

TL0375J

2.0 – 5.0 GHz GaAs Ultra Low Noise Amplifier

Application Note: TL0375J EVB D

Application Note

2900 MHz~3300 MHz

5.0 V, 65 mA

Rev-2.1

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1. General Description

The TL0375J is a broadband, ultra-low Noise Amplifier (LNA) providing high gain and linearity. With a simple input and output match, this LNA can be tuned for different frequency bands targeting LTE (small cells and infrastructure) and any other applications requiring low noise, high gain, and linearity. For < 3 GHz frequency band, TL0375J can be considered. The TL0375J is packaged in a compact, low-cost Dual Flat No Lead (DFN) 2 x 2 x 0.75 mm, 8 pin plastic package.

TL0375J-EVB-D is an evaluation board specially tuned for frequency range of 2900 MHz~3300 MHz applications. Its high gain, low noise performance makes it suitable for application of public safety, radar, tactical radio, IoT, Cellular infrastructure, LTE etc.

2. TL0375J-EVB-D Board Details

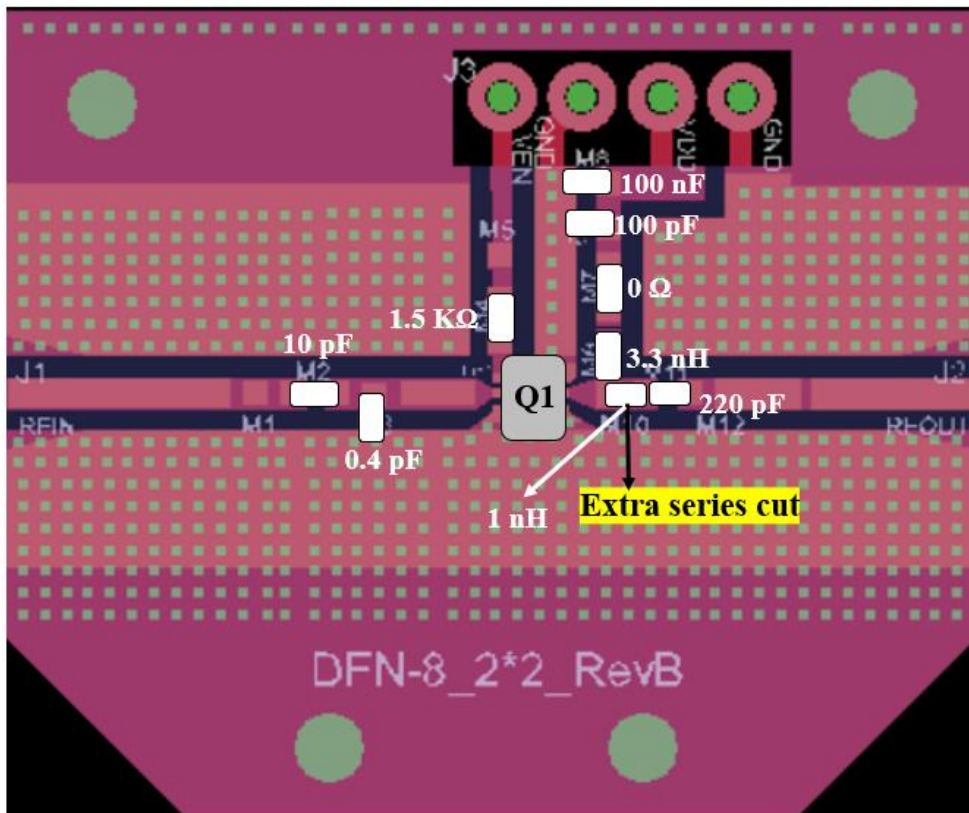
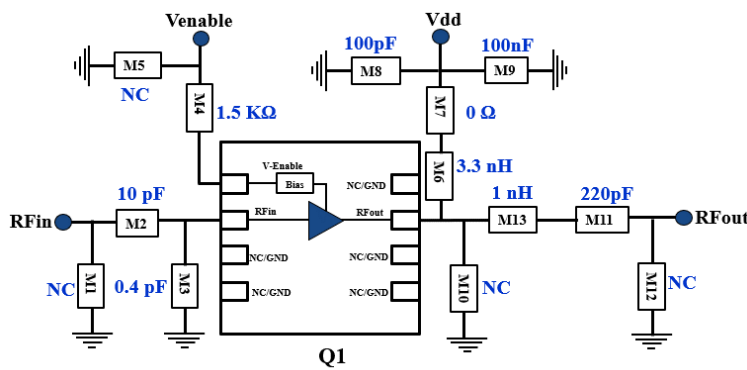


