Your partner in mobile communication infrastructure design

High Performance RF for wireless infrastructure

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High Performance RF for wireless infrastructure

Looking for a partner who can help you meet the challenges of wireless infrastructure base station design? As a global leader in RF technology and component design, NXP Semiconductors offers a complete portfolio of RF products, from low- to high-power signal conditioning and high-speed data converters that deliver advanced performance and help simplify your design and development process. Our solutions range from discrete devices to modular building blocks, so you can design a highly efficient signal chain.

NXP is focused on component innovation, and on architectural breakthroughs for base station RF boards. One example is the further digitization of the transmission chain, bringing digital signals closer to the antenna. Another is a digital signals 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 base station 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 8th generation LDMOS delivers unprecedented 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), medium power amplifiers, variable gain amplifiers (VGAs), mixers, local oscillators (LOs), and up and down conversion ICs.

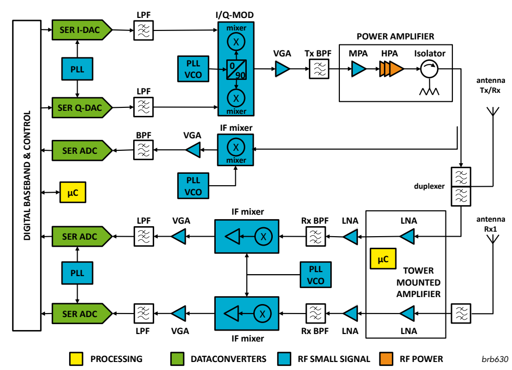
Our portfolio is based on high performance, state-of-the-art silicon based technologies such as our QUBiC4 BiCMOS process. QUBiC4 components meet the performance requirements (noise figure, linearity, power efficiency) of RF base stations and allow a higher level of integration, compared to traditional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

An optimized standard for RF High Speed Data converters

As a leader in high performance mixed-signal IC products, NXP offers an extensive selection of high-speed data converters, with digital interfaces including JESD204A (in the CGV product line), as well as CMOS LVCMOS and LVDS DDR interfaces.

NXP's high-speed DACs and ADCs deliver best-in-class converter core performance and ultra-stable dynamic performance across a broad temperature range. NXP is the only semiconductor vendor to offer high speed data converters, small-signal RF building blocks and RF power amplifiers, to enable system-level integration across the full radio transceiver signal chain.

Base station application diagram



The block diagram above shows base station transmit (upper part, Tx) and receive (lower part, Rx) functions, and includes the Tx feedback function (middle part, Tx feedback).

The signals generated in the "Digital Baseband & Control" block follow the air interface standard requirements. These signals are interfaced to the DAC via serial interface SER. The SER can use the LVDS or JEDEC standard. After the signals are fed to the I-DAC and Q-DAC, they are converted to the analog domain. Before the I and Q signals enter the IQ modulator, they are first low-pass filtered to remove any aliasing signals. At the IQ modulator, the signals are up-converted to RF using an LO signal coming from the PLL/VCO device, typically called the LO generator. Due to device aging and variation in cell load, the up-converted signals are fed to the VGA to control the power level. An additional band pass filter is needed to remove the out-of-band spurs. The clean signal is fed to the RF power board, where the desired transmit power is made. Finally, the RF power signal is fed to the antenna via a duplexer.

Directly after the final stage amplifier, a signal coupler picks up a certain amount of the RF signal, which is attenuated and then down-mixed using the IF Mixer. This signal is called the observation signal, and is used to derive coefficients for the digital pre-distortion algorithm. Since power levels vary, the observation is first fed to the VGA to control the power level, and after band pass filtering, the signal is converted to the digital domain using an ADC. The same serial interface is used to send the digital signals to the baseband processor.

At the receiver, the received signal directly after the duplexer is fed to the LNA for direct amplification, since the received signal level is quite low. If the first LNA is mounted in the tower top, a long RF cable is used to interface the RF signals with a base transceiver station (BTS). A second LNA is used to amplify the received signals. Band pass filtering is applied to reduce the out-of-band signal levels before these signals are applied to the IF mixer. Signal levels that change dramatically require a VGA to maintain the full scale ranges of the I-ADC and Q-ADC for optimal conversion performance. Low pass filtering is used before the ADC to remove the aliasing signals. These digital signals are interfaced to the baseband using a serial interface such as JEDEC.

The sample clocks and LO signals are derived from clock cleaners and PLLs respectively. This is denoted as Clock and PLL / VCO in the block diagram. This set-up is required to make a synchronized system. Typically denoted in SNRs, and in order to improve reception quality, the receive function is equipped with a second receiver, called a diversity receiver.

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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. The 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 use 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 base station applications. They are just as easy to design-in as a standard class AB transistors, so they also provide significant space and cost savings.

Discrete Doherty amplifiers

In addition 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 (50 W) with 43% efficiency and 15.7 dB gain for WCDMA applications. Our flagship 3-way Doherty reference design even achieves 47% efficiency at 48 dBm (63 W) 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 introducing its first LDMOS transistors nearly a decade ago. All of our transistors are designed to withstand a mismatch of 10:1 (VSWR) or more. Some of our 6th generation LDMOS transistors have been proven to be virtually indestructible. Recently we also introduced an extremely rugged technology based on 6th Generaton, HV LDMOS, which can even take the place of legacy VDMOS products. We could not destroy these "Unbreakable LDMOS" transistors. One example of this is the BLF578XR.

