

FPGA based FDDAC Transmitter Prototyping

Background

In the Chair of High Frequency Electronics, a new transmitter type is implemented. This transmitter utilizes parallelization in form of an analog inverse Fourier transformation within the RF-DAC stage. Therefore, several RF-DACs are implemented operating at different frequencies. A special digital signal processing block is providing to the 16 different RF-DACs the required baseband data. The complex transmitter system can be implemented by using discrete components. The baseband processing and the programming of those discrete components shall be done by a FPGA assisted test setup.

Tasks

The thesis scope will be adjusted whether it becomes a master or bachelor thesis. The first task is to fully understand the new transmitter architecture. The FPGA assisted prototype will consist of several sub-PCBs containing PLLs, DACs, IQ modulator phase shifters etc.

- A first sub-PCB is already implemented. This shall be characterised and if needed an updated and produced multiple times.
- The Xilinx Virtex-7 based setup connecting the sub-PCBs to the FPGA should be established.
- Further tasks is based on implementing the baseband signal processing in the FPGA and testing the performance of the transmitter prototype under certain conditions.



[1] <https://www.xilinx.com/>

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