

## NXP SiGe:C wireless infra LNAs BGU705x

# Extremely rugged LNAs with high RF input overdrive

Designed for high linearity and low noise, these monolithic SiGe:C BiCMOS LNAs deliver 18-24 dB gain, 3-5 dB more gain than equivalents in conjunction with low power consumption. The RF input power overdrive of 20 dBm and the high ESD protection (HBM 4 kV; CDM 2 kV) make these devices extremely rugged. Integrated biasing circuitry, 3.3 V supply voltage and low external component count (only 6 capacitors) ensures easy system integration.

### Key features

- ▶ Internally matched for 50  $\Omega$ 
  - BGU7051 = 0.5 GHz and 1.5 GHz
  - BGU7052 = 1.5 GHz and 2.5 GHz
  - BGU7053 = 2.3 GHz and 2.8 GHz
- ▶ Low noise figures
  - BGU7051 = 0.60 dB
  - BGU7052 = 0.75 dB
  - BGU7053 = 0.85 dB
- ▶ High maximum power gain
  - BGU7051 = 23.5 dB
  - BGU7052 = 21.5 dB
  - BGU7053 = 18.5 dB
- ▶ High output third-order intercept (IP<sub>3</sub>)
  - BGU7051 = 32.0 dBm
  - BGU7052 = 35.5 dBm
  - BGU7053 = 36.0 dBm
- ▶ Small 10-terminal leadless package (3 x 3 x 0.85 mm)

### ▶ Evaluation boards

- BGU7051 = OM7925
- BGU7052 = OM7926
- BGU7053 = OM7927

### Applications

- ▶ GSM, W-CDMA, WiMAX, LTE base stations
- ▶ Wireless point-to-point and repeaters

The NXP BGU705x is an excellent choice for modem base station receivers in the wireless communication infrastructure, where extreme sensitivity and intermodulation characteristics demand sub-1 dB noise figures and high linearity for the low noise amplifier (LNA).

In the base station receiver, since the received signal level is quite low, the received is typically fed, just after the duplexer, to an LNA for direct amplification. Typical configurations have



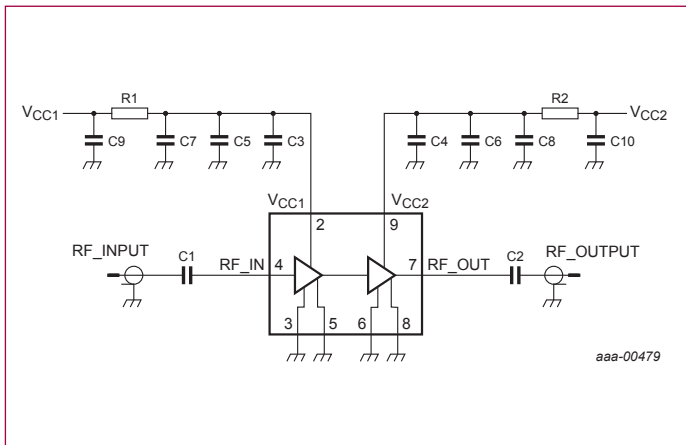
one LNA, mounted in the top of the tower, connected to a long cable for interfacing the RF signals with the base station transceiver. A second LNA is used to amplify the received signals. The BGU705x series is well suited for use as either the first or second LNA.

The BGU705x series are monolithic SiGe:C BiCMOS LNAs that deliver a high maximum gain of between 18 and 24 dB (more than three to five dB higher than equivalent devices), with power consumption between just 65 and 90 mA.

The RF input power overdrive of 20 dBm and the high ESD protection on all pins (HBM 4 kV; CDM 2 kV) make these devices extremely rugged. Integrated biasing circuitry, a standard supply voltage of 3.3 V, and low external component count (only 6 capacitors) simplify system integration and keep the bill of materials (BOM) low. As a result, engineers can produce a smaller design with higher integration and easier signal routing connections. Also, since design-in is simpler, the engineer can free up time to push the performance limits of application, realizing his design vision and gaining a competitive edge for his enterprise.

Type number	Package	@V <sub>CC</sub> [typ] (V)	@I <sub>CC</sub> [typ] (mA)	f <sub>range</sub> [min] (MHz)	f <sub>range</sub> [max] (MHz)	G <sub>ass</sub> [typ] (dB)	NF [typ] (dB)	P <sub>L(1dB)</sub> [typ] (dBm)	IP <sub>3o</sub> [typ] (dBm)	RL <sub>in</sub> [typ] (dB)	RL <sub>out</sub> [typ] (dB)
BGU7051	SOT650-1	3.3	65	500	750	23.5	0.60	17.0	32.0	27.5	18.0
		3.3	65	750	850	21.5	0.63	16.5	32.0	26.0	17.5
		3.3	65	900	1500	21.0	0.65	16.5	33.0	24.5	18.0
BGU7052	SOT650-1	3.3	80	1500	1750	21.5	0.76	15.5	37.0	23.0	22.0
		3.3	80	1850	1900	20.0	0.76	14.5	35.5	23.0	22.0
		3.3	80	1950	2500	19.7	0.79	14.5	35.0	22.0	21.0
BGU7053	SOT650-1	3.3	90	2300	2500	18.5	0.85	13.5	36.0	23.0	19.5
		3.3	90	2700	2800	17.5	0.90	13.0	36.0	26.0	23.0

### Typical application circuit for BGU705x



### BGU705x evaluation board

