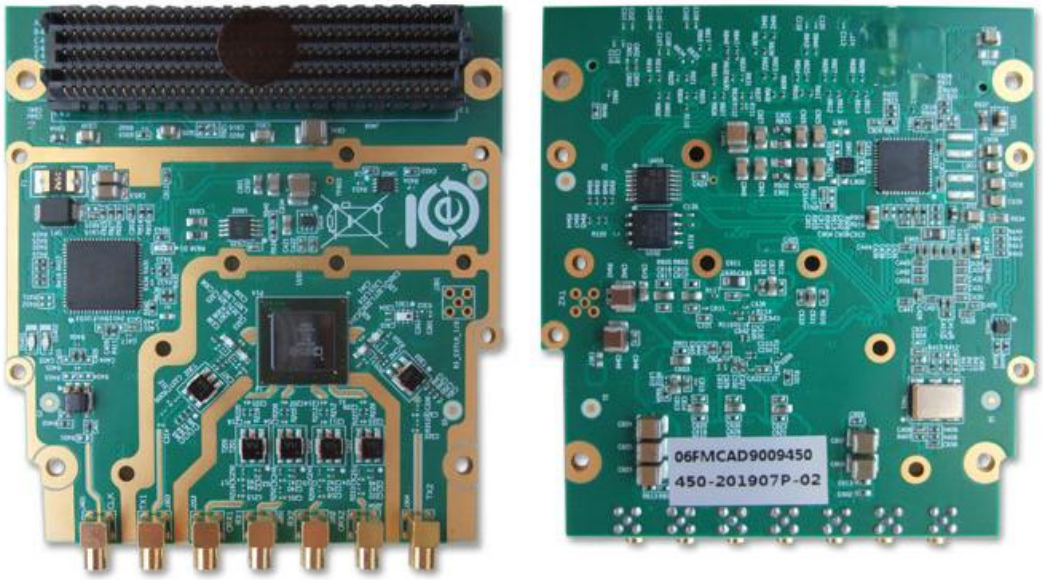
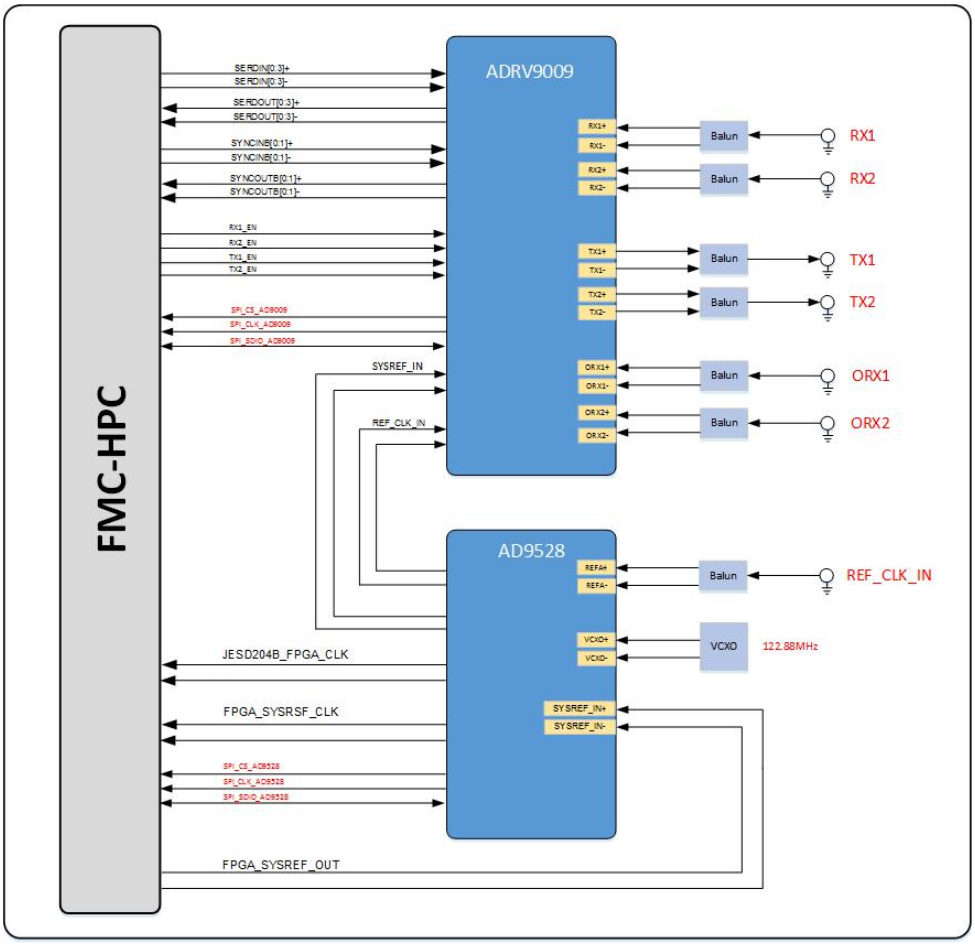
Dual receiver and transmitter RF FMC sub card based on ADRV9009



