

In this paper, a new characterization method, which allows the determination of the time constants of traps in AlGaN/GaN high electron-mobility transistors is proposed. The approach is based on the current transient method for assessing the time constants that are involved in real working conditions. To do that the dc filling pulses, which are classically used in this method, are replaced by RF filling pulses, which reproduce the real large-signal conditions. To investigate the impact of large-signal working conditions on the trapping phenomena, on-wafer single-pulse load-pull characterizations are carried out at different temperatures and for two different output load impedances: maximum of power-added efficiency and mismatched impedance. The results obtained show the deep impact of the load-line excursion on the current collapse of the detrapping drain current. A comparison between the single-pulse RF load-pull characterization and single-pulse dc measurement is finally presented.