

Product Description:

The TQL5000 is a low noise amplifier designed for 802.11a receive applications for the WLAN market. The device exhibits industry-leading noise figure and power consumption while maintaining high intercept performance. It requires a single 3 V supply voltage and draws 8 mA. The LNA is manufactured using TriQuint's GaAs pHEMT process and is packaged in an ultra-small, low-profile 1.3mm x 2mm x 0.4mm Lead Free SLIM-7 package.

Selected Electrical Specifications:

Parameter	min	typ	Max	units
Frequency Range	4900	-	5900	MHz
Noise Figure (with onchip match)		1.3		dB
Small Signal Gain	16.5	18		dB
Input Power (IP1dB)		-13		dBm
Input IP3		-3		dBm

Test Conditions: $T_a=25^{\circ}\text{C}$; $V_{dd}=3.0\text{V}$

**LNA for 5GHz UNII Band
802.11a Systems**

Features

- 4.9 to 5.9 GHz Frequency Coverage
- Low Noise Figure
- High Gain
- Low Current: 8mA Typical @ 3V
- 50-ohm Input and Output Match
- GaAs pHEMT Technology
- Leadless 1.3 x 2.0 x 0.4 mm Lead Free SMT Package

Applications

- 802.11a WLAN
- PCs and Mobile Devices
- WLAN Access Points
- WLAN Repeaters

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Absolute Maximum Ratings

Parameter	Symbol	Value		Unit
		min	max	
Supply Voltage Range	V _{ddl}	0	6	V
DC Voltage, @ RF Ports	V _{rf}	-0.3	0.3	V
DC Volgate, @ GND ports	V _{gnd}	-0.3	0.3	V
Operating Temperature Range	T _a	-40	85	°C
Channel Temperature	T _{ch}		150	°C
Storage Temperature Range	T _{stg}	-55	150	°C
Power Dissipation	P _{diss}		0.2	W
Maximum Input Power	P _I		0	dBm

General Electrical Characteristics^{1,2}

Electrical Characteristics

Parameter	min	typ	max	Unit
V _{dd} Supply Voltage	2.7	3.0	3.6	V
Supply Current: V _{dd} = 3.0V		8		mA

LNA Performance:

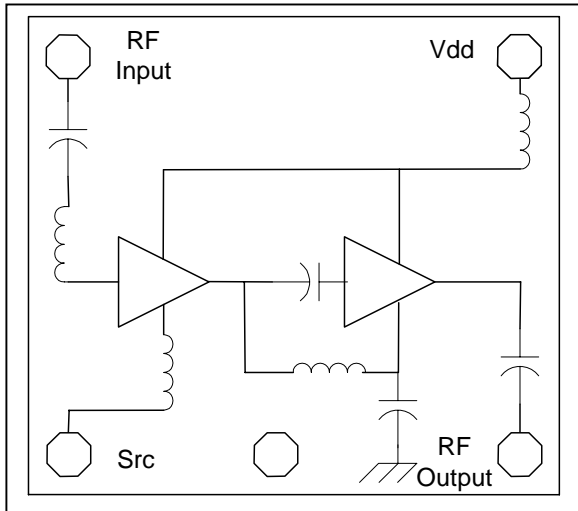
Parameter	min	typ	max	units
Frequency Range	4900	-	5900	MHz
Small Signal Gain	16.5	18		dB
Gain Variation vs V _{dd}		0.5		dB
Gain Variation vs Frequency		1.5		dB
Noise Figure (with on-chip matching)		1.3		dB
Input Power (IP1dB)		-13		dBm
Input IP3		-3		dBm
Isolation		30		dB
Stability		10:1		
Harmonics (2 nd , 3 rd , 4 th)		-30		dBc
Input VSWR (with on-chip matching)		1.7		
Output VSWR (with on-chip matching)		2		

