RigExpert© Fobos SDR
Wideband general purpose Software Defined Radio receiver

Applications

- SIGINT/COMINT
- Spectrum survey
- Wideband waveform digitizing
- HAM radio (HF + VHF/UHF)
- Test and measurement
- Wireless, Cellular, IoT, Media streaming
- Radio astronomy
- High Performance HF/VHF Telemetry

Main Features

- Double frequency conversion heterodyne
- Two HF direct sampling channels
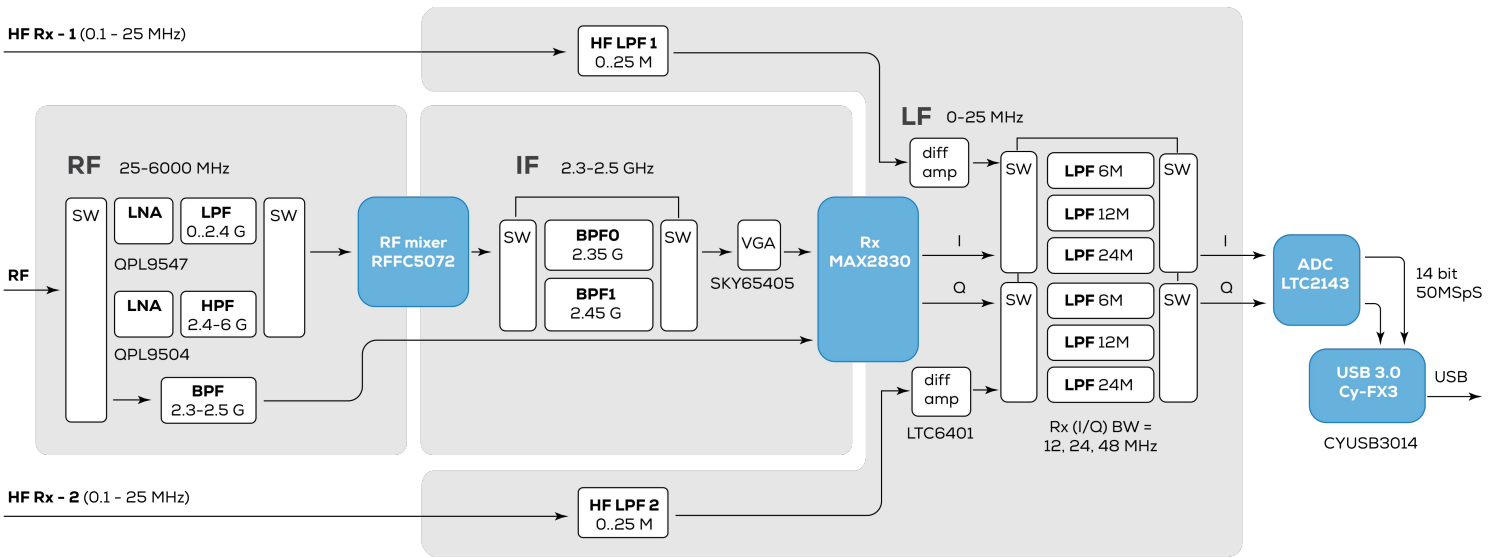- Fully continuous Rx data stream
- 14 bit ADC
- USB 3.0 interface

