

# NI PXI-5621 Specifications

## DC-Coupled High-Speed Digitizer

This document lists the specifications of the NI PXI-5621 digitizer. These specifications are warranted at 0 °C to 50 °C ambient unless otherwise specified, and include a 10 minute warm-up time from ambient conditions. All specifications are subject to change without notice.



**Note** Visit [ni.com/manuals](http://ni.com/manuals) for the most current specifications and product documentation.

## General Specifications

Number of channels .....	1
Resolution .....	14 bits
Sample rate range .....	1 kS/s to 64 MS/s
Onboard memory	
Not using DDC .....	32 MS
Using DDC (complex data) .....	16 MS

## Input

Signal level	
Nominal .....	0 dBm ( $\pm 0.316 V_p$ )
Full-scale .....	+10 dBm ( $\pm 1.000 V_p$ )
Max with dither enabled .....	+8 dBm ( $\pm 0.794 V_p$ )
Non-operating	
Max input level .....	+20 dBm ( $\pm 3.16 V_p$ )
Max DC input voltage .....	$\pm 3.0 V$
Input impedance .....	50 $\Omega$ nominal
Coupling .....	DC
DC offset .....	$\pm 1 mV$ (calibrated)

Analog bandwidth (-3 dB range) .....0 Hz to 36 MHz

Amplitude accuracy .....±0.5 dB

VSWR

0 MHz to 25 MHz.....<1.5:1

25 MHz to 32 MHz.....<3:1

Dither (can be disabled)

Frequency range .....150 Hz to 4 MHz

## Frequency

Internal sample clock

Frequency .....64/n MHz, where  $1 < n < 2^{16}$

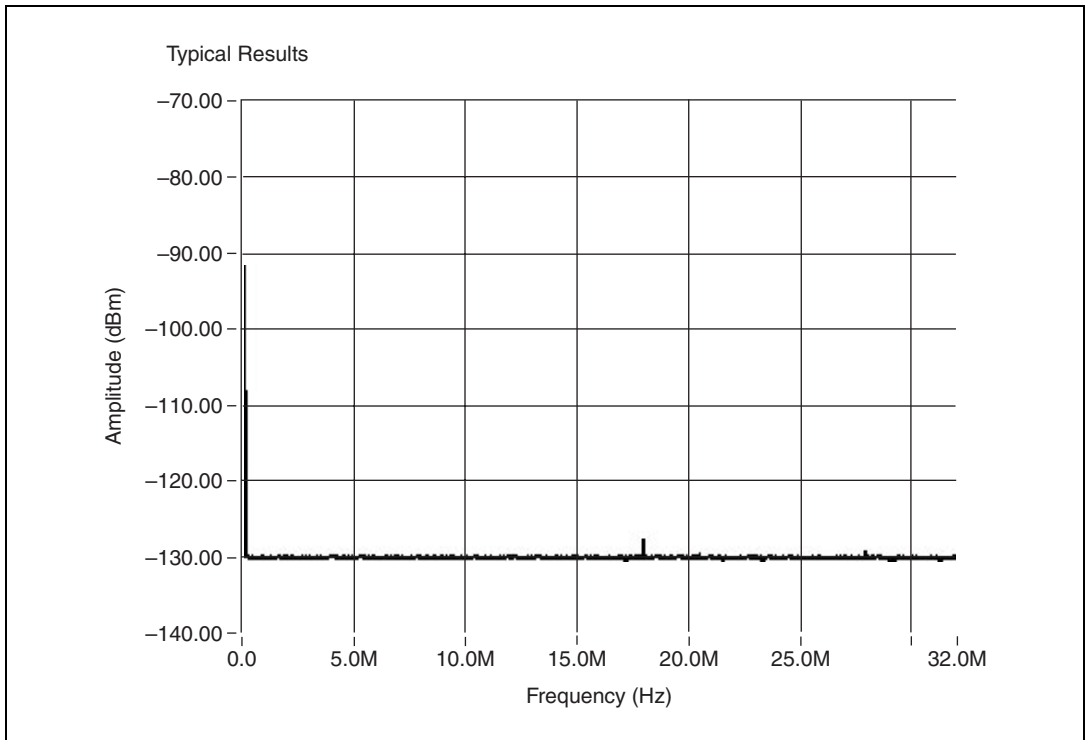
Accuracy .....<±25 ppm

Phase noise

Offset	Density
100 Hz	<-100 dBc/Hz
1 kHz	<-120 dBc/Hz
10 kHz	<-130 dBc/Hz
100 kHz	<-130 dBc/Hz

