
NI-5734

Specifications

2025-07-23



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NI-5734 Pinout

Use the pinout to connect to terminals on the NI-5734.

Figure 1. NI-5734 Front Panel Connector Pinout

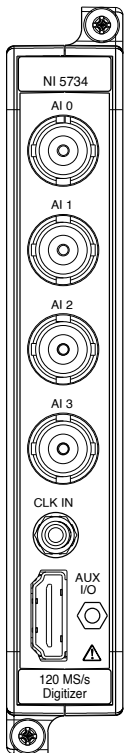


Table 1. Signal Descriptions

Signal Name	Description
AI 0	50 Ω single-ended analog input channel 0.
AI 1	50 Ω single-ended analog input channel 1.
AI 2	50 Ω single-ended analog input channel 2.
AI 3	50 Ω single-ended analog input channel 3.
CLK IN	Reference or external clock input, 50 Ω single-ended.

Signal Name	Description
AUX I/O	Refer to the AUX I/O Connector section.



Caution Connections that exceed the maximum ratings of any connector on the NI-5734 can damage the device and the chassis. NI is not liable for any damage resulting from such signal connections.

AUX I/O Connector

Figure 1. AUX I/O Connector Pinout

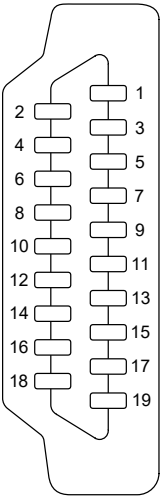


Table 2. Signal Descriptions

Pin	Signal Name	Description
1	DIO Port 0 (0)	Bidirectional single-ended digital I/O data channel.
2	GND	Ground reference for signals.
3	DIO Port 0 (1)	Bidirectional single-ended digital I/O data channel.
4	DIO Port 0 (2)	Bidirectional single-ended digital I/O data channel.
5	GND	Ground reference for signals.
6	DIO Port 0 (3)	Bidirectional single-ended digital I/O data channel.
7	DIO Port 1 (0)	Bidirectional single-ended digital I/O data

Pin	Signal Name	Description
		channel.
8	GND	Ground reference for signals.
9	DIO Port 1 (1)	Bidirectional single-ended digital I/O data channel.
10	DIO Port 1 (2)	Bidirectional single-ended digital I/O data channel.
11	GND	Ground reference for signals.
12	DIO Port 1 (3)	Bidirectional single-ended digital I/O data channel.
13	PFI 0	Bidirectional single-ended digital I/O data channel.
14	NC	No connect.
15	PFI 1	Bidirectional single-ended digital I/O data channel.
16	PFI 2	Bidirectional single-ended digital I/O data channel.
17	GND	Ground reference for signals.
18	+5V	+5 V power (10 mA maximum).
19	PFI 3	Bidirectional single-ended digital I/O data channel.



Caution The AUX I/O connector accepts a standard, third-party HDMI cable, but the AUX I/O port is not an HDMI interface. Do not connect the AUX I/O port on the NI-5734 into the HDMI port of another device. NI is not liable for any damage resulting from such signal connections.

Analog Input (AI 0, AI 1, AI 2, and AI 3)

General Characteristics

Number of channels	Four
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Connector type	BNC
Input type	Simultaneously sampled, singled-ended
Input impedance	50 Ω , per connector
Input coupling (software selectable)	AC or DC
Gain (software selectable)	0 dB, 6 dB, or 12 dB
Signal paths (software selectable)	Filter bypass, 7th-order Elliptic filter, 7th-order Bessel filter
Digital data resolution (16-bit, left-justified, unsigned, binary data)	16 bit
ADC part number ¹	AD9268BCPZ-125
Absolute maximum voltage	± 10 V DC, 10 V _{pk-pk} AC
DC overvoltage disconnect	± 2 V DC (exceeding this voltage forces AC-mode)

1. For additional information about the ADC within your device, use the listed part number to locate the appropriate Analog Devices data sheet at www.analog.com.

Typical Specifications

ADC DC offset	± 7.1 mV
DC-coupled common-mode output	± 0.8 mV (50 Ω terminated)
Full Scale Input	
Gain = 0 dB	2.085 V _{pk-pk}
Gain = 6 dB (FS at 0 dB divided by 2)	1.043 V _{pk-pk}
Gain = 12 dB (FS at 0 dB divided by 4)	0.5212 V _{pk-pk}
DC Gain Error (Full Scale)	
Gain = 0 dB	$\pm 0.6\%$
Gain = 6 dB	$\pm 0.8\%$
Gain = 12 dB	$\pm 1.5\%$

Noise				
Gain (dB)	Full Scale (V _{pk-pk})	Average Noise Density		
		(nV/ $\sqrt{\text{Hz}}$)	(dBm/Hz)	(dBFS/Hz)
0	2.085	26.9	-138.4	-148.4
6	1.0425	14.8	-143.6	-147.6
12	0.52125	8.6	-148.3	-146.3

