

BFP720

LNA using BFP720 for WLAN 5-6GHz Application

Technical Report TR154

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Previous Revision: No Revision

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1 Overview

Device : BFP720

Application: LNA using BFP720 for WLAN 5-6GHz Application

PCB Marking: BFP640-052402 Rev C

2 Summary of Measurement Results

Table 1 Summary of Measurement Results

Parameter	Symbol	Value			Unit	Note/Test Condition
DC Voltage	Vcc	3			V	
Icc	mA	10.1			mA	
Frequency Range	Freq	5	5.5	6	GHz	
Gain	G	14.9	14.4	13.8	dB	0.45dB loss of SMA connectors and PCB Subtracted
Noise Figure	NF	1.2	1.2	1.15	dB	0.25dB loss of SMA connectors and PCB included
Input Return Loss	RLin	10.2	10.3	10.1	dB	
Output Return Loss	RLout	12.1	12.5	10.1	dB	
Reverse Isolation	IRev	25.7	24.7	24.0	dB	Power@Port2: -30dBm
Input P1dB	IP1dB	-8.1			dBm	Measured@5.5GHz
Output P1dB	OP1dB	5.3			dBm	
Input IP3	IIP3	6.5			dBm	Power@Input: -30dBm @5.5/5.501GHz $\Delta f = 1\text{MHz}$
Output IP3	OIP3	20.9			dBm	
Stability	k	>1.2			--	Stability measured from 100MHz to 10GHz

3 Description

This Technical report provides the results of LNA using the BFP720 from Infineon Technologies for WLAN 5-6GHz applications.

This Low Noise Amplifier brings a gain of about 14dB between the frequency Range of 5-6GHz with a noise figure of 1.15dB (SMA connectors and PCB losses of 0.25dB included). Furthermore, this device provides an unconditional stability from 100MHz up to 10GHz. The circuit is matched with an input return loss of better than 10.0dB. The LNA brings a matching of 10.1dB at the output.

At the frequency of 5.5GHz, using two tones spacing by 1MHz, the output third-order intercept point reaches 20.9dBm. Besides we obtain an input -1dB compression point of -8.1dBm.

