

Keysight Technologies

UXA X-Series Signal Analyzer, Multi-touch N9040B

3 Hz to 8.4, 13.6, 26.5, 44, or 50 GHz

Data Sheet



Unlocking Measurement Insights

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This data sheet is a summary of the specifications and conditions for the UXA signal analyzers. For the complete specifications guide, visit:
www.keysight.com/find/uxa_specifications

Definitions and Conditions

Specifications describe the performance of parameters covered by the product warranty and apply to temperature ranges 0 to 55 °C, unless otherwise noted. 95th percentile values indicate the breadth of the population (approx. 2σ) of performance tolerances expected to be met in 95 percent of the cases with a 95 percent confidence, for any ambient temperature in the range of 20 to 30 °C. In addition to the statistical observations of a sample of instruments, these values include the effects of the uncertainties of external calibration references. These values are not warranted. These values are updated occasionally if a significant change in the statistically observed behavior of production instruments is observed.

Typical 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 95 percent confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.

Nominal values indicate expected performance, or describe product performance that is useful in the application of the product, but is not covered by the product warranty.

Frequency and Time Specifications

Frequency range	DC coupled	AC coupled
Option 508	3 Hz to 8.4 GHz	10 MHz to 8.4 GHz
Option 513	3 Hz to 13.6 GHz	10 MHz to 13.6 GHz
Option 526	3 Hz to 26.5 GHz	10 MHz to 26.5 GHz
Option 544	3 Hz to 44 GHz	10 MHz to 44 GHz
Option 550	3 Hz to 50 GHz	10 MHz to 50 GHz
Frequency band	LO multiple (N)	Frequency range
0	1	3 Hz to 3.6 GHz
1	1	3.5 to 8.4 GHz
2	2	8.3 to 13.6 GHz
3	2	13.5 to 17.1 GHz
4	4	17 to 26.5 GHz
5	4	26.4 to 34.5 GHz
6	8	34.4 to 50 GHz

Frequency reference	
Accuracy	\pm [(time since last adjustment x aging rate) + temperature stability + calibration accuracy]
Aging rate	Standard $\pm 3 \times 10^{-8}$ / year
Temperature stability Full temperature range	Standard $\pm 4.5 \times 10^{-9}$
Achievable initial calibration accuracy	Standard $\pm 3.1 \times 10^{-8}$
Example frequency reference accuracy (standard)	$= \pm (3 \times 10^{-8} + 4.5 \times 10^{-9} + 3.1 \times 10^{-8})$
1 year after last adjustment	$= \pm 6.6 \times 10^{-8}$
Residual FM Center frequency = 1 GHz 10 Hz RBW, 10 Hz VBW	$\leq (0.25 \text{ Hz} \times N)$ p-p in 20 ms nominal See band table above for N (LO multiple)

Frequency readout accuracy (start, stop, center, marker)
\pm (marker frequency x frequency reference accuracy + 0.1% x span + 5 % x RBW + 2 Hz + 0.5 x horizontal resolution ¹)

1. Horizontal resolution is span/(sweep points - 1).

Frequency and Time Specifications (continued)

Marker frequency counter

Accuracy	\pm (marker frequency x frequency reference accuracy + 0.100 Hz)
Delta counter accuracy	\pm (delta frequency x frequency reference accuracy + 0.141 Hz)
Counter resolution	0.001 Hz

Frequency span (FFT and swept mode)

Range	0 Hz (zero span), 10 Hz to maximum frequency of instrument
Resolution	2 Hz
Accuracy	
Swept	\pm (0.1% x span + horizontal resolution)
FFT	\pm (0.1% x span + horizontal resolution)

Sweep time and triggering

Range	Span = 0 Hz	1 μ s to 6000 s
	Span \geq 10 Hz	1 ms to 4000 s
Accuracy	Span \geq 10 Hz, swept	\pm 0.01% nominal
	Span \geq 10 Hz, FFT	\pm 40% nominal
	Span = 0 Hz	\pm 0.01% nominal
Sweep trigger	Free run, line, video, external 1, external 2, RF burst, periodic timer	
Trigger Delay	Span = 0 Hz or FFT	-150 to +500 ms
	Span \geq 10 Hz, swept	0 to 500 ms
	Resolution	0.1 μ s

Time gating

Gate methods	Gated LO; gated video; gated FFT
Gate length range (except method = FFT)	1 μ s to 5.0 s
Gate delay range	0 to 100.0 s
Gate delay jitter	33.3 ns p-p nominal

Sweep (trace) point range

All spans	1 to 40,001
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Resolution bandwidth (RBW)

Range (-3.01 dB bandwidth)	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz	
Bandwidth accuracy (power)		
RBW range	1 Hz to 100 kHz	\pm 0.5% (\pm 0.022 dB)
	110 kHz to 1.0 MHz (< 3.6 GHz CF)	\pm 1.0% (\pm 0.044 dB)
	1.1 to 2 MHz (< 3.6 GHz CF)	\pm 0.07 dB nominal
	2.2 to 3 MHz (< 3.6 GHz CF)	\pm 0.10 dB nominal
	4 to 8 MHz (< 3.6 GHz CF)	\pm 0.20 dB nominal
Bandwidth accuracy (-3.01 dB)		
RBW range	1 Hz to 1.3 MHz	\pm 2% nominal
Selectivity (-60 dB/-3 dB)	4:1 nominal	
EMI bandwidth (CISPR compliant)	200 Hz, 9 kHz, 120 kHz, 1 MHz	(Option EMC required)
EMI bandwidth (MIL STD 461E compliant)	10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz	(Option EMC required)

Frequency and Time Specifications (continued)

Analysis bandwidth¹

Maximum bandwidth	Option B25 (standard)	25 MHz
	Option B40	40 MHz
	Option B2X	255 MHz
	Option B5X	510 MHz

Video bandwidth (VBW)

Range	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz, and wide open (labeled 50 MHz)
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Accuracy	± 6% nominal (in swept mode and zero span)
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1. Analysis bandwidth is the instantaneous bandwidth available around a center frequency over which the input signal can be digitized for further analysis or processing in the time, frequency, or modulation domain.

Amplitude Accuracy and Range Specifications

Amplitude range	
Measurement range	Displayed average noise level (DANL) to +30 dBm (for preamp Off) DANL to +24 dBm (for frequency opts ≤ 526 with preamp On) DANL to +20 dBm (for frequency opts > 526 with preamp On)
Input mechanical attenuator range (3 Hz to 50 GHz)	0 to 70 dB in 2 dB steps
Electronic attenuator (Option EA3)	
Frequency range	3 Hz to 3.6 GHz
Attenuation range	
Electronic attenuator range	0 to 24 dB, 1 dB steps
Full attenuation range (mechanical + electronic)	0 to 94 dB, 1 dB steps
Maximum safe input level	
Average total power	+30 dBm (1 W)
Peak pulse power	< 10 μs pulse width, < 1% duty cycle +50 dBm (100 W) and input attenuation ≥ 30 dB
DC volts	
DC coupled	± 0.2 Vdc
AC coupled	± 100 Vdc
Display range	
Log scale	0.1 to 1 dB/division in 0.1 dB steps 1 to 20 dB/division in 1 dB steps (10 display divisions)
Linear scale	10 divisions
Scale units	dBm, dBmV, dBμV, dBmA, dBμA, V, W, A

