

LXI

Data Sheet

PXA

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LXI class C certified

Available frequncy ranges

N9030A-503	3 Hz to 3.6 GHz
N9030A-508	3 Hz to 8.4 GHz
N9030A-513	3 Hz to 13.6 GHz
N9030A-526	3 Hz to 26.5 GHz
N9030A-543	3 Hz to 43 GHz
N9030A-544	3 Hz to 44 GHz
N9030A-550	3 Hz to 50 GHz

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



Agilent Technologies

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Agilent's future-ready PXA signal analyzer is the evolutionary replacement for your current highperformance analyzer. It helps you sustain past achievements, enhance current designs and accelerate future innovations.

Its performance, flexibility, capability and compatibility enable you to address demanding applications in aerospace, defense, commercial communications and more.

- Reveal new levels of signal detail with outstanding RF performance
- Increase test throughput and protect your system investments
- Refresh legacy systems with a highly compatible replacement

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.

The analyzer will meet its specifications when:

- The analyzer is within its calibration cycle.
- Under auto couple control, except that Auto Sweep Time Rules = Accy.
- For signal frequencies < 10 MHz, DC coupling applied.
- The analyzer has been stored at an ambient temperature within the allowed operating range for at least two hours before being turned on, if it had previously been stored at a temperature range inside the allowed storage range but outside the allowed operating range.
- The analyzer has been turned on at least 30 minutes with 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. 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.

For the complete specifications guide, visit: www.agilent.com/find/pxa_specifications

Frequency and Time Specifications

Frequency range	DC coupled	AC coupled
Option 503	3 Hz to 3.6 GHz	10 MHz to 3.6 GHz
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 543	3 Hz to 43 GHz	NA
Option 544	3 Hz to 44 GHz	NA
Option 550	3 Hz to 50 GHz	NA
Band LO multiple (N)		
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	
Precision frequency reference		
Accuracy	\pm [(time since last adjustment x agin	g rate) + temperature stability + calibration accuracy]
Aging rate	± 1 x 10 ⁻⁷ / year ± 1.5 x 10 ⁻⁷ / 2 years	
Temperature stability 20 to 30 °C Full temperature range	± 1.5 x 10- ⁸ ± 5 x 10 ⁻⁸	
Achievable initial calibration accuracy	± 4 × 10 ⁻⁸	
Example frequency reference accuracy 1 year after last adjustment 20 to 30 °C	$= \pm (1 \times 1 \times 10^{-7} + 1.5 \times 10^{-8} + 4 \times 1)$ $= \pm 1.55 \times 10^{-7}$	0-8)
Residual FM Center frequency = 1 GHz 10 Hz RBW, 10 Hz VBW	≤ (0.25 Hz x N) p-p in 20 ms nomin See band table above for N (LO mu	
Frequency readout accuracy (start, s	top, center, marker)	
± (marker frequency x frequency reference a	ccuracy + 0.10% x span + 5% x RBW +	+ 2 Hz + 0.5 x horizontal resolution 1)
Marker frequency counter		
Accuracy	± (marker frequency x frequency re	ference 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 mod		
Range	0 Hz (zero span), 10 Hz to maximum	n frequency of instrument
Resolution	2 Hz	
Accuracy Swept FFT	± (0.1% x span + horizontal resolut ± (0.1% x span + horizontal resolut	

1. 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 Span = 0 Hz	± 40% nominal ± 0.01% nominal
Sweep trigger	Free run, line, video, external 1, exte	
Trigger Delay	Span = 0 Hz or FFT	-150 to +500 ms
	Span \geq 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 Gate delay jitter	0 to 100.0 s 33.3 ns p-p nominal	
Sweep (trace) point range		
All spans	1 to 40001	
Resolution bandwidth (RBW)		
Range (–3.01 dB bandwidth)	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8	3 MHz
Bandwidth accuracy (power)	1 Hz to 100 kHz	± 0.5% (± 0.022 dB)
RBW range	110 kHz to 1.0 MHz (< 3.6 GHz CF)	± 1.0% (± 0.044 dB)
	1.1 to 2 MHz (< 3.6 GHz CF)	± 0.07 dB nominal
	2.2 to 3 MHz (< 3.6 GHz CF)	± 0.10 dB nominal ± 0.20 dB nominal
Pandwidth accuracy (201 dP)	4 to 8 MHz (< 3.6 GHz CF)	
Bandwidth accuracy (–3.01 dB) RBW range	1 Hz to 1.3 MHz	± 2% nominal
Selectivity (-60 dB/-3 dB)		4.1:1 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)
Analysis bandwidth ¹		
Maximum bandwidth	Standard	10 MHz
	Option B25	25 MHz
	Option B40	40 MHz
	Option B85 Option B1X	85 MHz 160 MHz
Video bandwidth (VBW)		
Range	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8	3 MHz, and wide open (labeled 50 MHz)
Accuracy	± 6% nominal (in swept mode and z	rero span)
Measurement speed ²	Standard	
Local measurement and display update rate	10 ms (100/s) nominal	
Remote measurement and LAN transfer rate	10 ms (100/s) nominal	
Marker peak search	2.5 ms nominal	
Center frequency tune and transfer (RF)	43 ms nominal	
Center frequency tune and transfer ($\mu W)$	69 ms nominal	
Measurement/mode switching	40 ms nominal	

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.

2. Sweep points = 101.

Amplitude Accuracy and Range Specifications

Amplitude range			
Measurement range	Displayed average noise	e level (DANL) to maximum	safe input level
Input 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 Full attenuation range (mechanical + electronic)	0 to 24 dB, 1 dB steps 0 to 94 dB, 1 dB steps		
Maximum safe input level			
Average total power (with and without preamp)	+30 dBm (1 W)		
Peak pulse power	< 10 µs pulse width, < 1	% duty cycle +50 dBm (100	W) and input attenuation \geq 30 dB
DC volts DC coupled AC coupled	± 0.2 Vdc ± 100 Vdc (For frequenc	y Option 503, 508, 513, or 52	26)
Display range			
Log scale	0.1 to 1 dB/division in 0 1 to 20 dB/division in 1	.1 dB steps dB steps (10 display divisio	ns)
Linear scale	10 divisions		
Scale units	dBm, dBmV, dBµV, dBm	A, dBµA, V, W, A	
Frequency response		Specification	95th percentile (≈ 2σ)
(10 dB input attenuation, 20 to 30 °	C, preselector centering app	lied above 3.6 GHz)	
RF/MW (Option 503, 508, 513, 526)	3 Hz to 10 MHz 10 to 20 MHz 20 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 22.0 GHz 22.0 to 26.5 GHz	\pm 0.46 dB \pm 0.35 dB \pm 0.35 dB \pm 1.5 dB \pm 2.0 dB \pm 2.0 dB \pm 2.5 dB	± 0.16 dB ± 0.39 dB ± 0.45 dB ± 0.62 dB ± 0.82 dB
Millimeter-Wave (Option 543, 544, 550)	3 Hz to 20 MHz 20 to 50 MHz 50 MHz to 3.6 GHz 3.5 to 5.2 GHz 5.2 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 22.0 GHz 22.0 to 26.5 GHz 26.4 to 34.5 GHz 34.4 to 50 GHz	\pm 0.46 dB \pm 0.35 dB \pm 0.35 dB \pm 1.7 dB \pm 1.5 dB \pm 2.0 dB \pm 2.0 dB \pm 2.0 dB \pm 2.5 dB \pm 2.5 dB \pm 3.2 dB	\pm 0.19 dB \pm 0.15 dB \pm 0.70 dB \pm 0.57 dB \pm 0.54 dB \pm 0.64 dB \pm 0.72 dB \pm 0.71 dB \pm 0.93 dB \pm 1.24 dB
Preamp on (0 dB attenuation) (Opti	on P03, P08, P13, P26, P43, I	P44, P50)	
RF/MW (Option 503, 508, 513, 526)	9 to 100 kHz 100 kHz to 50 MHz 50 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 22.0 GHz 22.0 to 26.5 GHz	\pm 0.68 dB \pm 0.55 dB \pm 2.0 dB \pm 2.3 dB \pm 2.5 dB \pm 3.0 dB \pm 3.5 dB	$\begin{array}{c} \pm \ 0.36 \ dB \\ \pm \ 0.26 \ dB \\ \pm \ 0.28 \ dB \\ \pm \ 0.64 \ dB \\ \pm \ 0.76 \ dB \\ \pm \ 0.95 \ dB \\ \pm \ 1.41 \ dB \\ \pm \ 1.61 \ dB \end{array}$