4 Schematics

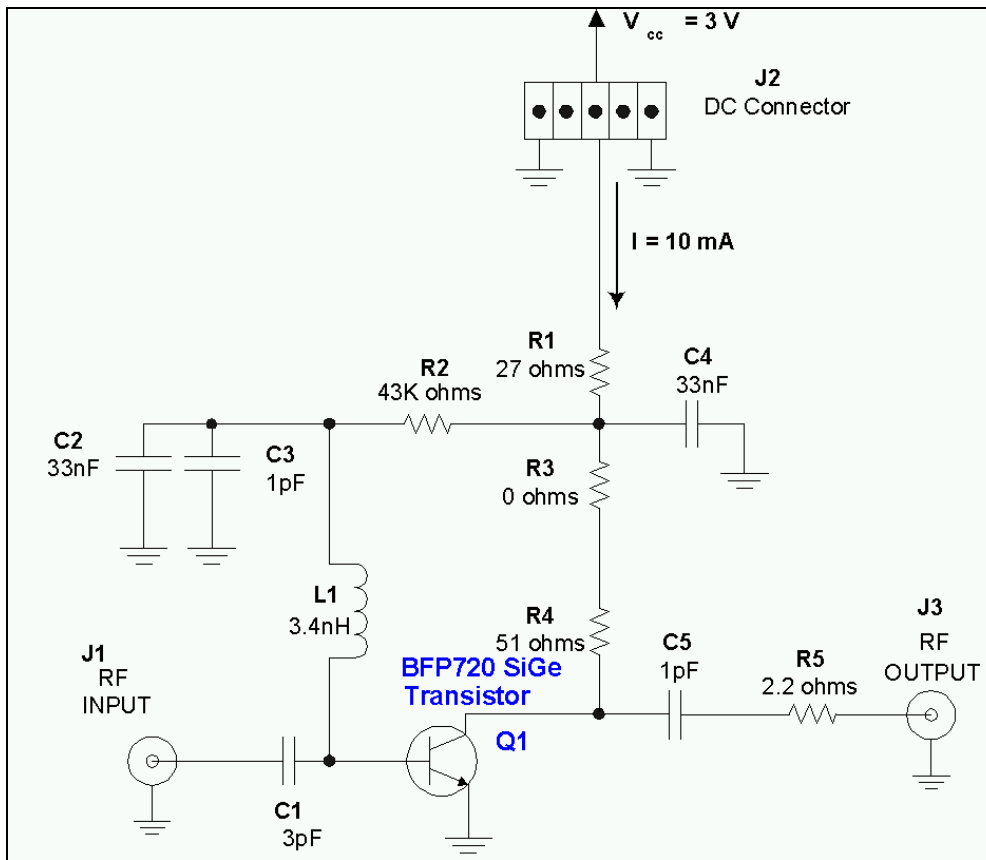


Figure 4-1: Schematics of the BFP720 for 5-6GHz WLAN Application

Table 2 : Bill of Materials

Symbol	Value	Unit	Size	Supplier	Comment
L1	3.4	nH	0402	Murata LQW15A	Input matching/DC feed to base
C1	3	pF	0402	Various	Input matching/DC block
C2	33	nF	0402	Various	HF to ground
C3	1	pF	0402	Various	Input matching
C4	33	nF	0402	Various	HF to ground
C5	1	pF	0402	Various	Output matching/DC block
R1	27	Ω	0402	Various	Biasing Voltage Setting
R2	43	k Ω	0402	Various	Base current setting
R3	0	Ω	0402	Various	Not used, jumper
R4	51	Ω	0402	Various	Output matching/stability
R5	2.2	Ω	0402	Various	Output matching/stability
Q1			SOT343	Infineon	SiGe MMIC LNA BFP720

