

Technical Report <TR129>

Device: BFP740F

Application: LNA for WLAN 5150-5825 MHz

Application

Revision: Rev. 1.0

Date: 2009-Apr-20

RF and Protection Devices



Never stop thinking

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1. Overview

Infineon Device: BFP740F

Application: LNA for WLAN 5150-5825 MHz Application

PCB Marking: 740-081009 Rev A

2. Summary of Measurement Results

Table 2-1: Summary of Measurement Results

Parameter	Symbol	Value	Unit	Note/Test Condition
Frequency Range	Freq	5150...5825	MHz	
DC Voltage	Vcc	3	V	
DC Current	Icc	10.6	mA	
Gain	G	14.2	dB	Power @ port1: -30dBm
Noise Figure	NF	1.2	dB	Including SMA connectors and PCB losses of 0.1dB
Input Return Loss	RLin	-10.1	dB	
Output Return Loss	RLout	-12.3	dB	
Reverse Isolation	IRev	21.9	dB	Power @ port2: -10dBm
Input P1dB	IP1dB	-6.3	dBm	Measured @ f=5500MHz
Output P1dB	OP1dB	7.4	dBm	
Input IP3	IIP3	5.3	dBm	Power @ Input -30dBm Δf 1=MHz@5500MHz
Output IP3	OIP3	19.5	dBm	
Stability	k	>1.2	--	Stability measured from 100MHz to 10GHz

3. Description:

This report presents the measurement results of the Low Noise Amplifier using the transistor BFP740F from Infineon Technologies for the 5-6GHz WLAN application.

The LNA brings a gain of 14.2dB on the frequency band from 5150MHz to 5825MHz with a noise figure of 1.2dB (including the SMA connectors and PCB losses of 0.1dB).

Furthermore, this device provides an unconditionally stability from 200MHz to 10GHz. The circuit is matched at input and output, and presents an input return loss of 10dB, and an output return loss of 12.3dB.

At the frequency of 5.5GHz, using two tones spaced from 1MHz, the output third intercept point reaches 19.5dBm. Besides, we obtain a -1dB compression point of -6.3dBm at the input

Schematic:

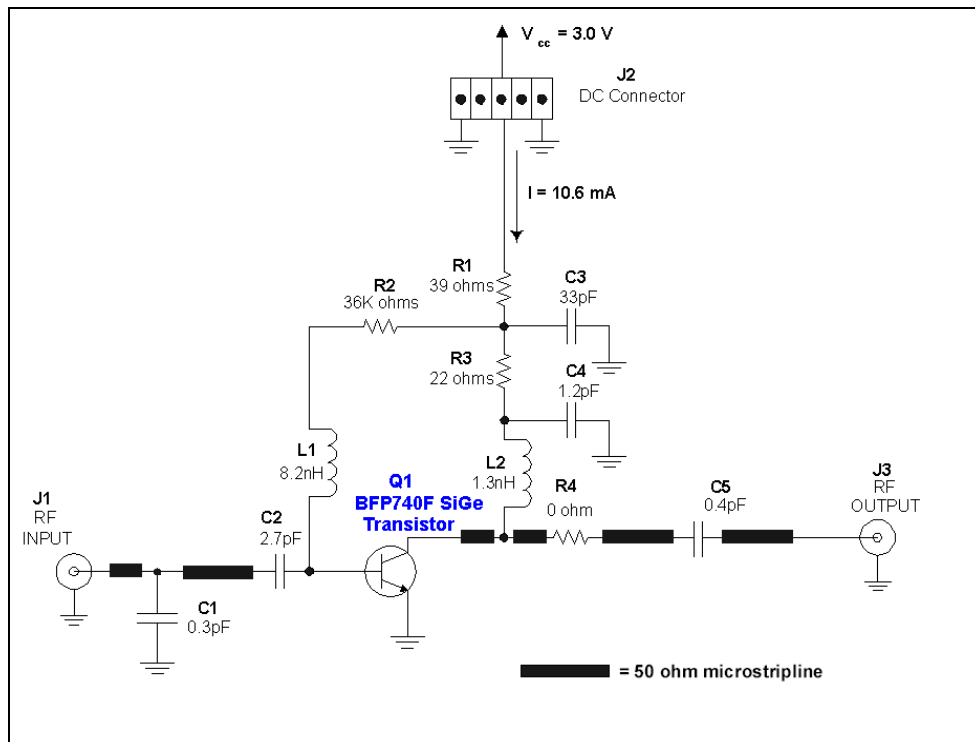


Figure 3-1: Schematics of the Circuit for 5150-5825MHz WLAN Application.

