DATA SHEET

N9038B MXE EMI Receiver

3 Hz to 3.6, 8.4, 26.5, and 44 GHz

KEYSIGHT TECHNOLOGIES

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Definitions and Conditions

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 σ) 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 are not covered by the product warranty.

Get more information

This data sheet is a summary of the specifications and conditions which are available in the MXE EMI Receiver Specification Guide N9038-90048.

For ordering information, refer to the MXE EMI Receiver Configuration Guide 3120-1527EN

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 MXE EMI receiver. For the complete specifications guide, visit: www.keysight.com/find/mxe_specifications

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 MXE: 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 MXE, and keep the test queue flowing.

Frequency and Time Specifications

Frequency range		DC coupled	AC coupled
Input 1			
• 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 526		3 Hz to 26.5 GHz	10 MHz to 26.5 GHz
• Option 544		3 Hz to 44 GHz	—
Input 2			
• Option 503, 508, or 526		3 Hz to 1 GHz	10 MHz to 1 GHz
• Option 544		3 Hz to 1 GHz	—
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	17.0 to 26.5 GHz	
5	4	26.4 to 34.5 GHz	
6	8	34.4 to 44 GHz	
Frequency reference			
Accuracy	± [(time since last adjustment x aging rate) + temperature stability + calibration accuracy]		
	Option PFR	**Standard**	
Total aging	± 1 x 10^{-7} / year ± 1.5 x 10^{-7} / 2 years	± 1 x 10^{-6} / year	
Temperature stability	**Option PFR**	**Standard**	
• 20 to 30 °C	± 1.5 x 10^{-8}	± 2 x 10^{-6}	
• Full temperature range	± 5 x 10^{-8}	± 2 x 10^{-6}	
Achievable initial calibration accuracy	± 4 x 10^{-8}	± 1.4 x 10^{-6}	
Residual FM (nominal)	≤ (0.25 Hz x N) p-p in 20 ms	≤ (10 Hz x N) p-p in 20 ms	
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 [1])			
Marker frequency counter			
Accuracy	± (marker frequency x frequency reference accuracy + 0.100 Hz)		
Delta counter accuracy	± (delta frequency x frequency reference accuracy + 0.141 Hz)		
Counter resolution	0.001 Hz		

Frequency span (FFT and swept mode)		
Range	0 Hz (zero span), 10 Hz to maximum frequency of instrument	
Resolution	2 Hz	
Accuracy		
• Stepped/Swept	± (0.25 % x span + horizontal resolution [1])	
• FFT	± (0.1% x span + horizontal resolution [1])	
Sweep time and triggering		
Range	Span = 0 Hz	1 µs to 6000 s
	Span ≥ 10 Hz	1 ms to 4000 s
Accuracy	Span ≥ 10 Hz, swept	± 0.01 % (nominal)
	Span ≥ 10 Hz, FFT	± 40 % (nominal)
	Span = 0 Hz	± 0.01 % (nominal
Trigger	Free run, line, video, external 1, external 2, RF burst, periodic timer	
Trigger delay	Span = 0 Hz or FFT	–150 to +500 ms
	Span ≥ 10 Hz, swept	0 µs to 500 ms
	Resolution	0.1 µs
Time gating		
Gate methods	Gated LO; gated video; gated FFT	
Gate length range (except method = FFT)	100.0 ns to 5.0 s	
Gate delay range	0 to 100.0 s	
Gate delay jitter	33.3 ns p-p (nominal)	
Sweep (trace) point range		
All spans	1 to 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	
Other bandwidths (–6 dB)	30 Hz, 300 Hz, 3 kHz, 30 kHz, 300 kHz, 3 MHz, 10 MHz	
Range (–3.01 dB bandwidth)	1 Hz to 3 MHz (10 % steps, E24 series, 24 per decade), 4, 5, 6, 8 MHz	
Bandwidth accuracy (power)	1 Hz to 750 kHz	± 1.0 % (± 0.044 dB)
	820 kHz to 1.2 MHz (< 3.6 GHz CF)	± 2.0 % (± 0.088 dB)
	1.3 to 2 MHz (< 3.6 GHz CF)	± 0.07 dB (nominal)
	2.2 to 3 MHz (< 3.6 GHz CF)	± 0.15 dB (nominal)
	4 to 8 MHz (< 3.6 GHz CF)	± 0.25 dB (nominal)
Bandwidth accuracy (–3.01 dB)	1 Hz to 1.3 MHz	± 2 % (nominal)
Selectivity (–60 dB/–3 dB)	4.1:1 (nominal)	

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

RF preselector filters	Filter band	Filter type	6 dB BW (nominal)
	20 Hz to 150 kHz	Fixed lowpass	310 kHz
	150 kHz to 1 MHz	Fixed bandpass	1.7 MHz
	1 to 2 MHz	Fixed bandpass	2.4 MHz
	2 to 5 MHz	Fixed bandpass	7.5 MHz
	5 to 8 MHz	Fixed bandpass	10 MHz
	8 to 11 MHz	Fixed bandpass	9.5 MHz
	11 to 14 MHz	Fixed bandpass	9.5 MHz
	14 to 17 MHz	Fixed bandpass	10 MHz
	17 to 20 MHz	Fixed bandpass	9.5 MHz
	20 to 24 MHz	Fixed bandpass	9.5 MHz
	24 to 30 MHz	Fixed bandpass	9.0 MHz
	30 to 70 MHz	Tracking bandpass	10 MHz
	70 to 150 MHz	Tracking bandpass	24 MHz
	150 to 300 MHz	Tracking bandpass	28 MHz
	300 to 600 MHz	Tracking bandpass	50 MHz
	600 MHz to 1 GHz	Tracking bandpass	60 MHz
	1 to 2 GHz	Tracking bandpass	180 MHz
	2 to 3.6 GHz	Fixed highpass	1.89 GHz (–3 dB corner frequency)
Analysis bandwidth [1]			
Maximum bandwidth	Option B1X	160 MHz	
	Option B85	85 MHz	
	Option B25	25 MHz	
	Standard	10 MHz	
Video bandwidth (VBW)			
Range	1 Hz to 3 MHz (10 % steps, E24 series 24 per decade), 4, 5, 6, 8 MHz, and wide open (labeled 50 MHz)		
Accuracy	± 6 % (nominal)		
Measurement speed [2]	**Standard**		
Local measurement and display update rate	4 ms (250/s) (nominal)		
Remote measurement and LAN transfer rate	5 ms (200/s) (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.

