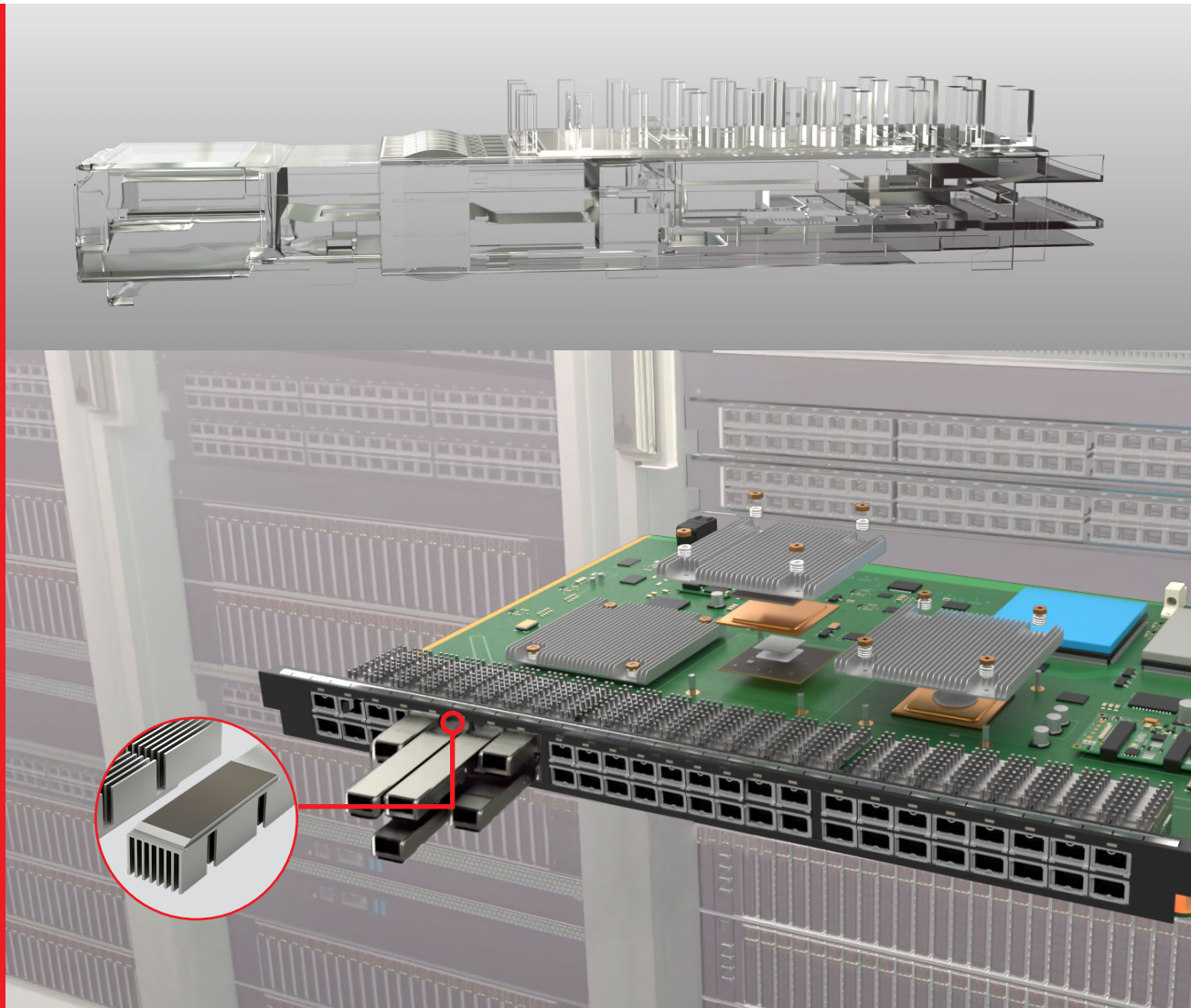
DURABLE,
THIN THERMAL INTERFACE COATING
REDUCES HEAT AND IMPROVES DATA CENTER SWITCH PERFORMANCE