¹Test Conditions: T_a=25°C, unless otherwise noted,

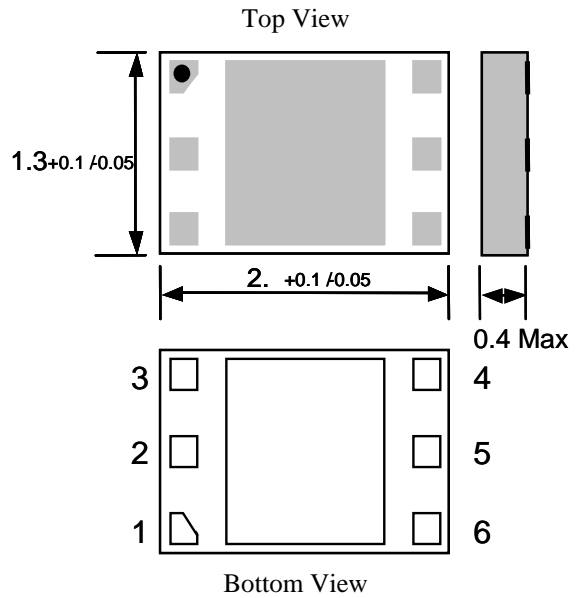
²AC performance is guaranteed at 25 Deg-C,

Applications Information

Functional Block Diagram:



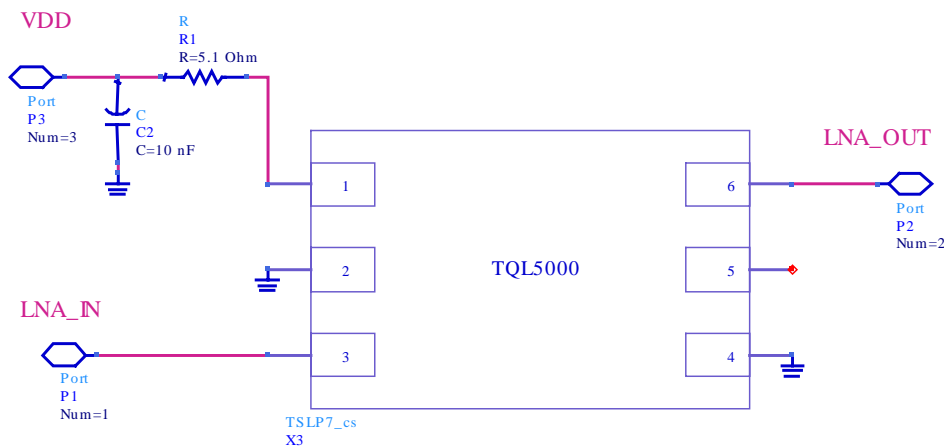
1.3mm x 2mm SLIM-7 Package



Pin Assignments:

PIN	Symbol	Abbreviation	Description
1	Vdd	Vdd	Drain Supply Voltage
2	Ground	GND	RF and DC Ground
3	RF IN	RF IN	RF Input
4	SRC	SRC	Source Grounding
5	N/C	N/C	No Connection
6	RF OUT	RF OUT	RF Output

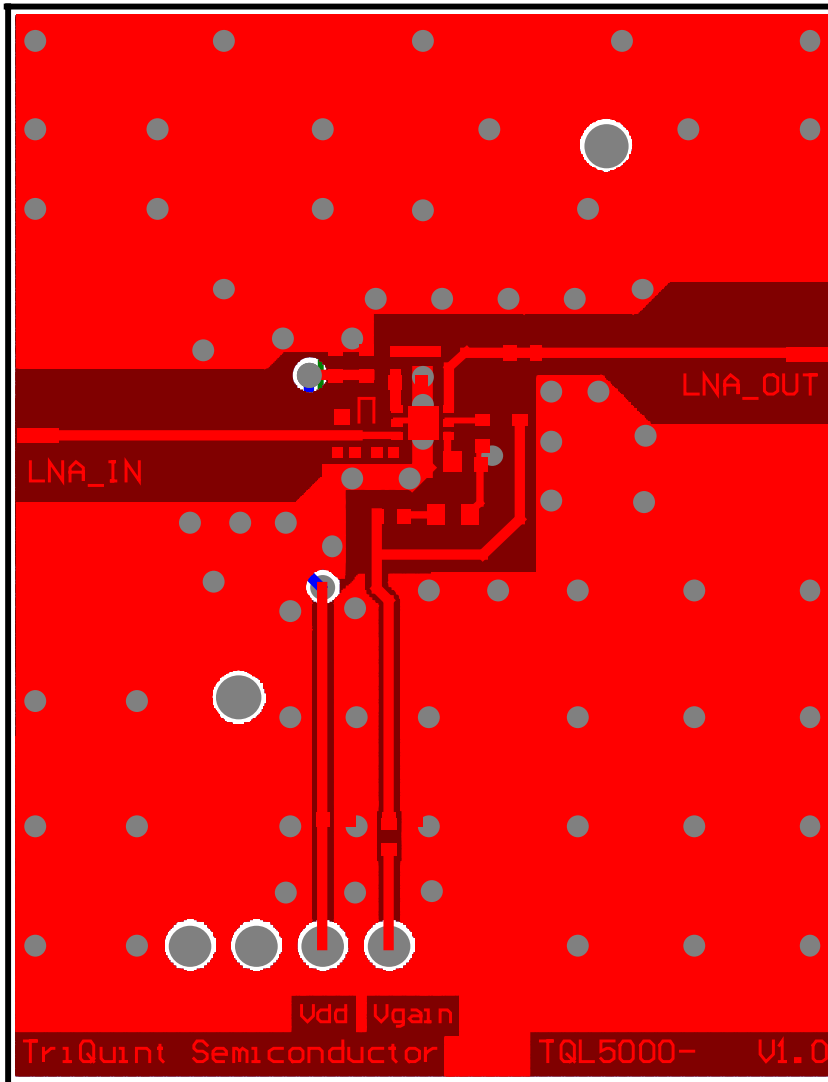
Application Circuit:



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TQL5000 5GHz LNA; TQL5000- V1.0 Evaluation board



Bill of Materials

Layer/Descriptions

Dielectric: FR4: Er=4.6

Top: 1 oz. Plated Copper

Dielectric 1 : 8 mils

Mid 1: 1 oz. Copper

Dielectric 2: 28 mils

Mid 2: 1 oz. Copper

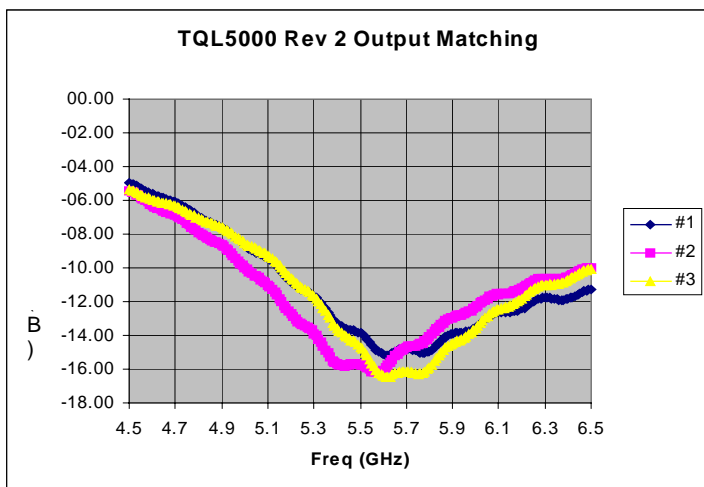
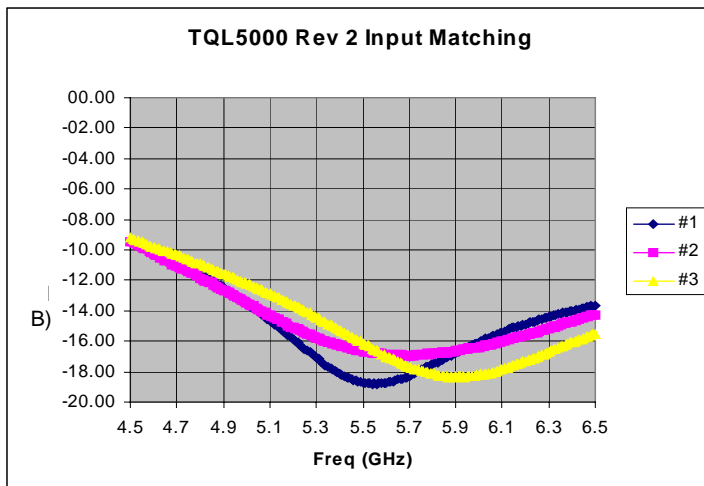
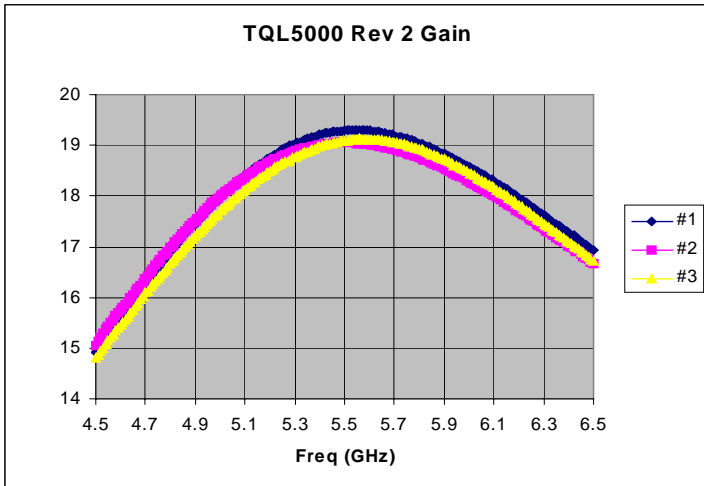
Dielectric 3: 6 mils