Marker peak search	1.5 ms (nominal)
Center frequency tune and transfer (RF)	20 ms (nominal)
Center frequency tune and transfer (µW)	47 ms (nominal)
Measurement/mode switching	39 ms (nominal)
Time domain sweep times	
CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz, measurement time = 100 ms, peak detector	12.1 s (nominal)
CISPR band B, 150 kHz to 30 MHz, RBW = 9 kHz, measurement time = 1 s, quasi-peak detector	181.7 s (nominal)
CISPR band C/D, 30 MHz to 1 GHz, RBW = 120 kHz, measurement time = 10 ms, peak detector	3.1 s (nominal)
CISPR band C/D, 30 MHz to 1 GHz, RBW = 9 kHz, measurement time = 10 ms, peak detector	18.1 s (nominal)
CISPR band C/D, 30 MHz to 1 GHz, RBW = 120 kHz, measurement time = 1 s, quasi-peak detector	211.5 s (nominal)

Amplitude Accuracy and Range Specifications

Amplitude range			
Measurement range	Displayed average noise level (DANL) to maximum safe input level		
Input attenuator range	0 to 70 dB in 2 dB steps		
Maximum safe input level (with and without preamp)	**RF Input 1**	**RF Input 2**	
Average total power	+30 dBm (1 W)	+30 dBm (1 W)	
Peak pulse power	+45 dBm (31.6 W)	+50 dBm (100 W)	< 10 µs pulse width, < 1 % duty cycle and input attenuation ≥ 30 dB
Surge power		+2k W	(10 µs pulse width)
DC volts			
• DC coupled	± 0.2 Vdc	± 0.2 Vdc	
• AC coupled	± 100 Vdc	± 100 Vdc	
Display range			
Log scale	0.1 to 1 dB/division in 0.1 dB steps		
	1 to 20 dB/division in 1 dB steps (10 display divisions)		
Linear scale	10 divisions		
Scale units	dBm, dBmV, dBµV, dBmA, dBµA, V, W, A		
	dBuV/m, dBuA/m, dBpT, dBG, dBpW		

Frequency response		Specification		95th percentile (≈ 2σ)	
		Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)	Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)
(10 dB input attenuation, 20 to 30 °C, preselector centering applied, σ = nominal standard deviation)					
RF preselector off, preamp off	3 Hz to 20 Hz			± 0.25 dB (nominal)	± 0.25 dB (nominal)
	20 Hz to 10 MHz [1]	± 0.6 dB	± 0.6 dB	± 0.22 dB	± 0.25 dB
	10 to 50 MHz	± 0.65 dB	± 0.65 dB	± 0.22 dB	± 0.21 dB
	50 MHz to 3.6 GHz	± 0.65 dB	± 0.65 dB	± 0.22 dB	± 0.15 dB
	3.5 to 5.2 GHz	± 1.5 dB	± 1.6 dB	± 0.47 dB	± 0.6 dB
	5.2 to 8.4 GHz	± 1.5 dB	± 1.5 dB	± 0.47 dB	± 0.57 dB
	8.3 to 13.6 GHz	± 1.5 dB	± 1.5 dB	± 0.46 dB	± 0.54 dB
	13.5 to 17.1 GHz	± 1.5 dB	± 1.5 dB	± 0.53 dB	± 0.64 dB
	17 to 18 GHz	± 1.5 dB	± 1.7 dB	± 0.57 dB	± 0.72 dB
	18 to 22 GHz	± 1.7 dB	± 1.7 dB	± 0.64 dB	± 0.72 dB
	22 to 26.5 GHz	± 1.7 dB	± 1.7 dB	± 0.61 dB	± 0.71 dB
	26.4 to 34.5 GHz		± 2.5 dB		± 0.93 dB
	34.4 to 44 GHz		± 3.2 dB		± 1.24 dB
RF preselector off, preamp on (0 dB attenuation)	100 kHz to 3.6 GHz [1]	± 0.75 dB		± 0.29 dB	
	100 kHz to 10 MHz		± 0.75 dB		± 0.43 dB
	10 to 50 MHz		± 0.75 dB		± 0.29 dB
	50 MHz to 3.6 GHz		± 0.75 dB		± 0.31 dB
	3.5 to 8.4 GHz	± 1.85 dB		± 0.63 dB	
	3.5 to 5.2 GHz		± 2.2 dB		± 0.9 dB
	5.2 to 8.4 GHz		± 1.85 dB		± 0.7 dB
	8.3 to 13.6 GHz	± 1.95 dB	± 1.95 dB	± 0.64 dB	± 0.79 dB
	13.5 to 17.1 GHz	± 1.8 dB	± 1.8 dB	± 0.81 dB	± 0.88 dB
	17 to 18 GHz	± 2.0 dB		± 0.95 dB	
	18 to 22 GHz	± 2.85 dB		± 1.23 dB	
	17 to 22 GHz		± 2.85 dB		± 1.07 dB
	22 to 26.5 GHz		± 2.6 dB	± 1.37 dB	± 1.03 dB
	26.4 to 34.5 GHz	± 2.6 dB	± 3.0 dB		± 1.35 dB
	34.4 to 44 GHz		± 4.1 dB		± 1.69 dB

1. DC coupling required to meet specifications below 50 MHz. With AC coupling, specifications apply at frequencies of 50 MHz and higher. Statistical observations at 10 MHz with AC coupling show that most instruments meet the DC-coupled specifications, however, a small percentage of instruments are expected to have errors exceeding 0.5 dB at 10 MHz at the temperature extreme. The effect at 20 to 50 MHz is negligible but not warranted.

