Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Remote Plasma Assisted, Low-Temperature SiO_2 growth on SiC for MOS Device Applications J.M. WILLIAMSON, B.A. TOLSON, Innovative Scientific Solutions, Inc., Dayton, OH 45440, S.F. ADAMS, J.D. SCOFIELD, Air Force Research Laboratory, Wright-Patterson AFB, OH 45433 — SiC is an attractive material for semiconductor device applications in environments too harsh for normal Si-based semiconductors. It has high thermal conductivity and breakdown electric field strength enabling high power and temperature operation. SiO_2 is readily grown on SiC by high-temperature ($\sim$1200 $^\circ$C) thermal oxidation, but defect densities in the SiO_2/SiC interface limits device performance. Plasma-assisted oxidation of SiC is being investigated as a low-temperature alternative to thermal SiC oxidation to produce MOS devices with lower defect densities. SiC wafers were oxidized with a remote microwave plasma in an O_2 / Ar gas mixture at temperatures much lower than thermal oxidation. Recent results of the plasma assisted oxide growth process have shown significant improvement, with SiO_2 layers in excess of 600 Å at growth temperatures near 300 $^\circ$C. Results will be presented of the plasma assisted SiC oxidation including plasma optical diagnostics and oxide layer characterization.

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Date submitted: 17 Jun 2008 Electronic form version 1.4