Passband	
AC-coupling low cut-off frequency (–3 dB)	20 kHz
DC-coupling low cut-off frequency	0 Hz
Passband High Cut-off Frequency (–3 dB)	
Filter Bypass	117 MHz
Elliptic Filter	37.1 MHz
Bessel Filter	24.1 MHz
Group Delay Flatness	
Maximum Frequency to 2 ns	
Elliptic Filter	30 MHz
Bessel Filter	53 MHz
Signal to Noise Ratio (SNR)²	
Input	9.7 MHz
Gain = 0 dB	69.6 dB
Gain = 6 dB	68.8 dB

2. Measured at –1 dBFS.

Gain = 12 dB	67.5 dB
Total Harmonic Distortion (THD)^[1]	
Input	9.7 MHz
Gain = 0 dB	–80.5 dBc
Gain = 6 dB	–85.0 dBc
Gain = 12 dB	–86.0 dBc
Spurious-Free Dynamic Range (SFDR)^[1]	
Input	9.7 MHz
Gain = 0 dB	–83.0 dBc
Gain = 6 dB	–86.0 dBc
Gain = 12 dB	–87.0 dBc

AI Channel-to-Channel Crosstalk



Note The following crosstalk tables are measured at 0 dB gain with a –1 dBFS 10 MHz signal on the aggressor channel, while the other channels are terminated at 50 Ω . When measuring crosstalk at 6 dB and 12 dB gain, the crosstalk is 6 dB and 12 dB worse, respectively.

Table 3. AI Channel Crosstalk (Adjacent Channel Paths $N - 1$ and $N + 1$)

Aggressor Channel N (0..3)	Receiver Channel (50 Ω Terminated)					
	Adjacent Channel Path ($N - 1$)			Adjacent Channel Path ($N + 1$)		
	Bypass	Elliptic	Bessel	Bypass	Elliptic	Bessel
Filter Bypass	-102 dB	-97 dB	-100 dB	-98 dB	-89 dB	-81 dB
Elliptic Filter	-102 dB	-77 dB	-81 dB	-104 dB	-79 dB	-77 dB
Bessel Filter	-87 dB	-73 dB	-77 dB	-103 dB	-83 dB	-80 dB

Table 4. AI Channel Crosstalk (Channel Paths $N \pm 2$ and $N \pm 3$)

Aggressor Channel N (0..3)	Receiver Channel (50 Ω Terminated)			
	Channel Path ($N \pm 2$)		Channel Path ($N \pm 3$)	
	Bypass	Elliptic or Bessel Filter	Bypass	Elliptic or Bessel Filter
Filter Bypass	-112 dB	-102 dB	-112 dB	-107 dB
Elliptic Filter	-112 dB	-85 dB	-112 dB	-90 dB
Bessel Filter	-112 dB	-86 dB	-112 dB	-90 dB

Phase adjust DAC range	429 $\pm$ 15 degrees
Frequency adjust DAC range	$\pm$ 100 ppm
Data rate (IOModuleClock0)	Sample rate

Measurements

Frequency Response

Figure 3. AC-Coupled Low Frequency Response (Multiple Channels Overlaid)

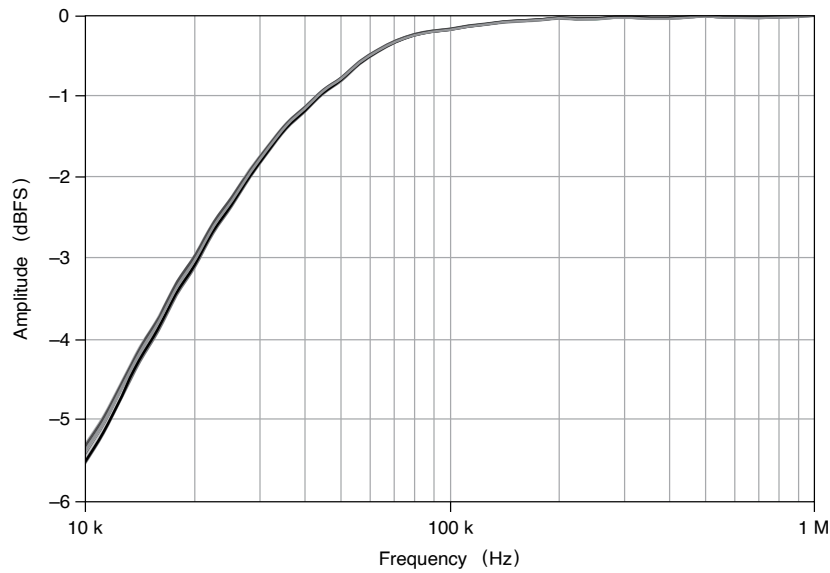


Figure 1. Filter Bypass Frequency Response (Multiple Channels Overlaid)