Frequency response		Specification		95th percentile (≈ 2σ)	
		Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)	Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)
RF preselector on, preamp off	3 Hz to 20 Hz			± 0.3 dB (nominal)	± 0.3 dB (nominal)
	20 Hz to 300 MHz [1]	± 0.65 dB	± 0.65 dB	± 0.30 dB	± 0.3 dB
	300 MHz to 1 GHz	± 0.65 dB	± 0.65 dB	± 0.28 dB	± 0.28 dB
	1 to 3.6 GHz	± 0.85 dB	± 0.85 dB	± 0.36 dB	± 0.36 dB
	3.5 to 8.4 GHz	± 1.5 dB		± 0.47 dB	
	3.5 to 5.2 GHz		± 1.6 dB		± 0.6 dB
	5.2 to 8.4 GHz		± 1.5 dB		± 0.57 dB
	8.3 to 13.6 GHz	± 1.5 dB	± 1.5 dB	± 0.46 dB	± 0.54 dB
	13.5 to 17.1 GHz	± 1.5 dB	± 1.5 dB	± 0.53 dB	± 0.64 dB
	17 to 18 GHz	± 1.5 dB	± 1.7 dB	± 0.57 dB	± 0.72 dB
	18 to 22 GHz	± 1.7 dB	± 1.7 dB	± 0.64 dB	± 0.72 dB
	22 to 26.5 GHz	± 1.7 dB	± 1.7 dB	± 0.61 dB	± 0.71 dB
	26.4 to 34.5 GHz		± 2.5 dB		± 0.93 dB
	34.4 to 44 GHz		± 3.2 dB		± 1.24 dB
RF preselector on, preamp on (0 dB attenuation)	1 kHz to 30 MHz [1]	± 0.8 dB	± 0.8 dB	± 0.36 dB	± 0.36 dB
	30 to 300 MHz [1]	± 0.7 dB	± 0.70 dB	± 0.29 dB	± 0.29 dB
	300 MHz to 1 GHz	± 0.65 dB	± 0.65 dB	± 0.30 dB	± 0.30 dB
	1 to 2.75 GHz	± 0.95 dB	± 0.95 dB	± 0.45 dB	± 0.45 dB
	2.75 to 3.6 GHz	± 1.15 dB	± 1.15 dB	± 0.55 dB	± 0.55 dB
	3.5 to 8.4 GHz	± 1.85 dB		± 0.63 dB	
	3.5 to 5.2 GHz		± 2.2 dB		± 0.9 dB
	5.2 to 8.4 GHz		± 1.85 dB		± 0.7 dB
	8.3 to 13.6 GHz	± 1.95 dB	± 1.95 dB	± 0.64 dB	± 0.79 dB
	13.5 to 17.1 GHz	± 1.8 dB	± 1.8 dB	± 0.81 dB	± 0.88 dB
	17 to 18 GHz	± 2.0 dB	± 2.85 dB	± 0.95 dB	± 1.07 dB
	18 to 22 GHz	± 2.85 dB	± 2.85 dB	± 1.23 dB	± 1.07 dB
	22 to 26.5 GHz	± 2.6 dB	± 2.6 dB	± 1.37 dB	± 1.03 dB
	26.4 to 34.5 GHz		± 3.0 dB		± 1.35 dB
	34.4 to 44 GHz		± 4.1 dB		± 1.69 dB

1. DC coupling required to meet specifications below 50 MHz. With AC coupling, specifications apply at frequencies of 50 MHz and higher. Statistical observations at 10 MHz with AC coupling show that most instruments meet the DC-coupled specifications, however, a small percentage of instruments are expected to have errors exceeding 0.5 dB at 10 MHz at the temperature extreme. The effect at 20 to 50 MHz is negligible but not warranted.

Input attenuation switching uncertainty		Specifications	
Attenuation > 2 dB, preamp off Relative to 10 dB (reference setting)	50 MHz (reference frequency)	± 0.20 dB	± 0.08 dB (typical)
Absolute amplitude accuracy		**Specifications**	**95th percentile (≈ 2σ)**
(10 dB attenuation, 20 to 30 °C, 1 Hz ≤ RBW ≤ 1 MHz, input signal –10 to –50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, σ = nominal standard deviation)			
RF preselector off and on, preamp off and on			
RF input 1 to 44 GHz	At 50 MHz	± 0.33 dB	± 0.25 dB
	At all frequencies	± (0.33 dB + frequency response)	
RF input 2 to 1 GHz	At 50 MHz	± 0.36 dB	± 0.27 dB
	At all frequencies	± (0.36 dB + frequency response)	
Input voltage standing wave ratio (VSWR)		**Input attenuation 0 dB**	**Input attenuation ≥ 10 dB**
RF preselector off, preamp on and off			
DC coupled	1 to 18 GHz	3.0:1	2.0:1
	18 to 26.5 GHz	3.0:1	2.0:1
	26.5 to 40 GHz	3.0:1	2.5:1
	40 to 44 GHz	—	—
AC coupled	1 to 18 GHz	3.0:1	2.0:1
	18 to 26.5 GHz	3.0:1	2.4:1
RF preselector on, preamp on and off			
DC coupled	9 kHz to 1 GHz	2.0:1	1.2:1
	1 to 26.5 GHz	3.0:1	2.0:1
	26.5 to 40 GHz	3.0:1	2.5:1
	40 to 44 GHz	—	—
AC coupled	50 MHz to 1 GHz	2.0:1	1.2:1
	1 to 18 GHz	3.0:1	2.0:1
	18 to 26.5 GHz	3.0:1	2.4:1
Resolution bandwidth switching uncertainty (referenced to 30 kHz RBW)			
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		
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 total		
Total measurement uncertainty		**95th percentile (≈ 2σ)**	
Signal level 0 to 90 dB below reference point, RF attenuation 0 to 40 dB, RBW ≤ 3 MHz, 20º to 30º C: AC coupled 10 MHz to 26.5 GHz DC coupled 9 kHz to 40 GHz			
		Option 503, 508, or 526 (RF/µW)	**Option 544 (mmW)**
RF preselector off, preamp off	1 kHz to 2 GHz	± 0.50 dB	± 0.50 dB
	2 to 3.6 GHz	± 0.60 dB	± 0.60 dB
	3.6 to 8 GHz	± 0.80 dB	± 1.70 dB
	8 to 18 GHz	± 1.10 dB	± 1.30 dB
	18 to 26.5 GHz	± 1.60 dB	± 1.60 dB
	26.5 to 40 GHz		± 1.70 dB
	40 to 44 GHz		± 2.30 dB
RF preselector off, preamp on	100 kHz to 2 GHz	± 0.60 dB	± 0.60 dB
	2 to 3.6 GHz	± 0.60 dB	± 0.60 dB
	3.6 to 8 GHz	± 1.10 dB	± 1.80 dB
	8 to 18 GHz	± 1.30 dB	± 1.30 dB
	18 to 26.5 GHz	± 1.90 dB	± 1.90 dB
	26.5 to 40 GHz		± 1.90 dB
	40 to 44 GHz		± 2.40 dB
RF preselector on, preamp off	9 kHz to 2 GHz	± 0.50 dB	± 0.50 dB
	2 to 3.6 GHz	± 0.50 dB	± 0.60 dB
	3.6 to 8 GHz	± 0.80 dB	± 1.70 dB
	8 to 18 GHz	± 1.10 dB	± 1.30 dB
	18 to 26.5 GHz	± 1.60 dB	± 1.60 dB
	26.5 to 40 GHz		± 1.70 dB
	40 to 44 GHz		± 2.30 dB
RF preselector on, preamp on	9 kHz to 2 GHz	± 0.50 dB	± 0.50 dB
	2 to 3.6 GHz	± 0.70 dB	± 0.70 dB
	3.6 to 8 GHz	± 1.10 dB	± 1.80 dB
	8 to 18 GHz	± 1.30 dB	± 1.30 dB
	18 to 26.5 GHz	± 1.90 dB	± 1.90 dB
	26.5 to 40 GHz		± 1.90 dB
	40 to 44 GHz		± 2.40 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 (Option P03/P08/P26/P44)		
Gain	100 kHz to 3.6 GHz	+20 dB (nominal)
• RF preselector off	3.6 to 26.5 GHz	+35 dB (nominal)
	26.5 to 44 GHz	+40 dB (nominal)
• RF preselector on	9 kHz to 3.6 GHz	+20 dB (nominal)
	3.6 to 26.5 GHz	+35 dB (nominal)
	26.5 to 44 GHz	+40 dB (nominal)
Amplitude probability distribution		
Dynamic range	> 70 dB	
Amplitude accuracy	< ± 2.7 dB	
Maximum measureable time period (no dead time)	2 minutes	
Minimum measureable probability	10^{-7}	
Amplitude level assignment	1000 levels	
Sampling rate	≥ 10 MSa/s (within a 1 MHz RBW)	
Amplitude resolution	0.1881 dB	

