

Technical Report <TR130>

Device: BGB741L7ESD

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

Revision: Rev. 1.0

Date: 2009-Apr-23

RF and Protection Devices



Never stop thinking

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1. Overview

Infineon Device: BGB741L7ESD

Application: 50Ω-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	16.1	dB	Power @ port1= -30 dBm
Noise Figure	NF	1.2	dB	Including SMA connectors and PCB losses of 0.1dB
Input Return Loss	RLin	-10.2	dB	
Output Return Loss	RLout	-14.7	dB	
Reverse Isolation	IRev	23.5	dB	Power @ port2 = -10 dBm
Input P1dB	IP1dB	-8.9	dBm	
Output P1dB	OP1dB	6.2	dBm	
Input IP3	IIP3	0.3	dBm	Power @ Input = -30 dBm Measured @ f1=100MHz $\Delta f = 1$ MHz
Output IP3	OIP3	16.4	dBm	
Stability	k	>1.1	--	Stability measured up to 10GHz

3. Description:

This report presents the measurement results of the Low Noise Amplifier using the SiGe:C LNA BGB741L7ESD from Infineon Technologies for the 80-110MHz FM application with an good input and output matching to 50 ohms. The LNA brings a gain of 16.1dB on the frequency of 80-110MHz with a noise figure of 1.2 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 6.3mA, this circuit achieves an output P1dB of +6.2dBm and OIP3 of +16.4 dBm (in-band).

4. Schematics:

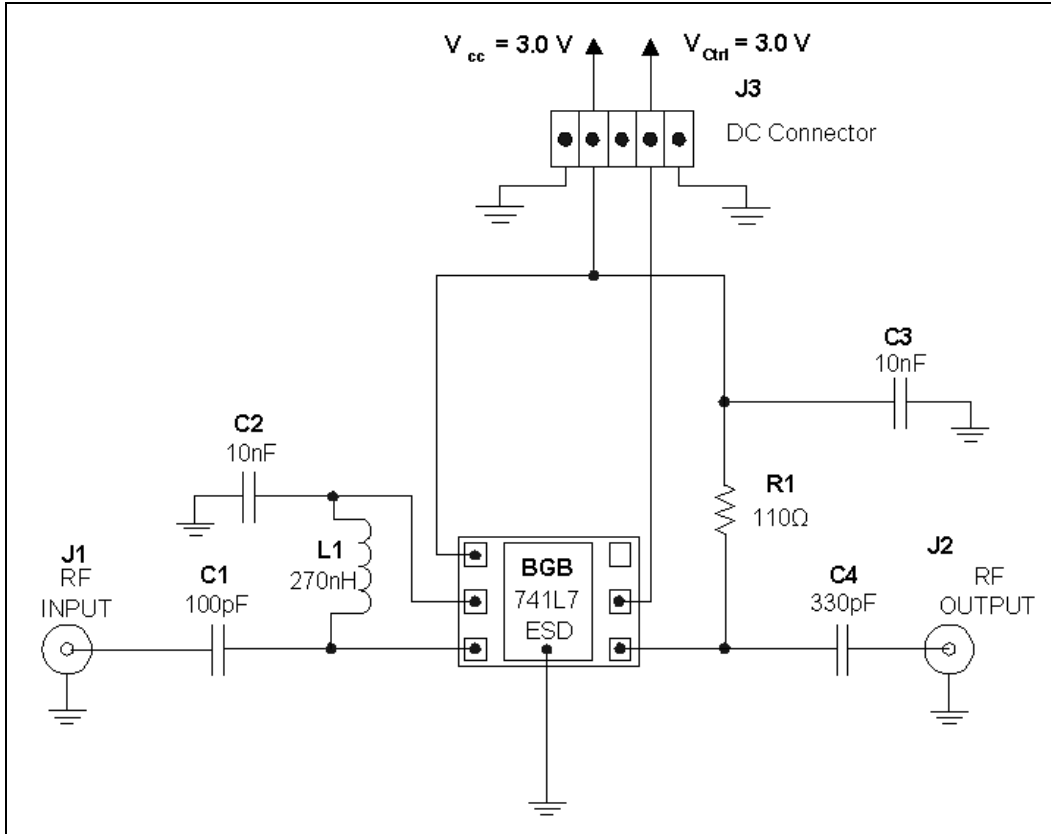


Figure 4-1: Schematic of the BGB741L7ESD for the FM 80-110 MHz Applications.

