
USB-5680

Specifications

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These specifications apply to the USB-5680 .

All specifications are subject to change without notice.



Notice The protection provided by the USB-5680 can be impaired if it is used in a manner not described in this document.

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** specifications describe the performance met by a majority of models.
- **Nominal** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are **Typical** unless otherwise noted.

Conditions

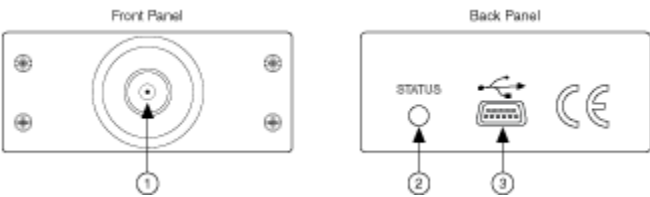
Minimum or maximum specifications are warranted under the following conditions unless otherwise noted.

- 1 hour warm-up time at ambient temperature
- Calibration cycle maintained
- Temperature 0 °C to 55 °C

USB-5680 Pinout

Use the pinout to connect to terminals on the USB-5680 .

The following figure shows both panels of the device.



- 1. Type-N Connector
- 2. LED
- 3. Mini-B USB Port

Table 1. Information about the USB-5680 module back panel LED

LED	Indication
Green	The USB-5680 is connected to a computer or a chassis and is functioning properly.
Yellow	An error has occurred.
Off	The USB-5680 is not initialized.



Note The USB-5680 device has a USB 2.0 interface with a USB Type Mini-B port. You can remotely program the device using this USB interface. In addition to communication, the USB port supplies power to the device. The interface is USB 2.0 and 1.1 compatible and operates with an interface speed of 12 Mbps.

General

Frequency range	50 MHz to 6 GHz
Dynamic range	-40 dBm to +23 dBm

Input return loss	
50 MHz to <2 GHz	<-26 dB
2 GHz to 6 GHz	<-20 dB
Measurement range	
Measurement range 1	-40 dBm to <-5 dBm
Measurement range 2	-5 dBm to +23 dBm

Table 2. Averaging, Low-Aperture Time Mode

Input Power (dBm)	Input Power (mW)	Number of Reads to Average for $\leq \pm 0.10$ dB Noise	Number of Reads to Average for $\leq \pm 0.01$ dB Noise
>10	>10.0	1	1
5	3.2	1	2
0	1.0	1	16
-5	0.32	1	78
-10	0.10	1	1
-15	0.032	1	1
-20	0.010	1	7
-25	0.0032	1	61
-30	0.0010	7	—
-35	0.00032	62	—
-40	0.00010	—	—

Table 3. Averaging, High-Aperture Time Mode

Input Power (dBm)	Input Power (mW)	Number of Reads to Average for $<\pm 0.10$ dB Noise	Number of Reads to Average for $<\pm 0.01$ dB Noise
>10	>10.0	1	1
5	3.2	1	5
0	1.0	1	1
-5	0.32	1	1
-10	0.10	1	1
-15	0.032	1	1
-20	0.010	1	1
-25	0.0032	1	4
-30	0.0010	1	38
-35	0.00032	4	—
-40	0.00010	39	—

Signal-channel bandwidth	100 Hz
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Uncertainty

Linearity	
Power level <18 dBm	± 0.13 dB
Power level ≥ 18 dBm	± 0.18 dB
Calibration factor ¹	± 0.06 dB

1. Expanded uncertainty with coverage factor K=2 for absolute power measurements on continuous wave (CW) signal at 0 dBm calibration level over a 50 MHz to 6 GHz frequency range.

Table 4. Noise²

Input Power Measurement Range	Low-Aperture Time Mode	High-Aperture Time Mode
-40 to <-5 dB	<2.5 nW	<1.3 nW
-5 to +23 dBm	<0.6 μ W	<1.7 μ W

Zero set³		
-40 to <-5 dBm		<10 nW
-5 to +23 dBm		<1.7 μ W

Zero drift⁴		
-40 to <-5 dBm		<3.0 nW
-5 to +23 dBm		< 0.5 μ W

Temperature compensation⁵		
0 °C to 50 °C		$\pm$ 0.06 dB
20 °C to 30 °C		0 dB

Effect of digital modulation		
Power level <18 dBm		$\pm$ 0.02 dB

2. Expanded uncertainty with coverage factor K=2 after zero operation for a five-minute measurement incorporating 128 averaged values. Includes effect of noise and zero offset.
3. After zero operation. 128 values averaged over one hour with temperature within ± 1 °C
4. After zero operation. 128 values averaged over one hour with temperature within ± 1 °C
5. Measurement error with reference to a CW signal of equal power and frequency at 25 °C. Negligible error at 20 °C to 30 °C.

Power level ≥ 18 dBm	± 0.10 dB
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System

Measurement	True root mean square/Average power
Measurement resolution	0.01 dB
Offset range	.±100 dB
Averaging range ⁶	1 to 256
Measurement speed	
Low-aperture time mode	15 measurements per second
High-aperture time mode	1 measurement per second
Interface	USB 2.0 and 1.1 compliant

Maximum Damage Levels

Maximum DC voltage at RF port	25 V
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6. Averaging range limit set by software. You can override this value; however, a value greater than 256 results in a higher measurement time.

Absolute power	33 dBm
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DC Power Requirements (5V) through Host US

Typical current	100 mA
Maximum current	150 mA

Calibration

Interval	1 year; calibration interval starts with the date the product is put into service by the customer
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Physical Dimensions

Dimensions	8.5 cm × 3.0 cm × 5.6 cm (3.35 in × 1.18 in × 2.2 in)
Weight	180 g (6.4 oz)

Environment

Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Operating Environment

Ambient temperature range	0 to 55 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)	
Relative humidity range ⁷ (noncondensing)		
At 55 °C		45%
At 40 °C		75%
At 30 °C		95%

Storage Environment

Ambient temperature range	-51 °C to +71 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)	
Relative humidity range	5% to 95%, noncondensing (Tested in accordance with IEC 60068-2-56.)	

Shock and Vibration

Operating shock	30 g peak, half-sine, 11 ms pulse
Random vibration	

7. Tested in accordance with IEC 60068-2-56.

Operating	5 Hz to 500 Hz, 0.3 g _{rms}
Nonoperating	5 Hz to 500 Hz, 2.4 g _{rms}

Compliance and Certifications

Safety Compliance Standards

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 C22.2 No. 61010-1



Note For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) 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
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: 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, certifications, and additional information, refer to the [Product Certifications and Declarations](#) section.

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

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 to the environment and to NI customers.

For additional environmental information, refer to the ***Engineering a Healthy Planet*** web page at 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.

EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国RoHS）

-  **中国RoHS**— NI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NI中国RoHS合规性信息，请登录 ni.com/environment/rohs_china。 (For information about China RoHS compliance, go to ni.com/environment/rohs_china.)