

Project Title: Quantifying Power Device Reliability due to Terrestrial Radiation

Objectives: Determine bias dependent Failure In Time (FIT) curves for flagship SiC power devices of PA Members.

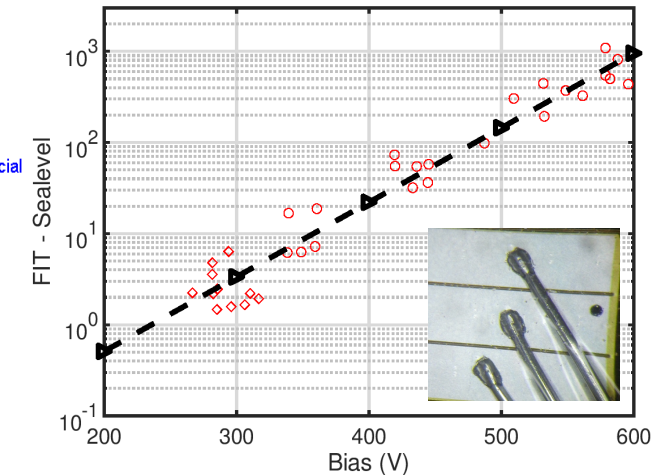
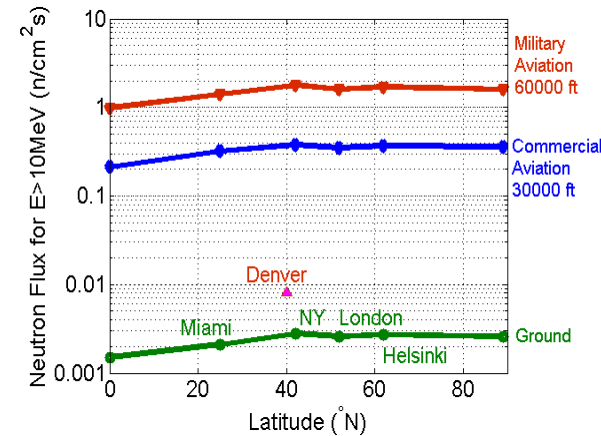
Deliverables: Experimental data and reports.

SOPO Task No.: BP4-3.14

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## WBG Technology Impact

1. The test services and the capability of gathering reliability data in a timely and cost effective manner will be available to our industry on an on-going basis.
2. Terrestrial neutron radiation hardness of some of the main SiC power devices will be determined. FIT rates can be used by power electronics industry to determine lifetime and reliability.
3. SiC devices exhibit unique failure modes due to atmospheric neutrons. These need to be understood for failure mitigation
4. This is a reliability test to aid SiC device market penetration.

## Additional impacts

1. We offer our terrestrial neutron testing services in particular and radiation testing services in general to the PA community on a regular basis.
2. We previously pursued terrestrial neutron reliability tests at Los Alamos Neutron Science Center to quantify terrestrial neutron radiation hardness of some SiC MOSFETs. Terrestrial neutron radiation induced effects cause major problems for Si power devices. Quantifying and mitigating these effects is necessary to pave the way for SiC's adoption in power electronics applications.
3. New generation devices fabricated by PA Members need to be quantified against these effects.