5 Measured Graphs

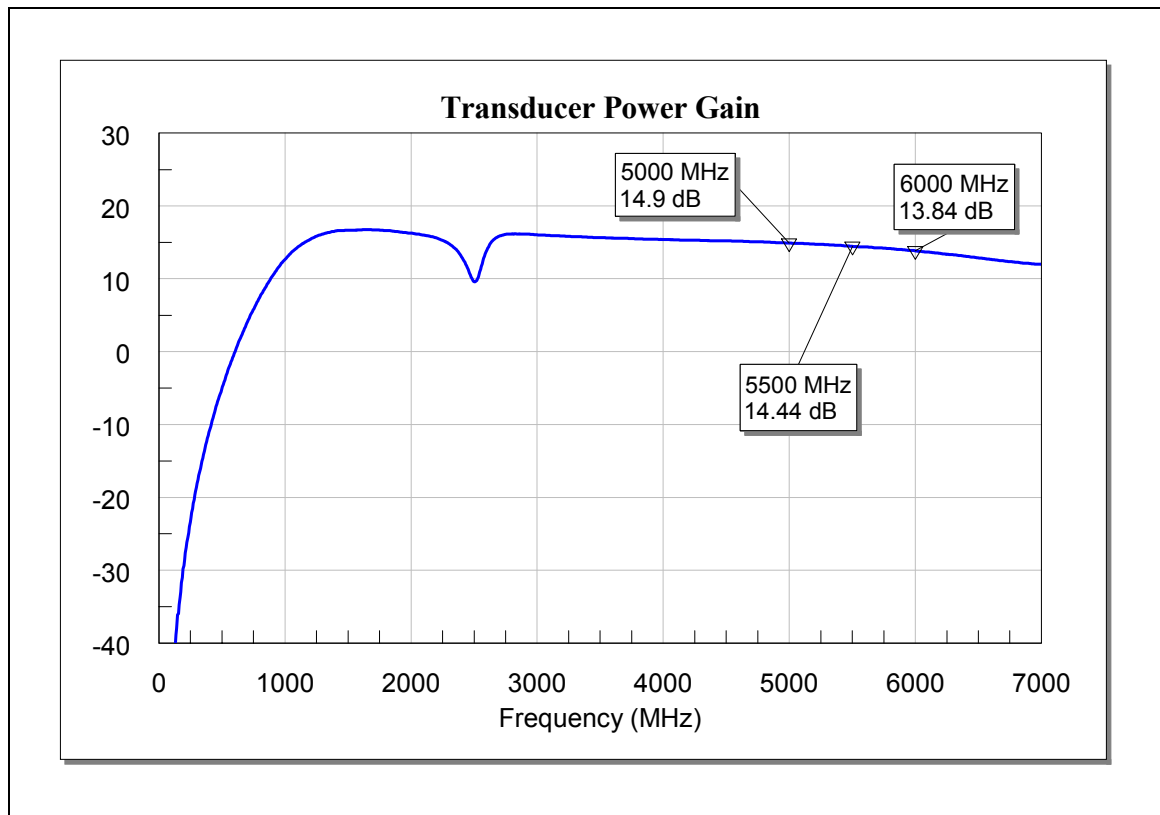


Figure 5-1: Power Gain of the BFP720 for WLAN 5-6GHz

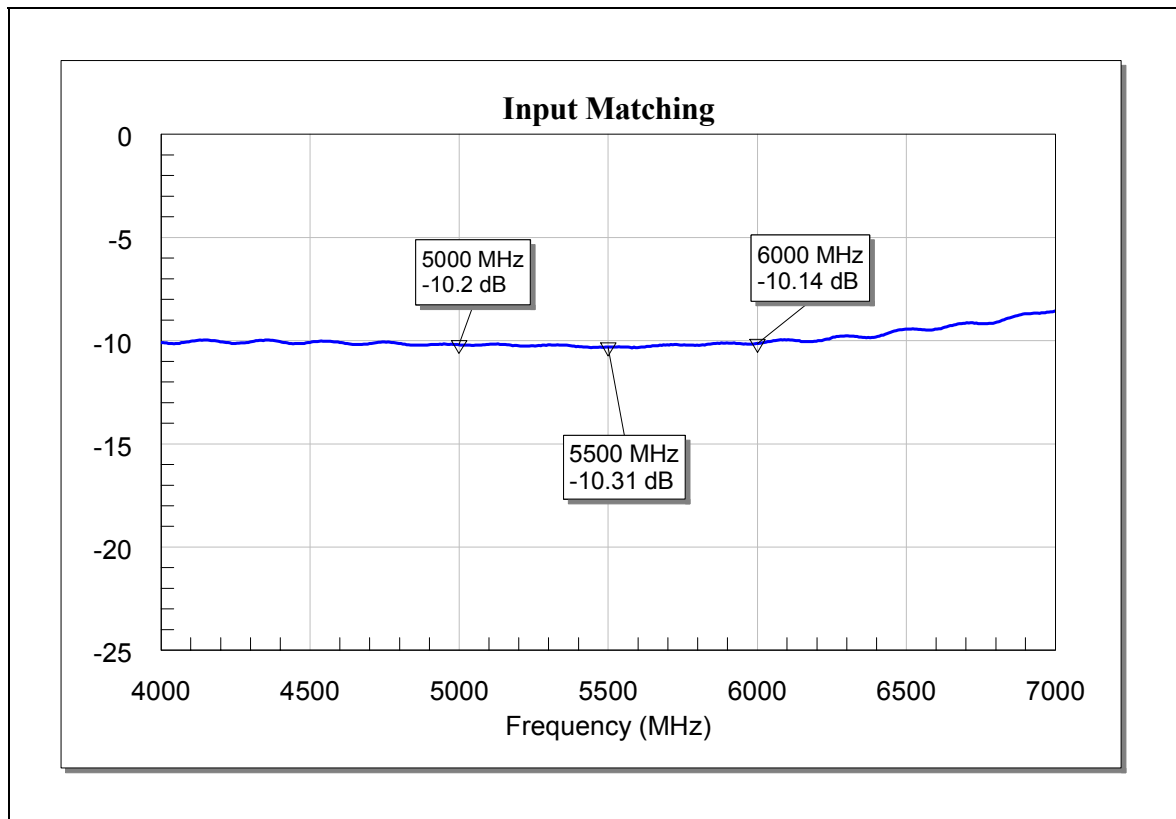


Figure 5-2: Input Matching of the BFP720 for WLAN 5-6GHz

