Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us
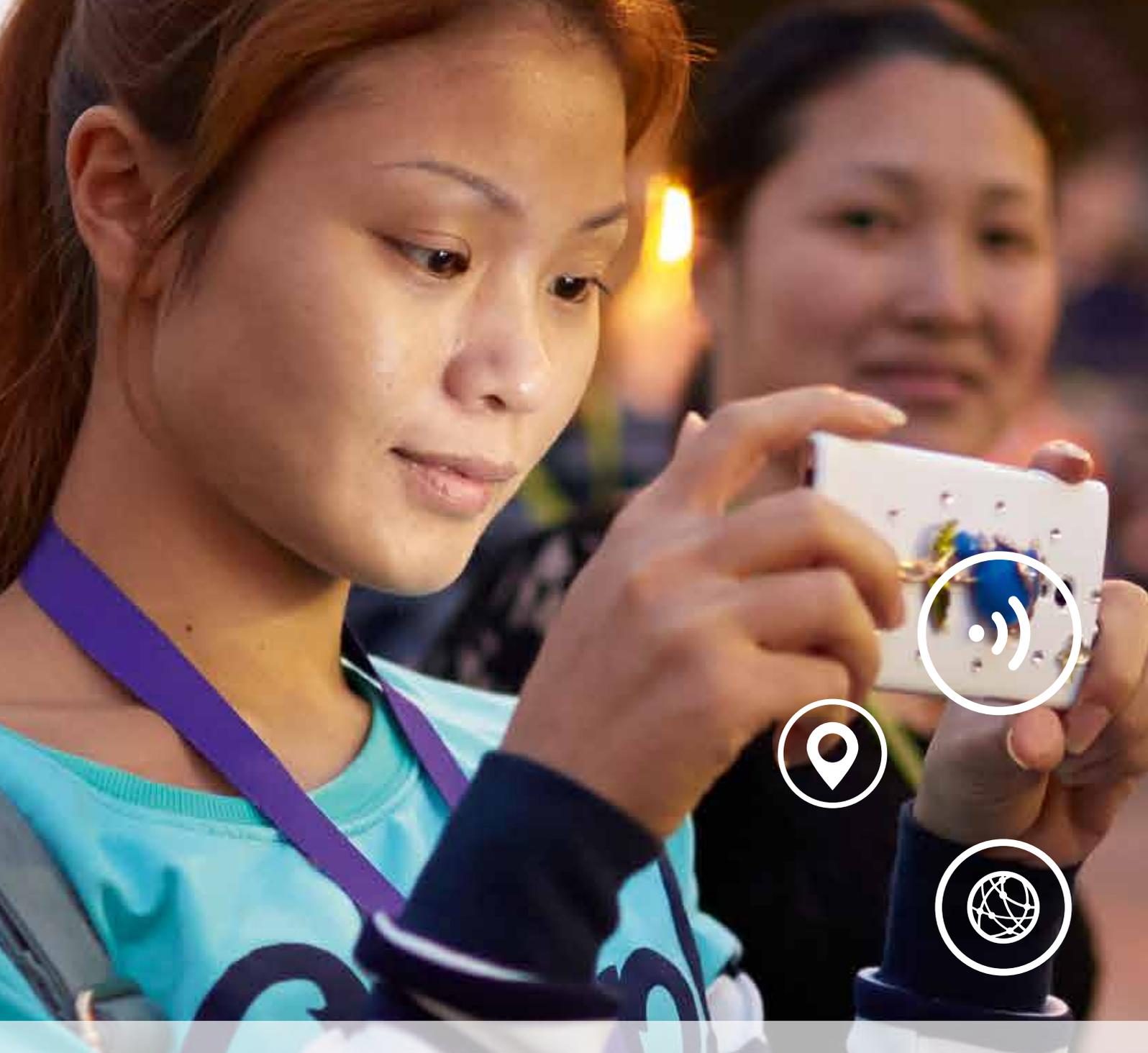
RF MANUAL 20TH EDITION

Application and design manual for Smart Antenna Solutions

May 2017

RF integration without compromise

At NXP, we are committed to ensuring you have the best mobile connection at all times.

With more than 3 Billion consumers online and over 50 Billion connected devices, the demand for always-on, always-connected devices continues to surge. With access to the internet by mobile device increasing by more than 200% every year, mobile device manufacturers and infrastructure network vendors now face unprecedented challenges to deliver the high performance voice and data services for all the downloading, streaming and cloud based services we have come to expect.

RF front-ends are becoming increasingly complex with the rapid deployment of LTE underway. More antennas are needed as well as support for an ever increasing number of cellular frequency bands. Just a few years ago only a handful of bands would need to be supported, whereas now 30+ bands are supported. To address all these RF challenges, while simultaneously achieving miniaturization and cost reduction, a new approach is needed.

The 20th edition of the RF Manual provides you with a comprehensive overview of our Smart Antenna Solutions with the highest level of integration without compromise; High performance, fully integrated combinations of multiple RF functions close to the antennas, delivering the highest, flawless performance, reliability, flexibility, quality or cost-of-ownership.
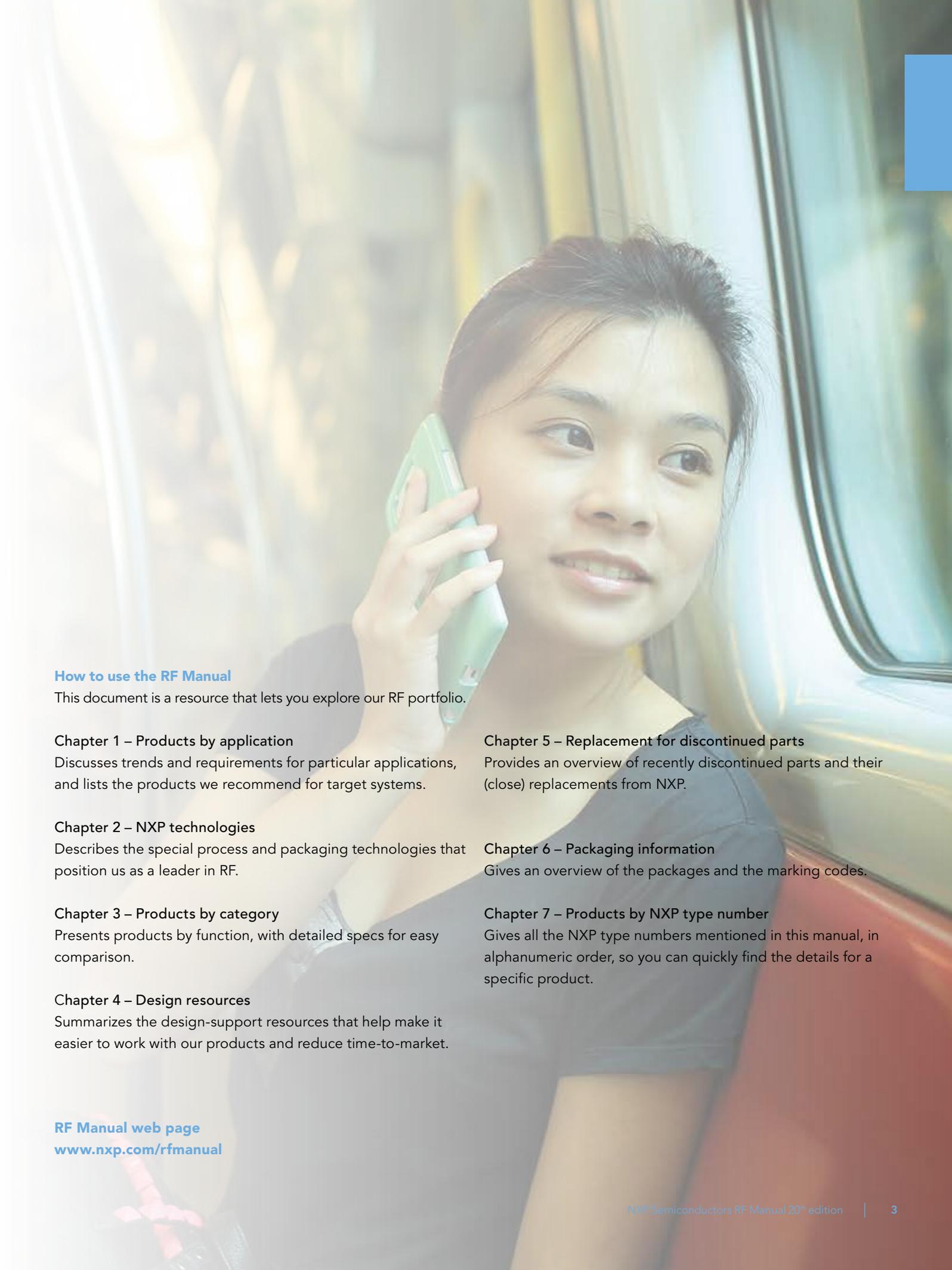
How to use the RF Manual

This document is a resource that lets you explore our RF portfolio.

Chapter 1 – Products by application
Discusses trends and requirements for particular applications, and lists the products we recommend for target systems.

Chapter 2 – NXP technologies
Describes the special process and packaging technologies that position us as a leader in RF.

Chapter 3 – Products by category
Presents products by function, with detailed specs for easy comparison.

Chapter 4 – Design resources
Summarizes the design-support resources that help make it easier to work with our products and reduce time-to-market.

Chapter 5 – Replacement for discontinued parts
Provides an overview of recently discontinued parts and their (close) replacements from NXP.

Chapter 6 – Packaging information
Gives an overview of the packages and the marking codes.

Chapter 7 – Products by NXP type number
Gives all the NXP type numbers mentioned in this manual, in alphanumeric order, so you can quickly find the details for a specific product.

RF Manual web page
www.nxp.com/rfmanual

Contents

LEADING IN ADVANCED RF SOLUTIONS

We're **trusted** by the world's top businesses. That's why 9 out of the top 10 smartphone OEMs use NXP GPS LNAs.

In Focus: BL SAS new type naming convention

As one of the industry's leading technology company, NXP is constantly looking for ways to improve our products and our accessibility to those evaluating our products. One way that we've improved accessibility is by creating a new naming convention for the Smart Antenna Solutions portfolio. The parts you're already ordering will not change. However, new part numbers will follow a simple and consistent structure to make it easier for you to identify and order in the future.

