The bladeRF is an affordable USB 3.0 Software Defined Radio (SDR) designed to allow students and RF enthusiasts to explore wireless communication, and to provide professionals with a versatile COTS waveform development platform.

Support is available for Linux, OSX, 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 with vendor-supplied tools and SDKs that are available online, free of charge.

**Features**

**Frequency range of 300 MHz to 3.8 GHz**
- Extendable down to HF/VHF bands with the XB-200 Transverter Module

**Independent RX and TX signal paths**
- Half or full duplex operation
- Per-module frequency, sample rate, bandwidth, and gain settings
- Direct access to analog ADC/DAC pins

**USB 3.0 Support**
- Cypress FX3 SuperSpeed peripheral controller with integrated ARM926EJ-S
- Fully bus-powered over USB 3.0
- External power option via 5V DC barrel jack
- Backwards compatible with USB 2.0 *(with sample rate limitations)*

**Up to 28 MHz of instantaneous bandwidth**
- Software-selectable filter options from 1.5 MHz to 28 MHz

**Arbitrary sample rates up to 40 MSPS**
- 12-bit IQ samples

**Factory-calibrated 1 PPM VCTCXO**
- Calibrated within 1 Hz of 38.4 MHz reference
- Taming supported via 1.8 V GPSDO reference (1 PPS or 10 MHz)

**Altera Cyclone IV FPGA**
- 40 kLE or 115 kLE options available for custom signal processing and hardware accelerators

**Fully Customizable**
- Expansion port with 32 I/O pins
- JTAG connectors
- SMB connector for MIMO configurations
- Triggered multi-device sampling synchronization

**Supported by popular third-party software**
- GNU Radio via gr-osmosdr
- Pothos via SoapySDR
- SDRangel
- SDR Console
- SDR# via sdrsharp-bladeRF
- MathWorks MATLAB® & Simulink® via libbladeRF bindings

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

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1 Third-party software is copyrighted by the respective owners and/or contributors.
### bladeRF

**USB 3.0 Software Defined Radio**

![Diagram](image-url)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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<tbody>
<tr>
<td><strong>RF Specifications</strong></td>
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<tr>
<td>ADC/DAC Sample Rate</td>
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<td>Operating Temp: x115 Thermal</td>
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**Add-on Options**
- **XB-100 GPIO Board**: GPIO breakout with LEDs and DIP switches
- **XB-200 Transverter**: 600 kHz to 300 MHz transverter with VHF filterbank, custom filter path, and bypass mode
- **Case**: Clear polycarbonate case for the bladeRF x40 or bladeRF x115

*Specifications are subject to change without notice.*

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