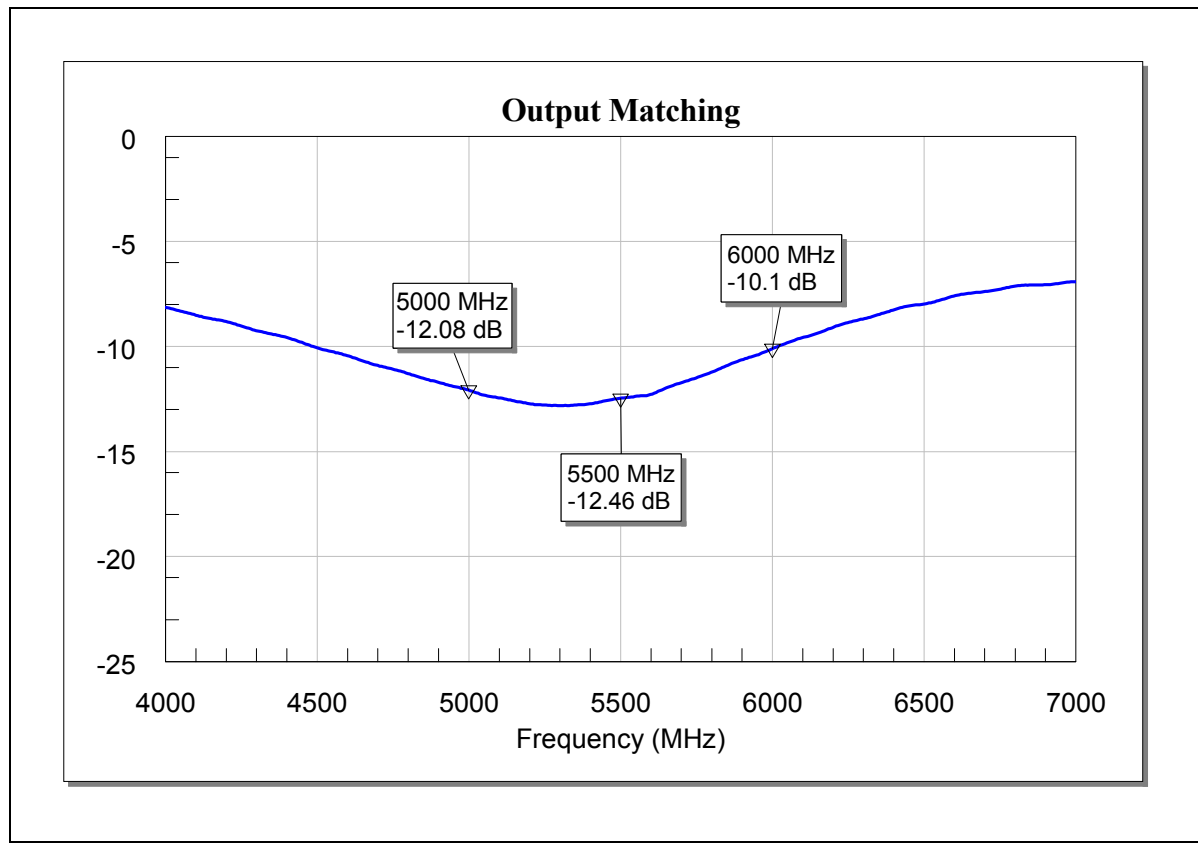


Figure 5-3: Output Matching of the BFP720 for WLAN 5-6GHz

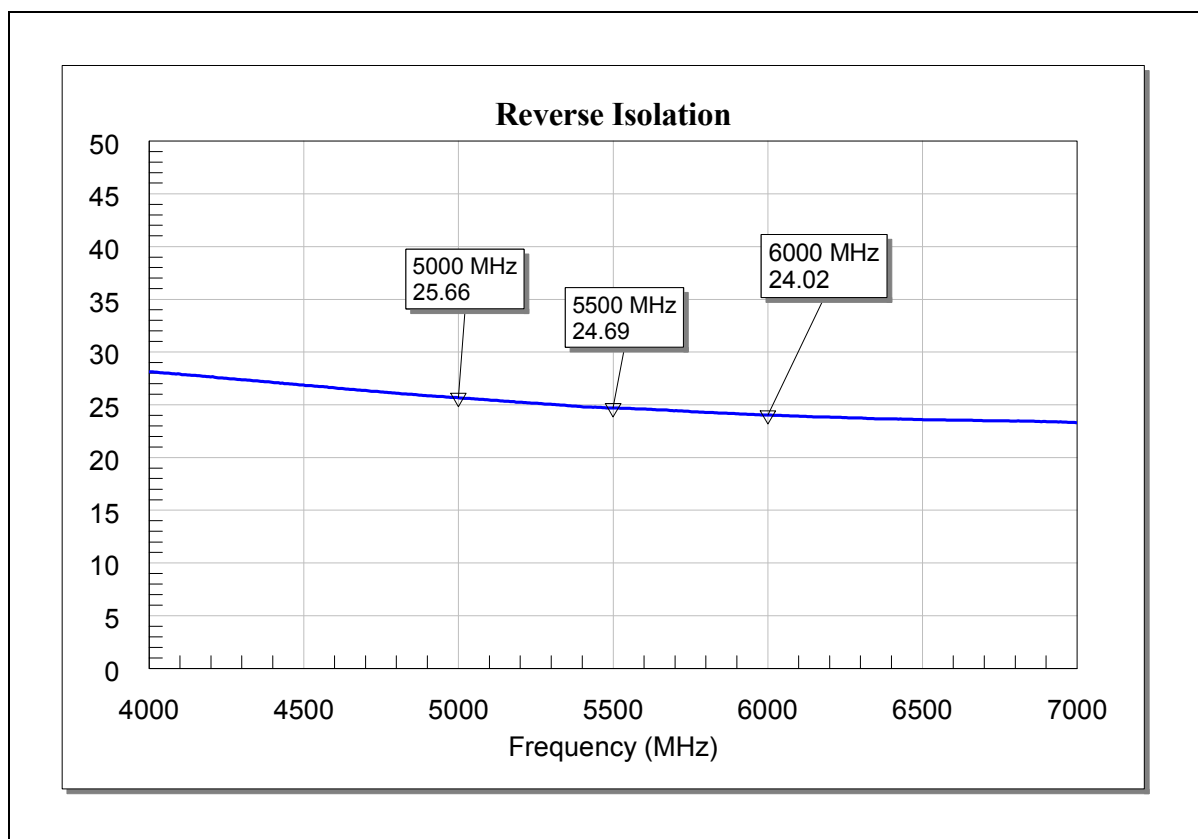


Figure 5-4: Reverse Isolation of the BFP720 for WLAN 5-6GHz

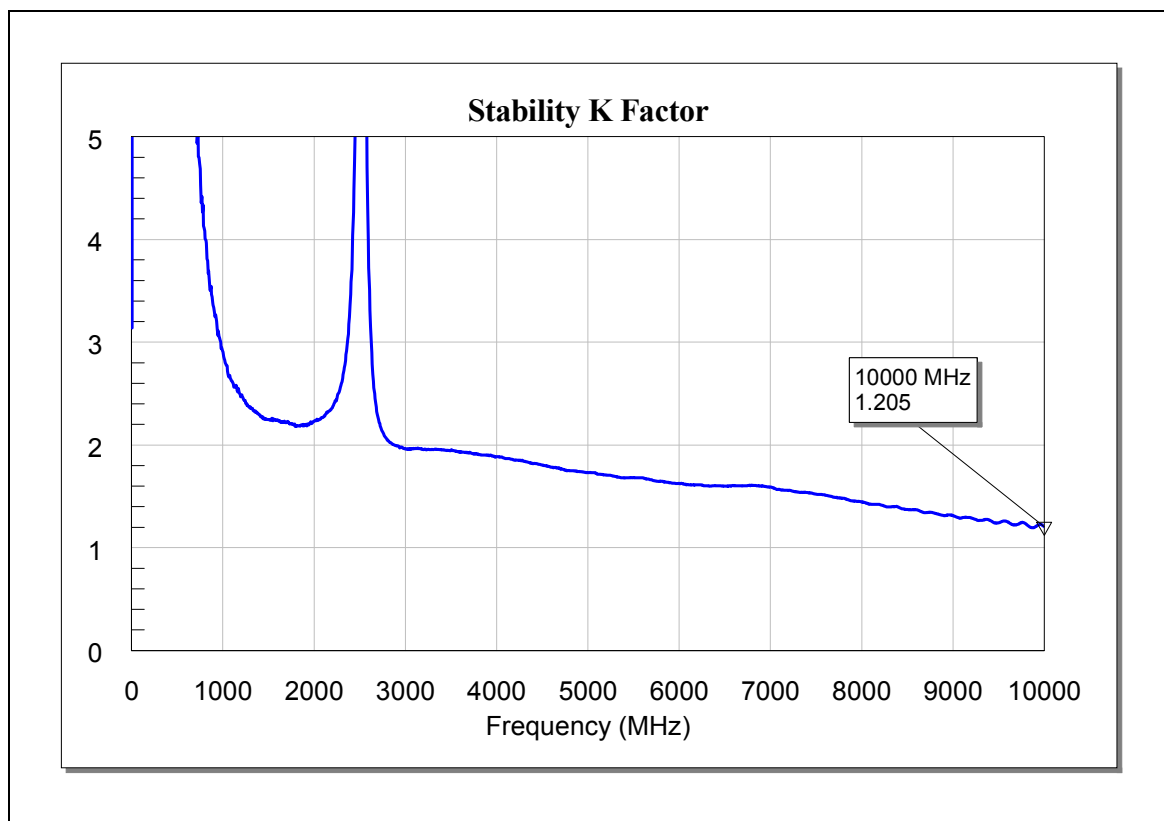


