

Liquid-Cooled High-Bandwidth Switch ASIC Micro-Cold Plate Assembly - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The Liquid-Cooled High-Bandwidth Switch ASIC Micro-Cold Plate Assembly is a direct-to-chip thermal management solution engineered for next-generation 51.2T and 102.4T datacenter switch ASICs. This assembly integrates a micro-machined cold plate with a high-efficiency manifold, providing a thermal resistance as low as $0.012\text{ }^{\circ}\text{C/W}$ and enabling sustained 800G and 1.6T port operation without throttling. The unit is designed for OEM integration into 1RU and 2RU chassis and supports facility water or rear-door heat exchanger loops.



ARCHITECTURE & CHASSIS DESIGN

The assembly comprises a nickel-plated copper micro-cold plate with 300 μm fins, a stainless-steel inlet/outlet manifold with dripless quick disconnects, and a leak-sensor harness. The cold plate footprint is 80 mm $\times$ 80 mm and is compatible with common switch ASIC packages. The assembly mounts directly to the ASIC lid via a precision load plate that maintains uniform pressure across the die. A secondary cold plate for optical transceivers is available as an option. The chassis-side interface uses standard 3/8-inch and 1/4-inch hose barbs or VCR fittings.

HARDWARE FEATURES

- Micro-machined copper cold plate with 300 μm fin pitch for high heat flux capability
- Thermal resistance: 0.012 $^{\circ}\text{C}/\text{W}$ at 1.5 L/min flow, derated to 0.018 $^{\circ}\text{C}/\text{W}$ at 0.8 L/min
- Pressure drop: 12 kPa at 1.5 L/min (water-glycol 25%)
- Integrated leak detection with dry-contact alarm output
- Dripless quick disconnects rated for 10,000 mating cycles
- Nickel plating for corrosion resistance and compatibility with deionized water and water-glycol loops
- Compliance with OCP Cold Plate specification and ASHRAE W32 water quality guidelines

COMPLIANCE & STANDARDS

The assembly is designed to meet the following standards:

- OCP Open Rack V3 and OCP Accelerator Module (OAM) thermal interface guidelines
- IEC 62368-1 safety requirements for liquid-cooled IT equipment
- ASHRAE W32 water quality and IEC 60364-7-710 for facility water loops
- RoHS and REACH compliance
- GR-63-CORE and GR-1089-CORE for central office deployment

TECHNICAL SPECIFICATIONS

Parameter	Specification
Cold Plate Material	Nickel-plated copper, 300 µm fin pitch
Thermal Resistance	0.012 °C/W at 1.5 L/min (water-glycol 25%)
Pressure Drop	12 kPa at 1.5 L/min
Flow Rate Range	0.5 to 2.0 L/min
Operating Coolant Temperature	15 to 45 °C
Maximum Heat Load	1,200 W per ASIC
Leak Detection	Integrated sensor with dry-contact

	alarm
Quick Disconnect Rating	10,000 mating cycles, dripless
Compliance	OCP Cold Plate, IEC 62368-1, ASHRAE W32

ORDERING OPTIONS

The assembly is available in three standard configurations: a single cold plate for the switch ASIC, a dual cold plate for ASIC and optical transceivers, and a cold plate with integrated flow meter and temperature sensors. Optional accessories include a leak detection controller, spare quick disconnect fittings, and a pressure test kit. Custom manifold designs are available for OEM chassis integration.

