

NI PXI-5690 with NI PXI-5660

RF Preamp with RF Vector Signal Analyzer System Specifications

This document lists system specifications for the NI PXI-5690 RF preamplifier connected to the NI PXI-5660 RF vector signal analyzer. Refer to the *NI PXI-5690 RF Preamplifier Specifications* and the *NI PXI-5660 RF Vector Signal Analyzer Specifications* documents for complete specifications of those devices.

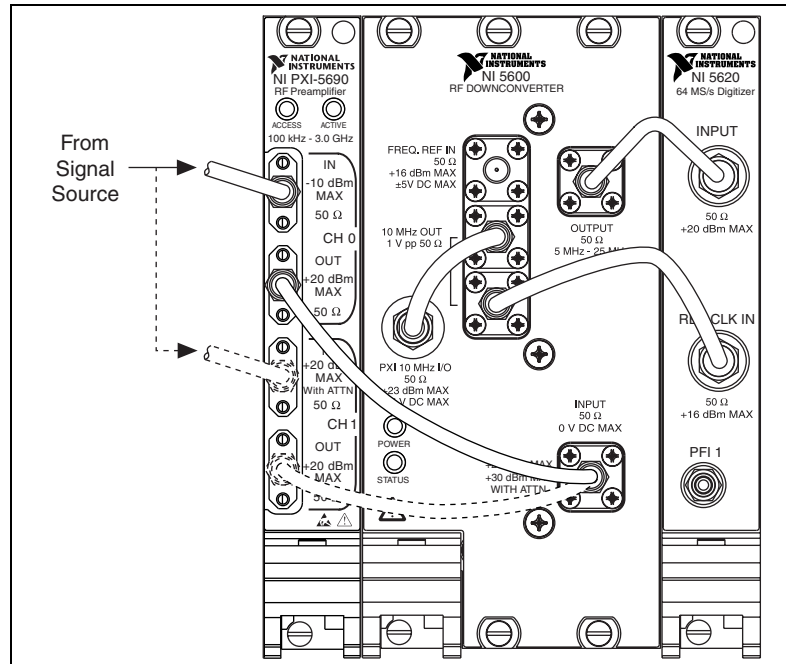


Figure 1. NI PXI-5690 RF Preamplifier Attached to NI PXI-5660 RF Vector Signal Analyzer

Absolute Amplitude Accuracy Specifications

PXI-5660			PXI-5690			PXI-5660/PXI-5690 Combination Absolute Amplitude Accuracy (dB) ¹		
Frequency	Absolute Amplitude Accuracy (dB)		Frequency	Gain Accuracy (dB)				
	Maximum	Typical		Maximum	Typical	Frequency	Maximum	Typical
9 kHz < f < 2 GHz	±1	±0.6	500 kHz to 2.7 GHz	0.4	0.32	500 kHz to 2 GHz	±1.1	±0.7
2 GHz < f < 2.7 GHz	±1.5	±1				2 GHz to 2.7 GHz	±1.6	±1.1

¹ Root sum square (RSS) based on a coverage factor of 2.

Does not account for connecting cable (NI part number 193600A-01). Cable loss is approximately $[-0.05 \times f(\text{GHz})] - 0.05$ dB with ±0.1 dB uncertainty.

Noise Density/Noise Figure Specifications (CH 0)¹

PXI-5660			PXI-5690				PXI-5660/PXI-5690 (CH 0) Combination Noise Density (dB)			
Frequency	Noise Density (dBm/Hz)		Frequency	Gain (dB)		Noise Figure (dB)		Frequency	Maximum	Typical
	Maximum	Typical		Minimum	Typical	Maximum	Typical			
9 kHz <math>f < 1\text{ GHz}</math>	-135	-140	500 kHz to 2.7 GHz	27	31	10	5	500 kHz <math>f < 1\text{ GHz}</math>	-159.8	-166.8
1 GHz <math>f < 2\text{ GHz}</math>	-134	-137						1 GHz <math>f < 2\text{ GHz}</math>	-159.2	-165.4
2 GHz <math>f < 2.5\text{ GHz}</math>	-130	-135						2 GHz <math>f < 2.5\text{ GHz}</math>	-156.2	-164.2
2.5 GHz <math>f < 2.7\text{ GHz}</math>	-129	-132						2.5 GHz <math>f < 2.7\text{ GHz}</math>	-155.3	-162