Figure 5-5: Stability K-Factor of the BFP720 for WLAN 5-6GHz

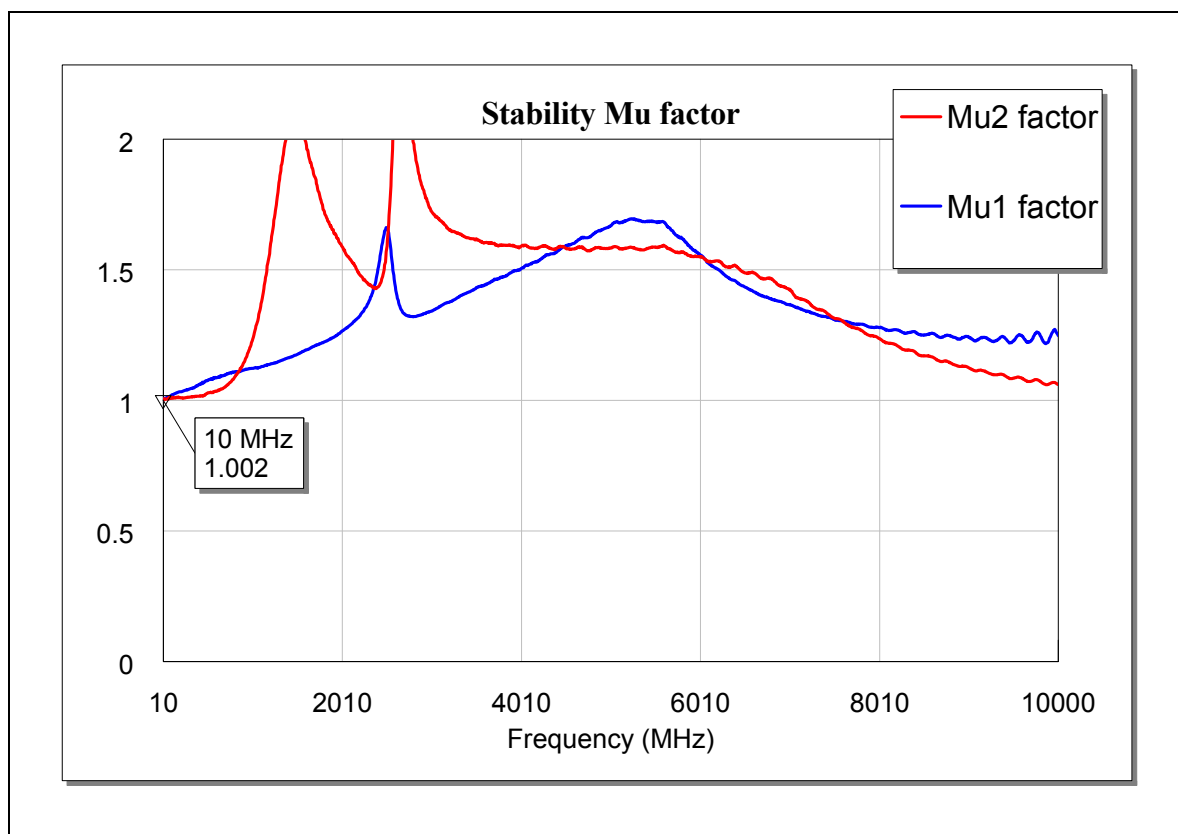


Figure 5-6: Stability Mu-Factor of the BFP720 for WLAN 5-6GHz

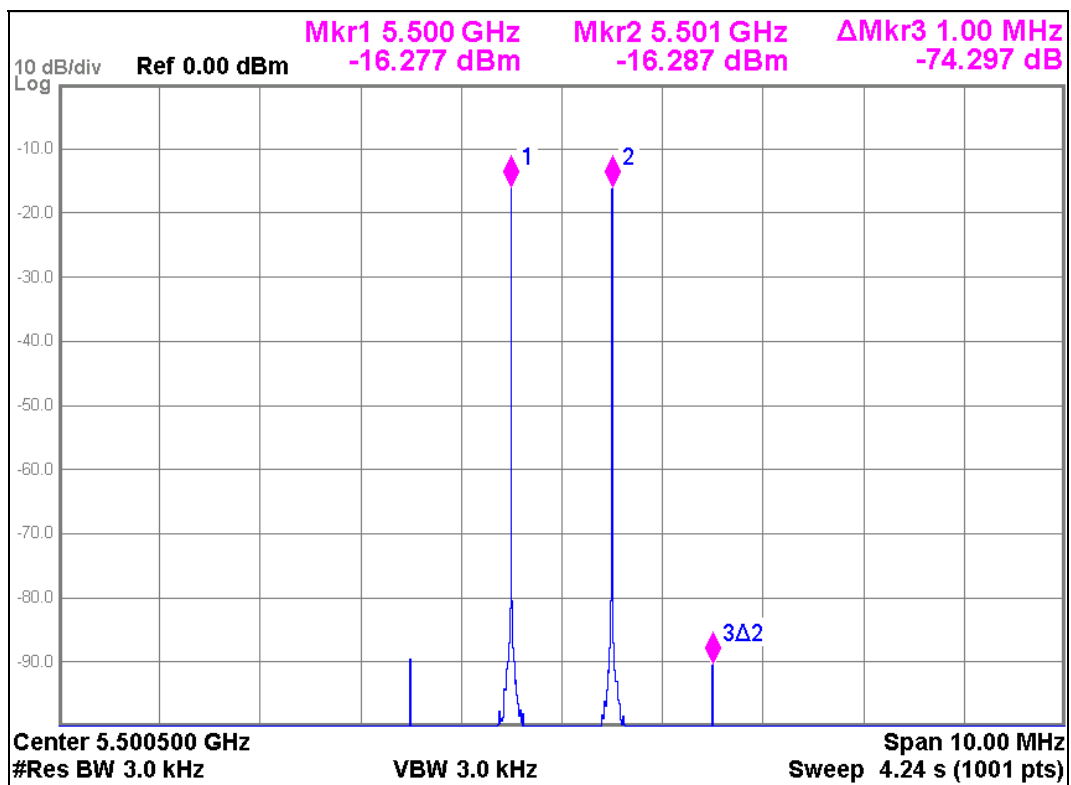


