DEVICE SPECIFICATIONS

NI USRP™-2920

50 MHz to 2.2 GHz Tunable RF Transceiver

This document lists specifications for the NI USRP-2920 universal software radio peripheral.

All characteristics described in this document are based on the manufacturing design. This equipment information is only for product description and is not covered by warranty. This device is not calibrated.

Typical values describe useful product performance that are not covered by warranty. Typical values may not be verified on all units shipped from the factory. Unless otherwise noted, typical values cover the expected performance of units over ambient temperature ranges of 23 °C ±5 °C with a 90% confidence level, based on measurements taken during development or production.

Note All numeric characteristics are typical unless otherwise noted.

Specifications are subject to change without notice. For the most recent NI USRP-2920 specifications, visit ni.com/manuals.

To access NI USRP-2920 documentation, navigate to Start»All Programs»National Instruments»NI-USRP»Documentation

Caution Refer to the Read Me First: Safety and Electromagnetic Compatibility document for important safety and electromagnetic compatibility information. To obtain a copy of this document online, visit ni.com/manuals and search for the document title.

Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories.

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Transmitter

Frequency range ................................................. 50 MHz to 2.2 GHz

Frequency step ....................................................... <1 kHz

Maximum Output Power ($P_{\text{out}}$)

- 50 MHz to 1.2 GHz ........................................ 50 mW to 100 mW (17 dBm to 20 dBm)
- 1.2 GHz to 2.2 GHz ................................. 30 mW to 70 mW (15 dBm to 18 dBm)

Gain range .............................................. 0 dB to 31 dB

Gain step ......................................................... 1.0 dB

Frequency accuracy ........................................ 2.5 ppm

Maximum instantaneous real-time bandwidth

- 16-bit sample width ................................. 20 MHz
- 8-bit sample width ................................. 40 MHz

Maximum I/Q sampling rate

- 16-bit sample width ................................. 25 MS/s
- 8-bit sample width ................................. 50 MS/s

DAC ................................................................. 2 channels, 400 MS/s, 16 bit

DAC SFDR ......................................................... 80 dB

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1 The output power resulting from the gain setting varies over the frequency band and among devices.
2 Frequency accuracy is based on temperature-compensated crystal oscillator (TCXO) vendor specifications and is not measured. Alternatively, you can incorporate an external reference source to provide a more precise frequency reference clock and to achieve better frequency accuracy.
3 Instantaneous bandwidth depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chip set dependent.
4 I/Q sampling rate depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chip set dependent.
Receiver

Frequency range.........................................................50 MHz to 2.2 GHz

Frequency step...........................................................<1 kHz

Gain range\(^5\)...............................................................0 dB to 31.5 dB

Gain step.................................................................0.5 dB

Maximum input power (P\(_{\text{in}}\)).................................0 dBm

Noise figure..............................................................5 dB to 7 dB

Frequency accuracy\(^6\)..................................................2.5 ppm

Maximum instantaneous real-time bandwidth\(^7\)
  16-bit sample width.................................................20 MHz
  8-bit sample width..................................................40 MHz

Maximum I/Q sampling rate\(^8\)
  16-bit sample width................................................25 MS/s
  8-bit sample width..................................................50 MS/s

ADC..............................................................................2 channels, 100 MS/s, 14 bit

ADC SFDR.................................................................88 dB

Power

Total power, typical operation.................................12 W to 15 W, typical, 18 W max

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\(^5\) The received signal amplitude resulting from the gain setting varies over the frequency band and among devices.

\(^6\) Frequency accuracy is based on temperature-compensated crystal oscillator (TCXO) vendor specifications and is not measured. Alternatively, you can incorporate an external reference source to provide a more precise frequency reference clock and to achieve better frequency accuracy.

\(^7\) Instantaneous bandwidth depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chip set dependent.

\(^8\) I/Q sampling rate depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chip set dependent.
Physical Characteristics

Physical dimensions
(L × W × H) ...........................................15.875 × 4.826 × 21.209 cm
       (6.25 × 1.9 × 8.35 in.)

Weight ...........................................1.193 kg (2.63 lb)

Hardware Front Panel

Figure 1. NI USRP-2920 Front Panel

Environment

Maximum altitude ...........................................2,000 m (at 25 °C ambient temperature)

Pollution Degree ...........................................2

Indoor use only.

Operating Environment

Ambient temperature range ...................................0 to 45 °C (tested in accordance with
I EC 60068-2-1 and I EC 60068-2-2.)

Operating temperature .....................................23 °C ±5 °C, room temperature.

Relative humidity range ...................................10% to 90%, noncondensing (tested
in accordance with I EC 60068-2-56.)
Compliance and Certifications

Safety
This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note For UL and other safety certifications, refer to the product label or the Online Product Certification section.

Electromagnetic Compatibility
This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia, and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, refer to the Online Product Certification section.

CE Compliance
This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification
To obtain product certifications and the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.
Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* web page at [ni.com/environment](http://ni.com/environment). This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

**EU Customers**  At the end of the product life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit [ni.com/environment/weee.htm](http://ni.com/environment/weee.htm).

电子信息产品污染控制管理办法（中国 RoHS）

**中国客户**  National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 [ni.com/environment/rohs_china](http://ni.com/environment/rohs_china)。（For information about China RoHS compliance, go to [ni.com/environment/rohs_china](http://ni.com/environment/rohs_china).）