Noise Density/Noise Figure Specifications (CH 1 Main Path – Max Gain)¹

PXI-5660			PXI-5690				PXI-5660/PXI-5690 (CH 1 Main Path) Combination Noise Density (dB)			
Frequency	Noise Density (dBm/Hz)		Frequency	Gain (dB)		Noise Figure (dB)		Frequency	Maximum	Typical
	Maximum	Typical		Minimum	Typical	Maximum	Typical			
9 kHz <math>f < 1\text{ GHz}</math>	-135	-140	500 kHz <math>f < 1\text{ GHz}</math>	17	21.1	13.1	7.4	500 kHz <math>f < 1\text{ GHz}</math>	-151.5	-160
1 GHz <math>f < 2\text{ GHz}</math>	-134	-137	1 GHz <math>f < 2\text{ GHz}</math>	14	18.3	14.2	8.1	1 GHz <math>f < 2\text{ GHz}</math>	-147.7	-154.9
2 GHz <math>f < 2.5\text{ GHz}</math>	-130	-135	2 GHz <math>f < 2.5\text{ GHz}</math>	12.5	17.6	14.8	8.3	2 GHz <math>f < 2.5\text{ GHz}</math>	-142.4	-152.4
2.5 GHz <math>f < 2.7\text{ GHz}</math>	-129	-132	2.5 GHz <math>f < 2.7\text{ GHz}</math>	12	16.8	15	8.3	2.5 GHz <math>f < 2.7\text{ GHz}</math>	-140.9	-148.7

¹ PXI-5660 Reference Level ≤ -30 dBm (RF Attenuation = 0 dB)

Third-Order Intercept (TOI) Specifications (CH 0)¹

PXI-5660		PXI-5690					PXI-5660/PXI-5690 (CH 0) Combination Input TOI (dBm)		
Frequency	Input TOI (dBm)	Frequency	Typical Gain (dB) ²		Output TOI (dBm)		Frequency	Minimum	Typical
	Minimum		High	Low	Minimum	Typical			
9 kHz <math>f < 1\text{ GHz}</math>	10	500 kHz <math>f < 1\text{ GHz}</math>	34	31	17	28	500 kHz <math>f < 1\text{ GHz}</math>	-24.1	-21
1 GHz <math>f < 2\text{ GHz}</math>	12	1 GHz <math>f < 2\text{ GHz}</math>			17	25	1 GHz <math>f < 2\text{ GHz}</math>	-22.2	-19
2 GHz <math>f < 2.7\text{ GHz}</math>	13	2 GHz <math>f < 2.7\text{ GHz}</math>			14	22	2 GHz <math>f < 2.7\text{ GHz}</math>	-22.1	-18

Third-Order Intercept (TOI) Specifications (CH 1 Main Path – Max Gain)¹

PXI-5660		PXI-5690					PXI-5660/PXI-5690 (CH 1 Main Path) Combination Input TOI (dBm)		
Frequency	Input TOI (dBm)	Frequency	Typical Gain (dB) ²		Output TOI (dBm)		Frequency	Minimum	Typical
	Minimum		High	Low	Minimum	Typical			
9 kHz <math>f < 1\text{ GHz}</math>	10	500 kHz <math>f < 1\text{ GHz}</math>	26	21.1	14	24	500 kHz <math>f < 1\text{ GHz}</math>	-16.3	-11.1
1 GHz <math>f < 2\text{ GHz}</math>	12	1 GHz <math>f < 2\text{ GHz}</math>	24	18.3	14	22	1 GHz <math>f < 2\text{ GHz}</math>	-12.7	-6.3
2 GHz <math>f < 2.7\text{ GHz}</math>	13	2 GHz <math>f < 2.7\text{ GHz}</math>	22	16.8	7	16	2 GHz <math>f < 2.7\text{ GHz}</math>	-15.1	-4.3

¹ PXI-5660 Reference Level ≤ -30 dBm (RF Attenuation = 0 dB)

² Typical High defines observed maximum gain, whereas Typical Low defines nominal gain

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