1. The first set of letters in the new part numbers represent the market: LTE, WLAN, GPS, BTS for Basestation and small cell, MMW for millimeter Wave, and RDR for our line of Radar products.

2. The next two numerical digits identify the product's function, like LNA, MPA, etc, see picture.

3. The last two numerical digits are like a serial number used e.g. to indicate revision history.

4. As the frequency is one of the most important aspects in the smart antenna domain, the next alpha digit indicates frequency of the part, like H for 2 – 2.8 GHz, K for 12 - 40 GHz, etc, see below.

0 = Passive
1 = LNA
2 = To be defined
3 = LNA Bypass
4 = Multi LNA + SW
5 = LNA, DSA, VGA / Multi LNA, SW, MIPI, MUX
6 = MPA
7 = FEIC
8 = LNA, VCO, PLL, MIX, IF
9 = ABF

LTE = LTE
WLAN = Wireless LAN
GPS = GPS
BTS = Basestation / Small Cell
MMW = mmWave
RDR = Radar

A = ALL
L = 0.7 —— 1
M = 1.4 —— 2
H = 2 —— 2.8
U = 3 —— 4
C = 4 —— 8
X = 8 —— 12
K = 12 —— 40
V = 40 —— 75
W = 75 —— 100
Y = Multi frequency

C = CSP

FUNCTION
SERIAL NUMBER
MARKET
FREQUENCY IN GHz
PACKAGE

LTE1001MC

Learn more on SharePoint: BL SAS – Marketing & Sales – Marketing Public Documents

5. And lastly, if the part comes in a CSP package, it will be indicated by the letter C.

To get used to this new type naming methodology more quickly, we selected our 55 most important products and 'translated' them according the new naming convention. You will see them often be communicated next to each other (dual branding). We're confident this will not only be easier to understand but will make ordering simple.

New Name	Current Type	New Name	Current Type	New Name	Current Type
BTS1001H	BGU8053	GPS1102M	BGU7007	LTE3301HC	BGS8H5UK
BTS1001L	BGU8051	GPS1103M	BGU7004	LTE3301L	BGS8L5
BTS1001M	BGU8052	GPS1104M	BGU7008	LTE3301LC	BGS8L5UK
BTS3001H	BGU8063	GPS1201M	BGU8009	LTE3301U	BGS8U5
BTS3001L	BGU8061	GPS1202M	BGU8019	LTE4101YC	BGS613L5UK
BTS3001M	BGU8062	GPS1203M	BGU8019W/N2	LTE4102YC	BGS613H5UK
BTS5001H	BGU7075	GPS1301M	BGU8103	LTE4201YC	BGS8LL5UK
BTS5001M	BGU7073	GPS1401M	BGU8309	LTE4202YC	BGS8LH5UK
BTS5002M	BGU7078	LTE1001H	BGU8H1	LTE4203YC	BGS8HH5UK
BTS5101M	BGU8812	LTE1001L	BGU8L1	LTE5001HC	BGS829H6UK
BTS5201H	BGU8823	LTE1001M	BGU8M1	LTE5001LC	BGS829L6UK
BTS5201L	BGU8821	LTE1001MC	BGU8M1UK	LTE5001MC	BGS829M6UK
BTS5201M	BGU8822	LTE3001H	BGS8H2	LTE5101HC	BGS839H6UK
BTS6001A	BGA7210	LTE3001L	BGS8L2	WLAN3001C	BGS8358
BTS8001A	BGX7101HN/1	LTE3001M	BGS8M2	WLAN3001H	BGS8324
GPS1001M	BGU6005/N2	LTE3101MC	BGS8M4UK	WLAN3101C	BGS8458
GPS1002M	BGU6009/N2	LTE3201HC	BGS6H5UK	WLAN3101H	BGS8424
GPS1101M	BGU7005	LTE3301C	BGS8C5	WLAN7001C	BGF8458
		LTE3301H	BGS8H5	WLAN7002C	BGF8658

1. Products by application

NXP RF product catalog:

http://www.nxp.com/rf

1.1 New products

DEV = in DEVelopment
CQS = Customer Qualification Samples
RFS = Released For Supply

Type	New name	Application/description	Expected status June 2015	Planned release	Section
NEW: SiGe:C LNAs (for e.g. GPS)					
BGU8103	GPS1301M	GPS LNA, low current 1 mA	RFS	released	3.1.1
BGU8309	GPS1401M	GPS LNA, small package (0.8 x 0.8 mm2)	RFS	released	3.1.1
NEW: LNAs for LTE					
BGS8L5	LTE3301L	LTE LNA with bypass from 0.7 to 1 GHz, 0.7 dB NF, 15 dB gain	DEV	Q2-2017	3.1.1
BGS8M5	LTE3301H	LTE LNA with bypass from 1.5 to 2.7 GHz, 0.8 dB NF, 14 dB gain	DEV	Q2-2017	3.1.1
BGS8C5	LTE3301C	LTE LNA with bypass from 3.4 to 3.8 GHz, 1.0 dB NF, 16 dB gain	DEV	Q2-2017	3.1.1
BGS8U5	LTE3301U	LTE LNA with bypass from 5.1 to 5.95 GHz, 1.25 dB NF, 15 dB gain	DEV	Q2-2017	3.1.1
-	LTE3401L	LTE LNA with bypass from 0.7 to 1 GHz, 0.85 dB NF, 18 dB gain	DEV	Q2-2017	3.1.1
NEW: LNAs for WLAN					
BGS8324	WLAN3001H	2.4 GHz LNA for WLAN, 802.11b/g/n	RFS	released	3.1.1
BGS8358	WLAN3001C	5 GHz LNA for WLAN, 802.11a/n/ac	RFS	released	3.1.1
BGS8424	WLAN3101H	2.4 GHz LNA for WLAN, 802.11b/g/n, small package	RFS	released	3.1.1
BGS8458	WLAN3101C	5 GHz LNA for WLAN, 802.11a/n/ac, small package	RFS	released	3.1.1
BGF8458	WLAN7001C	5 GHz FEIC for WLAN, 802.11a/n/ac	DEV	Q2-2017	3.1.1
NEW: LNAs for wireless infrastructures					
BGU7078	BTS5101H	Variable gain high-linearity LNA 2.3-2.6 GHz, 1.1 dB NF	RFS	released	3.1.1
BGU8061	BTS3001L	High-linearity LNA with bypass 0.3-1.5 GHz, 1.1 dB NF	RFS	released	3.1.1
BGU8062	BTS3001M	High-linearity LNA with bypass 1.5-2.5 GHz, 1.3 dB NF	RFS	released	3.1.1
BGU8063	BTS3001H	High-linearity LNA with bypass 2.5-4.0 GHz, 1.6 dB NF	RFS	released	3.1.1
NEW: DOCSIS Cable Modem					
BGA3131	-	DOCSIS 3.1 upstream amplifier	RFS	released	3.1.3

1.2 Wireless connectivity mobile & wearable

1.2.1 WLAN for mobile & wearable application

Application diagram for WLAN

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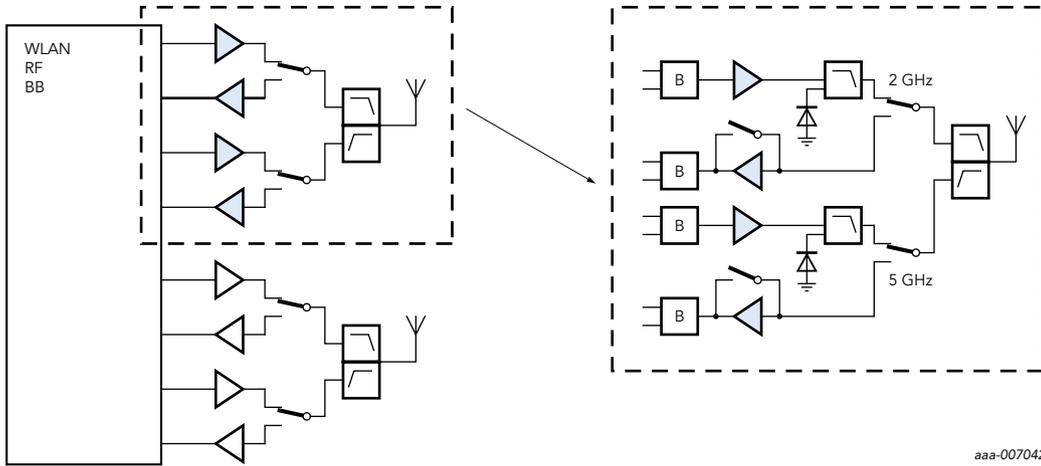
Recommended products

Function	Product	gain (dB)	NF (dB)	IIP3 (dB)	Package	Type	New name
2.4 GHz LNA + switch	MMIC	16 @ 8.3 mA	2.0	7	SOT1261	BGS8324	WLAN3001H
		15.5 @ 8.4 mA	2.0	6	SOT1261	BGS8424	WLAN3101H
5 GHz LNA + switch	MMIC	12.5 @ 9.5 mA	2.3	10	SOT1260	BGS8358	WLAN3001C
		13.5 @ 10.7 mA	2.4	9	SOT1234	BGS8458	WLAN3101C

Function	Product	gain (dB)	NF (dB)	Pout (dB)	Package	Type	New name
5 GHz FEIC	MMIC	14 @ 8 mA	2.3		SOT1436	BGF8458	WLAN7001C

For the complete product selection please see section 3.1.1

Product highlight:

WLAN LNAs plus switch BGS8424 [WLAN3101H] and BGS8458 [WLAN3101C]

These fully integrated LNAs plus switch are optimized for mobile IEEE 802.11b/g/n/ac WLAN applications in the 2.4 and 5 GHz bands. Manufactured in our high-performance QUBiC4 GEN8 technology, they combine best-in-class gain, noise figure, linearity for the LNA and an integrated RX/TX(/BT) switch with the process stability and ruggedness that SiGe technology is known for.