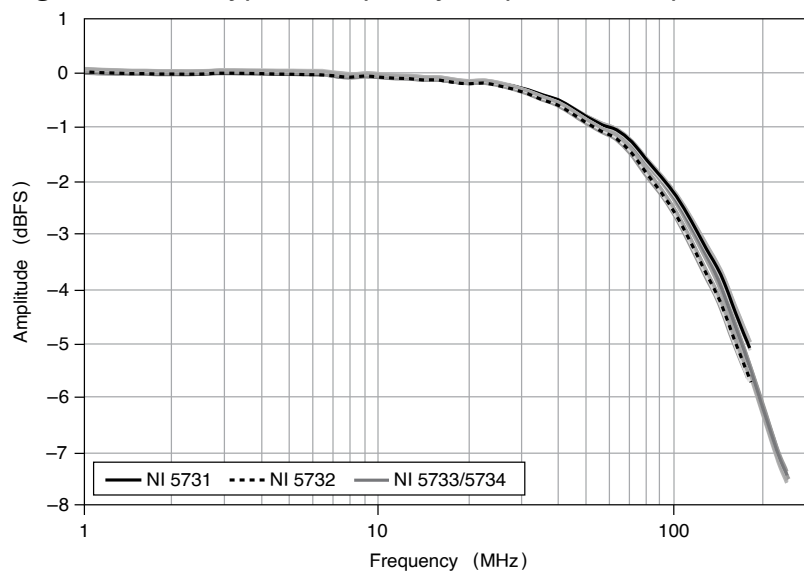


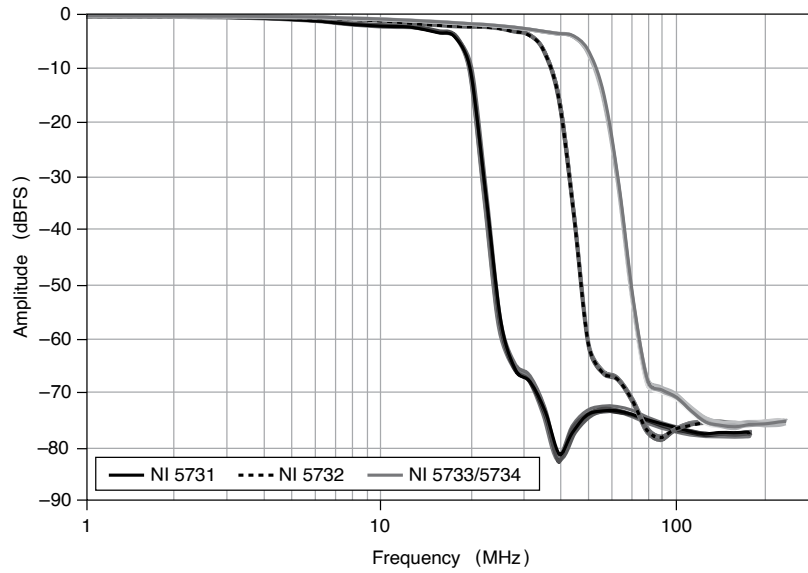
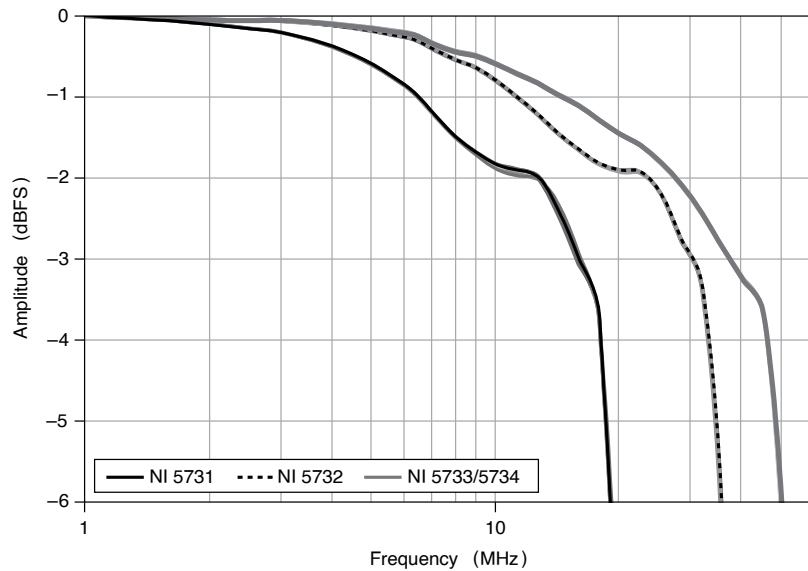
Figure 1. Elliptic Filter Frequency Response (Multiple Channels Overlaid)**Figure 6. Elliptic Filter Frequency Response: 0 to -6 dB (Multiple Channels Overlaid)**

Figure 1. Bessel Filter Frequency Response (Multiple Channels Overlaid)

