

SESSION 5: RELIABILITY

Chairs: Peter Ersland, *M/A-Com Technology Solutions*

This year's reliability session includes papers on both active and passive circuit elements, with relevance to both high volume consumer applications, and leading edge high voltage technologies. Our first paper describes an automated technique for characterizing the ruggedness of HBTs, an especially important parameter for GSM power amplifiers. The authors have used this technique to characterize different device designs, and will describe both the technique and their experimental results. Our second paper addresses the reliability of TaN thin film resistors as a function of temperature and current density. By performing reliability tests on resistors of various sizes the authors are able to better determine design rule limits for reliable resistor operation, leading to more compact circuit layouts. The third and fourth papers in this session address MIM capacitor reliability, particularly for use in high voltage MMIC technologies. The first of these discusses experiments performed to eliminate a low voltage failure population occurring at the edges of MIM capacitors. The authors identify both process and layout changes that lead to a reduction of these low voltage failures. The final paper of the session describes improved capacitor reliability resulting from the use of a new nitride deposition reactor. Comparing this new result to previous capacitor reliability tests, the authors show more than two orders of magnitude improvement in predicted capacitor lifetime, allowing long-term reliable operation at up to 50V.

In addition to this session, there are two reliability papers included in the poster session. The first of these describes a novel analysis technique used to determine the "as-processed" differences between stable and unstable ohmic contacts. The second presents the results of experiments performed to understand the root cause of early HBT failures during high temperature reliability tests.