PXIe-5860 Specifications

2025-03-10

Contents

PXIe-5860 Specifications

This specifications document contains specifications for the PXIe-5860 Vector Signal Transceiver (VST).

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.
- ***Typical-95*** specifications describe the performance met by 95% (≈2σ) of models with a 95% confidence.
- ***Nominal*** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.
- ***Measured*** specifications describe the measured performance of a representative model.

Specifications are ***Typical*** unless otherwise noted.

Conditions

All specifications are valid under the following conditions unless otherwise noted.

- 30 minute warm-up time. Warm-up time begins when the PXI Express chassis has been powered on and the operating system has completely loaded.
- Self-calibration is performed after the specified warm-up period has completed.
- Calibration cycle is maintained.
- Environment temperature is within the ambient range, onboard temperature sensors within the PXIe-5860 instrument are within ±5 °C of the last self-calibration temperature, and temperature correction is enabled. Note that temperature correction is enabled by default.

- Installed in chassis with 82 W slot cooling capacity with fan mode set to Auto.
- Empty chassis slots contain slot blockers and EMC filler panels to minimize temperature drift and reduce emissions.
- Connections are made according to the recommendations in the ***PXIe-5860 User Manual***.
- Indicated instrument driver is used with driver default settings unless otherwise noted: RFmx 2024 Q3 or later, NI-RFSA 2024 Q3 or later, or NI-RFSG 2024 Q3 or later.

Warranted specifications are valid under the following condition unless otherwise noted.

- The ambient temperature range is 0 °C to 40 °C.

Typical and Typical-95 specifications are valid under the following condition unless otherwise noted.

- The ambient temperature range is 23 °C ±5 °C.

Typical specifications do not include measurement uncertainty.

Measured specifications do not include measurement uncertainty and are measured immediately after a device self-calibration is performed.

Common Terms

Refer to the following list for definitions of common terms related to RF hardware and software-configured settings for the PXIe-5860 and used throughout documentation.

Table 1. Common Terminology Definitions

Term	Definition
Center Frequency	Refers to the IQ Carrier Frequency property in NI-RFSA, the Frequency property in NI-RFSG, and the Center Frequency property in RFmx.
Onboard	With respect to reference clocks, refers to the value of the

Term	Definition
	NI-RFSG Reference Clock Source or NI-RFSA Ref Clock Source properties. A value of Onboard Clock configures the hardware to use the internal reference clock within the instrument.
dBr	• **For input**—Power of an acquired signal with respect to the instrument's configured reference level. For example, if the reference level is set to -10 dBm and the acquired tone is -17 dBm, the signal is said to be at -7 dBr. • **For output**—Generated power of a CW with respect to the instrument's peak power setting. For example, with a peak power level setting of +5 dBm and a -3 dBr setting, the power of the generated CW is +2 dBm.

RF Input and RF Output Frequency Specifications

Center Frequency Range

Center frequency range	50 MHz to 8.5 GHz

Note ***Center frequency*** refers to the IQ Carrier Frequency property in NI-RFSA, the Frequency property in NI-RFSG, and the Center Frequency property in RFmx.

Equalized Bandwidth

Table 2. Maximum Bandwidth

Center Frequency	**Maximum Bandwidth**
50 MHz to 8.5 GHz	Up to 1 GHz*
*The frequency range is defined as band edges up to which the device can be used. Towards the band edges, the available bandwidth decreases according to the following calculation: ***Maximum Bandwidth*** = min[1 GHz, 2 x (***Center Frequency*** – 50 MHz)]	

Internal Frequency Reference Accuracy

Table 3. Internal Frequency Reference Accuracy, Nominal

Initial adjustment accuracy	$\pm 200 \times 10^{-9}$
Temperature stability	$\pm 1 \times 10^{-6}$
Aging	$\pm 1 \times 10^{-6}$ per year
Accuracy	***Initial Adjustment Accuracy*** ± ***Aging*** ± ***Temperature Stability***

Frequency Resolution

Table 4. Frequency Resolution

Tuning resolution	<1 µHz

Frequency Settling Time

Table 5. Frequency Settling Time (µs), Measured

≤1 x 10^{-6} of final frequency	≤150
≤0.1 x 10^{-6} of final frequency	≤150

Note ***Frequency Settling Time*** is the amount of time required for the frequency to settle once the hardware receives the frequency change. The additional time due to software-initiated frequency changes is not included and varies by computer. Frequency settling time includes only frequency settling and excludes any residual amplitude settling.

RF Input Amplitude Specifications

RF Input Amplitude Range

Table 6. RF Input Amplitude Range (dBm), Nominal

Amplitude Range	Average noise level to +25 (CW RMS)[1]

Note ***Amplitude Range*** refers to the settable range of the reference level. For input damage levels, see ***Front Panel I/O*** and ***Safety Voltages***.

Table 7. Gain Resolution (dB), Nominal

Gain Resolution	1

Table 8. RF Input Analog Gain Range (dB), Nominal

Center Frequency	**Analog Gain Range**
50 MHz to 8.5 GHz	56

RF Input Amplitude Settling Time

Table 9. RF Input Amplitude Settling Time (µs), Measured

<0.5 dB of final value	11
<0.1 dB of final value	27

Note ***Amplitude Settling Time*** refers to the time it takes to switch between two analog gain states with frequency unchanged once the hardware receives the amplitude change. The additional time due to software-initiated amplitude changes is not included and varies by computer. When changing frequencies, reconfiguration time is dominated by the frequency setting. Refer to ***Frequency Settling Time*** for more information.

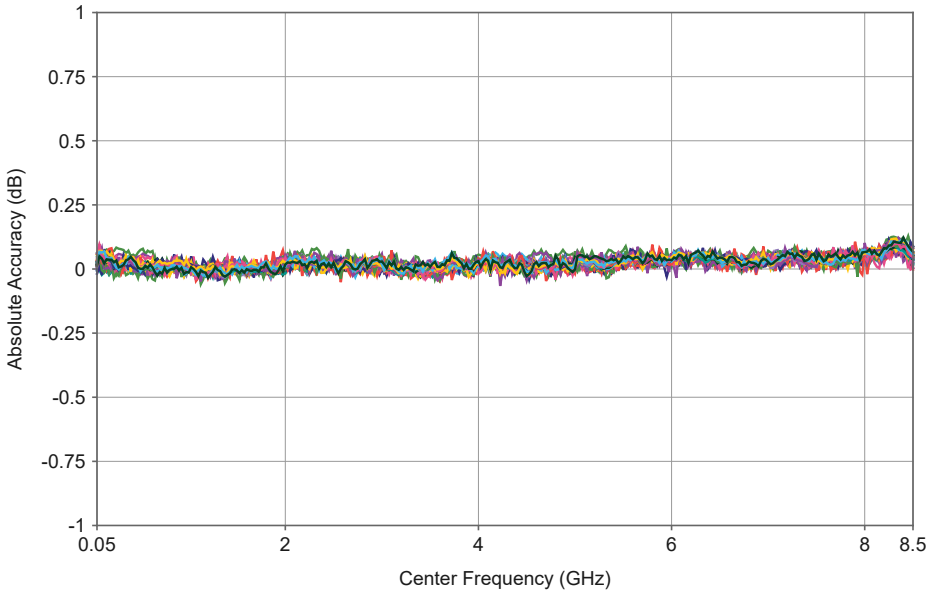
1. Reference levels up to +26 dBm are available when headroom is reduced to 0 dB.

RF Input Amplitude Accuracy

Table 10. RF Input Absolute Amplitude Accuracy (dB)

Center Frequency	Warranted 23 °C ± 5 °C	Warranted	Typical-95	Typical
50 MHz to 5 GHz	±1.00	±1.10	±0.55	±0.25
5 GHz to 7 GHz	±1.05	±1.15	±0.65	±0.25
7 GHz to 8.5 GHz	±1.15	±1.25	±0.75	±0.25
Conditions: reference level -30 dBm to +25 dBm. Measured with a CW signal at the center frequency.				