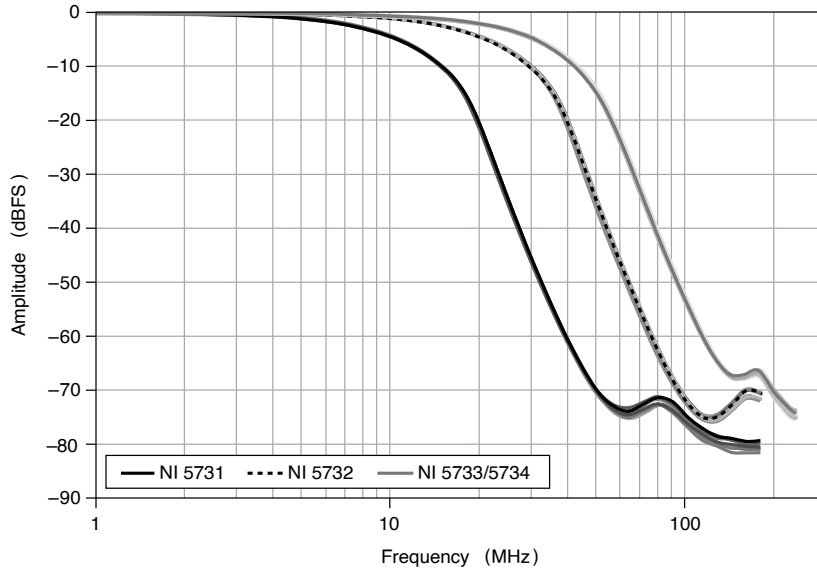
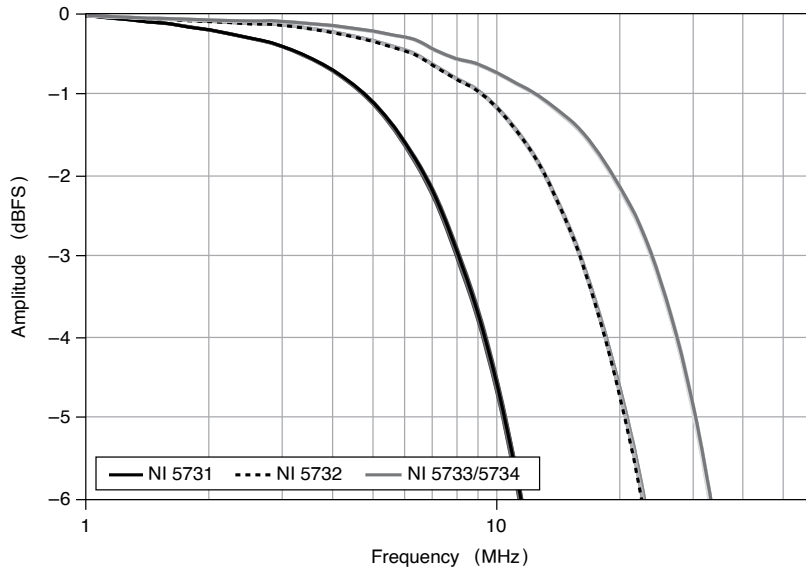
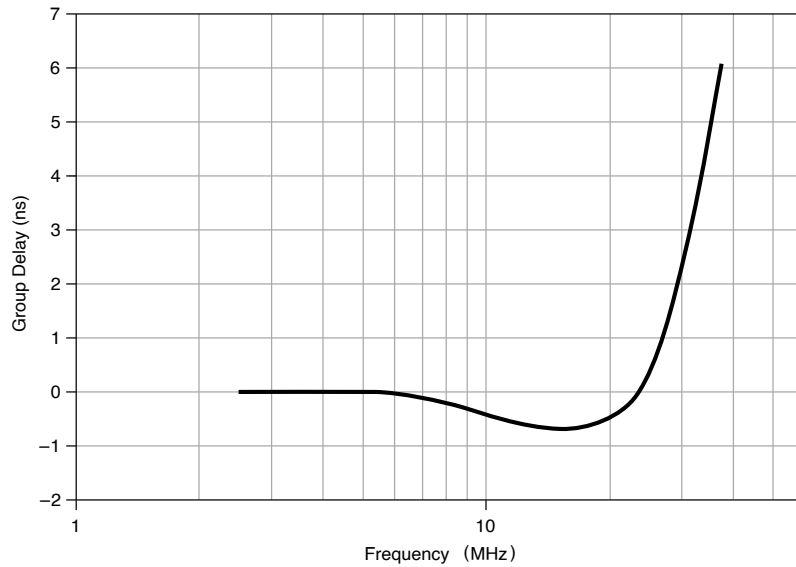
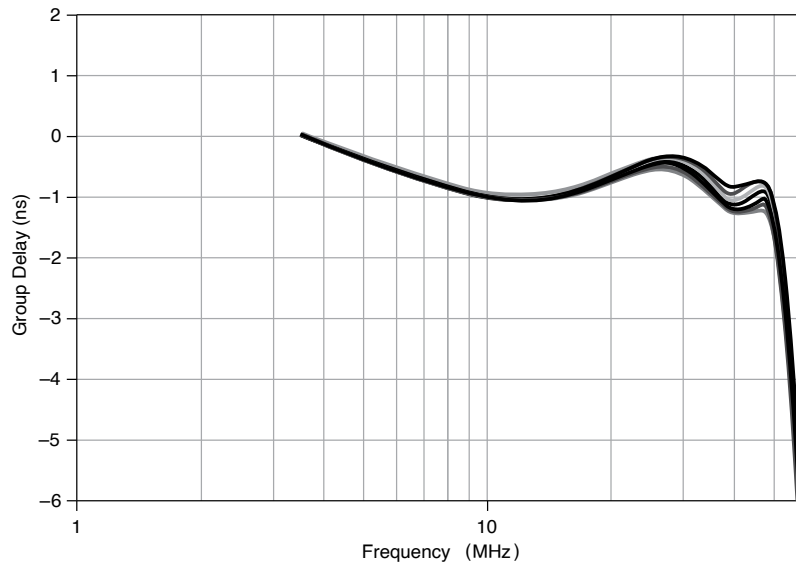


