



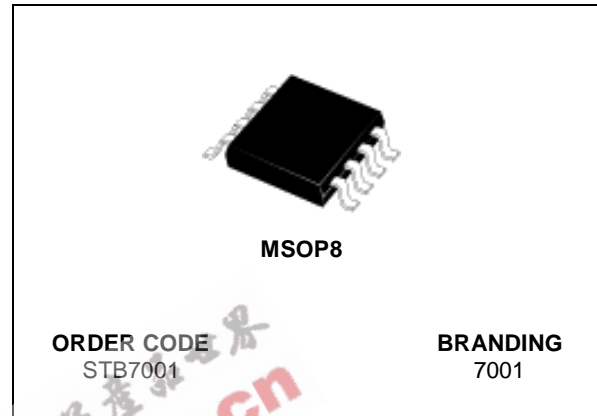
## STB7001

### 900 MHz THREE GAIN LEVEL LNA

- FULLY INTEGRATED 900 MHz LNA
- THREE GAIN LEVELS (0dB, 18dB, 26dB typ. @ 2.8V)
- LOW NOISE FIGURE
- TEMPERATURE COMPENSATED

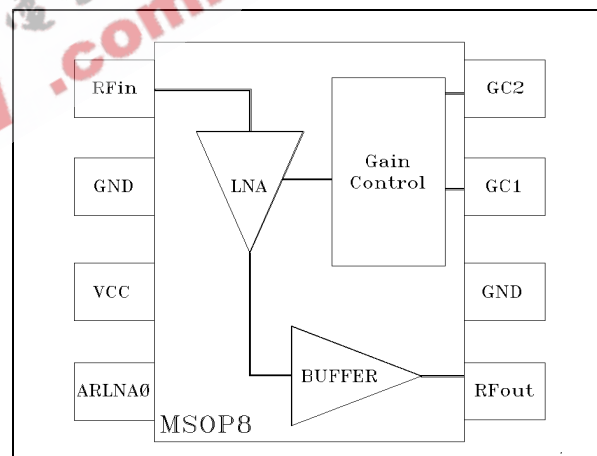
#### APPLICATIONS

- GSM HANDSETS



#### DESCRIPTION

The STB7001 is a Silicon monolithic amplifier, that offers low noise figure and three gain levels for 900-MHz applications. STB7001 is housed in a small industry-standard MSOP8 surface mount package, requiring very little board space (50% reduction vs SO8 Package). MSOP8 dimensions are 3mmx5mm with a 1.1mm thickness. The device 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 assures high stability over a wide range of operating conditions.



#### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply voltage	5.5	V
$T_j$	Junction Temperature	150	°C
$T_{stg}$	Storage temperature	-40 to +85	°C

#### THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction -ambient Thermal Resistance	200	°C/W

## STB7001

### ELECTRICAL SPECIFICATION ( $T_{amb} = 25^{\circ}\text{C}$ , $V_{cc} = 2.8\text{V}$ )

Symbol	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
$V_{cc}$	Supply voltage		2.7	2.8	2.9	V
$I_{bias}$	Bias current	for $G_{p1}^{(1)}$ $G_{p2}^{(1)}$ $G_{p3}^{(1)}$	8 14 10	11.5 17.5 15.0	15.0 22.5 19	mA
$I_{stby}$	Standby current				20	$\mu\text{A}$
f	Frequency range		925		960	MHz
$G_{p1,2,3}$	Power gain	for $G_{p1}$ $G_{p2}$ $G_{p3}$	-3.0 16.0 24.0	0.0 18.0 26.0	3.0 20.0 28.0	dB
$NF_{1,2,3}$	Noise figure	for $G_{p1}$ $G_{p2}$ $G_{p3}$		10 3.1 2.5		dB
$P1dB_{1,2,3}$	Input 1 dB Compr.Power	for $G_{p1}$ $G_{p2}$ $G_{p3}$		-15.0 -19.0 -26.5		dBm
$IIP3_{1,2,3}$	Input Third Order Intercept	for $G_{p1}$ $G_{p2}$ $G_{p3}$		-6.0 -11.0 -20.0		dBm
VSWRi	Input VSWR				1.5:1	
VSWRo	Output VSWR				1.5:1	
AZout	Zout LNA on/off				15	%

