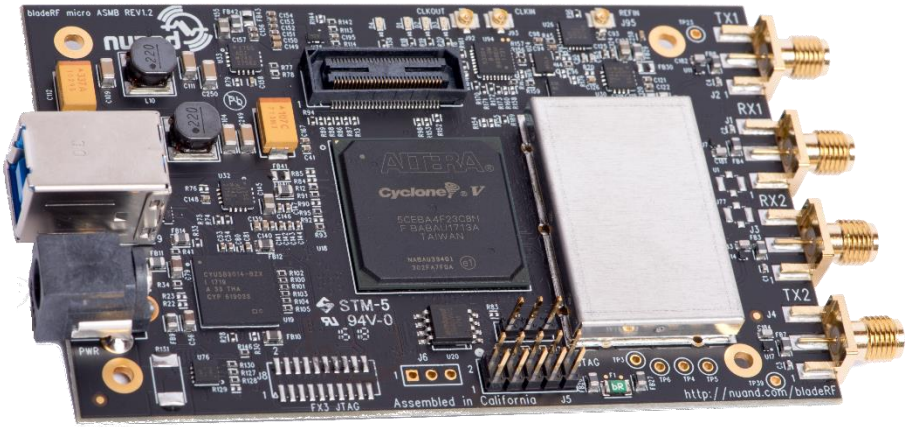
bladeRF 2.0

USB 3.0 Software Defined Radio

The bladeRF is an off-the-shelf USB 3.0 Software Defined Radio (SDR) that is easy and affordable for students and RF enthusiasts to explore wireless communications, yet provides a powerful waveform development platform expected by industry professionals.

Support is available for Linux, macOS, and Windows. The bladeRF libraries, utilities, firmware, and platform HDL are released under open source licenses, and schematics are available online. The FPGA and USB 3.0 peripheral controller are programmable using vendor-supplied tools and SDKs that are available online, free of charge.



FEATURES

Analog Devices RF Transceiver
- 47 MHz to 6 GHz frequency range
- 2x2 MIMO, 61.44 MHz sampling rate
- 56 MHz filtered bandwidth (IBW)
- Automatic gain control (AGC)
- Real-time custom gain control tables controlled via SPI and discrete external input pins
- Automatic IQ and DC offset correction
- 128-tap digital FIR filtering

USB 3.0 SuperSpeed Support
- Cypress FX3 peripheral controller with integrated 200 MHz ARM926EJ-S processor
- Fully bus-powered over USB 3.0
- External power option via 5 V DC barrel jack with automatic switchover

Altera Cyclone V FPGA
- 49 kLE and 301 kLE variants available for custom signal processing and hardware accelerators

Factory-calibrated SiTime MEMS VCTCXO
- Calibrated within 1 Hz of 38.4 MHz
- Taming supported via 12-bit DAC or ADF4002 PLL
- MEMS oscillators provide superior reliability, aging, power supply noise rejection, and vibe/shock performance compared to quartz oscillators

Fully Customizable
- Expansion port with 32 I/O pins (LVDS available)
- JTAG connectors
- Triggered multi-device sampling synchronization
- Onboard bias tee optionally provides 5 V to active antennas and accessories

SOFTWARE SUPPORT & APPLICATIONS

Supported by popular third-party software[1]
- GNU Radio via gr-osmosdr
- Pothos via SoapySDR
- SDRangel
- SDR Console
- SDR# via sdrsharp-bladeRF
- YateBTS
- OpenAirInterface
- srsUE & srsLTE
- MathWorks MATLAB® & Simulink® support
- Python bindings

Applications
- Custom modem and waveform development
- Wireless video (e.g., ATSC, DVB-T, DVB-S)
- GPS reception and simulation
- Whitespace exploration
- GSM and LTE
- ADS-B reception and simulation

