



AD6640/AD6620

Multi-Channel Multi-Mode Receiver Chipset

Analog Devices' all-digital solution lets you produce base stations for multiple air standards using the same core elements.

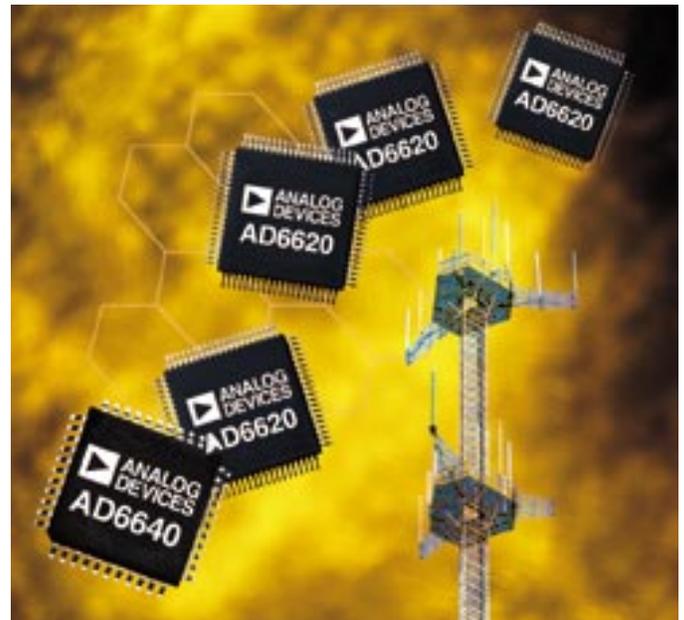
"FUTURE-PROOF" BASE STATIONS WITH NEXT-GENERATION DIGITAL RADIO

Analog Devices' breakthrough design for digital radio receivers lets you bring programmable wideband radio base stations to market with complete confidence.

This advanced "software" receiver is based on Analog Devices' function-rich, high-performance AD6640 and AD6620 chips. The AD6640 is a wideband analog-to-digital converter capable of sampling at 65 MSPS. The AD6620 is a 65 MSPS decimating receiver chip that enables the same radio to be tuned to different channels and even different air interface standards.

Industry-leading high dynamic range wideband sampling enables the AD6640 to digitize an entire 25 MHz of spectrum at one time.

The result: A single all-digital wideband radio replaces multiple analog radios for a smaller, more flexible, more readily configurable solution that helps your customers remove the uncertainty from network planning.



FEATURES

- One ADC digitizes multiple RF channels: replaces multiple analog radios for reduced receiver size
- Digital tuner/filter chips replace analog synthesizers and channel-select filters for reduced complexity and lower manufacturing costs
- On-chip programmable digital filters: easily reconfigured for new air standards such as AMPS, IS136, CDMA, GSM, PCS1900, PHS
- Enables high-frequency IF sampling at 70 MHz
- Maintains 80-100 dB SFDR over a bandwidth of 25 MHz
- Minimal hardware requirements for increasing capacity: simply add digital tuner/filter chips to demodulate additional RF channels
- Small outline, surface-mount plastic packaging (44-pin TQFP, 80-pin PQFP): reduces receiver size, simplifies micro- and pico-cell designs
- Easily interfaces to general-purpose DSPs
- Complete radio reference designs reduce your engineering investment

FLEXIBLE AND PROGRAMMABLE

Analog Devices' versatile receiver design enables you to manufacture base stations for a variety of air interface standards — including PCS1900, CDMA, IS136, PDC, AMPS, ETACS and NMT — using the same core elements.

Software receivers can be tuned to different channels and modulation standards without expensive hardware changes. This all-digital approach can also be used for fixed access receivers in wireless local loops.

Once deployed, base stations using these programmable receivers can be readily reconfigured by network operators to adapt to standards as they evolve. This solution enables your customers to take some of the guesswork out of future network planning. As new micro-cells and pico-cells are added to increase network capacity, operators can easily implement new frequency plans through software.

INNOVATIVE DESIGN SAVES TIME AND MONEY

Analog Devices' all-digital approach enables RF channels to be consolidated within a single ADC. The front-end section is therefore smaller and less expensive to manufacture.

