

RF Performance Investigation of NiO Pocket on Ga₂O₃-Based Hetero-MOSFET

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In this paper, the performance of *p*-type NiO pocket on Ga₂O₃|Graphene and Ga₂O₃|Black phosphorous hetero-MOSFET has been investigated to find out its applicability in the wireless applications. To show the utility of the proposed devices, its analog/RF characteristics have been studied and compared to those of the experimentally demonstrated conventional Ga₂O₃ MOSFET. The large signal RF performances analysis has also been carried out by considering CW Class-A power measurements at 0.8 GHz using passive source and load tuning. The important figure of merits (FOMs) used in the analysis are intrinsic capacitances C_{GS} and C_{GD} , cutoff frequency f_T , output power gain G_P , and power-added efficiency (PAE). The key idea behind this work is to propose a device which is efficient and shows low leakage current. All the analysis of proposed devices has been carried out using ATLAS TCAD simulator.

Keywords: wide band gap semiconductors, RFICs, high power FOMs, leakages, RF FOMs.

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