Table 3-1: Bill of Materials

Symbol	Value	Unit	Size	Manufacturer	Comment
C1	0.3	pF	0402	AVX 04023J0R3ABS	Input Matching
C2	2.7	pF	0402	Murata GJM155 series	Input Matching
C3	33	pF	0402	Murata GJM155 series	RF Bypass
C4	1.2	pF	0402	Murata GJM155 series	Output Matching
C5	0.4	pF	0402	AVX 04023J0R3ABS	Output Matching
L1	8.2	nH	0402	Murata LQP10A	Input Matching/DC Feed
L2	1.3	nH	0402	Murata LQP10A	Output Matching/ DC Feed to collector
R1	39	Ω	0402	various	
R2	36	k Ω	0402	various	Base current biasing
R3	22	Ω	0402	various	Collector current biasing
R4	0	Ω	0402	various	Jumper
Q1			TSFP-4	Infineon Technologies	BFP740F: NPN Silicon Germanium RF Transistor

4. Measured Graphs

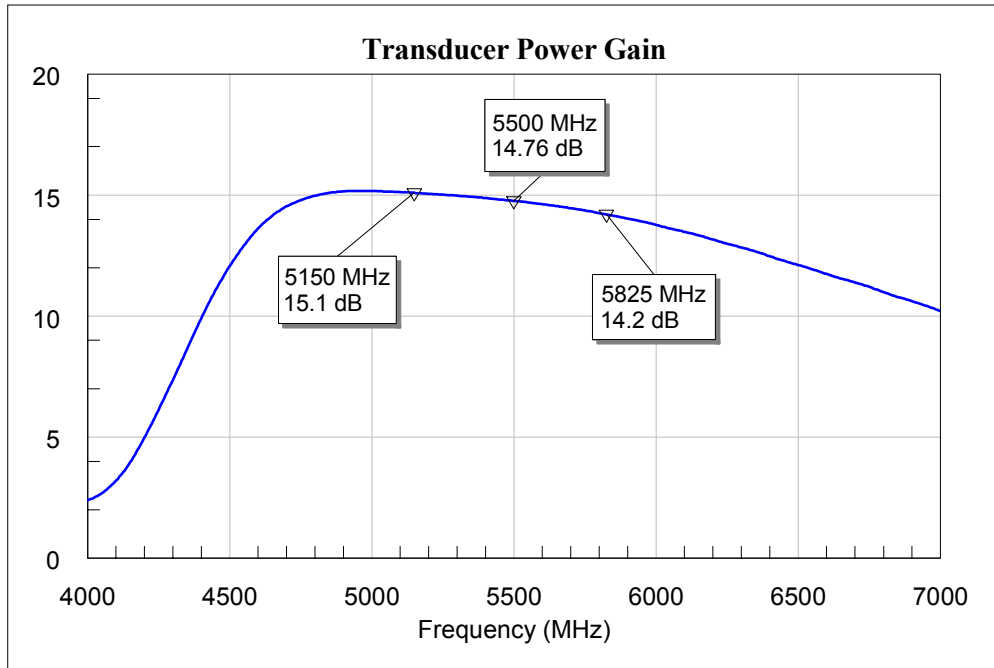


Figure 4-1: Power Gain of the BFP740F for WLAN 5150-5825 MHz Application.

