

Radar Frontend with Microstrip Antennas and Delay-Line in the E-Band Range

Objective of the Master's Thesis:

The goal of this master's thesis is to develop a radar frontend that uses microstrip antennas for transmitting and receiving radar radiation in the 77 GHz range. Additionally, a delay-line with discrete components is to be integrated to delay the received radar radiation and re-emit it. Essentially, this will function as an echo generator.

Sections of the Master's Thesis:

- Design and Simulation of the Microstrip Antennas:
 - Conceptualization and optimization of microstrip antennas for operation in the 77 GHz range.
 - Conducting simulations to characterize the antenna performance and properties.

- Development of the Delay-Line with Discrete Components:
 - Design and implementation of a delay-line for the temporal delay of the received radar radiation.
 - Optimization of the delay-line in terms of signal quality and minimal loss.

- Integration and Construction of the Radar Frontend:
 - Physical assembly and connection of the microstrip antennas with the delay-line and other required components.
 - Implementation of the entire circuit on a high-frequency printed circuit board.
 - Validation of results in comparison to theoretical expectations and identification of optimization potentials.

Organizational matters

- Requirements: Education in Electrical Engineering, Information and Computer Engineering or Physics
- Duration: 6 months
- Workplace: EMS, Inffeldgasse 33/I, 8010 Graz
- Payment: possible
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