Figure 5-7: 3rd Order Intercept Point of the BFP720 for WLAN 5-6GHz

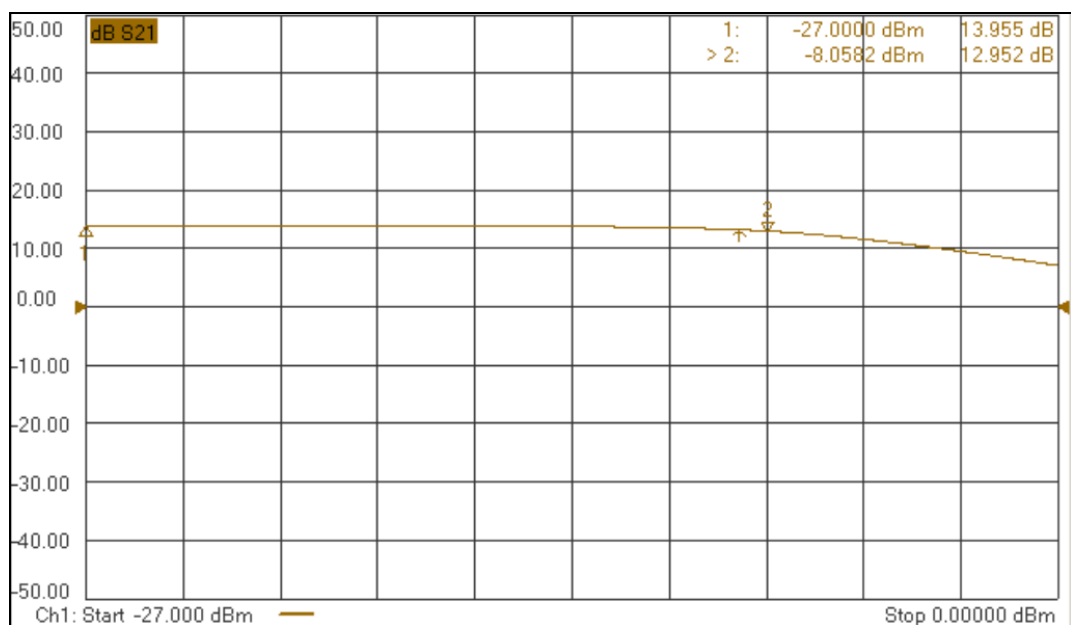


Figure 5-8: Input Power at 1dB compression point of the BFP720 for WLAN 5-6GHz

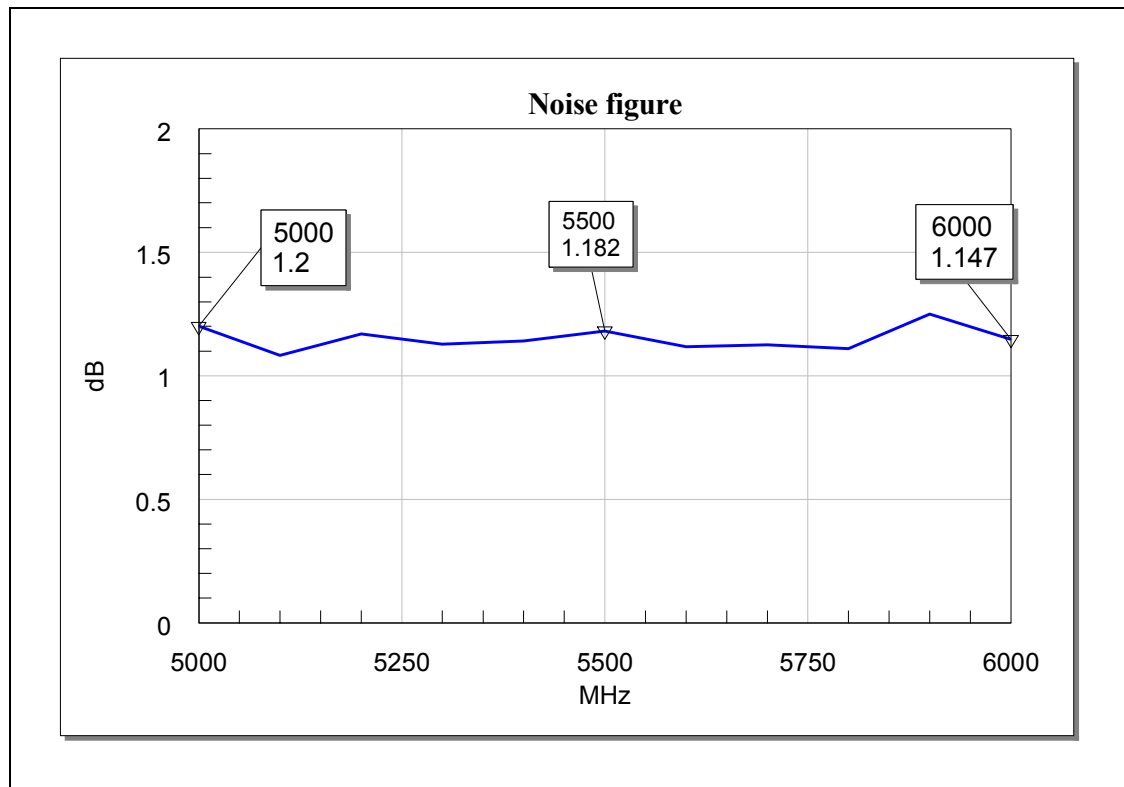


