Your partner in Mobile Communication Infrastructure design

Innovative, High Performance RF solutions for wireless infrastructures

High Performance RF

Looking for a partner who can help you meet the challenges of basestation design? As a global leader in RF technology and component design, NXP Semiconductors offers a broad portfolio of RF and mixed signal products that deliver advanced performance and help simplify your design and development process. Our solutions range from discrete devices to modular building blocks to ASSPs (application specific standard products).

Together with component innovation, NXP also focuses on architectural breakthroughs in basestation RF boards. One example is the further digitization of the transmission chain, bringing digital closer to the antenna. Another is a digital transmitter that achieves very high efficiency by using a switch mode power amplifier (SMPA) and is software reconfigurable for multiple frequency bands.

A power stronghold

NXP has built a strong position in RF transistors for basestation power amplifiers with reliable and innovative solutions. These include our Si-based LDMOS technology, which offers best in-class efficiency, power and ruggedness, and our new, high-speed technology using gallium nitride (GaN) material.

Optimized for Doherty applications, our 7th generation LDMOS delivers record performance, helping wireless network operators increase base station efficiency. The combination of the single transistor performance with our latest achievements in 2- and 3-way Doherty amplifier designs saves network operating costs as well as CO_2 emissions. Our products push amplifier efficiencies to ever higher levels, paving the way towards Green Mobile Communication Infrastructures.

Small signal, big choice

Choose the best-fit solution for your application from our extensive portfolio of small signal RF components including low noise amplifiers (LNAs), variable gain amplifiers (VGAs), mixers, local oscillators (LOs), and up- and down conversion ICs.

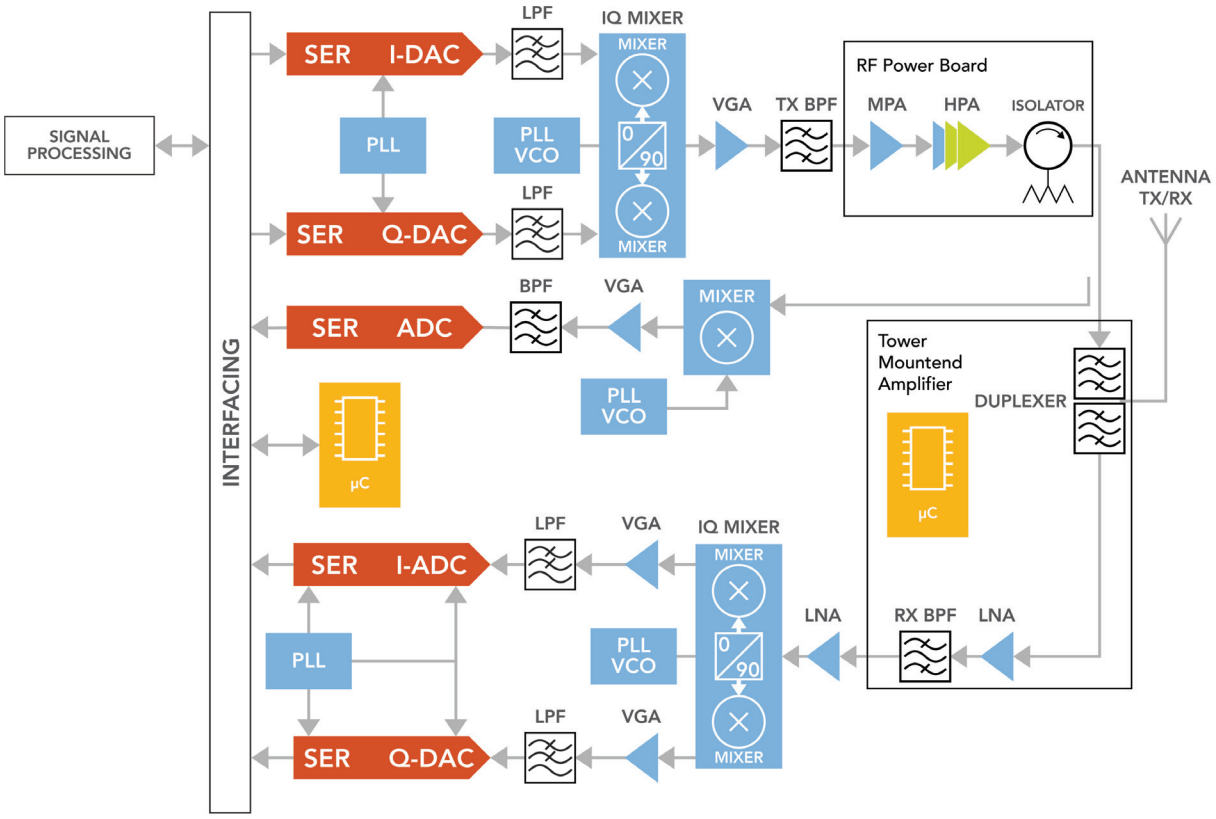
Our portfolio is based on high performance, state-of-the-art silicon based technologies such as our QUBiC4 BiCMOS process. QUBiC4 components meet the performance requirements (noise figure, linearity, power efficiency) of RF base stations and alows a higher level of integration, compared to traditional gallium arsenide (GaAs) components.

