



**THERMAL
SYSTEMS**

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Thermoelectric Modules Protect Heat Sensitive CMOS Sensors

HiTemp ET Series thermoelectric modules from Laird Thermal Systems simplify cooling in high heat applications...

April 30, 2019 – Laird Thermal Systems expands its Peltier thermoelectric module product family with the HiTemp ET Series, designed to protect critical electronic devices like CMOS sensors in high temperature applications. Recent advances in CMOS sensor technology have made these sensors practical and effective for use in a wide range of imaging applications found in autonomous systems, machine vision and learning, high-end scientific cameras, and more.

These sensitive CMOS sensors convert photons to electrons for digital processing. Thermal noise causes CMOS sensors to lose image resolution as temperature increases. This can occur in many outdoor applications, where heat generated by surrounding electronics exceeds the maximum operating temperature of the CMOS sensor. To prevent image quality from deteriorating, high temperature Peltier coolers can reduce the sensor's temperature, maintaining acceptable noise levels.

Laird Thermal Systems' HiTemp ET Series thermoelectric modules deliver spot cooling to ensure optimum CMOS sensor performance. The HiTemp ET Series is a preferred cooling solution in CMOS sensor applications and has proven not to degrade in high heat environments. To meet a broad range of design requirements, the HiTemp ET Series includes 53 models offering a variety of heat pumping capacities, geometric form factors and input voltages.

Laird Thermal Systems' enhanced Peltier module construction prevents copper diffusion and degradation in performance, which can occur in standard grade thermoelectric modules in higher temperature environments. The HiTemp ET Series construction does not sacrifice performance for reliability like other high thermoelectric modules on the market. It maintains a high coefficient of performance (COP) allowing for maximum heat removal into the air.

"As CMOS sensors are incorporated into new emerging applications for outdoor environments, thermal management becomes more important to keep sensors below their maximum operating temperature limit," said Andrew Dereka, Product Director at Laird Thermal Systems. "Spot cooling that features a thermoelectric module provides an active cooling solution that allows these critical sensors to maintain maximum image resolution for their application."

Offering active cooling for applications operating in temperatures ranging from 80 to 150 °C, the HiTemp ET Series offers a cooling capacity of more than 300 watts in a compact form factor. The HiTemp ET Series is designed for higher current and larger heat-pumping applications offering precise temperature control accuracy achieving $\pm 0.01^{\circ}\text{C}$.

For more information on the HiTemp ET Series visit <https://www.lairdthermal.com/products/product-series/hitemp-et-series>

For more information on CMOS sensor thermal management, visit <https://www.lairdthermal.com/resources/application-notes/thermoelectric-cooling-cmos-sensors>

About Laird Thermal Systems

Laird Thermal Systems designs, develops and manufactures thermal management solutions for demanding applications across medical, industrial and telecommunications markets. We manufacture one of the most diverse product portfolios in the industry, ranging from active thermoelectric modules (TEMs) and thermoelectric assemblies (TEAs) to temperature controllers and liquid cooling systems. With unmatched thermal management expertise, our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems. By offering a broad range of design, prototyping and in-house testing capabilities, we partner closely with our customers across the entire product development lifecycle to reduce risk and accelerate time-to-market. Our global design, manufacturing and support resources help customers shorten their product design cycle, maximize productivity, uptime, performance and product quality. Laird Thermal Systems is the optimum choice for standard or custom thermal solutions.

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