

# Keysight N9048B PXE EMI Receiver

2 Hz to 26.5 GHz



For more information:

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## Definition and Terms

**Specifications** describe the performance of parameters covered by the product warranty and apply to the full temperature range of 0 to 55 °C, unless otherwise noted.

**95th percentile values** indicate the breadth of the population (approx.  $2\sigma$ ) 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 values** describe 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 are not covered by the product warranty.

The receiver will meet its specifications when:

- It is within its calibration cycle
- Under auto couple control, except when Auto Sweep Time Rules = Accy.
- Signal frequencies < 10 MHz, with DC coupling applied
- The receiver has been stored at an ambient temperature within the allowed operating range for at least two hours before being turned on
- The receiver 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 receiver may fail to meet specifications without informing the user

This data sheet is a summary of the specifications and conditions for the PXE EMI receiver. For the complete specifications guide, visit:

[www.keysight.com/find/PXE](http://www.keysight.com/find/PXE)



### Keep the test queue flowing

In EMC testing, success depends on tools that can help you do more in less time—today and tomorrow. That’s why Keysight Technologies, Inc. created the PXE: it’s a standards-compliant EMI receiver and diagnostic signal analyzer built on an upgradeable platform. In the lab and on the bench, it provides the accuracy, repeatability, and reliability you need to test with confidence. Equip your team with the PXE and keep the test queue flowing.



## Frequency and Time Specifications

Frequency range	DC coupled	AC coupled
Input 1		
Option 503	2 Hz to 3.6 GHz	10 MHz to 3.6 GHz
Option 508	2 Hz to 8.4 GHz	10 MHz to 8.4 GHz
Option 526	2 Hz to 26.5 GHz	10 MHz to 26.5 GHz
Input 2	2 Hz to 1 GHz	10 MHz to 1 GHz
Band	LO Multiple (N)	
0	1	2 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	17.0 to 26.5 GHz
Frequency reference	Standard	With option PFR
Accuracy	± [(time since last adjustment x aging rate) + temperature stability + calibration accuracy]	
Aging rate	± 1 × 10 <sup>-6</sup> / year	± 1 × 10 <sup>-7</sup> / year
Temperature stability		
20 to 30 °C	± 2 × 10 <sup>-6</sup>	± 1.5 × 10 <sup>-8</sup>
Full temperature range	± 2 × 10 <sup>-6</sup>	± 5 × 10 <sup>-8</sup>
Achievable initial calibration accuracy	± 1.4 × 10 <sup>-6</sup>	± 4 × 10 <sup>-8</sup>
Residual FM	≤ (0.25 Hz × N) <sub>p-p</sub> in 20 ms (nominal). N is the LO multiplication factor	
Frequency readout accuracy (start, stop, center, marker)		
± (marker frequency x frequency reference accuracy + 0.25 % x span + 5 % x RBW + 2 Hz + 0.5 x horizontal resolution <sup>1</sup> )		
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		
Stepped/Swept	± (0.25 % x span + horizontal resolution)	
FFT	± (0.1% x span + horizontal resolution)	

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

### Sweep time and triggering

Range	Span = 0 Hz	1 $\mu$ s to 6000 s
	Span $\geq$ 10 Hz	1 ms to 4000 s
Accuracy	Span $\geq$ 10 Hz, swept	$\pm$ 0.01 % nominal
	Span $\geq$ 10 Hz, FFT	$\pm$ 40 % nominal
	Span = 0 Hz	$\pm$ 0.01 % nominal
Trigger	Free run, Line, Video, External 1, External 2, RF Burst, Periodic timer	
Trigger delay	Span = 0 or FFT	-150 to +500 ms
	Span $\geq$ 10 Hz, swept	0 to 500 ms
	Resolution	0.1 $\mu$ s

### Gated Sweep

Gate methods	Gated LO; gated video; gated FFT
Gate length range	1 $\mu$ s to 5.0 s (Except method = FFT)
Gate delay range	0 to 100.0 s
Gate delay jitter	33.3 ns p-p, nominal

### Sweep/Step (trace) point range

Analyzer mode	1 to 100,001
Receiver mode	1 to 4,000,001

### Resolution bandwidth (RBW)

EMI bandwidths (CISPR compliant)	200 Hz, 9 kHz, 120 kHz, 1 MHz	
EMI bandwidths (Mil-STD-461 compliant)	10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz	
Range (-3 dB bandwidth)	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz	
Bandwidth accuracy (power)		
1 Hz to 750 kHz		$\pm$ 1.0 % ( $\pm$ 0.044 dB)
820 kHz to 1.2 MHz (< 3.6 GHz CF)		$\pm$ 2.0 % ( $\pm$ 0.088 dB)
1.3 to 2 MHz (< 3.6 GHz CF)		$\pm$ 0.07 dB nominal
2.2 to 3 MHz (< 3.6 GHz CF)		$\pm$ 0.15 dB nominal
4 to 8 MHz (< 3.6 GHz CF)		$\pm$ 0.25 dB nominal
Bandwidth accuracy (-3 dB)	1 Hz to 1.3 MHz	$\pm$ 2% nominal
Selectivity (-60 dB/-3 dB)	4.1: 1 nominal	

### Video bandwidth (VBW)

Range	1 Hz to 3 MHz (10 % steps), 4, 5, 6, 8 MHz, and wide open (labeled 50 MHz)
Accuracy	$\pm$ 6 % (nominal)

### Analysis bandwidth <sup>1</sup>

Maximum bandwidth	Option B40	40 MHz
	Option B25	25 MHz
	Standard	10 MHz

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

<b>RF preselector filters</b>			
	Filter band	Filter type	6 dB Bandwidth (nominal)
	150 kHz	Fixed lowpass	289 kHz (-3 dB corner frequency)
	150 kHz to 30 MHz	Fixed bandpass	36 MHz
	30 to 52 MHz	Fixed bandpass	28 MHz
	52 to 75 MHz	Fixed bandpass	39 MHz
	75 to 120 MHz	Fixed bandpass	63 MHz
	120 to 165 MHz	Fixed bandpass	71 MHz
	165 to 210 MHz	Fixed bandpass	69 MHz
	210 to 255 MHz	Fixed bandpass	71 MHz
	255 to 300 MHz	Fixed bandpass	68 MHz
	300 to 475 MHz	Fixed bandpass	284 MHz
	475 to 650 MHz	Fixed bandpass	305 MHz
	650 to 825 MHz	Fixed bandpass	302 MHz
	825 to 1000 MHz	Fixed bandpass	314 MHz
	1 GHz	Fixed highpass	912 MHz (-3 dB corner frequency)
	1.7 GHz	Fixed highpass	1.56 GHz (-3 dB corner frequency)
	2.9 GHz	Fixed highpass	2.29 GHz (-3 dB corner frequency)
<b>Notch filters</b>			
Reject band	2.4 to 2.5 GHz		
Reject attenuation	20 dB nominal		

