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Abteilung Elektrotechnik und Informationstechnik
Institut für Nachrichten- und Kommunikationstechnik

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Diplomarbeit / Masterarbeit

Aufgabe der Abschlussarbeit im
ISE Bachelor/Masterstudiengang

für: Herrn Saeid **Ghassemi**
gestellt von: Prof. Dr.-Ing. K. Solbach
Fakultät für Ingenieurwissenschaften – Hochfrequenztechnik

Thema: Development of a 24 GHz fully integrated VCO

Thesis Task:

More and more applications in the consumer and automotive market require designs of RF integrated circuits near the millimetre wave length spectrum. Especially the 24 GHz ISM band is very attractive for a wide range of applications e.g. radar and short range data transmission. Another trend is that more and more integrated circuits will be designed in SiGe technology rather than using GaAs. This is driven by the need of low operational voltage, less current consumption and lower production costs in future products. In that frequency range transmission line effects have to be considered during circuit design and layout.

The work of this thesis comprises the design of a fully integrated VCO in the 24 GHz frequency range by using a sophisticated SiGe semiconductor technology, investigation and selection of suitable circuit topologies, simulation of key performance parameters and physical layout work

The output power is supposed to be 6 dBm and the phase noise less than -70 dBc/ Hz at 100 kHz. The control voltage is between 0.4 V and 2.8 V with a tuning range from 23.9 GHz to 24.1 GHz. Cadence design software will be used to simulate and design the circuit. Finally the characterisation of the VCO has to be planned and a test board has to be designed in close cooperation with the application and test engineers

On completion of the thesis, a presentation will be held in the Hochfrequenztechnik department.