The next generation of LDMOS RF power transistors for wireless infrastructure: NXP's Gen8

NXP recently announced the 8th generation of its RF power device portfolio for base stations. Listening carefully to the world's leading infrastructure providers and understanding their requirements, a holistic approach was taken during the development of Gen8. This basically means that we scrutinized every little detail of a power transistor and reconsidered the entire "transistor system" to come up with a new generation, which performs markedly better than its predecessors and again sets standards for the industry. Gen 8 clearly addresses the key trends in the wireless infrastructure industry:

BLF8G10LS-160

- Increasing signal bandwidths up to 100 MHz
- Cost sensitivity
- Reduction in the size/weight/volume of the cabinet
- Continuous need for greater electrical efficiency to reduce cooling requirements and operating expenses
- Ever increasing output power to unprecedented levels
- Need to deploy multi-standard and future-proof solutions

Completing NXP's RF power transistor offering: products in plastic packages (OMP)

NXP currently develops a complete line of overmolded plastic (OMP) RF power transistors and MMICs with peak powers ranging from 2.5 to 200 Watts. The main benefit of plastic packages is cost effectiveness with little or no impact on performance. The range of plastic devices will complement the extensive range of RF power products NXP offers in ceramic packages for all frequency ranges and applications up to 2.45 GHz.

SOT1204

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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.

VGAs with superior linearity for enhanced system performance.

NXP variable gain amplifiers BGA7202/4, BGA7350/1.

Manufactured in NXP's innovative QUBiC4 process, these VGAs deliver more on-chip functionality in less space, and meet the most demanding requirements for system performance.

Key features

- BGA720x: transmit VGAs
  - Frequency band: 700 to 2200 or 2750 MHz
  - Gain range: 23 or 31.5 dB
  - OIP3: +36 dBm/110 mA (BGA7202), +41 dBm/520 mA (BGA7204) @ minimum attenuation
- BGA735x: dual receive IF VGAs
  - Frequency band: 50 to 250 MHz
  - Gain range: 24 or 28 dB
  - OIP3: +44 dBm/245 mA or higher @ minimum attenuation
  - Gain flatness: 0.1 dB
  - Differential phase error: 0.1 degrees
- Best-in-class linearity (OIP3) at low power consumption
- ESD protection > 2 kV HBM and > 1.5 kV CDM on all pins
- HVQFN32 leadless packages (5 x 5 mm)

Key applications

- Wireless infrastructure base stations
- Multi-carrier systems

These high performance variable gain amplifiers (VGAs) support multiple frequency bands and the latest air interfaces. They offer best-in-class linearity, very low power consumption, high immunity to out-of-band signals, spurious performance, and output power. They are ideally suited for GSM, W-CDMA, WiMAX, LTE base-station infrastructure, and multi-carrier systems.

The BGA7202 and BGA7204 are RF VGAs used in the transmit path. The BGA7202 offers an output third-order intercept (OIP3) of +45 dBm and 27 dB of attenuation. The attenuation is controlled by means of an analog interface.

The BGA7204 provides an OIP3 of +37 dBm and 32 dB of attenuation. The attenuation is controlled by means of a digital interface. In addition, the gain curve of the BGA7204 can be programmed via an SPI interface.

The BGA7350 and BGA7351 are dual, independently controlled receive IF VGAs that operate from 50 to 250 MHz. Integrated matching improves performance in the receiver chain, because the VGA can drive the filter directly into the analog-to-digital converter to ensure a constant input level.

The BGA7350 has a gain range of 24 dB, while the BGA7351 has a range of 28 dB. For both devices, the maximum gain setting delivers 18 dBm output power at 1 dB gain compression (P1dB), with superior linear performance and overdrive performance up to +20 dBm. For gain control, each amplifier uses a separate digital gain-control code, which is provided externally through two sets of five bits. The resulting gain flatness is 0.1 dB.

Other features

All four devices are RoHS-compatible and available in space-saving HVQFN32 leadless packages that measure just 5 x 5 mm. They are unconditionally stable devices that offer ESD protection at all pins and meet moisture sensitivity level 1.

Low noise, high linearity amplifiers BGU705x

The BGU705x series of low noise amplifiers (LNAs) provide low noise figure (NF) of 0.6 dB and high linearity output third-order intercept point of 30 dBm. This 50 ohm internally matched LNA family has high input return loss and is designed to operate between 500 MHz and 3800 MHz in 4 pin compatible products. This family of products is ESD protected on all terminals, and is housed in HVSON10 leadless packages. And additionally offer compared to GaAs based discrete equivalents better DC power consumption, high immunity to high input level signals, spurious emission performance and increased output power.

Medium power amplifiers for wireless infrastructures

NXP's medium power (20 to 33 dBm) gain blocks are designed to deliver high efficiency without compromising 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) as well as in leadless options and SOT-89 packages.

Medium Power Amplifier BGA7127 (leadless SOT908 package)

Medium Power Amplifier BGA7024 (leaded SOT89 package)

Evaluation board BGA7124

NXP QUBiC4 process technology

NXP's innovative, high performance SiGe:C QUBiC4 process lets customers implement more functions into less space, with the added benefits of competitive cost, superb reliability, and significant manufacturing advantages. Our state-of-the-art QUBiC4 technology and extensive IP availability speed the migration from GaAs components to silicon by enabling cutting-edge products with best-in-class low noise performance, linearity, power consumption, immunity to out-of-band signals, spurious performance, and output power. QUBiC is a mature process that has been in mass production since 2002 and has had continuous performance upgrades added ever since. The QUBiC4 process is automotive-qualified and dual-sourced in two high volume, NXP-owned 8-inch waferfabs that provide flexible, low-cost manufacturing with high yields and very low ppm in the field.

QUBiC4+

The QUBiC4+ BiCMOS process features 0.25 µm CMOS with 5 metal layers for integration of dense digital logic-based smart functionality, and a set of active and passive devices for high frequency mixed-signal designs including thick top metal layers for high quality inductors. The device set includes a 37 GHz f_T NPNs with 3.8 V breakdown voltage (BVce0) and low noise figure (NF < 1.1 @ 2 GHz), 7 GHz f_T VPNPs, a 28 GHz high voltage NPN with 5.9 V breakdown voltage, differential and single-ended varicaps with Q-factor > 30, scalable inductors with Q-factor > 20, 800 MHz FT lateral PNP's, 0.25 µm CMOS, 137, 220 & 12 to 2000 ohm/sq. poly and active resistors, a 270 ohm/sq. SiCr thin film resistor, a 5.7 fF/µm² oxide capacitor and a 5 fF/µm² MIM capacitor, 1 to 6 fF/µm² oxide capacitors and various other devices including L-PNPs, isolated NMOS, 3.3 V CMOS and RF-CMOS oxide capacitors, and other various capacitors, including those for L-PNPs, isolated NMOS, 3.3 V CMOS, and RF-CMOS transistors. The QUBiC4+ process is silicon-based and ideal for applications up to 5 GHz (f_T = 37 GHz , NF < 1.1 dB @ 1.2 GHz), as well as for medium power amplifiers up to 33 dBm.