Operating Systems
- Linux
- Windows
- macOS

[1] *Third-party software is copyrighted by the respective owners and/or contributors.*

bladeRF@nuand.com
https://www.nuand.com
720 East Ave Suite 201
Rochester, NY 14607

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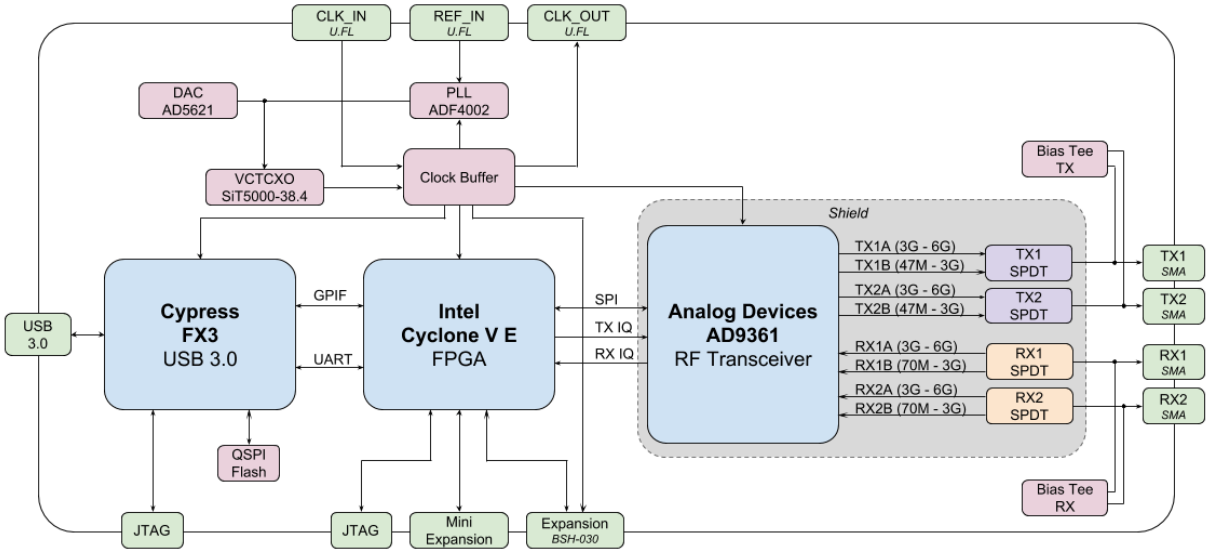

SPECIFICATIONS

	Min	Typ	Max	Unit
RF Specifications				
ADC/DAC Sample Rate	0.521[2]		61.44	MSPS
ADC/DAC Resolution		12		bits
VCTCXO Calibrated Accuracy[3]		26		ppb
RF Tuning Range (RX)	70		6000	MHz
RF Tuning Range (TX)	47		6000	MHz
RF Bandwidth Filter	<0.2		56	MHz
CW Output Power		+8		dBm
FPGA Specifications				
Logic Elements	49		301	kLE
Memory	3,383		13,917	kbits
Variable-precision DSP Blocks	66		342	
Embedded 18x18 Multipliers	132		684	
Physical Specifications				
Dimensions		6.3 x 11.7 x 1.8 2.5 x 4.6 x 0.70		cm inch
Weight		56 (0.12)		g (lb.)
Operating Temperature (A4/A9)	0		70	°C
Operating Temperature (A9 Thermal)	-40		85	°C

ACCESSORIES

Case	Clear polycarbonate case
BT-100	Wideband bias-tee powered Power Amplifier
BT-200	Wideband bias-tee powered Low Noise Amplifier

[2] The minimum ADC sampling rate is 25 MSPS. 521 KSPS is achieved using the maximum decimation of 12 and an additional FIR decimation of 4.
[3] VCTCXO is factory-calibrated to 1 Hz at 38.4 MHz. Temperature stability, aging, and other factors will affect accuracy after leaving the factory.
All specifications are subject to change without notice.

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