Features

▶ Fully integrated, high-performance LNA and switch (no external matching or DC blocking required)
▶ LNA Noise Figure (NF) of 2.0 dB (2.4 GHz) and 2.4 dB (5 GHz), with low current consumption of 8.4 resp. 10.7 mA
▶ Integrated TX-RX(-BT) switch with low losses (0.7 dB)
▶ Low bypass current of 8 resp. 4 μA
▶ Single-supply operation covering full Li-ion battery range from 2.7 to 5.25 V
▶ Small QFN-style package (1.5 x 1.5 x 0.3 resp. 1.2 x 1.4 x 0.3 mm, 0.4 mm pitch)

1.2.2　LTE LNA

While LTE/4G offers consumers much higher data rates (up to 300 Mbits/s) compared to UMTS/3G, LTE smartphones are more complex because they need more antennas, are used for multiple cellular and connectivity frequencies, and require additional switches and duplexers. BGS8x2 and BGU8x1 LTE LNAs increase the receive sensitivity of LTE main and diversity receivers by offering system-optimized gain, low noise figure, and high third-order linearity. As a result, LTE smartphone users enjoy higher and more consistent data rates. These features also mean RF designers have more options, as they can amplify the LTE signal close to the antenna and decrease line losses - something that is especially important for large tablet and combination phone/tablet ("phablet") form factors. The BGU8x1 and BGS8x2 LTE LNAs are available for Low (BGU8L1, BGS8L2), Mid (BGU8M1, BGS8M2) and High (BGU8H1, BGS8H2) cellular bands. The difference between the BGS8x2 and the BGU8x1 is that the BGS8x2 has a switch to bypass the LNA. This is beneficial when high RF signal levels are available at the input and there is no need for additional gain, because the LNA can be bypassed and switched off to lower the power consumption.

Application diagram of an LTE LNA in a mobile phone
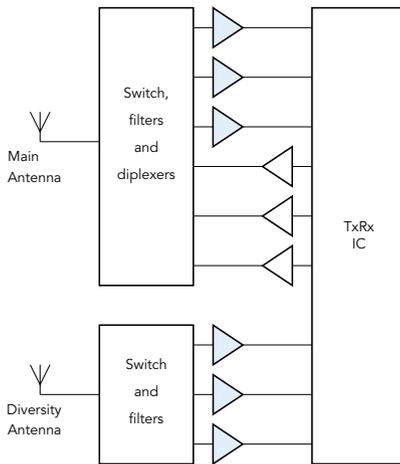
Recommended products

Function	Product	Frequency (MHz)	Gain (dB)	NF (dB)	Package	Type	New name
LNA	MMIC	728 - 960	14	0.7	SOT1232	BGU8L1*	LTE1001L
		1805 - 2200	13	0.8		BGU8M1*	LTE1001M
		2300 - 2690	13	0.9		BGU8H1*	LTE1001H
LNA + bypass	MMIC	728 - 960	13	0.85		BGS8L2	LTE3001L
		1805 - 2200	14.4	0.85		BGS8M2*	LTE3001M
		2300 - 2690	12.5	1.0		BGS8H2*	LTE3001H
		703 - 960	13.6	0.7		BGS8L5*	LTE3301L
		1425-2690	13.1	0.75		BGS8H5*	LTE3301H
		3400 - 3800	15.5	1.0		BGS8U5	LTE3301U
		5150 - 5850	15	1.25		BGS8C5	LTE3301C
		703-960	18	0.85		-	LTE3401L

* also available in CSP package, contact NXP for detailed information on specifications

For the complete product selection please see section 3.1.1

Product highlight:
LTE LNAs with bypass BGS8x5 [LTE3301x]

The BGS8x5 delivers a full range of LTE LNAs covering the full LTE(-U) frequency range from 700 MHz up 6 GHz with products, each optimized for a sub-range of frequencies. The BGS8x5 can be applied in both primary and diversity path of LTE receivers to deliver better sensitivity under severe co-existence conditions (e.g. simultaneous cellular TX in FDD systems). The bypass switch allows to switch off the LNA under higher input signal conditions, thereby reducing the current consumption to less than 1 uA. The BGS8x2 requires only one external matching inductor.

Features

▸ Smallest 6-pin leadless package (1.1 mm x 0.7 mm x 0.37mm)
▸ Cover all bands with a Low (from 700 to 960 MHz), High (from 1425 to 2700 MHz), Ultra High (from 3400 to 3800 MHz) and C-band (from 5150 to 5850 MHz)
▸ Noise figure (NF) between 0.7 and 1.25 dB at a gain between 13 and 15.5 dB
▸ Current consumption of 4.5 mA in gain mode, < 1 uA in bypass mode
▸ High linearity (1 dB compression point and IIP3)
▸ Supply voltage from 1.5 to 3.1 V
▸ Require only one input matching inductor

1.2.3   GPS for smartphones, tablets and wearables

BGU600x/700x/800x LNAs are designed to improve the linearity, noise figure, and reception of GPS signals, including GloNass and Compass, while offering the smallest footprint in the market. As the industry's first GPS LNAs to dynamically suppress strong cellular, Bluetooth, and WLAN transmit signals, the NXP BGU600x/700x/800x series offers the best reception for weak GPS signals, delivering an improvement of 10 dB or better IP3 under -40 to -20 dBm jamming conditions, while the noise figure remains below 1 dB. Requiring only one external component, the BGU600x/700x/800x LNAs save up to 70% in PCB size and 10% in component cost.

GPS is a standard feature in a wide range of consumer products, from smartphones, wearables, and tablets to digital still cameras, watches, electric cars, and more. GPS signal power levels are weak and below the noise floor at -155 dBm. In many of these products, especially smartphones and tablets, strong transmitters such as Bluetooth, WLAN, and cellular can drive the GPS LNA into compression. When the GPS LNA is in compression, it has lower gain, which causes poor GPS reception; it also generates inter-modulation products and harmonics from the transmitter signals, capable of overpowering weak signals and leading to loss of GPS reception.

The BGU600x/700x/800x series use adaptive biasing to immediately detect any output power from jammers, and compensate by temporarily increasing the current. As a result, optimal GPS signal reception is maintained for as long as possible. Each device in the BGU700x/800x series requires only one input-matching inductor and an optional one supply decoupling capacitor to complete the design. This creates a very compact design and lowers the bill of materials.

Application diagram of a GNSS LNA with pre- and post-SAWs and notches, implemented as discretes, for 788 MHz (LTE) and 2.4 GHz (WLAN) suppression

aaa-007041
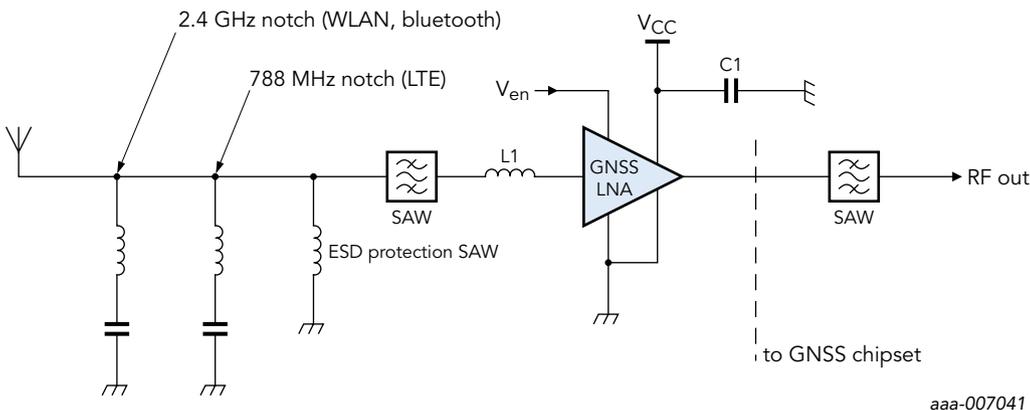
Product highlight:

GPS LNA in diamond package BGU8309 [GPS1401M]

The BGU8309 [GPS1401M] has all the features of its predecessors put into smaller diamond shaped package. It features adaptive biasing to have optimal linearity versus current consumption performance in co-existence scenarios with radios in mobile phones. In nominal, non-jamming conditions it delivers 17dB gain at a noise figure of 0.7 dB. The BGU8309 requires only one external matching inductor.

Features

▶ Smallest 5-pin leadless package (0.8 x 0.8 x 0.35 mm)
▶ Covers full GNSS L1 band, from 1559 to 1610 MHz
▶ Noise figure = 0.7 dB at a gain of 17 dB
▶ High 1 dB compression point of -9 dBm and out-of-band IP3i of 5 dBm
▶ Supply voltage 1.5 to 3.1 V, supply current 3.6 mA
▶ Power-down mode current consumption < 1 uA
▶ Integrated, temperature-stabilized bias for easy design

Recommended products

Function	Product	Icc (mA)	Gain (dB)	NF (dB)	Package	Type	New name
value LNA		5.2	17.5	0.85	SOT886	BGU6005	GPS1001M
		5.1	17.0	0.9	SOT1230	BGU6009	GPS1002M
mid end LNA		4.5	16.5	0.85	SOT886	BGU7005	GPS1101M
		4.8	18.5	0.85	SOT886	BGU7007	GPS1102M
high end LNA	MMIC	4.2	18.0	0.65	SOT1230	BGU8009*	GPS1201M
		4.6	18.5	0.55	SOT1232	BGU8019	GPS1202M
		4.0	17.0	0.7	SOT1226	BGU8309	GPS1401M
low current LNA		1.2	17.5	0.8	SOT1232	BGU8103*	GPS1301M
automotive qualified LNA		4.5	16.5	0.85	SOT886	BGU7004	GPS1103M
		4.8	18.5	0.85	SOT886	BGU7008	GPS1104M

* also available in CSP package, contact NXP for detailed information on specifications

For the complete product selection please see section 3.1.1

In wearable health and fitness applications like smart watches, low current is critical, but linearity requirements can be relaxed since the only relevant on-board jammers are Bluetooth and 2.4 GHz WLAN. For these low-current applications, NXP offers the BGU8010, which uses 3 mA of current and has a gain of 16 dB, the BGU8020, which uses 2 mA of current and has a gain of 16.5 dB, and the BGU8103, which uses 1.2 mA of current and has a gain of 17 dB.

