

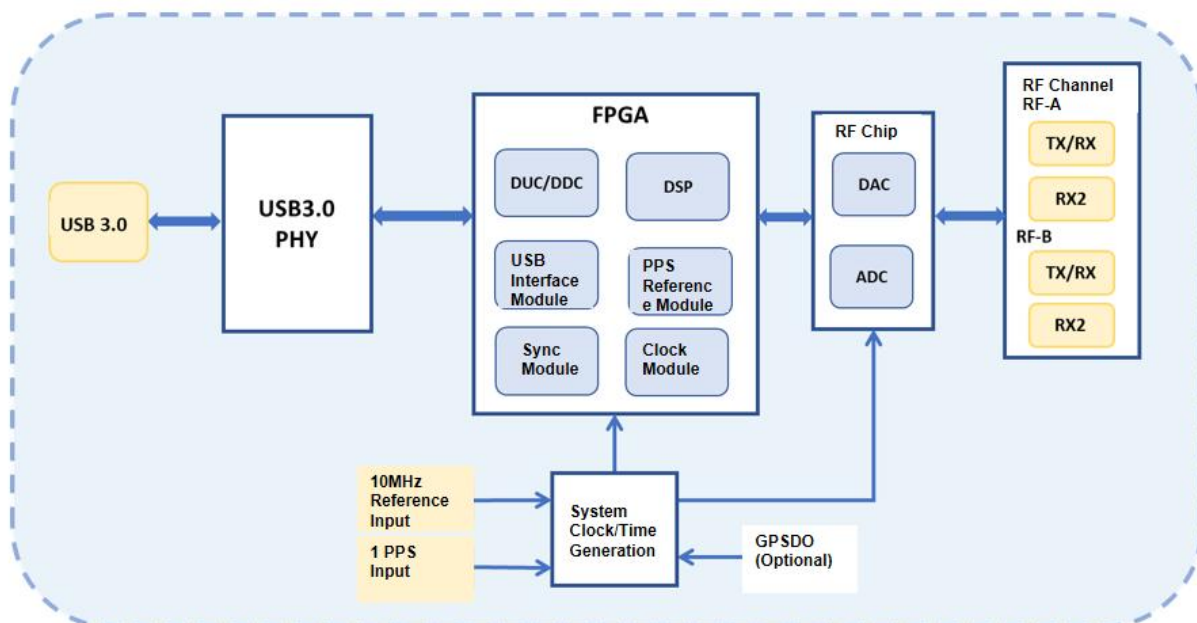
# USRP-TB B210 Datasheet

## Overview

The USRP-TB B210 is a highly integrated, industrial-grade universal software-defined radio platform supporting dual-channel transceiver operation. Featuring high-speed USB 3.0 interface, it accommodates multiple frameworks through the open-source USRP Hardware Driver (UHD). The device offers three programmable FPGA options: Spartan 6 XC6SLX150 FPGA, Xilinx Artix 7 100T FPGA, and Xilinx Artix 7 200T FPGA, catering to diverse logic resource requirements. With its AD9361 RF front-end, the platform delivers up to 56MHz instantaneous bandwidth. Its compact form factor ensures portability for both laboratory and field deployment scenarios.



## Block Diagram



## Features

Dual-channel transceiver with RF coverage from 70MHz to 6GHz

Maximum 56MHz real-time bandwidth

Features dual signal chains based on AD9361 for coherent MIMO capability

Supports high-speed USB 3.0 connectivity

Open-source UHD supports multiple frameworks

## Specification

TX		RX	
Channel Count	2	Channel Count	2
Frequency Range	70 MHz - 6 GHz	Frequency Range	70 MHz - 6 GHz
LO (Local Oscillator) Accuracy	± 2.0 ppm	Noise Figure	<8.5dB
Maximum Output Power	16 dBm	Maximum Input Power	-15 dBm
Maximum Real-Time Bandwidth	56 MHz	Maximum Real-Time Bandwidth	56 MHz
Phase Noise @10kHz Offset	1GHz: -102dBc/Hz	Input Third-Order Intercept Point (IIP3)	-20dBm
	5GHz: -91dBc/Hz	Input/Output	
Conversion Module		DC Input Voltage	6 V
ADC Maximum Sampling Rate	61.44 MSps	Power Consumption	8 W
ADC Resolution	12 bits	Physical Characteristics	
ADC Wideband Spurious-Free Dynamic Range (SFDR)	78dBc	Size and Weight	Size: 0.7kg Weight: 17.5*10*1.7cm
DAC Sampling Rate	61.44 MSps	GOSDO	
DAC Resolution	12 bits	TCXO Accuracy (GPS Unlocked)	±75ppb
Maximum Host Transfer Rate (16-bit)	61.44 MSps	TCXO Accuracy (GPS Locked)	<1ppb

## Key Functions

### Wide Frequency Range & High Bandwidth

- frequency range from 70MHz to 6GHz
- Up to 56MHz instantaneous bandwidth with maximum sampling rate of 61.44MSps per channel

### High-Speed Data Transfer

- Enables high-speed data transmission via USB 3.0 host interface
- Supports bidirectional streaming up to 61.44 MSps (16-bit samples)

### Synchronization & Clocking

- Integrated high-stability TCXO with:10 MHz external reference clock input and PPS synchronization
- Multi-device synchronization via shared clock/trigger signals

### Programmable FPGA

- Multiple FPGA Options: Spartan 6 FPGA, Xilinx Artix 7 100T FPGA, and Xilinx Artix 7 200T FPGA
- Users can develop custom FPGA logic through the programmable FPGA

### MIMO Capability

- Features 2 transmit + 2 receive channels for full-duplex communication and 2x2 MIMO systems
- Scalable for larger MIMO arrays through synchronized multi-device connectivity

### Open Ecosystem & Compatibility

- Universal Hardware Driver (UHD) supported
- Cross-platform development with GNU Radio, LabVIEW, MATLAB, other open-source SDR toolchains

## Compatible Platforms

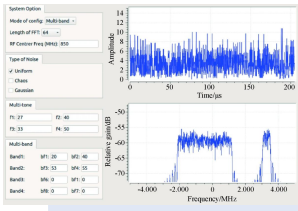


## Applications



### Wireless Communication Research

- Physical layer development & testing for 5G/6G, Wi-Fi, LTE protocols
- 2x2 MIMO system experiments (e.g. beamforming)



### Portable Field Applications

- On-site spectrum monitoring & interference detection
- Mobile comms testing (drone communications, IoT nodes)



### IoT & Sensor Networks

- Custom wireless protocol development (LoRa/ZigBee)
- Low-power communication system experiments



### Education & Labs

- University communication engineering courses
- Open-source projects (GNU Radio signal processing workflows)