Supplemental Documents (2 pages) – ASD 2026

Manuscript Title: Influence of Selective Nucleation on Crystallinity of AlN on Various Substrate Surface by ALD

Partha Mukhopadhyay[1 a)], Ivan Fletcher[1], Zuriel C. Caribe[1], and Jim Fulford[1]
partha.mukhopadhyay@us.tel.com

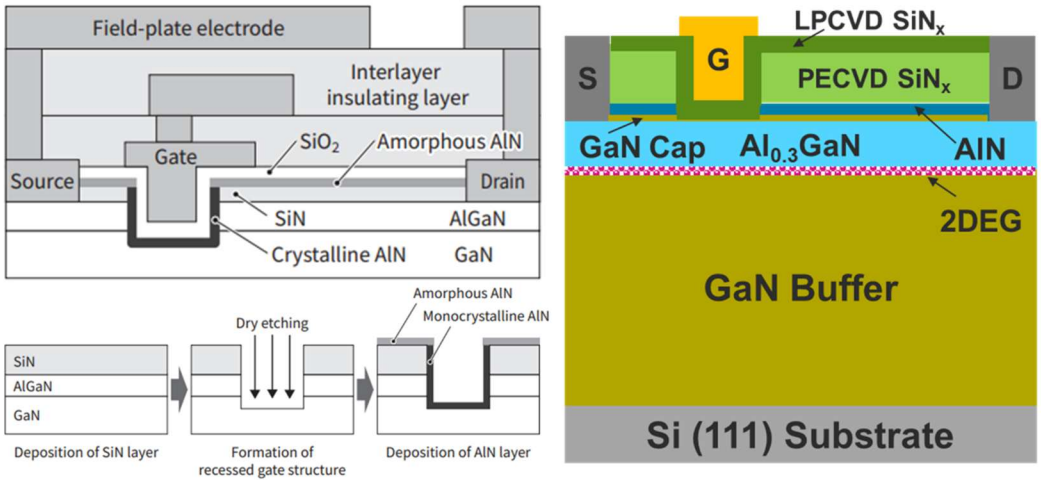

Fig. 1: Applications of ALD AlN with selective crystallinity requirements for various device applications (Left) Toshiba MOS-type GaN (right) AlN passivation on conventional AlGaN/GaN HEMT structure

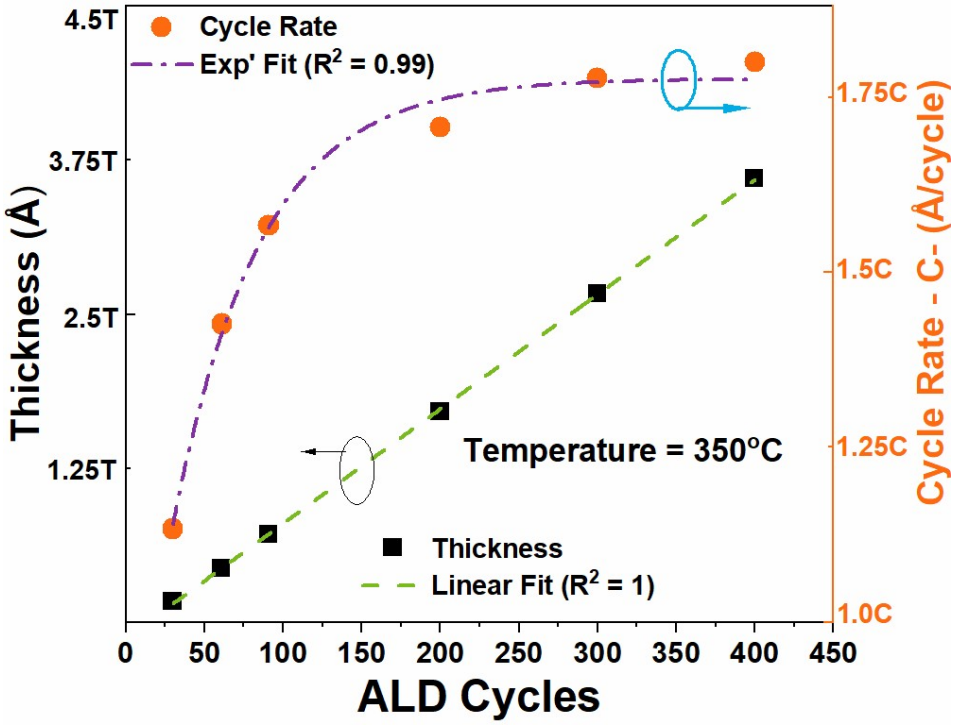

FIG. 2: Thickness variations and Cycle rate with respect to ALD cycles at a fixed temperature. In the Y-axis, values of T are in the range of 150 – 200 Å while values of C are 1.0 – 1.5 Å/cycle.