Figure 5-9: Noise Figure of the BFP720 for WLAN 5-6GHz

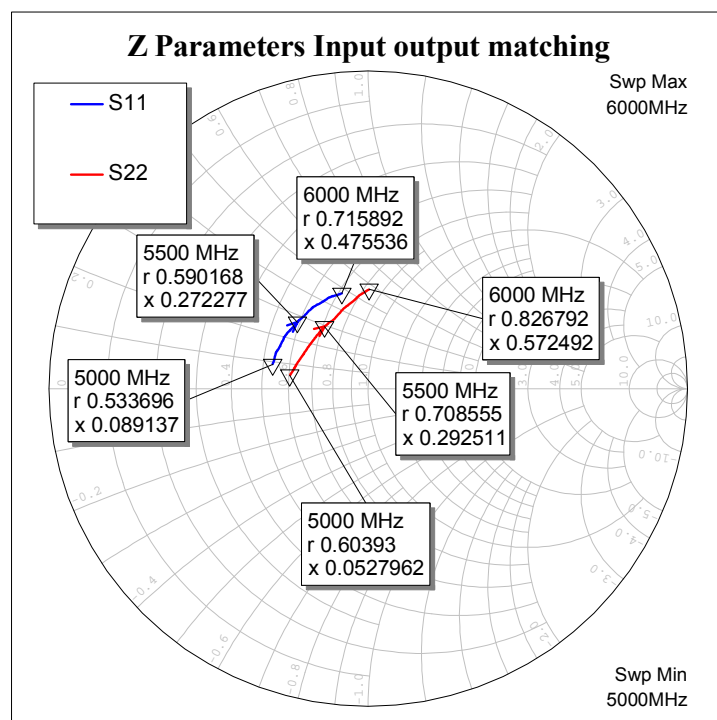


Figure 5-10: Input and Output Impedance of the BFP720 for WLAN 5-6GHz

6 Evaluation Board and layout Information