An optimized standard for RF High Speed Data converters

Our highly competitive high-speed ADCs and DACs feature three different data interfaces, including the industry's first implementation of JEDEC JESD204A (2008). This new standardized serial interface dramatically reduces the number of interconnect signals between data converters and logic devices. It also solves one of the major base station and other RF transceiving chain design challenges by synchronously bonding multiple data channels or lanes.

Our converters offer leading SFDR linearity performance and low power dissipation – as much as 5dB higher than the best competitive high-speed data converters. The high input frequency range supported by our ADCs has led to a new industry product segment: RF converters.

Base station block diagram



Above diagram shows a strongly simplified base station block diagram with its two main branches: transmit (upper half, TX) and receive (lower half, RX). Walking along the transmit branch, after the interfacing into the signal processing part, one first encounters the digital to analog converters (DAC), which include a serial interface in our case (SER). The transmit signal then passes a low-pass filter block (LPF) and is being upconverted in the IQ mixer stage. Next follows a variable gain amplifier (VGA), a bandpass filter (TX BPF) and the power amplifier board with a medium power amplifier- (MPA) and the high power amplifier (HPA)stages.
An isolater and duplexer are the last two basic blocks up to the antenna. A feedback line is provided to monitor the transmitted signal. The TX signal is "sampled", down-converted in a mixer, amplified (VGA), bandpassfiltered (BPF) and converted to digital by an analog to digital converter (SER ADC), with a high speed serial interface.

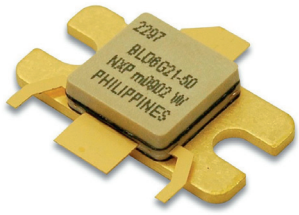
The main RX branch of the base station starts at the duplexer, is amplified by a low noise amplifier (LNA) and band pass filtered (RX BPF) very close to the antenna in a "tower mounted amplifier". A further amplifier (LNA) then feeds into the down conversion mixer; the I and Q base band signals are further amplified (VGA) and via a low pass filter (LPF) fed into the respective ADC's (SER I-ADC and SER Q-DAC). The serial interface in turn connects to the base band signal processing unit.

The synchronizing "heartbeats" in the diagram are controlled by phase locked loops (PLL) with or without a voltage controlled oscillators (VCO). Microcontrollers (µC) provide local control and monitoring functions within the building blocks.
The colored building blocks can all be sourced by NXP and are discussed in the following paragraphs.

Mobile Communication Infrastructure portfolio overview

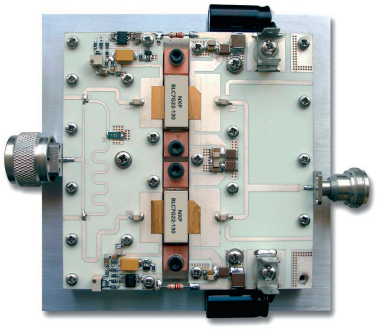
RF power

We offer a complete line-up of RF power transistors operating from 450 MHz right up to 3.8 GHz, covering all cellular technologies GSM/EDGE, CDMA, (TD-S)CDMA, W-CDMA/UMTS and WiMAX infrastructures. Latest 2- and 3-way Doherty designs are helping drive efficiency way beyond 40% in base stations for WiMAX, LTE, W-CDMA, and TD-SCDMA, which are using large peak to average ratio (PAR) signals.



Integrated Doherty amplifiers

From the outside these devices look like an ordinary transistor. In fact, they are integrated Doherty amplifiers that deliver the highest efficiency levels for basestation applications. They are just as easy to design-in as a standard class AB transistor, also providing significant space and cost savings..



Discrete Doherty amplifiers

Next to the integrated versions, NXP also offers reference designs for very efficient, high power, discrete 2- and 3- way Doherty amplifiers. The 2 way designs based on the BLF22LS-130 device deliver 47.0 dBm (50W) with 43% efficiency and 15.7dB gain for WCDMA applications. Our flagship 3-way Doherty reference design even achieves 47% efficiency at 48dBm (63W) output power and 15.0 dB gain. The current design covers the W-CDMA standard for band 1 operation and is tailored towards high yield, minimum tuning, volume manufacturing.

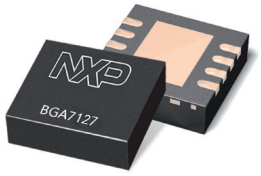
All our reference designs are supported by comprehensive support documentation and hardware.

Rugged RF power transistors

Ruggedness is one of the most important reliability parameters for RF power transistors. NXP has led the way since we introduced our first LDMOS transistors nearly a decade ago. All of our transistors are designed to withstand a mismatch of 10:1 (VSWR) or even more. Some of our 6th generation LDMOS transistors have been proven to be virtually indestructible.

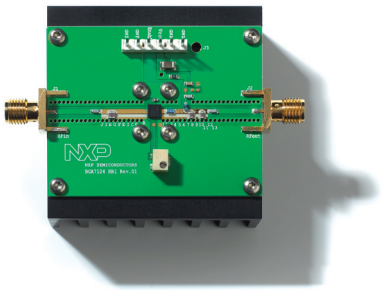
RF Small Signal

The RF Small Signal domain is defined as being the parts between the DACs and high power PA and the parts between the antenna and the ADCs. It comprises all the building blocks for up- and down conversion as well as the IF loop and the LNA from the antenna.



