



# STB7002

## 1.8GHz THREE GAIN LEVEL LNA

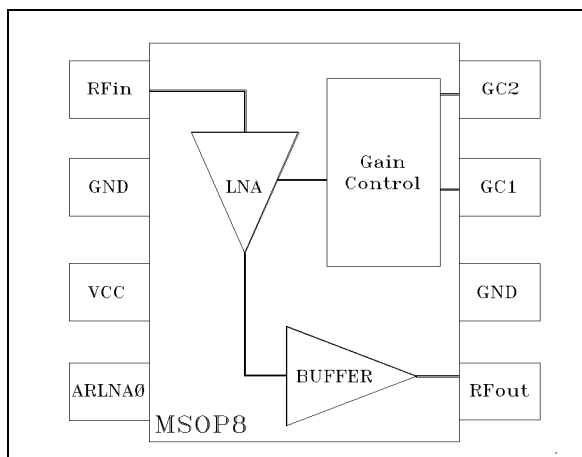
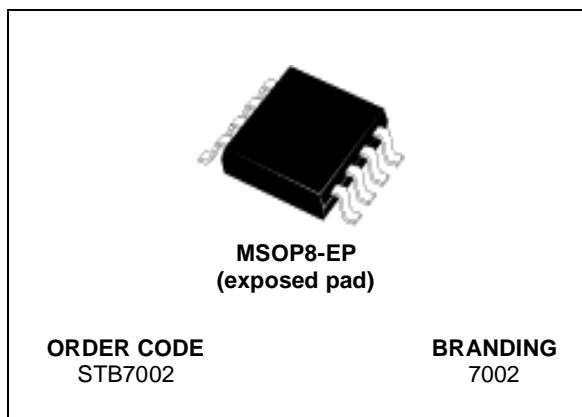
- FULLY INTEGRATED 1.8GHz LNA
- THREE GAIN LEVELS (0dB, 18dB, 26dB typ. @ 2.8V)
- LOW NOISE FIGURE
- TEMPERATURE COMPENSATED

### APPLICATIONS

- DCS HANDSETS

### DESCRIPTION

The STB7002 is a Silicon monolithic amplifier, that offers low noise figure and three gain levels for 1.8GHz applications. STB7002 is housed in a small industry-standard MSOP8-EP surface mount package, requiring very little board space (50% reduction vs SO8 Package). MSOP8-EP dimensions are 3mmx5mm with a 1.1mm thickness. STB7002 is ESD protected and requires minimum external components in the application circuit, for the on-chip bias and gain control. Furthermore, temperature and supply voltage compensation ensures high stability over a wide range of operating conditions.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>cc</sub>	Supply voltage	4	V
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage temperature	-40 to +85	°C

### THERMAL DATA

Symbol	Parameter	Value	Unit
R <sub>th(j-a)</sub>	Junction -ambient Thermal Resistance	TBD	°C/W

**ELECTRICAL SPECIFICATION (T<sub>amb</sub> = 25°C, V<sub>cc</sub> = 2.8V)**

Symbol	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>cc</sub>	Supply voltage		2.7	2.8	2.9	V
I <sub>bias</sub>	Bias current	for G <sub>p1</sub> <sup>(1)</sup> G <sub>p2</sub> <sup>(1)</sup> G <sub>p3</sub> <sup>(1)</sup>	8 14 10	11.5 17.5 15.0	15.0 22.5 19	mA
I <sub>stby</sub>	Standby current				20	μA
f	Frequency range		1805		1880	MHz
G <sub>p1,2,3</sub>	Power gain	G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>	-3.0 16.0 24.0	0.0 18.0 26.0	3.0 20.0 28.0	dB
NF <sub>1,2,3</sub>	Noise figure	for G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>		9 2.9 2.6		dB
P1dB <sub>1,2,3</sub>	Input 1 dB Compr.Power	for G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>		-15.5 -19 -27		dBm
IIP3 <sub>1,2,3</sub>	Input Third Order Intercept	for G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>		-4 -9 -17		dBm
VSWR <sub>i</sub>	Input VSWR	for G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>			2.5:1 2.2:1 1.5:1	
VSWR <sub>o</sub>	Output VSWR	for G <sub>p1</sub> G <sub>p2</sub> G <sub>p3</sub>			1.3:1 1.5:1 1.8:1	
AZout	Zout LNA on/off				15	%

Note(1) : Gp1 min gain, Gp2 mid gain and Gp3 max gain.