Application diagram of wearable health and fitness device, showing the input-match inductor (L1) and a post-SAW
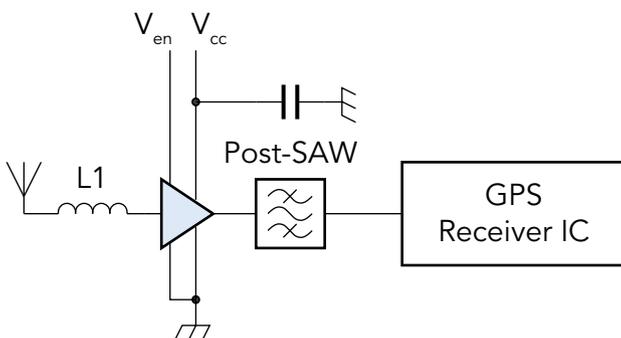
This application consists of the input match inductor L1 and a post SAW. Because no strong jammer signals are present, a pre-SAW is unnecessary.

Product highlight:
Low-current GPS LNA BGU8103 [GPS1301M]

Designed for extremely low power consumption, the BGU8103 delivers optimal performance even when exposed to jammers from coexisting cellular and connectivity transmitters.

Features
▶ Covers full GNSS L1 band, from 1559 to 1610 MHz
▶ Noise figure (NF) = 0.85 dB
▶ Gain 17.3 dB
▶ Input 1 dB compression point of -16 dBm
▶ Out-of-band IP3i of -8 dBm
▶ Supply voltage 1.5 to 3.1 V
▶ Optimized performance at low supply current of 1.2 mA
▶ Power-down mode current consumption < 1 µA
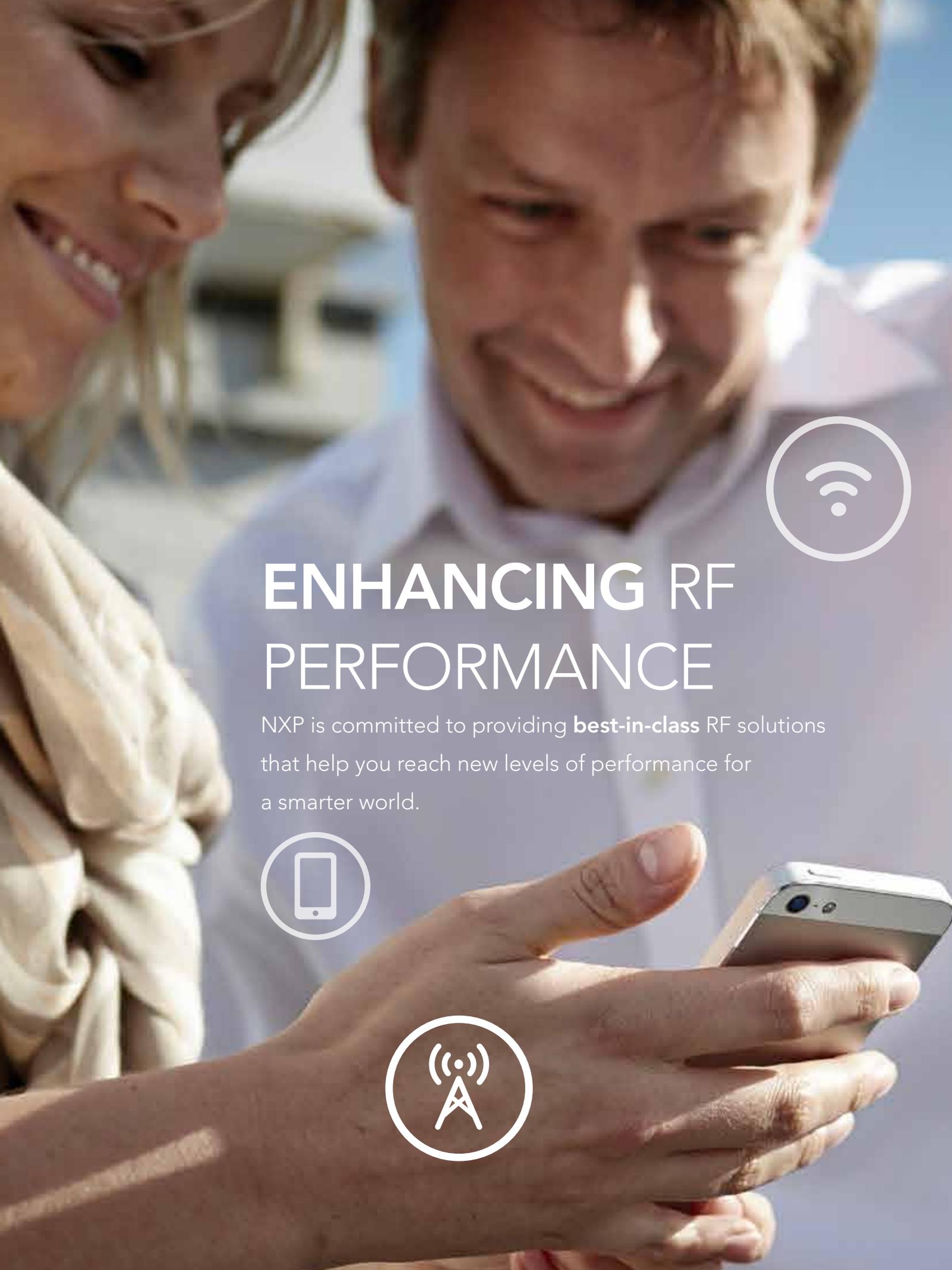
ENHANCING RF PERFORMANCE

NXP is committed to providing **best-in-class** RF solutions that help you reach new levels of performance for a smarter world.

1.3 Wireless communication infrastructur

1.3.1 Base stations (all cellular standards and frequencies)

RF components for transmit line-ups and receive chains

As a global leader in RF technology and component design, NXP Semiconductors offers a complete portfolio of RF products, from low- to medium-power signal conditioning, that delivers advanced performance and helps simplify your design and the development process. Our solutions range from discretes and amplifiers (LNA, VGA, MPA) to mixers/oscillators.

Application diagram of base station showing Tx, Rx, and Tx feedback functions
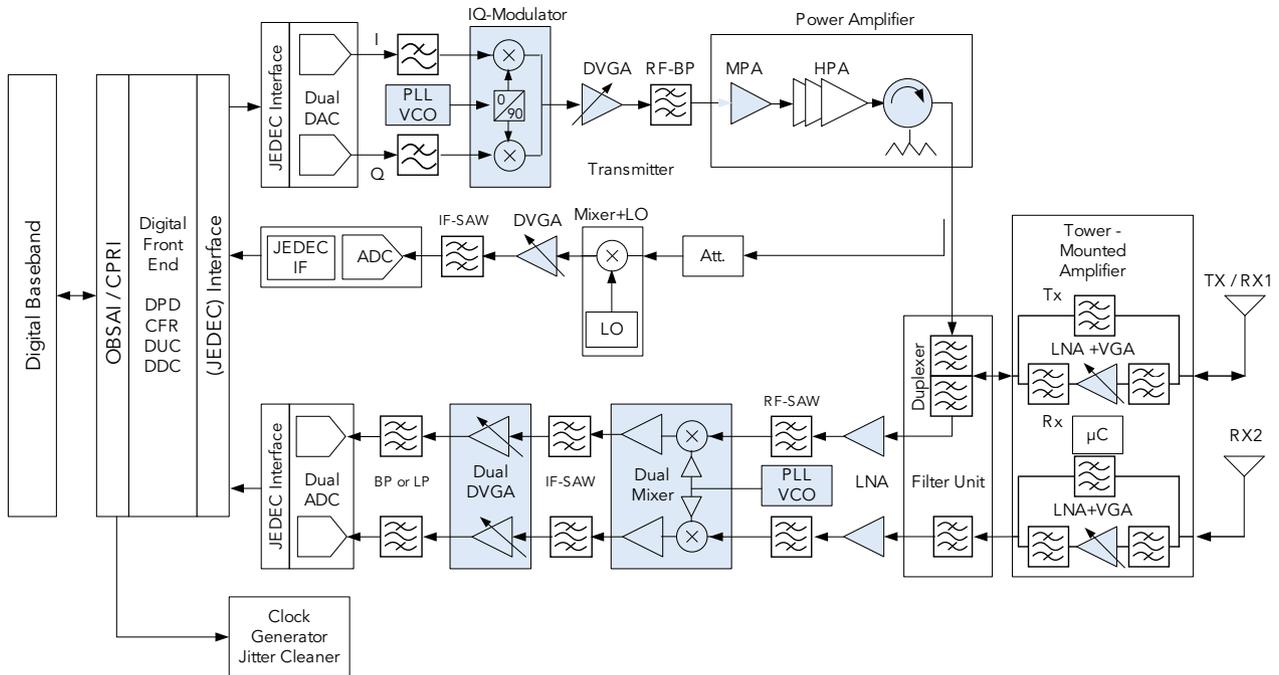
Tx functions are in the upper region, Rx in the lower, and Tx feedback in the middle.

Product highlight:
Base-station LNAs with ultra-low noise BGU805x [BTS1001x]

The BGU8051, BGU8052, and BGU8053 SiGe:C BiCMOS LNAs are designed to support high-performance communications systems from 300 up to 6000 MHz. Key enablers of maintaining sensitivity, even in adverse signal conditions, are high linearity (37 dB OIP3), ultra-low noise figures (e.g. 0.4 dB), and wideband S11<20 dB behavior. These ultra-low noise amplifiers enable 2G/3G/4G macro and micro base-station performance at unsurpassed value.

