Analog Devices’ integrated transceiver for next-generation software defined radio (SDR)

Steve Taranovich - November 10, 2013

Analog Devices, Inc. introduced a next-gen solution for software defined radio (SDR) applications. Designed to enable programmable radio applications that operate over a wide range of modulation schemes and network specifications such as defense electronics, instrumentation equipment and communications infrastructure, the new AD9361 RF Agile Transceiver achieves, what ADI claims is, best-in-class performance, high integration, wideband operation and flexibility. The IC is supported by a wide range of design resources to expedite time to market including a software design kit and FPGA mezzanine card (FMC) to rapidly develop software defined radio solutions.

For more information, watch videos here.
Analog Devices combined the AD9361, with a Xilinx Spartan-6 FPGA, USB 3.0 interface and comprehensive software support, to create one of the industry’s easiest-to-use and most flexible software-defined radio solutions.

The AD-FMCOMMS2-EBZ-FMC board provides designers with a rapid prototyping environment that supports multiple communications protocols, including most licensed and unlicensed bands.

**About the RF Agile Transceiver**

Operating over a frequency range of 70 MHz to 6 GHz, the device is a complete radio design that combines multiple functions in a single chip. The RF agile transceivers integrate an RF front end, flexible mixed-signal baseband section, frequency synthesizers, two analog-to-digital converters and two direct conversion receivers to simplify design and reduce bill of material cost. The device supports channel bandwidth from less than 200 kHz to 56 MHz, and is highly programmable, offering the widest dynamic range available in the market today.

Two independent direct conversion receivers have a state-of-the-art noise figure and linearity. Each receive subsystem includes independent automatic gain control, dc offset correction, quadrature correction, and digital filtering, eliminating the need for these functions in the digital baseband. The IC also has flexible manual gain modes that can be externally controlled.
The block diagram shows the high level of integration in this SDR solution

Two high-dynamic-range A/D converters per channel digitize the received I and Q signals and pass them through configurable decimation filters and 128-tap FIR filters to produce a 12-bit output signal at the appropriate sample rate. The transmitters use a direct conversion architecture that achieves high modulation accuracy with ultra-low noise.

Applications

- Defense electronics
- Handheld and manpack battlefield radios, electronic warfare, radar
- RF test equipment and instrumentation
- Communications and telemetry equipment
- Communications infrastructure
- Femtocell / picocell / microcell basestations, data card dongles
- General software-defined radio platforms
Design Resources Available: Software Design Kit and FMC Board

Xilinx FPGA development platform has a seamless connection to the FMC board

AD-FMCOMMS2-EBZ
Rapid Development Board
Together with the FPGA mezzanine cards, ADI offers a wide range of design resources for this solution including Gerber files, code references, Linux sample applications and drivers, and design support packages, which are available for download.

**Pricing, Availability and Complementary Products**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Sample Availability</th>
<th>Production Availability</th>
<th>Price Each in 1,000 Units</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD9361</td>
<td>Now</td>
<td>Now</td>
<td>$175</td>
<td>10-mm x 10-mm 144-ball CSPBGA</td>
</tr>
<tr>
<td>AD-FMCOMMS2-EBZ FMC Board</td>
<td>Now</td>
<td>Now</td>
<td>$750</td>
<td>Rapid Prototyping System</td>
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For more information visit the Analog Devices [website](https://www.analog.com)