Residual FM .....<2 Hz<sub>pk-pk</sub> in 10 ms

# Amplitude



**Figure 1.** Noise Density (Dither Disabled, Input Terminated)

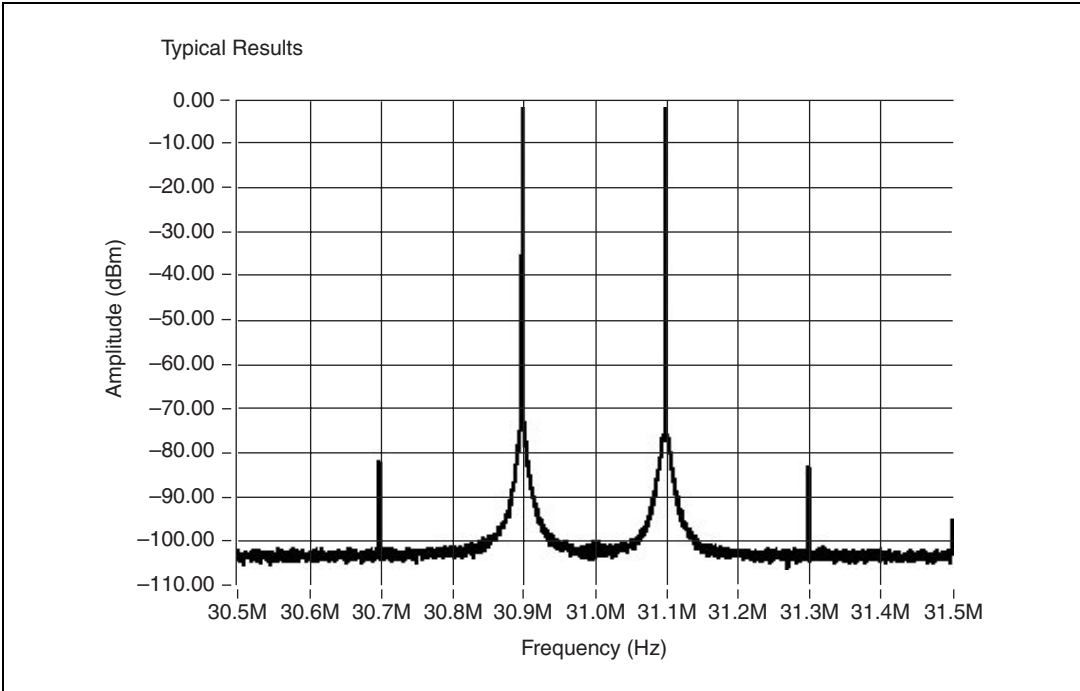
Average noise density  
(dither off) .....  $< -129$  dBm/Hz

Signal-to-noise ratio (9 dBm signal, full bandwidth),  
excluding dither below 9 MHz .....  $> 62$  dB

Harmonic distortion (single tone, 0 dBm signal;  
includes aliased harmonic distortion)

