WBX

Contents

- 1 Device Overview
- 2 Key Features
- 3 Daughterboard Specifications
 - ◆ 3.1 Features
 - ♦ 3.2 Antennas

 - ◆ 3.2 Antennas ◆ 3.3 Gains ◆ 3.4 Bandwidths
 - ♦ 3.5 Sensors
- 4 RF Specifications
 4.1 Freq Range

 - 4.1 Freq Hange
 4.2 Noise Figure
 4.3 RX IIP3 (Max)
 4.4 RX IQ Imbalance
 4.5 TX Power (Max)
 4.6 TX OIP3
 4.7 TX IQ Imbalance

 - ◆ 4.8 Input/Output Impedance
 - ◆ 4.9 Input Power Levels
- 5 RF Performance Data
- 6 Hardware Specifications 6.1 WBX-40 6.2 WBX-120
- 7 Environmental Specifications
 - 7.1 Operating Temperature Range
 7.2 Operating Humidity Range
- 8 USRP Compatibility 8.1 WBX-40

 - ♦ 8.2 WBX-120
- 9 Phase Synchronization
- 10 Schematics
 - ♦ 10.1 WBX
- 11 Key Component Datasheets
- 12 Mechanical Information
 - ♦ 12.1 Drawings
- 13 RF Connectors
- 14 Certifications
 - ♦ 14.1 RoHS
- ◆ 14.2 China RoHS 15 Certificate of Volatility ◆ 15.1 WBX-40/WBX-120
- 16 Downloads

The WBX is a wide bandwidth transceiver that provides up to 100 mW of output power and a noise figure of 5 dB. The LO's for the receive and transmit chains operate independently. The WBX daughterboard is supported by the USRP Hardware Driver? (UHD) software API for seamless integration into existing applications.

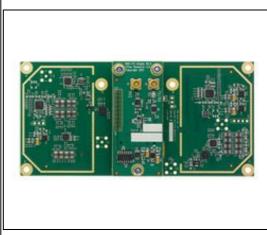
The WBX provides phase coherent operation, although with a 180-degree ambiguity, which must be calibrated out in the application. For phase-coherent applications, Ettus Research recommends the SBX with the N200/N210 or the SBX or UBX with the X300/X310.

• Frequency Range: 50MHz 2.2GHz

• Versions: 40MHz / 120MHz

 Power Output: 100mW Noise Figure: 5dB





- 2 quadrature frontends (1 transmit, 1 receive)
 - Defaults to direct conversion
 - Can be used in low IF mode through lo_offset with uhd::tune_request_t
- Independent receive and transmit LO's and synthesizers
 - ◆ Allows for full-duplex operation on different transmit and receive frequencies
 - ◆ Can be set to use Integer-N tuning for better spur performance with uhd::tune_request_t

Transmit: TX/RX

Receive: TX/RX or RX2

• Frontend 0: Complex baseband signal for selected antenna

 Note: The user may set the receive antenna to be TX/RX or RX2. However, when using a WBX board in full-duplex mode, the receive antenna will always be set to RX2, regardless of the settings.

Transmit Gains: PGA0, Range: 0-31.5dB
Receive Gains: PGA0, Range: 0-31.5dB

WBX: 40 MHz, RX & TXWBX-120: 120 MHz, RX & TX

- lo_locked: boolean for LO lock state
- 50MHz 2.2GHz
- 2 4 dB @ (50MHz ~ 1.2GHz) • 4 - 8 dB @ (1.2GHz ~ 2.2GHz)
- 10 18 dBm
- -30 dBc
- 18 20 dBm @ (50MHz ~ 1.4 GHz) • 12 - 18dBm @ (1.4GHz ~ 2.2 GHz)
- 30 32 dBm @ (50MHz ~ 800MHz) • 25 - 30 dBm @ (800MHz ~ 2.2GHz)
- -30 dBc @ (50MHz ~ 1.9GHz) • - 24 dBc @ (1.9GHz ~ 2.2GHz)
- All RF Ports are matched to 50 Ohm with -10dB or better return loss generally. Detailed test is pending.
- The maximum input power for the WBX is -15 dBm.
- WBX without UHD Corrections
- Ettus Research recommends to always use the latest stable version of UHD
- Current Hardware Revision: 1
- Minimum version of UHD required: 3.8.0
- Current Hardware Revision: 1
- Minimum version of UHD required: 3.8.0
- 0-40 °C
- 10% to 90% non-condensing
- N or X Series
- · X Series only

The WBX daughterboard is capable of phase-synchronous operation, but with a with a 180-degree ambiguity, which must be calibrated out in the user application. The SBX, UBX, TwinRX daughterboards are recommended for phase-coherent applications.

WBX Schematics

Part Number	Description	Schematic ID (Page)
ADA4937	Ultralow Distortion Differential ADC Driver	U304 (2)
ADP3336	High Accuracy Ultralow IQ, 500 mA any CAP® Adjustable Low Dropout Regulator	U306, U308 (2); U503, U505 (4)
ADL5387	50 MHz to 2 GHz Quadrature Demodulator	U307 (2)
ADL5385	50 MHz to 2200 MHz Quadrature Modulator	U501 (4,5)
ADF4350 / ADF4351	Wideband Synthesizer with Integrated VCO	U201 (3); U401 (5)
HMC472LP4	Attenuator	U302 (2); U504 (4,5)
MGA82563	Amplifier	U313 (2)
24LC024	EEPROM	U202 (3); U403 (5)
GVA?84+	Amplifier	U502 (4)

- Media:cu ettus-wbx-cca.pdf
- The WBX daughterboard features female MCX connectors for both the TX/RX and RX2 connectors.

As of December 1st, 2010 all Ettus Research products are RoHS compliant unless otherwise noted. More information can be found at http://ettus.com/legal/rohs-information

Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation

Chinese Customers

National Instruments is in compliance with the Chinese policy on the Restriction of Hazardous Substances (RoHS) used in Electronic Information Products. For more information about the National Instruments China RoHS compliance, visit ni.com/environment/rohs_china.

• Media:volatility UBX CBX WBX SBX r1 1.pdf

FPGA Resources

UHD Stable Binaries

UHD Source Code on Github