Frequency response	Specifications	95th percentile ($\approx 2\sigma$)
(10 dB input attenuation, 20 to 30 °C, preselector centering applied above 3.6 GHz)		
RF/MW	3 Hz to 10 MHz	± 0.46 dB
(Option 508, 513, 526)	10 to 50 MHz	± 0.35 dB
	50 MHz to 3.6 GHz	± 0.19 dB
	3.5 to 5.2 GHz	± 0.14 dB
	5.2 to 8.4 GHz	± 1.5 dB
	8.3 to 13.6 GHz	± 0.50 dB
	13.5 to 17.1 GHz	± 0.42 dB
	17.0 GHz to 22 GHz	± 2.0 dB
	22.0 to 26.5 GHz	± 0.51 dB
		± 0.57 dB
		± 0.65 dB
		± 0.87 dB
mmW	3 Hz to 20 MHz	± 0.46 dB
(Option 544, 550)	20 to 50 MHz	± 0.35 dB
	50 MHz to 3.6 GHz	± 0.20 dB
	3.5 to 5.2 GHz	± 0.16 dB
	5.2 to 8.4 GHz	± 1.7 dB
	8.3 to 13.6 GHz	± 0.69 dB
	13.5 to 17.1 GHz	± 1.5 dB
	17.0 GHz to 22 GHz	± 0.42 dB
	22.0 to 26.5 GHz	± 1.5 dB
	26.4 to 34.5 GHz	± 0.42 dB
	33.4 to 50 GHz	± 0.39 dB
		± 2.0 dB
		± 0.54 dB
		± 0.62 dB
		± 0.59 dB
		± 0.93 dB
		± 1.28 dB

Amplitude Accuracy and Range Specifications (continued)

Frequency response		Specifications	95th percentile ($\approx 2\sigma$)
Preamp on (0 dB attenuation)			
RF/MW	9 kHz to 1 MHz		± 0.38 dB
(Option P08, P13, P26)	1 to 50 MHz	± 0.68 dB	± 0.32 dB
	50 MHz to 3.6 GHz	± 0.55 dB	± 0.28 dB
	3.5 to 8.4 GHz	± 2.0 dB	± 0.64 dB
	8.3 to 13.6 GHz	± 2.3 dB	± 0.69 dB
	13.5 to 17.1 GHz	± 2.5 dB	± 0.84 dB
	17.0 to 22.0 GHz	± 3.0 dB	± 1.13 dB
	22.0 to 26.5 GHz	± 3.5 dB	± 1.48 dB
mmW	9 kHz to 1 MHz		± 0.45 dB
(Option P44, P50)	1 to 50 MHz	± 0.68 dB	± 0.27 dB
	50 MHz to 3.6 GHz	± 0.60 dB	± 0.29 dB
	3.5 to 5.2 GHz	± 2.0 dB	± 0.75 dB
	5.2 to 8.4 GHz	± 2.0 dB	± 0.52 dB
	8.3 to 13.6 GHz	± 2.3 dB	± 0.61 dB
	13.5 to 17.1 GHz	± 2.5 dB	± 0.61 dB
	17.0 to 22.0 GHz	± 3.0 dB	± 0.73 dB
	22.0 to 26.5 GHz	± 3.5 dB	± 0.63 dB
	26.4 to 34.5 GHz	± 3.0 dB	± 1.11 dB
	34.4 to 50 GHz	± 4.1 dB	± 1.47 dB

Input attenuation switching uncertainty		Specifications	Supplemental information
Relative to 10 dB and preamp off			
At 50 MHz	attenuation 12 to 40 dB	± 0.14 dB	± 0.04 dB typical
(reference frequency)	attenuation 2 to 8 dB	± 0.18 dB	± 0.06 dB typical
	attenuation 0 dB		± 0.05 dB nominal
Attenuation > 2 dB			
	3 Hz to 3.6 GHz		± 0.3 dB nominal
	3.5 to 8.4 GHz		± 0.5 dB nominal
	8.3 to 13.6 GHz		± 0.7 dB nominal
	13.5 to 26.5 GHz		± 0.7 dB nominal
	26.4 to 50 GHz		± 1.0 dB nominal

Amplitude Accuracy and Range Specifications (continued)

Total absolute amplitude accuracy	Specifications	
(10 dB attenuation, 20 to 30°C, 1 Hz ≤ RBW ≤ 1 MHz, input signal -10 to -50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, σ = nominal standard deviation)		
	At 50 MHz	± 0.24 dB
	At all frequencies	± (0.24 dB + frequency response)
	0.01 to 3.6 GHz	± 0.16 dB (95th Percentile approx. 2σ)
Preamp on (Option P08, P13, P26, P44, P50)	At all frequencies	± (0.36 dB + frequency response)

Input voltage standing wave ratio (VSWR)	95th percentile	
(10 dB input attenuation)	Freq Opt 508, 513, 526	Freq Opt 544, 550
50 MHz	1.07 nominal	1.025 nominal
10 MHz to 3.6 GHz	1.101	1.116
3.5 to 8.4 GHz	1.278	1.144
8.3 to 13.6 GHz	1.341	1.158
13.5 to 17.1 GHz	1.58	1.258
17.0 to 26.5 GHz	1.60	1.233
26.4 to 34.5 GHz	NA	1.363
34.4 to 50 GHz	NA	1.55
Preamp on (Option P08, P13, P26, P44, or P50) (0 dB input attenuation)		
10 MHz to 3.6 GHz	1.56	1.40 nominal
3.5 to 8.4 GHz	1.47	1.53
8.3 to 13.6 GHz	1.57	1.389
13.5 to 17.1 GHz	1.72	1.316
17.0 to 26.5 GHz	1.70	1.337
26.4 to 34.5 GHz	NA	1.42
34.4 to 50 GHz	NA	1.62

Amplitude Accuracy and Range Specifications (continued)

Resolution bandwidth switching uncertainty (referenced to 30 kHz RBW)

1 Hz to 1.5 MHz RBW	± 0.03 dB
1.6 MHz to 2.7 MHz RBW	± 0.05 dB
3 MHz RBW	± 0.10 dB
4, 5, 6, 8 MHz RBW	± 0.30 dB

Reference level

Range	
Log scale	-170 to +30 dBm in 0.01 dB steps
Linear scale	707 pV to 7.07 V with 0.11% (0.01 dB) resolution

Accuracy	0 dB ¹
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Display scale switching uncertainty

Switching between linear and log	0 dB ¹
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Log scale/div switching	0 dB ¹
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Display scale fidelity

Between -10 dBm and -18 dBm input mixer level	± 0.10 dB total	± 0.04 dB typical
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Below -18 dBm input mixer level	± 0.07 dB	± 0.02 dB typical
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Trace detectors

Standard	Normal, peak, sample, negative peak, log power average, RMS average, and voltage average
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With Option EMC	Add quasi-peak to above
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Preamplifier

Frequency range ²	Option P08	9 kHz to 8.4 GHz
	Option P13	9 kHz to 13.6 GHz
	Option P26	9 kHz to 26.5 GHz
	Option P44	9 kHz to 44 GHz
	Option P50	9 kHz to 50 GHz
Gain	9 kHz to 3.6 GHz	+20 dB nominal
	3.6 to 26.5 GHz	+35 dB nominal (for freq opts ≤ 526)
	3.6 to 50 GHz	+40 dB nominal (for freq opts > 526)

1. Only affects the display, not the measurement, so it causes no additional error in measurement results from trace data or markers.
2. Below 100 kHz, only 95th percentile (approx. 2s) value for frequency response is provide

Dynamic Range Specifications

1 dB gain compression (two-tone)		Maximum power at input mixer
(At 1 kHz RBW with 100 kHz tone spacing)		
	20 to 40 MHz	2 dBm nominal
	40 MHz to 2 GHz	5 dBm nominal
	2 to 26.5 GHz	10 dBm nominal
	26.5 to 50 GHz	0 dBm nominal
Preamp On	10 MHz to 3.6 GHz	-14 dBm nominal
(Option P08, P13, P26, P44, P50)	3.6 to 26.5 GHz	
	Tone spacing 100 kHz to 20 MHz	-28 dBm nominal
	Tone spacing > 70 MHz	
	Freq Opt ≤ 526	-10 dBm nominal
	Freq Opt > 526	-20 dBm nominal
	26.5 to 50 GHz	-30 dBm nominal

