

Supplementary Figures

Electric dipole of InN/InGaN quantum dots and holes and giant surface photovoltage directly measured by Kelvin probe force microscopy

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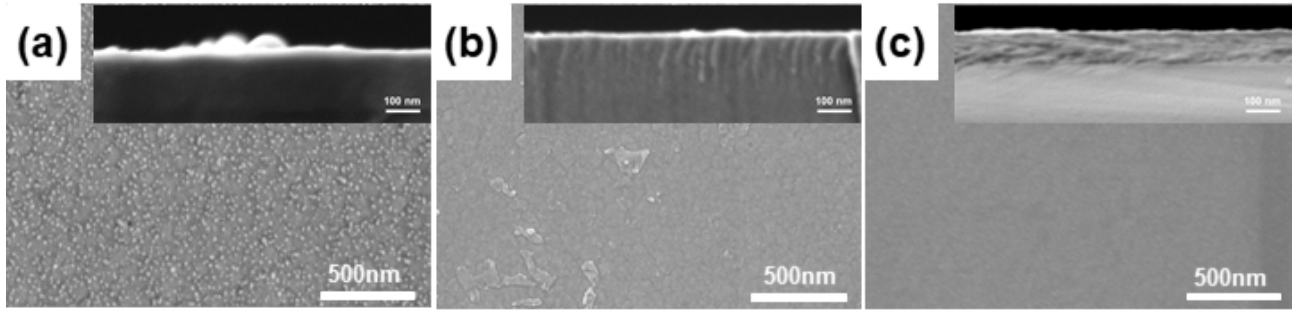


Figure S1. SEM images of the surface morphology of the as-grown (a) 1.2-ML-InN/In_{0.45}Ga_{0.55}N QD structure, (b) 0.8-ML-InN/In_{0.45}Ga_{0.55}N structure and (c) 1.5-ML-InN/In_{0.75}Ga_{0.25}N QD structure. Insets: Corresponding cross-sectional SEM images.

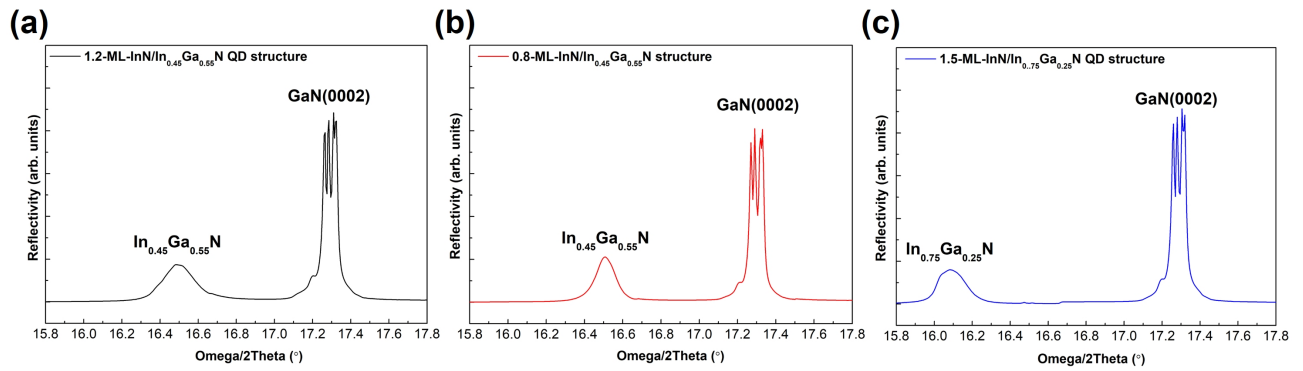


Figure S2. XRD spectra recorded around the symmetric GaN (0002) Bragg reflection using the Cu K-alpha 1 and 2 radiations of the (a) 1.2-ML-InN/In_{0.45}Ga_{0.55}N QD structure, (b) 0.8-ML-InN/In_{0.45}Ga_{0.55}N structure and (c) 1.5-ML-InN/In_{0.75}Ga_{0.25}N QD structure.