Table 4-1: Bill of Materials

Symbol	Value	Unit	Size	Manufacturer	Comment
C1	100	pF	0402	various	Input Matching/DC Block
C2	10	nF	0402	various	RF Bypass
C3	10	nF	0402	various	RF Bypass
C4	330	pF	0402	various	Output Matching/DC Block
L1	270	nH	0402	Murata LQG15A	Input Matching/DC Feed
R1	110	Ω	0402	various	Dc Feed to collector
Q1			TSLP 7-1	Infineon	SiGe MMIC LNA BGB741L7 with integrated ESD protection

5. Measured Graphs

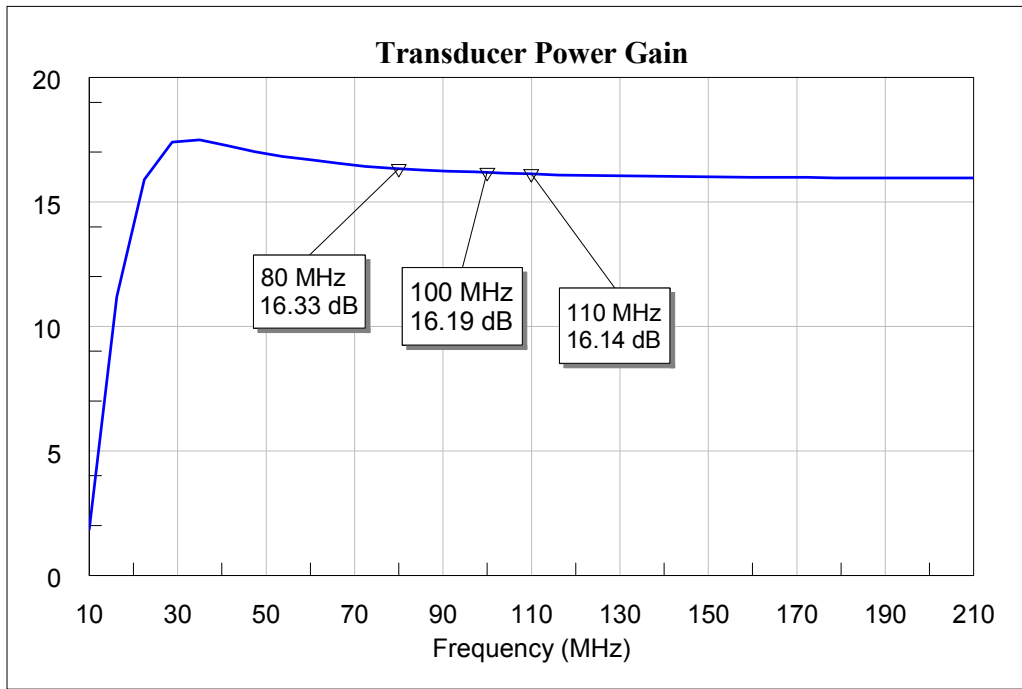


Figure 5-1: Transducer Power Gain of the BGB741L7ESD for FM.

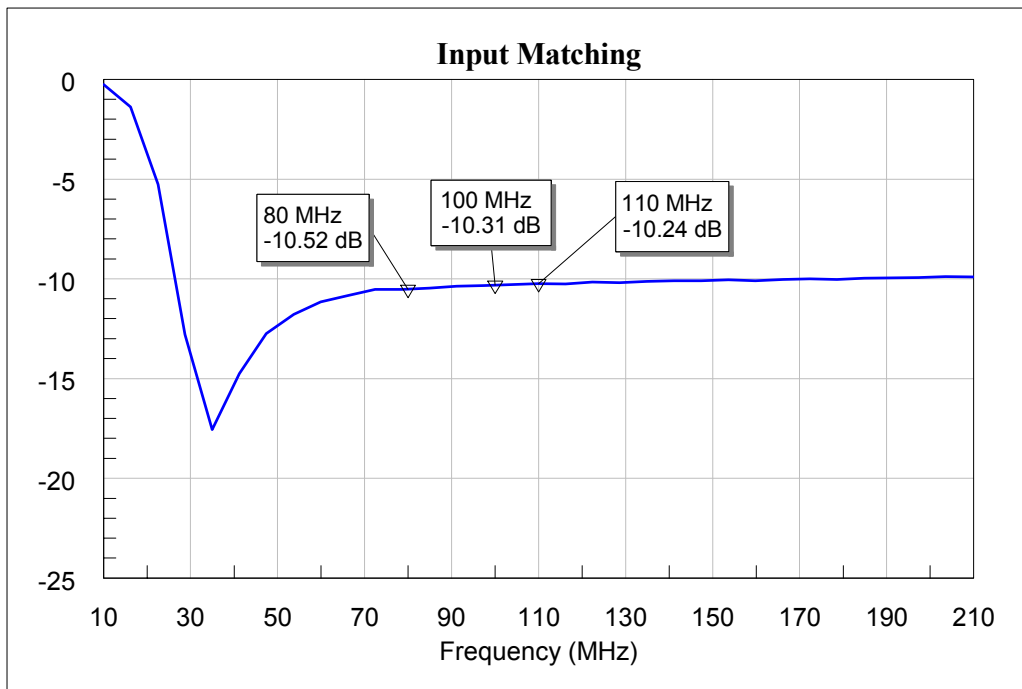


Figure 5-2: Input Matching of the BGB741L7ESD for FM.

