

Technical Report <TR127>

Device: BGB707L7ESD

**Application: 50Ω-Matched LNA for FM Application
(80-110MHz)**

Revision: Rev. 1.0

Date: 2009-Mar-31

RF and Protection Devices



Never stop thinking

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Information

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Warnings

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1. Overview

Infineon Device: BGB707L7ESD

Application: 50 ohms matched LNA for FM 80-110MHz Applications

PCB Marking: BGB7-Family TSLP-7-1 V1.0

2. Summary of Measurement Results

Table 2-1: Summary of Measurement Results

Parameter	Symbol	Value	Unit	Note/Test Condition
Frequency Range	Freq	80-110	MHz	
DC Voltage	Vcc	3.0	V	
DC Current	Icc	6	mA	
Gain	G	16.5	dB	Power @ port1= -30 dBm
Noise Figure	NF	1.5	dB	Including SMA connectors and PCB losses of 0.1dB
Input Return Loss	RLin	10.1	dB	
Output Return Loss	RLout	15.8	dB	
Reverse Isolation	IRev	26.4	dB	Power @ port2 = -10 dBm
Input P1dB	IP1dB	-12.2	dBm	
Output P1dB	OP1dB	3.3	dBm	
Input IP3	IIP3	0.7	dBm	Power @ Input = -30 dBm Measured @ f1=100MHz $\Delta f = 1$ MHz
Output IP3	OIP3	17.2	dBm	
Stability	k	>1.2	--	Stability measured up to 10GHz

3. Description:

This report presents the measurement results of the Low Noise Amplifier using the SiGe:C LNA BGB707L7ESD from Infineon Technologies for the 80-110MHz FM application with an input matched to 50 ohms. The LNA brings a gain of 16.5dB on the frequency of 80-110MHz with a noise figure of 1.5 dB (including the SMA connector and PCB losses of 0.1dB).

Furthermore, this device provides an unconditionally stability up to 10GHz. With a current of 6mA, this circuit achieves an output P1dB of +3.3dBm and IP3 of +17.2 dBm(in-band).

