

## REDUCTION OF GATE LEAKAGE CURRENT IN AN ALGAN/GAN HEMT

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### Abstract

AlGaIn/GaN high electron mobility transistor shows high power performance in high frequency operation due to its high breakdown voltage and high carrier density. However, it has some problems to be solved and gate leakage current is one of them. This talk presents the fabrication of AlGaIn/GaN high electron mobility transistor and the effect of gate leakage current for the transistor on various surface treatments. By oxygen plasma treatment on the surface, the leakage current of the transistor decreased four orders of magnitude without the degradation of transconductance and the drain current characteristics. But, it was not decreased in nitrogen plasma as much as in oxygen and the UV exposure degraded the electrical characteristics of the transistor. The reduction of gate leakage current occurred within a short time and long time process did not improved the electrical characteristics more. The reduced leakage current level was not varied by successive SiO<sub>2</sub> deposition and its removal.

### Speaker's Biographical Sketch

Jeon Wook Yang received a BS degree in electronics engineering from Kwangwoon University in 1981 and MS degree from Yonsei University, Korea in 1983. After one year military service, he joined as a research engineer in Electronics and Telecommunications Research Institute, Korea and had been worked in the fields of semiconductor device process. He received his Doctor's degree by study of high speed compound semiconductor transistors from Yonsei University in 1994. After that he did his research for the microwave monolithic IC using GaAs MESFETs and AlGaAs/GaAs HEMTs. In 1998, he joined as a faculty member in the Semiconductor Science and Technology Department, Chonbuk National University in Korea and began working GaN related electronic devices.

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