## Amplitude Accuracy and Range Specifications

<b>Amplitude range</b>			
Measurement range	Displayed average noise level (DANL) to +30 dBm		
Input attenuator range	0 to 70 dB in 2 dB steps		
<b>Maximum safe input level</b>	RF input 1	RF input 2	
Average total power	+30 dBm (1 W)	+30 dBm (1 W)	
Peak pulse power	+50 dBm (100 W)	+50 dBm (100 W)	
Surge power	+2 kW (10 $\mu$ s pulse width)		
DC volts			
DC coupled	$\pm 0.2$ Vdc	$\pm 0.2$ Vdc	
AC coupled	$\pm 100$ Vdc	$\pm 100$ Vdc	
<b>Display range</b>			
Log scale	0.1 to 1 dB/division in 0.1 dB steps 1 to 20 dB/division in 1 dB steps (10 display divisions)		
Linear scale	10 divisions		
Scale units	dBm, dBmV, dB $\mu$ V, dBmA, dB $\mu$ A, V, W, A, dBuV/m, dBuA/m, dBpT, DBG, dBpW		
<b>Frequency response</b>			
	Specification	95th percentile	
Maximum error relative to reference condition (50 MHz), Mechanical attenuator only, Non-FFT operation only, 20-30°C			
RF preselector Off	2 Hz to 9 kHz	$\pm 0.45$ dB	$\pm 0.16$ dB
Preamp Off (10 dB attenuation)	9 kHz to 10 MHz	$\pm 0.45$ dB	$\pm 0.25$ dB
	10 to 50 MHz	$\pm 0.40$ dB	$\pm 0.25$ dB
	50 MHz to 1.0 GHz	$\pm 0.40$ dB	$\pm 0.25$ dB
	1.0 to 3.6 GHz	$\pm 0.60$ dB	$\pm 0.25$ dB
	3.5 to 8.4 GHz	$\pm 1.00$ dB	$\pm 0.50$ dB
	8.3 to 13.6 GHz	$\pm 1.00$ dB	$\pm 0.50$ dB
	13.5 to 16 GHz	$\pm 1.10$ dB	$\pm 0.90$ dB
	16 to 17.1 GHz	$\pm 1.40$ dB	$\pm 1.03$ dB
	17.0 to 22.0 GHz	$\pm 1.20$ dB	$\pm 0.55$ dB
	22.0 to 26.5 GHz	$\pm 1.40$ dB	$\pm 0.60$ dB
RF preselector On	2 Hz to 20 Hz		$\pm 0.20$ dB (nominal)
Preamp off (10 dB attenuation)	20 Hz to 9 kHz	$\pm 0.50$ dB	$\pm 0.20$ dB
	9 kHz to 10 MHz	$\pm 0.60$ dB	$\pm 0.25$ dB
	10 to 30 MHz	$\pm 0.50$ dB	$\pm 0.23$ dB
	30 MHz to 1 GHz	$\pm 0.50$ dB	$\pm 0.23$ dB
	1 to 3.6 GHz	$\pm 0.60$ dB	$\pm 0.25$ dB
	3.5 to 8.4 GHz	$\pm 1.00$ dB	$\pm 0.50$ dB
	8.3 to 13.6 GHz	$\pm 1.00$ dB	$\pm 0.50$ dB
	13.5 to 16 GHz	$\pm 1.10$ dB	$\pm 0.90$ dB
	16 to 17.1 GHz	$\pm 1.40$ dB	$\pm 1.03$ dB
	17.0 to 22.0 GHz	$\pm 1.20$ dB	$\pm 0.55$ dB
22.0 to 26.5 GHz	$\pm 1.40$ dB	$\pm 0.60$ dB	

RF Preselector Off	100 kHz to 10 MHz	$\pm 0.70$ dB	$\pm 0.36$ dB
Preamp On, LNA Off	10 to 50 MHz	$\pm 0.60$ dB	$\pm 0.25$ dB
(0 dB attenuation)	50 MHz to 1.0 GHz	$\pm 0.60$ dB	$\pm 0.25$ dB
	1.0 GHz to 3.6 GHz	$\pm 0.70$ dB	$\pm 0.30$ dB
	3.5 to 8.4 GHz	$\pm 1.50$ dB	$\pm 0.75$ dB
	8.3 to 13.6 GHz	$\pm 1.50$ dB	$\pm 0.75$ dB
	13.5 to 16 GHz	$\pm 1.50$ dB	$\pm 1.02$ dB
	16 to 17.1 GHz	$\pm 1.50$ dB	$\pm 1.21$ dB
	17.0 to 22.0 GHz	$\pm 1.80$ dB	$\pm 0.95$ dB
	22.0 to 26.5 GHz	$\pm 2.00$ dB	$\pm 0.95$ dB
RF Preselector On	1 kHz to 9 kHz	$\pm 0.50$ dB	$\pm 0.20$ dB
Preamp On, LNA Off	9 kHz to 10 MHz	$\pm 0.80$ dB	$\pm 0.31$ dB
(0 dB attenuation)	10 to 30 MHz	$\pm 0.80$ dB	$\pm 0.32$ dB
	30 MHz to 1 GHz	$\pm 0.50$ dB	$\pm 0.23$ dB
	1 to 3.6 GHz	$\pm 0.60$ dB	$\pm 0.23$ dB
	3.5 to 8.4 GHz	$\pm 1.50$ dB	$\pm 0.75$ dB
	8.3 to 13.6 GHz	$\pm 1.50$ dB	$\pm 0.75$ dB
	13.5 to 16 GHz	$\pm 1.50$ dB	$\pm 1.02$ dB
	16 to 17.1 GHz	$\pm 1.50$ dB	$\pm 1.21$ dB
	17.0 to 22.0 GHz	$\pm 1.80$ dB	$\pm 0.90$ dB
	22.0 to 26.5 GHz	$\pm 2.00$ dB	$\pm 0.95$ dB
RF Preselector Off	30 to 50 MHz	$\pm 0.50$ dB	$\pm 0.25$ dB
Preamp Off or On, LNA On	50 MHz to 1.0 GHz	$\pm 0.50$ dB	$\pm 0.25$ dB
(0 dB attenuation)	1 to 3.6 GHz	$\pm 0.60$ dB	$\pm 0.30$ dB
RF Preselector On	10 to 30 MHz		$\pm 0.35$ dB
Preamp Off or On, LNA On	30 MHz to 1 GHz	$\pm 0.50$ dB	$\pm 0.22$ dB
(0 dB attenuation)	1 to 3.6 GHz	$\pm 0.60$ dB	$\pm 0.27$ dB
RF Preselector On or Off	3.5 to 8.4 GHz	$\pm 1.60$ dB	$\pm 0.75$ dB
Preamp Off, LNA On	8.3 to 13.6 GHz	$\pm 1.60$ dB	$\pm 0.85$ dB
(0 dB attenuation)	13.5 to 16 GHz	$\pm 1.60$ dB	$\pm 1.26$ dB
	16 to 17.1 GHz	$\pm 1.80$ dB	$\pm 1.61$ dB
	17.0 to 22.0 GHz	$\pm 1.90$ dB	$\pm 0.95$ dB
	22.0 to 26.5 GHz	$\pm 1.90$ dB	$\pm 0.95$ dB
RF Preselector On or Off	3.5 to 8.4 GHz	$\pm 1.60$ dB	$\pm 0.75$ dB
Preamp On, LNA On	8.3 to 13.6 GHz	$\pm 1.60$ dB	$\pm 0.75$ dB
(0 dB attenuation)	13.5 to 16 GHz	$\pm 1.60$ dB	$\pm 1.02$ dB
	16 to 17.1 GHz	$\pm 1.60$ dB	$\pm 1.28$ dB
	17.0 to 22.0 GHz	$\pm 1.80$ dB	$\pm 0.95$ dB
	22.0 to 26.5 GHz	$\pm 2.00$ dB	$\pm 0.95$ dB



