University of Stuttgart
Institute of Robust Power Semiconductor Systems

Thomas Ufschlag
Thomas.ufschlag@ilh.uni-stuttgart.de

15.08.2024

Research/ Master Thesis

ILH RF Group

System Simulations of Analog Pre-Distortion Concepts for 300 GHz Applications

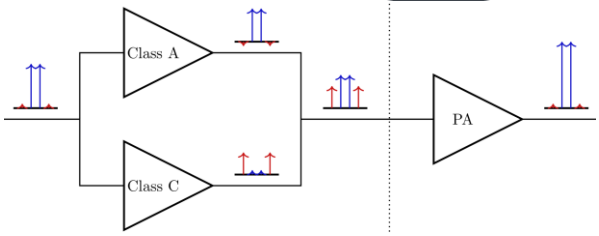
Our research group develops analog frontends for THz wireless communication systems operating in H-band (220-325 GHz).

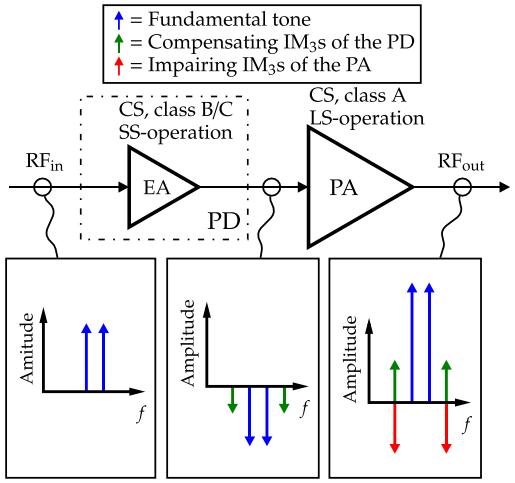
In the scope of the SOLITONIC project, an analog pre-distortion operating at a center frequency of 300 GHz is developed. Pre-distortion circuits are pre-connected to a power amplifier to compensate for its non-linearity. Several topologies based on class C amplifiers are considered, as shown on the right side.

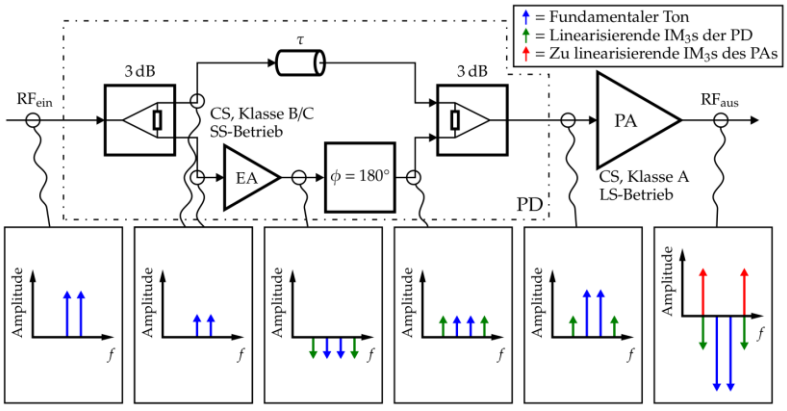
The goal of this thesis is to build a parametrized test bench in Keysights Advanced Design System to compare the concepts. You will use available ideal block components. The focus of the thesis should be also on modeling the ideal class C amplifier.

You will use the state-of-the-art 35 nm InGaAs HEMT technology from the Fraunhofer Institute of Applied Solid-State Physics, which has cutting-edge high frequency and low noise performance and achieves cutoff frequencies (f_max) of well beyond 1 THz.

The workload will be adjusted according to which kind of thesis you execute.







Three analog pre-distortion concepts, subject to investigation. All concepts try to enhance the PAs linearity by injecting compensating signal components.

SOLITONIC

Fraunhofer IAF