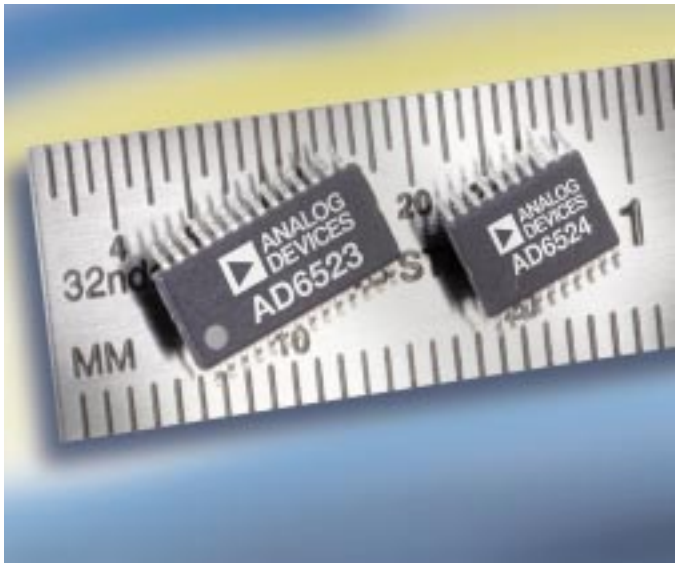
AD6523/AD6524 GSM Direct Conversion Radio Chip Set



The Othello chip set with each IC measuring only 4.4 mm meets current market demands for smaller phones.

GSM DIRECT CONVERSION CHIP SET FEATURES BREAKTHROUGH RF TECHNHOLOGY

Analog Devices' Othello,™ a GSM (Global System for Mobile Communications) direct conversion radio chip set, features a revolutionary radio architecture that provides 30-50 percent savings in cost and size for the next generation of dual-band and triple-band GSM phones.

Consisting of the AD6523 transceiver and the AD6524 synthesizer, Othello allows incoming signals to be "directly converted" to baseband, thus eliminating the need for IF (Intermediate Frequency) components. In addition, Othello's patented architecture provides two other significant performance benefits. First, the chip set enables 1,000 hours, or 1.5 months, of standby time for GSM cellular phones. Second, it provides capabilties for data rates of 25-30 times than the 14.4 kbps of current GSM solutions. That allows next generation content, like web browsing, e-mail, games, and real-time video to be possible over cellular phones and GSM platforms.

FEATURES

- New ADI Superhomodyne™ Architecture (Direct Conversion Receiver) meets current and future market demands
- Flexible and upgradable to support future generations of GSM phones and multiple applications
- 30-50 percent cost and space savings result in less expensive and smaller phones
- RF platform suitable for multi-mode and/or software radio markets
- Integrates single chip RF/Modulator/Baseband 28-TSSOP (AD6523) with separate synthesizer 20-TSSOP. Chip scale packaging available next year
- Implemented in 0.6 um BiCMOS process
- Virtual-IF™ transmitter loop
- Multi-band operation
- Ultra Fast Locking Fractional-N synthesizer for GPRS
- Signal chain optimization by utilizing ADI's systems experience, design and process technology

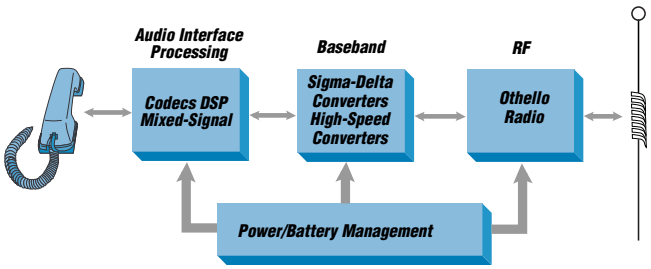
ANALOG DEVICES

NEW DIRECT CONVERSION ARCHITECTURE

The Othello chip set solution is based on Analog Devices' new patent-pending direct conversion architecture and features a greatly simplified approach to traditional radio architecture. Direct conversion technology reduces cost, component count, and power consumption. At the same time, emerging standards such as EDGE (Enhanced Data GSM Environment), GPRS (General Packet Radio Service) and 3G are addressed.