Displayed average noise level (DANL) ¹	Specifications	Typical
(Input terminated, sample or average detector, averaging type = Log, 0 dB input attenuation, IF Gain = High, 1 Hz RBW, 20 to 30 °C)		
RF/MW (Option 508, 513, 526)	LNP Off/LNP On ²	LNP Off/LNP On ²
	3 to 10 Hz	-100 dBm/NA nominal
	10 to 100 Hz	-125 dBm/NA nominal
	100 Hz to 1 kHz	-130 dBm/NA nominal
	1 to 9 kHz	-137 dBm/NA nominal
	9 to 100 kHz	-141 dBm/NA
	100 kHz to 1 MHz	-146 dBm/NA typical
	1 to 10 MHz	-150 dBm/NA
	10 MHz to 1.2 GHz	-155 dBm/NA
	1.2 to 2.1 GHz	-155 dBm/NA
	2.1 to 3.0 GHz	-155 dBm/NA typical
	3.0 to 3.6 GHz	-153 dBm/NA
	3.5 to 4.2 GHz	-152 dBm/NA typical
	4.2 to 8.4 GHz	-149 dBm/-154 dBm
	8.3 to 13.6 GHz	-150 dBm/-155 dBm
	13.5 to 16.9 GHz	-149 dBm/-155 dBm
	16.9 to 20.0 GHz	-145 dBm/-152 dBm
	20.0 to 26.5 GHz	-147 dBm/-155 dBm typical
Preamp On ³	100 to 200 kHz	-146 dBm/-154 dBm typical
(Option 508, 513, or 526)	200 to 500 kHz	-152 dBm/-155 dBm
	0.5 to 1 MHz	-152 dBm/-155 dBm
	1 to 10 MHz	-159 dBm
	10 MHz to 2.1 GHz	-161 dBm
	2.1 to 3.6 GHz	-166 dBm
	3.5 to 8.4 GHz	-166 dBm
	8.3 to 13.6 GHz	-166 dBm
	13.5 to 16.9 GHz	-163 dBm
	16.9 to 20.0 GHz	-163 dBm
	20.0 to 26.5 GHz	-159 dBm
		-161 dBm
		-158 dBm

1. With the NFE (Noise Floor Extension) "Off".

2. LNP (Low Noise Path) is standard for the UXA.

3. At higher frequency bands (beyond 3.6 GHz), Preamp "On" supersedes "LNP enabled". LNP cannot operate simultaneously with preamp.

Dynamic Range Specifications (continued)

Displayed average noise level (DANL) with noise floor extension (NF2) on	Specifications			Improvement @ 95th percentile		
	Preamp Off	Preamp On	LNP On	Preamp Off	Preamp On	LNP On
RF/MW (Option 508, 513, 526)						
Band 0, f > 20 MHz				9 dB	10 dB	NA
Band 1				10 dB	9 dB	10 dB
Band 2				10 dB	10 dB	10 dB
Band 3				9 dB	9 dB	10 dB
Band 4				9 dB	8 dB	9 dB
Examples of effective DANL (1 Hz RBW)	Preamp Off	Preamp On	LNP On			
Mid-Band 0 (1.8 GHz)	-161 dBm	-171 dBm	NA			
Mid-Band 1 (5.95 GHz)	-158 dBm	-172 dBm	-162 dBm			
Mid-Band 2 (10.95 GHz)	-159 dBm	-168 dBm	-162 dBm			
Mid-Band 3 (15.3 GHz)	-152 dBm	-165 dBm	-160 dBm			
Mid-Band 4 (21.75 GHz)	-149 dBm	-160 dBm	-160 dBm			

Displayed average noise level (DANL) ¹	Specifications	Typical
(Input terminated, sample or average detector, averaging type = Log, 0 dB input attenuation, IF Gain = High, 1 Hz RBW, 20 to 30 °C)		
mmW (Option 544, 550)	LNP Off/LNP On ²	LNP Off/LNP On ²
3 to 10 Hz		-95 dBm/NA nominal
10 to 100 Hz		-114 dBm/NA nominal
100 Hz to 1 kHz		-128 dBm/NA nominal
1 to 9 kHz		-136 dBm/NA nominal
9 to 100 kHz	-141 dBm/NA	-144 dBm/NA typical
100 kHz to 1 MHz	-150 dBm/NA	-154 dBm/NA typical
1 to 10 MHz	-154 dBm/NA	-156 dBm/NA typical
10 MHz to 1.2 GHz	-153 dBm/NA	-155 dBm/NA typical
1.2 to 2.1 GHz	-151 dBm/NA	-153 dBm/NA typical
2.1 to 3.0 GHz	-150 dBm/NA	-152 dBm/NA typical
3.0 to 3.6 GHz	-149 dBm/NA	-151 dBm/NA typical
3.5 to 4.2 GHz	-145 dBm/-151 dBm	-148 dBm/-154 dBm typical
4.2 to 6.6 GHz	-144 dBm/-152 dBm	-148 dBm/-154 dBm typical
6.6 to 13.6 GHz	-147 dBm/-153 dBm	-149 dBm/-155 dBm typical
13.5 to 14 GHz	-144 dBm/-150 dBm	-148 dBm/-153 dBm typical
14 to 17 GHz	-145 dBm/-151 dBm	-148 dBm/-153 dBm typical
17 to 22.5 GHz	-141 dBm/-149 dBm	-146 dBm/-152 dBm typical
22.5 to 26.5 GHz	-139 dBm/-146 dBm	-143 dBm/-150 dBm typical
26.4 to 34 GHz	-138 dBm/-146 dBm	-143 dBm/-150 dBm typical
33.9 to 37 GHz	-134 dBm/-142 dBm	-140 dBm/-148 dBm typical
37 to 40 GHz	-132 dBm/-141 dBm	-139 dBm/-146 dBm typical
40 to 46 GHz	-130 dBm/-141 dBm	-137 dBm/-146 dBm typical
46 to 49 GHz	-130 dBm/-139 dBm	-137 dBm/-145 dBm typical
49 to 50 GHz	-128 dBm/-139 dBm	-135 dBm/-145 dBm typical

1. With the NFE (Noise Floor Extension) "Off".

2. LNP (Low Noise Path) is standard for the UXA.

Dynamic Range Specifications (continued)

Preamp On ¹ (Option P08, P13, P26, P44, P50)	Specifications	Typical
100 to 200 kHz	-157 dBm	-159 dBm typical
200 to 500 kHz	-159 dBm	-161 dBm typical
0.5 to 1 MHz	-162 dBm	-164 dBm typical
1 to 2.1 GHz	-164 dBm	-165 dBm typical
2.1 to 3.6 GHz	-162 dBm	-164 dBm typical
3.5 to 13.6 GHz	-161 dBm	-162 dBm typical
13.5 to 17.1 GHz	-161 dBm	-164 dBm typical
17.0 to 20.0 GHz	-160 dBm	-163 dBm typical
20.0 to 26.5 GHz	-158 dBm	-161 dBm typical
26.4 to 30 GHz	-157 dBm	-160 dBm typical
30 to 34 GHz	-155 dBm	-159 dBm typical
33.9 to 37 GHz	-153 dBm	-158 dBm typical
37 to 40 GHz	-152 dBm	-156 dBm typical
40 to 46 GHz	-149 dBm	-155 dBm typical
46 to 50 GHz	-146 dBm	-152 dBm typical