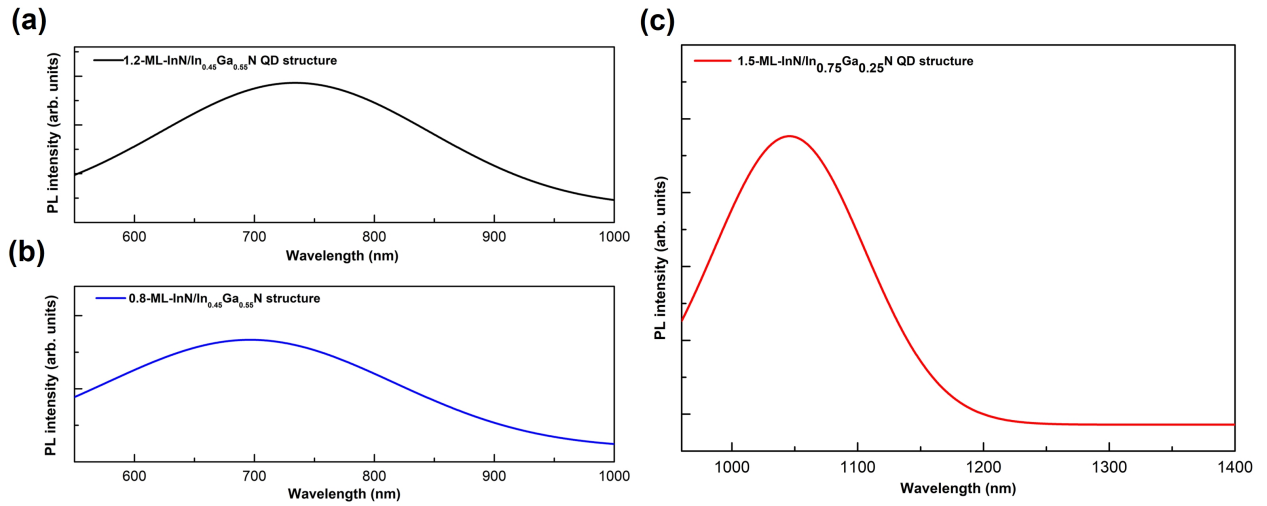


Figure S3. PL spectra at room temperature of the (a) 1.2-ML-InN/In_{0.45}Ga_{0.55}N QD structure, (b) 0.8-ML-InN/In_{0.45}Ga_{0.55}N structure and (c) 1.5-ML-InN/In_{0.75}Ga_{0.25}N QD structure. The PL is excited by the 532 nm line of a Nd-YAG solid-state laser with excitation power of 100 mW, dispersed by a single monochromator and detected by either a Si CCD or an InGaAs single channel detector.

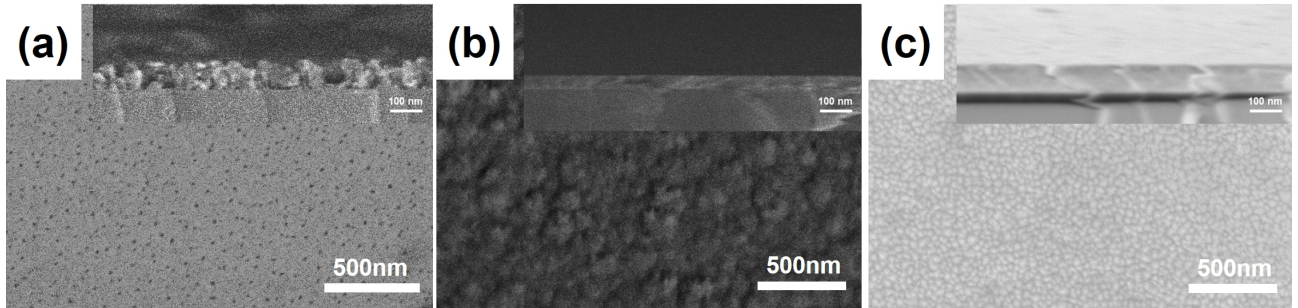


Figure S4. SEM images of the surface morphology after HCl-etching of the (a) 1.2-ML-InN/In_{0.45}Ga_{0.55}N QD structure, (b) 0.8-ML-InN/In_{0.45}Ga_{0.55}N structure and (c) 1.5-ML-InN/In_{0.75}Ga_{0.25}N QD structure. Insets: Corresponding cross-sectional SEM images.