Figure 1. RF Input Absolute Amplitude Accuracy vs. Center Frequency, Measured



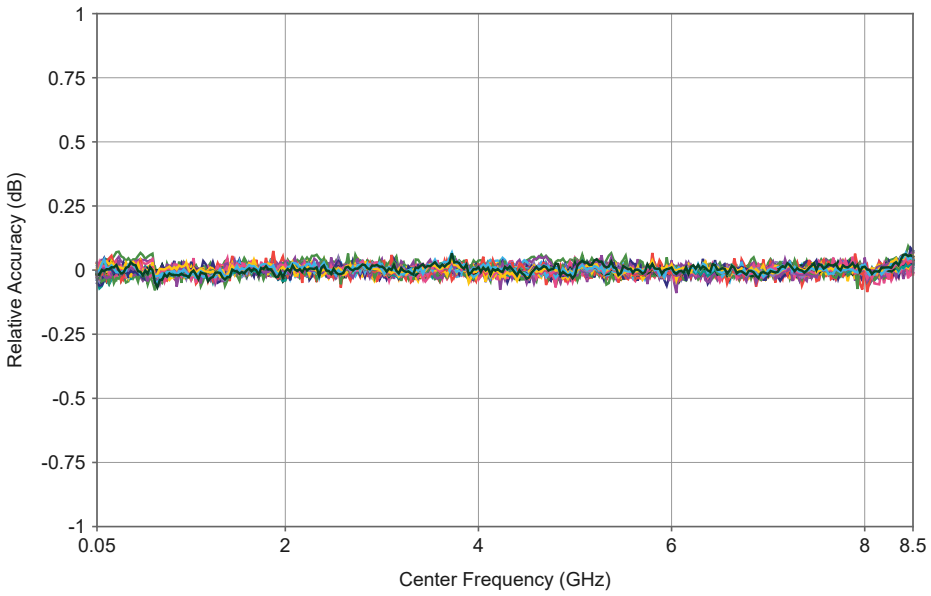
Conditions: measured in 1 dB steps between -30 dBm and +25 dBm reference levels.

Table 11. RF Input Relative Amplitude Accuracy (dB)

Center Frequency	RF Input Relative Amplitude Accuracy
50 MHz to 8.5 GHz	±0.15
Conditions: reference level -30 dBm to +25 dBm. Measured with a CW signal at the center frequency.	

Note ***Relative Accuracy*** describes the residual absolute error when compared to the absolute accuracy error at the 0 dBm reference level.

Figure 2. RF Input Relative Accuracy vs. Center Frequency, Measured



Conditions: measured in 1 dB steps between -30 dBm and +25 dBm reference levels. Normalized to absolute accuracy at 0 dBm reference level.

RF Input Frequency Response

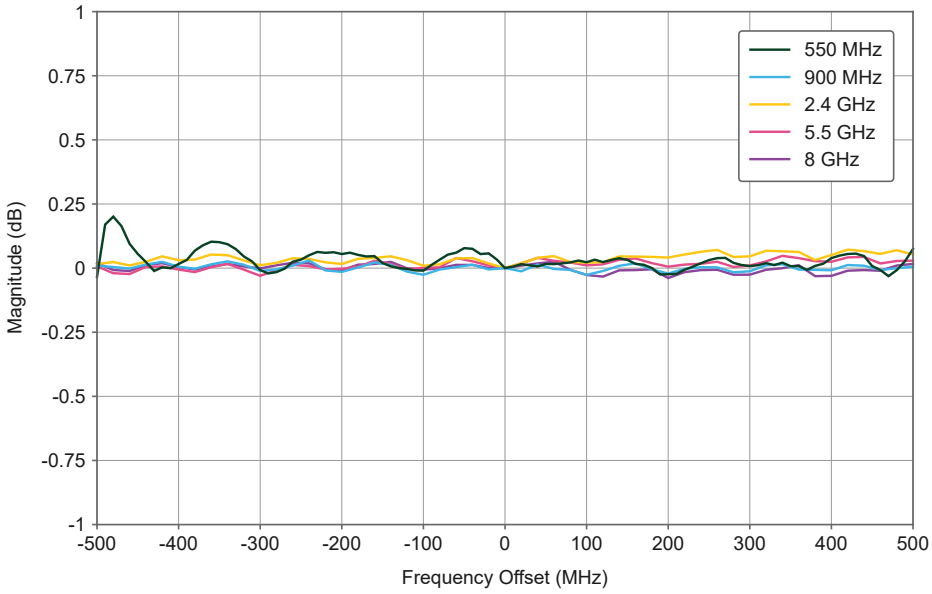
Table 12. RF Input Magnitude Response (dB)

Center Frequency	Warranted 23 °C ± 5 °C	Warranted	Typical-95	Typical
50 MHz to 550 MHz	± 1.45	± 1.45	± 1.00	± 0.55
550 MHz to 5 GHz	± 1.10	± 1.15	± 0.65	± 0.25
5 GHz to 8.5 GHz	± 1.30	± 1.40	± 0.80	± 0.25

Conditions: reference level -30 dBm to +25 dBm.

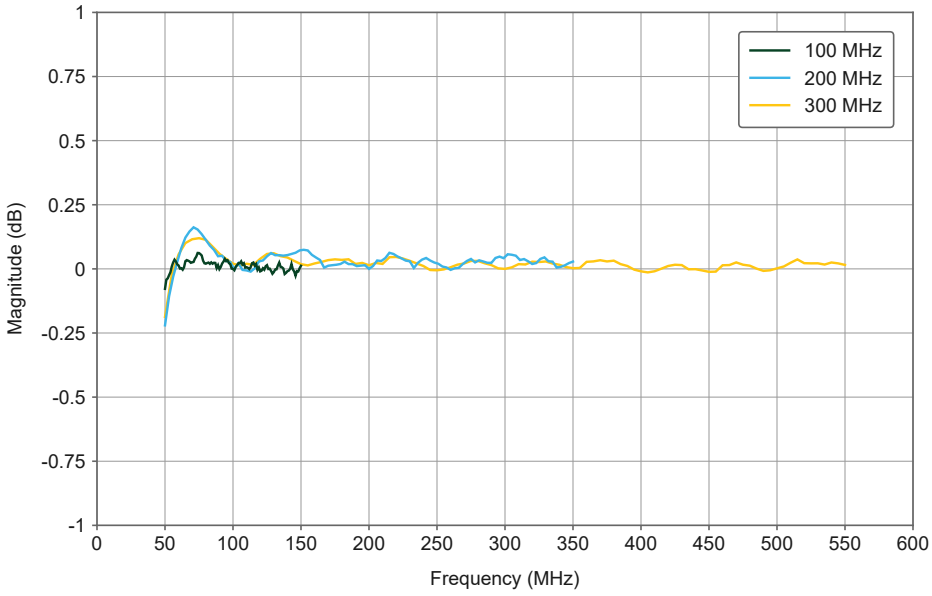
Magnitude Response is defined as the maximum relative amplitude deviation from the amplitude observed at the ***Reference Frequency***, or the frequency where absolute amplitude accuracy is defined. For the absolute amplitude accuracy at the reference frequency, refer to the RF Input Absolute Amplitude Accuracy table. For the PXIe-5860, the reference frequency is the center frequency.

Figure 3. RF Input Magnitude Response, Measured



Conditions: 0 dBm reference level, normalized to 0 Hz.

