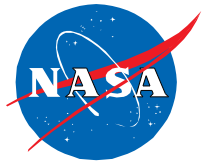

Dr. Philip G. Neudeck

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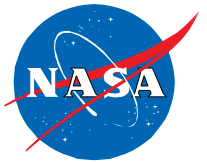

Workshop organizer question:
What is needed to manufacture quality SiC power switches for space applications within the next 5 years?

Commercial SiC Power Device Spec-Sheet Disclaimer:

"This product has not been designed or tested for use in, and is not intended for use in … applications in which failure of the product could lead to death, personal injury, or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators, or similar emergency medical equipment, aircraft navigation or communication or control systems, air traffic control systems, or weapons systems."

What will it take in order for fundamental reliability of WBG power devices be understood and guaranteed to sufficient degree that they could be used in mission-critical (including life-support) aerospace missions?

Qualification and screening?

Modifications to silicon-established standards?

Low-volume space applications MUST leverage experience gained in higher-volume commercial applications.

Workshop organizer question:
How can the proposed Consortium help achieve this goal?

SPONSOR COLLABORATION AND ENHANCEMENT OF FUNDAMENTAL UNDERSTANDING OF WBG POWER DEVICE RELIABILITY PHYSICS ISSUES.

SiC MOS performance and reliability.

Material defects.
- Impact on electrical reliability.
- Understanding WBG defect formation/propagation mechanisms.
- Elimination of crystal defects from WBG material.

Advanced packaging reliability.

Circuit/system/device reliability interactions.

Space radiation and lightning effects.

Expanded temperature range reliability.

Propose reliability and screening/qualification standards.

Fundamental physical understanding and standards would benefit mainstream commercial WBG power device/system industry.