Millimeter-Wave	9 to 100 kHz		± 0.40 dB
(Option 543, 544, 550)	100 kHz to 50 MHz	± 0.68 dB	± 0.34 dB
	50 MHz to 3.6 GHz	± 0.60 dB	± 0.31 dB
	3.5 to 5.2 GHz	± 2.0 dB	± 0.81 dB
	5.2 to 8.4 GHz	± 2.0 dB	± 0.70 dB
	8.3 to 13.6 GHz	± 2.3 dB	± 0.79 dB
	13.5 to 17.1 GHz	± 2.5 dB	± 0.88 dB
	17.0 to 22.0 GHz	± 3.0 dB	± 1.07 dB
	22.0 to 26.5 GHz	± 3.5 dB	± 1.03 dB
	26.4 to 34.5 GHz	± 3.0 dB	± 1.35 dB
	34.4 to 50 GHz	± 4.1 dB	± 1.69 dB
Input attenuation awitching und			Additional information
Input attenuation switching unc	ertainty	Specifications	Additional information
Relative to 10 dB and preamp off			
At 50 MHz (reference frequency)	attenuation 12 to 40 dB	± 0.14 dB	± 0.03 dB typical
	attenuation 2 to 8 dB	± 0.18 dB	± 0.05 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
Total absolute amplitude accura		1. 10 to 50 dBm all cottings out	a acualed avecant
(10 dB attenuation, 20 to 30 °C, 1 H	Iz ≤ RBW ≤ 1 MHz, input signa		p-coupled except
	$z \le RBW \le 1 MHz$, input signance level, any scale, $\sigma = nominante$	al standard deviation)	o-coupled except
(10 dB attenuation, 20 to 30 °C, 1 H	iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz	al standard deviation) ± 0.24 dB	
(10 dB attenuation, 20 to 30 °C, 1 H	iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon	se)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen	Iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies 10 Hz to 3.6 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app	se) rox. 2σ)
(10 dB attenuation, 20 to 30 °C, 1 H	iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon	se) rox. 2σ)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50)	Iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app	se) rox. 2σ)
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(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	Iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon	se) rox. 2σ) se)
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(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	Iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	Iz ≤ RBW ≤ 1 MHz, input signa nce level, any scale, σ = nomina At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	$dz \le RBW \le 1$ MHz, input signation ince level, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.178 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	$dz \le RBW \le 1$ MHz, input signation incellevel, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.178 (95th percentile) 1.204 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	$z \le RBW \le 1$ MHz, input signa acce level, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.178 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati	$dz \le RBW \le 1$ MHz, input signation incelevel, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz 26.4 to 34.5 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.178 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.321 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation)	$dz \le RBW \le 1$ MHz, input signa ace level, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz 26.4 to 34.5 GHz 34.4 to 50 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.178 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.321 (95th percentile) 1.378 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation) Preamp on (0 dB input attenuation)	$dz \le RBW \le 1$ MHz, input signa acce level, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies io (VSWR) 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz 26.4 to 34.5 GHz 34.4 to 50 GHz 10 MHz to 3.6 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.321 (95th percentile) 1.378 (95th percentile) 1.378 (95th percentile) 1.393 nominal
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation) (10 dB input attenuation) Preamp on (0 dB input attenuation) (Option P03. P08, P13, P26, P43,	$dz \le RBW \le 1$ MHz, input signatice level, any scale, $\sigma = nomina$ At 50 MHz At all frequencies 10 Hz to 3.6 GHz At all frequencies 50 MHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz 26.4 to 34.5 GHz 34.4 to 50 GHz 10 MHz to 3.6 GHz 3.5 to 8.4 GHz	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile) 1.54 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.321 (95th percentile) 1.378 (95th percentile) 1.393 nominal 1.50 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation) (10 dB input attenuation) Preamp on (0 dB input attenuation) (Option P03. P08, P13, P26, P43,	$\begin{aligned} z &\leq \text{RBW} &\leq 1 \text{ MHz, input signa} \\ \text{ace level, any scale, } \sigma &= \text{nomina} \\ \text{At 50 MHz} \\ \text{At all frequencies} \\ 10 \text{ Hz to 3.6 GHz} \\ \text{At all frequencies} \\ \hline \text{At all frequencies} \\ \hline \text{o (VSWR)} \\ \hline \hline \\ \hline $	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile) 1.54 (95th percentile) 1.57 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.378 (95th percentile) 1.378 (95th percentile) 1.393 nominal 1.50 (95th percentile) 1.310 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation) (10 dB input attenuation) Preamp on (0 dB input attenuation) (Option P03. P08, P13, P26, P43,	$\begin{aligned} z &\leq \text{RBW} &\leq 1 \text{ MHz, input signa} \\ \text{ace level, any scale, } \sigma &= \text{nomina} \\ \text{At 50 MHz} \\ \text{At all frequencies} \\ 10 \text{ Hz to 3.6 GHz} \\ \text{At all frequencies} \\ \hline \text{At all frequencies} \\ \hline \text{o (VSWR)} \\ \hline \\ $	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile) 1.54 (95th percentile) 1.57 (95th percentile) 1.48 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.378 (95th percentile) 1.378 (95th percentile) 1.393 nominal 1.50 (95th percentile) 1.310 (95th percentile) 1.330 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43,	$\begin{aligned} z &\leq \text{RBW} &\leq 1 \text{ MHz, input signa} \\ \text{ace level, any scale, } \sigma &= \text{nomina} \\ \text{At 50 MHz} \\ \text{At all frequencies} \\ 10 \text{ Hz to 3.6 GHz} \\ \text{At all frequencies} \\ \end{aligned}$	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile) 1.54 (95th percentile) 1.48 (95th percentile) 1.48 (95th percentile) 1.54 (95th percentile) 1.54 (95th percentile) 1.54 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.321 (95th percentile) 1.378 (95th percentile) 1.393 nominal 1.50 (95th percentile) 1.310 (95th percentile) 1.330 (95th percentile) 1.330 (95th percentile) 1.339 (95th percentile)
(10 dB attenuation, 20 to 30 °C, 1 H Auto Swp Time = Accy, any referen Preamp on (Option P03, P08, P13, P26, P43, P44 and P50) Input voltage standing wave rati (10 dB input attenuation) (10 dB input attenuation) Preamp on (0 dB input attenuation) (Option P03. P08, P13, P26, P43,	$\begin{aligned} z &\leq \text{RBW} &\leq 1 \text{ MHz, input signa} \\ \text{ace level, any scale, } \sigma &= \text{nomina} \\ \text{At 50 MHz} \\ \text{At all frequencies} \\ 10 \text{ Hz to 3.6 GHz} \\ \text{At all frequencies} \\ \hline \text{At all frequencies} \\ \hline \text{o (VSWR)} \\ \hline \\ $	al standard deviation) ± 0.24 dB ± (0.24 dB + frequency respon ± 0.19 dB (95th Percentile app ± (0.36 dB + frequency respon Freq Opt 503, 508, 513, 526 1.07:1 nominal 1.139 (95th percentile) 1.290 (95th percentile) 1.388 (95th percentile) 1.403 (95th percentile) 1.475 (95th percentile) NA NA 1.45 (95th percentile) 1.54 (95th percentile) 1.57 (95th percentile) 1.48 (95th percentile)	se) rox. 2σ) se) Freq Opt 543, 544, 550 1.025:1 nominal 1.134 (95th percentile) 1.152 (95th percentile) 1.204 (95th percentile) 1.331 (95th percentile) 1.378 (95th percentile) 1.378 (95th percentile) 1.393 nominal 1.50 (95th percentile) 1.310 (95th percentile) 1.330 (95th percentile)

Resolution bandwidth switch	ing uncertainty (refer	enced 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 Linear scale Accuracy	–170 to +30 dBm in 0. 707 pV to 7.07 V with 0 dB	01 dB steps 0.11% (0.01 dB) resolution
Display scale switching unce	rtainty	
Switching between linear and log	0 dB	
Log scale/div switching	0 dB	
Display scale fidelity		
Between –10 dBm and –80 dBm input mixer level	± 0.10 dB total	± 0.04 dB typical
Below –18 dBm input mixer level	± 0.07 dB	± 0.02 dB typical
Trace detectors		
Normal, peak, sample, negative pea	k, log power average, RMS	S average, and voltage average
Preamplifier		
Frequency range ¹	Option P03 Option P08 Option P13 Option P26 Option P43 Option P44 Option P50	9 kHz to 3.6 GHz 9 kHz to 8.4 GHz 9 kHz to 13.6 GHz 9 kHz to 26.5 GHz 9 kHz to 43 GHz 9 kHz to 44 GHz 9 kHz to 50 GHz
Gain	9 kHz to 3.6 GHz 3.6 to 26.5 GHz 26.5 to 50 GHz	+20 dB nominal +35 dB nominal +40 dB nominal

1. Below 100 kHz, only 95th percentile (approx. 2σ) value for frequency response is provided.

Dynamic Range Specifications

1 dB gain compression (two-to		Maximum n	ower at input r	nivor —	
(At 1 kHz RBW with 100 kHz tone spa	/		wer at input i	mxer	
(ALT KHZ KBVV WITH TUU KHZ TONE SPA	o ,	0.10		0 .1D	-1
	20 to 40 MHz 40 to 200 MHz	–3 dBm +1 dBm		0 dBm typic	
	200 MHz to 3.6 GHz			+3 dBm typ +5 dBm typ	
	3.6 to 16 GHz	+1 dBm		+4 dBm typ	
	16 to 26.5 GHz	–1 dBm		+2 dBm typ	
	26.5 to 50 GHz	T dDill		0 dBm nomi	
Preamp on	10 MHz to 3.6 GHz			-14 dBm no	
(Option P03, P08, P13, P26, P43,	3.6 to 26.5 GHz				iiiiiai
P44, and P50)	Tone spacing 100	kHz to 20 MHz		–28 dBm no	minal
F44, aliu F50)	Tone spacing > 7				
	Freq Option ≤ 5			—10 dBm no	minal
	Freq Option > 5	26		–20 dBm no	minal
	26.5 to 50 GHz			–30 dBm no	minal
Displayed average noise level (DANL)	Specificatior	1	Typical	
(Input terminated, sample or average detec	tor, averaging type = Log, () dB input attenuation, IF Ga	in = High, 1 Hz RBV	V, 20 to 30 °C)	
RF/MW (Option 503, 508, 513, 526)		Normal ¹ /LNP	enabled ²	Normal ¹ /LN	NP enabled ²
Preamp off	3 Hz to 9 kHz			-100 dBm/l	NA typical
	9 to 100 kHz	−146 dBm/NA		-152 dBm/l	
	100 kHz to1 MHz	-150 dBm/NA		-156 dBm/l	
	1 to 10 MHz	−155 dBm/NA		−158 dBm/l	NA typical
	10 MHz to 1.2 GHz	−155 dBm/NA		−157 dBm/l	
	1.2 to 2.1 GHz	-153 dBm/NA		-155 dBm/l	
	2.1 to 3.0 GHz	-152 dBm/NA		-154 dBm/l	
	3.0 to 3.6 GHz	-151 dBm/NA	0.40	-153 dBm/l	
	3.5 to 4.2 GHz 4.2 to 8.4 GHz	–147 dBm/–15 –150 dBm/–15			–156 dBm typical –157 dBm typical
	8.3 to 13.6 GHz	-149 dBm/-15			-157 dBm typical
	13.5 to 16.9 GHz	-145 dBm/-15			-155 dBm typical
	16.9 to 20.0 GHz	-143 dBm/-15			–153 dBm typical
	20.0 to 26.5 GHz	-137 dBm/-15			-152 dBm typical
Preamp on					
Option P03, P08, P13, P26	100 to 200 kHz	−157 dBm/NA		−160 dBm/l	
	200 to 500 kHz	-160 dBm/NA		-163 dBm∕l	
	0.5 to 1 MHz	-164 dBm/NA		_166 dBm∕l	
Option P03, P08, P13, P26	1 to 10 MHz	-164 dBm/NA		−167 dBm/l	
Option P03, P08, P13, P26	10 MHz to 2.1 GHz	-165 dBm/NA		-166 dBm/l	
Option P03, P08, P13, P26	2.1 to 3.6 GHz	-163 dBm/NA		-164 dBm/l	
Option P08, P13, P26 ³ Option P13, P26 ³	3.5 to 8.4 GHz	-164 dBm/NA		-166 dBm/l	
Option P13, P26 ° Option P26 °	8.3 to 13.6 GHz 13.5 to 16.9 GHz	-163 dBm/NA -161 dBm/NA		-165 dBm/l -162 dBm/l	
Option P26 ³	16.9 to 20.0 GHz	-159 dBm/NA		-161 dBm/l	
Option P26 ³	20.0 to 26.5 GHz	-155 dBm/NA		-157 dBm/l	
DANL with Noise Floor Extensi			Improve		h percentile
RF/MW (Option 503, 508, 513, 526)			Preamp Off	Preamp On	LNP enabled ^{2, 3}
Band 0, $f > 20$ MHz			10 dB	9 dB	NA
Band 1			4 dB	8 dB	5 dB
Band 2			7 dB	8 dB	9 dB
Band 3			7 dB	8 dB	9 dB
Band 4			6 dB	5 dB	8 dB
Examples of effective DANL	Preamp Off Prea	mp On LNP enabled ^{2, 3}			
Frequency 20 to 30 °C					
Mid-Band 0 (1.8 GHz)		dBm NA			
Mid-Band 1 (5.95 GHz)		dBm –160 dBm			
Mid-Band 2 (10.95 GHz)		dBm –161 dBm			
Mid-Band 3 (15.3 GHz)		dBm –158 dBm			
Mid-Band 4 (21.75 GHz)		dBm –155 dBm			

