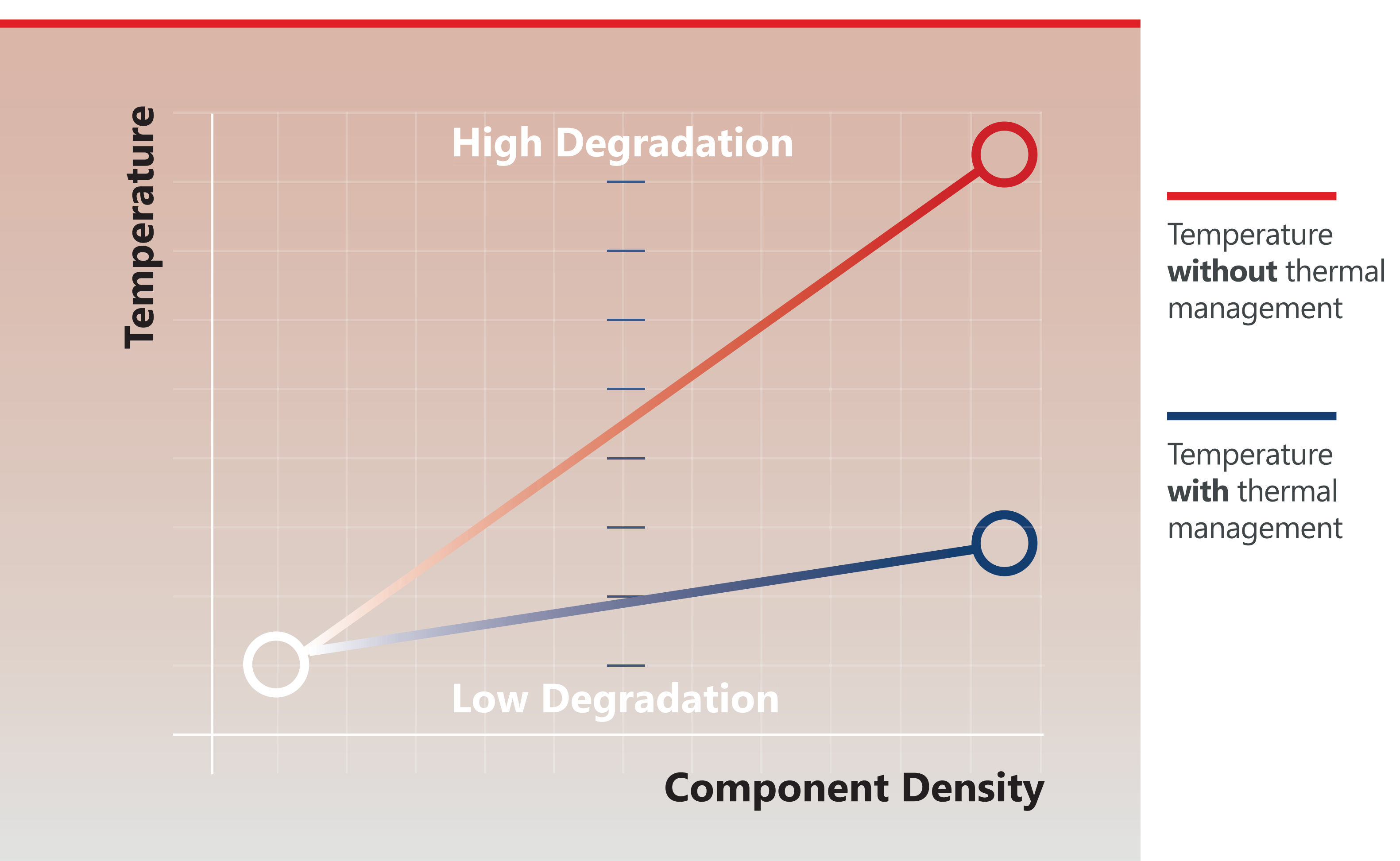
KEEP YOUR COOL: THE SECRET TO PERFORMANCE, RELIABILITY, AND COST CONTROL.

Effective thermal management in hardware components helps data centers and telecom operators reach target performance metrics while enabling emerging technologies.