Figure 1. Bessel Filter Frequency Response: 0 to -6 dB (Multiple Channels Overlaid)



Group Delay

Figure 1. NI-5734 Elliptic Filter Group Delay (44 Channels Overlaid)**Figure 1. NI-5734 Bessel Filter Group Delay (44 Channels Overlaid)**

Analog Input Total Phase Noise

Figure 1. NI-5734 AI Phase Noise (40 MHz Input, PLL Unlocked, Onboard Oscillator, 453 FS RMS Jitter)

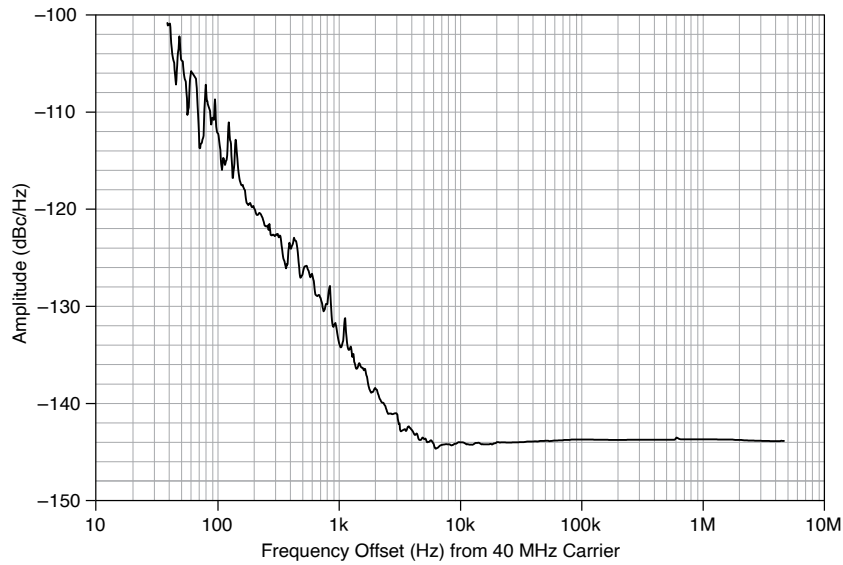
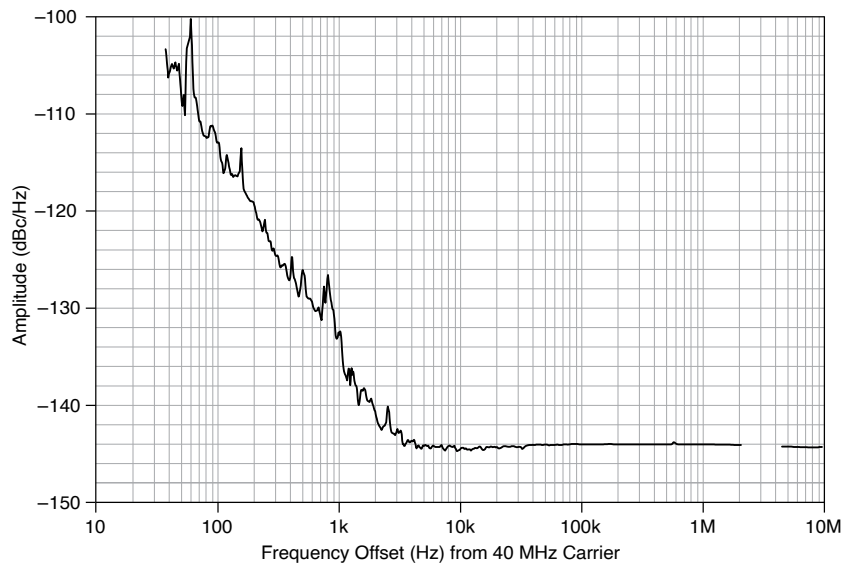
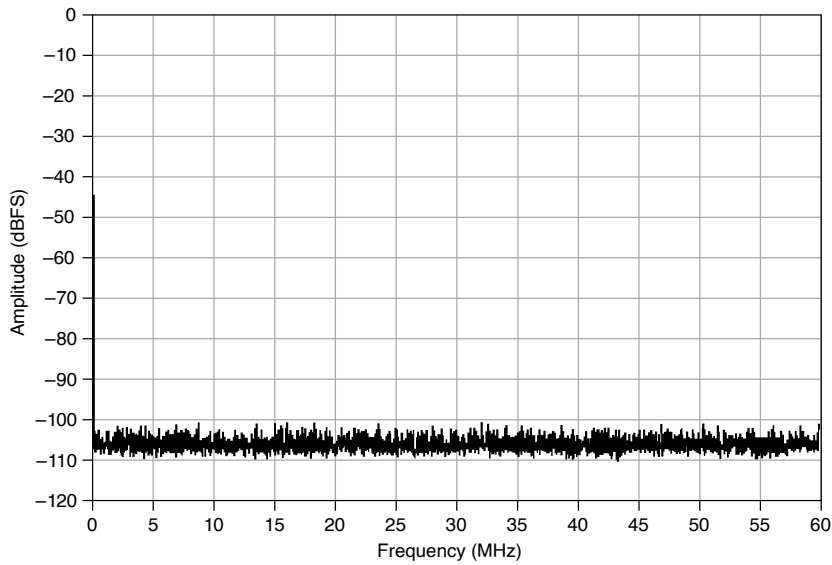
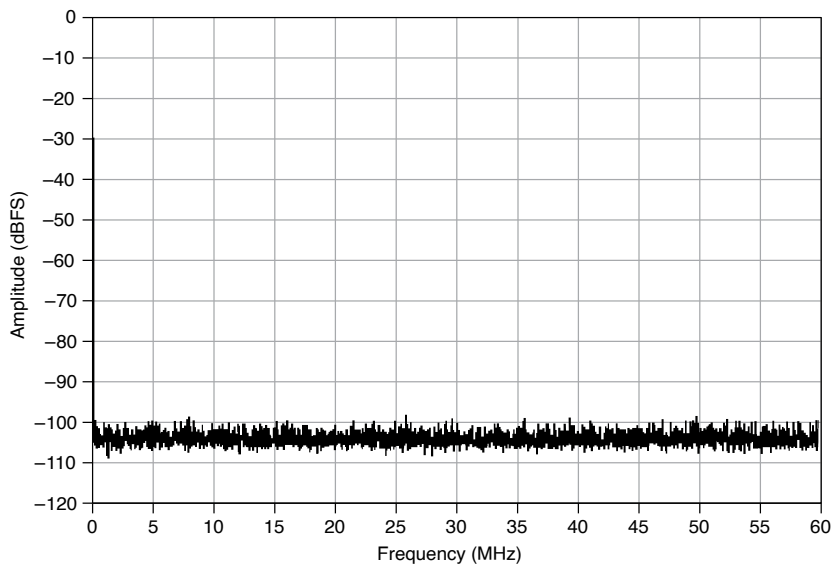


