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# Impact of 10 Ci-Neutron Irradiation on GaN-HEMT Devices

This study explores the effects of neutron irradiation on Gallium Nitride High-Electron-Mobility Transistors (GaN-HEMTs) in environments with high neutron flux, such as those encountered in space and particle accelerators. GaN-HEMT devices were irradiated using a 10 Ci Americium Beryllium (AmBe) source, generating a neutron spectrum ranging from thermal energies to 9.8 MeV, thereby simulating neutron-rich conditions. The devices were exposed to a neutron flux of 2.2 × 10ˆ6ncm−2Sˆ−1 for 168 hr. Following irradiation, γ-spectroscopy was utilized to assess induced radioactivity, and electrical characterization focused on IV characteristics. The subsequent changes in electrical properties have been systematically analyzed, offering crucial insights into the durability of GaN-HEMTs under extreme conditions and contributing to a deeper understanding of the mechanisms behind performance degradation in neutron-rich environments.

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