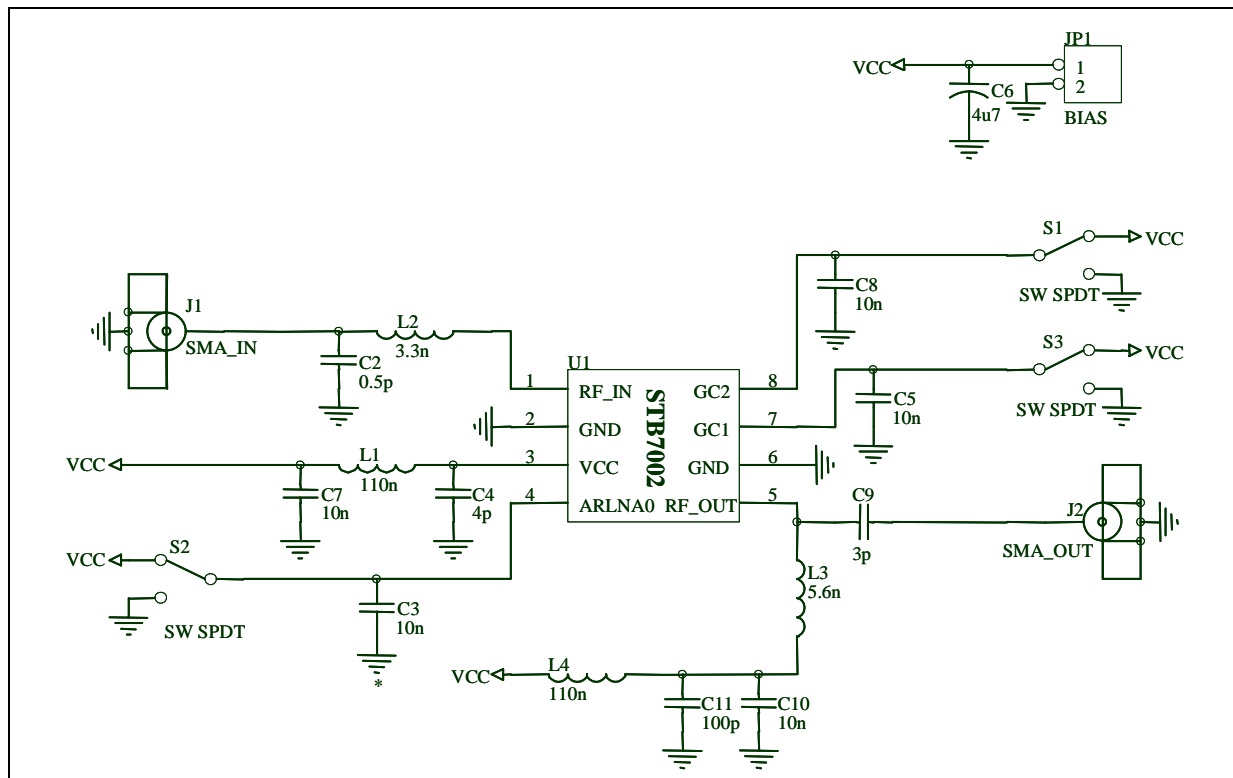
**PINOUT**

Pin Number	Symbol	Description	Evaluation circuit components
1	RFin	RF input	L2 = 3.3nH, C2 = 0.5pF
2	Gnd	Ground	
3	Vcc	Voltage supply	C4 = 4pF, L1 = 110nH, C7 = 10nF
4	ARLNA0	Enable for power down	C3 = 10nF
5	RFout	RF output	C9 = 3pF, L3 = 5.6nH, C10 = 10nF, C11 = 100pF, L4 = 110nH
6	Gnd	Ground	
7	GC1	Gain selection	C5 = 10nF
8	GC2	Gain selection	C8 = 10nF