1. LNP (low noise path) "Off". LNP cannot operate simultaneously with preamp.

Displayed average noise level (DANL) with noise floor extension (NF2) on	Specifications			Improvement @ 95th percentile		
	Preamp Off	Preamp On	LNP On	Preamp Off	Preamp On	LNP On
mmW (Opt 544, 550)						
Band 0, $f > 20$ MHz				10 dB	9 dB	NA
Band 1				8 dB	9 dB	9 dB
Band 2				8 dB	8 dB	9 dB
Band 3				9 dB	8 dB	10 dB
Band 4				10 dB	8 dB	11 dB
Band 5				11 dB	8 dB	11 dB
Band 6				11 dB	7 dB	11 dB
Examples of effective DANL (1 Hz RBW)	Preamp Off	Preamp On	LNP On			
Mid-Band 0 (1.8 GHz)	-160 dBm	-172 dBm	NA			
Mid-Band 1 (5.95 GHz)	-154 dBm	-165 dBm	-157 dBm			
Mid-Band 2 (10.95 GHz)	-154 dBm	-167 dBm	-157 dBm			
Mid-Band 3 (15.3 GHz)	-154 dBm	-167 dBm	-157 dBm			
Mid-Band 4 (21.75 GHz)	-150 dBm	-164 dBm	-157 dBm			
Mid-Band 5 (30.4 GHz)	-146 dBm	-160 dBm	-155 dBm			
Mid-Band 6 (42.7 GHz)	-140 dBm	-154 dBm	-150 dBm			

Dynamic Range Specifications (continued)

Residuals, images, and spurious responses						
Residual responses (Input terminated and 0 dB attenuation)		200 kHz to 8.4 GHz Zero span or FFT or other frequencies	-100 dBm -100 dBm nominal			
Image responses (Mixer level at -10 dBm)	Tuned Freq (f)	Excitation Freq	Response RF/MW (Opt 508, 513, 526)		mmW (Opt 544, 550)	
	10 MHz to 26.5 GHz	f+45 MHz	-80 dBc	-105 dBc typical	-80 dBc	-104 dBc typical
	10 MHz to 3.6 GHz	f+10,245 MHz	-80 dBc	-106 dBc typical	-80 dBc	-106 dBc typical
	10 MHz to 3.6 GHz	f+645 MHz	-80 dBc	-101 dBc typical	-80 dBc	-101 dBc typical
	3.5 to 13.6 GHz	f+645 MHz	-78 dBc	-86 dBc typical	-80 dBc	-106 dBc typical
	13.5 to 17.1 GHz	f+645 MHz	-74 dBc	-84 dBc typical	-80 dBc	-106 dBc typical
	17.0 to 22 GHz	f+645 MHz	-70 dBc	-78 dBc typical	-80 dBc	-101 dBc typical
	22 to 26.5 GHz	f+645 MHz	-66 dBc	-75 dBc typical	-70 dBc	-102 dBc typical
(Mixer level at -30 dBm)	26.5 to 50 GHz	f+45 MHz				-90 dBc nominal
	26.5 to 34.5 GHz	f+645 MHz			-70 dBc	-98 dBc typical
	34.4 to 42 GHz	f+645 MHz			-60 dBc	-84 dBc typical
	42 to 50 GHz	f+645 MHz				-75 dBc nominal
Other spurious responses	Mixer level	Response				
Carrier frequency \leq 26.5 GHz						
First RF order (f \geq 10 MHz from carrier)	-10 dBm	-80 dBc + 20log(N ²) Including IF feedthrough, LO harmonic mixing responses				
Higher RF order (f \geq 10 MHz from carrier)	-40 dBm	-80 dBc + 20log(N ²) Including higher order mixer responses				
Carrier frequency > 26.5 GHz						
(f \geq 10 MHz from carrier)	-30 dBm	-90 dBc nominal				
LO-related spurious responses (200 Hz \leq f < 10 MHz from carrier)	-10 dBm	-68 dBc ¹ + 20log(N ²)				
Line-related spurious responses		-73 dBc ¹ + 20log(N ²) (nominal)				

1. Nominally -40 dBc under large magnetic (0.38 Gauss rms) or vibrational (0.21 g rms) environmental stimuli.

2. N is the LO multiplication factor. Refer to page 3 for the N value versus frequency ranges.

Dynamic Range Specifications (continued)

Second harmonic distortion (SHI)				
	Source frequency	Mixer level	Distortion (LNP Off/LNP ON)	SHI (LNP Off/LNP On)
RF/MW (Opt 508, 513, 526)	10 MHz to 1.8 GHz	-15 dBm	-60 dBc/NA	+45 dBm/NA
	1.75 to 2.5 GHz	-15 dBm	-77 dBc/-95 dBc	+62 dBm/+80 dBm
	2.5 to 4 GHz	-15 dBm	-77 dBc/-101 dBc	+62 dBm/+86 dBm
	4 to 6.5 GHz	-15 dBm	-77 dBc/-105 dBc	+62 dBm/+90 dBm
	6.5 to 10 GHz	-15 dBm	-70 dBc/-105 dBc	+55 dBm/+90 dBm
	10 to 13.25 GHz	-15 dBm	-62 dBc/-105 dBc	+47 dBm/+90 dBm
mmW (Opt 544, 550)	10 MHz to 1.8 GHz	-15 dBm	-60 dBc/NA	+45 dBm/NA
	1.75 to 2.5 GHz	-15 dBm	-72 dBc/-95 dBc	+57 dBm/+80 dBm
	2.5 to 4 GHz	-15 dBm	-72 dBc/-99 dBc	+57 dBm/+84 dBm
	4 to 6.5 GHz	-15 dBm	-77 dBc/-105 dBc	+62 dBm/+90 dBm
	6.5 to 10 GHz	-15 dBm	-70 dBc/-105 dBc	+55 dBm/+90 dBm
	10 to 13.25 GHz	-15 dBm	-62 dBc/-105 dBc	+47 dBm/+90 dBm
	13.25 to 25 GHz	-15 dBm	-65 dBc/-105 dBc (nom)	+50/+90 dBm (nom)
	Source frequency	Preamp level	Distortion	SHI
Preamp On (Option P08, P13, P26, P44, P50)	10 MHz to 1.8 GHz	-45 dBm	-78 dBc nominal	+33 dBm nominal
	1.8 to 13.25 GHz	-50 dBm	-60 dBc nominal	+10 dBm nominal
	13.25 to 25 GHz	-50 dBm	-50 dBc nominal	0 dBm nominal
Third-order intermodulation distortion (TOI)				
(two -16 dBm tones at input mixer with tone separation > 5 times IF prefilter bandwidth, 20 to 30 °C)				
RF/MW (Opt 508, 513, 526)	10 to 300 MHz	+13.5 dBm		+16 dBm typical
	300 to 600 MHz	+18 dBm		+21 dBm typical
	0.6 to 1.5 GHz	+20 dBm		+22 dBm typical
	1.5 to 3.6 GHz	+21 dBm		+23 dBm typical
	3.5 to 8.4 GHz	+19 dBm		+22 dBm typical
	8.3 to 13.6 GHz	+19 dBm		+23 dBm typical
	13.5 to 17.1 GHz	+18 dBm		+23 dBm typical
	17.0 to 26.5 GHz	+19 dBm		+24 dBm typical
mmW (Opt 544, 550)	10 to 300 MHz	+13.5 dBm		+16 dBm typical
	300 to 600 MHz	+18 dBm		+21 dBm typical
	0.6 to 1.5 GHz	+20 dBm		+22 dBm typical
	1.5 to 3.6 GHz	+21 dBm		+23 dBm typical
	3.5 to 13.6 GHz	+16 dBm		+23 dBm typical
	13.5 to 17.1 GHz	+13 dBm		+17 dBm typical
	17.0 to 26.5 GHz	+13 dBm		+20 dBm typical
	26.5 to 50 GHz			+13 dBm nominal
Preamp On (Option P08, P13, P26, P44, P50)				
Tones at preamp input				
(two -45 dBm)	10 to 500 MHz			+4 dBm nominal
(two -45 dBm)	500 MHz to 3.6 GHz			+4.5 dBm nominal
(two -50 dBm)	3.6 to 26.5 GHz			-15 dBm nominal

Dynamic Range Specifications (continued)

