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"Large-signal modelling of AlGaN/GaN HEMTs with analytically calculated thermal resistance", pp.288-293

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Abstract – A large-signal equivalent circuit model of AlGaN/GaN HEMTs grown on sapphire substrate with gate width $W_g = 2 \times 150$ µm and gate length $L_g = 1$ µm is presented. The drain-source current equations include a term that accurately models the threshold region and improves agreement between measured and simulated intermodulation distortion. The model takes into account self-heating effects which are considerable in high-power transistors like GaN HEMTs. The thermal resistance has been calculated analytically. The DC, small signal and large-signal behaviour are accurately described by the model.