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# USRP B206mini-i Specifications

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## USRP B206mini-i Specifications

These specifications apply to the USRP B206mini-i.

### Revision History

Version	Date changed	Description
379222A-01	September 2025	Initial release.

### Looking For Something Else?

For information not found in the specifications for your product, such as operating instructions, browse ***Related Information***.

#### Related information:

- [Latest Driver Download](#)
- [USRP B206mini-i Tutorials](#)
- [Dimensional Drawings](#)
- [Product Certifications](#)
- [Letter of Volatility](#)
- [Discussion Forums](#)

### Definitions

***Warranted Specifications*** describe the performance of a model under stated operating conditions and are covered by the model warranty.

***Characteristics*** describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical**—describes the performance met by a majority of models.
- **Nominal**—describes an attribute that is based on design, conformance testing, or

supplemental testing.

- **Measured**—describes the measured performance of a representative model.

Values are **Measured** unless otherwise noted.

## Conditions

Specifications are valid under the following conditions unless otherwise noted.

- Ambient temperature:  $25\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$
- Driver: UHD 4.9 or later

## USRP B206mini-i Interfaces and Controls

Understand the terminals and controls on the USRP B206mini-i.

Figure 1. Enclosed USRP B206mini-i Interfaces (Top of Device)

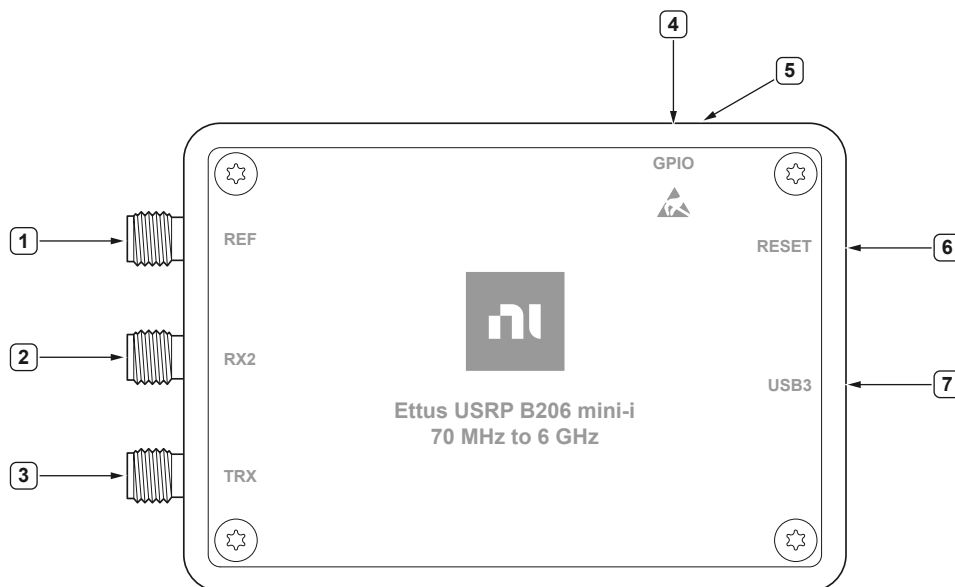


Figure 2. Board-Only USRP B206mini-i Interfaces (Top of Device)

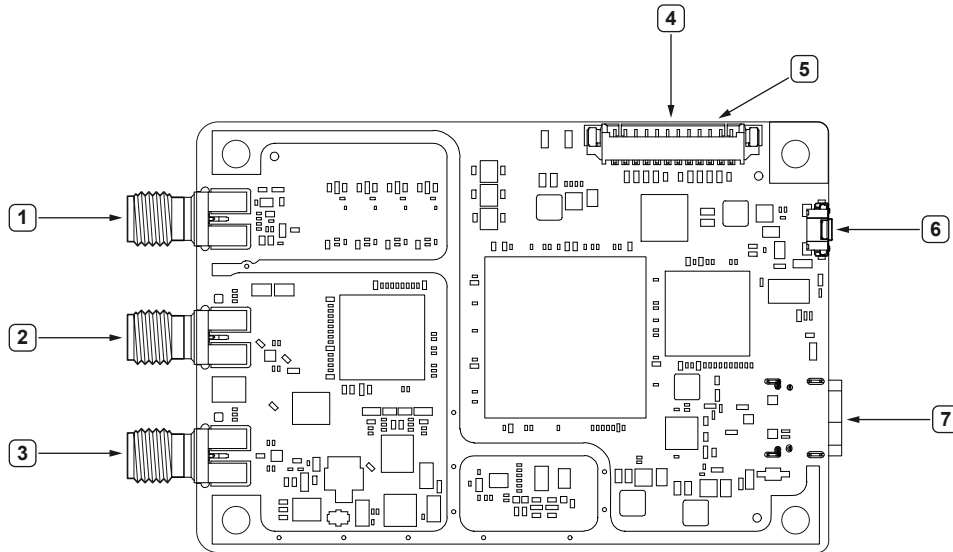


Table 1. Interface Descriptions

Item	Signal Name	Connector Type	Board Label	Description
1	REF	SMA (f)	J3	External 10 MHz/PPS reference
2	RX2	SMA (f)	J2	RF input channel
3	TRX	SMA (f)	J1	RF input/output channel
4	GPIO	PicoBlade, 12-pin	J5	Header connected to the FPGA for GPIO purposes; located on top of device board (accessible through enclosure)
5	JTAG	PicoBlade, 12-pin	J6	Interface to FPGA and FX3 for programming and debugging; located on bottom of device board (not accessible through enclosure)

