

ADRV9008/ADRV9009 INTEGRATED WIDEBAND RF TRANSCEIVER PLATFORM

*200 MHz Bandwidth, Software-Defined Radio
(SDR) Solution with Enhanced Frequency Agility*



Widest Bandwidth, Highest Performance Integrated Radio Solution

- ▶ Supports wideband applications while delivering the high performance required for narrow-band applications, from 75 MHz to 6 GHz
- ▶ Improved phase noise and linearity delivers MC-GSM and NB-IoT performance
- ▶ Single-chip TDD solution replaces over 20 discrete radio components, reducing power by 50% and size by 60%

Common Platform Design for 2G/3G/4G/5G Reduces Complexity, Costs, and Time to Market

- ▶ Reduces product development cycles for band and power variants by half
- ▶ Complete development toolkit, including JESD204B interface framework
- ▶ Enables modular architecture for scalable SDR solutions

Simplified Digital Beamforming for Massive MIMO and Phased Array Radar

- ▶ Supports multichip phase synchronization with internal LO
- ▶ On-chip user-programmable gain, phase, and digital filter blocks
- ▶ Enables high performance, digital beamforming with reduced SWaP-C and development time

Enhanced Frequency Agility

- ▶ Reduces system downtime with fast frequency hopping and precalibration profiles
- ▶ Ensures link security, situational awareness, and spectrum efficiency

Applications

- ▶ Macro base stations
- ▶ Massive MIMO
- ▶ Active antenna systems
- ▶ Phased array radar
- ▶ Electronic warfare
- ▶ Military communications
- ▶ Portable test equipment



Single-Chip TDD Solution

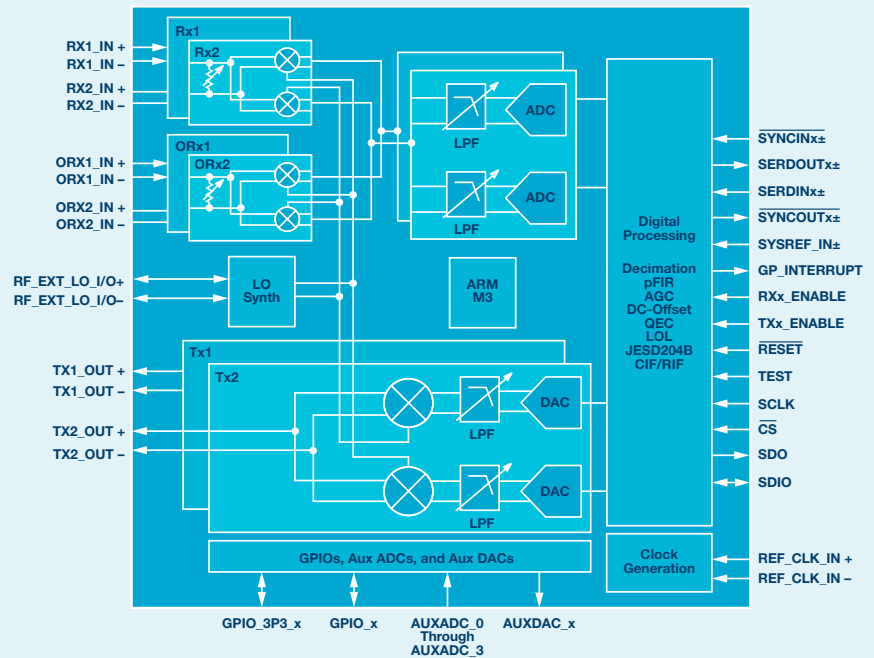


Two-Chip FDD Solution

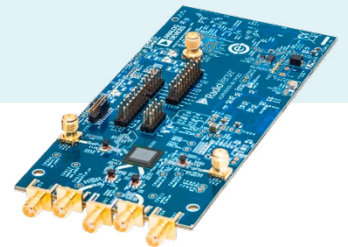


ADRV9008/ADRV9009 Functionality

- ▶ Dual transmitters
- ▶ Dual receivers
- ▶ Dual input shared observation receiver
- ▶ Tuning range: 75 MHz to 6 GHz
- ▶ Max receiver BW: 200 MHz
- ▶ Max transmitter synthesis BW: 450 MHz
- ▶ Max observation receiver BW: 450 MHz
- ▶ Fully integrated fractional-N RF synthesizer
- ▶ Fully integrated clock synthesizer
- ▶ 12 Gbps JESD204B data path interface
- ▶ ADRV9009: TDD operation
- ▶ ADRV9008-1: FDD receiver operation
- ▶ ADRV9008-2: FDD transmitter operation



ADRV9009 block diagram.



Evaluation and Prototyping Options

The table below outlines the full set of software and hardware tools available from ADI for evaluation, prototyping, and reference design.

	FMC Mezzanine Cards	Carrier Boards	Software and Driver	
Evaluation System	<ul style="list-style-type: none"> ▶ ADRV9009-W/PCBZ ▶ ADRV9008-1W/PCBZ ▶ ADRV9008-2W/PCBZ 	<ul style="list-style-type: none"> ▶ EVAL-TPG-ZYNQ3 	<ul style="list-style-type: none"> ▶ Operating system-agnostic API source in ANSI C ▶ Windows GUI for transceiver configuration and data capture 	<ul style="list-style-type: none"> ▶ Binary/image provided, uses Xilinx® JESD204B IP
Prototyping Platform	<ul style="list-style-type: none"> ▶ ADRV9009-W/PCBZ ▶ ADRV9008-1W/PCBZ ▶ ADRV9008-2W/PCBZ 	<ul style="list-style-type: none"> ▶ Xilinx Zynq UltraScale+ MPSoC ZCU102 evaluation kit ▶ Intel® Arria® 10 SoC development kit 	<ul style="list-style-type: none"> ▶ Open-source Linux® driver ▶ Open-source Linux IIO scope for data capture ▶ Compatible with MATLAB® and Simulink® 	<ul style="list-style-type: none"> ▶ Compatible with GNU radio ▶ Publicly available reference design on GitHub, uses ADI JESD204B interface framework
System on Module [Available 2018 Q4]	<ul style="list-style-type: none"> ▶ ADRV9009-ZU11EG 		<ul style="list-style-type: none"> ▶ Dual ADRV9009 connected to a Zynq UltraScale+ MPSoC ▶ Quad-core ARM® Cortex®-A53 MPCore™ ▶ 4 synchronized transmit channels 	<ul style="list-style-type: none"> ▶ 4 synchronized receive channels ▶ USB 3 and PCIe back to host PC ▶ 653k system logic cells and 2928 DSP slices for custom IP development

RadioVerse Ecosystem and Partnerships

RadioVerse® is a design and technology ecosystem for advanced radio design and development. We offer market leading integrated radio platforms, software tools, evaluation and prototyping platforms, a range of reference designs, and full radio solutions. RadioVerse is building up an ADI approved radio technology global partnership network to provide customers additional support, including partners with ADRV9009-based products such as:

- ▶ Epiq Sideiq X4, a dual ADRV9009 FMC mezzanine card
- ▶ Panateq FMC-ZU2RF-A, a single ADRV9009 FMC mezzanine card

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