<b>Input attenuation switching uncertainty</b>		Specification	95th percentile
Attenuation > 2 dB, preamp off	50 MHz (reference frequency)	± 0.20 dB	± 0.08 dB typical
Relative to 10 dB			
<b>Absolute amplitude accuracy</b>		Specification	95th percentile
10 dB attenuation, 20 to 30°C, 1 Hz ≤ RBW ≤ 1 MHz, input signal -10 to -50 dBm, RF Preselector Off, Preamp Off and On, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, σ = nominal standard deviation)			
RF input 1	At 50 MHz	± 0.30 dB	± 0.17 dB
	At all frequencies	± (0.30 dB + frequency response)	
RF input 2	At 50 MHz	± 0.35 dB	± 0.21 dB
	At all frequencies	± (0.35 dB + frequency response)	
<b>Input voltage standing wave ratio (VSWR) <sup>1</sup></b>		Input atten = 0 dB	Input atten ≥ 10 dB
RF Preselector Off, Preamp On and Off			
DC coupled	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.0:1, 1.8:1 typical
AC coupled	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.4:1, 2.0:1 typical
RF Preselector On, Preamp On and Off			
DC coupled	9 kHz to 1 GHz	2.0:1	1.2:1, 1.1:1 typical
	1 to 26.5 GHz	3.0:1	2.0:1, 1.5:1 typical
AC coupled	55 MHz to 1 GHz	2.0:1	1.2:1
	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.4:1, 2.0:1 typical
RF Preselector Off, Preamp On or Off, LNA On			
DC coupled	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.0:1, 1.8:1 typical
AC coupled	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.4:1, 2.0:1 typical
RF Preselector On, Preamp On or Off, LNA On			
DC coupled	50 MHz to 1 GHz	2.0:1	1.2:1
	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.4:1, 2.0:1 typical
AC coupled	55 MHz to 1 GHz	2.0:1	1.2:1
	1 to 18 GHz	3.0:1	2.0:1, 1.8:1 typical
	18 to 26.5 GHz	3.0:1	2.4:1, 2.0:1 typical
<b>RBW switching uncertainty (reference to 30 kHz RBW)</b>			
1 Hz to 1.5 MHz RBW		± 0.05 dB	
1.6 to 3 MHz RBW		± 0.10 dB	
4, 5, 6, 8 MHz RBW		± 1.0 dB	

1. When the notch filter is selected, the specs between 2.3 – 2.6 GHz is not applicable

## Reference level

Range	
Log scale	-170 to +30 dBm in 0.01 dB steps
Linear scale	Same as log (707 pV to 7.07 V)
Accuracy	0 dB

## Display scale switching uncertainty

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
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## Total measurement uncertainty

Spectrum analyzer  
mode (95th percentile)      EMI receiver mode

Signal level 0 to 90 dB below reference point, RF attenuation 0 to 40 dB, RBW ≤ 1 MHz, 20° to 30° C  
AC coupled 10 MHz to 26.5 GHz, DC coupled 9 kHz to 26.5 GHz

RF Preselector Off, Preamp Off	9 kHz to 10 MHz	± 0.35 dB	± 0.40 dB
	10 MHz to 3.6 GHz	± 0.25 dB	± 0.30 dB
	3.6 to 18.0 GHz	± 0.50 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.80 dB	± 0.95 dB
RF Preselector On, Preamp Off	9 kHz to 10 MHz	± 0.31 dB	± 0.44 dB
	10 MHz to 1 GHz	± 0.20 dB	± 0.31 dB
	1 to 3.6 GHz	± 0.20 dB	± 0.31 dB
	3.6 to 18.0 GHz	± 0.50 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.80 dB	± 0.95 dB
RF Preselector Off Preamp On, LNA Off	100 kHz to 10 MHz	± 0.40 dB	± 0.45 dB
	10 MHz to 3.6 GHz	± 0.30 dB	± 0.30 dB
	3.6 to 18.0 GHz	± 0.65 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.90 dB	± 0.95 dB
RF Preselector On Preamp On, LNA Off	9 kHz to 10 MHz	± 0.36 dB	± 0.41 dB
	10 MHz to 1 GHz	± 0.20 dB	± 0.34 dB
	1 to 3.6 GHz	± 0.20 dB	± 0.34 dB
	3.6 to 18.0 GHz	± 0.65 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.90 dB	± 0.95 dB
RF Preselector Off Preamp On or Off, LNA On	2 to 10 MHz	± 0.45 dB	± 0.50 dB
	10 MHz to 3.6 GHz	± 0.30 dB	± 0.30 dB
RF Preselector On Preamp On or Off, LNA On	10 MHz to 1 GHz	± 0.27 dB	± 0.33 dB
	1 to 3.6 GHz	± 0.27 dB	± 0.33 dB
	3.6 to 18.0 GHz	± 0.65 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.90 dB	± 0.95 dB
RF Preselector Off or On Preamp Off, LNA On	3.6 to 18.0 GHz	± 0.65 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.90 dB	± 0.95 dB
RF Preselector Off or On Preamp On, LNA On	3.6 to 18.0 GHz	± 0.65 dB	± 0.65 dB
	18.0 to 26.5 GHz	± 0.90 dB	± 0.90 dB

## Trace detectors

Normal, peak, sample, negative peak, log power average, RMS average, and voltage average  
CISPR detectors: quasi-peak, EMI-avg, RMS-avg