Application Challenges and Objectives

- Data center Ethernet switch manufacturers must tackle the requirement for accelerating data rates and the challenges that presents.
- At the line card level, one obstacle to maximum performance is the heat generated by higher-wattage pluggable optical modules, also known as POMs or transceivers.
- Traditional heat dissipation methods through metal-to-metal interfaces between POMs and their riding heat sinks are not optimal for the power output of newer transceiver designs, which can range from 10W to as high as 35W per module. In a single line card, there can be as many as 32 POMs.
- Older-generation thermal interface materials – like conventional phase change films – are not suitable because they scrape off after multiple POM insertions and pulls. This diminishes the thermal performance and can introduce volatiles into the data center system.
- Because of these realities, a top switch manufacturer looked to a new, innovative solution for thermal control to reduce operating temperatures of its 20W transceiver application.



Application Data and Testing

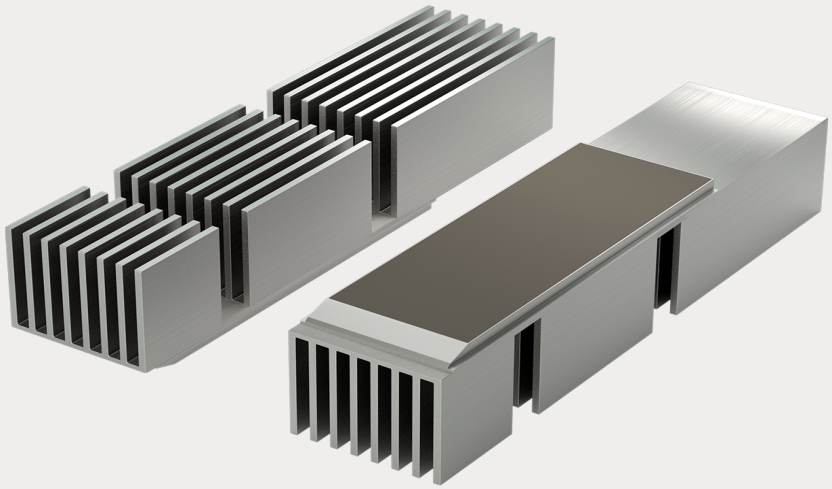
- Partnering with a leading advanced heat sink manufacturer, Henkel applied its durable micro-thermal interface material (mTIM) onto nickel plating aluminum heatsinks and tested them with the switch manufacturer's QSFP-DD 400 GbE transceiver design.
- The performance evaluation was conducted by placing thermocouples in four locations on the modules and one at the interface between the heatsink and the POM. Temperatures were measured for both metal-to-metal (module to heat sink with no thermal interface material) and Henkel BERGQUIST® microTIM mTIM 1028 -coated heatsinks.
- Temperature readings were taken at all five locations at initial mating (transceiver to heat sink initial contact), after 100 pulls/insertions and after 250 pulls/insertions.

Results

- The average change in temperature (ΔT, °C) across all five temperature sensors was as follows:

	Initial Temperature	Average ΔT after 100 pulls/insertions	Average ΔT after 250 pulls/insertions
Metal-to-Metal	29.3°C	34.6°C	33.1°C
microTIM-coated Heat Sink	26.3°C	27.2°C	26.7°C

Customer analysis validated Henkel's internal test data, with Henkel BERGQUIST® microTIM mTIM 1028 demonstrating average temperature reductions versus a metal-to-metal interface of 3°C at initial, 7.4°C after 100 pulls/insertions and 6.4°C after 250 pulls/insertions. Based on this success, this module plus heat sink combination is now in the field, serving data centers across the globe with improved switch performance.



To Find Out More On The Latest Innovations In Data & Wireless Technology:

https://www.henkel-adhesives.com/us/en/industries/electronics/industrial-and-infrastructure/telecom-datacom-infrastructure.html

Contact:
Tho Quang Nguyen
Lead Application Engineer, Thermal
thoquang.nguyen@henkel.com
Phone: 612-355-9615