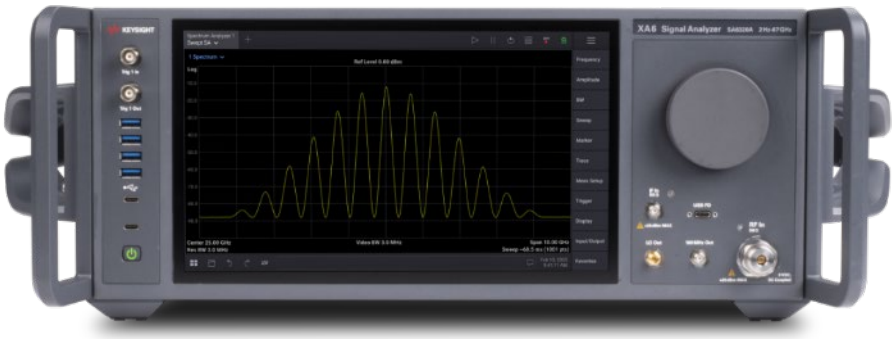
DATA SHEET

SA6320A XA6 X-Series Signal Analyzer

2 Hz to 67 GHz



KEYSIGHT

Table of Contents

Definitions and Conditions 3
Certification 4
Frequency and Time Specifications 5
Triggers and Gating 7
Amplitude Accuracy and Range Specifications 8
Frequency Response 10
Note: Frequency response specifications are given as absolute amplitude accuracy. 10
Dynamic Range Specifications 19
Displayed Average Noise Level (DANL) 20
Residuals, Images, and Spurious Responses 23
Second-Harmonic Intercept (SHI) 23
Third-Order Intercept (TOI) 25
Phase Noise (SSB) 27
IQ Analyzer 28
40 MHz Analysis Bandwidth (Option B40) 28
480 MHz Analysis Bandwidth (Option B4X) 30
2 GHz Analysis Bandwidth (Option R20) 32
4 GHz Analysis Bandwidth (Option R40) 34
8 GHz Analysis Bandwidth (Option R80) 36
General Specifications 38
Inputs and Outputs 39
Regulatory Information 42
Keysight Support Services 45

Definitions and Conditions

This data sheet provides performance information for Keysight SA6320A XA6 Signal Analyzer.

Specifications describe the performance of parameters covered by the product warranty and apply to temperature ranges 10 °C to 40 °C, unless otherwise noted.

95th percentile values indicate the breadth of the population (approx. 2 σ) of performance tolerances expected to be met in 95 % of the cases with a 95 % confidence, for any ambient temperature in the range of 20 °C 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 values (typ) describe additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80 % of the units exhibit with a 95 % confidence level over the temperature range 20 °C to 30 °C. Typical performance does not include measurement uncertainty.

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

The analyzer will meet its specifications when:

- Analyzer is within its calibration cycle
- Analyzer is under auto couple control, except that Auto Sweep Time Rules = Accuracy
- Analyzer is used in an environment that falls within allowed operating range; and has been in that environment at least 2 hours before being turned on.
- Analyzer has been turned on at least 30 minutes
- If the Auto Alignment Method is set to Standard, the following conditions apply: Auto Align set to Precision and Characterize Core Hardware must have been run in the last 30 days. No alerts or warning messages are shown on the front panel.
- If the Auto Alignment Method is set to Classic, the following conditions apply: Auto Align set to Normal; or, if Auto Align is set to Off or Partial, alignments must have been run recently enough to prevent an Alert message. Note that factory default is with the Auto Align set to Light, which (compared to Normal) allows wider temperature changes before causing Alignments to run automatically. The benefit is that Alignments interrupt less frequently. The user can change Auto Align to Normal if desired, and this setting will persist after power cycle or PRESET. If the Alert condition is changed from “Time and Temperature” to one of the disabled duration choices, the analyzer may fail to meet specifications without informing the user. In practice, the impact of such choices is primarily on Absolute Amplitude Accuracy.

The term “mixer level” is used as a condition for many specifications in this document. This term is conceptual quantity that is defined as follows: Mixer Level (dBm) = RF Input Power Level (dBm) – Attenuation (dB).

Certification

Keysight Technologies certifies that this product met its published specifications at the time of shipment from the factory. Keysight Technologies further certifies that its calibration measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Common Abbreviations	Function
BW	Bandwidth
FFT	Fast Fourier transform
IQ	In-phase quadrature-phase (sample data)
IVL	Individual validated license (for export to restricted countries)
LO	Local oscillator
PA	Pre-amplifier
MPB	Microwave preselector bypass path
RBW	Resolution bandwidth (filter)
VBW	Video bandwidth (filter)

Frequency and Time Specifications

Frequency Option	Frequency Range
555	2 Hz to 55 GHz
567	2 Hz to 67 GHz
Minimal Frequency	
PA OFF	2 Hz
PA ON	100 kHz

Swept Spectrum Analysis (These Bands are Not Applicable to Wide-Bandwidth IQ Analysis)

Swept Frequency Band (RBW < 3 MHz, PA off)	LO Multiple (N)	Frequency Range
Direct (not using an LO for frequency conversion)	N/A	2 Hz to 30 MHz
0	1	30 MHz to 3.6 GHz
1	2	3.5 to 8.2 GHz
2	1	8.1 to 11.5 GHz
3	2	11.4 to 23.47 GHz
3	3	23.37 to 34.5 GHz
4	3	34.4 to 36.4 GHz
4	4	36.3 to 48.52 GHz
4	6	48.42 to 53.5 GHz
5	6	53.4 to 67 GHz

Frequency Reference	
Accuracy (total)	± [(Initial accuracy) + (aging rate x time since last adjustment) + (temperature stability)]
Aging rate	Per day: ± 2 x 10^{-10} 1st year: ± 2 x 10^{-8} 2nd year: ± 1 x 10^{-8} 10 years: ± 1 x 10^{-7}
Temperature stability, full temperature range	± 2 x 10^{-9}
Achievable initial calibration accuracy	± 5 x 10^{-9}
Example frequency reference accuracy 1 year after last adjustment	= ± (5 x 10^{-9} + 2x 10^{-9} + 2 x 10^{-8}) = ± 2.7 x 10^{-8}
Residual FM	
Center frequency = 1 GHz 10 Hz RBW, 10 Hz VBW	≤ (0.25 Hz x N) p-p in 20 ms, nominal (N = LO multiple, see band table above)
Frequency Readout Accuracy (Start, Stop, Center, Marker)	
± (marker frequency x frequency reference accuracy + 0.10 % x span + 5 % x RBW + 2 Hz + 0.5 x horizontal resolution) where horizontal resolution is Span/(Sweep Points-1)	
Marker Frequency Counter	
Accuracy	± (marker frequency x frequency reference accuracy + 0.100 Hz)
Delta counter accuracy	± (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 (Nominal)	
Stepped/Swept	± (0.1 % x span + horizontal resolution) where horizontal resolution is span/(sweep points -1)
FFT	± (0.1 % x span + horizontal resolution) where horizontal resolution is span/(sweep points -1)

Sweep Time and Triggering		
Range	Span = 0 Hz	1 µs to 6000 s
	Span ≥ 10 Hz	1 ms to 4000 s
Accuracy	Span ≥ 10 Hz, swept	±0.01 % nominal
	Span ≥ 10 Hz, FFT	±40 % nominal
	Span = 0 Hz	±0.01 % nominal

Trigger delay	Span = 0 Hz or FFT	–150 to +500 ms
	Span ≥ 10 Hz, swept	0 to 500 ms
	Resolution	0.1 µs
Time Gating		
Gate methods		Gated LO; gated video; gated FFT
Gate length range (except method = FFT)		1 µs 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		3 to 100,001
Resolution Bandwidth (RBW)		
Range (with –3.01 dB bandwidth)		1 Hz to 10 MHz (step resolution of 3 digits)
		1 Hz to 40 MHz (step resolution of 3 digits; requires N90EMWR1B)
		1 Hz to 80 MHz (step resolution of 3 digits; requires N90EMWR2B, IVL)

Bandwidth Accuracy (Power)

RBW Range	Accuracy, Nominal
1 Hz to 100 kHz	± 0.005 dB
> 100 kHz to 1 MHz (< 8.2 GHz center frequency)	± 0.007 dB
> 1 to 2 MHz (< 8.2 GHz center frequency)	± 0.019 dB
> 2 to 3 MHz (< 8.2 GHz center frequency)	± 0.032 dB
4, 5, 6, 8, 10 MHz (< 8.2 GHz center frequency)	± 0.009 dB
20, 28, 30, 40 MHz (> 50 MHz center frequency)	± 0.177 dB
50, 80 MHz (> 50 MHz center frequency)	± 0.424 dB

Bandwidth Accuracy (-3.01 dB)

RBW Range	Accuracy, Nominal
1 Hz to 1 MHz	
≤ 8.2 GHz center frequency	± 0.35 %
> 8.2 GHz center frequency	± 0.55 %
> 1 to 3 MHz	± 1.19 %
4, 5, 6, 8, 10 MHz	± 0.42 %
20, 28, 30, 40 MHz	
> 50 MHz to 8.2 GHz center frequency	± 4.73 %
> 8.2 GHz center frequency	± 7.48 %
50, 80 MHz	
> 50 MHz to 8.2 GHz center frequency	± 14.2 %
> 8.2 GHz center frequency	± 20.2 %
Selectivity (-60 dB/-3 dB)	< 5: 1

Preselector Bandwidth

The preselector can have a significant passband ripple. To avoid ambiguous results, the -4 dB bandwidth is characterized

Center Frequency	Mean Bandwidth (-4 dB), Nominal
10 GHz	53 MHz
15 GHz	53 MHz
20 GHz	53 MHz
25 GHz	54 MHz
30 GHz	55 MHz
35 GHz	56 MHz
40 GHz	57 MHz
45 GHz	60 MHz
50 GHz	61 MHz
55 GHz	64 MHz
60 GHz	69 MHz
65 GHz	74 MHz
67 GHz	78 MHz

Video Bandwidth (VBW) Filters	
Range	1 Hz to 100 MHz
Accuracy	±6 %, nominal
Detector Types	

Normal, peak, sample, negative peak, log power average, RMS average, and voltage average

Triggers and Gating

Trigger/Gate Sources

	Swept Trigger	Gate Source	Wide Bandwidth IQ Trigger	Supplemental Information
Free run	Y		Y	
External 1	Y	Y	Y	Jitter up to ~10 ns p-p (nominal)
External 2	Y	Y	Y	
External 3	Y	Y	Y	
Precision			Y	
RF burst	Y	Y	Y	
Video (IF Mag)	Y		Y	ADC trigger is similar
ADC			Y	Similar to Video, but operates digitally on mag[I,Q], prior to decimation, filtering, and corrections
Periodic	Y	Y	Y	Repetitive "frame" trigger, at precise interval, following an External or RF Burst trigger

Triggers

Video (Independent of Display Scaling and Reference Level)	**Specifications**	**Supplemental Information**
Minimum settable level	-170 dBm	Useful range limited by noise
Maximum usable level		Highest allowed mixer level (the highest allowed mixer level depends on the IF gain. It is nominally –10 dBm for preamp off and IF gain = low) + 2 dB (nominal)

Detector and Sweep Type Relationships

Supplemental Information	
Sweep type = Swept	
Detector = Normal, Peak, Sample or Negative peak	Triggers on the signal before detection, which is similar to the displayed signal
Detector = Average	Triggers on the signal before detection, but with a single-pole filter added to give similar smoothing to that of the average detector
Sweep type = FFT	Triggers on the signal envelope in a bandwidth wider than the FFT width

RF Burst

	Specifications	**Supplemental Information**
Level range	–40 to –10 dBm plus attenuation (nominal)	Noise will limit trigger level range at high frequencies, such as above 15 GHz
Level Accuracy		
With positive slope trigger. Trigger level with negative slope is nominally 1 to 4 dB lower than positive slope.		
Absolute	±2 dB + absolute amplitude accuracy (nominal)	
Relative	±2 dB (nominal)	

Amplitude Accuracy and Range Specifications

Amplitude characteristics vary by user-selectable front-end path. Swept SA measurements are normally made with the preselector on (in circuit). These settings impact amplitude accuracy and range.

Microwave Path Control	PA	Allow RF Gain Adjust	Description
Front End Settings for Frequencies ≤ 8.2 GHz			
Standard path or MPB	Off	Off	Default instrument state following power-on, boot-up, or PRESET. Settings provide best dynamic range and lowest internally-generated distortion. Suitable for harmonics, IMD, spurious in presence of large signals, etc. unless noise-limited.
	Off	Enabled	Settings provide lower DANL at frequencies below 8.2 GHz, compared to Default. Settings provide lower DANL with degradation to distortion. Suitable for measurements near the noise floor when large, out-of-band signals are not present.
	Low	Not applicable with preamplifier enabled	Requires P55, P5N, P67 or P6N. Settings provide better DANL compared to PA Off, while preserving very good dynamic range. Suitable for distortion measurements (harmonics, IMD, etc.) when a lower noise floor is needed. Specified down to 100 kHz
	High		Requires P55, P5N, P67 or P6N. Settings provide best DANL, compared to PA Low. Best for finding low-level spurs, oscillations, etc. near the noise floor. Specified down to 100 kHz.
Frontend Settings for Frequencies > 8.2 GHz			
Standard	Off	Not applicable for frequencies > 8.2 GHz	Default instrument state following power-on, boot-up, or PRESET. Settings provide best dynamic range and lowest internally-generated distortion. Suitable for harmonics, IMD, spurious in presence of large signals, etc. unless noise-limited.
Standard	Low		Requires P55, P5N, P67 or P6N. Settings provide better DANL compared to PA Off, while preserving very good dynamic range. Suitable for distortion measurements (harmonics, IMD, etc.) when a lower noise floor is needed. Specified down to 100 kHz
Standard	High		Requires P55, P5N, P67 or P6N. Settings provide best DANL, compared to PA Low. Best for finding low-level spurs, oscillations, etc. near the noise floor. Specified down to 100 kHz.
MPB	Off		Bypasses preselector. Settings provide very good wideband digitizer measurements at mid-high input power region with minimal distortion. Good for wideband digitizer and FFT measurements.
MPB	Low		Bypasses preselector. Requires P55, P5N, P67 or P6N. MPB allows wideband measurements, provides better DANL and preserves dynamic range. Settings provide good wideband digitizer measurements at low input power region with very low distortion. Good for FFT measurements and wideband digitizer measurements, especially EVM at low input power.
MPB	High		Bypasses preselector. Requires P55, P5N, P67 or P6N. MPB allows wideband measurements, provides best DANL and preserves dynamic range. Settings provide good wideband digitizer measurements at very low input power region with low distortion. Good for FFT measurements and wideband digitizer measurements, especially EVM at very low input power.

Amplitude Range	
Measurement range	Displayed average noise level (DANL) to maximum safe input level
Input attenuator range (2 Hz to 67 GHz)	0 to 75 dB in 1 dB steps; 5 dB steps in Direct path with PA Off
Maximum Safe Input Level (Max Applied to RF Input Connector)	
Average total power (with and without preamp)	+26 dBm (0.4 W), 0 dB input attenuation
	+30 dBm (1 W), PA off, ≥ 10 dB input attenuation
Peak pulse power (< 10 µs pulse width, < 1 % duty cycle, and input attenuation ≥ 30 dB)	+50 dBm (100 W)
DC Volts	
DC coupled	± 0.2 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)
Linear scale	10 divisions
Scale units	dBm, dBmV, dBµV, dBmA, dBµA, V, W, A

Frequency Response

Note: Frequency response specifications are given as absolute amplitude accuracy.