Bottom: 1 oz. Plated Copper

TQL5000 Measured Performance:

TriQuint TQL5000- V1.0 Evaluation Board

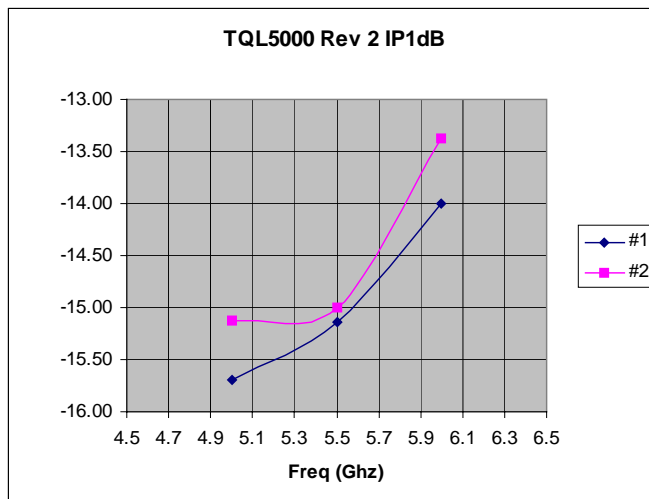
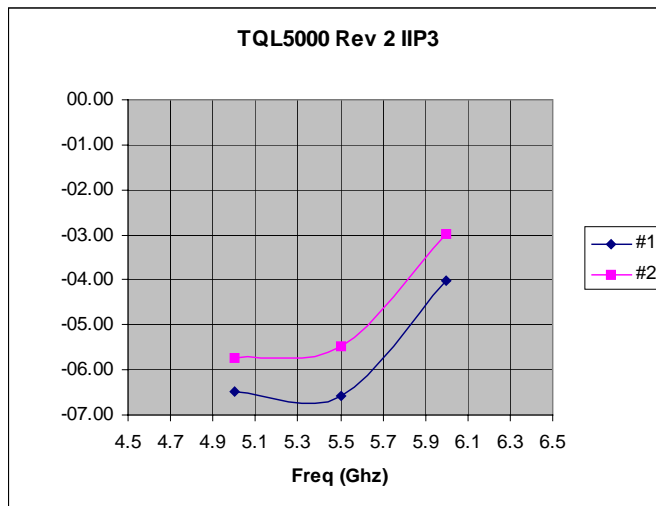
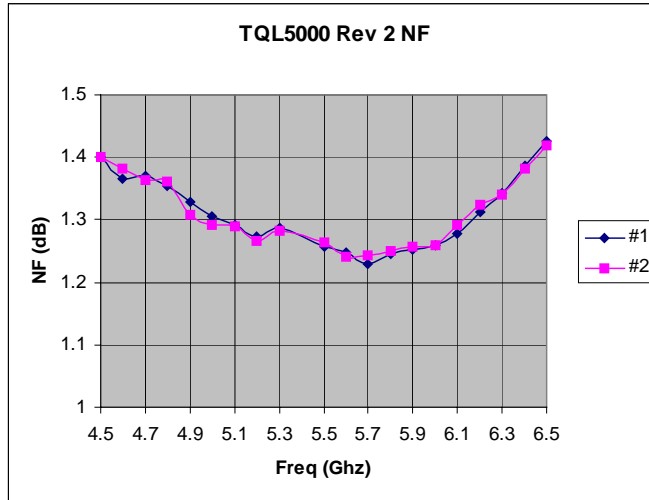
Measurement Conditions $T_a = 25^\circ\text{C}$, $V_{dd} = 3.0$, $I_{dd} = 8.2\text{mA}$