Phase noise			
	Offset	Specifications	Typical
Noise sidebands (20 to 30 °C, CF = 1 GHz)	10 Hz	-90 dBc/Hz ¹	-95 dBc/Hz typical ¹
	100 Hz	-107 dBc/Hz	-112 dBc/Hz typical
	1 kHz	-125 dBc/Hz	-129 dBc/Hz typical
	10 kHz	-134 dBc/Hz	-136 dBc/Hz typical
	100 kHz	-139 dBc/Hz	-142 dBc/Hz typical
	1 MHz	-145 dBc/Hz	-147 dBc/Hz typical
	10 MHz	-155 dBc/Hz	-157 dBc/Hz typical

1. For wide reference loop bandwidth.

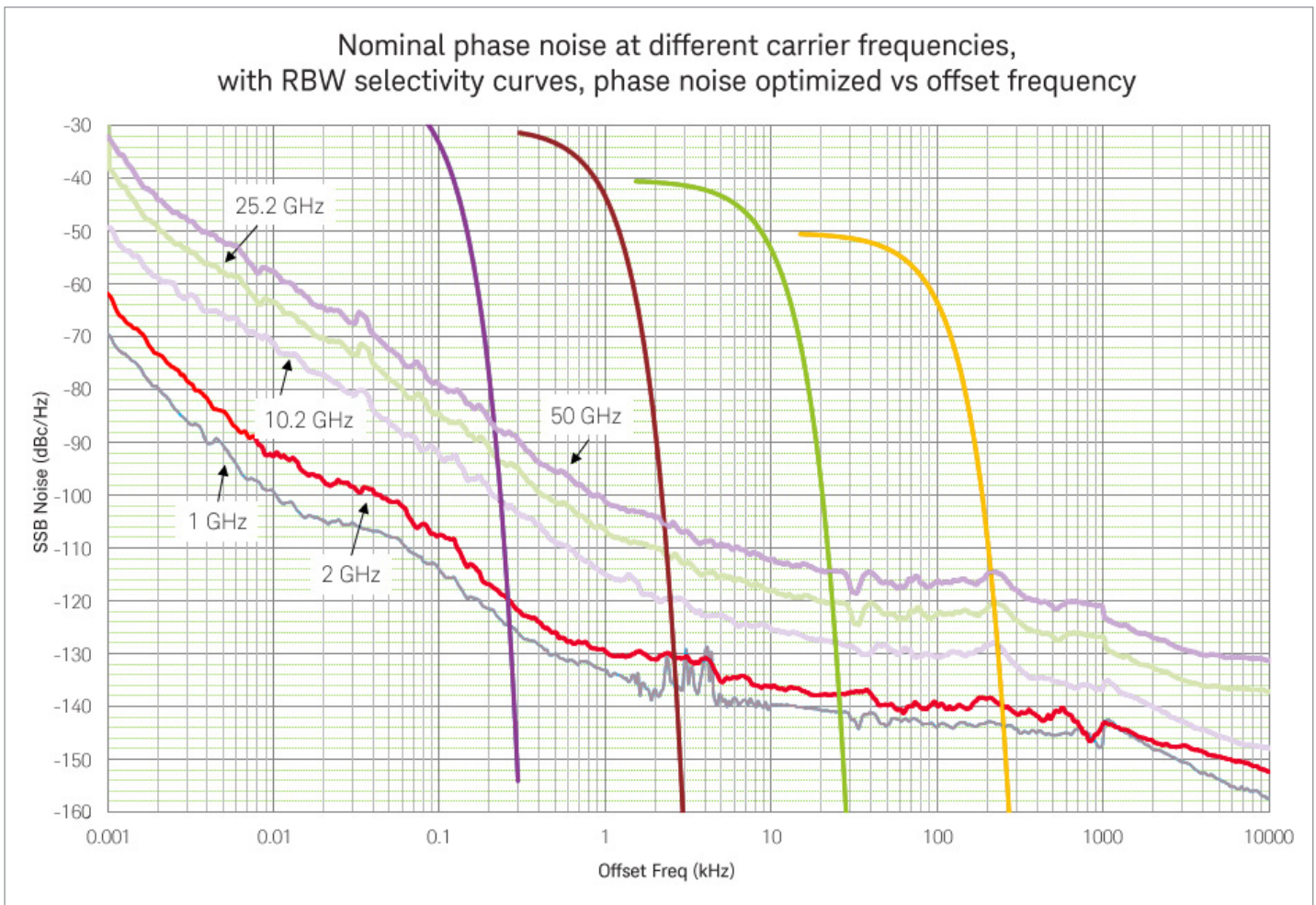


Figure 1. Nominal UXA phase noise at various center frequencies. 50 GHz curve is the predicted phase noise computed from the 25.2 GHz observation.

General Specifications

Temperature range

Operating	0 to 55 °C
Storage	-40 to +70 °C

Altitude

4,500 meters (approx. 15,000 feet)

EMC

Complies with the essential requirements of the European EMC Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity):

- 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.

South Korean Class A EMC declaration

This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

A 급 기기 (업무용 방송통신기자재)이 기 기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라 며, 가 정외의 지역에서 사용하는 것을 목적으로 합니다.

Safety

Complies with the essential requirements of the European Low Voltage Directive as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61010-1
- Canada: CSA C22.2 No. 61010-1
- USA: UL std no. 61010-1

Acoustic statement (European Machinery Directive)

Acoustic noise emission

LpA < 70 dB

Operator position

Normal operation mode per ISO 7779

Acoustic noise - more information

Values given are per ISO 7779 standard in the "Operator Sitting" position

Ambient temperature

< 35 °C

Nominally under 55 dBA Sound Pressure. 55 dBA is generally considered suitable for use in quiet office environment

≥ 35 °C

Nominally under 65 dBA Sound Pressure. 65 dBA is generally considered suitable for use in noisy office environment

Environmental stress

Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation, and end-use; those stresses include, but are not limited to, temperature, humidity, shock, vibration, altitude, and power line conditions; test methods are aligned with IEC 60068-2 and levels are similar to MILPRF-28800F Class 3.

Power requirements

Voltage and frequency	100 to 120 V, 50/60/400 Hz 220 to 240 V, 50/60 Hz
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Power consumption

On	850 W (Maximum)
Standby	25 W

General Specifications (continued)

Display

Resolution	1,280 x 800
Size	357 mm (14.1 in.) diagonal (nominal) Capacitive multi-touch screen

Data storage

Internal	Removable solid state drive (\geq 80 GB) and secure digital (SD) memory device
External	Supports USB 3.0/2.0 compatible memory devices

Weight (Basic configuration)

Net	30.9 kg (68 lbs) nominal
Shipping	39.5 kg (87 lbs) nominal

Dimensions

Height	280 mm (11 in)
Width	459 mm (18 in)
Length	500 mm (19.8 in)

Warranty

The UXA signal analyzer is supplied with a 3-year standard warranty

Calibration cycle

The recommended calibration cycle is one year. Calibration services are available through Keysight service centers

