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Electronic supplementary information

The investigation of in-situ removal of Si substrates for freestanding GaN crystals by HVPE

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To confirm the crystal quality of freestanding GaN grown using in-situ removal of a Si substrate, etch pit density (EPD) measurement was employed. EPD was evaluated after etching the freestanding GaN crystal in H_3PO_4 acid solution at 200 °C during 30 min. This revealed that threading dislocation densities were evaluated about 1×10^6 /cm^2.

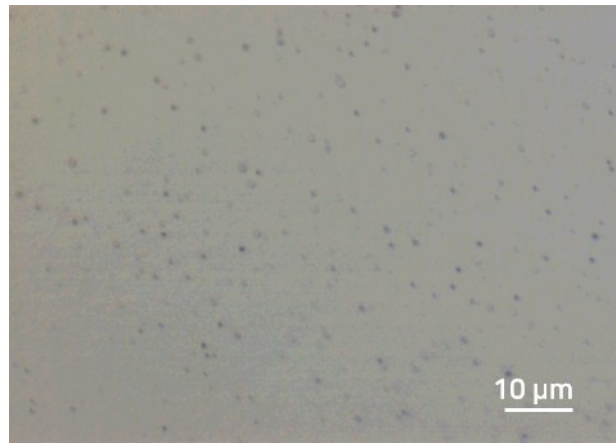

Fig. S1 Microscopy image of the freestanding GaN crystal using in situ removal of a Si substrate.

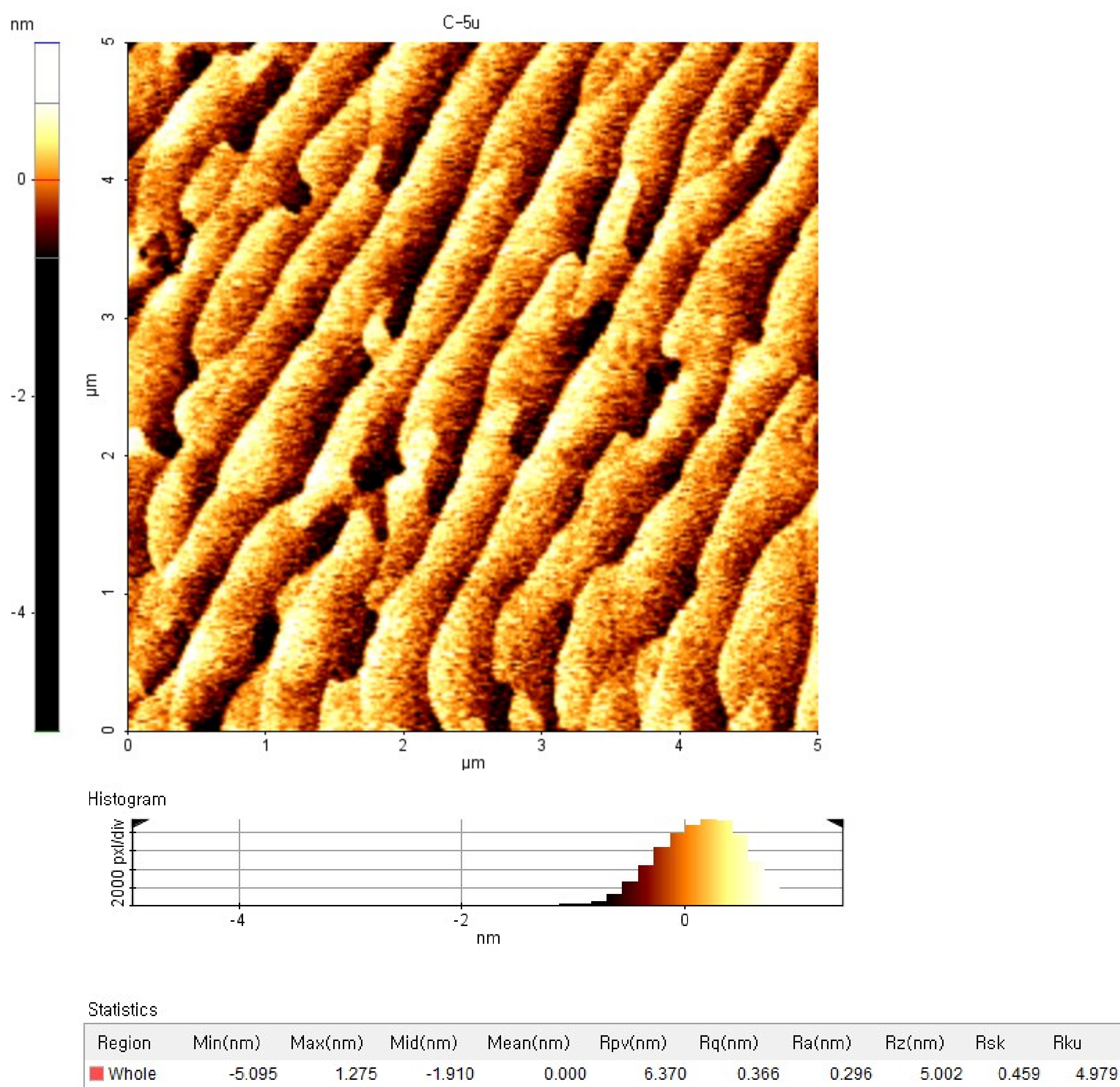

Fig. S2 Atomic force microscopy image of surface morphology in a 5 μm × 5 μm area of freestanding GaN grown from a Si substrate using in situ removal method.