Dynamic Range Specifications

1 dB gain compression		Specification		Typical	
		Maximum power at mixer			
	Frequency range	Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)	Option 503, 508, or 526 (RF/µW)	Option 544 (mmW)
RF Input 1 to 44 GHz (RF Input 2 to 1 GHz, performance = RF Input 1 performance + 9 dB)					
RF preselector on and off, preamp off	9 kHz to 10 MHz			+4 dBm (nominal)	+4 dBm (nominal)
	10 to 500 MHz	0 dBm	0 dBm	+3 dBm (typical)	+3 dBm (typical)
	500 MHz to 3.6 GHz	+1 dBm	+1 dBm	+5 dBm (typical)	+5 dBm (typical)
	3.6 to 26.5 GHz	0 dBm	0 dBm	+4 dBm (typical)	+4 dBm (typical)
	26.4 to 44 GHz		–3 dBm		+2 dBm (typical)
RF preselector off, preamp on	10 MHz to 3.6 GHz			–13 dBm (nominal)	−13 dBm (nominal)
	3.6 to 26.5 GHz				
	Tone spacing 100 kHz to 20 MHz			−26 dBm (nominal)	−30 dBm (nominal)
	Tone spacing > 70 MHz			−16 dBm (nominal)	−16 dBm (nominal)
	26.4 to 44 GHz				−30 dBm (nominal)
RF preselector on, preamp on	9 kHz to 10 MHz			–16 dBm (nominal)	–16 dBm (nominal)
	10 MHz to 2 GHz			–18 dBm (typical)	–21 dBm (typical)
	2 to 3.6 GHz			–16 dBm (typical)	–17 dBm (typical)
	3.6 to 26.5 GHz				
	Tone spacing, 100 kHz to 20 MHz			−26 dBm (nominal)	−30 dBm (nominal)
	Tone spacing > 70 MHz			−16 dBm (nominal)	−16 dBm (nominal)
	26.4 to 44 GHz				−30 dBm (nominal)

Displayed average noise level (DANL)			
Input terminated, sample or average detector, averaging type = Log, 0 dB input attenuation, IF Gain = High, 20 to 30 °C) RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance +11 dB			
		Specification	**Typical including NFE [1]**
RF preselector off, preamp off	3 to 10 Hz	—	–97 dBm (nominal) [2]
	20 Hz	–97 dBm	—
	100 Hz	–106 dBm	—
	1 kHz	–118 dBm	—
	9 kHz	–119 dBm	—
	100 kHz	–131 dBm	—
	1 MHz	–150 dBm	—
	10 MHz to 2.1 GHz	–150 dBm	–158 dBm
	2.1 to 3.6 GHz	–148 dBm	–157 dBm
	3.5 to 8.4 GHz	–148 dBm	–159 dBm
	• Option 544	–145 dBm	–153 dBm
	8.3 to 13.6 GHz	–147 dBm	–158 dBm
	• Option 544	–147 dBm	–156 dBm
	13.5 to 17.1 GHz	–141 dBm	–151 dBm
	17.0 to 20.0 GHz	–142 dBm	–152 dBm
	20.0 to 26.5 GHz	–135 dBm	–146 dBm
	26.4 to 34.5 GHz	–141 dBm	–148 dBm
	34.4 to 44 GHz	–135 dBm	–143 dBm
RF preselector off, preamp on	100 kHz	–144 dBm	—
	1 MHz	–162 dBm	—
	10 MHz to 2.1 GHz	–163 dBm	–175 dBm
	2.1 to 3.6 GHz	–161 dBm	–173 dBm
	3.5 to 8.4 GHz	–164 dBm	–172 dBm
	• Option 544	–161 dBm	–166 dBm
	8.3 to 13.6 GHz	–162 dBm	–173 dBm
	• Option 544	–161 dBm	–170 dBm
	13.5 to 17.1 GHz	–160 dBm	–171 dBm
	17.0 to 20.0 GHz	–158 dBm	–165 dBm
	20.0 to 26.5 GHz	–155 dBm	–162 dBm
	26.4 to 34.5 GHz	–156 dBm	–164 dBm
	34.4 to 44 GHz	–150 dBm	–158 dBm

1. Typical Indicated Noise including NFE = typical DANL+ Bandwidth and Log corrrections-DANL improvement with NFE.
2. No NFE at this frequency.

Displayed average noise level (DANL)			
(Input terminated, sample or average detector, averaging type = Log, 0 dB input attenuation, IF Gain = High, 20 to 30 °C) RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance +11 dB			
		Specification	Typical including NFE [1]
RF preselector on, preamp off	3 to 10 Hz	—	–92 dBm (nominal) [2]
	20 Hz	–92 dBm	–100 dBm [2]
	100 Hz	–101 dBm	–109 dBm [2]
	1 kHz	–114 dBm	–120 dBm [2]
	9 kHz	–118 dBm	–132 dBm
	100 kHz	–130 dBm	–143 dBm
	1 to 3 MHz	–147 dBm	–158 dBm
	3 to 30 MHz	–150 dBm	–160 dBm
	30 to 300 MHz	–151 dBm	–161 dBm
	300 to 600 MHz	–153 dBm	–164 dBm
	600 MHz to 1 GHz	–151 dBm	–162 dBm
	1 to 2 GHz	–150 dBm	–161 dBm
	2 to 2.5 GHz	–152 dBm	–164 dBm
	2.5 to 3 GHz	–151 dBm	–163 dBm
	3 to 3.6 GHz	–148 dBm	–161 dBm
	3.5 to 8.4 GHz	–148 dBm	–159 dBm
	• Option 544	–145 dBm	–153 dBm
	8.3 to 13.6 GHz	–147 dBm	–158 dBm
	• Option 544	–147 dBm	–156 dBm
	13.5 to 17.1 GHz	–141 dBm	–151 dBm
	17.0 to 20.0 GHz	–142 dBm	–152 dBm
	20.0 to 26.5 GHz	–135 dBm	–146 dBm
	26.4 to 34.5 GHz	–141 dBm	–148 dBm
	34.4 to 44 GHz	–135 dBm	–143 dBm
RF preselector on, preamp on	1 kHz	–119 dBm	–133 dBm [2]
	9 kHz	–143 dBm	–154 dBm
	100 kHz	–154 dBm	–165 dBm
	1 to 2 MHz	–166 dBm	–178 dBm
	2 to 30 MHz	–158 dBm	–167 dBm
	30 to 600 MHz	–159 dBm	–166 dBm
	600 to 800 MHz	–157 dBm	–166 dBm
	800 MHz to 1 GHz	–158 dBm	–167 dBm
	1 to 2 GHz	–156 dBm	–164 dBm
	2 to 2.75 GHz	–160 dBm	–168 dBm
	2.75 to 3.6 GHz	–157 dBm	–165 dBm