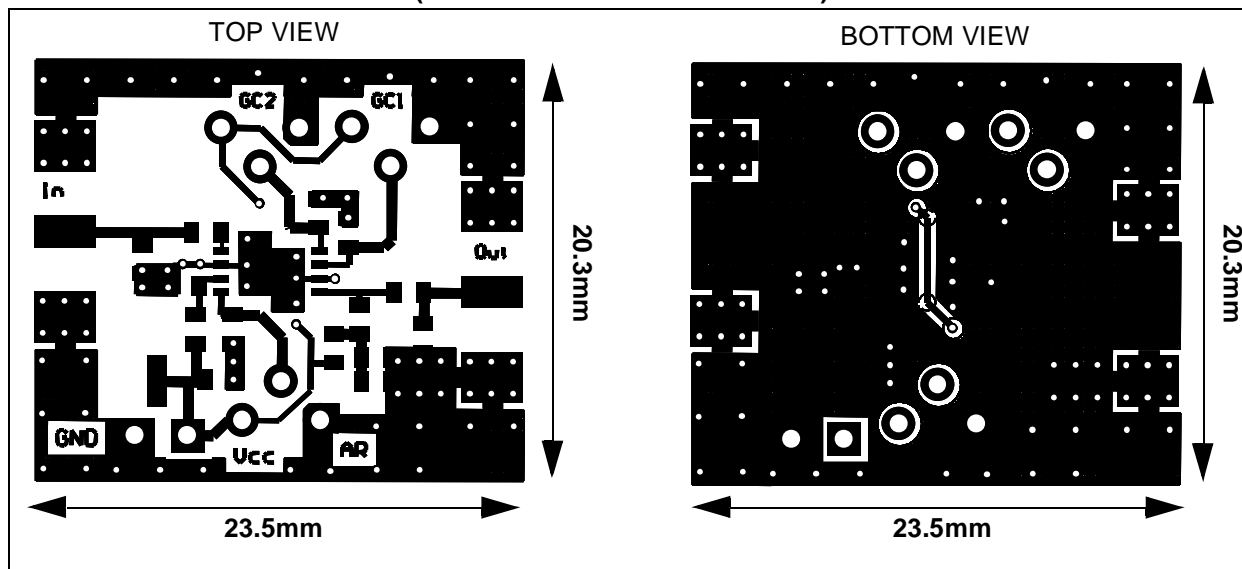
**GAIN SELECTION**

	G <sub>p1</sub>	G <sub>p2</sub>	G <sub>p3</sub>
GC1	0	0	1
GC2	0	1	1

## TEST CIRCUIT SCHEMATIC



## TEST CIRCUIT PHOTOMASTER (board dimensions 23.5x20.3mm)



**INPUT/OUTPUT VSWR, ISOLATION AND GAIN PARAMETERS (MEASURED DATA)****MAX GAIN**

<b>Freq.</b>	<b>VSWRi</b>	<b>VSWRo</b>	<b>Isolation</b>	<b>Gain</b>
<b>1802</b>	1.48	1.94	-36.91	24.83
<b>1813</b>	1.45	1.94	-36.37	24.79
<b>1824</b>	1.43	1.94	-35.51	24.76
<b>1835</b>	1.41	1.93	-35.14	24.75
<b>1846</b>	1.38	1.92	-34.95	24.74
<b>1857</b>	1.36	1.91	-34.03	24.71
<b>1868</b>	1.35	1.89	-34.17	24.68
<b>1879</b>	1.33	1.87	-33.08	24.59
<b>1890</b>	1.32	1.84	-33.53	24.52
<b>1901</b>	1.30	1.83	-32.87	24.45
<b>1912</b>	1.29	1.79	-33.03	24.38
<b>1923</b>	1.28	1.77	-32.55	24.29