ADI's architecture lowers manufacturing costs by eliminating the need for intermediate frequency devices, the most expensive components of the radio. In addition, Othello is fully compliant with GSM standards and enables manufacturers to upgrade easily and adapt their products to muti-mode and multi-slot data applications.

Othello was designed utilizing ADI's systems experience, design, and process technology for signal chain optimization.



ANALOG DEVICES: A LEADER IN GSM

An established supplier of components and solutions to GSM handset manufacturers, Analog Devices has an incomparable track record of high-volume, low-cost manufacturing and delivery. The company's mixed-signal processors and baseband converters are used in millions of GSM handsets worldwide. The Othello GSM direct conversion radio chip set represents another example of how Analog Devices continually develops new products that meet the needs of the GSM market.

ANALOG DEVICES IN COMMUNICATIONS

Analog Devices is recognized for its unparalleled technical capabilities in analog, digital, and mixed-signal processing used in RF signal processing, data conversion, interfaces, and total system design. The company develops and offers customers a wide range of innovative wireless and broadband wired communications products including solutions for GSM; CDMA(Code Division Multiple Access); cellular base stations/software radio; RF and IF (intermediate frequency) circuits, and xDSL. The company is committed to supplying the communications industry with the highest performance solutions at the lowest possible cost.

OTHELLO TECHNOLOGY:

Analog Devices' Othello chip set solution is comprised of the AD6523 transceiver and the AD6524 synthesizer.

• AD6523 Transceiver

The AD6523 is a monolithic Zero-Intermediate Frequency (Zero-IF) transceiver that combines, on a single chip, all radio transmitter and receiver functions that are necessary to build a complete GSM, DCS1800, or PCS1900 mobile radio. It contains a complete translation loop modulator for directly modulating baseband signals onto a voltage controlled oscillator (VCO) as well as a complete direct conversion receiver for converting received signals directly to baseband without intermediate frequency conversions. The AD6523 is packaged in a 4.4 mm, 28 lead TSSOP.

• AD6524 Synthesizer

The AD6524 is a Multi-Band Frequency synthesizer that combines on a single chip, a Fractional-N synthesizer, a crystal oscillator, and four general purpose outputs. These functions are critical in the design of GSM, DCS1800, or PCS1900 mobile phones. The AD6524 is packaged in a 4.4 mm 20 lead TSSOP.

Together, the AD6523 and the AD6524 can implement a complete dual band RF transceiver known as Analog Devices' Othello.

SPECIFICATIONS

AD6523

Complete Dual Band Transmitter/Receiver includes:

Translation Loop Direct VCO Modulator

Programmable Phase Detector Gain

On-chip Flittering of Tx Products

Zero-IF Direct Conversion Receiver

Differential GSM Low Noise Amplifier

Integrated Active Rx Channel Select Low Pass Filters

Programmable Gain Baseband Amplifiers

Baseband Interface

Multiplexed Differential I and Q Inputs/Outputs

Auxiliary/Control-Signals Through Serial Interface

On-chip Low Dropout Voltage Regulator

2.9V to 5.5V Direct Battery Voltage Input

Output to Supply All On-Chip Functions

28-Lead TSSOP

1.65 V – 2.95 V Digital Interface

Direct Interface to AD6524 Multi-band Synthesizer

AD6524

Fractional-N Synthesizer

Operation to 1.6 GHz

Sigma-Delta Modulator—Eliminates Fractional Spurs

Programmable Phase Detector Gain

High-Speed Channel Switching for Data Services

Crystal Oscillator

Standard 13 MHz GSM Operating Frequency

Frequency Doubler for Fractional-N Synthesizer

Course Tuning Function for Fast Startup Time

Low Operating Current

General Purpose Outputs

Four CMOS ouputs for radio switching 10 mA source or sink current

Standard Three Wire Serial Interface

20-Lead TSSOP

2.7-3.3 V Operation

1.65V – 2.95 V Digital Interface

Direct Interface to AD6523 Zero-IF Transceiver

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