## Preamplifier Gain

RF Preselector Off	100 kHz to 3.6 GHz	+20 dB (nominal)
Preamp On, LNA Off	3.6 to 26.5 GHz	+28 dB (nominal)
RF Preselector On	1 to 150 kHz	+20 dB (nominal)
Preamp On, LNA Off	150 kHz to 3.6 GHz	+15 dB (nominal)
RF Preselector On or Off	150 kHz to 26.5 GHz	+20 dB (nominal)
Preamp Off, LNA On		
RF Preselector On or Off	150 kHz to 3.6 GHz	+20 dB (nominal)
Preamp On, LNA On	3.6 to 26.5 GHz	+35 dB (nominal)

## Amplitude probability distribution

	Specifications
Dynamic range	> 70 dB
Amplitude accuracy	< ± 2.7 dB
Maximum measurable time period	2 minutes
Minimum measurable probability	10 <sup>-7</sup>
Amplitude level assignment	1000 levels
Sampling rate (within a 1 MHz RBW)	≥ 10 MSa/s
Amplitude resolution	0.1881 dB

## Dynamic Range Specifications

### 1 dB gain compression (two-tone)

Max. power at mixer<sup>1</sup>; At 1 kHz RBW with 100 kHz tone spacing, Input 1, 20 to 30 °C

RF Input 1 to 26.5 GHz (RF Input 2 to 1 GHz, performance = RF Input 1 performance + 9 dB)

RF Preselector Off, LNA Off	10 MHz to 3.6 GHz	-13 dBm nominal
Preamp On	3.6 to 26.5 GHz	
	Tone spacing 100 kHz to 20 MHz	-23 dBm nominal
	Tone spacing > 70 MHz	-16 dBm nominal
RF Preselector On, LNA Off	9 to 150 kHz	-17 dBm nominal
Preamp On	150 kHz to 10 MHz	-11 dBm nominal
	10 to 50 MHz	-13 dBm nominal
	50 MHz to 3.6 GHz	-10 dBm nominal
	3.6 to 26.5 GHz	
	Tone spacing 100 kHz to 20 MHz	-23 dBm nominal
	Tone spacing > 70 MHz	-16 dBm nominal
RF Preselector Off or On	30 MHz to 3.6 GHz	-16 dBm nominal
LNA On, Preamp Off	3.6 to 26.5 GHz	
	Tone spacing 100 kHz to 20 MHz	-13 dBm nominal
	Tone spacing > 70 MHz	-7 dBm nominal
RF Preselector Off or On	30 MHz to 3.6 GHz	-16 dBm nominal
LNA On, Preamp On	3.6 to 26.5 GHz	
	Tone spacing 100 kHz to 20 MHz	-30 dBm nominal
	Tone spacing > 70 MHz	-26 dBm nominal

### Spurious response

RF Input 1; RF Preselector Off or On

Residual responses <sup>1</sup>	200 kHz to 8.4 GHz (swept)	-100 dBm
	Zero span or FFT or other frequencies	-100 dBm nominal
Images response	10 MHz to 3.6 GHz	-80 dBc, -108 dBc typical
f ± 645 MHz,	3.5 to 13.6 GHz	-81 dBc, -85 dBc typical
Mixer level -10 dBm	13.5 to 17.1 GHz	-81 dBc, -86 dBc typical
	17.0 to 22 GHz	-76 dBc, -81 dBc typical
	22 to 26.5 GHz	-69 dBc, -76 dBc typical
LO related spurious (f > 600 MHz from carrier)		
	10 MHz to 3.6 GHz	-90 dBc + 20LogN <sup>2</sup> typical
Other spurious	f ≥ 10 MHz from carrier	-80 dBc + 20LogN <sup>2</sup> typical

1. Input terminated, 0 dB input attenuation

2. N is the LO multiplication factor

## Second harmonic distortion (SHI)

RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance +9 dB; see Specifications Guide for verification conditions

RF Preselector Off, Preamp Off	10 to 500 MHz	+54 dBm, +61 dBm typical
	500 MHz to 1.8 GHz	+45 dBm, +54 dBm typical
	1.8 to 4 GHz	+60 dBm, +67 dBm typical
	4 to 11 GHz	+65 dBm, +74 dBm typical
	11 to 13.25 GHz	+65 dBm, +73 dBm typical
RF Preselector On, Preamp Off	10 MHz to 30 MHz	+45 dBm, +50 dBm typical
	30 MHz to 500 MHz	+54 dBm, +58 dBm typical
	500 MHz to 1 GHz	+70 dBm, +78 dBm typical
	1 GHz to 1.6 GHz	+62 dBm, +70 dBm typical
	1.6 GHz to 1.8 GHz	+70 dBm, +82 dBm typical
	1.8 GHz to 4 GHz	+60 dBm, +67 dBm typical
	4 GHz to 11 GHz	+65 dBm, +74 dBm typical
11 GHz to 13.25 GHz	+65 dBm, +73 dBm typical	
RF Preselector Off	10 MHz to 1.8 GHz	+33 dBm nominal
Preamp On, LNA Off	1.8 to 13.25 GHz	+10 dBm nominal
RF Preselector On	10 MHz to 30 MHz	+43 dBm nominal
	30 MHz to 500 MHz	+56 dBm nominal
	500 MHz to 1 GHz	+61 dBm nominal
	1 GHz to 1.6 GHz	+57 dBm nominal
	1.6 GHz to 1.8 GHz	+57 dBm nominal
1.8 GHz to 13.25 GHz	+10 dBm nominal	
RF Preselector Off	30 MHz to 1.8 GHz	+15 dBm nominal
Preamp Off or On, LNA On	30 MHz to 300 MHz	+17 dBm nominal
RF Preselector Off or On	300 MHz to 500 MHz	+17 dBm nominal
	500 MHz to 1 GHz	+17 dBm nominal
	1 GHz to 1.6 GHz	+15 dBm nominal
	1.6 GHz to 1.8 GHz	+15 dBm nominal
RF Preselector Off or On	1.8 to 13.25 GHz	+15 dBm nominal
Preamp Off, LNA On	1.8 to 13.25 GHz	-5 dBm nominal
RF Preselector Off or On	1.8 to 13.25 GHz	-5 dBm nominal
Preamp On, LNA On	1.8 to 13.25 GHz	-5 dBm nominal

## Third-order intermodulation distortion (TOI)

RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance + 9 dB;

Tone separation > 5 times IF prefilter bandwidth, 20 to 30 °C, see Specifications Guide for verification conditions

RF Preselector Off, Preamp Off	10 to 100 MHz	+12 dBm, +17 dBm typical
	100 to 400 MHz	+15 dBm, +18 dBm typical
	400 MHz to 3.6 GHz	+17 dBm, +20 dBm typical
	3.5 to 8.4 GHz	+15 dBm, +20 dBm typical
	8.3 to 13.6 GHz	+16 dBm, +20 dBm typical
	13.5 to 26.5 GHz	+12 dBm, +16 dBm typical

