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Electron Transport Mechanism in GaN/AlGaN HEMT Structures

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Abstract: The electron transport mechanism in GaN/AlGaN HEMT (High Electron Mobility Transistors) structures grown with MBE on sapphire substrate was investigated by using the temperature dependence of the Hall coefficient, resistivity, carrier density and Hall mobility. Hall measurements were carried out using Van der Pauw geometry. From the LO-phonon-scattering-limited component of the mobility, we obtain LO phonon energy $\hbar\omega \approx 90$ meV and the momentum relaxation time of $\tau_m \approx 4$ fs. Also, from the temperature dependence of the 2D carrier density, we obtain the donor activation energy $E_a \approx 29$ meV.

 [Keywords](#)
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Key Words: GaN, Momentum Relaxation, LO Phonon Scattering

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