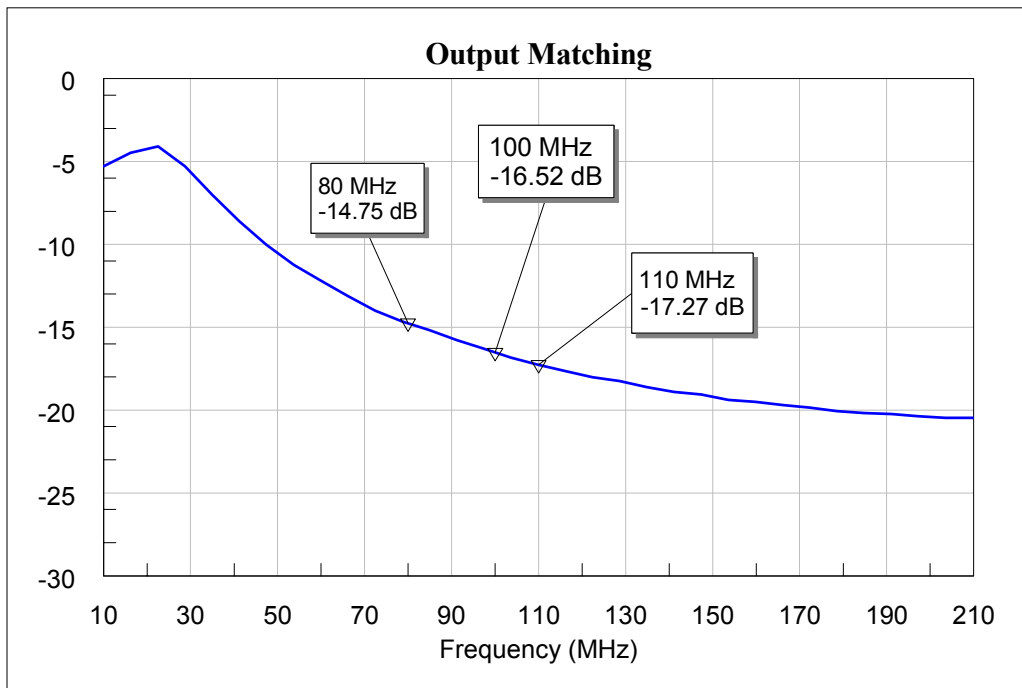


Figure 5-3: Output Matching of the BGB741L7ESD for FM.