Medium Power Amplifier BGA7127
(leadless SOT908 package)

Medium Power Amplifier BGA7024
(leaded SOT89 package)



Evaluation board BGA7124

NXP's medium power (20dBm-33dBm) gain blocks are designed to have a high efficiency though not to compromise at linearity. Along with improved thermal performance and ESD robustness, the QUBiC4 process enables features such as active biasing, quiescent current adjustment, flexible VGA interfaces and power-saving shutdown modes. To save space, NXP's medium power amplifier MMICs are available in the smallest package size (3 x 3 mm) and with leadless options as well as SOT-89.

Coming soon!

Currently, we have several product families for basestation systems in development including LOs, IQ modulators and mixers. (Engineering) samples are available of the Medium Power Amplifiers, Tx RF VGAs, dual Rx IF VGAs and LNAs. Tx RF VGAs will be available with digital SPI, digital parallel and analog interface control.

Medium Power Amplifiers

Amplifier	6589	7X24	7X27	7130	7133	
P1dB	20	24	27	30	33	dBm
Gain	17	17	16	13	13	dB
Wideband, 0.4GHz to 2.7GHz						

Variable Gain Amplifiers

Amplifier	BGA7202	BGA7203	BGA7204	BGA7350	BGA7351
Freq band (MHz)	700 - 2200	2100 - 2750	700 - 2750	50 - 250	50 -250
Gain range (dB)	27	27	31.5	24	28
More detail product data in portfolio					

ASSPs

BGX	71xx	72xx	73xx
	Modulator	Mixer	LO generator

Low Noise Amplifier

BGU	705x
NF<0.7dB, gain 25dB-32dB, two stages, matched.	

Mobile Communication Infrastructure ASICs

To complement our standard mobile communication infrastructure products, we also offer customers application-specific IC development opportunities including:

- Access to our industry leading RF, mixed signal and high power processes that offer superior performance compared to competition
- Access to engineering force of highly experienced engineers
- Our extensive IP block library
- Complete industrial flow – unlike other vendors, we can deliver the final, packaged and tested product in volume and at high quality
- QUBiC is dual source: 8 inch fabs in Nijmegen as well as in Singapore

By exploiting our technology excellence, we offer to you unique differentiation against your competition and the ability to get ahead in your market. You can choose between two standard engagement models:

- Customer design – for customers who have internal mixed-signal design capability, but want to exploit NXP's high performance and cost effective processes, supported by our industrialization and manufacturing teams
- NXP ASIC development – aimed at partners requiring the expertise of NXP's highly experienced RF engineering force to realize market leadership

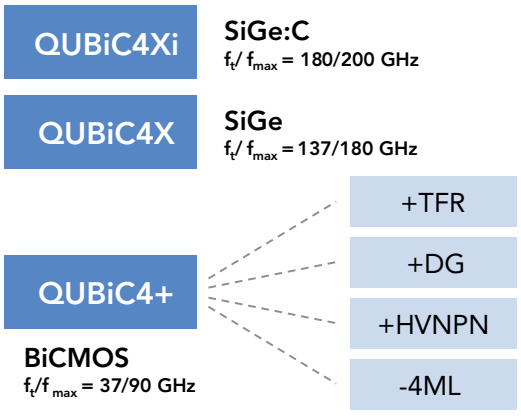
QUBiC4

NXP's innovative high performance SiGe:C QUBiC4 process allows customers to incorporate more functionality into devices with less space, competitive cost, reliability and manufacturing advantage. Our state-of-the-art QUBiC4 technology speeds the migration from GaAs components to silicon by enabling cutting-edge, low-noise performance and IP availability. QUBiC4 is the latest member of NXPs high performance RF IC processes and the development resulted in 3 variants, each having it's benefits for specific application areas:

- QUBiC4+: Silicon based, ideal for applications up to 5 GHz (Ft = 37 GHz , NF < 1.1dB @ 1.2 GHz) and for medium power amplifiers up to 33dBm

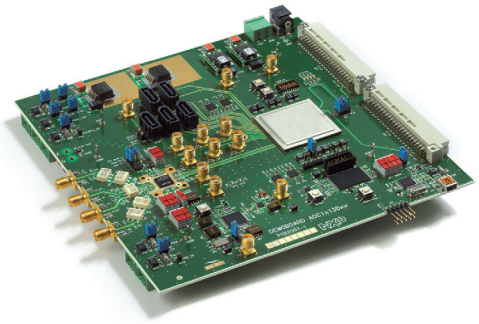
- QUBiC4X: first SiGe:C, ideal for applications typically up to 30 GHz (Ft = 137 GHz , NF < 0.8dB @ 10 GHz) and ultra low noise applications, e.g. LNAs and mixers

- QUBiC4Xi: newest SiGe:C improved on Ft (> 200 GHz) and even lower noise figure (NF < 0.5 dB @ 10 GHz), ideal for applications beyond 30 GHz, e.g. LO generators



High Speed Data converters

Many of the world's most creative innovators have benefited from our best-in-class data converters. We now offer that same industry-leading performance to the general market. These highly competitive ADCs and DACs build on NXP's long heritage of innovation in High Performance Analog.