QUBiC4X

The QUBiC4X BiCMOS process is a SiGe:C-based extension of the QUBiC process for high frequency mixed-signal designs and offers a rich set of devices, including a 140 GHz f_T NPN with 2.5 V breakdown voltage and very low noise figure (NF < 1.0 @ 10 GHz), 0.25 µm CMOS, a variety of resistors, a 5.7 fF/µm² oxide capacitor, and a 5 fF/µm² MIM capacitor.

QUBiC4X is ideal for applications that typically operate at up to 30 GHz (f_T = 137 GHz , NF < 0.8 dB @ 10 GHz) and ultra-low noise applications such as LNAs and mixers.

QUBiC4Xi

The QUBiC4Xi BiCMOS process further enhances the QUBiC4X process and offers additional features for high frequency mixed-signal designs, including 180 GHz f_T NPNs with 1.4 V breakdown voltage and ultra-low noise figure (NF < 0.7 @ 10 GHz), 0.25 µm CMOS, several resistors, and a 5.7 fF/µm² oxide capacitor, and a 5 fF/µm² MIM capacitor. QUBiC4Xi represents the newest SiGe:C process, with improved f_T (> 200 GHz) and even lower noise figure (NF < 0.5 7 dB @ 10 GHz). It is ideal for applications beyond 30 GHz, such as LO generators.

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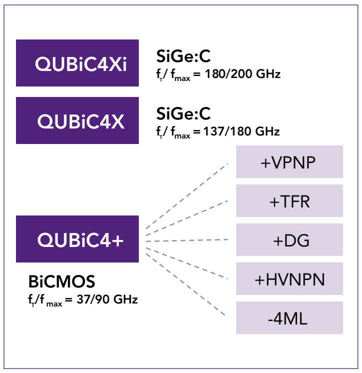

QUBiC4+

- Baseline, 0.25 µm CMOS, single poly, 5 metal
- Digital gate density 26k gates/mm²
- f_T/f_{MAX}= 37/90 GHz
- +TFR – Thin Film Resistor
- +DG – Dual Gate Oxide MOS
- +HVNPN – High Voltage NPN
- +VPNP – Vertical PNP (high V_{early})
- -4ML – high density 5 fF/µm² MIM capacitor
- Wide range of active and high quality passive devices
- Optimized for up to 5 GHz applications

QUBiC4X

- SiGe:C process
- f_T/f_{MAX}= 137/180 GHz
- Optimized for up to 30 GHz applications
- Transformers

QUBiC4Xi

- SiGe:C process
- Improves f_T/f_{max} up to 180/200 GHz
- Optimized for ultra-low noise for microwave above 30 GHz

Features	QUBiC4+	QUBiC4X	QUBiC4X
Release for production	2004	2006	2008
CMOS/Bipolar	CMOS 0.25 µm, Bipolar 0.4 µm, Double poly, Deep trench, Si	CMOS 0.25 µm, Bipolar LV 0.4 µm, Double poly, Deep trench, SiGe:C	CMOS 0.25 µm, Bipolar LV 0.3 µm, Double poly, Deep trench, SiGe:C
LV NPN f_T/F_{max} (GHz)	37/90 (Si)	137/180 (SiGe:C)	180/200 (SiGe:C)
HV NPN f_T/F_{max} (GHz)	28/70 (Si)	60/120 (SiGe:C)	tbd (SiGe:C)
NPN BVce0: HV/LV **	5.9 / 3.8 V	3.2 / 2.0 V	2.5 / 1.4 V
V-PNP f_T / BVcb0 (GHz / V)	7 / >9	planned	planned
CMOS Voltage / Dual Gate	2.5 / 3.3 V	2.5 V	2.5 V
Noise figure NPN (dB)	2 GHz: 1.1	10 GHz: 0.8	10 GHz: 0.5
RFCMOS f_T (GHz)	NMOS 58, PMOS 19	NMOS 58, PMOS 19	NMOS 58, PMOS 19
Isolation (60 dB @ 10 GHz)	STI and DTI	STI and DTI	STI and DTI
Interconnection (AlCu with CMP W Plugs)	5 LM, 3 µm top Metal	5 LM, 3 µm top Metal 2 µm M4	5 LM, 3 µm top Metal
Capacitors	NW, DN, Poly-Poly 5 fF/µm² MIM	NW, DN, Poly-Poly 5 fF/µm² MIM	NW, DN, Poly-Poly 5 fF/µm² MIM
Resistors (Ω/sq)	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr (270)	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr (270)	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr (270)
Varicaps (single-ended & differential)	2x single ended, Q > 40 3x differential, Q 30-50	2x single ended, Q > 40 3x differential, Q 30-50	2x single ended, Q > 40 3x differential, Q 30-50
Inductors (1.5 nH @ 2 GHz) - scalable	Q > 21, Thick Metal, Deep trench isolation, High R substrate	Q > 21, Thick Metal, Deep trench isolation, High R substrate	Q > 21, Thick Metal, Deep trench isolation, High R substrate
Other devices	LPNP, Isolated NMOS	Isolated-NMOS	LPNP, Isolated-NMOS
Mask count	31 / 32 (MIM) / 33 (DG)	35 (MIM)	35 (MIM)

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 I/Q modulation communications systems) design challenges by synchronously bonding multiple data channels or lanes.

