

Aufgabe der Abschlussarbeit im
ISE Masterstudiengang

für: Herrn Manar Bakro

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Thema: **Doubler/Amplifier Building Block for CW-Radar**

Background:

For the measurement of the velocity of traffic, e.g. cars and pedestrians, a radar system is used which radiates a continuous transmit signal (CW-radar). A moving object reflects the signal and shifts the frequency due to the Doppler-effect, hence the name "Doppler"-Radar. The frequency shift can be detected by the radar receiver and the velocity of the object can be evaluated from the frequency which is proportional to the velocity.

Thesis task:

The thesis task is to build one part of a radar system which operates at 24 GHz, namely the building block that takes-in a 12 GHz oscillator signal to double the frequency to 24 GHz and amplify it as a driver signal for the transmit amplifier.
In particular the thesis task is

1. Investigate available circuit options for a doubler circuit, passive and active.
2. Select one option and design and build a microstrip circuit using simulation in ADS; the design is to be aimed at an input power level of 0 dBm at 12 GHz; other specifications t.b.d..
3. Depending on the chosen design option for the doubler, if required, design and build an amplifier circuit as driver to boost the input signal (12 GHz) to an appropriate level for the doubler circuit.
4. Design and build a driver amplifier for the 24 GHz output signal.
5. Combine the individual circuits into one building block and evaluate the output power level and spectrum.

After completion of thesis work a public presentation of results is to be given at the department.