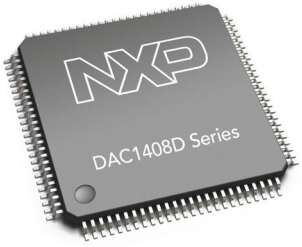


ADC1413D125 Demoboard

ADCs

Our new single- and dual-channel ADCs portfolio comprises over fifty models with optional input buffer and low-voltage CMOS, LVDS/DDR and JEDEC JESD204A digital outputs. Typical performance is 85 dBc SFDR at FIN = 170 MHz and FCLK = 125 MSPS input sample rate. Typical power consumption is 500 mW per channel.

With an input bandwidth of 650 MHz, the pipelined architecture and output error correction of the ADC1413D125 guarantees no missing codes over the full operating range. Independent programmable gain amplifiers enable the device to process very small amplitude input signals. Two JESD204A compliant transmitters output offset binary or two's complement format data on two differential lanes, with optional digital scrambling to reduce non-harmonic spurs. An SPI bus interface provides full device programmability, while power down and sleep modes ensure comprehensive power management.



DACs

Our new portfolio of dual-channel DACs comprises models with low-voltage CMOS, LVDS/DDR and JEDEC JESD204A digital inputs. Typical power consumption is 550 mW per channel.

The DAC1408D Series features x2, x4, and x8 interpolation filter options, an inverse sync filter option, four lanes of JEDEC JESD204A receiver compliant CML (Common Mode Logic) input data, with on-chip complex I and Q modulation, driven by a 32-bit NCO (Numerically-Controller Oscillator) with a 16-bit phase register, under SPI serial bus control. It includes two auxiliary DACs for external analog offset control and offers both power down and sleep modes.

RF Power transistor portfolio

Power LDMOS transistors 700 – 1000 MHz

Function	Type	Package	f_{range} (MHz)	$P_{L(AV)}$ (W)	η_D (%)	G_P (dB)	@V_{DS} (V)	Availability
driver	BLF6G21-10G	SOT538A	10 - 2200	0.6	15	18.5	28	Now
driver	BLM6G10-30	SOT834-1	800 - 1000	2	10	30	28	Now
driver	BLM6G10-30G	SOT822-1	800 - 1000	2	10	30	28	Now
driver	BLF6G10(S)-45	SOT608	800 - 1000	1	8	23	28	Now
driver	BLF6G10L(S)-40BRN	SOT1112A3/B3	728 - 960	2.5	15	15	23	Q2, 2010
final	BLF6G10(LS)-135RN	SOT502	800 - 1000	26.5	28	21	28	Now
final	BLF6G10(LS)-160RN	SOT502	800 - 1000	32	27	22.5	32	Now
final	BLF6G10(LS)-200RN	SOT502	688 - 1000	40	28.5	20	28	Now
final	BLF6G10L(S)-260PRN	SOT539A3/B3	728 - 960	40	27	27	22	Q2, 2010
final	BLF6G07L(S)-260PBM	SOT1110A3/B3	728 - 810	60	31	21	28	Q2, 2010

Power LDMOS transistors 1400 – 1700 MHz

driver	BLF6G15L(S)-40BRN	SOT1112A3/B3	1475-1511	2.5	13	22	28	Q2, 2010
final	BLF6G15L(S)-250PBRN	SOT1110A3/B3	1475-1511	60	32.5	18	28	Q2, 2010

Power LDMOS transistors 1800 – 2000 MHz

driver	BLF6G21-10G	SOT538A	10 - 2200	0.6	15	18.5	28	Now
driver	BLF6G20-40	SOT608A	1800 - 2000	2.5	15	18.8	28	Now
driver	BLF6G20(S)-45	SOT608B	1800 - 2000	2.5	14	19.2	28	Now
final	BLF6G20LS-75	SOT502	1800 - 2000	29.5	37.5	19	28	Now
			1800 - 2000	63	52	19	28	Now
final	BLF6G20(LS)-110	SOT502	1800 - 2000	25	31	19	28	Now
final	BLF6G20LS-140	SOT502B	1800 - 2000	35.5	30	16.5	28	Now
final	BLF6G20-180PN	SOT539A	1800 - 2000	50	29.5	18	32	Now
final	BLF6G20(LS)-180RN	SOT502B	1800 - 2000	40	27	17,2	30	Now
final	BLF6G20-230PRN	SOT539A	1800 - 2000	50	29.5	16.5	30	Now
final	BLF7G20L(S)-140P	SOT1121B3	1805 - 1880	20	31	17.5	28	Q2, 2010
final	BLF7G20L(S)-300P	SOT539A3/B3	1805-1990	85	30	17	28	Q3, 2010
final	BLF7G20L(S)-200	SOT502A3/B3	1805-1990	50	30	17	28	Q3, 2010
final	BLF7G20L(S)-250P	SOT539A3/B3	1805-1990	70	30	17	28	Q3, 2010