Inputs and Outputs

Front panel	
RF input connector	
Standard (for Opt 508, 513, 526)	Type-N female, 50 Ω nominal
Standard (for Opt 544, 550)	2.4 mm male, 50 Ω nominal
Option C35 (with Option 526 only)	APC 3.5 mm male, 50 Ω nominal
Probe power	+15 Vdc, \pm 7% at 150 mA max nominal
Voltage/current	-12.6 Vdc, \pm 10% at 150 mA max nominal
USB ports	
Master (3 ports)	
Standard	Compatible with USB 2.0
Connector	USB Type-A female
Output current	0.5 A nominal
Headphone jack	Miniature stereo audio jack (3.5 mm, also known as "1/8 inch")
External mixing	
Connection port	
Connector	SMA, female
Impedance	50 Ω nominal
Functions	Triplexed for mixer bias, IF input and LO output
Mixer bias range	\pm 10 mA in 10 μ A step
IF center frequency	
\leq 25 MHz IF path	322.5 MHz
40 MHz BW IF path	250.0 MHz
255 MHz BW IF path	750.0 MHz
510 MHz BW IF path	877.1484375 MHz
LO output frequency range	3.75 to 14.1 GHz
Rear panel	
10 MHz out	
Connector	BNC female, 50 Ω nominal
Output amplitude	\geq 0 dBm nominal
Frequency	10 MHz + (10 MHz x frequency reference accuracy)
Ext Ref In	
Connector	BNC female, 50 Ω nominal
Input amplitude range	-5 to 10 dBm nominal
Input frequency	1 to 50 MHz nominal (selectable to 1 Hz resolution)
Frequency lock range	\pm 2 x 10 ⁻⁶ of specified external reference input frequency
Trigger 1 and 2 inputs	
Connector	BNC female
Impedance	> 10 k Ω nominal
Trigger level range	-5 to +5 V (TTL) factory preset
Trigger 1 and 2 outputs	
Connector	BNC female
Impedance	50 Ω nominal
Level	0 to 5 V (CMOS) nominal
Sync (reserved for future use)	
Connector	BNC female
Monitor output 1	
Connector	VGA compatible, 15-pin mini D-SUB
Format	XGA (60 Hz vertical sync rates, non-interlaced) Analog RGB
Resolution	1,280x800

Inputs and Outputs (continued)

Monitor output 2	
Connector	Mini DisplayPort
Resolution	1,280x800
Noise source drive +28 V (pulsed)	
Connector	BNC female
Output voltage	On 28.0 ± 0.1 V (60 mA maximum) Off < 1 V
SNS series noise source	For use with the Agilent/Keysight SNS Series noise sources
Digital bus	
Connector	MDR-80
Analog out	
Connector	BNC female
USB ports	
Master (3 ports)	
Standard	Two ports (stacked with each other) are compatible with USB 3.0; one (stacked with LAN port) with USB 2.0
Connector	USB Type-A female
Output current	0.5 A nominal
Slave (1 port)	
Standard	Compatible with USB 3.0
Connector	USB Type-B female
GPIB interface	
Connector	IEEE-488 bus connector
GPIB codes	SH1, AH1, T6, SR1, RL1, PP0, DC1, C1, C2, C3, C28, DT1, L4, C0
GPIB mode	Controller or device
LAN TCP/IP interface	
Standard	1000Base-T
Connector	RJ45 Ethertwist
IF output	
Connector	SMA female, shared by the second IF out (wideband, standard) and Opt CRP, and ALV
Impedance	50 Ω nominal
2nd IF output	
Center frequency	
SA mode or I/Q analyzer with IF BW ≤ 25 MHz	322.5 MHz
with Option B40	250 MHz
with Option B2X	750 MHz
with Option B5X	877.1484375 MHz
Conversion gain	1 dB nominal
Bandwidth	
Low band	
IF Path ≤ 40 MHz	Up to 160 MHz nominal
IF Path 255 MHz	255 MHz nominal
IF Path 510 MHz	510 MHz nominal
High band, with preselector bypassed	Up to 800 MHz (nominal); expandable to 1200 MHz with corrections

Other Optional Outputs

Option ALV log video out

General port specifications		
Connector	SMA female	Shared with other options
Impedance		50 Ω nominal
Fast log video output		
Output voltage	Open-circuit voltages shown	
Maximum	1.6 V at -10 dBm nominal	
Slope	25 \pm 1 mV/dB nominal	
Log fidelity		
Range	49 dB (nominal) with input frequency at 1 GHz	
Accuracy within range	\pm 1.0 dB nominal	
Rise time	15 ns nominal	
Fall time		
Bands 1-4 with Option MPB	40 ns nominal best case	
Other cases	Depends on bandwidth	

Option CRP programmable IF output

General port specifications		
Connector	SMA female	Shared with other options
Impedance		50 Ω nominal
Programmable IF output		
Center frequency		
Range	10 to 75 MHz (user selectable)	
Resolution	0.5 MHz	
Conversion gain	-1 to +4 dB (nominal) plus RF frequency response	
Bandwidth		
Output at 70 MHz		
Low band or high band with preselector bypassed	100 MHz (nominal)	
Preselected band	Depends on RF center frequency	
Lower output frequencies	Subject to folding	
Residual output signals	\leq -88 dBm (nominal)	

Other Optional Outputs (continued)

Option YAV Y-axis output

General port specifications

Connector Impedance	SMA female	Shared with other options 50 Ω nominal
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Screen video

Operating conditions		"Lin" is linear in voltage
Display scale types	Log or Lin	
Log scales	All (0.1 to 20 dB/div)	
Modes	Spectrum analyzer only	
Gating	Gating must be off	
Output scaling	0 to 1.0 V open circuit, representing bottom to top of screen	
Offset		
Gain accuracy	$\pm 1\%$ of full scale nominal $\pm 1\%$ of output voltage nominal	

Log video (Log envelope) output

Amplitude range (terminated with 50 Ω)	
Maximum	V nominal for -10 dBm at the mixer
Scale factor	1 V per 192.66 dB
Bandwidth	Set by RBW
Operating conditions	Select Sweep Type = SweptSpectrum analyzer only

Linear video output

Amplitude range (terminated with 50 Ω)	
Maximum	1.0 V nominal for signal envelope at the reference level
Minimum	0 V
Scale factor	If carrier level is set to half the reference level in volts, the scale factor is 200% of carrier level per volt. Regardless of the carrier level, the scale factor is 100% of reference level per volt.
Bandwidth	Set by RBW
Operating conditions	Select Sweep Type = Swept

I/Q Analyzer

Frequency

Frequency span	
Option B25 (standard)	10 Hz to 25 MHz
Option B40	10 Hz to 40 MHz
Option B2X	10 Hz to 255 MHz
Option B5X	10 Hz to 510 MHz

Resolution bandwidth (spectrum measurement)

Range	
Overall	100 mHz to 3 MHz
Span = 1 MHz	50 Hz to 3 MHz
Span = 10 kHz	1 Hz to 10 kHz
Span = 100 Hz	100 mHz to 100 Hz
Window shapes	Flat Top, Uniform, Hanning, Hamming, Gaussian, Blackman, Blackman-Harris, Kaiser Bessel (K-B 70 dB, K-B 90 dB and K-B 110 dB)

Analysis bandwidth (waveform measurement)

Option B25 (standard)	10 Hz to 25 MHz
Option B40	10 Hz to 40 MHz
Option B2X	10 Hz to 255 MHz
Option B5X	10 Hz to 510 MHz

IF frequency response (standard 10 MHz IF path)

IF frequency response (demodulation and FFT response relative to the center frequency)

Frequency (GHz)	Span (MHz)	Preselector	Max error	Midwidth error (95th percentile)	Slope (dB/MHz) (95th percentile)	RMS (nominal)
≤ 3.6	≤ 10	NA	± 0.20 dB	± 0.12 dB	± 0.10 dB	0.02 dB
3.6 to < 26.5	≤ 10	Off ₁₂	± 0.25 dB	± 0.12 dB	± 0.10 dB	0.02 dB
≥ 26.5	≤ 10	Off ₁₂	± 0.30 dB	± 0.12 dB	± 0.10 dB	0.024 dB

IF phase linearity

Center freq (GHz)	Span (MHz)	Preselector	Peak-to-peak (nominal)	RMS (nominal)
≥ 0.02, < 3.6	≤ 10	NA	0.14°	0.032°
≥ 3.6	≤ 10	Off ¹	0.27°	0.057°

Dynamic range (standard 10 MHz IF path)

Clipping-to-noise dynamic range	Excluding residuals and spurious responses
Clipping level at mixer	Center frequency ≥ 20 MHz
IF gain = Low	-8 dBm nominal
IF gain = High	-17.5 dBm nominal
Noise density at mixer at center frequency	(DANL + IF Gain effect) + 2.25 dB

