

N5182BX07 Frequency Extender

9 kHz to 7.2 GHz

The Keysight N5182BX07 Frequency Extender is an accessory for the MXG (N5182B) or EXG (N5172B) that extends the frequency range to 7.2 GHz. The N5182BX07 is especially well suited for 802.11ax measurements, due to its excellent phase noise and EVM.



Table of Contents

Definitions and Conditions	3
Frequency Specifications	4
Amplitude Specifications	5
Spectral Purity Specifications.....	10
Modulation.....	11
General Specifications	13
Inputs and Outputs	15
Related Literature.....	16

Definitions and Conditions

Specifications represent warranted performance of a calibrated instrument with Extender Input Power Offset set to 0 dB that has been stored for a minimum of two hours within the operating temperature range of 0 to 55 °C, unless otherwise stated, and after a 45-minute warm-up period. The specifications include measurement uncertainty. Data represented in this document are specifications unless otherwise noted.

Typical (typ) describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80 percent of the units exhibit with a 90 percent confidence level at room temperature (approximately 25 °C). Typical performance does not include measurement uncertainty.

Nominal (nom) values indicate the expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ω connector. This data is not warranted and is measured at room temperature (approximately 25 °C).

Measured (meas) describes an attribute measured during the design phase for purposes of communicating expected performance, such as amplitude drift vs. time. This data is not warranted and is measured at room temperature (approximately 25 °C).

Frequency Specifications

Frequency range	
	9 kHz to 7.2 GHz ¹
Frequency bands	
Passthrough band	9 kHz < 5.900001 GHz
Upconverter band	5.900001 GHz to 7.2 GHz
Frequency switching speed	
Crossing 5.9 GHz	≤ 30 ms (nominal)
Elsewhere	Same as MXG or EXG
External frequency reference input	
Input frequency	10 MHz
Lock range	± 1 ppm, nominal
Amplitude	0 dBm, nominal

1. The band edge of a modulated signal can extend up to 7.26 GHz.

Amplitude Specifications

Output parameters	
Settable range with MXG/EXG Option 1EA	
Passthrough band	+30 to -144 dBm
Upconverter Band	+28 to -144 dBm
Settable range without MXG/EXG Option 1EA	
Passthrough band	+19 to -144 dBm
Upconverter Band	+19 to -144 dBm
Step attenuator in upconverter band	
	0 to 121 dB in 1 dB steps, mechanical
RF input connector	
	Type N, 50 Ω , nominal
RF output connector	
	Type N, 50 Ω , nominal

Maximum output power ¹

Frequency	Standard	With MXG/EXG Option 1EA
200 kHz to 10 MHz	+12 dBm (typ)	+16 dBm (typ)
> 10 MHz to 3 GHz	+17 dBm (typ)	+23 dBm (typ)
> 3 GHz to 5 GHz	+14 dBm (typ)	+17 dBm (typ)
> 5 GHz to < 5.900001 GHz	+14 dBm (typ)	+15 dBm (typ)
5.900001 GHz to 7.2 GHz	+16 dBm (+18 dBm typ)	+25 dBm (+27 dBm typ)

1. Temperature $\leq 35^{\circ}\text{C}$ and Extended Input Power Offset set to 0 dB. Max power degrade .06dB/ $^{\circ}\text{C}$ for temperatures above 35°C .