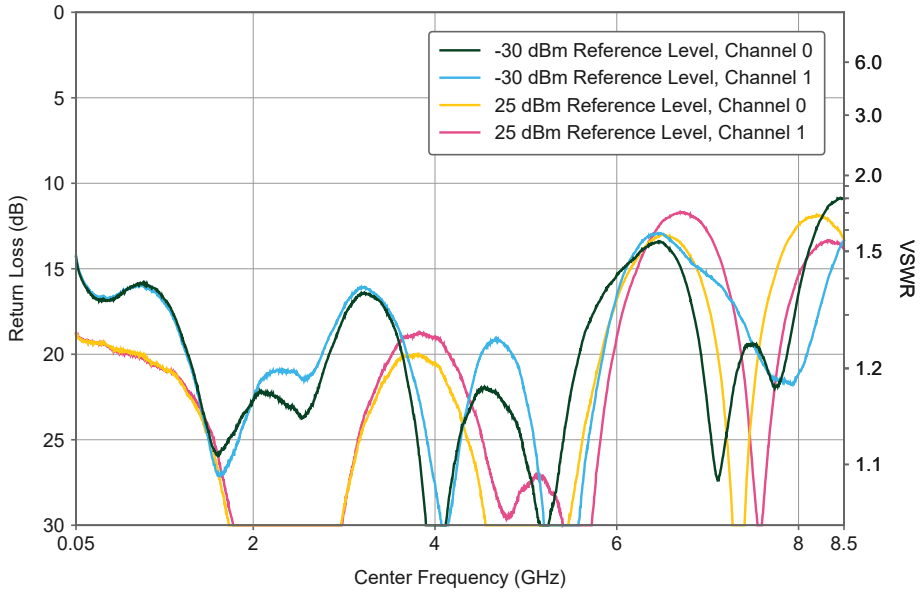
Figure 4. RF Input Magnitude Response (Low Frequency), Measured



Conditions: 0 dBm reference level, normalized to the center frequency.

RF Input Return Loss

Figure 5. RF Input Return Loss, Measured



Conditions: Return loss measured at center frequency.

RF Input Dynamic Range Specifications

RF Input Average Noise Density

Table 13. RF Input Average Noise Density (dBm/Hz)

Center Frequency	Reference Level	RF Input Average Noise Density
50 MHz to 625 MHz	-30 dBm	-160
625 MHz to 5.5 GHz	-30 dBm	-166
5.5 GHz to 7.5 GHz	-30 dBm	-165
7.5 GHz to 8.5 GHz	-30 dBm	-164
50 MHz to 625 MHz	0 dBm	-130
625 MHz to 8.5 GHz	0 dBm	-138
Conditions: Result is the power spectral density expressed in dBm/Hz. 10 averages computed from the root-mean-square average of the input signal across a 1 MHz span after spurs are removed and normalized to a 1 Hz noise bandwidth. Input terminated with a 50 Ω load.		

Note Signal analyzer specifications are often provided as ***displayed average noise level*** (DANL). To convert average noise density to DANL, subtract 2.51 dB. DANL is lower because it is computed using the average of the logarithm of measurement samples, not the logarithm of the average of measurement samples as provided.

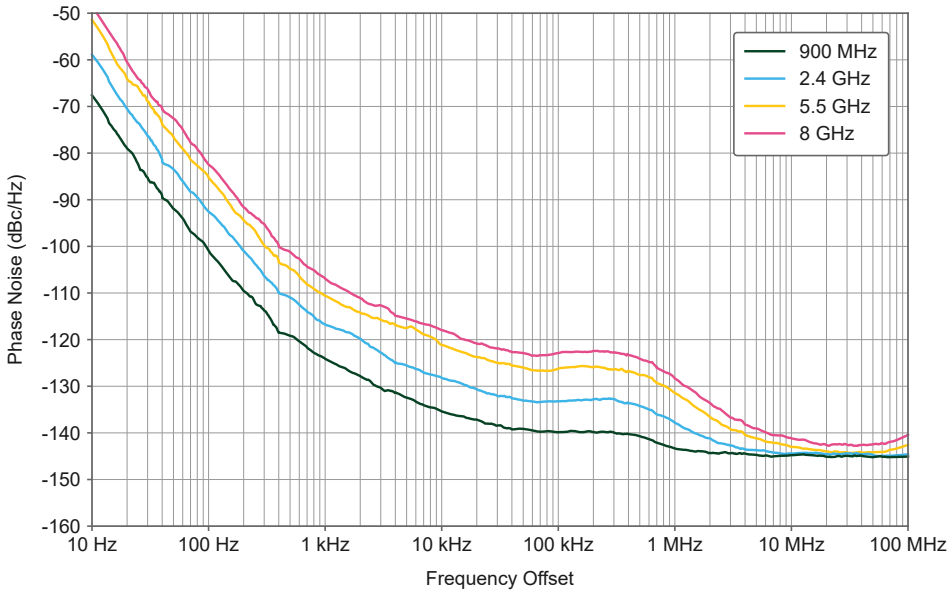
RF Input Third-Order Intermodulation

Table 14. RF Input Third-Order Intercept Point (IIP_3, dBm)

Center Frequency	Reference Level	RF Input Third-Order Intercept Point
50 MHz to 625 MHz	-30 dBm	-7
>625 MHz to 1 GHz	-30 dBm	-8
>1 GHz to 2 GHz	-30 dBm	-9
>2 GHz to 8.5 GHz	-30 dBm	-8

Center Frequency	Reference Level	RF Input Third-Order Intercept Point
50 MHz to 625 MHz	0 dBm	23
>625 MHz to 3 GHz	0 dBm	21
>3 GHz to 8.5 GHz	0 dBm	22
50 MHz to 625 MHz	15 dBm	38
>620 MHz to 3 GHz	15 dBm	36
>3 GHz to 8.5 GHz	15 dBm	37
Conditions: measured when receiving two -6 dBr tones offset -5 MHz and +5MHz from the center frequency		

Figure 6. RF Input Phase Noise, Measured



RF Input Non-Harmonic Spurs

Table 15. RF Input Non-Harmonic Spurs (dBc), Measured

Center Frequency	Spur Level
50 MHz to 150 MHz	-65
>150 MHz to 3.167 GHz	-71
>3.167 GHz to 3.5 GHz	-67
>3.5 GHZ to 4.75 GHz	-72

Center Frequency	Spur Level
>4.75 GHz to 5.25 GHz	-60
>5.25 GHz to 6.5 GHz	-72
>6.5 GHz to 6.833 GHz	-60
>6.833 GHz to 8.5 GHz	-72

Excludes RF harmonic spurs.

Conditions: Measured with 0 dBm reference level, receiving a -6 dBr CW tone at the center frequency. Spur search offset from tone ranges from ±10 kHz to the equalized bandwidth.

RF Output Amplitude Specification

RF Output Amplitude Range

Table 16. RF Output Maximum Power (dBm)

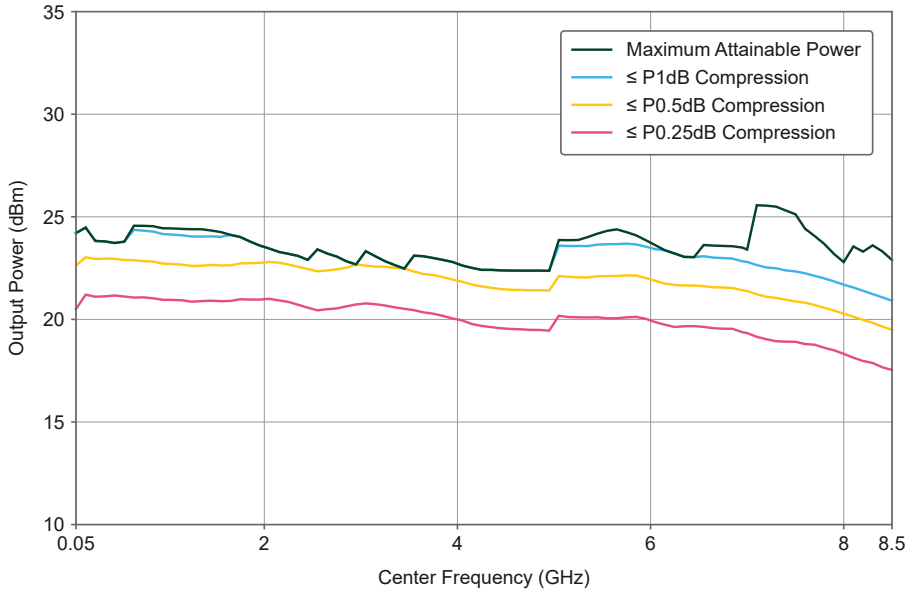
Center Frequency	Specification Maximum Level, Typical	Specification Maximum Level, Warranted	Maximum Attainable Power, Nominal
50 MHz to 2 GHz	20	19	23
2 GHz to 5 GHz	18	17	22
5 GHz to 7 GHz	17	15	23
7 GHz to 8.5 GHz	15	13	23
Conditions: measured with a CW signal at the center frequency.			