1. Typical DANL including NFE = Typical DANL-DANL improvement with NFE.
2. No NFE factor at this frequency.

	3.5 to 8.4 GHz	–164 dBm	–172 dBm
	• Option 544	–161 dBm	–166 dBm
	8.3 to 13.6 GHz	–162 dBm	–173 dBm
	• Option 544	–161 dBm	–170 dBm
	13.5 to 17.1 GHz	–160 dBm	–171 dBm
	17.0 to 20.0 GHz	–158 dBm	–165 dBm
	20.0 to 26.5 GHz	–155 dBm	–162 dBm
	26.4 to 34.5 GHz	–156 dBm	–164 dBm
	34.4 to 44 GHz	–150 dBm	–158 dBm

Indicated noise in CISPR BW		
Calculated from DANL data; EMI-AVG detector, 0 dB input attenuation; indicated RBW is CISPR RBW RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance +11 dB		
		Typical including NFE [1]
RF preselector on, preamp off	3 to 10 Hz (1 Hz RBW)	+ 17 dBµV [2] (nominal)
	20 Hz (1 Hz)	+9 dBµV [2]
	100 Hz (10 Hz)	+10 dBµV [2]
	1 kHz (100 Hz)	+9 dBµuV [2]
	9 kHz (200 Hz)	–2 dBµV
	100 kHz (200 Hz)	–13 dBµV
	1 to 3 MHz (9 kHz)	–11 dBµV
	3 to 30 MHz (9 kHz)	–13 dBµV
	30 to 300 MHz (120 kHz)	–3 dBµV
	300 to 600 MHz (120 kHz)	–6 dBµV
	600 MHz to 1 GHz (120 kHz)	–4 dBµV
	1 to 2 GHz (1 MHz)	+6 dBµV
	2 to 2.5 GHz (1 MHz)	+3 dBµV
	2.5 to 3 GHz (1 MHz)	+4 dBµV
	3 to 3.6 GHz (1 MHz)	+6 dBµV
	3.5 to 8.4 GHz (1 MHz)	+8 dBµV
	• Option 544	+14 dBµV
	8.3 to 13.6 GHz (1 MHz)	+9 dBµV
	• Option 544	+11 dBµV
	13.5 to 17.1 GHz (1 MHz)	+16 dBµV
	17.0 to 20.0 GHz (1 MHz)	+15 dBµV
	20.0 to 26.5 GHz (1 MHz)	+21 dBµV
	26.4 to 34.5 GHz (1 MHz)	+19 dBµV
	34.4 to 44 GHz (1 MHz)	+24 dBµV

1. Typical Indicated Noise including NFE = Typical DANL+ Bandwidth and Log corrrections-DANL improvement with NFE.
2. No NFE factor at this frequency.

RF preselector on, preamp on	1 kHz (100 Hz RBW)	–4 dBµV [1]
	9 kHz (200 Hz)	–24 dBµV
	100 kHz (200 Hz)	–35 dBµV
	to 2 MHz (9 kHz)	–31 dBµV
	to 30 MHz (9 kHz)	–20 dBµV
	30 to 600 MHz (120 kHz)	–8 dBµV
	600 to 800 MHz (120 kHz)	–8 dBµV
	800 MHz to 1 GHz (120 kHz)	–9 dBµV
	to 2 GHz (1 MHz)	+3 dBµV
	to 2.75 GHz (1 MHz)	–1 dBµV
	2.75 to 3.6 GHz (1 MHz)	+2 dBµV
	3.5 to 8.4 GHz (1 MHz)	–5 dBµV
	• Option 544	–1 dBµV
	8.3 to 13.6 GHz (1 MHz)	–6.0 dBµV
	• Option 544	–4 dBµV
	13.5 to 17.1 GHz (1 MHz)	–4 dBµV
	17.0 to 20.0 GHz (1 MHz)	+2 dBµV
	20.0 to 26.5 GHz (1 MHz)	+5 dBµV
	26.4 to 34.5 GHz (1 MHz)	+3 dBµV
	34.4 to 44 GHz (1 MHz)	+9 dBµV

1. No NFE factor at this frequency.

Spurious responses			
RF Input 1; RF preselector on and off			
	Source frequency	**Specification**	**Typical**
Residual responses [1] (Input terminated and 0 dB attenuation)	200 kHz to 8.4 GHz (swept)	–100 dBm	
	Zero span or FFT or other	–100 dBm (nominal)	
Image responses f ± 645 MHz Mixer level –10 dBm	10 MHz to 3.6 GHz	–80 dBc	–108 dBc
	3.5 to 13.6 GHz	–78 dBc	–88 dBc
	13.5 to 17.1 GHz	–74 dBc	–85 dBc
	17.0 to 22 GHz	–70 dBc	–82 dBc
	22 to 26.5 GHz	–68 dBc	–78 dBc
	26.5 to 34.5 GHz [3]	–70 dBc	–94 dBc
	34.4 to 44 GHz [3]	–60 dBc	–79 dBc
LO related spurious f > 600 MHz from carrier	10 MHz to 3.6 GHz		–90 dBc + 20xlogN [2]
Other spurious f ≥ 10 MHz from carrier	Carrier frequency ≤ 26.5 GHz	–80 dBc + 20xlogN [1]	
	Carrier frequency > 26.5 GHz		–90 dBc (nominal)