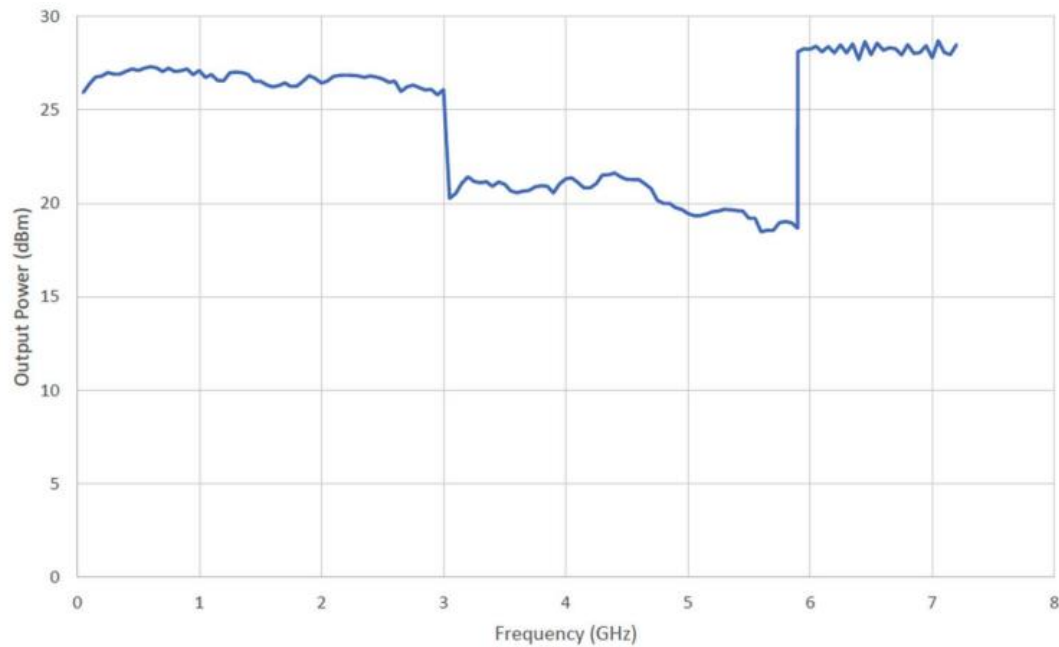


Figure 1. Measured Maximum Power with Option 1EA

Absolute Level Accuracy in CW Mode (ALC On) ¹

Frequency	+15 to -60 dBm	< -60 to -110 dBm
9 kHz to 100 kHz	± .6 dB (typ)	± 1 dB (typ)
100 kHz to 5 MHz	± .6 dB (typ)	± 1 dB (typ)
> 5 MHz to 3 GHz	± .6 dB (typ)	± 1 dB (typ)
> 3 GHz to < 5.9 GHz	± .6 dB (typ)	± 1 dB (typ)
5.9 GHz to 7.2 GHz	± .6 dB (typ)	± 1 dB (nom)

