

SESSION 12

GaAs PROCESSING

Chairs: Jim Crites, Skyworks Solutions
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Compound semiconductors, and specifically GaAs has come a long way in its maturity in recent decades, from the early days of materials research, maturing wafer supply, the GaAs DARPA MMIC programs of the 1980's, and to PA products mass produced in the today's wireless marketplace. While there are other materials being investigated for PA applications such as Si and GaN, GaAs remains the predominant player.

In this session titled GaAs Processing, there are five contributed papers featuring the prominent role of this compound semiconductor, highlighting all of the on-going process development and performance improvement activities. The session opens with a paper from United Monolithic Semiconductors integrating vertical slot vias which intern significantly reduces source inductance. The authors demonstrate how this allows designers an additional degree of freedom through reducing gate pitch for the same inductance, or conversely inductance for the same gate pitch. The second paper, contributed by MIT, describes the integration challenges and process modules developed for InGaAs MOSFETs compatible with CMOS fabrication techniques for potential next generation logic applications. The session continues with a third paper contributed by authors from MACOM, highlighting the effects of Pt thickness and interactions with other processes on gate sinking and subsequent device failure of a GaAs pHEMT. The fourth paper in this session investigates adding a high-Q Cu inductor to an existing HBT MMIC process enabling both an inductor Q-factor improvement and die size reduction. Compound semiconductor manufacturers are constantly working to find ways to reduce costs without compromising performance. This session concludes with another paper from UMS, where they establish a next generation pHEMT technology with a highly linear humidity tolerant product, packaged in a cost effective molded plastic package.

