

## عنوان مقاله:

An investigation of Uniformly-Doped and Delta-Doped Al<sub>0.25</sub>Ga<sub>0.75</sub>N/ In<sub>0.1</sub>Ga<sub>0.9</sub>N Pseudomorphic HEMTs

## محل انتشار:

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## خلاصه مقاله:

Electrical performance of AlGa<sub>N</sub>/InGa<sub>N</sub> pseudomorphic high electron mobility transistors (PHEMTs) are investigated using two-dimensional commercial numerical simulator. Two PHEMT structures are studied, namely uniformly doped PHEMT (U-PHEMT) and PHEMT with double-delta doped layers (D-PHEMT). Simulation results indicate that delta-doped structure has superior performance than uniformly-doped structure which includes better carrier confinement properties and consequently reduced parasitic conduction which is manifested as higher transconductance and improved drain current so that maximum drain current ( $I_{D,max}$ ) 1625 mA/mm and maximum transconductance ( $g_{m,max}$ ) 468 mS/mm are obtained for D-PHEMT while U-PHEMT displays maximum drain current ( $I_{D,max}$ ) 1300 mA/mm and maximum transconductance ( $g_{m,max}$ ) 418 mS/mm. The small signal properties were also achieved with the current gain cut-off frequency ( $f_T$ ) of 46.25 GHz for D-PHEMT and 45 GHz for U-PHEMT. It's found that D-PHEMT in addition to having higher  $I_{D,max}$  and  $g_{m,max}$ , also has an almost equal cut off frequency to the U-PHEMT.

## کلمات کلیدی:

P-HEMT, HFET, Pseudomorphic HEMT, Delta-Doping, 2DEG

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/170913>