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

2. LNP (Low Noise Path) requires option LNP.

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

Millimeter-Wave (Option 543, 544, 550)		Normal ¹ /LNP enabled ²	Normal ¹ /LNP enabled ²
Preamp off	3 Hz to 9 kHz		–100 dBm/NA nominal
	9 to 100 kHz	–146 dBm/NA	–152 dBm/NA typical
	100 kHz to 1 MHz	-150 dBm/NA	–156 dBm/NA typical
	1 to 10 MHz	–155 dBm/NA	–158 dBm/NA typical
	10 MHz to 1.2 GHz	–155 dBm/NA	–157 dBm/NA typical
	1.2 to 2.1 GHz	–153 dBm/NA	–155 dBm/NA typical
	2.1 to 3 GHz	–152 dBm/NA	–154 dBm/NA typical
	3 to 3.6 GHZ	-151 dBm/NA	–153 dBm/NA typical
	3.5 to 4.2 GHz	−143 dBm/−150 dBm	–153 dBm/NA typical
	4.2 to 6.6 GHz	−144 dBm/−152 dBm	–147 dBm/–154 dBm typical
	6.6 to 8.4 GHz	−147 dBm/−154 dBm	–148 dBm/–155 dBm typical
	8.3 to 13.6 GHz	−147 dBm/−153 dBm	–149 dBm/–156 dBm typical
	13.5 to 14 GHz	−143 dBm/−150 dBm	–149 dBm/–152 dBm typical
	14 to 17 GHz	−145 dBm/−151 dBm	–146 dBm/–153 dBm typical
	17 to 22.5 GHz	−141 dBm/−149 dBm	–148 dBm/–152 dBm typical
	22.5 to 26.5 GHz	−139 dBm/−146 dBm	–146 dBm/–150 dBm typical
	26.4 to 34 GHz	−138 dBm/−146 dBm	–142 dBm/–149 dBm typical
	33.9 to 37 GHz	−134 dBm/−141 dBm	–139 dBm/–147 dBm typical
	37 to 40 GHz	−132 dBm/−140 dBm	–138 dBm/–145 dBm typical
	40 to 46 GHz	−130 dBm/−140 dBm	–135 dBm/–145 dBm typical
	46 to 49 GHz	−130 dBm/−138 dBm	–135 dBm/–142 dBm typical
	49 to 50 GHz	−128 dBm/−138 dBm	–133 dBm/–142 dBm typical
Preamp on			
Option P03, P08, P13, P26, P43, P44, P50 ³	100 to 200 kHz	-157 dBm/NA	–160 dBm/NA typical
	200 to 500 kHz	-160 dBm/NA	–163 dBm/NA typical
	500 kHz to 1 MHz	-162 dBm/NA	–165 dBm/NA typical
	1 to 10 MHz	–164 dBm/NA	–167 dBm/NA typical
	10 MHz to 2.1 GHz	−164 dBm/NA	–166 dBm/NA typical
	2.1 to 3.6 GHz	−163 dBm/NA	–164 dBm/NA typical
Option P08, P13, P26, P43, P44, P50 ³	3.5 to 8.4 GHz	-161 dBm∕NA	–163 dBm/NA typical
Option P13, P26, P43, P44, P50 ³	8.3 to 13.6 GHz	-161 dBm∕NA	–163 dBm/NA typical
Option P26, P43, P44, P50 ³	13.5 to 17 GHz	–161 dBm/NA	–163 dBm/NA typical
	17 to 20 GHz	−160 dBm/NA	-163 dBm/NA typical
	20 to 26.5 GHz	−158 dBm/NA	–161 dBm/NA typical
Option P43, P44, P50 ³	26.4 to 30 GHz	–157 dBm/NA	–159 dBm/NA typical
	30 to 34 GHz	−155 dBm/NA	–158 dBm/NA typical
	33.9 to 37 GHz	–153 dBm∕NA	-157 dBm/NA typical
	37 to 40 GHz	−152 dBm/NA	-156 dBm/NA typical
	40 to 43 GHz	-149 dBm/NA	–154 dBm/NA typical
Option P44, P50 ³	43 to 44 GHz	-149 dBm/NA	–154 dBm/NA typical
Option P50 ³	44 to 46 GHz	-149 dBm/NA	–154 dBm/NA typical
	46 to 50 GHz	–146 dBm∕NA	-150 dBm/NA typical

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

2. LNP (Low Noise Path) requires option LNP.

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

DANL with Noise Floor Extension (NFE) on					ment @ 951	th percentile
Millimeter-Wave (Option 543, 544, 550)				Preamp Off	Preamp On	LNP enabled ^{1, 2}
Band 0, f > 20 MHz				10 dB	9 dB	N/A
Band 1				6 dB	5 dB	6 dB
Band 2				8 dB	8 dB	8 dB
Band 3				9 dB	8 dB	10 dB
Band 4				7 dB	6 dB	8 dB
Band 5				6 dB	6 dB	6 dB
Band 6				6 dB	5 dB	7 dB
Example of effective DANL	Preamp Off	Preamp On	LNP enabled ^{1, 2}			
Frequency 20 to 30 °C						
Mid-Band 0 (1.8 GHz)	–162 dBm	—172 dBm	N/A			
Mid-Band 1 (5.95 GHz)	–151 dBm	—165 dBm	–158 dBm			
Mid-Band 2 (10.95 GHz)	–152 dBm	—165 dBm	–158 dBm			
Mid-Band 3 (15.3 GHz)	–152 dBm	—165 dBm	–158 dBm			
Mid-Band 4 (21.75 GHz)	—149 dBm	—163 dBm	–155 dBm			
Mid-Band 5 (30.4 GHz)	—144 dBm	—160 dBm	—151 dBm			
Mid-Band 6 (42.7 GHz)	—139 dBm	—154 dBm	–147 dBm			

