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High Electron Mobility $Al_xGa_{1-x}N/GaN$ Heterostructures Grown by PAMBE on GaN Templates Prepared by MOCVD[1] YEN-LIANG CHEN, WEN-YUAN PANG, MING-HONG GAU, YU-CHI HSU, WAN-TSANG WANG, JIH-CHEN CHIANG, IKAI LO, Department of Physics, National Sun Yat-Sen University, Kaohsiung, Taiwan, R.O.C., CHIA-HO HSIEH, Institute of Material Science and Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan., JENN-KAI TSAI, Department of Electronic Engineering, National Formosa University, Yunlin, Taiwan, ROC. — A series high mobility $Al_xGa_{1-x}N/GaN$ heterostructures samples were grown on MOCVD-grown GaN templates by molecular beam epitaxy with different Al fractions(x = 0.017∼0.355). The highest mobility in this series samples at liquid nitrogen temperature is 14110 cm^2/Vs with carrier concentration 2.87 x 10^{12} cm^{-2} and Al fraction x = 0.022. In our experiments, the carrier density decreases as Al content reduces. While the carrier density decreases from 1.54 x 10^{13} cm^{-2} to 2.87 x 10^{12} cm^{-2}, the mobility increases. But as the carrier density decreases from 2.87 x 10^{12} cm^{-2}, the mobility decreases.

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Wen-Yuan Pang
Department of Physics, National Sun Yat-Sen University,
Kaohsiung, Taiwan, R.O.C.

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