

**Master 2015**

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**Design and Realization of Broadband Low-Noise Microwave Amplifier.**

***ABSTRACT - Masterthesis***

Modern microwave systems are applied in numerous areas such as communication systems, radar systems, medical systems and remote sensing. However, the vast majority usage belongs to communication systems. The idea about providing voice, video and data via wireless connection makes the role of microwave engineering even more important.

Design of the low noise amplifiers (LNA) commonly based on the S-parameters of the microwave transistor amplifier. The main parameters of the LNA are gain, noise, stability, DC bias and bandwidth. Such designs mostly start from picking a suitable type of microwave transistor depending on which exact function or feature will have the microwave LNA.

The principal idea of design of a broadband LNA is to acquire constant gain over the chosen operating frequency range. It could be achieved by using negative feedback and proper compensation matching network. Both can be done by using lumped elements. These parameters are strongly frequency dependent. Moreover, there is required to use CAD calculations because of its complexity. Furthermore, if there is a concern of more gain the single stage broadband amplifiers can be simply multi staged.

The main goal of this thesis is to design and realize the broadband LNA which can operate over the frequencies from 1 GHz to 4 GHz with determined special specifications. The design of the amplifier will be made by using the software "AWR Design Environment" and the real broadband LNA will be realized in the microwave laboratory of HS Bremen.