MASSIVE COMPUTING POWER = MASSIVE HEAT GENERATION

As network scale, speed, and bandwidth needs skyrocket and component density continues to increase, so does the heat generated within those circuits. Data center and telecom infrastructures use components in mass quantities. Optimizing these components at the integrated circuit level can create colossal, in-aggregate heat improvements.



DATA CENTERS: THE HEAT IS ON.

Network traffic within data centers is growing exponentially at 27% over the last five years[1], while budgets remain flat.

TYPICAL DATA CENTER:
50,000 – 80,000+ SERVERS[2]

DATA CENTER COOLING MARKET IS EXPECTED TO SURPASS
$20 BILLION
BY 2024[3]

PUBLIC CLOUD COMPUTING MARKET IS EXPECTED TO BALLOON TO
$800 BILLION
BY 2025[4]

TELECOM

Telecom infrastructure is growing rapidly. The tower market, valued at $39 billion in 2018, is projected to exceed $114.06 billion by 2026.[5]

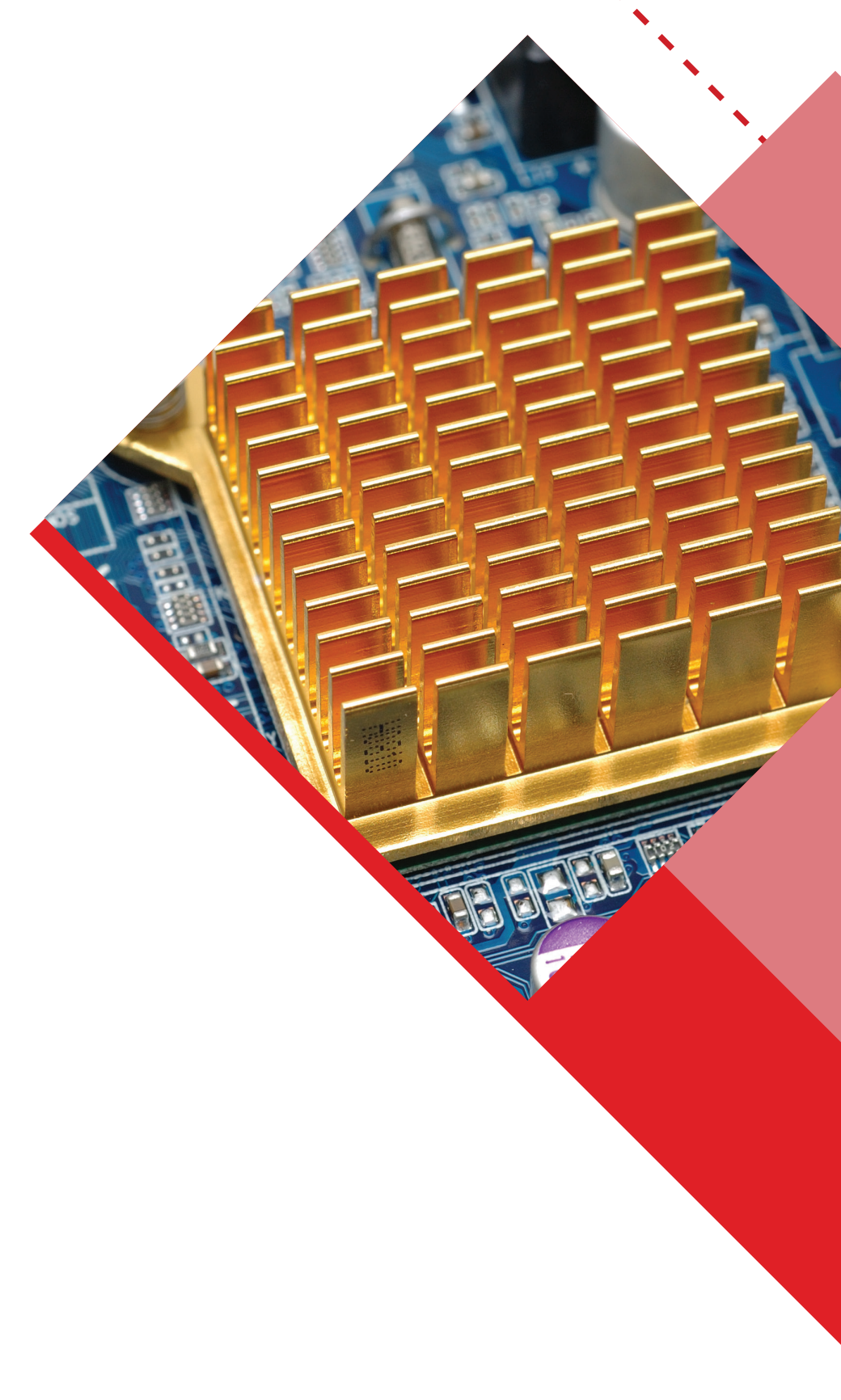
5G SITES REQUIRE
2-3X MORE POWER[6]