1. RF2 performance = RF1 performance +11 dB.
2. N is the LO multiplication factor.
3. Mixer level -30 dBm.

Second harmonic distortion (SHI)			
RF Input 1; input power –9 dBm, input attenuation 6 dB; RF Input 2 to 1 GHz. RF Input 2 performance = RF Input 1 performance +9 dB			
	Source frequency	**Specification**	**Typical**
RF preselector off, preamp off	10 MHz to 1.0 GHz	+45 dBm	+54 dBm
	1.0 to 1.8 GHz	+41 dBm	+50 dBm
	1.8 to 6.8 GHz	+65 dBm	+68 dBm
	1.8 to 3 GHz (Option 544)	+58 dBm	+64 dBm
	3 to 6.8 GHz (Option 544)	+60 dBm	+69 dBm
	6.8 to 11 GHz	+55 dBm	+64 dBm
	11 to 13.25 GHz	+50 dBm	+60 dBm
	13.2 to 22 GHz (Option 544)	+44 dBm	+51 dBm
RF preselector off, preamp on	10 MHz to 1.8 GHz (Preamp power = –45 dBm)		+33 dBm (nominal)
	1.8 to 13.25 GHz (Preamp power = –50 dBm)		+10 dBm (nominal)
	13.2 to 22 GHz (Option 544)		+0 dBm (nominal)
RF preselector on, preamp off	10 to 30 MHz	+47 dBm	+50 dBm
	30 to 500 MHz	+57 dBm	+63 dBm
	500 MHz to 1GHz	+45 dBm	+47 dBm
	1 to 1.6 GHz	+58 dBm	+70 dBm
	1.6 to 1.8 GHz	+46 dBm	+52 dBm
	1.8 to 6.8 GHz	+65 dBm	+68 dBm
	1.8 to 3 GHz (Option 544)	+58 dBm	+64 dBm
	3 to 6.8 GHz (Option 544)	+60 dBm	+69 dBm
	6.8 to 11 GHz	+55 dBm	+64 dBm
	11 to 13.25 GHz	+50 dBm	+60 dBm
	13.2 to 22 GHz (Option 544)	+44 dBm	+51 dBm
RF preselector on, preamp on, • Input power = –9 dBm • Attenuation = 26 dB	10 to 300 MHz		+53 dBm (nominal)
	300 to 500 MHz		+58 dBm (nominal)
	500 MHz to 1 GHz		+47 dBm (nominal)
	1 to 1.6 GHz		+53 dBm (nominal)
	1.6 to 1.8 GHz		+30 dBm (nominal)
	1.8 to 13.25 GHz (Preamp power = –50 dBm)		+10 dBm (nominal)
	13.2 to 22 GHz (Option 544)		+0 dBm (nominal)

1. N is the LO multiplication factor.

Third-order intermodulation distortion (TOI)			
(Two –14 dBm tones at input and 4 dB of input attenuation; tone separation > 5 times IF prefilter bandwidth, 20 to 30 °C, see Specifications Guide for IF prefilter bandwidths); RF Input 1; RF Input 2 to 1 GHz; RF Input 2 performance = RF Input 1 performance +9 dB			
		TOI	TOI (typical)
RF preselector off, preamp off	10 to 100 MHz	+12 dBm	+17 dBm
	100 to 400 MHz	+15 dBm	+20 dBm
	400 MHz to 1.7 GHz	+16 dBm	+20 dBm
	1.7 to 3.6 GHz	+16 dBm	+19 dBm
	3.5 to 8.4 GHz	+15 dBm	+18 dBm
	8.3 to 13.6 GHz	+15 dBm	+18 dBm
	13.5 to 26.5 GHz	+10 dBm	+14 dBm
	26.4 to 44 GHz	+10 dBm	+13 dBm
RF preselector off, preamp on	10 to 500 MHz		+4 dBm (nominal)
	500 MHz to 3.6 GHz		+5 dBm (nominal)
	3.6 to 26.5 GHz		–15 dBm (nominal)
	26.4 to 44 GHz		–17 dBm (nominal)
RF preselector on, preamp off	10 to 30 MHz	+12 dBm	+16 dBm
	30 MHz to 1 GHz	+12.5 dBm	+15 dBm
	1 to 1.5 GHz	+12.5 dBm	+14 dBm
	1.5 to 3.6 GHz	+14.5 dBm	+16 dBm
	3.5 to 8.4 GHz	+15 dBm	+18 dBm
	8.3 to 13.6 GHz	+15 dBm	+18 dBm
	13.5 to 26.5 GHz	+10 dBm	+14 dBm
	26.4 to 44 GHz (Option 544)	+10 dBm	+13 dBm
RF preselector on, preamp on	10 to 30 MHz	–9 dBm	–5 dBm
	30 MHz to 1 GHz	–9 dBm	–4 dBm
	1 to 2 GHz	–4 dBm	–2 dBm
	2 to 3.6 GHz	–6 dBm	–3 dBm
	3.6 to 26.5 GHz		−15 dBm (nominal)
	26.4 to 44 GHz (Option 544)		−17 dBm (nominal)
Phase noise [2]	**Offset**	**Specification**	**Typical**
Noise sidebands 20 to 30 °C CF = 1 GHz	10 Hz		–80 dBc/Hz (nominal)
	100 Hz	–91 dBc/Hz	–100 dBc/Hz
	1 kHz		–112 dBc/Hz (nominal)
	10 kHz	–113 dBc/Hz	–114 dBc/Hz
	100 kHz	–116 dBc/Hz	–117 dBc/Hz
	1 MHz	–135 dBc/Hz	–136 dBc/Hz
	10 MHz		–148 dBc/Hz (nominal)