4. Schematics:

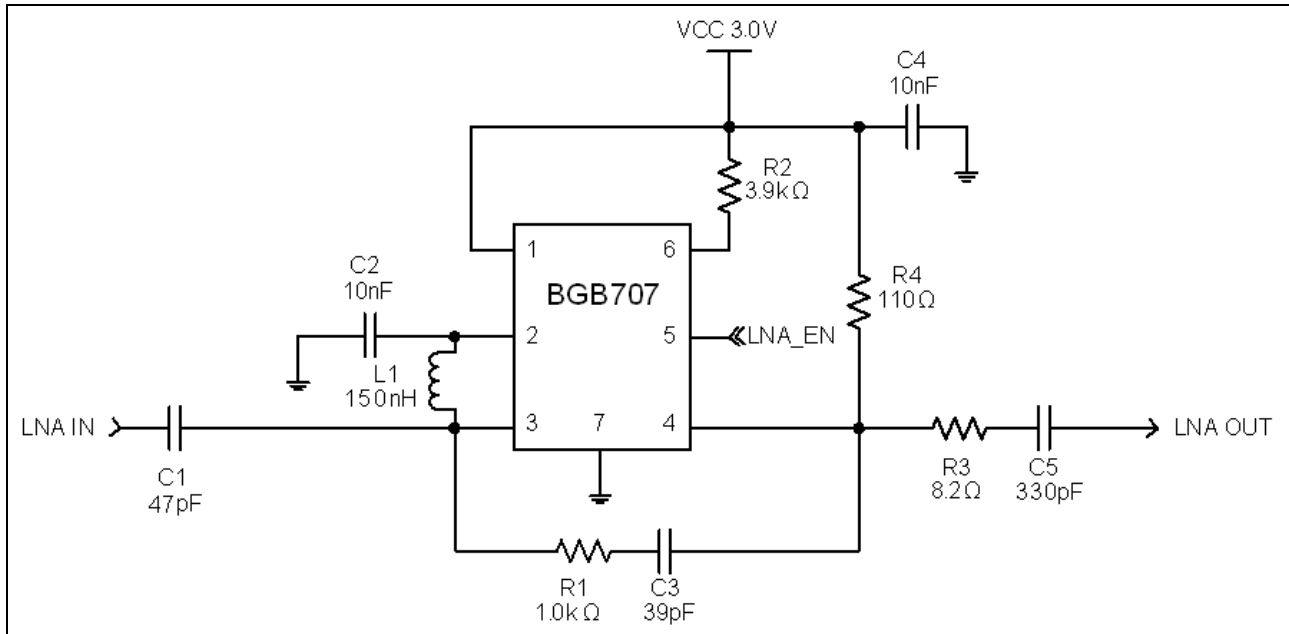


Figure 4-1: Schematic of the BGB707L7ESD for the FM 80-110MHz Applications.

Table 4-1: Bill of Materials

Symbol	Value	Unit	Size	Manufacturer	Comment
C1	47	pF	0402	various	Input Matching/DC Block
C2	10	nF	0402	various	RF Bypass
C3	39	pF	0402	various	Negative Feedback
C4	10	nF	0402	various	RF Bypass
C5	330	pF	0402	various	Output Matching/DC Block
L1	150	nH	0402	Murata LQG15A	Input Matching/Biasing
R1	1.0	kΩ	0402	various	Negative Feedback
R2	3.9	kΩ	0402	various	DC current Regulation
R3	8.2	Ω	0402	various	Stabilisation/Output Matching
R4	110	Ω	0402	various	Collector current Regulation
Q1			TSLP 7-1	Infineon	SiGe MMIC LNA BGB707L7 with integrated ESD protection

5. Measured Graphs

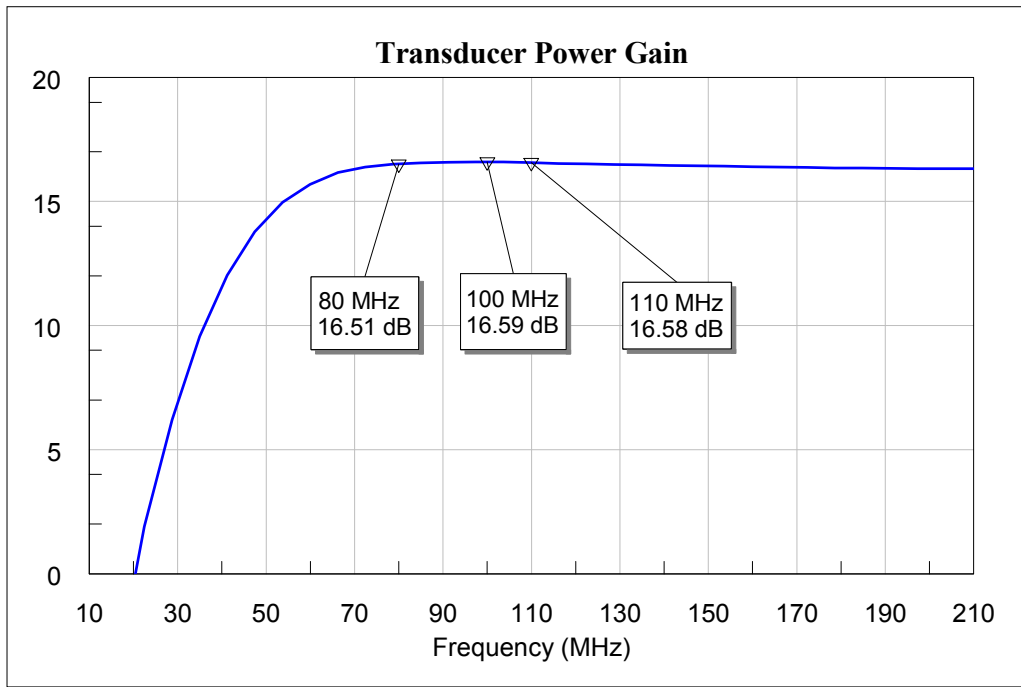


Figure 5-1: Transducer Power Gain of the BGB707L7ESD.