1. LNP (Low Noise Path) requires option LNP.

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

Residual responses (Input terminated and 0 dB attenuation) 200 Hitz to 84 GHz Zero span or FFT or other frequencies -100 dBm - -100 dBm nominal (Mixer level at -10 dBm) Turned Freq (I) Excitation Freq 10 MHz to 35 GHz 10 MHz to 36 GHz 10 MHz to 30 GHz 10 NHz to 22 GHz 10 MHz to 30 GHz 10 NHz to 20 GHz 10 MHz to 30 GHz 10 D to 22 GHz 10 MHz to 30 GHz 10 D dBm 10	(Input terminated and 0 dB attenuation) Zero span or FFT or other frequencies -100 dBm nominal Image responses Tunede freq (f) Excitation Freq Response (Mixer level at -10 dBm) 10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 13.5 to 17.1 GHz f+45 MHz 1+645 MHz -80 dBc -112 dBc to 10 dBc (Mixer level at -30 dBm) 25 to 13.6 GHz 15 to 17.1 GHz f+645 MHz 1+645 MHz -74 dBc 94 dBc ty 17.0 to 22 GHz f+645 MHz 1+645 MHz -70 dBc 92 dBc ty 17.0 to 22 GHz (Mixer level at -30 dBm) 26 to 13.4 5 GHz 34.4 to 46 GHz 44 to 50 GHz f+645 MHz 1+645 MHz -70 dBc ty 27 to 28.5 GHz -75 dBc -79 dBc ty 27 to 28.5 GHz Carrier frequency ≤ 26.5 GHz First RF order -10 dBm -80 dBc + 20log(N ¹) Including IF feedthroug (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (f ≥ 10 MHz from carrier) -68 dBc ² + 20log(N ¹) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (f ≥ 10 MHz from carrier) <th></th>	
Imput terminated and 0 dB atternation) Zero span or FFT or other frequencies -100 dBm nominal Image responses Tund Freq (f) Excitation Freq F45 MHz -80 dBc -110 dBc typical IMixer fevel at -10 dBm) 10 MHz to 255 GHz 10 MHz to 35 GHz F45 MHz -80 dBc -110 dBc typical IM MHz to 35 GHz 154 SH MHz -80 dBc -110 dBc typical 10 MHz to 35 GHz 154 SH MHz -73 dBc 89 dBc 97 dBc IM Sto 171 GHz 1454 SH MIZ -74 dBc -84 dBc typical 170 to 22 GHz 1464 SH MIZ -73 dBc 97 dBc 147 dBc IM Sto 13 SG CHZ 1464 SH MIZ -73 dBc 98 dBc -73 dBc typical 25 to 34 SG CHZ 1464 SH MIZ -75 dBc 79 dBc typical 34 to 04 GHz 146 dBc -93 dBc -75 dBc -75 dBc Carrier frequency > 24 SG CHZ -90 dBc -90 dBc -75 dBc -75 dBc First RF order -10 dBm -90 dBc nominal -10 dBm -90 dBc		
Image responses Tuned Freq (f) Excitation Freq Response (Mixer level at -10 dBm) 10 MHz to 26.5 GHz 14.45 MHz -80 dBc -112 dBc typical 10 MHz to 3.6 GHz 14.45 MHz -80 dBc -112 dBc typical 10 MHz to 3.6 GHz 14.465 MHz -80 dBc -112 dBc typical 13.5 to 17.0 GHz 14.465 MHz -74 dBc -80 dBc typical 17.0 to 22 GHz 14.465 MHz -74 dBc -70 dBc typical 12.5 to 13.5 GHz 14.465 MHz -74 dBc -70 dBc typical 22 to 25.5 GHz 14.465 MHz -74 dBc -70 dBc typical 14.4 to 50 GHz 14.645 MHz -76 dBc -76 dBc typical 14.4 to 50 GHz 14.645 MHz -76 dBc -76 dBc typical 14.5 to MHz from carrier) -10 dBm -80 dBc + 20log(N') Including ligher order mixer responses (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal - Higher RF order -30 dBm -90 dBc nominal - (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal - Higher RF order		
(Mixer level at -10 dBm) 10 MHz to 24.5 GHz 446 MHz -80 dBc -112 dBc typical 10 MHz to 38 GHz 14 0 MHz to 38 GHz 14 0 MHz -80 dBc -112 dBc typical 13 5to 17.1 GHz 14 0 MHz 14 0 MHz -80 dBc -112 dBc typical 13 5to 17.1 GHz 14 045 MHz -80 dBc -80 dBc typical -80 dBc 17.1 to 22 GHz 14 045 MHz -78 dBc -80 dBc typical -80 dBc 17.1 to 22 GHz 14 045 MHz -78 dBc -80 dBc -90 dBc typical 17.1 to 22 GHz 14 045 MHz -80 dBc -80 dBc -80 dBc -90 dBc typical 17.1 to 22 GHz 14 045 MHz -80 dBc	(Mixer level at -10 dBm) 10 MHz to 26.5 GHz 10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 13.5 to 13.8 GHz 13.5 to 13.8 GHz 13.5 to 13.8 GHz 13.5 to 17.1 GHz 14.645 MHz 13.5 to 17.1 GHz 14.645 MHz 17.0 to 22 GHz 14.645 MHz 14.645 MHz 15.0 GHz 14.645 MHz 17.0 dBm 10.6 GHz 14.645 MHz 15.0 GHz 14.645 MHz 15.0 GHz 14.645 MHz 15.0 GHz 14.645 MHz 15.0 GHz 14.645 MHz 15.0 GHz 14.645 MHz 15.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 14.0 GHz 15.0 GHz 15.0 GHz 15.0 GHz 15.0 GHz 15.0 GHz 10.0 MHz from carrier) Higher RF order 12.0 GHz 15.0 GHz 15.0 GHz 15.0 GHz 10.0 100 MHz 10.0 10.0 CHz 10.0 10.0 CHz 10.0 MHz 10.0 MHz 10.0 10.0 CHz 10.0 MHz 10.0 10.0 CHz 10.0 MHz 10.0 MHz 10.0 MHz 10.0 10.0 CHz 1	
10 MHz to 3.6 GHz 10 MHz to 3.6 GHz 35 to 13.6 GHz 13 5 to 17.1 GHz 14 465 MHz 22 to 22 GHz 17 0 to 22 GHz 17 0 to 22 GHz 17 0 to 22 GHz 12 to 22 GHz 14 465 MHz 22 to 22 GHz 14 465 MHz 23 40 GHz 14 465 GHz 14 465 GHz 14 465 GHz 14 465 GHz 14 465 GHz 14 465 GHz 14 645 MHz 10 GHz 14 645 GHz 14 645 MHz 10 GHz 10 MHz from carrier) Higher RF order (f ≥ 10 MHz from carrier) Higher RF order (f	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
10 MHz to 3.6 GHz 14-645 MHz -80 dBc -101 dBc typical 3.5 to 13.6 GHz 14-645 MHz -74 dBc	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	pical
35 to 13.6 GHz 1446 MHz -74 Bbc -87 dBc typical 135 to 12.6 GHz 14463 MHz -74 Bbc -82 dBc typical (Mixer level at -30 dBm) 26.5 to 34.5 GHz 144645 MHz -70 dBc -82 dBc typical 22 to 26.5 GHz 144645 MHz -68 dBc -70 dBc typical -88 dBc -	35 to 13.6 GHz f+645 MHz -78 dBc -87 dBc ty 13.5 to 17.1 GHz 13 5 to 17.1 GHz f+645 MHz -74 dBc -84 dBc ty 17.0 to 22 GHz (Mixer level at -30 dBm) 26.5 to 34.5 GHz f+645 MHz -68 dBc -79 dBc ty 17.0 to 22 GHz (Mixer level at -30 dBm) 26.5 to 34.5 GHz f+645 MHz -68 dBc -79 dBc ty 44 to 50 GHz f+645 MHz -76 dBc -94 dBc ty 44 to 50 GHz Chrer spurious responses Mixer level Response -75 dBc nd -75 dBc nd Carrier frequency 26.5 GHz First RF order -10 dBm -80 dBc + 20log(N ¹) Including IF feedthroug (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal -68 dBc ² + 20log(N ¹) (Do the fr order -30 dBm -90 dBc nominal -10 ta 13.0 GHz -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -57 dBc/NA -73 dBc ² + 20log(N ¹) (nominal) -57 dBc/NA (Option 503, 508, 513, 526) -15 ta 25 GHz -15 dBm -77 dBc/NA -73 dBc ² + 20log(N ¹) (nominal) Second harmon	
13.5 to 17.1 GHz 174 for 2 GHz 174 for 3 GHZ <th1< td=""><td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td><td></td></th1<>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
17.0 to 22 GHz 17.4 to 20 GHZ 17.4 to	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
Image: style	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
(Mixer level at -30 dBm) 26.5 to 34.5 GHz 34.4 to 44 GHz 44 to 50 GHz 44 to 50 GHz Fr4645 MHz Fr4645 MHz Fr465 MHz -79 dBc typical -79 dBc typical -70 dBc typical -7		
34.4 to 44 GHz 4+645 MHz -57 dBc - 79 dBc typical 44 to 50 GHz -75 dBc nominal Other spurious responses Mixer level Response Carrier frequency ≤ 26.5 GHz First RF order -10 dBm -80 dBc + 20log(N ¹) Including IF feedthrough, LO harmonic mixing responses (f ≥ 10 MHz from carrier) -40 dBm -80 dBc + 20log(N ¹) Including higher order mixer responses Carrier frequency > 26.5 GHz -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -73 dBc² + 20log(N ¹) (nominal) Second harmonic distortion SHI RF/MW 10 to 100 MHz -15 dBm -57 dBc/NA 10 to 100 MHz -15 dBm -77 dBc/-101 dBc 10 to 100 MHz -15 dBm -77 dBc/-101 dBc 10 to 100 MHz -15 dBm -77 dBc/-101 dBc 10 to 100 MHz -15 dBm -77 dBc/-105 dBc +62 dBm/NA	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	
Other spurious responses Mixer level Response Carrier frequency ≤ 26.5 GHz First RF order -10 dBm -80 dBc + 20log(N ¹) Including IF feedthrough, L0 harmonic mixing responses (f ≥ 10 MHz from carrier) -40 dBm -80 dBc + 20log(N ¹) Including higher order mixer responses (f ≥ 10 MHz from carrier) -40 dBm -80 dBc + 20log(N ¹) Including higher order mixer responses (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses -68 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -68 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -10 t10 0 MHz -15 dBm -57 dBc/NA +42 dBm/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-101 dBc +62 dBm/48 dBm Preamp on (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-101 dBc +62 dBm/A9 dBm Preamp on (0ption 503, 508, 513, 526) 10 to 1325 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/AA (0ption 503, 508, 513, 526) 10 to 100 MHz <td< td=""><td>Other spurious responses Mixer level Response Carrier frequency $\leq 26.5 \text{ GHz}$ First RF order -10 dBm -80 dBc + 20log(N⁻¹) Including IF feedthroug (f \geq 10 MHz from carrier) Higher RF order -40 dBm -80 dBc + 20log(N⁻¹) Including higher order (f \geq 10 MHz from carrier) -30 dBm -90 dBc nominal Carrier frequency > 26.5 GHz -30 dBm -90 dBc nominal (f \geq 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses -88 dBc⁻² + 20log(N⁻¹) -73 dBc⁻² + 20log(N⁻¹) (nominal) Second harmonic distortion (SHI) -80 dBc - 15 dBm -57 dBc/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-95 dBc 25 to 4 GHz -15 dBm -77 dBc/-101 dBc 2.5 to 4 GHz -15 dBm Preamp on 10 MHz to 1.8 GHz -15 dBm -70 dBc/-105 dBc 2.5 to 4 GHz Option P03, P08, P13, P26) 10 to 100MHz -15 dBm -78 dBc nominal Millimeter Wave Mixer level Distortion 10 MHz to 1.8 GHz -50 dBc/NA (0ption P03, P08, P13, P26) 10 to 100MHz -15 dBm</td><td></td></td<>	Other spurious responses Mixer level Response Carrier frequency $\leq 26.5 \text{ GHz}$ First RF order -10 dBm -80 dBc + 20log(N ⁻¹) Including IF feedthroug (f \geq 10 MHz from carrier) Higher RF order -40 dBm -80 dBc + 20log(N ⁻¹) Including higher order (f \geq 10 MHz from carrier) -30 dBm -90 dBc nominal Carrier frequency > 26.5 GHz -30 dBm -90 dBc nominal (f \geq 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses -88 dBc ⁻² + 20log(N ⁻¹) -73 dBc ⁻² + 20log(N ⁻¹) (nominal) Second harmonic distortion (SHI) -80 dBc - 15 dBm -57 dBc/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-95 dBc 25 to 4 GHz -15 dBm -77 dBc/-101 dBc 2.5 to 4 GHz -15 dBm Preamp on 10 MHz to 1.8 GHz -15 dBm -70 dBc/-105 dBc 2.5 to 4 GHz Option P03, P08, P13, P26) 10 to 100MHz -15 dBm -78 dBc nominal Millimeter Wave Mixer level Distortion 10 MHz to 1.8 GHz -50 dBc/NA (0ption P03, P08, P13, P26) 10 to 100MHz -15 dBm	
Carrier frequency ≤ 26.5 GHz First RF order -10 dBm -80 dBc + 20log(N ¹) Including IF feedthrough, LD harmonic mixing responses (f ≥ 10 MHz from carrier) -40 dBm -80 dBc + 20log(N ¹) Including higher order mixer responses (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses -73 dBc ² + 20log(N ¹) -73 dBc ² + 20log(N ¹) (20 Hz ≤ 1 - 10 MHz from carrier) -75 dBc/NA +42 dBm/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm (0ption 503, 508, 513, 526) 10 to 132 S GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm (0ption 503, 508, 513, 526) 10 to 132 S GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm (0ption 543, 544, 550) 10 to 100MHz -15 dBm -77	$\begin{tabular}{ c c c c c } \hline Carrier frequency $\leq 26.5 \ GHz \\ First RF order \\ (f $\geq 10 \ MHz from carrier) \\ Higher RF order \\ (f $\geq 10 \ MHz from carrier) \\ Carrier frequency $\geq 26.5 \ GHz \\ First RF order \\ (f $\geq 10 \ MHz from carrier) \\ Higher RF order \\ (f $\geq 10 \ MHz from carrier) \\ Higher RF order \\ (f $\geq 10 \ MHz from carrier) \\ Higher RF order \\ (f $\geq 10 \ MHz from carrier) \\ LO-related spurious responses \\ (200 \ Hz $\leq f < 10 \ MHz from carrier) \\ Line-related spurious responses \\ (200 \ Hz $\leq f < 10 \ MHz from carrier) \\ Exceed the spurious responses \\ (200 \ Hz $\leq f < 10 \ MHz from carrier) \\ \hline BF/MW \\ (0ption 503, 508, 513, 526) \\ \hline erreamp on \\ (0ption P03, P08, P13, P26) \\ \hline Millimeter-Wave \\ (0ption 543, 544, 550) \\ \hline Hereamp on \\ (0pt$	ninal