Item	Signal Name	Connector Type	Board Label	Description
				enclosure)
6	RESET	N/A: physical button	SW1	Hard reset for the USB controller
7	USB3	USB Type-C (f)	J4	USB 3 power and connectivity to host

## USRP B206mini-i GPIO Pinout

The GPIO port connects to a GPIO adapter board included in the USRP B206mini-i GPIO cable accessory kit. With this connection, you can implement custom GPIO functionality on the USRP B206mini-i.

Figure 3. USRP B206mini-i GPIO Connector

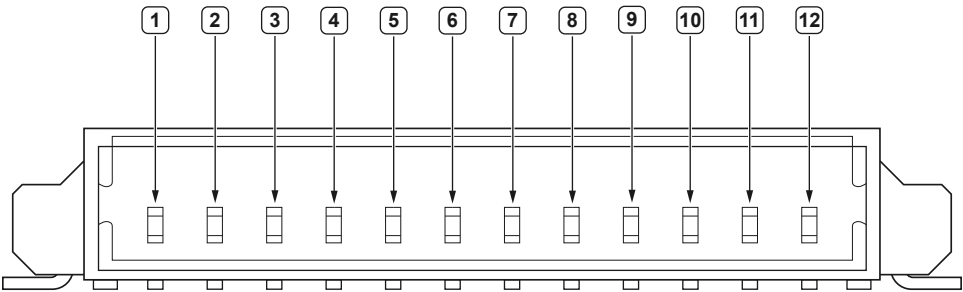


Table 2. GPIO Signal Descriptions

Pin	Description
1	3.3 V
2	GPIO_0
3	GPIO_1
4	GPIO_2
5	GPIO_3
6	GND
7	3.3 V
8	GPIO_4
9	GPIO_5

Pin	Description
10	GPIO_6
11	GPIO_7
12	GND

## USRP B206mini-i JTAG Pinout

The JTAG port connects to a Xilinx JTAG adapter board and a Cypress FX3 adapter board, both of which are included in the USRP B206mini-i JTAG cable accessory kit. With these connections, you can reprogram or debug the FPGA over JTAG or update the Cypress FX3 USB firmware.


**Note** The JTAG connector is not accessible through the USRP B206mini-i enclosure.

Figure 4. USRP B206mini-i JTAG Connector

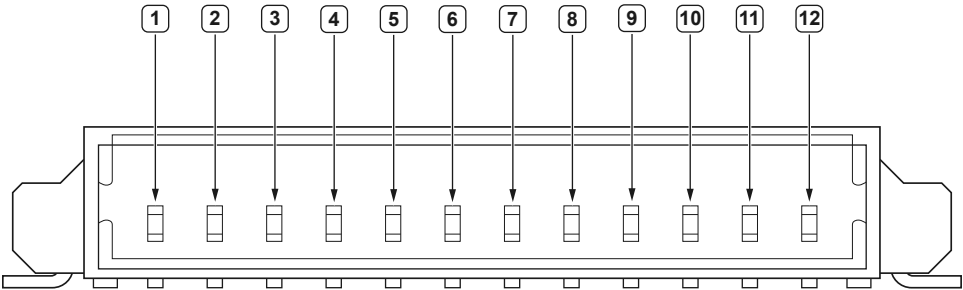


Table 3. JTAG Signal Descriptions

Pin	Board Label	Description
1	TDO	Test data out, Cypress FX3 adapter
2	TDI	Test data in, Cypress FX3 adapter
3	TMS	Test mode select, Cypress FX3 adapter
4	TCK	Test clock, Cypress FX3 adapter
5	TRST	Test reset, Cypress FX3 adapter

Pin	Board Label	Description
6	3.3V	VREF, Cypress FX3 adapter
7	GND	Ground, Xilinx JTAG adapter
8	2.5V	VREF, Xilinx JTAG adapter
9	TDO	Test data out, Xilinx JTAG adapter
10	TDI	Test data in, Xilinx JTAG adapter
11	TMS	Test mode select, Xilinx JTAG adapter
12	TCK	Test clock, Xilinx JTAG adapter

## Physical Characteristics

Table 4. Physical Characteristics

Dimensions	<ul style="list-style-type: none"> <li>Enclosed: 84.9 mm × 55.7 mm × 19.8 mm (3.3 in. × 2.0 in. × 0.8 in.)</li> <li>Board-only: 84.3 mm × 51.0 mm × 8.7 mm (3.3 in. × 2.0 in. × 0.3 in.)</li> </ul> <p>For more information, visit <a href="https://ni.com/dimensions">ni.com/dimensions</a> and search by module number.</p>
Weight	<ul style="list-style-type: none"> <li>Enclosed: 108 g (3.8 oz)</li> <li>Board-only: 25 g (0.9 oz)</li> </ul>