Note ***Specification Maximum Level*** defines the maximum requested power level where compression is minimal, and the RF output amplitude accuracy and RF output magnitude response specifications are valid.

Note ***Maximum Attainable Power*** defines the maximum realizable output power of the PXIe-5860 when the requested output power is maximized. Maximum attainable power is typically compressed from the requested power and its level accuracy is not specified by the RF output amplitude accuracy specification.

Minimum output power	Noise floor, nominal
Analog gain range	67 dB
Analog attenuation resolution	1 dB, nominal
Digital attenuation resolution[1]	<0.1 dB

Figure 7. RF Output Maximum Power, Measured



Conditions: measured with a CW signal at the configured center frequency.

Note Compression is calculated for each power level by comparing the expected full scale linear power from a 20 dB digital backoff against the actual full scale power without any digital backoff. Each compression metric trace in the figure represents the lowest output power where the stated compression is achieved. If the compression metric trace is equal to the maximum attainable power, then the compression metric was not achieved and the compression is less than the stated value.

RF Output Amplitude Settling Time

Table 17. RF Output Amplitude Settling Time (µs), Measured

<0.5 dB of final value	11
<0.1 dB of final value	27

Note ***Amplitude Settling Time*** refers to the time it takes to switch between two analog gain states with frequency unchanged once the hardware receives the amplitude change. The additional time due to software-initiated amplitude changes is not included and varies by computer.

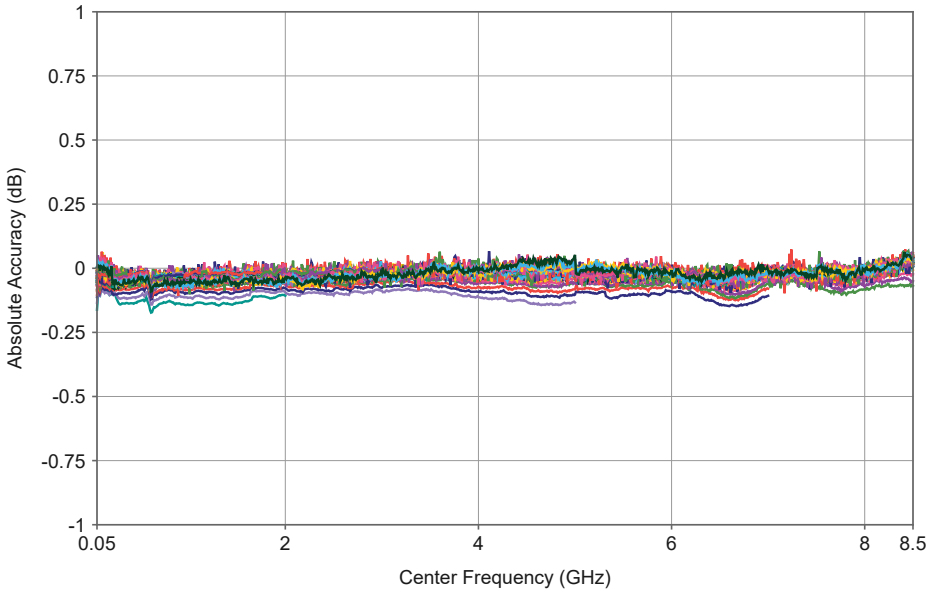
> When changing frequencies, reconfiguration time is dominated by the frequency settling. Refer to ***Frequency Settling Time*** for more information.

RF Output Amplitude Accuracy

Table 18. RF Output Absolute Amplitude Accuracy (dB)

Center Frequency	Warranted 23 °C ± 5 °C	Warranted	Typical-95	Typical
50 MHz to 2 GHz	±0.80	±0.90	±0.70	±0.25
2 GHz to 5 GHz	±0.95	±1.05	±0.75	±0.25
5 GHz to 7 GHz	±1.05	±1.15	±0.80	±0.25
7 GHz to 8.5 GHz	±1.35	±1.45	±1.00	±0.25
Conditions: Peak power level -30 dBm to specification maximum level for ***RF Output Amplitude Range***. Measured with a CW signal at the center frequency.				

Figure 8. RF Output Absolute Amplitude Accuracy vs. Center Frequency, Measured

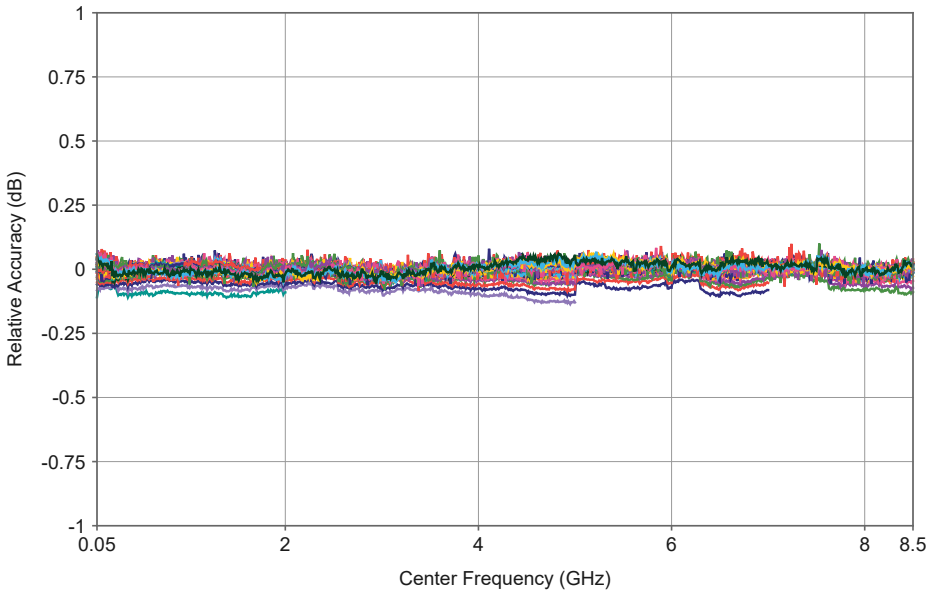


Conditions: measured in 1 dB steps between -30 dBm and specification maximum level in RF Output Maximum Power.

Table 19. RF Output Relative Amplitude Accuracy (dB)

Center Frequency	RF Output Relative Amplitude Accuracy
50 MHz to 8.5 GHz	± 0.2
Conditions: peak power level -30 dBm to specification maximum level in RF output amplitude range. Normalized to absolute accuracy at the 0 dBm power level setting while all other settings and conditions remain identical. Measured with a CW signal at the center frequency. ***Relative Accuracy*** describes the residual absolute error when compared to the absolute accuracy error at the 0 dBm peak power level setting while all other settings and conditions remain identical.	

Figure 9. RF Output Relative Accuracy vs. Center Frequency, Measured



Conditions: Measured in 1 dB steps between -30 dBm and Specification Maximum Level. Normalized to absolute accuracy at the 0 dBm power level setting.