First RF order (f ≥ 10 MHz from carrier) Higher RF order (f ≥ 10 MHz from carrier) -40 dBm -80 dBc + 20log(N ¹) Including Iif Feedthrough, L0 harmonic mixing responses Carrier frequency > 26.5 GHz First RF order -30 dBm -90 dBc nominal - (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal - (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal - (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal - L0-related spurious responses (200 Hz ≤ 1 < 10 dHz from carrier)	First RF order (f \geq 10 MHz from carrier) Higher RF order (f \geq 10 MHz from carrier)-10 dBm-80 dBc + 20log(N1) Including IF feedthroug (N1) Including higher order (A dBmCarrier frequency > 26.5 GHz First RF order (f \geq 10 MHz from carrier)-30 dBm-90 dBc nominalCarrier frequency > 26.5 GHz First RF order (f \geq 10 MHz from carrier)-30 dBm-90 dBc nominalLO-related spurious responses (200 Hz \leq f < 10 MHz from carrier). Mixer level at -10 dBm Line-related spurious responses-68 dBc ² + 20log(N1)Second harmonic distortion(SHI)Second harmonic distortionSource frequency 1.75 to 2.5 GHz 2.5 to 4 GHzMixer level -15 dBmDistortion ³ RF/MW (Option 503, 508, 513, 526)10 to 100 MHz 1.75 to 2.5 GHz 2.5 to 4 GHz -15 dBm-77 dBc/-101 dBc -15 dBm-77 dBc/-101 dBc -15 dBmPreamp on (Option P03, P08, P13, P26)10 MHz to 1.8 GHz 1.8 to 13.25 GHz-15 dBm -78 dBc nominal-78 dBc nominal -15 dBmMillimeter-Wave (Option 543, 544, 550)10 to 100MHz 1.8 GHz 1.8 to 13.25 GHz 3 to 5 GHz-15 dBm -77 dBc/-105 dBc -15 dBm-78 dBc nominal -78 dBc nominal -15 dBmMillimeter-Wave (Option 543, 544, 550)10 to 100MHz 1.8 GHz 3 to 5 GHz 3 to 5 GHz -15 dBm-77 dBc/-99 dBc -15 dBm -77 dBc/-105 dBc -15 dBmMillimeter-Wave (Option 543, 544, 550)10 to 100MHz 1.8 GHz 3 to 5 GHz -15 dBm -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15	
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Higher RF order (r ≥ 10 MHz from carrier) Carrier frequency > 28.5 GHz First RF order 30 dBm -90 dBc nominal (r ≥ 10 MHz from carrier) (r ≥ 10 MHz from carrier) (r ≥ 10 MHz from carrier) 30 dBm -90 dBc nominal L0-related spurious responses (200 Hz ≤ r 10 MHz from carrier), Mixer level at -10 dBm 80 dBc ² + 20log(N ¹) L0-related spurious responses (200 Hz ≤ r 10 MHz from carrier), Mixer level at -10 dBm 68 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (Gption 503, 508, 513, 526) -68 dBc ² + 20log(N ¹) (nominal) RF/MW (Option 503, 508, 513, 526) 10 to 100 MHz -15 dBm -57 dBc/NA +42 dBm/NA 10 to 100 MHz -15 dBm -77 dBc/-95 dBc +62 dBm/+80 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/H80 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/H80 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/H80 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/H80 dBm 10 to 13.25 GHz -15 dBm -77 dBc/-105 dBc +42 dBm/H80 dBm 10 to 13.25 GHz -15 dBm -77 dBc/-205 dBc +47 dBm/+90 dBm 10 to 100MHz <td>Higher RF order (f \geq 10 MHz from carrier) Carrier frequency > 26.5 GHz First RF order (f \geq 10 MHz from carrier) Higher RF order (f \geq 10 MHz from carrier)-30 dBm-90 dBc nominalL0-related spurious responses (200 Hz \leq f < 10 MHz from carrier). Mixer level at -10 dBm Line-related spurious responses-68 dBc 2 + 20log(N 1)-73 dBc 2 + 20log(N 1) (nominal)Second harmonic distortion (0ption 503, 508, 513, 526)-68 dBc 2 + 20log(N 1)Distortion 3RF/MW (0ption 503, 508, 513, 526)10 to 100 MHz 0.1 to 1.8 GHz 4 to 6.5 GHz 0.5 to 10 GHz-15 dBm -77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm-77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc -105 dBc -77 dBc/-105 dBc 2.5 to 4 GHz -15 dBmPreamp on (0ption 503, 908, P13, P26)10 to 100MHz 10 to 100MHz -15 dBm-78 dBc nominal -78 dBc nominal -77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-95 dBc 2.5 to 3 GHz -15 dBm -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -79 dBc/-105 dBc -15 dBm -77 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -77 dBc/-99 dBc -99 dBc -15 dBm -77 dBc/-95 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -70 dBc/-105 dBc -15 dBm -70 dBc/-105 dBc -15 dBm -70</td> <td>n, LO harmonic mixing responses</td>	Higher RF order (f \geq 10 MHz from carrier) Carrier frequency > 26.5 GHz First RF order (f \geq 10 MHz from carrier) Higher RF order (f \geq 10 MHz from carrier)-30 dBm-90 dBc nominalL0-related spurious responses (200 Hz \leq f < 10 MHz from carrier). Mixer level at -10 dBm Line-related spurious responses-68 dBc 2 + 20log(N 1)-73 dBc 2 + 20log(N 1) (nominal)Second harmonic distortion (0ption 503, 508, 513, 526)-68 dBc 2 + 20log(N 1)Distortion 3 RF/MW (0ption 503, 508, 513, 526)10 to 100 MHz 0.1 to 1.8 GHz 4 to 6.5 GHz 0.5 to 10 GHz-15 dBm -77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm-77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc -105 dBc -77 dBc/-105 dBc 2.5 to 4 GHz -15 dBmPreamp on (0ption 503, 908, P13, P26)10 to 100MHz 10 to 100MHz -15 dBm-78 dBc nominal -78 dBc nominal -77 dBc/-95 dBc 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-105 dBc -15 dBm -77 dBc/-95 dBc 2.5 to 3 GHz -15 dBm -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -78 dBc nominal -79 dBc/-105 dBc -15 dBm -77 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -77 dBc/-99 dBc -99 dBc -15 dBm -77 dBc/-95 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -79 dBc/-99 dBc -15 dBm -77 dBc/-99 dBc -70 dBc/-105 dBc -15 dBm -70	n, LO harmonic mixing responses
(f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal First RF order -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal Higher RF order -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal Line-related spurious responses -73 dBc² + 20log(N¹) (nominal) Second harmonic distortion (SHI) Second harmonic distortion (SHI) -57 dBc² NA RF/MW 10 to 100 MHz -15 dBm (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm 1.75 to 2,5 GHz -15 dBm -77 dBc²-105 dBc 4 to 6,5 GHz -15 dBm -77 dBc²-105 dBc 6,5 to 10 GHz -15 dBm -77 dBc²-105 dBc 10 to 13.25 GHz -15 dBm -77 dBc²-105 dBc 10 to 12.5 GHz -15 dBm -77 dBc²-105 dBc 10 to 13.25 GHz -15 dBm -77 dBc²-105 dBc 10 to 13.25 GHz -15 dBm -77 dBc²-105 dBc 10 to 12.5 GHz -15 dBm -77 dBc²-105 dBc 10 to 100MHz -15 dBm -77 dBc²-105 dBc 10 to 100MHz -15 dBm<	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
Carrier frequency > 26.5 GHz First RF order -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal Higher RF order -30 dBm -90 dBc nominal (f ≥ 10 MHz from carrier) -68 dBc² + 20log(N¹) -57 dBc² + 20log(N¹) (nominal) L0-related spurious responses -73 dBc² + 20log(N¹) (nominal) -68 dBc² + 20log(N¹) (nominal) Second harmonic distortion (SHI) -73 dBc² + 20log(N¹) (nominal) Second harmonic distortion (SHI) -73 dBc² + 20log(N¹) (nominal) RF/MW 10 to 100 MHz -15 dBm -57 dBc/NA +42 dBm/NA (0ption 503, 508, 513, 526) 0.1 to 18 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm 1.75 to 2.5 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/+80 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/+80 dBm 0.1 to 13.25 GHz -15 dBm -70 dBc/-105 dBc +52 dBm/+80 dBm 0.1 to 13.25 GHz -15 dBm -70 dBc/-105 dBc +52 dBm/+80 dBm 0.1 to 13.25 GHz -15 dBm -70 dBc/-105 dBc +53 dBm/+90 dBm 0.5 to 10 GHz <td>$\begin{array}{c} \mbox{Carrier frequency > 26.5 GHz} \\ \mbox{First RF order} \\ \mbox{(}f \geq 10 \ MHz \ from \ carrier) \\ \mbox{Higher RF order} \\ \mbox{(}f \geq 10 \ MHz \ from \ carrier) \\ \mbox{Lo-related spurious responses}$</td> <td>nixer responses</td>	$\begin{array}{c} \mbox{Carrier frequency > 26.5 GHz} \\ \mbox{First RF order} \\ \mbox{(}f \geq 10 \ MHz \ from \ carrier) \\ \mbox{Higher RF order} \\ \mbox{(}f \geq 10 \ MHz \ from \ carrier) \\ \mbox{Lo-related spurious responses} $	nixer responses
First RF order (f ≥ 10 MHz from carrier) Higher RF order (g ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses (200 Hz ≤ f < 10 MHz from carrier). Mixer level at -10 dBm -68 dBc ² + 20log(N ¹) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (ption 503, 508, 513, 526) -68 dBc ² + 20log(N ¹) (nominal) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (Option 503, 508, 513, 526) -05 dBc + 2 dBc + 2 dBc/ NA 10 to 100 MHz -15 dBm -57 dBc/NA + 42 dBm/NA - 50 dBc + 42 dBm/NA - 15 dBm RF/MW (Option 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-95 dBc +62 dBm/48 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/48 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/480 dBm 2.5 to 4 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/490 dBm 6.5 to 10 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/490 dBm 0 to 103 25 GHz -15 dBm -70 dBc/-105 dBc +62 dBm/490 dBm 10 to 12 325 GHz -15 dBm -70 dBc/-105 dBc +62 dBm/490 dBm (Option 543, 544, 550) 10 to 100 MHz -15 dBm -50 dBc +57 dBm/480 dBm	First RF order -30 dBm -90 dBc nominal (f \ge 10 MHz from carrier) -30 dBm -90 dBc nominal Higher RF order -30 dBm -90 dBc nominal (f \ge 10 MHz from carrier) -68 dBc ² + 20log(N ¹) -68 dBc ² + 20log(N ¹) L0-related spurious responses -68 dBc ² + 20log(N ¹) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (SHI) -15 dBm -57 dBc/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-105 dBc 0.1 to 1.8 GHz -15 dBm -77 dBc/-105 dBc -55 dBc -15 dBm -78 dBc nominal (0ption 503, 508, 513, 526) 10 to 13.25 GHz -15 dBm -78 dBc nominal -15 dBm -60 dBc/NA 1.175 to 2.5 GHz -15 dBm -78 dBc/-105 dBc -15 dBm -78 dBc/-105 dBc -57 dBc//A -10	
If ≥ 10 MHz from carrier) Higher RF order (f ≥ 10 MHz from carrier) -30 dBm -90 dBc nominal L0-related spurious responses (200 Hz ≤ f < 10 MHz from carrier), Mixer level at -10 dBm -68 dBc ² + 20log(N ¹) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (arrier), Mixer level at -10 dBm -73 dBc ² + 20log(N ¹) (nominal) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion (Option 503, 508, 513, 526) 10 to 100 MHz -15 dBm -57 dBc/NA +42 dBm/NA 1,75 to 2,5 GHz -15 dBm -73 dBc ² + 20log(N ¹) (nominal) -57 dBc/NA +42 dBm/NA (Option 503, 508, 513, 526) 10 to 100 MHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm 2, 5 to 4 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm -55 to 16 GHz +15 dBm -77 dBc/-105 dBc +62 dBm/+80 dBm 2, 5 to 4 GHz -15 dBm -70 dBc/-105 dBc +42 dBm/NA +10 dBm nominal (Option P03, P08, P13, P26) 10 MHz to 1.8 GHz -15 dBm -57 dBc/NA +42 dBm/NA (Option 543, 544, 550) 10 to 100MHz -15 dBm -57 dBc/NA +42 dBm/NA (Option 543, 544, 550) 10 to 100MHz -15 dBm	$ \begin{array}{ c c c c c c } \hline \mbox{to the dot normal} & \mbox{to the dot normal} \\ \hline \mbox{to to normal} \\ \hline \mbox{to to 10 MHz} \\ \hline \mbox{to 10 0 MHz} \\ \hline \mbox{to 12 S GHz} \\ \hline \mbox{to 13 BC} \\ \hline to 13 BC$	
Higher RF order (f ≥ 10 MHz from carrier) 30 dBm -90 dBc nominal L0-related spurious responses Carrier), Mixer level at -10 dBm -68 dBc ² + 20log(N ¹) -68 dBc ² + 20log(N ¹) Second harmonic distortion Carrier), Mixer level at -10 dBm -73 dBc ² + 20log(N ¹) (nominal) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion Corrier), Mixer level at -10 dBm -73 dBc ² + 20log(N ¹) (nominal) -73 dBc ² + 20log(N ¹) (nominal) Second harmonic distortion Corrier), Mixer level at -10 dBm -15 dBm -57 dBc/NA +42 dBm/NA (0ption 503, 508, 513, 526) 10 to 100 MHz -15 dBm -57 dBc/-101 dBc +62 dBm/+80 dBm 17.5 to 2.5 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm -68 dBc/-105 dBc +62 dBm/+80 dBm 10 to 12.5 GHz -15 dBm -77 dBc/-101 dBc +62 dBm/+80 dBm -68 dBc/-105 dBc +62 dBm/+80 dBm 10 to 13.25 GHz -15 dBm -77 dBc/-105 dBc +62 dBm/+80 dBm -69 dBc nominal +13 dBm nominal (Option P03, P08, P13, P26) 10 to 100MHz -15 dBm -57 dBc/NA +42 dBm/NA 110 to 100MHz -15 dBm -57 dBc/-95 dBc +57 dBm/+80 dBm +10 dBm nom	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
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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 dBm/+90 dBm (nom.) Preamp on (Option P03, P08, Preamp level Distortion SHI	10 to 13.25 GHz -15 dBm -62 dBc/-105 dBc	
13.25 to 25 GHz -15 dBm -65 dBc/-105 dBc (nom.) +50 dBm/+90 dBm (nom.) Preamp on (Option P03, P08, Preamp level Distortion SHI		
Preamp on (Option P03, P08, Preamp level Distortion SHI		
		/ / /
	P13, P26, P43, P44, P50)	
10 MHz to 1.8 GHz	10 MHz to 1.8 GHz	+33 dBm/NA (nominal)
1.8 to 13.25 GHz -50 dBm -60 dBm/NA (nominal) +10 dBm/NA (nominal)	1.8 to 13.25 GHz -50 dBm -60 dBm/NA (nomina) +10 dBm/NA (nominal)
13.25 to 25 GHz50 dBm50 dBm /NA (nominal)0 dBm /NA (nominal)	13.25 to 25 GHz -50 dBm -50 dBm/NA (nomina) 0 dBm/NA (nominal)