1.Overview

The ADRV9009 is a highly integrated radio frequency (RF), agile transceiver, dual-channel transmitter and receiver, integrated frequency synthesizer, and digital signal processing.This IC has a diversified combination of high performance and low power consumption. The FMC sub-card is a two channel input and two channel output RF transceiver card, which can work with FPGA to meet the application requirements of 3G, 4G and 5G macro cellular TIME Division duplex (TDD) base station.



2. Feature

- Double transmitter
- Dual receiver
- Shared observation of receiver with two inputs
- Biggest receiver bandwidth: 200 MHz
- Tunable transmitters biggest synthetic bandwidth: 450 MHz
- Maximum observed receiver bandwidth: 450 MHz
- Fully integrated fractional N radio frequency synthesizer
- Fully integrated clock synthesizer
- Suitable for RF LO and baseband clock chip phase synchronization
- JESD204B interface data path
- Tuning range: 75 MHz to 6000 MHz

	No.	Items	Specifications	Remark
Tx	1	Frequency	100~6000MHz	
	2	Bandwidth	Up to 450 MHz	Tx real-time bandwidth, tunable
	3	Transmission Power	17dBm	100~6000MHz, CW
	4	EVM	<0.7%	
	5	Gain Control Range	32dB	
	6	Gain Step	0.05 dB	
	7	ACLR	< -64dBc	@0dBm output
	8	Spurious	60dBc	
	9	SSB Suppression	65dBc	
	10	LO Suppression	70dBc	
	11	DAC Sample Rate (max)	122.88MS/s	
	12	DAC Resolution	14bits	
Rx	1	Frequency	100~6000MHz	
	2	Bandwidth	8 to 200 MHz	real-time bandwidth, tunable
	3	Sensitivity	-93dBm@20MHz	Noise Figure <3dB
	4	EVM	<1.5%	@ -30dBm input
	5	Gain Control Range	61.5dB	Including 30dB of ADRV9009 inside
	6	Gain Step	0.5dB	
	7	Rx Alias Band Rejection	80dB	Due to digital filters
	8	Noise Figure	<3dB	Maximum RX gain
	9	IIP3 (@ typ NF)	-25dBm	
	10	ADC Sample Rate (max)	122.88 MS/s	
	11	ADC Resolution	16bits	
	12	ADC Wideband SFDR	78dBc	
	1	Voltage	3.3V&12V	
	2	ON/OFFTIME	<6uS	TDD model
	3	Duplexing Model	TDD	
	4	Power Consumptions	<6W	

3. Application

3G/4G/5G TDD macro cellular base station; TDD active antenna system; Large-scale MIMO; Electronic warfare; Portable test equipment

