

## Fractional-Order Modeling of GaN High Electron Mobility Transistors for Switching Applications

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**Abstract :** In this paper, a fraction-order model for pad parasitic effect of GaN HEMT on Si substrate is developed and validated. Open de-embedding structure is used to characterize and de-embed substrate loading parasitic effects. Unbiased device measurements are implemented to extract parasitic inductances and resistances. The model shows very good simulation for S-parameter measurements under different bias conditions. It has been found that this approach can improve the simulation of intrinsic part of the transistor, which is very important for small- and large-signal modeling process.

**Keywords :** fractional-order modeling, GaNHEMT, si-substrate, open de-embedding structure

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