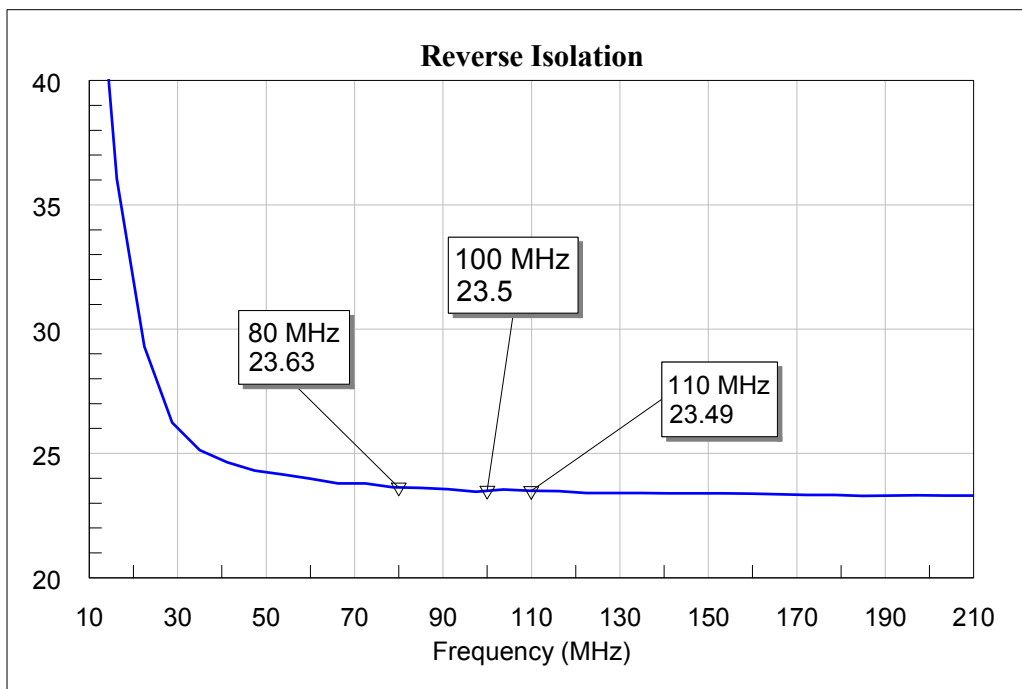


Figure 5-4: Reverse Isolation of the BGB741L7ESD for FM.

50Ω-Matched LNA using BGB741L7ESD for FM Application 80-110MHz

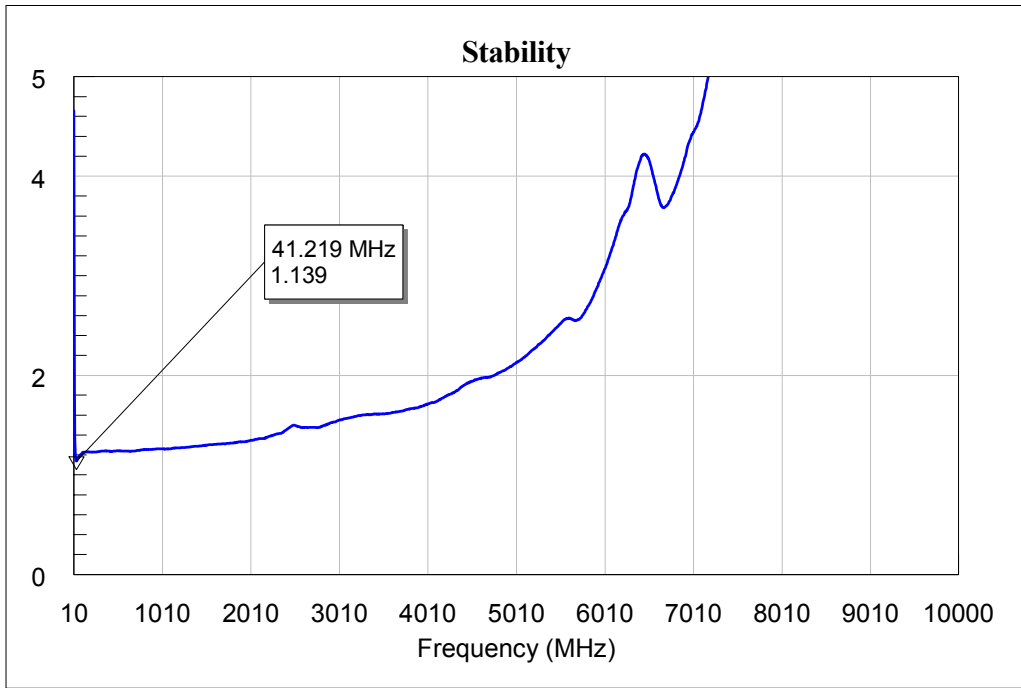


Figure 5-5: Stability of the BGB741L7ESD for FM.

