SESSION 16: THERMAL AND ELECTRICAL CHARACTERIZATION

Chair: Drew Hanser, *SRI International*

Presentations in this session focus on understanding the thermal and electrical behavior of devices and their impact on process control and device performance. A multinational collection of researchers will share their findings in these important areas. The first paper in this session, from Skyworks Solutions, Inc., addresses wafer level RF testing to provide more rapid process feedback and to increase production capacity and capabilities. Hitachi Cable Ltd. will then share results investigating the degradation in pHEMT performance in BiFETs due to their thermal history, clarifying the cause of degradation and proposing improvements. Following that, a research group headed by United Monolithic Semiconductors GmbH will present results from failure investigations in AlGaN/GaN HEMTs where they correlate the device temperature limit as measured by Raman thermography with the 2DEG sheet resistance of the device. In the next paper, researchers from the U.S. Air Force Research Laboratory and RF Micro Devices also investigate thermal effects in GaN materials and share IR measurements of heat spreading in GaN, presenting comparisons using different substrate materials. Finally, Skyworks presents a study investigating the repeatability and reproducibility of several measurement techniques for large-scale epitaxial wafer manufacturing, and introduces approaches to identify and address sources of measurement variation.