RF Output Frequency Response

Table 20. RF Output Magnitude Response (dB)

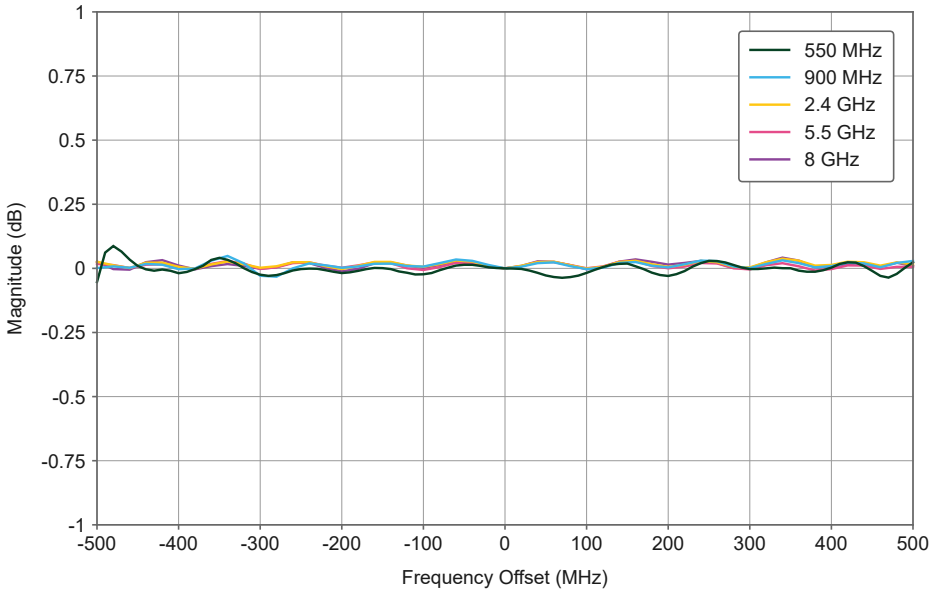
Center Frequency	Warranted 23 °C ± 5 °C	Warranted	Typical-95	Typical
50 Mhz to 550 MHz	± 1.00	± 1.05	± 0.70	± 0.45
550 MHz to 2 GHz	± 0.95	± 1.00	± 0.60	± 0.25

Center Frequency	Warranted 23 °C ± 5 °C	Warranted	Typical-95	Typical
2 GHz to 5 GHz	± 1.10	± 1.10	± 0.65	± 0.25
5 GHz to 7 GHz	± 1.20	± 1.25	± 0.75	± 0.25
7 GHz to 8.5 GHz	± 1.65	± 1.70	± 1.15	± 0.25

Conditions: Peak power level -30 dBm to the specification maximum level in ***RF Output Maximum Power***.

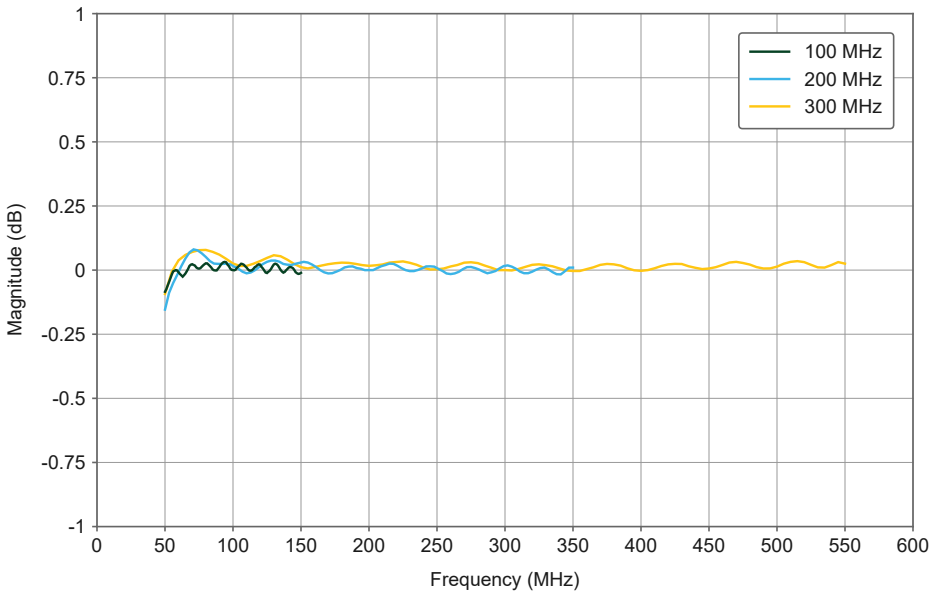
Magnitude Response is defined as the maximum relative amplitude deviation from the amplitude observed at the ***Reference Frequency***, the frequency where absolute amplitude accuracy is defined. For the absolute amplitude accuracy at the reference frequency, refer to the table in ***RF Output Amplitude Accuracy***. For the PXIe-5860, the reference frequency is the center frequency.

Figure 10. RF Output Magnitude Response, Measured



Conditions: 0 dBm power level, normalized to 0 Hz.

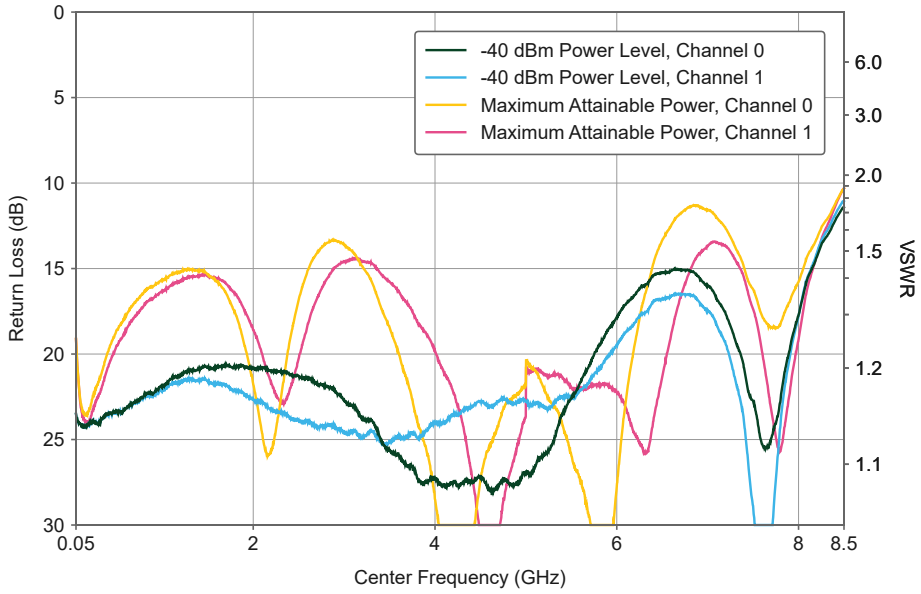
Figure 11. RF Output Magnitude Response (Low Frequency), Measured



Conditions: 0 dBm power level, normalized to center frequency.

RF Output Return Loss

Figure 12. RF Output Return Loss, Measured



Conditions: Return loss measured at RF output center frequency.

RF Output Dynamic Range Specifications

RF Output Average Noise Density

Table 21. RF Output Average Noise Density (dBm/Hz)

Center Frequency	Output Power	RF Output Average Noise Density
50 MHz to 3.0 GHz	-30 dBm	-166
3.0 GHz to 7.5 GHz	-30 dBm	-166
7.5 GHz to 8.5 GHz	-30 dBm	-165
50 MHz to 3.0 GHz	0 dBm	-151
3.0 GHz to 7.5 GHz	0 dBm	-150
7.5 GHz to 8.5 GHz	0 dBm	-146
50 MHz to 2.0 GHz	20 dBm	-132
2.0 GHz to 5.0 GHz	18 dBm	-133
5.0 GHz to 7.0 GHz	17 dBm	-134
7.0 GHz to 8.5 GHz	15 dBm	-130

Conditions:

- Measurement configuration: power measured at the center frequency; 10 averages; normalized to a 1 Hz equivalent noise bandwidth.
- Generation configuration: -40 dBr CW signal 5 MHz offset from the measurement frequency.
- Noise for power level setting of -30 dBm is limited by the measurement instrument.