Standard Path Frequency Response (Swept, Preselector ON, PA OFF)
10 dB Input Attenuation, RBW ≤ 3 MHz, Preselector Centering Applied Above 8.2 GHz

Frequency	Full Range	20 to 30 °C	Typical
9 kHz to 30 MHz	±1.16 dB	±1.05 dB	±0.39 dB
> 30 to 50 MHz	±0.86 dB	±0.78 dB	±0.26 dB
> 50 to 125 MHz	±0.85 dB	±0.76 dB	±0.28 dB
> 125 MHz to 3.6 GHz	±0.83 dB	±0.65 dB	±0.27 dB
> 3.6 to 5.65 GHz	±0.79 dB	±0.72 dB	±0.22 dB
> 5.65 to 8.2 GHz	±0.89 dB	±0.78 dB	±0.27 dB
> 8.2 to 9.5 GHz	±2.74 dB	±2.05 dB	±0.85 dB
> 9.5 to 11.47 GHz	±1.67 dB	±1.36 dB	±0.44 dB
> 11.47 to 34.5 GHz	±1.96 dB	±1.7 dB	±0.49 dB
> 34.5 to 53.5 GHz	±2.41 dB	±2.04 dB	±0.64 dB
> 53.5 to 55 GHz	±2.15 dB	±1.89 dB	±0.54 dB
> 55 to 59 GHz	±2.55 dB	±2.25 dB	±0.65 dB
> 59 to 66 GHz	±3.39 dB	±2.7 dB	±0.85 dB
> 66 to 67 GHz	±3.89 dB	±3.2 dB	±0.85 dB

Standard Path Frequency Response (Swept, Preselector ON, PA Low)
10 dB input Attenuation, RBW ≤ 3 MHz, Preselector Centering Applied Above 8.2 GHz

Frequency	Full Range	20 to 30 °C	Typical
100 to 300 kHz	±2.45 dB	±1.79 dB	±0.69 dB
> 300 kHz to 1 MHz	±1.4 dB	±1.2 dB	±0.22 dB
> 1 to 30 MHz	±1.04 dB	±0.96 dB	±0.54 dB
> 30 to 50 MHz	±0.99 dB	±0.89 dB	±0.31 dB
> 50 to 125 MHz	±0.92 dB	±0.8 dB	±0.33 dB
> 125 to 3.6 GHz	±0.91 dB	±0.72 dB	±0.30 dB
> 3.6 to 5.65 GHz	±0.9 dB	±0.78 dB	±0.36 dB
> 5.65 to 8.2 GHz	±0.84 dB	±0.7 dB	±0.34 dB
> 8.2 to 9.5 GHz	±2.82 dB	±2.03 dB	±1.08 dB
> 9.5 to 11.48 GHz	±2.3 dB	±1.94 dB	±0.78 dB
> 11.48 to 15.5 GHz	±2.49 dB	±1.97 dB	±0.73 dB
> 15.5 to 34.5 GHz	±2.36 dB	±2.04 dB	±0.87 dB
> 34.5 to 53.5 GHz	±2.8 dB	±2.38 dB	±0.81 dB
> 53.5 to 55 GHz	±2.28 dB	±2.08 dB	±0.65 dB
> 55 to 59 GHz	±3.2 dB	±2.8 dB	±0.90 dB
> 59 to 66 GHz	±3.95 dB	±3.42 dB	±1.22 dB
> 66 to 67 GHz	±4.04 dB	±3.5 dB	±1.03 dB

Standard Path Frequency Response (Swept, Preselector ON, PA High)
10 dB Input Attenuation, RBW ≤ 3 MHz, Preselector Centering Applied Above 8.2 GHz

Frequency	Full Range	20 to 30 °C	Typical
100 to 300 kHz	±2.38 dB	±1.93 dB	±0.68 dB
> 300 kHz to 1 MHz	±1.37 dB	±1.25 dB	±0.22 dB
> 1 to 30 MHz	±1.01 dB	±0.92 dB	±0.60 dB
> 30 to 50 MHz	±0.98 dB	±0.88 dB	±0.30 dB
> 50 to 125 MHz	±0.88 dB	±0.80 dB	±0.29 dB
> 125 to 3.6 GHz	±0.90 dB	±0.70 dB	±0.25 dB
> 3.6 to 5.65 GHz	±1.01 dB	±0.91 dB	±0.37 dB
> 5.65 to 8.2 GHz	±0.95 dB	±0.82 dB	±0.35 dB
> 8.2 to 9.5 GHz	±3.09 dB	±2.28 dB	±1.59 dB
> 9.5 to 11.48 GHz	±2.48 dB	±2.05 dB	±1.04 dB
> 11.48 to 15.5 GHz	±1.92 dB	±1.72 dB	±0.50 dB
> 15.5 to 34.5 GHz	±2.54 dB	±2.20 dB	±0.73 dB
> 34.5 to 53.5 GHz	±3.42 dB	±2.90 dB	±1.02 dB
> 53.5 to 55 GHz	±2.60 dB	±2.24 dB	±0.74 dB
> 55 to 59 GHz	±4.41 dB	±3.57 dB	±1.42 dB

> 59 to 66 GHz	±4.70 dB	±4.07 dB	±1.49 dB
> 66 to 67 GHz	±4.71 dB	±3.87 dB	±1.34 dB

Standard Path Frequency Response (Swept, Preselector ON, Allow RF Gain Adjust Enabled)
0 dB Input Attenuation, RBW ≤ 3 MHz, Preselector Centering Applied Above 8.2 GHz

Frequency	Full Range	20 to 30 °C	Typical
2 to 50 MHz	±1.09 dB	±0.97 dB	±0.34 dB
> 50 to 125 MHz	±0.90 dB	±0.80 dB	±0.29 dB
> 125 to 3.6 GHz	±1.02 dB	±0.90 dB	±0.34 dB
> 3.6 to 5.65 GHz	±1.42 dB	±1.02 dB	±0.51 dB
> 5.65 to 8.2 GHz	±0.99 dB	±0.86 dB	±0.36 dB

MPB Path Frequency Response (Swept, Preselector ON, PA OFF)
0 dB Input Attenuation, RBW ≤ 3 MHz

Frequency	Full Range	20 to 30 °C	Typical
8.2 to 11.47 GHz	±1.34 dB	±1.18 dB	±0.33 dB
> 11.47 to 34.5 GHz	±2.08 dB	±1.74 dB	±0.52 dB
> 34.5 to 53.5 GHz	±2.22 dB	±1.88 dB	±0.59 dB
> 53.5 to 55 GHz	±2.15 dB	±1.89 dB	±0.54 dB
> 55 to 59 GHz	±2.58 dB	±2.25 dB	±0.72 dB
> 59 to 66 GHz	±3.01 dB	±2.56 dB	±0.78 dB
> 66 to 67 GHz	±3.41 dB	±2.96 dB	±0.73 dB

MPB Path Frequency Response (Swept, Preselector Off, PA ON)
10 dB Input Attenuation, RBW ≤ 3 MHz, Nominal

Frequency	PA Low	PA High
8.2 to 11.48 GHz	±0.27 dB	± 0.27 dB
> 11.48 to 15.5 GHz	±0.23 dB	± 0.22 dB
> 15.5 to 34.5 GHz	±0.4 dB	± 0.38 dB
> 34.5 to 53.5 GHz	±0.37 dB	± 0.49 dB
> 53.5 to 67 GHz	±0.5 dB	± 0.68 dB

Standard Path Frequency Response (Swept, Preselector on)
RBW > 3 MHz, Preselector Centering Applied Above 8.2 GHz, Nominal

Frequency	PA Off, 10 dB Input Attenuation	PA Low, 10 dB Input Attenuation	PA High, 10 dB Input Attenuation	RF Gain Adjust Enabled, 0 dB Input Attenuation
260 MHz to 3.6 GHz	±0.11 dB	±0.15 dB	±0.13 dB	±0.19 dB
> 3.6 to 5.4 GHz	±0.12 dB	±0.20 dB	±0.21 dB	±0.21 dB
> 5.4 to 8.2 GHz	±0.14 dB	±0.16 dB	±0.19 dB	±0.20 dB
> 8.2 to 12.1 GHz	±0.27 dB	±0.38 dB	±0.42 dB	
> 12.1 to 15.2 GHz	±0.22 dB	±0.22 dB	±0.22 dB	
> 15.2 to 37.1 GHz	±0.22 dB	±0.44 dB	±0.43 dB	
> 37.1 to 53.1 GHz	±0.36 dB	±0.42 dB	±0.47 dB	
> 53.1 to 67 GHz	±0.39 dB	±0.49 dB	±0.65 dB	

MPB Path Frequency Response (Swept, Preselector Off)
RBW > 3 MHz, Nominal

Frequency	PA Off, 0 dB Input Attenuation	PA Low, 10 dB Input Attenuation	PA High, 10 dB Input Attenuation
8.2 to 12.1 GHz	±0.15 dB	±0.29 dB	±0.28 dB
> 12.1 to 15.2 GHz	±0.22 dB	±0.22 dB	±0.20 dB
> 15.2 to 37.1 GHz	±0.22 dB	±0.44 dB	±0.42 dB
> 37.1 to 53.1 GHz	±0.27 dB	±0.35 dB	±0.48 dB
> 53.1 to 67 GHz	±0.34 dB	±0.55 dB	±0.59 dB

MPB Path IF Frequency Response (Preselector Off, PA OFF)

Center Frequency	Span	Amplitude Max Error, Nominal	Amplitude RMS, Nominal
10 to 50 MHz	≤ 10 MHz	±0.09 dB	0.04 dB
> 50 MHz to 3.6 GHz	≤ 10 MHz	±0.11 dB	0.04 dB
> 3.6 to 5.65 GHz	≤ 10 MHz	±0.08 dB	0.03 dB
> 5.65 to 11.47 GHz	≤ 10 MHz	±0.06 dB	0.02 dB

> 11.47 to 34.5 GHz	≤ 10 MHz	±0.07 dB	0.02 dB
> 34.5 to 53.5 GHz	≤ 10 MHz	±0.12 dB	0.04 dB
> 53.5 to 55 GHz	≤ 10 MHz	±0.07 dB	0.02 dB
> 55 to 66 GHz	≤ 10 MHz	±0.05 dB	0.02 dB
> 66 to 67 GHz	≤ 10 MHz	±0.06 dB	0.02 dB

Attenuator Switching Uncertainty (Relative to 10 dB Reference Setting)

Attenuation > 2 dB, Nominal

Frequency	
9 kHz to 30 MHz	± 0.25 dB
> 30 MHz to 67 GHz	± 0.40 dB, PA Off
	± 0.50 dB, PA On

VSWR (Voltage Standing Wave Ratio) at RF Input (95th Percentile, Unless Stated Otherwise)

Standard path, 0 dB input attenuation, 900 Hz to 3.6 GHz	2.34:1 (nominal)

Center Frequency	STD (10 dB Input Attenuation)	STD, PA Low/High (0 dB Input Attenuation)	STD, RF Gain Adjust Enabled (0 dB Input Attenuation)
900 Hz to 30 MHz	1.08		
> 30 MHz to 3.6 GHz	1.19	1.58	1.22
> 3.6 to 8.2 GHz	1.12	1.22	1.15
> 8.2 to 11.5 GHz	1.16	1.27	
> 11.5 to 20 GHz	1.17	1.32	
> 20 to 30 GHz	1.26	1.68	
> 30 to 44 GHz	1.33	1.74	
> 44 to 53.5 GHz	1.74	1.91	
> 53.5 to 67 GHz	1.70	2.05	

The magnitude of the mismatch over the range of frequencies will be very similar between MPB and non-MPB operation, but the details, such as the frequencies of the peaks and valleys, will shift.

VSWR Plots

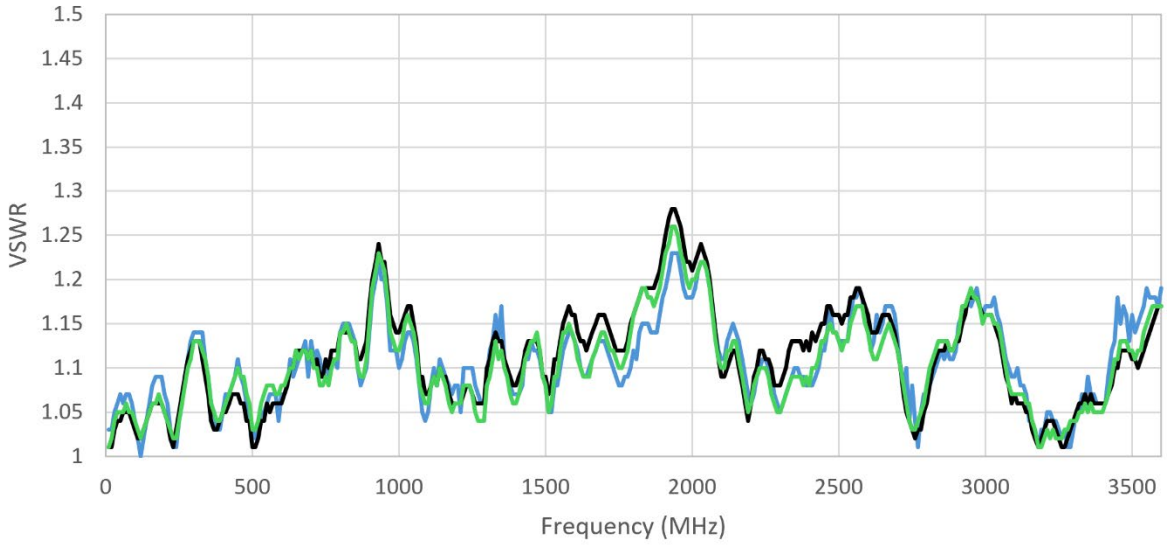


Figure 1. VSWR vs. frequency (0 to 3.6 GHz), standard path, PA off, 10 dB attenuation, measured on 3 units

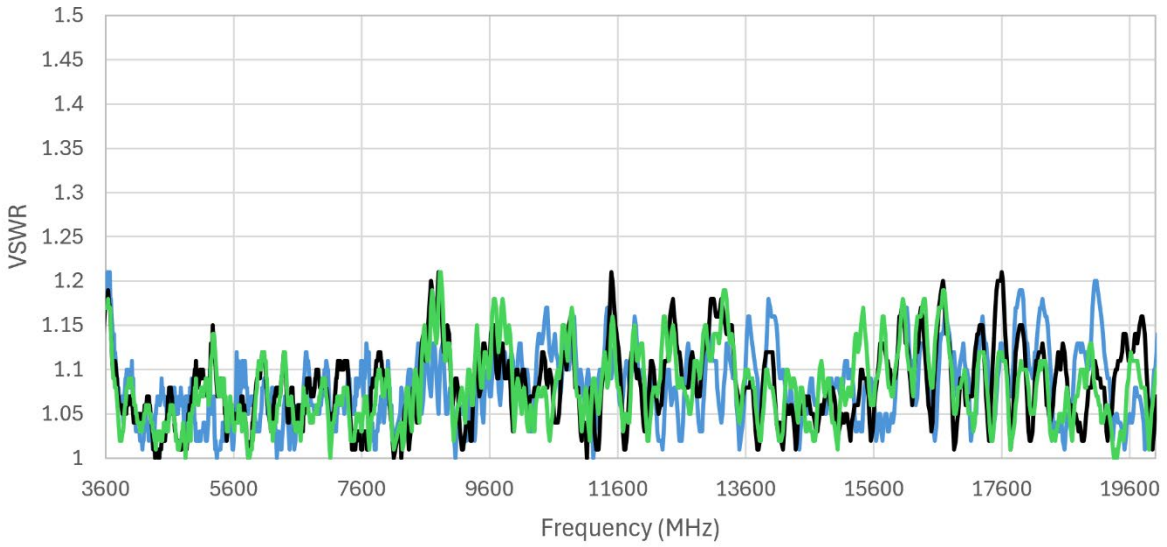


Figure 2. VSWR vs. frequency (3.6 to 20 GHz), standard path, PA off, 10 dB attenuation, measured on 3 units