4. Software system

Provide support for ZYNQ FMC interface test program source code

5.Physical property

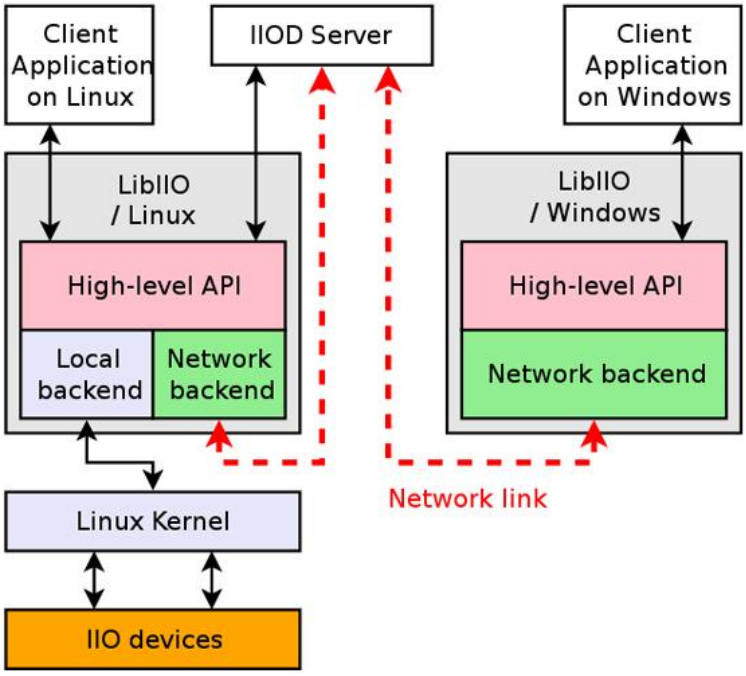
The board follows the FMC specification, HPC and is 76.5x69mm in size.