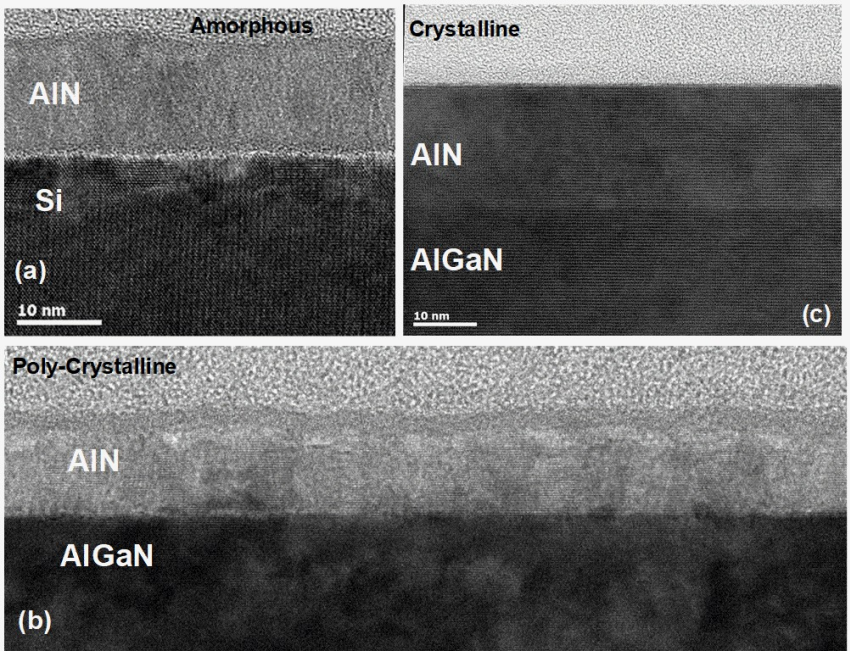

FIG. 3: Cross-sectional TEM of AlN thin film deposited on various substrates with varying temperature (a) Amorphous quality on Si. While on AlGaN/GaN/Si substrate (b) poly-crystalline at BKM temperature and (c) almost crystalline at higher temperatures

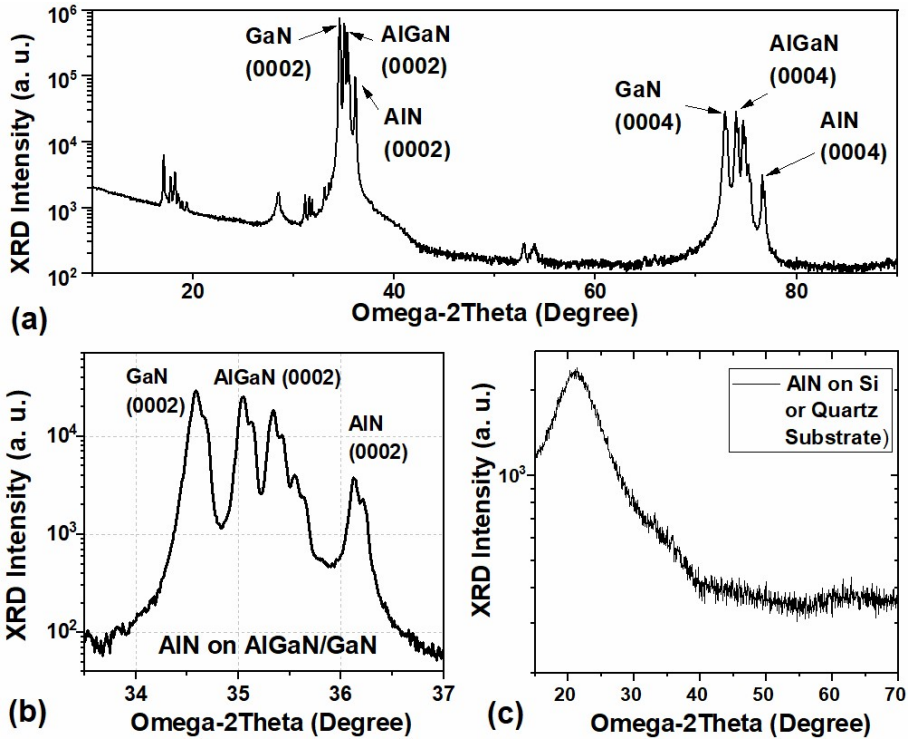

FIG. 4: XRD thin film scan of AlN on AlGaN/GaN (a) over the whole range of Ω–2θ and (b) elaborated at a specific range. (c) XRD of As-deposited AlN on glass or Si shows devoid of peaks over the wide range of omega-2theta, thereby, amorphous in nature