Features
▸ Three versions to cover low frequency (300 – 1500 MHz), mid frequency (1500 – 2500 MHz) and high frequency (2500 – 6000 MHz) ranges
▸ Very low Noise Figure 0.43 – 0.57 dB at a gain of 18 dB
▸ Very high linearity (1 dB compression point of 19dBm and IIP3 of 39 dBm) at 50 mA current consumption
▸ Supply voltage from 3.0 to 5.25 V
▸ Adjustable bias current through external resistor

Recommended products

Function	Product	Frequency	C_d (pF)	R_d (Ω)	IP3$_O$ (dBm)	Package	Type name	New name
attenuator	PIN diode	<3GHz	0.23	2	40dBm	SOT753	BAP64Q	-
			0.25	5.4	45dBm	SOT753	BAP70Q	-
			0.23	2	-	Various*	BAP64	-

Function	Product	Frequency range	NF (dB)	Gain (dB)	IP3$_O$ (dBm)	Package	Type name	New name
LNA	transistor	<6 GHz	0.65 @1.8 GHz	20.5 @1.8 GHz	34 @ 1.8 GHz	SOT343F	BFU690F	-
		<12 GHz	1.3 @ 12 GHz	12.5 @ 12 GHz	11 @ 12 GHz		BFU730F	-
		<12 GHz	0.5 @ 2.4 GHz	22 @ 2.4 GHz	32 @ 2.4 GHz		BFU760F	-
		<12 GHz	0.4 @ 1.8 GHz	19.5 @ 1.8 GHz	33 @ 1.8 GHz		BFU790F	-
	MMIC	0.3-1.5 GHz	0.43 @ 900 MHz	18.1	38.9	SOT1327	BGU8051	BTS1001L
		1.5-2.5 GHz	0.54 @ 1900 MHz	18.4	35.7		BGU8052	BTS1001M
		2-6 Ghz	0.57 @ 2500 MHz	18.4	36.0		BGU8053	BTS1001H
LNA + bypass	MMIC	0.3-1.5 GHz	1.1 @ 900 MHz	20.5	36.5	SOT650	BGU8061	BTS3001L
		1.5-2.5 GHz	1.3 @ 1500 MHz	18.5	36		BGU8062	BTS3001M
		2.7-4 GHz	1.6 @ 2500 MHz	19	34.5		BGU8063	BTS3001H

Function	Product	Frequency range	NF (dB)	Gain range (dB)	IP3$_i$ (dBm)	Package	Type name	New name
LNA + VGA	MMIC	0.699-0748 GHz	0.7 @ 700 MHz		0 @ 700 MHz	SOT1301	BGU7060	-
		0.770-0.915 GHz	0.75 @ 900 MHz		2 @ 900 MHz		BGU7061	-
		1.71-1.785 GHz	0.77 @1750 MHz		1 @ 1750 MHz		BGU7062N2	-
		1.92-1.98 GHz	0.9 @ 1950 MHz	0 - 35	0.9 @ 1950 MHz		BGU7063	-
		1.85-2.01 GHz	0.9 @ 1950 MHz		1 @ 1950 MHz		BGU7073	BTS5001M
		2.305-2.57 GHz	1.1 @ 2535 MHz		0.8 @ 2535 MHz		BGU7075	BTS5001H
		1.71-1.785 GHz	0.8 @ 1750 MHz		1.9 @ 1750 MHz		BGU7078	BTS5002M

Function	Product	Frequency range	Gain (dB)	IP3$_O$ (dBm)	Gain range (dB)	Package	Type name	New name
Single VGA	MMIC	0.7-3.8 GHz	30 dB	39dBm 0.7-1.4GHz	31.5 dB step 0.5dB	SOT167	BGA7210	BTS6001A
		0.4-2.75 GHz	18.5 dB	38dBm 0.4-0.7GHz	31.5 dB step 0.5dB		BGA7204	-
Dual IF VGA	MMIC	50-250 MHz	18.5 dB	43dBm @ 172MHz	24 dB step 1dB	SOT167	BGA7350	-
		50-500 MHz	22 dB	46 dBm @ 172MHz	28 dB step 1dB		BGA7351	-

Function	Product	Power (W)	$P_{L,1dB}$ (dBm)	Gain (dB)	IP3$_O$ (dBm)	Package	Type name	New name
MPA	MMIC	0.25	25.5 @ 2140 MHz	15	38.5	SOT89	BGA7024	-
		0.5	28 @ 2140 MHz	11	42.5		BGA7027	-
		0.25	25 @ 940 MHz	16	37.5	SOT908	BGA7124	-
		0.5	28 @ 2140 MHz	12	42		BGA7127	-
		1	30.5 @ 740 MHz	20	42.5		BGA7130	-

Function	Product	Frequency range	Conversion Gain	$P_{L,1dB}$ (dBm)	IP3$_i$ (dBm)	Package	Type	New name
Dual mixer	MMIC	0.7 - 0.95 GHz	8 @ 900MHz	13 dBm	26 dBm	SOT1092	BGX7220	-
		1.4 - 2.7 GHz	8 @ 2GHz	13 dBm	26 dBm		BGX7221	-

Function	Product	Frequency range	BW_{mod} (MHz)	$P_{L,1dB}$ (dBm)	Output power (dBm)	Package	Type name	New name
IQ modulator	MMIC	0.4-4 GHz	400	12	0	SOT616	BGX7100	-
		0.4-4 GHz	650	12	4		BGX7101	BTS8001A

For the complete product selection please see section 3.1.1, 3.1.2, 3.1.4 and 3.1.5

Product highlight:
Digital VGAs BGA7204 and BGA7210 [BTS6001A]

These 6-bit digital VGAs offer high linearity (35 dBm @ 2.2-2.8 GHz) and high output power (23 dBm @ 2.2-2.8 GHz) across a large bandwidth without external matching. Smart routing with no connection crosses simplifies design and decreases footprint by 25%. The unique power-save mode can effectively reduce the current consumption in TDD systems by up to 45%. The BGA7210 adds flexible current distribution across its two amplifiers, depending on the attenuation state, to save current.

Features

▸ Internally matched for 50 Ω
- BGA7204 = 0.4 to 2.75 GHz
- BGA7210 = 0.7 to 3.8 GHz
▸ High maximum power gain
- BGA7204 = 18.5 dB
- BGA7210 = 30 dB
▸ Attenuation range of 31.5 dB, 0.5 dB step size (6 bit)
▸ Fast-switching power-save mode (power-down pin)
▸ Simple control interfaces (SPI)
▸ ESD protection on all pins (HBM 4 kV; CDM 2 kV)

1.3.2   Repeater

Application diagram of the components used in a repeater system
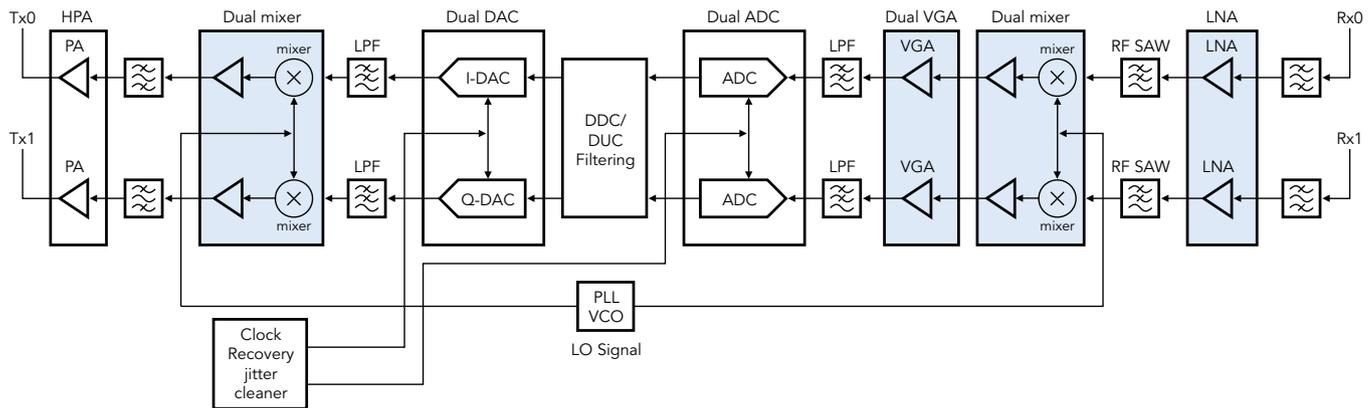
Function	Product	Frequency range	NF (dB)	Gain (dB)	IP3$_O$ (dBm)	Package	Type name	New name
LNA	MMIC	0.3-1.5 GHz	0.43 @ 900 MHz	18.1	38.9	SOT1327	BGU8051	BTS1001L
		1.5-2.5 GHz	0.54 @ 1900 MHz	18.4	35.7	SOT1327	BGU8052	BTS1001M
		2-6 Ghz	0.57 @ 2500 MHz	18.4	36.0	SOT1327	BGU8053	BTS1001H
LNA+bypass	MMIC	0.3-1.5 GHz	1.1 @ 900 MHz	20.5	36.5	SOT650	BGU8061	BTS3001L
		1.5-2.5 GHz	1.3 @ 1500 MHz	18.5	36	SOT650	BGU8062	BTS3001M
		2.7-4 GHz	1.6 @ 2500 MHz	19	34.5	SOT650	BGU8063	BTS3001H

Function	Product	Frequency range	Conversion Gain (dB)	P$_{L, 1dB}$ (dBm)	IP3$_i$ (dBm)	Package	Type name	New name
Dual mixer	MMIC	0.7 - 0.95 GHz	8 @ 900MHz	13 dBm	26 dBm	SOT1092	BGX7220	-
		1.4 - 2.7 GHz	8 @ 2GHz	13 dBm	26 dBm	SOT1092	BGX7221	-

Function	Product	Frequency range	NF (dB)	Gain range (dB)	IP3$_i$ (dBm)	Package	Type name	New name
LNA + VGA	MMIC	0.699-0748 GHz	0.7 @ 700 MHz	0 - 35	0 @ 700 MHz	SOT1301	BGU7060	-
		0.770-0.915 GHz	0.75 @ 900 MHz	0 - 35	2 @ 900 MHz		BGU7061	-
		1.71-1.785 GHz	0.77 @1750 MHz	0 - 35	1 @ 1750 MHz		BGU7062N2	-
		1.92-1.98 GHz	0.9 @ 1950 MHz	0 - 35	0.9 @ 1950 MHz		BGU7063	-
		1.85-2.01 GHz	0.9 @ 1950 MHz	0 - 35	1 @ 1950 MHz		BGU7073	BTS5001M
		2.305-2.57 GHz	1.1 @ 2535 MHz	0 - 35	0.8 @ 2535 MHz		BGU7075	BTS5001H
		1.71-1.785 GHz	0.8 @ 1750 MHz	0 - 35	1.9 @ 1750 MHz		BGU7078	BTS5002M

Function	Product	Frequency range	Gain (dB)	IP3$_O$ (dBm)	Gain range (dB)	Package	Type name	New name
Dual IF VGA	MMIC	50-250 MHz	18.5 dB	43dBm @ 172MHz	24 dB step 1dB	SOT167	BGA7350	-
		50-500 MHz	22 dB	46 dBm @ 172MHz	28 dB step 1dB		BGA7351	-

Function	Product	Power (W)	P$_{L, 1dB}$ (dBm)	Gain (dB)	IP3$_O$ (dBm)	Package	Type name	New name
MPA	MMIC	0.25	25.5 @ 2140 MHz	15	38.5	SOT89	BGA7024	-
		0.5	28 @ 2140 MHz	11	42.5		BGA7027	-

For the complete product selection please see section 3.1.1, 3.1.2, 3.1.4 and 3.1.5

Product highlight:
MMIC dual down-mixer BGX7221

The BGX7221 combines a pair of high-performance, high-linearity down-mixers for use in receivers that have a common local oscillator used with, for example, main and diversity paths. The device covers frequency bands from 1700 to 2700 MHz with an extremely flat behavior.