1. Power degrades .06 dB/ °C from last calibration.

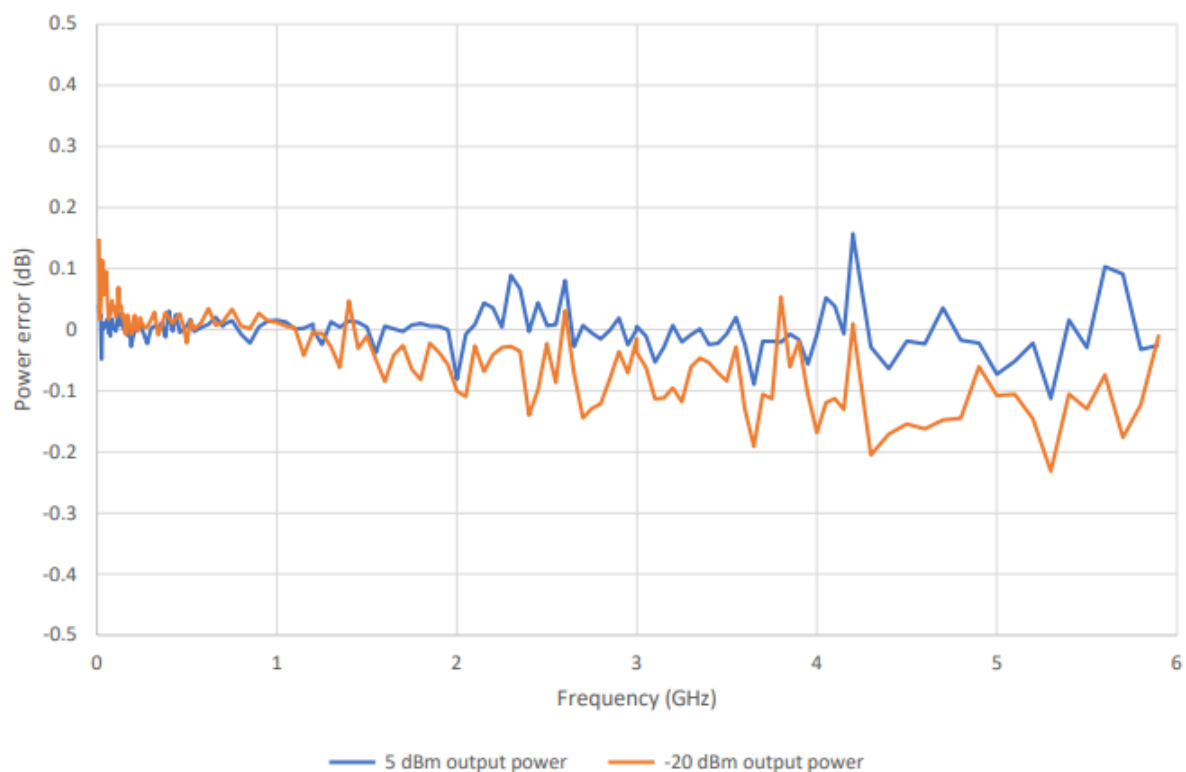


Figure 2. Measured Level Accuracy in Passthrough Band

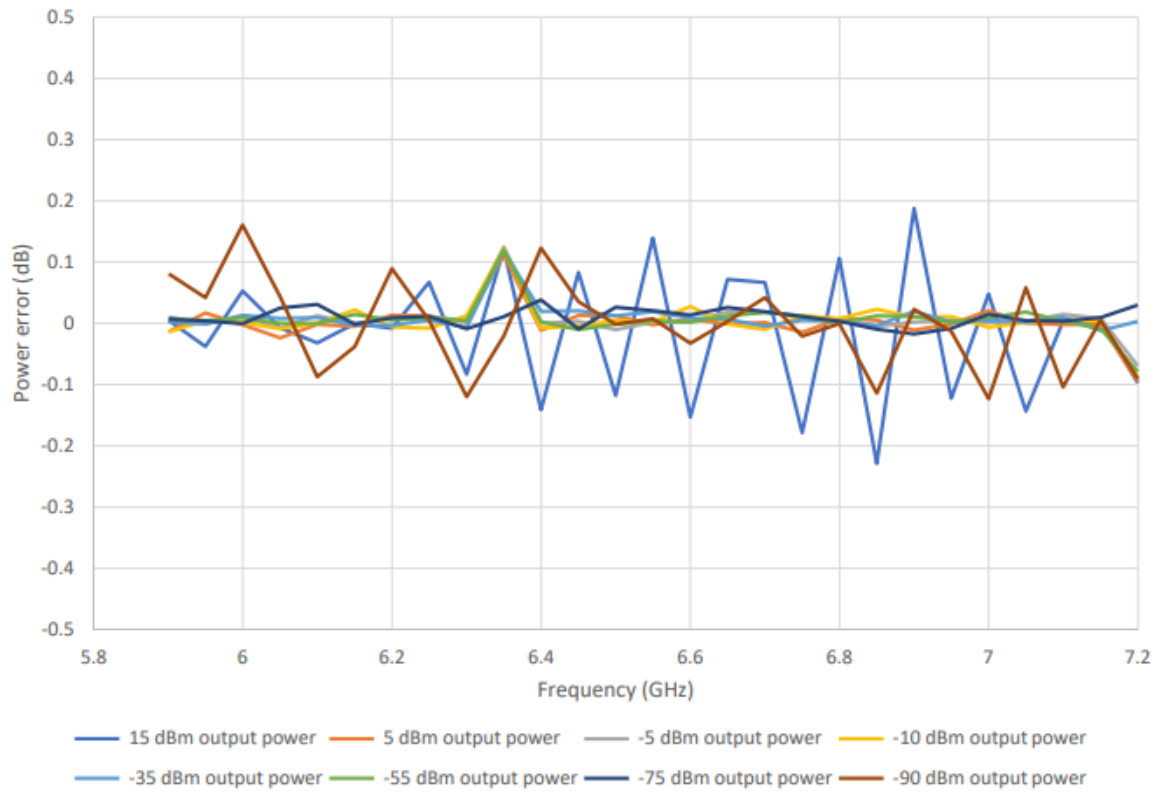


Figure 3. Measured Level Accuracy in Upconverter Band

Amplitude Switching Speed	
Below 5.9 GHz	Same as MXG or EXG
5.9 GHz and above	≤ 30 ms (nominal)
RF Input Limits ¹	
Maximum Input Power	
Passthrough mode	28 dBm, nominal
Upconverter mode	8 dBm, nominal
Maximum DC Voltage	
	0 VDC, nominal
RF Output Limits	
Maximum reverse power	0.5 W, nominal
Maximum DC voltage	0 VDC, nominal

1. The N5182BX07 Frequency Extender is designed to be used and controlled by an MXG/EXG instrument with Option FRQ. The MXG/EXG instrument will keep power levels below the maximum limits. RF Input Limits section is intended for informational purposes only.

