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**Low Contact Resistance Ohmic Junctions in GaN Nanowire Devices by Rapid Thermal Annealing**[1] G. CHEN, QIHUA XIONG, H. R. GUTIERREZ, J.J. ZENGEL, J. WU, S. TADIGADAPA, P.C. EKLUND, The Pennsylvania State University, University Park, PA 16802, K. BYON, J. FISCHER, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA 19104 — GaN nanowires grown by a thermal evaporation method using Au nanoparticles as catalysts on silicon or alumna substrates have been studied. The wires have typical diameter $\sim$ 10-40 nm and are 5-10 $\mu$m in length. The growth proceeds by the VLS mechanism. Electrical contacts (Ti/Au) to the wires on Si/SiO2 substrates were made by standard e-beam lithography, e-beam evaporation and lift-off procedures. The as-prepared devices usually exhibit I-V behavior consistent with Schottky barrier injection. However, using rapid thermal annealing (a few minutes) in vacuum at temperature in the range 450-600 $^\circ$C, we have been able to produce dramatically lower contact resistance and linear I-V ohmic connections to our n-type GaN nanowires. Field-effect transistor (FET) and 4-probe resistivity characteristics of the devices are presented over the temperature range 10-300K and the data are discussed in terms of the electronic structure of the GaN nanowires.

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