Features

▸ 8.5 dB conversion gain over all bands
▸ 13 dBm input, 1 dB compression point
▸ 25.5 dBm input third-order intercept point
▸ 10 dB (typ) small-signal noise figure
▸ Integrated active biasing
▸ Single +5 V supply operation
▸ Power-down per mixer with hardware control pins
▸ Low bias current in power-down mode
▸ Matched 50 Ω single-ended RF and LO input impedances
▸ ESD protection at all pins

1.3.3   Small cells

With the explosion of cellular data usage and the limited number of sites available for new macro base stations, operators have to find new ways of offering high data rates and excellent quality of service. One of the options is to complement the macro network with small cells, known as picocells (1 to 2 W average) and femtocells (0.25 to 0.5 W average). NXP offers and develops several types of solutions to the small-cell PAs designer, optimized for performance, integration, or cost.

Application diagram of a typical small-cell line-up
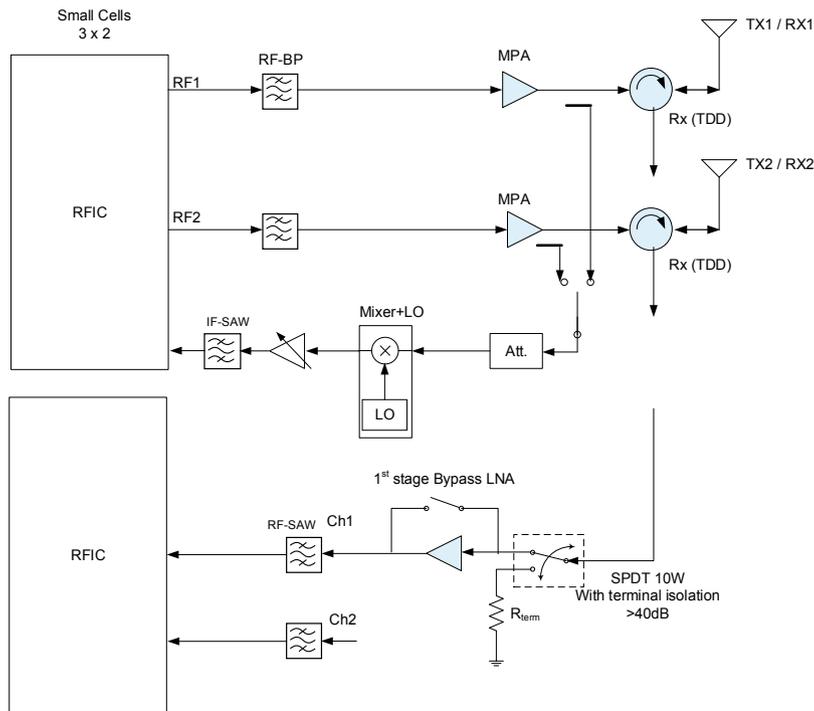
Recommended product

Function	Product	Frequency range	NF (dB)	Gain (dB)	IP3$_O$ (dBm)	Package	Type name	New name
		0.3-1.5 GHz	0.43 @ 900 MHz	18.1	38.9		BGU8051	BTS1001L
LNA	MMIC	1.5-2.5 GHz	0.54 @ 1900 MHz	18.4	35.7	SOT1327	BGU8052	BTS1001M
		2-6 Ghz	0.57 @ 2500 MHz	18.4	36.0		BGU8053	BTS1001H
		0.3-1.5 GHz	1.1 @ 900 MHz	20.5	36.5		BGU8061	BTS3001L
LNA+bypass	MMIC	1.5-2.5 GHz	1.3 @ 1500 MHz	18.5	36	SOT650	BGU8062	BTS3001M
		2.7-4 GHz	1.6 @ 2500 MHz	19	34.5		BGU8063	BTS3001H

For the complete product selection please see section 3.1.1

Product highlight:

Integrated low-noise, high-linearity amplifier with bypass BGU806x [BTS3001x]

Building on the success of the ultra-low noise BGU805x series, the BGU8062x is a series of SiGe:C BiCMOS LNAs with integrated bypass and fast shutdown. The BGU806x is a perfect 3rd stage gain block in the Rx chain in wireless infrastructure applications. The high-performance bypass function enables high dynamic range, while the fast shutdown function makes it well suited for TDD applications. The BGU806x is housed in a 10-pin package that measures 3 x 3 mm.

Features

▸ Three versions to cover low frequency (700 – 1500 MHz), mid frequency (1500 – 2700 MHz) and high frequency (2500 – 4000 MHz) ranges
▸ Low Noise Figure ranging from 1.1 to 1.4 dB at a gain of 18.5 - 20.5 dB
▸ Very high linearity (1 dB compression point of ~20dBm and IIP3 of ~36 dBm) at 70-75 mA current consumption
▸ Performance optimized for a supply voltage of 5 V
▸ ESD protected on all pins
▸ 3 x 3 x 0.85 mm package with MSL = 1

1.4   Broadband communication infrastructure and TV

The increasing demand for bandwidth is very visible in broadband communication: fibers are moving closer to the home, and RF requirements are changing, due to the increased use of digital communication protocols. NXP offers a wide range of products which can be used in the network and in the home. For the network, we support fiber-optics with products for down- and upstream communication. For the home, we focus on down- and upstream communication for TVs, set-top boxes and access points-routers.

1.4.1   WLAN: access points and routers, fixed consumer electronics

Application diagram for WLAN

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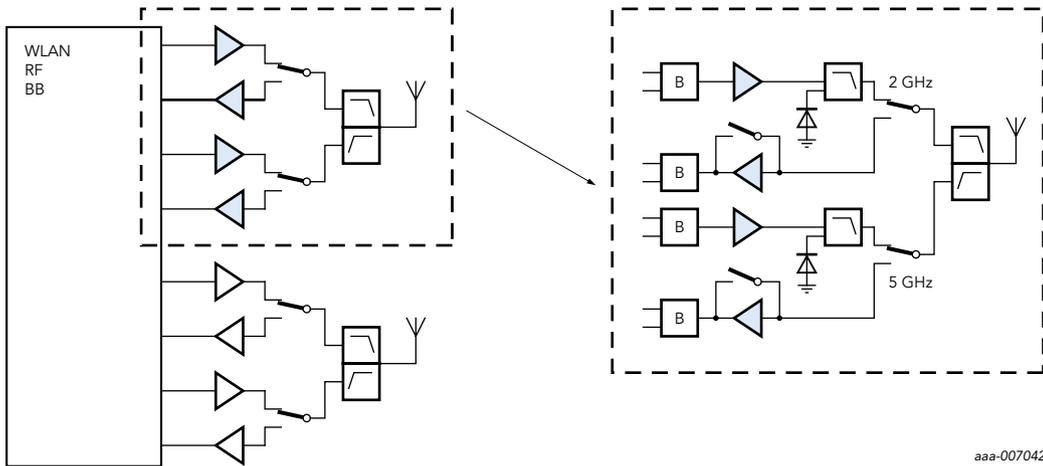
Recommended products

Function	Product	Gain @ 2.4GHz (dB)	Gain @ 5.5 GHz (dB)	NF (dB)	IIP3 (dBm)	Package	Type name
LNA	RF transistor	20	16	0.8 - 1.1	-5 - =10	SOT343F	BFU730F
		15	11	1 - 1.2	-1 - =15		BFU768F
		17	12	0.8 - 1.2	3 - +8	SOT883C	BFU730LX
		15	-	1	+6.5	SOT1189	BGU7224
	MMIC	-	13.5	1.6	+8		BGU7258

For the complete product selection please see section 3.1.1 and 3.2.1

Product highlight:
WLAN LNAs with bypass BGU7224 and BGU7258

These fully integrated LNAs enable IEEE 802.11b/g/n/ac WLANs and ISM applications in the 2.4 and 5 GHz bands. Manufactured in our high-performance QUBiC4x SiGe:C technology, they combine best-in-class gain, noise figure, linearity, and efficiency with the process stability and ruggedness that SiGe technology is known for.

Features

▸ Fully integrated, high-performance LNA with built-in bypass (no external matching or DC blocking required)
▸ Noise figure (NF) of 1.0 dB (2.4 GHz) and 1.6 dB (5 GHz), with low current consumption of 13 mA
▸ Low bypass current of 2 μA
▸ Single-supply operation from 3.0 to 3.6 V
▸ Integrated, temperature-stabilized bias network
▸ High ESD protection of 2 kV HBM on all pins
▸ Ultrasmall QFN-style package (1.6 x 1.6 x 0.5 mm, 0.5 mm pitch), MSL 1 at 260 °C

1.4.2   Cable modem and set-top boxes based on DOCSIS 3.0 & 3.1

DOCSIS, the cable-modem standard from the CableLabs research consortium, supports IP traffic over digital cable-TV channels. For the upstream path NXP offers two solutions: the BGA3131 for the new DOCSIS 3.0 standard and the requirements set by their respective standards. The BGA3131 has a very low power consumption which eliminates the need for a costly external heatsink.