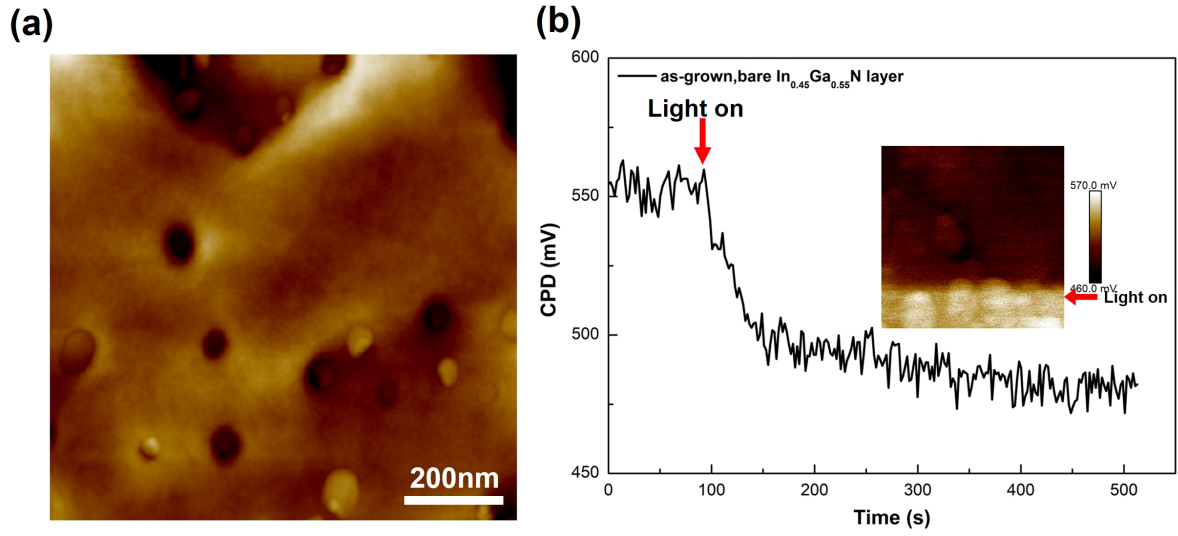


Figure S5. (a) AFM height image and (b) CPD as a function of time of the as-grown, bare $\text{In}_{0.45}\text{Ga}_{0.55}\text{N}$ layer. Inset in (b): KPFM CPD image. The arrows indicate the switching on of the light. The scan field is $1 \times 1 \mu\text{m}^2$ and the full height contrast is 15 nm in the AFM image.

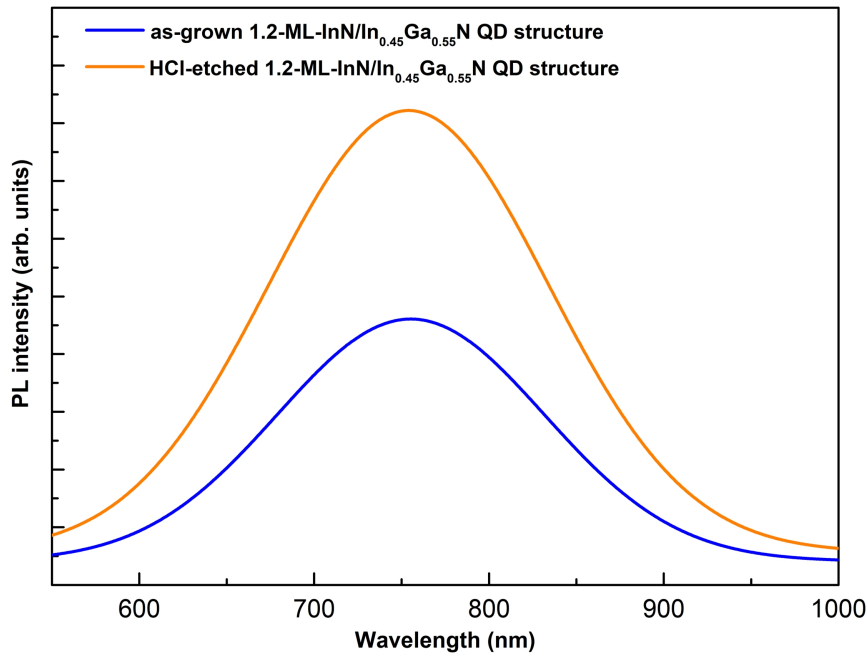


Figure S6. PL spectra at room temperature of the as-grown (blue line) and HCl-etched (orange line) 1.2-ML-InN/ $\text{In}_{0.45}\text{Ga}_{0.55}\text{N}$ QD structures.

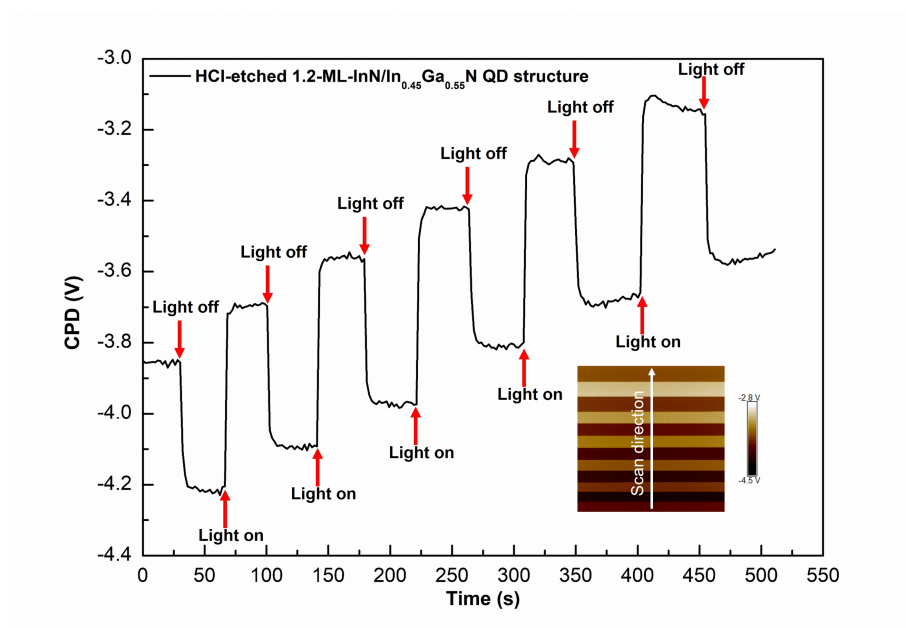


Figure S7. CPD as a function of time for the 1.2-ML-InN/In_{0.45}Ga_{0.55}N QD structure after HCl-etching. The light is alternately switched on and off, as indicated. Inset: KPFM CPD image.