Texas Tech University / Group NIRE — Academic / Startup

Project Title: Establish an Independent Testing Facility to Perform Reliability Analysis of Wide-Bandgap Semiconductor Devices

Objectives: Improve overall confidence in the long-term reliability performance of WBG devices/modules by providing independent reliability analysis services.

SOPO Task No.: BP4-3.17
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Some of the testbeds created during TTU's BP3 project will be upgraded and automated for use in the Independent Testing Facility.

WBG Technology Impact

1. WBG power semiconductor devices have many advantages over silicon devices including: higher breakdown voltages, improved thermal conductivity, and allowing for the design of physically smaller and more efficient application circuits.
2. Application sector: Semiconductor device manufacturing and testing, as well as device end-users.
3. Timeframe for commercialization: Limited functionality 6 months after project start date, and full functionality within 1 year.

Proposed Services

- Tests: High temperature reverse bias (HTRB), high temp gate bias (HTGB), high temp operating life (HTOL), temp humidity biased test (THBT), intermittent operating life (IOL), time dependent dielectric breakdown (TDDB), Avalanche, Surge, Short Circuit, di/dt, dv/dt and continuous switching
- General testing parameters: high voltage up to 15 kV, continuous low-voltage current at 300 A and 5 kA pulsed, temperature range of -65°C to 200°C and humidity control between 30% and 90% RH.