

Immersion Optical Module



AI Overview

Immersion Optical Modules are specialized optical transceivers designed to operate reliably in liquid-cooled or immersion-cooled data center environments, supporting high-speed data transmission while maintaining thermal efficiency.

Overview Immersion optical modules are optical transceivers engineered to function in liquid or two-phase immersion cooling systems, which are increasingly used in high-performance data centers to manage heat from AI, cloud, and high-density computing workloads. These modules are designed with airtight packaging and robust sealing to withstand immersion in cooling liquids, typically up to 1 meter deep, while maintaining signal integrity and reliability.

Key Features

Form Factors and Data Rates: Immersion optical modules are available in a wide range of form factors including SFP, SFP+, SFP28, QSFP+, QSFP28, QSFP56, QSFP-DD, OSFP-RHS, and QSFP112, supporting data rates from 10G up to 800G.

Transmission Distance: Depending on the type, multi-mode modules can transmit over 100–400 meters, while single-mode modules can reach 2–10 kilometers.

Cooling Compatibility: Modules are compatible with liquid immersion cooling, including two-phase systems, which significantly reduce operating temperatures and improve energy efficiency.

Reliability and Testing: Each module undergoes pressure, performance, and helium-leak testing to ensure airtightness, low bit error rates, and long-term reliability in immersion environments.

Connectivity Options: Modules often include fiber optic pigtailed with MPO12/APC connectors and customizable cable lengths, enabling flexible integration into existing data center infrastructure.

Advanced Technologies Some immersion optical modules incorporate Linear Pluggable Optical (LPO) or Linear Hybrid Pluggable Optical (LRO) designs, which reduce or partially retain DSP functionality to lower power consumption, reduce latency, and enhance reliability. These designs are particularly beneficial for AI and machine learning workloads, wh...

Article Content

Immersion Liquid Cooling Optical Transceivers

GIGALIGHT offers 10G to 800G rates immersion pluggable optical modules for liquid cooling data centers and 5G fronthaul networks.

Global Immersion Liquid Cooled Optical Module Market Size, Share ...

The immersion liquid cooled optical module market represents a critical segment within the broader high-performance optical communications industry, primarily driven by the escalating demand for

Submersible Optical Transceiver For Super Computing

A new submersible optical transceiver option with Samtec FireFly™ now solves this problem. In this demonstration at SC18 (Super Computing),

Immersion graded index optics: theory, design, and prototypes

Immersion graded index optical concentrators, that do not need to track the source, are described in terms of theory, simulations, and experiments.

DUV lithography for chip manufacturing | ZEISS SMT

DUV lithography optics from ZEISS SMT can be used to manufacture microchip structures of 40 nanometers for the semiconductor industry. DUV means "deep

Immersion Lithography | Springer Nature Link

Immersion lithography utilizes liquids with refractive indices >1 (the index of air) to enable sub-45-nm feature size (or half-pitch) patterning for semiconductor integrated circuits. An alternative to

Global Immersion Liquid Cooled Optical Module Market Size, Share ...

These modules are specialized optical transceivers that leverage immersion liquid cooling technology to dissipate heat more effectively than traditional air-cooled systems, thereby enabling higher power

VaporConnect Optical Feedthrough Modules

Molex VaporConnect Optical Feedthrough Modules provide a thermal management solution for AI-driven data center growth and help make two-phase immersion cooling easier and

VaporConnect Optical Feedthrough Modules Enabling

Introducing Molex's VaporConnect Optical Feedthrough Modules for efficient two-phase immersion cooling in hyperscale data centers. Future-proof,

Liquid-Cooled Optical Transceivers for 800G/1.6T

This product line overcomes the limitations of traditional optical modules by maintaining reliability even under immersion depths of up to 10

800G Liquid/Immersion Cooling Transceivers for Data Center

NADDOD 800G InfiniBand and ethernet liquid/immersion cooling transceivers integrate a fiber optic pigtail on the optical port side of the module with flexible and customizable solutions of polarity (Type

Molex Embraces Optical Solutions to Alleviate Critical

Molex introduced its VaporConnect Optical Feedthrough Modules for two-phase immersion cooling delivering continuous increases in data center

Silicon Photonic Micro-Transceivers for Beyond 5G

Each optical module receives inputs from both ASICs in a dual star redundant configuration for protection and computation offload purposes. These

Pro-optics Launches Immersive Liquid-Cooled Optical

Summary Pro-optics has introduced a product line of high-speed optical modules designed for immersion-cooled data centers, offering a substantial reduction in

VaporConnect Optical Feedthrough Modules Enabling

A cassette-based solution for two-phase immersion cooling that reduces time and cost in hyperscale data center installations, Molex's new

Autoimmersion Module for ZEISS Axio Observer 7

Immersion media between the sample and the objective is required for high-resolution imaging. Manual addition of immersion media risks loss of data points

OCP EMEA 2025: FiberMall Demonstrates 800G

FiberMall's demonstration of the 800G pluggable optical module with immersion cooling showcases a significant improvement in energy efficiency.

Molex Unveils Versatile VaporConnect Optical

Molex's VaporConnect Optical Feedthrough Module is a cassette-based solution for two-phase immersion cooling, designed for plug-and-play

Fast micromirror selection and angle setting algorithm for freeform ...

In the Immersion Lithography Machine, the freeform pupil illumination module is mainly composed of polarization purification components, polarization control components, energy

Immersion Liquid Cooling Modules | AscentOptics

This cable series the lack of optical transceivers which perform reliability in immersion even liquid immersion depth up to 10m, the Liquid cooling optical series transceiver is suitable for liquid

Immersion 800G OSFP DR8 Optical Transceiver

Built to withstand the most demanding operating conditions, the module resists

Immersion Liquid Cooling Interconnect Solutions

GrowsFiber's immersion cooling optical transceiver integrates a fiber optic pigtail on the optical port side of the module. The module adopts super air-tight packaging

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

VaporConnect Optical Feedthrough Modules | Molex

VaporConnect Optical Feedthrough Modules help make two-phase immersion cooling easier and more cost-effective by enabling data centers to scale and

Immersion 800G OSFP DR8 Optical Transceiver

The FIBERSTAMP 800G OSFP DR8 is a transceiver module designed for optical communication applications of up to 500 m in liquid immersion environments. It

Immersion 100G QSFP28 SR4 850nm 100m (328ft)

FIBERSTAMP 100G QSFP28 SR4 immersible liquid-cooled optical transceiver

Immersion Liquid Cooled Optical Module Market Global

The Immersion Liquid Cooled Optical Module Market is undergoing a major

VaporConnect Optical Feedthrough Modules | Molex

Enabling flexible and high-density optical connections to dual-phase immersion cooling tanks, VaporConnect Optical Feedthrough Modules provide scalable and

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://energy-powertools.eu>

Email: info@energy-powertools.eu

Phone: +49 172 6389472

Address: Musterstraße 12, 10115 Berlin, Germany

This document is for informational purposes only. Specifications subject to change without notice.

