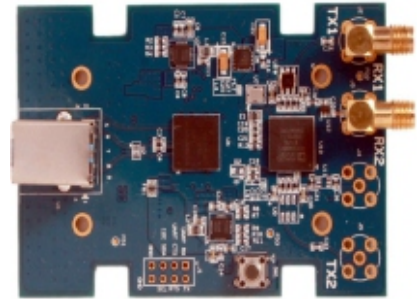


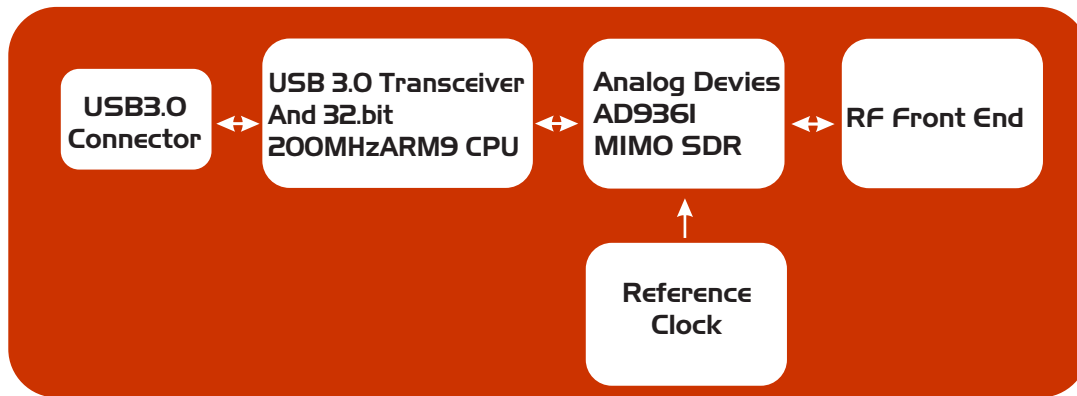
SDR Starter Kit Software Defined Radio Platform

Introduction

The ASRP4 SDR Starter Kit hardware covers RF frequencies from 50MHz to 6 GHz, has a Spartan6 FPGA, and dual USB 3.0 connectivity. This platform enables experimentation with a wide range of signals including FM and TV broadcast, cellular, Wi-Fi, and more. The ASRP4 SDR Starter Kit 1x1 features one receive and one transmit channel in a bus-powered design. The ASRP4 SDR Starter Kit 2x2 extends the capabilities for two receive and two transmit channels.



Block Diagram of SDR Kit



Both use an Analog Devices AD9361 RFIC to deliver a cost-effective RF



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SDR Starter Kit Software Defined Radio Platform

Application Areas

Type	Possibilities
Single Carrier	AM, PM, FM, BPSK, QPSK, QAM, MSK, other variants and higher modulation schemes
Multi Carrier	OFDM, OFDMA, SC-FDMA, MC-CDMA
Multi Antenna	MIMO, Beam forming, SDMA, Spatial Diversity and Multiplexing
Communication standards	3GPP CDMA2000, TD SCDMA, 1xEVDO, WCDMA, GSM, LTE IEEE WIMAX 16a,16d,16e 802.11a/b/g/n, HIPERLAN 802.15.4 (ZigBee), Bluetooth, RFID Broadcast Technology DVB(set top box), DAB (world space)
Others	Radar, SIGINT, COMINT, MILCOM, Cognitive Radio

Features

RF Tuning Range	50MHz to 6GHz
RF Instantaneous Bandwidth	200KHz to 56MHz
ADC/DAC Sampling Rates	400Ksps to 61.44Msps
USB 3.0 PC Interface	5 Gbps serial link
MIMO	2x2
FullDuplex	No
TDD/FDD	Yes
GPSDO	No
DCXO PPM Tuning	Yes - upto 25ppb accuracy
Application Development Environment	MATLAB/SIMULINK, LABVIEW, Visual C++, GCC, GNURADIO



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Application Areas

Simulate the physical layer of LTE and LTE-Advanced wireless communications systems

LTE System Toolbox provides standard-compliant functions and apps for the design, simulation, and verification of LTE and LTE-Advanced communications systems. The system toolbox accelerates LTE algorithm and physical layer (PHY) development, supports golden reference verification and conformance testing, and enables test waveform generation. With the system toolbox, you can configure, simulate, measure, and analyze end-to-end communications links. You can also create and reuse a conformance test bench to verify that designs, prototypes, and implementations comply with the LTE standard

LTE Modeling Basics

Resource grids, resource extraction, FDD and TDD duplexing modes, parameter structures

Downlink Channels

Physical signals and channels for transmit and receive, transport, control information, OFDM modulation

Uplink Channels

Physical signals and channels for transmit and receive, transport, control information, SC-FDMA modulation

Physical Layer Subcomponents

Downlink and uplink subcomponents for transport channels, physical channels, and physical signals

Signal Reception and Recovery

Frame synchronization, channel estimation, ZF and MMSE equalization, cell identity search, MIB decoding, SIB1 recovery, HARQ combining

End-to-End Simulation

Propagation channel models; RMC, FRC, and E-TM configuration and waveform generation; link-level BER and conformance test

Test and Measurement

Verification, waveform generation, EVM, and ACLR calculation



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Parameters	Typical value	Unit
	USB Bus Power	
DC Input	5	V
Conversion Performance and Clocks		
ADC Sample Rate(Max)	61.44	MSPS
DAC Sample Rate	61.44	MSPS
ADC Resolution	12	bits
DAC Resolution	12	bits
Frequency Accuracy	Upto 25ppb with DCXO Tuner	ppb
SSB/LO Suppression	-35	dBc
Power Output	Single Tone >10	dBm
IIP3	-20	dBm
Receiver Noise Figure	8	dB



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