N is the LO multiplication factor. Refer to page 4 for the N value verses frequency ranges.
 Nominally –40 dBc under large magnetic (0.38 Gauss rms) or vibrational (0.21 g rms) environmental stimuli.
 Normal path/LNP enabled (requires Option LNP).

Third-order intermodulation	Third-order intermodulation distortion (TOI)				
(two –16 dBm tones at input mixe	r with tone separation > 5	times IF prefilte	r bandwidth, 20 to 30 °C)		
For all frequency options (Option 503, 508, 513, 526, 543, 544, and 550)	10 to 150 MHz 150 to 600 MHz 0.6 to 1.1 GHz 1.1 to 3.6 GHz	+13 dBm +18 dBm +20 dBm +21 dBm	+16 dBm typical +21 dBm typical +22 dBm typical +23 dBm typical		
For RF/MW only (Option 503, 508, 513, and 526)	3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz	+17 dBm +17 dBm +15 dBm +16 dBm	+23 dBm typical +23 dBm typical +20 dBm typical +22 dBm typical		
For Millimeter-Wave only (Option 543, 544, and 550)	3.5 to 8.4 GHz 8.3 to 13.6 GHz 13.5 to 17.1 GHz 17.0 to 26.5 GHz 26.5 to 50 GHz	+16 dBm +16 dBm +13 dBm +13 dBm	+23 dBm typical +23 dBm typical +17 dBm typical +20 dBm typical +13 dBm nominal		
Preamp on (Option P03, P08, P13, P26, P43, P44, and P50)					
Tones at preamp input (two –45 dBm) (two –45 dBm) (two –50 dBm)	10 to 500 MHz 500 MHz to 3.6 GHz 3.6 to 26.5 GHz		+4 dBm nominal +4.5 dBm nominal –15 dBm nominal		

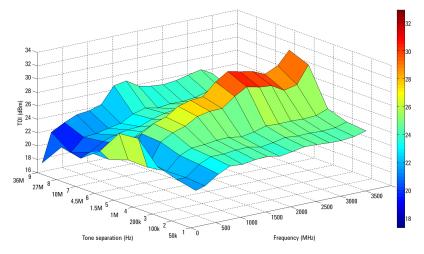
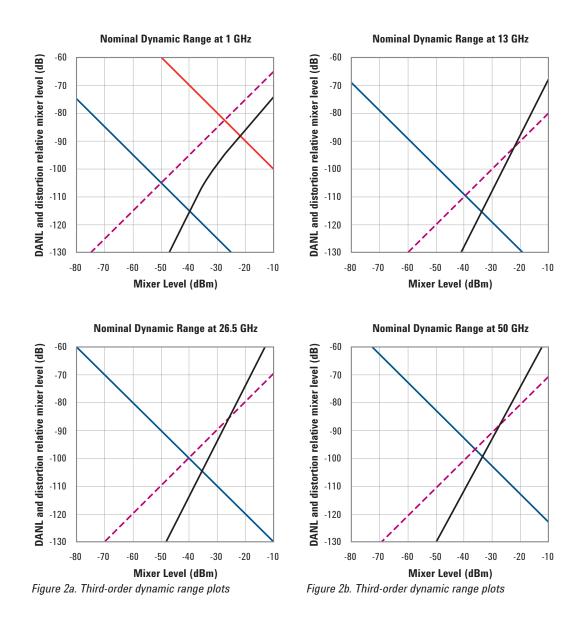


Figure 1. Nominal TOI performance versus frequency and tone separation



DANL (30 kHz RBW)
 DANL (1 Hz RBW)
 OANL (1 Hz RBW)
 OANL (1 Hz RBW)

------ 3rd Order Intermodulation

Phase noise	Offset	Specification	Typical
Noise sidebands	10 Hz		–80 dBc/Hz nominal
(20 to 30 °C, CF = 1 GHz)	100 Hz	–94 dBc∕Hz	–100 dBc/Hz typical
	1 kHz	−121 dBc/Hz	–125 dBc/Hz typical
	10 kHz	−129 dBc/Hz	–132 dBc/Hz typical
	30 kHz	_130 dBc∕Hz	–132 dBc/Hz typical
	100 kHz	−129 dBc/Hz	–131 dBc/Hz typical
	1 MHz	−145 dBc/Hz	–146 dBc/Hz typical
	10 MHz	–155 dBc/Hz	–158 dBc/Hz typical

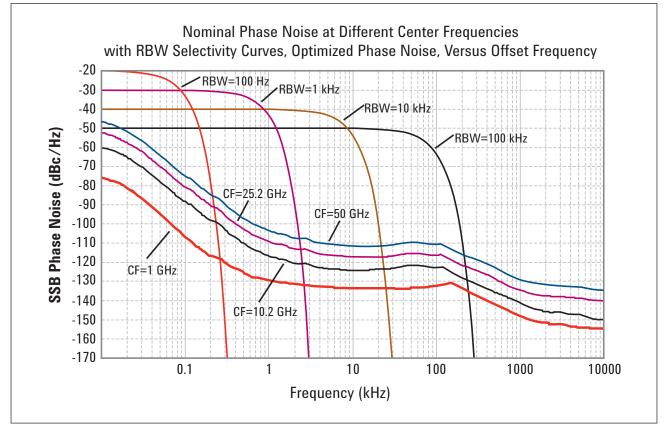


Figure 3. Nominal PXA phase noise at various center frequencies

Option MPB, microwave preselector bypass ¹			
Frequency range			
N9030A-508	3.6 to 8.4 GHz		
N9030A-513	3.6 to 13.6 GHz		
N9030A-526	3.6 to 26.5 GHz		
N9030A-543	3.6 to 43 GHz		
N9030A-544	3.6 to 44 GHz		
N9030A-550	3.6 to 50 GHz		

1. When Option MPB is installed and enabled, some aspects of the analyzer performance change. Please refer to the PXA specification guide for more details.

