NXP GPS LNAs
BGU7003 and BGU7005

Get the fastest TTFF* with GPS LNAs that use proven QUBiC4X SiGe:C

Manufactured in NXP's breakthrough QUBiC4X SiGe:C process technology and available in the industry's smallest package, these highly integrated GPS LNAs reduce cost while delivering better sensitivity, greater immunity against jamming signals, and higher linearity.

Features BGU7003

‣ Small, 6-pin SOT891 leadless package (1.0 x 1.0 x 0.5 mm)
‣ Low noise figure (NF): 0.80 dB at 1.575 GHz
‣ Integrated, temperature-stabilized bias for easy design
‣ Bias current configurable with external resistor
‣ High insertion power gain: 18.3 dB at 1.575 GHz
‣ Low current consumption in power-down mode (<1 µA)
‣ Optimized performance at low supply current (5 mA)
‣ ESD protection on all pins
‣ Supply voltage: 2.2 to 2.85 V
‣ Proven, robust QUBiC4X SiGe:C process technology (fT = 110 GHz)

Features BGU7005

‣ Requires only 4 external components (including decoupling) to build complete GPS front-end.
‣ Small, 6-pin SOT886 leadless package (1.45 x 1.0 x 0.5 mm)
‣ Requires only one external matching component
‣ Low current consumption (5 mA)
‣ Low noise figure (NF): 0.9 dB at 1.575 GHz
‣ High insertion power gain: 16 dB at 1.575 GHz
‣ Low current consumption in power-down mode (<1 µA)
‣ ESD protection on all pins
‣ Supply voltage: 1.5 to 2.85 V, optimized for 1.8 V
‣ Proven, robust QUBiC4X SiGe:C process technology (fT = 110 GHz)

*TTFF = Time-To-First-Fix

founded by Philips

These LNAs, designed for GPS receiver applications, are produced in NXP's industry-leading QUBiC4X process, a 0.25-µm SiGe:C technology. They have very low noise figures and superior linearity performance, so they help improve overall sensitivity, which in turn leads to faster Time-To-First-Fix (TTFF) and better tracking.

The BGU7003, optimized for small footprint and flexibility, is ideally suited for use in GPS front-end modules. The BGU7005, optimized for a minimum of non-critical external components, is an excellent solution for discrete implementations of the GPS front-end.

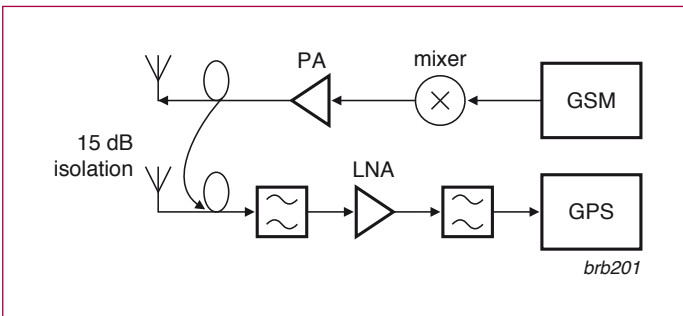The proven QUBiC4Xi process improves overall RF performance and means the LNAs are less expensive and offer higher, more flexible performance than their GaAs counterparts.

They restore sensitivity, provide greater immunity against out-of-band cellular signals, reduce filtering requirements, and lower overall cost. They can be placed close to the GPS antenna, minimizing the noise figure. Additional gain amplifies the GPS signal and raises the on-board signal-to-jammer ratio.

The GPS receiver can be put close to the primary phone antenna, for the best GSM/UMTS performance, while the GPS antenna can be placed far away. This improves antenna-to-antenna isolation and results in higher performance.

Both products have an enable function. In power-down mode, they consume less than 1 µA.

LNA in GPS block diagram (in GSM handset)

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Type	Package	supply voltage V_{cc} V		supply current I_{cc} mA			@ 1.575 GHz insertion power gain $|s_{21}|^2$ dB			noise figure NF dB	input power at 1 dB gain compression $P_{I(1dB)}$ dBm					input third-order intercept point f_1 = 1713 MHz, f_2 = 1851 MHz $IP3_i$ dBm				
		Min	Max	Min	Typ	Max	Min	Typ	Max	Typ	V_{cc} = 1.8V, Min	V_{cc} = 1.8V, Typ	V_{cc} = 2.5V, Icc = 5mA	V_{cc} = 2.85V, Min	V_{cc} = 2.85V, Typ	V_{cc} = 1.8V, Min	V_{cc} = 1.8V, Typ	V_{cc} = 2.5V, Icc = 5mA	V_{cc} = 2.85V, Min	V_{cc} = 2.85V, Typ
BGU7003	SOT891	2.2	2.85	3	-	15	16	18.3	20	0.8	-	-	-20	-	-	-	-	0	-	-
BGU7005	SOT886	1.5	2.85	-	5	-	-	16	-	0.9	-14	-10	-	-11	-8	5	10	-	5	12