

Multi-stage integrated base station LNAs with lowest NF

Delivering multiple stages in one design, these SiGe:C BiCMOS LNAs deliver the industry's lowest noise figure (0.66 - 1.05 dB) for the receive chain in silicon, while saving up to 80% in component cost. Additionally, the analog gain control up to 35 dB, the RF input power overdrive of 10-15 dBm and the high linearity (0.7 - 0.9 dBm IP₃ at maximum gain) make them very suitable in small cell sizes with demanding blocking requirements.

Key features

- ▶ Internally matched for 50 Ω
 - BGU7060 = 700 MHz to 800 MHz
 - BGU7061 = 800 MHz to 915 MHz
 - BGU7062 = 1710 MHz to 1785 MHz
 - BGU7063 = 1920 MHz to 1980 MHz
- ▶ Low noise figure ranging from 0.66 to 0.9 dB at maximum gain
- ▶ High maximum power gain: 35 dB
- ▶ RF input power overdrive of 10 to 15 dBm
- ▶ High output third-order intercept (IP₃) at maximum gain figure ranging from 0.7 dBm to 0.9 dBm
- ▶ Small 16-terminal leadless package SOT1301-1 (8 x 8 x 1.3 mm)
- ▶ Evaluation boards
 - BGU7060 = OM7954
 - BGU7061 = OM7935
 - BGU7062 = OM7936
 - BGU7063 = OM7937

Applications

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

The NXP BGU706x 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).

When signals arrive at the base station receiver, they're typically quite weak. For this reason, the received signal is often fed, just after the duplexer, to an LNA for direct amplification. The LNA conditions the signal and then sends it over the long cable that connects the top of the base station to the bottom. When the signal reaches the lower cabinet, further analog and digital processing is performed. If the LNA needs to handle large input signals, a variable RF attenuator function is also required. The extensive feature set of the BGU706x makes it well suited to meet all these LNA requirements.



The BGU706x combines multiple stages in one design, for a gain switch function (high and low gain), a smaller footprint, easier routing, and dramatic cost savings. In a typical 6-channel receiver, using the BGU706x can reduce component cost by as much as 80%.

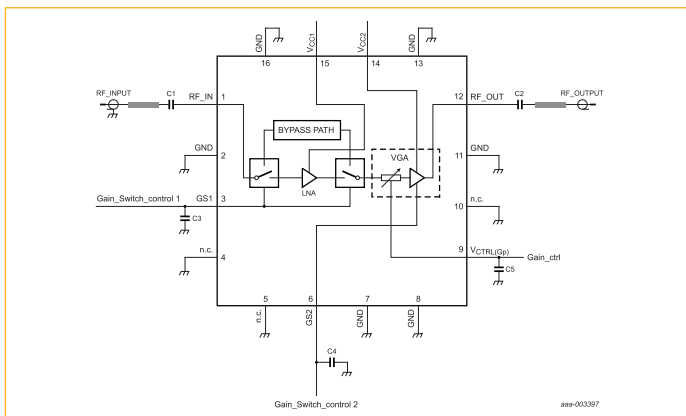
Manufactured in NXP's SiGe:C BiCMOS process, the BGU706x delivers the industry's lowest noise figure in the receive chain (0.66 - 1.05 dB), and very high linearity (0.9 to 2.5 dBm IP₃ at maximum gain).

The BGU706x makes the overall system more stable, thanks to low power consumption (so there is less heat dissipation to jeopardize noise figures), high RF input overdrive (10 to 15 dBm), and an analog-controlled gain control with a range up to 35 dB.

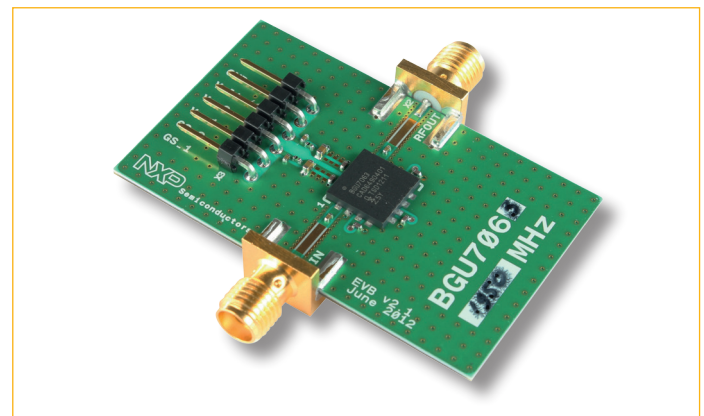
Being able to customize the solution increases design success by making it easier to meet exact design requirements and tailor the integration. The many features of the BGU706x make it an ideal selection for small cell sizes with demanding blocking requirements. And NXP will never let the drive to integration compromise the performance of your RF and microwave system designs.

Type number	Package	@V _{CC} [typ] (V)	@I _{CC} [typ] (mA)	f _{range} [min] (MHz)	f _{range} [max] (MHz)	G _p [typ] (dB)	NF [typ] (dB)	P _{L(1dB)} [typ] (dBm)	IP ₃ [typ] (dBm)	R _{Lin} [typ] (dB)	R _{Lout} [typ] (dB)
BGU7060	SOT1301AA	5	175	700	800	3	22.9	12.6	31.1	20	19
						12	15	9.4	23.8	22	18
			205	18	7.2	-7.6	5.6	20	19		
				35	0.91 0.66 (G _p =37dB)	-13.3	-0.7	19	19		
BGU7061	SOT1301AA	5	175	800	915	3	22.3	13	29	20	19
						12	15	10	25	26	18
			200	18	6	-5.8	6.3	20	19		
				35	0.91 0.77 (G _p =37dB)	-13	0.7	33	16.3		
BGU7062	SOT1301AA	5	190	1710	1785	3	20.6	10.5	28	23	16
						12	15	10	24	23	16
			220	18	5.8	-5.9	5	23	16		
				35	0.95 0.85 (G _p =37dB)	-12.8	0.8	25	17		
BGU7063	SOT1301AA	5	190	1920	1980	3	22	10.5	28	23	16
						12	15	10	24	25	18
			230	18	6.4	-6.4	5.4	35	15		
				35	1.05 0.9 (G _p =37dB)	-12.5	0.9	31	15		

BGU706x block diagram



BGU706x evaluation board



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