



SEMINAR

GaN-HEMT RELIABILITY

by

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- DATE/TIME: **Friday, 29 August 2008 at 4:00PM**
- VENUE: **Billings Room 3.04** (3rd Floor)
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The University of Western Australia (EE Building)
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ABSTRACT:

For the last few years, GaN-based technologies have been delivering many of the promises made in their earliest development stages. As usual, when a technology moves out of the labs and into production lines, reliability becomes a major concern. GaN-based HEMTs, in particular, owe most of their appeal and success to the ability to operate at higher power densities and temperatures than their competitors, i.e., under conditions that exacerbate reliability problems.

This paper will give an overview of the development and current status of GaN-HEMT reliability, highlighting the progress made and the challenges still to be met. The degradation mechanisms include (but are not limited to) effects related with traps and their interaction with hot carriers, passivation, material defects, and metallization problems.

Recent life testing data will be shown that indicate a remarkable progress in this area over the last few years. Since reliability is often (though not always) a matter of temperature, the paper will also review the main results obtained in the field of thermal evaluation of GaN-based devices. Experimental characterization techniques include both direct (i.e. microscopy-based) and indirect (i.e., electrical) methods, each with its own merits and drawbacks. Thermal modeling (either analytical or numerical) is also a valuable complement of (if not a substitute for) experimental characterization.