Spectral Purity Specifications

Harmonics (CW mode)		
9 kHz to < 5.900001 GHz	Same as MXG or EXG, typical	
5.900001 GHz to 7.2 GHz ¹	(< -84 dBc typical 2nd harmonic from 11.800002 GHz to 14.4 GHz)	
Non-Harmonics (CW mode) > 10 kHz Offset		
5.120 GHz	< -90 dBm, typical	
9 kHz to < 5.900001 GHz, excluding 5.120 GHz	1 dB higher than MXG or EXG, typical	
5.900001 GHz to 7.2 GHz with power ≤ 10 dBm ²	At 20.48 GHz - 2 * RF Output Frequency	< -40 dBc (-46 dBc typical)
	At 2 * RF Output Frequency - 5.12 GHz	< -41 dBc (-47 dBc typical)
	Other Frequencies	< -58 dBc (-64 dBc typical)

1. Measured at 10 dBm with Extended Input Power Offset set to 0 dB.

2. Measured with Extender Input Power Offset set to 0 dB.

Modulation

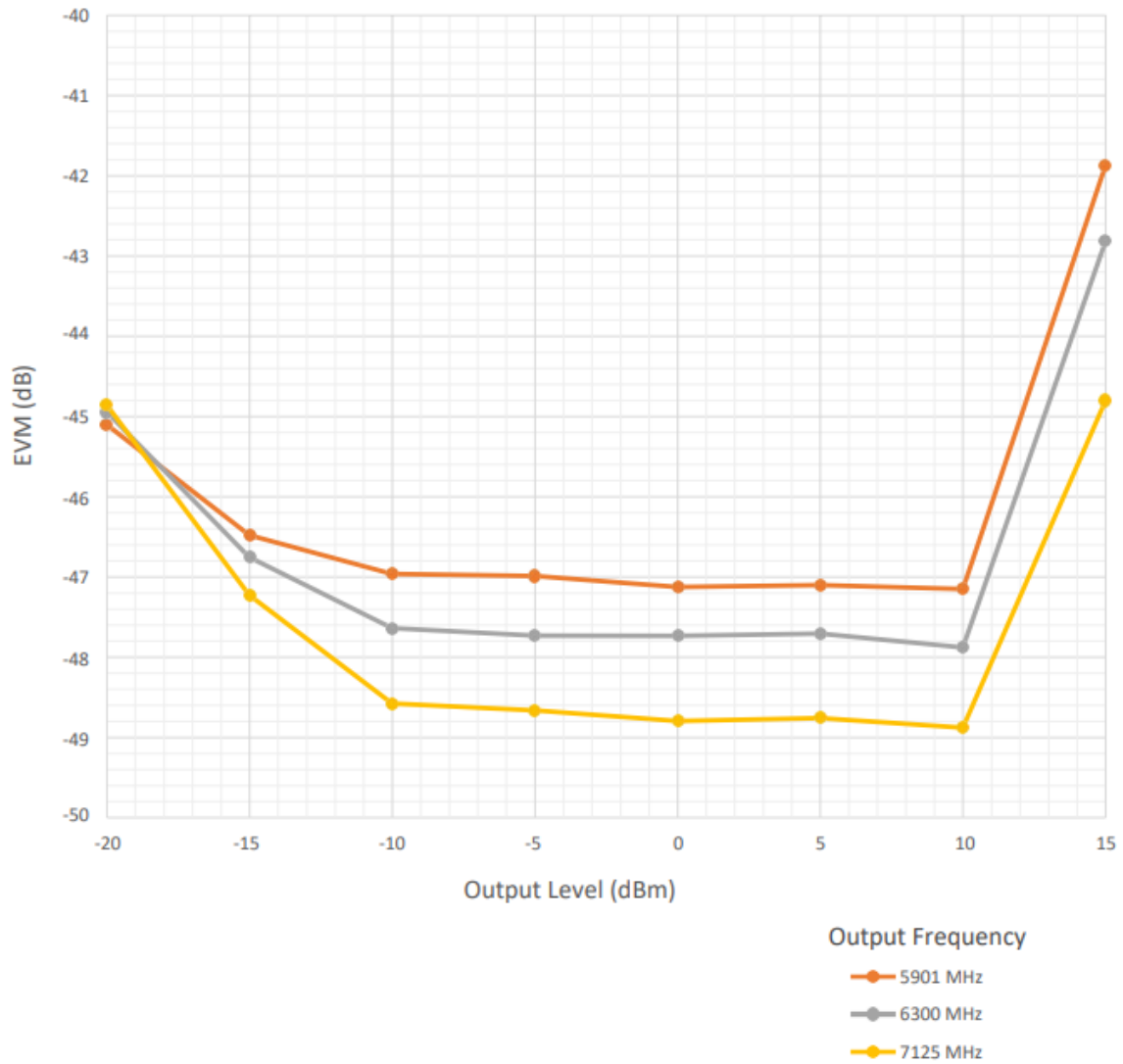


Figure 4. EVM – 802.11ax, 80 MHz Bandwidth (measured)