Power LDMOS transistors 2000 – 2200 MHz

driver	BLF6G21-10G	SOT538A	10 - 2200	0.6	15	18.5	28	Now
driver	BLM6G22-30	SOT834-1	2100 - 2200	2	9	30	28	Now
driver	BLM6G22-30G	SOT882-1	2100 - 2200	2	9	30	28	Now
driver	BLF6G22(S)-45	SOT608	2000 - 2200	2.5	13	18.5	28	Now
driver	BLF6G22L(S)-40BN	SOT1112A3/B3	2110 - 2170	2.5	16	19	28	Q2, 2010
final	BLF6G22LS-75	SOT502B	2000 - 2200	17	30.5	18.7	28	Now
final	BLF6G22LS-100	SOT502B	2000 - 2200	25	29	18.5	28	Now
final	BLF6G22L(S)-130	SOT502	2000 - 2200	30	28.5	17	28	Now
final	BLF7G22LS-130	SOT502B	2000 - 2200	44.8	32	18.5	28	Now
final	BLF6G22-180PN	SOT539A	2000 - 2200	50	27.5	17.5	32	Now
final	BLF6G22(LS)-180RN	SOT502	2000 - 2200	40	25	16	30	Now
final	BLF7G22L(S)-200	SOT502A3/B3	2110 - 2170	55	17	28	28	Q2, 2010
integrated Doherty	BLD6G21L(S)-50	SOT1130	2010 - 2025	8	38.9	12.6	28	Now
integrated Doherty	BLD6G22L(S)-50	SOT1130	2110 - 2170	8	39	12.6	28	Now

WiMAX power LDMOS transistors 2300 – 2700 MHz

driver	BLF6G27-10(G)	SOT975	2500 - 2700	2	20	19	28	Now
driver	BLF6G27(S)-45	SOT608	2500 - 2700	7	24	18	28	Now
driver	BLF6G27(LS)-75	SOT502	2500 - 2700	9	23	17	28	Now
driver	BLF7G27L(S)-75P	SOT1121A3/B3	2300 - 2400	10	25	17.5	28	Q2, 2010
driver	BLF6G27L(S)-45BN	SOT1112A3/B3	2500 - 2700	3	15	17	28	Q2, 2010
final	BLF6G27(LS)-135	SOT502	2500 - 2700	20	22.5	16	32	Now
final	BLF7G27L(S)-100	SOT502A3/B3	2500 - 2700	14	24	17.5	28	Q2, 2010
final	BLF7G27L(S)-140	SOT502A3/B3	2500 - 2700	20	22	17	28	Q3, 2010
final	BLF7G27L(S)-200P	SOT539	2500 - 2700	20	25	16.5	28	Now

WiMAX power LDMOS transistors 3500 – 3800 MHz

driver	BLF6G38-10(G)	SOT975	3400 – 3600	2	20	14	28	Now
driver	BLF6G38(S)-25	SOT608	3400 – 3800	4.5	24	15	28	Now
driver	BLF6G38(LS)-50	SOT502	3400 – 3800	9	23	14	28	Now
final	BLF6G38(LS)-100	SOT502	3400 – 3600	18.5	21.5	13	28	Now