4 MHz to 15 MHz,  
dither enabled .....  $< -77$  dBm

0 MHz to 32 MHz,  
dither disabled .....  $< -71$  dBm

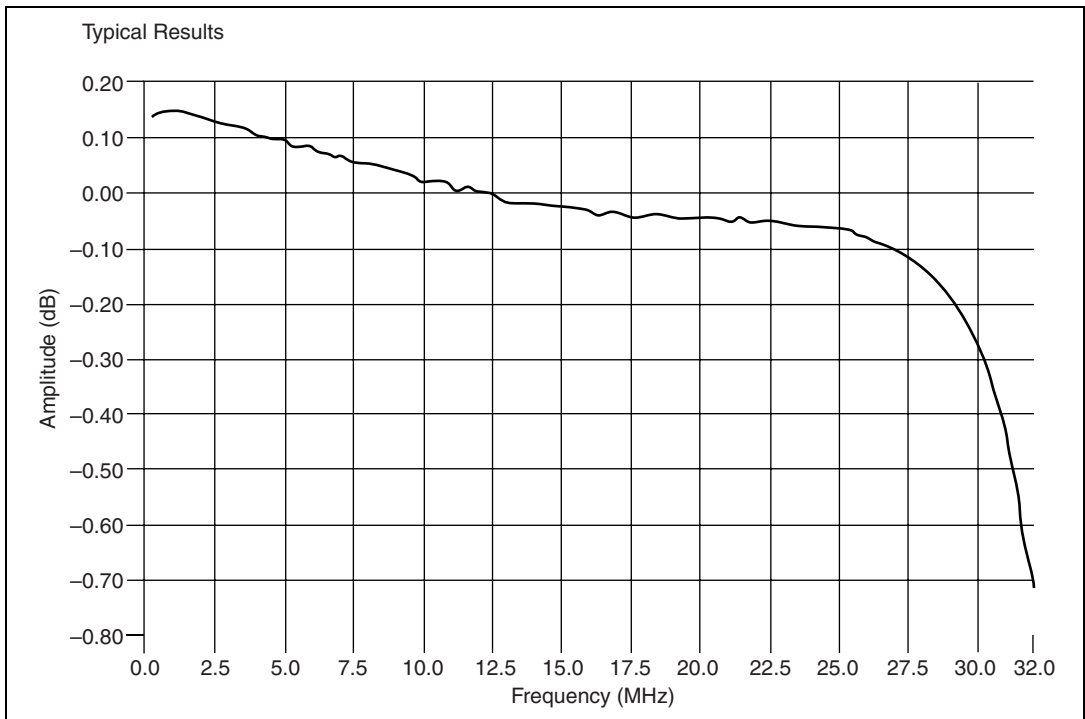


**Figure 2.** Intermodulation Distortion

Intermodulation distortion  
 (2-tone, 0 dBm signals, 200 kHz separation)

- 4 MHz to 15 MHz,  
 dither enabled .....<-86 dBm
- 0 MHz to 32 MHz,  
 dither disabled .....<-78 dBm

Residual responses (input terminated)....<-75 dBm



**Figure 3.** Frequency Response (0.1 MHz to 32 MHz)

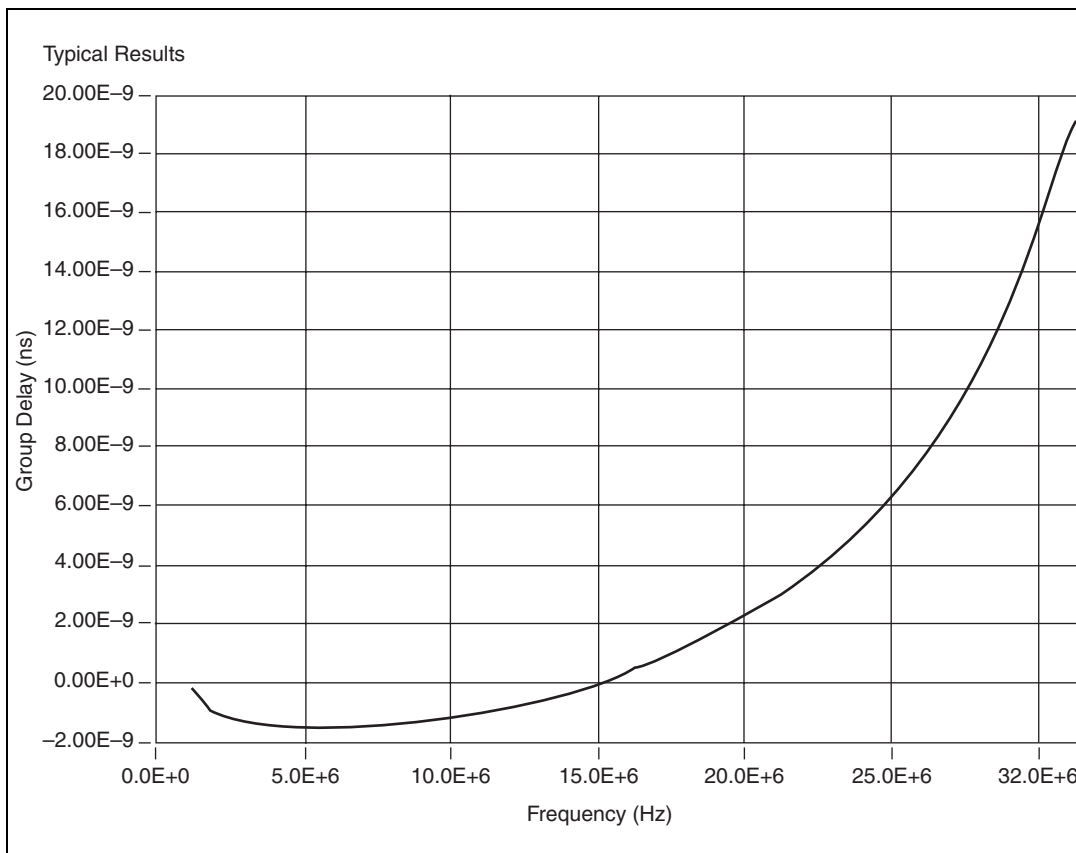
Frequency response (4 MHz to 25 MHz)