RF Preselector On, Preamp Off	10 to 30 MHz	+16.5 dBm, +18 dBm typical
	30 to 100 MHz	+13.5 dBm, +15.5 dBm typical
	100 to 1GHz	+15 dBm, +17 dBm typical
	1 to 1.5 GHz	+16 dBm, +17.5 dBm typical
	1.5 to 3.6 GHz	+17 dBm, +19.5 dBm typical
	3.5 to 8.4 GHz	+15 dBm, +20 dBm typical
	8.3 to 13.6 GHz	+16 dBm, +20 dBm typical
RF Preselector Off, Preamp On, LNA Off	13.5 to 26.5 GHz	+12 dBm, +16 dBm typical
	10 to 500 MHz	+1 dBm nominal
	500 MHz to 3.6 GHz	+3 dBm nominal
RF Preselector On, Preamp On, LNA Off	3.6 GHz to 26.5 GHz	-10 dBm nominal
	10 to 30 MHz	+1 dBm, +3 dBm typical
	30 MHz to 1 GHz	-3 dBm, -1 dBm typical
	1 to 2 GHz	-1 dBm, +1 dBm typical
	2 to 3.6 GHz	-1 dBm, +2 dBm typical
RF Preselector Off, Preamp Off or On, LNA On	3.6 GHz to 26.5 GHz	-10 dBm nominal
	30 to 500 MHz	0 dBm nominal
RF Preselector On, Preamp Off or On, LNA On	500 MHz to 3.6 GHz	+1 dBm nominal
	30 MHz to 1 GHz	-8dBm, -6 dBm typical
	1 to 2 GHz	-6 dBm, -4 dBm typical
RF Preselector Off or On, Preamp Off, LNA On	2 to 3.6 GHz	-4 dBm, -2 dBm typical
	3.6 to 13.6 GHz	+5 dBm nominal
RF Preselector Off or On, Preamp On, LNA On	13.6 to 26.5 GHz	+1 dBm nominal
	3.6 to 13.6 GHz	-14 dBm nominal
	13.6 to 26.5 GHz	-20 dBm nominal

### Displayed average noise level (DANL)

		Input 1	
		Specification	Typical including NFE
Input terminated, 1 Hz RBW, sample or average detector, averaging type = Log, 0 dB input attenuation, IF Gain = High, 20 to 30°C. Input 1; Input 2 = Input 1 performance + 11 dB; NFE = Noise Floor Extension			
RF Preselector Off	2 Hz to 10 Hz		-110 dBm, nominal <sup>1</sup>
Preamp Off	20 Hz	-120 dBm	
	100 Hz	-125 dBm	
	1 kHz	-130 dBm	
	9 to 150 kHz	-142 dBm	
	150 kHz to 1 MHz	-153 dBm	
	1 to 10 MHz	-154 dBm	
	10 MHz to 1 GHz	-154 dBm	-164 dBm
	1 to 2.5 GHz	-151 dBm	-161 dBm
	2.5 to 3.6 GHz	-148 dBm	-158 dBm
	3.5 to 8.4 GHz	-153 dBm	-163 dBm
	8.3 to 13.6 GHz	-152 dBm	-162 dBm
	13.5 to 18 GHz	-150 dBm	-160 dBm
	18 to 25 GHz	-146 dBm	-155 dBm
	25 to 26.5 GHz	-143 dBm	-155 dBm

RF Preselector On	2 Hz to 10 Hz		-110 dBm, nominal <sup>1</sup>
Preamp Off	20 Hz	-120 dBm	
	100 Hz	-125 dBm	
	1 kHz	-130 dBm	
	9 to 100 kHz	-141 dBm	-143 dBm
	100 to 150 kHz	-142 dBm	-163 dBm
	150 to 500 kHz	-149 dBm	-161 dBm
	500 kHz to 30 MHz	-153 dBm	-163 dBm
	30 MHz to 1 GHz	-154 dBm	-165 dBm
	1 to 1.7 GHz	-156 dBm	-166 dBm
	1.7 to 2.5 GHz	-153 dBm	-163 dBm
	2.5 to 3.6 GHz	-151 dBm	-161 dBm
	3.5 to 8.4 GHz	-153 dBm	-163 dBm
	8.3 to 13.6 GHz	-152 dBm	-162 dBm
	13.5 to 18 GHz	-150 dBm	-160 dBm
	18 to 25 GHz	-146 dBm	-155 dBm
	25 to 26.5 GHz	-143 dBm	-155 dBm
RF Preselector Off	100 kHz to 1 MHz	-157 dBm	
Preamp On, LNA Off	1 to 10 MHz	-165 dBm	
	10 MHz to 1 GHz	-165 dBm	-174 dBm
	1 to 3.6 GHz	-161 dBm	-172 dBm
	3.5 to 13.6 GHz	-164 dBm	-174 dBm
	13.5 to 26.5 GHz	-160 dBm	-170 dBm
RF Preselector On, Preamp On, LNA Off	1 kHz	-145 dBm	-150 dBm
	9 to 100 kHz	-160 dBm	-161 dBm
	100 to 1 MHz	-160 dBm	-171 dBm
	1 to 30 MHz	-163 dBm	-173 dBm
	30 MHz to 1 GHz	-164 dBm	-174 dBm
	1 to 1.7 GHz	-165 dBm	-174 dBm
	1.7 to 2.5 GHz	-164 dBm	-174 dBm
	2.5 to 3.6 GHz	-161 dBm	-172 dBm
	3.5 to 13.6 GHz	-164 dBm	-174 dBm
	13.5 to 26.5 GHz	-160 dBm	-170 dBm
RF Preselector Off, Preamp Off or On, LNA On	150 kHz to 1 MHz		-92 dBm
	1 to 10 MHz		-119 dBm
	10 to 30 MHz		-148 dBm
	30 to 50 MHz	-161 dBm	-172 dBm
	50 to 150 MHz	-165 dBm	-172 dBm
	150 MHz to 2 GHz	-167 dBm	-172 dBm
	2 to 3.6 GHz	-164 dBm	-172 dBm