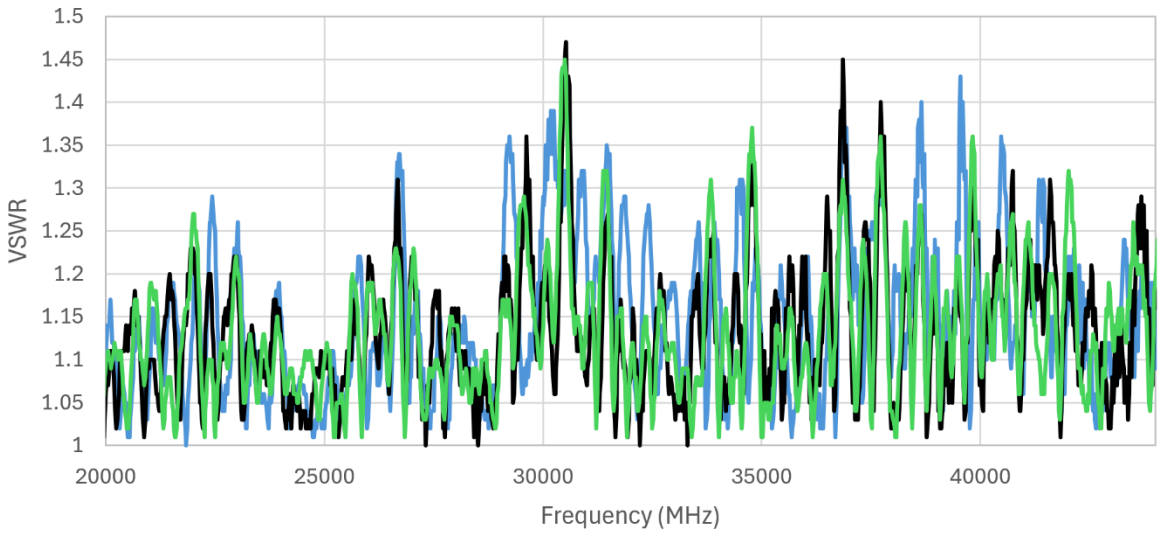


Figure 3. VSWR vs. frequency (20 to 44 GHz), standard path, PA off, 10 dB attenuation, measured on 3 units

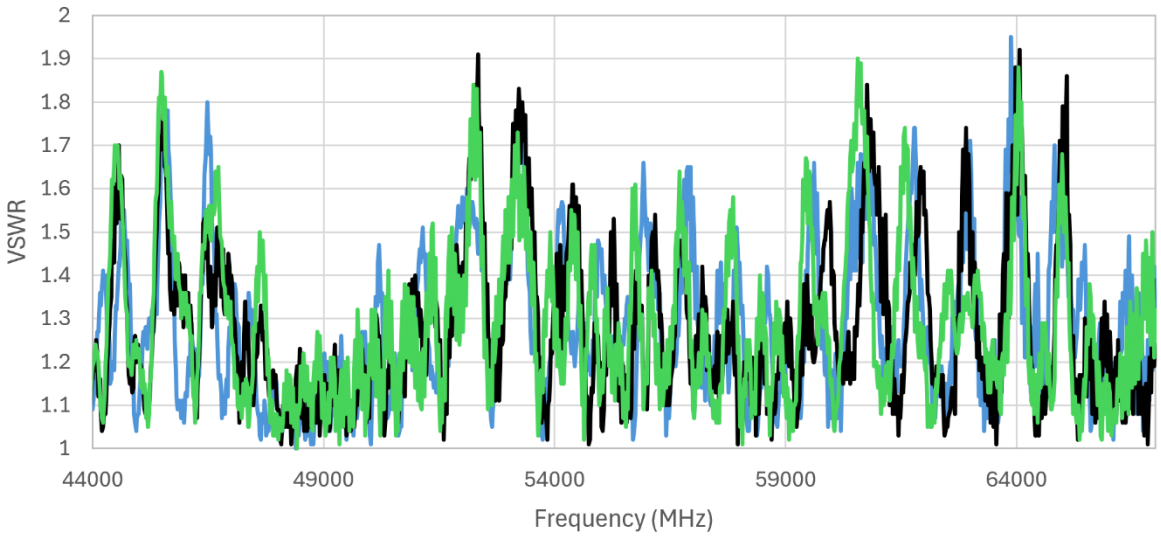


Figure 4. VSWR vs. frequency (44 to 67 GHz), standard path, PA off, 10 dB attenuation, measured 3 units

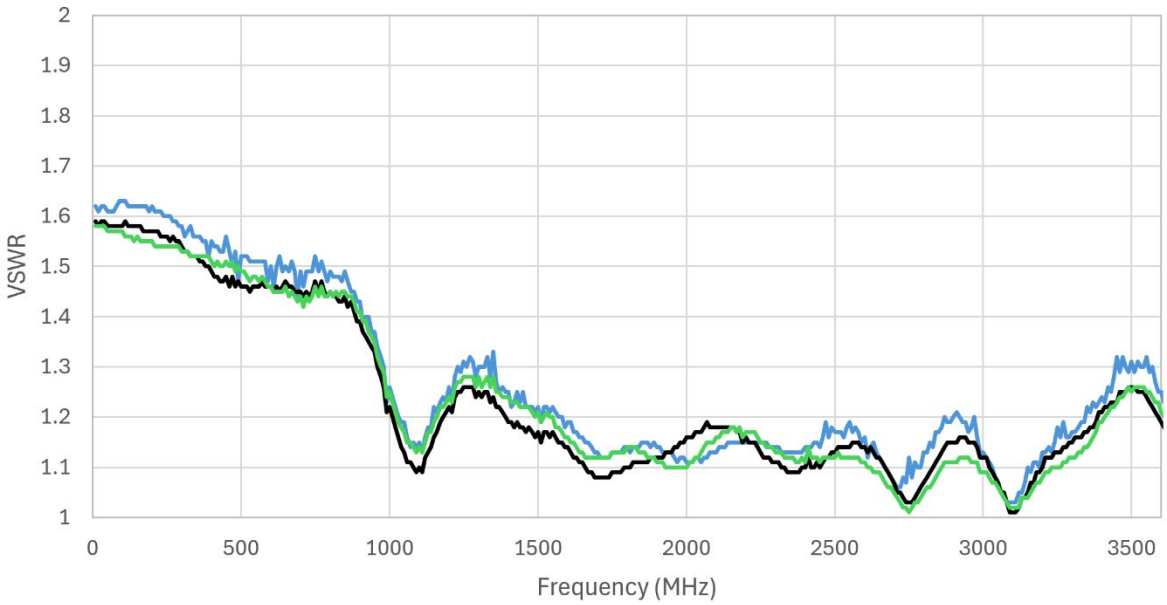


Figure 5. VSWR vs. frequency (0 to 3.6 GHz), standard path, PA Low/High, 0 dB attenuation, measured on 3 units

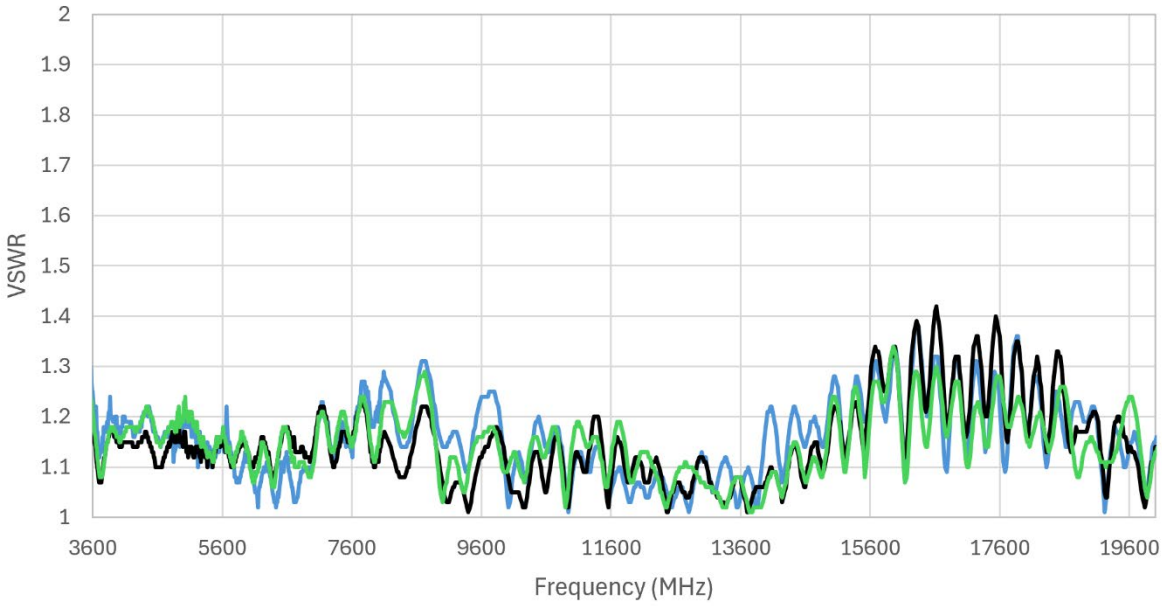


Figure 6. VSWR vs. frequency (3.6 to 20 GHz), standard path, PA Low/High, 0 dB attenuation, measured on 3 units

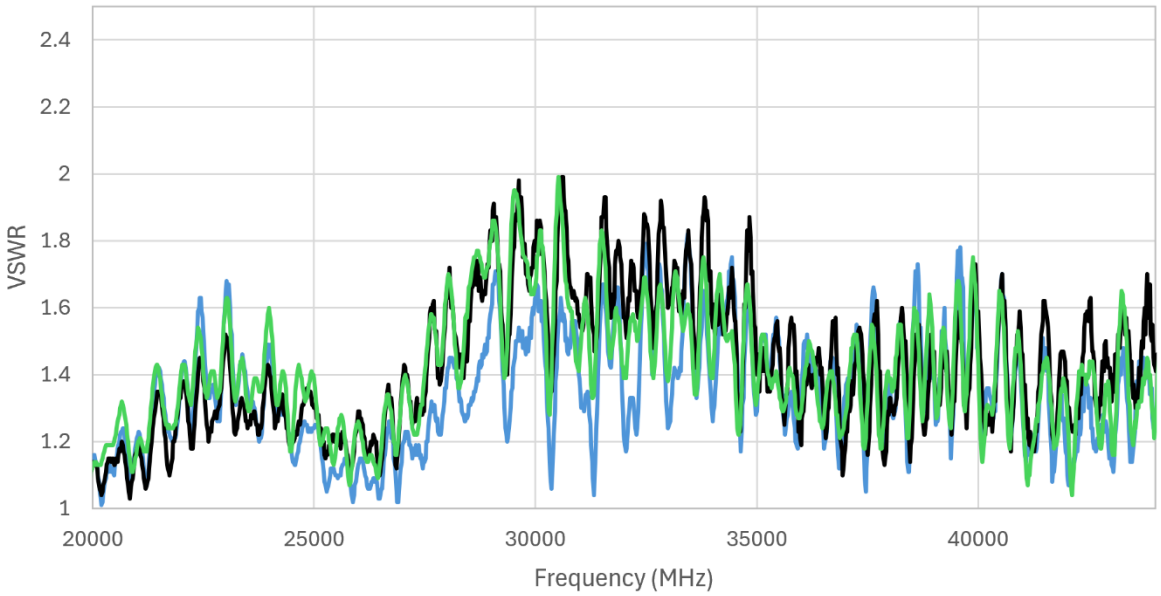


Figure 7. VSWR vs. frequency (20 to 44 GHz), standard path, PA Low/High, 0 dB attenuation, measured on 3 units

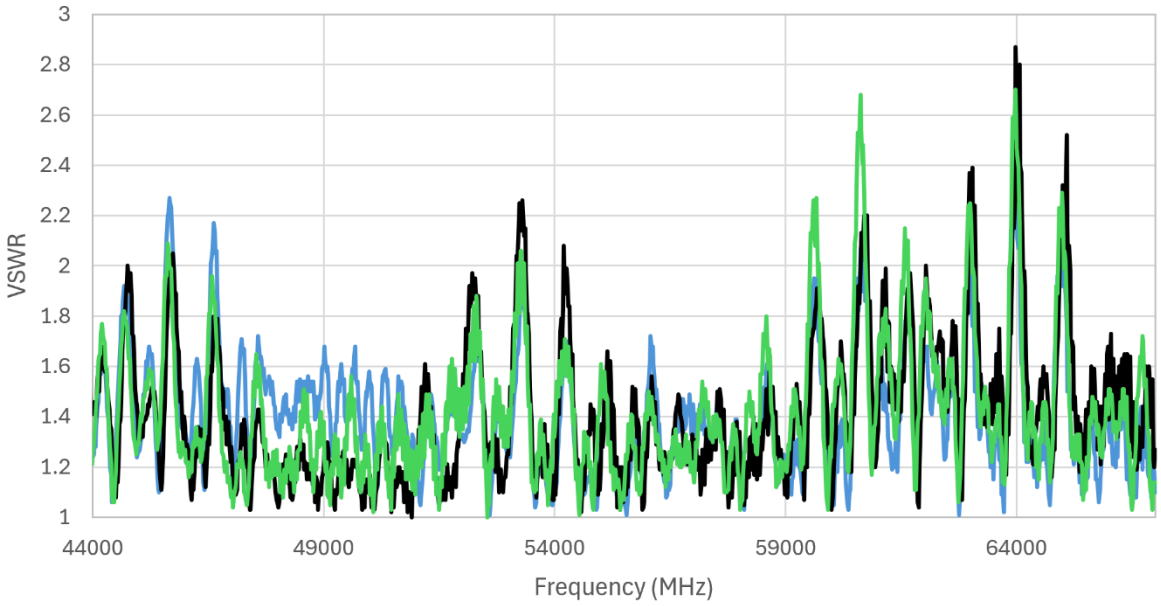


Figure 8. VSWR vs. frequency (44 to 67 GHz), standard path, PA Low/High, 0 dB attenuation, measured on 3 units

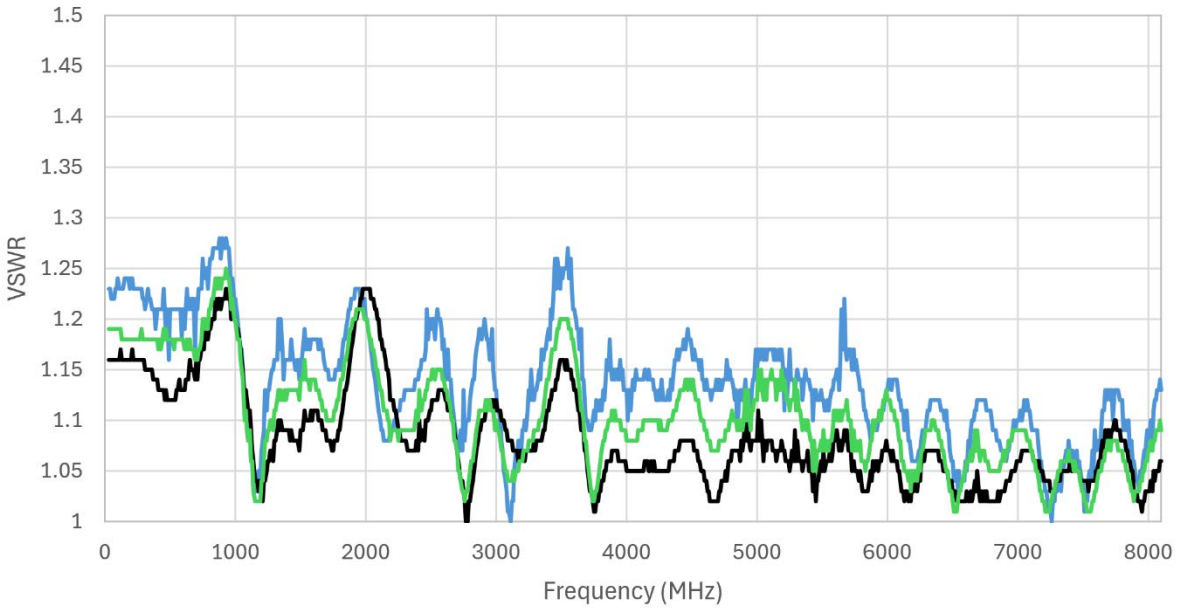


Figure 9. VSWR vs. frequency (30 MHz to 8.2 GHz), standard path, RF Gain Adjust enabled, 0 dB attenuation, measured on 3 units