1. Preamp input power = input power-input attenuation (–9 dB for input 2).
2. For nominal values, refer to Figure 1.

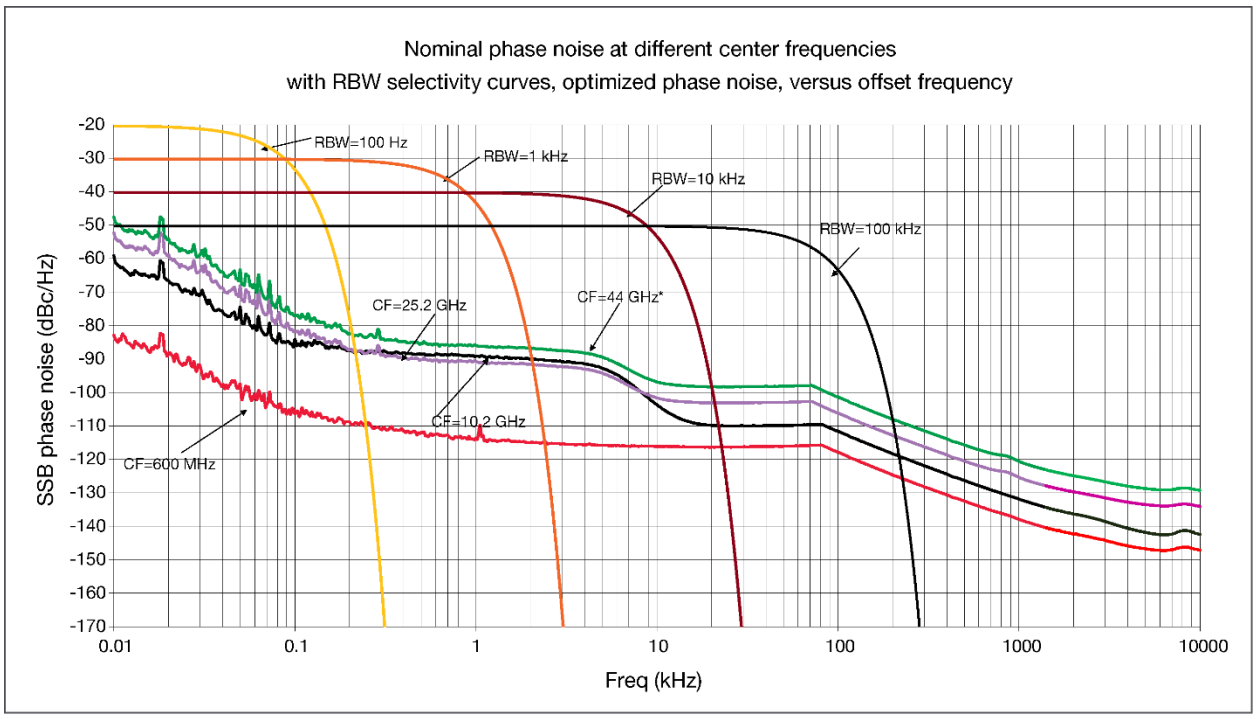

Figure 1. Nominal phase noise at different center frequencies.

PowerSuite Measurement Specifications

Channel power		
Amplitude accuracy, W-CDMA or IS95 (20 to 30 °C, attenuation = 10 dB)	± 0.82 dB (± 0.23 dB 95th percentile)	
Occupied bandwidth		
Frequency accuracy	± [span/1000] (nominal)	
Adjacent channel power		
Accuracy, W-CDMA (ACLR)		
(At specific mixer levels and ACLR ranges)	Adjacent	Alternate
• MS	± 0.14 dB	± 0.21 dB
• BTS	± 0.49 dB	± 0.44 dB
Dynamic range (typical)		
• Without noise correction	–73 dB	–79 dB
• With noise correction	–78 dB	–82 dB

Offset channel pairs measured	1 to 6	
ACP measurement and transfer time (fast method)	14 ms (nominal) (σ = 0.2 dB)	
Multiple number of carriers measured	Up to 12	
Power statistics CCDF		
Histogram resolution	0.01 dB	
Harmonic distortion		
Maximum harmonic number	10^{th}	
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, power within burst width	
Results	Single burst output power, average output pow burst, burst width	
Spurious emission		
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	
Spectrum emission mask (SEM)		
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 European EMC Directive 2004/108/EC	
• IEC/EN 61326-2-1	
• CISPR Pub 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 16-1-1:2019	The features in this instrument comply with the performance requirements of this basic standard [1]
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	
LpA < 70 dB	
Operator position	
Normal position	
Per ISO 7779	
Environmental stress	
Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation, and end-use; those stresses include, but are not limited to, temperature, humidity, shock, vibration, altitude, and power line conditions; test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3	
Power requirements	
Voltage and frequency (nominal)	100/120 V, 50/60/400 Hz
	220/240 V, 50/60 Hz
Power consumption	
• On	450 W maximum
• Standby	20 W

1. The use of Noise Floor Extension (NFE) is required to meet the “isolated pulse” test case in Bands B, C, and D. In addition, when making measurements in Band B below 160 kHz using time domain scans or making measurements using meters in monitor spectrum, NFE is also required to meet the 1 Hz pulse repetition frequency (prf) test case for the quasi-peak detector (QPD) and for the 5 Hz prf test case for the RMS-avg detector.

Display	
Resolution	1280 × 800
Size	269 mm (10.6 in) diagonal (nominal) capacitive multi-touch screen
Data storage	
Internal	≥ 80 GB (nominal) (removable solid state drive)
External	Supports USB 2.0 compatible memory devices
Weight (without options)	
Net	24 kg (52 lbs) (nominal)
Shipping	36 kg (79 lbs) (nominal)
Dimensions	
Height	177 mm (7.0 in)
Width	426 mm (16.8 inches)
Length	556 mm (21.9 inches)
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 Ω (nominal) (standard)
	3.5 mm male, 50 Ω (Option C35)
	2.4 mm male, 50 Ω (Option 544 only)
• RF Input 2 Connector	Type-N female, 50 Ω (nominal) (standard)
External Mixing (Option EXM)	
• Connection port	
◦ Connector	SMA, female
◦ Impedance	50 Ω, nominal
◦ Functions	Triplexed for LO output, IF input, and mixer bias
• Mixer bias range	± 10 mA in 10 µA step
• IF input center frequency	
◦ IF BW path <= 25 MHz	322.5 MHz (note - please use the proper <= sign)
◦ 85/160 MHz BW IF path	300 MHz
• LO output frequency range	3.75 to 14.0 GHz

Probe power	
• Voltage/current	+15 Vdc, ± 7% at 150 mA max (nominal)
	–12.6 Vdc, ± 10% at 150 mA max (nominal)
USB ports - Host (3 ports)	
• Standard	Compatible with USB 2.0
• Connector	USB type-A female
• Output current	
◦ Port marked with lightning bolt	1.2 A (nominal)
◦ Ports not marked with lightning bolt	0.5 A (nominal)
Headphone jack	
• Connector	Miniature stereo audio jack 3.5 mm
Rear panel	
10 MHz out	
• Connector	BNC female, 50 Ω (nominal)
• Output amplitude	≥ 0 dBm (nominal)
• Frequency	10 MHz × (1+ 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)
• Frequency lock range	± 5 x 10^{-6} of specified external reference input frequency
Trigger 1 and 2 inputs	
• Connector	BNC female
• Impedance	> 10 kΩ (nominal)
• Trigger level range	–5 to 5 V
Trigger 1 and 2 outputs	
• Connector	BNC female
• Impedance	50 Ω (nominal)
• Level	0 to 5 V (CMOS)
Monitor output 1 (Option PC6, PC6S, PC8 CPUs)	
• 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 (Option PC6, PC6S, PC8 CPUs)	
• Connector	Mini DisplayPort
• Resolution	1280 x 768
Monitor Output (Option PCA CPU)	
• Connector	DisplayPort

