technologies developed for electronics cooling applications. We are presenting selected patents that were awarded to

THERMAL OPTIMIZATIONS FOR OSFP OPTICAL TRANSCEIVER MODULES

The present disclosure provides methods, sys-tems, and apparatuses for thermal and electrical optimi-zations for OSFP optical transceiver modules. One aspect of the present

U.S. Patent Application for ULTRA-COMPACT CONFIGURABLE

Accordingly, the single configurable, double sided MMC cold plate provides a compact, lightweight design to provide enhanced thermal management to six or more electronic devices and/or

CN211047741U

Fig. 1 is a schematic diagram of the structure of the micro-module data center with totally closed cold and hot channels. As shown in the figure: 1. the system comprises a cabinet, 2, a...

Modular microchannel thermal solutions for integrated circuit devices

Abstract A microfluidic device having a channel within a first material to thermally couple with an IC die. The channel defines an initial fluid path between a fluid inlet port and a fluid outlet port. A second

Embedded manifold microchannel cooling for chiplet thermal

To address the escalating thermal management demands, embedded manifold microchannel cooling (EMMC) has been regarded as a promising technology for thermal management due to its

THERMAL OPTIMIZATIONS FOR OSFP OPTICAL TRANSCEIVER MODULES

This disclosure generally relates to methods, systems, and apparatuses for thermal and electrical op-timizations in Octal Small Form factor Pluggable (OSFP) optical transceiver modules.

Self-encapsulation ultra-soft micro-channel with high thermal ...

Accordingly, research on integrating multifunctional thermal management composite materials for designing micro-channels has become a hot development trend. Notably, the design

Micro heat exchanger technology landscape 2026 | PatSnap

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Micro heat exchanger innovation spans data center cooling, aerospace thermal management, and HVAC miniaturisation — with AI-integrated control, additive manufacturing, and

Asymmetric configurable double-sided manifold micro-channel cold

Zhou, Feng, et al. "Asymmetric configurable double-sided manifold micro-channel cold plates." US 11,596,088, United States Patent and Trademark Office, Feb. 2023.

Asymmetric configurable double-sided manifold micro-channel cold

Asymmetric configurable double-sided manifold micro-channel cold plates (U.S. Patent No. Zhou, Feng, Dede, Ercan Mehmet, Ukegawa, Hiroshi, et al., "Asymmetric configurable double

A review on the applications of micro-/mini-channels for battery ...

This review of the literature explores the potentials of liquid micro-/mini-channels to reduce operating temperatures and make temperature distributions more uniform in batteries. First, a

WO2022256455A1

Microfluidic devices with partially enclosed microfluidic channels and methods for forming perfusable vascular networks Abstract A device includes a substrate having a top surface and a bottom surface

Microchannel Thermal Management Analysis and Simulation Tool for ...

However, the wide variety of find-ings given various specific applications of straight micro and mini channels points to a need for further study, to include the specific sizing, spacing and application for

A study of mini-channel thermal module design for achieving high ...

In this study, pressure drop and heat transfer characteristics of multiple-mini-channel thermal modules were investigated quantitatively. The flow channels, which were mounted on one

Micro (Mini)-Channels and Their Applications in Solar Systems

This work proved the significant improvement of solar thermal systems efficiency by using micro (mini)-channels and thus participating in a significant fossil fuel use saving and carbon reduction.

Self-encapsulation ultra-soft micro-channel with high thermal ...

Ultimately, a self-encapsulated, flexible, high thermal conductivity (0.42 W m -1 K −1), passive radiation cooling micro-channel accumulated a temperature difference of 10.76 °C,

Thermal Performance Optimization of Integrated

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In high-integration electronic components, the insulated-gate bipolar transistor (IGBT) power module has a high working temperature, which requires

US8919426B2

A heat pipe device and a corresponding method in which micro-channel embedded pulsating heat pipes are incorporated into a substrate. A volume of fluid in a vacuum is introduced into a micro-channel

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