

Master 2013

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Design and Realisation of a Multistage Low-Noise Microwave Amplifier in C-Band.

ABSTRACT - Masterthesis

Modern communications systems frequently operate in the new 5.8 GHz ISM-Band. One of the most important devices in such systems is the low noise amplifier on the receiver side. The amplifier must operate over the complete Band with high gain and low noise figure.

The objective of this thesis is to design a multistage low-noise amplifier using a bipolar transistor of the Infineon BFP family with a minimum gain of 25dB. The amplifier shall operate over the complete ISM band at C-band namely 5.725 GHz to 5.875 GHz centered at 5.800 GHz.

Parameter	Symbol	value	unit	Limit	Remarks
Frequency Range	F=	5.725-5.875	GHz	min	
Transducer Gain	Gt=	25	dB	min	
Gain Balance	Gt=	± 1	dB	max	Within frequency range
Noise Figure	F=	1.5	dB	max	At room temperature
Input match	S_{11} =	-10	dB	max	
Output match	S_{22} =	-12	dB	max	

Stability: Unconditional stable.

The circuit must be realized on R04003 substrate using microstrip technology. The size of the circuit shall not exceed 2.5 inch by 2.5 inch and must match the design guide of the microwave board design of the Aulis Page.

DC power of 5V is provided (the lab DC can be adjusted) Design of a stabilized single stage low noise amplifier Then design of a multistage amplifier as described above. Manufacturing and testing.