• Resolution	1280 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 (Option PC6, PC6S, PC8 CPUs)	
- Host, super speed	2 ports (stacked with each other)
• Compatibility	USB 3.0
• Connector	USB Type A (female)
• Output current	0.9 A, nominal
- Host	1 port (stacked with LAN)
• Compatibility	USB 2.0
• Connector	USB Type A (female)
• Output current	0.5 A, nominal
- Device	1 port
• Compatibility	USB 3.0
• Connector	USB Type B (female)
• Output current	0.9 A, nominal
USB ports (Option PCA CPU)	
- Host	4 ports
• Standard	Compatible with USB 3.0
• Connector	USB Type-A female
• Output current	0.9 A (nominal)
- Device	
• Standard	Compatible with USB 3.0
• Connector	USB Type-B female
Thunderbolt (Option PCA CPU)	
• Connector	USB Type-C female, 2 ports
• Output current	5V, 1.0 A max
GPIB interface	
• Connector	IEEE-488 bus connector
• GPIB codes	SH1, AH1, T6, SR1, RL1, PP0, DC1, C1, C2, C3, C28, DT1, L4, C0
• GPIB mode	Controller or device
LAN TCP/IP interface (Option PC6, PC6S, PC8 CPUs)	
• Standard	1G Base-T
• Connector	RJ45 Ethertwist

LAN TCP/IP interface (Option PCA CPU)	
• Standard	1G Base-T
• Connector	RJ45 Ethertwist
• Standard	10G Base-T
• Connector	RJ45 Ethertwist
Aux I/O connector	
• Connector	25-pin D-SUB

I/Q 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	10 Hz to 10 MHz			
Option B25	10 Hz to 25 MHz			
Option B85	10 Hz to 85 MHz			
Option B1X	10 Hz to 160 MHz			
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 (GHz)	**Span (MHz)**	**Microwave preselector**	**Max. error**	**RMS (nominal)**
≤ 3.6	≤ 10	NA	± 0.40 dB	0.04 dB
3.6 < f ≤ 26.5	≤ 10	On		0.25 dB
f > 26.5	≤ 10	On		0.35 dB
IF phase linearity (deviation from mean phase linearity, nominal)				
Center frequency (GHz)	**Span (MHz)**	**Microwave preselector**	**Peak-to-peak (nominal)**	**RMS (nominal)**
0.02 < f ≤ 3.6	≤ 10	NA	0.4°	0.1°
3.6 < f ≤ 26.5	≤ 10	On	1.0°	0.2° (nom)
Data acquisition (10 MHz IF path)				
Time record length				
• IQ analyzer	32,000,001 IQ sample pairs			
Sample rate	100 MSa/s			
ADC resolution	16 bits			

I/Q Analyzer — Option B25

25 MHz analysis bandwidth

IF frequency response				
IF frequency response (demodulation and FFT response relative to the center frequency, 20 to 30 °C)				
Center frequency (GHz)	**Span (MHz)**	**Microwave preselector**	**Max. error**	**RMS (nominal)**
≤ 3.6	10 to ≤ 25	NA	± 0.45 dB	0.051 dB
3.6 < f ≤ 44	10 to ≤ 25	On		0.45 dB
IF phase linearity (deviation from mean phase linearity, nominal)				
Center frequency (GHz)	**Span (MHz)**	**Microwave preselector**	**Peak-to-peak (nominal)**	**RMS (nominal)**
0.02 ≤ f < 3.6	≤ 25	NA	0.6°	0.14°
3.6 ≤ f ≤ 26.5	≤ 25	On	4.5°	1.2°
Data acquisition (25 MHz IF path)				
Time record length				
• IQ analyzer	32,000,001 IQ sample pairs			
• 89600 VSA software	Data packing			
	32-bit	64-bit	Memory	
	536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)	2 GB	
Sample rate	90 MSa/s			
ADC resolution	14 bits			

I/Q Analyzer — Option B85/B1X

85/160 MHz analysis bandwidth

IF frequency response					
IF frequency response (20 to 30 °C)					
Center frequency (GHz)	**Span (MHz)**	**Microwave preselector**		**Typical**	**RMS (nominal)**
0.15 ≤ f < 3.6	≤ 85	NA	± 0.6 dB	± 0.17 dB	0.05 dB
	≤ 160	NA		± 0.2 dB nominal	0.07 dB
IF phase linearity (deviation from mean phase linearity, nominal)					
Center frequency (GHz)	**Span (MHz)**	**Microwave preselector**		**Peak-to-peak (nominal)**	**RMS (nominal)**
0.03 ≤ f < 3.6	≤ 85	NA		1.6°	0.54°
	≤ 160	NA		4.7°	1.23°

Dynamic range			
SFDR (Spurious-free dynamic range)			
• Signal frequency within ± 12 MHz of center	–72 dBc, nominal		
• Signal frequency anywhere within analysis BW			
• Spurious response within ± 63 MHz of center	–71 dBc, nominal		
• Response anywhere within analysis BW	–69 dBc, nominal		
Full scale (ADC clipping)			
Default settings, signal at CF (IF gain = Low: IF gain offset = 0 dB)			
• Band 0	–8 dBm mixer level, nominal		
• Band 1 through 6	–7 dBm mixer level, nominal		
High gain setting, signal at CF (IF gain = High)			
• Band 0	–18 dBm mixer level nominal, subject to gain limitations		
• Band 1 through 6	–17 dBm mixer level nominal, subject to gain limitations		
Effect of signal frequency ≠ CF	Up to ± 3 dB, nominal		
Data acquisition (85/160 MHz IF path)			
Time record length			
• IQ analyzer	32,000,001 IQ sample pairs		
• 89600 VSA software	Data packing		
	32-bit	64-bit	Memory
• Length (IQ sample pairs)	536 MSa (2^{29} Sa)	268 MSa (2^{28} Sa)	2 GB
• Length (time units)	Samples/(span x 1.25)		
Sample rate			
IQ pairs	1.25 x IFBW		
ADC resolution	14 bits		

Real-Time Spectrum Analyzer (RTSA) [1]

Option RT1

Real-time analysis		
Real-time analysis bandwidth		
• Option RT1	Up to 160 MHz ≤ 3.6 GHz	
	Up to 40 MHz > 3.6 GHz	
Minimum signal duration with 100% probability of intercept (POI) at full amplitude accuracy		
• Option RT1	3.7 µs	
Minimum acquisition time	104 µs	Spectrogram
FFT rate	292,969/s	
Supported triggers	Level, Level with time qualified (TQT), Line, External, RF burst, Frame, Frequency mask (FMT), FMT with TQT	

1. For additional RTSA specifications, please refer to Option RT1 Chapter in the MXE Signal Analyzer specifications guide (part number: N9038-90048).

Related Literature

Keysight MXE EMI receiver

Publication title	Publication number
MXE EMI Receiver, Configuration Guide	3120-1527EN

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