Resolution Bandwidth Switching Uncertainty (Relative to 30 kHz RBW), Nominal	
1 Hz to 27 kHz	± 0.06 dB
> 27 kHz to 91 kHz	± 0.01 dB
> 91 kHz to 910 kHz	± 0.02 dB
> 910 kHz to 3 MHz	± 0.03 dB
4, 5, 6, 8, 10 MHz	± 0.10 dB
20, 28, 30, 40 MHz	± 0.16 dB; requires Option N90EMWR1B or N90EMWR2B
50, 80 MHz	± 0.23 dB; requires Option N90EMWR2B

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 (Only affects the display, not the measurement, so it causes no additional error in measurement results from trace data or markers.)	0 dB
Display Scale Switching Uncertainty	
Switching between linear and log (Only affects the display, not the measurement, so it causes no additional error in measurement results from trace data or markers.)	0 dB
Log scale/div switching (Only affects the display, not the measurement, so it causes no additional error in measurement results from trace data or markers.)	0 dB

Preamplifier (PA)

	Low Gain	High Gain
Option P55/P5N	100 kHz to 55 GHz	100 kHz to 55 GHz
Option P67/P6N	100 kHz to 67 GHz	100 kHz to 67 GHz
Noise figure	DANL + 176.25 dB (nominal)	
Gain	15 dB (nominal)	25 dB (nominal)

Dynamic Range Specifications

1 dB Gain Compression

Notes:

- Large signals, even at frequencies not shown on the screen, can cause the analyzer to mismeasure on-screen signals because of two-tone gain compression. This specification tells how large an interfering signal must be in order to cause a 1 dB change in an on-screen signal.
- Specified at 1 kHz RBW with 100 kHz tone spacing. The compression point will nominally equal the specification for tone spacing greater than 5 times the prefilter bandwidth. At smaller spacings, ADC clipping may occur at a level lower than the 1 dB compression point.
- Reference level and off-screen performance: The Reference Level (RL) behavior differs from some earlier analyzers in a way that makes this analyzer more flexible. In other analyzers, the RL controlled how the measurement was performed as well as how it was displayed. Because the logarithmic amplifier in these analyzers had both range and resolution limitations, this behavior was necessary for optimum measurement accuracy. The logarithmic amplifier in this signal analyzer, however, is implemented digitally such that the range and resolution greatly exceed other instrument limitations. Because of this, the analyzer can make measurements largely independent of the setting of the RL without compromising accuracy. Because the RL becomes a display function, not a measurement function, a marker can read out results that are off-screen, either above or below, without any change in accuracy. The only exception to the independence of RL and the way in which the measurement is performed is in the input attenuation setting: When the input attenuation is set to auto, the rules for the determination of the input attenuation include dependence on the reference level. Because the input attenuation setting controls the tradeoff between large signal behaviors (third-order intermodulation, compression, and display scale fidelity) and small signal effects (noise), the measurement results can change with RL changes when the input attenuation is set to auto.
- Mixer power level (dBm) = total power at the input (dBm) – input attenuation (dB).
- Total power at the preamp (dBm) = total power at the input (dBm) – input attenuation (dB), when input attenuation ≤ 15 dB
- Total power at the preamp (dBm) = total power at the input (dBm) – 15 (dB), when input attenuation > 15 dB

Standard Path 1 dB Gain Compression (Swept, Preselector ON), Nominal

Center Frequency	PA Off	PA Low	PA High
30 to 100 MHz	+6 dBm	-10 dBm	-16 dBm
> 100 MHz to 8.2 GHz	+7 dBm	-9 dBm	-15 dBm
> 8.2 to 67 GHz	+7 dBm	-7 dBm	-15 dBm

IF Prefilter Bandwidth

This table applies for sweep rates ≤ 1.1 times RBW-squared, RBW shapes that are Gaussian, FlatTop or Custom and for the non-Direct signal path. Otherwise, compute an "effective RBW" = 1.1 * span / (sweep time × RBW). To determine the IF Prefilter bandwidth, look up this effective RBW in the table instead of the actual RBW. For example, for RBW = 3 kHz, Span = 300 kHz, and sweep time = 42 ms, the sweep rate = 7.1 MHz/s, while RBW-squared is 9 MHz/s. So, the sweep rate is < 1.1 times RBW-squared and the table applies; row 1 shows the IF prefilter bandwidth is nominally 10 kHz. If the sweep time is 1 ms, then the effective RBW computes to 100 kHz. This would result in an IF prefilter bandwidth from the third row, nominally 10 MHz.

RBW, Zero Span or Swept	FFT Width, Sweep Type = FFT	–3 dB Bandwidth (Nominal)
≤ 4.01 kHz	< 4.01 kHz	10 kHz
> 4.01 to 28.8 kHz	< 28.81 kHz	80 kHz
> 28.8 kHz to 3 MHz	< 10 MHz	10 MHz
	< 40 MHz	40 MHz
> 3 to 80 MHz	< 480 MHz	480 MHz

Displayed Average Noise Level (DANL)

Input terminated, Sample or Average detector, Averaging type set to Log, IF Gain = High, 30 kHz Resolution Bandwidth normalized to 1 Hz, 0 dB input attenuation, NFE off

Standard Path (Swept, Preselector ON, PA OFF)

Noise Floor Extension (Option NF2) nominally improves DANL by 7 to 11 dB

Frequency	RBW ≤ 3 MHz, Full Range	RBW ≤ 3 MHz, 20 to 30 °C	RBW ≤ 3 MHz, Typical, Unless Otherwise Stated	RBW > 3 MHz, Nominal
2 Hz to 9 kHz			-113 dBm (nominal)	
> 9 to 25 kHz			-121 dBm (nominal)	
> 25 to 100 kHz			-149 dBm (nominal)	
> 100 kHz to 3 MHz	-142 dBm	-143 dBm	-150 dBm	
> 3 to 30 MHz	-154 dBm	-154 dBm	-157 dBm	-157 dBm
> 30 MHz to 1 GHz	-154 dBm	-154 dBm	-156 dBm	-157 dBm
> 1 to 1.8 GHz	-152 dBm	-153 dBm	-155 dBm	-156 dBm
> 1.8 to 3.6 GHz	-150 dBm	-151 dBm	-153 dBm	-155 dBm
> 3.6 to 6 GHz	-153 dBm	-153 dBm	-156 dBm	-158 dBm
> 6 to 8 GHz	-151 dBm	-152 dBm	-154 dBm	-156 dBm
> 8 to 9 GHz	-145 dBm	-146 dBm	-150 dBm	-153 dBm
> 9 to 12 GHz	-147 dBm	-148 dBm	-151 dBm	-153 dBm
> 12 to 18 GHz	-150 dBm	-151 dBm	-154 dBm	-156 dBm
> 18 to 26 GHz	-147 dBm	-148 dBm	-152 dBm	-154 dBm
> 26 to 34.5 GHz	-143 dBm	-144 dBm	-148 dBm	-151 dBm
> 34.5 to 37 GHz	-145 dBm	-146 dBm	-149 dBm	-148 dBm
> 37 to 41 GHz	-144 dBm	-144 dBm	-148 dBm	-150 dBm
> 41 to 44 GHz	-143 dBm	-143 dBm	-147 dBm	-149 dBm
> 44 to 52 GHz	-140 dBm	-141 dBm	-144 dBm	-148 dBm
> 52 to 55 GHz	-137 dBm	-137 dBm	-142 dBm	-145 dBm
> 55 to 57 GHz	-135 dBm	-136 dBm	-140 dBm	-144 dBm
> 57 to 60 GHz	-136 dBm	-136 dBm	-141 dBm	-144 dBm
> 60 to 65 GHz	-133 dBm	-133 dBm	-138 dBm	-142 dBm
> 65 to 67 GHz	-130 dBm	-131 dBm	-136 dBm	-139 dBm

Standard path (Swept, Preselector ON, PA High, Option P55/P67)

Noise Floor Extension (Option NF2) nominally improves DANL by 5 to 9 dB

Frequency	RBW ≤ 3 MHz, Full Range	RBW ≤ 3 MHz, 20 to 30 °C	RBW ≤ 3 MHz, Typical	RBW > 3 MHz, Nominal
100 kHz to 1 MHz	-120 dBm	-122 dBm	-127 dBm	

> 1 to 3 MHz	-147 dBm	-148 dBm	-151 dBm	
> 3 to 9 MHz	-150 dBm	-150 dBm	-153 dBm	
> 9 to 30 MHz	-154 dBm	-154 dBm	-157 dBm	
> 30 to 300 MHz	-158 dBm	-158 dBm	-161 dBm	-165 dBm
> 300 MHz to 2.1 GHz	-165 dBm	-165 dBm	-168 dBm	-168 dBm
> 2.1 to 8 GHz	-165 dBm	-165 dBm	-167 dBm	-169 dBm
> 8 to 17 GHz	-163 dBm	-163 dBm	-166 dBm	-167 dBm
> 17 to 22 GHz	-162 dBm	-162 dBm	-165 dBm	-166 dBm
> 22 to 27 GHz	-161 dBm	-161 dBm	-164 dBm	-166 dBm
> 27 to 32 GHz	-160 dBm	-160 dBm	-163 dBm	-164 dBm
> 32 to 43 GHz	-159 dBm	-159 dBm	-162 dBm	-164 dBm
> 43 to 52 GHz	-156 dBm	-157 dBm	-160 dBm	-162 dBm
> 52 to 56 GHz	-155 dBm	-156 dBm	-159 dBm	-161 dBm
> 56 to 59 GHz	-154 dBm	-155 dBm	-158 dBm	-160 dBm
> 59 to 62 GHz	-152 dBm	-153 dBm	-156 dBm	-159 dBm
> 62 to 63 GHz	-151 dBm	-152 dBm	-156 dBm	-158 dBm
> 63 to 64 GHz	-149 dBm	-150 dBm	-154 dBm	-157 dBm
> 64 to 67 GHz	-146 dBm	-148 dBm	-152 dBm	-156 dBm

Standard path (Swept, Preselector ON, PA High, Option P5N/P6N)

Frequency	RBW ≤ 3 MHz, Full Range	RBW ≤ 3 MHz, 20 to 30 °C	RBW ≤ 3 MHz, Typical	RBW > 3 MHz, Nominal
100 kHz to 43.4 GHz	Refer to standard path DANL for Option P55/P67			
>43.4 to 52 GHz	-139 dBm	-140 dBm	-145 dBm	-147 dBm
>52 to 53.5 GHz	-135 dBm	-136 dBm	-142 dBm	-147 dBm
>53.5 to 56 GHz	-141 dBm	-141 dBm	-146 dBm	-147 dBm
>56 to 59 GHz	-138 dBm	-138 dBm	-144 dBm	-146 dBm
>59 to 62 GHz	-132 dBm	-132 dBm	-139 dBm	-142 dBm
>62 to 64 GHz	-130 dBm	-130 dBm	-136 dBm	-138 dBm
>64 to 67 GHz	-126 dBm	-126 dBm	-133 dBm	-136 dBm

Standard path (Swept, Preselector ON, RF Gain Adjust Enabled)

Frequency	RBW ≤ 3 MHz, Full Range	RBW ≤ 3 MHz, 20 to 30 °C	RBW ≤ 3 MHz, Typical	RBW > 3 MHz, Nominal
13 to 33 MHz	-146 dBm	-146 dBm	-149 dBm	-154 dBm
> 33 to 53 MHz	-150 dBm	-150 dBm	-153 dBm	-155 dBm
> 53 to 200 MHz	-152 dBm	-152 dBm	-155 dBm	-157 dBm
> 200 MHz to 7 GHz	-155 dBm	-156 dBm	-158 dBm	-160 dBm
> 7 to 8.2 GHz	-155 dBm	-155 dBm	-158 dBm	-159 dBm

MPB path (Swept, PA OFF)

Noise Floor Extension (Option NF2) nominally improves DANL by 7 to 10 dB

Frequency	RBW ≤ 3 MHz, Full Range	RBW ≤ 3 MHz, 20 to 30 °C	RBW ≤ 3 MHz, Typical	RBW > 3 MHz, Nominal
> 8.1 to 10 GHz	-153 dBm	-154 dBm	-156 dBm	-158 dBm
> 10 to 11.5 GHz	-152 dBm	-152 dBm	-155 dBm	-157 dBm
> 11.5 to 15 GHz	-153 dBm	-153 dBm	-156 dBm	-158 dBm
> 15 to 18 GHz	-151 dBm	-151 dBm	-154 dBm	-156 dBm
> 18 to 21 GHz	-148 dBm	-148 dBm	-152 dBm	-154 dBm
> 21 to 27 GHz	-145 dBm	-145 dBm	-149 dBm	-153 dBm
> 27 to 30 GHz	-142 dBm	-143 dBm	-147 dBm	-150 dBm
> 30 to 34.5 GHz	-141 dBm	-141 dBm	-145 dBm	-148 dBm
> 34.5 to 41 GHz	-146 dBm	-146 dBm	-150 dBm	-153 dBm
> 41 to 44 GHz	-145 dBm	-145 dBm	-150 dBm	-152 dBm
> 44 to 45 GHz	-143 dBm	-143 dBm	-149 dBm	-151 dBm
> 45 to 47 GHz	-145 dBm	-145 dBm	-149 dBm	-150 dBm
> 47 to 49 GHz	-144 dBm	-144 dBm	-148 dBm	-150 dBm
> 49 to 50 GHz	-139 dBm	-140 dBm	-146 dBm	-150 dBm
> 50 to 52 GHz	-143 dBm	-143 dBm	-147 dBm	-149 dBm
> 52 to 54 GHz	-139 dBm	-140 dBm	-145 dBm	-148 dBm
> 54 to 57 GHz	-139 dBm	-139 dBm	-144 dBm	-147 dBm
> 57 to 62 GHz	-136 dBm	-136 dBm	-143 dBm	-146 dBm
> 62 to 67 GHz	-138 dBm	-138 dBm	-142 dBm	-145 dBm

MPB path (Swept, PA High, Option P55/P67)