1. No NFE factor at this frequency.

RF Preselector On, Preamp Off or On, LNA On	150 kHz to 1 MHz		-100 dBm
	1 to 10 MHz		-125 dBm
	10 to 30 MHz		-165 dBm
	30 to 50 MHz	-163 dBm	-174 dBm
	50 to 100 MHz	-165 dBm	-174 dBm
	100 to 150 MHz	-166 dBm	-174 dBm
	150 MHz to 2 GHz	-166 dBm	-174 dBm
	2 to 3.6 GHz	-165 dBm	-174 dBm
RF Preselector Off/On, Preamp Off, LNA On	3.5 to 8.4 GHz	-165 dBm	-172 dBm
	8.3 to 13.6 GHz	-164 dBm	-171 dBm
	13.5 to 19 GHz	-163 dBm	-170 dBm
	19 to 22GHz	-161 dBm	-170 dBm
	22 to 26.5 GHz	-157 dBm	-168 dBm
RF Preselector Off/On, Preamp On, LNA On	3.5 to 8 GHz	-167 dBm	-174 dBm
	8 to 13.6 GHz	-166 dBm	-174 dBm
	13.5 to 19 GHz	-165 dBm	-173 dBm
	19 to 22GHz	-164 dBm	-173 dBm
	22 to 26.5 GHz	-163 dBm	-172 dBm

#### Indicated noise in CISPR bandwidth

Typical (including NFE) <sup>1</sup>

Calculated from Input 1 DANL performance, 0 dB input atten, EMI receiver mode; EMI-AVG detector; CISPR BW

RF Preselector On, Preamp Off	20 Hz (1Hz RBW)	-19 dB $\mu$ V
	100 Hz (10 Hz RBW)	-11 dB $\mu$ V
	1 kHz (100 Hz RBW)	-9 dB $\mu$ V
	9 to 50 kHz (200Hz RBW)	-14 dB $\mu$ V
	150 kHz to 1 MHz (9 kHz RBW)	-8 dB $\mu$ V
	1 to 30 MHz (9 kHz RBW)	-12 dB $\mu$ V
	30 MHz to 1 GHz (120 kHz RBW)	-3 dB $\mu$ V
	1 to 2.5 GHz (1 MHz RBW)	8 dB $\mu$ V
	2.5 to 3.6 GHz (1 MHz RBW)	11 dB $\mu$ V
	3.6 to 8.4 GHz (1 MHz RBW)	8 dB $\mu$ V
	8.3 to 13.6 GHz (1 MHz RBW)	11 dB $\mu$ V
	13.5 to 17.1 GHz (1 MHz RBW)	12 dB $\mu$ V
	17.1 to 25 GHz (1 MHz RBW)	14 dB $\mu$ V
25 to 26.5 GHz (1 MHz RBW)	18 dB $\mu$ V	

1. Typical Indicated Noise including NFE = Typical DANL + RBW correction – DANL Improvement with NFE +107.



RF Preselector On, Preamp On, LNA Off	1 kHz (100 Hz RBW)	-24 dB $\mu$ V
	9 to 150 kHz (200 Hz RBW)	-31 dB $\mu$ V
	150 kHz to 1 MHz (9 kHz RBW)	-17 dB $\mu$ V
	1 to 30 MHz (9 kHz RBW)	-20 dB $\mu$ V
	30 MHz to 1 GHz (120 kHz RBW)	-11 dB $\mu$ V
	1 to 2.5 GHz (1 MHz RBW)	-2 dB $\mu$ V
	2.5 to 3.6 GHz (1 MHz RBW)	0 dB $\mu$ V
	3.6 to 8.4 GHz (1 MHz RBW)	-2 dB $\mu$ V
	8.3 to 13.6 GHz (1 MHz RBW)	-2 dB $\mu$ V
	13.5 to 17.1 GHz (1 MHz RBW)	-3 dB $\mu$ V
RF Preselector On, Preamp Off, LNA On	17.1 to 25 GHz (1 MHz RBW)	1 dB $\mu$ V
	25 to 26.5 GHz (1 MHz RBW)	2 dB $\mu$ V
	30 MHz to 1 GHz (120 kHz RBW)	-11 dB $\mu$ V
	1 to 2.5 GHz (1 MHz RBW)	-5 dB $\mu$ V
	2.5 to 3.6 GHz (1 MHz RBW)	-3 dB $\mu$ V
	3.6 to 8.4 GHz (1 MHz RBW)	-4 dB $\mu$ V
	8.3 to 13.6 GHz (1 MHz RBW)	-3 dB $\mu$ V
RF Preselector Off/On, Preamp On, LNA On	13.5 to 17.1 GHz (1 MHz RBW)	-2 dB $\mu$ V
	17.1 to 25 GHz (1 MHz RBW)	1 dB $\mu$ V
	25 to 26.5 GHz (1 MHz RBW)	3 dB $\mu$ V
	3.6 to 8.4 GHz (1 MHz RBW)	-5 dB $\mu$ V
	8.3 to 13.6 GHz (1 MHz RBW)	-4 dB $\mu$ V
	13.5 to 17.1 GHz (1 MHz RBW)	-4 dB $\mu$ V
	17.1 to 25 GHz (1 MHz RBW)	0 dB $\mu$ V
	25 to 26.5 GHz (1 MHz RBW)	0 dB $\mu$ V

Phase noise	Offset	Specification	Typical
20 to 30 °C, CF = 1 GHz	10 Hz		-80 dBc/Hz, nominal
	100 Hz	-91 dBc/Hz	-100 dBc/Hz, typical
	1 kHz	-109 dBc/Hz	-112 dBc/Hz, typical
	10 kHz	-113 dBc/Hz	-114 dBc/Hz, typical
	100 kHz	-116 dBc/Hz	-117 dBc/Hz, typical
	1 MHz	-135 dBc/Hz	-136 dBc/Hz, typical
	10 MHz		-148 dBc/Hz, nominal

For nominal phase noise plot, please refer to Page 49, N9048B Specification Guide, Publish number N9048-90010)

## Powersuite Specifications

<b>Channel Power</b>		
Amplitude accuracy, W-CDMA or IS95 (20 to 30 °C, attenuation = 10 dB)	± 0.82 dB	± 0.23 dB (95th percentile)
<b>Occupied bandwidth</b>		
Frequency accuracy		± [span/1000] nominal
<b>Adjacent channel power</b>		
	Adjacent	Alternate
Accuracy, W-CDMA (ACLR) (at specific mixer levels and ACLR ranges)		
MS	± 0.14 dB	± 0.21 dB
BTS	± 0.49 dB	± 0.44 dB
Dynamic range		
Without noise correction	-73 dB typical	-79 dB typical
With noise correction	-78 dB typical	-82 dB typical
Offset channel pairs measured	1 to 6	
ACP measurement and transfer time (fast method)	14 ms nominal ( $\sigma = 0.2$ dB)	
Multiple number of carriers measured	Up to 12	
<b>Power statistics CCDF</b>		
Histogram resolution	0.01 dB	
<b>Harmonic distortion</b>		
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	
<b>Burst power</b>		
Methods	Power above threshold, power within burst width	
Result	Single burst output power, average output power, maximum power, minimum power within burst, burst width	
<b>Spurious emission</b>		
W-CDMA (1 to 3.6 GHz) table-driven spurious signals; search across regions		
Dynamic range	96.7 dB	101.7 dB typical
Absolute sensitivity	-85.4 dBm	
<b>Spectrum emission mask (SEM)</b>		
cdma2000@ (750 kHz offset)		
Relative dynamic range (30 kHz RBW)	78.9 dB	85 dB typical
Absolute sensitivity	-100.7 dBm	
Relative accuracy	± 0.12 dB	
3GPP W-CDMA (2.515 MHz offset)		
Relative dynamic range (30 kHz RBW)	81.9 dB	88.2 dB typical
Absolute sensitivity	-100.7 dBm	
Relative accuracy	± 0.12 dB	