Application diagram of a DOCSIS cable modem with the BGA3031 upstream amplifier
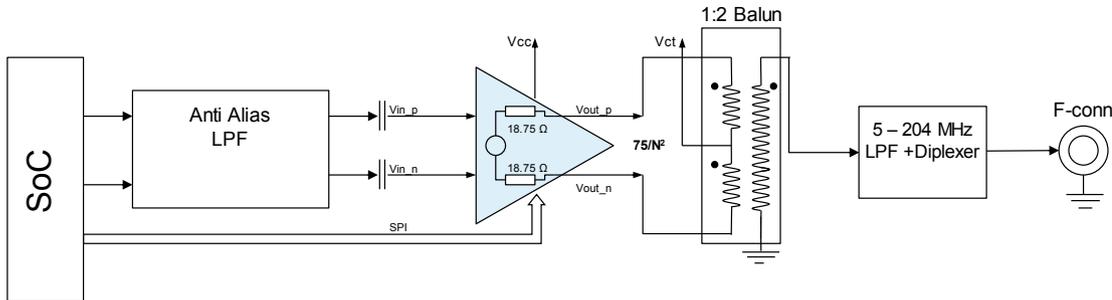
Recommended products

Function	Product	Frequency range (MHz)	Gain (dB)	$P_{L, 1dB}$ (dBmV)	Package	Type name
Upstream VGA for DOCSIS 3.0	MMIC	5 - 85	34	74	SOT662	BGA3031
Upstream VGA for DOCSIS 3.1	MMIC	5 - 205	37	78	SOT662	BGA3131

For the complete product selection please see section 3.1.3

Product highlight:
DOCSIS 3.1 upstream amplifier BGA3131 [BTS6031]

The BGA3131 MMIC is an upstream amplifier designed for the Data Over Cable Service Interface Specifications (DOCSIS 3.1) operating from 5 to 205 MHz. It meets the DOCSIS 3.1 specification at a best-in-class current consumption of 660 mA, eliminating the need for an expensive heatsink. The device provides can amplify DOCSIS 3.0 (QAM modulated signals) and DOCSIS 3.1 (OFDM modulated signals) up to an output level of 68 dBmV while meeting all the IMD, harmonics, ACLR and transient requirements.

Features

▸ 3-wire SPI control interface
▸ 58 dB gain control range, 1 dB steps with 0.4 dB gain step accuracy
▸ 5 MHz to 205 MHz frequency operating range
▸ Maximum voltage gain 37 dB, 6.5 dB noise figure
▸ Excellent linearity at 68 dBmV output power (IMD3 = 60 dBc, second & third harmonic level = 60 dBc, ACLR = 64 dBc)
▸ 5 V single supply operation
▸ ESD protection at all pins

1.4.3   Network Interface Module (NIM) for TV reception

Make a high-performance active splitter in a NIM tuner with the BGU703x/BGU704x

Today's TV tuners require complicated signal handling and benefit from flexibility in design. The front-end of a TV signal receiver is no longer just a tuned receiver, but has evolved into an RF network interface module (NIM) with tuned demodulators, active splitters, and remodulators. The active splitter requires an LNA with excellent linearity. NXP has two series of LNA/VGA MMICs (BGU703x/BGU704x), designed especially for high linearity (IP3O of 29 dBm) in low-noise applications such as an active splitter in a NIM tuner. The BGU703x family operates at a supply voltage of 5 V and is intended for use with conventional can tuners. The BGU704x family operates at 3.3 V and works seamlessly with Si tuner ICs, which also operate at 3.3 V.

Application diagram of an STB input stage with improved NF performance using the BGU703x and BGU704x

brb403
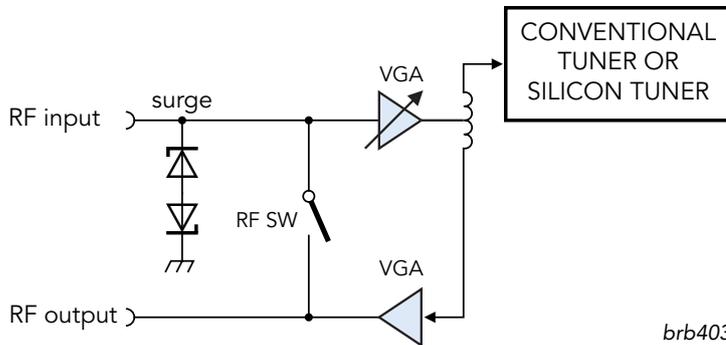
Recommended products

Function	Product	Supply voltage (V)	Gain (dB)	NF (dB)	Package	type name
VGA	MMIC	5	10	4.5	SOT363	BGU7031
			10	4.5	SOT363	BGU7032
			-2	2.5		
			10	4.5	SOT363	BGU7033
			5	6		
			-2	2.5		
		3.3	10	4	SOT363	BGU7041
			10	4	SOT363	BGU7042
			-2	2.5		
			14	2.8	SOT363	BGU7044
			14	2.8	SOT363	BGU7045
			-2	2.5		

For the complete product selection please see section 3.1.1

Product highlight:
VGAs for TVs/STBs BGU703x and BGU704x

Designed for high linearity and low noise, these 3.3 and 5 V wideband VGAs support multi-tuner applications in TVs, DVR/PVRs, and STBs operating between 40 MHz and 1 GHz. A unique programmable gain with bypass mode compensates for tuner switch signal loss (important in multi-tuner systems), and improves overall system performance by 7 to 10 dB.

Features

▸ Flat gain between 40 MHz and 1 GHz
▸ Output power at 1 dB gain compression ($P_{L(1\ dB)}$) ranging from 9 to 14 dBm
▸ Noise figure as low as 2.8 dB
▸ High linearity with an OIP3 of 29 dBm
▸ 75 Ω input and output impedance
▸ Power-down during bypass mode
▸ ESD protection >2 kV HBM, >1.5 kV CDM on all pins

1.4.4 Optical mini- and midi-node line-up

We provide a complete system solution for optical mini- and midi-node line-ups, for use in systems that take the broadband TV signal from an optical network and amplify the signal onto a coaxial distribution network. Depending on the placement of the node, this might go straight into a home (FTTH), an apartment building (FTTB), or deeper in the network (FTTC).

Application diagram of an MMIC broadband amplifier for TV and distribution systems

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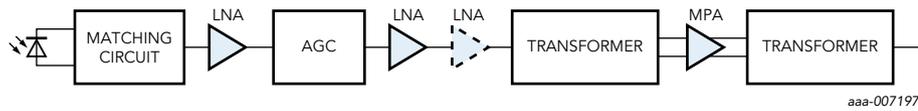
NXP delivers all the components for optical mini- and midi-node line-ups, for FTTx applications:

▸ BGA301x input stages are LNAs that keep overall noise low
▸ BGA302x MPAs deliver high output power with excellent overall performance
▸ The BAP70Q PIN diode enables an adjustable-gain control circuit

Recommended products

Function	Product	V_R max (V)	IF max (mA)	r_D (Ω) @ IF=10 mA	Package	Type name
AGC	PIN diode	50	100	5.4	SOT753	BAP70Q

Function	Product	Frequency range (MHz)	Gain (dB)	NF (dB)	Package	Type name
LNA	MMIC	40 - 1006	12	3.1	SOT89	BGA3012
			15	2.5		BGA3015
			18	2.2		BGA3018

Function	Product	Frequency range (MHz)	Gain (dB)	IP3 (dBm)	IP2 (dBm)	P1dB (dBm)	Package	Type name
MPA	MMIC	40 - 1200	16	46	75	30	SOT786-2	BGA3021
			18					BGA3022
			20					BGA3023

For the complete product selection please see section 3.1.2 and 3.3.2

Product highlight:

MMIC wideband amplifiers with internal biasing BGA302x

These are MPAs, specifically designed as the output stage for high-linearity CATV optical mini- and midi-nodes. They operate over a frequency range of 40 to 1200 MHz, and are housed in a lead-free HSO8 package.

Features

▸ Internally biased
▸ Flat gain between 40 and 1200 MHz
▸ High linearity with an IP3o of 46 dBm and an IP2o of 75 dBm
▸ High gain output 1dB compression point of 30 dBm
▸ 75 Ω input and output impedance
▸ Icc (total) can be controlled between 175 and 350 mA

1.4.5   Broadband line extenders

Larger coaxial distribution networks often require longer distances and additional amplification. Our broadband solutions are ideally suited for use in bidirectional line extenders.

Application diagram of a bidirectional line extender
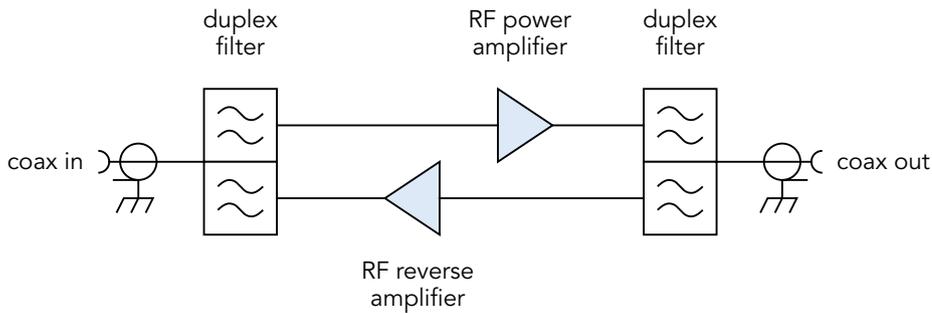
Recommended products

Function	Product	Frequency (MHz)	Gain (dB)	NF(dB)	Package	Type name
RF forward amplifier	Drop amplifier	1006	12	3.1	SOT89	BGA3012
			15	2.5	SOT89	BGA3015
			18	2.2	SOT89	BGA3018

Function	Product	Frequency range (MHz)	Gain (dB)	P1dB (dBm)	Package	Type name
RF reverse amplifier	Drop amplifier	5 - 300	12	22.5	SOT89	BGA3012
			15	23.5	SOT89	BGA3015
			18	24.5	SOT89	BGA3018

For the complete product selection please see section 3.1.2

Product highlight:

Extreme-broadband amplifiers BGA301x

The BGA3012, BGA3015, and BGA3018 are extreme-broadband amplifiers that deliver 12, 15, and 18 dB of gain from 40 to 1006 MHz, while providing outstanding linearity performance. These amplifiers can also be used as a return path amplifier from 5 to 300 MHz, or in a combined TV and satellite system from 40 to 2600 MHz. At the low end of the frequency band, these amplifiers outperform competing GaAs devices in noise figure performance by 5 dB and in input power rating by more than 20 dB, while offering a superior ESD rating of 2 kV and a larger supply voltage operating range of 5 to 8 V. These amplifiers are very well suited for various broadband TV distribution system applications, such as FFTH, home gateways, and set-top boxes.