Noise Floor Extension (Option NF2) Nominally Improves DANL by 5 to 7 dB				
Frequency	**RBW ≤ 3 MHz, Full Range**	**RBW ≤ 3 MHz, 20 to 30 °C**	**RBW ≤ 3 MHz, Typical**	**RBW > 3 MHz, Nominal**
8.1 to 11.5 GHz	-161 dBm	-162 dBm	-165 dBm	-165 dBm
> 11.5 to 18 GHz	-162 dBm	-163 dBm	-166 dBm	-167 dBm
> 18 to 26 GHz	-162 dBm	-162 dBm	-164 dBm	-165 dBm
> 26 to 29 GHz	-159 dBm	-160 dBm	-163 dBm	-164 dBm
> 29 to 32 GHz	-159 dBm	-159 dBm	-162 dBm	-163 dBm
> 32 to 42 GHz	-156 dBm	-156 dBm	-159 dBm	-159 dBm
> 42 to 48 GHz	-154 dBm	-155 dBm	-158 dBm	-159 dBm
> 48 to 51 GHz	-155 dBm	-155 dBm	-158 dBm	-159 dBm
> 51 to 60 GHz	-153 dBm	-153 dBm	-157 dBm	-157 dBm
> 60 to 63 GHz	-151 dBm	-151 dBm	-155 dBm	-156 dBm
> 63 to 67 GHz	-150 dBm	-150 dBm	-154 dBm	-155 dBm
MPB path (Swept, PA High, Option P5N/P6N)				
Frequency	**RBW ≤ 3 MHz, Full Range**	**RBW ≤ 3 MHz, 20 to 30 °C**	**RBW ≤ 3 MHz, Typical**	**RBW > 3 MHz, Nominal**
8.1 to 43.4 GHz	Refer to MPB path DANL for Option P55/P67			
>43.4 to 48GHz	-142 dBm	-142 dBm	-146 dBm	-148 dBm
>48 to 53GHz	-141 dBm	-141 dBm	-145 dBm	-146 dBm
>53 to 54GHz	-141 dBm	-142 dBm	-145 dBm	-146 dBm
>54 to 59GHz	-141 dBm	-141 dBm	-145 dBm	-146 dBm
>59 to 61GHz	-137 dBm	-137 dBm	-142 dBm	-144 dBm
>61 to 64GHz	-135 dBm	-135 dBm	-140 dBm	-141 dBm
>64 to 67GHz	-132 dBm	-132 dBm	-137 dBm	-140 dBm

Residuals, Images, and Spurious Responses

Residual Responses (Input Terminated, 0 dB Attenuation)	
400 kHz to 67 GHz (swept)	-100 dBm
Zero span or FFT	-100 dBm (nominal)

Image Responses (Standard Path, PA OFF)

Mixer Level	Tuned Frequency (f)	Excitation Frequency	Nominal
-10 dBm	≤ 67 GHz	f+45 MHz	-90 dBc
	≤ 8.2 GHz	f+1045 MHz	-80 dBc
	> 8.2 to 11.5 GHz	f+1045 MHz	-70 dBc
	> 11.5 to 34.5 GHz	f+1045 MHz	-75 dBc
	> 34.5 to 53.5 GHz	f+1045 MHz	-70 dBc
	> 53.5 to 67 GHz	f+1045 MHz	-64 dBc

Other Spurious Responses (Input-Related, Standard Path, PA OFF)

Performance is nominally the same, with PA on. N is the LO multiplication factor. Refer to earlier table for the N value versus frequency ranges.

	Mixer Level	Response, Nominal
First RF order (f ≥ 10 MHz from carrier) Including IF Feedthrough, LO Harmonic Mixing Responses		
Carrier frequency ≤ 3 GHz	-10 dBm	-80 dBc
3 GHz < Carrier frequency ≤ 4.1 GHz	-10 dBm	-54 dBc
4.1 < Carrier frequency ≤ 12 GHz	-10 dBm	-95 dBc
Carrier frequency > 12 GHz	-10 dBm	-100 dBc
Higher RF Order (f ≥ 10 MHz from Carrier)		
Carrier frequency ≤ 11.5 GHz	-30 dBm	-85 dBc
11.5 < Carrier frequency ≤ 53.4 GHz	-30 dBm	-95 dBc
53.4 < Carrier frequency ≤ 67 GHz	-30 dBm	-85 dBc
LO-Related Spurious Responses		
45 Hz ≤ f < 200 Hz from carrier frequency < 1 GHz	-10 dBm	-98 dBc, includes line-related
f ≥ 200 Hz from carrier frequency < 1 GHz	-10 dBm	-94 dBc
45 Hz ≤ f < 200 Hz from carrier frequency ≥ 1 GHz	-10 dBm	-77 dBc + 20*log(carrier/GHz), includes line-related
f ≥ 200 Hz from carrier frequency ≥ 1 GHz	-10 dBm	-91 dBc + 20*log(N), includes line-related

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

Second-Harmonic Intercept (SHI)

Standard Path (Swept, Preselector on, PA Off)

Frequency of the Fundamental	Mixer Level	Distortion	SHI
10 to 15 MHz (Direct)	-12 dBm	-57 dBc	+45 dBm
10 to 400 MHz	-12 dBm	-62 dBc	+50 dBm
> 400 to 600 MHz	-12 dBm	-56 dBc	+44 dBm
> 600 MHz to 1.2 GHz	-12 dBm	-59 dBc	+47 dBm
> 1.2 to 1.8 GHz	-12 dBm	-61 dBc	+49 dBm
> 1.8 to 2.3 GHz	-12 dBm	-77 dBc	+65 dBm
> 2.3 to 2.9 GHz	-12 dBm	-78 dBc	+66 dBm
> 2.9 to 3.2 GHz	-12 dBm	-76 dBc	+64 dBm
> 3.2 to 3.6 GHz	-12 dBm	-73 dBc	+61 dBm
> 3.6 to 4 GHz	-12 dBm	-76 dBc	+64 dBm
> 4 to 5.5 GHz	-12 dBm	-64 dBc	+52 dBm
> 5.5 to 11.5 GHz	-12 dBm	-75 dBc	+63 dBm
> 11.5 to 13 GHz	-12 dBm	-73 dBc	+61 dBm
> 13 to 16 GHz	-12 dBm	-72 dBc	+60 dBm
> 16 to 20 GHz	-12 dBm	-69 dBc	+57 dBm
> 20 to 23.5 GHz	-12 dBm	-67 dBc	+55 dBm
> 23.5 to 32.5 GHz	-12 dBm	-64 dBc	+52 dBm
> 32.5 to 33.5 GHz	-12 dBm	-61 dBc	+49 dBm

Standard Path (Swept, Preselector on, PA Low)

Frequency of the Fundamental	Preamp Level	Distortion, Nominal	SHI, Nominal
10 to 15 MHz	-27 dBm	-44 dBc	+10 dBm
> 15 to 50 MHz	-27 dBm	-49 dBc	+21 dBm
> 50 MHz to 1.8 GHz	-27 dBm	-50 dBc	+22 dBm
> 1.8 to 8 GHz	-27 dBm	-51 dBc	+22 dBm
> 8 to 11 GHz	-27 dBm	-57 dBc	+27 dBm
>11 to 13 GHz	-27 dBm	-53 dBc	+24 dBm
>13 to 27 GHz	-27 dBm	-52 dBc	+23 dBm
>27 to 30 GHz	-27 dBm	-53 dBc	+26 dBm
>30 to 31 GHz	-27 dBm	-45 dBc	+18 dBm
>31 to 33.5 GHz	-27 dBm	-42 dBc	+14 dBm

Standard Path (Swept, Preselector on, PA High)

Frequency of the Fundamental	Mixer Level	Distortion, Nominal	SHI, Nominal
10 to 15 MHz	-32 dBm	-75 dBc	+10 dBm
> 15 to 50 MHz	-32 dBm	-83 dBc	+18 dBm
> 50 MHz to 1.8 GHz	-32 dBm	-82 dBc	+17 dBm
> 1.8 to 8 GHz	-32 dBm	-82 dBc	+17 dBm
> 8 to 11 GHz	-32 dBm	-89 dBc	+24 dBm
>11 to 14 GHz	-32 dBm	-85 dBc	+20 dBm
>14 to 22 GHz	-32 dBm	-81 dBc	+16 dBm
>22 to 28 GHz	-32 dBm	-77 dBc	+12 dBm
>28 to 29 GHz	-32 dBm	-75 dBc	+10 dBm
>29 to 31 GHz	-32 dBm	-70 dBc	+5 dBm
>31 to 33.5 GHz	-32 dBm	-65 dBc	0 dBm

Third-Order Intercept (TOI)

Standard Path (Swept, Preselector on, PA Off)

Two –12 dBm (up to 40 GHz), or –5 dBm (> 40 to 67 GHz) tones at input mixer with tone separation = 1 MHz

Frequency	Full Range	20 to 30 °C	Typical, Unless Otherwise Stated
12 to 30 MHz	+21 dBm	+21 dBm	+26 dBm
> 30 to 800 MHz	+11 dBm	+12 dBm	+19 dBm
> 800 MHz to 1.3 GHz	+9 dBm	+9 dBm	+18 dBm
>1.3 to 3 GHz	+16 dBm	+17 dBm	+24 dBm
>3 to 4 GHz	+16 dBm	+17 dBm	+23 dBm
>4 to 8 GHz	+16 dBm	+16 dBm	+21 dBm
>8 to 10 GHz	+10 dBm	+10 dBm	+16 dBm
>10 to 13 GHz	+14 dBm	+15 dBm	+19 dBm
>13 to 16 GHz	+15 dBm	+15 dBm	+20 dBm
>16 to 19 GHz	+15 dBm	+16 dBm	+20 dBm
>19 to 20 GHz	+16 dBm	+16 dBm	+21 dBm
>20 to 26 GHz	+17 dBm	+17 dBm	+22 dBm
>26 to 30 GHz	+18 dBm	+18 dBm	+23 dBm
>30 to 34 GHz	+18 dBm	+19 dBm	+24 dBm
>34 to 39 GHz			+23 dBm (nominal)
>39 to 40 GHz			+21 dBm (nominal)
>40 to 45 GHz			+19 dBm (nominal)
>45 to 56 GHz			+21 dBm (nominal)
>56 to 60 GHz			+24 dBm (nominal)
>60 to 64 GHz			+27 dBm (nominal)
>64 to 67 GHz			+29 dBm (nominal)

Standard Path (Swept, Preselector on, PA Low)

Two –23 dBm (up to 40GHz); or –27 dBm (> 40 to 67 GHz) tones at preamp input with tone separation ≥ 1 MHz

Frequency	Nominal
10 to 30 MHz	+8 dBm
> 30 to 1.5 GHz	+8 dBm
> 1.5 to 8 GHz	+11 dBm
> 8 to 10 GHz	+8 dBm
> 10 to 15 GHz	+10 dBm
> 15 to 21 GHz	+11 dBm
> 21 to 26.5 GHz	+13 dBm
> 26.5 to 28 GHz	+14 dBm
> 28 to 34 GHz	+15 dBm
> 34 to 39.5 GHz	+6 dBm
> 39.5 to 45 GHz	+6 dBm
> 45 to 58 GHz	+10 dBm
> 58 to 60 GHz	+11 dBm
> 60 to 67 GHz	+12 dBm

Standard Path (Swept, Preselector on, PA High)

Two –33 dBm (up to 40 GHz); or –40 dBm (> 40 to 67 GHz) tones at preamp input with tone separation ≥ 1 MHz

Frequency	Nominal
10 to 30 MHz	+4 dBm
> 30 to 500 MHz	0 dBm
> 500 MHz to 1 GHz	+1 dBm
> 1 to 1.3 GHz	+3 dBm
> 1.3 to 4.5 GHz	+5 dBm
> 4.5 to 10 GHz	0 dBm
> 10 to 15 GHz	+2 dBm
> 15 to 20 GHz	-2 dBm
> 20 to 24 GHz	-1 dBm
> 24 to 26 GHz	0 dBm
> 26 to 34 GHz	+1 dBm
> 34 to 40 GHz	-2 dBm
> 40 to 44 GHz	-4 dBm
> 44 to 50 GHz	-1 dBm

> 50 to 55 GHz	-2 dBm
> 55 to 60 GHz	-1 dBm
> 60 to 67 GHz	+3 dBm

MPB Path (Swept, Preselector Off, PA Low)

Two –23 dBm (up to 40 GHz); or –27 dBm (> 40 to 67 GHz) tones at preamp input with tone separation ≥ 1 MHz

Frequency	Nominal
> 8.5 to 10 GHz	+9 dBm
> 10 to 16 GHz	+12 dBm
> 16 to 18 GHz	+14 dBm
> 18 to 26 GHz	+15 dBm
> 26 to 34 GHz	+17 dBm
> 34 to 40 GHz	+11 dBm
> 40 to 42 GHz	+10 dBm
> 42 to 57 GHz	+11 dBm
> 57 to 61 GHz	+12 dBm
> 61 to 67 GHz	+13 dBm

MPB Path (Swept, Preselector off, PA High)

Two –33 dBm (up to 40GHz); or –40 dBm (> 40 GHz to 67 GHz) tones at preamp input with tone separation ≥ 1 MHz

Frequency	Nominal
> 8.5 to 10 GHz	+1 dBm
> 10 to 15.5 GHz	+4 dBm
> 15.5 to 18.5 GHz	+2 dBm
> 18.5 to 25 GHz	+3 dBm
> 25 to 34.5 GHz	+4 dBm
> 34.5 to 59 GHz	0 dBm
> 59 to 67 GHz	+3 dBm

Phase Noise (SSB)

Phase Noise	Offset	Full Range	20 to 30 °C	Typical, Unless Otherwise Stated	Phase Noise Optimization, Best Close In, Nominal	Phase Noise Optimization, Best Wide Offset, Nominal
Noise sidebands (CF = 1 GHz)	10 Hz			–104 dBc/Hz (nominal)	–104 dBc/Hz	–104 dBc/Hz
	100 Hz			–114 dBc/Hz (nominal)	–114 dBc/Hz	–113 dBc/Hz
	1 kHz	–126 dBc/Hz	–126 dBc/Hz	–129 dBc/Hz	–130 dBc/Hz	–127 dBc/Hz
	10 kHz	–136 dBc/Hz	–136 dBc/Hz	–139 dBc/Hz	–140 dBc/Hz	–135 dBc/Hz
	100 kHz	–141 dBc/Hz	–141 dBc/Hz	–144 dBc/Hz	–146 dBc/Hz	–143 dBc/Hz
	1 MHz	–146 dBc/Hz	–146 dBc/Hz	–149 dBc/Hz	–151 dBc/Hz	–150 dBc/Hz
	10 MHz	–153 dBc/Hz	–154 dBc/Hz	–156 dBc/Hz	–153 dBc/Hz	–157 dBc/Hz
Noise sidebands (CF = 10 GHz)	10 Hz			–82 dBc/Hz (nominal)	–82 dBc/Hz	–81 dBc/Hz
	100 Hz			–94 dBc/Hz (nominal)	–94 dBc/Hz	–93 dBc/Hz
	1 kHz			–118 dBc/Hz	–122 dBc/Hz	–121 dBc/Hz
	10 kHz			–132 dBc/Hz	–134 dBc/Hz	–132 dBc/Hz
	100 kHz			–137 dBc/Hz	–139 dBc/Hz	–138 dBc/Hz
	1 MHz			–146 dBc/Hz	–147 dBc/Hz	–147 dBc/Hz
	10 MHz			–158 dBc/Hz	–149 dBc/Hz	–159 dBc/Hz