Relative (to response at 15 MHz) ...  $<\pm 0.25$  dB

Absolute .....  $<\pm 0.6$  dB

Absolute (using calibration table)...  $<\pm 0.5$  dB

# Phase



**Figure 4.** Group Delay versus Frequency

Group delay variation  
 (5 MHz to 25 MHz) .....9 ns<sub>pk-pk</sub>

Group delay variation  
 (0.5 MHz to 30 MHz) .....26 ns<sub>pk-pk</sub>

# DDC

Decimation rate.....32 to 4,096

DDC tuning resolution.....0.014901 Hz

## Triggering

Modes .....	Immediate, software, digital
Sources .....	PFI 1, PXI<0..7>, PXI Star
Export.....	PFI 1, PXI<0..7>
Slope.....	Rising, falling
Pretrigger depth.....	Up to 32 MS
Posttrigger depth .....	Up to 32 MS
Minimum pulse width .....	100 ns

## PFI 1 Input/Output

PFI 1 connector .....	SMB male
Trigger level.....	TTL
Max input voltage .....	5.5 V

## External Frequency Reference Input

Connector (REF CLK IN).....	SMA female
Impedance .....	50 $\Omega$ nominal
Input amplitude .....	-5 to +15 dBm
Max non-operating input level.....	+20 dBm
Max DC input voltage.....	$\pm 3.5$ VDC
Frequency range.....	10 MHz $\pm 40$ ppm
Crosstalk from reference input.....	<-85 dB

## Calibration

Calibration interval .....	1 year
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## Environmental Specifications

Warm-up time .....	10 minutes
Operating environment	
Ambient temperature .....	0 °C to 50 °C
Humidity .....	10% to 90%, noncondensing
Storage environment	
Storage temperature .....	-20 °C to 70 °C
Humidity .....	5% to 95%, noncondensing
Maximum altitude .....	2,000 meters
Pollution Degree .....	2
Indoor use only	

## Power Requirements

+3.3 VDC ( $\pm 5\%$ ) .....	<650 mA
+5 VDC ( $\pm 5\%$ ) .....	<1.5 A
+12 VDC ( $\pm 5\%$ ) .....	<650 mA
-12 VDC ( $\pm 5\%$ ) .....	<75 mA

## Maximum Working Voltage

Channel-to-earth .....	2.23 V operating, 3.0 V non-operating; Installation Category I
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## Dimensions

NI 5621 (1 PXI slot) .....	10 cm by 16 cm by 2.0 cm (3.9 in. by 6.3 in. by 0.8 in.)
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## Conductive Immunity

When tested as specified in EN 61000-4-6 at 3 V<sub>rms</sub>, the spurious response is within specifications except at the test frequency. A spurious signal of up to -45 dBm may appear at the test frequency.



## Safety

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

- IEC 61010-1, EN 61010-1
- UL 3111-1, UL 61010B-1
- CAN/CSA C22.2 No. 1010.1



**Note** For UL and other safety certifications, refer to the product label or to [ni.com](http://ni.com).

## Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) compliant

Emissions ..... EN 55011 Class A at 10 m  
FCC Part 15A above 1 GHz

Immunity ..... EN 61326:1997 + A2:2001,  
Table 1



**Note** For full EMC compliance, you *must* operate this device with shielded cabling. In addition, all covers and filler panels must be installed. Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit [ni.com/hardref.nsf](http://ni.com/hardref.nsf).

## CE Compliance

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

Low-Voltage Directive (safety) ..... 73/23/EEC

Electromagnetic Compatibility  
Directive (EMC) ..... 89/336/EEC



**Note** Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information.

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