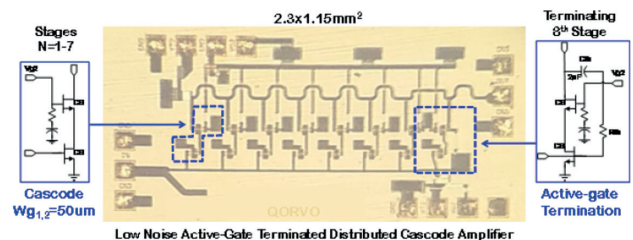


## Master's thesis proposal

# Analysis and design of distributed amplifiers with active gate termination

Fraunhofer IAF is one of the world's leading research institutions in the field of III-V semiconductors and synthetic diamond developing technologies for use in communication, energy, mobility, industry and medicine. In our microelectronics department we are offering the following master's thesis:

Distributed amplifiers are used to cover wide bandwidths, e.g., for measurement applications. In the conventional topology, the termination resistors ( $Z_0$ ) contribute to the overall noise figure of the circuit. It has been shown that if the gate termination is replaced with an active circuit, the noise figure can be improved. The goal of the thesis is to understand how the active gate termination circuit works, and what its trade-offs and limitations are.



### Tasks to complete:

- Literature survey and mathematical analysis of the gate termination circuit, derivation of its inherent trade-offs and limitations.
- Design of a low-noise distributed amplifier employing the active gate termination concept and verifying its capabilities and limitations (target: low frequencies up to mm-wave).
- Optional: characterization of existing circuits and test structures to aid in the design process.
- Electromagnetic simulation and layout.

### What we offer:

A thesis at Fraunhofer IAF allows you to apply the knowledge you have acquired during your studies to specific research projects. We offer modern laboratory equipment, supervision by experienced scientists and a variety of opportunities for further education.

### Send your application to:

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