### Related information:

- [Dimensional Drawings](#)

## Key Specifications

Table 5. Key Specifications

RF capabilities	1 TX, 1 RX, independently tunable
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	RF transceiver  70 MHz to 6 GHz  Up to 56 MHz bandwidth
Programmable logic (PL)	FPGA: Xilinx Spartan-6 XC6SLX150
Software	UHD 4.9 or later  GNU Radio  C/C++  Python
Synchronization	REF (external 10 MHz or PPS reference)
Digital interfaces	USB 3.0  GPIO (8 I/O lines with 3.3 V I/O voltage)  JTAG
Power, form factor	5 V DC, 0.9 A maximum  Board-only: 84.3 mm × 51.0 mm × 8.7 mm  Enclosed: 84.9 mm × 55.7 mm × 19.8 mm

## Baseband

Table 6. Baseband Performance

Maximum I/Q sample rate	61.44 MSa/s
Number of available channels	1 channel
ADC resolution	12 bits

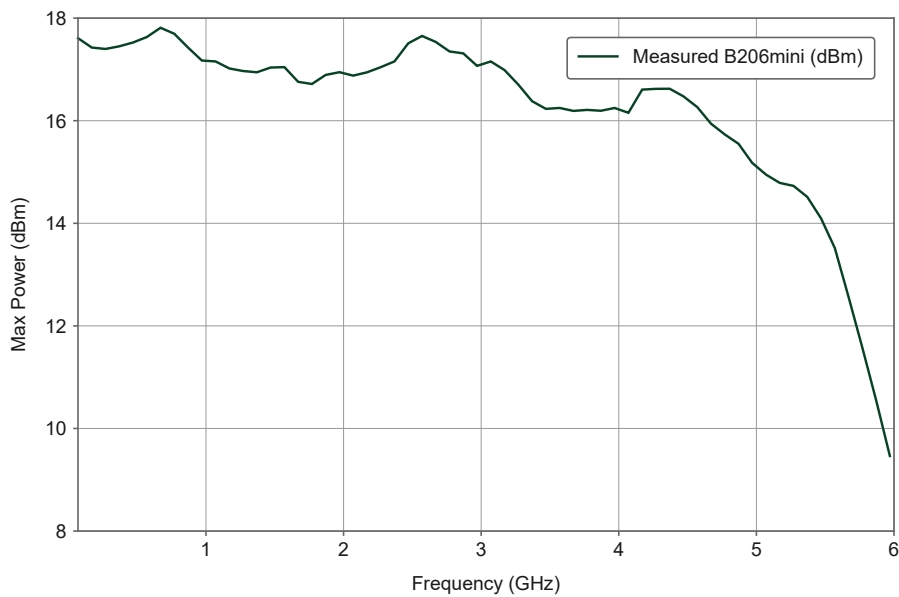
DAC resolution	12 bits
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## RF Transmitter Maximum Power

Table 7. TX Maximum Power

Frequency Range	Value
70 MHz to 4.0 GHz	16.06 dBm
4.0 GHz to 5.9 GHz	9.16 dBm

Figure 5. TX Maximum Power, Measured



## RF Receiver Noise Figure

Table 8. RX Noise Figure<sup>1</sup>

Frequency Range	Value
170 MHz to 2.0 GHz	7.56 dB
2.0 GHz to 4.0 GHz	8.47 dB
4.0 GHz to 5.9 GHz	9.75 dB

1. RX noise figure specifications apply only to the board-only USRP B206mini-i.

## RF Receiver IIP3

Table 9. RX IIP3

RX IIP3	-20 dBm
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## Power Requirements



**Caution** This product is rated for use only with suitable rated and certified USB Power Sources that have Class 2, Limited Energy, or LPC outputs only.

Table 10. Power Specifications

Voltage rating	5 V DC
Current rating	900 mA
Power rating	4.5 W

## Safety Voltages

Table 11. Rated Voltages

REF	<ul style="list-style-type: none"> <li>PPS: <math>\pm 5</math> V DC</li> <li>10 MHz: 0 V DC +5 V DC</li> <li>Maximum input power: +27 dBm</li> </ul>
RX2	Maximum input power: -15 dBm
TRX	<ul style="list-style-type: none"> <li>Maximum input power: -15 dBm</li> <li>Maximum output power: refer to <b><i>RF Transmitter Maximum Power</i></b></li> </ul>
GPIO	3.3 V DC, 12 mA

## Environmental Guidelines



**Notice** Failure to follow the mounting instructions in the product

documentation can cause temperature derating.



**Notice** This product is intended for use in indoor applications only.

## Environmental Characteristics

Table 12. Temperature

Operating (board-only)	0 °C to 45 °C
Operating (enclosed)	-40 °C to 75 °C
Storage	-40 °C to 75 °C

Table 13. Humidity

Operating	10% RH to 90% RH, noncondensing
Storage	5% RH to 95% RH, noncondensing

Table 14. Pollution Degree

Pollution degree	2
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Table 15. Maximum Altitude

Maximum altitude	2,000 m
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