1.5 Satellite

1.5.1 Satellite outdoor unit, QUAD LNB with integrated mixer/oscillator/downconverter/switch matrix

Application diagram of a QUAD LNB

aaa-017240
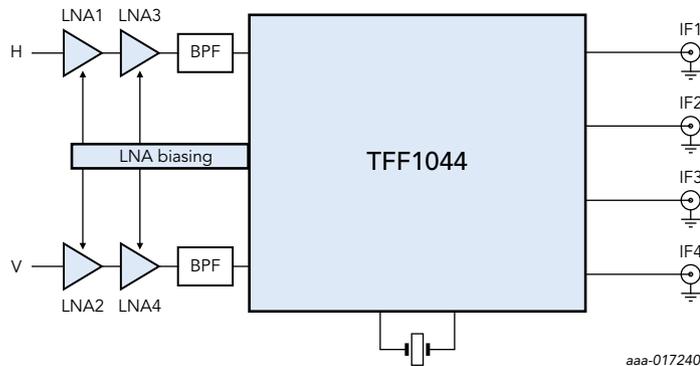
Recommended products

Function	Product	Maximum gain (dB)	NF$_{min}$ (dB)	I$_{cc, nom}$ (mA)	Package	Type name
1st stage LNA	RF transistor	14.2	0.65	6	SOT343F	BFU910F
2nd stage LNA	RF transistor	14	1.45	2	SOT343F	BFU710F
		12.5	1.3	5		BFU730F
		14.2	0.65	6		BFU910F

Function	Product	Gain (dB)	NF$_{min}$ (dB)	I$_{cc, nom}$ (mA)	Package	Type name
Mixer/Oscillator/downconverter	MMIC	30/33/36	8	145	HVLGA	TFF1044HN

For the complete product selection please see section 3.1.5 and 3.2.1
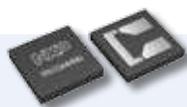
Product highlight:

World's first fully integrated Quad Ku-band to L-band downconverter IC TFF1044HN

This universal Quad DVB-S/DVB-S2 compliant Ku-band downconverter enables significant size reduction for Quad or Quattro LNB's. It reduces total costs, since it enables alignment-free production, and significantly decreases manufacturing time, since it's fully tested.

Features

▶ Integrated voltage/tone detection, 4 x 4 matrix switch
▶ Low current consumption (Icc = 170 mA for 4 users active)
▶ Low Phase Noise (1.6 degrees RMS PJ typ)
▶ Selectable gain (30, 33, 36 dB)
▶ Small PCB footprint – HVLGA36 (5.0 x 5.0 x 0.72 mm) – low external component count

1.5.2 Satellite outdoor unit, twin LNB with integrated mixer/oscillator/downconverter

Application diagram of a twin LNB based on the TFF101x*

* the same products can be used for a single LNB

aaa-007198

Recommended products

Function	Product	Package	Maximum gain (dB)	NF$_{min}$ [dB]	I$_{cc\,nom}$ [mA]	Type name
1st stage LNA	RF transistor	SOT343F	14,2	0,65	6	BFU910F
2nd and 3rd stage LNA	RF transistor	SOT343F	14	1,45	2	BFU710F
			12,5	1,3	5	BFU730F
			14,2	0,65	6	BFU910F

Function	Product	Package	Gain (dB)	NF$_{min}$ [dB]	I$_{cc\,nom}$ [mA]	Type name
Mixer/ Oscillator/ downconverter	RFIC	SOT763	30	9	52	TFF1012HN
			33	9	52	TFF1013HN
			36	7	52	TFF1014HN
			39	7	52	TFF1015HN
			42	7	52	TFF1017HN
			45	7	52	TFF1018HN

For the complete product selection please see section 3.1.5 and 3.2.1

### Product highlight: Industry's lowest-power integrated Ku-band downconverters TFF101xHN

These Universal DVB-S compliant Ku-band downconverters consume about 50% less current (52 mA) than other integrated solutions. They are fully integrated (PLL synthesizer/mixer/IF gain block) and RF tested – which results in significantly decreased manufacturing time. Stability of the local oscillator is guaranteed, which improves overall system reliability over temperature and time, and eliminates the need for manual alignment in production.

Features

▶ Ultralow current consumption (I$_{CC}$ = 52 mA)
▶ Low phase noise (1.5° RMS typ)
▶ Integration bandwidth from 10 kHz to 13 MHz
▶ Small PCB footprint
  - DHVQFN16 package (2.5 x 3.5 x 0.85 mm)
  - Only seven external components
  - No inductors necessary

1.5.3 Satellite outdoor unit, twin LNB with discrete components

Application diagram of a twin LNB with discrete components*

brb022
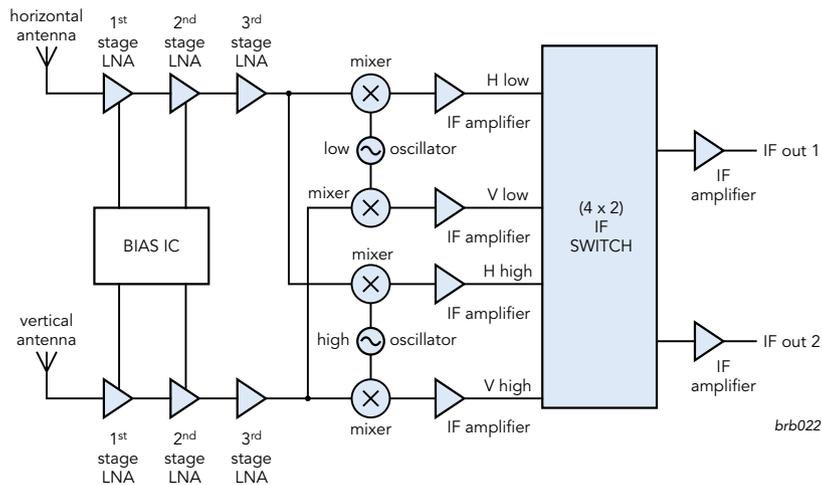
* the same products can be used for a single LNB

Recommended products

Function	Product	Gmax [dB]	NF$_{min}$ [dB]	I$_{cc\,nom}$ [mA]	Package	Type
1st stage LNA	RF transistor	14.2	0.65	6	SOT343F	BFU910F
2nd stage LNA	RF transistor	14	1.45	2	SOT343F	BFU710F
		12.5	1.3	5		BFU730F
		14.2	0.65	6		BFU910F

Function	Product	Gmax [dB]	NF$_{min}$ [dB]	I$_{cc\,nom}$ [mA]	Package	Type
Oscillator	RF transistor	12.5	1.2	30	SOT343F	BFU660F
		14	1.45	2		BFU710F
		12.5	1.3	5		BFU730F

Function	Product	Gmax [dB]	NF$_{min}$ [dB]	I$_{cc\,nom}$ [mA]	Package	Type
Mixer	RF transistor	14	1.45	2	SOT343F	BFU710F
		12.5	1.3	5		BFU730F

* Also available in ultrasmall leadless package SOD882D

For the complete product selection please see section 3.1.2, 3.2.1 and 3.3.2

Function	Product	V$_{R\,max}$ (V)	C$_d$ [pF]	R$_d$ [Ω] @10 mA	Package	Type
IF switch	PIN diode	175	0.23 @ 20 V	2	Various	BAP64*
		50	0.2 @ 20 V	1,5	Various	BAP51*
		50	0.2 @ 5 V	3	Various	BAP50*

Function	Product	Gain [dB]	P$_{1dB}$ [dBm]	V$_{cc/Icc}$ [V/ mA]	Package	Type
1st or output stage IF amplifier	IF gain block	20	-1	3.3 / 10.5	SOT363	BGA2800
		22.4	2	3.3 / 14.3		BGA2801
		26	1	3.3 / 12.5		BGA2802
		23	-6	3.0 / 5.8		BGA2803
		25	5	3.3 / 18.2		BGA2815
		31.3	5	3.3 / 22.2		BGA2816
		24.3	6	3.3 / 20		BGA2817
		29.8	6	3.3 / 19.9		BGA2818
		24	-1	5 / 9.1		BGA2850
		24.8	-3.5	5 / 7		BGA2851
		32.2	8	5 / 26.4		BGA2865
		23.9	4	5 / 17.4		BGA2866
		27.1	7	5 / 21.7		BGA2867
		31.7	10	5 / 24		BGA2869
	RF transistor	12.5		5.5 / 30	SOT343F	BFU660F

Product highlight:

NPN wideband SiGe RF transistor BFU910F

The BGU910F is a wideband RF transistor produced in the QUBIC GEN9 process for K-band applications (10 – 20 GHz). QUBiC GEN9 has been optimized towards extremely low noise figures in this frequency range. Typical applications are first, second or third stage amplifiers in satellite LNBs. The BFU910 can be used to replace GaAs devices giving the benefits of more robustness, single biasing and low current consumption in combination with an excellent RF performance.

Features

▸ Low noise, high gain microwave transistor with 90 GHz fT
▸ High maximum stable gain of 14.2 dB at 12 GHz
▸ Minimum noise figure (NF) of 0.65 dB at 12 GHz
▸ Current consumption 10 mA typical