

Liquid cooling has more potential than optical modules



Overview

HPC and AI applications are the primary factor driving the adoption of liquid cooling. Meanwhile, pluggable copper and optical IO module power consumption exceed MSA-specified limits, necessitating more effective cooling methods for front-panel pluggable form-factor. Thermal management plays a pivotal role in enhancing the reliability and efficiency of high-power pluggable optical modules. Read Time: 6 Min Bandwidth for chip-to-chip and chip-to-memory. Traditional air-cooling solutions can no longer meet the thermal demands of high-performance chips such as GPUs, ASICs, and optical chips. According to IDC, the global liquid-cooled data center market will exceed USD 20 billion by 2027, with a compound annual growth rate (CAGR) of 25%. 2 Liquid. Liquid cooling is a heat transfer mechanism in which the coolant (typically a dielectric fluid or water), via direct or indirect contact with a high-power component like the ASIC or the optical module, removes the heat dissipated by the component and, thereby, controls its temperature.



Article Content

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Optical Transceivers in Liquid Immersion Cooling Systems

Ethernet Alliance's OFC 2025 showcase included the latest optical connectivity solutions with energy-saving technologies, such as LPO and

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Optoelectronic Heat Sink Cooling: Liquid vs Air

From high - power lasers to precision optical communication modules, and from photovoltaic inverters to LED display devices, efficient heat dissipation

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Liquid cooling: the future of data center architecture and

Cooling the future: How AI is reshaping data center strategy The adoption of liquid cooling marks a decisive shift in how data centers are built and

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Molex Releases Report on Thermal Management Challenges and ...

In this informative report, Molex explores the latest in air cooling, along with the integration of creative liquid cooling solutions within existing form factors to address increased power

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Liquid cooling has huge potential, but let's not kid

Liquid cooling increases operational complexity Even when not combined with air systems, liquid cooling presents unfamiliar and more complex

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Full-Scale Immersion Cooling of Optical Transceiver, PCBs

Conduction cooling and immersion cooling are both more energy efficient than air cooling. With conduction cooling, a cold plate with liquid running

Oct 29, 2025

FiberMall Launches Liquid-Cooled Optical Modules and

This series adopts a high-efficiency liquid circulation cooling design, achieving a reduction in optical module operating temperatures by more than

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Optoelectronic Heat Sink Cooling: Liquid vs Air

Liquid cooling technology is better suited for high-power, high heat density optoelectronic devices, such as high-power lasers, large photovoltaic

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Liquid Cooling Solutions Spurs Next-Gen Optical

Liquid cooling is a critical enabler for the next generation of high-performance optical modules, allowing the industry to overcome the thermal and

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Gigalight Liquid-Cooled Optics: A Thematic Study on

As a leader in optical interconnect technology, Gigalight is pioneering immersion liquid-cooling extenders and silicon photonics liquid-cooled optical

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Liquid Cooling

Liquid cooling is a heat transfer mechanism in which the coolant (typically a dielectric fluid or water), via direct or indirect contact with a high-power

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Simulation and experimental investigation of liquid-cooling thermal ...

Abstract This study explores the application of cold plate liquid cooling technology in co-packaged optics (CPO). By integrating optical modules and the switch chip on the same substrate, CPO shortens the

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The basics of liquid cooling in AI data centers

Liquid cooling is increasingly vital in AI data centers as traditional methods struggle to keep manage intense heat. This blog provides a brief overview, some key facts, and a glossary of

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Liquid-Cooled Optical Transceivers for 800G/1.6T

A liquid-cooled optical transceiver is a high-speed module that incorporates liquid cooling technologies (such as cold plates or microchannels)

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GB300 Era: Liquid-Cooled Optical Modules for High

These modules not only address thermal management and energy efficiency challenges but also drive data centers toward greener and more

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Gigalight Liquid-Cooled Optics: A Thematic Study on

Conclusion Gigalight's immersion liquid-cooling extenders and silicon photonics liquid-cooled optical modules represent the future of optical

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Liquid Cooling: Exceeding the Limits of Air Cooling to

Liquid cooling is the best way to cool a system because liquid transfers heat much more efficiently than air. From an environmental perspective,

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Advantages and Disadvantages of Liquid Cooling

Effective and efficient heat management and cooling can extend the lifespan of these hardware components and improve their performance further.

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Advanced Cooling for Power Electronics

The other module is well suited for stacking in series for high voltage applications and provides both top and bottom surfaces for "double sided"

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The Future of Data Center Cooling: Liquid vs. Air –

As AI and high-performance computing drive demand for efficient cooling, the debate between liquid and air cooling intensifies. Discover the pros,

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U.S. Patent Application for Liquid cooling high-density pluggable ...

More particularly, the present disclosure relates to systems and methods for liquid cooling high-density network pluggable modules for use in networking, storage, computing, and the like

Feb 20, 2026

(PDF) Simulation and experimental investigation of liquid

This study explores the application of cold plate liquid cooling technology in co-packaged optics (CPO). By integrating optical modules and the

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Liquid Cooling

Liquid cooling has higher thermal transfer efficiency than air cooling and is used in high-power modules. The power module baseplate is thermally connected to a so-called cold plate, which is liquid-cooled.

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Solving Cooling Interconnects for Next-Gen Data

HPC and AI applications are the primary factor driving the adoption of liquid cooling. Meanwhile, pluggable copper and optical IO module power

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Advanced Thermal Management Strategies | Molex

The need for better cooling of high-powered optical transceivers in data centers has never been more crucial. With networks struggling to keep up with skyrocketing

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Liquid cooling for high-performance thermal management

Liquid cooling comes in two forms, cold-plate based systems, and immersion cooling systems. Cold plate liquid cooling is found in various high

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Liquid Cooling for Optical Networking Equipment

This article provides insights into a successful upgrade of an air-cooled coherent metro router into a Hybrid Liquid/Air-cooled system. Additionally, an innovative solution is presented for

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Breaking Through Computing Power Limits: A Complete

When AI cluster computing power is being strangled by thermal bottlenecks, you need more than just standard optical modules; you need an

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Simulation and experimental investigation of liquid-cooling thermal ...

For the unique architecture of CPO, this study analyzes its heat dissipation needs in detail, and a thermal management scheme is designed. The thermal management scheme is

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