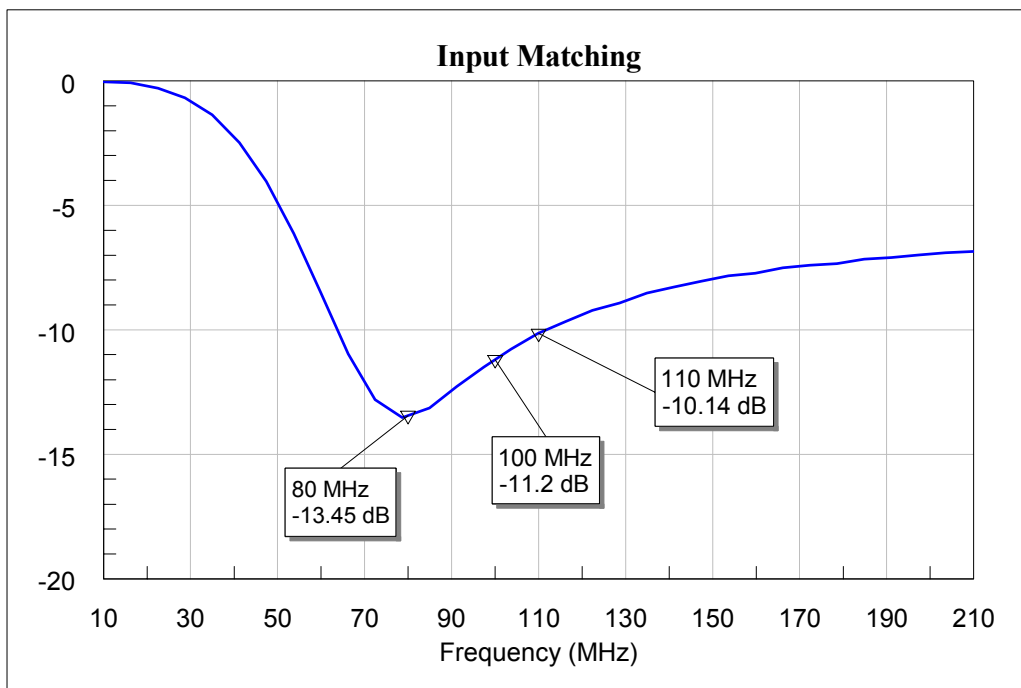


Figure 5-2: Input Matching of the BGB707L7ESD.