Figure 1. NI-5734 AI Phase Noise (40 MHz Input, PLL Locked to PXI 10 MHz Reference Clock, Onboard Oscillator, 448 FS RMS Jitter)



Terminated Spectral Measurements (16,382 Point FFT, 30 Average RMS)

Figure 1. NI-5734 Gain at 0 dB; Elliptic, Bessel, or Filter Bypass; AC- or DC-Coupled**Figure 1. NI-5734 Gain at 12 dB; Elliptic, Bessel, or Filter Bypass; AC- or DC-Coupled**

Spectral Measurements (16,382 Point FFT)

Figure 1. NI-5734 Gain at 0 dB: -1 dBFS at 20.1 MHz, -85 dBc SFDR, Bypass Filter, 100 Averages RMS

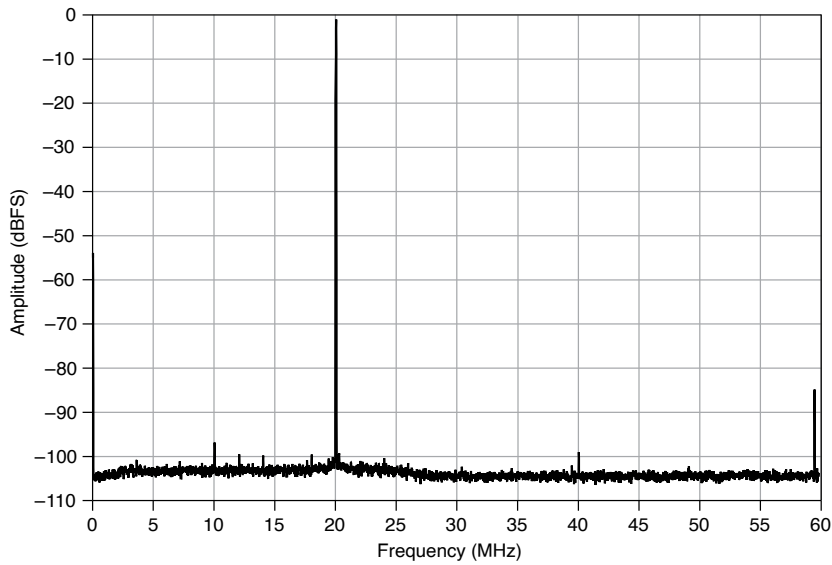


Figure 1. NI-5734 Gain at 12 dB: -1 dBFS at 20.1 MHz, -87 dBc SFDR, Bypass Filter, 100 Averages RMS