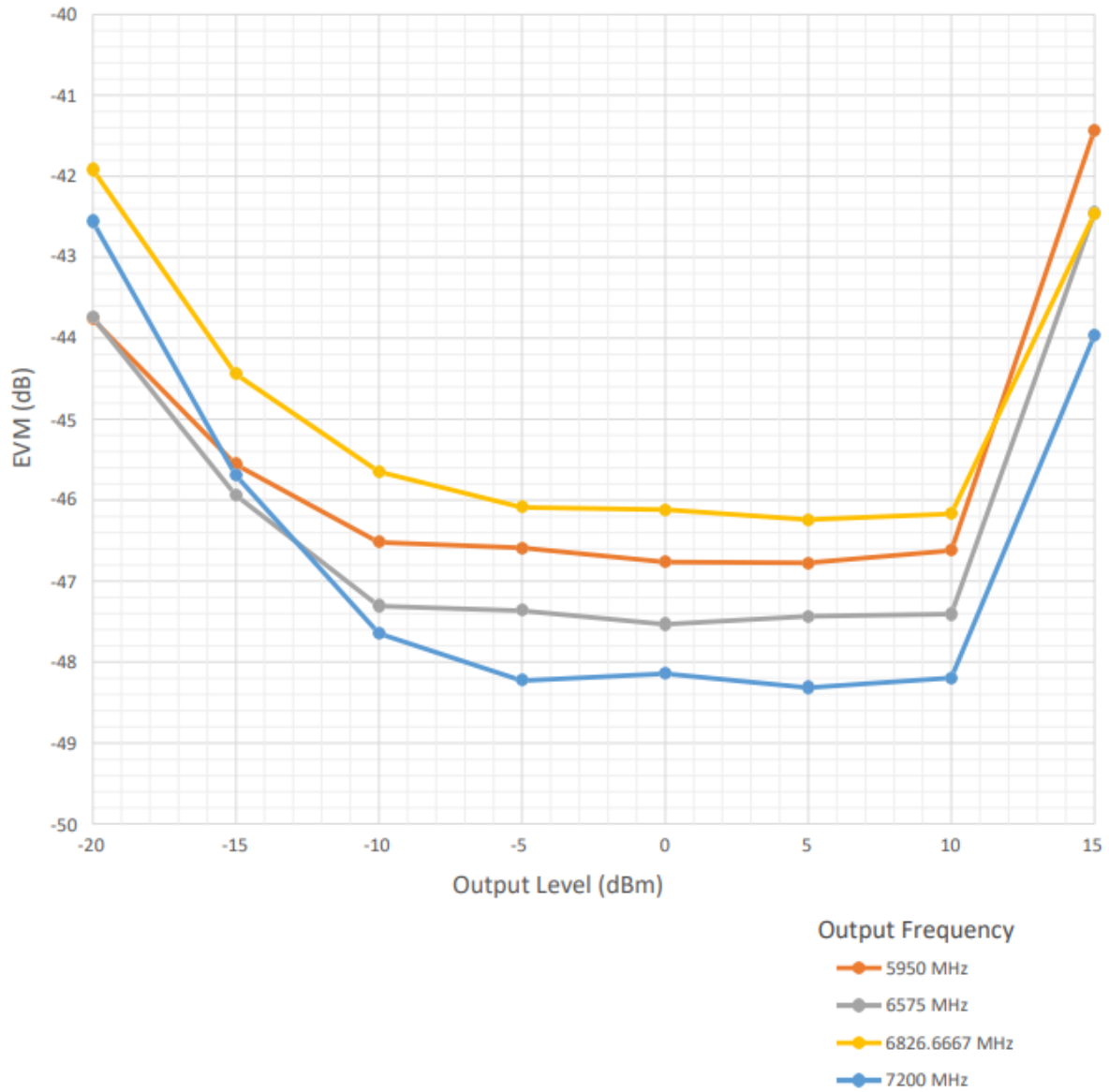


Figure 5. EVM – 802.11ax, 160 MHz Bandwidth (measured)

General Specifications

Remote Programming	
MXG or EXG can be controlled through GPIB, LAN, or USB. N5182BX07 is controlled by MXG or EXG using one USB port.	
Power Requirements	
100/120V VAC, 220/240 VAC (50/60 Hz)	
N5182BX07 maximum power is 160 W	
Environmental Tests	
The N5182BX07 complies with all applicable safety and regulatory requirements for the intended location of use.	
Operating environment	For indoor use only
Operating temperature	0 to 55 °C
Storage temperature	-40 to +70 °C
Operating and storage altitude	0 to 3000 meters (~9842 ft)
Maximum relative humidity (non-condensing)	95% RH up to 40 °C, decreasing linearly to 45 % RH at 55 °C. From 40 °C to 55 °C, the maximum % Relative Humidity follows the line of constant dew point.
Dimensions and Space Requirements	
Size, including RF connects and feet	
Width	425 mm (16.8")
Length	485 mm (19.1")
Height	55 mm (2.3")
Size, excluding RF connects and feet	
Width	426 mm (16.8")
Length	465 mm (18.3")
Height	44 mm (1.75")
Weight	
	≤ 6.2 kg (13.6 lb)

Safety and Regulatory Information	
European Low Voltage Directive	This instrument complies with the essential requirements of the European Low Voltage Directive as well as current editions of the following standards: • IEC/EN 61010-1 • Canada: CSA C22.2 No. 61010-1 • USA: UL std no. 61010-1