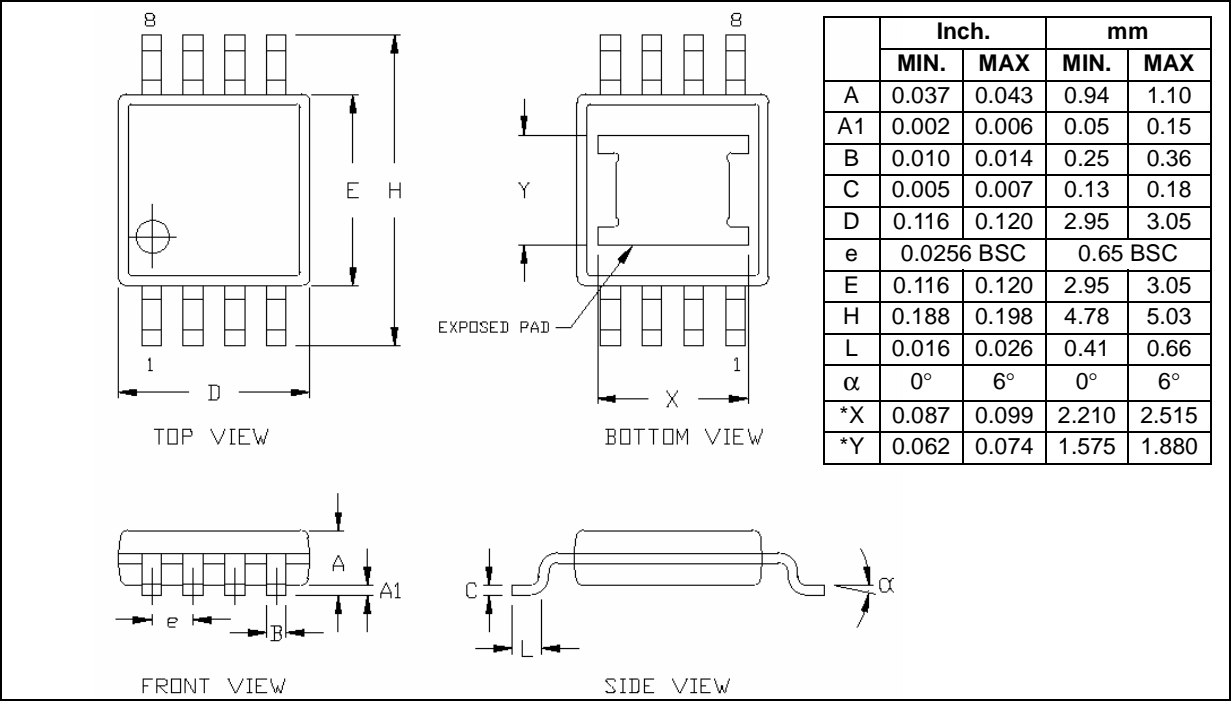
**MID GAIN**

<b>Freq.</b>	<b>VSWRi</b>	<b>VSWRo</b>	<b>Isolation</b>	<b>Gain</b>
<b>1802</b>	2.14	1.67	-36.70	18.32
<b>1813</b>	2.15	1.68	-36.07	18.33
<b>1824</b>	2.14	1.69	-35.58	18.34
<b>1835</b>	2.14	1.69	-35.13	18.37
<b>1846</b>	2.13	1.69	-34.51	18.40
<b>1857</b>	2.12	1.69	-33.92	18.43
<b>1868</b>	2.11	1.68	-33.38	18.45
<b>1879</b>	2.10	1.68	-32.30	18.42
<b>1890</b>	2.10	1.67	-33.39	18.41
<b>1901</b>	2.09	1.66	-32.80	18.39
<b>1912</b>	2.08	1.65	-32.72	18.35
<b>1923</b>	2.08	1.63	-32.20	18.32

**MIN GAIN**

<b>Freq.</b>	<b>VSWRi</b>	<b>VSWRo</b>	<b>Isolation</b>	<b>Gain</b>
<b>1802</b>	2.26	1.21	-34.63	1.97
<b>1813</b>	2.30	1.21	-34.45	1.93
<b>1824</b>	2.33	1.21	-33.83	1.89
<b>1835</b>	2.36	1.21	-33.57	1.86
<b>1846</b>	2.38	1.22	-32.99	1.82
<b>1857</b>	2.41	1.22	-32.3	1.79
<b>1868</b>	2.43	1.22	-31.94	1.76
<b>1879</b>	2.46	1.22	-31.55	1.70
<b>1890</b>	2.48	1.22	-31.91	1.66
<b>1901</b>	2.50	1.22	-31.52	1.63
<b>1912</b>	2.52	1.22	-31.34	1.58
<b>1923</b>	2.53	1.22	-31.09	1.53

MSOP8-EP MECHANICAL DATA



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