Figure 2.1 TL0375J-EVB-D 2900 MHz ~ 3300 MHz Schematic and EVB Layout

3. TL0375J-EVB-D Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
M2	10 pF	Murata	GJM1555C1H100JB01
M3	0.4 pF	Murata	GJM1555C1HR40BB01
M6	3.3 nH	Coil craft / Wurth Electronics	0402HP-3N3XGE / 744916033
M4	1.5 K Ω	Panasonic	ERJ-2RKF1501X
M8	100 pF	AVX	04025A101JAT4A
M9	100 nF	TDK	C1005X7R1H104K050BE
M7	0 Ω	Panasonic	ERJ-2GE0R00X
M11	220 pF	Kemet	C0402C221K5GCAUTO
M13	1 nH	Coil craft / Wurth Electronics	0402HP-1N0XJE /744916010
Q1	GaAs LNA	Tagore Tech	TL0375J
PCB		Rogers RO4350B, 20 mils, 1 oz copper	

Table 3.1 TL0375J-EVB-D BOM

4. TL0375J-EVB-D Biasing Sequence

Turn ON Device	Turn OFF Device
1. Set Venable to +5 V 2. Set V_{DD} to +5 V 3. Device will draw required I_{DQ} current 4. Apply RF power	1. Turn RF power off 2. Turn off V_{DD} 3. Turn off Venable

Table 4.1 TL0375J-EVB-D Bias and Sequencing

5. TL0375J-EVB-D Board Measurement Summary

Frequency (MHz)	EVB Noise Figure (dB)	Gain (dB)	OP1 (dBm)	OIP3(dBm) Fspacing:1 MHz 0dBm Pout/tone	S11 (dB)	S22 (dB)	Mu1
2900	0.4	18.5	19.4	33.8	-13.3	-6.0	1.1
3000	0.4	18.4	19.4	35.5	-14.5	-6.5	1.2
3100	0.5	18.3	19.4	34.5	-15.8	-7.0	1.2
3200	0.5	18.1	19.3	34.2	-17.4	-7.4	1.2
3300	0.5	17.9	19.3	34.5	-19.0	-8.3	1.2

Table 5.1 TL0375J-EVB-D Electrical Characteristics Summary

6. TL0375J-EVB-D Test Results

All the tests are carried out at room temperature.