Noise relative to output power, in dBc/Hz, is the difference between noise power density, in dBm/Hz, and the output power level in dBm.

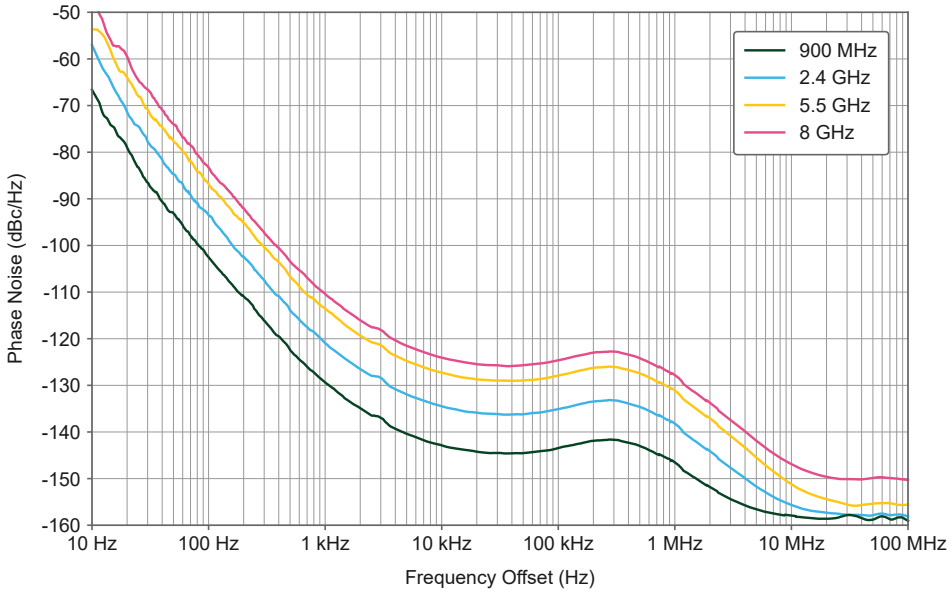
RF Output Third-Order Intermodulation

Table 22. RF Output Third-Order Intermodulation (IMD_3, dBc)

Center Frequency	Power Level Setting	RF Output Third-Order Intermodulation
50 MHz to 150 MHz	-30 dBm	-50
>150 MHz to 2 GHz	-30 dBm	-56
>2 GHz to 4 GHz	-30 dBm	-58
>4 GHz to 6 GHz	-30 dBm	-56
>6 GHz to 7 GHz	-30 dBm	-52
>7 GHz to 8 GHz	-30 dBm	-55
50 MHz to 150 MHz	0 dBm	-52
>150 MHz to 3 GHz	0 dBm	-54
>3 GHz to 4 GHz	0 dBm	-56
>4 GHz to 6 GHz	0 dBm	-50
>6 GHz to 7 GHz	0 dBm	-49
>7 GHz to 8.5 GHz	0 dBm	-48
>8 GHz to 8.5 GHz	0 dBm	-53
50 MHz to 2 GHz	15 dBm	-52
>2 GHz to 3 GHz	15 dBm	-51
>3 GHz to 4 GHz	15 dBm	-50
>4 GHz to 6 GHz	15 dBm	-49
>6 GHz to 7 GHz	15 dBm	-47
>7 GHz to 8.5 GHz	15 dBm	-46
Conditions: measured by generating two -8 dBr tones at ±5 MHz offset from the center frequency. The nominal peak envelope power is 2 dB below the output power level setting.		

RF Output Phase Noise

Figure 13. RF Output Phase Noise, Measured



Measured data post-processed using Savitzky-Golay filter. Conditions: 0 dBm power level.

RF Output Non-Harmonic Spurs

Table 23. RF Output Non-Harmonic Spurs (dBc), Measured

Center Frequency	Spur Level
50 MHz to 3.167 GHz	-77
>3.167 GHz to 3.5 GHz	-73
>3.5 GHZ to 4.75 GHz	-77
>4.75 GHz to 5.25 GHz	-65
>5.25 GHz to 6.5 GHz	-78
>6.5 GHz to 6.833 GHz	-75
>6.833 GHz to 8.5 GHz	-72
Conditions: Generating a -1.5 dBr CW tone at the center frequency. Excludes RF harmonic spurs. Spur search offset from tone ranges from ± 10 kHz to the Equalized Bandwidth.	

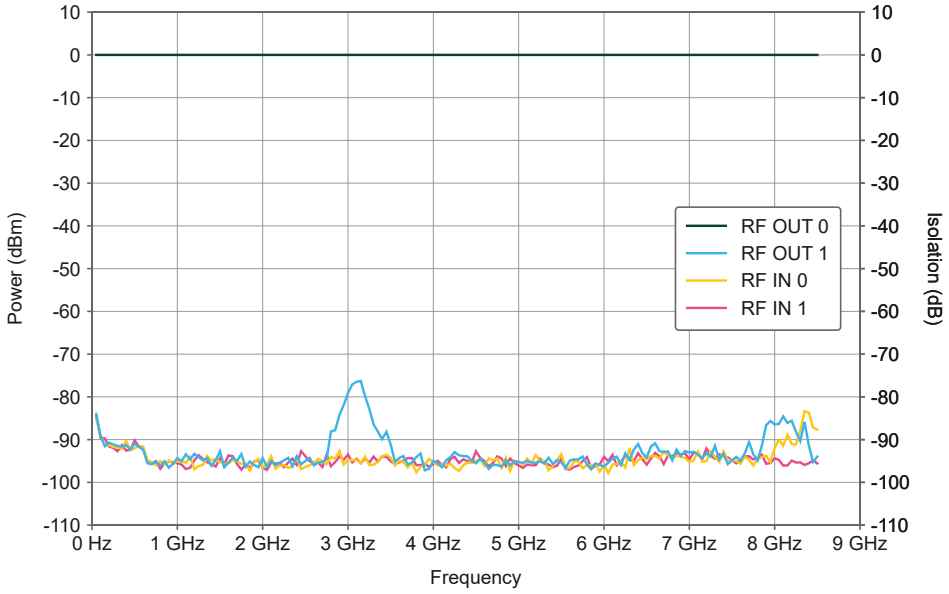
RF Output Harmonic Spurs

Table 24. RF Output Harmonic Spurs (dBc)

Center Frequency	Second Harmonic Spur
50 MHz to 2 GHz	-35
>2 GHz to 4 GHz	-35
>4 GHz to 6 GHz	-32
>6 GHz to 7 GHz	-33
>7 GHz to 8 GHz	-36
>8 GHz to 8.5 GHz	-41
Conditions: Generating a CW tone with a power level of 0 dBm at the center frequency.	

RF Input and RF Output Isolation

Figure 14. RF Isolation, measured



Conditions: RF OUT 0 generating a 0 dBm CW tone. Measurements in parallel on the following channels: RF OUT 1 (set at a reference output power of 0 dBm), RF IN 0 (set at a reference level of 0 dBm), and RF IN 1 (set at a reference level of 0 dBm).