EMC information	Complies with European EMC Directive 2014/30/EU • IEC/EN 61326-1 • CISPR Pub 11 Group 1, Class A • AS/NZS CISPR 11 • ICES/NMB-001 This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.
Acoustic statement (European Machinery Directive)	• Acoustic noise emission LpA < 70 dB Operator position Normal operation mode per ISO 7779
Recommended Calibration Cycle	
12 months	
ISO Compliant	
This instrument is manufactured in an ISO9001 registered facility in concurrence with Keysight Technologies' commitment to quality.	

Inputs and Outputs

Front Panel	
ON/OFF switch	Install the instrument so that the ON/OFF switch is readily identifiable and is easily reached by the operator. The ON/OFF switch is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. Or, the detachable power cord can be removed from the electrical supply. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.
LED status indicator	The light will turn yellow when the instrument is turned on.
RF input (without Option 1EM)	Type-N, 50 ohm, nominal
RF output (without Option 1EM)	Type-N, 50 ohm, nominal
Rear panel	
RF in (Option 1EM)	Type-N, 50 ohm, nominal
RF out (Option 1EM)	Type-N, 50 ohm, nominal
10 MHz in	10 MHz reference input, BNC
USB port	USB, type C
Line input	Power cord connection

Related Literature

Keysight X-Series Signal Generators	
N5182BX07 User Guide	N5182-90001
MXG Datasheet	5991-0038EN
EXG Data Sheet	5991-0039EN
MXG Configuration Guide	5990-9959EN
EXG Configuration Guide	5990-9958EN

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