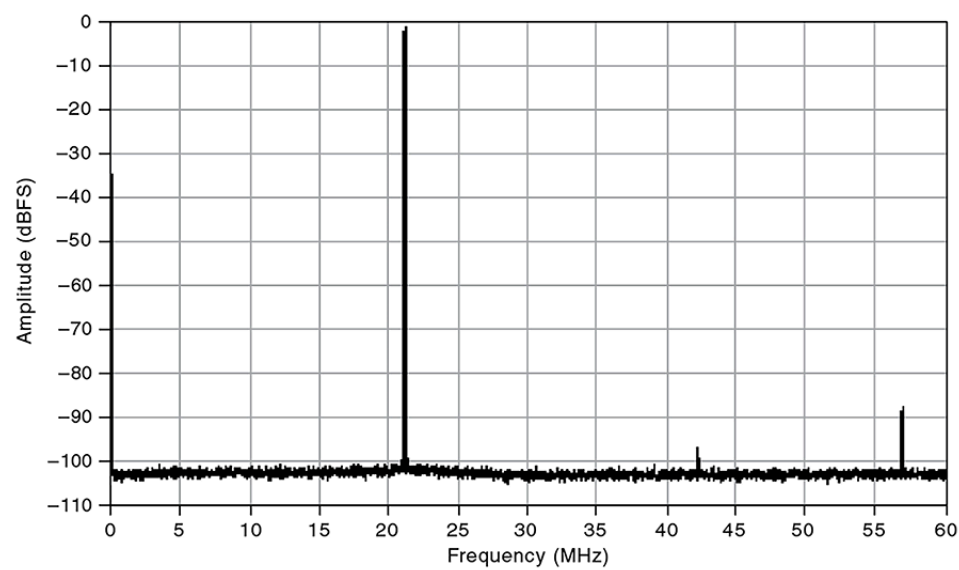
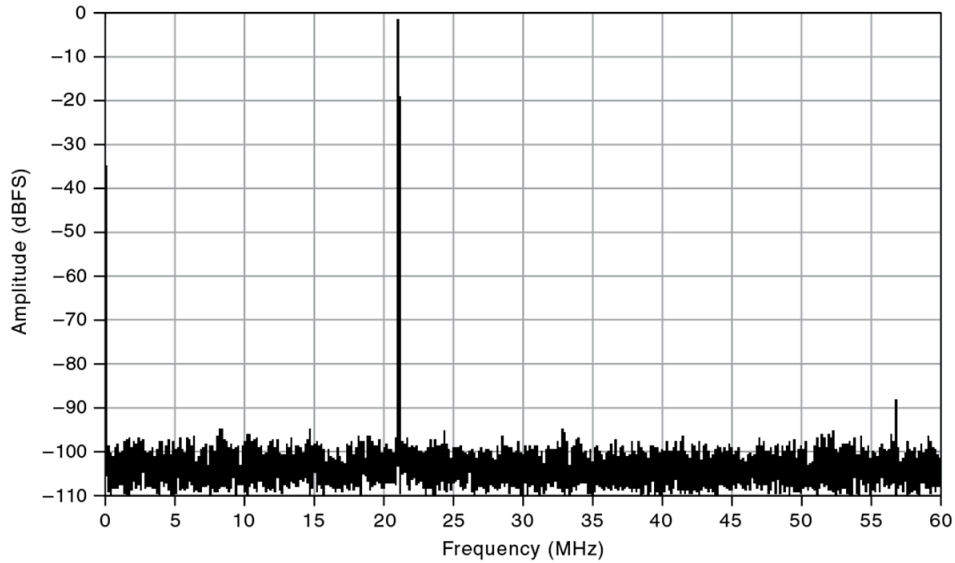
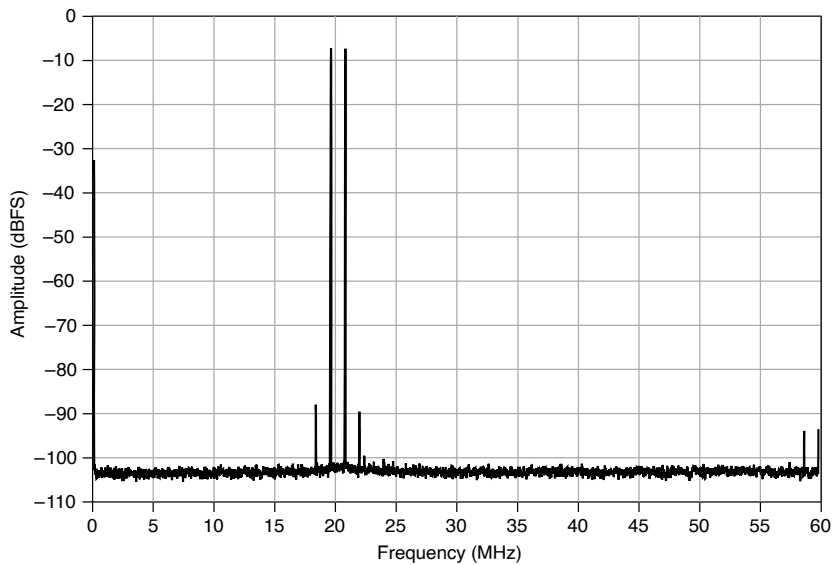


