



# 900 MHz Cordless Phone Radio IC

*Analog Devices and Zilog team up to create a winning solution for high-performance cordless phones*

## **AN ADVANCED SINGLE-CHIP RADIO IC FOR 900 MHZ CORDLESS PHONES**

Spread-spectrum cordless telephones that use the 902-928 MHz ISM band offer dramatic improvements in range, clarity and security over other cordless systems. Unfortunately, until now the cost has been too high for the mass consumer market.

Working with Zilog, developer of the "ZPhone™" frequency-hopping spread-spectrum protocol, Analog Devices has developed the AD6190 — the first single-chip radio for 900 MHz phone applications.

Combining the AD6190 with Zilog's Z87L00 frequency-hopping controller chip produces a complete chipset offering advanced spread-spectrum performance at a price suitable for the residential cordless-telephone market. Analog Devices even offers a reference design, developed jointly with Zilog, that can minimize the engineering effort of product development and get you to market more quickly.



## **FEATURES**

- High RF performance means longer range — as much as 10 times the range of conventional analog cordless phones
- Advanced frequency-hopping protocol identifies potential interference and avoids it
- All RF and IF functions reside on a single chip, reducing cost and improving manufacturability
- Small package footprint and a minimum of external passive components permit a low-cost single-board phone
- Software development tools allow easy addition of value-added phone features
- Reference design cuts development time

## A COMPLETE RADIO CHIP COMPLEMENTS THE MOST ADVANCED SPREAD-SPECTRUM SYSTEM

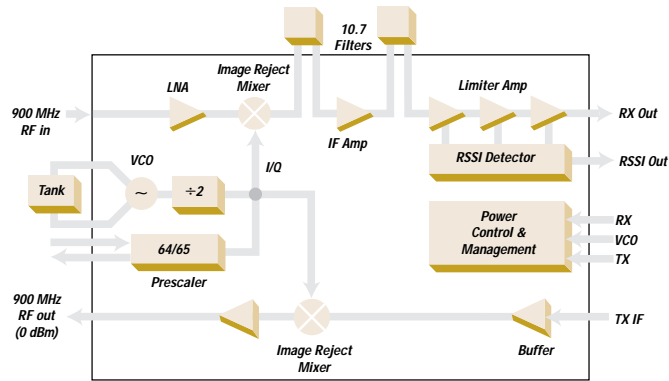
The AD6190 single-chip radio replaces a host of discrete and low-integration ICs in 900 MHz cordless phone designs. The high-performance low-noise amplifier (LNA) offers selectable high- and low-gain modes and achieves performance comparable to that of advanced cellular handset designs.

Image-reject mixers for receive and transmit allow using a single-conversion super-heterodyne architecture with low-cost 10.7 MHz filters. To extend the phone's range, a high-performance IF amplifier and limiter stage with received signal-strength indicator (RSSI) output provides over 100 dB of gain.

An innovative double-frequency VCO and a synthesizer prescaler provide channel selection and frequency control. The transmit driver amplifier offers a solid 0 dBm output, and can easily be boosted up to the desired system power level with one or two discrete transistors. The AD6190 also includes power-management circuitry that turns off unnecessary functions whenever possible.

The AD6190 is an excellent example of Analog Devices' RF IC capabilities. Traditional RF designs have been based on individual discrete semiconductor devices, painstakingly selected, then carefully matched with discrete inductors and capacitors in a time-consuming and often iterative process. Our approach reduces the problems and guesswork associated with this technique by integrating as much of the radio as possible onto a single VLSI radio chip.

AD6190 Block Diagram



## REFERENCE DESIGN REDUCES DEVELOPMENT TIME

You can get a 900 MHz spread-spectrum cordless phone prototype up and running in very little time with the help of hardware and software development tools from Zilog and Analog Devices.

Zilog, a leading supplier of microcontrollers, provides a full suite of software development and debugging tools. A starter software package includes basic telephone functions, and support is available to assist you in adding customized features such as Caller-ID. A complete reference design package is also available and ready to go into production "as-is" or with your custom modifications.

An AD6190-based reference radio design is also available from Analog Devices. As provided, it generates a 200-milliwatt transmitter output power. (FCC Part 15.247 rules allow up to 1 watt of transmitter power in the 902-928 MHz band.) This low-cost design is easily reproducible because of its low parts count and standard component use throughout. Of course, in your own application, you may want more power (for longer range) or less power (for longer talk time). Performing such modifications is quite simple, and we can help.

## ANALOG DEVICES: A LEADER IN RF ICs

Analog Devices has 30 years of experience in high-performance analog circuit design. Several years ago, we began to apply that experience to the development of a new generation of RF ICs, offering a unique combination of high performance and high levels of integration, aimed at the needs of the emerging digital wireless markets. The results have been impressive.

Our first wideband log amplifiers and analog function circuits have evolved into a family of high-performance IF amplifiers with added features such as high-accuracy RSSI, wideband quadrature modulators and demodulators and mixers, all designed for 3-volt operation. Our AD6430 GSM RF/IF chipset meets the GSM standard in just two chips. The AD6190 includes both RF and IF functions on one chip.

All of our RF ICs are manufactured using Analog Devices' advanced silicon processes — the same processes that many of our standard high-performance linear products use. This mainstream technology and standard IC packaging has permitted us to provide high-performance RF circuitry at an affordable price.