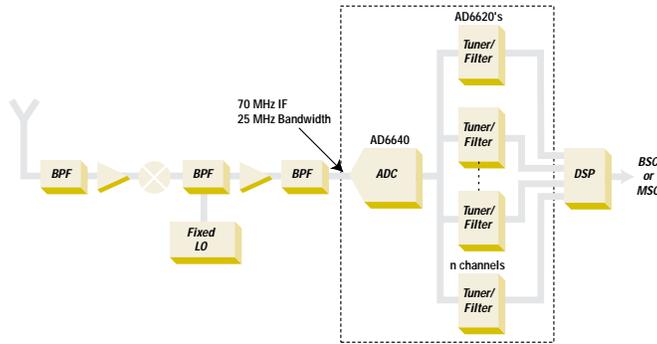
Channel-select filtering takes place in the digital signal processor.

Characteristics for bandwidth, passband ripple and stopband rejection are specified through software — rather than by sensitive and costly-to-produce analog filters.

By reducing front-end filtering requirements, this chipset solution cuts assembly costs and eliminates the need for extensive factory adjustments of analog components.

Complete reference designs further ease your development efforts. These designs show the optimal PCB layout for reducing noise and minimizing adjacent channel interference.

Multi-Channel Multi-Mode Receiver



COST-EFFECTIVE FOR MULTI-CHANNEL SYSTEMS

With a single AD6640 ADC digitizing an entire 25 MHz of spectrum, this advanced wideband receiver can deliver a lower cost-per-channel than traditional receivers.

To increase capacity, simply add digital tuner/filter chips to demodulate additional RF channels. For example, 30 AD6620 tuner/filter chips can be connected to an AD6640 ADC to accommodate a 30-channel AMPS system.

This easy add-on capability makes Analog Devices' solution ideal for high-volume, multi-channel cellular systems. As the number of channels increases, the cost-per-channel is reduced because of shared hardware costs.

This approach ensures that your customers' hardware investment is fully protected.

HIGH SFDR FOR OPTIMUM SENSITIVITY

This high-performance receiver maintains a spurious free dynamic range (SFDR) of 80-100 dB over a 25 MHz bandwidth. The AD6640 enables the receiver to maintain a signal-to-noise ratio (SNR) of 70 dB, prior to digital filtering. The AD6620 digital filter chip then adds processing gain of 20-35 dB.

ANALOG DEVICES: LEADING BASE STATION SUPPLIER

At the forefront of next-generation receiver technology, Analog Devices is an established supplier of integrated circuits used in current cellular base station subsystem designs.

We have the largest market share of mixed-signal integrated circuits in base stations worldwide. And we also hold a leadership position in high-speed conversion technology and high dynamic range sampling.

ANALOG DEVICES IN COMMUNICATIONS

Analog Devices is committed to supplying the communications industry with the highest-performance solutions at the lowest possible cost. We meet the needs of today's broadband wired and wireless markets with leadership capabilities in analog, digital and mixed signal processing, RF signal processing, data conversion, interfaces and total system design.

MULTI-CHANNEL MULTI-MODE RECEIVER CHIPSET

Analog Devices' advanced wideband digital receiver chipset consists of:

- AD6640 wideband ADC chip

The AD6640 is a high-speed, low-power monolithic 12-bit analog-to-digital converter with all necessary functions included on-chip to provide a complete conversion solution. It runs on a single +5 V supply and provides CMOS-compatible digital outputs at 65 MSPS.

This high-performance ADC maintains 80+ dB SFDR and 70 dB SNR over a bandwidth of 25 MHz.

Units are packaged in a 44-pin Thin Quad Plastic Flatpack (TQFP).

- AD6620 decimating receiver chip

The AD6620 is a 65 MSPS decimating receiver chip that maintains an SFDR greater than 100 dB. Its four cascaded signal processing elements are a digital tuner, two fixed coefficient filters and a programmable coefficient decimating filter.

A high-resolution Numerically Controlled Oscillator (NCO) allows flexibility in frequency planning; the RAM-based architecture allows easy reconfiguration for multi-mode applications.

The AD6620 is designed for easy integration; built-in circuitry enables multiple chips to be connected in a single system.

Units are packaged in an 80-pin Plastic Quad Flatpack (PQFP).

REFERENCE DESIGNS

AD6640/AD6620 multi-channel wideband receiver reference designs indicate all required external components in the optimal PCB layout which minimizes adjacent channel interference. Designs, along with a complete set of application notes and technical white papers, are available for 900 MHz cellular and 1.9 GHz PCS air interface standards.