Power LDMOS Doherty designs

Freq band (MHz)	P_{PEAK} (dBm)	P_{OUT} - AVG (dBm)	V_{DS} (V)	Gain (dB)	Drain Eff. (%)	Type	Main transistor	Peak transistor	Availability
728 - 756	55.3	47	28	19	40	SYM	1/2 BLF6G10-260PM	1/2 BLF6G10-260PM	Now
791 - 822	55.5	47	28	19	42	SYM	1/2 BLF6G10-260PRN	1/2 BLF6G10-260PRN	Now
728 - 768	58	50	32	20.5	47	SYM	BLF6G10-200	BLF6G10-200	Now
728 - 756	59.1	50.5	32	19	40	SYM	BLF6G10-260PM	BLF6G10-260PM	Now
790 - 821	58	50	32	20.5	47	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN	Now
869 - 894	52.7	44.5	28	15	50	SYM	1/2 BLF6G10LS-135P	1/2 BLF6G10LS-135P	Now
869 - 894	53	45	28	tbd	tbd	3-WAY	BLF6G10S-45	2x BLF6G10S-45	Q2, 2010
869 - 894	54.7	47	28	17.5	37	SYM	1/2 BLF6G10-260PM	1/2 BLF6G10-260PM	Now
920 - 960	53	45	28	tbd	tbd	SYM	1/2 BLF6G10LS-135P	1/2 BLF6G10LS-135P	Q2, 2010
920 - 960	56.2	48	28	18.5	40	SYM	BLF6G10-135RN	BLF6G10-135RN	Now
869 - 894	58	50	32	20.5	46	SYM	BLF6G10-200RN	BLF6G10-200RN	Now
925 - 960	58.9	50	32	22	44	SYM / MMPP	BLF6G10-260PRN	BLF6G10-260PRN	Now
1476 - 1511 MHz									
1476 - 1511	58.1	49.6	28	16	42	ASYM	BLF7G15LS-200	BLF7G15LS-300P	Q2, 2010
1805 - 1880 MHz (DCS)									
1805 - 1880	52	44	27	14.5	42	SYM	Transistor	1/2 BLC6G20-130PG	Now
1805 - 1880	52.5	44.5	28	16	44	SYM	1/2 BLF7G20LS-160P	1/2 BLF7G20LS-160P	Q2, 2010
1805 - 1880	55	47	32	16	38	SYM	1/2 BLF6G20-230PRN	1/2 BLF6G20-230PRN	Now
1805 - 1880	55	47	28	15	40	SYM	BLF6G18-140*1)	BLF6G18-140*1)	Now
1805 - 1880	55.5	47	28	16	41	SYM	1/2 BLF7G20-250P	1/2 BLF7G20-250P	Now
1805 - 1880	57.5	49.5	30	16	42	SYM	BLF7G20LS-200	BLF7G20LS-200	Now
1805 - 1880	57.9	50	32	15.5	37	SYM / MMPP	BLF6G20-230PRN	BLF6G20-230PRN	Now
1805 - 1880	58.2	50	28	16	42	SYM / MPPM	BLF7G20LS-250P	BLF7G20LS-250P	Now
1930 - 1990 MHz (PCS)									
1930 - 1990	53	45	28	16.5	40	SYM	BLF6G20-75	BLF6G20-75	Now
1930 - 1990	55.2	46.4	28	16	39	SYM	1/2 BLF7G20LS-250P	1/2 BLF7G20LS-250P	Now
1930 - 1990	56	48	31	15.3	38	SYM	BLF6G20-140	BLF6G20-140	Now
1930 - 1990	56	49	31	17	41	SYM	2x BLF6G20-75	2x BLF6G20-75	Now
1930 - 1990	57.5	49.5	28	tbd	tbd	SYM	BLF7G20LS-200	BLF7G20LS-200	Q2, 2010
1930 - 1990	58	50	32	15.5	37	SYM	BLF6G20-230PRN	BLF6G20-230PRN	Now
1930 - 1990	58.2	50	28	16	40	SYM	BLF7G20LS-250P	BLF7G20LS-250P	Q2, 2010
1880 - 2025 MHz (TD - SCDMA)									
2010 - 2025	47	39	28	14.4	41	SYM	BLD6G21-50	BLF6G21-50	Now
1880 - 2025	50	42	28	17	46	SYM	1/2 BLF7G20-90P	1/2 BLF7G20-90P	Now
2010 - 2025	50	42	28	17.2	47.2	SYM	1/2 BLF7G20-90P	1/2 BLF7G20-90P	Now
1880 - 1920	52.5	44.5	28	16	44	SYM	1/2 BLF7G20LS-160P	1/2 BLF7G20LS-160P	Q2, 2010
2110 - 2170 MHz (UMTS / LTE)									
2110 - 2170	47	39	28	13	38	SYM	BLD6G22-50	BLF6G22-50	Now
2110 - 2170	53	45	28	15.5	43	SYM	1/2 BLF6G22-150P	1/2 BLF6G22-150P	Now
2110 - 2170	54.7	46.5	28	16.5	43	SYM	BLF6G22-100	BLF6G22-100	Now
2110 - 2170	54.9	47	28	17	43	SYM	BLF7G22-130	BLF7G22-130	Now
2110 - 2170	55	47	28	15.5	38	SYM	BLF6G22-130	BLF6G22-130	Now
2110 - 2170	55.5	46.4	28	15	43	ASYM	BLF7G22LS-130	BLF7G22LS-200	Now
2110 - 2170	56	48	28	15	48	3-WAY	BLF7G22-130	7G22-130/7G22-130	Now
2110 - 2170	56.5	48.5	28	16.2	41	SYM	BLF7G22-200	BLF7G22-200	Now
2110 - 2170	57	49	32	14.5	41	ASYM	BLF6G22-100	BLF6G22-180PN	Now
2110 - 2170	58	50	32	15	40	SYM	BLF6G22-180PN	BLF6G22-180PN	Now
2110 - 2170	58.5	51	tbd	tbd	tbd	SYM	BLF7G22LS-250P	BLF7G22LS-250P	Q2, 2010
2110 - 2170	59	51	tbd	tbd	tbd	3-WAY	BLF7G22LS-160	7G22LS-160/7G22LS-160	Q2, 2010
2300 - 2400 MHz (WiBRO / LTE)									
2300 - 2400	49.5	42	28	14.5	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P	Now
2300 - 2400	52	44.5	28	tbd	tbd	ASYM	BLF7G27S-50	BLF7G27LS-100	Q2, 2010
2300 - 2400	52.5	45	28	tbd	tbd	SYM	1/2 BLF7G27LS-150P	1/2 BLF7G27LS-150P	Q2, 2011
2500 - 2700 MHz (WiMAX / LTE)									
2570 - 2620	49.5	42	28	15	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P	Now
2500 - 2700	50	42	28	15	37.5	SYM	BLF6G27-45	BLF6G27-45	Now
2500 - 2600	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45	Now
2600 - 2700	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45	Now
2600 - 2700	52	44	28	14	40	ASYM	BLF6G27-45	BLC6G27-100	Now
2500 - 2700	52.5	44.5	28	14	38	SYM	1/2 BLF6G27-150P	1/2 BLF7G27-150P	Now
2300 - 2400	52.5	45	28	tbd	tbd	SYM	1/2 BLF7G27LS-150P	1/2 BLF7G27LS-150P	Q2, 2010
2500 - 2700	55	47	28	tbd	tbd	ASYM	BLF7G27LS-100	BLF7G27LS-140	Q2, 2010
3300 - 3800 MHz (WiMAX)									
3400 - 3600	49.5	41.5	28	tbd	tbd	SYM	1/2 BLF7G38LS-75P	1/2 BLF7G38LS-75P	Q2, 2010
3400 - 3600	51	43	28	11.5	32	SYM	BLF6G38-50	BLF6G38-50	Now
3400 - 3600	52.5	44.5	28	tbd	tbd	SYM	BLF7G38-75	BLF7G38-75	Q2, 2010