Modulation Quality Specifications

Table 25. WLAN Modulation Quality, Measured (dB)

Center Frequency	80 MHz 802.11ax*	320 MHz 802.11be†
5.180 GHz	-52.1	-49.3
5.925 GHz	-52.3	-49.4
7.125 GHz	-51.9	-47.7

RF OUT 0 loopback to RF IN 0; 16 OFDM data symbols; 20 packet averages; channel estimation type: Ch Estimation Ref (Preamble and Pilots); ***Reference Level*** = ***Average Power Level*** + ***Waveform PAPR***; RF OUT digital gain servo technique (increase RF OUT digital gain until DSP overflow reported) applied; ModAcc Auto Level: Enabled; ModAcc Noise Compensation: Enabled; reference level headroom: 0 dB

*Waveform PAPR: 9.95 dB, MCS index: 11

†Waveform PAPR: 12.01 dB; MCS index: 13

Table 26. Cellular Modulation Quality: 5G NR FR1, Measured (dB)

Center Frequency	1 CC x 100 MHz*	2 CC x 100 MHz†	4 CC x 100 MHz‡
2 GHz	-55.0	–	–
4 GHz	-55.3	-53.2	-50.8
5.5 GHz	-55.5	-53.3	-50.9

Conditions: NR downlink, FDD, FR1, 256-QAM, fully filled resource blocks; RF OUT 0 loopback to RF IN 0; ***Reference Level*** = ***Average Power Level*** + ***Waveform PAPR***; ModAcc Auto Level: Enabled; RF OUT digital gain servo technique (increase RF OUT digital gain until DSP overflow reported) applied; 2 slots analyzed; 3 packet averages; ModAcc Noise Compensation: Enabled; Reference Level headroom: 0 dB

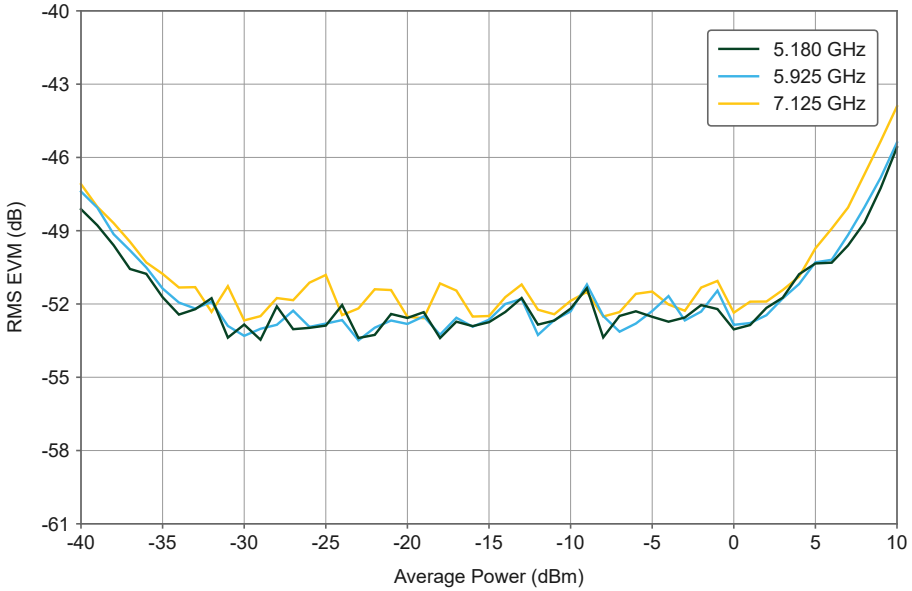
*1 × 100 MHz carrier: 30 kHz subcarrier spacing, 11.62 dB Waveform PAPR

†2 × 100 MHz carrier: 30 kHz subcarrier spacing, 11.87 dB Waveform PAPR, CC 0 and 1 averaged

Center Frequency	1 CC x 100 MHz*	2 CC x 100 MHz†	4 CC x 100 MHz‡

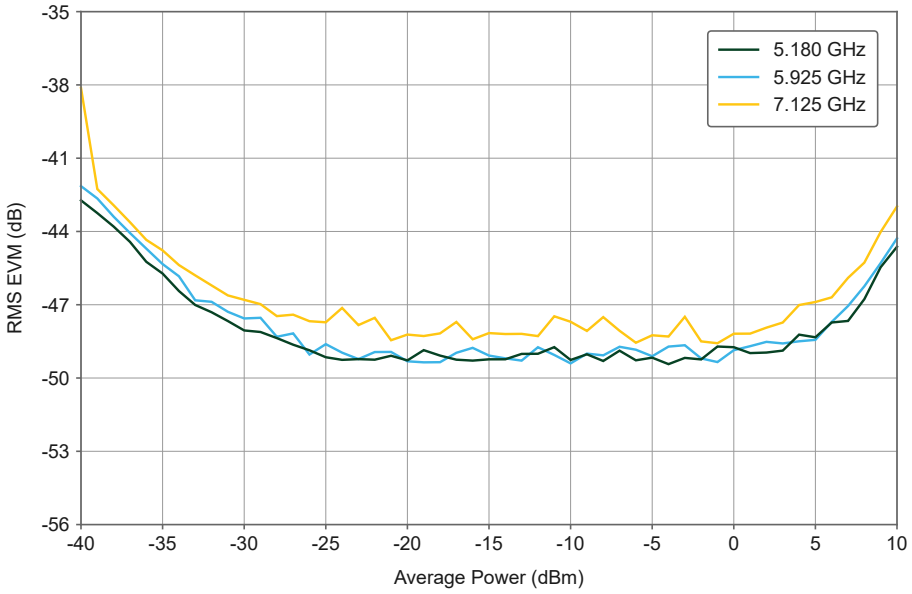
‡4 × 100 MHz carrier: 30 kHz subcarrier spacing; 12.29 dB Waveform PAPR; CC 0, 1, 2, and 3 averaged

Figure 15. WLAN 802.11ax 80 MHz RMS EVM vs. Average Power, Measured



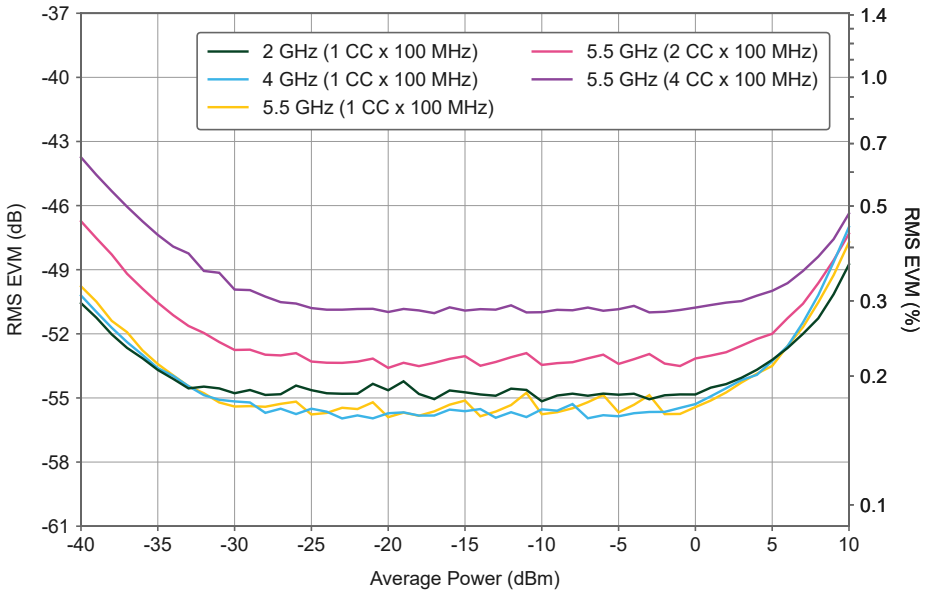
Conditions: RF OUT 0 loopback to RF IN 0; waveform bandwidth: 80 MHz; waveform PAPR: 9.95 dB; MCS index: 11; 16 OFDM data symbols; 20 packet averages; channel estimation type: Ch Estimation Ref (Preamble and Pilots); ***Reference Level*** = ***Average Power Level*** + ***Waveform PAPR***; RF OUT digital gain servo technique (increase RF OUT digital gain until DSP overflow reported) applied; ModAcc Auto Level: Enabled; ModAcc Noise Compensation: Enabled; reference level headroom: 0 dB

