

High Gain, Wideband Dielectric Resonator Antenna and Package for Device-to-Device Communication in 6G mobile networks

Future 6G mobile networks will be ultra-dense, heterogenous networks connecting all things with high speed data transmission. mmWave 6G communications bring several challenges to the RF designer, such as high free space path loss and broadband transitions. New solutions for device-to-device communication are in high demand.

Several wideband dielectric resonator antenna designs can be found in the literature. However, typically there exists a trade-off between gain and bandwidth, and therefore these antennas have low to medium gain. The use of high-resistivity silicon to produce higher gain DRAs is promising, but have not been extensively investigated for mmWave DRAs.

This work will involve multiple hardware aspects typically required in designing and assembling a mmWave antenna and package. The first goal would be to design and manufacture a wideband dielectric resonator with high resistivity silicon, using micromachining. The work will also include designing a broadband chip-to-package transition using either flip-chip or bondwires. Thereafter the total package, with the use of 3D-printed support structures, should be assembled. The suitability of the package and antenna for 6G communication will be evaluated.

Prerequisites

Knowledge of antennas and experience with CST Microwave Studio required.

The thesis can be written in English or German.

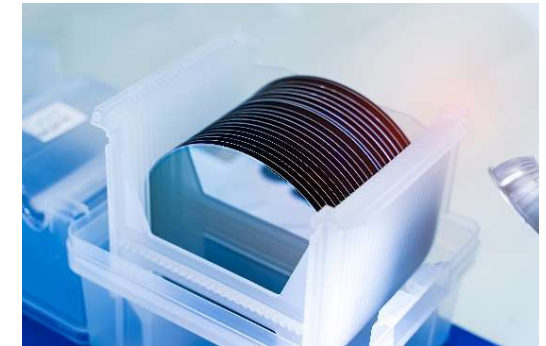
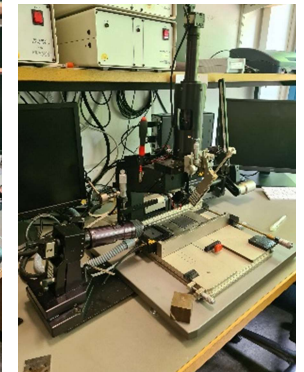
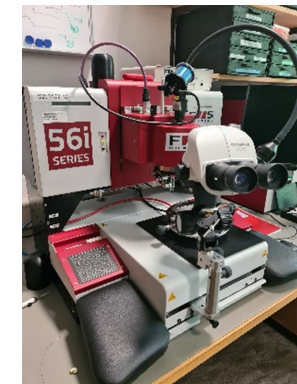


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Ansprechpartner

Elizabeth Bekker

Building 30.10, Room 1.29

E-Mail: elizabeth.bekker@kit.edu

Telefon: 0721-608 46253

Dr.-Ing. Akanksha Bhutani

Building 30.10, Room 1.28

E-Mail: akanksha.bhutani@kit.edu

Telefon: 0721-608 43304