Figure 1. NI-5734 Gain at 12 dB: -1 dBFS at 20.1 MHz, -87 dBc SFDR, Bypass Filter, 10 Averages RMS

Two-Tone FFT

Figure 1. NI-5734 at 12 dB Gain and Filter Bypass: -81 dBc, $f_{in} = 19.6$ MHz (-7 dBFS), 20.8 MHz

Internal Sample Clock

General Characteristics

Clock distribution part number	AD9511 ³ ; clock distribution
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3. For additional information about the AD9511, refer to the Analog Devices data sheet at

Oscillator type	VCXO
Frequency	120 MHz $\pm$ 100 ppm
Phase noise	Refer to the <i>Analog Input Total Phase Noise</i> section

Typical Specifications

Frequency stability	
Temperature	$\pm$ 30 ppm over the operating temperature range
Aging	$\pm$ 5 ppm per year

CLK IN

General Characteristics

Number of channels	1, single-ended
Connector type	SMB
Input impedance	50 Ω
Input coupling	AC

www.analog.com.

Input voltage range	0.40 V _{pk-pk} to 5.2 V _{pk-pk}
Absolute maximum voltage	±8.0 V DC, 8.0 V _{pk-pk} AC
Duty cycle	40% to 60%

Table 5. NI-5734 Clock Sources

Clock Configuration	Supported Sample Rates	External Clock Type	External Clock Frequency	Description
Internal Clock PLL Off	120 MS/s	—	—	The internal VCXO acts as a free-running clock.
Internal Clock PLL On (IoModSyncClk)	120 MS/s	—	10 MHz	The internal VCXO locks to IoModSyncClk (Sync Clock), which is provided only through the backplane of supported devices.
Internal Clock PLL On (CLK IN)	120 MS/s	Reference clock	10 MHz	The internal VCXO locks to an external Reference clock, which is provided through the CLK IN front panel connector.
External Clock (CLK IN)	The supported sample rate is equal to the external clock frequency.	Sample clock	Min = 50 MHz Max = 120 MHz	An external Sample clock can be provided through the CLK IN front panel connector.

AUX I/O (Port 0 DIO <0..3>, Port 1 DIO <0..3>, and PFI <0..3>)

General Characteristics

Number of channels	12 bidirectional (8 DIO and 4 PFI)
Connector type	HDMI
HDMI	3.3 V LVCMOS
Interface logic	
Maximum V_{IL}	0.8 V
Minimum V_{IH}	2.0 V
Maximum V_{OL}	0.4 V
Minimum V_{OH}	2.7 V
Maximum V_{OH}	3.6 V
Z_{out}	$50\ \Omega \pm 20\%$
I_{out} (DC)	$\pm 2\text{ mA}$
Pull-down resistor	150 k Ω

Recommended operating voltage	–0.3 V to 3.6 V
Overvoltage protection	±10 V
Maximum toggle frequency	6.6 MHz
+5 V maximum power	10 mA
+5 V voltage tolerance	4.2 V to 5 V

Power

Total power, typical operation	4.5 W
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Physical

Dimensions	12.9 x 2.0 x 12.1 cm (5.1 x 0.8 x 4.7 in.)
Weight	332 g (11.7 oz)
Front panel connectors	BNC, SMB, and HDMI

Environmental

Operating environment ⁴	0 °C to 55 °C, tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.
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Relative humidity range	10% to 90%, noncondensing, tested in accordance with IEC-60068-2-56.
Pollution Degree	2
Altitude	2,000 m

Indoor use only.

Storage environment	
Ambient temperature range	–20 °C to 70 °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.



Note Clean the device with a soft, non-metallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms pulse, tested in accordance with IEC-60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.
Random vibration	
Operating	5 Hz to 500 Hz, 0.3 grms

- For PXI/PXI Express chassis configurations that group NI FlexRIO adapter modules in three or more contiguous slots, NI recommends limiting the ambient operating temperature to less than 50 °C.

Nonoperating	5 Hz to 500 Hz, 2.4 grms, tested in accordance with IEC-60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.
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Safety

This product meets the requirements of the following standards of safety for electrical equipment 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, and additional information, refer to the **Online Product Certification** section of this document.

Online Product Certification

To obtain product certifications and the Declaration of Conformity 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 to the environment and to NI customers.

For additional environmental information, refer to the **NI and the Environment** 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.)

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