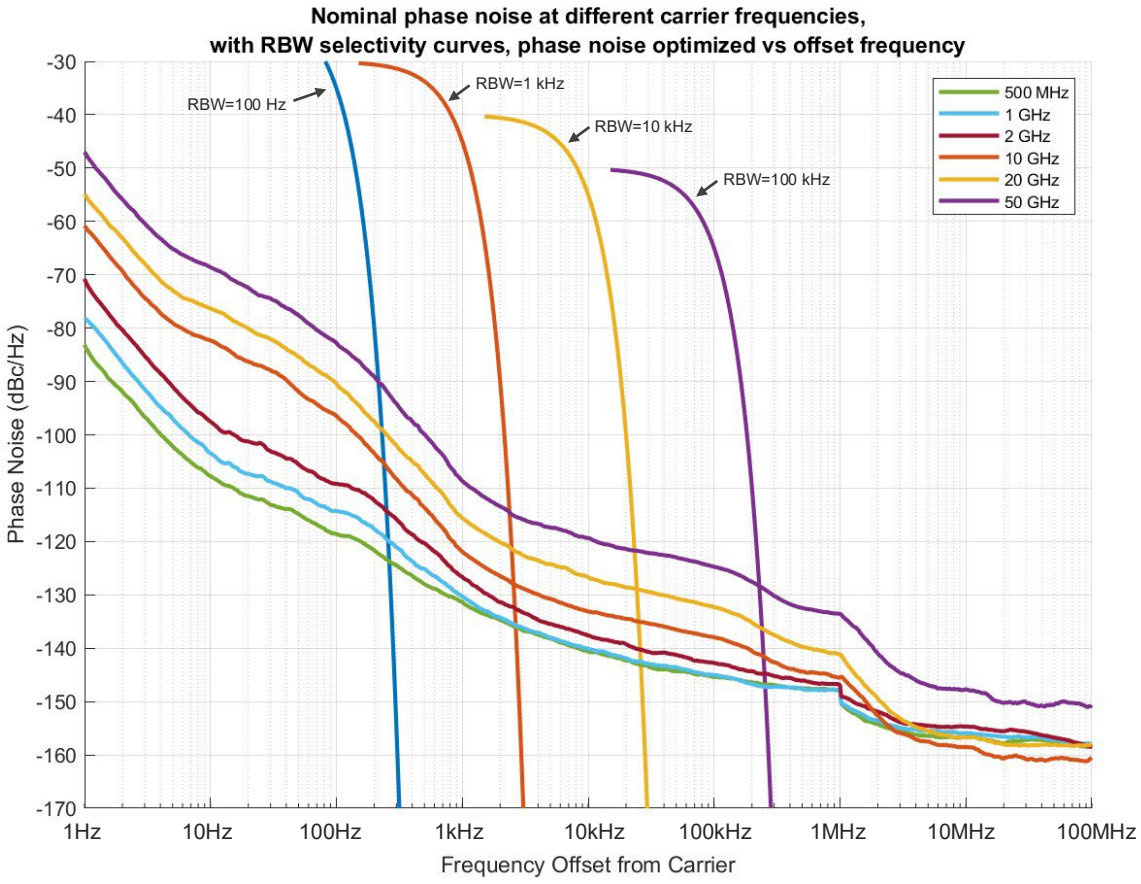


Figure 10. Nominal PXA phase noise at various center frequencies. 50 GHz curve is the predicted phase noise computed from the 24 GHz observation. RBW curves added to show impact of analyzer phase noise in resolving two closely spaced signals for various RBW filter choices.

IQ Analyzer

Each bandwidth option includes and enables all others with lesser bandwidth: e.g. instruments with R80 also have R40 licenses, plus R20, B4X, and B40 paths.

40 MHz Analysis Bandwidth (Option B40)

Specifications on this bandwidth apply with center frequencies of 65 MHz and higher. All specifications apply under the following settings unless otherwise specified: preselector bypassed, PA off, IF gain = Auto, IF gain offset = 0 dB.

Analysis bandwidth range	10 Hz to 40 MHz	
Tuning range	2 Hz to 67 GHz	In practice, low end of tuning range limited to < (½*BW), by image folding and LO feedthrough.
	67.0 to 110 GHz with V3050A	Over-range tuning to 50.5 GHz allowed, but without corrections, performance not specified
IF frequency	7.77 GHz (1st IF, center frequency ≤ 8.2 GHz)	
	570 MHz (Final IF)	
ADC sample rate	200 MSa/sec	
ADC resolution	16 bits	
Final data format	I & Q pairs, 32 bits each, 64 bits/Sa	
IQ-pair sample rate	1.25 x BW	
Capture memory	2 GB	
IQ analyzer	128,000,001 sample pairs	
Length (IQ sample pairs)	268,435,456 (2^{28} Sa) with 64-bit data packing	
Maximum capture time (time record length)	5.36 sec at full 40 MHz BW with 64-bit data packing	Capture time increases linearly with decrease in bandwidth

IF Frequency Response (Span ≤ 40 MHz, MPB Path, 10 dB Attenuation)

	PA Off (dB)				PA Low (dB)		PA High (dB)	
Center Frequency	Amplitude max error			RMS	Amplitude max error	RMS	Amplitude max error	RMS
	Full range	20 to 30 °C	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
65 MHz to 3.6 GHz	±0.6	±0.5	±0.07	0.03	± 0.18	0.06	±0.19	0.06
> 3.6 to 8.2 GHz	±0.7	±0.6	±0.13	0.04	± 0.15	0.05	±0.15	0.04
> 8.2 to 12 GHz	±0.7	±0.6	±0.09	0.02	± 0.21	0.09	±0.21	0.09
> 12 to 37.4 GHz	±1.1	±1.0	±0.13	0.04	± 0.23	0.10	±0.33	0.13
> 37.4 to 53.4 GHz	±1.3	±1.2	±0.16	0.04	± 0.18	0.08	±0.35	0.12
> 53.4 to 59 GHz	±1.4	±1.2	±0.13	0.04	± 0.18	0.06	±0.60	0.11
> 59 to 66 GHz	±1.7	±1.5	±0.13	0.04	± 0.18	0.06	±0.60	0.11
> 66 to 66.98 GHz	±2.4	±2.3	±0.13	0.04	± 0.18	0.06	±0.60	0.11

IF Phase Linearity

Center Frequency	Span (MHz)	Preselector	RMS (Nominal)
≤ 8.2 GHz	≤ 40 MHz	NA	0.08°
> 8.2 to 37.4 GHz	≤ 40 MHz	Off	0.08°
> 37.4 to 53.4 GHz	≤ 40 MHz	Off	0.1°
> 53.4 to 67 GHz	≤ 40 MHz	Off	0.17°

IF Dynamic Range (IF Gain = High, Signal at –20 dBFS, Anywhere in Full IF Width) (Nominal)

SFDR (spurious-free dynamic range) (ADC related spurious)	-86 dBc

IF Residual Responses (Input Terminated, 0 dB Attenuation, IF Gain = High) (Nominal)

Center Frequency	
65 MHz to 8.2 GHz	-115 dBm
> 8.2 GHz	-110 dBm

Signal to Noise Ratio

(Ratio of Clipping Level to Noise Level, Log Averaged, 1 Hz RBW, IF Gain = Low) (Nominal)

Center Frequency	
65 MHz to 3.6 GHz	149 dB
> 3.6 to 26.5 GHz	146 dB
> 26.5 to 37.4 GHz	144 dB
> 37.4 to 53.4 GHz	142 dB
> 53.4 GHz	138 dB

TOI

(3rd-Order Intermodulation Distortion in the IF, 2 Tones of Equal Level at -30 dBFS, 1 MHz Tone Separation, IF Gain = High) (Nominal)

Center Frequency	
65 MHz to 37.4 GHz	-83 dBc
> 37.4 to 67 GHz	-81 dBc

Noise Density in IF

Nominally 2 dB higher than DANL MPB PA Off specification under similar measurement conditions.
Nominally 2 dB higher than DANL MPB PA High specification under similar measurement conditions.
The noise level in the IF will change for frequencies away from the center of the IF.

Spurious Responses (Preselector Enabled for Frequencies > 8.2 GHz) (Nominal)

Residual responses (input terminated, 0 dB attenuation, IF gain = high)

Center Frequency	Nominal
65 MHz to 8.2 GHz	-110 dBm
> 8.2 GHz	-105 dBm

Image Responses

Tuned Frequency (f)	Excitation Frequency
≤ 8.2 GHz	f + 2 * 1st IF MHz
	f + 2 * Final IF MHz
> 8.2 GHz	f + 2 * Final IF MHz

Amplitude Accuracy, Absolute (MPB Path, 10 dB Attenuation)

	PA Off		PA Low	PA High
Center Frequency	Full Range	20 to 30 °C	Nominal	Nominal
30 to 50 MHz	±0.86 dB	±0.76 dB	±0.17 dB	±0.18 dB
> 50 to 125 MHz	±0.8 dB	±0.66 dB	±0.17 dB	±0.18 dB
> 125 MHz to 3.6 GHz	±0.84 dB	±0.66 dB	±0.17 dB	±0.18 dB
> 3.6 to 5.3 GHz	±0.78 dB	±0.71 dB	±0.21 dB	±0.22 dB
> 5.3 to 8.2 GHz	±0.85 dB	±0.75 dB	±0.16 dB	±0.19 dB
> 8.2 to 12 GHz	±1.34 dB	±1.15 dB	±0.27 dB	±0.25 dB
> 12 to 15.4 GHz	±2.3 dB	±1.79 dB	±0.17 dB	±0.18 dB
> 15.4 to 37.4 GHz	±2.3 dB	±1.79 dB	±0.37 dB	±0.38 dB
> 37.4 to 53.4 GHz	±2.27 dB	±1.94 dB	±0.41 dB	±0.53 dB
> 53.4 to 55 GHz	±2.2 dB	±1.95 dB	±0.4 dB	±0.49 dB
> 55 to 59 GHz	±2.78 dB	±2.33 dB	±0.52 dB	±0.70 dB
> 59 to 66 GHz	±3.11 dB	±2.66 dB	±0.6 dB	±0.77 dB
> 66 to 67 GHz	±3.61 dB	±3.16 dB	±0.6 dB	±0.77 dB

480 MHz Analysis Bandwidth (Option B4X)

Specifications on this bandwidth apply with center frequencies of 300 MHz and higher. All specifications apply under the following settings unless otherwise specified: preselector bypassed, PA off, IF gain = Auto, IF gain offset = 0 dB.

Analysis bandwidth range	10 Hz to 480 MHz	
Tuning range	2 Hz to 67 GHz	In practice, low end of tuning range limited to < (½*BW), by image folding and LO feedthrough.
	67.0 to 110 GHz with V3050A	Over-range tuning to 50.5 GHz allowed, but without corrections, performance not specified
IF frequency	8.1 GHz (1st IF, center frequency ≤ 8.2 GHz)	
	900 MHz (Final IF)	
ADC sample rate	1000 MSa/sec	
ADC resolution	14 bits	
Final data format	I & Q pairs, 32 bits each, 64 bits/Sa	
IQ-pair sample rate	1.25 x BW	
Capture memory	2 GB	
IQ analyzer	128,000,001 sample pairs	
Length (IQ sample pairs)	268,4 MSa (2^{28} Sa) with 64-bit data packing	
Maximum capture time (time record length)	0.447 second at full 480 MHz BW with 64-bit data packing	Capture time increases linearly with decrease in bandwidth

IF Frequency Response (Span ≤ 480 MHz, MPB Path, 10 dB Attenuation)

	PA Off (dB)				PA Low (dB)		PA High (dB)	
Center Frequency	Amplitude max error			RMS	Amplitude max error	RMS	Amplitude max error	RMS
	Full range	20 to 30 °C	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
300 MHz to 3.5 GHz	±1.3	±1.1	±0.4	0.13	±0.23	0.06	±0.21	0.06
> 3.5 to 8.2 GHz	±1.1	±0.8	±0.17	0.05	±0.30	0.09	±0.28	0.09
> 8.2 to 12 GHz	±1.1	±0.8	±0.12	0.04	±0.31	0.08	±0.30	0.08
> 12 to 37.1 GHz	±1.8	±1.4	±0.27	0.08	±0.71	0.27	±0.47	0.20
> 37.1 to 53.1 GHz	±2.0	±1.7	±0.30	0.10	±0.41	0.15	±0.52	0.20
> 53.1 to 59 GHz	±2.7	±2.2	±0.31	0.12	±0.64	0.24	±0.70	0.25
> 59 to 66 GHz	±3.0	±2.5	±0.31	0.12	±0.64	0.24	±0.70	0.25
> 66 to 66.76 GHz	±3.7	±3.3	±0.31	0.12	±0.64	0.24	±0.70	0.25

IF Phase Linearity

Center Frequency	Span (MHz)	Preselector	RMS (Nominal)
≤ 8.2 GHz	≤ 480 MHz	NA	0.3°
> 8.2 to 37.1 GHz	≤ 480 MHz	Off	0.3°
> 37.1 to 53.1 GHz	≤ 480 MHz	Off	0.6°
> 53.1 to 67 GHz	≤ 480 MHz	Off	0.75°

IF Dynamic Range (IF Gain = High, Signal at –20 dBFS, Anywhere in Full IF Width) (Nominal)

SFDR (spurious-free dynamic range) (ADC related spurious)	-70 dBc

IF Residual Responses (Input Terminated, 0 dB attenuation, IF gain = high) (Nominal)

Center Frequency	
300 MHz to 3.5 GHz	-99 dBm
> 3.5 to 8.2 GHz	-98 dBm
> 8.2 to 12.1 GHz	-96 dBm
> 12.1 to 37.1 GHz	-83 dBm
> 37.1 to 53.1 GHz	-91 dBm
> 53.1 GHz	-86 dBm

Signal to Noise Ratio

(Ratio of Clipping Level to Noise Level, Log Averaged, 1 Hz RBW, IF Gain = Low) (Nominal)

Center Frequency	
300 MHz to 3.5 GHz	155 dB
> 3.5 to 8.2 GHz	150 dB
> 8.2 to 12 GHz	152 dB
> 12 to 37.1 GHz	151 dB
> 37.1 to 53.1 GHz	148 dB
> 53.1 GHz	145 dB

TOI

(3rd-Order Intermodulation Distortion in the IF, 2 Tones of Equal Level at -25 dBFS, 10 MHz Tone Separation, IF Gain = High) (Nominal)

Center Frequency	
300 MHz 3.5 GHz	-92 dBc
> 3.5 to 8.2 GHz	-91 dBc
> 8.2 to 37.1 GHz	-95 dBc
> 37.1 to 53.1 GHz	-91 dBc
> 53.1 GHz	-92 dBc

Noise Density in IF

Nominally 2 dB higher than DANL MPB PA Off specification under similar measurement conditions.
Nominally 2 dB higher than DANL MPB PA High specification under similar measurement conditions.
The noise level in the IF will change for frequencies away from the center of the IF.

Spurious Responses (Preselector Enabled for Frequencies > 8.2 GHz) (Nominal)

Residual responses (input terminated, 0 dB attenuation, IF gain = high)

Center Frequency	Nominal
300 MHz to 1.7 GHz	-100 dBm
> 1.7 to 1.9 GHz	-95 dBm
> 1.9 GHz	-100 dBm

Image Responses

Tuned Frequency (f)	Excitation Frequency
≤ 8.2 GHz	f + 2 * 1st IF MHz
	f + 2 * Final IF MHz
> 8.2 GHz	f + 2 * Final IF MHz

Amplitude Accuracy, Absolute (MPB path, 10 dB Attenuation)

	PA Off		PA Low	PA High
Center Frequency	Full Range	20 to 30 °C	Nominal	Nominal
260 MHz to 3.5 GHz	±0.81 dB	±0.67 dB	±0.14 dB	±0.14 dB
> 3.5 to 8.2 GHz	±1.06 dB	±0.87 dB	±0.2 dB	±0.22 dB
> 8.2 to 12 GHz	±1.25 dB	±1.13 dB	±0.25 dB	±0.25 dB
> 12 to 15.2 GHz	±1.67 dB	±1.44 dB	±0.19 dB	±0.2 dB
> 15.2 to 24 GHz	±1.67 dB	±1.44 dB	±0.4 dB	±0.41 dB
> 24 to 37.1 GHz	±2.19 dB	±1.53 dB	±0.4 dB	±0.41 dB
> 37.1 to 53.1 GHz	±2.26 dB	±1.94 dB	±0.37 dB	±0.45 dB
> 53.1 to 55 GHz	±2.03 dB	±1.8 dB	±0.55 dB	±0.62 dB
> 55 to 59 GHz	±2.73 dB	±2.33 dB	±0.55 dB	±0.62 dB
> 59 to 66 GHz	±2.86 dB	±2.42 dB	±0.55 dB	±0.62 dB
> 66 to 67 GHz	±3.41 dB	±2.97 dB	±0.55 dB	±0.62 dB

2 GHz Analysis Bandwidth (Option R20)

Specifications on this bandwidth apply with center frequencies of 1200 MHz and higher. All specifications apply under the following settings unless otherwise specified: preselector bypassed, PA off, IF gain = Auto, IF gain offset = 0 dB.