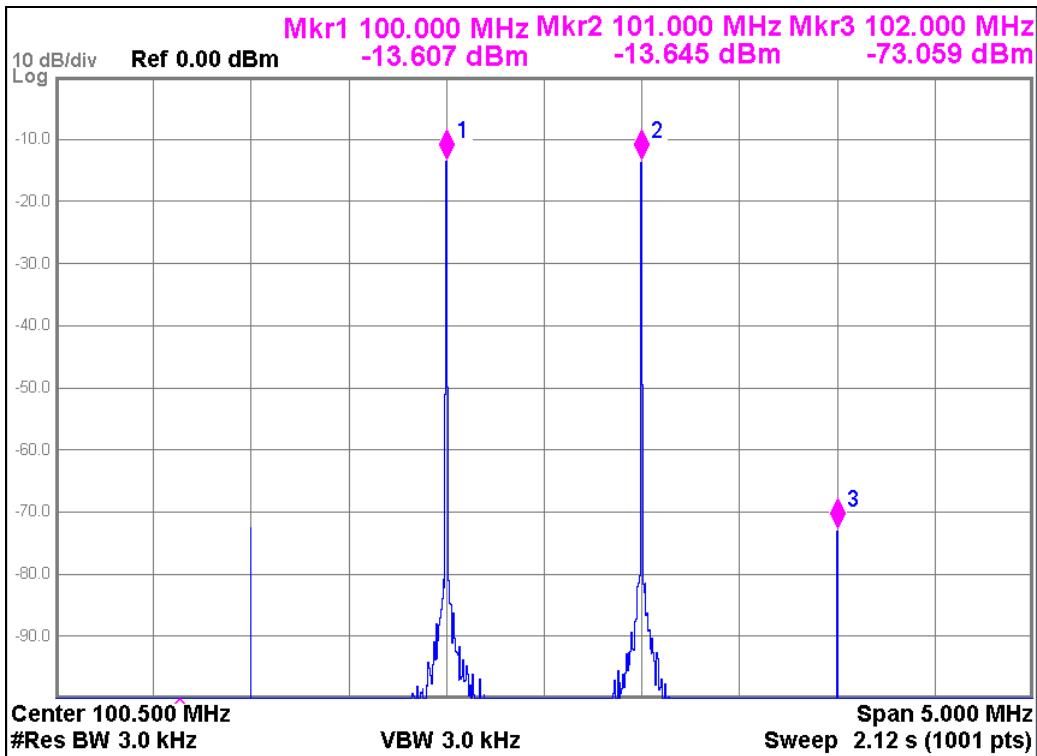


Figure 5-6: OIP3 of the BGB741L7ESD for FM.

6. Evaluation Board and Layout Information

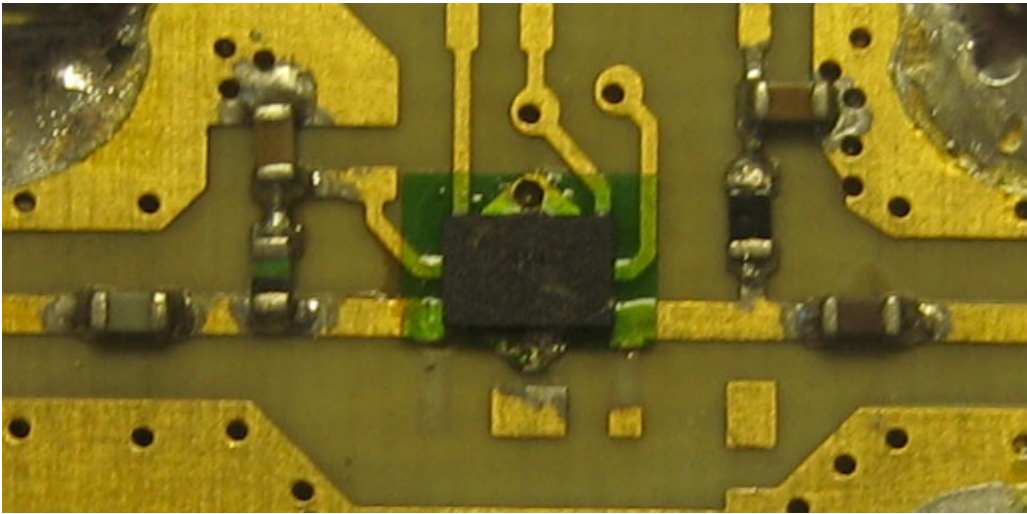


Figure 6-1: PCB Picture of the BGB741L7ESD

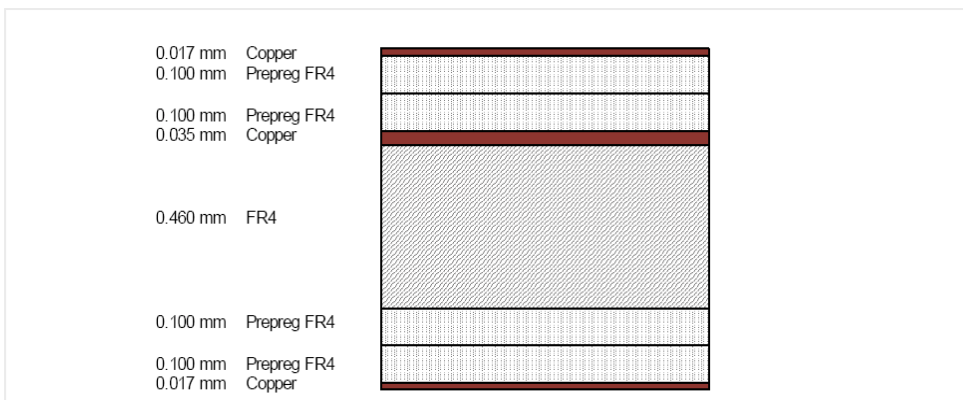


Figure 6-2: Layout Information