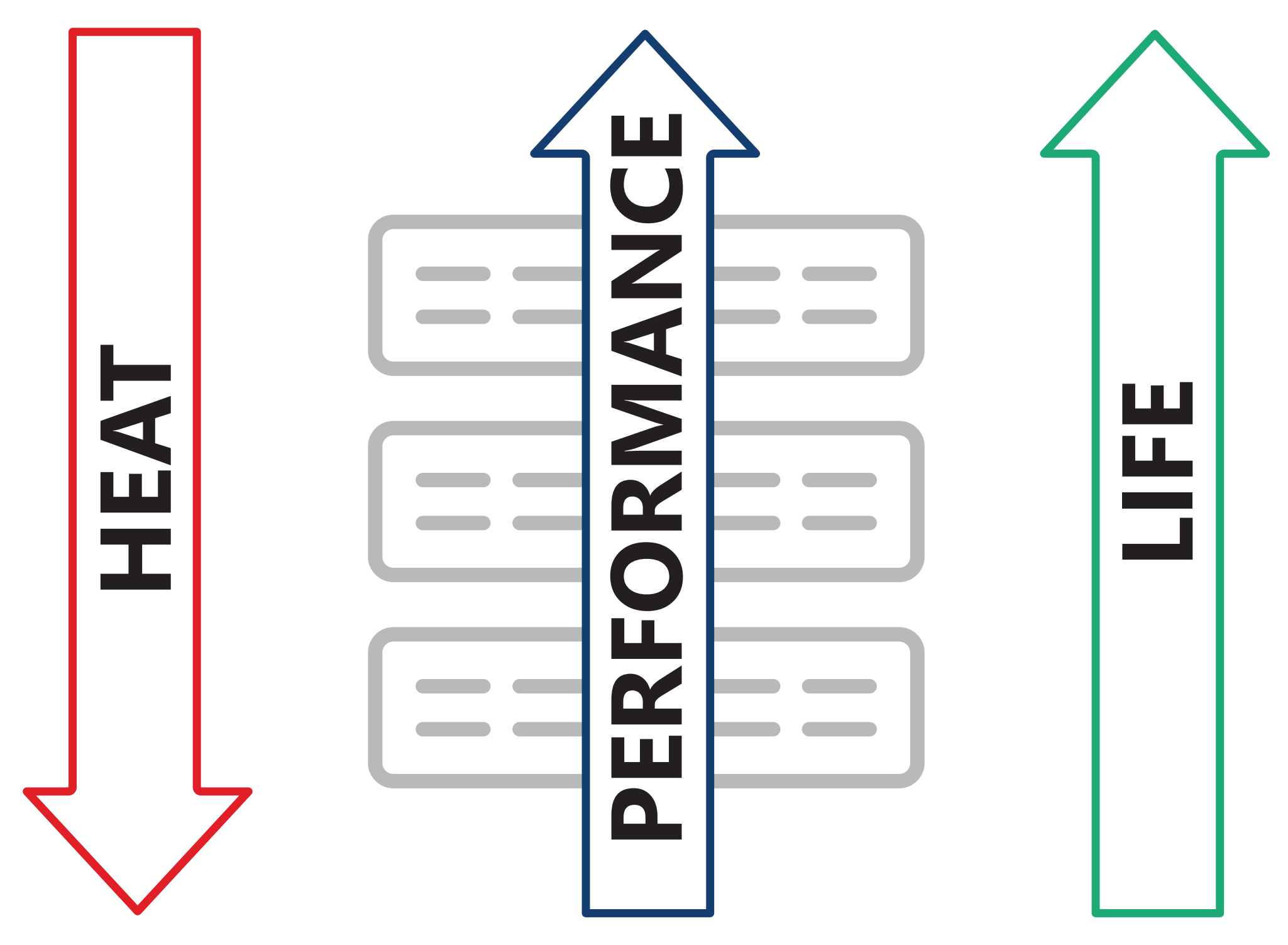
4.1 MILLION
TELECOM TOWERS THAT CAN BE UPGRADED GLOBALLY[7]