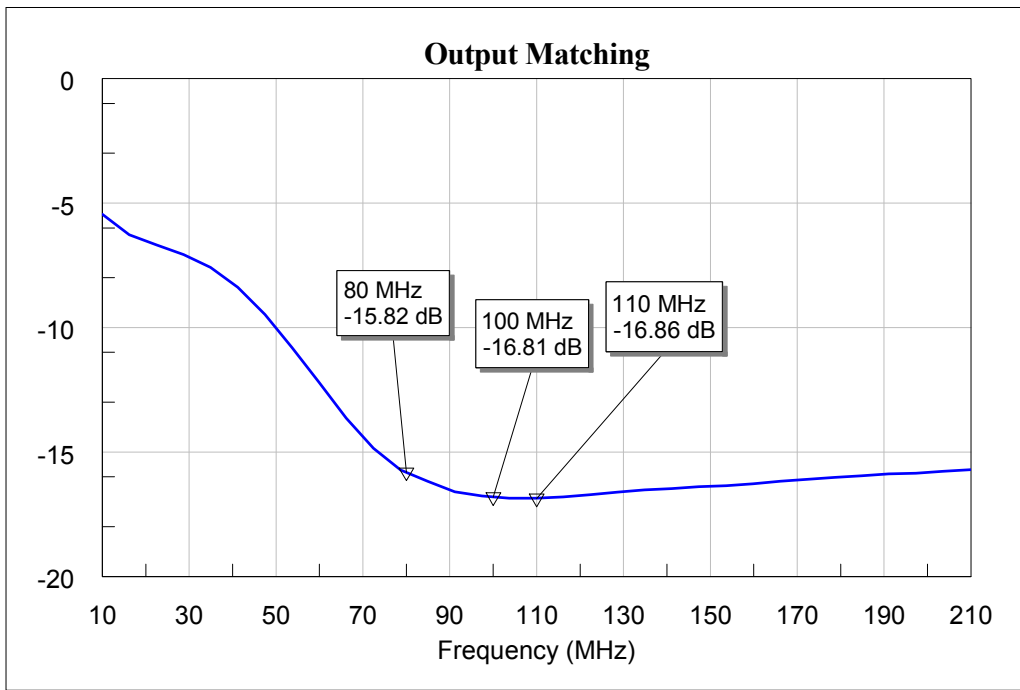


Figure 5-3: Output Matching of the BGB707L7ESD.

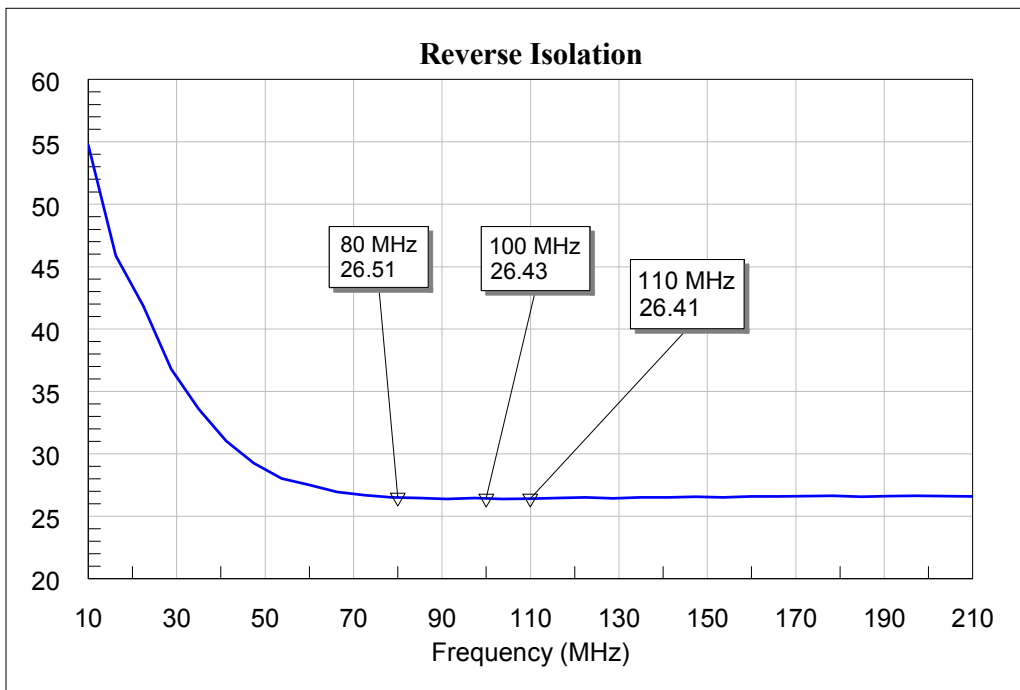


Figure 5-4: Reverse Isolation of the BGB707L7ESD.