Analysis bandwidth range	10 Hz to 2 GHz	
Tuning range	2 Hz to 67 GHz	In practice, low end of tuning range limited to < (½*BW), by image folding and LO feedthrough.
	67.0 to 110 GHz with V3050A	Over-range tuning to 50.5 GHz allowed, but without corrections, performance not specified
IF frequency	8.4 GHz (1st IF, center frequency ≤ 8.2 GHz)	
	1.2 GHz (Final IF)	
ADC sample rate	2400 MSa/sec	
ADC resolution	12 bits	
Final data format	I & Q pairs, 32 bits each, 64 bits/Sa	
IQ-pair sample rate	1.25 x BW	
Capture memory	16 GB	
IQ analyzer	32,000,001 sample pairs	
Length (IQ sample pairs)	268,4 MSa (2^{28} Sa) with 64-bit data packing	
Maximum capture time (time record length)	3.57 second at full 2 GHz BW with 64-bit data packing	Capture time increases linearly with decrease in bandwidth

IF Frequency Response (Span ≤ 2 GHz, MPB Path, 10 dB Attenuation)

	PA Off (dB)				PA Low (dB)		PA High (dB)	
Center frequency	Amplitude max error			RMS	Amplitude max error	RMS	Amplitude max error	RMS
	Full range	20 to 30 °C	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
1.2 to 3.5 GHz	±1.5	±1.2	±0.31	0.10	±0.52	0.15	±0.51	0.14
> 3.5 to 8.2 GHz	±1.0	±0.9	±0.21	0.05	±0.40	0.11	±0.41	0.11
> 8.2 to 12 GHz	±1.3	±1.1	±0.30	0.07	±0.30	0.13	±0.32	0.13
> 12 to 36.8 GHz	±2.0	±1.7	±0.30	0.08	±0.87	0.26	±0.62	0.18
> 36.8 to 52.8 GHz	±1.9	±1.6	±0.28	0.10	±0.49	0.16	±0.56	0.21
> 52.8 to 55 GHz	±2.9	±2.5	±0.39	0.14	±0.63	0.27	±0.93	0.27
> 55 to 66 GHz	±3.1	±2.7	±0.39	0.14	±0.63	0.27	±0.93	0.27

IF phase linearity

Center Frequency	Span (MHz)	Preselector	RMS (Nominal)
≤ 8.2 GHz	≤ 2000 MHz	NA	0.5°
> 8.2 to 67 GHz	≤ 2000 MHz	Off	0.5°

IF Dynamic Range (IF Gain = High, Signal at –16 dBFS, Anywhere in Full IF Width) (Nominal)

SFDR (spurious-free dynamic range) (ADC related spurious)	-61 dBc

IF Residual Responses (Input Terminated, 0 dB Attenuation, IF Gain = High) (Nominal)

Center Frequency	
1.2 to 8.2 GHz	-90 dBm
> 8.2 GHz	-95 dBm

Signal to Noise Ratio

(Ratio of Clipping Level to Noise Level, Log Averaged, 1 Hz RBW, IF Gain = Low) (Nominal)

Center Frequency	
1.2 to 3.5 GHz	152 dB
> 3.5 to 8.2 GHz	150 dB
> 8.2 to 12 GHz	149 dB
> 12 to 36.8 GHz	145 dB
> 36.8 to 52.8 GHz	142 dB
> 52.8 GHz	138 dB

TOI

(3rd-Order Intermodulation Distortion in the IF, 2 Tones of Equal Level at -20 dBFS, 10 MHz Tone Separation, IF Gain = High) (Nominal)

Center Frequency	
1.2 to 12 GHz	-82 dBc
> 12 GHz	-83 dBc

Noise Density in IF

Nominally 2 dB higher than DANL MPB PA Off specification under similar measurement conditions.
Nominally 2 dB higher than DANL MPB PA High specification under similar measurement conditions.
The noise level in the IF will change for frequencies away from the center of the IF.

Spurious Responses (Preselector Enabled for Frequencies > 8.2 GHz) (Nominal)

Residual responses (input terminated, 0 dB attenuation, IF gain = high)

Center Frequency	Nominal
1.2 to 8.2 GHz	-95 dBm
> 8.2 GHz	-100 dBm

Image Responses

Tuned Frequency (f)	Excitation Frequency
≤ 8.2 GHz	f + 2 * 1st IF MHz
	f + 2 * Final IF MHz
> 8.2 GHz	f + 2 * Final IF MHz

Amplitude Accuracy, Absolute (MPB Path, 10 dB Attenuation)

	PA Off		PA Low	PA High
Center Frequency	Full Range	20 to 30 °C	Nominal	Nominal
1.02 to 1.8 GHz	±0.69 dB	±0.57 dB	±0.29 dB	±0.26 dB
> 1.8 to 3.5 GHz	±0.69 dB	±0.57 dB	±0.17 dB	±0.16 dB
> 3.5 to 8.2 GHz	±0.94 dB	±0.76 dB	±0.2 dB	±0.19 dB
> 8.2 to 12 GHz	±1.2 dB	±1.07 dB	±0.25 dB	±0.27 dB
> 12 to 14.8 GHz	±1.58 dB	±1.37 dB	±0.2 dB	±0.2 dB
> 14.8 to 25 GHz	±1.58 dB	±1.37 dB	±0.35 dB	±0.44 dB
> 25 to 36.8 GHz	±2.16 dB	±1.5 dB	±0.35 dB	±0.44 dB
> 36.8 to 52.8 GHz	±2.34 dB	±2 dB	±0.44 dB	±0.6 dB
> 52.8 to 55 GHz	±2.28 dB	±2.02 dB	±0.43 dB	±0.5 dB
> 55 to 59 GHz	±2.68 dB	±2.35 dB	±0.55 dB	±0.75 dB
> 59 to 66 GHz	±3.16 dB	±2.72 dB	±0.65 dB	±0.8 dB
> 66 to 67 GHz	±3.59 dB	±3.15 dB	±0.65 dB	±0.8 dB

4 GHz Analysis Bandwidth (Option R40)

Specifications on this bandwidth apply with center frequencies of 2500 MHz and higher. All specifications apply under the following settings unless otherwise specified: preselector bypassed, PA off, IF gain = Auto, IF gain offset = 0 dB.

Analysis bandwidth range	8 kHz to 4 GHz	
Tuning range	2 to 67 GHz	In practice, low end of tuning range limited to < (½*BW), by image folding and LO feedthrough.
	67.0 to 110 GHz with V3050A	Over-range tuning to 50.5 GHz allowed, but without corrections, performance not specified
IF frequency	15.8 GHz (1st IF, center frequency ≤ 8.0 GHz)	
	3 GHz (Final IF, center frequency ≤ 10.0 GHz)	
	5 GHz (Final IF, center frequency > 10.0 GHz)	
ADC sample rate	20 GSa/sec	
ADC resolution	12 bits	
Final data format	I & Q pairs, 64 bits/Sa	
IQ-pair sample rate	1.25 x BW	
Capture memory	16 GB	
IQ analyzer	32,000,001 sample pairs	
Length (IQ sample pairs)	4 GSa with 32-bit data packing	
Maximum capture time (time record length)	0.858 second at full BW with 32-bit data packing	

IF Frequency Response (Span ≤ 4 GHz, MPB Path, 10 dB Attenuation)

	PA Off (dB)				PA Low (dB)		PA High (dB)	
Center frequency	Amplitude max error			RMS	Amplitude max error	RMS	Amplitude max error	RMS
	Full range	20 to 30 °C	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
2.5 to 8 GHz	±1.10	±0.90	±0.18	0.11	±0.28	0.06	±0.28	0.07
> 8 to 14 GHz	±1.30	±1.00	±0.23	0.10	±0.26	0.07	±0.23	0.07
> 14 to 35 GHz	±1.40	±1.10	±0.25	0.11	±0.40	0.13	±0.42	0.15
> 35 to 49 GHz	±1.70	±1.40	±0.26	0.12	±0.37	0.14	±0.62	0.20
> 49 to 59 GHz	±3.10	±2.60	±0.45	0.14	±0.59	0.22	±1.00	0.32
> 59 to 65 GHz	±3.60	±3.00	±0.45	0.14	±0.59	0.22	±1.00	0.32

IF Phase Linearity

Center Frequency	Span (MHz)	Preselector	RMS (Nominal)
≤ 8 GHz	≤ 4000 MHz	N/A	0.8°
> 8 to 14 GHz	≤ 4000 MHz	Off	1.2°
> 14 to 35 GHz	≤ 4000 MHz	Off	1°
> 35 to 49 GHz	≤ 4000 MHz	Off	2.6°
> 49 to 65 GHz	≤ 4000 MHz	Off	2.4°

IF Dynamic Range (IF Gain = High, Signal at –24 dBFS, Anywhere in Full IF Width) (Nominal)

SFDR (spurious-free dynamic range) (ADC related spurious)	-53 dBc

IF Residual Responses (Input Terminated, 0 dB Attenuation, IF Gain = High) (Nominal)

Center Frequency	
2.5 to 8 GHz	-78 dBm
8 to 14 GHz	-85 dBm
> 14 GHz	-78 dBm

Signal to Noise Ratio

(Ratio of Clipping Level to Noise Level, Log Averaged, 1 Hz RBW, IF Gain = High) (Nominal)

Center Frequency	
2.5 to 8 GHz	138 dB
> 8 to 35 GHz	144 dB
> 35 to 49 GHz	139 dB
> 49 to 65 GHz	138 dB

TOI

(3rd-Order Intermodulation Distortion in the IF, 2 Tones of Equal Level at -14 dBFS, 10 MHz Tone Separation, IF Gain = High) (Nominal)

Center Frequency	
2.5 to 35 GHz	-68 dBc
> 35 GHz	-69 dBc

Noise Density in IF

Nominally 2 dB higher than DANL MPB PA Off specification under similar measurement conditions.
For frequencies < 60 GHz nominally 2 dB higher than DANL MPB PA High specification under similar measurement conditions.
For frequencies ≥ 60 GHz nominally 6 dB higher than DANL MPB PA High specification under similar measurement conditions.
The noise level in the IF will change for frequencies away from the center of the IF.

Spurious Responses (Preselector Enabled for Frequencies > 8.0 GHz) (Nominal)

Residual responses (input terminated, 0 dB attenuation, IF gain = high)

Center Frequency	Nominal
2.5 to 8.0 GHz	-80 dBm
> 8.0 GHz	-100 dBm

Image Responses

Tuned Frequency (f)	Excitation Frequency
≤ 8.0 GHz	f + 2 * 1st IF MHz
	f + 2 * Final IF MHz
> 8.0 GHz	f + 2 * Final IF MHz

Amplitude Accuracy, Absolute (MPB path, 10 dB Attenuation)

	PA Off		PA Low	PA High
Center frequency	Full range	20 to 30 °C	Nominal	Nominal
2.15 to 8.2 GHz	±1.18 dB	±1.02 dB	±0.3 dB	±0.33 dB
> 8.2 to 14 GHz	±1.85 dB	±1.45 dB	±0.26 dB	±0.28 dB
> 14 to 25 GHz	±1.93 dB	±1.63 dB	±0.31 dB	±0.33 dB
> 25 to 35 GHz	±2.39 dB	±1.7 dB	±0.38 dB	±0.45 dB
> 35 to 49 GHz	±2.44 dB	±2.06 dB	±0.4 dB	±0.43 dB
> 49 to 55 GHz	±2.41 dB	±2.08 dB	±0.55 dB	±0.7 dB
> 55 to 59 GHz	±2.9 dB	±2.52 dB	±0.6 dB	±1.0 dB
> 59 to 66 GHz	±3.22 dB	±2.74 dB	±0.73 dB	±1.3 dB
> 66 to 67 GHz	±3.7 dB	±3.22 dB	±0.73 dB	±1.3 dB

8 GHz Analysis Bandwidth (Option R80)

Specifications on this bandwidth apply with center frequencies of 9 GHz and higher. All specifications apply under the following settings unless otherwise specified: preselector bypassed, PA off, IF gain = Auto, IF gain offset = 0 dB.

Analysis bandwidth range	8 kHz to 8 GHz	
Tuning range	9 to 67 GHz	In practice, low end of tuning range limited to < (½*BW), by image folding and LO feedthrough.
	67.0 to 110 GHz with V3050A	Over-range tuning to 50.5 GHz allowed, but without corrections, performance not specified
	5 GHz (Final IF)	
ADC sample rate	20 GSa/sec	
ADC resolution	12 bits	
Final data format	I & Q pairs, 64 bits/Sa	
IQ-pair sample rate	1.25 x BW	
Capture memory	32 GB	
IQ analyzer	32,000,001 sample pairs	
Length (IQ sample pairs)	8 GSa with 32-bit data packing	
Maximum capture time (time record length)	0.429 second at full BW with 32-bit data packing	

IF Frequency Response (Span ≤ 8 GHz, MPB Path, 10 dB Attenuation)

	PA Off (dB)				PA Low (dB)		PA High (dB)	
Center frequency	Amplitude max error			RMS	Amplitude max error	RMS	Amplitude max error	RMS
	Full range	20 to 30 °C	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
9 to 14 GHz	±1.9	±1.5	±0.34	0.10	±0.35	0.10	± 0.4	0.09
> 14 to 35 GHz	±2.7	±2.0	±0.36	0.10	±0.70	0.25	± 0.6	0.18
> 35 to 49 GHz	±2.8	±2.2	±0.34	0.10	±0.50	0.25	± 0.7	0.24
> 49 to 55 GHz	±3.9	±3.0	±0.43	0.15	±1.00	0.25	± 1.0	0.34
> 55 to 63 GHz	±4.3	±3.4	±0.40	0.15	±1.00	0.25	± 1.0	0.34

IF Phase Linearity

Center Frequency	Span (MHz)	Preselector	RMS (Nominal)
≤ 14 GHz	≤ 8000 MHz	Off	1.6°
> 14 to 35 GHz	≤ 8000 MHz	Off	1.25°
> 35 to 49 GHz	≤ 8000 MHz	Off	2.75°
> 49 to 63 GHz	≤ 8000 MHz	Off	3.75°

IF Dynamic Range (IF Gain = High, Signal at –24 dBFS, Anywhere in Full IF Width) (Nominal)

SFDR (spurious-free dynamic range) (ADC related spurious)	-55 dBc

IF Residual Responses (Input Terminated, 0 dB Attenuation, IF Gain = High) (Nominal)

Center Frequency	
9 to 11.4 GHz	-70 dBm
> 11.4 to 11.6 GHz	-53 dBm
> 11.6 to 12.9 GHz	-74 dBm
> 12.9 to 13.1 GHz	-63 dBm
> 13.1 to 29 GHz	-80 dBm
> 29 GHz	-90 dBm

Signal to Noise Ratio
(Ratio of Clipping Level to Noise Level, Log Averaged, 1 Hz RBW, IF Gain = High) (Nominal)

Center Frequency	
9 to 14 GHz	143 dB
> 14 to 35 GHz	144 dB
> 35 to 49 GHz	139 dB
> 49 GHz	137 dB

TOI

(3rd-Order Intermodulation Distortion in the IF, 2 Tones of Equal Level at -14 dBFS, 10 MHz Tone Separation, IF Gain = High) (Nominal)

Center Frequency	
9 to 63 GHz	-68 dBc

Noise Density in IF

Nominally 4 dB higher than DANL MPB PA Off specification under similar measurement conditions.
Nominally 1 dB higher than DANL MPB PA High specification under similar measurement conditions.
The noise level in the IF will change for frequencies away from the center of the IF.

