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Improvement of GaN Epilayer by Multi-Step Method in Molecular-Beam Epitaxy YEN-LIANG CHEN, MING-HONG GAU, CHIA-HO HSIEH, WEN-YUEN PANG, YU-CHI HSU, IKAI LO, WAN-TSANG WANG, JIH-CHEN CHIANG, DEPARTMENT OF PHYSICS, NATIONAL SUN YAT-SEN UNIVERSITY, KAOHSIUNG, TAIWAN, R.O.C. TEAM, INSTITUTE OF MATERIAL SCIENCE AND ENGINEERING, NATIONAL SUN YAT-SEN UNIVERSITY, KAOHSIUNG, TAIWAN TEAM — The quality of GaN template layer plays a very important role in high electron mobility transistors. We propose a special method in the growth of molecular beam epitaxy to enhance the quality of structure and the morphology of GaN. In our study, we used a nitrogen-rich GaN growth condition to deposit the initial varied layer. Then, we changed the N/Ga ratio step-wise to the growth condition of gallium-rich GaN and grew the epitaxy layer right away. In X-ray diffraction analysis, the full width at half-maximum (FWHM) value of rocking curves of GaN(002) is 59.43 arcsec. In atomic force microscopy (AFM) analysis, the surface is rather flat with a rms roughness of 1.622 nm over a $5 \mu\text{m}^2$ area.

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