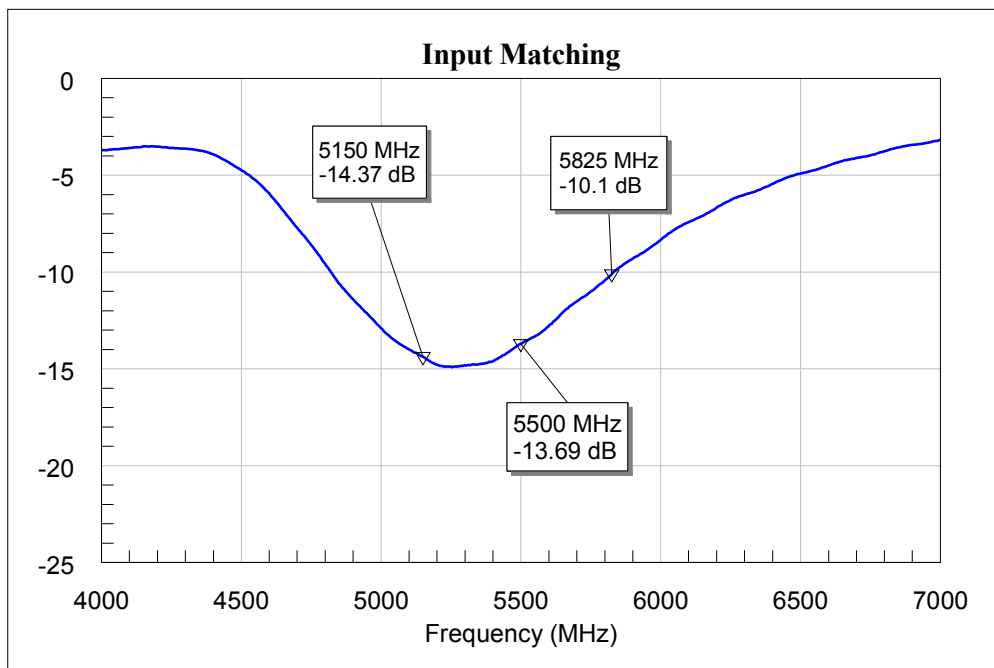


Figure 4-2: Input Matching of the BFP740F for WLAN 5150-5825 MHz Application.

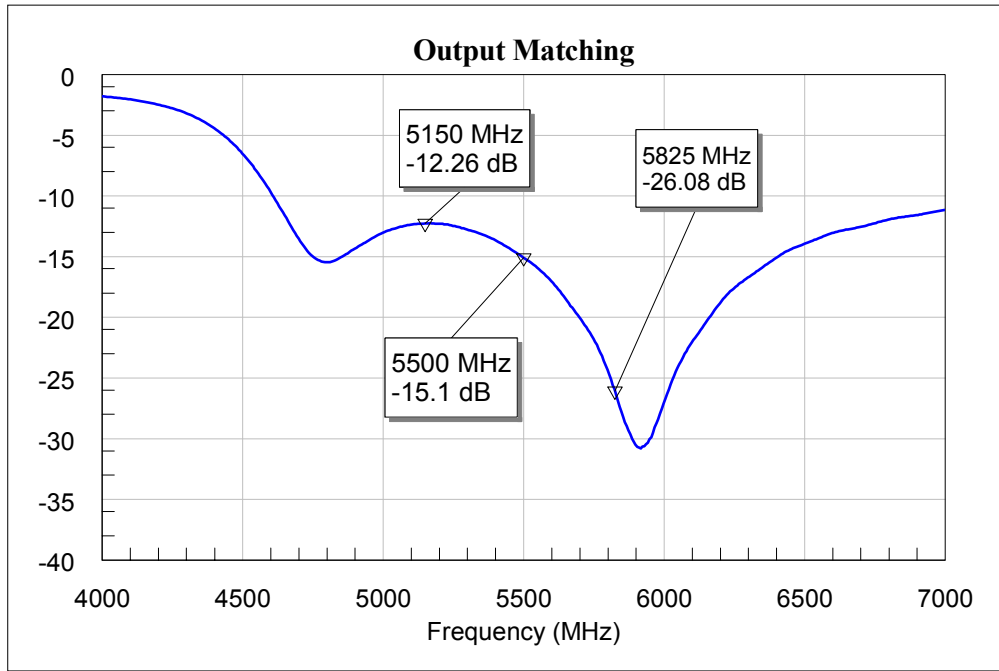


Figure 4-3: Output Matching of the BFP740F for WLAN 5150-5825 MHz Application.