RF Small Signal portfolio

Medium power amplifiers (MPA) 400-2700 MHz MMICs

Type	Package		f (MHz)	supply			shutdown control					RF performance				RF performance			
				V_{cc}	I_{cc}		$V_{I(D)L(SHDN)}$		$V_{I(D)H(SHDN)}$		$I_{I(D)L(SHDN)}$	Typ @ f = 940 MHz				Typ @ f = 1960 MHz			
				Typ	Typ	Max	Min	Max	Min	Max	Typ	Gp	$P_{L(1dB)}$	OIP3	NF	Gp	$P_{L(1dB)}$	OIP3	NF
				(V)	(mA)	(mA)	(V)	(V)	(V)	(V)	(µA)	dB	dBm	dBm	dB	dB	dBm	dBm	dB
BGA6589	SOT89	leaded	50 - 3100	4.8	84	150	-	-	-	-	-	21	21	33	3	17	20	31	3.3
BGA7124	SOT908	leadless	400 - 2700	5	130	200	0	0.7	2.5	Vbias	4	22	25	38	5	16	24	38	5
BGA7024	SOT89	leaded	400 - 2700	5	110	-	-	-	-	-	-	22	24	38	3	16	25	38	4
BGA7127	SOT908	leadless	400 - 2700	5	180	325	0	0.7	2.5	Vbias	4	20	28	44	3	13	28	43	5
BGA7027	SOT89	leaded	400 - 2700	5	170	-	-	-	-	-	-	19	28	41	3	12	28	43	4
BGA7130	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	30	45	4	12	30	45	4
BGA7133	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	33	46	4	12	33	47	4

The specifications of the BGA7130 and BGA7133 are target specifications until development is completed.

Variable gain amplifiers

Type	Package	Control interface	Vsup	Isup	frequency	Gain range	@ minimum attenuation			@ maximum attenuation		
							Gain	OIP3	NF	Gain	OIP3	NF
			(V)	(mA)	(MHz)	(dB)	(dB)	(dBm)	(dB)	(dB)	(dBm)	(dB)
BGA7202	SOT617	Analog	5	710	700 … 1450	27	24	45	6.5	-3	23.5	33.5
					1450 … 2200	27	24	45	6.5	-3	23.5	33.5
BGA7203	SOT617	Analog	5	710	2100 … 2750	27	24	45	6.5	-3	23.5	33.5
BGA7204	SOT617	Parallel, serial	5	160	700 ... 2750	31.5	24	37	6.5	-7.5	19	38
BGA7350	SOT617	Parallel, digital	5	240	50 … 250	24	18.5	-	6	-5.5	50	30
BGA7351	SOT617	Parallel, digital	5	240		28	18.5	-	6	-9.5	50	34

These specifications are target specifications until development is completed.
BGA7350 and BGA7351 are dual VGA products. The VGA function is twice on the chip.
BGA7350 and BGA7351 are designed for receiving.

SiGe:C wideband transistor for LNA and Mixer

Type	Package	f_T (typ) (GHz)	BV_{CEO} (V)	I_C (max) (mA)	@ f = 1.5 GHz			@ f = 1.8 GHz			@ f = 2.4 GHz		
					NF	MSG /$G_{P(max)}$	OIP3	NF	MSG /$G_{P(max)}$	OIP3	NF	MSG /$G_{P(max)}$	OIP3
					(dB)	(dB)	(dBm)	(dB)	(dB)	(dBm)	(dB)	(dB)	(dBm)
BFU725F/N1	SOT343F	70	3.2	40	0.42	28	17	0.43	27	17	0.47	25.5	17

RF PIN diodes for antenna switching

Type	Package	number of diodes	configuration	V_R max	I_F max	@ f = 100 MHz			@ f = 1 MHz		
						@ I_F = 0.5 mA	@ I_F = 1 mA	@ I_F = 10 mA	@ V_R = 0 V	@ V_R = 1 V	@ V_R = 20 V
						r_D typ	r_D typ	r_D typ	C_d typ	C_d typ	C_d typ
				(V)	(mA)	(Ω)	(Ω)	(Ω)	(pF)	(pF)	(pF)
BAP70Q*	SOT753	4	Quad	50	100	77	40	5.4	0.6	0.43	0.25
BAP64Q*	SOT753	4	Quad	100	100	20	10	2	0.52	0.37	0.23
BAP64-02	SOD523	1	SG	175	100	20	10	2	0.48	0.35	0.23
BAP64-03	SOD323	1	SG	175	100	20	10	2	0.48	0.35	0.23
BAP64-04	SOT23	2	SR	175	100	20	10	2	0.52	0.37	0.23
BAP64-04W	SOT323	2	SR	100	100	20	10	2	0.52	0.37	0.23
BAP64-05	SOT23	2	CC	175	100	20	10	2	0.52	0.37	0.23
BAP64-05W	SOT323	2	CC	100	100	20	10	2	0.52	0.37	0.23
BAP64-06	SOT23	2	CA	175	100	20	10	2	0.52	0.37	0.23
BAP64-06W	SOT323	2	CA	100	100	20	10	2	0.52	0.37	0.23

ad *: these parameters are based on a single diode (out of 4 in these quad pin diodes)