ADC1413D125 Demoboard

ADCs

Our single- and dual-channel ADC portfolio offers more than 80 different ADCs with resolutions from 8 to 16 bits, input samples rates from 20 to 125 Msps, optional input buffer and low-voltage CMOS, LVDS/DDR and JEDEC JESD204A digital outputs.

The ADC1413D is a dual-channel 14-bit Analog-to-Digital Converter (ADC) optimized for high dynamic performance and low power at sample rates up to 125 Msps. A pipelined architecture and output error correction ensure the ADC1413D is accurate enough to guarantee zero missing codes over the entire operating range. Supplied from a 3 V source for analog and a 1.8 V source for the output driver, it embeds two serial outputs. Each lane is differential and complies with the JESD204A standard. An integrated Serial Peripheral Interface (SPI) allows the user to easily configure the ADCs. A set of IC configurations is also available via the binary level control pins, which are used at power-up. The device also includes a programmable full-scale SPI to allow a flexible input voltage range of 1 to 2 V (peak-to-peak). Excellent dynamic performance (SNR=71.4 Db, SFDR=87 dBc typ) is maintained from the baseband to input frequencies of 170 MHz or more, making the ADC1413D ideal for use in communications, imaging, and medical applications.

DACs

Our dual-channel DACs portfolio offers DACs with resolutions of 10, 12 or 14 bits, output samples rates from 125 to 750 Msps, and low-voltage CMOS, LVDS/DDR or JEDEC JESD204A digital inputs.

The DAC1408D750 is a high-speed 14-bit dual channel Digital-to-Analog Converter (DAC) with selectable, 2x, 4x or 8x interpolating filters optimized for multi-carrier WCDMA transmitters up to 750 Msps. Thanks to its digital on-chip modulation, the DAC1408D750 allows the complex pattern provided through the lanes to be converted up from baseband to IF. The mixing frequency is adjusted via a Serial Peripheral Interface (SPI) with a 32-bit Numerically Controlled Oscillator (NCO) and the phase is controlled by a 16-bit register. The serial input digital interface (maximum data rate of 3.125 Gbps) is compliant with the JEDEC JESD204A standard. NXP's implementation of Multiple Device Synchronization (MDS) enables the data streams of several DACs to be sample synchronized and phase coherent.

CVG – The industry's first implementation of the JESD204A serial interface

CGV™ (Convertisseur Grande Vitesse), NXP's 100% JEDEC JESD204A-compliant interface that NXP enhanced for even greater ease-of-use and improved performance:

- Enhanced rate (up to 4.0 Gbps) – a 28% increase over the JEDEC standard 3.125 Gbps
- Enhanced reach (up to 100 cm) – a 400% increase over the JEDEC standard 20 cm
- Enhanced features (multiple DAC synchronization) – enables up to sixteen DAC data streams to be sample-synchronized and phase-coherent
- Comprehensive interoperability with SERDES-based FPGAs – eliminates the risk and cost associated with project schedules
- NXP CGV ADCs and DACs support FPGAs from Altera, Lattice and Xilinx –giving you plug-and-play interop!

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RF power transistor portfolio

Power LDMOS transistors 700 – 1000 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF6G21-10G	driver	1	2200	10	28	2	11.5	31	19.3	1-C WCDMA	SOT538A
BLM6G10-30(G)	MMIC driver	920	960	30	28	2	11.8	11.5	29	2-C WCDMA	SOT822-1
BLF6G10L-40BRN	driver/final	700	1000	40	28	2.5	12	15	23	2-C WCDMA	SOT1112A
BLF6G10(S)-45	driver/final	700	1000	45	28	1	16.5	8	23	2-C WCDMA	SOT608B
BLP7G10S-140P(G)	final	700	1000	140	28	32	8	32	19	2-C WCDMA	SOT1204
BLF6G10(LS)-160RN	final	700	1000	160	32	32	7	27	22.5	2-C WCDMA	SOT502
BLF8G10LS-160	final	700	1000	160	28	40	7	29	22	2-C WCDMA	SOT502B
BLF6G10-200RN	final	700	1000	200	28	40	7	28.5	20	2-C WCDMA	SOT502A
BLF6G10LS-200RN	final	688	1000	200	28	40	7	28.5	20	2-C WCDMA	SOT502B
BLF7G10LS-250	final	920	960	250	28	60	7	30	19	2-C WCDMA	SOT502B
BLF6G10L(S)-260PRN	final	700	1000	260	28	40	8.1	26.5	22	2-C WCDMA	SOT539B
BLF8G10LS-300P	final	700	1000	300	28	110	7	47	16	IS95	SOT539B

Power LDMOS transistors 1400 – 1700 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF6G21-10G	driver	1	2200	10	28	0.7	11.5	15	18.5	2-c WCDMA	SOT538A
BLF6G15L-40BRN	driver	1450	1550	40	28	2.5	12.0	13	22	2-c WCDMA	SOT1112A
BLF7G15LS-200	final	1450	1550	200	28	50	6.0	29	19.5	2-c WCDMA	SOT502B
BLF6G15L-250PBRN	final	1450	1550	250	28	60	6.2	33	18.5	2-c WCDMA	SOT1110A
BLF7G15LS-300P	final	1450	1550	300	28	85	5.5	31	18	2-c WCDMA	SOT539B