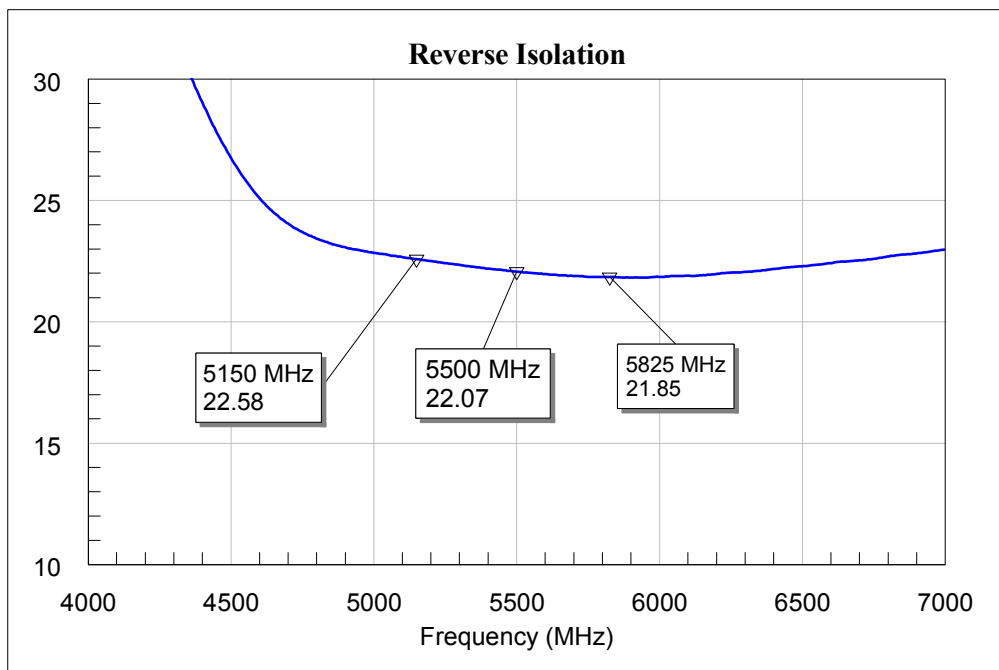


Figure 4-4: Reverse Isolation of the BFP740F for WLAN 5150-5825 MHz Application

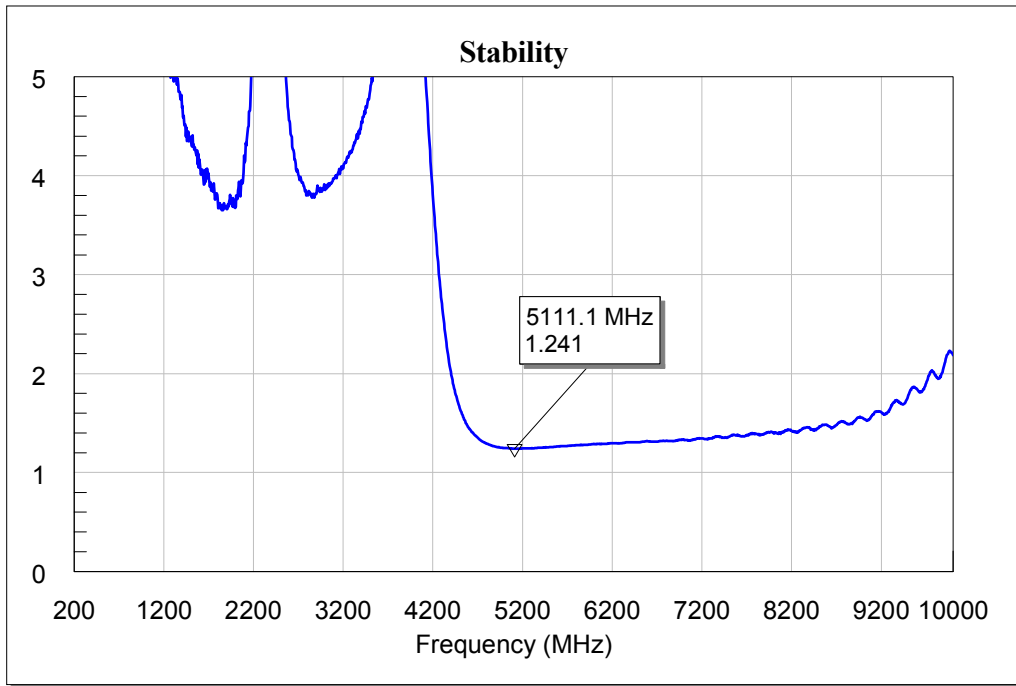


Figure 4-5: Stability of the BFP740F for WLAN 5150-5825 MHz Application

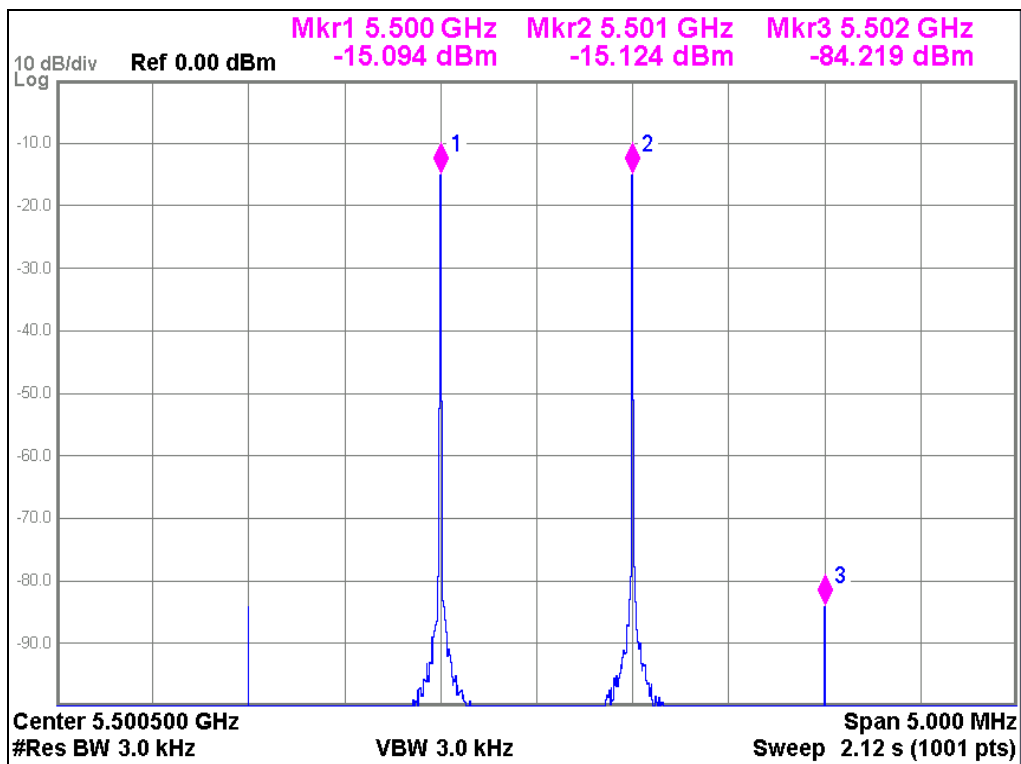