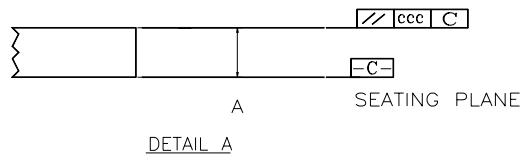
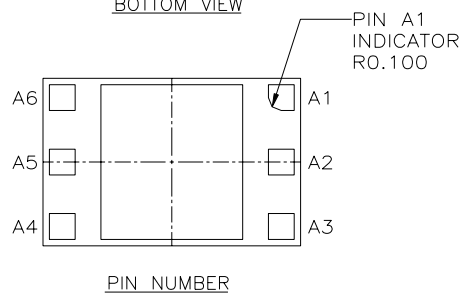
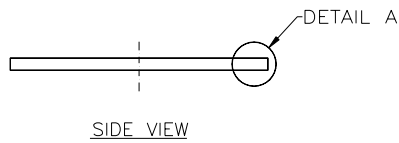
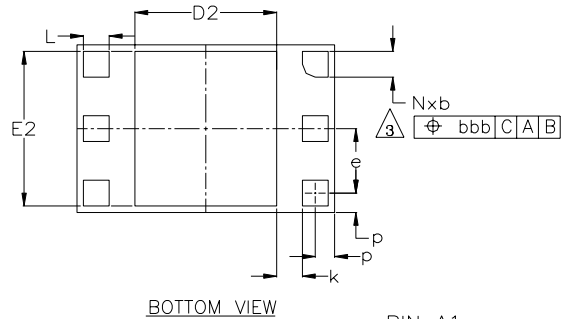
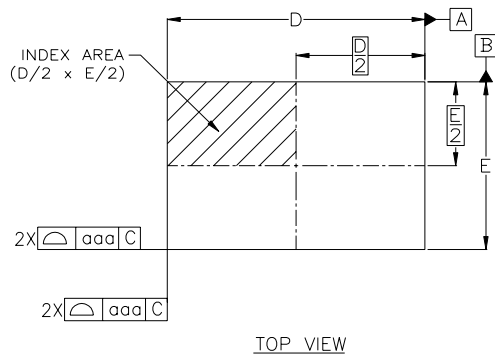
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TQL5000 Measured Performance:
TriQuint TQL5000- V1.0 Evaluation Board
Measurement Conditions $T_a = 25^\circ\text{C}$, $V_{dd}=3.0$, $I_{dd}=8.2\text{mA}$



Package Outline – SLIM7



DIMENSIONAL REFERENCES			
REF.	MIN.	NOM.	MAX.
A	-	-	0.40
D	1.95	2.00	2.10
E	1.25	1.30	1.40
k	0.15	-	0.25
D2	1.10		
E2	1.20		
p	0.125	0.15	0.200
e	0.50 BSC		
b	0.15	0.20	0.25
L	0.15	0.20	0.25
aaa	0.15		
bbb	0.10		
ccc	0.10		
N	6		

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. 'e' REPRESENTS THE BASIC LAND GRID PITCH.
3. "N" IS THE TOTAL NUMBER OF I/O
4. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
5. b IS MEASURED AT THE MAXIMUM I/O SIDE LENGTH.
6. LAND DESIGNATION PER JESD 95-1, SPP-002.
7. PACKAGE WARP SHALL BE 0.050MM MAXIMUM.
8. NO METAL CUT ON PAD IS ALLOWED

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Package Marking



Line 1: XXXX last 4 digits of TQS lot number

Pin 1

Caution: Electrostatic discharge sensitive. Observe handling Precautions!

Ordering Information

Type	Marking	Ordering code (tape and reel)	Package
TQL5000	XXXX	TBD	SLIM-7

Additional Information

For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

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