

Abstract Submitted
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A Transport Study of AlGa_N/Ga_N Heterostructures Grown on an AlN Substrate MO AHOUEJA, S. ELHAMRI, R. BERNEY, J.D. DANIEL, Physics, University of Dayton, W.C. MITCHEL, G. LANDIS, AFRL/MLPS, Wright-Patterson AFB, OH — AlGa_N/Ga_N heterostructures grown on AlN substrates by MOCVD/MEMOCVD technique were investigated using Hall and magnetoresistance measurements. The results indicate the presence of well defined Shubnikov-de Haas (SdH) oscillations which confirm the presence of a good quality two-dimensional electron gas in this structure. The carrier density and mobility were roughly $1.19 \times 10^{13} \text{ cm}^{-2}$ and $1100 \text{ cm}^2/\text{Vs}$ at room temperature and $1.02 \times 10^{13} \text{ cm}^{-2}$ and $5279 \text{ cm}^2/\text{Vs}$ at 10 K, respectively. Following illumination, a persistent photocurrent and an increase in the SdH amplitude were observed. Both of these effects are indicative of an increase in the quantum scattering time. The value of the ratio of the classical to the quantum scattering times is within the expected values for the AlGa_N/Ga_N grown on other substrates.

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