Avoiding Aerospace Electronics Failures, Thermal Testing and Simulation of High-power Semiconductor Components

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High semiconductor temperatures may lead to component degradation and ultimately failure. Proper semiconductor thermal management is key for design safety, reliability and mission critical applications. There are normally three types of high-power applications where thermal management must be treated very carefully, power electronics such as IGBT or MOSFET devices for power drives and conversion, VLSI IC-s for computation and control and LED-s and laser diodes for high power lighting and sensing applications. This presentation will introduce thermal transient testing to tackle thermal characterization tasks in all these three domains, supporting component selection, thermally aware design, quality inspections and reliability testing. We will demonstrate a bridge between tests and CFD simulation, allowing thermal designers to refine their simulation models and achieve unparalleled modeling accuracy.