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

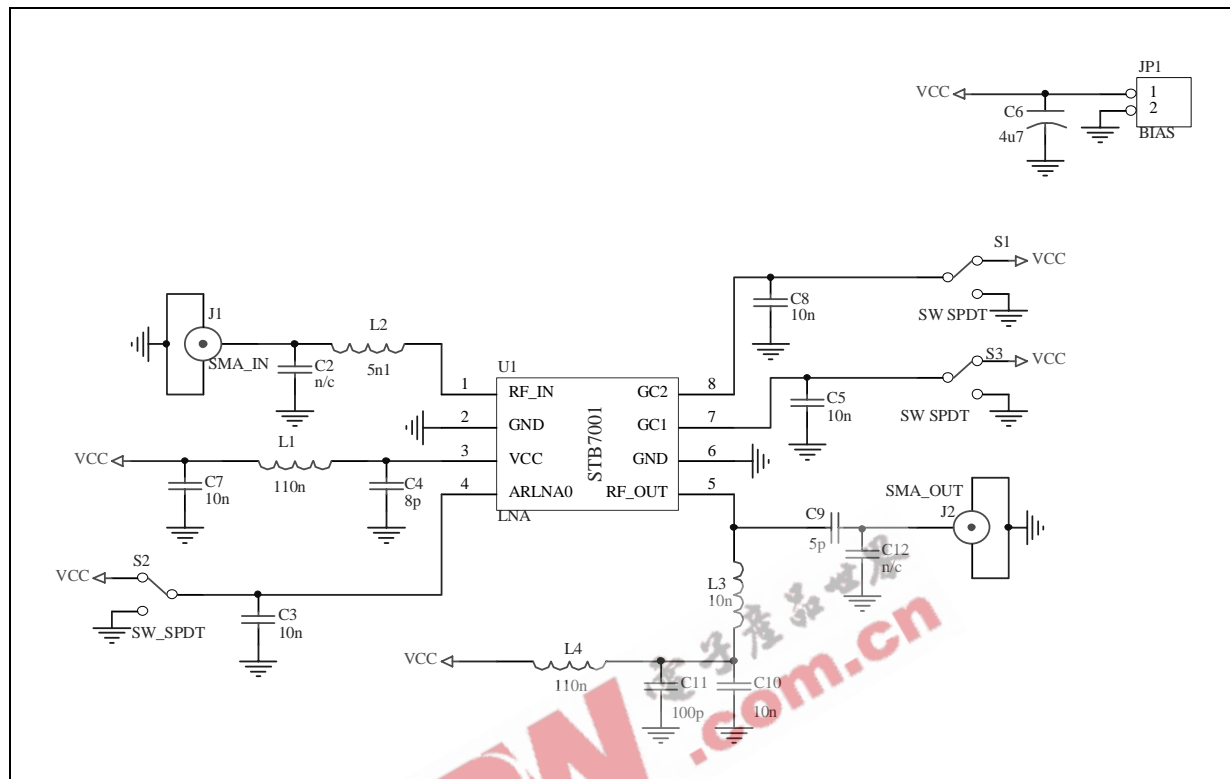
### PINOUT

Pin Number	Symbol	Description	Evaluation circuit components
1	RFin	RF input	$L2 = 5.1\text{nH}$ , $C2 = \text{n/c}$
2	Gnd	Ground	
3	Vcc	Voltage supply	$C4 = 8\text{pF}$ , $L1 = 110\text{nH}$ , $C7 = 10\text{nF}$ , $C6 = 4.7\mu\text{F}$
4	ARLNA0	Enable for power down	$C3 = 10\text{nF}$
5	RFout	RF output	$C9 = 5\text{pF}$ , $L3 = 10\text{nH}$ , $C10 = 10\text{nF}$ , $C11 = 100\text{pF}$ , $L4 = 110\text{nH}$
6	Gnd	Ground	
7	GC1	Gain selection	$C5 = 10\text{nF}$
8	GC2	Gain selection	$C8 = 10\text{nF}$