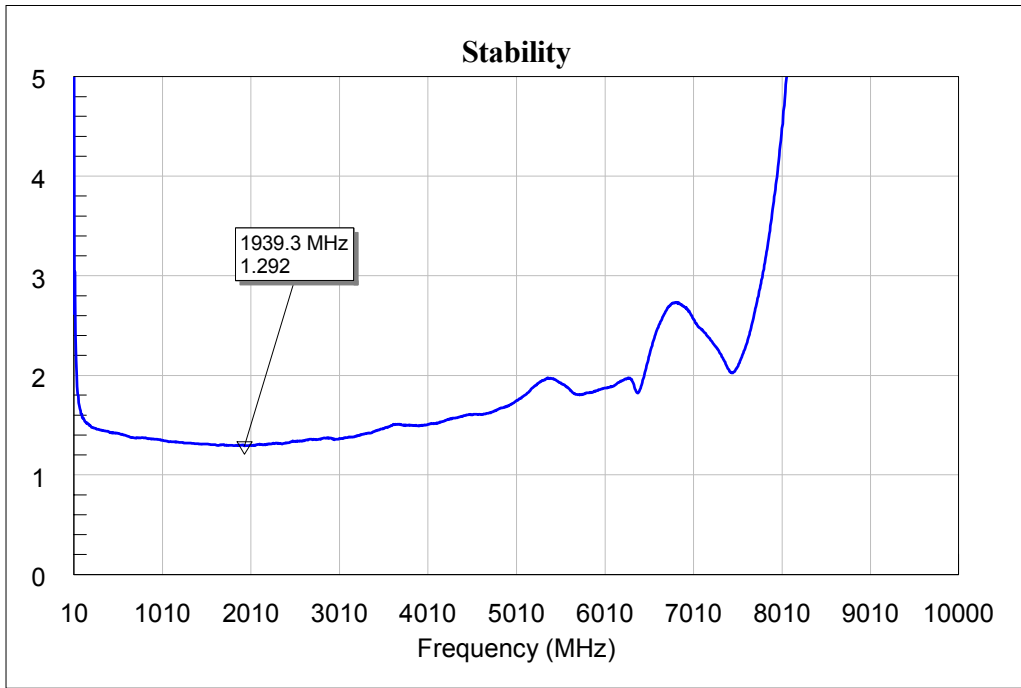


Figure 5-5: Stability of the BGB707L7ESD.