6.1. S parameters



Figure 6.1.1. S parameters of TL0375J-EVB-D

6.2. EVB Noise Figure

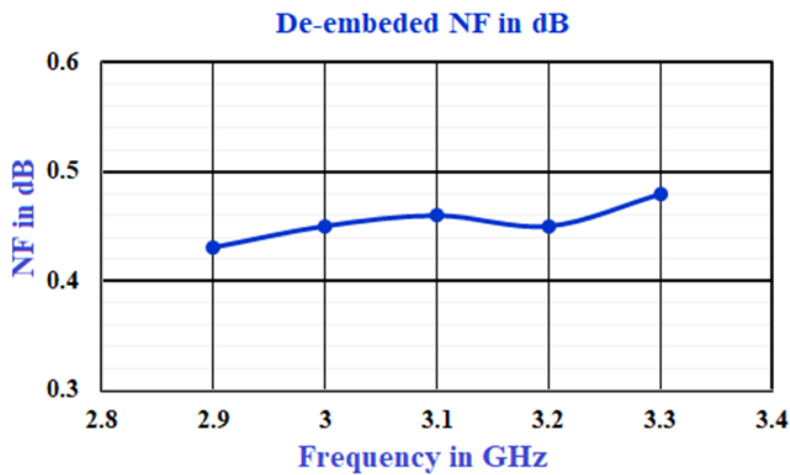


Figure 6.2.1. EVB Noise Figure mode of TL0375J-EVB-D

6.3. Large Signal Test Results

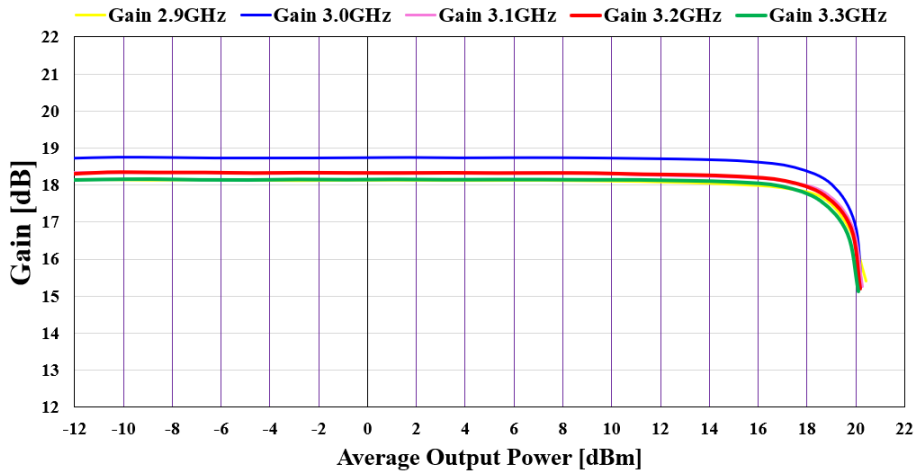


Figure 6.3.1. Gain Vs Pout of TL0375J-EVB-D

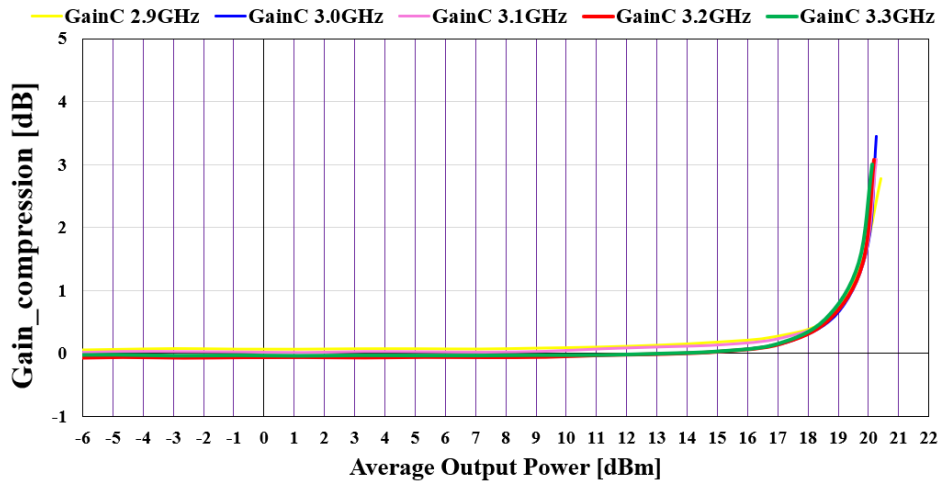


Figure 6.3.2. Gain compression Vs Pout of TL0375J-EVB-D

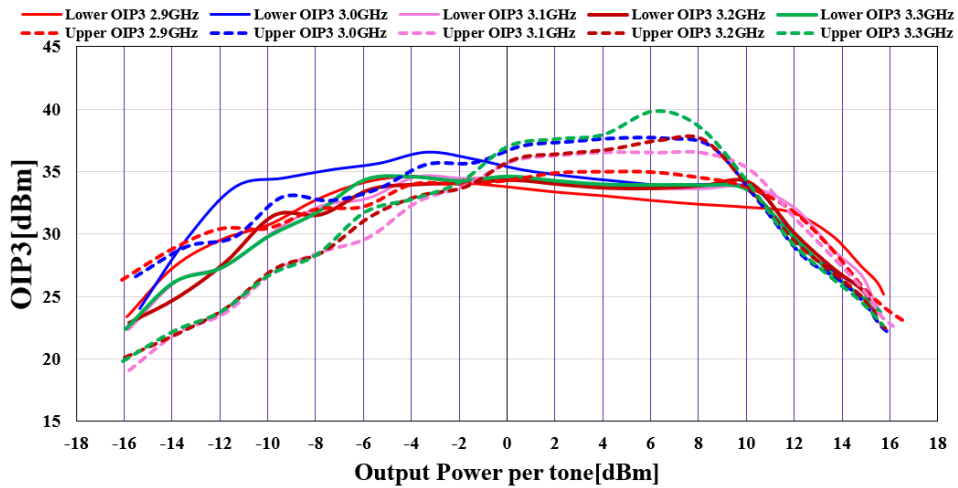


Figure 6.3.3. Output 3rd Order Intercept Point of TL0375J-EVB-D

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