1. MPB (microwave preselector bypass) is enabled. All UXAs ship with MPB as a standard feature.

I/Q Analyzer (continued)

Data acquisition (standard 10 MHz IF path)						
Time record length						
Analysis tool						
IQ analyzer		8,000,000 IQ sample pairs		Waveform measurement		
Advanced tool		Data packing		With 89600 VSA or fast capture		
		32-bit	64-bit			
Length (IQ sample pairs)		536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)	2 GB total memory		
Length (time units)		Samples/Sample rate (IQ pairs)				
Sample rate						
IQ pairs		1.25 x IFBW				
ADC resolution		16 bits				
IF frequency response (standard 25 MHz IF path)						
IF frequency response (demodulation and FFT response relative to the center frequency)						
Freq (GHz)	Span (MHz)	Preselector	Max error	Midwidth error (95th percentile)	Slope (dB/MHz) (95th percentile)	RMS (nominal)
< 3.6	≤ 25	NA	± 0.30 dB	± 0.12 dB	± 0.1 dB	0.02 dB
3.6 to < 26.5	≤ 25	Off ¹	± 0.40 dB	± 0.12 dB	± 0.1 dB	0.03 dB
≥ 26.5	≤ 25	Off ¹	± 0.40 dB			0.02 dB
IF phase linearity						
Center freq (GHz)	Span (MHz)	Preselector		Peak-to-peak (nominal)		RMS (nominal)
≥ 0.02, < 3.6	≤ 25	NA		0.41°		0.11°
≥ 3.6	≤ 25	Off ¹		1.0°		0.27°
Dynamic range (standard 25 MHz IF path)						
Full scale (ADC clipping)						
Default settings, signal at CF (IF gain = Low)						
Band 0				-8 dBm mixer level nominal		
Bands 1 through 4				-7 dBm mixer level nominal		
High gain setting, signal at CF (IF gain = High)						
Band 0				-18 dBm mixer level nominal, subject to gain limitations		
Bands 1 through 6				-17 dBm mixer level nominal, subject to gain limitations		
Effect of signal frequency ≠ CF				Up to ± 3 dB nominal		

1. MPB (microwave preselector bypass) is enabled. All UXAs ship with MPB as a standard feature.

I/Q Analyzer (continued)

Data acquisition (standard 25 MHz IF path)			
Time record length			
Analysis tool			
IQ analyzer	8,000,000 IQ sample pairs	Waveform measurement	
Advanced tool	Data packing		With 89600 VSA or fast capture
	32-bit	64-bit	
Length (IQ sample pairs)	536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)	2 GB total memory
Length (time units)	Samples/Sample rate (IQ pairs)		
Sample rate			
IQ pairs	1.25 x IF BW		
ADC resolution	16 bits		

Option B40 40 MHz analysis bandwidth (Option B40 is automatically included in Option B2X or B5X)

IF frequency response (40 MHz IF path)					
IF frequency response (relative to center)					
Freq (GHz)	Span (MHz)	Preselector	Specification	Typical	RMS (nominal)
$\geq 0.03, < 3.6$	≤ 40	NA	± 0.37 dB	± 0.22 dB	0.07 dB
$\geq 3.6, \leq 8.4$	≤ 40	Off ¹	± 0.5 dB	± 0.13 dB	0.05 dB
$> 8.4, \leq 26.5$	≤ 40	Off ¹	± 0.7 dB	± 0.14 dB	0.05 dB
$> 26.5, \leq 34.4$	≤ 40	Off ¹	± 0.8 dB	± 0.25 dB	0.07 dB
> 34.4	≤ 40	Off ¹	± 1 dB	± 0.35 dB	0.07 dB
IF phase linearity					
Center freq (GHz)	Span (MHz)	Preselector	Peak-to-peak (nominal)	RMS (nominal)	
$\geq 0.02, < 3.6$	≤ 40	NA	0.36°	0.083°	
≥ 3.6	≤ 40	Off ¹	1.0°	0.24°	
Dynamic range (40 MHz IF path)					
SFDR					
(Spurious-free dynamic range)					
Signal frequency within ± 12 MHz of center		-80 dBc nominal			
Signal frequency anywhere within analysis BW					
Spurious response within ± 18 MHz of center		-79 dBc nominal			
Response anywhere within analysis BW		-77 dBc nominal			
Full scale (ADC clipping)		Mixer level			
Default settings, signal at CF (IF gain = Low)		RF/MW (Opt 508, 513, 526)		mmW (Opt 544, 550)	
Band 0		-8 dBm nominal		-8 dBm nominal	
Bands 1 through 4		-6 dBm nominal		-7 dBm nominal	
Bands 5 through 6				-7 dBm nominal	
High gain setting, signal at CF (IF gain = High)		subject to gain limitations			
Band 0		-16 dBm nominal		-12 dBm nominal	
Bands 1 through 2		-9 dBm nominal		-16 dBm nominal	
Bands 3 through 4		-6 dBm nominal		-16 dBm nominal	
Bands 5 through 6				-15 dBm nominal	
Effect of signal frequency \neq CF		Up to ± 4 dB nominal			

1. MPB (microwave preselector bypass) is enabled. All UXAs ship with MPB as a standard feature.

I/Q Analyzer (continued)

Data acquisition (40 MHz IF path)			
Time record length			
Analysis tool			
IQ analyzer	8,000,000 IQ sample pairs	Waveform measurement	
Advanced tool	Data packing		With 89600 VSA software or fast capture
	32-bit	64-bit	
Length (IQ sample pairs)	536 MSa (2 ²⁹ Sa)	268 MSa (2 ²⁸ Sa)	2 GB total memory
Length (time units)	Samples/Sample rate (IQ pairs)		
Sample rate			
IQ pairs	1.25 x IF BW		
ADC resolution	12 bits		

Option B2X 255 MHz analysis bandwidth

IF frequency response (255 MHz IF path)					
Center Freq (GHz)	Span (MHz)	Preselector	Specification	Typical	RMS (nominal)
≥ 0.4, < 3.6	≤ 255	NA	± 0.74 dB	± 0.3 dB	0.1 dB
> 3.6, ≤ 8.4	≤ 255	Off ¹	± 0.82 dB	± 0.34 dB	0.1 dB
> 8.4	≤ 255	Off ¹		± 0.8 dB nominal	0.2 dB
IF phase linearity (255 MHz IF path)					
Center Freq (GHz)	Span (MHz)	Preselector		Pk-to-pk (nominal)	RMS (nominal)
≥ 0.4, < 3.6	≤ 255	NA		3°	0.6°
≥ 3.6, < 26.5	≤ 255	Off ¹		2°	0.5°
≥ 26.5	≤ 255	Off ¹		4°	0.8°
Dynamic range (255 MHz IF path)					
Spurious-free dynamic range (SFDR) Anywhere within the analysis BW					
Center frequency ≤ 26.5 GHz			-78 dBc nominal		
Full scale (ADC clipping)			Mixer level		
Default setting, signal at CF			RF/MW (Opt 508, 513, 526)		mmW (Opt 544, 550)
Band 0			+2 dBm nominal		+3 dBm nominal
Bands 1 through 2			+4 dBm nominal		+3 dBm nominal
Bands 3 through 4			+4 dBm nominal		+1 dBm nominal
Bands 5 through 6					+1 dBm nominal
High gain setting, signal at CF					
Band 0			-4 dBm nominal		-1 dBm nominal
Bands 1 through 2			+2 dBm nominal		-4 dBm nominal
Bands 3 through 4			+4 dBm nominal		-6 dBm nominal
Bands 5 through 6					-5 dBm nominal
Effect of signal frequency ≠ CF			Up to ± 4 dB nominal		
IF residual responses across the full BW					
Band 0			Preselector off ¹		-110 dBFS nominal
Band 1					-108 dBFS nominal
Third-order intermodulation distortion (Two tones of equal level, 1 MHz separation, each tone -23 dB relative to full scale (ADC clipping), IF gain = high)					
Band 0					-85 dBc nominal
Bands 1 through 4			Preselector off ¹		-85 dBc nominal
Bands 5 through 6			Preselector off ¹		-80 dBc nominal