Power LDMOS transistors 1800 – 2000 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF6G21-10G	driver	1	2200	10	28	0.7	11.5	15	18.5	2-c WCDMA	SOT538A
BLF6G20-40	driver	1800	2000	40	28	2.5	12.0	15	18.8	2-c WCDMA	SOT608A
BLF6G20-45	driver	1800	2000	45	28	2.5	12.6	14	19.2	2-c WCDMA	SOT608A
BLF6G20S-45	driver	1800	2000	45	28	2.5	12.6	14	19.2	2-c WCDMA	SOT608B
BLD6G21L-50	driver	2010	2025	50	28	8	8.0	43	14.5	TD-SCDMA	SOT1130A
BLD6G21LS-50	driver	2010	2025	50	28	8	8.0	43	14.5	TD-SCDMA	SOT1130B
BLF6G20-75	driver	1800	2000	75	28	29.5	4.1	37.5	19	GSM EDGE	SOT502A
BLF6G20LS-75	driver	1800	2000	75	28	29.5	4.1	37.5	19	GSM EDGE	SOT502B
BLF7G20L-90P	final	1800	2000	90	28	84	0.3	54	19	GSM EDGE	SOT1121A
BLF7G20LS-90P	final	1800	2000	90	28	84	0.3	54	19	GSM EDGE	SOT1121B
BLF6G20-110	final	1800	2000	110	28	25	6.4	32	19	2-c WCDMA	SOT502A
BLF6G20LS-110	final	1800	2000	110	28	25	6.4	32	19	2-c WCDMA	SOT502B
BLF6G20LS-140	final	1800	2000	140	28	35.5	6.0	30	16.5	2-c WCDMA	SOT502B
BLF7G20LS-140P	final	1800	2000	140	28	60	3.7	41	17.5	GSM EDGE	SOT1121B
BLF7G21L(S)-160P	final	1800	2050	160	28	45	5.5	34	18	2-c WCDMA	SOT1121
BLF6G20-180PN	final	1800	2000	180	32	50	5.6	29.5	18	2-c WCDMA	SOT539A
BLF6G20-180RN	final	1800	2000	180	30	40	6.5	27	17.2	2-c WCDMA	SOT502A
BLF6G20LS-180RN	final	1800	2000	180	30	40	6.5	27	17.2	2-c WCDMA	SOT502B
BLF7G20L-200	final	1805	1990	200	28	55	5.6	33	18	2-c WCDMA	SOT502A
BLF7G20LS-200	final	1805	1990	200	28	55	5.6	33	18	2-c WCDMA	SOT502B
BLF6G20-230PRN	final	1805	1880	230	30	50	6.6	29.5	16.5	2-c WCDMA	SOT539A
BLF6G20S-230PRN	final	1805	1880	230	30	50	6.6	29.5	16.5	2-c WCDMA	SOT539B
BLF7G20L-250P	final	1805	1880	250	28	70	5.5	35	18	2-c WCDMA	SOT539A
BLF7G20LS-250P	final	1805	1880	250	28	70	5.5	35	18	2-c WCDMA	SOT539B

Power LDMOS transistors 2000 – 2200 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF6G21-10G	driver	10	2200	10	28	0.7	11.5	15	18.5	2-c WCDMA	SOT538A
BLP7G22-10	driver	10	2200	10	28	0.7	11.5	15	17	2-c WCDMA	SOT1179
BLM6G22-30	driver	2100	2200	30	28	2	11.8	9	29.5	2-c WCDMA	SOT834-1
BLM7G22S-60PG	driver	2000	2200	60	28	3	11.5	10	29	2-c WCDMA	tbd
BLF6G22L-40BN	driver	2000	2200	40	28	2.5	12.0	16	19	2-c WCDMA	SOT1112A
BLF6G22L(S)-40P	driver	2110	2170	40	28	13.5	4.7	30	19	2-c WCDMA	SOT1121B3
BLF6G22(S)-45	driver	2000	2200	45	28	2.5	12.6	13	18.5	2-c WCDMA	SOT608B
BLD6G22L(S)-50	driver	2110	2170	50	28	8	8.0	40	14	TD-SCDMA	SOT1130B
BLF6G22LS-75	driver	2000	2200	75	28	17	6.4	30.5	18.7	2-c WCDMA	SOT502B
BLF7G22LS-100P	final	2000	2200	100	28	20	7.0	28	18	2-c WCDMA	SOT1121B3
BLF6G22LS-100	final	2000	2200	100	28	25	6.0	29	18.5	2-c WCDMA	SOT502B
BLF7G22L(S)-130	final	2000	2200	130	28	30	6.4	32	18.5	2-c WCDMA	SOT502B
BLF7G22L(S)-160	final	2000	2200	160	28	43	5.7	30	18	2-c WCDMA	SOT502B3
BLF6G22(LS)-180PN	final	2000	2200	180	32	50	5.6	27.5	17.5	2-c WCDMA	SOT539B
BLF6G22(LS)-180RN	final	2000	2200	180	30	40	6.5	25	16	2-c WCDMA	SOT502B
BLF7G22L(S)-200	final	2110	2170	200	28	55	5.6	31	18.5	2-c WCDMA	SOT502B
BLF7G22L(S)-250P	final	2110	2170	250	28	70	5.5	30	17	2-c WCDMA	SOT539B

Power LDMOS transistors 2300 – 2700 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF7G27L(S)-75P	driver	2300	2700	75	28	12	8.0	26	17	IS-95	SOT1121
BLF6G27LS-40P	driver	2500	2700	40	28	20	3.0	37	17.5	1-C WCDMA	SOT1121
BLF7G27L(S)-90P	final	2500	2700	90	28	16	7.5	27.5	17.5	IS-95	SOT1121
BLF7G24L(S)-100	final	2300	2400	100	28	14	8.5	24	18	IS-95	SOT502
BLF7G27L(S)-100	final	2500	2700	100	28	25	6.0	24	17.5	IS-95	SOT502
BLF7G24L(S)-140	final	2300	2400	140	28	30	6.7	22	17	IS-95	SOT502
BLF7G27L(S)-140	final	2500	2700	140	28	20	8.5	22	17	IS-95	SOT502
BLF7G27L(S)-150P	final	2500	2700	150	28	30	7.0	27	16.5	IS-95	SOT539
BLF7G24LS-160P	final	2300	2400	160	28	30	7.3	27	16.5	IS-95	SOT1246
BLF7G27LS-200P	final	2600	2700	200	28	42	7.0	25	16.5	IS-95	SOT1246