PowerSuite Measurement Specifications

Channel power			
Amplitude accuracy, W-CDMA or IS95 (20 to 30 °C, attenuation = 10 dB)	± 0.61 dB (± 0.19 dB 95th	n percentile)	
Occupied bandwidth			
Frequency accuracy	± [span/1000] nominal		
Adjacent channel power			
Accuracy, 3GPP W-CDMA (ACLR) (at specific mixer levels and ACLR ranges)	Adjacent	Alternate	
MS (UE) BTS	± 0.09 dB ± 0.18 dB	± 0.16 dB ± 0.31 dB	
Dynamic range (typical) Without noise correction With noise correction	82.5 dB 83.5 dB (88 dB 1)	–87 dB –89 dB	
Offset channel pairs measured	1 to 6		
Multi-carrier ACP			
Accuracy, 3GPP W-CDMA (ACPR) (4 carriers, 5 MHz offset, BTS, UUT ACPR range at –42 to –48 dB, optimal mixer level at –21 dBm)	± 0.13 dB		
Multiple number of carriers measured	Up to 12		
Power statistics CCDF			
Histogram resolution	0.01 dB		
Harmonic distortion			
Maximum harmonic number	10th		
Result	Fundamental power (dBm)	, relative harmonics power (dBc), total harmonic distortion in %	
Intermod (TOI)	Measure the third-order products and intercepts from two tones		
Burst power			
Methods	Power above threshold, p	power within burst width	
Results	Single burst output powe within burst, burst width	r, average output power, maximum power, minimum power	
Spurious emission	·		
3GPP W-CDMA table-driven spurious signals	s; search across regions		
Dynamic range (1 to 3.6 GHz) Absolute sensitivity (1 to 3.6 GHz)	97.1 dB –86.4 dBm	(101.9 dB typical) (–90.4 dBm typical)	
Spectrum emission mask (SEM)			
cdma2000® (750 kHz offset)			
Relative dynamic range	81.6 dB	(86.4 dB typical)	
Absolute sensitivity	–101.7 dBm	(–105.7 dBm typical)	
Relative accuracy	± 0.08 dB		
3GPP W-CDMA (2.515 MHz offset)			
Relative dynamic range	85.4 dB	(89.8 dB typical)	
Absolute sensitivity Relative accuracy	–101.7 dBm ± 0.08 dB	(–105.7 dBm typical)	
neiative accuracy	± 0.00 uD		

1. Nominal value base on hand-measured results from early production units. These observations were done near 2 GHz, the common W-CDMA operating region.

General Specifications

Stanby

0 to 55 °C				
-40 to +70 °C				
4,500 meters (approx 15,000 feet)				
4/108/EC ES-001 IMB-001 du Canada				
tive 2006/95/EC				
hinery Directive 2002/42/EC, 1.7.4.2u)				
the "Operator Sitting" position)				
Nominally under 55 dBA Sound Pressure. 55 dBA is generally considered suitable for use in quiet office environment				
Nominally under 65 dBA Sound Pressure. 65 dBA is generally considered suitable for use in noisy office environment				
ted in accordance with the Agilent Environmental Test Manual and verified to be robust ge, transportation, and end-use; those stresses include, but are not limited to, tempera- d power line conditions; test methods are aligned with IEC 60068-2 and levels are similar				
100 to 120 V, 50/60/400 Hz 220 to 240 V, 50/60 Hz				
630 W (Maximum)				

1. The N9030A is in full compliance with CISPR 11, Class A emissions and is declared as such. In addition, the N9030A has been type tested and shown to meet CISPR 11, Class B emissions limits. Information regarding the Class B emission performance of the N9030A is provided as a convenience to the user and is not intended to be a regulatory declaration.

40 W

Display				
Resolution Size	1024 x 768, XGA 213 mm (8.4 in.) diagonal (nominal)			
Data storage				
Internal	Removable solid state drive (80 GB)			
External	Supports USB 2.0 compatible memory devices			
Weight (without options)				
Net Shipping	22 kg (48 lbs) nominal 34 kg (75 lbs) nominal			
Dimensions				
Height Width Length	177 mm (7.0 in) 426 mm (16.8 in) 556 mm (21.9 in)			
Warranty				
The PXA signal analyzer is supplied with a 3-year standard warranty				
Calibration cycle				
The recommended calibration cycle is one year. Calibration services are available through Agilent service centers				

Inputs and Outputs

Front newsl	
Front panel	
RF input Connector	
Standard (Option 503, 508, 513, 526)	Type-N female, 50 Ω nominal
Option C35 (with Option 526 only)	APC 3.5 mm male, 50 Ω nominal
Standard (Option 543, 544, 550)	2.4 mm male, 50 Ω nominal
Analog baseband IQ inputs (Option BBA) ¹	
Connectors (I, Q, I-Bar, Q-Bar, and Cal Out)	BNC female
Cal Out	
Signal	AC coupled square wave
Frequency	Selectable between 1 kHz and 250 kHz
Input impedance (4 connectors: I, Q, I-, Q-)	50 Ω, 1 MΩ (selectable, nominal)
Probes supported ²	
Active probe	1130A, 1131A, 1132A, 1134A
Passive probe	1161A
Input return loss	–5 dB (0 to 10 MHz, nominal)
50 Ω impedance only selected	–0 dB (10 to 40 MHz. nominal)
Probe power	
Voltage/current	+15 Vdc, ± 7% at 150 mA max nominal
Ŭ	–12.6 Vdc, ± 10% at 150 mA max nominal
USB 2.0 ports	
Master (2 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% inch")

1. For additional specifications, please refer to Chapter BAA in the PXA Signal Analyzer specification guide

2. For more details, please refer to the Agilent Probe Configuration Guides, literature numbers 5968-7141EN and 5989-6162EN; probe heads are necessary to attach to your device properly and probe connectivity kits such as E2668B, E2669A. or E2675A are required.

External mixing, Option EXM				
Connection port Connector	SMA, female			
Impedance	50 Ω nominal			
Functions	Triplexed for mixer bias, IF input and LO output			
Mixer bias range	± 10 mA in 10 uA step			
IF input center frequency				
Narrowband IF path 40 MHz BW IF path	322.5 MHz			
85 or 160 MHz BW IF path	250.0 MHz 300 MHz			
LO output frequency range	3.75 to 14.0 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 5 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 50 Ω nominal			
Impedance Level	0 to 5 V (CMOS) nominal			
Sync (reserved for future use)				
Connector	BNC female			
Monitor output				
Connector	VGA compatible, 15-pin mini D-SUB			
Format	XGA (60 Hz vertical sync rates, non-interlaced) Analog RGB			
Resolution	1024 x 768			
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 Technologies SNS Series noise sources			
Digital bus (reserved for future use)				
Connector	MDR-80			

Rear panel	
Analog out	
Connector	BNC female
USB 2.0 ports Master (4 ports) Standard Connector Output current Slave (1 port) Standard Connector	Compatible with USB 2.0 USB Type-A female 0.5 A nominal Compatible with USB 2.0 USB Type-B female
Output current	0.5 A nominal
GPIB interface Connector GPIB codes GPIB mode	IEEE-488 bus connector SH1, AH1, T6, SR1, RL1, PP0, DC1, C1, C2, C3, C28, DT1, L4, C0 Controller or device
LAN TCP/IP interface Standard Connector	1000Base-T RJ45 Ethertwist
IF output Connector Impedance	SMA female, shared by Opts CR3, CRP, and ALV 50 Ω nominal
2nd IF output, Option CR3	
Center frequency SA mode or I/Q analyzer with IF BW ≤ 25 MHz with Option B40 with Option B85/B1X Conversion gain	322.5 MHz 250 MHz 300 MHz –1 to +4 dB (nominal) plus RF frequency response
Bandwidth	
Low band High band, with preselector High band, with preselector bypassed ¹	Up to 160 MHz (nominal) Depends on center frequency Up to 700 MHz (nominal); expandable to 900 MHz with corrections
Arbitrary IF output, Option CRP	
Center frequency Range Resolution	10 to 75 MHz (user selectable) 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 Preselected band	100 MHz (nominal) Depends on RF center frequency
Output at 70 MHz Low band or high band with preselector bypassed	

1. The maximum bandwidth is not centered around the IF output center frequency.

Other Optional Output

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	$25 \pm 1 \text{ mV/dB}$ nominal	
Log fidelity		
Range	49 dB (nominal) with input frequ	ency at 1 GHz
Accuracy within range	± 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 YAV Y-Axis output

General port specifications					
Connector Impedance	BNC female	Shared with other options 50 Ω nominal			
Screen video					
Operating conditions Display scale types Log scales Modes Gating	Log or Lin All (0.1 to 20 dB/div) Spectrum analyzer only Gating must be off	"Lin" is linear in voltage			
Output scaling Offset Gain accuracy	0 to 1.0 V open circuit, representing bottom to top of screen ± 1% of full scale nominal ± 1% of output voltage nominal				
Delay between RF input to analog output	71.7 μs +2.56/RBW + 0.159/V	/BW nominal			
Log video (Log envelope) output					
Amplitude range (terminated with 50 Ω)					
Maximum	1.0 V nominal for –10 dBm at t	the mixer			
Scale factor Bandwidth Operating conditions	1 V per 192.66 dB Set by RBW Select Sweep Type = Swept				
Linear video (AM Demod) output					
Amplitude range (terminated with 50 Ω)					
Maximum Minimum	1.0 V nominal for signal envelope at the reference level 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 Operating conditions	Set by RBW Select Sweep Type = Swept				

I/Q Analyzer

Frequency					
Frequency					
Frequency span					
Standard instrument	10 Hz to 10 MHz				
Option B25	10 Hz to 25 MHz				
Option B40	10 Hz to 40 MHz				
Option B85	10 Hz to 85 MHz				
Option B1X	10 Hz to 160 MHz				
Resolution bandwidth (spectrum me	asurement)				
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, Ha	nning, Hamming	, Gaussian, Blackma	an, Blackman-Harri	s, Kaiser Bessel
	(K-B 70 dB, K-B 90 dB	3 and K-B 110 dE	3)		
Analysis bandwidth (waveform meas	surement)				
Standard instrument	10 Hz to 10 MHz				
Option B25	10 Hz to 25 MHz				
Option B40	10 Hz to 40 MHz				
Option B85	10 Hz to 85 MHz				
Option B1X	10 Hz to 160 MHz				
IF frequency response (stand	ard 10 MHz IF path))			
IF frequency response (demodulation	n and FFT response rela	tive to the cente	r frequency)		
Freq (GHz)	Analysis	Max error	Midwidth	Slope (dB/	RMS (nominal)
	BW (MHz)		error (95th	MHz) (95th	
	(percentile)	percentile)	
≤ 3.6	≤ 10	± 0.20 dB	± 0.12 dB	± 0.10 dB	0.02 dB
3.6 to 26.5	\leq 10 preselected				0.23 dB
3.6 to 26.5	\leq 10 preselector off ¹	± 0.25 dB	± 0.12 dB	± 0.10 dB	0.02 dB
26.5 to 50	≤ 10 preselected				0.12 dB
26.5 to 50	\leq 10 preselected off ¹	± 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	0.06°	0.012°	
≥ 3.6 to ≤ 26.5	≤ 10	Off ¹	0.10°	0.022°	
≥ 3.6	≤ 10	On	0.11°	0.024°	
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	–10 dBm			–8 dBm nominal	
IF gain = High	–20 dBm			–17.5 dBm nominal	
Noise density at mixer at center	(DANL + IF Gain effect) + 2.25 dB				
frequency					
Data acquisition (standard 1	0 MHz IF path)				
Time record length					
Analysis tool					
IQ analyzer	4,000,000 IQ sample	Pairs			
	Data packing				
Advanced tools	32-bit	64-bit	 89600 VSA software or N9064A VXA 		
Length (IQ sample pairs)	536 MSa (2 ²⁹ Sa)	268 MSa (2 ²⁸ Sa)	2 GB total memo	pry	
Length (time units)	Samples/(span x 1.28)				
Sample rate					
At ADC	100 Msa/s				
IQ pairs	Span dependent				
ADC resolution	16 bits				