1. MPB (microwave preselector bypass) is enabled. All UXA ship with MPB as a standard feature

I/Q Analyzer (continued)

Noise density			
Band	Frequency (GHz)	IF gain = Low	IF gain = High
0	1.80	-144 dBm/Hz	-145 dBm/Hz
1	6.00	-141 dBm/Hz	-142 dBm/Hz
2	10.80	-140 dBm/Hz	-141 dBm/Hz
3	15.15	-137 dBm/Hz	-137 dBm/Hz
4	21.80	-135 dBm/Hz	-135 dBm/Hz
5	30.50	-130 dBm/Hz	-130 dBm/Hz
6	42.25	-130 dBm/Hz	-130 dBm/Hz

Data acquisition (255 MHz IF path)		
Time record length		
IQ analyzer	8,000,000 IQ sample pairs	Waveform measurement
Advanced tools	Data packing	
	32-bit	64-bit
Length (IQ sample pairs)	536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)
Maximum IQ capture time (89600 VSA and fast capture)	Length of IQ sample pairs/sample rate (IQ pairs)	
Sample rate (IQ pairs)	Minimum of (1.25 x IFBW, 300 Msa/s)	
ADC resolution	14 bits	

Option B5X 510 MHz analysis bandwidth

IF frequency response (510 MHz IF path)					
Center Freq (GHz)	Span (MHz)	Preselector	Specification	Typical	RMS (nominal)
$\geq 0.6, < 3.6$	≤ 510	NA	± 1.0 dB	± 0.41 dB	0.06 dB
$> 3.6, \leq 8.4$	≤ 510	Off ¹	± 1.25 dB	± 0.42 dB	0.3 dB
$> 8.4, \leq 26.5$	≤ 510	Off ¹		± 0.8 dB nominal	
> 26.5	≤ 510	Off ¹		± 1 dB nominal	

IF phase linearity (510 MHz IF path)				
Center Freq (GHz)	Span (MHz)	Preselector	Pk-to-pk (nominal)	RMS (nominal)
$\geq 0.4, < 3.6$	≤ 510	NA	5°	1°
$\geq 3.6, < 26.5$	≤ 510	Off	6°	1.4°
≥ 26.5	≤ 510	Off	7°	1.6°

1. MPB (microwave preselector bypass) is enabled. All UXA ship with MPB as a standard feature

I/Q Analyzer (continued)

Dynamic range (510 MHz IF path)			
Suprious-free dynamic range (SFDR) Anywhere within the analysis BW		-78 dBc nominal	
Full scale (ADC clipping)		Mixer level	
Default setting, signal at CF		RF/MW (Opt 508, 513, 526)	mmW (Opt 544, 550)
Band 0		+2 dBm nominal	+2.5 dBm
Bands 1 through 2		+2 dBm nominal	+2.5 dBm
Bands 3 through 4		+2 dBm nominal	nominal
Bands 5 through 6			+3.5 dBm nominal
High gain setting, signal at CF			+1 dBm nominal
Band 0		-3 dBm nominal	-1 dBm nominal
Bands 1 through 2		0 dBm nominal	-7 dBm nominal
Bands 3 through 4		+2 dBm nominal	-9 dBm nominal
Bands 5 through 6			-9 dBm nominal
Effect of signal frequency \neq CF		Up to \pm 4 dB nominal	
IF residual responses across the full BW			
Band 0		-104 dBFS nominal	
Band 1	Preselector off ¹	-103 dBFS nominal	
Noise density (preselector off above band 0)			
Band	Frequency (GHz)	IF gain = Low	IF gain = High
0	1.80	-144 dBm/Hz	-144 dBm/Hz
1	6.00	-140 dBm/Hz	-142 dBm/Hz
2	10.80	-140 dBm/Hz	-141 dBm/Hz
3	15.15	-137 dBm/Hz	-137 dBm/Hz
4	21.80	-135 dBm/Hz	-135 dBm/Hz
5	30.5	-130 dBm/Hz	-130 dBm/Hz
6	42.25	-130 dBm/Hz	-130 dBm/Hz
Data acquisition (510 MHz IF path)			
Time record length		8,000,000 IQ sample pairs	Waveform measurement
IQ analyzer			
Advanced tools		Data packing	89600 VSA or fast capture
Length (IQ sample pairs)		32-bit	64-bit
IFBW \leq 255.176 MHz		536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)
IFBW $>$ 255.176 MHz		1,073 MSa (2^{30} Sa)	536 MSa (2^{29} Sa)
Maximum IQ capture time (89600 VSA and fast capture)		Length of IQ sample pairs/sample rate (IQ pairs)	
Sample rate (IQ pairs)			
IFBW \leq 255.176 MHz		Minimum of (1.25 x IFBW, 300 MSa/s)	
IFBW $>$ 255.176 MHz		Minimum of (1.25 x IFBW, 600 MSa/s)	
ADC resolution		14 bits	

Real-time Spectrum Analyzer (RTSA)

Option RT1 real-time spectrum analyzer, basic detection, or RT2 real-time spectrum analyzer, optimal detection

Real-time analysis

Real-time analysis bandwidth		
Option RT1	Up to 509.47 MHz	Analysis BW option determines the max real-time BW
Option RT2	Up to 509.47 MHz	Analysis BW option determines the max real-time BW
Minimum detectable signal duration with > 60 dB StM ¹ ratio	11.42 ns	
Option RT1	3.33 ns	
Option RT2		
Minimum signal duration with 100% probability of intercept (POI) at full amplitude accuracy		For Frequency Mask Triggering (FMT)
Option RT1	17.17 μ s	Signal is at mask level
Option RT2	3.51 μ s	Signal is at mask level, span > 85 MHz
Minimum acquisition time	100 μ s	
FFT rate	292,969/s	
Supported Detectors	Peak, Negative Peak, Sample, Average	
Number of Traces	6	
Number of Markers	12	
Supported Markers	Normal, Delta, Noise, Band Power	
Supported triggers	Level, Level with Time Qualified (TQT), Line, External, RF burst, Frame, Frequency Mask (FMT), FMT with TQT	

1. "StM" = "Signal-to-Mask"

Option RTS Real-time I/Q Data Streaming

Real-time streaming¹

Output stream resolution	16-bit I + jQ	
IQ streaming bandwidth	255 MHz	
Electrical interface	LVDS	
Sample rate	varies continuously based on RTSA span setting	
Max IQ streaming bandwidth and sample rate		
B1X	160 MHz	200 Msamples/s
B2X or B5X	255 MHz	300 Msamples/s
Supported data recorder	X-COM Systems IQC5255B	
Capture time	< 3 hours at 255 MHz bandwidth	
Data tagging	Event markers, IRIG-B GPS	

1. Use with X-COM Systems IQC5255B data recorder to capture rare events and play back at RF using integrated control software on the UXA.

Related Literature

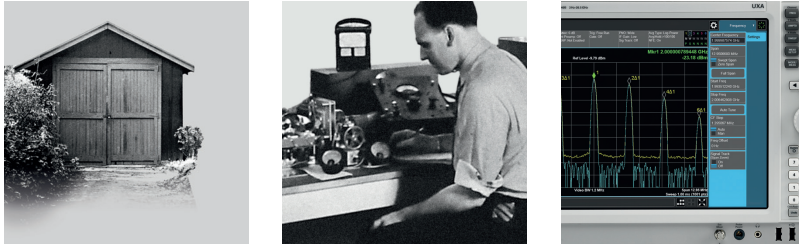
UXA Brochure, 5992-0089EN

UXA Configuration Guide, 5992-0043EN

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