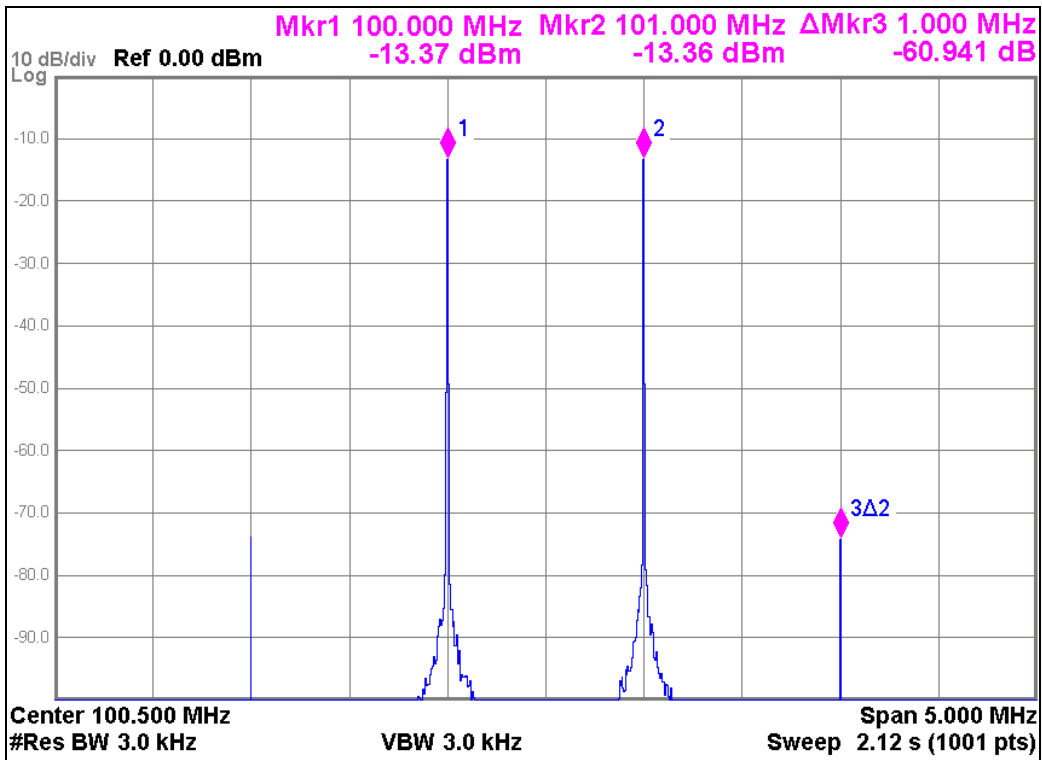


Figure 5-6: OIP3 of the BGB707L7ESD.

6. Evaluation Board and Layout Information

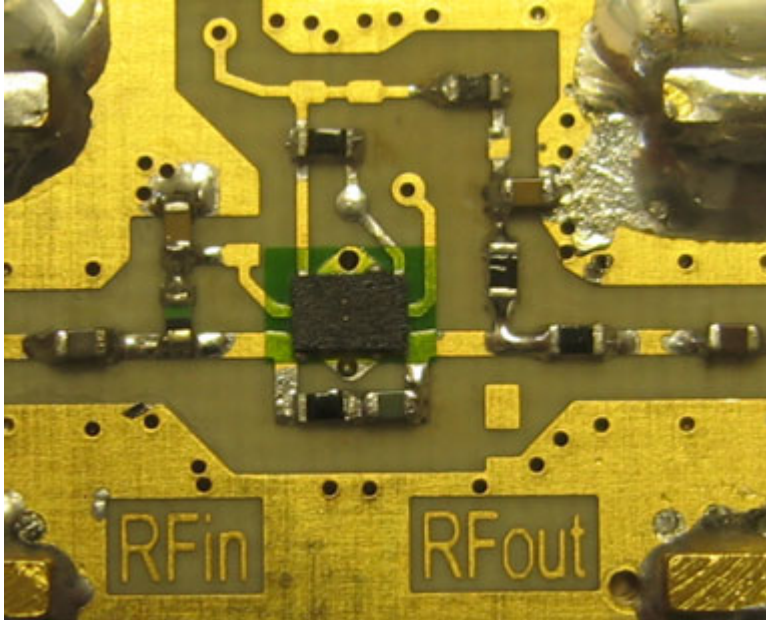


Figure 6-1: PCB Picture of the BGB707L7ESD

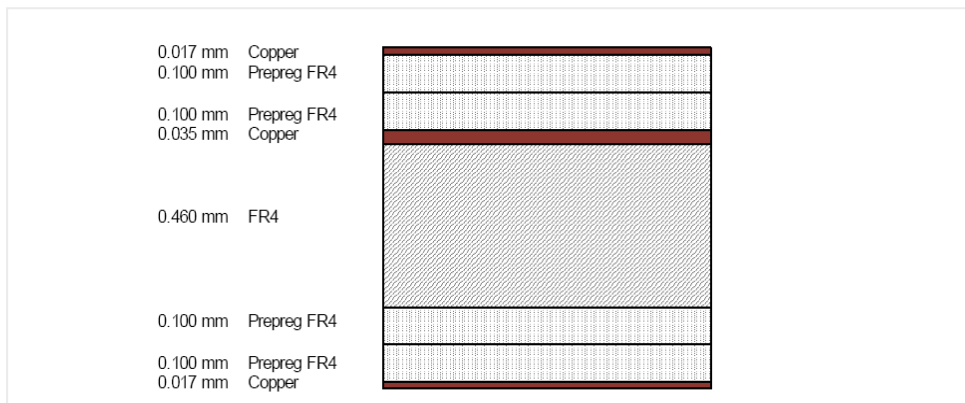


Figure 6-2: Layout Information