Option B25 25 MHz analysis bandwidth (Option B25 is automatically included in Option B40, B85 or B1X)

IF frequency response (demodulat	on and FFT response rela	ative to the center f	requency)		
Freq (GHz)	Analysis BW (MHz)	Max error	Midwidth error (95th percentile)	Slope (dB/ MHz) (95th percentile)	RMS (nominal)
< 3.6	10 to ≤ 25	± 0.30 dB	± 0.12 dB	± 0.05 dB	0.02 dB
3.6 to 26.5	10 to ≤ 25 preselected				0.50 dB
3.6 to 26.5	10 to ≤ 25 preselector off ¹	± 0.40 dB			0.03 dB
26.5 to 50	10 to ≤ 25 preselected				0.31 dB
26.5 to 50	10 to ≤ 25 preselector 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	0.48°		0.12°
≥ 3.6	≤ 25	Off ¹	0.85°		0.20°
Dynamic range (B25 IF path)					
Full scale (ADC clipping)					
Default settings, signal at CF (IF gain = Low) Band 0 Bands 1 through 4	–8 dBm mixer level r –7 dBm mixer level r				
High gain setting, signal at CF (IF gain = High) Band 0 Bands 1 through 4	–18 dBm mixer level –17 dBm mixer level		-		
Effect of signal frequency \neq CF	Up to ± 3 dB nomina	I			
Data acquisition (B25 IF pat	h)				
Time record length					
Analysis tool					
IQ analyzer	4,000,000 IQ sample Pa	airs			
	Data pac				
Advanced tools	32-bit	64-bit	- 89600 VSA soft	tware or N9064A V	ХА
Length (IQ sample pairs)	536 MSa (2 ²⁹ Sa)	268 MSa (2 ²⁸ Sa)	2 GB total men	norv	
Length (time units)	Samples/(span x 1.28)	. ,		,	
Sample rate	- sp. co, (opan x 1120)				
At ADC	100 Msa/s				
IQ pairs	Span dependent				
ADC resolution	16 bits				

Option B40 40 MHz analysis bandwidth (Option B40 is automatically included in Option B85 or B1X)

IF frequency response (B40 IF	path)				
IF frequency response				Relative to cent	er frequency
Center freq. (GHz)	Span (MHz)	Preselector		Typical	RMS (nominal)
≥ 0.03, < 3.6	≤ 40	NA	± 0.4 dB	± 0.25 dB	0.05 dB
≥ 3.6, ≤ 8.4	≤ 40	Off ¹	± 0.4 dB	± 0.16 dB	0.05 dB
> 8.4, ≤ 26.5	≤ 40	Off ¹	± 0.7 dB	± 0.20 dB	0.05 dB
≥ 26.5, < 34.4	≤ 40	Off ¹	± 0.8 dB	± 0.25 dB	0.1 dB
≥ 34.4, < 50	≤ 40	Off ¹	± 1.0 dB	± 0.35 dB	0.1 dB
IF phase linearity (deviation fr	· · · · · · · · · · · · · · · · · · ·	nearity)			
Center freq (GHz)	Span (MHz)	Preselector		Peak-to-peak (nominal)	RMS (nominal)
≥ 0.03, < 3.6	≤ 40	NA		0.16°	0.041°
≥ 3.6	≤ 40	Off ¹		1.5°	0.35°
EVM (EVM measurement floor for an	n 802.11g OFDM signa	l, using 89600B so	oftware equalization	n, channel estimatior	and data EQ)
2.4 GHz				-52.0 dB (0.25%	
5.8 GHz with Option MPB				–49.1 dB (0.35%) nominal
Dynamic range (B40 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)					
Default settings, signal at CF					
(IF gain = Low: IF gain offset = 0 dB)					
Band 0	–8 dBm mixer leve				
Bands 1 through 4	–7 dBm mixer leve	l nominal			
High gain setting, signal at CF					
(IF gain = High)					
Band 0	–18 dBm mixer lev				
Bands 1 through 4	–17 dBm mixer level nominal, subject to gain limitations				
Effect of signal frequency \neq CF	Up to ± 3 dB nomir	nal			

Option B40 40 MHz analysis bandwidth

Time record length				
Analysis tool				
IQ analyzer	4,000,000 IQ sample	pairs		
Advanced tools	Data p	backing	- 89600 VSA software or N9064A VXA	
	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/(span x 1.28	Samples/(span x 1.28)		
Sample rate				
At ADC	200 Msa/s	200 Msa/s		
IQ pairs	Span dependent	Span dependent		
ADC resolution	12 bits			

I/O Analyzer (continued)

Option B85 85 MHz or B1X 160 MHz analysis bandwidth

IF frequency response (B85 or B1X	(IF path)				
IF frequency response				Relative to cente	r frequency
Center freq. (GHz)	Span (MHz)	Preselector		Typical	RMS (nominal)
≥ 0.1, < 3.6	≤ 85	NA	± 0.6 dB	± 0.17 dB	0.05 dB
	≤ 140	NA	± 0.6 dB	± 0.25 dB	0.05 dB
	≤ 160	NA		± 0.2 dB (nom)	0.07 dB
≥ 3.6, ≤ 8.4	≤ 85	Off 1	± 0.73 dB	± 0.2 dB	0.05 dB
	≤ 140	Off ¹	± 0.8 dB	± 0.35 dB	0.05 dB
	≤ 160	Off ¹		± 0.3 dB (nom)	0.07 dB
> 8.4, ≤ 26.5	≤ 85	Off ¹	± 1.10 dB	± 0.50 dB	0.1 dB
	≤ 140	Off ¹	± 1.30 dB	± 0.75 dB	0.1 dB
	≤ 160	Off ¹		± 0.5 dB (nom)	0.12 dB
≥ 26.5, ≤ 50	≤ 85	Off 1	± 1.20 dB	± 0.45 dB	0.12 dB
	≤ 140	Off ¹	± 1.40 dB	± 0.65 dB	0.12 dB
IF phase linearity (deviation from n	nean phase line	earity)			
Center freq (GHz)	Span (MHz)	Preselector		Peak-to-peak (nominal)	RMS (nominal)
≥ 0.03, < 3.6	≤ 140	NA		0.9°	0.20°
≥ 3.6,	≤ 160	NA		1.7°	0.42°
	≤ 140	Off ¹		1.6°	0.39°
	≤ 160	Off 1		2.8°	0.64°
EVM (EVM measurement floor)	Customized se	ttings required, p	preselector bypassed	d (Option MPB) abov	ve Band 0
Case 1: 62.5 Msymbol/s, 160AM signal, R	RC filter alpha of ().2, non-equalized	d, with approximate	y 75 MHz occupied	bandwidth
Band 0, 1.8 GHz	0.8% nominal				
Band 1, 5.95 GHz	1.1% nominal				
Case 2: 104.167 Msymbol/s, 160AM signa	al, RRC filter alpha	of 0.35, non-equ	alized, with approxir	nately 140 MHz occ	upied bandwidth
Band 1, 5.95 GHz	3.0% nominal,	(unequalized)	0.5% nominal, (equalized)	
Band 2, 15.3 GHz	2.5% nominal,	(unequalized)	0.6% nominal, (equalized)	
Band 4, 26 GHz	3.5% nominal,	(unequalized)	1.6% nominal, (equalized)	
Effect of signal frequency \neq CF	Up to ± 3 dB n	ominal			

Option B85 85 MHz or B1X 160 MHz analysis bandwidth

Dynamic range (B85 or B1X IF path)				
SFDR (Spurious-free dynamic range)				
Signal frequency within \pm 12 MHz of center	–75 dBc nominal			
Signal frequency anywhere within analysis BW				
Spurious response within ± 63 MHz of center	–74 dBc nominal			
Response anywhere within analysis BW	–72 dBc nominal			
Full scale (ADC clipping)				
Default settings, signal at CF (IF gain = Low: IF gain offset = 0 dB) Band 0 Band 1 through 4	–8 dBm mixer level –7 dBm mixer level			
High gain setting, signal at CF (IF gain = High) Band 0		el nominal, subject to g		
Band 1 through 4	-17 dBm mixer level nominal, subject to gain limitations			
Effect of signal frequency \neq CF	Up to ± 3 dB nomin	lal		
Data acquisition (B85 or B1X IF path	1)			
Time record length				
Analysis tool				
IQ analyzer	4,000,000 IQ sample pairs			
Advanced tools		acking	89600 VSA software or N9064A VXA	
	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/(span x 1.28	3)		
Sample rate				
At ADC	400 Msa/s			
IQ pairs	Span dependent			
ADC resolution	14 bits			

Real-time spectrum analyzer (RTSA)¹

Option RT1 or RT2

Real-time analysis		
Real-time analysis bandwidth Option RT1 Option RT2	Up to 160 MHz Up to 160 MHz	Analysis BW option determines the max real-time bandwidth Analysis BW option determines the max real-time bandwidth
Minimum detectable signal duration with > 60 dB StM ² ratio		
Option RT1	11.42 ns	
Option RT2	5.0 ns	
Minimum signal duration with 100% probability of intercept (POI) at full amplitude accuracy		For Frequency Mask Triggering (FMT)
Option RT1	17.3 µs	Signal is at mask level
Option RT2	3.57 µs	Signal is at mask level
Minimum acquisition time	100 µs	
FFT rate	292,969/s	

1. For additional RTSA specifications, please refer to Option RT1/RT2 Chapter in the PXA Signal Analyzer specifications guide

2. StM = "Signal-to-Mask"

Related Literature

Agilent PXA signal analyzers

Brochure	5990-3951EN
Configuration guide	5990-3953EN

For more information or literature resources please visit the web: www.agilent.com/find/pxa

Additional information, including literature, can be found at the Agilent website:

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