HEAT AND MAINTENANCE OUTLAYS ARE
EXPECTED TO GROW
EXPONENTIALLY

REDUCE THE HEAT. ELEVATE THE PERFORMANCE. INCREASE THE LIFE.

Challenged by heightening demands for increased reliability, density, processing power, and speed, thermal management is the number one way to enhance performance, boost reliability, and extend component life.





Lowering the heat optimizes performance and extends the life of components.

Reducing heat turns up the possibilities:

- + Longer life
- + Reduced hardware and cooling costs
- + Maximized processing capabilities
- + Enhanced component & network reliability
- + Lower latency
- + Increased optical stability

MEET THE CHALLENGE OF EMERGING TECHNOLOGIES.

Advancements in emerging technologies and increasing demands for more reliability, processing power, and speed only increase the need for more thermal management solutions.

A lot of heat to keep up with:

- + 5G has 10 times faster data processing speeds than 4G
- + Wi-Fi 6 has the capacity for 9.6 Gbps vs. 3.5 Gbps for Wi-Fi 5
- + 400 GbE data transmission rates are four times as fast as current 100 GbE

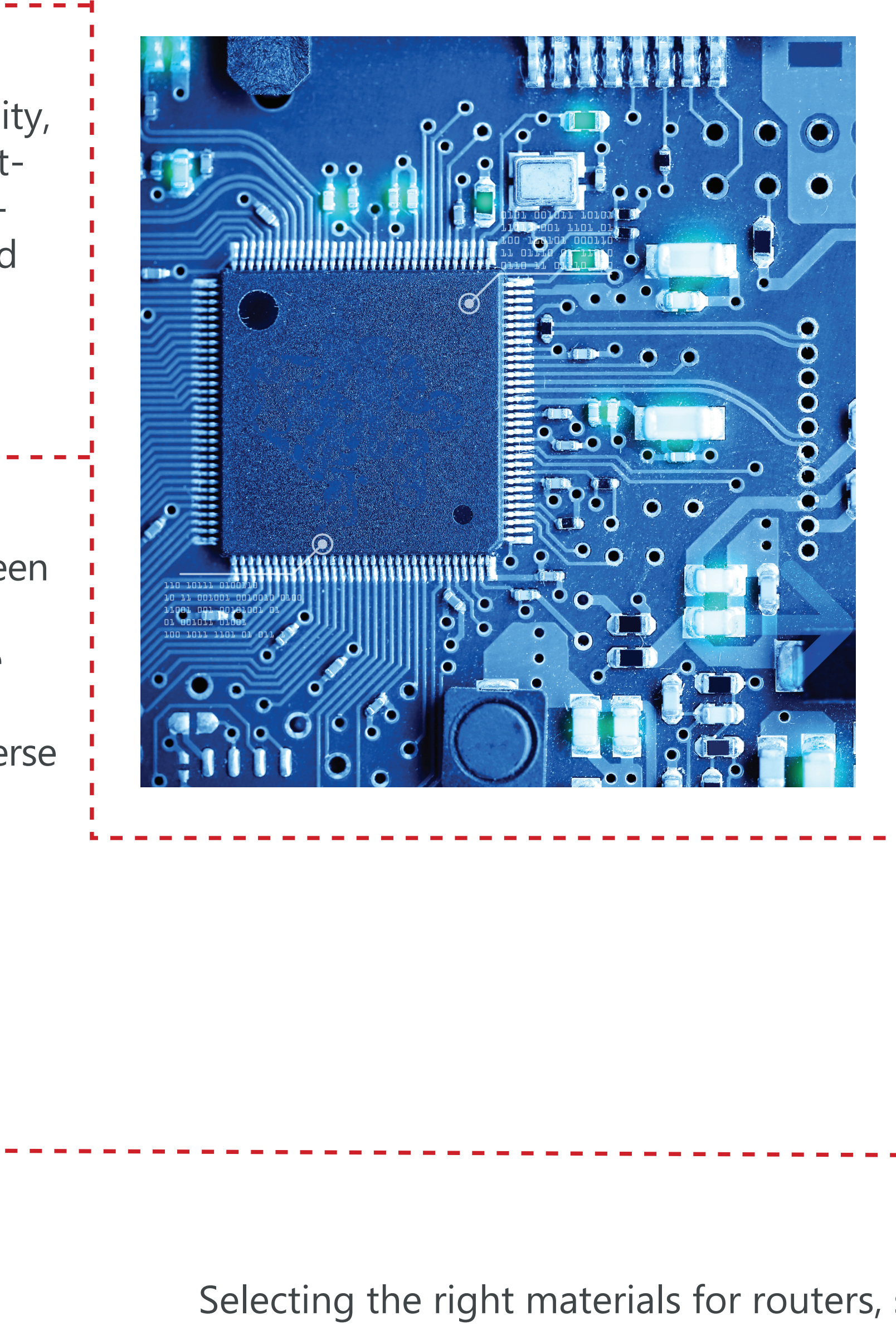
Even small, incremental improvements in thermal management add up to deliver significant results across networks.