## General Specifications

### Temperature range

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

### EMC

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

- IEC/EN 61326-2-1
- CISPR 11, Group 1, Class B
- AS/NZS CISPR 11
- ICES/NMB-001

This ISM device complies with Canadian ICES-001

Cet appareil ISM est conforme à la norme NMB-001 du Canada

### Radio disturbance measuring apparatus

CISPR 16-1-1	The features in this instrument comply with the performance requirements of this basic standard
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### Safety

Complies with European Low Voltage Directive 2006/95/EC

- IEC/EN 61010-1
- Canada: CSA C22.2 No. 61010-01
- USA: UL 61010-1

### Acoustic noise emission

	Geraeuschemission
LpA < 70 dB	LpA < 70 dB
Operator position	Am Arbeitsplatz
Normal position	Normaler Betrieb
Per ISO 7779	Nach DIN 45635 t.19

### 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 MIL-PRF-28800F Class 3.

### Power requirements

Voltage and frequency (nominal)	100/120 V, 50/60/400 Hz	The instruments can operate with mains supply voltage fluctuations up to $\pm 10\%$ of the nominal voltage
	220/240 V, 50/60 Hz	
Power consumption		
On	630 W maximum	
Standby	20 W	
Typical instrument configuration	Power (nominal)	
Base PXE instrument	300 W	
Adding Option WF1 to base instrument	+150 W	

**Display**

Resolution	1280 x 800
Size	269 mm (10.6 in.) diagonal (nominal) capacitive multi-touch screen

**Data storage**

Internal	Removable solid state drive ( $\geq$ 160 GB standard)
External	Supports USB 3.0/2.0 compatible memory devices

**Weight** (without options)

Net	24 kg (52 lbs.) (nominal)
Shipping	36 kg (79 lbs.) (nominal)

**Dimensions**

Height	177 mm (7 in)
Width	426 mm (16.8 in)
Length	556 mm (21.9 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		
RF input 1 Connector		Type-N female, 50 $\Omega$ (nominal) (standard) 3.5 mm male, 50 $\Omega$ (Opt. C35)
RF input 2 Connector		Type-N female, 50 $\Omega$ (nominal) (standard)
<hr/>		
External Mixing (Option EXM)		
Connection port		
Connector		SMA, female
Impedance		50 $\Omega$ , nominal
Functions		Triplexed for LO output, IF input, and mixer bias
Mixer bias range		$\pm 10$ mA in 10 $\mu$ A step
IF input center frequency		
$\leq 25$ MHz IF path		322.5 MHz
40 MHz BW IF path		250.0 MHz
LO output frequency range		3.75 to 14.0 GHz
<hr/>		
Probe power		
Voltage/current		+15 Vdc, $\pm 7\%$ at 150 mA max (nominal) -12.6 Vdc, $\pm 10\%$ at 150 mA max (nominal)
<hr/>		
USB ports		
Host (3 ports)		
Standard		One compatible with USB 3.0; Two compatible with USB 2.0
Connector		USB Type-A female
Output current		
Port marked with Lightning Bolt		1.2 A (nominal)
Port not marked with Lightning Bolt		0.5 A
<hr/>		
Headphone jack		
Connector		Miniature stereo audio jack 3.5 mm

### Rear panel

10 MHz out		
Connector		BNC female, 50 $\Omega$ (nominal)
Output amplitude		$\geq 0$ dBm (nominal)
Frequency		10 MHz $\times$ (1+ frequency reference accuracy)
<hr/>		
Ext Ref In		
Connector		BNC female, 50 $\Omega$ (nominal)
Input amplitude range		-5 to 10 dBm (nominal)
Input frequency		1 to 50 MHz (nominal)
Frequency lock range		$\pm 2 \times 10^{-6}$ of ideal external reference input frequency
<hr/>		
Trigger 1 and 2 inputs		
Connector		BNC female
Impedance		$> 10$ k $\Omega$ (nominal)
Trigger level range		-5 to 5 V

Trigger 1 and 2 outputs	
Connector	BNC female
Impedance	> 10 k $\Omega$ (nominal)
Trigger level range	0 to 5 V (CMOS)
Monitor output 1	
Connector	VGA compatible, 15-pin mini D-SUB
Format	XGA (60 Hz vertical sync rates, non-interlaced) Analog RGB
Resolution	1024 x 768
Monitor output 2	
Connector	Mini DisplayPort
Resolution	1024 x 768
Noise source drive +28 V (pulsed)	
Connector	BNC female
SNS Series noise source	For use with Keysight Technologies' SNS series noise sources
Analog out	
Connector	BNC female (used by Option YAS)
USB ports	
Host, Super Speed (2 ports)	
Standard	Compatible with USB 3.0
Connector	USB Type-A female
Output current	0.9 A (nominal)
Host, stacked with LAN (1 port)	
Standard	Compatible with USB 3.0
Connector	USB Type-A female
Output current	0.5 A (nominal)
Device (1 port)	
Standard	Compatible with USB 3.0
Connector	USB Type-B female
GPIO interface	
Connector	IEEE-488 bus connector
GPIO codes	SH1, AH1, T6, SR1, RL1, PP0, DC1, C1, C2, C3, C28, DT1, L4, C0
GPIO mode	Controller or device
LAN TCP/IP interface	
Standard	1000Base-T
Connector	RJ45 Ethertwist
Aux I/O connector	
Connector	25-pin D-SUB

## IQ Analyzer

### Resolution bandwidth (spectrum measurement)

Range	Overall	100 mHz to 3 MHz
	Span = 1 MHz	50 Hz to 1 MHz
	Span = 10 kHz	1 Hz to 10 kHz
	Span = 100 Hz	100 mHz to 100 Hz

### Window shapes

Flat top, Uniform, Hanning, Gaussian, Blackman, Blackman-Harris, Kaiser Bessel (K-B 70 dB, K-B 90 dB and K-B 110 dB)

### Analysis bandwidth

Standard	Optional
10 MHz	25 MHz (Option B25), 40 MHz (Option B40)

### IF frequency response (standard 10 MHz IF path)

IF frequency response (demodulation and FFT response relative to the center frequency, 20 to 30 °C)

