

Case Study

Optimization of Thermal/EMI Solution Reduces Design Time from Weeks to Days



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Due to the reduction in electronics form factors and the need to include more and more radios into each device, many original equipment manufacturers (OEMs) are looking to combine electromagnetic interference (EMI) and thermal solutions into single assemblies. This introduces additional complexities in the thermal design process such as the need for multiple layers of thermal interface materials whose performance interacts with each other.

Shahi Riaz, Thermal Design Engineer for Laird Technologies, worked with an OEM customer to design a combined EMI/thermal solution. The simulation showed that the package temperature of the heat source exceeded the maximum value of 90°C. Riaz then set up an optimization that explored the entire design space he had defined and iterated to an optimized design that reduced the package temperature to an acceptable level 13°C below the original design. The design was optimized in only a few days compared to the weeks that would have been required using the normal one-iteration-at-a-time method.

Laird Technologies designs and manufactures customized, performance-critical products for wireless and other advanced electronics applications. The company is a global market leader in electromagnetic interference (EMI) shielding, thermal management products, mechanical actuation systems, signal integrity components, and wireless antennae solutions, as well as radio frequency (RF) modules and systems across a wide variety of industries including IT/telecommunication, medical, automotive, foodservice, consumer electronics, military/aerospace, and more.

Laird Technologies uniquely provides multi-compartment shields to cover multiple-board areas simultaneously. These shields are made by molding conductive elastomer walls onto metal shield cans to provide any compartment geometry needed.

Some of Laird Technologies' popular combination shields include the Microwave Board-Level Shield – a combination of a microwave absorber with board-level shielding that can absorb or suppress high-frequency interference, enabling the board to be more effective at high frequencies. To address applications where heat needs to be removed and board-level shielding is also required, Laird Technologies incorporates thermal interface materials with board-level shields. Adding a gap filler material with high thermal conductivity between the electronic component and board-level shield cools the component by transferring heat efficiently to the shield, which acts as a heat spreader.