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Bulk GaN Substrate with Overall Dislocation Density on the Order of 10^5/ cm^2 Fabricated by Hydride Vapor Phase Epitaxy

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Abstract

In this study, a combined facet and flattening (FF) growth technique was implemented to fabricate GaN substrates by hydride vapor phase epitaxy. By changing the growth conditions, i.e., the growth temperature and V/III ratio, it was found that facet growth was promoted with a high V/III ratio and low temperature and planar growth was promoted with low V/III ratios and high temperature. We introduce a FF growth technique involving further reduction of the dislocation density using facet growth as the first step and flattening growth of the GaN layer as the second step. To