Power LDMOS transistors 3500 – 3800 MHz

Type iso	Function	f_{min} (MHz)	f_{max} (MHz)	CW P1dB (W)	V_{DS} (V)	P_L (W)	BO (dB)	η_D (%)	G_p (dB)	Test Signal	Package
BLF6G38-10(G)	driver	3400	3600	10	28	2	7.0	20	14	N-CDMA	SOT975
BLF6G38(LS)-25	driver	3400	3800	25	28	4.5	7.4	24	15	N-CDMA	SOT608
BLF6G38(LS)-50	driver	3400	3800	50	28	9	7.4	23	14	N-CDMA	SOT502
BLF6G38(LS)-100	final	3400	3600	100	28	18.5	7.3	21.5	13	N-CDMA	SOT502

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Power LDMOS Doherty designs

Freq band (MHz)	PPEAK (dBm)	POUT-AVG (dBm)	VDS (V)	Gain (dB)	Drain Eff. (%)	Type	Main transistor	Peak transistor
728-821 MHz								
790-821	55.5	47	28	19	42	SYM	1/2 BLF6G10L(S)-260PRN	1/2 BLF6G10L(S)-260PRN
790-821	57.2	49.5	32	20	42	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
728-768	58	50	32	20.5	47	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
869-960 MHz								
869-894	52	44	28	20	48	SYM	BLF6G10S-45	BLF6G10S-45
869-894	52.7	44.5	28	15	50	3-WAY	BLF6G10S-45	2x BLF6G10S-45
920-960	55.1	47.1	28	20.5	44	SYM	1/2 BLF6G10L(S)-260PRN	1/2 BLF6G10L(S)-260PRN
920-960	56.2	48	28	18.5	40	SYM	BLF6G10-135RN	BLF6G10-135RN
920-960	57.3	49.3	30	16	50	ASYM	BLF8G10LS-160	BLF7G10LS-250
925-960	57.7	49.7	28	20.5	40	SYM / MPPM	BLF6G10L(S)-260PRN	BLF6G10L(S)-260PRN
869-894	58	50	32	20.5	46	SYM	BLF6G10-200RN	BLF6G10-200RN
925-960	58.9	50.9	32	22	47	SYM / MMPP	BLF6G10L(S)-260PRN	BLF6G10L(S)-260PRN
1476-1511 MHz								
1526-1555	56.6	48.6	28	18.4	42	SYM	BLF7G15LS-200	BLF7G15LS-200
1476-1511	58.1	49.6	28	16	42	ASYM	BLF7G15LS-200	BLF7G15LS-300P
1476-1511	58.6	50.6	32	16.5	42	SYM	BLF6G15LS-250PBRN	BLF6G15LS-250PBRN
1805-1880 MHz (DCS)								
1805-1880	52.5	44.5	28	16	44	SYM	1/2 BLF7G21LS-160P	1/2 BLF7G21LS-160P
1805-1880	55	47	32	16	38	SYM	1/2 BLF6G20-230PRN	1/2 BLF6G20-230PRN
1805-1880	55.4	47.5	31	16.3	49	ASYM	BLF7G20LS-90P	BLF7G21LS-160P
1805-1880	55.5	47	28	16	41	SYM	1/2 BLF7G20L(S)-250P	1/2 BLF7G20L(S)-250P
1805-1880	56.1	48.1	30	15.2	48	ASYM	BLF7G20LS-90P	BLF7G20LS-200
1805-1880	57.5	49.5	30	16	42	SYM	BLF7G20LS-200	BLF7G20LS-200
1805-1880	57.9	50	32	15.5	37	SYM / MMPP	BLF6G20-230PRN	BLF6G20-230PRN
1805-1880	58.2	50	28	16	42	SYM	BLF7G20LS-250P	BLF7G20LS-250P
1805-1880	58.6	51	28	16	47.6	3-WAY	BLF7G20LS-200	2x BLF7G20LS-200
1930-1990 MHz (PCS)								
1930-1990	53	45	28	16.5	40	SYM	BLF6G20-75	BLF6G20-75
1930-1990	54.3	47.4	28	16.7	48.2	SYM	BLF6G20LS-110	BLF6G20LS-110
1930-1990	55.2	47.2	28	16	40	SYM	1/2 BLF7G20LS-250P	1/2 BLF7G20LS-250P
1930-1990	55.5	47.5	28	14.5	46	ASYM	BLF7G20LS-90P	BLF7G20LS-200
1930-1990	56	48	31	15.3	38	SYM	BLF6G20LS-140	BLF6G20LS-140
1930-1990	56	48	28	14.8	45	ASYM	BLF7G20LS-140P	BLF7G20LS-200
1930-1990	57	49	30	17.2	41	SYM	BLF7G20LS-200	BLF7G20LS-200
1930-1990	58	50	32	15.5	37	SYM	BLF6G20-230PRN	BLF6G20-230PRN
1930-1990	58.2	50	28	16	40	SYM	BLF7G20LS-250P	BLF7G20LS-250P
1930-1990	58.5	50.5	30	15.7	43	3-WAY	BLF7G20LS-200	2x BLF7G20LS-200
1880-2025 MHz (TD-SCDMA)								
1805-2050	52	44.5	28	15.2	41.5	SYM	1/2 BLF7G21LS-160P	1/2 BLF7G21LS-160P
2010-2025	47	39	28	14.4	41	SYM	BLD6G21L(S)-50	BLD6G21L(S)-50
1880-2025	50	42	28	17	46	SYM	1/2 BLF7G20L(S)-90P	1/2 BLF7G20L(S)-90P
2010-2025	50	42	28	17.2	47.2	SYM	1/2 BLF7G20L(S)-90P	1/2 BLF7G20L(S)-90P
1880-1920	52.5	44.5	28	16	44	SYM	1/2 BLF7G21LS-160P	1/2 BLF7G21LS-160P
2110-2170 MHz (UMTS / LTE)								
2110-2170	47	39	28	13	38	SYM	BLD6G22L(S)-50	BLD6G22L(S)-50
2110-2170	48.5	40.5	28	17.2	46	SYM	1/2 BLF6G22L-40P	1/2 BLF6G22L-40P
2110-2170	54.7	46.5	28	16.5	43	SYM	BLF6G22LS-100	BLF6G22LS-100
2110-2170	54.9	47	28	17	43	SYM	BLF7G22L(S)-130	BLF7G22L(S)-130
2110-2170	55	47	28	17	43	SYM	1/2 BLF7G22LS-250P	1/2 BLF7G22LS-250P
2110-2170	55	47	28	15.5	38	SYM	BLF6G22L(S)-130	BLF6G22L(S)-130
2110-2170	55.5	46.4	28	15	43	ASYM	BLF7G22L(S)-130	BLF7G22L(S)-200
2110-2170	55.9	47.9	28	17.3	42	SYM	BLF7G22LS-160	BLF7G22LS-160
2110-2170	56	48	28	15	48	3-WAY	BLF7G22L(S)-130	2x BLF7G22L(S)-130
2110-2170	56.5	48.5	28	16.2	41	SYM	BLF7G22L(S)-200	BLF7G22L(S)-200
2110-2170	57	49	32	14.5	41	ASYM	BLF6G22-100	BLF6G22-180PN
2110-2170	57.2	49.2	28	16	47	3-WAY	BLF7G22LS-160	2x BLF7G22L(S)-160
2110-2170	58	50	32	15	40	SYM	BLF6G22-180PN	BLF6G22-180PN
2110-2170	58	50	32	17.5	40	SYM	BLF7G22LS-250P	BLF7G22LS-250P
2300-2400 MHz (WiBRO / LTE)								
2300-2400	49.5	42	28	14.6	44	SYM	1/2 BLF7G27L(S)-75P	1/2 BLF7G27L(S)-75P
2300-2400	55	47.5	28	15.2	44	ASYM	BLF7G24LS-100	BLF7G24LS-140
2500-2700 MHz (WiMAX / LTE)								
2570-2620	49.5	42	28	15	43	SYM	1/2 BLF7G27L(S)-75P	1/2 BLF7G27L(S)-75P
2500-2700	50	42	28	15	37.5	SYM	BLF6G27-45	BLF6G27-45
2500-2700	50.3	42.3	28	14.5	39	SYM	1/2 BLF7G27LS-90P	1/2 BLF7G27LS-90P
2500-2600	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45
2600-2700	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45
2600-2700	52	44	28	14	40	ASYM	BLF6G27-45	BLF6G27(LS)-100
2500-2700	52.5	44.5	28	14	38	SYM	1/2 BLF7G27LS-150P	1/2 BLF7G27LS-150P
2620-2690	55.2	47.2	30	15	41	ASYM	BLF7G27LS-100	BLF7G27LS-140
2545-2575	55.3	47.3	28	15	41	ASYM	BLF7G27LS-100	BLF7G27LS-140
3300-3800 MHz (WiMAX)								
3400-3600	51	43	28	11.5	32	SYM	BLF6G38-50	BLF6G38-50