Features

- Primary receiving signal path with double frequency conversion heterodyne UHF/VHF with switchable preselector and intermediate frequency filters
- Auxiliary two coherent direct sampling Rx channels for HF band
- High quality lumped filters
- Precise 14 bit analog to digital conversion
- Up to 50 MHz IQ sample rate
- Fully continuous IQ data stream
- RF SMA connectors
- Cypress CYUSB3014-BZXC USB 3.0 interface controller
- Robust USB3.0 TYPE B socket
- Clock-in and clock-out options
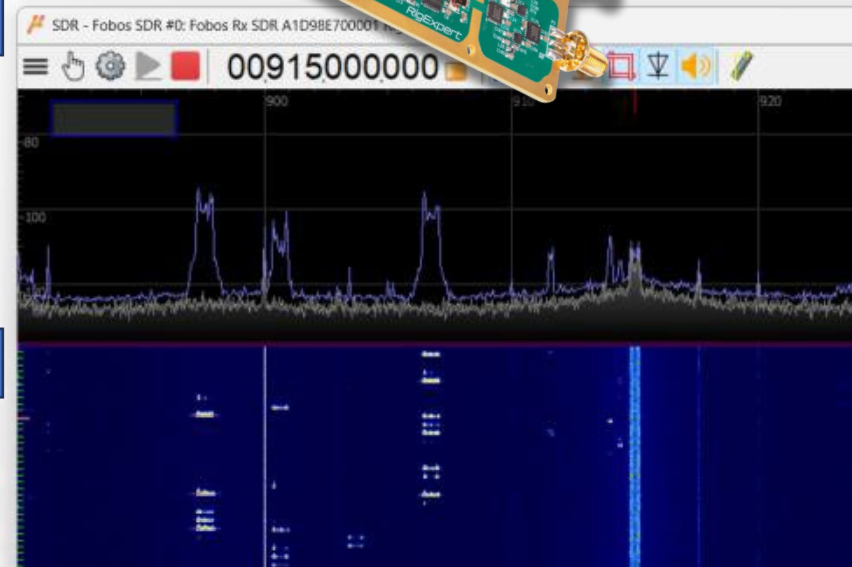
- Up to 6 lines of user defined low speed general purpose digital output
- Compact PCB design, no ponderous parts
- No switching power regulators, no onboard noise supplies
- Low power consumption, no auxiliary external power supply needed, no cooling facility needed
- EMI Shielded RF part
- Power switch option, no unplug/replug needed
- Lightweight API library for Windows and Linux
- SDRSharp plugin interface
- HDSDR ExtIO interface

Block Diagram

HF Rx – 1 (0.1 – 25 MHz)

HF LPF 1
0..25 M

LF   0-25 MHz

RF   25-6000 MHz

| SW | LNA | LPF 0..2.4 G | SW |

QPL9547

| LNA | HPF 2.4-6 G |

QPL9504

BPF 2.3-2.5 G

RF

IF   2.3-2.5 GHz

RF mixer RFFC5072

| SW | BPF0 2.35 G | SW |
| | BPF1 2.45 G | |

VGA
SKY65405

Rx MAX2830

I
Q

diff amp
SW

LPF 6M
LPF 12M
LPF 24M

SW

diff amp
LTC6401

SW

LPF 6M
LPF 12M
LPF 24M

SW

I
Q

ADC LTC2143

14 bit 50MSpS

USB 3.0 Cy-FX3

USB

2

CYUSB3014

Rx (I/Q) BW = 12, 24, 48 MHz

HF Rx – 2 (0.1 – 25 MHz)

HF LPF 2
0..25 M

Specifications

Operation modes	- double conversion heterodyne - two-channel direct sampling
Frequency range:	100 kHz – 25 MHz (direct sampling) 25 MHz – 6 GHz (double conversion heterodyne)
IQ sample rate (bandwidth):	4 - 50 MHz
ADC resolution:	14 bits
Frequency stability:	±0.5 ppm
Blocking Dynamic Range	82 dB UHF/VHF 86 dB in HF
Selectivity	-110 dBm combined selectivity
IQ Image rejection	52 dB (software)
Maximum RF input	+10 dBm
Power source	USB Plug, 3.8 - 5.5 V nominal
Current consumption	450 mA in idle state 670 mA in direct sampling mode 850 mA in full band operating mode
Clock source	- internal - external, selectable within API
External clock input	10 MHz, high impedance
Clock output	10 MHz, 5Ohm, 3.0 V p2p, permanent
Operating Temperature	0..+60° C
PCB type	6-layer impedance controlled, HASL finished
PCB dimensions:	110 mm x 60 mm
Outline dimensions	130 mm x 60 mm x 16 mm
Weight	48 g

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Connectivity

- USB 3.0 Type-B plug for power, control and data streaming
- Power control jumper
- 1x RF Input, primary Rx path, 25 MHz – 6 GHz (SMA female)
- 2x RF Input, auxiliary Rx path, 100 kHz – 25 MHz (SMA female)
- 1x Clock input (SMA female)
- 1x Clock output (SMA female)

Software

3

- libusb/WinUSB driver for Windows
- Native libusb support for Linux
- Lightweight open source multi-platform API library for Windows and Linux
- Easy to compile and run, no external dependencies, no heavy libraries and service packs needed
- Application examples for basic user cases: setup and tuning, IQ data acquisition, TCP streaming, recording
- SDRSharp plugin C# implementation code examples and binaries
- ExtIO plugin interface C/C++ implementation code examples and binaries
- Compatibility with state of art SDRSharp and HDSDR via plugins provided
- Native supported by µSDR software v.1.7 and later, see https://sourceforge.net/projects/u-sdr/
- For latest software releases (drivers, API library and demos) visit https://rigexpert.com web site

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