

# TL0375J

2.0 – 5.0 GHz GaAs Ultra Low Noise Amplifier

**Application Note: TL0375J EVB A**

## Application Note

3300 MHz~3800 MHz

5.0 V, 60 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, TL0374J 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-A is an evaluation board specially tuned for frequency range of 3300 MHz~3800 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-A Board Details

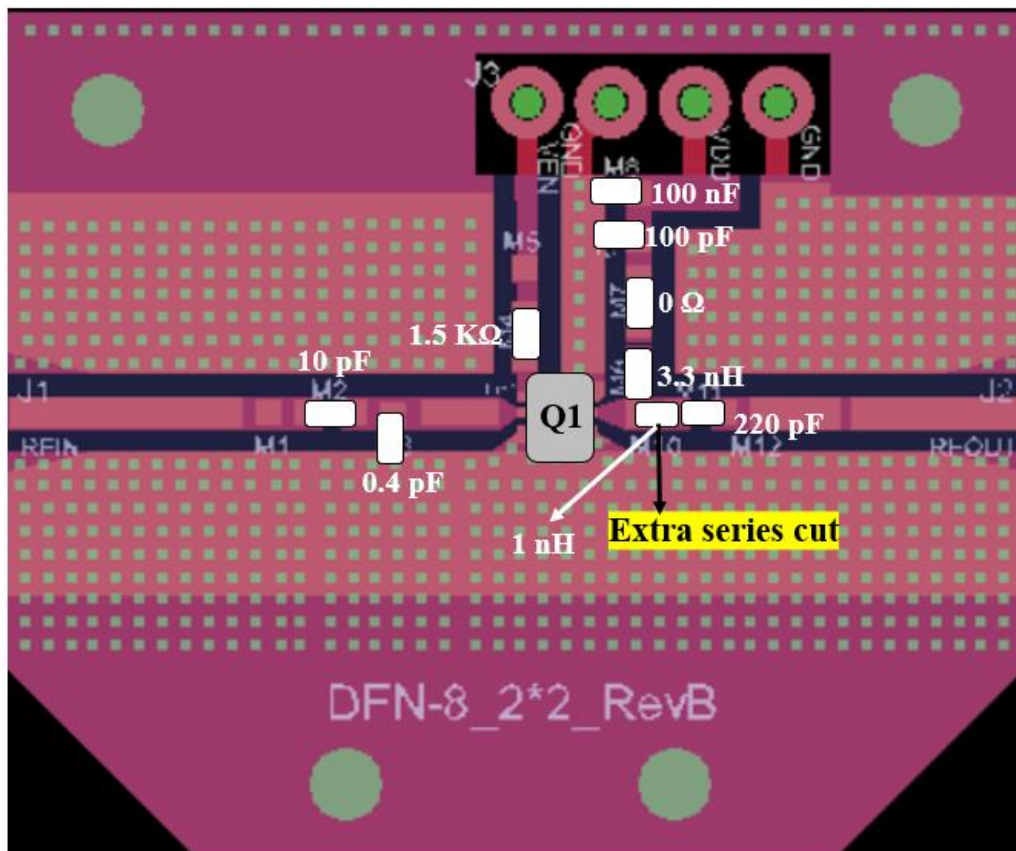
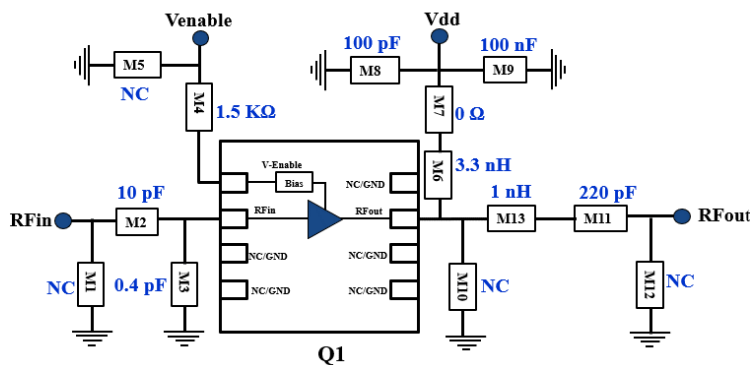


Figure 2.1 TL0375J-EVB-A 3300 MHz ~ 3800 MHz Schematic and EVB Layout

### 3. TL0375J-EVB-A Bill of Material

Component ID	Value	Manufacturer	Recommended Part Number
M2	10 pF	Murata	GJM1555C1H100JB01
M3	0.4 pF	Murata	GJM1555C1HR40BB01
M4	1.5 K $\Omega$	Panasonic	ERJ-2RKF1501X
M6	3.3 nH	Coil craft	0402HP-3N3XGE
M8	100 pF	AVX	04025A101JAT4A
M7	0 $\Omega$	Panasonic	ERJ-2GE0R00X
M9	100 nF	TDK	C1005X7R1H104K050BE
M11	220 pF	Kemet	C0402C221K5GACAUTO
M13	1 nH	Coil craft	0402HP-1N0XJE
Q1	GaAs LNA	Tagore Tech	TL0375J
PCB		Rogers RO4350B, 20 mils, 1 oz copper	