High Speed Data Converter portfolio

ADCs

Type	Description	Supply Voltage (V)	Power Dissipation (mW)	SFDR (dBc)	SNR (dBFS)	Digital Interface	Package
ADC1613D series	Dual 16-bit ADC up to 65/80/105/125Msps with serial interface	1.8 / 3.3	445	93	73.2	JESD204A	HVQFN56 8x8
ADC1610S series	Single 16-bit ADC up to 65/80/105/125Msps	1.8 / 3.3	350	93	73.2	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1415S series	Single 14-bit ADC up to 65/80/105/125Msps with input buffer	1.8 / 3.3/5	550	91	73.2	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1413D series	Dual 14-bit ADC up to 65/80/105/125Msps with serial interface	1.8 / 3.3	445	91	73.2	JESD204A	HVQFN56 8x8
ADC1412D series	Dual 14-bit ADC up to 65/80/105/125Msps	1.8 / 3.3	350	91	73.2	LVCMOS and LVDS/DRR	HVQFN64 9x9
ADC1410S series	Single 14-bit ADC up to 65/80/105/125Msps	1.8 / 3.3	350	91	73.2	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1215S series	Single 12-bit ADC up to 65/80/105/125Msps with input buffer	1.8 / 3.3/5	550	91	70.7	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1213D series	Dual 12-bit ADC up to 65/80/105/125Msps with serial interface	1.8 / 3.3	445	91	70.7	JESD204A	HVQFN56 8x8
ADC1212D series	Dual 12-bit ADC up to 65/80/105/125Msps	1.8 / 3.3	350	91	70.7	LVCMOS and LVDS/DRR	HVQFN64 9x9
ADC1210S series	Single 12-bit ADC up to 65/80/105/125Msps	1.8 / 3.3	350	91	70.7	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1207S080	Single 12-bit ADC 80 Msps	5	840	90	71	parallel LVCMOS	HTQFN48 7x7
ADC1206S series	Single 12-bit ADC 40/50/70 Msps	3.3 / 5.0	550	72	64	parallel CMOS and TTL	QFP44
ADC1115S125	Single 11-bit ADC up to 125Msps with input buffer	1.8 / 3.3/5	790	90	66.7	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1113D125	Dual 11-bit ADC up to 125Msps with serial interface	1.8 / 3.3	635	90	66.7	JESD204A	HVQFN56 8x8
ADC1015S series	Single 10-bit ADC up to 65/80/105/125Msps with input buffer	1.8 / 3.3/5	550	91	61.7	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1010S series	Single 10-bit ADC up to 125Msps	1.8 / 3.3	350	91	61.7	LVCMOS and LVDS/DRR	HVQFN40 6x6
ADC1006S series	Single 10-bit ADC 50/70 Msps	3.3 / 5.0	550	71	59	parallel CMOS and TTL	QFP44
ADC1005S060	Single 10-bit ADC 60 Msps	5	312	72	58	parallel CMOS and TTL	SSOP28
ADC1004S series	Single 10-bit ADC 30/40/50 Msps	5	175	72	58	parallel CMOS and TTL	SSOP28
ADC1003S series	Single 10-bit ADC 30/4050 Msps with internal Vref	5	235	70	58	parallel CMOS and TTL	SSOP28
ADC1002S020	Single 10-bit ADC 20 Msps	3 to 5,25	53	72	60	parallel CMOS and TTL	LQFP32
ADC0808S series	Single 8-bit ADC 125/250 Msps	1.8 / 3.3	215	57	50	parallel CMOS/ LVDS clk	HTQFN48 7x7
ADC0804S series	Single 8-bit ADC 30/40/50 Msps	5	175	72	49	parallel CMOS and TTL	SSOP28
ADC0801S040	Single 8-bit ADC 40 Msps	2.7 to 5.5	30	59	47	parallel CMOS and TTL	SSOP20

DACs

Type	Description	Supply Voltage (V)	Power Dissipation (mW)	SFDR (dBc)	Interpolation	Package
DAC1408D series	Dual 14-bit DAC upto 650/750 Msps	1.8 / 3.3	850	77	2x. 4x. 8x	HVQFN64 9x9
DAC1405D series	Dual 14-bit DAC upto 650/750 Msps	1.8 / 3.3	550	77	2x. 4x. 8x	HTQFP100 14x14
DAC1403D160	Dual 14-bit DAC 160 Msps	3.3	210	80	2x	HTQFP80 12x12
DAC1401D125	Dual 14-bit DAC 125 Msps	3.3	105	88	-	LQFP48
DAC1208D series	Dual 12-bit DAC upto 650/750 Msps	1.8 / 3.3	850	77	2x. 4x. 8x	HVQFN64 9x9
DAC1205D series	Dual 12-bit DAC upto 650/750 Msps	1.8 / 3.3	550	80	2x. 4x. 8x	HTQFP100 14x14
DAC1203D160	Dual 12-bit DAC 160 Msps	3.3	210	77	2x	HTQFP80 12x12
DAC1201D125	Dual 12-bit DAC 125 Msps	3.3	105	65	-	LQFP48
DAC1008D series	Dual 10-bit DAC upto 650/750 Msps	1.8 / 3.3	850	77	2x. 4x. 8x	HVQFN64 9x9
DAC1005D series	Dual 10-bit DAC upto 650/750 Msps	1.8 / 3.3	550	77	2x. 4x. 8x	HTQFP100 14x14
DAC1003D160	Dual 10-bit DAC 160 Msps	3.3	210	80	2x	HTQFP80 12x12
DAC1001D125	Dual 10-bit DAC 125 Msps	3.3	105	65	-	LQFP48

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