Center frequency	Span	Preselector	Max. error	RMS (nominal)
$f < 3.6 \text{ GHz}$	$\leq 10 \text{ MHz}$	NA	$\pm 0.4 \text{ dB}$	0.04 dB
$3.6 \text{ GHz} \leq f \leq 26.5 \text{ GHz}$	$\leq 10 \text{ MHz}$	On		0.25 dB

### IF phase linearity (deviation from mean phase linearity, nominal)

Center frequency	Span	Preselector	Peak-to-Peak	RMS (nominal)
$20 \text{ MHz} \leq f < 3.6 \text{ GHz}$	$\leq 10 \text{ MHz}$	NA	$\pm 0.5^\circ$	$0.2^\circ$
$3.6 \text{ GHz} \leq f < 26.5 \text{ GHz}$	$\leq 10 \text{ MHz}$	On	$\pm 1.5^\circ$	$0.4^\circ$

### Data acquisition

Time record length	(IQ analyzer)	4,000,000 IQ sample pairs
Sample rate		
IF path $\leq 25 \text{ MHz}$		100 Msa/s
IF Path = 40 MHz		200 MSa/s
ADC resolution		
IF path $\leq 25 \text{ MHz}$		16 bits
IF Path = 40 MHz		12 bits

### IF frequency response (25 MHz IF path)

IF frequency response (demodulation and FFT response relative to the center frequency, 20 to 30 °C)

Center frequency	Span	Preselector	Max. error	RMS (nominal)
$f < 3.6 \text{ GHz}$	$\leq 25 \text{ MHz}$	NA	$\pm 0.45 \text{ dB}$	0.05 dB
$3.6 \text{ GHz} \leq f \leq 26.5 \text{ GHz}$	$\leq 25 \text{ MHz}$	On		0.45 dB

### IF phase linearity (deviation from mean phase linearity, nominal)

Center frequency	Span	Preselector	Peak-to-Peak	RMS (nominal)
$20 \text{ MHz} \leq f < 3.6 \text{ GHz}$	$\leq 25 \text{ MHz}$	NA	$\pm 0.5^\circ$	$0.2^\circ$
$3.6 \text{ GHz} \leq f \leq 26.5 \text{ GHz}$	$\leq 25 \text{ MHz}$	Off	$\pm 1.5^\circ$	$0.4^\circ$

### IF frequency response (40 MHz IF path)

IF frequency response (demodulation and FFT response relative to the center frequency, 20 to 30 °C)

Center frequency	Span	Preselector	Max. error	RMS (nominal)
$30 \text{ MHz} \leq f < 3.6 \text{ GHz}$	$\leq 40 \text{ MHz}$	NA	$\pm 0.4 \text{ dB}$	0.07 dB

### IF phase linearity (deviation from mean phase linearity, nominal)

Center frequency	Span	Preselector	Peak-to-Peak	RMS (nominal)
$20 \text{ MHz} \leq f < 3.6 \text{ GHz}$	$\leq 40 \text{ MHz}$	NA	$\pm 0.5^\circ$	$0.12^\circ$

## Time Domain Scan (TDS)

<b>Frequency range</b>		
Standard time domain scan (Accelerated TDS = Off) Option N9048TDSB	20 Hz to 26.5 GHz	
Accelerated time domain scan (Accelerated TDS = On) Option N9048WT1B or N9048WT2B	30 MHz to 3.2 GHz	
<b>Trace detectors</b>		
CISPR detectors: peak, quasi-peak, EMI average, RMS average negative peak, voltage average		
<b>Maximum FFT bandwidth</b>		
Frequency range	Accelerated TDS = Off	Accelerated TDS = On
20 Hz to 30 MHz	30 MHz	
30 MHz to 3.2 GHz	59 MHz	350 MHz
3.2 to 3.6 GHz	59 MHz	
3.6 to 26.5 GHz	12.5 MHz	
<b>Real time scan bandwidth</b>		
Option N9048WT1B	Up to 170 MHz	
Option N9048WT2B	Up to 350 MHz	
<b>FFT overlap</b>		
> 92%		
<b>Measurement time</b>		
10 $\mu$ s to 30 s		
<b>Trace point range</b>		
1 to 4,000,001		
<b>Frequency step size</b>		
0.25 $\times$ resolution bandwidth		
<b>Resolution bandwidth (RBW)</b>		
EMI bandwidths (CISPR compliant)	200 Hz, 9 kHz, 120 kHz, 1 MHz	
EMI bandwidths (Mil-STD-461 compliant)	10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz	
<b>Measurement speed</b>		
	Accelerated TDS = Off	Accelerated TDS = On
CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz, measurement time = 100 ms, peak detector	110 ms (nominal)	
CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz, measurement time = 1 s, quasi-peak + EMI average detector	2 s (nominal)	
CISPR band C/D, 30 MHz to 1 GHz, RBW = 120 kHz, measurement time = 10 ms, peak detector	500 ms (nominal)	100 ms (nominal)
CISPR band C/D, 30 MHz to 1 GHz, RBW = 120 kHz, measurement time = 1 s, quasi-peak + EMI average detector	46.4 s (nominal)	5.8 s (nominal)



## RF preselector filters

Filter band	Accelerated TDS = Off	Accelerated TDS = On	Filter type	6 dB Bandwidth (nominal)
150 kHz	x		Fixed lowpass	289 kHz (-3 dB corner frequency)
150 kHz to 30 MHz	x		Fixed bandpass	36 MHz
30 to 300 MHz		x	Fixed bandpass	320 MHz
30 to 52 MHz	x		Fixed bandpass	28 MHz
52 to 75 MHz	x		Fixed bandpass	39 MHz
75 to 120 MHz	x		Fixed bandpass	63 MHz
120 to 165 MHz	x		Fixed bandpass	71 MHz
165 to 210 MHz	x		Fixed bandpass	69 MHz
210 to 255 MHz	x		Fixed bandpass	71 MHz
255 to 300 MHz	x		Fixed bandpass	68 MHz
300 to 650 MHz		x	Fixed bandpass	515 MHz
300 to 475 MHz	x		Fixed bandpass	284 MHz
475 to 650 MHz	x		Fixed bandpass	305 MHz
650 MHz to 1 GHz		x	Fixed bandpass	550 MHz
650 to 825 MHz	x		Fixed bandpass	302 MHz
825 to 1 GHz	x		Fixed bandpass	314 MHz
1 GHz	x	x	Fixed highpass	912 MHz (-3 dB corner frequency)
1.7 GHz	x	x	Fixed highpass	1.56 GHz (-3 dB corner frequency)
2.9 GHz	x	x	Fixed highpass	2.29 GHz (-3 dB corner frequency)

## Related Literature

Publication title	Publication number
N9048B PXE EMI Receiver Configuration Guide	<i>5992-3403EN</i>
N9048B PXE EMI Receiver Specifications Guide	<i>N9048-90010</i>

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