**Table 3.1 TL0375J-EVB-A BOM**

### 4. TL0375J-EVB-A Biasing Sequence

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> <li>1. Set Venable to +5 V</li> <li>2. Set V<sub>DD</sub> to +5 V</li> <li>3. Device will draw required I<sub>DQ</sub> current</li> <li>4. Apply RF power</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn RF power off</li> <li>2. Turn off V<sub>DD</sub></li> <li>3. Turn off Venable</li> </ol>

**Table 4.1 TL0375J-EVB-A Bias and Sequencing**

### 5. TL0375J-EVB-A 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
3300	0.5	18.2	19.3	33.5	-14.7	-8.4	1.2
3400	0.5	18.1	20.0	33.4	-15.4	-8.9	1.2
3500	0.5	17.9	19.8	33.0	-15.8	-9.5	1.2
3600	0.5	17.7	20.4	32.6	-16.0	-10.1	1.2
3700	0.5	17.6	19.5	32.6	-16.0	-10.4	1.2
3800	0.6	17.4	19.7	32.9	-16.0	-10.6	1.2

**Table 5.1 TL0375J-EVB-A Electrical Characteristics Summary**

## 6. TL0375J-EVB-A Test Results

All the tests are carried out at room temperature.

### 6.1. S parameters

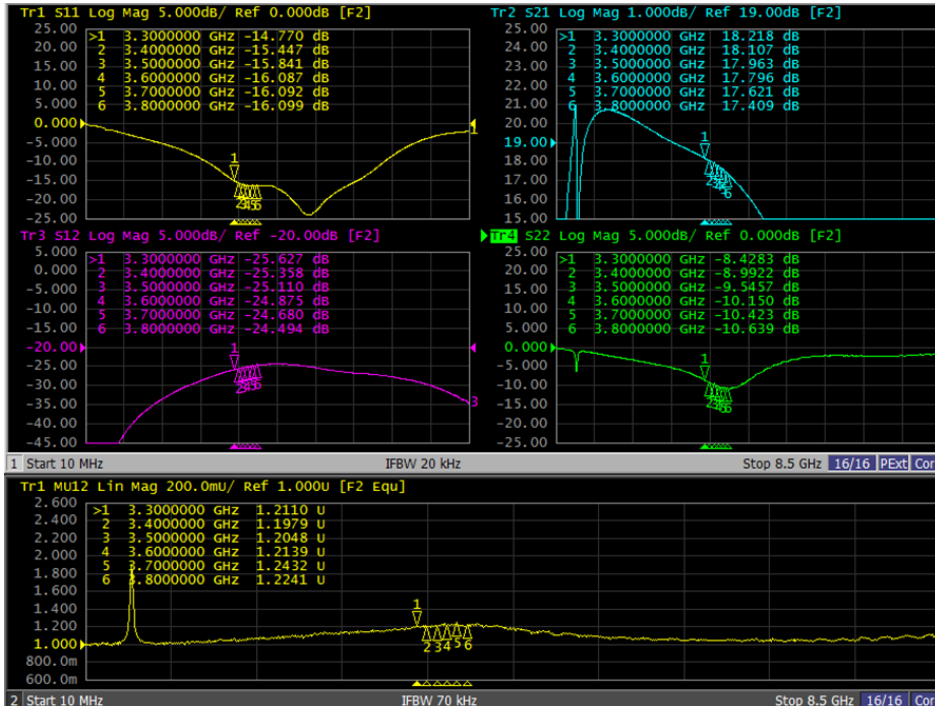


Figure 6.1.1. S parameters of TL0375J-EVB-A

### 6.2. EVB Noise Figure

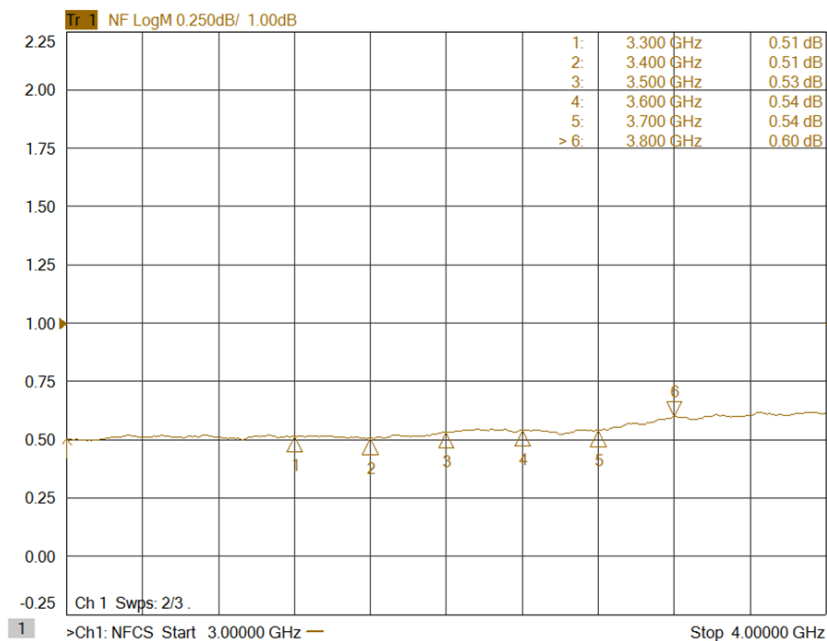
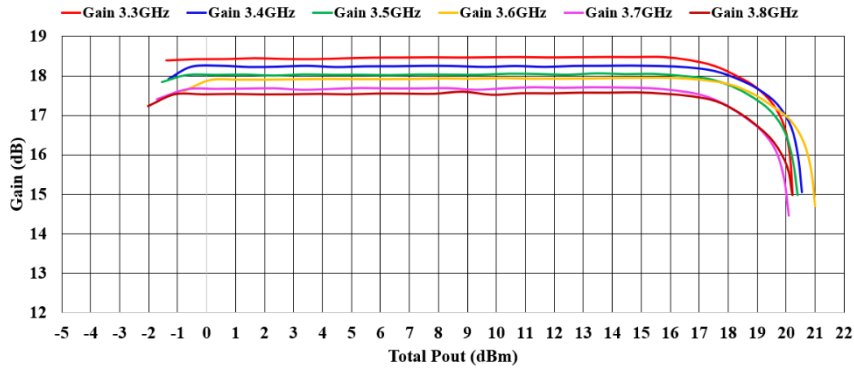
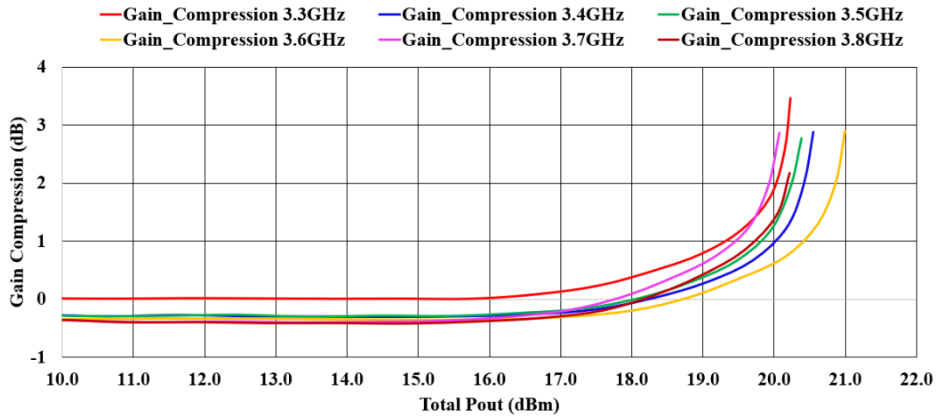


Figure 6.2.1. EVB Noise Figure mode of TL0375J-EVB-A

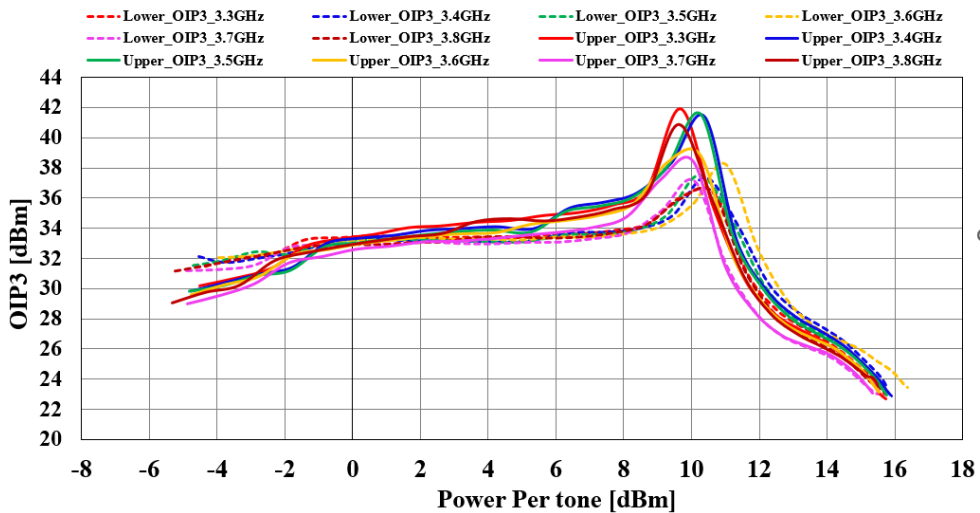
### 6.3. Large Signal Test Results



**Figure 6.3.1. Gain Vs Pout of TL0375J-EVB-A**



**Figure 6.3.2. Gain compression Vs Pout of TL0375J-EVB-A**



**Figure 6.3.3. Output 3<sup>rd</sup> Order Intercept Point of TL0375J-EVB-A**

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