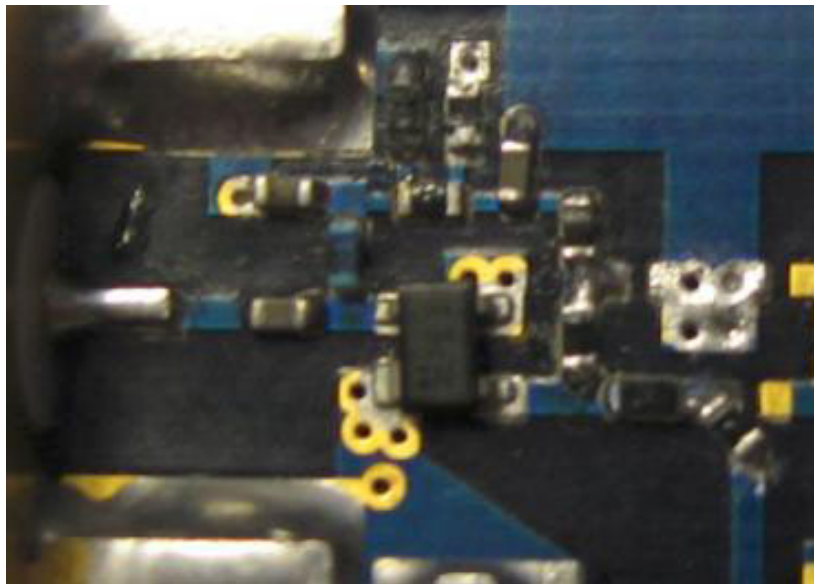


Figure 6-1: PCB picture of the BFP720 for WLAN 5-6GHz LNA

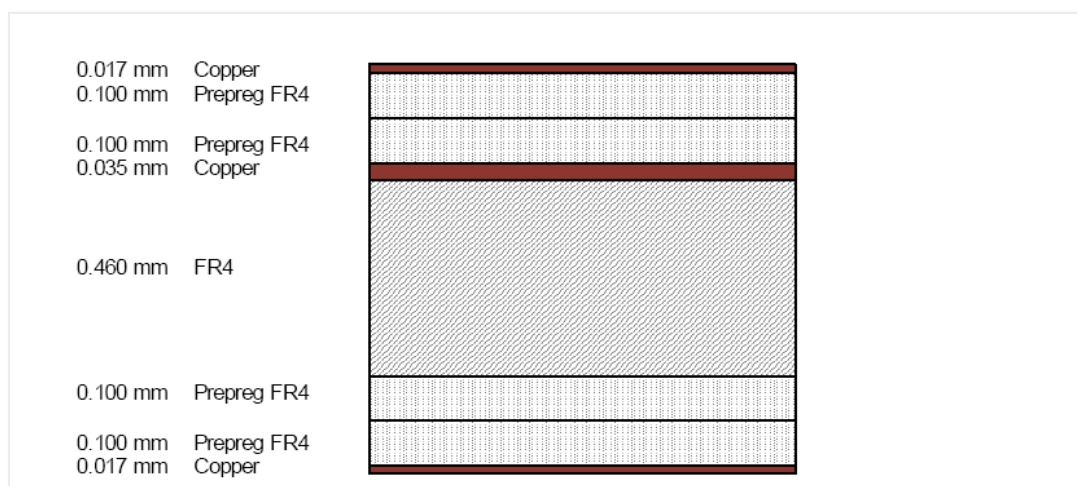


Figure 6-2: Layout Information

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