Spurious Responses (Preselector Enabled for Frequencies > 8.0 GHz) (Nominal)

Residual responses (input terminated, 0 dB attenuation, IF gain = high)

Center Frequency	Nominal
9 to 11.4 GHz	-70 dBm
> 11.4 to 11.6 GHz	-53 dBm
> 11.6 to 12.9 GHz	-74 dBm
> 12.9 to 13.1 GHz	-63 dBm
> 13.1 to 29 GHz	-80 dBm
> 29 GHz	-90 dBm

Image Responses

Tuned Frequency (f)	Excitation Frequency
> 9.0 GHz	f + 2 * Final IF MHz

Amplitude Accuracy, Absolute (MPB path, 10 dB Attenuation)

		PA Off	PA Low	PA High
Center frequency	Full range	20 to 30 °C	Nominal	Nominal
9 to 14 GHz	±2.15 dB	±1.65 dB	±0.38 dB	±0.4 dB
> 14 to 25 GHz	±1.93 dB	±1.6 dB	±0.33 dB	±0.37 dB
> 25 to 35 GHz	±2.27 dB	±1.58 dB	±0.5 dB	±0.5 dB
> 35 to 49 GHz	±2.46 dB	±2.08 dB	±0.38 dB	±0.48 dB
> 49 to 55 GHz	±2.55 dB	±2.22 dB	±0.48 dB	±0.49 dB
> 55 to 59 GHz	±2.95 dB	±2.55 dB	±0.56 dB	±0.75 dB
> 59 to 66 GHz	±3.22 dB	±2.69 dB	±0.7 dB	±0.78 dB
> 66 to 67 GHz	±3.67 dB	±3.14 dB	±0.7 dB	±0.78 dB

General Specifications

Temperature Range		
Operating	0 to 40 °C	
Storage	-40 to +70 °C	
Altitude	Operating: Up to 2,286 meters (7,500 feet)	
Maximum relative humidity	95 %, non-condensing	
Environment		
Indoor use		
Power Requirements		
Voltage and frequency (nominal)	100-120 V, 50/60/400 Hz	The instruments can operate with mains supply voltage fluctuations up to ± 10 % of the nominal voltage
	200-240 V, 50/60 Hz	
Rated input power	1,400 W(maximum)	
Power consumption, on	750 W (typical)	
Power consumption, standby	7 W max	
Display		
Resolution	1920 x 1080	
Size	290 mm (11.6 in.) diagonal (nominal) capacitive multi-touch screen	
Data Storage		
Internal	1 TB removable solid-state drive	
External	Supports USB 3.0/2.0 compatible memory devices	
CPU	Intel Core i9 13900E, 24-core, 5.2 GHz max clock, 128 GB DDR5 DRAM	
GPU	PCIe Gen 4 x16, 16 GB GDDR6 SDRAM	
Operating system	Windows -11, Enterprise	
Weight		
Net	47.8 kg (105.4 lbs) (nominal)	
Shipping	58.5 kg (129 lbs) (nominal)	
Dimensions		
Height	187 mm (7.4 in)	
Width	580 mm (22.8 in)	
Length	775 mm (30.5 in)	
Calibration Cycle		
The recommended calibration cycle is one year; calibration services are available through Keysight Service Centers.		

Inputs and Outputs

Front Panel

RF Input			
Option 555/567	1.85 mm male 50 Ω (nominal) (standard)		
	Adapters 2.4 mm (f) to 2.4 mm (f), 2.92 mm (f) to 2.4 mm (f), and 2.4 mm (f) to 3.5 mm (f) included		
USB Ports			
Type	**Description**	**Connector**	**Output Current**
USB 3 (4)	Compatible with USB 3.2 Gen 2	USB Type-A female (blue)	0.9A at 5V
USB C PD (3)	Compatible with USB Type-C 3.2 Gen 2	USB Type-C female	(2) 3.0 A at 5 V (1) 3.0 A at 15 V (right side)
External Frequency Extender, Wide Bandwidth (Option EXW), Interface for Use with V3050A			
LO Out			
Connector	1.85 mm female; connection to V3050A signal analyzer frequency extender		
LO Out power			
Frequency range	Full range		
10 to 52 GHz	9 ± 3 dBm (nominal)		
IF In			
Connector	SMA, female, 50 Ω nominal		
Bandwidth	Supports all optional IFs up to and including 8 GHz		
Maximum safe level	+7 dBm		
Flatness	Nominally dominated by mixer flatness after any amp corrections applied with some offset due to IF cable losses		
100 MHz Out			
Connector	SMA, female, 50 Ω nominal		
Frequency range	100 MHz		
Output amplitude	+10 dBm (nominal)		
Trigger 1 Input			
Connector	BNC female,10 kΩ (nominal)		
Trigger level range	–5 to 5 V		
Trigger 1 Output			
Connector	BNC female, 50 Ω (nominal)		
Level	1.5 to 5 V (CMOS) (nominal)		

Rear Panel

Ref Out	
Connector	BNC female, 50 Ω (nominal)
Output amplitude	+10 dBm (nominal)
Frequency	10 MHz × (1+ frequency reference accuracy), Other frequency x (1+ frequency reference accuracy)
Ref In	
Connector	BNC female, 50 Ω (nominal)
Input amplitude range	-5 to +10 dBm (nominal)
Input frequency	2 to 110 MHz (nominal)
Frequency lock range	± 1 x 10^{-6} of specified external reference input frequency
2.4 GHz Out	
Connector	SMA female
Impedance	50 Ω (nominal)
Output amplitude	+15 dBm (nominal)
Frequency	2.4 GHz (nominal)
2.4 GHz In	
Connector	SMA female
Impedance	50 Ω (nominal)
Input amplitude range	+11 to +17 dBm (nominal)
Frequency	2.4 GHz (nominal)
Trigger 2 and 3 Inputs	
Connector	BNC female,10 kΩ (nominal)
Trigger level range	–5 to 5 V
Precision Trigger In (For Wide-Bandwidth Measurements Only)	
Connector	SMA, female, 50 Ω (nominal)
Trigger level range	–5 to 5 V
Trigger 2 and 3 Outputs	
Connector	BNC female, 50 Ω (nominal)
Trigger level range	1.5 to 5 V (CMOS) (nominal)
Noise Source Drive +28 V (Pulsed)	
Connector	BNC female
Output voltage on	28.0 ±0.1 V (nominal, 60 mA maximum)
Output voltage off	< 1.0 V
SNS Series Noise Source (For Use with Keysight Technologies' SNS Series Noise Sources)	
Connector	12-pin circular
Ext PPS In (Reserved for Future Use)	
Connector	SMA female
Wide IF Out (Option CRW)	
Connector	SMA, female, 50 Ω nominal
IF Out	
Connector	SMA female
Impedance	50 Ω nominal
IF Out, Second IF Output, Licensed as Option CR3 (Included as Standard)	
SA mode	522.5 MHz center frequency (RBW ≤ 3 MHz)
	570 MHz center frequency (stepped FFTs)
	900 MHz center frequency (RBW > 3 MHz)
IQ analyzer in B40	570 MHz center frequency
IQ analyzer in B4X	900 MHz center frequency
USB Ports	
USB 3.0 (4 Ports)	
Standard	Compatible with USB 3.2 Gen 2
Connector	USB Type-A female (blue)
Output current	0.9 A at 5 V
USB Type-C (1 port)	
Standard	Compatible with USB Type-C 3.2 Gen 2

Connector	USB Type-C female
Output current	1.0 A at 5 V
DisplayPort (DP)	
Connector	DisplayPort
Resolution	1920 x 1080
Micro GPIB Interface	
Connector	Mini 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	
Option GBE (10 Gbit Ethernet, included as standard)	10G Base-T
Connector	RJ45 Ethertwist
Thunderbolt (TB)	
Standard	Compatible with Thunderbolt 4
Connector	USB Type C, female (2 ports)
Output current	3.0 A at 5 V

Regulatory Information

This product is designed for use in INSTALLATION CATEGORY II and POLLUTION DEGREE 2 and MEASUREMENT CATEGORY NONE.

This product has been designed and tested in accordance with accepted industry standards and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

This product is intended for indoor use.

Safety and Regulatory Markings which May be on the Product	
CE	The CE mark is a registered trademark of the European Community (if accompanied by a year, it is the year when the design was proven). This product complies with all relevant directives.
ccr.keysight@keysight.com	The Keysight email address is required by EU directives applicable to our product.
CAN ICES/NMB-001(A)	Canada EMC label. Interference-Causing Equipment Standard for industrial, scientific and medical (ISM) equipment. Matériel industriel, scientifique et médical (ISM)
ISM 1-A (GRP.1 CLASS A)	This is a symbol of an Industrial Scientific and Medical Group 1 Class A product. (CISPR 11, Clause 4)
c SA us	The CSA mark is a registered trademark of the CSA International.
	The RCM mark is a registered trademark of the Australian Communications and Media Authority.
UK CA	UK conformity mark is a UK government owned mark. Products showing this mark comply with all applicable UK regulations.
	This symbol indicates separate collection for electrical and electronic equipment mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive 2002/96/EC). The crossed out wheeled bin symbol indicates that separate collection for waste electric and electronic equipment (WEEE) is required, as obligated by the EU DIRECTIVE and other National legislation. Please refer to keysight.com/go/takeback to understand your Trade in options with Keysight in addition to product takeback instructions.
40	China Restricted Substance Product Label. The EPUP (environmental protection use period) number in the center indicates the time period during which no hazardous or toxic substances or elements are expected to leak or deteriorate during normal use and generally reflects the expected useful life of the product.
	Universal recycling symbol. This symbol indicates compliance with the China standard GB 18455-2001 as required by the China RoHS regulations for paper/fiberboard packaging.
	This symbol indicates the equipment requires ergonomic and safety considerations for moving and lifting due to its weight.
KC	South Korean Certification (KC) mark; includes the marking's identifier code.
	This symbol indicates the presence of a class 1 Laser device

Regulatory, Environmental and Certifications	
EMC	Complies with the essential requirements of the European EMC Directive and the UK Electromagnetic Compatibility Regulations 2016 as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity): IEC/EN 61326-1 CISPR 11 Group 1, Class A Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.AS/NZS CISPR 11 CAN ICES/NMB-001(A) This ISM device complies with Canadian ICES-001 Cet appareil ISM est conforme a la norme NMB-001 du Canada NOTE: This is a sensitive measurement apparatus by design and may have some performance loss (up to 25 dBm above the Spurious Responses, Residual specification of –100 dBm) when exposed to 3V/m ambient continuous electromagnetic phenomenon in the range of 80 MHz to 6 GHz (similar to those used in testing per IEC 61000-4-3).
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
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.

To find a current Declaration of Conformity for a specific Keysight product, go to:
http://www.keysight.com/go/conformity

Additional Resources

The SA6320A XA6 X-Series signal analyzer isn't the only thing that will bring you to RF breakthroughs. Powerful software drives your measurements while finely tuned hardware takes them to new heights. In order to move the measurement plane to your device under test, reach even higher levels of measurement accuracy, and achieve 8 GHz of signal analysis and generation, the SA6210A XA5 partners with the:

- PathWave X-Series measurement applications and PathWave Vector Signal Analysis (VSA)
- V3050A frequency extender for an unbanded, preselected frequency range to 110 GHz
- M9484C VXG signal generator for wideband stimulus and response testing

SA6320A XA6 Signal Analyzer Configuration Guide (3126-1389.EN)
https://www.keysight.com/find/SA6320A

Keysight Support Services

Accelerate your learning curve, enhance your test uptime, and confidently guarantee your instrument accuracy with Keysight Support Services. Keysight Services are here to support your test needs with expert technical support, instrument repair and calibration, training, alternative acquisition program options, and more.

A KeysightCare agreement provides dedicated, proactive support through a single point of contact for an extensive group of instruments, software, and solutions to ensure optimal uptime, with fast response times and resolution. Explore the services that are right for you.

Keysight Services

Offering	Benefits
KeysightCare 	KeysightCare provides elevated support for Keysight instruments and software, with access to technical support experts who respond within a specified time and ensure committed repair and calibration turnaround times (TAT). KeysightCare offers multiple service agreement tiers, including KeysightCare Assured, Enhanced, and Application Software Support. See the KeysightCare data sheet for details.
KeysightCare Assured	KeysightCare Assured provides a commitment to respond to your engineer's technical needs quickly. When unexpected repairs are necessary, you can count on a committed repair service turnaround time to get you back up and running.
KeysightCare Enhanced	KeysightCare Enhanced includes all the benefits of KeysightCare Assured plus Keysight's accurate and reliable Calibration Services, accelerated and committed TAT, and technical response.
Keysight Support Portal & Knowledge Center	All KeysightCare tiers include access to the Keysight Support Portal, where you can manage support and service resources related to your assets, such as service requests and status, or browse the Knowledge Center.
Education Services	Build confidence and gain new skills to make accurate measurements, with flexible Education Services developed by Keysight experts. Including Start-up Assistance.
Alternative Acquisition Options	
KeysightAccess	Reduce budget challenges with a lease-based subscription service that offers low monthly payments, enabling you to get the instruments, software, and technical support you want for your test needs.

Recommended Services

Maximize your instrument uptime and confidently make accurate measurements by securing technical support, repair, and calibration services with committed response and turnaround times. High-performance instruments include 1 year of KeysightCare Assured. Obtain multi-year KeysightCare upfront to eliminate the need for lengthy and tedious paperwork and yearly requests for maintenance budget. Plus, you benefit from secured service for 2, 3, or 5 years.

Service	Function
KeysightCare Enhanced*	**Includes Tech Support, Warranty and Calibration**
R-55B-001-1	KeysightCare Enhanced – Upgrade 1 year
R-55B-001-2	KeysightCare Enhanced – Extend to 2 years
R-55B-001-3	KeysightCare Enhanced – Extend to 3 years (Recommended)
R-55B-001-5	KeysightCare Enhanced – Extend to 5 years (Recommended)
KeysightCare Assured	**Includes Tech Support and Warranty**
R-55A-001-2	KeysightCare Assured – Extend to 2 years
R-55A-001-3	KeysightCare Assured – Extend to 3 years
R-55A-001-5	KeysightCare Assured – Extend to 5 years
Start-Up Assistance	
PS-S40-01	Included – instrument fundamentals and operations starter
PS-S40-04	Recommended – instrument fundamentals and operations starter
PS-S40-02	Optional, technology & measurement science standard learning

* Available in select countries. For details, please view the datasheet. R-55B-001-2/3/5 must be ordered with R-55B-001-1.

As a mission-critical design enablement partner, Keysight connects design, emulation, and test so customers can solve the world's most complex engineering challenges. Accelerate innovation at www.keysight.com.

KEYSIGHT