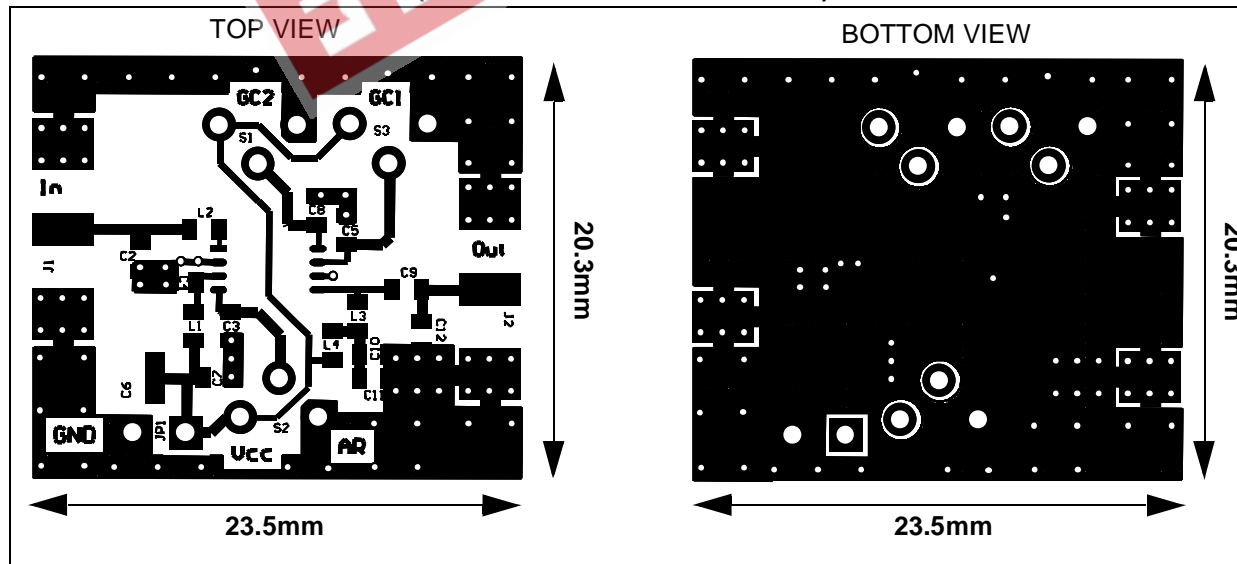
### GAIN SELECTION

	$G_{p1}$	$G_{p2}$	$G_{p3}$
GC1	0	0	1
GC2	0	1	1

TEST CIRCUIT SCHEMATIC



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



**STB7001****INPUT/OUTPUT VSWR, ISOLATION AND GAIN PARAMETERS (MEASURED DATA)****MAX GAIN**

Freq.	VSWR <sub>i</sub>	VSWR <sub>o</sub>	Isolation	Gain
905	1.16	1.15	-43.61	25.09
912.5	1.15	1.17	-45.69	25.04
913.5	1.15	1.17	-42.84	24.98
927.5	1.15	1.17	-43.36	24.92
935	1.14	1.18	-42.42	24.85
942.5	1.14	1.19	-48.58	24.79
950	1.14	1.20	-47.86	24.72
957.5	1.13	1.18	-41.52	24.68
965	1.13	1.19	-45.53	24.61
972.5	1.14	1.22	-49.18	24.57
980	1.13	1.20	-44.99	24.48
987.5	1.14	1.21	-47.83	24.41
995	1.14	1.21	-45.33	24.35

**MID GAIN**

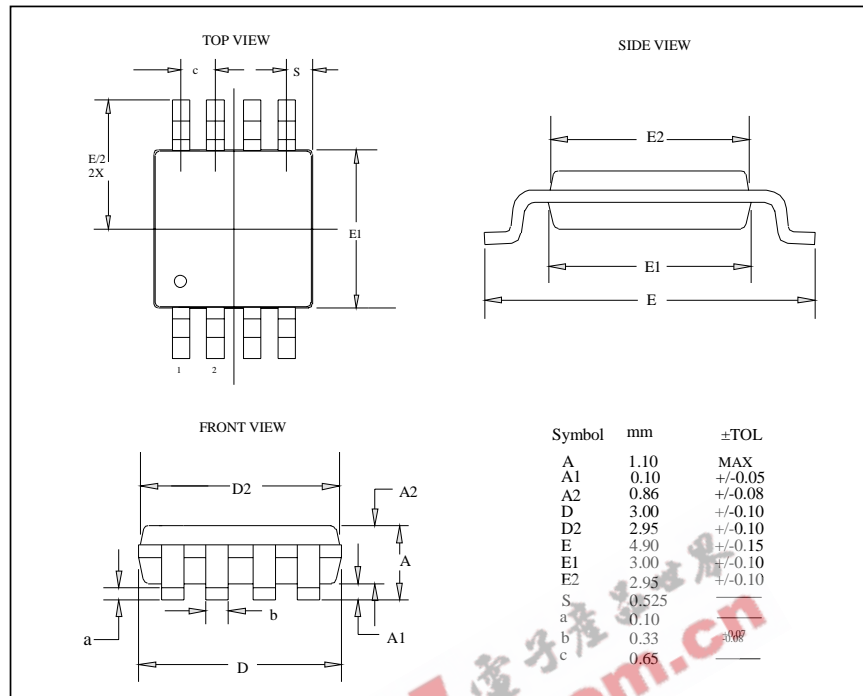
Freq.	VSWR <sub>i</sub>	VSWR <sub>o</sub>	Isolation	Gain
905	1.18	1.10	-44.66	17.41
912.5	1.18	1.11	-43.96	17.36
913.5	1.18	1.11	-46.54	17.32
927.5	1.18	1.12	-46.48	17.28
935	1.18	1.12	-46.39	17.25
942.5	1.18	1.13	-48.29	17.19
950	1.18	1.13	-47.05	17.16
957.5	1.19	1.13	-48.72	17.11
965	1.20	1.14	-50.07	17.07
972.5	1.20	1.14	-50.48	17.02
980	1.21	1.15	-55.86	16.96
987.5	1.22	1.15	-52.12	16.92
995	1.23	1.15	-56.92	16.86

## MIN GAIN

Freq.	VSWRi	VSWRo	Isolation	Gain
905	1.54	1.11	-43.83	0.07
912.5	1.54	1.11	-43.63	0.03
913.5	1.54	1.12	-45.88	-0.04
927.5	1.54	1.13	-45.76	-0.10
935	1.55	1.13	-45.69	-0.13
942.5	1.56	1.14	-46.75	-0.21
950	1.56	1.14	-45.29	-0.27
957.5	1.57	1.14	-45.20	-0.34
965	1.59	1.15	-45.38	-0.41
972.5	1.60	1.15	-45.79	-0.48
980	1.61	1.16	-45.15	-0.59
987.5	1.61	1.17	-42.79	-0.67
995	1.60	1.17	-43.49	-0.77

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MSOP8 MECHANICAL DATA



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