AD6644/AD6624/AD6622/AD9772

SOFTCELL™ MULTICARRIER TRANSCEIVER CHIPSET

Analog Devices' SoftCell chipset cuts the component count for wireless base stations.

ENABLING TECHNOLOGY FOR NEXT-GENERATION SOFTWARE BASE STATIONS

Analog Devices introduces the latest in Direct IF Sampling (DIFS) and Direct Digital Synthesis (DDS) technology to reduce the cost, size, and power of traditional multicarrier radios.

Finally, the dynamic range barriers in converter technology have been overcome to permit an entire 25 MHz spectrum to be digitally processed. Incremental RF carriers are easily added (or reprogrammed) for most air interface standards.

APPLICATIONS

Micro/Pico Cell Transceivers

In-building Wireless Base Stations

Wireless Local Loop

Software Programmable Base Stations

Phased Array Antenna Systems

RECEIVE SIGNAL PROCESSOR FEATURES

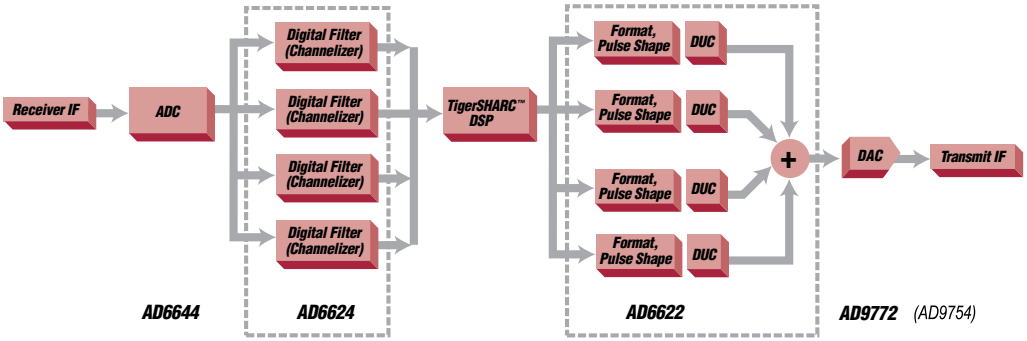
- Single Analog-to-Digital Converter (ADC) digitizes 25 MHz spectrum: replaces multiple radios for reduced size and cost
- AD6644 14-bit 65 MSPS ADC: samples multiple channels with 100 dB dynamic range and 75 dB SNR
- AD6624 Quad Digital Receive Signal Processor: four independent digital receivers on a single chip, replacing expensive analog tuners and filters
- Digital tuner/filters are programmable for AMPS, IS136, GSM, EDGE, PHS, and NMT. Noninteger decimation rates allow multiple air interfaces within a single chipset

TRANSMIT SIGNAL PROCESSOR FEATURES

- Direct Digital Synthesis eliminates multiple analog modulators and the matching problems they present
- AD6622 Quad Digital Transmit Signal Processor: independently interpolates, filters, tunes, and combines four carriers per chip
- AD9772 14-bit 2X interpolating 400 MSPS TxDAC®: optimized for high dynamic range and low distortion in a multicarrier environment
- Programmable channel filtering using linear I and Q inputs or pulse shaping for most air interface standards

ANALOG DEVICES

SoftCell Transceiver Chipset



FLEXIBLE AND PROGRAMMABLE

Analog Devices' versatile design enables you to manufacture base stations for a variety of air interface standards—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.

FUTURE-PROOF ARCHITECTURE

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

Direct IF Sampling and Direct Digital Synthesis platforms offer a flexible environment for 3G developments, including IS95 and Wideband CDMA air interface standards.

In transmitters, the AD6622 can be configured to support IS95 (including transmit predistortion phase equalizer) and 5 MHz WBCDMA signals. Digital receivers for 1.25 MHz to 5 MHz carriers will be supported in follow-on products to the AD6624.

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.

COST-EFFECTIVE FOR MULTICHANNEL SYSTEMS

With a single AD6644 ADC digitizing an entire 25 MHz of spectrum, this advanced wideband receiver can deliver a lower cost-per-channel than traditional receivers.

The AD6622 and AD6624 are optimized for four-channel applications.

To increase capacity, simply add digital transmit/receive chips to provide additional RF channels.

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

SoftCell 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 100 dB over a 25 MHz bandwidth. The AD6644 enables the receiver to maintain a signal-to-noise ratio (SNR) of 75 dB, prior to digital filtering. The AD6624 Digital Receive Signal Processor provides additional processing gain of 20 dB – 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.

Visit us on the Worldwide Web at:
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ANALOG DEVICES

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SOFTCELL MULTICARRIER TRANSCEIVER CHIPSET

- AD6644 14-bit 65 MSPS ADC

The AD6644 is an 65 MSPS, high dynamic range 14-bit ADC optimized to sample IF inputs up to 70 MHz. CMOS-compatible, this high-performance ADC provides 100 dB of SFDR and 75 dB SNR in a 25 MHz bandwidth.

- AD6624 Quad Digital Receive Signal Processor

The AD6624 contains four independent digital decimating receivers, each providing over 100 dB of SFDR. Each channel contains a digital tuner, two stages of fixed coefficient filters, and a user-programmable decimating filter.

- AD6622 Quad Digital Transmit Signal Processor

This four-channel transmit signal processor accepts I and Q inputs and digitally filters, interpolates, and tunes the baseband signal to the desired digital IF. Each independent channel is combined in a single 18-bit parallel output that can be combined with additional AD6622s to increase the number of carriers supported. Pulse shaping and matched filtering can be programmed to support most air interface standards.

- AD9772 14-bit 400 MSPS 2X Interpolating TxDAC

The AD9772 accepts wideband digital input at rates up to 150 MSPS, and generates a spectrally pure IF output at frequencies up to 60 MHz. The resolution and ac accuracy of the AD9772 minimize spurious signals, improve dynamic range, and simplify upconversion to the next IF frequency.