6.Power supply requirement

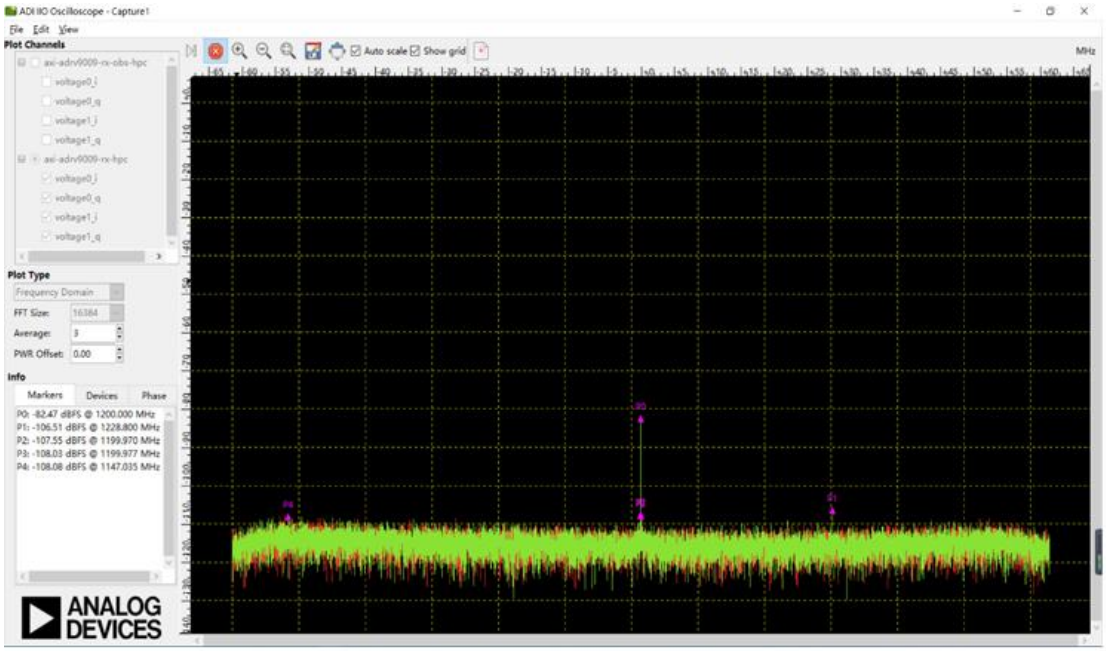
FMC interface+12V power supply

7.ADRV9009 application software

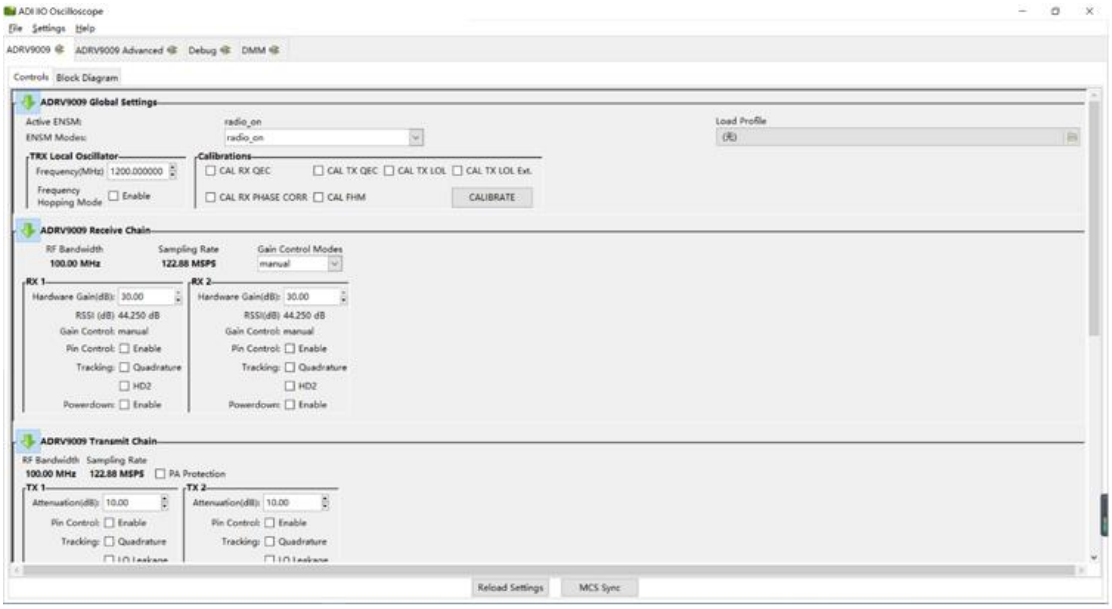
Software architecture

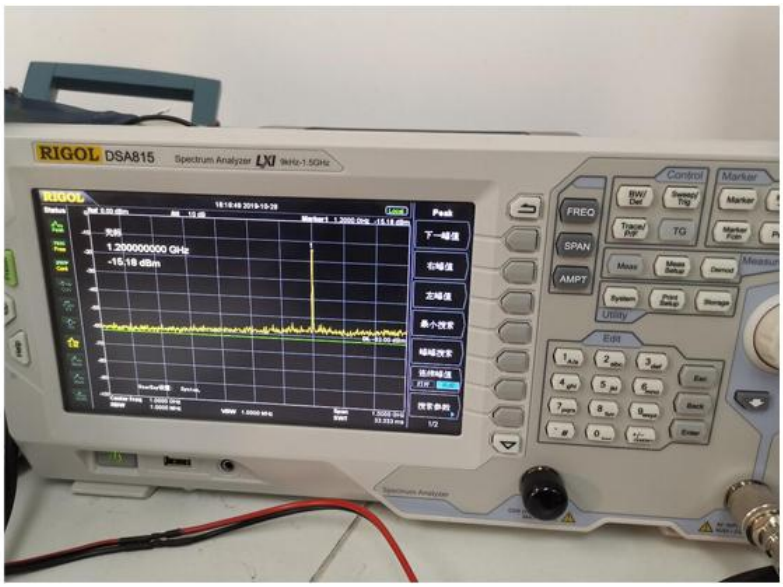


AD collect 1.2g waveform:



DA output setting 1.2g and waveform:




RIGOL DSA815
Spectrum Analyzer
9kHz-1.5GHz
1.200000000 GHz
-15.18 dBm
Peak
下一峰值
右峰值
左峰值
最小搜索
峰峰搜索
连续峰值
搜索参数
1/2
Control
Marker
Measure
Utility
Edit
FREQ
SPAN
AMPT