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GaN Reliability Report Advances Device Reliability And Lifetime Projections

EPC's Phase 17 Reliability Report delivers mission-specific reliability insights, expanded lifetime models, and new physics-based wear-out mechanisms to help power electronics engineers push the limits of GaN technology. EPC's test-to-fail methodology continues to push GaN technology beyond traditional silicon MOSFETs. By integrating real-world stress conditions into advanced lifetime models, the Phase 17 report ensures more accurate reliability projections for next-generation power applications.

The latest reliability report introduces expanded lifetime models, mission-specific reliability projections, and new physics-based wear-out mechanisms, providing engineers with more accurate and practical reliability data for GaN power devices.

Key highlights of the report include:

- An expanded gate lifetime model, which incorporates gate leakage current effects across voltages and temperatures, leading to enhanced impact ionization modeling.
- Repetitive transient gate overvoltage testing, which develops and validates a 7-V gate overvoltage rating, addressing resonance-like transient stress in real-world applications.
- Enhanced drain overvoltage robustness, which provides further validation of GaN's superior durability under repetitive transient drain-source overvoltage conditions.
- New pulsed current rating data, which extends testing to over 100 million pulses, proving minimal parametric shifts in Gen-5 and Gen-6 GaN devices.
- A comprehensive thermomechanical lifetime model, which now includes power cycling (PC) modeling, essential for high-stress applications like automotive and AI power systems.
- Mission-specific reliability insights, including expanded analysis for solar, lidar, and dc-dc conversion applications, allowing engineers to fine-tune their designs for long-term operation.

EPC's test-to-fail methodology continues to push GaN technology beyond traditional silicon MOSFETs, says the vendor. By integrating real-world stress conditions into advanced lifetime models, the Phase 17 report ensures more accurate reliability projections for next-generation power applications.

"This report advances GaN reliability modeling with mission-specific projections and new lifetime models, enabling engineers to integrate GaN into high-power, efficient, and robust designs with confidence," said Alex Lidow, EPC CEO and co-founder.

The EPC Phase 17 Reliability Report is available for download here.