The difference 5° can make.

Advanced, innovative microTIM materials enable modules to dissipate more heat and reduce operational temperature by upwards of 5° C, which is significant in aggregate across the line card.

Innovations in advanced materials.

Advanced materials—such as thermal gels, phase change and GAP PAD® materials as well as microTIMs—can make all the difference when used in micro-sized electronic components.



MicroTIM

Enhance thermal performance, durability, and resilience of heat-generating devices—including POMs—and aluminum heat sink assemblies.

Thermal GAP PAD® Materials

Eliminate space between hot components and heat sinks to optimize thermal transfer while minimizing adverse impacts of heat on device operation and overall lifetime.

Thermal Gels

Thermal conductive gels help reduce component stress and increase process flexibility, in-application stability, and thermal conductivity.

Phase Change Materials

Thermal phase-change compounds can replace grease as an interface material and form a thin bondline with low thermal resistance between power devices and heat sinks.

Selecting the right materials for routers, switches, and circuit boards is essential for data center and telecom performance. We invite you to align with an innovative, advanced materials partner to source and, in some cases, co-innovate material development.

LEARN MORE

Resources

1 Data centers is growing exponentially at 27% over the last five years
https://interfacemasters.com/company/blog/the-migration-to-400-gigabit-ethernet-400gbe/

2 Typical data center: 50,000 – 80,000+ servers
https://www.forbes.com/sites/johnsonpierr/2017/06/15/with-the-public-clouds-of-amazon-microsoft-and-google-big-data-is-the-proverbial-big-deal/?sh=7d3d4c1f2ac3

3 Data center cooling market is expected to surpass $20 billion by 2024
https://techhq.com/2020/05/data-center-cooling-a-24b-business-by-2024/

4 Public cloud computing market is expected to balloon to $800 billion by 2025
https://techhq.com/2020/05/data-center-cooling-a-24b-business-by-2024/

5 The tower market in 2018 and 2026
https://www.verifiedmarketresearch.com/product/global-telecom-towers-market-size-and-forecast-to-2025/

6 5G sites require 2-3x more power
https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-case-for-committing-to-greener-telecom-networks

7 4.3 million telecom towers that can be upgraded globally
https://www.globenewswire.com/en/news-release/2021/08/18/2282726/0/en/Global-Telecom-Towers-Market-Growth-Trends-COVID-19-Impact-and-Forecasts-2021-2026.html