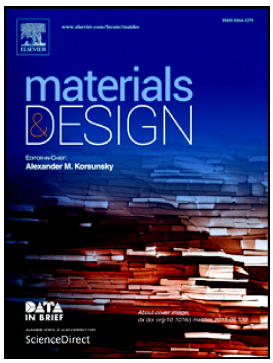

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Effects of polycrystalline AlN film on the dynamic performance of AlGaN/GaN high electron mobility transistors

Dongliang Zhang[a], Xinhong Cheng[a,*], Li Zheng[a], Lingyan Shen[a], Qian Wang[a], Ziyue Gu[a], Ru Qian[a], Dengpeng Wu[a], Wen Zhou[a], Duo Cao[b] and Yuehui Yu[a]

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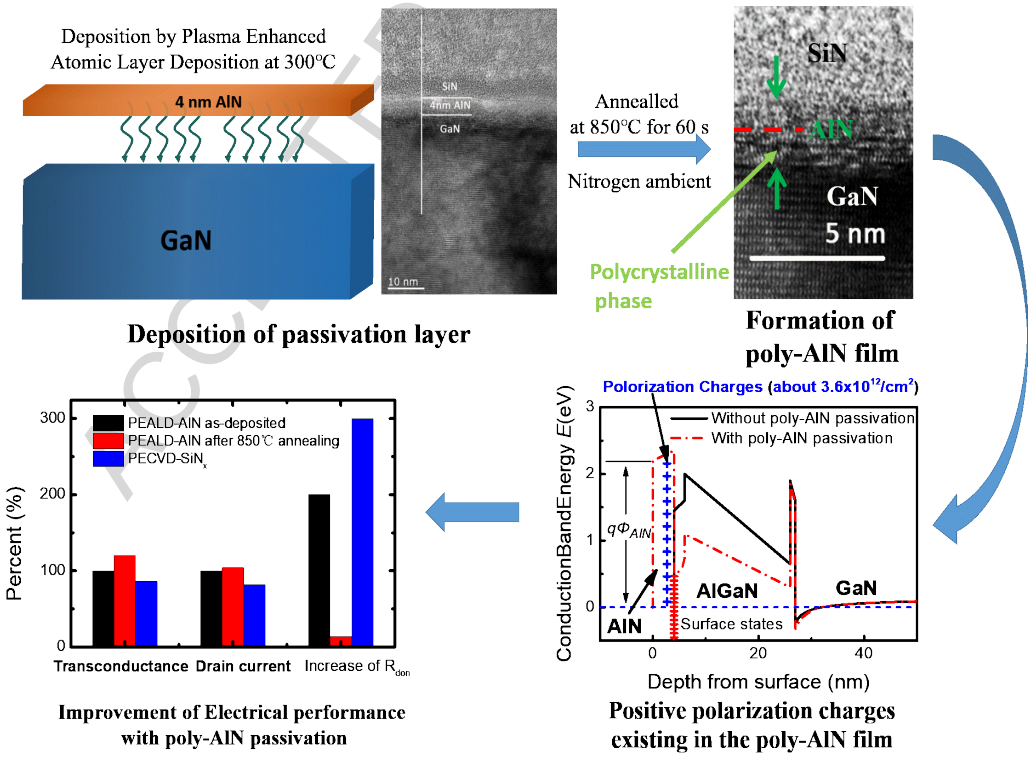
Highlights:

1. 4 nm amorphous AlN film was deposited on GaN surface by plasma enhanced atom layer deposition at 300 °C, and polycrystalline AlN film was formed after annealing the film at 850 °C for 60 s in nitrogen ambient.
2. Large density of positive polarization charges exists in the polycrystalline AlN film.
3. From the results of static and dynamic characteristics for the devices with different passivation, polycrystalline AlN film with large density of polarization charges can effectively improve the DC performance and suppress the degradation of dynamic on-resistance.

Graphical Abstract



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