RF small signal portfolio

LNAs for wireless infrastructures

Type	Package	Vsupply (typ) (V)	@ I_C = (mA)	@ f = (MHz)	Gass (typ) (dB)	NF (typ) (dB)	$P_{L(1dB)}$ (typ) (dBm)	OIP3 (typ) (dBm)	IRL (dB)	ORL (dB)
BGU7051	SOT650	3.3	65	900	20.9	0.7	17.8	34	22	15.8
BGU7052	SOT650	3.3	65	1900	20.1	0.8	18	35.5	20	15
BGU7053	SOT650	3.3	65	2500	20	0.9	18	35	20	15

Low noise VGAs for wireless infrastructures

Type	Package	Vsup	Isup	@ frequency	Gain range	@ minimum attenuation				@ maximum attenuation			
						Gain	$P_{L(1 dB)}$	$IP3_I$	NF	Gain	$P_{L(1 dB)}$	$IP3_I$	NF
		(V)	(mA)	(MHz)	(dB)	(dB)	(dBm)	(dB)	(dB)	(dB)	(dBm)	(dB)	(dBm)
BGU7061*	SOT1301	5	185	900	35	35	-12	2	1.1	0	11	25	21.5
BGU7062*	SOT1301	5	185	1750	35	35	-12.5	2.5	1.23	0	11	25	21.7
BGU7063*	SOT1301	5	185	1950	35	35	-12	2	1.2	0	8.1	25	21.5

VGAs for wireless infrastructures

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	23	23	41	7	0	30	30
					1450 … 2200	23	23	41	7	0	30	30
BGA7204*	SOT617	Parallel, serial	5	160	700 … 2750	31.5	24	37	6.5	-7.5	19	38
					1450 … 2100	30.5	17	36	6.5	-13.5	10	38
					2100 … 2750	29.5	16	34	7.5	-13.5	10	38
BGA7350	SOT617	Parallel, digital	5	240	50 … 250	24	18.5	44	6	-5.5	50	30
BGA7351						28	22	45	6	-6	50	34
BGA7210	SOT617	Serial, digital	5	185	700 … 3800	31.5	31	38	6.5	-0.5	36	27

BGA7350 and BGA7351 are dual, independently controlled, receive IF VGAs on one chip.