Figure 4-6: OIP3 of the BFP740F for WLAN 5150-5825 MHz Application

5. Evaluation Board and Layout Information

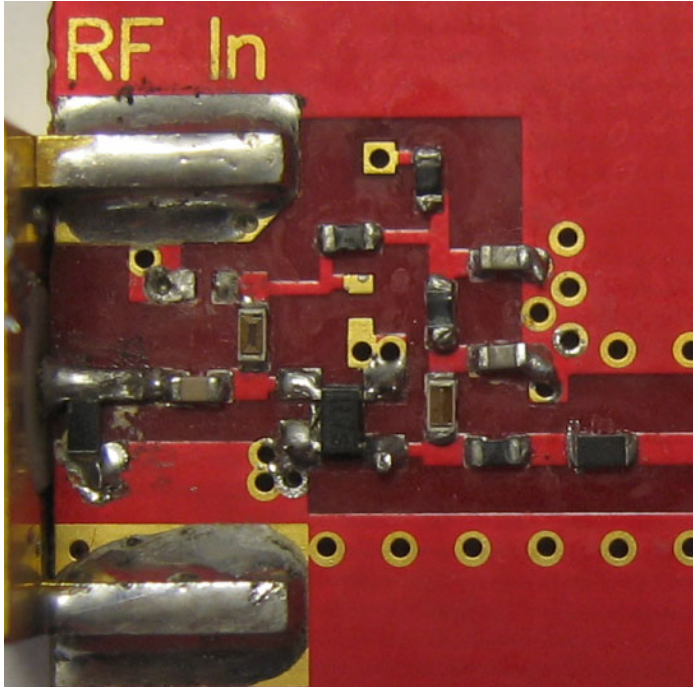


Figure 5-1: PCB Picture of the BFP740F for 5150-5825 Mhz WLAN Application

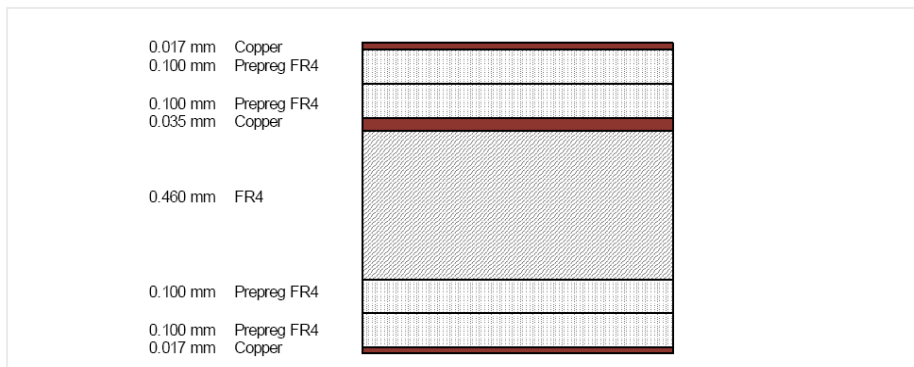


Figure 5-2: Layout Information