Figure 16. WLAN 802.11be 320 MHz RMS EVM vs. Average Power, Measured



Conditions: RF OUT 0 loopback to RF IN 0; waveform bandwidth: 320 MHz; waveform PAPR: 12.01 dB; MCS index: 13; 16 OFDM data symbols; 20 packet averages; channel estimation type: Ch Estimation Ref (Preamble and Pilots); ***Reference Level*** = ***Average Power Level*** + ***Waveform PAPR***; RF OUT Digital Gain Servo technique (increase RF OUT Digital Gain until DSP overflow reported) applied; ModAcc Auto Level: Enabled; ModAcc Noise Compensation: Enabled; Reference Level headroom: 0 dB

Figure 17. 5G NR FR1 RMS EVM vs. Average Power, Measured



Conditions: NR downlink, FDD, FR1, 256-QAM, fully filled resource blocks; RF OUT 0 loopback to RF IN 0; ***Reference Level*** = ***Average Power Level*** + ***Waveform PAPR***; ModAcc Auto Level: Enabled; RF OUT digital gain servo technique (increase RF OUT digital gain until DSP overflow reported) applied; 2 slots analyzed; 3 packet averages; ModAcc Noise Compensation: Enabled; Reference Level headroom: 0 dB

- 1 × 100 MHz carrier: 30 kHz subcarrier spacing, 11.62 dB PAPR
- 2 × 100 MHz carrier: 30 kHz subcarrier spacing, 11.87 dB PAPR, CC 0 and 1 averaged
- 4 × 100 MHz carrier: 30 kHz subcarrier spacing, 12.29 dB PAPR, CC 0, 1, 2, and 3 averaged

General Specifications

Baseband Characteristics

I/Q sample rate range	19 kS/s to 1.25 GS/s

Table 27. Onboard DRAM per Channel

Memory Type	Memory Size
RF input	2 GB
RF output	2 GB

PXIe-5860 Front Panel I/O

These specifications relate to front panel I/O of the PXIe-5860 module.

RF IN <0,1> Connectors

Table 28. RF IN Connector Description

Connector type	SMA (female)
Input impedance	50 Ω, nominal
Coupling	AC
Maximum DC input voltage	±10 V

Table 29. RF IN Absolute Maximum Input Power

Reference Level ≤ 20 dBm	***Reference Level*** + 6 dB
Reference Level >20 dBm	+26 dBm (CW RMS) with source match ≤-6 dB

RF OUT <0,1> Connectors

Table 30. RF OUT Connector Description

Connector type	SMA (female)

Input impedance	50 Ω, nominal
Coupling	AC
Absolute maximum reverse power (RF output power setting ≥+20 dBm)	Not to exceed +20 dBm
Absolute maximum reverse power (RF output power setting <20 dBm or disabled[2])	+15 dBm
Minimum load return loss	≥10 dB when RF output power setting ≥+20 dBm

REF: IN Connector

Table 31. REF: IN Connector Description

Connector type	SMA (female)
Frequency	10 MHz, nominal and 100 MHz, nominal (software-selectable)
Lock range	$\pm 10 \times 10^{-6}$
Amplitude	0.7 V pk-pk to 3.3 V pk-pk into 50 Ω, nominal
Output impedance	50 Ω, nominal
Coupling	AC

REF: OUT Connector

Table 32. RF: OUT Connector Description

Connector type	SMA (female)
Frequency	10 MHz, nominal and 100 MHz, nominal (software-selectable)
Amplitude	1.3 V pk-pk into 50 Ω, nominal
Output impedance	50 Ω, nominal
Coupling	AC

2. The device is not actively generating or the RF:Output Enabled property is set to False.

PFI <0,1> Connectors

Table 33. PFI Connector Description

Connector type	SMA (female)
Input impedance	100 kΩ, nominal
Output impedance	50 Ω, nominal
Maximum DC drive strength	24 mA
Absolute maximum input range	-0.5 V to 5.5 V
V_{IL}, maximum	0.8 V
V_{IH}, minimum	2.0 V
V_{OL}, maximum	0.2 V with 100 µA load
V_{OH}, minimum	2.9 V with 100 µA load

DIO Connector

Notice The DIO port is not an HDMI interface. Do not connect the DIO port on the PXIe-5860 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

Table 34. DIO Connector Description

Connector type	Mini HDMI
Number of channels	8
Signal type	Single-ended
Voltage families	3.3 V, 2.5 V, 1.8 V, 1.5 V, 1.2 V
Input impedance	100 kΩ, nominal
Output impedance	50 Ω, nominal
Signal direction control	Per channel
Minimum latency required for signal direction change	200 ns
Maximum output toggle rate	60 MHz with 100 µA load, nominal

3.3 V power supply	250 mA

CTRL Connector

CTRL is used as an internal connection only.

> **Notice** The CTRL port is not an HDMI interface. Do not connect the CTRL port on the PXIe-5860 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

MGT Connector

Table 35. MGT Connector Description

Connector type	iPass+ zHD
Number of connectors	4
Number of TX channels	4 per connector
Number of RX channels	4 per connector
Data rate	500 Mbps to 16.25 Gbps, nominal
Supported cable type	Electrical
I/O AC coupling capacitor	100 nF
Minimum differential output voltage	360 mV pk-pk into 100 Ω, nominal
Differential input voltage range (≤6.6 Gbps)	150 mV pk-pk to 2 V pk-pk, nominal
Differential input voltage range (>6.6 Gbps)	150 mV pk-pk to 1.25 V pk-pk, nominal
Differential input resistance	100 Ω, nominal

Safety Voltages

Rated Voltages

RF IN <0,1> absolute maximum input power	+26 dBm (CW RMS) with source match ≤ -6 dB
RF OUT <0,1> absolute maximum reverse power	+20 dBm

REF IN absolute maximum input voltage range	0.4 Vpp to 3.4 Vpp
REF OUT absolute maximum reverse voltage	2 Vpp
PFI <0,1> absolute maximum input range	-0.5 V to 5 V
DIO absolute maximum input range	-0.5 V to 5 V

Notice The DIO port is not an HDMI interface. Do not connect the DIO port on the PXIe-5860 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

MGT absolute maximum input	1.8 V
≤6.6 Gbps	150 mVpp to 2 Vpp
>6.6 Gbps	150 mVpp to 1.25 Vpp
CTRL absolute maximum input	1.8 V

Notice The CTRL port is not an HDMI interface. Do not connect the CTRL port on the PXIe-5860 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

Measurement Category	CAT I/O

Measurement Category

Warning Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV.

Mise en garde Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour effectuer des mesures dans ces catégories.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as ***MAINS*** voltage. MAINS is

a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Environmental Guidelines

Notice Failure to follow the mounting instructions in the product documentation can cause temperature derating.

Notice This product is intended for use in indoor applications only.

Environmental Characteristics

Operating temperature	0 °C to 40 °C
Storage temperature	-40 °C to 71 °C
Operating humidity	10% to 90% relative humidity, noncondensing
Storage humidity	5% to 95% relative humidity, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m (800 mbar) at 25 °C ambient temperature
Operating vibration	5 Hz to 500 Hz, 0.3 g RMS
Non-operating vibration	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse
Non-operating shock	50 g, half-sine, 11 ms pulse

Note Not all chassis with slot cooling capacity ≥58 W can achieve this ambient temperature range. Refer to PXI chassis specifications to determine the ambient temperature ranges your chassis can achieve.

Power Requirements

Table 36. Power Requirements

+3.3 V DC	4.2 A (13.9 W)
+12 V DC	8.9 A (106.8 W)
Total power	120.7 W

Physical Characteristics

Module size	3U, 2 slots
Dimensions	84 mm x 129 mm x 40.62mm not including ejector handle For more information, visit ni.com/dimensions and search by model number.
Weight	900 g (1.98 lbs)

Calibration

Table 37. PXIe-5860 Calibration

Interval	1 year