Medium power amplifiers for wireless infrastructures

Type	Package		f	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
			(MHz)	(V)	(mA)	(mA)	(V)	(V)	(V)	(V)	(µA)	(dB)	(dBm)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
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

* = Not released for mass production

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Wireless infrastructure ICs

Low noise LO generator for wireless infrastructures

Type	Package	$f_{IN(REF)}$	V_{CC}	I_{CC}	Noise 1 MHz offset @5.3 GHz	Output buffer (Po)	
			Typ	Typ	Typ	Typ	
		(MHz)	(V)	(mA)	(dBc/Hz)	(dBm)	
BGX7300*	SOT617	10-160	3.3	140	-131	0	-10

IQ modulator for wireless infrastructures

Type	Package	Bandwidth of IQ modulator	V_{CC}	I_{CC}	NFL (Output noise floor)	Output OIP3	Voltage gain G_V
		(MHz)	(V)	(mA)	(dBm/Hz)	(dBm)	(dB)
BGX7100*	SOT616	650	5	180	-159	27	1.5

Dual mixer for wireless infrastructures

Type	Package	Second order spur rejection (2RF-2LO)	V_{CC}	I_{CC}	Frequency range	NF_{ssb} (small signal noise figure)	IIP3	Conversion gain
		(dBc)	(V)	(mA)	(GHz)	(dB)	(dBm)	(dB)
BGX7220*	SOT617	60	5	380	0.7 - 1.2	10	26	7.5
BGX7221*	SOT617	60	5	380	1.7 - 2.7	10	26	8.5

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

* = Not released for mass production
** = These parameters are based on a single diode (out of 4 in these quad pin diodes)

High-speed data converter portfolio

High-speed ADC

			Digital interface								
Family	Description	Input Buffer	TTL/ CMOS	LVCMOS	LVDS/ DDR	CGV™	Supply Voltage (V)	Power Dissipation per channel (mW)	SFDR (dBc)	SNR (dBFS)	Package
ADC1613D series	Dual 16-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	635	89	71.6	HVQFN56 8x8
ADC1613S series	Single 16-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	690	87	71.4	HVQFN32 7x7
ADC1610S series	Single 16-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	630	89	71.6	HVQFN40 6x6
ADC1415S series	Single 14-bit ADC up to 65/80/105/125Msps	•		•	•		1.8 /3.0/5.0	840	87	71.4	HVQFN40 6x6
ADC1413D series	Dual 14-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	635	87	71.4	HVQFN56 8x8
ADC1413S series	Single 14-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	690	87	71.4	HVQFN32 7x7
ADC1412D series	Dual 14-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	610	87	71.4	HVQFN64 9x9
ADC1410S series	Single 14-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	630	87	71.4	HVQFN40 6x6
ADC1215S series	Single 12-bit ADC up to 65/80/105/125Msps	•		•	•		1.8 /3.0/5.0	840	87	69.6	HVQFN40 6x6
ADC1213D series	Dual 12-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	635	87	69.6	HVQFN56 8x8
ADC1213S series	Single 12-bit ADC up to 65/80/105/125Msps					•	1.8 / 3.0	690	87	71.4	HVQFN32 7x7
ADC1212D series	Dual 12-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	610	87	69.6	HVQFN64 9x9
ADC1210S series	Single 12-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	630	87	69.6	HVQFN40 6x6
ADC1207S080	Single 12-bit ADC 80 Msps	•		•			5,0	840	90	71	HTQFP48 7x7
ADC1206S series	Single 12-bit ADC up to 40/55/70 Msps	•	•				3.3 / 5.0	550	70	64	QFP44
ADC1115S125	Single 11-bit ADC up to 125Msps	•		•	•		1.8 / 3.0/5.0	840	87	66.2	HVQFN40 6x6
ADC1113D125	Dual 11-bit ADC up to 125Msps					•	1.8 / 3.0	635	87	66.2	HVQFN56 8x8
ADC1113S125	Single 11-bit ADC up to 125Msps					•	1.8 / 3.0	690	86	71,4	HVQFN32 7x7
ADC1112D125	Dual 11-bit ADC up to 125Msps			•	•		1.8 / 3.0	610	87	66.2	HVQFN56 8x8
ADC1015S series	Single 10-bit ADC up to 65/80/105/125Msps	•		•	•		1.8 /3.0/5.0	840	87	61.6	HVQFN40 6x6
ADC1010S series	Single 10-bit ADC up to 65/80/105/125Msps			•	•		1.8 / 3.0	630	87	61.6	HVQFN40 6x6
ADC1006S series	Single 10-bit ADC up to 55/70 Msps	•	•				3.3 / 5.0	550	71	59	QFP44
ADC1005S060	Single 10-bit ADC 60 Msps		•				5.0	312	72	58	SSOP28
ADC1004S series	Single 10-bit ADC 30/40/50 Msps		•				5.0	175	72	58	SSOP28
ADC1003S series	Single 10-bit ADC 30/40/50 Msps		•				5.0	235	70	58	SSOP28
ADC1002S020	Single 10-bit ADC 20 Msps		•				3 to 5.25	53	72	60	LQFP32
ADC0808S series	Single 8-bit ADC up to 125/250 Msps		•				1.8 / 3.3	215	56	48	HTQFP48 7x7
ADC0804S series	Single 8-bit ADC up to 30/40/50 Msps		•				5.0	175	72	49	SSOP28
ADC0801S040	Single 8-bit ADC 40 Msps	•	•				2.7 to 5.5	30	59	47	SSOP20

High-speed DAC

		Digital interface						
Family	Description	LVCMOS	CGV™	Supply voltage (V)	Power Dissipation per channel (mW)	SFDR (dBc)	Interpolation	Package
DAC1408D series	Dual 14-bit DAC up to 650/750 Msps		•	1.8 / 3.3	700	76	2x, 4x, 8x	HVQFN64 9x9
DAC1405D series	Dual 14-bit DAC up to 650/750 Msps	•		1.8 / 3.3	435	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	95	88	-	LQFP48
DAC1208D series	Dual 12-bit DAC up to 650/750 Msps		•	1.8 / 3.3	700	76	2x, 4x, 8x	HVQFN64 9x9
DAC1205D series	Dual 12-bit DAC up to 650/750 Msps	•		1.8 / 3.3	435	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	95	65	-	LQFP48
DAC1008D series	Dual 10-bit DAC up to 650/750 Msps		•	1.8 / 3.3	700	76	2x, 4x, 8x	HVQFN64 9x9
DAC1005D series	Dual 10-bit DAC up to 650/750 Msps	•		1.8 / 3.3	435	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	95	65	-	LQFP48

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